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Vol. 1190 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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PATENTS

September 3, 1996

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

...WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

September 3, 1996 Volume 1190 Number 1

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Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1187 O.G. 49, on June 18, 1996.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective July 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1187 O.G. 73, on June 25, 1996.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective July 1, 1996, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	220.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed	660.00
— Corresponding prior U.S. national application filed	430.00
— Supplemental search fee, per additional invention (payable only upon invitation)	190.00
European Patent Office as ISA	1585.00
International fees	
Basic fee	677.00
Basic supplemental fee (for each page over 30)	13.00
Designation fee per country or region	
— For the first 11 national or regional offices designated	164.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	164.00
— Confirmation fee	82.00
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	207.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	470.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	710.00
— Additional examination fee, per additional invention (payable only upon invitation)	250.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	47.00	94.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	340.00	680.00
USPTO was ISA but not IPEA	375.00	750.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	505.00	1010.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	440.00	880.00
Other National fees		
— For each independent claim in excess of 3	39.00	78.00
— For each claim in excess of 20	11.00	22.00
— For each application containing a multiple dependent claim	125.00	250.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(l)	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

June 4, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Patent Cooperation Treaty Update

Withdrawal by Greece of its Chapter II Reservation

On June 7, 1996, Greece notified the World Intellectual Property Organization (WIPO) that it was withdrawing its declaration under Article 64(1)(a) of the Patent Cooperation Treaty (PCT). Thus, Greece will become bound by Chapter II of the PCT on September 7, 1996, and nationals and residents of Greece may, from that date, submit demands for international preliminary examination of international applications filed by them, irrespective of whether the international application is filed before, on or after September 7, 1996.

Accession by Saint Lucia

The United States Patent and Trademark Office received notification from the World Intellectual Property Organization (WIPO) that Saint Lucia deposited its instrument of accession of the PCT on May 30, 1996. Saint Lucia will become the 86th Contracting State of the PCT on August 30, 1996. Consequently, nationals and residents of Saint Lucia are entitled to file international applications under the PCT on and after August 30, 1996, and from the same date it is possible to file international applications designating and electing Saint Lucia (country code: LC).

Accession by Bosnia and Herzegovina

The United States Patent and Trademark Office received notification from the World Intellectual Property Organization (WIPO) that Bosnia and Herzegovina deposited its instrument of accession of the PCT on June 7, 1996. Bosnia and Herzegovina will become the 87th Contracting State of the PCT on September 7, 1996. Consequently, nationals and residents of Bosnia and Herzegovina are entitled to file international applications under the PCT on and after September 7, 1996, and from the same date it is possible to file international applications designating and electing Bosnia and Herzegovina (country code: BA).

Listing of PCT Member Countries

Country	Instrument	Date of Deposit of Instrument	Entry into Force[1]
(1) Central African Republic[2]	Accession	15 September 1971	24 January 1978
(2) Senegal[2]	Ratification	08 March 1972	24 January 1978
(3) Madagascar	Ratification	27 March 1972	24 January 1978
(4) Malawi[3]	Accession	16 May 1972	24 January 1978
(5) Cameroon[2]	Accession	15 March 1973	24 January 1978
(6) Chad[2]	Accession	12 February 1974	24 January 1978
(7) Togo[2]	Ratification	28 January 1975	24 January 1978
(8) Gabon[2]	Accession	06 March 1975	24 January 1978
(9) United States of America	Ratification	26 November 1975	24 January 1978
(10) Germany[3]	Ratification	19 July 1976	24 January 1978
(11) Congo[2]	Accession	08 August 1977	24 January 1978
(12) Switzerland[3]	Ratification	14 September 1977	24 January 1978
(13) United Kingdom[3]	Ratification	24 October 1977	24 January 1978
(14) France[3]	Ratification	25 November 1977	25 February 1978
(15) Russian Federation	Ratification	29 December 1977	29 March 1978
(16) Brazil	Ratification	09 January 1978	09 April 1978
(17) Luxembourg[3]	Ratification	31 January 1978	30 April 1978
(18) Sweden[3]	Ratification	17 February 1978	17 May 1978
(19) Japan	Ratification	01 July 1978	01 October 1978
(20) Denmark[3]	Ratification	01 September 1978	01 December 1978
(21) Austria[3]	Ratification	23 January 1979	23 April 1979
(22) Monaco[3]	Ratification	22 March 1979	22 June 1979
(23) Netherlands[3]	Ratification	10 April 1979	10 July 1979
(24) Romania	Ratification	23 April 1979	23 July 1979
(25) Norway	Ratification	01 October 1979	01 January 1980
(26) Liechtenstein[3]	Accession	19 December 1979	19 March 1980
(27) Australia	Accession	31 December 1979	31 March 1980
(28) Hungary	Ratification	27 March 1980	27 June 1980
(29) Democratic People's Republic of Korea (North Korea)	Accession	08 April 1980	08 July 1980
(30) Finland	Ratification	01 July 1980	01 October 1980
(31) Belgium[3]	Ratification	14 September 1981	14 December 1981
(32) Sri Lanka	Accession	26 November 1981	26 February 1982
(33) Mauritania[2]	Accession	13 January 1983	13 April 1983
(34) Sudan[3]	Accession	16 January 1984	16 April 1984
(35) Bulgaria	Accession	21 February 1984	21 May 1984
(36) Republic of Korea (South Korea)	Accession	10 May 1984	10 August 1984
(37) Mali[2]	Accession	19 July 1984	19 October 1984
(38) Barbados	Accession	12 December 1984	12 March 1985
(39) Italy[3]	Ratification	28 December 1984	28 March 1985
(40) Benin[2]	Accession	26 November 1986	26 February 1987
(41) Burkina Faso[2]	Accession	21 December 1988	21 March 1989
(42) Spain[3]	Accession	16 August 1989	16 November 1989
(43) Canada	Ratification	02 October 1989	02 January 1990
(44) Greece[3]	Accession	09 July 1990	09 October 1990
(45) Poland	Accession	25 September 1990	25 December 1990
(46) Côte d'Ivoire[2]	Ratification	31 January 1991	30 April 1991
(47) Guinea[2]	Accession	27 February 1991	27 May 1991
(48) Mongolia	Accession	27 February 1991	27 May 1991
(49) Czech Republic	Declaration[4]	18 December 1992	01 January 1993
(50) Ireland[3]	Ratification	01 May 1992	01 August 1992
(51) Portugal[3]	Accession	24 August 1992	24 November 1992
(52) New Zealand	Accession	01 September 1992	01 December 1992
(53) Ukraine	Declaration[4]	21 September 1992	25 December 1991
(54) Viet Nam	Accession	10 December 1992	10 March 1993
(55) Slovakia	Declaration[4]	30 December 1992	01 January 1993

Country	Instrument	Date of Deposit of Instrument	Entry into Force[1]
(56) Niger[2]	Accession	21 December 1992	21 March 1993
(57) Kazakstan	Declaration[4]	16 February 1993	25 December 1991
(58) Belarus	Declaration[4]	14 April 1993	25 December 1991
(59) Latvia	Accession	07 June 1993	07 September 1993
(60) Uzbekistan	Declaration[4]	18 August 1993	25 December 1991
(61) China	Accession	01 October 1993	01 January 1994
(62) Slovenia	Accession	01 December 1993	01 March 1994
(63) Trinidad and Tobago	Accession	10 December 1993	10 March 1994
(64) Georgia	Declaration[4]	18 January 1994	25 December 1991
(65) Kyrgyzstan	Declaration[4]	14 February 1994	25 December 1991
(66) Republic of Moldova	Declaration[4]	14 February 1994	25 December 1991
(67) Tajikistan	Declaration[4]	14 February 1994	25 December 1991
(68) Kenya[5]	Accession	08 March 1994	08 June 1994
(69) Lithuania	Accession	05 April 1994	05 July 1994
(70) Armenia	Declaration[4]	17 May 1994	25 December 1991
(71) Estonia	Accession	24 May 1994	24 August 1994
(72) Liberia	Accession	27 May 1994	27 August 1994
(73) Swaziland[5]	Accession	20 June 1994	20 September 1994
(74) Mexico	Accession	01 October 1994	01 January 1995
(75) Uganda[5]	Accession	09 November 1994	09 February 1995
(76) Singapore	Accession	23 November 1994	23 February 1995
(77) Iceland	Accession	23 December 1994	23 March 1995
(78) Turkmenistan	Declaration[4]	01 March 1995	25 December 1991
(79) The former Yugoslav Republic of Macedonia	Accession	10 May 1995	10 August 1995
(80) Albania	Accession	04 July 1995	04 October 1995
(81) Lesotho[5]	Accession	21 July 1995	21 October 1995
(82) Azerbaijan	Accession	25 September 1995	25 December 1995
(83) Turkey	Accession	01 October 1995	01 January 1996
(84) Israel	Ratification	01 March 1996	01 June 1996
(85) Cuba	Accession	16 April 1996	16 July 1996
(86) Saint Lucia	Accession	30 May 1996	30 August 1996
(87) Bosnia and Herzegovina	Accession	7 June 1996	7 September 1996

[1]Although the PCT entered into force on January 24, 1978, the Assembly of the PCT Union fixed June 1, 1978, as the date from which international applications could be filed and demands for international preliminary examination could be submitted.

[2]Member of African Intellectual Property Organization (OAPI) regional patent system.

[3]Member of European Patent Convention (EPC) regional patent system.

[4]Declaration of continued application.

[5]Member of African Regional Industrial Property Organization (ARIPO) regional patent system.

August 6, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on August 31, 1993 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,239,703 through 5,241,702
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on August 29, 1989 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,860,381 through 4,862,516
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on August 27, 1985 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,536,889 through 4,538,300
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $495.00
By other than a small entity $990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $995.00
By other than a small entity $1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,495.00
By other than a small entity $2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $660.00
(2) unintentional $1,550.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED June 26, 1996
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 34,083	07/540,192	09/29/92
(4,752,793)	(06/945,359)	(06/21/88)
4,455,685	06/309,507	06/26/84
4,455,689	06/423,622	06/26/84
4,455,693	06/388,648	06/26/84
4,455,707	06/303,717	06/26/84
4,455,713	06/375,178	06/26/84
4,455,717	06/421,569	06/26/84
4,455,719	06/492,159	06/26/84
4,455,720	06/387,928	06/26/84
4,455,722	06/394,520	06/26/84
4,455,731	06/351,776	06/26/84
4,455,735	06/368,670	06/26/84
4,455,744	06/353,437	06/26/84
4,455,751	06/347,968	06/26/84
4,455,754	06/349,877	06/26/84
4,455,757	06/345,414	06/26/84
4,455,771	06/517,934	06/26/84
4,455,772	06/377,951	06/26/84
4,455,792	06/233,094	06/26/84
4,455,793	06/283,464	06/26/84
4,455,795	06/233,378	06/26/84
4,455,798	06/299,315	06/26/84
4,455,800	06/302,704	06/26/84
4,455,806	06/325,134	06/26/84
4,455,807	06/383,241	06/26/84
4,455,808	06/333,690	06/26/84
4,455,810	06/318,054	06/26/84
4,455,814	06/340,322	06/26/84
4,455,821	06/461,317	06/26/84
4,455,823	06/435,419	06/26/84
4,455,831	06/364,183	06/26/84
4,455,834	06/305,666	06/26/84
4,455,838	06/349,099	06/26/84
4,455,840	06/349,853	06/26/84
4,455,842	06/423,744	06/26/84
4,455,859	06/362,840	06/26/84
4,455,862	06/370,822	06/26/84
4,455,867	06/317,605	06/26/84
4,455,868	06/417,738	06/26/84
4,455,871	06/400,589	06/26/84
4,455,873	06/327,455	06/26/84
4,455,875	06/333,494	06/26/84
4,455,879	06/324,817	06/26/84
4,455,882	06/463,552	06/26/84
4,455,884	06/346,895	06/26/84
4,455,889	06/310,485	06/26/84
4,455,891	06/253,480	06/26/84
4,455,901	06/310,341	06/26/84
4,455,902	06/486,059	06/26/84
4,455,905	06/415,656	06/26/84
4,455,908	06/352,966	06/26/84
4,455,912	06/342,887	06/26/84
4,455,915	06/365,176	06/26/84
4,455,918	06/387,055	06/26/84
4,455,928	06/431,216	06/26/84
4,455,932	06/478,719	06/26/84
4,455,940	06/392,495	06/26/84
4,455,941	06/487,892	06/26/84
4,455,942	06/283,916	06/26/84
4,455,948	06/387,934	06/26/84
4,455,956	06/300,465	06/26/84
4,455,967	06/437,031	06/26/84
4,455,969	06/508,329	06/26/84
4,455,973	06/472,739	06/26/84
4,455,977	06/297,876	06/26/84
4,455,978	06/459,665	06/26/84
4,455,982	06/415,949	06/26/84
4,455,984	06/469,685	06/26/84
4,455,985	06/532,300	06/26/84
4,455,990	06/381,059	06/26/84
4,456,001	06/394,691	06/26/84
4,456,005	06/429,027	06/26/84
4,456,007	06/329,108	06/26/84
4,456,011	06/332,929	06/26/84
4,456,015	06/364,710	06/26/84
4,456,024	06/458,192	06/26/84
4,456,025	06/335,081	06/26/84
4,456,027	06/398,837	06/26/84
4,456,031	06/374,012	06/26/84
4,456,036	06/442,742	06/26/84
4,456,037	06/352,156	06/26/84
4,456,042	06/408,534	06/26/84
4,456,061	06/298,036	06/26/84
4,456,064	06/471,774	06/26/84
4,456,069	06/398,289	06/26/84
4,456,070	06/401,508	06/26/84
4,456,080	06/415,895	06/26/84
4,456,087	06/414,465	06/26/84
4,456,100	06/289,873	06/26/84

Patent Number	Serial Number	Issue Date
4,456,104	06/294,439	06/26/84
4,456,111	06/321,523	06/26/84
4,456,112	06/301,881	06/26/84
4,456,127	06/297,536	06/26/84
4,456,129	06/283,725	06/26/84
4,456,138	06/510,236	06/26/84
4,456,140	06/396,821	06/26/84
4,456,141	06/323,148	06/26/84
4,456,149	06/313,300	06/26/84
4,456,151	06/301,518	06/26/84
4,456,154	06/408,407	06/26/84
4,456,156	06/264,850	06/26/84
4,456,160	06/312,320	06/26/84
4,456,162	06/329,086	06/26/84
4,456,163	06/314,420	06/26/84
4,456,164	06/379,359	06/26/84
4,456,167	06/422,490	06/26/84
4,456,171	06/415,998	06/26/84
4,456,180	06/300,186	06/26/84
4,456,183	06/353,643	06/26/84
4,456,184	06/274,720	06/26/84
4,456,192	06/341,122	06/26/84
4,456,194	06/407,141	06/26/84
4,456,196	06/239,140	06/26/84
4,456,199	06/276,288	06/26/84
4,456,208	06/435,511	06/26/84
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5,124,659	07/485,329	06/23/92
5,124,663	07/663,485	06/23/92
5,124,664	07/618,669	06/23/92
5,124,671	07/727,161	06/23/92
5,124,676	07/661,759	06/23/92
5,124,683	07/699,515	06/23/92
5,124,684	07/728,355	06/23/92
5,124,688	07/519,977	06/23/92
5,124,694	07/631,495	06/23/92
5,124,695	07/532,152	06/23/92
5,124,696	07/653,301	06/23/92
5,124,708	07/661,031	06/23/92
5,124,710	07/628,165	06/23/92
5,124,734	07/500,508	06/23/92
5,124,783	07/460,630	06/23/92
5,124,794	07/549,869	06/23/92
5,124,797	07/556,557	06/23/92
5,124,806	07/538,552	06/23/92
5,124,808	07/511,152	06/23/92
5,124,819	07/570,899	06/23/92
5,124,835	07/540,933	06/23/92
5,124,841	07/597,819	06/23/92
5,124,844	07/705,769	06/23/92
5,124,848	07/650,781	06/23/92
5,124,854	07/510,199	06/23/92
5,124,857	07/693,154	06/23/92
5,124,873	07/428,975	06/23/92
5,124,877	07/381,555	06/23/92
5,124,881	06/669,062	06/23/92
5,124,882	07/503,913	06/23/92
5,124,887	07/619,513	06/23/92
5,124,892	07/624,024	06/23/92
5,124,895	07/596,303	06/23/92
5,124,902	07/775,536	06/23/92
5,124,906	07/464,224	06/23/92
5,124,908	07/512,827	06/23/92
5,124,913	07/451,916	06/23/92
5,124,915	07/529,385	06/23/92
5,124,922	07/574,682	06/23/92
5,124,929	07/302,688	06/23/92
5,124,932	07/734,047	06/23/92
5,124,942	07/255,156	06/23/92
5,124,953	07/736,397	06/23/92
5,124,954	07/588,543	06/23/92
5,124,972	07/475,615	06/23/92
5,124,982	07/486,086	06/23/92
5,124,992	07/484,758	06/23/92
5,125,004	07/647,875	06/23/92
5,125,010	07/597,159	06/23/92
5,125,032	07/442,146	06/23/92
5,125,037	07/485,283	06/23/92
5,125,097	07/301,586	06/23/92
5,125,104	07/521,194	06/23/92

Patents Reinstated Due To The Acceptance of a Late Maintenance Fee From 6/21/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,338,472	06/227,000	01/21/81	07/06/82	06/27/96
4,366,332	06/227,036	01/21/81	12/28/82	06/27/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,406,798	06/295,272	08/24/81	09/27/83	06/27/96
4,417,943	06/266,227	05/22/81	11/29/83	06/27/96
4,423,062	06/341,973	01/22/82	12/27/83	06/27/96
4,426,286	06/331,270	12/16/81	01/17/84	06/27/96
4,433,534	06/296,448	08/26/81	02/28/84	06/27/96
4,434,021	06/394,747	07/02/82	02/28/84	06/27/96
4,441,087	06/330,599	12/14/81	04/03/84	06/27/96
4,444,573	06/390,294	06/21/82	04/24/84	06/27/96
4,519,404	06/537,252	09/28/83	05/28/85	06/27/96
4,585,080	06/698,085	02/04/85	04/29/86	06/27/96
4,591,943	06/498,568	05/26/83	05/27/86	06/27/96
4,594,371	06/729,529	05/02/85	06/10/86	06/27/96
4,601,605	06/674,974	11/26/84	07/22/86	06/27/96
4,609,475	06/582,994	02/24/84	09/02/86	06/21/96
4,636,469	06/686,524	12/26/84	01/13/87	06/24/96
4,640,365	06/726,802	04/24/85	02/03/87	06/26/96
4,654,997	06/890,339	07/29/86	04/07/87	06/27/96
4,662,229	06/769,372	08/26/85	05/05/87	06/27/96
4,664,737	06/681,222	12/13/84	05/12/87	06/27/96
4,675,120	06/513,408	07/14/83	06/23/87	06/25/96
4,677,478	06/342,376	01/25/82	06/30/87	06/27/96
4,678,034	06/867,338	05/23/86	07/07/87	06/21/96
4,765,964	06/693,437	01/22/85	08/23/88	06/21/96
4,855,043	07/049,798	05/15/87	08/08/89	06/27/96
4,888,995	07/269,357	11/10/88	12/26/89	06/27/96
4,915,255	07/247,818	09/22/88	04/10/90	06/25/96
4,917,430	07/206,594	06/14/88	04/17/90	06/21/96
4,928,468	07/279,895	12/05/88	05/29/90	06/27/96
4,936,073	07/370,642	06/23/89	06/26/90	06/21/96
4,947,090	07/370,198	06/22/89	08/07/90	06/21/96
4,950,872	07/394,752	08/16/89	08/21/90	06/27/96
4,971,198	07/476,116	01/29/90	11/20/90	06/25/96
4,979,407	07/509,204	04/16/90	12/25/90	06/26/96
4,993,545	07/413,092	09/27/89	02/19/91	06/27/96
5,004,736	07/370,121	06/23/89	04/02/91	06/27/96
5,010,822	07/473,785	02/02/90	04/30/91	06/27/96
5,011,135	07/377,258	07/10/89	04/30/91	06/27/96
5,013,984	07/513,116	04/23/90	05/07/91	06/27/96
5,026,646	07/271,825	11/16/88	06/25/91	06/24/96
5,046,876	07/574,368	08/24/90	09/10/91	06/27/96
5,048,432	07/634,402	12/27/90	09/17/91	06/27/96
5,050,535	07/390,417	08/07/89	09/24/91	06/24/96
5,068,981	07/619,994	11/30/90	12/03/91	06/27/96
5,096,634	07/651,432	02/05/91	03/17/92	06/27/96
5,098,047	07/599,435	10/18/90	03/24/92	06/27/96
5,098,321	07/586,416	09/21/90	03/24/92	06/24/96
5,100,600	07/624,315	12/07/90	03/31/92	06/27/96
5,101,505	07/478,220	02/09/90	03/31/92	06/24/96
5,101,658	07/711,120	06/04/91	04/07/92	06/25/96

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

5,305,728, Re. S.N. 08/637,528, Apr. 25, 1996, Cl. 123/193, INTERNAL COMBUSTION ENGINE, Hiromitsu Ando, et. al., Owner of Record: *Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan,* Attorney or Agent: Herbert I. Cantor, Ex. Gp.: 3402

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,384,317, Re. S.N. 08/004,318, July 30, 1996, Cl. 362/18.3, SOLAR POWERED LIGHTING SYSTEM, Edward J. Stackpole, Owner of Record: *Flex-O-Lite,St. Louis, Mo.,* Attorney or Agent: None, Ex. Gp.: 3406, Requester: Trafcon Industries, Inc., c/o John J. Feldhaus, Foley & Lardner, Washington, D.C.

4,554,584, Reexam. No. 90/004,320, Aug. 1, 1996, Cl. 348/634, VIDEO AND AUDIO BLANKING SYSTEM, Carl M. Elam, et. al., Owner of Record: *D/B/A Greenwich Technology Associates, Greenwich, Conn.,* Attorney or Agent: Finnegan Henderson Farabow Garrett & Dunner, Washington, D.C., Ex. Gp.: 2602, Requester: Soundview Technologies, Inc., Greenwich, Conn.

4,589,815, Reexam. No. 90/004,311, July 19, 1996, Cl. 414/590, ELECTRONIC TEST HEAD POSITIONER FOR TEST SYSTEMS, Nathan R. Smith, Owner of Record: *In Test Corp., Cherry Hill, N.J.,* Attorney or Agent: Ratner & Prestia, Allan Batner, Valley Forge, Pa., Ex. Gp.: 3107, Requester: Reid-Ashman Manufacturing, Inc., St. George, Utah, c/o Oblandt Greeley, Ruggiero & Perle, Slamford, Conn.

4,765,432, Reexam. No. 90/004,308, July 17, 1996, Cl. 180/227, MOTORCYCLE HAVING A SUSPENSION COUPLED

SEAT, H. Paul Odom, Owner of Record: *Inventor,* Attorney or Agent: Charles F. Lind, Arlington Heights, Ill., Ex. Gp.: 3106, Requester: Dillis V. Allen, Elk Grove Village, Ill.

4,958,569, Reexam. No. 90/004,316, July 29, 1996, Cl. 402/476, WROUGHT COPPER ALLOY-SHAPED CHARGE LINER, Frank N. Mandigo, Owner of Record: *Olin Corp., Cheshire, Conn.,* Attorney or Agent: Paul Weinstein, Olin Corp., Cheshire, Conn., Ex. Gp.: 2201, Requester: Baker Hughes, Inc., c/o Gregory S. Rosenblatt, Wiggin & Dana, New Haven, Conn.

4,974,160, Reexam. No. 90/004,312, July 25, 1996, Cl. 395/161, MENU SELECTED APPLICATION PROGRAMS CREATED FROM DEFINED MODULES OF CODE, William K. Bone, et. al., Owner of Record: *Computer Associates International, Inc., Islandia, N.Y.,* Attorney or Agent: Kenneth R. Parks, Weil, Gotshal & Manges, New York, N.Y., Ex. Gp.: 2415, Requester: Owner

5,037,522, Reexam. No. 90/004,305, July 3, 1996, Cl. 204/298.41, ELECTRIC ARC VAPOR DEPOSITION DEVICE, Gary E. Vergason, Owner of Record: *Vergason Technology, Inc., Van Etten, N.Y.,* Attorney or Agent: William A. Blake, Jones Tullar & Cooper, Arlington, Va., Ex. Gp.: 1109, Requester: Owner

5,084,271, Reexam. No. 90/004,306, July 16, 1996, Cl. 424/009, VACCINE FOR EQUINE HERPES-VIRUS, Michael J. Studdert, Owner of Record: *The University of Melbourne, Victoria, Australia,* Attorney or Agent: George R. Repper, Rothwell, Figg, Ernst & Kurz, Washington, D.C., Ex. Gp.: 1211, Requester: Martin L. Katz, Dressler Goldsmith Milnamow & Katz, Chicago, Ill.

5,199,939, Reexam. No. 90/004,313, July 25, 1996, Cl. 600/003, RADIOACTIVE CATHETER, Michael D. Dake, et. al., Owner of Record: *Michael D. Dake, Los Angeles, Calif.; Bruce Hedger, Paramount, Calif. and Stephen Oesterle, Los Angeles, Calif.,* Attorney or Agent: Jeffrey G. Sheldon, Sheldon & Mak, Pasadena, Calif., Ex. Gp.: 3311, Requester: Edward O. Anaell, c/o Len R. Carroll, Rancho Cucamonga, Calif.

5,229,612, Reexam. No. 90/004,317, July 29, 1996, Cl. 250/349, RADIATION DETECTOR WITH REMOTE TEMPERATURE REFERENCE, Francesco Pompei, et. al., Owner of Record: *Exergen Corp., Newton, Mass.,* Attorney or Agent: James M. Smith Hamilton Brook Smith & Reynolds, Lexington, Mass., Ex. Gp.: 2506, Requester: Charles E. Krueger, c/o Townsend & Townsend and Crew, San Francisco, Calif.

5,254,751, Reexam. No. 90/004,314, July 25, 1996, Cl. 568/798, METHOD FOR DECOMPOSITION OF CUMENE HYDROPEROXIDE BY ACIDIC CATALYST TO PHENOL AND ACETONE, Vladimir M. Zakoshansky, Owner of Record: *General Electric Co., Schenectady, N.Y.,* Attorney or Agent: Gary L. Loser, General Electric Co., Pittsfield, Mass., Ex. Gp.: 1204, Requester: Pravel Hewitt Kimball & Krieger, Houston, Tex.

5,272,930, Reexam. No. 90/004,319, July 30, 1996, Cl. 074/434, MECHANICAL ELEMENT HAVING A SHAFT PRESSURE-FITTED INTO AN ENGAGING MEMBER AND ITS MANUFACTURING METHOD, Yoshikatsu Nakamura, et. al., Owner of Record: *Nippon Piston Ring Co., Ltd., Tokyo, Japan,* Attorney or Agent: Birch Stewart Kolasch & Birch, Falls Church, Va., Ex. Gp.: 3502, Requester: Etablissement Supervis, c/o Anderson Kill & Olick, New York, N.Y.

5,373,840, Reexam. No. 90/004,301, July 12, 1996, Cl. 600/106, ENDOSCOPE AND METHOD FOR VEIN REMOVAL, David R. Knighton, Owner of Record: *Embro Corp., St. Louis Park, Minn.,* Attorney or Agent: Terry L. Wiles, Popovich & Wiles, Minneapolis, Minn., Ex. Gp.: 3302, Requester: Ethican Endo-Surgery Inc., Cincinnati, Ohio, c/o John P. Milnamow, Dressler, Goldsmith, Milnamow & Katz, Chicago, Ill.

5,427,267, Reexam. No. 90/004,309, July 17, 1996, Cl. 220/403, CONTAINER WITH INNER BAG SEALING FEATURE, Samuel A. Willman, Owner of Record: *Inventor,* Attorney or Agent: Dowell & Dowell, Arlington, Va., Ex. Gp.: 3207, Requester: Chesapeake Packaging Co., Joseph G. Seeber, Great Falls, Va.

5,433,146, Reexam. No. 90/004,307, July 16, 1996, Cl. 101/035, APPARATUS AND METHOD FOR MARKING PELLET-SHAPED ARTICLES, E. Michael Ackley, Owner of Record: *Inventor,* Attorney or Agent: Weiser & Associates, Gary E. Cohen, Philadelphia, Pa., Ex. Gp.: 3307, Requester: R.W. Hartnett Co., Philadelphia, Pa., c/o John T. Synnestvedt, Synnestvedt & Lechner, Philadelphia, Pa.

5,456,498, Reexam. No. 90/004,315, July 26, 1996, Cl. 283/070, NEGOTIABLE INSTRUMENT FRAUD DETECTOR AND PROCESSOR, Edwin B. Greene, Owner of Record: *Inventor,* Attorney or Agent: John J. Byrne, Arlington, Va., Ex. Gp.: 3206, Requester: Theodore R. Touw, Westford, Vt.

5,463,793, Reexam. No. 90/004,310, July 17, 1996, Cl. 016/197, SASH SHOE SYSTEM FOR CURL SPRING WINDOW BALANCE, Norman R. Westfall, Owner of Record: *Caldwell Manufacturing Co., Rochester, N.Y.,* Attorney or Agent: Eugene Stephens & Associates, Rochester, N.Y., Ex. Gp.: 3209, Requester: Ashland Products, Inc., c/o Thomas K. Stine, Wallenstein & Wagner, Chicago, Ill.

5,516,274, Reexam. No. 90/004,321, Aug. 2, 1996, Cl. 425/526, STRETCH BLOW MOLDING MACHINE WITH MOVABLE BLOW MOLD ASSEMBLY, Lynn R. Maggert, Owner of Record: *Electra Form, Inc., Vandalia, Ohio,* Attorney or Agent: Salim A. Hasan, Locke, Reynolds, Boyd & Weiseu, Indianapolis, Ind., Ex. Gp.: 1305, Requester: Owner

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Commissioner Ordered Reexaminations

Notice under 37 CFR 1.11(c). The orders for reexamination listed below are open to inspection by the general public in the indicated Examining Group. Copies of the orders and other related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.2(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.24(a)(5) and 1.525(b)).

5,206,980, Reexam. No. 90/004,322, Aug. 9, 1996, Cl. 379/142, AUTOMATED ATTENDANT, David Canele, Owner of Record: *Inventor,* Attorney or Agent: Dressler Goldsmith Shore Sutker & Milnamow, Arlington, Va., Ex. Gp.: 2614, Requester: Commissioner of Patents & Trademarks, Washington, D.C.

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED APRIL 16, 1996
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
105,191	71/085,302	07/13/1915
105,253	71/084,075	07/13/1915
105,264	71/084,192	07/13/1915

Reg. Number	Serial Number	Reg. Date
105,285	71/084,542	07/13/1915
325,846	71/353,601	07/09/1935
325,848	71/352,207	07/09/1935
325,857	71/361,899	07/09/1935
325,871	71/362,531	07/09/1935
325,881	71/360,005	07/09/1935
325,899	71/361,136	07/09/1935
325,904	71/361,230	07/09/1935
325,906	71/361,246	07/09/1935
325,929	71/360,688	07/09/1935
325,945	71/324,855	07/09/1935
325,962	71/362,890	07/09/1935
325,968	71/362,697	07/09/1935
325,981	71/361,788	07/09/1935
325,999	71/357,855	07/09/1935
326,008	71/362,240	07/09/1935
608,513	71/658,988	07/12/1955
608,514	71/658,989	07/12/1955
608,515	71/658,990	07/12/1955
608,519	71/669,114	07/12/1955
608,520	71/669,563	07/12/1955
608,523	71/671,922	07/12/1955
608,528	71/672,721	07/12/1955
608,532	71/669,791	07/12/1955
608,533	71/670,081	07/12/1955
608,535	71/669,530	07/12/1955
608,539	71/668,959	07/12/1955
608,547	71/663,995	07/12/1955
608,562	71/668,227	07/12/1955
608,567	71/673,883	07/12/1955
608,575	71/653,435	07/12/1955
608,580	71/674,075	07/12/1955
608,581	71/674,133	07/12/1955
608,584	71/646,288	07/12/1955
608,586	71/658,428	07/12/1955
608,597	71/671,281	07/12/1955
608,614	71/673,015	07/12/1955
608,631	71/657,269	07/12/1955
608,638	71/662,810	07/12/1955
608,647	71/671,083	07/12/1955
608,649	71/671,367	07/12/1955
608,653	71/671,602	07/12/1955
608,656	71/672,178	07/12/1955
608,686	71/651,751	07/12/1955
608,694	71/662,031	07/12/1955
608,700	71/666,239	07/12/1955
608,713	71/671,482	07/12/1955
608,714	71/671,611	07/12/1955
608,725	71/660,876	07/12/1955
608,727	71/671,539	07/12/1955
608,737	71/668,709	07/12/1955
608,739	71/665,852	07/12/1955
608,740	71/665,853	07/12/1955
608,744	71/669,883	07/12/1955
608,746	71/646,108	07/12/1955
608,763	71/671,466	07/12/1955
608,767	71/674,691	07/12/1955
608,774	71/663,771	07/12/1955
608,776	71/668,320	07/12/1955
608,788	71/668,906	07/12/1955
608,792	71/639,311	07/12/1955
608,793	71/641,793	07/12/1955
608,794	71/641,794	07/12/1955
608,798	71/652,440	07/12/1955
608,801	71/654,051	07/12/1955
608,806	71/659,994	07/12/1955
608,808	71/662,374	07/12/1955
608,819	71/666,957	07/12/1955
608,820	71/668,201	07/12/1955
608,821	71/668,983	07/12/1955
608,823	71/670,329	07/12/1955
608,824	71/670,330	07/12/1955
608,828	71/671,422	07/12/1955
608,829	71/671,423	07/12/1955
608,834	71/672,463	07/12/1955
608,835	71/672,464	07/12/1955
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71/659,675		07/12/1955
71/650,769		07/12/1955
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71/667,451		07/12/1955
71/615,994		07/12/1955
72/023,007		06/17/1975
73/001,022		07/08/1975
73/005,470		07/08/1975
73/010,046		07/08/1975
73/011,400		07/08/1975
73/011,847		07/08/1975
73/018,547		07/08/1975
73/020,998		07/08/1975
73/026,135		07/08/1975
73/031,154		07/08/1975
73/007,543		07/08/1975
73/026,506		07/08/1975
73/030,640		07/08/1975
73/008,980		07/08/1975
73/012,230		07/08/1975
73/016,095		07/08/1975
73/016,972		07/08/1975
73/019,357		07/08/1975
73/049,858		07/08/1975
73/020,806		07/08/1975
73/021,712		07/08/1975
73/021,913		07/08/1975
73/022,872		07/08/1975
73/025,039		07/08/1975
73/025,729		07/08/1975
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37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of a national stage application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (John Barrie Kirk) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The international application number is PCT/GB94/00513 and was filed on 15 March 1994 in the names of John Barrie Kirk and Paul Goalby for the invention entitled ULTRASONIC LEAK DETECTION. The national stage application number is 08/525,607 and has a 35 U.S.C. 371 date of 20 February 1996.

37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of a national stage application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Ven Lin Chan) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The international application number is PCT/GB93/02228 and was filed on 29 October 1993 in the names of Choon Yong and Ven Lin Chan for the invention entitled PRACTICE BALL. The national stage application number is 08/428,169 and has a 35 U.S.C. 371 date of 06 May 1996.

37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of a national stage application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of the sole inventor. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor (Pieter Bakker) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The international application number is PCT/EP93/03548 and was filed on 09 December 1993, in the name of Pieter Bakker for the invention entitled DIMETHYL-CYCLOHEX-ANECARBOXYLIC ACID ESTERS IN PERFUMERY. The national stage application number is 08/454,219 and has a 35 U.S.C. 371 date of 29 April 1996.

37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of a national stage application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Anthony Kingdon) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The international application number is PCT/GB93/01155 and was filed on 01 June 1993, in the names of Jean Andre Calotychos, Mark Miles, Anthony Kingdon, and John Mather McBride for the invention entitled CONTROL OF PAINT SPRAYING MACHINES AND THE LIKE. The national stage application number is 08/343,454 and has a 35 U.S.C. 371 date of 23 January 1996.

37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of a national stage application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Robert John Mabbot) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The international application number is PCT/GB93/02951 and was filed on 17 December 1993, in the name of Robert John Mabbot for the invention entitled PRINTING PROCESS. The national stage application

known address of the non-signing inventor. The inventor whose signature is missing (John Barrie Kirk) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The international application number is PCT/GB94/00513 and was filed on 15 March 1994 in the names of John Barrie Kirk and Paul Goalby for the invention entitled ULTRASONIC LEAK DETECTION. The national stage application number is 08/525,607 and has a 35 U.S.C. 371 date of 20 February 1996.

37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of a national stage application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Thomas James Smith) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The international application number is PCT/GB93/02618 and was filed on 21 December 1993, in the names of Thomas James Smith and Geoffrey John Stubbs for the invention entitled WEIGHING APPARATUS. The national stage application number is 08/464,641 and has a 35 U.S.C. 371 date of 18 January 1996.

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Patent Application-As-Filed, Regular	17	18
Patent Related File Wrapper	25	38
Patent Copy	10	3
Patent Assignments	17	23

Certified Product	Goal	Actual Calendar Days to Mail
Trademark Application-As-Filed, Expedited	7	18
Trademark Application-As-Filed, Regular	17	15
Trademark Related File Wrapper	25	40
Trademark Assignments	17	20
Trademark Registration, Expedited	3*	5*
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August 2, 1996 WESLEY H. GEWEHR
Administrator for Information Dissemination

Registration To Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office who have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before October 18, 1996.

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Kenealy, David J., 634 S. 29th St., Arlington, Va. 22202

Rutherford, Kevin D., 5647 Westwood Ct., Bloomfield Hills, Mich. 48301

Silbermann, James M., 6760 Cardinal Woods Ct., Lorton, Va. 22079

August 5, 1996 KAREN L. BOVARD
Director
Office of Enrollment and Discipline

Registration To Practice

The following list contains the names of persons who successfully passed the registration examination that was held May 3, 1995 and have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before October 18, 1996.

Olsen, James M., 8 Weldin Park Dr., Wilmington, Del. 19803

Yablonsky, Michael D., 17 Stockton Rd., North Haledon, N.J. 07508

August 5, 1996 KAREN L. BOVARD
Director
Office of Enrollment and Discipline

Disclaimers

4,616,882 — Alfredo Bueno, Sao Paulo-Sp, Brazil. BRAKE ARRANGEMENT FOR HYDRAULICALLY POWERED VEHICLES. Patent dated October 14, 1986. Disclaimer filed June 3, 1996, by the assignee, Dynapac Aktiebolag.

The term of this patent subsequent to July 1, 1996, has been disclaimed.

4,959,860 — Jeffrey S. Watters; Norman P. Brown; James H. Nuckols, all of Houston, Tex. POWER-ON PASSWORD FUNCTIONS FOR COMPUTER SYSTEM. Patent dated September 25, 1990. Disclaimer filed December 29, 1995, by the assignee, Compaq Computer Corp.

Hereby enters this disclaimer to claims 14-20 of said patent.

5,251,184 — Harold A. Hildebrand, Applegate, Calif.; Aftab Alam, Sugar Land, Tex.; Peter Caragounis, Amersham, United Kingdom. METHOD AND APPARATUS FOR FINDING HORIZONS IN 3D SEISMIC DATA. Patent dated October 5, 1993. Disclaimer filed July 15, 1996, by the assignee, Landmark Graphics Corp.

Hereby enters this disclaimer to claims 1-9 of said patent.

5,318,226 — James A. Kime; Jeremy J. Margeson, both of Columbus, Ohio. DEPOSITION OF SNOW-ICE TREATMENT MATERIAL FROM A VEHICLE WITH CONTROLLED SCATTER. Patent dated June 7, 1994. Disclaimer filed April 4, 1996, by the assignee, H.Y.O., INC.

Hereby enters this disclaimer to claim 1 of said patent.

5,381,625 — Robert H. Wente, Palatine, Ill. FLOWERING PLANTER. Patent dated January 17, 1995. Disclaimer filed April 9, 1996, by the inventor.

Hereby enters this disclaimer to all claims of said patent.

5,476,974 — George G. I. Moore, Afton; Miguel A. Guerra, Woodbury, both of Minn. OMEGA-HYDROFLUORO-ALKYL ETHERS, PRECURSOR CARBOXYLIC ACIDS AND DERIVATIVES THEREOF, AND THEIR PREPARATION AND APPLICATION. Patent dated December 19, 1995. Disclaimer filed May 31, 1996, by the assignee, Minnesota Mining and Manufacturing Co.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

Disclaimers and Dedications

4,807,189 — Raymond Pinkham, Missouri City; Anthony M. Balistreri, Houston, both of Texas. READ/WRITE MEMORY HAVING A MULTIPLE COLUMN SELECT MODE. Patent dated February 21, 1989. Disclaimer and dedication filed June 17, 1996, by the assignee, Texas Instruments Inc.

Hereby disclaims and dedicates to the public the remaining term of said patent.

4,866,678 — Raymond Pinkham; Daniel F. Anderson, both of Missouri City, Tex. DUAL-PORT MEMORY HAVING PIPELINED SERIAL OUTPUT. Patent dated September 12, 1989. Disclaimer and dedication filed June 17, 1996, by the assignee, Texas Instruments Inc.

Hereby disclaims and dedicates to the public the remaining term of said patent.

4,891,795 — Raymond Pinkham; Daniel F. Anderson, both of Missouri City, Texas. DUAL-PORT MEMORY HAVING PIPELINED SERIAL OUTPUT. Patent dated January 2, 1990. Disclaimer and dedication filed June 17, 1996, by the assignee, Texas Instruments Inc.

Hereby disclaims and dedicates to the public the remaining term of said patent.

5,042,014 — Raymond Pinkham; Daniel F. Anderson, both of Missouri City, Tex. DUAL-PORT MEMORY HAVING PIPELINED SERIAL OUTPUT. Patent dated August 20, 1991. Disclaimer and dedication filed June 17, 1996, by the assignee, Texas Instruments Inc.

Hereby disclaims and dedicates to the public the remaining term of said patent.

5,172,257 — Jayantilal S. Patel, Red Bank, N.J. TWISTED FERROELECTRIC LIQUID CRYSTAL MODULATOR FOR PROVIDING GRAY SCALE. Patent dated December 15, 1992. Disclaimer and Dedication filed September 22, 1995, by the assignee, Bell Communications Research, Inc.

Hereby disclaims and dedicates to the public claims 1, 2 and 5-10 of said patent.

5,195,056 — Raymond Pinkham, Missouri City; Anthony M. Balistreri, Houston, both of Tex. READ/WRITE MEMORY HAVING AN ON-CHIP INPUT DATA REGISTER, HAVING POINTER CIRCUITS BETWEEN A SERIAL DATA REGISTER AND INPUT/OUTPUT BUFFER CIRCUITS. Patent dated March 16, 1993. Disclaimer and dedication filed June 17, 1996, by the assignee, Texas Instruments Inc.

Hereby disclaims and dedicates to the public the remaining term of said patent.

Removal From Register

Pursuant to 37 CFR § 10.11(b), a survey letter was directed on January 19, 1996, to the last post office address furnished to the Office of Enrollment and Discipline by each of the persons whose name and address appear on the following list. With respect to some of the letters, no reply was received within the period of forty-five (45) days therein set. Other letters were returned by the Post Office with notations to the effect that the addressee was deceased, unknown, or had moved and left no forwarding address or the forwarding had expired.

Accordingly, the names of the folowing persons have been removed from the Register of Patent Attorneys and Agents.

August 2, 1996 KAREN L. BOVARD
Director
Office of Enrollment & Discipline

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Certificate of Correction
For Week of September 3, 1996

P. 09,280	5,412,780	5,475,556	5,496,253
D. 364,585	5,415,186	5,475,877	5,496,540
D. 368,800	5,415,745	5,476,731	5,496,735
D. 369,617	5,416,889	5,476,827	5,496,857
D. 370,866	5,419,183	5,477,609	5,496,950
4,739,715	5,419,555	5,478,294	5,497,345
4,834,885	5,420,054	5,478,537	5,497,842
4,870,484	5,421,973	5,478,650	5,498,521
5,029,126	5,425,344	5,480,446	5,498,570
5,128,980	5,425,458	5,481,179	5,498,764
5,162,681	5,428,796	5,481,288	5,499,088
5,193,192	5,429,775	5,482,450	5,499,327
5,196,000	5,431,720	5,482,956	5,499,811
5,210,036	5,432,239	5,482,991	5,500,416
5,242,169	5,435,845	5,485,009	5,500,743
5,267,087	5,435,877	5,485,179	5,500,797
5,267,736	5,436,825	5,485,209	5,500,921
5,282,284	5,438,444	5,485,351	5,500,933
5,283,384	5,438,913	5,485,841	5,501,072
5,298,782	5,439,706	5,485,985	5,501,746
5,312,649	5,440,890	5,486,338	5,501,915
5,314,748	5,442,645	5,486,496	5,502,297
5,316,609	5,443,790	5,486,894	5,502,368
5,317,672	5,443,825	5,487,154	5,502,652
5,319,653	5,445,909	5,487,403	5,502,680
5,323,838	5,447,959	5,487,539	5,502,684
5,326,933	5,448,718	5,487,585	5,502,734
5,327,008	5,450,164	5,488,003	5,502,756
5,328,756	5,450,733	5,488,433	5,502,832
5,332,849	5,451,342	5,489,050	5,502,886
5,347,182	5,451,542	5,489,382	5,503,317
5,349,125	5,452,594	5,489,513	5,503,525
5,352,981	5,454,082	5,489,568	5,503,924
5,355,203	5,454,358	5,489,619	5,504,272
5,358,859	5,454,807	5,489,697	5,504,508
5,361,491	5,455,451	5,489,974	5,505,230
5,362,720	5,455,455	5,490,078	5,505,464
5,364,845	5,455,689	5,490,230	5,505,603
5,365,291	5,459,302	5,490,434	5,505,784
5,367,345	5,459,668	5,490,847	5,506,096
5,369,384	5,460,028	5,492,085	5,506,162
5,371,308	5,460,141	5,492,156	5,506,430
5,372,741	5,461,492	5,492,602	5,506,606
5,375,162	5,462,171	5,492,615	5,506,671
5,376,993	5,462,524	5,492,751	5,506,828
5,377,199	5,464,755	5,493,153	5,507,683
5,393,475	5,464,760	5,493,843	5,507,932
5,396,550	5,465,607	5,493,931	5,508,088
5,397,498	5,466,815	5,494,021	5,508,255
5,397,675	5,468,733	5,494,152	5,508,269
5,398,322	5,469,070	5,494,359	5,508,328
5,399,371	5,469,373	5,494,943	5,508,530
5,402,142	5,469,690	5,494,981	5,508,578
5,404,027	5,470,335	5,495,033	5,508,743
5,405,948	5,471,982	5,495,054	5,508,854
5,406,163	5,472,322	5,495,271	5,508,995
5,406,542	5,473,856	5,495,590	5,509,408
5,409,012	5,473,964	5,495,852	5,509,539
5,409,737	5,474,138	5,495,886	5,509,647
5,410,030	5,475,335	5,495,926	5,509,773
5,509,978	5,513,559	5,518,715	5,524,678
5,510,133	5,514,483	5,519,019	5,524,916
5,510,672	5,514,541	5,519,049	5,525,127
5,510,787	5,514,783	5,519,383	5,525,248
5,510,827	5,515,209	5,520,437	5,525,488
5,510,852	5,515,578	5,520,939	5,525,636
5,510,948	5,515,635	5,521,017	5,526,163
5,510,980	5,515,752	5,521,199	5,526,353
5,511,211	5,515,908	5,521,215	5,527,107
5,511,249	5,516,172	5,521,262	5,527,675
5,511,392	5,516,455	5,521,645	5,527,913
5,511,444	5,517,327	5,522,008	5,528,232
5,511,501	5,517,515	5,522,069	5,528,304
5,512,550	5,517,648	5,522,122	5,529,732
5,512,763	5,517,679	5,523,462	5,529,812
5,513,004	5,517,742	5,523,511	5,529,961
5,513,012	5,517,754	5,524,288	5,530,037
5,513,236	5,518,569		

Summary of Final Decisions
Issued by the
Trademark Trial and Appeal Board
June 17-21, 1996

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
6-18	EX	74/227,605	TDI Services Corp.	whether applicant uses the mark asserted for registration in connection with the services recited in the application (as shown by the specimens of record); whether applicant's proffered amendment to the recitation of services is acceptable—or is, rather, an impermissible expansion of the original recitation of services	Refusal Affirmed (on both grounds)		"TDI SERVICES CORPORATION" "TECHNOLOGY FOR THE 21ST CENTURY" [installation and repair for satellite supported communication networks, microwave and infra-red communication systems and fiber optic communication connections; engineering and design for satellite supported communication networks, microwave and infra-red communication systems and fiber optic communication connections]		No
6-18	OPP (R) OPP (R)	92,282 93,670	U. S. Surgical Corp. v. Linvatec Corp.	2(d); descriptiveness/ distinctiveness of opposer's pleaded mark	Request for Reconsideration Denied (Opposition Dismissed)	"GRAFTAC" [surgical staplers]	"GRAFTAC" [surgical drill bits and surgical instruments, namely, soft tissue protection devices]		No
6-18	EX	74/420,689	California Artichoke and Vegetable Growers Corp.	2(d)	Refusal Affirmed (on the basis of all three cited registrations)		"GREEN GLOBE" [fresh vegetables]	"RED GLOBE," "BLUE GLOBE," and "YELLOW GLOBE" (all three marks rendered in stylized lettering) [citrus fruit]	No
6-18	EX	74/447,457	Minnesota American, Inc.	2(d)	Refusal Reversed		"LOCKERMATE ADJUST-A-SHELF" [plastic pre-assembled legless shelf units used within lockers]	"ADJUSTO-SHELF" [storage shelf adjustable in size]	No

(1)EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (SJ) = SUMMARY JUDGMENT; (R) = REQ. FOR RECONSIDERATION

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
6-19	OPP	91,904	Robert J. Miller v. First Colony Life Insurance Co.	2(d); affirmative defense of abandonment	Opposition Dismissed	"LIFEBITWO" and "LIFETWO" [life insurance brokerage services to physicians]	"LIFE TWO" [life insurance underwriting services]		No
6-19	EX	74/341,734	Travomatic Corp.	2(d)	Refusal Affirmed as to the goods, but Reversed as to the services		"TC" (and design) [plastic molding machines; custom molding and decorating of plastic products for others]	"TC" (and gear design) [automated welding machines and mechanical expanding machines for metal components; plastic injection molding machines and parts thereof; metal stamping and assembly services in the field of metal fabrication systems for others; engineering services in the field of metal fabrication systems]	No
6-19	EX	74/489,761	Creative Enterprises	2(d)	Refusal Affirmed (on the basis of both cited registrations)		"OUTER BOUNDS" [duffel bags and backpacks; t-shirts, hats, jackets and sweat suits]	"OUTBOUND" (and design) [backpacks and frame]; "OUTERBOUND BY H.M.S." [outerwear, namely, sweaters, stadium coats, sweater-jackets and jackets]	No
6-20	CANC	21,782	JENAer Glaswerk GmbH v. William D. Mecca, Jr.	2(e)(3); 2(d)	Petition to Cancel Granted [but only on 2(e)(3) grounds]	"JENAerGLAS" (and design) [glass cups, glass saucers, glass pitchers, glass plates, drinking glasses, glass bowls, glass mugs, glass pans, glass skillets, and skillets and dishes made in part of glass]	"FROM JENA" (and design) [optical goods, namely, binoculars, monoculars, opera glasses, telescopes, riflescopes, and mounting rings, tripods, camera adapters, and carrying cases therefor]		No

(1)EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (SJ) = SUMMARY JUDGMENT; (R) = REQ. FOR RECONSIDERATION

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Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
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Box 17	Invoices directed to the Office of Finance.
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Box EEO	Mail for the Office of Civil Rights.
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Box OED	Mail for the Office of Enrollment and Discipline.

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All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4488
	Sunnyvale Center for Innovation, Invention and Ideas	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6249
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
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	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette: Siegesmund Engineering Library, Purdue University	(317) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
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Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
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Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Media Union Library, University of Michigan	(313) 647-5735
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6579
New Hampshire	Concord: New Hampshire State Library	Not Yet Operational
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
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North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Akron - Summit County Public Library	Not Yet Operational
	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	(503) 768-6786
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaquez General Library, University of Puerto Rico	Not Yet Operational
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(803) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University	Not Yet Operational
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director	308-0661	10/13/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	07/19/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director	308-0651	09/16/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	01/05/95
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	07/22/94
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	08/30/94
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	01/03/95
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—BOBBY R. GRAY, Director	305-9600	10/14/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	08/01/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	01/06/95
TELECOMMUNICATIONS, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	11/29/94
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	01/02/95
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director	308-1113	06/01/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director	308-1148	09/22/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	05/08/95
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	04/06/95
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	10/11/94

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of August 1, 1996

Law Office	Oldest Date New*	Oldest Date Amendment Filed
Law Office 101—Ron Williams, Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	12/14/95	04/10/96
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/22/96	02/12/96
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/05/96	06/26/96
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/22/96	04/01/96
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/27/96	05/01/96
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/06/96	02/08/96
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/17/96	01/30/96
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions— Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/14/96	03/18/96
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/15/96	05/15/96
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—Vacant (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	01/26/96	—0—
Renewals (All Classes)	05/02/96	—0—
Section 12(c) Publications (All Classes)	02/29/96	—0—

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

SEPTEMBER 3, 1996

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,066,854 (2980th)

Patent Not Issued For This Number

B1 4,220,815 (2981st)

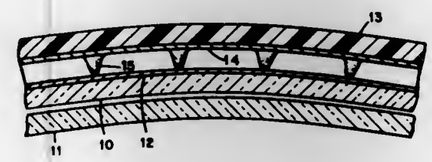
NONPLANAR TRANSPARENT ELECTROGRAPHIC SENSOR

William A. Gibson, Lenoir City, and John E. Talmage, Jr., Oak Ridge, both of Tenn., assignors to Elographics, Inc., Oak Ridge, Tenn.

Reexamination Request No. 90/003,757, Mar. 16, 1995.
Reexamination Certificate for Patent 4,220,815, issued Sep. 2, 1980, Ser. No. 966,351, Dec. 4, 1978.
Int. Cl.[6] G08C *21/00*

U.S. Cl. 178—18

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:



The patentability of claims **1–6** is confirmed.

1. An improved electrographic sensor for disposing upon a nonplanar data-containing surface so as to permit generation of electrical signals corresponding to x-and y-coordinates of any portion of said data, said sensor having a transparent uniformly thick substrate with a top and a bottom face, a uniform transparent resistive layer adherently deposited on said face, and means attached to said resistive layer for connecting to electrical circuits to produce uniform orthogonal electrical fields in said resistive layer, the improvement comprising:

a said substrate being shaped whereby said bottom face closely conforms to said nonplanar data-containing surface;

b. a transparent cover sheet supported at a substantially uniform gap distance above said resistive layer;

c. a transparent conductive layer applied to said cover sheet on a surface facing said resistive layer; and

d. insulation islands having a height of from 0.0001 to 0.01 inches and a maximum transverse dimension of 0.002 to 0.02 inches uniformly distributed in said gap between said cover sheet and said resistive layer to maintain said uniform gap distance, the spacing between said insulation islands being 0.025 to 0.50 inches.

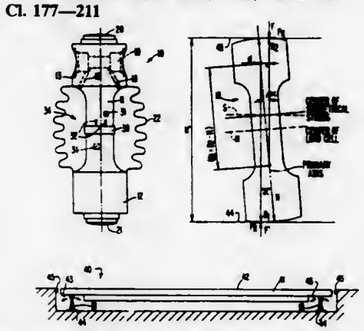
B1 4,804,053 (2982nd)

ROCKER PIN LOAD CELL

Kjell H. Nordstrom, Västerås, Sweden, assignor to Flintab AB, Västerås, Sweden

Reexamination Request No. 90/003,959, Sep. 15, 1995.
Reexamination Certificate for Patent 4,804,053, issued Feb. 14, 1989, Ser. No. 118,949, Nov. 10, 1987.
Int. Cl.[6] G01G *3/14;21/24;* G01L *1/22*

U.S. Cl. 177—211



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **3**, **6**, **10**, **11** and **15** are determined to be patentable as amended.

Claims **2**, **4**, **5**, **7**, **8**, **9**, **12**, **13** and **14**, dependent on an amended claim, are determined to be patentable.

1. A compression type load cell consisting essentially of:

an elongated dumbbell shaped column with a predetermined length having convex top and bottom surfaces and a midsection with symmetry about a primary axis of the column, said convex bottom surface being a surface portion of a first sphere having a first radius and a first center located on said primary axis, and said convex top surface being a surface portion of a second sphere having a second radius and a second center located on said primary axis, the sum of said first radius and said second radius being larger than said predetermined length so that said column will be self-stabilizing when placed in a vertical position between two substantially horizontal surfaces;

strain gage means affixed to said midsection midway between said first and second centers at a right angle to said primary axis for integrating compressive strains around said column *and for providing an output substantially independent of a tilt angle of said column*;

sealing means for protecting said strain gage means from moisture and other environmental effects; and

means for electrically connecting said strain gage means to circuits outside said sealing means.

B1 4,831,230

Patent Not Issued For This Number

B1 4,983,767 (2983rd)

PREPARATION OF ALIPHATIC CARBOXYLIC ACIDS BY OXIDATION OF MONOCYCLIC KETONES

Jean-Marie Bregeault, Bouray Saint-Antoine; El-Ali Bassam, Paris Cedex, and Jacques Martin, Orsay, all of, France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Reexamination Request No. 90/003,268, Nov. 29, 1993.
Reexamination Certificate for Patent 4,983,767, issued Jan. 8, 1991, Ser. No. 393,883, Aug. 15, 1989.
Claims priority, application France, Aug. 16, 1988, 88 11075
Int. Cl.[6] C07C *51/245*
U.S. Cl. 562—528

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1 and 5 are cancelled.

Claims 2, 6–11 and 15 are determined to be patentable as amended Claims 3–4 and 12–14 dependent on an amended claim, are determined to be patentable.

New claims 16–29 are added and determined to be patentable.

[1. A process for the preparation of an aliphatic carboxylic acid, comprising oxidizing a monocyclic ketone with molecular oxygen or an oxygen-containing gas, in the presence of a catalytically effective amount of a vanadium compound having one of the following formulae (I) and (II):

$$H_{3+n}[PM_{12-n}V_nO_{40}].yH_2O \quad (I)$$

$$VO(Y)_m \quad (II)$$

in which n is an integer greater than or equal to 1 and less than or equal to 6; M is a molybdenum or tungsten atom; y is an integer ranging from zero to less than 50; Y is an acetylacetonate group or an alkoxy radical containing from 1 to 10 atoms; and m is 2 or 3.**]**

B1 5,256,370 (2984th)

LEAD-FREE ALLOY CONTAINING TIN, SILVER AND INDIUM

James A. Slattery, Sauquoit, and Charles E. T. White, Clinton, both of N.Y., assignors to The Indium Corporation of America, Utica, N.Y.

Reexamination Request No. 90/003,868, Jun. 9, 1995.
Reexamination Certificate for Patent 5,256,370, issued Oct. 26, 1993, Ser. No. 878,050, May 4, 1992.
Int. Cl.[6] C22C *13/00*
U.S. Cl. 420—557

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 3, 6 and 7 are cancelled.

Claims 2, 4, 5 and 8 to 13 are determined to be patentable as amended.

2. **[**An**]** *A lead-free solder* alloy comprising about 70% to about 92% by weight tin, **[**about**]** 1% to about 6% by weight silver and from about 4% to about 35% by weight indium, *said solder alloy suitable for soldering in electronic or microelectronic applications and having a solidus temperature between about 167° and about 212° C. and a liquidus temperature between about 179° C. and 213° C.; provided further that the combined weight percentage of tin and indium is 96.7% or greater.*

STATUTORY INVENTION REGISTRATIONS

PUBLISHED SEPTEMBER 3, 1996

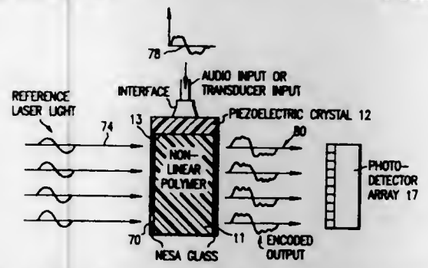
A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H1586

METHODS OF AND SYSTEMS FOR ENCODING AND DECODING A BEAM OF LIGHT UTILIZING NONLINEAR ORGANIC SIGNAL PROCESSORS

William G. Fellows, Laurel, and Lester Weinberger, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 30, 1990, Ser. No. 471,980
Int. Cl.[6] G02B *5/00*
U.S. Cl. 252—582 **6 Claims**



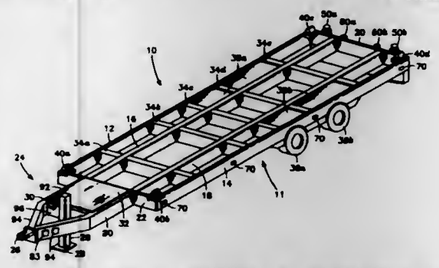
1. A method of encoding a beam of light comprising the steps of passing coherent, monochromatic light through an optical body of nonlinear organic material while controlling the diffraction of said light so as to produce an encoded or decoded optical output.

H1587

TRAILER FOR TRANSPORTING A SAFETY STRUCTURE WHICH IS USED FOR THE CONTAINMENT AND HANDLING OF HAZARDOUS MATERIALS

Norman S. Van Valkenburgh, Oxnard, and Gary L. Van Valkenburgh, Ventura, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 20, 1995, Ser. No. 407,533
Int. Cl.[6] B60P *3/00*
U.S. Cl. 280—789 **18 Claims**



1. A mobile trailer for transporting an environmentally safe modular storage unit over a highway, said environmentally safe modular storage unit have a frame, said mobile trailer comprising:

(a) a rectangular shaped frame work having four corners, said rectangular shaped framework including:

(i) a front end tubular support member, a rear end tubular support member and a pair of side tubular support members that are arranged end to end to define said rectangular shaped framework that has one end of each of the side tubular support members attached to a separate one of the opposed ends of the front end tubular support member and that has the other end of each of the side tubular support members attached to a separate one of the opposed ends of the rear end tubular support member:

(ii) first, second, third and fourth fastmounts, one of said first, second, third and fourth fastmounts being mounted on each of the four corners of said rectangular shaped frame work, each of said first, second, third and fourth fastmounts including:

A) a base recessed within an indent at one of the four corners of said rectangular shaped framework;

B) a support block fixedly attached to top portion of said base, said support block being adapted to fit snugly within an aperture located at each bottom corner of said environmentally safe modular storage unit;

C) a locking arm extending outwardly from said base; and

D) a locking member rotatably mounted on said support block, said locking member engaging an inside portion of the frame of said environmentally safe modular storage unit when said locking member is in a locked position, said locking arm being adapted to rotate said locking member to said locked position when said locking arm is a moved in one direction and said locking member being adapted to rotate said locking member to an unlocked position when said locking arm is a moved in an opposite direction, said first, second, third and fourth fastmounts securing said environmentally safe modular storage unit to said mobile trailer when the locking member of each of said first, second, third and fourth fastmounts is in the lock position;

(b) a tandem axis wheel assembly mounted on an underside of the rectangular shaped framework of said mobile trailer, said tandem axis wheel assembly having four wheels; and

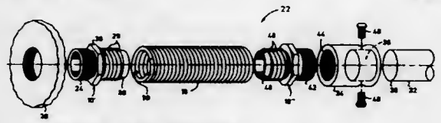
(c) a hitch assembly attached to and extending longitudinally forward from the front end tubular support member of the rectangular shaped frame.

H1588

HELICAL SPRING FASTENER

David V. Arney, 3895 Midway Dr., Apt. #318, San Diego, Calif. 92110

Filed Dec. 8, 1992, Ser. No. 988,310
Int. Cl.[6] H01Q *1/12*
U.S. Cl. 343—715 **3 Claims**



3. An antenna system comprising:

a round wire helical spring having a first and second end;

a fastener having a first end for attaching said fastener to a base and having a second end for attaching said fastener to said first end of said round wire helical antenna spring, said second end of said fastener having an exterior thread substantially cylindrical at its root and sharp at its crown that mates with radially inward surfaces of said round wire helical spring;

an antenna whip;

a collar having a recess into which an end of said antenna whip is fixed;

a second fastener having a first end for attaching to said collar and having a second end for attaching to said second end of said round wire helical antenna spring, said second end of said second fastener having an exterior thread substantially

170–918 O.G.–96–2: QL3

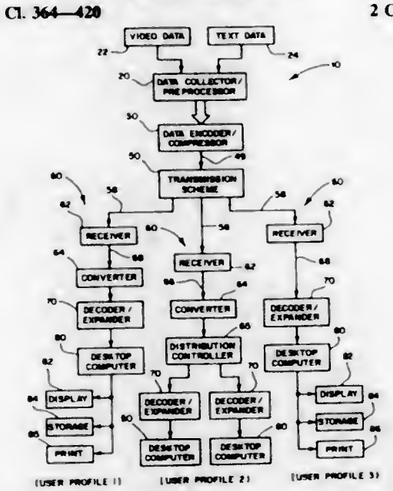
cylindrical at its root and sharp at its crown that mates with radially inward surfaces of said round wire helical spring, and in which said exterior thread of said fasteners have an inner diameter that is slightly larger than an inner diameter of said helical spring so that said helical spring is slightly expanded where threaded to said fasteners.

H1589

COMBINED VIDEO AND TEXT DATA DISTRIBUTION SYSTEM

David A. Rosenthal, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1994, Ser. No. 238,555
Int. Cl.[6] G01W *1/00*
U.S. Cl. 364—420 **2 Claims**



I. A data distribution system for combining input video signals and text data in a format compatible with desk top type computers comprising:

a data collection means adapted for collecting and processing a plurality of input video signals and text data;

an encoding and compressing means connected to the data collections means for encoding and compressing the input video signals and encoding text data thereby producing a digital data stream output signal;

a transmission means connected to the encoding and compressing means for transmitting the digital data stream output signal;

a receiving means adapted for receiving the transmitted digital data stream output signal;

a decoding and expansion means connected to the receiving means for decoding and expanding the digital data stream output signal received by the receiving means and producing a video signal output with digital information electronically inserted during the regularly occurring intervals when no video information is present; and

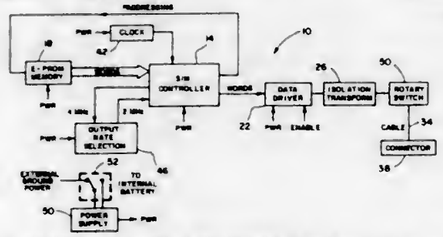
a desk top type computer connected to the decoding and expansion means for the management and display of the video output signal and interspersed text data produced by the decoding and expansion means.

H1590

PARTALILE AIRCRAFT INSTRUMENTATION DATA

Darrell C. Douglass, 240 W. Rader Ave., Ridgecrest, Calif. 93555

Filed Apr. 23, 1992, Ser. No. 872,475
Int. Cl.[6] G06F *3/00*
U.S. Cl. 395—500 **7 Claims**



1. An apparatus for supplying simulated MIL-STD 1553 to data bus traffic for instrumentation checkout, comprising:

an E-PROM for providing non-volatile digital memory;

a user-configured electronically internally connected logic device for controlling the reading of E-PROM data values and providing synchronous TTL serial output data;

a means for receiving TTL signals and producing a positive and negative differential output;

a means for switching and coupling output to a 1553 bus; and

a means for providing synchronous clocking to said controlling means.

H1591

PREPARATION OF FLAVOR-ENHANCED REDUCED CALORIE FRIED FOODS

John Fulcher, P.O. Box 35034, Dallas, Tex. 75235

Continuation of Ser. No. 150,255, Nov. 10, 1993, abandoned, which is a continuation of Ser. No. 958,708, Oct. 9, 1992, abandoned. This application Aug. 3, 1994, Ser. No. 283,159
Int. Cl.[6] A23D *9/06*
U.S. Cl. 426—601 **27 Claims**

1. A method of preparing a fried food product, comprising frying a food in a frying medium free from naturally-occurring animal and vegetable fats and oils and comprising poly(dimethylsiloxane) and a flavor-enhancing additive consisting essentially of a component, or a chemically-modified component, of a plant or animal fat or oil in an amount less than 5% by volume and effective to impart to the fried food product a flavor or aroma normally associated with a product fried in animal or vegetable fat or oil.

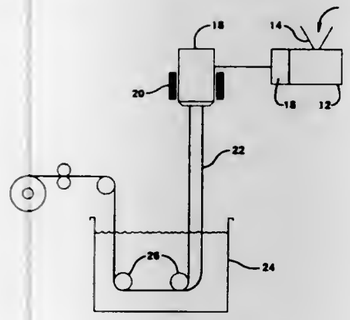
H1592

CELLULOSIC FOOD CASING

Myron D. Nicholson, Lemont, Ill., assignor to Viskase Corporation, Chicago, Ill.

Continuation of Ser. No. 135,647, Oct. 14, 1993, abandoned, which is a division of Ser. No. 822,506, Jan. 17, 1992, Pat. No. 5,277,857. This application Jul. 15, 1994, Ser. No. 275,889
Int. Cl.[6] A22C *13/00*
U.S. Cl. 428—34.8 **1 Claim**

1. A cellulosic food casing comprising a sulfur free seamless tubular film of nonderivatized cellulose precipitated from an amine oxide cellulose solution of cellulose dissolved in N-methylmorpholine-N-oxide (NMMO), wherein said casing is coated with an additive selected from the group consisting of a peeling aid, a coloring agent, and a flavoring agent.

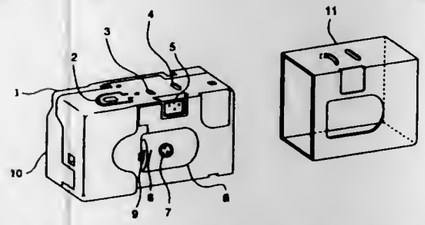


H1593

SILVER HALIDE COLOR LIGHT-SENSITIVE MATERIAL AND PHOTOGRAPHING UNIT PACKAGE

Hideaki Haraga, and Masaru Iwagaki, both of 1 Sakuramachi, Hino-shi, Tokyo, Japan

Filed Feb. 22, 1994, Ser. No. 199,675
Claims priority, application Japan, Feb. 26, 1993, 5-038674
Int. Cl.[6] G03C *1/46*
U.S. Cl. 430—496 **2 Claims**



1. A silver halide color photographic light-sensitive material having, on one side of a transparent support, photographic component layers comprising a red-sensitive silver halide emulsion layer, a green-sensitive silver halide emulsion layer, a blue-sensitive silver halide emulsion layer and a nonlight-sensitive layer, and

wherein said light-sensitive material has an ISO speed of 320 to 800,

the total coating weight of silver in the component layers is within a range of 3.0 to 8.0 g/m^2,

a total dry coating thickness of the photographic component layers is 22 μm or less, and

at least one of the component layers contains a dye in the form of a dispersion of solid particles dispersed in a binder.

H1594

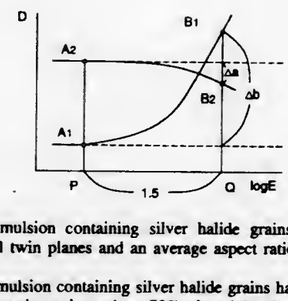
SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Tadanobu Sekiya, and Sadayasu Ishikawa, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 1, 1993, Ser. No. 130,360
Claims priority, application Japan, Oct. 6, 1992, 4-290886
Int. Cl.[6] G03C *1/46*
U.S. Cl. 430—506 **7 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon a red-sensitive layer, a green-sensitive layer and a blue-sensitive layer, at least one of which layers comprises two or more silver halide emulsion layers different in sensitivity from each other, wherein said two or more silver halide emulsion layers each contain a silver halide emulsion meeting the following requirements (i), (ii) and (iii):

(i) a monodispersed emulsion



(ii) an emulsion containing silver halide grains having two parallel twin planes and an average aspect ratio of less than 3.0

(iii) an emulsion containing silver halide grains having a developing starting point, at least 70% of total development starting points of the grains locating at the intersection of a line formed by a twin plane exposed to the grain surface and an edge of the grain, or in the vicinity of the intersection.

H1595

PESTICIDE SUBSTITUTED DIKETONITRILES

Paul A. Cain, Cary; David T.-W. Chou, Raleigh; Themistocles D. J. D'Silva, Chapel Hill; Daniel B. Grant, Durham, and Nancy D. Herman, Cary, all of N.C., assignors to Rhône-Poulenc Inc., Research Triangle Park, N.C.

Filed Jun. 13, 1994, Ser. No. 259,245
Int. Cl.[6] A01N *37/34*
U.S. Cl. 514—520 **9 Claims**

1. A method of controlling insects, aphids, mites or nematodes at a locus which comprises treatment of the locus with an effective amount of a compound of the formula:

(I)

wherein:

R is:

a) straight- or branched-chain alkyl, alkenyl or alkynyl having up to six carbon atoms, optionally substituted by one or more halogen;

b) cycloalkyl having from three to six carbon atoms, optionally bearing one or more substituents selected from the group consisting of R^6, halogen, —CO_2R^7, —SR^{71} and —OR^{71};

c) cycloalkenyl having five or six carbon atoms, optionally bearing one or more substituents selected from the group consisting of R^6, halogen and —CO_2R^7; or

d) —(CH_2)p-phenyl—$(R^{21})_r$;

A is a covalent bond, S, SO, SO_2 and O;

R^1 is:

hydrogen, chlorine, bromine, fluorine, methyl, methoxy or trifluoromethyl;

R^2 is:

a) phenyl, optionally substituted with one to five R^{21};

b) cycloalkyl having three to six carbon atoms, optionally comprising one or more substituents selected from the group consisting of R^6, halogen, SR^{71} or OR^{71};

R^3, R^4 and R^5, each being the same or different, are:

a) hydrogen;

b) straight- or branched-chain alkyl, alkenyl or alkynyl having up to six carbon atoms, optionally substituted by one or more halogen;

c) straight- or branched-chain alkyl having up to six carbon atoms, substituted by an —OR^6 group;

d) halogen;
e) nitro, cyano,—CO_2R^6, —COR^7, —X—$S(O)_mR^8$, —$S(O)_nR^9$, —$O(CH_2)_mOR^6$, —$NR^{10}R^{11}$, —$CONR^{10}R^{15}$ or —OR^{61};
f) phenyl, optionally substituted by from one to five R^{21} groups, which can be the same or different; or
g) cycloalkyl having from three to six carbon atoms;

R^6 is:
a) straight- or branched-chain alkyl, alkenyl or alkynyl having up to six carbon atoms, optionally substituted by one or more halogen; or
b) cycloalkyl having from three to six carbon atoms;

R^{61} is:
a) straight- or branched-chain alkyl, alkenyl or alkynyl having up to six carbon atoms, optionally substituted by one or more halogen;
b) phenyl, optionally substituted by one to five R^{21} groups, which can be the same or different; or
c) cycloalkyl having from three to six carbon atoms;

R^7 is:
a) straight- or branched-chain alkyl having up to six carbon atoms, optionally substituted by one or more halogen; or
b) cycloalkyl having from three to six carbon atoms;

R^{71} is:
straight- or branched-chain alkyl having up to three carbon atoms;

R^8 is:
a) straight- or branched-chain alkyl, alkenyl or alkynyl having up to six carbon atoms, optionally substituted by one or more halogen;
b) cycloalkyl having from three to six carbon atoms;
c) phenyl, optionally substituted by from one to five R^{21} groups, which can be the same or different; or
d) —CH_2CN, —$CH_2CO_2R^6$ or —$NR^{10}R^{11}$;

R^9 is:
a) straight- or branched-chain alkyl, alkenyl or alkynyl having up to six carbon atoms, optionally substituted by one or more halogen;
b) cycloalkyl having from three to six carbon atoms;
c) phenyl, optionally substituted by from one to five R^{21} groups, which can be the same or different; or
d) —CH_2CN, —$CH_2CO_2R^6$ or $NR^{10}R^{11}$;

R^{10} is:
a) hydrogen;
b) straight- or branched-chain alkyl having up to six carbon atoms, optionally substituted by one or more halogen; or
c) cycloalkyl having from three to six carbon atoms;

provided that when R^7 and R^{10} are part of a group —$CONR^7R^{10}$ they can, together with the nitrogen to which they are attached, form a five or six membered ring optionally having one additional hetero ring atom which is oxygen or nitrogen, said ring being optionally substituted by one or more alkyl, each having up to three carbon atoms;

R^{11} is:
a) straight- or branched-chain alkyl having up to six carbon atoms, optionally substituted by one or more halogen;
b) cycloalkyl having from three to six carbon atoms; or
c) —COR^7, —CO_2R^7 or—$CONR^7R^{10}$;

provided that when R^{10} and R^{11} are part of a group —$NR^{10}R^{11}$ they can, together with the nitrogen to which they are attached, form a five or six membered ring optionally having one additional hetero ring atom which is oxygen or nitrogen, said ring being optionally substituted by one or more alkyl, each having up to three carbon atoms;

X is:
oxygen, —$N(R^{12})$—, —$(CR^{13}R^{14}—)_t$— or —$S(O)_u$—;

R^{12} is:
a) hydrogen;
b) straight- or branched-chain alkyl, alkenyl or alkynyl having up to six carbon atoms, optionally substituted by one or more halogen;
c) cycloalkyl having from three to six carbon atoms;
d) phenyl, optionally substituted by from one to five R^{21} groups, which can be the same or different; or
e) —COR^7, —CO_2R^7, —$CONR^7R^{10}$, —OR^{17} or —SO_2R^7;

each of R^{13} and R^{14}, which can be the same or different, is:
a) hydrogen; or
b) straight- or branched-chain alkyl having up to six carbon atoms, optionally substituted by one or more halogen;

R^{15} is:
R^7 or —OR^{17};

provided that when R^{10} and R^{15} are part of a group —$CONR^{10}R^{15}$ they can, together with the nitrogen to which they are attached, form a five or six membered ring optionally having one additional hetero ring atom which is oxygen or nitrogen, said ring being optionally substituted by one or more alkyl, each having up to three carbon atoms;

R^{17} is:
straight- or branched-chain alkyl having up to six carbon atoms;

R^2 is:
halogen, R^7, nitro, cyano, —CO_2R^7, —$S(O)_nR^7$, —$NR^{10}R^{11}$ or —OR^7;
m is one, two or three;
n is zero, one or two;
p is zero or one;
q is zero, one or two; provided that when X is —$N(R^{12})$— or oxygen, then q is two, and that when X is -S(O)n-, then q is zero or two;
r is zero or an integer from one to five; and
t is an integer from one to four, provided that when t is greater than one, the groups —$(CR^{13}R^{14})$— can be the same or different; and
u is zero or two;

or an agriculturally acceptable salt, metal complex or enolic tautomeric form thereof.

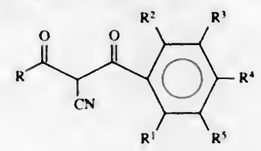
H1596

PESTICIDE SUBSTITUTED DIKETONITRILES

Paul A. Cain, Cary; David T. Chou, Raleigh; Themistocles D. J. D'Silva, Chapel Hill; Daniel B. Gant, Durham, and Nancy D. Herman, Cary, all of N.C., assignors to Rhône-Poulenc Inc., Research Triangle Park, N.C.

Filed Jun. 13, 1994, Ser. No. 259,248
Int. Cl.[6] A01N *37/34*
U.S. Cl. 514—521 **1 Claim**

1. A method of controlling insects, aphids, mites, or nematodes at a locus which comprises treatment of the locus with an effective amount of a compound of the formula:



(I)

wherein:

R is:
cyclopropyl, which is unsubstituted or is substituted by one or more substituents selected from the group consisting of R^6, halogen, —CO_2R^7, —SR^{71} and —OR^{71}.

R^1 is:
hydrogen, chlorine, bromine, fluorine, methyl or methoxy;

R^2 is:
a) hydrogen;
b) a straight- or branched-chain alkyl, alkenyl or alkynyl radical having up to six carbon atoms, said radical being unsubstituted or being substituted by one or more halogen, with the proviso that when R^2 is trifluromethyl, R^1, R^3 and R^5 are hydrogen, and R^4 is $S(O)_nR^{83}$, then n is 0;
c) a straight- or branched-chain alkyl radical having up to six carbon atoms, substituted by an —OR^6 group;
d) halogen;
e) cyano,—CO_2R^6 —COR^7, —$NR^{12}S(O)_2R^8$, —$(CR^{13}R^{14})_qS(O)_nR^8$, —$SR^9$, —$S(O)_nS(O)_qR^8$, —$O(CH_2)_mOR^6$, —$NR^{10}R^{11}$, —$CONR^{10}R^{15}$ or —OR^{61}; or
f) cycloalkyl having from three to six carbon atoms;

R^6 is:
a) a straight- or branched-chain alkyl, alkenyl or alkynyl radical having up to six carbon atoms, said radical being unsubstituted or being substituted by one or more halogen; or
b) cycloalkyl having from three to six carbon atoms;

R^{61} is:
a straight- or branched-chain alkyl, alkenyl or alkynyl radical having up to six carbon atoms, said radical being unsubstituted or being substituted by one or more halogen;

R^7 is:
a) a straight- or branched-chain alkyl radical having up to six carbon atoms, said radical being unsubstituted or being substituted by one or more halogen; or
b) cycloalkyl having from three to six carbon atoms;

R^{71} is:
straight- or branched-chain alkyl having up to three carbon atoms;

R^8 is:
a) a straight- or branched-chain alkyl, alkenyl or alkynyl radical having up to six carbon atoms, said radical being unsubstituted or being substituted by one or more halogen;
b) cycloalkyl having from three to six carbon atoms;
c) phenyl, which is unsubstituted or is substituted by from one to five R^{21} groups, which can be the same or different; or
d) —CH_2CN,—$CH_2CO_2R^6$ or —$NR^{10}R^{11}$;

R^9 is:
a straight- or branched-chain alkyl, alkenyl or alkynyl radical having three to six carbon atoms, said radical being unsubstituted or being substituted by one or more halogen;
with the proviso that when R^9 is sec-butyl, and R^1, R^3 and R^5 are hydrogen, then R^4 is not trifluoromethyl;
b) C_1-C_2 alkyl substituted with one or more halogen; or
c) —CH_2CN or—$CH_2CO_2R^6$;

R^{10} is:
a) hydrogen;
b) a straight- or branched-chain alkyl radical having up to six carbon atoms, said radical being unsubstituted or being substituted by one or more halogen; or
c) cycloalkyl having from three to six carbon atoms;
provided that when R^7 and R^{10} are part of a group —$CONR^7R^{10}$ they can, together with the nitrogen to which they are attached, form a five or six membered ring optionally having one additional hetero ring atom which is oxygen or nitrogen, said ring being unsubstituted or being substituted by one or more alkyl, each having up to three carbon atoms;

R^{11} is:
a) a straight- or branched-chain alkyl radical having up to six carbon atoms, said radical being unsubstituted or being substituted by one or more halogen;
b) cycloalkyl having from three to six carbon atoms; or
c) —COR^7, —CO_2R^7 or—$CONR^7R^{10}$;
provided that when R^{10} and R^{11} are part of a group —$NR^{10}R^{11}$ they can, together with the nitrogen to which they are attached, form a five or six membered ring optionally having one additional hetero ring atom which is oxygen or nitrogen, said ring being unsubstituted or being substituted by one or more alkyl, each having up to three carbon atoms;

R^{12} is:
a) hydrogen;
b) a straight- or branched-chain alkyl, alkenyl or alkynyl radical having up to six carbon atoms, said radical being unsubstituted or being substituted by one or more halogen;
c) cycloalkyl having from three to six carbon atoms;
d) phenyl, which is unsubstituted or is substituted by from one to five R^{21} groups, which can be the same or different; or
e) —COR^7, —CO_2R^7, —$CONR^7R^{10}$, —OR^{17} or —SO_2R^7;
each of R^{13} and R^{14}, which can be the same or different, is:
a) hydrogen; or
b) a straight- or branched-chain alkyl radical having up to six carbon atoms, said radical being unsubstituted or being substituted by one or more halogen;

R^{15} is:
R^7 or —OR^{17};
provided that when R^{10} and R^{15} are part of a group —$CONR^{10}R^{15}$ they can, together with the nitrogen to which they are attached, form a five or six membered ring optionally having one additional hetero ring atom which is oxygen or nitrogen, said ring being unsubstituted or being substituted by one or more alkyl, each having up to three carbon atoms;

R^{17} is:
straight- or branched-chain alkyl having up to six carbon atoms;

R^{21} is:
halogen, R^7, nitro, cyano, —CO_2R^7, —$S(O)_nR^7$, —$NR^{10}R^{11}$ or —OR^7;
m is one, two or three;
n is zero, one or two;
q is zero, one or two; provided when R^2 is —$S(O)_nS(O)_qR^8$ then q is zero or two;
t is an integer from one to four, provided that when t is greater than one, the groups —$(CR^{13}R^{14})$— can be the same or different;
u is zero or two;

R^3, R^4 and R^5, each being the same or different, are:
a) hydrogen;
b) a straight- or branched-chain-alkyl, alkenyl or alkynyl radical having up to six carbon atoms, said radical being unsubstituted or being substituted by one or more halogen;
c) straight- or branched-chain alkyl having up to six carbon atoms, substituted by an —OR^6 group;
d) halogen;
e) nitro, cyano,—CO_2R^6, —COR^7, —$NR^{12}SO2R^{82}$, —$(CR^{13}R^{14})_qS(O)_nR^{82}$ —$S(O)_nS(O)_qR^{82}$ —$S(O)_nR^{83}$ —$O(CH_2)_mOR^6$, —$NR^{10}R^{11}$, —$CONR^{10}R^{15}$ or —OR^{81};
f) phenyl, which is unsubstituted or is substituted by from one to five R^{21} groups, whicb can be the same or different; or
g) cycloalkyl having from three to six carbon atoms;

R^{81} is:
a) a straight- or branched-chain alkyl, alkenyl or alkynyl radical having up to six carbon atoms, said radical being unsubstituted or being substituted by one or more halogen;
b) phenyl, which is unsubstituted or is substituted by one to five R^{21} groups, which can be the same or different; or
c) cycloalkyl having from three to six carbon atoms;

R^{82} is:
a) a straight- or branched-chain alkyl, alkenyl or alkynyl radical having up to six carbon atoms, said radical being unsubstituted or being substituted by one or more halogen;
b) cycloalkyl having from three to six carbon atoms;
c) phenyl, which is unsubstituted or is substituted by from one to five R^{21} groups, which can be the same or different; or
d) —CH_2CN,—$CH_2CO_2R^6$ or—$NR^{10}R^{11}$; and

R^{83} is:
a) a straight- or branched-chain alkyl, alkenyl or alkynyl radical having up to six carbon atoms, said radical being unsubstituted or being substituted by one or more halogen;
b) cycloalkyl having from three to six carbon atoms;
c) phenyl, which is unsubstituted or is substituted by from one to five R^{21} groups, which can be the same or different; or
d) —CH_2CN,—$CH_2CO_2R^6$ or—$NR^{10}R^{11}$;
provided that when R^3, R^4 or R^5 is —$S(O)_nS(O)_qR^{82}$ then q is 0 or 2;
with the proviso that when R^2 is chlorine, R is cyclopropyl, R^1, R^3, R^5 are hydrogen, R^4 is —$S(O)_nR^{83}$, and n is 2, then R^{83} is other than ethyl or dimethylamino;
with the proviso that when R^2 is fluorine, R^1, R^3 and R^5 are each hydrogen, R^4 is —$S(O)_nR^{83}$, n is 2, and R is cyclopropyl, then R^{83} is not methyl;

with the proviso that when R^2 is chlorine, R is cyclopropyl, R^1, R^3, R^5 are each hydrogen, R^4 is $—NR^{12}SO_2R^{82}$ and R^{12} is hydrogen or methyl, then R^{82} is other than methyl;

with the proviso that when R^2 is $—NR^{12}SO_2R^8$, R is cyclopropyl, R^1, R^3 and R^5 are each hydrogen, and R^8 and R^{12} are methyl, then R^4 is other than methyl or nitro; and

with the proviso that when R^2 is bromine, R is cyclopropyl or 1-methylcyclopropyl, R^1, R^3 and R^5 are all hydrogen, and R^4 is $S(O)_nR^{83}$, then n is 0 or 1;

or an agriculturally acceptable salt, metal complex or enolic tautomeric form thereof.

H1597

EPOXIDIZED DIENE ELASTOMERS FOR EXTERIOR BLOCK CROSSLINKING

James R. Erickson, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 863,579, Apr. 3, 1992. This application Apr. 18, 1995, Ser. No. 423,431

Int. Cl.[6] C08J *3/28*

U.S. Cl. 522—158 **2 Claims**

1. A process for the production of a partially hydrogenated conjugated diene block copolymer of the formula

$$D_n\text{-}X\text{-}C_r$$

wherein D is $A\text{-}B\text{-}M_p$ or $(A\text{-}B)_j\text{-}M_p$ or $A\text{-}(B\text{-}A)_j\text{-}M_p$; and

wherein A is a diene block which has a molecular weight of 3,000 to 50,000; and

wherein B is a diene block which has a molecular weight of from 15,000 to 200,000; and

wherein C is a block or multiblock segment which has a molecular weight of from 100 to 200,000 and comprises A, B or methacrylate or mixtures thereof but is not identical to D; and

wherein the B block may comprise up to 50% of a monoalkenyl aromatic hydrocarbon monomer and the A blocks may comprise up to 99% of a monoalkenyl aromatic hydrocarbon monomer; and

wherein M is a miniblock of a monomer selected from the group consisting of vinyl aromatic hydrocarbons and dienes and which has a molecular weight of 50 to 3000; and

wherein the A blocks contain a greater concentration of di-, tri-, or tetrasubstituted olefinic epoxides than the B blocks; and

wherein X is a coupling agent or coupling monomers or initiator, j is 1 to 6, $n \geq 2$, $r \geq 0$, $n \geq r$, n+ r ranges from 3 to 100 and p is 0 or 1;

said process comprising polymerizing the diene which makes up block A under anionic polymerization conditions to form block A, adding the diene which makes up block B to the reaction mixture and polymerizing it to form block B at one end of block A, subsequently coupling AB diblocks together by adding X to the reaction mixture to form a coupled block copolymer, and partially hydrogenatinq the coupled block copolymer such that the ratio of olefinic double bonds in the A blocks to that in the B blocks is at least 3:1.

REISSUES

SEPTEMBER 3, 1996

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,322

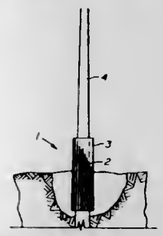
METHOD AND APPARATUS FOR COMPOSITE POLE REPAIR

Richard A. Owen, Conroe, Tex., and Richard C. Hannay, 11807 S. Red Cedar Clr., The Woodlands, Tex. 77380, assignors to Richard C. Hannay, The Woodlands, Tex.

Original No. 5,027,575, dated Jul. 2, 1991, Ser. No. 395,959, Aug. 17, 1989. Division of Ser. No. 206,579, Jun. 14, 1988, Pat. No. 4,918,883. Application for reissue Jul. 2, 1993, Ser. No. 87,166

Int. Cl.[6] E02D *27/42; E04C 5/07*

U.S. Cl. 52—741.14 **4 Claims**



1. A method of repairing a utility pole in situ comprising steps of:

(a) excavating around said utility pole to a predetermined depth;

(b) cleaning the surface of said pole;

(c) treating said surface;

(d) selecting and preparing a plurality of [longitudinal] woven fiber [strips] *mat*;

(e) saturating said [strips] *mat* with [the] *a* liquid composite;

(f) positioning each [strip with the longitudinal dimension of each strip substantially parallel to the longitudinal axis of said pole] *mat with the fibers of a first direction of the weave oriented substantially parallel to the longitudinal axis of said pole and the fibers of a second direction of the weave oriented at an angle relative to said first direction* ; and,

(g) applying said [strips] *mat* sequentially and circumferentially with each succeeding [strip] *mat* overlapping its preceding [strip] *mat*, around the circumference of said pole to form a cylindrical encasement of desired thickness; wherein the manner of applying the saturated woven mat [strips] comprises:

(i) fully saturating each [strip by placing the woven mat into a tray filled] *mat* with [the] *said* liquid [composite and rolling the mat strip with a paint roller];

(ii) [removing said saturated mat strips from the tray and] aligning each *mat* with the [longitudinal axis of the utility pole] *fibers of a first direction of the weave oriented substantially* parallel to the longitudinal axis of said pole and the fibers of a second direction of the weave oriented at an angle relative to said first direction then pressing it against the surface of the utility pole at the repair location;

(iii) [rolling said saturated woven mat strips with the paint roller to press] *pressing* the saturated mat against the pole surface and [to ensure] *ensuring* that no air bubbles are entrained;

(iv) repeating the process with the next woven mat [strip] which is saturated [in the tray]; and then placed against the utility pole so that [one half of] the second mat [strip] overlaps [half of] the first mat [strip] already in place;

(v) [rolling] *pressing* the second mat [strip with a paint roller] to ensure that no air bubbles are entrained; and,

(vi) repeating the saturated mat [strip] application until the [composite] *cylindrical* encasement [cylinder shell] reaches the desired thickness.

Re. 35,323

LINEAR MOTION GUIDE UNIT HAVING AN ADJUSTABLE RETAINER PLATE

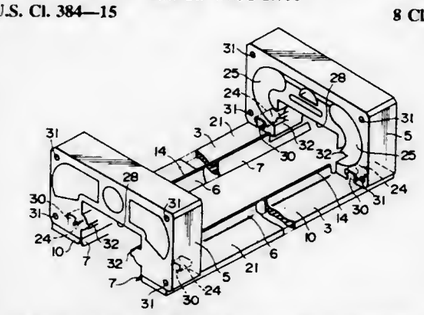
Masaichi Ohtake, Tokyo, Japan, assignor to Nippon Thompson Co., Ltd., Japan

Original No. 5,209,575, dated May 11, 1993, Ser. No. 928,908, Aug. 12, 1992. Application for reissue May 11, 1995, Ser. No. 439,006

Claims priority, application Japan, Dec. 8, 1991, 3-225297

Int. Cl.[6] F16C *29/06*

U.S. Cl. 384—15 **8 Claims**



1. A linear motion rolling contact guide unit, comprising:

a rail extending straight over a desired length;

a slider slidably mounted on said rail in a straddling manner;

a plurality of rolling members interposed between said rail and said slider;

sealing means for sealing a gap between said rail and said slider at a mouth of said gap for preventing undesired matter from entering into the interior of said guide unit; and mounting means for mounting said sealing means on said slider such that said mounting means absorbs a change in size of said sealing means relative to said slider so as to keep an intended sealing effect substantially unchanged even if said sealing means changes in size.

Re. 35,324

PREPOLYMERS OF OLEFINS CONTAINING A CHROMIUM OXIDE AND A GRANULAR REFRACTORY OXIDE SUPPORT

Jean-Claude Bailly, Martigues, France, and John G. Speakman, Bo'ness, Scotland, assignors to BP Chemicals Limited, London, England

Original No. 5,165,998, dated Nov. 24, 1992, Ser. No. 459,466, Jan. 2, 1990. Division of Ser. No. 776,470, Sep. 16, 1995, Pat. No. 4,910,271. Application for reissue Mar. 14, 1995, Ser. No. 404,469

Claims priority, application France, Sep. 17, 1984, 84 14323

Int. Cl.[6] B32B *27/02*

U.S. Cl. 428—407 **8 Claims**

1. A prepolymer of ethylene, or a prepolymer of ethylene and at least one higher alpha-olefin, prepared in a prepolymerisation step by contacting ethylene monomer or a mixture of monomers of ethylene and at least one higher alpha-olefin with a catalyst comprising a chromium oxide associated with a granular refractory oxide support, characterized in that the prepolymer containing said catalyst in an active form and consisting of solid particles having a chromium content from 4×10^{-5} to 3 milligram atoms of chromium per gram and having a mean diameter by mass [comprised] between 40 and 1000 microns is free from any monomer after having been separated from the monomer(s) of the prepolymerisation step, so that said prepolymer has an initial catalytic activ ity substantially reduced when it is used in a gas phase

(co-)polymerisation of ethylene, *and said prepolymer has a content of polymer or copolymer soluble in n-hexane at 60° C. of less than or equal to 2.0% by weight.*

Re. 35,325

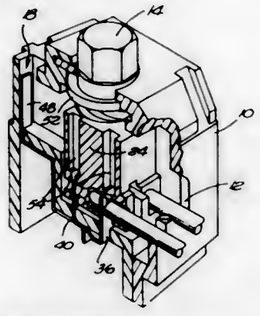
TERMINAL BLOCK

Charles W. Wass, Huntington Beach, and Mark R. Jespersen, Burbank, both of Calif., assignors to PSI Telecommunications, Inc., Burbank, Calif.

Original No. 5,149,278, dated Sep. 22, 1992, Ser. No. 660,284, Feb. 22, 1991. Application for reissue Sep. 21, 1994, Ser. No. 310,250

Int. Cl.[6] H01R *4/24*

U.S. Cl. 439—412 **38 Claims**



20. A terminal block comprising:

a housing having a chamber and a hole for allowing a wire to be inserted into said chamber;

an electrical contact element configured in said chamber;

a wire carrier member configured in said chamber, said wire carrier member having an opening for receiving a wire inserted through the hole in said chamber, and said wire carrier member being movable within the chamber so as to move a wire engaged thereby into contact with said electrical contact element; and

an actuator mechanism, coupled to said wire carrier member and adapted to move said wire carrier member within said chamber and relative to said actuator mechanism in a manner such that the actuator mechanism does not change its degree of entry into the chamber.

Re. 35,326

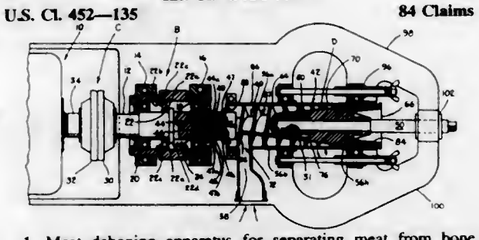
MEAT DEBONING APPARATUS AND METHOD

James B. Richburg, 101 Pumpkin La., Sumter, S.C. 29150

Original No. 5,160,290, dated Nov. 3, 1992, Ser. No. 625,412, Dec. 11, 1990. Application for reissue Nov. 1, 1994, Ser. No. 332,945

Int. Cl.[6] B02C *23/16*

U.S. Cl. 452—135 **84 Claims**



1. Meat deboning apparatus for separating meat from bone material of the type having a drive motor with a motor shaft, an auger for conveying said meat and bone material; a motor coupling for coupling said auger to said motor shaft; a housing surrounding said auger including a feed can having an inlet into which said meat and bone material are fed to an entry end of said auger, and a sieve screen through which said meat passes to separate meat from said bone material; and an outlet carried by said housing through which said bone material passes after separation from said meat; wherein said apparatus comprises:

an auger having a plurality of sections which include a feed auger and a compression auger integrally coupled together;

said feed auger and compression auger having a continuous tapered root along substantially their entire coupled total length;

said root having a root cross-section area which varies along its length;

flights carried by said auger root having a generally constant outside diameter representing a flight cross-section area which is generally constant over the length of said flights;

said auger having a cross-section area ratio at a given point along its length defined by the ratio of said flight cross-section area to said root cross-section area; and

said cross-section area ratio having a change greater than 2.3:1 over the length of said auger.

PLANT PATENTS

GRANTED SEPTEMBER 3, 1996

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,637

SHRUB ROSE PLANT NAMED 'POULURT'

Pernille Olesen, and Mogens N. Olesen, both of Fredensborg, Denmark, assignors to DeVor Nurseries, Inc., Watsonville, Calif.

Filed Jan. 30, 1995, Ser. No. 380,102

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct variety of rose plant, substantially as shown and described.

9,638

PLUM CULTIVAR 'CASTLETON'

John P. Watson, deceased, late of Phelps; Robert L. Andersen, and Kenneth G. Livermore, both of Geneva,, all of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Nov. 4, 1993, Ser. No. 148,085

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—38.1 **1 Claim**

1. A new and distinct plum tree as herein described and illustrated.

9,639

JUNIPERUS HORIZONALIS CV. MONBER

Willis A. Bergman, Quincy, Ill., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed Jun. 30, 1995, Ser. No. 497,067

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—50.2 **1 Claim**

1. A new and distinct selection of *Juniperus horizontalis* plant as substantially as shown and described herein, that is characterized particularly as a novelty by the unique combination of a brillant silvery blue color and the ability to retain a dense crown that does not open and become bare with age.

9,640

CORN PLANT NAMED 'SUN STAR'

Mary W. Eubanks, 4110 Hulon Dr., Durham, N.C. 27705

Filed May 31, 1995, Ser. No. 455,327

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—100 **1 Claim**

1. A new and distinct variety of corn plant, substantially as herein shown and described characterized by its profuse production of fruit, perennial habit, resistance to corn rootworm, and strong tolerance to drought and high temperatures.

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PATENTS

GRANTED September 3, 1996

ERRATA

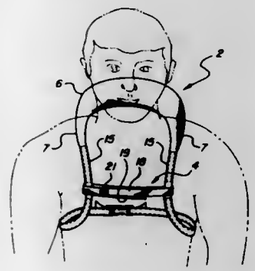
For CLASS	See PATENT NO.
191–012	5,551,545
192–084	5,551,546
192–089	5,551,547
192–006	5,551,548
192–007	5,551,549
473–323	5,551,691
473–037	5,551,693
473–234	5,551,694
473–236	5,551,695
473–226	5,551,696
463–036	5,551,701
604–226	5,551,947
216–002	5,552,015
205–785	5,552,025
508–433	5,552,067
508–436	5,552,068
508–229	5,552,069
508–224	5,552,070
508–581	5,552,071
510–498	5,552,077
510–351	5,552,078
510–466	5,552,079
510–412	5,552,080
116–214	5,552,088
510–417	5,552,089
156–345	5,552,124
423–199	5,552,126
238–380	5,552,586
375–224	5,553,243
235–379	5,553,320

PATENTS

GRANTED SEPTEMBER 3, 1996

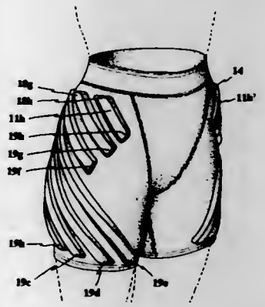
GENERAL AND MECHANICAL

5,551,081
NECK PROTECTING DEVICE
Dennis P. Starnes; John C. Mason, and Stephen M. Thompson, all of Mt. Pleasant, Mich., assignors to STM, Inc., Mt. Pleasant, Mich.
Filed Mar. 8, 1994, Ser. No. 207,384
Int. Cl.[6] A41D *13/00*
U.S. Cl. 2—2 **20 Claims**



1. A person's neck protecting device comprising a resilient body formed of cushioning material, said body having an arcuate bight from opposite ends of which a pair of arms extend, each of said arms terminating in a free end; a flexible mounting strap having opposite ends, the opposite ends of said mounting strap being joined to the free ends of the respective arms so that said body and said mounting strap together form an endless loop, said mounting strap having passages therein; and an anchor strap spanning said loop and extending through said passages, said anchor strap being coupled at opposite ends thereof to said mounting strap.

5,551,082
PROTECTIVE ATHLETIC PANTS HAVING DIAGONAL PROTECT PADS AROUND HIP, BUTTOCKS AND THIGH AREAS
David H. Stewart, New York, and Sheia C. Lehner, Brooklyn, both of N.Y., assignors to Crash Pads, Inc., Hillsboro, Oreg.
Continuation of Ser. No. 227,786, Apr. 14, 1994, abandoned, which is a continuation of Ser. No. 7,489, Jan. 25, 1993, abandoned, which is a continuation-in-part of Ser. No. 2,599, Jan. 11, 1993, abandoned. This application Feb. 24, 1995, Ser. No. 394,042
Int. Cl.[6] A41D *13/00*
U.S. Cl. 2—2 **16 Claims**

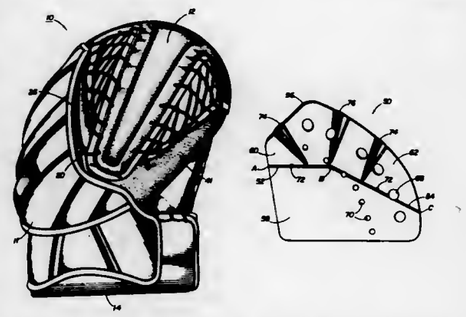


1. A garment for use in sports activities comprising:

a substantially tubular, body covering portion of stretchable fabric adapted to be worn by a person engaged in a sports activity;

impact absorbing protective means comprising a plurality of rib-shaped pads, said pads being located on an outer surface of said body covering portion for protecting the wearer in the event of a fall, said pads comprising at least a first plurality of relatively narrow, elongated diagonal pads each commencing at an upper end in the vicinity of a wearer's waist and curving, when worn, around the wearer's hip bones, and a second plurality of relatively narrow, elongated, diagonal pads each terminating at a relatively forwardly disposed lower end substantially in line with the lower portion of the buttocks of a wearer, said second plurality of pads having relatively rearwardly disposed upper ends below the waist of the wearer.

5,551,083
SPORTS CATCH GLOVE WITH STIFFENER HAVING A DISH SHAPE
Edward M. Goldsmith, Bloomfield Hills, Mich., assignor to Mike Vaughn Custom Sports, Inc., Lake Orion, Mich.
Filed Jun. 28, 1995, Ser. No. 496,024
Int. Cl.[6] A41D *13/10*
U.S. Cl. 2—19 **17 Claims**



1. A glove for use in catching fast moving objects, comprising:

a. an inner facing adapted to receive the objects, which inner facing comprises a pocket portion, a finger portion, and a thumb portion, which portions are interconnected via a web;

b. an intermediate support piece, portions of which correspond generally in shape to the inner facing, and which is adapted to be connected to a plurality of finger stalls and a thumb stall;

c. a stiffener that is

i) interposed between portions of the inner facing and the intermediate support piece,

ii) adapted to overlie a substantial portion of the wearer's fingers,

iii) curved about at least a first bend axis and a second bend axis to form at least a proximal section, a lateral distal section, and a medial distal section, each of which is connected to other of the sections, such that

A. the first bend axis is generally parallel to a line containing the distal ends of the index and middle fingers of the wearer's hand,

B. the second bend axis is generally parallel to a line containing the distal ends of the ring and small fingers,

C. the proximal section, the distal edge of which corresponds to the first and second bend axes, at least partially underlies the wearer's fingers,

D. the lateral distal section extends substantially distally from its connection to the proximal section along the first bend axis, and

E. the medial distal section extends substantially distally from its connection to the proximal section along the second bend axis,

whereby the stiffener approximates a dished tensegrity structure which (1) effectively extends distally the rigidity and cupping imparted on the glove by the wearer's fingers and (2) resolves forces imposed by the objects not only by resisting bending through the inherent stiffness of the stiffener material, but also through distributing the forces as tension forces within at least the proximal, lateral distal, and medial distal sections;

d. a plurality of stalls that are

i) attached to the intermediate support piece, and

ii) adapted to receive at least some of the wearer's fingers and one of the wearer's thumbs such that the fingers are retained to overlie at least a portion of the stiffener;

e. an elastomeric retainer that is

i) connected to the stalls and to the intermediate support piece, and

ii) adapted to cover a substantial portion of the back of the wearer's hand and to conform in shape to at least a substantial portion of the back of the wearer's hand;

f. a hand retainer strap that

i) spans at least a portion of the elastomeric retainer in the vicinity of the back of the wearer's hand, and

ii) cooperates with the elastomeric retainer in pressing the palm of the wearer's hand against the intermediate support piece such that force and control is imposed onto at least a portion of the pocket portion; and

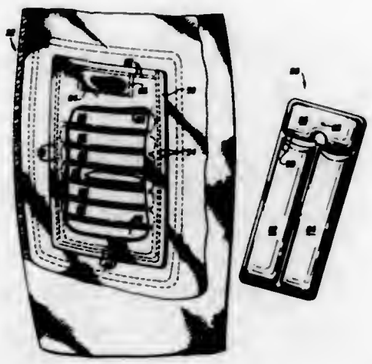
g. an outer facing connected to the inner facing which covers at least a portion of (1) the intermediate support piece and (2) the finger stalls.

5,551,084

FIREFIGHTERS PANTS WITH INSULATED CUSHION KNEE

George E. Freese, III, Somersworth, N.H., assignor to Globe Manufacturing Company, Pittsfield, N.H.

Filed Dec. 7, 1994, Ser. No. 350,481
Int. Cl.[6] A41D *13/06*
U.S. Cl. 2—23 **3 Claims**



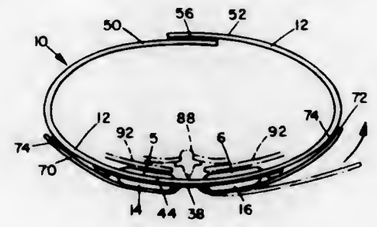
1. Firefighters pants including a torso portion, a pair of leg portions connected to said torso portion, each of said leg portions having a knee portion for covering the knee cap and surrounding knee area of a firefighter, each of said knee portions including a flexible knee cushion and thermal protection means comprising a plurality of flexible substantially gas-tight modules, said modules being unconnected to one another and being disposed in abutting relationship to one another to provide a substantially continuous cushion and thermal barrier over the knee cap and surrounding knee area of a firefighter and permitting individual ones of said modules to be removed and replaced, and pocket means within each knee portion for supporting said modules in position.

5,551,085

LOWER LUMBAR SUPPORT

Adam M. Leighton, 3138 Helix St., Spring Valley, Calif. 91977

Filed Feb. 7, 1995, Ser. No. 385,303
Int. Cl.[6] A61F *5/02*
U.S. Cl. 2—44 **11 Claims**



1. A support belt, comprising:

a first elongate strap member of elastic material having opposite first and second ends and a fastener for securing the strap member around a person's lower torso, the strap member having an outer face and an inner face and defining a central plane;

the first strap member having a narrow, inwardly facing channel for overlying a wearer's spine when the member is secured around the wearer's lower torso;

a first pad and a second pad secured to the strap member on opposite sides of the channel so as to extend up to opposite side edges of said channel, whereby said pads are positioned on opposite sides closely adjacent a wearer's spine but do not overlie the spine;

each pad projecting inwardly through the central plane defined by said strap member to form projecting regions on the inner face of the strap member and defining opposite side walls of said channel, whereby said strap member is spaced away from a wearer's spine at said channel and does not press against a wearer's spine, and said pads comprise means for exerting pressure on a wearer's lower back muscles; and

first and second wing strap portions of elastic material attached to the outer surface of said strap member between said pads, each wing strap portion having an outer free end and a fastener at the outer end of each wing strap portion for adjustable connection to an underlying portion of the strap member, the first and second wing strap portion comprising means for stretching over the first and second pads, respectively, and biasing said pads inwardly to apply a selected amount of pressure to the underlying muscles when said wing strap portions are secured to respective underlying portions of said strap member, whereby stretching each wing strap portion away from said channel in opposite directions acts to pull said channel outwardly away from the wearer's spine.

5,551,086

HAND RESTRAINT DEVICE

Michael Q. Albanese, 1522 Leatherleaf Dr., Las Vegas, Nev. 89123

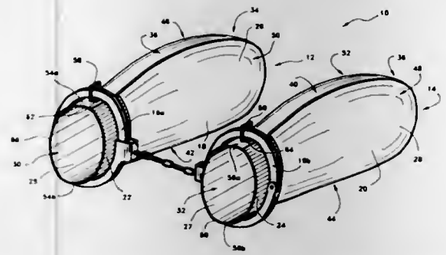
Filed Jul. 3, 1995, Ser. No. 498,088
Int. Cl.[6] A61F *5/37*; **A41D** *13/08*
U.S. Cl. 2—158 **6 Claims**

1. A hand restraint device for use with a pair of handcuffs for preventing a wearer from using his fingers or thumbs comprising:

a pair of mitts, each mitt having a hand-enveloping section having a first closed end, a second end, an outer surface, and an interior pocket for enveloping the hand of a wearer, said hand-enveloping section constructed of a durable, semi-rigid material, and each mitt further including a wrist-engaging section extending from said second end of said hand-enveloping section, said wrist-engaging section comprising at least one strip of said material forming said hand-enveloping section and the remainder thereof constructed of an elastic material, said elastic material and said strip forming a wrist-encircling band at said second end of said hand-enveloping section;

a ring connected to an outer surface of said strip of durable, semi-rigid material included in said wrist-engaging portion of each of said mitts for engagement by said handcuffs; and

a rib located on each of said wrist-encircling bands at an end thereof opposite said closed end of said hand-enveloping portion of said mitts.

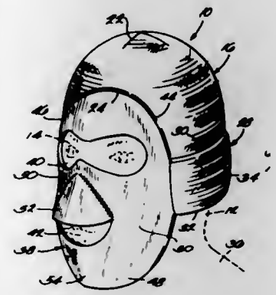


5,551,087

HAT AND FACE MASK COMBINATION

Morton Blutstein, Milwaukee, and Darwin Ulrich, Mequon, both of Wis., assignors to Reliable Knitting Works, Milwaukee, Wis.

Filed May 23, 1995, Ser. No. 447,495
Int. Cl.[6] A42B *3/18*
U.S. Cl. 2—173 **14 Claims**



1. A hat and face mask combination comprising

a hat adapted to cover the head of a wearer, the hat defining an opening for the face of a wearer, said opening having a periphery, and the hat including a lower portion, the lower portion having a lower periphery, and the lower portion having a rolled over position wherein the lower portion is rolled over upon itself to provide a double thickness along the lower periphery, the lower portion being fixed in the rolled over position along the periphery of the opening, and

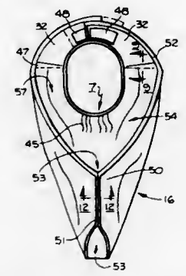
a face mask adapted to cover the face of a wearer, the face mask extending over the opening, and the face mask being secured to the hat along the periphery of the opening.

5,551,088

SHAMPOO SHIELD

Sharon Stepp, P.O. Box 435, Lake Villa, Ill. 60046

Filed Mar. 27, 1995, Ser. No. 410,696
Int. Cl.[6] A42B *1/06*
U.S. Cl. 2—174 **4 Claims**



1. A shampoo shield comprising,

a single flexible, water-impervious sheet having such character as to be capable of lying in a plane,

the sheet having an under surface and an upper surface, and having a front end and a rear end,

the sheet having at its front end, a head opening formed by a pair of transversely spaced horns extending generally forwardly and having free end tabs turned inwardly toward each other,

the sheet, at its rear portion, having side edges and an intermediate portion therebetween, the side edges being secured together in a seam at a position above said intermediate portion, thereby forming a tube defined entirely circumferentially therearound by the sheet,

said seam terminating at its rear end at a position forwardly of the rear end of the sheet, thereby forming an unimpeded rear open end of the tube,

said seam also terminating at its front end at a position forming an unimpeded front end of the tube that is located rearwardly of said head opening,

the shield being capable of being applied to the head of a patron and when so applied, the patron's head is fitted in said opening and the free end tabs are fitted to the front of the head and overlapped, such that the top of the head is thereby exposed through the opening, and

the free end tabs having counterpart securing pads thereon capable, when said free end tabs are overlapped, of interfitting and releasably securing the shield on the patron's head,

the free end tabs being operable for drawing the outer peripheral edges of the horns upwardly thereby forming a channel along the front and sides of the head communicating with said tube,

the free end tabs also being operable, in response to greater or less or extent of overlapping, respectively, for increasing or decreasing the tightness of the fit to the wearer's head, and increasing or decreasing the height of the outer peripheral edges of the horns, and correspondingly increasing or decreasing the depth of the channel.

5,551,089

DESIGNER EARMUFF HAVING INTERCHANGEABLE EAR MUFF PIECES

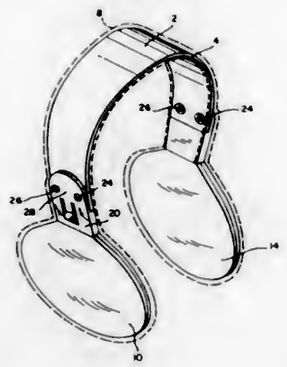
Jenna Whidden, 405 E. 78th St., New York, N.Y. 10021

Filed Jan. 10, 1995, Ser. No. 370,677
Int. Cl.[6] A42B *1/06*
U.S. Cl. 2—209 **2 Claims**

1. A designer ear muff which consists essentially of:

(a) a fabric covered arcuate top section having a first end and a second end, said arcuate top section being sized to fit over the top of the head of a wearer and extending downwardly to the area of the head which is above each of a wearer's ears;

(b) a first detachable, material covered ear covering piece which is removably affixed to the first end of said fabric covered



arcuate top section, wherein said fabric covered arcuate top section is provided with an intermediate cushioning layer; and

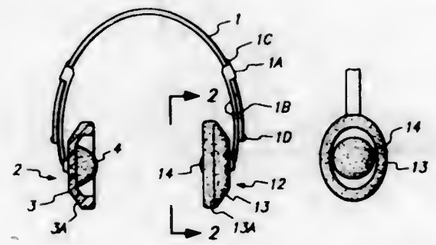
(c) a second detachable material covered ear covering piece which is removably affixed to the second end of said material covered arcuate top section said fabric covered arcuate top section having a widened middle section and having said first end and said second end tapered at the point where they are adapted to be attached to said first detachable material covered ear covering piece and said second detachable material covered ear covering piece.

5,551,090

EAR PROTECTING APPARATUS

Janet M. Thompson, 3211 Travelers Palm Dr., Edgewater, Fla. 32141

Filed Apr. 20, 1995, Ser. No. 425,927
Int. Cl.[6] A01F 11/02; G10K 11/04
U.S. Cl. 2—209 **11 Claims**



1. An ear protecting apparatus for children and infants, comprising:

a pair of ear protecting earmuffs;

a headband having said ear protecting earmuffs provided at opposite ends thereof, respectively;

each said ear protecting earmuff including a first predetermined noise-attenuating annular member which closely and completely surrounds an ear of the user of said apparatus;

each said ear protecting earmuff further including a second predetermined noise-attenuating member, said second member being dome shaped and having a substantially smooth, rounded surface which in an operative position presses against the opening of the auditory canal of said ear of said user, without protruding into said auditory canal, to substantially seal said auditory canal from sound;

said headband having a spring-like construction so as to apply a biasing force to each of said annular members and dome-shaped members such that said members are substantially firmly biased inwardly towards the user's head;

each said inwardly-biased annular member and respective dome-shaped member of each said earmuff operatively cooperating so as to retain said earmuff in position around said ear of said user; and

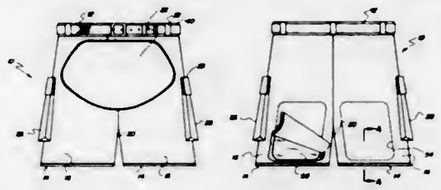
said headband and said ear protecting earmuffs being dimensioned to fit a child or infant.

5,551,091

TROUSERS WITH INTEGRAL SEATING COMPONENTS

Rick J. Tyndall, 1721 N. Amber Rd., Scottville, Mich. 49454

Filed Oct. 24, 1994, Ser. No. 327,603
Int. Cl.[6] A41D 1/06
U.S. Cl. 2—227 **6 Claims**



1. Trousers with integral seating components comprising, in combination:

short trousers having an upper end formed as a loop for the receipt of a wearer's torso, a lower end formed as a pair of small loops for the receipt of a wearer's legs above the knee and with legs formed therebetween;

an arcuate inseam coupling the trouser legs at an upper extent of the wearer's legs and an upper portion of the trouser, an enlarged opening in a front area of the trousers immediately above the inseam and immediately below the upper end of the trousers and extending laterally from a majority of the front area thereof;

large patch pockets formed on sides of the trousers with upper edges thereof adjacent to a central elevation of the trousers;

a plurality of belt loops secured to the trousers immediately between an upper opening of the trousers;

snap fasteners at the upper end in the front center thereof for the selective opening and closing of the trousers;

a heavy reinforcement material secured around the upper end of the garment;

the trousers being fabricated of multiple layers of flexible compressed foam with a layer of waterproof material between the foam layers and with an insulating fiber material internally of an external foam layer; and

a plurality of strips of flexible plastic inserts in the form of parallelograms interior of the compressed foam on the rear face of each leg and extending upwardly to a lower extent of an upper portion of the trousers with stitching therearound to hold the inserts in place.

5,551,092

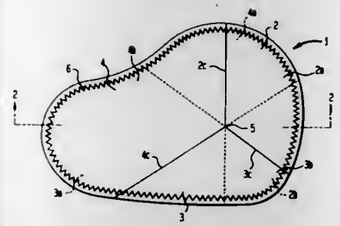
CLOSING APPARATUS FOR POCKETS IN ARTICLES OF CLOTHING

Georg Weber-Unger, Kufstein, Austria, assignor to Helbig GmbH & Co. Orthopädische Produkte KG, Brannenburg, Germany

Filed Oct. 4, 1994, Ser. No. 317,929
Claims priority, application Germany, Oct. 5, 1993, 9315100 U
Int. Cl.[6] A41D 27/20; A41C 3/12
U.S. Cl. 2—247 **8 Claims**

1. A closing apparatus for pockets in articles of clothing; comprising:

a body member which is securable to an article of clothing and comprised of at least three body sections, each body section



having two side pads, with one side pad overlapping a side pad of one neighboring body section and with the other side pad extending underneath a side pad of another neighboring body section; and

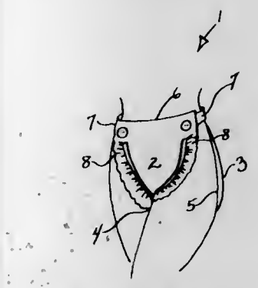
sealing means for joining overlapping side pads of neighboring body sections along a first edge area of said side pads, each said side pad having a second edge area which loosely sits upon the side pad of a neighboring body section for effecting a closure of the pocket of the article of clothing and is movable away from the neighboring body section to allow access to the pocket, said second edge areas of said side parts intersecting in a point of intersection which lies essentially in a center of said body member.

5,551,093

EXTRA PROTECTION UNDERGARMENT

Mildred L. Stricker, P.O. Box 18652, St. Louis, Mo. 63118

Filed Sep. 26, 1994, Ser. No. 312,517
Int. Cl.[6] A41B 9/00
U.S. Cl. 2—406 **1 Claim**



1. An undergarment comprising a waterproof outer layer and a coextensive inner lining, the undergarment being oblong when laid out flat in the unworn condition and comprising a front portion for covering the lower abdomen of a wearer, a rear portion for covering the buttocks of a wearer, and a middle connecting the front and rear portions and extending through the crotch of a wearer, the garment also having two sides and tow ends;

fastening elements on the front and rear portions adjacent the points where the sides meet the ends for securing the undergarment to a wearer;

elastic ruffles extending along each side of the undergarment from adjacent the middle of the garment to adjacent the fastening elements on the front portion so that, when the garment is worn, the elastic ruffles are present on each side of the front portion of the undergarment so as to cause the garment to conform to the curves of the body, and wherein the ruffles terminate at the crotch of the wearer so that the ruffles curve down and around the inside of the legs to hug the legs for extra protection;

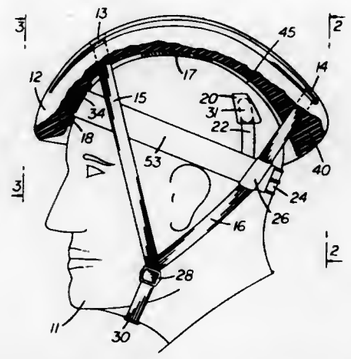
the undergarment being of a width such that the back portion will cup in, where it meets the ruffles, at the back of the inside of the legs.

5,551,094

HELMET RETENTION SYSTEM WITH ADJUSTABLE HEADBAND

Michael V. Navone, 838 Iris Ave., Sunnyvale, Calif. 94086, assignor to Michael V. Navone, Sunnyvale, Calif.

Filed May 20, 1994, Ser. No. 247,045
Int. Cl.[6] A42B 3/00
U.S. Cl. 2—421 **6 Claims**



1. In a protective helmet, the combination comprising:

a protective helmet body having a front and a back, said helmet body having a lower rim, said lower rim of said helmet body being situated approximately horizontally with respect to a head of a wearer,

a headband member which encircles said head of said wearer, said headband member having a front portion and a back portion, means for attaching said front portion of said headband member to said helmet body proximate said front of said helmet body at least one upwardly extending strut attached to said back portion of said headband member, said at least one upwardly extending strut having an upper end, said upper end having a means for attaching said upper end to said helmet body proximate said back of said helmet body,

and at least one retention strap member attached to said helmet body for engaging the chin of the wearer,

wherein said headband member is inclined with respect to said lower rim of said protective helmet body such that said front portion of said headband member is higher than said back portion of said headband member

and wherein said headband member further comprises a left strap holder for slidably attaching said left back strap to the left side of said headband member proximate said back portion of said headband member, and a right strap holder for slidably attaching said right back strap to the right side of said headband member proximate said back portion of said headband member.

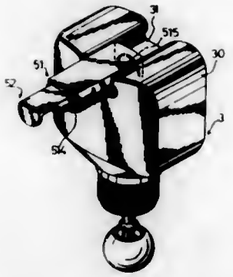
5,551,095

LIQUID RELEASING DEVICE WITH AN ADJUSTABLE MOUNTING UNIT FOR MOUNTING ON A RIM OF A WATER TANK

Sung-Tzu Chen, No. 2, Kuang-I-Heng Lane, Su-Ao-Chen, I-Lan Hsien, Taiwan

Filed Mar. 1, 1995, Ser. No. 396,609
Int. Cl.[6] E03D 9/02
U.S. Cl. 4—227.3 **3 Claims**

1. A liquid releasing device for a water tank, including a container which is to be disposed in said water tank and which receives liquid therein, a float-controlled valve assembly mounted on a bottom wall of said container for releasing said liquid in said container when water level in said water tank drops below a predetermined level, and a mounting unit for mounting said container on a rim of said water tank,



wherein the improvement comprises:

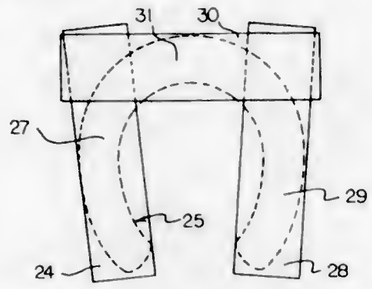
said mounting unit including an elongated first support member mounted slidably on a top surface of said container, and an elongated second support member mounted slidably and longitudinally to said first support member, said second support member having one end portion formed with a hook portion, and another end portion connected slidably to said first support member, said first support member having a distal end adjacent to said hook portion of said second support member, said hook portion of said second support member being movable relative to said distal end of said first support member so as to define a variable holding space with said distal end of said first support member for engaging said rim of said water tank, said first support member being movable relative to said container to permit maintaining of said container at an upright position so as to ensure proper operation of said float-controlled valve assembly.

5,551,096

DISPOSABLE TOILET SEAT COVER APPARATUS

G. Byron Gardner, 98 Wadsworth, Ste. 127–195, Lakewood, Colo. 80226

Filed May 30, 1995, Ser. No. 452,684
Int. Cl.[6] A47K *13/18;13/22*
U.S. Cl. 4—245.4 **2 Claims**



1. A disposable toilet seat cover apparatus, comprising:

a roll of continuous, flexible, biodegradable base sheet having two side edges, having a leading edge, having a top side, and having a bottom side, wherein said base sheet includes perforations positioned only at predetermined intervals along said base sheet, the length of each interval being equal to about three times the width of said roll, wherein each perforation extends across said base sheet from one side edge to the other side edge, and

a coating of tacky adhesive placed on said bottom side of said base sheet and coextensive with said bottom side of said base sheet,

wherein said base sheet with said tacky adhesive on said bottom side of said base sheet is wound into a roll whereby portions of said tacky adhesive contact portions of said top side of said base sheet, whereby said roll is maintained as a roll, and

wherein said roll is unrolled by pulling said leading edge of said base sheet away from said roll,

wherein said coating of tacky adhesive is water repellent,

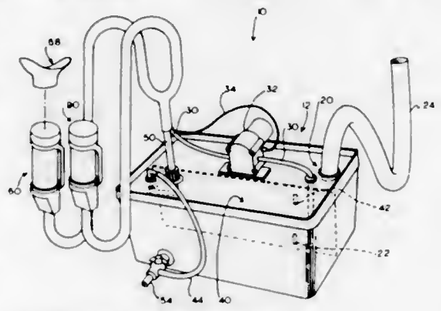
wherein said base sheet is made from a relatively non-porous paper.

5,551,097

COMPACT URINAL SYSTEM

Johnny W. Short, 309 Forest Rd. West, Wilson, N.C. 27893, assignor to Johnny W. Short, and L. Ralph Jones, both of Wilson, N.C.

Filed Mar. 2, 1995, Ser. No. 397,849
Int. Cl.[6] E03D *13/00;5/01*
U.S. Cl. 4—301.000 **18 Claims**



1. A compact urinal system, comprising:

a) a flushing tank for storing a flushing fluid;

b) a waste tank;

c) a remote receptacle head having an illuminating device for receiving urine;

d) a flushing line interconnected between the receptacle head and the flushing tank for delivering flushing fluid from the flushing tank to the receptacle head;

e) a pump for pumping flushing fluid from the flushing tank, through the flushing line, and into the receptacle head;

a switch for actuating the pump; and

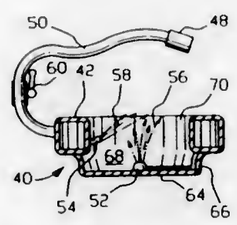
g) a waste line for delivering urine and flushing fluid from the receptacle head to the waste tank.

5,551,098

PERSONAL BIDET AND ASSOCIATED METHOD

Peter J. Wilk, 185 W. End Ave., New York, N.Y. 10023

Continuation-in-part of Ser. No. 181,666, Jan. 14, 1994, Pat. No. 5,361,427. This application Nov. 10, 1994, Ser. No. 337,556
Int. Cl.[6] A47K *3/22;7/08*
U.S. Cl. 4—420.300 **9 Claims**



1. A hygienic method comprising the steps of:

providing a bidet device including a substantially annular frame having an inlet, an outlet and a reservoir chamber between said inlet and said outlet;

disposing said frame on a toilet bowl rim or toilet seat;

introducing the fluidic cleaning agent to said reservoir chamber via said inlet;

only after the introduction of the cleaning agent into said reservoir chamber, pressurizing the fluidic cleaning agent introduced to said reservoir chamber;

after pressurizing the fluidic cleaning agent in said reservoir chamber, dispensing said fluidic cleaning agent from said reservoir chamber through said outlet onto one's anus and/or external genitalia; and

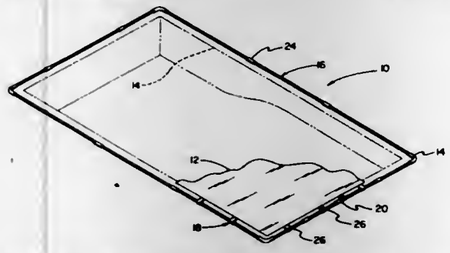
subsequently to said step of dispensing, removing said bidet device from the toilet bowl rim or toilet seat.

5,551,099

WEIGHTED POOL COVER PERIMETER ANCHOR

Richard A. Kirk, 335 Redwood Grove Ct., Millersville, Md. 21108

Filed Feb. 9, 1995, Ser. No. 386,148
Int. Cl.[6] E04H *4/10*
U.S. Cl. 4—503.000 **4 Claims**



1. A weighted pool cover perimeter anchor, comprising:

an elongated anchor means extending about the perimeter of a pool cover which is positioned over a pool to anchor such cover relative to such pool, said anchor means comprising a plurality of elongated conduits connected together in fluid communication by a plurality of connectors;

securing means comprising a plurality of straps which are mountable to the cover and extend about the elongated anchor means to removeably couple said cover to said anchor means; and,

a filling means coupled to and in fluid communication with said conduits of said anchor means to selectively permit introduction of fluid into said conduits wherein the filling means comprises a T-connector positioned in fluid communication with at least one of the elongated conduits of the elongated anchor means, the T-connector of filling means including a removable plug permitting the introduction of a fluid into the anchor means.

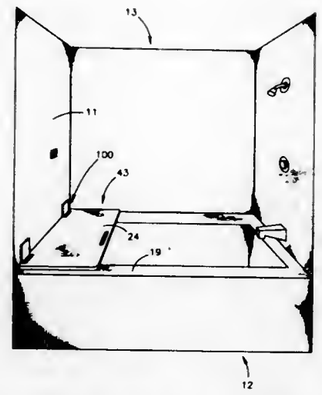
5,551,100

BATH BENCH

Ronald S. Kindrick, 10990 Weset Rd. #615, Houston, Tex. 77064

Filed Sep. 22, 1994, Ser. No. 310,914
Int. Cl.[6] A47K *3/022*
U.S. Cl. 4—578.1 **24 Claims**

1. A seating unit for a bathtub that is provided with a rear splash wall, said bathtub having a first side wall having an upper end, a second side wall having an upper end, a back end wall connecting the first side wall with the second side wall, said back end wall having an upper end, wherein the rear splash wall extends upwardly from the upper end of the back end wall of the bathtub, said seating unit comprising



a panel member having first end, a second end, a first side surface extending between the first end and the second end, a second side surface extending between the first end and the second end opposite to the first side surface, a length sufficient to simultaneously contact the upper end of the first side wall and the upper end of the second side wall and a width sufficient to accommodate a sitting person,

means for pivotally connecting the panel member to the rear splash wall at a location closely adjacent to the upper end of the back end wall so that the panel member will pivot from a storage position to a use position,

wherein downward travel of the panel member is limited by the upper end of the first side wall of the bathtub, the upper end of the second side wall of the bathtub, and the upper end of the back end wall of the bathtub when the panel member is in the use position,

wherein the panel member is positioned adjacent to the rear splash wall and is in contact with the upper end of the back end wall when the panel member is in the storage position, wherein the means for pivotally connecting the panel member to the rear splash wall comprises

a first hinge pin notch in the first side surface of the panel member;

a second hinge pin notch in the first side surface of the panel member;

a first hinge pin portion positioned across the first hinge pin notch;

a second hinge pin portion positioned across the second hinge pin notch;

a first hinge member affixed to the rear splash wall, said hinge member having a hinge pin housing portion, wherein the hinge pin housing portion defines a hinge pin receiving borehole and a hinge pin receiving slot leading to said hinge pin receiving borehole, said first hinge pin portion being positioned in the hinge pin receiving borehole of the first hinge member; and

a second hinge member affixed to the rear s plash wall, said hinge member having a hinge pin housing portion,

wherein the hinge pin housing portion defines a hinge pin receiving borehole and a hinge pin receiving slot leading to the hinge pin receiving borehole, said second hinge pin portion being positioned in the hinge pin receiving borehole of the second hinge member,

wherein the first hinge member further has a hinge member plate portion, wherein the hinge member plate portion has a first generally planar face and a second generally planar face opposite from the first generally planar face and extends from the first end surface of the hinge pin housing portion, and the hinge pin housing portion protrudes from the first generally planar face of the hinge member plate portion and extends at least partially across a width of the hinge member plate portion, the hinge member plate portion and the hinge pin housing portion forming a generally J shaped structure, and

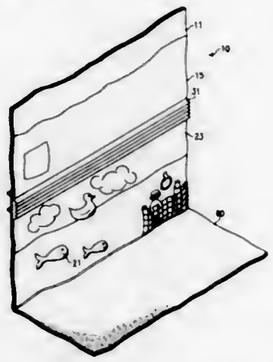
wherein the second hinge member further has a hinge member plate portion, wherein the hinge member plate portion has a first generally planar face and a second generally planar face opposite from the first generally planar face and extends from the first end surface of the hinge pin housing portion, and the hinge pin housing portion protrudes from the first generally planar face of the hinge member hinge member plate portion and extends at least partially across a width of the hinge member plate portion, the hinge member plate portion and the hinge pin housing portion forming a generally J shaped structure.

5,551,101

BATH MAT FOR USE IN BATHING OTHERS

Sheryl S. Leach, 2603 Foxboro, McKinney, Tex. 75070

Filed Jan. 27, 1993, Ser. No. 9,769
Int. Cl.[6] A47K *3/02*
U.S. Cl. 4—580 **3 Claims**



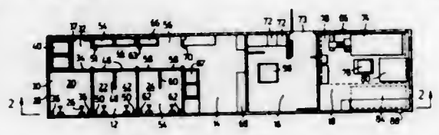
1. A bath mat for use over a top rim of a bathtub, said mat comprising:
a limited-slip surface on a portion of an underside of said mat;
means for collecting liquid spilled from said bathtub, said collecting means attached to an external flap of said mat; and
a mounting device located on said underside of said mat that is sized to fit into an adaptation of said bathtub.

5,551,102

MOBILE DECONTAMINATION AND CONTAINMENT UNIT

Craig Stewart, 577 Bud Gregory Blvd., Mississauga, Ontario, Canada, and Christopher W. A. Fredericks, 281 Sylvan Avenue, Scarborough, Ontario, Canada

Continuation of Ser. No. 814,753, Dec. 30, 1991, abandoned. This application Nov. 14, 1994, Ser. No. 337,880
Int. Cl.[6] A47K *3/22*
U.S. Cl. 4—612 **1 Claim**



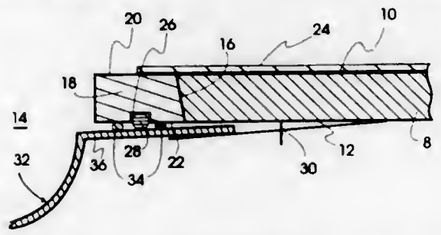
1. A Mobile Decontamination Unit, a self contained mobile decontamination unit comprising of a mechanical system driven by an on board power source, operating a heating and ventilation system, an electrical system and a plumbing system, (with on board reservoir storage tank) providing a means for directing water, heating, ventilation and lighting to the said mechanical room, waiting room and multiple showering compartment;
a first shower compartment comprising a first shower portion and adjacent changing portion, said shower having first means for spraying water onto a user prior to the said user removing any of his protective and outer clothing or equipment that may be contaminated, and a drain system located therein; said change portion to provide an area for removal of pre-showered outer and protective clothing and equipment; said changing portion to allow passage to second shower compartment and a drain system located therein;
a second shower comprising of a second shower portion and adjacent second changing portion, said second shower portion with second means for spraying water onto a user and a further drain system located therein; said second shower portion being completely separated from said first shower portion so that passage directly from the first to the second shower portion is not permitted without entering the changing portion;
means for providing water to said first and second spraying means;
storage tank means connected to the first and further drains;
means for maintaining the first and second shower compartments at a negative air pressure for reducing the amount of contaminant air that leaves the shower compartments; and
a waiting room connected by a passageway to the second shower compartment so as to permit a user to move from said second shower compartment to said waiting room without leaving said unit,
wherein the second shower compartment is connected by passageway to said changing portion so as to permit a user to move from said changing portion to said second shower compartment without returning to said first shower portion and without leaving said unit,
means for keeping the waiting room at a positive pressure.
the option of a third shower compartment and adjacent change area with a drainage system therein; maintained at a negative pressure and connected by a passageway to the second shower compartment so as to permit a user to move from the second to the third shower compartment without leaving the unit.

5,551,103

APERTURED COUNTERTOP MOUNTING UNIT

Bryan G. Drozdowich, 32612 Hacienda Place, Clearbrook, British Columbia, Canada, and Peter Zurba, 8557 Woodridge Place, Burnaby, British Columbia, Canada

Filed Aug. 17, 1994, Ser. No. 291,663
Int. Cl.[6] E03C *1/33*
U.S. Cl. 4—631 **29 Claims**



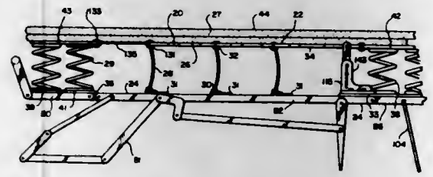
1. An apertured mounting unit comprising:
a deck sheet with a planar top surface and a planar bottom surface, the deck sheet having a porous cross-sectional edge defining an aperture in the deck sheet;
a non-porous seal ring, the outer peripheral surface of the seal ring abutting the cross-sectional edge, the inner peripheral surface of the seal ring defining an unobstructed opening through the mounting unit, the seal ring having a planar top surface and a planar exposed bottom surface, the planar top surface and the planar exposed bottom surface of the seal ring being coplanar respectively with the planar top surface and the planar bottom surface of the deck sheet; and,
a resilient gasket sealingly seated in a channel formed in the planar exposed bottom surface of the seal ring.

5,551,104

COLLAPSIBLE SOFA BED MATTRESS

Michael F. Hartline, Tupelo, Miss., assignor to Super Sagless Corporation, Tupelo, Mich.

Continuation of Ser. No. 118,972, Sep. 9, 1993, abandoned. This application Mar. 29, 1995, Ser. No. 412,610
Int. Cl.[6] A47C *17/04*
U.S. Cl. 5—13 **9 Claims**



1. A sofa bed comprising:
a sofa frame having a back, seating area and front rail with the seating area including a cavity for the storage of the bed frame and mattress when the sofa bed is in the sofa configuration,
a folding bed frame secured to the sofa frame and having a head section that extends upwardly behind the back of the sofa bed when in the sofa configuration, a main section connected to the head section and spanning the front rail when in the bed configuration and lying within the cavity in the sofa configuration, an intermediate section pivotally connected to the main section and a foot section pivotally connected to the intermediate section, said head, main, intermediate and foot sections being coplanar when the bed frame is in the bed configuration and said intermediate section lying perpendicular to the main section and the foot section lying parallel to and spaced above the main section when the bed frame is in the sofa configuration, and a mattress disposed on the bed frame and having a protion which is non-collapsing and a collapsible portion which is not collapsed when the frame is in the bed configuration and which is collapse when the frame is in the sofa configuration, wherein the portion which is non-collapsing is a foot portion overlying the foot section and the portion which is collapsible is a portion overlying at least one of the head, main or intermediate sections of the bed frame.

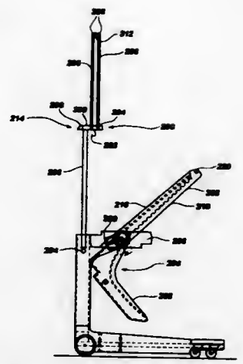
5,551,105

APPARATUS COMBINING OVERBED TABLE, IV STAND, WALKER, AND SEAT

J. Gordon Short, Salt Lake City, Utah, assignor to Brevis Corporation, Salt Lake City, Utah

Filed Aug. 26, 1994, Ser. No. 296,758
Int. Cl.[6] A61G *7/08*; A47C *13/00*
U.S. Cl. 5—87.1 **19 Claims**

1. Apparatus combining an overbed table, an IV stand, and a walker comprising
a wheeled base, having a rear portion, comprising generally horizontal elongate side members having front and back ends interconnected by a back cross member adjacent said back ends, said elongate side members extending forwardly from said back cross member so as to project beneath a bed frame, said side members containing wheels at the back and front ends for providing maneuverability and stability;
a generally vertical standard at the rear portion of said base comprising generally parallel, spaced apart, upwardly extending hollow support members disposed on said base;



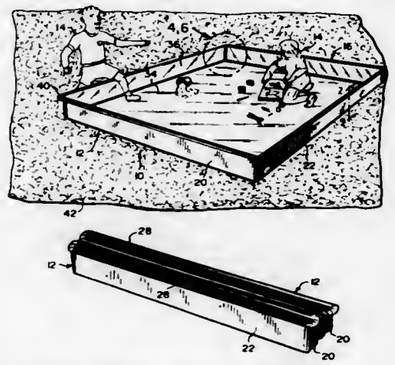
a table means vertically adjustable to at least one height disposed on said support members by attachment means and overlying said base for providing a generally horizontal work surface adapted to overlie said bed frame when said wheeled base projects therebeneath;
means for adjusting the height of said table means;
handle means disposed on said standard for gripping said apparatus; and
vertically adjustable IV stand means disposed on said support members of said standard for supporting at least one intravenously administered liquid, wherein said IV stand means comprises generally horizontally disposed upper and lower elongate members, said upper member disposed on a pair of generally vertical members slidably disposed in said hollow support members, wherein said upper member has disposed thereon a plurality of spaced apart IV attachment means for supporting containers of intravenously administered liquid and said lower member is adapted for receiving said upper member for concealing said IV attachment means.

5,551,106

PORTABLE FOLDABLE RECREATIONAL ENCLOSURE

Laurie A. Schacht, 952 Gertmin Rd., Woodmere, N.Y. 11598, and Laura Karson, 1291 Seawane Dr., Hewlett Harbor, N.Y. 11557

Filed Oct. 11, 1994, Ser. No. 320,698
Int. Cl.[6] A47C *7/00*
U.S. Cl. 5—99.1 **1 Claim**



1. A portable recreational enclosure comprising:
a) a pen large enough to hold at least one child therein and provide room for said child to play inside said pen, said pen made of vinyl semi-rigid material and comprising a floor, a pair of opposite end walls extending upwardly from said floor,

and a pair of opposite side walls extending upwardly from said floor, said walls each including a rolled lip along the upper edge thereof, said pen forming a compartment with an open top and including folding means comprising a plurality of accordion bellows fold lines in each of said end and side walls and in said floor to permit said pen to be folded up into a compact unit for storage when not in use; and

b) a disposable liner of flexible thin sheet of plastic material which fits into said pen, so that the child can make a mess when playing, allowing said liner to be removed and discarded later, said liner including a base portion and four integral upstanding side portions sized to fit into said pen, permitting said child to play within said liner, said liner having an outer perimeter with a bent over edge to engage the rolled outer lips of said walls of said pen.

5,551,107

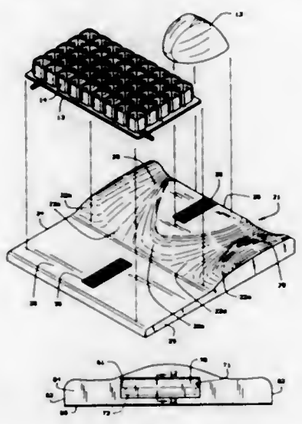
MODULAR CUSHION CONSTRUCTION WITH DETACHABLE POMMEL, HAVING A COVER WITH FRONT AND REAR OPENINGS

Robert H. Graebe, 7 Persimmon Ridge Dr., Belleville, Ill. 62223

Division of Ser. No. 334,601, Nov. 4, 1994, which is a continuation-in-part of Ser. No. 53,551, Apr. 27, 1993, abandoned, which is a continuation of Ser. No. 839,385, Feb. 20, 1992, abandoned. This application Nov. 7, 1995, Ser. No. 554,541

Int. Cl.[6] A47C *27/10;7/02;* **A47G** *9/00*

U.S. Cl. 5—654 **19 Claims**



1. A substantially rectangular shaped base made from expanded foam having

(a) a rear portion having an upper surface to accommodate the buttocks of a user,

(b) a raised front portion having a top surface adapted to support a user,

(c) a transition section connecting the rear portion and the raised front portion,

(d) the top surface of the front portion having a substantially flat center area bounded by two slight leg depressions which retain and position the user without impeding slide transfer of the user on and off the base, and

(e) a cover positioned over the base, said cover having an opening in the front panel aligned with the center area of the base, and a rear opening to allow the cover to be positioned over the base.

5,551,108

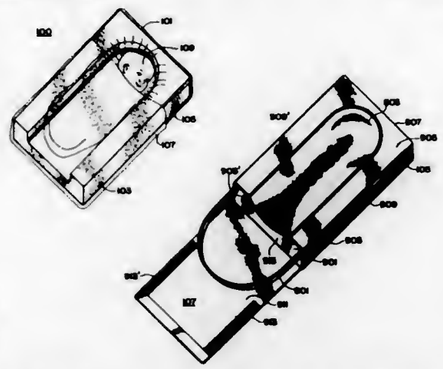
PORTABLE BABY CUSHION AND COVER COMBINATION

George D. Butler, III, 1960 Hughes Dr., Cumming, Ga. 30130

Continuation-in-part of Ser. No. 1,692, Nov. 20, 1992, Pat. No. Des. 342,855. This application Dec. 30, 1993, Ser. No. 175,602

Int. Cl.[6] A47D *13/00;* **A47C** *27/14;* **A47G** *9/04*

U.S. Cl. 5—655 **11 Claims**



1. An infant cushion and cover combination comprising a generally elongated fabric cover having an open end and a longitudinally spaced closed end, a top portion adapted to support an infant, a cushion adapted to be removably positioned within said fabric cover through said open end, said cushion comprising a generally central infant supporting region with peripherally located, elevated edge portions, an elongated blanket portion integral with said cover and adjacent said open end, said blanket adapted to selectively cover and uncover said infant supporting top portion, and separable fastener means adapted to releasably secure said blanket to said cover, thereby covering an infant resting on the top portion of said cover.

5,551,109

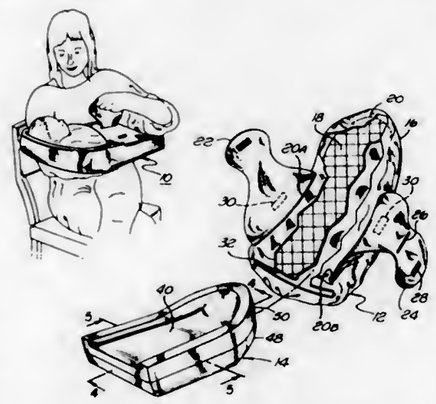
PILLOW FOR HOLDING AND FEEDING AN INFANT

Wayne F. Tingley, 13154 E. Annette St., Moorpark, Calif. 93021, and John M. Getzinger, 5629 Laurel Bluff Pl., Agoura Hills, Calif. 91301

Filed Feb. 17, 1995, Ser. No. 390,635

Int. Cl.[6] A47D *13/02*

U.S. Cl. 5—655 **17 Claims**



1. A pillow for holding and cradling an infant comprising:

a foam assembly approximately the length of an infant's head and body; said foam assembly having a recessed surface of ample depth and width to receive said infant's head and body; said foam assembly having a bottom surface and an inclined surface abutting said bottom surface, said bottom surface having a planar shape, said inclined surface having an acclivity from said bottom surface along an inscribed radial line creating an upwardly curved slope; said foam assembly having a top surface approximately equidistant from said recessed surface, and said top surface approximately equidistant from both said bottom surface, and said inclined surface; said top surface spaced from said recessed surface to give ample depth between said top surface and said recessed surface; said foam assembly being comprised of an upper foam layer and lower foam layer, wherein said upper foam layer and said lower foam layer is of a polyurethane material of different densities; said foam assembly having sufficient thickness between said top surface and both said bottom surface and said inclined surface, to adequately accommodate an infant's weight without undue distortion of said foam assembly.

5,551,110

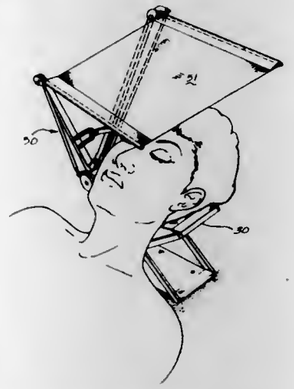
COLLAPSIBLE SHADE FOR HEAD CHAIR

Jeffrey A. Armstrong, Woodinville, and Roger L. Sortino, Bellevue, both of Wash., assignors to Beachead Products Company, Kirkland, Wash.

Filed Jun. 3, 1994, Ser. No. 253,731

Int. Cl.[6] A47C *20/02;7/62*

U.S. Cl. 5—656 **15 Claims**



1. A collapsible sunshade comprising:

a first and a second support arm rotatably coupled at their lower ends for swinging movement about a first axis, the first support arm including a first lever arm that extends radially from the first axis;

a first and second rib rotatably coupled to respective outer ends of the first and second support arms;

a flexible shade disposed between the first and second rib;

at least one pushrod having a first and a second end, the first end of the pushrod being coupled to the first lever arm and the second end coupled to the rib that is rotatably coupled to the second support arm;

wherein said first and second support arms are movable from a closed position in which the first and second support arms are in a substantially parallel relationship, to an open position in which the upper ends of the support arms are spaced from each other, the swinging movement of the first and second support arms from the closed to the open position causing the pushrod to move upwardly relative to the first and second support arm and raises the ribs so that the fabric shade is extended.

5,551,111

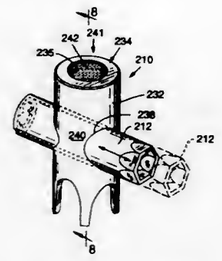
DEVICE FOR ATHLETIC SHOE CLEAT CARE

Terry D. Murphy, 3447 SW. Brentwood Dr., Portland, Oreg. 97201

Continuation-in-part of Ser. No. 113,179, Aug. 30, 1993, Pat. No. 5,386,605. This application Feb. 3, 1995, Ser. No. 391,249

Int. Cl.[6] B25B *13/00*

U.S. Cl. 7—138 **16 Claims**



1. A device for shoe cleat care, the device comprising:

a cleat burr remover including a hollow region to be disposed over a cleat and at least one member projecting into the hollow region to remove burrs as the device is rotated relative to the cleat;

a cleat cleaner mounted to the burr remover; and

a cleat wrench mounted to the cleaner and the burr remover.

5,551,112

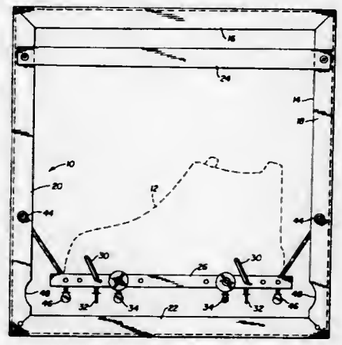
SHOE SUPPORT WITH PIVOTABLE CARRIER FOR USE WITH SEWING MACHINES

William J. Brandsma, Rifle, and Eligio Raybal, Greeley, both of Colo., assignors to Shoes By Design, Inc., Rifle, Colo.

Filed Apr. 28, 1994, Ser. No. 234,865

Int. Cl.[6] A43D *3/00;* **D05C** *7/04;* **D05B** *3/12*

U.S. Cl. 12—123 **11 Claims**



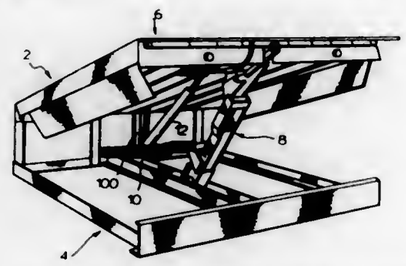
1. A shoe support for use in combination with a sowing machine, comprising:

a frame defining a perimeter about a central opening therein, having means for mounting the shoe support in a fixed position with respect to an associated sewing machine;

a carrying means for holding a shoe with respect to said frame, with a major plane of a shoe sole extending perpendicularly to the central opening of the frame; and

a positioning means for varying the position of said carrying means with respect to the frame.

5,551,113
MANUAL HYDRAULIC DOCK BOARD HOLD DOWN ARRANGEMENT
Arnold H. Marier, 345 Silverstone Drive, Rexdale, Ontario, Canada, and Stanley A. Marier, 39 Goodfellow Crescent, Bolton, Ontario, Canada
Filed Dec. 3, 1993, Ser. No. 161,253
Int. Cl.[6] E01D *1/00*
U.S. Cl. 14—71.7 **14 Claims**



1. Hydraulic locking arrangement for a loading dock having a pivotally mounted dock plate, said hydraulic locking arrangement controlling movement of said dock plate from a raised position to a lower trailer loading or unloading position, said hydraulic locking arrangement locking said dock plate against upward movement unless a predetermined pressure is exceeded, said hydraulic locking arrangement comprising

a cylinder, a piston moveable within said cylinder, a closable hydraulic fluid circuit acting on one side of said piston, said closable hydraulic fluid circuit when closed opposing any forces urging movement of said piston in a direction to raise said dock plate and results in an increase of the hydraulic fluid pressure of said closable hydraulic fluid circuit, a hydraulic fluid reservoir, a high pressure check valve arrangement connecting said hydraulic fluid circuit with said reservoir, a low pressure check valve for accommodating retraction of said piston and supply of hydraulic fluid from said reservoir into said fluid circuit, and release means for opening said fluid circuit and accommodating movement of said piston as said dock platform is moved to the raised position;

said high pressure check valve arrangement opening to said reservoir when a predetermined pressure is exceeded in said hydraulic fluid circuit caused by said dock board being forced upwardly and automatically closing when the pressure is within acceptable operating pressure range.

5,551,114
SHOESHINE ASSEMBLY
Tao-Pan Lee, No.37, Peishing, Chao-Chiao Chuen, Chao-Chiao Shiang, Miao-Li Hsien, Taiwan
Filed Jun. 20, 1995, Ser. No. 492,877
Int. Cl.[6] A46B *13/02*
U.S. Cl. 15—28 **1 Claim**

1. A shoeshine kit comprising:

a main body having a rotatable transmission shaft,

a motor for driving said transmission shaft,

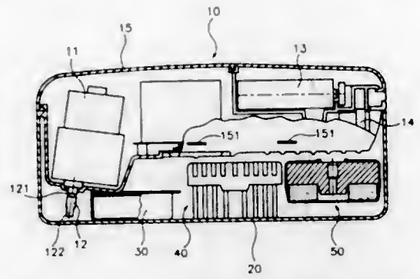
an upper casing to receive said main body and said motor,

a brush member including a fixing seat with a fixing hole in a central portion thereof to receive said transmission shaft,

a polishing member including a sponge, said polishing member including a fixing seat with a fixing hole in a central portion thereof to receive said transmission shaft,

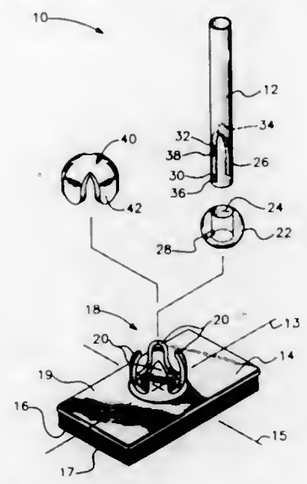
a polish cup to receive polish,

a lower casing with an opening on a top side thereof and side walls, said lower casing including a plurality of fixing members defining accommodating portions therebetween to receive said brush member, said polishing member, and said polish cup; and wherein



said lower casing has flexible portions which are affixed in grooves in said side walls of said lower casing, and said flexible portions are defined as flexible side walls with a stopper member thereon for retaining said brush member and said polishing member.

5,551,115
BRUSH HEAD ADAPTED FOR MECHANICAL OR MANUAL ENGAGEMENT
Duane H. Newville, 6242 3rd Ave. South, St. Petersburg, Fla. 33707
Filed Mar. 20, 1995, Ser. No. 407,157
Int. Cl.[6] A46B *5/02*
U.S. Cl. 15—172 **10 Claims**



1. A brush assembly, comprising:

an elongate handle;

a brush head of planar configuration having a longitudinal axis of symmetry and a transverse axis of symmetry;

said brush head having a first side adapted for mounting a brush thereon;

a ball-retaining socket defined by a plurality of circumferentially and equidistantly spaced apart retainers formed on a second of said brush head, each of said retainers having a radially inwardly directed curvature;

a plurality of handle-receiving spaces defined between circumferentially adjacent pairs of retainers, each of said spaces adapted to slidingly receive said elongate handle when said elongate handle is positioned at an acute angle relative to a plane of said brush head;

a ball disposed in surrounded and captured relation to said retainers, said ball being freely rotatable within said socket;

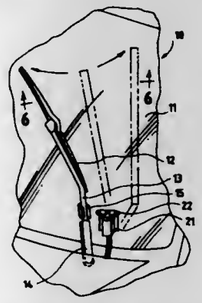
a first bore formed in said ball for receiving a distal end of said elongate handle;

a quick release means enabling quick connection and disconnection of said distal end of said elongate handle and said ball;

whereby said handle slidingly moves within a preselected space as said brush is used; and

whereby rotation of said brush head relative to said longitudinal axis of said elongate handle is prevented when said elongate handle is slideably positioned within said preselected space.

5,551,116
DEVICE TO REFRESH WIPERS IN USE
Nergal DeKelaita, 235 Myer Ave., Wheeling, Ill. 60090
Continuation of Ser. No. 338,944, Nov. 14, 1994, abandoned. This application Dec. 4, 1995, Ser. No. 567,132
Int. Cl.[6] B60S *1/44;1/32*
U.S. Cl. 15—250.19 **7 Claims**



7. In a wiper system having a surface, a wiper which can wipe a portion of the surface, and a wiper arm which is driven to carry the wiper across the portion of the surface being wiped and which is biased to exert a force keeping the wiper in contact with the portion of the surface being wiped, a new wiper refreshing device comprising:

a base attached to the surface outside of the portion of the surface being wiped;

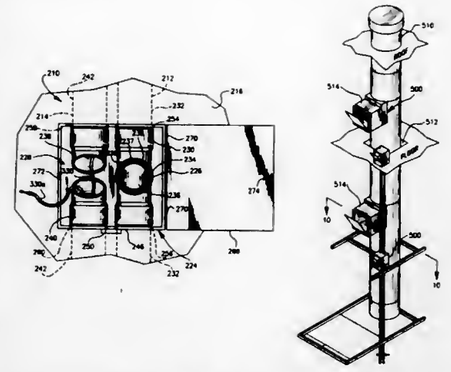
a ramp being pivotaly attached to the base, the ramp having an inactive state in which the ramp is pivoted so that the wiper arm passes over the ramp without contacting the ramp and the ramp having an active state in which the ramp is pivoted so that the wiper arm rides up the ramp lifting the wiper off of the surface so that after the wiper is lifted off of the surface the force exerted by the wiper arm returns the wiper to the surface with a jolt causing compression and shear strains of the wiper to weaken bonds holding debris on the wiper;

remotely locatable actuating means for manually actuating the ramp, the actuating means for causing the ramp to pivot from the inactive state to the active state and for causing the ramp to pivot

from the active state to the inactive state; and means for linking the actuating means to the ramp.

5,551,117
FLOOR AND CARPET CLEANING SYSTEM FOR MULTIPLE LEVEL BUILDINGS
Harvey W. Bamman, 1910 Virgina Ave., Apt. 1202B, Fort Myers, Fla. 33901
Continuation-in-part of Ser. No. 279,292, Jul. 22, 1994, abandoned. This application May 26, 1995, Ser. No. 452,315
Int. Cl.[6] A47L *5/38*
U.S. Cl. 15—302 **17 Claims**

1. A floor and carpet cleaning system for multiple level buildings, said system comprising:



a conduit mounted in a wall of the building, between an interior surface and an exterior surface of said wall, said conduit being separate from and extending vertically through a vertical passageway, which passageway is formed between said interior and exterior surfaces of said wall and extends through a plurality of levels of the building;

at least two upper vacuum hose connector units, each of said upper vacuum hose connector units being disposed in a corresponding upper level of the building, including an inlet connected to said conduit and being communicably and releasably engaged with one end of a first vacuum hose, said first vacuum bose having an intake nozzle attached at an opposite second end thereof, and a housing permanently mounted in the wall of the building and at least partly enclosing said inlet, said housing having an opening which enables said first vacuum hose to be interengaged with said inlet;

a lower vacuum hose connector unit disposed in a level of the building below the upper levels, lower vacuum hose connector unit including an outlet connected to said conduit and being communicably and releasably engaged with one end of a second vacuum hose, said second vacuum hose having an opposite end that is engaged with a vacuum apparatus, which apparatus is operated to create a suction which draws dirt and debris into said apparatus through said system;

raceway means for removably accommodating a solution line therethrough, said raceway means being mounted in said walls of said building adjacent to said conduit means and extending through said passageway and a solution line removably disposed within said raceway means.

5,551,118
MACHINE FOR CLEANSING A PLAYBALL
Ding-Tsai Yeh, 364, Pon-Yi Road, Tai-Ping, Taichung, Taiwan
Filed Jun. 23, 1995, Ser. No. 493,987
Claims priority, application China, Oct. 17, 1994, 94243292.4
Int. Cl.[6] A63B *47/04*
U.S. Cl. 15—302 **2 Claims**

1. A playball cleansing machine for playballs comprising:

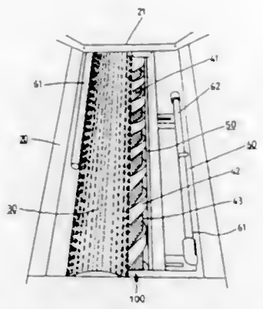
a housing; said housing including

a playball feeding means located at a top of said housing and provided at a bottom thereof with an exit for feeding the playballs into the housing;

a transporting unit; said transporting unit comprising:

a cleansing member disposed within said housing having a shaft driven by a power source, said cleansing member including peripherally and radially a plurality of bristles for scrubbing the playballs upon rotation of said cleansing member;

a transferring member including a rod which is parallel to said cleansing member and is driven by the power source, said rod having peripherally a protruded spiral strip located along a longitudinal axis thereof, the strip forming a recessed rail to transport the playballs along said cleansing member;



a guide plate member fastened at both ends thereof to said housing such that said guide plate member is disposed by one side of said transferring member and is separated from said cleansing member by a first predetermined distance, said guide plate member having a lower plate provided at a top thereof with a shoulder plate, said guide plate member further having an upper plate extending upwards from said shoulder plate to position the playballs relative to said transferring member and said cleansing member;

a water spraying unit comprising a first tube, a second tube, and a container within the housing, said first tube including means for spraying cleansing liquid within the housing, said second tube including means for spraying water within the housing, said container including means for keeping therein said cleansing liquid for cleaning the playballs and connected with said first tube; and

a ball discharging ring fastened with a front end of said transferring member for discharging cleansed playballs from the housing.

5,551,119

VACUUM CLEANING TOOL WITH ELECTRICALLY DRIVEN BRUSH ROLLER

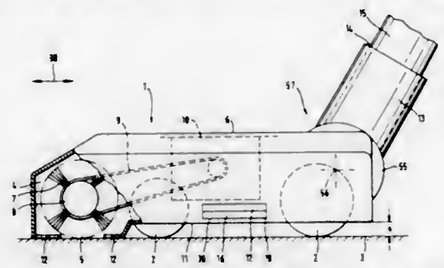
Peter Wörwag, Romanshorn, Switzerland, assignor to Firma Fedag, Romanshorn, Switzerland

Filed Dec. 17, 1993, Ser. No. 169,376

Claims priority, application Germany, Dec. 19, 1992, 9217416 U; Feb. 20, 1993, 43 05 262.2

Int. Cl.[6] A47L *9/28*

U.S. Cl. 15—319 **9 Claims**



1. A vacuum cleaning tool for connecting to a suction tube of a vacuum cleaning device, said tool comprising:

a casing with a bottom plate facing a floor surface to be cleaned;

a brush chamber enclosed within said casing;

a brush roller having bristles and being rotatably supported within said brush chamber;

an electric motor for rotatably driving said brush roller;

said bottom plate having a suction opening;

said bristles of said brush roller extending through said suction opening;

a speed regulator connected to said electric motor;

a movement sensor for sensing movement of said vacuum cleaning tool across a floor;

a first recognition circuit connected between said movement sensor and said speed regulator for recognizing signals emitted by said movement sensor derived from movement of said vacuum cleaning tool across the floor and sending switching signals derived from the signals emitted by said movement sensor to said speed regulator; and

wherein said speed regulator switches on and off said electric motor based on said switching signals.

5,551,120

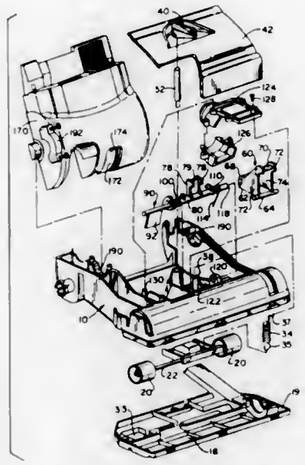
CONVERSION ASSEMBLY FOR VACUUM CLEANERS

Mark E. Cipolla, Chardon, Ohio, and David M. Wert, Atlanta, Ga., assignors to Royal Appliance Mfg. Co., Cleveland, Ohio

Filed Feb. 17, 1995, Ser. No. 390,655

Int. Cl.[6] A47C *5/32*

U.S. Cl. 15—333 **26 Claims**



1. A suction cleaner adapted for either on-the-floor or above-the-floor cleaning, comprising:

a base including a nozzle;

a handle pivotally secured to said base so as to be pivotable between a use position and a non-use position;

a suction passageway, located in at least one of said base and said handle, and communicating with said nozzle;

a valve rotatably mounted in said suction passageway for selectively closing said suction passageway;

an elevating means for selectively elevating said nozzle from and lowering said nozzle towards a subjacent floor surface, said elevating means being secured to said base; and,

an actuating means for manually actuating said elevating means, said actuating means being secured to at least one of said base and said handle and engaging both said valve and said elevating means, said actuating means being selectively engaged by a portion of said handle so that when said handle is pivoted to said non-use position said actuating means drives said elevating means to elevate said nozzle from the subjacent floor surface and also drives said valve to close said suction passageway.

5,551,121

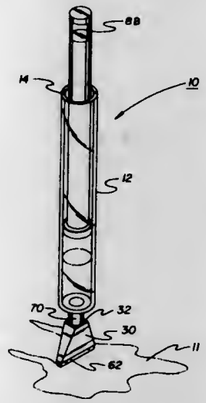
SQUEEGEE-TYPE MOPPING DEVICE

Rafael Vazquez, Jr., 2514 N. Marshfield, Chicago, Ill. 60614

Filed Jul. 10, 1995, Ser. No. 500,105

Int. Cl.[6] A47L *5/02*

U.S. Cl. 15—341 **7 Claims**



2. A squeegee-type mopping device comprising:

an elongated tubular rigid container having an open upper end and an open lower end;

a head having a hollow interior, an upper open extent coupled to the lower end of the container to allow communication therebetween, a lower extent having a peripheral lower edge bounding an opening that allows access to the interior, and a planar flexible blade removably coupled to the lower edge and extended downwards therefrom; and

an elongated plunger having an upper end and a lower end and with the lower end slidably disposed within the container to form a moveable seal, the opening of the head positionable upon a surface covered with liquid and with extension of the plunger, said device having means for creating a suctioning force for pulling the liquid through the head and into the container and with retraction of the plunger ejecting water from the container and through the opening.

5,551,122

CORDED HANDHELD VACUUM CLEANER

Robert W. Burkhardt, Bristol, Tenn.; John W. Walch, Abingdon, Va.; Ricky A. Owens, Bristol, and Dennis J. Mancl, Bluff City, both of Tenn., assignors to Electrolux Corporation, Atlanta, Ga.

Division of Ser. No. 122,149, Sep. 16, 1993, Pat. No. 5,448,794. This application Mar. 20, 1995, Ser. No. 407,117

Int. Cl.[6] A47L *5/24*

U.S. Cl. 15—344 **10 Claims**

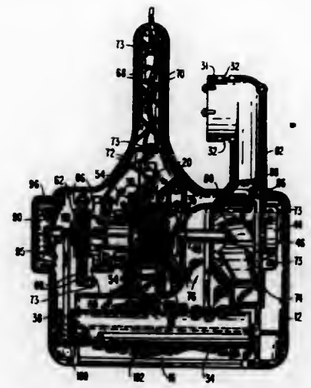
1. A handheld vacuum cleaner for removing dirt from a cleaning surface, the handheld vacuum cleaner comprising:

a housing having portions that define an intake orifice, and at least one motor mounting rib;

a motor having a rotating motor shaft that rotates about a rotational axis, and an end bell, the end bell having a cylindrical surface;

an elastomeric member that fits between the motor mounting rib and the end bell for securing the motor within the housing, wherein the elastomeric member has a plurality of raised elastomeric ribs that extend substantially parallel to the rotational axis of the motor shaft, the raised elastomeric ribs being compressed between the motor mounting rib and the end bell so that the motor is secured in the housing;

a suction fan chamber in the housing coupled to the intake orifice;



an exhaust chamber in the housing coupled to the suction fan chamber;

a suction fan rotatably positioned in the suction fan chamber, the suction fan being coupled to the motor shaft so that the suction fan is rotated by the motor during operation of said vacuum cleaner, the suction fan drawing air through the intake orifice into the suction fan chamber and passing said air into the exhaust chamber; and

dirt collection means connected to the exhaust chamber for receiving said air from the exhaust chamber and for collecting any dirt present in said air.

5,551,123

HINGE ASSEMBLY

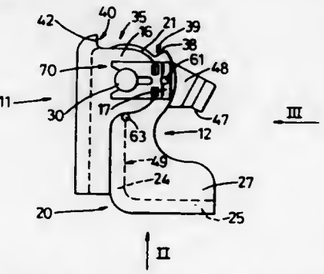
Derek Bartlett, Warwick, England, assignor to IHW Limited, Warwick, United Kingdom

Filed Nov. 10, 1994, Ser. No. 337,076

Claims priority, application United Kingdom, Nov. 13, 1993, 9323448.2; Oct. 14, 1994, 9420582.0

Int. Cl.[6] E05D *7/10;11/10*

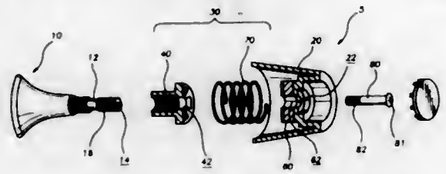
U.S. Cl. 16—257 **12 Claims**



1. A hinge assembly having a first hinge leaf pivotally connected to a second hinge leaf by first and second axially aligned pivotal connections, the first and second pivotal connections being axially spaced from one another, a first stop means located adjacent to the first pivotal connection and a second stop means located adjacent to the second pivotal connection, the first and second stop means being arranged to simultaneously limit pivotal displacement between the first and second hinge leafs at a fully open position, the first and second hinge leafs each being in the form of metal pressings and each leaf including a main body portion from which a pair of arms laterally project, a first adjacent pair of arms of the respective leafs being connected by said first pivotal connection and a second adjacent pair of arms of the respective leafs being connected by said second pivotal connection, the first stop means

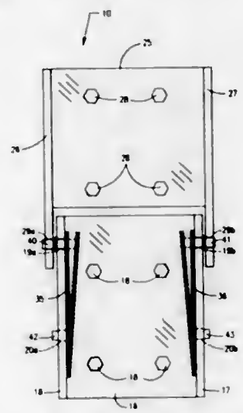
being defined by an abutment formed on an arm of the first hinge leaf and a co-operating abutment formed on the body portion of the second hinge leaf, and the second stop means being defined by an abutment formed on an arm of the second hinge leaf and a co-operating abutment formed on the main body portion of the first hinge leaf, the abutment formed on the arm of the second hinge leaf is defined by an abutment face formed on an extension of said arm.

5,551,124
FAUCET SAFETY HANDLE
Clay M. Zeringue, 710 Ave. F, Westwego, La. 70094
Filed Apr. 26, 1995, Ser. No. 429,325
Int. Cl.[6] E05B *1/00*
U.S. Cl. 16—121 **1 Claim**



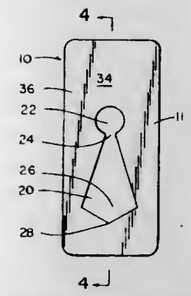
1. A faucet safety handle for use in conjunction with a valve having a rotatable valve stem comprising:
- a knob having a first and second cavity open on first and second ends of said knob, respectively, an aperture therethrough in connection with said first and second cavities, and a removable cap securable to said knob in a manner to block access to said second cavity;
- a clutch mechanism connectable between said knob and said valve stem such that in use said knob rotates freely with respect to said valve stem when said knob is in a first predetermined position and said valve stem rotates in conjunction with said knob when said knob is in a second predetermined position, said clutch mechanism including: a valve stem clutch element, functionally connectable with said valve stem, having a valve stem clutch element aperture therethrough and a first engagement surface having a substantially circular perimeter with a first engagement surface radial dimension, said first engagement surface having a plurality of first raised surfaces radially extending from said valve stem clutch element aperture, said valve stem clutch element aperture being substantially centered on said first engagement surface and passing therethrough; a knob clutch element, fixedly attached to said knob within said first cavity, having an aperture therethrough and a second engagement surface having a substantially circular perimeter with a second engagement surface radial dimension such that when said knob is in said second predetermined position at least a portion of said first engagement surface contacts at least a portion of said second engagement surface, said second engagement surface having a plurality of second raised surfaces radially extending from said knob clutch element aperture, said knob clutch element aperture being substantially centered on said second engagement surface and passes therethrough, said first raised surfaces extend radially a distance, less than said first engagement surface radial dimension and equal to said second engagement surface radial dimension, said second raised surfaces covering less than 50 percent of said second engagement surface; and biasing means disposed between said first engagement surface and said knob such that said knob is urged by said biasing means toward said first predetermined position and away from said second predetermined position, said biasing means including a helical coil spring having a first and second end, and an external radial spring dimension less than said first engagement surface radial dimension and an internal radial spring dimension greater than said second engagement surface radial dimension, said first end of said spring being in contact with said first engagement surface and said second end being in contact with said knob, said helical coil spring defining an interior pathway between said first and second ends through which said second engagement surface passes as said knob transitions from said first predetermined position to said second predetermined position, said spring interior pathway being in substantial alignment with said knob aperture; and
- connecting means for functionally securing said knob to said valve stem, said connecting means including a bolt having a head and an elongated shaft; said bolt head being located within said second cavity; said bolt head being maintained at a fixed distance from said valve stem and within said second cavity as said knob moves from said first predetermined position to said second predetermined position, at least a portion of said bolt head contacting said knob in said first predetermined position;
- said knob aperture, said spring, said knob clutch element aperture, and said valve stem clutch element aperture surround at least a portion of said elongated shaft of said bolt, said first and second raised surfaces being patterned such that at least a portion of said first raised surfaces may pass at least a portion of said second raised surfaces as said knob transitions from said first to said second predetermined position.

5,551,125
QUICK RELEASE HINGED SUPPORT
Thomas J. Adams, 154 Prairiewood Dr., Fargo, N. Dak. 58103
Filed Oct. 14, 1994, Ser. No. 323,255
Int. Cl.[6] E05D *7/10*
U.S. Cl. 16—229 **7 Claims**



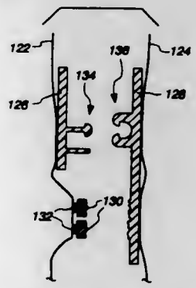
1. A quick release hinged support for hingedly mounting one object to a cooperating object comprising:
- a first plate having opposed side walls perpendicular thereto, each of said side walls having a first hole near an edge of said first plate and further having a second hole, said first holes being substantially in alignment to one another, said first plate being attachable to said one object;
- a second plate having opposed side walls perpendicular thereto which are adapted to receive at least portions of said side walls of said first plate therebetween, each of said side walls having a hole therethrough near an edge of said second plate, said boles being substantially in alignment to one another, said second plate being attachable to said cooperating object;
- a retractable coupling means comprising two elongate biased elements having end portions fixedly attached to said side walls of said first plate; two coupling members fixedly attached to said biased elements and retractably disposed through said first holes in said first plate to hingedly couple said first plate to said second plate; and two button-like tabs fixedly attached to said biased elements and retractably disposed in said second holes in said side walls of said first plate for retracting said coupling members, for quick coupling of said plates and for quickly separating said plates to allow quick coupling and quick separation of said objects.

5,551;126
BUTTON-ON HOLDER FOR EYEGLASSES
William H. Wallo, 8 Leeward Island, Clearwater, Fla. 34630
Filed Mar. 17, 1995, Ser. No. 406,158
Int. Cl.[6] A44B *21/00*; A45C *11/00*
U.S. Cl. 24—3.3 **4 Claims**



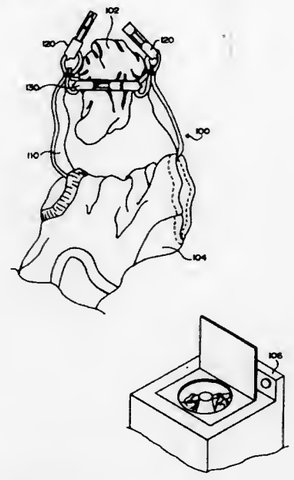
1. A hanger for suspending a pair of eyeglasses from a button sewn onto the front of an article of upper body apparel, the hanger comprising a thin flexible sheet of material having an elongated throughhole therethrough, the throughhole comprising
- a thread-retaining portion adjacent an upper end thereof, the thread-retaining portion having a diameter greater than a threading-hole spacing of the button,
- a temple-retaining portion adjacent a lower end thereof, the temple-retaining portion wider than a temple of the pair of eyeglasses, the temple-retaining portion comprising a centering-angle adjacent the lower end, and
- a locking slot intermediate the thread-retaining portion and the temple-retaining portion, the locking slot narrower than the threading-hole spacing.

5,551,127
CLOSURE ARRANGEMENT HAVING A PEELABLE SEAL
Timothy J. May, Greenville, Wis., assignor to Reynolds Consumer Products Inc., Appleton, Wis.
Division of Ser. No. 225,864, Apr. 11, 1994, Pat. No. 5,470,156.
This application Jul. 7, 1995, Ser. No. 499,622
Int. Cl.[6] B65D *33/16*
U.S. Cl. 24—30.5 R **20 Claims**



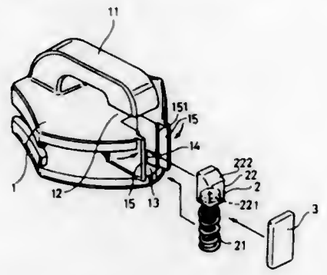
1. A closure arrangement for a polymeric bag having first and second opposing films, comprising:
- a first base strip having an inner and outer surface, said outer surface of said first base strip being adapted for attachment to the first film;
- a peelable band having a pair of opposing surfaces, one of said opposing surfaces being detachably connected to said inner surface of said first base strip to form a peelable seal; and
- a sealant band composed of a sealant material and attached to the other of said opposing surfaces of said peelable band, said sealant band having a sealing temperature lower than that of said peelable band and said sealant band being adapted for attachment to the second film, said sealant band being narrower than said peelable band.

5,551,128
STRAP FOR HOLDING LAUNDRY
Richard L. Townsend, DeKalb, Ill., assignor to Adams USA, Inc., Cookeville, Tenn.
Filed Mar. 27, 1995, Ser. No. 411,012
Int. Cl.[6] A44B *21/00*
U.S. Cl. 24—302 **15 Claims**



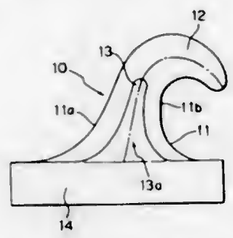
1. A laundry strap for holding at least one article of clothing while being washed comprising:
- (a) an elongated piece of flat material having a first end and a second end oppositely disposed from the first end;
- (b) a fastening means for releasably joining the first end to the second end;
- (c) the fastening means including a first joining means and a second joining means;
- (d) the first joining means being secured to the first end;
- (e) the second joining means being secured to the second end;
- (f) the first joining means including a first female member and a first male member;
- (g) the second joining means including a second female member and a second male member;
- (h) the first female member being releasably joinable to the second male member to form a primary loop of the elongated piece of flat material;
- (i) the second female member being releasably joinable to the first male member to form a secondary loop;
- (j) the secondary loop existing between the joined second female member and first male member, and the joined second male member and the first female member;
- (k) the first male member including a first squeezable mechanism for releasing the first male member from the second female member;
- (l) the second male member including a second squeezable mechanism for releasing the second male member from the first female member;
- (m) the primary loop being suitable for holding at least one apertured piece of clothing;
- (n) the secondary loop being suitable for holding at least one piece of clothing;
- (o) the secondary loop being suitable for holding at least one non-apertured piece of clothing; and
- (p) the secondary loop including an additional holding means for securing the at least one non-apertured piece of clothing therein.

5,551,129
SLIDER OF A ZIPPER
Tino Chu, No. 95, Chien Cheng Street, Chien Cheng, Kaoshiung, Taiwan
Filed Dec. 7, 1995, Ser. No. 568,953
Int. Cl.[6] A44B *19/00*
U.S. Cl. 24—429 1 Claim



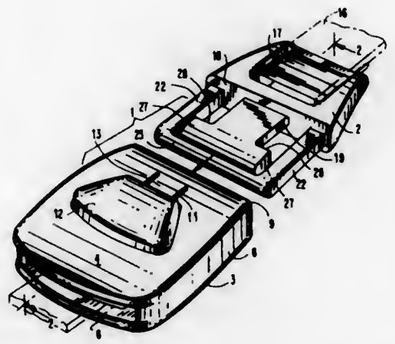
1. A slider comprising:
a slider body having a nose suspending at one side, a receiving open chamber at a front end thereof, two protrusive flanges longitudinally forwardly raised from two opposite sides of said receiving open chamber and defining a respective stop edge, and an upright rod disposed inside said receiving open chamber, said nose having a fixed end extending from one side of said slider body and a free end spaced above said receiving open chamber by a gap;
a spring bolt mounted inside said receiving open chamber, said spring bolt comprising a spring element mounted around said upright rod, and a bolt supported on said spring element and forced by it to block said gap, said bolt having a beveled top edge for permitting a pull tab to be inserted through said gap into engagement with said nose; and
a stop plate fastened to the stop edge of each protrusive flange and retained in place by said protrusive flanges to stop said spring bolt inside said receiving open chamber.

5,551,130
HOOK STRUCTURE OF MOLDED SURFACE FASTENER
Yutaka Tominaga, and Hiroshi Yoshida, both of Toyama, Japan, assignors to YKK Corporation, Tokyo, Japan
Continuation of Ser. No. 298,170, Aug. 30, 1994, abandoned.
This application Jan. 5, 1996, Ser. No. 583,535
Claims priority, application Japan, Sep. 14, 1993, 5-229148
Int. Cl.[6] A44B *18/00*
U.S. Cl. 24—452 7 Claims



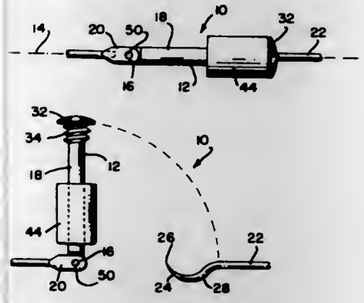
1. A hook structure for a molded surface fastener having a multiplicity of hooks molded integrally on an upper surface of a plate-like substrate;
wherein each of said hooks has a rising portion and a hook-shape engaging portion extending forwardly from an upper end of said rising portion, said rising portion having a rear surface rising obliquely in a smooth curve from said substrate, a front surface rising upwardly from said substrate, and side surfaces from at least one of which a reinforcing rib extends;
wherein a straight line drawn between a peak of said reinforcing rib and a peak of an arcuate, concave lower surface of said book-shape engaging portion is substantially parallel to the upper surface of said plate-like substrate;
wherein the reinforcing rib is rising upwardly and substantially centrally from a side surface of said rising portion of each of said hooks; and
wherein a straight line passing a center point in height of the reinforcing rib and parallel to the upper surface of the substrate crosses a width of the reinforcing rib and a width of the rising portion of each of said hooks in such a manner that a ratio of the width of the reinforcing rib to the width of the rising portion is ⅓ to ½.

5,551,131
BUCKLE WHICH IS RELEASABLE BY DEPRESSION OF A HINGED MEMBER AND HAVING IMPROVED LOCKING CAPABILITY
Joseph Anscher, Muttontown, N.Y., assignor to National Molding Corp., Farmingdale, N.Y.
Filed Dec. 15, 1994, Ser. No. 356,750
Int. Cl.[6] A44B *11/26*
U.S. Cl. 24—614 19 Claims



1. A buckle comprising:
a socket member having an obverse face and a pair of longitudinally disposed sides, wherein the obverse face and the sides define a socket therebetween, the socket member having an open end;
a flap belonging to the socket member, the flap being resiliently flexible and pivotable about a region of attachment of the flap to the socket member, and the flap being depressible to a location in which it projects inside the socket;
a pair of stop members projecting from an inner surface of the obverse face toward the interior of the socket; and
a plug member having a base portion and a resilient tongue projecting from the base portion in the longitudinal direction, the tongue having a means for locking the plug member to the stop members of the socket member, the means for locking consisting of a pair of laterally projecting wings, each wing defining a shoulder thereon, wherein the socket member is adapted to slidably receive the tongue, along the longitudinal direction, through the open end of the socket member, so as to couple the socket member and the plug member, and wherein the stop members are adapted to engage the shoulders defined by the wings for locking the plug member to the socket member when the plug member is coupled to the socket member, and wherein the plug member may be unlocked from the socket member by depressing the flap toward the interior of the socket to force the resilient tongue into the socket and disengage the shoulders from the stop members thereby permitting decoupling of the plug member and the socket member.

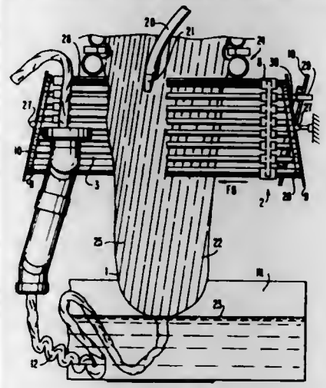
5,551,132
COUPLING ARRANGEMENT
Pasquale Matera, Plainview, N.Y., assignor to Milton L. Klein, Bronx, N.Y.
Filed Aug. 28, 1995, Ser. No. 520,019
Int. Cl.[6] A44B *9/18*
U.S. Cl. 24—708 9 Claims



1. A coupling arrangement, comprising:
a limb having a terminal end; and
a shaft assembly having a longitudinal axis; wherein
said shaft assembly has means, offset from said axis, for nesting said terminal end of said limb therein; and
means, movably coupled to said shaft assembly, for releasably locking said terminal end of said limb in said nesting means; wherein
said shaft assembly comprises a dual-ended shaft;
said shaft has an enlarged head at one end thereof;
said shaft further has an externally-threaded portion formed thereon extending between said head and an intermediate portion thereof; and
said nesting means comprises a slot formed in said shaft which traverses said externally-threaded portion of said head.

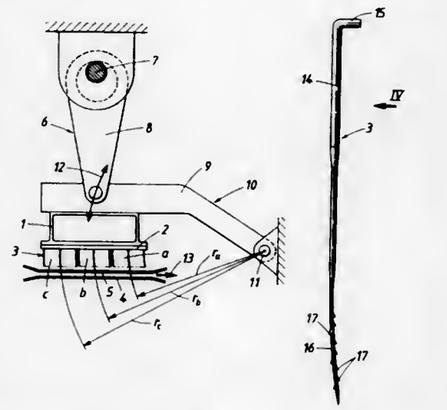
5,551,133
DEVICE TO CORRECT THE LONGITUDINAL TORSION IN A TUBULAR FABRIC
Gian F. Ferraro, Varese, Italy, assignor to Albrecht Equipamentos Industriais Ltda., Santa Catarina, Brazil
Filed May 9, 1995, Ser. No. 437,647
Claims priority, application Italy, May 9, 1994, MI94A0905
Int. Cl.[6] D06C *3/00*
U.S. Cl. 26—80 8 Claims

4. A device to correct the longitudinal torsion in a tubular fabric



wherein in a production phase the tubular fabric is formed with air pressure in a covered air channel in the shape of a balloon, said device comprising:
a conveyor element supported on each of two opposite sides of the balloon, each said conveyor having a revolving wall belt, each said wall belt being in a frictional contact with the tubular fabric at predetermined points on said revolving wall belt, said wall belt being pushed against the tubular fabric longitudinally and said wall belt being moved traversely in opposite directions to the longitudinal torque exerted by torsion upon the tubular fabric,
both said conveyor elements being movable in combination wherein longitudinal movements of said wall belts push the fabric forward and transveral movements of said wall belts correct the torsion in the fabric, both the longitudinal and the transversal movements competing to pull the fabric tube in a longitudinal direction while correcting torsion wherein each said conveyor element includes a revolving wall being formed by a plurality of strips of rules, said rules each having surfaces in frictional contact with the tubular fabric, wherein further said conveyor element is moved over the tubular fabric in a longitudinal direction of the tubular fabric toward a ring opener and a pair of squeeze rollers,
each said rule being in contact with the tubular fabric in transversal movements in opposite directions to the direction of the longitudinal torsion of the tubular fabric through the action of transversal guide means, each guide means moving in a direction transverse to the longitudinal direction of the tubular fabric,
wherein both said conveyor elements, through the combination of the longitudinal and transversal movements of said rules, compete to pull the fabric in a transverse direction, to correct its longitudinal torsion.

5,551,134
APPARATUS WITH CURVED NEEDLE FOR NEEDLING A NONWOVEN WEB
Ernst Fehrer, Auf der Gugl 28, A-4020 Linz, Austria
Filed Sep. 9, 1994, Ser. No. 303,378
Claims priority, application Austria, Sep. 24, 1993, 1930/93; Feb. 18, 1994, 329/94
Int. Cl.[6] D04H *18/00*
U.S. Cl. 28—115 4 Claims



1. In an apparatus for needling a nonwoven web moving in a predetermined direction of travel, which apparatus comprises
a rocker,
a pivot axis extending perpendicularly to said direction of travel, the rocker being pivoted on said pivot axis,
at least one needle board secured to said rocker and carrying a multiplicity of needles, each of which comprises a shank and a free working end portion, and
a slider-crank mechanism coupled to said rocker and operable to actuate said needle board by means of said rocker,

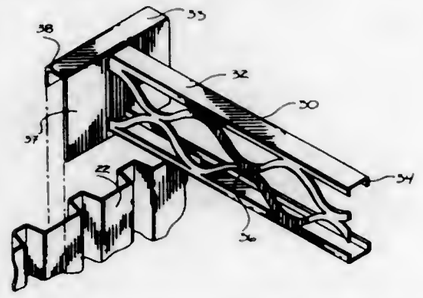
the improvement residing in that the working end portion of each of said needles is curved in a plane that is perpendicular to said pivot axis at least approximately along an arc of a circle having a center adjacent to said pivot axis.

5,551,135

METHOD OF FABRICATING A METAL PURLIN AND METHOD OF FABRICATING A BUILDING THEREWITH

John Powers III, 4446 East Flower, Phoenix, Ariz. 85018

Filed May 25, 1994, Ser. No. 249,283
Int. Cl.[6] B21D *31/04*
U.S. Cl. 29—6.1 9 Claims



1. A method of fabricating a metal purlin comprising the steps of:

providing a sheet of metal;

cutting the sheet into elongated strips having a predetermined width with longitudinal edges extending the length thereof;

rolling the edges of one of the strips into a channel having a generally C-shaped cross-section with a substantially flat web;

cutting a plurality of longitudinally extending and transversely spaced apart slots in the web, the slots further being staggered and longitudinally spaced apart;

expanding the web of the channel by expanding the width of the slots;

corrugating the expanded web;

providing a pair of second sheets of metal;

rolling one edge of each of the second sheets to form an inverted channel, with one edge of the inverted channel defining a vertical plate having an inner surface and an outer surface, the inner surface facing the inverted channel, the vertical plate extending downwardly a distance greater than the width of the expanded web; and

affixing the outer surface of the vertical plate of each of the inverted channels to a respective end of the C-shaped channel.

5,551,136

PAD REMOVAL DEVICE

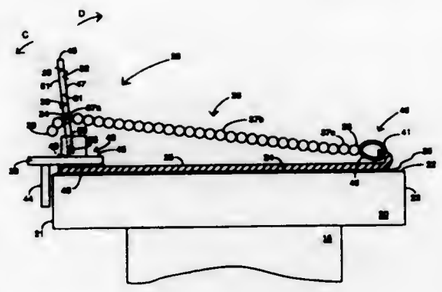
Steve Bartlett, Livermore, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 12, 1995, Ser. No. 421,587
Int. Cl.[6] B66F *3/00*
U.S. Cl. 29—239 12 Claims

1. A device for removing a polishing pad adhesively attached to a rotatable platen, comprising:

a) a substantially flat base having a generally planar top surface and a generally planar bottom surface, a first portion of said bottom surface in contact with a top surface of said pad;

b) a lever member pivotally attached to said top surface of said base;



c) at least one latch pin attached to said lever;

d) means for clamping a portion of said pad;

e) a chain having a plurality of links, said clamping means mounted to one end of said chain, said latch pin being engageable with at least one said link; and

f) means for bracing said base against said platen, said means for bracing being attached to a second portion of said bottom surface of said base, and

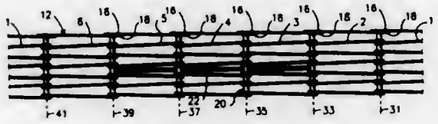
whereby when operating said device by contacting said first portion of said base with said top surface of said pad and rotating said lever in a first direction, said bracing means is urged against said platen and said base is prevented from moving in a second direction, said first direction being generally opposite to said second direction, thereby causing said link pin to impart a force on said chain to pry said pad from said platen.

5,551,137

METHOD FOR ASSEMBLING WASTE MATERIALS FILTERING APPARATUS

Richard D. Davis, 4103 Redcoat Dr., Zephyrhills, Fla. 33543

Continuation of Ser. No. 130,954, Oct. 4, 1993, abandoned.
This application Dec. 12, 1994, Ser. No. 355,941
Int. Cl.[6] B23P *6/00*; B01D *33/56*
U.S. Cl. 29—401.1 4 Claims



1. A method for modifying a rotating screen assembly for a waste water filter apparatus disposed in a stream of waste water, said rotating screen assembly formed by a plurality of flat, parallel links and spacers mounted in a preselected pattern on a plurality of shafts disposed transversely with respect to a direction of flow of said waste water stream and where a predetermined distance between said parallel links determines the largest size of waste material that may flow through said waste water filter apparatus, said preselected pattern forming a substantially rectangular opening between adjacent parallel links with which is received a sprocket when the rotating screen is rotating, comprising the steps of:

disassembling said rotating screen assembly of said waste water filter apparatus by removing the links and spacers from each shaft of said plurality of shafts;

reassembling said rotating screen assembly by forming a first loop of links by sliding a trailing end of a first of said removed links onto a first shaft; then

sliding a leading end of a second of said removed links onto said first shaft and simultaneously sliding a trailing end of said second link onto a second shaft; then

inserting a spacer onto said first shaft;

sliding a leading end of a third of said removed links onto said second shaft and simultaneously sliding a trailing end of said third link onto a third shaft; then

inserting a spacer onto said second shaft; then

repeating said first loop forming steps for successive links, spacers and shafts; then

completing said first loop of links by sliding a ending end of the first link onto a last shaft and then sliding a spacer onto said last shaft thereafter; then

forming a second loop of links by sliding a leading end of a fourth of said removed links onto said last shaft; then

sliding a trailing end of a fifth of said removed links onto said last shaft and simultaneously sliding a leading end of said fifth link onto a penultimate shaft; then

sliding a spacer onto said last shaft; then

sliding a trailing end of a sixth of said removed links onto said penultimate shaft and simultaneously sliding a leading end of said sixth link onto a third from the last shaft; then

sliding a spacer onto said penultimate shaft;

repeating said second loop forming steps for successive links, spacers and shafts;

completing said second loop of links by sliding a trailing end of a last link onto said first shaft and then sliding a spacer onto said first shaft; and then

adding a predetermined number of loops of links by successively repeating the steps recited for the formation of said first and second loops of links until a desired number of loops of links has been assembled, wherein along each shaft the following pattern is established; link trailing end, link leading end, spacer, link leading end, link trailing end, spacer;

said assembly of links creating a plurality of nonrectangular openings between adjacent nonparallel links within which are disposed sprockets that do not rub said links when the apparatus is in operation;

whereby said apparatus is less susceptible to jamming when reassembled because the nonrectangular openings provide increased clearance for said sprockets relative to the clearance provided by said preselected pattern.

5,551,138

PROCESS FOR ENCASING ARTICLES

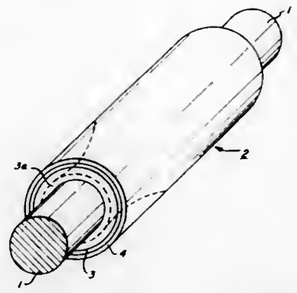
Franz Grajewski, Stadthagen, and Horst Matzat, Garbsen, both of, Germany, assignors to kabelmetal electro GmbH, Hanover, Germany

Continuation of Ser. No. 210,138, Mar. 17, 1994, abandoned.
This application Jun. 5, 1995, Ser. No. 465,187
Claims priority, application Germany, Mar. 18, 1993, 43 08 593.8
Int. Cl.[6] B29C *63/18*
U.S. Cl. 29—423 9 Claims

1. A process for encasing an article, said process comprising the steps of:

placing a radially expanded tube of a rubbery elastic material over said article,

maintaining said tube in said expanded condition by a tension medium attached to an outer surface of said tube, said tension medium being molded of a material which is not brittle at



ambient temperatures, maintains said tube in said expanded condition at said ambient temperatures, and becomes brittle when cooled below said ambient temperatures, and

removing said tension medium by cooling said tension medium to a sub-ambient temperature such that said tube shrinks about said article, said tension medium being cooled to said sub-ambient temperature by applying a cooled medium on said tension medium.

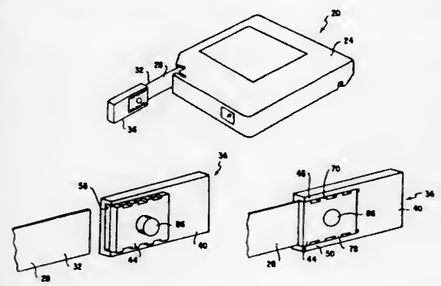
5,551,139

SHEAR CLAMPING METHOD

Michael V. Koushak, Louisville, and Justus A. W. Horstman, Boulder, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Division of Ser. No. 50,506, Apr. 20, 1993, Pat. No. 5,326,045.
This application May 23, 1994, Ser. No. 247,568
Int. Cl.[6] B23P *19/04*; G03B *1/40*
U.S. Cl. 29—432.2 19 Claims

1. A method for securing an intermediate member having a



length to a clamping device, comprising:

defining a space in a clamping device using a first member and a second member, wherein an insert member is associated with said second member;

positioning an intermediate member having a length into said space;

clamping said intermediate member to said clamping device, said clamping step comprising moving said insert member relative to each of said second member and said intermediate member in a direction different from said length of said intermediate member and through an entire thickness of said intermediate member; and

retaining said insert member within said intermediate member in said clamping device during use of said clamping device.

5,551,140

METHOD OF COVERING A FLOWER POT WITH A POT COVER HAVING AN ELASTIC FASTENER INCORPORATED THEREIN

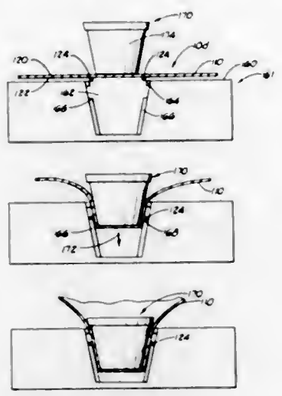
Donald E. Weder; Joseph G. Straeter, both of Highland, and William F. Straeter, Breese, all of Ill., assignors to Southpac Trust International, Inc., Highland, Ill.

Continuation-in-part of Ser. No. 108,093, Aug. 17, 1993, Pat. No. 5,472,752, which is a continuation of Ser. No. 24,573, Mar. 1, 1993, abandoned, which is a continuation of Ser. No. 464,694, Jan. 16, 1990, Pat. No. 5,208,027, which is a continuation of Ser. No. 219,083, Jul. 13, 1988, Pat. No. 4,897,031, which is a continuation of Ser. No. 4,275, Jan. 5, 1987, Pat. No. 4,773,182, which is a continuation of Ser. No. 613,080, May 22, 1984, abandoned, said Ser. No. 364,356is a continuation-in-part of Ser. No. 188,183, Jan. 28, 1994, Pat. No. 5,388,386, which is a continuation of Ser. No. 968,798, Oct. 30, 1992, Pat. No. 5,369,934, which is a continuation of Ser. No. 865,563, Apr. 9, 1992, Pat. No. 5,245,814, which is a continuation of Ser. No. 649,379, Jan. 31, 1991, Pat. No. 5,111,638, which is a continuation of Ser. No. 249,761, Sep. 26, 1988, abandoned, said Ser. No. 364,356is a continuation-in-part of Ser. No. 934,832, Aug. 24, 1992, Pat. No. 5,426,914, which is a continuation-in-part of Ser. No. 819,311, Jan. 9, 1992, abandoned, which is a continuation of Ser. No. 765,416, Sep. 26, 1991, Pat. No. 5,105,599, which is a continuation of Ser. No. 530,491, May 29, 1990, abandoned, which is a continuation of Ser. No. 315,169, Feb. 24, 1989, abandoned, said Ser. No. 934,832is a continuation-in-part of Ser. No. 832,096, Feb. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 765,416, Sep. 26, 1991, Pat. No. 5,105,599, which is a continuation of Ser. No. 530,491, May 29, 1990, abandoned, which is a continuation of Ser. No. 315,169, Feb. 24, 1989, abandoned. This application Dec. 27, 1994, Ser. No. 364,356

Int. Cl.[6] B23P *11/02*

U.S. Cl. 29—450 **12 Claims**

1. A method of forming a covered flower pot, comprising the steps of:



providing a cover forming apparatus comprising a platform having an opening formed therein for receiving a flower pot;

providing a flower pot having an outer peripheral surface and an upper opening;

providing a covering material for covering the flower pot comprising a sheet of material and an elastic fastener connected to the sheet of material;

moving the flower pot and the sheet of material through at least a portion of the flower pot opening in the cover forming apparatus such that the cover forming apparatus forms the sheet of material about at least a portion of the outer peripheral surface of the flower pot and the elastic fastener is stretched about the outer peripheral surface of the flower pot as the sheet of material is formed about the outer peripheral surface of the flower pot so as to hold the sheet of material about the outer peripheral surface of the flower pot; and

removing the flower pot with the sheet of material held by the fastener from the flower pot opening in the cover forming apparatus.

5,551,141

METHOD OF INJECTION MOULDING A POLYMERIC MATERIAL INSERT INTO A METAL SHELL

Roderick M. De'Ath, Wantage, and Donald E. Griffiths, Paignton, both of, United Kingdom, assignors to Carnaudmetalbox PLC, United Kingdom

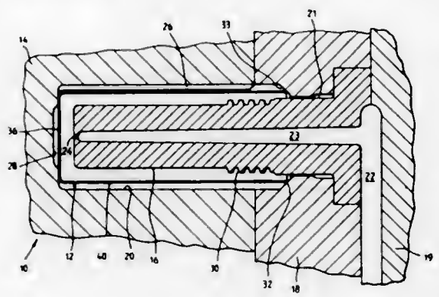
Filed Sep. 8, 1994, Ser. No. 303,197

Claims priority, application United Kingdom, Sep. 12, 1993, 9318937

Int. Cl.[6] B29C *45/14*

U.S. Cl. 29—527.3 **23 Claims**

1. A method of manufacturing a component defined by a metal



shell and an injection moulded polymeric material insert comprising the steps of:

(a) providing a metal shell having an open end and an end opposite thereto closed by an end panel,

(b) providing a mould assembly define by a mould cavity wall, said mould cavity wall having a frusto-conical portion,

(c) locating the metal shell in the mould assembly with the metal shell open end engaging the frusto-conical portion of the mould cavity wall to form a seal therewith, and

(d) injecting polymeric material at high pressure into the interior of the shell to form an insert therein during which longitudinal contraction of the shell under the effect of the high pressure is compensated for by the metal shell open end sliding along the frusto-conical portion to maintain seal integrity.

5,551,142

STATOR LAMINATION JIG SYSTEM

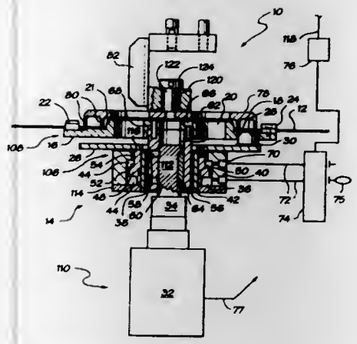
Gale A. Kooken, Englewood; John W. Murphy, Kettering, and Roger D. Fleming, Centerville, all of Ohio, assignors to Dayton-Phoenix Group, Inc., Dayton, Ohio

Filed Jan. 5, 1995, Ser. No. 368,917

Int. Cl.[6] B23P *23/00*

U.S. Cl. 29—564.3 **14 Claims**

1. A stator lamination jig system for forming notches on a stator lamination comprising:



a centrally located spindle;

means for supporting a stator lamination, said support means having a plurality of holes therein and being rotatively-mounted on said spindle for driving said lamination during a notching operation;

means for securing said lamination on said support means;

non-rotatable ejector means located below said support means having a lowered position and a raised position;

ejection cylinder means seated upon said ejector means, said ejection cylinder means shaped and positioned to extend through the boles in said support means; and

driving cylinder means for driving said ejector means, said driving cylinder means connected to said ejector means;

wherein when said driving cylinder means is actuated upwards, said ejector means is in said raised position which urges said ejection cylinder means through said holes in said support means to cause said lamination to be released from said jig.

5,551,143

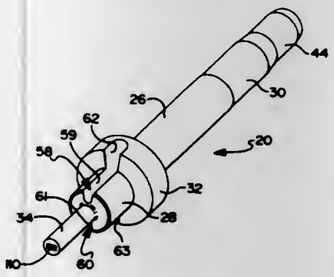
ROTOR SHAFT HAVING LEAD WIRE PASSAGE SLOTS AND METHOD OF FORMING COLLAR SUPPORT BY COLD HEADING

Joseph E. Saval, Romulus, and Timothy J. Brunetz, Tecumseh, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 21, 1994, Ser. No. 327,068

Int. Cl.[6] H02K *15/14*

U.S. Cl. 29—598 **11 Claims**



1. A method for forming an alternator shaft carrying a protected conductor comprising:

cold heading a blank to form a rotor shaft with a conductor groove, including reducing an end portion of said blank by cold heading and extending an axially extending groove in said blank adjacent to the reduced end by cold heading and

axially through-feeding said rotor shaft through at least one machining station in a single direction.

5,551,144

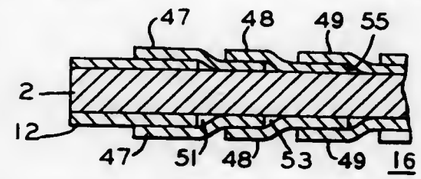
METHOD OF MAKING INSULATED SUPERCONDUCTING MAGNET COIL

Deborah R. Mantone, Effingham, and Barbara L. Myers, Florence, both of S.C., assignors to General Electric Company, Milwaukee, Wis.

Filed Dec. 29, 1994, Ser. No. 366,186

Int. Cl.[6] H01L *39/24*

U.S. Cl. 29—599 **10 Claims**



1. A method forming a superconducting magnet coil for use in magnetic resonance imaging comprising the steps of:

wrapping a superconductor with overlapping layers of crepe paper insulation;

winding the insulated superconductor into layers on a coil support structure to form a wound multilayer superconducting coil;

wherein said overlapping is controlled to provide approximately fifty percent overlap of the previous wrap to provide substantially double thickness flexible wrapping of said superconductor;

wherein said coil support structure includes a coil pocket formed between adjacent walls of said coil support using the crepe paper insulation as a friction reducing component;

securing a wire band around said superconducting coil after the application of an electrical insulating barrier;

wherein said electrical insulating barrier is wound With glass paper approximately ¼ inch thick; and

said wire band is wound with aluminum.

5,551,145

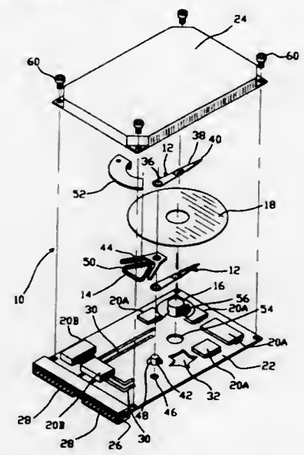
RIGID DISK DRIVE ASSEMBLY METHOD

Ryan A. Jurgenson, Hutchinson, Minn., assignor to Hutchinson Technology Incorporated, Hutchinson, Minn.

Filed Oct. 29, 1993, Ser. No. 145,876

Int. Cl.[6] G11B *5/42*

U.S. Cl. 29—603.03 **27 Claims**



1. A method for assembling a disk drive, including:

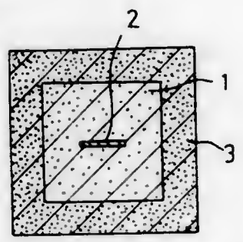
providing a transfer tool having actuator bearing and spindle motor datums configured to position an actuator bearing and a spindle motor in a predetermined relationship;
providing an actuator bearing;
providing a spindle motor;
positioning the actuator bearing on the actuator bearing datum of the transfer tool;
positioning a spindle motor on the spindle motor datum of the transfer tool;
providing a circuit board including conductors; and
mounting the circuit board to the actuator bearing and spindle motor while the suspension bearing and spindle motor are positioned on the transfer tool.

5,551,146

METHOD OF MANUFACTURING A SOLID INDUCTOR

Toshio Kawabata; Hiroyuki Takeuchi; Hisashi Katsurada; Kazutaka Nakamura, and Tomoaki Ushiro, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Division of Ser. No. 909,595, Jul. 7, 1992, Pat. No. 5,359,311. This application Aug. 10, 1994, Ser. No. 288,588
Claims priority, application Japan, Jul. 8, 1991, 3-194939
Int. Cl.[6] H01F *41/02*
U.S. Cl. 29—608 **13 Claims**



1. A method of manufacturing a solid inductor comprising the steps of:
laminating and cofiring green sheets of a magnetic material to form a ceramic body having two ends;
passing an inner conductor through said ceramic body from one end to the other end;
placing a pair of outer electrodes on both ends of said ceramic body and electrically connecting said outer electrodes to respective ends of said inner conductor; and
applying a vitreous material exhibiting lower permeability than the magnetic material to the surface of said magnetic material, and diffusing said vitreous material into the magnetic material, thereby forming a diffusion layer.

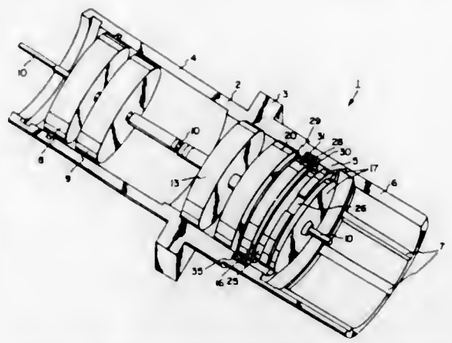
5,551,147

TOOL FOR REMOVING A REPAIRABLE ELECTRICAL CONNECTOR INSERT

Ronald W. Morse, Sidney, and Douglas M. Johnescu, Gilbertsville, both of N.Y., assignors to Amphenol Corporation, Wallingford, Conn.

Division of Ser. No. 26,009, Mar. 4, 1993, Pat. No. 5,471,740, which is a division of Ser. No. 848,337, Mar. 9, 1992, Pat. No. 5,211,582. This application Apr. 27, 1995, Ser. No. 429,781
Int. Cl.[6] H01R *43/00*
U.S. Cl. 29—764 **6 Claims**

1. An insert removal tool for removing an insert from an electrical connector, comprising:
a main body;



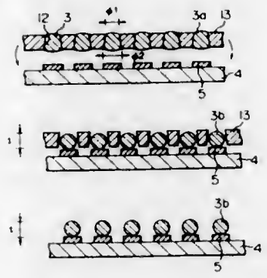
means extending from said main body for engaging a surface of said insert, said means including a sleeve having a rear portion attached to the main body and a front portion from which hooks extend,
wherein said hooks include at least one L-shaped extension, one leg of the L-Shaped extension extending parallel to a direction of insertion of the insert into the connector, and the other leg extending transversely to the direction of insertion and tangentially to a surface of the tool to form a means for engaging a surface on an interface portion of the insert upon insertion of the tool into the connector and rotation of the tool following insertion so that the hooks engage said surface and permit removal of the insert from the electrical connector.

5,551,148

METHOD FOR FORMING CONDUCTIVE BUMPS

Shinichi Kazui; Makoto Matsuoka; Hideyuki Fukasawa; Mitsunori Tamura; Mitsugu Shirai, and Hideaki Sasaki, all of Hadano, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 28, 1994, Ser. No. 330,569
Claims priority, application Japan, Oct. 28, 1993, 5-270418
Int. Cl.[6] H05K *3/00*
U.S. Cl. 29—843 **2 Claims**



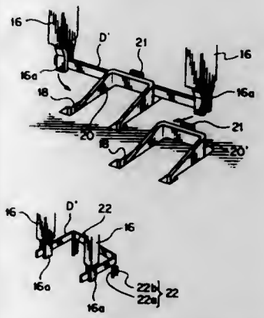
1. A method for forming conductive bumps comprising the steps of:
preparing a circuit board, preparing a flexible film-like member having conductive metals filled in holes extending tapered from one side to another side thereof through the thickness thereof;
positioning said film-like member to said circuit board such that larger diameter sides of said tapered holes of said film-like member face respective pad patterns on said circuit board;
heating and fusing said conductive metals to transfer said conductive metals to said pad patterns on said circuit board to form conductive bumps; and
removing said film-like member by heating said film-like member or solving said film-like member by cleaning liquid.

5,551,149

METHOD OF MAKING BUSBARS

Kunihiko Takeuchi, Kosai, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed May 11, 1994, Ser. No. 241,403
Claims priority, application Japan, May 13, 1993, 5-111686
Int. Cl.[6] H01R *43/16*
U.S. Cl. 29—874 **8 Claims**



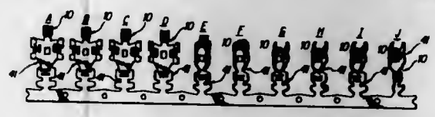
2. A method of making busbars comprising the steps of:
cutting a belt-shaped thin, plastically deformable electrical conductor into a piece of conductor of a predetermined length, said piece of conductor having a first end portion and a second end portion;
holding said first and second end portions of said piece of conductor with a pair of chucks, each of said chucks having a grasping mechanism to grasp said end portion and being adapted to move vertically, horizontally, and in a horizontal arcuate path;
positioning the pair of chucks above a jig plate having at least one pin rising from a surface thereof;
lowering the pair of chucks to position said piece of conductor into contact with said pin; and
causing at least one of said pair of chucks to move in a horizontal arcuate path about said pin to cause said piece of conductor to bend.

5,551,150

METHOD OF FABRICATING AN ELECTRICAL TERMINAL

Thomas E. Zielinski, China; Gregg A. Eisenmann, Canton; Robert D. Kennedy, Northville; Nicholas O'Branovic, Royal Oak, and Sucha S. Sian, Southfield, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Division of Ser. No. 155,506, Nov. 22, 1993, Pat. No. 5,427,562. This application Jun. 6, 1995, Ser. No. 466,530
Int. Cl.[6] H01R *43/04*
U.S. Cl. 29—882 **8 Claims**



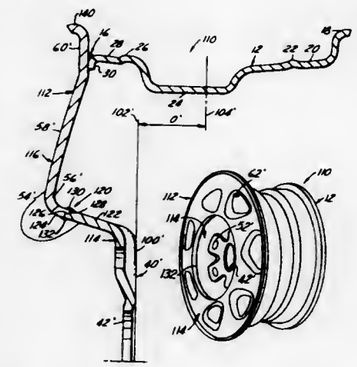
1. In a method for forming a female electrical terminal socket which is adapted to be affixed at one end to a wire lead and which has a socket at the other end for receiving a male contact pin urged into abutment with a portion of the socket by a contact spring, the improvement comprising the steps of forming the female socket from a unitary blank by:
a) folding a pair of side flanges to extend substantially normal with respect to a base portion to form a channel;
b) bending a cantilevered contact floor about a bight thereof into alignment with the channel so as to overlie the base portion;
c) while bending the cantilevered contact floor, supporting the cantilevered contact floor continuously at the bight thereof to minimize the formation of cracks; and
d) bending the side flanges so that free ends thereof overlie the cantilevered contact floor in spaced relation with respect thereto to form a space therebetween for receiving the contact spring.

5,551,151

METHOD OF MAKING A VARIABLE OFF-SET FULL FACE WHEEL

Joseph C. Overbeck, 4000 Collins Rd., Lansing, Mich. 48910

Division of Ser. No. 165,079, Feb. 10, 1993, Pat. No. 5,380,071. This application May 30, 1995, Ser. No. 453,226
Int. Cl.[6] B23P *19/00*
U.S. Cl. 29—894.322 **8 Claims**



1. A method of constructing a multi-piece, non-take-apart vehicle wheel assembly of the type comprising a single piece drop-center-well rim having an inboard bead seat and an outboard bead seat for mounting of a pneumatic tire thereon, said rim having disc mounting means affixed thereto and extending radially inwardly of the rim, and a wheel mounting disc having a center mounting portion with a center pilot opening and a circular row of wheel mounting bolt holes encircling said center pilot opening for receiving wheel mounting fasteners for fixing said wheel to the wheel mounting structure of a vehicle, said disc having an outer peripheral portion radially overlapping said disc mounting means of said rim in assembly therewith, said disc also having an intermediate window vent opening portion disposed radially between said disc center portion and said outer peripheral portion, said method comprising the steps of:
(1) finish forming said rim as a separate part to final dimensions;
(2) finish forming said disc outer and intermediate portions as a separate part to final dimensions with an annular connector flange formed at the inner periphery thereof;
(3) forming said center portion as a separate part with a connector flange formed at the outer periphery of the outboard side thereof and mounting plane means formed at the inboard side thereof;
(4) permanently interconnecting said disc outer and intermediate part with said rim part to form a rim and partial disc subassembly;
(5) fixturing said subassembly on an assembly apparatus to orient the average axis of the bead seats of said rim on a predetermined first axis of said apparatus,
(6) temporarily assembling said subassembly and said center part by placing said center part on said subassembly with said connector flanges movably engaged with one another;
(7) precision locating said center part relative to said rim by engaging a locating means of said apparatus with said center part to align said center part in a predetermined orientation

relative to said rim bead seats by bodily shifting of said center part as and if necessary relative to the rim to accomplish said alignment; and

(g) and permanently assembling said center part and subassembly in permanent fixed relationship while located as established in Step (7) by permanently securing said connector flange of said center part and subassembly together in a non-take-apart mode whereby final permanent assembly of said center part and subassembly provides a final predetermined permanently fixed orientation said center part relative to said rim bead seats.

5,551,152

SHAVING SYSTEM

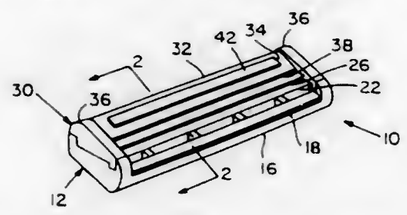
Mingchih M. Tseng, Hingham, Mass., assignor to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 865,594, Apr. 9, 1992, Pat. No. 5,349,750, which is a continuation of Ser. No. 590,027, Sep. 28, 1990, abandoned. This application Sep. 23, 1994, Ser. No. 311,726

The portion of the term of this patent subsequent to Sep. 27, 2011, has been disclaimed.

Int. Cl.[6] B26B *21/44;21/14*

U.S. Cl. 30—41 **16 Claims**



11. A shaving system of the wet shave type comprising a blade member having a shaving edge, and structure defining an external skin-engaging portion adjacent the shaving edge of said blade member, said skin-engaging portion including a composite having an exposed, skin-contacting surface comprising a mixture of ethylene vinyl acetate and of a shaving aid.

5,551,153

RAZOR BLADE ASSEMBLY

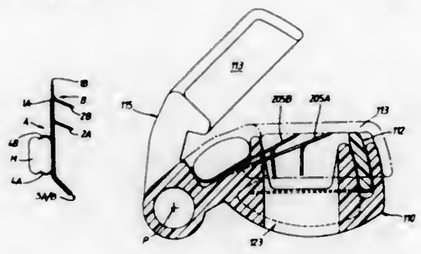
Graham J. Simms, Brookline, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Mar. 3, 1995, Ser. No. 400,428

Claims priority, application United Kingdom, Jun. 12, 1990, 9013047

Int. Cl.[6] B26B *21/30;21/44;21/16*

U.S. Cl. 30—041 **10 Claims**



1. A twin-blade assembly for use in a safety razor comprising two separately formed metallic blade members (A, B) each having a sharpened edge, said edges disposed parallel to one another in a spaced relationship, wherein said blade members are secured to each other for being mounted and replaced, as a unit, in a razor head, characterized in that at least one of said blade members (A, B) is resiliently flexible to allow the blade edges to be displaced relative to one another upon mounting the assembly in the razor head, and further characterized in that each said blade member (A, B) is formed of a blade steel blank and comprises a longitudinal rear margin (3 A/B) and a longitudinal generally planar blade strip (5 A/B), said blade strip having said sharpened blade edge (1 A/B) and being spaced forwardly of the rear margin and connected thereto by at least one integral spring arm (9 A/B) which is flexible about an axis parallel with said blade edges (1 A/B),

and further characterized in that each blade member (A, B) has a reinforcing leg (2 A/B) formed as an integral part of the blank in an area between its corresponding generally planar blade strip and its corresponding rear margin and extending at an angle away from said generally planar blade strip such that a gap is formed between the blade strip (5 A/B) and said rear margin (3 A/B).

10. A twin-blade assembly for use in a safety razor comprising two separately formed, metallic blade members (A, B) each having a sharpened edge, said edges facing in generally the same direction and being disposed parallel to one another in spaced relationship, wherein said blade members are secured to each other for being mounted and replaced, as a unit, in a razor head, characterized in that at least one of said blade members (A, B) is resiliently flexible to allow the blade members to be displaced about an axis parallel to at least one of said blade edges and at an acute angle relative to one another upon mounting the assembly in the razor head, said blade edges being displaced relative to one another in substantially parallel relationship and said acute angle having a vertex along one of said blade members along a projected line of intersection between said relatively displaced blade members, and further characterized in that said twin-blade assembly further comprises a strip of lubricating material which is permanently attached to the blade members (A, B).

5,551,154

RECIPROCATORY DRY SHAVER

Masao Tanahashi; Takeshi Shiba, and Toshio Ikuta, all of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Division of Ser. No. 377,361, Jan. 24, 1995, which is a division of Ser. No. 47,501, Apr. 19, 1993, Pat. No. 5,398,412. This application Apr. 25, 1995, Ser. No. 428,624

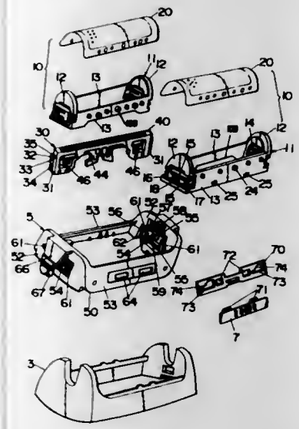
Claims priority, application Japan, Apr. 23, 1992, 4-103330; Dec. 22, 1992, 4-342204

Int. Cl.[6] B26B *19/04;19/06*

U.S. Cl. 30—43.92 **9 Claims**

1. A reciprocatory dry shaver comprising:

a shaver housing having a head frame which carries three elongated cutter heads each having a longitudinal axis, said three elongated cutter heads composed of a center cutter head and two outer cutter heads arranged on opposite sides of said center cutter head with the individual longitudinal axes substantially parallel to each other, each of said two outer cutter heads comprising an outer foil and an outer movable cutter driven to reciprocate along said longitudinal axis of each of said two outer cutter heads in hair shearing engagement with said outer foil of each of said two outer cutter heads, said center cutter head comprising a stationary cutter and a center movable cutter driven to reciprocate along said longitudinal axis of said center cutter head in hair shearing engagement with said stationary cutter of said center cutter head;



wherein said center and outer cutter heads are floatingly supported to said head frame respectively by associated center and outer spring members so that each of said three elongated cutter heads is vertically movable relative to said head frame, and wherein

said center spring member gives a bias for floatingly supporting said center cutter head which is less than a bias for floatingly supporting said outer cutter heads.

5,551,155

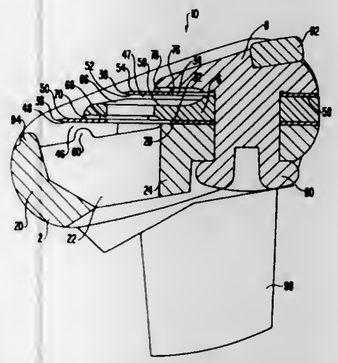
MOVABLE BLADE SHAVING CARTRIDGE WITH COATED RETAINING CLIPS

Frank H. Prochaska, Waynesboro, Va., assignor to American Safety Razor Company, Verona, Va.

Continuation-in-part of Ser. No. 46,989, Apr. 16, 1993, Pat. No. 5,341,571. This application May 23, 1994, Ser. No. 247,225

Int. Cl.[6] B26B *21/16*

U.S. Cl. 30—50 **27 Claims**



10. A blade cartridge comprising a platform member defining a guard member and a cap member, end clips and a blade means disposed therein having a forward and rearward section,

said end clips secured to the blade cartridge so as to cover the outer edges of said blade means, said end clips being bonded with a friction reduction agent so as to reduce drag forces encountered during the shaving process.

5,551,156

REVOLVING BLADE SKINNING DEVICE

Stefan Elmer, Ötisheim, Germany, assignor to Schmid & Wezel GmbH & Co., Maulbronn, Germany

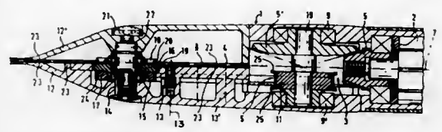
PCT No. PCT/EP93/02330, § 371 Date Apr. 19, 1995, § 102(e) Date Apr. 19, 1995, PCT Pub. No. WO94/05157, PCT Pub. Date Mar. 17, 1994

PCT Filed Aug. 28, 1994, Ser. No. 290,778

Claims priority, application Germany, Sep. 1, 1992, 42 29 134.8

Int. Cl.[6] A22B *5/16*

U.S. Cl. 30—276 **15 Claims**



1. A revolving blade skinning device, comprising:

a pair of housing shells;

a drive motor mounted within said housing shells, said drive motor defining an axis of rotation;

blade support means mounted to said housing shells;

a blade mounted to said blade support means for rotation relative to said housing shells, said blade defining a plane of rotation; and

gear means mounted within said housing shells between said drive motor and said blade support means,

said gear means including a drive wheel driven by said drive motor and a belt situated between said drive wheel and said blade support means which imparts motion from said drive wheel to said blade support means,

wherein the axis of rotation of said drive motor lies in said plane of rotation defined by said blade.

5,551,157

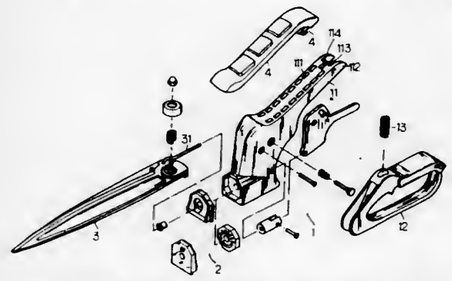
TOOL HANDLE ASSEMBLY FOR GARDEN TOOLS

Chin-Sung Wu, 30, Min Yu St., Lu Kang Town, Changhua, Taiwan

Filed May 17, 1995, Ser. No. 442,700

Int. Cl.[6] B26B *13/14*

U.S. Cl. 30—341 **4 Claims**



1. A tool handle assembly comprising a first handgrip to hold a pair of cutting blades, a second handgrip pivoted to said first handgrip and moved relative to said first handgrip in opening and closing said cutting blades for cutting things, and a compression spring connected between said first handgrip and said second handgrip, wherein said first handgrip comprises a longitudinal top side, two longitudinal rows of mounting holes bilaterally disposed on said longitudinal top side, two smoothly curved tail wings bilaterally disposed at one end, two projecting blocks inwardly projecting from said tail wings, a rectangular opening defined between said projecting blocks, a rectangular locating hole disposed behind said projecting blocks and communicated with said

rectangular opening, and a cushion on said top side, said cushion comprising two longitudinal rows of mounting blocks bilaterally disposed at a bottom side thereof and respectively fitted into said rows of mounting holes, a longitudinal locating rib fitted into said rectangular opening between said projecting blocks, and an end hook hooked in said rectangular locating hole.

5,551,158

METHOD FOR MEASURING POSITION AND ANGLE

Carl Tyren, Antibes, France, and Leif A. Persson, Staffanstorp, Sweden, assignors to RSO Corporation N.V., Netherlands

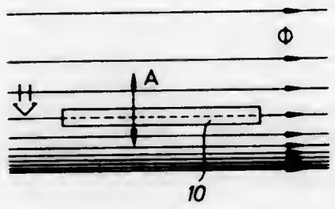
PCT No. PCT/SE93/00037, § 371 Date Sep. 6, 1994, § 102(e) Date Sep. 6, 1994, PCT Pub. No. WO93/14370, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 20, 1993, Ser. No. 256,490

Claims priority, application Sweden, Jan. 20, 1992, 9200145; Nov. 2, 1992, 9203258

Int. Cl.[6] G01B *13/24*

U.S. Cl. 33—1 N **9 Claims**



1. Method for position measurement, whereby a magnetic field having a flux intensity is generated in a measuring volume comprising at least one elongated element of amorphous material, the magnetic/mechanical properties of which are influenced by the magnetic field, which is arranged in the measuring volume,

providing the magnetic field with a gradient in the measuring volume;

providing the measuring volume with a plurality of sub-volumes;

choosing extension of the sub-volumes in desired measuring directions in such a way that the extension corresponds to a desired measuring resolution in the measuring directions;

detecting a change in the magnetic/mechanical properties of the element caused by the magnetic flux intensity in a respective sub-volume along a longitudinal direction of the element, the change being a measure of a position of the element; and

the position measurement comprising the steps of: measuring a gradient adapted to a total length of a total measuring area and magnetic working area of the element; and measuring a gradient adapted to a sub-distance of a length of the total measuring area of the element.

5,551,159

SCALABLE MEASURING APPARATUS AND DISPLACEMENT DISPLAY DEVICE, SYSTEM AND METHOD

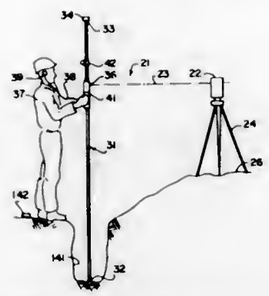
Glenn J. Mooty, 20580 Henwood Dr., San Jose, Calif. 95120

Division of Ser. No. 34,524, Mar. 22, 1993, Pat. No. 5,457,890. This application Oct. 11, 1995, Ser. No. 542,175

Int. Cl.[6] G01C *15/06*

U.S. Cl. 33—228 **6 Claims**

1. A method for use in making measurements at a job site by the use of a laser-level transmitter, comprising a laser beam rotating in a level elevation and a laser receiver for receiving the laser beam and for giving an indication when the laser beam is received, an unmarked grade pole, a housing, means securing said receiver to said housing so that said housing moves as said receiver is moved,



said housing containing a tunnel adapted to receive the grade pole and having it extend therethrough, a sensing wheel mounted in the housing and tangentially engaging the outer surface of the grade pole and rotating as the housing ascends and descends the grade pole, a numerical display mounted on the housing and being visible from the exterior of the housing, a shaft encoder driven by the sensing wheel and providing an electrical output, logic circuitry within the housing coupled to the electrical output of the shaft encoder and coupled to the numerical display for displaying a number on the numerical display which is related to the rotational position of the sensing wheel with respect to the position of the housing on the grade pole, and switch means carried by the housing and accessible from the exterior of the housing for controlling the logic circuitry, the method comprising operating the switch means to place a predetermined elevation in the numerical display, placing the grade pole in the tunnel in the housing, placing the lower end of the grade pole on an object at an unknown elevation at the job site with the grade pole being disposed vertically, moving the housing to ascend or descend the grade pole until the laser receiver carried thereby receives the laser beam to provide a read out on the display which provides a numerical representation of the elevation of the object at the job site.

5,551,160

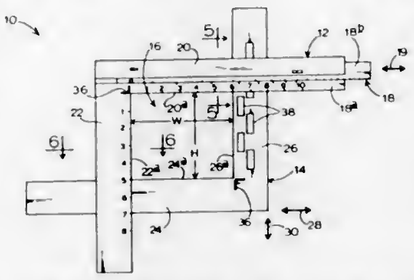
CALCULATING GRAPHIC SCALER

Byron S. Ferris, 11645 SW Lynnridge, Portland, Oreg. 97225, and Loren T. Weeks, 43 Aquinas, Lake Oswego, Oreg. 97035

Filed Aug. 24, 1994, Ser. No. 296,221

Int. Cl.[6] B43L *7/10*

U.S. Cl. 33—452 **9 Claims**



1. A measure and scale system for use in preparing an original image for infinitely selectable resize processing to a reprocessed image, said system comprising

a first, elongate linear element including first and second, fixed, linearly-distributed, laterally spaced, elongate scale structures each containing original-image measurement indicia marks, and

a second, elongate linear element, mounted on said first element for reversible, longitudinal, relative sliding movement, and including first and second, fixed, linearly-distributed, laterally

spaced, elongate scale structures each containing reprocessed-image calculation indicia marks, with one of these second-mentioned scale structures including reprocessed-image dimensional indicia marks, and the other such scale structure including reprocessed-image percentage-scale-resizing indicia marks, and with each indicia mark in said one scale structure having a nonexclusive, infinitely variable relationship with each indicia mark in said other scale structure, and vice versa.

5,551,161

FIGURE COORDINATE MARKING APPARATUS

Akio Kubo, 655 Yamanouchi,, Kamakura-shi, Kanagawa-ken, Japan

Filed Dec. 20, 1994, Ser. No. 360,998

Claims priority, application Japan, Feb. 4, 1994, 6-012432

Int. Cl.[6] G01B *5/004;5/26*

U.S. Cl. 33—503 **20 Claims**

1. A figure coordinate marking apparatus comprising

a main body having rollers each of which is provided at each end of a horizontal axle perpendicular to a running direction thereof so that the main body can run in only the straight running direction, a display device, an input device, and calculating means,

a measuring lever pivotably supported on the main body rotatable right or left relative to the running direction on a horizontal plane, said measuring lever having a marker and a tracing portion for tracing a figure to be measured to obtain coordinates, area, length for said figure, said calculating means calculating a specific coordinate position of said figure, and said display device indicating a difference between the specific coordinate position of the figure and a coordinate position of said marker,

a first wheel for fine movement of said measuring lever substantially in the running direction of the main body,

a second wheel for fine movement of said measuring lever in a turning direction of the measuring lever,

spacing means to normally maintain said first and second wheels a small distance above a sheet of paper on which the figure is drawn; said spacing means allowing said first and second wheels to be pressed down on said sheet of paper for fine adjustment.

5,551,162

HAND-HELD GAP AND CONTOUR MEASURING GAUGE

James E. Struble, Eaton Rapids, Mich., assignor to JS Research and Development, Inc., Eaton Rapids, Mich.

Filed Oct. 12, 1994, Ser. No. 321,969

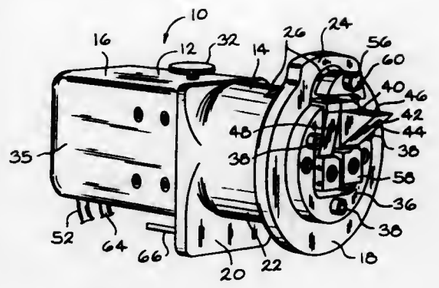
Int. Cl.[6] G01B *7/14*

U.S. Cl. 33—548 **26 Claims**

1. A device for simultaneously measuring a gap between spaced apart opposed surfaces and a contour between adjacent outwardly facing surfaces of a first part and a second part, comprising:

a main body;

a gap measuring element supported relative to said main body and movable along a first path relative to a first reference member carried by said main body, said first reference member being selectively engagable with one of the first and second parts, said gap measuring element insertable into the



gap for engagement with both of the first and second parts, said gap measuring element coupled to a first transducer for generating a first signal representative of the relative position of said gap measuring element along said first path and proportional to the gap between the opposed surfaces; and

a contour measuring element supported relative to said main body and movable along a second path relative to a second reference member carried by said main body, said second reference member being selectively engagable with the outwardly facing surface of one of the first and second parts, said contour measuring element engagable with the outwardly facing surface of the other of the first and second parts, said contour measuring element coupled to a second transducer for generating a second signal representative of the relative position of said contour measuring element along said second path and proportional to the contour of the adjacent outwardly facing surfaces.

5,551,163

LOW-VIBRATION FASTENING FOR THE HOUSING OF A POSITION MEASURING ARRANGEMENT

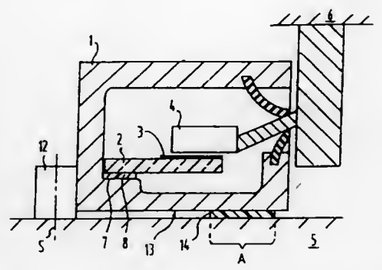
Alfred Affa, Stein/Traun, Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Germany

Filed Feb. 28, 1995, Ser. No. 396,136

Claims priority, application Germany, Mar. 2, 1994, 44 06 798.4

Int. Cl.[6] G01B *11/04*

U.S. Cl. 33—702 **19 Claims**



1. A length measuring instrument for measuring the relative position of a first and second object, the instrument comprising a carrier body, portions of which are fastened to the first object by translatory bearing fasteners, a measurement embodiment fastened to the carrier body, the measurement embodiment extending in a measuring direction, a scanning arrangement fastened to the second object for scanning the measurement embodiment, the improvement comprising:

a support zone located between the first object and an exterior portion of the carrier body for supporting a surface of the carrier body wherein the support zone is formed by a highly elastic layer.

5,551,164

DRYING SECTION WITH AN ADJACENT FINISHING ROLLER

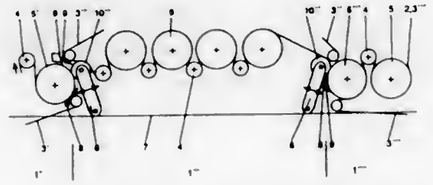
Erwin Brunnmair, Graz, Austria; Alfred Bublik, Ravensburg, Germany; Harald Hess, Grunkraut, Germany; Herbert Holik, Ravensburg, Germany; Werner Leitenberger, Schlier-Wetzisreute, Germany; Thomas Merath, Oberteuringen, Germany; Johann Moser, Grunkraut, Germany; Helmut Steib, Schlier, Germany, and Elmer Weisshuhn, Vogt, Germany, assignors to Voith Sulzer Papiermaschinen GmbH, Heidenheim, Germany

Filed Mar. 3, 1995, Ser. No. 398,668

Claims priority, application Germany, Mar. 5, 1994, 44 07 405.0

Int. Cl.[6] F26B *11/02*

U.S. Cl. 34—117 **28 Claims**



2. A drying section of a papermaking machine, the drying section including several drying groups and a paper web, wherein the paper web, together with at least one endless drying screen, associated with each of the several drying groups, is guided over heated drying cylinders, wherein the paper web is located between a drying screen and a drying cylinder, wherein a finishing roller is provided at both the end of one drying group and at the beginning of the next following drying group, with the finishing rollers together forming a finishing nip, and with only the paper web being guided through the finishing nip.

5,551,165

ENHANCED CLEANSING PROCESS FOR WAFER HANDLING IMPLEMENTS

Virgil Q. Turner, Sugarland; William D. Light, Richmond; Hilario T. Trevino, Needville; Richard L. Guldi, Dallas; Frank Poag, Plano, and Douglas E. Paradis, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 13, 1995, Ser. No. 421,415

Int. Cl.[6] F26B *5/04*

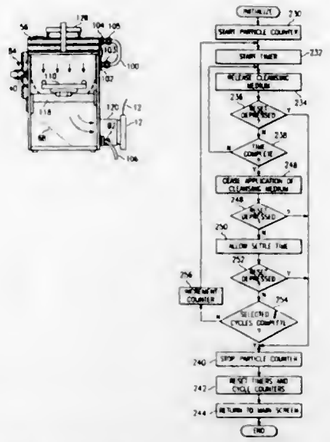
U.S. Cl. 34—404 **19 Claims**

19. A method for cleansing a substrate, comprising the steps of:

providing a cleansing medium stream and directing said stream at a substrate through a plurality of orifices;

controlling through which orifices said cleansing medium is released;

evacuating with negative pressure said cleansing medium directed against said substrate; and



monitoring a contaminant concentration level in said evacuated cleansing medium.

5,551,166

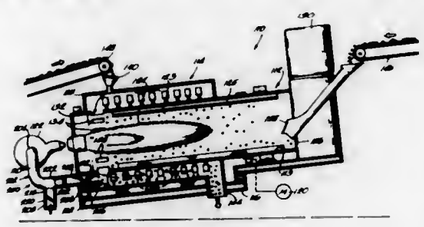
DRYER DRUM COATER HAVING VENTED OUTER SHELL FOR VOC/NOX REDUCTION

John Milstead, Chattanooga, Tenn., assignor to Astec Industries, Inc., Chattanooga, Tenn.

Filed Mar. 7, 1994, Ser. No. 206,879

Int. Cl.[6] F26B *3/00*

U.S. Cl. 34—479 **17 Claims**



7. A dryer drum coater comprising:

A. a rotary drum which heats and dries virgin aggregate, said rotary drum having an aggregate inlet, an aggregate outlet, and a combustion products outlet;

B. means for defining a mixing chamber for mixing heated and dried virgin aggregate with other asphaltic products, thereby producing blue smoke, wherein said mixing chamber includes a virgin aggregate inlet; and

C. means for evacuating said blue smoke from a vapor outlet located adjacent said virgin aggregate inlet of said mixing chamber and remote from said combustion products outlet of said rotary drum.

5,551,167

CONTINUOUS-FLOW GRAIN STEEPING AND COOLING METHOD AND APPARATUS

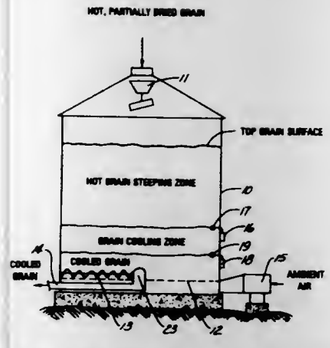
Larry van Fossen, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jul. 1, 1994, Ser. No. 269,736

Int. Cl.[6] F26B *3/00;19/00*

U.S. Cl. 34—491 **20 Claims**

1. A continuous-flow grain conditioning process for a grain container having a top and a bottom, grain in the grain container



being held first in a top steeping zone and then a bottom cooling zone, the process comprising the steps of:

heating harvested grain in a grain dryer to produce hot, partially dried grain;

distributing the hot, partially dried grain into the top of the grain container in an approximately level and uniformly thick layer;

providing a downward flow of the grain through the grain container;

sensing a cooled grain temperature in a lower portion of the cooling zone;

controlling the downward flow of grain based on the cooled grain temperature, the downward grain flow being at a rate that allows the grain to remain in the top steeping zone for a predetermined steeping time;

providing an upward flow of ambient air through the grain container such that the ambient air passes through the grain in the cooling zone and the grain in the steeping zone;

wherein the ambient air first passes through the grain in the cooling zone and is heated by the grain to the grain temperature at the top of the cooling zone, which is also the bottom of the steeping zone, and then passes through the grain in the steeping zone;

sensing a hot grain temperature in a lower portion of the steeping zone;

controlling the upward flow of ambient air based on the hot grain temperature in the bottom cooling zone, the upward flow of ambient air being at a rate that allows the grain to remain in the bottom cooling zone until it is cooled to a temperature within a few degrees of the ambient air temperature, whereby the combination of steeping and cooling the grain will cause about four additional points of moisture to be removed from the grain; and

discharging cooled dry grain from a layer of approximately uniform thickness near the bottom of the grain container.

5,551,168

CONTINUOUS-FLOW GRAIN STEEPING AND COOLING SYSTEM

Larry Van Fossen, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jul. 1, 1994, Ser. No. 269,748

Int. Cl.[6] F26B *3/00;19/00*

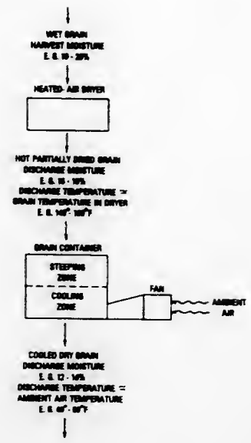
U.S. Cl. 34—491 **7 Claims**

1. A continuous-flow grain conditioning process for a grain container having a top and a bottom, the process comprising the steps of:

heating harvested grain in a grain dryer to produce hot, partially dried grain;

charging the hot, partially dried grain into the top of the grain container in an approximately level and uniformly thick layer; and

regulating a downward flow of the grain through the grain container at a rate that allows the grain to remain in a steeping zone for a predetermined steeping time, whereby grain temperature and moisture tend to become uniform within each kernel of the grain.



5,551,169

AIR VELOCITY CONTROL FOR EFFICIENT PRODUCT TEMPERATURE CYCLING

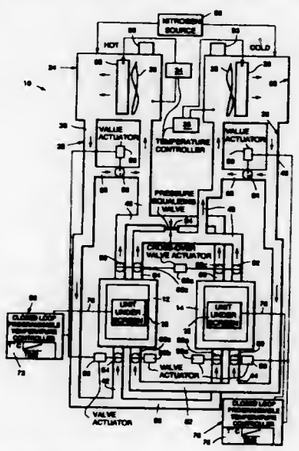
Robert H. Weinmann, Jr., Laguna Hills, Calif., assignor to Screening Systems, Inc., Laguna Hills, Calif.

Continuation of Ser. No. 848,633, Mar. 9, 1992, abandoned. This application Sep. 28, 1994, Ser. No. 315,029

Int. Cl.[6] F26B *3/00*

U.S. Cl. 34—491 **10 Claims**

10. Apparatus for rapidly imparting a desired temperature change to an item comprising:



means for providing a fluid at a selected temperature, which selected temperature is substantially higher or lower than a desired temperature for the item;

closed loop means for providing a fluid flow path from said fluid providing means to said item and return;

means for circulating said fluid through said closed loop at a high velocity of up to 20 ft per second;

means for sensing a current temperature of the item to provide a sensed temperature; and

means responsive to said sensed temperature for controlling and varying the velocity of the fluid passed over the to provide a temperature change for said item of up to substantially at least 50° C. in a minute.

5,551,170

REFUSE TREATING APPARATUS

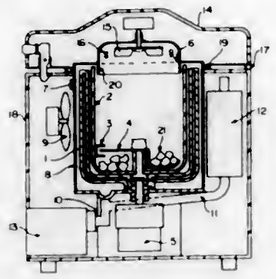
Hideaki Sakatani, Takarazuka; Hirofumi Nishida, Osaka; Yojl Uetani, Amagasaki; Yoichi Kuroki, Kawachinagano; Keiko Hata, Amagasaki; Tatsuo Fujita, Osaka; Tatsuo Kikawa, Oumihachiman; Seichi Ueno, Hikone, and Yukio Hayashida, Amagasaki, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 11, 1994, Ser. No. 225,903

Claims priority, application Japan, Apr. 12, 1993, 5-084255; Jul. 30, 1993, 5-189670

Int. Cl.[6] F26B *19/00*

U.S. Cl. 34—549 **8 Claims**



1. A refuse treating apparatus comprising,

a refuse container,

heating means for heating and drying the refuse in the refuse container,

a condenser for condensing the steam generated from the refuse,

first temperature detecting means for detecting the temperature near the refuse container, and

second temperature detecting means for detecting the temperature of the steam flowing out from the refuse container into the condenser,

wherein the output of the heating means is controlled by the first temperature detecting means to maintain the temperature near the refuse container at a predetermined temperature, and by the second temperature detecting means to terminate the drying process when the temperature detected by the second temperature detecting means exceeds a predetermined temperature.

5,551,171

WINDING DEVICE FOR A FIBER WEB

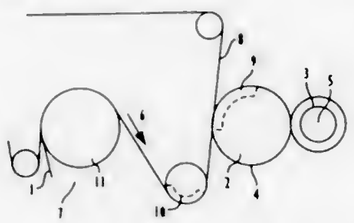
Hans Dahl, Ravensburg, Germany, assignor to Sulzer-Escher Wyss GmbH, Ravensburg, Germany

Filed Aug. 15, 1994, Ser. No. 290,283

Claims priority, application Germany, Aug. 23, 1993, 43 28 310.1

Int. Cl.[5] F26B *13/00*

U.S. Cl. 34—625 **22 Claims**



1. A winding device for a fiber web including a carrier drum, wherein the fiber web is at least partially wrapped around the carrier drum, a carrier axis for the fiber web adapted to be moved to the carrier drum and adapted to contact a jacket of the carrier drum in an axially parallel winding portion wherein the fiber web is transferred, from a dryer unit for the fiber web, which dryer unit precedes the carrier drum in the web moving direction, together with a driving band, to the carrier drum and transferred from the driving band to the carrier drum; and wherein a drying sieve, utilized in the dryer unit is, at the same time, used as the driving band.

5,551,172

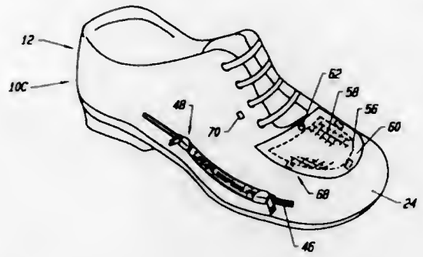
VENTILATION STRUCTURE FOR A SHOE

Simon S. C. Yu, 3806 Whittle Ave., Oakland, Calif. 94602

Continuation-in-part of Ser. No. 294,391, Aug. 23, 1994, abandoned. This application Jul. 31, 1995, Ser. No. 427,906

Int. Cl.[6] A43B *7/10*

U.S. Cl. 36—03 A **16 Claims**



1. A ventilation structure in combination with a shoe having a sole portion and a connected upper portion, the improvement comprising:

a. an aperture through the upper portion of the shoe providing communication between the exterior and the interior of the shoe, said aperture extending along a dimension of the upper portion of the shoe;

b. a mesh layer connected directly to the upper portion of the shoe in overlying relationship with said aperture; and

c. closure means for shutting at least a portion of said aperture by drawing said upper portion to itself and blocking at least a portion of said mesh layer thereby, said shut aperture forming a chamber between the shut aperture and said overlying mesh layer on the interior of the upper portion of the shoe.

5,551,173

COMFORT INSOLE

Mark D. Chambers, 3210 E. Vermont Ave., Phoenix, Ariz. 85018

Filed Mar. 16, 1995, Ser. No. 405,147

Int. Cl.[6] A43B *13/38;7/06*

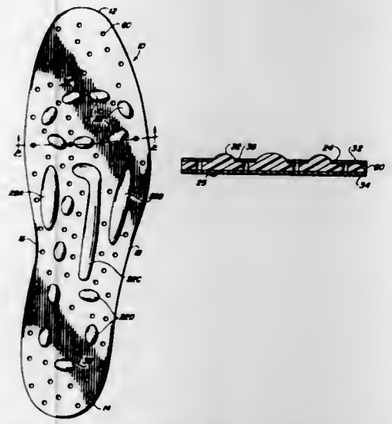
U.S. Cl. 36—44 **8 Claims**

1. An insole for insertion into footwear between the planar surface of the wearer's foot and the inner surface of a shoe, said insole comprising:

(a) a base having a peripheral edge defining a toe portion, a heel portion and an intermediate arch portion, said base being fabricated from a flexible, resilient cushioning material having opposite first and second generally planar surfaces;

(b) a plurality of protuberances disposed on said first surface of said base and projecting therefrom;

(c) moisture absorbing material covering said opposite first and second generally planar surfaces, said covering on said first planar surface defining openings corresponding to the location and shape of the protuberances disposed thereon to allow the protuberance to extend therethrough above the surface of the covering; and



(d) said base sole defining a plurality of apertures extending through said base insole whereby said insole may be worn with said first side disposed against the wearer's foot to provide a massaging action and may be reversed and worn with said second side disposed against the wearer's foot and with said protuberances engaging the shoe inner surface to induce an air flow through said insole as walking pressure is applied to the insole.

5,551,174

ALPINE SKI BOOT WITH FOOT TIGHTENING DEVICE

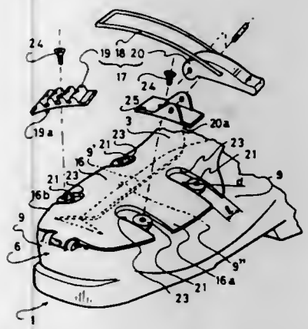
Claude Perrissoud, Saint-Jorioz, France, assignor to S.A. Salomon, Metz-Tessy, France

Filed Dec. 19, 1994, Ser. No. 358,759

Claims priority, application France, Dec. 24, 1993, 93 15944

Int. Cl.[6] A43B *5/04*

U.S. Cl. 36—50.5 **14 Claims**



1. A ski boot comprising:

a rigid shell base comprising a pair of lateral portions in at least an upper front portion of said shell base, said pair of lateral portions defining a longitudinally extending slit at least in said upper front portion of said shell base;

an upper and means for journalling at least a part of the upper with respect to the shell base, said upper comprising a front cuff and a rear spoiler, said front cuff covering said longitudinal slit;

at least one foot tightening device comprising an anchoring element affixed to one of said lateral portions of said shell base, a manoeuvering lever attached to a mounting member, said mounting member being affixed to the other of said lateral portions of said shell base, and at least one flexible traction element extending between said anchoring element and said manoeuvering lever;

each said anchoring element and each said mounting member of said manoeuvering lever being mounted upon a respective spacer, each said spacer being affixed to one of said lateral portions of said shell base, wherein a lower surface of each said anchoring element and a lower surface of each said mounting member of said manoeuvering lever and respective upper surfaces of said lateral portions of said shell base define a predeterminate height, said predeterminate height being substantially equal to a predeterminate thickness of said front cuff; and

said front cuff including a plurality of transversely extending slots, said spacers extending upwardly within respective ones of said slots, said lower surface of said anchoring element and said lower surface of said mounting member of said manoeuvering lever being positioned over said slots to securely position said front cuff downwardly against said lateral portions of said shell base, whereby said front cuff is mounted for sliding on said lateral portions of said shell base between a tightened position and a released position of said foot tightening device.

5,551,175

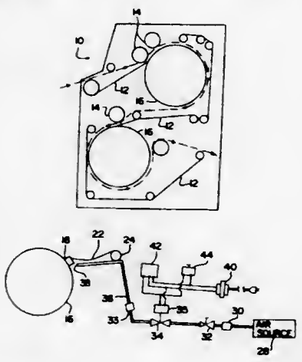
REMOVING LINT FROM FLATWORK IRONER TEMPERATURE SENSORS

Joseph H. Neyman, 3301 W. Coquelin Ter., Chevy Chase, Md. 20815

Filed Oct. 17, 1994, Ser. No. 324,202

Int. Cl.[6] D06F *65/10;* **G01K** *13/08;* **B08B** *5/02*

U.S. Cl. 38—44 **18 Claims**



1. An apparatus for automatically removing lint buildups from around a flatwork ironer temperature sensor mounted on a bracket adjacent a heated rotating cylinder comprising:

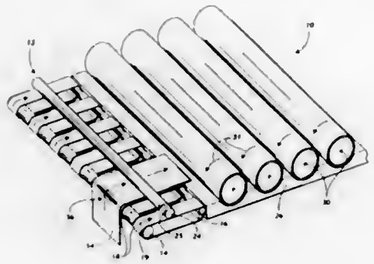
a source of compressed pressurized air;

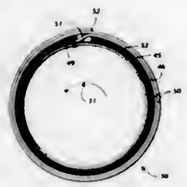
a conduit for receiving said pressurized air from said source, said conduit fixedly mounted adjacent the sensor for directing said pressurized air onto the temperature sensor;

air valve means interposed between said pressurized air source and the sensor; and

selectably controllable means for intermittently opening and closing said air valve means to control the flow of pressurized air through said conduit and onto the sensor to remove lint buildup.

5,551,176
ROLL COVER FOR FLAT WORK IRONER
Thomas J. Hejhal, Dunwoody, and Scott W. Moore, Peachtree City, both of Ga., assignors to Southern Mills, Inc., Union City, Ga.
Filed Nov. 22, 1994, Ser. No. 343,252
Int. Cl.[6] D06F *65/10;* **B30B** *3/02*
U.S. Cl. 38—44 **11 Claims**





1. In a flat work ironer of the type including a plurality of rotatable cylindrical rolls received in a series of semi-cylindrical parallel recesses of a heated chest, the improvement therein of a roll cover assembly for at least some of the cylindrical rolls comprising:

a compressible pad for surrounding said roll, and a roll cover adjacent said pad for surrounding said pad, each of said pad and roll cover attached at one of its edges to its cylindrical roll with its other edge in freely trailing relationship about its roll as the roll rotates,

said roll cover comprising a sheet of thermally resistant fabric coated with a mixture comprising an acrylic resin and a stiffening agent.

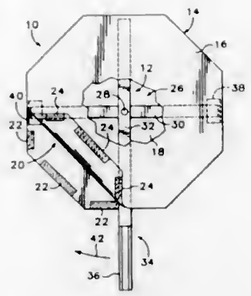
5,551,177
ROLL-UP SIGN WITH COLLAPSIBLE, FANNING FRAMEWORK
John H. Cowgill, Otis, and Charles W. Elroy, Jr., Depoe Bay, both of Oreg., assignors to Sportniks, Inc., Depoe Bay, Oreg.
Continuation-in-part of Ser. No. 252,232, Jun. 1, 1994. This application Nov. 14, 1994, Ser. No. 337,896
Int. Cl.[6] G09F *21/02*
U.S. Cl. 40—610 **9 Claims**

6. A roll-up sign (10) having:

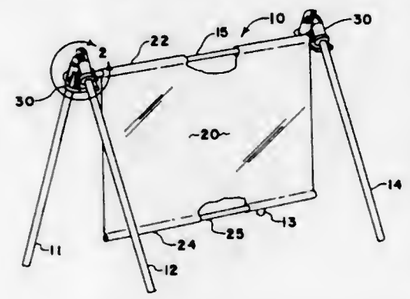
a frame (12) having plural, elongate arms (30, 32), wherein said arms are pivotally joined to each other adjacent the centers thereof;

a web (14) disposed over said frame (12) and secured to one of said arms, wherein said web includes a pair of co-extensive sides (16, 18), which are joined together about a majority of their periphery (19), thereby forming a pocket (20) between said sides, wherein said frame (12) is at least partially received in said pocket (20) and wherein another of said arms is free to rotate within said pocket; and

a handle (36), for supporting the sign, attached to said frame (12) at the end of one of said arms.



5,551,178
COLLAPSIBLE SIGN
James P. Foley, Kettering; Robert J. Nadeau, Dayton; Jan P. Ostendorf, Fairborn, and Lawrence J. Whitehead, Dayton, all of Ohio, assignors to Flexsign Inc., Dayton, Ohio
Filed Jan. 19, 1995, Ser. No. 374,887
Int. Cl.[6] G09F *15/00*
U.S. Cl. 40—610 **22 Claims**



1. For A-frame collapsible stands having a cross-member and two pairs of legs, a connector between the cross-member and a leg pair, comprising:

a base block having a top surface defined by edges;

a cross-member cup attached to the base block along one edge of the top surface by a living hinge for receiving an end of the cross member, the cross-member cup having a bore defined by an inner cup wall;

means for releasably latching the cross-member cup to the base block in an erected position;

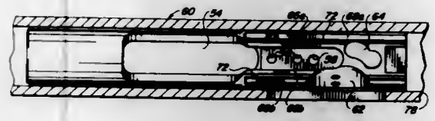
a first leg cup attached by a living hinge to the base block along one edge of the top surface adjacent the edge to which the cross-member cup is attached, the first leg cup having a bore defined by an inner cup wall opening at the end of the first leg adjacent the base block;

a second leg cup attached by a living hinge to the base block along the other edge of the top surface adjacent the edge to which the cross-member cup is attached, the second leg cup having a bore defined by an inner cup wall opening at the end of the second leg cup adjacent the base block;

means for releasably connecting the first leg cup to the second leg cup in a predetermined erected position,

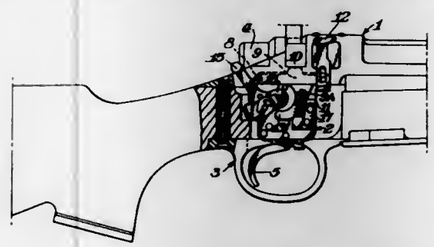
wherein, in the erected position, the cross-member cup bore is perpendicular to the bore of the first cup and perpendicular to the bore of the second leg cup and, in the collapsed position, the bores of the cross-member cup and the leg cups are generally parallel to one another.

5,551,179
BOLT CARRIER
Daniel H. Young, 4120 Mission La., Phoenix, Ariz. 85051
Filed Jan. 6, 1995, Ser. No. 369,388
Int. Cl.[6] F41A *3/12;3/64*
U.S. Cl. 42—16 **7 Claims**



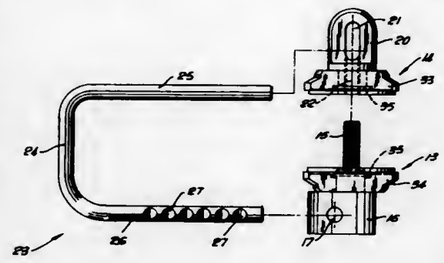
1. A bolt carrier for use in a gas operated firearm, said bolt carrier being in the shape of an elongated cylinder having a forward end as said bolt carrier is positioned in said firearm, said bolt carrier provided with lands separated by grooves about the exterior of its forward end portion, said lands functioning as bearing surfaces and constituting from about 25% to about 50% of the exterior surface of said forward end portion of said bolt carrier, said lands extending no more than one-half of the length of said bolt carrier.

5,551,180
FIREARM BOLT LOCK MECHANISM
David S. Findlay, Elizabethtown; Fred E. Martin, Radcliff, and James W. Ronkainen, Elizabethtown, all of Ky., assignors to Remington Arms Company, Inc., Wilmington, Del.
Filed Mar. 7, 1995, Ser. No. 399,795
Int. Cl.[6] F41A *17/32*
U.S. Cl. 42—70.01 **4 Claims**



1. In a bolt action firearm having a fire control mechanism, a two position safety, a safety actuating means to move the fire control mechanism between a safe and a fire position, a bolt and a bolt lock assembly including a bolt lock in operative relation to the bolt, the improvement wherein the bolt lock assembly comprises a pivotally mounted locking member to move between a locked and an unlocked position, the locking member having a tab which secures the bolt in the locked position and a downwardly and rearwardly extending portion which slideably interacts with the safety actuating means, the locking member having an upwardly projecting control means for moving the locking member between a locked and an unlocked position; and a spring and an associated spring keeper, the spring biasing the bolt lock to the locked position; the downwardly and rearwardly extending portion of the locking member slideably interacting with the safety in a manner such that moving the safety from a fire position to a safe position moves the bolt lock from an unlocked to a locked position; and wherein the upwardly projecting control means can manually overcome the spring bias to move the bolt lock to an unlocked position.

5,551,181
GUN LOCK
Bruce M. Upton, Roseville, Australia, assignor to McDonald Upton Limited, Auckland, New Zealand
PCT No. PCT/AU93/00165, § 371 Date Jan. 30, 1995, § 102(e) Date Jan. 30, 1995, PCT Pub. No. WO93/21491, PCT Pub. Date Oct. 28, 1993
PCT Filed Apr. 13, 1993, Ser. No. 318,756
Claims priority, application Australia, Apr. 13, 1992, 921888
Int. Cl.[6] F41A *17/54;17/02*
U.S. Cl. 42—70.11 **10 Claims**



1. A gun lock for a gun having a trigger and trigger guard, said gun lock comprising:

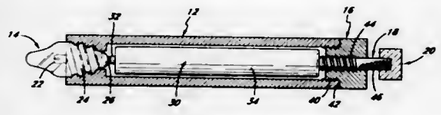
a pair of shield halves co-operating to enclose the trigger to prevent access thereto by being located on opposite sides of the trigger guard;

a shackle member to straddle the gun and having a pair of spaced arms to engage the shield halves to prevent the removal of the shield halves from a position enclosing the trigger;

lock means operable to secure a first one of said spaced arms of said shackle member to a first one of the shield halves to prevent removal of the shackle member from the shield halves; and

a wall mountable bracket, said bracket having a passage through which a second one of said spaced arms of said shackle member passes to secure the gun to said bracket; wherein a second one of said shield halves is adapted to receive said second one of said spaced arms.

5,551,182
BORE LIGHT
Ronald R. Dahlitz, and Brent V. Dahlitz, both of Santa Fe Springs, Calif., assignors to Buffalo Bullet Company, Inc., Santa Fe Springs, Calif.
Filed Nov. 29, 1994, Ser. No. 346,504
Int. Cl.[6] F41A *35/00*
U.S. Cl. 42—90 **7 Claims**



1. A light for illumination of the bore of a gun, the light including the following elements:

a sleeve of a diameter less than the bore of the gun, the sleeve having a first end and a second end, the sleeve being sized to receive therein a battery having a conductive terminal at each end;

a light bulb having a filament therein for producing light when electric current passes therethrough, the light bulb having a threaded case electrically connected to one end of the filament and a central conductive button at the base end of the light

bulb, the button being electrically insulated from the case and the button being electrically connected to the other end of the filament;

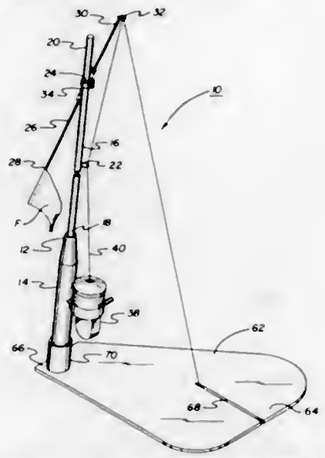
the sleeve having at the first end a threaded receptacle for receiving the threaded case of the light bulb with the conductive button positioned to engage one conductive terminal of a battery included in a case and to produce light at the first end of the sleeve,

means for selectively completing an electrical circuit between the battery and the light bulb, said completing means at least in part pressing the battery into engagement with the light bulb; and

a rubber bumper attached to and projecting beyond the second end of the sleeve and positioned to engage the breech mechanism after passage of the light through the gun's bore,

whereby the bore light may be turned on by actuating the completing means and then caused to pass down the bore of a muzzle loading gun to illuminate it.

5,551,183
HANDS-FREE FISHING SYSTEM
Donald G. Solem, 5845 Jean Duluth Rd., Duluth, Minn. 55803
Filed Jun. 19, 1995, Ser. No. 492,187
Int. Cl.[6] A01K *97/12*
U.S. Cl. 43—17 **2 Claims**



1. A new and improved hands-free fishing system with a signaling flag comprising, in combination:

a fishing rod formed of a handle at its lower extent and a cylindrical rod at its upper extent, the cylindrical rod having a lower extent, an upper extent and an intermediate extent therebetween, the intermediate extent having an eyelet extending radially outward therefrom, the upper extent of the rod having a region for the receipt of a portion of a bracket;

a supplemental cylindrical post having an upper end formed with a loop constituting an eyelet and having a lower end for supporting a flag and having an intermediate extent for receiving a portion of a bracket;

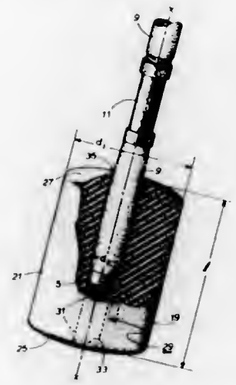
a reel secured to the handle with a line extending upwardly through the eyelet of the rod and the eyelet of the post and downwardly therefrom to the area being fished;

a bracket coupling adjacent regions of the rod and the post, the bracket having a spring plate of a resilient material with apertures at its opposite ends to receive central extents of the post and to allow the adjustment of the position with respect to each other, the plate having a central aperture, the bracket also having a pair of opposed convex portions secured around the rod adjacent to the upper extent, the convex portions having tabs having apertures and a bolt with a wing nut extending therethrough for adjustably tightening the bracket with respect to the rod at a predetermined location, the bracket also having a pin with a head extending radially outward from one of the convex portions and being located through the central aperture of the plate and with a coil spring around the pin to hold the plate at a fixed position with respect to the convex portion of the bracket;

a planar sheet having a large forward end and a small rearward end with a periphery therearound, the periphery having an inwardly directed slot for the passage of the line therethrough during operation and use; and

an upwardly extending cylindrical support extending upwardly at an angle from the vertical of between about five and fifteen degrees in a direction whereby its axis overlies the innermost region of the linear recess, the cylindrical support having an interior surface of a size to receive the lower end of the handle whereby when fishing in a hands-free mode, a fish biting on the line will pull the line to pivot the post and raise the flag as an indicator that a bite has occurred.

5,551,184
FISHING ROD BUTT PAD
Charles A. Grosse, 1931 Glasgow Ave., Cardiff, Calif. 92007
Filed Oct. 3, 1994, Ser. No. 316,846
Int. Cl.[6] A01K *87/00*
U.S. Cl. 43—25 **29 Claims**



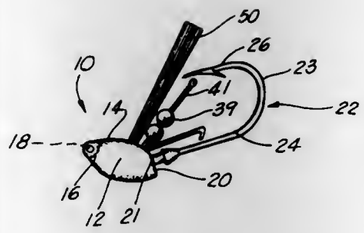
1. An elastic, portable cushion for enveloping a butt-end of a fishing rod for interposition with the fisher-person's body, to protect the body when fighting a fish, said cushion having a width at least 3 times the diameter of the fishing rod and having the property of generally retaining its shape during use and defined by an outer surface having a high coefficient of friction including first means formed therein for receiving said butt-end of said rod in fixed position therein, said means comprising a passageway, of equal or lesser diameter than the butt-end of the fishing rod, passing into said cushion to removably retain the rod therein by friction.

5,551,185
FISHING LURE
Dewayne Reed, 35 K. Littleton Rd., Deville, La. 71328
Filed Jan. 3, 1994, Ser. No. 176,206
Int. Cl.[6] A01K *85/00*
U.S. Cl. 43—42.39 **10 Claims**

1. An improved fishing lure, comprising:

a) a lure body having at least a curved underside;

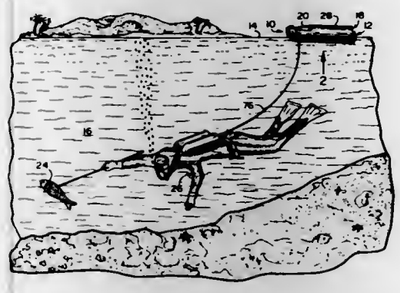
b) a fishing hook extending from the lure body;



c) a channel formed on the lure body for allowing the body to rest on the bottom of a body of water so that the hook is positioned upward over the lure; and for stabilizing the lure as it is pulled through the water or lowered onto the water bottom; and

d) sphere members placed on the lure body to emit a rattling sound when the spheres move along a portion of the lure body and strike one another during movement.

5,551,186
FISH CATCH CHEST
Walter S. Harada, 338 Kalama St., Kailua, Hi. 96734
Filed Jan. 18, 1995, Ser. No. 374,084
Int. Cl.[6] A01K *97/00*
U.S. Cl. 43—55 **8 Claims**



1. A fish catch chest comprising:

a) a boat-shaped hull capable of floating upon a top surface of a body of water comprising a flat base, a starboard side wall extending at a right angle upwardly from said flat base, a port side wall extending at a right angle upwardly from said flat base, a rear wall extending up from said flat base, a transom wall extending at a right angle upwardly from said flat base to the rear of said rear wall, a front wall extending up from said flat base, and a prow extending outwardly from said flat base in front of said front wall;

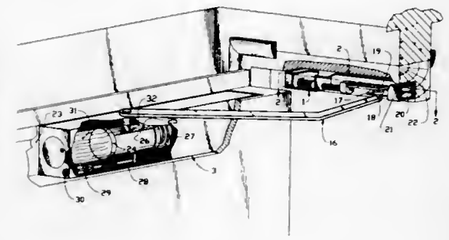
b) a receptacle having an open top with a compartment therein and being integral with and formed by the walls of said boat-shaped hull, so that the compartment will hold fish caught by a skin diver in the body of water; and

c) a lid for closing the open top of said receptacle and sealing the compartment;

d) a horizontal aft deck between said transom wall and said rear wall forming a rear sealed chamber and a inclined fore deck between said prow and said front wall forming a front sealed chamber, said sealed chambers assisting in keeping said hull afloat on the top surface of the body of water; and

e) a first insulating liner affixed against an inner surface of said flat bottom wall, said port and sideboard side walls, and said front and rear of said hull, and a second insulating liner affixed against an inner surface of said lid to keep the fish fresh within said receptacle.

5,551,187
RELEASE MECHANISM FOR A DOOR SPRING
Nicolaas D. Brouwer, Johannes Elsevierlaan 32, 3771 KT Barneveld, and Petrus A. Besselink, Gronausestraat 1220, 7534 AT Enschede, both of, Netherlands
Filed Mar. 9, 1994, Ser. No. 208,654
Claims priority, application Netherlands, Oct. 3, 1993, 93.00434
Int. Cl.[6] E05F *15/20*
U.S. Cl. 49—1 **25 Claims**



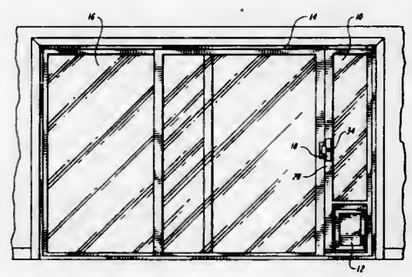
1. A release mechanism for releasing a door-spring blocked by a blocking device when a temperature is reached, said release mechanism comprising:

a temperature-sensitive control element made with a shape memory effect material and operatively adapted for direct thermal actuation and thereby enabling said release mechanism to intervene in a operation of the blocking device to release the door-spring when said control element is at the temperature;

a rod guided for movement in a longitudinal direction between a first end position and a second end position, said rod being moved in the direction of said first end position by a first bias, and said control element being operatively adapted to apply a second bias greater than said bias to move said rod in an opposite direction thereto; and

a control member actuated by movement of said rod and operatively adapted to keep the blocking device in operation when said rod is in said first end position and to render the blocking device inoperative when said rod is in said second end position.

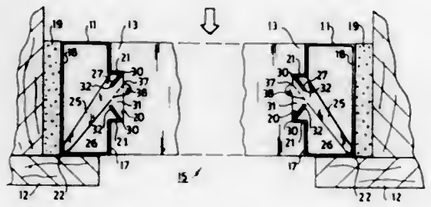
5,551,188
SECURITY KNOB ON PET DOOR PANEL
George N. Davlantes, Woodland Hills, Calif.
Filed Feb. 6, 1995, Ser. No. 383,955
Int. Cl.[6] E05D *15/48*
U.S. Cl. 49—169 **5 Claims**



1. An elongate panel securable in one end of a sliding door frame, including

a pet door for passage of a pet, and
latch means mounted on said panel remotely from said pet door, for latching a sliding door slidable in said sliding door frame, including
a latch movable between a lock position in which it lockingly engages said sliding door, and an unlock position in which it does not lockingly engage said sliding door, and
operating means for moving said latch between said lock and unlock positions, including a rotatable knob,
said knob being movable along its axis of rotation between first and second positions,
said operating means being responsive to rotation of said knob to move said latch when said knob in its said first position, and not responsive when said knob is in its said second position,
said operating means including biasing means for biasing said knob toward said second position.

5,551,189
HURRICANE WINDOW BRACE
Norman R. Westfall, Rochester, N.Y., assignor to Caldwell Manufacturing Company, Rochester, N.Y.
Filed Jun. 23, 1994, Ser. No. 264,474
Int. Cl.[6] E05D *15/22*
U.S. Cl. 49—76 **18 Claims**

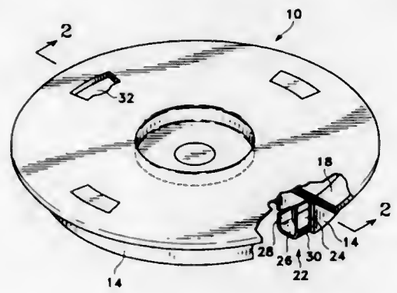


1. In a tilt window having resin sash run surfaces communicating with a shoe channel via a slot edged by guide ribs engaging a plow region of a tilt sash, the improvement comprising:
a. a hurricane brace extending from an inside corner of the shoe channel obliquely outward to an outer one of the guide ribs, the brace being arranged for maintaining a fixed distance between the inside corner and a region of the sash plow engaged by the outer guide rib for strengthening the interconnection between a window jamb and the sash plow; and
b. the brace being slidable along the shoe channel for movement vertically within the jamb so that the brace can be positioned at a check rail level to brace the window against wind force.

5,551,190
SLIDE DOOR DRIVING SYSTEM
Jun Yamagishi; Atsushi Kaminaga, and Yousuke Goutani, all of Yokohama, Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan
Filed Mar. 24, 1994, Ser. No. 216,950
Claims priority, application Japan, May 19, 1993, 5-026021; May 19, 1993, 5-117020; May 19, 1993, 5-117064
Int. Cl.[6] E05F *11/00*
U.S. Cl. 49—360 **3 Claims**

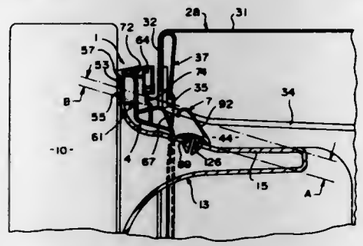
1. A slide door driving system of a motor vehicle, comprising:
an electric power source;
a door driving device to move a slide door between a full-open position and a full-close latched position with an aid of electric power from said electric power source;
a manual switch mounted in the motor vehicle;
a control circuit for controlling said door driving device in accordance with operation of said manual switch; and
a permission switch connected to said control circuit and an ignition switch for an engine of the vehicle, said permission switch being turned ON when the ignition switch is turned ON;
wherein said control circuit is provided with a judging circuit which makes said manual switch operative only when said permission switch is ON.

5,551,191
LATCHING SKIMMER LID
Farid Maiwandi, Granada Hills, Calif., assignor to KDI American Products Company, Moorpark, Calif.
Filed Sep. 13, 1994, Ser. No. 305,276
Int. Cl.[6] E05C *21/02*
U.S. Cl. 49—465 **4 Claims**



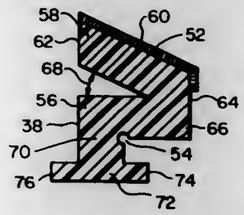
1. A pool skimmer lid for installation in a skimmer collar, the skimmer lid comprising:
a structure having an upper face and a lower face, and including integral support ribs and also including at least a portion of a peripheral wall depending from the lower face and positioned near the outer periphery of the structure;
at least one manually operated latch attached to the lower face of the structure, the latch having a bendable member positioned to engage a skimmer collar opening when the lid is being installed, to prevent inadvertent removal of the lid once the lid is installed; and
means for manually accessing the bendable member of the latch when the lid is in an installed position, to effect manual removal of the lid without tools, wherein the means for manually accessing the bendable member of the latch includes an opening through the lid structure.

5,551,192
REFRIGERATOR DOOR SEAL ASSEMBLY
Jose G. Avendano, Galesburg; Robert Katz, Barrington, and Scott R. Voll, Galesburg, all of Ill., assignors to Maytag Corporation, Newton, Iowa
Continuation-in-part of Ser. No. 89,507, Jul. 21, 1993, abandoned. This application Mar. 17, 1995, Ser. No. 405,830
Int. Cl.[6] E06B *7/16*
U.S. Cl. 49—484.1 **20 Claims**



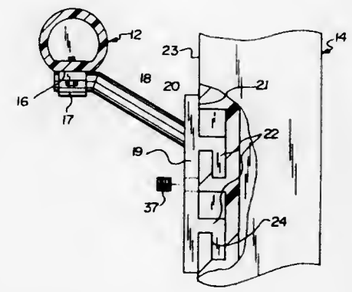
1. In a refrigerator having a cabinet shell, a shell liner, at least one door connected for pivotal movement relative to the cabinet shell between open and closed positions and a door liner secured to the door wherein, when the door is closed, an annular throat area is defined between the shell liner and a dike portion of the door liner, a seal assembly comprising:
a primary seal disposed between said door and at least one of said cabinet shell and said shell liner; and
a secondary seal including generally horizontal and vertical extending portions interconnected by corner sections, each of said corner sections being defined by a plurality of cantilevered arms that are spaced by respective notches, said secondary seal being disposed within said throat area between said door liner and said shell liner, said secondary seal including first and second legs interconnected by a vertex portion, said first leg being secured to one of said door and shell liners at spaced intervals and said second leg being deflectable relative to said first leg from a non-sealing position to a sealing position upon contact with the other of said door and shell liners when said door is closed.

5,551,193
WINDOW ASSEMBLY BLADE SEAL
Wayne Barnett, Lawrenceburg, Tenn., assignor to Excel Industries, Inc., Elkhart, Ind.
Filed Dec. 16, 1994, Ser. No. 358,199
Int. Cl.[6] E06B *7/232*
U.S. Cl. 49—496.1 **13 Claims**



1. A flexible blade seal for closure of a gap between a windowpane and an adjacent member of a window assembly, comprising an elongate body of substantially uniform cross section formed of flexible elastomeric material, wherein, in cross section,
a seal segment forms an exposed, substantially planar sealing surface for contact in a sealing plane against a surface of the pane, the seal segment in a free state extending at an angle to the sealing plane from a free end to a substantially flat end wall in a plane substantially perpendicular to the sealing plane,
a lateral segment extends, at an acute angle to the seal segment, from the end wall to an angled junction with a base segment, and
the base segment extends, in a direction substantially away from the sealing plane, from the angled junction with the lateral segment to a free distal portion attachable to the window assembly.

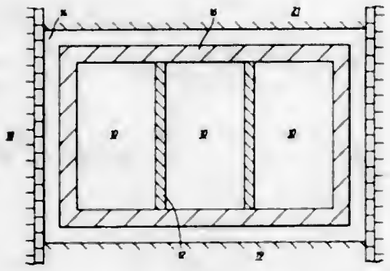
5,551,194
ADJUSTABLE HAND RAIL
Francis J. Toomey, 27 Burnham Rd., Wenham, Mass. 01984
Filed Oct. 18, 1994, Ser. No. 324,791
Int. Cl.[6] E04F *11/18*
U.S. Cl. 52—184 **4 Claims**



1. An adjustable handrail, comprising at least one support post, and
at least one secondary rail member, wherein the secondary rail member is arranged for securement to the support post, the support post having spaced side walls, wherein one of said spaced side walls has a row of receiving slots, and
the secondary rail member having secured thereto a mounting plate, the mounting plate including at least one projection arranged for reception within one of said slots, said secondary rail member including a bottom wall, said bottom wall having a support bracket and a support leg, the support leg having a first end spaced from a second end with the first end received within and secured to the bracket, the mounting plate having a front wall spaced from a rear wall, and the support leg second end fixedly secured to the front wall with the rear wall having said projection secured thereto, said projection being of an L-shaped configuration and wherein the slots are each of a generally L-shaped configuration complementarily arranged to receive said projection, and wherein the hand rail includes a lock fastener directed through the mounting plate in engagement with the support post.

5,551,195
FIRE-RETARDING WINDOW ASSEMBLY
Robert Vanderstukken, Ransart, Belgium, assignor to Glaverbel, Brussels, Belgium
Filed Apr. 13, 1993, Ser. No. 45,199
Claims priority, application United Kingdom, Apr. 16, 1992, 9208502
Int. Cl.[6] F06B *7/00;* **B32B** *17/06*
U.S. Cl. 52—171.3 **18 Claims**

1. A fire-retarding window assembly, comprising:
a frame; and



at least two transparent fire-retarding window panels which are held to the frame at two opposed edges and which are disposed in edge-to-edge relationship with one another,

wherein each transparent fire-retarding window panel comprises a plurality of sheets of glazing material and at least one intumescent layer sandwiched between sheets of the glazing material,

wherein at least one sheet of glazing material of each panel has a fire resistance which is at least equivalent to that of a comparative sheet of annealed soda-lime glass, which comparative sheet has a longest dimension which is the same as that of the panel and a thickness such that a ratio of its longest dimension to its thickness is not more than 340:1 with a minimum thickness of 5 mm, and

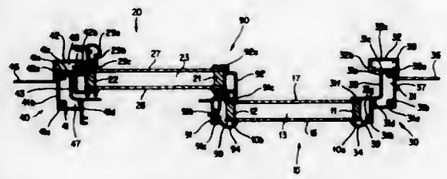
wherein adjacent edges of successive transparent fire-retarding window panels are assembled and sealed only with a non-structural filler material which is one of non-flammable or self-extinguishing.

5,551,196

WINDOW ASSEMBLY HAVING DEAD AIR SPACES FORMED BY NON CONDUCTIVE MEMBERS

Ivan Paredes, Fremont, and Glen A. Barth, Castro Valley, both of Calif., assignors to Rylock Company Ltd., Union City, Calif.

Filed Jun. 17, 1993, Ser. No. 79,615
Int. Cl.[6] E06B *1/32*
U.S. Cl. 52—204.1 **10 Claims**



1. A frame structure for a window assembly having an improved thermal efficiency and including at least one window panel having a periphery, the window assembly having an inside adapted to face an inside environment and an outside adapted to face an outside environment, the frame structure comprising:

a frame member made of a material having a high thermal conductivity, the frame member comprising an inside leg adapted to face the inside environment, an outside leg adapted to face the outside environment, and a web connecting the inside and outside legs, the inside leg, outside leg and connecting web defining a U-shape adapted to receive a portion of the periphery of said at least one window panel;

a cover made of a material having a low thermal conductivity, said cover connecting the inside and outside legs of the frame member; and

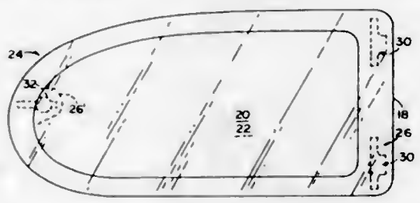
a first dead air space defined by the cover, the connecting web and the inside and outside legs of the frame member.

5,551,197

FLUSH-MOUNTED ARTICULATED/HINGED WINDOW ASSEMBLY

R. Scott Repp, Holland, and Pamela M. Stallman, Lawton, both of Mich., assignors to Donnelly Corporation, Holland, Mich.

Filed Sep. 30, 1993, Ser. No. 129,671
Int. Cl.[6] E05D *7/00;* **B60J** *1/00*
U.S. Cl. 52—204.62 **71 Claims**



1. A flush-mounted panel assembly for a vehicle, comprising in combination:

a panel having inner and outer surfaces terminating in a peripheral edge;

at least one mounting member secured to said inner surface and spaced from said peripheral edge, said mounting member having a flange attached to said inner surface, said flange including a plurality of perforations extending therethrough; and

an adhesive providing a bond between said flange of said mounting member and said inner surface of said panel; said perforations providing access therethrough to said adhesive and a mechanical bonding surface for said adhesive;

said bond between said flange of said mounting member and said panel being sufficiently strong such that in the event of failure of said panel assembly when a load sufficient to induce failure is imposed between said mounting member and said panel, said failure will occur in at least one failure mode in the group consisting essentially of a) cohesive failure of said adhesive, b) mechanical failure of said panel adjacent said adhesive, and c) mechanical failure of said mounting member adjacent said adhesive.

5,551,198

SOUND COLLECTING BLOCK AND SOUND ABSORBING WALL SYSTEM

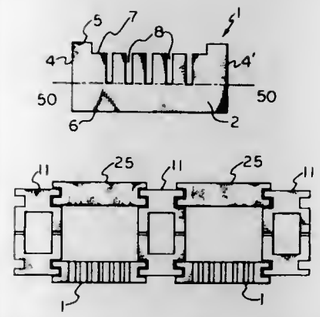
Cecil F. Schaaf, 3015 Palmer Rd., Standish, Mich. 48658, and Craig R. Schaaf, 741 Crawford St., Flint, Mich. 48507

Filed May 9, 1995, Ser. No. 438,229
Int. Cl.[6] E04B *1/82*
U.S. Cl. 52—604 **10 Claims**

1. A sound collecting block of solid molded structural material having a front surface which has a horizontal midline, a rear surface, two essentially identical end surfaces, a top surface, and a bottom surface;

said top surface having a planar notch therein, extending from the front surface to the rear surface thereof;

said sound collecting block containing a plurality of vertical slots extending between the front surface and the rear surface, said vertical slots extending from about the horizontal midline of the front surface, to and communicating with, the planar notch;



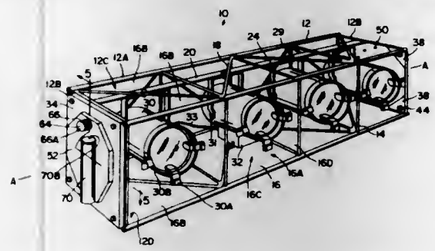
each said end surface having a vertical midline, and located at the vertical midline, a vertical well which extends between the top surface and the bottom surface of the block.

5,551,199

BOX TRUSS FOR LIGHTS

Jerry R. Hayes, and Patrick F. Pasch, both of 6240 Columbia, Haslett, Mich. 48840

Filed Nov. 8, 1993, Ser. No. 148,876
Int. Cl.[6] F21V *21/14*
U.S. Cl. 52—648.1 **25 Claims**



1. A truss assembly for supporting electric lights which comprises:

(a) a truss having a first end and a second end with a pair of end plate means on the first end and the second end of the truss;

(b) a rotatable plate means with two spaced apart sides mounted adjacent to and on each of the end plate means so as to allow the truss to rotate about a longitudinal axis of the truss;

(c) a disengageable locking means offset from the longitudinal axis and mounted so as to engage the rotatable plate means and the end plate means to lock the truss in a desired position relative to the rotatable plate means with a front side of the truss facing a desired position; and

(d) a support receiving means mounted on the rotatable plate means on a side opposite the mounted end plate means for supporting the truss in an elevated position with a support means.

5,551,200

ELONGATED INTEGRAL TRUSS BRACE

Eugene E. Krug, 11741 Rolling Pine La., Port Richey, Fla. 34668

Filed Jan. 24, 1995, Ser. No. 377,468
Int. Cl.[6] E04C *5/18;3/02;* **E04B** *1/38;* **E04H** *12/10*
U.S. Cl. 52—696 **25 Claims**

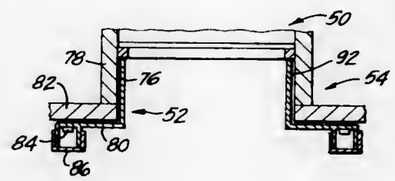
19. An elongated integral truss brace comprising a truss brace frame and a brace stiffener to operatively engage opposite end portions of each of a plurality of lower truss tie bars of a corresponding plurality of roof trusses to retain the plurality of lower truss tie bars and corresponding roof trusses in space relationship relative to each other to reinforce the roof truss system formed by the plurality of roof trusses, said elongated integral truss brace comprises a pair of substantially parallel lower interrupted side panels held in fixed spaced relationship relative to each other by an upper elongated interconnecting member to cooperatively form a longitudinally disposed stiffener channel to receive and retain a plurality of longitudinally disposed rigid brace stiffeners therein, each said lower interrupted side panel comprises a plurality of side panel sections disposed in spaced relationship relative to each other along the length of said upper interconnecting member to cooperatively form a tie bar notch between adjacent side panel sections to receive the lower truss tie bars therein, said upper elongated interconnecting member comprises a pair of elongated side plates interconnected by an elongated center connecting element and a positioning means to limit the inward movement of each said rigid brace stiffener relative to said stiffener channel to properly position each rigid brace stiffener within said stiffener channel, said positioning means comprises a brace stiffener limit extending inwardly from the inner surface of each side panel section into said stiffener channel.

5,551,201

PVC BUILDING TRIM

Carl E. Anderson, 2589 Richmond Terr., Staten Island, N.Y. 10303

Filed Dec. 10, 1991, Ser. No. 805,853
The portion of the term of this patent subsequent to Jun. 29, 2010, has been disclaimed.
Int. Cl.[6] F04F *19/02*
U.S. Cl. 52—717.05 **7 Claims**



1. A PVC building trim, comprising:

a coil of high impact exterior PVC strip material for use as an in-situ bendable building trim, said PVC strip material having the characteristic of restoring its flat shape upon being unwound from the coil without cracking or creasing, being able to restore its shape after slight contouring, and being cold bendable to form a permanent crease without cracking.

5,551,202

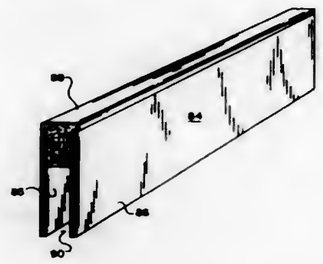
TIMBER SYSTEM

Bob Terenzoni, Medford, Mass., assignor to Daniel J. Bourque, Manchester, N.H.

Continuation of Ser. No. 832,014, Feb. 6, 1992, Pat. No. 5,377,472. This application Jan. 3, 1995, Ser. No. 367,936

Int. Cl.[6] E04C *3/12*; **E04G** *23/00*

U.S. Cl. 52—730.7 **6 Claims**



1. A timber system for spanning a distance between two existing timbers, fixed in place in an existing structure, said system comprising:

a generally "U" shaped timber expander including an existing timber receiver region adapted for receiving and coupling said existing timber fixed in place in an existing structure to said timber expander, said timber expander comprising:

a first continuous wood member having first and second portions, said first portion extending in a first direction, said second portion extending from said first portion in a second direction opposite from said first direction;

a second continuous wood member disposed in spaced parallel relationship to said first continuous wood member, said second continuous wood member having first and second portions, said first portion extending in said first direction parallel to said first portion of said first continuous wood member, said second portion of said second continuous wood member extending from said first portion of said second continuous wood member in said second direction opposite from said first direction parallel to said second portion of said first continuous wood member;

said first portions of both said first and second continuous wood members providing an existing timber coupling region, for allowing at least a segment of the first portion of said first continuous wood member to couple to a first major planar surface of at least a first and second existing timbers fixed in place in an existing structure, and for allowing at least a segment of said first portion of said second continuous wood member to couple to a second, parallel major planar surface of said at least first and second existing timbers fixed in a place in an existing structure; and

a spanning timber, disposed between and coupled to said second portions of both said first and second continuous wood members, for spanning a distance between said at least first and second existing timbers, wherein said spanning timber is substantially T-shaped and includes a spanning timber first body portion substantially perpendicular to a spanning timber second body portion, said spanning timber first body portion extending along at least a portion of longitudinal edges of said first and second continuous wood members, said spanning timber second body portion extending along said second portions of said first and second continuous wood members.

5,551,203

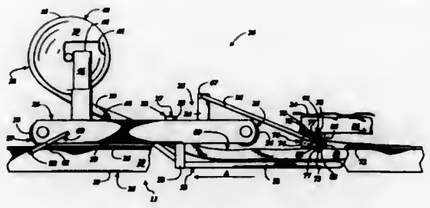
METHOD FOR FORMING AN INSULATED ROOF STRUCTURE HAVING A HEAT REFLECTIVE LAYER

Robert J. Alderman, San Antonio, and James E. Taylor, Sequin, both of Tex., assignors to Owens Corning Fiberglas Technology, Inc., Summit, Ill.

Division of Ser. No. 147,511, Nov. 5, 1993. This application Jun. 6, 1995, Ser. No. 470,379

Int. Cl.[6] E04G *21/14*

U.S. Cl. 52—746.11 **4 Claims**



1. A method of forming an insulated roof structure of the type including a series of spaced, parallel rafters with a plurality of mutually spaced parallel purlins mounted thereto, comprising the steps of:

urging rolls of heat insulation material along the purlins of the roof structure;

as the rolls of heat insulation material are urged along the purlins, dispensing blankets of insulation material between pairs of spaced purlins, with the dispensing of the insulation material controlled so as to form air spaces above the blankets of insulation materials;

applying layers of radiant barrier material to upper surfaces of the blankets of insulation material with the radiant barrier material received within the air spaces above the blankets of insulation material; and

applying cross layers of insulation onto the blankets of insulation material, with the air spaces maintained between the blankets of insulation material and the cross layers of insulation and the cross layers of insulation positioned out of engagement with the layers of radiant barrier material.

5,551,204

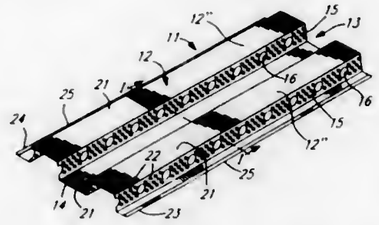
COMPOSITE STRUCTURAL STEEL WALL REINFORCED WITH CONCRETE AND MOLD THEREFOR

Paul Mayrand, 11 Rue De L'Armistice, Blainville, Quebec, Canada

Filed Apr. 28, 1994, Ser. No. 234,127

Int. Cl.[6] E04C *2/32*

U.S. Cl. 52—795.1 **20 Claims**



1. A composite structural steel wall reinforced with concrete, said wall comprising a corrugated steel sheet defining a plurality of integrally formed, alternately inverted, spaced ridges; said ridges on opposed sides of said sheet being separated by troughs defined by a rear face of said ridges on an opposite one of said sides and an integrally formed side wall of opposed ridges on a common side, said side walls having openings therein, at least some Of said openings in each said steel walls being aligned with one another to receive reinforcing steel elements, a first wall structure secured to at least some of said ridges on one of said opposed sides of said corrugated steel sheet and extending entirely thereover, a second wall structure secured to at least some of said ridges on the other of said opposed sides of said corrugated steel sheet and also extending entirely thereover, said first and second wall structures forming at least an integral part of the finished wall surfaces and being spaced apart and interconnected substantially parallel to one another by said corrugated steel sheet whereby to constitute a form to receive concrete from a top end thereof to form said wall, said holes permitting the flow of said concrete between adjacent troughs, said first wall structure being an internal vertical wall structure of a room of a building structure, said second wall structure is an integral part of an outer vertical wall structure of said building structure.

5,551,205

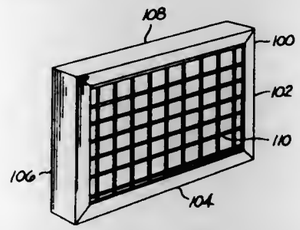
MOUNTING FRAME CONSTRUCTION FOR A SHEET OF PLASTIC, SCREEN GUARD OR THE LIKE

Roger Kidder, 32072 Howard St., Madison Heights, Mich. 48071-1406

Filed Aug. 3, 1994, Ser. No. 285,163

Int. Cl.[6] E04C *2/42*

U.S. Cl. 52—800.13 **6 Claims**



1. A mounting frame structure for a generally planar, rigid object having a known thickness, comprising:

an outer channel of a relatively rigid stiff material, and an inner channel of a relatively rigid stiff material located within said outer channel;

said outer channel comprising two side walls (**168**, **170**) and two inturned flanges (**172**, **174**) extending from said side walls;

said inner channel comprising two side walls (**118**, **120**) extending from said inturned flanges;

a unitary one piece insert of a relatively soft resilient material located within said inner channel;

said insert having an outer surface configuration that is complementary to the inner surface configuration of said inner channel, whereby said inner channel supports said insert in a stationary position;

said insert having two internal opposed resilient deflectable flanges having terminal ends normally spaced a distance less than the thickness of said rigid object, so that when an edge area of said object is moved into the space between said flanges, the flanges are deflected to exert a wedge clamp action on the planar object; and

said insert being adapted to completely encircle the edge area of the planar object.

5,551,206

DETECTION OF OBJECTS WHERE PACKAGE-MAKING FILM SHEETS ARE SEALED

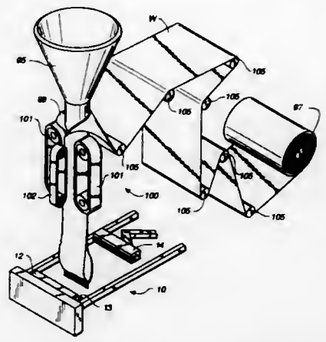
Masao Fukuda, Shiga, Japan, assignor to Ishida Co., Ltd., Japan

Filed Nov. 28, 1994, Ser. No. 345,180

Claims priority, application Japan, Dec. 28, 1993, 5-351684

Int. Cl.[6] B65B *9/06*; *51/30*; *57/02*

U.S. Cl. 53—75 **20 Claims**



1. A method of operating a packaging machine of a form-fill-seal type having a pair of sealing means operated by a motor for compressing film sheets together therebetween at a seal position to seal said film sheets together and to thereby form a bag, and detecting the existence of objects inserted between said film sheets at said seal position, said method comprising the steps of:

selecting a physical variable which relates to motion of said sealing means, varies with the separation between said pair of sealing means and is selected from the group consisting of the compression force between said sealing means, the distance between said pair of sealing means and the torque of said motor for moving said sealing means;

setting a standard range in said physical variable, said standard range including a standard value of said physical variable which is experimentally determined as corresponding to the separation between said pair of sealing means when said film sheets are sealed together by moving said pair of sealing means towards each other without any objects inserted between said film sheets;

operating said packaging machine to form a filled package by forming a bag with said film sheets, introducing objects into said bag, and moving said pair of sealing means towards each other to seal said bag;

obtaining a measured value of said physical variable when said bag is sealed; and

determining whether said measured value is within said standard range.

5,551,207

APPARATUS UTILIZING CO_2 SNOW FOR PREPARING LAYERED FOOD PRODUCTS

Hans-Joachim Beyer, Tuessling; Hans J. Jung, Muehldorf, and Manfred Wild, Meitingen, all of, Germany, assignors to Nestec S.A., Vevey, Switzerland

Division of Ser. No. 252,247, Jun. 1, 1994, Pat. No. 5,494,692. This application Oct. 31, 1995, Ser. No. 550,888

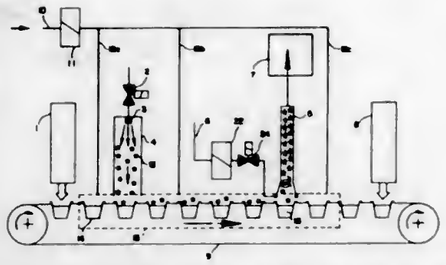
Claims priority, application European Pat. Off., Jul. 12, 1993, 93111111

Int. Cl.[6] B65B *63/08*

U.S. Cl. 53—127 **13 Claims**

1. An apparatus for preparing a layered multi-component food product comprising:

a first unit for metering and introducing an amount of a first food component into a container having an open top;



a conveyor for transporting the container containing the first food component;

a tunnel configured and positioned for passage therethrough of the conveyor and the container transported on the conveyor and for controlling air conditions about the container transported;

a second unit for metering, delivering and applying the CO_2 snow into the container and onto the first food component within the tunnel for covering a top surface of the first food component for obtaining a snow-covered top surface so that residual snow cover frosts the top surface to obtain a solidified top surface;

a third unit for applying suction to the residual snow cover and to the solidified top surface within the tunnel for removing the residual snow cover from the solidified top surface; and

a fourth unit positioned for, after suctioning, metering and introducing an amount of a second food component into the container onto the solidified top surface.

5,551,208

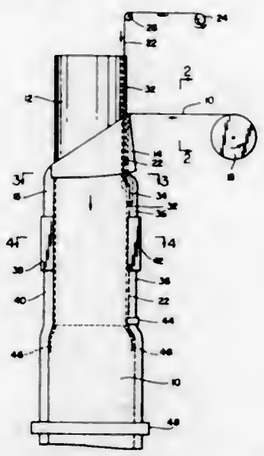
METHOD FOR APPLYING ZIPPER TO FILM AT TUBE ON A FORM-FILL-AND-SEAL

Donald Van Erden, Wildwood, Ill., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed May 31, 1995, Ser. No. 454,741

Int. Cl.[6] B65B *51/04*

U.S. Cl. 53—139.2 **7 Claims**



1. A method for manufacturing reclosable packages on a form, fill and seal machine comprising the steps of:

a) providing a continuous sheet of thermoplastic material having a first and a second lateral edge;

b) forming a Z-fold longitudinally along said continuous sheet between said first and second lateral edges;

c) directing said Z-folded continuous sheet onto the forming collar of a form, fill and seal machine and about a filling tube thereof, thereby bringing said first and second lateral edges of said continuous sheet together to form a fin extending longitudinally along and outwardly from said filling tube and to form a tube from said continuous sheet;

d) providing a continuous reclosable plastic zipper comprising a pair of mutually interlocking zipper profiles;

e) feeding said continuous reclosable plastic zipper into said tube of said thermoplastic material;

f) sealing said fin formed by said first and second lateral edges of said continuous sheet together to form a fin seal;

g) directing said Z-fold outwardly from said filling tube and opening said Z-fold to provide a loop extending longitudinally along said filling tube;

h) guiding said continuous reclosable plastic zipper into said loop;

i) sealing each one of said pair of mutually interlocking zipper profiles of said reclosable plastic zipper to opposed inside surfaces of said loop; and

j) sealing said tube transversely at intervals therealong to form individual reclosable packages from said sheet of thermoplastic material.

5,551,209

PRODUCTION LINE FOR PACKAGING ROWS OR LAYERS OF PRODUCTS AND PRODUCTION LINE RECYCLING DEVICE

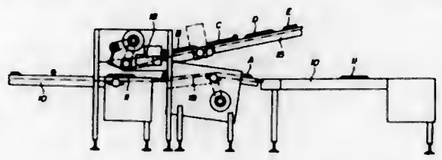
Ernest Molina, Dailens, and Alexis Chenevard, Morges, both of, Switzerland, assignors to Sapal Societe Anonyme Des Plieuses Automatiques, Ecublens, Switzerland

Filed Mar. 24, 1995, Ser. No. 409,531

Claims priority, application France, Mar. 31, 1994, 94 04090

Int. Cl.[6] B65B *41/18*

U.S. Cl. 53—168 **6 Claims**



1. A production line for packaging products (A, B, C, D) comprising one of products arranged in rows, products stacked in layers, and delicate food products, said line comprising a plurality of wrapping stations (12) and endless conveyor supply belts (10) which supply the wrapping stations with said products, at least one storage device (14) having at least one endless conveyor storage belt (15) for temporarily storing said products, and a recycling device (13) for timed re-introduction of the temporarily stored products (A, B, C, D) into empty spaces between the products on the conveyor belts (10), wherein said recycling device (13) comprises;

an endless conveyor recycling belt (18) mounted on a pivoting support for pivotal motion between a raised position in which the recycling belt (18) is located in an extension of the storage belt (15), and a lowered position; and

an endless conveyor switching belt (19) mounted on a pivoting support for pivotal motion between a raised position, in which the switching belt (19) is located in an extension of the recycling belt (18) when the recycling belt (18) is located in the lowered position, and a lowered position in which the switching belt (19) is located between two said supply belts (10) in an extension of said two supply belts;

wherein, when the switching belt (19) is in the raised position and the recycling belt (18) is in the lowered position, the recycling belt (18) and the switching belt (19) are driven at the same speed, such that said products are transferred between the switching belt (19) and the recycling belt (18) without any friction between the products and said belts, and when the switching belt (19) is in the lowered position and the recycling belt (18) is in the raised position said products are transferred between the switching belt (19) and the supply belts (10) and between the recycling belt (18) and the storage belt (15) without friction between the products and the belts.

5,551,210

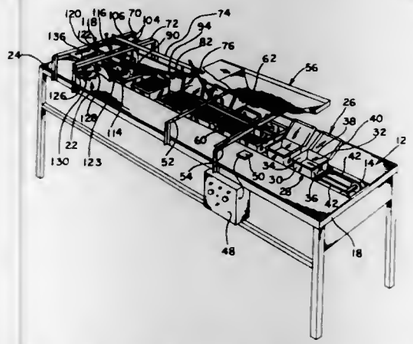
MACHINE FOR PACKAGING PRODUCT

Robert L. Williamson, 67602 62nd St., Hartford, Mich. 49057

Filed Mar. 31, 1995, Ser. No. 414,581

Int. Cl.[6] B65B *1/06;7/26;39/00;43/39*

U.S. Cl. 53—282 **17 Claims**



1. Machine for packaging product in a container having a receptacle and a lid connected to said receptacle for closing said receptacle comprising a support, dispensing means mounted on said support for dispensing product into said receptacle, closing means mounted on said support for closing and latching said lid on said receptacle, and conveying means carried by said support for transporting said container between said dispensing means and said closing means, said receptacle having sides connected by corners at the ends of each of said sides, said closing means including deflecting means for deflecting one of said sides and the corners at the ends of said one side and means for applying pressure to said lid while said corners at the ends of said one side are deflected to permit the lid to close over said corners, said deflecting means including a wheel rotatably mounted on said support, said wheel having teeth extending from said wheel and rotatable therewith, said teeth engaging said one side of said receptacle to deflect the latter in response to rotation of the wheel.

5,551,211

VACUUM OPERATED BOTTOM FORMER

Paul Kennedy, 795 Brookfield Ct., Lake Zurich, Ill. 60047; Richard Prochut, 950 Baytree Dr., Bartlett, Ill. 60103; Jörgen Löfstedt, 1125 Sterling Ave. #229, Palatine, Ill. 60067; Ikuro Yokoyama, 1405 E. Central Rd., Arlington Heights, Ill. 60005, and Christer Nilsson, 1423 W. Concord Dr., Arlington Heights, Ill. 60004

Filed Sep. 28, 1994, Ser. No. 315,403

Int. Cl.[6] B65B *51/10*

U.S. Cl. 53—371.7 **32 Claims**

24. An apparatus for forming a generally flattened seating area from a gabled bottom of a carton, the apparatus comprising:

an underpressure source;

a cup having a recess for receiving a carton, the recess having a shape generally corresponding to the carton, the cup further including an inlet in fluid communication with the recess and the underpressure source;

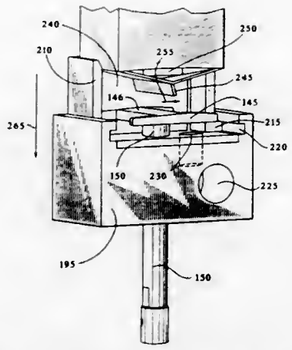
an anvil disposed in the recess, the canon forming a seal with the cup to create an underpressure in the recess that assists in driving the gabled bottom of the carton into engagement with the anvil thereby to form the generally flattened seating area;

an ejecting mechanism connected to the anvil, the ejecting mechanism comprising

a piston connected to the anvil and slidably disposed through an aperture in the cup, the piston extending from the cup to form a bumper,

a strike plate disposed below bumper,

drive means for creating relative movement between the strike plate and bumper, relative movement between the strike plate and the bumper causing the piston to drive upward into the cup to eject the carton.



5,551,212

METHOD OF PACKAGING ARTICLES

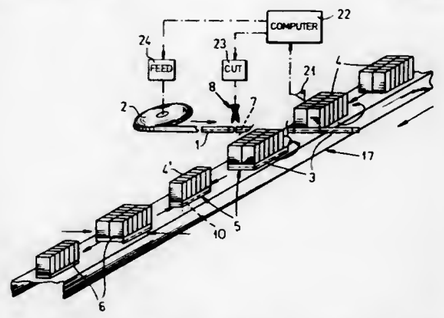
Heinz F. Odenthal, Zülpich, Germany, assignor to Ostma Maschinenbau GmbH, Zulpich, Germany

Continuation of Ser. No. 747,196, Aug. 16, 1991, abandoned. This application Mar. 3, 1993, Ser. No. 25,828

Claims priority, application Germany, Sep. 1, 1990, 40 27 762.3

Int. Cl.[6] B65B *13/02;61/02*

U.S. Cl. 53—397 **8 Claims**



1. A method of packaging a plurality of articles, the method comprising the steps of:

(a) assembling a plurality of the articles into a bundle with the articles in contact with one another and the bundle having upper and lower annular edges,

a plurality of corners at each of the edges,

respective top and bottom surfaces bounded by the edges,

a predetermined height between its top and bottom surfaces, and

side faces;

(b) drawing a planar strip of a substantially non-stretchable cardboard packaging material of a width less than the height

of the bundle and of a length greater than that of one of the edges from a supply roll of the packaging material and severing the strip from the supply roll so that the strip has two ends;

(b') scoring the strip to define a fold line extending a full length of the strip;

(b") cutting a margin of the strip at respective locations spaced corresponding to the corners of the one edge;

(c) wrapping the scored and cut planar strip around the one edge on the side faces in direct contact with the articles with the fold line at the one edge and the margin cuts at the corners while drawing the strip taut so that the margin of the strip projects beyond the one edge, the side faces of the bundle are left mainly exposed by the strip, and the ends of the strip overlap upon complete encircling of the bundle by the strip;

(d) folding the margin inward long the fold line to overlap the articles of the bundle on the respective surface, to overlap the margin with itself at the corners, and to impart an L-section to the strip; and

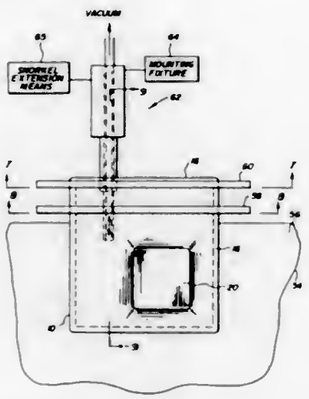
(e) connecting the ends together where they overlap and connecting the margin together where it overlaps at the corners.

5,551,213

APPARATUS AND METHOD FOR VACUUM SEALING POUCHES

Michael L. Koelsch; Dennis A. McIntyre, both of Rochester, and James B. Roy, Ontario, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 31, 1995, Ser. No. 414,462
Int. Cl.[6] B65B *31/00*
U.S. Cl. 53—434 **10 Claims**



1. An apparatus for packaging an object in a pouch, said pouch having an opposed pair of side walls, said side walls being joined to form an open mouth, said apparatus comprising:

a frame having a support surface for supporting the pouch;

a snorkel assembly supported by said frame, said snorkel assembly having a snorkel guide member telescopically surrounding a probe, said probe being axially movable relative to said snorkel guide member and having an end adapted to be inserted into the pouch through the open mouth, said probe including an axial channel through which air can flow;

means for moving said probe between an extended position within the pouch and a withdrawn position;

means for applying vacuum to said axial channel to remove air from the pouch;

a clamp assembly transversely mounted relative to said snorkel assembly, said clamp assembly including a first clamping jaw movable relative to a second clamping jaw between an open position and a closed position, said first and second clamping jaws engaging and clamping the pouch around said snorkel guide member when said first and second clamping jaws are in their closed position, at least one of said clamping jaws including a longitudinal surface extending transverse to said snorkel assembly, and a non-longitudinal surface projecting outward from said longitudinal surface; and

said external configuration of said snorkel guide member has a diamond shaped cross section and said first and second clamping jaws define an aperture geometrically similar to said external configuration of said snorkel guide member

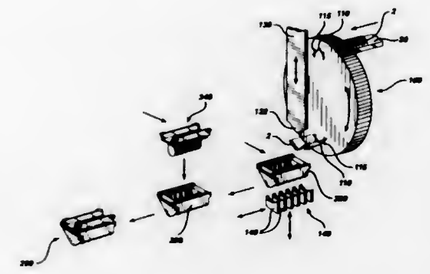
a seal assembly transversely mounted relative to said snorkel assembly and positioned between the object in the pouch and said clamp assembly, said seal assembly having a first sealing jaw movable relative to a second sealing jaw between an open position and a closed position, said first and second sealing jaws engaging said pouch therebetween and forming a seal in the open mouth along substantially a longitudinal dimension substantially parallel to said longitudinal surface.

5,551,214

LIGACLIP LOADING MACHINE AND PROCESS

Bela Vincze, Flemington, N.J.; Alan Deeter, Thousand Oaks, and Fred Dolder, Simi Valley, both of Calif., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jul. 20, 1994, Ser. No. 277,848
Int. Cl.[6] B65B *35/30*
U.S. Cl. 53—443 **18 Claims**



18. A method of loading ligating clips into a cartridge, comprising:

feeding ligating clips having a central apex from a hopper to an in-line track such that the apex is pointing up;

moving the clips on the track to a rotatable member having a least one longitudinal cavity for receiving a plurality of clips, wherein the longitudinal cavity has a longitudinal axis and a profile for receiving the clips;

loading a plurality of clips into the cavity;

rotating the member about 180° such that the apex of each clip in the cavity is pointing down;

mounting a ligating clip cartridge cover onto a comb means and indexing the comb means and cover to receive the ligating clips from the wheel;

displacing the clips out of the cavity;

using blade means to push each clip perpendicular to the longitudinal axis of the cavity onto comb means;

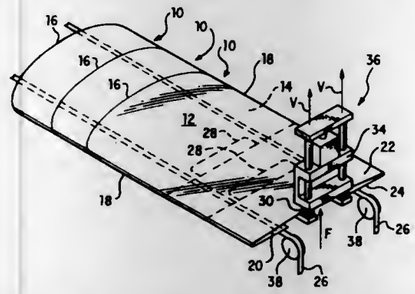
pushing a cartridge base into the cover thereby assembling a loaded ligating clip cartridge while removing the comb means from the cover.

5,551,215

BAG AND METHOD OF OPENING A BAG WITH PARTIAL OFFSET LIP

Gregory E. McDonald; Andrew W. Moehlenbrock, both of Simpsonville, and John D. Foster, Campobello, all of S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Jan. 13, 1995, Ser. No. 372,084
Int. Cl.[6] B65B *43/26*
U.S. Cl. 53—459 **7 Claims**



2. A bag opening system, comprising: a plurality of bags, each bag having a first lip and a second lip defining a substantially flat bag opening, said second lip having an extending portion extending beyond a portion of said first lip, but not beyond the first lip along the entire width of said first lip wherein said first lip has a cutout defining said extending portion of said second lip;

means for positioning said plurality of bags in a row, said bags being positioned with said first lip attached to said positioning means and with said bag opening positioned transverse to said row;

opening means for contacting said extending portion of said second lip so as to displace said second lip away from said first lip along the entire width of said first and second lips and open said bag opening, and wherein said opening means passes through said cutout to contact said extending portion; and

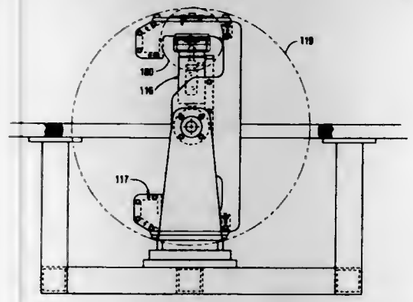
means for advancing said positioning means so as to advance said plurality of bags to said opening means.

5,551,216

METHOD AND APPARATUS FOR FILLING A BALL GRID ARRAY

Scott D. McGill, Tucson, Ariz., assignor to Vanguard Automation, Inc., Tucson, Ariz.

Continuation-in-part of Ser. No. 306,144, Sep. 14, 1994, Pat. No. 5,499,487. This application Jul. 20, 1995, Ser. No. 504,521
Int. Cl.[6] B65B *5/10*
U.S. Cl. 53—473 **11 Claims**



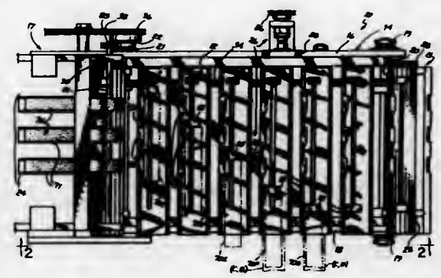
1. A method of filling a ball grid array with solder balls in a first work cell including a tooling plate, a ball grid array, a riser cylinder and reservoir, said method comprising the steps of aligning said ball grid array with said tooling plate, said tooling plate having an array of holes for receiving solder balls, rotating said ball grid array, said tooling plate and a reservoir of solder balls through a first range of orientations such that loose solder balls spread over said tooling plate for populating said array of holes therein, activating said riser cylinder for moving said ball grid array into juxtaposition with said tooling plate during a second range of orientations in which loose solder balls are recaptured in said reservoir and rotating said ball grid array and said tooling plate through a third range of orientations during which gravity is operative to transfer the solder balls to a like array of holes in said ball grid array.

5,551,217

LEAFLET INSERTER AND INTEGRATED PRODUCT BUCKET LOADER

William A. Huening, Union, Ky., and Richard E. Radigan, Cincinnati, Ohio, assignors to R. A. Jones & Company, Inc., Covington, Ky.

Filed Sep. 20, 1994, Ser. No. 308,919
Int. Cl.[6] B65B *35/20;61/20*
U.S. Cl. 53—474 **31 Claims**



27. A method for inserting a leaflet into at least one of a product carton or a product bucket comprising:

conveying at least one leaflet tray having a bottom wall on a path, the tray having a leaflet pusher slidably mounted on the bottom wall of said tray, the pusher mounted to slide in a longitudinal guide slot formed in the bottom wall for transverse movement across the tray;

loading a leaflet into the tray at a position along the path so that the leaflet lies generally flat on said bottom wall;

presenting one of a product carton or a product bucket adjacent to the tray at a position along the path;

moving the leaflet pusher in the tray such that the leaflet pusher scrapes the tray bottom wall and pushes the leaflet out of the tray and into the carton or bucket.

5,551,218

ROUND BALER MONITORING AND CONTROL SYSTEM

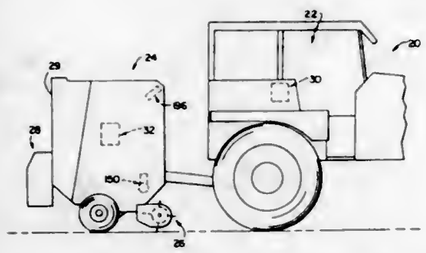
Steven J. Henderson, Madison, S. Dak.; George B. Cicci, West Bend, and Kim P. Viesselmann, Grafton, both of Wis., assignors to Gehl Company, West Bend, Wis.

Filed Sep. 19, 1994, Ser. No. 309,298
Int. Cl.[6] B65B *11/04;57/18;65/08*
U.S. Cl. 53—504 **14 Claims**

1. A round baler adapted to be towed by a towing vehicle, comprising:

a bale-forming arrangement for forming a cylindrical bale of crop material;

a processor-based control system mounted to the baler responsive to operator commands for setting and adjusting one or more parameters of baler operation;



one or more sensors interconnected with one or more components of the baler and interconnected with the control system for providing inputs thereto indicative of operation of the one or more baler components; and

wherein one or more of the baler components are interconnected with the control system for controlling operation of one or more baler components responsive to the control system and the inputs from the one or more sensors;

a tailgate movable between an open position for discharging a bale and a closed position for bale formation, and a latch mechanism for preventing movement of the tailgate away from its closed position, wherein the control system is interconnected with the latch mechanism for receiving a first input therefrom indicative that the tailgate is moved away from its closed position;

a take-up mechanism movable between a home position prior to bale formation and a finish position after bale formation, and including a return mechanism for returning the take-up mechanism to its home position prior to bale formation, wherein the control system is interconnected with the take-up mechanism for receiving a second input therefrom indicative that the take-up mechanism is moved away from its home position; and

wherein the control system is interconnected with one or more baler components so as to alert the operator when receiving either or both of the first and second inputs prior to operation.

5,551,219

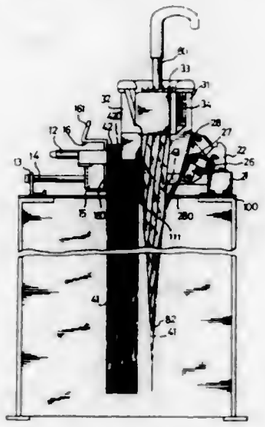
PACKAGE BAG EXPANDING DEVICE

Yao-ming Wei, No. 11, Alley 22, Lane 227, Chunho St., Chungkung Li, Taichung, Taiwan

Filed Oct. 24, 1995, Ser. No. 547,501

Int. Cl.[6] B65B *43/14*

U.S. Cl. 53—572 **6 Claims**



1. A device for expanding at least one package bag (41) which has a first sheet having a first top edge (42) and a second sheet having a second top edge (43) detachably engaged with each other, said first top edge (42) being at a level higher than that of said second top edge (43), said device comprising:

a substantially L-shaped base member (10) disposed in a horizontal manner and having a first plate (100) and a second plate (102);

a substantially U-shaped baffle (11) arranged vertically and in parallel with said first plate (100) of said base member (10) and having two distal ends (110) one of which is fixedly attached to said second plate (102) of said base member (10) and having a first side facing and a second side facing opposite said first plate (100) of said base member (10);

at least one horizontal post (12) having one distal end fixedly attached to the second side of said baffle (11), the first top edge (42) of the first sheet of said package bag (41) being mounted around said horizontal post (12);

a pushing member (16) including a vertical section (160) slidably mounted around said horizontal post (12) for urging and moving the first top edge (42) of the first sheet of said package bag (41) to abut on the second side of said baffle (11); and

a pressing mechanism (20) mounted on said first plate (100) of said base member (10) and including a pressing member (28) pivotally mounted thereon and having a first end portion and a second end portion, a pressing plate (280) formed on and protruding outwardly from the second end portion of said pressing member (28) and rested on the second top edge (43) of the second sheet of said package bag (41).

5,551,220

ENVIROMENTALLY SAFE CUTTING MECHANISM FOR STALKS OR STEMS OF PLANTS AND/OR GRASS LIKE VEGETATION

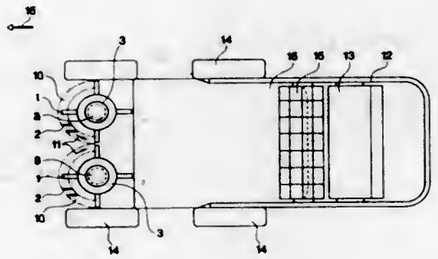
Attila Suller, 46 Urrétje u., Debrecen, H-4032, and Árpád Tóth, 19 Templom u., Debrecen, H-4225, both of, Hungary

Filed Jan. 10, 1995, Ser. No. 376,118

Claims priority, application Hungary, Jul. 16, 1992, P 92 02331

Int. Cl.[6] A01D *34/68;34/82*

U.S. Cl. 56—11.9 **18 Claims**



1. A mechanism for cutting stalks or stems comprising at least one cutting unit having counter-blades and moving blades, the counter-blades being arranged on a circular path below the moving blades, a predetermined spacing h being provided between the counter-blades and the moving blades, the predetermined spacing being in the range of $0<h\leq 2$ mm, the counter-blades having free spaces therebetween, the counter-blades each having a surface area and a ratio of the counter-blade surface areas to an area of the free spaces being less than one, the at least one cutting unit further having means for rotating the moving blades, the means for rotating driving the moving blades at a peripheral speed between 10 and 50 m/sec.

5,551,221

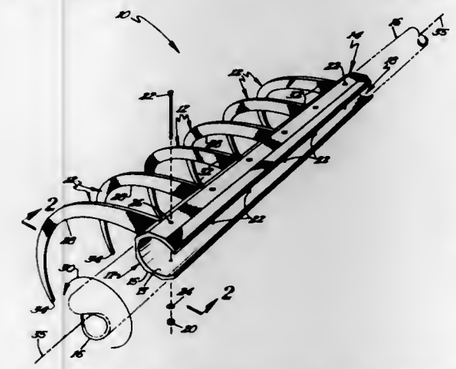
REPLACEABLE PICK-UP TOOTH ASSEMBLY FOR CROP PICK-UP

Lloyd P. Sund, HCT 2, Box 356, Newburg, N. Dak. 58762

Filed Mar. 1, 1995, Ser. No. 396,975

Int. Cl.[6] A01D *57/12*

U.S. Cl. 56—400 **21 Claims**



12. A replaceable pick-up tooth assembly for a crop pick-up, said pick-up tooth assembly comprising:

a substantially C-shaped flexible mounting unit;

a plurality of pick-up teeth integrally molded to said mounting unit at spaced apart locations thereon;

each of said pick-up teeth having a tip and an opposite base end integrally joined with said mounting unit;

each of said teeth having a greater height dimension in the plane within which each tooth rotates in comparison with the thickness dimension of each tooth in a direction perpendicular to said height dimension; and

said pick-up teeth being concave in the direction of rotation of the pick-up.

5,551,222

DRIVING APPARATUS FOR TWO-FOR-ONE TWISTER HAVING ADVANTAGEOUSLY LOCATED SPEED CHANGE DEVICES

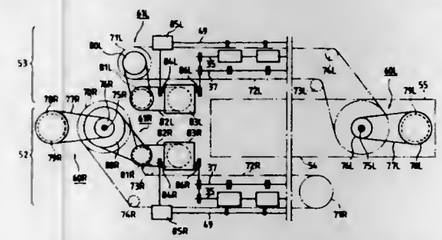
Tsukasa Kawarabashi, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Continuation of Ser. No. 088,308, Jul. 7, 1993, abandoned. This application Oct. 7, 1994, Ser. No. 320,829

Claims priority, application Japan, Jul. 9, 1992, 4-207474

Int. Cl.[6] D01H *13/00;9/14*

U.S. Cl. 57—105 **4 Claims**



1. A two-for-one twister defining a first end and a second end, the two-for-one twister comprising:

a first and second row of spindles,

a first and second row of take-up mechanisms,

a first belt for driving the first row of spindles,

a second belt for driving the second row of spindles,

a first motor for driving the first belt,

a second motor for driving the second belt, the first motor being disposed substantially adjacent the first end of the two-for-one twister, the second motor being disposed substantially adjacent the second end of the two-for-one twister,

a first speed changing mechanism in communication with the first belt for changing the speed of the first row of take-up mechanisms,

a second speed changing mechanism in communication with the second belt for changing the speed of the second row of take-up mechanisms,

the first and second speed changing mechanisms being disposed substantially adjacent the first end of the two-for-one twister.

5,551,223

PROCESS AND APPARATUS FOR OPTIMIZING SPIN GEOMETRY OF A RING SPINNING MACHINE

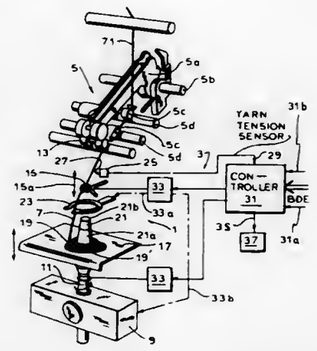
Helmut Nickolay, Uhingen, Germany, assignor to Zinser Textilmaschinen Gmbh, Ebersbach/Fils, Germany

Filed Jan. 30, 1995, Ser. No. 380,843

Claims priority, application Germany, Jan. 28, 1994, 44 02 582.3

Int. Cl.[6] D01H *7/46;* **B65H** *57/00*

U.S. Cl. 57—264 **20 Claims**



1. A process for optimizing the spin geometry of a ring spinning machine in which the spin geometry is defined as a configuration of a path of yarn to be spun extending from a pair of discharge rollers of a drafting frame, past a yarn-guide eye, past a balloon constricting ring, through a traveler orbiting a bobbin tube on a traveler ring and then to the bobbin tube for winding in a bobbin thereon, the bobbin tube is rotatable on a spindle of the ring spinning machine and wherein the ring spinning machine has spin-geometry influencing elements including a movable rail for the balloon constricting ring and means for moving said yarn-guide eye, at least one of said spin-geometry influencing elements having a respective drive for positioning said one of said elements, said process comprising the steps of:

(a) generating at least one measured value selected from a spinning force, a parameter correlated with the spinning force, and yarn-breakage frequency;

(b) feeding said measured value as an input value to a controller; and

(c) in said controller generating a control value for said drive for controlling a position of said one of said spin-geometry influencing elements within a predetermined adjustment range so that at least one of

(c1) the yarn-breakage frequency, and

(c2) the spinning force or a yarn tension does not exceed a predetermined value or is a minimum.

5,551,224

DEVICE FOR REVERSE-TWISTING STRANDING ELEMENTS

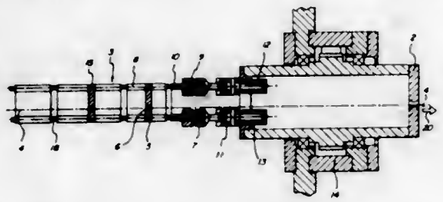
Friedhelm Kumpf, Pulheim, and Peter Haberberger, Nürnberg, both of, Germany, assignors to FRISCH Kabel-und Verseilmaschinenbau GmbH, Ratingen, Germany

Filed Apr. 6, 1995, Ser. No. 418,061

Claims priority, application Germany, Apr. 6, 1994, 44 11 506.7

Int. Cl.[6] D01N *5/00*; D01H *7/46*

U.S. Cl. 57—293 **24 Claims**



1. A device for the reverse-twisting of stranding elements, comprising:

a stationary guide disk;

a twisting disk, located at a distance from said guide disk, which is able to rotate around its axis;

said guide disk and said twisting disk each containing first axial passage apertures for guiding the stranding elements;

at least one filament-shaped, tension-proof support elements located between said guide disk and said twisting disk;

at least one holding element mounted to said at least one support element, said at least one holding element being located at a distance from said guide disk and said twisting, said at least one holding element containing second axial passage apertures for receiving the stranding elements therethrough; and

holders wherein the ends of the support elements are attached, said holders being able to tilt and rotate with respect to said twisting disk.

5,551,225

APPARATUS FOR SUPPRESSING FLUFF IN SPUN YARN

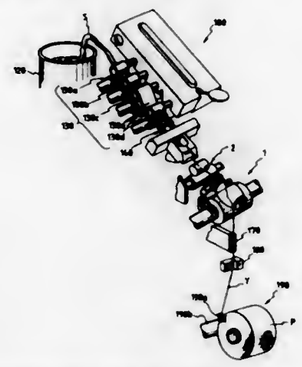
Hiroshige Maruki, Kusatsu, and Tsutomu Mekata, Ohtsu, both of, Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Aug. 4, 1994, Ser. No. 285,725

Claims priority, application Japan, Aug. 6, 1993, 5-215162

Int. Cl.[6] D01H *5/00*; *5/28*

U.S. Cl. 57—328 **13 Claims**



1. A fluff suppression apparatus comprising:

a pair of first and second rotary members disposed with respective axes of rotation thereof crossed at an angle with each other and in contact with each other for nipping a spun thread yarn,

wherein at least said first rotary member has, at a contacting portion thereof with the yarn, soft resiliency and wherein a central portion of said first rotary member has a diameter greater than the opposite end portions thereof.

5,551,226

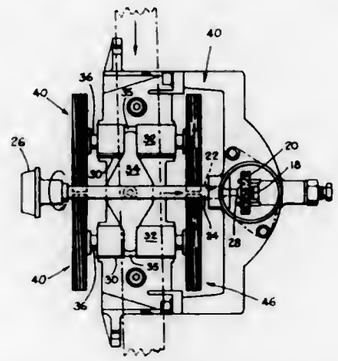
DISK FOR OPEN END SPINNING

Richard M. Keir, 4 Forest La., Greenville, S.C. 29605; William L. Brigham, Jr., 132 Winfield Rd., Greenville, S.C. 29607; Barry S. Ballew, Travelers Rest, and Cam W. Abshire, Greenville, both of S.C., assignors to Richard M. Keir, and William L. Brigham, Jr., both of Greenville, S.C.

Filed Sep. 1, 1995, Ser. No. 522,975

Int. Cl.[6] D01H *4/00*; *13/00*

U.S. Cl. 57—406 **21 Claims**



1. A supporting disk bearing for use in an open end spinning machine having:

a frame;

a plurality of supporting disks arranged in pairs and mounted in said frame to form a wedge shaped gap;

a spinning rotor having an elongated rotor shaft, said rotor shaft being mounted in said gap in rotational engagement with said supporting disks;

a thrust bearing carried by said frame and arranged to engage an end of said rotationally mounted rotor shaft;

a drive carried by said frame and arranged transversely of said rotor shaft, said drive acting to press said rotor shaft against a running surface provided on each of said supporting disk;

said supporting disk comprising a hub carrying an elastic ring, the peripheral surface of said ring comprising said running surface;

said running surface including a helically formed rib convoluted toward said thrust bearing, said rib defining an outwardly directed shoulder having a plurality of turns which appear over said running surface, said shoulder adhering sufficiently with said rotor shaft to reduce slippage and to uniformly and continuously urge said rotor shaft against said thrust bearing during operation of said spinning machine, whereby;

said rotor shaft is constantly urged axially toward said thrust bearing to be maintained in smooth running engagement therewith.

5,551,227

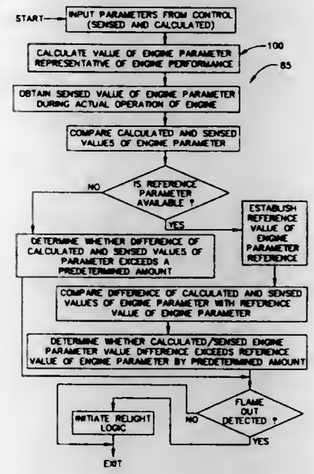
SYSTEM AND METHOD OF DETECTING PARTIAL FLAME OUT IN A GAS TURBINE ENGINE COMBUSTOR

John L. Moulton, West Chester, and Peter T. Harrison, Mason, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 22, 1994, Ser. No. 362,045

Int. Cl.[6] F02C *7/262*

U.S. Cl. 60—39.06 **16 Claims**



1. A method of detecting partial flame out in a combustor of a gas turbine engine, comprising the following steps:

(a) establishing a model for performance of said engine during a particular operating mode of said combustor, wherein said model assumes that all fuel supplied during said combustor operating mode is burned;

(b) calculating a value for an engine parameter in said model representative of engine performance;

(c) sensing a value for said engine parameter during operation of said engine at said combustor operating mode;

(d) comparing said calculated value of said engine parameter and said sensed value of said engine parameter; and

(e) relighting said combustor flame when said sensed value of said engine parameter differs from said calculated value of said engine parameter by a predetermined amount.

5,551,228

METHOD FOR STAGING FUEL IN A TURBINE IN THE PREMIXED OPERATING MODE

Warren J. Mick, Altamont, and Mitchell R. Cohen, Troy, both of N.Y., assignors to General Electric Co., Schenectady, N.Y.

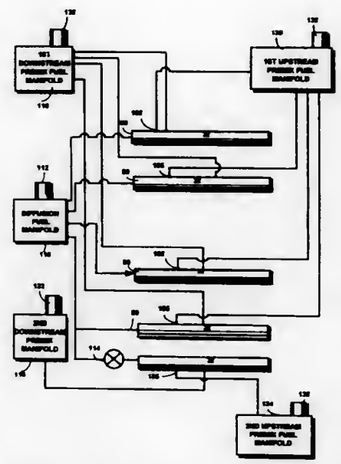
Continuation of Ser. No. 258,041, Jun. 10, 1994, abandoned. This application Aug. 22, 1995, Ser. No. 524,146

Int. Cl.[6] F02C *7/264*

U.S. Cl. 60—39.06 **20 Claims**

1. A method of operating a single-stage combustor for a gas turbine wherein the combustor has an axis, a plurality of generally axially extending nozzles about said combustor axis each defining a discrete air stream, and a single zone of combustion, comprising the steps of:

operating the single-stage combustor in a premixed mode; and



flowing fuel through said nozzles into said air streams, respectively, at axially spaced locations along the nozzles during the premixed mode of operation for combustion in the single zone of combustion.

5,551,229

Patent Not Issued For This Number

5,551,230

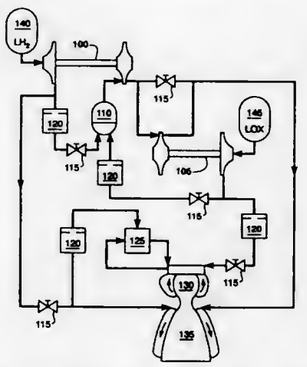
HEAT INDUCED HIGH PRESSURE LOX PUMP ROCKET ENGINE CYCLE

Sen Y. Meng, Reseda, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Mar. 14, 1994, Ser. No. 209,282

Int. Cl.[6] F02K *9/00*

U.S. Cl. 60—259 **3 Claims**



1. A rocket engine liquid oxygen (LOX) pump system comprising:

(a) a LOX reservoir;

(b) a heat exchanger having:

(1) a hydrogen inlet communicating with a source of hydrogen that is warmer than said LOX reservoir;

(2) a hydrogen outlet;

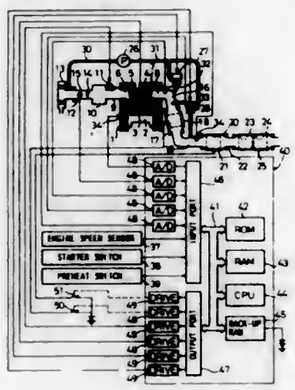
(3) a LOX inlet; and
(4) a LOX outlet;
(c) an eductor pump having:
(1) a LOX inlet communicating with said LOX reservoir;
(2) a priming fluid inlet in fluid communication with said heat exchanger LOX outlet, and
(3) a discharge;
(d) said heat exchange LOX inlet being in fluid communication with said eductor pump discharge.

5,551,231

ENGINE EXHAUST GAS PURIFICATION DEVICE

Hiroshi Tanaka, Susono; Takeaki Itou, Mishima; Keiso Takeda, Mishima; Hidemi Ohnaka, Susono; Kazuhisa Kunitake, Susono, and Toshio Tanahashi, Susono, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 23, 1994, Ser. No. 344,768
Claims priority, application Japan, Nov. 25, 1993, 5-295268
Int. Cl.[6] F01N *3/22*
U.S. Cl. 60—289 **25 Claims**



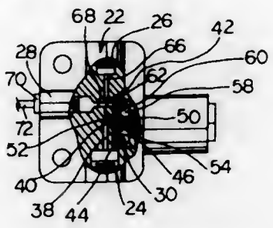
1. An exhaust gas purification device of an engine, comprising:
air-fuel mixture control means for making an air-fuel mixture burned in a combustion chamber of the engine a rich air-fuel mixture;
a three way catalyst arranged in an exhaust passage of the engine;
a NOx absorbent arranged in said exhaust passage downstream of said three way catalyst, said NOx absorbent absorbing NOx therein when an air-fuel ratio of exhaust gas flowing into said NOx absorbent is lean;
first secondary air supply means for feeding secondary air into said exhaust passage upstream of said three way catalyst;
second secondary air supply means for feeding secondary air into said exhaust passage between said three way catalyst and said NOx absorbent; and
secondary air control means for controlling amounts of secondary air fed from said first secondary air supply means and said second secondary air supply means to maintain the air-fuel ratio of the exhaust gas flowing into said three way catalyst at a rich air-fuel ratio which is larger than an air-fuel ratio of said first mentioned rich air-fuel mixture and to maintain the air-fuel ratio of the exhaust gas flowing into said NOx absorbent at a lean air-fuel ratio.

5,551,232

WINDSHIELD WASHER CONTROL SYSTEM

Richard J. Frigon, and Steven J. Stronczek, both of Michigan City, Ind., assignors to Sprague Devices, Inc., Michigan City, Ind.

Continuation-in-part of Ser. No. 201,788, Feb. 25, 1994, Pat. No. 5,427,012. This application Dec. 1, 1994, Ser. No. 347,969
Int. Cl.[6] F16D *31/02*; **B60J** *1/02*
U.S. Cl. 60—494 **8 Claims**



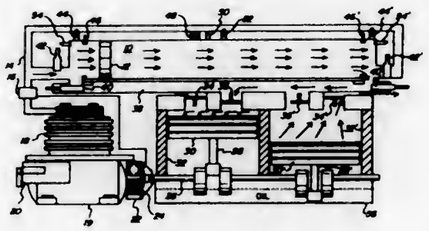
1. Windshield washer control system comprising a fluid pressure operated pump, a source of windshield wiper fluid communicated to said pump, said pump pumping windshield wiper fluid from said source in response to fluid pressure supplied to said pump and spraying said windshield wiper fluid on a vehicle windshield, and an electrically actuated control valve actuable between opened and closed conditions for controlling communication between a fluid pressure source and said pump, first constant area flow restricting means between the pressure source and said pump, and second flow restricting means between said pump and ambient atmosphere, said second flow restricting means being located between said pump and said control valve whereby said pump is communicated to the second flow restricting means regardless of the conditions of said control valve.

5,551,233

THERMAL CYCLE FOR OPERATION OF A COMBUSTION ENGINE

Constantine Tomolu, 991 Hancock Ave., Apt 1, Bridgeport, Conn. 06605

Continuation-in-part of Ser. No. 201,177, Feb. 24, 1994, Pat. No. 5,426,940. This application Apr. 4, 1995, Ser. No. 416,145
Int. Cl.[6] F02B *71/04*
U.S. Cl. 60—595 **11 Claims**



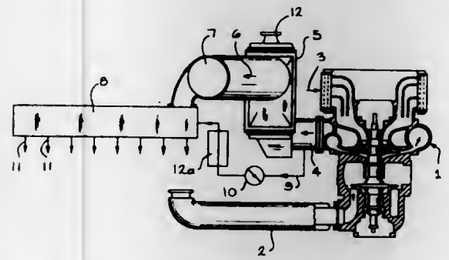
1. A method of operating a combustion engine having a new cycle comprising the steps of:
increasing the volume of a combustion chamber at a substantially constant pressure;
increasing the pressure in the combustion chamber at a substantially constant volume;
initiating combustion within the combustion chamber and maintaining the substantially constant volume; and
releasing the pressure in the combustion chamber to do work.

5,551,234

PROCESS FOR RUNNING A MARINE DIESEL ENGINE

Horst Ocholzki, Röthgener Str. 53, 52249 Eschweiler, Germany

PCT No. PCT/DE92/01019, § 371 Date Nov. 21, 1994, § 102(e) Date Nov. 21, 1994, PCT Pub. No. WO93/14306, PCT Pub. Date Jul. 22, 1993
PCT Filed Dec. 8, 1992, Ser. No. 256,615
Claims priority, application Germany, Jan. 14, 1992, 42 00 661.9
Int. Cl.[6] F02B *29/04*
U.S. Cl. 60—599 **4 Claims**



1. A method for running a marine diesel engine comprising at least one cylinder, a sea-water-cooled charge air cooler, an exhaust gas turbocharger, means for delivering air from the turbocharger, through said charge air cooler to the at least one cylinder and means for delivering air from the turbocharger directly to the at least one cylinder while bypassing the charge air cooler, said method comprising the steps of
supplying the at least one cylinder of the engine with charge air from the exhaust gas turbocharger,
conducting, when charge air cooling is required to maintain the charge air temperature within a suitable temperature range for the marine diesel engine, some charge air from the exhaust gas turbocharger through the sea-water-cooled charge air cooler before it is delivered to the at least one cylinder,
conducting, when charge air cooling is required to maintain the charge air temperature within a suitable temperature range for the marine diesel engine, a constant throughput of sea-water through the charge air cooler,
bypassing some or all of the charge air from the exhaust gas turbocharger around the charge air cooler for mixture with the charge air, if any, which has been conducted through the charge air cooler,
cooling the charge air which charge air cooler by jacket cooling before it is delivered to the at least one cylinder,
delivering bypassed air or a mixture of bypassed air and charge air that has been conducted through the charge air cooler to the at least one cylinder and
controlling the amount of charge air which bypasses the charge air cooler so that the temperature of the charge air which is delivered to the at least one cylinder is above the dew point of that air and does not exceed the maximum permissible temperature for the marine diesel engine, wherein, during normal operation of the diesel engine, a portion or the charge air which is delivered to the at least one cylinder is air that has bypassed the charge air cooler.

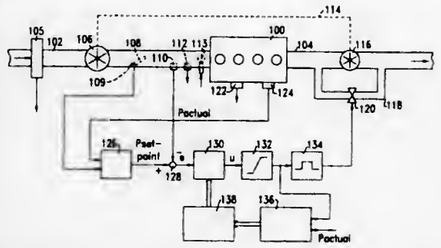
5,551,235

SYSTEM FOR THE CLOSED-LOOP CONTROL OF THE SUPERCHARGING OF AN INTERNAL-COMBUSTION ENGINE

Robert H. Entenmann, Benningen; Stefan Unland, Schwieberdingen; Matthias Philipp, Stuttgart; Werner Haeming, Neudenau; Iwan Surjadi, Vaihingen, all of, Germany; Ulrich Rothhaar, Milan, Italy, and Michael Baeuerle, Besigheim, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 23, 1994, Ser. No. 363,178
Claims priority, application Germany, Dec. 30, 1993, 43 44 960.3
Int. Cl.[6] F02B *37/12*
U.S. Cl. 60—602 **10 Claims**

1. A system for a closed-loop control of a supercharging operation of an internal-combustion engine including a charging device, comprising:



a final controlling element, triggered as a function of a supercharging parameter, for controlling the supercharging operation of the internal-combustion engine;
a controller for producing the supercharging parameter as a function of a deviation between a desired supercharging value and an actual supercharging value and as a function of a plurality of controller parameters establishing a transient behavior of the controller; and
a modeling device, having as inputs the supercharging parameter and the actual supercharging value, for modeling the internal-combustion engine, for determining a plurality of model parameters as a function of the inputs, for determining the plurality of controller parameters as a function of the plurality of model parameters, and for transmitting the plurality of controller parameters to the controller.

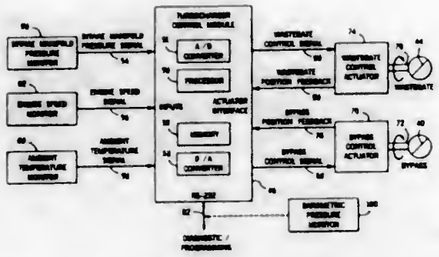
5,551,236

TURBOCHARGER CONTROL MANAGEMENT SYSTEM

Michael T. Zimmer, Brookfield; Richard J. Kakoczki, Waukesha; James A. Davis, Ripon; Jerrold A. Pratt, Eagle, and Edward O. Reinbold, Waukesha, all of Wis., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed May 2, 1994, Ser. No. 236,467
Int. Cl.[6] F02B *33/44*
U.S. Cl. 60—605.1 **11 Claims**

1. An electronic turbocharger control system for an internal combustion engine comprising:
at least one turbocharger connected to the engine and having a turbine and a compressor;
a plurality of engine characteristic monitors to sense at least engine speed and intake manifold pressure;
plurality of engine characteristic signals produced by the plurality of engine characteristic monitors;
an electronic control for processing the characteristic signals;
a control signal produced by the electronic control in response to the characteristic signals;
a bypass valve connected between the compressor and the turbine for changing airflow through the compressor in response to the control signal; and



wherein the electronic control comprises a memory programmed with predetermined parameters wherein the electronic control selects a predetermined parameter from the memory and produces the control signal based upon the engine characteristic signals, wherein the memory comprises sets of predetermined parameters, each set based upon barometric pressure.

5,551,237
METHODS FOR PRODUCING HYDROELECTRIC POWER

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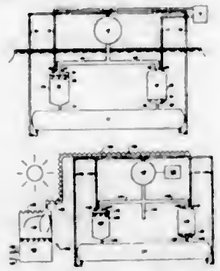
Division of Ser. No. 222,753, Apr. 4, 1994, Pat. No. 5,461,858. This application Jun. 6, 1995, Ser. No. 470,093
The portion of the term of this patent subsequent to Apr. 4, 2011, has been disclaimed.
Int. Cl.[6] B60K *16/00*; **F03G** *6/00*; **F16D** *31/02*
U.S. Cl. 60—641.8 **20 Claims**



1. A process for producing hydro-electric power from vapor which comprises:
providing water in an enclosure;
exposing the enclosure to sunlight to heat the water and generate vapor;
removing the vapor from the enclosure;
providing a tank having first and second ends, and a plate which is capable of movement therein;
providing water in the tank between the first end and the plate;
passing the removed vapor into the tank to displace the plate toward the first end and to release water from the tank through an aperture which has a relatively small area compared to that of the tank; and
directing the released water to drive a power producing device.

5,551,238
HYDRO-AIR RENEWABLE POWER SYSTEM

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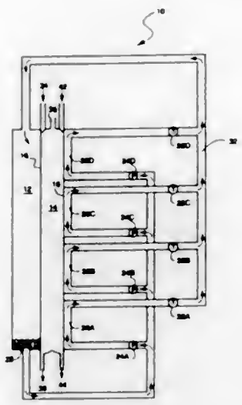
Filed Aug. 23, 1995, Ser. No. 518,499
Int. Cl.[6] F01R *1/04*
U.S. Cl. 60—643 **10 Claims**

1. A power generating system having a turbine powered by a circulating working fluid, said system comprising:

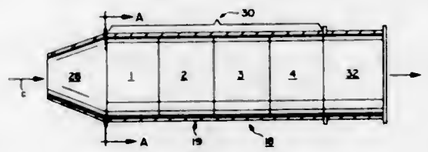


a condenser for transferring heat from working fluid vapor exhaust from said turbine to cooling water for condensing said working fluid vapor and heating said cooling water to a first vapor pressure;
a heat transfer chamber having a concentrated brine solution in vapor communication with said cooling water so that vapor from said cooling water at said first vapor pressure will condense on said brine solution for diluting and heating said brine solution; and
a boiler in heat transfer communication with said brine solution for receiving heat from said brine solution and heating said condensed working fluid to a vapor for input to said turbine.

5,551,239
CATALYTIC COMBUSTION SYSTEM INCLUDING A SEPARATOR BODY

Jennifer S. Feeley, Clinton; James C. Fu, Plainsboro; Matthew P. Larkin, Cranbury, and Dianne O. Simone, Edison, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Continuation of Ser. No. 24,707, Mar. 1, 1993, abandoned. This application Jul. 7, 1994, Ser. No. 271,244
Int. Cl.[6] F02C *3/00*
U.S. Cl. 60—723 **21 Claims**



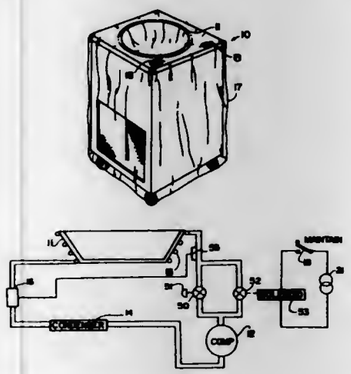
1. A combustor for catalytically promoting thermal combustion of an inlet combustion gas mixture flowed sequentially through an upstream zone and then a downstream zone of the combustor, the combustor comprising: a catalyst body disposed in the upstream zone and comprising a plurality of catalyst members comprising a carrier having a plurality of gas flow channels extending therethrough defined by channel walls, the channel walls of the carrier having disposed thereon a catalyst composition effective for promoting combustion of the combustion gas mixture and wherein each catalyst member abuts the catalyst member or members adjacent to it; a separator body disposed in the upstream zone in a position downstream of the catalyst body, wherein the catalyst body and the separator body comprise discrete bodies and wherein the most downstream catalyst member abuts the separator body;

and a homogeneous reaction zone disposed within the downstream zone; the separator body being dimensioned and configured to thermally shield the catalyst body from the homogeneous reaction zone.

5,551,240
METHOD AND APPARATUS FOR MAINTAINING TEMPERATURE CONTROL OF STERILE FLUID

Durward I. Faries, Jr., McLean, and Mark Licata, Richmond, both of Va., assignors to O. R. Solutions, Inc., Chantilly, Va.

Continuation-in-part of Ser. No. 213,807, Mar. 16, 1994, Pat. No. 5,402,644. This application Mar. 7, 1995, Ser. No. 399,985
Int. Cl.[6] F25B *21/02*
U.S. Cl. 62—3.6 **27 Claims**



1. Apparatus for providing surgical slush from a sterile fluid medium, said apparatus comprising:
a cabinet for housing the apparatus;
a basin disposed in said cabinet;
a refrigeration system in said housing for cooling said basin;
a sterile drape overlying said cabinet and conforming to said basin to define a drape container for receiving said fluid medium;
wherein said refrigeration system includes selectively actuable means for cooling said basin to a temperature substantially below the freezing temperature of said sterile fluid medium; and
selectively actuable maintain means for maintaining said basin at substantially said freezing temperature.

5,551,241
THERMOELECTRIC COOLING CENTRIFUGE

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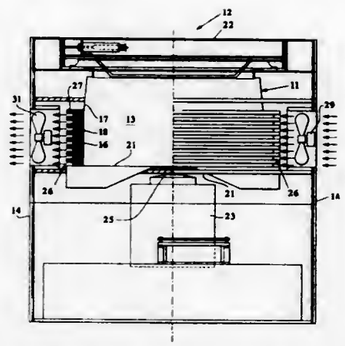
Continuation-in-part of Ser. No. 204,561, Mar. 2, 1994, Pat. No. 5,433,080. This application Jun. 7, 1995, Ser. No. 476,870
Int. Cl.[6] F25B *21/02*
U.S. Cl. 62—3.6 **4 Claims**

1. A thermoelectrically cooled device for a centrifuge having a rotor comprising in combination;
a centrifuge housing having at least one side ingress port and at least one oppositely disposed side egress port;
said centrifuge housing having a top portion;
a thermal conductive chamber adapted and constructed to contain a rotor of said centrifuge;
said centrifuge housing surrounding said chamber and defining a space therebetween housing;
at least one thermoelectric module having a cooling side and a heating side;

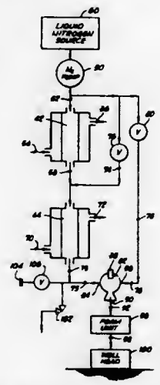


said cooling side of said thermoelectrically module being attached to said chamber in said space;
at least one heat sink attached to a heating side of said thermoelectric module to form a unitary and locally rigid structure with said chamber at the point of attachment;
said at least one thermoelectrically cooling module having a first heat receiving side communicated to said side of said chamber and having a heat discharge side for passing heat energy away from said chamber;
said heat discharge side including a plurality of horizontally disposed fins positioned in said space between said chamber and said housing communicated to each of said thermoelectric modules at said heat discharge side for dissipation, heat energy from said chamber and heat energy from said thermoelectric module;
said side ingress port of said housing having air pressurizing means and means direction, the pressurized air horizontally between said fins and out the egress port of said housing to thereby remove heat.

5,551,242
FLAMELESS NITROGEN SKID UNIT

Stanley B. Loesch; James C. St. John, and Danny K. Mints, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 136,047, Mar. 31, 1980, Pat. No. 4,438,729. This application Mar. 14, 1984, Ser. No. 589,421
Int. Cl.[6] F17C *9/04*
U.S. Cl. 62—50.3 **20 Claims**



1. An apparatus for converting liquid nitrogen to gaseous nitrogen comprising:
a. a source of liquid nitrogen;
b. at least one liquid nitrogen inlet;

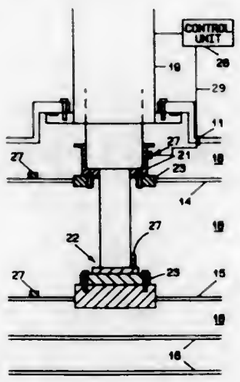
c. means for pumping said liquid nitrogen connected to said inlet;
d. engine means for driving said pumping means having engine fluid flow therethrough;
e. first heat exchanger having first fluid flow therethrough and connected to said means for pumping liquid nitrogen wherein heat is provided from said first fluid to said liquid nitrogen thereby converting said liquid nitrogen to gaseous nitrogen;
f. means for conducting said first fluid through said first heat exchanger; and
g. second heat exchanger having said first fluid flow therethrough and providing engine fluid from said engine means in heat exchange relation with said first fluid.

5,551,243

SUPERCONDUCTIVE MAGNET FOR MAGNETIC RESONANCE SYSTEMS

Alex Palkovich, Oxford; John Bird, Oxon, and Neil Clarke, Oxford, all of, England, assignors to Elscint Ltd., Haifa, Israel

Continuation of Ser. No. 214,138, Mar. 16, 1994, abandoned. This application Jul. 12, 1995, Ser. No. 501,513
Claims priority, application United Kingdom, Mar. 18, 1993, 9305600
Int. Cl.[6] F25B *19/00*
U.S. Cl. 62—51.1 **10 Claims**



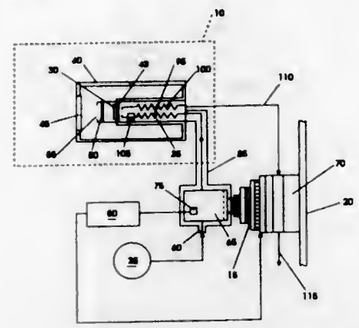
1. An improved cryogenic superconductive magnet system for use in magnetic resonance (MR) devices, said system comprising:
(a) a cryogenic superconducting electro-magnet immersed in a first tank containing a first liquified gas;
(b) said first tank being mounted in a vacuum container;
(c) at least one heat radiation shield surrounding said first tank in said vacuum container;
(d) a refrigerator system external to said vacuum container thermally coupled to said at least one heat radiation shield for cooling said heat radiation shield;
(e) temperature control means for maintaining a constant temperature on said at least one heat radiation shield; and
(f) said temperature control means including means for maintaining a constant cooling power from said refrigeration system by varying the frequency of the refrigeration system cycle.

5,551,244

HYBRID THERMOELECTRIC/JOULE-THOMSON CRYOSTAT FOR COOLING DETECTORS

Theodore B. Bailey, Chelmsford, Mass., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Nov. 18, 1994, Ser. No. 344,602
Int. Cl.[6] F25B *19/02;21/02*
U.S. Cl. 62—51.2 **28 Claims**



1. A low gas consumption cryogenic cooling apparatus comprising:
a container for pressurized gas;
a thermoelectric cooler in fluid communication with said container for pre-cooling said pressurized gas, said thermoelectric cooler including a cold side for precooling cooling the cryogenic gas and a hot side for dissipating heat;
a heat sink having a large surface area exposed to ambient air, the hot side of the thermoelectric cooler being mounted on the heat sink:
a dewar vessel; and
a Joule-Thomson cryostat mounted within the dewar vessel and located remote from said thermoelectric cooler, said Joule-Thomson cryostat being in fluid communication with said thermoelectric cooler and receiving pre-cooled pressurized gas from said thermoelectric cooler.

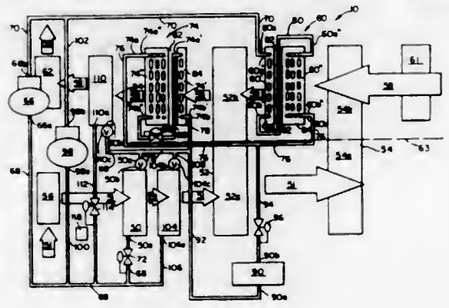
5,551,245

HYBRID AIR-CONDITIONING SYSTEM AND METHOD OF OPERATING THE SAME

Dean S. Calton, Lavernia, Tex.; James A. Coellner, Philadelphia; Paul R. Heimann, Wyncote, both of Pa., and Douglas C. Scott, LaVerne, Calif., assignors to Engelhard/ICC, Philadelphia, Pa.

Continuation-in-part of Ser. No. 378,154, Jan. 25, 1995. This application Mar. 23, 1995, Ser. No. 409,296
Int. Cl.[6] F25D *17/06*; F28D *3/00*
U.S. Cl. 62—90 **8 Claims**

1. A hybrid air-conditioning system for controlling the condition



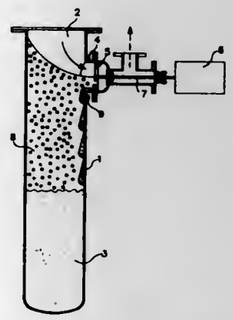
of air in a building enclosed space comprising:
first means for passing process air from an ambient space through a first pre-cool evaporator coil, through a first zone of a rotatable moisture transfer wheel and then through a first zone of a rotatable heat exchange wheel to an enclosed and conditioned space;
second means for passing regenerative air from the enclosed and conditioned space through a second zone of said heat exchange wheel, through a first condenser coil, through a second zone of said moisture transfer wheel and then to the ambient space;
a first compressor having a suction side in fluid communication with a first side of said first pre-cool evaporator coil and a discharge side in fluid communication with a first side of said first condenser coil, a second side of said first pre-cool evaporator coil being in fluid communication with a second side of said first condenser coil; and
a second compressor having a suction side in fluid communication with a first side of a second pre-cool evaporator coil and a discharge side in fluid communication with a first side of a second condenser coil, said second condenser coil having a second side in fluid communication with a second side of said second pre-cool evaporator coil, the second condenser coil having first and second coil sections, said first coil section of said second condenser coil being positioned between said first condenser coil and said second zone of said moisture transfer wheel and said second coil section of said second condenser coil being positioned between said second zone of said moisture transfer wheel and said ambient space such that the regenerative air passes through said first and second sections of said second condenser coil.

5,551,246

CENTRIFUGAL LIQUID SEPARATOR AND DEFOAMER

Russell Ojala, Bridgewater, N.J., assignor to Croll-Reynolds Company, Inc., N.J.

Filed Apr. 6, 1995, Ser. No. 418,084
Int. Cl.[6] F25B *19/00*
U.S. Cl. 62—100 **8 Claims**



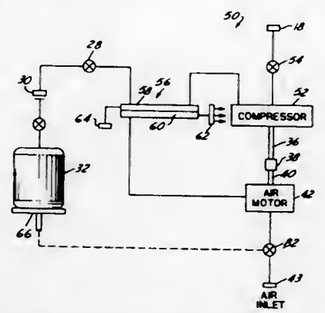
1. A centrifugal liquid separator and defoamer in a vacuum cooling system including a cooling vessel having a vessel interior for containing a liquid to be cooled, and a vacuum system for applying a vacuum to said vessel interior through a vessel vapor outlet nozzle,
said centrifugal liquid separator and defoamer comprising at least one impeller blade positioned in the vicinity of a juncture of said vessel interior and said vessel vapor outlet nozzle, said impeller blade being rotatable at a speed at which any liquid contacting the rotating impeller blade will be thrown off said blade, and any foam contacting said rotating impeller blade will be converted to liquid and thrown off said blade, in a direction of said vessel interior, by centrifugal action.

5,551,247

REFRIGERANT HANDLING SYSTEM AND METHOD ESPECIALLY FOR FLAMMABLE AND POTENTIALLY FLAMMABLE REFRIGERANTS

Kenneth W. Manz, Paulding; Allan F. Heisler, II; Gary P. Murray, both of Montpelier; Walter D. Murray, Pioneer, and Daniel L. Olds, Bryan, all of Ohio, assignors to SPX Corporation, Muskegon, Mich.

Filed Sep. 30, 1994, Ser. No. 315,836
Int. Cl.[6] F25B *45/00*
U.S. Cl. 62—149 **8 Claims**



1. A refrigerant recovery system that comprises:
a cabinet,
a compressor disposed within said cabinet having an inlet for connection to a source of refrigerant external to said cabinet and an outlet,
a condenser disposed within said cabinet, including means connecting an inlet of said condenser to said compressor outlet for at least partially condensing refrigerant passing through said condenser from said compressor outlet and means for connecting an outlet of said condenser to a refrigerant storage container outside of said cabinet,
a fluid motor within said cabinet operating coupled to power said compressor,
valve means disposed on a wall of said cabinet for connection to a source of fluid under pressure outside of said cabinet and coupled to said motor for applying fluid to power said motor, and
a scale carried by said cabinet, including a platform disposed outside of said cabinet for supporting the refrigerant storage container connected to said condenser outlet connecting means, and means disposed within said cabinet operatively coupling said platform to said valve means such that weight of the storage container and refrigerant therein above a preselected level functions to close said valve means and terminate operation of said fluid motor and said compressor.

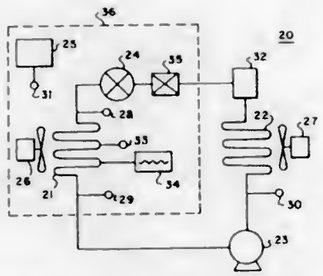
5,551,248

CONTROL APPARATUS FOR SPACE COOLING SYSTEM

Gregory S. Derosier, Conyers, Ga., assignor to Heatcraft Inc., Grenada, Miss.

Filed Feb. 3, 1995, Ser. No. 383,250
Int. Cl.[6] F25B *41/04*
U.S. Cl. 62—155 **20 Claims**

1. In a space cooling system having an evaporator in heat exchange relationship with a space to be cooled, a condenser external to the space, a compressor for circulating heat transfer fluid between the evaporator and the condenser, and an expansion valve between an outlet side of the condenser and an inlet side of the evaporator, the expansion valve being positionable in at least a fully open position to allow the heat transfer fluid to enter the evaporator and a fully closed position to substantially inhibit the heat transfer fluid from entering the evaporator, apparatus for controlling operation of the space cooling system, said apparatus comprising:



first temperature sensing means for sensing a difference in temperature between the heat transfer fluid at the inlet to the evaporator and the heat transfer fluid at an outlet from the evaporator and for generating a first electrical signal indicative thereof, said difference in temperature corresponding to a level of superheat across the evaporator;

second temperature sensing means for sensing temperature of the heat transfer fluid on a discharge side of the compressor and for generating a second electrical signal indicative thereof; and

control means for controlling operation of the space cooling system, said control means including first means for increasing pressure of the heat transfer fluid in the condenser in response to said level of superheat indicated by said first electrical signal being greater than a predetermined level when the expansion valve is in the fully open position and the compressor is operative, said control means further including second means for disabling said first means when the compressor is operative in response to the temperature of the heat transfer fluid on the discharge side of the compressor indicated by said second electrical signal being greater than a selected temperature when the compressor is not operative.

5,551,249

LIQUID CHILLER WITH BYPASS VALVES

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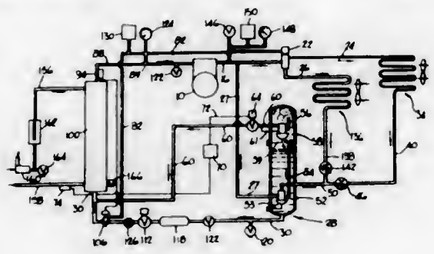
Filed Oct. 5, 1992, Ser. No. 956,749

Int. Cl.[6] F25B *41/06*

U.S. Cl. 62—196.4 **9 Claims**



1. A liquid chiller comprising:

(a) a compressor, a condenser, a receiver, a thermal expansion valve, and an evaporator;

(b) a first compressor-receiver pathway from the compressor to the receiver via the condenser, a second compressor-receiver pathway from the compressor to the receiver bypassing the condenser, and a condenser bypass valve controlled by pressure within the receiver for selectively directing the refrigerant to the first and second compressor-receiver pathways;

(c) a first receiver-evaporator pathway from the receiver to the evaporator via the thermal expansion valve, a second receiver-evaporator pathway from the receiver to the evaporator bypassing the thermal expansion valve, and a vapor bypass valve controlled by pressure within the evaporator for selectively directing the refrigerant to the first and second receiver-evaporator pathways; and

(d) a chiller control valve in said second receiver-evaporator pathway, said chiller control valve controlled by the temperature of a liquid to be chilled.

5,551,250

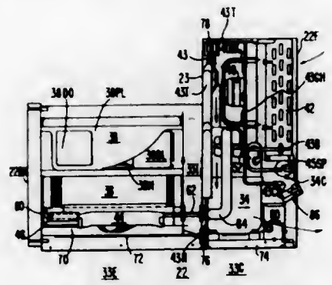
FREEZER EVAPORATOR DEFROST SYSTEM

Thomas E. Yingst; Gerald J. Stensrud, both of Bedford, and Ronald S. Davis, Euless, all of Tex., assignors to Traulsen & Co. Inc., College Point, N.Y.

Continuation-in-part of Ser. No. 302,280, Sep. 8, 1994, Pat. No. 5,491,980. This application Dec. 7, 1994, Ser. No. 354,231

Int. Cl.[6] F25D *21/12*

U.S. Cl. 62—234 **23 Claims**



1. A freezer evaporator defrost system comprising:

(A) a compressor for compressing low pressure vapor refrigerant into high pressure hot gas refrigerant;

(B) a condenser for condensing high pressure hot gas refrigerant from said compressor into high pressure liquid refrigerant;

(C) thermal expansion means for expanding high pressure liquid refrigerant from said compressor into low pressure liquid refrigerant;

(D) an evaporator having an inlet for receiving and evaporating the low pressure liquid refrigerant from said thermal expansion means to cool said evaporator whereby the outside surface of said evaporator accumulates ice;

(E) an evaporator condensate container mounted beneath said evaporator;

(F) an evaporator condensate container heater coil attached to and in thermal contact with the bottom of said evaporator condensate container, said evaporator condensate container heater coil having an inlet and an outlet;

(G) a hot gas tube connecting the outlet of said evaporator condensate container heating coil directly to the low pressure side of said thermal expansion means and thereby directly to the inlet of said evaporator;

(H) a hot gas valve for conducting when activated high pressure hot gas refrigerant from said compressor to the inlet of said evaporator condensate container heater coil to heat said evaporator condensate container heater coil and thereby heat said attached evaporator condensate container;

(I) heated air from said heated evaporator condensate container rising to heat the outside of said evaporator to help melt ice accumulated on the outside of said evaporator into condensate water which drips into said evaporator condensate container;

(J) the high pressure hot gas refrigerant fed from the outlet of said evaporator condensate container heater coil via said hot gas tube directly to the inlet of said evaporator heating the inside of said evaporator and melting ice accumulated on the outside of said evaporator into condensate water which drips into said evaporator condensate container;

(K) condensate evaporating means separate from said evaporator condensate container for evaporating the condensate water in said evaporator condensate container; and

(L) a compressor condensate container mounted beneath said compressor and connected by a condensate conduit to said evaporator condensate container to conduct condensate water from said evaporator condensate container to said compressor condensate container;

(M) said condensate evaporating means comprising a condenser fan mounted horizontally adjacent said condenser and vertically over said compressor and adapted to move outside air through said condenser and around said compressor to cool said condenser and compressor while heating the moved air, which is then passed over the condensate water in said compressor condensate container to evaporate the condensate water solely by said heated moved air and expel it from the freezer system.

5,551,251

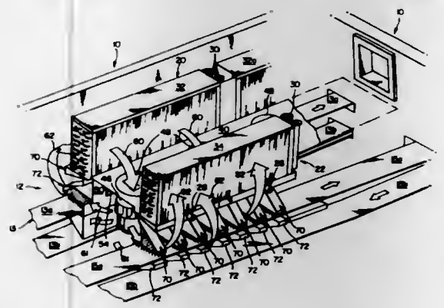
IMPINGEMENT FREEZER

Gregory L. Ochs, Kirkland, and James E. Aikins, Renton, both of Wash., assignors to York Food Systems, Issaquah, Wash.

Filed Feb. 8, 1995, Ser. No. 385,633

Int. Cl.[6] F25D *25/02*

U.S. Cl. 62—380 **19 Claims**



1. An impingement freezing system for fast freezing of food products which comprises:

i) enclosure means providing an elongated freezing zone having an inlet for food products to enter said zone and an outlet for food products to leave said zone, said enclosure means having a width, length and height sufficient to enable humans to physically enter therein to service the hereinafter-described means;

ii) mechanical refrigeration means located within said enclosure means and comprising low temperature evaporator means for cooling air contained within said enclosure to provide refrigerating air for freezing food products, and fan means for circulating refrigerated air into contact with food products so that food products may enter said zone in an unfrozen state and leave said freezing zone in a frozen state;

iii) conveyor means comprising endless conveyor belt means providing an open mesh conveyor belt for supporting and conveying food products through said freezing zone, and power means for causing said conveyor belt to travel continuously through said freezing zone;

iv) refrigerated air delivery means located in said enclosure means for receiving refrigerated air from said mechanical refrigeration means and delivering individual jets of refrigerated air to the topsides and undersides of food products conveyed through said enclosure means on said conveyor belt, said delivery means comprising:

a) first and second pluralities of duct means, the duct means of said first plurality of duct means being arranged in parallel with one another and positioned at intervals along and above said conveyor belt with each duct means having an inlet in air communication with said mechanical refrigeration means and an outlet oriented downward toward the topside of said conveyor belt; the duct means of said second plurality of duct means being arranged in parallel with one another and positioned at intervals along and below said conveyor belt with each duct means having an inlet in air communication with said mechanical refrigeration means and an outlet oriented upward toward the bottomside of said conveyor belt; each of the ducts means of said first and second pluralities of duct means being provided as air distribution modules that are spaced apart from the air distribution modules of adjacent duct means so that air return spaces are provided between the air distribution modules of adjacent duct means permitting air discharged from said duct means along air escape paths between adjacent air distribution modules to return unimpeded to said evaporator means after contacting food products on said conveyor belt;

b) and a plurality of refrigerated air jet-forming means, each jet-forming means comprising a solid block having a predetermined width, length and thickness defining spaced-apart inner and outer surfaces with each block having a multiplicity of cylindrical jet passages extending through the block with jet inlets opening at said inner surface and with jet outlets opening at said outer surface;

c) each duct means having at least one jet-forming means removably positioned in the duct means outlet so that refrigerated air entering the duct means through its inlet will contact the inner surface of the jet-forming means and pass through the jet passages,

d) each jet-forming means being located in a duct means outlet so that the jet-forming means outer surface is parallel to said conveyor belt with its jet passage outlets in close proximity to said conveyor belt.

5,551,252

REFRIGERATOR HAVING A COOL AIR CONDUCTING PASSAGE

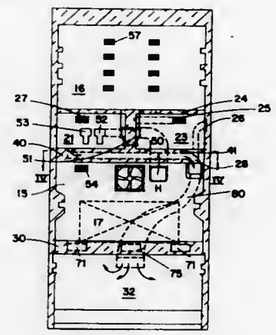
Sun Gyou Lee, Kyungki-Do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Dec. 29, 1994, Ser. No. 366,104

Claims priority, application Rep. of Korea, Jan. 26, 1994, 94-1398

Int. Cl.[6] F25D *17/06*

U.S. Cl. 62—441 **2 Claims**



1. A refrigerator, comprising:

a refrigerating compartment having an air inlet and an air outlet;

a freezing compartment spaced vertically from said refrigerating compartment and having an air inlet and first and second air outlets disposed at front and rear regions, respectively, of a lower portion of said freezing compartment;

a vegetable compartment disposed beneath said freezing compartment and including an air inlet connected to said air outlet of said refrigerating compartment;

a common wall separating said freezing and vegetable compartments and forming a first passage structure having first and second air inlets communicating with said first and second air outlets, respectively, of said freezing compartment, and a third air inlet communicating with an upper portion of said vegetable compartment, said first passage structure conducting combined air received from said first, second, and third air inlets thereof;

an evaporator arranged to receive all of the combined air conducted by said first passage structure; and

a second passage structure connecting an outlet of said evaporator with said air inlets of both of said refrigerating and freezing compartments, whereby

a portion of air cooled in said evaporator is delivered to said refrigerating compartment, and the rest is delivered to said freezing compartment.

5,551,253

OIL SEPARATOR FOR AIR CONDITIONER

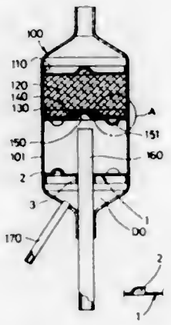
Jong Y. Kim, Kyungki-Do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Nov. 17, 1994, Ser. No. 343,920

Claims priority, application Rep. of Korea, Dec. 22, 1993, 1993-29082 U

Int. Cl.[6] F25B *43/02*

U.S. Cl. 62—470 **5 Claims**



1. An oil/vapor separator for separating oil from refrigerant vapor, comprising:

a body having a wall forming a chamber, said chamber including an inlet for oil and refrigerant vapor, a first outlet for refrigerant vapor, and a second outlet for oil, said first outlet arranged laterally inwardly from said wall;

a first apertured buffer plate disposed in said chamber below said inlet for distributing oil and refrigerant vapor;

a filtering medium disposed in said chamber below said first buffer plate for filtering said distributed oil and refrigerant vapor;

a second apertured buffer plate disposed in said chamber below said filtering medium and above said first and second outlets for discharging filtered oil and refrigerant vapor in a swirling direction so that the refrigerant vapor is discharged through said first outlet and the oil is displaced outwardly against said wall by centrifugal force and collects at a lower portion of said chamber which communicates with said second outlet; and

a separating plate disposed in said chamber below said second buffer plate, said separating plate accommodating the passage of oil downwardly therepast and isolating the oil collected therebelow from the swirling refrigerant vapor;

said second buffer plate including guiding holes through which oil and refrigerant vapor passes, said guiding holes having outlets facing generally circumferentially to produce said swirling of said vapor and oil, said separating plate including holes having inlets facing generally circumferentially for receiving the oil and vapor.

5,551,254

DOUBLE EFFECT ABSORPTION REFRIGERATING MACHINE

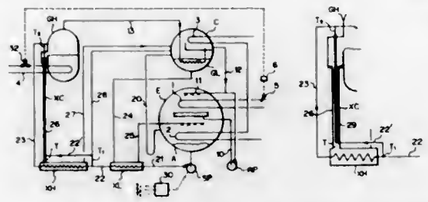
Naoyuki Inoue, Kanagawa-ken, Japan, assignor to Ebara Corporation, Tokyo, Japan

Filed Aug. 8, 1995, Ser. No. 512,865

Claims priority, application Japan, Aug. 9, 1994, 6-206111

Int. Cl.[6] F23B *15/00*

U.S. Cl. 62—489 **4 Claims**



1. A double effect absorption refrigerating machine comprising an absorber (A), a low temperature generator (GL), a high temperature generator (GH), a condenser (C), an evaporator (E), a low temperature heat exchanger (XL), a high temperature heat exchanger (XH), and a solution pump (SP), characterized in that;

said refrigerating machine further comprises;

a liquid level detecting heat exchanger (XC) which has an effective heat transfer area variable according to a level of concentrated solution in a concentrated solution piping (**26**, **29'**) which connects said high temperature generator (GH) and said high temperature heat exchanger (XH), a heating fluid of said detecting heat exchanger (XC) consisting of the concentrated solution in said piping (**26**, **29'**), a heated fluid of said detecting heat exchanger (XC) consisting of a diluted solution;

first temperature sensors for detecting temperatures (T_1, T_2) of one of said heating fluid and heated fluid at an inlet and an outlet of said detecting heat exchanger (XC),

a second temperature sensor for detecting a temperature (T) of the other of said heating fluid and heated fluid, and

a computing means (**30**) for conducting a calculation based on the temperatures (T_1, T_2, T) detected by said first and second temperature sensors and constants of said detecting heat exchanger (XC) to generate a signal indicative of the level of concentrated solution in said piping (**26**, **29'**).

5,551,255

ACCUMULATOR DISTILLATION INSERT FOR ZEOTROPIC REFRIGERANT MIXTURES

Peter I. Rothfleisch, Gaithersburg, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Sep. 27, 1994, Ser. No. 312,636

Int. Cl.[6] F25B *1/00*

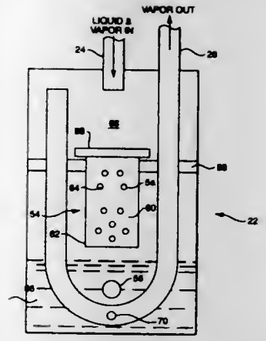
U.S. Cl. 62—502 **18 Claims**

1. An accumulator distillation insert for a heat pump system, said insert comprising:

an accumulator, said accumulator having a two-phase input and a vapor output, said accumulator having a refrigerant mixture, in liquid form, disposed at a bottom of said accumulator;

heating means provided in communication with said refrigerant mixture, in liquid form; and

a distillation column disposed in said accumulator, said distillation column maintained above said refrigerant mixture in liquid form, said distillation column provided for changing



the chemical composition of said refrigerant mixture by decreasing the amount of volatile components in said refrigerant mixture stored in said accumulator and thereby increasing the capacity of said heat pump system.

5,551,256

PROCESS FOR LIQUEFACTION OF NATURAL GAS

Hans Schmidt, Wolfratshausen, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Nov. 9, 1995, Ser. No. 556,195

Claims priority, application Germany, Nov. 11, 1994, 44 40 401.8

Int. Cl.[6] F25J *3/00*

U.S. Cl. 62—614 **13 Claims**

1. A process for liquefaction of a pressurized natural gas feedstream, said process comprising:

removing CO_2 and H_2O from a pressurized natural gas stream in an adsorptive separation zone;

bringing the resultant pre-purified natural gas stream into heat exchange with at least one refrigerant in a refrigeration circuit and liquefying said pre-purified natural gas stream; and

regenerating said adsorptive separation zone using a regeneration gas containing a partial flow of said pre-purified natural gas stream;

wherein, during cooling and liquefaction of said pre-purified natural gas stream, said partial flow of pre-purified natural gas used for regeneration of said adsorptive separation zone is separated from said pre-purified natural gas stream and expanded to regeneration pressure;

whereby said partial flow of pre-purified natural gas is cooled and, prior to introduction into said adsorption zone, the cooled partial flow of prepurified natural gas is heated by heat exchange with said natural gas stream.

5,551,257

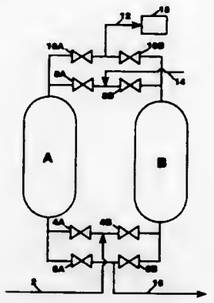
PRODUCTION OF ULTRAHIGH PURITY NITROGEN

Ravi Jain, Piscataway, N.J., assignor to The BOC Group, Inc., New Providence, N.J.

Filed Oct. 1, 1992, Ser. No. 955,180

Int. Cl.[6] F25J *3/00*

U.S. Cl. 62—644 **15 Claims**



1. A temperature swing adsorption process for removing carbon monoxide from a gaseous nitrogen stream which contains carbon monoxide as an impurity comprising the step of passing said gaseous nitrogen stream through a bed of carbon monoxide-selective adsorbent at a temperature below about 150° K., thereby producing a substantially carbon monoxide-free nitrogen stream.

5,551,258

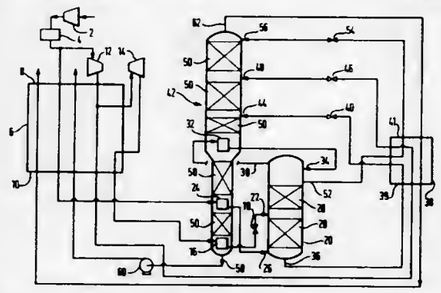
AIR SEPARATION

Thomas Rathbone, Farnham, England, assignor to The BOC Group plc, Windlesham Surrey, England

Continuation of Ser. No. 356,096, Dec. 15, 1994, abandoned. This application Nov. 28, 1995, Ser. No. 563,554

Int. Cl.[6] F25J *3/02*

U.S. Cl. 62—646 **23 Claims**



1. A method of separating air comprising:

rectifying a first stream of air in a higher pressure rectification column and thereby producing nitrogen vapor and oxygen-enriched liquid;

condensing at least some of the nitrogen vapor and employing at least some of the resulting condensate as reflux in the higher pressure rectification column;

rectifying a stream of oxygen-enriched fluid in a lower pressure rectification column;

providing liquid nitrogen reflux for the lower pressure rectification column;

withdrawing impure product oxygen from the lower pressure rectification column;

reboiling a first liquid taken from a first mass exchange region of the lower pressure rectification column and passing a flow of reboiled first liquid upwardly through the lower pressure rectification column;

reboiling a second liquid taken from at least one second mass exchange region of the lower pressure rectification column, and passing a flow of reboiled second liquid upwardly through the lower pressure rectification column;

said second liquid being reboiled by indirect heat exchange with the first air stream;

the said nitrogen vapor being condensed by indirect heat exchange with a third liquid taken from at least one third mass exchange region of the lower pressure rectification column and the second liquid being richer in oxygen than the third liquid but less rich in oxygen than the first liquid.

5,551,259

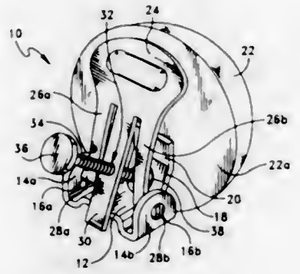
ADJUSTABLE EAR CLIP

Anthony Calabro, 51 Church Hill Dr., Cranston, R.I. 02920

Filed May 9, 1995, Ser. No. 437,574

Int. Cl.[6] A44C *7/00*

U.S. Cl. 63—14.5 **6 Claims**



1. An adjustable pressure ear clip, comprising:

a base plate;

a pair of ears connected to opposing ends of said base plate; said ears being positioned substantially perpendicular to said base plate and each ear including a pivot aperture therethrough;

a stop plate connected to an end of said base plate, not connected to said ears, at an angle greater than **90** degrees relative to said base plate;

a mounting plate connected to said stop plate;

an ornamental member connected to said mounting plate;

an ear engaging member;

a pair of arms connected to said ear engaging member; said arms each including protrusions at ends thereof not connected to said ear engaging member; said protrusions being positioned in said pivot apertures, respectively;

a spring tongue connected to said ear engaging member and disposed between said arms; said spring tongue including a stop bolt aperture therethrough; said spring tongue resting on a end of said base plate opposite the end on which said stop plate is connected; and

a stop bolt, having male threading thereon, threadably positioned through said stop bolt aperture and engageable with said stop plate to limit travel of said ear engaging member toward said ornamental member.

5,551,260

METHOD FOR JOINING TWO EDGES OF A KNITTED TUBULAR ARTICLE UPON COMPLETION THEREOF

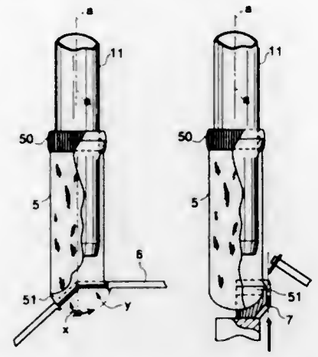
Alberto Frullini, and Paolo Frullini, both of Firenze, Italy, assignors to Fabritex, S.R.L., Firenze, Italy

Continuation-in-part of Ser. No. 281,454, Jul. 27, 1994. This application Oct. 24, 1995, Ser. No. 547,276

Claims priority, application Italy, Jul. 29, 1993, FI93A0150

Int. Cl.[6] D04B *9/40*

U.S. Cl. 66—148 **7 Claims**



1. A method for closing an end of a tubular article, the method comprising the steps of:

forming the tubular article on a circular knitting machine;

closing sinkers of the knitting machine to retain stitches of a last course;

lifting knitting needles of the circular machine with the sinkers being closed in order to move the stitches to a position on the needles where the stitches will be removed;

opening the sinkers;

lifting the needles further with the sinkers being open to move the stitches above a nib of the sinkers;

transferring the stitches from the needles to a transfer means;

moving the transfer means with the stitches and the tubular article to an everting station;

everting the tubular article to turn the tubular article inside out;

moving a first portion of the stitches of the everted article adjacent a second portion of the stitches of the everted article by rotating a first portion of the transfer means substantially 180 degrees about a diametrical axis of the tubular article to position the first portion of the transfer means adjacent a second portion of the transfer means;

linking the adjacent first and second portions of stitches of the everted article to close the tubular article;

un-everting the tubular article to turn the tubular article right side out;

unloading the tubular article from the everting station.

5,551,261

AUTOMATIC WASHING MACHINE AND METHOD FOR CONFIRMATION OF CLUTCHING OPERATION THEREOF

Jae C. Lyu; Chang S. Kang, both of Kyungki-do; Gwan R. Park, and Kyeong H. Kim, both of Seoul, all of, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Mar. 8, 1994, Ser. No. 207,415

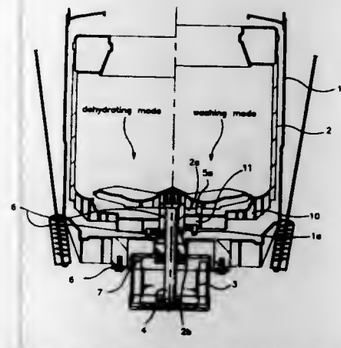
Claims priority, application Rep. of Korea, Mar. 9, 1993, 3531/1993; May 8, 1993, 7294/1993; Aug. 27, 1993, 16813/1993

Int. Cl.[6] D06F *23/04;37/40*

U.S. Cl. 68—23.6 **9 Claims**

1. An automatic washing machine, comprising:

an outer tub for containing washing water therein;



a movable inner tub for washing and dehydration, said inner tub being movably concentrically placed in said outer tub in order to ascend and descend and having a plurality of perforations on its side wall;

means for generating buoyancy in accordance with a water level of washing water charged in said outer tub, said buoyancy being applied to said inner tub in order to cause said inner tub to ascend;

a shaft rotatably penetrating bottom centers of both the outer tub and the inner tub and guiding the ascending and descending of said inner tub;

motor means for generating a rotational force for rotating said shaft;

means for generating a water current using the rotational force of said motor means, said water current generating means being mounted on a top end of said shaft; and

clutching means for selectively coupling said inner tub to one of said outer tub and said water current generating means in accordance with said position of said inner tub ascending and descending under the guide of said shaft

wherein said clutching means comprises:

a first tooth part formed on an upper section of a bottom of said inner tub;

a second tooth part formed on a lower section of the bottom of said inner tub;

a third tooth part formed on a lower surface of said water current generating means and being engaged with said first tooth part when said inner tub completely descends; and

a fourth tooth part formed on a n inner bottom surface of said outer tub and being engaged with said second tooth part when said inner tub completely ascends.

5,551,262

POWER TRANSMISSION APPARATUS OF A WASHING MACHINE

Je-Man Seo, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Feb. 27, 1995, Ser. No. 394,745

Claims priority, application Rep. of Korea, Feb. 28, 1994, 94-3812

Int. Cl.[6] D06F *37/40*

U.S. Cl. 68—23.7 **8 Claims**

1. A clothes washing machine comprising:

a spin-drying tub rotatable about an axis;

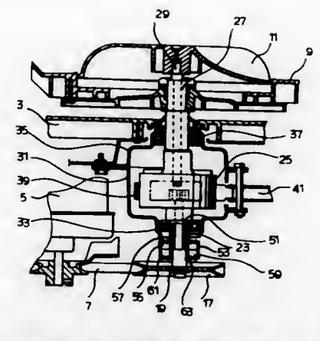
a pulsator disposed in the spin-drying tub and movable relative thereto for agitating water therein;

an electric motor;

a washing shaft connected to said motor to be rotated thereby and being connected to said pulsator to drive said pulsator;

a spin-drying shaft operably connected to said spin-drying tub; and

a drive-transmitting mechanism for selectively transmitting power from said washing shaft to said spin-drying shaft, comprising:



a first member connected to one of said spin-drying shaft and said washing shaft for rotation therewith; and

a second member connected to the other of said spin-drying shaft and said washing shaft for rotation therewith, said second member being longitudinally slidable along said other shaft between a first position out of drive-transmitting relationship with said first member, and a second position in drive transmitting relationship with said first member;

wherein said at least one of said first and second members carries an electromagnet energizable to attract said first and second members together to said second position.

5,551,263

LOCK WITH DEAD BOLT CAMMING ACTION ON 90 DEGREE LOCK CYLINDER ROTATION

Gary L. Myers, Monee, and Aurelia C. Haiduc, River Grove, both of Ill., assignors to Fort Lock Corporation, River Grove, Ill.

Filed Aug. 25, 1994, Ser. No. 295,558

Int. Cl.[6] E05B *65/46*

U.S. Cl. 70—86 **2 Claims**

1. An improved drawer lock assembly adapted to be mounted to a drawer panel, the drawer lock assembly comprising, in combination:

a lock plug housing having a cylindrical opening formed therethrough and a rectangular channel with substantially parallel side walls formed thereon, the cylindrical opening of the lock plug housing having a longitudinal axis, the rectangular channel arranged substantially perpendicular to the longitudinal axis of the cylindrical opening;

a key operated lock plug rotatably disposed in the cylindrical opening of the lock plug housing, the lock plug having a key entry way disposed on one end and an offset projecting cam member disposed on the opposite end; and a dead bolt slidably disposed within the rectangular channel, the rectangular channel having opposite open ends, from one end of which the dead bolt extends in its fully extended position, and opposite open sides positioned radially outward from the lock plug housing, whereby the dead bolt may be positioned immediately adjacent to a drawer panel when mounted to the drawer panel, the dead bolt having a longitudinal axis and a

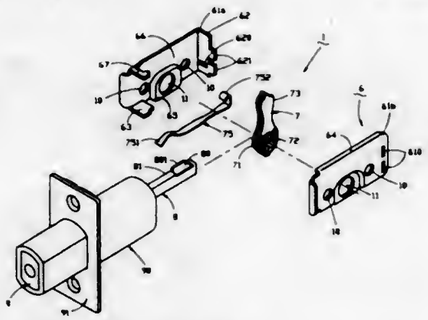
linear slot oriented at substantially a 45° angle with respect to the longitudinal axis of the dead bolt, the linear slot receiving the projecting cam member of the lock plug, the projecting cam member linearly actuating the dead bolt between a fully withdrawn position and a fully extended position when the lock plug is rotated 90°, the linear slot permitting the lock plug to be rotated to an angle of 180° when actuating the dead bolt.

5,551,264

DOOR LOCK HAVING A DEADBOLT ASSEMBLY WITH A LOW-COST CORROSION-RESISTANT BOLT MEMBER

Yaw-Shin Fann, Chia-Yi City; San-Yi Lin, Yun-Lin Hsien; Ching-Chuan Kuo; Lan-Kun Don, both of Chia-Yi Hsien, and Ming-Shyang Chiou, Chia-Yi City, all of, Taiwan, assignors to Tong-Lung Metal Industry Co., Ltd., Taiwan

Filed Sep. 27, 1994, Ser. No. 321,611
Int. Cl.[6] E05B *65/06*
U.S. Cl. 70—134 **14 Claims**



8. A deadbolt assembly, comprising:
a bolt member;
a pull member having a forward extension connected to said bolt member, and a rearward extension connected to said forward extension;
a deadbolt casing assembly including: a bolt casing for receiving said bolt member slidably therein, said bolt casing having an open rear end to permit extension of said forward extension of said pull member therein; and a pair of spaced side plates formed with a pair of mounting holes and having front ends connected to said open rear end of said bolt casing, said side plates further having inner wall surfaces formed with a respective boss between said mounting holes, said rearward extension of said pull member resting slidably on each said boss and being movable forward and rearward relative to said side plates; and
a drive arm disposed between said side plates, said drive arm having a first end mounted rotatably to said boss of each of said side plates and formed with a spindle hole, said drive arm further having a second end which engages operably said rearward extension of said pull member.

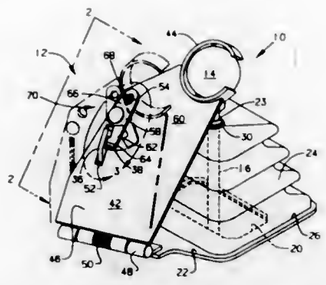
5,551,265

RESTRAINT MECHANISM FOR A CONTROL LEVER

Ronald H. Garman, Pekin; Stephen C. Garnett, Princeville, and Steven L. Groth, Morton, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Apr. 28, 1995, Ser. No. 431,698
Int. Cl.[6] G05G *5/28*
U.S. Cl. 70—177 **11 Claims**

1. A restraint mechanism for a control lever, comprising:
a first plate having a first end portion and a first aperture formed therethrough, said first end portion defining a receiving portion having a preselected configuration, said first plate being pivotally mounted to a base plate at a second end portion thereof for being located adjacent the control lever and being moveable between a first position wherein the receiving portion is positioned to encapsulate a portion of the control lever to restrain the movement of the control lever and a second position wherein the first plate is pivoted away from engagement with the control lever;
a support member having a first end portion mounted to the base plate and a second end portion having an aperture formed therethrough, said second end portion being adapted for receipt within the first aperture of the first plate when the first plate is in its first position; and
a second plate having a first end portion having an engagement portion defined thereon and a second end portion having an aperture extending therethrough, said second plate being pivotally mounted at a point spaced from said aperture of said second plate to the first plate for movement between a first position wherein the engagement portion of the second plate is received within the aperture defined by the support member when the first plate is in its first position and a second position wherein the engagement portion is pivoted away from engagement with the aperture defined by the support member.

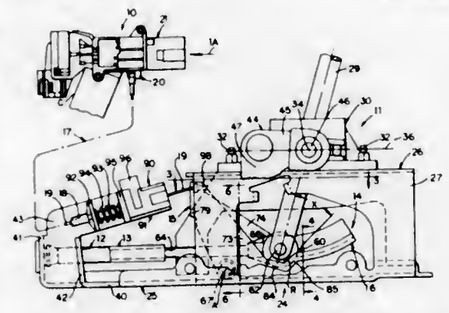


5,551,266

MANUAL TRANSMISSION SHIFTER TO IGNITION INTERLOCK

William L. Behrens, Ortonville, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed May 22, 1995, Ser. No. 445,482
Int. Cl.[6] B60R *25/06*; **E05B** *65/12*
U.S. Cl. 70—247 **10 Claims**



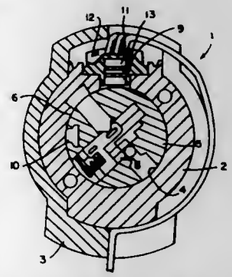
1. An anti-theft gear shifter arrangement for a vehicle manual transmission comprising:
a shifter assembly including a base and an upper support, a shifter pivoted on said support for movement to drive and reverse gear positions, a bellcrank lever pivoted on said base for forward and aft movement about a transverse axis, said lever including an upstanding first arm and an aft extending second arm defining an upwardly facing semi-spherical raceway formed with a reverse gear position notch; and
a key cylinder and interlock assembly arranged near said shifter, said cylinder being movable by a key between a key-retain non-Lock position and a key-release Lock position, a cable core having one end connected to a resiliently-biased interlock slider and its other end connected to an upper end of said first arm, and a runner on a lower end of said shifter;
whereby, with said cylinder in its non-Lock position, said runner adapted for longitudinal and transverse sliding travel on said raceway in response to said shifter being pivoted between a plurality of forward and reverse gear positions, during aft runner travel said core extending against said slider bias in response to said second arm being pivoted downwardly by said runner, and whereby during forward runner travel said core biases said first arm forwardly thereby maintaining said raceway in contact with said runner; and
upon said shifter being shifted into said reverse gear position said runner is captured in said reverse notch and said core biases said first arm to a forward limit position such that, upon said cylinder being moved to its key-release Lock position, said runner is locked in said notch thereby preventing movement of said shifter, whereby the vehicle may be driven only in reverse gear.

5,551,267

ANTI-MAGNETIC TAMPERING SYSTEM FOR AUTOMOBILE IGNITION LOCK

David C. Janssen, Whitefish Bay, Wis., and Thomas G. Osborne, Lewisville, Tex., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Apr. 15, 1994, Ser. No. 228,510
Int. Cl.[6] B60R *25/02*
U.S. Cl. 70—252 **7 Claims**



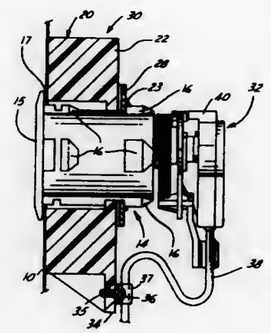
1. A lock for an automobile ignition circuit, comprising:
a hollow sleeve defining a cylindrical inner surface;
a cylinder member rotatably mounted within said sleeve and having a cylindrical outer surface defining a cylindrical interface with the inner surface of said sleeve, said cylinder member having a keyway therein for receiving a key used to rotate said cylinder between off and start positions;
a control Hall effect sensor on said sleeve for detecting when said cylinder member is rotated to is start position, said control Hall effect sensor having a first trip level for producing an activation signal;
a control magnet on said cylinder member for activating said control Hall effect sensor when said cylinder member is rotated to its start position;
an anti-tampering Hall effect sensor spaced in radial alignment with and adjacent to said control Hall effect sensor, said anti-tampering Hall effect sensor having a second trip level for producing a deactivation signal, the trip level of said anti-tampering Hall effect sensor being lower than the trip level of said control Hall effect sensor;
blocking means disposed between said control Hall effect sensor and said anti-tampering Hall effect sensor to prevent the anti-tampering Hall effect sensor from being tripped by the control magnet when said cylinder member is rotated to its start position and to enable the anti-tampering Hall effect sensor to be tripped to produce said deactivation signal in response to a magnetic force induced from the exterior of said sleeve; and
wherein said anti-tampering Hall effect sensor is tripped prior to said control Hall effect sensor in response to the magnetic force induced from the exterior of said sleeve.

5,551,268

RETAINER ASSEMBLY FOR A LOCK CYLINDER

Vince S. Carnes, White Lake, and Javier Saldana, Pontiac, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

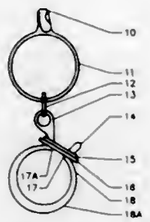
Filed Apr. 3, 1995, Ser. No. 415,282
Int. Cl.[6] E05B *9/08*
U.S. Cl. 70—370 **11 Claims**



7. A retainer assembly for attaching a lock cylinder to a door panel, the lock cylinder being partially disposed within a door panel aperture, elongated, and having a plurality of radially spaced flanges disposed thereon and raised outwardly therefrom, the retainer assembly comprising:
an anti-theft device engaged with the lock cylinder;
a U-shaped retainer clip having at least two laterally spaced apart flanges, the at least two laterally spaced apart flanges engaging two of the lock cylinder flanges and preventing lateral movement of the lock cylinder when the lock cylinder is engaged with the U-shaped retainer clip;
a substantially solid, integrally formed, base having a first side, a second side, and an open-ended slot, the base being connected to the U-shaped retainer clip at the second side, the open-ended slot providing sliding engagement of the lock cylinder with the base such that upon engagement of the lock cylinder the first side of the base flatly abuts against the door panel thereby preventing dimpling on the body panel, the U-shaped retainer clip abuts against the plurality of radially spaced flanges of the lock cylinder thereby preventing rotation of the lock cylinder when partially disposed within the door panel aperture, the base having a width equaling at least the length of the lock cylinder thereby preventing disengagement of the anti-theft device from the lock cylinder upon insertion of an instrument into the door panel at a point that is in lateral proximity to the door panel aperture, and the base having a height equaling at least half of the length of the lock cylinder thereby preventing disengagement of the anti-theft device from the lock cylinder upon insertion of an instrument into the door panel at a point distal to the door panel aperture;
means for preventing disengagement of the anti-theft device with the lock cylinder, the means for preventing disengagement of the anti-theft device connected to the base; and

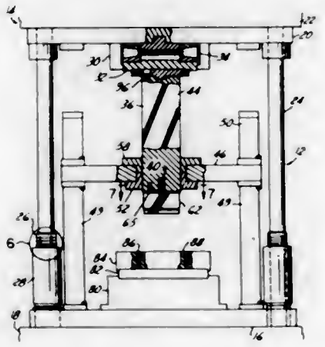
whereby the height and the width of the base provide a bending moment of approximately 50 ft/lbs thereby preventing the lock cylinder from being forcibly removed from the door panel.

5,551,269
KEYRING & ATTACHMENT
Archie Lewinstein, 160 Valparaiso #16, Cotati, Calif. 94931, and Stefan Goya, 15000 Rio Nido Rd., Guerneville, Calif. 95446
Filed Nov. 1, 1993, Ser. No. 152,032
Int. Cl.[6] A44B *15/00*
U.S. Cl. 70—459 **1 Claim**



1. A key holding ring in combination with an attachment device, said attachment device comprising a hook projecting from a retrieval ring, said retrieval ring being joined to a linking ring, said linking ring being connected to a rounded terminus of a linking arm of said key holding ring, said key bolding ring being resilient and generally circular in shape and having a gap defined by said linking arm and a latch arm, said gap being opened or closed by two flat, independent bars mounted below said terminus.

5,551,270
EXTRUSION FORMING OF INTERNAL HELICAL SPLINES
Alexander Bajraszewski, Richmond; David H. Dodds, South Lyon; Charles E. Muessig, Novi, and Vijay Nagpal, Westland, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Jul. 18, 1994, Ser. No. 276,591
Int. Cl.[6] B21K *1/30*
U.S. Cl. 72—21.3 **10 Claims**



1. An apparatus for backward extrusion forming internal helical teeth in a blind end gear blank capable of forming finished gears comprising:

a press, including a first member and a base, with the first member coupled to and axially movable relative to the base, and the base axially supporting the blind end of the gear blank;

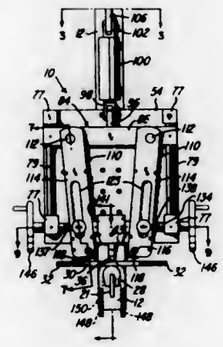
a lead bar coupled to the first member having an outer surface which includes helical guides;

a mandrel coupled concentrically to the lead bar and having an outer surface which includes helical die teeth;

a lead nut assembly mounted to the press having nut guides operatively engaging the helical guides on the lead bar for helically guiding the lead bar as it moves axially relative to the lead nut assembly; and

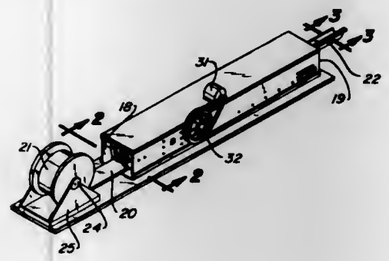
a die mounted to the base including a cavity concentrically located relative to the mandrel and adapted to receive the gear blank.

5,551,271
U-BOLT BENDING APPARATUS
John C. Gray, and Jerry W. Corder, both of Dayton, Ohio, assignors to L&H Threaded Rods Corporation, Dayton, Ohio
Continuation-in-part of Ser. No. 129,672, Sep. 30, 1993, Pat. No. 5,461,897. This application Sep. 15, 1994, Ser. No. 306,402
Int. Cl.[6] B21K *1/74*; B21D *7/06*
U.S. Cl. 72—213 **22 Claims**



1. Apparatus for bending a straight metal rod having a center portion integrally connecting opposite threaded end portions into a U-bolt having parallel legs formed from the end portions, said apparatus comprising an elongated frame member, a removable forming die supported by said frame member and adapted to receive the center portion of the metal rod, a pair of support arms each supporting a bending roller positioned to engage the rod, a carriage member pivotally supporting said arms, means mounted on said frame member and supporting said carriage member for linear movement between a retracted position and an extended position, means for positively clamping a rod to said die and including a lever pivotally supported by said frame spaced from a support surface, a power actuated wedge member slidably engaging said lever and said support surface, power operated means for moving said carriage member and said arms between said retracted and extended positions, means for moving said arms and said rollers along converging paths in response to movement of said carriage member to said extended position for overbending the rod around said die, an adjustment screw connected to said means for moving said arms, and means for simultaneously adjusting said arms in response to rotation of said screw for conveniently adjusting the spacing between said bending rollers to accommodate rods and dies of different sizes.

5,551,272
HALF-ROUND GUTTER MAKING APPARATUS
Gary A. Knudson, 17356 W. 57th Ave., Golden, Colo. 80401
Continuation of Ser. No. 230,314, Apr. 20, 1994, abandoned. This application Sep. 1, 1995, Ser. No. 522,699
Int. Cl.[6] B21D *5/08*
U.S. Cl. 72—181 **14 Claims**



1. In roll forming apparatus for making gutters having a semi-circular bottom wall with a preselected final radius and substantially parallel opposed walls, the combination comprising:

initial roll forming station means including a series of spaced forming stations for gradually forming a flat sheet metal into a generally U-shaped, partially formed gutter body having a curved bottom wall having a radius substantially the same as the preselected final radius of the formed gutter and first and second opposed walls projecting away from said bottom wall and terminating in a pair of opposed edges,

side roller means following said forming stations for gripping and bringing said opposed walls and edges of said gutter body toward one another,

at least one over bending forming station following said side roller means, said over bending forming station including

a generally spherical upper roller,

a generally concave lower roller opposite said upper roller, and

opposed first and second wall bending means on opposite sides of said upper and lower rollers,

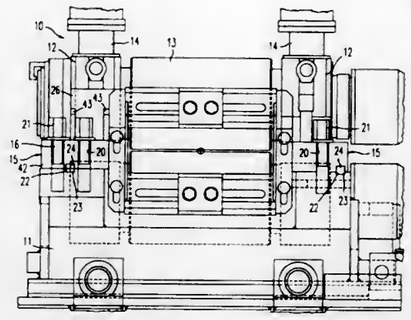
said upper and lower rollers being shaped and sized for bending that portion of said gutter body that finally forms the bottom wall to a smaller radius than said preselected final radius whereby the elasticity of the sheet metal causes said bottom wall to expand to said preselected final radius after leaving said overbending forming station,

said wall bending means turning said first and second opposed walls and edges of said gutter body toward one another past a parallel relation to a converging relation,

whereby the elasticity of the sheet metal causes said bottom wall and said opposed walls to expand back to the preselected final size and shape,

said side roller means including a box-like side roller assembly including a series of sets of opposed inner and outer side rollers arranged to rotate about a vertical axis, each outer side set roller having a section for gradually bending a head and for bringing an associated one wall toward the opposite wall and a hook forming assembly opposite said side roller assembly including a series of sets of opposed side rollers for progressively forming a hook in the other opposed wall and bringing said hook toward said head.

5,551,273
ROLLING STAND WITH TIE-RODS WITH EXTREMELY HIGH STRENGTH TO AXIAL STRESSES
Gianfranco Mantovan, Busto Arsizio, Italy, assignor to Pomini S.p.A., Varese, Italy
Filed Sep. 30, 1994, Ser. No. 317,655
Int. Cl.[6] B21B *31/02;31/08*
U.S. Cl. 72—237 **10 Claims**



1. Rolling stand comprising:

a stand base;

at least two rolling rolls and carriers supporting said at least two rolling rolls, said rolling rolls supported by said carriers being supported by said stand base;

plural vertical tie-rods operable to move said carriers vertically towards or apart from each other, said tie-rods having screw-threaded portions;

at least one pair of support feet arranged between said stand base and said carriers, said support feet supporting a central portion of said tie-rods, said tie-rods having screw-threaded portions provided on opposite sides of said support feet;

at least one of said support feet having a contoured portion extending vertically parallel to said tie-rods;

at least one of said carriers having a vertical rib housed and guided in said contoured portion; and

removable adjustment and sliding elements provided in said contoured portion interposed between said contoured portion and said rib with said removable adjustment and sliding elements having opposite surfaces contacting said contoured portion and said rib, respectively.

5,551,274
IMPACT ABSORPTION FOR STAMPING PRESS
Howard Hintz, Bridgeview, Ill., assignor to Clearing Niagara, Inc., Chicago, Ill.
Filed Nov. 21, 1994, Ser. No. 343,085
Int. Cl.[6] B21J *7/12*
U.S. Cl. 72—431 **12 Claims**

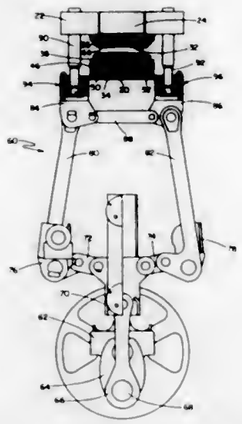
1. A stamping press wherein a piece part is engaged by first and second die members for forming said piece part into a desired configuration and size, wherein said first die member contacts said second die member giving rise to a high impact force, said stamping press comprising:

a die support member coupled to and providing support for said first die member;

a drive mechanism undergoing reciprocating, linear displacement;

linkage including a plurality of pull rods connecting said die support member to said drive mechanism for displacing said die support member and said first die member in a reciprocating, linear manner, wherein said first die member contacts said second die member and the high impact force is directed along the length of said pull rods; and

resilient impact absorption means including one or more disc springs disposed about and coupled to an end of each of said

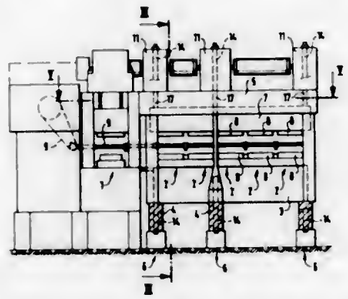


pull rods and engaging adjacent movable linkage members for undergoing compression during absorption of an impact force and for assuming a non-compressed state when the impact force is removed in absorbing and isolating said linkage from the high impact force.

5,551,275
MULTIPLE STAND PRESS

Hans Hofele; Wolfgang Michael, both of Goeppingen; Kurt Stroemmer, Kuchen, and Karl Thudium, Waeschebeuren, all of, Germany, assignors to Schuler Pressen GmbH, Germany

Filed Jun. 10, 1994, Ser. No. 258,069
Claims priority, application Germany, Jun. 11, 1993, 43 19 338.2
Int. Cl.[6] B21J 9/18
U.S. Cl. 72—450 11 Claims



1. A multiple stand press for the forming of sheet metal parts, comprising:

at least one bedplate;

pairs of press stands, each press stand forming a stand construction for the press, the press stands positioned at spaced locations on the bedplate;

at least one press slide driven by a press drive, wherein the press slide extends between at least two pairs of the press stands;

tools operatively arranged on the press slide and on the bedplate and cooperating so as to form the sheet metal parts;

waste disposal shafts operatively associated with the tools; and

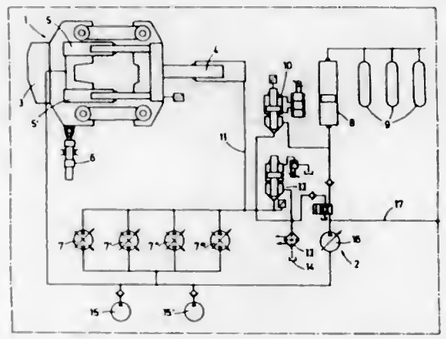
connecting rods linked to the press slide and via which an introduction of force in the areas of the press stands takes place, wherein for each pair of the press stands, two of said connecting rods are operatively associated with the press slide,

wherein the press slide extends along three pairs of the press stands, and wherein the introduction of force takes place via the connecting rods in the area of each of the three pairs of the press stands.

5,551,276
UPSETTING PRESS MAIN DRIVE

Berghold Hild, Burbach, Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Germany

Filed Jun. 29, 1994, Ser. No. 263,614
Claims priority, application Germany, Jun. 18, 1993, 43 20 213.6
Int. Cl.[6] B21J 7/18
U.S. Cl. 72—453.1 13 Claims



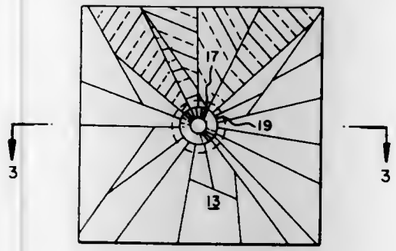
1. A method of operating pressing tools of an upsetting press for rolling stock, the pressing tools including hydraulic reduction drives, the reduction drives carrying out forward strokes and return strokes, wherein each reduction drive has a pressing cylinder, further including work pumps and return stroke cylinders forming together with the reduction drives an essentially closed circuit, the method comprising effecting the return strokes of the reduction drives by means of the work pumps, conducting pressure medium displaced from the pressing cylinders into a pressure medium accumulator, and utilizing the pressure medium in the pressure medium accumulator for effecting the forward strokes together with the work pumps at least until the pressing tools contact the rolling stock.

5,551,277
ANNULAR DIAMOND BODIES

Thomas R. Anthony, Niskayuna, N.Y.; Friedel S. Knemeyer, Granville, and Bradley E. Williams, Worthington, both of Ohio, assignors to General Electric Company, Worthington, Ohio

Filed Sep. 23, 1994, Ser. No. 311,658
Int. Cl.[6] B21C 3/02
U.S. Cl. 72—467 29 Claims

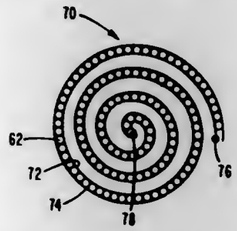
1. An annular body comprising a transparent CVD diamond body having an opening of uniform diameter, the opening establishing an interior surface in the annular body and with said interior surface in a region of smaller diamond grains and an external surface defined by a periphery of the annular body and having a region of larger diamond grains, wherein said opening extends entirely through said body along an axial direction, said body including diamond grains having a. 110 orientation extending substantially radially to the axial direction so that the grains do not extend parallel to one another.



5,551,278
VAPOR COLLECTOR/DESORBER WITH NON-CONDUCTIVE TUBE BUNDLE

David P. Rounbehler, Bedford; Eugene K. Achter; David P. Lieb, both of Lexington; David H. Fine, Sudbury; Eugenie Hainsworth, Arlington; Alf L. Carroll, Cohasset, and Gregory J. Wendell, Stoneham, all of Mass., assignors to Thermedics Inc., Woburn, Mass.

Filed Jul. 8, 1987, Ser. No. 81,953
Int. Cl.[6] G01K 19/00; B01D 15/08
U.S. Cl. 73—1 G 16 Claims



1. Apparatus for collecting vapors of nitrogen-containing compounds, from an air sample comprising:

an open-ended cartridge including a housing formed of a material transmissive to infrared radiation; and

a plurality of open-ended small diameter tubes arranged in parallel in a closely-packed bundle within said cartridge with the longitudinal axis of each tube parallel to the longitudinal axis of said cartridge, each of such tubes formed of a material transmissive to radiant energy and having on its inner surface a coating of a material effective at a first temperature to trap vapors of said compounds from an air sample passed through the tubes and, when heated to a second temperature, to release said vapors into a carrier gas without decomposition of said vapors.

5,551,279
IMPACT GAUGE

Donald C. Quick, 1328 Hallam Ave., Mahtomedi, Minn. 55115

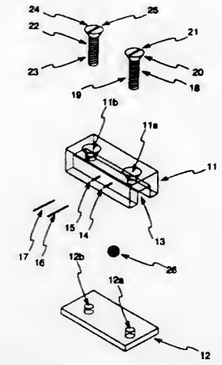
Filed Oct. 6, 1995, Ser. No. 540,442
Int. Cl.[6] G01M 7/00
U.S. Cl. 73—12.01 16 Claims

1. An impact gauge for determining the accumulated force in both directions along a single axis comprising:

a first member;

a second member, said first member and said second member securable to one another to form a housing with a chamber therein;

a first bendable member having a first end secured to said first member with a second end projecting into the chamber in a cantilevered fashion, said first bendable member comprising a cylindrical wire formed from a non-resilient but bendable material;



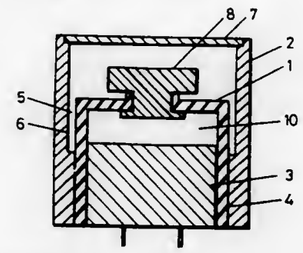
a second bendable member having a first end secured to said first member with a second end projecting into the chamber in a cantilevered fashion, said second bendable member comprising a cylindrical wire formed from a non-resilient but bendable material; said second end of said first bendable member and said second end of said second bendable member located in a spaced and parallel position with respect to one another;

an impact-sensitive object located in said chamber, said impact-sensitive object located between said second end of said first bendable member and said second end of said second bendable member, said impact-sensitive object having sufficient mass to bend the bendable members in proportion to an impact on the housing to thereby provide an indication of impact by an angle of bend formed by the bendable members.

5,551,280
MULTI PURPOSE SHOCK SENSOR

Sang-Moon Lee, 107 Na-dong Kangnam 1st A.P.T. 923-30, Hogye 2-dong, Dongahn-gu, Ahnyang-si, Kyungki-do, Rep. of Korea, assignor to Sang-Moon Lee, and Ja-Young Yoon, both of Kyungki-do, Rep. of Korea

Filed Aug. 4, 1995, Ser. No. 511,694
Claims priority, application Rep. of Korea, Aug. 6, 1994, 94-19393
Int. Cl.[6] G01M 7/00
U.S. Cl. 73—12.08 7 Claims



1. A multipurpose shock sensor consisting of:

a cap(**1**) having an upper part and an open lower part, said upper part having a coupling hole(**9**) therein,

a vibration sensing element(**3**) located within said lower part of said cap(**1**);

a balance weight(**8**) having a groove (**12**) having a diameter, said balance weight (**8**) joined to said upper end of said cap(**1**) in said coupling hole (**9**) to provide a sealed cavity(**10**) formed by said cap(**1**) and said vibration sensing element(**3**), said coupling hole(**9**) having a diameter less than said diameter of said groove(**12**);

a safety cover(2) having a surface (4) which securely joins and surrounds said cap(1), and

a lid (7) joined to said safety cover (2),

said safety cover (2) having an inner surface(6) spaced from said cap (1) to provide a gap(5) between said safety cover (2) and said cap(1).

5,551,281

METHOD FOR DETERMINING GAS HOLD-UP

Robert W. Todd, Bryncaemeilir, Machynlleth, Powys SY20 8QG, Great Britain

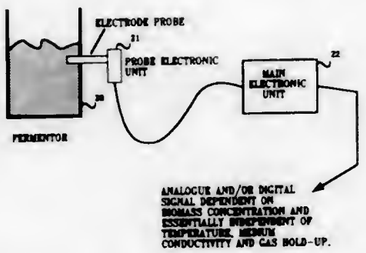
PCT No. PCT/GB93/00011, § 371 Date May 26, 1994, § 102(e) Date May 26, 1994, PCT Pub. No. WO93/14402, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 1, 1993, Ser. No. 244,359

Claims priority, application United Kingdom, Jan. 7, 1992, 9200246

Int. Cl.[6] **C12M** *01/34;* **G01R** *11/52;* **G01N** *11/00*

U.S. Cl. 73—19.01 **38 Claims**



1. A method of determining gas hold-up in a fermentation culture having a concentration of biological cells in a biomass, the method comprising the steps of first prior to aeration and then during fermentation of the culture inputting inputting to the culture electrically coupling an alternating signal of a frequency which is above the range of frequencies at which β dispersion occurs, determining the magnitude of reactive current signal leading voltage in the culture and using measured difference in said magnitudes determined prior to aeration and determined during fermentation as a measure of the gas hold-up.

5,551,282

METHOD AND APPARATUS FOR MEASURING VOLUME CORRECTION USING MOLAR QUANTITIES

William H. Vander Heyden, Mequon, Wis., assignor to Badger Meter, Inc., Milwaukee, Wis.

Filed Mar. 20, 1995, Ser. No. 407,456

Int. Cl.[6] **G01F** *1/86;15/02;* **G01N** *9/00*

U.S. Cl. 73—30.03 **28 Claims**

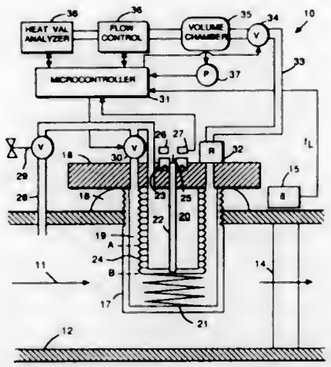
1. A method of measuring volume correction in a gas pipeline for use with a flow meter in the pipeline, .the method comprising:

flowing a sample of pipeline gas into a variable volume chamber while maintaining the gas at temperature and pressure of gas in the pipeline;

flowing the sample gas from said variable volume chamber while varying the volume of said chamber to maintain temperature and pressure of gas remaining in said chamber at the temperature and pressure of gas in the pipeline;

measuring the flow rate of sample gas from said chamber with a flow meter;

calculating the molar density of the pipeline gas from the flow rate of the sample gas over a time period during which said



chamber changes from a first volume to a second volume; and

calculating the volume correction for gas in the pipeline in response to the molar density of the pipeline gas.

5,551,283

ATMOSPHERE MEASURING DEVICE AND FLOW SENSOR

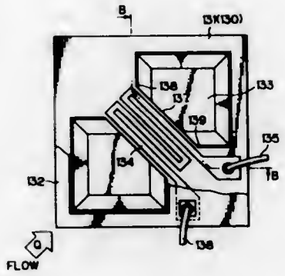
Junji Manaka, and Tetsuo Ishibashi, both of Tokyo, Japan, assignors to Ricoh Seiki Company, Ltd., Tokyo, Japan

Filed Aug. 3, 1994, Ser. No. 285,666

Claims priority, application Japan, Aug. 10, 1993, 5-198148; Aug. 20, 1993, 5-206388

Int. Cl.[6] **G08B** *17/10;* **G01F** *1/68;* **G01N** *25/18*

U.S. Cl. 73—31.010 **20 Claims**



16. A flow measuring method for determining gas flow rate, using two resistors inserted in a gas flow to be measured, comprising:

simultaneously applying one of a first current or voltage at a level below that necessary to induce substantive self-heating to one of the two resistors and one of a second current or voltage to the other resistor at a level greater than that of said one of said first current or voltage and sufficient to induce substantive self-heating;

determining resistance values of the two resistors from said one of said first current or voltage and said one of said second current or voltage;

calculating a difference between the two measured resistance values; and

determining a flow rate of the gas flow from the difference of the two resistance values.

5,551,284

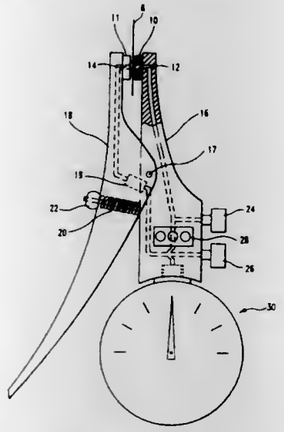
PORTABLE INSTRUMENT AND METHOD FOR MEASURING THE AIR PERMEABILITY OF PLANT LEAVES

William Wenkert, R.D. 1, Box 223-B, Redhook, N.Y.

Filed Feb. 23, 1995, Ser. No. 393,175

Int. Cl.[6] **G01N** *15/08;33/483*

U.S. Cl. 73—38 **3 Claims**



1. A instrument held in one hand for measuring the air permeability of a plant leaf comprising:

air inlet means which is placed over at least a part of a leaf surface and air outlet means which is placed over at least a part of the opposite surface;

means for holding the air inlet and air outlet means in place on the surfaces of the leaf while measurements of the air permeability between the air inlet and the air outlet are taken;

pump means for introducing pressurized air in order to pressurize the air inlet;

means for measuring the pressure of air at the air inlet;

means for releasing the pressurized air from the air outlet;

means for timing any change in air inlet pressure while the air outlet means remains closed; and

means for timing any change in air inlet pressure after the air outlet means is opened.

5,551,285

LEAK CHECKER DATA LOGGING SYSTEM

Jeffrey C. Cannon, Arlington, Tex., and John J. Payne, Waterman, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 18, 1994, Ser. No. 245,272

Int. Cl.[6] **G01M** *3/20*

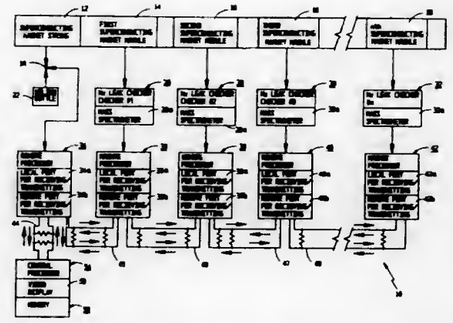
U.S. Cl. 73—40.7 **24 Claims**

1. Apparatus for detecting and locating leaks in a closed system having a plurality of coupled, sealed modules containing a confined fluid, said apparatus comprising:

a plurality of remote detectors each coupled to a respective module and including a mass spectrometer for detecting escape of the confining fluid from the closed system;

a plurality of remote processing means for receiving, storing and transmitting data where each of said processing means is coupled to a respective one of said remote detectors;

a means for serially linking said plurality processing means one to another with a first processing means being coupled to a central processing unit and where said linking is accomplished by a plurality of twisted pairs of conductors each coupling adjacent pairs of remote processors,



and where said central processing unit provides a means for receiving an output signal and providing an operator of the system with an indication of escape of the confined fluid from the closed system and for providing operator initiated control inputs to said remote processors.

5,551,286

DETERMINATION OF DRILL BIT RATE OF PENETRATION FROM SURFACE MEASUREMENTS

Anthony K. Booer, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, Sugar Land, Tex.

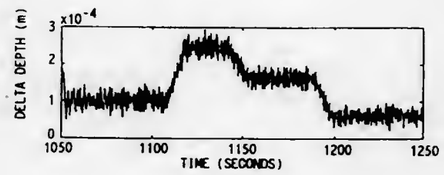
PCT No. PCT/GB93/00368, § 371 Date Nov. 21, 1994, § 102(e) Date Nov. 21, 1994, PCT Pub. No. WO93/17219, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 22, 1993, Ser. No. 290,940

Claims priority, application United Kingdom, Feb. 22, 1992, 9203844

Int. Cl.[6] **G01B** *05/18;* **G06F** *17/15;* **E21B** *45/00*

U.S. Cl. 73—152.45 **1 Claim**



1. A method of determining the rate of penetration Δd of a drill bit at the end of a drill string while drilling a well, comprising:

(a) installing and connecting compatible components of mechanical drill bit hardware, electronic instruments, and a computer program system to a drill string that is to be lowered into a well at a known rate observed relative to the surface;

(b) measuring while drilling a value S, representing the noise distorted actual vertical displacement s of the drill string at the surface;

(c) formulating a mathematical model to describe the vertical displacement of the drill string within the well in terms of certain chosen physical parameters pertaining to the drilling with drill bit hardware, the electronic instruments, and a mode of drilling operation, such as drill string compliance, hookload, hookload rate, and an error due to noise distortion contributions from electrical noise, mechanical vibrations and/or as representing random state fluctuations,

wherein said mathematical model is a mathematical state space model of the evolving system, comprising a state space measurement equation for the state parameters S, s taken at different times for consecutive or adjacent samples k(i)= k+i, where i is equal to 1,2,3, . . . last data sample;

$$S = [1\,0\,0\,0]\begin{bmatrix} s \\ \Delta s \\ \Lambda \\ \Delta d \end{bmatrix} + \rho$$

wherein S, Δd, and s are as previously defined, Δ is the difference operator for time τ between adjacent samples k and k+1, Λ is the drill string compliance, and p is the noise term associated with the surface displacement measurement corresponding to the drill bit penetration,

and a state evolution equation;

$$\begin{bmatrix} \sigma \\ \Delta\sigma \\ \Lambda \\ \Delta\delta \end{bmatrix}_{k+1} = \begin{bmatrix} 1 & \tau & 0 & 0 \\ 0 & 0 & -\Delta h & 1 \\ 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} s \\ \Delta s \\ \Lambda \\ \Delta d \end{bmatrix}_k + r$$

wherein all the symbols are as previously defined, with the additions of r being the noise term associated with fluctuations in the state, h being the hookload, and Δh being the hookload rate over the same time interval τ of change;

(d) applying a Kalman filter to said equations to obtain a noise-compensated estimate of the state parameters S, s; and

(e) using said estimate to determine said actual rate of penetration Δd of said drill bit within the well while drilling said well, absent the effect of said noise distortion.

5,551,287

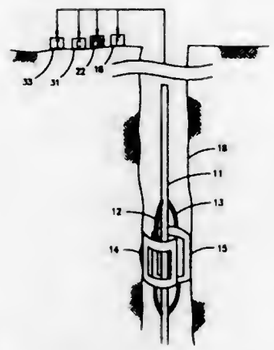
METHOD OF MONITORING FLUIDS ENTERING A WELLBORE

Robert E. Maute, Richardson; Laird B. Thompson, Dallas; Adam Bednarczyk, Carrollton, and David Symmons, Dallas, all of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Feb. 2, 1995, Ser. No. 383,028

Int. Cl.[6] E21B *47/00*; G01V *3/18*

U.S. Cl. 73—152.02 **33 Claims**



1. A borehole logging tool comprising:

a tool body;

a sensor pad, mounted on said tool body to be near said borehole wall said sensor pad being open with an opening for allowing fluid flow therethrough said sensor pad from a surrounding earth formation into said borehole for measuring a parameter of the fluid at the wall of said borehole.

5,551,288

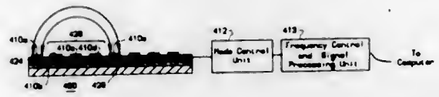
MEASURING ICE DISTRIBUTION PROFILES ON A SURFACE WITH ATTACHED CAPACITANCE ELECTRODES

Joseph J. Geraldi; Gail A. Hickman, both of Dryden; Ateen A. Khatkhate, and Dan A. Pruzan, both of Ithaca, all of N.Y., assignors to Innovative Dynamics, Inc., Ithaca, N.Y.

Continuation of Ser. No. 28,436, Mar. 9, 1993, Pat. No. 5,398,547, which is a continuation-in-part of Ser. No. 518,043, May 4, 1990, Pat. No. 5,191,791, which is a continuation-in-part of Ser. No. 295,722, Jan. 10, 1989, Pat. No. 5,206,806. This application Mar. 20, 1995, Ser. No. 407,940

Int. Cl.[6] G08B *19/02*; G01R *27/26*

U.S. Cl. 73—170.26 **31 Claims**



1. A device for detecting the ice thickness associated with a surface comprising:

a plurality of spaced electrodes, said plurality of spaced electrodes including at least one selectable positive electrode, at least one selectable ground electrode and at least one selectable guard electrode, wherein a capacitance value associated with said positive and ground electrodes is indicative of the ice thickness associated with said surface; and

control means for selectively setting from said plurality of spaced electrodes one electrode as said positive electrode, one electrode a desired spacing from said positive electrode as said ground electrode and any intervening electrode or electrodes between said positive and ground electrodes as a guard electrode or electrodes, said desired spacing selected such that the capacitance value associated with said positive and ground electrodes saturates at a predetermined minimum ice thickness level.

5,551,289

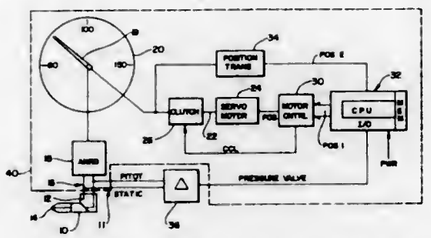
SERVO CONTROLLED AIRSPEED INDICATOR

Ronald M. Miller, Sr., Clearwater, and Brian T. K. Nielson, Seminole, both of Fla., assignors to Aerosonic Corporation, Clearwater, Fla.

Filed Mar. 30, 1995, Ser. No. 413,715

Int. Cl.[6] G01C *21/00*

U.S. Cl. 73—182 **6 Claims**



1. An airspeed indicator having needle connected to an aneroid drive responsive to static and pitot pressure, comprising by:

first means, electrically operable by a first signal, for transmitting an input force to the needle to overriding the aneroid means;

second means responsive to a position signal for providing said force to the first means; and

signal processing means for providing the position signal, as a function of the static and pitot pressure and a feedback signal indicating needle position, to position the needle at a particular location to indicate an airspeed computed for said static and pitot pressure from stored values and for providing the first signal if one or more stored tests are satisfied.

5,551,290

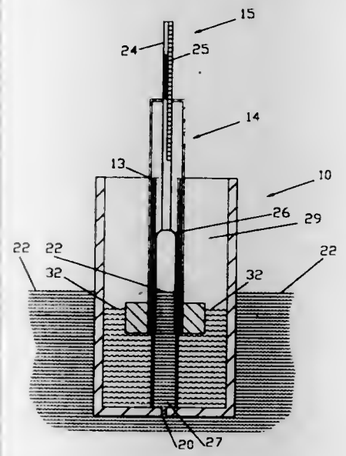
LEAK DETECTOR

Bill Spiegel, 1412-SE. Carnahan Ave., Arcadia, Fla. 33821

Filed Jun. 10, 1994, Ser. No. 258,440

Int. Cl.[6] G01M *3/04*; G01F *23/30*

U.S. Cl. 73—311 **2 Claims**



1. A liquid level indicating device for detecting a leak in a liquid container that is open to the effects of rain and evaporation, said device comprising:

an outer cylinder suspended in a liquid in a container and partially submerged in said liquid in said container, said outer cylinder having a bottom with a hole formed vertically through the center and an inner tube having a bottom edge fastened to said bottom thereby forming an inner chamber above said hole for holding a volume of said liquid at the liquid level of said container, and an environmental compensation chamber formed between said inner tube and said outer cylinder for holding a reference volume of liquid to measure environmental changes in liquid volume,

an environmental indicator tube having a first end and a second end, and having a top edge cap at said first end for providing a reference point for taking readings, and a float fastened to said second end, said environmental indicator tube being inserted on and sliding over said inner tube and floating on said reference volume of liquid, and responding only to environmental changes,

an inner floating indicating gauge inserted in said inner chamber and consisting of a rod having a first end with graduated lines formed thereon for indicating liquid level, said indicating gauge being inserted in, and guided by said environmental indicator tube top edge cap reference point, and a second end of said rod having a float formed thereon and floating on said container level volume of liquid at the level of the container liquid, said indicating gauge responding to gross liquid level changes in the container,

whereby a net difference of liquid levels of said inner chamber and said environmental compensation chamber is indicated on said inner floating indicating gauge graduations by the change in relationship with said environmental indicator top edge cap.

5,551,291

TONE WHEEL FOR ROTATIONAL SPEED DETECTION UNIT

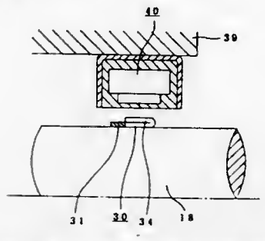
Kouichi Morita, Yokohama, Japan, assignor to NSK Ltd, Tokyo, Japan

Filed Mar. 8, 1995, Ser. No. 400,986

Claims priority, application Japan, Mar. 8, 1994, 6-037015

Int. Cl.[6] G01P *1/02*

U.S. Cl. 73—494 **1 Claim**



1. A tone wheel for use in detecting a rotational speed of a rotating member, the tone wheel being made by bend-forming a magnetic metal plate, and comprising an annular portion supported by the rotating member and having a rim, and a plurality of fingers protruding in a comb teeth fashion from the rim of the annular portion and arranged intermittently in a circumferential direction therearound, the fingers having end portions bent approximately 180 degrees by bending the magnetic metal plate back so that each finger includes at least two layers overlapping each other, such that each of the fingers has a thickness of at least two times the thickness of the magnetic metal plate.

5,551,292

ANGULAR VELOCITY DETECTION CIRCUIT FOR VIBRATORY GYROSCOPES

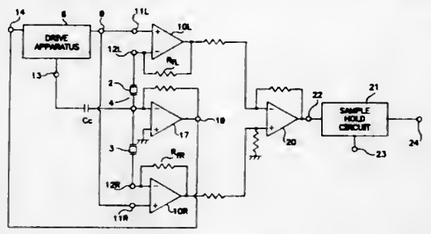
Kokichi Terajima, Tokyo, and Shinichi Aotsu, Urawa, both of, Japan, assignors to Akai Electric Co., Ltd., Tokyo, Japan

Filed Jan. 10, 1995, Ser. No. 371,028

Claims priority, application Japan, Mar. 22, 1994, 6-050103

Int. Cl.[6] G01P *3/00*

U.S. Cl. 73—504.12 **2 Claims**



1. An angular velocity detection circuit for a vibrating gyroscope comprising,

(a) a detection circuit, and

(b) a vibrator having a vibration member having a side surface with a resonance point,

(c) first and second piezo-electric elements on said side surface, each one of said piezo-electric elements having a first electrode and a second electrode, wherein said detection circuit detects differences in currents flowing in said first and second piezo-electric elements under a resonance state, and

(d) a sample and hold circuit, wherein said sample and hold circuit samples and holds an output of said detection circuit at a time when displacement velocity of said vibrator becomes zero and angular velocity based on the output of said sample and hold circuit is detected.

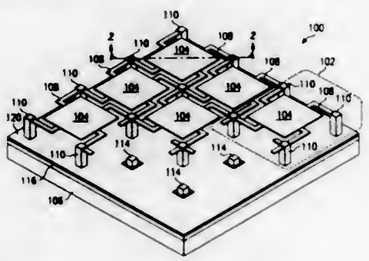
5,551,293
MICRO-MACHINED ACCELEROMETER ARRAY WITH SHIELD PLANE

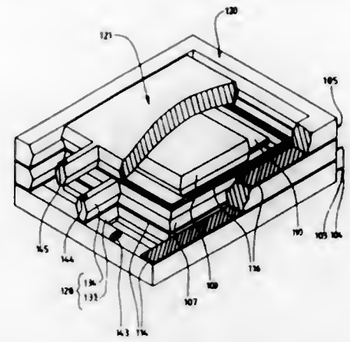
Robert M. Boysel, and Jeffrey B. Sampsell, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 233,838, Apr. 26, 1994, which is a continuation-in-part of Ser. No. 877,841, May 1, 1992, Pat. No. 5,305,640, which is a division of Ser. No. 596,841, Oct. 12, 1990, Pat. No. 5,192,395. This application Jun. 7, 1995, Ser. No. 485,170

Int. Cl.[6] G01P *15/08*

U.S. Cl. 73—514.14 **8 Claims**





1. An accelerometer array comprising:

a plurality of deflection elements, each one of said deflection elements comprising

an inertial mass, and

at least one hinge supporting said inertial mass in a normal position, deflection of said inertial mass occurring as movement of said inertial mass in a first direction out of said normal position by a force applied thereto, said movement storing energy in said at least one hinge,

at least one component selected from the group consisting of said inertial mass and said at least one hinge being different from one of said deflection elements to another in said accelerometer array so that said force applied to said inertial masses by simultaneous acceleration of said plurality of deflection elements deflects some of said inertial masses, respective discrete ranges of acceleration causing the deflection of different respective combinations of said inertial masses;

an electrical circuit for detecting which combinations of said inertial masses deflect and for producing a sensible output representative thereof; and

a shield plane between said electrical circuit and said plurality of deflection elements.

5,551,294
MICROMACHINED MEASURING CELL WITH ARM SUPPORTED SENSOR

Jean Hermann, Neuchâtel, Switzerland, assignor to CSEM-Centre Suisse D'Electronique et de Microtechnique, Neuchatel, Switzerland

Continuation of Ser. No. 152,417, Nov. 16, 1993, abandoned. This application Jan. 27, 1995, Ser. No. 380,144

Claims priority, application France, Nov. 23, 1992, 92 14148

Int. Cl.[6] H01L *21/00*

U.S. Cl. 73—514.32 **13 Claims**

1. A micromachined measuring cell adapted to be mounted on a support and having a sensor comprising a first member, a third member and a second member interposed between said first and third members, said second member comprising a frame and a movable body fixed to said frame by at least one first suspension arm, at least one of said members comprising an electrically conducting element, and said measuring cell comprising an assembly structure separate from said sensor and connected to one side of said sensor by a second suspension arm adapted to support said sensor and extending longitudinally across a space separating all other sides of said sensor from said assembly structure, at least a part of the assembly structure, a part of the second suspension arm and a part of the sensor being connected together to provide an integral piece of said measuring cell.

5,551,295
METHOD AND APPARATUS USING ULTRASONIC AND LIGHT WAVES FOR IDENTIFICATION OF TEST SPECIMENS

Hermann Stockburger, Hebelweg 13, Badenweiler D-7847, Germany

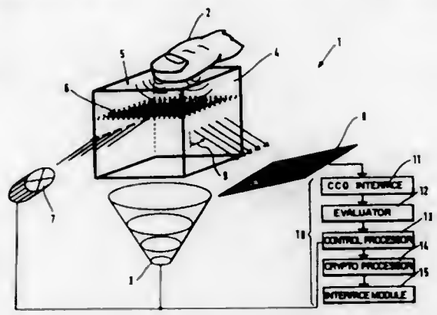
PCT No. PCT/EP93/01659, § 371 Date Jan. 25, 1995, § 102(e) Date Jan. 25, 1995, PCT Pub. No. WO94/01043, PCT Pub. Date Jan. 20, 1994

PCT Filed Jun. 29, 1993, Ser. No. 362,555

Claims priority, application Germany, Jul. 8, 1992, 42 22 387.3

Int. Cl.[6] G01N *29/26;* **G06K** *9/00*

U.S. Cl. 73—602 **17 Claims**



1. A method for determining the authenticity and for identifying the respective spatial structure of a test specimen (2), particularly the epithelial structure of the skin, comprising the steps of:

providing a body (4) having a layer (6), which is transparent to ultrasonic waves and reflects electromagnetic waves, and a surface (5) for supporting the test specimen (2);

placing the test specimen (2) on the surface;

exposing the test specimen (2) to ultrasonic waves traversing the body (4) contiguous with said surface (5) such that the ultrasonic waves are reflected or backscattered by the test specimen (2);

deforming the layer (6) in the body (4) in a locally different and time-dependent way by the ultrasonic waves according to the form and intensity of the backscattered or reflected ultrasonic waves;

exposing said layer (6) to radiation of electromagnetic waves at an angle;

intercepting the electromagnetic waves reflected at an angle of emergence (9) from the layer (6); and

evaluating a change in the reflected electromagnetic waves caused by their reflection at the layer (6).

5,551,296
METHOD AND DEVICE FOR REVEALING DEFECTS IN MATERIALS AND THEIR CONNECTIONS

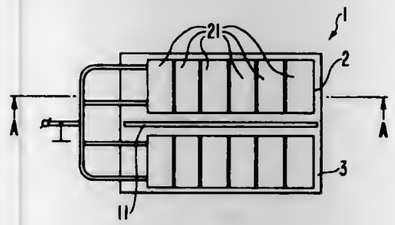
Vladimir Taran, Jerusalem, Israel, assignor to System Testing Materials Ltd., Jerusalem, Israel

Continuation of Ser. No. 57,765, May 7, 1993, abandoned. This application Aug. 28, 1995, Ser. No. 520,174

Claims priority, application Israel, Mar. 17, 1993, 105085

Int. Cl.[6] G01N *29/04*

U.S. Cl. 73—628 **50 Claims**



1. A device for revealing defects in materials and their connections by radiating ultrasonic energy and receiving that energy following its reflection from a product to be tested, comprising:

an ultrasonic energy radiator;

an ultrasonic energy receiver; and

a base for directing ultrasonic energy while appearing substantially transparent thereto, said base having a curvilinear surface section on one side, and an opposite side to be directed toward the product to be tested;

wherein, at least one of said ultrasonic energy radiator and receiver comprises a system of interconnected sub-plates mounted to said curvilinear surface section of said base and approximating the shape thereof.

5,551,297
PIPE CLOGGING DETECTING DEVICE

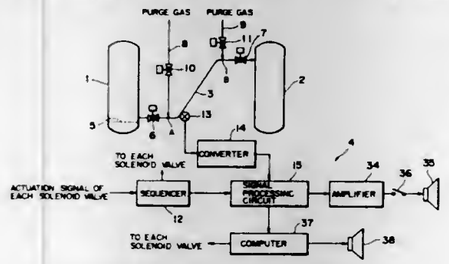
Yasuhiro Miura, Chiba; Yutaka Shiomi, and Mitsuki Sunada, both of Ichihara, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 3, 1993, Ser. No. 160,794

Claims priority, application Japan, Dec. 4, 1992, 4-325515

Int. Cl.[6] G01H *11/08*

U.S. Cl. 73—658 **20 Claims**



1. A pipe clogging detecting device comprising:

a plurality of containers;

a pipe interconnecting said containers, said pipe being susceptible to clogging by a fluid passing through said pipe;

a vibration sensor provided on said pipe, said vibration sensor detecting vibrations generated when the fluid passes through said pipe;

detecting means for detecting occurrence of clogging in said pipe, based on output signals from said vibration sensor; and

purge gas feeding means for feeding purge gas into spaced-apart locations along said pipe for removing a clog;

whereby said purge gas may be alternately applied at said spaced-apart locations to produce a flow through said pipe in a first direction or alternately in a second opposite direction.

5,551,298
IDENTIFICATION OF VIBRATION INDUCED NOISES ON VEHICLES

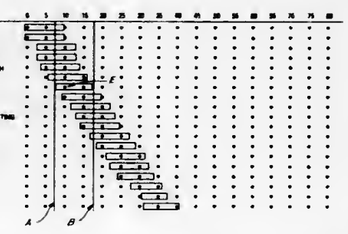
Kevin D. Rayment, Chelmsford, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Mar. 8, 1995, Ser. No. 399,050

Claims priority, application United Kingdom, Mar. 9, 1994, 9404595

Int. Cl.[6] G01M *17/00*

U.S. Cl. 73—669 **17 Claims**



1. An apparatus for identification of vibration induced noises on vehicles, the apparatus comprising wheel supporting means for supporting a vehicle on its wheels, a vibration generator for vibrating the wheel supporting means, control means for controlling the frequency of operation of the vibration generator, data input means for receiving input when a vibration induced noise occurs on the vehicle, data storage means for storing a set of stored data representing frequencies at which known vibration induced noises occur, and comparator means coupled to the data input means and the data storage means for comparing the frequency at which the vibration induced noise occurs with a set of stored data to identify the source of the vibration induced noises.

5,551,299
APPARATUS FOR MEASURING PRESSURE IN A FLUID USING A SEAL DIAPHRAGM AND PRESSURE TRANSMITTING MEDIUM

Mitsuru Tamai; Hironobu Yao, and Masao Saitoh, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kangawa, Japan

Division of Ser. No. 863,113, Apr. 3, 1992, Pat. No. 5,400,655. This application Aug. 25, 1994, Ser. No. 296,151

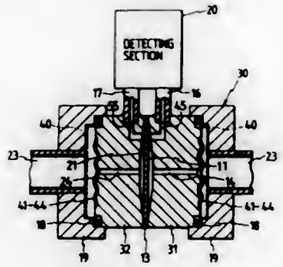
Claims priority, application Japan, Jul. 4, 1991, 3-163171

Int. Cl.[6] G01L *7/00;13/02*

U.S. Cl. 73—706 **2 Claims**

1. An apparatus for measuring pressure in a fluid, comprising:

a pressure transmitting medium contained in the apparatus for transmitting a pressure variation of the fluid to a pressure detecting section;



a seal diaphragm for separating the fluid from the pressure transmitting medium;

a cover for covering said seal diaphragm and thereby forming a pressure introducing space contiguous to said seal diaphragm;

a connecting pipe for fluidly connecting said pressure introducing space with a source of the fluid;

a non-electrically conductive ceramic film coated on a surface of said seal diaphragm for inhibiting the accumulation of hydrogen gas within the apparatus, said non-electrically conductive ceramic film and said surface being on the side of said fluid; and

a corrosion resistant resin material coated on inner surfaces of said cover and said connecting pipe.

5,551,300

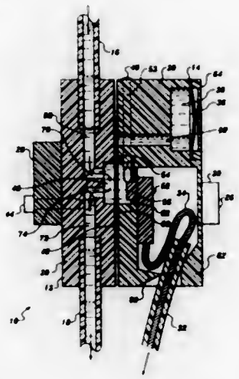
USER-RESTRICTED PASSAGE IN REUSABLE PORTION OF DEVICE FOR MONITORING A PHYSIOLOGICAL PRESSURE

Gerald G. Vurek, Mountain View, and Harlow B. Christianson, San Jose, both of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Dec. 18, 1995, Ser. No. 574,206

Int. Cl.[6] G01L *7/00;* **A61B** *5/02*

U.S. Cl. 73—706 **17 Claims**



9. A disposable device for use in monitoring fluid pressure, comprising:

(a) a housing having an inlet port adapted to couple to a source of a medicinal fluid, and an outlet port adapted to connect in fluid communication with a patient's body;

(b) a chamber formed in said housing, said chamber being in fluid communication with both the inlet port and the outlet port;

(c) an elastomeric membrane that sealingly covers said chamber, defining a side of the chamber; and

(d) a ridge formed on a surface of the housing, adjacent to the chamber and the elastomeric membrane, said ridge extending outwardly from the surface and thereby adapted to interrupt a fluid communication through a passage within a reusable pressure transducer when the disposable device is mated with the reusable pressure transducer for monitoring the pressure of the physiological fluid.

5,551,301

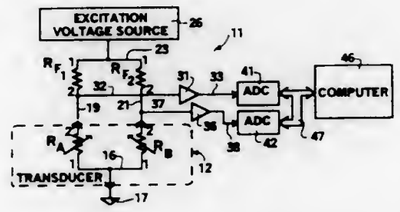
PIEZORESISTIVE PRESSURE TRANSDUCER CIRCUITRY ACCOMMODATING TRANSDUCER VARIABILITY

Mark W. Cowan, Fremont, Calif., assignor to Cardiometrics, Inc., Mountain View, Calif.

Filed Jun. 19, 1995, Ser. No. 492,397

Int. Cl.[6] G01L *19/04*

U.S. Cl. 73—708 **15 Claims**



1. Pressure transducer circuitry accommodating pressure transducer variables for making pressure measurement in a living body comprising a microminiature piezoresistive pressure transducer having first and second variable resistive elements, the pressure transducer being characterized as having a pressure sensitivity ranging from 1.2 to 15 ohms per 1,000 ohms per 100 millimeters of mercury, each having first and second ends, circuitry coupled to the first and second variable resistive elements of the transducer including third and fourth fixed resistive elements external of the transducer and of known values, each having first and second ends, means for connecting the first ends of the first and second resistive elements, means for connecting the second ends of the first and third resistive elements to form a first junction, means for connecting the second ends of the second and fourth resistive elements to form a second junction, means for supplying excitation to the first ends of the third and fourth resistive elements, first amplifier means having an input coupled to the means for connecting the second ends of the first and third resistive elements, second amplifier means having an input coupled to the means for connecting the second ends of the second and fourth resistive elements, a first analog-to-digital converter having an input coupled to the output of the first amplifier means, a second analog-to-digital converter having an input coupled to the output of the second amplifier means, said analog-to-digital converters having independent outputs with digitized voltages thereon having a pressure component and a temperature component and computer means coupled to the outputs of the first and second analog-to-digital converters for ascertaining the unknown resistances of the first and second variable resistive elements as independent variable resistance elements in solving a set of equations having said first and second variable resistance elements as unknowns and pressure and temperature as the remaining unknowns to provide a temperature compensated pressure value as measured by the microminiature pressure transducer.

5,551,302

PORTABLE GAS PURGE AND FILL SYSTEM FOR NIGHT VISION EQUIPMENT

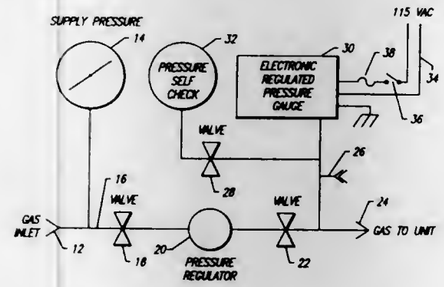
Erasmo Martinez, Torrance, and Earl Winter, Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 7,942, Jan. 25, 1993, abandoned.

This application Feb. 22, 1995, Ser. No. 392,283

Int. Cl.[6] G01L *27/00*

U.S. Cl. 73—714 **4 Claims**



1. A method for portably purging and filling a night vision cooling system comprising the steps of:

providing a portable housing;

providing inlet means within said housing for receiving fluid from a source;

providing outlet means within said housing for communicating said fluid supplied via said inlet means to a night vision cooling system;

connecting an electronic pressure gauge within said housing to said outlet means for measuring the pressure of the fluid at said outlet means;

verifying calibration and operation of said electronic pressure gauge; and

connecting a pressure regulator within said housing and between said inlet means and said outlet means to allow said fluid to flow into said night vision cooling system at a pressure between 500 and 5000 psi.

5,551,303

PRESSURE-MEASURING ARRANGEMENT WITH CONDUCTIVE FOIL SHIELDING

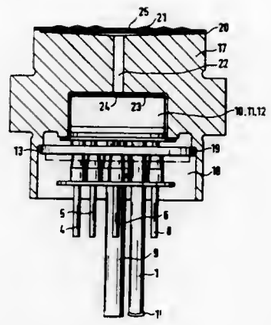
Arno Donner, Fuldabrück; Norbert Gill; Jürgen Lange, both of Vellmar; Volker Schröbel, Heisa, and Rolf Schade, Kassel, all of, Germany, assignors to ENVEC Mess-und Regeltechnik GmbH + Co., Germany

Filed Dec. 5, 1994, Ser. No. 349,608

Claims priority, application European Pat. Off., Dec. 14, 1993, 93810874

Int. Cl.[6] G01L *9/04*

U.S. Cl. 73—726 **12 Claims**



7. A pressure sensor comprising

a diaphragm having an upper surface,

a strain gage situated on the upper surface of the diaphragm, and

an electrically conductive foil situated as close as possible to, and covering but not touching, the strain gage.

5,551,304

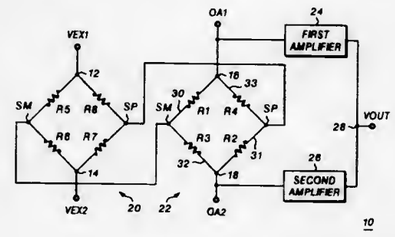
METHOD FOR SETTING SENSING POLARITY OF A SENSOR DEVICE

Ira E. Baskett, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 27, 1995, Ser. No. 549,112

Int. Cl.[6] G01L *1/00*

U.S. Cl. 73—769 **16 Claims**



1. A method for setting a sensing polarity of a sensor device, comprising the steps of:

providing a sensing element coupled to a first sensing output node and a second sensing output node;

providing a switching bridge having a first bridge output node and a second bridge output node, a first branch coupled between said second sensing output node and said first bridge output node, a second branch coupled between said first sensing output node and said second bridge output node, a third branch coupled between said second sensing output node and said second bridge output node, and a fourth branch coupled between said first sensing output node and said first bridge output node, wherein said first branch and said second branch correspond to a first polarity of said sensor device and said third branch and said fourth branch correspond to a second polarity of said sensor device; and

creating an electrical open circuit in said first branch and said second branch to set said sensor device to said first polarity.

5,551,305

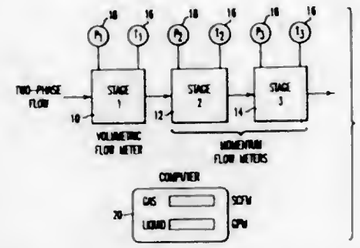
APPARATUS AND METHOD FOR MEASURING TWO- OR THREE- PHASE FLUID FLOW UTILIZING ONE OR MORE MOMENTUM FLOW METERS AND A VOLUMETRIC FLOW METER

David Farchi, Houston, Tex., and Joram Agar, Grand Cayman, Great Britain, assignors to Agar Corporation Inc., Houston, Tex.

Continuation of Ser. No. 852,554, Mar. 17, 1992. This application Jun. 7, 1995, Ser. No. 485,733

Int. Cl.[6] G01F *1/74*

U.S. Cl. 73—861.04 **20 Claims**



1. An apparatus for measuring flow rates of gas and liquid components in a fluid flowing in a flow path, comprising:

a. volumetric flow meter capable of measuring a total flow rate for a fluid and further capable of outputting a corresponding total flow rate signal;

b. first and second momentum flow meters coupled in series in said flow path with said volumetric flow meter for measuring the momentum flux of a fluid and outputting respective first and second momentum signals; and

c. a processor coupled to said volumetric flow meters and said first and second momentum flow meters, said processor capable of determining the flow rate of a gas component and the flow rate of a liquid component by solving predetermined equations for total flow and momentum or energy utilizing said total flow rate signal and said first and second momentum signals.

5,551,306

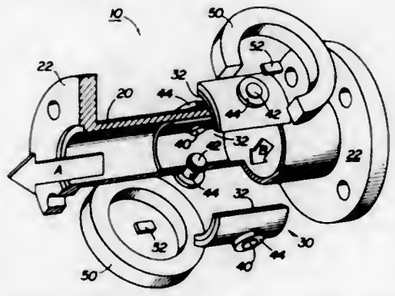
MAGNETIC FLOWMETER

Thomas J. Scarpa, Edinboro, Pa., assignor to Hersey Measurement Company, Spartanburg, S.C.

Filed Dec. 6, 1994, Ser. No. 351,577

Int. Cl.[6] G01F *1/00*

U.S. Cl. 73—861.16 **27 Claims**



1. A flowmeter for measuring the velocity of a fluid, comprising:

a. means for producing a magnetic field transverse to the direction of fluid velocity thereby inducing a voltage potential in the fluid;

b. two primary electrodes in electrical contact with the fluid, spaced apart along a first line transverse to the direction of the magnetic field and transverse to the direction of the fluid velocity a first potential between said primary electrodes corresponding to the induced voltage potential and any background voltage potential therebetween;

c. two secondary electrodes in electrical contact with the fluid, spaced apart along a plane, the plane being parallel to the direction of the magnetic field and also parallel to the direction of the fluid velocity, a second potential between said secondary electrodes corresponding to any background voltage potential therebetween; and

d. signal processing means, responsive to said primary electrodes and said secondary electrodes that subtracts the secondary voltage potential of the secondary electrodes from the primary voltage potential of the primary electrodes for generating a velocity signal representative of the magnitude of the velocity of the fluid.

5,551,307

MASS FLOW MEASURING DEVICE

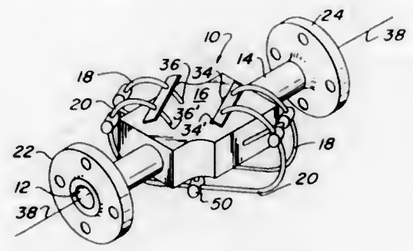
Martin Kane, Linwood, N.J.; Wayne Pratt, Scottsdale, Ariz.; Jozsef Alesz, Budapest, Hungary; Zoltan Biro, Budapest, Hungary, and Zoltan Varga, Budapest, Hungary, assignors to ABB K-Flow Inc., Millville, N.J.

Division of Ser. No. 912,893, Sep. 26, 1986, Pat. No. 5,423,221, which is a continuation-in-part of Ser. No. 809,659, Feb. 11, 1986, Pat. No. 4,716,771. This application Jun. 25, 1990, Ser. No. 543,279

The portion of the term of this patent subsequent to Feb. 11, 2016, has been disclaimed.

Int. Cl.[6] G01F *1/00*

U.S. Cl. 73—861.356 **41 Claims**



1. An apparatus for measuring the mass flow of a fluid within a defined fluid stream comprising: a conduit having an inlet for receiving flow from the defined stream and an outlet for returning flow to the stream, the inlet and the outlet being rigidly fixed with respect to one another, a continuous flexible flow tube communicating with and fixedly mounted at respective ends to the inlet and the outlet, the flow tube formed symmetrical with respect to the inlet and the outlet and having an overall center of gravity juxtaposed to its mounting to the inlet and the outlet; means for vibrating the flow tube transverse to the flow within the flow tube, said vibrating means located at a point on the flow tube that is spaced from but closely adjacent the center of gravity of the flow tube; means for generating signals representative of the motion of the flow tube; and means for determining the mass flow through the conduit by determining the portion of said signals which are a component of the Coriolis reaction of the flow through the conduit.

5,551,308

METHOD AND APPARATUS FOR CONTROLLING A FORCE ASSIST APPARATUS

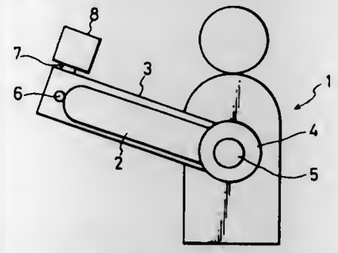
Hirohiko Arai; Kazuo Tanie, and Yasuo Hayashibara, all of Tsukuba, Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Jul. 5, 1995, Ser. No. 498,486

Claims priority, application Japan, Jul. 6, 1994, 6-177471

Int. Cl.[6] G01L *1/00*

U.S. Cl. 73—862.541 **3 Claims**



1. A method of controlling a force assist apparatus worn on a human body, comprising:

separating a force signal relating to a load force imposed on the force assist apparatus detected by a force sensor into a static force component and a dynamic force component,

attenuating the static force by a smaller factor than the factor by which the dynamic force is attenuated,

attenuating the dynamic force by a factor within a range according to actuator output margin in which saturation does not occur,

summing the attenuated signals, subtracting an operating force signal detected by a force sensor from the sum, and

using the total signal as an output command to drive actuators.

5,551,309

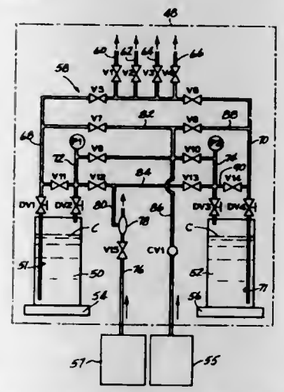
COMPUTER-CONTROLLED CHEMICAL DISPENSING WITH ALTERNATIVE OPERATING MODES

Dirk Goossens, Sint Niklaas, Belgium, and Herman J. Boeglin, South Meriden, Conn., assignors to Olin Corporation, Cheshire, Conn.

Filed Jan. 17, 1995, Ser. No. 374,000

Int. Cl.[6] G02D *7/06*

U.S. Cl. 73—863 **3 Claims**



1. A system for transferring liquid chemicals from a bulk supply thereof to a chemical application station, said system comprising:

a) a plurality of pressurized bulk chemical supply tanks;

b) a volume sensor associated with each of said bulk chemical supply tanks, said volume sensors being operable to monitor the volume of chemical remaining in each of said bulk chemical supply tanks;

c) a chemical supply ampule for receiving chemical from said bulk chemical supply tanks, said ampule being operable to feed chemical to said application station;

d) level detectors associated with said ampule and operable to detect chemical levels in said ampule;

e) a chemical flow path-controlling manifold interconnecting said bulk chemical supply tanks with each other and with said ampule, said manifold including: a first chemical transfer line between said bulk chemical supply tanks; a second chemical transfer line between one of said bulk chemical supply tanks and said ampule; and a third chemical transfer line between another of said bulk chemical supply tanks and said ampule;

f) a plurality of valves in said manifold for selectively opening said first, second or third chemical transfer lines so as to transfer chemical from one of said bulk chemical supply tanks through said first, second or third chemical transfer lines; and

g) microprocessor controller means for selectively operating said system in a fixed/shuttle mode which mode involves the use of a fixed bulk chemical supply tank and the use of a shuttle bulk chemical supply tank, or in a shuttle/shuttle mode which mode involves the use of a plurality of shuttle bulk chemical supply tanks:

h) said microprocessor controller means being programmed, when operating the system in the fixed/shuttle mode: to periodically actuate said valves to open said first chemical transfer line upon receipt of a predetermined signal from one of said volume sensors indicating a need-to-add volume of chemical in the fixed bulk chemical supply tank, and to periodically actuate said valves to open said second chemical transfer line between said fixed bulk chemical supply tank and said ampule upon receipt of a predetermined signal from said level detectors indicating a need-to-add level of chemical in said ampule, and to keep said valves in a condition which holds said third chemical transfer line in a closed condition; and

i) said microprocessor controller means further being programmed, when operating the system in the shuttle/shuttle mode, to periodically actuate said valves to open one of said second and third chemical transfer lines upon receipt of said need-to-add level of chemical signal from said level detectors and, after receipt of a tank-empty signal from one of said volume sensors, to periodically subsequently actuate said valves to open the other of said second and third chemical transfer lines upon receipt of subsequent need-to-add level of chemical signals from said level detectors, and to keep said valves in a condition which holds said first chemical transfer line in a closed condition.

5,551,310

DETECTION DEVICE WITH A GAS DETECTOR ELEMENT

Philip M. Formica, Lübeck; Wolfgang May, Reinfeld, and Lore Evers, Lübeck, all of, Germany, assignors to Drägerwerk AG, Lubeck, Germany

Filed Aug. 16, 1995, Ser. No. 515,811

Claims priority, application Germany, Sep. 10, 1994, 44 32 218.6

Int. Cl.[6] G01N *1/22*

U.S. Cl. 73—863.86 **22 Claims**

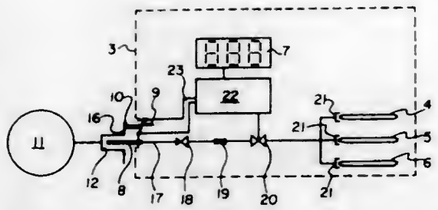
1. A detection device, comprising:

a detector means for analyzing pressurized gases;

a reservoir containing pressurized gas to be analyzed;

coupling means for connecting said detector means to said reservoir for providing a sampling flow from said reservoir to said detector means, said detector means including timing means for determining a duration of a sampling flow; and

switching means connected to said timing means for starting and/or stopping said timing means, said switching means



being actuated upon coupling and/or decoupling said detector means to/from said reservoir.

5,551,311

AIR SAMPLING SYSTEM AND FLOW CALIBRATION SYSTEM FOR SAME

Michael W. Ogden, and David L. Heavner, both of Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed May 26, 1994, Ser. No. 249,487
Int. Cl.[6] G01N *1/16*
U.S. Cl. 73—863.31 **14 Claims**

1. An environmental air sampling system for personal use by a user in an indoor area comprising:
- a pump for drawing indoor area environmental air through at least two different sample collection means;
- a timing system for recording an elapsed time of operation of said pump; and
- a sampler head connected to said pump for holding said at least two different sample collection means, said sampler head comprising:
- a manifold block having a main air passageway fluidly connected to said pump and at least first and second parallel air passageways fluidly connected to said main air passageway; and
- at least two different sample collection means, each fluidly connected to one of said at least first and second air passageways such that said pump simultaneously draws environmental air through said at least two different sample collection means; and
- a calibration system connected to each of said at least two different sample collection means for independently generating at least two different signals representative of air flow through each of said at least two different sample collection means, said calibration system further including a system for storing said at least two different signals.

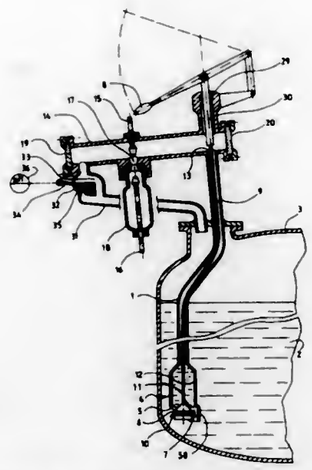
5,551,312

DEVICE FOR SAMPLING AND PUMPING LIQUIDS CONTAINED IN A CHEMICAL REACTION VESSEL, DRUM OR STORAGE TANK

Guy Masson, 5041 Park Forest Dr., Baton Rouge, La. 70816

Continuation-in-part of Ser. No. 196,127, Feb. 17, 1994, Pat. No. 5,450,763. This application Mar. 10, 1995, Ser. No. 401,989
Int. Cl.[6] G01N *1/14*
U.S. Cl. 73—863.810 **12 Claims**

1. A device for collecting a sample of a liquid contained in a vessel, said device comprising, a conduit having a lower extremity disposed in the vessel, a hollow cylinder having a first end in communication with said lower extremity and a second end spaced from the first end, said cylinder being submerged in the liquid to permit a sample of the liquid to flow into the cylinder, said ends of said cylinder defining the length thereof, the second end of the cylinder having a flared extremity formed thereon, a semi-rigid wire passing through the conduit, a piston connected to a terminal end of the wire and movable reciprocally within the cylinder by actuation of the wire, the piston having a seal to matingly engage



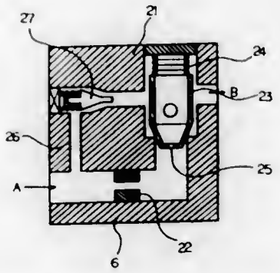
the inner wall of the cylinder, the piston being operable by actuation means connected to said wire external of the vessel to move the piston along the length of said cylinder and thereby move the liquid within the cylinder and through the conduit to a sample collection means.

5,551,313

AUTOMATIC TRANSMISSION SYSTEM FOR HEAVY CONSTRUCTION EQUIPMENT

Deok-Gyu Lee, and Byung-Yun Huh, both of Kyung Nam, Rep. of Korea, assignors to Samsung Heavy Industry Co., Ltd., Rep. of Korea

Filed Oct. 14, 1994, Ser. No. 323,026
Claims priority, application Rep. of Korea, Mar. 31, 1994, 6726
Int. Cl.[6] F16H *61/06*
U.S. Cl. 74—336 R **6 Claims**



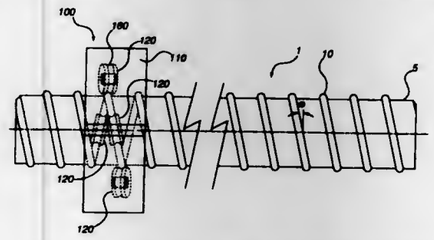
1. An automatic transmission system for heavy construction equipment for changing the rotative speed of an output shaft by selectively engaging any one of a plurality of change gears according to the selection of oil passages of a solenoid valve comprising:
- a speed sensor for sensing at least one of the rotative speed of said output shaft and the running speed of the equipment;
- a converter connected to said speed sensor, for converting a value sensed by said speed sensor into an electrical signal which represents the speed sensed by the speed sensor;
- a controller for receiving the electrical signal output from said converter and comparing the electrical signal with a predetermined stored value, to apply a driving signal to said solenoid valve if said electrical signal received from said sensor, which represents the speed sensed by the speed sensor, is within a predetermined range, so as to shift gears; and
- a flow rate controller installed in said oil passages between said solenoid and said gears, for relieving shocks when shifting gears, said flow rate controller having a fixed orifice and a poppet valve respectively installed in series in the oil passages.

5,551,314

LEAD SCREW AND LINEAR DRIVE ASSEMBLIES USING SUCH LEAD SCREW

Max C. Andrzejewski, Jr., 117 Arden Dr., Glenshaw, Pa. 15116; John D. Steranko, 23 Seneca Dr., Pittsburgh, Pa. 15228, and Richard K. Steranko, 201 Outlook Dr., Pittsburgh, Pa. 15228

Filed Aug. 24, 1994, Ser. No. 294,954
Int. Cl.[6] F16H *55/17*
U.S. Cl. 74—459 **9 Claims**



1. A follower nut for use in a linear drive assembly in conjunction with a lead screw, the lead screw comprising a helical guide means, the follower nut comprising a housing member, the housing member having a bore axially therethrough, the bore having a diameter slightly greater than the diameter of the lead screw, the follower nut further comprising at least three grooved roller ball bearing means, each of the grooved roller ball bearing means comprising a grooved raceway suitable to seat the helical guide means of the lead screw, the grooved roller ball bearing means disposed around the circumference of the bore upon a helical path having a lead substantially the same as a lead of the helical guide means such that the grooved roller ball bearings means contact the helical guide means and provide a bearing surface therefor when the lead screw is threaded through the bore of the follower nut, an axial angle of each grooved roller ball bearing means being equal to a lead angle of the lead screw, the axis of each grooved roller ball bearing means being maintained in a plane parallel to a plane tangent to the lead screw at a point of contact of the grooved roller ball bearing means.

5,551,315

AUTOMATIC GEAR CHANGING SYSTEM

George W. Pikoulas, 105 Ojibwa Dr., Butler, Pa. 16001

Filed Feb. 3, 1994, Ser. No. 191,174
Int. Cl.[6] F16C *1/10*; B62M *9/00*; G06F *15/50*; F16H *7/08*
U.S. Cl. 74—502.2 **15 Claims**

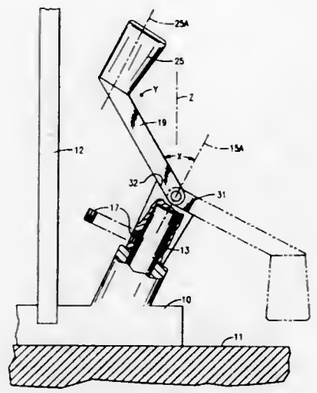
1. In combination with a multi-speed bicycle having at least one front chain wheel, a plurality of rear transmission sprockets, an endless chain trained around the front chain wheel and one of the plurality of rear transmission sprockets and a gear changing assembly adjacent the rear transmission sprockets and from which a rear derailleur cable extends, an automatic gear changing system for selectively derailing the chain from one rear transmission sprocket to another transmission sprocket, comprising:
- a main housing member for mounting to the bicycle;
- a selectively actuated drive motor enclosed within the main housing member;
- a linear actuator threaded shaft disposed within the main housing member which is selectively actuated by the drive motor for rotational motion therein to mechanically initiate chain derailment and transmission gear changing;
- a linear actuator stub mounted to the linear actuator threaded shaft so that the selective rotatable motion of the linear actuator threaded shaft engages the linear actuator stub and causes a predetermined linear reciprocable movement of the linear actuator stub within the main housing member;
- cable attachment means for attaching the rear derailleur cable to the linear actuator stub;
- position indicating means circumjacent a portion of the linear actuator threaded shaft and the linear actuator stub and in which discrete voltage changes are induced by the linear movement of the linear actuator stub interacting with the electromagnetic field of the position indicating means whereby output signals are produced corresponding to the discrete voltage changes; and
- a microprocessor mounted to the bicycle for monitoring the amount of power available to the drive motor and for evaluating the output signals produced by the position indicating means in order to initiate, control, and terminate the automatic derailing of the chain from one rear transmission sprocket to another rear transmission sprocket so that automatic gear shifting occurs.

5,551,316

RETRACTABLE WINDOW CRANK

Jay L. Blank, 74 Summit Ave., Catskill, N.Y. 12414

Filed Jan. 23, 1995, Ser. No. 377,060
Int. Cl.[6] G05G *1/00*
U.S. Cl. 74—547 **2 Claims**



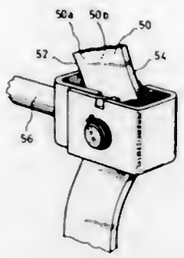
1. In combination with a window pivoting device wherein an axially rotatable actuator stub shaft projects outwardly and upwardly on a sill on the inside of a window, a retractable crank comprising
- a) a socket fitted on the stub shaft in fixed turning engagement therewith with its axis coaxial with the stub shaft,

b) a pair of ears on the end of the socket opposite the stub shaft,
c) a turning arm pivotable on the socket between the ears about a pivot axis perpendicular to the socket axis between operating and retracted positions,
d) a knob on the end of the turning arm opposite the socket and rotatable about a knob axis coplanar with the socket axis parallel to the socket axis in the operating position of the arm,
e) a first flat abutment surface between the ears on the socket perpendicular to the socket axis to locate the turning arm in its retracted position with the knob projecting inwardly toward the window when the turning arm is directed upwardly and projecting downwardly toward the sill when the turning arm is directed downwardly with the socket axis perpendicular to the turning arm, and
f) a second flat abutment surface between the ears on the socket at an included angle with respect to the socket axis locating the turning arm in its operating position over dead center from the retracted position when the turning arm is directed upwardly.

5,551,317
PEDAL DEVICE FOR A MOTOR VEHICLE, PARTICULARLY FOR A BRAKE SYSTEM

Jean-Pierre Gautier; Ulysse Verbo, both of Aulnay Sous Bois, and Miguel Perez Revilla, Argenteuil, all of, France, assignors to AlliedSignal Europe Services Techniques, Drancy, France

PCT No. PCT/FR93/00915, § 371 Date Mar. 20, 1995, § 102(e) Date Mar. 20, 1995, PCT Pub. No. WO94/07715, PCT Pub. Date Apr. 14, 1994
PCT Filed Sep. 22, 1993, Ser. No. 122,559
Claims priority, application France, Oct. 7, 1993, 92 11863
Int. Cl.[6] G05G *1/14*
U.S. Cl. 74—560 **9 Claims**

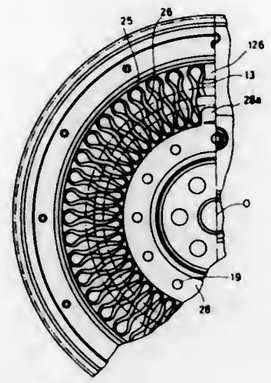


1. A pedal device for a motor vehicle, comprising a first rod having a first end articulated on the vehicle and a second end attached securely to said pedal and a control rod, the control rod having a first end articulated by connecting means on a middle part of the first rod and a second end which interacts with a control assembly, the connecting means comprising a yoke having a base and two substantially parallel arms, said base attached securely to the first end of the control rod, a pivot pin engaged in an aperture of said first rod and in two apertures of said yoke, said first rod engaged between the arms of said yoke and having a first side toward said control rod and a second side, and resilient means bearing against said yoke so as to hold part of a wall of the aperture of the first rod against said pivot pin, characterized in that said resilient means comprises means interacting with the second side of the first rod for substantially immobilizing said first rod in translation relative to said yoke in the direction of said pivot pin.

5,551,318
POWER TRAIN FLYWHEEL ASSEMBLY WITH FLEXIBLE INPUT-SIDE INCORPORATING DAMPING MECHANISM

Hirotaka Fukushima, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Feb. 24, 1995, Ser. No. 393,778
Claims priority, application Japan, Feb. 25, 1994, 6-028140
Int. Cl.[6] F16F *15/10*
U.S. Cl. 74—574 **14 Claims**



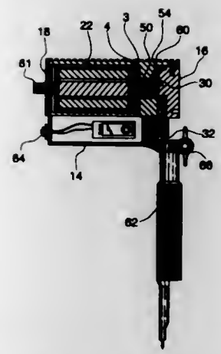
1. A flywheel assembly comprising:
an annular flexible input plate formed from sheet metal, coupleable to a crankshaft of an internal combustion engine;
a sub-plate fixed to said input plate, said sub-plate and said input plate at least partially defining an annular fluid filled chamber;
an annular flywheel rotatably supported on a portion of said annular input plate; and
an elastic spring element disposed inside said annular fluid filled chamber;
wherein said elastic spring element defines at least one choking duct between an inner surface of said annular fluid filled chamber and an axial edge of said elastic spring element, said choking duct creating fluid flow resistance in response to relative rotary displacement between said annular flywheel and said annular input plate, and said elastic spring element elastically connects said annular input plate and said annular flywheel for limited relative rotary displacement therebetween.

5,551,319
DEVICE FOR MARKING AND ARTICLE WITH INK

Darwin Spaulding, Voorheesville; Andrew J. Stanton, and Byron Fleury, both of St. James, all of N.Y., assignors to Spaulding & Rogers MFG., Inc., Voorheesville, N.Y.

Filed Jun. 6, 1995, Ser. No. 470,068
Int. Cl.[6] B43K *5/00*
U.S. Cl. 81—9.22 **24 Claims**

1. A device for marking an article with ink, the device comprising;
a housing having a first end and a second end, said second end of said housing forming a track;
a motor mounted within said housing, said motor including a rotor;
an armature slidably positioned in said track of said housing;
crank means connected to said rotor and for converting rotary motion of said motor into reciprocating motion of said armature in said track;
a needle connected to said armature and reciprocating with said armature, said needle having means for inserting ink below a surface of the article;



needle stabilization means for limiting movements of said needle in a plane substantially perpendicular to said reciprocating motion of said needle caused by one of vibration of said motor and a tolerance between said armature and said track.

5,551,320
SYSTEM FOR THE REMOVING OF THREADED FASTENERS

Bill R. Horobec, and Judy K. Horobec, both of 9114 Canberly Dr., Tampa, Fla. 33647

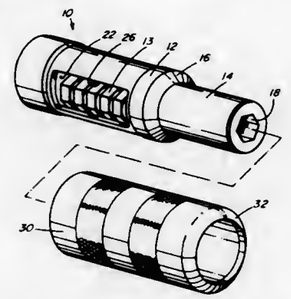
Continuation-in-part of Ser. No. 242,594, May 13, 1994. This application Jul. 24, 1995, Ser. No. 506,199
Int. Cl.[6] B25B *13/50*
U.S. Cl. 81—53.2 **4 Claims**

1. A new and improved device for the removing of threaded fasteners with rounded off heads from nuts comprising, in combination:
a socket head having a partly cylindrical external configuration with an upper end and a lower end and an axis with a first axial length therebetween and with a square recess on the upper end that may receive the end of a ratchet wrench, the lower end of the socket head being fabricated with a major recess of a generally frustroconical configuration with a second axial length constituting more than 50 percent of the first axial length, the major recess having an interior surface formed with a plurality of V-shaped projections integral with the socket and extending radially inwardly from the lower end with V-shaped valleys intermediate the V-shaped projections, thereby forming a plurality of triangles with radially interior teeth, each of the triangles having an apex with two faces of essentially common lengths, the faces of each triangle being offset essentially equally from the radius of the cylinder, the apex of each tooth being angularly oriented with respect to the axis of the cylinder, the axial interior of the major recess, having a smaller diameter than the axial exterior of the square recess, the major recess having a width greater than the diameter of the major recess at its axial interior whereby when placed over a rounded off head of a threaded fastener, a portion thereof will extend beyond the projections, and the socket head is rotated with a ratchet motion, the teeth will pull downwardly over the threaded fastener and bite into its exterior surface to effect a coupling therebetween for rotation of the socket bead and associated threaded fastener to effect its removal.

5,551,321
SOCKET HAVING NUT STORAGE MAGAZINE

Peter Bottiglieri, 20841 Stoney Avenue, Maple Ridge, British Columbia, Canada

Filed May 30, 1995, Ser. No. 453,966
Int. Cl.[6] B25B *13/02*
U.S. Cl. 81—125 **6 Claims**



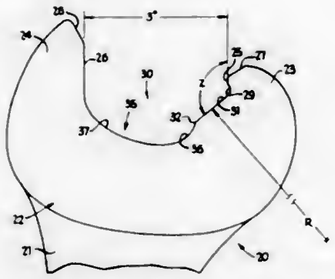
1. A socket for use in unfastening nuts from bolts comprising:
(a) a generally cylindrical body having a first end and a second end, said body having a chamber therein for receiving and holding a plurality of said nuts;
(b) means at said first end for attachment to a drive wrench;
(c) a socket head at said second end having an axial bore therein with inner walls adjacent said second end configured to fit over and engage a nut, said bore extending into said chamber and permitting nuts unfastened by said socket to move through said axial bore into said chamber;
(d) an aperture through a side of said body into said chamber whereby nuts in said chamber may be removed therefrom; and
(e) means for covering said aperture.

5,551,322
SPEED WRENCH

Frank Mikic, and Jeffrey H. Hoff, both of Kenosha, Wis., assignors to Snap-on Technologies, Inc., Crystal Lake, Ill.

Continuation of Ser. No. 276,519, Jul. 11, 1989, abandoned, which is a continuation of Ser. No. 102,504, Aug. 5, 1993, abandoned, which is a continuation of Ser. No. 917,363, Jul. 23, 1992, abandoned. This application Aug. 2, 1995, Ser. No. 510,295
Int. Cl.[6] B25B *13/08*
U.S. Cl. 81—186 **13 Claims**

1. An open-end speed wrench for use in torque applying forward rotation and ratcheting reverse rotation with a fastener having a plurality of substantially flat sides each having the same side dimension and intersecting at a plurality of corners, the fastener having an across sides dimension, said wrench comprising: a wrenching head including two jaws and a throat interconnecting said jaws, said jaws respectively including short and long driving surfaces each shorter than the side dimension and respectively defining first and second driving planes spaced apart a predetermined distance slightly greater than the across sides dimension and respectively disposed for driving engagement with opposed sides



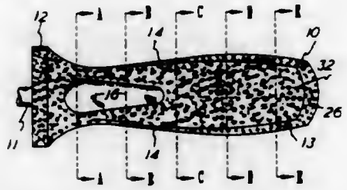
of the fastener, said throat including a generally flat first surface portion adjacent to said short driving surface and inclined with respect thereto at a predetermined angle of at least approximately 120° and having a length substantially 0.29 times said predetermined distance, said first surface portion extending from a first end between said driving planes to a second end spaced from said short driving surface and disposed on the opposite side of said first driving plane from said long driving surface, said throat including means for defining a recessed second surface portion extending from said first surface portion to said long driving surface and shaped and dimensioned so as to remain spaced in use, from an associated fastener which is engaged with said driving surfaces and said first surface portion.

5,551,323

SCREWDRIVER HANDLE

Richard F. Beere, Waterford, and Guy L. Bradshaw, Kenosha, both of Wis., assignors to Beere Precision Medical Instruments, Inc., Racine, Wis.

Filed Mar. 22, 1995, Ser. No. 408,533
Int. Cl.[6] B25G *1/01*
U.S. Cl. 81—489 **3 Claims**



1. A screwdriver handle for use in a sterile medical environment, comprising a core piece of a rigid material of a cylindrical shape along a longitudinal axis and being capable of withstanding a user's hand-gripping force without distortion, a cover encapsulating said core piece and being affixed to said core piece and capable of transmitting hand-applied torque to said core piece, said cover being of silicone rubber material molded onto said core piece and extending therealong in the direction of said longitudinal axis and being of a cross-sectional shape on the plane perpendicular to said longitudinal axis to present various thicknesses extending from said core piece, thereby, providing a plurality of corners and sides for enhancement of hand-gripping, said cover having a completely smooth depression on each of said sides and said depressions being elongated in the direction parallel to said axis and being only in the half of said handle adjacent one longitudinal end of said handle, for receiving the user's thumb during hand-gripping, and said cover has a dimpled exterior which extends throughout substantially all of the exterior surface of said cover except for said depressions and said dimpled exterior has recesses and lands and with said recesses being of a depth only less than one-half the width of said lands, for enhancing gripping and sterilization, and said dimpled exterior consists of forty per cent thereof being depressed and the remaining sixty per cent being raised to lie along one outermost plane of said cover's exterior surface.

5,551,324

METHOD AND DEVICE FOR COOLING THE MACHINE ZONE USING IONIZED GASEOUS CUTTING FLUID

Izyasiav D. Akhmetzyanov, Moskovsky prospekt, 52,kv.57, Russian Federation, and Atik Zamman, Kutuzovsky prospekt, 2/1, kv. 686, Moscow, Russian Federation

PCT No. PCT/RU93/00110, § 371 Date Jun. 25, 1994, § 102(e) Date Jun. 25, 1994, PCT Pub. No. WO94/07631, PCT Pub. Date Apr. 14, 1994
PCT Filed May 17, 1993, Ser. No. 244,307
Claims priority, application Russian Federation, Oct. 7, 1992, 5060170
Int. Cl.[6] B23Q *11/10*; B23B *1/00*
U.S. Cl. 82—111 **5 Claims**

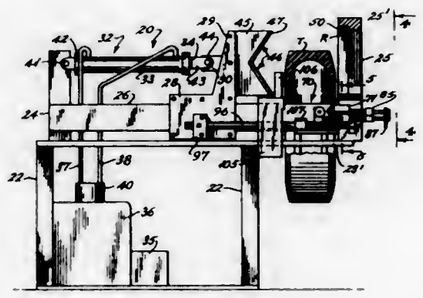
1. A method for cooling a machining zone, wherein a gaseous cutting fluid is fed to the machining zone, said cutting fluid having been treated in an ionizer in a field of a corona discharge, CHARACTERIZED in that the gaseous cutting fluid is fed to the machining zone at a flow rate not below the cutting speed and a controlled electric current is used for initiating the corona discharge, an intensity of the electric current being varied in accordance with a change in the flow rate of the gaseous cutting fluid.

5,551,325

TIRE CUTTING MACHINE

Donald Schutt, 1520 Waukazoo Dr., Holland, Mich. 49424

Filed Oct. 13, 1994, Ser. No. 322,762
Int. Cl.[6] B26D *1/09;5/22;7/02*
U.S. Cl. 83—133 **19 Claims**



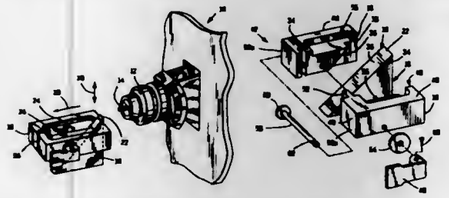
1. An apparatus for reducing a tire having an inner bead portion and an outer sidewall portion to pieces comprising, a support means, a guide means supported by said support means and having first and second end portions, a slide means mounted relative to said guide means, power means connected to said slide means for reciprocately moving said slide means relative to said guide means, said slide means including a tire severing means extending toward said second end portion of said guide means, a die means mounted adjacent said second end portion of said guide means, indexing means for engaging a tire which has been positioned about said second end portion of said guide means between said severing means and said die means, said severing means having at least one cutting edge which cooperates with said die means for severing a portion of a tire positioned therebetween, and means for activating said indexing means to rotate a tire positioned between said severing means and said die means, said indexing means including a pair of indexing wheel means for cooperatively engaging the bead portion of a tire therebetween, said means for activating said indexing means including drive means for intermittantly rotating at least one of said indexing wheel means when said severing means is spaced from said die means, and means for activating said power means.

5,551,326

ADHESIVE-LESS MICROTOME BOAT

Steven L. Goodman, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Dec. 15, 1994, Ser. No. 356,422
Int. Cl.[6] G01N *1/06*
U.S. Cl. 83—167 **8 Claims**



1. A reusable microtome boat that may be attached to a microtome knife, the knife having an upper surface, an upper edge of the upper surface forming a cutting edge, the boat comprising:

(a) two upstanding, opposed, and spaced apart sidewalls having oppositely facing front and rear edges, each side wall forming an interface surface, the side walls joined at the rear edges by an upstanding rear wall, the rear wall having a lower edge shaped to fit against the upper surface of the knife at a first interface spaced apart from the cutting edge when the front edges of the upstanding sidewalls are positioned adjacent the cutting edge of the knife and the interface surfaces abut the knife at second and third spaced apart interfaces, respectively, so that the upper surface of the knife forms a fourth wall joining the front edges of the upstanding sidewalls, the rear wall, side walls and upper surface together forming an upwardly open trough;

(b) a compression means for urging the upstanding sidewalls against the knife at the second and third interfaces with a predetermined force; and

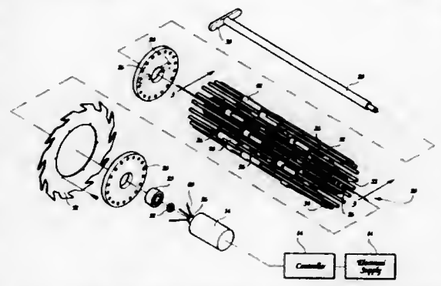
(c) an elastomeric sealing material positioned on the two upstanding side walls at the second and third interfaces and on the rear wall at the first interface so as to create a releasable liquid tight seal between the knife and the upstanding walls and the rear wall when the upstanding side walls are held against the knife by the force.

5,551,327

ADJUSTING MEANS FOR MULTI-BLADE CUTTING APPARATUS

William D. Hamby, 541 Legion Rd., and James T. Clark, 125 Timber La., both of Lenoir, N.C. 28645

Filed Aug. 22, 1994, Ser. No. 294,601
Int. Cl.[6] B23D *45/10*
U.S. Cl. 83—508.3 **19 Claims**



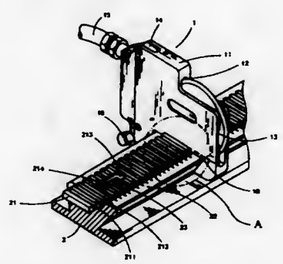
1. In a cutting apparatus having multiple cutting implements supported at spacings from one another on a common drive member for making multiple correspondingly spaced parallel cuts in a workpiece, means for selectively adjusting the spacings between the cutting implements for selectively making differently spaced cuts in workpieces, the adjusting means comprising an elongate support member, a plurality of electrical drive devices, each drive device being mounted to the support member for lengthwise movements along the support member and being arranged in operative association with a respective one of the cutting implements to correspondingly move the associated cutting implement along the common drive member, and means associated with the support member for supplying electrical power to each drive device.

5,551,328

CUTTING APPARATUS

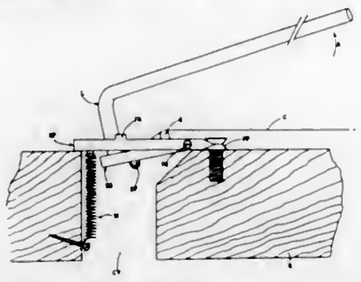
Yuan-Chang Hsu, 4F, No. 13, Lane 277, Chung Shan Rd., Taipei Hsien, Taiwan

Filed Jan. 18, 1995, Ser. No. 374,176
Int. Cl.[6] B26D *1/00*
U.S. Cl. 83—508.3 **4 Claims**



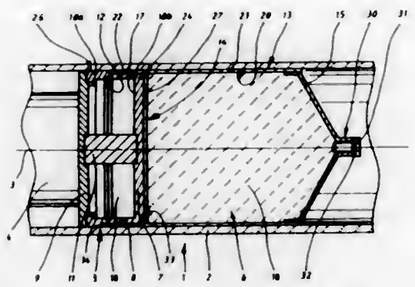
1. A cutting tool comprising a dovetailed tool rest having a dovetail platform, and a row of cutting tools having a respective dovetail groove engaged with said dovetail platform, wherein a rack is mounted on said dovetail platform and engaged with the dovetail groove of each cutting tool, said rack having two oblong mounting holes longitudinally disposed near two opposite ends thereof and respectively fixed to said dovetail platform by a respective screw bolt; two scales are made on said dovetail platform at two opposite sides by said rack; the position of said rack on said dovetail platform can be adjusted longitudinally by means of loosing the screw bolts from said oblong mounting holes.

5,551,329
STABLE THREMOLO SYSTEM FOR STRINGED MUSICAL INSTRUMENTS AND RELATED ADJUSTMENT DEVICE
Antonio Iovane, Via Brescia N. 13, 80034 Marigliano, Italy
Filed Dec. 15, 1994, Ser. No. 358,146
Claims priority, application Italy, Dec. 21, 1993, NA93A0030
Int. Cl.[6] G10D *3/00*
U.S. Cl. 84—313 **9 Claims**



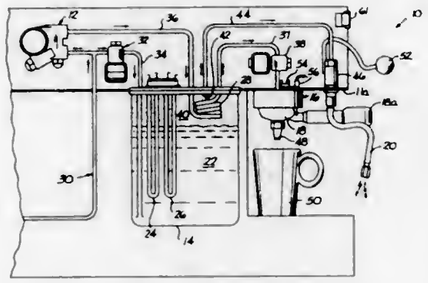
1. Tremolo-bridge system for a stringed instrument including an instrument body and strings, said tremolo-bridge system comprising saddles for said strings, said saddles being rotatable about each of two rotation axes; a tremolo arm and means for rotating said saddles about a selected one of the two rotation axes according to a selected travel direction of the tremolo arm.

5,551,330
DISPERSIBLE COUNTERMASS SYSTEM FOR A RECOILLESS WEAPON
Marc Reuche, La Chapelle Saint Ursin, France, assignor to Luchaire Defense SA, Versailles, France
Filed Dec. 20, 1994, Ser. No. 359,607
Claims priority, application France, Dec. 22, 1993, 93 15418
Int. Cl.[6] F41A *1/08*
U.S. Cl. 89—1.701 **16 Claims**



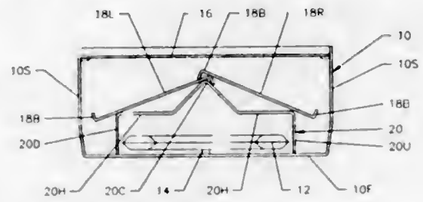
1. A dispersible countermass system for a recoilless weapon, designed to be installed in a weapon barrel and to be ejected on firing through a rear portion thereof by a piston driven by pressure of the combustion gases of a propellant charge while a projectile is simultaneously being launched towards the front portion of the barrel, the system comprising a charge of dispersible and inert matter disposed inside a case that is closed by a cover and by an end, wherein the case is formed by a cylindrical wall that fits inside the barrel and that is prevented from moving in translation relative thereto, wherein the end of the case is formed by a partition connected to the case by connection means, wherein the cover is connected to the case via connection means, and wherein the connection means of the end and the cover to the case are ruptured by the piston on firing, the case serving to guide the piston which has a peripheral rim that remains in contact with the case so as to provide sealing for the gases, the piston thus serving to eject the inert matter from the barrel.

5,551,331
ESPRESSO APPARATUS WITH IMPROVED HEATING OF THE BREW HEAD AND BOILER
Thomas J. Pfeifer, Louisville, Ky., and Ziv S. Rotlevi, Fresh Meadows, N.Y., assignors to Grindmaster Corporation, Louisville, Ky.
Filed May 15, 1995, Ser. No. 440,889
Int. Cl.[6] A47J *31/54*
U.S. Cl. 99—280 **11 Claims**



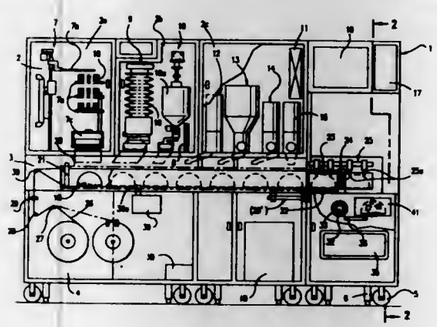
1. An espresso machine including
a boiler connected to a water source for containing water,
a first heating element within said boiler for heating the water to form steam in a steam zone above said water,
a heat exchanger positioned within said steam zone of said boiler,
a pump connected to the water source for supplying water under pressure to said heat exchanger,
a brew head for receiving water from said heat exchanger, and
means for heating said brew head while receiving water from said heat exchanger including a heating element mounted within said brew head and a thermostat sensing device mounted on said brew head for detecting when said brew head is below a predetermined temperature, said heating element in response to said thermostat sensing device heating said brew head when below said predetermined temperature.

5,551,332
BARBECUE WITH SUPPORT STAND FOR SMOKE PLATES
Theodore J. Beatty, 110B Valley Oaks Dr., Visalia, Calif. 93292
Filed Aug. 23, 1995, Ser. No. 518,193
Int. Cl.[6] A47J *37/00;37/07*
U.S. Cl. 99—446 **20 Claims**



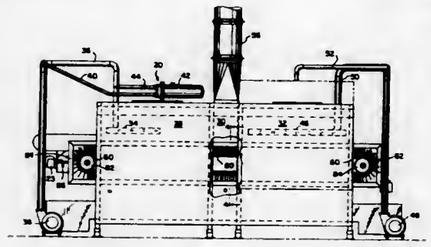
1. A barbecue, comprising:
a housing having a floor,
a burner in said housing, said burner having a predetermined height and being mounted above said floor,
a food-holding grill above said burner,
a stand supporting a smoke-generating plate arrangement between said burner and said grill, said stand comprising
a base portion on at least one side of said burner for supporting said stand on said floor,
a leg portion extending up from said base portion on said side of said burner to a first height above said predetermined height,
said leg portion having an upper part,
a support portion extending from said upper part of said leg portion over said burner, said support portion adjoining said leg portion to form a shoulder projecting portion at said predetermined height, said support portion having a top projecting portion above said burner at a second height above said first height,
whereby said smoke-generating plate arrangement can be positioned in a sloping manner on said shoulder projecting portion and said top projecting portion.

5,551,333
AUTOMATIC COOKING APPARATUS
Hisashi Goto; Tatsuya Hirano, and Shinichi Kobayashi, all of Mie, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan
Filed Oct. 20, 1995, Ser. No. 546,440
Claims priority, application Japan, Oct. 27, 1994, 6-263414; Feb. 28, 1995, 7-064828
Int. Cl.[6] A21C *9/00;11/00;* **A23P** *1/00*
U.S. Cl. 99—450.6 **9 Claims**



1. An automatic cooking apparatus, comprising:
wrapping paper supply means for supplying an elongated wrapping paper,
wrapping paper folding means situated adjacent to the supply means, said folding means folding the wrapping paper along a center line thereof into a V-shape,
wrapping paper guide means situated adjacent to the folding means and having a wrapping paper entry side and a wrapping paper exit side, said guide means guiding and holding the wrapping paper folded into the V-shape,
wrapping paper transferring means situated adjacent to the guide means, said transferring means consecutively transferring the wrapping paper situated in the guide means in a predetermined pitch,
shell storing and delivery means disposed above the guide means at the wrapping paper entry side thereof, said storing and delivery means being adapted to supply a shell folded in half one by one into the wrapping paper whenever the wrapping paper is advanced stepwise,
a plurality of stuff storing and delivery means disposed above the guide means and from a portion adjacent to the shell storing and delivery means in a row toward the wrapping paper exit side, said storing and delivery means supplying a predetermined amount of stuffs into the shell in order whenever the wrapping paper is advanced stepwise to thereby complete a food item,
first wrapping paper sealing means situated adjacent to the stuff storing and delivery means, said first sealing means jointing a periphery of the wrapping paper outside the food item,
wrapping paper cutting means for cutting the wrapping paper, said cutting means being situated adjacent to a portion selected from the group consisting of the wrapping paper folding means and first sealing means, and
product transferring means situated near the first sealing means, said product transferring means guiding the food item wrapped by the wrapping paper toward a product delivery port.

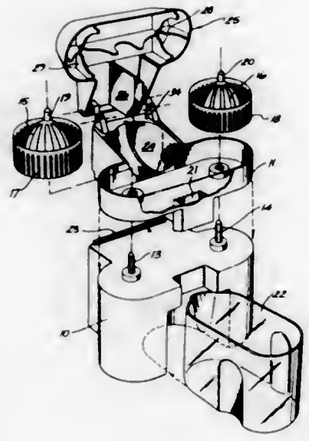
5,551,334
PASTEURIZER
Daniel J. Cody, Prairie du Sac, Wis., assignor to DEC International, Inc., Madison, Wis.
Filed Sep. 29, 1994, Ser. No. 315,229
Int. Cl.[6] A23B *4/00;4/03*
U.S. Cl. 99—470 **20 Claims**



1. A meat product pasteurizer comprising in combination:
a first conveyor transporting a cooked and packaged seat product to a loading station;
a pasteurizing processing chamber comprising a fluid media heating zone, an intermediate zone, and a fluid media chilling zone, said intermediate zone being located between said heating zone and said chilling zone;
a second conveyor transporting said meat product from said loading station through said heating zone, then through said intermediate zone, and then through said chilling zone to an unloading station;
a third conveyor transporting said meat product from said loading station to a blow-off station for removing surface fluid from said packaged meat product,
wherein said second conveyor comprises a plurality of flights formed by paddles extending from a conveyor belt and defining pockets receiving said meat product between adjacent paddles, said pockets having a first narrow width during the conveyor run through said heating zone and through said intermediate zone and through said chilling zone, and having a second wider width at said loading and unloading stations.

5,551,335
CITRUS JUICER
Stephen J. McClean, Beverly Hills, Australia, assignor to Breville R & D Pty Ltd., Pyrmont, Australia
Filed Mar. 25, 1994, Ser. No. 217,688
Claims priority, application Australia, Apr. 29, 1993, PL8559
Int. Cl.[6] A23N *1/00*
U.S. Cl. 99—504 **5 Claims**

1. A citrus juicer, comprising a base; an electric motor accommodated in said base; a pair of upstanding spindles driven by said electric motor and each having a top provided with a juicing cone; a container for collecting juice and arranged so that said juicing cones are located above said container, said container being attached to said base so as to be readily movable from said base for



cleaning; a lid arranged to extend over said juicing cones in said container and being hingedly removably attached to said container, said lid being provided with internal means arranged to apply pressure to a half-citrus fruit placed on top of each of said juicing cones after closure of said lid, said means and said lid being formed as a single piece element composed of plastic and arranged so that when a citrus fruit is placed on top of each said juicing cones and said lid is hinged downwardly said means press simultaneously the halves of the citrus fruit onto said juicing cones in order to cause the juice to be extracted from the citrus fruit.

5,551,336

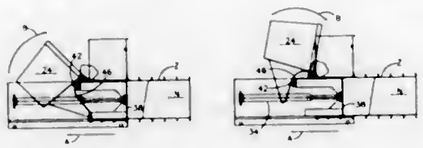
APPARATUS FOR LOADING AND COMPACTING WASTE MATERIAL

Dennis B. Griffin, Erlanger; Mark I. Stein, Florence, and Don F. Greis, Fort Thomas, all of Ky., assignors to Griffin Industries, Inc., Cold Springs, Ky.

Filed Feb. 23, 1995, Ser. No. 392,584

Int. Cl.[6] B30B *15/30*

U.S. Cl. 100—53 **19 Claims**



1. An apparatus for loading and compacting waste material and moving the compacted waste material into a refuse storage unit, comprising:

a housing defining a compression zone;

means for dumping waste material into the compression zone;

means for compacting the waste material in the compression zone; and

an arcuate cam and cooperating cam follower for mechanically connecting said dumping means and compacting means to coordinate operation thereof whereby the waste material is dumped into the compression zone, compacted and then moved into the refuse storage unit.

5,551,337

METHOD AND APPARATUS FOR DETECTING A TYPE OF STENCIL AND CONTROLLING THERMAL PERFORATION ENERGY THEREBY

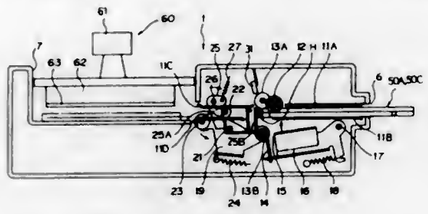
Takashi Miki, Toyoake, and Takashi Okumura, Nagoya, both of, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 30, 1994, Ser. No. 315,497

Claims priority, application Japan, Oct. 28, 1993, 5-270205

Int. Cl.[6] B41C *1/055;1/14*

U.S. Cl. 101—128.4 **33 Claims**



1. A plate making device, comprising:

a stencil plate, the stencil plate being one of at least two types, each type having a unique identifying feature and comprising an ink impermeable layer, a frame, a non-woven cloth impregnated with ink, and a heat sensitive stencil paper;

heat-perforating means for thermally perforating the heat sensitive stencil paper of the stencil plate according to a desired image;

detecting means for detecting the type of the stencil plate based on the unique identifying feature; and

controlling means for controlling perforation energy of said heat-perforating means in accordance with the detected type of the stencil plate.

5,551,338

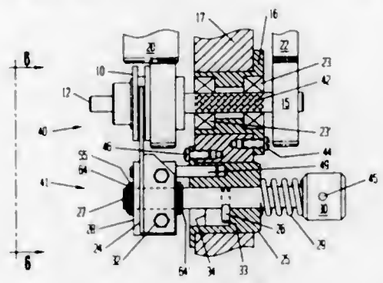
DRIVE DISENGAGING DEVICE FOR AN OFFSET LITHOGRAPHIC SEAL-TYPE DAMPENING SYSTEM

Robert Wall, Prospect Park, and James W. Jakobsen, Bergenfield, both of N.J., assignors to Varn Products Company, Inc., Oakland, N.J.

Filed May 1, 1995, Ser. No. 432,317

Int. Cl.[6] B41F *7/26;7/40*

U.S. Cl. 101—148 **18 Claims**



1. A drive disengaging device for disengaging a seal-type continuous dampening system from the drive train of an offset lithographic printing press; the seal-type dampener including at least two rollers, two seals enclosing the ends of the inward nip of two of the rollers, and a dampener drive gear; the printing press including a plate cylinder, press drive gears and a sideframe supporting the plate cylinder and the press drive gears; wherein the improvement comprises:

a drive shaft, having a first and second end, rotationally supported by the sideframe;

a clutch gear rotationally mounted on the first end of the drive shaft and meshing with at least one press drive gear;

a drive gear secured to the second end of the drive shaft and meshing with the dampener drive gear; and

a means for engaging and disengaging the clutch gear from the drive shaft.

5,551,339

PROCESS AND DEVICE FOR REGISTER-CORRECT POSITIONING OF PRINTING FORM SLEEVES

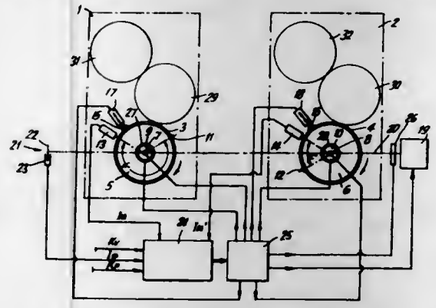
Ralf Schädlich; Klaus Reichenbach; Klaus Koblitz, and Udo Meier, all of Plauen, Germany, assignors to Man Roland Druckmaschinen AG, Offenbach am Main, Germany

Filed Jan. 18, 1995, Ser. No. 373,976

Claims priority, application Germany, Jan. 18, 1994, 44 01 269.1

Int. Cl.[6] B41F *27/00*

U.S. Cl. 101—216 **19 Claims**



1. A process for register-correct positioning of at least one elastically expandable printing form sleeve on at least one printing cylinder of a rotary printing machine with, in each case, a pressure gas cushion producible on respective ones of the printing cylinders for shifting the elastically expandable printing form sleeve, the method comprising the steps of: determining positions of the priming form sleeves fitting tightly through friction sealing on the printing cylinders; individually setting and releasing the respective priming form sleeves to and from the respective printing cylinder using the pressure gas cushion; holding the priming form sleeve; turning the respective printing cylinder relative to the priming form sleeve by an angular deviation to obtain a register-correct position to be realized; and subsequently letting go of the priming form sleeve and setting the priming form sleeve onto the printing cylinder by turning off the pressure gas cushion.

5,551,340

FLEXIBLE BEVELED EDGE PLATE SECURABLE ON A CYLINDER

Hans-Bernhard Bolza-Schünemann; Claus A. Bolza-Schünemann, both of Würzburg; Christian M. M. Fischer, Marktheidenfeld, and Willi A. P. Kutzner, Würzburg, all of, Germany, assignors to Koenig & Bauer-Albert Aktiengesellschaft, Wurzburg, Germany

Filed Aug. 1, 1995, Ser. No. 509,804

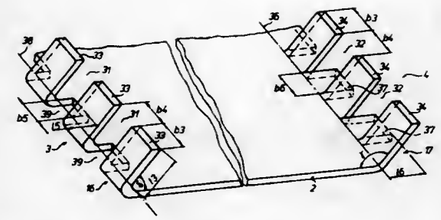
Claims priority, application Germany, Aug. 6, 1994, 44 27 945.0

Int. Cl.[6] B41N *1/00*

U.S. Cl. 101—395 **6 Claims**

1. A flexible plate securable to a cylinder of a rotary printing press comprising:

a flexible plate body;



first and second beveled ends on said plate body, said beveled ends joining said plate body along first and second bending lines which extend across said plate body generally parallel to an axis of rotation of a cylinder on which said plate is securable;

a plurality of spaced fastening tabs formed on said first and second beveled ends;

a plurality of spaced tongues on said first end of said plate, each of said tongues being interposed between two of said first end fastening tabs, said tongues extending out from said plate body beyond said first bending line; and

a plurality of spaced cut-outs on said second end of said plate, each of said cut-outs being interposed between two of said second end fastening tabs, said cut-outs extending into said plate body beyond said second bending line, each of said cut-outs being sized to receive one of said tongues in an interengaged manner.

5,551,341

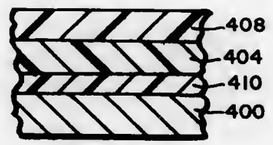
LITHOGRAPHIC PRINTING PLATES FOR USE WITH LASER DISCHARGE IMAGING APPARATUS

Thomas E. Lewis, E. Hampstead; Richard A. Williams, Hampstead; Frank G. Pensavecchia, Hudson; John F. Kline; John P. Gardiner, both of Londonderry, all of N.H.; Michael T. Nowak, Leominster, and Kenneth T. Robichaud, Fitchburg, both of Mass., assignors to Presstek, Inc., Hudson, N.H.

Continuation of Ser. No. 380,805, Jan. 30, 1995, which is a continuation of Ser. No. 159,955, Nov. 29, 1993, Pat. No. 5,385,092, which is a continuation of Ser. No. 917,481, Jul. 20, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 476,706

Int. Cl.[6] B41C *1/08*

U.S. Cl. 101—453 **11 Claims**



1. A lithographic printing member directly imageable by laser discharge, the member comprising:

a. a first solid layer;

b. a second solid layer underlying the first layer;

c. a solid substrate underlying the second layer; and

wherein

e. the first layer and substrate exhibit different affinities for at least one printing liquid selected from the group consisting of ink and an abhesive fluid for ink;

f. the second layer, but not the first layer, is formed of a material being subject to ablative absorption of imaging radiation; and

g. at least one layer disposed beneath the second solid layer reflects imaging radiation.

5,551,342
METHOD FOR CONTROLLING THE INK GUIDANCE IN A PRINTING MACHINE

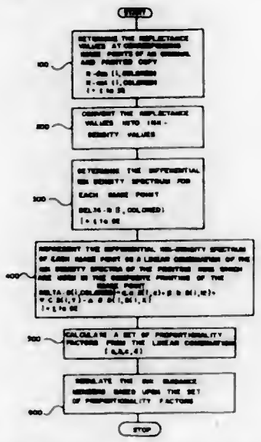
Thomas Fuchs, Muhlheim; Johannes Slotta, Geinhausen, and Dieter Wagner, Heidelberg, all of, Germany, assignors to MAN Roland Druckmaschinen AG, Germany

Filed Dec. 22, 1994, Ser. No. 361,596

Claims priority, application Germany, Dec. 22, 1993, 43 43 985

Int. Cl.[6] B41F *31/05*

U.S. Cl. 101—484 **5 Claims**



1. A method for controlling the ink guidance in an offset printing machine comprising the steps of:

determining desired and actual reflectance values of at least one image point in an original and a printed copy;

calculating desired and actual ink-density spectra from the desired and actual reflectance values of the at least one image point;

calculating a differential ink-density spectrum from the desired and actual in-density spectra;

equating the differential ink-density spectrum with a linear combination of the ink-density spectra of individual printing inks participating in the composite printing of the at least one image point, the linear combination including a plurality of proportionality coefficients equal in number to the number of individual printing inks participating in the composite printing of the at least one image point;

solving the linear combination for the plurality of proportionality coefficients using a regression technique; and

regulating ink-guide members of the offset printing machine in accordance with the sign associated with the plurality of proportionality coefficients to increase or decrease the quantity of the particular ink participating in the composite printing of the at least one image point.

5,551,343
SPECIAL GEOMETRY GENERANT BODIES FOR AUTOMOTIVE GAS BAG INFLATOR

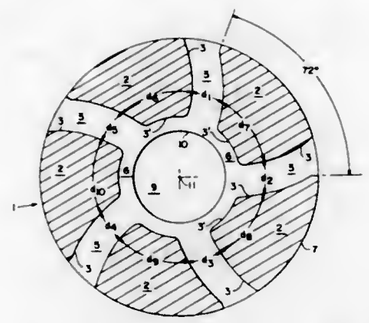
Christopher Hock, Uintah; Brian T. Snyder, Hooper; Linda M. Rink, Liberty, and Guy R. Letendre, Ogden, all of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Jan. 21, 1994, Ser. No. 185,535

Int. Cl.[6] C06B *45/00*

U.S. Cl. 102—288 **16 Claims**

1. In a gas generant wafer comprising a solid body having a plurality of relatively flat-surfaced, alike projections equally spaced and radially equidistant about the periphery of at least one side or face of the wafer thereby defining lower flat-surfaced



sections or spaces between the projections, the improvement wherein each projection is defined by a first arcuate inside wall which is spaced from a second inside wall and both of which walls emanate from the center of the generant wafer curving and flaring outwardly to the peripheral edge of the wafer, and wherein at least one angular arc length of each projection is significantly greater than the angular arc length of each space therebetween.

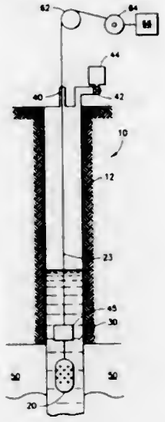
5,551,344
METHOD AND APPARATUS FOR OVERBALANCED PERFORATING AND FRACTURING IN A BOREHOLE

Benoit Couet, Bethel; Luc Petijean, Danbury, and Luis C. Ayestaran, Ridgefield, all of Conn., assignors to Schlumberger Technology Corporation, Ridgefield, Conn.

Continuation-in-part of Ser. No. 975,497, Nov. 10, 1992, Pat. No. 5,355,802. This application Jun. 10, 1994, Ser. No. 258,115

Int. Cl.[6] F42B *3/00*

U.S. Cl. 102—312 **27 Claims**



1. A method of affecting fluid flow in a subterranean formation surrounding a borehole comprising:

(a) containing a fluid column in the borehole;

(b) positioning a non-explosive gas generator in the column at a first location along the borehole:

(c) activating the gas generator such that gas releases and pressurizes a portion of the borehole: and

(d) driving the column generally from the first location towards a second location along the borehole with the released gas such that fluid of the column propagates a fracture into the formation at the second location.

5,551,345
DUAL-CHARGE SMOKE SCREEN SHELL

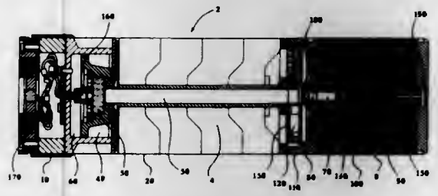
Norbert Wardecki, Heuweiler, and Herwig Feldmeier, March, both of, Germany, assignors to Buck-Werke GmbH & Co., Bad Ueberkingen, Germany, and SM Schweizerische Munitionsunternehmung, Thun, Switzerland

Filed Nov. 3, 1994, Ser. No. 333,632

Claims priority, application Germany, Nov. 4, 1993, 43 37 680.0

Int. Cl.[6] F42B *4/28*

U.S. Cl. 102—340 **20 Claims**



1. A smoke screen shell comprising:

an ejection charge disposed in an ignition chamber;

a slowly burning camouflage charge for generating a lasting fog, said camouflage charge being disposed adjacently to said ignition chamber;

a rapidly burning decoy charge for generating a spontaneous fog, said decoy charge being disposed adjacently to said camouflage charge opposite said ignition chamber;

an ignition system for igniting said ejection charge to discharge said camouflage charge and said decoy charge;

a relief chamber disposed between said camouflage charge and said decoy charge; and

a channel extending between said ignition chamber and said relief chamber;

wherein pressure arising upon ignition of said ejection charge, via said channel and relief chamber, causes a separation of said decoy charge from said camouflage charge and causes a relative difference between a trajectory of said decoy charge and a trajectory of said camouflage charge such that said decoy charge and said camouflage charge land proximally to one another at a target location to such an extent that a collocation of said spontaneous fog and of said lasting fog approaching said former chronologically retarded, said decoy charge being deployed in the air after firing prior to deployment of said camouflage charge.

5,551,346
APPARATUS FOR DISPERSING A JET FROM A SHAPED CHARGE LINER VIA NON-UNIFORM LINER MASS

William Walters, Elkton, and Richard Summers, Conowingo, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 17, 1995, Ser. No. 543,972

Int. Cl.[6] F42B *12/10*

U.S. Cl. 102—476 **5 Claims**

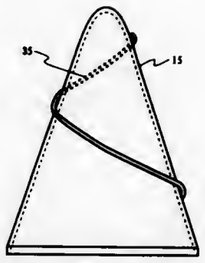
1. A shaped charge round having a disrupted and dispersed jet comprising:

a substantially cylindrical outer casing;

an explosive charge provided within the outer casing; and

a shaped charge liner provided within the outer casing;

wherein the mass of the shaped charge round has been altered by adding a wire having circular cross section in a spiral fashion



about said round so as to locally alter charge to mass ratio so as to alter the collapse of the shaped charge liner upon detonation in a non-axisymmetric manner at certain regions of the shaped charge liner so as to disperse over a wider area the resulting jet emitted by said shaped charge round.

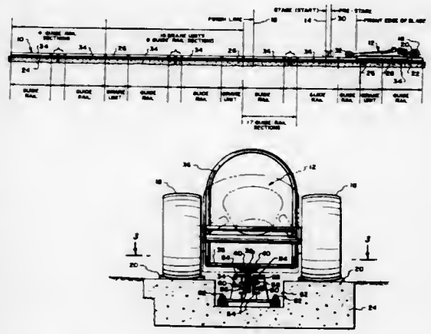
5,551,347
HUMAN AMUSEMENT RIDE

Leroy H. Gutknecht, Las Vegas, Nev., assignor to Newera Capital Corporation, Burnaby, Canada

Filed Apr. 19, 1995, Ser. No. 424,655

Int. Cl.[6] A63G *25/00*

U.S. Cl. 104—53 **10 Claims**



1. A human amusement ride comprising:

a track having a Start position, a Finish position and a braking area located past said Finish position;

a vehicle within which a human is to be located, said vehicle being mounted on said track, said vehicle to move from said Start position to said Finish position and then into said braking area;

a guide rail assembly included within said track, said guide rail assembly being formed of a plurality of separate guide rail sections, each said guide rail section having a longitudinal through slot, said guide rail sections being mounted in an in-line manner with said slots being aligned, said guide rail sections being slightly spaced apart from each other, each said slot terminating in ends;

a guide blade mounted on said vehicle, said guide blade to connect with said slots as said vehicle moves along said track, said guide blade to be continuously in engagement with said slots; and

said track including a retaining channel, a retainer bar mounted on said guide blade, said retainer bar to be located within said retaining channel, said retainer bar to prevent vertical movement of said vehicle sufficient to result in disengagement of said vehicle from said track.

5,551,348

AUTOMATIC CONVEYANCE SYSTEM

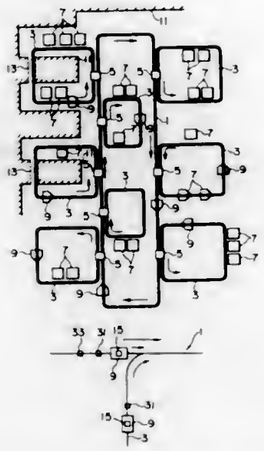
Hajime Matsumoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

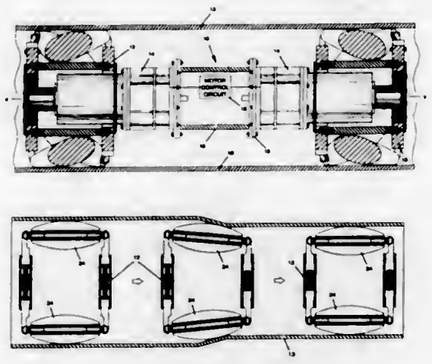
Filed Dec. 24, 1992, Ser. No. 996,604

Claims priority, application Japan, Dec. 27, 1991, 3-346476

Int. Cl.[6] B61L *1/00*

U.S. Cl. 104—88.02 **5 Claims**





1. An automatic conveyance system for transporting items among a plurality of production devices comprising:

a main track;

a plurality of auxiliary tracks, each auxiliary track having first and second ends and extending to one of a plurality of production devices;

couplers disposed at the first and second ends of the auxiliary tracks for coupling to the main track and de-coupling from the main track the first and second ends of the auxiliary tracks;

a plurality of vehicles running on the main and auxiliary tracks to convey items among the production devices;

a plurality of signaling units disposed on the main and auxiliary tracks adjacent each of the couplers for controlling passage of vehicles through the couplers;

a plurality of passage sensors disposed on the main track adjacent each of the couplers for sensing passage of vehicles, no passage sensors being disposed on the auxiliary tracks; and

signal control means responsive to the passage sensors for controlling the signaling units to avoid a collision of vehicles when respective vehicles are concurrently approaching one of the couplers on the main track and on one of the auxiliary tracks.

5,551,349

INTERNAL CONDUIT VEHICLE

Leon J. Bodzin, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 29, 1995, Ser. No. 496,827

Int. Cl.[6] B61B *13/00*

U.S. Cl. 104—138.2 **5 Claims**

1. An internal conduit vehicle, comprising:

a chassis;

coaxially aligned first and second dual-vector wheels mounted to said chassis, each said dual-vector wheel comprising:

a hub assembly having multiple bores;

multiple rollers pivotally mounted about said hub assembly, each said roller having a prolate spheroid-like shape;

multiple pairs of pin support brackets, each said pair of pin support brackets pivotably supporting one of said rollers, and each pin support bracket mounted to slide within one of said bores of said hub assembly; and

motor means mounted to said chassis for rotating said first and second dual-vector wheels.

5,551,350

TRANSPORTING SYSTEM DRIVEN BY LINEAR MOTOR HAVING INDUCTIVE POWER SUPPLY

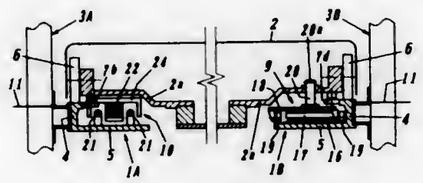
Yoshihiko Yamada, Inuyama, and Kazuhiro Taguchi, Niwa-gun, both of, Japan, assignors to Daifuku Co., Ltd., Osaka, Japan

Filed Oct. 7, 1994, Ser. No. 320,441

Claims priority, application Japan, Oct. 7, 1993, 5-251890; Oct. 7, 1993, 5-251891

Int. Cl.[6] B60L *13/02*

U.S. Cl. 104—293 **9 Claims**



1. An automated warehouse system comprising a transport unit having

(i) a car for running on the upper surfaces of first and second rails disposed parallel to each other with each rail having a vertical webbing with inner and outer surfaces, and each rail further having horizontal upper and lower surfaces, a bottom, one side and an other side,

(ii) a pair of wheels disposed respectively at said one and said other sides for running said car on said rails,

(iii) a drive for moving said car on said first and second rails, and having

(a) a linear motor body attached from said car, and facing

(b) a horizontally disposed secondary conductor secured to said first rail,

(iv) a power supplying system for supplying power to said drive, mounted from one side of said car, and having

(a) two horizontally and parallel disposed induction wires secured to and along said second rail, and

(b) at least one induction coil attached to said car and disposed between said induction wires,

(v) two pairs of positioning rollers, one pair being attached at one side from and along the car substantially transversely from the pair of rollers attached from the other side, and

(vi) a plurality of vertical shafts each for rotatably supporting one of said rollers for contact between each roller with an adjacent inner surface of an adjacent said rail, the rollers at said one side of the car being maintained in a fixed position relative to said car, and the rollers at the other side being urged horizontally movably within a predetermined range, against the inner surface of the adjacent rail.

5,551,351

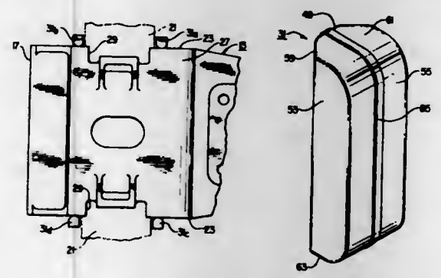
BOLSTER GIB

Don R. Hardin, Albertville, Ala., assignor to Progressive Rail Services Corporation, Albertville, Ala.

Filed Feb. 24, 1995, Ser. No. 393,705

Int. Cl.[6] B61D *49/00*

U.S. Cl. 105—226 **14 Claims**



1. In a rail car having a bolster which extends perpendicular to a longitudinal axis of the rail car, the bolster having oppositely extending outer ends, each of which extends through an opening in a side frame of the rail car, each of the outer ends having oppositely facing first and second vertical sides, a pair of outer gibs on the first and second vertical sides and positioned to be on the outer side of the side frame, and a pair of inner gibs on the first and second vertical sides and positioned to be on the inner side of the side frame, each of the gibs being a solid metal bar, comprising:

a mounting side which has a flat portion that is parallel to and abuts one of the vertical sides and which has edge portions welded to one of the vertical sides;

a gage side which has a flat portion perpendicular to the mounting side, the gage sides of the inner and outer gibs on the first vertical side facing each other and the gage sides of the inner and outer gibs on the second vertical side facing each other; and

a seam which extends along the mounting side and around a perimeter of the gib in a plane which passes through the gib and is parallel to and spaced from the flat portion of the gage side.

5,551,352

TABLE OR COVER PLATE

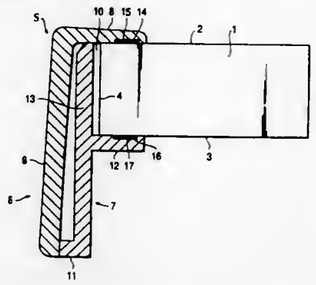
Max Meier, and Karl-Heinz Meier, both of Lichtenau, Germany, assignors to Mecalit GmbH Kunststoffverarbeitung, Lichtenau, Germany

Filed Feb. 17, 1995, Ser. No. 390,043

Claims priority, application Germany, Feb. 25, 1994, 44 06 118.8

Int. Cl.[6] A47B *17/00*

U.S. Cl. 108—27 **22 Claims**



1. An assembly comprising at least one core plate having a top, an underside and a cut lateral surface and peripheral plastic edge protection contacting the top and the underside of the core plate and which comprises two moulded angle sections including inner and outer frames, the outer frame having a first leg contacting the underside and a second leg contacting the top, the inner frame having a first leg inside of the first leg of the outer frame in an area projecting over the underside and a second leg contacting the underside of the core plate and after insertion of the at least one core plate in the outer frame and mounting of the inner frame on the core plate, the inner and outer frames are connected together at their first legs and between the inner frame and the cut lateral surface of the core plate is disposed a gap and at least between the second leg of the outer frame and the top is disposed an elastic seal.

5,551,353

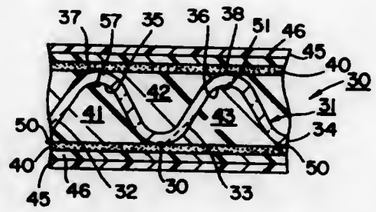
LIGHTWEIGHT PALLETS

Leslie C. Fiedler, 553 N. Mission Dr., San Gabriel, Calif. 91775

Division of Ser. No. 936,766, Aug. 27, 1992, Pat. No. 5,349,749. This application Jun. 29, 1994, Ser. No. 267,714

Int. Cl.[6] B65D *19/00*

U.S. Cl. 108—51.3 **14 Claims**



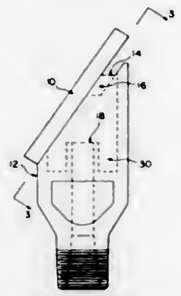
1. A pallet comprising parallel slats and parallel vertical risers, said slats and risers extending normally to one another in plan view, and all being made from composite plate material, said plate material having an axis of length, and comprising:

an axially extending corrugation having an undulating shape including crests and troughs;

a reinforcement sheet enclosing said corrugation, a plurality of adjacent crests of said corrugation being attached directly to said reinforcement sheet;

buttress material filing said troughs and being bonded to said corrugation and to said reinforcement sheet, whereby to form a unitary composite plate; and
a skin on said reinforcement sheet.

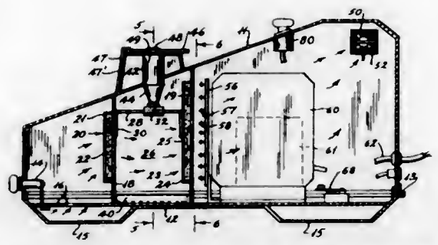
5,551,354
BIASED FLOW DIRECTIONAL LIQUOR NOZZLE
Stanton A. Crofut, Massillon; Edward E. Gayhart, Jr., North Canton, both of Ohio, and John B. Parisi, Totowa, N.J., assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Aug. 23, 1995, Ser. No. 518,436
Int. Cl.[6] F23G *7/04*; B44D *1/08*
U.S. Cl. 110—238 **3 Claims**



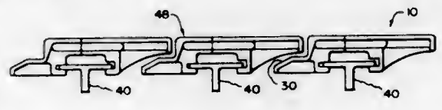
1. A biased flow directional black liquor nozzle for spraying a black liquor in a recovery furnace, the nozzle comprising:
a conduit with an open end for carrying a black liquor, the conduit having a longitudinal axis;
a housing connected to the open end of the conduit, the housing defining a chamber forming enclosure with an outlet, the outlet having a short-notched side on one side of the axis and a long-notched side on an opposite side of the axis; and
a splash plate attached to said chamber forming enclosure at an acute angle to the longitudinal axis of the conduit and covering said notches to define said short and long-notched sides of said outlet for spraying the black liquor asymmetrically with respect to the axis for spreading a char band evenly on a furnace wall of a recovery boiler.

5,551,355
NEEDLE INCINERATOR
Ralph Haines, 61 Morrell Street, Brantford, Ontario, Canada; Klaus Heidelberger, 82 Glenburn Drive, Waterloo, Ontario, Canada; Brian Lang, 39 Greenwood Trail, Brantford, Ontario, Canada; William D. Mitchell, C/O 85 Inglis Street, Ayr, Ontario, Canada, and Petar Stancu, Unit 3, 81 Eagan Drive, Kitchener, Ontario, Canada
Filed May 1, 1995, Ser. No. 431,836
Int. Cl.[6] F23G *5/00*
U.S. Cl. 110—242 **20 Claims**

1. An incinerator apparatus for disintegrating a needle connected to a hypodermic syringe comprising, a housing having ambient air inlet and at least one exhaust outlet, a combustion chamber within said housing, a pair of spaced electrical contacts mounted within said combustion chamber, an opening in said housing and aligned with said electrodes through which a needle connected to a hypodermic syringe may be inserted so as to selectively contact the needle with said contacts, fan means mounted within said housing for drawing air through said inlet and exhausting air through said at least one outlet, at least one exhaust filter means mounted within said housing between said combustion chamber and said at least one exhaust outlet, whereby exhaust gases are filtered through said at least one exhaust filter means and ionized by said at least one ionizer means before being exhausted by said fan means through said at least one exhaust outlet, and energizing means mounted within said housing for supplying electrical energy to said contacts, said at least one ionizer means, and said at least one fan means, and switch means mounted to said housing for activating said energizing means.



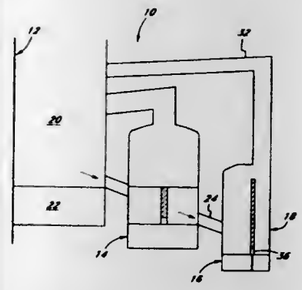
5,551,356
TWO PIECE GRATE CLIP FOR USE AS A POWER GENERATOR MAINTENANCE PART
Joseph R. Post, Canandaigua, N.Y., assignor to Powerhouse Technology, Inc., Farmington, N.Y.
Filed Oct. 11, 1995, Ser. No. 540,671
Int. Cl.[6] F23H *11/00*
U.S. Cl. 110—269 **16 Claims**



1. A grate clip for engaging a T-bar support on a traveling grate stoker comprising:
a first elongated flange piece having a body with a fuel supporting surface and a threaded opening in the body parallel to the fuel supporting surface; a second elongated flange piece having a body with a fuel supporting surface, coplanar with the fuel supporting surface of the first piece when the clip is assembled; a bore extending through the body of the second piece parallel to the fuel supporting surface and aligned with the threaded opening when the clip is assembled; the first piece having a transverse notch and the second piece having a transverse notch forming a T-shaped transverse notch in an assembled position; and a fastener extending through the bore and into the threaded opening parallel to the fuel supporting surface.

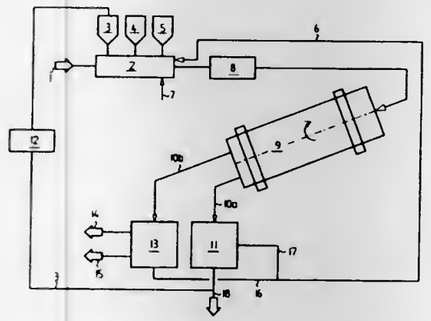
5,551,357
METHOD AND SYSTEM FOR RECYCLING SORBENT IN A FLUIDIZED BED COMBUSTOR
Song Wu, South Williamsport; Samuel G. Probst, Lock Haven; Christina M. Edvardsson, Montoursville, and Michael G. Alliston, Lewsburg, all of Pa., assignors to Tampella Power Corporation, Williamsport, Pa.
Filed Aug. 19, 1994, Ser. No. 293,471
Int. Cl.[6] F23J *3/00*
U.S. Cl. 110—344 **35 Claims**

1. A method for recycling sorbent particles in a fluidized bed, fossil-fuel combustor, comprising the steps of:
(a) removing a combustion residue from a fluidized bed fossil-fuel combustor, the combustion residue comprising sorbent particles and non-sorbent particles;



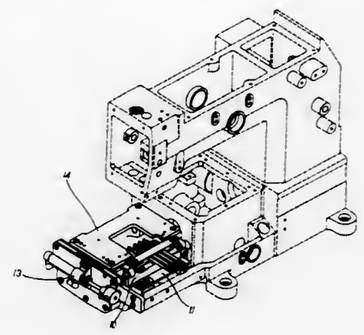
(b) transporting the combustion residue to a hydrator;
(c) hydrating the sorbent particles by contacting the combustion residue in the hydrator with a hydration fluid;
(d) conveying the combustion residue to a classifier;
(e) classifying the combustion residue in the classifier into a portion comprising principally the sorbent particles and a portion comprising principally the non-sorbent particles, wherein classifying is carried out by fluidizing the combustion residue present in the classifier; and
(f) returning the portion comprising principally the sorbent particles to the fluidized bed fossil-fuel combustor.

5,551,358
METHOD OF BURNING WASTE, ESPECIALLY PVC WASTE, COMPRISED ESSENTIALLY OF PLASTIC
Theo Burkhard, Gummersbach; Christoph Schmid, Bergneustadt, and Hans Sobolewski, Wiehl, all of, Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Germany
PCT No. PCT/EP94/00156, § 371 Date Nov. 18, 1994, § 102(e) Date Nov. 18, 1994, PCT Pub. No. WO94/17332, PCT Pub. Date Aug. 4, 1994
PCT Filed Jan. 21, 1994, Ser. No. 313,025
Claims priority, application Germany, Jan. 23, 1993, 43 01 814.9
Int. Cl.[6] F23G *1/00*
U.S. Cl. 110—346 **10 Claims**



1. A method of burning waste comprised essentially of plastic, said method including the steps of:
burning said waste in a revolving cylindrical furnace accompanied by the addition to said waste of at least one finely ground solid additive, wherein said at least one solid additive has at least one component with a melting temperature higher than the melting temperature of said plastic of said waste, and wherein said at least one finely ground solid additive, together with at least one additive contained in said plastic, leads to the formation of an extract-resistant residue from said burning.

5,551,359
UNDER TRIMMING DEVICE FOR A MULTI-NEEDLE MULTI-LOOPER SEWING MACHINE
Kenji Ikeda, Tao-Yuan Hsien, Taiwan, assignor to Kaulin Mfg. Co., Ltd., Taipei, Taiwan
Filed Aug. 23, 1995, Ser. No. 518,162
Int. Cl.[6] D05B *65/00*
U.S. Cl. 112—292 **5 Claims**

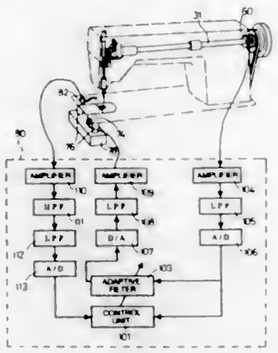


1. An under trimming device for a multi-needle sewing machine with multiple longitudinally extended loopers, being disposed in an end portion of a bed of said sewing machine below a needle plate and needles thereof, comprising:
a cutting part being disposed in front of said needle plate and including a plurality of movable catchers fixedly mounted on a movable catcher holder which is connected to a transmission mechanism of said sewing machine via a link, such that said movable catchers mounted thereon longitudinally reciprocate when said movable catcher bolder is driven by said transmission mechanism, and a fixed cutter fixedly mounted on a fixed cutter holder and thereby connected to a front edge of said needle plate, said fixed cutter holder further having a leaf spring mount mounted thereon to receive a plurality of leaf springs which press against bottom sides of said movable catchers to hold said movable catchers in a borizontal position, said leaf springs having a number and position corresponding to those of said movable catchers; and
a clamping part being disposed beneath said needle plate to correspondingly face said cutting part and including a plurality of looper and looper thread claw assemblies which each consists of a looper, a claw leaf spring, and a holding pin abutting against said claw leaf spring, all being mounted on a claw base, said looper and looper thread claw assemblies being fixedly mounted on a mounting block which is connected to a looper driving mechanism of said sewing machine and thereby causes said assemblies to reciprocate longitudinally;
wherein when a trimming operation is to be done, said a plurality of movable catchers are driven by said transmission mechanism to move longitudinally and horizontally toward said needle plate while said loopers are parallel to said needle plate in a horizontal position, such that multiple sets of looper thread loops and corresponding needle thread loops are separately extended through by said forward moving movable catchers and slide into a recess portion of said movable catchers and are held thereto when said movable catchers move toward a dead point on their forward travel, and, when said movable catchers are moving back from said dead point to their initial position, said looper threads are guided into a gap between said claw leaf spring and said holding pin and clamped thereto so that when said movable catchers return to their initial position, said needle threads and said looper threads are cut off at the same time.

5,551,360
VIBRATION CONTROL DEVICE FOR SEWING MACHINE

Zhongqi Qui, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 3, 1995, Ser. No. 497,986
Claims priority, application Japan, Feb. 3, 1994, 6-11569; Jul. 27, 1994, 6-175309
Int. Cl.[6] D05B *19/00*
U.S. Cl. 112—470.01 **20 Claims**



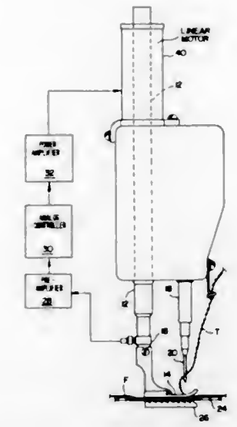
1. A sewing machine having a vibration control device machine, comprising:
- sync signal generating means for generating a sync signal in synchronism with rotation of an arm shaft of said sewing machine;
- vibration detecting means for detecting vibration generated on a machine body of said sewing machine;
- control vibration generating means capable of generating control vibration for canceling the vibration generated on said machine body;
- transfer function setting means for preliminarily setting a transfer function indicative of characteristics of mechanical parts and electrical parts of said sewing machine; and
- vibration control means for controlling said control vibration generating means so as to minimize the vibration detected by said vibration detecting means according to the sync signal generated from said sync signal generating means, the transfer function set by said transfer function setting means, and a detection signal from said vibration detecting means.

5,551,361
SEWING MACHINE HAVING PRESSER BAR SYSTEM FOR MAINTAINING CONSTANT CONTACT FORCE BETWEEN PRESSER FOOT AND FABRIC

Timothy G. Clapp, Raleigh, N.C., and George R. Barrett, Ann Arbor, Mich., assignors to North Carolina State University, Raleigh, N.C.

Filed Apr. 17, 1995, Ser. No. 423,639
Int. Cl.[6] D05B *29/02*
U.S. Cl. 112—475.01 **20 Claims**

15. A method for maintaining a constant force during sewing between the presser foot of a sewing machine and a fabric being sewn by the machine independent of the fabric guiding forces in order to optimize material stitch quality, the method comprising the steps of:
- (a) providing the sewing machine with force measurement means mounted on the presser bar, electromagnetic actuator means operatively connected to the presser bar, and circuit means electrically connected to the force measurement means and the electromagnetic actuator means for controlling the current to electromagnetic actuator means;

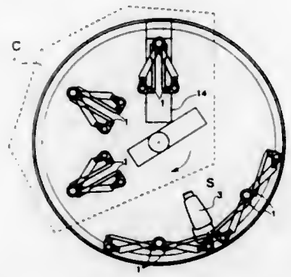


- (b) detecting the load being applied to the presser bar during sewing;
- (c) converting the detected load measurements into corresponding signal data during sewing; and
- (d) controlling the current to the electromagnetic actuator means during sewing in response to the signal data so as to maintain a constant contact force between the presser foot and fabric being sewn during sewing by selectively imparting both compressive and lifting forces to said presser bar.

5,551,362
AUTOMATICALLY SEAMING TWO STOCKINGS TO FORM A PANTYHOSE ARTICLE

Pier L. Migliorini, Terranuova Bracciolini Arezzo, Italy, assignor to Solis S.R.L., Tavarnuzze, Italy

Filed Mar. 28, 1994, Ser. No. 219,021
Claims priority, application Italy, Apr. 1, 1993, F193A0066
Int. Cl.[6] D05B *21/00*
U.S. Cl. 112—475.12 **15 Claims**

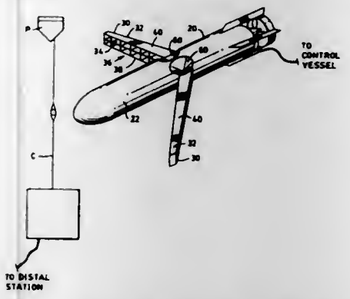


1. A method for seaming two stockings together, the method comprising the steps of:
- providing a plurality of pairs of shapes:
  - moving said plurality of pairs of shapes to a first station;
  - cutting a bodice of each of said two stockings on said each pair of shapes;
  - spreading apart each shape of said each pair of shapes after said cutting;
  - independently moving said each pair of shapes from said first station to a seaming station;
  - seaming the two stocking of said each pair of shapes together at said seaming station.

5,551,363
UNDERWATER VEHICLE AND A COMBINATION DIRECTIONAL CONTROL AND CABLE INTERCONNECT MEANS

Jeffrey L. Cipolla, Newport, R.I.; Ronald E. Waclawik, Fairhaven, Mass., and Charles L. Elste, Portsmouth, R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 27, 1995, Ser. No. 411,234
Int. Cl.[6] F42B *19/06*
U.S. Cl. 114—23 **15 Claims**

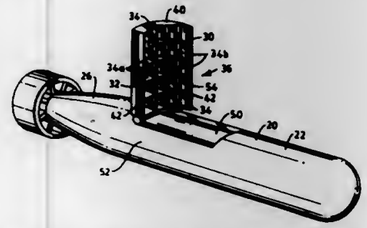


1. An assembly comprising an underwater vehicle and a combination directional control and cable interconnection means therefor, said assembly comprising:
- an underwater vehicle which remains underwater during travel of said vehicle through water and;
- a combination directional control and cable interconnect means comprising arms extendible from sides of said vehicle, each of said arms including a multiplicity of fins in a compact array for contact with said water through which said vehicle moves in said travel; and
- each of said fins having a neutral lift, uncambered, shape of cross section chosen to substantially match the hydrodynamic streamline flow about the fin at a predetermined vehicle speed below cavitation threshold speed.

5,551,364
UNDERWATER VEHICLE AND COMBINATION DIRECTIONAL CONTROL AND CABLE INTERCONNECT DEVICE

Jeffrey L. Cipolla, Newport, R.I., and Ronald E. Waclawik, Fairhaven, Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 27, 1995, Ser. No. 411,235
Int. Cl.[6] F42B *19/06*
U.S. Cl. 114—23 **15 Claims**

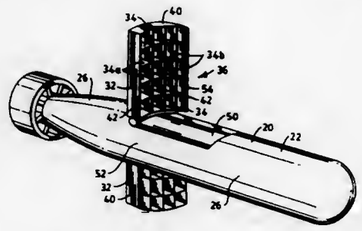


1. An assembly comprising an underwater vehicle and a combination directional control and cable interconnection device therefor, said assembly comprising:
- an underwater vehicle which remains underwater during travel of said vehicle through water;
- a combination directional control and cable interconnect device comprising only one arm extendible from only one side of said vehicle, said arm including a multiplicity of fins in a compact array for contact with said water through which said vehicle moves in said travel; and
- each of said fins having a neutral-lift, uncambered shape of cross section chosen to substantially match the hydrodynamic streamline flow about the fin at a predetermined vehicle speed below cavitation threshold speed.

5,551,365
WATER VEHICLE AND A DIRECTIONAL CONTROL MEANS THEREFOR

Jeffrey L. Cipolla, Newport, R.I.; Ronald E. Waclawik, Fairhaven, Mass., and Charles L. Elste, Portsmouth, R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 27, 1995, Ser. No. 411,236
Int. Cl.[6] F42B *19/06*
U.S. Cl. 114—23 **16 Claims**



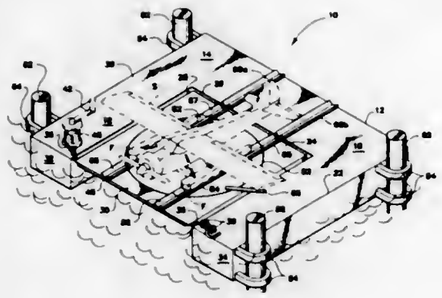
1. In combination, a water vehicle and directional control means therefor, said combination comprising:
- a water vehicle having at least a portion thereof underwater during travel of said vehicle through water;
- a directional control means comprising a plurality of symmetrically disposed arms extendible from sides of said portion of said vehicle, each of said arms including a multiplicity of fins in a compact array for contact with said water through which said vehicle portion moves in said travel, each of said arms further including a shroud surrounding said array of fins;
- each of said fins having a neutral-lift, uncambered, shape of cross section chosen to substantially match the hydrodynamic streamline flow about the fin at a predetermined vehicle speed below cavitation threshold speed; and
- wherein said arrays of fins include a plurality of first fins parallel to each other, and a plurality of second fins parallel to each other and normal to said first fins, said first and second fins intersecting to form a grid-like configuration, with ends of said fins fixed to an inside surface of said shroud.

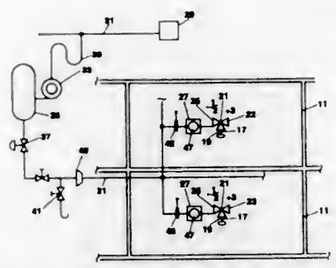
5,551,366
SEAPLANE DOCKING FACILITY AND TELESCOPING HANGAR

E. Clinch Kavanaugh, 102 N. Sixth St., Fernandina Beach, Fla. 32034

Filed May 4, 1995, Ser. No. 434,785
Int. Cl.[6] B63C *1/02*
U.S. Cl. 114—45 **7 Claims**

1. A seaplane docking facility installable in a body of water and providing for use by seaplanes, amphibious aircraft, and surface effect vehicles, comprising:
- a substantially U-shaped buoyant member having an outer periphery and comprising a base portion with first and second end s and with first and second arms extending respectively from said base portion first and second ends at substantially





right angles to said base portion, with said first and second arms respectively terminating in a first arm end and a second arm end;

a ramp member having a first edge adjacent said base portion and being hingedly attached to said buoyant member adjacent said base portion and extending between said first and second arms, and a second forward edge opposite said first edge and extending between said first arm end and said second arm end;

lifting means for said ramp member disposed beneath said ramp member forward edge;

said ramp member having an upper surface and including a turntable installed therein, said turntable having a periphery and an upper surface substantially coplanar with said upper surface of said ramp member;

a plurality of skid tracks each having an upper surface having a low coefficient of friction, with at least one turntable skid track installed upon said turntable and extending substantially thereacross, at least one ramp skid track installed between said forward edge of said ramp member and said turntable, and at least one ramp skid track installed between said turntable and said rearward edge of said ramp, whereby;

a craft resting upon said turntable is launched into the water by turning said turntable to position the craft to face toward said forward edge of said ramp member, said ramp member is lowered to place said forward edge of said ramp member in the water and the craft resting upon said turntable is slidably moved along said skid tracks each having an upper surface having a low coefficient of friction, with the operation being reversed for the recovery of the craft to position the craft upon said turntable.

5,551,367

DUAL SETTING UNDER PRESSURE RELIEF SYSTEM

John D. Vitkauskas, Novato, Calif., assignor to Chevron U.S.A. Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 156,215, Nov. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 842,841, Feb. 26, 1992, abandoned. This application Mar. 29, 1995, Ser. No. 412,639

Int. Cl.[6] B63B *25/08*

U.S. Cl. 114—74 R **5 Claims**

1. A differential pressure relief system for use in vessels having at least one closed tank for cargo, said tank having a hatch, and a vent conduit having a distal end connecting said tank with the atmosphere at said distal end, said system providing automatic differential pressure relief comprising:

(a) a pressure/vacuum valve connected to said distal end of said vent conduit, said pressure/vacuum valve having a pressure discharge outlet, a separate vacuum outlet, and separate valve seats;

(b) a vacuum pump adaptor having an adaptor conduit connected to said vacuum outlet of said pressure/vacuum valve;

(c) a vacuum pump connectable to said vacuum pump adaptor such that said vacuum pump can maintain a first desired pressure differential through said adaptor conduit and across said tank;

(d) a source of inert gas having an inert gas bias conduit connecting said source to said vacuum pump adaptor to provide a pressure bias to said vacuum outlet so that said pressure/vacuum valve will open at a second desired pressure differential between the tank and the atmosphere;

(e) means for providing said inert gas from said source to said vacuum outlet at a desired pressure;

(f) means for providing said inert gas from said source to said vacuum outlet at a desired flow rate; and

(g) a rupture disk disconnectably connected to said vacuum pump adaptor to seal off said adaptor conduit, such that said disk will rupture at a third desired pressure differential across said disk to allow atmospheric pressure to reach said vacuum outlet, after which said rupture disk is removed and said vacuum pump substituted therefor, so that said first desired pressure differential through said adaptor conduit and across said pressure/vacuum valve can be maintained.

5,551,368

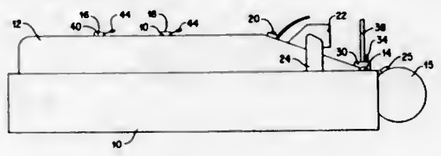
CONTAINER FOR LAUNCHING A LIGHTWEIGHT TORPEDO FROM A SURFACE CRAFT

René Vire, Hyeres, France, assignor to Etat Francais represented by the Delegue General pour l'Armement, Paris, France

Filed Jan. 12, 1995, Ser. No. 371,746

Int. Cl.[6] B63B *1/00*

U.S. Cl. 114—238 **17 Claims**



1. A container intended for containing a lightweight weapon to be launched from a surface craft, said weapon including an activation means for batteries supplying energy to the weapon, means for extraction of an activation safety device when launching said weapon, and a remote control connection to supply the programming of weapon commands before said weapon is launched, said container comprising:

means for holding said weapon in a storage position; and

means for separating said weapon from said container, wherein said activation means for the batteries, said means for extraction of the activation safety device, and disconnection of said remote control connection are interdependent with said container and are activated automatically at the moment said weapon is launched by separating said weapon from said container.

5,551,369

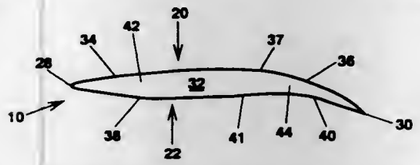
DUALCAVITATING HYDROFOIL STRUCTURES

Young T. Shen, Potomac, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 31, 1995, Ser. No. 414,836

Int. Cl.[6] B63B *1/24*

U.S. Cl. 114—274 **20 Claims**



1. A dualcavitating hydrofoil for providing dynamic lift to a marine vehicle, comprising:

an upper surface and a lower surface, said upper and lower surfaces functioning to provide a lift force sufficient to lift the marine vehicle above a water surface;

a leading edge formed by a forward intersection of said upper and lower surfaces;

a trailing edge formed by an aft intersection of said upper and lower surfaces;

said upper and lower surfaces defining a cross-sectional shape adapted to provide a smooth flow exit at said trailing edge during normal subcavitating operation at subcavitating speeds;

said upper surface being adapted to efficiently produce said lift force during said normal subcavitating operation at subcavitating speeds wherein said upper and lower surfaces are fully wetted; and

said lower surface being adapted to efficiently produce said lift force during normal supercavitating operation at supercavitating speeds wherein said upper surface is completely enveloped within a cavity generated by said lower surface and at least a portion of said lower surface is wetted.

5,551,370

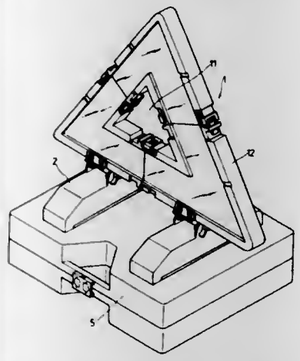
WARNING TRIANGLE ASSEMBLY

Wen-Chin Hwang, P.O. Box 82-144, Taipei, Taiwan

Filed Jan. 23, 1995, Ser. No. 376,832

Int. Cl.[6] E01F *9/012*; **G02B** *5/12*

U.S. Cl. 116—63 T **3 Claims**



1. A warning triangle assembly comprising an isometric triangle having an isometric recess at a central portion, said isometric triangle being symmetrical to said isometric triangle, said isometric triangle being composed of three angular portions each having a large V-shaped side, a small V-shaped side, a first end side and a second end side, said first end side being provided with a protrusion, the second end side of one of said angular portions being formed with a recess adapted to receive the protrusion of the first end side of another one of said angular portions, said large V-shaped side being provided with a male fastener at one end and a female fastener at another end and at least one reflective panel connecting the large and small V-shaped sides of each angular portion.

5,551,371

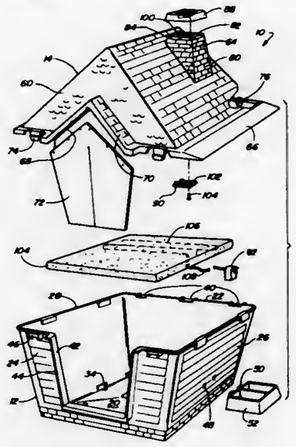
PET ENCLOSURE FOR HOUSING A PET ENABLING PASSING IN AND OUT OF THE ENCLOSURE

Dennis P. Markey; Joe Pietranton; Nick Nagy, all of Warren, Mich.; Rick Garton, Fort Wayne, Ind.; Philip Swinhart, Fort Wayne, Ind.; Ron Rensberger, Fort Wayne, Ind., and Walter Herbst, Chicago, Ill., assignors to Handy Home Products, Inc., Warren, Mich.

Filed Jan. 18, 1994, Ser. No. 183,024

Int. Cl.[6] A01K *1/02*

U.S. Cl. 119—499 **21 Claims**



1. A pet enclosure comprising:

a base having a floor, a front wall, a rear wall and at least two side walls, said base defining an internal chamber and at least one unitary locking aperture formed on said base, at least one unitary hinge element formed on one of said walls, a doorway opening in one of said walls and adjacent said floor for enabling passage of a pet in and out of said internal chamber,

a roof pivotally secured to said base by at least one complementary unitary hinge element formed on said roof, said hinge elements interconnecting to form at least one hinge, said roof being movable between an open and a closed position, said roof defining at least one unitarily formed locking tab for engagement with said locking aperture of said base to lock said roof into said closed position.

5,551,372

MODULAR CAGE SYSTEM

Anthea V. Nicholls, Cherry Tree Road, Pomonal Vic 3381, Australia

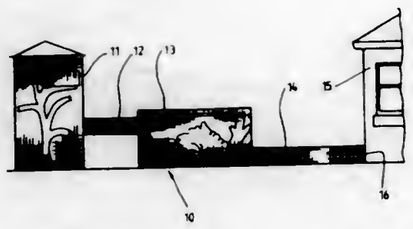
Filed Oct. 14, 1994, Ser. No. 323,452

Claims priority, application Australia, Oct. 15, 1993, PM 1816

Int. Cl.[6] A01K *31/08*

U.S. Cl. 119—474 **15 Claims**

1. A modular cage system for a terrestrial animal or a bird which comprises at least two enclosure modules, each of the enclosure



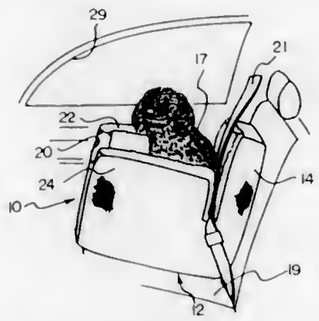
modules being selectively joined by joining means to at least one other of the enclosure modules by at least one of a tunnel module and a walkway module, and at least one of said enclosure modules having an entrance/exit means for providing entrance and exit by the animal or bird from and to sleeping quarters, wherein each of the enclosure modules is sufficiently large to allow the animal or bird to move in a relatively unobstructed fashion, each of the at least one of a tunnel and walkway is unobstructed to provide unobstructed passage from one enclosure to another and to provide the illusion of travel over an extended distance and a diminished sense of being caged, and the joining means facilitates joining of the modules together in any desired combination of modules in any desired configuration and facilitates unjoining of the modules for movement and reconfiguration of the modules as desired.

5,551,373

PORTABLE PET BOOSTER SEAT APPARATUS

Norman J. O'Donnell, 3 Andromeda Ct., Greenville, S.C. 29615

Filed Aug. 11, 1995, Ser. No. 514,406
Int. Cl.[6] A01K *1/035;29/00*
U.S. Cl. 119—28.5 **3 Claims**



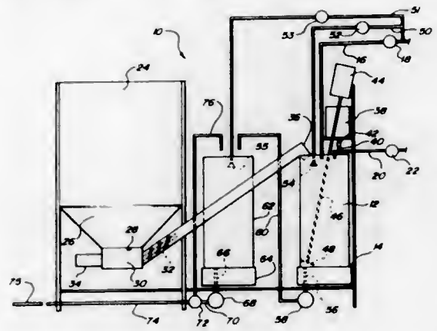
1. A portable pet booster seat apparatus, comprising:
a base portion which includes a top surface and a support portion,
a first wall portion connected to said base portion at a first peripheral portion of said base portion, wherein said first wall portion projects upward above said top surface of said base portion, and
a second wall portion connected to said base portion at a second peripheral portion of said base portion, wherein said second wall portion projects upward above said top surface of said base portion,
wherein a pair of gaps are provided between said first wall portion and said second wall portion,
wherein:
said base portion includes four sides,
said first wall portion extends along a first side of said base portion, and
said second wall portion includes a first wall segment, a second wall segment, and a third wall segment,
wherein said first wall segment extends along a second side of said base portion,
wherein said second wall segment extends partially along a third side of said base portion leaving a gap between said second wall segment and said first wall portion, and
wherein said third wall segment extends partially along a fourth side of said base portion leaving a gap between said third wall segment and said first wall portion,
and further including a removable and replaceable cover assembly which includes:
a first cover portion for covering said first wall portion,
a second cover portion for covering said first wall segment of said second wall portion,
a third cover portion for covering said second wall segment of said second wall portion,
a fourth cover portion for covering said third wall segment of said second wall portion, and
a fifth cover portion for covering said base portion.

5,551,374

AUTOMATED NIPPLE LIVESTOCK FEEDER AND METHOD OF OPERATION

John A. Wells, 7280 Hoxie Rd., North Adams, Mich. 49262-9778

Filed Oct. 20, 1994, Ser. No. 326,653
Int. Cl.[6] A01K *9/00;5/02*
U.S. Cl. 119—71 **23 Claims**



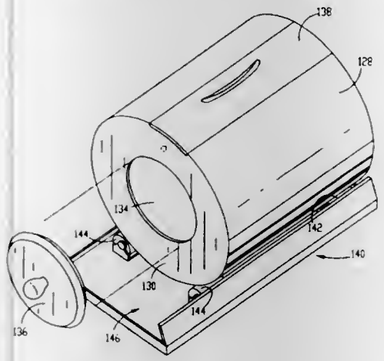
1. An apparatus for feeding a plurality of animals each housed in individual stalls with individual predetermined rations of formula comprising:
mixing means for mixing a liquid formula, said mixing means including a mixing tank in which liquid and dry ingredients are mixed and means for weighing said mixing tank and the contents thereof;
a feed tank for holding a quantity of formula and means for weighing said feed tank and the formula therein;
first pump means for pumping formula from said mixing tank into said feed tank;
second pump means for pumping formula from said feed tank;
conduit means for directing the flow of the formula from said feed tank, said conduit means including a delivery conduit, a return conduit and a selector valve having a delivery position and a return position for directing formula to said delivery conduit and said return conduit respectively, said return conduit returning formula to said feed tank;
a movable traveler carrying a nipple for sucking by the animals;
means for moving said traveler along a predetermined path and for stopping said traveler in close proximity to each of the stalls whereby the animal in each stall can suck on said nipple, said delivery conduit being in communication with said nipple to deliver formula to said nipple when said selector valve is in said delivery position;
means responsive to an animal sucking on said nipple for changing the position of said selector valve and the direction of formula flow through said conduit means whereby the flow of formula through said conduit means is regulated by an animal through said selector valve; and
programmable control means for operating said mixing means to mix formula in said mixing tank, delivering formula from said mixing tank to said feed tank, delivery of the formula to said traveler, movement of said traveler past each of the stalls for feeding the animals and mixing of additional formula in said mixing tank when the quantity of formula in the feed tank reaches a predetermined low level while continuing to feed animals with formula from the feed tank.

5,551,375

PET WASTE BOX

J. Esteban Flores, 11711 E. 27th St., Tulsa, Okla. 74129

Filed Jun. 16, 1995, Ser. No. 491,450
Int. Cl.[6] A01K *29/00*
U.S. Cl. 119—166 **12 Claims**



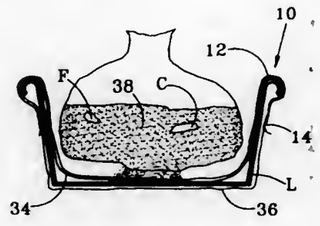
1. A pet waste box comprising:
a housing including a plurality of walls defining an interior space for retaining pet litter and pet waste, and an opening through which a pet can enter and exit the housing;
means for closing the opening, the closing means including a door having structure for frictionally retaining the door to the opening so that the housing is substantially air-tight;
means for supporting the housing for rotation about a horizontal axis such that the litter moves along a circular path movement through the interior of the housing;
a screen supported in the housing and extending across the path of movement of the litter so that the litter passes through the screen during rotation of the housing through 360°, the screen presenting numerous apertures of a size adapted to permit passage of the litter while blocking waste so that the waste is separated from the litter;
retaining means supported in the housing for retaining the blocked waste separate from the litter subsequent to rotation of the housing; and
the housing including a removable element on which the retaining means is supported, the element being removable for removing the retaining means from the interior to permit disposal of the waste.

5,551,376

CLUMPING LITTER LINER-SIEVE SYSTEM

Marcee G. Lundeen; Daniel N. Lundeen, both of 1700 W. Loop South, Suite 1230, Houston, Tex. 77027, and Milton Gaman, R.R.-1 Box 185X26, Galveston, Tex. 77554

Filed Aug. 31, 1995, Ser. No. 522,193
Int. Cl.[6] A01K *29/00*
U.S. Cl. 119—167 **20 Claims**



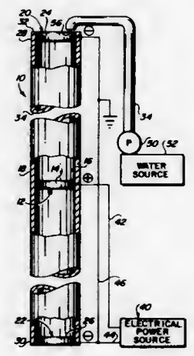
1. An animal litter box system, comprising:
a box having a central area and a peripheral wall;
a plurality of flexible liner sheets stacked over the box and covering the central area, each liner sheet having a netting secured to an upper surface opposite the central area and a releasable flap formed in the liner sheet beneath the netting, wherein the liner sheets are held together at peripheral edges draped over the peripheral wall, and the liner sheets are perforated adjacent the peripheral edges for separation of an uppermost liner sheet from the next lower liner sheet;
a quantity of clumping litter disposed in the central area over an uppermost liner, wherein the netting has grid openings for unclumped litter to sift therethrough and clumped litter to be retained thereon, and wherein the flap substantially inhibits litter from passing through the netting until the uppermost liner sheet is lifted up from the next lower liner sheet.

5,551,377

APPARATUS AND METHOD FOR ELECTROANESTHETIZING FISH

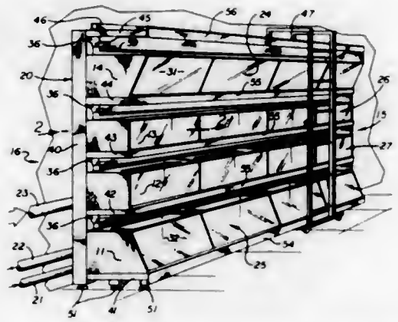
Norman G. Sharber, Flagstaff, Ariz., assignor to Coffelt Manufacturing, Inc., Flagstaff, Ariz.

Continuation-in-part of Ser. No. 960,119, Oct. 13, 1992, Pat. No. 5,341,764. This application Aug. 29, 1994, Ser. No. 297,700
Int. Cl.[6] A01K *61/00*
U.S. Cl. 119—220 **25 Claims**



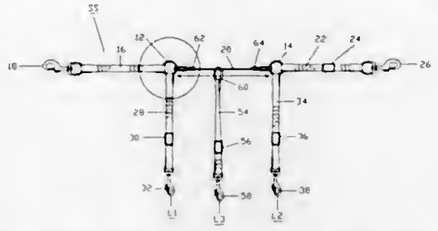
19. Apparatus for electroanesthetizing fish, said apparatus comprising in combination:
a) an electrically insulated waterway;
b) a first electrode disposed within said waterway;
c) a pair of second electrodes disposed within said waterway on opposed sides of said first electrode;
d) a source of electric power;
e) means for applying electric power to said first electrode and each electrode of said pair of second electrodes to establish an electric field only between said first electrode and each electrode of said pair of second electrodes within any water in said waterway to electroanesthetize any fish entering the electric field in the water in the waterway; and
f) means for grounding said pair of second electrodes to limit the electric field to the water in said waterway between said first electrode and each electrode of said pair of second electrodes.

5,551,378
AQUARIUM DISPLAY CONFIGURATION
Craig A. Dewalt, Long Beach, Calif., assignor to California Aquarium Supply, Cerritos, Calif.
Continuation of Ser. No. 82,251, Jun. 24, 1993, Pat. No. 5,413,070. This application Feb. 21, 1995, Ser. No. 393,135
Int. Cl.° A01K *63/00*
U.S. Cl. 119—247 **5 Claims**



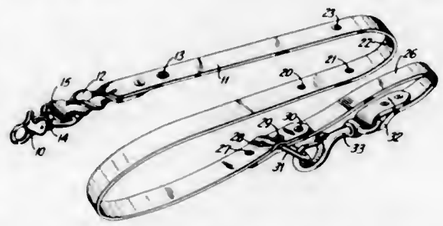
1. An improved aquarium display system of the type comprising a plurality of aquarium tanks stacked vertically, having a front side viewable from a viewing location facing said front side, and a rear side, the improvement comprising:
at least one of said plurality of aquarium tanks having a transparent front viewing wall, said transparent front viewing wall being inclined at a selected oblique angle with respect to a horizontal reference plane, said inclined transparent front viewing wall refracting light passing therethrough so that the volume within said aquarium tank is more fully viewable from the viewing location due to a light refraction effect caused by the inclination of the transparent front wall of said aquarium tank, said selected amount of inclination being chosen based upon the relative vertical and horizontal displacements of the front viewing wall and the selected viewing location;
the plurality of aquarium tanks being supported from the rear side by a cantilevered support rack formed of welded steel to provide a front of the display uncluttered by vertical supports;
said support rack further comprising a library ladder track, and said display further comprising a library ladder mounted in said library ladder track enabling convenient access to high portions of the display.

5,551,379
MULTIPLE USE MOTION RESTRAINT DEVICE
Marcie J. Hart, 7175 Dalscote St., Hesperia, Calif. 92345
Filed Apr. 17, 1995, Ser. No. 423,013
Int. Cl.° A01K *27/00*
U.S. Cl. 119—771 **12 Claims**



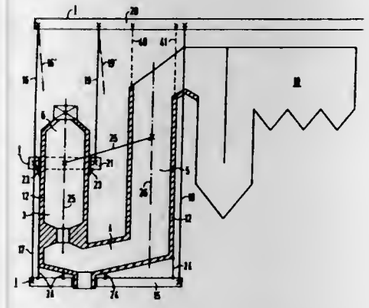
7. A multiple use motion restraint device that restricts the movement range of cargo and animals inside the cargo area of a pick up truck, configured into an animal leash comprising:
(a) a support strap of flexible composition and of a predetermined adjustable length, having two opposite ends and center portion extending therebetween,
(b) said support strap being comprised of three approximately equal in length, separate sections, consecutively joined together with two ring type links, said center portion existing in the middle span created between said two links,
(c) a plurality of leads of a predetermined adjustable length, with said support strap composition, having two opposite ends, one end of two said leads being affixed to said links, respectively,
(d) said opposite ends of said support strap and said leads having an openable connector means whereby releasable engagement of any end to any corresponding link creates a hand grip loop or multiple loops therefrom, any remaining said end is attached to an animal collar, idle said ends are secured by said openable connector means to any corresponding said link.

5,551,380
DOG TEACHING LEAD AND METHOD
Sarah Hodgson, 21 Branch St., Goldens Bridge, N.Y. 10526
Filed Jan. 27, 1995, Ser. No. 379,938
Int. Cl.° A01K *27/00*
U.S. Cl. 119—795 **13 Claims**



1. A dog leash to teach a dog wearing a dog collar to behave, the leash being adapted to be easily adjusted to different waist sizes, the leash comprising:
(a) an elongated flexible leash body member having a distal end and a proximal end;
(b) a first fastener clip means connected at the distal end to connect the leash to a dog collar;
(c) a station hole through the leash body member and in the range of 3 to 7 inches from the distal end, the station hole being used to removably attach the dog to a post or other object;
(d) a series of from 3 to 7 waist holes arranged in line, each waist hole being in the range of 25 to 45 inches from the proximal end and the waist holes being adapted to removably attach the leash to a person's waist; and
(e) a second fastener clip means connected at the proximal end to connect the proximal end to the station hole or alternatively a selected one of the waist holes.

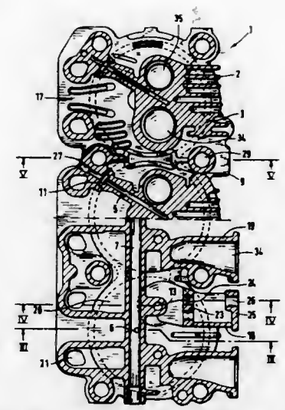
5,551,381
CONFIGURATION OF A STEAM GENERATOR IN A SUPPORTING STRUCTURE
Georg Lösel, Uttenreuth; Werner Kraupa, Fürth, and Reiner Engelhardt, Effeltrich, all of, Germany, assignors to Siemens AKtiengesellschaft, Munich, Germany
Filed Aug. 31, 1994, Ser. No. 298,567
Claims priority, application Germany, Mar. 3, 1992, 42 06 657.3
Int. Cl.° F22B *37/24*
U.S. Cl. 122—510 **12 Claims**



1. A steam generator configuration, comprising:
a supporting structure;
a flue gas channel being disposed in said supporting structure and having a first vertical segment, a second at least approximately horizontal segment, and a third vertical segment being connected through said second segment to said first segment to form a structural unit; and
supporting members suspending said first segment in said supporting structure, said supporting members being in an oblique position relative to the vertical in a cold condition, said oblique position essentially corresponding to a thermal expansion of said second horizontal segment in a hot condition, and said supporting elements being parallel to the vertical in the hot condition.

5,551,382
COOLING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE
Lothar Bauer, Köln; Werner Lemme, Rösrath; Reinhard Rechberg, St. Augustin; Wolfgang Strusch, Köln; Heinz W. Fuchs, Remscheid, and Jürgen Wahnschaffe, Bergisch Gladbach, all of, Germany, assignors to Klöckner-Humboldt-Deutz AG
Filed Dec. 15, 1994, Ser. No. 358,083
Claims priority, application Germany, Dec. 15, 1993, 43 42 800.2
Int. Cl.° F02F *1/36*
U.S. Cl. 123—41.82 R **11 Claims**

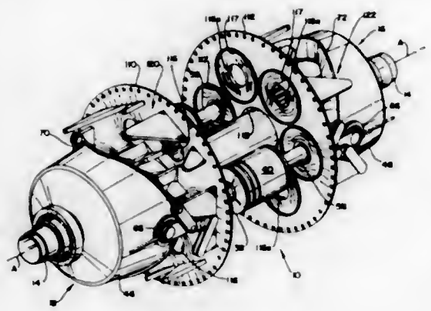
1. A reciprocating internal combustion engine including a cylinder crankcase having at least two cylinders cooled by liquid flowing in cooling spaces in said cylinder crankcase, a block type cylinder head elongated in one direction and having a bottom base adapted for mounting on top of said cylinder crankcase with seal surfaces for said cylinders, said cylinder head (1) including



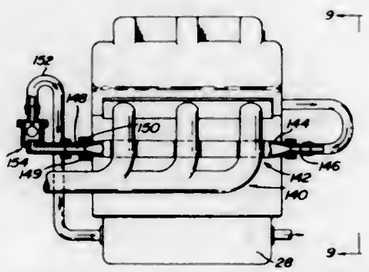
at least one laterally extending intake duct for each cylinder including an intake valve opening in said base,
at least one laterally extending exhaust duct for each cylinder including an exhaust valve opening in said base,
laterally extending vertical cooling fans (2) for air cooling formed on said cylinder head above said bottom base,
a liquid cooling annulus (3) in said base for each cylinder, each annulus being disposed coaxial with its associated cylinder and outside of said seal surfaces, said annulus being in free flow fluid communication with one of said cooling spaces in said cylinder crankcase,
a web duct (5) extending from each annulus (3) to at least between said intake valve and exhaust valve openings of the associated cylinder,
a collecting header (7) spaced above said web ducts and extending in said one direction,
a pillar (16) extending upwardly from said bottom base above each cylinder said pillar (16) being independent of said intake and exhaust ducts and
a connecting conduit (6) in said pillar (16) interconnecting said web duct (5) and said collecting header (7), said annulus, said connecting conduit (6) and said web duct (5) being in fluid communication with one another, with said collecting header (7) and with at least one of said cooling spaces of said cylinder crankcase.

5,551,383
INTERNAL COMBUSTION ENGINE UTILIZING PISTONS
Rudolph J. Novotny, 1879 NW. River Trail, Stuart, Fla. 34994
Filed Jul. 20, 1995, Ser. No. 505,407
Int. Cl.° F02B *75/28*
U.S. Cl. 123—51 BD **41 Claims**

1. An internal combustion engine including at least one outer cylindrical case defining a base compression cylinder, an inner cylindrical case concentrically disposed relative to said outer cylindrical case defining a power cylinder, opposing intake and exhaust pistons mounted in said power cylinder, at least one piston ring mounted in an annular groove formed in each of said intake piston and exhaust piston, means for hydrostatically supporting each of the piston rings and intake piston and exhaust piston to float in said power cylinder, said means including a plurality of flex tubes each having one end attached to said piston ring and an opposite end attached to each of the pistons to feed high pressure air to circumferentially spaced pockets formed in the periphery of each of said piston rings, said pockets facing the walls of said power cylinder and means including the back end of the intake piston and exhaust piston to pressurize the air in the power cylinder, and means for collecting and storing said pressurized air and being fluidly connected to said flex tubes for continuously supplying high pressure air in said pockets.

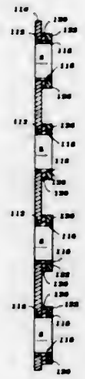


5,551,384
SYSTEM FOR HEATING TEMPERATURE CONTROL FLUID USING THE ENGINE EXHAUST MANIFOLD
Thomas J. Hollis, 5 Roxbury Dr., Medford, N.J. 08055
Filed May 23, 1995, Ser. No. 447,468
Int. Cl.[6] F02N *17/02*
U.S. Cl. 123—142.5 R **17 Claims**



1. A system for heating a flow of temperature control fluid, the temperature control fluid being operative for heating and cooling an internal combustion engine, the system comprising:
- a first temperature sensor for sensing the temperature of temperature control fluid;
- a second temperature sensor for sensing the temperature of engine oil;
- an exhaust manifold for exhausting heated gases from the engine;
- an exhaust input tube adapted to direct a flow of temperature control fluid from the engine;
- an exhaust output tube adapted to direct a flow of temperature control fluid to the engine;
- an exhaust heat assembly connected to the exhaust input and output tubes and adapted for channeling a flow of temperature control fluid from the exhaust input tube to the exhaust output tube, the exhaust heat assembly being located adjacent to the exhaust manifold and adapted to permit heat transfer from the heated gases in the exhaust manifold to the temperature control fluid in the exhaust heat assembly;
- a first flow control valve in fluid communication with the exhaust input tube; and
- an engine computer for controlling the flow of the temperature control fluid through the exhaust heat assembly by actuating the first flow control valve, the engine computer receiving signals from the first and second temperature sensors, the engine computer actuating the flow control valve so as to permit the flow of temperature control fluid along the input exhaust tube and into the exhaust heat assembly when the sensed temperature of the engine oil is below a predetermined value and the engine computer actuating the flow control valve so as to prevent the flow of temperature control fluid along the input exhaust tube and through the exhaust heat assembly when the sensed temperature of the temperature control fluid is above a predetermined value.

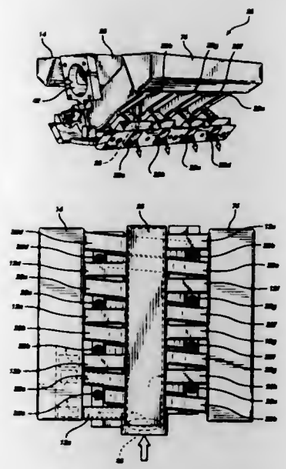
5,551,385
INTAKE SYSTEM INSULATOR FOR OUTBOARD MOTOR
Sadato Yoshida; Hiroshi Nakai; Akihiko Hoshiba, and Yasuhiko Shibata, all of Hamamatsu, Japan, assignors to Sanshin Koygo Kabushiko Kaisha, Hamamtsu, Japan
Filed Sep. 8, 1994, Ser. No. 302,184
Claims priority, application Japan, Sep. 8, 1993, 5-247583
Int. Cl.[6] B63H *21/26*
U.S. Cl. 123—184.21 **22 Claims**



1. An intake system comprising a charge former, an intake conduit, and an insulator interposed between said charge former and said intake conduit, said insulator comprising a rigid support member directly connected to said intake conduit, at least one rigid mounting member directly connected to said charge former, and an elastic insulator member interposed between said support member and said mounting member, said insulator member forming the sole mechanical connection joining together said charge former and said intake conduit.

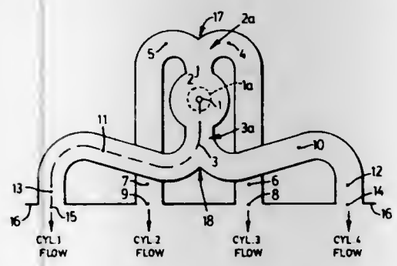
5,551,386
INTAKE SYSTEM FOR V-TYPE ENGINE
Bruce C. Gambardella, 199 McNamara Rd., Spring Valley, N.Y. 10977
Filed May 31, 1995, Ser. No. 456,144
Int. Cl.[6] F02M *35/10*
U.S. Cl. 123—184.35 **18 Claims**

1. An inlet manifold system for a "V" Type internal combustion engine having a first and a second bank of cylinders, each bank having a plurality of combustion cylinders, the manifold comprising:
- a] a first elongated secondary plenum disposed substantially parallel to and above the first bank of cylinders;
- b] a second elongated secondary plenum disposed substantially parallel to and above the second bank of cylinders;
- c] a first set of a plurality of parallel, spaced apart, demand runners joined to the first secondary plenum along its length, each demand runner extending from the first secondary plenum to a respective cylinder in the second bank of cylinders and in fluid connection therewith;
- d] a second set of a plurality of parallel, spaced apart, demand runners joined to the second secondary plenum along its length, each demand runner extending from the second secondary plenum to a respective cylinder in the first bank of cylinders and in fluid connection therewith;



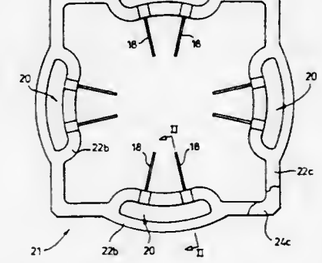
- e] a first set of a plurality of parallel, spaced apart, supply runners joined to the first secondary plenum along its length and in fluid connection therewith;
- f] a second set of a plurality of parallel, spaced apart, supply runners joined to the second secondary plenum along its length and in fluid connection therewith;
- the demand runners and the supply runners are connected to the first and second secondary plenums such that each pair of adjacent spaced apart demand runners has a supply runner therebetween; and
- the demand runners and supply runners being sufficiently straight so as to provide a line of sight through each of the runners from end to end.

5,551,387
TUNED INTAKE MANIFOLD FOR OTTO CYCLE ENGINES
Stephen A. Carter, Mississauga; Karl-Heinz Kozole, Burlington, and Richard T. Hannaby, Mississauga, all of, Canada, assignors to Ortech Corporation, Ontario, Canada
Filed Feb. 24, 1995, Ser. No. 393,682
Int. Cl.[6] F02M *35/10*
U.S. Cl. 123—184.42 **12 Claims**



1. A tuned intake manifold for Otto cycle engines, comprising:
- a plenum,
- an aperture in the plenum through which the plenum can receive a gaseous fuel mixture,
- first and second branch openings into the plenum, the openings being disposed in substantial opposition to each other across the plenum,
- first and second branch conduits communicating with said first and second branch openings respectively,
- each branch conduit divaricating into a plurality of runner conduits all of which terminate at their connections to a head flange; all of the various gaseous paths, each defined by one of the branch conduits and one of the runner conduits into which the branch conduits divaricates, being substantially free of abrupt angulations; and all said paths having substantially the same length beginning at the plenum, substantially the same volume, and substantially the same radius and arc-length of curvature.

5,551,388
PISTON WITH CAVITY
Roger H. Slee, Warwick, England, assignor to T&N Technology Limited, Rugby, England
PCT No. PCT/GB94/00357, § 371 Date Aug. 4, 1995, § 102(e) Date Aug. 4, 1995, PCT Pub. No. WO94/20241, PCT Pub. Date Sep. 15, 1994
PCT Filed Feb. 23, 1994, Ser. No. 500,851
Claims priority, application United Kingdom, Mar. 5, 1993, 9304528
Int. Cl.[6] B22D *19/00*
U.S. Cl. 123—193.6 **7 Claims**

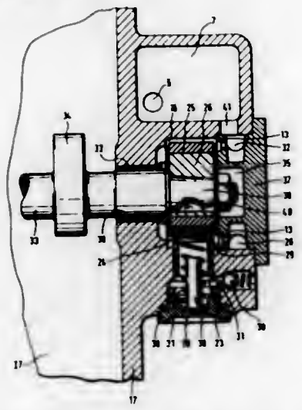


1. A method of manufacturing a piston (**10**) having a cavity (**16**) therein, wherein the method comprises forming a box (**20**; **50**; **70**; **80**), the box having an interior which is the size and shape of the required cavity, providing the box with at least one external projection (**22***c*, **24***c*; **52**; **58**; **73**) by which the box can be supported, mounting the box in a die cavity (**26**) bounded by a wall having the shape of the required piston (**10**), introducing molten metal into the die cavity so that the metal envelopes the box without entering the interior thereof, allowing the metal to solidify, and removing the piston from the die cavity, characterised in that said box (**20**; **50**; **70**; **80**) is mounted in the die cavity (**26**) with said external projection extending into a recess (**34**) in the wall of the die cavity and resting on an abutment in said recess so that said projection serves to support and orientate the box in the cavity, machining off the portion of the projection which extends beyond the cast metal after the piston has been removed from the die cavity, and forming an opening of said cavity in a combustion recess in a crown of the piston.

5,551,389
HYDRAULIC PUMP DRIVEN BY AN INTERNAL COMBUSTION ENGINE

Manfred Kahrs, Wiesbaden, and Gerhard Kunz, Linden, both of, Germany, assignors to ITT Automotive Europe GmbH, Frankfurt, Germany

PCT No. PCT/EP93/01175, § 371 Date Nov. 29, 1994, § 102(e) Date Nov. 29, 1994, PCT Pub. No. WO93/24346, PCT Pub. Date Dec. 9, 1993
PCT Filed May 12, 1993, Ser. No. 343,549
Claims priority, application Germany, May 30, 1992, 4217910.6
Int. Cl.[6] F01M *1/02*
U.S. Cl. 123—196 R **28 Claims**



1. A hydraulic unit including a hydraulic pump, driven by a camshaft of an internal combustion engine, for the supply of engine-compartment consumers in automotive vehicles, the suction side of the hydraulic pump being connected to an intermediate reservoir with an unrestricted overflow tank, into which operating medium from the lubrication system is supplied by the lubrication pressure pump of the internal combustion engine, characterized in that the hydraulic pump is an externally pressurized and internally driven radial piston pump including at least one pump piston and being integrated into the cylinder head of the internal combustion engine.

5,551,390
FUEL INJECTION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Masakuni Tauge, and Hidenobu Nagase, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1994, Ser. No. 335,378
Claims priority, application Japan, Nov. 5, 1993, 5-300885
Int. Cl.[6] F02M *37/04*
U.S. Cl. 123—198 DB **6 Claims**

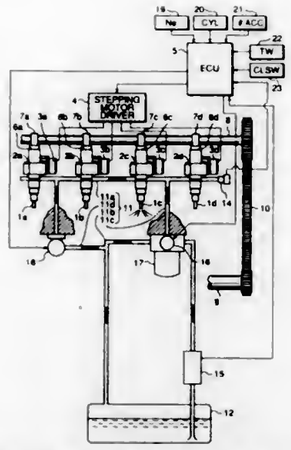
1. A fuel injection control system for an internal combustion engine, comprising:

at least one cylinder, including at least one unit injector each provided for each of said at least one cylinder, for injecting fuel into said each of said at least one cylinder, said at least one unit injector each having a plunger;

actuator means engaging said plunger of each of said at least one unit injector, for varying a stroke of said plunger for pressure delivery of fuel to thereby control an amount of fuel injected into said each of said at least one cylinder;

no-load condition-detecting means for detecting a no-load condition of said engine; and

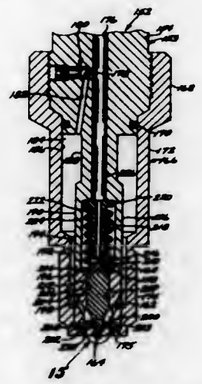
actuator shifting means for shifting said actuator means to a predetermined position, which makes it possible to prevent an abnormal rise in the rotational speed of said engine under said no-load condition, when said no-load condition of said engine is detected by said no-load condition-detecting means.



5,551,391
ACCUMULATOR FUEL INJECTION SYSTEM

Niels J. Beck, Bonita; James A. Peña, Solana Beach; Alan R. Roach, Del Mar, and Bevan H. Johnston, La Mesa, all of Calif., assignors to Servojet Electronic Systems, Ltd., San Diego, Calif.

Division of Ser. No. 830,981, Jan. 28, 1992, Pat. No. 5,241,935, which is a continuation of Ser. No. 152,013, Feb. 3, 1988, abandoned. This application Sep. 3, 1993, Ser. No. 117,392
Int. Cl.[6] F02B *5/00*
U.S. Cl. 123—305 **31 Claims**



1. A method of automatically tailoring the spray of fuel injected from a fuel injector for varying power settings of an internal combustion engine fueled by said injector, said method comprising:

providing a fuel injector having a pintle nozzle including a conical seat which surrounds a spray orifice

terminating in an outer spray opening, and an injector needle having a pintle head with a

fuel deflecting surface section that flares downwardly and outwardly away from the direction of the seat, said fuel deflecting surface section extending at least partially outside of said spray opening when said needle is fully lowered or partially lifted and being spaced inwardly from said spray opening at maximum needle lift, wherein the spray configuration from said spray opening is dependent upon the position of said fuel deflecting surface section with respect to said spray opening and varies with movement of said fuel deflecting surface section with respect to said spray opening;

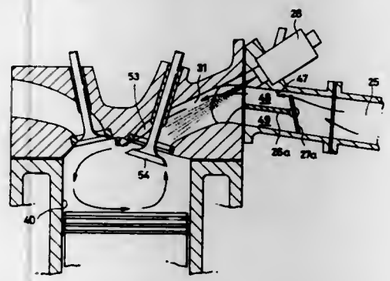
lifting said injector needle from said seat by a first designated amount at a first engine power setting and injecting spray from said nozzle in a first spray configuration; and

lifting said injector needle from said seat by a second designated amount at a second engine power setting and injecting spray from said nozzle in a second spray configuration.

5,551,392
ENGINE AIR INTAKE SYSTEM

Toshio Yamaji, and Nobumitsu Tanaka, both of Tokyo, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1994, Ser. No. 317,641
Claims priority, application Japan, Oct. 19, 1993, 5-260708
Int. Cl.[6] F02B *31/00*
U.S. Cl. 123—306 **16 Claims**



1. A fuel injection engine having a combustion chamber with a roof, an intake valve for closing an intake port provided on a first part of said roof of said combustion chamber, an exhaust valve for closing an exhaust port provided on another part of said roof, a cylinder and a piston, the engine comprising:

an air intake passage including a bent portion connected to said intake port;

said air intake passage including a first straight portion and a second straight portion provided upstream of said bent portion, said first straight portion situated in between said second portion and said bent portion; and

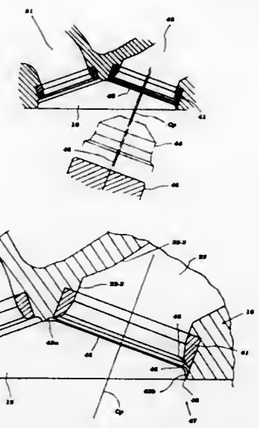
said air intake passage having a center line in said first straight portion approximately in parallel with said another part of said roof so as to introduce air into said combustion chamber without disturbing a streamline flow of air formed at said first straight portion and to generate a tumble flow of air in said cylinder.

5,551,393
INDUCTION SYSTEM FOR ENGINE

Junkichi Amano; Tetsuji Yamazaki, and Takashi Hara, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Nov. 21, 1994, Ser. No. 342,811
Claims priority, application Japan, Nov. 26, 1993, 5-321085
Int. Cl.[6] F02B *31/00*
U.S. Cl. 123—306 **18 Claims**

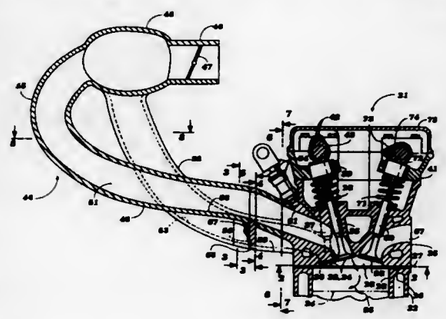
1. An intake passage for the cylinder head of an internal combustion engine, said cylinder head having a combustion chamber surface adapted to be in facing relationship to a cylinder bore of an associated cylinder block to form a combustion chamber, said intake passage being formed in said cylinder head and extending from an inlet opening formed in an outer wall of said cylinder head to an intake valve seat formed in said cylinder head combustion chamber surface and having a valve seating surface adapted to be engaged by an intake valve, said intake valve seat being juxtaposed to a peripheral edge of said cylinder bore, said intake passage having a first straight portion extending from said inlet opening toward said intake valve seat disposed at an acute angle to a plane perpendicular to the axis of said cylinder bore and terminating at a portion curving into said intake valve seat, said intake valve seat being recessed at least in part into said combustion chamber surface on a side closest to said cylinder bore surface so that said valve seating surface is spaced inwardly of said combustion chamber surface for forming a masked area around the adjacent peripheral edge of the associated intake valve for restricting the flow into that area to direct the flow of the intake charge into said combustion chamber toward the side of said cylinder bore opposite said intake valve seat to generate a tumble action in the flow into said cylinder bore.



5,551,394
INDUCTION SYSTEM FOR ENGINE

Masaaki Yoshikawa, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jul. 28, 1994, Ser. No. 281,843
Claims priority, application Japan, Jul. 28, 1993, 5-186354
Int. Cl.[6] F02B *15/00*
U.S. Cl. 123—308 **32 Claims**



1. A cylinder head and induction passage arrangement for a multi-valve, internal combustion engine comprised of a cylinder head having a surface facing an associated cylinder bore and forming therewith at least in part a combustion chamber, a pair of

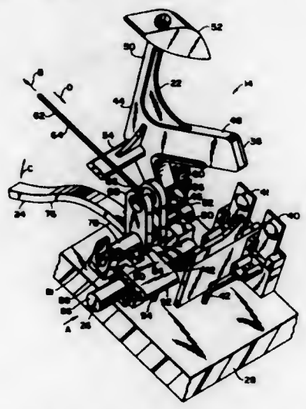
side valve seats formed in said surface in proximity to the periphery of said cylinder bore and on opposite sides of a first plane containing the axis of the cylinder bore and substantially on one side of a second plane perpendicular to said first plane and containing said cylinder bore axis, and a center intake valve seat intersected by said first plane, spaced from said second plane and in proximity to the periphery of said cylinder bore, induction passage means for supplying a charge to said valve seats, and throttle means for controlling the flow through said induction passage means so that said center valve seat serves the combustion chamber only at high speed, high load conditions.

5,551,395

CONTROL SYSTEM FOR POWER TOOL WITH INTERNAL COMBUSTION ENGINE

Claudia A. Isaacs, and Keith M. Schorr, both of Charlotte, N.C., assignors to Homelite, Inc., Charlotte, N.C.

Filed Jul. 12, 1994, Ser. No. 273,729
Int. Cl.[6] F02D *11/04;* **F02N** *11/00;17/08*
U.S. Cl. 123—339.13 **17 Claims**



1. In a power tool having a user control section, an internal combustion engine with a throttle valve, and a compression release system, the improvement comprising:

a single control cable connected between the control section and the engine, the cable being adapted to control the position of the throttle valve, actuation of the compression release system, and stopping of the engine.

7. In a string trimmer having an internal combustion engine, a throttle actuator, an electric starter and a start switch, the improvement comprising:

means for preventing the start switch from being actuated unless the throttle actuator is located at a predetermined actuated position, wherein the means for preventing includes a first section on the throttle actuator that is located, at least partially, in a path of a second section on the start switch into the throttle actuator is moved to its predetermined actuated position.

10. In a power tool having an internal combustion engine with a throttle valve, and a throttle valve control system with a user actuated throttle lever and a control link between the throttle valve and the throttle lever, the improvement comprising:

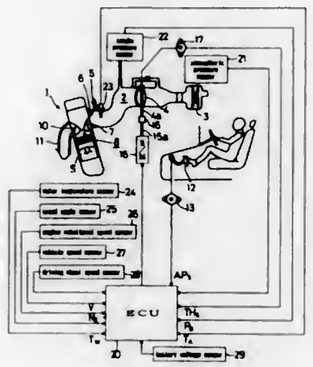
a throttle lever control member movably connected to the throttle lever, the throttle lever control member having a first position relative to the throttle lever for adjustably stopping movement of the throttle lever in a predetermined direction at an idle position and a second throttle lever release position for allowing the throttle lever to move past the idle position in the predetermined direction to an engine stop position, wherein the throttle lever has a projection adapted to be stopped by the control member at the first position and, the control member has an aperture to allow the projection to move past the idle position when the control member is at its second position.

5,551,396

DEVICE FOR COPING WITH SENSOR ABNORMAL STATE IN ELECTRONIC CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Norio Suzuki, and Yousuke Tachibana, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 3, 1995, Ser. No. 498,299
Claims priority, application Japan, Jul. 6, 1994, 6-176148
Int. Cl.[6] F02D *41/22*
U.S. Cl. 123—399 **4 Claims**



1. A device for coping with a sensor abnormal state in an electronic control system for controlling an internal combustion engine in response to detection signals obtained from various sensors of the internal combustion engine comprising:

an engine speed sensor for outputting a first signal indicating a rotational speed of the engine;

a temperature sensor for outputting a second signal indicating a temperature related to a temperature of the engine;

a first detecting means for detecting that said rotational speed indicated by said first signal is higher than a predetermined speed;

a second detecting means for detecting that said temperature indicated by said second signal is lower than a predetermined temperature;

a discriminating means for discriminating that said temperature sensor is in an abnormal state when a state in which said first detecting means detects that said rotational speed indicated by said first signal is higher than said predetermined speed and said second detecting means detects that said temperature indicated by said second signal is lower than said predetermined temperature is continued for a predetermined time; and

a correcting means for correcting said temperature indicated by said second signal to a higher temperature provisionally so as to decrease the rotational speed of the engine when said discriminating means discriminates the abnormal state.

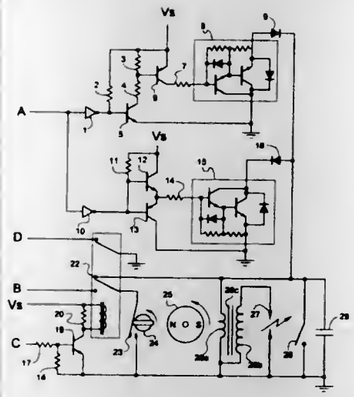
5,551,397

DIGITALLY CONTROLLED MAGNETO IGNITION SYSTEM WITH ALTERNATE TIMING

Derrick A. Early, 8517 60th Ave., Berwyn Heights, Md. 20740

Filed Mar. 13, 1995, Ser. No. 402,696
Int. Cl.[6] F02P *1/08*
U.S. Cl. 123—418 **19 Claims**

1. An ignition system for an internal combustion engine having



a magneto generator comprising a rotor having a magnet, said rotor rotationally coupled to said internal combustion engine;

a primary and a secondary induction coil magnetically coupled to said magneto generator and at least one spark gap connected to said secondary induction coil;

sensor means for providing a timing signal representing a rotational position;

timing control means connected to said sensor means for generating a switching time signal in response to said timing signal, said timing control means together including means for generating an enable signal;

semiconductor switch means controlled by said switching time signal and connected to said primary induction coil, forming a primary circuit for conducting and interrupting current flowing in said primary induction coil in response to said switching time signal thereby generating a spark in said spark gap;

alternate timing means coupled to the rotation of said rotor, said alternate timing means being activated in an absence of said enable signal, and connected to said primary induction coil forming an alternate primary circuit for generating said spark in said spark gap.

5,551,398

ELECTRONICALLY-CONTROLLED FLUID INJECTOR SYSTEM HAVING PRE-INJECTION PRESSURIZABLE FLUID STORAGE CHAMBER AND DIRECT-OPERATED CHECK

Dennis H. Gibson, Chillicothe; Gregory W. Hefler, Dunlap; Ronald D. Shinogle, Peoria, and Mark F. Sommars, Sparland, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 242,501, May 13, 1994. This application May 10, 1995, Ser. No. 438,858
Int. Cl.[6] F02M *37/04*
U.S. Cl. 123—446 **24 Claims**

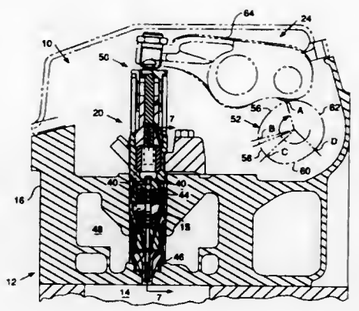
1. A unit fuel injector for receiving fuel at a low supply pressure and for injecting fuel into a combustion chamber of an engine during an injection sequence, comprising:

an injector body having an injector orifice;

means disposed in the body for pressurizing fuel to a selectable level independent of and substantially higher than the supply pressure;

means disposed in the injector body to directly control the injection of pressurized fuel through the orifice into the combustion chamber at a selectable point in the injection sequence, and;

means disposed in the injector body to directly control the end of fuel injection at a selectable point in the injection sequence.

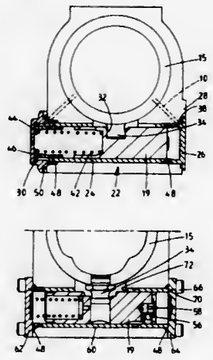


5,551,399

ADVANCE PISTON MOUNTING

Peter A. G. Collingborn, Kent, England, assignor to Lucas Industries public limited company, West Midlands, England

Filed Jul. 10, 1995, Ser. No. 499,972
Claims priority, application United Kingdom, Jul. 12, 1994, 9413994
Int. Cl.[6] F02M *41/00;37/04*
U.S. Cl. 123—450 **10 Claims**



1. A mounting for an advance piston comprising a sleeve within which the advance piston is provided, the sleeve being provided with a first outwardly extending flange integral with the sleeve, and a second outwardly extending flange arranged to be secured to the sleeve, the first and the second flanges being arranged to secure the sleeve to a pump housing.

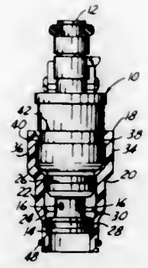
5,551,400

MOUNTING ADAPTER FOR AIR-ASSIST FUEL INJECTOR

Peter C. Rice, Yorktown; Anthony L. Franchitto, Hampton, and Jingming J. Shen, Newport News, all of Va., assignors to Siemens Automotive L.P., Auburn Hills, Mich.

Continuation of Ser. No. 154,317, Nov. 18, 1993, abandoned. This application Dec. 18, 1995, Ser. No. 573,900
Int. Cl.[6] F02M *55/02*
U.S. Cl. 123—470 **1 Claim**

1. A mounting adapter for an air-assist fuel injector having one or more air-assist entrances through the valve body for receiving assist air to act on fuel within the fuel injector, the adapter comprising:



a tubular body of fuel-compatible plastic, with main wall means circumferentially girdling a main through-bore for receiving a portion of the fuel injector containing the assist air entrances, said main wall means cooperating with the fuel injector to form an annular zone around the air-assist entrances in the fuel injector;

a tube attached to and transversely intersecting said wall means for conveying assist air from an external source through said wall means to said annular zone;

axially spaced apart seals acting between said main wall means and the fuel injector to axially bound and seal said annular zone in a fluid tight manner;

seal retaining means on the outside of said body for locating another seal for sealing the adapter in a manifold; and

resilient catch means projecting from said wall means for catching said body on the fuel injector and for locating said annular zone relative to said assist air entrances in the fuel injector.

5,551,401

AIR SUCTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

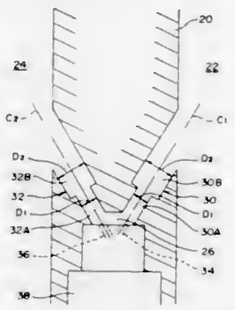
Hideki Komada; Takahiro Muramatsu, and Yuji Yamamoto, all of Shizuoka-ken, Japan, assignors to Suzuki Motor Corporation, Shizuoka, Japan

Filed Feb. 27, 1995, Ser. No. 394,578

Claims priority, application Japan, May 31, 1994, 6-141035; May 31, 1994, 6-141036; May 31, 1994, 6-141037

Int. Cl.[6] F02M *51/00*

U.S. Cl. 123—472 **4 Claims**



1. In an air suction system for an internal combustion engine in which an air intake port of said internal combustion engine is partitioned by a partition wall into first and second intake port sections which separately communicate with a single combustion chamber of said internal combustion engine, said second intake port section being provided with an air intake control valve which selectively provides opening and closing actions depending on an engine-running state, said partition wall being defined with first and second injection passage portions whose one ends are joined together at a location of said partition wall, the other ends of said first and second injection passage portions being respectively in communication with said first and second intake port sections on a downstream side of said air intake control valve, the other ends of said first and second injection passage portions being oriented toward said combustion chamber, said partition wall being provided with a fuel injection valve which has first and second nozzle hole portions directed toward said combustion chamber respectively through said first and second injection passage portions, the improvement wherein a passage cross-section of said first injection passage portion is greater in area than that of said second injection passage portion.

5,551,402

INJECTION ARRANGEMENT FOR INJECTING PRESSURE MEDIUM INTO A CYLINDER OF AN INTERNAL COMBUSTION ENGINE

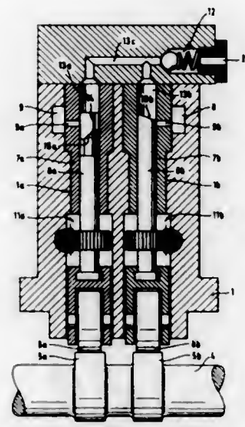
Gösta Liljenfeldt, Solf; Dave Jay, Vähäkyrö, and Håkan Nynäs, Vasa, all of, Finland, assignors to Wartsila Diesel International LTD OY, Helsinki, Finland

Filed Nov. 14, 1995, Ser. No. 557,824

Claims priority, application Finland, Dec. 1, 1994, 945679

Int. Cl.[6] F02M *37/04*

U.S. Cl. 123—500 **6 Claims**



1. An injection arrangement for injecting a pressure medium into a cylinder of an internal combustion engine, said arrangement comprising at least two injection pump elements (1*a*,1*b*) arranged in a common pump body (1) and arranged to inject the pressure medium into the same cylinder during at least one continuous injection period, each pump element (1*a*,1*b*) including a pump cylinder (7*a*,7*b*), a piston member (8*a*,8*b*) reciprocatingly movable therein and a pressure chamber (13,13*a*,13*b*), the piston members (8*a*,8*b*) being arranged to receive control from a cam race (5*a*,5*b*) of at least one cam arranged in a camshaft (4) or the like of the engine and the pressure chambers (13,13*a*,13*b*,13*c*) in the pump cylinders (7*a*,7*b*) being continuously in connection with each other, and for determining the entire volume of the injection during said injection period as well as the speed and timing of the injection affecting it the piston members (8*a*,8*b*) are provided with control edges for the timing of the injection so that the control edge (10*b*) in one of the piston members (8*b*) determines the starting moment of the injection and the control edge (10*a*) in the other piston member (8*a*) respectively determines the termination of the injection during movement of the piston members (8*a*,8*b*) towards the direction of the pressure chambers (13,13*a*,13*b*,13*c*).

5,551,403

FUEL SUPPLY QUANTITY LIMITING ARRANGEMENT

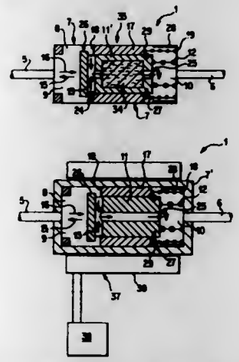
Guenther Schmidt, Meckenbeuren, Germany, assignor to MTU Motoren- Und Turbinen-Union Friedrichshafen GmbH, Germany

Filed Aug. 4, 1995, Ser. No. 511,232

Claims priority, application Germany, Aug. 4, 1994, 44 27 607.9

Int. Cl.[6] F02M *47/02*

U.S. Cl. 123—510 **20 Claims**



1. An arrangement for limiting supply of fuel from a fuel pressure reservoir to a controllable injection valve for injection into a combustion space of an internal-combustion engine, comprising a housing, an interior space being formed in the housing having an inlet and an outlet, a separating piston inserted in the interior space to divide the interior space into an inlet-side chamber and an outlet-side chamber in a liquid-tight manner, the separating piston being prestressed by a first spring against a fuel flow direction, and which, under the effect of forces applied thereto, is displacably arranged in a displacing direction between a starting position and an end position, a flow-through opening being formed in the separating piston to selectively connect the chambers with one another, and the separating piston, at least in the end position, interrupting fuel flow-through, wherein a closing device is operatively arranged in the housing for closing the flow-through opening as a function of an axial displacing direction of the separating piston.

5,551,404

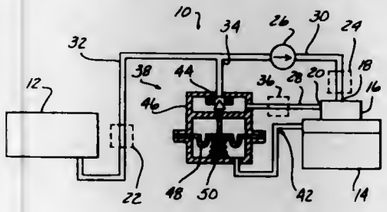
FUEL INJECTION SYSTEM FOR MARINE ENGINES

David D. Bauerle, Chesterfield Township, and Kevin R. Liske, Madison Heights, both of Mich., assignors to Coltec Industries Inc., New York, N.Y.

Filed Dec. 10, 1993, Ser. No. 164,705

Int. Cl.[6] F02M *37/04*

U.S. Cl. 123—514 **20 Claims**



1. In a fuel injection system for injecting fuel from a fuel supply tank at a variable controlled rate into an internal combustion gasoline engine, said system including fuel injection means having a supply port for receiving fuel at a rate in excess of said controlled rate, an injection port for discharging fuel into said engine at said controlled rate, and a return port for conducting fuel in excess of that discharged from said injection port from said injection means;

the improvement wherein said system further comprises pump means having an inlet connected by a first conduit to said return port and an outlet directly connected by a second conduit to said supply port, third conduit means for conducting fuel from said supply tank into said first conduit at a first location between said return port and said inlet, and pressure regulating means for maintaining the pressure at said return port at a predetermined substantially constant superatmospheric pressure to prevent said fuel from flashing to vapor downstream of said fuel injection means.

5,551,405

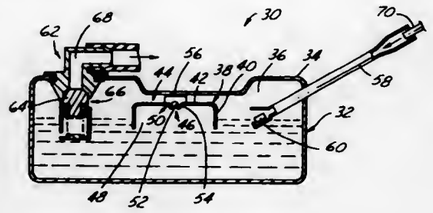
MOTOR VEHICLE FUEL SYSTEM WITH INTERNAL VAPOR RESERVOIR

Robert H. Thompson, Redford, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 13, 1995, Ser. No. 556,478

Int. Cl.[6] F02M *33/02*

U.S. Cl. 123—516 **14 Claims**



1. A motor vehicle fuel system, comprising:

a fuel tank having an upper wall portion and defining a first interior volume for storing fuel therein, said first interior volume including a first ullage space adjacent said upper wall portion; and

a generally cup-shaped vapor reservoir carried within said first interior volume and having vertically extending sides, a horizontally extending top and an open bottom operative to define a second interior volume open to the bottom of said fuel tank, said second interior volume including a second ullage space, said top including means for effecting fluid communication between said first ullage space and said second ullage space, said means for effecting fluid communication including:

a small bleed orifice;

a large orifice arranged in parallel fluid relationship with said small bleed orifice;

and valve means movable between a closed position closing said large orifice and an open position in response to acceleration of said vehicle.

5,551,406

CANISTER PURGE SYSTEM HAVING IMPROVED PURGE VALVE

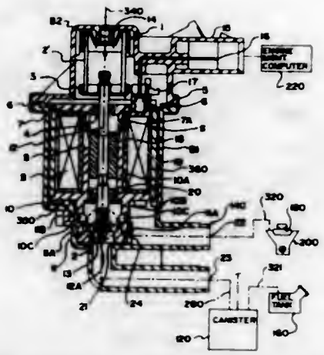
Gary Everingham; John E. Cook; Paul D. Perry, and Murray F. Busato, all of Chatham, Canada, assignors to Siemens Electric Limited, Chatham, Canada

Filed May 19, 1995, Ser. No. 447,166

Int. Cl.[6] F02M *33/02*

U.S. Cl. 123—520 **20 Claims**

1. In a vapor collection system for an internal combustion engine fuel system wherein an electrically-operated canister purge valve comprises a purge flow path disposed between an intake manifold of an engine and a fuel vapor collection canister that



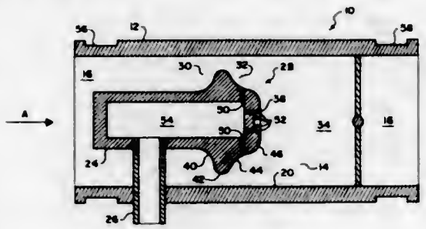
collects vapor generated by volatile fuel in a fuel tank, said canister purge valve controlling the purging of said canister to said intake manifold in accordance with a purge control signal that sets the extent to which said canister purge valve allows purge flow through said purge flow path, the improvement in which said canister purge valve comprises a solenoid having an electromagnetic coil disposed about a central longitudinal axis, stator structure associated with said coil for conducting magnetic flux created as a result of current flow in said coil, said stator structure comprising an air gap disposed within a through-hole extending through said coil along such an axis, an armature that is disposed proximate said air gap for positioning along said axis as a function of magnetic force resulting from current flow in said coil, a valve element that is positioned axially by and with said armature in relation to a valve seat for establishing the extent to which the canister purge valve allows flow from said canister to said manifold, said armature having an association with said stator structure such that an axial component of magnetic force acting on said armature in a direction that increasingly allows flow through said purge flow path, is substantially linearly related to the average current flow in said coil over an operating range of average current flows, and a bias spring that exerts a spring force that urges said armature and valve element toward said valve seat.

5,551,407

FUEL-AIR MIXING APPARATUS AND METHOD FOR GASEOUS FUEL ENGINES

Donald Q. Greenway, Georgetown, Tex., assignor to Greenway Environmental Research, Georgetown, Tex.

Filed Sep. 15, 1995, Ser. No. 528,729
Int. Cl.[6] F02M *21/04*
U.S. Cl. 123—527 **18 Claims**



1. A fuel-air mixer apparatus for gaseous fuel engines, the fuel-air mixer apparatus comprising:

(a) a mixer body having a mixer passage extending therethrough, the mixer passage defined by a mixer passage wall and having an outlet end and an inlet end;

(b) a fuel release body positioned within the mixer passage;

(c) a flow restricting outer surface formed on the fuel release body, a flow restricting section being defined between the flow restricting outer surface and the mixer passage wall;

(d) a flow area increasing surface formed on the fuel release body adjacent to the flow restricting surface and spaced from the flow restricting surface in a flow direction from the inlet end to the outlet end of the mixer passage, the flow area increasing surface extending at an angle to the mixer passage wall so that the area defined between the flow area increasing surface and the mixer passage wall increases in the flow direction;

(e) an end surface formed on the fuel release body, the end surface extending generally transversely to the mixer passage and facing the outlet end of the mixer passage;

(f) a plurality of first fuel release openings spaced apart around the periphery of the flow area increasing surface;

(g) a plurality of second fuel release openings spaced apart across the end surface; and

(h) a fuel supply structure for supplying fuel to the first and second fuel release

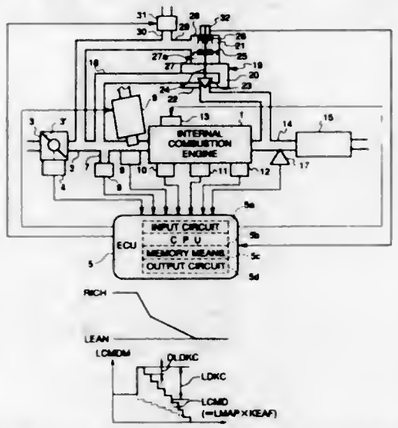
openings.

5,551,408

EXHAUST GAS RECIRCULATION CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Daisuke Shimizu; Kotaro Miyashita; Yoshihisa Hara, and Hiroshi Ikeba, all of Wako, Japan, assignors to Honda Giken Kogyo K.K. (Honda Motor Co., Ltd, in English), Tokyo, Japan

Filed Oct. 12, 1994, Ser. No. 322,193
Claims priority, application Japan, Oct. 19, 1993, 5-284368
Int. Cl.[6] F02M *25/07*
U.S. Cl. 123—571 **7 Claims**



1. In an exhaust gas recirculation control system for an internal combustion engine having an intake system, and an exhaust system, including an exhaust gas recirculation passage extending between said intake system and said exhaust system, for recirculating part of exhaust gases emitted from said engine, an exhaust gas recirculation control valve for controlling a flow rate of exhaust gases to be recirculated through said exhaust gas recirculation passage, engine operating condition-detecting means for detecting operating conditions including rotational speed of said engine and load on said engine, desired air-fuel ratio-calculating means for calculating a desired air-fuel ratio of a mixture supplied to said engine, based on operating conditions of said engine detected by said operating condition-detecting means, and desired valve opening-calculating means for calculating a desired valve opening of said exhaust gas recirculation control valve, based on operating conditions of said engine detected by said operating condition-detecting means and said desired air-fuel ratio calculated by said desired air-fuel ratio-calculating means,

the improvement comprising:

determining means for determining whether said desired air-fuel ratio has been changed from a lean state to a rich state or vice versa, based on said desired air-fuel ratio calculated by said desired air-fuel ratio-calculating means;

valve opening-modifying means for modifying said desired valve opening of said exhaust gas recirculation control valve calculated by said desired valve opening-calculating means, by a first predetermined amount; and

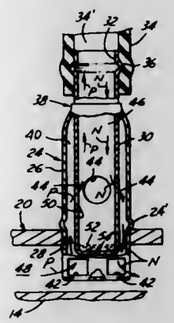
valve opening control means for starting said controlling of said flow rate of exhaust gases to be recirculated by said exhaust gas recirculation control valve, by the use of said modified desired valve opening, when it is determined by said determining means that said desired air-fuel ratio of said mixture has been changed from said lean state to said rich state or vice versa.

5,551,409

OIL SEPARATOR FOR ENGINE VENT SYSTEM

Brian V. Sanders, Westland, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 1, 1995, Ser. No. 566,102
Int. Cl.[6] F02B *25/06*
U.S. Cl. 123—572 **4 Claims**



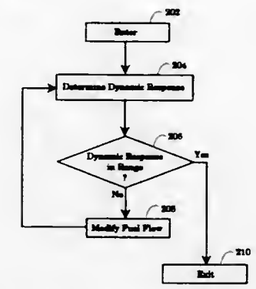
1. To vent the crankcase of an internal combustion engine during operation thereof generating a positive pressure, a compact flow control device for separating oil from a mixture of air and oil flowing from the crankcase, comprising: an elongated first tubular member; an elongated second tubular member sized to permit it to be positioned coaxially within said first tubular member; an annular flow passage formed between said tubular members; means attaching and sealing said first tubular member's upper end portion to said second tubular member; at least one aperture extending through a midportion of said second tubular member to communicate said annular passage with the interior of said second tubular member; an upper end portion of said second tubular member extending upward from said attaching and sealing means to define an outlet from said control device; inlet openings formed in the lower end of said first tubular member to admit a mixed flow of air and oil from an engine crankcase into said device; said second tubular member having a substantially closed lower end to cause a flow of air and oil to pass upwardly through said annular passage, turn to pass through said apertures, and then turn to again flow upward through said second tubular member whereby changes in flow direction cause heavier oil to separate from the flow and drop to the lower portion of said second tubular member; means for collecting and returning such separated oil to the engine.

5,551,410

ENGINE CONTROLLER WITH ADAPTIVE FUEL COMPENSATION

Isis A. Messih, Troy, and Charles F. Aquino, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 26, 1995, Ser. No. 506,716
Int. Cl.[6] F02D *41/14*
U.S. Cl. 123—679 **7 Claims**



1. An electronic engine controller for controlling the delivery of fuel to an intake of an engine comprising:

means for receiving an air/fuel signal from a switching type exhaust gas composition sensor which provides a first indication if air/fuel mixture combusted by said engine is rich of stoichiometry and a second indication if said air/fuel mixture is lean of stoichiometry;

means for determining, from a plurality of said first and second indications, the actual dynamic response of said engine to a predetermined change in the air/fuel mixture;

means for comparing said actual dynamic response to a predetermined dynamic response; and

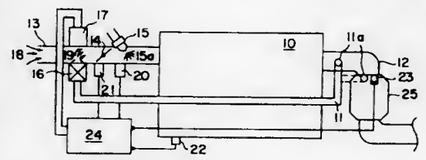
means, responsive to said actual dynamic response being outside of a predetermined response range, for altering the delivery of fuel to said intake to bring said actual dynamic response within said predetermined response range.

5,551,411

DILUTION CONTROLLED LEAN BURN SYSTEM

Michael A. V. Ward, Lexington, Mass., assignor to Combustion Electromagnetics, Inc., Arlington, Mass.

PCT No. PCT/US93/02729, § 371 Date Feb. 2, 1995, § 102(e) Date Feb. 2, 1995, PCT Pub. No. WO94/03717, PCT Pub. Date Feb. 17, 1994
PCT Filed Sep. 19, 1993, Ser. No. 379,643
Int. Cl.[6] F02D *41/00;* **F02M** *23/00;25/00*
U.S. Cl. 123—684 **43 Claims**



1. An improved combustion engine comprising:

(1) means defining at least one combustion chamber and expansion means powered by combustion therein to drive a rotary output of the engine, the output speed being defined as revolutions per minute, RPM;

(2) means defining a main air intake zone with means for adding fuel thereto, the air intake zone leading to the combustion chamber for supplying air-fuel mixture thereto, the intake zone having a high pressure region in the air flow path to the combustion chamber and a low pressure region in said flow

path downstream from the high pressure region, the two regions being separated by throttle means;

(3) means for controlling air-fuel ratio, AFR, of the mixture;

(4) means for discharging the combustion exhaust from the chamber to an exhaust zone

(5) means for tapping a portion of exhaust gas from the exhaust zone and conveying the tapped gas via a conduit to the high pressure region of the intake zone to dilute intake air and establish a gas-fuel ratio, GFR, and exhaust-fuel ratio, EFR,

where GFR=AFR+EFR, and AFR=AFRO+EAFR, where AFRO is stoichiometric air-fuel ratio and EAFR is the actual air-fuel ratio fed to the combustion chamber, less stoichiometric, i.e. excess air-fuel ratio,

said means for tapping being constructed and arranged to provide a variable area Aex defining a variable exhaust cross section flow area between the point of tapping the exhaust zone and the point of delivery of tapped exhaust gas to the high pressure region of the intake zone, with a maximum value of Aex(0),

and wherein,

the engine further comprises control means that control the amount of exhaust gas tapped, and therefore the amount returned to the high pressure zone intake zone, to thereby establish EFR/GFR in relation to RPM and manifold absolute pressure of the low pressure region of the intake zone, MAP, in the following ways:

(a) means, responsive to engine speed and intake zone pressure, for introducing said tapped portion of the exhaust gas at the high pressure side of said intake zone according to the following two dilution equations, defined according to whether MAP and RPM are below or above respective pre-set control values of MAP, MAP1 and MAP2, and RPM N1 that are intermediate between extreme highs and lows of MAP and RPM at the extremes of engine operation of idling and wide open throttle, WOT,:

$$EFR/GFR=K(Aex/Aex(0))\sqrt{SQRT(M*N)} \quad (I)$$

where MAP and RPM are below the respective pre-set MAP1, N1, and where M=MAP1 and N=RPM/N1, and

$$EFR/GFR=K(Aex/Aex(0)) \quad (II)$$

where MAP is between two preset control values thereof, the lower one of which is the MAP control value used in equation (I), MAP1, and the higher one MAP2, is below MAP at the WOT, condition and RPM is above the value thereof used for equation (I) above

where K is a constant essentially independent of speed and MAP and which is related to the engine size, dimensions of said tapping means, exhaust system restriction and other engine parameters, and

(b) means for maintaining the ratio EFR/GFR consistent with said dilution equations I and II under essentially all engine conditions, at a level providing variable dilution and engine stability to accordingly provide:

(A) as high GFR as the engine can tolerate efficiently at idle speed and corresponding MAP and at idle conditions of less than 1.5 times idle speed,

(B) increasing exhaust dilution through variable tapped Aex as per dilution equations I and II for MAP values to up to a further control value of MAP, MAPDC to provide essentially stoichiometric air-fuel ratio for MAP values at and above MAPDC,

(C) increasing exhaust dilution through variable tapped area Aex as per dilution equation I for speed, MAP conditions between idle and N1 MAP1,

(D) essentially constant GFR, EFR, and area Aex for MAP between MAP1 and MAP2, where MAP2 is above MAP1 and is less than WOT,

(E) decreasing tapped area Aex, and therefore decreasing EFR, between MAP2 and WOT so that EFR is reduced substantially from its maximum value, EFRO, at WOT.

5,551,412

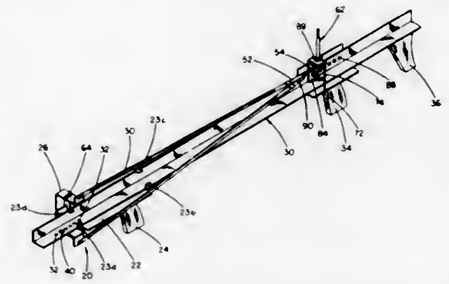
VERTICALLY ORIENTED SLINGSHOT RELEASE APPARATUS

Wesley J. Warnke, 7060 Binney St., Omaha, Nebr. 68104

Filed Mar. 27, 1995, Ser. No. 411,278

Int. Cl.[6] F41B *3/02*

U.S. Cl. 124—20.1 **11 Claims**



3. A slingshot device for accurate shooting of a projectile comprising:

an elongated stationary support channel having forward and rearward portions;

a movable carriage slidably engaged by said stationary support channel and movable between an extended, forward cocked position and a retracted rearward holding position;

locking means mounted on the forward portion of said elongated stationary support channel and operative to releasably lock said carriage in the extended, forward cocked position;

an elongated elastic band means having opposite ends mounted in vertically spaced relation on said carriage and including a pouch at a midpoint of said elastic band means for releasably retaining the projectile;

a trigger means on said stationary support channel and movable between an engagement position in releasable engagement with the pouch of said elastic band means, and a release position such that upon movement of the trigger means to the engagement position and upon engagement of said pouch with said trigger means and upon movement of said carriage to the forward cocked position, said elastic band means is substantially stretched and upon movement of the trigger means to the release position, said elastic band means is operative to propel a projectile in said pouch forwardly, defining a line of departure; and

sighting means on said support channel and carriage positioned above said line of departure.

5,551,413

ARCHERY BOW HANDLE RISER WITH REPLACEABLE GRIP HEEL

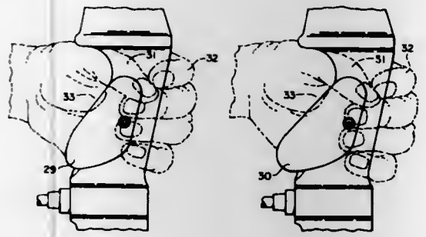
Randy J. Walk, Tooele, Utah, assignor to Hoyt USA, Salt Lake City, Utah

Filed Sep. 13, 1994, Ser. No. 305,202

Int. Cl.[6] F41B *5/14*

U.S. Cl. 124—88 **9 Claims**

1. An archery bow handle riser comprising a riser body having opposite ends to which blow limbs may be attached; a hand grip throat portion intermediate the riser body between the ends of the riser body configured to be held between the thumb and the forefinger of an archer holding the riser; and a hand grip heel member mounting portion adjacent the hand grip throat portion configured to removably accept a hand grip heel member that is separate and apart from the hand grip throat portion.



5,551,414

SEAL AND INSTALLATION IMPROVEMENTS

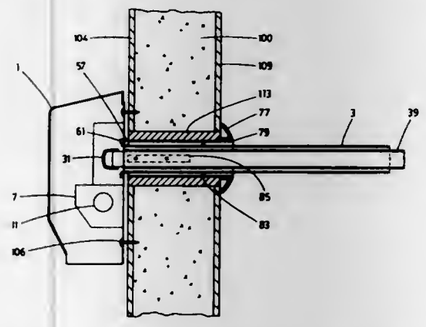
John Quick, Hisdale, Canada, assignor to Hunter Energy and Technologies, Inc., Orillia, Canada

Filed Mar. 1, 1995, Ser. No. 396,710

Claims priority, application Canada, Sep. 27, 1994, 2133052

Int. Cl.[6] F24C *3/00*

U.S. Cl. 126—85 B **9 Claims**



1. A weather vent seal kit comprising: a seal with a resiliently deformable ring having an internal circumference and an external circumference, an upper surface and a lower surface, each surface extending about the internal circumference from the internal circumference to the external circumference, and with a thickness between the upper surface and the lower surface, the external circumference being deformable inwardly when inserted into a hole of smaller diameter than the external circumference and the internal circumference being constant when inserted into a hole of greater diameter than the internal circumference, and the ring rebounds to its normal position when it emerges from the hole, and the ring substantially flattens when brought back toward the hole against a substantially flat surface about the hole, and

a tubular sleeve of substantially the same outer contour as the internal circumference of the seal, and two straps.

5,551,415

CAPSULAR BASE LATERALLY CARRYING GRAPHIC ELEMENTS, FOR A COOKING UTENSIL

Ferdinando Cartossi, Baveno, Italy, assignor to Cartossi S.R.L., Novara, Italy

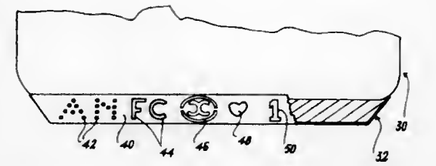
Filed Nov. 1, 1994, Ser. No. 332,862

Claims priority, application Italy, Nov. 4, 1993, MI93U0852 U

Int. Cl.[6] A47J *27/00*

U.S. Cl. 126—390 **10 Claims**

1. A capsular heat-radiating base for a stainless steel cooking utensil, comprising



an external stainless steel covering having a bottom face spaced from a surface of the utensil and a lateral peripheral wall extending between said bottom face of said covering and the surface of the utensil,

a first metal member interposed between said bottom face of said covering and the surface of the utensil and having side surface regions situated contiguous with said lateral wall of said covering, and

identification means for identifying the utensil, said identification means comprising a pattern of apertures in said lateral wall of said covering through which said first metal member is visible.

5,551,416

NEBULISER AND NEBULISER CONTROL SYSTEM

Philip G. Stimpson, Welford, and Andrew D. Hopkins, Sutton Coldfield, both of, United Kingdom, assignors to Medix Limited, Lutterworth, United Kingdom

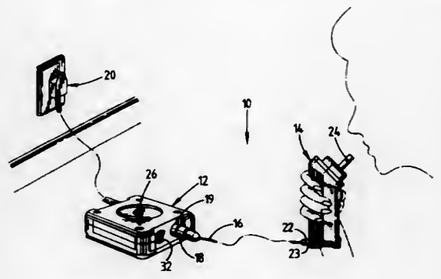
PCT No. PCT/GB92/02098, § 371 Date May 10, 1994, § 102(e) Date May 10, 1994, PCT Pub. No. WO93/09881, PCT Pub. Date May 27, 1993

PCT Filed Nov. 12, 1992, Ser. No. 232,244

Claims priority, application United Kingdom, Nov. 12, 1991, 9123969

Int. Cl.[6] A61M *11/00*

U.S. Cl. 128—200.16 **8 Claims**



1. A nebuliser, comprising:

an electrically-energisable ultrasonic transducer in the form of a piezo-electric crystal;

a transducer drive system; and

a high-frequency drive signal generated by the drive system for energising the transducer,

the transducer being connected to the drive signal to receive said drive signal and the transducer, when energised by the drive signal, being operative to cause physical vibrations in a fluid to be nebulised,

the transducer having a frequency-dependent impedance characteristic exhibiting a maximum impedance at an anti-resonance frequency corresponding to an anti-resonance condition of the crystal, the drive system further comprising frequency control means operable to adjust the frequency of the drive signal so as to be maintained substantially equal to the anti-resonance frequency.

5,551,417

Patent Not Issued For This Number

5,551,418

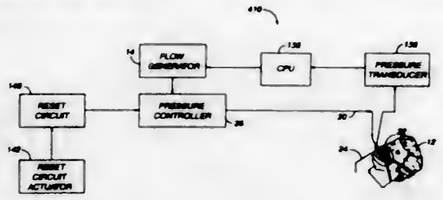
SLEEP APNEA TREATMENT APPARATUS WITH RESET CIRCUITRY

Mark C. Estes, Irwin, and Janice M. Cattano, Gibsonia, both of Pa., assignors to Respironics, Inc., Murrysville, Pa.

Continuation-in-part of Ser. No. 768,269, Oct. 17, 1991, Pat. No. 5,239,995. This application Aug. 23, 1993, Ser. No. 110,372

Int. Cl.[6] A61M *16/00;* **A62B** *7/00;* **F16K** *31/02*

U.S. Cl. 128—204.23 **7 Claims**



1. Apparatus for delivering pressurized gas to the airway of a patent, said apparatus comprising;

gas flow generator means for providing a flow of said gas;

conduit means for delivery of said gas flow to the airway of said patient;

pressure controller means cooperable with said gas flow generator means to provide for flow of said gas within said conduit means and within the airway of said patient at at least one pressure level; and

reset circuit means for permitting said patient to substantially instantaneously reset said pressure controller means to provide said flow of gas at a predetermined reduced pressure after which said pressure controller means resumes provision of said flow of gas in a manner substantially similar to that provided prior to said reset.

5,551,419

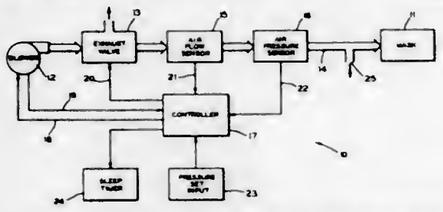
CONTROL FOR CPAP APPARATUS

James P. Froehlich, Berlin; Joseph N. Mitchell, Rockwood, and Stephen M. Jones, Turtle Creek, all of Pa., assignors to DeVilbiss Health Care, Inc., Somerset, Pa.

Filed Dec. 15, 1994, Ser. No. 356,471

Int. Cl.[6] A61M *16/00*

U.S. Cl. 128—204.23 **15 Claims**



1. An improved method for controlling CPAP apparatus adapted to apply a positive airway pressure to a patient, said apparatus including an air blower and means for applying a positive air pressure from said blower through a hose to a mask adapted to be secured to a patient in communications through the patient's nose with the patient's respiratory airway, said apparatus including means for detecting abnormal breathing events and for automatically increasing the positive airway pressure applied to the patient in response to the detection of at least one abnormal breathing event, said method comprising the steps of:

a) detecting air leakage through the patient's mouth caused by the patient maintaining an open mouth while breathing blower air through the nose; and

b) preventing an automatic pressure increase as a consequence of a predetermined high air leakage through the patient's open mouth.

5,551,420

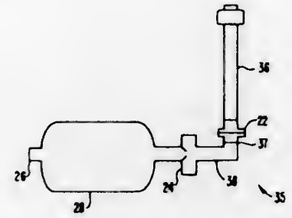
CPR DEVICE AND METHOD WITH STRUCTURE FOR INCREASING THE DURATION AND MAGNITUDE OF NEGATIVE INTRATHORACIC PRESSURES

Keith G. Lurie, Minneapolis; Michael Sweeney, St. Paul, and Barbara Gold, Minneapolis, all of Minn., assignors to CPRx, Inc., Minneapolis, Minn.

Filed Nov. 9, 1993, Ser. No. 149,204

Int. Cl.[6] A62B *9/02;7/00*

U.S. Cl. 128—205.13 **41 Claims**



1. A method for increasing cardiopulmonary circulation induced by chest compression and decompression when performing cardio pulmonary resuscitation, by augmenting at least the negative intrathoracic pressure, said method comprising the steps of:

providing a ventilatory tube having a length which extends at least between a patient's mouth and throat, a source of respiratory gases, and at least one inflow valve;

performing chest compression and chest decompression, wherein during chest decompression, said at least one inflow valve prevents respiratory gases from entering the lungs until a negative intrathoracic pressure level is exceeded at which time said at least one inflow valve opens, said at least one inflow valve assisting in increasing the magnitude and duration of negative intrathoracic pressure during decompression and thereby enhancing the amount of venous blood flow into the heart and lungs; and

periodically, every 2–10 chest compressions, supplying the patient with gas from the respiratory gas source so as to properly ventilate the patient.

5,551,421

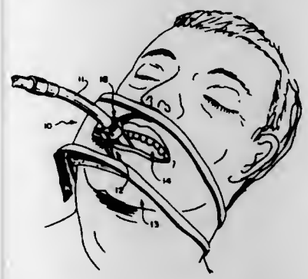
DEVICE FOR SECUREMENT OF AN ENDOTRACHEAL TUBE IN A PATIENT'S MOUTH

Abdel H. Noureldin, 1315 Glenmore Ct., Barrington, Ill. 60010; Richard W. Carter, 935 Sandpiper Ct., Bartlett, Ill. 60103, and Ahmed M. Noureldin, 133 Oliver Ct., Schaumburg, Ill. 60168

Continuation of Ser. No. 861,465, Apr. 1, 1992, abandoned. This application Nov. 8, 1994, Ser. No. 335,594

Int. Cl.[6] A61M *16/00;5/32;* **A62B** *9/06*

U.S. Cl. 128—207.17 **9 Claims**



1. A device for holding an endotrachcal tube at a corner of a human patient's mouth to allow the mouth to remain free of obstruction in event aspiration of stomach contents occurs comprising a relatively stiff clamp holder pad to be positioned at the corner of the patient's mouth in engagement against a patient's cheek, clamping means for releasably clamping the endotracheal tube at one side of the patient's mouth adjacent the corner to leave a central area of the patient's mouth between its corners free of obstructions to enable regurgitated foods and fluids to flow more freely from the patient's mouth, the clamp holder pad having holding means, cantilever mounted from one end of the pad so that an end portion of the holding means is projected away from a center portion of the clamp holder pad, for holding said clamping means adjacent the corner of the patient's mouth, the holding means having releasable means for releasably securing the clamping means to said holding means, the releasable means including a pair of flexible hook-shaped jaws operatively engageable with the clamping means, straps attached to said relatively stiff clamp holder pad at a position on an exterior surface thereof on opposite sides of said clamping means, said straps having means for securing a strap wrapped around a patient's head and extending directly underneath a patient's nose and another strap wrapped around the patient's head and extending across a patient's chin to firmly position the device on the patient's head at the one side of the patient's mouth.

5,551,422

METHOD AND APPARATUS FOR ANALYTICAL DETERMINATION OF GLUCOSE IN A BIOLOGICAL MATRIX

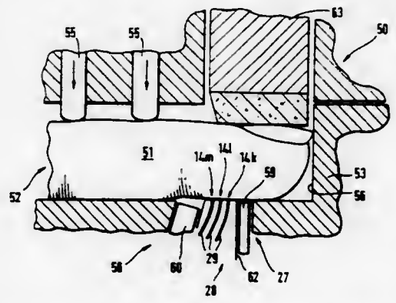
Jan H. Simonsen, Struer, Denmark, and Dirk Boecker, Heidelberg, Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed Jul. 6, 1994, Ser. No. 271,072

Claims priority, application Denmark, Nov. 9, 1992, 1363/92; Apr. 20, 1993, 0446/93; Apr. 21, 1993, 0457/93; Germany, May 5, 1993, 43 14 835.2

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—633 **101 Claims**



1. A method for determination of glucose concentration in a biological matrix, said method comprising the steps of:

performing at least two detection measurements, each detection measurement comprising the further steps of irradiating light at a first irradiation site as primary light into the biological matrix through a boundary surface thereof, said light being propagated along a light path within the biological matrix, and measuring an intensity of the light as the light emerges from the biological matrix as secondary light through a first detection site of the boundary surface thereof;

wherein at least one of said at least two detection measurements is a spatially resolved measurement of multiply scattered light, wherein the primary light is irradiated into the biological matrix at the first irradiation site, the intensity of the secondary light emerging from the biological matrix at the first detection site is measured, and wherein the first detection site is located relative to the first irradiation site such that light which was multiply scattered by scattering centers in the biological matrix is detected, and wherein the light paths of said at least two detection measurements are different, and

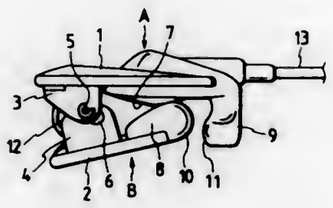
deriving the glucose concentrations from the dependence of the intensity of the secondary light from the relative position of the first irradiation site and the first detection site in said at least two detection measurements.

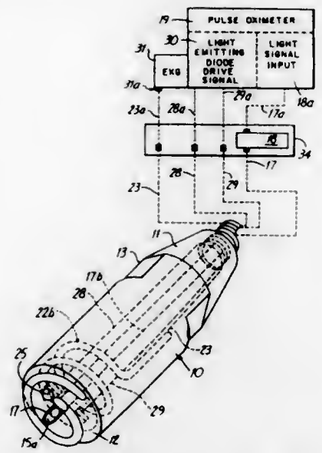
5,551,423

PULSE OXIMETER PROBE

Keiichi Sugiura, Tokyo, Japan, assignor to Nihon Kohden Corporation, Tokyo, Japan

Continuation of Ser. No. 186,526, Jan. 26, 1994, abandoned.
This application Jun. 7, 1995, Ser. No. 487,225
Claims priority, application Japan, Jan. 26, 1993, 5-001607; Jan. 26, 1993, 5-001609
Int. Cl.[6] A61B 5/00
U.S. Cl. 128—633 7 Claims





1. A pulse oximeter probe comprising:
a first holding member having a first compressing portion;
a second holding member connected to said first holding member and having a second compressing portion, wherein said first and second compressing portions are urged toward each other for holding a part of an ear;
at least one light emitting element mounted on one of said first and second holding members; and
a light receiving element mounted on one of said first and second holding members,
wherein at least one of said light emitting and light receiving elements is mounted on one of said first and second holding members at a position away from the compressing portions so that light which is emitted from said light emitting element travels completely through a portion of the ear which is not compressed by said compressing portions and which is not bordered by ear tissue which is compressed by said compressing portions before reaching said light receiving element, and
wherein said light emitting and light receiving elements cooperate to form a measuring device.

5,551,424

FETAL PROBE APPARATUS

James P. Morrison, Batavia, Ill., and Samual K. Yue, Bloomington, Minn., assignors to pHox Medical Optics, Inc., St. Charles, Ill.

Division of Ser. No. 530,875, May 29, 1990. This application Jun. 7, 1995, Ser. No. 480,254
Int. Cl.[6] A61B 5/00;5/042
U.S. Cl. 128—634 3 Claims

1. Fetal probe monitoring apparatus for continuously monitoring a constituent of arterial blood of a fetus during labor and delivery, comprising:
a fetal probe body having a longitudinal central axis and a distal end surface;
first means mounted by the probe body for penetrating fetal skin and at least in part removably attaching the body to the fetus, the first means including a first needle mounted by the probe body to extend distally of the body distal surface, the first needle having a distal linear portion extending distally of the probe body surface and having a central axis at least substantially coextensive with the probe body central axis and the first needle having a distal terminal end portion that has an opening to open to fetal tissue inwardly of fetal skin and into perfused fetal tissue;
second means having a distal light collecting surface for collecting light after the light has passed through adjacent perfused fetal tissue;
third means having a distal light transmitting surface for transmitting light to pass through the perfused fetal tissue and then to the second means collecting surface wherein the third means comprise first and second diodes that emit visible and infrared light, respectively, the diodes having the light transmitting surfaces exterior of the fetal skin when the probe body is attached to the fetus and adjacent to the probe body distal surface to transmit light through the fetal skin, the diodes being generally located on diametric opposite sides of the first needle linear portion and transversely spaced from the first needle linear portion;
wherein the second means extends within the first needle to have its distal light collecting surface adjacent to the first needle opening so that the collected light passes through the first needle opening and the third means having its distal light transmitting surface exterior of the first needle and spaced from the first needle sufficiently that light in being transmitted has to travel through perfused tissue prior to being collected, each of the second and third means at least in part extending within the probe body and adjacent to the body distal surface: and
a pulse oximeter having means for cooperating with the third means and having means for receiving collected light from the second means for determining the oxygen saturation of arterial hemoglobin.

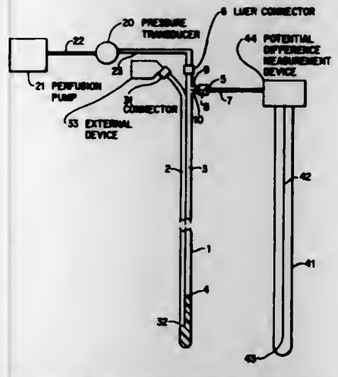
5,551,425

POTENTIAL DIFFERENCE AND PERFUSION PRESSURE CATHETER

Anders Essen-Moller, Stockholm, Sweden, assignor to Synectics Medical, Inc., Irving, Tex.

Continuation of Ser. No. 60,930, May 13, 1993, abandoned.
This application Jan. 18, 1995, Ser. No. 375,209
Int. Cl.[6] A61B 5/05
U.S. Cl. 128—635 8 Claims

1. A gastrointestinal catheter device comprising:
(a) a first catheter having a tubular body with a proximal end, a distal end, an interior, a length, an exterior, and a first lumen running through the interior of the tubular body for the length of the tubular body, the first lumen having a proximal end and a diameter,
(b) a wire electrode within the first lumen near the proximal end of the tubular body,
(c) a first outlet at the distal end of the tubular body, communicating from the first lumen to the exterior of the tubular body,
(d) a first luer connector, at the proximal end of the first lumen, connectable to a pressure transducer,
(e) an external shielded cable,



(f) a center wire in said external shielded cable,
(g) a second luer connector, adjacent to the proximal end of the first lumen, connecting the wire electrode to said external shielded cable,
(h) a pressure transducer,
(i) a perfusion pump,
(j) a tube connecting the first luer connector to the pressure transducer,
(k) a capillary connecting the pressure transducer to the perfusion pump,
(l) a second catheter, with a distal end, a proximal end, and an electrode at its distal end, and with a potential difference between the electrode at the distal end of the second catheter and the wire electrode within the first lumen running through the interior of the tubular body of the first catheter, and
(m) a potential difference measurement device connected to the proximal end of the second catheter and the external shielded cable, the potential difference measurement device electrically communicating with the electrode at the distal end of the second catheter and the wire electrode within the first lumen running through the interior of the tubular body of the first catheter.

5,551,426

INTRACARDIAC ABLATION AND MAPPING CATHETER

John D. Hummel, 3437 Burbank, Ann Arbor, Md. 48105, and Ronald D. Berger, 3101 Northbrook Rd., Baltimore, Md. 21208

Filed Jul. 14, 1993, Ser. No. 92,438
Int. Cl.[6] A61B 5/04; A61N 1/05
U.S. Cl. 128—642 22 Claims

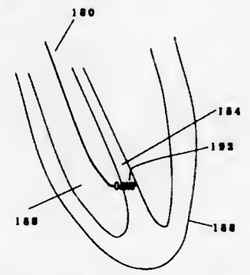
1. An intracardiac ablation and mapping apparatus comprising:
a catheter comprising:
a housing;
a plurality of radially spaced apart insulated electrodes for mapping and ablating having a distal curved portion, said distal curved portion being operatively deployable from said housing;
a plurality of insulated wires, each of said insulated wires being attached to one of said plurality of radially spaced apart electrodes for mapping and ablating, and a guidewire, said plurality of insulated wires and said guidewire being at least partially disposed in said housing; and
a bushing movably disposed within said housing and attached to a proximal end of each of said insulated wires.

5,551,427

IMPLANTABLE DEVICE FOR THE EFFECTIVE ELIMINATION OF CARDIAC ARRHYTHMOGENIC SITES

Peter A. Altman, 370 Altair Way Suite 302, Sunnyvale, Calif. 94086

Filed Feb. 13, 1995, Ser. No. 387,257
Int. Cl.[6] A61N 1/05
U.S. Cl. 128—642 26 Claims



21. An apparatus for locally modifying electrical action within a heart, comprising:
a biocompatible, electrically inactive, implantable device including a means for penetrating cardiac tissue to effect an implantation of the implantable device at a designated site in a heart, to modify electrical action in the cardiac tissue at and proximate the site.

5,551,428

AUTOMATIC ROUTING TO SELECTED DESTINATIONS OF STORAGE PHOSPHOR IMAGES

Wayne W. Godlewski, Hilton; James D. Chapman; Gary M. Diana, both of Henrietta; Steven P. Hiss, Fairport; Jane M. Volo, Rochester; Richard Weil, Pittsford, and Lance H. Underwood, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 981,144, Nov. 24, 1992, abandoned.
This application Apr. 12, 1995, Ser. No. 422,001
Int. Cl.[6] A61B 5/05
U.S. Cl. 128—653.1 4 Claims

1. A method of processing and routing an x-ray image signal comprising the steps of:
providing an x-ray image signal having one or more of the following data associated with said signal, data identifying a radiologist, data denoting a body part, data denoting an x-ray projection;
providing a first data base having data for a default radiologist, a default body part, and a default x-ray projection;
providing a second data base having preference data for radiologists, body parts, x-ray projections, and a body part/x-ray projection combination, for each body part/x-ray projection combination—a number of versions of the provided x-ray

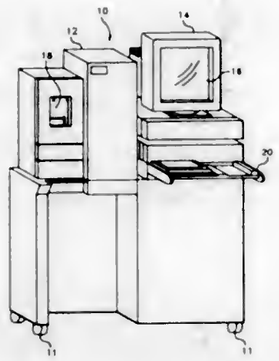


image signal to be produced, including edge enhancement image processing parameters and tonescale image processing parameters for each version, and one or more destinations for each said version;

searching said second data base to determine if there is a match for the radiologist data associated with said provided x-ray image signal, and if no match is found, searching said first data base for the default data of said default radiologist and associating said default radiologist data with said provided x-ray image signal;

searching said second data base to determine if there is a match for the default radiologist and body part and x-ray projection data associated with said provided x-ray image signal, and if no match is found, searching said first data base for the data of said default radiologist and default body part and default x-ray projection, and temporarily associating said default body part and default x-ray projection with said provided x-ray image signal;

searching said second data base to determine that there is a match file for the default radiologist, default body part and default x-ray projection, and extracting from said match file said one or more versions with edge enhancement and tonescale image processing parameters and said one or more destinations for each said versions;

processing said provided x-ray image signal to produce said one or more versions of said provided x-ray image signal, as a function of said edge enhancement and tonescale parameters extracted from said match file for each of said versions; and

routing each of said produced versions of said x-ray image signal to said one or more destinations extracted from said file.

5,551,429

METHOD FOR RELATING THE DATA OF AN IMAGE SPACE TO PHYSICAL SPACE

J. Michael Fitzpatrick, 6301 Robin Hill Rd., Nashville, Tenn. 37205, and Jennifer J. McCrory, 9 Timberland Dr., Lincoln, R.I. 02865

Division of Ser. No. 162,986, Dec. 8, 1993, abandoned, which is a continuation-in-part of Ser. No. 17,167, Feb. 12, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 459,873

Int. Cl.[6] A61B *6/00*

U.S. Cl. 128—653.1 **3 Claims**

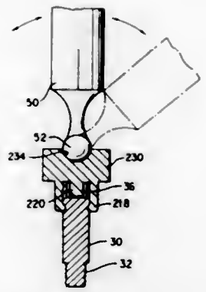
1. A method for relating the data of an image space to physical space, comprising the steps of:

attaching a series of at least three bases to bone;

attaching an imageable marker to each base;

scanning the anatomy so as to generate an addressable space;

locating the centroid of each marker in the addressable space;



removing the imageable markers from their bases;

attaching a localization cap to each base; and

utilizing the localization caps to relate the position in space that the centroids of the imageable markers would occupy were they attached to the bases to an externally defined coordinate system.

5,551,430

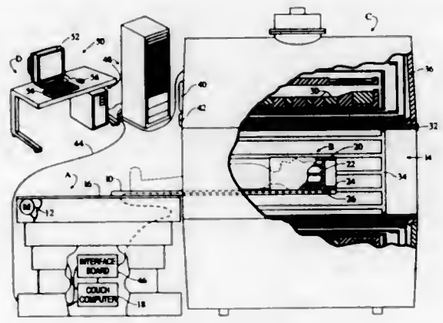
RF COIL IDENTIFICATION AND TESTING INTERFACE FOR NMR SYSTEMS

Douglas M. Blakeley, Euclid, and David A. Molyneaux, Willowick, both of Ohio, assignors to Picker International, Inc., Highland Heights, Ohio

Filed Aug. 5, 1994, Ser. No. 286,780

Int. Cl.[6] A61B *5/055*

U.S. Cl. 128—653.2 **21 Claims**



1. A magnetic resonance system comprising:

a primary magnet system for generating a temporally constant magnetic field through an examination region;

a patient couch including a patient supporting portion for selectively positioning a patient and an insertable coil within the examination region;

a plug and socket assembly connected to the patient supporting portion and the insertable coil, respectively, such that the insertable coil is plugged into the patient supporting portion with electrical cabling for the insertable coil extending down the patient supporting portion;

a coil identification component mounted in the insertable coil in electrical connection with the plug and socket assembly; and,

a coil identification component interrogator in electrical connection with the plug and socket assembly for interrogating the coil identification component for determining an identification of the inserted coil.

5,551,431

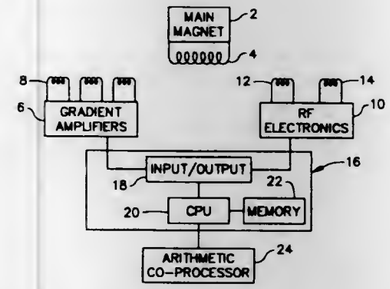
CORRECTION OF MAGNETIC RESONANCE IMAGER INTENSITY INHOMOGENEITIES USING TISSUE PROPERTIES

William M. Wells, III, Cambridge, and Ron Kikinis, Brookline, both of Mass., assignors to The Brigham and Women's Hospital, Inc., Boston, Mass.

Filed Oct. 4, 1994, Ser. No. 318,057

Int. Cl.[6] A61B *5/055*

U.S. Cl. 128—653.2 **17 Claims**



1. A method for correcting for intensity inhomogeneities in a radiofrequency gain field of magnetic resonance imaging equipment for imaging human tissue having intensity inhomogeneities in its radiofrequency sensitivity, comprising the steps of

modeling image intensities that are due to components of said human tissue;

modeling image inhomogeneities that are not due to said human tissue;

combining said models into a nonlinear estimator of intensity inhomogeneities;

constructing an iterative algorithm for obtaining estimates from said nonlinear estimator that alternates between the following steps:

(a) estimating the probabilities of various components of said human tissue throughout an image based on the results of step (b) for each iteration except the first;

(b) estimating said intensity inhomogeneities by predicting intensities based on the results of step (a) for each iteration except the first and comparing these estimates to intensities that were observed, and filtering intensity differences;

acquiring intensity data by exciting nuclear magnetic resonance in said human tissue with a magnetic field induced by a transmitting coil of said magnetic resonance imaging equipment and then detecting currents induced in a receiving coil of said magnetic resonance imaging equipment, wherein said acquired intensity data has been disturbed by said gain field inhomogeneities;

obtaining estimates of said intensity inhomogeneities from said nonlinear estimator using said acquired intensity data in conjunction with said iterative algorithm; and

displaying an image of said human tissue which has been corrected to compensate for said estimated intensity inhomogeneities.

5,551,432

SCANNING CONTROL SYSTEM FOR ULTRASOUND BIOMICROSCOPY

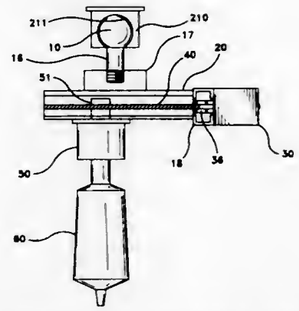
Raymond Iezzi, Mineola, N.Y., assignor to Nano Systems L.L.C., Collegeville, Pa.

Filed Jun. 19, 1995, Ser. No. 491,403

Int. Cl.[6] A61B *8/00*

U.S. Cl. 128—660.09 **21 Claims**

1. A scanning system for obtaining a three-dimensional image of an object by ultrasound biomicroscopy comprising:



a probe being adapted to transmit ultrasonic pulses of energy into a body in a series of directions, all lying in a scanning plane and being adapted to receive echoes of these pulses and to transform them into electrical signals;

means for mounting, having an inner thread, being connected to the probe;

means for guiding adapted to provide sliding contact to the mounting means;

means for transmission, having an external thread which is adapted to mate with the inner thread of the mounting means, being located on an axis which is normal to the scanning plane; and

motor means having a shaft adapted to drive the transmission means in a bi-directional rotary motion thereby causing the probe to move between successive scanning planes.

5,551,433

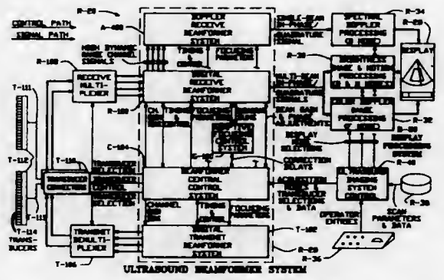
METHOD AND APPARATUS FOR A GEOMETRIC ABERRATION TRANSFORM IN AN ADAPTIVE FOCUSING ULTRASOUND BEAMFORMER SYSTEM

J. Nelson Wright, Menlo Park; Gregory L. Holley, and Donald R. Langdon, both of Mountain View, all of Calif., assignors to Acuson Corporation, Mountain View, Calif.

Filed Aug. 5, 1994, Ser. No. 286,664

Int. Cl.[6] A61B *8/00*; G01N *29/00*

U.S. Cl. 128—660.07 **95 Claims**



1. A method for providing aberration correction values in an ultrasonic imaging system to compensate for propagation aberrations in a medium, said ultrasonic system comprising a plurality of transducer elements organized into a plurality of transducer subarrays, comprising the steps of:

storing a first plurality of aberration correction values, each aberration correction value corresponding to a respective one of a plurality of transducer subarrays and a respective one of a plurality of first locations in said medium; and

selecting for a second location in said medium a second plurality of aberration correction values from the first plurality of aberration correction values wherein at least two of the selected aberration correction values correspond to distinct

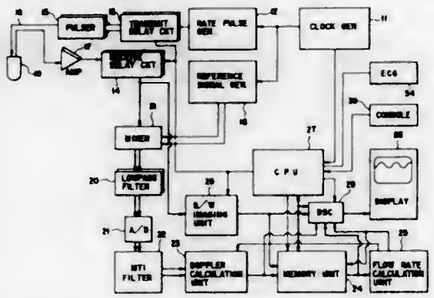
first locations, and wherein said second location is at a distinct depth from the first locations.

5,551,434

ULTRASONIC IMAGING DIAGNOSIS APPARATUS

Kazuhiro Iinuma, Tochigi-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 20, 1995, Ser. No. 492,633
Claims priority, application Japan, Jun. 22, 1994, 6-140347; Jun. 22, 1994, 6-140348
Int. Cl.[6] A61B *8/00*
U.S. Cl. 128—661.09 **13 Claims**



1. An ultrasonic diagnosis apparatus comprising:

a probe to be set in contact with a subject under examination, for transmitting ultrasonic waves and receiving reflected waves;

scanning means for driving said probe to scan a sectional plane of the subject with an ultrasonic beam;

means for obtaining tomography data from an output of said scanning means;

means for obtaining velocity data from the output of said scanning means;

first storage means for storing multiple frames of the tomography data;

second storage means for storing multiple frames of the velocity data;

display means for displaying the tomography data stored in said first storage means as a tomography image after said scanning means finishes scanning the sectional plane;

operating means for setting a region of interest (ROI) on the tomography image displayed by said display means; and

means for calculating, for each frame, one of a distribution of blood flow velocity, a blood flow rate and a tissue velocity from the velocity data stored in said second storage means and corresponding to the ROI.

5,551,435

METHOD AND SYSTEM FOR MANAGING HEMODYNAMIC STATE AND OXYGEN TRANSPORT

Bohumir Sramek, 19211 Edgehill Dr., Irvine, Calif. 92715

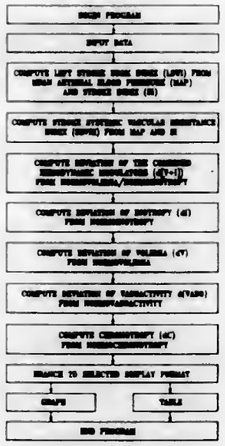
Filed May 26, 1995, Ser. No. 452,271
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—668 **13 Claims**

9. A method of attaining a preselected combination of MAP, SI and CI, or a preselected combination of LSWI and SSVRI in patient comprising the steps of:

(a) determining the patient's mean arterial pressure (MAP), stroke index (SI) and cardiac index (CI);

(b) determining the patient's left stroke work index (LSWI) according to formula;

$$LSWI=A\times\{SI\times(MAP-LAP)\}$$



and determining the patient's stroke systemic vascular resistance index (SSVRI) according to the formula;

$$SSVRI=B\times(MAP-CVP)/SI$$

where LAP represents left atrial pressure, CVP represents central venous pressure and A and B are constants;

(c) determining the patient's deviation of the combined hemodynamic modulators {volume±inotropy}, d{V±I}, from normovolemia/normoinotropy according to the formula;

$$d\{V\pm I\}=+(LSWI_{actual}/LSWI_{ideal}-1)\times 100$$

when $LSWI_{actual}>LSWI_{ideal}$ or from the formula;

$$d\{V\pm I\}=-(LSWI_{ideal}/LSWI_{actual}-1)\times 100$$

when $LSWI_{actual}<LSWI_{ideal}$, where $LSWI_{actual}$ is the LSWI determined in step (b) and $LSWI_{ideal}$ is known from predetermined values according to the type of patient and clinical state;

(d) determining the patient's Inotropic State Index (ISI)

(e) determining the patient's deviation in inotropy (dI) from normoinotropy using the formula;

$$dI=+(ISI_{ideal}/ISI_{ideal}-1)\times 100$$

when $ISI_{actual}>ISI_{ideal}$ or from the formula;

$$dI=-(ISI_{ideal}/ISI_{actual}-1)\times 100$$

when $ISI_{actual}<ISI_{ideal}$, where ISI_{actual} is the ISI determined in step (d) and ISI_{ideal} is known from predetermined values according to the type of patient and clinical state;

(f) determining the patient's deviation in volemia, dV, from normovolenta using the formula;

$$dV=d\{V\pm I\}\pm dI$$

(g) determining the patient's deviation in vasoactivity, d(Vaso), from normovasoactivity using the formula;

$$d(Vaso)=+(SSVRI_{actual}/SSVRI_{ideal}-1)\times 100$$

when $SSVRI_{actual}>SSVRI_{ideal}$, and from the formula;

$$d(Vaso)=-(SSVRI_{ideal}/SSVRI_{actual}-1)\times 100$$

when $SSVRI_{actual}<SSVRI_{ideal}$, where $SSVRI_{actual}$ is the SSVRI determined in step (b) and $SSVRI_{ideal}$ is known from predetermined values according to the type of patient and clinical state;

(h) determining the patient's deviation in chronotropy (dC), from normochronotropy using the formula;

$$dC=+(CI_{actual}/CI_{ideal}-1)\times 100$$

when $CI_{actual}>CI_{ideal}$, and from the formula;

$$dC=-(CI_{ideal}/CI_{actual}-1)\times 100$$

when $CI_{actual}<CI_{ideal}$, where CI_{actual} is the CI determined in step (a) and CI_{ideal} is known from predetermined values according to the type of patient and clinical state;

(i) preselecting a desired combination of MAP, SI and CI, or a desired combination of LSWI and SSVRI; and

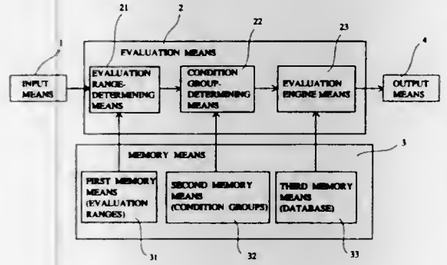
(j) administering therapeutic doses of one or more pharmacologically active agents or volume expanders for altering one or more hemodynamic modulators to attain the preselected combination of step (i).

5,551,436

MEDICAL DIAGNOSIS SYSTEM

Akihiko Yago, Tokyo, Japan, assignor to Hardy Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1994, Ser. No. 255,726
Claims priority, application Japan, Jun. 10, 1993, 5-163845
Int. Cl.[6] A61B *5/02*
U.S. Cl. 128—670 **6 Claims**



1. A medical diagnosis system comprising:

(a) an input means for inputting data of test items obtained by doctor's consultation, physical examination and/or test;

(b) an evaluation range-determining means for comparing each of said input data with evaluation ranges to determine into which evaluation range each of said input data falls, said evaluation ranges being prepared by classifying possible values of each test item into a predetermined number of groups;

(c) a condition group-determining means for comparing said evaluation range determined from each of said input data with condition groups each comprising one or more condition formulae, thereby generating an evaluation result of sickness or disorder;

(d) an evaluation engine means for providing data of sickness or disorder including type, level, causes, and comments if said condition groups are satisfied, thereby preparing a list of evaluation results, wherein in the event different evaluation results are obtained with respect to a sickness or disorder, the most serious evaluation result with respect to such sickness or disorder is added to said list of evaluation results; and

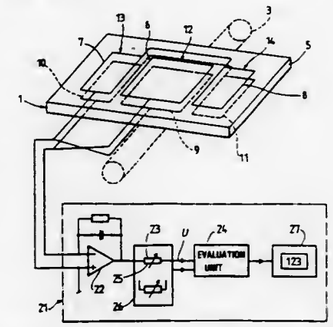
(e) an output means for displaying said evaluation result list in a sentence format.

5,551,437

SENSOR FOR MEASURING BLOOD PRESSURE

Bernhard Lötscher, Andelfingen, Switzerland, assignor to AVL Medical Instruments AG, Schaffhausen, Switzerland

PCT No. PCT/CH93/00273, § 371 Date Aug. 1, 1994, § 102(e) Date Aug. 1, 1994, PCT Pub. No. WO94/13207, PCT Pub. Date Jun. 23, 1994
PCT Filed Dec. 6, 1993, Ser. No. 256,974
Claims priority, application Switzerland, Dec. 5, 1992, 3721/92
Int. Cl.[6] A61B *5/02*
U.S. Cl. 128—672 **13 Claims**



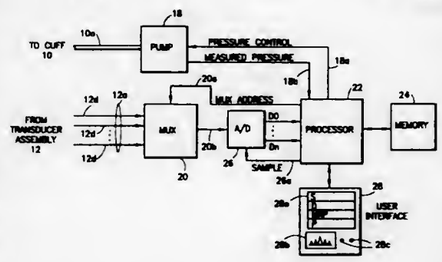
1. A combination of a sensor for measuring blood pressure and a fastening means for positioning the sensor against a live body, said sensor comprising first, second and third force pick-up means for detecting pulses of blood passing through an artery in a live body, said first force pick-up means being located between said second and third force pick-up means, each of said first, second and third force pick-up means defining a surface which can be positioned close to a live body containing an artery, the surfaces of said second and third force pick-up means being smaller than the surface of said first force pick-up means, and said fastening means positioning the sensor against a live body so that said first force pick-up means is pressed against a part of the live body containing an artery therein.

5,551,438

METHOD AND APPARATUS FOR DETERMINING BLOOD PRESSURE

John A. Moses, 80 Laslo Ter., Fairfield, Conn. 06430

Division of Ser. No. 97,283, Jul. 26, 1993, Pat. No. 5,368,039. This application Sep. 2, 1994, Ser. No. 300,337
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—672 **11 Claims**

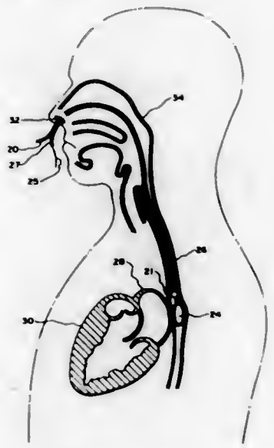


11. Apparatus for determining blood pressure within an artery of a subject, comprising in combination:
a cuff adapted for being placed around an extremity of the subject;
means for controllably pressurizing and depressurizing said cuff, including means for sensing a pressure within said cuff;
a blood pressure sensor assembly comprising a substrate and at least one pressure transducer means disposed upon said substrate for being urged against the extremity by said cuff, said at least one pressure transducer means being capable of sensing an arterial blood pressure oscillation; and
means, having inputs coupled to an output of said cuff pressure sensing means and also to an output of said at least one pressure transducer means, for determining a magnitude of the systolic blood pressure, a magnitude of the diastolic blood pressure, and a magnitude of a mean arterial blood pressure of the subject as a function of measured amplitudes, and relationships between measured amplitudes, of a plurality of arterial blood pressure oscillations and also in accordance with a sensed pressure within said cuff at a time of occurrence of each of said plurality of arterial blood pressure oscillations,
wherein said substrate has a curvature selected to conform to a curvature of the extremity and is adapted for having a concave surface thereof maintained in contact with said extremity when placed between said cuff and said extremity, wherein said at least one pressure transducer means is disposed upon said concave surface.

5,551,439
METHOD OF DETERMINING A MEAN PRESSURE FROM A SOURCE WITHIN A BODY

Donald D. Hickey, Buffalo, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.

Continuation of Ser. No. 114,775, Aug. 31, 1993, Pat. No. 5,398,692, which is a continuation of Ser. No. 980,460, Nov. 23, 1992, Pat. No. 5,263,485, which is a continuation-in-part of Ser. No. 717,854, Jun. 25, 1991, Pat. No. 5,181,517, which is a continuation-in-part of Ser. No. 409,041, Sep. 18, 1989, Pat. No. 5,048,532. This application Feb. 24, 1995, Ser. No. 393,848
Int. Cl.[6] A61B *5/02*
U.S. Cl. 128—673 **2 Claims**

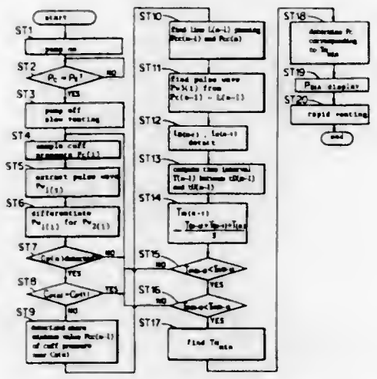


1. A method of determining a mean pressure from a source within a body comprising the steps of:
a. positioning a balloon within the body adjacent to the source and between the source and a member;
b. inflating the balloon with the source effecting the balloon pressure to have oscillations and with the member acting as an anvil therefor; and
c. measuring the balloon pressure thereby obtaining a measure of the mean pressure when the amplitude of balloon pressure oscillations effected by the source is at a peak.

5,551,440
ELECTRONIC BLOOD PRESSURE METER

Yoshinori Miyawaki, Yawata, Japan, assignor to OMRON Corporation, Kyoto, Japan

Continuation of Ser. No. 153,281, Nov. 17, 1993, abandoned, which is a continuation of Ser. No. 839,284, Feb. 25, 1992, abandoned, which is a continuation of Ser. No. 689,099, Apr. 22, 1991, abandoned, which is a continuation of Ser. No. 465,650, Jan. 22, 1990, abandoned, which is a continuation of Ser. No. 323,026, Mar. 15, 1989, abandoned. This application Feb. 28, 1995, Ser. No. 395,640
Claims priority, application Japan, Mar. 15, 1988, 63-60750; Mar. 17, 1988, 63-64334
Int. Cl.[6] A61B *5/0225*
U.S. Cl. 128—681 **7 Claims**

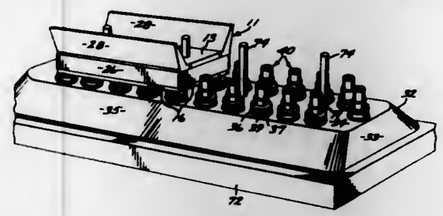


1. An electronic blood pressure meter, comprising: a cuff; pressurization means for pressurizing fluid in said cuff; depressurization means for rapidly or gradually depressurizing said fluid in said cuff; pressure detecting means for detecting said pressure of said fluid in said cuff; pulse wave detecting means for detecting a pulse wave at a part of a subject to which said cuff is applied; and blood pressure value determining means for determining a blood pressure value according to said fluid pressure detected by said pressure detecting means and said pulse wave detected by said pulse wave detecting means; further comprising:
peak extracting means for extracting a first non-flattened peak from said pulse wave detected by said pulse wave detecting means continuously as said pressure in said cuff decreases, said blood pressure value determining means determining said fluid pressure of said cuff corresponding to said first non-flattened peak detected by said peak extracting means as a blood pressure value wherein said peak extracting means for extracting said first non-flattened peak from said pulse wave comprises:
peak detecting means for detecting peaks of said pulse wave;
intersection detecting means for detecting points of intersection of a level of said pulse wave with a certain threshold level line; and
time measurement means for measuring a time interval between each pair of adjacent points of intersection surrounding one of said peaks;
said first non-flattened peak being determined as a peak corresponding to a smallest one of said time intervals.

5,551,441
INJECTION PICK HOLDER APPARATUS

Isadore Pitesky, 4001 Linden Ave., Long Beach, Calif. 90807

Filed Dec. 9, 1994, Ser. No. 352,364
Int. Cl.[6] A61B *5/10*
U.S. Cl. 128—743 **9 Claims**

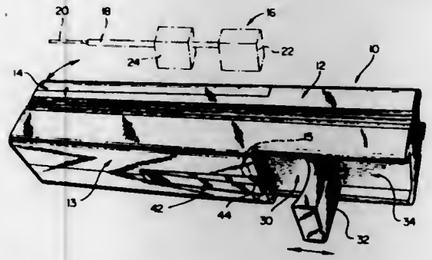


1. Allergen applicator apparatus for applying to a patient a plurality of allergens comprising:
a tray formed with a plurality of upwardly opening bores arranged in predetermined spaced relation;
a plurality of open top vials received in the respective said bores for receipt of respective allergens;
applicator picks received in the top ends of said vials and formed on their perspective lower ends with penetration points and on their respective top extremities with clamp posts projecting upwardly from said tray; and
a holder including respective pairs of clamp jaws arranged in said predetermined spaced relation and cooperating to define respective clamps openable for receipt over said posts and operative to close on and clamp the respective said posts, said holder further including a bias device operative to normally maintain the respective pairs of clamp jaws closed to clamp on the respective said posts and further including a pair of handles shiftable from a closed position with said jaws in the respective said closed position to an open position overcoming said bias device to shift said jaws to the respective said open positions.

5,551,442
ACTIVATION ARRANGEMENT WITH SAFETY LOCK-OUT FOR TISSUE SAMPLING INSTRUMENT

Rowland W. Kanner, and Richard M. Davis, both of Guntersville, Ala., assignors to Ryder International Corporation, Arab, Ala.

Filed May 17, 1994, Ser. No. 243,979
Int. Cl.[6] A61B *10/00*
U.S. Cl. 128—754 **13 Claims**

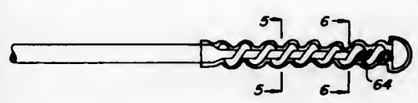


1. An actuator device for propulsion of a needle assembly particularly employed for tissue sampling procedures comprising:
a movable drive structure for propelling tissue sampling displacement of a needle assembly;
a cocking structure arranged to move said drive structure between a first position in which said needle assembly displacement is terminated and a second armed position in which said needle assembly displacement can be initiated;
a trigger structure cooperable with said drive structure to selectively activate movement thereof from said second position to said first position for said needle assembly displacement;
retention means for releasably restraining activation of said drive structure movement;
lock means for releasably locking restraint of said activation by said retention means; and
said cocking structure comprising release means for unlocking said restraint by said retention means to allow operation of said trigger structure to activate said drive structure movement.

5,551,443
GUIDEWIRE-TYPE DEVICE AXIALLY MOVEABLE BY TORQUE OR AXIAL FORCE AND METHODS FOR USE THEREOF

Ivan Sepetka, Redwood City; Phong Pham; Dai T. That, both of San Jose, and Julian Nikolchev, Portola Valley, all of Calif., assignors to Conceptus, Inc., San Carlos, Calif.

Continuation of Ser. No. 83,134, Jun. 24, 1993, abandoned. This application Jan. 21, 1995, Ser. No. 379,575
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—772 **17 Claims**

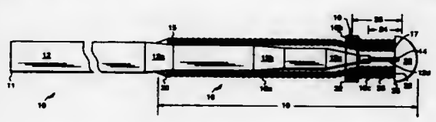


1. A guidewire-type device comprising:
a core having an elongate proximal section and an elongate distal section; and
a helical element disposed over the distal section, wherein successive turns of the helical element have a uniform pitch and are spaced-apart by a distance which is greater than the width of the helical element;
wherein the core wire substantially fills an inner diameter defined by the helical element, and wherein the helical element is attached to the core at a distal end of the helical element and at a plurality of attachment points along the distal section.

5,551,444
FLEXIBLE GUIDEWIRE WITH RADIOPAQUE OUTER COIL AND NON-RADIOPAQUE INNER COIL

Maureen Finlayson, Acton, Mass., assignor to Radius Medical Technologies, Inc., Maynard, Mass.

Filed May 31, 1995, Ser. No. 456,037
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—772 **15 Claims**



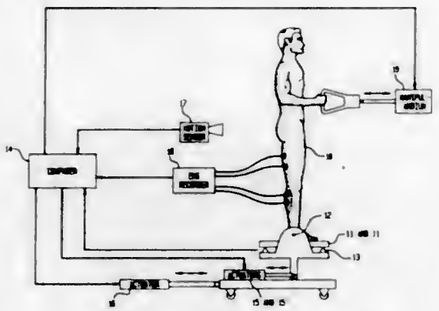
1. A guidewire for use in gaining access to an artery, the guidewire including:
A. a tapered core wire with a proximal end and a distal end and at least one tapered section between the proximal and distal ends;
B. an elongated non-radiopaque inner coil that is concentric with the core and extends over a distal portion of the core to the distal end of the core, the inner coil having a proximal end, a tapered distal end section and a distal end;

C. a radiopaque outer coil that is concentric with and fits over the tapered distal end section of the inner coil and extends to the distal end of the inner coil.

5,551,445
APPARATUS AND METHOD FOR MOVEMENT COORDINATION ANALYSIS

Lewis M. Nashner, Lake Oswego, Oreg., assignor to NeuroCom International, Inc., Clackamas, Oreg.

Division of Ser. No. 749,045, Aug. 22, 1991, Pat. No. 5,269,318, which is a division of Ser. No. 7,294, Jan. 27, 1987, Pat. No. 5,052,406, which is a continuation-in-part of Ser. No. 873,125, Jun. 11, 1986, Pat. No. 4,738,269, which is a continuation of Ser. No. 408,184, Aug. 16, 1982. This application Nov. 5, 1993, Ser. No. 147,613
Int. Cl.[6] A61B *5/10*
U.S. Cl. 128—782 **9 Claims**



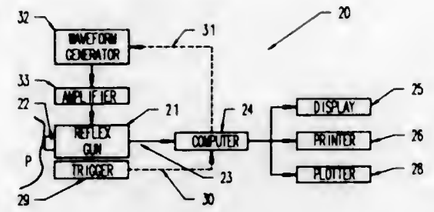
1. A device for assessing a subject's ability to utilize support surface inputs from one of the subject's first and second supporting legs, such device comprising:
means for measuring at least one quantity related to the subject's displacement from a standing equilibrium position;
a fixed support surface on which the subject's first leg rests;
a movable support surface, on which the subject's second leg rests, the movable support surface being rotatable about a horizontal axis;
actuator means for rotating the movable support surface;
control means for receiving the quantity related to the subject's displacement from a standing equilibrium position and for controlling the actuator means so that the actuator means causes the movable support surface to rotate on a continuous basis in functional relation to the measured quantity, so that the movable support surface has a sway-reference gain greater than zero; and
means for measuring the subject's ability to maintain the standing equilibrium position.

5,551,446
REFLEX MEASURING DEVICE, AND METHOD

Jerry G. Chutkow, Clarence, N.Y.; Patrick Flanagan, North Royalton, Ohio, and Michael T. Riggs, Batavia, N.Y., assignors to Apollo Research Corp., Lancaster, N.Y.

PCT No. PCT/US92/11284, § 371 Date Jul. 8, 1994, § 102(e) Date Jul. 8, 1994, PCT Pub. No. WO94/15540, PCT Pub. Date Jul. 21, 1994
PCT Filed Dec. 30, 1992, Ser. No. 256,381
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—782 **15 Claims**

1. A reflex measuring device for measuring certain parameters of a patient's physical response to application of an external stimulus, comprising:

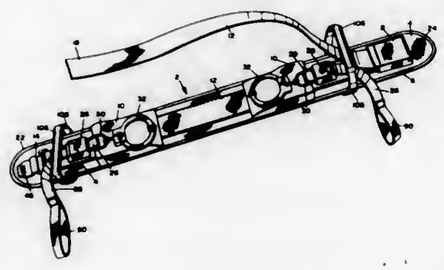


stimulus means for selectively applying a stimulus to the patient; and
sensor means for sensing and measuring the period of latency between the application of said stimulus and the beginning of the patient's physical response thereto, said sensor means having a member and a head mounted for movement toward and away from one another and having a transducer operatively arranged between said member and bead and arranged to provide an output signal as a function of the relative positions of said member and head, said head having a surface adapted to continuously bear against a portion of the patient's skin between the application of the stimulus and the end of the measurement of the response;
whereby said transducer output signal will be a function of the patient's response to said stimulus.

5,551,447
RESTRAINT BELT

Andrew T. Hoffman, 1020 Jamacha Rd., El Cajon, Calif. 92019; Christopher J. Hoffman, 11591 Polaris Dr., San Diego, Calif. 92126; Tracy D. Webster, 3518 Rancho Diego Cir., El Cajon, Calif. 92019, and John D. Arnold, 16064 Loose Creek Rd., Jamul, Calif. 91935

Filed Dec. 2, 1994, Ser. No. 361,115
Int. Cl.[6] A61B *19/00;* **A61F** *5/37;* **E05B** *75/00*
U.S. Cl. 128—869 **33 Claims**

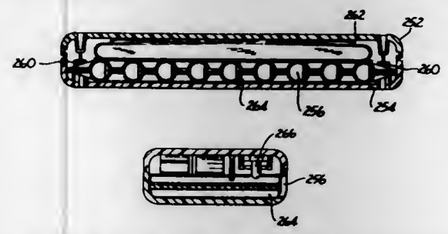


1. A restraint device to limit the movements of a person, which comprises:
an elongated belt having a first end with a hasp adjacent thereto, an opposite second end with a belt buckle adjacent thereto, said ends being releasably connectible by interconnection of said hasp and said belt buckle to secure said belt around said person's waist;
a pair of arm restraints each comprising an elongated arm tether and with a releasable arm clamp at one end thereof for securement to a respective arm of said person and restriction of said person's movement of said arm;
each said arm restraint being independently attached to said belt by a tether buckle on said belt, said arm tether being securable to said tether buckle at a plurality of positions to provide variable distance between said belt and said arm clamp; and
said buckles and said arm clamps all having lock means to control the releasability of said buckles and said arm clamps.

5,551,448
ENDOSCOPIC SURGICAL INSTRUMENT FOR ASPIRATION AND IRRIGATION

Paul A. Matula, Brookfield; William J. McCabe, New Canaan, both of Conn.; Gerald T. McCourtney, Orono, Minn.; Dennis Gemmell, Robbinsdale, Minn.; Jerry Hamlin, Golden Valley, Minn., and Graeme Winslow, Excelsior, Minn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 906,673, Jun. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 781,062, Oct. 18, 1991, abandoned. This application Jul. 21, 1994, Ser. No. 278,560
Int. Cl.[6] B65D *83/00*
U.S. Cl. 128—897 **22 Claims**

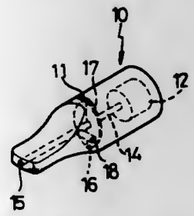


1. A surgical accessory dispenser for surgical instrumentation comprising:
a housing having at least two parts secured to each other, a first part being movable with respect to a second part;
a plurality of chambers disposed within said housing for accommodating a surgical accessory in each of said chambers;
said housing having at least one opening for accessing each of said chambers;
means for releasably securing a surgical accessory in each of said chambers to permit removal of said accessory; and
means for uncoupling said accessory from a surgical instrument to permit re-loading of said accessory into said housing said means for uncoupling bring actuated by moving said first part of said housing with respect to said second part of said housing;
wherein said at least one opening permits loading and unloading of said surgical accessory into each of said chambers.

5,551,449
CIGARETTE HOLDER HAVING CONTROL DEVICE

Chang-Shin Huang, No. 331, Sec 2, Yung Ping Road, Taichung, Taiwan

Filed Jun. 19, 1995, Ser. No. 492,239
Int. Cl.[6] A24F *5/04*
U.S. Cl. 131—187 **3 Claims**

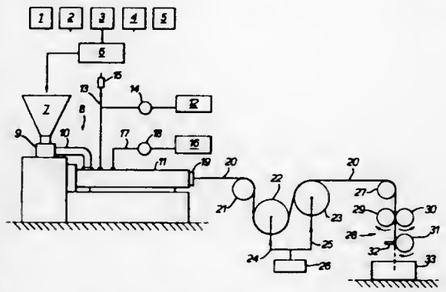


1. A cigarette holder comprising:
a body including a passageway longitudinally formed therein and including a first end having a cavity formed therein for engaging with a cigarette and communicating with said passageway, and the body including a second end, said passageway including an opening formed in said second end of said body, said body including a middle portion having a space formed therein and intersecting said passageway, and
a pair of resilient blades mounted in said space, each of the blades including a middle portion movable by being alternately squeezed and relaxed between
a closed condition wherein it cooperates with the other blade to block said passageway and
an open condition wherein it is spaced from the other blade to open said passageway.

5,551,450
SMOKING PRODUCTS

Stephen R. Hemsley, Romsey, United Kingdom, assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Continuation of Ser. No. 992,960, Dec. 18, 1992, abandoned. This application Sep. 16, 1994, Ser. No. 306,926
Claims priority, application United Kingdom, Dec. 18, 1991, 9126828.4
Int. Cl.[6] A24B *15/00*
U.S. Cl. 131—359 **15 Claims**

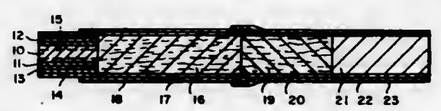


1. A method of making a smoking product comprising the steps of:
mixing particulate material, including tobacco, with a binder, sugar, or portion thereof replaced with a non-sugar reducing substance and an ammonium salt to form a mixture;
adding said mixture to an extruder and simultaneously therewith adding aqueous ammonia and water to said extruder; and,
extruding said mixture and said aqueous ammonia and water at a temperature and pressure such that said water remains in a liquid phase.

5,551,451
FUEL ELEMENT COMPOSITION

Dennis M. Riggs, Belews Creek; Dwayne W. Beeson, Kernersville, and Billy T. Conner, Greensboro, all of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

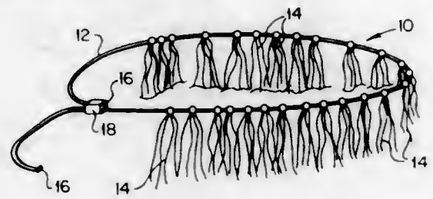
Continuation of Ser. No. 43,886, Apr. 7, 1993, abandoned. This application Apr. 19, 1995, Ser. No. 425,354
Int. Cl.[6] A24B *15/00*
U.S. Cl. 131—359 **18 Claims**



1. A burnable composition suitable for making fuel elements for smoking articles, comprising at least fifty weight percent powdered elemental carbon, at least one weight percent binder, at least three weight percent powdered graphite, and at least one weight percent calcium carbonate, the amount of powdered graphite and calcium

carbonate being sufficient to reduce the carbon monoxide generated during combustion of a fuel element prepared from the composition.

5,551,452
HAIRPIECE WITH ADJUSTABLE SUPPORT LOOP
Estie O. Barlow, 1354 S. 1000 West, Salt Lake City, Utah 84104
Filed May 26, 1995, Ser. No. 452,374
Int. Cl.[6] A41G *5/00*
U.S. Cl. 132—54 **18 Claims**

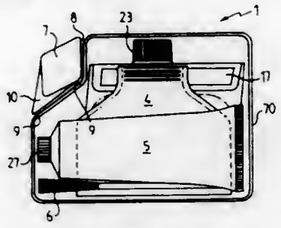


1. An adjustable hair piece construction comprising:
an elongate support element having two free ends and being formed into a loop so as to fit around the head of a wearer;
hair affixed to said loop formed by said support element so as to, in use, hang down therefrom; and
adjustment means for adjusting the size of said loop; said adjustment means comprising an abutment member including first and second bores therethrough between first and second ends thereof, portions of said support element extending through each of said first and second bores so that said abutment member is movable on said support element, said support element including stop means at said free ends for capturing said abutment member on said support element between said free ends, said adjustment means further comprising releasable fixing means, movable along said support element between substantially fixed positions, for, in a substantially fixed position thereof and with said first end of said abutment member in engagement with one of said stop means, engaging the second end of abutment member so as to fix the position of said abutment member and thus fix the size of said loop.

5,551,453
PROCESS FOR THE TEMPORARY RESHAPING OF KERATINOUS FIBRES
Jean-Michel Sturla, Saint-Cloud, France, assignor to L'Oreal, Paris, France
Filed Dec. 16, 1994, Ser. No. 357,030
Claims priority, application France, Dec. 22, 1993, 93 15477
Int. Cl.[6] A45D *7/06*
U.S. Cl. 132—206 **26 Claims**

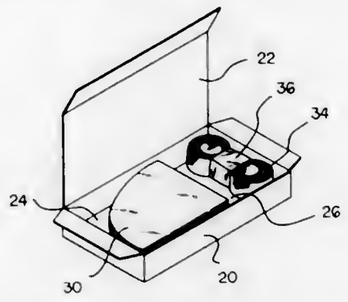
1. A process for non-permanent reshaping of human keratinous fibres, comprising the steps of:
(a) contacting said fibres, said fibres being maintained under mechanical tension and having had applied thereto a composition containing at least one oil, with a gas containing water vapour, said gas having a temperature of at least 75° C., for a time not exceeding 2 minutes to non-permanently reshape said fibres;
(b) cooling said fibres after said contacting step; and
(c) removing the mechanical tension which was applied to said fibres.

5,551,454
ASSEMBLY FOR PACKAGING OF PRODUCTS FOR LIGHTENING THE HAIR, AND CORRESPONDING METHOD FOR LIGHTENING THE HAIR
Antonin Goncalves, Montmorency, France, assignor to L'Oreal, Paris, France
Filed Jun. 7, 1994, Ser. No. 255,737
Claims priority, application France, Jun. 7, 1993, 93 06762
Int. Cl.[6] A45D *19/00*
U.S. Cl. 132—208 **18 Claims**



1. Assembly of products packaged for lightening the hair, comprising, in one container:
a flexible plastic sachet containing a bleaching powder;
a recipient containing a fluid developer,
wherein the sachet includes a bag having an attachment head fixed thereon, said attachment head includes an annular element forming a neck equipped with at least one thread, the sachet is closed by a cap screwed on to the annular element, and
wherein the recipient is a tube of flexible material, the tube including a neck equipped with a thread which can cooperate with the at least one thread of the annular element, the tube being closed by a top which is screwed on to the thread of the tube neck; and
a dish for receiving a mixture of the powder and the developer for application on the hair.

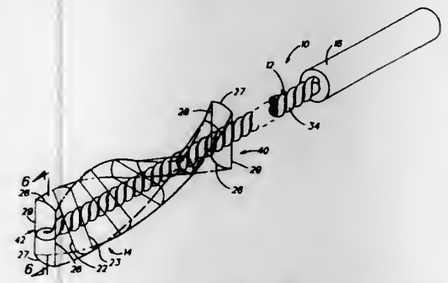
5,551,455
HAIR REPAIR KIT
Adelle Spatola, 347 Willowdale Ave., North York, Canada
Filed Jan. 17, 1995, Ser. No. 373,604
Int. Cl.[6] A45D *7/02*
U.S. Cl. 132—212 **3 Claims**



1. A kit for use in conjunction with a hair conditioning treatment, the kit comprising:
a container having an opened top, a closed bottom, four sidewalls, an inner surface and an outer surface, and a cover hingedly attached to the open top, a plastic cap receiving area defined upon the inner surface, a cotton strip receiving area defined upon the inner surface;

a plurality of plastic caps, each of the plastic caps having a closed top and opened bottom, a peripheral edge defining the opened bottom, each of the caps adapted to be worn upon the head of the user, each of the plastic caps being stacked one upon the other and positioned within the plastic cap receiving area of the container;
a number of cotton strips, each cotton strip being of substantially similar dimensions and adapted to encircle the scalp of a user, the cotton strips adapted to be positioned within the cotton strip receiving area of the container; and
a paper sleeve having a first end, a second end, an intermediate extent, an inner surface and an outer surface, the paper sleeve adapted to be secured about the cotton strips, the paper sleeve and the cotton strips adapted to be positioned within the cotton strip receiving area of the container.

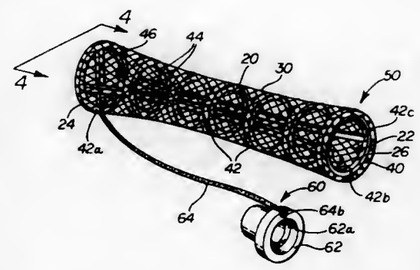
5,551,456
MASCARA BRUSH CONSTRUCTION
Franklin J. Hartel, Palmer, Mass., assignor to Sanderson-Macleod, Inc., Palmer, Mass.
Filed Nov. 3, 1994, Ser. No. 333,751
Int. Cl.[6] A45D *40/26*
U.S. Cl. 132—218 **3 Claims**



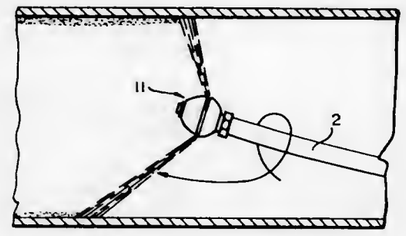
1. An applicator brush for mascara comprising in combination, a twisted wire core, a bristle block of radially extending bristles secured to the twisted wire core, said bristles being initially trimmed along at least a substantial portion of its length to provide a bristle block having tip portions of said bristles defining a portion of the length of said brush of generally rectangular cross-section including a pair of longer, opposed, parallel sides and shorter sides, the bristles forming the shorter sides being at a substantially greater radial distance from the twisted wire core than the longer, opposed sides, said core being further twisted so that said shorter sides define opposed helically shaped lands and said longer sides define helically shaped channels therebetween.

5,551,457
HAIRSTYLING ROD
Diane L. Williamson, 3945 Angus La., Dayton, Ohio 45439
Filed Nov. 15, 1994, Ser. No. 339,936
Int. Cl.[6] A45D *2/08*
U.S. Cl. 132—250 **19 Claims**

1. A rod device for rolling a lock of hair during permanent wave hairstyling, said rod device comprising:
an elongated, rigid center core including a central opening extending from a first end of said core to a second end of said core such that air is permitted to pass through said center core; and,
a fine open mesh covering said center core and having approximately 16 to 30 separate openings per every 1 inch of mesh length for providing support for a lock of hair wrapped onto said mesh and core sufficient to prevent the hair from being damaged during permanent wave hairstyling, said fine mesh allowing fluid applied to the hair to pass therethrough such that at least a portion of the fluid applied to the hair is evaporated as air passes through said center core.

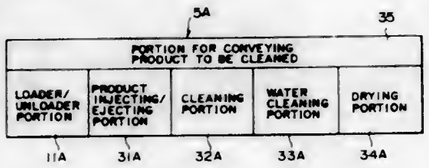


5,551,458
PROCESS FOR CLEANING PIPE LINES
Johan Faxon, Ladugårdsvägen 36 B, S-269 38, Båstad, Sweden
Filed Oct. 25, 1994, Ser. No. 328,454
Claims priority, application Sweden, Feb. 26, 1993, 9300645
The portion of the term of this patent subsequent to Mar. 22, 2011, has been disclaimed.
Int. Cl.[6] B08B *9/00;9/02;9/04;5/02*
U.S. Cl. 134—22.12 **4 Claims**



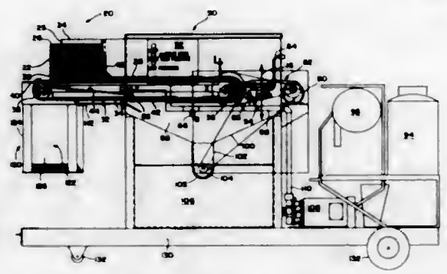
1. A process for cleaning pipe lines with a cleaning means, which is connected via a rigid supply conduit to a source of pressurized medium and which exhibits nozzle opening directed in at least one direction of a backward direction and a forward direction, said backward direction being a direction towards said supply conduit and said forward direction being a direction away from said supply conduit, wherein said nozzle opening is in a form of a substantially continuous annular gap which extends along a periphery of the cleaning means and which is connected to the supply conduit and the source of pressurized medium, said process comprising the steps of:
discharging said pressurized medium through the nozzle opening to clean inner walls of a pipeline;
bringing said nozzle opening in close contact with the inner wall of the pipeline to cause a pressure differential on opposite sides of the cleaning means thereby keeping the cleaning means in contact with the inner wall; and
forcing the cleaning means forward through the pipeline by means of moving said rigid supply conduit therethrough, wherein the discharging pressurized medium is at least directed forward in the direction of movement of the cleaning means.

5,551,459
SEMICONDUCTOR CLEANING APPARATUS AND WAFER CASSETTE
Masashi Ohmori; Hiroshi Tanaka; Akira Nishimoto; Hiroshi Sassi, all of Itami; Naohiko Fujino, and Satoru Kotoh, both of Amagasaki, all of, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Division of Ser. No. 123,244, Sep. 20, 1993, Pat. No. 5,445,171. This application Jul. 17, 1995, Ser. No. 503,235
Claims priority, application Japan, Sep. 25, 1992, 4-256827; Sep. 10, 1993, 5-225611
Int. Cl.[6] B08B *3/04*
U.S. Cl. 134—61 **19 Claims**



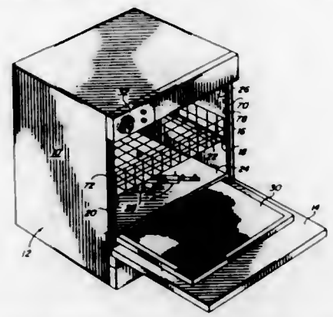
1. A semiconductor cleaning apparatus comprising:
a cassette loader/unloader for accommodating a product cassette containing a wafer;
a cleaning cassette for accommodating said wafer and having handles disposed above a wafer in the cleaning cassette;
a shifting portion for shifting a wafer between a product cassette accommodated by said cassette loader/unloader and said cleaning cassette;
a cleaning portion for cleaning with a cleaning solution a wafer accommodated in said cleaning cassette;
a water cleaning portion for cleaning with water a wafer that has been cleaned in said cleaning portion while the wafer is in said cleaning cassette;
a drying portion for drying said wafer that has been cleaned with water in said water cleaning portion while the wafer is in said cleaning cassette; and
a conveyance for holding the handles of said cleaning cassette to sequentially convey said cleaning cassette from said cassette loader/unloader to said cleaning portion, said water cleaning portion, and said drying portion.

5,551,460
POULTRY NEST PAD CLEANING METHOD AND APPARATUS
Derwood L. Runion, Rte. 2, Box 300, Timberville, Va. 22853
Filed Jan. 19, 1995, Ser. No. 374,830
Int. Cl.[6] B08B *3/02*
U.S. Cl. 134—62 **9 Claims**



1. An apparatus for cleaning poultry nest pads, comprising:
first means for supporting said nest pads,
second means for applying cleaning fluid to said nest pads while said nest pads are supported by said first means,
third means for bending each of said nest pads so as to increase exposure of recessed portions of said nest pads to said cleaning fluid,
said second means including a plurality of spraying devices for applying said cleaning fluid to said nest pads, and
said first means including a conveyor system with receptacles for receiving in stacked relation nest pads to be cleaned and thereafter providing cleaned nest pads in stacked relation.

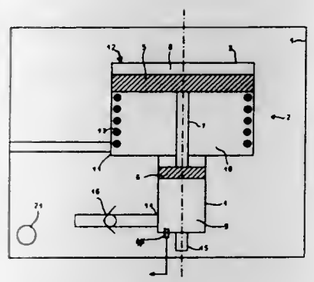
5,551,461
PRODUCE WASHER
Marty St. Martin, 613 E. Grand Ave., Fruita, Colo. 81521
Continuation of Ser. No. 289,913, Aug. 12, 1994, Pat. No. 5,437,731, which is a division of Ser. No. 951,167, Sep. 25, 1992, Pat. No. 5,357,993. This application Feb. 6, 1995, Ser. No. 384,134
Int. Cl.[6] B08B *3/02*
U.S. Cl. 134—111 **28 Claims**



1. A produce washer for washing produce with a washing fluid, said produce washer comprising in combination:
a) a compartment for housing the produce, said compartment including an opening for inserting and removing the produce;
b) a door for closing said opening;
c) at least one washing fluid permeable basket for supporting the produce within said compartment;
d) a plurality of nozzles for spraying the washing fluid onto the produce inserted into said basket, each nozzle of said plurality of nozzles emitting an expanding cone shaped spray having a cross-section perpendicular to the axis of rotation of the cone essentially filled with water droplets to bathe and agitate any debris on the produce that lies within the circumference of the impinging cone of spray;
e) a trough disposed in said compartment for receiving the washing fluid flowing from the produce;
f) a pump for pumping the washing fluid to said plurality of nozzles; and
g) a conduit tree interconnecting said pump with said plurality of nozzles for conveying the washing fluid from said pump to said plurality of nozzles.

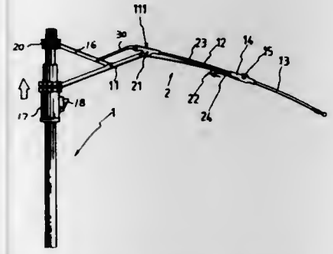
5,551,462
CLEANING AND DISINFECTION MACHINE FOR MEDICAL DEVICES HAVING NARROW CHANNELS, PARTICULARLY ENDOSCOPES
Hans Biermaier, Uhrichstrasse 47, 86316 Derching, Germany
Filed Dec. 29, 1994, Ser. No. 365,793
Claims priority, application Germany, Dec. 30, 1993, 43 45 005.9; Feb. 11, 1994, 44 04 460.7
Int. Cl.[6] B08B *3/04*
U.S. Cl. 134—166 C **42 Claims**

1. Cleaning and disinfection machine for medical devices having narrow channels, particularly endoscopes, with a pressure chamber



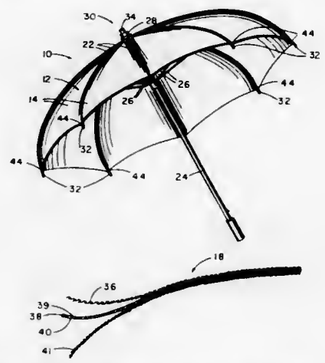
into which the object to be cleaned is inserted, with a circulating pump, which supplies the pressure chamber with pressurized cleaning fluid, and with an arrangement for supplying one or more channels of the device to be cleared with pressurized cleaning fluid, characterized in that a pressure-increase unit fed by the circulating pump is provided with a two-stage piston-cylinder arrangement, the inlet side of which has a first chamber fed by the circulating pump and a first piston connected with a second piston in a second chamber of the outlet side, which is connectable to the channel to be cleaned and is connected to act with the first piston, the cross-section of the first piston being greater than that of the second piston, and wherein the pressure-increase unit is arranged inside the pressure chamber into which the object to be cleaned is inserted.

5,551,463
SKELETON FOR A TELESCOPIC UMBRELLA
Mao S. Wang, P.O. Box 82-144, Taipei, Taiwan
Filed Nov. 9, 1995, Ser. No. 555,812
Int. Cl.[6] A45B *19/10*
U.S. Cl. 135—25.3 **2 Claims**



1. A skeleton for telescopic umbrella comprising:
a shank having a tab;
a ring slidably fitted on said shank and having a slot adapted to receive said tab;
a fixed collar fixedly mounted at an upper end of said shank;
a plurality of expanders pivotally connected with said fixed collar at an end;
a plurality of supporters each pivotally connected with a first intermediate portion of one of said expanders at an end;
a plurality of first joints each pivotally connected with another end of respective one of said supporters;
a plurality of first ribs pivotally connected with said fixed collar at an end and pivotally connected with said first joints at another end, each of said first ribs being pivotally connected with another end of said expanders at a second intermediate portion;
a plurality of second ribs fixedly connected with respective first joints at an end;
a plurality of second joints each pivotally connected with another end of said second ribs;
a plurality of third ribs pivotally connected with respective second joints at an end; and
a plurality of pulling means each including a connecting rod, a spring and a curved plate, said connecting rod having an end pivotally connected with one of said first ribs and another end fixedly connected with an end of said spring, another end of said spring being pivotally connected with an end of said curved plate, another end of said curved plate being fixedly connected with a connector, said connector being fixedly connected with an end of one of said third ribs and being pivotally connected with one of said second joints.

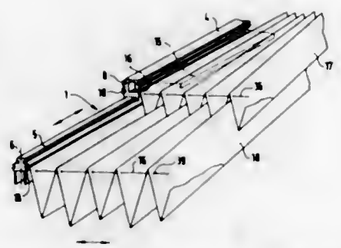
5,551,464
HEAT REFLECTING PARASOL
Carla D. Kelly, 209 S. Collidge St., Tampa, Fla. 33609
Filed Dec. 2, 1994, Ser. No. 348,349
Int. Cl.[6] A45B *25/18*
U.S. Cl. 135—33.2 **2 Claims**



1. A heat reflective parasol comprising in combination:
a multi-ply roof material having an outside layer, an inside layer and a metallic middle layer therebetween;
said metallic middle layer being composed of a reflective material so as to facilitate the reflecting of the sun's rays and energy;
said inside layer being composed generally of an opaque material to thereby prevent any light from passing through to the user;
said outside layer being composed of a translucent material thereby allowing light to be received from the sun and thereafter diffused to prevent strong reflections from said reflective metallic middle layer; and
a frame support means for supporting said multi-ply roof material,
whereby said roof material is dispersed about said frame support means thereby providing a reduced exposure to the heat producing energy of the sun to a user thereof.

5,551,465
SUNSHADE
Walter Steiner, Saentisstrasse 52, CH-8311 Bruetten, Switzerland
Division of Ser. No. 963,055, Oct. 19, 1992, Pat. No. 5,398,710. This application Dec. 6, 1994, Ser. No. 349,829
Int. Cl.[6] F04H *15/28;* **A45B** *25/18*
U.S. Cl. 135—98 **3 Claims**

1. A sunshade with carrying bars (1) pivotably fixed to a central headpiece (2) for fixing screening surface structures (17,18) and



with supporting bars (**50**) for supporting the carrying bars (**1**) in a position spread away from the central headpiece (**2**) and whose inner end is connected by means of an articulation to a sliding body (**25**), which is displaceable on a pole (**3**) connected to the central headpiece (**2**), and to each of the carrying bars (**1**) is fixed a different surface structure (**17,18**) made from pleated surface material, whose pleating folds are radial to the central headpiece (**2**), each surface structure (**17,18**) being multiply folded and being collapsible in zig-zag manner (FIG. 5) when the sunshade is closed, the sunshade further having cord spring pull assemblies (**33–38**) each of which comprises a cord (**35,36**) which extends along a path which passes between two circumferentially adjacent carrying bars (**1**), over a reversing point (**37,38**), and in the direction along the carrying bars (**1**), the surface structure (**17,18**) being displaceably guided on the cord (**35,36**) in the vicinity of its radially outer edge (**42**).

5,551,466

HYDRAULIC VALVE

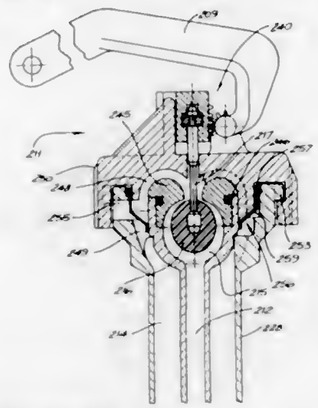
Timothy De Pieri, Fulham Gardens, Australia, assignor to Caroma Industries Limited, Queensland, Australia

Filed Sep. 15, 1994, Ser. No. 306,756

Claims priority, application Australia, Sep. 20, 1993, PM1316

Int. Cl.[6] F16K *21/18;1/12*

U.S. Cl. 137—1 **18 Claims**



1. A valve comprising:

a valve housing which has an inlet leading into, and an outlet leading from, an interior cavity, with said inlet and outlet being substantially opposed; and

a generally bulbous valve body located within said cavity and mounted for movement towards and away from said outlet, said valve body and said outlet being sized to permit said outlet to be occluded by said valve body;

means for reciprocally moving said valve body longitudinally and extending from to said valve body;

wherein said interior surface of said cavity and said exterior surface of said valve body are adapted to provide pressure and flow balance in said valve so as

to reduce the cross-sectional area available for flow towards said outlet and between said valve body and said cavity and to simultaneously increase the cross-sectional area available for flow from said inlet and between said valve body and said cavity as said valve body moves towards said outlet, and

to increase a cross-sectional area available for flow towards said outlet and between said valve body and said cavity and to simultaneously decrease the cross-sectional area available for flow from said inlet and between said valve body and said cavity as said valve body moves away from said outlet,

said cavity and said valve body thereby altering a balance flow velocity induced pressure forces acting on said valve body.

5,551,467

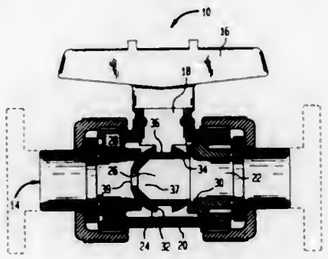
BALL VALVE WITH CONTROLLED FLOW VARIATION

Walter Booth, East Hanover, and Alan R. Levin, Somerville, both of N.J., assignors to H-Tech, Inc., Wilmington, Del.

Filed Aug. 11, 1995, Ser. No. 514,317

Int. Cl.[6] F16K *47/04;5/12*

U.S. Cl. 137—1 **14 Claims**



1. A method for controlling flow volume through a fluid conduit system, comprising the steps of:

(a) installing a ball valve in said conduit system, said ball valve having a control ball with a conduit therein terminating at an end thereof in an outlet orifice having a non-circular shape, said orifice shape determining the rate of flow at a selected ball orientation, the relationship between the angular orientation of said ball and fluid flow differing from that of a ball valve having a circular outlet orifice;

(b) actuating said valve to position said ball at a selected orientation, said ball being reversible to provide one of two alternative angular orientation/fluid flow relationships; and

(c) selecting one of said two alternative relationships by reversing or not reversing said ball.

5,551,468

FLUIDIC DENSITY CONTROL FOR CHLOR ALKALI CELLS

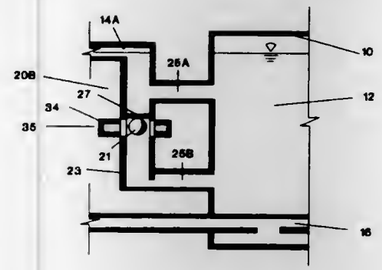
Chris A. Lemke, 3727 N. Hughes Ave., Fresno, Calif. 93722

Continuation of Ser. No. 177,760, Jan. 4, 1994, abandoned. This application Jan. 30, 1995, Ser. No. 380,236

Int. Cl.[6] G05D *21/02*

U.S. Cl. 137—3 **8 Claims**

7. A method of regulating concentration of a caustic in a chlor-alkali cell system containing, a caustic reservoir holding said caustic of a predetermined concentration, a dilution water reservoir containing a dilution water for reducing concentration of said caustic to said predetermined concentration, a conduit intercon



necting said dilution water reservoir and said caustic reservoir, a caustic reservoir inlet, a control valve governing said conduit interconnecting said dilution water reservoir and said caustic reservoir, and a switch governing said control valve, said method comprising the steps of:

positionally adjusting an object body in buoyant response to the concentration of said caustic in said caustic reservoir where said object body is positionally associated to an object body stop submerged in said caustic at a predetermined reference datum;

sensing a predetermined position of said object body in said caustic reservoir which corresponds to said predetermined reference datum indicative of a caustic concentration that exceeds said predetermined concentration of said caustic; and

regulating said caustic concentration when said predetermined position of said object body activating said switch governing said control valve and passing said dilution water from said dilution water reservoir through said control valve into said caustic reservoir as long as said caustic concentration of said caustic in said caustic reservoir exceeds said predetermined concentration.

5,551,469

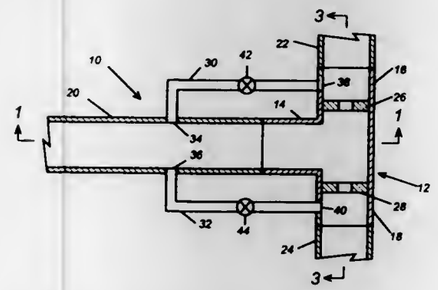
METHOD AND APPARATUS TO MAINTAIN INDEX STEAM QUALITY IN BOTH OUTLET LEGS OF A HORIZONTAL IMPACT T JUNCTION

Edward A. Woerheide, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Feb. 24, 1995, Ser. No. 393,786

Int. Cl.[6] F16L *41/02*

U.S. Cl. 137—8 **3 Claims**



1. A method to control steam quality in both outlet arms of a horizontal impact T pipe junction having an input leg and two outlet arms, comprising the steps of:

providing flow constriction means in both outlet arms of said junction at the same distance from the center of said input leg:

providing two, equal length liquid and vapor bypass lines in a plane between horizontally and vertically aligned points in said input leg upstream of said junction in said input leg and a pair of symmetrical horizontally and vertically aligned points downstream of said respective flow constriction means in said outlet arms, the dimensions of said liquid and vapor bypass being selected such that the liquid phase of the two phase steam is extracted from said input leg in the same proportion as the vapor mass flow rate in each of said outlet arms respectfully and each of said equal length liquid and vapor bypass lines being provided with a liquid flow control valve along its length for controlling the liquid mass flow rate therethrough: and

flowing wet steam into said junction through said input leg and through said liquid and vapor bypass lines to a point on each junction outlet arm downstream of said flow constrictions due to the differential pressure created by the vapor phase as it flows past said flow constrictions, and varying said liquid flow control valves to control the liquid flow rate in each of said liquid and vapor bypass lines resulting in controlling to a predetermined value the steam quality in each of said outlet arms.

5,551,470

THERMALLY RESPONSIVE PRESSURE RELIEF APPARATUS

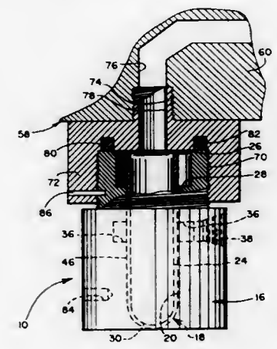
Paul F. Duvall, c/o Brunswick Corporation, 1 N. Field Ct., Lake Forest, Ill. 60045

Continuation-in-part of Ser. No. 258,516, Jun. 10, 1994, Pat. No. 5,435,333. This application Jan. 17, 1995, Ser. No. 373,073

The portion of the term of this patent subsequent to Jul. 25, 2012, has been disclaimed.

Int. Cl.[6] F16K *17/16;17/40*

U.S. Cl. 137—68.12 **16 Claims**



1. A thermally responsive pressure relief system for a receptacle such as a pressure vessel which has an opening therein, comprising:

a valve means mounted in said opening;

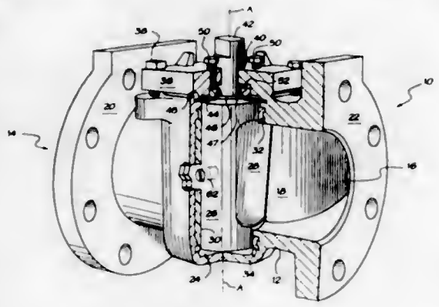
means defining a passage communicating the interior of the vessel with the exterior thereof through said valve means;

a closure member positioned in said passage;

a fusible bonding material of a selected melting point affixing the closure member in the passage; and

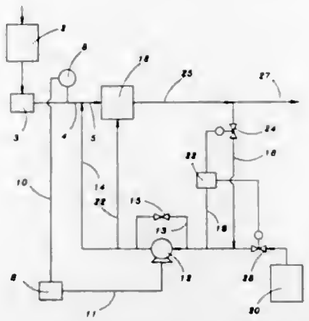
the closure member including an integral rupturable section that ruptures at a selected pressure differential between the interior and the exterior of the vessel.

5,551,471
VALVE WITH CONSUMABLE VENT HOLE SEAL DEVICE
Michael Sandling, Loveland; David E. Klotter, Cincinnati; Edward Scheid, Milford, and M. R. Ramakrishnan, Cincinnati, all of Ohio, assignors to Xomox Corporation, Cincinnati, Ohio
Filed Feb. 27, 1995, Ser. No. 395,147
Int. Cl.[6] F16K *17/38*
U.S. Cl. 137—74 **19 Claims**



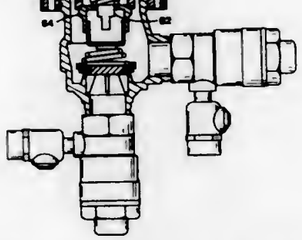
1. A valve assembly, comprising:
(a) a valve, the valve including:
(i) a valve body having an inlet and an outlet and an internal flow passage extending between the inlet and the outlet;
(ii) a valving member movably rotatably in the internal flow passage of the valve body for selectively controlling fluid flow through the internal passage; the valve defining a cavity that receives fluid flowing through the internal flow passage of the valve body; wherein the valving member includes a fluid flow blocking structure with a fluid passageway extending therethrough, and wherein the cavity is at least partially formed in the valving member;
(b) a vent for relieving pressure in the cavity;
(c) a vent bole seal device sealingly disposed within the vent for preventing fluid flow through the vent, the vent hole seal device being formed of a consumable material that allows pressure relief through the vent hole when the valve is exposed to predetermined ambient conditions; and
(d) an actuating mechanism for selectively effecting rotation of the valving member relative to the valve body, the actuating member being operative to move the valving member between a first open position in which the valving member's fluid passageway is aligned with and allows fluid flow through the internal flow passage and a second closed position in which the internal flow passage is substantially blocked by the blocking structure.

5,551,472
PRESSURE REDUCTION SYSTEM AND METHOD
Roy N. McBrayer, Jr., Austin; Jimmy G. Swan, Alvin, and John S. Barber, Round Rock, all, Tex., assignors to RPC Waste Management Services, Inc. d/b/a Eco Waste Technologies, Austin, Tex.
Filed Aug. 1, 1994, Ser. No. 283,699
Int. Cl.[6] G05D *11/00*
U.S. Cl. 137—114 **31 Claims**



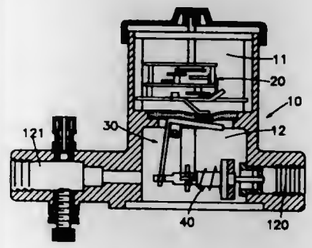
1. A pressure reduction system, comprising:
a first conduit connected to contain fluid during use, the first conduit being adapted to contain fluid at a pressure of at least about 500 p.s.i.g. during use;
a pressure sensor connected to sense the pressure of the fluid in the first conduit during use;
a static restriction device adapted to reduce the pressure of fluid flowing through it by at least about 500 p.s.i. during use, the static restriction device being connected downstream of the pressure sensor: and the static restriction device having an inlet and an outlet;
a second conduit connected to introduce fluid into the first conduit upstream of an inlet of the static restriction device and downstream of the pressure sensor;
a pump connected to pump fluid in the second conduit during use; and
an automatic fluid introduction system coupled to the pump and being adapted to vary the amount of fluid introduced from the second conduit as a function of the pressure sensed by the pressure sensor.

5,551,473
THERMAL EXPANSION RELIEF VALVE
Ping Lin, Bedford, Mass., and Anthony L. Arthur, Derry, N.H., assignors to WattsRegulator Company, Wilimington, Del.
Filed Jan. 6, 1995, Ser. No. 369,415
Int. Cl.[6] F16K *24/02*
U.S. Cl. 137—218 **12 Claims**



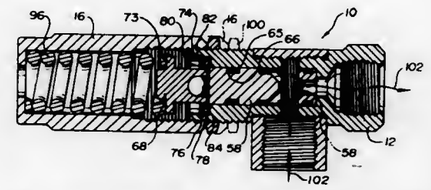
1. A thermal expansion relief valve for protection against damage due to freezing of fluid in a fluid flow control valve comprising a main valve body having a wall with an exterior wall surface exposed to freezing temperatures and an interior wall surface defining a main fluid flow conduit and said wall defining a central region in the main fluid flow conduit spaced from the interior wall surface, and other components, said thermal expansion relief valve comprising:
a relief valve body defining a relief conduit in fluid communication with said main fluid flow conduit, said relief conduit having an inlet located in said central region thereby to delay obstruction of said relief valve conduit by initiation of ice formation upon the interior wall surface and an outlet in fluid communication with a region exterior of said main fluid flow conduit,
a valve element disposed and adapted for movement within said relief conduit between a first sealing position in engagement with a valve seat to resist fluid flow and a second position spaced from said valve seat to allow fluid flow from the main fluid flow conduit through said relief conduit, and
means for biasing said valve element toward said first sealing position with a predetermined force representing a threshold pressure selected to exceed normal operating pressure of the fluid flow control valve and selected to lie below pressure damaging to the main valve body and other components.

5,551,474
GAS FLOW DIRECT PRESSURE REGULATOR
Rung-Chao Chuang, and Hut N. Chuang, both of No. 869, San Fong Rd., Fung Yuan, Taichung Hsien, Taiwan
Filed Jun. 20, 1995, Ser. No. 492,792
Int. Cl.[6] F16K *31/14*; **G01L** *7/00*
U.S. Cl. 137—495 **2 Claims**



1. A direct pressure regulator, comprising:
(a) a casing having a top chamber and a bottom chamber, said bottom chamber including a gas passage having an inlet and an outlet;
(b) an air-sealing member provided between said top chamber and said bottom chamber;
(c) a timer device provided within said top chamber and having its axis provided with a cam driving a horizontal transmission member;
(d) a supporting member for supporting said timer device within said top chamber;
(e) a vertical transmission member having one end coupled to said timer device supporting member and used to convert horizontal movement of said horizontal transmission member into vertical movement;
(f) a direct pressure valve provided at said outlet of said through gas passage in said bottom chamber said direct pressure valve including a valve body with an elastic sealing member having, a valve bar movably supported on a front supporting element provided on the outlet and a rear supporting element attached to the casing, an actuating bole provided on an end of said valve bar; and
(g) an indirect transmission member provided within said bottom chamber, said indirect transmission member having an L-shape with a planar base portion forming one leg of the L-shape and a triangular portion forming the other leg of the L-shape and having a top formed with a slender portion extending into said actuating bole so as to couple the indirect transmission member to the direct pressure valve, said indirect transmission member being pivotally attached to the casing to pivot about an axis between the ends of the legs of the L-shape, said slender portion of said triangular portion being coupled to said actuating hole of said valve bar such that said indirect transmission member on one side of the air-sealing member is pivoted about said axis by the vertical movement of said vertical transmission member on an opposite side of the air-sealing member through said air-sealing member, said direct pressure valve being thus opened to allow gas to pass through from the inlet to the outlet of said gas passage.

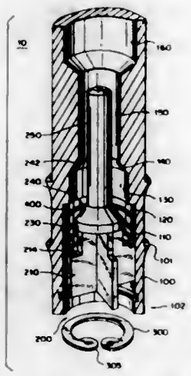
5,551,475
PRESSURE RELIEF VALVE
Paul K. Nelson, Shoreview, and Jerry K. Hammer, Jr., Hugo, both of Minn., assignors to The Specialty Mfg. Co., St. Paul, Minn.
Filed Sep. 2, 1994, Ser. No. 300,142
Int. Cl.[6] F16K *17/08*
U.S. Cl. 137—509 **3 Claims**



1. An improved adjustable pressure relief valve having a valve body and an adjustable biasing apparatus engaged thereto and exerting a biasing force on a fluid valve device, the valve device having a piston defining a fluid boundary and being acted upon by a fluid under pressure, the fluid pressure exerting a force upon the piston counter to said biasing force, the improvement comprising:
an actuator adapted for operably, abuttably contacting the piston, the actuator presenting a longitudinal axis, the piston having a sealing end oriented within the valve body for inhibiting flow within the valve when the pressure is insufficient to overcome the biasing force and a second end opposite the sealing end adapted for operable, abuttable contact with actuator;
and
a retainer ring removably disposed within the valve body for presenting a barrier to the piston, the retainer ring having a bore with a diameter less than the piston along an axis passing through the center of the bore, whereby the fluid boundary defined by the piston is maintained in the event of disengagement of the adjustable biasing apparatus from the fluid valving device of the pressure relief valve;
where a portion of the actuator with a diameter less than the diameter of the bore of the retaining ring passes through the bore of the ring to contact the piston with a portion of the actuator on either side of the plane defined by the center of the ring and thereby to transmit the biasing force to the piston.

5,551,476
BALANCED-FLOW GAS SAFETY VALVE
Joseph M. McGinnis, West Chester, Pa., assignor to UMAC Incorporated, Exton, Pa.
Filed Jan. 5, 1995, Ser. No. 369,132
Int. Cl.[6] F16K *17/30*
U.S. Cl. 137—517 **4 Claims**

1. A gas flow safety valve comprising:
a through-passage including an upstream large bore, a downstream small bore, and a valve seat disposed between the large bore and the small bore;
a float slidably disposed within the through-passage, the float including a piston disposed within the large bore, a stem disposed within the small bore, and a poppet disposed between the piston and the stem the poppet being sealingly matable with the valve seat,
the stem having a lesser cross-sectional area and the piston having a greater cross-sectional area; and
spring means for urging the poppet upstream and away from the valve seat;
whereby an upstream orifice is formed between the large bore and the piston, a downstream orifice is formed between the small bore and a stem, and gas flowing Sequentially through the upstream orifice and the downstream orifice may exert fluid forces, opposing the spring means, to close the poppet against the valve seat; and



wherein the large bore, the small bore, the piston, and the stem are each cylindrical in shape and are all mutually concentric; and

wherein the valve seat and the poppet are generally conical and an apex of a surface of the poppet is disposed downstream of the poppet; and

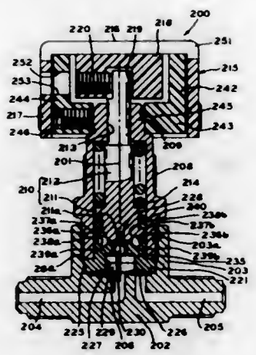
wherein the float includes guide fins slidably engaging the large bore for aligning the float within the through-passage.

5,551,477

DIAPHRAGM-TYPE FLOW CONTROL VALVE AND MANUAL CONTROL VALVE APPARATUS

Yohichi Kanno; Osamu Uchisawa, and Sigekazu Yamazaki, all of Sendai, Japan, assignors to Kabushiki-Kaisha Motoyama Seisakusho, Miyagi-ken, Japan

Filed Jul. 8, 1994, Ser. No. 273,052
Int. Cl.[6] F16K *37/00;31/524;1/32*
U.S. Cl. 137—553 **1 Claim**



1. A manual control valve apparatus, comprising:

a valve casing having a valve seat;

a tubular guide member coupled with said valve casing;

a valve stem supported by said guide member so as to be capable of reciprocating motion in one of a direction toward and a direction away from said valve seat, said valve stem supported so as to be capable of rotation about an axis, an end portion on the opposite side from said valve casing projecting outward from said guide member;

a valve interposed between said valve stem and said valve seat, said valve moving relative to said valve seat to one of coming into contact with and separating from said valve seat via said valve stem;

a spring member which urges said valve in a direction such that said valve is continuously pressed into said valve seat;

a handle which is coupled to an end of said valve stem and which projects outward and which moves said valve to one of contact with and away from said valve seat by rotating said valve stem;

a conversion mechanism for converting rotation of said valve stem into reciprocating motion in an axial direction interposed between said valve casing and said guide member, said conversion mechanism provided with a base possessing an opposing surface in mutual opposition with a lead end portion of said valve stem, engaging grooves which are formed in the opposing surface of said base and which are curved in an arcuate form having an axis of said valve stem as a center thereof, and rolling elements which are supported by a lead end surface of said valve stem and which are engaged in a freely rolling manner in said engaging grooves;

bottom surfaces of said engaging grooves inclined along a direction of said grooves, said bottom surfaces defining cam surfaces for causing reciprocating motion in the axial direction of said valve stem;

an indicator adjoining said handle provided with an opening display portion displaying a rotational position of said valve stem, said indicator attached at an end of said guide member opposite from said valve casing, said handle adjoining said indicator provided with a circumferential wall covering a circumferential surface of said indicator, and an end wall covering the opening display portion of said indicator and connected to said circumferential wall;

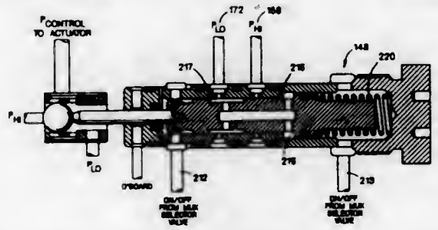
a window exposing said opening display portion provided in an area extending from said circumferential wall of said handle to said end wall; and cavities provided in said bottom surfaces of said engaging grooves, said rolling elements snapping into said cavities when said valve stem is rotated to one of a closed position and an open position.

5,551,478

MULTIPLEXING HYDRAULIC CONTROL NETWORK WITH LATCHING VALVES

Leo J. Veilleux, Jr., Wethersfield; David T. Anzulewicz, Rocky Hill, and Gerald P. Dyer, Enfield, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 21, 1994, Ser. No. 327,026
Int. Cl.[6] F15B *13/07*
U.S. Cl. 137—596.15 **21 Claims**



8. A hydraulic control system, comprising:

a. a first hydraulic fluid at a first pressure;

b. a second hydraulic fluid at a second pressure;

c. a multiplexer selector valve having an input that is connectable with at least one of the first and second hydraulic fluids and having a movable element that is translatable between a plurality of selector valve output ports to connect at least one of the first and second hydraulic fluids to a selected one of the plurality of selector valve output ports;

d. a plurality of actuator valves, each one of the actuator valves being selectively connectable with a corresponding one of the plurality of valve output ports, each one of the actuator valves being translatable between two positions by selected application of the first hydraulic fluid thereto; and

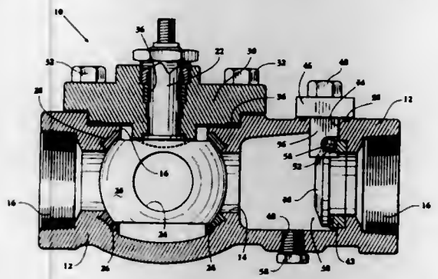
e. means for holding each one of the actuator valves in its last one of the two positions upon selected application of the second hydraulic fluid to the actuator valves.

5,551,479

COMBINATION BALL AND CHECK VALVE

John G. Graves, 3107 S. Woodward Blvd., Tulsa, Okla. 74105

Filed Oct. 5, 1994, Ser. No. 317,662
Int. Cl.[6] F16K *51/00;5/00*
U.S. Cl. 137—614.2 **8 Claims**



1. A combination ball and check valve for control of fluids through a conduit, comprising:

a valve housing having a longitudinal opening extending therethrough;

a ball valve closure member disposed within the housing adjacent a first end thereof, the ball valve closure member having a bore extending therethrough, and the ball valve closure member adapted to be rotated to a closed position wherein the ball valve closure member is in sealing engagement with an annular seat disposed within the housing to prevent the flow of fluid through the longitudinal opening, and adapted to be rotated to an open position wherein the bore within the ball valve closure member is brought into fluid communication with the longitudinal opening to permit the flow of fluid therepast;

a one-way closure member disposed within the housing adjacent a second end thereof, the one-way closure member adapted to be rotated to a closed position wherein the one-way closure member is in sealing engagement with a seat disposed within the housing to prevent the flow of fluid through the longitudinal opening in a first direction, and adapted to be rotated to an open position wherein the one-way closure member permits the flow of fluid therepast in a second direction;

a removable second bonnet sealably covering a second access opening in the housing adjacent the one-way closure member, the second opening sized to permit the insertion and removal of the one-way closure member; and

the second bonnet and the second access opening are generally rectangular in configuration with a major axis thereof extending transversely to the longitudinal axis of the longitudinal opening.

5,551,480

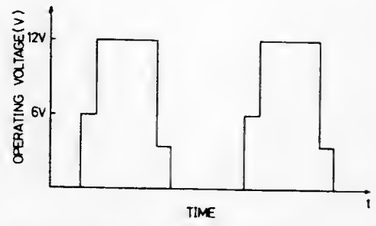
VALVE DRIVING SYSTEM

Yoshitaka Tomatsu, Chiryu, and Takehito Mizutani, Obu, both of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 10, 1994, Ser. No. 339,209
Claims priority, application Japan, Nov. 11, 1993, 5-282265
Int. Cl.[6] F16K *31/06*
U.S. Cl. 137—625.29 **8 Claims**

6. A valve driving system for opening and closing a passage comprising:

a valve case which a part of the passage is formed therein;



a first valve seat formed in said valve case;

a second valve seat formed in said valve case;

a valve body movably disposed in said valve case, said valve body having a normally-close type valve body, a normally-open type valve body, and a shaft connecting said normally-close type valve body with a normally-open type valve body as a unit;

valve body forcing means for generating a return force to normally maintain said normally-close type valve body in a valve-close position where said normally-open type valve body is contacted with said first valve seat and to normally maintain said normally-open type valve body in a valve-open position where said normally-open type valve body is separated from said second valve seat;

driving means for driving said valve body despite said return force to a position where said normally-close type valve body is separated from said first valve seat and where said normally-open type valve body is contacted with said second valve seat; and

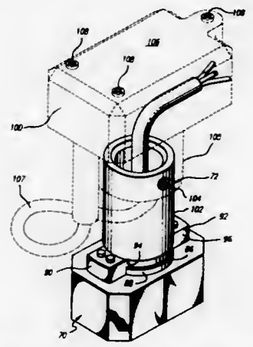
a driving force control means for controlling said driving means stepwise so that said valve body moves stepwise, said driving force control means including first means for controlling said driving means to drive said valve body to said closed position with a lower force and second means for controlling said driving means to increase a sealing force between said valve body and said valve seat with a higher force.

5,551,481

METHOD OF MANUFACTURING DIRECT DRIVE SERVOVALVE AND DIRECT DRIVE SERVOVALVE RESULTING THEREFROM

Alvon C. Elrod, Jr., Ventura, Calif., assignor to HR Textron Inc., Valencia, Calif.

Filed Jan. 27, 1994, Ser. No. 187,938
Int. Cl.[6] F15B *13/044*
U.S. Cl. 137—625.65 **10 Claims**

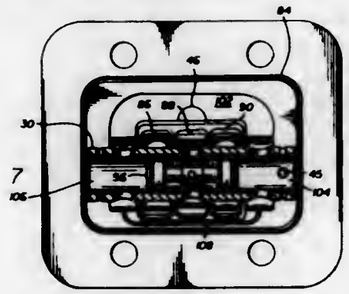


5. A limited angle rotary-to-linear direct drive servovalve comprising:

(A) a hydraulic stage including

(1) a body defining a bore therein, and
(2) a valve member disposed within said bore for reciprocal linear movement for controlling flow of fluid from a source thereof through said valve;
(B) a completely packaged self contained rotary limited angle torque motor having all required motor components therein including
(1) a stator,
(2) a rotor having a drive means,
(3) stop means for limiting the angle of rotation of said rotor,
(4) an isolation tube surrounding said rotor to isolate said stator from system fluid,
(5) support bearings for supporting said rotor,
(6) a rotor position sensing means, and
(7) a housing means surrounding said motor components;
(C) hold down means including fastener means for securing said motor on said hydraulic stage body, and
(D) said motor being rotationally moveable on said body when said fastener means is loose and non-moveable when said fastener means is tightened.

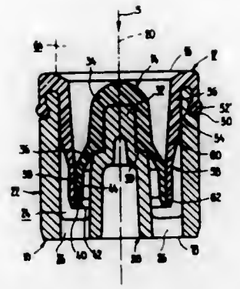
5,551,482
PLASTIC SERVOVALVE
Keith W. Dixon, Canoga Park, and Leah Markowitz, Valencia, both of Calif., assignors to HR Textron Inc., Valencia, Calif.
Filed Nov. 13, 1995, Ser. No. 557,984
Int. Cl.[6] F15B *13/04;* **F16K** *11/07*
U.S. Cl. 137—625.65 **7 Claims**



1. A direct drive valve comprising:
(a) first and second molded plastic housing sections ultrasonically bonded together to form a housing;
(b) a metallic sleeve disposed within said housing and defining a plurality of openings therethrough, at least a portion of said openings receiving fluid under pressure;
(c) a seal formed by contact between said sleeve and said housing around each of said portion of said openings for preventing leakage of said fluid under pressure;
(d) a spool slidably disposed within said sleeve; and
(e) a means coupled to said spool for moving said spool responsive to control signals for controlling the flow of fluid under pressure through said valve.

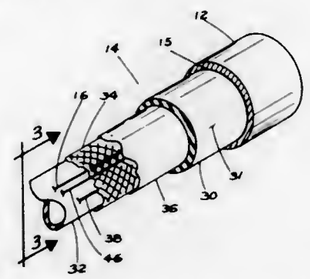
5,551,483
BACKFLOW-PREVENTER
Ferdinand Hochstrasser, Auenstein, Switzerland, assignor to KWC AG, Unterkulm, Switzerland
Filed Aug. 17, 1994, Ser. No. 291,473
Claims priority, application Switzerland, Aug. 17, 1993, 02447/93
Int. Cl.[6] F16K *15/14*
U.S. Cl. 137—846 **7 Claims**

1. A backflow-preventer for sanitary devices, especially for sanitary fittings, which comprises:



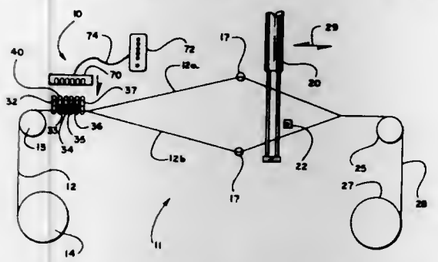
a housing having a conduit, the housing including an outer sleeve, formed of an elastomeric material, which is disposed in the conduit and is fastened in a sealtight manner to the housing part and which includes a free-ending sleeve section, facing an outlet end of the conduit, wherein the sleeve section, upon water flowing through the outer sleeve from an inlet end of the conduit to the outlet end thereof, is elastically expandable,
an inner sleeve which engages the outer sleeve and is fixed to the housing, the inner sleeve including a supporting section which is fold-resistant to water pressure, and
a sealing lip section which adjoins said supporting section in the direction of the outlet end, the sleeve section of the outer sleeve engaging, under pretensioning, the supporting section and sealing lip section, of the inner sleeve, forming a sealing lip interacting with the sealing lip section and ending at least substantially in proximity with a free end of the inner sleeve, and
a bearing element on which the inner sleeve is disposed and a plurality of ribs protruding from the housing, downstream from the outer sleeve, wherein the ribs project into the conduit and support said bearing element.

5,551,484
PIPE LINER AND MONITORING SYSTEM
Kenneth R. Charboneau, 213 Ranger Pl., Slidell, La. 70458
Filed Aug. 19, 1994, Ser. No. 292,579
Int. Cl.[6] F16L *55/00*
U.S. Cl. 138—104 **9 Claims**



1. A multi-layered liner for lining and monitoring a pipeline comprising, an external jacket, an interior liner, a woven intermediate layer interposed between the external jacket and interior liner and at least one optical fiber running the length of the multi-layered liner to monitor stress in the pipeline, said optical fiber being woven into the woven intermediate layer.

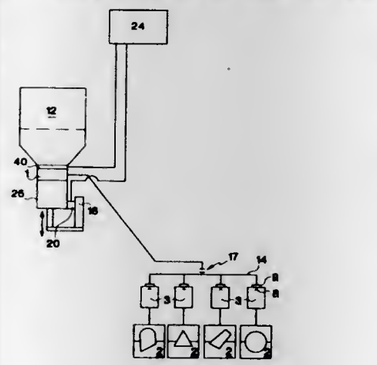
5,551,485
FALSE WARP STOP DIAGNOSTIC APPARATUS
John V. Faulkner, 7217 Kirkwood Dr., Columbus, Ga. 31904
Filed Sep. 30, 1994, Ser. No. 315,393
Int. Cl.[6] D03D *51/30*
U.S. Cl. 139—353 **3 Claims**



1. A false warp stop diagnostic device for use with an industrial loom having at least one electrically conducting warp bar and a plurality of drop wires associated therewith, comprising:
a connector comprising a housing that defines at least one channel configured for receipt of at least one warp bar of the loom;
a source of electrical energy for establishing a current in a circuit;
at least one indicator device connected in parallel with said electrical energy source; and
a rectifier connected in series with each of said indicator devices, whereby when one of the drop wires contacts a warp bar on the loom, the gate of the rectifier associated with said warp bar is fired and said circuit is completed including one of said indicator devices such that said indicator device is activated and remains activated even after the loom is restarted.

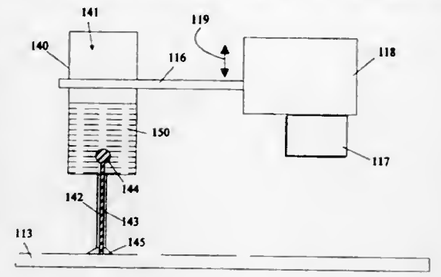
5,551,486
METHOD AND EQUIPMENT FOR FILING CASTING MOLDS WITH CASTING RESIN OR SIMILARLY CASTING-READY LIQUID MEDIA
Erhard Häuser, Schöffengrund, and Hans-Joachim Steindorf, Sinn, both of, Germany, assignors to Wilhelm Hedrich Vakuumanlagen GmbH & Co. KG, Ehringshausen-Katzenfurt, Germany
Filed Mar. 14, 1994, Ser. No. 212,163
Claims priority, application Germany, Mar. 14, 1993, 43 07 919.9; Mar. 18, 1993, 43 08 651.9; Jun. 4, 1993, 43 18 496.0
Int. Cl.[6] B29C *39/24*
U.S. Cl. 141—1 **17 Claims**

1. A method for filling a casting mold with casting ready liquid media, said method comprising the steps of;
pumping said casting ready liquid media from a tank or pressurized vessel to a variable volume buffer leading to a casting mold, wherein the feed rate of said pump is divided into a predetermined filling rate for said casting mold and a storing rate for said buffer, the quantity of said casting ready liquid stored in said buffer is discharged to said casting mold during the pump suction stroke according to said predetermined filling rate until the new discharge stroke of said pump begins.



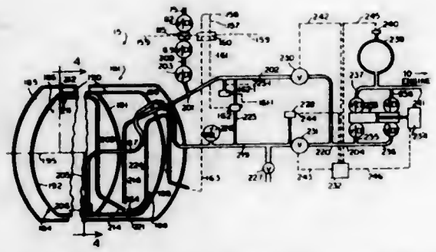
5,551,487
MICRO-DISPENSER FOR PREPARING ASSAY PLATES
Gary B. Gordon, Saratoga; Scott A. Conradson, Palo Alto, and Kay Lichtenwalter, San Jose, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Mar. 10, 1995, Ser. No. 401,520
Int. Cl.[6] B65B *43/42;* **B67C** *3/00*
U.S. Cl. 141—1 **4 Claims**

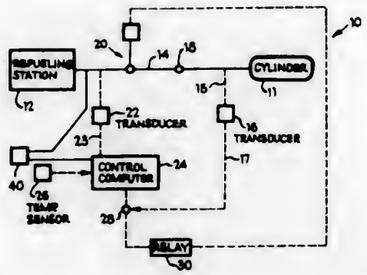
1. An apparatus for dispensing immobilized reactants onto substrates for use in generating biological assay plates for detecting the presence of mobile reactants that bind to said immobilized reactants, said apparatus comprising:
a dispensing bed for holding a plurality of substrates;
means for holding a plurality of cartridges, each said cartridge containing one of said immobilized reactants or a precursor thereof;
means for positioning one of said cartridges over each of said substrates;
means for bringing said positioned cartridge into contact with each of said substrates at a predetermined location on each of said substrates so as to dispense a known quantity of said immobilized reactant onto said substrate at said location.



5,551,488
METHOD OF FILLING A TWO-COMPARTMENTS STORAGE TANK WITH CRYOGENIC FLUID
Anker Gram, Vancouver, Canada, assignor to Process System International, Inc., Westborough, Mass.
Division of Ser. No. 294,084, Aug. 22, 1994, which is a division of Ser. No. 39,908, Mar. 30, 1993, Pat. No. 5,411,374.
This application May 25, 1995, Ser. No. 450,085
Int. Cl.[6] B65B *1/04;3/04;31/00*
U.S. Cl. 141—18 **10 Claims**

1. A method of filling a tank with cryogenic liquid from a cryogenic liquid supply, the method comprising the steps of:
(a) coupling a supply conduit to a cryogenic liquid inlet conduit of the tank, the supply conduit cooperating with the liquid supply,
(b) delivering the cryogenic liquid from the supply conduit to the liquid inlet conduit,
(c) discharging the liquid into a liquid compartment of the tank at a pressure which is sufficiently high to widely disperse the liquid within the tank to increase chances of contact between





the liquid and any vapour in the liquid compartment so as to condense most vapour therein, and

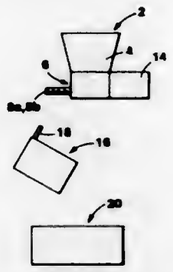
(d) when the liquid compartment is essentially full, conducting excess liquid from a position adjacent an upper portion of the liquid compartment to discharge the excess liquid into a vapour compartment.

5,551,489

AGGLOMERATION OF FINELY DIVIDED POWDERS

Eva A. C. Trofast, and Erik J. Falk, both of Lund, Sweden, assignors to Astra Aktiebolag, Sodertalje, Sweden

Filed Oct. 3, 1994, Ser. No. 317,833
Int. Cl.[6] B65B *1/04;3/04*
U.S. Cl. 141—18 **26 Claims**



1. A method of treating a finely divided powder to form a free-flowing spheronized powder, comprising the steps of:

a) providing a substantially dry finely divided powder;

b) feeding the substantially dry finely divided powder through a screw feeder to form agglomerates; and

c) spheronizing the agglomerates, in substantially dry form, to form a free-flowing spheronized powder.

5,551,490

APPARATUS AND METHOD FOR CONTROLLING THE CHARGING OF NGV CYLINDERS FROM NATURAL GAS REFUELING STATIONS

Kenneth J. Kountz, Palatine, and Christopher F. Blazek, Palos Hills, both of Ill., assignors to Gas Research Institute, Chicago, Ill.

Division of Ser. No. 237,001, May 2, 1994, Pat. No. 5,488,978. This application Jun. 7, 1995, Ser. No. 483,380
Int. Cl.[6] B65B *31/00*
U.S. Cl. 141—21 **3 Claims**

1. A system for the rapid, substantially adiabatic, filling of containers with a gas, under pressure, wherein each container has a known pressure rating at standard ambient pressure and temperature, and an unknown amount of residual gas remaining therein, said system, in combination with one or more of said containers, comprising:

a source of gas;

means for directing the flow of the gas from the source to one or more of the containers;

means for sensing the temperature and pressure of the gas being supplied by the source, and producing indications representative of the temperature and pressure;

means for sensing the pressure within the one or more containers, and producing an indication representative of the pressure in the one or more containers,

said means for sensing the pressure within the one or more containers being capable of sensing an initial pressure within the one or more containers, and thereafter substantially continuously sensing the pressure within the one or more containers, while the flow of gas from the source into the container is substantially continuous and uninterrupted during the filling process;

means for sensing an initial temperature of the one or more containers prior to filling thereof;

control means for determining a cutoff pressure to which the one or more containers can be filled, the cutoff pressure being based upon the initial pressure within the one or more containers, the initial temperature of the one or more containers, and the temperature and pressure of the gas being supplied by the source and presuming that substantially no heat transfer occurs between the container and the surrounding environment, during the filling of the container, the control means being operably associated with the means for sensing the temperature and pressure of the gas being supplied, the means for sensing the pressure within the one or more containers and the means for sensing the initial temperature of the one or more containers, the control means being further configured for determining and achieving filling of the container to a predetermined level.

5,551,491

AUTOMATIC CAROUSEL MACHINE FOR THE METERED FEEDING AND PACKAGING OF FLUID PRODUCTS

Roberto Baruffato, San Lazzaro Di Savena; Claudio Trebbi, Medicina; Claudio Barbieri, and William Vigna, both of Bologna, all of, Italy, assignors to I.M.A. Industria Macchine Automatiche S.p.A., Ozzano Emilia, Italy

Filed Jun. 22, 1994, Ser. No. 264,353
Claims priority, application Italy, Jul. 1, 1993, BO93A0310
Int. Cl.[6] B65B *43/42*
U.S. Cl. 141—145.000 **13 Claims**

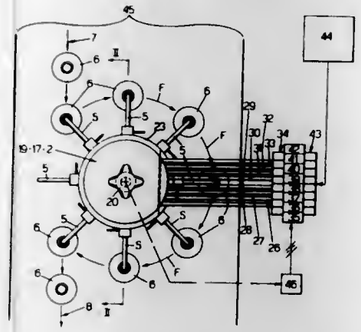
1. An automatic machine for the metered feeding and packaging of fluid products, comprising

a carousel;

at least one rotary joint coaxial with said carousel, said joint being provided with a first part which rotates with the carousel and a second part fixed with respect to the carousel;

a plurality of product feed nozzles fixedly connected to said first part of said joint for feeding a metered amount of product into suitable containers;

a set of metered volume feeders which are stationary relative to said fixed second part;



valve means for controlling flow into and out of each of said volume feeders of said set which are stationary relative to said fixed second part;

a plurality of fixed ducts connecting said fixed second part to said set of metered volume feeders through said valve means;

a supply reservoir of the product to be fed fluidly connected to said feeders which are stationary relative to said fixed second part; and

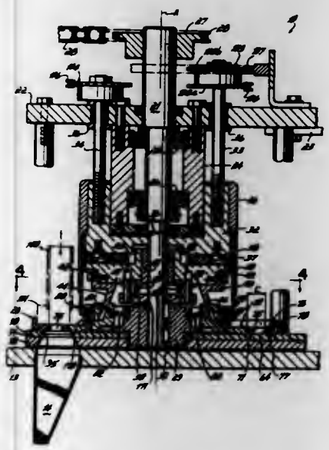
means for synchronizing the rotation of the carousel with a sequence of operation of the metered volume feeders and the corresponding valve means so that, through said rotary joint, the metered volume feeders are caused to be fluidly connected with said product feed nozzles of the carousel in a stage of discharge of the portion of product into the containers and to be isolated from said nozzles and fluidly connected to the supply reservoir at a stage in which a subsequent portion of product is drawn from the supply reservoir.

5,551,492

ROTARY DISC FEEDER

Daniel J. Rack, Cincinnati, Ohio, and Michael E. Myers, Bellevue, Ky., assignors to R.A. Jones & Co. Inc., Crescent Springs, Ky.

Filed Aug. 19, 1994, Ser. No. 293,020
Int. Cl.[6] B65B *1/00*
U.S. Cl. 141—147 **24 Claims**



1. Product feeding apparatus comprising:

a rotary disk mounted for rotation about a vertical axis;

at least one radially disposed slot extending through said disk;

at least one adjustment slider which is radially movable with respect to said axis and is operably disposed in said slot and defining with said slot a volumetric, product receiving and measuring chamber movable along a circular path as said disc rotates; and

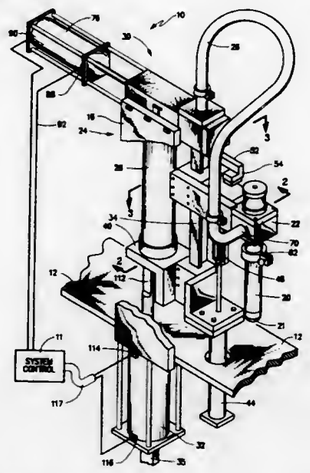
a cam for adjusting the radial extension of said slider in said slot for adjusting the volume of said chamber.

5,551,493

FILLING APPARATUS WITH TRAVELING NOZZLE

Donald W. Sonntag, Titusville, and James Bonner, Flemington, both of N.J., assignors to Reagent Chemical & Research, Inc., Middlesex, N.J.

Filed Aug. 5, 1994, Ser. No. 286,871
Int. Cl.[6] B67C *3/26;3/24*
U.S. Cl. 141—263 **34 Claims**



1. Apparatus adapted to be connected to a source of flowable material and operative to dispense a measured quantity of material into a container, comprising:

(a) a dispensing nozzle reciprocally movable in opposite first and second directions along a movement axis;

(b) a metering assembly including a metering cylinder having an interior, a metering element reciprocally movable into and out of the interior of said metering cylinder and a switching valve, said metering assembly switchable between a metering mode wherein said switching valve is in a first state operative to place an inlet of said metering assembly in fluid communication with the source of material so that material flows into the interior of the metering cylinder thereby displacing said metering element a displacement distance from an inserted position to a retracted position and a discharge mode wherein said switching valve is in a second state operative to place an outlet of said metering assembly in fluid communication with said dispensing nozzle;

(c) a metering element drive operative when said switching valve is in the second state to drive said metering element the displacement distance from the retracted position to the inserted position thereby displacing material through the outlet of said metering cylinder and thereby to dispense the selected quantity of material from said dispensing nozzle; and

(d) a lift bracket mounted for common equidistant movement with said metering element as said metering element moves into and out of the interior of said metering cylinder, said dispesing nozzle fixedly interconnected to said lift bracket such that, when said metering element moves from the retracted position to the inserted position, said dispensing nozzle moves equidistantly in the first direction.

5,551,494

DEVICE FOR MAKING PATCHES, ESPECIALLY OF WOOD, AND FOR PATCHING RESIN GALLS ON PIECES OF WOOD

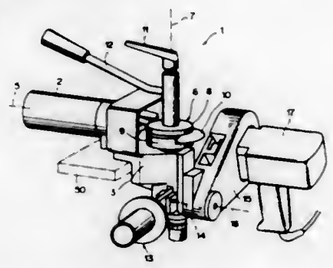
Wilfried Schneider, Bubendorf, and Dieter Steiner, Ziefen, both of, Switzerland, assignors to Lamello AG, Hauptstrasse, Switzerland

Filed Apr. 26, 1995, Ser. No. 427,923

Claims priority, application European Pat. Off., Apr. 26, 1994, 94810236

Int. Cl.[6] **B27C** *5/00;9/00*

U.S. Cl. 144—24.16 **9 Claims**



1. A device for making patches of the type used for patching resin galls on pieces of wood, the device comprising:

a milling tool defining a milling axis;

a support frame having a driving unit for holding the milling tool rotatably driveable about the milling axis;

a clamping device disposed on the support frame for holding a workpiece;

means for rotating the clamping device about a rotational axis perpendicular to the milling axis;

means for shifting the clamping device along the rotational axis between a first position, where the workpiece is led past the milling tool a first time by means of rotation of the clamping device about the rotational axis, and a second position, where the workpiece is led a second time past the milling tool by means of rotation of the clamping device about the rotational axis; and

a cutter for separating a patch from the workpiece.

5,551,495

UNIVERSAL STAIRCASE HANDRAIL VOLUTE

Lynn H. Smith; Mark D. Smith, and Dee R. Smith, all of Gunter, Tex., assignors to L. J. Smith, Bowerston, Ohio

Filed Mar. 31, 1994, Ser. No. 220,836

Int. Cl.[6] **B27B** *1/00;* **B27D** *1/00;* **B27M** *3/00*

U.S. Cl. 144—346 **18 Claims**

1. A method of manufacturing a staircase handrail volute, comprising the steps of:

(a) cutting a workpiece from wood with a bandsaw such that said workpiece has an approximation of a shape of said volute, wherein said approximation dimensions are larger than said shape dimensions;

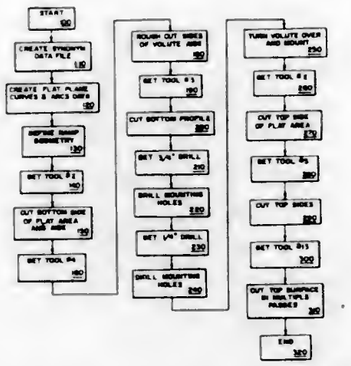
(b) mounting said workpiece so that said workpiece may be operated on by a numerically controlled machine tool;

(c) cutting a bottom surface of said workpiece to said shape dimensions with said machine tool;

(d) cutting lower side surfaces of said workpiece with said machine tool to a first dimension between said approximation dimensions and said shape dimensions;

(e) cutting said lower side surfaces of said workpiece with said machine tool to said shape dimensions;

(f) drilling at least one mounting hole in said bottom surface with said machine tool, said at least one mounting hole for holding said workpiece in steps (g) through (j);



(g) turning said workpiece over and mounting said workpiece so that said workpiece may be operated on by a numerically controlled machine tool;

(h) cutting an upper surface of said workpiece with said machine tool to a second dimension between said approximation dimension and said shape dimension;

(i) cutting upper side surfaces of said workpiece with said machine tool to said shape dimensions; and

(j) cutting said upper surface of said workpiece to said shape dimensions with said machine tool.

5,551,496

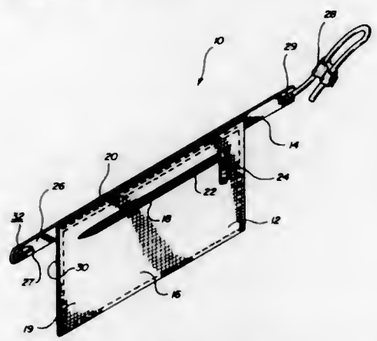
CONCEALABLE WALLET

Hugh H. Gray, Jr., 820 Sunset Blvd., Apt. 22, Kenner, La. 70065

Filed Jan. 11, 1995, Ser. No. 371,124

Int. Cl.[6] **A45C** *1/02;1/06;13/18*

U.S. Cl. 150—134 **1 Claim**



1. A concealable wallet for use with a garment comprising:

a wallet member having a first and second sidewall secured together in a manner to form a pocket therebetween, said pocket being accessible through a sealable opening formed through said first sidewall and having a zipper installed in said sealable opening in a manner to allow a user to selectively seal and unseal said sealable opening by operating said zipper; and

an elongated attachment strap having a first and second end attached to said second sidewall, said first end extending out past said wallet member and having attached thereto an adjustable length fastening mechanism including a length of flexible cord suitable for fastening about a belt loop of said garment, said second end extending out past said wallet member and having a fastening mechanism including a length of nylon strapping having a button hole formed therethrough to form a button connector suitable for fastening about a button of said garment;

said adjustable length fastening mechanism including a resilient member having a first and second holding channel through which sections of said flexible cord are installed, each of said first and second holding channels are defined by sidewalls which frictionally contact and hold said flexible cord; at least one of said first and second holding channels including an insertion channel running along a side thereof of a size sufficient to allow a section of said flexible cord to be inserted laterally therethrough;

said adjustable length fastening mechanism being adjustable between 1 inch and 6 inches in length, said pocket being of a size sufficient to receive therein a 6¼ inch long, 2⅝ inch wide, ¼ inch thick rectangular object.

5,551,497

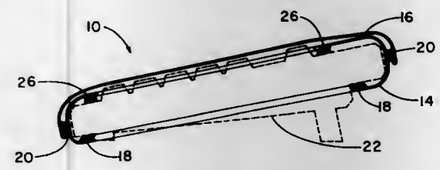
DECORATIVE COMPUTER KEYBOARD COVER

David B. Stanley, 4576 Plum Orchard La., Stone Mountain, Ga. 30083

Filed Jul. 5, 1994, Ser. No. 271,000

Int. Cl.[6] **B65D** *65/10*

U.S. Cl. 150—154 **13 Claims**



12. A cower assembly for use with a computer keyboard, the keyboard comprising a keyboard case having an upper case side and adjacent side surfaces extending downwardly from the upper case side, and a plurality of keys extending upwardly from the keyboard relative to the upper case side, the keyboard upper case side defining a perimeter extending along the upper case side between the keys and the adjacent side surfaces, said cover comprising:

a keyboard body cover engageable with the keyboard and sized and configured to cover the keyboard perimeter and the side edge surfaces, the keys of the keyboard remaining exposed for use when said keyboard body cover is engaged with the keyboard; and

securing means adapted to said keyboard body cover and the keyboard for selectively securing said keyboard body cover in position on the keyboard.

5,551,498

PNEUMATIC TIRE WITH HYBRID STEEL/ARAMID BELT CORD

Masato Komatsuki, Takasago, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan

Filed Apr. 5, 1994, Ser. No. 223,108

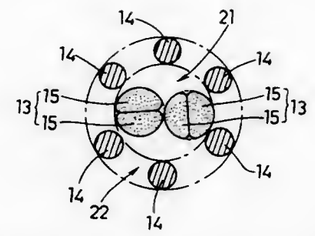
Claims priority, application Japan, Apr. 21, 1993, 5-118956

Int. Cl.[6] **B60C** *9/00;9/18;9/20*

U.S. Cl. 152—527 **5 Claims**

1. A pneumatic tire comprising

a pair of bead cores each disposed in a bead portion,



a toroidal carcass extending between the bead portions and turned up around said pair of bead cores, and

a belt disposed radially outside the carcass and inside a tread portion,

the belt comprising two cross plies, each made of parallel hybrid cords,

each said hybrid cord comprising a core consisting of aramid strands twisted together in a first direction and an outer layer consisting of steel strands twisted around the core in a second direction which is reverse to the first direction,

each said aramid strand consisting of yarns twisted together in the second direction, each said yarn consisting of aramid fiber filaments twisted together in the first direction,

each said steel strand consisting of a steel monofilament,

the aramid fiber filaments being resin-coated to hinder the transfer of humidity from the aramid strands to the steel strands.

5,551,499

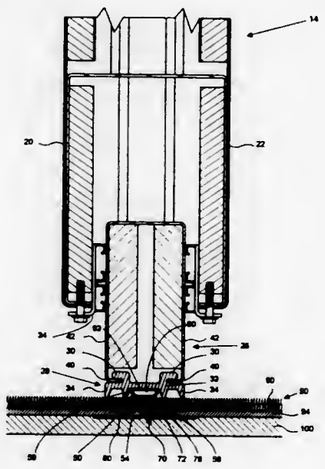
SEAL ASSEMBLY FOR AN OPERABLE PARTITION

Jerald A. McRoberts, New Castle, Ind., assignor to Modernfold, Incorporated, New Castle, Ind.

Filed Jul. 8, 1994, Ser. No. 272,692

Int. Cl.[6] **E06B** *7/18*

U.S. Cl. 160—40 **18 Claims**



1. In combination:

a strip of carpeted floor including a carpet layer, said carpet layer

including one of a slit and seam defined by facing side edges of said carpet layer;

an operable partition movable between an open position and a wall forming position above the strip of carpeted floor, wherein the operable partition when in the wall forming position extends in a first direction, wherein the operable partition includes a drop seal having a thickness; and

an operable partition seal assembly comprising:

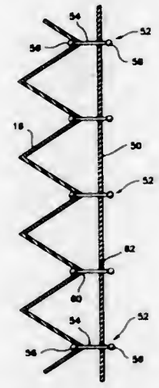
a first sealing strip component attached to an underside of the drop seal and having a sealing surface, said first sealing strip component sealing surface including a length extending in the first direction and a width;

a second sealing strip component installed in the carpeted floor strip at a location beneath said first sealing strip component when the operable partition is in the wall forming position, said second sealing strip component comprising an upwardly extending sealing portion within the carpet layer and in contact with said facing side edges of the carpet layer, said upwardly extending sealing portion having a width less than the drop seal thickness, said upwardly extending sealing portion including a crest for sealingly engaging said first sealing strip component sealing surface to provide a sound barrier seal, said crest including a length extending in the first direction and a width, and wherein said width of said sealing portion crest is less than the first sealing strip component sealing surface width.

5,551,500
PLEATED BLIND

Reginald C. Allsopp, Stockport, England, assignor to Louver-Lite Ltd., England

Filed May 23, 1994, Ser. No. 247,769
Int. Cl.[6] E06B *3/48*
U.S. Cl. 160—84.04 7 Claims

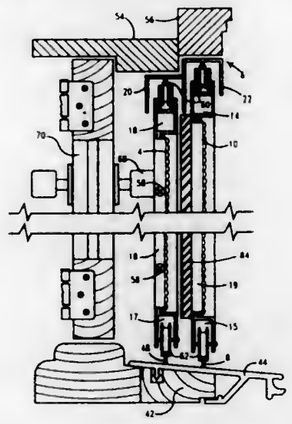


1. A pleated blind having at least two rails selectively displaced towards one another and away from one another, and a flexible sheet element, said flexible sheet element being arranged between said at least two rails, said flexible sheet element having a plurality of fold lines arranged so that the element is folded into pleats between the rails when the rails are displaced towards one another, the improvement comprising at least one flexible connecting member disposed between the two rails, the member being flexibly secured to the flexible sheet element substantially at alternate ones of said fold lines, said connecting member, when said rails are displaced away from one another, constraining said sheet element to a predefined maximum spacing between said alternate fold lines, said flexible connecting member being flexibly secured to the flexible sheet element by at least one connecting submember, which said submember comprises an elongate shank and a projection at each longitudinal end of said shank, the submember being arranged such that the flexible connecting member and flexible sheet element are retained between said projections.

5,551,501
SCREEN ASSEMBLY

Floyd C. Davis, Knoxville; Jesse T. Boring, Maryville; Charles W. Cowart, and T. Glen Lowe, both of Knoxville, all of Tenn., assignors to DCL, Inc., Wedowee, Ala.

Filed Oct. 21, 1994, Ser. No. 327,303
Int. Cl.[6] A47H *1/00*
U.S. Cl. 160—87 12 Claims

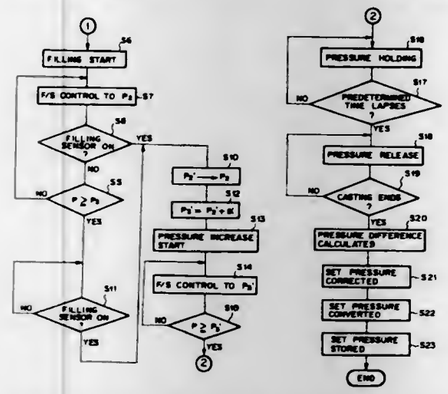


1. A screen system for double-hung entry doors comprising an inner screen assembly containing a frame having upper and lower horizontal frame members and first and second vertical frame members carrying a screen; an outer screen assembly containing a frame having upper and lower horizontal frame members and first and second vertical frame members carrying a screen; upper inner and outer longitudinal screen guides attached to a building adjacent the entry doors for slidably engaging a portion of the upper horizontal frame members of each of said inner and outer screen assemblies, each of said inner and outer screen guides containing an elongate planar horizontal member having first and second edges, a first planar vertical member adjacent said first edge and a second planar vertical member adjacent said second edge whereby the second planar vertical member is common to both the inner and outer screen guides, wherein said elongate planar horizontal members lie in separate substantially parallel planes and wherein said outer screen guide further contains an upstanding rigid elongate member substantially centered between said first and second planar vertical members for limiting the lateral movement of said outer screen assembly when slidably positioning said outer screen longitudinally along said outer guide; and a lower sill attached adjacent a sill of the entry doors, said lower sill having an inner guide rail for engaging said lower horizontal frame member of said inner screen assembly and for limiting lateral movement of said inner screen assembly and an outer guide rail for slidably guiding said lower horizontal frame member of said outer screen assembly and for limiting lateral movement of said outer screen assembly when slidably adjusting said outer screen.

5,551,502
PRESSURIZING CONTROL METHOD AND PRESSURIZING CONTROL SYSTEM FOR LOW-PRESSURE CASTING

Nobuyuki Matsubayashi, and Toru Takeshita, both of Hiroshima-ken, Japan, assignors to Mazda Motor Corporation, Hiroshima-ken, Japan

Filed May 12, 1995, Ser. No. 439,939
Claims priority, application Japan, May 13, 1994, 6-099474
Int. Cl.[6] B22D *46/00;27/13;17/06;17/32*
U.S. Cl. 164—457 20 Claims



1. In a low-pressure casting in which molten metal is introduced into a cavity of a casting mold under a pressure applied to the surface of the molten metal according to a preset reference pressurizing pattern,

a pressurizing control method of controlling the pressure applied to the molten metal surface comprising the steps of

correcting said reference pressurizing pattern when that the cavity has been filled with molten metal is detected,

controlling the pressure applied to the molten metal surface according to the reference pressurizing pattern after the correction,

calculating the pressure difference between a set pressure at a predetermined time in the reference pressurizing pattern after the correction and a set pressure at the corresponding time in the reference pressurizing pattern before the correction, and

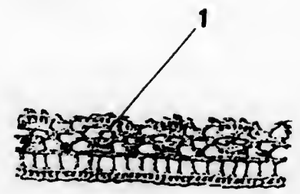
correcting a set pressure for the period up to the time the cavity is filled with molten metal in the reference pressurizing pattern as a current reference pressure pattern for the next casting cycle on the basis of the calculated pressure difference.

5,551,503
PROCESS FOR THE PRODUCTION OF DECORATIVE ARTICLES IN GOLD OR OTHER PRECIOUS METALS AND THE ARTICLES MADE BY THE PROCESS

Antonio Padino, Bassano Del Grappa, Italy, assignor to Padino Antonio Microfusioni, Bassano Del Grappa, Italy

Filed Jan. 25, 1995, Ser. No. 377,697
Claims priority, application Italy, Jan. 27, 1994, VI94A0010
Int. Cl.[6] B22C *9/00;9/02*
U.S. Cl. 164—516 1 Claim

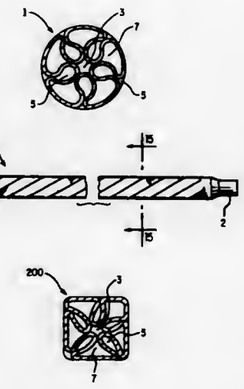
1. A process for the production of a decorative article made in gold or another precious metal which consists of the steps of making a model of lace or embroidery of cotton, said model having a body, said body having a size, then applying to the model a member selected from the group consisting of wax, resins, varnishes, and plastic materials whereby the size of the body of the model is enlarged, afterwards coating the model with gypsum, then introducing said model into a heated furnace whereby the model is destroyed and a cavity is formed, said cavity having the shape of said lace or embroidery, finally introducing into said cavity a precious metal in the molten condition, allowing the article to solidify and crushing said gypsum.



5,551,504
HEAT EXCHANGE ELEMENT

L. Robert Zifferer, Waco, Tex., assignor to Packless Metal Hose, Inc., Waco, Tex.

Division of Ser. No. 6,926, Jan. 22, 1993, Pat. No. 5,409,057.
This application Mar. 10, 1995, Ser. No. 402,146
Int. Cl.[6] F28D *7/10*
U.S. Cl. 165—156 37 Claims



21. A method of exchanging heat, comprising:

passing a first fluid through a central fluid passage of a heat exchanger;

passing a second fluid through a plurality of substantially helically convoluted second fluid passages of a heat exchanger, the second fluid passages substantially surrounding at least a portion of the central fluid passage;

passing the first fluid through a plurality of substantially helically convoluted first fluid passages of the heat exchanger, the first fluid passages substantially surrounding at least a portion of the second fluid passages; and

wherein a combination comprises the first fluid passages, the second fluid passages, and the central fluid passage, and wherein a cross-section of the combination is substantially orthogonal.

37. A method of exchanging beat, comprising:

passing a first fluid through a central fluid passage of a heat exchanger;

passing a second fluid through a plurality of substantially helically convoluted second fluid passages of a heat exchanger, the second fluid passages substantially surrounding at least a portion of the central fluid passage, wherein the central fluid passage and the second fluid passages comprise a heat exchange element of single-piece construction; and

passing the first fluid through a plurality of substantially helically convoluted first fluid passages of the heat exchanger, the

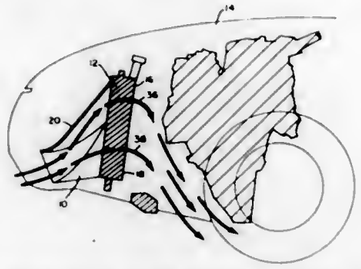
first fluid passages substantially surrounding at least a portion of the second fluid passages.

5,551,505

HEAT EXCHANGER INLET DUCT WITH A CENTER BAFFLE

Mark Freeland, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 3, 1994, Ser. No. 316,768
Int. Cl.[6] F28F *9/00*
U.S. Cl. 165—041 **18 Claims**



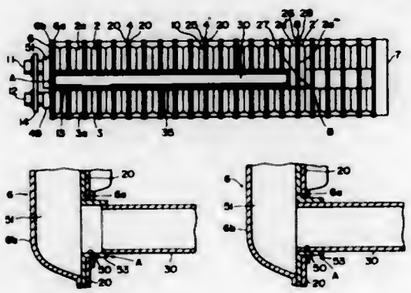
1. An air inlet duct for a heat exchanger, comprising:
a first baffle having at least one member with a vertical portion dividing said air inlet into a plurality of vertical sections and at least one horizontal portion combining alternate ones of said vertical sections and directing air flowing therethrough to a first selected portion of said heat exchanger and also combining other alternate ones of said vertical sections and directing air flowing therethrough to a second selected portion of said heat exchanger so that said first and second selected portions receive substantially equal air flow.

5,551,506

LAMINATED HEAT EXCHANGER

Kunihiko Nishishita, Konan, Japan, assignor to Zexel Corporation, Tokyo, Japan

Filed Dec. 22, 1994, Ser. No. 361,555
Claims priority, application Japan, Dec. 24, 1993, 5-347796
Int. Cl.[6] F28D *1/03;* **F28F** *7/00*
U.S. Cl. 165—76 **22 Claims**



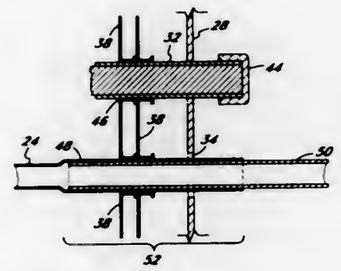
21. An air conditioning system for a vehicle including,
a laminated heat exchanger comprising:
an assembly of tanks including a plurality of hydraulically connected tube elements, each of said tube elements having a pair of tanks and a U-shaped passage providing communication between said tanks, said tank assembly having a first end and a second end;
a plurality of corrugated fins laminated with said tube elements;
a first end-plate structure positioned at said first end of said tank assembly and including an exterior wall and an interior wall, said first end plate structure defining at least two interior coolant inlet/outlet passageways, each said passageway extending between an opening through said exterior wall and an opening through said interior wall;
a second end-plate structure positioned at said second end of said tank assembly; and
a pipe extending between said first end-plate structure and a selected one of said plurality of tube elements intermediate said first and second end-plate structures, wherein said first pipe end is coupled to one of said first end-plate passageways at one of said openings through said interior wall and said second pipe end is coupled to an inlet passage of said selected tube element.

5,551,507

FINNED HEAT EXCHANGER SUPPORT SYSTEM

Kenneth E. Vogel, Yuma, Ariz., assignor to Russell a Division of Ardco, Inc., Brea, Calif.

Filed Mar. 17, 1995, Ser. No. 405,593
Int. Cl.[6] F28F *7/00*
U.S. Cl. 165—82 **10 Claims**



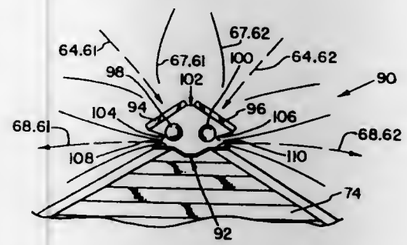
1. A heat exchanger, comprising:
a plurality of spaced support plates;
a plurality of spaced elongated support members extending between and fixed to said plates, said elongated support members including support tubes joined to said support plates and support rods extending through said support plates, an exterior of said support rods tightly engaging an interior of said support tubes;
a bundle of tubes arranged in generally spaced parallel relation with said tubes extending through holes in said support plates;
a plurality of heat transfer fins secured to the tubes and to the support members whereby said tubes are supported by said fins, said holes in said plates being larger than said tubes so that said tubes move freely in said holes in response to thermal expansion and contraction and in response to vibration;
a tubular header at one end of said tubular bundle to be connected to a fluid inlet line; and
a pair of spaced tubular connectors joining said header to ends of two of said tubes, each of said connectors having an end portion which is telescopically received within an end of a respective one of said tubes, with said connector ends extending through portions of said ends of said tubes that pass through one of said plates and at least one of said fins to provide a firm support for said header.

5,551,508

CONDENSING UNIT USING CROSS-FLOW BLOWER

Alexander I. Lim, Brentwood; Richard DeVos, Murfreesboro, and Jeffrey B. Scott, Antioch, all of Tenn., assignors to Inter-City Products Corporation (USA), Lewisburg, Tenn.

Filed Jun. 7, 1995, Ser. No. 474,718
Int. Cl.[6] F28F *13/12*
U.S. Cl. 165—122 **4 Claims**



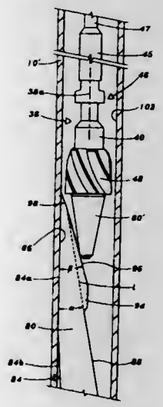
1. A split system air conditioner for conditioning air inside a building, said split air conditioner comprising:
fluid circuit means for circulating refrigerant fluid through an indoor heat exchanger and an outdoor heat exchanger;
an indoor module disposed within the building, said indoor module including said indoor heat exchanger and means for circulating indoor air about said indoor heat exchanger; and
an outdoor module disposed in communication with the exterior of the building, said outdoor module including said outdoor heat exchanger, and first and second cross-flow blowers, with said first and second cross-flow blowers arranged to cause outdoor air to circulate about said outdoor heat exchanger, said outdoor module including a housing having an angled top wall and means for attaching said outdoor module to a peak of a similarly angled roof top of the building.

5,551,509

WHIPSTOCK AND STARTER MILL

Britt O. Braddick, Houston, Tex., assignor to TIW Corporation, Houston, Tex.

Filed Mar. 24, 1995, Ser. No. 409,879
Int. Cl.[6] E21B *7/08*
U.S. Cl. 166—55.7 **19 Claims**



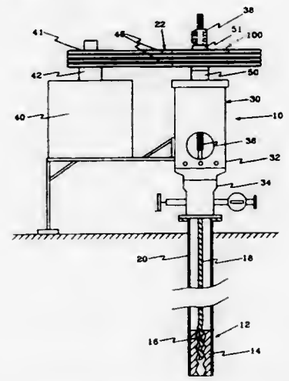
1. A mill kick out apparatus comprising:
a whipstock having
a lower end pivotally connected to a supporting assembly;
an upper end;
an outer side for disposition adjacent one side of a well wall and having a vertically elongate upper portion angularly disposed with respect to a lower portion thereof, whereby the upper portion of the outer side may abut the one side of the well wall when the lower portion is inclined with respect to the upper portion and is radially spaced from said one side of the well wall;
an inner side diametrically opposite the outer side and configured to be disposed at a first angle with respect to the one side of the well wall when the upper portion of the outer side of the whipstock abuts the one side of the well wall; and
a lug projecting generally radially inwardly from the inner side of the upper end of the whipstock and having a facing surface disposed at a second angle inclined with respect to both the first angle and with respect to the one side of the well wall, an axial length of the facing surface being no greater than an axial length of the upper portion of the outer side of the whipstock.

5,551,510

SAFETY COUPLING FOR ROTARY DOWN HOLE PUMP

Robert A. R. Mills, Calgary, Canada, assignor to Kudu Industries Inc., Canada

Filed Mar. 8, 1995, Ser. No. 399,075
Int. Cl.[6] E21B *43/00;* **F16D** *9/10*
U.S. Cl. 166—68 **19 Claims**



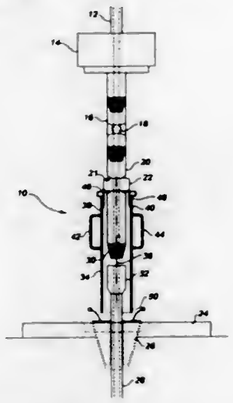
1. A safety coupling for preventing backspin at excessive speeds of a torque transmitting drive powering a drive shaft which stores reactive torque due to torsional stress, the drive shaft normally being rotated in a forward direction by the torque transmitting drive, and backspin of the drive shaft being caused by the release, upon interruption of power to the drive shaft, of reactive torque stored in the drive shaft due to elastic torsion of the shaft, the safety coupling comprising,
a rotatable driving member to be coupled with a torque producing power source;
a rotatable driven member to be coupled with the drive shaft for axial rotation therewith;
means for coaxially and rotatably supporting the driving and driven members in relation to each other;
a radial abutment provided on the driving member; and
a centrifugal force responsive pawl pivotally mounted to the driven member for releasable engagement with the abutment, the pawl being pivotable between a locking position wherein it engages the radial abutment upon mutual rotation of the driving and driven members to provide a positive driving connection there between, and a disengaged position wherein the driving and driven members are freely rotatable relative to each other; the pawl being shaped and constructed to be moved from the locking position to the a disengaged position by a centrifugal force acting thereon when the driven member

is coupled to the drive shaft and the drive shaft is backspinning at a speed in excess of a selected speed.

5,551,511
DRILLING FLUID CONTAINMENT APPARATUS FOR USE IN DISCONNECTING A KELLY FROM A DRILL STRING

Quinn A. J. Holtby, 3611 - 111B Street, Edmonton, Alberta, Canada

Filed Jan. 18, 1995, Ser. No. 374,024
Claims priority, application Canada, Feb. 18, 1994, 2116520
Int. Cl.[6] E21B *33/00*
U.S. Cl. 166—81.1 **1 Claim**



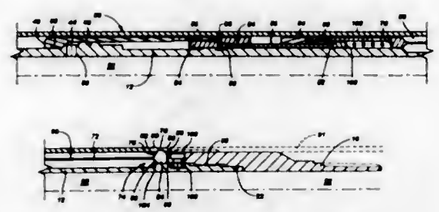
1. In combination:
a kelly assembly including: a kelly, a kelly bushing and a tubular member disposed below the kelly bushing having an annular groove;
a drilling fluid containment apparatus, comprising:
a. a tubular containment chute divided along its longitudinal axis into two pivotally connected halves, each of the halves having an attached handle by means of which the two pivotally connected halves are manipulated into position and pivoted between a spaced apart open position and a closed position encircling the tubular member; and
b. an annular engagement plate split between the two pivotally connected halves at one end of the containment chute, the annular engagement plate engaging the annular groove of the tubular member when the two pivotally connected halves are in the closed position thereby physically attaching the containment chute to the tubular member of the kelly assembly; and
c. annular sealing means at the one end of the containment chute immediately adjacent to the annular engagement plate, the annular sealing means engaging the tubular member when the two pivotally connected halves are in the closed position, and when the two pivotally connected halves are in the closed position the sole means of egress for drilling fluids being an open ended opposed end of the tubular containment chute.

5,551,512
RUNNING TOOL

Sidney K. Smith, Conroe, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Jan. 23, 1995, Ser. No. 376,910
Int. Cl.[6] E21B *23/00*
U.S. Cl. 166—212 **18 Claims**

1. A running tool for downhole tubulars, comprising:
a body;

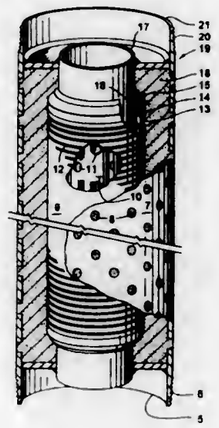


a gripping member on said body, selectively engageable with a groove on the tubular, said gripping member, once engaged to the groove on the tubular, retaining its grip whether the tubular is placed in tension or compression, or under a torque by said body;
a releasing device on said body to defeat the grip of the gripping member.

5,551,513
PREPACKED SCREEN

Billy W. Surles, and Howard L. Mcklazie, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed May 12, 1995, Ser. No. 440,157
Int. Cl.[6] E21B *43/04*
U.S. Cl. 166—278 **18 Claims**



1. In any version of a prepacked well screen assembly well known in the industry, comprising a wire screen and perforated casing with an annular space between filled with granular material, the improvement wherein said granular material is coated with a resin composition comprising an oligomer of furfuryl alcohol, an acid catalyst and an ester of a weak organic acid.

5,551,514
SAND CONTROL WITHOUT REQUIRING A GRAVEL PACK SCREEN

Erik B. Nelson, Broken Arrow, Okla.; J. Ernest Brown, Madisonville, La., and Roger J. Card, Tulsa, Okla., assignors to Dowell, a division of Schlumberger Technology Corp., Houston, Tex.

Filed Jan. 6, 1995, Ser. No. 369,625
Int. Cl.[6] E21B *33/138;43/267*
U.S. Cl. 166—280 **19 Claims**

1. The method of treating a subterranean formation penetrated by a wellbore comprising the steps of consolidating the formation in a near-wellbore zone with a resinous material, providing a fluid suspension including an intimate mixture of a particulate material and a fibrous material, pumping the fluid suspension including a mixture of the particulate material and the fibrous material through the wellbore and the near-wellbore zone to deposit the mixture of particulate material and fibrous material in the subterranean formation, and perforating the wellbore, wherein the steps of perforating and consolidating are performed simultaneously.

5,551,515
HEMICELLULASE ACTIVE AT EXTREMES OF PH AND TEMPERATURE AND UTILIZING THE ENZYME IN OIL WELLS

Douglas W. Fodge; David M. Anderson, both of Rockville, and Thomas M. Pettey, Gaithersburg, all of Md., assignors to Chemgen Corporation, Gaithersburg, Md.

Division of Ser. No. 851,122, Mar. 16, 1992, Pat. No. 5,476,775, which is a continuation of Ser. No. 529,655, May 29, 1990. This application May 26, 1995, Ser. No. 450,899
Int. Cl.[6] C12N *9/00;9/42;* **E21B** *43/267*
U.S. Cl. 166—300 **2 Claims**

1. A method of conditioning subterranean oil wells comprising the steps of
(a) preparing a suspension comprised of water, a hydraulic gelling agent and a proppant, said proppant having an indicated mesh size;
(b) pumping an adequate amount of said suspension under high pressure into an oil well causing a fracture to occur in subterranean geologic formations adjacent to said well such that said suspension is deposited in said fracture; and
(c) pumping an adequate amount of an enzyme endo-β-mannanase enzyme that catalyzes the degradation of mannan, wherein said enzyme (i) has a pH profile for endo-β-mannanase activity with the substrate guar that ranges from pH 4.5 to pH 11, and (ii) retains 50% of its maximum activity after 45 minutes at pH 9.0 and 75° C. with the substrate guar into said fracture with said suspension to effect degradation of said hydraulic gelling agent.

5,551,516
HYDRAULIC FRACTURING PROCESS AND COMPOSITIONS

William D. Norman, Lafayette, La.; Raymond J. Jasinski, Tulsa, and Erik B. Nelson, Broken Arrow, both of Okla., assignors to Dowell, a division of Schlumberger Technology Corporation

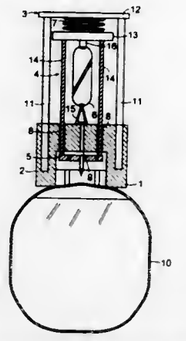
Filed Feb. 17, 1995, Ser. No. 389,857
Int. Cl.[6] E21B *43/269*
U.S. Cl. 166—308 **6 Claims**

1. A method of fracturing a subterranean formation comprising the steps of
(A) providing an aqueous viscoelastic surfactant based hydraulic fracturing fluid comprising:
(1) an aqueous medium;
(2) an effective amount of an inorganic water soluble ammonium salt to stabilize a subterranean formation by inhibiting hydration;
(3) an effective amount of at least one thickener in the fluid, the thickener comprising N-methyl-N, N-bis(2-hydroxyethyl) rapeseed ammonium chloride in an amount ranging from about 0.5 to about 6% by weight of the fluid;
(4) an effective amount of an organic stabilizing additive selected from the group consisting of an organic salt, a C_4 to C_{12} aliphatic alcohol and mixtures thereof, and
(B) pumping the aqueous viscoelastic surfactant based fluid through a wellbore and into a subterranean formation at a pressure sufficient to fracture the formation.

5,551,517
AUTOMATIC FIRE EXTINGUISHING DISCHARGE VALVE

Joseph Arsenault, 92 Chesnut St., Saugus, Mass. 01906, and James Analetto, 27 Line Rd., Reading, Mass. 01867

Filed Sep. 5, 1995, Ser. No. 523,180
Int. Cl.[6] A62C *35/02*
U.S. Cl. 169—57 **3 Claims**



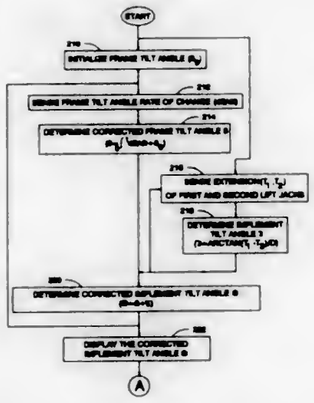
1. An automatic fire extinguishing discharge valve comprising:
a main body adapted to be attached to an outlet of a fire extinguisher, said main body having a hollow recess adapted to cover said outlet and having a first protruding finger on a surface opposite said hollow recess, said main body having at least two passages capable of each slidingly receiving a beam element and having at least one discharge bole capable of allowing passage of a fire extinguishing medium;
a guide housing having an end cap and at least two fixed beam elements securely affixed at a first end thereof to said end cap and at a second end thereof to the main body, said fixed beam elements are affixed at said first and second end such that they maintain parallel relation with respect to each other;
a carriage assembly having a plate, a puncturing means, and at least two sliding beam elements having first and second ends, said sliding beam elements are securely affixed at said first end to said plate and at said second end to said puncturing means, said sliding beam elements slidingly engage the passages of said main body and are affixed at said first and second end such that they maintain parallel relation with respect to each other and said passages, said plate having a second protruding finger, said second protruding finger pointing toward and in substantial axial alignment with said first protruding finger, said puncturing memos normally retracted and maintained within the hollow recess of said main body capable upon extension of puncturing a fire extinguisher seal;
a spring placed between said plate and said end cap, said spring constantly exerting sufficient force capable of driving said puncturing means [element] through said fire extinguisher seal;
a trigger mechanism placed between said first and second protruding fingers, said trigger mechanism capable of continuous opposition to the force exerted by said spring so long as said trigger mechanism remains between said first and second protruding fingers.

5,551,518
TILT RATE COMPENSATION IMPLEMENT SYSTEM AND METHOD

Kenneth L. Stratton, Dunlap, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Dec. 19, 1994, Ser. No. 314,473
Int. Cl.[6] E02F *3/76;3/85*
U.S. Cl. 172—4.5 **20 Claims**

1. A tilt angle control system for a geographic surface altering implement; comprising:



a frame;

first and second lift jacks each having first and second end portions and being connected at the first end portion to said frame and at the second end portion to an implement, said second end portions being extensibly movable relative to the first end portions in response to elevational movement of said implement;

first sensing means for sensing the position of the first end portion of the first lift jack relative to the second end portion of the first lift jack and delivering a responsive first position signal;

second sensing means for sensing the position of the first end portion of the second lift jack relative to the second end portion of the second lift jack and delivering a responsive second position signal;

third sensing means for sensing a tilt angle of the frame relative to a predetermined plane and delivering a responsive frame tilt angle signal;

fourth sensing means for sensing the rate of change of the frame tilt angle relative to the predetermined plane and delivering a responsive rate of change signal;

control means for receiving said first, second, frame tilt angle, and rate of change signals, determining an implement tilt angle relative to the frame based on the first and second signals, determining a frame tilt angle based on the frame tilt angle signal, determining a corrected frame tilt angle based on the frame tilt angle and rate of change signals, combining the implement tilt angle and the corrected frame tilt angle and delivering a responsive corrected actual implement tilt angle signal.

5,551,519

DEVICE FOR DRIVING PILES, PREFERABLY POLES, INTO A FOUNDATION

Karl Pach, Vienna, Austria, assignor to ELIN Energieversorgung Gesellschaft M.B.H., Vienna, Austria

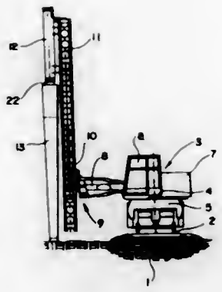
PCT No. PCT/AT93/00097, § 371 Date Dec. 5, 1994, § 102(e) Date Dec. 5, 1994, PCT Pub. No. WO93/25765, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 8, 1993, Ser. No. 347,383

Claims priority, application Austria, Jun. 10, 1992, A1189/92

U.S. Cl. 173—181 **10 Claims**

1. A device for ramming a foundation for a mast, wherein the foundation is drivable into the soil via the device, the device comprising: a rammer, with the rammer being provided on a leader and the leader being provided with a hoisting arm, wherein the hoisting arm is tiltable in a vertical plane and retained on a carrying unit, with the carrying unit being comprised of an undercarriage, the undercarriage having mounted thereupon a turnable top, with one end of the hoisting arm being tiltably arranged on the



carrying unit, wherein a turning-tilting unit is arranged on a free end of the hoisting arm, with the turning-tilting unit being comprised of a positioning plate, a rotary table and a guiding unit for the leader, with the turning-tilting unit being adapted for the positioning of the leader in any desired position within a three dimensional space.

5,551,520

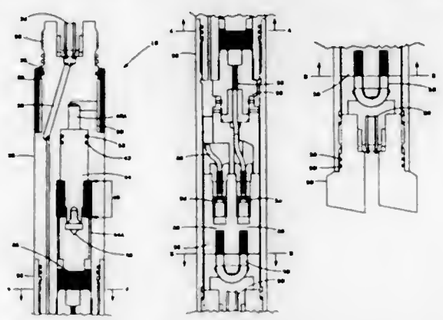
DUAL REDUNDANT DETONATING SYSTEM FOR OIL WELL PERFORATORS

Robert K. Bethel; Michael B. Grayson, and James Ellis, all of Houston, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Jul. 12, 1995, Ser. No. 501,480

Int. Cl.[6] E21B *43/117;43/1185*

U.S. Cl. 175—4.54 **8 Claims**



1. An apparatus for initiating a wellbore perforator, comprising:

a first firing head attached to said perforator, said first firing head for generating a first explosive signal when a first actuation signal is applied to said first firing head;

a second firing head attached to said perforator, said second firing head for generating a second explosive signal when a second actuation signal is applied to said second firing head;

first means for transferring said first explosive signal to shaped charges in said perforator, said first means comprising a first bulkhead interposed between said shaped charges and said first means, said first bulkhead for preventing transfer of low order initiation of said first means to said shaped charges; and

second means for transferring said second explosive signal to said shaped charges in said perforator, said second means comprising a second bulkhead interposed between said shaped charges and said second means, said second bulkhead for preventing transfer of low order initiation of said second means to said shaped charges, said first means for transferring and said second means for transferring isolated from each

other so that initiation of one of said means for transferring does not cause initiation of the other of said means for transferring.

5,551,521

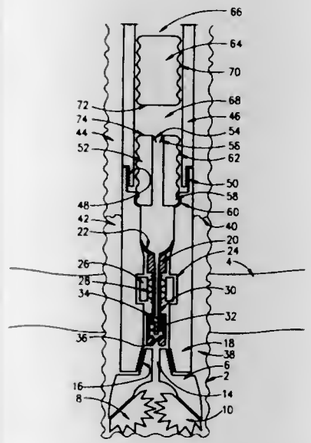
METHOD AND APPARATUS FOR CEMENTING DRILL STRINGS IN PLACE FOR ONE PASS DRILLING AND COMPLETION OF OIL AND GASS WELLS

William B. Vail, III, 3123 198th Pl. SE, Bothell, Wash. 98012

Filed Oct. 14, 1994, Ser. No. 323,152

Int. Cl.[6] E21B *33/00*

U.S. Cl. 175—65 **3 Claims**



1. A method of making a cased wellbore comprising at least the steps of:

assembling a lower segment of a drill string comprised in sequence from top to bottom of a first hollow segment of drill pipe, a latching subassembly means, and a rotary drill bit having at least one mud passage for passing drilling mud from the interior of the drill string to the outside of the drill string;

rotary drilling the Well into the earth to a predetermined depth with the drill string by attaching successive lengths of hollow drill pipes to said lower segment of the drill string and by circulating mud from the interior of the drill string to the outside of the drill string during rotary drilling so as to produce a wellbore;

after said predetermined depth is reached, pumping a latching float collar valve means down the interior of the drill string with drilling mud until it seats into place within said latching subassembly means;

pumping a bottom wiper plug means down the interior of the drill string with cement until the bottom wiper plug means seats on the upper portion of the latching float collar valve means so as to clean the mud from interior of the drill string;

pumping any required additional amount of cement into the wellbore by forcing it through a portion of the bottom wiper plug means and through the mud passages of the drill bit into the wellbore;

pumping a top wiper plug means down the interior of the drill string with water until the top wiper plug seats on the upper portion of the bottom wiper plug means thereby cleaning the interior of the drill string and forcing additional cement into the wellbore through the mud passages of the drill bit;

allowing the cement to cure;

thereby cementing in to place the drill string to make a cased wellbore.

5,551,522

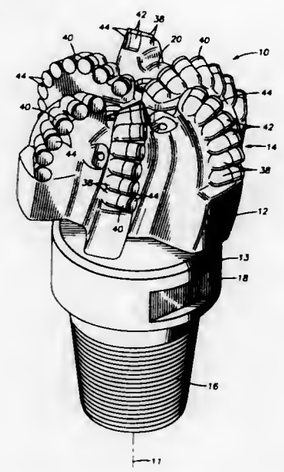
DRILL BIT HAVING STABILITY ENHANCING CUTTING STRUCTURE

Carl W. Keith, Spring, and Graham Mensa-Wilmot, Houston, both of Tex., assignors to Smith International, Inc., Houston, Tex.

Filed Oct. 12, 1994, Ser. No. 321,942

Int. Cl.[6] E21B *10/36*

U.S. Cl. 175—420.2 **22 Claims**



1. A cutting structure for a bit face of a fixed cutter drill bit, said cutting structure comprising:

sets of cutter elements mounted in spaced relationship on the bit face, each of said cutter sets having a set cutting profile and comprising a plurality of cutter elements having element cutting profiles, wherein each set cutting profile is defined by the rotated cutting profiles of the cutter elements in the set; and

wherein a first set includes a first cutter element mounted at a first exposure height equal to X, a second cutter element mounted at a second exposure height equal to Y, and a third cutter element mounted at a third exposure height equal to Y':

wherein Y and Y' are each greater than X: and

wherein said first and second cutter elements are radially spaced apart a distance equal to R; and

wherein said second and third cutter elements are mounted at substantially the same radial position on said bit face, and wherein Y' is greater than Y.

5,551,523

TRACTION LOCK

Gerald M. Berg, Lisbon, and Larry E. Albright, Gwinner, both of N. Dak., assignors to Clark Equipment Company, Woodcliff Lake, N.J.

Filed Feb. 18, 1994, Ser. No. 198,957

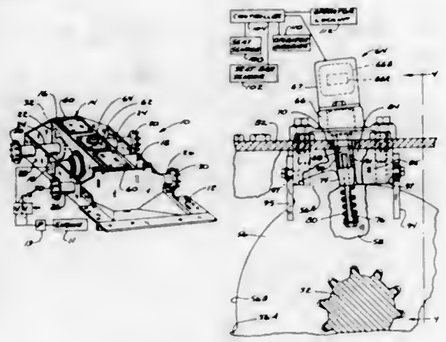
Int. Cl.[6] B60K *28/04*

U.S. Cl. 180—273 **14 Claims**

1. A traction drive lock in combination with a powered vehicle, comprising:

a frame;

a rotary drive mounted on the frame for driving axles of the vehicle, said rotary drive including a rotating final drive



component, said final drive component being rotatably mounted on the frame, a rotary element rotationally driven by said final drive component and having at least one lug which extends outwardly farther than adjacent portions of said rotary element; and

a lock member movable in directions toward and away from the rotary final drive component along a guided substantially linear path between a first position wherein it clears the lug on the rotary element, and a second position where it intercepts the lug in the path of rotary movement of the lug;

a power actuator operable for holding the lock member in its first position and releasable to permit the lock member to move to its second position, said power actuator comprising a solenoid which has a plunger movable when the solenoid is energized;

and a spring to spring load the plunger relative to the lock member such that the plunger can move away from the lock member when the solenoid is energized regardless of loads on the lock member from the lug, and when the lock member is sufficiently unloaded, the spring being operable to move the lock member to its first position.

5,551,524

REMOTE CONTROL APPARATUS OF A CONSTRUCTION MACHINE

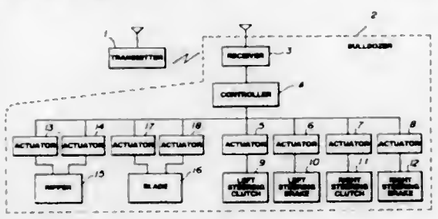
Shigeru Yamamoto; Shigenori Matsushita; Kazushi Nakata, and Nobuhisa Kamikawa, all of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 20, 1994, Ser. No. 360,047

Claims priority, application Japan, Dec. 24, 1993, 5-327830

Int. Cl.[6] B62D *11/08*

U.S. Cl. 180—6.62 **4 Claims**



1. A steering control apparatus adapted for utilization in a construction machine comprising:

left and right steering clutches for connecting and disconnecting the transmission of a force of an engine of a construction machine to left and right drive tumblers;

left and right steering brakes for braking the left and right drive tumblers, respectively;

receiving means for receiving a first steering command including a clutch-on signal for turning on the steering clutches and a clutch-off signal for turning off the steering clutches and a second steering command including a brake-on signal for turning on the steering brakes and a brake-off signal for turning off the steering brakes, the first and second steering commands being generated and transmitted by separately provided remote operating means; and

control means for performing a control of releasing/connecting hydraulic pressure for the steering clutches in response to on/off of the first steering command received by the receiving means, and for performing a control in such a manner that when the second steering command comes on during a period when the first steering command is on, hydraulic pressure of the steering brakes is gradually changed from a releasing side to a braking side with a predetermined gradient for a predetermined period of time, and when the predetermined period of time elapses, the hydraulic pressure of the steering brakes is rapidly changed to reach a predetermined braking pressure.

5,551,525

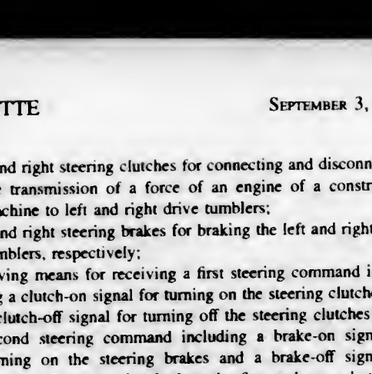
CLIMBER ROBOT

Robert T. Pack; Moenes Z. Iskarous, and Kazuhiko Kawamura, all of Nashville, Tenn., assignors to Vanderbilt University, Nashville, Tenn.

Filed Aug. 19, 1994, Ser. No. 293,498

Int. Cl.[6] B62D *57/032*

U.S. Cl. 180—8.6 **7 Claims**



1. A mobile robot adapted for movement and climbing on horizontal and vertical surfaces comprising:

a. a movement mechanism having a front leg assembly and a rear leg assembly, a front ankle pivotally attached to a distal end of said front leg assembly, a rear ankle pivotally attached to a distal end of said rear leg assembly, and said front and rear leg assemblies pivotally joined at their proximal ends by a knee joint;

b. at least one pair of front leg pneumatic muscles mounted to said front leg assembly and operably attached to said knee joint and to said front ankle;

c. at least one pair of rear leg pneumatic muscles mounted to said rear leg and operably attached to said rear ankle;

d. each of said pneumatic muscles comprising a pneumatic cavity within an elastic tube, said tube having an opening therein for delivering and releasing air from said cavity, said tube defining a cylinder having a circumference and length, and whereby said circumference increases in proportion to an increase in air pressure within said cavity and whereby said length decreases in proportion to said increase in said circumference;

e. said front leg muscles operably connected in a cooperative relationship whereby said front ankle can be pivoted above and below a horizontal plane defined by said front leg assembly and whereby said front leg can be pivoted about said knee joint above and below a horizontal plane defined by said rear leg assembly;

f. said rear leg muscles operably connected in a cooperative relationship whereby said rear ankle can be pivoted above and below a horizontal plane defined by said rear leg assembly; and

g. a front foot attached to said front ankle and a rear foot attached to said rear ankle, said front foot and said rear foot adapted for releasably engaging horizontal and vertical surfaces.

5,551,526

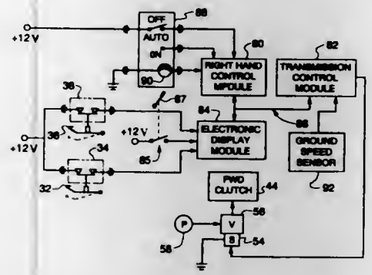
MODULATED FWD CLUTCH FOR TRACTOR BRAKING

Steven C. Young, Lancaster; Thomas L. Stiefvater, and John H. Posselius, Jr., both of Ephrata, all of Pa., assignors to New Holland North America, Inc., New Holland, Pa.

Filed Sep. 23, 1994, Ser. No. 311,618

Int. Cl.[6] B60K *23/08*

U.S. Cl. 180—233 **12 Claims**



1. A method of four-wheel braking a tractor having brakes on the rear wheels only, the tractor having a front wheel drive clutch for drivingly coupling the rear wheels and the front wheels, said method comprising:

sensing the actuation of the brakes on the rear wheels; and,

intermittently engaging and disengaging the front wheel drive clutch while the rear wheels are being braked to couple the front and rear wheels whereby braking of the rear wheels causes intermittent braking of the front wheels.

5,551,527

LIFT DEVICE FOR A THREE POINT HITCH

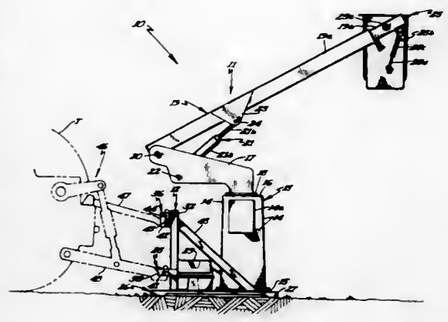
Terry Luscombe, Highway 15 South, Box 108, Armstrong, Iowa 50514

Filed Oct. 3, 1994, Ser. No. 317,188

Int. Cl.[6] B66F *11/04*

U.S. Cl. 182—2 **4 Claims**

1. A lift apparatus adapted to be connected to the three point hitch of a conventional tractor, the tractor having front and rear ends, the three point hitch operatively connected to the rear end of the tractor and including a pair of lower hitch arms and an upper hitch arm, comprising:



a lift device including a base, a lower boom arm connected to the base, a telescoping upper boom arm pivotally connected to the base, a telescoping upper boom arm pivotally connected to the lower boom arm, and an occupant bucket connected to the upper boom arm,

a mounting hitch assembly including a substantially horizontally disposed support frame connected to and supporting the base of the lift device thereon, a hitch frame rigidly connected to the support frame and projecting upwardly therefrom, a plurality of hitch engaging elements including an upper hitch element and a pair of lower hitch elements on said hitch frame for connection respectively, to the upper hitch arm and lower hitch arms respectively of the three point hitch of a tractor.

5,551,528

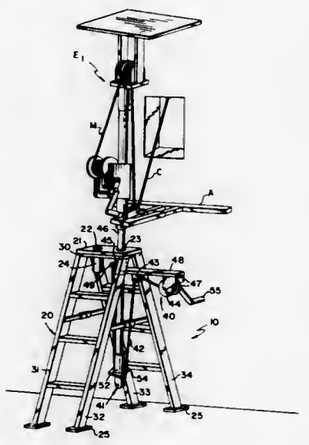
STEPLADDER WITH LIFTING ASSEMBLY

Pedro L. Vieito, 2206 S.W. 60 Ave., Miami, Fla. 33155

Filed Jun. 2, 1995, Ser. No. 458,523

Int. Cl.[6] E06C *7/00*

U.S. Cl. 182—129 **11 Claims**



1. A stepladder for positioning equipment and material and said stepladder having two pairs of legs, each pair having legs that are kept in a parallel spaced apart relation with respect to each other

and a plurality of connecting step members mounted between the legs of each pair, and said legs resting on a supporting surface, comprising:

A) a head step assembly having an underside and a first opening; and

B) lifting means mounted to said head step assembly including first pulley means and cable means trained thereon, said cable means having two ends, one of said ends being rigidly attached to a fixed point connected to said head step assembly, and further including spool means for collecting said cable means from the other end, and further including first shaft means having first and second ends, said shaft being passed through said first opening and said first end being mounted to said first pulley means so that said equipment and material can be removably mounted to said second end of said shaft to be lifted and lowered.

5,551,529

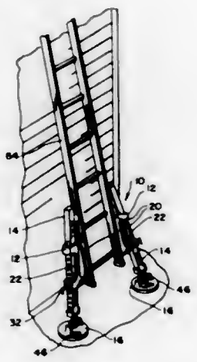
LADDER STABILIZER

Daniel J. Molitor, 8824 Rocky Rd., Galena, Ill. 61036

Filed Nov. 21, 1994, Ser. No. 342,816

Int. Cl.[6] E06C *7/44*

U.S. Cl. 182—204 **2 Claims**



1. A ladder stabilizer for use with a ladder having side rails and a plurality of hollow horizontal rungs therebetween, said ladder stabilizer comprising:

a pair of main frames, each main frame having a vertical portion for attachment to a respective side rail and a diagonal portion, the vertical portion having two holes spaced a distance equal to the distance between the hollow horizontal rungs of the ladder, the diagonal portion having a hole for accommodating a locking means;

two transverse rods, each adapted to extend through one of said plurality of horizontal rungs and having ends removably secured to the vertical portions of the main frames;

a pair of legs, each leg slidably mounted to the diagonal portion of one of the pair of main frames and having a plurality of horizontally extending holes spaced vertically along an outer facing side of the leg;

locking pins mounted on the diagonal portion of each main frame, wherein in the locked position one of the holes in each of the legs is aligned with the hole in the diagonal portion of the main frame and the locking pins extend through the aligned holes, and wherein each locking pin can be disengaged from the holes independent of the other locking pin by pulling one end of the locking pin in a direction away from the aligned holes; and

a pair of feet, one foot secured to each of the legs in a swivel manner by means of a ball joint, each foot comprising a foot plate and a plurality of rubber projections extending downwardly therefrom, said feet supporting the entire weight of and on the ladder wherein when said main frames are operatively connected to said rails movement of the legs along the main frames varies the horizontal distance between the feet.

5,551,530

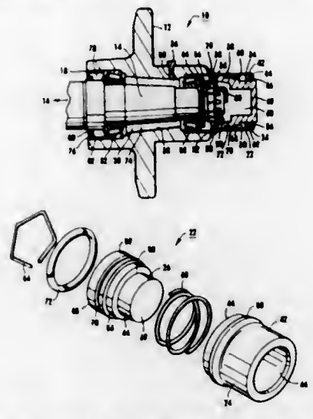
PRESSURE REDUCING CAP FOR A LIQUID LUBRICANT-FILLED WHEEL HUB

Bernhardt P. Goettker, 1031 Gale St., Escondido, Calif. 92027

Filed May 17, 1995, Ser. No. 444,826

Int. Cl.[6] F16N *11/04*

U.S. Cl. 184—45.2 **20 Claims**



1. A cap for retaining a liquid lubricant within a wheel hub, said cap comprising:

a hollow barrel having a forward opening, a rearward opening and a piston engagement surface forward of said rearward opening;

a substantially rigid piston having a closed forward end sealed to fluid flow therethrough and a barrel engagement surface positioned within said barrel and slidably engaging said piston engagement surface;

a substantially continuously forwardly enclosed interior cavity defined by said barrel and said piston, said interior cavity axially extending from said rearward opening to said forward end of said piston and maintaining substantially continuous fluid communication with said forward end, wherein said interior cavity has a variable fluid volume in response to the slidable position of said piston within said barrel;

a non-grease liquid lubricant positioned within said variable fluid volume; and

a substantially continuous seal positioned at said piston and barrel engagement surfaces, thereby preventing flow of said non-grease liquid lubricant between said piston and barrel engagement surfaces throughout slideable engagement of said piston and barrel engagement surfaces.

17. A method for lubricating a bearing of a hub-spindle assembly comprising:

providing a hub-spindle assembly including a spindle, a bearing and a hub, said hub having a forward aperture, a rearward aperture and an axial passageway bordered by an interior surface extending between said forward aperture and said rearward aperture;

receiving said spindle through said rearward aperture into said axial passageway;

positioning said bearing within said axial passageway between said spindle and said interior surface;

providing a cap sealingly engaging said hub, said cap including a substantially rigid piston and a hollow barrel having a forward opening and a rearward opening;

slidably and sealably positioning said piston within said barrel, wherein said piston and barrel define an interior cavity in fluid communication with said axial passageway, said interior cavity and axial passageway forming a continuous lubricant chamber having a fluid volume, and wherein said piston substantially blocks fluid communication between said forward opening and the environment external to said assembly;

placing a liquid lubricant in said fluid volume and substantially sealing said lubricant chamber to the environment; and

slidably displacing said piston within said barrel in response to expansion or contraction of said liquid lubricant, thereby varying said fluid volume.

5,551,531

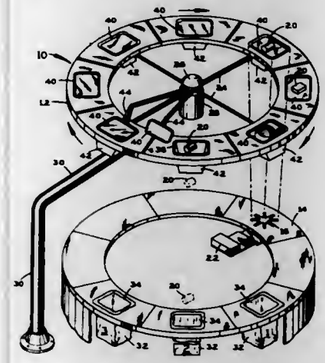
PURCHASE ITEM CHECKOUT STATION AND METHOD

Charles Dumont, Carib Impex Ltd., P.O. 1409 Old Parham Rd., St. John's, Antigua, France

Continuation-in-part of Ser. No. 241,354, May 11, 1994, Pat. No. 5,437,346. This application Oct. 12, 1994, Ser. No. 321,798

Int. Cl.[6] A47F *10/02*

U.S. Cl. 186—61 **7 Claims**



1. An apparatus for pricing and bagging purchase items which are marked with bar codes, comprising:

hub means rotatably mounted on a hub mounting structure,

a transparent and substantially horizontal upper table positioned over item bag holding means and rotatably mounted on said hub means, said upper table having a circular array of purchase item delivery ports opening through said upper table,

a transparent tray removably covering said purchase item delivery ports for receiving and retaining one said purchase item,

motor means for rotating said upper table on said hub means,

scanner means positioned beneath said upper table and directed upward,

a plurality of bags individually designated for specific types of purchase items and positioned below one of said delivery ports for selectively receiving said purchase item,

tray tilting means for tilting said tray to drop said purchase item from said tray through the port beneath said tray into one of said bags,

a microprocessor for controlling the operation of said motor means to rotate said upper table to pass said purchase item over said scanner means to read the price and classification of said purchase item, and then for operating said motor means to rotate said purchase item to a position directly above one of said bags designated for receiving purchase items of the classification of said purchase item, and for operating said tray tilting means to drop said purchase item off said tray and through the port beneath said tray and into said one of said bags, and to replace said tray over said port.

5,551,532

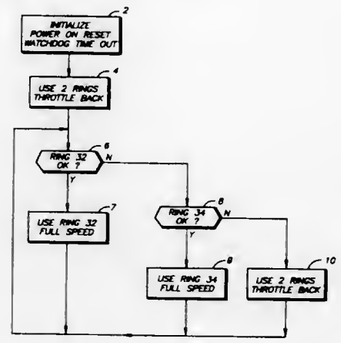
METHOD FOR TRANSMITTING MESSAGES IN AN ELEVATOR COMMUNICATIONS SYSTEM

Bertram F. Kupersmith, Avon, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Feb. 28, 1994, Ser. No. 203,139

Int. Cl.[6] B66B *3/00*

U.S. Cl. 187—391 **5 Claims**



1. A method for transmitting messages in an elevator communications system comprising:

providing a two-way ring communications system including a plurality of elevator controllers, said elevator controllers being peers in that none has exclusive control over the operation of the others, each elevator controller providing two serial asynchronous full duplex I/O channels to communicate with the next and previous elevator controllers, each elevator controller having three remote serial link interfaces including one to elevator fixtures, elevator buttons and elevator tell tale lights, another interface to elevator-related hall fixtures and hall lanterns, and a third interface for group-related hall fixtures, hall buttons and hall lights;

checking operation of a first ring of said two-way elevator ring communications system including transmitting from an originating elevator controller a status message to see if said status message is received by said originating elevator controller after traveling around said ring and providing a first-ring-good signal if the status message is received at the originating controller within a watchdog time after traveling around said first ring and providing a first-ring-bad signal if said status message is not received by said originating elevator controller within said watchdog time after traveling around said first ring;

checking the operation of a second of said two-way elevator communications ring system including transmitting a second status message around the ring to see if said second status message is received by said originating elevator controller afar traveling around said second ring and providing a second-ring-good signal if the second status message is so

received within said watchdog time and a second-ring-bad signal if said second status message is not so received by said originating elevator controller within said watchdog time;

transmitting on said first ring in response to said first-ring-good signal;

transmitting on said second ring in response to said second-ring-good signal;

transmitting messages on both rings in response to said first-ring-bad signal and second-ring-bad signal; and

varying a reassignment time at which assignment of hall calls to elevators is decided, wherein said varying step is provided in response to both said first-ring-bad signal and second-ring-bad signal.

5,551,533

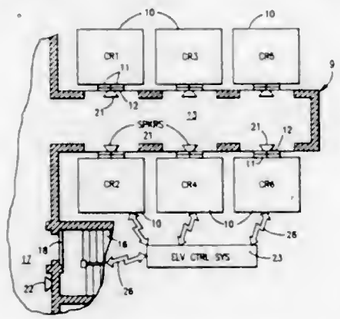
AUDIO DIRECTION AND INFORMATION FOR ELEVATOR PASSENGERS

Bok S. Ng, Singapore, Singapore, assignor to Otis Elevator Company, Farmington, Conn.

Filed Apr. 1, 1994, Ser. No. 222,135

Int. Cl.[6] B66B *1/34;3/00*

U.S. Cl. 187—391 **26 Claims**



1. An elevator system serving a plurality of floors in a building having a stairwell and having a door on each of said floors to provide access from a related floor to said stairwell, comprising:

a plurality of first speaker systems, each of said first speaker systems corresponding to and disposed in proximity with a corresponding one of said doors, each of said first speaker systems including an audio acoustical transducer and signal responsive means for causing said transducer to emit selected audible announcements in dependence on message signals provided thereto; and

a plurality of second speaker systems, each of said second speaker systems disposed on each floor of said building in proximity with an elevator corridor on the related floor; and

a controller for providing a fire signal indicative of the fact that a fire emergency mode of elevator operation is in effect in the building, in which mode the elevators are rendered non-responsive to ordinary passengers, and for providing, in response to said fire signal, a fire message signal to at least one of said first and second speaker systems on each of said floors of the building to cause at least one of said first speaker systems to announce the presence of the stairwell and to cause at least one of said second speaker systems to announce that passengers should not use the elevator and should use the stairwell.

5,551,534

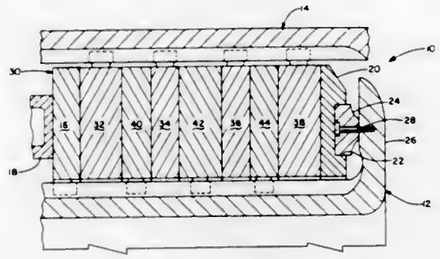
PRESSURE BALANCED BRAKE STACK

Joe E. Smithberger, Canton; Thomas E. Nemcheck, Uniontown; Kamran Z. Moradi, Fairlawn, and John M. Hall, Uniontown, all of Ohio, assignors to Aircraft Braking Systems Corp., Akron, Ohio

Filed Jun. 5, 1995, Ser. No. 461,353

Int. Cl.[6] F16D *55/02*

U.S. Cl. 188—71.5 **15 Claims**



1. A pressure balanced brake disc stack, comprising:

a plurality of rotor discs;

a plurality of stator discs interleaved with said rotor discs;

a pressure plate at a first end of said stack;

an end plate at a second end of said stack; and

wherein a rotor disc at each of said first and second ends is thicker than said stator and rotor discs adjacent thereto such that during braking operations employing said brake disc stack, said rotor disc at each of said first and second ends will deflect less and distribute pressure more uniformly through the stack than if said end rotor discs were as thin as said stator and rotor discs disposed adjacent thereto.

5,551,535

DEVICE FOR ENSURING SAFETY BY PREVENTING MECHANICALLY RAISED AND LOWERED COMPONENTS FROM CRASHING DOWN

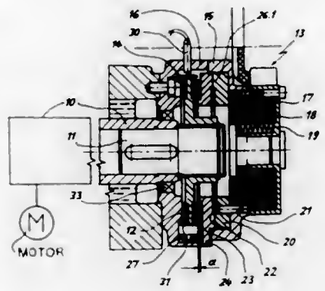
Mirko Krolo, Nagold, and Robert Röcker, Mössingen, both of, Germany, assignors to Flender-Himmelwerk GmbH, Tübingen, Germany

Filed Mar. 3, 1995, Ser. No. 397,903

Claims priority, application Germany, Mar. 5, 1994, 44 07 416.6

Int. Cl.[6] F16D *55/14*

U.S. Cl. 188—72.2 **10 Claims**



1. A safety device for preventing mechanically raised and lowered means and roll-up gates from crashing downward when a motor or transmission fails, comprising: a friction brake having a stationary half and a moving half; housing; said stationary half being secured to a shaft inside said housing; the motor having motor means for driving said mechanically raised and lowered means and roll-up gates through said shaft; said moving half being mounted on a base and being electromagnetically displaceable axially in relation to said base and against said stationary half, a force exerted by said moving half against said stationary half being augmented by a first spring engaging between said housing and said base; supplying said electricity, said moving half comprising two parallel disks rotatable against each other and engageable with said stationary half and held by said base; at least one electromagnet and at least one second spring; a switch for supplying electricity to said electromagnet; said electromagnet having an armature spring-loaded by said second spring, said parallel disks being axially movable toward said stationary half by said spring-loaded armature upon switching off said electromagnet by said switch; said disks having facing surfaces with ramp-shaped elevations sliding against each other upon limited relative rotation of said disks and force said disks axially apart; said first spring pressing thereby apart axially said housing and said base.

5,551,536

PAD SUPPORT FOR DISC BRAKE ASSEMBLY

Nui Wang, Croydon, Australia, assignor to Brake and Clutch Industries Australia Pty. Ltd., Victoria, Australia

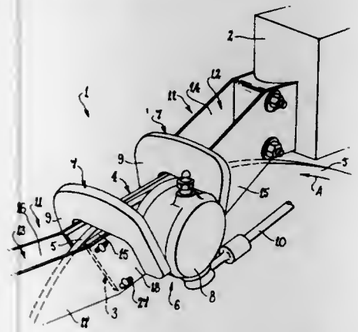
Continuation of Ser. No. 917,144, Oct. 9, 1992, abandoned. This application Jan. 18, 1995, Ser. No. 374,996

Claims priority, application Australia, Dec. 10, 1990, PK3810

Int. Cl.[6] F16D *65/02;65/095*

U.S. Cl. 188—73.31 **20 Claims**

1. A disc brake assembly including a rotatable disc, a brake pad located on each of two opposite sides of the disc, a support located away from said pads in a direction transverse to the rotational axis of the disc, mounting means connecting said pads to said support and having an arm which extends between the pads and the support and holds the pads in an operative position relative to said support, said arm being composed of two parts, each of which is connected to a respective one of said pads, and each said part includes two straps which are arranged in substantially parallel spaced apart relationship, wherein each said arm part is deflectable in the general direction of said rotational axis to thereby permit each said pad to move towards and away from the respective adjacent side of the disc, and each said arm part is substantially resistant to deflection in at least one direction transverse to said rotational axis such that the pads are not caused to be moved out of said operative position by the load imposed on said arm as a consequence of said pads engaging the disc while the disc is rotating.



5,551,537

DISK BRAKE USING A PULLED PAD WITH SLIDING BEARING

Jean Claude Mery, Pavillons-Sous-Bois, and Jean Charles Maligne, Aubervilliers, both of, France, assignors to Allied-Signal Europe Services Techniques, Drancy, France

PCT No. PCT/FR94/00174, § 371 Date Mar. 7, 1994, § 102(e) Date Mar. 7, 1994, PCT Pub. No. WO94/24452, PCT Pub. Date Oct. 27, 1994

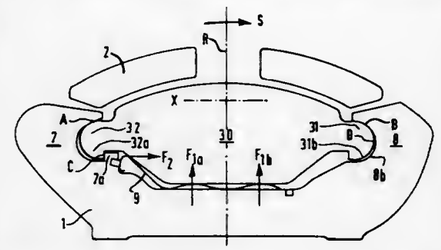
PCT Filed Feb. 17, 1994, Ser. No. 204,248

Claims priority, application France, Apr. 15, 1993, 93 04392

Int. Cl.[6] F16D *55/226*

U.S. Cl. 188—73.39 **7 Claims**

1. A disk brake for a motor vehicle, comprising: a first support fixed with respect to the vehicle, a second support shaped into a caliper and slidably mounted with respect to said first support, first and second pads each of which is held by one of said supports to resist any drive forces developed during a brake application, and a brake motor associated with said second support and capable of being actuated to move said pads into engagement with a rotor to effect said brake application, said movement of said first and second pads being in a direction substantially perpendicular to a plane of rotation of said rotor, each pad having a body with a central friction zone and first and second lateral ends, said first lateral end being offset with respect to said central zone in the direction of rotation of said rotor and at least said second lateral end having a drive profile, said support for each pad having a retaining profile which interacts with said drive profile to retain each pad when said pad is stressed in the direction of rotation of said rotor by said drive forces, and at least said first end of each pad having an external contact surface suitable which abuts against a corresponding internal contact surface of a first bearing surface provided on said support for each pad, characterized in that one of said external and internal contact surfaces has a concave shape and the other of said external and internal contact surfaces has a convex shape, said convex contact surface having a rounded profile and said concave contact surface points in a direction which is substantially perpendicular to a radius of said rotor and passes through said central zone of each said pad, said concave contact surface having at least two tangents which are oblique with respect to the direction in which said concave surface points to form a non-zero angle therebetween, said concave and convex contact surfaces in the absence of said drive forces being separated by a radial clearance and a tangential clearance, said body of each said pad being stressed with respect to said support by an elastic force, said elastic force having at least a first component pointing along the radius of said rotor which passes through the central zone of said pad and a second component perpendicular to the radius of said rotor which passes through said central zone of said pad and pointing in the direction of rotation of said rotor such that said contact surfaces engage each other with a non-zero bearing force in the absence of actuation of said brake motor both by mutual contact of said contact surfaces and by mutual contact of said retaining and drive profiles to balance said drive force developed therebetween during a brake application.



5,551,538

TRAILER BRAKE SYSTEM WITH RELEASE APPARATUS

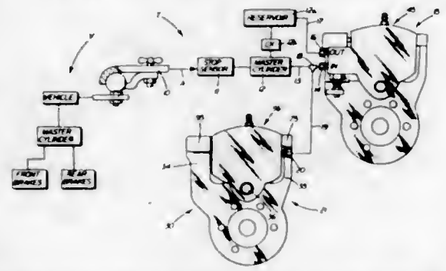
Robert L. Null, 2868 State Route 378, Willow Wood, Ohio 45696

Continuation of Ser. No. 195,941, Feb. 10, 1994, Pat. No. 5,411,120, which is a continuation of Ser. No. 856,544, Mar. 24, 1992, Pat. No. 5,316,110. This application May 1, 1995, Ser. No. 432,440

Int. Cl.[6] B60T *7/20*

U.S. Cl. 188—112 R **10 Claims**

1. A braking system including a disc brake assembly for a trailer



or other towed vehicle to provide release of the brake pads from firm braking engagement with the rotor upon backing comprising:

a stationary bracket for attachment to the vehicle for supporting the disc brake assembly;

power means for moving the pads into and out of engagement with the rotor in response to forward braking and non-braking modes of vehicle operation, respectively;

a caliper unit including a housing for mounting said pads for relative movement toward and away from said rotor and into and out of engagement therewith;

said power means including moving means in said housing in operative engagement with at least one of said pads to provide said relative movement;

a single pivot pin for mounting said caliper unit for pivoting movement in response to rotor movement upon backing;

means to release the firm braking engagement of the brake pads with the rotor in response to said pivoting movement, whereby said braking system is effective to provide efficient braking during forward movement and automatic release upon backing.

5,551,539

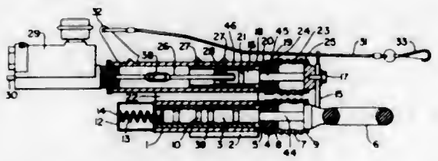
TRAILER SURGE BRAKE ACTUATOR

Brian E. Frymiare, North East, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 16, 1995, Ser. No. 441,558

Int. Cl.[6] B60T *7/20*

U.S. Cl. 188—112 R **6 Claims**



1. A trailer surge brake actuator, comprising:

a rigid, circular, cylindrical first tubular body;

means for attaching said first tubular body to a trailer frame;

a rigid, circular, cylindrical first slider which reciprocates into said first tubular body;

low friction bearing means in contact with the surface of said first slider and an inside surface of said first tubular body;

means for attaching said first slider to a towing vehicle;

a rigid, circular, cylindrical second slider outside said first tubular body;

a rigid member connecting said first slider to said second slider;

a rigid, circular, cylindrical second tubular body into which said second slider reciprocates;

means for connecting said first tubular body to said second tubular body;

a master brake cylinder assembly connected to one end of said second tubular body; and

a push rod extending longitudinally within said second tubular body with one end of said push rod abutting a piston of said master brake cylinder assembly.

5,551,540

VIBRATION DAMPER AND A VIBRATION DAMPER WITH A VALVE ACTUATION DEVICE

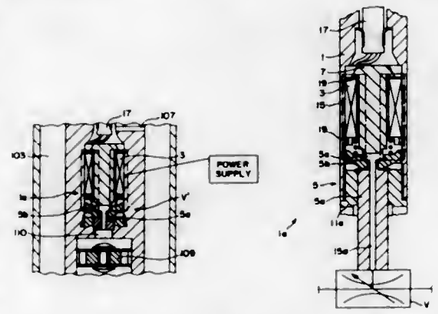
Andreas Förster, and Alfred Wirth, both of Schweinfurt, Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Jan. 12, 1995, Ser. No. 371,887

Claims priority, application Germany, Jan. 15, 1994, 44 01 065.6

Int. Cl.[6] F16F *9/46;9/34*

U.S. Cl. 188—299 **15 Claims**



1. A vibration damper for damping vibrations of a suspension of a motor vehicle, said vibration damper comprising:

a cylinder defining a chamber therein, said cylinder containing a damping fluid;

a piston rod sealingly projecting into said cylinder and being axially displaceable within said cylinder;

said piston rod having a longitudinal axis and defining a longitudinal direction parallel to the longitudinal axis;

a piston being attached to said piston rod, said piston being slidably disposed within said cylinder to sealingly divide said chamber into first and second chambers;

means for permitting fluid communication between said first chamber and said second chamber;

a first end and a second end;

said cylinder being disposed between said first end and said second end;

said first end comprising first means for connecting said vibration damper to a body of a motor vehicle;

said second end comprising second means for connecting said vibration damper to a suspension of a motor vehicle;

valve means for regulating flow of damping fluid through said means for permitting fluid communication;

valve actuation means for opening and closing said valve means;

said valve actuation means comprising:

an armature, said armature being axially movable between a first position for opening said valve means to permit damping fluid to flow therethrough, and a second position for closing said valve means to prevent damping fluid from flowing therethrough;

coil means for generating a magnetic flux immediately adjacent said coil means, to move said armature;

a magnetic flux path comprising means for leading a substantial portion of a magnetic flux generated by said coil means;

said piston rod comprising a housing disposed adjacent said coil means, at least a substantial portion of said housing comprising a substantial portion of said magnetic flux path;

said valve actuation means further comprising means for guiding said armature during movement of said armature between said first position and said second position, a substantial portion of said guiding means being disposed outside of said magnetic flux path.

5,551,541

SHOCK ABSORBER

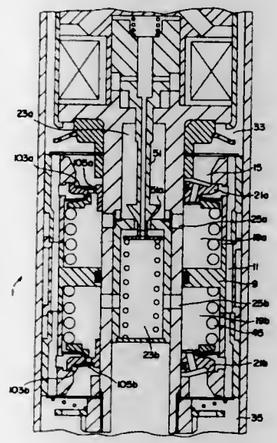
Andreas Förster, Schweinfurt, Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Mar. 17, 1994, Ser. No. 214,615

Claims priority, application Germany, Mar. 18, 1993, 43 08 603.9; Feb. 26, 1994, 44 06 373.3; Mar. 3, 1994, 44 06 918.9

Int. Cl.[6] F16F *9/46*

U.S. Cl. 188—317 **18 Claims**



1. A shock absorber comprising:

a cylinder defining a chamber therein, said cylinder containing a damping fluid;

a piston rod sealingly projecting into said cylinder and being axially displaceable with respect to said cylinder;

a piston being attached to said piston rod, said piston being slidably disposed within said cylinder to sealingly divide said cylinder into first and second chambers;

means for permitting fluid communication between said first and second chambers;

said means for permitting fluid communication being disposed in at least a portion of said piston, said means for permitting fluid communication comprising:

a first spring-loaded main stage valve body;

a second spring-loaded main stage valve body;

a control chamber being defined between said first main stage valve body and said second main stage valve body;

first inlet means for directing fluid from said first chamber to said control chamber through said first main stage valve body upon axial displacement of said piston in a first direction;

second inlet means for directing fluid from said second chamber to said control chamber through said second main stage valve body upon axial displacement of said piston in a second direction, the second direction being opposite the first direction;

means for permitting axial displacement of said first main stage valve body towards said second main stage valve body during flow of damping fluid through said first inlet means; and

means for permitting axial displacement of said second main stage valve body towards said first main stage valve body during flow of damping fluid through said second inlet means;

said first chamber is a piston-side chamber;

said second chamber is a non piston-side chamber;

said means for permitting fluid communication between said first and second chambers further comprising:

means for dividing the damping medium into a main flow and a bypass flow;

a damping valve device, said damping valve device comprising:

a damping valve body and first and second main stage valves;

said first main stage valve comprising said first main stage valve body;

said second main stage valve comprising said second main stage valve body; and

a pilot stage valve configured for activating said first and second main stage valves;

outlet means for directing damping fluid between said control chamber and said first and second chambers; and

actuator means for adjustably controlling the flow of damping fluid through said outlet means.

5,551,542

PROCESS AND APPARATUS FOR IDENTIFYING COINS

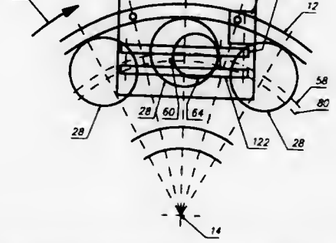
Rudolf Stockli, Gallusstrasse 36, 4600 Olten, Switzerland

Filed Dec. 13, 1994, Ser. No. 357,253

Claims priority, application Switzerland, Dec. 13, 1993, 03 703/93

Int. Cl.[6] G07D *5/02;3/12*

U.S. Cl. 194—334 **34 Claims**



17. An apparatus for identifying coins, the apparatus comprising:

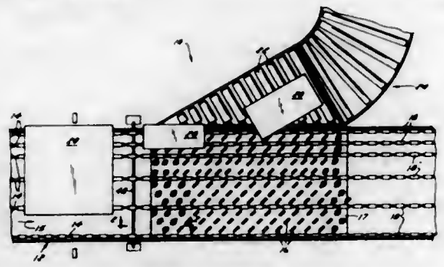
a separating device including a continuously rotatable disc provided with receiving compartments for individual coins;

a sensing device for measuring a property of the coins, the sensing device being arranged in a region of a path defined by the receiving compartments upon a rotation of the disc;

a computing device for determining a size and/or identity of respective coins from signals from the sensing device as a result of a presence of a coin in an associated receiving compartment; and

a positioning device comprising means for moving the coins rotating with the separating device within the receiving compartments by applying accelerating or decelerating forces to the coins so as to move the coins, at least in a region of the sensing device, into abutment against a leading or trailing border of the associated receiving compartment.

5,551,543
SORTER
James F. Mattingly, Louisville, and Ellsworth H. Collins, Mt. Washington, both of Ky., assignors to Interlake Companies, Inc., Shepherdsville, Ky.
Filed Mar. 27, 1995, Ser. No. 410,728
Int. Cl.[6] B65G *47/46*
U.S. Cl. 198—370.09 **9 Claims**

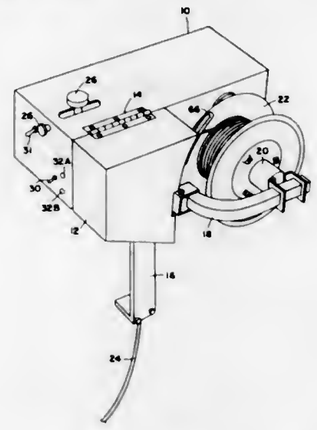


1. A conveyor for use in the sortation of articles, comprising:
a conveyor frame defining a first path over which articles may be conveyed;
a plurality of chain-driven pushers for pushing articles along said first path;
a plurality of diverting idler wheels which can be directed at an angle to said path; and
a steering mechanism for steering said diverting idler wheels from a first position, directing the articles along said first path, to a second position, directing the articles at an angle to said first path; such that, when said pushers push articles along said first path, and said articles contact said diverting idler wheels directed at an angle to said path, said diverting idler wheels direct said articles off of said first path.

5,551,544
CIGARETTE FILTER ASSEMBLY MACHINE
Fiorenzo Draghetti, Medicina, Italy, assignor to G.D Societá per Azioni, Bologna, Italy
Filed Jan. 19, 1995, Ser. No. 375,345
Claims priority, application Italy, Jan. 20, 1994, BO94A0013
Int. Cl.[6] B65G *47/24*
U.S. Cl. 198—404 **6 Claims**

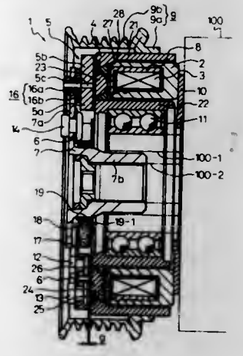
1. A cigarette filter assembly machine (1) comprising first conveyor means (20) for supplying a first (11) and second (12) succession of side by side, oppositely oriented cigarettes (13); turnover means (14) for receiving said first (11) and second (12) successions, turning over the cigarettes (13a) in the first succession (11) so that they face the same way as the cigarettes (13b) in the second succession (12), and so forming two successions (12, 26) of equioriented, transversely spaced cigarettes; output combining means (36) for combining said two successions (12, 26) into a single final succession (37) of equioriented cigarettes (13); and second conveyor means (35) for transferring said two successions (12, 26) from the turnover means (14) to the combining means (36); characterized in that said second conveyor means (35) comprise two distinct conveyor lines (33, 34), each relative to a respective said succession (12; 26); the two conveyor lines (33, 34) extending along two distinct paths (P1, P2) spatially offset both in a first direction (B) crosswise to the paths (P1, P2), and in a second direction (C) crosswise to the first direction (B); and a first (34) of said lines (33, 34) comprising a portion (50) extending obliquely in relation to said two directions (B, C).

5,551,545
AUTOMATIC DEPLOYMENT AND RETRIEVAL TETHERING SYSTEM
Stanley Gelfman, 1 Douglas La., Larchmont, N.Y. 10538
Filed Mar. 18, 1994, Ser. No. 210,514
Int. Cl.[6] H02G *11/02;* **G01L** *1/22*
U.S. Cl. 191—12.2 A **84 Claims**



1. Apparatus adapted to be mounted on a mobile vehicle for deploying and retrieving cable from the vehicle into the environment external to the vehicle comprising:
a frame for mounting to the vehicle;
receiving means on the frame adapted to receive a cable storage reel having cable wound thereon for rotatable motion, the cable having a first end near the center of the reel, a wound portion of cable on the reel and an unwound portion of cable that extends from the reel;
coupling means for coupling the first end of the cable to the vehicle;
feeding means for feeding the cable on and off the cable storage reel;
guiding means including a cable exit area for guiding the unwound cable from the vehicle into the environment in any direction defined by a 360° arc around the cable exit area;
sensing means for sensing the tension in the unwound cable in any direction defined by the 360° arc around the cable exit area; and
controlling means coupled to the sensing means receiving a signal from the sensing means related to the tension in the unwound cable for bi-directionally controlling said feeding means so as to maintain a preset tension in the unwound cable.

5,551,546
ELECTROMAGNETIC CLUTCH
Masashi Tabayama, Obu; Yasuo Tabuchi, Anjo, and Junichi Obguchi, Toyoake, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Aug. 19, 1994, Ser. No. 293,248
Claims priority, application Japan, Aug. 31, 1993, 5-047306 U; Jun. 15, 1994, 6-132796
Int. Cl.[6] F16D *27/112*
U.S. Cl. 192—84.96 **3 Claims**

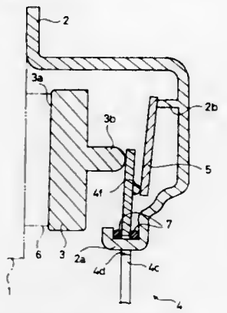


1. A four-pole electromagnetic clutch comprising:
a stationary electromagnetic coil of substantially tubular shape generating an electromagnetic force when electrically energized;
a rotor disposed about a rotational axis having an outer ring portion and an inner ring portion, the outer ring portion being concentrically disposed and radially spaced from the inner ring portion, the rotor also having a friction wall disposed substantially perpendicular to the rotational axis between the outer ring portion and the inner ring portion thereby defining an annular space between the outer ring portion, the inner ring portion and the friction wall, the coil being disposed within the annular space such that the rotor is rotatable relative to the coil;
a pulley disposed on an outer periphery of the outer ring portion, the pulley being constructed and arranged to be integrally rotated with the rotor; and
an armature made of a magnetic material having an inner portion and an outer portion, the outer portion being concentrically disposed and radially spaced from the inner portion such that an annular gap is defined between the inner portion and the outer portion, the armature also having a friction face laterally spaced from the friction wall, the friction face of the armature being biased away from the friction wall of the rotor when the coil is not energized and the friction face of the armature engaging the friction wall when the coil is energized so that a rotation of the rotor is transmitted to the armature,
the outer ring of the rotor having a constant outer diameter,
the outer ring of the rotor having a thick portion disposed on an inner surface of the outer ring adjacent to the friction wall, a thickness of the thick portion being gradually and smoothly increased toward the friction face,
wherein an axial length x of the thick portion satisfies, with respect to an axial length L of the outer ring, the following equation

$$\frac{L}{10} \geq x \geq \frac{L}{3}\text{, and}$$

wherein the outer ring of the rotor, the inner ring of the rotor, the outer portion of the armature, the inner portion of the armature and the friction wall are constructed and arranged such that when the coil is energized a magnetic flux path is created between the outer ring of the rotor, the outer portion of the armature, the friction wall, the inner portion of the armature, and the inner ring of the rotor.

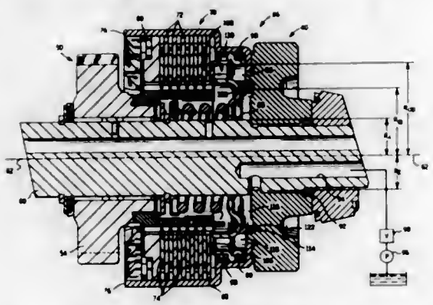
5,551,547
CLUTCH COVER ASSEMBLY
Hiroshi Mizukami; Hiroshi Uehara, and Shinichi Okada, all of Neyagawa, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan
Division of Ser. No. 103,455, Aug. 6, 1993, Pat. No. 5,400,887. This application Dec. 19, 1994, Ser. No. 359,078
Claims priority, application Japan, Aug. 7, 1992, 4-55619
Int. Cl.[6] F16D *13/71*
U.S. Cl. 192—89.23 **3 Claims**



1. A clutch cover assembly, comprising:
a clutch cover rotationally coupled to a flywheel;
a pressure plate disposed between said clutch cover and said flywheel, said pressure plate having an annular friction surface adapted to apply an axial force to clamp at least one facing to said flywheel, said pressure plate having an element protruding from a side opposite said friction surface;
an elastic member positioned is said clutch cover to apply a first engaging load to said pressure plate; and
a clutch release lever supported by said clutch cover and positioned to apply a second engaging load to said pressure plate, said release lever being a low-rigidity member applying said second engaging load on said protruding element of said pressure plate; and
wherein said elastic member is a washer-type spring that one edge of said washer-type spring is supported by said clutch cover and a second edge of said washer-type spring opposite said one edge applies said first engaging load on said release lever at a point out of alignment with said protruding element of said pressure plate.

5,551,548
CLUTCH ASSEMBLY FOR AN OFF-HIGHWAY TRANSMISSION
Vladimir D. Shubinsky, Northbrook, Ill., assignor to Case Corporation, Racine, Wis.
Filed Jun. 21, 1995, Ser. No. 493,007
Int. Cl.[6] F16D *25/061*
U.S. Cl. 192—106 F **32 Claims**

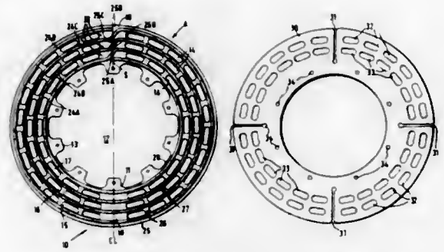
1. A transmission assembly for off-highway equipment, comprising:
first and second gear meshes for establishing different drive gear ratio combinations for the transmission, each gear mesh including a series of constant intermeshing gears, and wherein said first gear mesh includes a drive component mounted for conjoint rotation with a rotating shaft defining an elongated axis, and wherein said second gear mesh includes a driven component mounted for rotation about said axis and relative to said shaft; and



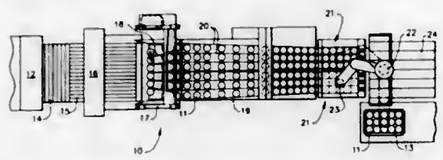
a fluid actuated clutch assembly interposed between the drive and driven components of said first and second gear meshes for selectively establishing a drive connection between said drive and driven components of the first and second gear meshes respectively, said clutch assembly comprising an actuator assembly arranged in operable combination with a clutch pack of interleaved friction members for transferring rotary power from said drive component to said driven component in response to said actuator assembly applying a compressive force upon said clutch pack, said actuator assembly including a piston fluid tightly sealed relative to said shaft for axial movement from a released position toward the friction members, a clutch housing rotatable with said drive component and that is arranged in a fluid tight slidable sealed relationship with said piston to define an expandable fluid receiving pocket, a fluid passage defined by said shaft and opening from an exterior of said shaft to direct pressurized fluid to said pocket thereby moving said piston away from its released position and toward said clutch pack thereby conditioning said clutch assembly to releasably couple the drive and driven components to each other, and an annular ring for effectively dividing said pocket into inner and outer chambers disposed different radial distances from said axis, with said fluid passage opening to the inner chamber and with the piston having a valve arranged in operable association with the outer chamber of said pocket for exhausting residual fluid therefrom, and wherein opposite edges of said ring seal against said piston and the drive component as long as said piston remains in said released position thereby minimizing centrifugal head force applied to the piston as a result of rotation of the drive component after said clutch assembly is conditioned to uncouple the driven component from the drive component and for inhibiting fluid from draining from the fluid passage through the check valve thereby diminishing variability in the time required to fill the pocket with pressurized fluid.

5,551,549
FRICTION FACING AND CARRIER ASSEMBLY
Richard D. M. Cooke, Warwick, and Benjamin C. Struve, Leamington Spa, both of, Great Britain, assignors to Automotive Products, plc, Leamington Spa, England
PCT No. PCT/GB94/00363, § 371 Date Oct. 11, 1994, § 102(e) Date Oct. 11, 1994, PCT Pub. No. WO94/19616, PCT Pub. Date Sep. 1, 1994
PCT Filed Feb. 23, 1994, Ser. No. 318,683
Claims priority, application United Kingdom, Feb. 27, 1993, 9304004
Int. Cl.[6] F16D *13/64*
U.S. Cl. 192—107 R **14 Claims**

1. A friction material facing and carrier assembly (**10**) for a clutch driven plate, which comprises at least a first annular friction facing (**20A**) secured to a first side of a carrier plate (**11**) by stripes (**24A**, **24B**, **24C**, **24D**) of adhesive elastomeric material which are coaxial with the facing, characterised in that the carrier plate has a plurality of perforations (**14**) therein arranged in different diameter circular rows (**15**, **16**, **17**) with circumferentially extending lands on both radially inner and outer sides thereof, and the stripes of adhesive are located on each circular lands (**25**, **26**, **27**, **28**) radially inside and outside each row of perforations.



5,551,550
ARTICLE ACCUMULATOR FOR USE WITH A ROBOTIC HAND
Robert H. Marshall, Crestwood, and Gary L. Wallace, Jeffersontown, both of Ky., assignors to Planet Products Corporation, Cincinnati, Ohio
Filed Aug. 18, 1994, Ser. No. 292,527
Int. Cl.[6] B65G *47/29*
U.S. Cl. 198—432 **20 Claims**



1. An accumulator for receiving and holding generally flattened articles in a precise position for pick-up by a robotic hand, said accumulator comprising:

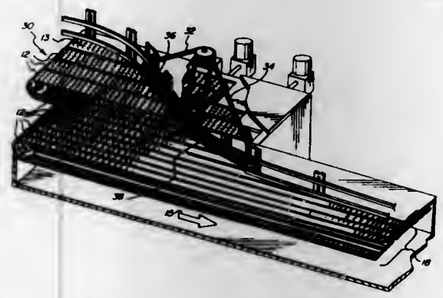
(a) an open frame for operably positioning to an input conveyor of an article packaging line;

(b) an endless open conveyor mounted on the open frame to receive rows of generally flattened articles from the input conveyor of the article packaging line and move the articles to the robotic hand;

(c) a repositioning system mounted on the open frame in operable association with the generally flattened articles on the endless open conveyor, said repositioning system having (i) an actuator, and (ii) a set of plate members for each row of articles operably connected to said actuator, wherein each plate member has at least three vertically extending fingers of sufficient length to extend through the endless open conveyor at preset intervals such that programmed activation of the actuator causes the vertically extending fingers of the plate members to raise upwardly to encompass a set of the articles and reposition them on the endless open conveyor in precise spots; and

(d) a lifting system mounted on the open frame in operable association with the generally flattened articles on the endless open conveyor, said lifting system having (i) an actuator, and (ii) a set of lift rails operably connected to said actuator and capable of engaging the articles and lifting them above the endless open conveyor such that programmed activation of the actuator causes the lift rails to move from a position below the endless open conveyor upwardly through said endless open conveyor to engage the articles and lift them above said endless open conveyor for a time sufficient for the robotic hand to pick said articles from the lift rails.

5,551,551
ARTICLE COMBINER WITH MULTIPLE CONVEYING SURFACES AND MOVING GUIDES
William C. Crawford, Lynchburg, Va., assignor to Simplimatic Engineering Company, Lynchburg, Va.
Filed Jul. 25, 1995, Ser. No. 506,689
Int. Cl.[6] B65G *47/12*
U.S. Cl. 198—453 **15 Claims**



1. A conveyor for combining articles from a mass to a single file comprising:

a first conveying surface circulating at a first speed;

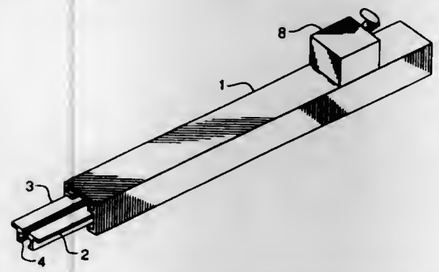
a second conveying surface circulating at a second speed greater than the first speed, said second conveying surface mounted adjacent said first conveying surface;

a first guide traversing said first and second conveying surfaces at a first angle to deflect articles from said first conveying surface toward said second conveying surface;

a second guide traversing said third conveying surface at a second angle; and

a motor for moving said first at a first guide speed selected to minimize rotation of articles along said first guide extending at said first angle.

5,551,552
MODULAR SHUTTLE CONVEYOR
Herman Ophardt, Lindenau 27 D-47661, Issum, Germany, and Heiner Ophardt, 3931 Vineyard Cres., Vineland, Canada
Filed Dec. 21, 1994, Ser. No. 360,929
Int. Cl.[6] B65G *25/00*
U.S. Cl. 198—465.1 **15 Claims**



1. A conveyor for conveying items along a longitudinal track, said conveyor comprising:

at least one shuttle means engaged on said track for longitudinal movement therealong,

each shuttle means including longitudinal tooth rack means with engagement means,

drive means along the track for engaging and propelling each shuttle means,

the drive means comprising pinion gear means complementary to the rack means for synchronized movement of the pinion gear means and the rack means by engagement between the engagement means of the rack means and teeth means of the pinion gear means when the engagement means of the rack means is disposed along a desired path relative the pinion gear and located on the path in phase with the teeth means,

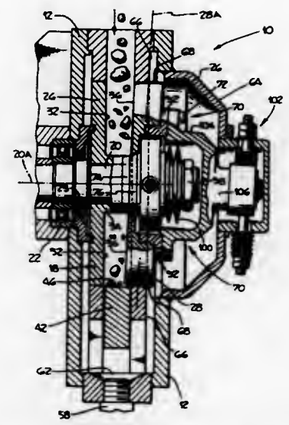
the rack means having a flexible end portion at at least one end of the rack means capable of being deflected from a normal position to a deflected position in which the engagement means are displaced from the path away from the pinion gear when engaged by teeth of the pinion gear means to assist in preventing jamming of the rack means and the pinion gear means when the teeth of the pinion gear means and the engagement means are not in phase along the path,

the flexible end portion resiliently deflectable from the normal position to the deflected position and being biased to the normal position,

one said flexible end potion provided as a forwardmost portion on a forward end of the rack means, and

cantilevered spring means coupled to the shuttle means rearward of the forwardmost portion and extending forwardly towards the forward end to resiliently support the forwardmost portion in the normal position and biasing it to the normal position.

5,551,553
ANGLED DISK DRIVE APPARATUS FOR TRANSPORTING AND METERING PARTICULATE MATERIAL
Andrew G. Hay, Santa Monica, Calif., assignor to Stamet, Inc., Gardena, Calif.
Continuation of Ser. No. 929,880, Aug. 11, 1992, abandoned. This application Jul. 6, 1993, Ser. No. 88,620
Int. Cl.[6] B65G *29/00*
U.S. Cl. 198—624 **31 Claims**



1. A system for transporting particulate material comprising:

a housing having a wall defining an inlet and a wall defining an outlet spaced downstream from the inlet;

a duct enclosed in the housing between said inlet and outlet, said duct being formed between first and second substantially opposed friction drive walls movable relative to said housing from said inlet towards said outlet and at least one arcuate wall extending between said inlet and said outlet, said friction drive walls having a greater surface area for contacting a plurality of particulates than said at least one arcuate wall;

means for rotating the friction drive walls relative to an axis;

means for positioning the second friction drive wall in the housing for rotation in a plane at an angle relative to the axis such that particulates introduced into said duct at said inlet are compacted downstream of said inlet between said inlet and

said outlet sufficiently to form a bridge of particulates spanning the width of said duct; and

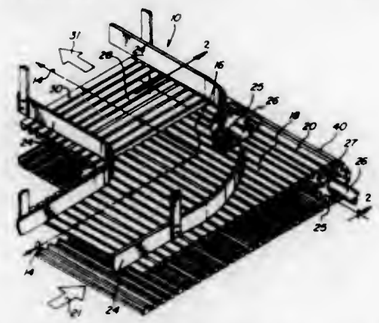
a plurality of particulates having properties such that, upon compaction within said duct, said particulates form a bridge which spans the width of said duct, said bridge of particulates engaging said friction drive walls such that the friction forces created by rotation of said friction drive walls transports said particulates within said duct toward said outlet.

5,551,554

CONVEYOR WITH DISCONTINUOUS TURN

Quentin L. Wilson, Big Island, and George H. Dawson, III, Madison Heights, both of Va., assignors to Simplimatic Engineering Company, Lynchburg, Va.

Filed Apr. 11, 1995, Ser. No. 419,830
Int. Cl.[6] B65G *47/74*
U.S. Cl. 198—636 **10 Claims**



1. A conveyor for transferring articles along a conveying path through a discontinuous turn comprising:

a first conveying surface for moving articles across a first conveying plane between a first position and a discontinuity in the conveying path;

a second conveying surface adjacent said first conveying surface for moving articles across a second conveying plane between the discontinuity and a second position;

means for diverting said second conveying surface below the first conveying plane in a region adjacent the discontinuity; and

an edge of said first conveying surface extending toward and over said second conveying surface in the region adjacent the discontinuity to minimize a gap between said first and second conveying surfaces for transferring articles between said first and second conveyor surfaces across the discontinuity.

5,551,555

GUIDE SYSTEM FOR PACKAGES ON A CONVEYOR SYSTEM

Michael J. Gladieux, and Daniel A. Pollock, both of Perrysburg, Ohio, assignors to Roe, Incorporated, Perrysburg, Ohio

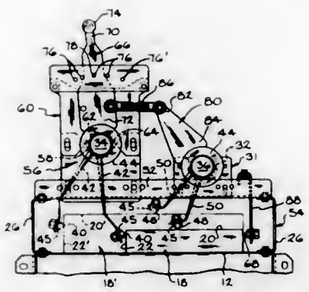
Filed Oct. 30, 1995, Ser. No. 550,338
Int. Cl.[6] B65G *21/20*
U.S. Cl. 198—836.3 **20 Claims**

1. A guide system for packages on a conveyor system, said guide system comprising:

generally linear first and second guide members for aligning said packages as they move along the conveyor system, and

generally linear first and second control members connected to and lying generally parallel to said first and second guide members, respectively,

wherein each of said control members can be rotated around its longitudinal axis to move its associated guide member in a generally arcuate path, in order to adjust said guide members to accommodate different sizes of packages.

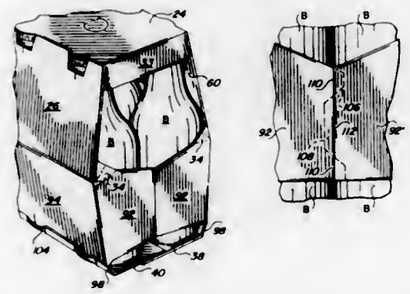


5,551,556

WRAP-AROUND CARRIER WITH BAR CODE BLOCKING END PANELS

Robert L. Sutherland, Kennesaw, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.

Filed Jun. 14, 1995, Ser. No. 490,480
Int. Cl.[6] B65D *75/00*
U.S. Cl. 206—147 **4 Claims**



1. A package comprised of a wrap-around carrier containing a plurality of rows of adjacent articles, comprising:

opposite side panels connected to top and bottom panels, the bottom panel being comprised of a first bottom panel flap connected to a second bottom panel flap, the top panel, each bottom panel flap and each side panel having opposite end edges;

an upper end panel flap connected to each of the end edges of the top panel, the upper end panel flaps having opposite ends;

a lower end panel flap connected to each of the end edges of the side panels;

each opposite end of each upper end panel flap being connected by a fold line to an upper gusset panel;

a locking flap between each upper gusset panel and each associated lower end panel flap, the locking flap being foldably connected to the associated upper gusset panel and to the associated lower end panel flap;

at least a portion of each locking flap extending between, and being in contact with, the adjacent end article and the associated side panel; and

at least a portion of each upper gusset panel extending between the adjacent end article and the associated locking flap;

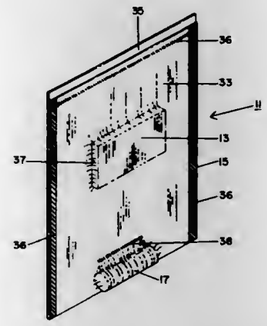
the lower end panel flaps at each end of the carrier having end portions which mechanically interlock with each other.

5,551,557

EFFICIENT METHOD AND APPARATUS FOR ESTABLISHING SHELF-LIFE OF GETTERS UTILIZED WITHIN SEALED ENCLOSURES

Ray G. Brooks, Irving, Tex., and Charles J. Corris, Elkmont, Ala., assignors to Convey, Inc., Irving, Tex.

Filed Oct. 25, 1994, Ser. No. 328,368
Int. Cl.[6] B65D *81/24;81/26*
U.S. Cl. 206—205 **11 Claims**



1. A method for establishing a shelf life of a getter, said getter being used to absorb a gas, comprising the steps of:

a) providing said getter in a container that is impervious to said gas;

b) positioning said container within an interior of a sealable enclosure;

c) sealing said enclosure; and

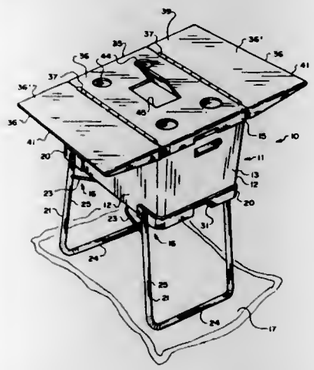
d) rupturing said container in said sealed enclosure to expose said getter to any of said gas within said enclosure, wherein a start time of said getter can be determined.

5,551,558

COMBINED PORTABLE CONTAINER AND COLLAPSIBLE TABLE

H. Lee Bureau, 3 Park Ave., Waterville, Me. 04901

Continuation-in-part of Ser. No. 26,782, Jul. 1, 1994. This application Oct. 20, 1994, Ser. No. 327,091
Int. Cl.[6] B65D *43/00*
U.S. Cl. 206—223 **30 Claims**



1. In a portable container having a bottom portion and side portions defining a receptacle of a predetermined maximum width and height, the improvement of means for connection to the receptacle for acting as support legs and a carrying handle comprising first and second leg means for attachment to opposite edges of the receptacle, each of said first and second leg means comprising:

(A) base means for attachment to the bottom of the receptacle,

(B) a U-shaped leg member having first and second leg portions extending from an interconnecting base to free ends thereof at a distance than is greater than the maximum height of the receptacle, said base spacing said first and second leg portions by a distance greater than the maximum width of the receptacle,

(C) means for connecting each free end of a leg portion to said base means at spaced, coaxial pivot points whereby said U-shaped leg member can pivot between first and second positions, and

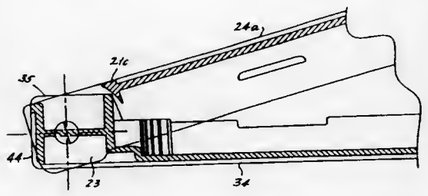
(D) means interacting with said base and said first and second leg portions for locking said leg in the second position with said U-shaped leg member depending from the bottom portion whereby said U-shaped shaped leg members when locked in the second position support said receptacle thereover and when in the first position extend above said receptacle to define a carrying handle.

5,551,559

MEDIA DISK STORAGE CONTAINER WITH PRINTED PAPERBOARD SHEETS

Richard Roth; Paul D. Miller, and William L. Plumb, all of New York, N.Y., assignors to Queens Group Inc., Long Island City, N.Y.

Continuation of Ser. No. 304,927, Sep. 13, 1994, which is a continuation of Ser. No. 192,829, Feb. 7, 1994, Pat. No. 5,377,827, which is a continuation-in-part of Ser. No. 904,342, Jun. 22, 1992, Pat. No. 5,284,242. This application Jan. 18, 1995, Ser. No. 374,026
Int. Cl.[6] B65D *85/57*
U.S. Cl. 206—308.1 **20 Claims**



1. A media disk storage container, comprising:

a lid comprising a first panel having an inner surface and an outer surface, and a first sidewall extending at least partially around the periphery of the first panel, the outer surface of the first panel being recessed with respect to a peripheral edge of the first sidewall;

a base comprising a second panel having an inner and an outer surface, and a second sidewall extending at least partially around the periphery of the second panel, the outer surface of the second panel being recessed with respect to a peripheral edge of the second sidewall;

means for hingedly connecting the lid and the base together;

at least one sheet of material adhered to the lid; and

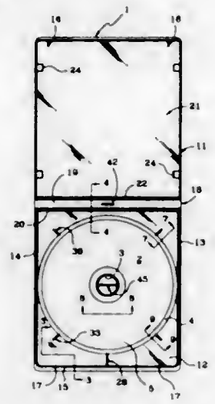
at least one sheet of material adhered to the base.

5,551,560

CONTAINER FOR COMPACT DISC AND JEWEL BOX

James T. Weisburn, Massillon, and Bruce C. Straslicka, Medina, both of Ohio, assignors to Alpha Enterprises, Inc., North Canton, Ohio

Filed Jun. 30, 1994, Ser. No. 268,317
Int. Cl.[6] B65D 85/30;85/57
U.S. Cl. 206—310 12 Claims



1. A storage container for a disc which contains recorded information on at least one surface thereof, and a peripheral edge, said container including:

a housing having a base and a closure lid forming a storage compartment therebetween;

hinge means for movably mounting the lid on the base for movement between open and closed positions;

rib means formed on the housing and extending into the storage compartment for supporting a first portion of the peripheral edge of a disc to be stored therein;

post means formed on the housing, said post means includes a post formed with an undercut for trapping a second portion of the peripheral edge of the disc under the undercut; and

tab means formed on the hinge means for engaging a third portion of the peripheral edge of the disc when the lid is in the closed position on the base, and in combination with the post means and rib means, secure the disc in the storage compartment.

5,551,561

FULLY ENCLOSED CONVERTIBLE GOLF EQUIPMENT CARRIER

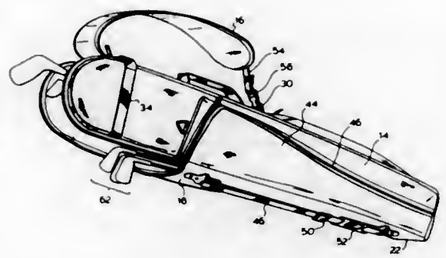
Edward G. MacRae, 11 Lancewood Cres., Brampton, Ontario, Canada; John A. Paterson, 354 Clendenan Avenue, Toronto, Ontario, Canada, and James A. MacRae, 95 Thorncliffe Park Drive, Toronto, Ontario, Canada

Continuation of Ser. No. 131,743, Oct. 5, 1993, abandoned.
This application Sep. 8, 1995, Ser. No. 524,934
Int. Cl.[6] A63B 55/00
U.S. Cl. 206—315.3 9 Claims

6. A convertible golf bag comprising

at least two elongated side panels, said side panels having a length of a longest golf club of a convectional golf set, said side panels having means for joining said side panels together in a hinged relation along a longitudinal edge of said side panels from an end of said side panels for a distance of approximately a length of a shaft of a shortest golf club of a conventional golf set, and

an elongated gusset panel having length for extending about a perimeter of said side panels opposite where said side panels are hinged together, said gusset panel having a first end joined to said at least two side panels at said end of said side panels,



a first fastening means

for releasably fastening said at least two side panels and said gusset panel together defining a compartment for storing golf clubs,

for selectively opening and closing an end of said compartment for receiving and storing golf clubs, and

for releasing either of said at least two side panels for hingedly opening a side of said compartment,

a second fastening means for releasably joining said gusset panel to said golf bag when said gusset panel is in a folded over condition presenting a carrying strap when said end of said compartment is an open condition, and

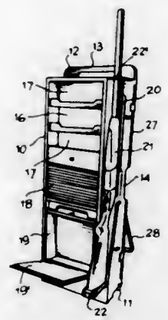
securing means for securing said first fastening means preventing said first fastening means from opening while said gusset is presented as a carrying strap.

5,551,562

CARRIER-SUITCASE FOR SPORTS GUNS, THEIR SPARE PARTS AND EQUIPMENT FOR THE USER

Ugo G. Beretta, Brescia, Italy, assignor to Fabrica D'Armi P. Beretta S.p.A., Gardone V.T. (Brescia), Italy

Filed Apr. 11, 1995, Ser. No. 422,145
Claims priority, application Italy, Jul. 20, 1994, BS94A0090
Int. Cl.[6] A45C 5/14
U.S. Cl. 206—317 6 Claims



1. A carrier-suitcase, comprising: a body with a bottom, a top, a first flank, a second flank, a front side and a rear side, the body including roller transport means for moving the carrier-suitcase over the ground as a carrier and suitcase grip means for carrying the carrier-suitcase as a suitcase, said body having an interior accessible from said front side, said interior accessible from said front side having means defining a plurality of front side spaces, and said body having an interior accessible from said rear side, said interior accessible from said rear side having means defining a plurality of rear side spaces, said spaces being formed to hold, in an orderly manner, at least one sports gun as well as cartridges and

equipment and service components for the user, said roller transport means including wheels provided at said bottom of said body for support of said body over ground, said grip means including a grip for pulling the carrier-suitcase on said wheels and including one of a suitcase grip and a shoulder strap, for carrying the unit as a suitcase, said suitcase grip means being provided on said first flank of said body; a sliding gate accessible on said front side of said body for closing one or more of said front side spaces; and a door hinged to said second flank of said body for closing one or more of said rear side spaces, said door being closable and locked on said first flank, adjacent to said suitcase grip.

2. A carrier-suitcase, comprising: a body with a bottom, a top, a first flank, a second flank, a front side and a rear side, the body including roller transport means for moving the carrier-suitcase over the ground as a carrier and suitcase grip means for carrying the carrier-suitcase as a suitcase, said body having an interior accessible from said front side, said interior accessible from said front side having means defining a plurality of front side spaces, and said body having an interior accessible from said rear side said interior accessible from said rear side having means defining a plurality of rear side spaces, said spaces being formed to hold, in an orderly manner, at least one sports gun as well as cartridges and equipment and service components for the user, a back portion for sub-dividing internal spaces of said body into at least one compartment on said front side and at least one compartment on said rear side, one part of said compartment on said front side being subdivided by shelves into a plurality of spaces for carrying objects, said plurality of spaces being accessible through said sliding gate, another part of said front compartment forming a space for receiving a small case, said small case for carrying cartridges, said small case being extractable from said case space for use as an independent carrying case, another part of said front compartment defining a housing extending along an entire beight of said body, said housing for accommodating an assembled rifle; an additional shelf for supporting a butt of said rifle, said additional shelf being provided in the lower part of said housing, said additional shelf being connected to said body for folding up into an interior of said housing, said compartment on said rear side of said body being sub-divided into said rear side spaces, said rear side spaces including a space for accommodating a rifle butt with platform balance of the rifle, a space for a disassembled barrel of the same rifle, space for a spare barrel or a possible double barrel and a space for carrying objects, all of which are closed by said rear door.

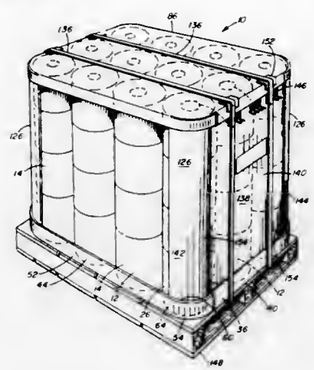
4. A carrier-suitcase, comprising: a body with a bottom, a top, a first flank, a second flank, a front side and a rear side, the body including roller transport means for moving the carrier-suitcase over the ground as a carrier and suitcase grip means for carrying the carrier-suitcase as a suitcase, said body having an interior accessible from said front side, said interior accessible from said front side having means defining a plurality of front side spaces, and said body having an interior accessible from said rear side, said interior accessible from said rear side having means defining a plurality of rear side spaces, said spaces being formed to hold, in an orderly manner, at least one a sports gun including one of a rifle and a gun having a dimension substantially corresponding to a rifle as well as cartridges and equipment and service components for the user said roller transport means including wheels provided at said bottom of said body for support of said body over ground, said grip means including a grip for pulling the carrier-suitcase on said wheels and including one of a suitcase grip and a shoulder strap, for carrying the unit as a suitcase, said suitcase grip means being provided on said first flank of said body; a sliding gate accessible on said front side of said body for closing one or more of said front side spaces; and a door hinged to said second flank of said body for closing one or more of said rear side spaces, said door being closable and locked on said first flank, adjacent to said suitcase grip.

5,551,563

PACKAGING UNITS FOR PACKAGING A PLURALITY OF GENERALLY CYLINDRICAL OBJECTS

Lesley M. Allen, Shelby, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 21, 1994, Ser. No. 360,541
Int. Cl.[6] B65D 85/00
U.S. Cl. 206—394 29 Claims



1. A packaging unit, comprising:

(a) a generally rigid support base comprising a bottom wall having a plurality of edges; a plurality of side walls, each side wall extending upwardly from an edge; and a plurality of corners, each corner extending upwardly from an intersection of two edges;

(b) a plurality of generally cylindrical objects arranged in an assembly having at least one vertical column; each vertical column comprising a bottom object and a top object, each object having a top end, a bottom end and a side extending therebetween, the bottom end of each bottom object being supported by the support base, a portion of the side of selected bottom objects being adjacent to a portion of the support base selected from the group consisting of at least one of the side walls of the support base, at least one of the corners of the support base, and combinations thereof, wherein the assembly is free of walls between the cylindrical objects of the assembly, each corner of the base being generally arcuate about the objects of the adjacent vertical column;

(c) a generally rigid lid comprising a top wall having a lower side, an upper side opposite the lower side, and a plurality of edges; a plurality of side walls, each side wall extending downwardly from a corresponding edge of the top wall; and a plurality of corners, each corner extending downwardly from an intersection of two edges, each corner of the lid being generally arcuate about the objects of the adjacent vertical column, a portion of each corner of the support base being adjacent to a portion of a corresponding corner of the lid; the lower side of the lid being adjacent to the top end of each top object, a portion of the side of selected top objects being adjacent to a portion of the lid selected from the group consisting of at least one of the side walls of the lid, at least one of the corners of the lid, and combinations thereof, each side wall of the support base being spaced apart from each corresponding side wall of the lid; and

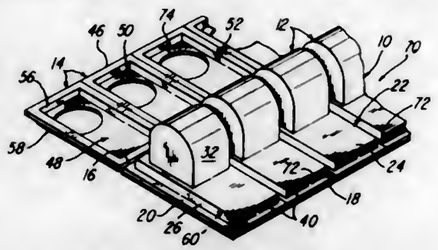
(d) a retainer means extending around the support base, assembly of cylindrical objects and lid to maintain the integrity of the packaging unit during movement of the packaging unit.

5,551,564

ROLL PACKAGE CONVERTIBLE TO A DISPENSER

James L. Prater, 5831 Williams Dr., Fort Meyers Beach, Fla. 33931, and Joseph F. Moore, 1605 Harborough Rd., Richmond, Va. 23233

Filed Feb. 2, 1994, Ser. No. 190,268
Int. Cl.[6] B65D *85/67*
U.S. Cl. 206—409 **14 Claims**



1. A package for a roll formed from a strip of labels, which package is convertible to a dispenser, comprising:

an upper housing formed from a single piece of plastic, said upper housing having a chamber having a roll formed from a strip of labels disposed therein;

a lower housing formed from said piece of plastic;

an integral hinge formed from said piece of plastic that joins said housings to one another along an edge of each housing; and

a separate, removable cover sheet underlying and attached to said upper housing for retaining said roll in said chamber for delivery to a purchaser,

one of said housings defining a dispensing orifice,

said lower housing having surfaces (a) adapted to frictionally interfit within said upper housing following removal of said cover sheet, and (b) insertable into said upper housing following removal of said cover sheet by folding said housings toward another about the axis of said hinge, and

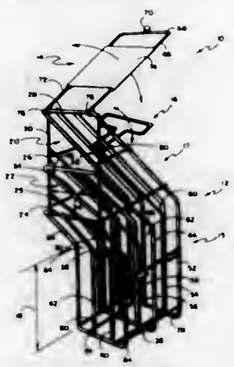
said upper housing and said lower housing having surface portions which, when said surfaces of said lower housing are inserted into said upper housing, define a delivery channel extending from said chamber to said dispensing orifice.

5,551,565

BEVERAGE CAN CARRIER AND STORAGE DEVICE

Kathleen S. Kendrick, 21 Lincoln St., Weston, Mass. 02193

Filed Feb. 9, 1995, Ser. No. 389,279
Int. Cl.[6] B65D *65/00; 75/00*
U.S. Cl. 206—427 **9 Claims**



1. A structure for the storage and carrying of empty beverage cans, said cans each having a diameter and a length, comprising:

a wire form structure having a lower vertical portion and an upper angular portion having an upper end, said upper angular portion disposed at approximately a 45-degree angle to said lower vertical portion, said structure at its lower vertical portion including a lower channel former, a mid-channel former spaced apart and behind said lower channel former, and an upper channel former spaced apart and behind said mid-channel former defining, respectively, therebetween a lower channel and an upper channel, said channel formers having an upper angular portion said upper angular portion of each of said channel formers being bent parallel to one another at approximately a 45-degree angle to its respective lower vertical portion, said upper and lower channels being substantially parallel to one another, and said upper angular portion extending away from said lower vertical portion, said lower channel having a lower entrance defined at said upper end between said lower channel former and said mid-channel former, said upper channel having an upper entrance defined at said upper end between said mid-channel former and said upper channel former;

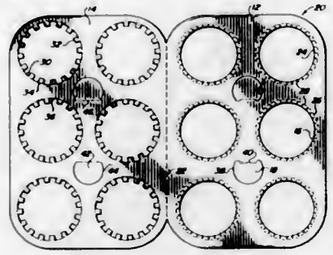
said lower and upper entrances being vertically disposed, respectively, in said lower channel and said upper channel with said upper entrance disposed immediately above said lower entrance for cans entered into said lower and upper entrances to pass first at approximately a 45-degree angle downward within said channels of said upper angular portion to where they reach said lower vertical portion and fall down into said channels in said lower vertical portion for storage.

5,551,566

CAN CLIP CARRIER

Robert L. Sutherland, Kennesaw, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.

Filed Apr. 6, 1995, Ser. No. 416,385
Int. Cl.[6] B65D *71/12*
U.S. Cl. 206—427 **12 Claims**



1. A package containing a plurality of articles each of which has an upper portion including an outwardly projecting lip, comprising:

a carrier comprised of a top panel and an adjacent substantially parallel bottom panel;

each panel containing a plurality of apertures through which the upper portions of the articles extend;

a plurality of support tabs connected to the top panel along fold lines adjacent the apertures, the top panel support tabs engaging the lip of an associated article;

a plurality of support tabs connected to the bottom panel along fold lines adjacent the apertures, the bottom panel support tabs engaging the lip of an associated article;

there being more top panel tabs than bottom panel tabs;

at least some of the bottom panel support tabs being located between and in contact with the upper portion of an associated article and an adjacent top panel support tab;

at least some of the bottom panel support tabs being spaced from adjacent bottom panel support tabs; and

at least a portion of the width of one of the top panel support tabs being located between said spaced bottom panel support tabs in contact with the upper portion of an associated article.

7. A package containing a plurality of articles each of which has an upper portion including an outwardly projecting lip, comprising:

a carrier comprised of a top panel and an adjacent substantially parallel bottom panel;

each panel containing a plurality of apertures through which the upper portions of the articles extend;

a plurality of support tabs connected to the top panel along fold lines adjacent the apertures, the top panel support tabs engaging the lip of an associated article;

a plurality of support tabs connected to the bottom panel along fold lines adjacent the apertures, the bottom panel support tabs engaging the lip of an associated article; and

at least some of the bottom panel support tabs being located between and in contact with the upper portion of an associated article and an adjacent top panel support tab;

the articles being beverage cans, each of which has a relatively short substantially vertical upper portion extending between the lip and a tapered portion of the can, the support tabs contacting the beverage cans on the substantially vertical portion thereof.

8. A blank for forming a carrier for supporting a plurality of articles each of which has an upper portion including an outwardly projecting lip, comprising:

a top panel section connected to a bottom panel section;

each panel section containing a plurality of apertures which are aligned with the apertures of the other panel section in a carrier formed from the blank;

a plurality of support tabs connected to the top panel section adjacent the apertures therein;

a plurality of support tabs connected to the bottom panel section adjacent the apertures therein, the distance between adjacent bottom panel support tabs being greater than the distance between adjacent top panel support tabs;

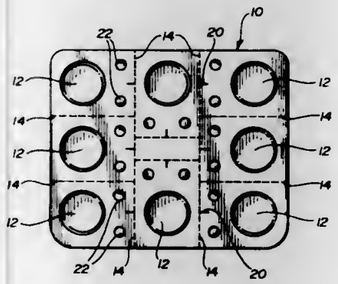
the location and size of the support tabs being such that at least some of the bottom panel support tabs are located between and in contact with both the upper portion of an associated article and an adjacent top panel support tab in a carrier formed from the blank, both the bottom panel support tabs and the top panel support tabs engaging the lip of an associated article in such a carrier.

5,551,567

BLISTER PACKAGE CONTAINING GRIPPING MEANS

Yolanda Malone, Wyncote, Pa.; James Warner, New York, N.Y., and Richard Park, Palisades Park, N.J., assignors to McNeil-PPC, Inc., Milltown, N.J.

Filed Apr. 29, 1994, Ser. No. 235,072
Int. Cl.[6] B65D *85/48*
U.S. Cl. 206—469 **20 Claims**



1. A package comprising:

at least one blister having a well adapted to hold a medicament dosage, a cover placed in sealing arrangement with said blister;

a score line in said blister and said cover, said score line forming a weakened portion on said cover and blister to enable tearing of said blister to expose said well; and

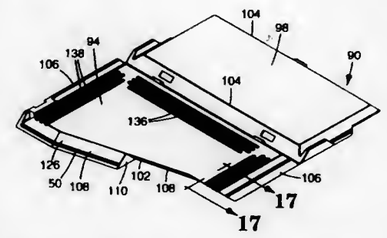
a raised surface on said blister adapted for gripping said blister, said raised surface spaced apart from said score line.

5,551,568

STACKING DEVICE FOR CONTAINERS

Gerald J. Niles, and Davis W. Chamberlin, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 52,121, Apr. 22, 1993, which is a continuation-in-part of Ser. No. 915,126, Jul. 17, 1992, Pat. No. 5,303,823. This application Jun. 6, 1995, Ser. No. 467,734
Int. Cl.[6] B65D *21/02; 6/18*
U.S. Cl. 206—509 **9 Claims**



1. A stacking device for use on containers that can be disassembled into flat sections, wherein each container includes a first wall and a second wall and wherein the first wall includes an inner surface, an outer surface, first and second corners, and edges, wherein the stacking device permits fully assembled containers to be interlocked and secured from lateral motion and permits disassembled container sections to be interlocked and secured from lateral motion, wherein the stacking device comprises:

a first positive locking member located on the outer surface of the first wall adjacent a first corner of and on one side of a line dividing the angle of the corner of the first wall;

a first negative locking member located on the outer surface of the first wall adjacent the first corner of and on the other side of the line dividing the angle of the corner of the first wall; and

a second negative locking member located on the inner surface of the first wall, adjacent the first corner of and on the one side of the diagonal of the first wall, and directly opposite the first positive locking member.

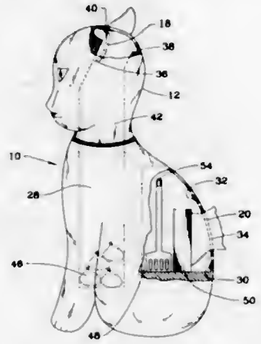
9. A container that can be disassembled into flat sections, wherein each container includes a first wall and a second wall and wherein the first wall includes an inner surface, an outer surface, first and second corners, and edges, and a stacking device which permits fully assembled containers to be interlocked and secured from lateral motion and permits disassembled container sections to be interlocked and secured from lateral motion, wherein the stacking device comprises:

a first positive locking member located on the outer surface of the first wall adjacent a first corner of and on one side of a line dividing the angle of the corner of the first wall;

a first negative locking member located on the outer surface of the first wall adjacent the first corner of and on the other side of the line dividing the angle of the corner of the first wall; and

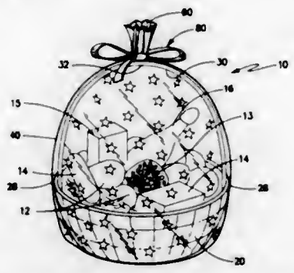
a second negative locking member located on the inner surface of the first wall, adjacent the first corner of and on the one side of the diagonal of the first wall, and directly opposite the first positive locking member.

5,551,569
BAG DISPENSER AND TEMPORARY PET WASTE RECEPTACLE
Joni M. Garvin-Mazzarisi, 11640 NW. 39th St., Coral Springs, Fla. 33065
Filed Dec. 6, 1994, Ser. No. 349,810
Int. Cl.[6] B65F *1/06*
U.S. Cl. 206—554 **15 Claims**



1. An apparatus for temporary storage of domestic animal waste comprising: an animal shaped housing means defined by a head portion threadingly secured to a body portion, said head portion including a centrally disposed aperture extending from an upper surface of said head portion leading to said body portion, said body portion having a first chamber juxtapositioned to said head portion and accessible through said aperture; door means for sealing said aperture; and a second chamber disposed in said body portion, said second chamber not communicating with said first chamber; whereby said second chamber is available for storage of a plurality of plastic bags to be used for bolding animal waste wherein the bags are filled with waste and inserted into said aperture through said door means for temporary storage in said first chamber, said head portion removable for accessing said first chamber for permanent disposal of waste filled bags.

5,551,570
DECORATIVE PACKAGING SYSTEM INCLUDING A METHOD AND KIT THEREFOR
Pauline S. Shaffer, 28 Viking Dr., Englewood, Colo. 80110, and Kathy L. Fisher, 9355 Notts Ct., Littleton, Colo. 80214
Filed Feb. 2, 1994, Ser. No. 191,030
Int. Cl.[6] B65D *77/00*
U.S. Cl. 206—575 **14 Claims**



1. A decorative packaging system adapted to contain and display objects, comprising in combination:

(a) a container adapted to receive and support objects placed therein and having a bottom wall, a surrounding sidewall extending upwardly to terminate in a rim defining an opening for said container, and a handle extending between opposed portions of said rim in an arch-like manner so as to have a medial handle portion oriented above said rim and positioned in opposed relation to the bottom of said container;

(b) a flexible bag having a pair of side panels joined along lateral side edges thereof, an open mouth and a bottom panel enclosing a bottom end of said bag opposite the mouth, said bag formed of a relatively clear material and sized and adapted so that said bottom wall may be positioned against the bottom panel when in the open state with said side panels extending upwardly beyond the medial portion of said handle to define a top margin for said bag;

(c) a fastener operative to encircle the top margin of said bag when said basket is placed therein and thereby operative to form a closure for the mouth of said bag that is supported by the medial portion of said handle while drawing said side panels tautly about said basket and said handle; and

(d) a packet, said bag being received in said packet, said packet being secured to said basket.

5,551,571
SEMICONDUCTOR WAFER CONTAINER
Jenq-Tyan Lin, Kaohsyung, and Horng-Huei Tseng, Hsin Chu, both of, Taiwan, assignors to Vanguard International Semiconductor Corp., Hsinchu, Taiwan
Filed Sep. 18, 1995, Ser. No. 529,634
Int. Cl.[6] B65D *85/90*
U.S. Cl. 206—710 **23 Claims**

1. A container for integrated circuit wafer comprising:

a body member having a circular base, a flat upper surface on said base for supporting wafers in stacked relation, an arcuate upright member on said base, adapted to encircle approximately 180° of a stack of wafers supported on said flat upper surface;

an enclosure member having a circular top wall and cylindrical wall adapted to mate with said body member to form a complete enclosure for wafers, a means to secure said enclosure member to said body member; and

a cylindrically shaped retainer element adapted to be placed on said base of said body member to encircle said arcuate upright member, said retainer element of a length approximately equal to the length of said arcuate upright member.

14. A container for integrated circuit wafers comprising:

a body member having a circular base, a flat upper surface on said base for supporting wafers in stacked relation, an arcuate upright member on said base, adapted to encircle approximately 180° of a stack of wafers supported on said flat upper surface;

an enclosure member having a circular top wall and a cylindrical wall adapted to mate with said body member to form a complete enclosure for wafers, a means to secure said enclosure member to said body member;

a cylindrically shaped retainer element adapted to be placed on said base of said body member to encircle said arcuate upright member, said retainer element of a length approximately equal to the length of said arcuate upright member, and a diametral slot in the bottom surface of said base.

21. A method for carrying and removing integrated circuit wafers from a container comprising:

providing a body member having a circular base, a flat upper surface on said base for supporting wafers in stacked relation, an arcuate upright member on said base adapted to encircle approximately 180° of a stack of wafers supported on said flat upper surface;

providing enclosure member having a circular top wall and a cylindrical wall adapted to mate with said body member to form a complete enclosure for wafers, a means to secure said enclosure member to said body member;

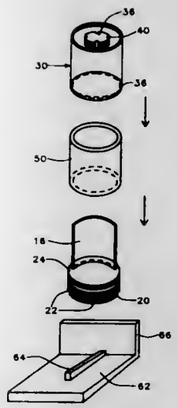
providing a cylindrically shaped retainer element to retain wafers positioned said enclosure member adapted to be placed on said base of said body member to encircle said arcuate upright member, and retainer element of a length approximately equal to the length of said arcuate upright member;

providing a diametral slot in the bottom surface of said base;

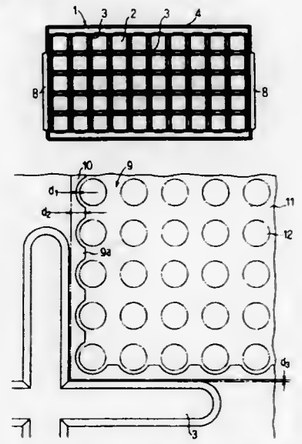
positioning a fixture for opening said container, wherein said fixture has a flat support panel, an upright abutment panel, and a ridge element on said support panel that interacts with said diametral slot in said base element to prevent rotation of said body member;

rotating said enclosure member until it can be removed from said base;

removing said retainer element; and removing said wafers from said container borizontally from said stack of wafers by means of a vacuum wafer handler.



5,551,572
TRAY FOR SEMICONDUCTOR DEVICES
Hisashi Nemoto, Tokyo, Japan, assignor to Shinon Denkisangyo Kabushiki-Kaisha, Tokyo, Japan
Filed Jan. 23, 1995, Ser. No. 376,879
Claims priority, application Japan, Sep. 7, 1994, 6-239502
Int. Cl.[6] B65D *73/02*
U.S. Cl. 206—725 **3 Claims**



1. A tray for housing semiconductor devices of a ball grid type, each semiconductor device to be housed in the tray having a surface provided with a plurality of wiring solder balls, said surface of each of said semiconductor devices having peripheral edges, each of said wiring solder balls having a diameter, the tray comprising:

a tray surface;

a plurality of pockets formed in said tray surface, each pocket for receiving a semiconductor device therein and each of said pockets having corners and a bottom surface forming a depression;

a plurality of ribs, each rib having a root formed on each of said corners of each of said pockets for dividing said pockets from each other and each rib having a width which gradually increases toward said bottom surface of each of said pockets;

a plurality of supporting step portions, each supporting step portion formed between said roots of said ribs and said depression for supporting a corresponding peripheral edge of said surface of each of said semiconductor devices which are to be housed in the tray, each of said supporting step portions having an inner wall forming an inner wall of said depression; and

a plurality of projections formed in each said supporting step portion and said projections defining a plurality of recesses therebetween for receiving peripheral ones of said wiring solder balls, each said recess having a substantially part-circular shape for receiving one said peripheral wiring solder ball therein.

5,551,573

MACHINE AND METHOD FOR SEPARATING RECYCLABLE MATTER

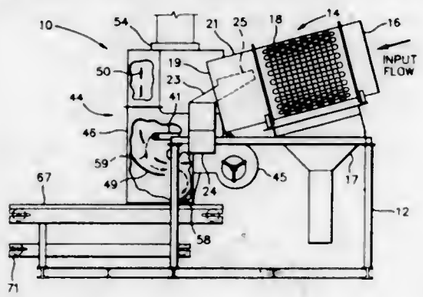
Robert M. Davis, Bonita, Calif., assignor to CP Manufacturing, Inc., National City, Calif.

Continuation of Ser. No. 218,353, Mar. 28, 1994, Pat. No. 5,452,804, which is a division of Ser. No. 930,739, Aug. 14, 1992, Pat. No. 5,328,034. This application Jan. 18, 1995, Ser. No. 374,066

Int. Cl.[6] B03C *1/30;* **B07B** *7/00*

U.S. Cl. 209—38 **13 Claims**

1. An apparatus for extracting magnetic articles from a stream of



matter, comprising:

a frame;

a trommel rotatably mounted to the frame, the trommel including an input opening for receiving a flow of matter, a plurality of perforations opening through the trommel, and an unapertured annulus with an inner surface, the annulus forming a discharge opening of the trommel for discharging a flow of matter;

an extracting mechanism including a plurality of permanent magnets mounted to rotate with the trommel, the extracting mechanism including means responsive to rotation of the trommel for bringing permanent magnets into direct contact with the annulus following a disengagement location and for disengaging permanent magnets from direct contact with the annulus at the disengagement location; and

the extracting mechanism including a member mounted to the frame, the member projecting into the discharge opening for receiving and discharging magnetic articles from the flow of matter when the magnetic articles are released from the inner surface at the disengagement location.

5,551,574

METHOD AND APPARATUS FOR CONCENTRATION OF MINERALS BY FROTH FLOTATION

Gary W. Hicks, Rolla, and William L. Cornell, Salem, both of Mo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Division of Ser. No. 416,562, Apr. 4, 1995, Pat. No. 5,467,876. This application Sep. 18, 1995, Ser. No. 529,813

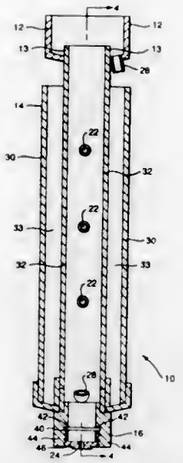
Int. Cl.[6] B03D *1/02*

U.S. Cl. 209—164 **6 Claims**

1. A continuous froth flotation process for separating a target mineral from a slurry of mineral ore which also contains a non-floatable particulate material, said process comprising the steps of:

a) introducing the slurry into a vertical flotation column comprising a plurality of fluid-impermeable, vertically-spaced baffles disposed above the point of introduction of the slurry B1 and arranged in a manner which creates a plurality of quiescent flow areas in the flotation column B2;

b) introducing a gaseous material into the vertical flotation column below the point of introduction of the slurry; the rate of introduction of the gaseous material and slurry combined with the placement of the baffles being sufficient to create



sufficient turbulence in the vertical column to separate the target mineral from the non-floatable material;

c) recovering the target mineral concentrate at an upper portion of the vertical flotation column located above the baffles; and

d) recovering the non-floatable particulate material from the quiescent flow zones in the vertical flotation column.

5,551,575

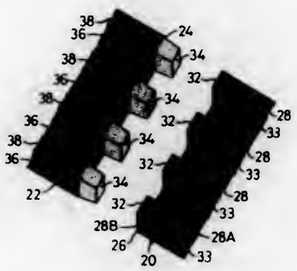
SHALE SHAKER SCREENS

Vincent D. Leone, Houston, Tex., assignor to Environmental Procedures, Inc., Houston, Tex.

Filed Jul. 29, 1994, Ser. No. 282,983

Int. Cl.[6] B07B *1/04*

U.S. Cl. 209—273 **24 Claims**



1. A screen combination for a shale shaker, the screen combination having a first screen and a second screen, the screen combination comprising

each of the first screen and the second screen having a frame with two end members interconnected by two spaced-apart side members which define an opening through the frame,

screening material attached to each frame and covering each frame's opening,

interconnection means at a first end of the first screen for interconnecting the first end with a second end of the second screen adjacent the first end of the first screen,

the screening material on each screen with a plurality of raised portions therealong whose ends define a plurality of end openings,

the interconnection means including a connector member with a body and a first set of a plurality of first plugs protruding from the body, one first plug corresponding to and disposed in each end opening of the first end of the first screen, and

the connector member having a second set of a plurality of second plugs protruding from the body, each second plug in a corresponding end opening of the second end of the second screen.

5,551,576

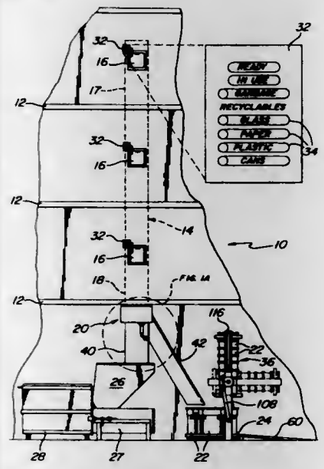
DISPOSAL SYSTEM FOE USE IN TALL BUILDINGS

Michael Importico, P. O. Box 810, Mays Landing, N.J. 08330

Filed Feb. 10, 1995, Ser. No. 386,575

Int. Cl.[6] B07C *7/04*

U.S. Cl. 209—705 **6 Claims**



1. A system to separate and store trash which has been segregated into various categories for use in a multi-floor building, the system comprising:

(a) a vertical waste chute with at least one access door to the chute located on a floor of the building, the chute having an upper and lower portion and a first path therethrough, the chute further including a second path which is angled respectively to the first path;

(b) diverting means located adjacent the lower portion of the chute for diverting the path of the trash placed into the chute, from a first location comprising a plurality of trash receptacles located on a platform to a second location comprising at least one trash receptacle;

(c) receptacle moving means for moving a selected one of the plurality of trash receptacles beneath the chute to receive a particular category of trash deposited into the chute;

(d) control means for controlling the receptacle moving means, the control means including selection means for selecting the particular category of trash to be deposited into the access door and indicating means for indicating the category selected, the selection means and indicating means located adjacent each access door, the control means operatively connected to the receptacle moving means for selectively controlling the receptacle moving means;

(e) dispensing means for dispensing at least one empty receptacle onto the platform to replace a receptacle which is removed from the platform after the receptacle is filled with trash;

(f) replacing means for removing a receptacle filled with trash from the platform to allow the dispensing means to dispense an empty receptacle onto the platform, the replacing means comprising sensing means to sense when a receptacle on the platform is filled with trash and needs to be replaced with an empty receptacle; and

(g) access door locking means connected to each door for locking the door while the receptacle moving means is in motion, the door locking means being operatively connected to the control means.

5,551,577

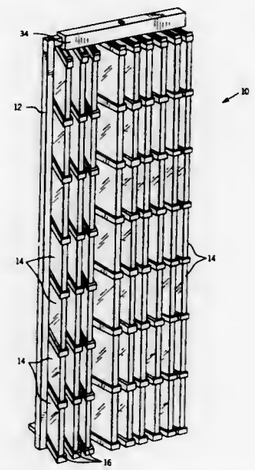
MERCHANDISE DISPLAY SYSTEM

Gerald M. Hagopian, Oak Creek, Wis., assignor to KCS Industries Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 305,039, Sep. 13, 1994. This application Oct. 19, 1994, Ser. No. 325,801

Int. Cl.[6] E05B *73/00*

U.S. Cl. 211—4 **20 Claims**



1. A merchandise display system comprising:

a support structure;

at least one elongated display bar mounted substantially vertically on the support structure; and

a plurality of merchandise holders disposed in a column along the display bar, each merchandise holder including an end portion having an opening for receiving the display bar therethrough, a display portion extending substantially perpendicularly from the end portion and a retaining member, the display portion having substantially vertical sides for receiving and holding merchandise, the retaining member being configured to engage at least a portion of the sides of an adjacent holder in the column for maintaining alignment of the holders in the column to substantially enclose the adjacent holder, each merchandise holder being pivotable between a first position wherein the holder is aligned with at least one adjacent holder in the column, thereby preventing removal of merchandise, and a second position wherein the holder is angularly displaced with respect to at least one adjacent holder in the column, thereby permitting removal of merchandise.

5,551,578

SHOPPING CART STORAGE AND CONTROL STATION

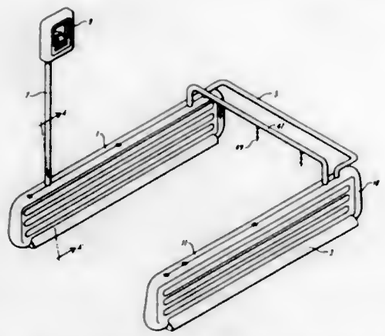
David S. McCue, Marblehead, Mass., and Roland M. Gebhardt, New York, N.Y., assignors to McCue Corporation, Salem, Mass.

Filed Jul. 28, 1994, Ser. No. 281,757

Int. Cl.[6] A47F *7/00*

U.S. Cl. 211—17 **38 Claims**

22. A shopping cart station for storage of shopping carts, said shopping cart station comprising



first and second hollow wall members each elongated along a first axis and having a bottom surface,

a connecting means coupling said first hollow wall member to said second hollow wall member, and

a ballast means contained within said first hollow wall member for stabilizing said first hollow wall member,

wherein said first axis is substantially normal to horizontal, and

wherein said first and second hollow wall members are arranged relative to one another to hermit storage of at least one shopping cart therebetween.

5,551,579

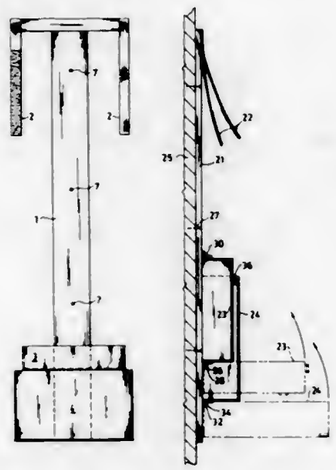
WALL MOUNTED GOLF EQUIPMENT STORAGE CADDY

William L. Converse, 640 Perry Rd., Strykersville, N.Y. 14145

Continuation-in-part of Ser. No. 115,162, Oct. 18, 1993, abandoned. This application Jan. 19, 1995, Ser. No. 374,848

Int. Cl.[6] A47F *7/00*

U.S. Cl. 211—70.2 **5 Claims**



1. A wall mounted storage caddy which provides for the upright support of a golf bag comprising a vertically disposed main support member, an adhesive fastener located near the upper end of said main support member to secure the upper portion of said golf bag, a cup-like appendage attached near the lower end of said main support member to provide support for said golf bag, and a shoe compartment attached to said main support member below said cup-like appendage.

5,551,580

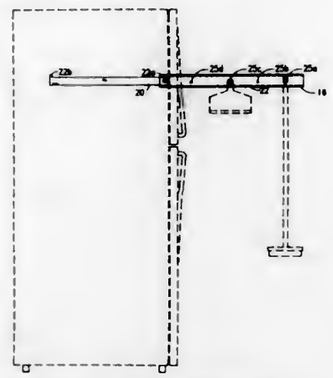
SLIDABLE STORAGE WALL-MOUNT

Brian C. Knutson, 245 - 12th Ave. East, West Fargo, N. Dak. 58078

Filed Jan. 13, 1995, Ser. No. 372,356

Int. Cl.[6] A47F *5/00*

U.S. Cl. 211—94 **12 Claims**



1. A slidable storage wall-mount comprising:

a generally thin, elongate member having a front side, a back side, and a groove extending in the back side and along the length of said elongate member;

a track fixedly attached in said groove of said elongate member;

a rail member upon which said track is slidably and securely mounted, said rail member being fixedly attachable to a wall; and

a plurality of hanger members spacingly disposed in said front side of said elongate member for supporting items.

5,551,581

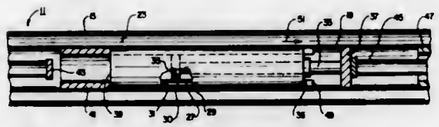
SINGLE ACTING SLIDING SILL CUSHIONING UNIT

Harry B. Kalina, Arlington, Tex., assignor to FM Industries, Inc., Fort Worth, Tex.

Filed Oct. 7, 1994, Ser. No. 320,169

Int. Cl.[6] B61G *9/16*

U.S. Cl. 213—8 **11 Claims**



1. In a rail car having a frame, a sliding sill extending longitudinally through the frame and having couplings on each end for coupling to adjacent rail cars, the frame and sliding sill being slidable relative to each other due to shock, the improvement comprising:

a housing having concentric inner and outer chambers containing oil and gas which communicate with each other through at least one restrictive port, the housing having a base end wall and a shaft end wall and being slidably carried within the sliding sill;

a piston located in the inner chamber of the housing;

a shaft mounted to the piston, extending outward from the shaft end wall of the housing, and having a metal outer end, the shaft and piston being capable of buff and draft movement relative to the housing;

sliding sill stop means rigidly mounted to the sliding sill and positioned adjacent the base end wall of the housing and adjacent the outer end of the shaft for engaging the base end wall of the housing and the outer end of the shaft when encountering shock for providing limits to the amount of movement of the housing and the shaft relative to the sliding sill;

frame stop means rigidly mounted to the frame of the rail car and located within the sliding sill adjacent the base end wall of the housing and the outer end of the shaft for engaging the base end wall of the housing and the outer end of the shaft when encountering shock for providing a limit to the amount of movement of the housing and the shaft relative to the frame; and

buff limit means comprising at least one metal buff limit stop member rigidly mounted to and protruding from the shaft end wall of the housing toward the outer end of the piston for metal-to-metal contact by the outer end of the piston for stopping buff movement of the shaft and piston relative to the housing prior to the piston reaching engagement with the base end wall of the housing.

5,551,582

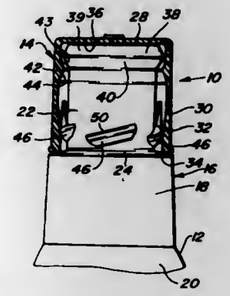
CHILD RESISTANT TWIST OFF CLOSURE AND CONTAINER

Clayton L. Robinson, Newburgh, Ind., assignor to Rexam Closures, Evansville, Ind.

Filed Sep. 29, 1995, Ser. No. 536,113

Int. Cl.[6] B65D *55/02*

U.S. Cl. 215—216 **18 Claims**



1. A child resistant container and closure package comprising;

a hollow cylindrical neck forming part of said container;

a cylindrical skirt forming part of said closure and being disposed coaxially with and in radially spaced relation to said neck in a closed condition of said package;

latch members formed on said skirt and neck and being engageable with each other to form a snap connection resiliently resisting axial opening movement of said closure from said container;

a plurality of cam elements arranged circumferentially on the exterior of said neck and below said latch members;

a pair of diametrically opposed cam followers formed on the interior of said skirt and in radially spaced relation to said cam elements to permit axial placement of said closure on said container without interference and to permit relative rotation of said closure and container in a closed condition of said package;

guide members formed on the interior of said skirt between said cam followers and in close proximity to said cam elements to permit free rotation of said closure relative to said neck and to engage said cam elements to resist tilting of said closure relative to said neck; and

said skirt being deflectable radially inwardly only at diametrically opposed portions on said skirt opposite to said cam followers to move said cam followers radially inwardly into overlapping relation to said cam elements whereby simultaneous opening rotation of said closure relative to said container moves said closure axially of said container to disengage said latch members for removal of said closure.

5,551,583

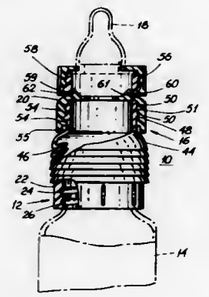
ADJUSTABLE ORIENTATION DEVICE FOR CONNECTING A NIPPLE TO A BABY BOTTLE

Rakeshwar Sachathamakul, and Gurpinder Duggal, both of Bangkok THX, assignors to Mother's Love Pte. Ltd., Singapore

Filed Aug. 22, 1994, Ser. No. 293,475

Int. Cl.[6] A61J *9/00;11/04;15/00*

U.S. Cl. 215—386 **10 Claims**



1. An adjustable orientation device for a baby bottle to change the angular relationship between an exit area of the bottle and an exit from an exit orifice coupled with the exit area, comprising:

a bellows-type cylindrical structure having an entrance way and an exit way, and a longitudinal axis between said exit way and said entrance way in one condition of said structure when said entrance way and said exit way are axially aligned;

said entrance way including means for connecting said bellows-type structure to an exit opening of the baby bottle;

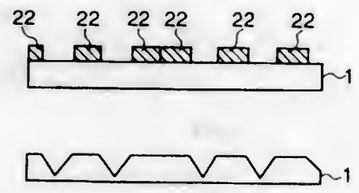
said exit way including means for connecting said bellows-type structure to a nipple orifice means defining said exit orifice;

said bellows-type structure including:

at least one bellow member and being sufficiently resilient to remain in any one of a plurality of pre-selected positions and being compressible to a minimum length condition and extendable to a maximum length condition and various dimensions between said minimum length and said maximum length; and

locking means connected with said at least one bellow member so that said at least one bellow member and said locking means can be locked to each other and when said exit way and said entrance way are no longer axially aligned, and said locking means including an interlocking mechanism having a roof member, and a half bellow member coupled with said at least one bellow member for locking thereof in different angular orientations between said exit way and said entrance way with said at least one bellow member being locked under said roof member, and said at least one bellow member having an outer diametrical extent greater than an outer diametrical extent of said roof member.

5,551,584
METHOD OF PRODUCING LAMBDA/4-SHIFTED DIFFRACTION GRATING
Yoshihiro Hisa, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 8, 1995, Ser. No. 400,960
Claims priority, application Japan, Jun. 21, 1994, 6-138899
Int. Cl.[6] B44C *1/22*
U.S. Cl. 216—2 **3 Claims**

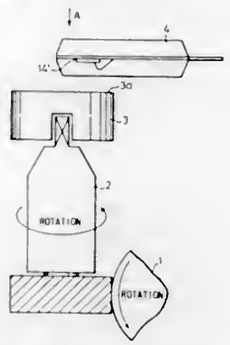


1. A method of producing a λ/4-shifted diffraction grating comprising:
depositing an image reversible resist on a substrate in which a diffraction grating is to be formed;
exposing the image reversible resist to an interference pattern having a light intensity pattern including a plurality of crests of maximum light intensity such that the exposed resist is not dissolved when developed;
exposing the resist on a first region of the substrate to an interference pattern having a light intensity pattern including a plurality of crests of maximum light intensity so that only portions of the resist exposed to the maximum light intensity are dissolved when developed;
developing the resist on the first region of the substrate;
exposing portions of the resist on the first region of the substrate remaining after the developing to light of sufficient intensity so that image reversal occurs in these portions when subjected to image reversal baking;
exposing the resist on a second region of the substrate adjacent the first region to a light intensity pattern including a plurality of crests of maximum light intensity so that only portions of the resist exposed to the maximum light intensity are sufficiently exposed so that image reversal occurs in these portions when subjected to image reversal baking;
image reversal baking the image reversible resist on the first and second regions of the substrate;
exposing and developing the resist on the first and second regions of the substrate to remove portions in which image reversal did not occur, thereby forming a resist pattern; and
etching the substrate using the resist pattern as a mask.

5,551,585
PROCESS FOR THE SURFACE TREATMENT OF LITHOGRAPHIC PRINTING PLATE PRECURSORS
Jen-chi Huang, Mt. Kisco, and Daniel M. Bourgeois, Mahopac, both of N.Y., assignors to Sun Chemical Corporation, Fort Lee, N.J.
Filed Apr. 10, 1995, Ser. No. 419,228
Int. Cl.[6] C23F *1/00*
U.S. Cl. 216—11 **11 Claims**

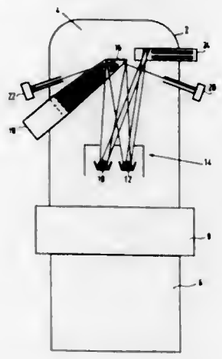
1. A process for the non-electrical or non-mechanical graining of the surface of aluminum sheet to produce a white, non-reflective matte appearance with fine honeycomb topography for lithographic printing plate production, said process comprising:
contacting said aluminum sheet with an aqueous silicate solution at a temperature between 10° C. and 120° C. for a period of time between 5 seconds and 5 minutes; to provide a silicated sheet; and
etching said silicated sheet chemically or electrolytically.

5,551,586
METHOD FOR MANUFACTURING AN ELECTROMAGNETIC CONVERSION DEVICE AND A DISPLACEMENT DETECTOR WHICH USES AN ELECTROMAGNETIC CONVERSION DEVICE
Hirofumi Uenoyama, Anjo; Kenichi Ao, Tokai; Yasutoshi Suzuki, Okazaki; Yoshimi Yoshino, Inuyama, and Motofumi Suzuki, Aichi-gun, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Aug. 24, 1994, Ser. No. 293,966
Claims priority, application Japan, Aug. 25, 1993, 5-210634
Int. Cl.[6] B44C *1/22*; **C23F** *1/00*; **H01L** *21/00*
U.S. Cl. 216—22 **14 Claims**



1. A method of manufacturing a magneto-electric conversion device comprising:
providing a substrate;
alternatively depositing a magnetic thin film and a non-magnetic thin film on said substrate;
depositing an insulating film on said thin films; and
patterning said insulating film.

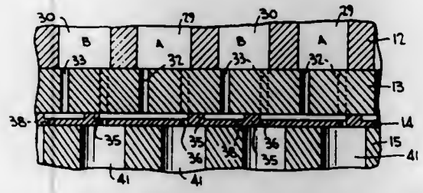
5,551,587
MULTILAYER MIRROR WITH A VARIABLE REFRACTIVE INDEX
Anton Keppel, Heiloo; Rutger Schlatmann, Amsterdam, and Jan Verhoeven, Kockengen, all of, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 6, 1994, Ser. No. 319,181
Int. Cl.[6] B44C *1/22*
U.S. Cl. 216—24 **4 Claims**



1. A method of manufacturing multilayer mirrors, in which:
a first layer of a first material and of a first thickness is deposited on a substrate;

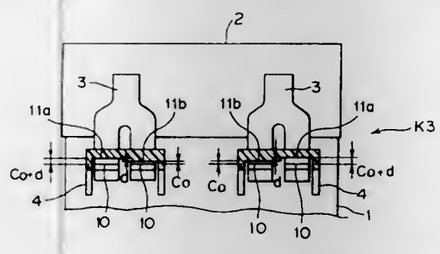
a second layer of a second material and of a second thickness is deposited on the first layer;
material is removed from the second layer by ion-etching the material by ion bombardment; and
the foregoing steps are repeated at least once again; characterized in that during each repeat
the ion bombardment of the second layer is sustained until an amount of material equal to the second layer thickness has been removed, so that the first and second materials interface entirely within the first layer.

5,551,588
PROFILED MULTI-COMPONENT FIBER FLOW PLATE METHOD
William H. Hills, Melbourne Village, Fla., assignor to BASF Corporation, Parsippany, N.J.
Division of Ser. No. 241,299, May 11, 1994, Pat. No. 5,466,410, which is a division of Ser. No. 893,286, Jun. 4, 1992, Pat. No. 5,344,297, which is a continuation-in-part of Ser. No. 354,259, Aug. 7, 1989, Pat. No. 5,162,074, which is a continuation of Ser. No. 103,594, Oct. 2, 1987, abandoned. This application Jun. 6, 1995, Ser. No. 470,530
Int. Cl.[6] B44C *1/22*
U.S. Cl. 216—56 **1 Claim**



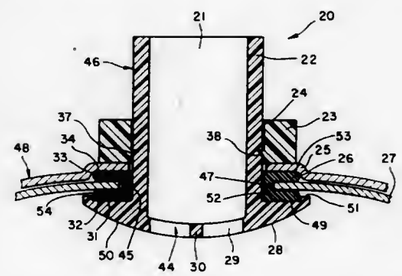
1. A process for manufacturing a flow distribution plate for use in the melt spinning of fibers comprising etching distribution flow paths in at least one surface of said flow distribution plate in a pattern which feeds mutually separated polymer components to each inlet hole of an array of multiple spinneret orifices.

5,551,589
LOCKING CONSTRUCTION OF ELECTRICAL CONNECTION BOX
Masayoshi Nakamura, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan
Filed Aug. 22, 1994, Ser. No. 292,980
Claims priority, application Japan, Oct. 12, 1993, 5-055046 U
Int. Cl.[6] B65D *45/16*
U.S. Cl. 220—326 **5 Claims**



1. A locking construction of an electrical connection box, comprising:
a lower casing member which is made of resin;
an upper casing member which is made of resin and is mounted on an upper portion of the lower casing member;
a first locking member which has a first engageable face and is provided on the lower casing member; and
a second locking member which has a second engageable face engageable with the first engageable face and is provided on the upper casing member;
wherein one of the first and second engageable faces of the first and second locking members is formed by two engageable face sections having a predetermined difference in height therebetween such that the engageable face sections are sequentially brought into engagement with the other of the first and second engageable faces of the first and second locking members, and said first locking member comprises said engageable face sections and said second locking member forks to two leg portions extending towards the first locking member such that said second engageable faces having an identical height are, respectively, formed on said leg portions.

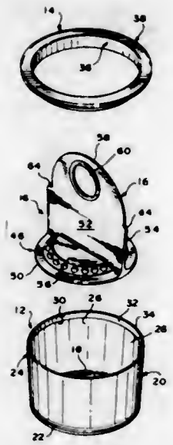
5,551,590
NON-METALLIC PRESSURE VESSEL FITTING
Mark Mazur, North Kingstown; Joseph F. Silva, Bristol, and Albert R. Heilman, West Warwick, all of R.I., assignors to Amtrol Inc., West Warwick, R.I.
Filed May 30, 1995, Ser. No. 453,656
Int. Cl.[6] B65D *90/10*
U.S. Cl. 220—465 **13 Claims**



1. A pressure vessel fitting for use on a pressure vessel, comprising, in combination:
(a) an internal fitting having an outer surface, an elongated body, an outward-extending flange at the end of said body, and an internal passageway in the elongated body;
(b) a snap retainer having a one way lock lip and being slidable on said elongated body, said internal fitting has a snap lock groove into which said one way lock lip of said snap retainer can be positioned; and
(c) a grommet having a back portion, an upper leg and a lower leg, said back portion of said grommet being positioned against the outer surface of said internal fitting.

5,551,591
SINK CONTAINER
Douglas M. Laib, Kissimmee, Fla., assignor to Dart Industries Inc., Deerfield, Ill.
Filed May 27, 1994, Ser. No. 249,601
Int. Cl.[6] B65D *25/30;25/08;3/04;3/26*
U.S. Cl. 220—528 **20 Claims**

1. A drainage container for hand-held implements, said container including a receptacle and a partition, said receptacle comprising a



base and an upwardly extending wall fixed to and surrounding said base and forming an upwardly opening chamber, said wall having an upper rim portion defining an upwardly opening chamber mouth remote from said base, said partition comprising a support platform removably positioned in said chamber in overlying relation to said base for the support of implements received through said chamber mouth, spacer means for supporting said platform in closely spaced relation to and above said base in said chamber, means for allowing drainage downwardly past said platform to said base, and a handle engaged with said platform and extending upwardly through said chamber and beyond said open chamber mouth, cooperating retainer means on said wall within said chamber and on said partition for releasably fixing said partition within and against withdrawal from said chamber with said platform supported by said spacer means in said closely spaced relation to said base and with said handle extending beyond said chamber mouth to define an exposed hand grip for manual gripping of the handle and for lifting of said container, said partition being removable from said chamber by said handle upon release of said retaining means.

5,551,592

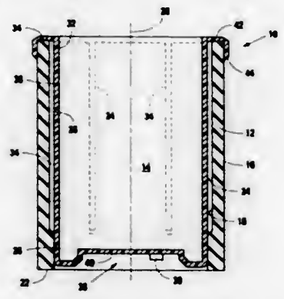
BEVERAGE HOLDER

Bradley D. Barton, and Jimi Ellis, both of San Antonio, Tex., assignors to Radio Cap Company, Inc., San Antonio, Tex.

Filed May 9, 1995, Ser. No. 437,324

Int. Cl.[6] B65D *90/04*

U.S. Cl. 220—571 **7 Claims**



1. A beverage holder assembly, comprising:

a thermally insulative sleeve formed of a resiliently compressible material and having a cylindrical outer wall surface and a cylindrical inner wall surface, said outer and inner wall surfaces each having a predetermined diameter and each being concentrically disposed about a longitudinal axis in radially spaced relationship with each other, and a first end surface and a second end surface, said first and second end surfaces extending between said outer and inner wall surfaces in a radial direction with respect to said longitudinal axis and in a predetermined axially spaced relationship with each other;

a liner disposed within said sleeve and having a cylindrical wall portion concentrically disposed about said longitudinal axis, said wall portion having an outer surface extending between first and second axially spaced ends and having a diameter substantially equal to the diameter of said inner wall surface of the sleeve and disposed in abutting contact with the inner wall surface of said insulative sleeve, a plurality of ridges extending radially outwardly from said outer surface of the liner and along said outer surface in a direction parallel with said longitudinal axis wherein the outward and longitudinal extension of the ridges above and along the outer surface of the liner is sufficient to resiliently compress an adjacently disposed area of the abutting inner wall surface of said sleeve and thereby maintain the sleeve in a fixed relative position with respect to the liner during spinning of the assembly about said longitudinal axis, and a bottom portion extending radially across said first end of the wall portion and having an exterior surface with a reference indicia disposed thereon.

5,551,593

COMBINATION FOOD AND BEVERAGE PLATE

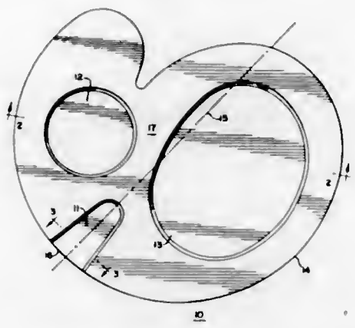
Duane D. Wiens, 7269 S. Cook Cir., Littleton, Colo. 80122

Continuation of Ser. No. 324,716, Oct. 18, 1994, abandoned.

This application Dec. 5, 1995, Ser. No. 567,216

Int. Cl.[6] B65D *1/36*

U.S. Cl. 220—575 **9 Claims**



1. A food and beverage plate comprising:

a substantially continuous surface having no through holes or through slots;

a thumb recess disposed in the surface along a periphery of the food and beverage plate, with a longitudinal axis of the thumb recess passing substantially through a center of the continuous surface of the food and beverage plate;

a beverage recess disposed in the food and beverage plate proximate the thumb recess on a first side of the axis; and

a food recess disposed in the food and beverage plate proximate the thumb recess substantially on a second side of the axis.

5,551,594

BOX-SHAPED CONTAINER OF PLASTICS MATERIAL

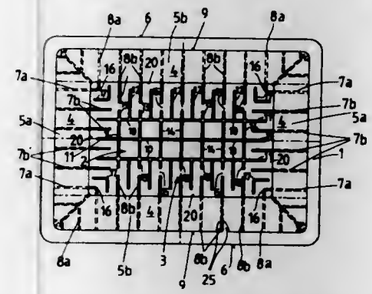
Gerhard Schäfer, Neunkirchen, Germany, assignor to Fritz Schäfer Gesellschaft mit beschränkter Haftung, Neunkirchen, Germany

Filed Nov. 8, 1994, Ser. No. 335,581

Claims priority, application Germany, Nov. 8, 1993, 43 38 063.8

Int. Cl.[6] B65D *6/00*

U.S. Cl. 220—675 **9 Claims**



1. A box-shaped container of plastics material, particularly a storage and transport container, the container including a bottom and side walls extending upwardly from the bottom, the bottom having a rim, a flat upper side and a bottom side, stiffening ribs attached to the bottom side for stabilizing the bottom, further including flat webs extending in a plane parallel to the bottom and along the rim of the bottom, the flat webs forming, in the manner of a frame, a center field of the bottom, the stiffening ribs in the center field intersecting each other in the manner of a grid, the flat webs forming support surfaces of the container and being connected, spaced apart from the bottom, to the stiffening ribs arranged transversely of the rim of the bottom, wherein pocket-shaped free spaces are formed between the bottom side of the container bottom, upper sides of the flat webs and the transversely extending stiffening ribs, such that the free spaces are completely open at the rim of the bottom, wherein the improvement comprises that the stiffening ribs connected to the flat webs are spaced apart, separate, and distinct from the stiffening ribs of the center field.

5,551,595

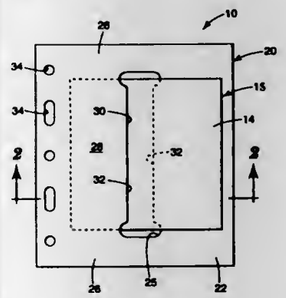
DISPENSER PACKAGE FOR USE IN RING BINDERS

Timothy A. Mertens, Cottage Grove, and Alden R. Miles, Lakeville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 30, 1994, Ser. No. 268,923

Int. Cl.[6] A47K *10/24*

U.S. Cl. 221—45 **8 Claims**



1. A dispenser package comprising:

a plurality of flexible sheets, each of said sheets having first and second spaced ends and a predetermined uniform length between said first and second ends, comprising a backing having opposite major top and bottom surfaces, and having a layer of pressure sensitive adhesive on at least a second end portion of said bottom surface adjacent said second end, said sheets being releasably adhered to each other by adhesion of said layers of pressure sensitive adhesive to portions of the top surfaces of underlying sheets adjacent the first ends of the underlying sheets to form a stack with adjacent ends of said sheets aligned and with the first and second ends of successive sheets in said stack being adjacent, and having means for restricting or preventing adhesion of first end portions of said sheets adjacent said first ends to underlying sheets in said stack; and

an enclosure comprising opposed top and bottom walls having opposite major surfaces, each of said opposed walls having peripheral portions and a central portion bounded by said peripheral portions, the opposite major surfaces of said top and bottom walls being attached together surface to surface along said peripheral portions so that the central portions of said walls define a chamber, and said top wall having edge surfaces between the major surfaces of said top wall defining a generally central transverse slot which edge surfaces include spaced opposed edge surfaces, and said peripheral portions along one side of said chamber having spaced through openings adapted to receive the rings of a ring type binder;

said stack of sheets being positioned in said chamber with said ends of said sheets generally parallel to said first and second edge surfaces, the lowermost sheet in said stack adjacent said bottom wall, and the first end portion of said uppermost sheet projecting through said slot and resting against one of said opposed edge surfaces so that as the uppermost sheet is pulled through said slot by said first end portion, it will cause movement of the first end portion of the first underlying sheet through said slot with the second end portion of said uppermost sheet to leave, after said uppermost sheet is fully peeled from the first portion of the first underlying sheet, the first end portion of said first underlying sheet in a position projecting through said slot and resting against the other of said opposed edge surfaces in a position where it may be grasped for manual removal in a manner similar to the removal of the uppermost sheet.

5,551,596

PARTS FEEDING APPARATUS FOR SELECTIVELY FEEDING PARTS OF DIFFERENT TYPES

Shigenori Oomori, Toyama-ken, Japan, assignor to YKK Corporation, Tokyo, Japan

Filed Sep. 30, 1994, Ser. No. 316,497

Claims priority, application Japan, Oct. 13, 1993, 5-255628

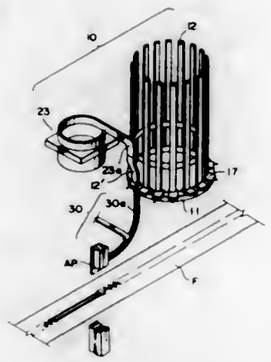
Int. Cl.[6] B65G *59/06*; **G07F** *11/54*

U.S. Cl. 221—113 **5 Claims**

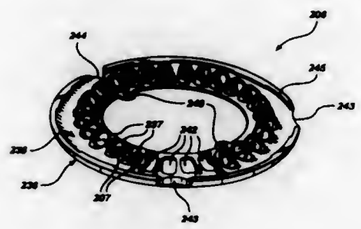
1. A parts feeding apparatus for selectively feeding parts of different types to a subsequent processing station, comprising:

(a) a parts inventory unit including a rotating circular plate having a plurality of parts supply openings arranged on the same circumference, and a plurality of removable and remotely refillable parts stocking cassettes storing respectively therein rows of parts of different types and removably attached to corresponding ones of said parts supply openings in such a manner that the parts in each of said parts stocking cassettes can be discharged from the cassette successively one at a time, said circular plate being intermittently rotatable in a horizontal plane to selectively index said parts supply openings; and

(b) a chute unit including a parts delivery chute mounted fixedly and having an inlet opening facing a portion of said circumference so that said parts supply openings in said rotating circular plate can selectively come to communicate with said inlet opening of said parts delivery chute in response to intermittent rotation of said rotating circular plate.



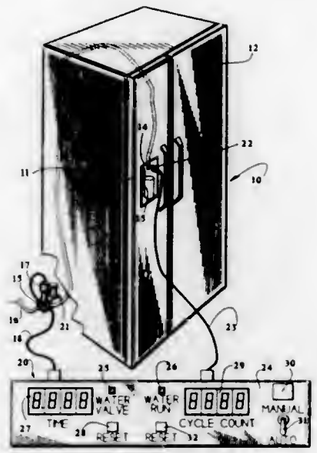
5,551,597
VARIABLE DAY START TABLET DISPENSER
Lawrence E. Lambelet, Jr.; Henry Passarotti, both of Flemington, N.J., and Gary E. McQuay, Watsontown, Pa., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.
Division of Ser. No. 282,950, Jul. 29, 1994. This application Jun. 6, 1995, Ser. No. 470,382
Int. Cl.[6] B65D *83/04*
U.S. Cl. 221—197 5 Claims



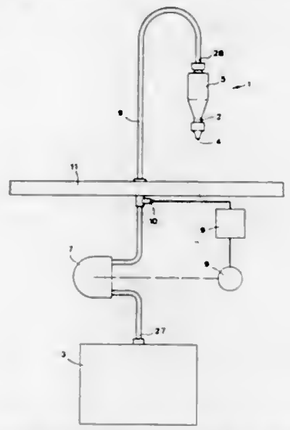
3. A circular tablet package comprising:
a hole in the center of said package;
notches on the outer periphery of said package; and
at least one lug protruding from the periphery of said center hole;
such that said center hole, said notches and said at least one lug are configured to engage a base of a pill dispenser system in only a single desired orientation of said package on said base.

5,551,598
WATER RUN-ON TIMER
Thad J. Cutsinger, Fort Smith, Ark., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Sep. 6, 1994, Ser. No. 301,081
Int. Cl.[6] B67D *5/08*
U.S. Cl. 222—52 26 Claims

1. An apparatus for measuring and displaying a time interval between a valve shut-off controlling a liquid flow and a subsequent cessation of the liquid flow at a spigot, comprising:
sensing means for detecting when a valve is closed and for providing a representative signal output therefor;
means for detecting a fluid flow and for providing a representative signal output therefor; and
means for measuring and displaying a time interval between said signal output of said sensing means and said signal output of said means for detecting a fluid flow.

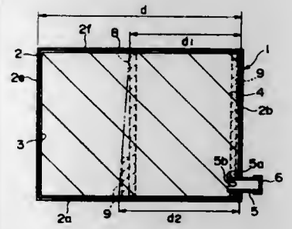


5,551,599
DISPENSING DEVICE FOR FLAWING SUBSTANCES HAVING A PRESSURE CONTROLLED PUMP ARRANGEMENT
Jan-Anders Niss, Smultronvägen 1, Malung, Sweden
PCT No. PCT/SE93/00014, § 371 Date Aug. 3, 1994, § 102(e) Date Aug. 3, 1994, PCT Pub. No. WO93/14679, PCT Pub. Date Aug. 5, 1993
PCT Filed Jan. 13, 1993, Ser. No. 284,429
Claims priority, application Sweden, Feb. 3, 1992, 9200287
Int. Cl.[6] B27D *5/08*
U.S. Cl. 222—63 9 Claims



1. A dispensing device for flowing substances, in particular food substances and the like, comprising a container for accommodating a flowing substance, said container being in communication with a flexible tube, said flexible tube capable of receiving said flowing substance and having, at an end thereof, an opening for discharging said flowing substance from said flexible tube and a valve arrangement for regulation of said flowing substance to be discharged from said opening upon application of pressure applied to said flexible tube, the improvement comprising:
a conduit which extends between said container and said flexible tube thereby providing fluid communication between said container and said flexible tube; a pump arrangement for movement of said flowing substance from said container, via said conduit, to said flexible tube; a pressure sensor, being in communication with said pump arrangement, for detecting pressure changes in said conduit such that when pressure in said conduit is below a threshold value said pump arrangement is activated and when pressure in said conduit is above a threshold value said pump arrangement is inactivated; and a valve arrangement which, in a closed condition, prevents discharge of said flowing substance from said opening of said flexible tube and which opens when pressure applied to said flexible tube exceeds a threshold value, thereby permitting the discharge of flowing substance from said opening of the tube.

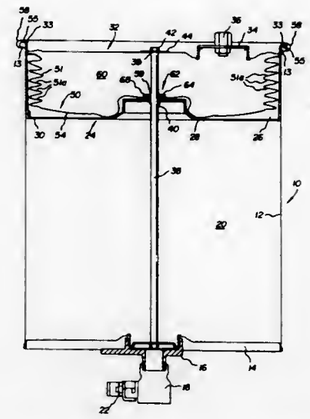
5,551,600
BAG-IN-CARTON AND POURING SPOUT THEREOF
Yasuyuki Sasaki; Takehiko Bizen; Hiroshi Miyama; Takeshi Morisako, and Hiroko Tsukada, all of Tokyo-To, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan
Continuation of Ser. No. 140,470, Oct. 25, 1993, Pat. No. 5,433,345. This application Apr. 19, 1995, Ser. No. 424,629
Claims priority, application Japan, Oct. 28, 1992, 4-312987; Mar. 17, 1993, 5-82683; Mar. 17, 1993, 5-82684; Mar. 17, 1993, 5-82685; Mar. 17, 1993, 5-82686; Jun. 25, 1993, 5-180003
Int. Cl.[6] B65D *17/06*
U.S. Cl. 222—81 27 Claims



1. A bag-in-carton, comprising:
a closed box-shaped carton;
a flexible inner bag disposed in said closed box-shaped carton, for containing a content; and
a pouring spout disposed on said closed box-shaped carton and piercing through said inner bag,
wherein a portion of said inner bag proximate said pouring spout is adhered and fixed to the inner surfaces of said closed box-shaped carton, while the remaining portion of said inner bag is movable, and
wherein the area of the fixed portion of said inner bag is larger than the area of said movable portion of said inner bag, said movable portion of said inner bag moving into said fixed portion as said content is discharged from said inner bag.

5,551,601
DISPENSER WITH INTERNAL DIAPHRAGM
James O. Camm, 51 Millewa Avenue, Chadstone, Victoria, 3184, and Stephen J. Camm, 11 Kaizma Square, Wantirna, Victoria, 3152, both of, Australia
PCT No. PCT/AU92/00604, § 371 Date May 25, 1994, § 102(e) Date May 25, 1994, PCT Pub. No. WO93/11059, PCT Pub. Date Jun. 10, 1993
PCT Filed Nov. 11, 1992, Ser. No. 244,345
Claims priority, application Australia, Nov. 27, 1991, PK9708
Int. Cl.[6] B65D *35/22*
U.S. Cl. 222—94 31 Claims

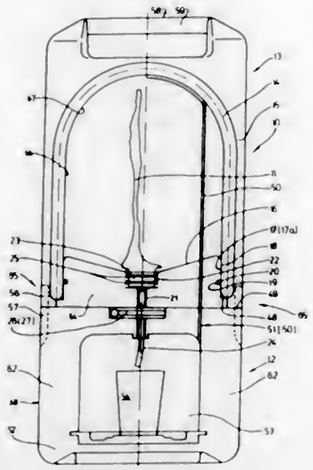
1. A dispenser for dispensing a component comprising:
a container, including a container wall, for containing the component to be dispensed;
a space in the container;



a piston arranged between the component and the space, said piston having a base portion and an upstanding wall portion, the piston being movable from an initial position to an end position to dispense substantially all of the component from the dispenser;
an expandable fluid chamber arranged within the space, the fluid chamber having a side wall;
a means for enabling supply of fluid to the fluid chamber to expand the fluid chamber to occupy substantially the entire space in the container to allow the piston to move from the initial position to the end position, the side wall having a folded portion which, when the piston is in the initial position, is folded in a concertina fashion within the upstanding wall portion with sections of the folded portion arranged transverse to the direction of movement of the piston and which, when the chamber is expanded, is of sufficient length to cause the piston to move to the end position, the portion being within the confines of the piston defined by the base and upstanding wall when the piston is in the initial position; and
wherein when the expandable fluid chamber is progressively filled with the fluid, the piston is progressively forced toward the end position and the sections of the folded portion of the side wall are progressively unfolded, drawn out of the confines of the piston as the piston moves, and forced flat against the container wall, and before being drawn out the sections are prevented from contacting the container wall by the upstanding wall portions of the piston.

5,551,602
APPARATUS FOR STORING AND DISPENSING HOT AND COLD BEVERAGES
Frithjof Kurtzahn, Weyhe-Leeste, and Wolfgang Heilmann, Bremen, both of, Germany, assignors to Kraft Jacobs Suchard, AG, Zurich, Switzerland
Filed Sep. 6, 1994, Ser. No. 301,377
Claims priority, application Germany, Apr. 9, 1993, 43 30 005.7
Int. Cl.[6] B65D *35/56*
U.S. Cl. 222—105 9 Claims

1. An apparatus for storing and dispensing beverages comprising:
an outside casing including a top section and a bottom section, the bottom section including a base and forming an outlet region, the top section being removably supported by and extending upward from the base and defining a casing interior;
a flexible inner container disposed in the casing interior, comprised of a thin, flexible and collapsible material, and defining a container interior for holding a beverage; and



a dispensing tube having an upper end in fluid communication with the container interior, and having a lower end in fluid communication with the outlet region to conduct the beverage from the inner container to said outlet region;

wherein the base includes an upper outside circumferential edge, and the top section includes a lower lateral edge extending around the outside circumferential edge of the base in a contacting, sealing relationship therewith; and

wherein the top section further includes a bell shaped insulating insert defining a hollow vacuum interior extending around the casing interior to thermally insulate the container interior.

5,551,603

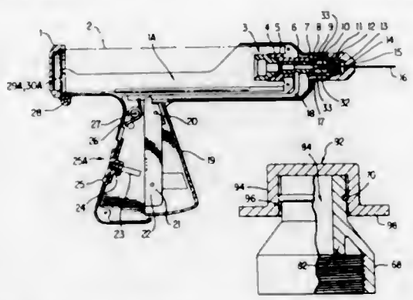
DISPENSER GUN FOR VISCOUS OR SEMI-VISCOUS PRODUCTS

Keith F. Woodruff, Mountainside, N.J., assignor to American Cyanamid Company, Wayne, N.J.

Division of Ser. No. 151,729, Nov. 12, 1993, Pat. No. 5,441,180, and a continuation-in-part of Ser. No. 82,405, Jun. 23, 1993. This application Jun. 7, 1995, Ser. No. 473,312

Int. Cl.[6] B67D *5/42*

U.S. Cl. 222—325 **5 Claims**



1. In a device for dispensing selected quantities of liquid product, said device comprising a housing having an inlet end defining an inlet opening and an outlet end defining a discharge opening, and pump means for causing said liquid product to flow between said inlet opening and said discharge opening of said housing, the improvement comprising:

a product reservoir removably receivable in said housing in an operating position therein in fluid communication with said inlet opening defined in said housing, said product reservoir being removably receivable within an adapter, said adapter defining an outlet opening for discharge of liquid product from said reservoir,

and a cap removably mountable over said outlet opening of said adapter, said cap defining therein means for venting air from said adapter when said cap is mounted to said outlet opening in said adapter.

5,551,604

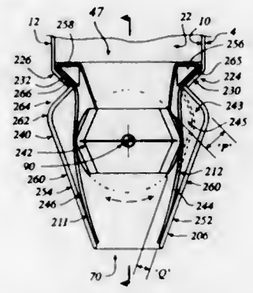
MODULAR STICKY FOOD DISPENSER

Francois Kern, 97 Dorset Road, Scarborough, Ontario, Canada, and Derek Burgener, 40 Marcella Street, Scarborough, Ontario, Canada

Filed Jan. 19, 1995, Ser. No. 374,820

Int. Cl.[6] G01F *11/10*

U.S. Cl. 222—349 **13 Claims**



1. A dispenser for dispensing material from a source, said dispenser comprising:

a passageway having an inlet to receive material from said source and an outlet;

a scoop for controlling the dispensing of said material, said scoop mounted across said passageway intermediate said inlet and said outlet, said scoop having at least one cavity for receiving a charge of material, said scoop movable from a first position for receiving that charge of material to a second position for discharging that charge; said passageway comprising at least two spaced apart opposed flexible walls biased toward and disposed to co-operate with said scoop, each of said walls being displaceable by both of, and in continuous contact with at least one of, (a) said scoop, and (b) a portion of said charge protruding from said scoop.

5,551,605

SEALING AND DISPENSING DEVICE

George Bethlendy, Pittsford, N.Y., assignor to Berthiex, Inc., Mississauga, Canada

Filed Oct. 24, 1994, Ser. No. 327,659

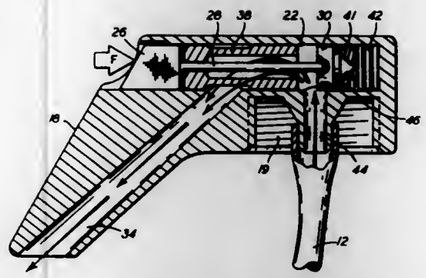
Int. Cl.[6] B65D *83/00*

U.S. Cl. 222—402.25 **9 Claims**

1. A sealing and dispensing device for controllably dispensing pressurized liquid from a container having a discharge opening located above the surface of the liquid contained within the container comprising when the container is oriented with the discharge opening on top;

(a) an adapter for matingly sealably connecting with the discharge opening of the container, said adapter further including a central opening in the form of an elongated channel that is oriented perpendicular to the discharge opening;

(b) a flexible elongated tube sealably connected to said central opening of said adapter with the unconnected lower end of said tube being weighted to insure that it remains immersed within the liquid held in said container; and



(c) a dispensing valve housing formed integral with the top of said adapter and surrounding said central opening, said housing having a valve chamber which contains a channel, said channel having a horizontally operable valve plunger operably located within said channel for reciprocal movement in the elongated channel, perpendicular to the discharge opening, with said plunger operating from a normally closed position in which said central opening and said plunger are in sealed engagement, to an open position where said plunger and said central opening define an open flow path to allow the flow of liquid under pressure from said container through said flexible elongated tube, through said central opening, past said plunger and to discharge through a dispensing spout connected to said adapter, the dispensing spout located between the elongated channel when the container is oriented with the discharge opening on top.

5,551,606

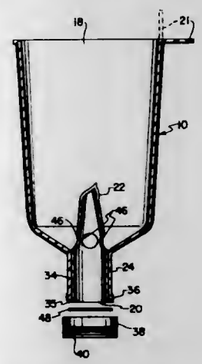
DISPENSER

Charn Rai, 913 Henley St., New Westminister, Canada, and Barry R. Wertz, 9022 Lyra Place, Burnaby, Canada

Filed Jul. 14, 1994, Ser. No. 274,973

Int. Cl.[6] B65D *88/26*

U.S. Cl. 222—460 **4 Claims**



1. A dispenser with a funnel portion to receive a flexible plastic pouch containing a liquid, the funnel portion having an open top and an open bottom, comprising:

a spike positioned adjacent the center of the open bottom, whereby the flexible plastic pouch is placed in the funnel portion, through the open top, to be pierced by said spike to allow the liquid to escape from the flexible plastic pouch and flow out through the open bottom;

a spout wherein the open bottom is positioned at the end of said spout, and said spike has a shank that engages said spout: and

an external thread on said spout and a threaded ring to be received on said external thread to hold aid spike within said spout.

5,551,607

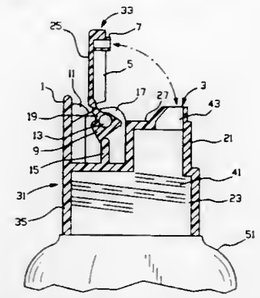
DISPENSING CAP WITH LEVERAGED PIVOT TRIGGER

Stuart DeJonge, Sr., Easton, Pa., and John E. Harrold, Borough of Bloomsbury, N.J., assignors to Primary Delivery Systems, Inc., Easton, Pa.

Filed Aug. 7, 1995, Ser. No. 511,758

Int. Cl.[6] B67D *3/00*

U.S. Cl. 222—505 **34 Claims**



1. A container and dispensing cap closure mechanism therefore, which comprises:

(a) a container having a neck, an open top and means thereon, adapted to receive and affix a circular base thereto;

(b) a circular base having a circular inside wall with means thereon for attachment to said container, said circular base also having an opening, a flat horizontal top surface portion, a portion for affixing a pivot cap thereto, means adapted to regulate the pivotal rotation of a pivot cap, and also having an inwardly flexible leveraged sidewall trigger means with a catch thereon adapted to engage and pivot a pivot cap; and,

(c) a pivot cap having means to attach to and pivotally engage a portion of said circular base, said pivot cap also having a plug thereon.

5,551,608

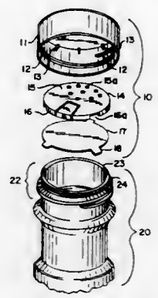
CLOSURE ASSEMBLY WITH TABBED LINER

David N. Moore, Plainfield, and Jeffrey F. Ullrich, Western Springs, both of Ill., assignors to Phoenix Closures, Inc., Naperville, Ill.

Filed Jun. 20, 1995, Ser. No. 492,625

Int. Cl.[6] B67D *3/00*

U.S. Cl. 222—542 **10 Claims**



1. A closure assembly for use with a container, the container having a neck with a land surface at an uppermost end of the neck defining a container mouth, said closure assembly comprising:

a cap having means for releasable engagement of the cap onto the neck of the container;

a liner disposed in said cap, said liner having at least one circumferential tab, and having a top surface and a bottom surface; and

a fitment disposed in the cap adjacent the top surface of the liner, said fitment having a dispensing portion spanning the mouth of the container, and having a side portion with at least one slot in said side portion for receiving the at least one tab;

whereby a sealing portion of the bottom surface of the liner can be sealed to the land surface of the neck of the container to cover the mouth of the container.

5,551,609

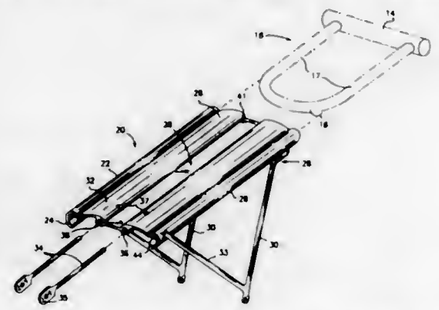
BICYCLE RACK WITH INTEGRAL LOCK HOLDER

Paul S. Best, 410 Whitney Ave., New Haven, Conn. 06511

Continuation-in-part of Ser. No. 239,534, May 9, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 476,602

Int. Cl.[6] B62J *11/00*

U.S. Cl. 224—440 **19 Claims**



1. A rack, for attachment to a cycle having a frame and wheel, and for carrying a shackle lock comprised of a U-shape shackle and a cross bar engaged on the open end of the U-shape shackle, comprising:

a platform having a top opposing sides, a rear end and a front end spaced apart along the length of the platform;

means for vertically supporting the platform on the cycle frame with the top in a horizontal position for supporting articles thereon above the cycle wheel, connected to the platform;

means for horizontally securing the platform to the cycle frame, connected to the platform;

a C-shaped cross section in a vertical plane intersecting the platform top comprised of the platform top and two opposing downwardly extending arms respectively running lengthwise along the opposing sides of the platform; the extremities of the arms angled inwardly toward the center of the platform, the C-shaped cross section shaped to receive and retain the shackle lock; wherein the shackle of the lock is insertable into and removable from the C-shaped cross section at the rear end of the platform, without disengagement of the cross bar from the shackle, by sliding the shackle lengthwise along the platform.

5,551,610

TRUNCHEON HOLSTER

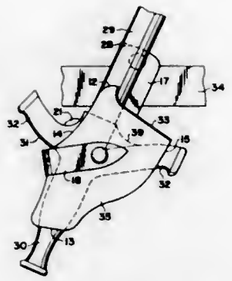
Norman E. Clifton, Jr., 607 Trumpetvine Ct., Jacksonville, Fla. 32225

Filed Jul. 15, 1994, Ser. No. 275,582

Int. Cl.[6] F41C *33/00*

U.S. Cl. 224—197 **19 Claims**

1. A clam-shell holster for a truncheon having an elongated staff and a hand grip, said holster being adapted to be worn adjacent a wearer's waist to dispose said staff along a wearer's back, said holster including an inside wall, and an outside wall spring biased through a rear fold integral with said inside and outside walls, an open top adjacent the wearer's waist, an open bottom remote from the wearer's waist, an open front extending between said open top and bottom, a belt loop connected to said inside wall, and a mechanical means attached between the inside and outside walls to adjust the strength of said spring bias, said holster retaining the truncheon with the hand grip directed downwardly through said open bottom and the staff directed upwardly through said open top from the wearer's waist to adjacent the wearer's shoulder.



5,551,611

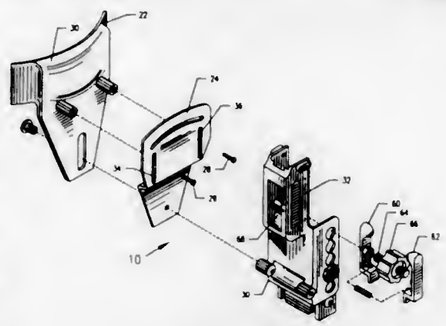
VARIABLE POSITION HANDGUN HOLSTER

W. Riley Gilmore, 2924 E. 73rd St., Tulsa, Okla. 74136

Continuation of Ser. No. 112,184, Aug. 26, 1993, Pat. No. 5,421,497. This application Jun. 5, 1995, Ser. No. 462,077

Int. Cl.[6] F41C *33/02*

U.S. Cl. 224—198 **11 Claims**



1. A variable position handgun holster having a belt plate securable to a belt, which holster comprises:

a. an elongated holster receptacle generally parallel to said belt plate, said holster receptacle for receipt of a handgun;

b. said belt plate and said receptacle each having a centrally located center point thereon wherein said belt plate is connected to said receptacle;

c. means to adjust said holster receptacle radially with respect to said belt plate about a horizontal axis parallel to said belt plate and passing through said center point connecting said receptacle and said belt plate; and

d. means to retain said handgun in said receptacle by retaining a trigger guard of said handgun including a pair of opposed retention fingers, each finger having threaded openings to receive a threaded shaft and a rotatable adjustment wheel extending radially from said shaft between the finger for adjusting spacing between said fingers.

5,551,612

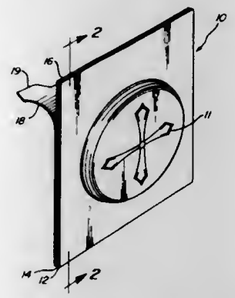
STICK-ON CONDOM PACKAGE ASSEMBLY

Stanley Hochfeld, Howard Beach, N.Y., assignor to Leonard Holtz, New York, N.Y.

Filed Jan. 27, 1994, Ser. No. 187,758

Int. Cl.[6] B65D *57/00;65/10;65/14*

U.S. Cl. 224—219 **8 Claims**



1. A stick-on condom package assembly, comprising:

a completely sealed condom package containing a condom completely sealed therein, said completely sealed condom package being flexible and having a rear wall connected to a front wall, to completely enclose said condom within said flexible package in an original, sealed non-use condition;

an adhesive layer means on the rear wall of said completely sealed condom package for adhering said completely sealed condom package, in its originally sealed condition, to a skin portion of a user; and

a peel-off release layer covering said adhesive layer means on the rear wall of said condom package for covering and protecting said adhesive layer means prior to use thereof, said adhesive layer means being adapted to be removably secured to a skin portion of the user after removal of said peel-off release layer, and said adhesive layer means being easily removable from the skin portion of the user when the user is ready to use the condom in said flexible package, and

said front wall being permanently and non-detachably adhered to said rear wall and being free of any opening means such that said flexible package is openable only after removal thereof from the skin portion of the user when it is ready for use.

5,551,613

TAPE HOLDER WITH NOTCHED BACK PANEL

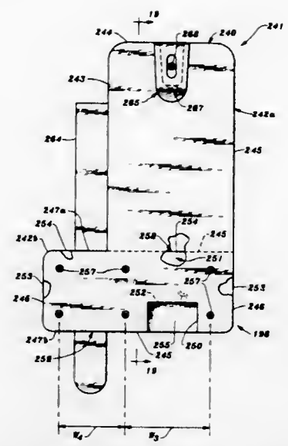
Casimier L. Malinowski, 747 Warford Ave., Vallejo, Calif. 94590

Continuation-in-part of Ser. No. 308,136, Sep. 19, 1994, Pat. No. 5,450,994. This application Oct. 12, 1994, Ser. No. 321,724

Int. Cl.[6] A45F *5/00*

U.S. Cl. 224—666 **9 Claims**

1. A holder for a measuring tape comprising a planar back panel of rectangular cross section having a first longitudinal axis of symmetry, a front surface terminating in top, bottom and side edges, and a rear surface similar in shape to said front surface; a front panel also of rectangular cross section defining a second longitudinal axis of symmetry parallel to said first longitudinal axis of symmetry and attached to said back panel to form a tight-fitting pocket therebetween at a position between said side edges but adjacent to said bottom edge of said back panel; and a series of rivets for attaching said front and rear panels together to form said tight-fitting pocket therebetween, said back panel including a rectangular notch formed therein having an opening starting at said bottom edge of said back panel and terminating in side walls and at least one end wall defining dimensions that permit a cantilevered free leg of a conventional tear-dropped clip of a measuring tape to disconnectably reside when said clip is inserted into said pocket said back panel also including a pair of longitudinally extending slots each having a third longitudinal axis of symmetry parallel to said first and second axes of symmetry of said back panel and said front panel, respectively, and offset a common distance therefrom adjacent to said side edges of said back panel to define therebetween, a first central region associated with said front surface and a second central region associated with said rear surface, said first and second central regions being bisected by said first and second axes of symmetry and being each positioned between said pair of slots.



5,551,614

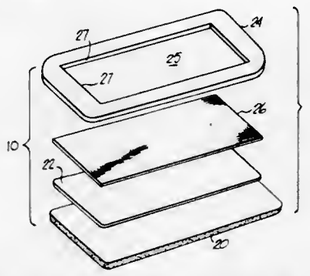
SHOULDER PAD FOR A LUGGAGE CASE SHOULDER STRAP

SooJung Ham, Providence, R.I., assignor to Samsonite Corporation, Denver, Colo.

Filed Mar. 2, 1995, Ser. No. 397,526

Int. Cl.[6] A45F *3/12*

U.S. Cl. 224—264 **6 Claims**



1. A shoulder pad for use with a shoulder strap used to support a luggage case upon a user's shoulder, the pad comprising:

an elongated body portion, the body portion having opposing longitudinal edges extending along a first direction along the length dimension of the strap when in use, the body portion having a bottom side adapted for contact with the user's shoulder;

a decorative layer comprising a frame extending along the longitudinal edges of the body portion and an aperture extending through the decorative layer and defined within the periphery of the frame wherein a bottom side of the decorative layer is disposed adjacent a top side of the body portion such that the aperture is located intermediate the longitudinal edges of the body portion;

means for holding the body portion between the strap and the user's shoulder comprising at least one band of stretchable fabric made from a length of elastic webbing disposed intermediate the body portion and the decorative layer; and

means for fastening the decorative layer and the stretchable fabric to the body portion such that the stretchable fabric extends across the aperture, wherein, in use, the strap is serpentined through the aperture and under the layer of stretchable material for holding the body portion to the strap.

5,551,615

NECK HARNESS

Raymond F. McIntosh, 956 Shearers Rd., Mooresville, N.C. 28115

Filed May 30, 1995, Ser. No. 452,811
Int. Cl.[6] A45F *5/00*
U.S. Cl. 224—270 **13 Claims**

1. A neck harness for suspending a hand-held scanner about a user's neck for disposition of the scanner at a viewable angle forwardly of the user's torso, comprising:

a housing having a channel accommodating the insertion and removal of a scanner to face upwardly from the channel for viewing of the scanner;

a rigid brace arrangement having two rigid angular support members, each said support member respectively attached to said housing at opposite sides of said channel, each said support member having converging portions projecting upwardly from said housing; and

an elongated flaccid neck strap having opposite ends connected respectively, to said converging portions of said support members from the user's neck with one end of said housing engaging the user's torso at an upward incline from the user's torso for easy viewability of the scanner.

5,551,616

PORTABLE VEHICLE ORGANIZING CONTAINER

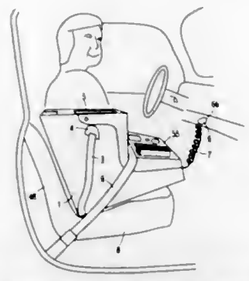
Robert N. Stitt, Kailua-Kona, Hi., and Kenneth Tarlow, Corte Madera, Calif., assignors to Robert Stitt, Kaila-Kona, Hi.

Filed Feb. 22, 1995, Ser. No. 392,235
Int. Cl.[6] B60R *7/04*
U.S. Cl. 224—275 **8 Claims**

1. A vehicle organizing container adapted for use in a vehicle having a seat inclined approximately 15 degrees with respect to a horizontal plane, said container comprising:

a base, upstanding side walls and an upper surface forming an enclosure having an interior thereof;

said upper surface comprising a first panel and a vertically stepped cover member having a second panel and a third panel lower than said second panel and coupled therebetween by a substantially vertical panel, said first and second panels being hinged together to form a higher top surface and said



third panel forming a lower top surface wherein upon upward pivotal movement of said cover member about said hinge between a closed position and an open position, half of said higher top surface and all of said lower top surface pivot upwardly to allow access to said interior; and

said base being inclined approximately 15 degrees relative to the horizontal plane such that when said base is set on the seat of the vehicle, said higher and lower top surfaces are substantially parallel with the horizontal plane.

5,551,617

TRACK MOUNT SYSTEM

Ralph D. Ray, Boulevard; Richard L. Ireland, Upland, and Jon Apogee, Mira Loma, all of Calif., assignors to Sport Carriers, Inc., Colton, Calif.

Filed Nov. 1, 1994, Ser. No. 333,003
Int. Cl.[6] B60R *9/045*
U.S. Cl. 224—321 **12 Claims**

1. A track mount system for a vehicle carrier comprising

an elongated track,

an end support operably connected to said track and adapted to slide longitudinally along said track, and

a locking mechanism slidably retained within said track and operably connected to said end support, said locking mechanism including

first and second opposed wedges, and

a device operably connected to said first and second opposed wedges to force said second wedge against said first wedge, said device including a tensioning bolt extending from said first wedge through said second wedge.

5,551,618

APPARATUS FOR CUTTING PLATE-SHAPED BRITTLE MATERIAL

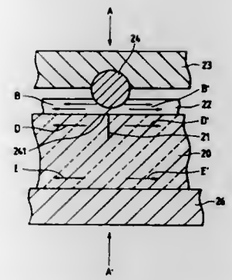
Kengo Shinozaki, Tokyo; Kimihiro Wakabayashi, Kanagawa; Hiroki Murakami, Kanagawa, and Masaaki Araki, Kanagawa, all of, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Division of Ser. No. 84,069, Jun. 30, 1993, Pat. No. 5,398,857.
This application Jan. 13, 1994, Ser. No. 181,405
Claims priority, application Japan, Jun. 30, 1992, 4-172813
Int. Cl.[6] C03B *33/03*
U.S. Cl. 225—96 **6 Claims**

1. An apparatus for cutting a plate-shaped brittle material into two plate pieces, the plate-shaped material including a surface having a cut groove, the apparatus comprising:

a press table having a flat surface for supporting the plate-shaped brittle material such that the plate-shaped brittle material does not bend;

a jig having a thread-shaped projection secured thereto with a constant height as measured in a direction perpendicular to the flat surface of the press table, said thread-shaped projection extending in conformity with a predetermined pattern positionally coincident with the cut groove formed on the surface of the plate-shaped brittle material; and



an elastic member interposed between said jig and the press table and contacting the thread-shaped projection during cutting of the plate-shaped material, the elastic member and the press table defining a space therebetween for receiving the plate-shaped material,

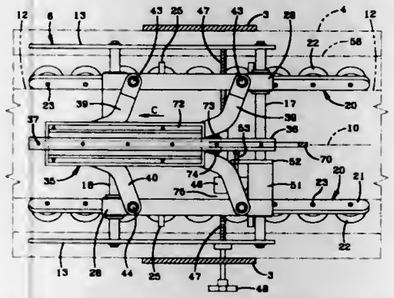
whereby movement of said jig toward said press table applies a compressing force to the plate-shaped brittle material at a right angle relative to the plate-shaped brittle material, the compressing force generating first tensile stresses, said first tensile stresses generating second tensile stresses in said plate-shaped brittle material by friction between said elastic member and the plate-shaped brittle material, said second tensile stresses fracturing the plate-shaped brittle material in conformity with said predetermined pattern.

5,551,619

TREAD STRIP CENTERING GUIDE FOR TIRE BUILDING MACHINES

Jessie R. Narron, Lucama, N.C., assignor to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Feb. 14, 1995, Ser. No. 388,705
Int. Cl.[6] B23Q *15/00*
U.S. Cl. 226—17 **13 Claims**



1. In a strip-centering guide for tire-building machines, said strip guide including:

a support housing having a longitudinal material path extending therethrough;

a pair of support rods mounted on the housing and extending transversely across the longitudinal material path;

a pair of spaced longitudinally extending guide rails movably mounted on the support rods and connected together for simultaneous movement toward and away from each other only in a transverse direction with respect to the longitudinal path of the support housing;

guide means mounted on each of the guide rails for guiding engagement with a strip of tire-building material moving longitudinally between the guide rails;

linkage means including a panograph having a slide block longitudinally slidably mounted on the housing and two pairs of link arms pivotally mounted at first ends to the slide block and at second ends to the guide rails for moving the guide rails toward and away from each other on the support rods; and

biasing means operatively engageable with the guide rails for biasing the rails toward each other and for moving the guide means into engagement with a strip of material moving between said rails to maintain said strip centered within the housing as it moves therethrough, said biasing means including a spring and an adjustment block adjustably mounted on the housing and engaged by the spring for automatically adjusting the transverse spacing between the pair of guide rails dependent upon the width of the strip; and

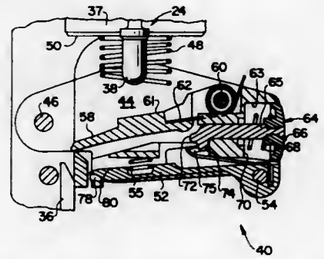
means for adjusting the position of said adjustment block with respect to the housing.

5,551,620

CONVERTIBLE CONTACT/SEQUENTIAL TRIP TRIGGER

Glenn E. Vallee, West Warwick, R.I., assignor to Stanley-Bostitch, Inc., East Greenwich, R.I.

Filed Aug. 10, 1994, Ser. No. 288,085
Int. Cl.[6] B25C *1/04*
U.S. Cl. 227—8 **7 Claims**



1. A fastener driving tool comprising: a portable housing defining a fastener drive track,

a magazine assembly carried by the housing for receiving a supply of fasteners and feeding successive fasteners into the drive track,

a fastener driving element mounted within the drive track for movement through repetitive cycles, each of which includes a fastener drive stroke in one direction which a fastener within the drive track is engaged and moved outwardly of the drive track into a work piece, and a return stroke,

a drive piston operatively connected with the fastener driving element for movement therewith,

an actuating mechanism carried by said housing and being constructed and arranged for movement from a normal, inoperative position into an operative position for initiating movement of said piston and said fastener driving element through a fastener driving stroke, and

a work piece contact responsive assembly carried by said housing and being constructed and arranged for movement from a normal, inoperative position into an operative position in response to movement of said tool into cooperating engagement with the work piece,

said actuating mechanism including an actuator movable from an inoperative position to an operative position for controlling movement of said piston and fastener driving element through a fastener driving stroke, and a trigger assembly pivotally connected to said housing and movable between an inoperative position and a manually actuated position for moving said actuator to its operative position,

said trigger assembly including control structure constructed and arranged to be manually movable between (1) a sequential operating mode position whereby movement of said contact responsive assembly to its operative position followed by

movement of said trigger assembly to its actuated position moves said actuator to its operative position permitting said piston and fastener driving element to move through a fastener driving stroke, and movement of said trigger assembly to its actuated position prior to movement of said contact responsive assembly to its operative position prevents movement of said actuator to its operative position so that inadvertent movement of said contact responsive assembly will not actuate the fastener driving tool, and (2) a contact operating mode position whereby repeated movement of said contact responsive assembly to its operative position repeatedly moves said actuator to its operative position to move said piston and fastener driving element through successive fastener driving strokes only so long as said trigger assembly is in said actuated position, release of said trigger assembly from said actuated position causing said control structure to move to its sequential operating mode position,

said control structure being constructed and arranged to remain in its contact operating mode position only when said trigger assembly is in its actuated position,

wherein said trigger assembly includes:

a trigger member pivotally coupled to the housing,

a trigger lever pivotally coupled to a proximal end of said trigger member, said trigger lever including a locking member extending therefrom,

a contact lever pivotally coupled to the proximal end of said trigger assembly at a position spaced from said trigger lever, and

a torsional spring operatively coupled to said contact lever for biasing the contact lever,

said control structure being disposed between said trigger lever and said contact lever, and including a slide assembly and a spring for biasing said slide assembly towards a sequential operating mode position,

whereby (1) when said slide assembly is disposed in its sequential operating mode position and the trigger assembly is moved to its actuated position prior to moving said contact responsive assembly to its operative position, said contact lever is biased by said torsional spring so that said contact lever may not be engaged by said contact responsive assembly, and when said contact responsive assembly is moved to its operative position followed by movement of said trigger assembly to its actuated position, said contact responsive assembly engages said contact lever, said contact lever thereafter engages said actuator permitting the piston and fastener driving element to move through a fastener driving stroke, and (2) when said slide assembly is in its contact operating mode position, said locking member locks said slide assembly in its contact operating mode position so long as said trigger assembly is in said actuated position, said contact lever being oriented so as to be in position to be moved by said contact responsive assembly such that movement of said contact responsive assembly while said trigger assembly remains in its actuated position moves said contact lever so as to engage said actuator permitting the piston and fastener driving element to move through a fastener driving stroke,

release of said trigger assembly releases said locking member so that the said spring biases said slide assembly to its sequential operating position.

5,551,621

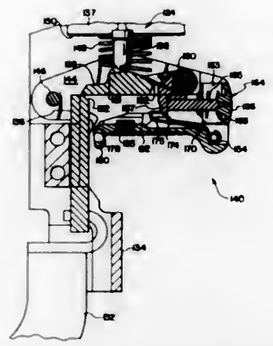
CONVERTIBLE CONTACT/SEQUENTIAL TRIP TRIGGER WITH DOUBLE ACTUATION PREVENTION STRUCTURE

Glenn E. Vallee, West Warwick, R.I., assignor to Stanley-Bostitch, Inc., East Greenwich, R.I.

Continuation-in-part of Ser. No. 288,085, Aug. 10, 1994. This application May 24, 1995, Ser. No. 449,099

Int. Cl.[6] B25C *1/04*

U.S. Cl. 227—8 **10 Claims**



1. A fastener driving tool comprising:

a portable housing defining a fastener drive track,

a magazine assembly carried by the housing for receiving a supply of fasteners and feeding successive fasteners into the drive track.

a fastener driving element mounted within the drive track for movement through repetitive cycles, each of which includes a fastener drive stroke in one direction which a fastener within the drive track is engaged and moved outwardly of the drive track into a work piece, and a return stroke,

a drive piston operatively connected with the fastener driving element for movement therewith, an actuating mechanism carried by said housing and being constructed and arranged for movement from a normal, inoperative position into an operative position for initiating movement of said piston and said fastener driving element through a fastener driving stroke, and

a work piece contact responsive assembly carried by said housing and being constructed and arranged for movement from a normal, inoperative position into an operative position in response to movement of said tool into cooperating engagement with the work piece,

said actuating mechanism including an actuator movable from an inoperative position to an operative position for controlling movement of said piston and fastener driving element through a fastener driving stroke, and a trigger assembly pivotally connected to said housing and movable between an inoperative position and a manually actuated position for moving said actuator to its operative position,

said trigger assembly including control structure constructed and arranged to be manually movable between (1) a sequential operating mode position whereby movement of said contact responsive assembly to its operative position followed by movement of said trigger assembly to its actuated position moves said actuator to its operative position permitting said piston and fastener driving element to move through a fastener driving stroke, and movement of said trigger assembly to its actuated position prior to movement of said contact responsive assembly to its operative position prevents movement of said actuator to its operative position so that inadvertent movement of said contact responsive assembly will not actuate the fastener driving tool, and (2) a contact operating mode position whereby repeated movement of said contact responsive assembly to its operative position repeatedly moves said actuator to its operative position to move said piston and fastener driving element through successive fastener driving strokes only so long as said trigger assembly is in said actuated position, release of said trigger assembly from said actuated position causing said control structure to move to its sequential operating mode position,

said control structure being constructed and arranged to remain in its contact operating mode position only when said trigger assembly is in its actuated position,

said control structure and said work piece contact responsive assembly cooperating to define actuation prevention structure constructed and arranged to prevent more than one cycle from occurring during a sequential mode of operation when only one cycle is intended,

wherein said trigger assembly includes:

a trigger member pivotally coupled to the housing,

a trigger lever pivotally coupled to a proximal end of said trigger member, said trigger lever including a locking member extending therefrom for locking said control structure in its contact operating mode position,

and wherein said control structure includes:

a slide assembly and a spring for biasing said slide assembly towards a sequential operating mode position,

contact lever coupled to said slide assembly for movement therewith and pivotally coupled to the proximal end of said trigger assembly at a position spaced from said trigger lever, and

torsional spring operatively coupled to said contact lever for biasing the contact lever away from said actuator,

whereby (1) when said control structure is disposed in its sequential operating mode position and the trigger assembly is moved to its actuated position prior to moving said contact responsive assembly to its operative position, said contact lever is biased by said torsional spring so that said contact lever may not be engaged by said contact responsive assembly, and when said contact responsive assembly is moved to its operative position followed by movement of said trigger assembly to its actuated position, said contact responsive assembly engages said contact lever, said contact lever thereafter engages said actuator permitting the piston and fastener driving element to move through a fastener driving stroke, and (2) when said control structure is locked by said locking member in its contact operating mode position, so long as said trigger assembly is in said actuated position, said contact lever is oriented so as to be in position to be moved by said contact responsive assembly such that movement of said contact responsive assembly while said trigger assembly remains in its actuated position moves said contact lever so as to engage said actuator permitting the piston and fastener driving element to move through a fastener driving stroke,

release of said trigger assembly releases said locking member so that the said spring biases said control structure to its sequential operating position.

5,551,622

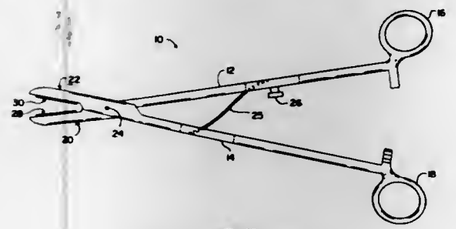
SURGICAL STAPLER

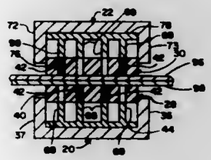
InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131

Filed Jul. 13, 1994, Ser. No. 274,402

Int. Cl.[6] A61B *17/068*

U.S. Cl. 227—178.1 **17 Claims**





1. A surgical stapler comprising

a pair of opposed jaws adapted to receive tissue therebetween;

a plurality of staples and staple-forming anvils carried by each of said jaws, said staples each having two or more tissue penetrating legs aligned with one of the anvils carried by the opposed jaw; and

operating means, coupled with said jaws, for driving said tissue penetrating legs of said staples through the tissue and bending said legs against opposed anvils.

5,551,623

PROCESS FOR WELDING TWO BLADE PARTS

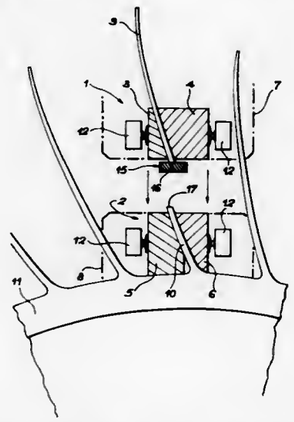
André C. F. Collot, Mennecy; Jean-Pierre Ferte, Corbeil Essonnes, and Roger Jolly, Cesson, all of, France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "SNECMA", Paris, France

Filed Feb. 17, 1995, Ser. No. 390,317

Claims priority, application France, Feb. 23, 1994, 94 02026

Int. Cl.[6] B23K *20/12*

U.S. Cl. 228—112.1 **13 Claims**



1. Process for welding two blade parts (**9**, **10**), in which the blade parts are gripped between the jaw pairs (**1**, **2**) and contacted with contact surfaces (**16**, **17**) by moving together the jaw pairs, characterized in that a flange (**15**, **20**, **25**) is located at the contact surfaces of the blade parts at least at the leading and trailing edges (**23**, **24**) of said surfaces (**16**, **17**), the flange extending around the contact surfaces.

5,551,624

5,551,625

METHOD OF MANUFACTURING A MOLDING MEMBER AND MOLDING MEMBER WHICH CAN BE MANUFACTURED BY MEANS OF THE METHOD

Anthonius J. H. Snoeyen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

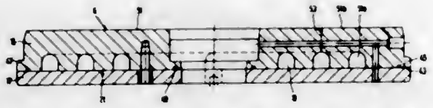
Continuation of Ser. No. 67,200, May 25, 1993, abandoned. This application Jul. 7, 1995, Ser. No. 499,645

Claims priority, application European Pat. Off., Jul. 20, 1992, 92202204

Int. Cl.[6] B23K *1/19*

U.S. Cl. 228—174 **9 Claims**

1. A method of manufacturing a molding member comprising two at least substantially flat plates which are secured to one



another via a contact surface present on each plate, at least one of the plates having a groove which forms a cooling duct in the contact surface, said method comprising the steps of:

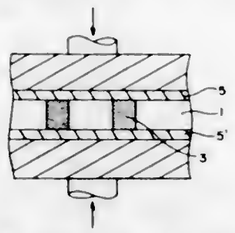
(1) stress-relief annealing of the plates;
(2) electroplating the contact surfaces;
(3) introducing a solder between the contact surfaces while the same are in facing relationship;
(4) pressing the plates against one another while maintaining said contact surfaces in facing relationship;
(5) heating the plates and the solder to liquefy the solder; and
(6) cooling the plates to solidify the solder and secure the plates one to another at said contact surfaces.

5,551,626

DIFFUSION JOINING METHOD AND A PASTE USED THEREFOR

Yo Hasegawa, Nara; Masahiro Nagasawa, Hirakata, and Masahide Tsukamoto, Nara, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 71,408, Jun. 4, 1993, Pat. No. 5,439,164.
This application Feb. 27, 1995, Ser. No. 394,482
Claims priority, application Japan, Jun. 5, 1992, 4-145276; Sep. 8, 1992, 4-239064; Dec. 1, 1993, 5-003127
Int. Cl.[6] H05K *3/34*
U.S. Cl. 228—179.1 **5 Claims**



1. A method for preparing a multilayer printed wiring board which comprises:

providing at least two foils of Cu or Cu alloy; interposing an insulating adhesive layer between each pair of adjacent foils; making via holes in the each insulating adhesive layer at desired positions; imprinting the via holes with a conductive paste and heatpressing them to electrically connect the foils through the via holes imprinted with the conductive paste, wherein the conductive paste mainly consists of conductive metal particles selected from the group comprising Ag, Cu and alloys thereof and a metal oxide remover; wherein the heat pressing is carried out at a temperature higher than about 170° C. whereat the Cu atoms can be diffused.

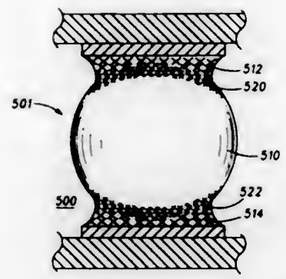
5,551,627

ALLOY SOLDER CONNECT ASSEMBLY AND METHOD OF CONNECTION

John L. Leicht, Hawthorn Woods, and William R. Bratschun, La Grange, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 29, 1994, Ser. No. 314,833
Int. Cl.[6] H05K *3/34*; **H01L** *21/58*
U.S. Cl. 228—180.22 **27 Claims**

1. A method of forming a melted alloy connection to a faying surface of a substrate, the method comprising the steps of:



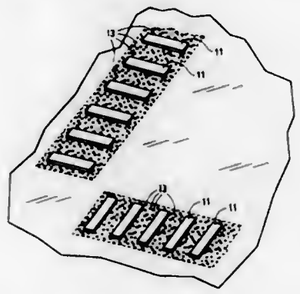
(a) depositing a first alloy solder having a first melting point onto the faying surface;
(b) placing a second alloy solder formed of a material more compliant than the first alloy solder in contact with the first alloy solder, the second alloy solder having a second melting point greater than the first melting point; and
(c) heating the first alloy solder and the second alloy solder to a temperature between the first melting point and the second melting point sufficient to dissolve the material more compliant than the first alloy solder from the second alloy solder into the first alloy solder and transform the first alloy solder into a third alloy solder that is elementally different from the first alloy solder.

5,551,628

SOLDER-COATING METHOD, AND SOLDER PASTE SUITABLE FOR USE THEREIN

Johannes A. H. Van Gerven, and Michael T. W. De Langen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 31, 1994, Ser. No. 331,823
Claims priority, application European Pat. Off., Nov. 2, 1993, 93203059
Int. Cl.[6] B23K *1/00*; **H05K** *3/34*
U.S. Cl. 228—248.1 **6 Claims**



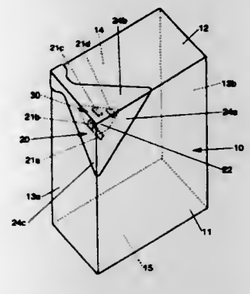
1. A method of solder-coating a metallic pad provided on a substrate, whereby at least the surface of the pad is provided with a deposit of solder paste, after which the substrate is at least partially subjected to a heating process, which heating process induces localised precipitation of an essentially continuous metallic solder layer out of the solder paste, which localised precipitation occurs on the pad but not upon the substrate surface outside the borders of the pad, subsequent to which any unwanted solder paste debris upon the substrate surface outside the borders of the pad is removed, characterised in that a solder paste is used which comprises a suspension of metallic solder particles which, when molten, have a surface energy lower than the critical surface energy of the metallic pad but higher than the critical surface energy of the substrate surface outside the borders of the pad, that the heating process causes the metallic solder particles within the paste lying upon the pad to melt and fuse together into an essentially continuous metallic solder layer, and that the metallic solder particles within any paste lying upon the substrate surface outside the borders of the pad do not fuse together into a layer but are instead deposited as mutually-isolated solder beads, which beads can be subsequently removed from the substrate surface after completion of the heating process.

5,551,629

GRANULAR SUBSTANCE STORING AND DISPENSING CONTAINER

Kanna Fujimoto, Tarumi-ku, Japan, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 8, 1994, Ser. No. 351,984
Claims priority, application Japan, Dec. 10, 1993, 5-310666
Int. Cl.[6] B65D *43/00*
U.S. Cl. 229—125.15 **3 Claims**



2. A detachable lid for a substantially rectangular parallelopiped container, said container having six panels, of which a first set of three panels converges at a first corner and a second set of three panels converges at a second comer, said first set of three panels having two panels in common with said second set of three panels, said first corner having a dispensing opening formed into said first set of three panels, said detachable lid comprising:

a) a handle portion having a first end and a second end, said handle portion also having a longitudinal member and a transverse wall substantially perpendicular to said longitudinal member, said transverse wail located at said first end of said handle portion;
b) a cup-shaped measuring device connected to said second end of said handle portion, said measuring device having three adjoining walls adapted to rest against said first set of three panels of said container to completely cover said dispensing opening when said handle portion is also mounted against said container, said transverse wall of said handle portion resting against said second comer of said container; and
c) at least two clips projecting from at least two of said three adjoining walls of said measuring device, said at least two clips engaging at least two of said panels of said first set of three panels at said dispensing opening to hold said measuring device against said dispensing opening to close said dispensing opening when said detachable lid is mounted to said container.

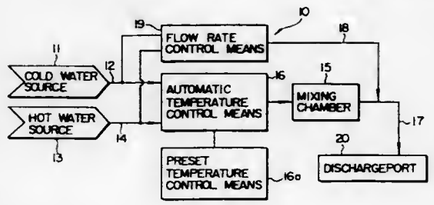
5,551,630

HOT AND COLD WATER MIXING DISCHARGE DEVICE

Masatoshi Enoki; Osamu Tonkunaga; Shinichi Yamato, and Masahiko Imazono, All of Kitakyushu, Japan, assignors to Toto Ltd., Kitakyushu, Japan

Division of Ser. No. 303,578, Sep. 8, 1994, Pat. No. 5,462,224, which is a continuation of Ser. No. 187,825, Jan. 27, 1994, abandoned, which is a division of Ser. No. 867,234, Jun. 3, 1992, abandoned. This application May 25, 1995, Ser. No. 452,565
Claims priority, application Japan, Oct. 5, 1990, 2-69095
Int. Cl.[6] G05D *23/13*
U.S. Cl. 236—12.13 **4 Claims**

1. A hot and cold water mixing discharge device comprising a



cold water inflow passage connected to a cold water source; a hot water inflow passage connected to a hot water source; a mixing chamber in which a cold water and a hot water are mixed together to make a warm water; an automatic temperature control means provided between said chamber and each of said passages so that the ratio of the flow rates of said cold and hot waters flowing into said chamber is automatically modulated by said means depending on a preset temperature for said warm water; a warm water passage communicating with said chamber; a by-pass for optionally connecting said cold water inflow passage and said hot water inflow passage to said warm water passage around said means; a flow rate control means provided in said by-pass in order to regulate the flow rate of said cold and hot water flowing from said by-pass to said warm water passage, wherein the flow rate control means is provided at the upstream end of the by-pass, and includes a means for regulating the flow rates of the cold and hot waters from the cold and the hot water inflow passages; and a discharge port provided at the downstream end of said warm water passage.

5,551,631

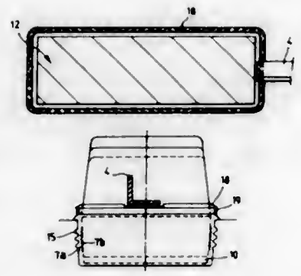
RAIL SUPPORT DEVICE FOR UNBALLASTED RAILWAY TRACK

Joël Cailliau, Faches Thumesnil, France, assignor to Allevard, Saint Cloud Cedex, France

PCT No. PCT/FR93/00706, § 371 Date Jan. 20, 1995, § 102(e) Date Jan. 20, 1995, PCT Pub. No. WO94/02685, PCT Pub. Date Feb. 3, 1994
PCT Filed Jul. 20, 1993, Ser. No. 367,316
Claims priority, application France, Jul. 20, 1992, 92 08946
Int. Cl.[6] E01B *1/00*
U.S. Cl. 238—115 **8 Claims**

8. Device supporting a railway rail on an unballasted track, comprising:

a) a concrete block on which the rail is to rest;
b) a supple sole located below the concrete block, on which the block rests;
c) an elastomeric shell which envelops the supple sole and a lower part of said concrete block, said shell having an upper edge provided with a bead; and
d) a bed of mortar in which the shell is anchored, said block having a horizontal cross-section which varies and presents a maximum area at a vertical level just below the bead and remote from the soles, so as to limit relative displacement of the block and the envelope by elastic retention.



5,551,632

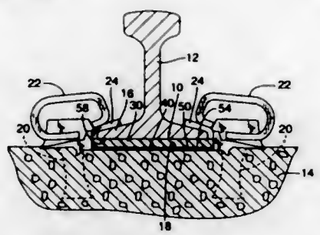
ELASTOMERIC PAD BETWEEN RAILROAD RAIL AND RAILROAD TIE

Frederick A. Kish, Wheeling; Herbert S. Golinkin, Naperville, and Daniel C. Abt, Arlington Heights, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

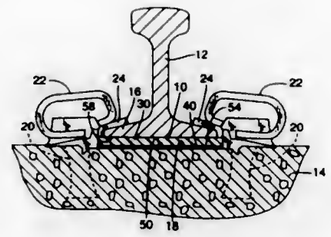
Continuation-in-part of Ser. No. 333,522, Nov. 2, 1994. This application Jun. 7, 1995, Ser. No. 472,303

Int. Cl.[6] E01B 9/62

U.S. Cl. 238—283 **20 Claims**



1. In a railroad track, a combination comprising a railroad rail having a lower flange, a railroad tie, an elastomeric pad mounted between the lower flange of the railroad rail and an upper surface of the railroad tie, the elastomeric pad being in direct contact with the lower flange of the railroad rail, and means comprising a particulate layer and an adhesive layer for bonding the elastomeric pad to the railroad tie, the particulate layer being interposed between the elastomeric pad and the railroad tie and comprising particles bonded to the elastomeric pad, the adhesive layer being interposed between the elastomeric pad and the railroad tie and bonded to particles among the bonded particles and to the railroad tie, whereby the elastomeric pad and the railroad tie are bonded to one another via the particulate and adhesive layers so as to resist relative movement between the elastomeric pad and the railroad tie, the combination permitting relative movement between the railroad rail and the elastomeric pad.



a lower surface, the upper surface underlying and being in direct contact with the lower flange of the railroad rail, means comprising a bonding layer and an adhesive layer for bonding the elastomeric pad to the railroad tie, the bonding layer being bonded to the lower surface of the elastomeric pad, the bonding layer being at least as flexible as the elastomeric pad, the adhesive layer bonded to the upper surface of the railroad tie, the bonding and adhesive layers being bonded to each other, whereby the elastomeric pad and the railroad tie are bonded to each other via the bonding and adhesive layers so as to resist relative movement between the elastomeric pad and the railroad tie, the combination permitting relative movement between the railroad rail and the elastomeric pad.

5,551,634

FUEL INJECTION NOZZLE FOR AN INTERNAL COMBUSTION ENGINE

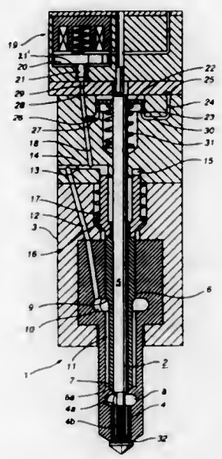
Alois Raab, Aalen; Klaus Binder, Delzisau, and Ulrich Augustin, Kernen, all of, Germany, assignors to Mercedes-Benz A.G., Stuttgart, Germany

Filed Nov. 21, 1994, Ser. No. 342,606

Claims priority, application Germany, Nov. 26, 1993, 43 40 305.0

Int. Cl.[6] F02M 41/16

U.S. Cl. 239—96 **6 Claims**



1. A fuel injection nozzle for an internal combustion engine comprising: a nozzle housing having an opening with a valve seat at one end thereof, a nozzle opening control needle disposed in said opening and being normally seated on said valve seat, said nozzle opening control needle having a body portion with axially elongated fuel discharge openings with an effective opening depending on the axial outward displacement of said nozzle opening control needle from said valve seat and a needle stem including

5,551,633

ELASTOMERIC PAD BETWEEN RAILROAD RAIL AND RAILROAD TIE

Frederick A. Kish, Wheeling, and Michael J. Rancich, Mundelein, both of Ill., assignors to Illinois Tool Works, Inc., Glenview, Ill.

Continuation-in-part of Ser. No. 333,522, Nov. 2, 1994. This application Jun. 7, 1995, Ser. No. 475,184

Int. Cl.[6] E01B 9/62

U.S. Cl. 238—283 **12 Claims**

1. In a railroad track, a combination comprising a railroad rail having a lower flange, a railroad tie, an elastomeric pad mounted between the lower flange of the railroad rail and an upper surface of the railroad tie, the elastomeric pad having an upper surface and

means for holding said nozzle opening control needle in its seated position and for limiting outward displacement thereof, a hollow nozzle needle disposed around said needle stem and forming a fuel control valve having a seating surface normally seated on a fuel control valve seat disposed in axially spaced relationship from said nozzle opening control needle body portion with a nozzle space formed between said nozzle opening control needle body portion and said fuel control valve seat, said hollow nozzle needle having, at its end opposite its seating surface, a control space, and passages in said nozzle housing for supplying fuel to said control space and to said fuel control valve, said hollow nozzle needle having a shoulder area exposed to the pressurized fuel supplied to said control valve to provide a valve lifting force thereto and means for timed release of the fuel pressure in said control space to permit lifting of said hollow nozzle needle thereby permitting pressurized fuel to enter said nozzle space and to unseat said nozzle exposing control needle for outward displacement of said body portion as limited by said limiting means for controlling the effective fuel discharge opening.

5,551,635

ADJUSTABLE SPRAY NOZZLE FOR PRESSURE WASHER

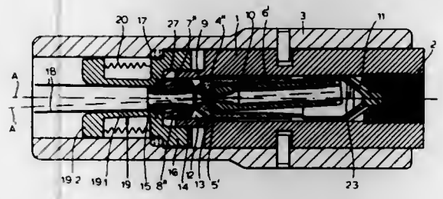
Anton Jäger, Krautgartenweg 12, D-89250 Senden, Germany

Filed Nov. 22, 1994, Ser. No. 343,103

Claims priority, application Germany, Nov. 25, 1993, 43 40 184.8

Int. Cl.[6] B05B 3/04

U.S. Cl. 239—240 **20 Claims**



1. A pressure-washer nozzle comprising:

an inner sleeve generally centered on and extending along an axis and having a rear end formed as a high-pressure liquid inlet;

an outer sleeve coaxial with and rotatable but axially nondisplaceable on the inner sleeve;

a rear nozzle body in the inner sleeve formed with a small-diameter axially throughgoing central rear passage opening at a front face of the rear nozzle body, the rear nozzle body further forming with the outer sleeve an array of outer rear passages;

a front nozzle body in the inner sleeve forward of the rear nozzle body and having a large-diameter axially throughgoing front passage coaxial with the rear passage, the front body being formed with a rear face engageable flatly with the front face of the rear nozzle body, the front body being movable axially in the inner sleeve between a front position with the faces spaced axially apart and flow possible through the inner and outer passages to the front passage and a rear position with the faces engaging each other and flow through the outer passages blocked; and

means coupling the outer sleeve with the front nozzle body for displacing the front nozzle body axially relative to the rear nozzle body between its positions on rotation of the outer sleeve relative to the inner sleeve.

5,551,636

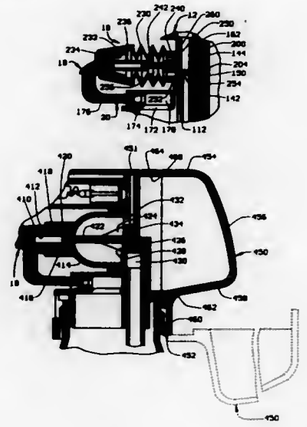
LOW COST TRIGGER SPRAYER HAVING ELASTOMERIC PUMP WITH INTERNAL GUIDE MEANS

Donald D. Foster, St. Charles, and Philip L. Nelson, Ellisville, both of Mo., assignors to Contico International, Inc., St. Louis, Mo.

Division of Ser. No. 964,158, Oct. 21, 1992, Pat. No. 5,385,302, which is a continuation-in-part of Ser. No. 603,281, Oct. 25, 1990, Pat. No. 5,234,166. This application Jan. 12, 1995, Ser. No. 371,959

Int. Cl.[6] B05B 9/043

U.S. Cl. 239—333 **20 Claims**



1. A spray dispenser for dispensing a liquid substance from a container, the dispenser comprising:

a housing having a first liquid passage extending between first and second ends;

a nozzle positioned at the first end of the first liquid passage, the nozzle having an orifice through which the liquid substance is dispensed;

a primary valve positioned at the second end of the first liquid passage, the valve being configured to permit flow through the first liquid passage in a direction from the second end to the first end and to inhibit flow through the first liquid passage in an opposite direction from the first end to the second end;

a pump having an elastomeric pump element secured to the housing for pumping the liquid substance from the container and through the orifice, the elastomeric pump element having an internal volume which varies in response to actuation of the spray dispenser, the pump element being biased toward an extended position and being sufficiently compliant to permit the pump element to assume a contracted position when a force is applied to the pump element, the internal volume being maximized when the pump element is in the extended position and minimized when the pump element is in the contracted position;

a guide positioned at least partially within the internal volume of the elastomeric pump element, the guide including a rod extending from the housing and a tubular sleeve extending from the pump and moveable therewith, the sleeve being configured to reciprocatively receive the rod extending from the housing for directing the pump element between the extended and contracted positions; and

a second liquid passage extending from the elastomeric pump element.

5,551,637

A MULTI-SPRAY SHOWER HEAD COMPRISING A MIST SPRAY AND LOCKING DEVICE

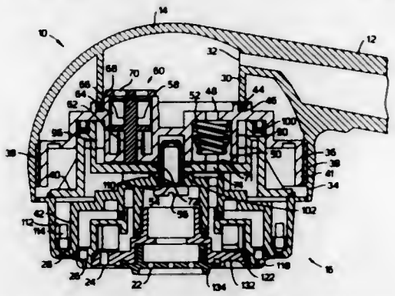
Mei K. Lo, Flat D, Floor 24, 162 Tung Lo Wan Road, Causeway Bay, Hong Kong

Filed Nov. 3, 1994, Ser. No. 335,370

Claims priority, application United Kingdom, Nov. 5, 1993, 9322825

Int. Cl.[6] B05B *1/16*

U.S. Cl. 239—394 **12 Claims**



1. A shower head having more than one spray mode including a mist spray mode, the shower head comprising:

an inlet portion including a water inlet;

means moveable relative to the inlet portion to bring selectively into register with the inlet portion a plurality of spray faces each capable of providing a different spray mode, and one of which is a spray face producing the mist spray mode; and

a locking device operable to preclude movement of the mist-producing spray face relative to the inlet portion when the mist spray mode has been selected by a user, said locking device being moveable from an unlocked position to a locked position and including gasket means for automatically placing the locking device in said locked position after selection whereby, when in the locked position, the user cannot bring any other spray face into register with the inlet portion.

5,551,638

VALVE MEMBER FOR FUEL INJECTION NOZZLES

David J. Caley, Sorrento, Australia, assignor to Orbital Engine Company (Australia) Pty. Limited, Balcatta, Australia

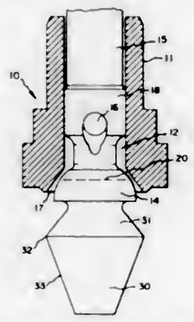
PCT No. PCT/AU93/00074, § 371 Date Jul. 19, 1994, § 102(e) Date Jul. 19, 1994, PCT Pub. No. WO93/16282, PCT Pub. Date Aug. 19, 1993

PCT Filed Feb. 17, 1993, Ser. No. 256,356

Claims priority, application Australia, Feb. 17, 1992, PL0913

Int. Cl.[6] B05B *1/32*

U.S. Cl. 239—453 **20 Claims**



1. An injector nozzle for use with a fuel injected internal combustion engine, comprising a nozzle through which fuel is delivered to an engine, said nozzle comprising a port having an internal surface and a valve member having a complimentary external surface, said valve member being movable relative to the port to respectively provide a passage therebetween for a delivery of fuel or sealed contact therebetween to prevent said delivery of fuel, wherein said valve member has a projection extending beyond the extremity of the nozzle when the valve member is in sealed contact with the port and defined by an external surface of rotation, said projection being configured and positioned such that a fuel plume established by a fuel issuing from the passage will follow a path defined by the external surface of the projection, wherein in the direction of flow of the fuel, the surface of the projection initially diverges from an axis of the valve member and then converges towards the axis thereof wherein at least a substantial part of the convergent portion of the projection has an included angle of less than about 50°.

5,551,639

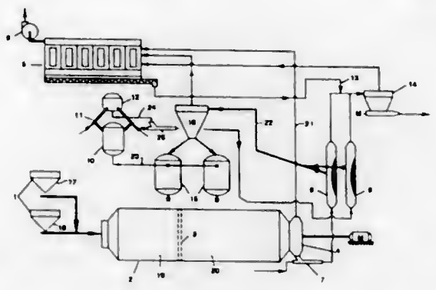
METHOD AND APPARATUS FOR SOLID MATERIAL GRINDING

Vladimir K. Artemjev, Moscow, Russian Federation, and Amando J. Garcia-Segovia, San Pedro Garza Garcia, Mexico, assignors to Standart 90, Moscow, U.S.S.R., and Cementos Mexicanos, S.A., Monterrey, Mexico

Continuation of Ser. No. 196,902, Feb. 15, 1994, abandoned, which is a continuation of Ser. No. 802,946, Dec. 6, 1991, abandoned. This application Sep. 28, 1994, Ser. No. 314,450

Int. Cl.[6] B02C *23/12;23/14*

U.S. Cl. 241—5 **2 Claims**



1. Process for decreasing energy consumption in a ball mill during crushing and fine grinding of solid materials by means of a multipurpose grinding apparatus which performs preliminary grinding of material within a ball mill and fine grinding within a Jet mill comprising:

(a) feeding solid material into the ball mill:

(b) preliminarily grinding said material within at least one chamber of said ball mill, which said ball mill contains a reduced ball charge relative to a charge of balls otherwise needed to complete grinding if done wholly in the ball mill, to give a preground material;

(c) feeding at least a portion of said preground material by pneumatic means from said ball mill into a ballistic classifier of said jet mill;

(d) classifying said fed portion of said preground material into a final product having a specified fineness quality and into a relatively coarser product which requires further grinding;

e) delivering said relatively coarser product from said classifier into a cyclone;

(f) transporting said final product from said ballistic classifier for ultimate collection;

(g) precipitating within said cyclone finer particles of said relatively coarser product;

(h) recovering and transporting for ultimate collection the fine particles qualifying as final product from the cyclone thus separating them from relatively coarser particles in the cyclone;

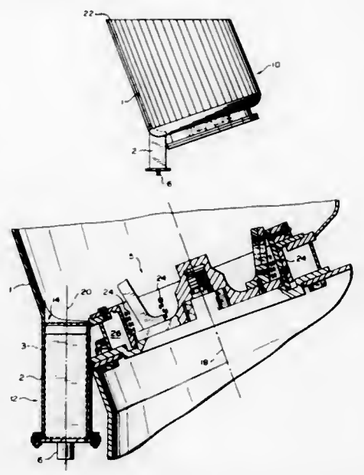
(i) delivering the relatively coarser particles from the cyclone into chamber pumps of said jet mill;

(j) from said chamber pumps aerating the relatively coarser particles therein and delivering the relatively coarser particles under high pressure and high velocity in at least two converging streams inside a grinding chamber of said jet mill to produce a fine finish ground material;

(k) submitting the fine finish ground material from said jet mill grinding chamber to secondary classification within another ballistic classifier of said jet mill;

(l) transporting for ultimate collection the fine finish ground material qualifying as final product obtained by secondary classification; and

(m) recycling to said jet mill relatively coarse fine finish ground material obtained by the secondary classification.



5,551,640

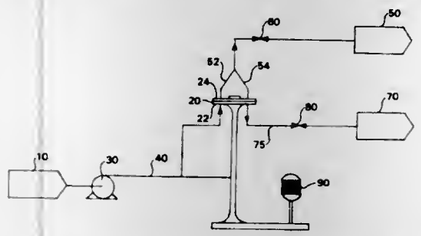
METHOD OF CONCENTRATING FINE COAL SLURRIES

Marcus E. Rajchel, 12803 West 84th Pl., Arvada, Colo. 80005

Filed May 12, 1995, Ser. No. 439,871

Int. Cl.[6] B02C *19/00;23/08*

U.S. Cl. 241—21 **24 Claims**



1. A method for concentrating a slurry comprising coal fines having an average particle diameter of 250 microns or less, comprising:

a) feeding said slurry to a liquid-permeable membrane having a permeate side and a product side, and having a pore size between about 0.1 and about 250 microns;

b) providing a high rate of shear flow parallel to said membrane;

c) pulsing said flow parallel to said membrane to reduce buildup of coal fines on said membrane;

d) removing liquid from said permeate side at a rate permitting flow of product from said product side;

e) recovering concentrated slurry from said product side.

5,551,641

NON-PULPABLES COLLECTION CHAMBER WITH REMOVABLE BASKET FOR SOLID WASTE PULPERS

William K. Upton, III, Chester, Md.; William E. Schneider, White Pine, Tenn.; Stuart H. Brown, Severna Park, Md.; Steven A. Stetz, Stevensville, Md.; Emily J. Gotich, Crofton, Md., and Jack L. McCrea, Pittsburgh, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 30, 1994, Ser. No. 312,948

Int. Cl.[6] B02C *23/36*

U.S. Cl. 241—46.17 **11 Claims**

1. A pulper, comprising:

a pulping chamber having a pulping mechanism for processing pulpable material into a pulp; and

a collection chamber attached to a bottom of said pulping chamber below a top of said pulping mechanism in an annular area outside of said pulping mechanism for collecting non-pulpable material,

wherein said collection chamber comprises:

a container having openings at first and second ends,

a basket having an opening at a first end and disposed inside the container wherein at least a bottom portion of the basket includes perforations, said bottom portion being positioned proximate said second end of said container, and

a pipe connection located at said second end of said container for permitting a fluid to flow upward into said container and via said perforations into said basket to prevent pulp from settling into collection chamber,

wherein said first end of said container is inserted into said pulping chamber in said annular area outside of said pulping mechanism and is attached thereto.

5,551,642

ELECTROSTATIC DISPERSING APPARATUS

John P. Dunn, Hammondsport, N.Y., assignor to Advanced Electrostatic Technologies, Inc., Hammondsport, N.Y.

Continuation-in-part of Ser. No. 924,897, Aug. 4, 1992, abandoned. This application Nov. 17, 1993, Ser. No. 153,589

Int. Cl.[6] B02C *19/00*

U.S. Cl. 241—47 **9 Claims**

1. An electrostatic particle oscillator for dispersing and comminuting articles comprising:

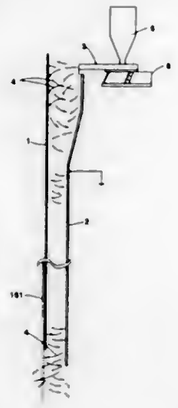
a) a source of direct potential having first and second terminals;

b) an electrode connected to said first terminal;

c) an electrode connected to said second terminal; and

d) means for feeding particles to a transfer point located between said electrodes such that said particles disperse and oscillate between said electrodes;

wherein the length of one of said electrodes can be adjusted to control the charge of the dispersed particles exiting the apparatus.

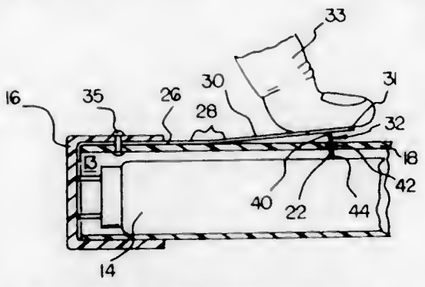


5,551,643

FLUORESCENT TUBE BREAKER APPARATUS

Michael Chapin, 14673 SE Sterling Ct., Clackamas, Oreg. 97015-8292

Filed Sep. 8, 1995, Ser. No. 524,992
Int. Cl.[6] B02C *19/14*
U.S. Cl. 241—99 **9 Claims**



1. A fluorescent tube breaker apparatus, comprising:

a housing assembly which defines a bulb-receiving chamber for receiving a fluorescent tube, wherein said housing assembly includes a first end portion, a body portion connected to said first end portion, and a second end portion connected to said body portion, wherein said second end portion is selectively removable and replaceable with respect to said body portion, and wherein said body portion includes a spike-receiver aperture,

a tube breaker assembly connected to said housing assembly, wherein said tube breaker assembly includes a housing-connection portion connected to said housing assembly, a hinge portion connected to said housing-connection portion, a lever portion connected to said hinge portion, and a spike portion connected to said lever portion, wherein said spike portion projects from said lever portion and is in registration with said spike-receiver aperture of said body portion of said housing assembly, wherein said spike portion includes a connected end which is connected to said lever portion of said tube breaker assembly, a main body connected to said connected end, and a free tip end connected to said main body, and

spring means, positioned between said lever portion of said tube breaker assembly and said body portion of said housing assembly, for normally positioning said lever portion with respect to said body portion such that said main body of said spike portion is normally positioned outside of said bulb-receiving chamber.

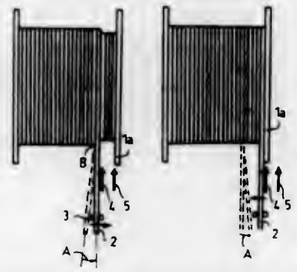
5,551,644

METHOD OF AND A DEVICE FOR WINDING A WIRE-LIKE PRODUCT ON A FLANGED REEL

Gustaf Linderoth, Enköping, Sweden, assignor to Nokia-Maillefer Oy, Finland

PCT No. PCT/FI93/00034, § 371 Date Aug. 23, 1994, § 102(e) Date Aug. 23, 1994, PCT Pub. No. WO93/15991, PCT Pub. Date Aug. 19, 1993
PCT Filed Feb. 10, 1993, Ser. No. 284,651
Claims priority, application Sweden, Feb. 12, 1992, 9200412
Int. Cl.[6] B65H *57/28;54/00*
U.S. Cl. 242—158.4 R **9 Claims**

1. In a method of winding a cable on a flanged reel of a winding



machine including providing a reel having at least one flange and rotatably supported on a support structure; winding the cable onto the reel to form superimposed layers of adjacent cable turns between said at least one flange on the reel by a guide structure; displacing the support structure and the guide structure relative to each other with a pitch corresponding to a thickness of the cable per one cable turn; winding the cable on the reel at a first lag angle with respect to a point on the reel at which the cable runs beside a previously wound and adjacent cable turn on the reel; and changing the first lag angle to a zero lag angle and then to a second lag angle opposite said first lag angle when another cable turn contacts the reel flange; the improvement comprising:

changing the lag angle to zero before said another cable turn contacts the reel flange.

5. A winding machine for winding a cable on a flanged reel comprising:

a reel mounted on a support structure for rotation about an axis of the reel, said reel having flanges at opposite ends thereof;

a cable guide for passing the cable onto the reel to form superimposed layers of adjacent cable turns wound between said flanges;

displacement means for displacing the support structure and reel relative to said cable guide in a first direction of movement at a pitch corresponding to a thickness of the cable per one cable turn, and at a first lag angle with respect to a point on the reel at which the cable runs beside a previously wound and adjacent cable turn on the reel;

first detector means for sensing one of said flanges and for reversing said first direction of movement of said support structure and reel when another cable turn contacts said one flange; and

second detector means for sensing said one of said flanges and for changing said lag angle to zero before said first detector means reverses said first direction of movement.

5,551,645

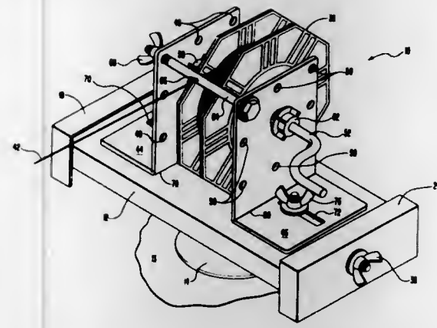
FISHING ROD REEL RESPOOLING DEVICE

Lawrence J. Torvund, 525 Park Blvd. #49, Ogden, Utah 84404

Filed May 19, 1995, Ser. No. 444,568
Int. Cl.[6] B65H *75/30*
U.S. Cl. 242—395 **20 Claims**

1. A spooling device for dispensing and taking up a quantity of a line comprising:

(a) a support plate including:



(1) means for attaching said support plate to a mounting surface; and

(2) means for adjustably stabilizing a plane of said support plate into a position that is parallel to a plane of said mounting surface;

(b) a first bracket mounted by a first base plate to said support plate and having a first upright end plate with a bearing surface thereon;

(c) a second bracket mounted by a second base plate to said support plate and having a second upright end plate with a bearing surface thereon opposing the bearing surface of the first upright end plate;

(d) means for adjusting the distance between the opposing bearing surfaces of said first and second upright end plates by adjusting the position of at least one of the first and second base plates on the support plate;

(e) a spool having opposing flanges rotatably carried between the opposing bearing surfaces of said first and second upright end plates;

(f) a supply of line disposed between the opposing flanges of said spool and adapted to be withdrawn from and taken up upon said spool as said spool rotates; and

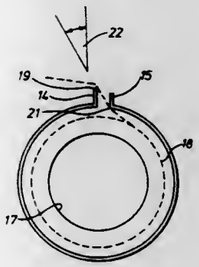
(g) adjustable means for operably coupling said spool and said first and second brackets.

5,551,646

RIBBON CURLING AND RIBBON SPLITTING DEVICE

Fredric Goldstein, Värmdövägen 207, 13141 Nacka, Sweden

PCT No. PCT/EP92/02138, § 371 Date May 13, 1994, § 102(e) Date May 13, 1994, PCT Pub. No. WO93/05932, PCT Pub. Date Jan. 4, 1993
PCT Filed Sep. 16, 1992, Ser. No. 211,026
Claims priority, application United Kingdom, Sep. 17, 1991, 9119782; Sep. 27, 1991, 9120570; Jul. 10, 1992, 9214747
Int. Cl.[6] B26B *27/00;* **B65H** *35/00;35/02*
U.S. Cl. 242—419 **32 Claims**



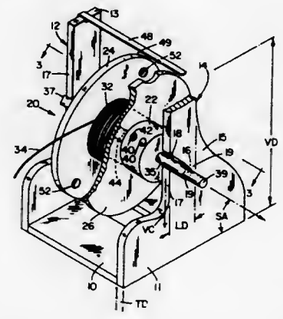
1. A ribbon curling device (**13**, **110**) adapted to be used with a spool (**11**, **116**) or reel of gift wrapping ribbon, said spool or reel being rotatable about an axis, the device being engageable with the spool such that the spool rotates in use relative to the device, and the device defining a ribbon exit pathway generally radially of the spool, ribbon guiding means (**21**, **121**) disposed adjacent the pathway, and a ribbon curling edge disposed downstream of said ribbon guiding means, whereby a length of ribbon is curled on being drawn from said spool and against said ribbon curling edge, said ribbon guiding means ensuring a substantially constant approach angle of ribbon to said edge (**19**, **47**, **115**).

5,551,647

CABLE STORAGE AND FEEDING DEVICE

Thomas D. Browning, 222 V A Ave., Norton, Va. 24273

Continuation-in-part of Ser. No. 553,612, Jul. 18, 1990, abandoned, Ser. No. 650,284, Feb. 4, 1991, abandoned, and Ser. No. 10,490, Jan. 28, 1993, abandoned. This application Jun. 10, 1994, Ser. No. 258,656
Int. Cl.[6] B65H *75/24*
U.S. Cl. 242—578.2 **17 Claims**



1. A portable storage and feeding device for coiled cable items, comprising a base adapted to be placed on a floor, a pair of spaced apart stanchion members each being affixed to said base and extending generally normally upwardly therefrom and formed to have a lower section adjacent said base, an upper section spaced above said base, and an intermediate section lying between said lower and upper sections, said intermediate section of each of said stanchion members having a lateral dimension, a vertical dimension and a thickness dimension and having a front edge through which a slot is formed having a lateral component and a vertical component, said lateral component being directed inwardly from said edge and said vertical component being directed downwardly toward said base to give a designed slant angle to each said slot with respect to said base of from about 20° to about 60°, the portions of each of said stanchion members which form and provide said slots further provide a shoulder means at the terminus of each said slot lying substantially in a common plane passing through both said stanchion members at said terminus, spool means for carrying said cable items coiled thereon and having elongated hub means of substantially uniform lateral cross-section and having a longitudinal axis, first rim means, at least one second rim means having aperture means formed generally axially therethrough, said first and second rim means being mounted in spaced arrangement on said hub means with said hub means being inserted through said aperture means of said second rim means, said first

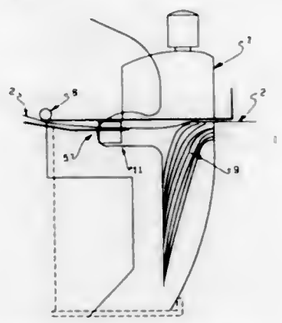
and second rim means being adapted to axially position and retain cable items in coiled configuration around said hub means, said aperture means being bordered by bearing surface means for slidably mounting said second rim means on said hub means for providing for longitudinal positioning thereof on said hub means, said upper section of each of said stanchion members being spaced above said base a distance greater than the largest diameter of said first and second rim means, said base and stanchion members providing a supporting structure for said spool means, axle means slidably mounted through bore means provided substantially longitudinally and axially through said spool means for rotatably supporting said spool means, said first rim means being stationarily affixed on said hub means, cooperating latch means on said second rim means and hub means for removably locking said second rim means to said hub means at a desired longitudinal axial position therealong with respect to said first rim means for confining therebetween a coiled cable item axially mounted on said hub means, said shoulder means of said slots contacting opposite end portions of said axle means which extend axially outwardly of both said rim means and support said axle means and said spool means for rotational motion of said spool means for uncoiling and dispensing said coiled cable item, handle means affixed to said upper section of each of said stanchion members and spanning the same and being positioned above said first and second rim means to provide a clearance space, said handle means providing manual lifting means for said device, and wherein said slant angles of said slots are substantially the same and have a sufficient lateral component to allow said axle means and said spool means to be operably positioned on said stanchion members or removed therefrom within the limits of said clearance space and without interference with said handle means, said lateral dimension of said intermediate section of each said stanchion member being sufficient to accommodate the slot formed therein while providing sufficient strength to said stanchion members for allowing said device with a loaded spool mounted thereon to be picked up hy said handle means.

5,551,648

PRESSURE PLATE POSITIONER FOR A TAPE DISPENSER

Sam B. Vodoor, Parlin, and Jonathan Rivlin, Easy Brunswick, both of N.J., assignors to Central Products Company, Manasha, Wis.

Filed Sep. 30, 1994, Ser. No. 316,601
Int. Cl.[6] B65H *23/04*; **B05C** *1/06*;*11/00*
U.S. Cl. 242—615.3 **16 Claims**



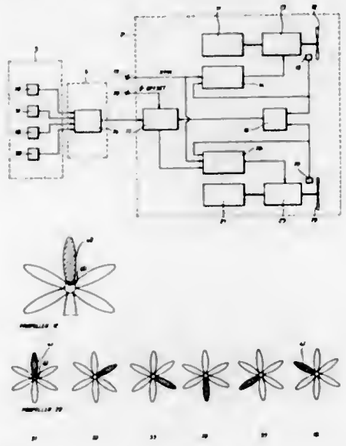
1. The combination of a tape dispensing machine which includes an exit chute and a pressure plate assembly, and a pressure plate positioner comprising at least one support member positioned upon the chute and having a center section which spans the width of the pressure plate assembly for providing an upward force on the pressure plate assembly and a gap between the pressure plate and the chute to reduce the frictional force on any tape which passes therebetween to prevent jamming of the tape during dispensing.

5,551,649

PROPELLER BLADE POSITION CONTROLLER

Dick Kaptein, Alphen A/D Rijn, Netherlands, assignor to Fokker Aircraft B.V., Schiphol, Netherlands

Continuation-in-part of Ser. No. 866,563, Apr. 10, 1992, Pat. No. 5,295,641, which is a continuation of Ser. No. 600,445, Oct. 19, 1990, Pat. No. 5,150,855. This application Jan. 18, 1994, Ser. No. 184,752
Claims priority, application United Kingdom, Oct. 20, 1989, 8923643
Int. Cl.[6] B64D *31/12*
U.S. Cl. 244—1 N **10 Claims**



1. A system for reducing vibrations in the cabin of an aircraft driven by two or more propellers each having n blades, n being an integer equal to or larger than 2, and having a relative, adjustable phase angle between one and another of a pair of said propellers, said system comprising:

a) a synchrophase system for adjusting said relative phase angle such that a predetermined relative phase angle is maintained;

b) a vibration-level detecter to supply vibration level related information from one or more positions within said cabin, and to generate a corresponding vibration level signal;

c) a control unit for supplying an error signal to said synchrophase system in response to said vibration level said error signal causing said synchrophase means to adjust an initial predetermined relative phase angle to a new predetermined relative phase angle providing a reduced vibration level, said new relative phase angle differing by m.(2π/n) radians (m being an integer) from said initial predetermined relative phase angle;

d) for each said propeller of said pair of propellers, at least one recognizing mark identifying one propeller blade and distinguising said one propeller blade from other blades on said each propeller; and

e) a respective sensor for detecting each said recognizing mark, said sensor being connected to said control unit to send a blade detection signal to said control unit upon passing of said recognizing mark past each said respective sensor;

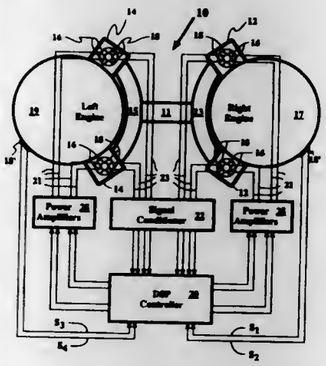
whereby said blade detection signal can be used to relate said predetermined relative phase angles to an absolute phase angle between said one propeller blades of said pair of propellers distinguished by one said recognizing mark.

5,551,650

ACTIVE MOUNTS FOR AIRCRAFT ENGINES

Steve C. Southward, and Douglas E. Ivers, both of Cary, N.C., assignors to Lord Corporation, Erie, Pa.

Filed Jun. 16, 1994, Ser. No. 260,945
Int. Cl.[6] B64D *27/00*
U.S. Cl. 244—54 **11 Claims**



1. A system for minimizing vibration transmitted from a plurality of power plants, including a first power plant operating at a frequency N_{1R} and a second power plant operating at a frequency N_{1L}, where N_{1R} and N_{1L} are equal or nearly equal, into a passenger compartment of an aircraft, said system comprising

a) a first active mount securing a first of said power plants to a first portion of an aircraft structure, said first active mount including first actuator means;

b) a second active mount securing a second of said power plants to a second portion of said aircraft structure, said second active mount including second actuator means;

c) first sensor means mounted proximate said first power plant for detecting vibration induced by said first power plant and for producing a first signal representative thereof, said first sensor means being spaced sufficiently far away from said second power plant to minimize an influence of N_{1L} on said first signal;

d) second sensor means mounted proximate s aid second power plant for detecting vibration induced by said second power plant and for producing a second signal representative thereof, said second sensor means being spaced sufficiently far away from said first power plant to minimize an influence of N_{1R} on said second signal;

e) signal processing means for converting said first and second representative signals into first and second control signals for said first and second actuator means of said first and second active mounts, respectively;

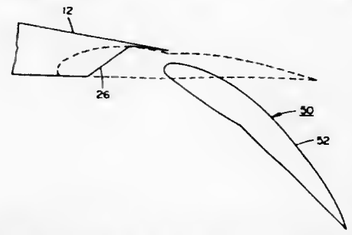
whereby said first and second sensor means are positioned so as to decouple the response of said actuators to their respective first and second representative signals.

5,551,651

HIGH LIFT OUT-OF-CONTOUR FLAP FOR AIRCRAFT WING

Ronald H. Hendrickson, Smithtown, N.Y., assignor to Grumman Aerospace Corporation, Los Angeles, Calif.

Filed Aug. 11, 1994, Ser. No. 288,996
Int. Cl.[6] B64C *9/16*
U.S. Cl. 244—215 **39 Claims**



1. A wing assembly for an aircraft, comprising:

a) main airfoil having a leading edge, a trailing edge, and upper and lower surfaces extending between said leading and trailing edges;

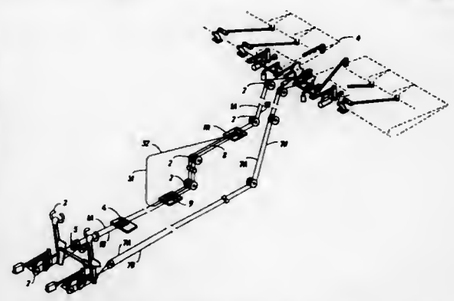
b) lift augmenting means for said wing assembly, said lift augmenting means comprising a trailing edge flap articulate to the trailing edge of said main airfoil, said flap having a leading edge, a trailing edge, and upper and lower surfaces extending between said leading and trailing edges, said flap upper surface having a smooth continuous curvature forming a distributed camber extending from the flap leading edge to the flap trailing edge thereby forming a raised out-of-contour shape relative to the upper airfoil surface upon said flap being stowed in said main airfoil and forming a continuous aerodynamic surface in deployed positions of said flap so as to enhance the lifting efficacy of said flap.

5,551,652

STANDBY CONTROL SYSTEM

Teunes Verhoeven, Long Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Mar. 28, 1994, Ser. No. 219,675
Int. Cl.[6] B64C *13/30*
U.S. Cl. 244—220 **12 Claims**



1. In a control system utilizing at least one means for actuation of an element of said control system, an actuation means failure recovery system comprising:

a. sensing means adapted for generating a bypass signal on sensing a failure of said actuating means,

b. bypass means for bypassing the actuating means,

c. at least one apparatus adapted for selectively operating said bypass means adapted for receiving said bypass signal from said sensing means when in a bypass status and coupled to said control system, and

d. means for selectively biasing said bypass means into a standby status until failure of said actuating means is sensed.

5,551,653

METHOD AND DEVICE FOR THE RADIO-FREQUENCY CONNECTION OF ACTIVE SUBSECTIONS OF A RADIO-FREQUENCY TRANSMISSION SYSTEM

Eberhard Friebe; Matthias Moritz, and Sepp Schoenbacher, all of Berlin, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

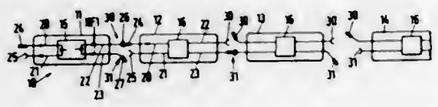
PCT No. PCT/DE93/00285, § 371 Date Aug. 4, 1994, § 102(e) Date Aug. 4, 1994, PCT Pub. No. WO93/19966, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 26, 1993, Ser. No. 284,530

Claims priority, application Germany, Apr. 2, 1992, 42 11 377.6

Int. Cl.[6] B61L *23/00*

U.S. Cl. 246—167 R **7 Claims**



2. Radio-frequency transmission system comprising a plurality of active subsections, and a plurality of vehicles connectable with each other in a vehicle unit, wherein each of said vehicles contains one and only one of said active subjections, said active subsections comprise a first subsection and at least one other section; said first subsection includes a head station containing means for transmitting a first radio-frequency signal in a transmission direction, two radio-frequency cables connected electrically to the head section and plug-connector elements connected to the two radio-frequency cables and located at opposite ends of the vehicle in which the first subsection is located; the at least one other subsection comprises two radio-frequency cables, an amplifier having an output and an input and connected in one of said two radio-frequency cables and plug-connector elements connected to the radio-frequency cables located at opposite ends of the vehicle in which the amplifier is located, so that the first radio-frequency signal (HF1) is transmitted to the at least one other subsection when the plug-connector elements are connected with each other, wherein said device comprises:

a vehicle station (**16**) in each of said vehicles (**12,13**) containing said at least one other subsection and not in said vehicle containing said first subsection, said vehicle station (**16**) comprising

means for producing a second radio-frequency signal (HF2) transmitted in a direction opposite to the transmission direction of the first radio-frequency signal (HF1);

a first detector (**42**) for identifying a presence of the first radio-frequency signal (HF1) at at least one of the plug-connector elements;

a second detector (**44**) for identifying a presence of the second radio-frequency signal (HF2) at at least one of the plug-connector elements;

switching means (**40**) for making connections between the plug-connector elements (**30,31**) and the amplifier (**41**) of the vehicle in which the vehicle station is located; and

time-sequence controller means (**43**) for controlling the switching means (**40**) so as to connect the input of the amplifier (**41**) with the at least one plug-connector element at which the presence of the first radio-frequency signal (HF1) is detected by the first detector (**42**) and the output of the amplifier (**41**) with the at least one plug-connector element at which the presence of the second radio-frequency signal (HF2) is detected by the second detector (**44**).

5,551,654

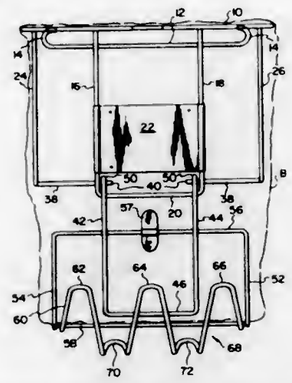
COLLAPSIBLE SUPPORT STRUCTURE FOR FLEXIBLE BAGS

Francis B. McNerney, Richmond Hill, Canada, assignor to Extrufix Inc., Pefferlaw, Canada

Filed Mar. 24, 1995, Ser. No. 410,295

Int. Cl.[6] B65B *67/04*

U.S. Cl. 248—99 **9 Claims**



1. A supporting structure for flexible containers comprising:

a first body member including:

retaining means for retaining an open mouth of a flexible container open under tension;

means for restraining lateral movement of the flexible container mounted in said structure;

first rear frame means for supporting and mounting said first body member;

a second body member pivotally connected to said first body member, said second body member after their width including:

moveable flexible container bottom supporting means for supporting the bottom of said flexible container, said bottom supporting means including second rear frame means movably mounted to said first body member for movement from a flexible container supporting position to a collapsed position; and

second lateral restraint means for restraining lateral movement of said flexible container bottom.

5,551,655

PORTABLE TRIPOD

Yossef Berger, Yuvalim, Israel, assignor to The State of Israel, Ministry of Defence, Rafael Armament Development Authority, Tel-Aviv, Israel

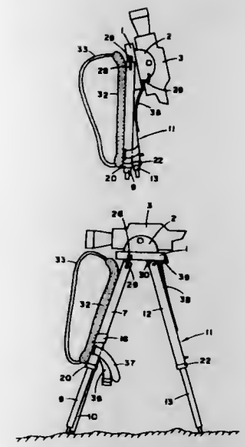
Filed Sep. 10, 1993, Ser. No. 120,276

Claims priority, application Israel, Sep. 18, 1992, 103212

Int. Cl.[6] F16M *11/38*

U.S. Cl. 248—168 **4 Claims**

1. A portable tripod comprising a head portion; first, second and third telescopic legs hinged to said head portion, each telescoping leg having a fixed tubular leg member and at least one telescoping leg member slidably mounted therein, the fixed tubular leg members of said first and second legs being interconnected by telescoping bracing means hingedly linked to said fixed tubular leg members to form a leg assembly of the first and second legs; back packing means coupled to said leg assembly on a side facing away from the third leg to enable a tripod bearer to carry the tripod on a bearer's back; means for pivotally coupling each of the first and second legs to said head portion such that each of said first and second legs has two degrees of freedom for swinging in two planes normal to each other so that said first and second legs of the leg assembly are swingable between a collapsed position and a spread



position and said head portion is swingable between a collapsed non-operating position to be carried on the bearer's back by said backpacking means and an erected operating position to be supported on said first, second and third telescopic legs; and spring means connected to the fixed tubular leg member of the third telescopic leg and having an end portion for engaging said head portion when said head portion is in said erected operating position to prevent said head portion from spontaneously moving to said collapsed non-operating position thereof.

5,551,656

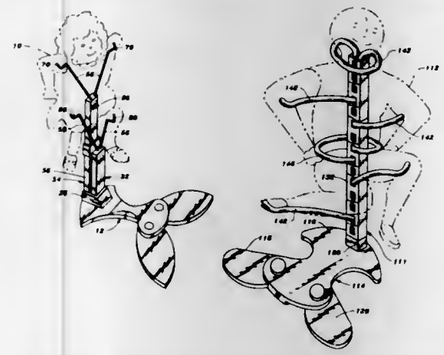
APPARATUS FOR SUPPORTING AND DISPLAYING A DOLL

Rudy De Lozada, 777 Arguello Boulevard, San Francisco, Calif. 94118, and Waldemaan Dreher, 5261 Milton Ranch Rd., Shingle Springs, Calif. 95682

Filed Oct. 20, 1994, Ser. No. 326,723

Int. Cl.[6] F16M *11/00*

U.S. Cl. 248—176.1 **17 Claims**



1. Apparatus for supporting and displaying a doll, said apparatus comprising, in combination:

base means for positioning on a support surface;

column means for connecting to said base means whereby said column means extends upwardly from said base means and is stabilized relative to said support surface by said base means, said column means having a column means distal end and defining a plurality of recesses at said column means distal end;

a plurality of elongated support elements selectively positionable in said plurality of recesses, said elongated support elements having attachment ends positionable in the plurality of recesses and outer ends spaced from said attachment ends; and

doll engagement means connected to said elongated support elements for engaging a doll at spaced locations on said doll to support and display the doll when the attachment ends of said elongated support elements are positioned in said plurality of recesses at said column means distal end.

5,551,657

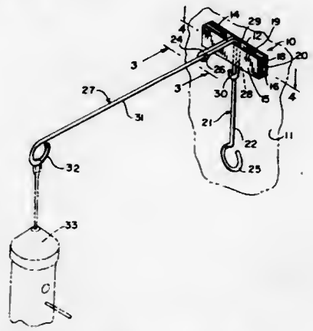
WINDOW ATTACHED MOUNTING BRACKET

Frederic J. Liethen, P.O. Box 296, Appleton, Wis. 54912

Filed Feb. 14, 1995, Ser. No. 388,288

Int. Cl.[6] A44B *11/18*

U.S. Cl. 248—205.2 **6 Claims**



1. A mounting bracket for demountable attachment to a flat vertical surface comprising:

a backing strip having a rear face adapted to be adhesively secured to the surface and a front face having secured thereto a first layer of a two layer book and loop type fastening material;

a mounting plate having a rear face to which is secured a second layer of said two layer book and loop material;

a support arm operatively joined at one end to said mounting plate and extending generally horizontally from the surface; and,

a bearing arm having an upper end attached to said mounting plate and extending vertically downwardly to a lower end below the mounting plate, said bearing arm having bearing means on said lower end for engaging the vertical surface when said mounting plate is secured to said backing strip with said fastening material layers.

5,551,658

PROJECTOR LIFT SYSTEM

Jay S. Dittmer, Burnsville, Minn., assignor to Chief Manufacturing, Inc., Burnsville, Minn.

Filed Aug. 15, 1994, Ser. No. 290,689

Int. Cl.[6] A47F *5/00*

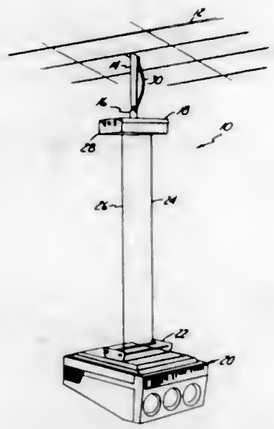
U.S. Cl. 248—329 **22 Claims**

1. A ceiling mounted projector lift system for moving audio/visual equipment between an operating position fixed rigidly to the ceiling and a lowered position, comprising:

a housing rigidly suspended below the ceiling;

a motorized winch assembly mounted in the housing for winding and unwinding a cable;

an equipment mounting member connected to the cable, the mounting member adapted to connect to the audio/visual equipment; and



a releasable fastener for rigidly connecting the housing to the equipment mounting member so that the audio/visual equipment is rigidly retainable by the releasable fasteners when in the operating position.

5,551,659

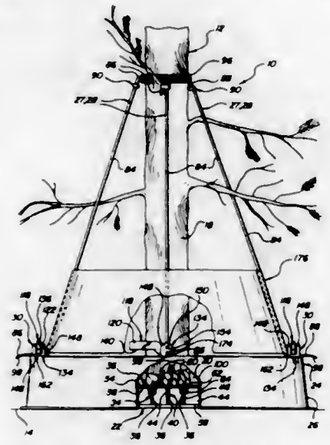
TREE STAND

Hugh M. Sofy, Troy, Mich., assignor to HMS Manufacturing Company, Troy, Mich.

Filed Jul. 5, 1994, Ser. No. 271,060

Int. Cl.[6] F16M *13/00*

U.S. Cl. 248—523 **5 Claims**



5. An assembly (**10**) for holding a tree (**12**) in an upright position above a level surface (**14**) while holding a trunk end (**16**) of the tree (**12**) submerged in a quantity of water (**20**), said assembly comprising:

a base (**22**) for supporting the trunk end (**16**) over an extended area to resist tipping;

a plurality of diagonally-extending guy elements (**28**) for engaging the tree (**12**) at an elevated position above the trunk end (**16**) and resisting tree-tipping forces;

a rim (**24**) for holding a quantity of water (**20**) on said base means (**22**) and in contact with the trunk end (**16**);

a central retainer (**34**) for holding the trunk end (**16**) centrally on said base means (**22**); and

characterized by water-permeable back-up retainer (**32**) fixed to said base means (**22**) and disposed between said central retainer means (**34**) and said rim means (**24**) for preventing the trunk end (**16**) from sliding or twisting past said back-up retainer means (**32**) while allowing the quantity of water (**20**) to flow to the trunk end (**16**).

5,551,660

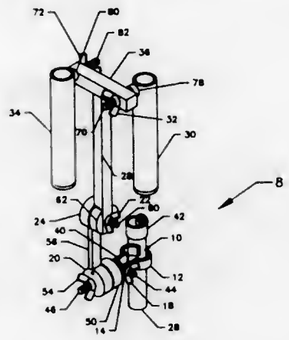
DRUM STICK HOLDER

Kenneth L. Leduchowski, 17676 Cameron St. Apt. 1, Huntington Beach, Calif. 92647

Filed Mar. 24, 1994, Ser. No. 216,803

Int. Cl.[6] E04G *3/00*

U.S. Cl. 248—176.1 **12 Claims**



1. A holder for drumsticks comprising;

a. a clamp for attaching said holder to a longitudinally elongated stanchion,

b. a first pivotable arm,

c. a first releasably clampable pivotable joint fastened between said clamp and said first pivotable arm, said pivotable joint allowing pivotable motion of said first arm in a first plane parallel to the longitudinal axis of said stanchion,

d. a second pivotable arm,

e. a second releasably clampable pivotable joint fastened between said first and second pivotable arms, said second pivotable joint allowing pivotable motion of said second second pivotable joint allowing pivotable motion of said second arm in a second plane parallel to said second arm, the respective pivot axes of said first and second pivotable joints being mutually perpendicular,

f. at least one drumstick retaining means attached to said second pivotable arm for releasably retaining a drumstick on said second pivotable arm, and

g. a longitudinally elongated cross arm portion disposed transversely across an end portion of said second pivotable arm opposite said second pivotable joint, said cross arm being interposed between said second pivotable arm and at least one drumstick retaining means, the latter being attached to a first longitudinal outer end portion of said cross arm.

5,551,661

AUTOMOTIVE TRANSMISSION MOUNT

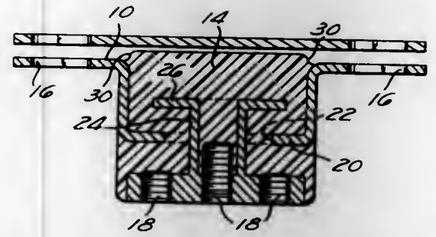
Donald D. Bunker, 28182 Palmada, Mission Viejo, Calif. 92692

Filed Oct. 11, 1994, Ser. No. 322,091

Int. Cl.[6] F16M *13/00*

U.S. Cl. 248—634 **15 Claims**

1. An automotive transmission mount comprising:



a) a top plate configured for attachment to a transmission housing and defining top and bottom surfaces;

b) a bottom plate configured for attachment to a vehicle frame, the bottom plate being interlocked with the top plate to prevent separation of the bottom plate from the top plate; and

c) a resilient material disposed between said top plate and said bottom plate and including an upwardly extending portion which protrudes beyond the top surface of the top plate.

5,551,662

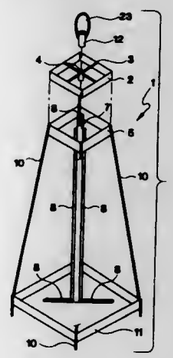
STONE POST GUIDE SYSTEM

Paul A. Keady, P.O. Box 242, Schurz, Nev. 89427

Filed Oct. 17, 1995, Ser. No. 543,927

Int. Cl.[6] E04G *13/02*

U.S. Cl. 249—51 **7 Claims**



1. A stone post guide system comprising:

a jig having at least two pair of legs,

a first collar attached adjacent to one end of said legs,

a second collar attached adjacent to another end of said legs,

a third collar which slips over said first collar,

said legs are attached to said first collar and extending downward to and past said second collar,

a pipe having external threads on one end,

a cylinder open at both ends, and having no threads,

said cylinder being attached in the center of said third collar, and having at least a portion of said pipe protrude through said cylinder,

L-shaped bars attached to an external surface of said pipe,

whereby said legs may be driven into the ground to level said stone post guide system, and said legs may be used as a guide for laying stone to form a stone post.

5,551,663

PLASTIC MOLDS FOR OPHTHALMIC DEVICES AND METHODS FOR FORMING SAME

Young C. Bae, Seoul, Rep. of Korea; Fredric J. Lim, Fremont; Thomas B. Ottoboni, Belmont, and David S. Soane, Piedmont, all of Calif., assignors to Soane Technologies, Inc., Hayward, Calif.

Filed Sep. 20, 1994, Ser. No. 309,998

Int. Cl.[6] B29C *33/62*

U.S. Cl. 249—115 **6 Claims**

1. A mold for forming ophthamlic devices comprising one or more plastic pieces defining a shape of the device to be molded and a coating, wherein said coating, comprises:

I: ten to fifty parts of polyacryloylated alkane polyols, said alkane polyols containing up to about twenty carbon atoms and an average of at least three O-acryloyl groups; and

II: twenty to eighty parts of alkane polyols, said alkane polyols containing up to about twenty carbon atoms and an average of at least three O-(acryloyl-(polyalkylene oxide)) chains; wherein each of said polyalkylene oxide chains comprise from one to twenty alkylene oxide groups.

5,551,664

PILOT CONTROLLED VALVE FOR MOTOR VEHICLE TANK SYSTEMS

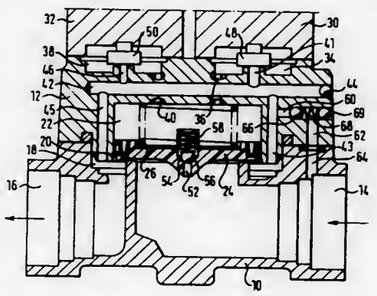
Harald Böke, Kalldorf, Germany, assignor to Burkert Werke GmbH & Co., Germany

Filed Sep. 15, 1994, Ser. No. 305,313

Claims priority, application Germany, Sep. 16, 1993, 43 31 568.2

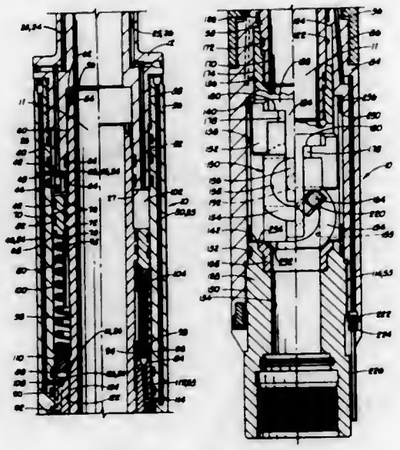
Int. Cl.[6] F16K *31/12*

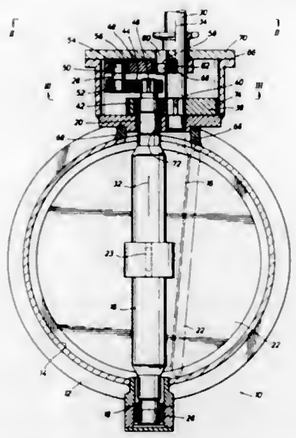
U.S. Cl. 251—30.03 **16 Claims**



1. A pilot controlled valve for fuel dispensers for motor vehicles, comprising a valve body in which an inlet duct, an outlet duct, an annular valve seat and an annular duct surrounding the valve seat are formed, a valve closure member, a compression spring urging said closure member toward engagement with said valve seat, said closure member, on a side thereof turned away from said valve seat, defining a pressure equalizing space connected by at least one pressure equalizing duct with said inlet duct to provide a flow connection, at least one pilot valve, by which a fluid flow through a separate flow path between said pressure equalizing space and said outlet duct may be controlled to thereby control movement of said valve closure member, and a check valve arranged in said pressure equalizing duct and adapted to close the same in a direction of flow from said pressure equalizing space to said inlet duct to avoid counter flow of metered fuel through said check valve.

5,551,665
BALL VALVE WITH COILED TUBING CUTTING ABILITY
Timothy Noack, Dumas, and Wesley R. Allred, Dallas, both of Tex., assignors to Halliburton Company, Dallas, Tex.
Filed Apr. 29, 1994, Ser. No. 236,787
Int. Cl.[6] F16K *31/122;* **E21B** *29/00;34/16*
U.S. Cl. 251—58 **29 Claims**





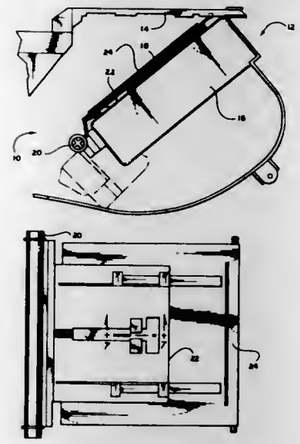
15. A valve apparatus comprising:
a housing;
a pressure actuated piston slidably disposed in said housing between first and second positions thereof;
biasing means for biasing said piston toward said first position; and
a ball valve assembly disposed in said housing and comprising:
a seat attached to said piston;
a ball rotatable between open and closed positions adjacent to said seat, said ball defining a pair of slots on opposite sides thereof, each of said slots having a bearing surface therein;
a pair of control frames disposed adjacent to said sides of said ball, each of said control frames defining an opening therein; and
a pair of control pins, each control pin being disposed between a side of said ball and a corresponding control frame and comprising:
a first end extending into the corresponding slot and having a bearing surface thereon adapted for sliding engagement with the corresponding bearing surface on said ball; and
a second end extending into the corresponding opening in the adjacent control frame;
wherein, as said piston is moved from said first position to said second position, relative longitudinal movement between said seat and said control frames occurs such that said ball is rotated from said closed position to said open position and during such rotation, said second ends of said control pins are pivoted within the corresponding openings in the adjacent control frames and said first ends of said control pins slide within the corresponding slots in said ball.

5,551,666
BUTTERFLY FLAP VALVE
Franz-Josef Irnich, Hürtgenwald-Gey, Germany, assignor to Zimmermann & Jansen GmbH, Germany
Filed Jun. 16, 1994, Ser. No. 260,891
Int. Cl.[6] F16K *1/22*
U.S. Cl. 251—160 **3 Claims**

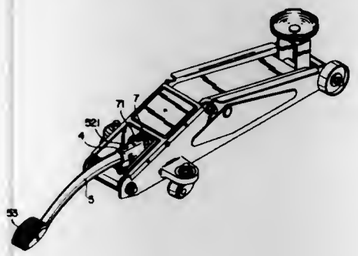
1. A butterfly flap valve, comprising:
a valve housing having a flow aperture within which a valve seat is circumferentially located;
a flap shaft extending across said flow aperture having a first end pivotally connected to said valve housing and a second end extending beyond said valve housing;
a flap carried by said flap shaft that seats against said valve seat when said flap shaft is in a valve closed position;
an actuator shaft having a long axis parallel to that of the flap shaft in the valve closed position;
means for linking said actuator shaft with the second end of said flap shaft such that upon rotation of said actuator shaft the second end of said flap shaft moves through an arc about the long axis of said actuator shaft to a valve open position;
a first lever having two ends, one end of which is non-rotatably affixed to said second end of said flap shaft;
a second lever having two ends, one end of which is pivotally affixed to a point that is stationary relative to said valve housing;
the second end of each of said first and second levers being pivotally secured to each other.

5,551,667
VARIABLE LENGTH PIVOTING AIR DUCT DOOR
Dale A. Galka, Southfield, and Roy A. Adanti, Farmington Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Apr. 5, 1995, Ser. No. 417,363
Int. Cl.[6] F16K *3/00;* **B60H** *1/24*
U.S. Cl. 251—212 **20 Claims**

1. An air duct door for controlling air flow through an air duct in a vehicle, comprising:
a first panel having a first end, first and second end portions, a middle portion intermediate said end portions defining a central slot extending between said end portions, first and second side portions respectively containing first and second side protrusions extending outwardly in a direction away from said central slot; and
a second panel, overlaying said first panel, having first and second rails with first and second protruding portions respectively extending from said second panel and with first and second slider portions respectively extending laterally under said first panel from said first and second protruding portions toward said central slot and slidably engaging said first and second side portions, said panels being slidably movable one relative to the other to vary the length of said door.

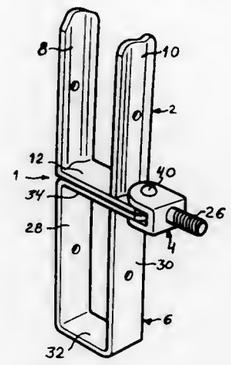


5,551,668
HYDRAULIC JACK WITH RESTORABLE LEVER AND RETAINING DEVICE
Michael Hung, 9-16, Nan Kan Hsia, Nan Kan, Lu Chu Hsiang, Tao Yuan County, Taiwan
Filed Nov. 7, 1994, Ser. No. 336,240
Int. Cl.[6] B60P *1/48*
U.S. Cl. 254—8 B **15 Claims**



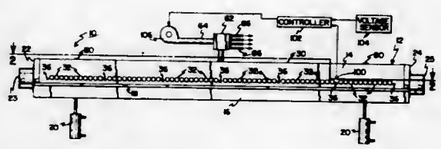
1. A hydraulic jack comprising:
a hydraulic cylinder main body;
a base at an end of said main body, said base having at a first end thereof adjacent said main body a supporting post, a second end spaced from said main body, and a central portion between said first and second ends;
a pump assembly mounted in said central portion of said base;
a lever holder connected to said pump assembly and having a first end pivotally connected to said supporting post and two side walls having extending therebetween an abutment;
a lever connectable to a second end of said lever holder and operable to pivot said lever holder in first and second opposite directions toward and away from said base and thereby to operate said pump assembly;
a compression spring having a first end supported at said second end of said base and a second end abutting said abutment, such that when said lever holder is pivoted in said first direction said abutment acts on and compresses said compression spring, thereby generating stored energy in said compression spring acting on said lever holder to urge said lever holder to pivot in said second direction; and
a retaining pin insertable in a pin hole in said supporting post to abut said lever holder and prevent said lever holder from pivoting in said second direction.

5,551,669
GUARD RAIL FITTINGS
Lars A. Reinklou, Ostersund, Sweden, assignor to Reinklou Innovation AB, Follinge, Sweden
PCT No. PCT/SE92/00588, § 371 Date Apr. 28, 1994, § 102(e) Date Apr. 28, 1994, PCT Pub. No. WO93/04249, PCT Pub. Date Mar. 4, 1993
PCT Filed Aug. 26, 1992, Ser. No. 199,154
Claims priority, application Sweden, Aug. 27, 1991, 9102452
Int. Cl.[6] E04H *17/00*
U.S. Cl. 256—65 **11 Claims**



1. A fitting comprising an upper main component (**2**) and a lower main component (**6**) for supporting an individual guard element, said upper main component being made as a holder (**2**) which is open upwards with an outer leg (**8**) and an inner leg (**10**), said outer and inner legs being connected by a connecting portion (**12**), which extends outside the inner leg (**10**) into an upper lug (**14**), said lower component being shaped as a rectangular holder (**6**), with an outer side-piece (**28**), an inner side-piece (**30**), a lower piece (**32**) and an upper piece (**34**) which extends outside said inner side-piece into a lower lug (**36**), said upper and lower lugs (**14**, **36**) being pivotally joined to each other along a pivot axis by means of a clevis (**4**) with an anchoring pin (**26**) and a fastening element, on which clevis the upper and lower lugs (**14**, **36**) are pivotally mounted, said anchoring pin being arranged essentially perpendicular to the pivot axis of the lugs.

5,551,670
HIGH INTENSITY INFRARED HEAT TREATING APPARATUS
James E. Heath, Fridley, and Scott L. Angell, Blaine, both of Minn., assignors to BGK Finishing Systems, Inc., Blaine, Minn.
Filed Oct. 16, 1990, Ser. No. 598,393
Int. Cl.[6] C21D *11/00*
U.S. Cl. 266—87 **8 Claims**



1. An apparatus for heat treating a product being moved continuously along a product length, said apparatus comprising;
a frame having a plurality of walls defining a product heat treatment area sized to receive a continuous moving feed of said product as said product moves along said product length, said plurality of walls including end walls have means to pass

said feed from an exterior of said frame and into said heat treatment area with said product extending between said end walls;

a plurality of lamp assemblies each having an infrared lamp, aa lamp conduit of material generally transparent to infrared radiation with said lamp disposed within said conduit and cooling fluid admission means for admitting a cooling fluid to said conduit;

said lamp assemblies carried on said frame with said lamp assemblies opposing said heat treatment area;

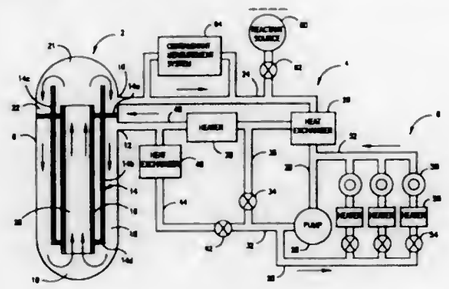
reflective refractory means surrounding said heat treatment area.

5,551,671

HOT ARGON CLEANING AND PROTECTIVE COATING OF COMPONENTS MADE OF METAL OR ALLOY

Gerald W. McKenzie, Wilmington, N.C., assignor to General Electric Company, Wilmington, N.C.

Filed Jul. 27, 1994, Ser. No. 281,400
Int. Cl.[6] C21B *7/22*
U.S. Cl. 266—156 **6 Claims**



1. An apparatus for treating surfaces of a component made of metal or metal alloy, comprising:

an airtight treatment chamber having an inlet and an outlet;

a cylindrical wind tunnel mounted inside said treatment chamber and having an inlet in fluid communication with said treatment chamber inlet and having an outlet in fluid communication with said treatment chamber outlet;

a baffle structure which blocks a flow of gas from said treatment chamber inlet to said treatment chamber outlet except through said wind tunnel, said baffle structure being connected to said treatment chamber and to said wind tunnel;

recirculation means having an outlet connected to said treatment chamber inlet and having an inlet connected to said treatment chamber outlet;

means for pumping gas through said recirculation means with a force sufficient to cause a high-velocity stream of gas to flow through said wind tunnel during recirculation of said gas through said recirculation means; and

a getter loop connected in parallel with a portion of said recirculation means, said getter loop comprising:

getter means for removing a contaminant from gas flowing therethrough;

a first conduit in fluid communication with said recirculation means and with said getter means for diverting a portion of the recirculating gas to said getter means; and

a second conduit in fluid communication with said getter means and with said recirculating means for returning said diverted portion of said recirculating gas from said getter means to said recirculation means,

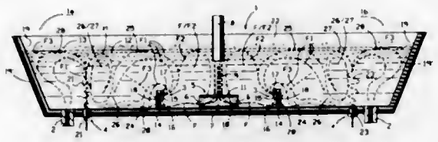
wherein said getter means reduces the amount of said contaminant contained in said recirculating gas.

5,551,672

APPARATUS FOR CONTROLLING MOLTEN METAL FLOW IN A TUNDISH TO ENHANCE INCLUSION FLOAT OUT FROM A MOLTEN METAL BATH

Manfred Schmidt, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jan. 13, 1995, Ser. No. 372,535
Int. Cl.[6] C21C *5/48*
U.S. Cl. 266—229 **55 Claims**



1. Flow control apparatus for use with an impact pad in a continuous caster tundish containing a liquid steel bath comprising:

a dam positioned downstream from said impact pad including;

a) an upper portion shaped to receive and redirect a flood of molten metal released from said impact pad into at least one sub-flow current toward a slag cover floating on said liquid steel bath, and

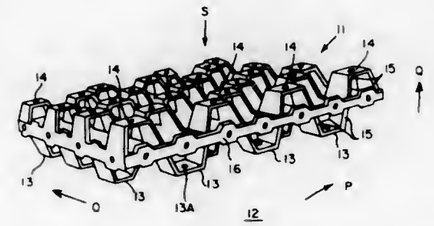
at least one aperture extending through said dam at a compound angle including an upward angle α and outward angle θ.

5,551,673

RESIN SHOCK ABSORBER

Hironobu Furusawa, Osaka; Tokio Kokubu, Ohtsu; Sakashi Kamata, Ohtsu, and Hitoshi Ueno, Ohtsu, all of, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Dec. 6, 1994, Ser. No. 349,903
Claims priority, application Japan, Mar. 30, 1994, 6-61342
Int. Cl.[6] F16F *1/18*
U.S. Cl. 267—160 **4 Claims**



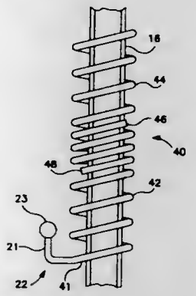
1. A resin shock absorber comprising a compression deformable portion made from a resin having a flexural modulus of elasticity of 500–20,000 kg/cm^2, said shock absorber having a yield strain of 2–25 kN/m^2 and a compressive energy absorption efficiency of 50% or higher, wherein said shock absorber includes an impact application side, wherein said compression deformable portion has a yield point at a compressive strain of 20% or lower, wherein said shock absorber comprises a plurality of corrugated, long shock absorber strips of a specific width, said corrugated, long shock absorber strips including a plurality of slant portions defining a plurality of alternating convexes and concaves, wherein said convexes and concaves are arranged in such a way that said convexes and concaves form a checkered pattern when seen from the impact application side, said plurality of shock absorber strips being connected integrally with one another at the vertical center of the slant portion of the strips where the strips come into contact with each other.

5,551,674

ADJUSTABLE RESILIENT SUPPORT DEVICE

Thore K. Johnsen, U.S. Flyer, Inc. 285 Chambers Ave., Eastmeadow, N.Y. 11554

Filed Jul. 6, 1994, Ser. No. 271,161
Int. Cl.[6] F16F *1/06*
U.S. Cl. 267—168 **21 Claims**



1. A resilient support device for installation between first and second support parts of a load bearing support member subject to receiving shocks, said device comprising:

an outer coil spring;

an adjustable inner coil spring having first and second ends;

means for coupling each of the ends respectively of said outer coil spring directly to said first and second support parts;

means for coupling one end of said inner coil sprang to one of said first and second support parts; and

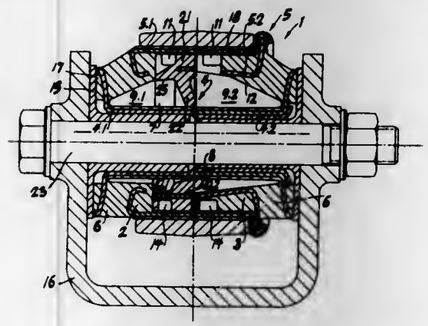
means for adjusting the compression characteristics of said inner coil spring without affecting the compression characteristics of said outer coil spring.

5,551,675

HYDRAULICALLY DAMPING RUBBER SLEEVE SPRING

Arnold Simuttis, Bad Kreuznach; Werner Hettler, Mannheim, and Axel Rudolph, Bensheim, all of, Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Division of Ser. No. 201,593, Feb. 25, 1994, Pat. No. 5,503,376. This application Jun. 5, 1995, Ser. No. 463,434
Claims priority, application Germany, Feb. 25, 1993, 43 05 808.6
Int. Cl.[6] F16F *13/00*
U.S. Cl. 267—293 **3 Claims**



1. A hydraulically damping rubber sleeve spring comprising:

two annular elements assembled together axially, each said annular element comprising:

an inner support sleeve and an outer support sleeve surrounding the inner support sleeve and spaced radially therefrom;

a spring element constructed of an elastomeric material connecting the support sleeves, said spring element being provided with at least two recesses;

the annular elements being assembled such that the recesses of one of said annular elements interconnect with the recesses of another of said annular elements to form first and second fluid-filled working chambers, said working chambers being sealed, said working chambers being connected to one another by at least one damping passage, whereby the two spring elements are braced against one another such that the axial and radial spring stiffnesses of the rubber sleeve spring can be adjusted separately from one another: and

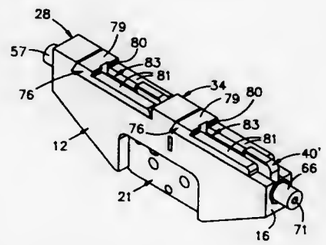
a valve made of an elastomeric material, said valve being provided with a closure member projecting toward the inner support sleeves, said valve being arranged axially between the annular parts, and wherein the closure member divides each working chamber into two axially adjacent subchambers and can be actuated by differential pressure inside the subchambers.

5,551,676

DUAL CLAMPING VISE

Michael D. Tibbet, Ventura, Calif., assignor to Gaiser Tool Co., Ventura, Calif.

Filed Mar. 24, 1995, Ser. No. 409,700
Int. Cl.[6] B25B *1/20*
U.S. Cl. 269—43 **18 Claims**



1. A dual vise assembly comprising:

a vise body having a clamping portion and a connector portion;

said clamping portion having an upper surface extending longitudinally between a first end and a second end;

a first stationary jaw extending upwardly from said upper surface at said first end and a second stationary jaw extending upwardly from said upper surface at a location between said first stationary jaw and said second end;

said first stationary jaw comprising a first body defined by an outside wall, a first top wall and a first abutment surface which faces toward said second stationary jaw;

said second stationary jaw defined by a back wall, a second top wall and a second abutment surface which faces said second end;

a first movable jaw positioned between said first and second stationary jaws having a first movable abutment face directed toward said first stationary jaw;

a first actuator means attached to said vise body for moving said first movable jaw relative to said first stationary jaw;

a second movable jaw positioned between said second stationary jaw and said second end having a second movable abutment face directed toward said second stationary jaw; and,

a second actuator means attached to said vise body for moving said second movable jaw relative to said first stationary jaw.

5,551,677

PROFILED CLAMPING JAW FOR CLAMPING WORKPIECES

Hermann Paettmer, Kirchberg/Murr, and Peter Abraham, Ilsfeld, both of, Germany, assignors to Goetz GmbH Metall- und Anlagenbau, Feilbach, Germany

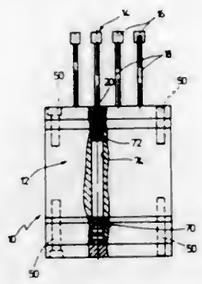
PCT No. PCT/EP92/02687, § 371 Date Jul. 25, 1994, § 102(e) Date Jul. 25, 1994, PCT Pub. No. WO93/14907, PCT Pub. Date Aug. 5, 1993

PCT Filed Nov. 23, 1992, Ser. No. 256,820

Claims priority, application Germany, Jan. 25, 1992, 42 02 032.8

Int. Cl.[6] B25B *1/24*

U.S. Cl. 269—266 **13 Claims**



1. In a profiled clamping jaw for a clamping device comprising a base body and a shapable clamping surface arranged on said base body, said clamping surface being shapable by moving said base body toward a workpiece until a clamping position is reached, and thereby automatically adapting to the contour of the workpiece surface, said clamping surface being composed of a plurality of pressure pieces each movable independently of one another relative to said base body and being lockable in said clamping position on said base body, each said pressure piece being guided by a clamping ram in a sliding guide of said base body, said clamping rams each carrying a ram piston in a ram cylinder of said base body, and said ram cylinders being loadable through a common hydraulic distributor in said clamping direction with hydraulic fluid, the improvement wherein between individual said ram cylinders and said hydraulic distributor there is arranged a check valve, wherein said check valves each carry a single control piston having a plurality of piston surfaces loadable on two sides with hydraulic fluid and arranged in a control cylinder, of said base body and wherein said control pistons are loadable together with hydraulic fluid on their piston surfaces, which are opposite to one another, through two separate hydraulic distributors.

5,551,678

CYLINDER FOLDING APPARATUS

Horst B. Michalik, Höchberg, and Otto T. Weschenfelder, Würzburg, both of, Germany, assignors to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

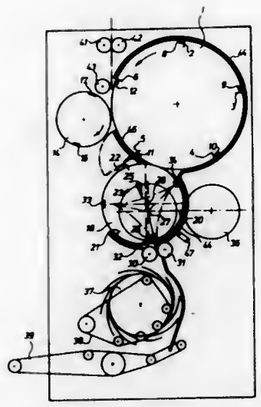
Filed Dec. 22, 1994, Ser. No. 361,576

Claims priority, application Germany, Dec. 24, 1993, 43 44 620.5

Int. Cl.[6] B41F *13/56*; B41L *43/08*

U.S. Cl. 270—20.1 **10 Claims**

1. A cylinder folding apparatus usable in a web-fed rotary printing press to perform collection and double production, said folding apparatus comprising:



a five section counter-cutting and collection bar cylinder which is operable in collection and double production;

a two section cutting cylinder having cutters and operating with said counter-cutting bar and collection cylinder to cut a paper web train into paper web sections;

a three section hollow folding drum rotatable about a first axis of rotation and positioned to receive paper web sections from said counter-cutting bar and collection cylinder; and

a two section folding blade cylinder supported within said hollow folding drum cylinder for rotation about a second axis of rotation offset from said first axis of rotation and having extendable folding blades.

5,551,679

FACSIMILE-LIKE RECORDING APPARATUS WITH OUT-OF-STAPLES OPERATION

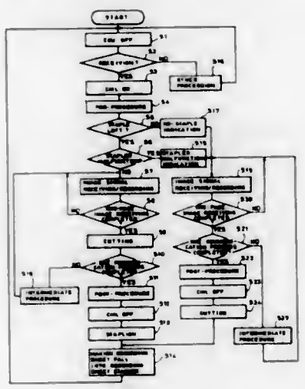
Takehiro Yoshida, Tokyo, and Shoji Miyake, Yokohama, both of, Japan, assignors to Canon Kabushika Kaisha, Tokyo, Japan

Filed Jun. 24, 1992, Ser. No. 903,289

Claims priority, application Japan, Jun. 25, 1991, 3-153130; Sep. 20, 1991, 3-268698; Jan. 24, 1992, 4-034470

Int. Cl.[6] B42B *5/00*; H04N *1/00*; H04M *11/00*

U.S. Cl. 270—58.09 **36 Claims**



1. A recording apparatus comprising:

recording means for recording images on a recording sheet of at least a predetermined size and a size larger than said predetermined size;

binding means for binding with a binding member a plurality of recording sheets of the predetermined size on which images are recorded by said recording means;

detection means for detecting the existence of a binding member in said binding means; and

control means for controlling said recording means and binding means so that, upon detection of the existence of said binding member, images are recorded on the plurality of recording sheets of the predetermined size and the plurality of recording sheets are bound, and that, upon failure to detect the existence of said binding member, the images are recorded on one recording sheet of the size larger than said predetermined size.

8. A recording method comprising:

recording images on a recording sheet of at least a predetermined size and a size larger than the predetermined size;

binding with a binding member a plurality of recording sheets of the predetermined size on which images are recorded in said recording step;

detecting the existence of a binding member for binding the plurality of recording sheets; and

controlling said recording step and binding step so that, upon detection of the existence of the binding member, images are recorded on the plurality of recording sheets of the predetermined size and the plurality of recording sheets are bound, and that, upon failure to detect the existence of the binding member, the images are recorded on one recording sheet of the size larger than the predetermined size.

5,551,680

SHEET SORTING APPARATUS WITH ROTATING CAM MEMBER

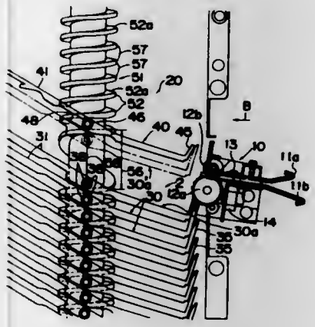
Yoshiki Ohmichi; Kuniaki Ishiguro, and Kenichi Yasuda, all of Toyokawa, Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Feb. 17, 1995, Ser. No. 390,706

Claims priority, application Japan, Feb. 23, 1994, 6-025616

Int. Cl.[6] B42C *1/12*; B65H *39/10*

U.S. Cl. 270—58.08 **9 Claims**



1. A sheet sorting apparatus of a moving bin type for sorting sheets received successively from a sheet delivery station into collated sets, which apparatus comprises:

a plurality of trays stacked one above the other in a vertical direction;

a frame structure by which the trays are vertically movably supported;

first and second camming members extending in a direction parallel to a direction of movement of the trays, each of said first and second camming members having helically continuing threads each having an upwardly oriented camming face engageable with any one of the trays;

a sheet delivery mechanism for successively discharging the sheets towards the delivery station;

a drive motor drivingly coupled with the first and second camming members for driving the camming members about respective longitudinal axes of said camming members to move the trays up and down therealong;

said helically continuing threads being divided into a low pitch region in which each neighboring threads are spaced a small pitch and a high pitch region in which the neighboring threads are spaced an increased pitch, said first and second camming members being so supported with their high pitch regions confronting the sheet delivery station, one of the trays supported on the thread in the high pitch region being permitted to be manually upwardly shiftable.

5,551,681

DISK COMPILER INTEGRATED INTO A DISK STACKER OR DISK-IN-DISK FINISHER

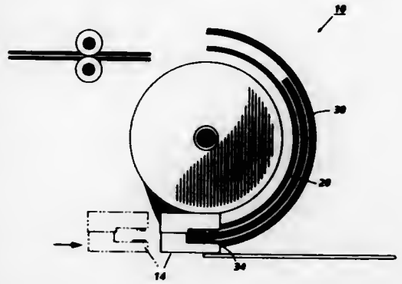
Joseph J. Ferrara, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 5, 1995, Ser. No. 435,942

Int. Cl.[6] B42B *5/00*

U.S. Cl. 270—58.08 **9 Claims**

1. A job set compiler for compiling the printed sheets output of



a printer or copier into superposed stacks of said printed sheets, into which job set compiler said printed sheets are sequentially individually fed, comprising:

a first sheet retaining unit for sequentially receiving therein a single said sequentially individually fed sheet and temporarily retaining said sheet therein;

a second and adjacent sheet retaining unit for sequentially receiving from said first sheet retaining unit a plurality of said sheets and compiling said plurality of sheets therein in an arcuate configuration as a complied set,

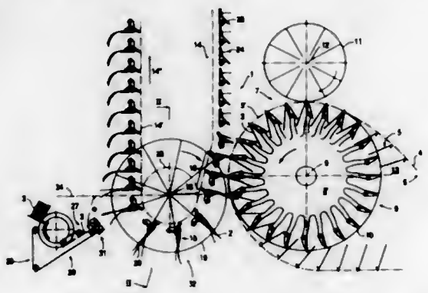
said second sheet retaining unit being rotatable to eject said compiled set of plural sheets retained as a compiled set.

5,551,682

METHOD OF SUPPLYING ENCLOSURES TO MULTIPLE-PAGE PRINTED SHEETS COLLECTED TO FORM PRINTED PRODUCTS

Ernst Lüthi, Brittnau, Switzerland, assignor to GRAPHA-Holding AG, Hergiswil, Switzerland

Filed Dec. 21, 1994, Ser. No. 361,335
Claims priority, application Switzerland, Dec. 21, 1993, 03801/93
Int. Cl.[6] B65H *5/30*
U.S. Cl. 270—52.18 **12 Claims**



1. A device for supplying enclosures to printed products produced from a plurality of printed sheets, comprising:

a plurality of collecting carriers spaced from one another at regular intervals and being arranged to rotate past a transfer location, each for collecting and conveying a respective printed product to the transfer location;

a conveyor apparatus having a movable traction mechanism; and a plurality of gripping pliers secured to the traction mechanism, each gripping plier being associated with a respective one of said collecting carriers, and being moved past the transfer location to grip the respective printed product at the transfer location and remove the printed product from the respective collecting carrier;

separating means positionable inside a fold of the printed product gripped by the respective plier for opening the printed product; and

a feeder for delivering the enclosures along a path of movement to the printed product gripped by the respective plier; whereby the printed products are moved by the pliers along a conveyor path approximately transversely to the path of movement of the enclosures in an opened supplying form for receiving at least one enclosure delivered by the feeder.

5,551,683

COMPACT ENCODER WITH POWER-ASSISTED HAND-DROP CAPABILITY

Stuart G. Donaldson, Kirkland; James M. Graverholt, Stanwood; Kevin M. Bagley, Everett, and Richard W. Witbeck, Snohomish, all of Wash., assignors to Maverick International, Inc., Mukilteo, Wash.

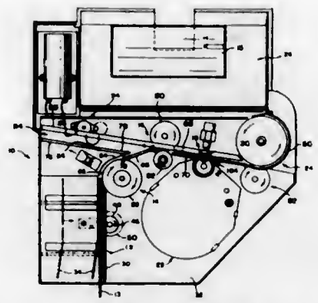
Filed Nov. 30, 1994, Ser. No. 346,629
Int. Cl.[6] B65H *3/44*
U.S. Cl. 271—9.09 **6 Claims**

1. In a MICR encoder, which includes a document feed assembly for moving the documents into a document guide path which extends past an encoding station, the improvement comprising:

a document guide portion, located directly upstream from the encoding station, which defines a hand-drop region for documents to be encoded;

a hand-drop roller assembly means, including a motor having a motor shaft and a roller fixedly mounted on the motor shaft and further including a support member which is rotatably mounted on the motor shaft and a wheel rotatably mounted on the support member, such that the wheel is in frictional contact with said roller, so that when the motor is turned on, the roller initially rotates the support member from a first position in which the wheel thereon is away from the hand-drop region into a second position in which the wheel is within the hand-drop region, clamping the hand-dropped document, wherein continued rotation of the roller results in a counterrotation of the wheel, which moves the document along the check guide path to the encoder station; and

means for turning the motor on when the presence of a document is sensed in the hand-drop region.

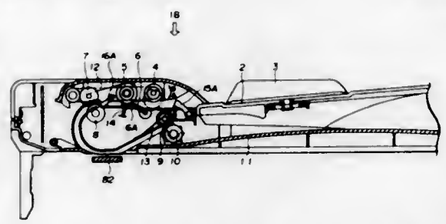


5,551,684

SHEET-MATERIAL AUTOMATIC FEEDING DEVICE

Junichi Sata, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 165,588, Dec. 13, 1993, abandoned.
This application Jun. 6, 1995, Ser. No. 463,864
Claims priority, application Japan, Dec. 28, 1992, 4-361202
Int. Cl.[6] B65H *7/02*
U.S. Cl. 271—110 **9 Claims**



1. A sheet-material automatic feeding device for individually separating and feeding sheets from sheet material mounted on sheet-material mounting means, said device comprising:

sheet-material-leading-end detection means for detecting the leading end of the sheet material mounted on the sheet-material mounting means and for generating a detection signal in response to the detection of the leading end;

sheet-material prefeeding means for feeding the sheet material mounted on the sheet-material mounting means to sheet-material separating/feeding means provided downstream of said sheet-material prefeeding means, said sheet-material prefeeding means being movable between a non-feed position out of contact with the sheet material and a feed position in contact with the sheet material; and

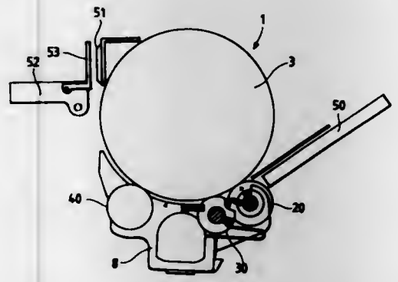
control means for controlling movement of said sheet-material prefeeding means so that in response to the detection signal, said sheet-material prefeeding means is moved to the feed position where it is in contact with a leading-end portion of an upper surface of the sheet material mounted on the sheet-material mounting means, wherein said sheet material prefeeding means temporarily holds the sheet material upstream of the sheet-material separation/feeding means.

5,551,685

PAPER FEED MECHANISM IN RECORDING APPARATUS

Fumihisa Hori, Takizawa-mura, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1994, Ser. No. 275,865
Claims priority, application Japan, Jul. 14, 1993, 5-174184
Int. Cl.[6] B65H *9/04*
U.S. Cl. 271—245 **5 Claims**



1. A paper feed mechanism in a recording apparatus having a paper receptacle portion containing plural sheets of paper, a recording portion for recording information on the sheets of paper and the paper feed mechanism for conveying the sheets of paper one by one from said paper receptacle portion to said recording portion, said paper feed mechanism comprising a main roller adapted to be rotated in both forward and reverse directions for conveying the sheets of paper from said paper receptacle portion to said recording portion, a paper separating and feeding member which comes into pressure contact with said main roller to separate and feed the sheets of paper accommodated in said paper receptacle portion, and a stop member which comes into pressure contact with said main roller on a downstream side with respect to said paper separating and feeding member in the paper conveyance direction to forcibly stop the feed of the sheets being fed continuously.

5,551,686

PRINTING AND MAILBOX SYSTEM FOR SHARED USERS WITH BINS ALMOST FULL SENSING

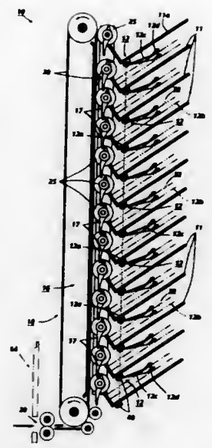
Hector J. Sanchez; John P. Serio, and Ronald S. Tomory, all of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 23, 1995, Ser. No. 393,604
Int. Cl.[6] B65H *39/10*
U.S. Cl. 271—298 **10 Claims**

1. In a mailboxing system adapted to receive respective plural print jobs of plural printed sheets of respective different plural users of a shared users printing and mailboxing system, electronic printer for printing respective plural print jobs of plural printed sheets of respective different plural users of said printer, with a printer mailbox system connected to said electronic printer to receive said print said mailboxing system having multiple individual print job storage mailbox bins of a limited preset maximum sheet stacking capacity, and said mailboxing system further having a sheet distribution system for automatically variably directing and stacking into different said individual mailbox bins electronically assigned to different respective users the respective plural print jobs of the different plural users, the improvement comprising:

a bin almost-full sensing system for detecting and signaling upon its actuation that the stacking level of printed sheets in an individual said mailbox bin is has reached a preset almost-full level which is approaching but less than said preset limited sheet stacking capacity,

said bin almost-full sensing system providing a bin almost-full signal when said sheet stacking level in said individual mailbox bin has reached said preset almost-full level,



and a mailbox control system controlled by said signaling from said bin almost full sensing system to indicate that only a preset limited further number of said printed sheets may be directed to that same said individual mailbox bin upon the actuation of said bin almost-full sensing system,

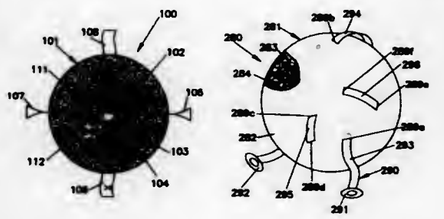
said mailbox control system controlling said sheet distribution system to direct a subsequent print job from said sheet distribution system which would exceed said preset limited further number of said printed sheets to a different said mailbox bin.

5,551,687

TOY HAVING MULTIPLE TAGS

Mark A. Krull, 7932 Somerset Rd., Woodbury, Minn. 55125

Continuation of Ser. No. 148,387, Nov. 8, 1993, abandoned.
This application Jan. 17, 1995, Ser. No. 373,476
Int. Cl.[6] A63B *37/14*; **A63H** *33/04*
U.S. Cl. 273—58 K **6 Claims**



1. A stuffed toy, comprising:

a plurality of fabric segments sewn together to form a fabric housing having an interior, an exterior, and seams extending between adjacent fabric segments;

a soft stuffing material disposed within the interior of the fabric housing to form an essentially spherical ball free to roll in any direction; and

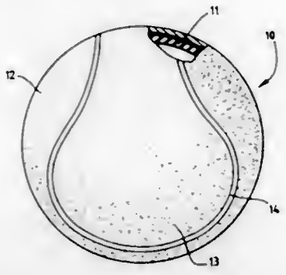
at least six cloth tags which are essentially planar and have essentially rectangular ends, the tags sewn within the seams of the fabric housing and extending at least one inch outward from the exterior of the ball, one tag proximate each point of intersection between the fabric housing and three orthogonal diameters of the ball, whereby at least one tag is visible and accessible to an infant regardless of bow the stuffed toy is oriented relative to the infant.

5,551,688

MAGNETICALLY DETECTABLE TENNIS BALL

R. A. Miller, Simpsonville, S.C., assignor to Wilson Sporting Goods Co., Chicago, Ill.

Filed Apr. 1, 1992, Ser. No. 861,926
Int. Cl.[6] A63B 61/00
U.S. Cl. 273—61 R 6 Claims



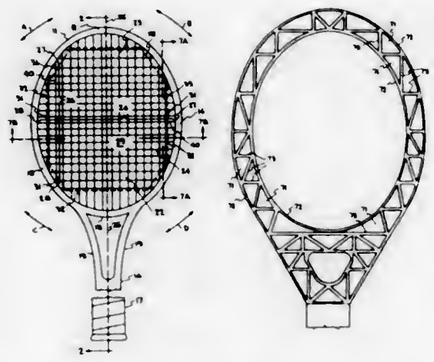
1. A magnetically detectable tennis ball which meets USTA specifications comprising a rubber core and a felt cover surrounding the core, the core including magnetite iron ore in the form of sponge iron powder.

5,551,689

STRING SUSPENSION AND FRAME CONSTRUCTION FOR SPORTS RACKETS

Rodney Svoma; James Speros, both of Phoenix, Ariz., and Gene A. Broadman, Livermore, Calif., assignors to Athletic Alternatives Inc., Phoenix, Ariz.

Division of Ser. No. 740,336, Aug. 5, 1991, Pat. No. 5,197,731, which is a continuation-in-part of Ser. No. 233,228, Aug. 18, 1988, Pat. No. 5,037,097. This application Mar. 29, 1993, Ser. No. 38,988
Int. Cl.[6] A63B 49/02;51/06
U.S. Cl. 273—73 C 30 Claims



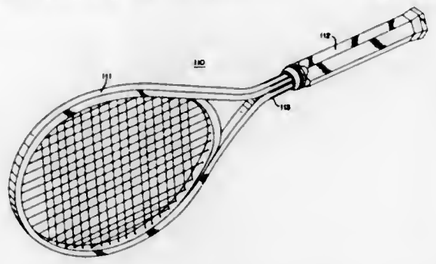
1. A sports racket having a frame comprising two frame half sections joined together along a plane substantially parallel to the central plane through said racket, said half sections having outer frame walls and having ribs criss-crossing the interior of said frame walls to counteract deformation of said frame, said frame walls and ribs defining recesses facing the other section, providing, upon joining, hollow regions within said frame.

5,551,690

RACKET HANDLE

Andrew J. Brown, Cincinnati, Ohio, assignor to R. H. Associates, Ltd., Cincinatti, Ohio

Continuation-in-part of Ser. No. 24,482, Mar. 1, 1993, Pat. No. 5,409,216, which is a continuation-in-part of Ser. No. 937,366, Aug. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 853,981, Mar. 20, 1992, abandoned, which is a continuation-in-part of Ser. No. 675,406, Mar. 21, 1991, abandoned, which is a continuation-in-part of Ser. No. 562,406, Aug. 2, 1990, abandoned, which is a continuation of Ser. No. 414,596, Sep. 27, 1989, abandoned, which is a continuation of Ser. No. 178,210, Apr. 6, 1988, abandoned, which is a continuation of Ser. No. 833,633, Feb. 27, 1986, Pat. No. 4,744,000, which is a continuation of Ser. No. 601,488, Apr. 18, 1984, abandoned. This application Apr. 10, 1995, Ser. No. 419,412
Int. Cl.[6] A63B 49/08
U.S. Cl. 273—73 J 69 Claims



1. A racket, comprising:
a substantially planar striking surface;
a neck having a first end connected to said substantially planar striking surface;
a handle with one end thereof adjacent to a second end of said neck, wherein said handle has a shape such that when two parallel planes, which are perpendicular to the planar striking surface, intersect the handle, the planes and the handle define a prism which comprises a polygonal base and a plurality of surfaces;
said handle is rotatable relative to said planar striking surface about an axis to one or more predetermined positions;
said one end of said handle comprises a male member protruding away from said handle toward said end of said neck; and
said second end of said neck comprising one or more indentations, wherein said male member releasably engages said one of said one or more indentations at one of said one or more predetermined positions.

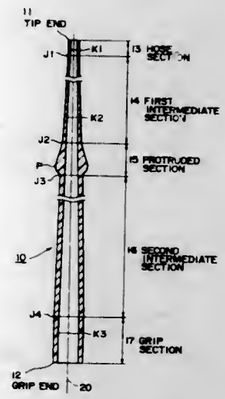
5,551,691

GOLF CLUB SHAFT

Takashi Harada, Misato; Akira Suzawa, Koshigaya, and Yoshihiro Motoki, Misato, all of, Japan, assignors to Somar Corporation, Japan

Filed Nov. 2, 1995, Ser. No. 556,073
Claims priority, application Japan, Jun. 7, 1995, 7-194279
Int. Cl.[6] A63B 53/10
U.S. Cl. 473—323 8 Claims

1. A hollow golf club shaft having a tip end and a grip end and formed of a fiber-reinforced plastic, said golf club shaft comprising in adjacent order from said tip end to said grip end a hosel section, a first intermediate section, a protruded section, a second intermediate section, and a grip section;
said first intermediate section having varying outer diameter increasing from its junction J1 with said hosel section to its junction J2 with said protruded section;
said second intermediate section having varying outer diameter increasing from its junction J3 with said protruded section to its junction J4 with said grip section;



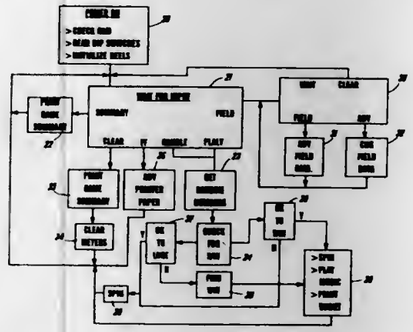
said protruded section having varying outer diameter increasing from said junction J2 to an apex point between said junction J2 and said junction J3 and decreasing from said apex point to said junction J3;
the outer diameter of said shaft at said junction J3 being greater than that at said junction J2;
said junction J3 being located at a position spaced apart from said tip end a distance equal to 35–80% of the length from said tip end to said grip end; and
the distance between said junction J2 and said junction J3 being in the range of 50–400 mm.

5,551,692

ELECTRONIC GAME PROMOTION DEVICE

Donald W. Pettit, and Terrence W. Plourd, both of Las Vegas, Nev., assignors to Casino Coin Company, Inc., Las Vegas, Nev.

Filed Aug. 2, 1994, Ser. No. 284,787
Int. Cl.[6] A63B 71/00; A63F 1/00; G06F 17/00; G06G 7/48
U.S. Cl. 273—143R 6 Claims



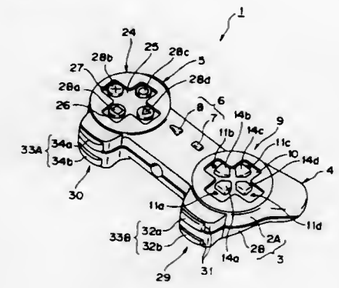
1. Method for distributing prizes using a gaming machine, comprising the steps of:
(a) activating said gaming machine to carry out a play by selecting one of a plurality of positions in a memory table and a combination of symbols associated with the selected position where each combination of symbols in said memory table is predetermined to indicate win/lose status and a single selection of each combination of symbols from said table constitutes an entire gaming cycle for said machine;
(b) indicating win or lose status of said selected position from said memory table based upon a pre-designated combination of symbols associated with said selected position, and eliminating the selected position in the memory table from further selection in a current gaming cycle; and
(c) checking a plurality of counters to determine if said gaming cycle is complete; step (a) further comprising the sub-step of randomly picking one of 128 virtual stops based upon operation of a virtual slot machine where each of the virtual stops has a corresponding position in said memory table; said virtual operation of said virtual slot machine being carried out by random selection of a position on said table; said method, further comprising a preliminary step of (d) selecting one of a plurality of memory tables to program a predetermined win/lose percentage said preliminary step of selecting further comprising
(i) programming a plurality of combinations of symbols to have the same chance of occurrence within a single gaming cycle defined by a predetermined number of plays by adjusting occurrences of combinations of symbols in a selected memory table;
(ii) preprogramming at least one of said plural combinations of symbols to have less chance of occurrence than others of said plural virtual combinations of symbols by adjusting occurrences of combinations of symbols in a selected memory table; and
(iii) selecting at least one of said plurality of combinations of symbols to have an absolute random chance of occurrence independent of said gaming cycle.

5,551,693

CONTROLLER UNIT FOR ELECTRONIC DEVICES

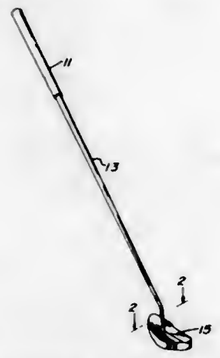
Teiyu Goto, Saitama, and Hiroki Ogata, Chiba, both of, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 8, 1995, Ser. No. 436,728
Claims priority, application Japan, May 9, 1994, 6-094988; Oct. 3, 1994, 6-238898
Int. Cl.[6] A63F 9/22
U.S. Cl. 463—37 22 Claims



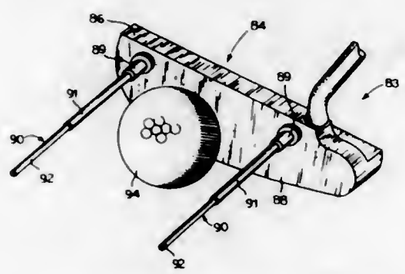
1. A controller unit for controlling electronic devices, comprising:
a housing;
a plurality of control sections mounted to said housing to be manipulated by fingers of a user; and
a pair of handles diverging from each other in a direction from said housing toward the user, said diverging handles to be contacted with and supported by palms of both hands of the user, said housing, said handles and said control sections sized and arranged to allow manipulation of the control section by the user'fingers while the housing is supported by said handles in the user's palms.

5,551,694
SOUNDING GOLF PUTTER
J. Lawrence Grim, Jr., 717H W. Callahill Rd., Perkasie, Pa. 18944, and Jacob H. Malta, 223 N. Shady Retreat, New Britain, Pa. 18901
Filed Jun. 16, 1995, Ser. No. 491,106
Int. Cl.[6] A63B 69/36
U.S. Cl. 473—234 9 Claims



9. A golf club, comprising:
a shaft and a club head having a toe and a heel, said head affixed to the end of said shaft;
first and second vertical cuts made completely through said club head and extending horizontally from the outer edge of the heel to a point short of the end of the toe, said cuts being parallel; and
a plurality of sound-generating tines formed integrally with said club head, said tines being free end vibrating bar-type sound generators.

5,551,695
APPARATUS FOR TRAINING A GOLFER TO PROPERLY PUTT A GOLF BALL
Roger S. Wolk, 28 Malibu Colony Dr., Malibu, Calif. 90265
Filed Aug. 2, 1994, Ser. No. 284,147
Int. Cl.[6] A63B 69/36
U.S. Cl. 473—236 7 Claims

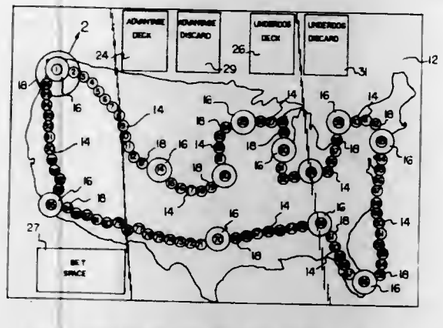


1. A conventional golf putter having a face plate with a head portion for training a golfer in the putting of a golf ball, comprising:
a. two elongated telescoping guide members each having an outer guide and an inner guide, the inner guides telescoping within the outer guides such that the inner guides can be extended forwardly from the outer guides to increase the length of the two telescoping guide members for increasing the difficulty of hitting said golf ball; and
b. means for removably affixing said two elongated telescoping guide members to said face plate of said head portion of said putter which allows said two telescoping guide members to be repositioned;
c. whereby said two elongated telescoping guide members provide guiding spacers for properly hitting said golf ball, and when said golf ball is not between said two elongated telescoping guide members when it is stroked, said golf ball will be deflected, and thereby causing an error on hitting said golf ball.

5,551,696
TWO-SHAFTED GOLF PUTTER CLUB AND METHOD FOR USING SAME
George G. Izett, 2538 Haverford Ave., Ardmore, Pa. 19003, and Jay Ciccarone, 668 Woodland Ave., Pottstown, Pa. 19464
Continuation-in-part of Ser. No. 313,732, Sep. 27, 1994, abandoned. This application Apr. 20, 1995, Ser. No. 425,574
Int. Cl.[6] A63B 69/36
U.S. Cl. 473—226 13 Claims

1. A golf putter club for training a golfer to repeatedly putt a golf ball using a constant putting stroke, said golfer having a pair of shoulders and first and second hands, said constant putting stroke being defined by movement of said shoulders of said golfer in a pendulum motion, comprising:
(A) a putter head body having a heel, a top and a ball striking face, said ball striking face being formed of a flat surface lying in a first plane;
(B) a connecting neck rigidly affixed to said top for rigidly coupling first and second hosels to said putter head body;
(C) a first hosel having a first proximate end attached to said neck and a second opposing end sized and configured to rigidly hold a connecting end of a first shaft in a fixed position relative to said putter head body;
(D) a second hosel having a first proximate end attached to said neck and a second opposing end sized and configured and rigidly holding a connecting end of a second shaft in a fixed position relative to said putter head body, said first and second shafts lying in a second plane that is perpendicular to said first plane; and
wherein said first and second hosels are angled relative to each other such that said first and second shafts extend therefrom with a desired angle that helps train said golfer to repeatedly putt using said constant putting stroke when said first and second shafts are simultaneously and respectively gripped by said first and second hands of said golfer, said desired angle being less than 180 degrees and remaining substantially fixed during said putting stroke.

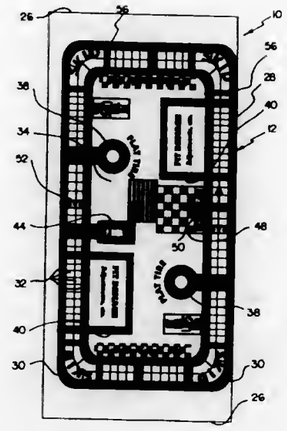
5,551,697
SPORT WAGERING AND OUTCOME GAME APPARATUS
Vince Willenbring, 556 E. Bellwood Ave., Maplewood, Minn. 55117
Filed Nov. 20, 1995, Ser. No. 561,039
Int. Cl.[6] A63F 3/00
U.S. Cl. 273—244 11 Claims



1. A sport wagering and outcome game apparatus, comprising:
a game board which includes a plurality of game spaces, wherein each game space represents a specific game,
a group of tokens for movement on said game spaces of said game board, wherein each player adopts a specific token in said group of tokens,
a first group of team cards corresponding to a first group of sport teams,
a second group of team cards corresponding to a second group of sport teams,
a first random number generator which generates numbers which correspond to individual teams of said first group of sport teams for selecting an individual first-group team to play in a specific game,
a second random number generator which generates numbers which correspond to individual teams of said second group of sport teams for selecting an individual second-group team to play in a specific game,
a first group of score-bearing cards which bears scores of player-predicted winners for specific games,
a second group of score-bearing cards which bears scores of player-predicted losers for specific games,
recording media for recording actual outcomes of specific games, that is, for recording winners and losers of specific games,
money used for wagering by individual players with respect to actual outcomes of specific games, wherein a portion of said money is transferred from a player wagering for a win of an actual loser of a specific game to a player wagering for a win of an actual winner of a specific game.

5,551,698
BOARD GAME
Robert F. Lyon, 577 Mill Rd., Coram, N.Y. 11727
Filed Mar. 10, 1995, Ser. No. 402,534
Int. Cl.[6] A63F 3/00
U.S. Cl. 273—246 1 Claim

1. A new and improved board game comprising, in combination:
a playing board fabricated of cardboard and formed in a planar generally rectangular configuration with an upper surface, a lower surface, parallel long side edges and parallel short side edges, the upper surface of the board including a generally rectangular shaped race track with parallel long regions and parallel short regions with rounded edges therebetween, the track having an outer periphery with four lanes and a center section, each lane traversing the perimeter of the board and comprising one hundred individual printed blocks;



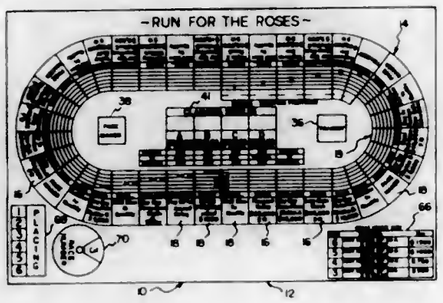
the center section of the track having a plurality of printed structures located therein, each structure being formed contiguously with the periphery of the track, two circular shaped printed structures being positioned adjacent to each long side edge, the circular shaped structures including the words FLAT TIRE positioned therearound, two generally rectangular shaped printed structures including the words PIT DAMAGE and being positioned opposite each circular structure, a printed structure including the word Gas printed therewithin, the Gas structure being positioned at about the center point of a long side edge of the track;
a generally rectangular shaped printed structure including black and white printed squares in a checker board configuration, the words VICTORY LANE being positioned at an end of the structure and offset from the central extent of one long region, the words START/FINISH being positioned adjacent to the words VICTORY LANE and extending across one long region, the word CRASH being positioned at the approximate center point of each long side edge, the corners of the track being rounded and including the word SKID positioned adjacent thereto, the printed blocks of the corners being colored yellow, green and orange, the printed blocks adjacent to the corners being colored all black;
the game including three six sided white dice with black dots, one six sided black die with white dots and a plurality of race car tokens fabricated in a wide variety of colors, designs, and numbers; and
a set of playing rules informing the users how to play the game, the game adapted to be played by between one and forty four players, each player being permitted to control multiple race car tokens, the car tokens being positioned adjacent to the start/finish line to begin the game, the first player reaching the finish line after five laps around the track being declared the winner, upon commencement of their turn each player rolling all four dice and moving the number of blocks indicated by the total of the dice, players landing on a crash square being required to move backward the number of blocks indicated by the black die, players rolling four dice of equal amount being permitted to roll and move again, players being required to traverse the printed gas structure during their second and fourth laps or lose their next five turns, the printed gas structure, the printed PIT DAMAGE structure, and the printed FLAT TIRE structure having green and red printed blocks, wherein the red printed blocks are for out and the green printed blocks are for in such that the players landing on a printed green block of a structure in the track are required to traverse the periphery of the associated structure and players are prohibited from jumping over other cars as they make their way around the board.

5,551,699

HORSE RACING GAME

Dallas C. J. Pavelich, Box 278, Kenaston, Saskatchewan, Canada

Filed Dec. 14, 1995, Ser. No. 572,037
Int. Cl.[6] A63F 3/00
U.S. Cl. 273—246 **12 Claims**



1. A horse racing game method comprising the steps of:

(a) providing a game apparatus including a game board having a business track having a plurality of land spaces and a plurality of action spaces printed thereon, and a race track defined concentrically within the business track for permitting the simulated racing of horses;

(b) providing a bank having money;

(c) providing a plurality of land title cards, the land title cards each defining a particular land space on the business track of the game board;

(d) providing a plurality of horse cards, the plurality of horse cards each defining a particular horse as a type of horse being either a mare or a stallion, a pre-race value of the horse, an age of the horse, and a ranking of the horse;

(e) providing a plurality of disparate player tokens, for positioning upon the business track of the game board;

(f) providing a plurality of race horse pieces for positioning upon the race track of the game board;

(g) providing a pair of dice;

(h) initially giving each player a land title card, a horse card, and a predetermined amount of money from the bank, and an individual one of the player tokens;

(i) selecting a player order;

(j) rolling the dice by a player in the player order;

(k) moving a respective player token in a predetermined direction about the business track of the board in accordance with a number generated during a rolling of the dice;

(l) permitting the player to purchase land when residing on a land space and permitting the player to purchase a horse card when residing on an action space which allows a player to purchase a horse;

(m) attempting to qualify a horse by the player, wherein the player must land on an action space indicating that the player can roll the dice to qualify;

(n) rolling the dice by the player to determine which horse card can be qualified;

(o) paying a fee by the player to qualify the horse;

(p) positioning a respective one of the race horse pieces corresponding to the horse card onto the race track;

(q) repeating steps (j) through (p) until six horse cards have been qualified and six horse pieces are positioned on the race track;

(r) rolling the dice separately for each of all six race horse pieces, starting from the race horse piece positioned on a track number one through to a track number six of the race track to define a set of rolls of the dice;

(s) advancing a race horse piece for a particular roll of the dice a corresponding number of spaces in a predetermined direction about the race track;

(t) repeating steps (r) and (s) until after a completion of a set of rolls, and a passage of at least one horse past a finish line marked on the race track of the game board; then repeating sets of rolls until all positions of the horses in each race have been finalized;

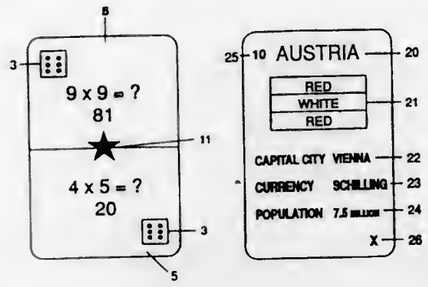
(u) determining a winner as the player with a horse piece first to pass the finish line, as well as determining the remaining horses finishing positions 1st through 6th as they pass the finish line.

5,551,700

PLAYING CARDS FOR AN EDUCATIONAL GAME

Harry F. Druce, 3 Roundwood Lane, Harpenden, Hertfordshire AL5 3BW, Great Britain, and John M. Druce, 33 Glen Trool Village, Newton Stewart, Wigtownshire DG8 6TO, Great Britain

PCT No. PCT/GB93/02112, § 371 Date Sep. 27, 1994, § 102(e) Date Sep. 27, 1994, PCT Pub. No. WO94/08671, PCT Pub. Date Apr. 28, 1994
PCT Filed Oct. 13, 1993, Ser. No. 244,392
Claims priority, application United Kingdom, Oct. 14, 1992, 9221535; Sep. 20, 1993, 9319387
Int. Cl.[6] A63F 1/00;9/18;3/00
U.S. Cl. 273—296 **18 Claims**



1. A pack of playing cards for an educational game, comprising:

a) a number of sets of cards exactly equal to the number of faces on a die, each card having a front and rear face;

b) each card having disposed on said front face at least one question and answer;

c) each card having disposed thereon a depiction of at least one die-face;

d) each card of each set having disposed thereon the depiction of the same die-face, the die-face being different in each set, and there being equal numbers of cards in each set, such that said cards are adapted for replacing the die in a die-and-track game, whereby a player correctly answering the question gets to move based on the number represented by said die-face; and

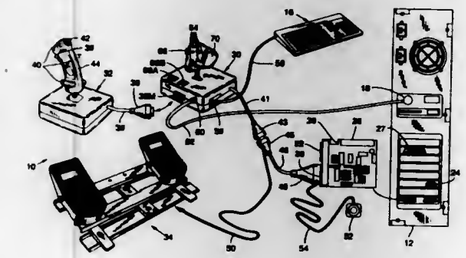
e) each card belonging to one of a number of suits of cards, and said cards in each suit are numbered sequentially on said rear face.

5,551,701

RECONFIGURABLE VIDEO GAME CONTROLLER WITH GRAPHICAL RECONFIGURATION DISPLAY

Frank M. Bouton, Beaverton, Oreg.; Robert L. Carter, Vancouver, Wash.; Clarence A. Hoffman, Beaverton, Oreg.; Eric K. Juve, Aloha, Oreg., and Rodney W. Kimmel, Beaverton, Oreg., assignors to Thrustmaster, Inc., Tigard, Oreg.

Continuation-in-part of Ser. No. 78,763, Jun. 15, 1993, abandoned, and Ser. No. 2,828, Jan. 7, 1993, Pat. No. 5,396,267, which is a continuation-in-part of Ser. No. 932,501, Aug. 19, 1992, Pat. No. 5,245,320, which is a continuation-in-part of Ser. No. 911,765, Jul. 9, 1993, abandoned. This application Jan. 5, 1994, Ser. No. 177,625
Int. Cl.[6] A63F 9/24; G09C 3/02
U.S. Cl. 463—36 **38 Claims**



1. A method of reconfiguring a video game/simulator system comprising a personal computer having a microprocessor operable under control of a system reconfiguration program during a reconfiguration mode and under a video game program during a functional mode, the computer having a keyboard interface port, a display coupled to the personal computer for displaying images produced by the programs, a computer keyboard, and a video game/simulator controller coupled to the keyboard through a keyboard input port and coupled to the computer keyboard interface port through a controller keyboard input/output port, the controller having a plurality of input devices, the method comprising:

displaying a representation of the controller on the display including the controller input devices;

inputting reconfiguration keycodes into the computer, each reconfiguration keycode corresponding to one of the controller input devices;

downloading the reconfiguration keycodes from the computer to the controller; and

reconfiguring the controller input devices responsive to downloading the reconfiguration keycodes.

5,551,702

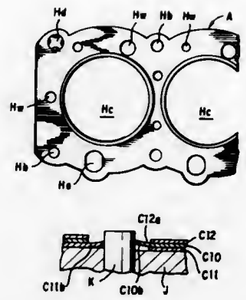
METAL LAMINATE GASKET WITH ENGAGING DEVICE

Susumu Inamura, Tokyo, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Filed Jul. 5, 1994, Ser. No. 270,651
Int. Cl.[6] F16J 15/08
U.S. Cl. 277—11 **7 Claims**

1. A metal laminate gasket adapted to be engaged with an engaging projection of an engine part for immovably locating the gasket on the engine part, comprising,

a first plate including at least one first hole for receiving therein the engaging projection of the engine part, a plurality of first engaging portions and a plurality of first non-engaging portions alternately arranged together, said engaging projection having a size greater than a space surrounded by the first engaging portions and smaller than a space surrounded by the first non-engaging portions, said first engaging and non-engaging portions defining the first hole, and



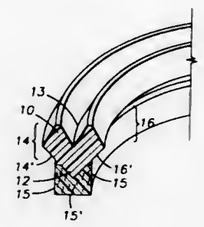
a second plate situated above the first plate, said second plate including at least one second hole located above the first hole, and a plurality of restricting portions formed along the second hole and situated above the first engaging portions and first non-engaging portions, said restricting portions regulating and restricting bending strength of the first engaging portions located under the restricting portions when the first engaging portions engage the engaging projection by urging the first and second plates to the engaging projection to allow the engaging projection to enter into the first and second holes so that the gasket does not easily disengage from the engaging projection.

5,551,703

PACK OFF SEAL

John D. Morvant, 14535 Chrisman, Houston, Tex. 77039

Continuation-in-part of Ser. No. 950,820, Sep. 24, 1992, Pat. No. 5,306,021, which is a continuation of Ser. No. 512,734, May 21, 1990, abandoned, which is a continuation of Ser. No. 833,690, Feb. 25, 1986, abandoned. This application Jan. 29, 1993, Ser. No. 11,338
The portion of the term of this patent subsequent to Apr. 26, 2011, has been disclaimed.
Int. Cl.[6] F16J 15/10
U.S. Cl. 277—188 R **1 Claim**



1. An anti-extrusion sealing device for use in an enclosed area subject to mechanical loading, comprising:

an extrudable body section having substantially uniform extrudable material and an upper end and lower end and an inner and an outer sealing surface with the enclosed area on opposite sides of said body section;

an upper anti-extrusion section and a lower anti-extrusion section, each of said sections having an upper portion and a bottom, said bottom having a bottom surface extending substantially across the width of said anti-extrusion section, said anti-extrusion section in continuous and uninterrupted contact at said upper portion to one of said upper end and lower end of said body section, and said bottom surface abutting the enclosed area, said anti-extrusion section having means for

resisting extrusion forces acting on said sealing surfaces adjacent said anti-extrusion section, said anti-extrusion section being comprised of a knitted material, at least some of the filaments of said knitted material being metallic in nature, said upper portion having inner and outer radial edges facing the enclosed area and an upper surface having at least a partial V-shape in cross-section between said edges;

said extrudable body section upper and lower ends having a lower portion having a lower surface shaped for reception in said upper surface of said anti-extrusion section upper portion;

said anti-extrusion section bottom includes a portion below said V-shape upper surface of sufficient axial thickness to permit outward rotation of said radial edges and said upper surface so that said radial edges contact the enclosed area in response to normal force applied to said bottom surfaces, whereby upon application of force from the enclosed area upon said top, said radial edges rotate into contact with the enclosed area adjacent to said sealing surfaces, forming an anti-extrusion seal for said extrudable material of said sealing surfaces.

5,551,704

SEAL FOR ENHANCING PIPES

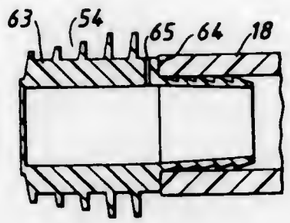
John Taylor, South Godstone; Michael Hicks, Woking; Richard Lamb, Worcester Park; Robert N. Bennett, Hextable; Keith Nixon, Biggin Hill; Ian Ashcroft, Purley; Adrian S. Parkes, Burgess Hill, and John P. Smith, Sevenoaks, all of, United Kingdom, assignors to British Gas plc, London, England

Division of Ser. No. 566,411, Oct. 23, 1990. This application Nov. 4, 1994, Ser. No. 336,049

Claims priority, application United Kingdom, Dec. 23, 1988, 8830111

Int. Cl.[6] F16J *15/10*

U.S. Cl. 277—208 **9 Claims**



1. A seal for replacing an existing fluid-carrying pipe with a replacement pipe, which comprises:

a tubular body of a flexible material, the body having a rear portion for connection to the leading end of the replacement pipe and a front portion to provide a barrier to the flow of fluid along an annular gap between an internal wall of the existing pipe and an external wall of the replacement pipe, the seal also having a seal member preventing the flow of fluid through the bore of the seal, the seal member being one of the removable seal member and a puncturable seal member preventing the flow of fluid through the seal, wherein the front portion has a plurality of vanes, disposed around an external wall of the front portion, the vanes providing a barrier to the flow of fluid along the annular gap wherein the body includes a wall having an aperture and wherein the wall, in use, links the bore of the seal to the annular gap.

5,551,705

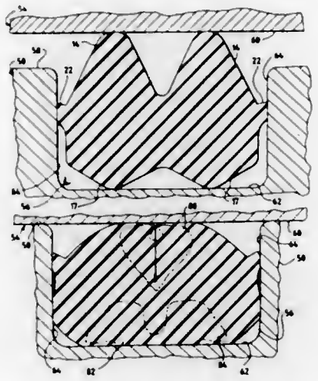
DOUBLE BEADED SPAGHETTI SEAL WITH STIFFNESS INCREASING DEFORMATION BEHAVIOR

Colin Chen, Barrington; Keith Madison, Carol Stream, and Michael J. Szott, Hanover Park, all of Ill., assignors to Fel-Pro Incorporated, Skokie, Ill.

Filed Jul. 12, 1995, Ser. No. 501,234

Int. Cl.[6] F16J *15/10*

U.S. Cl. 277—206 A **9 Claims**



1. A sealing assembly comprising a spaghetti seal having an elongated elastomeric body seated and retained in a groove defined in a flange of a first part to be sealed to a second part, said groove opening at a surface of said first part and adapted to face said second part, said groove having a bottom surface and side surfaces,

said elastomeric body having a central body portion and side surfaces, said body side surfaces bearing against said groove side surfaces,

a pair of integrally formed side-by-side upwardly projecting sealing beads of similar size and shape extending upwardly from said central body portion and extending along the length of said body, each of said sealing beads having a peak extending outwardly beyond the surface of said first part with a first elongated void zone lying between said upstanding sealing beads and along the length of said body,

said central body portion confronting and engaging said bottom surface of said groove, and wherein when said seal is loaded by a load applied to said first and second parts said beads incline inwardly towards each other to promote movement of said beads into contact with each other to increase the stiffness of the seal in its zone of contact with said second part.

5,551,706

COMPOSITE GASKET FOR SEALING FLANGES AND METHOD FOR MAKING AND USING SAME

Eileen C. Barna, West Chester, Pa.; Elizabeth M. Hamilton; Eric W. Lalli, both of Elkton, Md., and Cindy B. Lubin, Chapel Hill, N.C., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Continuation-in-part of Ser. No. 183,386, Jan. 19, 1994, which is a continuation-in-part of Ser. No. 118,372, Sep. 8, 1993, which is a continuation-in-part of Ser. No. 50,903, Apr. 20, 1993. This application Jul. 29, 1994, Ser. No. 283,480

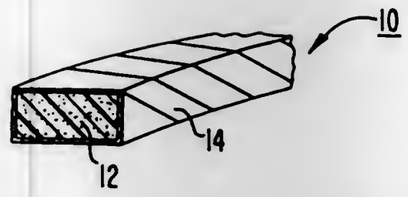
Int. Cl.[6] F16J *15/10*

U.S. Cl. 277—229 **26 Claims**

1. A gasket material for sealing a fluid connection in an apparatus, which gasket material comprises:

a core of elongated polytetrafluoroethylene (PTFE);

means to constrain the core from lateral flow when the core is placed under compressive pressure to establish and maintain a fluid seal, the means comprising a film wrap around the PTFE core to form a sealant of sufficient strength to limit creep of the PTFE core when the gasket is placed under pressure.



5,551,707

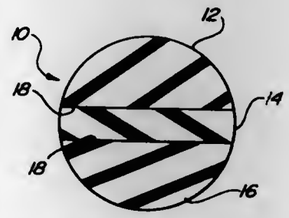
MULTI-MATERIAL SEAL RING

Douglas E. Pauley; Gary D. D'Abate, both of Gainesville; Kazushi Ishikawa, and John M. Lopez, both of Cleveland, Ga., assignors to Freudenberg-NOK General Partnership, Plymouth, Mich.

Filed Jun. 6, 1995, Ser. No. 469,653

Int. Cl.[6] F16J *15/00*

U.S. Cl. 277—233 **18 Claims**



1. A composite seal ring comprising:

a multi-layer member including the following layers:

a first elastomeric silicone layer;

a thermoplastic elastomeric layer;

a second elastomeric silicone layer, said plastic layer sandwiched between said first and second elastomeric layers wherein said first and second elastomeric layers and said plastic material are formed of a material free of cross-linkage bonding and;

an adhesive, said adhesive positioned between said elastomeric silicone layers and said thermoplastic elastomeric layer to form a permanent bond between said layers resulting in said multi-layer member.

5,551,708

FACE RING RETAINER ARRANGEMENT FOR MECHANICAL SEAL

John R. Vesey, Mattawan, and Harry L. Mason, Portage, both of Mich., assignors to Durametallic Corporation, Kalamazoo, Mich.

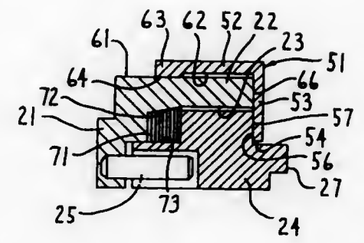
Filed Jun. 29, 1994, Ser. No. 268,235

Int. Cl.[6] F16J *15/38*

U.S. Cl. 277—81 R **7 Claims**

1. A mechanical seal assembly for creating a sealed relationship between a housing and a rotatable shaft which is surrounded by the housing, comprising:

first and second seal ring arrangements disposed in axially opposed relationship to one another in surrounding relationship to the shaft, said first seal ring arrangement being nonrotatably coupled relative to the shaft and said second seal ring arrangement being nonrotatably coupled relative to the housing, said first and second seal ring arrangements being relatively axially movable, and resilient means for normally axially urging the seal ring arrangements relatively axially toward one another;



said first and second seal ring arrangements respectively including first and second annular seal rings which respectively define thereon first and second annular seal faces which are disposed in axially opposed and facing relationship and are normally maintained in relatively rotatable and slidable engagement with one another to create a seal between regions disposed adjacent radially inner and outer edges of said seal faces;

one said seal ring arrangement including a support ring maintained in axial and radial supporting engagement with one said seal ring as respectively associated with said one seal ring arrangement;

said one seal ring having first and second annular radial surfaces which face axially outwardly in opposite directions and which are respectively defined adjacent opposite axial ends of said one seal ring, said first radial surface facing axially in the same direction as the seal face defined on said one seal ring but being disposed axially inwardly from the respective seal face;

said support ring including a radial wall which is positioned in radially overlapping relation to said one seal ring adjacent a rear axial end thereof, said radial wall having a third radial surface thereon disposed in facing and opposed relation to said second radial surface, said support ring having an annular sleevelike flange which externally surrounds said one seal ring so as to be disposed in close proximity to an exterior cylindrical peripheral surface of said one seal ring without creating a distortion-inducing contact therewith, said annular flange terminating in a free end which is positioned in the vicinity of said first radial surface;

a one-piece cuplike retainer fixedly secured to said annular flange and radially overlapping said one seal ring for axially confining said one seal ring between said retainer and said radial wall, said retainer including an annular sleeve portion which is telescoped over said annular flange and is fixedly engaged therewith by a press fit therebetween, said retainer including a radial ringlike flange portion which is fixedly joined to and projects radially inwardly from said sleeve portion so as to radially overlap said one seal ring, said radial flange portion defining thereon a fourth radial surface which is disposed in opposed relation to said first radial surface;

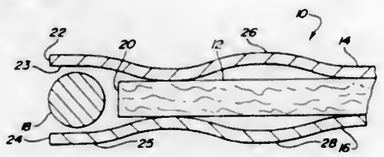
said first and fourth opposed radial surfaces defining a first pair of confining surfaces which are disposed adjacent one axial end of said one seal ring and are disposed in direct axial abutting and contacting engagement with one another, and said second and third opposed radial surfaces defining a second pair of confining surfaces as disposed adjacent the other axial end of said one seal ring; and

an annular gasket resiliently axially compressed between the opposed confining surfaces of said second pair of confining surfaces, said gasket being disposed radially between and radially sealingly engaged with said one seal ring and said support ring;

whereby said one seal ring is surrounded by and contained within the support ring and is axially confined between said third and fourth radial surfaces so as to withstand pressure

reversals imposed on said one seal ring without requiring use of a radial interference-type fit between said one seal ring and said support ring.

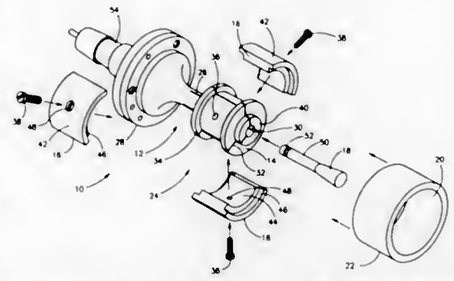
5,551,709
MULTIPLE LAYER CYLINDER HEAD GASKET WITH A WIRE RING
Tom P. Plunkett, Lemont, Ill., assignor to Dana Corporation, Toledo, Ohio
Filed Apr. 7, 1995, Ser. No. 418,710
Int. Cl.[6] F16J *15/08*
U.S. Cl. 277—235 B **4 Claims**



1. A cylinder head gasket for an internal combustion engine comprising:
a substantially flat center plate having an opening therein;
a first spring plate disposed over the center plate and having an opening smaller than the opening in the center plate and aligned therewith and thereby defining a ring retention portion of the first spring plate extending radially inwardly from the opening in the center plate;
a second spring plate disposed over the center plate opposite the first spring plate having an opening smaller than the opening in the center plate aligned therewith and thereby defining a ring retention portion of the second spring plate extending radially inwardly from the opening in the center plate;
a substantially wavelike concentric embossment with a plurality of undulations in the first spring plate encircling the opening therein and radially proximate thereto;
a substantially wavelike concentric embossment with a plurality of undulations in the second spring plate encircling the opening therein and radially proximate thereto; and
a wire ring having a wire diameter greater than a thickness of the center plate and disposed between the ring retention portions of the spring plates, the wire ring being radially exposed at an inside diameter;
wherein clamping the gasket between two sealing surfaces forms a primary combustion seal at the wire ring and forms a secondary combustion seal radially outwardly of the primary combustion seal.

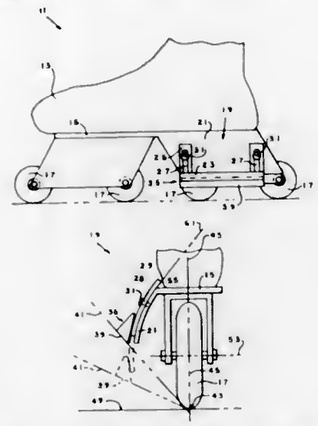
5,551,710
UNIVERSAL MODULAR SLEEVE-CLAMP SYSTEMS
Asher Bruchman, Petach Tikvah, Israel, assignor to Techcom Technical Computerized Fixturing Ltd., Hefer, Israel
Filed Feb. 28, 1995, Ser. No. 396,040
Int. Cl.[6] B23B *31/40*
U.S. Cl. 279—20 **13 Claims**

1. A universal sleeve-clamp for using interchangeable jaw pieces to clamp and align a workpiece, the universal-sleeve clamp comprising:
(a) a sleeve having a plurality of radially moveable elements;
(b) locating means for locating the interchangeable jaw pieces on said radially moveable elements;
(c) attachment means for attaching the interchangeable jaw pieces to said radially moveable elements;
(d) a clamping taper coaxial with said sleeve, said clamping taper being moveable relative to said sleeve so as to bear against said radially moveable elements thereby forcing said radially moveable elements, and hence the interchangeable jaw pieces, to move radially to clamp the workpiece; and



(e) positioning means for positioning a locator plate for aligning the workpiece.

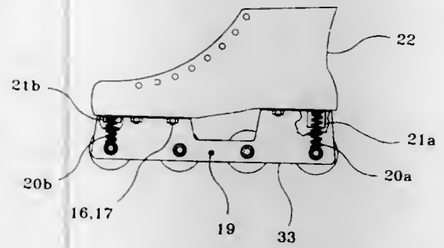
5,551,711
BRAKING MECHANISM FOR IN-LINE SKATE
Gary Mangelsdorf, 8400 Grizzly Way, Evergreen, Colo. 80439
Filed Feb. 24, 1995, Ser. No. 393,659
Int. Cl.[6] A63C *17/14*
U.S. Cl. 280—11.2 **12 Claims**



1. A braking mechanism on an in-line roller skate, said skate including a boot, an elongate base plate having a longitudinal axis, a rearward half, and an upper portion to which said boot is secured, and a plurality of in-line wheel assemblies supported from the lower portion of said base plate, said plate having first and second opposite sides, and said assemblies including wheels aligned one behind the other and disposed in a common plane that is through said longitudinal axis and perpendicular to the rotational axes of said wheels, and said wheels having lower end portions for engaging a travel surface, said braking mechanism including:
a) a brake element having a lower end to which a brake pad is secured, the pad having a generally flat brake surface;
b) means on at least one of said opposite sides of said base plate including an arcuate guide surface slidably and lockably engaged by said brake element and having an axis of curvature parallel to said longitudinal axis for supporting the brake element lower end laterally spaced a predetermined distance from said common wheel plane for adjustable movement that raises or lowers the pad along an arcuate path that has an axis of curvature parallel to said longitudinal axis such that the plane of said pad surface is maintained in substantial alignment with said wheel lower end portions, and whereby said pad surface is adapted to engage said travel surface when said common wheel plane achieves a predetermined acute angle to said travel surface; and

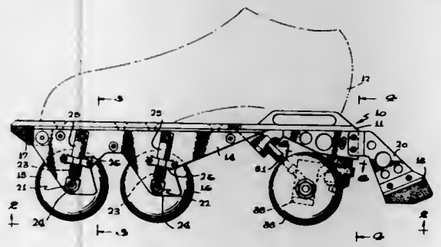
c) clamp means for releasably securing said brake element against movement relative to said supporting means.

5,551,712
SKATE BRAKE AND BRAKING SYSTEM
Richard M. Repucci, 44 Summer St., Medford, Mass. 02155
Filed May 2, 1995, Ser. No. 433,003
Int. Cl.[6] A63C *17/14*
U.S. Cl. 280—11.2 **6 Claims**



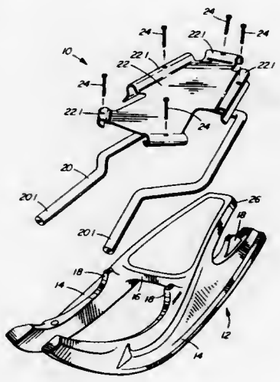
1. A brake for stopping the rolling motion of a skate comprising:
a) a chassis with slots as a means for guidance for enabling translation of a skate wheel axle in a direction which is generally perpendicular to an axis of rotation and to a direction of a skater's motion,
b) a spring means with a spring means force for restraining the motion of said axle in said slots, and
c) a friction pad or other surface means which bears against a skate wheel when a skater's weight or momentum is disposed to overcome said spring means force.

5,551,713
SHOCK ABSORBING BLADE ROLLER SKATES
Joshua Alexander, P.O. Box 40511, Pasadena, Calif. 91114
Filed Jun. 13, 1995, Ser. No. 490,029
Int. Cl.[6] A63C *17/00*
U.S. Cl. 280—11.19 **1 Claim**



1. Shock absorbing blade roller skate comprising:
a shoe plate having a front end and a back end integrally connected together;
a pair of wheels downwardly depending from said front end in an in-line series spaced-apart relationship;
a pair of wheels downwardly depending from said back end of said shoe plate in a tandem parallel side-by-side, spaced-apart relationship;
shock absorbing means resiliently supporting said in-line pair of wheels to said shoe plate and resiliently supporting said tandem pair of wheels to said shoe plate;
said shock absorbing means includes a piston and cylinder assemblage wherein each piston and cylinder assemblage comprising a cylinder connected to said shoe plate and to a said piston which is connected to each wheel depending from said front end;
said pair of in-line wheels include a shock absorbing means consisting of said piston and cylinder assemblage resiliently connecting each wheel of said pair of in-line wheels to said shoe plate;
said pair of tandem wheels include a shock absorbing means consisting of a pair of coil springs laterally expanding between said tandem wheels and said shoe plate at an angular disposition so as to permit rotation of said shoe plate about a longitudinal axis extending along the length of said shoe plate;
said tandem wheels are mounted on axle mounts which are pivotally mounted on a block by pivots; and
said block includes a recess occupied by said coil spring on each side of said block.

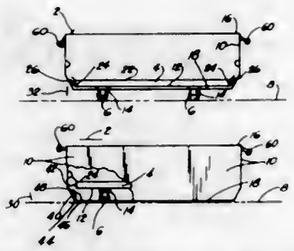
5,551,714
SNOW LUGE
Wally Rauf, Calgary; Derek Gratz, Red Deer, and Bruce Smith, Toronto, all of, Canada, assignors to Canadian Luge Association, Gloucester, Canada
Continuation-in-part of Ser. No. 156,997, Nov. 24, 1993, Pat. No. 5,348,322, which is a continuation of Ser. No. 969,873, Oct. 30, 1992, abandoned. This application Aug. 22, 1994, Ser. No. 294,005
Int. Cl.[6] B62B *13/06*
U.S. Cl. 280—18 **11 Claims**



1. A luge for tobogganing on snow comprising a pair of spaced runners having spaced forward ends and spaced rearward ends, a single bridge portion extending between said runners and connecting the runners together and a seat portion located between said runners and extending generally rearwardly of said bridge portion wherein said bridge portion is spaced at a first predetermined distance rearwardly of the forward ends of said runners and spaced at a second predetermined distance forwardly of the rearward ends of said runners and a pair of handles spaced laterally of the seat portion.

5,551,715
TWO POSITION UTILITY BASKET
Albert Pickard, 14308 Big Ridge Rd., Biloxi, Miss. 39532
Filed Nov. 30, 1994, Ser. No. 347,648
Int. Cl.[6] B62B *5/04*
U.S. Cl. 280—43.24 **10 Claims**

1. A wheeled basket for holding contents comprising:



a load bearing platform supported by a plurality of wheels for rolling on a floor, said wheels being pivotally affixed to said platform for maintaining said platform at a fixed height relative to said floor,

a basket container having an outer peripheral wall surrounding said platform, a bottom wall located below said platform, and openings formed in said bottom wall; and

a plurality of latches for selectively latching said container to said platform in either of a lower position and a upper position relative to said platform, said wheels adapted to pass through said openings formed in said bottom wall when said container is in said upper position to permit rolling engagement with said floor and said bottom wall having a friction surface adapted to engage with said floor when said container is in said lower position for braking said wheeled basket.

5,551,716

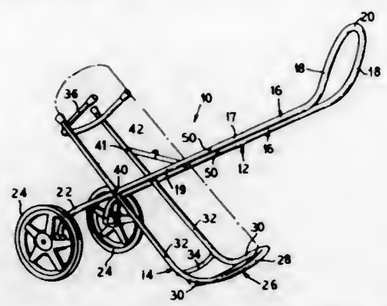
PUSHABLE GOLF CART

Michael E. Kordecki, 298 E. Saddle Back Rd., Vernon Hills, Ill. 60061, and John R. Kordecki, Arlington Heights, Ill., assignors to Michael E. Kordecki, Vernon Hills, Ill.

Filed Dec. 30, 1993, Ser. No. 175,795

Int. Cl.[6] B62B *1/04*

U.S. Cl. 280—47.18 **19 Claims**



1. A golf cart for holding a golf bag on a support surface comprising:

an elongated, upstanding carriage frame terminating at an upper end thereof in a handle and having mounted to a lower end thereof a pair of carriage wheels; and

a generally planar golf bag cradle mounted to said carriage frame, the cradle including an upper end that extends upwardly from the carriage and a lower end that terminates at a bag stop between the pair of wheels and the handle, wherein the bag stop supports the golf bag and is a base that defines a stand for the cart to rest on the support surface between the pair of wheels and the handle,

wherein the cradle is generally U-shaped and includes at least two generally coplanar parallel elongated cradle arm, and

wherein the cradle arms are connected to respective bights and the bag stop is defined by a base crossbar extending between the bights connected to the cradle arms.

5,551,717

SPORTS CONVEYANCE

John De Courcey Milne, 6/39 Grosvenoer Street, Balmoral, Queensland, 4171, Australia

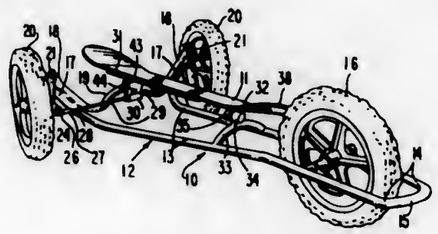
PCT No. PCT/AU93/00161, § 371 Date Oct. 11, 1994, § 102(e) Date Oct. 11, 1994, PCT Pub. No. WO93/20911, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 8, 1993, Ser. No. 318,709

Claims priority, application Australia, Apr. 9, 1992, PL1807; Dec. 18, 1992, PL6443

Int. Cl.[6] B62M *1/00*

U.S. Cl. 280—87.042 **7 Claims**



1. A sports conveyance comprising:

a substantially flat, elongate, rider-supporting board having spaced longitudinal side edges extending between front and rear ends of the board;

frame means connected to the board in such manner that the board is tiltable about a longitudinal tilt axis, the board being symmetrical to either side of the tilt axis so that the longitudinal side edges of the board are at equal distances on opposite sides of the tilt axis;

said frame means including a rear frame section supported by rear wheel means permitting motion of the board in the direction along said tilt axis;

said frame means including a forward frame section supported by a pair of steerable front wheels disposed at equal distances on opposite sides of the board and spaced from the longitudinal side edges of the board;

said front wheels having respective stub axles in respective wheel mountings arranged to permit rotation of the front wheels about axes transverse to said longitudinal tilt axis;

interconnecting means between the front wheels whereby they may be turned in unison to either side of the direction along said tilt axis;

the board being adapted to be disposed in either an untilted substantially horizontal disposition in which the front wheels permit motion of the conveyance in the direction along the tilt axis or in a selected tilted disposition, the board being so connected to the said interconnecting means of the front wheels that depression of the board by body weight of the rider at a respective side of the board causes turning of the front wheels in unison for steering in the corresponding direction;

said front wheels having their wheel mountings connected by said forward frame section which extends transversely beneath the board rearwardly of the front end of the board, said forward frame section having said tilt axis midway along its length, while to each side of said tilt axis the forward frame section is of a shape defining a depression or bowed portion at a lower height than the tilt axis to accommodate a respective side edge of the board when the latter is tilted to the maximum extent at the respective side of the tilt axis.

5,551,718

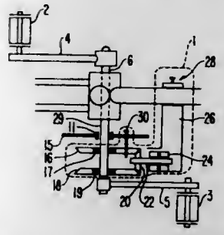
PEDAL MECHANISM FOR CYCLE AND EXERCISE EQUIPMENT

Salvatore Toronto, 3995 Hortensia St., Ste. G-1, San Diego, Calif. 92109, and Paul Novak, 1617 Brookes Ave. #6, San Diego, Calif. 92103

Filed Feb. 4, 1994, Ser. No. 191,586

Int. Cl.[6] B62M *1/04*

U.S. Cl. 280—252 **28 Claims**



1. A pedal mechanism for attachment to a bicycle, having pedals, a pedal shaft, a drive chain and a drive wheel, said drive wheel being caused to rotate in a clockwise direction, when viewed from the right side of said bicycle, by a clockwise force provided by rotation of said drive chain in one direction, comprising:

a gearing means for attachment to said bicycle to impart a clockwise force in said one direction to said drive chain simultaneously from both of said pedals by rotation of said pedals in a counterclockwise direction in addition to imparting a force in said one direction to said drive chain simultaneously from both of said pedals by rotation of said pedals in said clockwise direction.

5,551,719

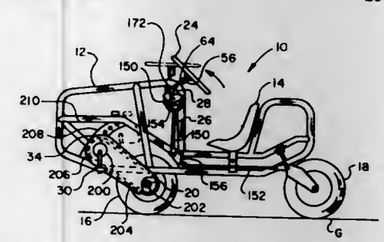
PEDAL-PROPELLED TRICYCLE VEHICLE HAVING TWO MODES OF STEERING

Harry C. Rettger, Jr., 3557 Ridgewood Dr., Pittsburgh, Pa. 15235

Filed Dec. 28, 1994, Ser. No. 364,938

Int. Cl.[6] B62K *5/04*

U.S. Cl. 280—282 **20 Claims**



1. In a steerable toy vehicle having a frame, a driver's seat secured to said frame, and three ground engaging wheels joined to said frame, the improvement comprising:

a steering wheel having a central shaft rotatably connected to said frame, a linkage coupled to said steering wheel and connected to one of said ground engaging wheels about a steering axis, said linkage coupled to said steering wheel through said central shaft and a gearing arrangement, said gearing arrangement includes a worm carried by said central shaft and a worm gear joined to said frame in meshing relation with said worm, the rotational axes of said worm and said worm gear being substantially perpendicular; and

said central shaft capable of rotating in a first mode about said rotational axis of said worm to cause said linkage to effect turning of said one of said ground engaging wheels, and said central shaft capable of rotating in a second mode about said rotational axis of said worm gear to also cause said linkage to effect turning of said one of said ground engaging wheels.

5,551,720

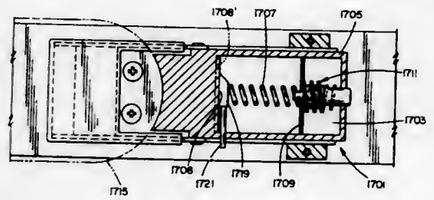
APPARATUS FOR SELECTIVELY VARYING THE STIFFNESS OF A SKI

Piero G. Ruffinengo, 820 Edgehill Rd., Salt Lake City, Utah 84103

Division of Ser. No. 114,385, Aug. 30, 1993, Pat. No. 5,320,377, which is a continuation-in-part of Ser. No. 715,598, Jun. 14, 1991, Pat. No. 5,251,923. This application Jun. 3, 1994, Ser. No. 253,754

Int. Cl.[6] A63C *9/086*

U.S. Cl. 280—602 **8 Claims**



1. A system for controlling the stiffness and/or vibration in a ski, the ski having binding apparatus with a toe piece and a heel piece for attaching the system to the ski, said system comprising:

a boot having boot sole means extending in a longitudinal direction, said boot sole means having heel portion means and toe portion means, said heel portion means and said toe portion means each having a transverse width which is substantially equal, one of said toe portion means and said heel portion means being fixed to said boot and the other one of said toe portion means and said heel portion means being longitudinally movable relative thereto, said boot and the movable one of said toe portion means and said heel portion means having a movable interconnection including a rib received within a channel to enable the longitudinal movement of the movable one of said toe portion means and said heel portion means relative to the fixed one of said toe portion means and said heel portion means,

biasing means urging the movable one of said toe portion means and said heel portion means in a direction away from the fixed one of said toe portion means and said heel portion means when said toe portion means is received in the toe piece and said heel portion means is received in the heel piece to control the stiffness and/or vibration in the ski; and

limiting means for limiting the relative movement in the longitudinal direction of said toe portion means relative to said heel portion means, said limiting means including stop means for retaining said toe portion means in an operative relationship relative to said heel portion means when said boot is removed from said binding apparatus.

5,551,721

SKI BRAKE

Gilles Renaud-Goud, Annecy; Pierre Szafranski, Pringy, and Jean-Francois Merino, Annecy le Vieux, all of, France, assignors to Salomon S.A., Chavanod, France

Filed Jul. 18, 1994, Ser. No. 276,851

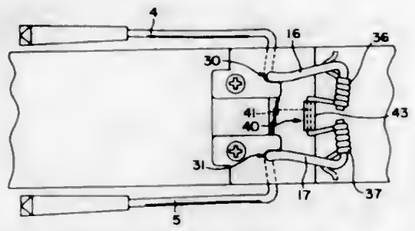
Claims priority, application France, Jul. 16, 1993, 93 08914

Int. Cl.[6] A63C *7/10*

U.S. Cl. 280—605 **9 Claims**

1. A ski brake designed to slow travel of a ski in motion following release of a ski boot, said ski brake comprising:

(a) two separate brake arms, each brake arm incorporating a braking segment movable between an operative braking posi-



tion and a non-operative rest position, a rotational segment extending transversely to the braking segment, and an actuator, the actuator including an intermediate segment and a transverse connection segment, said transverse connection segments of said brake arms being substantially aligned;

(b) a base, the base having a transverse opening forming a bearing for each rotational segment, said rotational segments being movably held within the transverse openings; and

(c) a return spring made of a wire and separate from said brake arms acting on said actuators of said brake arms in order to bring said braking segments elastically back into operative braking position, said return spring having a central area comprising a loop extending toward said base, said loop having a lower base which rests against an upper surface of said base in front of said transverse openings, each side of said loop terminating in a winding made of the wire used to make said spring, said windings of said spring being fitted on said transverse connection segments of said brake arms, in order to connect said spring to said actuators, and incorporating, toward the outside, hook-shaped ends which grip said actuators of said brake arms.

5,551,722

VEHICLE SUSPENSION LINK

Andrew W. Schwartz, Vernon Hills; William K. Hayes, Lake Bluff, and John E. Bettini, St. Charles, all of Ill., assignors to Mac Lean-Fogg Company, Mundelein, Ill.

Continuation of Ser. No. 457,912, Dec. 27, 1989, abandoned, which is a continuation-in-part of Ser. No. 262,768, Oct. 26, 1988, abandoned. This application May 10, 1991, Ser. No. 701,363

Int. Cl.[6] B60G *11/20*

U.S. Cl. 280—689 **8 Claims**

1. An attachment link for connecting a stabilizer arm to a suspension arm of a vehicle, comprising:

(a) a shaft, threaded on each end, having a centrally located, integrally molded corrosion-resistant spacer with an enlarged flange at each end thereof;

(b) a pair of interior bushings mounted on the shaft adjacent the flanges; and

(c) a pair of retainer components for capturing the stabilizer arm and the suspension arm on opposite ends of the spacer, said retainer components including generally similarly shaped urethane retainer bushings each including an outwardly directed integrally molded groove for capturing and retaining a washer, the washer itself retaining a threaded nut thereon for engagement with the threaded ends of the shaft;

(d) wherein the interior bushings include inwardly, radially directed protrusions for frictionally retaining the interior bushings on the shaft.

5,551,723

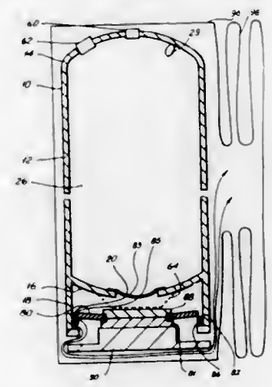
PULSE SHAPING FOR AIRBAG INFLATORS

Geoffrey L. Mahon, Ridgewood, and Peter Materna, Metuchen, both of N.J., assignors to Breed Automotive Technology, Inc., Lakeland, Fla.

Filed Jul. 20, 1994, Ser. No. 278,377

Int. Cl.[6] B60R *21/26*

U.S. Cl. 280—737 **63 Claims**



1. A vehicular airbag inflator assembly comprising:

a vessel capable of containing a source of gas under pressure for inflating an airbag, said vessel having a sealed outlet and means for opening said sealed outlet in response to detection of a vehicle crash,

pulse-shaping valving means located between said source of said gas and said airbag having a variable open flow area and a movable element and through which said gas entering said airbag must flow, for varying the flowrate of said gas flowing through said pulse-shaping valving means by controlling the open flow area of said pulse-shaping valving means as a function of the force exerted on said pulse-shaping valving means by said gas flowing through said pulse-shaping valving means, said force being related to the instantaneous difference between the pressure of said gas in said source and the pressure in said airbag, the pulse shaping valve means being so constructed and arranged such that the behavior of said open flow area of said pulse-shaping valving means is such that said open flow area of said pulse-shaping valving means generally decreases with increasing values of said force exerted on said movable element of said pulse-shaping valving means, but always remains at least as large as a minimum always-open flow area no matter how large said load becomes.

5,551,724

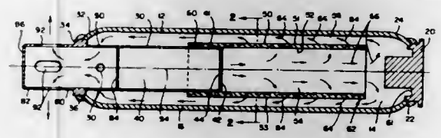
TREATMENT OF INFLATABLE RESTRAINT SYSTEM INFLATOR PARTICULATE-CONTAINING GAS WITH EXPANDED METAL

Charles W. Armstrong, III, Huntsville; Linda M. Rink, Liberty; Wesley L. Hatt; Todd S. Parker, both of Centerville, and Brian H. Fulmer, Farr West, all of Utah, assignors to Morton International, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 121,397, Sep. 14, 1993, Pat. No. 5,360,232, Ser. No. 248,939, May 25, 1994, and Ser. No. 280,487, Jul. 26, 1994. This application Oct. 21, 1994, Ser. No. 326,996

Int. Cl.[6] B60R *21/26*

U.S. Cl. 280—737 **19 Claims**



1. A process for treating particulate-containing gas of a vehicular safety restraint inflator, said process comprising the step of:

contacting a particulate-containing gas of a vehicular safety restraint inflator with a treatment element comprising at least one layer of an expanded metal.

5,551,725

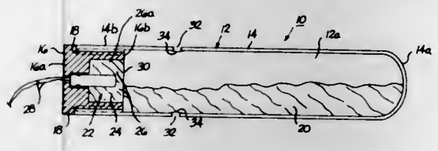
VEHICLE AIRBAG INFLATOR AND RELATED METHOD

Christopher P. Ludwig, 4038 Normanwood, West Bloomfield, Mich. 48323

Filed Mar. 10, 1995, Ser. No. 402,103

Int. Cl.[6] B60R *21/16*

U.S. Cl. 280—737 **17 Claims**



1. A vehicle airbag inflator comprising:

a contained volume;

a gas producing source disposed within the contained volume for producing a main gas in the contained volume, the main gas comprising a working gas;

an initiating system in fluid or thermal communication with the gas producing source for causing the gas producing source to produce the main gas; and

at least one exhaust orifice in fluid communication with the contained volume for providing an exhaust path for the working gas from the contained volume and for controlling the flow of the working gas as it is exhausted from the contained volume, the at least one exhaust orifice including at least one contained volume closure in or across the at least one exhaust orifice for selectively creating a fluid-tight seal in the contained volume;

the working gas creating a pressure-volume quantity in the contained volume ($PV_{cv}(t)$), the working gas has associated with it a pressure-volume quantity for the cumulative amount of the working gas ($PV_{cum}(t)$), and the working gas having associated with it a total pressure-volume quantity (PV_{total}) when the gas producing source is fully converted to the main gas;

the pressure-volume quantity in the contained volume ($PV_{cv}(t)$) reaching a peak (PV_{peak}) during the conversion of the gas producing source to the main gas that is at least about one half of the total pressure-volume quantity (PV_{total}).

5,551,726

SAFETY NET SYSTEM FOR A MOTOR VEHICLE TO SEPARATE A CARGO COMPARTMENT FROM A PASSENGER COMPARTMENT

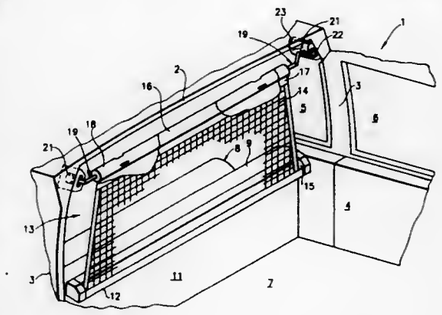
Eduard Ament, Aichwald, Germany, assignor to Baumeister +Ostler GmbH & Co., Aichwald, Germany

Filed Sep. 12, 1994, Ser. No. 304,246

Claims priority, application Germany, Oct. 25, 1993, 43 36 380.6

Int. Cl.[6] B60R *21/06*

U.S. Cl. 280—749 **24 Claims**



1. Safety net system for combination with a motor vehicle to separate a cargo compartment of the vehicle from a passenger compartment and to prevent cargo from the cargo compartment to penetrate the passenger compartment upon abrupt deceleration of the vehicle, having

a safety net (**14**) having a pair of essentially parallel edges (**16**);

first attachment means (**15**) for connecting one edge of the safety net to the vehicle; and

second attachment means for connecting another edge of the safety net to the vehicle,

wherein said second attachment means comprises an elongated and essentially rod-shaped element (**18**) which is hollow and tubular adjacent at least one of its ends to there define a coaxial chamber, extending from the at least one end of the elongated element (**18**) internally thereof;

a tubular insert element (**24**) located in said chamber and extending from the at least one end of the elongated element (**18**) internally thereof and secured therein;

an internally projecting rib (**48**), projecting internally from the elongated element (**18**) into said chamber, engaging and retaining said tubular insert element (**24**) in the chamber;

an elongated holding element (**19**) having vehicle coupling means (**21**) at one end thereof for releasable coupling with a reception element (**23**) secured to the motor vehicle,

said holding element (**19**) having a shaft-like portion (**36**) terminating at the other end thereof, said shaft-like portion being received in said tubular insert element (**24**) and movable therein between two terminal positions;

and kinetic energy absorbent means including interengagement means between the shaft-like portion (**36**) of the holding element (**19**) and the tubular insert element (**24**) in the chamber of said elongated element (**18**), for interengagement upon forced relative movement of said holding element (**19**) and the second attachment means due to impingement of cargo against the net and deflection of said second attachment means upon abrupt deceleration of the vehicle.

5,551,727

VEHICLE STEERING COLUMNS

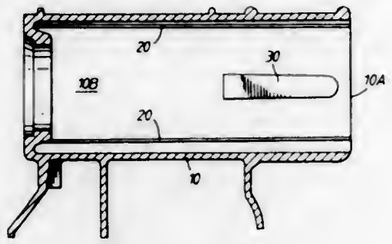
Gerald A. Speich, Warwickshire, England, assignor to The Torrington Company, Torrington, Conn.

Filed Sep. 12, 1994, Ser. No. 304,467

Claims priority, application United Kingdom, Sep. 20, 1993, 9319397

Int. Cl.[6] B62D 1/11

U.S. Cl. 280—777 7 Claims



1. A vehicle steering column comprising:

at least one steering column member;

a means for absorbing energy, the means comprising a steering wheel lock housing including a tubular member in sliding engagement about one of said at least one steering column members, the one of said at least one steering column members having an open-ended axially extending slot therein, the tubular member having a radially inward projecting peg, there being an interference fit between the peg and the slot, the steering wheel lock housing having an installed position wherein the peg is spaced from the end of the slot, and in the event of a vehicle crash, the steering wheel lock housing sliding from the installed position with the peg sliding towards the closed end of the slot.

5,551,728

GLIDING BOARD

Fritz Barthel, Haering, and Josef Dummer, Innsbruck, both of, Austria, assignors to silvretta-sherpas Sportartikel GmbH, Rothschwaige, Germany

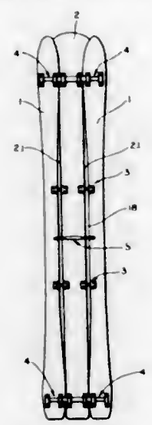
Filed Jul. 25, 1994, Ser. No. 279,658

Claims priority, application Germany, Jul. 23, 1993, 43 24 871.3

Int. Cl.[6] A63C 5/16

U.S. Cl. 280—818 17 Claims

1. In a gliding board having a form of a snowboard having a longitudinal axis, two touring skis, and fitting means for connecting the skis with one another, the improvement comprising clamping means for connecting the two skis at least in a central region thereof so that said two skis can be clamped together accompanied by a deformation of the ski in a direction transverse to the longitudinal axis, so that the gliding board in a clamped state has a substantially smaller sidecut radius than the individual skis when the individual skis are not clamped, and that fixed distances may be adjusted between the skis at least in tip regions of the skis and end regions of the skis.



5,551,729

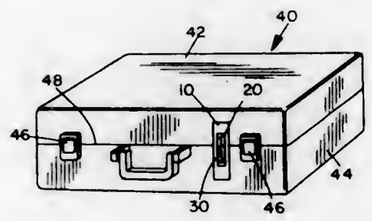
TAMPER INDICATION DEVICE

Brian R. Morgan, 2641 Calle del Oro, La Jolla, Calif. 92037

Filed Nov. 7, 1994, Ser. No. 335,631

Int. Cl.[6] B42D 15/00

U.S. Cl. 283—94 12 Claims



1. A tamper indicating device for securing an item to be protected, comprising:

a multi-layer strip having an upper layer of at least partially transparent material, an indicia-forming layer, and a lower, adhesive layer for securing the strip to an item to be protected;

the upper layer including an imprintable signature area for receiving personal indicia and a non-imprintable area outside said signature area; and

the indicia-forming layer comprising means for changing the appearance of said non-imprintable area of the strip irreversibly on lifting of the strip from a protected item to which it has previously been adhered.

5,551,730

GREETING CARDS

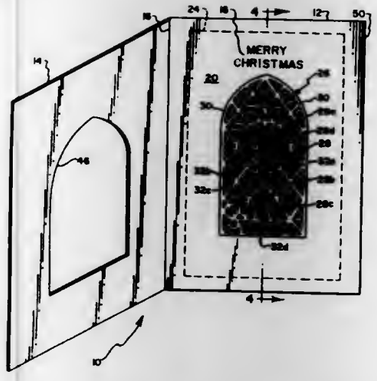
Robert Barreca, 306 Lamarck Dr., Snyder, N.Y. 14226, and Karen Hurley, 117 Chatham, Buffalo, N.Y. 14216

Continuation of Ser. No. 185,501, Jan. 24, 1994, Pat. No. 5,435,603, which is a division of Ser. No. 849,951, Mar. 12, 1992, Pat. No. 5,303,957. This application Jun. 6, 1995, Ser. No. 470,978

Int. Cl.[6] B42D 15/04

U.S. Cl. 283—117 18 Claims

1. A greeting card comprising panel means and further comprising inscription means on said panel means for providing a greeting, said panel means comprising a face panel composed of opaque material and including means having a plurality of ribs defining a decorative pattern of cut-outs therein, and a panel of translucent material rearwardly of said face panel and having a plurality of light transmittable colored regions of different colors with boundary lines defined therebetween, the boundary lines being aligned with said ribs to provide a stained-glass effect, said panel means further comprising a protective back panel, said panel of translucent material being between said face panel and said back panel, and said back panel including cut-out means to allow unobstructed passage of light through said translucent material.



5,551,731

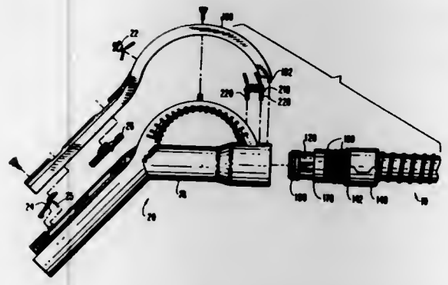
HANDLE SYSTEM FOR VACUUM CLEANER

Steven L. Gray, Johnson City; Peter Hoekstra; Michael F. Martin, both of Bristol, and George C. Moyher, Jr., Bluff City, all of Tenn., assignors to Electrolux Corporation, Atlanta, Ga.

Division of Ser. No. 53,250, Apr. 23, 1993, Pat. No. 5,389,004. This application Oct. 12, 1994, Ser. No. 321,511

Int. Cl.[6] A47L 9/32

U.S. Cl. 285—7 3 Claims



1. For use in a vacuum cleaner system including a suction hose having a hose cuff with a groove therein extending around the hose cuff, the hose cuff being attached to the suction hose at one end of the suction hose, a handle comprising:

a handle body having a front opening and a rear opening and having a suction conduit therein extending inward from the front opening, and further having a bore having a side wall, the bore extending inward from the rear opening and communicating with the suction conduit in fluid flow relationship, the handle body having a slot opening in the side wall of the bore; and

a handle cover joined with the handle body, the handle cover including a tab at a rear end thereof projecting through said slot into said bore; such that:

the hose cuff may be joined to the handle by being positioned in the bore in the handle body in sealing relationship with the side wall of the bore and with the groove in the hose cuff aligned with the slot opening in the side wall of the bore, such that the tab of the handle cover protrudes through the slot opening and into the groove in the hose cuff to prevent the suction hose and hose cuff from being removed from the handle while permitting the suction hose and hose cuff to rotate within the bore.

5,551,732

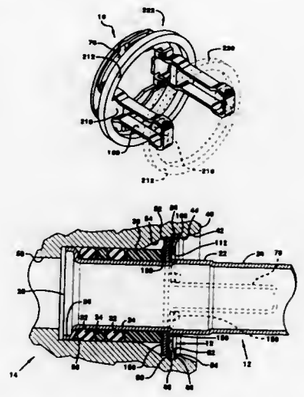
QUICK CONNECTOR

Donald D. Bartholomew, Mt. Clemens, Mich., assignor to Proprietary Technology, Inc., Bloomfield Hills, Mich.

Filed Feb. 14, 1995, Ser. No. 388,397

Int. Cl.[6] F16L 35/00

U.S. Cl. 285—93 4 Claims



1. A quick connector used to couple a male conduit to a female receptacle, said female receptacle having a bore centrally extending therethrough defined by an inside surface therein, said quick connector comprising:

a body segment having an aperture therethrough defined by an inner edge therearound, said inner edge of said body segment surrounding a predetermined portion of said male conduit therewithin;

a pair of waist segments each having an interior edge thereabout, said body segment coupled to said pair of waist segments;

interface portions mounted on said pair of waist segments which attachably engage said female receptacle thereagainst;

a leg segment attached to said pair of waist segments clear of said aperture within said body segment thereof, said leg segment defined by a pair of projecting elements each extending substantially perpendicular to said pair of waist segments such that said leg segment is orientated substantially parallel with a longitudinal axis of said male conduit adjacent thereto; and

said leg segment protruding through said bore of said female receptacle so as to be accessible from thereout, said interface portions insertable into said bore of said female receptacle by allowing said pair of projecting members of said leg segment to at least partially compress toward one another, said leg segment further urging said interface portions radially outward so as to be engagably coupled within said female receptacle, said interface portions being disengagable from said female receptacle by at least partially compressing said projecting members of said leg segment toward one another whereby said quick connector can be longitudinally removed from said female receptacle.

5,551,733

PLASTIC PIPE BRANCH FITTING WITH REINFORCING RIBS

James V. Henwood, Mona Vale, Australia, assignor to Vinidex Tubemakers Pty. Limited, Australia

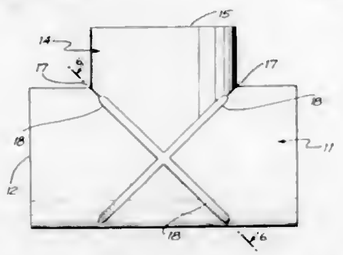
PCT No. PCT/AU93/00344, § 371 Date Jan. 12, 1995, § 102(e) Date Jan. 12, 1995, PCT Pub. No. WO94/07712, PCT Pub. Date Jan. 20, 1994

PCT Filed Jul. 13, 1993, Ser. No. 373,240

Claims priority, application Australia, Jul. 13, 1992, PL3495

Int. Cl.[6] F16L 41/02

U.S. Cl. 285—155 18 Claims



1. A pipe tee comprising a body having a pair of oppositely directed end sockets disposed on a common axis, a branch having a socket with an axis normal to the axis of the body, a center plane containing the axes of the body and the branch, and a pair of crutch points at the intersection of the branch and body in said center plane wherein said pipe tee is of plastics material and stiffening means is provided at side regions of the tee effective to preferentially stiffen said side regions compared to the crutch points.

5,551,734

CONNECTION ASSEMBLY FOR THE CONNECTION OF A PIPE TO A PLASTIC HOUSING

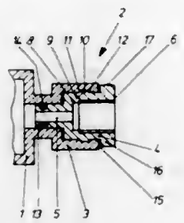
George Sulzyc, Eppelheim, and Horst Venghaus, Walldorf, both of, Germany, assignors to Grau GmbH, Heidelberg, Germany

Filed Jun. 21, 1995, Ser. No. 493,362

Claims priority, application Germany, Jun. 21, 1994, 44 21 574.6

Int. Cl.[6] F16L 55/00

U.S. Cl. 285—174 11 Claims



1. A connector assembly for connecting a pipe to a plastic housing:

said housing including a sleeve extending therefrom, said sleeve defining a passage therethrough for the flow of fluid with respect to said housing;

said sleeve having a small diameter neck portion adjacent said housing and a larger diameter body portion of a breadth greater than said neck portion extending from said neck portion away from said housing;

said passage through the neck portion of said sleeve comprising a neck passage being of small diameter, and through the larger body portion comprising a body portion passage being of larger diameter than said neck passage, and a right angle shoulder formed between said neck passage and said body portion passage;

a connector plug sized and shaped to be partially inserted into the passage of said sleeve and defining a passage therethrough for coupling a pipe to said sleeve;

said connector plug including an elongation of a small external breadth sized and shaped to be received in the neck passage of said sleeve, and including a middle region of greater external breadth than said neck portion and sized and shaped to be received in the passage through said larger body portion of said sleeve for insertion into said sleeve and into juxtaposition with said right angle shoulder, and including an external flange for protruding from said sleeve;

said middle region of said connector plug and the larger body portion of said sleeve including means for rotatably retaining said plug in said sleeve;

said passage through said plug comprising an elongation passage through said elongation and being of small diameter and comprising a middle region passage through said middle region and through said external flange being of larger diameter than said elongation passage, and a right angle shoulder formed between said elongation passage and said middle region passage;

the middle region passage of said connector plug defining connector thread means extending from said flange and through said middle region toward said shoulder;

so that an end portion of a pipe can be inserted into the connector thread means of the middle region passage of the plug and the plug can be engaged at its external flange and rotated with respect to both the housing and the pipe for threaded connection to the plug, and in response to rotation of the plug the end portion of the pipe is moved into the plug and into the sleeve and abuts the right angle shoulder of the plug.

5,551,735

TUBE FITTING

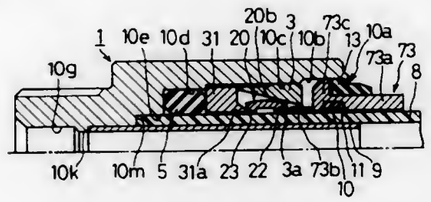
Akira Takayanagi, Nishikasugai-gun; Toshihiro Kumagai, Tajimi, and Kinji Hosoya, Gotenba, all of, Japan, assignors to Tokai Rubber Industries, Ltd., Komaki, Japan, and Kabushiki Kaisha AOI, Gotenba, Japan

Filed Jun. 14, 1994, Ser. No. 261,060

Claims priority, application Japan, Jun. 14, 1993, 5-165894

Int. Cl.[6] F16L 21/06

U.S. Cl. 285—323 6 Claims



1. A tube fitting, comprising:

a tubular body including an opening disposed at an end, an axial bore into which a tube is fitted via the opening, and an inner peripheral surface having a tapered regulatory surface;

an annular clamping member disposed in said axial bore on said regulatory surface, held movably in an axial direction of said axial bore, and including two claws and an outer peripheral portion, each of said two claws being disposed at axially opposite ends of said clamping member, each of said two claws having an inclined surface projecting in a radial direction and engaging with an outer peripheral surface of said tube fitted into said axial bore via said opening, the outer peripheral portion contacting with said regulatory surface and being pressed in a radial direction by said regulatory surface so as to press said two claws onto the outer peripheral surface of said tube;

a releasing mechanism including a tubular base and a leading end, the tubular base disposed in said axial bore on said regulatory surface and held movably in an axial direction of said axial bore, the leading end extending from the base to an inner side of said axial bore and extending between said inclined surfaces of said claws and said outer peripheral surfaces of said tube; and

a sealing ring disposed so as to seal between an inner peripheral surface of said axial bore and an outer peripheral surface of said tube fixed in said axial bore.

5,551,736

DUAL BACKSET DEADBOLT ASSEMBLY FOR A CYLINDER LOCK

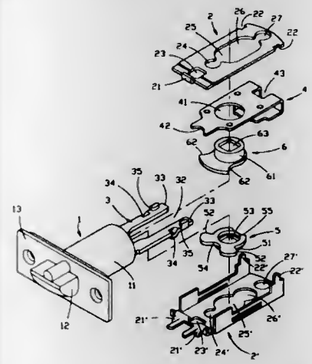
Yaw-Shin Fann, deceased, late of Chia-Yi; Ching-Chuan Kuo, Chia-Yi Hsien, and Ming-Shyang Chiou, Chia-Yi, all of, Taiwan, assignors to Tong-Lung Metal Industry Co., Ltd., Taiwan

Filed Apr. 8, 1994, Ser. No. 225,145

Claims priority, application China, Mar. 25, 1994, 94 1 03424.0

Int. Cl.[6] E05C 19/00

U.S. Cl. 292—1.5 5 Claims



1. A dual backset deadbolt assembly for a lock with a deadbolt operating spindle, said deadbolt assembly being adjustable between shorter and longer backset lengths and comprising:

a deadbolt housing having a front end and a rear end;

a deadbolt mounted in said deadbolt housing and movable between an extended position and a retracted position relative to said front end of said deadbolt housing;

an extension housing extending from said rear end of said deadbolt housing and including two parallel side plates which are connected to one another so as to confine a chamber, each of said side plates having a longitudinal axis and first and second backset holes formed along said longitudinal axis, said second backset hole being posterior to said first backset hole;

an auxiliary mounting plate extending into said chamber of said extension housing and formed with a mounting hole;

a transmission plate having a front engaging end that is connected to said deadbolt, and a rear forked portion that extends into said chamber of said extension housing and that includes a pair of spaced strips and an oblong opening formed between said strips and aligned with said first and second backset holes of said side plates, each of said strips having a first side formed with a first engagement member, and an opposite second side formed with a second engagement member, said second engagement member being posterior to said first engagement member;

a first cam drive unit retained rotatably within said first backset hole of one of said side plates and disposed adjacent to said first side of said strips, said first cam drive unit being formed with a spindle engaging hole and having a pair of cam elements for actuating said first engagement members of said strips; and

a second cam drive unit retained rotatably within said mounting hole of said mounting plate and disposed adjacent to said second side of said strips, said second cam drive unit being formed with a spindle engaging hole and having a pair of cam elements for actuating said second engagement members of said strips, said second cam drive unit being movable relative to said extension housing between first and second backset positions;

said spindle engaging hole of said second cam drive unit being aligned with that of said first cam drive unit being aligned with that of said first cam drive unit and said first backset holes of said side plates when said second cam drive unit is in said first backset position, thereby permitting extension of the deadbolt operating spindle through said spindle engaging holes of said first and second cam drive units so as to rotate said first cam drive unit therewith in order to actuate said first engagement members of said strips of said transmission plate when said deadbolt assembly is adjusted to the shorter backset length;

said second cam drive unit being aligned with said second backset holes of said side plates when said second cam drive unit is in said second backset position, thereby permitting extension of the deadbolt operating spindle through said spindle engaging hole of the second cam drive unit so as to rotate said second cam drive unit therewith in order to actuate said second engagement members of said strips of said transmission plate when said deadbolt assembly is adjusted to the longer backset length.

5,551,737

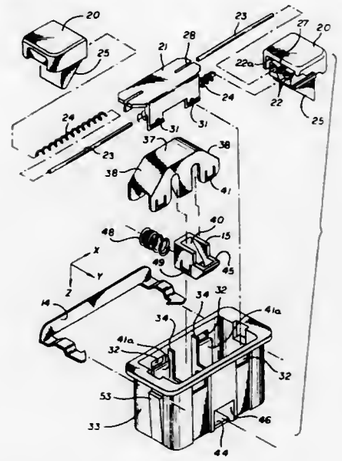
SINGLE-POINT SELF-CLOSING LATCH

Timothy J. Clavin, Corona, Calif., assignor to Hartwell Corporation, Placentia, Calif.

Filed Sep. 26, 1995, Ser. No. 533,694

Int. Cl.[6] E05C 1/12

U.S. Cl. 292—169 6 Claims



1. In a single-point latch for a door, the combination of:

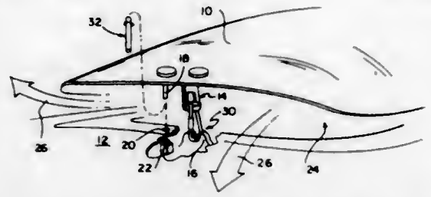
a housing;

a bolt mounted in said housing for sliding along a first axis;

an actuator mounted in said housing for sliding along a second axis perpendicular to said first axis;

first and second handles mounted in said housing for sliding along a third axis perpendicular to said first and second axes;
first spring means carried in said handles for urging said handles apart;
said handles and said actuator having first interengaging cam surfaces for moving said actuator along said second axis by movement of said handles along said third axis toward each other;
said actuator and said bolt having second interengaging cam surfaces for moving said bolt inward into said housing along said first axis by said movement of said handles along said third axis; and
second spring means carried in said housing for urging said bolt outward from said body to a latched position.

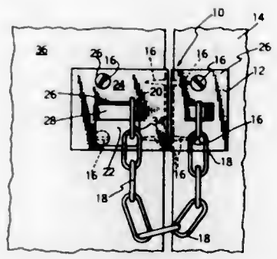
5,551,738
WINDOW LATCH EXTENDER
Jerry L. Thornton, 767 Colonial Way, Greenwood, Ind. 46142
Filed Mar. 4, 1994, Ser. No. 206,119
Int. Cl.[6] E05C *17/04*
U.S. Cl. 292—262 **18 Claims**



1. A latch extender for separating a hasp normally configured to directly engage a locking mechanism to a spaced apart position from the locking member for providing a locking connection between the hasp and locking member, the latch extender comprising:
a rigid base means for engaging the locking mechanism;
a first side leg extending upwardly from the base, the first side leg having a proximal end coupled to the base and a distal end;
a second side leg extending upwardly from the base spaced apart from the first side leg, the second side leg having a proximal end coupled to the base and a distal end;
a first tang means formed at the distal end of the first side leg for springingly engaging the hasp at a first corner location thereon; and
a second tang means formed at the distal end of the second side leg for springingly engaging the hasp at a second and axially spaced apart corner location from the first corner location; and
wherein the first and second tang means engage the hasp at the spaced apart corner locations and press against the hasp at the spaced apart corner locations respectively to rigidly hold the latch extender and couple the latch extender to the hasp while restraining axial and rotary movement of the tang means from their corner locations on the hasp while at the same time providing for a rigid spaced apart connection between the hasp and the locking member.

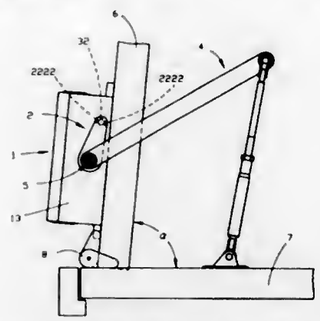
5,551,739
CHAIN LOCK FOR TRAILER DOORS OR MOBILE HOME DOORS
Avis A. Solis, P.O. Box 12512, Wichita, Kans. 67277
Filed Apr. 5, 1995, Ser. No. 417,105
Int. Cl.[6] E05C *17/36*
U.S. Cl. 292—264 **1 Claim**

1. A chain lock for trailer doors or mobile home doors comprising a first mounting member; a chain member pivotally attached to said first mounting member, a locking member pivotally connected



to the other end of said chain member, said locking member including a solid flat member; a second mounting member having a structure defining a plurality of aperture a lug means interposed on said second mounting member to form an eye, said lug means having a structure of a constant depth throughout its length, said being no greater than one-half the depth of said solid flat member and a generally elongated rectangular shape with respect to a top plan view and essentially horizontal with respect to a horizontal plane, said shape being essentially symmetrical such that when said solid flat member is inserted into said eye, the sides of said flat member are snugly yet slidably engaged within said eye, said first mounting member has a structure defining a plurality of opening, fastener means inserting into said openings for securing said first mounting member behind a casement of a trailer wall or mobile home wall, said second mounting member is generally L-shaped, fastener means inserted into said apertures of said second mounting member to secure same to the edge of a trailer door or mobile home door such as to have one leg of said L-shaped mounting member overlaying the edge of the door and the other leg or said L-shaped mounting member overlaying the inside surface of the door adjacent the edge thereof.

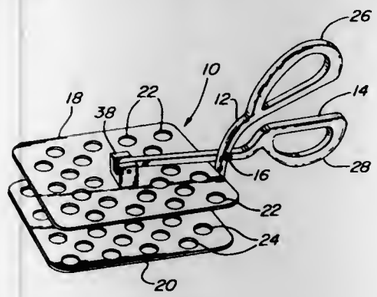
5,551,740
RETAINING ASSEMBLY FOR RETAINING RELEASABLY A DOOR AT A DESIRED OPEN POSITION TO A DOOR FRAME
San-Yi Lin, Yun-Lin Hsien; Song-Gen Shyu, and Tong-Pei Wu, both of Chia-Yi Hsien, all of, Taiwan, assignors to Tong-Lung Metal Industry Co., Ltd., Taiwan
Filed Oct. 4, 1994, Ser. No. 317,701
Int. Cl.[6] E05C *17/44*
U.S. Cl. 292—338 **10 Claims**



1. A retaining assembly for retaining releasably a door at a desired open position of a plurality of selectable open positions relative to a door frame, said retaining assembly comprising:
a hollow casing which is adapted to be securely mounted on said door frame and which has a horizontal wall portion that is formed with a through-hole, said casing further having an upright rotary shaft which is connected rotatably thereto and

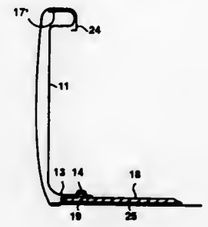
which has an end portion extends out of said casing through said horizontal wall portion, said rotary shaft being rotatably relative to said casing;
a coupling rod having a first end portion adapted to be connected pivotally to said door and a second end portion connected to said end portion of said rotary shaft, said coupling rod driving rotatably said rotary shaft in a first direction when said door moves relative to said door frame to said desired open position;
a spring-loaded pin unit which is disposed in said casing and which includes pin having an end portion that is normally biased to extend out or said casing via said through-hole; and
a stop unit including an elongated positioning plate which has a first end portion and a second end portion, and means for coupling releasably and selectively said second end portion of said positioning plate to said end portion of said rotary shaft, said coupling means including an angle setting plate being cooperative with the second end portion of the positioning plate for selectively displacing said first end portion at one of variable initial angles, corresponding to said desired open position, with respect to said pin when said door is in a closed position, said positioning plate being rotatable with said rotary shaft in said first direction to a position where said pin engages said first end portion of said positioning plate by a friction force sufficient to arrest releasably rotation of said rotary shaft in a second direction opposite to said first direction so as to retain releasably said door at said desired open position.

5,551,741
FOOD HANDLING TONGS
Alfred C. LaBoccetta, 3421 W. School House La., Philadelphia, Pa. 19144
Continuation-in-part of Ser. No. 22,945, May 16, 1994, Pat. No. Des. 366,399. This application May 15, 1995, Ser. No. 441,111
Int. Cl.[6] A47J *43/28*
U.S. Cl. 294—7 **4 Claims**



1. Food handling tongs, comprising:
a first elongated member having a handle at one end and means for connecting at the other end;
a second elongated member having a handle at one end and a first pivotal connection at the other end;
said first and said second elongated members being pivotally connected together by a second pivotal connection at a point between said handle and the other end of each of said first and second elongated members;
a first flat food blade mounted to said means for connecting on said first elongated member;
a second flat food blade mounted to said first pivotal connection on said second elongated member;
said first flat food blade and said second flat food blade being provided with apertures, said apertures in said first flat food blade not being aligned with said apertures in said second flat food blade;
said first flat food blade and said second flat food blade each being formed in the shape of a triangle;
said first triangular shaped flat food blade being mounted to said first elongated member in a central portion of said first triangular flat food blade such that an imaginary line bisecting said first flat food blade is parallel to said first elongated member;
said second triangular shaped flat food blade being mounted to the first pivotal connection on said second elongated member in a central portion of said second triangular flat food blade such that an imaginary line bisecting said second triangular shaped flat food blade is parallel to said second elongated member; and
whereby an item of food may be picked up by and between said first flat food blade and said second flat food blade.

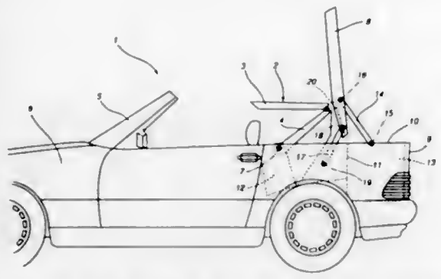
5,551,742
DUAL COMPOSITION BED LINER
Gerald A. Martindale, 4079 W. Cherry La., Meridian, Id. 83642, and Lonnie D. Kuenzli, 755 Palmer, Eagle, Id. 83616
Continuation-in-part of Ser. No. 50,674, Apr. 21, 1993, Pat. No. 5,370,436. This application Apr. 7, 1994, Ser. No. 225,132
Int. Cl.[6] B60R *13/01*
U.S. Cl. 296—39.2 **9 Claims**



1. A pickup truck bed liner comprising:
a unitary wall member having: two side wails joined together by a from wall in a generally "U" shaped configuration wherein the unitary wall member is constructed from a plurality of individual panels being rigidly attached together;
a flexible and resilient bed mat being positioned between the side walls and along a bottom edge of the unitary wall member wherein the bed mat has an upper surface with a high coefficient of friction to inhibit any sliding of cargo placed thereon; and
attachment means for matingly interconnecting the bed mat to the bottom edge of the unitary wall member.

5,551,743
ARRANGEMENT OF A REAR LID OR THE LIKE ON THE BODY FRAME OF A MOTOR VEHICLE
Berthold Klein, Rutesheim, and Hans-Joachim Ostertag, Sindelfingen, both of, Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany
Filed Jul. 5, 1994, Ser. No. 266,859
Claims priority, application Germany, Jul. 5, 1993, 43 22 285.4
Int. Cl.[6] B62D *25/10*
U.S. Cl. 296—76 **14 Claims**

1. Arrangement of a rear lid on the body frame of a motor vehicle having a storable top structure, comprising:
a pivoted mounting of the rear lid by which the rear lid is swingable up into a vertical loading position around an axis which extends substantially at one end of said rear lid;
a two-part storage space having an opening in the body frame that is exposed when the rear lid is swung up to allow access to two regions of the two-part storage space, a partial cross-



section of the opening in the body frame being respectively associated with each of the two storage space regions; and

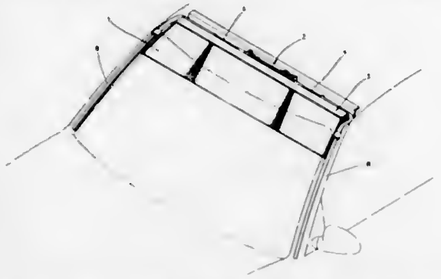
a slide-swing mounting on the body frame and coupled to the rear lid such that the rear lid is movable into the loading position in which the partial cross-sections of the opening in the body frame are respectively accessible in a vertical direction from a first side and a second side of the swung up rear lid, said first side being opposite said second side.

5,551,744

MOTOR VEHICLE WINDSHIELD CURTAIN STRUCTURE

Chuen-Rong Liao, Taichung City, Taiwan, assignor to Energy Conservation Partnership, Ltd., Boulder, Colo.

Filed Jan. 12, 1995, Ser. No. 371,974
Int. Cl.[6] B60J *3/02*
U.S. Cl. 296—97.4 **4 Claims**



1. A windshield curtain structure for selectively covering a front window of a motor vehicle having a crossbeam located at a front roof portion of the motor vehicle, said windshield curtain structure comprising:

a furling casing;

a power casing, said furling casing and said power casing being attached to the crossbeam at the front roof portion of the motor vehicle;

a motor mounted in said power casing;

a transversely extending axle rotatably mounted within said power casing, said axle having first and second ends extending out opposing lateral sides of said power casing;

means for drivingly interconnecting said motor to said axle such that activation of said motor causes said axle to rotate;

first and second hollow side racks each of which extends along a respective side of the front window, each of said side racks being provided with a first elongated aperture;

first and second plastic guiding pipes, each of said guiding pipes extending from the crossbeam along a respective said side rack and including a second elongated aperture aligned with a respective said first elongated aperture;

first and second springs each including multiple spiral sections with the spiral sections of said second spring being orientated opposite to the spiral sections of said first spring, said first and second springs being positioned in said first and second guide pipes respectively, each of said first and second springs having one end portion attached to a respective one of the first and second ends of said axle;

first and second line blocks each of which has a length greater than a distance spanned by at least two of said spiral sections and is positioned inside a respective one of said first and second springs;

first and second link sticks each of which is attached to a respective one of said first and second link blocks and projects through a respective aligned pair of said first and second elongated apertures; and

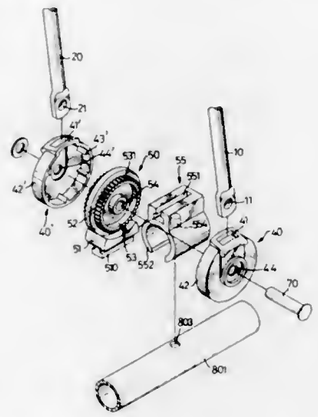
a windshield curtain adapted to be reeled within said furling casing, said windshield curtain including a bottom that is attached to said first and second link sticks, wherein operation of said motor causes rotation of said axle, spiralling of said springs, shifting of said link blocks and movements of said windshield curtain through said link sticks.

5,551,745

ADJUSTING DEVICE FOR A HOOD OF A TOY STROLLER

Ming T. Huang, 4Fl., No. 302, Sec. 7, Cheng Teb Rd., Taipei, Taiwan

Filed Apr. 4, 1995, Ser. No. 416,050
Int. Cl.[6] B60J *7/12*
U.S. Cl. 296—111 **3 Claims**



1. An adjusting device for a hood of a toy stroller, said stroller comprising a frame having two side tubes, a plurality of wheels rotatably disposed to an under side of said frame and a handle connected to said frame; said adjusting device comprising two sets of control means each having a middle element, a first side element and a second side element;

said middle element having a top portion and a coupling means for engagement with one of said side takes, said top portion having a first side and a second side for said first side element and said second side element disposed thereto respectively and having a hole defined in a center thereof, each of said first side and said second side of said top portion having a tubular portion extending laterally therefrom and said tubular portion having a toothed periphery defined in an outer periphery thereof;

each of said first side elements and said second side elements having a skirt portion extending laterally from a side facing said corresponding tubular portion of said middle element, a plurality of protrusions extending radially from an inner periphery of said skirt portion and engaged to said toothed portion of said middle element, a central hole defined in each of said first side element and said second side element and, an opening defined in each said skirt portion;

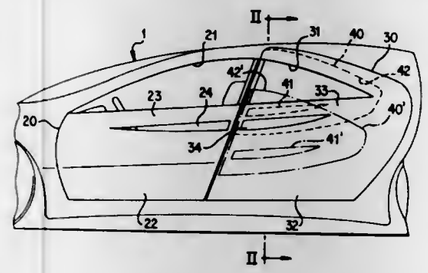
a first support and a second support, each having two distal ends, each of said distal ends having a passage defined therein said distal ends of said first support and said second support inserted through said openings of said first side elements and said second side elements respectively for a pin extending through said central hole of said front side element, said passage of said first support, said hole of said middle element, said passage of said second support and said central hole of second side element.

5,551,746

SIDE WINDOW ARRANGEMENT FOR A VEHICLE

Christopher Rhoades, Ostelsheim; Lucian Reindl, Weil der Stadt, and Harald Leschke, Sindelfingen, all of, Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Jul. 6, 1994, Ser. No. 267,929
Claims priority, application Germany, Jul. 6, 1993, 43 22 432.6
Int. Cl.[6] B06J *1/17*
U.S. Cl. 296—146.2 **6 Claims**



1. Side window arrangement for a vehicle with a side pane displaceably guided in a side section, comprising:

a main window cutout and an auxiliary window cutout in the side section which are separate from one another and are arranged one behind the other in an opening direction of the window side pane;

an opening in the side pane which can be aligned with the auxiliary window cutout during movement of the side pane in the opening direction; and

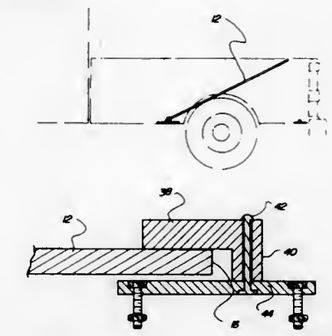
wherein the side pane and cutouts are configured such that the opening of the side pane is covered by a web separating the window cutouts when the window is closed.

5,551,747

TRUCK BED AIR DEFLECTOR

Charles E. Larsen, 3610 Emerson Dr., Carson City, Nev. 89706

Filed Feb. 8, 1995, Ser. No. 385,593
Int. Cl.[6] B62D *35/00*
U.S. Cl. 296—180.1 **4 Claims**



3. A truck bed air deflector for managing airflow through a truck bed to minimize drag and increase fuel efficiency comprising, in combination:

an air deflector shield having a generally rectangular configuration, the air deflector shield being dimensioned to be received within the truck bed;

a pair of spring-loaded hinges secured to opposite end portions of a first end of the air deflector shield, the spring-loaded hinges having mounting brackets theresecured, the mounting brackets being adapted to be secured to the truck-bed thereby securing the air deflector shield to the truck bed, the spring-loaded hinges biasing the air deflector shield to a raised position parallel with a tailgate of the truck bed; and

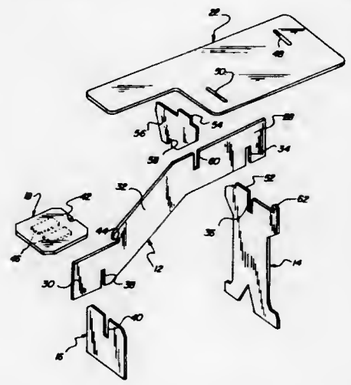
a pair of L-shaped locking latches each pivotally secured to a mounting bracket, each mounting bracket being secured to the truck bed adjacent to a second end of the air deflector shield, the locking latches being adapted to secure the second end of the air deflector shield in a stowed position.

5,551,748

PORTABLE SHOOTING BENCH

Patrick McKelvey, P.O. Box 483, and Dick Baird, P.O. Box 802, both of Hines, Oreg. 97738

Filed Mar. 13, 1995, Ser. No. 402,858
Int. Cl.[6] A47B *39/00*
U.S. Cl. 297—170 **6 Claims**



1. A new portable shooting bench comprising:

a main support member including an upper portion connected to a lower portion by a medial portion such that the upper portion is spaced from and parallel to the lower portion, said lower portion having a downwardly projecting lower portion slot formed therein, said medial portion having a horizontally extending medial portion slot formed in said medial portion at an upper juncture of said medial portion and said lower portion, said upper portion including a downwardly oriented first upper portion slot;

a forward leg member having an upwardly extending forward leg slot releasably engaged to said first upper portion slot, said leg member further having a leg projection extending upwardly therefrom;

a seat support member having an upwardly extending seat support slot releasably engaged to said lower portion slot;

a seat member extending across the seat support member, said seat member having a seat slot releasably engaged to said medial portion slot;

and,

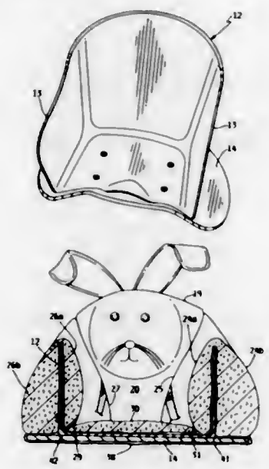
a top member extending across an upper edge of said forward leg member and along said upper portion of said main support member, said top member having a first transverse slot extending therethrough with said leg projection extending at least partially into said first transverse slot of said top member.

5,551,749

CHILD SUPPORT CUSHION

Judy M. Reher, Richfield, and Cindy Hanson, Buffalo, both of Minn.

Filed Jan. 11, 1996, Ser. No. 584,783
Int. Cl.[6] A47D 1/00
U.S. Cl. 297—219.12 6 Claims



1. An infant support seat and cushion, comprising:

a) a seat and backrest member affixed to a base support member, said base support member having a flat form and extending beyond said seat and backrest member;

b) a cushion assembly having an interior opening sized to receive said seat and backrest member and said base support member, said cushion assembly further comprising a backrest cushion section overlying said backrest member, a seat cushion section overlying a portion of said base support member, and right and left support cushion sections overlying respective portions of said seat and backrest member; said backrest cushion section, said seat cushion section, and said right and left support cushion sections being affixed together along respective joining seams;

c) a crotch support strap affixed to said seat cushion and a pair of belt sections respectively affixed to said right and left support cushion sections and engageable with said crotch support strap; and

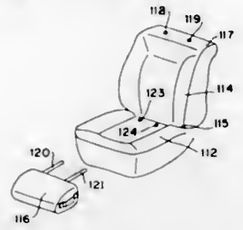
d) an outer cover fitted over said base support member and portions of said seat and backrest member, said outer cover having a release mechanism whereby said seat and backrest member and said base support member may be removably inserted between said outer cover and said cushion sections.

5,551,750

HEADREST BOOSTER SEAT

Nobuyoshi Yoshimura, Utsunomiya, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1994, Ser. No. 242,327
Int. Cl.[6] A47C 1/08
U.S. Cl. 297—250.1 5 Claims



2. A vehicle seat comprising:

a seat cushion having an upwardly facing seating surface;

a seat back including a first end operatively connected to said seat cushion and a second end projecting upwardly therefrom;

a headrest removably connected to the second end of the seat back, for enabling said headrest to be selectively removed therefrom;

two retaining members projecting outwardly from said headrest for selectively mounting said headrest directly to said second end of said seat back; and

securing members mounted on said seating surface of said seat cushion for receiving said retaining members and for securing said headrest to said seat cushion for operatively positioning said headrest upon said seating surface of said seat cushion as a booster seat for enabling an individual to be elevated relative to a normal elevation of said seat cushion.

5,551,751

RECLINING RESTRAINT (SMART MOVE)

Mark A. Sedlack, Cuyahoga Falls, and Francis Bernart, Homeworth, both of Ohio, assignors to Century Products Company, Macedonia, Ohio

Filed Jul. 12, 1994, Ser. No. 274,173
Int. Cl.[6] A47D 1/10; B60N 2/26
U.S. Cl. 297—256.13 11 Claims

1. A restraint seat having an adjustable seat inclination with enhanced safety features during impact forces comprising:

a body forming a seat;

a base, said seat adjustable to move relative to said base to a plurality of predetermined angles of inclination to allow said seat to be fixed with respect to said base at one of said angles of inclination;

said body rotatable with respect to said base from said predetermined angles of inclination and

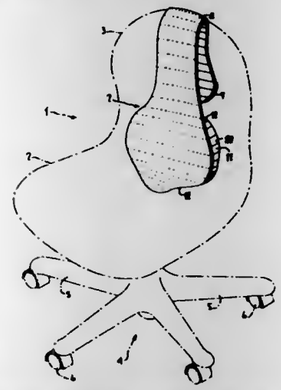
a mechanism for connecting said base to said body to allow said adjustable movement, said connecting mechanism including a spring connected to said body and said base, and a recline lever pivotally connected to said body and having a portion selectively engaging stops on said base to allow for the selective inclination of said body with respect to said base to said plurality of predetermined angles of inclination said portion of said recline lever comprising a bar slidably contained in a slot in said lever and lying traverse to said slot, said bar connected to said spring and engaging said stops at the ends of said bar, said mechanism holding said body at said predetermined angles of inclination with respect to said base during ordinary travel and adjustable to allow said seat to be fixed with respect to said base at one of said plurality of predetermined angles of inclination, but said mechanism allowing said body to move relative to said base during a sudden impact, whenever the impact forces exceed a predetermined value.

5,551,752

LUMBAR SUPPORT CUSHION FOR CHAIRS

Ross Lovegrove, London, England, and Stephen Peart, Los Gatos, Calif., assignors to Knoll, Inc., East Greenville, Pa.

Continuation of Ser. No. 216,562, Mar. 22, 1994, abandoned.
This application Sep. 27, 1995, Ser. No. 534,600
Int. Cl.[6] A47C 3/025
U.S. Cl. 297—284.5 5 Claims



1. A cushion for supporting the lumbar area of a person while seated in a chair having a back, the cushion comprising:

an elongated strip of material having two ends, a front face and a rear face;

a pad of foamed cushion material having a front longitudinal surface, a rear longitudinal surface, a top portion, a bottom portion and side portions;

the elongated strip of material having a discreet weight attached to the front face of the elongated strip of material at one end thereof and the pad of foamed cushion material attached to the rear face of the elongated strip of material at the other end thereof, the rear face of the elongated strip of material substantially covering the front longitudinal surface of the pad of foamed cushion material; and

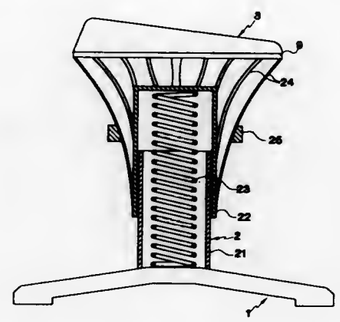
the pad of foamed cushion material adapted to fit between a seated person's lumbar area and the back of the chair.

5,551,753

ACTIVE DYNAMIC SEAT

Josef Glöckl, Ammerseestrasse 6, D-8011 Kirchheim, Germany

PCT No. PCT/EP93/00758, § 371 Date Jan. 6, 1995, § 102(e) Date Jan. 6, 1995, PCT Pub. No. WO93/19650, PCT Pub. Date Oct. 14, 1993
PCT Filed Mar. 29, 1993, Ser. No. 150,107
Claims priority, application Germany, Mar. 27, 1992, 42 10 099.2
Int. Cl.[6] A47C 1/023
U.S. Cl. 297—314 9 Claims



1. Please amend the claims as follows: An active dynamic seat comprising: a base;

an intermediate piece connected with the base; and

a seat part connected with the intermediate piece by a plurality of spring strips, each of said plurality of spring strips having a first end portion and a second end portion, each of said first end portions being connected to a periphery of the seat part and each of said second end portions being connected to an outer cylindrical periphery of the intermediate piece, the plurality of spring strips forming a springs structure.

5,551,754

HEIGHT ADJUSTMENT FOR THE BACKS OF CHAIRS

Maria Neumueller, Burgthann, Germany, assignor to SIfaSitefabrik GmbH, Sulzbach-Rosenberg, Germany

Filed Oct. 17, 1994, Ser. No. 324,000
Claims priority, application Germany, Oct. 15, 1993, 43 35 320.7
Int. Cl.[6] A47C 1/00
U.S. Cl. 297—353 10 Claims

1. A height-adjusting mechanism for the back rest of a chair, which comprises:

a back plate;

a fastening element connected to said back plate;

said fastening element being slidably mounted on a back rest carrier to slide lengthwise thereon;

means for clamping said back rest carrier and said fastening element;

said means for clamping comprising a clamping body mounted on a side of said fastening element opposite said back plate;

said clamping body having at least one continuous slot;

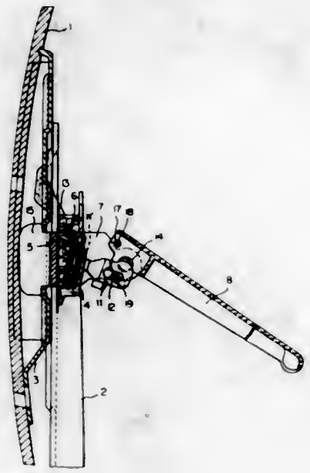
at least one anchor;

one end of said at least one anchor passing through a slot in said fastening element and held therein by undercuts;

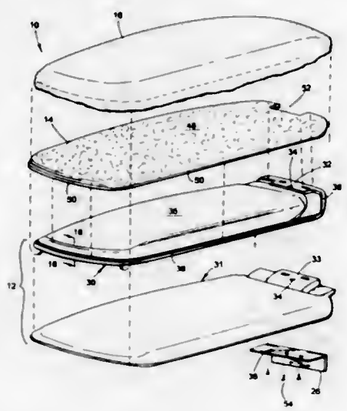
another end of said anchor passing through said at least one continuous slot and connecting to a lever;

said lever being pivotably mounted on a bolt; and

said lever having a lug that swivels between said bolt and said clamping body, whereby tractive force is applied to said anchor and pressure is applied to said clamping body to clamp said fastening element and said back rest carrier to each other.

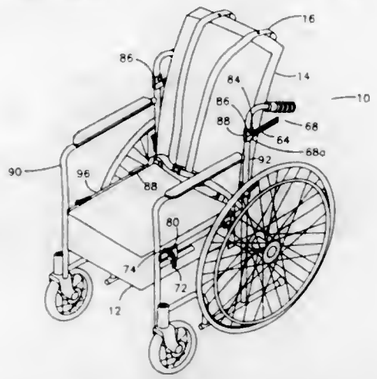


5,551,755
PADDED ARTICLE
Kenneth M. Lindberg, Holland, Mich., assignor to Prince Corporation, Holland, Mich.
Filed Aug. 12, 1994, Ser. No. 289,660
Int. Cl.[6] A47C *7/54*
U.S. Cl. 297—411.46 **29 Claims**



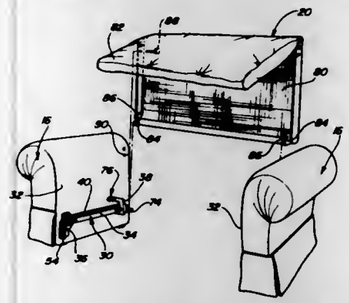
1. An armrest for a vehicle comprising:
an elongated support adapted for attachment to the vehicle, said support being configured to support the weight of a person's arm;
a non-foam cushion configured to mateably engage said support, said cushion engaging said support and comprising a mat of polymeric fibers forming a pad on said support, said cushion including a lower density section having a first resiliency and first and second higher density sections having a second resiliency different than said first resiliency, said first and second higher density sections being positioned on opposing sides of said cushion; and
a sheet of material attached to said support covering said support and said cushion.

5,551,756
ORTHOTIC WHEELCHAIR POSITIONING DEVICE AND SUPPORT SYSTEM
William G. Gurasich, Austin, and Mark H. Bussell, Fort Worth, both of Tex., assignors to Custom Orthotics, Inc., Austin, Tex.
Filed Mar. 16, 1994, Ser. No. 214,091
Int. Cl.[6] A61G *5/10*
U.S. Cl. 297—440.20 **18 Claims**



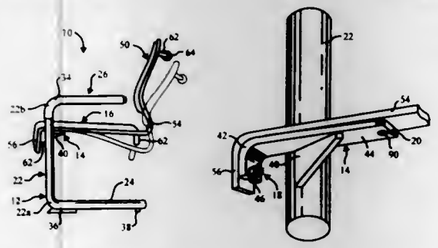
1. An adjustable wheelchair patient support system attachable to a frame of a wheelchair, the system comprising:
a generally rectangular seat having a molded seat shell, the shell with a contoured top surface, a front wall, a pair of side walls and a rear wall pending from the top surface, said top surface of said shell overlain with a first foam layer wherein the first foam layer includes means for deformably softening on contact with a warm surface and covered with a first tough, durable cover;
a generally rectangular back having a molded back shell with a contoured front surface, depending top, bottom and side walls, said front surface of said back shell overlain with a second foam layer and covered with a second tough, durable cover;
a harness for securing a patient to said seat and said back, the harness having a lap belt and shoulder straps, and secured to the frame of the wheelchair; and
attachment means for releasably attaching said seat and said back to said frame of said wheelchair, said attachment means further including adjustment means for selectively positioning said seat and said back to said frame, said adjustment means of said attachment means capable of maintaining the position selected when removing said system from a first frame of a first wheelchair and attaching said system to a second frame of a second wheelchair,
wherein the adjustment means of said attachment means includes means to selectively adjust the seat fore and aft, up and down, and to tilt in angular relation to said back; and
wherein the adjustment means of said attachment means includes means to selectively adjust the back up and down, fore and aft, and to tilt in angular relation to said seat; and
wherein the first foam layer of said seat is comprised of two or more plies of at least two different densities; and
wherein said harness includes quick release means for releasing the patient from said harness; and
wherein the belt and the shoulder straps of said harness are adjustably mounted to said seat and said back; and
wherein the shells of said seat and said back are formed of molded ABS and wherein said seat provides a depression positioned beneath the coccyx of the seated patient, a pair of buttock wells, a pair of leg channels, and said back provides a channel rearward of the spinal column of the seated patient; and
wherein the cover of said seat and said back is comprised of fluid-proof two-way stretch vinyl.

5,551,757
FASTENING SYSTEM READY-TO-ASSEMBLE
Lanny R. Glover, New Albany, Miss., assignor to Universal Furniture Industries, Inc., High Point, N.C.
Continuation of Ser. No. 227,153, Apr. 13, 1994, abandoned. This application Jul. 10, 1995, Ser. No. 500,021
Int. Cl.[6] A47C *17/86*
U.S. Cl. 297—440.23 **19 Claims**



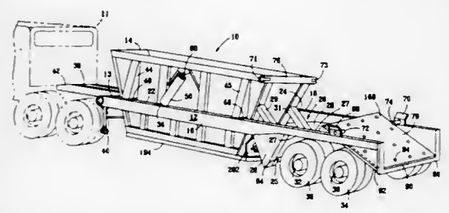
1. In a ready-to-assemble furniture piece which can be selectively assembled and disassembled, the furniture piece having a plurality of components including a pair of opposing arm sections, a back section, a front section and platform means for supporting a user of the furniture piece, the improvement comprising:
a fastening system for interconnecting the components of the furniture piece, the fastening system including a pair of integrally constructed side support rails secured to an inside surface of the arm sections, each said side support rail having a rail member supporting said platform means, a front bracket for attaching the front section to said arm sections, and a rear bracket for attaching the back section to said arm sections, said rear bracket including an axially adjustable knob formed at an upper end of said rear bracket, said adjustable know selectively extendable to support a back rest portion of the back section of various inclinations whereby the back section, front section and platform means are supported by said side support rails attached to the arm sections.

5,551,758
DURABLE PATIENT CHAIR
Roger K. Leib, Los Angeles, and James L. Reinis, Culver City, both of Calif., assignors to Roger and Bonita Lieb Trust, Los Angeles, Calif.
Continuation-in-part of Ser. No. 160,921, Nov. 30, 1993, abandoned. This application Oct. 11, 1994, Ser. No. 320,605
Int. Cl.[6] A47C *1/02*
U.S. Cl. 297—451.3 **23 Claims**



1. A chair comprising:
(a) a chair base frame including a pair of substantially rigid, substantially vertical front legs spaced apart from each other;
(b) a rearwardly extending, substantially horizontal seat for supporting a human body in a seated position, the seat having a front edge with a downwardly extending lip;
(c) a pair of brackets for cantilevering the seat from the front edge, each bracket having a downwardly extending lip with a rearwardly extending, substantially horizontal portion and each bracket being fixedly attached to the chair base frame; and
(d) a pair of first fasteners, each first fastener for attaching the downwardly extending lip of one of the brackets to the downwardly extending lip of the seat.

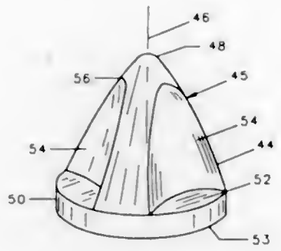
5,551,759
DUAL USE MATERIALS TRANSPORT VEHICLE WITH BELLY-DUMPING AND IMPROVED END-DUMPING CAPABILITIES AND METHOD OF CONSTRUCTION
Gregg M. Hoss, Bedford; James E. Thompson, Ft. Worth; Thomas F. Johnson, Uvalde; Martin Kirbie, Grand Prairie, and Andrew J. Speer, III, Arlington, all of Tex., assignors to JHC Ventures, L.P., Irving, Tex.
Filed Feb. 22, 1995, Ser. No. 392,630
Int. Cl.[6] B60P *1/16*
U.S. Cl. 298—22 P **15 Claims**



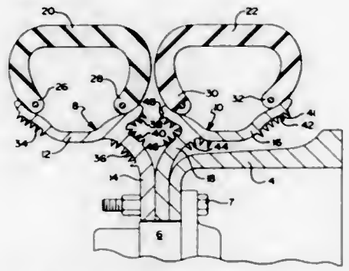
14. A method of constructing a dual use materials transport vehicle having improved capabilities comprising the steps of:
forming a frame with left and right box beam rails, a front beam and at least one rear beam with an open space defined therebetween;
connecting a plurality of rear wheels to said frame;
providing a hopper with belly dumping capabilities and pivotably attaching said hopper within said opening of said frame; and
(d) attaching left and right hydraulic cylinders between said left and right box beam rails, respectively, and said hopper for pivotably actuating said hopper between a transport position and an end dumping position.

5,551,760
TUNGSTEN CARBIDE INSERT FOR A CUTTING TOOL
Phillip A. Sollami, Herrin, Ill., assignor to The Sollami Company, Herrin, Ill.
Continuation-in-part of Ser. No. 114,832, Sep. 2, 1993, Pat. No. 5,484,191. This application Feb. 13, 1995, Ser. No. 387,066
Int. Cl.[6] E21B *10/00;* **E21C** *35/18*
U.S. Cl. 299—105 **12 Claims**

1. An insert for a cutting tool comprising in combination:
a tapered central body with a principal longitudinal axis, a forward cutting end and a rearward end,
a base disposed rearwardly of said rearward end of said tapered central body, said base having a planar forwardly facing surface,
said central body having a plurality of longitudinal grooves therein,
each of said grooves extending forwardly from said planar forwardly facing surface to a location near said cutting end.



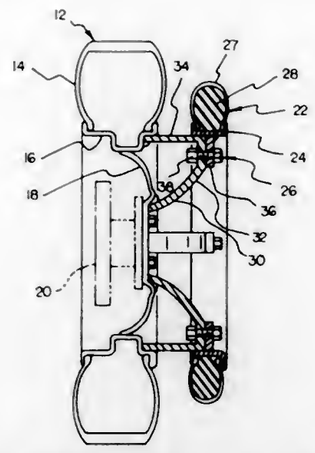
5,551,761
VEHICLE WHEEL AND BRAKE ASSEMBLY WITH ENHANCED CONVECTIVE HEAT TRANSFER
Jay D. White, Galesburg, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed Dec. 9, 1994, Ser. No. 352,474
Int. Cl.[6] B60B *19/10*
U.S. Cl. 301—6.3 **1 Claim**



1. A vehicle wheel comprising:
a rim for supporting a tire;
a flange attached to said rim for mounting to a vehicle wheel hub;
a mulitplicity of pin fins formed on a surface of said rim and on a surface of said flange for increasing the rate of convective heat transfer;
said pin fins having a conical cross sectional shape, each of said pin fins having a base mounted to said wheel, said pin fins extending outward a distance of approximately twice the width of said base, and arranged in a random pattern on said wheel to promote random airflow over said wheel.

5,551,762
AUXILIARY WHEEL ASSEMBLY
Yong Roopngam, 6063 Camerino St., Lakewood, Calif. 90713
Filed Mar. 27, 1995, Ser. No. 411,103
Int. Cl.[6] B60C *17/06*
U.S. Cl. 301—40.3 **4 Claims**

1. An auxiliary wheel assembly for use with a vehicle wheel including a vehicle tire supported upon a vehicle rim and a center web extending interiorly across the vehicle rim and including provisions for mounting the vehicle wheel to a hub of the vehicle, the auxiliary wheel assembly comprising:
an auxiliary wheel including an auxiliary rim and having an outside diameter substantially smaller than an outside diameter of the vehicle wheel;
a plurality of mounting brackets extending from said auxiliary rim and being coupleable to the vehicle wheel, said mounting brackets each comprising an arcuate brace for securing to said center web of the vehicle wheel, said arcuate brace projecting

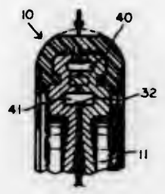


axially and radially outward from a center of said center and terminating in an outer distal portion oriented so as to be positionable within a plane substantially parallel to a plane containing said vehicle rim; an orthogonal brace extending from the vehicle rim and projecting substantially orthogonally from a plane containing the vehicle rim and extending to the outer distal end of the arcuate brace;

and

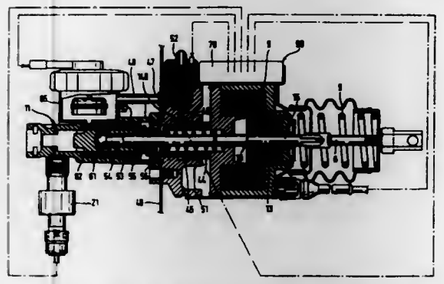
a mounting plate secured to the auxiliary rim and projecting parallel to a plane containing the auxiliary rim of the auxiliary wheel, the mounting plate being secured to the outer distal end of the arcuate brace, said arcuate brace and said orthogonal brace being comprised of a substantially resilient material wherein deflection of the mounting brackets is permitted in a direction parallel to the plane containing the vehicle rim of the vehicle wheel.

5,551,763
FORMED WHEEL TIRE AND METHOD
Edward R. Alsman, Priddis, Canada, assignor to Polyair Tires, Inc., Calgary, Canada
Filed Sep. 13, 1994, Ser. No. 305,023
Int. Cl.[6] B60C *7/24*
U.S. Cl. 301—64.7 **1 Claim**



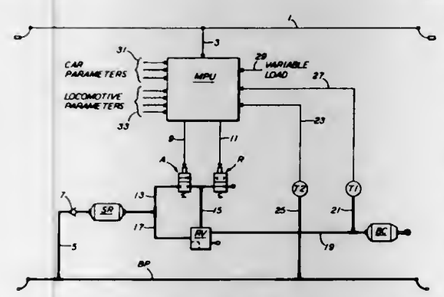
1. A wheel and tire assembly comprising in combination,
a wheel having an outer rim void and an inner rim void separated by a web and further having a pair of rim lock grooves located on said wheel between said outer and inner rim voids;
a solid polyurethane tire having a substantially U-shaped cross-section with the two legs of the U-shape, each provided with a lock rib means, wherein, when said tire is mounted onto said wheel, said legs of said U-Shaped cross-section substantially surrounds said outer rim void and said lock ribs lit into said rim lock grooves of said wheel to form a shock-absorbing structure.

5,551,764
BRAKE SYSTEM FOR AUTOMOTIVE VEHICLES WITH ELECTRIC DRIVE
Dieter Kircher, Bad Vilbel-Dortelweil; Peter E. Rieth, Eltville; Karlheinz Bill, Dreieich; Juergen Balz, Wiesbaden; Lothar Kunze, Hofheim-Langenhain, and Georg Halasy-Wimmer, Eschborn, all of, Germany, assignors to ITT Automotive Europe GmbH, Frankfurt, Germany
Division of Ser. No. 157,742, Nov. 24, 1993, Pat. No. 5,421,643. This application Mar. 14, 1995, Ser. No. 403,651
Claims priority, application Germany, Nov. 24, 1992, 42 39 386.8
Int. Cl.[6] B60T *11/20;11/28;13/66;13/74*
U.S. Cl. 303—3 **50 Claims**



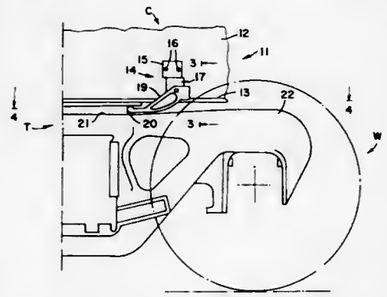
1. A brake system for automotive vehicles with electric drive which is operable by an actuating pedal cooperating with an actuating rod, comprising at least one electric drive motor and hydraulic friction brakes which are connected to a master brake cylinder, means for determining a pressure prevailing in the master brake cylinder, a first control device to which the output signal of a sensor for determining the actuating condition of the actuating pedal is fed, and a second control device, responsive to said first control device, for controlling the electric drive motor, characterized in that the actuating pedal is in force-transmitting/travel-transmitting connection with a spring having a predefinable characteristic curve, and in that the master brake cylinder, uncoupled from the actuating pedal, is operable by an electromagnet drivable by the first control device.

5,551,765
ELECTRIC BRAKE CONTROL SYSTEM AND METHOD FOR RAILROAD CAR
Gary M. Sich, Irwin, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed Jun. 22, 1995, Ser. No. 493,606
Int. Cl.[6] G60T *13/00*
U.S. Cl. 303—7 **22 Claims**



1. A microprocessor based brake control system on board a railroad car having a designed net braking ratio predicated on a predetermined brake pressure and a predetermined load weight of said railroad car, said brake control system comprising:
a) means for receiving a command signal representing a desired net braking ratio of said railroad car;
b) a source of fluid under pressure;
c) a fluid pressure operated brake device for effecting retardation of said railroad car;
d) valve means for controlling fluid pressure communication of said brake device with said source and with the atmosphere;
e) transducer means for providing a feedback signal BCP_F corresponding to the fluid pressure effective at said brake device;
f) a microprocessor for providing a brake pressure signal BCP that differs from said predetermined brake pressure in proportion to the difference between said command signal and said designed net braking ratio; and
g) said feedback signal BCP_F being connected to said microprocessor which operates said valve means when said brake pressure signal BCP deviates from said feedback signal BCP_F in a manner to bring said feedback signal into general equality with said brake pressure signal.

5,551,766
EMPTY/LOAD SENSOR MECHANISM FOR CONTROLLED VEHICLE BRAKING
Daniel H. Brushwood, Greenville, S.C., assignor to Elcon National, Inc., N.Y.
Filed Oct. 11, 1994, Ser. No. 320,853
Int. Cl.[6] B60T *8/18*
U.S. Cl. 303—22.2 **2 Claims**

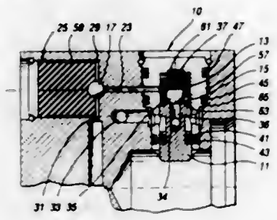


1. An empty/load sensor mechanism for actuating a brake pressure control device of a vehicle in response to the load condition of the vehicle as represented by a distance between a sprung part and an unsprung part of the vehicle, the mechanism comprising: a body adapted to be mounted on the sprung part of the vehicle, a valve in said body for controlling braking pressure and an operating shaft connected to said valve and extending horizontally from said body; a pivotable sensing arm mounted at one end on said operating shaft for rotating said shaft and extending transversely to the axis of rotation of said operating shaft, said sensing arm having a free end remote from said operating shaft, and a generally horizontal contact shaft mounted on said free end for contact with the unsprung part of the vehicle, said contact shaft being mounted on said free end of the sensing arm by adjustable mounting means for adjusting the distance of said contact shaft from said operating shaft; said adjustable mounting means including a plate mounted on said sensing arm for rotation about a predetermined axis and said contact shaft being secured to said plate with its axis displaced from said predetermined axis.

5,551,767
COMBINATION HIGH PRESSURE PUMP/ATTENUATOR FOR VEHICLE CONTROL SYSTEMS

Herbert L. Linkner, Jr., Dexter, Mich., assignor to Kelsey Hayes, Livonia, Mich.

Continuation-in-part of Ser. No. 163,658, Dec. 7, 1993. This application Feb. 24, 1995, Ser. No. 394,693
Int. Cl.[6] F16L *55/04*
U.S. Cl. 303—87 **17 Claims**



1. In combination, a hydraulic control unit housing suitable for use in vehicle control systems and including a high pressure pump piston assembly at an outlet side of said pump piston assembly;

said pump piston assembly comprising a reciprocable piston member sealingly engaged in a bore of said housing, and providing a high pressure fluid pump cavity;

a pump inlet passage connected to said high pressure fluid pump cavity; an attenuator containing a solid, volumetrically compressible, elastomeric attenuating element positioned in and substantially filling an attenuator cavity, the attenuator also having an outlet orifice;

an attenuator inlet passage connecting said attenuator cavity with said pump cavity, the diameter of said inlet passage being larger than the diameter of said outlet orifice; and

an outlet check valve located within said attenuator cavity and allowing one way passage of high pressure fluid from said high pressure pump to said attenuator, said outlet check valve being compression loaded against a check valve seat by a force generated by compression of said attenuating element.

5,551,768
CIRCUIT CONFIGURATION FOR DECTECTING WHEEL SENSOR MALFUNCTIONS

Helmut Fennel, Bad Soden; Ivica Batistic, Frankfurt am Main, and Michael Latarnik, Friedrichsdorf, all of, Germany, assignors to ITT Automotive Europe GmbH, Frankfurt, Germany

Division of Ser. No. 178,300, Jan. 5, 1994, Pat. No. 5,476,311. This application Jun. 6, 1995, Ser. No. 468,928
Claims priority, application Germany, Jul. 6, 1991, 41 22 484.1
Int. Cl.[6] B60T *8/00*
U.S. Cl. 303—122.06 **3 Claims**

1. A system for detecting wheel sensor malfunctions for an automotive vehicle having a plurality of wheels each having a rotational behavior and having a brake system with a control unit including at least one anti-lock control and traction slip control, said system for detecting wheel sensor malfunctions comprising:

sensor means for sensing the rotational behavior of said plurality of wheels and generating output signals representative of the rotational behavior;

first circuit means, responsive to said output signals, for generating:

(a) wheel speed signals individually representative of the wheel speeds of said plurality of wheels and

(b) wheel acceleration signals individually representative of the wheel accelerations of said plurality of wheels;

logic circuit means, responsive to:

(a) said wheel speed signals and

(b) said wheel acceleration signals,

for generating valve control signals;

a valve block responsive to said valve control signals for modulating braking pressure; and

second circuit means, responsive to:

(a) said wheel speed signals,

said wheel acceleration signals,

(c) a predetermined deceleration limit value,

(d) a predetermined overspeed threshold, and

(e) a predetermined bottom speed threshold

for initiating a time monitoring function having a duration when:

(a) at least one of said wheel acceleration signals has a wheel acceleration value which is below said deceleration limit value and said overspeed threshold, and

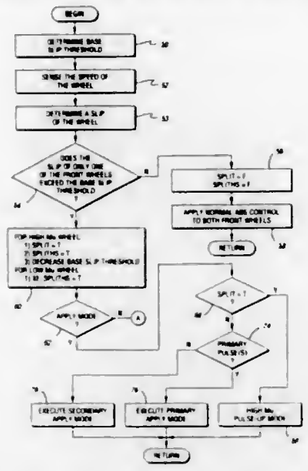
(b) at least one of said wheel speed signals has a value which is below said bottom speed threshold.

5,551,769
METHOD AND SYSTEM FOR SPLIT MU CONTROL FOR ANTI-LOCK BRAKE SYSTEMS

Mark S. Luckevich, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Livonia, Mich.

Filed Feb. 6, 1995, Ser. No. 384,509
Int. Cl.[6] B60T *8/32*
U.S. Cl. 303—149 **23 Claims**

1. In a vehicle having front first and second wheels, rear wheels,



and corresponding brakes, and a hydraulic brake system for applying hydraulic brake pressure to the brakes during an anti-lock braking event wherein the brake pressure is applied to the brakes according to a predetermined pressure control profile having a predetermined gain, a method for controlling the hydraulic brake pressure applied to the brakes during the anti-lock braking event when the vehicle is braking on a split mu surface, the method comprising:

sensing a speed of each of the wheels to generate a speed signal for each of the wheels;

determining if the first wheel is braking on a low mu road surface and the second wheel is braking on a high mu road surface relative to the low mu road surface based on the speed signals;

detecting the anti-lock braking event based on the speed signals;

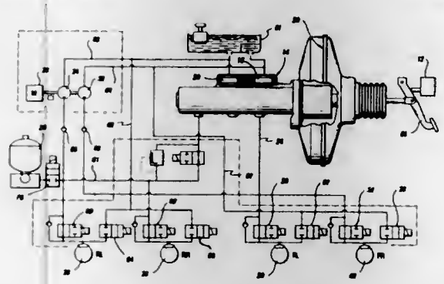
if the first wheel is braking on a low mu road surface and the second wheel is braking on a high mu road surface, modifying the predetermined gain to obtain a reduced gain and an increased gain, applying a first pressure control profile having the reduced gain to the brake of the first wheel and applying a second pressure control profile having the increased gain to the brake of the second wheel, the first pressure control profile differing from the second pressure control profile; and

applying the first pressure control profile to each of the brakes of the rear wheels.

5,551,770
METHOD FOR ESTIMATING PRESSURE IN A PRESSURE ACTUATED CONTROLLER

Davoria D. Hrovat, and Minh N. Tran, both of Dearborn, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 27, 1994, Ser. No. 329,928
Int. Cl.[6] B60T *8/42*
U.S. Cl. 303—167 **6 Claims**



1. A method for estimating pressure in a hydraulic control system having fluid pressure-operated elements, each of said fluid pressure operated elements having a fluid pressure working chamber, a pressure fluid supply line and a pressure fluid return line communicating with said pressure working chamber, a solenoid operated pressure distributor valve means for each pressure working chamber for forming a controlled flow restriction in said pressure supply line communicating therewith, said method including the steps of;

commanding a solenoid duty cycle to establish a controlled flow restriction in the supply line and in the return line for each of said working pressure chambers;

detecting a pressure differential between supply pressure in each of said supply lines and pressure on the flow return side of said pressure distributor valve means;

determining an effective solenoid duty cycle for each solenoid operated distributor valve means using an empirical relationship between commanded duty cycle and effective duty cycle for various values of said differential pressure;

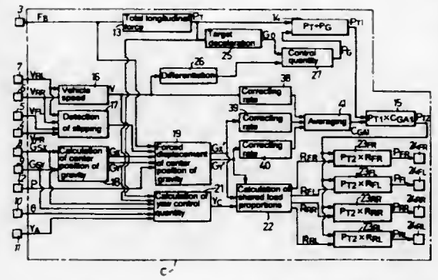
calculating differential flow into and out of said distributor valve means in accordance with a functional relationship between estimated pressure in at least one of said pressure-operated elements and said effective duty cycle; and

determining effective brake pressure in accordance with an empirical relationship between said differential flow and said estimated pressure.

5,551,771
PROCESS FOR CONTROLLING WHEEL LONGITUDINAL FORCE IN VEHICLE

Kenji Akuzawa, and Hiromi Inagaki, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 252,558, Jun. 1, 1994, abandoned. This application Jan. 11, 1996, Ser. No. 583,958
Claims priority, application Japan, Jun. 3, 1993, 5-133508
Int. Cl.[6] B60T *8/30*
U.S. Cl. 303—186 **2 Claims**



1. A process for controlling a wheel longitudinal force in a vehicle in which longitudinal forces applied to a plurality of wheels (W_{FR}, W_{FL}, W_{RR}, W_{RL}) can be controlled at least on a front wheel side and on a rear wheel side, comprising the steps of:

detecting or determining a total longitudinal force which is a sum total of the longitudinal forces applied to the plurality of wheels (W_{FR}, W_{FL}, W_{RR}, W_{RL}) in accordance with a total braking fluid pressure;

controlling the longitudinal forces applied to the wheels on the basis of a front wheel-side target wheel longitudinal force and a rear wheel-side target wheel longitudinal force determined by distribution of said total longitudinal force at a predetermined distribution proportion; and

detecting the presents of a slipping state for each wheel,

changing said distribution proportion by increasing an amount of said distribution proportion to one of the front and rear wheel sides in which more wheels are not in the slipping state, such that the target wheel longitudinal force is larger for the one side,

wherein in changing said distribution proportion, the increased amount in said distribution proportion at a time when the front wheel-side target wheel longitudinal force is increased is determined larger than the increased amount in said distribution proportion at a time when the rear wheel-side target wheel longitudinal force is increased.

5,551,772
JEWELRY FRAME

Michael E. Keffer, 11222 S. Bryant, Oklahoma City, Okla. 73160

Filed Mar. 6, 1995, Ser. No. 398,836
Int. Cl.[6] A47F *3/00*; **A45C** *11/04*; **B65D** *73/00*
U.S. Cl. 312—114 **1 Claim**

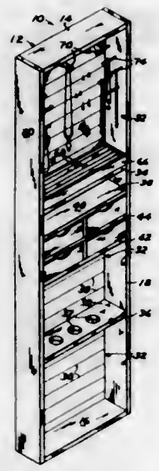
1. A free standing jewelry cabinet, comprising:

a generally rectangular open front frame formed by interconnected top, bottom and right and left side wall panels having front and rear edge portions and having inner and outer surfaces;

a backboard secured to the rear portions of the top, bottom and right and left side panels;

a fabric-like material having a pleasing appearance overlying a visually perceivable surfaces of the backboard;

an elongated monofilament elastomeric strand of uniform diameter tautly wrapped around said backboard over the fabric like material thereon for forming a plurality of parallel equally



vertically spaced strand runs for supporting jewelry items when attached thereto;

a plurality of pairs of horizontal and vertically equally spaced-apart knobs secured to the inner surface of said right and left side wall panels in confronting relation with respect to the respective pairs of knobs on the opposite side panel;

a plurality of shelf panels each having opposing end surfaces and top and bottom surfaces and extending horizontally between said right and left side panels,

each shelf panel having a pair of recesses adjacent its respective end open through its bottom and end surfaces for cooperatively nesting respective opposing pairs of said pairs of knobs and preventing horizontal outward movement of the shelf panels relative to said frame;

shelf and drawer means removably supported in the frame for storing relatively small jewelry items,

said shelf and drawer means comprising:

upper, lower and intermediate vertically spaced-apart shelf panels each having opposing end surfaces and top and bottom surfaces and extending horizontally between said right and left side panels,

each shelf panel of said upper, lower and intermediate shelf panels having a pair of recesses adjacent its respective end open through its bottom and end surfaces for cooperatively nesting respective opposing pairs of said pairs of knobs and preventing horizontal outward movement of said upper, lower and intermediate shelf panels relative to said frame side panels;

a partition transversely interposed between and medially the end surfaces of said intermediate shelf panel and said upper and lower shelf panels, respectively, for forming a drawer receiving space between opposite sides of the respective said partition and the adjacent said frame side panel; and,

a drawer removably contained by the respective drawer space.

5,551,773

UNIVERSAL MOBILE WORKBENCH

Rickey E. Cottrell, 317 Boonshurst Dr., Hermitage, Tenn. 37076

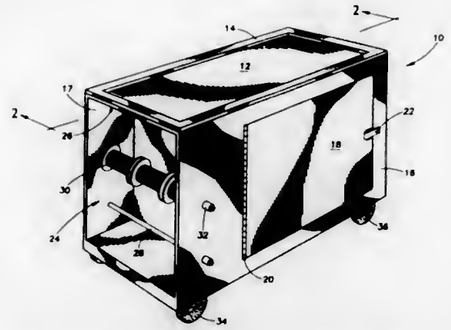
Filed Aug. 26, 1994, Ser. No. 296,460
Int. Cl.[6] A47B *96/00*
U.S. Cl. 312—249.8 **7 Claims**

1. A mobile work bench comprising:

a structure having top, bottom, side and end panels joined forming a void;

an aperture in one side panel providing access to said void;

a door covering the aperture;



a lip mounted on the top panel and following a perimeter of said top panel;

a shelf adjustably positioned in the void and accessible from said aperture;

an area of recess between said panels, including the top, bottom, two sides and one end panel;

aperture means in said side panels in the area defined by the recess for receiving support means;

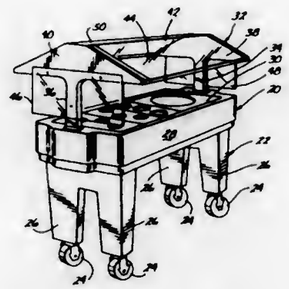
support means, formed in the shape of elongated cylinders extending through said aperture means and beyond on each end and within reinforcement end stops; said reinforcement end stops abutting said aperture means for securing the support means between said side panels.

5,551,774

FOOD BAR WITH MODULAR SUPPORT SYSTEM

Argyle Campbell, Newport Beach, and Larry D. Maddux, Westminster, both of Calif., assignors to Cambro Manufacturing Company, Huntington Beach, Calif.

Filed Oct. 12, 1994, Ser. No. 321,742
Int. Cl.[6] A47G *19/26*
U.S. Cl. 312—284 **19 Claims**



1. A food bar comprising:

a chamber defined by a bottom wall and side walls and having a top opening therein; and,

a plurality of divider bars arranged across said top opening of said chamber to form a grid for support of food containers and panel inserts;

said divider bars comprising:

an elongated member having a substantially U-shaped cross section defined by a top wall, and two skirt walls extending downwardly from said top wall, said top wall having ends which extend beyond said skirt walls for resting on said side walls of said chamber; and,

at least one opening spaced along said top wall of said divider bar.

5,551,775

TELESCOPIC DRAWER SLIDE WITH MECHANICAL SEQUENCING LATCH

Jackie D. Parvin, Pomona, Calif., assignor to Accuride International, Inc., Santa Fe Springs, Calif.

Filed Feb. 22, 1994, Ser. No. 199,451
Int. Cl.[6] A47B *88/00*
U.S. Cl. 312—334.11 **8 Claims**

1. A slide mechanism comprising:

an outer slide member of a generally C-shaped section having a pair of upper and lower bearing raceways facing vertically inward;

an intermediate slide member of a generally C-shaped section having a pair of upper and lower bearing raceways facing vertically outward;

a first plurality of upper and lower bearings in rolling engagement with respective upper and lower raceways of the outer and intermediate slide members;

an inner slide member of a generally C-shaped section having a pair of upper and lower bearing raceways facing vertically outward;

a second plurality of upper and lower bearings in rolling engagement with the pair of upper and lower raceways of the inner slide member and a second pair of opposed vertically inward facing upper and lower raceways of the intermediate slide member;

a latch carried by the intermediate slide member, the latch engageable with a locking element on the inner slide member for restricting relative movement of the inner and intermediate slide members and engageable with an actuating element on the outer slide member for disengaging the latch from the locking element;

said latch comprising a unitarily formed combination of a substantially flat vertical body having a transverse pivot hole for pivotally mounting the latch to the intermediate slide member; and a projection extending transverse to the body for engaging the actuating element to pivot the latch;

said locking element comprising a raceway portion of the inner slide member having a slot for receiving a stop portion of the latch; and

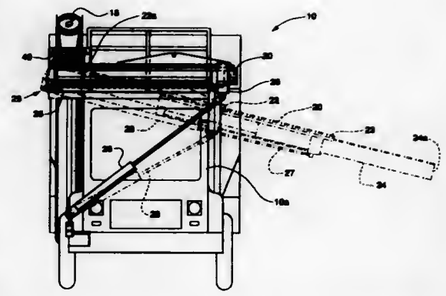
a spring arm connected to the body at a location below and forward of the pivot hole and extending forward and upward therefrom, the spring arm having a forwardmost surface located forward of and above the pivot hole for engaging a rear face of an inner slide stop on the inner slide member, and wherein the projection connects to the body at a location above and behind the pivot hole.

5,551,776

TELESCOPING DISCHARGE CHUTE FOR CONCRETE TRUCKS

Harold M. Miller, R. D. #1, Wabash Rd., Ephrata, Pa. 17522

Filed Mar. 30, 1995, Ser. No. 413,383
Int. Cl.[6] B28C *7/16;* **B65G** *11/14*
U.S. Cl. 366—68 **20 Claims**



1. In a mobile concrete mixer operable to deliver a concrete mixture to a selected location, said concrete mixer having opposing lateral sides defining a transverse width of said concrete mixer; a wheeled frame having forward and rearward ends and supporting an operator's cab at said forward end; mixer means for delivering said concrete mixture at said forward end; and discharge chute means pivotally supported about a generally vertical pivot axis at said forward end to receive said concrete mixture from said mixer means and to discharge said concrete mixture therefrom along a range of operation extending forwardly and laterally from said pivot axis, an improved discharge chute means comprising:

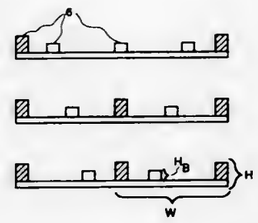
a plurality of chute sections extendable from said pivot axis in a predetermined manner, at least one of said chute sections having a length substantially equal to the transverse width of said concrete mixer, said discharge chute means being positionable in a transport position in which said at least one chute section is oriented generally transversely between said opposing sides of said concrete mixer.

5,551,777

SINGLE SCREW EXTRUDER CAPABLE OF GENERATING CHAOTIC MIXING

Mahari Tjahjadi, Clifton Park, N.Y., and Robert W. Foster, Evansville, Ind., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 121,473, Sep. 16, 1993, abandoned.
This application Nov. 16, 1995, Ser. No. 558,380
Int. Cl.[6] B27F *3/02*
U.S. Cl. 366—100 **2 Claims**



2. A single screw extruder for generating chaotic mixing comprising:

a screw having a continuous primary flight and a continuous secondary flight thereon which define a pair of channels each having a width and a height;

a plurality of baffles disposed in each channel; and

each channel has an aspect ratio of said width-to-height between 4 and 6.

5,551,778

A CYLINDER FOR MIXING COMPONENTS TO FORM BONE CEMENT

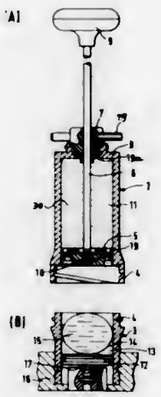
Gunter Hauke, Muhltal; Rainer Specht, Furth; Ralf Krotz, Wiesloch; Reiner Funk, Munster/Altheim; Peter Martin, Wiesbaden, and Berthold Nies, Frankisch-Crumbach, all of, Germany, assignors to Merck Patent Gesellschaft Mit Berschrankter Haftung, Darmstadt, Germany

Filed Jul. 14, 1995, Ser. No. 502,556

Claims priority, application Germany, Jul. 16, 1994, 44 25 218.8

Int. Cl.[6] B01F *13/06*

U.S. Cl. 366—139 15 Claims



1. In a device for mixing at least first and second components of a bone cement and for discharging bone cement, the device including a two-part mixing cylinder in which an openworked mixture plunger is moved axially and rotatably by means of an actuation rod emerging in a sealed manner at one cylinder end, the mixing cylinder being closed at the other cylinder end by a releasably locked discharging plunger which is pressed axially into the mixing cylinder in order to discharge the mixed bone cement through an opposite discharge opening, the improvement comprising:

a separating plunger (**10**) arranged for axial displacement in the mixing cylinder (**1**) between the mixing plunger (**5**) and the discharging plunger (**12**); the separating plunger (**10**), mixing plunger (**5**) and discharging plunger (**12**) being initially disconnected from one another;

the separating plunger being a rigid, imperforable element;

the first component of the bone cement being a pulverulent polymer (**30**) and the second component of the bone cement being a liquid monomer (**15**);

a first cylinder chamber (**11**) extending from a first end of the mixing cylinder (**1**) and initially containing the first component **30**;

a second cylinder chamber (**13**) disposed between the separating plunger (**10**) and discharging plunger (**12**);

a container (**14**) for the second component (**15**) of the bone cement being disposed in the second cylinder chamber (**13**);

the cylinder chambers (**11**, **13**) of the mixing cylinder (**1**), which are initially separated from each other by the separating plunger (**10**), being connected to each other via at least one through-flow channel (**18**) in at least one of said separating plunger and mixing cylinder, whereby upon displacing the mixing plunger toward the second cylinder chamber (**13**), the separating plunger (**10**) moves to rupture the container (**14**) and the second component (**15**) flows through the at least one channel (**18**) to mix with the first component (**30**).

5,551,779

MIXING APPARATUS FOR COUNTERBALANCING FLOWABLE MASSES

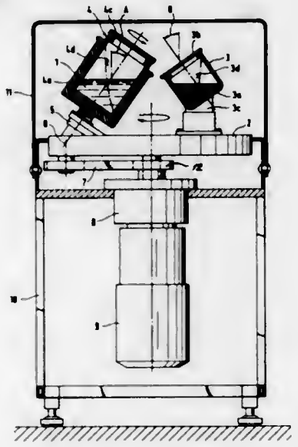
Gebhard Gantner, Nenzing, and Fritz Mark, Mäder, both of, Austria, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Continuation of Ser. No. 156,041, Nov. 23, 1993, abandoned. This application Aug. 17, 1995, Ser. No. 516,116

Claims priority, application Germany, Nov. 23, 1992, 42 39 284.5

Int. Cl.[6] B01F *9/02*

U.S. Cl. 366—217 9 Claims



1. Apparatus for mixing flowable masses within at least one container comprising a substantially horizontal rotatable support having a substantially vertical central axis of rotation and an upper surface and a lower surface, at least one rotatable container carrier mounted on the upper surface of said rotatable support, said at least one container carrier having an axis of rotation spaced radially outwardly from and inclined inwardly towards the central axis of rotation of said rotatable support, said at least one container carrier being adapted to firmly hold said at least one container containing said flowable masses for rotation therewith, and a drive motor for rotating said rotatable support about the central axis of rotation, said drive motor being arranged coaxially with the central axis of rotation of said rotatable support below said rotatable support and adapted for separately rotating said at least one container carrier together with said at least one container containing said flowable masses about the inclined axis of rotation thereof and counter to the rotational direction of said rotatable support by means of a drive for said at least one rotatable container carrier located below the lower surface of said rotatable support, said rotatable support being rotated about twice as fast as said container carrier, said rotatable support further being provided with a means for dynamically counterbalancing centrifugal forces resulting from rotation of said at least one container carrier together with said at least one container containing said flowable masses therein, such that at all rotational speeds an equilibrium is established between the centrifugal forces acting on said at least one container carrier with said at least one container containing said flowable masses and centrifugal forces acting on said counterbalancing means.

5,551,780

METHOD TO DETERMINE CHARACTERISTIC FEATURES OF PROCESSES FORMING RADICALS

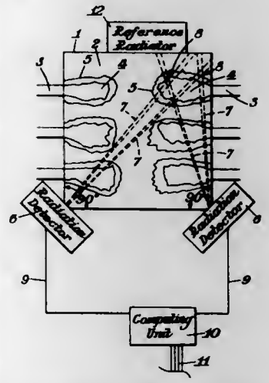
Franz Wintrich, Essen; Dieter Kaiser, Dortmund; Holger Eisenlober, Heiligenhaus, and Kurt-Henry Mindermann, Ratingen, all of, Germany, assignors to RWE Entsorgung, Germany

Filed Feb. 17, 1994, Ser. No. 198,102

Claims priority, application Germany, Feb. 24, 1993, 43 05 645.8

Int. Cl.[6] G01N *21/00*; G01J *5/00*

U.S. Cl. 374—45 6 Claims



1. A method of determining characteristic features of a process that forms radicals within a process space comprising the steps of sensing with at least two spaced apart radiation detectors a radiation spectrum within the process space by detection of radiation intensity along various radiation directions; sensing the radiation spectrum along the various radiation directions in multiple zones within the process space, wherein said sensing the radiation spectrum comprises the steps of simultaneously detecting the radiation intensity of band radiation of multiple radicals within radical forming zones within the multiple zones along the various directions, and detecting the radiation intensity of body and particle radiation at band and band-free wavelength ranges within the multiple zones along the various radiation directions; integrating the radiation intensities within the multiple zones along the various radiation directions; and tomographically evaluating the radiation spectrum within crossing multiple zones to determine the characteristic features of the process.

5,551,781

STERILIZABLE CONTAINER AND METHOD OF FABRICATION

Kenneth R. Wilkes, 55 Brookwood Rd., Asheville, N.C. 28804; Chatchai Taosuwan, 2330 Agostino Dr., Rowland Heights, Calif. 91748, and David M. Factor, 15251 Alondra Blvd., La Mirada, Calif. 90638

Filed Apr. 21, 1995, Ser. No. 426,103

Int. Cl.[6] B65D *33/00*

U.S. Cl. 383—205 6 Claims

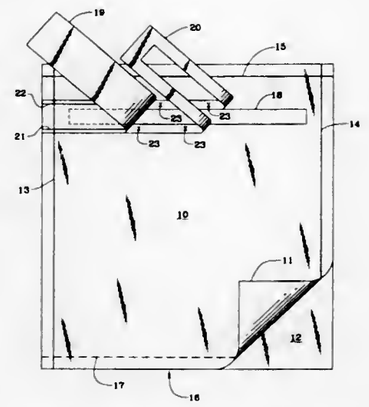
1. A sterilizable package for storing sterile items which comprises:

a sealed container having at least one flexible plastic wall, said flexible wall of said container having an access opening therein with a predetermined length and width; and

a tear strip peelably sealed over said access opening, said tear strip comprising:

a porous membrane,

an interlayer between said porous membrane and said sealed container and sealed to both, said interlayer having an opening therein substantially the same size as said access opening, the width of said opening in said interlayer being 25% or more of the width of said interlayer.



5,551,782

COMPONENT HAVING AT LEAST ONE SPLIT BEARING SEAT AND METHOD OF PRODUCING SAME

Volker Arnhold, Wuppertal; Uwe Eilrich, Lindlar, and Harald Neubert, Monheim, all of, Germany, assignors to Sintermetallwerk Krebsöge GmbH, Radevormwald, Germany

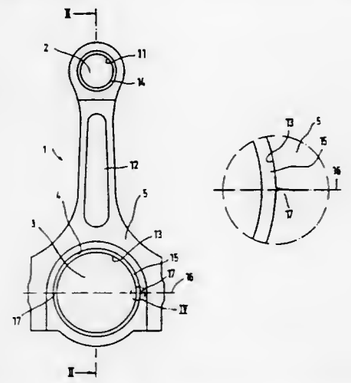
PCT No. PCT/EP94/00199, § 371 Date Oct. 4, 1994, § 102(e) Date Oct. 4, 1994, PCT Pub. No. WO94/18463, PCT Pub. Date Aug. 18, 1994

PCT Filed Jan. 26, 1994, Ser. No. 313,257

Claims priority, application Germany, Feb. 8, 1993, 43 03 592.2

Int. Cl.[6] B21D *53/10*; F16C *9/04*

U.S. Cl. 384—294 16 Claims



1. A method of producing a component from a preform made of a first material and having a bearing seat defining a bearing seat surface, the component including a remainder portion, and a bearing cap portion split from the remainder portion and adapted to mate therewith, the method comprising the steps of:

coating the bearing seat surface of the preform with a second material different from the first material for providing a bear

ing layer made of the second material on the bearing seat surface, the bearing layer having a running face, the step of coating including the step of thermal spraying the second material on the bearing seat surface;

separating the preform into the bearing cap portion and the remainder portion; and

splitting the bearing layer by fracture separation at a separation region of the bearing layer into a bearing cap bearing layer portion corresponding to the bearing cap portion, and a remainder bearing layer portion corresponding to the remainder portion.

16. A component comprising:

a bearing cap;

a remainder portion separated from the bearing cap and adapted to be joined with the bearing cap for forming a split bearing seat therewith defining a bearing seat surface and a first fracture separation region, the bearing cap and the remainder portion being made of a first material; and

a bearing layer made of a second material different from the first material, the bearing layer being disposed on the bearing seat surface and defining a second fracture separation region.

5,551,783

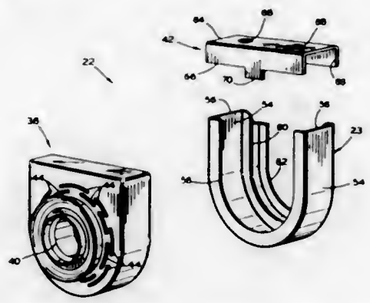
DRIVESHAFT CENTER BEARING ASSEMBLY WITH MOUNTING CHANNEL

Tim M. Whitney, Toledo, and Anthony C. Dietsch, Sylvania, both of Ohio, assignors to Dana Corporation, Toledo, Ohio

Filed Jun. 9, 1995, Ser. No. 488,846

Int. Cl.[6] F16C *27/06*

U.S. Cl. 384—536 **36 Claims**



1. A center bearing assembly adapted to rotatably support a rotatable shaft on a vehicle frame comprising:

a ball bearing adapted to rotatably support the rotatable shaft;

a support member supporting said ball bearing;

a bracket holding said support member; and

a mounting channel secured to said bracket for attaching the center bearing assembly to the vehicle frame, said mounting channel including a base wall and at least one sidewall, said base wall defining a seating surface for seating said support member.

5,551,784

Patent Not Issued For This Number

5,551,785

DIVISIONALLY-PRINTABLE LABEL PRODUCING APPARATUS

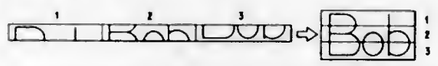
Masaharu Mori, Anjo; Hideo Ueno, Nagoya; Kazuhisa Hirono, Nagoya, and Akihiko Niwa, Nagoya, all of, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jul. 24, 1995, Ser. No. 505,968

Claims priority, application Japan, Aug. 10, 1994, 6-188354

Int. Cl.[6] B41J *5/31*

U.S. Cl. 400—76 **20 Claims**



1. A label producing apparatus for printing data of a height greater than a width of a print receiving medium, comprising:

character data inputting means for inputting character data including letters, numbers and symbols;

storing means for storing therein the character data input by said character data inputting means;

print image developing means for developing the character data stored in said storing means into print image data;

print receiving medium width identifying means for identifying a width of the print receiving medium; and

dividing means for dividing the print image data developed by said print image developing means linearly to create a plurality of segments comprising at least a top segment and a bottom segment relative to the print image data so each segment height corresponds to the width of the print receiving medium.

5,551,786

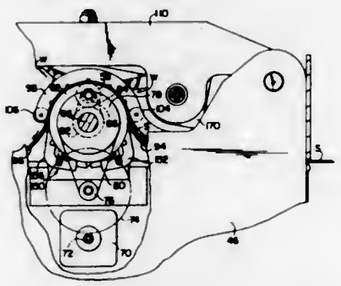
APPARATUS FOR MAKING A GRAPHIC PRODUCT

Charles M. Hevenor, Glastonbury; Ronald B. Webster, Vernon; David J. Logan, Bloomfield; Jay T. Niland, Wethersfield; Lisa M. Brant, Middletown; William Loos, Broad Brook; Martin C. Voelker, East Hampton, and Joseph W. Stempien, Newington, all of Conn., assignors to Gerber Scientific Products, Inc., Manchester, Conn.

Division of Ser. No. 7,662, Jan. 22, 1993. This application May 24, 1995, Ser. No. 449,425

Int. Cl.[6] B41J *11/28*

U.S. Cl. 400—616.3 **8 Claims**



1. A printer for printing on a strip of sheet material comprising:

a printing head;

a roller platen having a cylindrical support surface on which a strip of sheet material is supported for printing by the printing head and for movement relative to the printing head during a printing operation, the roller platen having a width between axial ends of the roller platen less than the width of the strip of sheet material between longitudinally extending marginal edges of the strip whereby a marginal edge portion of the strip overlaps and extends beyond each axial end of the roller platen; and

drive means having curved segments engaging respective marginal edge portions of the strip of sheet material at each axial end of the roller platen for feeding the strip over the roller platen relative to the printing head, the curved segments engaging each of the marginal edge portions of the strip being respectively tangent to axial extensions of the cylindrical support surface at the ends of the roller platen and having radii of curvature at each point along the segments larger than that of the cylindrical support surface of the roller platen, whereby the relatively small radius of the cylindrical support surface establishes a narrow zone of contact between the strip and the printing head for high pressure contact during printing, and the relatively large radius of curvature of the segments establishes greater engagement areas between the strip and the drive means for driving the strip.

5,551,787

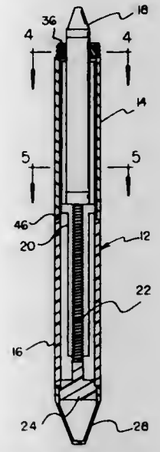
WAX PENCIL HOLDING DEVICE AND SHARPENER

Donald M. Rosenthal, 3780 Elmira Ave., Claremont, Calif. 91711

Filed Aug. 7, 1995, Ser. No. 511,800

Int. Cl.[6] B43K *29/06;21/08*

U.S. Cl. 401—50 **1 Claim**



1. A wax pencil holding device comprising:

an elongated main body including a first portion removably coupled to a second portion, the first portion of the main body includes a threaded neck projecting therefrom;

the first portion of the main body is shaped so as to define an annular projection extending radially inwardly therefrom, and the second portion of the main body being shaped so as to define an annular groove extending thereinto, with the annular projection being removably coupled to and positioned within the annular groove of the second portion;

a thin wax pencil removably received within the first portion of the main body;

a concentric support member removably positioned within the first portion of the main body and concentrically positioned about the thin wax pencil therewithin, the concentric support member is shaped so as to define a center aperture directed therethrough which receives the wax pencil therethrough, and a plurality of radial apertures extending from contiguous communication with the center aperture and radially outwardly therefrom so as to define a plurality of resilient projections which are cantilevered from an outer peripheral portion of the concentric support member and resiliently engage an exterior surface of the wax pencil;

a plunger slidably mounted within the main body and abuttingly engaging an interior end of the wax pencil, the plunger is movably supported within the first portion of the main body and precluded from rotation relative thereto by a plurality of longitudinal projections extending along diametrically opposed interior surfaces of the first portion of the main body, with the plunger being shaped so as to define longitudinal grooves such that the longitudinal projections engage the longitudinal grooves within the plunger to slidably and non-rotatably mount the plunger within the main body;

a threaded rod threadably engaged to the plunger and extending therefrom towards an end of the second portion of the main body;

a knob is rotatably mounted to the end of the second portion of the main body and secured to the threaded rod such that a rotation of the knob will effect concurrent rotation of the threaded rod relative to the plunger so as to effect axial movement of the plunger within the main body;

a cover cap removably coupled to the first portion of the main body so as to enclosure the wax pencil therewithin, the cover cap having an interior portion being capable of threadably engaging the neck of the first portion; and

a sharpener cap removably coupled to the knob, the sharpener can be selectively decoupled from the knob and engaged to a writing end of the wax pencil to effect sharpening thereof, the sharpener cap is shaped so as to define an aperture extending therethrough with a cutting blade being mounted along an interior surface of the sharpener cap so as to effect cutting of the wax pencil with severed portions thereof being ejected from the sharpener cap through the aperture thereof.

5,551,788

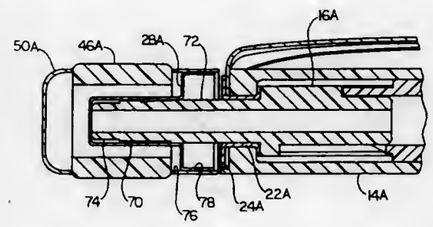
WRITING INSTRUMENT

Martin E. Wacha, 1728 Arrowhead Dr., Beloit, Wis. 53511, and Evan K. Pennell, 8 Daniels St., Arlington, Mass. 02174

Continuation-in-part of Ser. No. 187,760, Jan. 27, 1994, abandoned. This application Dec. 16, 1994, Ser. No. 358,051

Int. Cl.[6] B43K *7/12;24/06*

U.S. Cl. 401—116 **5 Claims**

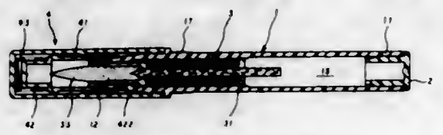


1. A writing instrument having a barrel and an advance-retract mechanism actuated by rotation of a knob disposed at the rear of the instrument barrel opposite the writing tip, comprising:

a shaft extending rearwardly from within said barrel to receive a knob for rotation of said shaft, and said shaft being effective to advance and retract said writing tip when so rotated; and

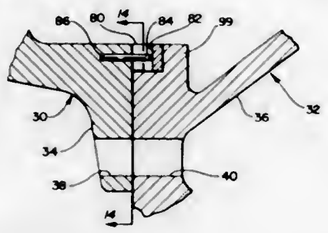
a retainer member having a first cylindrical portion enveloping said shaft and having a plurality of rearwardly inwardly extending tangs contacting the surface of said shaft; said retainer member having a second cylindrical portion disposed forwardly of said retainer first cylindrical portion and having a forward facing surface in spaced relation with a rearwardly facing end surface of said barrel.

5,551,789
COSMETIC MATERIAL CONTAINER
Akira Otawa, and Yuji Sugaya, both of Tokyo, Japan, assignors to Kawakami Gikon Co Ltd, Nakatsugawa, Japan
Filed Oct. 4, 1994, Ser. No. 317,549
Claims priority, application Japan, Oct. 13, 1993, 60018 U
Int. Cl.[6] B43K 8/04;9/00
U.S. Cl. 401—199 2 Claims



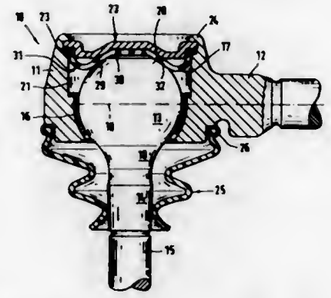
1. A cosmetic material container comprising:
a sleeve holder having an open front end and an open rear end wherein said open front end is narrower than said open rear end;
a tail plug for closing said open rear end of said sleeve holder;
an applying tip unit secured to an open front end side of said sleeve holder; and
a double cap unit attachably and detachably coupled to said sleeve holder on the outer periphery of its front end;
said applying tip unit including an adjuster provided on its outer periphery with a number of annular grooves, a porous joining core inserted into an axial hole in said adjuster and communicating with a part of said annular grooves, and a porous tip connected to a front end of said joining core and inserted in a socket provided in a front end of said adjuster;
a cosmetic material reservoir being defined between a rear end of said adjuster and a tail end in said sleeve holder;
said porous joining core being disposed in said adjuster to project its rear end in said reservoir;
wherein said sleeve holder is provided on its middle interior with a stepped portion formed by a difference in its inner diameters and projections and wherein said adjuster is secured in said sleeve holder when a rear end of said adjuster is clamped between said stepped portion and said projections when said adjuster is inserted into said open rear end of said sleeve holder;
wherein said sleeve holder is provided on the outer periphery of its front end with a converged tapered portion and wherein said sleeve holder is provided on its interior with at least one vent slot extending in an axial direction; and
wherein said adjuster is provided on its outer periphery with at least one slit extending from its front end to its rear end and wherein at least a part of said slit is in communication with said axial hole in said adjuster.

5,551,790
THERMAL LOAD RELIEF RING FOR ENGINE CASE
Patrick B. Melton, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.
Division of Ser. No. 241,574, May 13, 1994, Pat. No. 5,503,490. This application Dec. 11, 1995, Ser. No. 570,428
Int. Cl.[6] F16C 17/22
U.S. Cl. 403—28 3 Claims



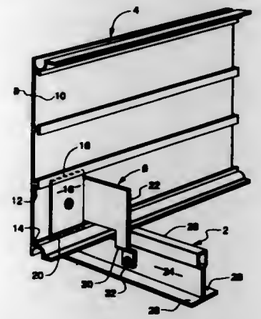
1. Means for maintaining concentricity of two adjacent cases having end walls and being attached at adjacent mating surfaces defined by said end wall of each of said cases comprising a thermal load relief ring fitted into a recess formed in one of said end walls of said two adjacent cases and axially bearing against the other of said end walls of said two adjacent cases, said thermal load relief ring being retained in an axial direction by a wall defining said recess, at least two dowel pins circumferentially spaced about said thermal load relief ring, wherein each of said dowel pins having one end extending into the recess to be fitted into a slot formed on an internal diameter of said thermal load relief ring and having another end fitted into a drilled hole formed in said other end wall of said two adjacent cases, said one of said two adjacent cases having a predetermined coefficient of thermal expansion, the material of said thermal load relief ring having a predetermined coefficient of thermal expansion, and the material of said thermal load relief ring having the same or higher coefficient of thermal expansion as the coefficient of thermal expansion of said one of said two adjacent cases.

5,551,791
BALL JOINT
Eberhard Schneider, Halver, Germany, assignor to P. C. Turck GmbH & Co. KG, Ludenscheid, Germany
PCT No. PCT/DE94/00336, § 371 Date Dec. 15, 1994, § 102(e) Date Dec. 15, 1994, PCT Pub. No. WO94/23218, PCT Pub. Date Oct. 13, 1994
PCT Filed Mar. 23, 1994, Ser. No. 347,464
Claims priority, application Germany, Mar. 31, 1993, 9304897 U
Int. Cl.[6] F16C 11/00; F16D 1/12
U.S. Cl. 403—144 6 Claims



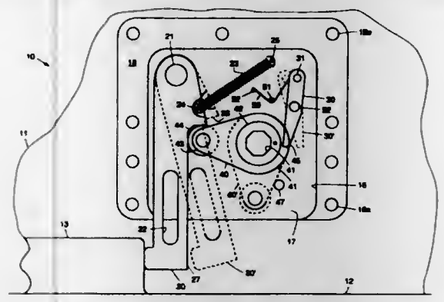
1. A ball joint comprising:
a housing forming a cavity;
a ball in the housing;
a stem fixed to the ball and extending downward out of the housing;
a rigid cover fixed in the housing and upwardly closing the cavity over the ball;
a metallic lower ball cup in the cavity traversed by the stem and engaged between a lower portion of the ball and the housing and complementarily fitted to the lower portion of the ball; and
a metallic spring-plate upper ball cup between the ball and the cover, separate from and out of contact with the lower ball cup, and having cutouts defining at least one portion bearing resiliently upward on the cover and at least one portion bearing resiliently downward on the ball.

5,551,792
CONNECTOR
Brian E. Witmyer, Lititz, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.
Filed Apr. 28, 1995, Ser. No. 430,812
Int. Cl.[6] E04B 9/12
U.S. Cl. 403—241 1 Claim



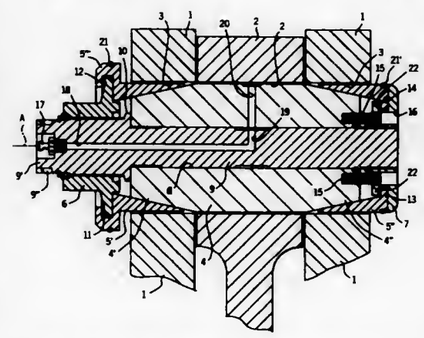
1. The combination of an inverted T-shaped ceiling runner, a decorative/utilitarian element and a connector fastening together said runner and said element, said element having a flat planar front side and a back side having two opposed facing parallel grooves said connector having a flat plate-like portion with two opposed sides sized to fit into the two opposed facing parallel grooves and be held therein, a second portion of the connector being fastened to said connector flat plate-like portion and said runner, said connector flat plate-like portion and connector second portion form a one piece structure with the two portions positioned at a right angle to each other, said element being positioned above said runner and being at right angles to said runner, the runner having a vertical web sectional with an enlarged upper end adjacent said element and horizontal flanges on its lower end, said second portion of said connector being an elongated element and being fastened to the vertical web section, the second portion of said connector extending downward from said element to said runner and having an offset portion adjacent its point of connection to said vertical web section to permit the second portion to extend past the enlarged upper end of said runner.

5,551,793
LOCKING DEVICE FOR ATTACHING AND REMOVING MISSILE WINGS AND THE LIKE
Richard S. Lewis, Chino Hills, Calif., assignor to Loral Aerospace Corp., New York, N.Y.
Filed Jul. 26, 1994, Ser. No. 281,456
Int. Cl.[6] B25G 3/18; F16B 21/00; F42B 10/00; E05C 3/06
U.S. Cl. 403—322 13 Claims



1. A locking device comprising:
a rotatable cam having a opening disposed therein for receiving a locking tool, having a contacting member attached thereto and a notch for locking the cam;
a rotatable cam follower that is rotatable around a pivot, and having a surface for contacting the contacting member of the cam; and
a pivotable cam latch for locking the cam follower in place that comprises a flat end for engaging the notch when the cam follower is locked in place, a release pin for engaging a hole disposed beneath the cam latch when the cam follower is locked in place.

5,551,794
SWIVEL LINK
Arne Aarre, Askepottveien 37, and Knut S. Oaland, Royskattveien 27, both of 4300 Sandnes, Norway
PCT No. PCT/NO93/00050, § 371 Date Sep. 29, 1994, § 102(e) Date Sep. 29, 1994, PCT Pub. No. WO93/20360, PCT Pub. Date Oct. 14, 1993
PCT Filed Mar. 29, 1993, Ser. No. 307,822
Claims priority, application Norway, Apr. 3, 1992, 921297
Int. Cl.[6] F16C 11/04; F16B 3/06
U.S. Cl. 403—374 6 Claims



1. A link for pivotally connecting a first member to a second member, said second member having a portion embracing the first member, said embracing portion of said second member having link attachment holes aligned with a pivot hole in said first member, said link comprising:
a tubular member positionable in the aligned holes, said tubular member having a central axis extending between a pair of ends of said tubular member, said tubular member having a central cylindrical portion which is positioned in the pivot hole of said first member when said tubular member is inserted in said aligned holes so that said first member may rotate with respect to said tubular member, said tubular member having conically tapering end portions at each end thereof, the outer surface of each of said conically tapering end portions being inclined toward the central axis of the tubular member in a direction toward the respective end of said tubular member, one of said conically tapering end portions being positioned in each of said attachment holes of said second member portion when said tubular member is inserted in said aligned holes;
an expandable, internally conical wedge sleeve member mounted on each of said tapering end portions to surround said outer surface of said tapering end portion;
a shaft extending axially through said tubular member, said shaft being rotatable with respect to said tubular member and having exposed end portions extending from each end of said tubular member, at least said end portions of said shaft being threaded, said shaft having means abutting a first end of said tubular member for preventing axial movement of said shaft with respect to said tubular member toward a second end of

said tubular member when said shaft is in a given position with respect to said tubular member;

a nut threaded on each of said exposed end portions of said shaft adjacent the ends of said tubular member, each of said nuts being axially moveable along said shaft responsive to relative rotation between the nuts and said shaft, each of said nuts engaging one of said wedge sleeve members for moving the wedge sleeve member along the inclined outer surface of one of said tapering end portions by the movement of the associated nut along said shaft, movement of said sleeve members up the inclined outer surface of said tapering end portions bringing said sleeve members into wedging engagement with the attachment holes of said second member portion to secure said link to said second member; and

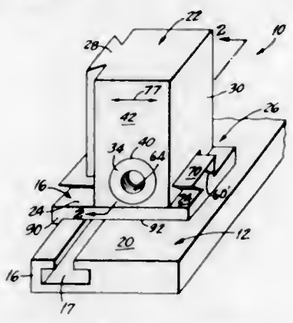
means interposed between said second end of said tubular member for engaging the adjacent nut for preventing rotation of said adjacent nut with respect to said tubular member while allowing axial displacement of said adjacent nut with respect to said tubular member, thereby to axially move the wedge sleeve member associated with said adjacent nut along the inclined surface of the tapering end portion of said tubular member located at said second end of said tubular member as a result of the rotation of said shaft.

5,551,795

TOOL HOLDER SUPPORT ASSEMBLY

Eddy Engibarov, c/o E.Z.E. Machine Company, 616 Onderdonk Ave., Ridgewood, N.Y. 11385

Filed Sep. 2, 1994, Ser. No. 300,796
Int. Cl.[6] F16B *2/14*
U.S. Cl. 403—381 **9 Claims**



1. A tool holder support assembly, comprising:

a first support member having a dovetail projection protruding from a first support surface and extending lengthwise in a first direction, said dovetail projection including a pair of opposed sloped surfaces extended in said first direction and converging toward said first support surface to define, in part, a cross section of said dovetail projection;

a second support member having a second support surface with a dovetail slot formed in said second support surface, said dovetail projection of said first support member being slidably engageable in said dovetail slot with said second support surface adjacent to said first support surface, a lateral opening in said second support member extending transversely to and intersecting said dovetail slot to expose a portion of one of said sloped surfaces of said dovetail projection when said first and second support members are slidably engaged;

a wedge member inserted in said lateral opening and having a wedge surface movable translationally without rotation to make contact with said one exposed sloped surface of said dovetail projection, pressing said wedge surface against said one exposed sloped surface causing, by wedge action, said first support surface to press against said second support surface, whereby said first and second support members are releasibly fixed relative to each other; and

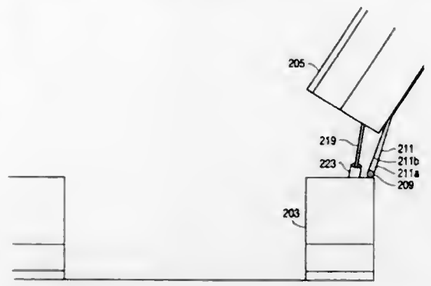
driving means for translating said wedge surface without rotation to press against said one exposed sloped surface of said dovetail projection.

5,551,796

MOVEABLE BARRIER

Hugh G. Anderson, Jr., Arnold; Roy Shawn, Grasonville, and Elmer F. Currence, Jr., Baltimore, all of Md., assignors to Emergency Public Safety Services, L.L.C., Grasonville, Md.

Filed Jan. 20, 1995, Ser. No. 375,825
Int. Cl.[6] E01F *13/00*
U.S. Cl. 404—6 **25 Claims**



21. A method of configuring a moveable highway barrier, the method comprising the steps of:

connecting a stationary barrier section to a substantially fixed barrier;

connecting a moveable shell having a profile matching a profile of the stationary barrier section and the substantially fixed barrier to the stationary barrier section; and

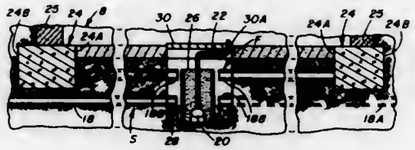
connecting a drive means to the moveable shell such that the drive means moves the moveable shell between an upright open position and a lowered closed position.

5,551,797

UNDERGROUND DRAINAGE SUMP SYSTEM AND METHOD OF RETROFITTING FOR PROTECTING A FLOOR SLAB

Paul C. Sanford, P.O. Box 1071, Elbow Lake, Minn. 56531

Filed Feb. 17, 1995, Ser. No. 390,242
Int. Cl.[6] E02D *31/02;* **F24F** *7/06;11/00*
U.S. Cl. 405—36 **40 Claims**



1. A method of retrofitting an underground water drainage sump system to below a floor slab for protecting the floor slab, said retrofitting method comprising the steps of:

(a) forming a sump hole to extend through a floor slab and into underground below the floor slab;

(b) forming a plurality of lateral passageways in the underground below the floor slab so as to extend outwardly from said sump hole along and below the floor slab to the vicinity of an outer perimeter of the floor slab;

(c) inserting a plurality of perforated hollow collection pipes into the lateral passageways such that outer ends of said collection pipes extend to the vicinity of the outer perimeter of the floor slab and inner ends of said collection pipes are disposed in flow communication with said sump hole; and

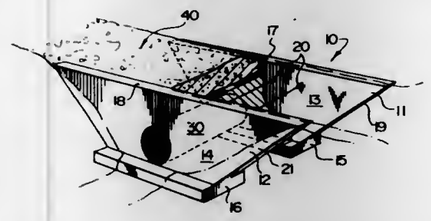
(d) placing a sump pump into said sump hole for pumping from said sump hole drainage water discharged into said sump hole from said collection pipes.

5,551,798

CULVERT END WALL RETAINER SYSTEM

Eugene A. Goodreau, 145 Queen Street North, Tilbury Ontario, Canada

Filed Sep. 15, 1994, Ser. No. 306,404
Int. Cl.[6] E01F *5/00*
U.S. Cl. 405—124 **8 Claims**



7. A method of fabricating an in situ culvert in which or over which a roadway is to be postured over an indentation or valley in the ground which may, from time to time, pass water therethrough comprising the steps of:

(a) precasting from concrete, at least two opposite culvert end walls, the end wall having an upper margin, a base margin, each with respective opposite ends, and defining an aperture in close proximity with the base margin,

(b) attaching connection means to each end wall at a predetermined distance from the base margin;

(c) placing, in situ, each end wall in a generally orthogonal position to the valley in which they are to be positioned,

(d) interconnecting between connection means of each opposite culvert end wall, an interconnecting means,

(e) extending between each aperture of each end wall a conduit communicating the apertures; and,

(f) backfilling that void defined between the two opposite culvert end walls to a pre-determined grade or level above and about the conduit so as to structure an in situ culvert.

5,551,799

CRYOGENIC METHOD AND SYSTEM FOR REMEDIATING CONTAMINATED EARTH

J. Gregory Dash, Seattle, Wash., assignor to University of Washington, Seattle, Wash.

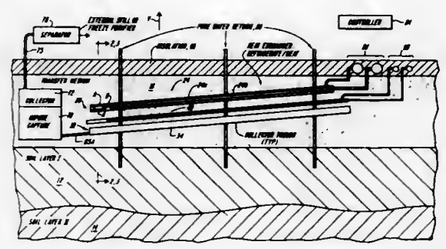
Continuation-in-part of Ser. No. 19,085, Feb. 18, 1993, Pat. No. 5,324,137. This application May 2, 1994, Ser. No. 236,459
Int. Cl.[6] B09B *1/00;* **A62D** *3/00*
U.S. Cl. 405—128 **32 Claims**

1. A method for remediating contaminated earth situ, comprising the steps of:

A) utilizing a heat transfer assembly to establish an advancing freeze-front in a moist region adjacent to said assembly, said freeze-front advancing away from said assembly and toward a collection zone in said region, said moist region being substantially frozen on a first side of said freeze-front and being substantially unfrozen on a second side of said freeze-front and said freeze-front being the solid-liquid interface between said frozen and unfrozen portions of said moist region, , said region being in or adjacent to said contaminated earth, whereby contaminants in said contaminated earth migrate toward said freeze-front to establish a relatively high concentration of contaminants adjacent to the leading edge of and on said second side of said freeze-front,

B) advancing said freeze-front toward said collection zone whereby said contaminants are driven toward said collection zone, and

C) collecting concentrated contaminants in said collection zone.

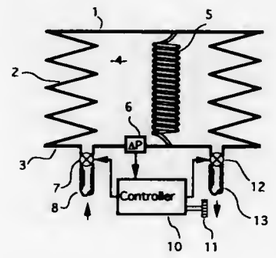


5,551,800

DEVICE WITH ADJUSTABLE BUOYANCY WITH PRESSURE COMPENSATION

Maximilian Hobelsberger, Dorfstr. 16, Ch-5303 Würenlingen, Switzerland

Filed Apr. 19, 1993, Ser. No. 48,298
The portion of the term of this patent subsequent to Mar. 6, 2014, has been disclaimed.
Int. Cl.[6] B63C *11/08*
U.S. Cl. 405—186 **4 Claims**



1. Adjustable buoyancy compensator for scuba divers, comprising:

a hollow, airtight container, the volume of which depends on the pressure difference between inside and outside of the container,

valves through which air can be released from the inside to the outside and can be fed into the container,

means for measuring the air pressure difference between inside and outside of the container,

a pressure controller, which is stimulated by said means for measuring the pressure difference, and which keeps the pressure difference constant by steering the input or output valves

to release air from or to refill air into the container, whereby the value of the pressure difference can be adjusted by the diver for adjustment of the buoyancy while diving and at normal operation of the compensator.

5,551,801

HYJACK PLATFORM WITH COMPENSATED DYNAMIC RESPONSE

Dale M. Gallaher, Metairie, La., and Mark A. Smith, Houston, Tex., assignors to Shell Offshore Inc., New Orleans, La.

Filed Dec. 23, 1994, Ser. No. 370,763

Int. Cl.[6] E02B *17/00*; E02D *5/00*

U.S. Cl. 405—204 **8 Claims**

1. An offshore compliant platform structure for temporarily using a jack-up rig for well operations in deepwater applications, comprising:

a bottom founded compliant jacket base designed for dynamic response with the mass of the jack-up engaged;

a surface tower supported by the jacket base and extending above the ocean surface;

a platform deck supported by the surface tower;

a subsea rig support interface presented at the top of the jacket base and adapted to support the jack-up rig for well operations; and

at least one ballastable rig support buoyancy tank in the form of a rig mat connected to the rig support interface, comprising:

a selectively buoyant and ballastable tank member;

a jacket base interface presented on the bottom of the tank member which attaches on top of the jacket base on the rig support interface; and

a secondary subsea rig support interface presented on the top of the tank member, interconnected in a load bearing relationship with the jacket base interface, and adapted to receive the jack-up rig;

whereby the weight of the jack-up rig is substantially offset by buoyant forces supplied by the rig support buoyancy tank when the jack-up rig is deployed on the jacket base and the mass of the jack-up rig is substantially replaced in the offshore platform structure by adding water as ballast in the rig support buoyancy tank when the jack-up rig is removed to contribute toward avoiding harmonic periods for the compliant tower during production operations which do not require the presence of the jack-up rig.

5,551,802

TENSION LEG PLATFORM AND METHOD OF INSTALLATION THEREFOR

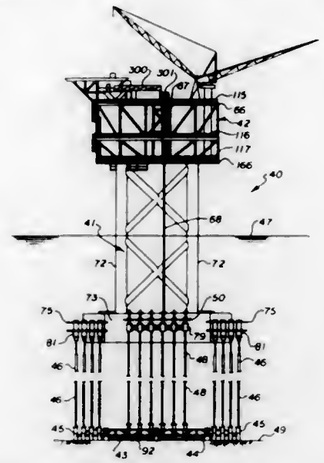
Pieter G. Wybro, Houston, Tex., assignor to Sea Engineering Associates, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 14,690, Feb. 8, 1993, Pat. No. 5,421,676. This application Jan. 25, 1994, Ser. No. 186,901

The portion of the term of this patent subsequent to Feb. 8, 2013, has been disclaimed.

Int. Cl.[6] B63B *35/44*; E02B *17/00*

U.S. Cl. 405—223.1 **29 Claims**



1. An offshore tension leg platform comprising:

(a) a buoyant hull adapted at an upper end for supporting at least one deck above the water surface;

(b) structural support elements connected to said hull and containing tendon connection devices;

(c) at least one foundation element secured to the seabed;

(d) a plurality of elongate substantially vertical tendons each connected at a lower end to said at least one foundation element and at an upper end to said tendon connection devices to restrain said hull and substantially inhibit roll and pitch rotation of said hull about a horizontal axis;

(e) at least one deck supported at the upper end of said hull;

(f) riser support devices connected to said hull at substantially the same elevation as said tendon connection devices for supporting an upper end of substantially vertical risers at substantially the same elevation as the tendon connection to said hull, said risers having a lower end connected to wells on the seabed; and

(g) at least one well workover structure movably mounted adjacent the periphery of said at least one deck to provide vertical access to the supported risers.

5,551,803

RISER TENSIONING MECHANISM FOR FLOATING PLATFORMS

Joseph W. Pallini, Jr., Tomball, and Charles E. Jennings, Houston, both of Tex., assignors to ABB Vetco Gray, Inc., Houston, Tex.

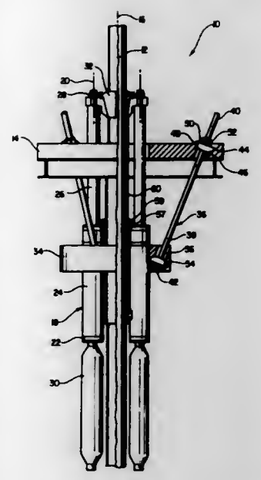
Filed Oct. 5, 1994, Ser. No. 321,044

Int. Cl.[6] E21B *17/07*

U.S. Cl. 405—223.1 **18 Claims**

1. An apparatus for tensioning a riser having an axis, the riser extending downwardly from a platform to a subsea wellhead, the apparatus comprising:

a plurality of hydraulic cylinders, each having a piston portion, a cylinder portion, and an axis;



a plurality of accumulators, each attached to the cylinder portion of one of the hydraulic cylinders and extending coaxially along the axis of one of the hydraulic cylinders; and

mounting means for mounting the hydraulic cylinders between the platform and the riser in a cluster around the riser with the axes of the hydraulic cylinders substantially parallel with the axis of the riser for applying tension to the riser and allowing movement of the platform relative to the riser; wherein the mounting means comprises:

a cylinder receiver rigidly supporting one of the portions of the hydraulic cylinders, the cylinder receiver having a hole therethrough for receiving the riser, the riser and cylinder receiver being axially movable relative to each other;

a plurality of struts extending downwardly and inwardly from the platform to the cylinder receiver to support the cylinder receiver for movement with the platform; and

a riser collar rigidly connected to the riser, the other portion of each of the hydraulic cylinders being rigidly connected to the riser collar.

5,551,804

METHOD OF DRIVING A PILE

Larry D. Breaux; James A. Haney, both of Houston, Tex., and Daniel M. Houser, Thibodaux, La., assignors to McDermott International, Inc., New Orleans, La.

Filed Apr. 24, 1995, Ser. No. 427,372

Int. Cl.[6] E02D *5/28*; *7/10*

U.S. Cl. 405—227 **9 Claims**

1. A method of driving a hollow tubular pile string into the seabed comprising the steps of:

(a) closing or plugging a lower end of a pile;

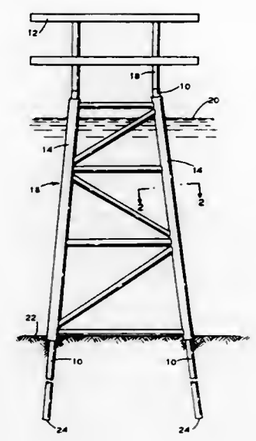
(b) temporarily suspending said pile from a support located above the waterline;

(c) reducing the load upon said support by controlling the buoyancy of said pile;

(d) adding additional lengths to said pile, thereby forming a pile string, while said pile string is temporarily suspended from said support;

(e) incrementally lowering said pile string toward the seabed until self-support is reached; and,

(f) driving said closed or plugged lower end of said pile into the seabed until a desired penetration depth is reached, said step of driving causing the seabed to be displaced around said closed or plugged lower end.



5,551,805

ANCHORING CARTRIDGE FOR ANCHORING A FASTENING ELEMENT IN A DRILLED HOLE

Norbert Arnold, Waldachtal, and Willi Haug, Freudenstadt, both of, Germany, assignors to fischerwerke Artur Fischer GmbH & Co. KG, Waldachtal, Germany

Filed Feb. 7, 1994, Ser. No. 192,702

Claims priority, application Germany, Feb. 16, 1993, 43 04 620.7

Int. Cl.[6] E21D *20/02*

U.S. Cl. 405—259.6 **4 Claims**

1. Anchoring cartridge for anchoring a fastening element in a drilled hole, said anchoring cartridge comprising at least two chambers,

wherein one of said chambers contains from 1.0 to 10% of a hardener component dissolved in a mixture of styrene and an unaccelerated radical-curing resin, and another of said chambers contains an accelerator mixed with another mixture of styrene and said unaccelerated radical-curing resin.

5,551,806

PROCESS FOR MAKING CEMENTITIOUS MINE BACKFILL IN A SALT ENVIRONMENT USING SOLID WASTE MATERIALS

Larry D. Milliken, Factoryville, Pa., assignor to Akzo Novel N.V., Arnhem, Netherlands

Continuation-in-part of Ser. No. 928,038, Jul. 31, 1992, Pat. No. 5,340,235. This application May 23, 1994, Ser. No. 247,794

Int. Cl.[6] C04B *7/02*; B65G *5/00*

U.S. Cl. 405—266 **20 Claims**

1. A method of hydraulically backfilling an empty salt cavity which comprises combining at least one pozzolanically active waste material with an effective amount of at least one cementing agent and brine to form a pozzolanic mixture, wherein the relative proportions of said pozzolanically active waste material, cementing agent and brine are sufficient for reaction under conditions present in said salt cavity to form a stable, low porosity, load bearing pozzolanic cement; oxidizing said pozzolanic mixture in order to substantially convert aluminum metal in the mixture to aluminum oxide; and hydraulically depositing said pozzolanic mixture in the empty salt cavity.

5,551,807

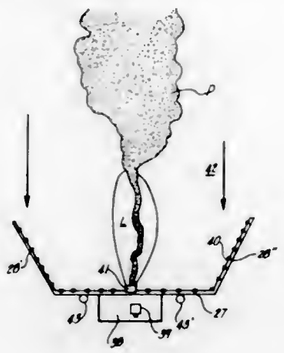
IN-GROUND BARRIER SYSTEM

Louis B. Breaux, 2521 Fawnwood Rd., Marrero, La. 70072

Continuation-in-part of Ser. No. 986,241, Dec. 4, 1992, and Ser. No. 93,524, Jul. 19, 1993, Pat. No. 5,354,149, each which is a continuation-in-part of Ser. No. 831,555, Feb. 5, 1992, Pat. No. 5,240,348, which is a continuation of Ser. No. 398,613, Sep. 25, 1989, Pat. No. 5,106,233. This application Oct. 6, 1994, Ser. No. 320,431

Int. Cl.[6] E02D 27/00;29/02

U.S. Cl. 405—267 14 Claims



1. A method of intercepting and collecting a subterranean plume of contaminants migrating through ground along a path, comprising the steps of:

a. determining the path of migration of said plume through the ground;

b. making an excavation in the vicinity of said plume, of an extent and depth to allow for the interception of said plume:

c. forming a fluid impermeable barrier in the ground intersecting said plume, including the sub-steps of:

i. placing a first guide box assembly, having at least one longitudinal slot formed therein of a depth sufficient to accommodate a barrier member in the excavation;

ii. placing a subsequent series of guide box assemblies in the excavation adjacent to a preceding one of said guide box assemblies, each guide box assembly having at least one longitudinal slot formed therein of a depth sufficient to accommodate a barrier member, said guide box assemblies being placed in the excavation with the exterior side walls of the guide box assemblies being spaced from the side walls of the excavation, the interiors of said guide box assemblies providing a temporary, open, protected work space for the insertion and assembly of a barrier in the longitudinal slots of respective ones of said guide box assemblies;

iii. providing a barrier member in the longitudinal slot of said first guide box assembly; and

iv. providing said barrier in the longitudinal slots formed in said subsequent series of guide box assemblies in the excavation adjacent to said preceding one of said guide box assemblies, forming a fluid impermeable barrier in the ground, allowing for the interception of said plume, thereby blocking the further lateral migration of said plume;

d. filling the excavation; and

e. removing at least a portion of said guide box assemblies from the excavation.

5,551,808

INTERLOCKING JOINT

Richard D. Sandanasamy, and Joaquim P. Siu, both of Singapore, Singapore, assignors to RasWILL Representative Pte. Ltd., Singapore, Singapore

Filed Jun. 1, 1994, Ser. No. 252,230

Claims priority, application United Kingdom, Jun. 2, 1993, 9311320

Int. Cl.[6] E02D 5/14

U.S. Cl. 405—279 19 Claims

1. An interlocking joint for linking sheets together in a sealed manner to form a screen, the joint comprising:

a hook portion extending substantially along the length of a free edge of the joint;

a rib portion extending substantially along the length of the joint adjacent the hook portion, the rib portion having a free rib edge that cooperates with the hook portion to define a rib receiving portion;

a hook receiving portion;

a first space defined between the hook portion and the rib portion, the first space having physical means, discrete from the rib receiving portion, for retaining an expansion seal; and

a second space defined between the hook receiving portion and the rib portion, wherein the shape of the first space substantially corresponds to the shape of the rib portion and the shape of the second space substantially corresponds to the shape of the hook portion such that the interlocking joint is adapted to slidably receive another interlocking joint.

5,551,809

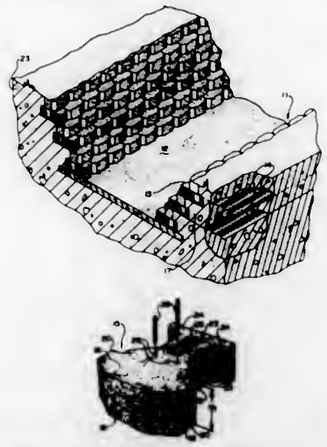
EMBANKMENT WALL CONSTRUCTION AND METHOD AND BLOCK CONSTRUCTION FOR MAKING THE SAME

Paul J. Forsberg, Wayzata, Minn., assignor to Keystone Retaining Wall Systems, Inc., Edina, Minn.

Filed Aug. 30, 1994, Ser. No. 298,415

Int. Cl.[6] E02D 17/20

U.S. Cl. 405—285 30 Claims



1. An embankment wall structure comprising:

a wall having a lower end supported on a support surface, said wall extending upwardly from said support surface at a slope angle of about 30° to 60° from the horizontal;

said wall formed of a plurality of precast modules, said modules arranged in a plurality of horizontal rows positioned one on top of the other as said wall extends upwardly from said support surface, with each row having a plurality of modules in immediate, substantially touching, adjacent relationship throughout the entire length of said row and each row being in set back position relative to an adjacent lower row wherein said set back position is sufficient to provide said slope angle, said modules in any one row further being positioned so that each module in said one row bridges a first pair of adjacent modules in an adjacent higher row and a second pair of adjacent modules in an adjacent lower row; and

interlock means comprising pin connection means associated with each module to interlock said plurality of modules and said plurality of rows in said set back position, said interlock means effective to interlock each module directly with said first pair of adjacent modules in the adjacent higher row and said second pair of adjacent modules in the adjacent lower row.

5,551,810

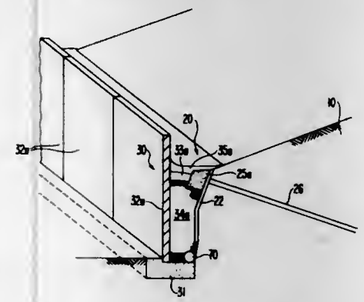
RETAINING WALL WITH AN OUTER FACE AND METHOD OF FORMING THE SAME

John A. Franceski, Aurora, Colo.; Hubert J. Deaton, III, Great Falls, Va., and Claus J. Ludwig, Walnut Creek, Calif., assignors to Schnabel Foundation Company, Sterling, Va.

Filed Jun. 8, 1994, Ser. No. 257,776

Int. Cl.[6] F02D 29/02

U.S. Cl. 405—286 61 Claims



1. A method of forming a retaining wall with an outer face comprising the following steps:

excavating a cut in successive sections to form an exposed cut face;

forming a retaining wall by

providing a concrete wale which extends substantially horizontally along a portion of the exposed cut face of each successively excavated section,

installing tiebacks through said concrete wale, and

testing, tensioning and securing said tiebacks against said concrete wale; and

forming an outer face for said retaining wall by

providing a concrete footing at a base of said retaining wall,

erecting a first tier of facing elements above said concrete footing,

securing said first tier of facing elements to a first adjacent concrete wale with a first connector, and

placing backfill material between said first tier of facing elements and said retaining wall.

5,551,811

TOOL ASSEMBLY HAVING INTERFITTING MALE AND FEMALE COUPLING MEMBERS

Amir Satran, Kfar Havradim, and Rafael Margulis, Karmiel, both of, Israel, assignors to Iscar, Ltd., Migdal Tefen, Israel

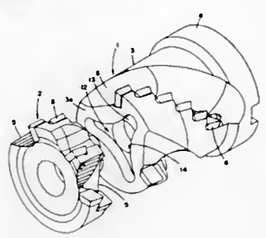
PCT No. PCT/EP94/00452, § 371 Date Dec. 5, 1994, § 102(e) Date Dec. 5, 1994, PCT Pub. No. WO94/19132, PCT Pub. Date Sep. 1, 1994

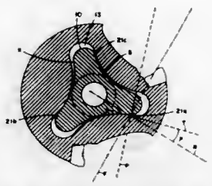
PCT Filed Feb. 17, 1994, Ser. No. 318,798

Claims priority, application Israel, Feb. 18, 1993, 104774

Int. Cl.[6] B23C 5/26

U.S. Cl. 407—40 10 Claims





1. A rotary cutting tool assembly having a rotary axis and comprising first and second tool assembly components adapted to be coaxially coupled together by means of a clamping screw and so that a drive transmitted to said first component is transmitted to said second component, at least one of the tool assembly components being provided with peripherally disposed flutes;

the components being formed with interfitting male and female coupling members, each coupling member being formed with at least two terminal lobe portions directed into peripheral areas located between said flutes and a central, symmetrically disposed portion which is inset with respect to the associated lobe portions, the central and lobe portions of the male coupling member mating within the central portion and lobe portions of the female coupling member;

each pair of mating lobe portions of the coupling members having a respective pair of surfaces at least one of which is curved so that, upon relative rotational displacement of said components about said rotary axis, a point of contact is established between at least one pair of said surfaces at an area thereof remote from said central portion and so that

an angle defined between a tangent to said curved surface at said point of contact and a radius extending from said rotary axis to said point of contact lies substantially between −10° and +25°.

5,551,812

SINGLE-BLADE REAMER

Andreas Basteck, D-72474 Winterlingen, Ebingor Str. 115, Germany

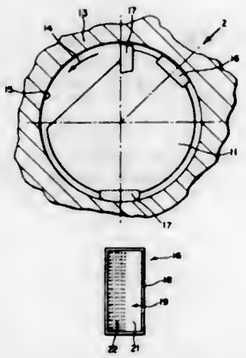
Filed Aug. 29, 1994, Ser. No. 297,448

Claims priority, application Germany, Feb. 9, 1993, 43 29 553.3

Int. Cl.[6] B23B 41/00

U.S. Cl. 408—199 7 Claims

1. A single-blade reamer having a blade head comprising a blade plate head comprising a blade plate and at least a first guide fillet having a guide surface thereon, said guide fillet comprising a main



body of hard metal provided with a coating forming at least a part of the guide surface of the guide fillet, wherein the coating comprises a cubical boron nitride (CBN).

5,551,813

MACHINING CENTRE AND ROUTER GUARD

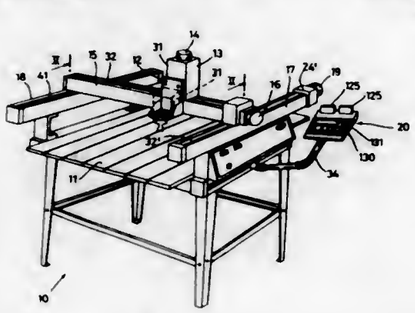
John Bennett, Middlesex, United Kingdom, assignor to Black & Decker Inc., Newark, Del.

Filed Mar. 4, 1994, Ser. No. 206,295

Claims priority, application United Kingdom, May 5, 1993, 9304639

Int. Cl.[6] **B23Q** *11/02;* **B27G** *19/00*

U.S. Cl. 409—134 **17 Claims**



1. A machining center for maneuvering a rotary tool over a work table to perform operations on a workpiece, comprising:

a tool bit attached to said rotary tool;

a support for supporting said rotary tool;

at least one column slidingly attached to said rotary tool and movable toward the workpiece;

a base mounted to said at least one column;

a compressible spring positioned between and connected to said base and said support and co-axial with said bit;

an aperture formed in said base for receiving said bit of said rotary tool; and

a dust hood attached to said aperture for removing dust from the operations of said bit on the workpiece, and said dust hood is made of a transparent material such that the view of said bit operating on the workpiece is not obstructed.

5,551,814

CRANKSHAFT MILLING MACHINE CONTROL SYSTEM

Masanori Hazama, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

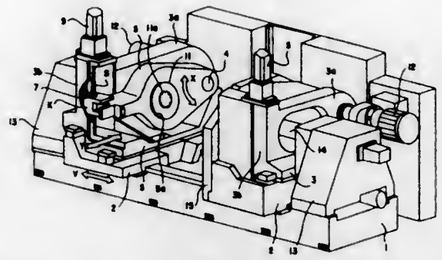
PCT No. PCT/JP93/01537, § 371 Date Apr. 20, 1995, § 102(e) Date Apr. 20, 1995, PCT Pub. No. WO94/09935, PCT Pub. Date May 11, 1994

PCT Filed Oct. 25, 1993, Ser. No. 325,174

Claims priority, application Japan, Nov. 5, 1992, 4-296068

Int. Cl.[6] **B23C** *3/06;* **B23Q** *15/18*

U.S. Cl. 409—200 **3 Claims**



1. A crankshaft milling machine control system for controlling a crankshaft milling machine wherein the vertical movement and horizontal movement of a spindle head having an inner-tooth milling cutter are combined to put the inner-tooth milling cutter in circular motion, thereby cutting a workpiece fixedly supported at both ends thereof, the control system comprising:

(a) basic processing data setting means for setting basic processing data for the workpiece related to a diameter of a circular path followed by the center of the inner tooth milling cutter and to the center of the circular path in accordance with input work data;

(b) spindle head controlling means for controlling the vertical movement and horizontal movement of the spindle head in accordance with the output of the basic processing data setting means;

(c) temperature detecting means for detecting the temperature of the crankshaft milling machine at a specified position during machining operation, wherein the temperature detecting means detects temperature at a position in the vicinity of the bearing part of the inner-tooth milling cutter;

(d) temperature-related correction data computing means for looking up temperature-related processing data in a table with the output of the temperature detecting means and computing temperature-related correction data from the comparison between the temperature-related processing data and the basic processing data; and

(e) processing data correcting means for correcting the basic processing data for the workpiece set by the basic processing data setting means in accordance with the temperature-related correction data computed by the temperature-related correction data computing means.

5,551,815

STANCHION FOR SUPPORTING MOVING AND LOADING/UNLOADING HIGHWAY SEMI-TRAILERS ON RAIL CARS

Terence H. Rainbow, Erie, Pa., and James Long, Ripley, N.Y., assignors to General Electic Company, Erie, Pa.

Filed Jan. 6, 1995, Ser. No. 369,221

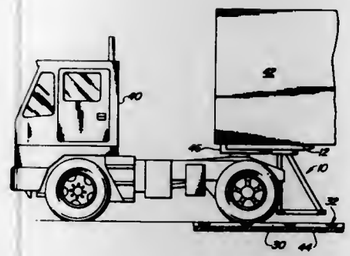
Int. Cl.[6] **B60P** *7/13*

U.S. Cl. 410—58 **8 Claims**

1. A stanchion for supporting a semi-trailer on a rail car comprising:

a vertical support member having a base end and a top end;

a fifth wheel pivotably attached to said top end of said vertical support member;



a base member attached to said base end of said vertical support member, said base member including a plurality of releasable connection means for attaching said base member to a rail car bed; and

a pin protruding from a lower surface of said fifth wheel for enabling said fifth wheel to be coupled to a fifth wheel on a yard tractor.

5,551,816

REMOVABLE RIVET AND METHOD OF REMOVING THE HEAD FROM THE SHANK OF THE RIVET

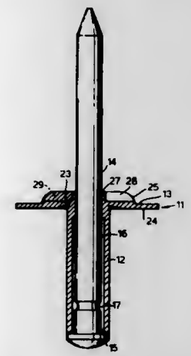
Jonathan L. Brewer, Dunstable; Keith Denham, Welwyn Garden City, and Neil J. Sherry, Knebworth, all of, England, assignors to Avdel Systems Limited, Hertfordshire, England

Filed Apr. 11, 1995, Ser. No. 420,057

Claims priority, application United Kingdom, Apr. 12, 1994, 9407181

Int. Cl.[6] **F16B** *13/04;13/06*

U.S. Cl. 411—43 **20 Claims**



1. A removable rivet comprising a shank and a preformed heat at at least one end of the shank, the shank being insertable through workpieces and being capable of being permanently deformed to rivet the workpieces together, the rivet comprising:

an annular groove at the junction of the shank and the head, the annular groove extending radially inwardly of the diameter of the shank, thereby to facilitate separation of the head from the shank when a drill of a diameter substantially equal to that of the shank is applied to the head of an installed rivet co-axially with the shank until the drill meets the annular groove;

locating means carried by the head of the rivet for cooperating with a drilling apparatus having the drill, thereby to locate the drill co-axially with the annular groove; and

engaging means carried by the head of the rivet for engaging a non-rotating part of drilling apparatus thereby to prevent rotation of the rivet under the influence of the rotating drill wherein the annular groove lies entirely within the head, thereby to facilitate separation of the head from the shank by the drill without need of the drill entering the shank.

5,551,817

FASTENER FOR ATTACHING IN ONE DIRECTION

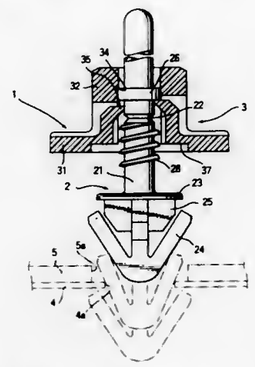
Hideki Kanie, Toyohashi, Japan, assignor to Emhart Inc., Newark, Del.

Filed Jun. 3, 1994, Ser. No. 253,871

Claims priority, application Japan, Jun. 4, 1993, 5-030024 U

Int. Cl.[6] **F16B** *19/00;37/08;39/00*

U.S. Cl. 411—107 **4 Claims**



1. A push-in fastener for releasably securing a plurality of panels, said fastener comprising:

a stud including a shank having a breakable portion at mid-section thereof, a resilient engagement section formed at one end of the shank for engaging a rear surface of the panels, a nut engagement portion having circumferential grooves formed between said end of the shank and said breakable portion, and a flange disposed between said end of the shank and said nut engagement portion; and

a nut having an axial hole to allow the shank of the stud to pass therethrough, resilient engagement pawls on the inner wall of said axial hole for resilient engagement with said nut engagement portion of said stud, and a flange-receiving surface to abut said flange of said stud; and

so that when said stud is inserted into holes in the panels with the engagement section positioned behind a rear surface thereof, and said nut is fitted on said stud with said flange-receiving surface facing the panels, said nut is adapted to be moved into engagement with said panels by pulling on said shank while pressing on said nut until said breakable portion breaks.

5,551,818

SELF-DRILLING FASTENER

Norbert Köppel, Widnau, Switzerland, assignor to SFS Industrie Holding AG, Heerbrugg, Switzerland

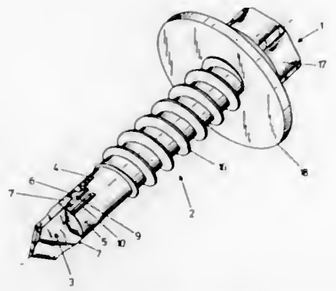
Filed Aug. 11, 1994, Ser. No. 284,624

Claims priority, application Germany, Feb. 11, 1992, 42 03 949.5

Int. Cl.[6] **F16B** *13/04;25/00*

U.S. Cl. 411—387 **7 Claims**

1. A self-drilling fastener comprising a fastener element having two jaws and a slot defined by said jaws and formed at a free end thereof and extending parallel to an axis of the fastener, and a plate-shaped drilling insert having an end inserted into the slot of the fastening element, the drilling insert being connected to the fastening element due to deformation of said jaws forming a boundary of the slot of the fastening element, the drilling insert



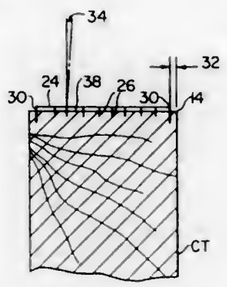
having at an end region thereof engaging the slot of the fastener element at one lateral boundary surfaces one or more groove means selected from the group consisting of notches, incisions, grooves and channels, which extend over a thickness (D) of the drilling insert and into which an edge region of a respective jaw is or edge regions of both said jaws of the fastening element are pressed with plastic deformation.

5,551,819

END PLATE FOR RAILWAY CROSSTIES, SCAFFOLDING PLANKS, AND OTHER WOOD PRODUCTS AND METHODS OF USE

E. George Stern, 328 W. Eakin St., Blacksburg, Va. 24060

Filed Dec. 29, 1994, Ser. No. 366,306
Int. Cl.[6] F16B *15/00*; **E04B** *1/00*
U.S. Cl. 411—466 **7 Claims**



1. An end plate for a wood product, said wood product having an end surface defined by a peripheral edge, said end plate comprising:

a metal plate of substantially rectangular shape and including two surfaces, an intermediate portion, first and second substantially opposed edges and third and fourth substantially opposed edges;

a plurality of elongated intermediate teeth, extending outwardly from said intermediate portion from one surface of said metal plate, for engaging said end surface of said wood product; and

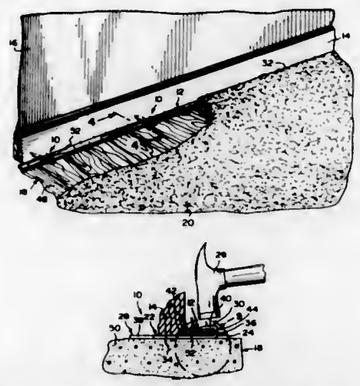
a plurality of elongated edge teeth, located along said first and second substantially opposed edges and along said third and fourth substantially opposed edges and extending outwardly from said one surface of said metal plate, for engaging said end surface of said wood product near said peripheral edge thereof.

5,551,820

SHOE HOOK SPIKE AND METHOD OF UTILIZING SAME FOR SECURING A TACKLESS STRIP AGAINST A WALL WHEN INSTALLING CARPET

Anthony W. Catalano, Jr., 86 Arch Dr., Holbrook, N.Y. 11741

Filed Oct. 6, 1994, Ser. No. 319,459
Int. Cl.[6] F16B *15/02*
U.S. Cl. 411—485 **1 Claim**



1. A shoe hook spike in combination with a tackless strip and a baseboard on a wall at a floor to secure said tackless strip against said baseboard when installing carpet comprising:

a) an elongated and integral flat shank comprising a rectangular shaped plate in cross section with smooth top and bottom extended surfaces in cross section made of a durable non-corrosive steel material;

b) means consisting of an upstanding flange bent at a first end of said elongated flat shank for receiving blows from a hammer;

c) means consisting of a pointed tip at a second end of said elongated flat shank for guiding said elongated flat shank under the baseboard on the wall; and

d) means on said blow receiving means for engaging with the tackless strip to retain the tackless strip in contact with and against the baseboard on the wall at the floor, so that an edge of the carpet can be held in place on the tackless strip, said engaging means consisting of a lip bent on an upper edge of said upstanding flange forming a hook head and overhanging said rectangular shaped plate so that said lip rests upon a top surface of the tackless strip, the lip being deformed by a blow so as to deform and engage said tackless strip thereby clamping said tackless strip between said lip and said shank.

5,551,821

WORKTABLE LOADING AND UNLOADING APPARATUS AND METHOD

Hendley W. Hall, San Pedro, Calif., assignor to Excellon Automation Co., Torrance, Calif.

Filed May 8, 1995, Ser. No. 439,658
Int. Cl.[6] B65G *47/00*
U.S. Cl. 414—18 **16 Claims**

1. A material handling assembly comprising:

a flexible tape,

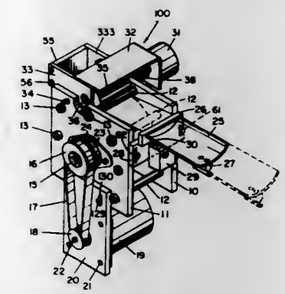
drum means for storing said tape,

drive means for driving said drum means to selectively extend and retract said tape relative to said drum means,

said drive means comprises a prime mover,

tape guide means for receiving said flexible tape and urging said flexible tape into a predetermined configuration to impart rigidity to said flexible tape when said flexible tape assumes said predetermined configuration,

positioning means engaged with said tape guide means for controlling the vertical position of said tape relative to said drum means, and



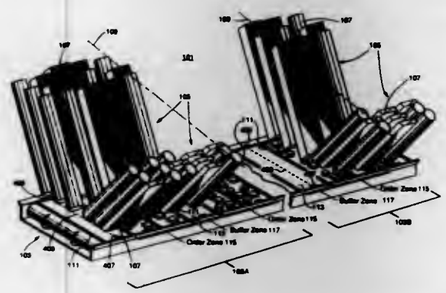
encoder means driven by said flexible tape for determining the position to which said flexible tape has been driven by said drive means relative to said drum means.

5,551,822

ORDER FILLING SYSTEM WITH CARTRIDGE DISPENSER

James M. Pippin, Keller, and Jerry D. Erwin, Dallas, both of Tex., assignors to ElectroCom Automation L.P., Arlington, Tex.

Continuation of Ser. No. 177,140, Jan. 4, 1994, abandoned, which is a division of Ser. No. 115,247, Sep. 1, 1993, Pat. No. 5,322,406, which is a continuation of Ser. No. 884,863, Apr. 16, 1992, abandoned, which is a continuation of Ser. No. 566,530, Aug. 13, 1990, abandoned. This application May 3, 1995, Ser. No. 434,830
Int. Cl.[6] G07F *11/00*; **B65G** *1/02*
U.S. Cl. 414—273 **6 Claims**



1. An automated order system for dispensing a plurality of products of different types, comprising:

a gathering conveyor having virtually defined order zones and buffer zones for conveying dispensed products for subsequent collection;

a plurality of storage means arrayed in a column by row matrix, said storage means holding products of different shapes and sizes to be selectively dispensed onto the gathering conveyor;

a plurality of means for dispensing products onto the gathering conveyor, each means for dispensing coupled to a corresponding row and column of the storage means matrix;

first means for simultaneously actuating each of the means for dispensing coupled to each of the storage means in a selected column;

second means for actuating one means for dispensing per row at a time in one or more rows of the matrix to dispense products onto the gathering conveyor from multiple rows associated with a single column; and

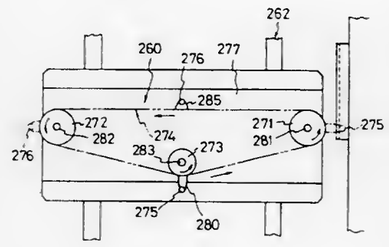
means associated with each row of the storage means matrix for verifying the dispensing of a product from the storage means matrix onto the gathering conveyor.

5,551,823

TRANSFER APPARATUS HAVING TRACTION PIN MOVED WITH HEIGHT DIFFERENCE

Asao Maruyama, Himeji, Japan, assignor to Tsubakimoto Chain Co., Osaka, Japan

Filed Aug. 12, 1994, Ser. No. 289,867
Claims priority, application Japan, Aug. 20, 1993, 5-226684; Aug. 27, 1993, 5-051174 U
Int. Cl.[6] B65G *1/04*
U.S. Cl. 414—280 **3 Claims**



1. A transfer apparatus assembled in a movable table moved along an article storage rack for transferring a tray between said article storage rack and said movable table along a transfer direction, said tray having a bottom which when said tray is supported by said apparatus defines a reference plane and which is of a certain width in a direction perpendicular to said transfer direction, said apparatus comprising:

first, second and third rotors each having a coaxial rotational shaft, said rotors being arranged along said transfer direction such that said rotational shafts of said rotors are perpendicular to said transfer direction and are inclined to said reference plan;

an endless chain or belt wound around said first, second and third rotors;

a traction pin erected on said chain or belt in such a manner as to be in parallel to said rotational shafts for engaging a portion to be engaged of said stored article; and

a pressing pin erected on said chain or belt in such a manner as to be in parallel to said rotational shafts for abutting said stored article, said traction pin and said pressing pin being arranged at diagonally opposite positions with respect to said chain or belt;

wherein said chain or belt as viewed from a plane which is parallel to said reference plane is smaller in width in a direction perpendicular to said transfer direction than said width of said bottom of said tray; and

wherein said first and second rotors are located at opposite ends of a transfer path which is traversed by said chain or belt and is on a first lateral side of said first and second rotors, said transfer path being directed in a longitudinal direction which is parallel to said transfer direction, and said third rotor is located along a return path which is traversed by said chain or belt and is on a second lateral side of said first and second rotors which is opposite from said first lateral side, said transfer path and said return path being in a plane which is inclined at an acute angle to said reference plane and said third rotor being located along said return path at a longitudinal position which is between said first and second rotors.

5,551,824

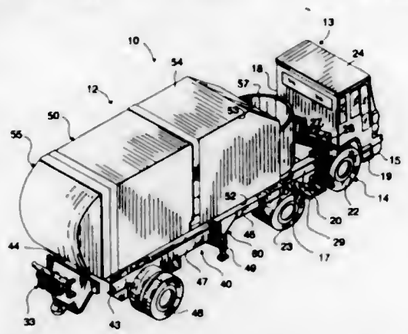
ARTICULATED REFUSE COLLECTION APPARATUS

Jerald G. Zanzig, Signal Mountain, Tenn.; Marcel G. Stragier, and John W. Pickrell, both of Scottsdale, Ariz., assignors to The Heil Company, Chattanooga, Tenn.

Division of Ser. No. 33,127, Mar. 18, 1993, abandoned. This application Jul. 7, 1994, Ser. No. 271,194

Int. Cl.[6] B65F *3/02*

U.S. Cl. 414—408 **17 Claims**



1. An articulated collection vehicle for collecting and transporting refuse comprising:

a) a collection towing vehicle including;

i) a chassis having a rearward end and a forward

ii) fifth wheel connector coupled to said chassis proximate said rearward end;

iii) a cab coupled to said chassis proximate said forward end;

iv) a refuse loading mechanism coupled to said chassis intermediate said rearward end and said forward end; and

b) a semi trailer having a king pin with a vertical axis of rotation rotatably and removably coupled to said fifth wheel connector of said towing vehicle, said refuse loading mechanism oriented to discharge refuse substantially vertically downward along an extended vertical axis of said king pin, said semi-trailer further including:

i) a chassis having a forward end, a rearward end, a frame, and rear wheels coupled proximate a rearward end of said semi-trailer frame;

ii) a refuse collection body carried by said semi-trailer chassis, said refuse collection body including:

1) storage receptacle having a forward end and a rearward end;

2) a hopper coupled to said forward end of said storage receptacle, said hopper centered over said king pin along said vertical axis of rotation so as to be centrally located over said king pin with said semi trailer at substantially any orientation with respect to said collection towing vehicle;

3) a compactor coupled to said hopper; and

4) a tailgate assembly coupled to said rearward end of said storage receptacle;

iii) refuse ejecting apparatus for ejecting refuse from said refuse collection body; and

iv) a trailer umbilical having a plurality of conduits, coupled to said frame.

5,551,825

LIVE BOTTOM SHEAR DECK REFUSE BAG OPENER

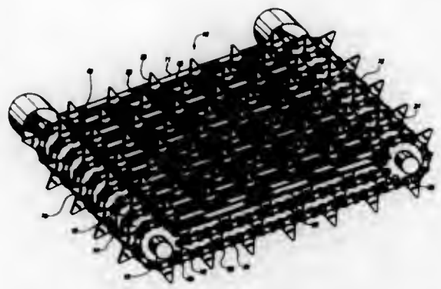
James R. Montgomery, Portland, Oreg., assignor to Beloit Technologies, Inc., Wilmington, Del.

Filed Oct. 11, 1994, Ser. No. 321,365

Int. Cl.[6] B65G *65/00*

U.S. Cl. 414—412 **16 Claims**

1. An apparatus for opening refuse bags to discharge refuse contained therein, the apparatus comprising:



a garbage bag infeed;

a deck defining an inclined plane, the deck in receiving relation to the bag infeed;

a plurality of first chain guides mounted to the deck;

a plurality of second chain guides mounted to the deck substantially parallel to the first set of chain guides and spaced between the first guides;

a plurality of first chains which move in an upward direction along the deck in the first chain guides, the first chains forming endless loops about the deck, wherein each first chain has a plurality of links and a plurality of outwardly extending blades; and

a plurality of second chains which move in a downward direction along the deck in the second chain guides, the second chains forming endless loops about the deck, wherein each second chain has a plurality of links and a plurality of outwardly extending blades; and wherein the first and second chain guides are spaced apart less than the width of a refuse bag so the blades on the first and second chains moving in the first and second guides rend a refuse bag when it is fed to the deck by the infeed.

5,551,826

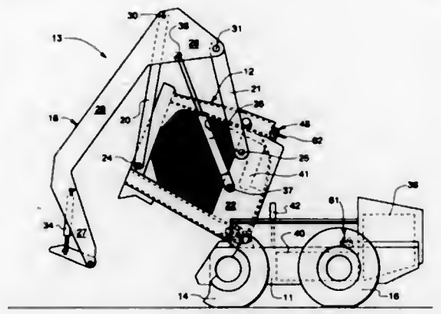
SKID STEER LOADER CAB MOUNTING APPARATUS

Robert R. Todd, Leola, and Dale A. Ashcroft, New Holland, both of Pa., assignors to New Holland North America, Inc., New Holland, Pa.

Filed Apr. 10, 1995, Ser. No. 419,475

Int. Cl.[6] E02F *3/00*

U.S. Cl. 414—685 **7 Claims**



1. In a skid steer loader comprising

a main frame including a compartment in which an engine and transmission components are contained, both of which generate high levels of noise,

a cab,

means for mounting said cab adjacent said compartment on said main frame,

said cab including load bearing side walls extending upwardly from said main frame to define an operator control area therebetween,

a boom structure mounted on said load bearing side walls,

said boom structure comprising a pair of arms and a linkage assembly for operatively coupling said pair of arms to said side walls, and

power means comprising means for operatively associating said engine with said boom structure for raising and lowering each of said pair of arms along a generally vertical path adjacent its corresponding load bearing side wall to which it is coupled, the improvement comprising

resilient support means for isolating said frame from said cab and said boom structure whereby said cab and said boom structure are isolated from said compartment to thereby interrupt the path of the noise transmitted through the frame from the engine and transmission contained in said compartment.

5,551,827

DEVICE FOR LOADING AND UNLOADING COPS IN TEXTILE WINDING APPARATUS

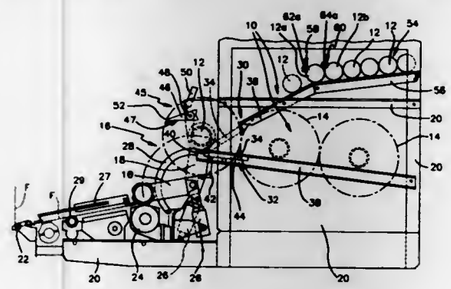
Carlo Menegatto, Milan, Italy, assignor to Menegatto S.r.l., Milan, Italy

Filed Dec. 23, 1994, Ser. No. 363,521

Claims priority, application Italy, Dec. 24, 1993, MI93A2735

Int. Cl.[6] B66F *11/00*

U.S. Cl. 414—746.1 **12 Claims**



1. Device for loading and unloading cops in a textile apparatus for winding yarn and having a cop-holder arm suitable for picking up a cop, supporting said cop during a yarn winding operation, and for transferring said cop when the operation has ended; the device comprising: a support structure including a first guide for loading empty cops to the textile apparatus towards a single zone of pick-up and transfer of said cops by said cop-holder arm and a second guide for unloading and moving away full cops loaded with yarn from the textile apparatus from said zone of pick-up and transfer by said cop-holder arm, said first guide and said second guide extending from said zone of pick-up and transfer; a mobile guide element extending from the zone of pick-up and transfer for sliding the cops, said mobile guide element including drive means for positioning said mobile guide element in a first upper position defining an extension of said first guide for loading empty cops, and in a second lower position defining a portion of said second guide, whereby loading of empty cops and unloading of full cops is achieved by gravity; and means for stopping and positioning said empty cops sliding on the first guide in a suitable position for pick-up by said cop-holder arm at said zone of pick-up and transfer of the cops.

5,551,828

CONTAINER MOVER AND METHOD OF MOVING A CONTAINER

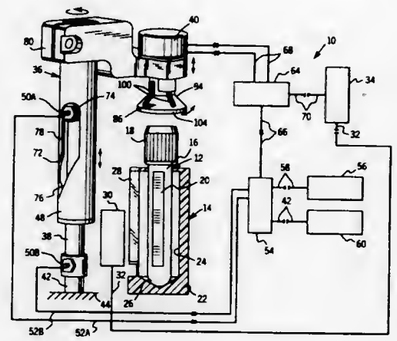
Kenneth E. Iles, Los Altos, Calif., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Oct. 27, 1994, Ser. No. 330,281

Int. Cl.[6] G01N *35/02*

U.S. Cl. 414—757 **20 Claims**

1. A mover for moving a container comprising:



(a) a prime mover;

(b) a container engaging element operatively connected with the prime mover such that the container engaging element moves responsive to the prime mover to move the container, the container engaging element substantially surrounding a portion of the container when the container engaging element is moving the container, wherein the container engaging element has a fixed lower surface which contacts the container when the container engaging element is moving the container, the lower surface having a first portion dimensioned to engage a container of a first size and a second portion, disposed above the first portion, dimensioned to engage a container of a second size; and

(c) a driver operatively connected with the container engaging element for moving the container engaging element between a first position where the container engaging element engages the container and a second position where the container engaging element is offset from the container.

5,551,829

NOTCH FINDER HAVING A FLEXIBLE ALIGNMENT ROD

Mark J. Jerolimov, Cupertino, and Quincy D. Allison, Boulder Creek, both of Calif., assignors to H-Square Corporation, Sunnyvale, Calif.

Filed Oct. 11, 1995, Ser. No. 540,959

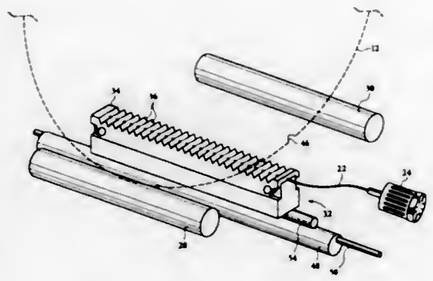
Int. Cl.[6] B65G *47/24*

U.S. Cl. 414—757 **17 Claims**

1. An orientation apparatus for achieving a desired position of a disk-shaped member having an indexing notch comprising:

a flexible alignment rod;

displaceable means for supporting said flexible alignment rod, said displaceable means having an operation position and a retracted position, said flexible alignment rod having an intermediate portion coupled to said displaceable means and having a first end that is stationary such that said flexible alignment rod is caused to flex when said displaceable means is moved between said operation position and said retracted position; and



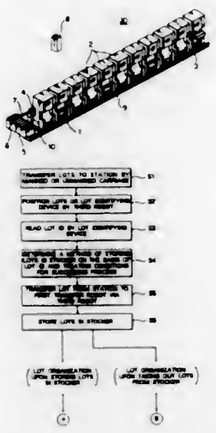
means for supporting said disk-shaped member in spaced relation from said flexible alignment rod when said displaceable means is in said retracted position.

5,551,830

AUTOMATIC LOT ORGANIZATION METHOD

Hiroshi Watanabe, and Hiroaki Hasegawa, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1994, Ser. No. 267,360
Claims priority, application Japan, Jun. 30, 1993, 5-162832
Int. Cl.[6] B65G 1/00
U.S. Cl. 414—786 3 Claims



1. In a system for manufacturing articles through a series of sequential processes, wherein at least two successive ones of the processes differ from each other with respect to a number of lots of multiple ones of the articles which can be treated on a batch basis in the at least two processes, a method for automatically organizing the lots upon transferring the lots from a preceding one of the processes to a succeeding process, comprising the steps of:

receiving the lots transferred from the preceding process;

reading identification information from individual ones of the lots and transmitting the information to a control unit, the control unit storing lot organization information;

storing the individual ones of the lots in a stocker;

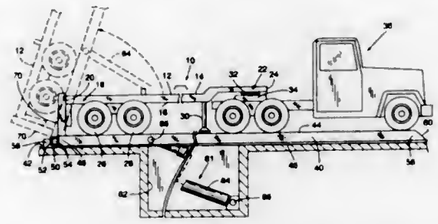
organizing the individual ones of the lots by grouping the individual ones of the lots in sets for successive processing according to the identification information read from the lots and the lot organization information stored in the control unit.

5,551,831

METHOD AND APPARATUS FOR ELEVATING A CARGO CONTAINER CHASS IS FOR STORAGE

Nelson H. Corbett, Portland, Oreg., assignor to Chassis Systems, Inc., Portland, Oreg.

Filed Mar. 29, 1995, Ser. No. 412,543
Int. Cl.[6] B65G 57/08
U.S. Cl. 414—786 29 Claims



1. A method of storing a cargo container chassis, comprising the steps of:

providing a lifting platform that pivots around a hinged axis, wherein the lifting platform has an upper surface and a lower surface;

positioning the chassis on the upper surface of the lifting platform; and

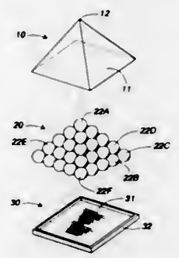
rotating the lifting platform around the hinged axis, to tilt the lifting platform and raise the chassis to an elevated position in which the chassis is transferred to a transport vehicle, and the lifting platform is not carried by the transport vehicle.

5,551,832

METHOD AND APPARATUS FOR STACKING GOLF BALLS

Gregory J. Kelly, 1900D Riverwood La., Roswell, Ga. 30075

Filed Aug. 14, 1995, Ser. No. 514,823
Int. Cl.[6] B65B 35/50; A47F 7/00
U.S. Cl. 414—788 7 Claims



1. A method for stacking golf balls, comprising the steps of:

a) placing a plurality of golf balls into an upwardly-directed interior cavity of a stack forming member such that a first golf ball is above a second golf ball and placing a base member atop said stack forming member;

b) inverting said stack forming member and said base member along with said plurality of said golf balls such that said cavity of said stack forming member is directed downwardly and said first golf ball is below said second golf ball and contacts said member; and

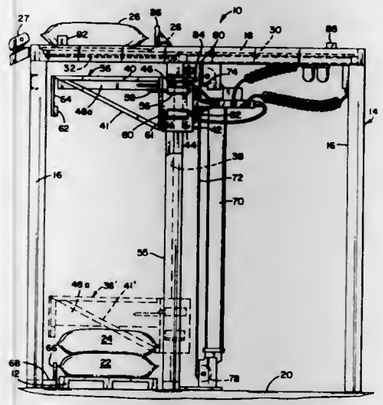
c) removing said stack forming member such that said first golf ball is below and at least partially supports said second golf ball and said first golf ball is at least partially contained by said base member.

5,551,833

APPARATUS FOR STACKING BAGS OF A PALLET

Julian Marsh, 3171 Watterson Trail, Jeffersontown, Ky. 40299

Filed Dec. 15, 1994, Ser. No. 356,500
Int. Cl.[6] B65G 57/06; B65H 29/34
U.S. Cl. 414—793.4 34 Claims



1. An apparatus for stacking a column of bags on a pallet, comprising:

a) a frame having a slidable plate mounted at a horizontal upper end of said frame for supporting a bag when said slidable plate is in an extended position, a stationary fence positioned near said slidable plate on a side opposite said slidable plate's extended position and a track attached to said frame for directing vertical movement and positioning of a carriage assembly beneath said slidable plate;

said carriage assembly further comprising downwardly opening panels for supporting the bag being transported downwardly from near said slidable plate toward the column of bags, means for closing said carriage assembly panels and a first sensor for detecting an uppermost column surface thereby opening the carriage assembly panels and reversing the vertical movement of said carriage assembly after the bag has been deposited on the column;

b) means for vertically moving said carriage assembly; and

c) means for retracting and extending said slidable plate.

5,551,834

PRESSURE ROLLER MECHANISM FOR STACKING APPARATUS

Brian S. Thompson, Derby; Joseph H. Marzullo, Brookfield, and Irena Makarchuk, Fairfield, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

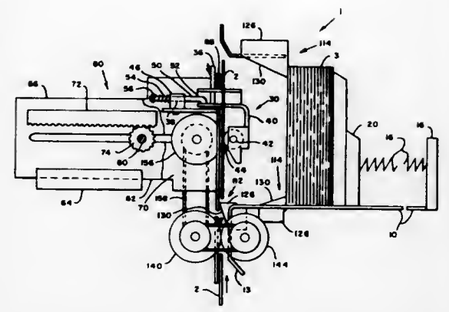
Filed Aug. 2, 1995, Ser. No. 510,208
Int. Cl.[6] B65G 47/04
U.S. Cl. 414—798.7 5 Claims

1. A normal force roller apparatus for use in an envelope stacker having a horizontal deck for supporting a stack of envelopes on edge; a vertical rear wall mounted at a first end of the deck; a transport means located at a second end of the deck for feeding an envelope into the stacker; a pusher wall repositionable along the deck for receiving the envelope at the second end of the deck and pushing the envelope toward the rear wall; and means for repositioning the pusher wall back and forth along the deck; the normal force roller apparatus comprising:

a frame;

a roller; and

means for pivotally mounting the roller to the frame to pivot between a first position resulting when the pusher wall is positioned at the second end of the deck wherein the roller is in operative engagement with the transport means to form a nip therebetween and a second position wherein the roller is disengaged from the transport means.

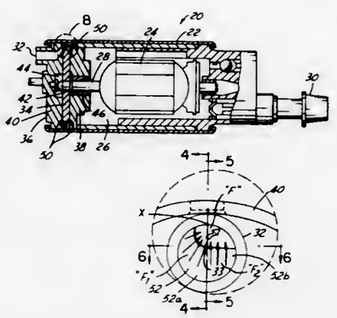


5,551,835

AUTOMOTIVE FUEL PUMP HOUSING

Dequan Yu, Ann Arbor, and Harold L. Castle, Dexter, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 1, 1995, Ser. No. 566,210
Int. Cl.[6] F04D 9/00
U.S. Cl. 415—55.1 20 Claims



1. A fuel pump for supplying fuel from a fuel tank to an automotive engine, comprising:

a pump casing;

a motor mounted within said casing and having a shaft extending therefrom;

a rotary pumping element slidingly engaged onto said shaft and having a plurality of vanes around an inner circumference, said inner circumference defining a rotary pumping element inner radius; and

a pump housing mounted within said pump casing and encasing said rotary pumping element therein, said pump housing comprising:

a cover having an inlet port with an axis and an annular cover channel in fluid communication with said inlet port, said inlet port comprising a directional control surface defined by an inclined frustoconical portion and an inclined planar portion conjoined therewith and laterally extending therefrom such that fuel flowing over said inclined frustoconical portion accelerates primarily radially and combines with fuel flowing primarily axially over said inclined planar portion, whereby the combined flow is smoothly directed to said annular cover channel; and,

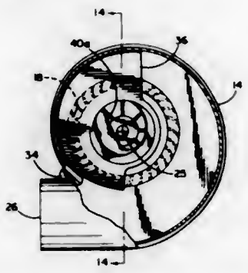
a bottom having an annular bottom channel in fluid communication with said annular cover channel and a fuel outlet port in fluid communication with said annular bottom channel.

5,551,836

HIGH PRESSURE COMBUSTION BLOWER ASSEMBLY

James E. Roth, St. Charles, Ill., and Louis H. Zimmermann, Elgin, Ill., assignors to Revcor, Inc., Carpentersville, Ill.

Filed Jan. 27, 1995, Ser. No. 379,356
Int. Cl.[6] F04D 29/44
U.S. Cl. 415—204 18 Claims



1. A high pressure blower assembly comprising:

a scroll-shaped blower housing including an inlet located about a housing axis, an outlet oriented tangentially from the housing axis, a cut-off point disposed proximate the outlet, and a generally spiral shaped sidewall defining an interior of the housing;

an impeller wheel disposed within the housing, coupled to a drive aligned with the housing axis, and including an inner periphery portion; and

a baffle piece including a first segment having a first surface defined by an end and a pair of sides and extending from the inlet toward the inner periphery of the impeller wheel, a second baffle segment having a first end, a second end, and an apex region disposed proximate the cut-off point of the housing that controls the amount of fluid recirculated through the housing, the second baffle segment including at least one gradually contoured surface joining the first end with the apex region disposed to direct recirculated fluid therealong, and a third segment having a curvature approximating the inner periphery of the impeller wheel, the third segment joining the first and second ends of the second baffle segment, and together with the first and second baffle segments, defining an opening to receive pressurized fluid from the inlet and pass the pressurized fluid to the impeller wheel.

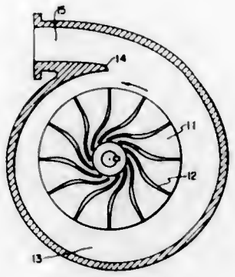
5,551,837

APPARATUS FOR REGULATING THE TRANSPORT FLOW OF A LIQUID THAT IS CIRCULATED BY A CENTRIFUGAL PUMP IN A CLOSED PIPE SYSTEM

Peter Hergt, Ludwigshafen, Germany, assignor to KSB Aktiengesellschaft, Frankenthal, Germany

PCT No. PCT/EP92/02978, § 371 Date Jul. 18, 1994, § 102(e) Date Jul. 18, 1994, PCT Pub. No. WO93/14450, PCT Pub. Date Jul. 22, 1993
PCT Filed Dec. 21, 1992, Ser. No. 256,656
Claims priority, application Germany, Jan. 17, 1992, 42 01 100.0
Int. Cl.[6] G05D 7/01; F04D 15/00
U.S. Cl. 415—206 9 Claims

1. An apparatus for regulating the transport flow of a liquid that is circulated in a closed pipe system by a centrifugal pump to regulate the circulation of water in a heating system comprising a centrifugal pump having a pump characteristic curve that falls in the direction toward zero transport flow from a design point.

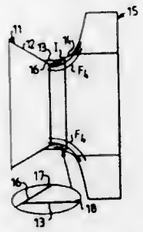


5,551,838

INLET BELL FOR CENTRIFUGAL FANS

Jean-Paul Hugbart, Rully, France, assignor to ABB Flakt AB, Stockholm, Sweden

PCT No. PCT/SE93/00772, § 371 Date Mar. 29, 1995, § 102(e) Date Mar. 29, 1995, PCT Pub. No. WO94/08144, PCT Pub. Date Apr. 14, 1994
PCT Filed Sep. 24, 1993, Ser. No. 406,975
Claims priority, application Sweden, Oct. 1, 1992, 9202850
Int. Cl.[6] F04D 29/44
U.S. Cl. 415—206 20 Claims



1. Inlet bell for a centrifugal fan, the centrifugal fan having an impeller with a cover plate, the inlet bell having an inlet end and an outlet end, the outlet end opening into the cover plate of the centrifugal fan, the outlet end and the cover plate defining a gap for recirculation air, the inlet bell comprising:

a conical inlet part having an inlet end and an outlet end, the inlet part being inwardly tapered toward the outlet end of the inlet part; and

a mouthpiece having an inlet end and an outlet end, the mouthpiece being connected, at its inlet end, to the outlet end of the inlet part, the outlet end of the inlet part being partly inserted into inlet end of the mouthpiece to define a circular lip, the lip being disposed at an intersection between the inlet part and the mouthpiece.

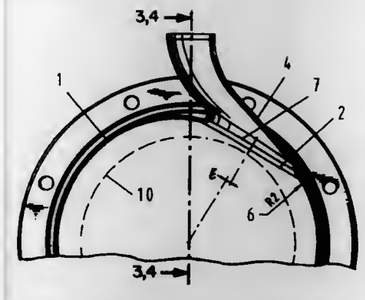
5,551,839

PUMP HOUSING FOR ROTARY PUMPS

Oliver Schuster, Bobstadt; Axel Riel, and Kurt Seitz, both of Frankenthal, all of, Germany, assignors to KSB Aktiengesellschaft, Frankenthal, Germany

PCT No. PCT/EP93/00992, § 371 Date Oct. 28, 1994, § 102(e) Date Oct. 28, 1994, PCT Pub. No. WO93/22564, PCT Pub. Date Nov. 11, 1993
PCT Filed Apr. 24, 1993, Ser. No. 331,526
Claims priority, application Germany, Apr. 29, 1992, 42 14 026.9
Int. Cl.[6] F04D 29/44
U.S. Cl. 415—212.1 8 Claims

1. A pump housing having a circumference, a flow chamber and a separately-formed pipe disposed on the housing circumference,



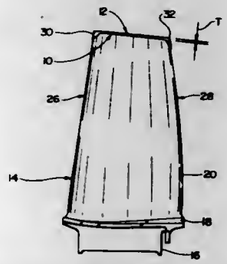
the pipe being connected to an opening located on the outer housing circumference, wherein a flattened part (2) is provided on the housing circumference, the flattened part narrows the flow chamber delimited by the pump housing in the direction of the pump axis, the opening for connection of the pipe is mounted on the flattened part which has a two-dimensional flattened surface cross-section.

5,551,840

ABRASIVE BLADE TIP

Roland Benoit, Lake Park; Eugene M. Beverly, Palm Beach Gardens; Charles M. Love, Jupiter, and Gregory J. Mack, Palm Beach Gardens, all of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 164,048, Dec. 8, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 483,644
Int. Cl.[6] B63H 7/02
U.S. Cl. 416—241 B 11 Claims



1. A gas turbine engine blade having a convex surface, a concave surface, a leading edge, a trailing edge and a tip surface, said blade comprising an abrasive layer encompassing portions of the convex surface and the concave surface at corners where the tip surface intersects the leading edge and the trailing edge of the blade.

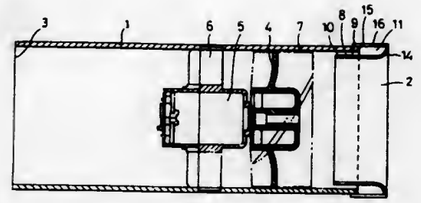
5,551,841

AXIAL-FLOW FAN

Kenji Kamada, Kadoma, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Jun. 20, 1995, Ser. No. 492,522
Claims priority, application Japan, Jun. 27, 1994, 6-145160
Int. Cl.[6] F04D 29/54
U.S. Cl. 417—89 8 Claims

1. An axial-flow fan comprising a cylindrical casing having an inlet port at an upstream end thereof, and an outlet port at a downstream end thereof; a motor disposed within the casing; stabilizer fins connecting the motor to an inner periphery of the casing; generally radially extending vanes mounted to the motor to be rotated thereby about an axis coinciding with a longitudinal axis of the casing; an inside wall member disposed within the casing upstream of the vanes and situated coaxially with respect to the casing at a radial inward spacing from the inner periphery of the casing to form therewith an annular flow path; the annular flow path having a generally radially outwardly facing inlet opening, and a generally axially facing outlet opening lying in a plane disposed substantially perpendicular to the longitudinal axis; a first radial distance between the inner periphery of the casing and radially outer edges of the vanes being no greater than a second radial distance between the inner periphery of the casing and the inside wall member; rotation of the vanes producing a main air flow from the inlet port to the outlet port of the casing, and a peripheral air flow from the inlet opening to the outlet opening of the annular path for opposing the creation of a leakage swirl and accompanying noise around the outer edges of the vanes.

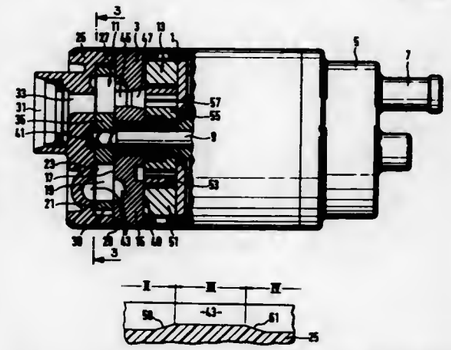


5,551,842

UNIT FOR DELIVERING FUEL FROM A SUPPLY TANK TO THE INTERNAL COMBUSTION ENGINE OF A MOTOR VEHICLE

Werner Schmid, Tamm, and Manfred Treter, Moeglingen, both of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 5, 1994, Ser. No. 318,394
Claims priority, application Germany, Oct. 22, 1993, 43 36 090.4
Int. Cl.[6] F04B 23/14
U.S. Cl. 417—203 8 Claims



1. A device for delivering fuel from a supply tank to an internal combustion engine of a motor vehicle, comprising a pump chamber, a revolving impeller (21), which is driven to rotate in said pump chamber (19) by an electric drive motor, said impeller has a disk-shaped hub part (35) disposed on a rotor shaft (9) of the drive motor, a plurality of blades (37) which extend radially outward to outer ends are disposed on a circumference of said disk-shaped hub, at least one partially ring-shaped supply conduit (43) which has a semicircular cross section and which is disposed in chamber walls (17 and 23) which define face ends of the pump chamber (19), in a region of the outer ends of the blades of the impeller

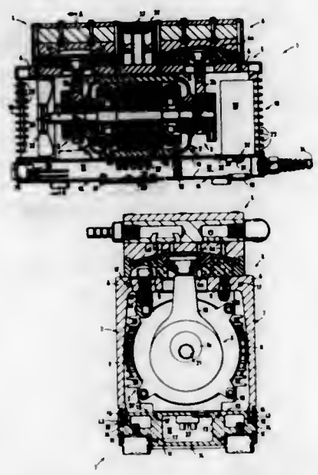
(21), said supply conduit (43) extends around the rotational axis of the impeller (21) and leads from an inlet opening (33) for the fuel to be fed into the pump chamber (19) to an outlet opening (45) for fuel from the pump chamber (19) which has been raised to delivery pressure, the supply conduit (43) has a cross sectionally reduced region (III) between the inlet opening (33) and the outlet opening (45), which is defined by adjoining regions (II, IV) of the supply conduit (43), each of which have a greater cross section than the cross sectionally reduced region (III).

5,551,843

PUMP WITH A DRIVING MOTOR AND A CASE

Erwin Hauser, Emmendingen-Kollmarsreute, Germany, assignor to KNF Neuberger GmbH, Freiburg-Munzingen, Germany

Filed Oct. 31, 1994, Ser. No. 332,001
Claims priority, application Germany, Nov. 9, 1993, 9317083 U
Int. Cl.[6] F04B *21/00*
U.S. Cl. 417—234 **18 Claims**



1. A pump comprising a driving motor, at least one pump head, at least one drive for transferring pump movement from the driving motor to a pump head, and a case (5) essentially formed as at least one extrusion (6) configured to accommodate therein said at least one drive (3) and the driving motor (2), said case carrying the driving motor (2) and said at least one drive (3) therein, and the pump head (4) being mounted on the case, the extrusion 16) having an approximately U-shaded cross section with U-limbs (8) and a U-crosspiece (9), the at least one pump head (4) and the driving motor (2) being mounted on the U-crosspiece (9) of the extrusion (6).

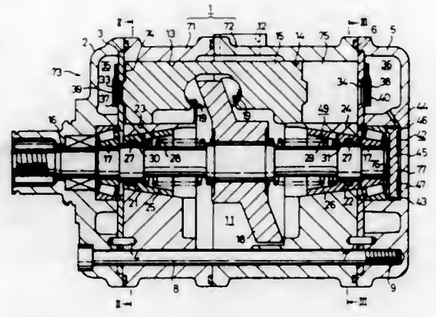
5,551,844

RECIPROCATING COMPRESSOR WITH DOUBLE HEADED PISTONS

Toshiro Fujii; Yuichi Kato; Kazuaki Iwama, and Katsuya Ohyama, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Jul. 3, 1995, Ser. No. 498,026
Claims priority, application Japan, Jul. 4, 1994, 6-152362
Int. Cl.[6] F04B *49/00*
U.S. Cl. 417—269 **8 Claims**

1. A reciprocating compressor comprising:



a housing having an axis, a front and a rear cylinder block having a plurality of pairs of cylinder bores arranged around the axis with each pair including coaxially extending front and rear cylinder bores, a crank chamber formed between said front and rear cylinder blocks, and a tapered valve chamber formed in the cylinder blocks on either side of the crank chamber along the axis, the tapered valve chambers having conical inner surfaces with larger and smaller diameter ends;

double headed pistons arranged in the respective pairs of cylinder bores to form compression chambers at either head of the pistons;

a drive shaft inserted in the crank chamber and the valve chambers and rotatably supported by the housing;

a cam plate arranged in the crank chamber and fixed to the drive shaft to engage with the pistons for reciprocatingly moving the pistons;

a pair of tapered rotary valves arranged in the valve chambers and supported by the drive shaft so that each rotary valve can rotate with the drive shaft and can move axially relative to the drive shaft, the rotary valves having conical outer surfaces to make surface-contact with the conical inner surfaces of the valve chambers;

the rotary valves having suction passages for introducing a coolant gas into the compression chambers during suction strokes;

first urging means for urging each of the rotary valves into contact with the conical inner surface of the associated valve chamber;

second urging means for urging the drive shaft in an axially predetermined direction; and

means for controlling the movements of the rotary valves away from the valve chambers caused by a pressure in the compression chambers when the pressure in the compression chambers becomes higher than the compression pressure during normal operation of the compressor so that a compression reaction force acting on the drive shaft via the pistons and the cam plate occurs in said axially predetermined direction.

5,551,845

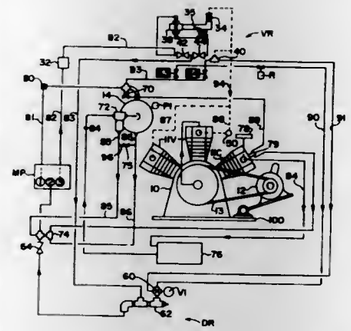
MEDICAL AIR VACUUM

David N. Milam, 214 Chimney Hill, West Monroe, La. 71291

Filed Jan. 10, 1995, Ser. No. 370,687
Int. Cl.[6] F04B *49/00*
U.S. Cl. 417—290 **14 Claims**

1. An apparatus for supplying vacuum and compressed air utilities for dental and medical applications, comprising:

a reciprocating piston device having at least two cylinders, one of the cylinders creating a vacuum in an intake line and another of the cylinders producing compressed air in an exhaust line, the vacuum being used to cause air at a pressure below atmospheric to flow through the intake line carrying with it water vapor and effluent from a patient;



means carried by said device for separating the effluent and water vapor from the air in the intake line before the air reaches said device;

means carried by said device for regulating the pressure level of the air in the intake line below atmospheric pressure;

means communicating with said separating means for draining the effluent and water vapor separated from the air in the intake line; and

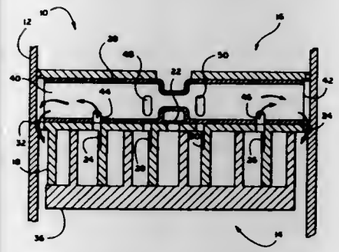
means for receiving the compressed air from said device.

5,551,846

SCROLL COMPRESSOR CAPACITY CONTROL VALVE

Roderick D. Taylor, Dearborn, and Brian R. Kelm, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 1, 1995, Ser. No. 566,202
Int. Cl.[6] E04C *18/02*
U.S. Cl. 417—308 **11 Claims**



1. A scroll compressor having a fluid capacity and a compression cycle, comprising:

a housing;

a fixed scroll mounted in said housing and having a central discharge port and a first pair of bypass ports, said pair of bypass ports being located at thermodynamically symmetrical points in said compression cycle relative to said discharge port;

a moving scroll mounted in said housing and intermeshed with said fixed scroll to trap a fluid between said fixed and moving scrolls; and

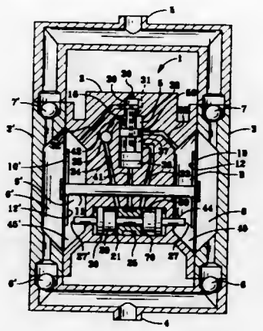
a rotatable, hollow, cylindrical control valve having a valve wall with a first pair of slots therein controllably alignable with said pair of bypass ports to vent said trapped fluid and modulate said fluid capacity of said scroll compressor.

5,551,847

LOST MOTION PILOT VALVE FOR DIAPHRAGM PUMP

Richard K. Gardner, Montpelier, and Robert J. Knecht, Edgerton, both of Ohio, assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Apr. 24, 1995, Ser. No. 427,542
Int. Cl.[6] F04B *35/02*
U.S. Cl. 417—393 **2 Claims**



1. A pilot valve for a diaphragm pump comprising:

a mechanical shift spool valve shiftable in response to diaphragm position, and

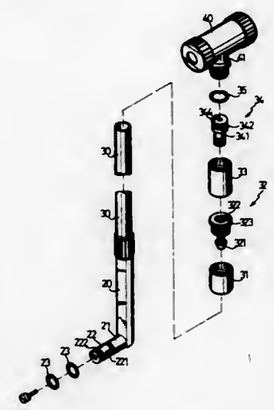
lost motion means operatively associated with said pilot valve for delaying or retaining a pilot signal initiated by said diaphragm position.

5,551,848

ATTACHMENT MECHANISM FOR PORTABLE HAND PUMP

Louis Chuang, No. 7th Floor-8, No. 20, Ta Lou Road, Taichung, and Scott Wu, No. 2, Lane 296, Ming Sheng Road, Wu Feng, Hsiang, Taichung, both of, Taiwan

Filed Aug. 14, 1995, Ser. No. 514,802
Int. Cl.[6] F04B *53/00*
U.S. Cl. 417—437 **1 Claim**



1. A portable hand pump comprising:

a housing including a bottom portion having a hole laterally formed therein,

a tube including an extension rotatably engaged in said hole of said housing, said extension including a bore formed therein including an opening formed therein for communicating said bore with said hole of said housing,

means securing said extension to said housing so as to allow said extension to rotate relative to said housing,

a hose including a lower portion secured to said tube and including an upper portion,

an attachment member secured to said upper portion of said hose,

a lock member secured to said upper portion of said hose add including an inner thread formed therein,

a connector including an annular slot formed therein for engaging with a sealing ring and including a lower portion threadly engaging with said inner thread of said lock member, and

a barrel rotatably engaged on said connector and including an upper portion having an inner thread formed therein and including a lower portion having an annular rib extended radially inward therefrom for engaging with said connector so as to prevent said barrel from disengaging from said connector, said attachment member including an outer thread for engaging with said inner thread of said barrel so as to be secured to said barrel, said barrel being rotatable relative to said connector so as to allow said attachment member to rotate relative to said connector, and said extension being rotatable relative to said housing so as to allow said hose and said attachment member to rotate about said extension.

5,551,849

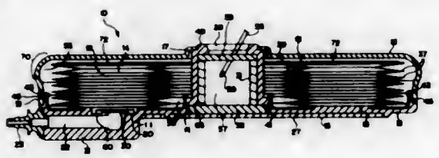
MEDICATION DELIVERY DEVICE AND METHOD OF CONSTRUCTION

Chris C. Christiansen, Oakdale, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 29, 1994, Ser. No. 235,436

Int. Cl.[6] F04B *45/033;* **A61M** *5/152*

U.S. Cl. 417—472 **9 Claims**



1. A medication delivery device comprising:

a housing,

a reservoir within said housing, said reservoir having peripheral pleated side portions bounded by an end terminal and an opposing surface portion, said reservoir being movable from an expanded position to a compressed position, said end terminal having a surface portion which is indented in the direction of said opposing surface portion such that when said reservoir is in the compressed position there is substantially no separation between said indented surface portion and said opposing surface portion, said indented surface lying generally between said pleated side portions such that when said reservoir is in the compressed position nearly all of the fluid medication in the reservoir is evacuated by said indented surface,

a reservoir refill port in fluid communication with said reservoir,

an outlet port, means connected between said reservoir and said outlet port for dispensing medication from said reservoir through said outlet port.

5,551,850

PUMP CHAMBER AND VALVE ASSEMBLY

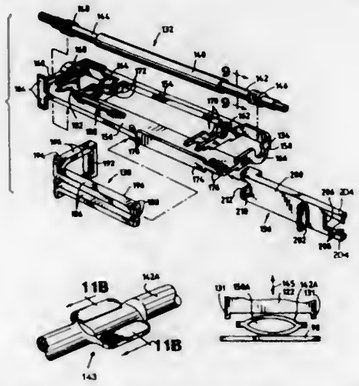
Mark E. Williamson, Wonder Lake; Jerry W. Newbrough, Zion, both of Ill.; Robert L. Anderson, Boulder, Colo.; Jeffrey P. Castleberry, Boulder, Colo.; Warren P. Heim, Boulder, Colo., and Steve W. Stracener, Frederick, Colo., assignors to Baxter International Inc., Deerfield, Ill.

Division of Ser. No. 289,518, Mar. 9, 1994, Pat. No. 5,482,446.

This application May 11, 1995, Ser. No. 439,316

Int. Cl.[6] F04B *43/12*

U.S. Cl. 417—474 **9 Claims**



1. In a peristaltic infusion pump having a housing defining a pump chamber cassette, the pump chamber cassette including a pump chamber assembly having a lumen, the housing further containing a pump driving mechanism including at least an inlet and an outlet pincher valve, means for maintaining the pump chamber cassette in an operative position relative to the pump driving mechanism and means for actuating the pump driving mechanism pincher valves to constrict the lumen of the pump chamber at spaced points along the pump chamber assembly by compressing the pump chamber assembly against a platen to propel liquid through the pump chamber assembly, an improved pump chamber cassette comprising:

a pump chamber assembly comprising an elastomeric tube having an inlet valve portion and an outlet valve portion made of a first material and a tubular chamber portion disposed therebetween, the chamber portion being made of a second material, there being a lumen through the inlet and outlet valve portions and the chamber portion, the first material having a durometer less than a durometer of the second material, one of the valve portions and the chamber portion having a football-shaped cross section;

a rigid frame; and

means for attaching the elastomeric tube to the frame, the attaching means maintaining the elastomeric tube between the valve pinchers and the platen with the minor axis of the football-shaped cross-section aligned parallel to the direction of the movement between the valve pinchers and the platen with the cassette received in the operative position within a cassette receptacle.

5,551,851

SCROLL COMPRESSOR CONSTRUCTION AND METHOD OF ASSEMBLY

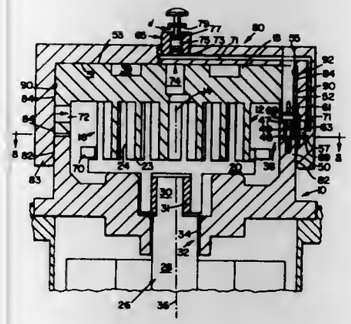
John R. Williams; Scott A. Schultz, both of Bristol, and Terry L. Lyons, Blountville, all of Tenn., assignors to Bristol Compressors, Inc., Bristol, Va.

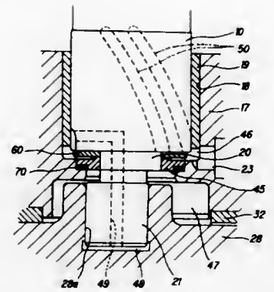
Filed Feb. 3, 1995, Ser. No. 385,996

Int. Cl.[6] F04C *18/04*

U.S. Cl. 418—55.1 **20 Claims**

1. A scroll compressor comprising housing means containing a non-orbiting, axially movable scroll means having a center axis,





and an orbiting scroll means also having a center axis, each said scroll means having a base means and a wrap extending axially outwardly therefrom, said wraps being in nested association and said axes being spaced in operative relationship, crankshaft means having an axial section and an eccentric section, said eccentric section being rotatably mounted on said orbiting scroll means for orbiting the same about its center axis and thereby generating a pressure continuum between said scrolls, main bearing means within and formed on said housing means and having a bore whose axis defines the longitudinal axis of said compressor, said axial section of said crankshaft being mounted for rotation in said bore, alignment means fixing the radial and angular positions of said non-orbiting scroll means on said housing means with its center axis and said longitudinal axis in alignment and providing a predetermined force to said non-orbiting scroll means for resisting any tendency for axial separation movement thereof caused by pressures developed in said pressure continuum, said alignment means having a plurality of pairs of cooperating, scroll positioning first and second components, support means on each of said housing means and non-orbiting scroll means, said pairs being angularly spaced about said longitudinal axis, one component of each said pair being mounted or formed on said support means on said housing means and the other component of each said pair being mounted or formed on said support means on said non-orbiting scroll means, adjustment means on one component of at least one said pair rendering that component at least radially, position adjustable with respect to the other component of its pair, and hold-down means locking each said position adjustable component to its support means in an immovable position, said alignment means, during compressor operation, allowing axial compliance, separating movement of said non-orbiting scroll means only in response to predetermined pressures developed in said pressure continuum.

5,551,852

SCROLL TYPE COMPRESSOR HAVING A SEAL BEARING UNIT

Susumu Saito; Nobukazu Takagi; Kiyohiro Harada; Yukio Kazahaya; Seiji Kuchiki; Masakuni Ishikawa, and Nobuyuki Nakajima, all of Konan, Japan, assignors to Zexel Corporation, Tokyo, Japan

Filed Jul. 21, 1995, Ser. No. 505,641

Claims priority, application Japan, Jul. 29, 1994, 6-197753

Int. Cl.[6] F01C *21/04;1/04*

U.S. Cl. 418—98 **18 Claims**

1. A scroll type compressor comprising:

a sealed case having a high pressure space;

a block having a through hole and being secured in said sealed case;

a main bearing positioned in said through hole of said block;

a drive unit mounted in said sealed case and having a rotary drive shaft which is rotatably mounted in said main bearing;

an orbiting shaft connected to and extending eccentrically from a lower end of said drive shaft;

an orbiting scroll member having an orbiting bearing in which said orbiting shaft is inserted, said orbiting bearing and said orbiting shaft defining a bearing space, and a lower surface of said block and said orbiting scroll member defining an orbiting space;

a fixed scroll member secured to said block and being operably engaged with said orbiting scroll member;

a lubricating oil reservoir defined by an upper portion of said block and an interior surface of said sealed case, said reservoir being located within said high pressure space;

an oil space defined between said block and a lower end of said main bearing and being in communication with said lubricating oil reservoir;

at least one spiral groove formed in an external surface of said drive shaft at an axial location thereof corresponding to said main bearing, and having a first end and a second end, wherein said first end is in fluid communication with said oil space and said second end is in communication with said high pressure space;

an oil induction hole fluidically communicating between said oil space and said bearing space; and

a seal bearing unit, mounted between said lower end of said drive shaft and said block, isolating said oil space from said orbiting space,

wherein said seal bearing unit includes:

a seal bearing,

a circular seal washer positioned between said seal bearing and said lower end of said drive shaft, and

a seal member positioned between said seal bearing and said block.

5,551,853

AXIAL VANE ROTARY DEVICE AND SEALING SYSTEM THEREFOR

Brian W. Cherry, Richmond, Canada; James E. Smith, Morgantown, W. Va.; Victor E. Mucino, Morgantown, W. Va.; Nigel N. Clark, Morgantown, W. Va.; Gregory Thompson, Morgantown, W. Va., and Patrick R. Badgley, Columbus, Ind., assignors to Regi U.S., Inc., Richmond, Canada

Continuation of Ser. No. 208,723, Feb. 25, 1994, Pat. No. 5,429,084. This application May 26, 1995, Ser. No. 451,393

Int. Cl.[6] F01L *19/10;1/00*

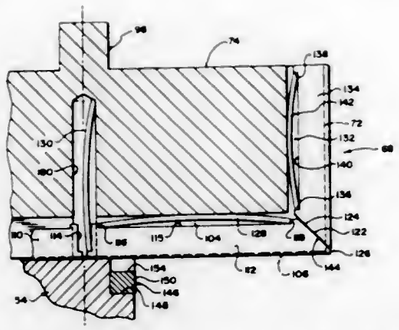
U.S. Cl. 418—148 **12 Claims**

1. An axial vane rotary device comprising:

a) a stator with a cylindrical internal chamber defined by an annular outer wall and two side walls of the stator, each said side wall having an annular cam surface;

b) a rotor rotatably mounted within the chamber, the rotor having an annular outer wall and a plurality of angularly spaced-apart, axial slots extending therethrough; a vane slidably received in each said slot, each said vane having an outer edge, an inner edge and side edges, the side edges slidably engaging the cam surfaces;

c) alternating first portions and second portions on the cam surfaces, the second portions being further from the rotor than



the first portions, the first portions of one said cam surface being aligned with the second portions of another said cam surface; and

d) means for reciprocating the vanes independently of the cam surfaces including a guide cam on the outer wall of the stator and a follower on each said vane received by the guide cam, the guide cam being a groove in the annular outer wall of the stator, the follower including a cylindrical pin on the outer edge of each said vane, the follower including a member rotatably received on the pin, the member being elongated in a direction parallel to the groove.

5,551,854

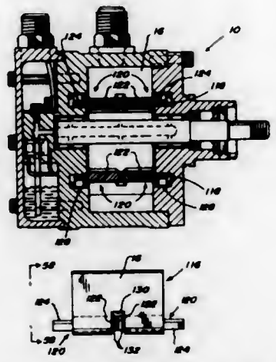
NON-CONTACT VANE-TYPE FLUID DISPLACEMENT MACHINE WITH CONSILIDATED VANE GUIDE ASSEMBLY

Thomas C. Edwards, 1426 Gleneagles Way, Rockledge, Fla. 32955

Continuation of Ser. No. 268,083, Jun. 28, 1994, abandoned. This application Nov. 13, 1995, Ser. No. 556,669

Int. Cl.[6] F04C *18/00*

U.S. Cl. 418—265 **1 Claim**



1. A non-contact vane type fluid displacement machine, comprising:

(a) a stator housing having an annular interior wall surface defining an interior bore having a longitudinal axis and a pair of opposing flat interior wall surfaces extending in transverse relation to said annular interior wall surface and said longitudinal axis and closing opposite ends of said interior bore;

(b) a rotor supported in said interior bore of said stator housing between said opposing flat interior wall surfaces thereof and in an eccentric position relative to said annular interior wall surface thereof to undergo rotation relative to said stator housing about a central rotational axis laterally offset from said longitudinal axis, said rotor having a pair of opposite flat end surfaces, an annular outer surface extending between said opposite flat end surfaces, and at least one slot defined therein extending radially from said annular outer surface toward said central rotational axis and axially between said opposite flat end surfaces;

(c) at least one vane disposed in said slot of said rotor to undergo reciprocable movement in a radial direction relative to said central rotational axis of said rotor such that an outer tip portion of said vane is maintained in a non-contacting substantially sealed relationship with said annular interior wall surface of said stator housing; and

(d) a pair of separate, unitary, one-piece vane guide combined axle glider segments for positioning said one vane in said slot of said rotor, each of said vane guide segments supporting a portion of said one vane and having (i) a glide portion supported in one of a pair of annular channels arranged concentrically about said central rotational axis of said rotor and defined in one of said opposing flat interior wall surfaces of said stator housing, and (ii) a stub axle portion rigidly attached at an outer end thereof to said glider portion and each stub axle portion fitting into a separate portion of the length of an axial hole defined through an inner portion of said vane; said vane further having a notch formed therein at about a middle location along an underside of said inner portion thereof such that inner ends of said stub axle portions are exposed to receive a retainer element so as to retain said stub axle portions within said hole of said vane, said glider portion having a height less than a diameter of said stub axle portion, and said glider portion of each of said combined axle glider segments is disposed at the respective one of a pair of opposite ends of said vane and is supported in one of said annular channels.

5,551,855

APPARATUS FOR ASSEMBLY OF A WINDSHIELD GLASS AND A WEATHER STRIP HAVING A PARTLY MODIFIED CROSS SECTION

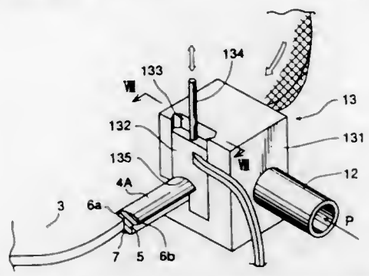
Yukihiko Yada, and Toshikazu Ito, both of Obu, Japan, assignors to Tokai Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 109,449, Aug. 20, 1993, Pat. No. 5,445,780. This application Mar. 30, 1995, Ser. No. 413,620

Claims priority, application Japan, Aug. 26, 1992, 4-250545; Jul. 20, 1993, 5-179324

Int. Cl.[6] B29C *47/02*

U.S. Cl. 425—113 **4 Claims**



1. An apparatus for manufacturing an assembly of a windshield glass and a weather strip, the weather strip being extruded onto the peripheral edge of the windshield glass and having different cross sections at the upper edge of the windshield glass and at a pair of side edges of the windshield glass, the weather strip including a projection extending toward the center of the windshield glass at the outboard side thereof, wherein the projection is in contact with the windshield glass at the upper edge of the windshield glass, and wherein the projection is apart from the windshield glass at the pair of side edges of the windshield glass to define a groove between the windshield glass and the projection, said apparatus comprising:

fixed die having an orifice for extruding molding material, an opening for supplying molding material to said orifice and a slot through which the peripheral edge of the windshield glass is inserted into the orifice and moved longitudinally relative thereto;

a movable die having an orifice comprising a portion being aligned with the orifice of the fixed die and a wider portion extending laterally from the portion being aligned with the orifice of the fixed die and having a supplementary passage means communicating with the wider portion for supplying molding material to the wider portion of the orifice of the movable die, the movement of the movable die being performed between a position where the wider portion is in contact with the windshield glass and a position where the wider portion is apart from the windshield glass to vary the height of the projection to be formed by the wider portion without restriction of the movement of the windshield glass;

means for supplying molding material to the orifice of the fixed die through said opening and to the wider portion of the orifice of the movable die through said supplementary passage means; and

means for moving the windshield glass with respect to said fixed die along the peripheral edge of the windshield glass.

5,551,856

APPARATUS FOR CONNECTING PUNCHES IN POWDER MOLDING PRESS MACHINE

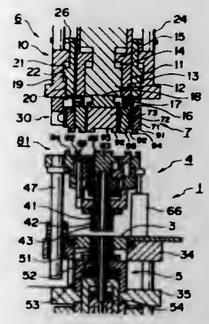
Takeshi Katagiri, Machida, Japan, assignor to Yoshizuka Seiki Co., Ltd., Kawasaki, Japan

Filed Nov. 3, 1993, Ser. No. 145,532

Claims priority, application Japan, Nov. 5, 1992, 4-319227

Int. Cl.[6] B22F *3/02*

U.S. Cl. 425—78 **7 Claims**



1. An apparatus for connecting punches in a powder molding press machine having a main body, comprising:

a punch unit having a plurality of punches assembled so as to allow the punches to move reciprocally; and

punch operating means in said main body of said powder molding press for individually reciprocating each of said plurality of punches, said punch operating means having a plurality of operational end portions each corresponding to a respective one of the plurality of punches,

wherein each of said operational end portions includes connecting means for connecting and disconnecting the corresponding punch by rotating the punch unit relative to the punch operating means.

5,551,857

CYLINDER TEMPERATURE CONTROLLER FOR AN INJECTION MOLDING MACHINE

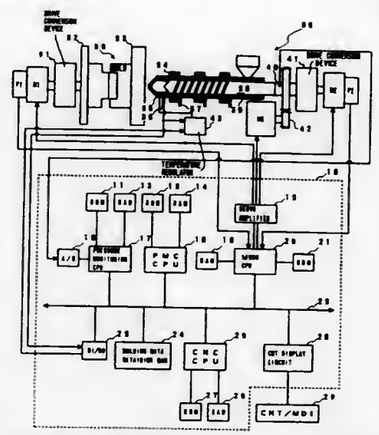
Osamu Fujioka; Tokuhisa Miyauchi, and Noriaki Neko, all of Yamanashi, Japan, assignors to Fanuc Ltd., Minamitsuru-gun, Japan

Filed Nov. 2, 1994, Ser. No. 332,810

Claims priority, application Japan, Nov. 8, 1993, 5-300851

Int. Cl.[6] B29C *45/78*

U.S. Cl. 425—143 **5 Claims**



1. A temperature controller for an injection molding machine having an injection cylinder and at least one injection molding cycle, the temperature controller comprising:

a heater for heating said injection cylinder;

temperature detecting means for detecting an actual cylinder temperature of said injection cylinder;

a temperature regulator for regulating a calorific value of said heater by carrying out proportional, integral and differential (PID) feedback control using PID parameters so that the cylinder temperature detected by said temperature detecting means agrees with a preset value;

command outputting means for outputting an automatic tuning command when the cylinder temperature detected by said temperature detecting means deviates from a temperature range defined by predetermined upper and lower limits at a beginning of each injection molding cycle; and

PID parameter adjusting means provided on said temperature regulator, for automatically tuning the PID parameters in response to the automatic tuning command from said command outputting means.

5,551,858

APPARATUS FOR FORMING SYNTHETIC RESINS

Yukio Yoshizawa; Sumio Sato; Masaki Ogawa, all of Nagaoka, and Masakazu Ohno, Tokyo, all of, Japan, assignors to Niigata Engineering Company, Ltd., and Sankyokasei Kabushiki Kaisha, both of Tokyo, Japan

Filed Sep. 1, 1994, Ser. No. 299,908

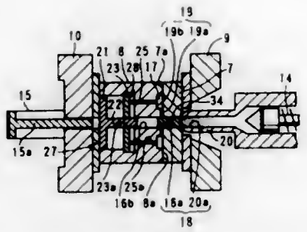
Claims priority, application Japan, Oct. 8, 1993, 5-253508

Int. Cl.[6] B29C *45/38*

U.S. Cl. 425—217 **26 Claims**

1. A synthetic resin product forming apparatus for making molded resin products by delivering molten resin to a separable mold cavity including a first mold and a separable second mold, an injection device communicating with said first mold through a molten resin passage provided in said first mold, comprising a moving device having:

means for extending said molten resin passage to said second mold;



means for coupling an independent reciprocating member inside said molten resin passage, wherein said reciprocating member moves between an injection position functioning to communicate said mold cavity with said molten resin passage, located in said second mold, and a back position wholly or partially located on said first mold;

means for moving said reciprocating member to said pack position;

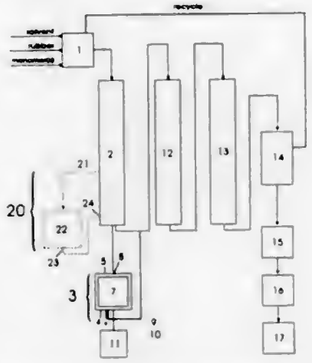
wherein said reciprocating member is disposed wholly or partially in said first mold when said first mold is separated from said second mold so as to remove a molded resin product from said mold cavity; and

said reciprocating member, when placed in said injection position, is positioned inside said second mold and is disposed away from an opening of said molten resin passage to said mold cavity opposite to said injection device.

5,551,859
PARTICULATOR

James E. Cantrill, Acton, and Thomas R. Doyle, Leominster, both of Mass., assignors to Novacor Chemicals (International) S.A., Fribourg, Switzerland

Filed Jul. 19, 1993, Ser. No. 94,309
Int. Cl.[6] C08F 2/00; B01F 3/00
U.S. Cl. 425—317 **9 Claims**



1. An apparatus comprising in sequential and cooperating arrangement:

(i) one or more initial reactors suitable for the bulk polymerization of a syrup comprising one or more monomers having dissolved therein one or more rubbers, said one or more reactors being selected from the group consisting of low shear continuous stirred tank reactors and plug flow reactors;

(ii) one or more uniform shear field devices located downstream from said one or more initial reactors to receive at least a portion of said syrup which has been polymerized to from 4 to 95% conversion, said one or more uniform shear field devices having a volume of less than 10% of the volume of said one or more initial reactors and comprising:

(a) a chamber having a circular cross section perpendicular to its longitudinal axis comprising two ends and therebetween a continuous wall, at least one input port, at least one output port, and a ratio of length to diameter from 0.5:1 to 3:1;

(b) a closed cylinder within and occupying substantially the volume of said chamber, said cylinder having a circular cross section perpendicular to its longitudinal axis, a continuous side wall whose surface closely conforms to the continuous wall of said chamber, except for a closely controlled clearance between the surface of the continuous wall of said chamber and the surface of the side wall of the cylinder, the ratio of the radius of the chamber to the radius of the cylinder being from 1:0.999 to 1:0.875; and

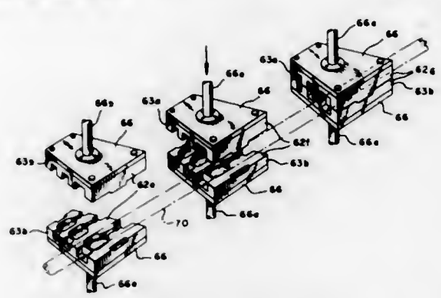
(c) means for rotating at least one of said cylinder and said chamber relative to each other;

one or more downstream reactors cooperating with said one or more uniform shear field devices to receive syrup from said one or more uniform shear field devices, said one or more downstream reactors being selected from the group consisting of low shear continuous stirred tank reactors and plug flow reactors.

5,551,860
QUICK BOTTLE PRODUCTION CHANGEOVER UTILIZING MULTI-CAVITY MOLDS IN AN EXTRUSION BLOW MOLDING SYSTEM

Danny L. Budzynski, Dublin, and Gary S. Bliss, Beavercreek, both of Ohio, assignors to Dow Brands L.P., Indianapolis, Ind.

Division of Ser. No. 259,025, Jun. 13, 1994, which is a continuation-in-part of Ser. No. 80,456, Jun. 18, 1993, Pat. No. 5,433,916. This application Jun. 2, 1995, Ser. No. 458,594
Int. Cl.[6] B29C 49/50
U.S. Cl. 425—504 **10 Claims**



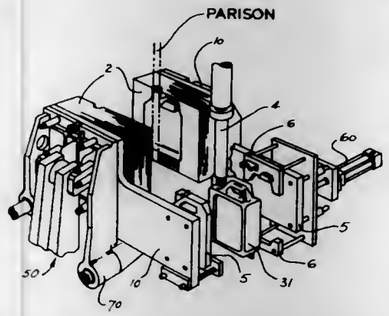
1. A blow mold for receiving a parison to be blow molded into an article, said blow mold comprising:

first and second blow mold halves which are engageable and disengageable with one another, said first and second blow mold halves defining first and second inner cavities when said mold halves are engaged, said first cavity having a first shape and said second cavity having a second shape which differs from said first shape, said first cavity receives a parison when a first article having substantially said first shape is to be formed and said second cavity receives a parison when a second article having substantially said second shape is to be formed, said blow mold halves having opposing portions which engage and clamp off a portion of the received parison when said mold halves are engaged.

5,551,861
QUICK CHANGE MOLD FOR BLOW MOLDING APPARATUS

Massenzio Baldi, Florence, Italy, assignor to Hoover Universal, Inc., Plymouth, Mich.

PCT No. PCT/US93/07210, § 371 Date Jan. 27, 1995, § 102(e) Date Jan. 27, 1995, PCT Pub. No. WO94/03320, PCT Pub. Date Feb. 17, 1994
PCT Filed Jul. 30, 1993, Ser. No. 374,682
Claims priority, application Italy, Jul. 31, 1992, FI92A156
Int. Cl.[6] B29C 49/50
U.S. Cl. 425—527 **10 Claims**



1. Tooling for quick change of molds and accessories in a blow molding machine for blow molding hollow plastic articles, which includes a mold that can be opened and closed; said mold having a feed opening or inlet for compressed air; a nozzle for compressed air feeding; a nest for holding the hollow plastic article after being blown and released from the mold; trim tooling for the removal of flash; and a carriage for providing relative movement between said nozzle and said mold and nest, comprising said mold, said nest, and said trim tooling being supported by two spaced apart, parallel and opposing supporting plates forming a modular assembly; said modular assembly having means for securing said modular assembly as a unit to said carriage, enabling said modular assembly to be moved as a unit lengthwise by said carriage relative to the nozzle between a first position at which the nozzle is aligned with the vertical axis of said feed opening or inlet of said mold and a second position at which the nozzle is aligned with a median vertical axis of said nest; and said compressed air feeding nozzle is assembled on a removable self-bearing support, the mouth of said mold, said nest, and said trim tooling on said supporting plates enabling a distance "a" between the vertical axis of said feed opening or inlet of said mold and said median vertical axis of said nest and the alignment of said trim tooling relative to said median vertical axis of said nest to be established prior to the assembly of the modular assembly on the blow molding machine, whereby when said modular assembly is mounted on the blow molding machine with said feed opening or inlet of said mold aligned with said nozzle at said first position, said median vertical axis of said nest and said trim tooling of the modular assembly are automatically located at said second position.

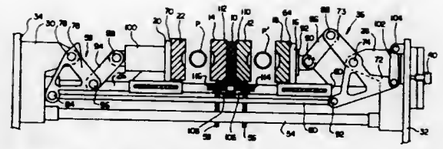
5,551,862
DUAL PARISON STACKED CLAMP BLOW MOLDING APPARATUS

John F. Allred, Jr., Wilmington, N.C., assignor to Wilmington Machinery, Wilmington, N.C.

Filed Jun. 6, 1994, Ser. No. 252,685
Int. Cl.[6] B29C 49/56
U.S. Cl. 425—532 **12 Claims**

1. A clamp for clamping two molds in back-to-back alignment in a blow molding apparatus comprising:

(a) a central platen having first and second opposed, outwardly facing, die section supporting surfaces;



(b) first movable platen having a die section supporting surface facing the first die section supporting surface of said central platen;

(c) a second movable platen having a die section supporting surface facing the second die section supporting surface of said central platen;

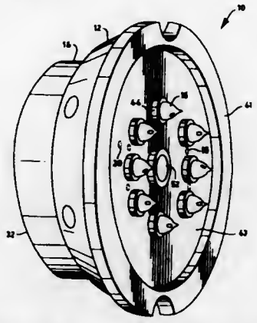
(d) a positioning means, when activated, moves said first and second movable platens relative to said central platen between a first open position and a second closed and locked position, and

(e) a central platen retainer resiliently positioning said central platen, whereby said central platen adjusts in response to unequal pressure when said movable platens are moved to said closed position.

5,551,863
SELF-CONTAINED RUNNERLESS MOLDING SYSTEM

Douglas C. Hepler, Rochester, N.Y., assignor to Polyshot Corporation, Henrietta, N.Y.

Continuation-in-part of Ser. No. 249,889, May 25, 1994, Pat. No. 5,464,343, which is a continuation of Ser. No. 982,473, Nov. 27, 1992, abandoned. This application Sep. 21, 1994, Ser. No. 309,579
Int. Cl.[6] B29C 45/22
U.S. Cl. 425—549 **10 Claims**



1. A self-containing multitip hot runnerless apparatus for use in transporting molten plastic from an injection machine to a plurality of mold cavities while controlling the temperature of the molten plastic, said apparatus comprising:

a distribution body of given length and having a central longitudinal axis extending therethrough, said body having top and bottom surfaces, a distribution well formed in said top surface for receiving molten plastic, a plurality of unrestricted and identically configured through flow channels formed between said distribution well and said bottom surface of said body to transport molten plastic from said distribution well along said flow channels and toward said bottom surface, each of said through flow channels having lower sections adapted to releasably receive tips for transporting molten plastic beyond said bottom surface to gates of respective mold cavities, a plurality of heater cartridge holes for said flow channels and equally spaced within said body with respect to said flow channels so that each flow channel is surrounded in said body by an identical thermal mass to assure uniform heating of said flow channels, said heating cartridge holes being non-through

holes extending from said top surface of said body to a predetermined length short of said body given length, and a single non-through thermocouple hole, also extending from said top surface of said body to a predetermined length short of said body given length and near said bottom surface thereof, said thermocouple hole being closely adjacent one of said plurality of said flow channels to monitor the temperature thereof near said bottom surface of said body, said distribution body including a surface adapted to attach directly to a flat injection machine platen, said distribution body further including means for automatically aligning the axial and lateral position of said apparatus with respect to a cavity carrying plate;

a plurality of heating cartridges, each heating cartridge being located in a corresponding one of said heater cartridge holes to supply heat to said distribution body when energized;

a thermocouple located in said thermocouple hole to monitor temperature and supply temperature feedback information for controlling the temperature of the molten plastic in all of said flow channels;

a plurality of tips, one for each of said plurality of flow channels, each of said tips being releasably engageable within a respective one of said lower sections of said flow channels to form an air space to prevent heat loss, each of said tips being fabricated of a material with high heat conducting properties relative to that of said distribution body to conduct heat from said distribution body outside of said bottom surface thereof to prevent plastic freeze at cavity gates; and

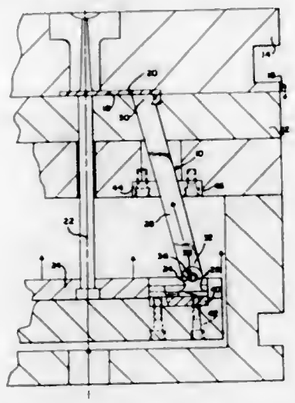
a plurality of mold plates at least one of which is moveable and includes means for defining at least one mold cavity, said plurality of mold plates including a stationary plate to which said distribution body is directly, fixedly attached so that it does not move, said moveable mold plate and said distribution body including complementary configured means for automatically axially and laterally aligning said distribution body and said moveable plate when said distribution body and said moveable plate are brought into operative engagement with respect to one another to form the mold cavity.

5,551,864

CORE LIFTER SYSTEM

Borislav Boskovic, 2102 Bannockburn, Inverness, Ill. 60067

Filed Jan. 12, 1995, Ser. No. 372,030
Int. Cl.[6] B29C *45/44*
U.S. Cl. 425—556 **8 Claims**



1. A core lifter system for a plastic mold, comprising

a. a core blade having a mold-cooperating end and an opposite coupling end,

b. a blade support said blade support having means for mounting said blade support on an ejector plate and for permitting linear translation of the support on the ejector plate, and having means for connecting said coupling end to said support, and

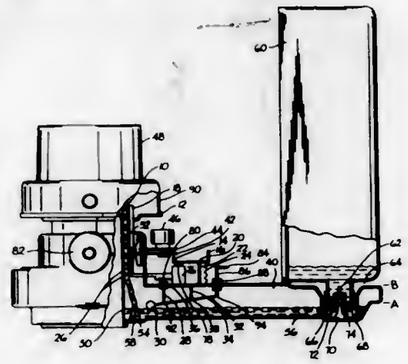
c. means in said core blade and said blade support for fixedly retaining said core blade on said blade support at a desired angle of inclination of said blade relative to said support.

5,551,865

SAFETY SHUT-OFF DEVICE FOR LIQUID FUEL BURNERS

Richard W. Henderson, 1820 Stricklen, Florence, S.C. 29505, and Samuel R. Henderson, 2976 Hwy. 112, DeRidder, La. 70634

Filed Nov. 17, 1995, Ser. No. 559,922
Int. Cl.[6] F23N *5/00*
U.S. Cl. 431—33 **16 Claims**



1. An apparatus for preventing flareup in a liquid fuel burner of the type comprising (a) a removable liquid fuel tank, (b) a fuel chamber, (c) an automatic wick extinguishing unit, and (d) a combustion chamber having a wick, where said fuel chamber carries liquid fuel from said removable tank to said wick of said combustion chamber, comprising:

an electrical circuit for normally preventing operation of said automatic wick extinguishing unit; and

means for causing said electrical circuit to allow said wick extinguishing unit to operate should fuel in said fuel chamber exceed a predetermined level, thereby actuating said automatic wick extinguishing unit.

5,551,866

SAFETY SYSTEM AND FUEL CAP FOR INHIBITING OPERATION OF AN APPARATUS DURING REFUELING

Harold Josephs, 25311 Ronald Ct., Oak Park, Mich. 48237, and Ronald W. Szczesny, 27333 Spring Arbor Dr., Southfield, Mich. 48075

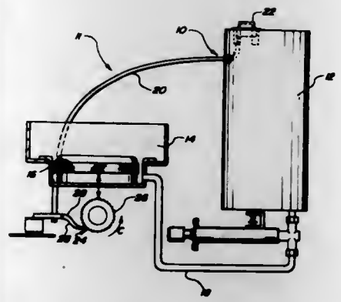
Filed Aug. 29, 1994, Ser. No. 298,225
Int. Cl.[6] F23D *11/36*
U.S. Cl. 431—153 **12 Claims**

1. A safety system for a liquid fuel combusting apparatus comprising:

a tank having a refueling opening;

a filler cap receptacle encompassing the refueling opening and having defined thereabout a periphery;

a cap adapted to be removed from and seated on the filler cap receptacle;



an elongated mechanical link having a first end contained within a recess defined by the filler cap receptacle;

means for interrupting operation of an preventing hazard from the apparatus;

said elongated mechanical link having a second end mechanically engaging said means for interrupting operation of the apparatus;

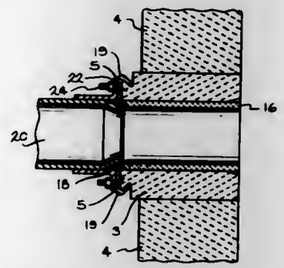
said elongated mechanical link being engaged by a lower face of an annular projection formed on said cap which is received in the recess defined by the filler cap receptacle, wherein said recess is an annular slot formed about the periphery of the filler cap receptacle.

5,551,867

METHOD OF CONVERTING A FURNACE TO OXYGEN-FUEL WHILE IT IS OPERATING AND ABURNER BLOCK ASSEMBLY

Donald E. Shamp, Millbury, Ohio, assignor to Schuller International, Inc., Denver, Colo.

Filed Oct. 7, 1994, Ser. No. 319,917
Int. Cl.[6] F23D *11/36*
U.S. Cl. 431—154 **9 Claims**



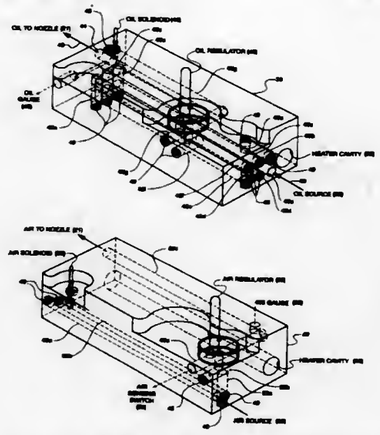
1. In the method of converting a furnace from air-fuel burners to oxy-fuel burners requiring a generally cylindrically shaped burner block tunnel comprising removing the old air-fuel burner, removing the old burner block, installing a new burner block, and installing an oxy-fuel burner, the improvement comprising removing only a center cylindrical portion of the old burner block, inserting a refractory tube into said center portion, said tube having an outer diameter just slightly smaller than the diameter of said cylindrical center portion and an inner diameter required by the oxy-fuel burner, and installing a compressible refractory gasket between the end of said tube and said oxy-fuel burner such that a seal is formed when said oxy-fuel burner is installed.

5,551,868

PREHEATER BLOCK FOR MULTI OIL FURNACES

Benjamin K. Smoker; David J. Yoder; Benuel F. Smoker, and Frederick W. Phillips, all of Leola, Pa., assignors to Clean Burn, Inc., Leola, Pa.

Filed Apr. 14, 1994, Ser. No. 227,257
Int. Cl.[6] F23D *11/44*
U.S. Cl. 431—208 **19 Claims**



1. In a multi oil furnace having a burner chamber in which is housed a burner assembly for igniting and burning used oil supplied thereto; means for supplying a flow of used oil to said burner assembly; oil regulator means for controlling the flow of used oil to said burner assembly; a preheater block formed of heat conductive material and being co-operable with said means for supplying used oil to preheat said used oil before being fed to said burner assembly, an improved preheater block comprising:

a heater chamber for housing a heating element;

a plurality of interconnected first passageways separate from said heater chamber to define a first serpentine flow path for the flow of used oil therethrough, the flow of used oil through said interconnected first passageways allowing said used oil to absorb conductive heat from said heating element; and

a plurality of interconnected second passageways separate from said heater chamber and said first passageways and defining a second serpentine flow path through said preheater block for the flow of compressed air therethrough to allow said compressed air to absorb conductive heat from said heating element and reach substantially the same temperature as said heated used oil.

5,551,869

GAS STAGED BURNER

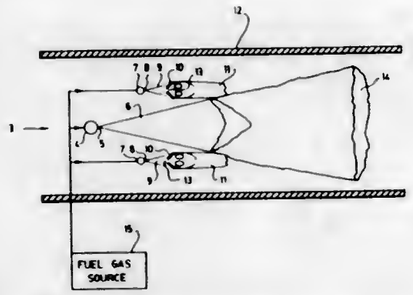
Normand Brais, Rosemere; Louis-Michel Malouin, Montréal, and Jacques Martrés, Hampstead, all of, Canada, assignors to Brais, Martres et Associés Inc., Montréal, Canada

Filed Mar. 7, 1995, Ser. No. 399,538
Int. Cl.[6] F23Q *9/00*
U.S. Cl. 431—285 **12 Claims**

1. A burner for heating a stream of combustion supporting gas, said burner comprising:

a main feed pipe extending across the stream of combustion supporting gas, said main feed pipe having an inlet for receiving a fuel gas from a fuel gas source, and at least one outlet for producing a main jet of fuel gas substantially in the direction of said stream;

two parallel auxiliary feed pipes extending across the stream of combustion supporting gas, at a predetermined distance downstream from said main pipe and on each side of said main jet, each of said auxiliary feed pipes having an inlet for



receiving fuel gas from said fuel gas source, and at least one outlet for producing an auxiliary jet of fuel gas in the direction of said stream; and

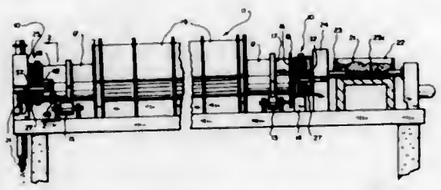
two bluff-body devices in front of the outlets of both said auxiliary feed pipes respectively, each of said bluff-body devices having a hole aligned with each corresponding outlet of the auxiliary feed pipes for receiving a portion of the auxiliary jet from said corresponding outlet in order to produce a stable pilot flame adjacent to the main jet of fuel gas for ignition thereof.

5,551,870

ROTATING KILN SEAL

Charles O. Gale, Bountiful, Utah, assignor to Summit Valley Equipment and Engineering, Salt Lake City, Utah

Filed Dec. 8, 1994, Ser. No. 351,663
Int. Cl.[6] F27B *7/24*
U.S. Cl. 432—115 **10 Claims**



1. In a kiln installation including an elongate cylindrical drum having a longitudinal axis of symmetry and extending between and joining stationary inlet and outlet end hood structures, means for rotating the drum about said axis, and means for creating and maintaining the interior of the drum at selected elevated temperatures without combustion therewithin, a device sealing against entry of atmospheric air into the interior of the kiln installation at each end of the rotating drum, said devices each comprising:

a rotating seal member welded sealably around the outside surface of the drum, carrying an annular sealing surface facing toward an adjacent end of the drum;

a non-rotating seal member sized to clearingly encircle the drum at all temperatures thereof, having an annular sealing surface facing and in sealing contact with the rotating sealing surface;

a flexible bellows member of gas-impervious material, and means sealably securing said bellows member clearingly encircling the drum and spanning longitudinally between the non-rotating seal member and a near side of an associated end hood;

means preventing rotation of the non-rotating sealing member during rotation of the drum; and

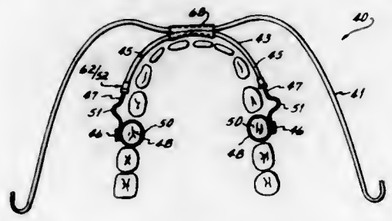
means urging the sealing surface of the non-rotating sealing member with unvarying force into sealing contact with the sealing surface of the rotating seal member, at all expanded and contracted conditions of the drum.

5,551,871

TEMPERATURE-SENSITIVE MEDICAL/DENTAL APPARATUS

Petrus A. Besselink, Gronausestraat 1220, 7534 AT Enschede, Netherlands, and Rohit C. L. Sachdeva, 2605 Courtside La., Plano, Tex. 75093

Continuation-in-part of Ser. No. 26,980, Mar. 5, 1993, abandoned. This application May 20, 1993, Ser. No. 64,953
Int. Cl.[6] A61C *5/00*
U.S. Cl. 433—5 **64 Claims**



1. A medical/dental apparatus, comprising:

a first element having a first portion and a second portion spaced therefrom, the first portion of said first element adapted for being connected to a first body part;

a second element having a first portion and a second portion spaced therefrom, the first portion of said second element adapted for being connected to a second body part spaced from said first body part,

the second portions of said first and second elements being proximately disposed and overlapping in a first variable spatial relationship;

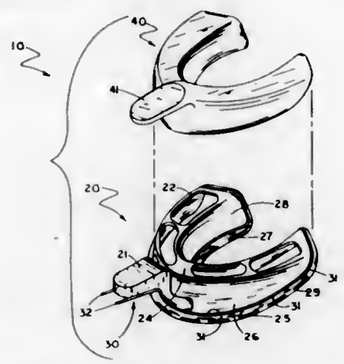
first variable locking means made of a first shape memory material having a first transformation temperature range for limiting changes of said first spatial relationship at a first working temperature and for allowing changes of said first spatial relationship by one or the other of increasing and decreasing the temperature of said first shape memory material relative to said first working temperature.

5,551,872

DENTAL IMPRESSION DEVICE

Raul Mena, 201 N. University Dr., Suite 101, Plantation, Fla. 33324

Filed Sep. 30, 1994, Ser. No. 315,519
Int. Cl.[6] A61C *9/00*
U.S. Cl. 433—37 **7 Claims**



1. A device for obtaining a dental impression of a portion of a user's mouth with moldable setting material that is applied to the area being worked on including teeth, and said device comprising:

A. housing means having substantially a "U" shape that coincides with a user's gum and including an upper wall having a plurality of openings to permit injection of said moldable setting material therethrough when said housing means is positioned over said teeth, and said housing means further including inner and outer lateral walls that extend along the entire periphery of said housing means and ending with lower edges that come in contact with a user's gum to define a space therein;

B. cover means having substantially a "U" shape that cooperatively mounts over said housing means and is adapted to force said moldable setting material to conform to the shape of said area being worked on; and

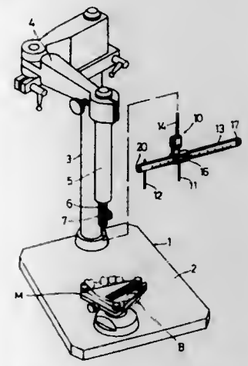
C. suction means mounted substantially close to said outer lower edge and extending along the outer periphery of said housing so that the saliva being segregated by said patient can be readily sucked in thereby minimizing its interference with the work being undertaken.

5,551,873

DETECTOR OF THE CLASP REGION OF A DENTURE

Tatsuya Aiba, Shizuoka, Japan, assignor to Ltd. Aibagiken, Shizuoka, Japan

Filed Oct. 26, 1994, Ser. No. 329,469
Int. Cl.[6] A61C *19/04*
U.S. Cl. 433—72 **5 Claims**



1. A detector of the clasp region of a denture, for use with a model of an oral cavity for denture construction to identify a region to which a clasp can be hooked onto a first tooth corresponding to a abutment tooth for fixing a removable partial denture for a defective portion of a dentition, the detector comprising:

a first sensing element having a pointed end for abutting against a top surface of another tooth that becomes a center of rotational motion for mounting/demounting the clasp onto and from said first tooth through a mounting/demounting method utilizing a rotational path;

a second sensing element capable of contacting a side surface of said first tooth where the clasp is hooked in parallel with the first sensing element;

a supporting body for the sensing elements for making one of the sensing elements fixable and fitting the other of the sensing elements in an accessible and separable manner while keeping both sensing elements in parallel; and

an installation member attached to the supporting body for securing the supporting body in a holder with the first and second sensing elements above a model that is positioned facing upward on a model table, the supporting body being attached to the installation member by means of a swivel connection including a support shaft allowing rotational movement of the supporting body relative to the installation member about a substantially horizontal axis.

5,551,874

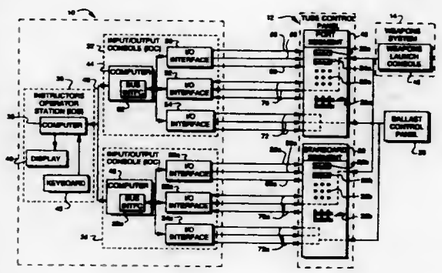
Patent Not Issued For This Number

5,551,875

LAND BASED SUBMARINE WEAPONS SYSTEM SIMULATOR WITH CONTROL PANEL TESTER AND TRAINER

Stephen G. Shaffer; Connie L. Thome, both of Virginia Beach, and Timothy F. Clark, Chesapeake, all of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 3, 1994, Ser. No. 317,253
Int. Cl.[6] F41A *33/00*
U.S. Cl. 434—13 **6 Claims**

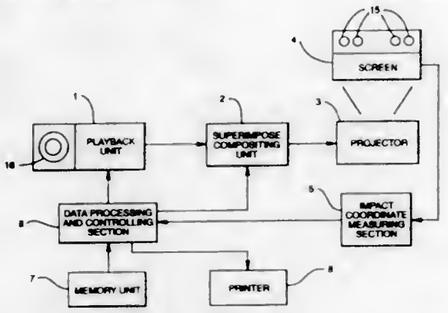


1. A land based submarine weapons system launch tube control panel testing and training system, for providing operation and maintenance training, said system comprising:

a land based submarine weapons launch tube control panel apparatus including a port launch tube control panel segment and a starboard launch tube control panel segment, each of said port and starboard launch tube control panel segments including means for receiving weapons launch system operational data signals from at least a weapons launch system, and for displaying an indication representing said received weapons launch system operational data signals, each of said port and starboard launch tube control panel segments also including a means for transmitting at least weapons launching system control data signals from each of said port and starboard launch tube control panel segments to said weapons launch system; and

a land based submarine weapons launch tube control panel operation and maintenance trainer, coupled to each of said port and starboard launch tube control panel segments, for receiving at least said weapons launching system control data signals transmitted from each of said port and starboard launch tube control panel segments, and responsive to at least one weapons launching system control data signal received from at least one of said port and starboard launch tube control panel segments, for transmitting to said at least one of said port and starboard launch tube control panel segments, at least one weapons launching system operational data signal including a predetermined weapons launching system operational data signal type and data signal value, said weapons launching system operational data signal type and data signal value predetermined as a function of said received at least one weapons launching system control data signal.

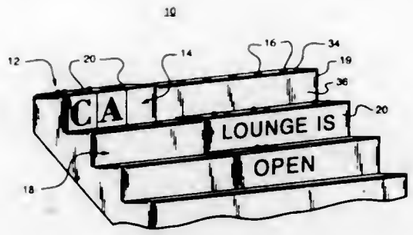
5,551,876
TARGET PRACTICE APPARATUS
Sunao Koresawa; Masanori Yamazaki, both of Kure, and Hidetoshi Imaide, Tokyo, all of, Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 23, 1995, Ser. No. 393,397
Claims priority, application Japan, Feb. 25, 1994, 6-028195
Int. Cl.[6] F41G *3/26*
U.S. Cl. 434—16 **10 Claims**



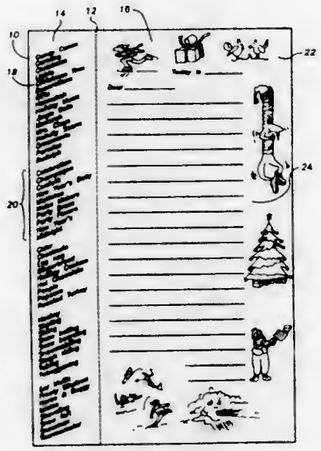
1. A target practice apparatus comprising:
a screen on which a training image is projected;
three or more acoustic sensors for detecting a sound generated when a bullet passes through said screen;
impact coordinate measuring section for computing the coordinates of an impact position on said screen based on differences among points of time when said acoustic sensors detect the sound;
a projector for projecting the training image on said screen;
a playback unit for supplying the projector with an image signal and including a recording medium in which an image representing a hit and an image representing a miss are recorded as well as the training image;
a memory unit in which a hit range and a miss range are previously stored for each frame of said training image;
a data processing and controlling section which controls said playback unit in a frame-by-frame fashion, compares the coordinates of the impact position fed from said impact coordinate measuring section with data of the hit range and the miss range stored in said memory unit so as to perform judgment as to whether a hit or a miss, and selects the image representing a hit or the image representing a miss based on the results of the judgment, and reproduces the selected image;
a superimpose compositing unit for displaying a mark representing an impact position on the screen by superimposing the mark on said training image; and
an output device for outputting a list of scores representing the results of the training which are determined based on the results of said judgment.

5,551,877
SYMBOLIC LANGUAGE DISPLAY SIGN UTILIZING TACTILE AND VISUAL PATTERN DISCRIMINATION
Kevin C. Murphy, 97 Forrest St., Plaistow, N.H. 03865
Continuation-in-part of Ser. No. 74,795, Jun. 10, 1993, Pat. No. 5,391,078. This application Aug. 15, 1994, Ser. No. 290,605
Int. Cl.[6] G09B *21/00*
U.S. Cl. 434—113 **18 Claims**

16. A tactile recognition language display device system for conveying tactilly and visually recognizable information, comprising:
at least one language communication segment including at least a first portion and a second portion, said first portion including a tactilly recognizable language symbol and said second portion including a visually recognizable language symbol corresponding to said tactilly recognizable language symbol;
at least one of said first and second portions of said at least one language communication segment including an elongated engaging member extending from said at least one of said first and second portions of said at least one language communication segment; and
a mounting region, for removably mounting said at least one language communication segment, said mounting region including at least one language communication segment engaging member aperture, for receiving said elongated engaging member, and for generally preventing movement of said at least one language communication segment as said tactilly recognizable symbol is recognized by touch.

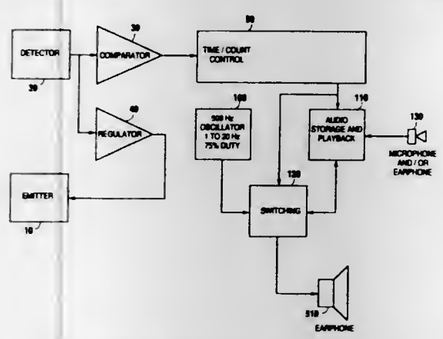


5,551,878
ARTICLE FOR IMPROVING CORRESPONDENCE LETTER WRITING SKILLS
David M. Ellenbogen, 13 Witte Rd., Albany, N.Y. 12203
Continuation of Ser. No. 237,688, May 4, 1994, abandoned. This application Nov. 7, 1995, Ser. No. 553,193
Int. Cl.[6] G09B *11/04*
U.S. Cl. 434—165 **2 Claims**



1. An associative correspondence letter writing template, comprising:
stationery with outer edges and having perforations therein running uninterrupted from one edge of a second edge and that the perforations run substantially in a straight line parallel to at least one outer edge of said stationary forming distinct first and second regions separable from one another along said perforations;
said first region having a plurality of parallel lines forming a skeletal outline of a correspondence letter;
a plurality of correlative graphical illustrations relating to a selected theme positioned on said first region between said skeletal outline of said letter and the outer edge of said first region; and
a plurality of correlative words relating to said selected theme positioned on said second region.

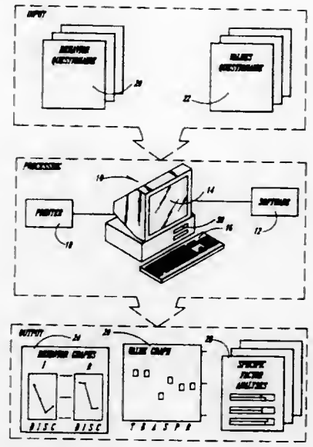
5,551,879
DREAM STATE TEACHING MACHINE
Arthur D. Raynie; Raul G. Rodriguez; Gary L. Forister, and Alexander B. Crawford, all of San Antonio, Tex., assignors to Dream Weaver J.V., San Antonio, Tex.
Filed Sep. 16, 1994, Ser. No. 307,324
Int. Cl.[6] A61M *21/00*
U.S. Cl. 434—236 **23 Claims**



1. A device to aid in inducing a lucid dream state, the device comprising:
means for detecting movement of an eye and for transmitting an eye movement signal in response thereto;
means for receiving and evaluating the eye movement signal to determine a REM or non-REM sleep condition, said receiving and evaluating means including means to emit a signal representative of the REM sleep condition of the individual when the frequency of the eye movement signal received by said receiving means exceeds a preselected number for a preselected period of time;
means for relaying prerecorded messages to the individual, said relaying means in operative engagement with the emitting means of said receiving and evaluating means; and
a headband unit for locating said detecting means, said receiving and evaluating means, and said relaying means therein.

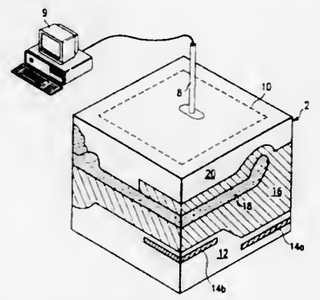
5,551,880
EMPLOYEE SUCCESS PREDICTION SYSTEM
Bill J. Bonnstetter, 6602 E. Ludlow Dr., Scottsdale, Ariz. 85254, and Jon C. Hall, 101 N. Center, Zearing, Iowa 50278
Continuation of Ser. No. 7,484, Jan. 22, 1993, abandoned. This application Apr. 21, 1995, Ser. No. 428,354
Int. Cl.[6] G09B *7/00*
U.S. Cl. 434—236 **6 Claims**

1. A method of using behavioral and value characteristics of an individual to evaluate potential for a specific job comprising:
presenting to the individual selected questions related to behavior characteristics relevent to the job;
presenting to the individual selected question related to values characteristics relevant to the job;
recording and relating answers to the questions related to the behavior characteristics to a plurality of behavior categories relevant to the job;
recording and relating answers to the question related to values to a plurality of values categories relevant to the job;



recording and scoring the related answers to a predetermined score on a pre-selected scale or scores based on determination on the importance of the behavioral and value characteristic to the job;
recording and correlating the related answers to specific predetermined numerical values in the predetermined range for a plurality of behavior factors relevant to the job and to values related to the job;
averaging the numerical values by the number of behavior characteristics and value characteristics to maintain an average score within the range for behavior and values;
adding the behavior numerical value and values numerical values for the specific behavioral factor;
dividing the sum of the numerical value by two to weight behavior and values approximately equally for each behavior factor; and
presenting in a report the results of the weighted calculation of each behavioral factor based on behavior and values.

5,551,881
METHOD AND SYSTEM FOR GEOPHYSICAL AND GEOLOGIC MODELING
Gerald J. Henderson; Peter C. Johnson, and Lawrence B. Sullivan, all of Plano, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.
Division of Ser. No. 896,047, Jun. 9, 1992, Pat. No. 5,451,164, and a continuation-in-part of Ser. No. 714,272, Jun. 12, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 470,429
Int. Cl.[6] G06F *15/00*
U.S. Cl. 434—299 **13 Claims**



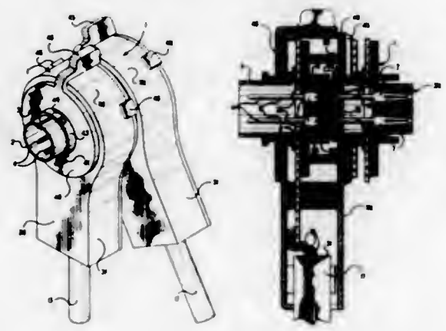
1. A method of modeling a portion of the earth, comprising:

constructing a scale model of a portion of the earth, said scale model comprising a plurality of structures adjacent one another having different acoustic velocities from one another;
coupling ultrasonic energy into said scale model from a source at a surface of the scale model;
detecting said ultrasonic energy with a plurality of receivers, each located at said surface, the ultrasonic energy detected by each receiver having traveled from said source through a portion of said scale model to said receiver;
moving said source and said plurality of receivers along said surface of the scale model; and
generating an image of a portion of said scale model from the ultrasonic energy detected by said plurality of receivers.

5,551,882
STACKABLE CONNECTOR

Robert N. Whiteman, Jr.; Robert W. Walker, both of Harrisburg, and James P. Moser, Steelton, all of Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Filed Mar. 22, 1995, Ser. No. 409,128
Int. Cl.[6] H01R *33/08;39/00*
U.S. Cl. 439—21 **9 Claims**



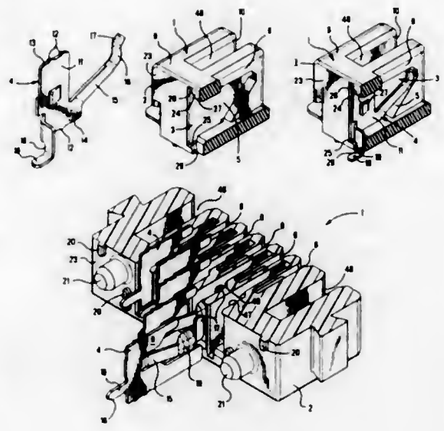
1. An electrical connector constructed to mate with a connector of duplicate construction comprising: a front mating ring, multiple contacts brushing respective concentric circuits on a rotatable circuit board, said contacts being connected to respective wires of an electrical cable, a rear facing socket receiving a front mating ring of another, duplicate connector, and the front mating ring and the rear facing socket being connected electrically together.

5,551,883
ELECTRICAL CONNECTOR

Wayne S. Davis, Harrisburg, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 153,700, Nov. 17, 1993, abandoned. This application Dec. 19, 1994, Ser. No. 358,271
Int. Cl.[6] H01R *13/432;13/41;23/68*
U.S. Cl. 439—65 **14 Claims**

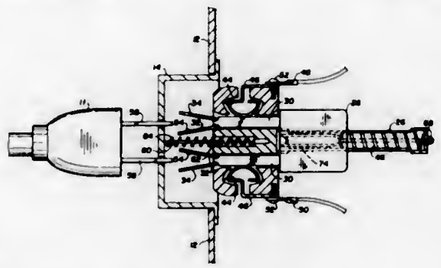
1. An electrical connector, comprising:
an insulated housing, at least one contact receiving cavity in the housing, an electrical contact in a first cavity portion of the cavity, a contact portion of the contact extending into a second cavity portion of the cavity to engage a mating contact received in the second cavity portion, and a tip of the electrical contact is received in a channel of the first cavity portion, and
said contact portion extends diagonally forward in the first cavity portion.



5,551,884
LOCKING ELECTRICAL OUTLET

Steven A. Burkhart, Sr., P.O. Box 532, Spring Arbor, Mich. 49283

Filed Jan. 25, 1995, Ser. No. 378,014
Int. Cl.[6] H01R *13/703;13/44*
U.S. Cl. 439—140 **20 Claims**

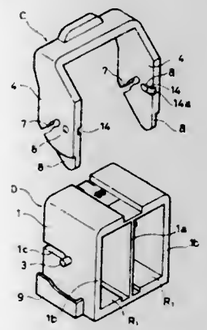


1. A locking socket comprising:
a housing having a front face, a rear face, a first passage extending from said front face to said rear face, and a second passage spaced apart from and parallel to said first passage, said second passage extending from said front face to said rear face, said first passage intersecting said front face to form a first front opening, said first passage intersecting said rear face to form a first rear opening, said second passage intersecting said front face to form a second front opening, and said second passage intersecting said rear face to form a second rear opening;
a guide fixed to said rear face and positioned between said first rear opening and said second rear opening, said guide extending from said rear face for a predetermined distance;
a carrier member slidably mounted to said guide and movable between a locked position and an unlocked position, said carrier member having first and second lateral portions in registry with respective ones of said first and second passages when said carrier member is mounted to said guide;
first and second arms each extending from a respective one of said first and second lateral portions and into a respective one of said first and second passages, said first arm terminating at a first support end distal from said carrier member, and said second arm terminating at a second support end distal from said carrier member;
a first pair of grasping jaws hingedly supported at said first support end, said first pair of grasping jaws protruding from said first front opening for a first distance, and being in an open configuration, when said carrier member is in the unlocked position, and said first pair of grasping jaws having a greater portion thereof being retracted into said first passage when said carrier member is in the locked position, than is in the case when said carrier member is in the unlocked position, and said first pair of grasping jaws being in a closed configuration when said carrier member is in the locked position; and
a second pair of grasping jaws hingedly supported at said second support end, said second pair of grasping jaws protruding from said second front opening for said first distance, and being in an open configuration, when said carrier member is in the unlocked position, and said second pair of grasping jaws having a greater portion thereof being retracted into said second passage when said carrier member is in the locked position, than is the case when said carrier member is in the unlocked position, and said second pair grasping jaws being in a closed configuration when said carrier member is in the locked position, whereby a plug having at least first and second prongs can be firmly held within said locking socket, with each of said first and second prongs being grasped by a respectively one of said first and second pairs of grasping jaws, when said carrier member is in the locked position.

5,551,885
CONNECTOR SYSTEM REQUIRING SMALL FORCE BY USE OF OPERATION LEVER

Makoto Yamanashi, and Nobuyuki Akeda, both of Haibara-gun, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 52,767, Apr. 27, 1993. This application Apr. 12, 1994, Ser. No. 226,481
Claims priority, application Japan, May 1, 1992, 4-112579; Apr. 12, 1993, 5-018279 U
Int. Cl.[6] H01R *13/62*
U.S. Cl. 439—157 **2 Claims**

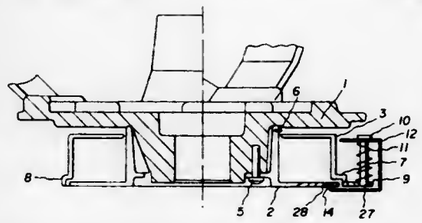


1. A connector system requiring a small force by use of an operation lever, said system comprising:
first connector means and second connector means for connecting to each other;
a frame surrounding and being slidably mountable on said second connector means before connecting said first and second connector means, said frame including a pair of flexible side walls and a bottom wall, a pivot being provided on an outer surface of each side wall, and a separation preventing plate integrally formed with said bottom wall and outwardly extending from said each side wall;
pivotable lever means disposed on said frame to connect said first and second connector means within said frame, said lever means including a pair of drive plates, each drive plate having a pivot hole engaging with said pivot, a free end portion for engaging with said separation preventing plate, and connection guide means for guiding said pivot into said pivot hole, said connection guide means being formed of an introducing tapered portion disposed on an inner surface of said drive plate for engaging with said pivot at the same time as engagement of said separation preventing plate and said free end portion of said drive plate and a connection guide groove continuously connected to said introducing tapered portion for guiding and engaging with said pivot upon pressurizing said drive plates and causing inwardly deforming of said side walls of said frame.

5,551,886
CURRENT TRANSFER ELEMENT FOR STEERING WHEELS OF MOTOR VEHICLES

Gregor Zeller, Aschaffenburg, and Helmut Bonn, Haibach, both of, Germany, assignors to Petri AG, Aschaffenburg, Germany

Filed Aug. 30, 1994, Ser. No. 297,868
Claims priority, application Germany, Aug. 30, 1993, 43 29 116.3
Int. Cl.[6] H01R *35/04*
U.S. Cl. 439—164 **3 Claims**

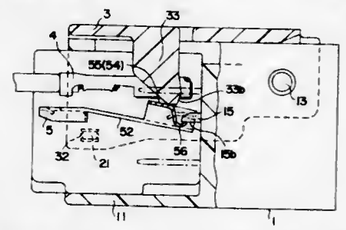


1. A current conductor apparatus for a stator of a steering column and for a rotor of a steering wheel comprising:
a stator;
a rotor;
an attachment located on the stator;
a screw located in a tapped hole on the attachment;
a clamp comprising an elbow end and an other end;
a spring;
a bore located on the rotor, and a shoulder located on the stator, wherein the clamp and the attachment are attached to one another by the screw and the spring, the elbow end is configured so that it may project into the bore, and the other end is configured so that it may lie on the shoulder.

5,551,887
CONNECTOR

Yuichi Nankoh, and Hajime Kawase, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Suzuka, Japan

Filed Apr. 10, 1995, Ser. No. 419,365
Claims priority, application Japan, Apr. 20, 1994, 6-106085
Int. Cl.[6] H01R *29/00*
U.S. Cl. 439—188 **10 Claims**



1. A connector comprising an apparatus side connector housing (2) in which (+)- and (−)-supply terminals (4, 4) and a short-circuit

terminal (5) for bringing the supply terminals (4, 4) into a short-circuited state are mounted, a supply side connector housing (1), and a movable member (3) which is movably mounted with respect to the connector for pressing the short-circuit terminal (5) to release the short-circuiting state, wherein:

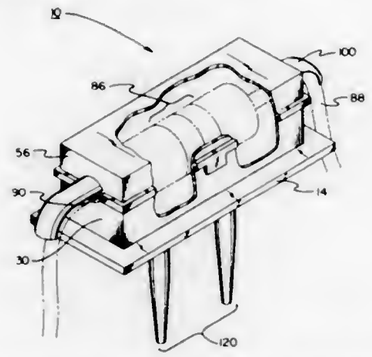
an engaging portion (15) is formed at the supply side connector housing (1) for retaining the release state of the short-circuit terminal (5) as long as the connector housings (1, 2) are coupled.

5,551,888

SURFACE-PIERCING ELECTRICAL CONNECTOR PROTECTOR

Rockney J. Rhodes, Sr., 6 Storer Ct., Morganville, N.J. 07751

Filed Feb. 3, 1995, Ser. No. 383,303
Int. Cl.[6] H01R *13/62*
U.S. Cl. 439—369 **2 Claims**



1. A surface-piercing electrical connector protector for securing a pair of mated electrical plugs and associated electrical cords to a recipient surface, protecting the plugs from damage, and ensuring a proper electrical interconnection comprising, in combination:

a rigid plastic container including a rectangular planar horizontal bottom wall with an upper surface, a lower surface, and a periphery interconnecting the upper surface with the lower surface formed of a pair of long edges and a pair of short edges extended therebetween, the container further including a pair of opposed spaced rectangular planar vertical long walls and a pair of opposed spaced rectangular planar vertical short walls, each long wall having an upper long edge, a lower long edge, and a pair of opposed side edges extended therebetween, each short wall having an upper short edge, a lower short edge, and a pair of opposed side edges extended therebetween, the side edges of the long walls and the short walls interconnected in an end-to-end configuration to define a sidewall having a rectangular cross section, an upper peripheral edge formed-of the upper long edges with the upper short edges extended therebetween, and a lower peripheral edge formed of the lower long edges with the lower short edges extended therebetween, the lower peripheral edge centered upon and integral with the upper surface of the bottom wall thereby defining a hollow interior portion bounded by the sidewall and the bottom wall and further defining a ledge extended around the sidewall, each short wall further including a first semicircular recess formed thereon at the midpoint of its upper short edge and a semicircular rubber seal secured to the first semicircular recess, one long wall further including a section of teeth projected outwards therefrom at a location near the midpoint of its associated upper long edge;

a rigid plastic lid including a pair of opposed spaced rectangular planar vertical long walls each having an upper long edge, a lower long edge, and a pair of opposed side edges extended therebetween, a pair of opposed spaced rectangular planar vertical short walls each having an upper short edge, a lower short edge, and a pair of opposed side edges extended therebetween, the side edges of the long walls and the short walls interconnected in an end-to-end configuration to define a border having a rectangular cross section, an upper peripheral edge formed of the upper long edges with the upper short edges extended therebetween, and a lower peripheral edge formed of the lower long edges with the lower short edges extended therebetween, the lower peripheral edge further including a peripheral lip with a L-shaped cross section projected outwards and downwards therefrom and a tongue extended downwards from the lip at the midpoint of a lower long edge, the lid further including a rectangular planar horizontal top wall having a periphery integral with the upper peripheral edge of the border to define a hollow interior portion, each short wall further including a second semicircular recess formed thereon at the midpoint of its lower short edge and a semicircular rubber seal secured to said second semicircular recess;

a rigid metal hinge having a lower portion coupled to one of the long walls of the container at a location directly opposite the teeth on the container and an upper portion coupled to a long wall of the lid at location opposite the tongue on the other long wall of the lid, the hinge allowing the lid to be opened for placing a pair of mated electrical plugs within the interior portion of the container and for positioning each associated electrical cord of a plug within the first semicircular recess of the container, the hinge further allowing the lid to be closed with the recesses defining a pair of axially aligned through holes, the tongue to be snapidly secured to the section of teeth on the container to prevent access to the electrical plugs, and the seals to be held snugly in contact with the associated electrical cords;

a pair of plastic arms, each arm having a generally semicircular cross section, an exterior surface, an interior surface, an inboard end integral with a short wall of the lid at a location directly above the first and second semicircular recesses, a downwardly projected outboard end, an intermediate location defined between the inboard end and outboard end, a linear inboard section extended from the inboard end to the intermediate location, and an arcuate outboard section extended from the intermediate location to the outboard end, each arm snapidly securable to an electrical cord extended from a through hole; and

a pair of spaced plastic stakes with each stake having a base end integral with the lower surface of the bottom wall of the container and a pointed tip end projected downwards therefrom, the pair of stakes adapted for piercing a recipient surface and thereby holding the container in a fixed horizontal position for use.

5,551,889

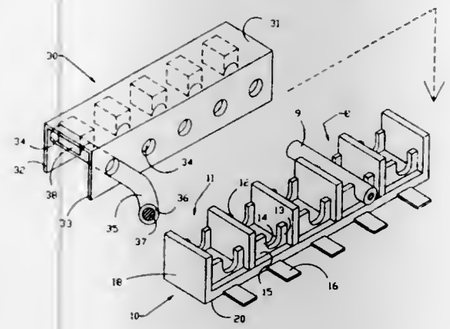
LOW PROFILE INSULATION DISPLACEMENT CONNECTION PROGRAMMABLE BLOCK AND WIRE TO BOARD CONNECTOR

Charles A. Kozel, McHenry, and Cathy J. Edgerton, Oakwood Hills, both of Ill., assignors to Methode Electronics, Inc., Chicago, Ill.

Filed Dec. 30, 1993, Ser. No. 176,073
Int. Cl.[6] H01R *4/24*
U.S. Cl. 439—404 **8 Claims**

1. A wire to board connector providing insulation displacement contact (IDC) connection and programmability comprising:

an insulation block including a bottom surface and at least one cavity having at least a pair of IDC contacts mounted in said cavity for receiving a wire having insulation that is pierced by knife-like edges of the contacts, said contacts having two arms each having, length and the cavity surrounding the entire said length of the contact arms and surface mount contact tails protruding parallel to said bottom surface for mounting on a circuit board.

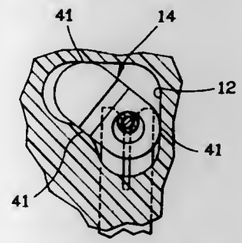


5,551,890

PATCH PANEL IDC CONNECTOR

Alain Caberec, Conflans Sainte Honorine, France, assignor to The Whitaker Corporation, Wilmington, Del.

Filed Dec. 22, 1994, Ser. No. 362,313
Claims priority, application France, Feb. 23, 1994, 9402039
Int. Cl.[6] H01R *4/26*
U.S. Cl. 439—409 **12 Claims**



1. An insulation displacing contact (IDC) connector comprising an insulative housing, an insulation displacing contact mounted therein for connection to a conducting wire, and an actuator for guiding and inserting the wire into a slot of the IDC, characterized in that the housing comprises a cavity for receiving the actuator, the housing cavity having a camming surface cooperable with the actuator for guiding simultaneous rotational and translational movement thereof during insertion of the wire into the IDC slot, the actuator further comprising a wire receiving cavity proximate the IDC slot and extending substantially parallel to the rotational axis of the actuator.

5,551,891

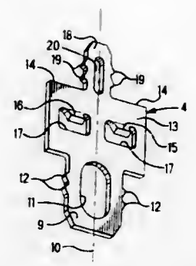
ELECTRICAL CONNECTOR WITH BOARDLOCK RETENTION FEATURE

John P. Huss, Jr., Harrisburg, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Mar. 31, 1995, Ser. No. 414,688
Int. Cl.[6] H01R *13/73*
U.S. Cl. 439—567 **4 Claims**

1. An electrical connector comprising: an insulating housing; conductive electrical contacts in the housing extending toward a mating face on the housing; at least one conducting boardlock projecting from a mounting surface on the housing for insertion into respective apertures in a circuit board; and each boardlock being received in a corresponding cavity in the housing from an insertion face thereof;

each of the boardlocks comprises: a unitary substantially planer metal plate, a first post portion projecting from a top of the plate, a second post portion projecting from a bottom of the plate, the first and second post portions extending along an axis of rotation, and first and second locking lances in the plate symmetrically spaced radially from the axis of rotation, both locking lances projecting out of the plane of the boardlock and being resiliently bendable toward and away from the plane; and wherein:



each corresponding cavity is intersected by a corresponding opening in the housing, internal walls on each opening provide first and second locking shoulders adjacent to opposite sides of the corresponding cavity facing away from said insertion face, and each boardlock is capable of facing in either of two directions within the corresponding cavity to avoid incorrect assembly of the boardlock, with the first locking lance being lockingly engaged on the first shoulder when the boardlock faces a first of said two directions, and with the second locking lance being lockingly engaged on the second shoulder when the boardlock faces a second of said two directions, whereby successful assembly of the boardlock is achieved with the boardlock facing in either of said two directions, and further wherein each corresponding cavity extends along a second opening into the insertion face, the second opening providing a widened portion extending along each corresponding cavity, the first locking lance being received along said second widened portion without locking engagement with said housing when the boardlock faces said second of said two directions, the second locking lance being received along said second widened portion without locking engagement with said housing when the boardlock faces and first of said two directions, whereby only one of the locking laces lockingly engages the housing, thus facilitating tool-assisted lance disengagement for boardlock removal.

5,551,892

WATER-PROOF CONNECTOR AND DUMMY PLUG FOR WATER-PROOF CONNECTOR

Takayoshi Endo; Hitoshi Sakai, and Hitoshi Saito, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

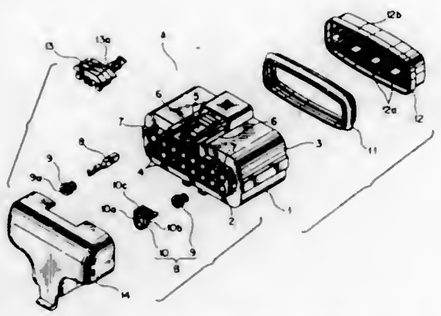
Filed Oct. 24, 1994, Ser. No. 327,906
Claims priority, application Japan, Oct. 27, 1993, 5-268950
Int. Cl.[6] H01R *13/40*
U.S. Cl. 439—587 **6 Claims**

1. A dummy plug comprising:

a shielding plug to be inserted into unused terminal accommodating chambers provided in a connector housing of a water-proof connector, and

a shielding plug holding means for pushing said shielding plug into the unused terminal accommodating chambers, wherein said shielding plug holding means includes

a lid portion,



a pushing projection for pushing said shielding plug into the terminal accommodating chambers formed on one side surface of said lid portion, and

a housing locking section formed integrally with said lid portion, locking said shielding plug holding means to the connector housing.

5,551,893

ELECTRICAL CONNECTOR WITH GROMMET AND FILTER

Bradley G. Johnson, Russell, Pa., assignor to Osram Sylvania Inc., Danvers, Mass.

Filed May 10, 1994, Ser. No. 240,304
Int. Cl.[6] H01R *13/66*
U.S. Cl. 439—620 4 Claims

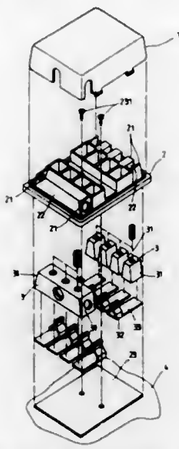
1. An electrical connector comprising: a body formed from a substantially rigid electrically insulating material, said body including a transverse portion having a cavity therein, said cavity having a floor with at least one floor aperture therein; a substantially flexible, electrically insulating grommet fitted within said cavity, said grommet including at least one grommet aperture substantially aligned with said floor aperture; a ferrite filter positioned adjacent said grommet and in contact therewith, said filter having at least one filter aperture substantially aligned with said grommet aperture and said floor aperture; a cover formed of a substantially rigid, electrically insulating material overlying said filter and fixed to said transverse portion, said cover having at least one cover aperture therein substantially aligned with said filter aperture, said grommet aperture and said floor aperture; and an electrically conductive contact fitted within said aperture.

5,551,894

ELECTRIC JUNCTION BOX

Kuang-Ts'an Lin, and Shih-Tzung Liang, both of No. 360, Sec. 1, Min-Sheng N. Rd., Kuei-Shan Hsiang, Taoyuan County, Taiwan

Filed Jan. 18, 1995, Ser. No. 374,119
Int. Cl.[6] H01R *13/68*
U.S. Cl. 439—621 1 Claim



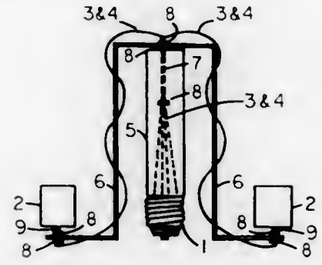
1. An electric junction box comprising a base frame coupled with a flat bottom plate, a plurality of conductor holders and a plurality of fuse holders respectively fastened to the base frame and supported on the flat bottom plate, and a cover shell covered on said base frame over said conductor holders and said fuse holders, wherein said conductor holders each have two opposite sloping sides sloping downwards and outwards; said fuse holders each have a respective extension strip respectively welded to said conductor holders; said base frame comprises a plurality of elongated receiving chambers, which receive said conductor holders respectively, and pairs of opposite tilted end supports disposed at two opposite ends of each receiving chamber and fitting over the two opposite sloping sides of said conductor holders to hold said conductor holders in place.

5,551,895

3-LEVEL FLUORESCENT LIGHT ADAPTER

Domenick Calbi, Denver, Colo., assignor to Domenick A. Calbi, Denver, Colo.

Filed Mar. 27, 1995, Ser. No. 384,649
Int. Cl.[6] H01R *25/00*
U.S. Cl. 439—642 1 Claim



1. A device adapted to be connected to a 3-way lampholder having a switch, said device comprising:

a 3-contact male base (1) with a tip contact phase wire (4), a ring contact phase wire (4), and two screw shell neutral wires (3);

said tip contact phase wire (4) and one of said screw shell contact neutral wires (3) electrically connected to a first lampholder;

said ring contact phase wire (4) and the other screw shell contact neutral wire (3) electrically connected to a second lampholder;

a main body (5) made of a rigid insulative material attached to said 3-contact male base;

said phase and neutral wires extending through said main body, and through a steel nipple (7) located within said main body; and

arms (6) made of flexible steel connecting said main body to said lampholders;

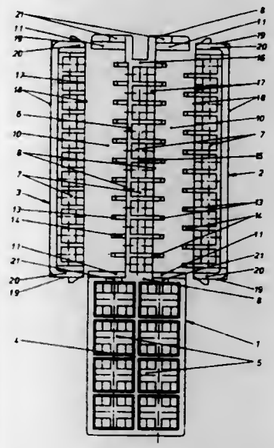
wherein, said lampholders can be energized separately or together depending on a position of said switch.

5,551,896

MODULAR ELECTRICAL CONNECTOR SYSTEM

Anton J. Hess, Hagen; Wolfgang Holle, Iserlohn, and Klaus Buhle, Schwerte, all of, Germany, assignors to Leopold Kostal GmbH & Co. KG, Ludenscheid, Germany

Filed Mar. 3, 1995, Ser. No. 397,900
Claims priority, application Germany, Mar. 9, 1994, 44 07 796.3
Int. Cl.[6] H01R *13/502*
U.S. Cl. 439—701 18 Claims



1. A modular electrical connector system, comprising:

at least two independent housing sections which can be clipped together in a row, and which are each provided with at least one retaining chamber for the accommodation of contact elements;

at least one of the independent housing sections having locking elements which pass through suitable openings in the other housing section when the housings sections are joined together in order to lock contacts which are in the retaining chambers of the other housing section;

one of the independent housing sections being formed as a central housing (1);

at least two other housing sections which cooperate with the central housing being in the form of satellite housings (2,3); and

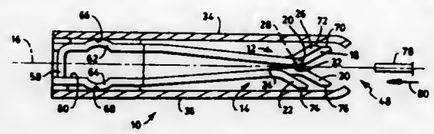
the locking elements (13) which are formed onto the central housing (1) engaging in the retaining chambers (7) of the first satellite housing (2) and the retaining chambers (7) of the second satellite housing (3).

5,551,897

ELECTRICAL CONTACT

K. Troy Alwine, Warren, Pa., assignor to OSRAM Sylvania Inc., Danvers, Mass.

Filed Feb. 8, 1995, Ser. No. 385,415
Int. Cl.[6] H01R *11/22*
U.S. Cl. 439—850 20 Claims



1. An electrical contact comprising:

a first bifurcated beam which is electrically conductive and extends in the direction of a longitudinal axis;

a second bifurcated beam which is electrically conductive and extends in the direction of said longitudinal axis, said second bifurcated beam being spaced from said first bifurcated beam;

a first outer enclosing member which is electrically conductive and extends in the direction of said longitudinal axis adjacent to and spaced from said first bifurcated beam;

a second outer enclosing member which is electrically conductive and extends in the direction of said longitudinal axis adjacent to and spaced from said second bifurcated beam; and

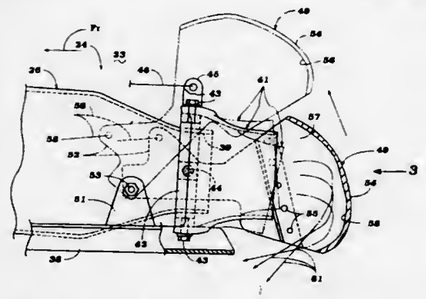
a bridging portion which is electrically conductive and which joins said first bifurcated beam, said second bifurcated beam, said first outer enclosing member and said second outer enclosing member, said bridging portion further comprising an end segment adjacent said first bifurcated beam which is turned towards and engages a portion of said bridging portion adjacent said second bifurcated beam.

5,551,898

DISCHARGE NOZZLE ARRANGEMENT FOR WATER JET PROPULSION UNIT

Chihiro Matsumoto, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 9, 1995, Ser. No. 401,930
Int. Cl.[6] B63H *11/11*
U.S. Cl. 440—41 14 Claims



1. A jet propulsion unit for a watercraft, said jet propulsion unit being comprised of an outer bousing defining a water inlet portion adapted to receive water from a body of water in which the watercraft is operating, an impeller portion containing an impeller for drawing water through said water inlet portion and a discharge nozzle portion through which the water pumped by the impeller is discharged for providing a propulsion force to the watercraft, a steering nozzle pivotally supported on said discharge nozzle for pivotal movement about a vertically extending steering axis, and a reverse thrust bucket supported for movement relative to the steering nozzle and independently of said steering nozzle between a forward drive position wherein the water from sad steering nozzle

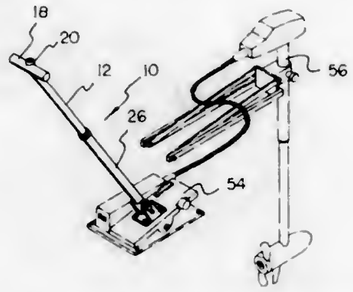
is discharged rearwardly providing a forward driving thrust to the associated watercraft and a reverse position in confronting relationship to said steering nozzle for redirecting the water flow in a forward direction for generating a reverse thrust on the associated watercraft, the path of movement of said reverse thrust bucket being fixed relative to the associated watercraft.

5,551,899

ATTACHMENT FOR HAND CONTROL OF A FOOT OPERATED CONTROLLER FOR AN ELECTRIC TROLLING MOTOR

Jerry J. Hatcher, 622 N.C. Hwy. 111 South, Chinquapin, N.C. 28521

Filed May 5, 1995, Ser. No. 436,004
Int. Cl.[6] B60L *11/02*
U.S. Cl. 440—6 **1 Claim**



1. An attachment for hand control of a foot operated controller for an electric trolling motor for allowing a user to use their hands to control an electric trolling motor comprising, in combination:

a tubular upper handle having an open first end and an open second end, the open first end having a grasping handle secured orthogonally thereto, the grasping handle having a control mechanism on an upper portion thereof, the control mechanism having wiring extending downwardly therefrom outwardly of the open second end;

a tubular lower handle having an open first end and an open second end, the open first end having external threads thereon, the open first end telescopically receiving the open second end of the tubular upper handle therein, the open first end having an adjustment nut thereon cooperating with the external threads thereof for adjustable securement of the tubular upper handle within the tubular lower handle, the open second end of the tubular lower handle having a circular securement portion integral therewith, the circular securement portion having an aperture formed horizontally therethrough, the circular securement portion having a plurality of female detent elements formed on a side thereof positioned in a semi-circular arrangement above the aperture formed therethrough, the wire from the control mechanism of the upper tubular handle extending outwardly of the open second end;

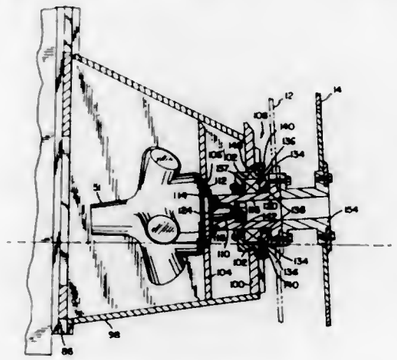
a U-shaped securement bracket having a lower portion and two upper portions, the lower portion having an aperture formed therethrough, the lower portion secured to a foot operated controller for an electric trolling motor, the wire from the control mechanism of the upper tubular handle extending through the aperture in the lower portion for electrical coupling with the foot operated controller, the U-shaped securement bracket receiving the circular securement portion of the lower tubular handle between the two upper brackets and pivotally coupling the circular securement portion to the two upper brackets by a pivot pin extending through the two upper portions and the aperture formed horizontally through the circular securement portion, one of the two upper portions having a spring biased male detent element coupled thereto, the spring biased male detent element selectively cooperating with one of the plurality of female detent elements of the circular securement portion to adjust the angle of the tubular lower handle in relationship to the U-shaped securement bracket and the foot operated controller.

5,551,900

AQUATIC VEGETATION CUTTER

John R. Dauffenbach, 608 Lake St., Waukesha, Wis. 53186; David D. Dauffenbach, 432 W. Walnut Dr., Sturgeon Bay, Wis. 54235, and James M. Dauffenbach, 1421 Victoria Dr., Waukesha, Wis. 53186

Filed May 8, 1995, Ser. No. 437,032
Int. Cl.[6] B63H *21/12*
U.S. Cl. 440—111 **18 Claims**



1. An aquatic vegetation cutter comprising:

a boat that floats in water having a hull with a horizontal plane therethrough and having a bow;

a motor mounted forward of the bow having an output shaft which slants slightly upward as the output shaft extends forward of the bow; and

a cutting blade only partially submerged in the water, the cutting blade being mounted to the output shaft in a plane normal to a longitudinal axis of the output shaft so that the lower part of the cutting blade is forward of the upper part of the cutting blade when the cutting blade is being rotated by the motor output shaft;

wherein the motor and the cutting blade are movable only in a direction substantially perpendicular to the horizontal plane through the hull of the boat, and an attitude of the longitudinal axis of the output shaft remains fixed with respect to the horizontal plane through the hull of the boat.

5,551,901

BUOYANT WATER COURSE MARKER

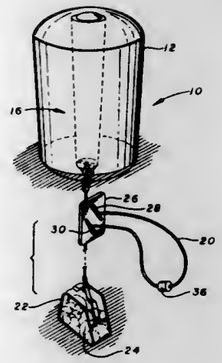
Eduard A. Jaeger, 16844 Margate St., Encino, Calif. 91436

Filed Sep. 30, 1994, Ser. No. 315,600
Int. Cl.[6] B63B *22/16*
U.S. Cl. 441—6 **26 Claims**

1. In a buoyant water marker for marking a water course in a body of water having an inflatable buoyant member and an anchoring means, the improvement comprising:

an elastic cord of variable length having one end removably coupled to said buoyant member and its other end removably coupled to said anchoring means, said elastic cord comprising a stretchable material having a length that is substantially greater in a stretched state than in an unstretched state, said anchoring means being portable; and

self-locking cord length adjusting means for varying the length of said cord according to the depth of the body of water, said cord length adjusting means being positioned proximate said buoyant member and proximate the surface a body of water.

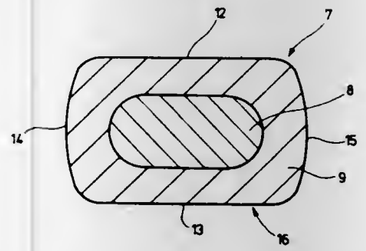


5,551,902

EXTRUSION MOLDED ELECTRODE FORMED AS COMPOUND BODY AND A METHOD OF PRODUCING THE SAME

Hans Hubert, Priesendorf; Werner Langer, Litzendorf; Walter Wuest, Staffelstein, and Stephan Weigel, Thurnau, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 29, 1994, Ser. No. 298,324
Claims priority, application Germany, Aug. 27, 1993, 9312864 U
Int. Cl.[6] H01T *21/02*
U.S. Cl. 445—7 **3 Claims**



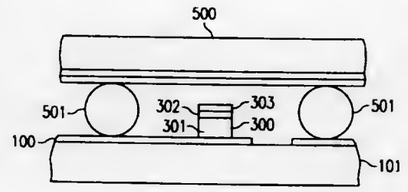
1. In a method of producing a compound electrode for a spark plug, which has a core of a first electrically conductive material and a casing surrounding the core and composed of a second electrically conductive material, wherein initial starting bodies of a core and a casing having a circular contour are provided, and the casing is deformed on the core to surround the core, the improvement comprising performing the deformation of the casing on the core by a single step of extrusion molding the casing on the core with simultaneous shaping of the core and simultaneous formation of a rectangular cross-sectional profile of the electrode.

5,551,903

FLAT PANEL DISPLAY BASED ON DIAMOND THIN FILMS

Nalin Kumar, Austin, and Chenggang Xie, Cedar Park, both of Tex., assignors to Microelectronics and Computer Technology, Austin, Tex.

Division of Ser. No. 300,771, Jun. 20, 1994, which is a continuation of Ser. No. 851,701, Mar. 16, 1992, abandoned. This application Oct. 19, 1994, Ser. No. 326,302
Int. Cl.[6] H01J *1/30;9/02*
U.S. Cl. 445—24 **24 Claims**



1. A method of making a field emission cathode, comprising the steps of:

depositing a layer of conductive material over a substrate;

depositioning an electrically resistive pillar over said layer of conductive material, said electrically resistive pillar having a substantially flat surface spaced from and substantially parallel to said substrate; and

depositing a layer of cathode material over said surface of said electrically resistive pillar, said layer o cathode material having a substantially flat exposed surface spaced from and substantially parallel to said substrate, wherein said cathode material has a negative electron affinity.

5,551,904

METHOD FOR MAKING AN ION THRUSTER GRID

Daniel E. Hedges, Seattle; Jere S. Meserole, Jr., Issaquah, and Michael E. Rorabaugh, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.

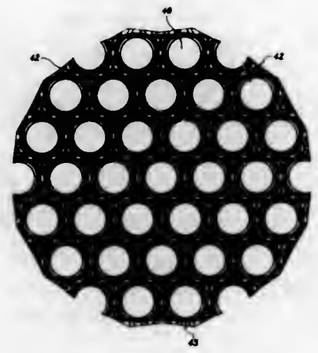
Division of Ser. No. 303,094, Sep. 8, 1994, which is a continuation-in-part of Ser. No. 23,285, Feb. 26, 1993, Pat. No. 5,448,883. This application Jun. 5, 1995, Ser. No. 463,581
Int. Cl.[6] F03H *1/00*
U.S. Cl. 445—47 **7 Claims**

1. A process for manufacturing a carbon-carbon grid element of an ion optics set for an ion beam source comprising the steps of:

positioning at least two layers of carbon fibers in a crossing or woven array;

embedding the array of carbon fibers in a carbon matrix; and

creating apertures in the carbon matrix between the carbon fibers.



partial one of a plurality of images and the slats of both sheets of a panel defining at least a full one of said plurality of images, each of said slats of the overlying sheet being laterally narrower than said slats of the underlying sheet; and

(B) means for moving in turn each of a subset N−1 of said plurality of panels a length greater than the length of a louver such that movement of a given panel in one longitudinal direction exposes the slats of an adjacently overlying panel and conceals the slats of the given panel underneath the slats of an underlying panel, and movement of said given panel in the opposite longitudinal direction exposes the slats of said given panel and conceals the slats of an adjacently overlying panel under the slats of said given panel.

5,551,905

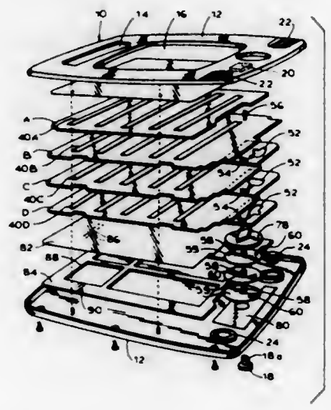
SUCCESSIVE IMAGE DISPLAY DEVICE

Zeb Billings, 5392 N. Hwy. 83, Hartland, Wis. 53029, and Michael Henning, 6040 Blvd. East, West New York, N.J. 07093

Filed Feb. 14, 1994, Ser. No. 195,483

Int. Cl.[6] A63H *33/38;33/30*

U.S. Cl. 446—151 **12 Claims**



1. A device for successively displaying a plurality of images, comprising:

(A) a plurality N of overlying flexible panels where N is at least 3, each of said panels defining a longitudinal series of flexible slats and louvers between said slats, said slats being longitudinally longer than said louvers, each of said slats of all underlying panels being interleaved longitudinally through said louvers of all overlying panels, said slats of each panel cooperatively defining one of said plurality of images, each of said slats of an overlying panel being laterally narrower than said slats of all underlying panels; each of said panels being a composite of two overlying flexible sheets marginally sealed together along the longitudinal edges thereof, each of said sheets defining a longitudinal series of flexible slats and windows between said slats, said slats being longitudinally longer than said windows, each of said slats of the underlying sheet being interleaved longitudinally through said windows of the overlying sheet to divide each window of the overlying sheet into two louvers, said slats of each sheet defining a

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5,551,906

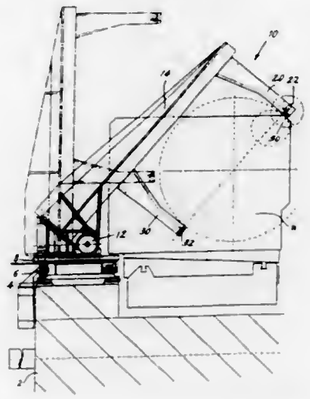
CALIPER ASSEMBLY FOR GRINDER

Dale Helgren, Green Bay, Wis., assignor to Voith Sulzer Paper Technology North America Inc., Appleton, Wis.

Filed Nov. 23, 1994, Ser. No. 344,095

Int. Cl.[6] B24B *49/00*

U.S. Cl. 451—8 **16 Claims**



11. A caliper assembly for a grinding apparatus, the caliper assembly comprising:

a pair of caliper arms and means supporting the caliper arms to extend past opposite sides of a workpiece, the caliper arms have inward facing sides which are opposed when the arms are in position to straddle the workpiece, dimension measuring means located on each of the caliper arms including means for contacting the workpiece surface and means for measuring the distance between the contacting means for thereby measuring a dimension of the workpiece and

a surface inspecting device located on the inward facing side of one of the caliper arms and also outward beyond the dimension measuring means on the one caliper arm, the inspecting device being for inspecting a surface characteristic of the workpiece surface, the inspecting device is supported on the one caliper arm such that the inspecting device does not contact the workpiece and such that the surface inspecting device is located at a desired, fixed distance from the workpiece surface when the dimension measuring means is in contact with the workpiece surface.

5,551,907

SYSTEM FOR ULTRASONIC LAP GRINDING AND POLISHING

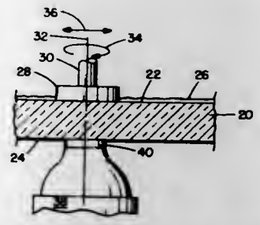
Sandeep Davé, Bethel, Conn., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 14, 1994, Ser. No. 213,393

Int. Cl.[6] B24B *1/00*

U.S. Cl. 451—41 **9 Claims**

1. A method of lapping or polishing a substrate to an optical



finish, said substrate having first and second opposed surfaces, the method comprising the steps of:

introducing an abrasive slurry to the first surface of the substrate;

moving a lap across, and in engagement with, the first surface of the substrate in the medium of the abrasive slurry; and

applying ultrasonic energy in one instance to the second surface of the substrate and in another instance to the first surface of the substrate at a level up to approximately 2,000 watts at a frequency in excess of 15 kHz and at a location generally centered with the lap such that, in either instance, half wave resonance occurs substantially at the first surface thereof whereby the surface of the substrate engaged by the lap is polished to an optical finish.

5,551,908

CENTERLESS GRINDER AND WHEEL TRUING DEVICE THEREFOR

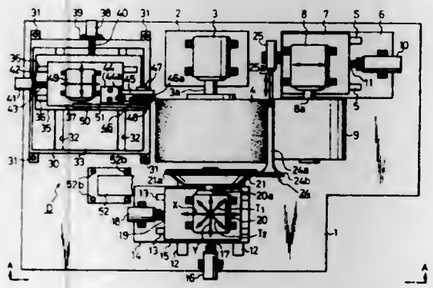
Katsuhiko Harada, Fujisawa, Japan, assignor to Fuji Oozx, Inc.

Continuation of Ser. No. 165,946, Dec. 10, 1993, abandoned. This application Jun. 8, 1995, Ser. No. 489,004

Claims priority, application Japan, Apr. 26, 1993, 5-099101; May 14, 1993, 5-112615

Int. Cl.[6] B24B *7/00*

U.S. Cl. 451—72 **8 Claims**



1. A centerless grinder for grinding a workpiece which comprises a head and a stem, the grinder comprising:

a first grinding wheel which rotates at high speed;

first drive means for driving the first grinding wheel;

an adjusting wheel which is movable with respect to the first grinding wheel and rotates at speed lower than the first grinding wheel, the stem of the workpiece being held between the first grinding wheel and the adjusting wheel so that the stem may be ground;

a second grinding wheel for grinding the head of the workpiece, the second grinding wheel rotating on an axis in parallel with an axis of the first grinding wheel;

second drive means capable of rotating the second grinding wheel while the first grinding wheel is driven; and

means for moving the second drive means in directions parallel with and perpendicular to an axis of the workpiece so that the head may be ground by the second grinding wheel in directions parallel with, perpendicular to, and oblique to the axis of the workpiece.

5,551,909

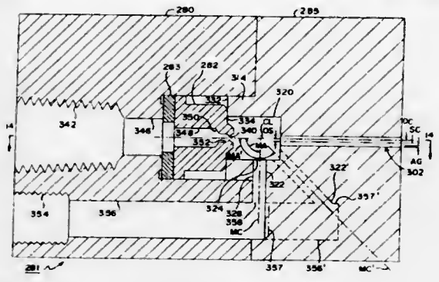
METHOD AND APPARATUS FOR CLEANING WITH HIGH PRESSURE LIQUID AT LOW FLOW RATES

Donald C. Bailey, 106 Redwood Ct., Summerville, S.C. 29483

Continuation-in-part of Ser. No. 067,056, May 26, 1993, abandoned, which is a division of Ser. No. 635,949, Dec. 28, 1990, Pat. No. 5,220,935. This application Nov. 28, 1994, Ser. No. 348,863

Int. Cl.[6] B24C *3/00*

U.S. Cl. 451—75 **36 Claims**



24. A method of abrasive cleaning comprising:

providing a flow of liquid under pressure from a liquid supply means to a liquid orifice defined by a nozzle member of a nozzle assembly;

providing a flow of an admixture of abrasive particles and a transport gas under pressure, said particles being propelled by said transport gas from a media supply means to a media opening defined by said nozzle assembly;

discharging a liquid spray through said liquid orifice into an impact chamber along a spray axis, said impact chamber being defined by said nozzle assembly, and the liquid spray discharged by said liquid orifice having an inner core substantially free of said transport gas;

discharging said admixture of abrasive particles and transport gas through said media opening into said impact chamber along a media axis; and,

conveying said abrasive particles, said transport gas and said liquid spray to the outside of said nozzle assembly through a discharge passage for impinging said abrasive particles against a surface to be cleaned, said discharge passage communicating with said impact chamber and being defined by said nozzle assembly;

said media axis defining an incidence angle relative to said liquid spray axis,

said liquid orifice having a shape for providing said liquid spray in a pattern having a transverse width dimension substantially larger than a transverse height dimension,

said media opening being positioned relative to said orifice shape to produce an impact area on a side of said spray pattern corresponding to said width dimension,

said incidence angle and the velocity of said particles discharged along said media axis being sufficient to separate said abrasive

particles from said transport gas and cause at least a substantial portion of said separated abrasive particles to impact said impact area of the liquid spray with sufficient kinetic energy to penetrate into and be carried by said inner core,

the flow rates of said abrasive particles and said transport gas and the size of said media opening being such as to provide said particle velocity,

a side of said spray pattern corresponding to said width dimension being spaced from a wall portion of said discharge passage by a gap providing a flow path for said separated transport gas to exit said impact chamber separately from said inner spray core,

the gas pressure in said impact chamber being sufficient to propel a flow of said separated transport gas through said gap,

and the size of said gap being such that said inner spray core remains substantially free of said transport gas as said transport gas, said abrasive particles and said liquid spray are conveyed to the outside of said nozzle assembly through said discharge passage.

5,551,910

ARRANGEMENT AND PLANT FOR FLUID JET CUTTING OF FOOD PRODUCTS

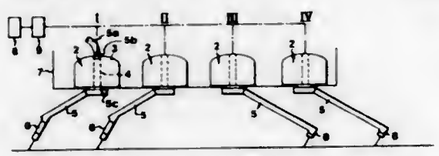
Jens Nielsen, Bagsvaerd, and Leif Dalum, Hörsholm, both of, Denmark, assignors to Lumetech A/S, Denmark

Filed Mar. 7, 1995, Ser. No. 397,115

Claims priority, application Sweden, Sep. 8, 1992, 9202573

Int. Cl.[6] A22C *17/00*

U.S. Cl. 452—149 **2 Claims**



1. An arrangement for fluid jet cutting, especially for food products, comprising:

a belt conveyor for carrying food products;

a frame;

a nozzle assembly movably attached to the frame, the nozzle assembly including an angled pipe having first and second ends, the first end being connected to a spray nozzle;

a reversible rotary motor including a hollow shaft having third and fourth ends, said third end of the shaft being fixedly connected to and in fluid communication with said second end of the pipe; and

a conduit for supplying cutting fluid, the conduit being connected by means of a rotary coupling to said fourth end of the shaft.

5,551,911

SYSTEM FOR HANDLING COINS

Karl F. Rumbach, Alfter-Witterschlick, Germany, assignor to Standardwerk Eugen Reis GmbH, Bruchsal, Germany

Filed Apr. 7, 1995, Ser. No. 418,519

Claims priority, application Germany, Apr. 8, 1994, 44 12 092.3

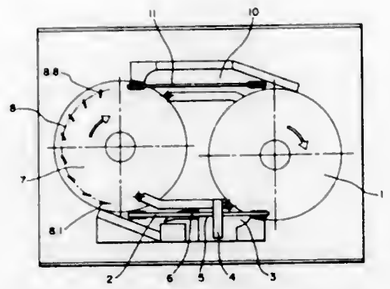
Int. Cl.[6] G07D *3/14*

U.S. Cl. 453—3 **13 Claims**

1. A system for sorting coins and similar disk-shaped objects comprising:

a generally horizontal and circular loading tray;

a circular sorting track and sorting disk, said sorting track being equipped with sorting devices for sorting coins on one of a diameter-dependent and diameter-independent basis and said sorting disk comprising an elastic friction material;



a control track extending between said loading tray and said sorting track and disk, said control track adapted to singularize, separate and transport coins from said loading tray to said sorting track and disk, said control track being provided with a coin sensing device and a coin conveying mechanism extending from said loading tray to said sorting track and disk, said control track being disposed in a position which is substantially tangential to both said loading tray and said sorting track and disk.

5,551,912

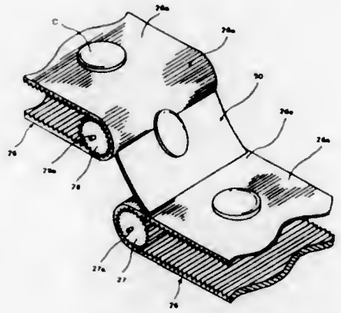
COIN CONVEYING APPARATUS

Takatoshi Takemoto; Toshikazu Chida, both of Tokyo; Noriaki Kano, Hanamaki; Eizi Ito, Hanamaki; Koji Murakami, Hanamaki; Takasi Itagaki, Hanamaki; Kozo Sekimoto, Sendai, and Masanori Suzuki, Hanamaki, all of, Japan, assignors to Kagushiki Kaisha Ace Denken, Japan

Filed Aug. 29, 1994, Ser. No. 297,509

Int. Cl.[6] G07D *1/00*; **B65G** *47/56*

U.S. Cl. 453—56 **8 Claims**



1. A coin conveying apparatus for conveying coins comprising a plurality of conveying units, each including an endless belt having a flat peripheral surface, a drive pulley and a driven pulley over which said endless belt is placed, a shaft for each pulley, a pulley driving mechanism to rotate said shaft of said drive pulley, and a conveying base upon which the above mentioned parts are mounted, wherein:

said shaft of said driven pulley is rotatably fixed to said conveying base to extend parallel to a horizontal direction;

said shaft of said drive pulley is rotatably fixed to said conveying base to extend parallel to a horizontal direction, at a higher position than said shaft of said driven pulley to allow said endless belt to ascend gradually from a driven pulley end to a drive pulley end;

said pulley driving mechanism rotates said shaft of said drive pulley so that a portion of said flat peripheral surface of said endless belt positioned at an upper side of said endless belt, and on which the coins are placed, moves toward said drive pulley from said driven pulley; and

said plurality of conveying units are arranged next to each other so that said drive pulley end of one conveying unit is adjacent to said driven pulley end of another conveying unit;

said coin conveying apparatus further comprising a coin slide which allows coins that have reached the drive pulley end of said one conveying unit to slide onto said coin conveying endless belt of said another conveying unit at the driven pulley end thereof.

5,551,913

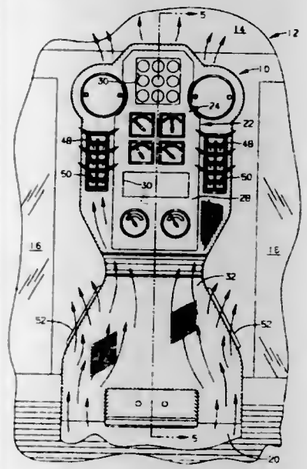
COMBINED INSTRUMENT MOUNTING AND AIR CONDUCTING HOUSING

Gary S. Peifer, Waynesville, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Jan. 3, 1995, Ser. No. 367,548

Int. Cl.[6] B60H *1/26*

U.S. Cl. 454—121 **11 Claims**



8. An instrument housing for use with construction equipment to mount instrument displays and deliver conditioned air to an operator, comprising:

a first central portion adapted for mounting a number of instrument displays thereon;

a second portion sealingly separated from said first central portion, said second portion surrounding said first central portion and being adapted for receiving and ducting air around said first central portion;

said second portion including an inlet duct disposed below said first central portion, a first outlet duct disposed at or above said first central portion and a pair of distribution ducts adapted for conducting the air between said inlet duct and said first outlet duct;

said pair of distribution ducts individually extending about opposite sides of said first central portion.

5,551,914

DEVICE FOR PROVIDING FRESH AIR TO THE PASSENGER COMPARTMENT OF A VEHICLE

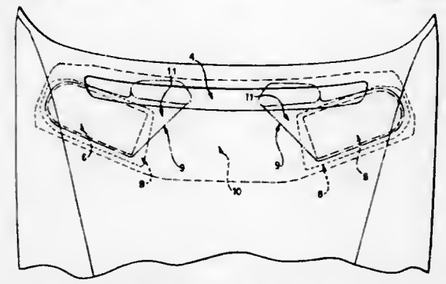
Michael Heil, Markt Schwaben, and Karl-Heinz Eder, Munich, both of, Germany, assignors to Bayerische Motoren Werke AG, Germany

Filed Jan. 20, 1995, Ser. No. 374,569

Claims priority, application Germany, Jul. 21, 1992, 42 24 051.4

Int. Cl.[6] B60H *1/28*

U.S. Cl. 454—146 **10 Claims**



1. A device for providing fresh air to the passenger compartment of a vehicle having a hood, comprising a filter device arranged on a back of the hood and connected with an air collecting chamber in a front wall area of the vehicle, a blower arranged to aspirate and convey air to air outlet openings terminating in an interior portion of the vehicle, and fresh air intake openings provided in the hood at a level of the filter device, wherein

means is provided for dividing the fresh air flow into two partial flows after passing the fresh air intake openings and bringing the two partial flows to two filters, such that the partial flows are guided around the filters and flow upwardly therethrough, and the cleaned fresh air is separately guided from each of the filters into the common air collecting chamber.

5,551,915

FLOOR MOUNTED AIR DISTRIBUTION OUTLET

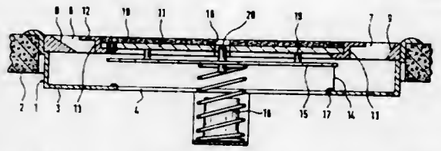
Wolfgang Schweikert, Stolberg, Germany, assignor to H. Krantz-TKT GmbH, Gladbach, Germany

Filed Mar. 23, 1995, Ser. No. 409,005

Claims priority, application Germany, Apr. 28, 1994, 9407055 U

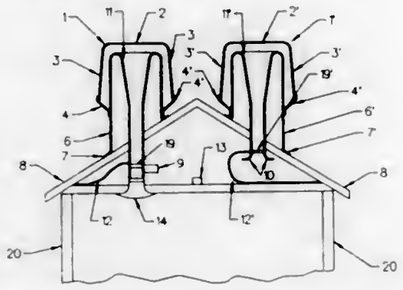
Int. Cl.[6] F24F *13/06*

U.S. Cl. 454—290 **6 Claims**



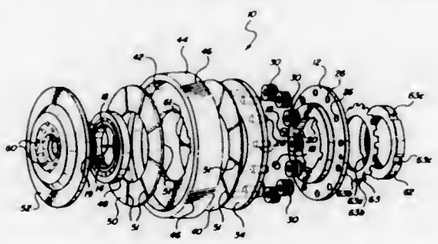
1. A floor well air distribution outlet for forming a trumpet shaped air stream comprising a cylindrical casing, a ring disk overlying said casing, a plate in spaced parallel relation to said disk, said plate including an inflow opening concentric with said disk, said disk including a first and second series of radially directed slots extending therethrough, the slots of said first series intervening between the slots of said second series, said slots being defined at their radial outermost ends by soffit portions sloping downwardly toward the axis of said disk, the inclination of said soffit portions of said first series being steeper than the inclination of said soffit portions of said second series and a cover member overlying said disc, said cover member including a plurality of radially outwardly extending tongue portions, said tongue portions partially covering said slots.

5,551,916
TORNADO PROTECTION SYSTEM
Harry R. Morse, Jr., P.O. Box 20904, Waco, Tex. 76702
Filed May 16, 1995, Ser. No. 442,561
Int. Cl.[6] F24F *11/00*
U.S. Cl. 454—340 10 Claims



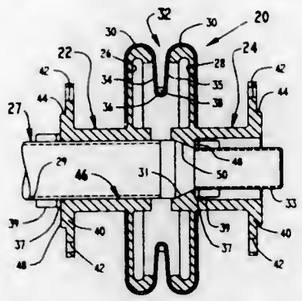
1. A pressure stabilizing system for equalizing the pressure within an enclosure and the atmosphere during rapidly developing low pressure atmospheric conditions comprising: a duct communicating between the inside and outside of said enclosure, a valve means for normally closing said duct, means for detecting a rapidly developing low pressure atmospheric conditions, and actuator means for automatically opening said valve during said rapidly developing low pressure atmospheric conditions.

5,551,917
TORQUE REGULATING DEVICE
William B. Wood, Kalamunda, Australia, assignor to Vysarn Pty Ltd., Bently, Australia
Continuation of Ser. No. 129,491, Sep. 30, 1993, abandoned, which is a continuation of Ser. No. 768,978, Oct. 3, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 475,746
Claims priority, application Australia, Apr. 14, 1989, PJ3668
Int. Cl.[6] F16D *7/02;13/76*
U.S. Cl. 464—46 29 Claims



3. A torque regulating device adapted for continuous slipping at a predetermined torque value between a driven shaft and a drive member, including a disc adapted to be fixedly attached to the shaft and having an outer face and an inner face, a bearing adjacent the inner face of the disc, drive gear wheel means carried on the bearing and arranged to receive an external driving force to transfer said driving force to the device, a low friction material disposed between the disc and the drive gear wheel means, clamp means for clamping the friction material between the disc and the drive gear wheel means, and the disc including radially inclined passages extending longitudinally through the disc from the outer face to the inner face and angled radially outwardly from the outer face to the inner face to enable a lubricating liquid assisted by centrifugal force to pass to the interior of the device adjacent the bearing and the friction material.

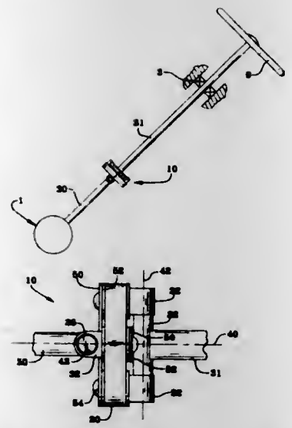
5,551,918
FLEXIBLE COMPOSITE COUPLING
Peter J. Jones, Erie, Pa.; Peter L. Valentine, Marion, Va., and Duncan J. Lawrie, Erie, Pa., assignors to Lawrie Technology Incorporated, Girard, Pa.
Filed Feb. 28, 1992, Ser. No. 843,671
Int. Cl.[6] F16D *3/50*
U.S. Cl. 464—80 5 Claims



1. A coupling for transmitting torque and accommodating axial and cocking misalignment between a driving member and a driven member, comprising:
a) a first attachment means formed on a first end of said coupling adapted to be attached to one of said driving member and said driven member, said first attachment means including a first flange extending generally outward from an axis of rotation of said first attachment means and further including a radiused periphery formed on said first flange at the largest diameter of said first flange;
b) a second attachment means formed on a second end of said coupling adapted to be attached to another of said driving member and said driven member, said second attachment means including a second flange extending generally outward from an axis of rotation of said second attachment means and further including a radiused periphery formed on said second flange at the largest diameter of said second flange;
c) a composite flexible element further including a wound filament impregnated with a resin matrix defined by at least two opposed diaphragm surfaces extending substantially radially inward from said radiused periphery formed on said first flange and said radiused periphery formed on said second flange to meet at a minimum diameter; and
d) pretensioning means in the form of at least one hoop wrap wound about said minimum diameter on said composite flexible element for pretensioning said flexible element;
whereby the torque carrying capacity and service-life of said coupling is increased by prohibiting micro buckling of said wound filament.

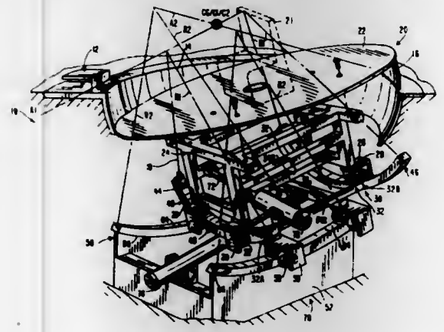
5,551,919
STEERING COLUMN ASSEMBLY
Berci Cherpician, Farmington, Conn., assignor to The Torrington Company, Torrington, Conn.
Continuation of Ser. No. 843,321, Feb. 28, 1992, abandoned, and a continuation of Ser. No. 843,792, Feb. 26, 1992, abandoned. This application Nov. 23, 1993, Ser. No. 156,324
Int. Cl.[6] F16D *3/52*
U.S. Cl. 464—92 3 Claims

1. A steering column assembly comprising:
a steering wheel connected to an upper shaft member having an axis, the upper shaft member being connected to a first yoke;
a steering box connected to a lower shaft member having an axis, the lower shaft member being connected to a second yoke; and
one flexible elastomeric disc cross member having a perimeter and disposed in a plane generally perpendicular to the axis of



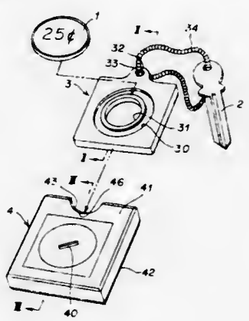
the first and second shaft members, two pairs of pins spaced around the perimeter of the elastomeric disc cross member in one plane, each pin being spaced 90° from adjacent pins and each set of non-adjacent pins acting as pivot points and defining an axis of pivot for, respectively, the first and second yokes so that each yoke is pivotally connected to the flexible elastomeric disc cross member in a plane parallel to the flexible elastomeric disc cross member, the pins and the elastomeric disc cross member being joined together so that any torque applied around the axis of a shaft member is transmitted through the elastomeric member to the pins, wherein the axis of pivot of the first yoke is 90° to the axis of pivot of the second yoke and the axis of pivot of the first yoke intersects the axis of pivot of the second yoke.

5,551,920
MOTION BASE
Andrew M. Ogden, Pasadena; Alexander Burkat, Placentia; Jon H. Snoddy, Pasadena, and Edward Fritz, Valencia, all of Calif., assignors to The Walt Disney Company, Burbank, Calif.
Filed Jun. 28, 1994, Ser. No. 267,787
Int. Cl.[6] A63G *31/16*
U.S. Cl. 472—59 11 Claims



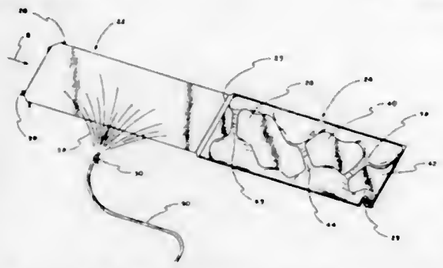
1. A motion base for apparatus for subjecting a user to a sensory experience, said motion base comprising:
a platform having an upper surface for supporting said user;
a first lower arcuate bearing portion having a first center and a first radius for supporting said platform for rotation about at least a first axis, said first arcuate bearing portion comprising a first pair of arcuate rails defined by longitudinally spaced apart radii of a first right circular cylinder having a longitudinal axis extending in a first direction;
a second lower arcuate bearing portion having a second center and a second radius for supporting said platform for rotation about at least a second axis, said second arcuate bearing portion comprising a second pair of arcuate rails defined by longitudinally spaced apart radii of a second right circular cylinder having a longitudinal axis extending in a second direction substantially orthogonal to said first direction; and
a motion generator for moving said platform about at least one axis of rotation; wherein:
a lower surface of said platform bears on said first pair of arcuate rails; and
lower surfaces of said first pair of arcuate rails bear on said second pair of arcuate rails.

5,551,921
COIN MAGIC DEVICE
Atsushi Fukano, Tokyo, Japan, assignor to Tenyo Co., Ltd., Tokyo, Japan
Filed Jul. 20, 1995, Ser. No. 504,958
Claims priority, application Japan, Jul. 22, 1994, 6-171193
Int. Cl.[6] A63J *5/00*
U.S. Cl. 472—69 4 Claims



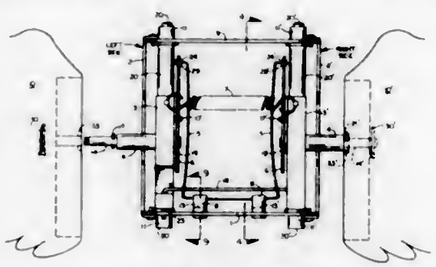
1. A coin magic device, comprising:
a coin holder formed like a plate, having formed in the center thereof a generally circular concavity having a through-hole formed in the bottom thereof and in which a coin is to removably be held;
a case for receiving said coin holder therein, composed of two opposite members, upper and lower, made of an opaque material, each having a slot formed in a position corresponding to said through-hole in said coin holder; and
a piercing piece which is to be penetrated through said case from one of said slots toward another;
said circular concavity in said coin holder being so deep that one side of said coin set therein is generally flush with the surface of said coin holder, said through-hole in said coin holder and two slits in said case having such a size that said piercing piece can be passed through them;
said case having formed on the inner surface thereof which faces the concavity side of said coin holder a guide wall which guides said coin moving between a set position lying on a straight line connecting said two slits in the case and a offset position located away from said straight line.

5,551,922
TOY WATER SLIDE
Harvey Katz, Barrington, and Marvin Smollar, Libertyville, both of Ill., assignors to Empire Industries, Inc., Delray Beach, Fla.
Filed May 27, 1994, Ser. No. 250,565
Int. Cl.[6] A63G *21/18*
U.S. Cl. 472—117 **11 Claims**



1. A toy water slide comprising a pool, an elongated slide attached to and extending outwardly from said pool, said slide having an edge adjacent to said pool, means for tautly holding said slide on a flat and horizontal surface, means for wetting the surface of said slide to decrease its surface friction, said pool having portions defining a serpentine path extending from the edge of the elongated slide adjacent to said pool and through said pool, so that a person will experience side to side forces while moving along said path, said pool including means for forming basins on the surface of said pool to retain puddles of water.

5,551,923
SIMULATED ARTICULATED BIRD WITH WIND ACTIVATED WING FLAPPING APPARATUS
Ronald A. Worzella, 35128 Hwy PP, Plymouth, Wis. 53073
Filed Nov. 27, 1992, Ser. No. 982,488
Int. Cl.[6] A61F *31/02*
U.S. Cl. 472—137 **4 Claims**



1. As an article of manufacture a simulated articulated bird with wind activated wing flapping apparatus wherein the improvement comprises;

a—a pair of flappable variable pitch wings, each wing mounted on a separate wing mount axle and

b—each said axle extending outward from assembled wing flapping apparatus mounted in the midsection of said simulated bird,

c—and means for changing the pitch of said wings, said means comprising said wing mount axles attached to wing pitch actuating cams and said cams actuated by a formed spring wire for said cams to pivot on a wing mount axle bearing extending through wing bearing mount blocks and,

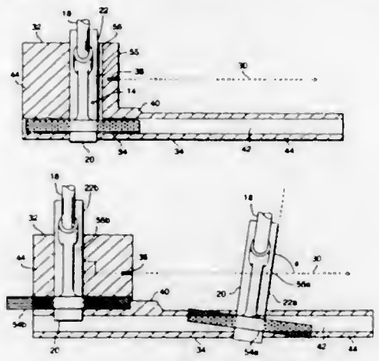
d—said formed spring wire having a base inserted in horizontal slots in slotted spring wire guides mounted on a rear wall bracket and,

e—a ball end on ends of said formed spring wire and each said ball end fitting into dimple socket mounts in said cams and

f—said wing bearing mount blocks rotate on axles mounted in bearing bushings in rear wall bracket and front wall bracket of said wing bearing mount blocks and means to synchronize flapping wings by means of a connector arm extending from the top of said wing bearing mount block on the left side to the bottom of said wing bearing mount on the right side and each of the two legs of said connector arm extending into its respective wing bearing mount block and further into a stop slot for each said end leg of said connector arm and

g—a tension spring connecting mount pins located on the top surface of wing mount bearing mounts.

5,551,924
PUTTING TRAINING APPARATUS
Daniel C. Zumtobel, Las Vegas, Nev., assignor to Muscle Memory Sports, Las Vegas, Nev.
Filed Aug. 21, 1995, Ser. No. 517,362
Int. Cl.[6] A63B *69/36*
U.S. Cl. 473—238 **17 Claims**



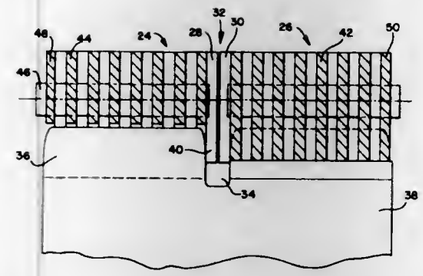
1. A training apparatus for use with a golf club having a shaft and a club head attached to said shaft, said apparatus comprising:

a base plate adapted to rest on a practice surface, said base plate comprising a body, a pointer attached to said body, and means for indicating alignment of said club head relative to an initial target line for a golf ball; and

a club member comprising means for mounting said club member onto said shaft, an extension arm coupled to said means for mounting, and a colored translucent blade attached to said extension arm, said club member being configured such that said means for indicating, as viewed through said blade relative to a user, appears as a first color where said blade is aligned with said means for indicating and appears as a second color where said blade is misaligned with said means for indicating.

5,551,925
CHAIN ASSEMBLIES WITH MINIMAL PIN PROJECTION
Philip J. Mott, and David C. White, both of Dryden, N.Y., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.
Continuation-in-part of Ser. No. 131,473, Oct. 4, 1993, Pat. No. 5,427,580, which is a continuation-in-part of Ser. No. 885,194, May 19, 1992, abandoned. This application Dec. 21, 1994, Ser. No. 361,432
Int. Cl.[6] F16H *7/00*
U.S. Cl. 474—85 **22 Claims**

1. A silent chain assembly, comprising:



a plurality of interleaved sets of links, pivot members connecting adjacent sets of links, each link having a pair of apertures for receiving said pivot members,

some of said sets of links including inside links, each of said inside links having at least one depending tooth adapted to contact the teeth of a sprocket, said inside links being constructed to permit articulation of said inside links with respect to said pivot members,

some of said sets of links having at least one guide link at an innermost portion of said sets and an outer link at an outermost portion of said sets, said guide links having said pivot members extending through at least a portion of said apertures of said guide links, said pivot members extending from beyond an edge of said guide link to beyond an edge of said outer link in said guide sets of links,

said pivot member extending a greater distance beyond said edge of said outer link than the distance said pivot member extends beyond said edge of said guide link.

12. A silent chain and sprocket assembly, comprising:

first and second chains, each of said chains having a plurality of interleaved sets of links, said chains being in side-by-side relationship around sets of sprockets, each chain having an inner portion that is located closest to the other chain and an outer portion located on the opposite side of said chain from said inner portion,

each chain having pivot members connecting adjacent sets of links, each link having a pair of apertures for receiving said pivot members,

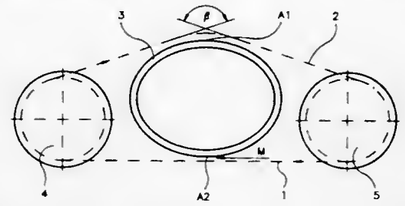
each chain having some of said sets of links including inside links, each of said inside links having at least one depending tooth adapted to contact the teeth of a sprocket, said inside links being constructed to permit articulation of said inside links with respect to said pivot members,

each of said chains having some of said sets of links with at least one guide link at said inner portion of said chain and an outer link at an outer portion of said chain, said guide links having said pivot members extending through at least a portion of said apertures of said guide links, said pivot members extending from said pivot members extending from beyond an edge of said guide link to beyond an edge of said outer link in said sets of links having guide links,

at least some of said guide links of said first chain contacting at least some of said pivot members of said second chain as said chains transverse said sprockets during operation, and

said pivot members of said second chain contacting said guide links of said first chain at a location along said guide links between said pivot members of said first chain.

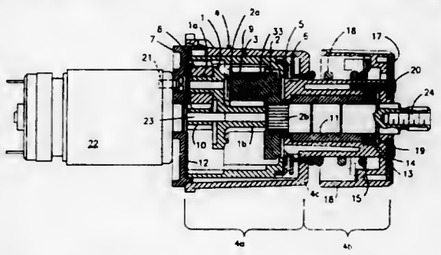
5,551,926
AUTOMATIC TENSIONING AND DAMPING ELEMENT FOR ENDLESS CHAIN DRIVES
Siegfried Ebert, and Ilona Ebert, both of Radefelderstrasse 18, both of 04509 Freiroda, Germany
Filed Jan. 27, 1995, Ser. No. 379,940
Claims priority, application Germany, Jul. 27, 1992, 42 24 753.5
Int. Cl.[6] F16H *7/08*
U.S. Cl. 474—101 **6 Claims**



1. An automatic tensioning and damping element for endless chain drives comprising

a deformable ring having a jacket profile matching with play a profile of a chain, and having a shape continuously disposed between the shape of a concentric ring and the shape of a cassinic curve with an ellipse-like shape, where the outer diameter of the ring is larger than the diameter of the largest chain wheel of the chain drive, wherein the automatic tensioning and damping element is disposed as an elastically deformable element between a loose strand and a load strand, and where the automatic tensioning and damping element continuously acts simultaneously on the loose strand and on the load strand.

5,551,927
GEAR MECHANISM FOR ACCUMULATOR FOR DRIVEN ELECTRIC DRILL OR ELECTRIC SCREWDRIVER
Bernd Enzmann, Villingen-Schwenningen, and Hansjörg Maus, Donaueschingen, both of, Germany, assignors to IMS Morat Sohne GmbH, Germany
Filed Jul. 25, 1994, Ser. No. 280,237
Claims priority, application Germany, Jul. 23, 1993, 43 24 876.4
Int. Cl.[6] F16H *35/10;* **B25B** *21/00*
U.S. Cl. 475—265 **15 Claims**



1. A gear assembly comprising a gear housing (**4**), an annular gear (**3**) provided inside said gear housing, a planetary gearing (**1, 2, 8, 9**) provided internal of said annular gear (**3**) for reduction of rotations between a drive shaft (**23**) and an output shaft (**24**), said annular gear (**3**) provided with internal teeth which are in engagement with said planetary gearing, and an overload clutch provided between said annular gear and said output shaft,

wherein said annular ring (3) is formed of a plastic material, and wherein said overload clutch is comprised of a guard plate (5) and a pressure ring (6), said pressure ring (6) being secured against rotation with respect to said gear housing (4), said guard plate (5) being secured against rotation with respect to the annular gear (3), said guard plate (5) and said pressure ring (6) facing each other and having engaging means provided on facing surfaces, said spring element (18) pressing against said pressure ring (6), said pressure ring (6) pressing against said guard plate (5), said guard plate (5) pressing against said annular gear (3), and said annular gear (3) pressing against a detente wall (12), such that said annular gear (3) is frictionally prevented from rotation with respect to said detente wall (12) and said pressure ring (6) until a predetermined torque loading is exceeded, and wherein upon exceeding said predetermined torque load said annular gear (3) is able to rotate with respect to said pressure ring (6) and said detente wall (12).

5,551,928

TORSIONAL VIBRATION DAMPER WITH A PLANETARY GEARSET

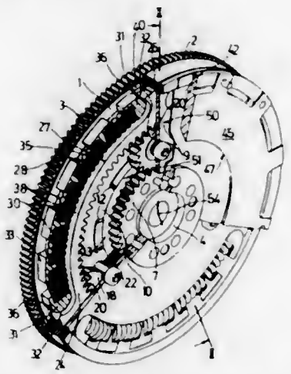
Jörg Sudau, Niederwerrn, Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Dec. 19, 1994, Ser. No. 358,697

Claims priority, application Germany, Dec. 22, 1993, 43 43 802.4; Jun. 29, 1994, 44 22 732.9

Int. Cl.[6] F16D *3/80;* **B60K** *17/02;* **F16F** *15/16;15/12*

U.S. Cl. 475—347 **13 Claims**



1. Torsional vibration damper in particular for clutches on motor vehicles, with a driving-side transmission element with at least one planet wheel which is engaged with a ring gear, and with a driven-side transmission element, whereby one of the transmission elements has actuating means for a spring device, wherein both the driving-side transmission element and the driven-side transmission element each have a centrifugal mass, at least one of which is connected by means of the spring device to at least one of the following elements: a planet carrier, and the ring gear;

the at least one element acting as an intermediate mass, whereby the intermediate mass can be driven in a movement which is a function of the speed and direction of rotation of the two centrifugal masses in relation to one another;

corresponding to one of the two centrifugal masses there is a recess which houses at least the planet carrier and the ring gear; and

the recess is formed by a chamber which is at least partly enclosed by one of the centrifugal masses, which chamber contains a pasty medium and is provided with a seal to prevent the discharge of said medium.

5,551,929

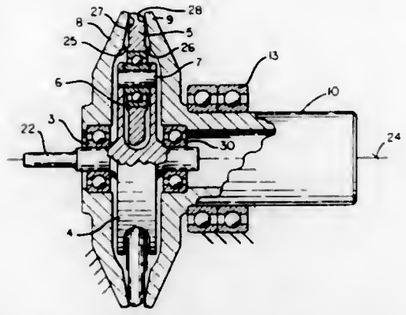
DIFFERENTIAL TRACTION DRIVE TRANSMISSION

Joseph E. Fritsch, 14001 Sherwood, Oak Park, Mich. 48237

Filed Apr. 12, 1993, Ser. No. 46,486

Int. Cl.[6] F16H *13/08*

U.S. Cl. 476—67 **14 Claims**



1. A differential traction drive transmission comprising:

an input shaft rotating about a first axis of rotation;

a carrier directly fixed to said input shaft and arranged to rotate with said input shaft about the first axis of rotation, having at least one planet pin;

axis of said planet pin, is substantially parallel to the first axis of rotation;

each said planet pin rotatably supporting a compound-planet;

said compound-planet having only a first surface and a second surface for conveying rotational energy;

said surfaces for conveying rotational energy are located on opposed sides of said compound-planet;

a reaction disc having a surface for conveying rotational energy;

said compound-planet's first surface for conveying rotational energy, engaging said reaction disc's surface for conveying rotational energy;

an output disc having a surface for conveying rotational energy;

said compound-planet's second surface for conveying rotational energy, engaging said output disc's surface for conveying rotational energy;

the engagement areas of the first and second surface for conveying rotational energy located on the same side of the rotational axis of said compound-planet;

a means for maintaining a force, normal to the engagement areas;

said output disc rotatable with an output shaft.

5,551,930

ADAPTIVE CONTROL METHOD FOR AN AUTOMATIC TRANSMISSION

Todd D. Creger, Metamora; Richard B. League, Peoria; Randall M. Mitchell, Washington; David M. Spurlock, Peoria, all of Ill.; James R. Talbott, Westborough, Mass., and Gregory L. Williamson, Metamora, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Apr. 13, 1995, Ser. No. 421,722

Int. Cl.[6] F16H *61/26*

U.S. Cl. 477—130 **17 Claims**

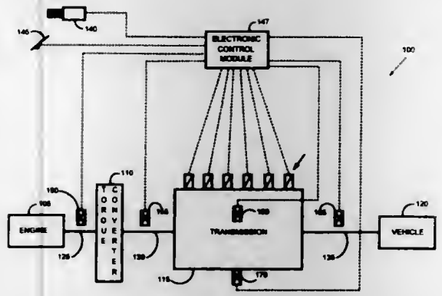
1. A method for filling clutches with fluid, in a vehicle having an engine, a transmission, and a torque convertor for transmitting torque between the engine and transmission, the transmission comprising:

a plurality of speed changing clutches;

a plurality of direction changing clutches;

a plurality of pressure control valves individually connected to the clutches;

a hydraulic pump adapted to deliver pressurized hydraulic oil to the plurality of pressure control valves, predetermined ones of



the pressure control valves metering hydraulic fluid to the clutches in response to receiving a clutch command signal in accordance with a method comprising the steps of:

commanding a pressure control valve of a predetermined clutch for a predetermined time period in order to fill the predetermined clutch in accordance with a plurality of clutch fill parameters;

determining the actual time to substantially fill the clutch, the actual time being indicative of a clutch fill period;

comparing the actual fill time with a predetermined fill time; and

adjusting at least one of the plurality of clutch fill parameters in response to the comparison in order to modify the clutch fill period during subsequent shifts to the predetermined clutch.

5,551,931

METHOD OF AND SYSTEM FOR GEAR SHIFT CONTROLLING FOR AN AUTOMATIC TRANSMISSION

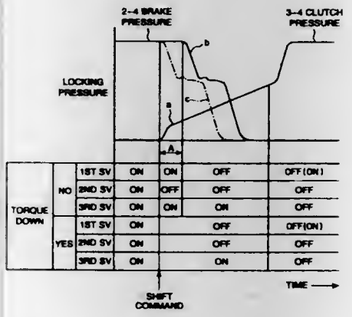
Akio Matsumoto, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima-ken, Japan

Filed Aug. 20, 1993, Ser. No. 109,485

Claims priority, application Japan, Aug. 20, 1992, 4-245914

Int. Cl.[6] B60K *41/06*

U.S. Cl. 477—149 **4 Claims**



1. In a shift control system for an automobile automatic transmission, having a plurality of hydraulically operated frictional elements, for selectively locking and unlocking said hydraulically operated frictional elements to automatically perform gear shifts, and for performing a torque down control for an engine according to engine operating conditions during a gear shift, a specific one of said gear shifts being created by locking a first specific hydraulically operated frictional element of said hydraulically operated frictional elements simultaneously with unlocking a second specific hydraulically operated frictional element of said hydraulically operated frictional elements, the improvement comprising:

control means for delaying commencement of said unlocking of said second specific hydraulically operated frictional element relative to commencement of said locking of said first specific hydraulically operated frictional element during said specific one of said gear shifts only when not performing said torque down control.

5,551,932

ENGINE IDLE CONTROL DURING BRAKING WITH LOCKUP CLUTCH BEING RELEASED

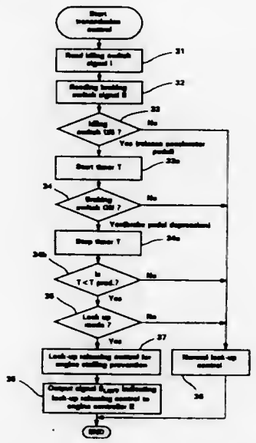
Shigeru Ishii, Atsugi; Yoshihide Shinso, Zama; Kosei Murata, Tsuchiure; Shigeki Shimanaka, Hadano; Shuji Kurokawa, Machida; Hideharu Yamamoto, Odawara, and Makoto Shiomori, Kikuchi-Gun, all of, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 5, 1995, Ser. No. 435,131

Claims priority, application Japan, May 6, 1994, 6-094334

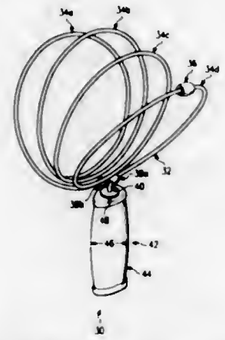
Int. Cl.[6] F16H *9/00;61/00;* **B60K** *41/28*

U.S. Cl. 477—168 **2 Claims**



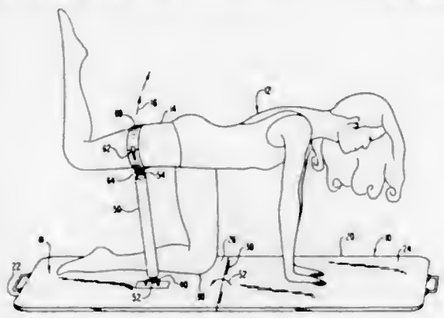
1. An apparatus for preventing occurrence of an engine stalling in a power train of an automotive vehicle, which is comprised of an engine and a lock-up type automatic transmission driven by the engine, said automatic transmission including a torque converter which can be set in a lock-up mode, said apparatus being operative during a braking operation of the vehicle for avoiding occurrence of an engine stalling and comprising an engine controller adapted to perform an idling speed control for the engine, and a transmission controller adapted to perform a lock-up releasing control for releasing the torque converter from the lock-up mode, said transmission controller being adapted to generate an output signal which indicates that the lock-up releasing control for the transmission is being performed, said apparatus further comprising a signal transmission means for transmitting said output signal from the transmission controller to the engine controller, and said engine controller being responsive to said output signal from the transmission controller, for performing the idling speed control of the engine and thereby preventing occurrence of an engine stalling.

5,551,933
WRIST MOBILIZATION TREATMENT DEVICE AND METHOD
Caryl A. Washburn, Lewisville, Tex., assignor to Applied Therapeutic Sciences, Inc., Southlake, Tex.
Filed Feb. 3, 1995, Ser. No. 383,731
Int. Cl.[6] A63B *23/16*; **A63H** *33/00*
U.S. Cl. 482—44 **14 Claims**



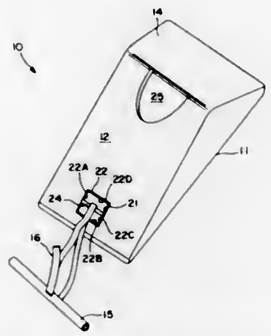
1. An exerciser for treating a wrist comprising:
a handle;
a track attached to said handle and having a first and second end wherein said track forms a plurality of continuous loops between said first end and said second end, said track being repeatedly adjustable between a first position which define an adjustable angle between said loops between 0° and 180° and a second position; and
a bead slidably coupled to said track wherein said bead is maneuvered from first end to said second end by manipulating said wrist through all possible ranges of motion.

5,551,934
PORTABLE GLUTEUS MAXIMUS EXERCISE MAT
Steve D. Binette, 3820 NW. 77th Ave., Hollywood, Fla. 33024
Filed May 2, 1995, Ser. No. 433,261
Int. Cl.[6] A63B *21/00*
U.S. Cl. 482—123 **10 Claims**



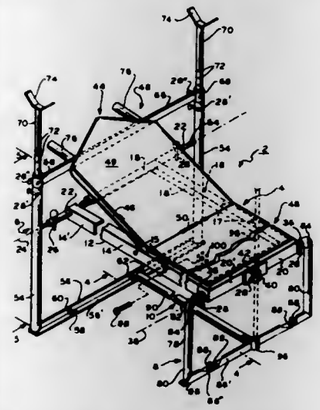
1. A portable exercise mat enabling a user to exercise his or her gluteus maximum muscles comprising a forward, planar mat section forming a singular, entirely flat and planar forward exercise surface and a rearward, planar mat section forming a singular, entirely flat and planar rearward exercise surface made of a flexible compressible material, both joined together with a hinge mechanism such that in a first, operable mode, said forward and rearward mat sections are coplanar and form a flat enlarged mat system with said forward and rearward exercise surfaces being coplanar without any elements rising thereabove, and in a portable mode, said forward and rearward mat sections having respective planar exercise surfaces disposed adjacent each other; said rearward exercise mat section having only one centrally located coupler mounted therein, said coupler being exposed to said corresponding planar exercise surface, said coupler mounted to a centrally located reinforcement plate occupying at least 30% of said rearward mat section; an expansible exercise link with a complementary coupler at one end thereof, said complementary coupler being removably attached to the mat mounted coupler, said expansible exercise link having a strap at an opposite end thereof which strap is attachable to a thigh of said user, whereby in said operable mode, said user attaches said strap onto his or her thigh, attaches said mat mounted coupler to said complementary coupler on said expansible exercise, link, places an opposing knee, opposite the strapped thigh, atop said rearward mat section and said centrally located reinforcement plate and lifts said strapped thigh away from said corresponding planar exercise mat surface thereby causing said expansible exercise link to resist said lifting of said strapped thigh.

5,551,935
EXERCISE DEVICE FOR THE LOWER BACK
Mark R. Pustaver, Matthews, N.C.; David A. Schmukler, Aliso Viejo, Calif., and Lewis S. Winter, III, Chesterfield, Mo., assignors to QL, Inc., Matthews, N.C.
Filed Oct. 28, 1994, Ser. No. 345,260
Int. Cl.[6] A63B *23/04*
U.S. Cl. 482—142 **9 Claims**



1. An exercise device for strengthening the lower back of a user, comprising:
(a) a base for being located on a supporting surface;
(b) an inclined surface supported by the base and defining a relatively long, gradual incline for engaging the thighs of the user to support at an angle a portion of the body extending generally from the waist to the knees, whereby the upper body of the user extends over a front edge of the inclined surface for exercising movement between a flexed position and an extended position, the user being oriented in a downwardly-facing condition relative to the supporting surface;
(c) said inclined surface defining a recess therein for protecting the groin area of the user during exercising;
(d) a declined surface supported by the base, and defining a relatively short, steep decline extending downwardly at an angle from the front edge of said inclined surface towards the supporting surface, said declined surface engaging a lower portion of the upper body of the user when in the flexed position; and the base, inclined surface, and declined surface being integrally formed together from a unitary, solid structure; and
(e) stabilizer means connected to a back end of the inclined surface of the exercise device for engaging and holding the legs of the user against the inclined surface when exercising.

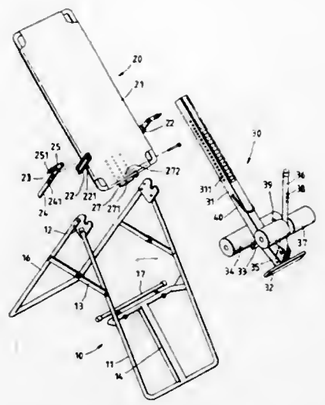
5,551,936
COLLAPSIBLE WEIGHT LIFTER'S BENCH
Richard H. Parisi, 51 Glenroy Rd. South, Fairfield, N.J. 07004, and Patrick J. Murphy, 248 2nd Ave., Garwood, N.J. 07027
Filed Oct. 12, 1995, Ser. No. 543,855
Int. Cl.[6] A63B *21/00*
U.S. Cl. 482—142 **19 Claims**



1. Collapsible weight lifter's bench comprising:
a pad support frame having a head end and a foot end;
a pad supported on and secured to the pad support frame;
a head end frame rotatably secured to and for supporting said pad support frame at said head end comprising:
a pair of spaced elongated upright member;
an elongated first cross base member secured to an end of each said upright members for supporting said upright member; and
an elongated intermediate member secured at its respective ends to and medially each said upright members and rotatably secured to the pad support frame;
first means including first pin means for selectively fixedly locking the pad support frame at said pad support frame head end to said intermediate member to preclude relative rotation of the intermediate member to the pad support frame;
a foot end frame for supporting said pad frame at said foot end comprising;
a U-shaped support member including a pair of upright legs and a pad frame support bar fixedly connected to and between an end of each said upright legs, said bar being rotatably secured to said pad support frame;
second means including second pin means for selectively fixedly locking the pad support frame at said pad support frame foot end to said support bar to preclude relative rotation of the bar to the pad support frame; and
an elongated second cross base member secured to an end of each said legs distal said bar for supporting said legs; and
an elongated brace member releasably secured to and between the head end frame medially the elongated first cross base member and the foot end frame medially the second cross base member.

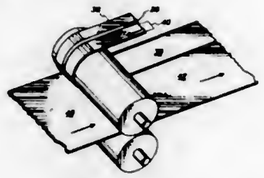
5,551,937
BODY INVERSION SUSPENSION EXERCISE DEVICE
Chung-Jen Kwo, Room 6, No. 18, San Fu Li, Yang Mei Township, Tao Yuan Hsien, Taiwan
Filed Jan. 4, 1995, Ser. No. 368,617
Int. Cl.[6] A63B *26/00*
U.S. Cl. 482—144 **2 Claims**

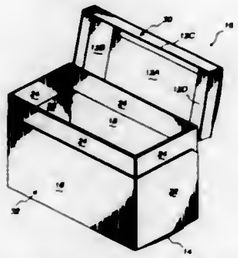
1. An exercise device comprising:
a frame having two U-shaped frames which are provided respectively and correspondingly at a top thereof with two hanging plates each having in a top thereof a recessed area, said frame further having two support arms which are fastened pivotally and respectively with said two U-shaped frames;



a back rest set mounted obliquely on said frame and, composed of a back rest, two hanging lugs, two suspension shafts, and a fastening rod, said back rest having respectively and corresponding on two side thereof a hanging member of a rectangular constructions and having an insertion block, said two hanging lugs being disposed respectively on said hanging member for mounting said back rest on said frame, said two hanging lugs having respectively a hanging piece which is provided with a plurality of through holes engageable with said insertion block of said hanging member, said two suspension shafts being disposed respectively on said hanging piece and provided respectively with a locating sleeve which is provided centrally with a circular groove respectively engageable with each said recessed area of said hanging plates, said fastening rod having longitudinally a through hole and being fastened to said back rest, said fastening rod further having at one end thereof at least one insertion hole dimensioned to receive therein an insertion pin; and
a leg pressing rod comprising a height adjusting rod, an operating rod, and a retaining ring, said height adjusting rod having a head which is engageable with said through hole of said fastening rod, said height adjusting rod further having a height scale marked thereon and a plurality of through holes which are so adjustable as to remain coaxial with said insertion hole of said fastening rod and are engageable with said insertion pin, said height adjusting rod further having a rest pad set located at a midsegment thereof and a pedal located at a bottom thereof, said operating rod being fastened pivotally to said height adjusting rod such that said operating rod can be caused to swivel in relation to said height adjusting rod, said operating rod provided at a lower segment thereof with another rest pad set and at an upper segment thereof with a plurality of projections spaced equidistantly, said retaining ring being joined with said height adjusting rod such that said retaining ring can be so moved as to be caught securely between two of said projections of said operating rod;
wherein said pedal of said leg pressing rod permits use by an exerciser to stand thereon in such a manner that both legs of the exerciser are restrained by said operating rod and said height adjusting rod which are connected by said retaining ring; and wherein said back rest can be caused to tilt rearwards when the exerciser lies on said back rest and stretches his or her hands over his or her head;
wherein said another rest pad set of said operating rod is providing centrally with a counter releasing elastic member to bias said height adjusting rod away from said another rest pad set.

5,551,938
RECLOSEABLE CONTAINER WITH PRESS-BONDED COLLAR
James L. Stone, Grand Rapids, Mich., assignor to Tenneco Packaging, Evanston, Ill.
Filed Jun. 9, 1994, Ser. No. 257,368
Int. Cl.° B65D *5/54;5/56*
U.S. Cl. 493—96 **9 Claims**

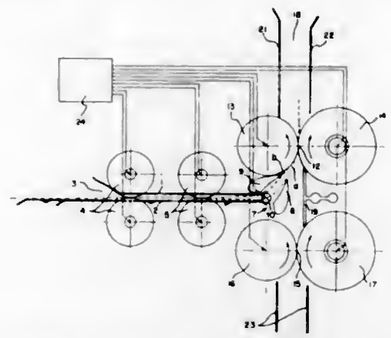




1. A method of manufacturing a recloseable container, comprising the steps of:
supplying a sheet of carton material and a strip of collar material separate from the sheet of carton material;
adhesively press bonding an outer surface of the strip of collar material to an inner surface of the sheet of carton material; and
after adhesively press bonding the strip of collar material to the sheet of carton material, simultaneously die-cutting and scoring the sheet of carton material and the strip of collar material into a respective carton blank and collar blank; and folding the respective blanks to produce a carton having opposing top and bottom walls, opposing front and back walls, and opposing side walls and a collar disposed within the carton and extending substantially from the top wall to a location spaced away from the bottom wall.

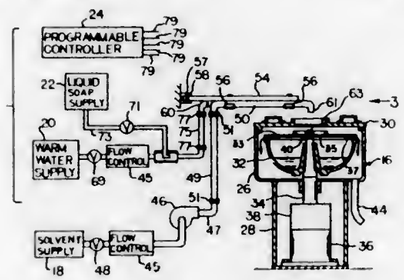
5,551,939
ZIGZAG FOLDING DEVICE
Rudolf J. H. R. Deckers, HC Eindhoven, Netherlands, assignor to Oce-Nederland, B.V., Venlo, Netherlands
Filed Aug. 11, 1994, Ser. No. 288,266
Claims priority, application Netherlands, Aug. 27, 1993, 9301483
Int. Cl.° B65H *45/16*
U.S. Cl. 493—442 **7 Claims**

1. A folding device for the zigzag folding of a sheet in a folding cycle, comprising two pairs of folding rollers which each form two parallel folding nips, the folding rollers of each pair are drivable alternately in opposite directions of rotation for transporting a sheet with a speed of conveyance, said folding nips being situated at some specified distance from one another in a folding path, and feed means for feeding a sheet with a speed of conveyance for folding in the folding path between the folding nips and deflecting means for alternately deflecting a part of a sheet fed to the folding nips, the speed of conveyance of the folding rollers being greater than or equal to the speed of conveyance of the feed means, wherein control means are provided which, shortly after a sheet has been folded in a folding nip, the folding rollers are changed over from a first speed of conveyance greater than the speed of



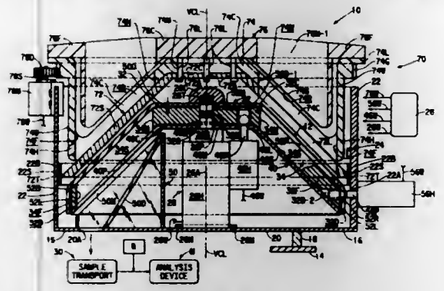
conveyance of the feed means, to a second speed of conveyance equal to the speed of conveyance of the feed means, maintaining said second speed of conveyance until subsequent change of direction of drive of the folding rollers.

5,551,940
APPARATUS FOR SEPARATING AGGREGATES FROM AN ASPHALT-AGGREGATE MIXTURE
Michael M. Cote, Hampden, Me., assignor to The Lane Construction Corporation, Meriden, Conn.
Filed Jul. 6, 1995, Ser. No. 498,931
Int. Cl.° B04B *13/00;11/04*
U.S. Cl. 494—11 **7 Claims**



1. Apparatus for extracting aggregates from an asphalt-aggregate mixture, comprising:
a centrifuge that includes a rotary bowl, an electric motor for rotating said bowl around a vertical axis, and a drain for the flow of liquid out of said centrifuge;
an organic solvent supply source having a first liquid line connectable to said bowl, and a first electrically-operated flow control means controlling flow through said first liquid line;
a warm water supply source having a second liquid line connectible to said bowl, and a second electrically-operated flow control means controlling flow through said second liquid line;
a liquid soap supply source having a third line for injecting liquid soap into said second liquid line, and a third electrically-operated flow control means controlling flow through said third line; and
a timer means having a first electrical output connected to said first electrically-operated flow control means, a second electrical output connected to said second electrically-operated flow control means, a third electrical output connected to said third electrically-operated flow control means; and a fourth electrical output connected to said electric motor; and
whereby solvent, water and soap can be cyclically delivered to the rotatable bowl, and dissolved asphalt can be drained out of the bowl on an automatic timed cycle.

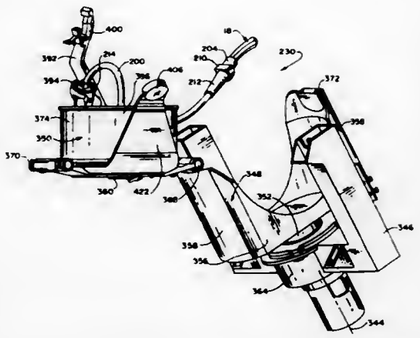
5,551,941
AUTOMATIC SAMPLE CONTAINER HANDLING CENTRIFUGE AND A ROTOR FOR USE THEREIN
Gary W. Howell, Elkton, Md., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 136,353, Oct. 14, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 461,466
Int. Cl.° B04B *5/02*
U.S. Cl. 494—16 **23 Claims**



21. In a sample test analyzer having
a sample analysis device,
a centrifuge instrument having a rotor for exposing a sample in a sample container to a centrifugal force field, and,
a transport for transporting small containers having a sample therein from the centrifuge instrument to the sample analysis device,
an improved rotor comprising:
a core having at least one container-receiving cavity extending completely therethrough; and
a floor, the floor and the core being positioned relative to each other so that, unless inhibited by the floor a container receivable within the cavity in the core would drop by gravity therefrom,
the floor and the core being movable together as a unit and also being movable with respect to each other from a closed position to an open position,
in the closed position the floor at least partially closes the cavity in the core to inhibit a container receivable within the core from dropping from the core in response to gravity, while in the open position the container receivable within
the cavity responds to gravity to drop from the core.

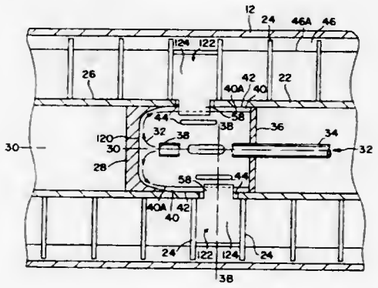
5,551,942
CENTRIFUGE WITH PIVOT-OUT, EASY-LOAD PROCESSING CHAMBER
Richard I. Brown, Northbrook, Ill.; Warren P. Williamson, Loveland, Ohio, and Paul M. Di Perna, Long Grove, Ill., assignors to Baxter International Inc., Deerfield, Ill.
Filed Dec. 22, 1993, Ser. No. 176,425
Int. Cl.° B04B *7/08*
U.S. Cl. 494—45 **18 Claims**

1. A centrifuge comprising
a yoke element including a base, a pair of arms extending from the base defining a space between the arms, a cross member, a hinge coupling the cross member to one of the arms for pivoting the cross member about the hinge between an operating position, in which the cross member extends across the space between the arms, and an access position, in which the cross member is cantilevered from the hinge outside the space between the arms,
a drive mechanism coupled to the base of the yoke element to rotate the yoke element about a rotational axis,
a processing chamber carried by the cross member for rotation about an axis and for pivoting with the cross member about the hinge between the operating position and the access position, the processing chamber including a bowl element



having a wall defining an interior area, a spool element having an exterior surface, and a mechanism joining the spool and bowl elements for movement between a mutually cooperating position, in which the spool element is enclosed within the interior area of the bowl element to define the processing chamber between the bowl element wall and the exterior spool surface, and a mutually separated position, in which the spool element is at least partially out of the interior area of the bowl element to expose the exterior spool surface for access, and
the cross member, when in the operating position, orienting the spool and bowl elements in the space between the arms with the processing chamber axis oriented generally coaxial with the rotational axis for rotation with the yoke element about the rotational axis, and the cross member, when in the access position, orienting the spool and bowl elements outside the space between the arms and outside the rotational axis for movement from the mutually cooperating position into the mutually separated position.

5,551,943
FEED ACCELERATOR SYSTEM INCLUDING ACCELERATING VANE APPARATUS
Woon F. Leung, Norfolk, and Ascher H. Shapiro, Jamaica Plain, both of Mass., assignors to Baker Hughes Incorporated, Houston, Tex.
Division of Ser. No. 110,324, Aug. 20, 1993, which is a continuation of Ser. No. 815,432, Dec. 31, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 481,043
Int. Cl.° B04B *1/20;3/04*
U.S. Cl. 494—53 **4 Claims**



1. A feed accelerator system for use in a centrifuge, the system comprising:
a conveyor hub rotatably mounted substantially concentrically within a rotating bowl, the hub having an inside surface and an outside surface,

at least one helical blade mounted to the outside surface of the conveyor hub, the blade having a plurality of turns,

an accelerator secured within the conveyor hub and including a distributor having a distributor surface,

a feed pipe mounted substantially concentrically within the conveyor hub for delivering a feed slurry to the centrifuge, the feed pipe including a discharge opening positioned proximate to the distributor surface,

at least one feed slurry passageway between the inside surface of the conveyor hub and the outside surface of the conveyor hub, each passageway having a leading edge and a trailing edge relative to the direction of rotation of the conveyor hub, and

a vane apparatus associated with the passageway and disposed between two adjacent turns of the helical blade, the vane apparatus including a baffle disposed only along the trailing edge of the passageway and extending radially inward into a slurry pool formed by the feed slurry on the inside surface of the conveyor hub, and an accelerator vane extending outwardly from the passageway and disposed between two adjacent turns of the helical blade.

5,551,944

Patent Not Issued For This Number

5,551,945

ENDOSCOPE SYSTEM INCLUDING ENDOSCOPE AND PROTECTION COVER

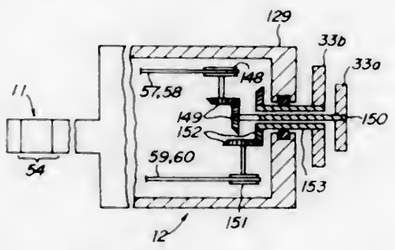
Hisao Yabe, Hachioji; Yoshihiro Iida, Tama; Akira Suzuki; Hideo Ito, both of Hachioji; Yoshio Tashiro, Hino; Minoru Yamazaki, and Osamu Tamada, both of Hachioji, all of, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 28, 1993, Ser. No. 52,450

Claims priority, application Japan, Mar. 16, 1993, 5-011594 U; Mar. 16, 1993, 5-011597 U; Mar. 16, 1993, 5-055860 U

Int. Cl.[6] A61B *1/00*

U.S. Cl. 600—122 **1 Claim**



1. An endoscope system including an endoscope having an insertion section to be inserted into a cavity under inspection and an operation section to which a proximal end of the insertion section is connected and a protection cover having an insertion section cover for covering said insertion section and an operation section cover for covering said operation section, wherein said operation section comprises a housing having a first longitudinal end to which said insertion section is coupled, a shaft protruding from a second longitudinal end of said housing which is opposite said first longitudinal end, and at least angle knob secured to said shaft near said second longitudinal end.

5,551,946

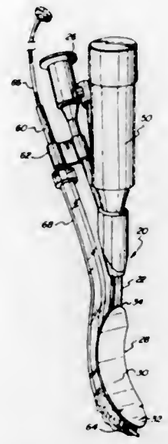
MULTIFUNCTIONAL INTUBATING GUIDE STYLET AND LARYNGOSCOPE

James R. Bullard, P.O. Box 14727, Augusta, Ga. 30919-0727

Filed May 17, 1994, Ser. No. 245,026

Int. Cl.[6] A61B *1/26*

U.S. Cl. 600—194 **11 Claims**



1. An intubating guide stylet and laryngoscope, comprising:

a rigid curved body, having a distal end for fitting into human oral and pharyngeal passageways, said body containing therein both a means for viewing and a means for illuminating a field adjacent said distal end of said body, and a laryngoscope blade affixed to said distal end of said body;

a hollow tubular stylet having a distal end and a proximal end, said stylet being affixed to said body by a connection remote from said stylet distal end, a flexible guide member having a distal end being provided in said hollow stylet, said hollow stylet having an outer diameter adapted to permit an endotracheal tube to be mounted on the exterior of said stylet; said stylet distal end being located adjacent said distal end of said body such that, upon passage of said flexible guide member through said stylet, said flexible guide member will be manipulated to position the guide member at a desired position in a patient's anatomy with direct vision by said illuminating and viewing means of said body, such that an endotracheal tube, when mounted to said stylet, may be advanced along the stylet onto the guide member to be positioned in the patient at the desired position in the patient's anatomy.

5,551,947

VISUALLY DIRECTED TROCAR FOR LAPAROSCOPIC SURGICAL PROCEDURES AND METHOD OF USING SAME

Steven G. Kaali, Dobbs Ferry, N.Y., assignor to Worldwide Optical Trocar Licensing Corporation, Dobbs Ferry, N.Y.

Continuation-in-part of Ser. No. 978,092, Nov. 17, 1992, Pat. No. 5,334,150. This application Nov. 17, 1993, Ser. No. 153,628

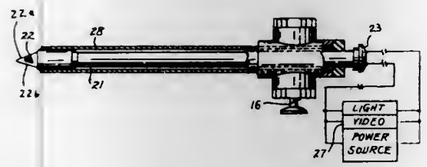
Int. Cl.[6] A61B *1/313*

U.S. Cl. 604—264 **21 Claims**

1. A surgical penetration device comprising:

a) an inflexible elongated member having first and second opposite ends and an inside space,

b) a light transmission and imaging member affixed to and extending beyond said first end of said inflexible elongated member and being formed essentially of transparent material to project light and receive light images,



c) a piercing edge for said light transmission and imaging member cooperable with said light transmission and imaging member, and

d) the second end of said elongated member being open and the open second end and the inside space being of respective predetermined size to permit detachable slidable insertion of a conventional lighting member and a conventional light image receiving member in the form of a conventional light telescope into the inside space from the open second end of the elongated member, and slidable removal of the conventional light telescope from the open second end of the elongated member, whereby said light transmission and imaging member is cooperable with said conventional light telescope when said conventional light telescope is inserted in said elongated member.

b) means for generating mechanical vibration disposed within said housing, the mechanical vibration being transmitted to at least the infrared transparent portion of said housing, said infrared transparent portion being substantially transparent to infrared radiation;

c) at least one source of infrared radiation disposed within said housing, the infrared radiation being applied to at least the infrared transparent portion of said housing;

d) a number of first fresnel lenses, the number of first fresnel lenses corresponding to the number of sources of infrared radiation, formed in the infrared transparent portion of said housing for concentrating said infrared radiation;

e) an infrared radiation reflecting member disposed proximate said infrared radiation sources for reflecting at least one infrared radiation from said infrared radiation source toward the infrared transparent portion of said housing; and

f) at least one thermal conduction member, the number of thermal conduction members corresponding substantially to the number of infrared radiation sources, substantially surrounding individual ones of said infrared radiation sources to absorb infrared radiation radiated therefrom and transfer the heat generated thereby to the infrared transparent portion of said housing.

5,551,948

Patent Not Issued For This Number

5,551,949

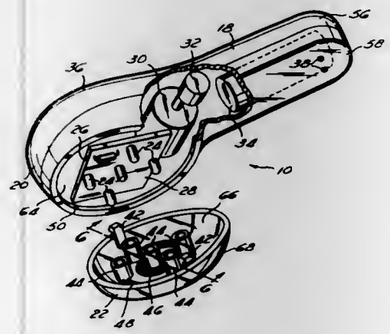
INFRARED MASSAGE DEVICE

Yong Kim, Seoul, Rep. of Korea, assignor to Interport International, Inc., Corona Del Mar, Calif.

Continuation of Ser. No. 961,104, Oct. 13, 1992, abandoned, which is a continuation of Ser. No. 775,295, Oct. 10, 1991, Pat. No. 5,176,130. This application Dec. 2, 1994, Ser. No. 356,651

Int. Cl.[6] A61H *1/00*

U.S. Cl. 601—15 **10 Claims**



1. A heated message therapy device comprising:

a) a hand-held housing having an infrared transparent portion;

5,551,950

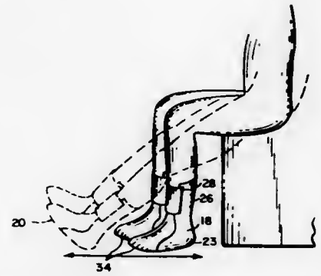
REHABILITATION METHOD

Peter Oppen, 10 Sassafras Rd., Westford, Mass. 01886

Filed Jul. 8, 1993, Ser. No. 88,790

Int. Cl.[6] A61H *1/00*

U.S. Cl. 601—35 **13 Claims**



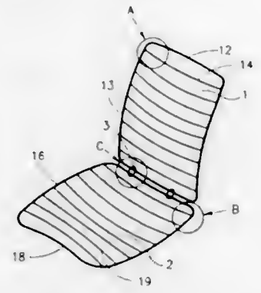
6. A rehabilitation method, comprising:

providing a rehabilitation device including a left cuff constructed and arranged to receive a left limb of a patient, a right cuff constructed and arranged to receive a right limb of the same patient, the right cuff being rigidly attached to the left cuff in a side-by-side relationship, and wherein the cuffs include constraining surfaces constructed and disposed in a manner to prevent longitudinal and lateral motion of the right limb with respect to the right cuff and to prevent longitudinal and lateral motion of the left limb with respect to the left cuff;

positioning a portion of an impaired limb of a patient in one of the left and right cuffs, and positioning a portion of a corresponding unimpaired limb of the same patient in the other of the left and right cuffs to cause the impaired limb of the patient and the unimpaired limb of the patient to remain symmetrically disposed; and

moving the unimpaired limb and the constrained portion of the impaired limb together relative to the trunk of the patient by the muscles of the unimpaired limb of the patient.

5,551,951
VEHICLE SEAT WITH MASSAGE DEVICE
Boris Fradkin, Rehov Hadas 9, Oranit, Israel
Filed Oct. 31, 1994, Ser. No. 332,116
Int. Cl.[6] A61H *15/00*
U.S. Cl. 601—115 **5 Claims**



1. An orthopaedic vehicle seat for providing driver/passenger massaging and ventilation comprising:

an upper seat-back portion having a rigid, rectangular frame defining a vertical plane with side frame portions bent at a point above its lower end approximately 0.3–0.5 of its height, so as to extend in arched fashion out of said vertical plane at an angle of 10–30 thereto, said upper portion frame enclosing a plurality of rows of horizontal, spring-resilient rigid rods connected thereto and extending along its width, each rod having rotatably disposed thereon a plurality of beads defining spaces therebetween, each of said beads being generally cylindrically-shaped; and

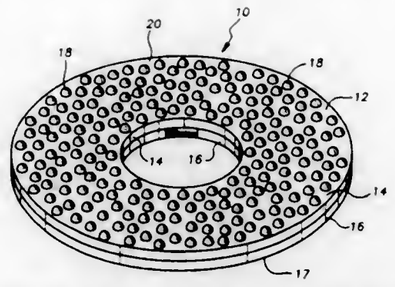
a lower seat portion having a rigid frame defining a horizontal plane and being joined at its rear end to said upper seat-back portion by a foldable joint, said lower seat portion frame enclosing a plurality of rows of spring-resilient rigid rods connected thereto and extending along its width, said plurality of rows of rigid rods defining a seat contour gently upwardly arched out of said horizontal plane proximate the front end of said lower seat portion frame and gently depressed toward its rear end, each said rigid rod having rotatably disposed thereon a plurality of said beads defining spaces therebetween,

such that when the vehicle seat is placed on a support base surface and a driver is seated thereon, said spring-resilient rigid rods thereof assume the contour of and support the driver's back, waist and hips, providing pressure while said beads massage said body parts and said spaces provide air-flow for ventilation.

5,551,952
TEETHING RING
Andreé M. Falgout, 104 Gladys St., Houma, La. 70364
Filed Feb. 9, 1995, Ser. No. 386,290
Int. Cl.[6] A61C *5/00*
U.S. Cl. 601—139 **1 Claim**

1. A teething ring comprising:

a teething member including a first and second washer shaped member, each said first and second washer shaped member having, respectively, a first and second hollow cavity, a first and second central aperture, and a first and second portion constructed from a resilient material and of a size sufficient to allow an infant to place said portions between its gums, said first portion including a first surface having a plurality of first protrusions extending therefrom, each said first protrusion having a rounded end portion, said second portion including a second surface having a plurality of second protrusions extending therefrom, each said second protrusion having a rounded end portion; and



a means for causing said first and second portions to vibrate at between 0.5 and 100 cycles per second, said means for causing said first and second portions to vibrate including:

an electric motor having a rotatable shaft,

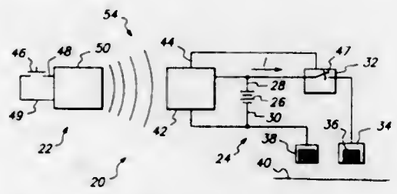
a mass attached to said rotatable shaft,

a first and second contact in electrical connection with said electric motor suitable for connection with a battery, and

means, in electrical connection between one of said first and second contacts and said electric motor, for adjusting the frequency of vibration, said means having an adjustable resistance element having an adjusting switch extending exteriorly of said teething ring that is positionable by a user;

said first and second washer members being secured together in a manner such that said first and second central apertures are concentrically aligned, said first and second hollow cavities form a chamber containing said means for causing said first and second portions to vibrate, and said adjusting switch extends partially into at least one of said first and second central apertures.

5,551,953
ELECTROTRANSPORT SYSTEM WITH REMOTE TELEMETRY LINK
Gary A. Lattin, Forest Lake, Minn., and Thomas A. Riddle, Sunnyvale, Calif., assignors to Alza Corporation, Palo Alto, Calif.
Filed Oct. 31, 1994, Ser. No. 332,322
Int. Cl.[6] A61N *1/30*; **A61M** *11/00*
U.S. Cl. 604—20 **21 Claims**

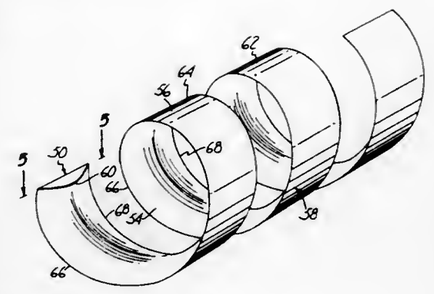


1. In an electrotransport system for delivering a therapeutic agent through a body surface of a patient, the system including a delivery unit having a pair of electrodes, at least one of the electrodes containing the therapeutic agent to be delivered, a source of electrical power electrically connectable to the electrodes, and a control unit for communicating with the delivery unit, the improvement comprising:

the delivery unit being physically remote from the control unit; and

a telemetry communication link between the delivery and control units whereby the units communicate through a radiated energy signal transmitter and a receiver.

5,551,954
BIODEGRADABLE DRUG DELIVERY VASCULAR STENT
Paul J. Buscemi, Long Lake; Elizabeth A. Stejskal, St. Paul, and Erin S. Doyle, Minneapolis, all of Minn., assignors to SCIMED Life Systems, Inc., Maple Grove, Minn.
Continuation of Ser. No. 944,069, Sep. 11, 1992, abandoned, which is a continuation-in-part of Ser. No. 771,655, Oct. 4, 1991, abandoned. This application Oct. 12, 1994, Ser. No. 322,107
Int. Cl.[6] A61F *2/06*; **A61M** *29/02*
U.S. Cl. 623—1 **21 Claims**



1. A stent having a generally tubular main body formed from a coiled strip for insertion into a lumen of a vessel of a living being wherein the main body includes an exterior surface for contacting the vessel when the main body is placed in a living being, said coiled strip including a cambered interior surface contacting a fluid passing through the lumen of the vessel, said coiled strip including a substantially flat exterior surface to which said cambered interior surfaces abuts, said cambered interior surface including a leading end facing a direction of flow and a trailing end wherein the leading end is immediately adjacent a wall of the vessel and the trailing end is immediately adjacent the wall of the vessel.

5,551,955

SOLID OXIDE FUEL CELL AND MANUFACTURING METHOD THEREOF

Hiroaki Taira; Michiaki Iha, and Hiroshi Takagi, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Division of Ser. No. 209,109, Mar. 9, 1994. This application Apr. 28, 1995, Ser. No. 430,404

Claims priority, application Japan, Mar. 10, 1993, 5-48841; Jun. 28, 1993, 5-157147; Mar. 1, 1994, 6-30740

Int. Cl.[6] H01M *6/00;* B05D *5/12*

U.S. Cl. 29—623.3 2 Claims

1. A method for producing a solid oxide fuel cell, the method comprising the steps of:

laminating a green sheet of solid electrolyte, a green sheet of fuel electrode and a green sheet of air electrode with the green sheet of solid electrolyte in the middle;

putting a sheet of sandpaper on each of the green sheet of said fuel electrode and the green sheet of said air electrode and placing a plastic film in between the rough surfaces of the sandpaper face and the green sheet of said fuel electrode and the green sheet of said air electrode, respectively;

pressing the laminate of green sheets and sandpaper to fix the green sheets together and to roughen an interface between the green sheet of solid electrolyte and the green sheet of said fuel electrode and an interface between the green sheet of solid electrolyte and the green sheet of said air electrode;

removing the sandpaper and the plastic films from the laminate of green sheets; and

sintering the laminate of green sheets.

5,551,956

SUPERHEAVY OIL EMULSION FUEL AND METHOD FOR GENERATING DETERIORATED OIL-IN-WATER SUPERHEAVY OIL EMULSION FUEL

Noboru Moriyama, Wakayama; Tsugitoshi Ogura, Kanagawa, and Akio Hiraki, Nagasaki, all of, Japan, assignors to Kao Corporation, and Mitsubishi Jukogyo Kabushiki Kaisha, both of Tokyo, Japan

PCT No. PCT/JP93/01056, § 371 Date Mar. 17, 1994, § 102(e) Date Mar. 17, 1994, PCT Pub. No. WO94/03560, PCT Pub. Date Feb. 17, 1994

PCT Filed Jul. 27, 1993, Ser. No. 196,219

Claims priority, application Japan, Aug. 5, 1992, 4-208991; Sep. 18, 1992, 4-249952; Sep. 18, 1992, 4-249953

Int. Cl.[6] C10L *1/10*

U.S. Cl. 44—301 12 Claims

1. A superheavy oil emulsion fuel consisting essentially of in a mixed and emulsified state, 100 parts by weight of a superheavy oil, 25 to 80 parts by weight of water and 0.02 to 5 parts by weight of a nonionic surfactant selected from the group consisting of the following nonionic surfactants (i), (ii), (iii) and (iv):

nonionic surfactant (i)

an alkylene oxide adduct of a tall oil fatty acid, a tall rosin, a gum rosin, a wood rosin or a mixture thereof,

nonionic surfactant (ii)

a mono- or/and diester of a tall oil fatty acid, a tall rosin, a gum rosin, a wood rosin or a mixture thereof with an alkylene oxide polymer;

nonionic surfactant (iii)

an alkylene oxide adduct of an aromatic ring compound having in its molecule one or more carboxyl groups and derived from petroleum or coal; and

nonionic surfactant (iv)

a mono- or/and diester of an aromatic ring compound having in its molecule one or more carboxyl groups and derived from petroleum or coal with an alkylene oxide polymer.

5,551,957

COMPOSTION FOR CONTROL OF INDUCTION SYSTEM DEPOSITS

Lawrence J. Cunningham, Kirkwood; Doo P. Hollrah, Manchester, and Alexander M. Kulinowski, St. Louis, all of Mo., assignors to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 127,967, Sep. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 878,969, May 6, 1992, abandoned. This application Dec. 27, 1994, Ser. No. 364,062

Int. Cl.[6] C10L *1/22;1/30*

U.S. Cl. 44—347 9 Claims

1. A fuel additive concentrate comprising:

a) fuel-soluble succinimide detergent/dispersant formed by reaction between (i) a mixture of ethylene polyamines having an average of about 3 to about 4 nitrogen atoms per molecule and (ii) at least one substituted succinic acylating agent in which the substituent is derived from polyisobutene containing an average of 50 to 100 carbon atoms;

b) a fuel-soluble mineral oil carrier or induction aid having a volatility of 50% or less; and

c) a fuel-soluble cyclopentadienyl manganese tricarbonyl compound that exists as a liquid at 25° C.; in proportions effective to reduce the weight of intake valve deposits in a spark-ignition internal combustion engine operated on a gasoline-based fuel containing an intake valve deposit-controlling amount of said fuel additive concentrate to below the weight of intake valve deposits in said engine operated in the same manner on the same gasoline-based fuel except that it is devoid of cyclopentadienyl manganese tricarbonyl compound.

5,551,958

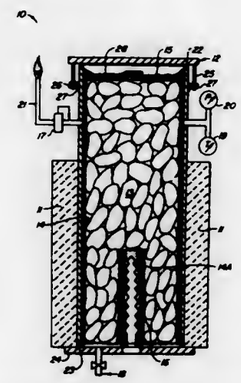
PROCESS FOR CHARCOAL PRODUCTION FROM WOODY AND HERBACEOUS PLANT MATERIAL

Michael J. Antal, Jr., Honolulu, Hi., assignor to University of Hawaii, Honolulu, Hi.

Division of Ser. No. 148,278, Nov. 8, 1993, Pat. No. 5,435,983, which is a continuation-in-part of Ser. No. 547,953, Jul. 2, 1990, abandoned. This application Feb. 24, 1995, Ser. No. 399,001

Int. Cl.[6] C10J *3/00*

U.S. Cl. 44—629 4 Claims



1. A reactor for pyrolytic conversion of woody and herbaceous plant material to charcoal and gas, comprising.

a housing having a sealable opening for receiving a canister containing said material;

heating means for heating said reactor;

pressure regulating means for regulating removal of gas from said reactor to control pressure within said reactor;

insulation means surrounding at least a portion of the sides of said reactor; and a removable canister, said canister being receivable in said housing to form a tight seal to minimize

exposure of the contents of said canister to the atmosphere when said sealable opening to said housing is open.

5,551,959

ABRASIVE ARTICLE HAVING A DIAMOND-LIKE COATING LAYER AND METHOD FOR MAKING SAME

Lawrence L. Martin, Maplewood; David G. O'Neill, and Moses M. David, both of Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 24, 1994, Ser. No. 294,919
Int. Cl.[6] B24D *11/00*
U.S. Cl. 51—295 **17 Claims**

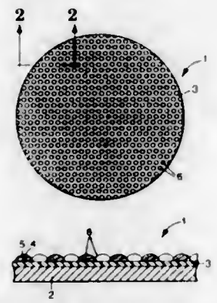
1. An abrasive article, comprising:
(a) a substrate having at least one major surface;
(b) an abrasive coating adhered to said at least one major surface of said substrate, wherein said abrasive coating comprises a plurality of abrasive particles and an organic binder medium; and
(c) a hard carbon coating layer comprising an amorphous diamond-like carbon film having a plasmon energy of 26 eV or more, on at least a portion of an outer surface of said abrasive coating.

5,551,960

ARTICLE FOR POLISHING STONE

Todd J. Christianson, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 436,891, May 8, 1995, abandoned, which is a continuation of Ser. No. 30,787, Mar. 12, 1993, abandoned. This application May 15, 1995, Ser. No. 441,426
Int. Cl.[6] B24D *3/02*
U.S. Cl. 51—295 **28 Claims**



1. An abrasive article suitable for refining stone comprising a backing and a resilient composite comprising a binder and abrasive particles, the abrasive particles adhered to the backing to the binder, the binder comprising a cured resin, said resin comprising unsaturated addition polymerizable units and an effective amount of a plasticizer, the abrasive particles being present in amount ranging from about 1 to about 25 weight percent of the weight of binder and abrasive particles, and the resilient composite having a Knoop hardness of greater than 1 and no more than 20.

5,551,961

ABRASIVE ARTICLES AND METHODS OF MAKING SAME

Robbyn L. Engen, River Falls, Wis.; Douglas S. Spencer, St. Paul, and Jeffrey E. Ford, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 308,656, Sep. 19, 1994, which is a continuation-in-part of Ser. No. 300,854, Sep. 6, 1994, Pat. No. 5,486,219, which is a continuation of Ser. No. 945,126, Sep. 15, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 479,318
Claims priority, application WIPO, Aug. 5, 1993, PCT/US93/07357; South Africa, Aug. 11, 1993, 93/5852; Mexico, Sep. 3, 1993, 935405; China, Sep. 14, 1993, 93117696
Int. Cl.[6] B24D *3/02*
U.S. Cl. 51—298 **29 Claims**

1. An abrasive article comprising
(a) a plurality of abrasive particles and
(b) a bond system which adheres the plurality of abrasive particles together, the bond system comprising a binder;
the binder being formed from a binder precursor essentially free of organic solvent, the binder precursor comprising a blend of an urea-aldehyde resin and a water dilutable resole phenolic resin, the blend being catalyzed by an acid catalyst.

5,551,962

ABRASIVE ARTICLES AND METHOD OF MAKING ABRASIVE ARTICLES

Kwok-Lun Ho, Woodbury, Minn., assignor to Minnesota Mining Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 538,183, Aug. 23, 1995, abandoned, which is a continuation of Ser. No. 214,394, Mar. 16, 1994, abandoned. This application Jan. 23, 1996, Ser. No. 589,998
Int. Cl.[6] C09K *3/14*
U.S. Cl. 51—306 **43 Claims**

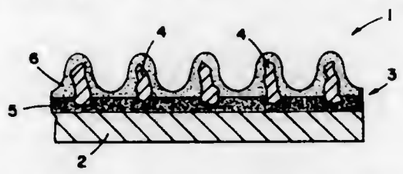
1. An abrasive article having a peripheral surface adapted to contact and abrade a workpiece, said abrasive article comprising a plurality of abrasive particles and a plurality of coated grinding aid particles, said coated grinding aid particles comprising grinding aid particles coated with an inert, hydrophobic, hydrocarbon-containing substance selected from the group consisting of fatty acids, fatty acid salts, and oils, and a binder in which said abrasive particles and said coated grinding aid particles are dispersed.

5,551,963

ABRASIVE GRAIN CONTAINING ALUMINA AND ZIRCONIA

Henry A. Larmie, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Continuation of Ser. No. 239,926, May 9, 1994, abandoned, which is a continuation of Ser. No. 951,654, Sep. 25, 1992, abandoned. This application Nov. 6, 1995, Ser. No. 554,033
Int. Cl.[6] B24D *3/34*
U.S. Cl. 51—307 **25 Claims**



1. A method of preparing abrasive grain material; said method comprising the steps of:
(a) preparing a dispersion of alumina hydrate and zirconia particles, wherein at least about 97% by weight of said zirconia particles are less than about 0.2 micrometer in size;
(b) forming alumina base grits from said dispersion; and
(c) sintering said alumina base grits to provide abrasive grain comprising about 70 to about 99.9 percent by weight alumina and at least about 0.1 percent by weight zirconia, based on the total weight of said abrasive grain, said alumina being present as one of alpha alumina, alumina reaction product, or a combination thereof, said zirconia being present as one of zirconia or zirconia and zirconia reaction product,
with the proviso that said zirconia particles are present in said dispersion in an amount sufficient to increase densification of said abrasive grain of step (c) as compared to an abrasive grain made according to steps (a), (b), and (c) without the presence of zirconia in said abrasive grain.

5,551,964

ABRASIVE GRITS FORMED OF CERAMIC, IMPREGNATION METHOD OF MAKING THE SAME AND PRODUCTS MADE THEREWITH

William P. Wood, Golden Valley, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 237,400, May 3, 1994, Pat. No. 5,431,705, which is a continuation of Ser. No. 976,893, Nov. 16, 1992, Pat. No. 5,312,789, which is a continuation of Ser. No. 799,867, Nov. 27, 1991, Pat. No. 5,164,348, which is a continuation of Ser. No. 645,349, Jan. 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 54,440, May 27, 1987, abandoned. This application Jun. 7, 1995, Ser. No. 474,730
Int. Cl.[6] C09C *1/68*
U.S. Cl. 51—309 **17 Claims**

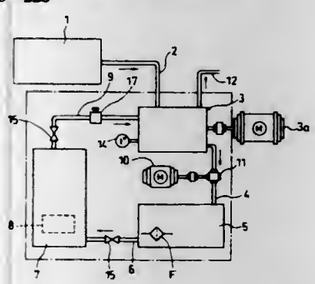
1. Sol gel ceramic abrasive grits comprising:
a. alpha alumina; and
b. between 0.5 to 30% by weight of a modifying additive comprising an oxide of yttrium, magnesium, and a rare earth metal selected from the group consisting of: praseodymiun, samarium, ytterbium, neodymium, lanthanum, gadolinium, cerium, dysprosium and erbium and combinations thereof and wherein the ceramic has a theoretical density of 95% or greater.

5,551,965

APPARATUS FOR SEPARATING AND REMOVING A DANGEROUS SUBSTANCE FROM AN EXHAUST GAS

Ichirou Takahashi, Kamakura, Japan, assignor to Japan Process Engineering Ltd., Osaka, Japan

Filed Jul. 7, 1994, Ser. No. 271,735
Claims priority, application Japan, Jul. 8, 1993, 5-221989
Int. Cl.[6] B01D *47/02*
U.S. Cl. 55—228 **7 Claims**



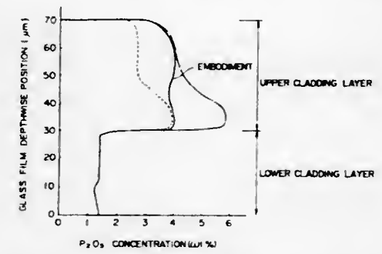
1. A separation and removal apparatus for separating and removing a substance from exhaust gas, said separation and removal apparatus comprising:
an oil-sealed rotary vacuum pump for suctioning the exhaust gas to separate the substance from the exhaust gas and mix the substance with operating oil in the oil-sealed rotary vacuum pump thereby generating a mixture operating oil of the substance and the operating oil, and discharging the rest of the exhaust gas from which the substance has been separated;
a filtration device connected to the oil-sealed rotary vacuum pump and having a filter for filtering and precipitating the substance from the mixture operating oil generated in the oil-sealed rotary vacuum pump;
an oil-temperature control means connected to the filtration device and the oil-sealed rotary vacuum pump and having a temperature control element for changing to a set temperature the temperature of filtered operating oil from which the substance has been removed by the filtration device to maintain the viscosity of the operating oil to above a preselected level;
a circulating pump for circulating the operating oil so that the operating oil in the oil-sealed rotary vacuum pump returns to the oil-sealed rotary vacuum pump through the filtration device and the oil-temperature control means;
an operating-oil temperature sensor for sensing a temperature of the operating oil in the oil-sealed rotary vacuum pump; and
a controller for controlling the temperature control element of the oil-temperature control means based on an output signal of the operating-oil temperature sensor so that the temperature of the operating oil which has been sensed by the operating-oil temperature sensor reaches to the set temperature.

5,551,966

OPTICAL WAVEGUIDE AND METHOD OF FABRICATING THE SAME

Chisai Hirose; Hiroo Kanamori; Akira Urano; Shinji Ishikawa; Haruhiko Aikawa, and Masahide Saito, all of Yokohama, Japan, assignors to Sumitomo Electrical Industries, Ltd., Osaka, Japan

Filed Jan. 13, 1994, Ser. No. 181,126
Claims priority, application Japan, Jan. 14, 1993, 5-005073; Jul. 8, 1993, 5-169259; Jul. 29, 1993, 5-188346
Int. Cl.[6] C03B *8/04*
U.S. Cl. 65—377 **6 Claims**



1. A method for fabricating an optical waveguide with a lower cladding layer, an upper cladding layer, and a core layer disposed between the lower cladding and the upper cladding layers, the method comprising the steps of:
(a) arranging a burner near a substrate;
(b) supplying gases including $POCl_3$ and $SiCl_4$ to the burner in a first flow rate ratio of $POCl_3$ to $SiCl_4$ and during a first period of time, to form glass particles for the lower cladding layer on the substrate by a flame hydrolysis deposition method;
(c) supplying gases including $POCl_3$ and $SiCl_4$ to the burner in a second flow rate ratio of $POCl_3$ to $SiCl_4$ greater than the first flow rate ratio and after the first period of time, to form glass particles for the lower cladding layer on the substrate by the flame hydrolysis deposition method;
(d) consolidating the glass particles of steps (b) and (c) to form the lower cladding layer;
(e) forming the core layer with a refractive index higher than the lower cladding layer;
(f) supplying gases including $POCl_3$ and $SiCl_4$ to the burner in a third flow rate ratio of $POCl_3$ to $SiCl_4$ and during a third

period of time, to form glass particles for the upper cladding layer on the substrate by the flame hydrolysis deposition method;

(g) supplying gases including $POCl_3$ and $SiCl_4$ to the burner in a fourth flow rate ratio of $POCl_3$ to $SiCl_4$ greater than the third flow rate ratio and after the third period of time, to form glass particles for the upper cladding layer on the substrate by the flame hydrolysis deposition method; and

(h) consolidating the glass particles of the steps (f) and (g) to form the upper cladding layer with a refractive index lower than the core layer.

5,551,967

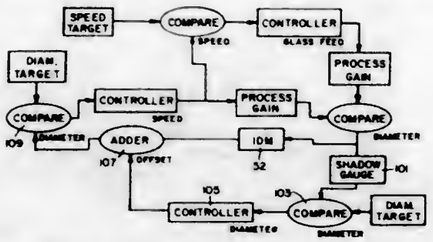
METHOD FOR CONTROLLING FIBER DIAMETER DURING DRAWING

Eric H. Urruti, Wilmington, N.C., assignor to Corning Incorporated, Corning, N.Y.

Division of Ser. No. 11,384, Jan. 29, 1994, Pat. No. 5,443,610. This application Apr. 27, 1995, Ser. No. 428,498

Int. Cl.[6] C03B *37/07*

U.S. Cl. 65—378 **9 Claims**



1. A method for producing an optical fiber from a preform comprising the steps of:

heating the preform and drawing a fiber therefrom, said drawn fiber having a region where the fiber is not fully formed;

producing a first signal indicative of the diameter of the fiber in the region where it is not fully formed;

coating the fiber with a light absorbing coating to form a coated fiber;

producing a second signal indicative of the diameter of the coated fiber;

producing a control signal from the first and second signals; and

controlling the diameter of the fiber by means of the control signal.

5,551,968

METHOD OF FORMING A MICROLENS AT THE TIP OF A FIBER BY JERKING APART TWO FUSED FIBERS

Jing-Jong Pan, 1613 Ridgetree Way, San Jose, Calif. 95131

Division of Ser. No. 159,882, Nov. 30, 1993, Pat. No. 5,371,816, which is a division of Ser. No. 867,651, Apr. 13, 1992, Pat. No. 5,267,340, which is a division of Ser. No. 648,176, Jan. 11, 1991, Pat. No. 5,117,473, which is a division of Ser. No. 390,795, Aug. 8, 1989, Pat. No. 5,016,963. This application Aug. 23, 1994, Ser. No. 294,666

Int. Cl.[6] C03B *37/15*

U.S. Cl. 65—387 **23 Claims**

1. A method of manufacturing a microlens at a tip of an optical fiber comprising

joining two optical fibers, each fiber having an end, at said ends;

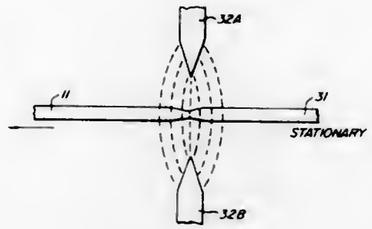
fusing said ends together;

drawing one of said fibers away from the other said fiber;

jerking said one fiber away from said other fiber to separate said fibers, each fiber having a separated tip; and

rounding said separated tip of said one fiber;

whereby a microlens is formed at said tip of said one fiber.



5,551,969

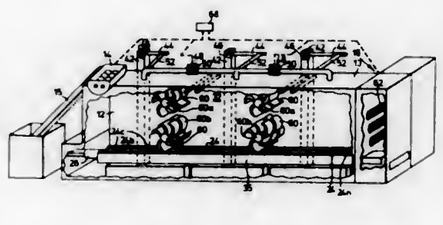
CONTINUOUS COMPOSTER

James Wright, 511 Woodland Acres Crescent, R.R. #2, Maple, Ontario, Canada

Continuation of Ser. No. 188,784, Jan. 31, 1994, abandoned, which is a continuation-in-part of Ser. No. 17,613, Feb. 11, 1993, Pat. No. 5,409,831. This application May 30, 1995, Ser. No. 454,469

Int. Cl.[6] C05F *9/04*

U.S. Cl. 71—9 **7 Claims**



1. A method of continuous composting comprising depositing garbage into a closed composting tunnel for bulk undivided garbage through an inlet in a top surface of the tunnel in the region of a first end into a trough in a first position comprising an elongate section of a cylinder having a mouth opening upwardly, an elongate bottom and end walls, the trough being located across the top surface of the tunnel below the inlet for garbage and, in its first position forming a barrier between the interior and exterior of the tunnel;

blending garbage in the trough in a first position of the trough using blending augers extending between the end wall of the trough;

tilting the trough about a longitudinal axis to a second position so that the mouth opens downwardly to empty garbage onto a flat foraminous tray located beneath the trough being the furthest upstream tray of a row of unattached trays on a track running longitudinally within the tunnel, and returning the trough to its first position to receive further garbage;

moving the trays longitudinally stepwise within the tunnel by shunting trays in discrete steps by operation of a ram against an upstream shunting surface of a frame the furthest upstream tray, the ram having a stroke equivalent to the longitudinal width of a tray whereby each step is equivalent to the longitudinal width of a tray whereby each step is equivalent to said width of the tray, to create space upstream of the trays for location of a further upstream tray and to eject a downstream tray from an outlet in a second end of the tunnel;

subjecting garbage in the tunnel to mixing downstream of the furthest upstream tray;

aerating garbage in the tunnel through foraminous bases of the trays; and

removing exhaust air through ducting.

5,551,970

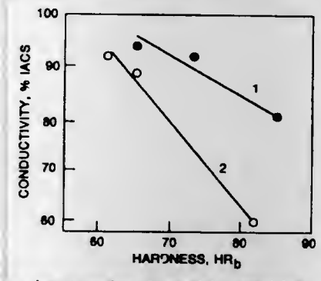
DISPERSION STRENGTHENED COPPER

Evgeny P. Danelia, Moscow, Russian Federation, assignor to Otd Products L.L.C., Denver, Colo.

Filed Aug. 17, 1993, Ser. No. 107,529

Int. Cl.[6] C22C *29/12*

U.S. Cl. 75—235 **14 Claims**



1. A dispersion strengthened material, comprising

a copper metal matrix and

disperse oxides of aluminum oxide, titanium oxide and hafnium oxide dispersed throughout said copper metal matrix wherein the mass ratio of aluminum to titanium to hafnium is about 4:1:1 and wherein said material is made by a process comprising the steps of:

(a) forming particles from an alloy comprising copper, aluminum, titanium and hafnium, said particles having an average particle size of less than about 300 micrometers;

(b) oxidizing said particles at a first temperature of from about 250° C. to about 900° C.;

(c) internally oxidizing said particles at a second temperature of from about 850° to about 950° C.;

(d) heating said internally oxidized particles at a third temperature of from about 300° C. to about 900° C. to remove an excess oxide layer therefrom;

(e) compressing said particles into a preform;

(f) extruding said preform using a drawing coefficient of at least about 12 to form said dispersion strengthened material.

5,551,971

PARTICULATE FILTER, AND SYSTEM AND METHOD FOR CLEANING SAME

John Chadderton, Beam; David Child, Cinderford, and John Deighton, Soudley, all of, England, assignors to Engelhard Corporation, Iselin, N.J.

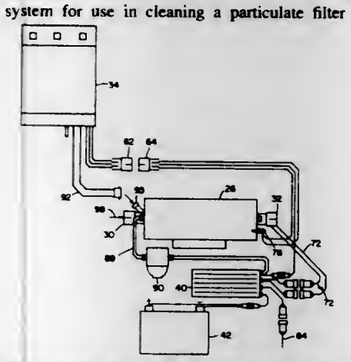
Filed Dec. 13, 1994, Ser. No. 355,930

Claims priority, application United Kingdom, Dec. 14, 1993, 9325492

Int. Cl.[6] B01D *29/62;35/18*

U.S. Cl. 95—15 **26 Claims**

1. A system for use in cleaning a particulate filter medium,



which medium is to be cleaned by inputting energy to heat particulate matter collected thereon, the system, comprising:

(a) means for inputting energy to heat the particulate matter collected on the particulate filter medium;

(b) means for monitoring the temperature of the medium at several points;

(c) means for determining the point having a maximum individual temperature and creating a control signal commensurate with the maximum temperature;

(d) means for determining if the control signal exceeds a predetermined set point level and if so reducing the energy input;

(e) means for determining if the control signal falls within a predetermined range of acceptable values less than the set point level, the range defining the band width, and if so controlling the energy input and varying it as appropriate in order to maintain the control signal within the band width.

2. A method for use in cleaning a particulate filter medium, which medium is to be cleaned by the input of energy to heat particulate matter collected thereon, the method comprising:

(a) inputting energy to heat the particulate matter collected on the particulate filter medium:

(b) monitoring the temperature of the medium at several points;

(c) determining the point having a maximum individual temperature and creating a control signal commensurate with the maximum temperature;

(d) determining if the control signal exceeds a predetermined set point level and if so reducing the energy input;

(e) determining if the control signal falls within a predetermined range of acceptable values less than the set point level, the range defining the band width, and if so controlling the energy input and varying it as appropriate in order to maintain the control signal within the band width.

5,551,972

ABSORPTION PROCESS WITHOUT EXTERNAL SOLVENT

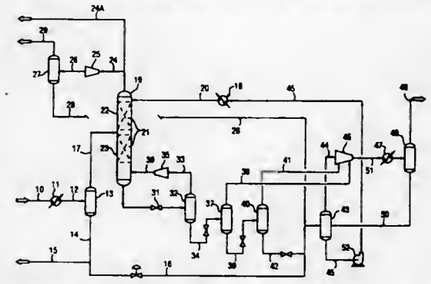
Glenn C. Wood, Houston, and Yuv R. Mehra, The Woodlands, both of Tex., assignors to Advanced Extraction Technologies, Inc., Houston, Tex.

Division of Ser. No. 206,420, Mar. 4, 1994, Pat. No. 5,462,583. This application Aug. 23, 1995, Ser. No. 518,145

Int. Cl.[6] B01D *47/14*

U.S. Cl. 95—192 **14 Claims**

1. A process for separating a feed gas stream consisting of



components which have a spectrum of volatilities including most volatile (light) components, intermediate volatility components, and least volatile (heavy) components, comprising the steps of:

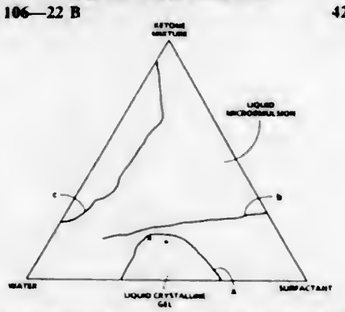
introducing the feed gas stream, in the absence of an external lean solvent stream, to an absorption zone;

contacting the feed gas stream with an internally generated liquid lean solvent stream in an absorption zone to produce a light product gas stream comprising the light components from the feed gas, and a rich solvent liquid stream comprising the intermediate and heavy components of the feed gas;

flashing the rich solvent liquid stream from the absorption zone in a flashing zone to produce at lower pressure a flash gas stream comprising the intermediate components from the feed gas, and the lean solvent stream comprising the heavy components supplied from the feed gas; and

conveying the lean solvent produced in the flashing zone to the absorption zone as the lean solvent stream.

5,551,973
PHOTOCHROMIC MICROEMULSION INK COMPOSITIONS
John F. Oliver, Calgary; Trevor I. Martin, Burlington; Carol A. Jennings, Etobicoke, all of, Canada; Eric G. Johnson, Plant City, Fla., and Marcel P. Breton, Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.
Continuation-in-part of Ser. No. 325,762, Oct. 19, 1994, Pat. No. 5,492,559. This application Dec. 5, 1995, Ser. No. 567,456
Int. Cl.[6] C09D *11/02;11/06*
U.S. Cl. 106—22 B **42 Claims**



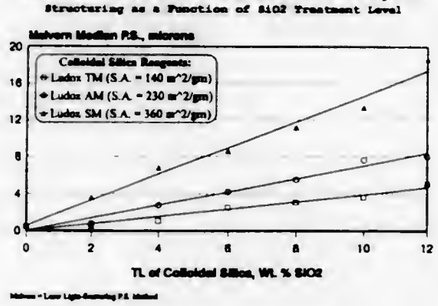
1. An ink composition which comprises an aqueous phase, an oil phase, a photochromic material, and a surfactant, said ink exhibiting a liquid crystalline gel phase at a first temperature and a liquid microemulsion phase at a second temperature higher than the first temperature.

5,551,974
PROCESS FOR THE MALEATION OF POLYETHYLENE WAXES
Thomas D. Roberts; Kerry D. Muhlestein, and Greg T. Slemons, all of Longview, Tex., assignors to Eastman Chemical Company, Kingsport, Tenn.
Continuation of Ser. No. 435,915, May 5, 1995, abandoned, which is a division of Ser. No. 168,542, Dec. 16, 1993, Pat. No. 5,420,303. This application Oct. 16, 1995, Ser. No. 543,765
Int. Cl.[6] L09D *191/06*
U.S. Cl. 106—271 **7 Claims**

1. An emulsion composition comprising:
(a) about 10 to 30 weight percent of a low melt viscosity maleated polyethylene wax having a melt visocosity of less than 600 cP at 125° C., an acid number of at least 7, essentially no objectionable odor, and a Garden color number less than 3,
(b) a minor amount up to 15 weight percent of a surfactant, and
(c) about 60 to 90 weight percent water.

5,551,975
STRUCTURED PIGMENT COMPOSITIONS, METHODS FOR PREPARATION AND USE
Gary M. Freeman, Macon; Kurt H. Moller, Warner Robins, and Richard D. Carter, Macon, all of Ga., assignors to J. M. Huber Corporation, Locust, N.J.
Filed Jun. 23, 1994, Ser. No. 264,579
Int. Cl.[6] C04B *14/04*
U.S. Cl. 106—485 **84 Claims**

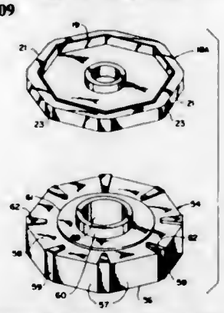
1. A modified clay product consisting essentially of the reaction product of a kaolin clay having a BET surface area not greater than 34 m^2/g and colloidal silica.



5,551,976
SUPERPLASTICIZER-CONCRETE COMPOSITION FOR WASTE DISPOSAL
William C. Allen, Pasadena, Calif., assignor to Union Oil Company of California, El Segundo, Calif.
Continuation-in-part of Ser. No. 238,682, May 5, 1994, Pat. No. 5,525,155. This application Dec. 21, 1994, Ser. No. 361,425
Int. Cl.[6] C04B *18/04*
U.S. Cl. 106—696 **54 Claims**

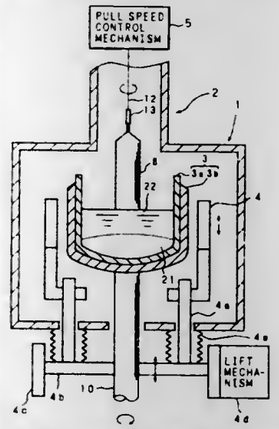
1. A method for disposing of waste by preparing a waste-containing hydraulic cementitious composition, said method comprising:
mixing solid particles comprising dry hydraulic cement and waste-containing filler particles with a superplasticizer and water to form a mobile slurry wherein essentially all of said solid particles being of average cross-sectional dimension greater than aobout 1 micron, said solid particles comprising greater than 50 dry weight percent of said hydraulic cement, and said slurry containing less than 25 weight percent of free water relative to the weight of said dry hydraulic cement;
transferring said slurry into a storage vessel; and
permitting said slurry to harden into a concrete composition containing stabilized waste contaminants.

5,551,977
SUSCEPTOR FOR EFG CRYSTAL GROWTH APPARATUS
Andrew A. Menna, Belmont, Mass., assignor to ASE Americas, Inc., Billerica, Mass.
Filed Nov. 14, 1994, Ser. No. 339,357
Int. Cl.[6] C30B *35/00*
U.S. Cl. 117—209 **12 Claims**



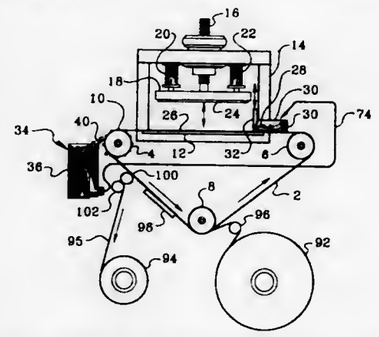
1. In an apparatus for growing by the EFG process hollow crystalline bodies having a regular polygonally-shaped cross section, said apparatus including:
a longitudinal axis;
a crucible for containing a melt of a selected crystalline material, said crucible being centered on said longitudinal axis and having an outer side wall and a bottom wall defining an open-topped, melt containment volume;
a die formed integrally with said outer side wall of said crucible so as to form a crucible/die assembly, said die including an upwardly facing top end surface having a polygonal shape characterized by n sides and n corners formed by said n sides, where n is an integer having a value of at least three (3);
capillary means connecting said melt containment volume of said crucible to said top end surface of said die for transporting said melt material from said melt containment volume of said crucible to said top end surface of said die;
heating means for heating said crucible/die assembly such that at least the minimum temperature necessary for EFG process crystal growth from said melt material is established along the entirety of said top end surface of said die; and
a heat susceptor centered on said longitudinal axis and underlying said crucible, said heat susceptor having an upper surface, a centrally located annular portion which projects upwardly from said upper surface and defines a land which thermally engages said bottom wall of said crucible, and a plurality of circumferentially spaced projections extending upwardly from said upper surface of said heat susceptor, each of said projections having an upper surface thermally engaging said bottom wall of said crucible, and each of said projections being in line with a corner of said top end surface of said die, whereby (a) heat is conducted to said melt containment volume by said land so as to maintain melt material located in said melt containment volume in a molten state and (b) additional heat is conducted by said projections to said crucible in line with the corners of said top end surface of said die so as to equalize the temperature along said top end surface of said die.

5,551,978
APPARATUS FOR PRODUCING SINGLE CRYSTAL
Yoshihiro Akashi; Kaoru Takiuchi, and Setsuo Okamoto, all of Amagasaki, Japan, assignors to Sumitomo Sitix Corporation, Amagasaki, Japan
Filed Apr. 14, 1995, Ser. No. 421,789
Claims priority, application Japan, Mar. 29, 1993, 5-95617
Int. Cl.[6] C30B *35/00*
U.S. Cl. 117—222 **8 Claims**



1. An apparatus for producing a single crystal, comprising:
a crucible for accommodating a material having a liquid layer and a solid layer;
a seed crystal set in a position facing the crucible;
means for pulling up a seed crystal; and
a heater mounted on an outer periphery of said crucible and movable along the direction of pulling up the single crystal, the crucible containing a layer of liquid material above a solid layer of the material, the layer of liquid material being heated by the heater, the heater being positioned to maintain a correlationship between a pulling speed of the seed crystal and heater position such that the solid layer does not contact a single crystal pulled from the layer of liquid material; the heater position being adjusted by moving the heater to position along the pulling direction of the seed crystal at which said correlationship will be maintained during pulling the single crystal from the layer of liquid material.

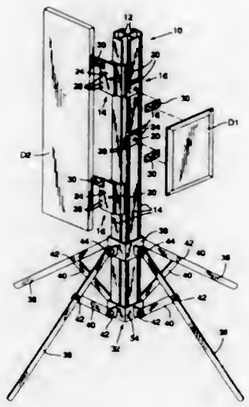
5,551,979
APPARATUS FOR APPLYING TERMINATION PASTE TO ELECTRONIC COMPONENTS
Evart D. Shealey, Jamul, Calif., assignor to Electro Scientific Industries, Inc., Portland, Oreg.
Continuation-in-part of Ser. No. 86,713, Jul. 2, 1993, abandoned. This application Nov. 23, 1994, Ser. No. 344,404
Int. Cl.[6] B05C *1/02*
U.S. Cl. 118—70 **31 Claims**



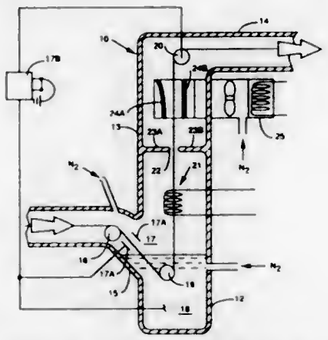
1. An apparatus for applying termination paste to an array of electronic components held by a carrier such that the portions of the components to which the paste is to applied are protruding from the carrier generally in a common plane, said apparatus comprising:
(a) means, having an upper planar surface, for conveying termination paste to a dipping site,
(b) means for producing a uniform sheet of termination paste atop the planar surface,
(c) means, disposed at said dipping site, for vertically supporting said means for conveying in order to maintain the planarity of the sheet of termination paste, and
(d) means, registered with said dipping site, for dipping the protruding portions of the array into the sheet of termination paste and for subsequently withdrawing the array from the paste.

5,551,980
HOLDER FOR SUPPORTING DOORS TO BE TREATED
James R. Turnbo, 2143 W. 12th, Apt. 9, Eugene, Oreg. 97402
Filed Jan. 12, 1995, Ser. No. 371,863
Int. Cl.[6] B05C *13/00*
U.S. Cl. 118—200 **12 Claims**

1. A holder for supporting doors to be treated comprising:
upright support means having upper and lower ends,
said upright support means including at least one vertical rail,
hanger bracket means supported on said at least one vertical rail for vertical adjustment,
door support means on said hanger bracket means,
and hinge means on said door support means for temporarily attaching a door to be treated to said door support means wherein the door is supported in upright relation and is hingedly movable for treating both sides thereof.

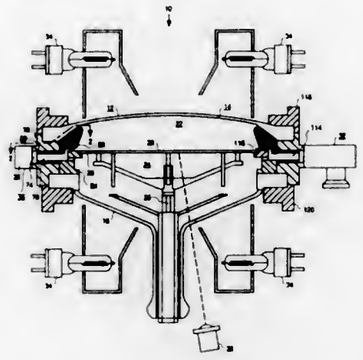


5,551,981
APPARATUS TO GALVANIZE A FERROUS SUBSTRATE
Thomas A. Sellitto, Madison, Ohio, assignor to SMS Engineering, Inc., Pittsburgh, Pa.
Division of Ser. No. 75,327, Jun. 11, 1993, Pat. No. 5,384,165.
This application Sep. 26, 1994, Ser. No. 311,916
Int. Cl.[6] B05C *3/132*
U.S. Cl. 118—621 **11 Claims**



1. An apparatus for coating a ferrous substrate with zinc, said apparatus including:
a vertically extending coating chamber separated by a restricted passageway to a cooling chamber, said coating chamber includes a fluidized bed of zinc containing galvanizing powder;
means for maintaining an inert atmosphere in each of said coating and cooling chambers;
means for directing an elongated substrate into said fluidized bed of zinc containing galvanizing powder within said coating chamber;
means for establishing electrostatic potential between said substrate and said fluidized bed sufficient to form an electrostatic deposition of zinc containing galvanizing powder on said substrate;
means for heating said zinc containing galvanizing powder on the substrate the inert atmosphere of said coating chamber to a temperature sufficient to liquefy the zinc in said zinc containing galvanizing powder for a period of time to allow reflowing and forming a zinc iron alloy interface; and
means for cooling the reflowed coating on said substrate below the liquidous temperature of the coating in the inert atmosphere of said cooling chamber.

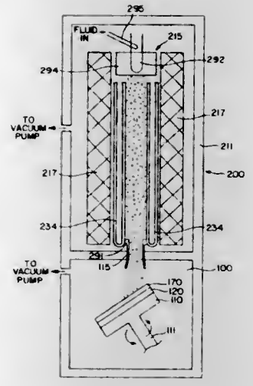
5,551,982
SEMICONDUCTOR WAFER PROCESS CHAMBER WITH SUSCEPTOR BACK COATING
Roger N. Anderson; H. Peter W. Hey, both of San Jose; Israel Beinglass, Sunnyvale, and Mahalingam Venkatesan, San Jose, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.
Filed Mar. 31, 1994, Ser. No. 221,118
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—715 **22 Claims**



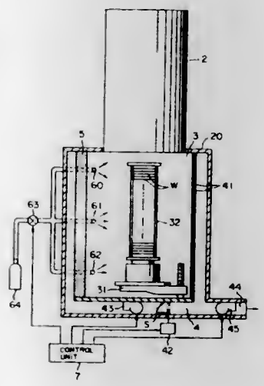
1. A deposition apparatus for depositing a layer of material on a wafer, comprising:
a deposition chamber having an outer wall;
a susceptor plate within said chamber, said susceptor plate extending across said chamber to divide said chamber into an upper portion which is above the top surface of the susceptor plate on which the wafer is supported and a lower position which is below the back surface of the susceptor plate; and
a gas inlet manifold in the wall of the chamber, said gas inlet manifold having at least one passage opening to direct a deposition gas into said lower portion of said deposition chamber and at least one passage opening to direct said deposition gas into said upper portion of said deposition chamber.

5,551,983
METHOD AND APPARATUS FOR DEPOSITING A SUBSTANCE WITH TEMPERATURE CONTROL
Cecil B. Shepard, Jr., Laguna Niguel; Michael S. Heuser, Foothill Ranch; Daniel V. Raney, Mission Viejo; William A. Quirk, Lake Forest, and Gregory Bak-Boychuk, San Juan Capistrano, all of Calif., assignors to Celestech, Inc., Irvine, Calif.
Filed Nov. 1, 1994, Ser. No. 332,832
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—723 R **19 Claims**

1. Apparatus for depositing a substance, comprising:
a mandrel rotatable on an axis;
a spacer mounted on said mandrel;
a substrate mounted on said spacer;
means for directing, toward said substrate, a plasma containing constituents of the substance being deposited;
said spacer having a thermal conductance in its thickness direction that varies by increasing or decreasing with radial dimension.

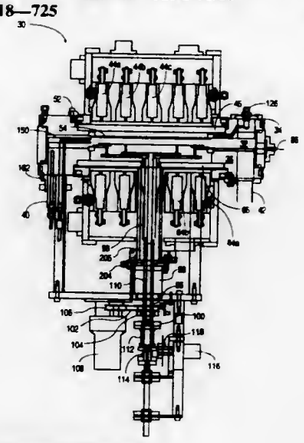


5,551,984
VERTICAL HEAT TREATMENT APPARATUS WITH A CIRCULATION GAS PASSAGE
Takashi Tanahashi, Sagamihara, Japan, assignor to Tokyo Electron Kabushiki Kaisha, Tokyo-To, and Tokyo Electron Tohoku Kabushiki Kaisha, Iwate-Ken, both of, Japan
Filed Dec. 5, 1994, Ser. No. 353,288
Claims priority, application Japan, Dec. 10, 1993, 5-341425; Feb. 10, 1994, 6-037889
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—724 **11 Claims**



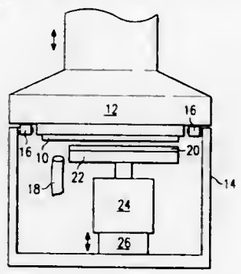
9. A heat treatment apparatus wherein objects to be treated are loaded into a reaction tube from a transfer chamber for a heat treatment on an objects-to-be-treated holder, and unloaded after the treatment, comprising a circulation gas passage with an inlet opening that opens in the transfer chamber and a dust removing filter unit, and gas in the transfer chamber is circulated through the circulation gas passage so as to pass through the filter unit when the heat treatment apparatus is in a gas circulation mode, the apparatus further comprising:
a control unit assembly which includes a control unit that initiates a stoppage of ventilation through the circulation gas passage at a time of unloading of treated objects out of the reaction tube.

5,551,985
METHOD AND APPARATUS FOR COLD WALL CHEMICAL VAPOR DEPOSITION
Daniel L. Brors, Byron, and Robert C. Cook, San Jose, both of Calif., assignors to Torrex Equipment Corporation, Livermore, Calif.
Filed Aug. 18, 1995, Ser. No. 517,045
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—725 **9 Claims**



1. A CVD reactor comprising:
a chamber containing;
a first thermal plate,
a second thermal plate positioned below said first thermal plate, wherein a wafer is interposed between said first and second thermal plates and not in contact with first and second thermal plates; and
a thermal ring plate laterally surrounding an outer edge of said wafer;
a first heat source positioned above said first thermal plate, said first thermal plate absorbing heat energy emitted from said first heat source and heating said wafer;
a second heat source having first and second portions and positioned below said second thermal plate, said second thermal plate absorbing heat energy emitted from said first portion of second heat source and heating said wafer, said thermal ring plate absorbing heat energy emitted from said second portion of said second heat source and heating said outer edge of said wafer.

5,551,986
MECHANICAL SCRUBBING FOR PARTICLE REMOVAL
Manoj K. Jain, Plano, Tex., assignor to Taxas Instruments Incorporated, Dallas, Tex.
Filed Feb. 15, 1995, Ser. No. 389,833
Int. Cl.[6] B08B *7/04*
U.S. Cl. 134—6 **14 Claims**



1. A method for removing particulate contaminants from a semiconductor wafer surface, said method comprising the overlapping steps of:

a) contacting said wafer surface with a cleaning pad;

b) supplying a rinse fluid to at least one of said wafer surface and said cleaning pad; and

c) rotating said cleaning pad at a rotational velocity sufficient to effect a centripetal acceleration of at least 80 ft/sec^2 on at least one portion of said pad contacting said wafer surface.

5,551,987

PROCESS FOR THE BIOLOGICAL TREATMENT OF SOLID WASTE AND MUD CONTAMINATED BY HYDROCARBONS

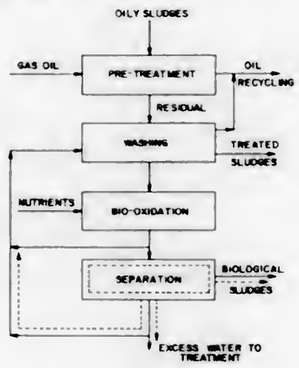
Ezio D'Addario, Monterotondo; Eugenio Fascetti, Rome; Alberto Patricelli, Monterotondo; Giulio Prosperi, and Andrea Robertiello, both of Rome, all of, Italy, assignors to Ministero Dell 'Universita' E Della Ricerca Scientifica E Tecnologica, Rome, Italy

Filed Oct. 21, 1994, Ser. No. 327,240

Claims priority, application Italy, Nov. 4, 1993, MI93A2335

Int. Cl.^{6} B01D *11/02;* **B08B** *3/08;* **C02F** *11/02;* **C23G** *5/02*

U.S. Cl. 134—10 **6 Claims**



1. A process for treating solid waste or mud contaminated by oily hydrocarbon residues, which process consists of the following steps:

(a) extracting oily hydrocarbon residues from the solid waste or mud, at least once at 40°–110° C., using a non-volatile organic solvent, thereby forming an oily supernatant phase and a solid phase, the ratio of organic solvent to oily hydrocarbon residues being 0.1–3:1;

(b) contacting the oily supernatant phase with a mixture of microbes which oxidize hydrocarbons and microbes which produce high levels of biosurfactant, so as to form a bio-oxidized solution; and

(c) washing the solid phase formed in step (a) with a bio-oxidized solution selected from the group consisting of (i) the solution formed in step (b) and (ii) a culture broth comprising the mixture of microbes used in step (b), the ratio of bio-oxidized solution to solid phase being 5–15:1.

5,551,988

METHOD AND APPARATUS FOR CLEANING A BREWING DEVICE, ESPECIALLY OF A COFFEE MACHINE

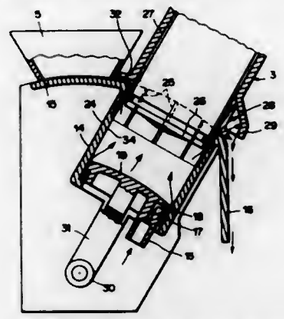
Shahryar Reyhanloo, Grenchen; Markus Hermann, Balsthal, and Markus Anliker, Grünichen, all of, Switzerland, assignors to Jura Elektroapparate AG, Niederbuchsiten, Switzerland

Filed Dec. 6, 1994, Ser. No. 354,125

Claims priority, application Switzerland, Dec. 15, 1993, 3752/93

Int. Cl.^{6} B08B *9/00;3/04;* **A47J** *31/60*

U.S. Cl. 134—22.1 **13 Claims**



1. A method of cleaning a brewing device having at least one cleaning phase including feeding water for a cleaning process from one of a water tank and an external water supply via a supply line to a water supply connection of a brewing cylinder; and

during said at least one cleaning phase feeding said water through elements of the brewing cylinder and into areas outside the brewing cylinder, wherein said elements are grooves or channels disposed on an inner surface of a wall of said brewing cylinder, and wherein feeding of said water into areas outside the brewing cylinder is accomplished by said grooves or channels disposed on the inner surface of the wall of said brewing cylinder.

5,551,989

METHOD OF CLEANING USING A FOAMED LIQUID

Pat A. Mestetsky, St. Charles, Ill., assignor to United Laboratories, Inc., St. Charles, Ill.

Continuation-in-part of Ser. No. 228,575, Apr. 15, 1994, Pat. No. 5,462,607. This application Aug. 24, 1995, Ser. No. 518,678

Int. Cl.^{6} B08B *3/10;9/00;9/02;9/08*

U.S. Cl. 134—22.12 **6 Claims**

1. A method of removing hydrocarbon and coke deposits from industrial processing equipment, comprising the steps of preparing an aqueous cleaning solution containing from 30 to 2500 ppm of an amphoteric surfactant having the following formula:

$$CH_3-(CH_2)_n-\underset{\displaystyle CH_3}{\overset{\displaystyle CH_3}{N}}=O$$

where n is 6 to 20; introducing said solution into a vessel having hydrocarbons and coke deposits on walls thereof to partially fill the vessel and provide a headspace in a vessel above a level of said solution; heating the solution in the vessel to an elevated temperature and ebullating the solution to generate a quantity of foam in said headspace, said foam carrying said surfactant, circulating the heated solution through the vessel to remove the hydrocarbons and coke deposits from said walls; and flowing the foam from the headspace of the vessel into contact with a contaminated surface outside of the vessel to remove hydrocarbons and coke deposits from said surface.

5,551,990

ENZYMATIC DISHWASHING AND RINSING COMPOSITION

Willem R. Van Dijk, Oud-Beijerland, Netherlands, assignor to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation of Ser. No. 20,884, Feb. 19, 1993, which is a continuation of Ser. No. 826,293, Jan. 27, 1992, which is a continuation of Ser. No. 563,730, Aug. 3, 1990, which is a continuation of Ser. No. 365,290, Jun. 9, 1989. This application Sep. 2, 1994, Ser. No. 300,581

Claims priority, application United Kingdom, Jun. 9, 1988, 8813687

Int. Cl.^{6} C11D *3/386*

U.S. Cl. 134—25.2 **2 Claims**

1. A method of enhancing removal of spots from glass products in a dishwashing machine which method comprises using a dishwashing or rinsing composition consisting of 0.5 to 10.0% by wt. of a surfactant and an enzyme, wherein said enzyme is a lipase gene from *Humicola lanuginosa* (Syn. Thermomyces lanuginosus) and expressing the gene in Aspergillus as host and said enzyme is incorporated in the composition in an amount in the range of about 0.005 to 100 LU/mg.

5,551,991

COMPACT SOLAR ENERGY COLLECTOR

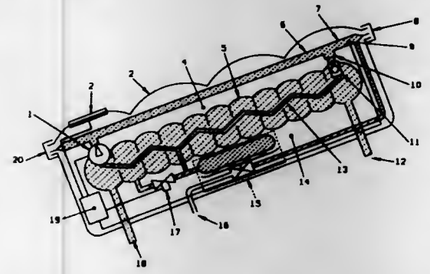
Manuel B. Avero, Poligono Costa Sur. Nave 15, 38009 Santa Cruz de Tenerife, Spain

Filed Jan. 27, 1995, Ser. No. 379,850

Claims priority, application Spain, Feb. 7, 1994, 9400213

Int. Cl.^{6} F24J *2/00;* **H01L** *31/058*

U.S. Cl. 136—248 **3 Claims**



1. A compact solar energy collector, characterized by the collector itself and the accumulator being integrated in one housing unit, the housing unit at its upper portion having a transparent cover of a corrugated shape fixed at its ends using an assembly clamp and a batten, being also internally fitted with a honeycomb divided by vertical walls and fitted with a water inlet and an outlet, as well as a primary circuit of a heat exchanger, which exchanger is at one end connected to a pump and to the collector itself, whereas at the other end it is fitted with a one way valve and a crimping lip joined to the collector, the rest of the inside of the housing unit being filled with insulating material;

the pump being supplied with electrical power generated by a photovoltaic panel and providing a pumping rate dependent upon a level of available solar radiation.

5,551,992

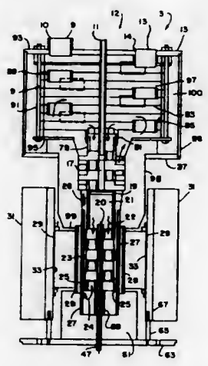
THERMOPHOTOVOLTAIC GENERATOR WITH LOW BANDGAP CELLS AND HYDROCARBON BURNER

Lewis M. Fraas, Issaquah, Wash., assignor to JX Crystals Inc., Issaquah, Wash.

Continuation-in-part of Ser. No. 393,919, Feb. 24, 1995, which is a continuation-in-part of Ser. No. 260,910, Jun. 15, 1994, Pat. No. 5,439,532, which is a continuation-in-part of Ser. No. 47,477, Apr. 19, 1993, Pat. No. 5,383,976, which is a continuation-in-part of Ser. No. 906,452, Jun. 30, 1992, Pat. No. 5,312,521. This application May 9, 1995, Ser. No. 437,875

Int. Cl.^{6} H01L *31/058*

U.S. Cl. 136—253 **35 Claims**



1. A thermophotovoltaic generator comprising a first heat exchanger having a first end and a second end, a second, ceramic heat exchanger having a second end and having a first end connected to the second end of the first heat exchanger, a combustion chamber connected to the second end of the second heat exchanger, an air supply connected to the first heat exchanger and connected through the second, ceramic heat exchanger for supplying air to the combustion chamber, a fuel supply connected to the first heat exchanger and connected through the second heat exchanger for supplying fuel to the combustion chamber, a stacked element infrared emitter connected to the combustion chamber for receiving hot combustion gases from the combustion chamber, at least one tube surrounding the emitter, thermophotovoltaic cells positioned around the emitter outside of the tube, filters fitted with the cells and an igniter extending in the combustion chamber.

5,551,993

Patent Not Issued For This Number

5,551,994

NON-CHROMATED OXIDE COATING FOR ALUMINUM SUBSTRATES

Matthias P. Schriever, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 173,591, Dec. 23, 1993, Pat. No. 5,487,949, which is a division of Ser. No. 525,800, May 17, 1990, Pat. No. 5,298,092, said Ser. No. 287,690is a continuation-in-part of Ser. No. 173,593, Dec. 23, 1993, which is a division of Ser. No. 525,800, May 17, 1990, Pat. No. 5,298,092, said Ser. No. 287,690is a continuation-in-part of Ser. No. 212,654, Mar. 11, 1994, which is a continuation of Ser. No. 621,132, Nov. 30, 1990, said Ser. No. 287,690is a continuation-in-part of Ser. No. 58,655, May 6, 1993, which is a continuation of Ser. No. 732,586, Jul. 19, 1991, abandoned, said Ser. No. 287,690is a continuation-in-part of Ser. No. 903,853, Jun. 25, 1992. This application Aug. 9, 1994, Ser. No. 287,690

Int. Cl.[6] C23C *22/56*

U.S. Cl. 148—273 **57 Claims**

1. An improved process that is commercially practical for forming an oxide film cobalt conversion coating exhibiting corrosion resistance and paint adhesion properties on a substrate, wherein said substrate is aluminum or aluminum alloy, said process comprising the steps of:

(a) providing an oxide film forming cobalt conversion solution comprising an aqueous reaction solution containing a 3-valent cobalt complex prepared by reacting the following starting materials:

(1) a cobalt-II salt wherein said cobalt-II salt is CoX_2 where X=Cl,-Br, NO_3, CN, SCN, $\frac{1}{3}PO_4$, $\frac{1}{2}SO_4$, $C_2H_3O_2$, or $\frac{1}{2}CO_3$,

(2) an ammonium salt wherein said ammonium salt is selected from the group consisting of ammonium nitrate nitrate and ammonium acetate;

(3) one or more inorganic complexing agents selected from the group consisting of a soluble metal carboxylate, a soluble metal nitrite, and ammonia;

(4) a water soluble amine wherein said water soluble amine is selected from the group consisting of ethylenediamine triethanolamine (TEA), and ethylenediaminetetraacetic acid (EDTA); and

(5) an oxidizing agent; and

(b) contacting said substrate with said aqueous reaction solution for a sufficient amount of time to oxidize the surface of said substrate, whereby said oxide film cobalt conversion coating is formed, thereby imparting corrosion resistance and paint adhesion properties to said substrate.

5,551,995

SPHEROIDAL GRAPHITE CAST IRON FOR CRANK SHAFTS AND A CRANK SHAFT MANUFACTURED FROM SUCH CAST IRON

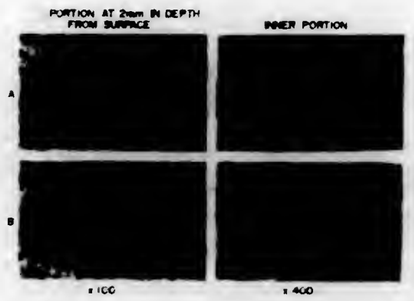
Hideaki Nagayoshi, Kitakyushu, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Filed Mar. 3, 1995, Ser. No. 397,925

Claims priority, application Japan, Mar. 11, 1994, 6-040821

Int. Cl.[6] C22C *37/04*

U.S. Cl. 148—321 **6 Claims**



1. Spheroidal graphite cast iron for crank shafts with superior conformability and machinability, consisting, by area ratio, of 5 to 15% graphite, of not more than 10% ferrite, and the balance pearlite matrix, and having a Brinell hardness (HB) of 241 to 277, said cast iron further consisting essentially by weight, of 3 to 4% C; 1.5 to 2.5% Si; less than 0.5% Mn; 0.005 to 0.08% Mg; at least one of 0.010 to 0.050% in total selected from group consisting of Sn, Sb and As; and the balance iron and incidental impurities.

5,551,996

SI-CONTAINING MAGNESIUM ALLOY FOR CASTING WITH MELT THEREOF

Mitsuru Adachi; Satoru Sato, and Hiroto Sasaki, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed Mar. 29, 1994, Ser. No. 219,355

Claims priority, application Japan, Mar. 30, 1993, 5-071977; Oct. 7, 1993, 5-251868

Int. Cl.[6] C22C *23/02;23/04*

U.S. Cl. 148—420 **6 Claims**

1. A Si-containing magnesium alloy for high pressure casting from a melt thereof to produce a cast alloy part with reduced hot cracking, comprising 6 to 12% by weight of aluminum, 0.3 to 1.5% by weight of silicon, from more than 0.1 to 0.2% by weight of strontium, and 0.01 to 2.0% by weight of zinc, the balance being magnesium.

5,551,997

BERYLLIUM-CONTAINING ALLOYS OF ALUMINUM AND SEMI-SOLID PROCESSING OF SUCH ALLOYS

James M. Marder, Shaker Heights, and Warren J. Haws, Cleveland, both of Ohio, assignors to Brush Wellman, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 156,356, Nov. 23, 1993, abandoned, which is a continuation of Ser. No. 770,187, Oct. 2, 1991, abandoned. This application Mar. 31, 1994, Ser. No. 221,374

Int. Cl.[6] C22C *21/00*

U.S. Cl. 148—437 **18 Claims**

1. An aluminum alloy containing beryllium consisting of from about 5 to about 80 weight percent beryllium with the balance an aluminum component, wherein the alloy has non-dendritic beryllium microstructure, said beryllium is equiaxed, solid beryllium dispersed in said aluminum component, and said aluminum component is substantially pure aluminum.

5,551,998

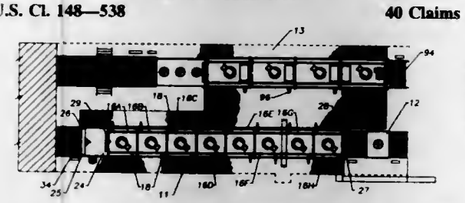
METHOD AND APPARATUS FOR HEAT TREATING METAL CASTINGS

Paul M. Crafton, Marietta, and Scott P. Crafton, Kennesaw, both of Ga., assignors to Consolidated Engineering Company, Inc., Kennesaw, Ga.

Continuation of Ser. No. 283,773, Aug. 1, 1994, which is a continuation of Ser. No. 149,323, Nov. 9, 1993, Pat. No. 5,350,160, which is a division of Ser. No. 979,621, Nov. 20, 1992, Pat. No. 5,294,094, which is a continuation of Ser. No. 705,626, May 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 415,135, Sep. 29, 1989, abandoned. This application May 30, 1995, Ser. No. 456,117

Int. Cl.[6] C21D *5/00*

U.S. Cl. 148—538 **40 Claims**



1. A method for heat treating a casting having a sand core and reclaiming sand from the sand core, the sand core comprising sand particles bound together by a binder material, the sand core defining a cavity within the casting, and the method comprising steps of:

providing an oxygenated atmosphere;

heating the oxygenated atmosphere to a temperature in excess of the combustion temperature of the binder material;

introducing the casting, with at least a portion of the sand core therein, into a furnace,

wherein the furnace includes a support assembly for supporting the casting within the furnace,

wherein the introducing step includes a step of placing the casting upon the support assembly,

wherein the casting is exposed within the furnace to the oxygenated and heated atmosphere to permit binder material to combust, and

wherein portions of the sand core are loosened from and fall from the cavity of the casting and the support assembly while the casting is within the furnace;

collecting, distant from the casting and the support assembly, portions of the sand core which fall from the support assembly prior to the binder material being combusted therefrom;

maintaining the collected portions of the sand core within the oxygenated atmosphere in a manner that permits binder material to be combusted therefrom such that sand is at least partially reclaimed from the collected portions of the sand core; and

conveying the at least partially reclaimed sand away from the furnace.

5,551,999

CYCLIC RECOVERY HEAT TREATMENT

William J. Gostic, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Apr. 23, 1984, Ser. No. 604,255

Int. Cl.[6] C21D *1/78;* C22F *1/10*

U.S. Cl. 148—562 **13 Claims**

6. A method for reducing the tendency of moderately deformed nickel base superalloy single crystals to recrystallize when heated to temperatures in excess of their gamma prime solvus temperature, said heat treatment comprising:

at least three cycles of alternating temperature wherein a single cycle comprises an exposure at a first temperature at which the majority of the gamma prime phase is in solid solution, but sufficient gamma prime remains in precipitate form to prevent recrystallization, and an exposure at a second, lower temperature at which most of the gamma prime phase is present in precipitate form, said first temperature being below but within 100° F. of the gamma prime solvus temperature.

5,552,000

SHAPED EXPLOSIVE BY RECRYSTALLIZATION FROM A NON-AQUEOUS SELF-EXPLOSIVE EMULSON

Walter B. Shepherd, Jr., Akron, Ohio, assignor to Mega Research Corporation, Uniontown, Ohio

Filed Oct. 1, 1987, Ser. No. 103,390

Int. Cl.[6] C06B *45/00*

U.S. Cl. 149—2 **12 Claims**

1. An explosive composition derived from a non-aqueous unstable emulsion comprising (i) a solution of a self-explosive in a first liquid and, (ii) a dispersion of a surfactant or emulsifier in a second liquid which is non-reactive with said first liquid and essentially insoluble therein;

said emulsion being formed by adding said solution to said dispersion at a temperature above the recrystallization temperature of said self-explosive from said first liquid so as to form droplets of said solution;

said self-explosive being selected from the group consisting of nitro-containing and nitramine containing organic compounds present in a major proportion by weight of said emulsion in which said droplets of said solution form the discontinuous phase and said dispersion forms the continuous phase; and,

said surfactant or emulsifier is non-reactive with said self-explosive which remains in solution as the discontinuous phase at a temperature below the recrystallization temperature of said self-explosive,

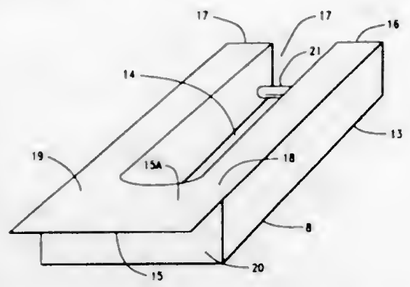
whereby, upon aging and cooling, said emulsion is destabilized, so as to form a mass of contiguous discrete crystals of said self-explosive, in which mass plural phases are trapped, said phases including said first and second liquids, surfactant or emulsifier, and mixtures thereof.

5,552,001

OXYGEN YIELDING FIRESTARTER/FIREBUILDER

Robert E. Fearon, Box 470787, Tulsa, Okla. 74147-0787

Filed Aug. 4, 1994, Ser. No. 285,693
Int. Cl.[6] C06B *29/02*
U.S. Cl. 149—77 **2 Claims**



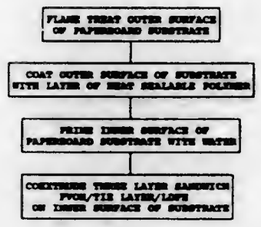
1. An oxygen yielding firestarter/firebuilder in which the oxygen yielding material is a composition comprising not less than 85% nor more than 97% potassium chlorate, and not less than 3% nor more than 15% of manganous acid.

5,552,002

METHOD FOR MAKING PAPERBOARD PACKAGING CONTAINING A PVOH BARRIER

Robert A. Farrell, Silver Spring, and Christopher J. Parks, Ellicott City, both of Md., assignors to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 159,528, Dec. 1, 1993, Pat. No. 5,506,011.
This application Oct. 24, 1994, Ser. No. 328,118
Int. Cl.[6] B32B *31/12*
U.S. Cl. 156—82 **4 Claims**



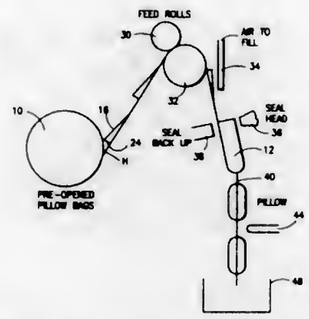
1. A process for manufacturing a heat-sealable, PVOH barrier laminate useful for preparing containers for non-refrigerated liquid and dry products comprising the steps:
(a) flame treating a first surface of a paperboard substrate;
(b) extrusion coating a first layer of about 6–18 lbs/ream of a heat-sealable polymer onto the flame treated surface of the paperboard;
(c) priming a second surface of the paperboard substrate with water to wet the surface of the paperboard; and,
(d) coextruding a product contact sandwich comprising a layer of 4–6 lbs/ream of a polyvinyl alcohol copolymer, an adhesive tie layer of 4–6 lbs/ream, and a second layer of about 10–14 lbs/ream of a heat sealable polymer in molten form onto the primed surface of said paperboard substrate such that the polyvinyl alcohol copolymer contacts the primed surface of the paperboard and the adhesive tie layer is between the polyvinyl alcohol layer and the second layer of heat-sealable polymer.

5,552,003

METHOD FOR PRODUCING INFLATED DUNNAGE

Gregory A. Hoover, 700 Scotland St., Dunedin, Fla. 34698; Roger A. Hoover, 24 Sunset Bay Dr., Belleair, Fla. 34616; E. Riley Rowe, 519 White Oak Cir., Hartsville, S.C. 29550, and David L. Rowe, 11904 E. Appaloosa Run, Raleigh, N.C. 27613

Filed Oct. 4, 1994, Ser. No. 317,760
Int. Cl.[6] B65B *61/00;* **B63B** *25/24*
U.S. Cl. 156—147 **5 Claims**



1. Method for producing dunnage, comprising the steps of:
a) coextruding two polymers of differing tack to form a plastic sheet having opposite surfaces of differing tack;
b) sealing said plastic sheet to another said plastic sheet so as to form a plurality of plastic bags, each of said bags comprising said plastic sheets in facing relationship and sealed along three edges thereof with one edge remaining open, said bags having inner and outer surfaces with said outer surfaces having greater tack than said inner surfaces, and said bags being releasably attached to each other along two opposed edges;
c) rolling up said plurality of plastic bags to form a plurality of bags in roll form;
d) providing said plurality of plastic bags in roll form at a site where said dunnage is to be produced;
e) unrolling said plurality of bags in roll form at said site, and blowing air towards each said open edge in sequence, causing each said bag to inflate;
f) sealing the fourth edge of each said inflated bag, said bag being empty except for air of inflation;
g) separating at least one said sealed bag from said plurality of bags in roll form; and
h) placing a plurality of said separated, sealed bags in a carton to serve as dunnage.

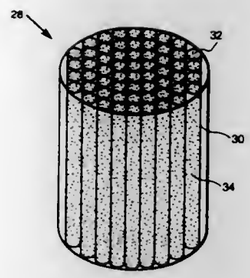
5,552,004

METHOD OF MAKING AN ACOUSTIC COMPOSITE MATERIAL FOR AN ULTRASONIC PHASED ARRAY

Peter W. Lorraine, 876 Heather La., Niskayuna, N.Y. 12309, and John T. Pedicone, 532 Pinard Dr., Orlando, Fla. 32825

Filed Apr. 3, 1995, Ser. No. 415,903
Int. Cl.[6] H01L *41/08;* **G01N** *29/00;* **H04R** *17/00*
U.S. Cl. 156—154 **11 Claims**

1. A method for forming an acoustic composite material, comprising the steps of:
forming a microcapillary array having a plurality of holes of a constant cross-section and volume fraction;
depositing a polymer fill in each of the plurality of holes of the microcapillary array;
cutting the polymer filled microcapillary array into a plurality of sections; the polymer filled microcapillary array cut at an axis perpendicular to the microcapillary array; and
grinding each of the plurality of sections into a predetermined thickness.

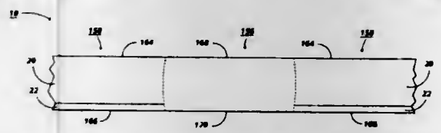


5,552,005

METHOD OF CONSTRUCTING A SEAMED FLEXIBLE IMAGING SHEET

Joseph Mammino, Penfield; Satchidanand Mishra, Webster; Shyshung S. Hwang, Penfield, and Edward A. Domm, Hilton, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 27, 1991, Ser. No. 815,086
Int. Cl.[6] B29C *65/00*
U.S. Cl. 156—157 **1 Claim**



1. A method of constructing a seamed, flexible imaging sheet for use in an electrophotographic imaging apparatus, comprising the steps of;
overlapping a first marginal end region and a second marginal end region of the flexible imaging sheet to form an overlap region and a non-overlap region;
joining the first marginal end region and the second marginal end region to one another in the overlap region;
shaping the overlap region to form a generally planar surface substantially co-planar with a surface of the non-overlap region to minimize stress concentration on the sheet, resulting in a seamed, endless, flexible member; and
forming a layer on the flexible imaging sheet subsequent to said steps of joining and shaping.

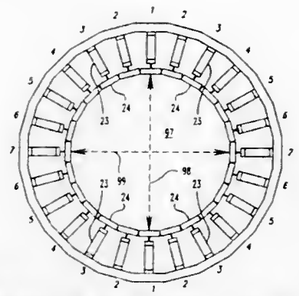
5,552,006

METHOD OF MAKING A STRETCHED MEMBRANE MIRROR FROM FILM WITH ANISTROPY PROPERTIES

Patrick K. Soliday; Gary W. Thomas; Monte A. McGlaun, and Michael J. Taylor, all of Abilene, Tex., assignors to Cummins Power Generation, Inc., Columbus, Ind.

Continuation of Ser. No. 17,700, Feb. 12, 1993, abandoned.
This application May 30, 1995, Ser. No. 453,993
Int. Cl.[6] B32B *7/14;* **B29D** *11/00*
U.S. Cl. 156—160 **6 Claims**

1. A method of fabricating a stretched membrane mirror comprising the following steps:
(a) providing a mirror frame having a top surface;
(b) providing a sheet of reflective film which exhibits anistropy in film properties;
(c) attaching a plurality of clamps to the periphery of said sheet of reflective film and arranging said plurality of clamps into a plurality of opposing pairs;
(d) connecting one each of a plurality of pneumatic cylinders to each of said plurality of clamps;
(e) connecting each of said plurality of pneumatic cylinders to a corresponding source of pneumatic fluid;



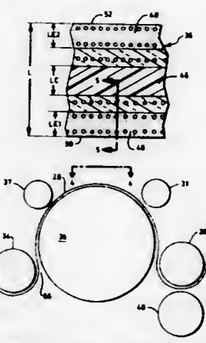
(f) actuating said plurality of pneumatic cylinders for pulling said sheet of reflective film into tension via said plurality of opposing pairs of clamps;
(g) selectively varying the pulling tension which is applied to each opposing pair of clamps to accommodate said anistropy in film properties in order to create a tensioned sheet of reflective film which is uniformly tensioned throughout its tensioned surface; and
(h) adhesively securing said tensioned sheet of reflective film to the top surface of said mirror frame.

5,552,007

CONVEYING CONTINOUS WEB HAVING CROSS-DIRECTION TENSION

Gregory J. Rajala, Neenah; Gerald L. Rabe, Appleton; Paul M. Niemi, Neenah, and Donald J. Holewski, Greenville, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 31, 1995, Ser. No. 382,109
Int. Cl.[6] B32B *31/06;* **A61F** *13/15*
U.S. Cl. 156—164 **67 Claims**



1. A method of handling a continuous web in a process wherein the web advances in a machine direction, the web having a length defined in the machine direction and a width defined in the cross-machine direction between first and second edges of the web, wherein substrate elements of the web define openings therebetween into the web, and edges of the openings, the method comprising the steps of:
(a) incorporating into the web stretched elastic-type elements having a retracting force active in the cross-machine direction and urging effective reduction in the width of the web;
(b) transporting the web on a first outer working surface of a first rotary transport device, the first outer working surface including a first set of protuberances thereon, the first set of protuberances interacting with the substrate elements defining the edges of a first set of the openings into the web and thereby inhibiting lateral movement of the respective substrate elements defining the edges of the first set of openings, and stabilizing the width of the web in the cross-machine direction

between the first and second edges of the web on the first rotary transport device; and

(c) transferring the web from the first rotary transport device to a second outer working surface of a second rotary transport device, the second outer working surface including a second set of protuberances thereon, the second set of protuberances interacting with the substrate elements of a second set of the openings into the web and thereby inhibiting lateral movement of the respective edges of the second set of openings, and stabilizing the width of the web in the cross-machine direction between the first and second edges of the web, during the transferring step.

5,552,008

METHOD FOR THE PREPARATION OF HIGH MODULUS CARBON AND GRAPHITE ARTICLES

Daniel H. Hecht, Duluth, and David A. Schulz, Flowery Branch, both of Ga., assignors to Amoco Corporation, Chicago, Ill.

Division of Ser. No. 76,538, Jun. 14, 1993. This application Dec. 14, 1994, Ser. No. 355,514

Int. Cl.[6] B65H *81/00*; C01B *31/00*

U.S. Cl. 156—174 **13 Claims**

1. A method for producing carbon articles consisting of fused, mesophase pitch-based carbon fiber, said method comprising the steps of:

(a) fabricating a preform structure by the steps of winding continuous mesophase pitch fiber wet with from 30 to 45 wt. % aqueous nitric acid on a bobbin, removing said bobbin to provide a wound cylinder and sectioning said cylinder; and

(b) carbonizing said preform structure by a thermal treatment conducted in a substantially inert gas atmosphere to a final temperature above about 1100° C.

5,552,009

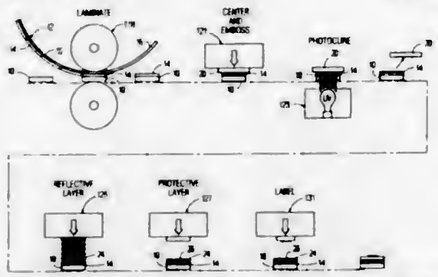
METHOD FOR MAKING OPTICALLY READABLE MEDIA CONTAINING EMBOSSED INFORMATION

Stephen A. Zager, Newark, and Felix P. Shvartsman, Wilmington, both of Del., assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 719,087, Jun. 19, 1991, Pat. No. 5,466,319, which is a continuation of Ser. No. 375,100, Jun. 30, 1989, abandoned. This application Apr. 10, 1995, Ser. No. 419,492

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—220 **5 Claims**



1. A method for making a stamper for use in making an optically readable medium comprising the sequential steps of:

(a) laminating an optically transparent dry photohardenable film to a surface of a dimensionally stable substrate;

(b) embossing the exposed surface of the photohardenable film with the surface of a relief information track;

(c) passing actinic radiation through the photohardenable film to effect hardening of the photohardenable film while it is in contact with the relief information track; and

(d) separating the resultant photohardened stamper from the relief information track.

5,552,010

METHOD FOR PRODUCING TILE CARPET

Teruo Kajikawa, Yokosuka; Yasuhiko Ganno, Ebina; Junichi Takeda, Kitakatsuragi-gun, and Syuichi Yonezawa, Hashimoto, all of, Japan, assignors to Suminoe Orimono Kabushiki Kaisha, Osaka, Japan, and Nippon Petrochemicals Co., Ltd., Tokyo, Japan

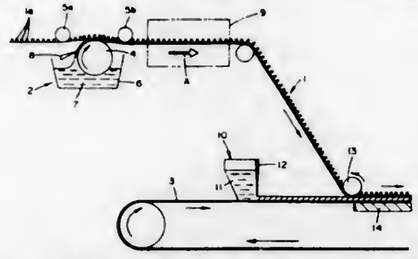
PCT No. PCT/JP93/00424, § 371 Date Dec. 1, 1993, § 102(e) Date Dec. 1, 1993, PCT Pub. No. WO93/19654, PCT Pub. Date Oct. 14, 1993

PCT Filed Apr. 2, 1993, Ser. No. 157,047

Claims priority, application Japan, Apr. 2, 1992, 4-080752

Int. Cl.[6] B32B *31/08*

U.S. Cl. 156—231 **13 Claims**



1. A method for producing a tile carpet, which method comprises sealing a carpet cloth by the applying thereon of a heated first olefin polymer composition (B); cooling said first olefin polymer composition (B); applying a second heat-melted, olefin polymer composition (A) at least once onto a traveling releasable endless belt, then laminating said carpet cloth which has been previously sealed with said first olefin polymer composition (B) onto the coating surface of the composition (A) which is in a melted state in the absence of an application of heat to obtain an integral laminate; and forcibly cooling the laminate at the point of lamination into a tile shape.

5,552,011

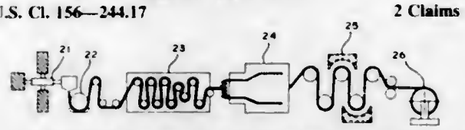
PROCESS OF 3-LAYER CO-EXTRUDED BIAXIAL ORIENTED POLYPROPYLENE (BOPP) SYNTHETIC PAPER

Allen F. Lin, Taipei, Taiwan, assignor to Nanya Plastics Corporation, Taipei, Taiwan

Filed Oct. 14, 1994, Ser. No. 321,880

Int. Cl.[6] B29C *35/10*

U.S. Cl. 156—244.17 **2 Claims**



1. A process for manufacturing a 3-layer co-extruded biaxial-oriented polypropylene (BOPP) synthetic paper comprising:

(a) extruding by means of a primary extruder an intermediate layer from a first resin composition comprising 70–80% by weight of a high crystallinity polypropylene having over 97% isotacticity, 14–10% by weight of a calcium carbonate master batch, 13–9% by weight of a titanium dioxide master batch, and 3–1% by weight of a static resistant agent;

(b) extruding by means of two secondary extruders two paper surface layers from a second resin composition comprising 30–55% of polypropylene, 40–30% by weight of polyethylene, 26–14% by weight of a titanium dioxide master batch,

2–0.5% by weight of a static resistant agent, 1–0.4% by weight of an adhesion resistant agent, and 1–0.1% by weight of an UV absorbent;

said first and second resin composition being extruded for co-flow at 200° to 280° C.;

(c) extruding said co-flow through a T-die to form a paper sheet with three layers comprising a top paper surface layer, an intermediate layer, and a bottom paper surface layer, wherein said intermediate layer is formed from an extrudate from said primary extruder and said top paper surface and said bottom paper surface layer is formed from an extrudate from said two secondary extruders;

(d) cooling and shaping said paper sheet by passing through a cooling roller at 15° to 60° C. and being biaxially oriented for 3–6 times of longitudinal orientation through preheating, orienting and tempering under 120° to 150° C. and for 5–12 times of lateral orientation through preheating, orienting and tempering under 150° to 185° C.;

(e) treating said paper sheet through corona discharge treatment with high frequency wave under a power of 20–120 KW; and

(f) rolling said paper sheet from (e) through a rolling device to form a roll of synthetic paper having a thickness of 30μ–100μ.

5,552,012

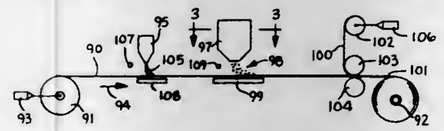
PLACEMENT OF ELECTRIC-FIELD-RESPONSIVE MATERIAL ONTO A SUBSTRATE

Marion C. Morris, Appleton; Robert R. Bomber, Green Bay; Franklin M. C. Chen, Appleton, and Ronald H. Wideman, Menasha, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Sep. 9, 1994, Ser. No. 303,994

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—272.4 **27 Claims**



1. A process for preparing an absorbent structure comprising using an electric field to contact a material responsive to an electric field selected from the group consisting of a hydrogel-forming polymeric material and an adhesive material, with a substrate, wherein the material responsive to an electric field remains substantially neutrally charged during the process and is in the form of particles which have maximum cross-sectional diameters within the range of from about 50 micrometers to about 1000 micrometers.

5,552,013

APPARATUS AND METHOD FOR ROTARY BONDING

Thomas D. Eblert, Neenah, and Norman R. Stegelmann, Appleton, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jun. 29, 1994, Ser. No. 268,758

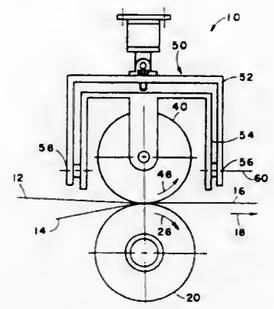
Int. Cl.[6] B32B *31/16*

U.S. Cl. 156—555 **9 Claims**

1. An apparatus for bonding at least two continuously moving substrate webs together comprising:

a) a rotatable bonding roll which is configured to rotate about a bonding axis and which has an outer peripheral bonding surface upon which said substrate webs travel;

b) a rotatable anvil roll which has an outer peripheral anvil surface and which is configured to rotate about an anvil axis and press said substrate webs against said bonding surface of said bonding roll thereby bonding said substrate webs together; and



c) a pivotal support means which is rotatably connected to said anvil roll and configured to pivot about a pivot axis for continuously aligning said anvil surface to maintain said anvil surface in a substantially parallel relationship with said bonding surface of said bonding roll wherein said pivot axis of said pivotal support means is located a first distance from said bonding axis and said anvil axis is located a second distance from said bonding axis, wherein said second distance is greater than said first distance.

5,552,014

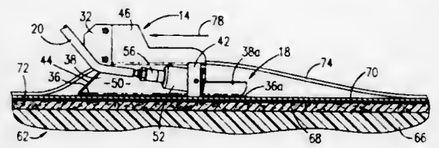
ROOFING TORCH

Paul L. Morris, 8815 W. 104th St., Overland Park, Kans. 66212

Continuation-in-part of Ser. No. 62,91, May 17, 1993, Pat. No. 5,353,782, which is a continuation-in-part of Ser. No. 880,235, May 8, 1992, Pat. No. 5,211,158. This application Jan. 31, 1994, Ser. No. 189,591

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—577 **10 Claims**



1. A torch assembly for use in fabricating and repairing roof joints and the like, comprising:

an elongated handle presenting a forward upper end and a lower rearward end, the upper end presenting a gripping means for permitting the apparatus to be gripped and pulled in a forward direction during use;

a torch supported adjacent the lower end of the handle for directing a flame away from the handle;

a supply means for supplying fuel to the torch;

a support means for supporting a roll of bituminous material on the apparatus so that the material may be dispensed from the roll in a rearward direction as the apparatus is pulled forward; and

an elongated shoe having a front end adjacent the lower end of the handle and a rear end spaced rearward of the torch, the shoe including

upper and lower wall sections which are connected together at the rear end of the shoe,

at least one side wall section which extends between the upper and lower wall sections and defines a flame-receiving cavity for substantially surrounding the flame directed by the torch, and

a diverter means for diverting the flame in the flame-receiving cavity upward and rearward toward the bituminous material being dispensed from the support means.

5,552,015

PROCESS FOR MANUFACTURING A PRESSURE-DIFFERENCE SENSOR

Frank Arndt, and Helmut Schlaak, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

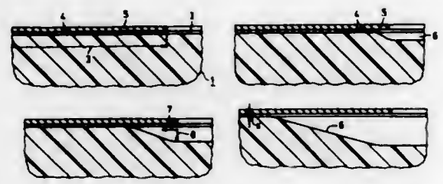
PCT No. PCT/DE93/00152, § 371 Date Sep. 28, 1994, § 102(e) Date Sep. 28, 1994, PCT Pub. No. WO93/17440, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 18, 1993, Ser. No. 256,401

Claims priority, application Germany, Feb. 28, 1992, 42 06 677.8

Int. Cl.[6] H01L *21/306*

U.S. Cl. 216—2 **4 Claims**



1. A process for the manufacture of a pressure-difference sensor for detecting a difference between two pressures, having a measuring diaphragm of silicon material clamped between two disk-shaped bearing parts of glass with the formation of a separate inner chamber formed between said diaphragm and each of said disk-shaped bearing parts, in which one inner chamber can be acted on by one pressure of the two pressures to be measured via a passage opening in the one bearing part associated with said one inner chamber, and the other inner chamber can be acted on by a second pressure, comprising the steps of:

(a) prior to clamping the silicon measuring diaphragm to one or both of the disk-shaped bearing parts, limiting the inner chamber with a recess having oblique sides of very slight slope, said limiting step includes the following sub-steps:

(i) applying a thin layer, removable by an isotropically acting etching liquid, to regions of the surface of the disk-shaped bearing part based on where the oblique sides of the inner chamber recess will be produced;

(ii) covering the thin layer with an etching mask that is not removable by the isotropically acting etching liquid; and

(iii) effecting isotropic etching thereupon.

5,552,016

METHOD AND APPARATUS FOR ETCHBACK ENDPOINT DETECTION

Steve G. Ghanayem, Sunnyvale, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 364,830, Dec. 23, 1994, abandoned, which is a continuation of Ser. No. 141,171, Oct. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 55,066, Apr. 28, 1993, abandoned. This application Aug. 17, 1995, Ser. No. 516,115

Int. Cl.[6] H01L *21/306*; **C23F** *1/02*

U.S. Cl. 156—627.1 **4 Claims**

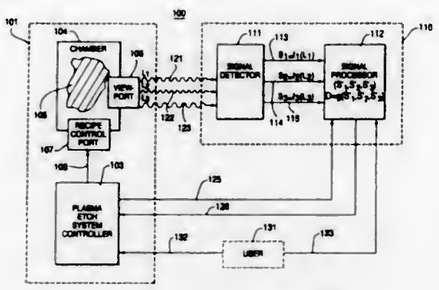
1. A plasma etching system for etching titanium nitride from a semiconductor wafer in a chlorine-argon plasma, comprising:

a plasma chamber for generating the chlorine-argon plasma in which electromagnetic emissions are generated;

a viewport into the chamber for viewing the electromagnetic emissions;

plasma control means responsive to an activation signal for initiating tracking of said etching process and to an endpoint indicator signal for terminating the etching process;

detector means, coupled to the viewport, for detecting the emissions from elements present in the chamber and for generating a detector signal representing the intensity of the emissions within a limited bandwidth centered on an optical wavelength of about 700 nm;



signal processor means coupled to the detector means and said control means and responsive to said activation signal for processing said limited bandwidth detector signal in response to the activation signal to generate an endpoint indicator signal which is a function of said detector signals and indication of the endpoint of said etching process, said endpoint indicator signal being coupled to said plasma control means, whereby said etching process is automatically terminated in response to said endpoint indicator signal.

5,552,017

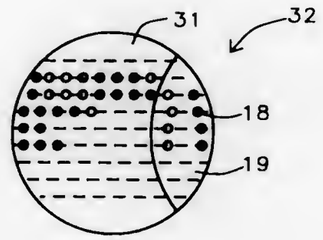
METHOD FOR IMPROVING THE PROCESS UNIFORMITY IN A REACTOR BY ASYMMETRICALLY ADJUSTING THE REACTANT GAS FLOW

Syun-Ming Jang, Hsin-Chu, and Chen-Hua Yu, Keeling City, both of, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsin-Chu, Taiwan

Filed Nov. 27, 1995, Ser. No. 563,142

Int. Cl.[6] C23C *16/00*

U.S. Cl. 156—643.1 **21 Claims**



1. A method for plasma etching in a single-wafer etching chamber having improved etch rate uniformity, comprising the steps of:

providing a single-wafer etching chamber having a pumping system and a throttle valve for evacuating and maintaining a constant low pressure in said chamber;

providing gas flow controllers and gas monitor meters connected to said etching chamber, thereby controlling the flow rates of reactant gases into said etching chamber; and

providing a gas distribution system in said etching chamber to asymmetrically distribute said reactant gas over a wafer having a wafer flat, said wafer resting on a substrate electrode, thereby improving the etch uniformity near the flat on said wafer during etching;

forming a plasma in said reactant gas by coupling radio frequency (RF) power to said reactant gas, and thereby plasma etching said wafer.

5,552,018

A PROCESS FOR DELIGNIFYING PULP WITH ORGANIC PEROXYACID IN THE PRESENCE OF PHOSPHONIC ACIDS AND THEIR SALTS

Johan Devenyns, Brussels, Belgium, assignor to Solvay Interox (Societe Anonyme), Brussels, Belgium

Filed Jun. 29, 1993, Ser. No. 83,180

Claims priority, application Belgium, Jul. 6, 1992, 09200627

Int. Cl.[6] D21C *9/16*

U.S. Cl. 162—76 **12 Claims**

1. A process for improving the selectivity of the delignification of a chemical paper pulp by means of an organic peroxyacid, comprising the step of: treating an unbleached pulp originating from a cooking operation with an aqueous solution of the organic peroxyacid containing at least 10% by weight of peroxyacid in the presence of a stabilizer for the peroxyacid, said stabilizer comprising at least one compound selected from the group consisting of phosphonic acids and their salts, wherein the organic peroxyacid is fed in an amount sufficient to delignify the unbleached pulp and produce a delignified chemical pulp.

5,552,019

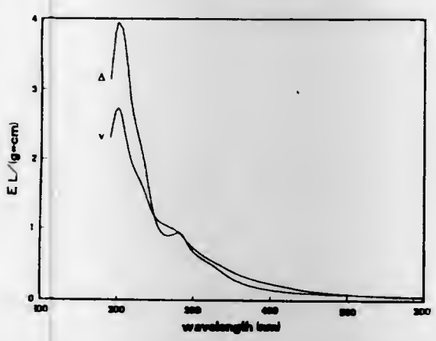
OXIDATIVE DELIGNIFICATION OF WOOD OR WOOD PULP BY TRANSITION METAL-SUBSTITUTED POLYOXOMETALATES

Ira A. Weinstock, Madison, Wis.; Craig L. Hill, Atlanta, Ga., and Rajai H. Atalla, Verona, Wis., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C., and Emory University, Atlanta, Ga.

Continuation-in-part of Ser. No. 937,634, Aug. 28, 1992, Pat. No. 5,302,248. This application Mar. 28, 1994, Ser. No. 219,041

Int. Cl.[6] D21C *3/00*

U.S. Cl. 162—79 **13 Claims**



1. A method for delignifying wood pulp comprising the steps of:

obtaining a wood pulp; and

contacting the wood pulp with a solution of a polyoxometalate of the formula $[V_lMo_mW_nNb_oTa_p(TM)_qX_rO_s]^{t-}$ where l is 0–18, m is 0–40, n is 0–40, o is 0–10, p is 0–10, q is 0–9, r is 0–6, TM is a d-electron-containing transition metal ion, and X is a heteroatom, which is a p or d block element, where $l+m+n+o+p \geq 4$, $l+m+q>0$ and s is sufficiently large that x>0, under conditions wherein

said polyoxometalate solution is 0.001 to 0.20M;

the pH of said solution is adjusted to 1.5 or higher;

the consistency of said wood pulp and polyoxometalate solution is approximately 1 to 20%;

said mixtures are heated in a sealed vessel under conditions of temperature and time wherein the polyoxometalate is reduced and enhanced delignification occurs.

5,552,020

TISSUE PRODUCTS CONTAINING SOFTENERS AND SILICONE GLYCOL

Michael J. Smith, Neenah; Wen Z. Schroeder, and Gary L. Shanklin, both of Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jul. 21, 1995, Ser. No. 505,839

Int. Cl.[6] D21H *17/13*

U.S. Cl. 162—164.4 **20 Claims**

20. A method for making a soft tissue comprising: (a) adding one or more softener/debonders and a silicone glycol to an aqueous suspension of papermaking fibers, either separately or as a combined aqueous mixture, wherein the amount of softener/debonder is from about 0.01 to about 6 percent active matter, based on the weight of fiber, and wherein the amount of silicone glycol is from about 0.0001 to about 3 percent active matter, based on the weight of fiber; (b) depositing the aqueous suspension of papermaking fibers onto a forming fabric to form a tissue web; and (c) dewatering and drying the web.

5,552,021

METHOD, DEVICE AND ARRANGEMENT FOR REGULATING THE CONTROL OF A TRANSVERSE PROFILE OF A PAPER WEB IN A PAPER MACHINE

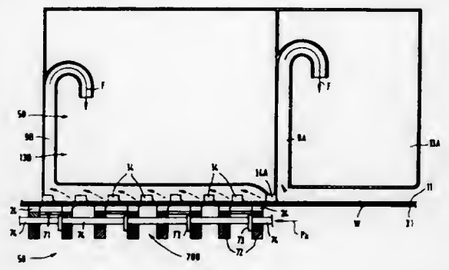
Heikki Ilvespää, Jyväskylä; Jyrki Jaakkola, Korpilahti; Ari Linsuri, Jyväskylä; Erkki Partanen, Jyväskylä; Antti Polkolainen, Jyväskylä; Pasi Turpeinen, Jyväskylä, and Lauri Verkasalo, Jyväskylä, all of, Finland, assignors to Valmet Corporation, Helsinki, Finland

Filed Jun. 17, 1994, Ser. No. 262,138

Claims priority, application Finland, Jun. 17, 1993, 932793; May 3, 1994, 942027

Int. Cl.[6] D21F *1/00*

U.S. Cl. 162—203 **27 Claims**



1. Method in a paper machine for controlling a transverse profile of at least one property of a paper web, wherein the web is carried between two forming wires and dewatered under compression by dewatering ribs and/or forming ribs, the paper machine having a machine direction, comprising the steps of:

arranging a first group of said ribs in a loop of a first one of said forming wires, each of said ribs in said first group extending in a direction transverse to the machine direction,

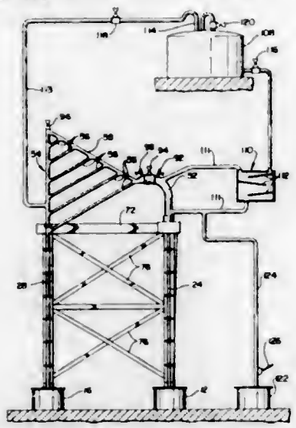
deflecting at least two ribs in said first group of ribs in the transverse direction, said deflecting step comprising the steps of arranging a plurality of elastic hoses each at a different location in the transverse direction in a position extending substantially in the machine direction between said at least two ribs, and directing pressure media through said hoses, and

regulating the deflection of said at least two ribs by independently regulating the pressure of the pressure medium being directed through each of said hoses to control the transverse retention profile of the web to thereby influence the transverse fiber-orientation profile and/or the filler profile of the paper web.

5,552,022
DESALINATION SYSTEM UTILIZING TRANSFER CONDUIT EXTENDING ABOVE SALT WATER SIPHON HEIGHT

Henry A. Wilson, 7461 W. Belvedere Rd., West Palm Beach, Fla. 33411

Filed Jan. 31, 1995, Ser. No. 384,316
Int. Cl.[6] B01D *3/42;3/00*
U.S. Cl. 202—176 **20 Claims**



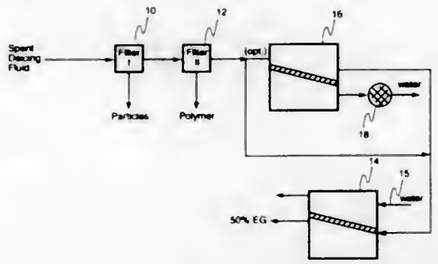
1. A desalination system, comprising:
a pool of a salt water exposed to atmospheric pressure;
a separate pool of desalinated water in a desalinated water container;
a transfer conduit for transferring water from said salt water pool to said desalinated water pool without transferring salt to said desalinated water pool, said transfer conduit having end openings respectively submerged in said salt water pool and said desalinated water pool said transfer conduit extending upwardly and having a portion above a siphon height of said salt water at atmospheric pressure, wherein said transfer conduit encloses a column of said salt water extending from said salt water pool and a column of said desalinated water extending from said desalinated water pool separated by a transfer volume vacuum;
means for filling said conduit with water above said siphon level and allowing the water to lower to said siphon height to establish a transfer volume in said transfer conduit;
means for maintaining the temperature of said salt water column above the temperature of said desalinated water column;
a salt water storage device; and
means for exchanging salt water transferred from said salt water storage device to said salt water column with gases transferred from the transfer conduit to said salt water storage device.

5,552,023
RECOVERY OF SPENT DEICING FLUID

Shaojun J. Zhou, Palatine, Ill., assignor to AlliedSignal Inc., Morris Township, Morris County, N.J.

Filed Dec. 15, 1993, Ser. No. 167,671
Int. Cl.[6] B01D *3/00*
U.S. Cl. 203—18 **16 Claims**

1. A method of concentrating spent deicing fluid wherein said fluid is selected from the group consisting of ethylene glycol and propylene glycol in aqueous solutions by removing water therefrom consisting essentially of:
(a) passing said aqueous glycol solution over one face of a hydrophobic porous membrane having 0.01 to 2.0 μm pores at a pressure below the breakthrough pressure of liquid water and at a temperature below the boiling point of said solution



between about 40° C. and 80° C. and above the temperature on the opposite face of said membrane between about 5° C. and 40° C., whereby water vapor from said solution passes through the pores of said membrane to said opposite membrane face while rejecting liquid water and glycol and said aqueous glycol solution is concentrated by removing said water vapor;
(b) removing said water vapor of (a) passed through said membrane; and
(c) recovering the concentrated aqueous glycol solution.

13. An apparatus for the concentration of spent deicing fluid wherein said fluid is selected from the group consisting of ethylene glycol and propylene glycol in an aqueous solution by removing water therefrom consisting essentially of:
(a) an evaporative membrane means in contact with said glycol solution for removing water as vapor from said solution wherein said membrane means has pores of about 0.01 to 2.0 μm and is capable of passing water vapor and rejecting liquid water and glycol;
(b) means for establishing a pressure of said solution below the breakthrough pressure of liquid water on a first face of said membrane means and a temperature between about 40° C. and 80° C. on said first face of said membrane means and between about 5° C. and 40° C. on the opposite face of said membrane to establish a vapor pressure differential across said membrane means;
(c) means for removing said water vapor of (a) pass through said membrane; and
(d) means for recovering the concentrated aqueous glycol solution.

5,552,024
PROCESS FOR RECOVERING DIPROPYLENE GLYCOL TERT-BUTYL ETHERS

Te Chang, West Chester, and Stephen H. Harris, Kennett Square, both of Pa., assignors to ARCO Chemical Technology, L.P., Greenville, Del.

Filed Feb. 28, 1994, Ser. No. 203,162
Int. Cl.[6] B01D *3/40*
U.S. Cl. 203—64 **17 Claims**

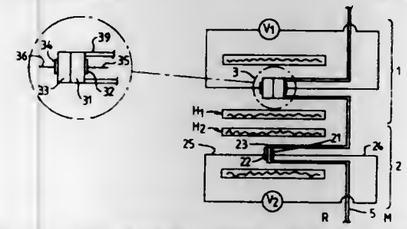
1. A process for recovering dipropylene glycol tert-butyl ethers (DPTB) from a mixture of DPTB and di-tert-butyl ether impurities derived from dipropylene glycol, said process comprising:
(a) distilling a mixture consisting essentially of DPTB and a minor proportion of di-tert-butyl ether impurities derived from dipropylene glycol in an extractive distillation column using an agent consisting essentially of a glycol extracting agent selected from the group consisting of dipropylene glycol, tripropylene glycol, triethylene glycol, and tetrapropylene glycol in an amount effective to maintain at least about 40% of glycol extracting agent in the liquid in the extractive distillation column and to permit removal of the di-tert-butyl ether impurities from the mixture as an overhead distillation product; and
(b) distilling the resulting purified DPTB in a product distillation column to recover, as an overhead product, DPTB that is substantially free of di-tert-butyl ether impurities.

15. A process for making and recovering dipropylene glycol tert-butyl ethers (DPTB), said process comprising:
(a) reacting dipropylene glycol with isobutylene in the presence of an acidic ion-exchange resin to produce a mixture which consists essentially of DPTB, unreacted dipropylene glycol, and di-tert-butyl ether impurities derived from dipropylene glycol;
(b) distilling the mixture in an extractive distillation column using an agent consisting essentially of dipropylene glycol in an amount effective to maintain at least about 40 wt. % of dipropylene glycol in the liquid in the extractive column and to permit removal of the di-tert-butyl ether impurities from the mixture as an overhead distillation product; and
(c) distilling the resulting purified DPTB in a product distillation column to recover, as an overhead product, DPTB that is substantially free of di-tert-butyl ether impurities.

5,552,025
SENSORS

David E. Coe, St. Neots, England, assignor to ABB Kent-Taylor Limited, Bedfordshire, England

Filed Apr. 20, 1994, Ser. No. 230,065
Claims priority, application United Kingdom, Apr. 22, 1993, 9308305
Int. Cl.[6] G01N *27/26*
U.S. Cl. 205—785.5 **28 Claims**

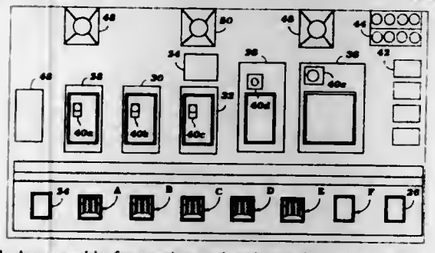


23. A method of measuring a sulphur oxide in gas, comprising the steps of directly exposing to the gas a sensing electrolyte of doped β-alumina or doped NASICON and detecting an electrochemically developed potential, the dopant being chosen to improve polarization effects in the electrolyte thereby reducing hysteresis in the presence of sulphur dioxide.

5,552,026
SURFACE TREATMENT APPARATUS

Hirihiko Ikegaya; Masaaki Isobe, and Masayuki Watanabe, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Sep. 1, 1994, Ser. No. 299,834
Claims priority, application Japan, Sep. 2, 1993, 218755; Jun. 16, 1994, 134714
Int. Cl.[6] C25D *17/00;17/06;* **B05C** *3/02*
U.S. Cl. 204—198 **17 Claims**



1. An assembly for treating an interior surface of a workpiece, wherein said interior surface forms a first opening and a second opening, comprising a body defining a support to which a workpiece is mountable in an upright position by attaching a first opening portion of said workpiece to said support, said support having an opening so as to fit said first opening of said workpiece to said opening of said support when said workpiece is mounted on said support; a hollow member defining a fluid passage for treating liquid to flow inside and outside said hollow member through an opening provided at the upper end of said hollow member, said hollow member protruding from said support through said opening of said support and occupying the interior of said workpiece when said workpiece is mounted on said support, up to the proximity of the second opening of said workpiece, so that said treating liquid is allowed to flow between the interior surface of said workpiece and said hollow member and inside said hollow member when said workpiece is mounted on said support, said fluid passage defining a treating liquid feed end and a treating liquid discharge end; a removable cover to said second opening of said workpiece, said cover not being connected to said member; a treating liquid feed channel connected to said treating liquid feed end of said member; a treating liquid discharge channel connected to said treating liquid discharge end of said member; a source of pressure communicating with one of said feed channel and said discharge channel to circulate liquid within said assembly; and a washing fluid inlet communicating with said fluid passage.

3. The assembly of claim 1, wherein said member comprises an electrode.

5,552,027
WORKING ELECTRODE FOR ELECTROCHEMICAL ENZYMATIC SENSOR SYSTEMS

Sigfried Birkle, Hoechstadt; Johann Kammermaier, deceased, Late of Unterhaching, and Rolf Schulte, Erlangen, all of, Germany, assignors to Siemens Aktiengesellschaft, München, Germany

Continuation of Ser. No. 287,025, Aug. 18, 1994, abandoned. This application Jul. 18, 1995, Ser. No. 503,563
Claims priority, application Germany, Sep. 22, 1993, 43 32 251.4
Int. Cl.[6] G01N *27/26;* **C25B** *11/00*
U.S. Cl. 204—290 F **18 Claims**

1. A working electrode for an electrochemical-enzymatic sensor system, comprising a base body of titanium, zirconium, molybdenum, tungsten or electrically conductive silicon, the base body having a thin layer consisting essentially of amorphous hydrogenated carbon (a-C:H).

5,552,028
POLYMERS FOR SEPARATION OF BIOMOLECULES BY CAPILLARY ELECTROPHORESIS

Ramakrishna S. Madabhushi, Foster City; Steven M. Menchen, Fremont; J. William Efcavitch, San Mateo, and Paul D. Grossman, Burlingame, all of Calif., assignors to The Perkin-Elmer Corporation, Foster City, Calif.

Division of Ser. No. 350,852, Dec. 6, 1994, which is a continuation-in-part of Ser. No. 170,078, Dec. 17, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 458,525
Int. Cl.[6] C07K *1/26;* **C25B** *7/00;* **B01J** *13/00*
U.S. Cl. 204—451 **5 Claims**

1. A composition for separating polynucleotides by capillary electrophoresis, the composition comprising:
a charge-carrying component;
a sieving component;
a surface interaction component consisting of one or more uncharged watersoluble silica-adsorbing polymers having (i) water solubility in a temperature range between about 20° C. and about 50° C., (ii) a concentration in the separation medium in a range between about 0.001% and about 10% (weight/volume), (iii) a molecular weight in the range between about 5×10^3 and about 1×10^6 Daltons, and (iv) an

absence of charged groups in an aqueous medium having a pH in the range between about 6 and about 9; and

wherein at least one of said one or more uncharged water-soluble silica-adsorbing polymers is an N,N-disubstituted polyacrylamide or an N-substituted polyacrylamide, wherein said nitrogen substituents are selected from the group consisting of C_1 to C_3 alkyl; halo-substituted C_1 to C_3 alkyl; methoxy-substituted C_1 to C_3 alkyl; and hydroxylsubstituted C_1 to C_3 alkyl.

5,552,029

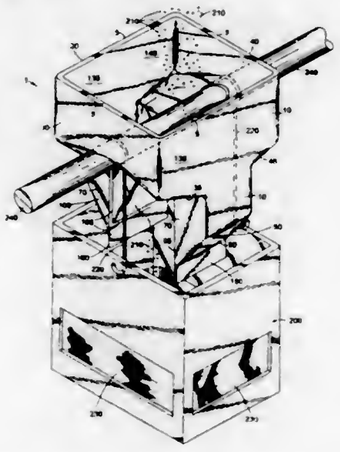
MATERIAL HANDLING DEVICE FOR ELECTROPLATING APPLICATIONS

Gregory B. Grieves, Saranac, Mich., assignor to Saranac Tank, Inc., Saranac, Mich.

Division of Ser. No. 281,419, Jul. 27, 1994, Pat. No. 5,494,197. This application Oct. 10, 1995, Ser. No. 541,811

Int. Cl.[6] C25D *5/00;17/02;21/00*

U.S. Cl. 205—80 **8 Claims**



7. A method for protecting at least a portion of a suspending device in an electroplating assembly comprising an electroplating tank, a support rod extending across at least a portion of said tank, and at least one material bin suspended from said support rod by said suspending device, said method comprising:

obtaining a material handling device defining an upwardly facing opening, and comprising (1) an upper region comprising a first upper sidewall, a second upper sidewall, and at least a pair of laterally spaced upper endwalls disposed between said first and said second upper sidewalls, wherein a pair of distal shoulders are formed on the ends of said device and (2) a pair of discharge members extending in a direction opposite said upwardly facing opening; and

positioning said device on said support rod such that at least one of said shoulders extends over and provides protection for said suspending device.

5,552,030

METHOD OF MAKING A MAGNETIC MATERIAL IN THE FORM OF A MULTILAYER FILM BY PLATING

Kazuo Shimizu; Motonobu Onoda; Takeji Tsuchiya, all of Yono, and Tohru Watanabe, Atsugi, all of, Japan, assignors to Nippon Piston Ring Co., Ltd., Tokyo, Japan

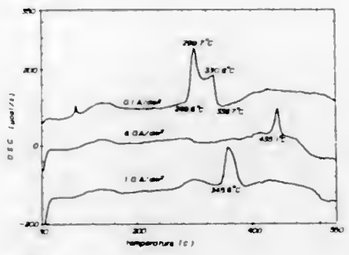
PCT No. PCT/JP93/01365, § 371 Date Feb. 22, 1994, § 102(e) Date Feb. 22, 1994, PCT Pub. No. WO94/08072, PCT Pub. Date Apr. 14, 1994

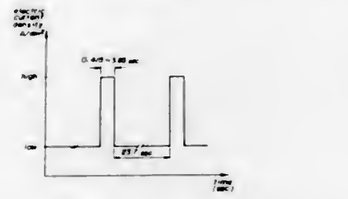
PCT Filed Sep. 24, 1993, Ser. No. 196,062

Claims priority, application Japan, Sep. 25, 1992, 4-280861

Int. Cl.[6] C25D *5/18;11/00;5/10;5/50*

U.S. Cl. 205—105 **5 Claims**





1. A method of making a magnetic material in the form of a multilayer thin film by alloy electroplating on an object in which the alloy content in a plated layer is defined by the plating current density utilized in the course of plating,

said method comprising the step of altering said plating current density at intervals during plating to laminate different alloy-content plated layers into a multilayer thin film in a plating bath having a rotary electrode as a cathode and the object on which the alloy is electroplated as the anode, said anode and cathode being supplied with a predetermined pattern of electric current, and heat-treating said multilayer thin film to modify the magnetic characteristics thereof, said different alloy content plated layers being composed of amorphous alloy plated layers and crystal alloy plated layers alternatively overlapped to each other.

5,552,031

PALLADIUM ALLOY PLATING COMPOSITIONS

Sung S. Moon, Pusan, Rep. of Korea, assignor to Hanyang Chemical Ind., Co., Pusan, Rep. of Korea

Filed Feb. 21, 1995, Ser. No. 391,978

Claims priority, application Rep. of Korea, Feb. 26, 1994, 943550

Int. Cl.[6] C25D *3/62;3/56*

U.S. Cl. 205—247 **11 Claims**

1. A palladium-gold alloy plating composition comprising 4 to 20 g/l of palladium in the form of a soluble palladium compound, 0.3 to 2.0 g/l of gold in the form of a soluble gold compound, 5 to 100 g/l of a conductive salt and 0.5 to 20 g/l of a complexing agent selected from 4-oxopentanoic acid, benzaldehyde tristyrilphenate, and a mixture thereof.

5,552,032

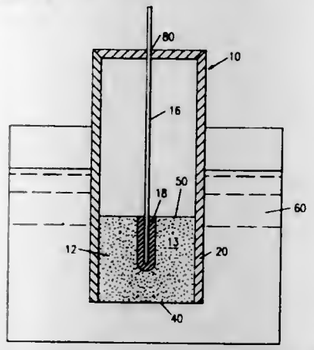
SOLID STATE ION SELECTIVE ELECTRODE AND METHOD OF USING THE SAME

Youqin Xie, and John N. Harman, III, both of Brea, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 24, 1995, Ser. No. 427,579

Int. Cl.[6] G01N *27/333*

U.S. Cl. 205—789 **30 Claims**



1. A solid state ion selective electrode device for the detection of a selected ion species in solution, the device comprising:

a) a solid state ion selective electrode consisting essentially of a homogeneous solid mixture comprising (i) a solid electrolyte composition possessing ionic conductivity and (ii) polyvinyl chloride, wherein the electrode is substantially free of metallic silver, the electrode containing sufficient electrolyte composition for detecting the selected ion species in solution and containing no greater than about 4% polyvinyl chloride; and

b) an electrical connection to the electrode, the connection operating as a contact between the electrode device and a reference source.

5,552,033

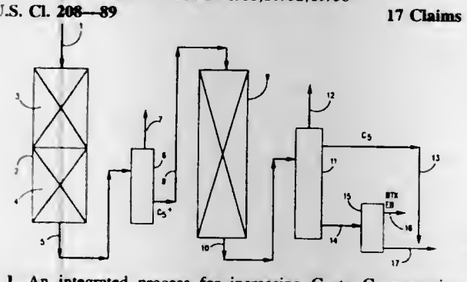
INTEGRATED PROCESS FOR INCREASING C_6 TO C_8 AROMATICS CONTENT IN REFORMATE PREPARED FROM C_9^+ AROMATICS-CONTAINING FEED

Stuart S. Shih, Cherry Hill, N.J., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 1, 1994, Ser. No. 347,732

Int. Cl.[6] C10G *45/00;59/02;69/08*

U.S. Cl. 208—89 **17 Claims**



1. An integrated process for increasing C_6 to C_8 aromatics content in reformate prepared from C_9^+ aromatics-containing feed which comprises:

1) pretreating a raw naphtha feedstream containing C_9^+ aromatics and sulfur by contacting with a) a hydrodesulfurization catalyst under hydrodesulfurization conditions to produce a hydrodesulfurized feedstream and thereafter b) cascading said hydrodesulfurized feedstream over a porous crystalline inorganic oxide catalyst containing metal selected from the group consisting of noble metals and Group VIA metals, said catalyst comprising pores having openings of 12-member rings under conditions sufficient to effect conversion of C_9^+ aromatics, thereby providing a pretreated effluent stream of enhanced C_8^- aromatics content relative to that obtained in the absence of said cascading; and

2) reforming at least a portion of said pretreated effluent stream to provide a reformate stream.

5,552,034

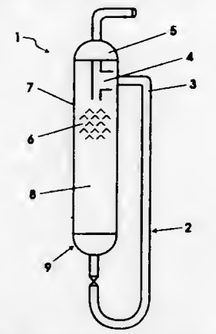
FLUID CATALYTIC CRACKING PROCESS

Patrick H. Terry, Middletown, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 64,569, May 19, 1993, Pat. No. 5,360,598, and Ser. No. 64,602, May 19, 1993, abandoned. This application Jun. 13, 1994, Ser. No. 259,209

Int. Cl.[6] C10G *11/00;35/14*

U.S. Cl. 208—113 **9 Claims**



1. A fluid catalytic cracking process comprising:

(a) reacting hydrocarbon with a catalytic cracking catalyst in a dilute phase reactor to form a dilute phase reaction medium having a density of less than about 10 lbs/ft^3 and comprising hydrocarbon, cracked hydrocarbon and coked catalytic cracking catalyst;

(b) separating and recovering the cracked hydrocarbon from the dilute phase reaction medium;

(c) stripping hydrocarbon, H_2, H_2S, NH_3 and cracked hydrocarbon entrained with the separated, coked catalytic cracking catalyst with a stripping gas containing NO_x and SO_x wherein the stripping takes place substantially entirely in a dilute phase and the NO_x and SO_x content is reduced by reaction with H_2, H_2S and NH_3; and

(d) regenerating the separated, coked catalytic cracking catalyst by heating the coked catalytic cracking catalyst at a temperature of about 1100°–1400° F. in the presence of a regenerating gas containing at least about 21% oxygen to remove the coke from the coked catalytic cracking catalyst and to form the stripping gas which is used in the stripping step to thereby reduce NO_x and SO_x.

5,552,035

ZEOLITE AGGREGATES AND CATALYSTS

Mark J. Potter, League City; Jar-Lin Kao; Virginia R. Cross, both of Houston, all of Tex.; Thomas H. Vanderspurt, Stockton, N.J.; Edward K. Dienes, Louisville, Ky.; Robert E. Riley, Elizabeth; Freddie L. Tungate, Georgetown, both of Ind., and Arie Bortinger, Ridgewood, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 23,733, Feb. 23, 1993, Pat. No. 5,348,924, which is a continuation of Ser. No. 414,285, Sep. 29, 1989. This application Jul. 6, 1994, Ser. No. 271,324

Int. Cl.[6] C10G *35/06*

U.S. Cl. 208—135 **61 Claims**

1. A reforming process for producing aromatic hydrocarbons comprising:

contacting a hydrocarbon feedstock under reforming conditions with a catalyst comprising a zeolite, a binder comprising a metal oxide containing aluminum, and at least one catalytically active metal formed into an aggregate having a crush strength greater than about 0.9 pound per millimeter, a loss by attrition resistance of less than about 3.0%; and a catalyst activity pass through to the bound zeolite of at least about 70% of the initial catalyst activity of the zeolite.

5,552,036

PROCESS FOR REDUCING THE LEVEL OF SULFUR IN A REFINERY PROCESS STREAM AND/OR CRUDE OIL

Todd L. Foret, 107 N. Morein St., Ville Platte, La. 70586; William D. Mansfield, 11543 Blackwater Rd., Baker, La. 70714, and Hubert P. Vidrine, Rte. 1, Box 191, Opelousas, La. 70570

Filed Jun. 1, 1994, Ser. No. 251,890
Int. Cl.[6] C10G *29/20*
U.S. Cl. 208—236 **14 Claims**

1. A process for reducing the sulfur in a refinery process stream selected from the group consisting of an emulsion, water stream, condensate stream, stripping stream, hydrocarbon-containing stream and mixtures thereof comprising:

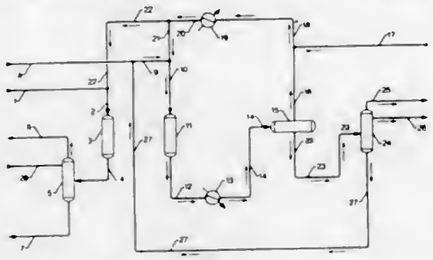
adding to said refinery process stream an effective sulfur reducing amount of a reducing agent selected from the group consisting of hydrazine, oximes, hydroxylamines, carbohydrazide, erythorbic acid, and mixtures thereof wherein said reducing agent, said refinery process stream, or both have a temperature of at least 50° C. to thereby reduce the level of sulfur in said refinery process stream.

5,552,037

PROCESS FOR THE TREATMENT OF TWO HALOGENATED HYDROCARBON STREAMS

Tom N. Kalnes, La Grange, and Robert B. James, Jr., Northbrook, both of Ill., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 81,715, Jun. 25, 1993, abandoned. This application Sep. 1, 1994, Ser. No. 299,873
Int. Cl.[6] B62D *3/00*; **C01G** *17/00*; **C07C** *1/00*
U.S. Cl. 208—262.1 **18 Claims**



1. A process for treating a halogenated organic stream containing less than about 500 ppm by weight of water or water precursors and a halogenated organic stream containing oxygen-containing compounds to produce hydrocarbonaceous compounds having a reduced level of organic halogen and a liquid stream comprising a hydrogen halide and containing less than about 500 ppm by weight water which process comprises the steps of:

(a) contacting said halogenated organic stream containing less than about 500 ppm by weight of water or water precursors and at least a portion of a hydrogen-rich gaseous recycle stream with a hydrogenation catalyst in a first hydrogenation reaction zone at hydrogenation conditions to increase the hydrogen content of the halogenated organic stream containing less than about 500 ppm by weight of water or water precursors and to thereby produce hydrogen halide;

(b) condensing at least a portion of a resulting effluent from said first hydrogenation reaction zone to produce a hydrogen-rich gaseous recycle stream and a liquid stream comprising hydrogenated hydrocarbonaceous compounds, hydrogen halide and containing less than about 500 ppm by weight water;

(c) contacting said halogenated organic stream containing oxygen-containing compounds and at least a portion of said hydrogen-rich gaseous recycle stream produced in step (b) with a hydrogenation catalyst in a second hydrogenation reaction zone at hydrogenation conditions to increase the hydrogen content of said halogenated organic stream and to thereby produce hydrogen halide; and

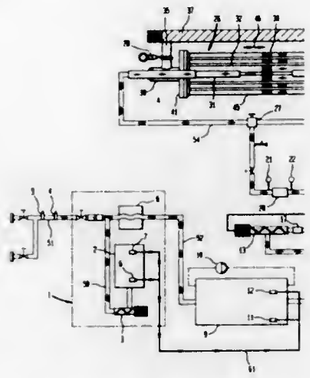
(d) contacting an effluent from said second hydrogenation reaction zone with a lean aqueous solution in an absorption zone to produce a hydrogen halide-rich aqueous stream and a gaseous stream comprising hydrogen.

5,552,038

APPARATUS FOR DEWATERING ORGANIC SEWAGE SLUDGE, INDUSTRIAL SLUDGE AND SPECIAL WASTE SLUDGE OF VARYING COMPOSITION BY PRESSURE

Wolfgang Müller, Schieder-Schwalenberg, and Dirk Herzog, Lemgo-Brake, both of, Germany, assignors to Müller Umwelttechnik GMBH & Co. KG, Schieder-Schwalenberg, Germany

Filed Oct. 6, 1994, Ser. No. 319,135
Claims priority, application Germany, Jul. 29, 1994, 9412246 U
Int. Cl.[6] C02F *11/14*
U.S. Cl. 210—86 **11 Claims**



1. Apparatus for dewatering organic sewage sludge, industrial sludge and special waste sludge of varying composition by pressure, said apparatus comprising:

a fully automatic sludge conditioning unit;

a fully automatic sludge feeding unit cooperating with said sludge conditioning unit for supplying conditioned sludge;

a pressure reactor receiving conditioned sludge from said feeding unit, and including a press plunger reciprocating on filter candles between axial end retainer plates for conveying formed dewatered filter cake;

a filtrate chamber formed outside of one retainer plate and communicating with said filter candles for removal of filtrate; and

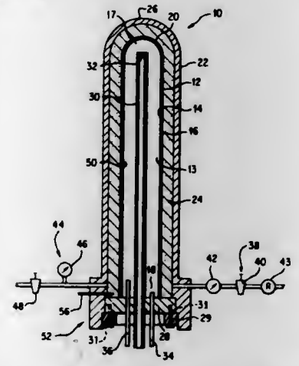
discharge means for removing the filter cake from said pressure reactor, said discharge means including a riser pipe located outside of each of said retainer plates and incorporating a motor-driven discharge valve, and a screw conveyor mounted above said pressure reactor and communicating with said riser pipes for further transport of the filter cake to a container.

5,552,039

TURBULENT FLOW COLD-WALL REACTOR

Roy N. McBrayer, Jr., Austin; James E. Deaton, Georgetown, and James M. Eller, Austin, all of Tex., assignors to RPC Waste Management Services, Inc., Austin, Tex.

Filed Jul. 13, 1994, Ser. No. 274,640
Int. Cl.[6] C02F *1/72*
U.S. Cl. 210—90 **65 Claims**



1. A reactor for treating an aqueous liquid, comprising:

a pressure vessel having a first vessel end, a second vessel end substantially opposite the first vessel end, an inside wall, and an outside wall;

a reaction chamber substantially enclosed within the pressure vessel, the reaction chamber having a first chamber end, a second chamber end, an inside wall and an outside wall, the pressure vessel and the reaction chamber forming an annulus, the reaction chamber defining a reaction zone, the reaction zone being substantially isolated from the annulus, wherein said annulus comprises a thermal insulator which allows an inert gas to pass through, and which insulates a substantial portion of the reaction chamber from the annulus;

an annulus pressure system coupled to the annulus and being configured to pressurize the annulus with a substantially inert fluid during use;

an annulus cooler coupled to the outside wall of the pressure vessel and being configured to cool an outside wall of the annulus by cooling an outside wall of the pressure vessel during use;

a feeding conduit ending in a fluid exit in the reaction chamber; and

an effluent output.

5,552,040

METHOD OF INCREASING SERVICE LIFE OF OIL AND A FILTER FOR USE THEREWITH

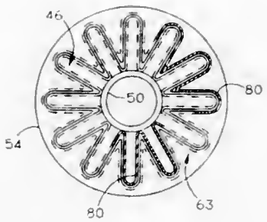
Thomas W. Baehler, Rockford; Henry R. Vanderzyden, Byron, and Kenneth N. Baker, Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Continuation-in-part of Ser. No. 277,931, Jul. 20, 1994, Pat. No. 5,435,912, which is a continuation of Ser. No. 951,492, Sep. 24, 1992, Pat. No. 5,374,354. This application Dec. 19, 1994, Ser. No. 359,266
Int. Cl.[6] B01D *37/02;27/06*
U.S. Cl. 210—168 **27 Claims**

1. A method of increasing service life of an oil, comprising:

placing a quantity of oil within a circuit; and

placing a filter in the circuit, the filter having surfaces including interstices which contain a quantity of a liquid additive at a time of placement in the circuit, the additive being washed from the interstices of the filter into solution with the oil during filling and operation of the circuit to form a mixture of the oil and additive which reduces the formation of metallo-organic soaps.

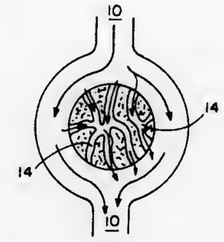


5,552,041

PERFUSIVE CHROMATOGRAPHY

Noubar B. Afeyan, Brookline, Mass.; Fred E. Regnier, West Lafayette, Ind., and Robert C. Dean, Jr., Norwich, Vt., assignors to PerSeptive Biosystems, Inc., Framingham, Mass.

Division of Ser. No. 14,473, May 10, 1993, Pat. No. 5,384,042, which is a division of Ser. No. 988,028, Dec. 9, 1992, Pat. No. 5,228,989, which is a continuation of Ser. No. 669,047, Mar. 14, 1991, abandoned, which is a division of Ser. No. 595,661, Oct. 9, 1990, Pat. No. 5,019,270, which is a continuation of Ser. No. 376,885, Jul. 6, 1989, abandoned. This application Oct. 3, 1994, Ser. No. 317,161
Int. Cl.[6] B01D *15/08*
U.S. Cl. 210—198.2 **9 Claims**



1. A chromatography system comprising:

a pump for passing liquids therethrough at a velocity greater than 1000 cm/hour, and

a matrix comprising a multiplicity of packed particles having pores of a diameter greater than 2000 Å defining:

interconnected first and second throughpore sets, each of which comprise a multiplicity of pores for channeling through said matrix a mixture of solutes disposed in a fluid, and

surface regions in fluid communication with the members of the second throughpore set which sorb a solute in said mixture,

the relative dimensions of the members of said first and second throughpore sets and said surface regions permitting, when said fluid is passed through said matrix by said pump at a velocity of about 1000 cm/hour or greater,

convective fluid flow through both throughpore sets,

a convective fluid flow velocity through said first throughpore set greater than the fluid flow velocity through the second throughpore set,

a convective fluid flow velocity through said second throughpore set greater than the diffusive rate of said solute within the members of said second throughpore set whereby the Peclet number therein is greater than 1.0,

whereby there exists a range of fluid flow velocities through said matrix over which the effective plate height of the matrix is substantially constant.

5,552,042

RIGID SILICA CAPILLARY ASSEMBLY

David A. Le Febre, Camino; James R. Lansbarkis, El Dorado, and Roy V. Semerdjian, Fair Oaks, all of Calif., assignors to UOP, Des Plaines, Ill.

Filed Feb. 24, 1995, Ser. No. 394,127
Int. Cl.[6] B01D *15/08*
U.S. Cl. 210—198.2 **21 Claims**

1. A rigid assembly of a hollow silica tube helically wound on a silica mandrel comprising:

a. a mandrel of a substantially linear segment of a first hollow silica tubing, said mandrel having an inside surface within said tubing and an outside surface;

b. a helical continuous coil length of a second hollow silica tube located on the outside surface of said mandrel and in fused contact with said outside surface at a multiplicity of points along the length of said helical coil;

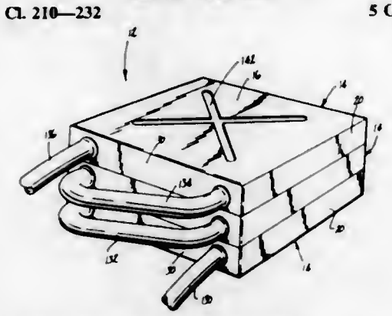
c. each portion of said coil having a direction generally transverse to the linear segment of said mandrel.

5,552,043

WATER CONDITIONING SYSTEM

Samuel P. Noordhoff, Lincoln, Nebr., assignor to Norland International, Inc., Lincoln, Nebr.

Filed Mar. 16, 1994, Ser. No. 213,713
Int. Cl.[6] C02F *1/42*
U.S. Cl. 210—232 **5 Claims**



1. A water conditioning system comprising:

a plurality of water conditioning modules, each of the modules comprising;

a housing having a substantially hollow interior;

an inlet in fluid communication with the hollow interior;

an outlet in fluid communication with the hollow interior; and

water conditioning material received in the hollow interior of the housing;

a first module of said plurality of modules, the first module having an interconnecting projection formed on a surface thereof, wherein the projection does not pierce the surface;

a second module of said plurality of modules, the second module having an interconnecting recess formed on a surface thereof, wherein the recess does not pierce the surface and is complementary in shape to the projection of the first module; and

a conduit interconnecting the outlet of one of the first and second modules to the inlet of the other of the first and second modules;

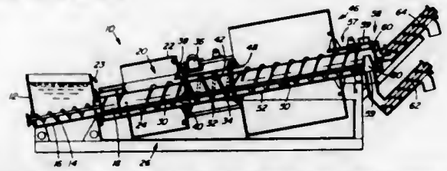
wherein the first and second modules can be fluidly connected in series in response to varying levels of desired water conditioning and mechanically connected through the interengagement of the projection and recess.

5,552,044

APPARATUS FOR SEPARATING SOLID MATERIAL AND LIQUID

Gunther Abel, 8212 Alpine Way, Whistler British Columbia, Canada

Continuation-in-part of Ser. No. 729,535, Jul. 15, 1991, Pat. No. 5,207,904. This application Feb. 23, 1993, Ser. No. 21,049
Int. Cl.[6] C02F *1/40;* **B01D** *21/00;36/00*
U.S. Cl. 210—252 **15 Claims**



1. Apparatus for separating solid material and liquid, comprising:

an upwardly inclined cylindrical passage;

said cylindrical passage having a lower end and an upper end;

an auger in said cylindrical passage for conveying the solid material upwardly along said cylindrical passage;

an inlet opening at said lower end of said cylindrical passage for receiving a mixture of the solid material and liquid into said auger;

at least one radial outlet opening at an upper end of said cylindrical passage; and a compactor rotor in said cylindrical passage at said upper end of said cylindrical passage;

said compactor rotor having a pressure surface facing radially outwardly of said cylindrical passage for pressing the solid material radially outwardly through the said radial outlet opening;

said auger comprising a lower first auger section and an upper second auger section;

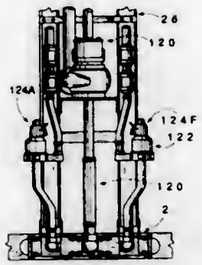
said apparatus further comprising a compactor within said cylindrical passage between said first and second auger sections, a first screen which is rotatable about said first auger section for screening the solid material and depositing the screened solid material into said first auger section, and a second screen which is rotatable about said second auger section for further screening the liquid screened by said first screen and depositing solid material screened therefrom into said second auger section.

5,552,045

SLIDING SHOE UNIT FOR AUTOMATIC BACKWASH FILTERS

Gerald S. Wagner, Jr., Tyrone, Pa., assignor to Infilco Degremont Inc., Richmond, Va.

Filed Jan. 26, 1996, Ser. No. 592,590
Int. Cl.[6] B01D *24/46*
U.S. Cl. 210—264 **10 Claims**



1. In an automatic backwash filter system which includes a filter tank divided into a multiplicity of filter cells of substantially the same width by a plurality of vertical cell sheets, said filter cells each having at their base a port for liquid to pass into and out thereof, all said base ports being spaced apart substantially an equal distance, and a sliding shoe that moves under the control of a carriage assembly seriately into contact with trios of said equally spaced ports of the separate filter cells,

the improvement which is an articulated shoe with a segmented sliding surface, said articulated shoe comprising:

a rectangular support frame comprising a spaced pair of longitudinal rigid parts and a spaced pair of transverse rigid parts, said support frame defining a face side, a rear aide, a vertical operation plane and a rear limit of movement parallel to said plane,

a central valve member, including a quadrilateral first plate defined by a first front side and a first rear side and having a first port therein for seriatim connection to said filter cells for backwashing thereof, carried by said support frame with said first front side aligned parallel to said operation plane,

first pressure means to urge said first plate perpendicularly away from said rear limit of movement,

a fore waste valve member, including a quadrilateral second plate defined by a second front side and a second rear side and having a second port therein for seriatim connection to said filter cells for disposal of waste liquid therefrom, carried by said support frame with said second front side aligned parallel to said operation plane,

second pressure means to urge said second plate perpendicularly away from said rear limit of movement,

an aft side valve member, including a quadrilateral third plate defined by a third front side and a third rear side and having a third port therein for seriatim connection to said filter cells for disposal of waste liquid therefrom, carried by said support frame with said third front side aligned parallel to said operation plane,

third pressure means to urge said third plate perpendicularly away from said rear limit of movement,

said first, second and third plates being moveable within said support frame perpendicularly away from said rear limit of movement, but substantially immobile parallel to said operation plane,

said first, second and third ports being spaced apart substantially said equal distance,

said first port being connected to first pump means to perform said seriatim backwashing of said filter cells, and

said second and third ports being connected to second pump means to perform said disposal of waste liquid from said filter cells.

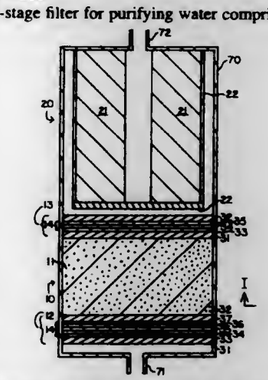
5,552,046

MULTI-STAGE MICROBIOLOGICAL WATER FILTER

Arthur W. Johnston, and Arthur F. Johnston, both of 307 Bainbridge Dr., Atlanta, Ga. 30327

Filed Jan. 23, 1995, Ser. No. 376,424
Int. Cl.[6] B01D *27/02*
U.S. Cl. 210—266 **18 Claims**

1. A multi-stage filter for purifying water comprising water inlet means, a first stage of filter media, a second stage of filter media and water outlet means, said water passing through said inlet means, said first stage, said second stage, and then through said outlet means, wherein said first stage of filter media comprises a bed of granulated activated carboo containing silver positioned between two multi-layer filter wafers, said first stage operable for removing greater than 99 percent of the particulates in the water having a dimension greater than 0.5 microns, and wherein said second stage comprises a large surface area filter membrane with a pore size less than 0.5 microns, said second stage operable for removing greater than 99 percent of all bacteria and cysts in the water.

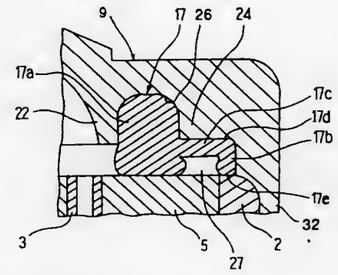


5,552,047

HOLLOW FILAMENT BLOOD PROCESSING APPARATUS

Masatoshi Oshida, and Hiromi Deguchi, both of Shizuoka, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1995, Ser. No. 445,500
Claims priority, application Japan, May 24, 1994, 6-135227
Int. Cl.[6] B01D *3/00*
U.S. Cl. 210—321.8 **3 Claims**



1. A hollow filament blood processing apparatus comprising a housing having opposite open ends, a bundle of multiple hollow filaments for processing blood, the hollow filament bundle being located in the housing,

an inlet and an outlet disposed in the housing near the opposite ends for passing a blood-processing fluid through the housing,

partitions fixedly securing the hollow filament bundle at opposite ends to the opposite of the housing, and

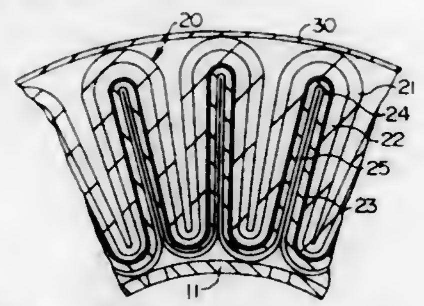
caps fixedly attached to the opposite ends of the housing to face the respective partitions and each having a port for passing blood from one port to the other port through the hollow filaments,

each of said caps having received therein a respective elastomeric annular gasket which is deformable under pressure, each annular gasket including an inside elastomeric ring, an outside elastomeric ring, and an elastomeric annular bridge connecting said inside and outside elastomeric rings, said inside elastomeric ring, said outside elastomeric ring and said annular bridge defining and annular space with a respective partition, each inside elastomeric ring interposed between the respective cap and one of the partitions, said outside elastomeric ring being interposed between the respective cap and the housing.

5,552,048
TWO PLEATED FILTER COMPOSITE HAVING CUSHIONING LAYERS

John D. Miller, Ithaca; Kenneth M. Williamson, LaFayette, and Joseph R. Swiezbin, Glen Head, all of N.Y., assignors to Pall Corporation, East Hills, N.Y.

Continuation of Ser. No. 91,928, Jul. 16, 1993, abandoned, which is a continuation of Ser. No. 733,625, Jul. 22, 1991, Pat. No. 5,252,207, which is a continuation-in-part of Ser. No. 559,335, Jul. 30, 1990, abandoned, which is a continuation-in-part of Ser. No. 323,217, Mar. 15, 1989, Pat. No. 5,084,178, which is a continuation of Ser. No. 206,676, Jun. 15, 1988, abandoned. This application Mar. 7, 1995, Ser. No. 400,507
Int. Cl.⁶ B01D *29/21*
U.S. Cl. 210—489 **54 Claims**



1. A filter element comprising:
a pleated composite including first and second support and drainage layers, each support and drainage layer including a polymeric mesh, layer filter layer positioned between the first and second mesh layers, a first cushioning layer smoother than the first mesh layer positioned between the first mesh layer and the filter layer, and a second cushioning layer smoother than the second mesh layer positioned between the second mesh layer and the filter layer, wherein the filter layer has a pore size less than the support and drainage layers in the composite and wherein each said cushioning layer comprises a material constructed so as to substantially prevent the respective, adjacent support and drainage layer from abrading the filter layer.

5,552,049
CERAMIC FIBER REINFORCED FILTER

Paul E. Gray, North East, Md., assignor to Du Pont Lanxide Composites, L.P., Newark, Del.

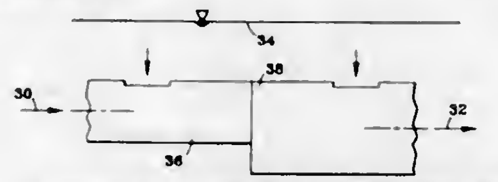
Filed Jan. 19, 1995, Ser. No. 375,092
Int. Cl.⁶ B01D *71/02*
U.S. Cl. 210—490 **12 Claims**

1. A filter comprising:
a) a support with a support surface and a body having an average pore size of from 50 to 250 microns and wherein the support consists of ceramic fibers with a ceramic coating of generally uniform thickness throughout the support securing the fibers together and a refractory carbonaceous interfacial layer of generally uniform thickness between the fibers and the ceramic coating
b) on the support surface, a filtration layer of ceramic particles that are bound at points of contact to one another and to the support surface by a cured ceramic binder wherein the layer has a thickness of from 0.2 to 2.0 mm and an average pore size of from 0.5 to 50 microns and the average pore size of the layer is selected such that it is lower than that of support.

5,552,050
DEVICE FOR THE REMOVAL OF CLARIFIED WASTE WATER FROM RECTANGULAR BASINS

Franz Valentin, Munich, Germany, assignor to Hans Huber Gmbh & Co. KG, Berching, Germany

Filed Jul. 27, 1994, Ser. No. 281,367
Claims priority, application Germany, Aug. 30, 1993, 9312978 U
Int. Cl.⁶ B01D *21/24*
U.S. Cl. 210—525 **10 Claims**



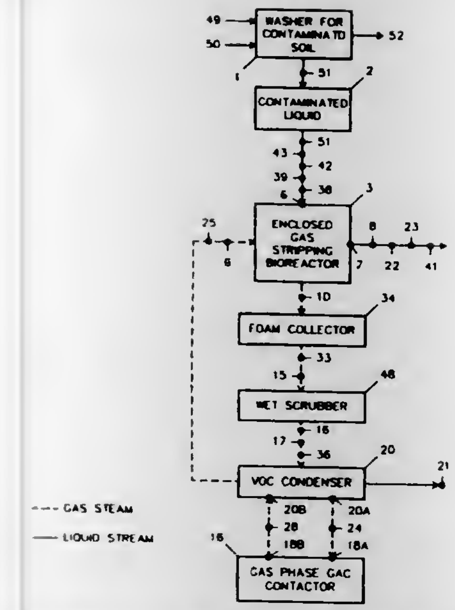
1. A device for the removal of clarified waste water from a rectangular basin the device comprising: at least one pipe completely submerged underneath the water surface in the rectangular basin, the at least one pipe having a clarified water inlet opening through which clarified water enters the pipe and a clarified water outlet through which the clarified water is discharged into an outlet of the basin, the inlet openings being arranged to provide a two-dimensionally uniform take-off of the clarified waste water over the entire basin, wherein the inlet opening to the at least one pipe is a plurality of slots of varying slot length to precisely adjust hydraulic boundary conditions.

5,552,051
SITE REMEDIATION TECHNOLOGY

Lawrence K. Wang, Latham, N.Y.; Lubomyr Kurylko, New Providence, N.J., and Orest Hyrcyk, Syracuse, N.Y., assignors to International Environmental Systems, Inc., Latham, N.Y.

Division of Ser. No. 550,515, Jul. 10, 1990. This application Jun. 11, 1991, Ser. No. 714,381
The portion of the term of this patent subsequent to Jun. 16, 2009, has been disclaimed.
Int. Cl.⁶ C02F *3/02;* **B08B** *3/14*
U.S. Cl. 210—604 **18 Claims**

1. A biochemical continuous process for removing volatile organic compounds, volatile inorganic compounds, heavy metals, and surface active agents from a contaminated soil comprises the following steps:
(a) mixing and washing the contaminated soil with water and surfactants in a washer, thereby producing a mixture of a washed clean soil and dirty wash water,
(b) separating the washed clean soil and the dirty wash water by gravity sedimentation,
(c) discharging the dirty wash water by pumping, gravity, or by both pumping and gravity, into an enclosed gas stripping bioreactor which is connected to a gas emission control system and equipped with a liquid inlet, a liquid outlet, liquid drains, a gas inlet, a gas outlet, gas release valves, a sparger system, a vacuum breaker, a manhole with cover, an enclosure, chemical feeders, a fine bubble distribution system, vacuum/pressure gauges, and a liquid flow meter; said gas emission control system further comprising a gas flow meter, a demister pad, a gas mover, a foam collector, a wet scrubber, a condenser, a condensed volatile organic compounds collector, a gas phase contactor, operating valves, regenerating

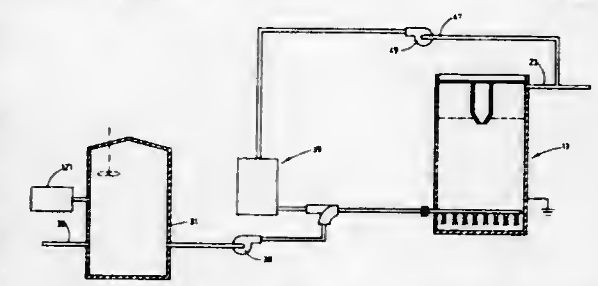


valves, sampling ports, and a gas feed point; said wet scrubber further comprising an absorbing chemical; said gas phase contactor further comprising a first media,
(d) adjusting hydraulic residence time of said bioreactor to conform to different influent liquid flow rates and providing sufficient gas head space above a liquid level in said bioreactor,
(e) feeding microorganisms and chemicals into said bioreactor, for pH adjustment, chemical reaction, and biological reaction; said chemicals being selected from the group consisting of liquid chemicals, solid chemicals, gas chemicals, or combinations, thereof; said solid chemicals consisting of powdered activated carbon,
(f) bubbling coarse gas bubbles up through said sparger system into a liquid phase with a low pressure and low volume gas mover; said sparger system being located at bottom of said bioreactor,
(g) stripping residual volatile organic compounds, volatile inorganic compounds and surfactants from the liquid phase into a gas phase and a foam phase in said bioreactor by the coarse gas bubbles; thereby producing a gas effluent containing volatile organic compounds, volatile inorganic compounds and surfactants,
(h) sucking the gas effluent from the gas outlet of said bioreactor by said gas mover,
(i) transporting said gas effluent by the gas mover through the foam collector for removal of the foam phase, through said wet scrubber for removal of volatile inorganic compounds, through the demister pad for removal of liquid droplets, through the condenser twice for condensation of volatile organic compounds, through the gas phase contactor for further removal of volatile organic compounds, and through the gas inlet for re-entering said sparger system,
(j) supplying a supplemental gas to said sparger system,
(k) bubbling coarse gas bubbles and the supplemental gas up through said sparger system,
(l) treating a liquid phase inside said bioreactor by repeating steps (d) to (k) for a plurality of times, thereby producing a bioreactor effluent,
(m) discharging the bioreactor effluent through an outlet with a trap into a clarification unit; said trap further preventing external gas intrusion into said bioreactor,
(n) separating the insoluble microorganisms, chemicals, heavy metals, organic compounds, and inorganic compounds from the bioreactor effluent by said clarification unit, thereby producing a clarified liquid effluent and a clarified sludge,
(o) discharging the clarified liquid effluent from said clarification unit as a final purified liquid effluent, or into a liquid phase contactor comprising a second media for further treatment before final disposal,
(p) recycling a portion of the clarified sludge to said bioreactor for continuous biological reaction, and wasting the remaining portion of the clarified sludge,
(q) regenerating said first media and said second media for reuse periodically,
(r) replacing the absorbing chemical in said wet scrubber, periodically, and
(s) draining and collecting a recovered foams from the foam collector, a liquid volatile organic compounds from the condensed volatile organic compounds collector, and a recovered liquid volatile inorganic compounds from the wet scrubber.

5,552,052
METHOD OF REDUCING IRON FOULING IN GROUNDWATER TREATMENT SYSTEMS

Eugene E. Mazewski, Pewaukee, and Robert D. Hines, Jr., Kenosha, both of Wis., assignors to Envirex Inc., Waukesha, Wis.

Division of Ser. No. 13,941, Feb. 4, 1993, abandoned. This application Dec. 9, 1994, Ser. No. 353,196
Int. Cl.⁶ C02F *3/08;1/64*
U.S. Cl. 210—617 **7 Claims**



1. A method for treating water polluted with volatile constituents in a treatment facility, the treatment facility including a fluid bed reactor including a reactor tank containing a bed of particles which function as a carrier for growth of biological material, the reactor tank having an inlet and an outlet, the fluid bed reactor further including means for conducting liquid to be treated from the reactor tank inlet upwardly through the bed of particles at a rate conducive to fluidization of the bed of particles, the treatment facility including an equalization surge tank for housing liquid to be treated in the fluid bed reactor the equalization surge tank having an inlet, and an outlet connected to the reactor tank inlet, said method comprising the step of:
(a) oxidizing iron in the liquid in the equalization surge tank without stripping the volatile constituents.

5,552,053
SOLID POLY-AMPHIPHILIC POLYMER HAVING USE IN A SEPARATION PROCESS

Sa V. Ho; Robert Z. Greenley, both of St. Louis, Mo., and Alan S. Michaels, Chestnut Hill, Mass., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 88,126, Jan. 13, 1993, abandoned, which is a continuation-in-part of Ser. No. 925,445, Aug. 11, 1992, abandoned. This application Nov. 15, 1994, Ser. No. 340,014
Int. Cl.⁶ B01D *61/38*
U.S. Cl. 210—640 **22 Claims**

1. A solid poly-amphiphilic polymer having repeating units of the formula

$$\{[Hy-X]_n[Z_m]_x\} \text{ or } \{[\underset{\displaystyle X}{\underset{|}{Hy}}]_n[Z]_m\}_x$$

which are crosslinked to make the polymer solid and wherein Hy is a hydrophobic moiety which is essentially water insoluble and

water immiscible; X is a polar moiety with a selective affinity for polar organic target compounds; Z is a linking moiety, and n, m or x is a number wherein the average total of the numbers represents repeating units and which is (1) a continuous film to be used alone, supported on a frame, or overlaid or cast on a porous hydrophobic support; or within the pores of a microporous hydrophobic membrane.

5,552,054

COMPOSITE MEMBRANE, ITS APPLICATION AND PROCESS FOR THE DEHYDRATION OF ORGANIC SOLVENTS

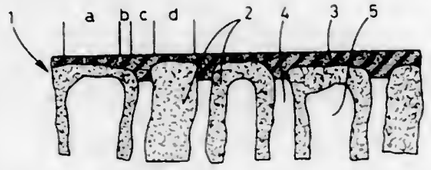
Geert-Hendrik Koops, Tsukuba, Japan; Marcellinus H. V. Mulder, and Cornelis A. Smolders, both of Enschede, Netherlands, assignors to Deutsche Carbone AG Membran-Treunverfahren GFT, Germany

Continuation of Ser. No. 40,207, Apr. 1, 1993, abandoned. This application Mar. 22, 1995, Ser. No. 407,981

Claims priority, application Netherlands, Apr. 3, 1992, 9200624

Int. Cl.[6] B01D *61/36*

U.S. Cl. 210—640 **2 Claims**



1. A process for dehydration of liquid acetic acid comprising the steps of:

providing a composite membrane comprised of a microporous polyacrylonitrile (PAN) support layer and a dense, defect-free and non-porous polyvinyl chloride film attached to one side thereof, said support layer having a thickness of less than 10 microns and said film having a thickness of between 0.05 micron to 10 microns, the overall thickness of said composite membrane having a thickness of less than 15 microns,

maintaining a vacuum at the support layer side of said composite membrane,

introducing a liquid acid solution containing between 0.5% to 90% by weight of water into contact with said film side of said composite membrane and maintaining said acid solution at between 40° to 100° C., and

recovering permeate having a higher percentage of water than said acid solution from the support layer side of said composite membrane.

5,552,055

PHOTOFINISHING EFFLUENT PURIFYING PROCESS AND APPARATUS

George J. Arato, Vancouver, Canada, assignor to London Drugs Limited, Richmond, Canada

Filed Sep. 15, 1994, Ser. No. 305,309

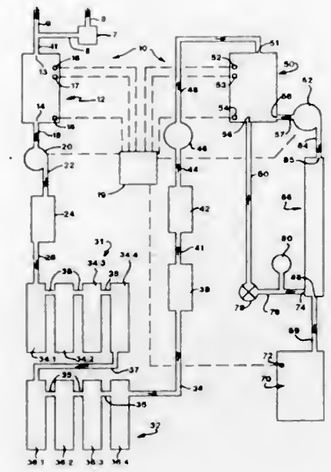
Int. Cl.[6] B01D *61/00*

U.S. Cl. 210—651 **26 Claims**

1. A process of purifying a photofinishing chemical effluent, the process comprising steps of:

(a) passing the effluent through a plurality of adsorbents, in which at least one adsorbent adsorbs inorganic compounds, and at least one other adsorbent adsorbs organic compounds to produce a primary filtrate fluid, followed by,

(b) directing the primary filtrate fluid to a membrane filter and discharging permeate fluid that passes through the membrane filter as a secondary filtrate fluid for disposal or re-use, and essentially simultaneously,



(c) rejecting concentrate fluid that does not pass through the membrane filter and collecting said concentrate fluid.

5,552,056

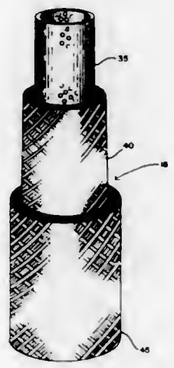
FILTER ELEMENT HAVING AN ION EXCHANGE YARN WINDING LAYER

Joseph M. Ragosta, Elkton, Md., assignor to Graver Chemical Company, Glasgow, Del.

Filed Jan. 17, 1995, Ser. No. 374,046

Int. Cl.[6] C02F *1/42*; **B01D** *27/06*

U.S. Cl. 210—660 **14 Claims**



8. A method for removing dissolved solids from a liquid, the method comprising:

a) providing a filter unit that contains a filter element that comprises a foraminous center core and at least one layer of ion exchange yarn wound about the center core;

b) passing a liquid through the filter element, the filter element removing dissolved solids from the liquid directed therethrough; and

c) precoating the filter element with a particulate ion exchange resin.

5,552,057

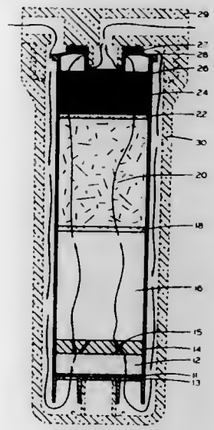
WATER-PURIFYING DEVICE

Doug Hughes, 1335 Greg St., Ste. #104, Sparks, Nev. 89431, and Roger Reid, P.O. Box 1359, Caldwell, Id. 83605

Continuation-in-part of Ser. No. 69,600, Jun. 1, 1993, Pat. No. 5,407,573. This application Apr. 17, 1995, Ser. No. 423,393

Int. Cl.[6] C02F *1/42;1/50*

U.S. Cl. 210—668 **18 Claims**



18. A method of disinfecting non-potable water containing pathogenic microorganisms comprising bacteria and most virus strains, protozoan cysts and other contaminants by filtering consisting of the steps of:

passing water through a chamber containing biocidal media, whereby biocide is imparted into said water;

passing the water and biocide through a baffle;

passing said water and biocide through an extended contact chamber;

passing said water through a cyst-retention means in the extended contact chamber so that cysts are retained only in the extended contact chamber;

passing said water and biocide through a biocide removal chamber containing biocide removal medias to remove the biocide from the water, and

passing the water through an anti-contamination chamber containing bacteriostatic media.

5,552,058

COOLING TOWER WATER TREATMENT METHOD

Chris E. Fanning, Oklahoma City, Okla., assignor to Advanced Waste Reduction, Tulsa, Okla.

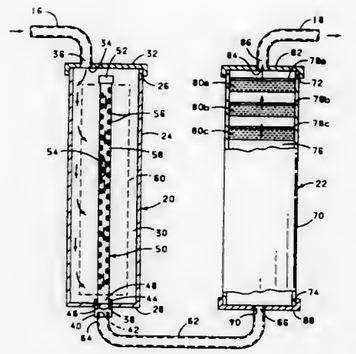
Continuation-in-part of Ser. No. 117,265, Sep. 3, 1993, abandoned. This application Apr. 21, 1994, Ser. No. 230,573

Int. Cl.[6] C02F *9/00*

U.S. Cl. 210—669 **29 Claims**

26. A method for removing dissolved heavy metal contaminants from cooling tower water and for providing the cooling tower water with a substantially neutral pH so as to retard bacterial growth in the cooling tower water, the method comprising:

passing the cooling tower water through at least one porous metal sponge-like structure comprising metal particles bound together in an interconnected form.



5,552,059

PROCESS TO DECONTAMINATE SOIL CONTAINING CHLOROPHENOLS

Suezone Chow, Richmond, Canada, assignor to Canadian Forest Products Ltd., Vancouver, Canada

Filed Mar. 15, 1995, Ser. No. 404,684

Int. Cl.[6] C02F *1/78*

U.S. Cl. 210—747 **11 Claims**

1. A process to decontaminate soil containing a chlorinated phenol compound said process consisting essentially of:

adding water to the soil to produce a chlorinated phenol solution containing at most about 2% by weight of the chlorinated phenol compound and passing ozone through said solution to decompose said chlorinated phenol compound.

5,552,060

ABATEMENT OF HYDROGEN SULFIDE WITH EPOXIDES

Glenn L. Roof, Sugar Land, Tex., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed May 5, 1995, Ser. No. 435,624

Int. Cl.[6] C02F *1/58*

U.S. Cl. 210—749 **22 Claims**

1. A method for scavenging sulfhydryl compounds from sour aqueous and hydrocarbon substrates comprising thoroughly mixing said substrate with an effective amount of a scavenging agent comprising an epoxide wherein said epoxide is a liquid at ambient temperature and is not ethylene oxide.

5,552,061

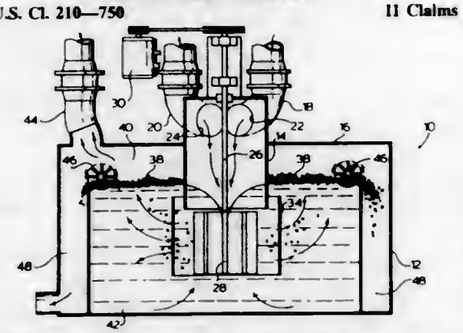
METHOD FOR EFFECTING GAS-LIQUID CONTACT

James W. Smith, 33 Airdrie Rd., Toronto Ontario, Canada; David T. R. Ellenor, 2512 Linwood St., Pickering, Ontario, Canada, and John N. Harbinson, 44 Macklingate Ct., Scarborough, Ontario, Canada

Continuation of Ser. No. 313,153, Apr. 5, 1993, Pat. No. 5,520,818, which is a continuation-in-part of Ser. No. 863,720, Apr. 3, 1992, Pat. No. 5,352,421, which is a continuation-in-part of Ser. No. 622,485, Dec. 5, 1990, Pat. No. 5,174,973, which is a continuation-in-part of Ser. No. 582,423, Sep. 14, 1990, abandoned, which is a continuation-in-part of Ser. No. 446,776, Dec. 6, 1989, abandoned. This application Jun. 5, 1995, Ser. No. 463,965

Int. Cl.[6] C01B *17/16;* **B05B** *7/10*

U.S. Cl. 210—750 **11 Claims**



1. A method for the processing of a viscous liquid which is liquid sulfur, bitumen or asphalt, which comprises:

immersing a rotary impeller comprising a plurality of blades in a mass of said viscous liquid surrounded by a shroud through which are formed a plurality of openings, and

rotating said impeller about a axis at a speed sufficient to draw viscous liquid from said mass and to flow said viscous liquid through the openings in said shroud to cause a circulation of said mass of viscous liquid and simultaneously to effect desorption of an absorbed component in said viscous liquid and/or to effect transfer of a gaseous component to said viscous liquid.

5,552,062

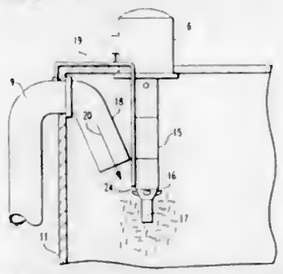
METHOD FOR TREATMENT OF WASTE WATER CONTAMINATED WITH CYANIDE ION

Sanford M. Stevenson, 124 Braun Dr., McMurray, Pa. 15317

Filed Dec. 23, 1993, Ser. No. 173,360

Int. Cl.[6] C02F *1/72*

U.S. Cl. 210—758 **10 Claims**



1. A method of treating water contaminated with cyanide ion without need of ozone or irradiation with ultraviolet light comprising:

providing a treatment unit comprising aerator means, said aerator means having a shaft extending therefrom into said treatment and said aerator means having agitation means, influent pipe means disposed generally adjacent to a discharge end of said aerator shaft and neutralizing agent feed line means disposed generally adjacent to an exit of said aerator means.

providing means for introducing a source of water contaminated with cyanide ion into a treatment unit,

introducing said water contaminated with cyanide ion to be treated into said treatment unit,

introducing a neutralizing agent to raise the pH of the water into said treatment unit,

introducing oxidant selected from air and gaseous oxygen at the same point at which neutralizing agent is introduced into the water to be treated,

agitating said water, oxidant and neutralizing agent,

providing a means for receiving precipitates from said mixture, and

discharging treated water from the unit.

5,552,063

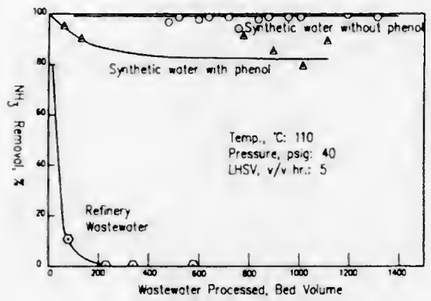
PROCESS FOR TREATING WASTEWATER CONTAINING PHENOL, AMMONIA, AND COD

Tsoung Y. Yan, Wayne, Pa., assignor to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 227,749, Apr. 13, 1994, which is a continuation of Ser. No. 61,127, May 12, 1993, Pat. No. 5,338,463. This application Aug. 16, 1995, Ser. No. 515,773

Int. Cl.[6] C02F *1/72*

U.S. Cl. 210—763 **14 Claims**



1. A method for treating wastewater comprising:

(a) directing a source of oxygen and a wastewater containing phenol, cresol, ammonia, and, optionally, an offensive substance selected from the group consisting of cyanide, sulfide, sulfite, thiosulfate, mercaptan, disulfide, and mixtures thereof, over a catalyst selected from the group of NiMo, NiW, and CoMo on activated carbon in a reaction zone under treating conditions effective to reduce the concentration of at least one of the phenol, cresol, ammonia, and the offensive substance contained in the wastewater and to thereby produce a treated wastewater, the treating conditions comprising a temperature of from about 80° C. to about 145° C., a pressure of from about 10 to about 500 psig, a liquid hourly space velocity of from about 0.5 to about 5 v/v Hr^{-1}, and about 1.5 to about 5 mole O_2 per mole of chemical oxygen demand due to phenol, cresol, ammonia, and the offensive substance present in the wastewater; and

(b) discharging the treated wastewater from the reaction zone.

5,552,064

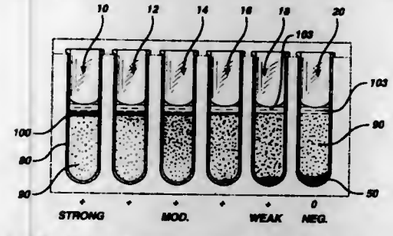
COLUMN AGGLUTINATION ASSAY AND DEVICE USING BIPHASIC CENTRIFUGATION

Rosemary K. Chachowski, Manville; Thomas M. Setcavage, and Kathleen J. Reis, both of Milford, all of N.J., assignors to Ortho Diagnostic Systems, Inc., Raritan, N.J.

Continuation of Ser. No. 23,500, Feb. 26, 1993, abandoned. This application Aug. 26, 1993, Ser. No. 112,402

Int. Cl.[6] B01D *21/26*

U.S. Cl. 210—787 **3 Claims**



1. A method of sequentially enhancing a potential agglutination reaction and separating agglutinated cells from unagglutinated cells in a single vessel, wherein the vessel comprises a separation region containing a matrix for separating agglutinated cells from unagglutinated cells, and an incubation region in which cells and antibodies against the cells are incubated without entering the Separation region, the method comprising i) placing cells and antibodies in the incubation region; ii) centrifuging the vessel for a first period of time at a first force which promotes contact between the cells and antibodies without causing cells to enter the separation region; and iii) centrifuging the vessel for a second period of time at a second force which causes unagglutinated cells to migrate through the matrix, thus separating unagglutinated cells from agglutinated cells, wherein the first period of time is approximately 2 minutes and the first force is 52–58 g.

5,552,065

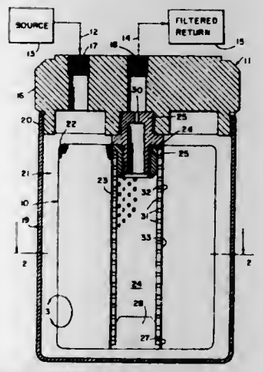
OIL FILTRATION METHOD AND ELEMENT OF WOUND COTTON/PAPER COMPOSITION

Mark T. Meddock, Carlsbad; Leroy J. Meddock, Santa Ana, both of Calif., and Charles W. Johnson, Amarillo, Tex., assignors to The OilGuard Company LLC, Rancho Santa Fe, Calif.

Filed Jan. 10, 1995, Ser. No. 371,090

Int. Cl.[6] B01D *39/18;27/06*

U.S. Cl. 210—808 **13 Claims**



6. A filter element, comprising:

a core having a hollow interior, a perforated outer surface in fluid communication with the hollow interior, an open first end in fluid communication with the hollow interior, and a closed second end;

a length of yarn of cotton and cellulose paper composition that is wound in a series of layers over the perforated outer surface of the core in an irregular winding pattern such that the series of layers are adapted to filter different size particles; and

means in the form of a layer of filter material disposed between the series of layers and the perforated outer surface of the core for trapping any paper and cotton particles breaking free from the yarn;

the series of layers of the filter element including at least one inward layer disposed near the core, said at least one inward layer having a first winding pattern adapted to filter particles down to a first size; and

the series of layers of the filter element including at least one intermediate layer disposed radially further out from the core than the at least one inward layer, said at least one intermediate layer having a different second winding pattern adapted to filter particles down to a second size that is larger than the first size.

5,552,066

RIBOSE DIESTER QUATERNARY USEFUL AS A FABRIC CONDITIONER

Mohammad A. Rahman, River Edge, N.J.; Anthony Hung, New City, N.Y., and Shang-Ren Wu, Mahwah, N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

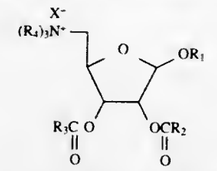
Continuation-in-part of Ser. No. 252,033, Jun. 1, 1994, Pat. No. 5,429,756. This application Apr. 14, 1995, Ser. No. 393,626

Int. Cl.[6] D06M *13/322;13/46;* **C07D** *307/02*

U.S. Cl. 252—8.63 **11 Claims**

7. A fabric conditioning composition comprising:

about 1 to about 99 wt. % of a compound having a Formula I



(I)

wherein R_1 is a C_{1-4} alkyl or alkenyl, R_2 and R_3 are each independently a C_7–C_{30} straight or branched alkyl or elkenyl, R_4 is a C_{1-4} alkyl or alkenyl or hydroxyalkyl and X is a water soluble anion; and

about 99 wt. % to about 1 wt. % water.

5,552,067

THERMALLY STABILIZING ORGANIC FUNCTIONAL FLUIDS IN THE ABSENCE OF OXYGENS

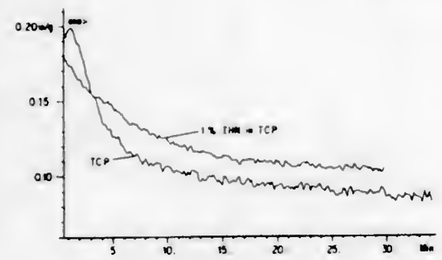
Douglas G. Placek, Fairless Hills, Pa., assignor to FMC Corporation, Philadelphia, Pa.

Filed Apr. 22, 1994, Ser. No. 231,220

Int. Cl.[6] C10M *127/00*

U.S. Cl. 508—433 **8 Claims**

1. A method for improving the heat-stability of a functional fluid comprising from about 5% to 100% by weight of a triester of a phosphorus acid and from 0% to 95% by weight of a fluid selected from the group consisting of C10–C20 paraffin hydrocarbons, C10–C20 aromatic hydrocarbons, C8–C15 dialkyl ethers, C8–C15 N,N dialkyl amides, esters of mono- and di-carboxylic acids, and mixtures thereof, the improvement comprising incorporating into the base fluid a compound selected from the group consisting of tetrahydronaphthalene and decahydronaphthalene in sufficient quantity to provide an increased stability to high temperature in the absence of oxygen.



5,552,068

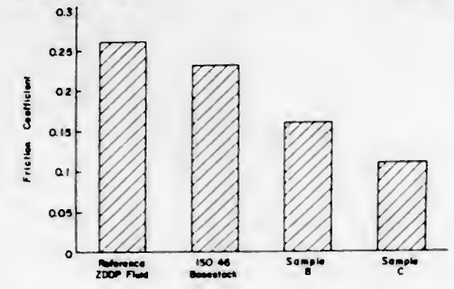
LUBRICANT COMPOSITION CONTAINING AMINE PHOSPHATE

Martin G. Griffith, Westfield, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

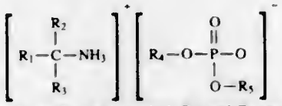
Continuation-in-part of Ser. No. 113,153, Aug. 27, 1993. This application Aug. 2, 1994, Ser. No. 284,772

Int. Cl.[6] C10M *137/08*

U.S. Cl. 508—436 **8 Claims**



1. A method for improving the extreme pressure, antiwear and stability properties of industrial, hydraulic and gear oils while providing friction reduction and reduced copper corrosivity which comprises mixing a major portion of a lubricating oil base stock with a minor amount of an amine phosphate salt of the formula



(I)

where R_1 is C_9 to C_{22} hydrocarbyl, R_2 and R_3 are each independently C_1 to C_4 hydrocarbyl, R_4 is C_{10} to C_{20} hydrocarbyl, and R_5 is hydrogen or C_{10} to C_{20} hydrocarbyl; wherein the amine phospate salt is soluble in the lubricant oil basestock at 25° C., is a liquid at 25° C., and the ratio of molar equivalents of amine to phosphate in said salt is from about 1.0 to 1.2.

5,552,069

ADDITIVES FOR FUELS AND LUBRICANTS

Noyes L. Avery, Bryn Mawr; Joan C. Axelrod, Media, both of Pa.; James T. Carey, Medford; Hiebert John, Levittown, Pa., and Andrew G. Horodysky, Cherry Hill, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 217,818, Mar. 25, 1994. This application May 25, 1995, Ser. No. 450,826

Int. Cl.[6] C10M *135/36*

U.S. Cl. 508—229 **8 Claims**

1. A lubricant composition comprising a lubricating oil or a grease prepared therefrom and an effective amount, sufficient to enhance cleanliness, provide stability at high temperatures, retard wear, and inhibit corrosion in an engine, of a reaction product obtained by reacting a (1) polyalkylene amine which is at least 30 carbons in length with (2) a carbonyl linking group and (3) a heterocyclic compound having both sulfur and nitrogen molecules at a temperature in the range from 50° C. to 250° C. and at a pressure from subatmospheric to about 500 psig using a ratio of polyalkylene to carbonyl linking group to heterocyclic compound in a range from 0.1:10:0.1 to 10:0.1:10.

5,552,070

PHOSPHORYLATION OF EPOXIDES

Volker Schäfer, Altrip; Robert Kohler, Oberhausen; Günter Schilling, Schwetzingen; Alfred Pauli, Sandhausen; Ingo Röhrs, Rimbach, and Joachim Korff, Hockenheim, all of, Germany, assignors to Rhein Chemie Rheinau GmbH, Mannheim, Germany

Continuation of Ser. No. 115,642, Sep. 3, 1993, abandoned. This application Oct. 11, 1994, Ser. No. 321,580

Claims priority, application Germany, Sep. 17, 1992, 42 31 073.3

Int. Cl.[6] C10M *137/04*

U.S. Cl. 508—224 **1 Claim**

1. A lubricating oil or fat containing 0.1 to 1.5% by weight of a phosphorylated epoxidized fatty acid triglyceride which is produced by reacting an epoxidized fatty acid glyceride with a mixture of mono- and diester of phosphoric acid at 0° to 120° C.

5,552,071

ALKYLATED DIPHENYL ETHER LUBRICANTS

Leslie R. Rudnick, Lawrenceville; Ross A. Kremer, Ringoes, both of N.J., and Derek A. Law, Yardley, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 206,233, Mar. 3, 1994, abandoned, which is a continuation of Ser. No. 888,666, May 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 637,425, Jan. 4, 1991, abandoned. This application Sep. 23, 1994, Ser. No. 311,829

Int. Cl.[6] C10M *105/16;129/14;129/91*

U.S. Cl. 508—581 **6 Claims**

1. A process for the preparation of a high-temperature stable lubricant fluid or lubricant additive comprising reacting in the presence of a zeolite catalyst (1) an olefinic alkylating agent containing from 12 to about 500 carbons and optionally containing S, N, O, P, F, or mixtures thereof, and (2) a diphenyl ether wherein the reaction temperature varies from ambient to about 350° C., the molar ratio of said alkylating agent to diphenyl ether varies from 0.5:1.0 to about 10.0:1.0, the amount of catalyst varies from 5 to about 100 grams of catalyst to about 1 mole of diphenyl ether, and the reaction product comprising a substantially monosubstituted adduct.

5,552,072

COATED ACICULAR FINE PARTICULATE MATERIALS, PROCESSES FOR PREPARING SAME AND USE THEREOF

Takuya Arase; Fumihiro Kamiya; Masayuki Tsuji; Tadashi Ino; Ikuo Kitamura; Yoshiyuki Shibuya, and Shigeo Daimon, all of Settsu, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

PCT No. PCT/JP94/00242, § 371 Date Oct. 18, 1994, § 102(e) Date Oct. 18, 1994, PCT Pub. No. WO94/19276, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 17, 1994, Ser. No. 318,877

Claims priority, application Japan, Feb. 19, 1993, 5-054769; Jul. 14, 1993, 5-197908

Int. Cl.[6] C04B *35/00*

U.S. Cl. 252—62.51 R **19 Claims**

1. An acicular fine particulate material which is coated with a compound (A) containing at least one element selected from among elements of Groups III and IV of the Periodic Table in Periods 5 and 6, and at least one additional compound selected from the group consisting of (B) at least one of a nickel compound copper compound, manganese compound and cobalt compound and (C) at least one of a silicon compound and aluminum compound, the acicular fine particulate material being one of (i) an acicular fine particulate material containing iron carbide, (ii) an acicular fine particulate material containing iron carbide, metallic iron and carbon, and (iii) an acicular fine particulate metallic iron containing carbon.

5,552,073

FEROMAGNETIC FINE PARTICLES OF EPSILON IRON CARBIDE AND METHOD FOR PRODUCING THE SAME

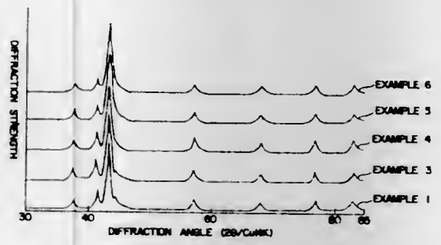
Yasushi Tomiku; Hideaki Takano, both of Wakayama-ken, and Yoshichika Bando, Shiga-ken, all of, Japan, assignors to Seisan Kaihatsu Kagaku Kenkyusho, Kyoto-fu, Japan, and Kyodo Oxygen Co., Ltd., Wakayama-ken, Japan

Continuation of Ser. No. 678,932, Apr. 3, 1991, abandoned, which is a continuation-in-part of Ser. No. 412,771, Sep. 26, 1989, abandoned. This application Sep. 3, 1993, Ser. No. 115,806

Claims priority, application Japan, Sep. 26, 1988, 2-41789; Aug. 28, 1989, 2-22650

Int. Cl.[6] C01B *31/30*

U.S. Cl. 252—62.55 **26 Claims**



2. A method for producing ferromagnetic granular ultrafine particles consisting of single phase ε' iron carbide represented by the composition formula:

$$\epsilon'\text{-}Fe_{2.2}C$$

having an average particle size of about 0.03 to 0.2 μm, which method comprises reacting iron metal powder having an average particle size of 0.03 to 0.2 μm with a reducing and carbonizing agent containing carbon and optionally a reducing agent containing no carbon at a temperature of 200°–210° C.

5,552,074

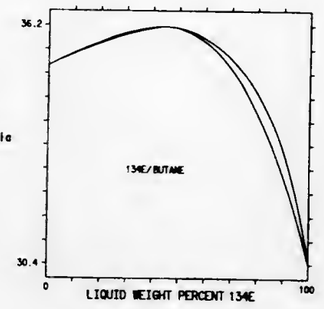
REFRIGERANT COMPOSITIONS INCLUDING BIS(DIFLUOROMETHYL) ETHER

Donna M. Patron, Newark, Del., and Barbara H. Minor, Elkton, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 960,845, Oct. 14, 1992, abandoned. This application May 19, 1994, Ser. No. 246,191

Int. Cl.[6] C09K *5/04;3/30;* **C08D** *9/14;* **C11D** *7/50*

U.S. Cl. 252—67 **7 Claims**



1. A binary composition consisting essentially of about (i) 1–70 weight percent (a) bis(difluoromethyl)ether and about 30–99 weight percent (b) butane or (ii) about 1–30 weight percent (a) bis(difluoromethyl)ether and about 70–99 weight percent (b) isobutane wherein at about 25° C., said binary composition has a vapor pressure higher than the vapor pressure of components (a) and (b) when the temperature has been adjusted to about 25° C.

5,552,075

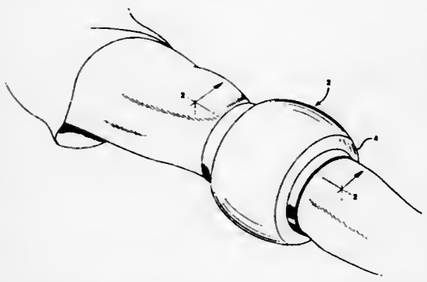
COMPOSITIONS FOR THERMAL ENERGY STORAGE OR THERMAL ENERGY GENERATION

Ival O. Salyer, Dayton, Ohio, assignor to Phase Change Laboratories, Inc., San Diego, Calif.

Continuation of Ser. No. 228,147, Apr. 15, 1994, Pat. No. 5,423,996. This application Jun. 1, 1995, Ser. No. 456,950

Int. Cl.[6] B89D *22/00;* **B32B** *1/00;* **C09K** *5/02*

U.S. Cl. 252—70 **9 Claims**



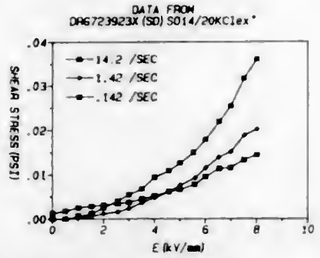
1. An article for use in thermal energy generation comprising a container having a plastic housing, a mixture of hydrophilic silica particles and an endothermic or exothermic compound disposed in the plastic housing of said container, and a liquid activating solution disposed in the plastic housing of said container, separated from said mixture by a rupturable device.

5,552,076

ANHYDROUS AMORPHOUS CERAMICS AS THE PARTICULATE PHASE IN ELECTRORHEOLOGICAL FLUIDS

Daniel R. Gamota, Palatine, Ill.; Brian L. Mueller, Utica, and Frank E. Filisko, Ann Arbor, both of Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Jun. 8, 1994, Ser. No. 257,319
Int. Cl.[6] H01B *3/20;* **C09K** *3/00;* **C10M** *125/10*
U.S. Cl. 252—74 **5 Claims**



1. An electrorheological fluid comprising:
an electrically nonconductive non-polar liquid phase; and
a dispersed particulate phase of amorphous, substantially water-free, ceramic particles of a sodium-aluminosilicophosphate having the following chemical composition:

$$A_{(a/n)}D_{(a/m)}[(F_xG_y)_z(GO_2)_iRO_4)_{.2}]wH_2O$$

where:
A is principally sodium of valence charge n;
D is an anion of valence charge m; or is a mixture of anions of average valence charge m;
F is essentially aluminum;
G is essentially silicon;
R is essentially phosphorus;
O is essentially oxygen;
a and d are respective real number multipliers of A and D, provided that a cannot be zero; and
i, j, k, x, y, and z each is any real number, not including zero and w is any low number resulting from two heat treatments of the amorphous material at a temperature of about 400 to 600 degrees Celsius for at least about five hours in each heat treatment.

5,552,077

Patent Not Issued For This Number

5,552,078

CARBONATE BUILT LAUNDRY DETERGENT COMPOSITION

Charles D. Carr, Yardley, Pa.; Steven A. Bolkan, Hopewell, and Joseph G. Becker, Martinsville, both of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 85,008, Jun. 29, 1993, Pat. No. 5,376,300. This application Dec. 21, 1994, Ser. No. 360,312
Int. Cl.[6] C11D *3/10;1/14*
U.S. Cl. 510—351 **11 Claims**

1. A powdered laundry detergent composition comprising about 5 to 24 wt. % of an active surfactant including anionic and nonionic surfactants, wherein said anionic surfactant is an alkali metal salt of sulfated linear C_{12}–C_{16} alcohols ethoxylated with an average of 1 to 12 moles of ethylene oxide per mole of alcohol, and said nonionic surfactant consists of C_{12}–C_{16} linear alcohols ethoxylated with an average of 1 to 12 moles of ethylene oxide per mole of alcohol, at least about 70 wt. % of sodium carbonate, about 0.1 to 2 wt. % of a phosphorus-containing sequestering agent, about 0.1 to 2 wt. % of an at least partially neutralized polymeric polycarboxylate, and about 1–12 wt. % water, said anionic surfactant being present in an amount greater than that of said nonionic surfactant and in the range of about 4 to 16 wt. %, said nonionic surfactant being present in the range of about 2 to 8 wt. % and said at least partially neutralized polymeric polycarboxylate having a number average molecular weight of about 1000 to 10,000.

5,552,079

TABLETED DETERGENT, METHOD OF MANUFACTURE AND USE

Kenneth J. Roach, Canton, and Patricia A. Anderson, Northville, both of Mich., assignors to Diversey Corporation, Ontario, Canada

Continuation of Ser. No. 120,563, Sep. 13, 1993, abandoned. This application Apr. 27, 1995, Ser. No. 430,177
Int. Cl.[6] C11D *7/06;3/075*
U.S. Cl. 510—446 **7 Claims**

1. A compressed tablet detergent composition comprising:
20% to about 70% hydratable sodium hydroxide or potassium hydroxide;
from about 20% to 60% hardness sequestering agent comprising a combination of alkali metal tripolyphosphate and alkali metal tripolyphosphate hexahydrate;
less than about 8% water of hydration; and
2% to 10% total liquid components;
said detergent being compressed into tablets having a uniform dissolution rate.

5,552,080

COLD CLEANING SOLVENTS

Michael S. Bolmer, Montgomery County, Pa., assignor to Elf Atochem North America, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 378,430, Jan. 26, 1995, abandoned, which is a continuation-in-part of Ser. No. 198,455, Feb. 18, 1994, abandoned, which is a continuation-in-part of Ser. No. 185,567, Jan. 24, 1994, abandoned, which is a continuation-in-part of Ser. No. 48,090, Apr. 15, 1993, abandoned. This application Oct. 11, 1995, Ser. No. 540,679
Int. Cl.[6] C11D *7/30;7/50;* **C23G** *5/032*
U.S. Cl. 510—412 **5 Claims**

1. A nonazeotropic solvent blend useful for cold cleaning applications in an open environment consisting essentially of about 10–60 weight % of a halocarbon component selected from 1,1-dichloro-1-fluoroethane and 1,1,2,3,3-pentafluoropropane; about 1–30 weight % of a nonflammable chlorinated solvent component with a boiling point of about 80°–130° C. selected from the group consisting of perchloroethylene, trichloroethylene, and mixtures thereof; and from 10 to about 40 weight % of an oxygenated organic solvent component having at least 3 carbons, a flash point over 0° C. and a boiling point intermediate that of the other two components, said components and their proportions being chosen such that (a) the blend has an average vapor pressure of about 2–7.6 psia and a substantially lower ozone depletion potential than 1,1,2-trichloro-1,2,2-trifluoroethane or 1,1,1-trichloroethane, and (b) when the blend is allowed to evaporate the resultant vapor fractions and liquid fractions each have no flash point.

5,552,081

DICYCLOOCTYLHALOBORANES

Herbert C. Brown, West Lafayette, Ind., assignor to Aldrich Chemical Company, Inc., Milwaukee, Wis.

Division of Ser. No. 905,115, Jun. 26, 1992, Pat. No. 5,380,940. This application Sep. 12, 1994, Ser. No. 304,161
Int. Cl.[6] C07F *5/02*
U.S. Cl. 252—182.12 **3 Claims**

1. An enoboration agent represented by the formula:

$$R_2BX/R'_3N$$

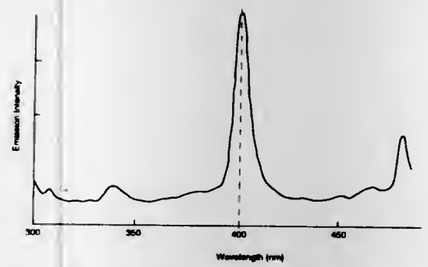
wherein each R is, cyclooctyl, B is boron, X is halo, R' is lower alkyl and/indicates that R_2BX is employed in the presence of R'_3N.

5,552,082

QUANTUM SPLITTING OXIDE PHOSPHOR AND METHOD OF MAKING

Alok M. Srivastava, Schenectady, N.Y., and William W. Beers, Chesterland, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 3, 1995, Ser. No. 367,634
Int. Cl.[6] C09K *11/63*
U.S. Cl. 252—301.4 R **11 Claims**



1. An oxide material having an atomic ratio, comprising:
$La_{1-x}Pr_xMgB_5O_{10}$;
where $0<X\leqq 0.20$.

5,552,083

SOL AND FINE POWDER OF SODIUM MAGNESIUM FLUORIDE AND PROCESSES FOR THEIR PRODUCTION

Yoshitane Watanabe; Keitaro Suzuki; Yoshinari Koyama, and Motoko Iijima, all of Funabashi, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Filed Aug. 19, 1994, Ser. No. 293,207
Claims priority, application Japan, Aug. 31, 1993, 5-216252
Int. Cl.[6] B01J *13/00;* **C01B** *9/08*
U.S. Cl. 252—309 **12 Claims**

1. A process for producing a sol of sodium magnesium fluoride, which comprises the following steps (a), (b) and (c):
(a) a step of mixing an aqueous sodium fluoride solution and an aqueous magnesium salt solution in a Na/Mg molar ratio of 3.0 to form a slurry of aggregates of colloidal particles of sodium magnesium fluoride,
(b) a step of removing by-product salts contained in the slurry of aggregates of colloidal particles of sodium magnesium fluoride obtained in the step (a), and
(c) a step of wet-pulverizing the slurry of aggregates of colloidal particles of sodium magnesium fluoride obtained in the step (b);
thereby forming a sol comprising colloidal particles of sodium magnesium fluoride ($NaF.MgF_2$) having an average particle diameter of from 10 to 100 um.

5,552,084

FREE-FLOWING POTASSIUM BICARBONATE COMPOSITION

M. Stephen Lajoie, Basking Ridge, and Robin C. Sargent, Willingboro, both of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Continuation of Ser. No. 277,605, Jul. 20, 1994, abandoned. This application Nov. 16, 1995, Ser. No. 558,411
Int. Cl.[6] C01D *7/42*
U.S. Cl. 252—385 **3 Claims**

1. A free-flowing crystalline potassium bicarbonate composition which has an average particle size between about 10–1000 microns, and has a content of between about 0.2–2 weight percent of magnesium carbonate which is distributed as an adherent physically-bonded coating on the surface of the potassium bicarbonate particles; wherein the composition accumulates less than about 3.5 weight percent of potassium bicarbonate particles in agglomerated form, after exposure to 80° F. and 80 percent relative humidity conditions for three months.

5,552,085

PHOSPHORUS THIOACID ESTER INHIBITOR FOR NAPHTHENIC ACID CORROSION

Elizabeth Babaian-Kibala, Fulshear, Tex., assignor to Nalco Chemical Company, Naperville, Ill.

Continuation of Ser. No. 298,731, Aug. 31, 1994, abandoned. This application Oct. 3, 1995, Ser. No. 538,521
Int. Cl.[6] C23F *11/16;11/167*
U.S. Cl. 252—389.23 **8 Claims**

1. A process for controlling corrosion on the metallic surfaces of distillation columns, trays, packing, and pumparound piping in contact with the condensed distillate of a distilling hydrocarbon containing naphthenic acids which comprises adding a phosphorus thioacid hydrocarbyl ester to the condensed distillate and allowing such condensed distillate containing the phosphorus thioacid hydrocarbyl ester to contact the metallic surfaces of the distillation column, trays, packing, and pumparound piping.

5,552,086

IMMOBILIZED METAL COLLOIDS ON DISPERSED POLYMER MICROSHPERES

Olavi Siiman, Davie; Alexander Burshteyn, Hialeah, and Marilyn Cayer, Miami, all of Fla., assignors to Coulter Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 827,347, Jan. 29, 1992, Pat. No. 5,248,772. This application Sep. 9, 1993, Ser. No. 118,980
Int. Cl.[6] B01J *13/22;* **B32B** *15/08;15/16;* **G01N** *33/52*
U.S. Cl. 252—408.1 **35 Claims**

1. Stable colloidal particles suitable for use in instrumental analyses such as flow cytometry or Raman spectroscopy, each such particle comprised of a colloidal-sized core substrate, an aminodextran coating over the peripheral surface of said substrate and a uniform layer of colloidal-sized metallic solid overlaying said aminodextran coating, wherein the metal for said metallic solid is selected from the group consisting of metals which can be reduced from the ionic state to the metal (O) state by the aminodextran coating the core substrate.

5,552,087

HIGH TEMPERATURE EVAPORATION INHIBITOR LIQUID

Ron Zeheb, and Paula M. Rodgers, both of Tucson, Ariz., assignors to Ventana Medical Systems, Inc., Tucson, Ariz.

Filed Nov. 15, 1993, Ser. No. 155,935
Int. Cl.[6] C09K *3/00*
U.S. Cl. 252—408.1 **6 Claims**

1. An evaporation inhibitor liquid consisting essentially of a mixture of an alkane having at least six carbons, a non-volatile oil,

and a surfactant, said alkane being present in said mixture in an amount sufficient to provide a density which facilitates floating the mixture on the surface of an aqueous medium, said non-volatile oil being present in said mixture in an amount sufficient to inhibit evaporation of said mixture at elevated temperatures, and said surfactant being present in an amount sufficient to maximize the contact surface area between the evaporation inhibitor liquid and the aqueous medium.

5,552,088

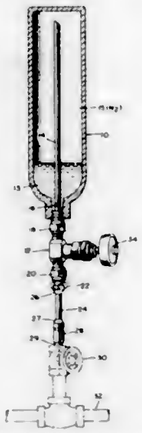
NON-OZONE DEPLETING MALODOROUS COMPOSITION OF MATTER AND WARNING SYSTEM

Charles Pottier, 6700 Johnston Rd., and Richard Varien, 20 Foothill Ct., both of Danville, Calif. 94588

Filed Oct. 18, 1994, Ser. No. 324,804

Int. Cl.[6] **G01D** *21/00*

U.S. Cl. 116—214 **13 Claims**



1. A malodorous warning composition of matter which is non-flammable and non-ozone depleting for introduction into a pressurized air breathing system of a facility to warn a person of danger, comprising:

about 1 part by weight of a liquid malodorous substance selected from the group consisting of methyl mercaptan, ethyl mercaptan, propyl mercaptan, butyl mercaptan, and tetrahydrothiophene;

from about 2 to about 6 parts by weight of 1,1,1,2-tetrafluoroethane; and

from about 0.2 to about 0.4 parts by weight of an inert gas under pressure.

5,552,089

LIQUID CLEANING COMPOSITIONS WITH GREASE RELEASE AGENT

Anne-Marie Misselyn, Villers-l'eveque; Marianne Mahieu, Ferrieres; Georges Yianakopoulos, Liege, and Rita Erilli, Liege, all of, Belgium, assignors to Colgate-Palmolive Co., Piscataway, N.J.

Continuation-in-part of Ser. No. 155,262, Nov. 22, 1993, Pat. No. 5,415,813. This application May 8, 1995, Ser. No. 435,073

The portion of the term of this patent subsequent to May 16, 2012, has been disclaimed.

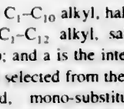
Int. Cl.[6] **C11D** *3/30;3/43;3/44;1/62*

U.S. Cl. 510—417 **8 Claims**

1. A light duty liquid detergent consisting essentially of approximately by weight:

(a) 1 to 50 wt. % of at least one surfactant; wherein said at least one said surfactant is selected from the group consisting of fatty acid soap surfactants, nonionic surfactants, anionic surfactants, zwitterionic surfactants and alkyl polysaccharide surfactants and mixtures thereof.

(b) 0.1 to 10 wt. % of a grease release agent having the formula



wherein R_1 is a methyl group and R_2, R_3, and R_4 are independently selected from the group consisting of CH_3, C_2H_5, CH_2CH_2Y and, wherein Y is selected from the group consisting of Cl, Br, CO_2H, $(CH_2O)nOH$, wherein n is 1 to 10 and OH, CH_2CH_2OH and X is selected from the group consisting of Cl, Br, methosulfate and HCO_3—;

(c) 1 to 15% by weight of a solubilizing agent selected from the group consisting of C_2-C_3 mono- and di- hydroxy alkanols, water soluble salts of C_1-C_3 substituted benzene sulfonate hydrotropes, and mixtures thereof; and

(d) the balance being water.

5,552,090

PHOTOCHROMIC NAPHTHOPYRAN COMPOUNDS

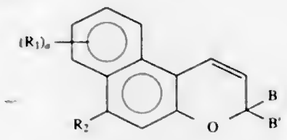
Barry Van Gemert, Murrysville, and David B. Knowles, Apollo, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 302,292, Sep. 8, 1994, Pat. No. 5,458,815, which is a division of Ser. No. 80,250, Jun. 21, 1993, Pat. No. 5,384,077. This application Dec. 20, 1994, Ser. No. 359,773

Int. Cl.[6] **G02B** *5/23;27/00;* **C07D** *405/10;413/10*

U.S. Cl. 252—586 **21 Claims**

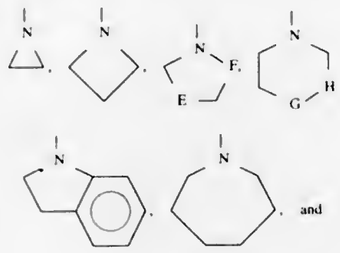
1. A naphthopyran compound represented by the following graphic formula:



wherein,

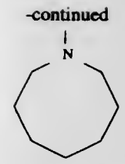
(a) R_1 is C_1–C_{10} alkyl, halogen, or the group, —O—L, wherein L is C_1–C_{12} alkyl, said halogen being chloro, fluoro, or bromo; and a is the integer 0, 1, or 2;

(b) R_2 is selected from the group consisting of saturated, unsubstituted, mono-substituted, and di-substituted nitrogen-containing heterocyclic groups represented by the following graphic formulae:



and

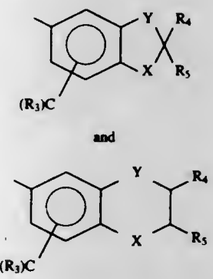
-continued



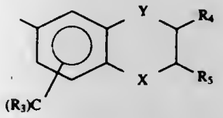
wherein E and F are each nitrogen or carbon atom, G is nitrogen, oxygen, or carbon atom, and H is nitrogen or carbon, provided that when E is nitrogen, F is carbon, and when H is nitrogen, G is carbon, and said nitrogen-containing heterocyclic group substitutents being selected from C_1–C_6 alkyl and C_1–C_6 alkoxy;

(c) B is the substituted or unsubstituted aryl group, naphthyl or phenyl, said aryl substituents being C_1–C_5 alkyl, halo(C_1–C_5)alkyl, hydroxy, C_1–C_5 alkoxy, C_1–C_4 alkoxy(C_1–C_4)alkyl, halogen, morpholino, piperidino, or R(R')N—, wherein R and R' are each hydrogen or C_1–C_3 alkyl, said halogen (or halo) groups being fluorine or chlorine; and

(d) B' is selected from the groups represented by the following graphic formulae:



and



wherein X is oxygen or nitrogen and Y is carbon or oxygen provided that when X is nitrogen, Y is carbon; R_4 and R_5 are each hydrogen or C_1–C_5 alkyl; each R_3 is C_1–C_5 alkyl, C_1–C_5 alkoxy, hydroxy, or halogen, said halogen being chloro, fluoro, or bromo, and c is an integer from 0 to 3.

5. A photochromic article comprising a polymeric organic host material and a photochromic amount of a naphthopyran compound of claim 1.

5,552,091

BENZOPYRAN COMPOUNDS

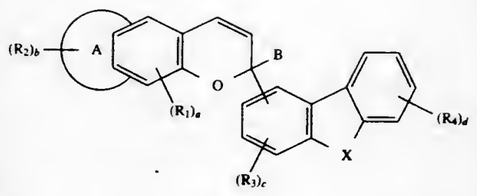
Anil Kumar, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 220,344, Mar. 30, 1994, Pat. No. 5,429,774, which is a continuation-in-part of Ser. No. 201,948, Feb. 25, 1994, abandoned, which is a continuation-in-part of Ser. No. 30,932, Mar. 12, 1993, abandoned. This application Jun. 30, 1995, Ser. No. 497,516

Int. Cl.[6] **G02B** *5/23;* **C07D** *209/82;333/50;311/78*

U.S. Cl. 252—586 **20 Claims**

1. A benzopyran compound represented by the following graphic formula:



wherein,

(a) X is CH_2, O, S, or N—R_{12}, wherein R_{12} is selected from the group consisting of hydrogen, C_1–C_6 alkyl, C_5–C_7 cycloalkyl, unsubstituted, mono- and di-substituted phenyl, said phenyl substituents being C_1–C_6 alkyl, C_1–C_6 alkoxy, chloro, or fluoro, R_3 and R_4 are each hydrogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, chloro or fluoro, and c and d are each the integers 0, 1, 2, or 3;

(b) each R_1 is selected from the group consisting of halogen, C_1–C_6 alkyl, C_3–C_7 cycloalkyl, the unsubstituted, mono-, and di-substituted aryl groups phenyl and naphthyl, and the groups, —C(O)W, —N(R_5)R_6, and —OR_7, wherein W is hydrogen, C_1–C_6 alkoxy, or —N(R_5)R_6, R_5 and R_6 are each selected from the group consisting of hydrogen, C_1–C_6 alkyl, C_5–C_7 cycloalkyl, unsubstituted, mono- and di-substituted phenyl, or R_5 and R_6 together with the nitrogen atom form an unsubstituted, mono-, or di-substituted heterocyclic ring selected from the group consisting of 1-indolinyl, morpholino, piperidino, and 1-pyrrolidyl, R_7 is hydrogen, C_1–C_6 alkyl, unsubstituted or mono-substituted phenyl(C_1–C_3)alkyl, C_1–C_6 alkoxy(C_2–C_4)alkyl, C_3–C_7 cycloalkyl, mono(C_1–C_4)alkyl substituted(C_3–C_7)cycloalkyl, C_1–C_6 haloalkyl, allyl, or the group, —C(O)Y, wherein Y is C_1–C_6 alkyl, C_1–C_6 alkoxy, the unsubstituted, mono-, or di-substituted aryl groups phenyl or naphthyl, an unsubstituted, mono-, or di-substituted phenoxy, C_1–C_6 alkylamino, an unsubstituted, mono-, or di-substituted phenylamino, each of said heterocyclic, phenyl, naphthyl, phenyl(C_1–C_3)alkyl, phenoxy, and phenylamino substituents being C_1–C_6 alkyl or C_1–C_6 alkoxy, each of said halogen or halo substituents being chloro or fluoro, and a is the integer 0, 1, or 2;

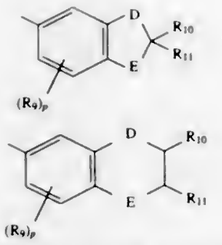
(c) A is selected from the group consisting of benzothieno, benzofurano, and benzo, the 2,3 or 3,2 position of said benzothieno or benzofurano group being fused to the f, g, or h side of said benzopyran compound, said benzo group being fused to the f side of said benzopyran compound, and each R_2 is selected from the group consisting of R_1, and an unsubstituted, mono-, or di-substituted benzo group fused to the benzo portion of the benzothieno or benzofurano of group A, said benzo substituents being C_1–C_4 alkyl, C_1–C_4 alkoxy, C_5–C_7 cycloalkyl, chloro or fluoro, and b is the integer 0, 1, or 2, provided that when R_2 is an unsubstituted, mono-, or di-substituted benzo group, b is 1;

(d) B is selected from the group consisting of:

(i) the unsubstituted, mono-, di-, and tri-substituted aryl groups phenyl and naphthyl;

(ii) the unsubstituted, mono-, and di-substituted heterocyclic aromatic groups pyridyl, furanyl, benzofuran-2-yl, benzofuran-3-yl, thienyl, benzothien-2-yl, and benzothien-3-yl, said phenyl, naphthyl, and heterocyclic substituents being selected from the group consisting of —N(R_5)R_6, hydroxy, C_1–C_6 alkyl, C_1–C_6 haloalkyl, C_1–C_6 alkoxy, mono(C_1–C_6)alkoxy(C_1–C_4)alkyl, acryloxy, methacryloxy and halogen, said halogen or (halo) groups being fluoro or chloro;

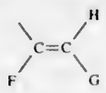
(iii) the groups represented by the following graphic formulae:



wherein D is carbon or oxygen, and E is oxygen or substituted nitrogen provided that when E is substituted nitrogen, D is carbon, said nitrogen substituents being selected from the group consisting of hydrogen, C_1–C_6 alkyl, C_2–C_6 acyl, and C_1–C_3 alkylcarbonyl; R_{10} and R_{11} are each hydrogen or C_1–C_6 alkyl; each R_9 is C_1–C_6 alkyl, C_1–C_6 alkoxy, hydroxy or halogen, said halogen being chloro or fluoro; and p is the integer 0, 1, or 2;

(iv) C_1–C_6 alkyl, C_1–C_6 haloalkyl, (C_1–C_6)alkoxy(C_1–C_4)alkyl, C_3–C_6 cycloalkyl, mono(C_1–C_6)alkoxy(C_3–C_6)cycloalkyl, and halo(C_3–C_6)cycloalkyl, each of said halo groups being fluorine or chlorine; and

(v) the group represented by the following graphic formula:



wherein F is hydrogen or C_1–C_4 alkyl, and G is selected from the unsubstituted, mono-, and di-substituted members of the group consisting of naphthyl, phenyl, furanyl, and thienyl, said group substituents being C_1–C_4 alkyl, C_1–C_4 alkoxy, fluoro, or chloro.

5,552,092

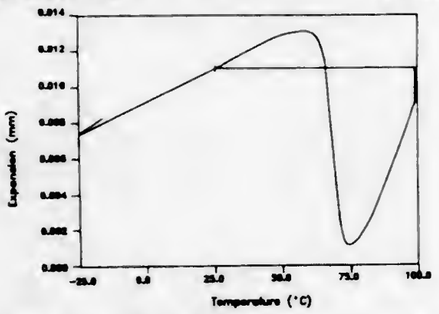
WAVEGUIDE COUPLER

Gaylord L. Francis, Painted Post, N.Y.; Ronald E. Johnson, Tioga, Pa.; Paul A. Tick, Corning, and Lung-Ming Wu, Horseheads, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Division of Ser. No. 251,326, May 31, 1994. This application Mar. 23, 1995, Ser. No. 408,791

Int. Cl.[6] G02B *6/16;6/42*

U.S. Cl. 264—1.24 **6 Claims**



1. A method for packaging an optical waveguide coupler, said coupler comprising a body having two end portions and a constricted portion located between the end portions, said method comprising:

(a) placing the coupler in a mold, said mold surrounding at least the constricted portion of the coupler;

(b) introducing a polymeric composition into the mold, said polymeric composition substantially filling the constricted portion;

(c) curing the polymeric composition; and

(d) removing the mold wherein the end portions of the coupler each have a substantially circular cross-section of diameter D and the mold is configured so that the constricted portion when filled with the cured polymeric composition has a substantially circular cross-section whose diameter is substantially equal to D.

5,552,093

PROCESS FOR THE REMOVAL OF A SOLID ROCKET PROPELLANT FROM A ROCKET MOTOR CASE

David E. Lee, 2755 Fountain Oak Dr., Morgan Hill, Calif. 95037

Filed Jun. 5, 1989, Ser. No. 361,625

Int. Cl.[6] F27B *9/04*

U.S. Cl. 264—3.1 **9 Claims**

1. A method of reclaiming a solid rocket motor, said motor comprising a binder containing propellant disposed in a motor case comprising:

a) cooling the propellant to a temperature below the Tg range of the binder;

b) shattering the cooled propellant; and

c) removing the shattered propellant from the rocket motor case.

5,552,094

METHOD FOR PRODUCING A THIN FILM

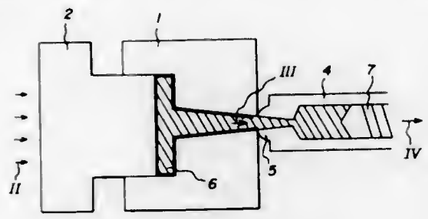
Atsushi Kubota, Susono, Japan, assignor to General Electric Company, Pittsfield, Mass.

Filed Aug. 26, 1994, Ser. No. 296,786

Claims priority, application Japan, Aug. 27, 1993, 5-235812

Int. Cl.[6] B29C *45/56*

U.S. Cl. 264—40.5 **3 Claims**



1. A method of producing a thin film having a desired thickness, comprising the steps of:

(A) injecting molten resin at a first injection pressure into a cavity formed between a stationary die and a moveable die with the movable die positioned so that the cavity is opened wider than the desired thickness of the thin film; and

(B) closing the dies by moving the movable die toward the stationary die so that the cavity reaches the desired thickness and reducing the injection pressure to allow backflow of the molten resin from the cavity during the closing.

5,552,095

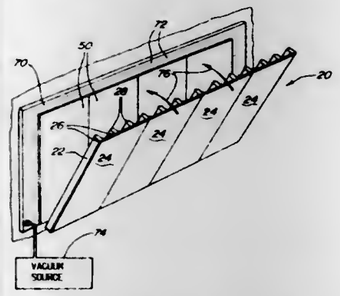
METHOD OF FORMING STRUCTURAL PANEL ASSEMBLIES USING A VACCUUM PLATE

N. Keith Merser, Northbranch, and Stanley E. Wencley, Rochester Hills, both of Mich., assignors to Foamseal, Inc., Oxford, Mich.

Continuation-in-part of Ser. No. 14,440, Feb. 5, 1993, Pat. No. 5,425,908. This application Jul. 9, 1993, Ser. No. 89,726

Int. Cl.[6] B29C *65/00*

U.S. Cl. 264—46.4 **18 Claims**



17. A method of forming a flat relatively rigid panel assembly comprising at least two generally flat relatively flexible rectangular fibrous panels subject to warpage and surface irregularities, said panels being orientated in edge-to-edge coplanar relationship, and there being a plurality of transverse structural support members supporting said panels, said structural support members having relatively flat end faces permanently adhesively bonded to said panels, reinforcing said panel assembly, the method comprising the following steps:

(a) orientating said panels on a flat vacuum plate in edge-to-edge relationship, drawing a vacuum through said plate, drawing said panels flat against said plate, thereby reducing any non-planar portions in said panels

(b) adhesively bonding said end faces of said structural support members to said panels while said panels are flattened against said vacuum plate; and

(c) attaching said adjacent panels together, while said panels are held on said vacuum plate with a vacuum drawn, such that any discontinuities between edges of adjacent panels are reduced.

5,552,096

MULTIPLE REACTION PROCESS IN MELT PROCESSING EQUIPMENT

Richard S. Anda; William M. Davis, both of Westfield; David Y. Chung, Edison; Lawrence W. Flatley, Somerville, all of N.J.; Brenton G. Jones, Overijse, Belgium; Donald A. White, Edison, N.J., and Hans G. Woudboen, Bonn-Bad Godesberg, Germany, assignors to Exxon Chemical Patents Inc., Wilmington, Del.

Division of Ser. No. 382,336, Feb. 1, 1995, which is a division of Ser. No. 989,289, Dec. 11, 1992, Pat. No. 5,424,367, which is a continuation-in-part of Ser. No. 807,282, Dec. 13, 1991, abandoned. This application May 31, 1995, Ser. No. 454,998

Int. Cl.[6] B29C *47/78;* **C08F** *4/00*

U.S. Cl. 264—85 **19 Claims**

1. A process for modifying a thermopolastic polymer through a series of sequential reactions in an extruder-reactor comprising:

(a) introducing said polymer into an extruder;

(b) conveying said polymer into a reaction zone wherein said polymer undergoes one of the sequential reactions with a first reagent;

(c) conveying said polymer into a first purification zone wherein impurities produced by the reaction of the preceding step are removed from or neutralized in said polymer;

(d) repeating the steps of (b) and (c) on the polymer of step (c) with at least a second and different reagent than the first reagent, until each of said sequential reactions are completed; and

(e) conveying said polymer through the rest of the extrusion process, wherein said reaction and purification zones are isolated from each other.

5,552,097

METHOD AND APPARATUS FOR HEATING A SYNTHETIC FILAMENT YARN

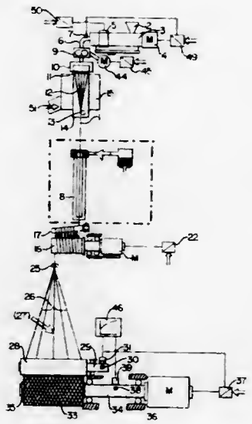
Heinz Schippers, Remscheid, Germany, assignor to Barmag AG, Remscheid, Germany

Filed Feb. 28, 1995, Ser. No. 395,878

Claims priority, application Germany, Feb. 28, 1994, 44 06 416.0

Int. Cl.[6] D01D *5/084;10/02*

U.S. Cl. 264—103 **16 Claims**



1. A method of producing a synthetic filament yarn comprising the steps of

extruding a polymeric material so as to form a plurality of advancing filaments,

gathering the extruded filaments so as to form an advancing yarn,

guiding the advancing yarn through an elongate heating chamber, and

applying heated water vapor to the advancing yarn immediately prior to its entry into the heating chamber so that the water vapor condenses on the yarn as it enters into the heating chamber.

5,552,098

METHOD FOR FABRICATION OF DISC SUBSTRATE

Junichiro Kudo, and Jun Shimizu, both of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

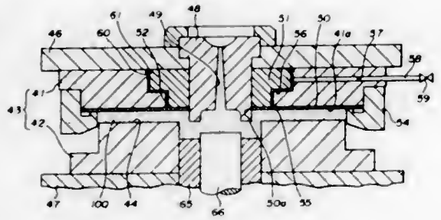
Division of Ser. No. 957,671, Oct. 7, 1992, Pat. No. 5,326,240. This application Mar. 3, 1994, Ser. No. 206,791

Claims priority, application Japan, Oct. 12, 1991, 3-292558; Jan. 8, 1992, 4-019445; Apr. 21, 1992, 4-126662

Int. Cl.[6] B29C *45/38;* **B29D** *17/00*

U.S. Cl. 264—106 **8 Claims**

1. A method for forming in a mold cavity created by a first metal mold and a second metal mold a disc substrate having a bottomed centering hole and a reference loading plane for disc rotating and driving means, the reference loading plane being substantially parallel to a planar region on which a light beam is incident, the



reference loading plane being projected from the planar region, comprising the steps of:

holding a radially outer edge of a stamper in the mold cavity against an outer edge of the first metal mold with a holder attached to the first metal mold;

holding a radially inner side of the stamper to the first metal mold;

injecting synthetic resin into the mold cavity for forming the bottomed centering hole, wherein the bottomed centering hole is formed by a stationary member protruding into the mold cavity; and

punching at least a part of the bottomed centering hole by a movable member protruded into the mold cavity for forming a through-hole.

5,552,099

PROCESS FOR PELLETISING PARTICLES OF ALKALI METAL FERRITE

Heiko Wunder; Robert E. Scott-Young; Kenneth N. Maddern, and Jack Scukovic, all of Tasmania, Australia, assignors to Amcor Limited, South Melbourne, Australia

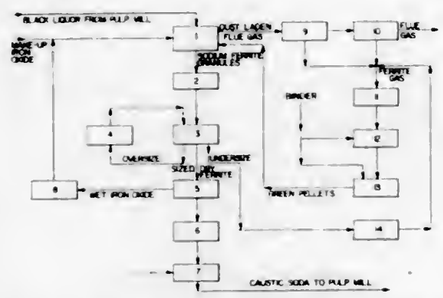
PCT No. PCT/AU93/00500, § 371 Date May 3, 1995, § 102(e) Date May 3, 1995, PCT Pub. No. WO94/07595, PCT Pub. Date Apr. 14, 1994

PCT Filed Sep. 30, 1993, Ser. No. 397,144

Claims priority, application Australia, Sep. 30, 1992, PL5206

Int. Cl.[6] B29B *9/08*

U.S. Cl. 264—117 **7 Claims**



1. A process for pelletising particles of alkali metal ferrite with an aqueous binder, the process comprising:

(i) grinding the particles to form ground particles of a predetermined particle size range;

(ii) measuring controlled quantities of the ground particles and an aqueous binder into a microgranulator;

(iii) mixing the ground particles and the aqueous binder in the microgranulator to produce microgranules of alkali metal ferrite;

(iv) agglomerating the microgranules on a pelletising pan at a controlled pan temperature to produce pellets of alkali metal ferrite wherein the pan temperature is controlled by cooling either or both the particles of alkali metal ferrite or aqueous binder prior to measuring them into the microgranulator.

5,552,100

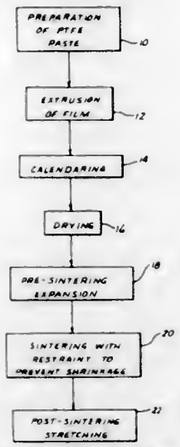
METHOD FOR MANUFACTURING POROUS FLUOROPOLYMER FILMS

Donald Shannon, Mission Viejo; Chris Kuo, Orange; Robert Peterson, Dove Canyon, and Chris McCollam, Irvine, all of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Filed May 2, 1995, Ser. No. 432,997

Int. Cl.[6] B29C *55/10*

U.S. Cl. 264—127 **18 Claims**



1. A method for manufacturing a porous fluoropolymer film having a thickness of less than 0.002 inches, said method comprising the steps of:

a) providing an unsintered fluoropolymer film;

b) expanding the unsintered fluoropolymer film in at least one axis at a temperature below the crystalline melting point of the porous fluoropolymer film;

c) sintering of the expanded fluoropolymer film while restraining the film in at least one dimension to prevent shrinkage of the film in the restrained dimension; and

d) stretching the previously expanded and sintered fluoropolymer film in at least one axis at a temperature below the crystalline melting point of the porous fluoropolymer film to cause the thickness of the film to be reduced to less then 0.002 inch.

5,552,101

METHOD FOR MANUFACTURING PLASTIC CASE

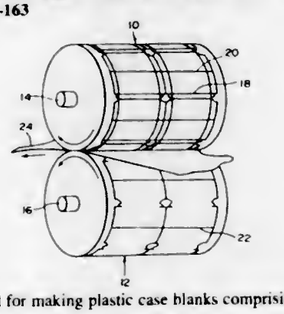
Tatsuo Fujii, and Kimio Tanaka, both of Saku, Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 86,261, Jul. 1, 1993, abandoned. This application May 30, 1995, Ser. No. 453,308

Claims priority, application Japan, Jul. 4, 1992, 4-200292

Int. Cl.[6] B29C *43/24;43/46;* **B65D** *85/575*

U.S. Cl. 264—163 **2 Claims**



1. A method for making plastic case blanks comprising the steps of:

supplying a molten plastic material;

passing the molten plastic material through a nip of a first, preforming pair of cylinders to form a semi-solidified sheet having a first thickness;

simultaneously molding the semi-solidified sheet into a final sheet having a second, uniform thickness less than the first thickness, scoring the final sheet to form folding scores, and cutting the final sheet to form a plurality of the blanks, the step of simultaneously molding, scoring and cutting being performed by passing the semi-solidified sheet through a nip of a second pair of cylinders, one of the second pair of cylinders having scoring means for forming the folding scores in the final sheet and cutting means for cutting the final sheet to form the plurality of the blanks and the other of the second pair of cylinders having recess means complementary to the cutting means for receiving the cutting means and effectuating the cutting.

5,552,102

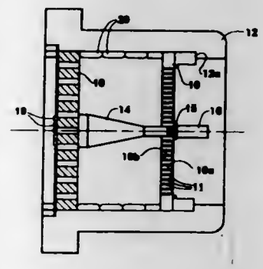
METHOD AND APPARATUS FOR EXTRUDING LARGE HONEYCOMBS

Harry A. Kragle; David W. Lambert, both of Corning, and G. Daniel Lipp, Painted Post, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Dec. 16, 1994, Ser. No. 358,099

Int. Cl.[6] B29C *47/12*

U.S. Cl. 264—177.11 **14 Claims**



1. Die apparatus for the extrusion of a honeycomb structure which comprises:

an extrusion die having an inlet face provided with a multiplicity of feedholes for the input of batch material from an upstream direction and an outlet face provided with a multiplicity of discharge slots for the discharge of the batch material as a honeycomb in a downstream direction,

at least one support rod connected to a center portion of the die and extending in the upstream direction from the inlet face, and

support means positioned in the upstream direction from the inlet face and connecting with the support rod,

whereby plate distortion of the die, and stress and strain on the die during honeycomb extrusion at a selected extrusion pressure, are reduced.

11. A method of forming a honeycomb body from a plasticized batch material which comprises the step of:

extruding the batch material through a honeycomb extrusion die in a downstream direction, while

applying a supporting force to a central portion of the die in an upstream direction, the supporting force being applied by a support rod connecting the central portion of die to support means located upstream of the die,

whereby plate distortion of the die, and stress and strain on the die during honeycomb extrusion at a selected extrusion pressure, are reduced.

5,552,103

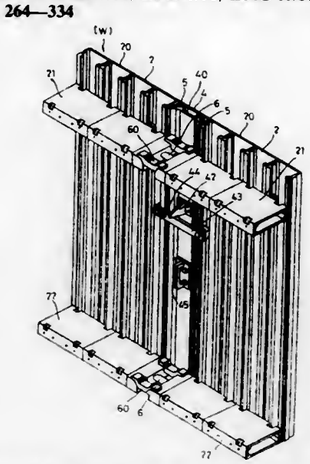
FORM SET-UP AND METHOD FOR STRIPPING UPRIGHT FORM PANELS OF THE FORM SET-UP FROM A CONCRETE UNIT

Wen-Yuan Lee, 7F-3, No. 8, Lane 390, Sec. 1, Chien-Kang Rd., Tainan, Taiwan

Filed Jan. 18, 1995, Ser. No. 374,301

Int. Cl.[6] B28B *7/10;* **E04B** *1/16;* **E04G** *11/06;17/06*

U.S. Cl. 264—334 **7 Claims**



1. A method for stripping upright form panels from a concrete unit having at least one vertical surface, said upright form panels constituting a form set-up defining a pouring space into which concrete is poured and cast so as to form said concrete unit, said form set-up including at least two of said upright form panels and an interconnecting member interposed removably between said two upright form panels, each of said two upright form panels having a contact surface in contact with said vertical surface of said concrete unit, a mounting surface opposed to said contact surface, and a substantially horizontally positioned reinforcing beam member secured to said mounting surface, said reinforcing beam members of said upright form panels being aligned with each other, said interconnecting member having a contact surface which is flush with said contact surfaces of said two upright form panels and which is in contact with said vertical surface of said concrete unit, said method comprising the steps of:

(a) interposing a driving assembly between said reinforcing beam members;

(b) removing said interconnecting member from said two upright form panels so as to leave a space between said two upright form panels; and

(c) activating said driving assembly to move said reinforcing beam members toward each other so as to move said two upright form panels toward each other in order to separate said two upright form panels from said concrete unit.

3. A form set-up defining a pouring space into which concrete is poured and cast so as to form a concrete unit, said concrete unit having at least one vertical surface, said form set-up comprising:

at least two upright form panels, each of said upright form panels having a contact surface in contact with said vertical surface of said concrete unit, a mounting surface opposed to said contact surface, and a substantially horizontally positioned reinforcing beam member secured to said mounting surface, said reinforcing beam members of said two upright form panels being aligned with each other;

an interconnecting member interposed removably between said two upright form panels, said interconnecting member having a contact surface which is flush with said contact surfaces of said two upright form panels and which is in contact with said vertical surface of said concrete unit; and

a driving assembly interposed between said reinforcing beam members and activable to move said reinforcing beam members toward each other so as to move said two upright form

panels toward each other in order to separate said two upright form panels from said concrete unit after said interconnecting member is removed from said upright form panels.

5,552,104

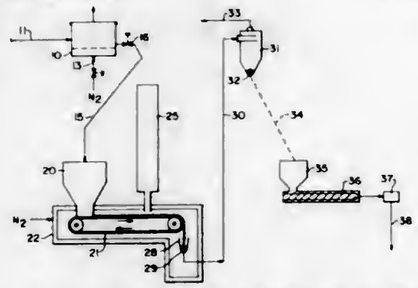
HIGH MELT STRENGTH, ETHYLENE POLYMER, PROCESS FOR MAKING IT, AND USE THEREOF

Anthony J. DeNicola, Jr.; John W. Mayfield; Thomas F. McLaughlin, all of New Castle County, and James R. Beren, Chester County, all of Del., assignors to Montell North America Inc., Wilmington, Del.

Division of Ser. No. 293,251, Aug. 19, 1994, Pat. No. 5,508,319, which is a continuation of Ser. No. 898,766, Jun. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 718,951, Jun. 21, 1991, abandoned. This application Apr. 13, 1995, Ser. No. 421,092

Int. Cl.[6] B29C *35/08*

U.S. Cl. 264—456 **6 Claims**



1. A process for making normally solid, high molecular weight, gel-free, irradiated, ethylene polymer material with strain hardening elongational viscosity from normally solid, ethylene polymer material without strain hardening elongational viscosity, which comprises:

(1) irradiating an ethylene polymer material selected from the group consisting of high density polyethylene, and random copolymers and terpolymers of ethylene and C_{3-10} alpha-olefins, the ethylene content of which copolymers and terpolymers is at least about 80% by weight, the weight average molecular weight of each member of the group being at least about 50,000, and each member of the group having been made by low pressure polymerization with a Ziegler-Natta catalyst system, and being without strain hardening elongational viscosity, while in the solid state,

(a) in an environment in which the active oxygen concentration is established and maintained at less than about 15% by volume of said environment

(b) with high energy ionizing radiation at a dose rate in the range from about 1 to about 1×10^4 megarads per minute for a period of time sufficient to provide an exposure of up to 2.0 Mrads of radiation, but insufficient to cause gelation of the material;

(2) maintaining the thus irradiated material while in the solid state in such an environment for a period of time sufficient for the irradiated material to have acquired enough free-end long chain branches to cause the branching index of the material to be less than about 0.9, and to cause the material to have strain hardening elongational viscosity; and

(3) then treating the irradiated material while in such an environment to deactivate substantially all of the free radicals present in the irradiated material.

6. In a method for making blown film in which an ethylene composition is extruded into a tube that subsequently is blown into a bubble, the improvement in which said composition consists essentially of the ethylene polymer material made by the process of claim 1.

5,552,105

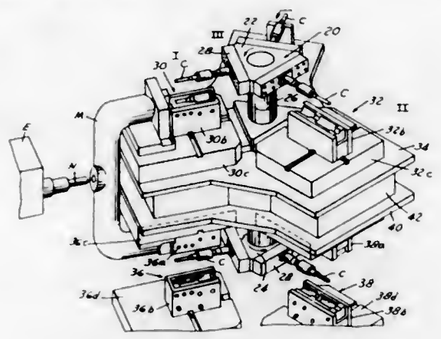
INJECTION BLOW MOLDING MACHINE WITH STACKED MOLDS

Robert S. Konefal, Wilton, N.H., assignor to Owens-Brockway Plastic Products Inc., Toledo, Ohio

Filed Feb. 15, 1995, Ser. No. 388,928

Int. Cl.[6] B29C *49/06;49/36*

U.S. Cl. 264—538 **7 Claims**



1. A method of injection blow molding with stacked molds comprising

providing a stationary platen,

supporting said stationary platen in horizontal position with said platen having an upper and lower surface,

providing an upper injection mold including an upper movable injection mold half and a lower stationary injection mold half which cooperate to define a plurality of cavities,

mounting said lower stationary injection mold half on the upper surface of the stationary platen,

supporting said upper injection mold half for movement toward and from said lower injection mold half,

providing an upper blow mold including an upper mold half and a lower mold half which cooperate to define a plurality of cavities,

mounting said lower blow mold half on the upper surface of the stationary platen,

supporting said upper blow mold half for movement toward and from said lower blow mold half,

providing a lower injection mold including an upper injection mold half and a lower injection mold half defining a plurality of cavities,

mounting said upper injection mold half of said lower injection mold on the lower surface of the stationary platen,

supporting said lower injection mold half of said lower injection mold for movement toward and from said upper injection half,

providing a lower blow mold including an upper stationary mold half and a lower movable mold half defining a plurality of cavities,

mounting said upper stationary mold half of said lower blow mold on the lower surface of the stationary platen,

supporting said lower movable blow mold half of said lower blow mold for movement toward and from said stationary lower blow mold half,

providing a first turret having a triangular configuration having three surfaces with a plurality of core rods on each surface,

providing a second turret having a triangular configuration having three surfaces with a plurality of core rods on each of said surfaces, said first turret being associated with said upper injection and blow molds and said second turret being associated with said lower injection and blow molds,

intermittently rotating said turrets,

moving said first turret vertically downwardly to bring the core rods thereon into position with respect to said lower stationary mold halves of said upper injection and blow molds,

moving said second turret to bring the core rods thereon into position with said upper stationary mold halves of said lower injection and blow molds,

moving said upper movable mold halves of said upper injection and blow molds into and out of mold closed position, and

moving said lower movable mold halves of said lower injection and blow molds into and out of closed position,

injecting molten plastic material into said closed upper and lower injection molds to form parisons,

simultaneously blowing previously formed parisons in the upper and lower blow molds.

5,552,106

METHOD OF MAKING BEARING COMPONENT FOR ROTARY CONE ROCK BIT

K. T. Kembaiyan, The Woodlands, Tex., assignor to Smith International, Inc., Houston, Tex.

Division of Ser. No. 108,043, Aug. 16, 1993, abandoned. This application May 3, 1995, Ser. No. 432,633

Int. Cl.[6] B22F *5/00*

U.S. Cl. 419—5 **14 Claims**

1. A method of making a bearing component for a rotary cone rock bit comprising:

providing a sintered powder compact of a composition that would be subject to segregation when produced by casting, said composition comprising:

a copper base alloy,

about 5–20 wt. % of a transition metal soluble in copper and forming a solid solution therewith, and

about 0.5–10 wt. % of at least one metalloid of limited solid solubility in copper capable of forming a stable compound with the transition metal and/or with copper, which is substantially insoluble in solid solution with copper; and

rolling said sintered compact to form a strip or plate; and

forming said strip or plate into a bearing component, whereby the beneficial strengthening effect of the metalloid or its compound is achieved without the undesirable effects of segregation.

5,552,107

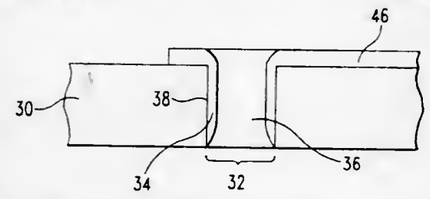
ALUMINUM NITRIDE BODY HAVING GRADED METALLURGY

Jon A. Casey, 349 New Hackensack Rd., Poughkeepsie, N.Y. 12603; Carla N. Cordero, 98 Kent Rd., Wappingers Falls, N.Y. 12590; Benjamin V. Fasano, 30 Windy Hill Rd., New Windsor, N.Y. 12553; David B. Goland, Scenic Dr., Apt. 22E, Croton, N.Y. 10520; Robert Hannon, 9 Robin La., Wappingers Falls, N.Y. 12590; Jonathan H. Harris, 13431 E. Bloomfield, Scotsdale, Ariz. 85259; Lester W. Herron, 12 Innsbruck Blvd., Hopewell Junction, N.Y. 12533; Gregory M. Johnson, 410 Cherry Hill, Poughkeepsie, N.Y. 12603; Niranjan M. Patel, 16A Carnaby St., Wappingers Falls, N.Y. 12590; Andrew M. Reitter, 4 Debbie Ct., Poughkeepsie, N.Y. 12601; Subhash L. Shinde, 518 Half Moon Bay Dr., Croton-on-Hudson, N.Y. 10520; Rao V. Vallabhaneni, 25-A, Alpine Dr., Wappingers Falls, N.Y. 12590, and Robert A. Youngman, 5804 Echo Canyon La., Paradise Valley, Ariz. 86018

Division of Ser. No. 361,351, Dec. 21, 1994. This application May 9, 1995, Ser. No. 437,494

Int. Cl.[6] B22F *7/02*

U.S. Cl. 419—13 **6 Claims**



1. A method for producing an aluminum nitride sintered body having graded metallurgy comprising:

providing an aluminum nitride sintered body having at least one via therein;

filling said at least one via with graded metallurgy paste, said graded metallurgy paste comprising a first layer of metallurgy paste adhered to the walls of said at least one via but leaving a central portion of said at least one via devoid of said first layer of metallurgy paste and a second layer of metallurgy paste filling the central portion of said at least one via;

said first layer of metallurgy paste comprising 30 to 60 volume percent aluminum nitride and 40 to 70 volume percent of a metal selected from the group consisting of tungsten, molybdenum and mixtures thereof;

said second layer of metallurgy paste comprising 90 to 100 volume percent of a metal selected from the group consisting of tungsten, molybdenum and mixtures thereof and 0 to 10 volume percent of aluminum nitride; and

sintering said aluminum nitride body and first and second layers of metallurgy paste at a predetermined time and temperature to form a fully dense aluminum nitride sintered body having at least one via therein with first and second layers of graded metallurgy.

5,552,108

METHOD OF PRODUCING A SINTERED CARBONITRIDE ALLOY FOR EXTREMELY FINE MACHINING WHEN TURNING WITH HIGH CUTTING RATES

Gerold Weinl, Älvsjö, and Rolf Oskarsson, Rönninge, both of, Sweden, assignors to Sandvik AB, Sandviken, Sweden

Continuation of Ser. No. 78,252, Jun. 21, 1993, abandoned. This application May 11, 1995, Ser. No. 439,184

Claims priority, application Sweden, Dec. 21, 1990, 9004116; WIPO, Dec. 19, 1991, PCT/SE91/00885

Int. Cl.[6] B22F *3/16*

U.S. Cl. 419—15 **17 Claims**

1. A method of producing a sintered titanium-based carbonitride alloy with 3–25 weight percent binder phase, comprising steps of:

milling a complex carbonitride raw material and said binder phase to form a mixed powder composite, said complex carbonitride raw material comprising $(A_xB_{1-x})(C_yN_{1-y})$ where A is one or more elements from Group IV and B is one or more elements from Group V, with

$0.86 \leqq x \leqq 0.99$ and

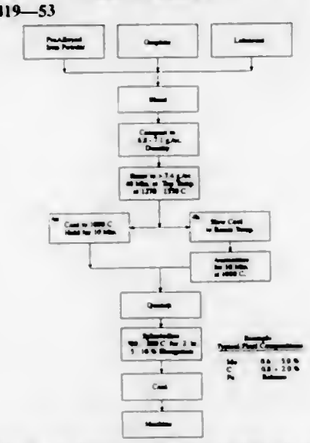
$0.74 \leqq y \leqq 0.83$; and

sintering the powder composite to produce said sintered titanium-based carbonitride alloy, all of the Group IV and V elements in the alloy being added via the complex raw material.

5,552,109
HI-DENSITY SINTERED ALLOY AND SPHEROIDIZATION METHOD FOR PRE-ALLOYED POWDERS

Rohith Shivanath, 238 Aldercrest Road, Toronto, Canada; Peter Jones, 3 Dalston Road, Toronto, Canada, and Danny T. D. Thieu, 21 Highfield Road, Toronto, Canada

Filed Jun. 29, 1995, Ser. No. 496,726
Int. Cl.[6] B22F 3/17
U.S. Cl. 419—53 **16 Claims**



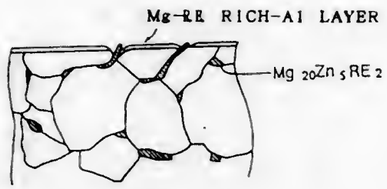
1. A process of forming a sintered article of powder metal comprising blending graphite and lubricant with a pre-alloyed iron based powder, pressing said blended mixture to shape in a single compaction stage sintering said article, and then high temperature sintering said article in a reducing atmosphere to produce a sintered article having a density greater than 7.4 g/cc.

5,552,110
HEAT RESISTANT MAGNESIUM ALLOY

Hideki Iba; Chikatoshi Maeda, both of Toyota; Tadashi Takeuchi, Nagoya, and Yasuyuki Suzuki, Toyota, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 918,602, Jul. 24, 1992, Pat. No. 5,336,466. This application Mar. 25, 1994, Ser. No. 217,862
Claims priority, application Japan, Jul. 26, 1991, 3-210305; Dec. 20, 1991, 3-355893; Apr. 30, 1993, 5-104381; Dec. 3, 1993, 5-304031
Int. Cl.[6] C22C 23/00
U.S. Cl. 420—406 **14 Claims**

1. A mold-cast structure formed of a heat resistant magnesium alloy, consisting essentially of:



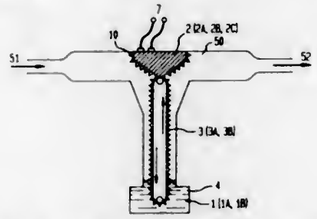
0.1 to 6.0% by weight of aluminum (Al);
1.0 to 6.0% by weight of zinc (Zn);
0.1 to 3.0% by weight of rare earth element;
zirconium (Zr) in an amount of 0.1 to 2.0% by weight; and
the balance of magnesium (Mg) and inevitable impurities.

3. A mold-cast structure formed of a heat resistant magnesium alloy, consisting essentially of:
0.1 to 6.0% by weight of aluminum (Al);
1.0 to 6.0% by weight of zinc (Zn);
0.1 to 3.0% by weight of rare earth element;
silicon (Si) in an amount of 0.1 to 3.0% by weight; and
the balance of magnesium (Mg) and inevitable impurities.

5,552,111
SELF-METABOLIC FUNCTIONAL MATERIAL

Yoshio Kishimoto, Osaka, Japan, assignor to Matsushita Electric Industrial, Osaka, Japan

Division of Ser. No. 188,103, Jan. 27, 1994, Pat. No. 5,424,041, which is a continuation of Ser. No. 975,818, Nov. 13, 1992, abandoned. This application Mar. 7, 1995, Ser. No. 399,628
Claims priority, application Japan, Nov. 14, 1991, 8-298744; Apr. 16, 1992, 4-96380; Sep. 7, 1992, 4-237875; Sep. 7, 1992, 4-237876
Int. Cl.[6] A61L 9/00; C09K 3/00
U.S. Cl. 422—5 **15 Claims**

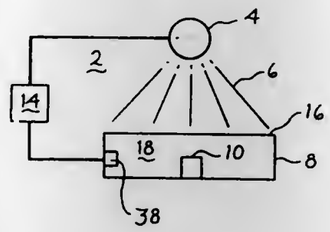


1. A method for effecting a preselected function for an extended period, comprising:
providing a self-metabolic functional material comprising particles dispersed in a fluid and a carrying means in constant contact with the fluid for carrying the functional material,
wherein each of the particles comprises at least two substances, one of which is a functional component and the other is an indicator component,
wherein said functional component has a preselected function which is gradually lost by being used, and said indicator component has a property selected from the group consisting of ferromagnetism and electrical chargeability which is lost by a chemical reaction between said indicator component and a reactive gas thus indicating loss of function of the functional material;
contacting the functional material with the reactive gas, or exposing the functional material to light, heat, or electricity to effect said function; and
allowing a used particle in the functional material to drop out from the carrying means, where the property of the indicator component of the particle has been lowered below a predetermined level or lost; and
supplying a fresh particle from the fluid to the carrying means.

5,552,112
METHOD AND SYSTEM FOR STERILIZING MEDICAL INSTRUMENTS

Robert F. Schiffmann, New York, N.Y., and Jeffery S. Held, Chicago, Ill., assignors to Quiclave, LLC, Chicago, Ill.

Filed Jan. 26, 1995, Ser. No. 381,685
Int. Cl.[6] A61L 2/00
U.S. Cl. 422—21 **80 Claims**



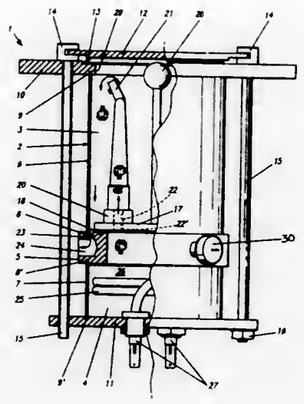
1. A method of sterilizing a metal object, said method comprising the steps of:
providing a container with an exterior surface, said exterior surface comprises a microwave interactive layer and defines an interior space having an initial temperature;
placing said metal object within said interior space of said container;
exposing said microwave interactive layer to a first amount of microwaves so that the layer produces heat which raises the temperature within said interior space to a predetermined sterilization temperature;
sensing the temperature of said metal object within said interior space; and
maintaining the temperature within said interior space at said predetermined temperature based on said sensed temperature for an amount of time sufficient to sterilize said metal object solely by said heat generated by said microwave interactive layer.

5,552,113
AUTOCLAVE

Stanley C. Jennings, Kismet, Bridge Hill, Epping Essex CM16 4ER, United Kingdom

Filed Jul. 15, 1994, Ser. No. 275,775
Claims priority, application United Kingdom, Jul. 16, 1993, 9314761
Int. Cl.[6] A61L 2/06
U.S. Cl. 422—26 **13 Claims**

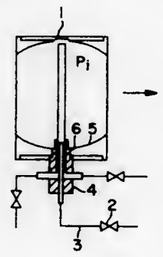
8. A method for sterilizing a generally hollow article having a first end opening and a second opening remote from the first end opening, the method comprising:
a. providing a substantially sealed chamber to facilitate operation at greater than atmospheric pressure;
b. providing a steam generator disposed within the chamber and capable of generating dry saturated steam;
c. sealingly mounting a generally hollow article having a first end opening and a second opening remote from the first end opening by the first end opening to an adaptor;
d. supplying dry saturated steam from the steam generator to the interior of the article via the adaptor so as to cause the steam to pass through and out of the article at the second opening and into the chamber, thereby sterilizing said article.



5,552,114
STERILIZATION OF KEGS

Volker Till, Hofheim am Taunus, Germany, assignor to GEA Till GmbH & Co., Kriftel, Germany

Filed Mar. 16, 1995, Ser. No. 404,966
Claims priority, application Germany, Mar. 16, 1994, 44 08-839.6
Int. Cl.[6] A61L 2/06
U.S. Cl. 422—26 **14 Claims**



1. In a process for the sterilization of containers by steam injection, the containers being of the type from which a pressurized liquid is dispensed, the process comprising the pressurization of a container to be sterilized at a time t_1 with steam at a pressure P_i, sealing the pressurized container and measuring the residual pressure P_{iR} at a time t_2—at least commensurate with the achievement of the desired degree of sterilization, wherein t_2 is later than t_1, the improvement comprising the steps of:

recording the time t_1 when the container was sealed;
calculating the waiting time $t_W = t_2 - t_1$; and
comparing the measured residual pressure P_{iR} to a residual pressure P_S from a standard cooling curve for the calculated waiting time to determine if the pressure P_{iR} deviates from P_S by more than a predetermined amount, any such deviation which is greater than the predetermined amount being evidence that the container has a leak.

5,552,115

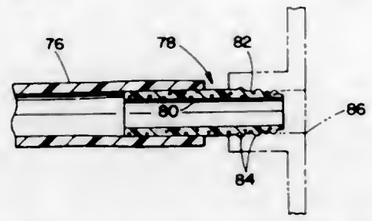
MICROBIAL DECONTAMINATION SYSTEM WITH COMPONENTS POROUS TO ANTI-MICROBIAL FLUIDS

Paul S. Malchesky, Painesville Township, Ohio, assignor to Steris Corporation, Mentor, Ohio

Continuation-in-part of Ser. No. 64,391, May 18, 1993, Pat. No. 5,407,685, which is a continuation-in-part of Ser. No. 23,048, Feb. 25, 1993, Pat. No. 5,374,394, which is a continuation-in-part of Ser. No. 793,589, Nov. 18, 1991, Pat. No. 5,209,909, which is a continuation-in-part of Ser. No. 681,118, Apr. 5, 1991, Pat. No. 5,217,698, and Ser. No. 342,189, Apr. 24, 1989, Pat. No. 5,116,575, said Ser. No. 681,118is a continuation-in-part of Ser. No. 349,304, May 9, 1989, Pat. No. 5,091,343, and Ser. No. 342,189, said Ser. No. 349,304is a continuation-in-part of Ser. No. 140,388, Jan. 4, 1988, Pat. No. 4,892,706, said Ser. No. 342,189is a continuation-in-part of Ser. No. 229,917, Aug. 8, 1988, Pat. No. 5,077,008, which is a continuation-in-part of Ser. No. 140,388, and Ser. No. 165,189, Mar. 17, 1988, Pat. No. 5,037,623, which is a continuation-in-part of Ser. No. 826,730, Feb. 6, 1986, Pat. No. 4,731,222, said Ser. No. 140,388is a continuation-in-part of Ser. No. 826,730. This application Jan. 28, 1994, Ser. No. 187,855

Int. Cl.[6] A61L *2/00;2/26*

U.S. Cl. 422—28 **28 Claims**



23. A method of microbially decontaminating an item, the method comprising:

connecting a rigid porous fitting into firm frictional contact with a surface adjacent a port which provides access to an interior of the item:

circulating a microbial decontamination fluid through the porous fitting into the interior, microbially decontaminating the interior;

the rigid porous fitting having sufficient porosity such that the anti-microbial fluid penetrates through the rigid porous fitting to the frictionally contacted surface adjacent the port, assuring microbial decontamination of the surface.

5,552,116

TEST STRIP PICK-UP MECHANISM IN AUTOMATED ANALYZER

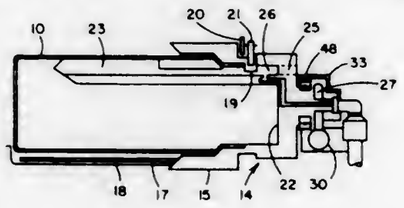
Hiroshi Yokota, and Keiji Takahashi, both of Hiratsuka, Japan, assignors to Bayer Corporation, Elkhart, Ind.

Filed Apr. 17, 1995, Ser. No. 423,322

Claims priority, application Japan, May 10, 1994, 6-119687

Int. Cl.[6] G01N *35/00*

U.S. Cl. 422—63 **2 Claims**



1. A test strip pick-up mechanism in an automated analyzer, which comprises:

a bottle holder removably holding a test strip bottle containing a plurality of test strips and having a pierced groove formed in a peripheral direction and a test strip pick-up portion connected to the groove and formed in a longitudinal direction;

a bottle turning motor connected to the bottle holder;

a guide member extended from an inner part of the bottle holder in parallel to a central axis of the test strip bottle and having a L-shaped guide portion formed over an entire length of the guide member with suction holes for adsorbing the test strips being formed on the guide portion which is adjacent to the test strip pick-up portion;

claws engaged with the groove of the bottle holder;

an air chuck having suction holes for drawing out the test strips contained in the test strip bottle;

a movable member on which the air chuck is mounted;

a test strip drawing out motor connected to the movable member via a guide bar;

depressing arms for pushing the air chuck downward; and

an air chuck depressing motor connected to the depressing arms via a shaft.

5,552,117

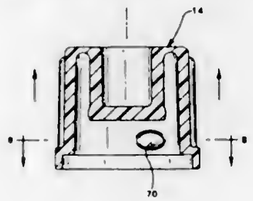
COLLECTION ASSEMBLY HAVING A CAP LIFTING MECHANISM

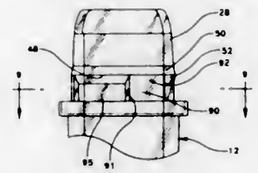
James A. Burns, Elizabeth, N.J., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Apr. 29, 1994, Ser. No. 236,288

Int. Cl.[6] A61B *5/14;* **B01L** *3/14;* **B65D** *41/18;* **C12M** *1/24*

U.S. Cl. 422—102 **7 Claims**





1. A collection assembly comprising:

a cap comprising a closed top portion and an open bottom portion; said cap further comprising:

an outer skirt extending from said closed top portion to a bottom stop ledge at said open bottom portion and having an inner surface;

a closed bottom inner skirt surrounded by said outer skirt and extending from said closed top portion toward said open bottom portion; and

a solid protrusion extending from said inner surface of said outer skirt; and

a container comprising an open top portion, a closed bottom portion and a side wall having an outer surface; said container further comprising:

an integral lip extending from said open top portion;

a cap seating flange on said outer surface of said container positioned where said integral lip extends from said top portion and containing a trough;

a locking ring on said outer surface of said container positioned between said integral lip and said cap seating flange having an upper edge and a lower edge; and

lifting means on said outer surface of said container positioned between said locking ring and said cap seating flange, said lifting means interacting with said solid protrusion on said cap to lift said solid protrusion over said locking ring and facilitate removal of said cap from said container upon rotation of said cap,

wherein said solid protrusion bears against said locking ring of said container and said outer skirt on said cap extends over and beyond said trough in said cap seating flange so that said bottom stop ledge contacts said cap seating flange, when said cap is locked on said open top portion of said container.

5,552,118

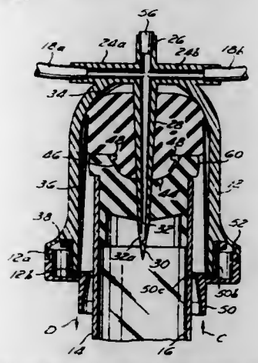
NEEDLELESS VACUUM CONTAINER PORT SYSTEM

Bruno Franz P. Mayer, Santa Ana, Calif., assignor to Critical Device Corporation, Brea, Calif.

Filed Jul. 22, 1994, Ser. No. 279,496

Int. Cl.[6] A61M *25/00;* **B01L** *11/00*

U.S. Cl. 422—103 **2 Claims**



1. A needleless vacuum container port system comprising:

a) a bell-shaped housing having a top end and an open bottom end, said open bottom end being designed and configured to receive a vacuum container, said housing having at least one passageway disposed along said top portion thereof for establishing fluid communication with a source of biological material, said at least one passageway having a hollow spike member depending within said housing to establish fluid communication between said source of biological material and said vacuum container;

b) an elastic seal member axially affixed about said open bottom end of said housing and disposed intermediate said housing and said vacuum container when said vacuum container is engaged with said housing, said seal member being designed and configured to axially retract about said hollow spike member such that, in use, a resealable closure is formed about said at least one passageway;

c) an annular member attachable to said open bottom end of said housing, said annular member being shaped and designed to allow said vacuum container to pass therethrough, said annular member being designed and configured to interconnect with said housing such that said interconnection provides means for axially affixing said seal member to said housing; and

d) wherein when said vacuum container is inserted and withdrawn from said open bottom end of said housing, said insertion into said housing simultaneously urges said seal member to axially retract about said spike member and forces said spike member to penetrate into said vacuum container such that fluid communication between said source of biological material and said vacuum container is established and a portion of said biological material is drawn into said vacuum container, said withdrawal of said vacuum container from said bottom end of said housing simultaneously retracting said spike member from said vacuum container and allowing said seal member to axially advance about said spike member such that said fluid communication between said source of biological material and said vacuum container is closed off.

5,552,119

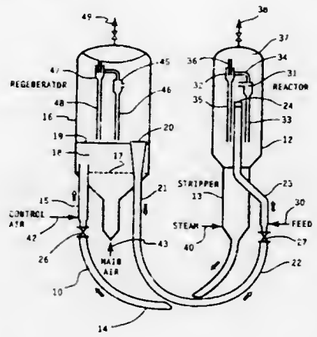
METHOD AND APPARATUS FOR CONTACTING SOLID PARTICLES AND FLUID

Philip Holmes, West Horsley, United Kingdom, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 123,573, Sep. 17, 1993, abandoned, which is a continuation of Ser. No. 778,906, Jan. 9, 1992, abandoned. This application Dec. 22, 1994, Ser. No. 362,329

Int. Cl.[6] F27B *15/08,* **C10G** *35/00*

U.S. Cl. 422—144 **10 Claims**



1. A riser for contacting regenerated catalyst particles from a fluidized catalytic cracking regenerator with a hydrocarbon feed, comprising:

a venturi means within the riser having a convergent entrance portion, a throat and a divergent exit portion, wherein the entrance portion has a cross-section which reduces progressively and smoothly toward the throat and increases progressively and smoothly toward the divergent exit portion;

a riser inlet means for supplying all of the regenerated catalyst particles from the fluidized catalytic cracking regenerator directly to the convergent entrance portion of the venturi means;

a hydrocarbon feed inlet means for injecting hydrocarbon feed external to the venturi and within the riser to contact the hydrocarbon with all of the regenerated catalyst particles supplied from the riser inlet means so that the hydrocarbon feed commences vaporization between the throat and the divergent exit portion of the venturi means; and

a riser outlet means for transporting all of the regenerated catalyst particles and vaporized hydrocarbon feed from the divergent exit portion of the venturi means.

5,552,120

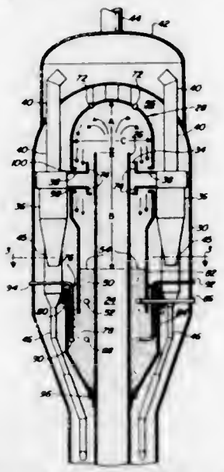
FCC APPARATUS WITH ENCLOSED VENTED RISER

Paul A. Sechrist, Des Plaines; David A. Lomas, Barrington, and Edward C. Haun, Glendale Heights, all of Ill., assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 804,311, Dec. 6, 1991, Pat. No. 5,393,415. This application Feb. 27, 1995, Ser. No. 395,142

Int. Cl.[6] F27B *15/08*

U.S. Cl. 422—144 **3 Claims**



1. An apparatus for the fluidized catalytic cracking (FCC) of an FCC feedstock by contact with an FCC catalyst, said apparatus comprising:

a) an upwardly directed riser conduit having an upwardly directed outlet end adapted to upwardly discharge FCC catalyst particles;

b) a reactor vessel surrounding said outlet end;

c) a disengaging vessel at least partially contained within said reactor vessel and surrounding said outlet end, said disengaging vessel having a bottom substantially closed to direct catalyst flow, a downwardly extending sidewall and an overlapping, upwardly extending sidewall, said riser and said downwardly extending sidewall define an inner annular passageway, said upwardly extended sidewall and said downwardly extended sidewall define an outer annular passageway that communicates with said inner annular passageway and the upper end of said outer passageway providing a catalyst outlet, and an open volume above said riser to receive said upwardly discharged catalyst particles;

d) a distributor in said disengaging vessel located below said catalyst outlet for introducing a gaseous medium into said disengaging vessel;

e) a stripping vessel subadjacent to and in communication with said reactor vessel; and,

f) a product outlet in said disengaging vessel for withdrawing a product stream from an upper portion of said disengaging vessel.

5,552,121

CONTAINMENT OF HEAVY VAPOR CLOUDS

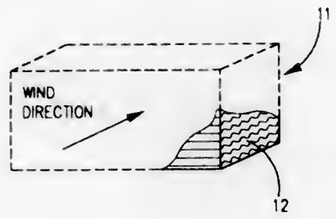
J. Scott Buchanan, Hamilton, N.J.; Mohsen N. Harandi, Langhorne, Pa.; Frederick J. Krambeck, Cherry Hill, and Klaus W. Schatz, Lawrenceville, both of N.J., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 29, 1994, Ser. No. 296,605

Int. Cl.[6] A62D *3/00*; **B01D** *50/00*

U.S. Cl. 422—171 **24 Claims**

1. A system for containing and neutralizing a heavy vapor cloud comprising:



a potential source of a heavy vapor cloud of a hazardous vapor;

primary means enclosing said source for containing and neutralizing a major portion of said vapor in the event of a leak; and

secondary means spaced from said primary means for absorbing said vapor as said vapor passes therethrough,

said secondary means comprising a porous absorbent fence line formed of a plurality of spaced parallel corrugated panels having opposing surfaces therebetween, and a reactive composition on the opposing surfaces of said panels for neutralizing and absorbing said vapor therein.

5,552,122

Patent Not Issued For This Number

5,552,123

CATALYST DEVICE AND COMBUSTION APPARATUS PROVIDED THEREWITH

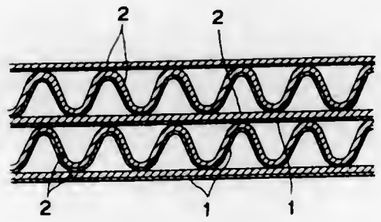
Hironao Numoto, Ikoma, and Tetuo Terashima, Neyagawa, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Apr. 21, 1994, Ser. No. 230,845

Claims priority, application Japan, Apr. 22, 1993, 5-094702

Int. Cl.[6] B01D *53/34*

U.S. Cl. 422—180 **24 Claims**



1. A catalyst device comprising:

a plurality of flat sheets alternatingly laminated with a plurality of corrugated sheets so as to form a plurality of pairs of adjacent sheets, each of said pairs comprising one of said flat sheets and one of said corrugated sheets, and so as to form multiple gas flow channels along a longitudinal direction between said flat sheet and said corrugated sheet of each of said pairs of adjacent sheets;

wherein, for each of said pairs of adjacent sheets, one of said flat sheet and said corrugated sheet comprises a paper layer mainly composed of inorganic heat-resistant fibers carrying catalyst metal dispersed thereon, and the other of said flat sheet and said corrugated sheet comprises a thin metal layer.

5,552,124

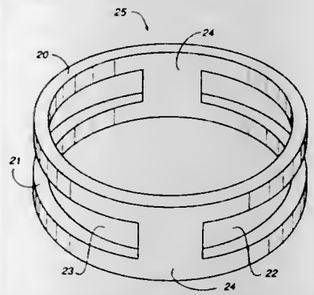
STATIONARY FOCUS RING FOR PLASMA REACTOR

Yin-Jia Su, Cupertino, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed Jun. 22, 1994, Ser. No. 263,847

Int. Cl.[6] C23C *16/02*

U.S. Cl. 156—345 **19 Claims**



1. A focus ring for a plasma reactor for processing a semiconductor wafer, said focus ring surrounding the periphery of the wafer, said focus ring comprising:

an upper ring portion;

a lower ring portion; and

at least one link joining said upper and lower ring portions such that said upper and lower ring portions and said link define a first slotted opening adapted to receive a wafer transfer blade and a wafer and a second slotted opening; said first and second slotted openings being adapted to cooperate to exhaust process gas across the wafer surface, such that gas flow distribution across the wafer surface is balanced, while contaminating particles are swept from the wafer edges.

5,552,125

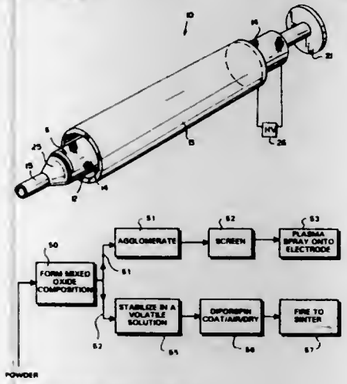
DIELECTRIC COATING FOR OZONE GENERATOR ELECTRODES

J. Wayne Chamblee, Queensbury, N.Y., and Eskil L. Karlson, Erie, Pa., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed Jan. 10, 1994, Ser. No. 179,566

Int. Cl.[6] C23C *4/10*

U.S. Cl. 422—186.07 **29 Claims**



1. An ozone generator comprising:

first and second electrodes;

means for mounting said electrodes to define a flow path for oxygen containing gas between them;

means for applying an electrical potential to said electrodes sufficient to generate ozone from oxygen containing gas flowing in said flow path; and

a mixed oxide dielectric between at least one of said electrodes and said flow path, said dielectric comprising a mixed oxide composition having a dielectric constant of at least 200, a dielectric strength of at least about 800 volts/mil, and a low level of piezoelectric activity.

11. A method of coating a metal electrode for use in an ozone generator, comprising the steps of substantially sequentially:

(a) mixing a plurality of different metal oxides together to form a mixed oxide composition;

(b) agglomerating the mixed oxide composition with about 1–5 weight percent binder and plasticizer combined to develop a particle size distribution suitable for plasma spraying;

(c) subjecting the agglomerated mixed oxide composition to treatment to provide a substantially uniform particle size; and

(d) plasma spraying the agglomerated mixed oxide composition substantially uniform particle size composition onto the metal electrode at a temperature high enough to substantially completely volatize the binder but low enough to substantially prevent volatization of low boiling point metals of the metal oxide mixture.

5,552,126

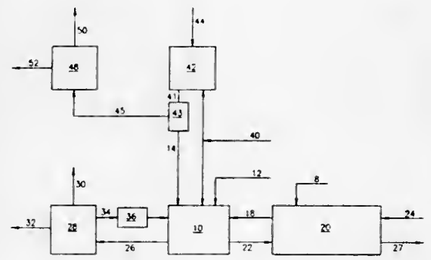
CO-PRODUCTION OF POTASSIUM SULFATE, SODIUM SULFATE AND SODIUM CHLORIDE

Itzhak Efraim, Omer; Shalom Lampert, Maalot, and Curt Holdengraber, Qiryat Tivon, all of, Israel, assignors to Dead Sea Works Ltd., Beer Sheva, Israel

Filed Nov. 28, 1994, Ser. No. 348,118

Int. Cl.[6] C01D *5/00*

U.S. Cl. 423—199 **9 Claims**



1. A process for producing potassium sulfate, sodium sulfate, and sodium chloride from potash and a sodium sulfate/water source, comprising the steps of:

(a) treating the sodium sulfate/water source to produce a slurry containing anhydrous sodium sulfate;

(b) concentrating said slurry to form a concentrate and a diluent;

(c) treating said diluent to precipitate out anhydrous sodium sulfate;

(d) taking a portion of said anhydrous sodium sulfate from steps (b) and/or (c) as co-product, leaving a remainder of said anhydrous sodium sulfate from steps (b) and/or (c);

(e) subjecting said remainder of said anhydrous sodium sulfate from steps (b) and/or (c) to conversion with potash in an aqueous medium to yield glaserite and a first mother liquor;

(f) converting said glaserite with potash and water to produce a precipitate of potassium sulfate and a second mother liquor;

(g) returning said second mother liquor to step (e);

(h) introducing said first mother liquor directly to evaporative crystallization such that sodium chloride is precipitated in a third mother liquor; and

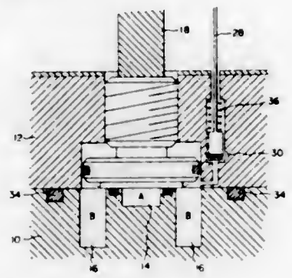
(i) returning said third mother liquor for conversion to potassium salts.

5,552,127

BIOLOGICAL MACROMOLECULAR SUBSTANCES CRYSTALLIZATION APPARATUS

Koji Asano, Kawasaki, Japan, assignor to Fujitsu, Ltd., Kanagawa, Japan

Filed May 2, 1995, Ser. No. 433,708
Claims priority, application Japan, Jul. 25, 1994, 6-172436
Int. Cl.[6] B01D *9/02*
U.S. Cl. 422—245.1 **7 Claims**



1. A biological macromolecular substances crystallization apparatus comprising:

a plate-like base;

a lid having a concavity which defines an experimental vessel for crystallizing biological macromolecular substances when the lid is put on the base,

a groove formed in the base of the experimental vessel for holding a first specimen solution for crystallizing the biological macromolecular substances;

a trench-like groove formed in the base of the experimental vessel for holding a second specimen solution for crystallizing the biological macromolecular substances;

tight sealing means for tightly sealing the experimental vessel;

a plug which is provided in the concavity in the lid, and which is pressed to cover said groove and to separate said groove from said trench-like groove; and

a valve which is provided in the concavity in the lid, and which equalizes an internal pressure in the experimental vessel to an external pressure.

5,552,128

SELECTIVE CATALYTIC REDUCTION OF NITROGEN OXIDES

Clarence D. Chang, Princeton, N.J.; Jose G. Santiesteban, Yardley, Pa.; David S. Shihabi, Pennington, N.J.; Scott A. Stevenson, Langhorne, and James C. Vartuli, Westchester, both of Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 100,940, Aug. 3, 1993, Pat. No. 5,401,478. This application Mar. 24, 1995, Ser. No. 410,156
Int. Cl.[6] B01D *53/56*
U.S. Cl. 423—235 **14 Claims**

1. A method for converting nitrogen oxides to nitrogen by contacting the nitrogen oxides with a reducing agent in the presence of a catalyst which is effective for the reduction of nitrogen oxides, said catalyst consisting essentially an acidic solid component comprising a Group IVB metal oxide modified with an oxyanion of a Group VIB metal and further containing at least one metal selected from the group consisting of Group IB, Group IVA, Group VB, Group VIIB, Group VIII, and mixtures thereof.

5,552,129

CATALYTIC SYSTEM FOR THE REDUCTION OF NITROGEN OXIDES

Maria D. Farnos, Wilmington, Del., and John P. McWilliams, Woodbury, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jul. 7, 1994, Ser. No. 271,686
Int. Cl.[6] B01J *8/00*
U.S. Cl. 423—239.2 **30 Claims**

1. A method for treating an exhaust gas comprising NO_x and ammonia, said method comprising directing the exhaust gas along with a source of oxygen over a catalyst under treating conditions effective for the selective catalytic reduction of NO_x; said catalyst comprising a metal and a zeolite having the structure of ZSM-5; said process further comprising preparing said catalyst by in-situ crystallization of an aggregate comprising ZSM-5 seeds, clay, a non-clay source of silica, and a metal oxide selected from at least one of the oxides of Groups of the Periodic Table IIIA, IB, IIB, VA, VIA, VIIA, and VIIIA, said metal oxide being present in the aggregate in an amount sufficient to produce a metal loading on the in-situ formed zeolite of between about 0.01 and about 5 wt. %, the aggregate having been calcined at a temperature greater than about 1000° C. prior to crystallization of the zeolite, the catalyst having been finished in a humidified atmosphere under conditions effective to improve the hydrothermal stability of the catalyst, the finish treatment being conducted after the zeolite has been crystallized

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5,552,130

PROCESS FOR THE CONTINUOUS PREPARATION OF NITROSYL CHLORIDE

Helmut Kraus, Odenthal; Alexander Klausener, Köln, and Heinz Landscheidt, Duisburg, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 25, 1995, Ser. No. 429,277
Claims priority, application Germany, May 2, 1994, 44 15 337.6
Int. Cl.[6] C01B *21/084*
U.S. Cl. 423—386 **5 Claims**

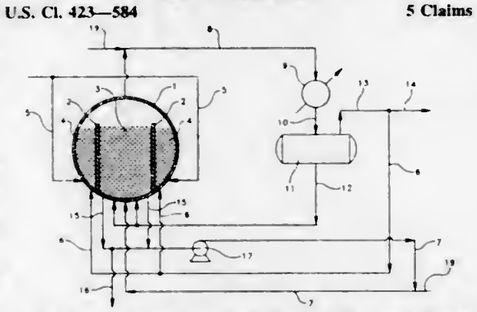
1. A gas phase process for preparing pure nitrosyl chloride which consists essentially of continuously introducing hydrogen chloride and 0.4 to 1 times its molar amount of nitrogen dioxide at the bottom of a reactor, continuously taking off nitrosyl chloride from the top of the reactor, and continuously taking off nitric acid at the bottom of the reactor, the reaction being effected in the presence of little or no water.

5,552,131

OXIDATION OF SECONDARY ALCOHOLS

John C. Jubin, Jr., West Chester, Pa., assignor to ARCO Chemical Technology, L.P., Greenville, Del.

Filed Jun. 30, 1994, Ser. No. 268,891
Int. Cl.[6] C01B *15/01*
U.S. Cl. 423—584 **5 Claims**



1. In a process for the liquid phase molecular oxygen oxidation of a secondary alcohol to hydrogen peroxide wherein the exothermic heat of reaction is removed by vaporizing a portion of the reaction mixture and condensing the resulting vapors, the improvement which comprises adding a ballast gas selected from methane, ethane, and propane to the said vapors prior to condensation.

5,552,132

PREPARING A CRYSTALLINE ALUMINOPHOSPHATE COMPOSITION

Susan T. Evans, Mt. View, Calif., assignor to Chevron U.S.A. Inc., San Francisco, Calif.

Filed Oct. 28, 1994, Ser. No. 330,401
Int. Cl.[6] C01B *37/04;37/06;37/08*
U.S. Cl. 423—701 **33 Claims**

1. A method for preparing a molecular sieve comprising $[AlO_2]$ and $[PO_2]$ units in tetrahedral coordination, said method comprising contacting under crystallization conditions a reaction mixture comprising at least one active source of phosphorous, at least one active source of alumina, and an organosulfonium cation templating agent capable of forming said molecular sieve, wherein the organosulfonium cation has a molecular structure of the form $S^+(R)_3$, wherein each "R" is independently selected from alkyl, aryl and alkyaryl.

5,552,133

METHOD OF MAKING ENCAPSULATED GAS MICROSPHERES USEFUL AS AN ULTRASONIC IMAGING AGENT

Karel J. Lambert, San Diego; Edward G. Jablonski, Escondido, and Carl Hulle, San Diego, all of Calif., assignors to Molecular Biosystems, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 187,656, Jan. 26, 1994, abandoned, which is a continuation-in-part of Ser. No. 86,717, Jul. 2, 1993, abandoned. This application Aug. 12, 1994, Ser. No. 290,022
Int. Cl.[6] A61K *49/00*
U.S. Cl. 424—9.52 **16 Claims**

1. A method of making encapsulated gas microspheres useful as an ultrasonic imaging agent comprising:

a) providing an aqueous solution of a heat-denaturable protein at a temperature necessary to achieve incipient denaturation temperature during subsequent mechanical emulsification;

b) combining the solution with a gas;

c) emulsifying the protein solution and gas mixture by mechanically shearing the mixture to form a suspension of gas microbubbles having a mean diameter in the range of about 0.1 to about 10 microns; and

d) encapsulating the gas microbubbles to form microspheres by mechanically cavitating the suspension to cause the protein to become denatured and thereby deposited at the gas-solution interface.

5,552,134

USES OF BENZOCHLORINS, VERDINS AND PORPHYRIN DERIVATIVES AND OF COMPOSITIONS CONTAINING SUCH BENZOCHLORINS, VERDINS AND PORPHYRIN DERIVATIVES

Alan R. Morgan, Santa Barbara, Calif., and Steven H. Selman, Toledo, Ohio, assignors to University of Toledo, and Medical College of Ohio, both of Toledo, Ohio

Continuation-in-part of Ser. No. 131,485, Oct. 4, 1993, Pat. No. 5,438,051, which is a continuation-in-part of Ser. No. 818,133, Jan. 8, 1992, Pat. No. 5,250,668, which is a continuation-in-part of Ser. No. 562,168, Aug. 3, 1990, Pat. No. 5,109,129, which is a division of Ser. No. 448,738, Dec. 11, 1989, Pat. No. 4,988,808, which is a continuation-in-part of Ser. No. 142,034, Jan. 11, 1988, abandoned. This application Jun. 7, 1995, Ser. No. 479,954
Int. Cl.[6] A61K *31/40*
U.S. Cl. 424—9.61 **54 Claims**

1. A method for detecting diseased tissue which comprises administering intravenously, intramuscularly, subcutaneously or topically to a human or animal patient an effective amount of a benzochlorin, a benzochlorin metal complex, a verdin, a verdin metal complex, a porphyrin derivative or a porphyrin derivative metal complex, and, after sufficient time for healthy tissue to reject the benzochlorin or the like, examining the patient under illumination which causes residual benzochlorin or the like to fluoresce, wherein the benzochlorin has the structure of FIG. **3**, the metal complex of a benzochlorin has the structure of FIG. **1**, the verdin has the structure of FIG. **4**, the metal complex of a verdin has the structure of FIG. **2**, the porphyrin derivative has the structure of FIG. **9**, and the metal complex of a porphyrin derivative has the structure of FIG. **10**:

Fig. 1

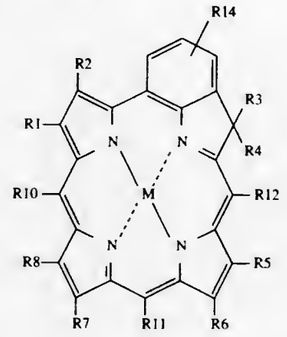
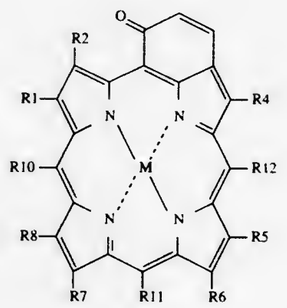


Fig. 2



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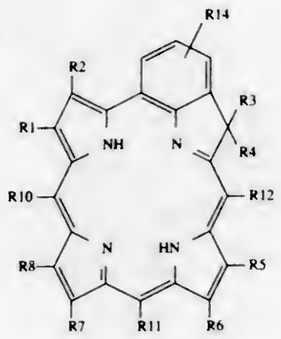


Fig. 3

Mn, Mo, Nd, Pb, Pd, Pr, Pt, Rh, Sb, Sc, Sm, Sn, Tb, Th, Ti, Tl, Tm, U, V, Y, Yb, Zn or Zr,

R13 is an alkyl group having from 1 to 4 carbons, and

each of R1 through R8, R10 through R12 and R14 is H or CHO,

an alkyl group other than t-butyl having from 1 to 4 carbon atoms,

an alkylene group having from 2 to 4 carbon atoms,

a group having the formula $R_2N(R_3)_2$ where R_2 is a bivalent aliphatic hydrocarbon radical having from 1 to 4 carbon atoms, wherein any carbon to carbon bond is either a single or a double bond, and not more than one is a double bond; R_3 is hydrogen or an alkyl radical having from 1 to 2 carbon atoms and the two R_3 groups can be the same or different,

a group having the formula $R_2N(R_4)_3A$ where R_2 is a bivalent aliphatic hydrocarbon radical having from 1 to 4 carbon atoms, wherein any carbon to carbon bond is either a single or a double bond, and not more than one is a double bond; A is a physiologically acceptable anion, and R_4 is an alkyl group having from 1 to 2 carbon atoms and the three R_4 groups can be the same or different,

Fig. 4

a group having the formula R_2OH were R_2 is a bivalent aliphatic hydrocarbon radical having from 1 to 4 carbon atoms, wherein any carbon to carbon bond is either a single or a double bond, and not more than one is a double bond, or

CO_2R', CH_2CO_2R' or $CH_2CH_2CO_2R'$ where R' is H, or an alkyl group other than t-butyl having from one to four carbon atoms, with the proviso that R14 can be SO_3H or a salt thereof and that not more than one of R1 through R8, R10 through R12 and R14 is CHO, a group having the formula $R_2N(R_3)_2$ or a group having the formula $R_2N(R_4)_3A$.

5,552,135

SUNSCREENS CONTAINING PLANT EXTRACTS

Gheorghe Cioca, Lake Grove; Jon E. Anderson, Bayside; Isaac D. Cohen, Brooklyn; Charles C. Tadlock, Islip Terrace, and Andrew J. Bevacqua, East Setauket, all of N.Y., assignors to Estee Lauder, Inc., Melville, N.Y.

Filed Feb. 25, 1993, Ser. No. 22,238

Int. Cl.[6] A61K *7/42*

U.S. Cl. 424—59 **21 Claims**

1. A sunscreen composition comprising an oat extract, a sunscreening agent, and a vehicle for enabling said composition to be applied to the skin.

5,552,136

GEL STICK COMPOSITIONS COMPRISING OPTICALLY ENRICHED GELLANTS

Curtis B. Motley, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 25, 1994, Ser. No. 248,938

Int. Cl.[6] A61K *7/38;7/32*

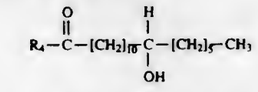
U.S. Cl. 424—68 **19 Claims**

1. Antiperspirant gel composition comprising:

a. an effective amount of an antiperspirant active

b. an effective amount of a gelling agent, comprising:

(i) an optically enriched primary gellant selected from the group consisting of 12-hydroxystearic acid, esters of 12-hydroxystearic acid, amides of 12-hydroxystearic acid corresponding to the formula:



wherein R_4 is OR_5 or NR_5R_6; and R_4 and R_5 are, independently selected from the group consisting of hydrogen, alkyl moieties, aryl moieties and mixture thereof, wherein said moieties have from 1 to about 26 carbon atoms, wherein said primary gellant is the S

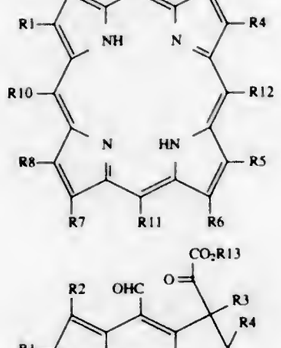


Fig. 9

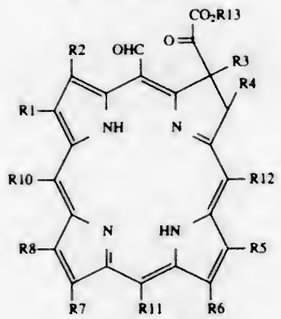
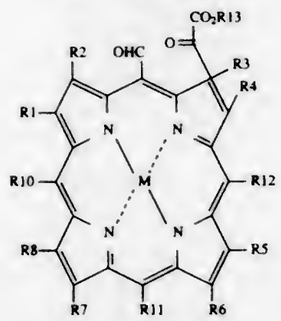


Fig. 10

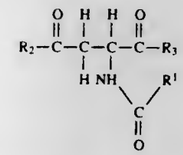


wherein

M is a metal cation that is complexed with two of the nitrogens of the benzochlorin, verdin or porphyrin derivative and is Ag, Al, Ce, Co, Cr, Cu, Dy, Er, Eu, Fe, Ga, Gd, Hf, Ho, In, La, Lu,

isomer and combinations of the S isomer and R isomer of said primary gellant, wherein the ratio of S to R or R to S isomers is not less than 45%:55%;

(ii) a secondary gellant selected from the group consisting of d or l n-acyl amino acid amide derivatives corresponding to the formula:



wherein R_1 is an alkyl moiety, aryl moiety and mixtures thereof having from about 6 to about 22 carbon atoms; and

R_2 and R_3 are independently selected from the group consisting of alkyl ester, aryl ester, alkyl amide, aryl amide and mixtures thereof having from about 1 to about 26 carbon atoms;

and

c. an effective amount of a liquid base material having a solubility parameter of 9 or below wherein the gel stick has a hardness of 75 g of force or more.

5,552,137

BIODEGRADABLE QUATERNARY HAIR CONDITIONERS

Monna M. Manning; Andrea S. Allardice, both of Columbus, and Floyd Friedli, Dublin, all of Ohio, assignors to Witco Corporation, Greenwich, Conn.

Filed Aug. 5, 1994, Ser. No. 286,544

Int. Cl.[6] A61K *7/75*

U.S. Cl. 424—70.1 **14 Claims**

1. A method for conditioning hair comprising applying to the hair a conditioning effective amount of a composition comprising

(a) from 0.1 wt. % to 10 wt. % of a mixture of compounds of the formula (1)

$$(R^1)(R^2)\overset{+}{N}(CH_2CH_2OC(O)R)_2X^- \quad (1)$$

wherein R^1 is alkyl containing 1 to 6 carbon atoms, or hydroxyalkyl containing 1 to 6 carbon atoms; R^2 is alkyl containing 1 to 6 carbon atoms, or benzyl; X^- is an anion; and R is selected from the group consisting of alkyl and alkylene groups containing 11 to 23 carbon atoms and up to 3 carbon-carbon double bonds, provided that said mixture contains compounds of formula (1) containing R groups which have at least 2 different chain lengths and containing R groups which have 0, 1 and 2 carbon-carbon double bonds; and

(b) a cosmetically acceptable vehicle which imparts to said composition fluidity upon application thereof to the hair and which has a pH value compatible with said hair.

5,552,138

BACILLUS CEREUS STRAIN AS4-12

Jo Handelsman; Lynn M. Jacobson; David W. Johnson; Kevin P. Smith; Robert M. Goodman, and Eric V. Stabb, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jun. 6, 1995, Ser. No. 468,292

Int. Cl.[6] C12N *1/20;* **A01N** *63/00*

U.S. Cl. 424—93.46 **4 Claims**

1. A biologically pure culture of *Bacillus cereus* which is AS4-12, ATCC 55609.

5,552,139

METHOD FOR THE BIOLOGICAL CONTROL OF POLLEN IN PLANTS

Oded Shoseyov, Shimshon; Levava Roiz, Shmuel; Uzi Ozeri, Kibbutz Rosh Zurim; Ben-Ami Bravdo, and Raphael Goren, both of Rehovot, all of, Israel, assignors to Yissum Research Development Co. of the Hebrew University of Jerusalem, Jerusalem, Israel

Filed Nov. 4, 1993, Ser. No. 145,512

Claims priority, application Israel, Sep. 23, 1993, 107080

Int. Cl.[6] A61K *38/44*

U.S. Cl. 424—944 **12 Claims**

1. A method for thinning fruit on a plant comprising applying to said plant during anthesis an effective amount of activated or inactivated RNase or a mixture thereof, wherein the fruit is selected form the group consisting of peaches, nectarines, apples, kiwi, grapes, plums and pears.

5,552,140

DNA ENCODING A RIBOSOME INACTIVATING PROTEIN

Rebecca S. Boston, Raleigh, N.C.; Henry W. Bass, Oakland, Calif., and Gregory R. OBrian, Raleigh, N.C., assignors to NorthCarolina State University, Raleigh, N.C.

Division of Ser. No. 941,651, Sep. 8, 1992, Pat. No. 5,332,808. This application Jul. 25, 1994, Ser. No. 279,996

Int. Cl.[6] C12N *9/24;* **A61K** *38/47;* **C07K** *14/415*

U.S. Cl. 424—94.61 **2 Claims**

1. An isolated ribosome inactivating protein having the amino acid sequence of SEQ ID NO:2.

5,552,141

POLYMERIC IMMUNOLOGICAL ADJUVANTS

Hans O. Ribi, 1465 Woodberry Ave., San Mateo, Calif. 94403

Continuation of Ser. No. 784,923, Oct. 30, 1991, Pat. No. 5,312,620. This application Feb. 15, 1994, Ser. No. 196,950

Int. Cl.[6] A61K *39/00*

U.S. Cl. 424—184.1 **2 Claims**

1. A method for producing an immune response in a vertebrate host, said method comprising administering to said host an immunogenic effective amount of an immunological composition comprising an antigen and a polymeric immunological adjuvant composition comprising:

a copolymer formed from the polymerization of monomers comprising at least one a water soluble addition polymerizable acrylyl or methacrylyl monomer having at least one adjuvent joined thereto through a linking group and a a water soluble addition polymerizable acrylyl or methacrylyl monomer having joined thereto a lamellar forming lipid comprising a chain of from 8 to not more than 36 carbon atoms;

said lipid adjuvant selected from the group consisting of monophosphoryl lipid A, lipopolysaccharide, BCG cell wall skeleton, diphosphoryl lipid A, muramyl di- or tripeptide, muramyl dipeptide-phosphatidyl-ethanolamine, muramyltripeptide phosphatidylcthanolamine, trehalose monomycolate, trehalose dimycolate, lipid X, isoprinosine, and lithosperman (A, B or C), wherein said lamellar forming lipid is present in a ratio of at least 1 lamellar forming lipid per 100 monomer units of said polymer.

5,552,142

CLONING AND SEQUENCING OF ALLERGENS OF DERMATOPHAGOIDES (HOUSE DUST MITE)

Wayne R. Thomas, Nedlands, and Kaw-Yan Chua, Nollamara, both of, Australia, assignors to Immulogic Pharmaceutical Corporation, Waltham, Mass.

Division of Ser. No. 945,288, Sep. 10, 1992, Pat. No. 5,433,948, which is a continuation-in-part of Ser. No. 580,655, Sep. 11, 1990, abandoned, which is a continuation-in-part of Ser. No. 458,642, Feb. 13, 1990, abandoned. This application Jun. 5, 1995, Ser. No. 462,831

Int. Cl.[6] A61K *39/00;39/35;39/36*

U.S. Cl. 424—185.1 **6 Claims**

1. A protein allergen of Der p II consisting of the amino acid sequence:

Asp Gln Val Asp Val Lys Asp Cys Ala Asn His Glu Ile Lys Lys Val Leu Val Pro Gly Cys His Gly Ser Glu Pro Cys Ile Ile His Arg Gly Lys Pro Phe Gln Leu Glu Ala Val Phe Glu Ala Asn Gln Ash Xaa_1 Lys Thr Ala Lys Ile Glu Ile Lys Ala Ser Ile Asp Gly Leu Glu Val Asp Val Pro Gly Ile Asp Pro Asn Ala Cys His Tyr Met Lys Cys Pro Leu Val Lys Gly Gln Gln Tyr Asp Ile Lys Tyr Thr Trp Asn Val Pro Lys Ile Ala Pro Lys Ser Glu Asn Val Val Val Thr Val Lys Val Met Gly Xaa_2 Asp Gly Val Leu Ala Cys Ala Ile Ala Thr His Ala Lys Xaa_3 Arg Asp

where Xaa_1 is selected from the group consisting of Thr and Ser;

where Xaa_2 is selected from the group consisting of Asp and Asn; and

where Xaa_3 is selected from the group consisting of Ile and Leu, except for the amino acid sequence where Xaa_1 is Thr, Xaa_2 is Asp and Xaa_3 is Ile.

5,552,143

RECOMBINANT CYTOMEGALOVIRUS VACCINE

Stanley Plotkin, Paris, France; Robert P. Ricciardi, Glen Mills, Pa.; Ewa Gonczol, Rosemont, Pa.; Klara Berencsi, Rosemont, Pa., and Robert F. Rando, The Woodlands, Tex., assignors to The Wistar Institute of Anatomy & Biology, Philadelphia, Pa., and The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 48,978, Apr. 16, 1993, abandoned, which is a continuation-in-part of Ser. No. 17,130, Feb. 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 666,471, Mar. 6, 1991, abandoned, which is a continuation of Ser. No. 328,406, Mar. 24, 1989, abandoned. This application Dec. 2, 1994, Ser. No. 349,006

Int. Cl.[6] A61K *39/295;39/245;39/235*

U.S. Cl. 424—199.1 **19 Claims**

1. A non-defective recombinant adenovirus containing a fragment of the gB gene selected from the group consisting of (a) the gB gene fragment encoding amino acid 1 to amino acid 700 of human cytomegalovirus gB subunit protein SEQ ID NO:2 and (b) smaller fragments thereof, said smaller fragments comprising the gB gene fragment encoding amino acid 155 to 303 of human cytomegalovirus gB subunit protein SEQ ID NO:2, said gB gene fragment being under the control of an expression control sequence, said adenovirus capable of expressing said subunit protein fragment.

5,552,144

IMMUNOGENIC SHIGA-LIKE TOXIN II VARIANT MUTANTS

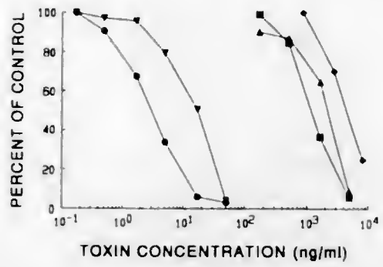
James E. Samuel, Germantown, and Valery M. Gordon, Kensington, both of Md., assignors to MicroCarb, Inc., Gaithersburg, Md., and The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 824,139, Jan. 22, 1992, abandoned. This application Jan. 10, 1994, Ser. No. 180,761

Int. Cl.[6] A61K *39/108;* **C07K** *14/25;14/245;* **C12N** *9/24*

U.S. Cl. 424—236.1 **6 Claims**

1. An immunogenic mutant Shiga-Like Toxin II variant (SLT-



IIv) holotoxin comprising SEQ ID NO:2, which is a mutant A subunit of the SLT-IIv holotoxin, wherein said mutant A subunit differs from the native A subunit of the SLT-IIv holotoxin in having a glutamine at residue 167 and SEQ ID NO:3, which is the B subunit of the SLT-IIv holotoxin; and wherein the enzymatic activity of said mutant SLT-IIv holotoxin is reduced by at least 750-fold and the cytotoxicity is reduced by at least 10,000-fold compared to the native SLT-IIv holotoxin.

5. A method of inducing an immune response in an animal host to bacteria that cause edema disease of swine comprising administering an immunologically effective amount of the immunogenic mutant Shiga-Like Toxin II variant holotoxin of claim 1 to said host.

5,552,145

FEED COMPOSITION AND A METHOD FOR DECREASING PIGLET MORTALITY IN PIGLETS

Yasuhiko Toride, Tokyo; Norimasa Onishi, Kawasaki, and Yoichiro Togashi, Tokyo, all of, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Nov. 23, 1992, Ser. No. 979,885

Claims priority, application Japan, Apr. 6, 1992, 4-082586

Int. Cl.[6] A61K *39/05;39/07;* **C12N** *13/00*

U.S. Cl. 424—245.1 **13 Claims**

1. A method for decreasing piglet mortality at birth comprising administering to a pregnant sow a feed composition comprising at least one component selected from the group consisting of sterilized bacterial cells, disrupted cell fragments obtained by mechanical disruption or enzymatic digestion of said sterilized bacterial cells, and a cell wall component-containing fraction obtained by fractionating said disrupted bacterial cell fragments, wherein said bacterial cells are at least one member selected from the group consisting of the genus Bacillus, the genus Brevibacterium, and the genus Corynebacterium.

5,552,146

METHODS AND COMPOSITIONS RELATING TO USEFUL ANTIGENS OF *MORAXELLA CATARRHALIS*

Eric J. Hansen, Plano; Merja Helminen, and Isobel Maciver, both of Dallas, all of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Aug. 15, 1991, Ser. No. 745,591

Int. Cl.[6] A61K *39/95;39/02;39/40;* **C07K** *14/22*

U.S. Cl. 424—251.1 **7 Claims**

1. An antigen composition comprising an *Moraxella catarrhalis* outer membrane antigen selected from the group consisting of *M. catarrhalis* outer membrane antigens immunologically reactive with monoclonal antibody 10F3 (ATCC HB 11092) or 17C7 (ATCC 11093), wherein said antigen is purified free of other *M. catarrhalis* outer membrane antigens.

5,552,147

PETROLEUM JELLY WITH ALPHA HYDROXY CARBOXYLIC ACIDS

Alexander P. Znaiden, Trumbull; Michael C. Cheney, Fairfield, and Walter Rose, New Haven, all of Conn., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Apr. 25, 1995, Ser. No. 428,760

Int. Cl.[6] A61K *7/48*

U.S. Cl. 424—401 **9 Claims**

1. A cosmetic composition comprising:

(i) from about 50% to about 98% by weight of petroleum jelly;

(ii) from about 0.01 to about 20% by weight of a C_2–C_{20} α-hydroxy carboxylic acid or salt thereof;

(iii) from about 0.1 to about 10% by weight of a phosphatide; and

(iv) from 0 to 15% by weight of water.

5,552,148

PETROLEUM JELLY WITH INOSITOL PHOSPHATES

Alexander P. Znaiden, Trumbull; Brian Crotty, Branford, and Anthony Johnson, Fairfield, all of Conn., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Jun. 7, 1995, Ser. No. 481,568

Int. Cl.[6] A61K *7/48*

U.S. Cl. 424—401 **7 Claims**

1. A cosmetic composition comprising:

(i) from 50% to 98% by weight of petroleum jelly;

(ii) from 0.001 to 40% by weight of inositol phosphate;

(iii) from 0.1 to 30% by weight of a lipid system; and

(iv) from 0 to 15% by weight of water.

5,552,149

METHOD FOR MICROENCAPSULATION OF AGRICULTURALLY ACTIVE SUBSTANCES

Stuart E. Lebo, Jr., and William J. Detroit, both of Schofield, Wis., assignors to Lignotech USA, Inc., Rothschild, Wis.

Filed Oct. 12, 1993, Ser. No. 133,896

Int. Cl.[6] A01N *25/34;* **B01J** *13/10;13/20*

U.S. Cl. 424—408 **19 Claims**

1. A method for encapsulating an ultra-violet sensitive agriculturally active pesticide in a protective capsule wall, comprising the steps of:

dissolving a protein and an ultra-violet protectant selected from the group consisting of a lignosulfonate, a sulfonated lignite, a sulfonated tannin, a naphthalene sulfonate, a condensed naphthalene sulfonate and an azolignosulfonate in a solution;

mixing a pesticide in said solution to form an emulsion;

coacervating the emulsion to form capsules having a protein/ultra-violet protectant complex as a capsule wall; and

recovering the capsules.

5,552,150

COMPOSTIONS CONTAINING DI-LINOLEOYL-MONO-GAMMA-LINOLENYL-GLYCEROL

David F. Horrobin, Guildford, England, and Yung-Sheng Huang, Kentville, Canada, assignors to Efamol Holdings PLC, England

Division of Ser. No. 891,037, Jun. 1, 1992, Pat. No. 5,328,691. This application Nov. 30, 1993, Ser. No. 158,986

Claims priority, application United Kingdom, Jun. 3, 1991, 91/11900.8

Int. Cl.[6] A61K *31/20;9/14;47/12*

U.S. Cl. 424—439 **4 Claims**

1. A food additive, nutritional supplement or special food for infants; older children or adults which contains or has added thereto a natural or synthetic glycerol oil comprising at least 20% by weight of di-linoleoyl-mono-gamma-linolenyl-glycerol.

5,552,151

STABLE NATAMYCIN SUSPENSIONS

Bertus Noordam, Gravenzande; Jacobus Stark, Rotterdam; Ben R. De Haan, Voorburg, and Hong Sheng Tan, Bleiswijk, all of, Netherlands, assignors to Gist-brocades B.V., Ma Delft, Netherlands

Filed Apr. 11, 1995, Ser. No. 420,021

Claims priority, application European Pat. Off., Apr. 11, 1994, 94200888.9

Int. Cl.[6] A61K *47/36*

U.S. Cl. 424—439 **10 Claims**

1. An aqueous fungicide composition comprising a suspension of 0.5 to 40% (w/w) of a polyene fungicide and from 0.2 to 5% (w/w) of a thickening agent wherein said composition has a pH of 3 to less than 6 and said composition has a viscosity of at least about 500 mPa.

5,552,152

TASTE MASKING OF IBUPROFEN BY FLUID BED COATING

Robert W. Shen, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 958,070, Oct. 7, 1992, which is a continuation of Ser. No. 508,193, Apr. 11, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 469,715

Int. Cl.[6] A61K *9/22;9/32;9/58*

U.S. Cl. 424—441 **6 Claims**

1. A chewable taste-masked tablet having controlled release characteristics consisting essentially of a microcapsule of about 100 microns to about 0.8 mm in diameter having (a) a pharmaceutical core including crystalline ibuprofen and (b) a methacrylic acid copolymer coating having sufficient elasticity to withstand chewing.

5,552,153

PHARMACEUTICAL COMPOSITION FOR TRANSDERMAL DELIVERY

Charanjit R. Behl, Nutley, N.J., assignor to Hoffman-La Roche Inc., Nutley, N.J.

Filed Apr. 28, 1994, Ser. No. 234,216

Int. Cl.[6] A61K *9/70;* **A61F** *13/00;* **A61L** *15/10*

U.S. Cl. 424—449 **35 Claims**

1. A pharmaceutical composition for transdermal delivery consisting essentially of an effective transdermal amount of an active ingredient selected from a benzodiazepine and a benzodiazepine antagonist; and, as the essential transdermal absorption enhancers caprylic acid; ethanol; and oleic acid.

5,552,154

METHOD FOR TREATING CANCER WITH WATER-INSOLUBLE S-CAMPTOTHECIN OF THE CLOSED LACTONE RING FORM AND DERIVATIVES THEREOF

Beppino C. Giovanella, Houston; Hellmuth R. Hinz, Kingwood; Anthony J. Kozielski, Springs, and John S. Stehlin, Houston, all of Tex., assignors to The Stehlin Foundation for Cancer Research, Houston, Tex.

Continuation of Ser. No. 2,844, Jan. 15, 1993, abandoned, which is a continuation-in-part of Ser. No. 820,334, Jan. 14, 1992, abandoned, which is a continuation-in-part of Ser. No. 432,066, Nov. 6, 1989, Pat. No. 5,225,404. This application Sep. 7, 1994, Ser. No. 301,727

Int. Cl.[6] A61K *9/70;31/44*

U.S. Cl. 424—449 **10 Claims**

1. A method of treating or retarding a malignant tumor in a mammal comprising administering transdermally to said mammal in need of such treatment and away from the tumor site an effective amount of a water-insoluble compound with a closed-lactone ring wherein said malignant tumor is selected from the group consisting of breast cancer, lung cancer, stomach cancer, ovary cancer, pancreas cancer, prostate cancer, osteosarcoma, and bladder cancer;

and wherein said compound is selected from the group consisting of 20(S)-camptothecin, 9-nitro- 20(S)-camptothecin, 9-amino-20(S)-camptothecin, dimethylaminomethyl-10-hydroxy-20(S)-camptothecin (topotecan), 7-ethyl-10-carbonyloxy-camptothecin (camptothecin-11), 7-ethyl-10-hydroxy-20(S)-camptothecin, 10,11-methylenedioxy-20(S)-camptothecin, 9-chloro- 20(S)-camptothecin, 9-bromo-20(S)-camptothecin, 9-hydroxy- 20(S)-camptothecin, 11-hydroxy-20(S)-camptothecin, 10-hydroxy-20(S)-camptothecin, and mixtures thereof.

5,552,155

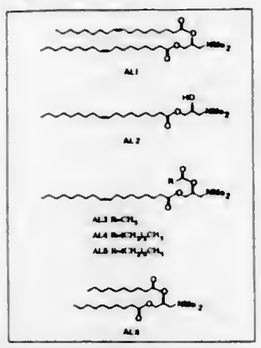
FUSOGENIC LIPSOMES AND METHODS FOR MAKING AND USING SAME

Austin L. Bailey, and Pieter R. Cullis, both of Vancouver, Canada, assignors to The Liposome Company, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 985,673, Dec. 4, 1992, abandoned. This application Aug. 15, 1994, Ser. No. 226,642

Int. Cl.[6] A61K *9/127;9/133*

U.S. Cl. 424—450 **17 Claims**



1. A liposome composition comprising:

(a) a unilamellar liposome having:

(i) a bilayer which comprises a bilayer forming phosphatidylcholine and between about 1 mole percent and about 20 mole percent of a fusogenic lipid selected from the group consisting of 1-N,N-dimethylamino dioleoyl propane, 1-oleoyl-2-hydroxy-3-N,N-dimethylamino propane, 1,2-diacyl-3-N,N-dimethylamino propane and 1,2-didecanoyl-1-N,N,-dimethylamino propane; and

(ii) an internal compartment comprising an aqueous solution; and

(b) an aqueous solution external to the liposome,

wherein the pH of the internal aqueous solution is less than the pKa of the fusogenic lipid in the bilayer and the pH of the external aqueous solution is greater than the pKa of the fusogenic lipid in the bilayer,

whereby there is a pH gradient across the bilayer, and

whereby the fusogenic lipid is accumulated in the bilayer's inner monolayer.

5,552,156

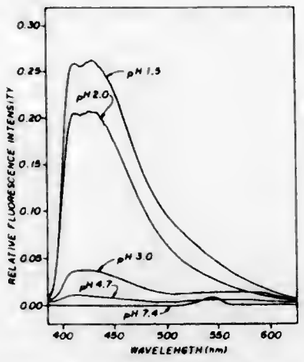
LIPOSOMAL AND MICELLULAR STABILIZATION OF CAMPTOTHECIN DRUGS

Thomas G. Burke, Columbus, Ohio, assignor to Ohio State University, Columbus, Ohio

Continuation of Ser. No. 965,933, Oct. 23, 1992, abandoned. This application Mar. 22, 1995, Ser. No. 407,989

Int. Cl.[6] A61K *9/127*

U.S. Cl. 424—450 **17 Claims**



1. A liposome, comprising a camptothecin drug or mixtures of camptothecin drugs containing a least one lactone ring, and a bilayer membrane comprised of lipid, at least some of the said lactone ring being intercalated in the bilayer so that said ring is protected from hydrolysis at an internal liposomal compartment pH of from about 3 to about 7.4.

5,552,157

LIPOSOME FOR ENTRAPPING GENE, LIPOSOMAL PREPARATION AND PROCESS FOR THE MANUFACTURE OF THE PREPARATION

Kunio Yagi; Hitoshi Noda, both of Aichi-ken; Nobuko Ohishi, Gifu, and Masayasu Kurono, Mie-ken, all of, Japan, assignors to Kabushiki Kaisha Vitamin Kenkyusya, Gifu-ken, Japan

Continuation of Ser. No. 84,629, Jun. 30, 1993, abandoned, which is a division of Ser. No. 750,125, Aug. 26, 1991, abandoned. This application Mar. 28, 1995, Ser. No. 412,107

Claims priority, application Japan, Aug. 27, 1990, 2-222553

Int. Cl.[6] A61K *9/27;* **C12N** *11/00;11/02*

U.S. Cl. 424—450 **4 Claims**

1. A process for producing a deoxyribonucleic acid entrapping multilamellar liposome, comprising the following steps:

dissolving lipids of N-(α-trimethylammonioacetyl)-didodecyl-D-glutamate chloride, dilauroylphosphatdylcholine and dioleophosphatidylethanolamine in a molar ratio of 1:2:2, in a solvent suitable for forming a lipid film,

removing the solvent with an evaporator to form a lipid film,

adding a deoxyribonucleic acid solution to said lipid film to form a mixture, and

shaking said mixture with a vortex mixer to form a deoxyribonucleic acid entrapping multilamellar liposome.

5,552,158

SKIN CARE COMPOSITION

David A. Evans, and Uy Nguyen, both of Edmonton, Canada, assignors to Norac Technologies Inc., Edmonton, Canada

Continuation of Ser. No. 224,583, Apr. 7, 1994, abandoned, which is a continuation-in-part of Ser. No. 23,217, Feb. 23, 1993, Pat. No. 5,358,752. This application May 26, 1995, Ser. No. 451,624

Int. Cl.[6] A61K *37/22*

U.S. Cl. 424—450 **10 Claims**

1. A method for treating skin to provide a temporary prophylactic effect against the production of peroxides in skin tissues, comprising the step of topically applying a composition to the skin, the composition comprising an antioxidant effective amount of a phenolic diterpene compound selected from the group consisting of carnosic acid, a C_{1-5} alkyl ester of carnosic acid, an alkali metal salt of carnosic acid, carnosol and mixtures thereof, which is dissolved or dispersed in a skin compatible carrier, the antioxidant effective amount of diterpene being in the range of 1–100,000 ppm based on the total weight of the composition.

5,552,159

SOLID DEPOT DRUG FORM

Winfried Mueller, Mannheim; Reinhard Spengler; Sven Grabowski, both of Ludwigshafen, and Axel Sanner, Frankenthal, all of, Germany, assignors to BASP Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 979,654, Nov. 20, 1992, abandoned. This application Sep. 23, 1993, Ser. No. 125,133

Claims priority, application Germany, Nov. 23, 1991, 41 38 513.6

Int. Cl.[6] A61K *9/20*

U.S. Cl. 424—464 **3 Claims**

1. A process for the production of a solid depot drug form which comprises melt extruding at from 50° to 200° C. and hot cut pelletizing a mixture of from 0.1 to 70% by weight, based on the finished depot form, of a pharmaceutically active ingredient with a polymer melt of the following composition:

(a) At least 6% by weight, based on the complete depot form, of a extrudable water-insoluble poly(meth)acrylate with a glass transition temperature Tg in the range from –60° to 180° C., and

(b) A polymer which is (1') a water-soluble hydroxyalkylcellulose or (1") hydroxyalkylmethylcellulose with 2 or 3 carbons in the hydroxyalky, or (2) an N-vinylpyrrolidone polymer with from 0 to 50% by weight of vinyl acetate or (3) a mixture of b(1') or b(1") and b(2) wherein polymer (b) is present in an amount of 5% to 95% of the weight of (a) and (b), and

(c) 0–30% by weight, based on the finished depot form, of one or more conventional pharmaceutical auxiliaries, the said extrudable water-insoluble poly(meth)acrylate having a solubility of less than 10 mg in one liter of water at 20° C.

5,552,160

SURFACE MODIFIED NSAID NANOPARTICLES

Gary G. Liversidge; Philip Conzentino, Jr., both of West Chester; Kenneth C. Cundy, Pottstown, and Pramod P. Sarpotdar, Malvern, all of Pa., assignors to NanoSystems L.L.C., Collegeville, Pa.

Continuation of Ser. No. 897,193, Jun. 10, 1992, abandoned, which is a continuation-in-part of Ser. No. 647,105, Jan. 25, 1991, Pat. No. 5,145,684. This application Mar. 13, 1995, Ser. No. 402,662

Int. Cl.[6] A61K *9/14*

U.S. Cl. 424—489 **13 Claims**

1. Particles consisting essentially of 99.9–10% by weight of crystalline NSAID having a solubility in water of less than 10 mg/ml, said NSAID having a non-crosslinked surface modifier adsorbed on the surface thereof in an amount of 0.1–90% by weight and sufficient to maintain an average particle size of less than about 400 nm.

5,552,161

LOW VISCOSITY, HIGHLY CONCENTRATED SURFACTANT SUSPENSION

Bernd Disse, Albrecht-Durer-Strasse; Eberhard Weller, Volmarweg, and Robert Becker, Huhnerfeldstrasse, all of, Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Germany

Continuation of Ser. No. 174,935, Dec. 28, 1993, abandoned, which is a continuation of Ser. No. 58,859, May 7, 1993, abandoned, which is a continuation of Ser. No. 881,450, May 12, 1992, abandoned, which is a continuation of Ser. No. 741,287, Aug. 7, 1991, abandoned, which is a continuation of Ser. No. 546,140, Jun. 29, 1990, abandoned. This application May 1, 1995, Ser. No. 432,386

Claims priority, application Germany, Jul. 4, 1989, 39 21 954.2

Int. Cl.[6] A61K *31/66*

U.S. Cl. 424—557 **9 Claims**

1. An aqueous pulmonary surfactant suspension for use in replacement therapy in diseases of the respiratory tract, having a surfactant lipid/protein concentration of from about 60 to about 200 mg/ml and a viscosity of from about 6 to about 40 mPas, comprising:

a) natural or artificial surfactant lipid/protein, having calcium and/or magnesium ions bound thereto in a ratio of from 25 to 70 mmol per mol of organically extractable phosphlipid, suspended in an aqueous medium comprising about 1 to about 3.5 mmol/l of unbound calcium and/or magnesium ions, and

b) additionally comprising sodium chloride in a concentration of from about 33 to about 150 mmol/l, wherein the natural or artificial surfactant lipid/protein is present in the aqueous medium at a total concentration of from about 60 to about 200 mg/ml.

5,552,162

METHOD FOR IMPROVEMENT OF SCAR SIZE AND APPEARANCE

Raphael Lee, Chicago, Ill., assignor to Arch Development Corporation, Chicago, Ill.

Filed Feb. 9, 1993, Ser. No. 15,216

Int. Cl.[6] A61K *31/275*

U.S. Cl. 424—646 **13 Claims**

1. A method for improving the size and appearance of an existing hypertrophic or keloid scar comprising stimulating collagenase activity in said scar for a period of time sufficient to result in a noticeable improvement in said scar, wherein stimulating collagenase activity is accomplished by covering said scar with a thermal insulating material that elevates the surface temperature of the scar from about 0.5° C. to about 5° C., wherein said thermal insulating material contains a therapeutically effective amount of a medicament.

5,552,163

GUM BASE IN CHEWING GUM HAVING IMPROVED COMPATIBILITY AND FLAVOR

Scott E. Hartman, Roosevelt, and Archie L. Hightower, Plainfield, both of N.J., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

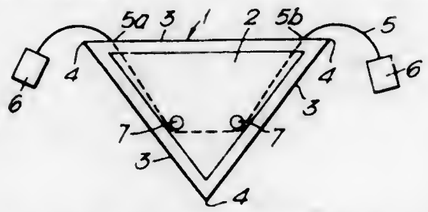
Continuation-in-part of Ser. No. 405,344, Mar. 16, 1995, abandoned. This application May 5, 1995, Ser. No. 435,672

Int. Cl.[6] A23G *3/30*

U.S. Cl. 426—3 **20 Claims**

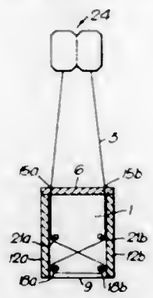
1. A gum base comprising at least approximately 1.0% by weight of a non-soy liquid lecithin composition.

5,552,164
INFUSION PACKAGE
Jan Knipers, Goudswaard, Netherlands, and Craig S. McLean, Northampton, United Kingdom, assignors to Thomas J. Lipton, Co., Division of Conopco, Inc., Englewood, N.J.
Filed Oct. 11, 1994, Ser. No. 321,191
Claims priority, application United Kingdom, Oct. 12, 1993, 9321034; Nov. 8, 1993, 9322995
Int. Cl.[6] B65B 29/04
U.S. Cl. 426—80 10 Claims



1. A package containing a flowable infusible material comprising at least two panels of a porous material and at least three sides, said package having a drawstring that passes out of the interior of the package via a first exit point and a second exit point said drawstring having two ends outside of the interior of said package and two or more spot welds which constrain said drawstring adjacent to at least two of said sides, by independently sandwiching said drawstring between said spot welds and the adjacent side whereby pulling the ends of the drawstring in substantially opposite directions causes the drawstring to move relative to the sides it engages thus allowing the package to collapse.

5,552,165
INFUSION PACKAGE
Robert H. A. Haak, Delft; Jan J. Kuipers, Goudswaard, both of, Netherlands, and Craig S. McLean, Northampton, Great Britain, assignors to Thomas J. Lipton Co., Division of Conopco, Inc., Englewood, N.J.
Filed Nov. 7, 1994, Ser. No. 335,029
Claims priority, application United Kingdom, Nov. 8, 1993, 9322995; Oct. 3, 1994, 9419895
Int. Cl.[6] B65B 29/04
U.S. Cl. 426—80 2 Claims



1. A package for containing a flowable infusible material comprising a closed bag made from a porous material which is defined by a first side, a second side that opposes the first side and two other sides, said package having a drawstring that has two ends which pass out of the interior of the package in which the infusible material is contained via a first exit point located adjacent one end of the first side and a second exit point located adjacent the other end of the first side, the package being characterised in that the drawstring is constrained within the bag by being urged adjacent the ends of the second side and at some intermediate point along each of said other sides by spot welds wherein pulling the ends of the drawstring in substantially opposite directions causes the drawstring to move relative to the sides it engages and thus enable the package to collapse.

5,552,166
COATED FRIED FOOD PRODUCT
Seiki Harada, Kanagawa-ken, and Masayuki Ikeda, Saitama-ken, both of, Japan, assignors to Uni Colloid Kabushiki Kaisha, Zushi, Japan
Continuation of Ser. No. 171,931, Dec. 22, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 463,104
Claims priority, application Japan, Dec. 24, 1992, 4-357331
Int. Cl.[6] A23L 1/0532; 1/212; 1/31
U.S. Cl. 426—89 20 Claims

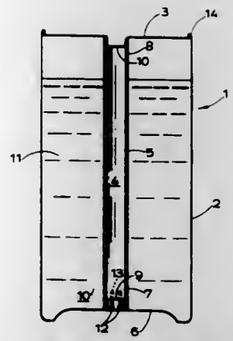
1. A fried food consisting essentially of at least one foodstuff and a coating on an exposed surface of said at least one foodstuff, said coating consisting essentially of a mixture of at least one condiment selected from the group consisting of salad oil, vinegar, butter, margarine, mayonnaise, catchup, cheese, soybean sauce, soybean paste, sauces, curry powder and horseradish and at least one cohesive agent selected from the group consisting of alginic acid, an alginate and glucomannan, said fried food being produced by coating said foodstuff with said coating of said condiment and said cohesive agent to obtain a coated foodstuff, freezing said coated foodstuff and then frying said coated foodstuff.

5,552,167
RICE BRAN OIL ANTIOXIDANT
James B. Taylor, Sparta; Thomas M. Richar., Long Valley; Carolyn L. Wilhelm, Hackettstown; Michael M. Chrysam, Blairstown; Michael Otterburn, Randolph, and Gilbert A. Leveille, Denville, all of N.J., assignors to Nabisco, Inc., Parsippany, N.J.
Filed May 5, 1995, Ser. No. 435,704
Int. Cl.[5] A23D 9/00
U.S. Cl. 426—99 18 Claims

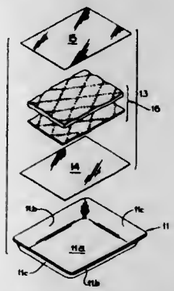
1. A process for preparing a snack food product comprising spray-coating a baked, roasted, or popped snack food substrate containing starch or nuts with a stabilized edible oil composition containing a mixture of about 0.5 to about 10% by weight rice bran oil and another edible oil selected from the group consisting of soybean oil, canola, walnut oil, wheat germ oil, menhaden oil, rapeseed oil and mixtures thereof, such that said stabilized composition is free of off-flavors and rancidity on storage at room temperature for a period of at least six months.

5,552,168
CARBONATED BEVERAGE PACKAGE
Ernest J. Cameron-Price, Regent House, Poolhead Lane, Tanworth-in Arden, Solihull, West Midlands, B94 5ED, England
PCT No. PCT/GB91/01139, § 371 Date Mar. 16, 1993, § 102(e) Date Mar. 16, 1993, PCT Pub. No. WO92/00897, PCT Pub. Date Jan. 23, 1992
PCT Filed Jul. 10, 1991, Ser. No. 30,174
Claims priority, application United Kingdom, Jul. 11, 1990, 9015239; Aug. 4, 1990, 9017131
Int. Cl.[6] B65B 25/00; 31/00
U.S. Cl. 426—106 7 Claims

1. A beverage package comprising a sealed, openable can comprising a tubular metal can body, opposite ends of which are closed by first and second end walls, the can interior forming a chamber containing a beverage in which a gas is dissolved, and a gas reservoir assembly comprising a gas-filled reservoir of tubular form disposed longitudinally within the can body, said tubular reservoir being sealingly attached said first end wall by a push fit existing between the reservoir and the first end wall, and substantially extending to said second end wall, said reservoir being provided with gas outlet orifice means substantially adjacent to said second end wall, said gas outlet orifice means enabling gas present in the reservoir to flow into said beverage when the can is opened.



5,552,169
FOOD PACKAGE ADAPTED FOR MICROWAVE OR OTHER COOKING
Charles P. Kannankeril, North Caldwell, N.J., and Carol A. Norris, Lenoir, N.C., assignors to Sealed Air Corporation, Saddle Brook, N.J.
Continuation-in-part of Ser. No. 691,218, Apr. 25, 1991, abandoned. This application Dec. 13, 1991, Ser. No. 807,267
Int. Cl.[6] B65D 85/00
U.S. Cl. 426—107 20 Claims

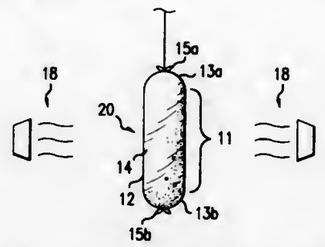


1. A food package adapted for microwave or conventional oven cooking of the food contained therein characterized by the capability to absorb exudants from the food during handling, shipment and storage and to absorb grease, water or both during cooking, said package comprising

a container formed of high temperature resistant material for confining and displaying a food product adapted to be cooked within the container; said container including a bottom wall, and

an absorbent pad disposed within said container and overlying and resting upon said bottom wall thereof, said pad comprising upper and lower layers of high temperature resistant, heat sealable sheet material and an intermediate layer of absorbent material capable of absorbing grease and water simultaneously without hindering the absorption of the other, said upper and lower layers extending beyond the periphery of said intermediate layer and being secured together around their periphery to enclose said intermediate layer therebetween, at least one of said upper and lower layers being liquid permeable whereby liquids exuded by the food product both prior to and during cooking thereof will penetrate through said permeable layer and be absorbed by said intermediate layer.

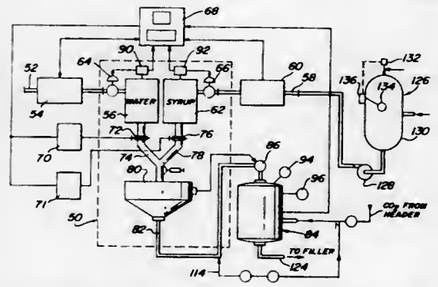
5,552,170
FOOD-CONTAINING SUSTAINED SHRINK FORCE COOK-IN FILM
Martindale Nelson, Greer, S.C., assignor to W. R. Grace & Co.-Conn., Duncan, S.C.
Filed Jan. 31, 1994, Ser. No. 189,475
Int. Cl.[6] B65B 53/00; B65D 85/00
U.S. Cl. 426—113 2 Claims



1. A package comprising a food article, and a heat shrinkable cook-in casing which encloses the food article, the casing comprising at least one layer of a thermoplastic polymer, the casing having a lay flat width of 165 millimeters or less, and having a sustained shrink force, in grams per centimeter, measured (ASTM D2838) after 15 minutes at a temperature to be used in a cooking cycle for the package, which exceeds the shrink force value obtained by the formula:

$$\frac{\text{package length (cm)} \times \text{casing lay flat width (cm)}}{3}$$

5,552,171
METHOD OF BEVERAGE BLENDING AND CARBONATION
Michael W. Gibney, Ingleside; Lawrence M. Lucas, Corpus Christi, and Roy Culver, Jr., Ingleside, all of Tex., assignors to Micro-Blend, Inc., Ingleside, Tex.
Division of Ser. No. 180,404, Jan. 12, 1994, abandoned, and a continuation-in-part of Ser. No. 904,421, Jun. 26, 1992, Pat. No. 5,314,703, each which is a continuation-in-part of Ser. No. 798,824, Nov. 22, 1991, abandoned, which is a division of Ser. No. 482,363, Feb. 20, 1990, Pat. No. 5,068,116, which is a continuation-in-part of Ser. No. 416,813, Oct. 4, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 486,783
Int. Cl.[6] A23L 2/00
U.S. Cl. 426—231 13 Claims



1. A method of blending a beverage comprising the steps of:
(a) measuring the mass flow rate of a first beverage component by a Coriolis mass flow meter;
(b) measuring the mass flow rate of a second beverage component by a Coriolis mass flow meter;
(c) calculating a required flow rate of the first beverage component as a function of the measured mass flow rates of the first

and second beverage components and a preset value for the ideal mass flow rates of the first and second beverage;

(d) combining the first and second beverage components to form a beverage flow;

(e) adjusting the flow rate of the first beverage flow component so that the beverage flow conforms to the preset value.

5,552,172

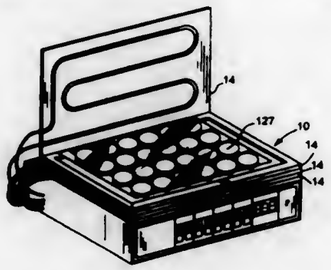
MULTI-DECK CLAMSHELL COOKING AND STAGING PROCESS

Beano E. Liebermann, 2805 Lime Kiln La., Louisville, Ky. 40222

Continuation of Ser. No. 229,581, Apr. 19, 1994. This application Jun. 7, 1995, Ser. No. 477,408

Int. Cl.[6] A23L *1/00*

U.S. Cl. 426—232 **28 Claims**



1. A clamshell grill cooking and staging process for pathogenic risk management, comprising the steps of:

placing at least one food article sealed within a heat conducting container between a pair of heat transfer plates of a clamshell cooking and staging grill comprising a top plate, a bottom plate, and at least one intermediate plate, spaced apart and in alignment with one another, the top plate and the at least one intermediate plate being hingedly mounted to a housing frame by a floating hinge means;

heating a heat transfer fluid contained within a reservoir in fluid connection with the top plate, the bottom plate, and the at least one intermediate plate to a selected temperature at less than 212° F.;

controlling the selected temperature of the heat transfer fluid within the reservoir at about ±2° F.;

recirculating the heat transfer fluid through the plates in fluid-connection with the reservoir;

sensing the temperature of the heating fluid, each individual plate, or the food article sealed within the heat conducting container, for controlling the temperature thereof; and

cooking the at least one food article sealed within the heat conducting container at a selected temperature for a selected period of time achieving pathogenic lethality of the at least one food article sealed in the heat conducted container.

5,552,173

METHOD FOR DEFATTING MEAT

Prem S. Singh, Glenellyn, and William A. Trujillo, Oakpark, both of Ill., assignors to Swift-Eckrich, Inc., Downers Grove, Ill.

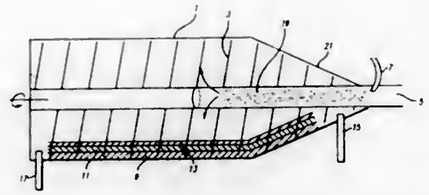
Continuation of Ser. No. 201,114, Feb. 23, 1994, abandoned. This application May 2, 1995, Ser. No. 434,126

Int. Cl.[6] A23L *1/31;1/317*

U.S. Cl. 426—417 **18 Claims**

1. A method for defatting meat comprising:

pumping raw meat starting material through a heating means to adjust the temperature of said raw material up to about the live body temperature of the corresponding species, then



feeding said raw material into a decanter centrifuge maintained under suitable conditions to form a substantially solid layer of defatted meat, an intermediate boundary layer containing particles of fat, meat and moisture, and a substantially liquid layer of fat within the centrifuge by centrifugal separation, and

metering liquid into the temperature adjusted raw material entering the centrifuge in an amount sufficient to separate the meat layer from the intermediate boundary layer and the fat layer during centrifugal separation in the centrifuge, then

driving the boundary layer from the centrifuge along with the substantially liquid fat layer, and then

recovering a defatted meat composition having a moisture content substantially the same as the natural moisture content of the raw meat starting material from the centrifuge.

5,552,174

REDUCED CALORIE TRIGLYCERIDE MIXTURES

Edward L. Wheeler, Fairfield; Ronald P. D'Amelia, Hicksville; Gilbert A. Leveille, Deerville; Michael S. Otterburn, Rudolph; Lawrence P. Klemann, Somerville; John W. Finley, Whippany, all of N.J.; Allan D. Roden, Nobelsville, Ind.; Michael M. Chrysam, Blairstown, N.J.; Turiddu A. Pelloso, Carmel, Ind., and Peter S. Given, Jr., Glencoe, Ill., assignors to Nabisco, Inc., Parsippany, N.J.

Continuation of Ser. No. 175,020, Dec. 29, 1993, Pat. No. 5,456,939, which is a division of Ser. No. 83,795, Jun. 28, 1993, Pat. No. 5,378,490, which is a division of Ser. No. 804,140, Dec. 6, 1991, Pat. No. 5,258,197, which is a continuation-in-part of Ser. No. 624,056, Dec. 7, 1990, abandoned, and a continuation-in-part of Ser. No. 410,161, Sep. 20, 1989, abandoned, Ser. No. 665,629, Mar. 6, 1991, abandoned, and Ser. No. 732,518, Jul. 19, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 476,916

Int. Cl.[6] A23G *1/00*

U.S. Cl. 426—607 **25 Claims**

1. A reduced-calorie liquid oil composition comprising at least 10% of a mixture of at least two triglycerides of the following formulae

CH_2OR	CH_2OR'	CH_2OR	CH_2OR
|	|	|	|
$CHOR'$	$CHOR$	$CHOR$	$CHOR'$
|	|	|	|
CH_2OR'	CH_2OR'	CH_2OR'	CH_2OR
(SSL)	(SLS)	(LLS)	(LSL)

wherein

each R, independently, is a long chain saturated fatty acid residue having between 18 and 22 carbons,

each R', independently, is a short chain acid residue derived from an acid selected from a group consisting of acetic acid, propionic acid, butyric acid and mixtures of any of these acids wherein said triglycerides are formulated to deliver less than or equal to about 7 kcal/gram.

5,552,175

PROCESS FOR SOLUBILISING AN ALPHA-GLUCAN CONTAINING FOODSTUFF

Philip A. Camburn, Slough, England, assignor to SmithKline Beecham p.l.c., Brentford, England

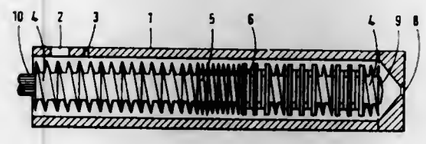
PCT No. PCT/GB92/01877, § 371 Date Apr. 15, 1994, § 102(e) Date Apr. 15, 1994, PCT Pub. No. WO93/07769, PCT Pub. Date Apr. 9, 1993

PCT Filed Oct. 13, 1992, Ser. No. 211,857

Claims priority, application United Kingdom, Oct. 17, 1991, 9122109

Int. Cl.[6] A23L *1/10*

U.S. Cl. 426—615 **14 Claims**



1. A process for solubilising an alpha-glucan containing foodstuff which process comprises processing an alpha-glucan containing carbohydrate material having a moisture content of less than 40% by weight in an extruder under severe conditions of mechanical disruption and shear having a specific mechanical energy input of from about 0.124 k/Wh/Kg to about 0.16 k/Wh/Kg to produce an extrudate which contains soluble alpha-glucan and milling said extrude to give a powder with a particle size of below 200 microns, the soluble alpha-glucan component of the extrudate having a degree of polymerization of from about 50 to about 50,000 and a weight ratio a degree of polymerization greater than 50 to the amount of alpha-glucan with a degree of polymerisation less than 50 is greater than 1 and such that the true solubility of the soluble alpha glucan after milling is greater than 55% by weight in water.

5,552,176

PET FOOD PREMIX PREPARATION

Richard P. Marino, Lakewood, Calif., assignor to Scope Products, Inc., Tucson, Ariz.

Filed May 5, 1994, Ser. No. 238,679

Int. Cl.[6] A23K *1/18;1/10*

U.S. Cl. 426—641 **20 Claims**

1. A process for preparing a pet food premix product for use by pet food manufacturers comprising:

(a) providing at least one source of meat selected from the group consisting of beef, horse, pork, lamb, poultry, fish, venison, offal thereof, and by-products thereof;

(b) providing at least one career substrate selected from the group consisting of farinaceous and plant proteinaceous carriers;

(c) mixing said at least one source of meat and said at least one carrier substrate to form a mixture, said mixture comprising about 40 to 70 wt % of at least one source of meat and about 30 to 60 wt % of at least one carrier substrate, wherein said at least one source of meat and said at least one carrier substrate are employed in said mixture at a ratio that is determined based upon the density of said at least one carrier substrate, with a lower carrier substrate density corresponding to a lower amount of carrier substrate in the ratio;

(d) drying said mixture in a dryer to dehydrate said mixture to a moisture level of less than about 10% to form a dried mixture; and

(e) grinding and screening said dried mixture to form said pet food premix product.

5,552,177

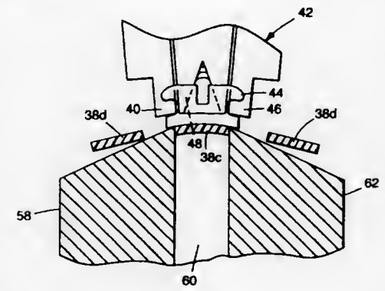
METHOD FOR APPLYING ADHESIVE TO THE BASE OF AN ORTHODONTIC APPLIANCE

Dwight W. Jacobs, River Falls, Wis.; Oliver L. Puttler, La Crescenta, Calif.; Evangelos G. Georgakis, Altaloma; Allen B. Amundson, Upland, Calif., and Russell A. Jordan, Rancho Cucamonga, Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 21, 1995, Ser. No. 407,622

Int. Cl.[6] B05D *3/12;5/10*

U.S. Cl. 427—2.29 **15 Claims**



1. A method for applying adhesive to a base of an orthodontic appliance comprising the steps of:

placing a quantity of adhesive onto a carrier;

maintaining at least a portion of the adhesive on the carrier at a temperature below room temperature;

contacting the base of the appliance with the adhesive; and

disengaging the adhesive from the carder while the temperature of the portion of the adhesive is below room temperature.

5,552,178

METHOD FOR PREPARING ANTI-REFLECTIVE COATING FOR DISPLAY DEVICES

Kang-Il Seo, Seoul; Dong-Sik Jang, Kyungki-Do; Heon-Soo Kim, Seoul, and Su-Min Jeong, Kyungki-Do, all of, Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Jan. 28, 1994, Ser. No. 187,712

Claims priority, application Rep. of Korea, Aug. 5, 1993, 1993-15225

Int. Cl.[6] B05D *5/06*

U.S. Cl. 427—64 **17 Claims**

1. A method for preparing an anti-reflective coating which comprises the steps of:

applying a first coating composition containing an alcohol solution of a silicon alkoxide, at least one metal alkoxide of the formula $M(OR)_4$, an acid and water, where M is a metal selected from the group consisting of Ti, Sn, In and Zr and R is an alkyl group, on the outer surface of a panel to form a first layer;

drying said panel at about 40°–80° C. to form a first layer;

applying a second coating composition containing an alcohol solution of a silicon alkoxide, a salt selected from the group consisting of KCl, KNO_3, CH_3COOK, NaCl, $NaNO_3$, CH_3COONa, NH_4Cl, NH_4NO_3 and CH_3COONH_4, an acid and water onto the first layer to form a second layer; and

heating the first and second layers coated on the outer surface of a panel.

5,552,179

METHOD FOR TREATING CONCRETE

John R. Ramus, Poland, Ohio, assignor to Allied Gator, Inc., Youngstown, Ohio

Filed Jun. 16, 1995, Ser. No. 491,407
Int. Cl.[6] B05D 7/24;1/36; C08K 3/00
U.S. Cl. 427—136 17 Claims

1. A method of treating concrete containing a wetting agent to protect the upper region of the concrete comprising the steps of:

a) providing a binder which increases the flexibility and durability of said concrete, said binder being a copolymer which is capable of forming an aqueous dispersion when mixed with water, wherein said binder is a vinyl acetate/ethylene copolymer;

b) mixing said binder with water to form an aqueous dispersion, said aqueous dispersion consisting essentially of said binder and water, in which the ratio of said binder is 5–20 wt % per weight of said aqueous dispersion;

c) applying said aqueous dispersion of said binder and said water to a surface of said concrete before said concrete sets;

d) penetrating said aqueous dispersion beneath said surface of said concrete to a desired depth; and

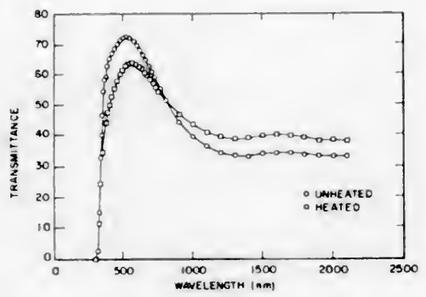
e) allowing said aqueous dispersion to dry whereupon an integral, protective region of treated concrete is formed in said concrete.

5,552,180

MULTILAYER HEAT PROCESSABLE VACUUM COATINGS WITH METALLIC PROPERTIES

James J. Finley, O'Hara Township; Mehran Arbab, Pittsburgh, and Thomas J. Waynar, New Kensington, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 799,806, Nov. 29, 1991. This application Jun. 6, 1995, Ser. No. 471,662
Int. Cl.[6] B05D 5/06
U.S. Cl. 427—165 26 Claims



1. A method of making a tempered coated article having a metallic appearance comprising the steps of:

depositing on a surface of a glass substrate a stabilizing metallic film selected from the group consisting of titanium, zirconium, tantalum, chromium, niobium, nickel-chromium alloys and aluminum nitride;

depositing a metal compound film on the stabilizing film;

depositing a protective layer comprising a silicon or silicon alloy dielectric over the metal compound film to prevent oxidation of the metal compound film upon heating; and

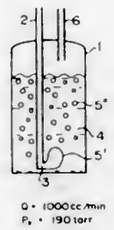
heating the glass substrate having the stabilizing metallic film, the metal compound film and the protective layer defined as a coated substrate to a temperature sufficient to temper the glass substrate, to increase the transmission of the coated substrate in the wavelength range of 400–800 nanometers, to decrease solar transmission of the coated substrate in the wavelength range of 800 to 2100 nanometers and to oxidize the stabilizing metallic film.

5,552,181

METHOD FOR SUPPLYING LIQUID MATERIAL AND PROCESS FOR FORMING THIN FILMS USING THE LIQUID MATERIAL SUPPLYING METHOD

Eiichi Kondoh; Toru Mitomo; Hiroshi Yamamoto, and Tomohiro Ohta, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Dec. 21, 1993, Ser. No. 170,789
Claims priority, application Japan, Dec. 21, 1992, 4-340088; Mar. 26, 1993, 5-068261
Int. Cl.[6] C23C 16/00
U.S. Cl. 427—248.1 16 Claims



2. A method for forming a thin film of at least a first material on a substrate by chemical vapor deposition using a viscous liquid material provided in a bubbler, the method comprising the steps of:

supplying a carrier gas at a volumetric flow rate into the bubbler through at least one nozzle immersed in the viscous liquid material;

controlling the volumetric flow rate of the carrier gas into the bubbler and a pressure P_b within the bubbler, the pressure P_b being below atmospheric pressure;

dissolving the carrier gas into the viscous liquid material, the viscous liquid material having a viscosity of at least 100 cp and including an least the first material;

vaporizing the viscous liquid material into bubbles of the carrier gas;

introducing the vaporized viscous liquid material as a gas together with the carrier gas into a CVD reaction vessel containing the substrate; and

depositing at least the first material onto the substrate to form the thin film,

wherein the viscous liquid material is dimethyl aluminum hydride, the pressure P_b and the volumetric flow rate of the carrier gas per nozzle, Q', being selected to meet the following condition:

$$0.0014\ exp(0.024\ P_b) < Q' < 2.3\ hP_b$$

where h represents a height difference between an outlet end of each of the at least one nozzle and surface of the viscous liquid material in the bubbler.

5,552,182

INKING METHOD AND COMPOSITIONS FOR PRODUCTION OF DIGITIZED STEREOSCOPIC POLARIZING IMAGES

Julius J. Scarpetti, Revere, Mass., assignor to Rowland Institute for Science, Cambridge, Mass.

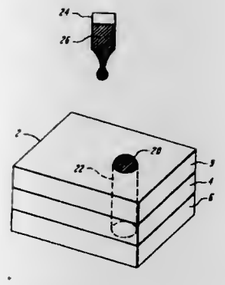
Filed Jan. 31, 1995, Ser. No. 380,949
Int. Cl.[6] B05D 5/00
U.S. Cl. 427—256 19 Claims

14. A method of manufacturing a polarizing image from a stretched and oriented polymer sheet, comprising the steps of

forming an ink from a de-salted dye by dissolving the dye in de-ionized water and polyhydric alcohol,

coating the polymer sheet with a dye-permeable hydrophilic polymeric material, and

applying the ink to the coated polymer sheet.



5,552,183

PROCESS FOR COATING OR PRINTING A PLASTIC FILM WITH WATER OR SOLVENT-CONTAINING COATING AGENTS OR MIXTURES THEREOF, U/V-CURABLE PAINTS OR INKS AND PVC PASTES

Erich Killar, D-8067, Petershausen, Germany, assignor to Erich Killar, Petershausen, Germany

PCT No. PCT/DE93/00365, § 371 Date Jan. 6, 1995, § 102(e) Date Jan. 6, 1995, PCT Pub. No. WO93/22072, PCT Pub. Date Nov. 11, 1993
PCT Filed Apr. 23, 1993, Ser. No. 325,450
Claims priority, application Germany, Apr. 24, 1992, 42 13 582.6
Int. Cl.[6] B05D 3/00;7/00
U.S. Cl. 427—271 29 Claims

1. A method for providing a coating or printing on a plastic foil or film, said method comprising the steps of:

providing an endless conveyor belt having a conveying surface;

depositing a plastic foil or film on said conveying surface;

adhering the plastic foil or film to the conveying surface by heating the plastic foil or film to a temperature sufficient to adhere the plastic foil or film to the conveying surface to provide an adhered foil or film;

cooling the adhered foil or film;

coating a surface of the adhered foil or film opposite the conveying surface with a coating composition to provide a wet coated foil or film;

heating the wet coated foil or film to provide a dry coated foil or film;

cooling the dry coated foil or film; and

thereafter, removing the cooled dry coated foil or film from said conveyor belt.

5,552,184

COATING AGENTS, THEIR USE AS CLEAR COATS AND PROCESSES FOR THE PRODUCTION OF MULTICOAT LACQUER FINISHES

Peter Klostermann; Hans-Martin Schönarock, both of Wuppertal; Klaus Schröter, Schwelm, and Thomas Kutzner, Sprockhövel, all of, Germany, assignors to Herberts GmbH, Wuppertal, Germany

Continuation of Ser. No. 178,591, Jan. 7, 1994, abandoned, which is a continuation of Ser. No. 16,650, Feb. 12, 1993, abandoned. This application Dec. 16, 1994, Ser. No. 358,055
Claims priority, application Germany, Feb. 15, 1992, 42 04 611.4
Int. Cl.[6] B05D 5/00
U.S. Cl. 427—284 11 Claims

1. A process for the production of a multicoat lacquer finish, comprising:

preparing a clear coating agent by a process consisting essentially of:

reacting together 45–85% of one or more polyester resins having a branched structure and being essentially free from acetal-functional groups and from aromatic structural units, and which have a number average molecular weight of 350–3000 and a polydispersity of less than 3.5, and

10–40 wt % of one or more cross-linking agents based on at least one member selected from the group consisting of aminoplastic resins, blocked di-isocyanates and blocked polyisocyanates,

0–20 wt % of one or more reactive diluents, and

0–10 wt % of one or more organic solvents having a boiling point or boiling range not less than about 170° C.;

thereby forming a clear coating agent which has a viscosity of 100–1000 mPa.s, measured by rotation viscometry at 70° C. and a shear rate of 235 s^{-1};

hot spraying the clear coating agent on a base coat layer and

stoving to produce a lacquer finish, thereby chemically incorporating the reactive diluent, if present, into the lacquer finish.

5,552,185

PLASTIC ARTICLE HAVING FLAME RETARDANT PROPERTIES

François De Keyser, Overijse, Belgium, assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 835,151, Feb. 13, 1992, Pat. No. 5,413,828. This application Sep. 23, 1994, Ser. No. 311,243
Int. Cl.[6] B05D 3/12; B32B 27/00; B29D 22/00; C09K 21/00
U.S. Cl. 427—358 1 Claim

1. A process for the manufacture of a plastic article having flame retardant properties, which process comprises the step of coating a core of plastic polymeric material with a protective, flame retardant layer consisting essentially of a mixture of a thermoplastic polymeric material selected from the group consisting of a polyolefin and mixtures of polyolefins and a flame retardant, char-forming, intumescent system (FRI system) comprising a flame retardant, char-forming, intumescent additive and a catalyst selected from the group consisting of phosphoric acid precursor, a polyphosphoric acid precursor, and mixtures thereof, each in a concentration, expressed by reference to FRI system (100%), effective to provide flame retardancy to the plastic article, wherein the plastic polymeric material of the core is coated with the protective, flame retardant layer by a technique selected from the group consisting of sequential extrusion, co-extrusion, crosshead extrusion, jacketing, and lamination.

5,552,186

PROCESS FOR COATING A SURFACE IN CONTACT WITH FOOD USING AQUEOUS PHENOLIC RESIN DISPERSIONS

Ken A. Bourlier, Randolph, N.J., and Peggy S. Mulrenin, Tucker, Ga., assignors to Georgia-Pacific Resins, Atlanta, Ga.

Division of Ser. No. 377,735, Jan. 25, 1995, Pat. No. 5,548,015. This application Jun. 6, 1995, Ser. No. 468,401
Int. Cl.[6] B05D 3/02
U.S. Cl. 427—385.5 7 Claims

1. A process for coating a surface in contact with food, said process comprising the steps of:

applying to said surface at least one coating that comprises an aqueous dispersion containing: (a) a heat-reactive hydrophilic phenolic resin obtained from the reaction of an aromatic alcohol and an aldehyde, (b) a hydrophobic etherified bisphenol-A resin in an amount of at least about 10% by weight based on the weight of said phenolic resin, and (c) a protective colloid; and

baking the coated surface for a time sufficiently long enough and a temperature sufficiently high enough to form a crosslinked coating.

5,552,187

COATED FIBROUS MAT-FACED GYPSUM BOARD

George W. Green, and Brian G. Randall, both of Stone Mountain, Ga., assignors to Georgia-Pacific Corporation, Atlanta, Ga.

Division of Ser. No. 93,798, Jul. 19, 1993, Pat. No. 5,397,631, which is a continuation of Ser. No. 806,810, Dec. 6, 1991, abandoned, which is a continuation of Ser. No. 539,363, Jun. 15, 1990, abandoned, which is a continuation of Ser. No. 221,313, Jul. 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 121,219, Nov. 16, 1987, abandoned. This application Mar. 13, 1995, Ser. No. 402,677

Int. Cl.[6] B05D 3/02

U.S. Cl. 427—389.8 25 Claims

2. A method for forming a water-resistant article comprising:

(a) providing a gypsum board comprising a core and a porous mat comprising mineral fibers facing at least one surface of said core;

(b) applying to the surface of said porous mat an aqueous latex coating composition containing at least about 15 wt. % resin solids dispersed therein, the amount of composition applied to said surface of said porous mat being sufficient to cover said mat to the extent that substantially none of said mineral fibers of said porous mat protrude from said coating thereby forming on said surface a wet film of said composition; and

(c) drying said wet film to form therefrom a dry, continuous resinous coating such that substantially none of said mineral fibers of said porous mat protrude from said dry, continuous resinous coating, said coating having a Modified Cobb Test surface water absorption value of no greater than about 2.4 grams and being capable of bonding with Portland cement-based mortar.

5,552,188

METHOD AND APPARATUS FOR HIGH SPEED, THIN LAYER COATING

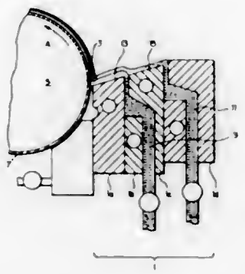
Yoshinori Suzuki; Tadahiro Tsujimoto, and Satoru Fujisaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 7, 1995, Ser. No. 487,518

Claims priority, application Japan, Jun. 8, 1994, 6-126477

Int. Cl.[6] B05D 1/26; B05C 5/02

U.S. Cl. 427—402 4 Claims



1. A method of bead coating a substrate comprising applying a coating solution comprising at least one component having a boiling point of 80° C. or less with a slide hopper composed of a raw material having a coefficient of linear expansion of 3×10^{-6}/°C. or less.

5,552,189

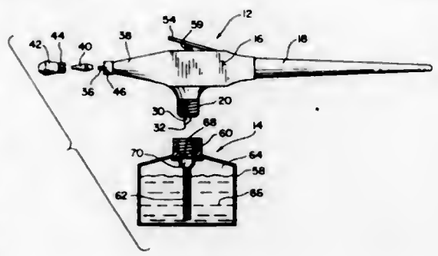
METHOD AND APPARATUS FOR APPLYING A PAINTED DESIGN TO AN ARTICLE OF CLOTHING

Jeffrey P. Shaffer, 9504 Coldwater Rd., Fort Wayne, Ind. 46825

Filed Mar. 25, 1993, Ser. No. 36,905

Int. Cl.[6] B05D 7/00

U.S. Cl. 427—421 3 Claims



1. A method of painting a design onto an article of clothing, the method comprising the steps of:

providing a valve/nozzle assembly comprising an elongated main body, an elongated handle attached to an end of the main body, a spray regulating head attached opposite the elongated handle, and a container attaching portion having a piercing means, the main body including a passageway extending from the container attaching portion to an outlet nozzle opening located opposite the elongated handle, a passageway including a valve disposed therein, the valve being operatively coupled to a finger actuated trigger for selectively actuating the valve, wherein the trigger is located opposite the container attaching portion, the spray regulating head including a threaded portion threaded into an internal nut secured to the end of the main body opposite elongated handle;

securing a container of pressurized paint directly to the container attaching portion and operatively connecting the valve/nozzle assembly with the container of pressurized paint using the piercing means, thereby causing the paint to flow into the passageway of the main body, wherein said container is attached to the main body in such a manner as to prevent noticeable upward recoil of main body upon paint being delivered through said outlet nozzle opening;

grasping the main body of the valve/nozzle assembly between a thumb and a forefinger, thereby causing the elongated handle to be embraced against a hand of the user;

depressing the trigger on the valve/nozzle assembly with the forefinger to cause a fine spray of paint to be released through the nozzle;

moving the valve/nozzle assembly and attached container in a controlled manner about an article of clothing to create a painted design on the clothing;

rotating the spray regulating head in one direction to narrow the thickness of the spray and in the opposite direction to widen the thickness of the spray;

releasing the trigger to stop the flow of spray through the nozzle; and

removing the container from the main body of the valve/nozzle assembly.

5,552,190

GOLF BALL AND METHOD OF MANUFACTURING THE SAME

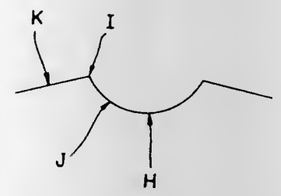
Kiyoto Maruoka; Kuniyasu Horiuchi, both of Kobe, and Yoshikazu Yabuki, Akashi, all of, Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan

Continuation of Ser. No. 163,720, Dec. 9, 1993, abandoned. This application Nov. 6, 1995, Ser. No. 553,830

Claims priority, application Japan, Dec. 9, 1993, 4-352542

Int. Cl.[6] B01J 19/08; H01F 41/00

U.S. Cl. 427—457 10 Claims



1. A method of manufacturing a golf ball comprising the steps of supplying a paint to which a voltage of more than 50,000 V is applied to a disk, rotating the disk at a velocity of more than 15,000 rpm for atomization, coating atomized paint from the disk on the surface of the golf ball at a thickness of 5 to 60 μm with a ratio of maximum to minimum of the coating being 1 to 2.

5,552,191

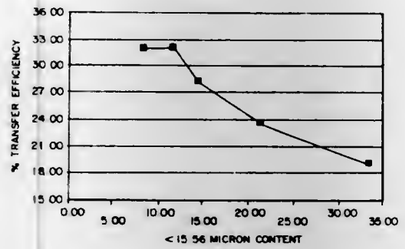
TRIBOELECTRIC COATING POWDER AND PROCESS

Paul R. Horinka, Reading, and Martin J. Korecky, Shillington, both of Pa., assignors to Morton International, Inc., Chicago, Ill.

Continuation of Ser. No. 837,459, Feb. 14, 1992, abandoned. This application Dec. 20, 1993, Ser. No. 169,793

Int. Cl.[6] B05D 1/04

U.S. Cl. 427—475 2 Claims



1. In a coating process wherein plastic powder is fed to a triboelectric spray gun and in which said powder is then spray deposited onto a substrate, said powder having an average particle size, Mv, of between about 35 and about 36 microns, the improvement wherein said powder has particle size distribution, Mx, comprising, all in percents by weight:

100% smaller than 88 microns,

10%–15% smaller than 15.56 microns and

4%–6% smaller than 11 microns.

5,552,192

COLOR FILTER AND METHOD FOR MANUFACTURING IT

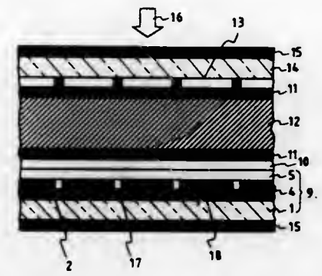
Akio Kashiwazaki; Hiroshi Sato, both of Yokohama; Katsuhiro Shirota, Tokyo; Hideto Yokoi, Yokohama, and Shoji Shiba, Sagamihara, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1994, Ser. No. 357,331

Claims priority, application Japan, Dec. 21, 1993, 5-322132

Int. Cl.[6] B05D 3/06

U.S. Cl. 427—492 23 Claims



1. A method for manufacturing a color filter which comprises forming a colored pattern on a substrate by imparting energy-curable inks of different colors, comprising the steps of:

(1) imparting, to the substrate, the energy-curable inks to form a colored pattern,

(2) applying the energy to the substrate to partially cure the inks applied to the substrate,

(3) forming an energy-curable resin layer over the substrate, and

(4) curing the inks and the resin layer by the application of the energy.

5,552,193

LIQUID CRYSTAL DEVICE

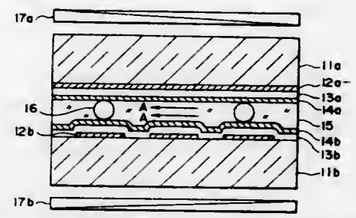
Masanobu Asaoka, Yokohama; Hideaki Takao, Sagamihara; Takeshi Togano, Yokohama, and Makoto Kojima, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 122,936, Sep. 20, 1993, Pat. No. 5,419,931. This application Mar. 6, 1995, Ser. No. 399,043

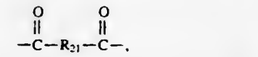
Claims priority, application Japan, Sep. 18, 1992, 273574; Sep. 18, 1992, 273576; Dec. 14, 1992, 352913

Int. Cl.[6] G02F 1/1337

U.S. Cl. 428—1 3 Claims

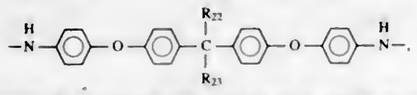


1. A liquid crystal device, comprising: a pair of substrates and a chiral smectic liquid crystal disposed between the substrates; at least one of said pair of substrates having thereon an alignment film of a composite polyamide having at least two species of dicarboxylic acid-originated units each represented by formula (2) below:



(2)

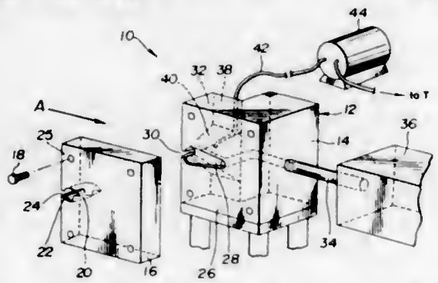
wherein R_{21} denotes a divalent organic residue group including an aromatic ring; and a diamine-originated unit represented by formula (3) below:



(3)

wherein R_{22} and R_{23} independently denote an alkyl group having 1–10 carbon atoms, with the proviso that at least one species of the dicarboxylic acid originated units is one having a straight molecular structure.

5,552,194
EXTRUSION DIE, METHOD OF FORMING MOLDING ON PLATELIKE ARTICLE AND PLATELIKE ARTICLE WITH MOLDING
Toshikazu Ito, Obu, and Yutaka Yamauchi, Matsusaka, both of, Japan, assignors to Central Glass Company, Limited, Ube, and Tokai Kogyo Kabushiki Kaisha, Obu, both of, Japan
Filed Dec. 22, 1994, Ser. No. 361,417
Claims priority, application Japan, Dec. 24, 1993, 5-328411
Int. Cl.[6] B29C *47/02;47/92*
U.S. Cl. 428—31.000 **8 Claims**



1. A method for producing a plate article having an adhesive layer and a molding, said adhesive layer being formed on a peripheral edge of said plate article, said molding covering said adhesive layer and being formed on said peripheral edge, using an extrusion die comprising a first space for supplying an adhesive to said peripheral edge and a second space for supplying a molding material to said peripheral edge, said method comprising the steps of:

(a) inserting said peripheral edge into said first and second spaces;

(b) moving said plate article relative to said extrusion die while said peripheral edge is kept inserted in said first and second spaces;

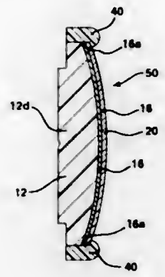
(c) applying said adhesive from said first space to said peripheral edge so as to form said adhesive layer thereon, said adhesive being a thermoplastic hot melt adhesive; and

(d) extruding said molding material from said second space onto said adhesive layer substantially simultaneously while the step (c) is conducted, said molding material being a thermoplastic resin,

wherein said first and second spaces are so arranged relative to each other such that said molding and said adhesive layer are substantially simultaneously formed on said peripheral edge and that said adhesive layer is covered with said molding.

7. A plate article having an adhesive layer and a molding, said adhesive layer being formed on a peripheral edge of said plate article, said molding covering said adhesive layer and being formed on said peripheral edge, said adhesive being a thermoplastic hot melt adhesive, said molding being a thermoplastic polymer, a boundary between said adhesive and said molding having a rough surface, said adhesive and said molding being fused together at said boundary, said plate article being prepared in accordance with the method of claim 1.

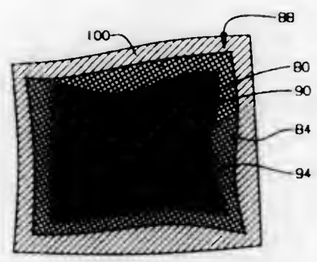
5,552,195
TRIM STRIP AND METHOD FOR MAKING SAME
Bernard L. Cook, Dayton, and David D. Dilley, Centerville, both of Ohio, assignors to Plastic Trim, Inc., Dayton, Ohio
Division of Ser. No. 34,084, Mar. 22, 1993, Pat. No. 5,456,786.
This application Jun. 2, 1995, Ser. No. 458,397
Int. Cl.[6] B60R *13/04*
U.S. Cl. 428—31 **15 Claims**



1. A trim strip comprising:

an elongate strip having an outer peripheral edge and an upper surface, said elongate strip being formed of two or more layers of material and having a molded edge portion on a substantial portion of its outer peripheral edge which engages said upper surface.

5,552,196
INSULATED PORT LINEAR ASSEMBLY
Michael H. Haselkorn, and Michael C. Long, both of Peoria, Ill., assignors to Caterpillar Inc., Peoria, Ill.
Continuation-in-part of Ser. No. 201,290, Feb. 24, 1994. This application May 26, 1995, Ser. No. 452,223
Int. Cl.[6] B32B *1/08;* **F01N** *7/10*
U.S. Cl. 428—34.5 **16 Claims**



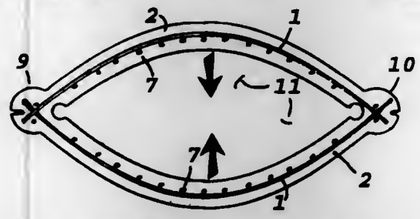
1. A port liner assembly adapted for use with an internal combustion engine, comprising:

a tubular port liner including a body having an outer surface, the liner being composed entirely of a ceramic material containing a low temperature softening phase;

an insulating layer of material including ceramic fibers substantially surrounding the outer surface; and

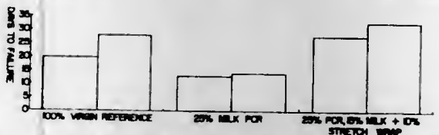
means for totally encapsulating the insulating layer of material, the encapsulating means being composed of a woven fiberglass cloth with high thermal resistance which is stitched in a quilted pattern to encapsulate the insulating layer within a plurality of individual pockets to define a blanket removably fitted around the surface.

5,552,197
DYNAMIC POLYMER COMPOSITES
David S. Bettinger, 8030 Coventry, Grosse Ile, Mich. 48138
Filed Nov. 5, 1993, Ser. No. 149,092
Int. Cl.[6] B65B *53/00*
U.S. Cl. 428—34.9 **13 Claims**



1. A composite material comprising a multiplicity of prestressed high modulus fibers circumferentially oriented within the walls of a hollow construction, said prestressed fibers constrained within and by a polymer matrix which possesses an opposing and balanced prestress, wherein said matrix is capable of yielding to said prestress to generate a dimensional change, said dimensional change resulting in a constriction of said hollow construction.

5,552,198
PLASTIC CONTAINER MADE FROM POST CONSUMER PLASTIC FILM
James E. Hiltner, Sylvania; James M. Fargher, Holland, and James N. Herman, Sylvania, all of Ohio, assignors to Owens-Illinois Plastic Products, Toledo, Ohio
Continuation-in-part of Ser. No. 842,838, Feb. 27, 1992, abandoned, and Ser. No. 842,839, Feb. 27, 1992, abandoned. This application Nov. 19, 1993, Ser. No. 154,413
Int. Cl.[6] B65D *23/00*
U.S. Cl. 428—35.7 **42 Claims**



1. A plastic container having stress crack resistance comprising a single plastic layer which comprises a fusion blend of a post consumer film resin and a resin selected from the group consisting essentially of post consumer milk resin which comprises primarily high density polyethylene homopolymer from milk containers, virgin high density polyethylene copolymer resin, virgin high density homopolymer resin or fusion blends thereof,

said post consumer film resin having a material density of 0.915–0.930 grams/cc and a melt index of 0.5–2.0 DGM,

said post consumer milk resin having a material density of 0.961±0.002 and a melt index of 0.75±0.2 DGM,

said virgin high density polyethylene copolymer resin having a density of at least 0.94 gm/ml and a melt index of less than 0.5 gm/10 min.

5,552,199
MELT-PROCESSABLE ELECTROCONDUCTIVE FLUOROPLASTIC
Thomas J. Blong, Woodbury, Minn., and Claude Lavallée, London, Canada, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Sep. 2, 1994, Ser. No. 300,641
Int. Cl.[6] C08L *27/16;27/18;27/20;* **C08K** *3/04*
U.S. Cl. 428—36.9 **20 Claims**

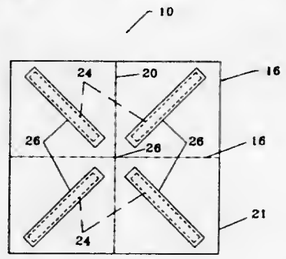
1. A melt-processable conductive fluoroplastic composition consisting essentially of a blend of:

(a) a major amount of a melt-processable, thermoplastic fluoropolymer component having at least 5 wt % of its interpolymerized units derived from vinylidene fluoride and more than 25 wt % of its interpolymerized units derived from a combination of tetrafluoroethylene and hexafluoropropylene, such that the fluoropolymer has an amount of fluorine up to 75 wt %,

(b) from 1 to 20 percent by weight of conductive particulate component comprising conductive carbon black particles, and

(c) from 0.1 to 20 percent by weight, to reduce melt defecting of the composition of a polymer component comprising a polymer of ethylene and/or propylene.

5,552,200
PAPER NAPKIN
Arnold Gureff, 41-09 41st St., Sunnyside, N.Y. 11104
Filed Apr. 18, 1995, Ser. No. 423,364
Int. Cl.[6] B32B *3/10;7/14*
U.S. Cl. 428—41.9 **9 Claims**



1. A napkin, comprising:

three rectangular layers including a top, middle and bottom layer attached together and having a first and second fold line which divide the napkin into four substantially equal sized sections and facilitate storage of the napkin in a folded configuration;

said first fold line extending the length of the napkin and said second fold line extending the width of the napkin so that said first and second fold lines intersect at substantially the center point of the napkin;

said top layer being absorbent to soak up and catch any spilled substance;

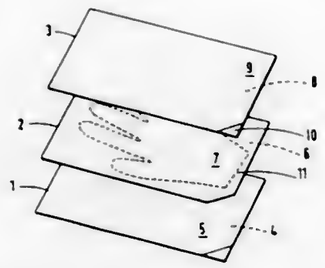
said middle layer fixed between said top and bottom layers and being moisture resistant to prevent the spilled substance from passing through the napkin; and

said bottom layer including a plurality of adhesive strips for attaching and securing the napkin to its user's garment upon removal of a cover attached to each adhesive strip to expose each strip's adhesive surface, said adhesive strips being concealed when the napkin is in its said folded configuration.

5,552,201
PROTECTIVE DEVICES
Donald M. Burgess, and Nicholas P. R. Legh-Heppel, both of London, England, assignors to Universal Shield Ltd., Wiltshire, England
Continuation of Ser. No. 825,302, Jan. 24, 1992, abandoned, which is a continuation of Ser. No. 457,739, Jan. 16, 1990, abandoned. This application May 16, 1994, Ser. No. 243,557
Claims priority, application United Kingdom, Jul. 14, 1987, 8716568; Sep. 30, 1987, 8722963; Apr. 14, 1988, 8808861
Int. Cl.[6] C09J *7/02*
U.S. Cl. 428—43 **8 Claims**

1. A protective device, comprising;

covering means for covering only part of a user's hand, the covering means comprising a single sheet of material having:



at least a general shape of a user's hand to conform to the shape of at least part of the user's hand;

adhesive attachment means on a first surface for attaching the sheet of material to the user's hand, the adhesive attachment means consisting only of a pressure-sensitive adhesive on at least a portion of the first surface, whereby placing the user's hand on the adhesive retains the sheet of material on the user's hand with the adhesive; and

a second surface opposite the first surface of the sheet of material for contacting an article while the sheet of material is attached to the user's hand.

5,552,202

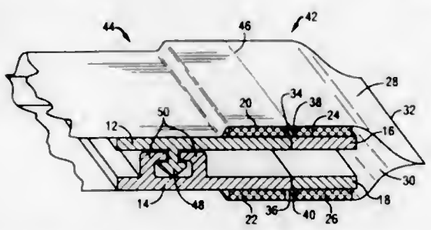
TEAR GUIDE ARRANGEMENT

Timothy J. May, Greenville, Wis., assignor to Reynolds Consumer Products Inc., Appleton, Wis.

Filed Jul. 11, 1995, Ser. No. 501,221

Int. Cl.[6] B65D *17/40*

U.S. Cl. 428—43 **14 Claims**



1. A tear guide arrangement for opening a package from a sealed form, the package having first and second opposing films, said tear guide arrangement comprising:

first and second opposing base strips disposed between the first and second films and adapted for attachment to the respective first and second films, said first base strip having upper and lower sides and said second base strip having upper and lower sides, said first and second base strips being composed of a first polymeric material;

first and second opposing tear guide strips disposed generally parallel to and co-planar with said respective first and second base strips, said first and second tear guide strips being detachably connected to said upper sides of said respective first and second base strips to form respective breakable bonds, said first and second tear guide strips being composed of a second polymeric material which is stiffer than said first polymeric material; and

sealant material disposed between said first tear guide strip and the first film for firmly attaching said first tear guide strip to the first film, and disposed between said second tear guide strip and the second film for firmly attaching said second tear guide strip to the second film.

5,552,203

MAGNETIC DISK HAVING A PROTECTIVE LAYER OF SPUTTERED PARTICLES OF TWO DIFFERENTLY CONTROLLED GRAIN SIZES

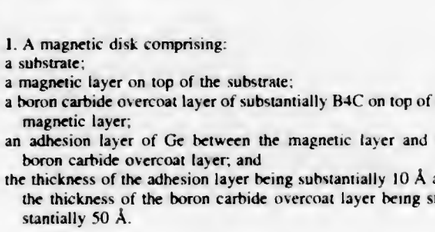
Eiji Takaike, Kawasaki, Japan, assignor to Fujitsu Limited, Japan

Division of Ser. No. 120,149, Sep. 10, 1993, Pat. No. 5,486,276. This application Dec. 30, 1994, Ser. No. 367,055

Claims priority, application Japan, Sep. 10, 1992, 4-241790; Sep. 29, 1992, 4-259513

Int. Cl.[6] G11B *5/72*

U.S. Cl. 428—65.5 **4 Claims**



1. A magnetic disk comprising a nonmagnetic substrate, at least one underlayer applied to the substrate, a layer of magnetic material applied to said at least one underlayer, and a protective layer applied to the layer of magnetic material, said protective layer being formed by a sputtering treatment and comprising at least two kinds of sputtered particles having differently controlled grain sizes and mixed with each other, wherein one kind of said two kinds of sputtered particles has a grain size at least two times greater than the grain size of the second kind of sputtered particles.

5,552,204

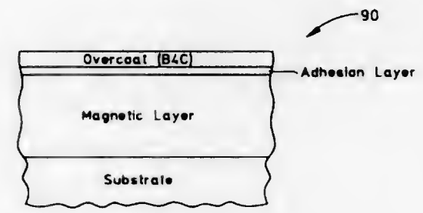
MAGNETIC DISK WITH BORON CARBIDE OVERCOAT LAYER

Richard H. Ahlert, San Jose; James K. Howard, Morgan Hill; Muhammad I. Ullah, Morgan Hill, and Richard D. Umphress, Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 13, 1995, Ser. No. 372,410

Int. Cl.[6] G11B *5/72*

U.S. Cl. 428—65.5 **7 Claims**



1. A magnetic disk comprising:

a substrate;

a magnetic layer on top of the substrate;

a boron carbide overcoat layer of substantially B4C on top of the magnetic layer;

an adhesion layer of Ge between the magnetic layer and the boron carbide overcoat layer; and

the thickness of the adhesion layer being substantially 10 Å and the thickness of the boron carbide overcoat layer being substantially 50 Å.

5,552,205

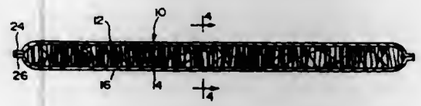
BATTING FILLED INFLATABLE BODY AND METHOD OF MAKING THE SAME

James M. Lea, Seattle, Wash., assignor to Cascade Designs, Inc., Seattle, Wash.

Division of Ser. No. 895,085, Jun. 30, 1992, abandoned, which is a division of Ser. No. 451,463, Dec. 15, 1989, Pat. No. 5,152,018. This application Mar. 21, 1994, Ser. No. 215,158

Int. Cl.[6] B32B *1/06;5/02*

U.S. Cl. 428—74 **8 Claims**



1. An inflatable body comprising:

(a) an air impervious envelope having first and second sheets of substantially flexible and non-stretchable material joined to one another at perimeter portions thereof and defining a chamber, said first and second sheets each having an interior and exterior surface;

(b) a valve mounted to said envelope to permit air ingress to and egress from said chamber;

(c) a resilient, fiber batt core positioned within said chamber, said core having a planar configuration with first and second batt surfaces, having length and width dimensions substantially in excess of its thickness dimension, and having tensile elements extending from said inner surface of said first sheet to said inner surface of said second sheet to define the separation therebetween, the resiliency of said tensile elements causing said tensile elements to straighten and thereby urge said first and second sheets apart until said tensile elements are fully extended, thus preventing further separation thereof,

said batt core being substantially continuous throughout said chamber and having said first and second surfaces thereof securely bonded to said first and second sheets of said envelope with a bonding strength adequate to resist tension forces imparted by internal air pressure resulting from compression loading on the body.

5,552,206

NON-WOVEN COMPOSITE INTERLINING FABRIC

Jürgen Knoke, Weinheim, and Manfred Jöst, Hemsbach, both of, Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Filed Feb. 13, 1995, Ser. No. 388,000

Claims priority, application Germany, Mar. 16, 1994, 44 08 813.2

Int. Cl.[6] B32B *7/14*

U.S. Cl. 428—102 **19 Claims**

1. A method for manufacturing a non-woven composite interlining fabric which is capable of being fused on by means of an adhesive substance, comprising the steps of: selecting a non-woven fabric having a weight of 10 to 40 g/m^2; reinforcing the fabric by interweaving it with textured warp yarn which has an initial elongation of 10 to 35%, the weight ratio of warp yarn to non-woven fabric being from 1:3 to 3:1, the thread count of the warp yarn being from 3 to 25/inch (1.8 to 9.84/cm); subjecting the resulting composite fabric, without tension, to a complete shrinking process up to a final elongation of 50 to 120% in the longitudinal direction; thermofixing the fabric while simultaneously smoothing its surface; and coating the fabric with melting adhesive.

5,552,207

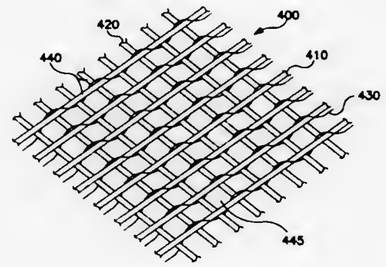
OPEN GRID FABRIC FOR REINFORING WALL SYSTEMS, WALL SEGMENT PRODUCT AND METHODS OF MAKING SAME

John F. Porter, St. Catharines; Mark O. Kittson, Niagara Falls; Mark Tucker, Waubaushene; Larry Ferris, and Steve LePage, both of Midland, all of, Canada, assignors to Bay Mills Limited, St. Catharines, Canada

Division of Ser. No. 87,263, Jul. 8, 1993, abandoned, which is a continuation-in-part of Ser. No. 976,642, Nov. 16, 1992, abandoned, which is a continuation of Ser. No. 861,166, Mar. 27, 1992, abandoned, which is a continuation of Ser. No. 548,240, Jul. 5, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 480,331

Int. Cl.[6] B32B *5/12*

U.S. Cl. 428—109 **36 Claims**



1. An impact resistant wall segment product comprising:

rigid insulation board;

a stucco coating mixture; and

a high strength, alkali and impact resistant, resin-coated open grid wall reinforcement fabric comprising:

a first set of substantially parallel impact resistant rovings comprising an effective impact-resisting amount of a direct-sized silane sizing, having a linear density between 130 and 400 grams per thousand meters, and being arranged in the set at an average of 1.5 to 12 ends per inch;

a second set of substantially parallel impact resistant rovings comprising an effective impact-resisting amount of a direct-sized silane sizing, having a linear density between 130 and 400 grams per thousand meters, and being arranged in the set at an average of 1.5 to 12 ends per inch;

the first and second sets of rovings being arranged next to each other with the rovings of one set being arranged at a substantial angle to the rovings of the other set, without compressing rovings of one set between rovings of the other set, to form an open grid fabric wall reinforcement weighing between 50 to 650 gm/square meter to provide strength and impact resistance to the wall segment product; and

an effective impact-resisting amount of polymeric coating on the rovings of the wall reinforcement at a level of 10 to 150 parts dry weight of resin to 100 parts by weight of the open grid fabric wall reinforcement,

the stucco coating mixture being affixed to the insulation board and binding the fabric to the board by penetrating the openings between the rovings to the board, filling the openings in the open grid and covering the reinforcement fabric, such that the open grid fabric is embedded in the stucco coating mixture and provides impact resistance to the wall segment product.

5,552,208

HIGH STRENGTH COMPOSITE

Leroy C.-T. Lin, Richmond; Laura G. Wilson; Ashok Bhatnagar, both of Chester, all of Va., and Hsin L. Li, Parsippany, N.J., assignors to AlliedSignal Inc., Morristown, N.J.

Filed Oct. 29, 1993, Ser. No. 148,732

Int. Cl.[6] B32B *5/12;* **D04H** *3/02;* **F41H** *1/02*

U.S. Cl. 428—113 **23 Claims**

1. An article comprising at least one consolidated network of high strength fibers in a matrix composition, the high strength fibers having a tenacity of at least about 7 g/d, a tensile modulus of at least about 150 g/d and an energy-to-break of at least about 8 J/g, wherein prior to consolidation the matrix composition comprises at least one thermoset vinyl ester, diallyl phthalate, and at least one carbon-carbon saturated solvent, said solvent being substantially removed during consolidation, and said thermoset vinyl ester having a tenacity of about 10,000 to 50,000 psi (6.9×10^4 to 3.4×10^5 kPa), a tensile modulus of about 1×10^6 to 3×10^6 psi (6.9×10^6 to 2.1×10^7 kPa), a T_G of less than about 165° C., and an elongation-to-break of about 2 to 1.4%.

5,552,209

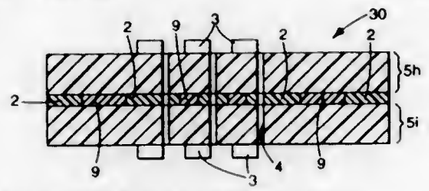
INTERNALLY DAMPED CIRCUIT ARTICLES

Jeffrey W. McCutcheon, Eagan, Minn., assignor to Minnesota Mining & Manufacturing Company, Saint Paul, Minn.

Filed Jul. 29, 1994, Ser. No. 283,096

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—209 **37 Claims**



1. An internally damped circuit article comprising:
(a) a circuit article laminate structure; and
(b) vibration damping material, wherein the vibration damping material is incorporated into the circuit article laminate structure.

5,552,210

CERAMIC FILLED COMPOSITE POLYMERIC ELECTRICAL SUBSTRATE MATERIAL EXHIBITING HIGH DIELECTRIC CONSTANT AND LOW THERMAL COEFFICIENT OF DIELECTRIC CONSTANT

Allen F. Horn, III, Danielson, Conn.; Robert L. Bush, Phoenix, Ariz., and Michael E. St. Lawrence, Thompson, Conn., assignors to Rogers Corporation, Rogers, Conn.

Filed Nov. 7, 1994, Ser. No. 335,510

Int. Cl.[6] B32B *3/00*

U.S. Cl. 428—209 **28 Claims**

1. An electrical substrate composite material comprising:
(1) a polymeric matrix;
(2) particulate ceramic filler material, said filler material comprising a mixture of;
(a) at least one first ceramic material having a a K'>30 and a TCK'<−300 ppm/°C., said mixture of ceramic fillers being proportioned in a ratio effective to provide the composite material with a K' of ≧5 and an absolute value TCK' of ≦200 ppm/°C.; and
(b) at least one second ceramic material having K'<30 and a TCK'>0 ppm/°C.

5,552,211

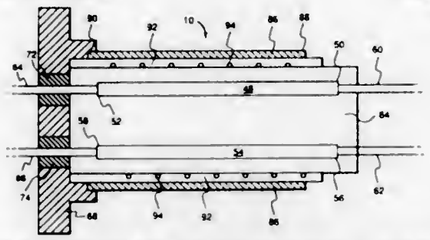
CERAMIC SUPERCONDUCTING LEAD RESISTANT TO BREAKAGE

Robert A. Ackermann, Schenectady; Kenneth G. Herd, Niskayuna; Evangelos T. Laskaris, Schenectady, and Richard A. Ranze, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 329,919, Oct. 27, 1994, abandoned. This application May 12, 1995, Ser. No. 440,159

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—209 **1 Claim**



1. In combination with a superconductive device cooled by a cryocooler coldhead having a first stage and a second stage, a superconductive lead assembly comprising:
a) a first ceramic superconductive lead having a first end thermally connected to said first stage and a second end thermally connected to said second stage;
b) a jacket comprising an open cell material having a coefficient of thermal conductivity not exceeding that of glass reinforced epoxy at a temperature of 50 Kelvin, said jacket in surrounding compressive contact with said first ceramic superconductive lead;
c) a rigid support tube surrounding said jacket, having a coefficient of thermal conductivity not exceeding that of stainless steel at a temperature of 50 Kelvin, having a first end, and having a second end thermally connected to said second stage;
d) a glass-reinforced-epoxy jacket overwrap in general surrounding contact with and attached to said jacket, and wherein said rigid support tube is in general surrounding contact with and attached to said glass-reinforced-epoxy jacket overwrap; and
e) a metallic wire disposed within said rigid support tube and generally helically wound around said jacket binding it, wherein said metallic wire has a coefficient of thermal expansion generally equal to that of said rigid support tube, and wherein said glass-reinforced-epoxy jacket overwrap is also attached to said metallic wire.

5,552,212

HIGH BARRIER FILM COMBINATION

Anthony R. Knoerzer, Fairport, N.Y., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 13, 1990, Ser. No. 627,113

Int. Cl.[6] B32B *7/02;27/30;27/32*

U.S. Cl. 428—213 **4 Claims**

1. A film combination comprising a pair of polymeric substrate films, at least one side of each having been treated so as to have a surface free energy of at least about 35 dynes/cm; each said at least one side having a primer coating thereon; each primer coating carrying a layer of poly(vinylalcohol) containing cross-linking means; each film of said pair having been positioned with the poly(vinylalcohol) layers in intimate contacting relationship before any substantial cross-linking occurred.

5,552,213

REFRACTORY FIBER STRUCTURES

Axel Eschner, Wiesbaden, Germany, assignor to Didier-Werke AG, Wiesbaden, Germany

Continuation of Ser. No. 73,064, Jun. 8, 1993, abandoned. This application Dec. 30, 1994, Ser. No. 366,446

Claims priority, application Germany, Aug. 26, 1992, 42 28 355.8

Int. Cl.[6] D04H *1/04;* **C04B** *35/02;* **C03C** *13/06*

U.S. Cl. 428—283 **6 Claims**

1. A refractory molding which comprises (1) inorganic fibers, wherein (a) at least 90% by weight of each inorganic fiber comprises 20–50% by weight of CaO and 50–80% by weight of Al_2O_3, based on the weight of the fiber, (b) each inorganic fiber contains up to 10% by weight of impurity oxides, including 0–1.5% by weight of SiO_2 based on the weight of the fiber, (c) the fibers have a maximum diameter of 10 μm, and (d) the fibers have a property such that when the fibers come into contact with water for two days, the fibers are nearly completely hydrated and decomposed, and (2) refractory additives.

5,552,214

UNIDIRECTIONAL PREPREG AND CARBON FIBER REINFORCED COMPOSITE MATERIALS COMPRISING PITCH-BASED CARBON FIBERS AND POLYACRYLONITRILE-BASED CARBON FIBERS

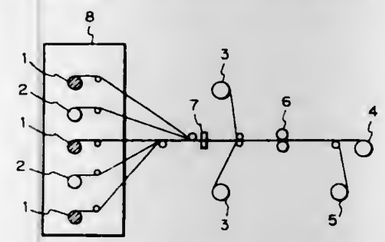
Kenji Kobomura; Hiromi Kimura; Hideo Osone, all of Kawasaki; Mikio Shima, Kimitsu; Michiya Hayashida, and Nobuyuki Tsuji, both of Kawasaki, all of, Japan, assignors to Nippon Steel Corporation, and Nippon Steel Chemical Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 13,442, Feb. 4, 1993, abandoned. This application May 3, 1995, Ser. No. 433,599

Claims priority, application Japan, Feb. 7, 1992, 4-022221; Feb. 19, 1992, 4-031888; Jun. 1, 1992, 4-140617; Jun. 1, 1992, 4-140618

Int. Cl.[6] D04H *3/02;* **B32B** *5/06;29/02;* **B05D** *3/02*

U.S. Cl. 428—294 **8 Claims**



1. A unidirectional prepreg comprising at least one bundle of (A) pitch-based carbon fibers and at least one bundle of (B) polyacrylonitrile-based carbon fibers arranged unidirectionally and adjacent to each other and a resin impregnated into said arranged at least one bundle of pitch-based carbon fibers (A) and at least one bundle of polyacrylonitrile carbon fibers (B); said pitch-based carbon fibers having a modulus in tension of not less than 400 GPa, a tensile strength of not less than 2000 MPa, a compressive strength as a unidirectionally reinforced composite material of 100 MPa to 800 MPa, and a fiber diameter of 4 μm to 15 μm, said polyacrylonitrile-based carbon fibers (B) having a modulus in tension of not less than 200 GPa, compressive strength and compression strain at failure as a unidirectionally reinforced composite material higher than those of said pitch-based carbon fibers (A), and a fiber diameter smaller than that of said pitch-based carbon fibers (A).

5,552,215

FIBER REINFORCED GLASS MATRIX COMPOSITES WITH SECONDARY MATRIX REINFORCEMENT

William K. Tredway, Manchester; Craig W. Musson, Wethersfield, both of Conn., and Otis Y. Chen, Tokyo, Japan, assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 9, 1991, Ser. No. 774,756

Int. Cl.[6] B32B *17/02;33/00*

U.S. Cl. 428—298 **7 Claims**

1. A fiber reinforced glass matrix composite, comprising a glass or glass-ceramic matrix and a plurality of primary continuous or discontinuous reinforcing fibers dispersed in the matrix, characterized in that:
the composite further comprises a plurality of discontinuous secondary reinforcing fibers dispersed in the matrix such that the secondary reinforcing fibers fill regions of the matrix not filled with the primary reinforcing fibers, wherein the secondary reinforcing fibers are shorter than the primary fibers, wherein the secondary reinforcing fibers are about 0.5 mm to about 2 mm long.

5,552,216

ELECTRICALLY CONDUCTIVE COMPOSITION

Toshiya Sugimoto; Minoru Suezaki; Tokushige Shitiri, and Kouji Maruyama, all of Osaka, Japan, assignors to Sekisui Chemical Co., Ltd., Osaka, Japan

Filed Oct. 6, 1993, Ser. No. 132,315

Claims priority, application Japan, Oct. 7, 1992, 4-268509; Feb. 18, 1993, 5-028866; Mar. 12, 1993, 5-051991

Int. Cl.[6] B32B *5/16;27/30;* **H01B** *1/20*

U.S. Cl. 428—328 **6 Claims**

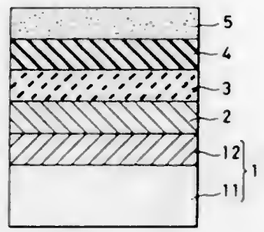
1. An electrically conductive composition comprising 100 parts by weight of a (meth)acrylate compound possessing at least two(meth)acryloyl groups, 5 to 100 parts by weight of an anilinic electrically conductive polymer composed of a salt of anilinic polymer and a dopant which is an unsaturated compound possessing at least one group selected from the group consisting of phosphoric acid group and sulfonic acid group, and 0.1 to 20 parts by weight of a photopolymerization initiator sensitized by active rays.

4. An antistatic form forming a coating layer made of a composition according to claim 1, on the surface of a form.

5,552,217
MAGNETIC RECORDING MEDIUM AND A METHOD FOR PRODUCING IT

Kiyoto Yamaguchi; Hisashi Yamasaki, and Yoshifumi Matsui, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 595,591, Oct. 11, 1990, abandoned. This application Jun. 10, 1993, Ser. No. 74,720
Claims priority, application Japan, Oct. 20, 1989, 1-273207; Dec. 25, 1989, 1-336060; Feb. 23, 1990, 2-43063
Int. Cl.[6] G11B 5/66; B32B 5/16
U.S. Cl. 428—332 **11 Claims**



1. A magnetic recording medium, comprising:
a non-magnetic substrate;
a non-magnetic metal primary layer formed on said substrate, said non-magnetic metal primary layer being made of chromium and having a thickness of 500 to 3400 Å;
a thin film ferromagnetic alloy layer formed on said primary layer and made of an alloy composed of not more than 15 at % of chromium, not more than 12 at % of platinum, 0.3 to 4.7 at % of hafnium, and the balance cobalt, said ferromagnetic alloy layer having a thickness of 250 to 800 Å, a coercive force of not less than 1500 Oe, and a squareness ratio of not less than 0.85; and
a protective layer formed on said ferromagnetic alloy layer.

5,552,218
POLYKETONE YARN AND A METHOD OF MAUFACTURING SAME

Hendrik T. Maat, Rijssen; Peter J. Cloos, Dulven; Harm Van Der Werff, Ede, and Bert J. Lommerts, Dieren, all of, Netherlands, assignors to Akzo Nobel N.V., Arnhem, Netherlands

PCT No. PCT/EP93/01586, § 371 Date Dec. 21, 1994, § 102(e) Date Dec. 21, 1994, PCT Pub. No. WO94/00623, PCT Pub. Date Jan. 6, 1994
PCT Filed Jun. 21, 1993, Ser. No. 360,703
Claims priority, application Netherlands, Jun. 26, 1992, 9201141
Int. Cl.[6] D02G 3/00
U.S. Cl. 428—357 **7 Claims**

1. A yarn comprising a linear polymer of alternating ethylene and carbon monoxide units, wherein the yarn is spun in a single step, the yarn has a maximum tangential modulus, at an elongation of more than 0.2%, of at least 10 N/tex, the yarn has a quality number, according to the formula $\sigma.\epsilon$, higher than 85 mN/tex and the yarn comprises at least 30 filaments which are spun simultaneously through one spinneret.

5,552,219
MULTIFILAMENT YARNS OF THERMOPLASTIC POLYMERS BASED ON TETRAFLUOROETHYLENE, AND FIBERS OBTAINED THEREFROM

Giandomenico Vita, Como; Giuseppe Ajroldi, Milano, and Mario Miani, Rho, all of, Italy, assignors to Ausimont S.p.A., Italy

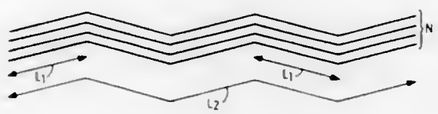
Division of Ser. No. 144,189, Oct. 27, 1993, Pat. No. 5,460,882. This application Jun. 1, 1995, Ser. No. 457,095
Claims priority, application Italy, Oct. 29, 1992, MI92A2476
Int. Cl.[6] D02G 3/00
U.S. Cl. 478—357 **2 Claims**

1. A non-drawn multifilament yarn of a thermoplastic polymer based on tetrafluoroethylene, with a Melt Flow Index (MFI) from 7 g/10' to 16.3 g/10' according to ASTM D2116 standard, said multifilament yarn consisting of a plurality of filaments produced by extruding said thermoplastic polymer through an extrusion die having a plurality of holes with a hole density of from 10 to 300 holes/cm^2, cooling said extruded polymer, and directly obtaining said yarn from the cooled extruded polymer,
wherein each filament of said multifilament yarn has a diameter between 10 and 150 μm, an ultimate tensile strength from 9.8 to 45 MPa at 200° C. which is at least double with respect to the ultimate tensile strength of a specimen of the same polymer obtained by compression molding according to the ASTMD3307 or ASTM D2116 standard, and a maximum shrinkage at 200° C. lower than 10%.

5,552,220
METHOD OF MANUFACTURING A COMPOSITE MATERIAL HAVING A PYROLYTIC CARBON INTERPHASE OF LAMELLAR MICROTEXTURE BETWEEN REINFORCING FIBERS AND A MATRIX, AND A MATERIAL AS OBTAINED BY THE METHOD

Stéphane Goujard; Pascal Dupel, both of Merignac; René-Pailler, Cestas, and Xavier Bourrat, Bordeaux, all of, France, assignors to Societe Europeene de Propulsion, Suresnes, France

Filed May 16, 1994, Ser. No. 243,633
Claims priority, application France, May 24, 1993, 93 06139
Int. Cl.[6] C23C 16/00; 16/26; B32B 9/00
U.S. Cl. 428—367 **5 Claims**



1. A method of manufacturing a composite material in which fiber reinforcement is densified by means of a matrix, the fibers being provided with a layered interphase coating of anisotropic pyrolytic carbon obtained by chemical vapor infiltration or deposition, wherein the pyrolyric carbon layered interphase is formed on the reinforcing fibers inside a chamber in which a plurality of successive cycles is performed, each cycle comprising: injecting a reaction gas in which the pyrolyric carbon precursor is selected from alkanes, excluding methane taken as a sole component, alkenes, alkynes, and aromatic hydrocarbons, and mixtures thereof; maintaining the gas inside the chamber for a first time period to form an interphase layer of controlled thickness of less than 10 nanometers, and evacuating the gaseous reaction products during a second time period; the cycles being performed in the chamber until the thickness desired for the interphase has been obtained, thereby achieving a layered interphase that is highly anisotropic, whose lattice fringe texture has distorted fringes of total length not less than 4 nanometers on average with maximum values exceeding 10 nanometers.

5,552,221
POLYBENZAZOLE FIBERS HAVING IMPROVED TENSILE STRENGTH RETENTION

Ying H. So; Steven J. Martin; Chieh-Chun Chau; Ritchie A. Wessling; Ashish Sen, all of Midland, Mich., and Katsuhiko Kato, Ikeda, Japan, assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 29, 1994, Ser. No. 366,346
Int. Cl.[6] B32B 5/02; C08G 73/22
U.S. Cl. 428—373 **22 Claims**

1. A method for preparing a polybenzazole filament which comprises extruding a polybenzazole dope filament, drawing the filament across an air gap, washing the filament, and drying the filament, characterized in that a solution of a compound selected from the group consisting of ferrocenes, ruthocene, iodide-, cobalt-, and copper-containing compounds, dyes, and mixtures thereof is contacted with a filament subsequent to the washing step and prior to the drying step.

5,552,222
ELECTRICALLY CONDUCTIVE ARTICLES COMPRISING INSULATION RESISTANT TO CORONA DISCHARGE-INDUCED DEGRADATION

Donald A. Bolon, Charlton, and Patricia C. Irwin, Altamont, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 27, 1995, Ser. No. 379,812
Int. Cl.[6] B32B 9/00
U.S. Cl. 428—379 **16 Claims**

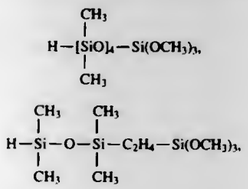
1. An article comprising a stator bar or tie bar for a turbine generator, said stator bar or tie bar having an insulating coating on its surface, said coating comprising an inner layer comprising a heat-resistant non-silicon-containing thermoplastic first polymer which is a polyimide, polyphthalamide, polyetherketone or polyethersulfone and an outer layer comprising a second polymer having at least about 30% by weight of polyorganosiloxane units.

5,552,223
ORGANOPOLYSILOXANE MODIFIED POLYESTERS AND METHOD OF THE PREPARATION THEREOF

Ryuzo Mikami, and Isao Ona, both of Chiba Prefecture, Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Division of Ser. No. 143,678, Oct. 27, 1993. This application May 19, 1995, Ser. No. 446,175
Claims priority, application Japan, Oct. 30, 1992, 4-315652
Int. Cl.[6] B32B 9/00
U.S. Cl. 428—391 **16 Claims**

1. An organopolysiloxane-modified polyester prepared by a process comprising the step of:.
(I) reacting a mixture of:
(A) an aliphatically unsaturated polyester having a number average molecular weight of 300 to 15,000;
(B) an organopolysiloxane having at least one silicon-bonded hydrogen atom in its molecule; and
(C) a silicon compound selected from the group consisting of



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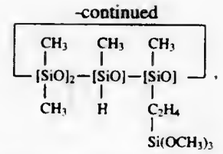


trimethoxysilane, methyldimethoxysilane, triacetoxysilane, and tri(methyl ethyl ketoxime)silane in the presence of:
(D) a hydrosilylation-reaction catalyst to form a reaction product, with the proviso that (B) is free of silicon-bonded hydrolyzable groups.

5,552,224
CARBONATE BLEND POLYMER COMPOSITIONS COMPRISING A HIGH MOLECULAR WEIGHT BRANCHED CARBONATE POLYMER COMPONENT AND METHODS FOR THEIR PREPARATION

Michael K. Laughner, and Maurice J. Marks, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 22, 1993, Ser. No. 156,174
Int. Cl.[6] C08L 69/00
U.S. Cl. 428—401 **33 Claims**

1. A carbonate polymer blend composition comprising a first high molecular weight branched carbonate polymer component and a second, different carbonate polymer component having a lower molecular weight than the first component, characterized in that the first high molecular weight branched carbonate polymer component is themally stable at a temperature at least 100° C. above the Tg of the carbonate polymer blend composition and that the first high molecular weight branched carbonate polymer component has been prepared from a precursor component with latent reactive moleties selected from the group consisting of arylcyclobutene, cyanate, biphenylene, vinyl, propargyl, acrylic, methacrylic and allyl, in situ after combination with the second carbonate polymer component and has a weight average molecular weight of at least about 99,100.

5,552,225
COATED GRINDING AID PARTICLE

Kwok-Lun Ho, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 538,183, Aug. 23, 1995, abandoned, which is a continuation of Ser. No. 214,394, Mar. 16, 1994, abandoned. This application Nov. 17, 1995, Ser. No. 558,241
Int. Cl.[6] B32B 33/00; B24D 3/34
U.S. Cl. 428—403 **4 Claims**

1. A coated grinding aid particle comprising a grinding aid particle coated with an inert, hydrophobic, hydrocarbon-containing substance selected from the group consisting of fatty acids, fatty salts,and oils.

5,552,226

PROCESS FOR PRETREATING SURFACES OF PLASTIC ITEMS

Siegfried Thurm, Meerbusch; Klaus Sommer, Bergisch Gladbach; Peter Bier, Krefeld; Andreas Elschner, Mülheim/Ruhr; Manfred Kowitz, Moers, and Axel Sandquist, Monheim, all of, Germany, assignors to Bayer AG, Leverkusen, Germany

Division of Ser. No. 302,844, Sep. 16, 1994, Pat. No. 5,487,810. This application Jun. 2, 1995, Ser. No. 459,325

Claims priority, application Japan, Mar. 26, 1992, 42 09 807.6; Mar. 5, 1993, 43 06 971.1

Int. Cl.[6] **B32B** *77/36*

U.S. Cl. 428—412 **8 Claims**

1. Plastic items with a pretreated surface which is free of fluorine, formed by a process for pretreating the surface of plastic items in a low-pressure plasma for the subsequent application of layers, wherein a process gas is used for the low-pressure plasma which contains sulphur hexaflouride (SE_6), further wherein this process gas is kept essentially free of oxygen and the plastic surface is kept free of adsorbed or included fluorine during pretreatment and after said layer is applied to the surface of the plastic item, the adhesion of the applied layer withstands an adhesive tape test with a pull-off force of 7N/cm.

5,552,227

PROCESS OF PRODUCING MULTILAYER COATINGS WITH CATIONIC LAYERS OF PRIMER SURFACE

Wolfgang Göldner, Heiligenhaus, Germany, assignor to Herberts GmbH, Wuppertal, Germany

Continuation of Ser. No. 300,578, Sep. 2, 1994, abandoned, which is a continuation of Ser. No. 147,100, Nov. 4, 1993, abandoned, which is a continuation of Ser. No. 959,897, Oct. 13, 1992, abandoned. This application Mar. 6, 1995, Ser. No. 400,297

Claims priority, application Germany, Oct. 17, 1991, 41 34 301.8

Int. Cl.[6] **B05D** *1/36;1/38*

U.S. Cl. 428—423.1 **9 Claims**

1. Process for producing a multi-layered lacquer coating of a substrate, comprising:

applying a layer of primer,

applying a layer of primer surfacer above the layer of primer,

wherein the layer of primer surfacer comprises a coating agent which contains one or several cationic crosslinking binding agents which are polyacrylate, polyester, polyurethane or epoxide resins or mixtures thereof and which at least in part contain cationic groups and optionally groups which are capable of being converted into cationic groups,

stoving the layer of primer surfacer at a temperature between 100° and 150° C., thereby crosslinking the primer surfacer, and

applying a layer of surface lacquer above the layer of crosslinked primer surfacer.

5,552,228

WATERBORNE MALEINIZED POLYBUTADIENE EMULSION COATING COMPOSITION

James J. Fong, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 2, 1994, Ser. No. 300,639

Int. Cl.[6] **B05D** *3/02;* **B32B** *21/04;27/40;* **C08L** *75/04*

U.S. Cl. 428—425.1 **12 Claims**

1. A waterborne coating composition comprising an emulsion having a continuous aqueous phase and a dispersed organic phase comprising a solution of water-reducible, film-forming, air-drying maleinized polybutadiene polymer in a water-immiscible hydrocarbon solvent,

wherein said polymer is present in an amount ranging from 5 to 40 weight percent, said solvent is present in an amount ranging from 10 to 50 weight percent, and said water is present in an amount ranging from 30 to 80 weight percent, based on the weight of said coating composition.

10. A method comprising coating a surface of a substrate with the coating composition of claim 1 and drying and curing the resulting coated surface in air.

5,552,229

MAGNETIC RECORDING MEDIUM CONTAINING MAGNETIC MATERIAL DISPERSED IN A POLYURETHANEUREA-POLYURETHANE BINDER

Gregor Brodt, Heppenheim; Attila Vass, Munich; Werner Loch, Appenweier; August Lehner, Rödersheim-Gronau; Werner Lenz, Bad Dürkheim, and Norbert Schneider, Altrip, all of, Germany, assignors to BASF Magnetics GmbH, Mannheim, Germany

Filed Sep. 29, 1994, Ser. No. 314,956

Claims priority, application Germany, Sep. 30, 1993, 43 33 292.7

Int. Cl.[6] **G11B** *5/702*

U.S. Cl. 428—425.9 **8 Claims**

1. A magnetic recording medium, consisting of a nonmagnetic substrate and at least one magnetizable layer applied thereon, said magnetizable layer containing a magnetic material dispersed in a binder mixture which contains at least one hydroxyl-containing polyureaurethane and one polyurethaneurea (meth)acrylate, wherein the polyurethaneurea (meth)acrylate is obtained by reacting a poly(meth)acrylate having up to 2 terminal OH groups per mol and a number average molecular weight of from 200 to 50,000 with a mixture of aliphatic polyisocyanates having an average functionality of from 3.0 to 6.0 NCO groups per mol, consisting of

from 0.1 to 10% by weight of a disiocyanate

from 30 to 80% by weight of a triisocyanate and

from 20 to 60% by weight of an isocyanate having a functionality of from 4 to 10,

with the proviso that from 1.2 to 3.0 NCO groups react per OH group and the remaining NCO groups are converted into substitute terminal urea groups by reacting with a polyfunctional amine having amino functions or with a mixture of different polyfunctional amines having amino functions.

5,552,230

Patent Not Issued For This Number

5,552,231

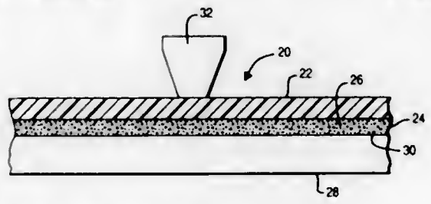
THERMAL TRANSFER RIBBON

Shashi G. Talvalkar, Kettering; Marion E. McCreight, West Carrollton, and Yaoping Tan, Miamisburg, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 46,834, Apr. 13, 1993, abandoned. This application Apr. 11, 1995, Ser. No. 419,979

Int. Cl.[6] **B41M** *5/26*

U.S. Cl. 428—484 **8 Claims**



1. A thermal transfer ribbon, comprising:

a substrate; and

a coating applied on said substrate, said coating containing ingredients for thermally transferring color images onto an image receiving medium upon application of heat to said thermal transfer ribbon, said ingredients comprising poly(ethylene oxide) resin, casein, high density polyethylene, coloring material and carnauba wax.

5,552,232

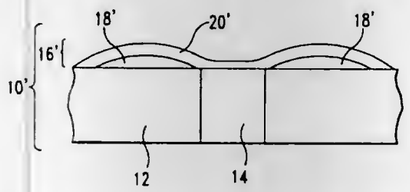
ALUMINUM NITRIDE BODY HAVING GRADED METALLURGY

Jon A. Casey, Poughkeepsie; Carla N. Cordero, Wappingers Falls; Benjamin V. Fasano, New Windsor; David B. Goland, Croton; Robert Hannon, Wappingers Falls, all of N.Y.; Jonathan H. Harris, Scotsdale, Ariz.; Lester W. Herron, Hopewell Junction, N.Y.; Gregory M. Johnson, Poughkeepsie, N.Y.; Niranjan M. Patel, Wappingers Falls, N.Y.; Andrew M. Reitter, Poughkeepsie, N.Y.; Subhash L. Shinde, Croton-on-Hudson, N.Y.; Rao V. Vallabhaneni, Wappingers Falls, N.Y., and Robert A. Youngman, Paradise Valley, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y., and The Carborundum Company, Niagara Falls, N.Y.

Filed Dec. 21, 1994, Ser. No. 361,351

Int. Cl.[6] **B22F** *3/00*

U.S. Cl. 428—547 **10 Claims**



1. An aluminum nitride sintered body having graded metallurgy comprising:

an aluminum nitride sintered body having at least one via therein; and

graded metallurgy on said sintered body and in direct contact with said at least one via, said graded metallurgy comprising a first layer of metallurgy in direct contact with said sintered body and a second layer of metallurgy in direct contact with, and that completely covers, said first layer of metallurgy;

said first layer of metallurgy comprising 30 to 60 volume percent aluminum nitride and 40 to 70 volume percent of

a metal selected from the group consisting of tungsten, molybdenum and mixtures thereof:

said second layer of metallurgy comprising 90 to 100 volume percent of a metal selected from the group consisting of tungsten, molybdenum and mixtures thereof and 0 to 10 volume percent of aluminum nitride;

wherein said first layer of metallurgy is positioned around said at least one via but is not in contact therewith and said second layer of metallurgy is in direct contact with said at least one via.

5,552,233

ARTICLE HAVING A DECORATIVE AND PROTECTIVE MULTILAYER COATING SIMULATING BRASS

Stephen R. Moysan, III, Douglasville, and Rollin W. Sugg, Reading, both of Pa., assignors to Baldwin Hardware Corporation, Reading, Pa.

Filed May 22, 1995, Ser. No. 445,617

Int. Cl.[6] **B32B** *15/04;15/20*

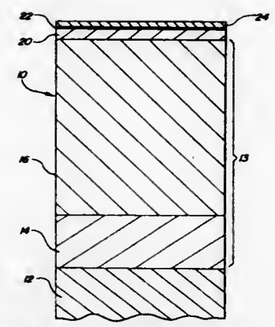
U.S. Cl. 428—627 **42 Claims**

1. An article comprising a metallic substrate having disposed on at least a portion of its surface a multi-layer coating simulating brass comprising:

layer comprised of semi-bright nickel;

layer comprised of bright nickel;

layer comprised of tin-nickel alloy;



layer comprised of zirconium or titanium; and

a top layer comprised of zirconium or titanium compound.

5,552,234

COPPER FOIL FOR PRINTED CIRCUITS

Yoshio Kawasumi, Toda, Japan, assignor to Japan Energy Corporation, Tokyo, Japan

Filed Mar. 24, 1994, Ser. No. 217,263

Claims priority, application Japan, Mar. 29, 1993, 5-091842; Aug. 31, 1993, 5-237181

Int. Cl.[6] **C03C** *27/00;* **B32B** *15/20*

U.S. Cl. 428—633 **7 Claims**

1. A highly thermal oxidation-resistant copper foil for printed circuits comprising:

a copper foil having a shiny side;

a thermal oxidation-resistant layer comprising a Zn—Ni or Zn—Co alloy formed on the copper foil shiny side,

a Cr-base anticorrosive layer formed on the thermal oxidation-resistant layer, and

a copper plating layer between the foil shiny side and the thermal oxidation-resistant layer, said copper foil resisting thermal oxidation of its shiny side at 300° C. for 30 minutes.

5,552,235

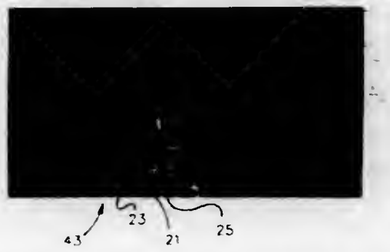
EMBOSSED COLD ROLLED STEEL WITH IMPROVED CORROSION RESISTANCE, PAINTABILITY, AND APPEARANCE

Adel F. Bastawros; John G. Speer, both of Bethlehem, Pa.; Leo J. Deistler, Valparaiso, Ind., and Eugene H. Schuchert, Iowa City, Iowa, assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Mar. 23, 1995, Ser. No. 409,219

Int. Cl.[6] **B32B** *15/18;* **B21B** *27/00*

U.S. Cl. 428—687 **17 Claims**



1. An embossed steel sheet adapted to be painted, the steel sheet comprising:

a plurality of plateaus and corresponding impressions in the steel sheet defining an embossed pattern, each impression having an impression wall connecting the bottom of the impression to an adjacent plateau with the vertical distance between the

adjacent plateau and the bottom of the impression defining the depth of the impression; and wherein the arithmetic average surface roughness of said plateaus is from about 50 to 100 microinches, and the maximum depth of said impressions is from about 0.0025 to 0.0032 inches thereby improving corrosion resistance and providing a consistent and aesthetically pleasing appearance of the embossed steel sheet when painted.

5,552,236

ORGANIC MAGNETIC FILM AND METHOD OF MANUFACTURING THE SAME

Tadashi Ohtake, Neyagawa; Norihisa Mino, Setsu, and Kazufumi Ogawa, Hirakata, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 3, 1993, Ser. No. 25,662
Claims priority, application Japan, Mar. 16, 1992, 4-055944
Int. Cl.[6] G11B *5/66; C09J 5/02;* **B05D** *5/12*
U.S. Cl. 428—692 **15 Claims**

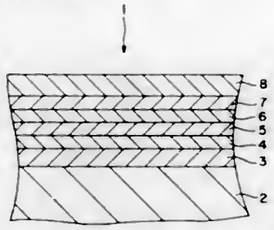
1. A chemical adsorption magnetic film, consisting essentially of molecules fixed directly or indirectly to a substrate by covalent bonding through at least one atom selected from the group consisting of Si, Ge, Sn, Ti, Zr, S and C, wherein unpaired electrons on a metal or radical are provided in the film.

5,552,237

MAGNETOOPTICAL RECORDING MEDIUM

Hajime Utsunomiya, and Masanori Kosuda, both of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Mar. 10, 1993, Ser. No. 29,394
Claims priority, application Japan, Sep. 30, 1992, 4-285440
Int. Cl.[6] G11B *5/66*
U.S. Cl. 428—634 ML **11 Claims**



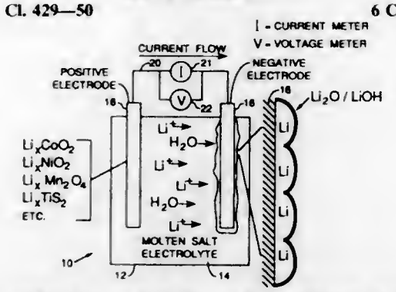
1. A magneto-optical recording medium, comprising:
a first dielectric layer, a recording layer, a second dielectric layer, a metal reflective layer, and a protective coat on a substrate in the described order,
said first dielectric layer is thinner than the thickness Tmin corresponding to the minimum reflectivity in the reflectivity versus thickness curve of the first dielectric layer measured at the selected wavelength, and said first dielectric layer has a refractive index of 1.8 to 2.3,
said recording layer contains a rare earth element including terbium (Tb), iron (Fe), cobalt (Co) and Chromium (Cr),
the content of Tb being 5 to 23 at %, the content of Co being 5 to 15 at %, the content of Cr being 2 to 10%, an atomic ratio of Co/Cr being 1/2 to 5/1, and the total content of said rare earth element Fe, Co and Cr and being 100 at %,
said recording layer operating in a magnetic field modulation mode using recording light having a wavelength in the range of 400 to 900 nm; and
said medium has a light reflectivity of at least 15% at the selected wavelength.

5,552,238

STABILIZED RECHARGEABLE CELL IN MSE AND METHOD THEREFOR

Richard T. Carlin, Colorado Springs, Colo., and Joan Fuller, Raleigh, N.C., assignors to United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 26, 1995, Ser. No. 494,425
Int. Cl.[6] H01M *10/38*
U.S. Cl. 429—50 **6 Claims**



1. A method for preparing and operating a stabilized rechargeable cell having a negative electrode and a molten salt electrolyte (MSE) comprising:
a) adding BF_4^- anions to EMI^+ cations to obtain a melt of $EMIBF_4$ in said MSE,
b) adding $LiBF_4$ to said melt,
c) adding H_2O to said melt,
d) applying a charging potential to said negative electrode to drive Li^+ ions from said melt to plate out as Li metal on said negative electrode and
also to form a lithium salt film on the Li metal surface that protects such metal from reacting with said melt, which film is permeable to Li^+ ions and
e) continuing to apply said charging potential to drive Li^+ ions from said melt through said film, to plate out more Li metal on said negative electrode and build up as more metal under said film.

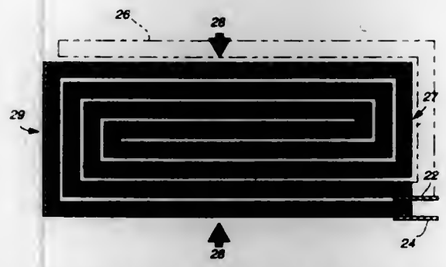
5,552,239

RECHARGEABLE BATTERY STRUCTURE AND METHOD OF MAKING SAME

Antoni S. Gozdz, Tinton Falls; Caroline N. Schmutz, Eatontown; Jean-Marie Tarascon, Martinsville, and Paul C. Warren, Far Hills, all of N.J., assignors to Bell Communications Research, Inc., Morristown, N.J.

Filed Aug. 29, 1994, Ser. No. 297,349
Int. Cl.[6] H01M *10/38*
U.S. Cl. 429—94 **15 Claims**

1. A rechargeable battery comprising a flexible laminate electrolytic cell in which a hybrid electrolyte/separator layer of polymer composition comprising one or more plasticizers is interposed between positive and negative electrode layers of lithium-ion-intercalating plasticized polymer compositions bearing respective current collector foils
characterized in that



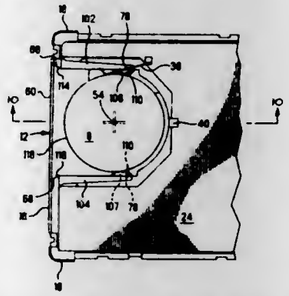
a) said battery comprises an elongate cell having two longitudinal ends folded upon itself about a first transverse fold at its longitudinal mid-region to enclose in facing contact with each other within the resulting structure substantial areas of one said electrode layer and its associated collector foil; and
b) substantial areas of the other said electrode layer and its associated collector foil are in facing contact with each other throughout said structure.

5,552,240

BATTERY OPERATED COMPONENT WITH REMOVABLE BATTERY HOLDER

Michael P. Derstine, Winston-Salem, N.C., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Oct. 25, 1994, Ser. No. 328,636
Int. Cl.[6] H01M *2/10*
U.S. Cl. 429—96 **7 Claims**



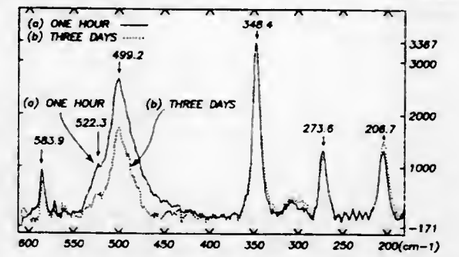
1. A battery powered electrical device having an outer case with a first opening therein, an electrical component within said outer case adjacent said first opening, a battery, and a holder for holding and positioning said battery within said first opening in electrical engagement with said component,
said holder comprising:
(a) a body having top and bottom opposite major surfaces, a front surface and two opposite side surfaces each being vertically disposed and extending between said top and bottom major surfaces;
(b) a second opening through said body intersecting said top and bottom surfaces, having an axis that is perpendicular to said top surface, wherein said second opening is adapted for receiving said battery therein when said battery is moved along said axis toward said second opening;
(c) two depressions, one depression in each of said two side surfaces, positioned further from said front surface than is said axis, and
(d) first and second beveled surfaces, one of which is between one of said two side surfaces and said front surface and the other of which is between the other of said two side surfaces and said front surface, so that said first and second beveled surfaces mutually diverge toward said front surface, and wherein said case includes mating beveled surfaces that engage said first and second beveled surfaces for limiting lateral movement thereof with respect to said case when said holder is latched within said first opening,
wherein said outer case includes a pair of arms attached thereto extending cantilevered into said first opening on opposite sides thereof, each arm having a projection on its free end, one of which extends into one of said depressions and the other of which extends into the other of said depressions thereby latching said holder within said first opening and holding said battery in said electrical engagement with said component.

5,552,241

LOW TEMPERATURE MOLTEN SALT COMPOSITIONS CONTAINING FLUOROPYRAZOLIUM SALTS

Gleb Mamantov, deceased, late of Knoxville, Tenn.; Josip Caja, Knoxville, and Thanthrimudalige D. J. Dunstan, Oak Ridge, both of Tenn., assignors to Electrochemical Systems, Inc., Knoxville, Tenn.

Filed May 10, 1995, Ser. No. 438,609
Int. Cl.[6] H01M *04/36;04/60;10/36*
U.S. Cl. 429—103 **34 Claims**



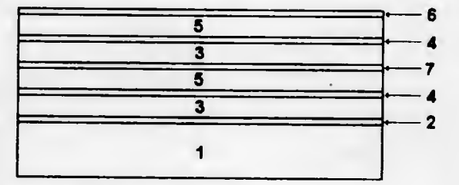
1. A ambient temperature molten composition comprising a mixture of a metal halide and fluoropyrazolium salt.

5,552,242

SOLID STATE BATTERY USING A HYDROGENATED SILICON NITRIDE ELECTROLYTE

Stanford R. Ovshinsky, Bloomfield, and Rosa Young, Troy, both of Mich., assignors to Ovonic Battery Company, Inc., Troy, Mich.

Continuation of Ser. No. 155,059, Nov. 19, 1993, abandoned.
This application Sep. 19, 1995, Ser. No. 530,493
Int. Cl.[6] H01M *10/36;10/02*
U.S. Cl. 429—152 **13 Claims**



1. A solid state battery comprising:
A.) a substrate;
B.) at least one multilayered electrochemical cell deposited onto said substrate, said multilayered electrochemical cell comprising:
1) a solid state layer of negative electrode material capable of electrochemically adsorbing and desorbing protons during charge and discharge;
2) a solid state layer of positive electrode material capable of electrochemically desorbing and adsorbing protons during charge and discharge; and

3) a solid state layer of hydrogenated silicon nitride material

5,552,246

providing a reduction projection tool having a known reduction

3) a solid state layer of hydrogenated silicon nitride material disposed between said layer of positive electrode material and said layer of negative electrode material, where said layer of hydrogenated silicon nitride material is electrically insulating and capable of readily conducting or transporting protons from said layer of positive electrode material to said layer of negative electrode material while said battery is charging and from said layer of negative electrode material to said layer of positive electrode material while said battery is discharging; and

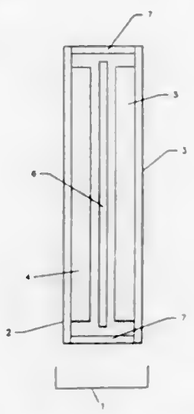
C.) an electrically conductive layer deposited a top the last of said at least one multilayered electrochemical cells, said electrically conductive layer providing one battery terminal.

5,552,243

BIPOLAR ELECTROCHEMICAL BATTERY OF STACKED WAFER CELLS

Martin Klein, Brookfield, Conn., assignor to Electro Energy, Inc., Danbury, Conn.

Continuation of Ser. No. 134,429, Oct. 8, 1993, Pat. No. 5,393,617. This application Feb. 23, 1995, Ser. No. 392,704
Int. Cl.[6] H01M *10/36;4/58;6/48;10/48*
U.S. Cl. 429—157 **31 Claims**



1. A bipolar electrochemical battery comprising:

a stack of at least two electrochemical cells electrically arranged in series wherein the adjacent cells have a positive face of one cell contacting a negative face of the adjacent cell and wherein each of said cells contains

(a) a negative electrode;

(b) a positive electrode;

(c) a porous separator between said electrodes, wherein said separator contains an electrolyte;

(d) a first electrically conductive polymeric outer layer in electrical contact with the outer face of said negative electrode; and

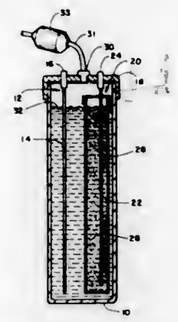
(e) a second electrically conductive polymeric outer layer in electrical contact with the outer face of said positive electrode; wherein said outer layers are sealed peripherally to an electrically non-conductive polymeric material such as to form a sealed enclosure containing said electrodes, said separator and said electrolyte.

5,552,244

REVERSIBLE HIGH ENERGY CAPACITY METAL-SULFUR BATTERY AND METHOD OF MAKING SAME

Eric B. Griffin, San Diego, Calif., and Jack V. Edling, Escondido, Calif., assignors to Eric Blair Griffen, San Diego, Calif.

Continuation-in-part of Ser. No. 388,495, Feb. 14, 1995, Pat. No. 5,506,072. This application Oct. 16, 1995, Ser. No. 543,704
Int. Cl.[6] H02M *12/00;10/00*
U.S. Cl. 429—188 **26 Claims**



1. A high energy capacity battery which comprises:

a case;

at least one cathode comprising a mixture of about 10 to 90 weight percent finely divided sulfur and about 90 to 10 weight percent finely divided graphite packed about a solid graphite electrode positioned in said case;

at least one anode comprising at least one reactive metal, spaced from said cathode positioned in said case; and

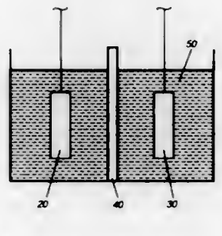
an electrolyte at least partially filling said case and in contact with said cathode and said anode, said electrolyte comprising particles of a cation chelated resin including a resin substrate having bonded thereto an alkyl sulfide compound carrying an agent selected from the group consisting of H_2S, HS^-, S_2^- and mixtures thereof, dispersed in a polar solvent.

5,552,245

MODIFIED ELECTROLYTE FOR ELECTROCHEMICAL CELLS AND CELLS USING SAME

Changming Li, Vernon Hills; Keryn Lian, Northbrook; Lijun Bai, Vernon Hills, and Joseph G. Kincs, Arlington Heights, all of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Division of Ser. No. 396,991, Mar. 1, 1995. This application Nov. 20, 1995, Ser. No. 560,613
Int. Cl.[6] H01M *6/04*
U.S. Cl. 429—188 **11 Claims**



1. An electrochemical charge storage device comprising:

an anode;

a cathode; and

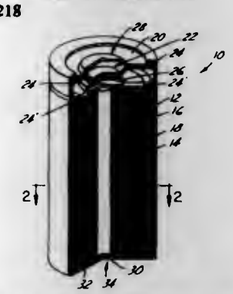
an aqueous electrolyte system comprising an electrolyte species and a porphine modifier species.

5,552,246

MATERIALS FOR HYDROGEN STORAGE, HYDRIDE ELECTRODES AND HYDRIDE BATTERIES

Kuochih Hong, 1790 Rollingwoods Dr., Troy, Mich. 48098

Continuation-in-part of Ser. No. 212,354, Mar. 14, 1994, Pat. No. 5,541,017. This application Jun. 19, 1995, Ser. No. 491,524
Int. Cl.[6] H01M *4/02*
U.S. Cl. 429—218 **24 Claims**



1. A material for hydrogen storage and hydrogen storage electrode, said material comprising a multicomponent alloy having a composition represented by the formula:

$Ti_aNb_bNi_cR_xD_yQ_p$

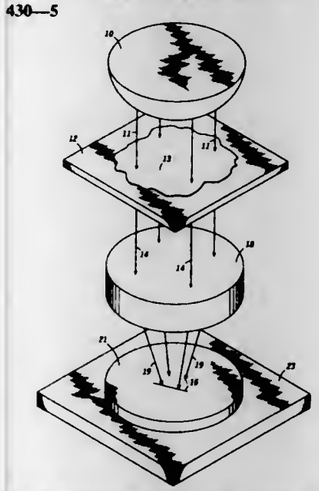
and its hydride thereof, where R is at least one element selected from the group consisting of B, Hf, Sc, Zn, Sb, W, Sn, N, O, Ge, and Ga; D is at least one element selected from the group consisting of Mn, Cu, Si, and Mm, where Mm is the mischmetal; Q is at least one element selected from the group consisting of C, Mg, Ca, Sr, Ba, Al, Si, V, Mn, Fe, Co, Cu, Zr, Mo, Pd, Ag, Y, Ta, La, Ce, and Mm, where Mm is a mischmetal; and where the atomic mole ratios: a,b,c,x,y and p are defined by: $0.10 \leqq a \leqq 0.85$, $0.001 \leqq b < 0.50$, $0.02 \leqq c \leqq 0.85$, $0 < x < 0.30$, $0 \leqq y < 0.30$, $0 < p < 0.45$, $b+y < 0.62$, and $a+b+c+x+y+p = 1.00$; and if present, $Mm \leqq 12$ at. %.

5,552,247

METHOD FOR PATTERNING AN X-RAY MASTER MASK

Whitson G. Waldo, III, Poughkeepsie, and Matthew A. Thompson, Fishkill, both of N.Y., assignors to Motorola, Schaumburg, Ill.

Filed Apr. 1, 1991, Ser. No. 678,098
Int. Cl.[6] G03F *9/00*
U.S. Cl. 430—5 **7 Claims**



1. A method for improving line width control of a projected feature for an X-ray mask comprising:

providing a reduction projection tool having a known reduction capability;

providing a reticle in which features have been placed on the reticle having a random error that ranges between 0.5 micron to 0.12 micron;

placing the reticle into the reduction projection tool with the known reduction capability;

providing an X-ray master mask blank including at least an X-ray transparent layer with a first surface, a plating base layer made of chromium covering the said first surface, and a photoactive material coating the plating base layer; and

exposing selected portions of the photoactive material on the X-ray master mask blank with a pattern generated and projected from the features on the reticle reducing the random error of the projected features by the known reduction capability, thereby improving control of the line width of the exposed features on the photoactive material coating the plate base layer.

5,552,248

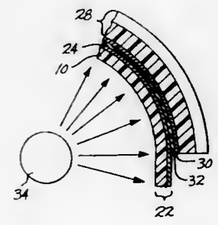
Patent Not Issued For This Number

5,552,249

METHOD FOR MAKING A MASK USEFUL IN THE CONFORMAL PHOTOLITHOGRAPHIC MANUFACTURE OF PATTERNED CURVED SURFACES

David G. Jensen, Auburn, and Daniel R. Tichenor, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 978,322, Nov. 18, 1992, Pat. No. 5,395,718. This application Sep. 30, 1994, Ser. No. 315,993
Int. Cl.[6] G03F *9/00*
U.S. Cl. 430—5 **23 Claims**



1. A method of making a reusable mask for use in forming a precise pattern repeatable from article to article on a plurality of curved surfaces of complex curvature on an article having a predetermined shape, comprising the steps of:

(a) forming a substrate having complex curvature from material transparent to electromagnetic radiation within a predetermined frequency range, the substrate having a shape complementary to said predetermined shape;

(c) applying to said substrate a layer of material opaque to said radiation;

(d) using essentially parallel electromagnetic radiation to define a pattern of temporary areas and permanent areas of said layer by moving an end effector on a five-axis gantry to position a radiation source carried on the end effector substantially normal to the target point on the layer;

(e) removing the temporary areas while leaving said permanent areas to produce the mask by leaving a patterned opaque layer on the substrate.

5,552,250

METHOD OF MANUFACTURING RETICLE

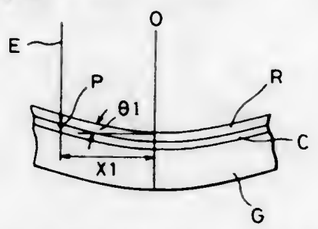
at least one pair of son vernier patterns, one of the pair disposed toward each of the opposite sides, and the son verniers spaced

5,552,255

ARTICLE UTILIZING QUINONE DIAZIDE RESIST

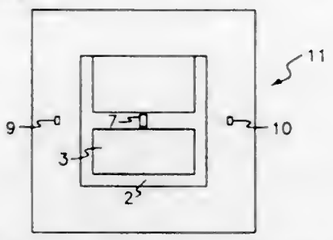
compound wherein said naphthoquinone diazo compound contains a non-metallic atom directly bonded to the naphthalene ring of a

5,552,250
METHOD OF MANUFACTURING RETICLE
Hiroshi Nozue, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Nov. 4, 1994, Ser. No. 334,065
Claims priority, application Japan, Nov. 15, 1993, 5-306997
Int. Cl.[6] G03F 9/00
U.S. Cl. 430—5 **6 Claims**



1. A method of manufacturing a reticle having a desired pattern and being used with said desired pattern facing downwards in a stepper to expose a semiconductor wafer arranged below said reticle to transmitted light projected from a light source arranged above said reticle and transmitted through said reticle, said method comprising the steps of:
(a) placing a mask blank on a holder, said mask blank comprising a glass substrate and a sensitive layer, said sensitive layer facing downward;
(b) projecting electron beams from an electron gun positioned beneath a surface of said sensitive layer to expose said sensitive layer to the electron beams; and
(c) generating said desired pattern on said sensitive layer to thereby, manufacture said reticle, said mask blank being held in place by said holder in a same relationship between a direction of a curvature of said mask blank and a direction in which said electron beams are projected, with respect to a relationship in which said stepper exposes said semiconductor wafer to said transmitted light through said reticle.

5,552,251
RETICLE AND METHOD FOR MEASURING ROTATION ERROR OF RETICLE BY USE OF RETICLE
Joon Hwang, Icheonkun, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Rep. of Korea
Filed Mar. 31, 1995, Ser. No. 414,110
Claims priority, application Rep. of Korea, Apr. 1, 1994, 1994-6961
Int. Cl.[6] G03F 9/00
U.S. Cl. 430—5 **4 Claims**



1. A reticle for measuring a rotation error of the reticle, the reticle having a first center, and being for use in exposure equipment having a lens with a second center, the reticle comprising:
a scribe line pattern traversing between opposite sides of the reticle and passing through the first center of the reticle;
a mother vernier pattern disposed on the scribe line pattern, centrally between the opposite sides, in a position corresponding to the second center of the lens; and
at least one pair of son vernier patterns, one of the pair disposed toward each of the opposite sides, and the son verniers spaced apart from the mother vernier along the scribe line pattern, respectively.

5,552,252
MAGNETIC TONER IMAGING
Douglas A. Lundy; Joseph R. Matalevich, Webster; Michael J. Cortash, Walworth, and Michael L. Grande, Palmyra, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Mar. 30, 1995, Ser. No. 413,581
Int. Cl.[6] G03G 13/09
U.S. Cl. 430—39 **16 Claims**

1. A process for avoiding, reducing, or minimizing comet formation in a magnetic image character recognition device which consists essentially of utilizing for the development of the magnetic characters a toner prepared by dispersing in a magnetic toner consisting essentially of resin particles, a first magnetite, pigment, charge additive, and wax, a second soft magnetite; and wherein the toner contains a silica surface additive, and wherein said charge additive is 2-[6-(ethylamino)-3-(ethylimino)-3H-xanthen-9-yl] ethyl ester.

5,552,253
MULTIPLE LAYER PHOTORECEPTOR FOR COLOR XEROGRAPHY
Gregory J. Kovacs, Mississauga, Canada; G. A. Neville Connel, Cupertino, Calif.; Ah-Mee Hor, and Zoran D. Popovic, both of Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.
Filed Mar. 31, 1995, Ser. No. 422,205
Int. Cl.[6] G03G 5/043
U.S. Cl. 430—57 **18 Claims**

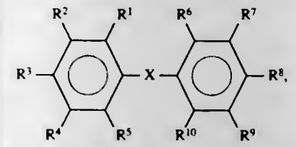
1. A two photoconductive stack photoreceptor for exposure to at least one first modulated beam at a first wavelength and at least one second modulated beam at a second wavelength, said second wavelength being different from said first wavelength, comprising:
an electrically conductive substrate upon which is a first photoconductive stack and a second photoconductive stack, said first photoconductive stack, adjacent to said electrically conductive substrate, being sensitive or accessible only to said first wavelength and said second photoconductive stack being sensitive or accessible only to said second wavelength, said first photoconductive stack and said second photoconductive stack each having a charge generator layer and a charge transport layer,
wherein, after charging said photoreceptor, areas of said photoreceptor are exposed to neither beam, said first beam, said second beam, or both first beam and second beam for subsequently depositing toner on said photoreceptor in response to exposure of said areas of said photoconductive stacks to said beams and to the resulting discharge pattern.

5,552,254
AMIC ACID BASED TONER COMPOSITIONS
Walter Mychajlowsky, Georgetown; Guerino G. Sacripante, Oakville; T. Brian McAneney, Burlington, and Richard P. N. Veregin, Mississauga, all of, Canada, assignors to Xerox Corporation, Stamford, Conn.
Filed Feb. 27, 1995, Ser. No. 394,869
Int. Cl.[6] G03G 9/097
U.S. Cl. 430—109 **33 Claims**

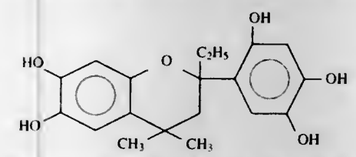
1. A toner composition consisting essentially of pigment and a polyamic acid based resin

5,552,255
ARTICLE UTILIZING QUINONE DIAZIDE RESIST LAYER ON TANTALUM SUBSTRATE SURFACE
Tetsuya Kato, Fujisawa; Kouichi Takahashi, Sagamihara; Hidekatsu Kohara, Chigasaki, and Toshimasa Nakayama, Hiratsuka, all of, Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kanagawa-ken, Japan
Division of Ser. No. 230,883, Apr. 20, 1994, Pat. No. 5,401,617, which is a continuation of Ser. No. 46,239, Apr. 13, 1993, abandoned. This application Nov. 22, 1994, Ser. No. 344,342
Claims priority, application Japan, Apr. 14, 1992, 4-119568
Int. Cl.[6] G03F 7/09
U.S. Cl. 430—165 **5 Claims**

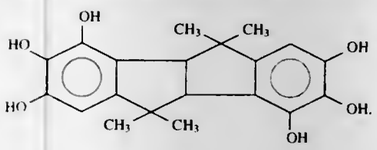
1. A product comprising a positive-working photosensitive resin composition as a coating layer on a substrate, of which at least the surface layer is made from tantalum, said resin composition comprising, as a uniform blend,
(a) an alkali-soluble novolac resign;
(b) a quinone diazide group-containing organic compound; and
(c) an aromatic compound having two benzene rings in a molecule selected from the group consisting of
(c-1) the compounds represented by the general formula



IN which R^1 to R^{10} are each, independently from the others, a hydrogen atom, alkyl group having 1 to 4 carbon atoms, alkenyl group, halogen atom, hydroxy group, alkoxy group or carboxyl group including at least five hydroxy groups and X is a divalent atom or group of the formula —CO—O—, —CO—, —S—, —SO—, —SO_2—, —O— or —CR_2—, each R being an alkyl group,
(c-2) a compound expressed by the structural formula



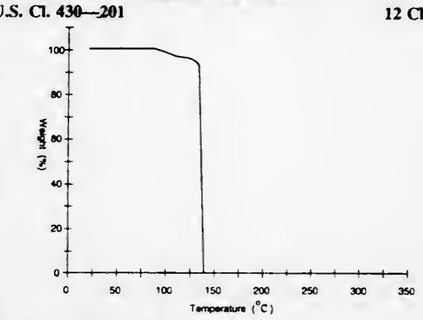
and (c-3) a compound expressed by the structural formula



5,552,256
POSITIVE RESIST COMPOSITION CONTAINING NAPHTHOQUINONEDIAZIDE COMPOUND HAVING NON-METALLIC ATOM DIRECTLY BONDED TO THE NAPHTHALENE RING
Ari Aviram, Croton-on-Hudson; William R. Brunsvold, Poughkeepsie, both of N.Y.; Daniel Bucca, Alexandria, Va.; Willard E. Conley, Jr., Cornwall, and David E. Seeger, Congers, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 29, 1994, Ser. No. 314,975
Int. Cl.[6] G03F 7/023
U.S. Cl. 430—192 **8 Claims**

1. A positive photoresist composition comprising a positive acting organic polymer; and a naphthoquinone-diazo photoactive compound wherein said naphthoquinone diazo compound contains a non-metallic atom directly bonded to the naphthalene ring of a naphthoquinone diazo compound, and wherein said non-metallic atom is selected from the group consisting of iodine, germanium, arsenic, antimony and mixtures thereof.

5,552,257
THERMAL DECOMPOSITION OF AZIDE-CONTAINING MATERIALS
Edward G. Stewart, White Bear Lake; William V. Dower; Michael C. Palazzotto, both of St. Paul; Martin B. Wolk, Woodbury, and Anthony P. Manzara, Lake Elmo, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jan. 21, 1994, Ser. No. 184,281
Int. Cl.[6] G03C 8/00
U.S. Cl. 430—201 **12 Claims**



1. A material comprising:
(a) at least one polymer which contains at least about 25 wt % azide groups; and
(b) at least one catalyst precursor which is an organometallic complex which upon thermolysis liberates at least one coordination site, thereby generating a catalyst for the thermal decomposition of said polymer, said catalyst precursor having the formula:

$$[L^1L^2L^3M]^{e+}X_f$$

wherein:
L^1 represents none or 1 to 12 ligands contributing pi-electrons that can be the same or different selected from: substituted and unsubstituted acrylic and cyclic unsaturated compounds and groups and substituted and unsubstituted carbocyclic aromatic and heterocyclic aromatic compounds, each contributing 2 to 6 pi-electrons to the valence shell of M;
L^2 represents none or 1 to 24 ligands that can be the same or different, contributing an even number of sigma-electrons, selected from: mono-, di-, and tri-dentate ligands, each donating 2, 4, or 6 sigma-electrons to the valence shell of M;
L^3 represents none or 1 to 12 ligands that can be the same or different, each contributing no more than one sigma-electron each to the valence shell of each M;
M represents 1 to 4 of the same or different metal atoms selected from the elements of periodic Groups IVB, VB, VIB, VIIB, and VIII;
e is an integer having a value of 0, 1, or 2, such that the organometallic portion of the molecule is neutral, cationic, or dicationic;
X is an anion selected from organic sulfonate and halogenated metal or metalloid groups; and
f is an integer having a value of 0, 1, or 2, the number of anions required to balance the charge e on the organometallic complex;
with the proviso that (i) the organometallic complex contains at least one metal-carbon bond; (ii) L^1, L^2, L^3, M, e, X, and f are

polymer backbone, said acid labile pendant groups comprising at each conveyor belt receiving only one plate at a time; and that

chosen so as to achieve a stable electronic configuration; and (iii) if M is Fe, e is 0, and L^1 is two substituted or unsubstituted cyclopentadienyl ligands, then one of L^2 or L^3 must be present.

5,552,258

DIFFUSION TRANSFER PRINTING PLATE WITH ACID GELATIN UNDER LAYER

Michael T. Macioch, Baldwin, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 13, 1995, Ser. No. 421,078

Int. Cl.[6] G03C *8/52;* **G03F** *7/07*

U.S. Cl. 430—204 **13 Claims**

1. A process for producing a lithographic printing plate comprising the steps of imagewise exposing a single sheet lithographic plate material consisting of a flexible support, having thereon a) at least an underlayer containing an acid ossein gelatin having a viscosity before it is hardened of less than 40 cps at 60 degrees Centrigrade at 6 ⅔% weight/weight of gelatin and aqueous carrier wherein said acid ossein gelatin in solution has a pH of at least 7.1, b) a light sensitive silver halide layer, and c) a physical development nucleating surface layer, and, after said exposing, processing said plate material in a diffusion transfer developer or alkaline activator solution to develop imaged portions as hydrophilic areas and retain non-exposed areas as oleophilic areas on said plate.

5,552,259

ADHESIVE COMPOSITION, AND IMAGING MEDIUM COMPRISING THIS ADHESIVE COMPOSITION

Iris B. K. Bloom, Waltham; Richard A. Minns, Arlington, and Cynthia L. Zakka, Belmont, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 23, 1993, Ser. No. 126,087

Int. Cl.[6] G03F *7/11;* **G03C** *1/805*

U.S. Cl. 430—253 **13 Claims**

1. A laminar thermal imaging medium, actuatable in response to intense image-forming radiation for production of an image, the laminar medium comprising in order:

a first sheet transparent to the image-forming radiation and having at least a surface zone or layer of polymeric material heat-activatable upon subjection of the thermal imaging medium to brief and intense radiation;

a layer of porous or particulate image-forming substance having cohesivity in excess of its adhesivity for the polymeric heat-activatable layer;

a first layer of adhesive affixed, directly or indirectly, to the layer of porous or particulate image-forming substance;

a second layer of adhesive adhered to the first layer of adhesive; and

a second sheet covering the layer of porous or particulate image-forming substance and adhered, via the first and second layers of adhesive, to the layer of image-forming substance, the second sheet, upon separation of the first and second sheets after exposure to the intense radiation, being adapted to the removal therewith of unexposed portions of the image-forming substance;

the second layer of adhesive comprising a polymeric hardenable adhesive comprising a macromolecular organic binder having acidic groups, and a photopolymerizable monomer, the harden able adhesive layer being capable in its unhardened condition of reducing the tendency for the laminar thermal imaging medium to delaminate on application of physical stresses to the medium and being hardenable to a layer of sufficient hardness to provide a durable base for the image,

the thermal imaging medium being capable of absorbing the radiation at or near the interface of the surface zone or layer with the layer of porous or particulate image-forming substance, converting the absorbed radiation into heat sufficient in intensity to heat activate the surface zone or layer, such that upon cooling exposed portions of the layer of porous or particulate image-forming substance are more firmly attached to the first sheet,

the thermal imaging medium being adapted to image formation by imagewise exposure of portions of the thermal imaging medium to radiation of sufficient intensity to attach exposed portions of the layer of porous or particulate image-forming substance firmly to the first sheet, and by removal to the second sheet, upon separation of the first and second sheets after the imagewise exposure, of unexposed portions of the layer of porous or particulate image-forming substance, thereby to provide first and second images, respectively, on the first and second sheets.

13. A laminar thermal imaging medium, actuatable in response to intense image-forming radiation for production of an image, the laminar medium comprising in order:

a first sheet transparent to the image-forming radiation and having at least a surface zone or layer of polymeric material heat-activatable upon subjection of the thermal imaging medium to brief and intense radiation;

a layer of porous or particulate image-forming substance having cohesivity in excess of its adhesivity for the polymeric heat-activatable layer;

a release layer adapted to facilitate separation between the first and second sheets and to provide, respectively, first and second images;

a first layer of adhesive comprising a halogen-containing polymer;

a second layer of adhesive adhered to the first layer of adhesive and comprising a polymeric hardenable adhesive comprising a macromolecular organic binder having acidic groups, and a photopolymerizable monomer, the hardenable adhesive layer being capable in its unhardened condition of reducing the tendency for the laminar thermal imaging medium to delaminate on application of physical stresses to the medium and being hardenable to a layer of sufficient hardness to provide a durable base for the image; and

a second sheet adapted, upon separation of the first and second sheets after exposure to the intense radiation, to the removal therewith of unexposed portions of the image-forming substance,

the thermal imaging medium being capable of absorbing the radiation at or near the interface of the surface zone or layer with the layer of porous or particulate image-forming substance, and converting the absorbed radiation into heat sufficient in intensity to heat activate the surface zone or layer, such that upon cooling exposed portions of the layer of porous or particulate image-forming substance are more firmly attached to the first sheet,

the thermal imaging medium being adapted to image formation by imagewise exposure of portions of the thermal imaging medium to radiation of sufficient intensity to attach exposed portions of the layer of porous or particulate image-forming substance firmly to the first sheet, and by removal to the second sheet, upon separation of the first and second sheets after the imagewise exposure, of unexposed portions of the layer of porous or particulate image-forming substance, thereby to provide first and second images, respectively, on the first and second sheets.

5,552,260

SHOOT AND RUN PRINTING MATERIALS

Dennis E. Vogel, Lake Elmo, and Leonard J. Stulc, Shafer, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 983,124, Nov. 30, 1992, Pat. No. 5,395,734. This application Nov. 16, 1994, Ser. No. 340,243

Int. Cl.[6] G03F *7/039*

U.S. Cl. 430—270.1 **9 Claims**

1. A photosensitive composition comprising in admixture: (a) a photoinitiator which generates an acid upon exposure to radiation; and (b) a polymer having acid labile groups pendant from the polymer backbone, said acid labile pendant groups comprising at least one each of A and B wherein A has the formula $—T-(C=O)OCR^1R^2OR^3$, and B has the formula $—T-(C=O)OR^4Si(R^5)_3$, wherein R^1 and R^2 each represent H or an alkyl group with the proviso that at least one of R^1 and R^2 must be hydrogen; R^3 represents an alkyl group; or any two of R^1, R^2, and R^3 may together form a ring group having from 3 to 36 carbon atoms; R^5 represents an alkyl group, aryl group, an alkoxy group, an aryloxy group, an acyloxy group, or a trialkylsiloxy group; and R^4 and T represents a divalent linking group wherein T is bonded to the polymer backbone and R^4 is not bonded to the polymer backbone.

5,552,261

RECYCLING THE RECORDING LAYER OF FLEXOGRAPHIC PRINTING PLATES

Ursula A. Kraska, Weiterstadt; Udo Weikart, Obernburg, and Reimund Simon, Bierstein, all of, Germany, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 121,388, Sep. 14, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 457,178

Claims priority, application Germany, Sep. 25, 1992, 42 32 188.3

Int. Cl.[6] G03F *7/28*

U.S. Cl. 430—273.1 **5 Claims**

1. A raw flexographic printing plate comprising at least one photopolymerizable recording layer, a dimensionally stable support, and optionally a protective sheet, wherein the photopolymerizable recording layer contains recovered photopolymer material which comprises exposed solid photopolymerized material which has been exposed to actinic radiation and a synthetic resin mixture or solid unexposed photopolymerizable material which has not been exposed to actinic radiation or both wherein said recovered photopolymer material is derived from recycled flexographic printing plates or from recovered raw printing plates or both and wherein the photopolymerizable recording layer comprises an elastomeric binder; an unsaturated monomer and an initiator.

5,552,262

PROCESS FOR PRODUCTION OF PHOTOPOLYMERIZABLE FLEXOGRAPHIC PRINTING PLATES

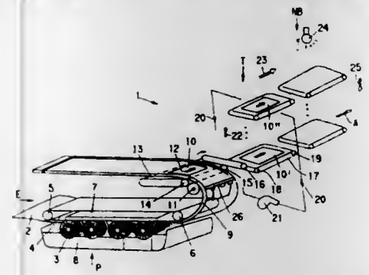
Herbert Konermann, Lengerich, Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 7, 1993, Ser. No. 117,268

Claims priority, application Germany, Sep. 17, 1992, 42 31 102.0

Int. Cl.[6] G03F *7/00;* **G03D** *5/00;* **G03B** *27/30;* **F26B** *11/18*

U.S. Cl. 430—306 **16 Claims**



1. A process for production of photopolymerizable flexographic printing plates in which exposed printing plates are washed out with image sides down at a conveying speed and dried with the image sides up at a transportation speed characterized by the fact that the plates with the image sides up are transferred onto a plurality of conveyor belts in a dryer where the plates are dried, each conveyor belt receiving only one plate at a time; and that during drying the printing plates are transported in a direction perpendicular to planes containing back sides of the printing plates, the transportation speed is selected to be lower than the conveying speed, packing density of the printing plates is increased during the drying, and the printing plates are continuously supported from the back sides.

5,552,263

PROCESS FOR PREPARING FLEXOGRAPHIC PRINTING PLATES

Hans-Leander Schröder, Offenbach, and Manfred Schober, Reinheim, both of, Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 980,146, Nov. 23, 1992, abandoned, which is a continuation of Ser. No. 635,918, Dec. 28, 1990, abandoned. This application Apr. 24, 1995, Ser. No. 427,299

Claims priority, application Germany, Mar. 8, 1990, 40 07 248.7

Int. Cl.[6] G03F *7/38;7/40*

U.S. Cl. 430—306 **6 Claims**

1. A process for preparing a flexographic printing plate consisting essentially of in order

(a) exposing imagewise with actinic radiation a photopolymerizable printing plate comprising a support; a solid photopolymerizable layer; and a cover layer wherein the imagewise exposure occurs from the cover layer side of the photopolymerizable printing plate and wherein the solid photopolymerizable layer comprises

(i) at least one polymeric binder selected from the group consisting of thermoplastic, elastomeric block copolymers, polybutadiene and polyisoprene;

(ii) at least one ethylenically unsaturated compound that can be addition-polymerized upon exposure to actinic radiation, and

(iii) a photoinitiator or photoinitiator system,

(b) overall exposure the photopolymerizable printing plate from the support side with actinic radiation to form a base;

(c) removing non-imagewise exposed areas of the photopolymerizable layer by wash-out development to produce a flexographic printing plate; and

(d) drying the flexographic printing plate produced in step (c) to produce an imagewise exposed, developed and dried flexographic printing plate.

5,552,264

PHOTOGRAPHIC CONDITIONING SOLUTION CONCENTRATE CONTAINING BLEACH ACCELERATOR AND FORMALDEHYDE PRECURSOR AND METHOD OF USE

Ann M. Cullinan, Rochester; Charles M. Darmon; Rosa P. Sauter, both of Spencerport, and Charles F. Leith, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 5, 1995, Ser. No. 417,416

Int. Cl.[6] G03C *11/00;5/18;5/26;5/50*

U.S. Cl. 430—372 **17 Claims**

9. A method for processing a color silver halide photographic element comprising:

A) treating an imagewise exposed and developed color silver halide photographic element with a conditioning solution concentrate that is diluted up to 9:1, said concentrate comprising a water-soluble N-methylol compound, sodium formaldehyde bisulfite or hexamethylenetetramine as a formaldehyde precursor in an amount of from about 200 to about 450 g/l, a sulfite in an amount of from about 40 to about 100 g/l, a bleach accelerating agent in an amount of from about 1.5 to about 13.5 g/l, and metal ion chelating agent in an amount of from about 5 to about 45 g/l, and

B) bleaching said treated element.

5,552,265

REVERSAL COLOR PHOTOGRAPHIC MATERIAL WITH A FINE GRAIN SUBLAYER

Francois J. Bredoux, Cohamd, and Maurice E. Pfaff, Le Perreux-Sur Marne, both of, France, assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 971,916, Mar. 12, 1993, abandoned. This application Aug. 16, 1994, Ser. No. 291,248

Claims priority, application France, Jul. 4, 1990, 90 08785

Int. Cl.[6] G03C *7/46*

U.S. Cl. 430—379 **6 Claims**

1. A reversal color silver halide photographic paper comprising: a support having thereon in the order at least one red-sensitive emulsion layer having associated therewith a cyan-forming coupler, at least one green-sensitive emulsion layer having associated therewith a magenta-forming coupler, at least one blue-sensitive emulsion layer having associated therewith a yellow-forming coupler, characterized in that between the support and the red-sensitive emulsion layer is positioned a substantially light-insensitive fine grain silver halide emulsion layer comprising fine grains having an average grain size less than 0.5 μm the silver amount present in the fine grain layer being not higher than .10 mg/m^2.

5,552,266

PHOTOGRAPHIC MATERIAL COMPRISING A MAGENTA DYE IMAGE FORMING COUPLER COMBINATION

Paul L. R. Stanley, and Christina M. Watts, both of Harrow, England, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 30, 1992, Ser. No. 946,310

Claims priority, application United Kingdom, May 16, 1990, 9010966

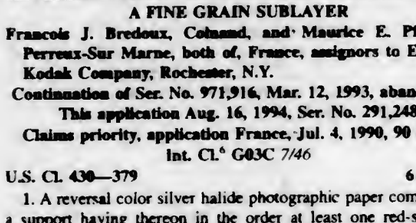
Int. Cl.[6] G03C *1/08;7/26;7/32*

U.S. Cl. 430—546 **15 Claims**

1. A photographic element comprising a support bearing a light-sensitive silver halide emulsion and, in association with said support and said silver halide emulsion to provide an image of enhanced light stability, at least one layer comprising a dispersion of a substituted phenol, a magenta dye image-forming coupler capable of forming a magenta dye by reaction with oxidized color developing agent, and a light-sensitive silver halide emulsion, characterized in that said phenol has the structural formula

(I)

wherein each R is the same or different and is an alkyl, halogen, cyano, SO_2R^1, SO_2NHR^1, wherein R^1 is an alkyl or aryl group and n is from 1 to 5, provided that when R is an alkyl group, the total number of carbon atoms in $(R)_n$ is less than 20, and said magenta coupler is a pyrazolone of formula



(II)

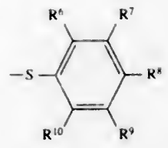
wherein

Hal represents a halogen,

R^2 and R^3 are the same or different and each is hydrogen or a halogen,

R^4 is hydrogen, $COOR^{11}$, $CONHR^{11}$, $NHCOR^{11}$, $NHSO_2R^{11}$, SO_2NHR^{11}, $SO_2NR^{11}R^{12}$, OSO_2R^{11}, SO_2R^{11} or OR^{11};

R^5 is hydrogen or



and

R^6 is $NHSO_2R^{11}$, $NHCOR^{12}$, $NHCONHR^{12}$, $CONHR^{12}$, $NR^{11}R^{12}$, R^{11}, OR^{11};

R^7, R^8, R^9 and R^{10} are the same or different and each is hydrogen, a halogen or R^6;

R^{11} and R^{12} are the same or different and each is an alkyl; halogen, alkoxy, hydroxy, carboxylic acid, aryl, or aryloxy substituted alkyl; or R^{12} may be hydrogen.

5,552,267

SOLUTION FOR PROLONGED ORGAN PRESERVATION

David M. Stern, Great Neck, N.Y.; Mehmet C. Oz, Fort Lee; Roman Nowygrod, Teaneck, both of N.J.; Shin Koga, New York, and David J. Pinsky, Riverdale, both of N.Y., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Continuation-in-part of Ser. No. 206,197, Mar. 3, 1994, Pat. No. 5,370,989, which is a continuation of Ser. No. 863,197, Apr. 3, 1992, abandoned. This application Dec. 5, 1994, Ser. No. 350,319

Int. Cl.[6] A01N *1/02*

U.S. Cl. 435—1.1 **47 Claims**

1. An aqueous solution for organ preservation or maintenance, comprising:

a) a phosphodiesterase inhibitor in an amount sufficient to maintain vascular homeostasis;

b) D-glucose in an amount sufficient to support intracellular function and maintenance of cellular bioenergetics;

c) magnesium ions in an amount sufficient to support intracellular function and maintenance of cellular bioenergetics;

d) macromolecules of molecular weight greater than 20,000 daltons in an amount sufficient to maintain endothelial integrity and cellular viability;

e) potassium ions in a concentration greater than about 110 mM; and

f) a buffer in an amount sufficient to maintain the average pH of the organ preservation or maintenance solution during the period of organ preservation at about physiologic pH or above.

5,552,268

METHOD FOR MEASURING TOTAL BODY TISSUE IRON STORES

Victor D. Herbert, New York; Spencer Shaw, Larchmont, both of N.Y., and Elizabeth Jayatilleke, Englewood, N.J., assignors to Quixote Associates, Inc., Katonah, N.Y.

Continuation-in-part of Ser. No. 283,598, Aug. 1, 1994. This application Aug. 8, 1995, Ser. No. 512,466

Int. Cl.[6] C12Q *1/00*

U.S. Cl. 435—4 **19 Claims**

1. A process for evaluating total body tissue iron stores in a patient comprising:

releasing iron contained in ferritin protein isolated from a unit volume of body fluid sample recovered from the patient;

measuring the released iron; and

evaluating the total body tissue iron stores in the patient by comparing the amount of measured released iron per unit volume to a normal range for ferritin iron per unit volume.

5,552,269

MEANS FOR THE QUANTITATIVE DETERMINATION OF RETROVIRUS, METHOD FOR ITS PREPARATION, AND DIAGNOSTIC KIT CONTAINING SAID MEANS

Jean-Marie Andrieu, and Wei Lu, both of Paris, France, assignors to Aremas (Association pour la Recherche, l'Etude, le Traitment et la Prevention des Maladies Malignes du Sang), France

PCT No. PCT/FR93/00455, § 371 Date Jan. 12, 1994, § 102(e) Date Jan. 12, 1994, PCT Pub. No. WO93/23565, PCT Pub. Date Nov. 25, 1993

PCT Filed May 11, 1993, Ser. No. 193,205

Int. Cl.[6] C12Q *1/70;1/68;* **C12P** *19/34*

U.S. Cl. 435—5 **9 Claims**

1. A method for the quantitative determination of retroviruses in vitro, comprising (1) performing reverse transcription of an RNA viral genome of a retrovirus in a test sample to produce a DNA copy; (2) performing polymerase chain reaction amplification of the DNA copy of the RNA viral genome to produce a plurality of DNA copies; (3) performing quantitative hybridization of the DNA copies to a plurality of complementary DNA probes to measure the DNA content of the test sample; and (4) converting the DNA content from the test sample to a viral particle number by reference to a standard curve of DNA content derived from reverse transcription-polymerase chain reaction of a plurality of concentrations of retrovirus standardized in their concentration of a viral reference protein.

5,552,270

METHODS OF DNA SEQUENCING BY HYBRIDIZATION BASED ON OPTIMIZING CONCENTRATION OF MATRIX-BOUND OLIGONUCLEOTIDE AND DEVICE FOR CARRYING OUT SAME

Konstantin R. Khrapko; Alexandr A. Khorlin, both of Moscow; Igor B. Ivanov, Moskovskaya oblast; Gennady M. Ershov, Moscow; Jury P. Lysov, Moscow; Vladimir L. Florentiev, Moscow, and Andrei D. Mirzabekov, Moscow, all of, Russian Federation, assignors to Institut Molekulyarnoi Biologii Imeni V.A., Moscow, Russian Federation

PCT No. PCT/RU92/00052, § 371 Date Nov. 9, 1992, § 102(e) Date Nov. 9, 1992, PCT Pub. No. WO92/16655, PCT Pub. Date Oct. 1, 1992

PCT Filed Mar. 18, 1992, Ser. No. 949,541

Claims priority, application U.S.S.R., Mar. 18, 1991, 4919321

Int. Cl.[6] C12Q *1/68;* **G01N** *33/48*

U.S. Cl. 435—6 **9 Claims**

9. A method for determining the sequence of a test nucleotide molecule:

(a) providing an array of oligonucleotides wherein the array are present at concentrations effective to distinguish a perfect duplex from a one-base mismatch at a given temperature;

(b) hybridizing the test nucleotide molecule to the oligonucleotides in the array;

(c) washing the array at the given temperature; and

(d) determining the oligonucleotides in the array which hybridized to the test nucleotide molecule to obtain information about the sequence of the test nucleotide molecule.

5,552,271

RXR HOMODIMER FORMATION

Magnus Pfahl, Solana Beach; Xiao-kun Zhang, La Jolla; Jürgen M. Lehmann, Solana Beach; Marcia I. Dawson, Menlo Park; James F. Cameron, Palo Alto; Peter D. Hobbs, Moss Beach, and Ling Jong, Sunnyvale, all of Calif., assignors to La Jolla Cancer Research Foundation, La Jolla, Calif.

Continuation-in-part of Ser. No. 901,719, Jun. 16, 1992, abandoned. This application Nov. 25, 1992, Ser. No. 982,174

Int. Cl.[6] G01N *33/53;33/566;* **C12Q** *1/68*

U.S. Cl. 435—6 **4 Claims**

1. A method of screening a substance for the ability to selectively induce the formation of a retinoid X receptor homodimer over a retinoid X receptor heterodimer comprising:

a. combining in a cell expressing a retinoid X receptor vector the substance to be screened and a second receptor capable of forming a retinoid X receptor heterodimer;

b. determining by cotransfection and expression of a response element linked reporter gene (1) if the substance induces a retinoid X receptor heterodimer, and (2) if the substance induces the formation of a retinoid X receptor homodimer; and

c. selecting the substance which selectively induces the formation of a retinoid X receptor homodimer.

5,552,272

DETECTION OF AN ANALYTE BY FLUORESCENCE USING A THIN FILM OPTICAL DEVICE

Gregory R. Bogart, Berthoud, Colo., assignor to Biostar, Inc., Boulder, Colo.

Filed Jun. 10, 1993, Ser. No. 76,348

Int. Cl.[6] G01N *33/543*

U.S. Cl. 435—6 **27 Claims**

1. Assay system for detecting the presence or amount of an analyte of interest, comprising:

a reflective solid, optical substrate;

an attachment layer provided on an uppermost surface of said substrate, wherein said attachment layer comprises a chemical selected from the group consisting of dendrimers, star polymers, molecular self-assembling polymers, polymeric siloxanes, and film forming latexes;

a receptive layer provided on an uppermost surface of said attachment layer comprising a specific binding partner for said analyte;

a label capable of generating fluorescent signal upon excitation with a suitable light source attached to a specific binding reagent so as to allow said label to become bound to said analyte;

wherein said substrate provides an enhanced level of exciting photons directly to said label when said label is bound to said receptive layer in the presence of said analyte and said substrate also increases the capture of fluorescent signal relative to capture in the absence of said substrate;

and wherein capture of said signal by a detector indicates the presence or amount of said analyte of interest.

5,552,273

caused by the reduction in mass of the immobilized double

(a) a porous body having releasably attached thereto an agent soluble in said test sample;

5,552,273

POLYPEPTIDES CONTAINING SEQUENCES CHARACTERISTIC OF PYRROLIDONE CARBOXYLYL PEPTIDASES, POLYNUCLEOTIDES CONTAINING A SEQUENCE CODING FOR SUCH POLYPEPTIDES, AND THEIR USE, IN PARTICULAR FOR DIAGNOSTIC PURPOSES

Philippe L. Cleuziat, Lyons; Abalo Awade, Rennes; Jeannine Robert-Baudouy, Rillieux La Pape, and Jean-Pierre Gayral, Ambérieu en Bugey, all of, France, assignors to Bio Merieux, L'Etoile, France

PCT No. PCT/FR92/01237, § 371 Date Oct. 18, 1993, § 102(e) Date Oct. 18, 1993

PCT Filed Dec. 23, 1992, Ser. No. 107,684

Claims priority, application France, Dec. 23, 1991, 91 16059

Int. Cl.[6] **C12Q** *1/68;* **C12P** *21/06;* **C12N** *1/20;* **C07H** *19/00*

U.S. Cl. 435—6 **17 Claims**

1. Purified polypeptide consisting of a peptide sequence consisting of part or all of a sequence selected from the group consisting of:

amino acid residues 4–11 of SEQ ID NO: 11;
amino acid residues 6–13 of SEQ ID NO: 13;
amino acid residues 5–12 of SEQ ID NO: 12;
amino acid residues 78–99 of SEQ ID NO: 11;
amino acid residues 81–102 of SEQ ID NO: 13;
amino acid residues 81–102 of SEQ ID NO: 12;
amino acid residues 127–146 of SEQ ID NO: 11;
amino acid residues 130–149 of SEQ ID NO: 13; and
amino acid residues 130–149 of SEQ ID NO: 12; wherein said part of said sequence is at least six amino acids long.

5,552,274

METHOD FOR DETECTING TARGET SEQUENCES BY OSCILLATION FREQUENCY

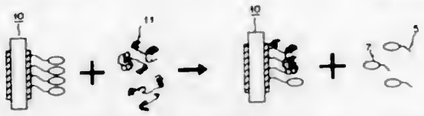
Noboru Oyama, Fuchu; Shuichiro Yamaguchi, Kanagawa-ken; Takeshi Shimomura, Kanagawa-ken; Takeshi Shimomura, Kanagawa-ken, and Keizaburo Miki, Kanagawa-ken, all of, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 7, 1993, Ser. No. 117,329

Claims priority, application Japan, Sep. 7, 1992, 4-0238607; Feb. 19, 1993, 5-29497

Int. Cl.[6] **C12Q** *1/68;* **G01N** *33/48*

U.S. Cl. 435—6 **18 Claims**



1. A method for detecting a target DNA in a sample comprising the following steps:

(i) immobilizing a double stranded nucleic acid sequence to the surface of an electrode of an elastic wave element, wherein said double stranded nucleic acid sequence comprises a first nucleic acid sequence having a 5'-terminus which is bound to the surface of the electrode of the elastic wave element, and a second nucleic acid sequence which is complementary to the first nucleic acid sequence which is hybridized to the first sequence and wherein the 5'-terminus of said second nucleic acid sequence is bound to a chemical species of sufficient molecular weight to produce a nucleic acid sequence having a higher mass than a target DNA which is to be detected;

(ii) contacting said immobilized nucleic acid sequence with a sample suspected of containing a target DNA sequence which is complementary to the first nucleic acid sequence under conditions that provide for the displacement of the second nucleic acid sequence from the first nucleic acid sequence and the hybridization of the target DNA sequence to the first nucleic acid sequence; and

(iii) detecting the presence of the target DNA sequence in the sample on the basis of an increase in oscillation frequency caused by the reduction in mass of the immobilized double stranded nucleic acid sequence which occurs upon displacement of the second nucleic acid sequence by the target DNA sequence and the subsequent hybridization of the target DNA to the first DNA sequence.

5,552,275

HUMAN LEUKOCYTE ANTIGEN TYPING

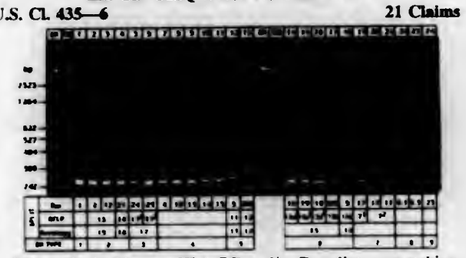
Kam M. Hui, Kent Ridge, Singapore, and Jeffrey L. Bidwell, Bristol, United Kingdom, assignors to National University of Singapore, Singapore

Continuation of Ser. No. 116,043, Sep. 1, 1993, abandoned, which is a continuation of Ser. No. 652,072, Feb. 6, 1991, abandoned. This application Feb. 23, 1994, Ser. No. 200,949

Claims priority, application United Kingdom, Feb. 6, 1990, 9002625

Int. Cl.[6] **C12Q** *1/68;1/48;* **C21P** *19/34*

U.S. Cl. 435—6 **21 Claims**



1. A method of human HLA-DR and/or Dw allotype matching, which method, consists initially of the following steps:

(i) effecting polymerase chain reaction (PCR) amplification of a HLA-DRB gene exon 2 nucleotide sequence of a first sample of DNA;

(ii) separating the DNA fragments resulting from said amplification by non-denaturing polyacrylamide gel electrophoresis;

(iii) observing the positions on the non-denaturing polyacrylamide gel of the thus separated DNA fragments to determine a PCR fingerprint; and

(iv) comparing the thus-determined fingerprint with the fingerprint resulting from PCR amplification of the said HLA-DRB gene exon 2 nucleotide sequence of a second sample of DNA.

5,552,276

APPARATUS AND PROCESS FOR SIMPLIFIED MEASUREMENT

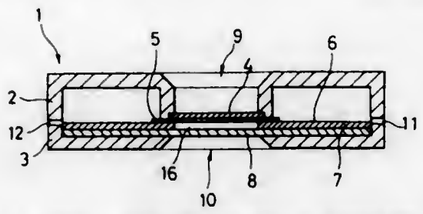
El Mochida; Yasuhiko Miyauchi; Takashi Matsuura, and Tomoaki Katamine, all of Tokyo, Japan, assignors to Mochida Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1994, Ser. No. 207,715

Claims priority, application Japan, Mar. 18, 1993, 5-058707

Int. Cl.[6] **G01N** *33/543*

U.S. Cl. 435—6 **19 Claims**



1. A simplified measuring apparatus for use in a binding assay to determine the presence or amount of an analyte in a fluid test sample through the use of a label capable of producing a detectable response, said apparatus comprising:

(a) a porous body having releasably attached thereto an agent soluble in said test sample;

(b) a liquid permeable porous reaction membrane disposed below said porous body having defined thereon at least one reaction area, said reaction area having immobilized thereon an affinity substance capable of directly or indirectly capturing the analyte or an agent soluble in said test sample to thereby produce the detectable response;

(c) an absorption member disposed below said liquid permeable porous membrane having an opening being positioned below the reaction area of said liquid permeable porous membrane to define a reaction solution storing space within the opening, said absorption member being, arranged so as to contact only a peripheral area of said liquid permeable porous membrane via an intervening liquid impermeable sheet;

(d) a liquid impermeable transparent cover disposed below said opening of said absorption member; and

(e) a liquid impermeable case accommodating said members (a), (b), (c) and (d) having a top surface adjacent said porous body and a bottom surface adjacent said transparent cover, said top surface having defined therein a top opening for introducing said fluid test sample, and said bottom surface having defined therein a bottom opening for observation of said detectable response.

5,552,277

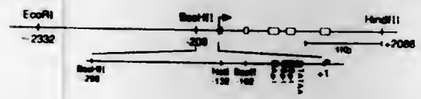
GENETIC DIAGNOSIS OF PROSTATE CANCER

William G. Nelson, Ruxton; William B. Isaacs, Glyndon, both of Md., and Wen-Hsiang Lee, Scottsdale, Ariz., assignors to The Johns Hopkins University School of Medicine, Baltimore, Md.

Filed Jul. 19, 1994, Ser. No. 277,202

Int. Cl.[6] **C07H** *21/02;21/04;* **C12Q** *1/68*

U.S. Cl. 435—6 **10 Claims**



1. A method for detecting a prostatic cell proliferative disorder associated with glutathione-S-transferase (GSTP1) in a subject comprising:

contacting a target nucleic acid in a sample of prostate tissue or biological fluid from the subject with a reagent which detects GSTP1, wherein the reagent detects methylation of the promoter region of GSTP1 when the target nucleic acid is DNA, and wherein the reagent detects the level of GSTP1 RNA when the target nucleic acid is RNA; and

detecting GSTP1 target nucleic acid, wherein hypermethylation of the promoter of GSTP1 DNA, or decreased levels of GSTP1 RNA, as compared with the level of GSTP1 RNA in a normal cell, is indicative of a GSTP1-associated cell proliferative disorder in prostate tissue.

5,552,278

DNA SEQUENCING BY STEPWISE LIGATION AND CLEAVAGE

Sydney Brenner, Cambridge, England, assignor to Spectragen, Inc., Hayward, Calif.

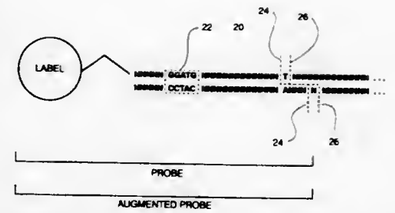
Continuation-in-part of Ser. No. 222,300, Apr. 4, 1994, abandoned. This application Jul. 25, 1994, Ser. No. 280,441

Int. Cl.[6] **C07H** *21/04;* **C12P** *19/34;* **C12Q** *1/68*

U.S. Cl. 435—6 **57 Claims**

1. A method for determining the nucleotide sequence of a polynucleotide, the method comprising the steps of:

(a) providing the polynucleotide in double stranded form such that the polynucleotide has a protruding strand at at least one end;



(b) ligating a probe from a mixture of probes to an end of the polynucleotide having a protruding strand to form a ligated complex, each probe having an end with a complementary protruding strand to that of the polynucleotide and each probe having a nuclease recognition site of a nuclease whose cleavage site is separate from its recognition site;

(c) identifying one or more nucleotides in the protruding strand of the polynucleotide;

(d) cleaving the ligated complex with said nuclease that recognizes said nuclease recognition site and cuts the ligated complex to give an augmented probe and a new protruding strand on the polynucleotide; and

(e) repeating steps (a) through (d) until the nucleotide sequence of the polynucleotide is determined.

5,552,279

NUCLEIC ACID PROBES FOR THE DETECTION OF MYCOPLASMA PNEUMONIAE AND MYCOPLASMA GENITALIUM

William G. Weisburg, Milford, and Dale A. Pelletier, Brighton, both of Mass., assignors to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 673,686, Mar. 22, 1991, abandoned. This application Jul. 29, 1994, Ser. No. 283,067

Int. Cl.[6] **C12Q** *1/68;* **C07H** *21/00*

U.S. Cl. 435—6 **22 Claims**

1. An isolated nucleic acid consisting of a nucleotide sequence fully complementary or identical to any one of probes 2295 (SEQ ID NO:1), 2289 (SEQ ID NO:2), 2296 (SEQ ID NO:3), 2298 (SEQ ID NO:4), 2299 (SEQ ID NO:5), 2300 (SEQ ID NO:6), and 2294 (SEQ ID NO:7), and wherein said nucleic acid hybridizes to the 23S ribosomal RNA (rRNA) or ribosomal DNA (rDNA) of *Mycoplasma pneumoniae* under normal hybridization conditions and does not hybridize to rRNA or rDNA of non-*Mycoplasma pneumoniae* bacteria and humans under identical hybridization conditions.

5,552,280

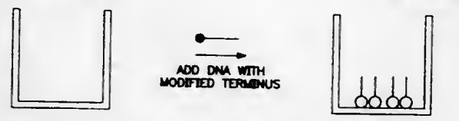
HYDROPHOBIC NUCLEIC ACID PROBES

Michael S. Urdea, Alamo, and Thomas Horn, Berkeley, both of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Continuation of Ser. No. 64,357, May 18, 1993, abandoned, which is a continuation of Ser. No. 855,448, Mar. 19, 1992, abandoned, which is a continuation of Ser. No. 374,462, Jun. 30, 1989, abandoned. This application Feb. 6, 1995, Ser. No. 384,630

Int. Cl.[6] **C07H** *21/02;21/04;* **C12Q** *1/68*

U.S. Cl. 435—6 **4 Claims**



1. A polynucleotide capture probe for binding a target polynucleotide in a sample to a substrate, wherein said capture probe comprises:

at least one hydrophobic moiety capable of noncovalently

5,552,283

METHOD, REAGENTS AND KIT FOR DIAGNOSIS AND

5,552,285

IMMUNOASSAY METHODS, COMPOSITIONS AND KITS

5,552,288

CHROMOGEN AGAR COLOR REACTIVE TEST SHEET

at least one hydrophobic moiety capable of noncovalently attaching to an unsubstituted substrate selected from the group consisting of glass, nylon, polystyrene, and nitrocellulose; and

a polynucleotide covalently bound to said at least one hydrophobic moiety,

wherein said at least one hydrophobic moiety is selected from the group consisting of a naphthalene moiety, a decahydronaphthalene moiety, and a non-polar C_{12} to C_{50} moiety that is linear, branched, cyclic or aromatic.

5,552,281

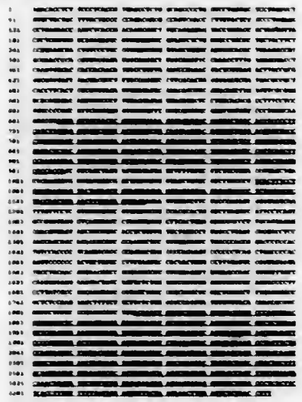
HUMAN OSTEOCLAST-SPECIFIC AND -RELATED GENES

Philip Stanbenko, Norfolk; Yi-Ping Li, Boston, and Anne L. Wucherpfennig, Brookline, all of Mass., assignors to Forsyth Dental Infirmary for Children, Boston, Mass.

Continuation of Ser. No. 45,270, Apr. 6, 1993, abandoned. This application Feb. 23, 1995, Ser. No. 392,678

Int. Cl.[6] C07H *21/04;* **C12N** *5/10;15/70;* **C12Q** *1/68*

U.S. Cl. 435—6 **5 Claims**



1. An isolated osteoclast-specific or -related DNA sequence, or its complementary sequence, the DNA sequence comprising a nucleic acid sequence selected from the group consisting of:

a) DNA sequences set forth in the group consisting of SEQ ID NOS. 12, 14, 16 and 17, or their complementary strands; and

b) DNA sequences which hybridize under standard conditions to the DNA sequences defined in a).

5,552,282

DIAGNOSIS OF MYOTONIC MUSCULAR DYSTROPHY

C. Thomas Caskey, West University, Tex.; Ying-Hui Fu, Columbus, Ohio; David L. Friedman, Houston, Tex.; Antonio Pizzuti, Milan, Italy, and Raymond G. Fenwick, Sugarland, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Continuation of Ser. No. 019,940, Feb. 19, 1993, abandoned. This application Jun. 6, 1993, Ser. No. 484,044

Int. Cl.[6] C12Q *1/68;* **C12P** *19/34;* **C07H** *21/04;* **C12N** *15/00*

U.S. Cl. 435—6 **17 Claims**

1. A method of screening, whereby individuals at risk for developing DM are identified, said method comprising the steps of:

digesting DNA from an individual to be tested with a restriction endonuclease; and

measuring the length of a restriction fragment length polymorphism (RFLP) with hybridization to probes that recognize a $(GCT)_n$ repeat at the 3' end of a DM locus and southern blot analysis.

5,552,283

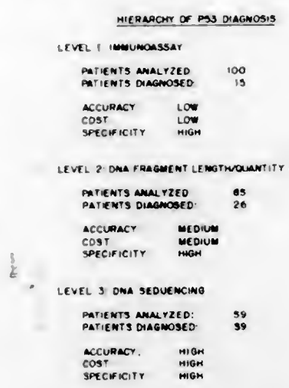
METHOD, REAGENTS AND KIT FOR DIAGNOSIS AND TARGETED SCREENING FOR P53 MUTATIONS

Eleftherios Diamandis, Toronto; James M. Dunn, Scarborough, and John K. Stevens, Toronto, all of, Canada, assignors to Visible Genetics Inc., Toronto, Canada

Continuation-in-part of Ser. No. 271,946, Jul. 8, 1994. This application Feb. 14, 1995, Ser. No. 388,381

Int. Cl.[6] C12Q *1/68;* **C12P** *19/34;* **C07H** *21/02;21/04*

U.S. Cl. 435—6 **60 Claims**



1. A method for testing a patient sample for a disease-associated mutation in the p53 gene, comprising the steps of:

(a) selecting a hierarchy of assay techniques comprising at least a first and final assay, said first assay being selected to provide a test for the presence or absence of the disease-associated mutation with essentially no false results indicating the presence of a mutation and said final assay being selected to provide a test for the presence or absence of the disease associated mutation with essentially no false results indicating the presence or absence of a mutation;

(b) analyzing the patient sample using the first assay; and, if the result of the first assay did not unambiguously indicate the presence of a disease-associated mutation,

(c) analyzing the patient sample using the final assay.

5,552,284

DETECTION OF INTERLEUKIN 8 RECEPTORS BY NUDEIC ACID HYBRIDIZATION

James Lee, San Bruno; William E. Holmes, Pacifica, and William L. Wood, San Mateo, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 234,494, Apr. 28, 1994, abandoned, which is a continuation of Ser. No. 677,211, Mar. 29, 1991, abandoned. This application Mar. 24, 1995, Ser. No. 410,451

Int. Cl.[6] C12Q *1/68;* **C07H** *21/04*

U.S. Cl. 435—6 **1 Claim**

1. A method for determining the presence or absence of an IL-8 receptor nucleic acid in a sample, comprising the steps of:

(a) electing a probe comprising of at least 20 contiguous nucleotides selected from SEQ ID NO: 1 or at least 20 contiguous nucleotides exactly complementary to SEQ ID NO: 1, wherein the probe is neither identical nor exactly complementary to the nucleic acid encoding the rabbit fMLP receptor,

(b) hybridizing the probe to any IL-8 receptor nucleic acid present in a nucleic acid sample to form a probe/IL-8 receptor nucleic acid complex,

(c) detecting the presence or absence of the probe/IL-8 receptor nucleic acid complex in the sample, and

(d) determining the presence or absence of IL-8 receptor nucleic acid in the sample based on the result of step (c).

5,552,285

IMMUNOASSAY METHODS, COMPOSITIONS AND KITS FOR ANTIBODIES TO OXIDIZED DNA BASES

Krystyna Frenkel, Woodmere, N.Y., assignor to New York University, New York, N.Y.

Continuation of Ser. No. 841,633, Feb. 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 660,992, Feb. 27, 1991, abandoned. This application Jul. 1, 1994, Ser. No. 269,617

Int. Cl.[6] C12Q *1/68;* **G01N** *33/53;33/564;33/00;* **C07H** *21/02*

U.S. Cl. 435—7.1 **23 Claims**

16. An immunoassay method for detecting antibodies specific for an oxidized DNA base, comprising

(a) contacting a sample suspected of containing said antibodies with an oxidized DNA base which is not part of an oligonucleotide or polynucleotide molecule; and

(b) measuring the amount of antibodies in said sample which are specific for said base.

5,552,286

HYBRIDOMA CELL LINES AND THEIR MONOCLONAL ANTIBODIES TO HUMAN PLURIPOTENT GRANULOCYTE COLONY STIMULATING FACTOR

David Chang, Thousand Oaks, and Bruce Altrock, Newbury Park, both of Calif., assignors to Kirin-Amgen, Inc., Thousand Oaks, Calif.

Continuation of Ser. No. 243,055, May 16, 1994, abandoned, which is a continuation of Ser. No. 445,118, Nov. 30, 1989, abandoned, which is a continuation of Ser. No. 201,386, May 31, 1988, abandoned, which is a continuation of Ser. No. 806,755, Dec. 9, 1985, abandoned. This application Jan. 31, 1995, Ser. No. 382,942

Int. Cl.[6] G01N *33/53;33/577;* **C12N** *5/12;* **C07K** *16/22*

U.S. Cl. 435—7.2 **4 Claims**

3. In an immunological procedure for the isolation of biologically active hpG-CSF from a biological fluid on the basis of a selective immunological reaction with an antibody specific for hpG-CSF, the improvement comprising:

employing a monoclonal antibody capable of specifically binding hpG-CSF in an antigen/antibody reaction, wherein the monoclonal antibody is produced by a cell line selected from the group consisting of A.T.C.C. HB-8957, HB-8958, HB-8959, HB-8960, HB-8961 and HB-8962.

5,552,287

MONOCLONAL ANTIBODY SPECIFIC FOR ANTIGENS IN MOUSE INBRED STRAINS

Moriaki Kusakabe, Wako, and Teruyo Sakakura, Tsu, both of, Japan, assignors to Rikagaku Kenkyusho, Wako, Japan

Continuation of Ser. No. 944,650, Sep. 14, 1992, abandoned. This application Jun. 16, 1994, Ser. No. 261,301

Claims priority, application Japan, Dec. 26, 1991, 3-344608

Int. Cl.[6] G01N *33/573*

U.S. Cl. 435—7.4 **4 Claims**

1. A method for identifying the origin of a cell from a chimeric mouse, derived from strain DBA/1, CE/J, SM/J, IQI, PL/J, SWM/Ms, RIII/J or RFM/MsNrs comprising:

a) reacting said cell with a monoclonal antibody of IgG1/κ subclass, characterized in that said monoclonal antibody recognizes antigens specifically present in mouse inbred strains DBA/1, CE/J, SM/J, IQI, PL/J, SWM/Ms, RIIIS/J, and RFM/MsNrs, wherein one of said antigens has a molecular weight of 66,000 and another of said antigens has a molecular weight of 68,000 and said antigens are present in the mitochondria of strain C3H, wherein said chimeric mouse is also derived from a strain which does not contain said antigens, and

b) detecting said antigens in said cell with said monoclonal antibody; thereby indicating said cell is derived from DBA/1, CE/J, SM/J, IQI, PL/J, SWM/Ms, RIIIS/J, or RFM/MsNrs.

5,552,288

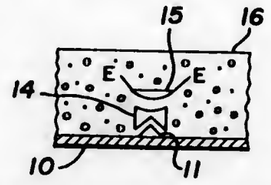
CHROMOGEN AGAR COLOR REACTIVE TEST SHEET

Dale A. Christensen, and Peter Nash, both of c/o Camas Diagnostic Company, 1313 Fifth St. SE., both of Minneapolis, Minn. 55414

Continuation-in-part of Ser. No. 957,686, Oct. 7, 1992, which is a division of Ser. No. 555,232, Jul. 20, 1990, Pat. No. 5,156,948. This application Mar. 10, 1995, Ser. No. 402,464

Int. Cl.[6] G01N *33/535*

U.S. Cl. 435—7.9 **4 Claims**



1. A moist uniform non-laminar chromogen agar color reactive test sheet for use in ELISA diagnostic testing, which comprises a sheet of white absorbent material impregnated with a chromogen in the form of an enzyme substrate contained in solidified agar, said test sheet being sealed in foil or plastic to maintain its moisture.

5,552,289

CDNA ENCODING THE LONG ISOFORM OF THE D2 DOPAMINE RECEPTOR

David R. Sibley, Rockville; Frederick J. Monsma, Jr., Baltimore; Loris D. McVittie, and Lawrence C. Mahan, both of Bethesda, all of Md., assignors to United States of America, Washington, D.C.

Continuation of Ser. No. 838,931, Feb. 21, 1992, abandoned, which is a division of Ser. No. 430,049, Nov. 1, 1989, Pat. No. 5,128,254. This application Aug. 3, 1993, Ser. No. 102,594

Int. Cl.[6] G01N *33/567*

U.S. Cl. 435—7.21 **3 Claims**

1. A method of screening compounds for binding activity on the long isoform of mammalian D2 dopamine receptors comprising an amino acid sequence 242–270 shown in FIG. 1 of this specification, comprising the steps of

transfecting an isolated cDNA segment into eukaryotic cells, said isolated cDNA segment encoding the long isoform of the mammalian D2 dopamine receptor comprising said amino acid sequence 242–270 and being operably linked with an expression vector;

harvesting said transfected eukaryotic cells;

treating said harvested eukaryotic cells with a labelled compound; and

measuring amount of said labelled compound bound to said dopamine receptors on said eukaryotic cells.

5,552,290

DETECTION OF PROCOAGULANT PLATELET-DERIVED MICROPARTICLES IN WHOLE BLOOD

Alan D. Michelson, Sudbury, and Marc. R. Barnard, Douglas, both of Mass., assignors to University of Massachusetts Medical Center, Worcester, Mass.

Filed Nov. 14, 1994, Ser. No. 339,417

Int. Cl.[6] G01N *33/567*

U.S. Cl. 435—7.21 **27 Claims**

1. A method for detecting procoagulant platelet-derived microparticles in whole blood comprising:

a) obtaining an anticoagulated sample of said whole blood from a patient;

b) contacting said sample with an inhibitor of fibrin clot formation, wherein said inhibitor is selected from the group consist-

ing of (i) glycyl-L-prolyl-L-arginyl-L-proline, (ii) molecules having 2–20 amino acides of the amino terminal half of human fibrinogen, and (iii) an antibody which specifically binds to the amino terminal half of said human fibrinogen;

c) contacting said sample of step b) with a first agent comprising a first detectable label, under conditions whereby said first labeled agent specifically binds to any platelets and any PDMP to identify said platelets and said PDMP;

d) contacting said sample of step c) with a second agent comprising a second detectable label, under conditions whereby said second labeled agent specifically binds to any procoagulant PDMP to distinguish said procoagulant PDMP from said platelets and any non-procoagulant PDMP, wherein said first and second labels are different; and

e) detecting said procoagulant PDMP by detecting any PDMP which are specifically bound by both said first labeled agent and said second labeled agent.

5,552,291

ANTI-HUMAN PULMONARY ADENOCARCINOMA SPECIFIC MONOCLONAL ANTIBODY

Hajime Yoshida, Kanagawa, Japan; Nobuo Hanai, Mercer Island, Wash., and Kenya Shitara, Tokyo, Japan, assignors to Kyowa, Hakko Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 33,440, Mar. 18, 1993, abandoned, which is a continuation of Ser. No. 724,479, Jun. 28, 1991, abandoned, which is a continuation of Ser. No. 353,197, May 16, 1989, abandoned, which is a continuation-in-part of Ser. No. 262,042, Oct. 24, 1988, abandoned, which is a continuation of Ser. No. 916,275, Oct. 7, 1986, abandoned. This application Feb. 10, 1994, Ser. No. 194,633

Claims priority, application Japan, Oct. 9, 1985, 60-225327

Int. Cl.[6] G01N *33/574;33/53*

U.S. Cl. 435—723 **1 Claim**

1. A method of screening for the presence of pulmonary adenocarcinoma in a patient, comprising:

contacting a serum sample from the patient with monoclonal antibody ALC-186, which is secreted by hybridoma cell line NCACC85082903; and

detecting binding of the antibody to a pulmonary adenocarcinoma-associated antigen in the serum sample, wherein the presence of said binding is indicative of the presence of pulmonary adenocarcinoma.

5,552,292

METHOD OF SCREENING FOR COLORECTAL CANCER

Kazuo Uchida, Hyogo-ken, and Shinichi Mashiba, Kyoto-fu, both of, Japan, assignors to Ikagaku Co., Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 113,134, Aug. 30, 1993, abandoned. This application Nov. 10, 1994, Ser. No. 339,192

Claims priority, application Japan, Jan. 18, 1993, 5-5676; Jul. 8, 1993, 5-194089; Jul. 5, 1994, 6-177647

Int. Cl.[6] G01N *33/53;33/574*

U.S. Cl. 435—7.23 **9 Claims**

1. A screening test method for colorectal cancer carried out on a fecal sample of a person suspected of suffering from colorectal cancer which comprises determining the amount of lactoferrin in the fecal sample by immunoassay, wherein an amount of more than 2.4 μg lactoferrin per g feces indicates colorectal cancer.

2. A screening test method for colorectal cancer carried out on a fecal sample of a person suspected of suffering from colorectal cancer which comprises determining the amount of myeloperoxidase in the fecal sample by immunoassay, wherein an amount of more than 4.2 μg myeloperoxidase per g feces indicates colorectal cancer.

5,552,293

TUMOR ANTIGEN SPECIFIC ANTIBODY

Leif G. Lindholm, Kullavik; Jan Holmgren, Vastra Frolunda, and Peter Lind, Uppsala, all of, Sweden, assignors to Pharmacia Aktiebolag, Uppsala, Sweden

Continuation of Ser. No. 906,350, Jul. 2, 1992, abandoned. This application May 8, 1995, Ser. No. 438,123

Claims priority, application Sweden, Jul. 3, 1991, 9102074

Int. Cl.[6] G01N *33/53;33/574*

U.S. Cl. 435—7.23 **9 Claims**

1. A substantially pure antibody which binds the same epitope as the antibody produced by hybridoma cell line C242:11, which cell line has ECACC identification number 90012601.

7. A method for diagnosing a tumor antigen in vitro, comprising the steps of contacting a sample with a monoclonal antibody according to claim 1 under conditions permitting formation of a complex containing said monoclonal antibody bound to its antigen and subsequently determining that the complex formed, the amount of which is correlated to the amount of antigen present in the sample.

5,552,294

RAPID DETECTION OF VIRULENCE-ASSOCIATED FACTORS

Grace M. Thorne, Framingham, Mass., assignor to Children's Medical Center Corporation, Boston, Mass.

Continuation of Ser. No. 963,724, Oct. 20, 1992, abandoned. This application Jul. 25, 1994, Ser. No. 279,832

Int. Cl.[6] G01N *33/569;33/543;33/62;33/573*

U.S. Cl. 435—7.32 **21 Claims**

1. A method for immunochemically detecting a virulence-associated factor in feces, comprising:

contacting a feces sample suspected of containing a virulence-associated factor producing bacteria with a factor releasing solution under conditions which release at least one virulence-associated factor from the bacteria; and

immunochemically detecting the presence or quantity of the released virulence-associated factor,

wherein said virulence-associated factor is selected from the group consisting of a bacterial toxin, a surface antigen, an adhesive factor, and a heat-release protein;

said factor releasing solution containing:

a) a surface-active agent;

b) urea; and

c) an antibiotic selected from the group consisting of polymyxins and mitomycin C; and said solution releasing the virulence-associated factor without impeding the immunochemical detectability of the virulence-associated factor.

5,552,295

MONOCLONAL ANTIBODIES TO BOVINE HAPTOGLOBIN AND METHODS FOR DETECTING SERUM HAPTOGLOBIN LEVELS

Larry H. Stanker; Cynthia L. Sheffield, and John R. DeLoach, all of College Station, Tex., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 2, 1994, Ser. No. 205,669

Int. Cl.[6] G01N *33/53;33/543;* **C07K** *16/18;* **C12N** *5/20*

U.S. Cl. 435—7.92 **18 Claims**

1. A hybridoma cell line which produces and secretes monoclonal antibodies which specifically bind to bovine haptoglobin at non-hemoglobin binding sites.

5,552,296

METHOD FOR THE DETERMINATION OF COAGULATION PARAMETERS

Enno Adema, Tutzing; Ulrike Gebert, Seeshaupt, and Reinhard Herz, Poecking/Possenhofen, all of, Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed Jan. 30, 1995, Ser. No. 380,184

Claims priority, application Germany, Jan. 29, 1994, 44 02 631.5

Int. Cl.[6] C12Q *1/56;1/00;* **G01N** *33/53;31/00*

U.S. Cl. 435—13 **18 Claims**

1. A method for the determination of coagulation parameters in a sample, comprising the steps of:

forming a thrombin-catalyzed fibrin clot, and

measuring formation of the fibrin clot,

wherein the determination is carried out in the presence of an activation inhibitor of F XIII, F $XIII_A$ or the fibrin cross-linking activity of F $XIII_A$.

5,552,297

LEAD DETECTION METHOD AND REGGENTS UTILIZING AMINOLEVULINIC ACID DEHYDRATASE AND TERTIARY PHOSPHINES

Martin Wong, Grayslake, and John M. Ramp, Gurnee, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 171,035, Dec. 21, 1993, abandoned. This application Apr. 11, 1995, Ser. No. 419,845

Int. Cl.[6] C12Q *1/32;* **G01N** *33/53*

U.S. Cl. 435—26 **36 Claims**

1. A method for detecting lead in a sample suspected of containing lead, the method comprising:

(a) forming an aqueous solution from the sample such that any lead in the sample is present in said aqueous solution;

(b) contacting the aqueous solution with an aminolevulinic acid dehydratase enzyme in the presence of a water soluble tertiary phosphine;

(c) incubating the enzyme with aminolevulinic acid to form a product comprising porphobilinogen;

(d) stopping said enzyme incubation performed in step (c) after a predetermined time interval;

(e) detecting said porphobilinogen resulting from step (c); and

(f) correlating said porphobilinogen detected in step (e) with the presence of lead in the sample whereas porphobilinogen detected indicates the presence of lead in said sample.

5,552,298

ENZYME-CATALYZED CHEMILUMINESCENCE FROM HYDROXYARYL CYCLIC DIACYLHYDRAZIDE COMPOUNDS

Hashem Akhavan-Tafti, Sterling Heights, Mich., assignor to Lumigen, Inc., Southfield, Mich.

Filed Oct. 23, 1992, Ser. No. 965,231

Int. Cl.[6] C12Q *1/28;* **G01N** *33/53*

U.S. Cl. 435—28 **30 Claims**

1. A process for producing chemiluminescence which comprises reacting a hydroxyaryl cyclic diacylhydrazide with a peroxide compound, a phenolic enhancer compound and a peroxidase enzyme, wherein the hydroxyaryl has the formula HOAr.

5,552,299

PLASMIDS AND PROCESS FOR PRODUCING RECOMBINANT DESULPHATOHIRUDIN HV-1 PEPTIDES

István Ott; Tibor Klupp; István Molnár; András Patthy; István Barta; Zsuzsa Barkó née Tóth; Gábor Ambrus; János Salát; Anikó Tegdes; Imre Moravcsik; Cecilia Együd; Kárnly Albrecht; Kálmán Könczöl; Attila Vincze; Éva Barabás; György Máté, all of Budapest; György B. Kiss; Péter Kiss, both of Szeged; Kálmán Pólya, Debrecen; János Erdei, Debrecen; Éva Gulyás, Debrecen, and Erika Zilahi, Debrecen; all of, Hungary, assignors to Biogal Gyogyszergyar Rt., Budapest, Hungary

Filed Apr. 9, 1993, Ser. No. 44,506

Claims priority, application Hungary, Apr. 9, 1992, 92-01200

Int. Cl.[6] C12P *21/06;* **C12N** *1/19;15/81*

U.S. Cl. 435—69.1 **11 Claims**

1. A process for producing desulphatohirudin HV-1 33 ASP and desulphatohirudin HV-1 33 ASN peptides, comprising the steps of biosynthesizing said desulphatohirudin HV-1 peptides by expressing the nucleotide sequences coding for said hirudin HV-1 peptides synthesized in vitro on the basis of the codon usage of microorganisms,

under the control of pX promoter, UAS transcription activating sequence, initiation and termination codons, employing the synthetic nucleotide sequence [SEQ ID NO:30]:

. . . 5'-TCA TTC GTT CAA GGT GTA TCT TTG GAT AAG AGA-3'

this sequence coding for signal peptide and an amino acid sequence to ensure the secretion and cleavage site for endopeptidase, using the URA3 and leu2-d genes to determine the level of expression and stability of plasmid vector DNAs, applying expression/secretion cassettes in the aforesaid plasmids, by means of cells of a yeast selected from the group consisting of *Saccharomyces bayanus* and *Saccharomyces cerevisiae*,

by cultivating the foregoing microorganisms under proper fermentation conditions after transformation of plasmids comprising the aforesaid elements, then separating the hirudin accumulated extracellularly.

5,552,300

T CELL ANTIGEN RECEPTOR V REGION PROTEINS AND METHODS OF PREPARATION THEREOF

Savvas C. Makrides, Bedford, and Patrick C. Kung, Brookline, both of Mass., assignors to T Cell Sciences, Inc., Needham, Mass.

Filed Jan. 13, 1994, Ser. No. 181,492

Int. Cl.[6] C12N *15/00;15/13*

U.S. Cl. 435—69.1 **30 Claims**

1. A method for producing a recombinant T cell antigen receptor Vβ5.3 protein which comprises;

a) transforming a competent bacterial host cell with a recombinant expression vector containing an inducible bacterial promoter and a coding region for a T cell antigen receptor Vβ5.3 protein free of extraneous Vβ protein sequences, operably linked in a 5' to 3' orientation;

b) inducing the transformed bacterial host cell of step a. and;

c) recovering the T cell antigen receptor Vβ5.3 protein.

5,552,301

-continued

5,552,305

5,552,306

5,552,301

PROCESS FOR ENCHANCING THE PRODUCTION OF HETEROLOGOUS PROTEIN IN BIOLOGICALLY ACTIVE CONFORMATION IN A TRANSFORMED E. COLI DNAK MUTANT HOST CELL

Francois Baneyx, Seattle, Wash.; Anthony A. Gatenby, Wilmington, and Cathy E. Kalbach, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 38,380, Mar. 29, 1993, abandoned. This application Apr. 26, 1994, Ser. No. 233,158

Int. Cl.[6] C12N *15/00;15/73;* **C12P** *21/00;21/02*

U.S. Cl. 435—69.1 **6 Claims**

1. A process for using a transformed *Escherichia coli* dnaK mutant host cell to produce heterologous protein in biologically active conformation, said process comprising:

a) expressing in said dnaK mutant host cell said heterologous protein having a biologically active conformation and being either a full length mutant protein or a partially inactivated but functional mutant protein; and

b) harvesting said heterologous protein having a biologically active conformation from said host cell.

5,552,302

METHODS AND COMPOSITIONS FOR PRODUCTION OF HUMAN RECOMBINANT PLACENTAL RIBONUCLEASE INHIBITOR

Martin K. Lewis, Madison, and John W. Shultz, Verona, both of Wis., assignors to Promega Corporation, Madison, Wis.

Continuation of Ser. No. 856,863, Mar. 24, 1992, abandoned, which is a continuation of Ser. No. 510,881, Apr. 18, 1990, abandoned, which is a continuation-in-part of Ser. No. 342,362, Apr. 24, 1989, abandoned. This application Jul. 27, 1994, Ser. No. 282,151

Int. Cl.[6] C07K *1/14;1/30;* **C12P** *21/02*

U.S. Cl. 435—692 **13 Claims**

1. A method of solubilizing and refolding into active form human placental ribonuclease inhibitor from insoluble inclusion bodies formed in *E. coli* cells by expression therein of a cDNA encoding said inhibitor, comprising:

a) isolating the insoluble, inactive human placental ribonuclease inhibitor from said cells;

b) solubilizing the inactive human placental ribonuclease inhibitor of step a) wherein the solubilization process comprises combining the insoluble, inactive human placental ribonuclease inhibitor with a buffer solution comprising urea in a concentration no less than about 4 M; and

c) activating the human ribonuclease inhibitor by dilution thereof.

5,552,303

DNA ENCODING EPITHELIUM-DERIVED T-CELL FACTOR

Kenneth Grabstein, Mercer Island; Dirk Anderson; June Eisenman, both of Seattle; Victor Fung, Redmond, and Charles Rauch, Bainbridge Island, all of Wash., assignors to Immunex Corporation, Seattle, Wash.

Filed Mar. 8, 1993, Ser. No. 31,399

Int. Cl.[6] C12P *21/06;* **C12N** *15/24;5/10;* **C07K** *14/54*

U.S. Cl. 435—69.51 **21 Claims**

1. An isolated DNA sequence encoding a mammalian epithelium-derived T-cell factor (ETF) polypeptide, wherein the DNA sequence is selected from the group consisting of:

(a) a DNA sequence encoding a mammalian ETF polypeptide comprising (SEQ. ID NO 12):

Asn	Trp	Val	Asn	Val	Ile	Ser	Asp	Leu	Lys	Lys	Ile	Glu	Asp	Leu	
1				5				10							15

-continued

Ile	Gln	Ser	Met	His	Ile	Asp	Ala	Thr	Leu	Tyr	Thr	Glu	Ser	Asp	
				20					25						30
Val	His	Pro	Ser	Cys	Lys	Val	Thr	Ala	Met	Lys	Cys	Phe	Leu	Leu	
				35					40						45
Glu	Leu	Gln	Val	Ile	Ser	Xaa	Glu	Ser	Gly	Asp	Xaa	Xaa	Ile	His	
				50					55						60
Asp	Thr	Val	Glu	Asn	Leu	Ile	Ile	Leu	Ala	Asn	Asn	Xaa	Leu	Ser	
				65					70						75
Ser	Asn	Gly	Asn	Xaa	Thr	Glu	Ser	Gly	Cys	Lys	Glu	Cys	Gly	Glu	
				80					85						90
Leu	Glu	Glu	Lys	Asn	Ile	Lys	Glu	Phe	Leu	Gln	Ser	Phe	Val	His	
				95					100						105
Ile	Val	Gln	Met	Phe	Ile	Ans	Thr	Ser							
				110											

wherein amino acid 52 is Leu or His, amino acid 57 is Ala or Thr, amino acid 58 is Ser or Asp, amino acid 73 is Ser or Ile, and amino acid 80 is Val or Ile; and

(b) DNA sequences that detectably hybridize to the DNA sequences of (a) or their complementary strands under conditions of high stringency and upon expression encode mammalian ETF.

5,552,304

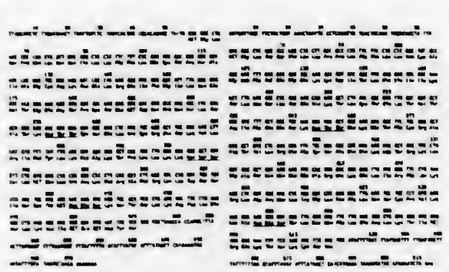
CDNA CLONES CODING FOR HUMAN PROTEIN EXHIBITING A BROAD CELLULAR ACTIVITY SPECTRUM (HUMAN INTERLEUKIN-4)

Frank Lee; Takashi Yokota; Ken-ichi Arai, all of Palo Alto; Timothy Mosmann, Atherton, and Donna Rennick, Los Altos, all of Calif., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 799,668, Nov. 19, 1985, abandoned. This application Mar. 25, 1986, Ser. No. 843,958

Int. Cl.[6] C12P *21/02;* **C12N** *15/19;1/21;5/16;1/19*

U.S. Cl. 435—69.52 **30 Claims**



1. A process for producing a polypeptide, said process comprising expressing in a host cell a vector comprising a nucleotide sequence encoding

His—Lys—Cys—Asp—Ile—Thr—Leu—Gln—Glu—Ile—Ile—Lys—Thr—Leu—Asn—Ser—Leu—Thr—Glu—Gln—Lys—Thr—Leu—Cys—Thr—Glu—Leu—Thr—Val—Thr—Asp—Ile—Phe—Ala—Ala—Ser—Lys—Asn—Thr—Thr—Glu—Lys—Glu—Thr—Phe—Cys—Arg—Ala—Ala—Thr—Val—Leu—Arg—Gln—Phe—Tyr—Ser—His—His—Glu—Lys—Asp—Thr—Arg—Cys—Leu—Gly—Ala—Thr—Ala—Gln—Gln—Phe—His—Arg—His—Lys—Gln—Leu—Ile—Arg—Phe—Leu—Lys—Arg—Leu—Asp—Arg—Asn—Leu—Trp—Gly—Leu—Ala—Gly—Leu—Asn—Ser—Cys—Pro—Val—Lys—Glu—Ala—Asn—Gln—Ser—Thr—Leu—Glu—Asn—Phe—Leu—Glu—Arg—Leu—Lys—Thr—Ile—Met—Arg—Glu—Lys—Tyr—Ser—Lys—Cys—Ser—Ser.

5,552,305

BIOCATALYTIC CONVERSION OF AZOBISNITRILES TO CYANOAMIDES OR DIAMIDES USING PSEUDOMONAS, RHODOCOCCUS OR BREVIBACTERIUM

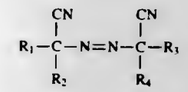
Robert D. Fallon, Elkton, Md., and Ernest B. Wysong, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 30, 1995, Ser. No. 413,529

Int. Cl.[6] C12P *13/02;13/04;17/00*

U.S. Cl. 435—129 **13 Claims**

1. A process for the enzymatic conversion of an azobisnitrile to a more water soluble cyanoamide or diamide derivative without destroying the N=N bond, the azobisnitrile having formula I:



wherein,

R_1, R_2, R_3 and R_4 independently of each other are

a) unsubstituted C_1–C_8 aliphatic hydrocarbon;

b) C_1–C_8 aliphatic hydrocarbon substituted with carboxyl, hydroxyl, halogen, or OR_5 wherein R_5 is a C_1–C_4 aliphatic hydrocarbon;

c) C_3–C_8 alicyclic hydrocarbon;

d) C_3–C_8 alicyclic hydrocarbon substituted with alkyl or halogen;

e) C_4–C_{10} aromatic hydrocarbon substituted with halogen or nitro; or

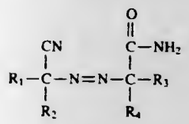
f) a five or six membered heterocyclic ring containing O, S or N atoms; or

R_1 and R_2 are taken together to form a C_4–C_{12} alicyclic hydrocarbon and R_3 and R_4 are as defined above; or

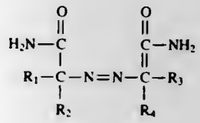
R_3 and R_4 are taken together to form a C_4–C_{12} alicyclic hydrocarbon and R_1 and R_2 are as defined above, said process comprising:

1) contacting an aqueous suspension of an azobisnitrile of formula I with a microorganism having nitrile hydratase activity and incapable of degrading N=N bonds selected from the group consisting of Rhodococcus, Pseudomonas and Brevibacterium; and

2) recovering either a cyanoamide of formula II



wherein R_1, R_2, R_3 and R_4 are defined as above for formula I, or a diamide of formula III



wherein R_1, R_2, R_3 and R_4 are defined as above for formula I.

5,552,306

PRODUCTION OF γ-LINOLENIC ACID BY A Δ6-DESATURASE

Terry L. Thomas, College Station; Avutu S. Reddy, Bryan; Michael Nuccio, College Station, all of Tex., and Georges L. Freyssinet, Saint Cyr au Mont d'Or, France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

Continuation of Ser. No. 959,952, Oct. 13, 1992, abandoned, which is a continuation of Ser. No. 817,919, Jan. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 774,475, Oct. 10, 1991, abandoned. This application Sep. 14, 1994, Ser. No. 307,382

Int. Cl.[6] C12P *7/64;* **C12N** *15/63;9/02;5/14*

U.S. Cl. 435—134 **23 Claims**

1. An isolated nucleic acid encoding cyanobacterial Δ6-desaturase wherein said isolated nucleic acid is isolatable from a cyanobacteria that produces gamma linolenic acid.

5,552,307

METHOD OF USING AN ELECITOR TO INCREASE PRODUCTION OF METABOLITES IN BIOLOGICAL CELLS

Bezalel Kessler, Rehobot, Israel; Chaim Frenkel; Daphna Frenkel, both of North Brunwick, N.J., and Abraham Kessler, Rehobot, Israel, assignors to Bar-Ilan University, Ramat-Gan, Israel, and Rutgers, The State University of New Jersey, New Brunswick, N.J.

Continuation of Ser. No. 749,638, Aug. 19, 1991, abandoned, which is a continuation of Ser. No. 236,055, Aug. 24, 1988, abandoned. This application Nov. 4, 1994, Ser. No. 334,794

Int. Cl.[6] C12N *5/00;5/02*

U.S. Cl. 435—171 **37 Claims**

1. A method for culturing cells to produce a metabolite comprising growing cells selected from the group consisting of plant and fungi cells in a culture medium containing an elicitor to increase production of said metabolite, said elicitor being selected from the group consisting of oxidized BSA, glycosylated BSA, oxidized lysozyme, glycosylated lysozyme and azetidine-2-carboxylic acid, and being in an amount effective to increase production of said metabolite in an amount of at least 1000% over the production of said metabolite by said method when said elicitor is not present in said culture medium, and recovering said metabolite.

5,552,308

CDNA CLONE OF A RAT SEROTONIN TRANSPORTER AND PROTEIN ENCODED THEREBY

Beth J. Hoffman, Kensington; Eva Mezey, and Michael J. Brownstein, both of Rockville, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Oct. 24, 1991, Ser. No. 782,298

Int. Cl.[6] C12N *15/12*

U.S. Cl. 435—172.3 **5 Claims**

1. An isolated DNA molecule encoding a serotonin transporter protein consisting of a DNA molecule having a nucleotide sequence which encodes the amino acid sequence of SEQ. I.D. NO. 2.

5,552,309

USE OF POLYOLS FOR IMPROVING THE INTRODUCTION OF GENETIC MATERIAL INTO CELLS

Keith L. March, Carmel, Ind., assignor to Indiana University Foundation, Bloomington, Ind.

Filed Sep. 30, 1994, Ser. No. 315,974

Int. Cl.[6] A01N *63/00;* **C12N** *5/00;15/00*

U.S. Cl. 435—172.3 **15 Claims**

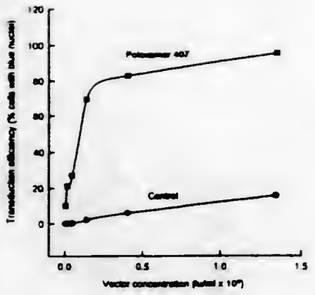
1. In a process for transfecting a cell with a viral particle, the improvement comprising:

5,552,315

BACTERIA FOR THE CONTROL OF FUSARIUM DRY

5,552,317

METHOD FOR PREPARING OPTICALLY ACTIVE



contacting said cell with a composition comprising said viral particle and a non-ionic polyol, said non-ionic polyol being a polyoxyalkylene block copolymer wherein the alkylene moieties of the polyoxyalkylene groups each have from 2 to 5 carbon atoms, whereby said cell is transfected with said viral particle.

5,552,310

REPLICATION OF HEPATITIS C VIRUS GENOME AND IDENTIFICATION OF VIRUS HAVING HIGH INFECTIVITY

Hiroshi Yoshikura, 644, Nakamachi, Kodaira-shi, Tokyo; Yohko Shimizu, 3-17-23, Nishiwaseda, Shinjuku-ku, Tokyo; Aikichi Iwamoto, and Minako Hijikata, both of Tokyo, all of, Japan, assignors to Hiroshi Yoshikura, and Yohko Shimitzu, both of Tokyo, Japan

Filed Oct. 20, 1992, Ser. No. 963,490

Claims priority, application Japan, Jun. 12, 1992, 4-153786; Oct. 19, 1992, 4-304351

Int. Cl.[6] C12Q *1/70*; C12N *7/01;7/02*

U.S. Cl. 435—235.1 **4 Claims**

1. A method for replication of hepatitis C virus genome, comprising infecting animal cells selected from the group consisting of Molt-4 cell line and HPB cell line, which animal cells have been infected with sarcoma virus-amphotropic murine leukemia virus complex, with hepatitis C virus, and culturing said cells.

5,552,311

PURINE NUCLEOSIDE PHOSPHORYLASE GENE THERAPY FOR HUMAN MALIGNANCY

Eric J. Sorscher; William B. Parker, and Leonard L. Bennett, Jr., all of Birmingham, Ala., assignors to University of Alabama at Birmingham Research Foundation, Birmingham, Ala., and Southern Research Inst., Birmingham, Ala.

Filed Sep. 14, 1993, Ser. No. 122,321

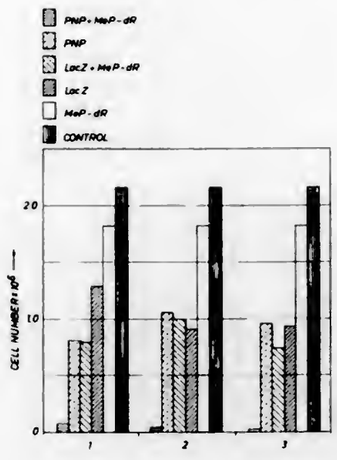
Int. Cl.[6] C12N *5/00;15/00*

U.S. Cl. 435—240.2 **14 Claims**

1. A method of killing replicating or non-replicating, transfected or transduced cultured mammalian cells and bystander cells, comprising:

(a) transfecting or transducing mammalian cells with a nucleic acid encoding an *E. coli* purine nucleoside phosphorylase, whereby the purine nucleoside phosphorylase is expressed and

(b) contacting the transfected or transduced cells with an effective amount of a nucleoside substrate for the purine nucleoside phosphorylase, wherein the substrate is non-toxic to mammalian cells and is cleaved by the phosphorylase to yield a putinc base which is toxic to the targeted mammalian cells and bystander cells, to kill the mammalian cells expressing the phosphorylase and the bystander cells.



5,552,312

RECOMBINANT $HT_{\mu 4}$ GENE, PROTEIN AND ASSAYS

Bing Lim, Dorcester; Chaker N. Adra, Boston, both of Mass., and Jean-Michel Lelias, Toulouse, France, assignors to Beth Israel Hospital Boston, Boston, Mass.

Filed Oct. 6, 1994, Ser. No. 318,492

Int. Cl.[6] C12N *5/00;1/20;15/00*; C07H *21/04*

U.S. Cl. 435—240.2 **6 Claims**

1. A recombinant DNA molecule which encodes a mammalian $HT_{\mu 4}$ protein.

5,552,313

DNA ENCODING MOUSE PHOSPHOTRIESTERASE-RELATED PROTEIN

James P. Calvet; Xiaoying Hou; Brenda S. Magenheimer, and Robin L. Maser, all of Kansas City, Kans., assignors to Kansas University, Kansas City, Kans.

Filed Nov. 21, 1994, Ser. No. 343,027

Int. Cl.[6] C12N *1/20;9/00*; C07K *1/00*

U.S. Cl. 435—252.33 **7 Claims**

1. DNA sequences encoding a mouse phosphotriesterase-related protein having the sequence shown in SEQ ID NO. **12**.

5,552,314

CLONING HOST ORGANISMS

Alan L. Greener, Del Mar, Calif., assignor to Stratagene, La Jolla, Calif.

Continuation of Ser. No. 51,572, Apr. 22, 1993, abandoned, which is a continuation of Ser. No. 462,505, Jan. 8, 1990, abandoned. This application May 15, 1995, Ser. No. 441,368

Int. Cl.[6] C12N *1/21;15/01;15/70*

U.S. Cl. 435—252.33 **1 Claim**

1. A culture of E. coli having ATCC deposit number 55695 wherein the E. coli is recB, recJ, sbcC201, phoR, uvrC, umuC::Tn5, mcrA, mcrB, mrr, (MsdRMS), endA1, gyrA96, thi, relA1, lac, supE44, and {F'pro AB, $lacI^{Q}ZM15$, Tn1056 and the E. coli can prevent rearrangements in DNA sequences containing inverted repeats or Z-DNA.

5,552,315

BACTERIA FOR THE CONTROL OF FUSARIUM DRY ROT TO POTATOES

Patricia J. Slininger, Metamora; David A. Schisler, Morton, and Rodney J. Bothast, East Peoria, all of Ill., assignors to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Continuation-in-part of Ser. No. 199,409, Feb. 22, 1994, abandoned, which is a division of Ser. No. 68,872, May 28, 1993. This application Aug. 25, 1994, Ser. No. 295,583

Int. Cl.[6] C12N *1/00;1/20*; C12Q *1/04;1/18*

U.S. Cl. 435—253.3 **11 Claims**

1. A biologically pure culture of a bacterial antagonist of *Fusarium* selected from the group consisting of *Pantoea agglomerans* NRRL B-21048, *Pseudomonas* sp. NRRL B-21049, *Enterobacter cloacae* NRRL B-21050, *Pseudomonas* sp. NRRL B-21051, *Pseudomonas sp.* NRRL B-21053, *Enterobacter* sp. NRRL B-21101, *Pseudomonas sp.* NRRL B-21102, *Enterobacter* sp. NRRL B-21103, *Pantoea* sp. NRRL B-21104, *Pseudomonas* sp. NRRL B-21105, *Pseudomonas* sp. NRRL B-21128, *Pseudomonas* sp. NRRL B-21129, *Enterobacter* sp. NRRL B-21132, *Pseudomonas sp.* NRRL B-21133, *Pseudomonas* sp. NRRL B-21134, *Pseudomonas* sp. NRRL B-21135, *Pseudomonas corrugata* NRRL B-21136 and *Pseudomonas* sp. NRRL B-21137.

5,552,316

CLARIFYING *E. COLI* FERMENTATION BROTHS WITH A COMBINATION OF ANIONIC AND CATIONIC FLOCCULANTS

Christopher M. Savage, East Lansing, Mich., assignor to Environmental Marketing Services, Ltd., Lansing, Mich.

Continuation of Ser. No. 72,542, Jun. 4, 1993, abandoned. This application Jan. 18, 1995, Ser. No. 375,002

Int. Cl.[6] C12N *1/02*; C12P *13/04*; B03D *3/00*

U.S. Cl. 435—261 **17 Claims**

1. A process for recovering a clarified broth by separating cells and parts thereof from an aqueous fermentation broth in which bacterial cells produce a water-soluble product, said process comprising,

(a) sequentially mixing an anionic polymer ("Polymer A") and thereafter a cationic polymer ("Polymer C") in said broth wherein said cells are *Escherichia coli* ("*E. coli*"), said Polymer A has a viscosity in the range from 10 to 1 million cps at 15% by weight polymer solids in water alone, and said Polymer C has a viscosity in the range from 500 to 100,000 cps at 1% by weight polymer solids in water alone, so as to provide a concentration of polymers from 1 to 5000 parts per million in said broth, said Polymer A being a copolymer of first and second monomers, wherein said first monomer is selected from the group consisting of an α,β-unsaturated monomer and an alkali metal or alkaline earth metal salt thereof, present in an amount from 5 to 95 mole percent, and said second monomer is selected from the group consisting of allyl sulfonic acid, methallyl sulfonic acid, allyl ether sulfonic acid, styrene sulfonic acid, methyl styrene sulfonic acid, vinyl sulfonic acid, 2-sulfoxy ethyl methacrylate, 2-acrylamido-2-methylpropane sulfonic acid, and a salt of each acid, wherein said salt is an alkali metal or alkaline earth metal salt, present in an amount in the range from 95 to 5 mole percent, said Polymer C being a polymer containing amine repeating units derived from an aminated α,β-unsaturated monomer having a tertiary or quaternary alkyl amine group containing from 1 to 10 carbon atoms, wherein said aminated monomer is derived from said first monomer, wherein the ratio of Polymer A:Polymer C is in the range from 1:1 to 100:1 by weight;

(b) allowing a flocculant mass containing said Polymers A and C and said cells and parts thereof to separate from said broth; and,

(c) removing said flocculant mass from said broth to produce a clarified broth.

5,552,317

METHOD FOR PREPARING OPTICALLY ACTIVE HOMOPHENYLALANINE AND ESTERS THEREOF USING LIPASE FROM WHEAT GERM OR *CANDIDA LIPOLYTICA*

Jer-Yiing Houng, and Chung-Lung Hsieh, both of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu Hsien, Taiwan

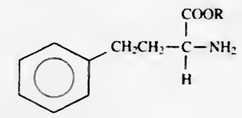
Filed May 26, 1995, Ser. No. 451,602

Int. Cl.[6] C12P *41/00*

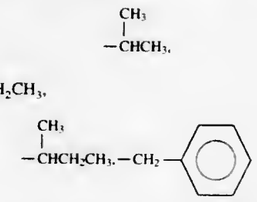
U.S. Cl. 435—280 **14 Claims**

1. A method for preparing optically active homophenylalanine and esters thereof, comprising the steps of:

(a) preparing a reaction mixture containing a DL-homophenylalanine ester and an enzyme, which is selected from the group consisting of wheat germ lipase and *Candida lipolytica* lipase, in an aqueous solution, wherein said DL-homophenylalanine ester is represented by the following general formula:



where R is selected from the group consisting of: $-CH_3$, $-CH_2CH_3$, $-CH_2CH_2CH_3$,



$-CH_2CH_2DH_2CH_3$,

(b) reacting said reaction mixture at room temperature; and

(c) using an extractant to separate the reacted reaction mixture into an upper layer, which contains an optically active D-homophenylalanine ester, and a lower layer, which contains L-homophenylalanine.

5,552,318

METHOD FOR PREPARING OPTICALLY ACTIVE AMINO ACIDS AND THEIR ESTERS USING WHEAT GERM LIPASE

Jer-Yiing Houng, and Chung-Lung Hsieh, both of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu Hsien, Taiwan

Filed May 26, 1995, Ser. No. 451,631

Int. Cl.[6] G12P *41/00*

U.S. Cl. 435—280 **10 Claims**

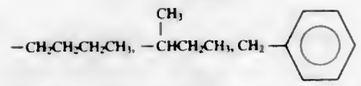
1. A method for preparing optically active amino acids or esters thereof, comprising the steps of:

(a) preparing a reaction mixture containing esters of a mixture of DL-amino acids and wheat germ lipase in an aqueous solution, wherein said esters of the mixture of DL-amino acids are represented by the following formula:

where A is an amino acid and
where R is selected from the group consisting of:

$-CH_3$, $-CH_2CH_3$, $-CH_2CH_2CH_3$, $-CHCH_3$,

-continued



(b) reacting said reaction mixture at room temperature; and
(c) using an organic extractant to separate the reacted reaction mixture into an upper layer, which contains the optically active D-amino acid ester, and a lower layer, which contains the L-amino acid.

5,552,319

APPARATUS AND METHOD FOR MONITORING AND CONTROLLING BIOLOGICAL ACTIVITY IN WASTEWATER AND CONTROLLING THE TREATMENT THEREOF

Xin Yang, Holland; Jaw F. Lee, Berwyn; Sergey K. Maneshin, Upper Holland, and Marcus E. Kolb, Phoenixville, all of Pa., assignors to BioChem Technology, Inc., King of Prussia, Pa.

Continuation-in-part of Ser. No. 288,028, Mar. 8, 1994, Pat. No. 5,466,604, which is a continuation-in-part of Ser. No. 95,123, Jul. 20, 1993, Pat. No. 5,401,412. This application May 25, 1994, Ser. No. 248,767
Int. Cl.[6] C12M *1/34*
U.S. Cl. 435—286.5 **20 Claims**

1. Apparatus for in situ monitoring biological activity in a wastewater treatment process comprising:
a wastewater sample chamber immersed in a supply of wastewater and having an opening;
a closure positioned adjacent said opening and adapted to substantially seal said chamber;
a probe positioned relative to said sample chamber to detect changes in dissolved oxygen content in samples of wastewater in said chamber;
a dissolved oxygen analyzer connected to said probe; and
a controller connected to said analyzer and said closure to introduce and remove samples from said chamber at selected time intervals.

5,552,320

SELF-CONTAINED BIOLOGICAL INDICATOR

Daniel F. Smith, Irvine, Calif., assignor to Johnson & Johnson Medical, Inc., Arlington, Tex.

Continuation of Ser. No. 103,875, Aug. 9, 1993, abandoned. This application Mar. 16, 1995, Ser. No. 406,262
Int. Cl.[6] C12M *1/40*
U.S. Cl. 435—287.4 **10 Claims**

1. A sterility indicator for use with a hydrogen peroxide sterilizer, said sterility indicator comprising a translucent, liquid impermeable outer container, having an opening that is normally closed by a vapor-permeable, microorganism-impermeable closure, and containing:
a) a source of viable microorganisms,
b) at least one closed inner container containing a liquid culture medium that, with incubation, is capable of promoting growth of the viable microorganisms and an agent for decomposing hydrogen peroxide,
c) opening means actuable external to the outer container for opening the at least one closed inner container to permit the source of microorganisms, culture medium, and hydrogen peroxide-decomposing composition to be brought into contact, and
d) a detector means contained in at least one of the containers for undergoing a visible change in response to growth of the microorganisms;
whereby the sterility indicator may be subjected to a hydrogen peroxide based sterilization procedure in a hydrogen peroxide

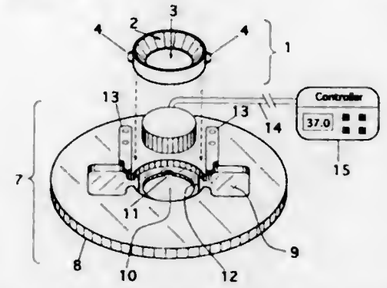
sterilizer, and whereafter said opening means may be actuated to bring the source of microorganisms, culture medium, and hydrogen peroxide-decomposing composition into contact with one another and with the detector means, and whereby the agent for decomposing hydrogen peroxide will decompose any hydrogen peroxide left in the sterility indicator after said sterilization procedure, and whereafter if any of the microorganisms remain viable they will grow in said culture medium and said detector means will provide a visual indication that said sterilization procedure failed to sterilize all of said microorganisms.

5,552,321

TEMPERATURE CONTROLLED CULTURE DISH APPARATUS

Daniel C. Focht, Butler, Pa., assignor to Bioptechs Inc., Butler, Pa.

Filed Aug. 24, 1993, Ser. No. 111,107
Int. Cl.[6] C12M *1/38*
U.S. Cl. 435—286.1 **3 Claims**



1. An apparatus for viewing a biological specimen through a microscope with precise control of specimen temperature, comprising:
(a) a culture dish assembly consisting of:
(i) a dish bottom of glass with high optical transmissivity;
(ii) a transparent electrically conductive coating material on the underside of the dish bottom;
(iii) electrically conductive bus bars attached to the transparent electrically conductive coating material at a plurality of locations;
(iv) a molded ring mount attached to the dish bottom the sides of which molded ring mount cause the culture dish assembly to take the form of a cylinder and defines an optical aperture of the dish bottom;
(b) a stage insert assembly consisting of:

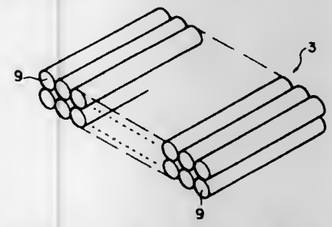
(i) a stage insert containing a recess dimensioned to accept the culture dish assembly;
(ii) a circular cutout in the stage insert to permit unobstructed microscopic viewing through the optical aperture existing at the culture dish bottom;
(iii) power wires on the recess in the stage insert which power wires come into contact with the bus bars on the transparent electrically conducive coating material on the culture dish bottom;
(iv) a thermistor on the recess in the stage insert which comes into contact with the transparent electrically conductive coating material on the culture dish bottom and which measures the temperature of the culture dish bottom and communicates that temperature to a temperature controlling means;
(c) temperature controlling means which regulates the electrical voltage placed on the power wires, thereby regulating the heat given off by the transparent electrically conductive coating material, and thereby regulating the temperature of the biological specimen on the surface of the culture dish bottom.

5,552,322

DNA BASE SEQUENCER

Ryozi Nemoto, Honzyo, and Yoshinori Mishina, Saitama-ken, both of, Japan, assignors to Hitachi Electronics Engineering Co., Ltd., Tokyo, Japan

Filed Sep. 28, 1994, Ser. No. 313,912
Claims priority, application Japan, Sep. 28, 1993, 5-264320
Int. Cl.[6] C12M *1/34*
U.S. Cl. 435—287.2 **5 Claims**



1. In a DNA base sequencer comprising a flat plate type gel electrophoretic means that has a multiple of tracks for electrophoresing DNA fragments and which is held in a vertical position, a light exciting laser light applying means that applies laser light to the respective tracks in said electrophoretic means from one lateral side thereof in such a way that it crosses said tracks at right angles, and a fluorescence detecting means that detects the fluorescence as generated from the DNA fragments illuminated with the laser light and which converts the detected fluorescence to an electric signal, the improvement wherein said fluorescence detecting means comprises an index-distributed lens array, a filter and a solid-state imaging device.

5,552,323

METHOD OF BLENDING AN ANTICOAGULANT

Steven F. Mercereau, 4911 W. Lake Dr., Conyers, Ga. 30208

Filed Aug. 3, 1994, Ser. No. 285,054
Int. Cl.[6] G01N *33/86*
U.S. Cl. 436—18 **2 Claims**

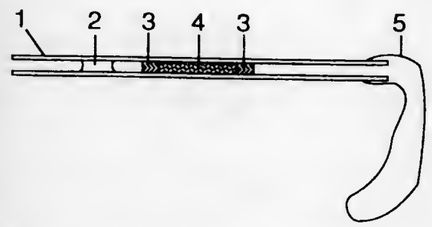
2. A method of blending a heparin salt for use as an anticoagulant in a blood sample, the blended heparin salt substantially eliminating a skew in a determined amount of ionized calcium imparted by the heparin anticoagulant in the blood sample, comprising:
providing a zinc salt of heparin having a zinc concentration per unit of heparin potency of an amount equal or exceeding a predetermined amount of zinc per unit of heparin potency to be provided by a blended heparin salt for use as an anticoagulant in a blood sample held in a sampling syringe;
determining the additional units of heparin potency needed to dilutingly add to the zinc salt of heparin, for providing the predetermined amount of zinc per unit of heparin potency in the blended heparin salt, based on a quotient less 1.0 of the zinc concentration in the zinc salt of heparin divided by the predetermined amount of zinc per unit of heparin potency in the blended heparin salt times the heparin potency of the zinc salt of heparin;
providing a lithium salt heparin having a predetermined heparin potency;
determining an amount of the lithium salt of heparin that provides an additional amount of heparin potency by dividing said additional units of heparin potency needed to dilutingly add to the zinc salt of heparin by the predetermined heparin potency of lithium salt of heparin;
blending the amount of the lithium salt of heparin with the zinc salt of heparin in a ratio of the determined additional amount of heparin potency to 1 by weight respectively to form a blended heparin salt that provides the predetermined amount of zinc per unit heparin potency,
whereby the blended heparin salt, being placed in a sampling syringe with a blood sample, substantially eliminates the skew in the measured amount of ionized calcium in the blood sample imparted by the heparin anticoagulant.

5,552,324

METHOD AND APPARATUS FOR DETERMINING THE CONCENTRATION OF READILY OXIDIZABLE ORGANIC VAPORS IN GAS SAMPLES

Francis P. Liu, State College, Pa., assignor to Supelco, Inc., Bellefonte, Pa.

Continuation of Ser. No. 893,611, Jun. 5, 1992, abandoned. This application May 23, 1994, Ser. No. 193,249
Int. Cl.[6] G01N *1/22*
U.S. Cl. 436—132 **29 Claims**



20. A process for estimating the concentration of readily oxidizable organic vapors in a gas sample of known volume which comprises contacting the gas sample with an inert, porous, solid support impregnated with a permanganate salt and activated by wetting with an alkaline solution of sufficient alkalinity so that permanganate salt is reduced to green manganate salt upon contact of said permanganate salt with said solution and said readily oxidizable organic vapors, observing the volume of support in which a color change occurs, and estimating the amount of readily oxidizable organic vapors in the sample by comparison to the volume of activated, permanganate-impregnated support which changes color in response to a gas sample of similar volume containing a known concentration of readily oxidizable organic vapors containing ethanol.

170–918 O.G.–96–15: QL3

5,552,325

depositing an optical coating above said common electrode layer

forming a polysilicon film for a gate electrode on the fourth

5,552,325

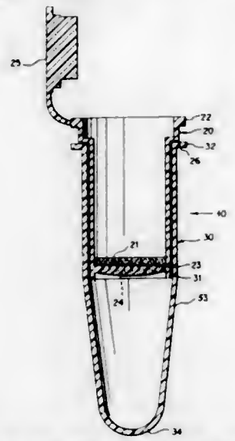
METHOD FOR SEPARATION AND RECOVERY OF BIOLOGICAL MATERIALS

Samuel Nochumson, Randolph, and Bruce S. Goldberg, Clifton, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 433,259, Nov. 8, 1989, abandoned. This application Jul. 17, 1992, Ser. No. 916,801

Int. Cl.[6] G01N *1/18*

U.S. Cl. 436—177 **8 Claims**



1. A method for selectively separating and recovering desired biological substances from liquids containing the same which comprises centrifuging said liquid in a centrifuge tube wherein said tube is divided into a separable upper container and lower container, the bottom of said upper container being comprised of a porous selection means capable of selectively binding desired biological substances thereto while allowing filtrate to pass therethrough, said porous selection means comprising a porous membrane containing an integrally bound particulate affording binding sites distributed throughout said membrane, thereby binding said biological substances to the selection means, and recovering the bound biological substances from the selection means by elution.

5,552,326

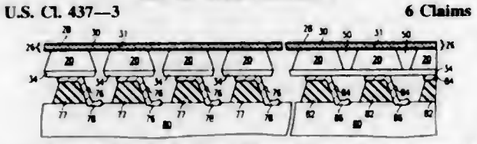
METHOD FOR FORMING ELECTRICAL CONTACT TO THE OPTICAL COATING OF AN INFRARED DETECTOR USING CONDUCTIVE EPOXY

Steven N. Frank, McKinney; James F. Belcher; Charles E. Stanford, both of Plano; Robert A. Owen, and Robert J. S. Kyle, both of Rowlett, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 1, 1995, Ser. No. 397,706

Int. Cl.[6] H01L *31/18;21/58*

U.S. Cl. 437—3 **6 Claims**



1. A method of forming an electrical contact to a common electrode of an infrared detector using conductive epoxy, said method comprising:

forming thermal isolation trenches in a substrate;

forming bias contact vias around a periphery of said substrate;

depositing a trench filler in said thermal isolation trenches and depositing conductive epoxy in said bias contact vias;

depositing a common electrode layer on top of said substrate over said thermal isolation trenches and bias contact vias;

depositing an optical coating above said common electrode layer and said conductive epoxy;

thinning a backside of said substrate to expose said trench filler;

depositing a contact metal on said backside of said substrate;

etching said contact metal and said trench filler to form pixel mesas of said contact metal and said substrate; and

forming a bias contact with a portion of said contact metal, wherein said contact metal is electrically connected to said common electrode layer by the conductive epoxy filled bias contact via in said substrate.

5,552,327

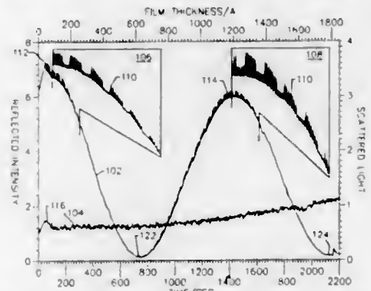
METHODS FOR MONITORING AND CONTROLLING DEPOSITION AND ETCHING USING P-POLARIZED REFLECTANCE SPECTROSCOPY

Klaus J. Bachmann; Nikolaus Dietz, and Amy E. Miller, all of Raleigh, N.C., assignors to North Carolina State University, Raleigh, N.C.

Filed Aug. 26, 1994, Ser. No. 296,694

Int. Cl.[6] H01L *21/306;21/66;* **C30B** *25/16*

U.S. Cl. 437—8 **20 Claims**



1. A method of monitoring deposition or etching of a layer on a substrate to form a heterostructure, comprising the steps of:

impinging polarized radiation on said layer during deposition or etching thereof on said substrate, at an angle which is approximately the Brewster's angle for said substrate;

detecting radiation which is reflected from said heterostructure during said deposition or etching of said layer to produce a quarter wavelength interference signal having a periodicity;

detecting extrema in said quarter wavelength interference signal; and

calculating a ratio of selected extrema to monitor deposition or etching of said layer.

5,552,328

METHOD OF FABRICATION OF POROUS SILICON LIGHT EMITTING DIODE ARRAYS

Thomas E. Orlowski, Fairport, and Sophie V. Vandebroek, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 257,247, Jun. 8, 1994, Pat. No. 5,510,633. This application Jun. 5, 1995, Ser. No. 463,162

Int. Cl.[6] H01L *21/3063;21/77*

U.S. Cl. 437—23 **7 Claims**

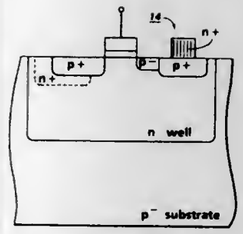
1. A method for forming a high speed, high resolution LED, comprising the steps of:

fabricating drive circuitry on a silicon chip;

defining an area on the silicon chip;

depositing crystalline silicon in the area; and

electrochemical etching the crystalline silicon, said electrochemical etching step includes operating the drive circuitry to form a porous silicon LED element from the crystalline silicon in the area.



5,552,329

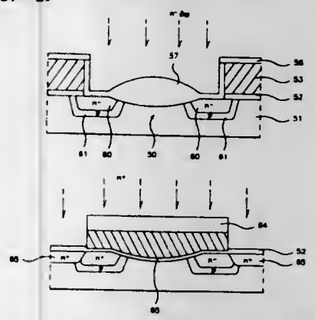
METHOD OF MAKING METAL OXIDE SEMICONDUCTOR TRANSISTORS

Kyung S. Kim, and Jun H. Lim, both of Seoul, Rep. of Korea, assignors to LG Semicon Co., Ltd., Tokyo, Japan

Division of Ser. No. 180,784, Jan. 5, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 472,593

Int. Cl.[6] H01L *21/266;21/8234*

U.S. Cl. 437—29 **7 Claims**



1. A method of making metal oxide semiconductor transistor comprising the steps of:

growing a first oxide film on a silicon substrate having a first conductivity type;

depositing a nitride film thickly on the first oxide film;

etching the nitride film together with the first oxide film to form an opening region;

depositing a first polysilicon film thinly on the whole surface of the silicon substrate;

forming sidewall spacers in the opening region to expose a portion of the first polysilicon film formed on the silicon substrate and the first polysilicon film formed on the nitride film;

performing a thermal oxidation process to the first polysilicon film exposed on the silicon substrate and the polysilicon film exposed on the nitride film using the sidewall spacers as an oxidation mask to form a thick field oxide film and a thin second oxide film, respectively;

removing the sidewall spacers to expose the remaining first polysilicon film covered by the sidewall spacers;

oxidizing said remaining first polysilicon film to form a third oxide film;

implanting a second conductivity type of impurity-ions and a first conductivity type of impurity ions into the silicon substrate in this order using the thick field oxide film as an ion-implantation mask, to form the second conductivity type low concentration source region and drain region and the first conductivity type impurity region enclosing the low concentration source region and drain region;

removing the third oxide film and the field oxide film such that the silicon substrate has a recessed surface in the opening region and also removing the second oxide film to expose the nitride film;

forming a fourth oxide film for a gate oxide film on the recessed surface of the silicon substrate;

forming a polysilicon film for a gate electrode on the fourth oxide film to fill a portion of the opening region with the polysilicon film;

forming a thick oxide film on the second polysilicon film and then etching back to fill the opening region completely;

removing the exposed nitride film to expose the first oxide film; and

implanting a second conductivity type of impurity-ions into the silicon substrate via the exposed first oxide film using the second polysilicon film as a mask, to form a high concentration source region and drain region.

5,552,330

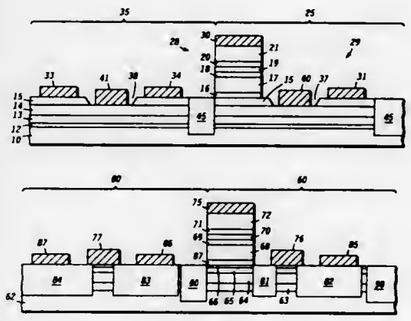
RESONANT TUNNELING FET AND METHODS OF FABRICATION

Saied N. Tehrani, Scottsdale; Herbert Goronkin, Tempe; Jun Shen, Phoenix, and Xiaodong T. Zhu, Chandler, all of Ariz., assignors to Motorola, Schaumburg, Ill.

Division of Ser. No. 209,788, Mar. 11, 1994, abandoned. This application Feb. 9, 1995, Ser. No. 386,171

Int. Cl.[6] H01L *21/265;21/20;21/44*

U.S. Cl. 437—39 **15 Claims**



1. A method of fabricating a resonant tunneling field effect transistor comprising the steps of:

providing a substrate with a planar surface;

forming a plurality of layers including a buffer layer on the planar surface of the substrate, a channel layer on the buffer layer, a supply layer on the channel layer, a conductive layer on the supply layer, an etch stop layer on the conductive layer, a first resonant tunneling layer on the etch stop layer, a first barrier layer on the first resonant tunneling layer, a quantum well layer on the first barrier layer, a second barrier layer on the quantum well layer, and a second resonant tunneling layer on the second barrier layer;

forming a first ohmic metal contact on the second resonant tunneling layer;

selectively etching the second resonant tunneling layer, the second barrier layer, the quantum well layer, the first barrier layer and the first resonant tunneling layer to the etch stop layer, using the first ohmic metal contact as a mask and using a first etchant;

selectively etching the etch stop layer to the conductive layer using the first ohmic metal contact as the mask and using a second etchant;

forming a second ohmic metal contact on the conductive layer;

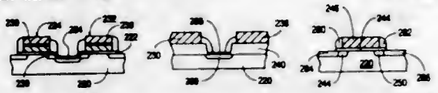
defining a gate contact area and selectively removing the conductive layer in the gate contact area to expose a surface of the supply layer; and

forming a Schottky metal contact on the surface of the supply layer in the gate contact area.

5,552,331
PROCESS FOR SELF-ALIGNED SOURCE FOR HIGH DENSITY MEMORY

James J. Hsu, Saratoga, and Steven W. Longcor, Mountain View, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 11, 1995, Ser. No. 500,648
Int. Cl.[6] H01L *21/265*
U.S. Cl. 437—40 **20 Claims**

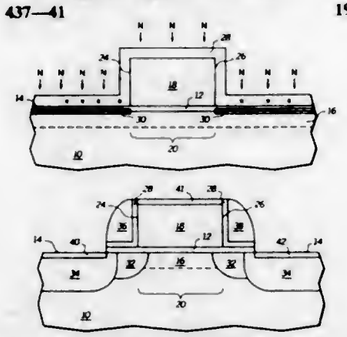


1. A method of fabricating a semiconductor structure including (i) a first transistor having a gate oxide on a semiconductor body and a gate structure including a control gate, (ii) a field oxide region on the semiconductor body adjacent the first transistor and having an extended portion of the control gate thereon, and (iii) a second transistor having a gate oxide on the semiconductor body and a gate on the gate oxide, comprising:
providing a first film layer over the thus-described structure;
anisotropically etching portions of the film layer to provide a first spacer on a side of the gate structure, and to provide a second spacer on a side of the extended portion of the control gate, said etching exposing a portion of the semiconductor body adjacent the first spacer, and, through the field oxide region, exposing a portion of the semiconductor body adjacent the extended portion of the control gate;
implanting ions into the semiconductor body;
providing a second film layer over the resulting structure; and
anisotropically etching the resulting structure to provide a third spacer which is wider than the first and second spacers adjacent a side of the gate of the second transistor.

5,552,332
PROCESS FOR FABRICATING A MOSFET DEVICE HAVING REDUCED REBERSE SHORT CHANNEL EFFECTS

Hsing-Huang Tseng; Philip J. Tobin; Paul G. Y. Tsui; Shih W. Sun, and Stephen S. Poon, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 2, 1995, Ser. No. 460,339
Int. Cl.[6] H01L *21/265;21/02*
U.S. Cl. 437—41 **19 Claims**

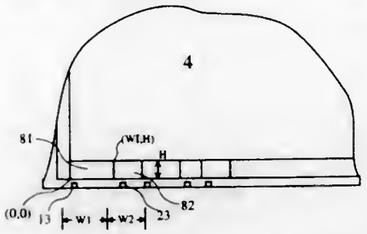


1. A process for fabricating a semiconductor device comprising the steps of:
providing a substrate having a gate dielectric layer thereon;
forming a gate electrode on the gate dielectric layer;
depositing a buffer layer to overlie the gate electrode and the gate dielectric layer;
subjecting the substrate to a defect compensating species; and
diffusing the defect compensating species through the buffer layer and the gate dielectric layer to form a defect-compensating regions between the substrate and the gate dielectric layer, and separated by the gate electrode.

5,552,333
METHOD FOR DESIGNING LOW PROFILE VARIABLE WIDTH INPUT/OUTPUT CELLS

Gary H. Cheung, Fremont; Elias Lozano, Sunnyvale; Trung Nguyen, San Jose; Michael J. Colwell, Livermore, all of Calif., and Kevin Atkinson, Eden Prairie, Minn., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Sep. 16, 1994, Ser. No. 307,942
Int. Cl.[6] H01L *21/70*
U.S. Cl. 437—51 **10 Claims**

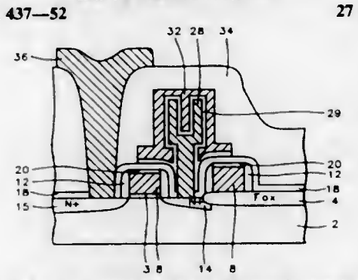


1. A method for maximizing the overall gate density in an integrated circuit chip comprising:
defining input/output band areas along the periphery of said integrated circuit chip said periphery comprising a plurality of peripheral edges,
dividing said input/output band areas into rectangular grid units having a width parallel to adjacent peripheral edge and a height perpendicular to said adjacent peripheral edge, each of said grid units having essentially the same width,
defining a plurality of input/output cells comprising one or more grid units, said cells having the same height as said grid unit height, and each of said plurality of input/output cells have a cell width essentially equal to the sum of the widths of said one or more of grid units depending on the different requirements of an input/output circuit to be contained therein, and
placing a plurality of bonding pads of essentially the same size along the input/output bands that are connected one each to the respective input/output cells.

5,552,334
METHOD FOR FABRICATING A Y-SHAPED CAPACITOR IN A DRAM CELL

Horng-Huei Tseng, Hsinchu, Taiwan, assignor to Vanguard International Semiconductor Company, Hsin-Chu, Taiwan

Filed Jan. 22, 1996, Ser. No. 589,281
Int. Cl.[6] H01L *21/70;27/00*
U.S. Cl. 437—52 **27 Claims**



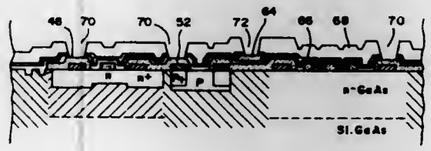
1. A method of manufacturing a Y-shaped capacitor for a memory device, comprising the steps of:
forming a first insulation layer over a substrate;
forming a resist layer over said first insulation layer, said resist layer having a first opening, etching a node contact hole defined by said first opening in said first insulation layer, said node contact hole extending partially through said first insulation layer, said node contact hole having a depth less than a thickness of said first insulation layer;

laterally etching said resist layer thereby enlarging said first opening in said resist layer to form a second opening over said node contact hole, said second opening having a larger area than said node contact hole;
anisotropically etching said first insulation layer using said etched resist layer as a mask and extending said node contact hole through said first insulation layer to expose said substrate, and etching said first insulation layer through said second opening thereby forming a storage electrode hole into said first insulation layer to a depth less than the thickness of said first insulation layer, said storage electrode hole being defined by sidewalls of said first insulation layer;
removing said resist layer;
forming a first polysilicon layer completely filling said extended node contact hole and coating sidewalls of said storage electrode hole and a top surface of said first insulation layer;
forming a second insulation layer over the first polysilicon layer thereby completely filling said storage electrode hole forming a plug in said storage electrode hole;
removing said second insulation layer exposing said first polysilicon layer and said plug;
etching back said exposed first polysilicon layer thereby exposing said first insulation layer;
selectively etching said plug and said first insulation layer thereby forming a Y-shaped storage electrode from remaining portions of said first polysilicon layer; and
forming a dielectric layer and a top electrode over said Y-shaped storage electrode thereby completing said Y-shaped capacitor.

5,552,335
ACOUSTIC CHARGE TRANSPORT INTEGRATED CIRCUIT PROCESS

Steven S. Mahon; Martin J. Brophy, both of Urbana, and Michael J. Hoskins, Mahomet, all of Ill., assignors to Electronic Decisions, Inc., Urbana, Ill.

Filed Mar. 29, 1991, Ser. No. 676,967
Int. Cl.[6] H01L *21/70*
U.S. Cl. 437—53 **30 Claims**



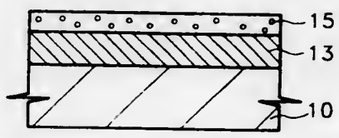
1. A process for fabricating an acoustic charge transport (ACT) integrated circuit, comprising the steps of:
a) providing a semi-insulating wafer;
b) providing an epitaxial layer with a thickness and carrier concentration appropriate for an ACT device on the semi-insulating wafer;
c) providing at least one circuit element semiconductor layer on the surface of the epitaxial layer for construction of an integrated circuit element, the at least one semiconductor layer having a thickness substantially less than the thickness of the ACT epitaxial layer and having a carrier concentration substantially greater than the ACT epitaxial layer;
d) removing lateral conductivity of the entire ACT epitaxial layer except in the regions associated with the at least one circuit element semiconductor layer and the ACT device in order to achieve lateral electrical isolation between the circuit element semiconductor layer and the ACT device;
e) providing ohmic contacts on the at least one layer and on the ACT device;
f) providing a first metal layer on selected areas on the at least one layer and the ACT device;
g) rendering semi-insulating the epitaxial layer underneath the at least one layer to provide significant vertical electrical isolation with minimal detrimental effect on the electrical characteristics of the circuit element to be constructed on the semiconductor layer; and
h) providing at least one layer of dielectric material on the wafer; and
i) providing at least a second metal layer connected at selected areas to the first metal layer.

5,552,336
Patent Not Issued For This Number

5,552,337
METHOD FOR MANFACTURING A CAPACITOR FOR A SEMICONDUCTOR MEMORY DEVICE HAVING A TAUTALUM OXIDE FILM

Kee-won Kwon, Suwon, and Chang-seok Kang, Seoul, both of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Division of Ser. No. 103,059, Aug. 9, 1993, abandoned. This application Sep. 9, 1994, Ser. No. 301,437
Claims priority, application Rep. of Korea, Aug. 7, 1992, 1992/14195
Int. Cl.[6] H01L *21/70;27/00*
U.S. Cl. 437—60 **10 Claims**



6. A method for manufacturing a capacitor for a semiconductor memory device comprising steps of:
forming a first electrode on a semiconductor substrate;
simultaneously depositing on said first electrode TEOS used as a silicon raw material together with tantalum penta-ethoxide used as a tantalum raw material to form a dielectric tantalum pentoxide film; and

forming a second electrode on said dielectric tantalum pentoxide

5,552,339
FURNACE AMORPHOUS-SI CAP LAYER TO PREVENT

between an active device region in said semiconductor substrate, and an overlying interconnect metallization layer, comprising the

5,552,342
METHOD FOR PRODUCING A CONTACT HOLE IN A

forming a second electrode on said dielectric tantalum pentoxide film.

5,552,338

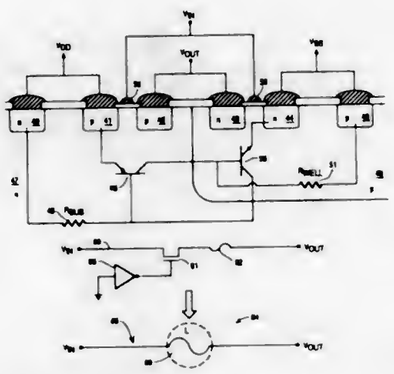
METHOD OF USING LATCHUP CURRENT TO BLOW A FUSE IN AN INTEGRATED CIRCUIT

Woujae L. Kang, Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 312,140, Sep. 26, 1994, abandoned. This application Sep. 28, 1995, Ser. No. 535,540

Int. Cl.[6] H01L *21/329;21/8238*

U.S. Cl. 437—170 **1 Claim**



1. A method of blowing a fuse formed in the logic of a CMOS integrated circuit which includes an inverter disposed on a semiconductor substrate, said method comprising the steps of:

forming said inverter by forming a n-channel transistor disposed in a p-region of said semiconductor substrate adjacent to a p-channel transistor, said p-channel transistor being disposed in a n-region of said semiconductor substrate such that a parasitic bipolar transistor is formed therebetween;

forming said fuse coupled to said inverter;

raising an output node of said inverter to a potential which is higher than an existing potential of said n-region;

forward biasing a source/drain region of either said n-channel or p-channel transistors, said forward biasing and raising steps turning on said parasitic bipolar transistor, thereby causing a latchup current to flow through said fuse, said latchup current being sufficiently large as to blow said fuse.

5,552,339

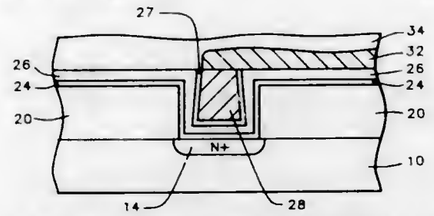
FURNACE AMORPHOUS-SI CAP LAYER TO PREVENT TUNGSTEN VOLCANO EFFECT

Shih-Huang Hsieh, Kaohsiung, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company, Hsinchu, Taiwan

Filed Aug. 29, 1994, Ser. No. 297,501

Int. Cl.[6] H01L *21/44*

U.S. Cl. 437—190 **17 Claims**



1. The method of forming tungsten plug metallization without peeling of the tungsten or the glue layer in the fabrication of integrated circuits comprising.

providing semiconductor device structures in and on a semiconductor substrate;

providing an insulating layer covering said semiconductor device structures wherein a contact hole has been opened through said insulating layer to said semiconductor substrate;

depositing a glue layer conformally over the surface of said insulating layer and within said contact opening;

annealing said glue layer to prevent peeling of said glue layer;

depositing a layer of amorphous silicon to a thickness of between about 50 to 100 Angstroms overlying said glue layer to prevent peeling of said glue layer and to prevent peeling of said tungsten to be deposited subsequently; and

forming a tungsten plug within said contact opening in the fabrication of said integrated circuit.

5,552,340

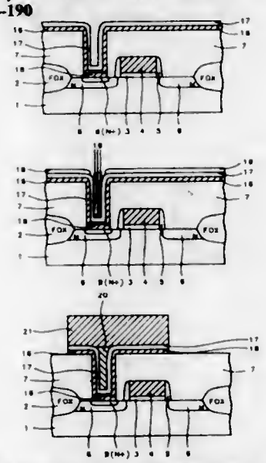
NITRIDATION OF TITANIUM, FOR USE WITH TUNGSTEN FILLED CONTACT HOLES

Ching-Ying Lee, Hsin Chu; Shaw-Tzeng Hsia, Taipei, and Haw Yen, Hsin-chu, all of, Taiwan, assignors to Vanguard International Semiconductor Corp., Hsin-Chu, Taiwan

Filed Oct. 27, 1995, Ser. No. 549,262

Int. Cl.[6] H01L *21/28*

U.S. Cl. 437—190 **25 Claims**



1. A method for fabricating a MOSFET device, on a semiconductor substrate, using a contact hole lined with adhesive and barrier layers, and filled with a metal, to provide electrical contact

between an active device region in said semiconductor substrate, and an overlying interconnect metallization layer, comprising the steps of:

providing device elements on said semiconductor substrate;

depositing a dielectric layer on said semiconductor substrate, including depositing on said device elements;

photolithographic processing to open a region in photoresist, exposing said dielectric layer, directly over a specific region of said device element;

anisotropic etching of said dielectric layer, in the opened region in said photoresist, to create a contact hole to said specific region of said device element;

ion implanting a first conductivity imparting dopant into said specific region of said device element, to create said active device region;

surface cleaning of said active device region;

deposition of an adhesive layer on said dielectric layer, on sides of said contact hole, and on a surface of said active device region;

thermal annealing in an ammonia ambient to convert a surface of said adhesive layer to a first barrier layer;

deposition of a second barrier layer on said first barrier layer;

deposition of said metal, on said second barrier layer completely filling said contact hole;

etchback of said metal, to remove said metal from all areas except in said contact hole;

deposition of said interconnect metallization layer; and

patterning of said interconnect metallization layer to form metal interconnect structure.

5,552,341

SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING THE SAME

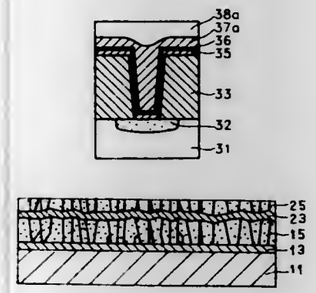
Sang-in Lee, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 10, 1993, Ser. No. 164,920

Claims priority, application Rep. of Korea, Dec. 10, 1992, 92-23807

Int. Cl.[6] H01L *21/441*

U.S. Cl. 437—192 **31 Claims**



1. A method for manufacturing a semiconductor device comprising the steps of:

forming a first diffusion barrier layer comprised of a refractory metal on a semiconductor substrate;

forming a second diffusion barrier layer comprised of a refractory metal compound on said first diffusion barrier layer;

forming a silylation layer on said second diffusion barrier layer; and

forming a third diffusion barrier layer comprised of a refractory metal compound on said silylation layer.

5,552,342

METHOD FOR PRODUCING A CONTACT HOLE IN A SEMICONDUCTOR DEVICE USING REFLOW AND ETCH

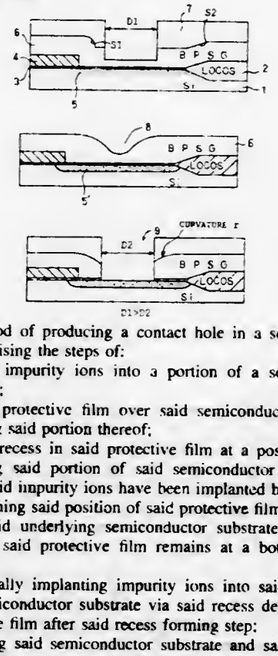
Hiroyasu Itou, Nagoya; Tosiyuki Morisita, Iwakura, and Takanori Simamoto, Okazaki, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 19, 1994, Ser. No. 293,247

Claims priority, application Japan, Aug. 20, 1993, 5-206263

Int. Cl.[6] H01L *21/28*

U.S. Cl. 437—195 **2 Claims**



1. A method of producing a contact hole in a semiconductor device comprising the steps of:

implanting impurity ions into a portion of a semiconductor substrate;

forming a protective film over said semiconductor substrate including said portion thereof;

forming a recess in said protective film at a position thereof overlying said portion of said semiconductor substrate in which said impurity ions have been implanted by anisotropically etching said position of said protective film so as not to reach said underlying semiconductor substrate, whereby a layer of said protective film remains at a bottom of said recess;

supplementally implanting impurity ions into said portion of said semiconductor substrate via said recess defined in said protective film after said recess forming step;

heat treating said semiconductor substrate and said protective film causing said protective film to reflow so that said recess in said protective film is deformed into a shape wherein a periphery of an opening of said recess has a convex upward shape and so that said ions implanted into said semiconductor substrate are activated; and

forming a contact hole in said layer of said protective film overlying said activated implanted ions by fully etching said deformed recess anisotropically through to said underlying semiconductor substrate.

5,552,343

METHOD FOR TAPERED CONTACT FORMATION

Iman Hsu, Miao Li, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company, Hsin-Chu, Taiwan

Filed Oct. 19, 1995, Ser. No. 545,385

Int. Cl.[6] H01L *21/28*

U.S. Cl. 437—195 **14 Claims**

1. A method of forming contact holes, comprising the steps of:

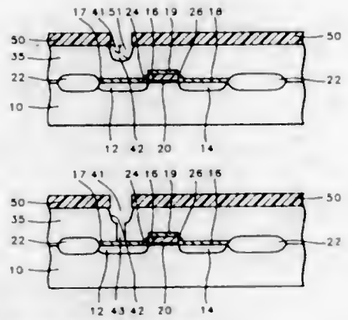
providing a semiconductor substrate having source and drain regions formed therein;

forming a patterned gate oxide layer on said semiconductor substrate;

forming a gate electrode on said gate oxide layer;

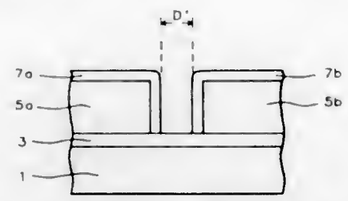
forming silicide contact regions on said gate electrode and said source and drain regions;

forming a first dielectric layer on said semiconductor substrate wherein said first dielectric covers said gate electrode, said silicide contact regions, and said source and drain regions;



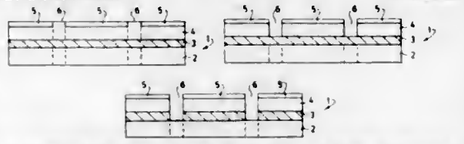
reflowing said first dielectric layer;
forming a second dielectric layer over said first dielectric layer;
curing said second dielectric layer whereby said first dielectric layer and said second dielectric layer form a third dielectric layer having a horizontal top surface;
etching back said third dielectric layer whereby a densified region is formed on said horizontal top surface of said third dielectric layer;
removing said densified region by means of a wet buffered oxide etch;
forming a layer of photoresist having contact hole openings over said third dielectric layer after said densified layer has been removed;
forming a partial contact hole having a side profile in said third dielectric layer by means of isotropic etching said third dielectric layer using said layer of photoresist having contact hole openings as a mask;
forming a complete contact hole in said third dielectric layer by means of vertical anisotropic etching said third dielectric layer using said layer of photoresist having contact hole openings as a mask; and
stripping said layer of photoresist.

5,552,344
NON-ETCHBACK SELF-ALIGNED VIA SIZE REDUCTION METHOD EMPLOYING OZONE ASSISTED CHEMICAL VAPOR DEPOSITED SILICON OXIDE
Syun-Ming Jang, Hsin, and Chen-Hua D. Yu, Keelung, both of, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsin-chu, Taiwan
Filed Nov. 16, 1995, Ser. No. 559,051
Int. Cl.[6] H01L *21/443*
U.S. Cl. 437—195 **21 Claims**



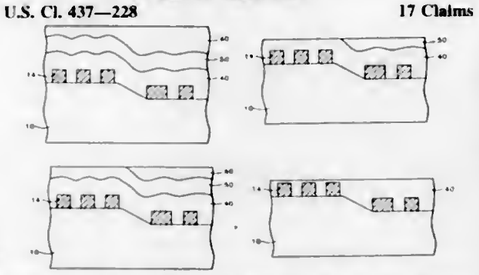
1. A method for forming an insulator layer having a cross-sectional diameter via formed there-through for use within an integrated circuit comprising:
forming upon a semiconductor substrate a metal layer, at least the top surface of the metal layer being formed from a titanium nitride layer;
forming upon the titanium nitride layer an insulator layer, the insulator layer exhibiting a first incubation time with respect to forming an ozone assisted Chemical Vapor Deposited (CVD) silicon oxide insulator coating upon the insulator layer, the first incubation time being less than a second incubation time for forming the ozone assisted Chemical Vapor Deposited (CVD) silicon oxide insulator coating upon the titanium nitride layer;
forming completely through the insulator layer a via, the bottom of the via exposing a portion of the titanium nitride layer;
forming upon the surface of the insulator layer and upon the edges of the insulator layer exposed in the via the ozone assisted Chemical Vapor Deposited (CVD) silicon oxide insulator coating, the ozone assisted Chemical Vapor Deposited (CVD) silicon oxide insulator coating being deposited for a deposition time greater than the first incubation time, but no greater than the second incubation time.

5,552,345
DIE SEPARATION METHOD FOR SILICON ON DIAMOND CIRCUIT STRUCTURES
Gregory A. Schrantz; Stephen J. Gaul, and Jack H. Linn, all of Melbourne, Fla., assignors to Harris Corporation, Melbourne, Fla.
Filed Sep. 22, 1993, Ser. No. 125,411
Int. Cl.[6] H01L *21/302*
U.S. Cl. 437—227 **75 Claims**



1. A method for forming separate dies from a substrate having a layer of semiconductive material and a diamond layer, on a support layer comprising the steps of:
selectively removing portions of the semiconductive layer to expose portions of the diamond layer and define scribe lines in said semiconductive layer; and
removing diamond from said exposed diamond areas in said scribe lines.

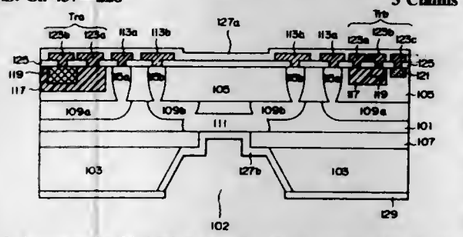
5,552,346
PLANARIZATION AND ETCH BACK PROCESS FOR SEMICONDUCTOR LAYERS
Yuan-Chang Huang, Hsin-Chu, and Chih-Kun Wang, San-Chung, both of, Taiwan, assignors to Taiwan Semiconductor Manufacturing Co., Hsinchu, Taiwan
Filed Apr. 27, 1995, Ser. No. 429,811
Int. Cl.[6] A01L *21/811*
U.S. Cl. 437—228 **17 Claims**



1. A method for planarization of an integrated circuit structure, said structure having metallurgy lines having a given thickness; the method which comprises;
(a) depositing a silicon oxide insulating layer over said structure having a thickness greater than said thickness of said metallurgy lines;
(b) forming a silicon nitride dielectric layer over said insulating layer;

(c) forming a spin on glass planarization layer over said insulating layer and said dielectric layers; and
(d) etching portions of said planarization layer, dielectric layer, and insulating layer to planarize said insulating layer.

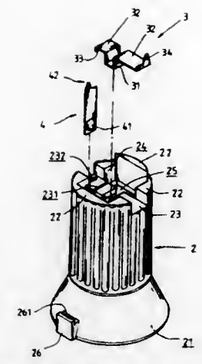
5,552,347
FABRICATION PROCESS FOR A SEMICONDUCTOR PRESSURE SENSOR FOR SENSING PRESSURE APPLIED THERETO
Osamu Takano, and Koji Matsumi, both of Tokyo, Japan, assignors to OKI Electric Industry Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 177,379, Jan. 5, 1994, abandoned, which is a division of Ser. No. 680, Jan. 5, 1993, Pat. No. 5,296,730. This application Jun. 2, 1995, Ser. No. 460,762
Claims priority, application Japan, Jan. 16, 1992, 4-5655
Int. Cl.[6] H01L *21/465*
U.S. Cl. 437—228 **3 Claims**



1. A process for fabricating a semiconductor pressure sensor, the process comprising the steps of:
i) preparing a first semiconductor substrate having a first surface and a second surface, the second surface being opposite to the first surface;
ii) forming an insulating layer on the first surface of the first semiconductor substrate;
iii) forming a second semiconductor substrate on the insulating layer, said second semiconductor substrate having a third surface and a fourth surface, the fourth surface being opposite to the third surface, and the insulating layer being sandwiched between the first surface and the third surface;
iv) introducing an impurity in first and second regions in and adjacent to the fourth surface to form first and second diffusion regions;
v) forming a recess in the first semiconductor substrate after forming the first and second diffusion regions to expose a third region in the third surface of the second semiconductor substrate; and
vi) introducing the impurity to the third region to form a third diffusion region, the third diffusion region being electrically connected with the first and second diffusion regions,
wherein both the first and second diffusion regions and the third diffusion region constitute a continuous diffusion region extending from the third surface to the fourth surface.

5,552,348
BULB SOCKET STRUCTURE
Gordon K. H. Wu, P.O. Box 81-518, Taipei, Taiwan
Filed Jan. 12, 1995, Ser. No. 371,989
Int. Cl.[6] H01R *4/24*
U.S. Cl. 439—419 **6 Claims**

1. A bulb socket structure for mounting a light bulb which has a bulb base having a tip contact and a ring contact to an external power cord which comprises a pair of wires each having conductive material enclosed by an insulation sheath to establish an electrical connection therebetween, comprising a socket housing defining therein an internal space to receive therein the light bulb through a bulb insertion opening; a first electrically-conductive member having a first contact formed thereon engageably received within a first slot formed on a first end of said socket housing to



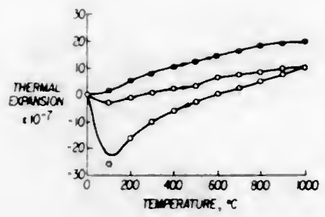
partially extend into the internal space of said socket housing, the first electrically-conductive member having a first sharpened tip so shaped and located as to be pierceable through the insulation sheath of a first one of the wires of the power cord to be in electrical connection with the conductive material thereof; the first electrically-conductive member comprises a U-shaped portion having two side extensions, one of the side extensions having formed on a free end thereof a retaining tab forcibly fit into corresponding slit formed on the first end of the socket housing to retain the first electrically-conductive member on the socket housing and the other one of sid extensions having a free end with the sharpened tip formed thereon, the U-shaped portion of the first electrically-conductive member being received and retained within the first slot to serve as the first contact; a second electrically-conductive member insertable into a second slot formed on the first end of said socket housing to have a second contact formed thereon extend into the internal space of said socket housing, the second electrically-conductive member having a second sharpened tip pierceable through the insulation sheath of a second one of the wires of the power cord to be in electrical connection with the conductive material thereof; said first and second contacts of the first and second electrically-conductive members being so located within the internal space of the socket housing to be respectively electrically contactable with the tip contact and the ring contact of the light bulb so that said first and second electrically-conductive members electrically connect the light bulb to the power cord; a support member formed inside said socket housing to shield and hold a portion of said second electrically-conductive member extending into the internal space of the housing so as to prevent the second electrically-conductive member from being deformed by the insertion of the light bulb into the internal space of the socket housing; and an end cap fitted on the first end of said socket housing to cover and securely confine said first and second electrically-conductive members and the power cord between said socket housing and said end cap.

5,552,349
LOW THERMAL EXPANSION CORDIERITE AGGREGATE AND ITS BONDED BODY
Tomoko Ichii; Keiichiro Suzuki, and Masataro Okumiya, all of Yokohama, Japan, assignors to AG Technology Co., Ltd., Yokohama, Japan
Filed Aug. 11, 1994, Ser. No. 289,280
Claims priority, application Japan, Aug. 11, 1993, 5-219033
Int. Cl.[6] C04B *35/04*
U.S. Cl. 501—9 **7 Claims**

1. A low thermal expansion cordierite aggregate, which consists of cordierite crystals having a mean crystal diameter of at least 50 μm and almost no orientation in the crystal structure, shows hysteresis in its thermal expansion property accompanying a rise and fall of the temperature, and has a mean thermal expansion coefficient within a temperature range of from room temperature to 1000° C. of at most 10×10^{-7}/°C.

in each group being parallel to and spaced apart from every

5,552,354



5,552,350
LOW-FUSING TEMPERATURE PORCELAIN

John A. Hornor, Sicklerville, N.J., assignor to Ceramco Inc., Burlington, N.J.

Filed Dec. 12, 1994, Ser. No. 354,385
Int. Cl.[6] C03C *8/02;3/095*
U.S. Cl. 501—64 **4 Claims**

1. A low-fusing temperature porcelain composition for use in a dental prosthesis, consisting essentially of in weight percent of the porcelain composition:

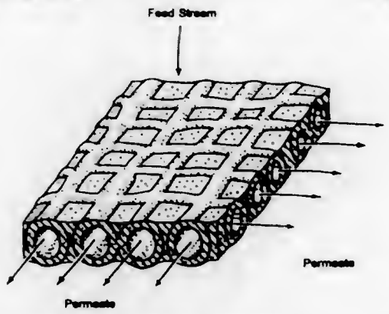
Oxide	Weight Percent
SiO_2	57–61
Al_2O_3	6.5–11.5
Na_2O	10–12
K_2O	8–16
Li_2O	1–3
CaO	1.5–4
BaO	1.5–2.5
CeO_2	0.5–2
Tb_2O_3	0.5–2,

said porcelain having a fusing temperature of about 700° C.±50° C. and a coefficient of thermal expansion compatible with a substrate of metal or ceramic suitable for a dental prothestic.

5,552,351
CERAMIC MEMBRANES HAVING MACROSCOPIC CHANNELS

Marc A. Anderson, and Reid A. Peterson, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation of Ser. No. 159,646, Nov. 29, 1993, abandoned. This application Mar. 30, 1995, Ser. No. 413,314
Int. Cl.[6] C04B *38/06*
U.S. Cl. 501—81 **5 Claims**



1. A porous ceramic membrane, comprising:

a matrix of porous ceramic tubes in the shape of a woven fabric having a top face, a bottom face and at least one side face, the tubes comprising a first group and a second group, each tube in each group being parallel to and spaced apart from every other tube in that group, the tubes of the first group being perpendicular to the tubes of the second group, the matrix having voids between the tubes, each tube having a plurality of randomly distributed micropores having a mean pore diameter of less than 100 Å and having within each microporous tube a channel having a mean internal diameter greater than the mean pore diameter of the micropores, each tube having an external diameter, the matrix having a total thickness of no greater than two external tube diameters, each channel having a terminus on the at least one side face of the matrix, the channels being positioned relative to the micropores such that when a feed stream enters the micropores through the top or bottom face of the matrix, a permeate passes from the micropores through the channels to the channel termini at the sides of the matrix; and

a porous ceramic reinforcing phase in the voids between the tubes of the matrix.

5,552,352
SILICON CARBIDE COMPOSITE WITH COATED FIBER REINFORCEMENT

Milivoj K. Brun, Ballston Lake; Krishan L. Luthra, and Raj N. Singh, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 215,246, Mar. 21, 1994, abandoned, which is a division of Ser. No. 59,843, May 11, 1993, abandoned, which is a continuation of Ser. No. 716,443, Jun. 17, 1991, abandoned. This application Sep. 8, 1995, Ser. No. 525,332
Int. Cl.[6] C04B *35/577*
U.S. Cl. 501—88 **3 Claims**

1. A fiber reinforced composite body comprising from about 5 to 90 volume percent of a continuous silicon carbide matrix phase, formed in situ by molten silicon infiltration and reaction between molten silicon and a carbonaceous material, and at least about 10 volume percent of reinforcing fibers consisting essentially of silicon carbide fibers, said fibers having a continuous first coating layer on the silicon carbide fiber surface of a metal oxide selected from the group consisting of aluminum oxide, yttrium oxide, titanium oxide, zirconium oxide, hafnium oxide, beryllium oxide, silicon oxide, lanthanum oxide, and scandium oxide, whereby the silicon carbide fiber coated with the metal oxide first layer is protected against the effects of molten silicon during infiltration and after infiltration provides a composite having a relatively weak bond at a fiber-matrix interface, said composite having the porosity of less than 20 volume percent, and said matrix containing a silicon carbide and an elemental silicon phase, said silicon phase in an amount of about 1 to 30 percent by volume of the composite.

5,552,353
PROCESS FOR PRODUCING ADVANCED CERAMICS

Kyei-Sing Kwong, Tuscaloosa, Ala., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 5, 1994, Ser. No. 341,227
Int. Cl.[6] C04B *35/565;35/584*
U.S. Cl. 501—89 **23 Claims**

1. A process for producing substantially homogeneous ceramic materials which comprises

(a) forming a mixture by dispersing an intercalation composition comprising a solution of one or more carbohydrate compounds into the interlamellar spaces of a clay;

(b) drying the mixture; and

(c) heating in an inert or a reducing atmosphere for a sufficient time and at a temperature of at least the carbothermal reduction temperature of the mixture to produce a substantially homogeneous ceramic material.

5,552,354
REFRACTORY BRICK

Harald Harmuth, Villach; Roland Heindl, and Josef Deutsch, both of Leoben, Austria, assignors to Veitsch-Radex Aktiengesellschaft Fur Feuerfeste Erzeugnisse, Vienna, Austria

Filed Mar. 16, 1995, Ser. No. 404,915
Claims priority, application Germany, Mar. 17, 1994, 44 09 078.1
Int. Cl.[6] C04B *35/01*
U.S. Cl. 501—94 **7 Claims**

1. Refractory brick having improved ductility and energy of fracture, said brick formed of a ceramic refractory matrix material which comprises one or more metal oxides in two particle fractions, namely

4–30 wt. % smaller than 0.01 mm (10 μm), and

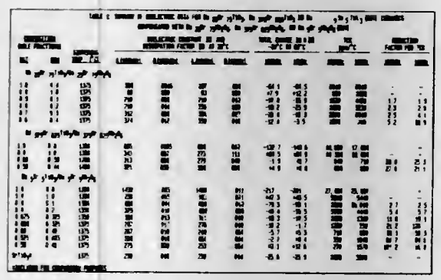
70–96 wt. % larger than 0.01 mm, but smaller than 8.0 mm,

the brick having been prepared from said matrix material after molding and firing at a temperature below the sintering temperature of the particles of said fraction smaller than 0.01 mm and without recrystallization of said particles.

5,552,355
COMPENSATION OF THE TEMPERATURE COEFFICIENT OF THE DIELECTRIC CONSTANT OF BARIUM STRONTIUM TITANATE

Robert J. Cava, Bridgewater; James J. Krajewski, Raritan, and William F. Peck, Bridgewater, all of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Oct. 3, 1995, Ser. No. 538,317
Int. Cl.[6] C04B *35/46*
U.S. Cl. 501—137 **4 Claims**



1. A dielectric material comprising a mixture of $Ba_{1-x}Sr_xTiO_3$ (BST) and $Ba_{1-z}Sr_xNbO_6$ (BSN) in which x is about 0.1 to about 0.9 and the molar ratio of BST to BSN in the mixture ranges from about 0.95:0.05 to about 0.5:0.5.

5,552,356
BORON SUBPHOSPHIDE/ALUMINUM OXIDE COMPOSITE MATERIALS, PROCESSES FOR THE PRODUCTION THEREOF AND USE THEREOF

Nils Perchenek, Leverkusen, Germany, assignor to Bayer AG, Leverkusen, Germany

Filed Jun. 29, 1995, Ser. No. 496,315
Claims priority, application Germany, Jul. 11, 1994, 44 24 402.9
Int. Cl.[6] C04B *35/10;38/00;38/06*
U.S. Cl. 501—153 **20 Claims**

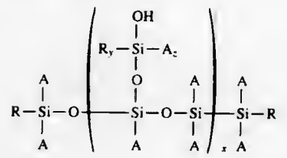
1. Ceramic composite materials,consisting essentially of aluminum oxide and compounds of the general composition $B_{12+x}Al_yP_{2-z}$, wherein $0 \leqq x \leqq 1$, $0 \leqq y \leqq 1$ and $0 \leqq z \leqq (x+y)$.

5,552,357
CATALYST MODIFICATION FOR SHAPE SELECTIVE HYDROCARBON CONVERSIONS

Rudolph M. Lago, Yardley, Pa.; David O. Marler, Deptford, N.J.; Sharon B. McCullen, Newtown, Pa., and David H. Olson, Pennington, N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 42,430, Apr. 5, 1993, Pat. No. 5,371,312. This application Aug. 25, 1994, Ser. No. 294,801
Int. Cl.[6] B01J *29/06*
U.S. Cl. 502—63 **8 Claims**

1. A method for modifying a catalytic molecular sieve comprises providing a zeolite molecular sieve having protected acid sites in as-synthesized condition or exchanged with at least one member selected from the group consisting of alkali metals, alkaline earth metals and organic cations; contacting said zeolite molecular sieve with a first silicon-containing compound, said compound represented by the formula



wherein

R is a C_{1-6} alkane

A is selected from the group consisting of ethylamine, n-propylamine, iso-propylamine, n-butylamine and iso-butylamine

x is 1–50

y is 0–2

z is 0–2

y+z=2;

and calcining, to provide a modified catalytic molecular sieve.

5,552,358
POLYMERIZATION CATALYST SYSTEMS, THEIR PRODUCTION AND USE

Anthony N. Speca, Kingwood, Tex., assignor to Exxon Chemical Patents Inc., Wilmington, Del.

Continuation of Ser. No. 287,322, Aug. 8, 1994, abandoned. This application Jun. 27, 1995, Ser. No. 495,770
Int. Cl.[6] B01J *31/00*
U.S. Cl. 502—117 **21 Claims**

1. A method for producing a catalyst system comprising contacting an emulsifier comprising a hydrocarbon liquid and an emulsion forming agent, a proton donor, an alumoxane activator and a metallocene catalyst component.

5,552,359
COMPONENTS AND CATALYST FOR THE POLYMERIZATION OF OLEFINS

Giampiero Morini, Pavia; Luisa Barino, Novara; Raimondo Scordamaglia, Milan; Elisabetta Barbassa, Pavia, and Giovanni Baruzzi, Ferrara, all of, Italy, assignors to Montell North America Inc., Wilmington, Del.

Continuation of Ser. No. 125,947, Sep. 23, 1993, abandoned. This application Feb. 21, 1995, Ser. No. 391,327
Claims priority, application Italy, Sep. 24, 1992, MI92A2197
Int. Cl.[6] B01J *31/00*
U.S. Cl. 502—123 **9 Claims**

1. A catalyst component for the polymerization of olefins, comprising a magnesium halide in active form, and, supported thereon, a titanium halide or titanium halogen alcoholate and diamine of formula

a) producing an acid aqueous solution of one or more aluminum

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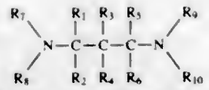
REVERSIBLE THEROMOSENSITIVE COLORING

A B (I)



(I)

wherein the radicals R_1 to R_{10} are the same or different and are hydrogen, C_1–C_{18} linear or branched alkyl radicals, C_3–C_{18} cycloalkyl radicals, C_6–C_{18} aryl radicals, C_7–C_{18} alkaryl or aralkyl radicals, with the proviso that at least one of the R_7 and R_8 radicals and at least one of the R_9 and R_{10} radicals are not hydrogen, and wherein at least one of the R_3 and R_4 radicals is selected from the group consisting of methyl, ethyl, n-propyl, isopropyl, n-butyl, isobutyl, sec-butyl, tert-butyl, cyclohexyl, cyclohexenyl, cyclohexylmethyl, phenyl and benzyl.

5,552,360

SUBSTRATE CONFIGURATION FOR CATALYTIC COMBUSTION SYSTEMS

Robert J. Farrauto, Westfield; Jennifer S. Feeley, Clinton; Dianne O. Simone, Edison; Yiu K. Lui, Parlin, and Teresa Kennelly, Belle Mead, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.

Continuation of Ser. No. 26,376, Mar. 4, 1993, abandoned. This application Apr. 4, 1994, Ser. No. 222,353

Int. Cl.[6] B01J *21/04;21/08;21/10;27/224*

U.S. Cl. 502—178 **23 Claims**

1. A combustor for catalytically promoting thermal combustion of an inlet combustion gas mixture flowed therethrough in a flow path which passes sequentially through a catalyst zone and then a downstream zone of the combustor, a homogeneous reaction zone being disposed within the downstream zone, and the combustor comprising: a catalyst body disposed in the catalyst zone and comprising at least a first catalyst member and a second catalyst member, the first catalyst member being comprised of a first carrier having a plurality of gas flow channels extending therethrough and defined by channel walls on which a first catalyst composition is carried, and the second catalyst member being disposed downstream of the first catalyst member and being comprised of a second carrier having a plurality of gas flow channels extending therethrough and defined by channel walls on which a second catalyst composition is carried;

wherein the first carrier comprises a silica-magnesia-alumina material comprising primarily a mixture of cordierite, and wherein the second carrier comprises a ceramic fiber matrix material comprising ceramic fibers, the composition of which comprises alumina, boron oxide and silica, the fibers being fixed in a silicon carbide matrix.

5,552,361

ALUMINUM PHOSPHATE COMPOSITION WITH HIGH PORE VOLUME AND LARGE PORE DIAMETER, PROCESS FOR ITS PRODUCTION AND USE THEREOF

Klaus Rieser, Worms; Christoph Weber, Heidelberg, both of, Germany, and William A. Welsh, Highland, Md., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Nov. 4, 1993, Ser. No. 148,143

Int. Cl.[6] B01J *27/18*

U.S. Cl. 502—208 **15 Claims**

1. Homogeneous amorphous aluminum phosphate composition with a surface of 100 to 300 m^2/g and a pore volume in pores with diameters of less than 1000 nm of at least 1.0 cm^3/g, in which phosphorus and aluminum are present in a molar ratio in the range from 0.9:1 to 1:1, characterized in that it is present in the form of microspherical particles with a particle size of 10 to 250 μm and displays a bimodal pore-size distribution in the pore-diameter range of less than 1000 nm.

9. A process for the production of a homogenous amorphous aluminum phosphate composition in the form of microspherical particles, the steps comprising:

a) producing an acid aqueous solution of one or more aluminum salts and one or more phosphate salts, the solution displaying a molar P/Al ration of 0.9:1 to 1:1,

b) partially neutralizing this solution, keeping the pH below 5.0, by the slow addition of a base while thoroughly mixing it,

c) permitting the partially neutralized solution to form a gel,

d) neutralizing the thus-formed hydrogel by treating it for 10 to 30 hours with an aqueous basic solution and then washing it with a hot, dilute base solution at a temperature of ca. 60° C. to 90° C.,

e) removing water from the hydrogel by solvent exchange treatment with a solvent selected from the group consisting of alcohol, acetone or ethyl acetate and,

f) drying the exchanged hydrogel to the desired volatile constituents content,

g) grinding the dried gel, mechanically or with a jet mill, to a particle size of less than 10 μm,

h) suspending the ground hydrogel in water to form a slurry of having a solids content of from 10 to 30 wt. %,

i) adjusting the pH value of the slurry to 3 to 7 by the addition of an acid or base, and

j) spray drying the slurry.

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CATALYSTS FOR THE REMOVAL OF SULFUR COMPOUNDS FROM INDUSTRIAL GASES, A PROCESS FOR THEIR PRODUCTION AND THEIR USE

Otto Immel, Krefeld, and Harald Müller, Dormagen, both of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

PCT No. PCT/EP93/00917, § 371 Date Oct. 20, 1994, § 102(e) Date Oct. 20, 1994, PCT Pub. No. WO93/22052, PCT Pub. Date Nov. 11, 1993

PCT Filed Apr. 16, 1993, Ser. No. 325,251

Int. Cl.[6] B01J *23/24;8/00*

U.S. Cl. 502—308 **24 Claims**

1. A catalyst for the removal of volatile sulfur compounds from industrial gases comprising an inorganic, abrasion-resistant, incombustible support that is uniformly impregnated with

(a) an oxide or hydroxide of

(1) manganese and

(2) hafnium and

(b) an oxide or hydroxide of

(3) tungsten or

(4) molybdenum.

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HALOGEN RESISTANT HYDROGENATION PROCESS AND CATALYST

Richard B. Pannell, Kingwood, Tex., and Serge M. J. P. Maroie, Nivelles, Belgium, assignors to Exxon Chemical Patents Inc., Wilmington, Del.

Division of Ser. No. 214,336, Mar. 16, 1994. This application Jun. 6, 1995, Ser. No. 469,710

Int. Cl.[6] B01J *23/755*

U.S. Cl. 502—337 **5 Claims**

1. A catalyst composition consisting essentially of

(a) nickel in the range of from greater than 35 weight percent to 65 weight percent based upon the total weight of the catalyst;

(b) one or more promoters selected from the group consisting of oxides of the elements in Group 1, Group 2, the Lanthanides group, the Actinides group and mixtures thereof; and

(3) a support.

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REVERSIBLE THEROMOSENSITIVE COLORING RECORDING METHOD, RECORDING MEDIUM AND RECORDING APPARATUS FOR THE RECORDING METHOD

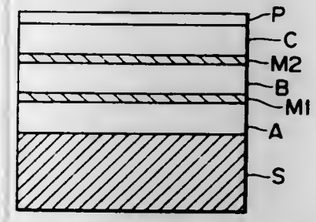
Kyoji Tsutsui, Mishima, and Takehito Yamaguchi, Shizuoka-ken, both of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 9, 1993, Ser. No. 28,229

Claims priority, application Japan, Mar. 9, 1992, 4-085902; Jun. 25, 1992, 4-191644

Int. Cl.[6] B41M *5/34*

U.S. Cl. 503—201 **2 Claims**



1. A reversible thermosensitive coloring recording method for producing multi-color images by use of a reversible thermosensitive coloring recording medium which comprises a support and a reversible thermosensitive coloring recording layer formed thereon, said reversible thermosensitive coloring recording layer comprising a plurality overlaid reversible thermosensitive coloring composition layers, each of said reversible thermosensitive coloring composition layers being independently present separated from the other reversible thermosensitive coloring composition layers, and capable of reversibly forming a color development state with a different color in a predetermined color development temperature range, and a decolorization state in a predetermined decolorization temperature range by the application of heat thereto and maintaining said color development state and said decolorization state at room temperature, said decolorization temperature range being located lower in terms of temperature than said color development temperature range therefor, comprising the steps of:

temporarily applying heat to said reversible thermosensitive coloring recording medium to a color development temperature at which at least two of said reversible thermosensitive coloring composition layers are colored or to a temperature higher than said color development temperature to obtain a mixed coloring state,

rapidly cooling the reversible thermosensitive coloring recording medium in its mixed coloring state to maintain its mixed coloring state, and

decolorizing, by heating to the decolorization temperature, at least one but not all of said reversible thermosensitive coloring composition layers which have been colored, thereby producing multi-color images.

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PRESSURE-SENSITIVE RECORDING MATERIAL WHICH COMPRISES NATURAL OILS AND/OR DERIVATIVES THEREOF

Horst Berneth, Leverkusen; Günter Klug, Monheim, and Jürgen Weisser, Dormagen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

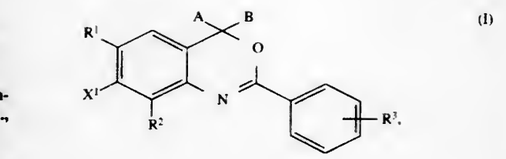
Filed Mar. 10, 1995, Ser. No. 401,841

Claims priority, application Germany, Mar. 18, 1994, 44 09 265.2

Int. Cl.[6] B41M *5/165*

U.S. Cl. 503—213 **14 Claims**

1. A pressure-sensitive recording material which comprises a support carrying a colour donor, which colour donor is in microencapsulated form and dissolved in a solvent, at least one 3,1-benzoxazine of the formula (I)

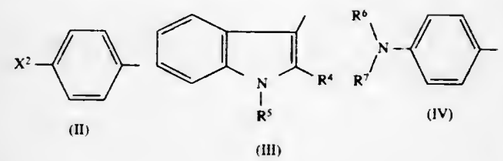


(I)

in which

A denotes a radical of the formulae (II) or (III) and

B denotes a radical of the formulae (III) or (IV)



(II) (III) (IV)

X^1 denotes hydrogen, halogen, nitro, cyano, C_1–C_4-alkyl, OR^8 or NR^9R^{10}.

X^2 denotes hydrogen, halogen, C_1–C_4-alkyl or OR^8,

R^1 to R^3 independently of one another in each case denote hydrogen, halogen, C_1–C_4-alkyl or OR^8 and

R^4 to R^{10} independently of one another in each case denote C_1–C_8-alkyl, cyclohexyl, benzyl or phenyl, wherein the groups

NR^6R^7 and NR^9R^{10} independently of one another can in each case also denote pyrrolidino, piperidino or morpholino,

with the proviso that the following do not occur simultaneously:

A represents a radical of the formula (II),

B represents a radical of the formula (IV),

X^1 represents dimethylamino,

X^2 represents methoxy,

R^3 represents hydrogen,

R^6 and R^7 represent ethyl and

one of the radicals R^1 and R^2 represents methyl and the other represents hydrogen,

in which the solvent comprises at least one natural oil or ester of a fatty acid of a natural oil.

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METHOD OF FOLIAR APPLICATION OF MAGNESIUM HYDROGEN CARBONATE

Henri R. Langelin, Caffiers, France, and Robert Goffin, Trooz, Belgium, assignors to Lhoist Recherche et Developpment S.A., Ottignies-Louvain-La-Neuve, Belgium

Continuation of Ser. No. 777,323, Jan. 29, 1992, abandoned. This application Jun. 3, 1994, Ser. No. 253,604

Claims priority, application Belgium, May 31, 1989, 08900589

Int. Cl.[6] A01N *59/06;* **C05D** *5/00*

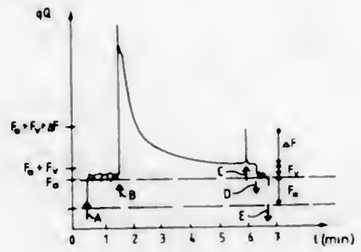
U.S. Cl. 504—116 **3 Claims**

1. A method for enhancing and/or restoring photosynthetic activity in chlorophyllous plants consisting essentially of the step of foliar application to said plants of an aqueous solution of magnesium hydrogen carbonate of the formula $Mg(HCO_3)_2$, wherein said solution is free of any anion of a strong acid.

5,552,368

Q represents oxygen, sulphur or one of the following groups

cycloalkyl-C_1–C_4-alkyl, each of which is optionally



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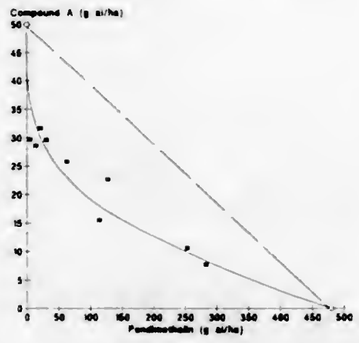
SYNERGISTIC HERBICIDAL COMPOSITIONS COMPRISING 4-BENZOYLISOXAZOLE AND DINITROANILINE HERBICIDES

Alan Gamblin, and Richard H. Hewett, both of Essex, England, assignors to Rhone-Poulenc Agriculture Ltd., Ongar, England

Filed Nov. 18, 1994, Ser. No. 344,603

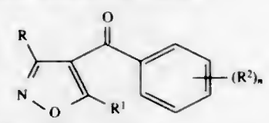
Int. Cl.[6] A01N *43/74;33/18*

U.S. Cl. 504—138 **44 Claims**



1. A synergistic herbicidal product comprising a synergistic herbicidally effective amount of:

(a) a 4-benzoylisoxazole of formula (I):



(I)

wherein

R is hydrogen or $—CO_2R^3$;

R^1 is cyclopropyl;

R^2 is selected from the group consisting of halogen, $—S(O)_pMe$, C_{1-6} alkyl and C_{1-6} haloalkyl;

n is two or three;

p is zero, one or two; and

R^3 is C_{1-4} alkyl; and

(b) a dinitroaniline herbicide;

as a combined preparation for simultaneous, separate or sequential use in controlling the growth of weeds at a locus; wherein the weight ratio of (a):(b) is from 1:6000 to 64:1.

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SULFONYLUREAS

Willy Meyer, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

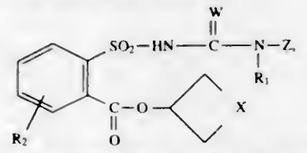
Division of Ser. No. 419,307, Apr. 10, 1995, which is a continuation of Ser. No. 373,713, Jan. 17, 1995, abandoned, which is a division of Ser. No. 154,768, Nov. 19, 1993, Pat. No. 5,412,107, which is a division of Ser. No. 14,947, Feb. 8, 1993, Pat. No. 5,286,709, which is a division of Ser. No. 823,515, Jan. 21, 1992, Pat. No. 5,209,771. This application May 26, 1995, Ser. No. 451,366

Claims priority, application Switzerland, Jan. 25, 1991, 220/91-6

Int. Cl.[6] A01N *43/653;* **C07D** *249/14*

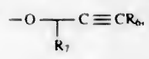
U.S. Cl. 504—211 **10 Claims**

1. A compound of the formula I

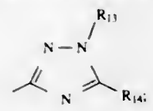


(I)

in which X is oxygen, sulfur, SO or SO_2; W is oxygen or sulfur, R_1 is hydrogen or methyl; R_2 is hydrogen, fluorine, chlorine, bromine, iodine, $(X)_nR_3$, NO_2, NR_4R_5, $—C≡CR_6$,



or cyano; n is the number 0 or 1;



Z3

R_{13} is C_1–C_3alkyl; and R_{14} is C_1–C_3alkyl, C_1–C_3alkoxy, chlorine or $OCHF_2$; or a salt of these compounds.

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SULPHONYLAMINOCARBONYLTRIAZOLINONES

Kurt Findeisen; Karl-Heinz Linker, both of Leverkusen; Joachim Kluth, Langenfeld; Klaus-Helmut Müller, Düsseldorf; Hans-Jochem Riebel, Wuppertal; Klaus König, Odenthal; Hans-Joachim Santel, Leverkusen, and Robert R. Schmidt, Bergisch Gladbach, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

PCT No. PCT/EP93/02706, § 371 Date Apr. 7, 1995, § 102(e) Date Apr. 7, 1995, PCT Pub. No. WO94/08979, PCT Pub. Date Apr. 28, 1994

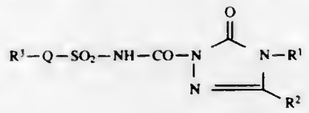
PCT Filed Oct. 4, 1993, Ser. No. 411,718

Claims priority, application Germany, Oct. 15, 1992, 42 34 801.3

Int. Cl.[6] A01N *47/38;57/32;* **C07D** *249/12;413/04*

U.S. Cl. 504—273 **5 Claims**

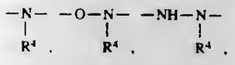
1. A sulphonylaminocarbonyltriazoline of the formula



(I)

in which

Q represents oxygen, sulphur or one of the following groups



R^1 represents hydrogen, hydroxyl, amino, or represents C_2–C_{10}-alkylideneamino, or represents C_1–C_6-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, C_1–C_4-alkoxy, C_1–C_4-alkylcarbonyl or C_1–C_4-alkoxy-carbonyl, or represents C_3–C_6-alkenyl or C_3–C_6-alkinyl, each of which is optionally substituted by fluorine, chlorine or bromine, or represents C_3–C_6-cycloalkyi which is optionally substituted by fluorine, chlorine, bromine and/or C_1–C_4-alkyl, or represents phenyl-C_1–C_3-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy or C_1–C_4-alkoxy-carbonyl, or represents phenyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy, fluorine- and/or chlorine-substituted C_1– C_3-alkoxy, C_1–C_4-alkylthio, fluorine- or chlorine-substituted C_1–C_3-alkylthio, C_1–C_4-alkylsulphinyl, C_1–C_4-alkylsulphonyl or C_1–C_4-alkoxy-carbonyl, or represents C_1–C_6-alkoxy which is optionally substituted by fluorine, chlorine, cyano, phenyl, C_1–C_4-alkoxy or C_1–C_4-alkoxy-carbonyl, or represents C_3–C_6-alkenyloxy, or represents C_1–C_4-alkylamino, C_3–C_6-cycloalkylamino or di(C_1–C_4-alkyl)-amino, each of which is optionally substituted by fluorine, cyano, C_1–C_4-alkoxy or C_1–C_4-alkoxy-carbonyl, or represents C_1–C_6-alkanoylamino, or represents C_1–C_6-alkoxycarbonylamino,

R^2 represents hydrogen, hydroxyl, mercapto, amino, halogen, or represents C_1–C_6-alkyl or C_2–C_6-alkenyl, optionally substituted by fluorine, chlorine, bromine cyano, C_3–C_6-cycloalkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio or C_1–C_4-alkoxy-carbonyl, or represents C_3–C_6-cycloalkyl which is optionally substituted by fluorine, chlorine, bromine or C_1–C_4-alkyl, or represents cyclohexenyl, or represents phenyl-C_1–C_3-alkyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy or C_1–C_4-alkoxycarbonyl, or represents phenyl which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy, fluorine- or chlorine-substituted C_1–C_3-alkoxy, C_1–C_4-alkylthio, fluorine- or chlorine-substituted C_1–C_3-alkylthio, C_1–C_4-alkyl-sulphinyl, C_1–C_4-alkylsulphonyl and/or C_1–C_4-alkoxy-carbonyl, or represents C_1–C_6-alkoxy which is optionally substituted by fluorine, chlorine, cyano, C_1–C_4-alkoxy or C_1–C_4-alkoxy-carbonyl, or represents C_3–C_6-alkenyloxy, C_3–C_6-alkinyloxy or C_3–C_6-cycloalkyloxy, or represents phenoxy or benzyloxy, each of which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy, difluoromethoxy or trifluoromethoxy, or represents C_1–C_6-alkylthio, C_1–C_6-alkylsulphinyl, C_1–C_6-alkylsulphonyl, C_3–C_6-alkenylthio, C_3–C_6-alkinylthio or C_3–C_6-cycloalkylthio, each of which is optionally substituted by fluorine, chlorine, cyano, C_1–C_4-alkoxy or C_1–C_4-alkoxy-carbonyl, or represents phenylthio or benzylthio, each of which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy, difluoromethoxy or trifluoromethoxy, or represents C_1–C_6-alkylamino or C_3–C_6-alkenylamino, or represents phenylamino or benzylamino, each of which is optionally substituted by fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy, difluoromethoxy or trifluoromethoxy, or represents di-(C_1–C_4-alkyl)-amino, or represents aziridino, pyrrolidino or morpholino, each of which is optionally substituted by C_1–C_4-alkyl,

R^3 represents C_1–C_6-alkyl, C_3–C_6-alkenyl or C_3–C_6-alkinyl, each of which is optionally substituted by halogen, cyano, carboxyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl, C_1–C_4-alkylsulphonyl or C_1–C_4 -alkoxy-carbonyl, or represents C_3–C_6-cycloalkyl or C_3–C_6-cycloalkyl-C_1–C_4-alkyl, each of which is optionally substituted by halogen, cyano, carboxyl, C_1–C_4-alkyl, C_1–C_4-halogenoalkyl or C_1–C_4-alkoxy-carbonyl, or represents C_1–C_6-alkylsulphonyl, C_1–C_6-alkylamirfosulphonyl or di-(C_1–C_4-alkyl)-aminosulphonyl, each of which is optionally substituted by halogen, or represents phenyl, naphthyl, tetralinyl, phenyl-C_1–C_4-alkyl, naphthyl-C_1–C_4-alkyl or tetralinyl-C_1–C_4-alkyl, each of which is optionally substituted by halogen, cyano, carboxyl, nitro, by C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl or C_1–C_4-alkylsulphonyl (in each case optionally substituted by halogen, cyano, C_1–C_4-alkoxy or C_1–C_4-alkoxy-carbonyl), by C_1–C_4-alkylsulphonyloxy, C_1–C_4-alkylaminosulphonyloxy, di-(C_1–C_4-alkyl)aminosulphonyloxy, C_1–C_4-halogenoalkylsulphonyloxy, di-(C_1–C_4-alkyl)aminocarbonyl or C_1–C_4-alkylaminocarbonyloxy, by C_3–C_6-cycloalkyl or C_3–C_6-cycloalkyl-C_1–C_4-alkyl (in each case optionally substituted by halogen or C_1–C_4-alkyl), by phenyl, phenoxy, phenylthio, phenylsulphinyl, phenylsulphonyl, phenylsulphonyloxy, phenylamino, phenylcarbonyl or phenyl-C_1–C_4-alkyl (in each case optionally substituted by halogen, cyano, nitro, C_1–C_4-alkyl, C_1–C_4-halogenoalkyl, C_1–C_4-alkoxy, C_1–C_4 -halogenoalkoxy, C_1–C_4-alkylthio, C_1–C_4-halogenoalkylthio, C_1–C_4-alkoxycarbonyl or C_1–C_4-alkoxy-amino), by C_1–C_4-alkyl-carbonyl, C_3–C_6-cycloalkylcarbonyl or C_1–C_4-alkoxy-carbonyl (in each case optionally substituted by halogen, C_3–C_6-cycloalkyl or C_1–C_4-alkoxy),

R^4 represents hydrogen, hydroxyl, amino, cyano, or represents C_1–C_6-alkyl, C_3–C_6-alkenyl or C_3–C_6-alkinyl, each of which is optionally substituted by halogen, cyano, carboxyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylsulphinyl, C_1–C_4-alkylsulphonyl, C_1–C_4-alkylamino, di(C_1–C_4-alkyl)-amino or C_1–C_4-alkoxy-carbonyl, or represents C_1–C_4-alkoxy-carbonyl, or represents C_1–C_6-alkoxy, C_3–C_6-alkenyloxy, benzyloxy, phenoxy or di-(C_1–C_4-alkoxy)-(thio)-phosphoryl, or represents the following group $Q^1—R^5$ in which

Q^1 represents —CO— or $—SO_2—$ and

R^5 represents C_1–C_6-alkyl which is optionally substituted by halogen or C_1–C_4-alkoxy, or represents C_3–C_6-cycloalkyl which is phenyl which is optionally substituted by halogen, or C_1–C_4-alkyl, or represents phenyl which is optionally substituted by halogen, C_1–C_4-alkyl, C_1–C_4-halogenoalkyl or C_1–C_2-alkoxy,

or a salt thereof.

5,552,370

SILVER ADDITIVES FOR CERAMIC SUPERCONDUCTORS

John T. Anderson, Woodside; V. K. Nagesh, Cupertino, and Richard C. Ruby, Menlo Park, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 751,463, Aug. 29, 1991, Pat. No. 5,338,507, which is a continuation of Ser. No. 74,799, Jul. 17, 1987, abandoned, which is a continuation-in-part of Ser. No. 32,414, Mar. 30, 1987, abandoned. This application Jan. 18, 1994, Ser. No. 182,884

Int. Cl.[6] H01B *12/00;* **C04B** *35/01;35/628;* **H01L** *39/12*

U.S. Cl. 505—124 **11 Claims**

8. A superconductor ink for applying a superconductor thick film to a substrate by sintering the ink after application to said substrate, comprising:

a plurality of copper oxide based ceramic superconductor grains;

a silver compound in a solvent; and

an organic carrier;

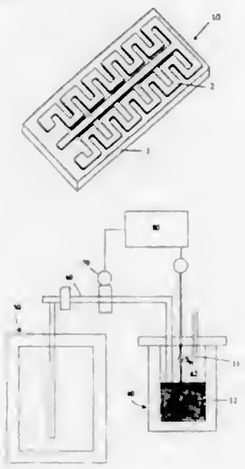
wherein said silver compound is present in an amount sufficient to cover the copper-oxide based superconductor gains with metallic silver approximately 0.05 microns thick.

1. A Josephson junction device comprised of a substrate and a flows ranging from one half of a length of the thin superconducting

5,552,371
YBA CUO-TYPE SUPERCONDUCTING MATERIAL BASED APPARATUS FOR AUTO-FILLING LIQUID NITROGEN

Yeow-Chin Chen; Ran-Jin Lin, and Ru-Shi Liu, all of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu Hsien, Taiwan

Filed May 17, 1994, Ser. No. 245,224
Int. Cl.[6] G01F *23/24*
U.S. Cl. 505—160 **8 Claims**



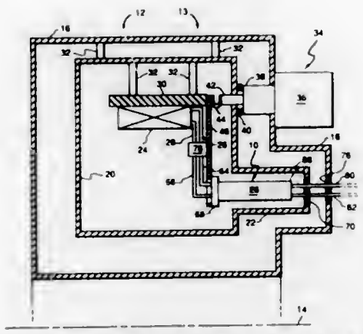
5. A liquid nitrogen level monitoring element to be placed inside a liquid nitrogen container to provide information about whether said liquid nitrogen in said container has fallen below a predetermined level, said liquid nitrogen level monitoring element comprising a superconducting material disposed on a non-conducting substrate, wherein said superconducting material having a critical temperature approximately equal to the boiling point temperature of said liquid nitrogen, and said superconducting material being placed at or near said predetermined level so that it exhibits zero or near zero resistance under normal conditions;
wherein said superconducting material consists of a YBaCuO superconducting material, which is disposed on said non-conducting substrate in the shape of a narrow strip having a plurality of meandering loops so as to substantially reduce the amount of electric current passing therethrough;
further wherein said non-conducting substrate is magnesium oxide.

5,552,372
CERAMIC SUPERCONDUCTING LEAD RESISTANT TO BREAKAGE

Robert A. Ackermann, Schenectady; Kenneth G. Herd, Niskayuna; Evangelos T. Laskaris, Schenectady, and Richard A. Ranze, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 329,919, Oct. 27, 1994, abandoned. This application May 11, 1995, Ser. No. 439,168
Int. Cl.[6] B32B *9/00*
U.S. Cl. 505—163 **4 Claims**

1. In combination with a superconductive device cooled by a cryocooler coldhead having a first stage and a second stage, a superconductive lead assembly comprising:
a) a first ceramic superconductive lead having a first end thermally connected to said first stage and a second end thermally connected to said second stage;
b) a jacket comprising an open cell material having a coefficient of thermal conductivity not exceeding that of glass reinforced

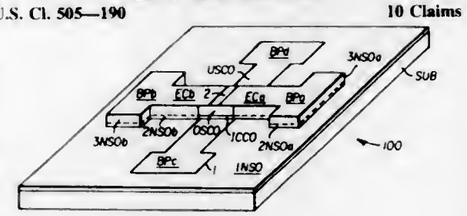


epoxy at a temperature of 50 Kelvin, said jacket in surrounding compressive contact with said first ceramic superconductive lead;
c) a rigid support tube surrounding said jacket, having a coefficient of thermal conductivity not exceeding that of stainless steel at a temperature of 50 Kelvin, having a first end, and having a second end thermally connected to said second stage;
d) a glass-reinforced-epoxy jacket overwrap in general surrounding contact with and attached to said jacket, and wherein said rigid support tube is in general surrounding contact with and attached to said glass-reinforced-epoxy jacket overwrap;
e) a metallic wire disposed within said rigid support tube and generally helically wound around said jacket binding it, wherein said metallic wire has a coefficient of thermal expansion generally equal to that of said rigid support tube, and wherein said glass-reinforced-epoxy jacket overwrap is also attached to said metallic wire;
f) a second ceramic superconductive lead generally identical to and spaced apart from said first ceramic superconductive lead said, second ceramic superconductive lead having a first end flexibly, dielectrically, and thermally connectable to said first stage and a second end flexibly, dielectrically, and thermally connectable to said second stage, with said jacket also in general surrounding compressive contact with said second ceramic superconductive lead; and
g) a rigid thermal station, said second ends of said first and second ceramic superconductive leads flexibly, dielectrically, and thermally connected to said rigid thermal station, said second end of said rigid support tube rigidly attached to said rigid thermal station, and said rigid thermal station thermally connectable to said second stage.

5,552,373
JOSEPHSON JUNCTION DEVICE COMPRISING HIGH CRITICAL TEMPERATURE CRYSTALLINE COPPER SUPERCONDUCTIVE LAYERS

John A. Agostinelli, Rochester; Jose M. Mir, Webster; Gerrit Lubberts, and Samuel Chen, both of Penfield, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 615,936, Nov. 15, 1990, abandoned. This application Apr. 10, 1992, Ser. No. 867,063
Int. Cl.[6] H01L *29/06;39/22*
U.S. Cl. 505—190 **10 Claims**

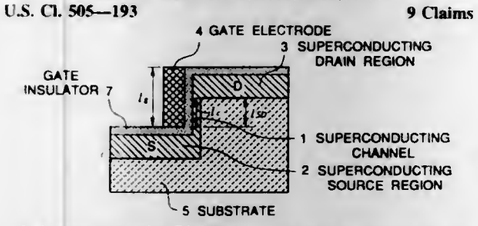


1. A Josephson junction device comprised of a substrate and a Josephson junction layer sequence comprised of an underlying high temperature superconductive crystalline copper oxide layer, an overlying high temperature superconductive crystalline copper oxide layer, and an impedance controlling crystalline copper oxide layer interposed between the superconductive layers,
CHARACTERIZED IN THAT
the underlying superconductive crystalline copper oxide layer is located on a portion of a major surface of the substrate in a selected area,
a first nonsuperconductive copper oxide layer portion only lies on the substrate and laterally abuts and laterally surrounds the underlying superconductive crystalline copper oxide layer
the impedance controlling crystalline copper oxide layer overlies the underlying superconductive layer in only a portion of the selected area to leave a portion of the underlying superconductive crystalline Copper oxide layer free of an overlying oxide layer,
a second nonsuperconductive copper oxide layer portion overlies the first nonsuperconductive copper oxide layer and laterally abuts the impedance controlling layer,
the overlying superconducting crystalline copper oxide layer overlies only the impedance controlling layer,
a third nonsuperconductive copper oxide layer portion overlies only the second nonsuperconductive copper oxide layer and laterally abuts the overlying superconducting crystalline copper oxide layer, and
an electrical conductor is attached to the overlying superconductive crystalline copper oxide layer and extends laterally over at least a portion of the third nonsuperconductive copper oxide layer portion.

5,552,374
OXIDE SUPERCONDUCTING A TRANSISTOR IN CRANK-SHAPED CONFIGURATION

So Tanaka, and Michitomo Iiyama, Both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 44,623, Apr. 19, 1993, abandoned. This application Apr. 4, 1994, Ser. No. 221,966
Claims priority, application Japan, Apr. 9, 1992, 4-116946
Int. Cl.[6] H01L *23/48;39/06;39/08;39/14*
U.S. Cl. 505—193 **9 Claims**



1. A superconducting FET device comprising a superconducting source region and a superconducting drain region separately formed of an oxide superconductor and connected by a thin superconducting portion formed of the oxide superconductor that is thin enough to ensure a complete ON/OFF operation, so that superconducting current can flow through the thin superconducting portion between the superconducting source region and the superconducting drain region, and a gate electrode positioned on a gate insulator on the thin superconducting portion for controlling superconducting current flowing through the thin superconducting portion, wherein the superconducting source region, the thin superconducting region and the superconducting drain region are arranged in a crank-shaped configuration in which the superconducting source and drain regions are on different levels with the thin superconducting portion vertically arranged between an end of the superconducting source region and an end of the superconducting drain region, and wherein a part of the thin superconducting portion constitutes a superconducting channel, a length of the gate electrode along the direction in which the superconducting current flows ranging from one half of a length of the thin superconducting portion having a thickness the same as the superconducting channel to one and a half length of the thin superconducting portion having a thickness the same as the superconducting channel.

5,552,375
METHOD FOR FORMING HIGH T_C SUPERCONDUCTING DEVICES

Toshikazu Nishino, Kawasaki; Ushio Kawabe, Tokyo; Yoshinobu Tarutani, Yamanashi; Shinya Kominami, Tokorozawa; Toshiyuki Aida, Chofu; Tokuumi Fukazawa, Tachikawa, and Mutsuko Hatano, Kodaira, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 853,593, Mar. 17, 1992, Pat. No. 5,326,745, which is a division of Ser. No. 155,806, Feb. 16, 1988, Pat. No. 5,126,315. This application Feb. 7, 1994, Ser. No. 192,573
Claims priority, application Japan, Feb. 27, 1987, 62-42558; Jun. 15, 1987, 62-147043; Jun. 29, 1987, 62-159596
Int. Cl.[6] H01L *39/24*
U.S. Cl. 505—330 **14 Claims**

1. A method of manufacturing a superconducting device, comprising the steps of:
(a) providing a body selected from the group consisting of a semiconductor body and a normal conductor body, a principal surface of which is perpendicular to a c-axis thereof;
(b) forming a superconductor on the body by sputtering, the superconductor being formed of a high T_c superconducting oxide having a crystalline structure whose crystals have a c-axis;
(c) forming a pattern of photoresist on the superconductor; and
(d) processing the superconductor into two opposing superconducting electrodes by etching the pattern on the superconductor.

5,552,376
METHOD OF PREPARING BISMUTH OXIDE SUPERCONDUCTING WIRE

Takeshi Kato, and Kenichi Sato, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd.; Director General of National Research Institute for Metals of Science and Technology Agency of Japan, and Research Development Corporation of Japan, all of, Japan

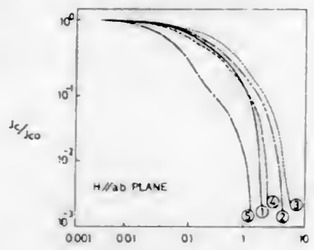
Continuation of Ser. No. 30,423, Mar. 23, 1993, abandoned. This application Nov. 28, 1994, Ser. No. 345,920
Claims priority, application Japan, Jul. 24, 1991, 3-184303
Int. Cl.[6] H01L *39/24*
U.S. Cl. 505—433 **8 Claims**

1. A method of preparing a bismuth oxide superconducting wire comprising the steps of
adding an amount of Sr, Ca, and Cu sufficient to form a non-superconducting Sr-Ca-Cu-O phase to a bismuth oxide superconductor powder of Bi, Pb, Sr, Ca, and Cu or a raw material therefore to form a $(Bi_{2.2-x}, Pb_x)Sr_2Ca_2Cu_3$ (x = 0.3 to 0.4) superconducting phase, wherein said amount of Sr, Ca, and Cu is in a composition ratio of 0.4Y:1.6Y:1.0Y with Y in a range of 0.2 to 1.0;
charging said bismuth oxide superconductor powder or a raw material therefor in a metal sheath;
plastically-working said metal sheath being charged with said powder into a wire;

5,552,379
NOVEL AROMATIC COMPOUNDS, PROCESSES FOR

5,552,381
RECOMBINANTLY PRODUCED HUMAN MEMBRANE

E has the following formula:



performing a first heat treatment on said wire;
performing a plastic working step or pressing on said wire; and
performing a second heat treatment on said wire such that the $(Bi_{2-x}Pb_x)Sr_2Ca_2Cu_3$ superconducting phase and the non-superconducting Sr-Ca-Cu-O phase are formed by said heat treatment steps, wherein said non-superconducting Sr-Ca-Cu-O phase acts as a pinning point in said bismuth oxide superconducting wire.

5,552,377

MUD SWEEP AND SPACER COMPOSITION

Jack E. Kindred, 605 Green Ct., Athens, Tex. 75751

Filed Apr. 20, 1993, Ser. No. 49,945
Int. Cl.[6] E21B *33/06;33/16;43/00*
U.S. Cl. 507—209 **11 Claims**

1. A composition for the preparation of a mud sweep and spacer, the composition consisting of:
from about 25 to about 70 weight percent, based on total weight of the composition, of a petroleum-based hydrocarbon;
from about 20 to about 65 weight percent, based on total weight of the composition, of a biopolymer;
from about 0.3 to about 8 weight percent, based on total weight of the composition, of a thickening agent selected from the group consisting of organophilic clay and bentonite;
from about 0.1 to about 6 weight percent, based on total weight of the composition of a surfactant;
from about 0.1 to about 2 weight percent, based on total weight of the composition, of a halide of an alkali metal;
from about 1 to about 6 weight percent, based on total weight of the composition, of a lower alkanol;
from about 0.3 to about 5 weight percent, based on total weight of the composition, of sodium silicate and sodium carbonate; and
from about 0.1 to about 1 weight percent, based on total weight of the composition, of a defoamer.

5,552,378

SOLID CONSUMER PRODUCT COMPOSITIONS CONTAINING SMALL PARTICLE CYCLODEXTRIN COMPLEXES

Toan Trinh, Maineville, and John M. Gardlik, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 707,266, May 24, 1991, abandoned, which is a continuation of Ser. No. 486,757, Mar. 6, 1990, abandoned. This application Jun. 29, 1994, Ser. No. 268,157
Int. Cl.[6] A61K *7/46*
U.S. Cl. 512—3 **22 Claims**

1. Solid consumer product composition comprising an effective amount of active/cyclodextrin inclusion complex prepared by the kneading method and having a particle size of less than about 5 microns which provides for fast release of said active, wherein said active is perfume.

5,552,379

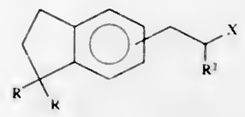
NOVEL AROMATIC COMPOUNDS, PROCESSES FOR THEIR PREPARATION AND THEIR USE IN PERFUMERY

Beat Winter, Sezenove/Bernex; Pierre-Alain Blanc, Crassier, and Serge Lamboley, Bussigny, all of, Switzerland, assignors to Firmenich SA, Switzerland

Filed May 12, 1995, Ser. No. 439,754
Claims priority, application Switzerland, May 31, 1994, 1689/94
Int. Cl.[6] A61K *7/46;* **C07D** *317/12;319/06;* **C07C** *47/115*
U.S. Cl. 512—12 **7 Claims**

1. A compound of formula

(Ic)



wherein X represents a —CHO group or a group of formula —CH$(OR')_2$ in which R', taken separately, each represent a C_1 to C_4 linear or branched alkyl radical, or taken together represent a C_2 to C_4 alkylene radical, R^2 represents a hydrogen atom or a methyl radical, and R represents a hydrogen atom or a methyl radical, the groups R being identical or different.

4. A perfuming composition or a perfumed article which contains as an active perfuming ingredient a compound according to claim 1.

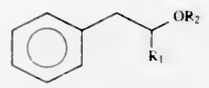
5,552,380

PERFUME USES OF PHENYL ALKANOL DERIVATIVES

Mark A. Sprecker, Sea Bright; Richard A. Weiss, Pine Brook, and Marie R. Hanna, Keyport, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Dec. 15, 1994, Ser. No. 356,504
Int. Cl.[6] A61K *7/46*
U.S. Cl. 512—20 **11 Claims**

1. A process for augmenting, enhancing or imparting an aroma in or to a consumable material selected from the group consisting of perfume compositions, perfumed articles and colognes comprising the step of intimately admixing with said consumable material an aroma augmenting, enhancing or imparting quantity and concentration of a phenyl alkanol derivative defined according to the structure:



wherein R_2 is selected from the group consisting of hydrogen and acetyl and R_1 is selected from the group consisting of methyl and ethyl with the proviso that when R_2 is hydrogen, R_1 is ethyl and when R_2 is acetyl, R_1 is methyl.

5,552,381

RECOMBINANTLY PRODUCED HUMAN MEMBRANE COFACTOR PROTEIN (MCP) PHARMACEUTICAL COMPOSITION, AND METHOD OF INHIBITING COMPLEMENT ACTIVITY

John P. Atkinson, St. Louis, Mo., assignor to Washington University, St. Louis, Mo.

Continuation of Ser. No. 984,247, Nov. 30, 1992, abandoned, which is a continuation of Ser. No. 510,709, Apr. 19, 1990, abandoned, which is a continuation-in-part of Ser. No. 384,210, Jul. 21, 1989, abandoned. This application Feb. 28, 1994, Ser. No. 203,867
Int. Cl.[6] A61K *38/17;* **C07K** *14/435;14/705*
U.S. Cl. 514—8 **14 Claims**

1. An insolated soluble mammalian membrane cofactor protein which inhibits complement, has cofactor activity, and is free of decay-accelerating activity, said membrane cofactor protein lacking the membrane-bound region of native membrane cofactor protein.

13. A method to inhibit complement activity, in a subject, which method comprises administering to a subject in need of such treatment an effective amount of the membrane cofactor protein of claim 1, or a pharmaceutical composition thereof, to inhibit complement activity.

5,552,382

GRAMICIDIN AS A SPERMICIDE AGAINST SEXUAL TRANSMISSION OF HIV

Aldar S. Bourinbaiar, New York, N.Y.; Richard Lyon, Owasso, Okla.; George O'Brien, and Bob Hampton, both of Tulsa, Okla., assignors to Metatron, Inc., Deer Park, N.Y.

Filed Dec. 2, 1994, Ser. No. 348,482
Int. Cl.[6] A61K *38/00*
U.S. Cl. 514—14 **4 Claims**

1. A method for the prevention of sexual transmission of HIV in a human host in need thereof, said method comprising administering by topical application in the vagina or rectum of the human host in need thereof a quantity of gramicidin which is sufficient to exert a protective effect.

5,552,383

BRADYKININ ANTAGONIST PSEUDOPEPTIDE DERIVATIVES OF AMINOALKANOIC ACIDS AND RELATED OLEFINS

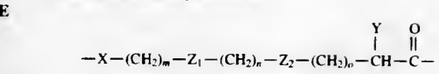
Donald J. Kyle, Abingdon, and Babu J. Mavunkel, Baltimore, both of Md., assignors to Scios Nova Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 957,879, Oct. 8, 1992. This application Sep. 9, 1993, Ser. No. 118,550
Int. Cl.[6] A61K *38/08*
U.S. Cl. 514—15 **9 Claims**

1. A pseudopeptide which has an affinity for a bradykinin receptor having the formula:

A-B-C-D-E-F-G-H-I-J-Cn

wherein
A is selected from the group consisting of the L- and D-isomers of Arg and Lys;
B is selected from the group consisting of the L- and D-isomers of Arg and Lys;
C is a direct bond or is selected from the group consisting of Pro, 4Hyp and Oic;
D is selected from the group consisting of 2-pyrrolidinyl, Pro, 4Hyp and Oic;
E has the following formula:



wherein
X is selected from the group consisting of a direct bond and an imino (—NH) group;
Z_1 is a C_2 to C_{18} monoolefin;
Z_2 is a direct bond;
Y is selected from the group consisting of hydrogen, hydroxymethyl, C_1 to C_6 alkyl, benzyl, thiophenylmethyl and furanylmethyl;
m, n, and o are independently 0 to 6;
F is a direct bond or is selected from the group consisting of Phe and N-benzyl-Gly;
G is selected from the group consisting of Ser, Thr, Gly and Val;
H is selected from the group consisting of a D-Phe, D-Tic and a D-trans-Hype;
I is selected from the group consisting of Oic, Aoc, Tic, Phe, and a Hype;
J is selected from the group consisting of Arg and Lys;
Cn is selected from the group consisting of a hydroxyl group, an amino group, and an alkoxy group,
and pharmaceutically accepted salts thereof.

5,552,384

ANTIHERPES COMPOSITIONS AND METHOD OF USE

Robert Déziel, Ville Mont-Royal, and Yvan Guindon, Montreal, both of, Canada, assignors to Bio-Mega Boehringer Ingelheim Research Inc., Laval, Canada

Continuation of Ser. No. 58,066, May 4, 1993, which is a continuation of Ser. No. 808,828, Dec. 17, 1991, abandoned. This application Jun. 6, 1994, Ser. No. 254,391
Claims priority, application Canada, Dec. 31, 1990, 2033488
Int. Cl.[6] A61K *38/08*
U.S. Cl. 514—17 **6 Claims**

1. A pharmaceutical composition for treating herpes infections in a mammal comprising a pharmaceutically or veterinarily acceptable carrier and an effective amount of a combination of an antiviral nucleoside analog, or a therapeutically acceptable salt thereof, selected from the group consisting of acyclovir, vidarabine, idoxuridine, trifluridine, ganciclovir, edoxudine, brovavir, fiacitabine, penciclovir, famciclovir and rociclovir and a peptide selected from the group consisting of:
$PhCH_2CH_2CO$—N-Me-Val-Tbg-Asp(pyrrolidino)-Asp(cyPn)-{(S)—NHCH[CH_2 $C(CH_3)_3$]CH_2OH},
$PhCH_2CH_2CO$—N-Me-Val-Tbg-Asp(pyrrolidino)-Asp(cyPn)-Leu-OH,
[4-(Boc-NH)-Ph]CH_2CH_2CO—N-Me-Val-Tbg-Asp(pyrrolidino)-Asp(cyPn)-γMeLeu-OH,
(4-NH_2-Ph)CH_2CH_2CO—N-Me-Val-Tbg-Asp(pyrrolidino)-Asp(cyPn)-γMeLeu-OH,
$PhCH_2CH_2CO$—N-Me-Val-Tbg-Asp(pyrrolidino)-Asp(cyPn)-γMeLeu-NH_2,
(4-NH_2-Ph)CH_2CH_2CO—N-Me-Val-Tbg-Asp(pyrrolidino)-Asp(cyPn)-Leu-OH,
$PhCH_2CH_2CO$—N-Me-Val-Tbg-Asp(N-Me-piperazino)-Asp(cyPn)-Leu-OH,
$PhCH_2CH_2CO$—N-Me-Val-Tbg-Asp(pyrrolidino)-Asp(cyPn)-γMeLeu-OH,
$PhCH_2CH_2CO$—N-Me-Val-Tbg-Asp(pyrrolidino)-Asp(cyBu)-Leu-OH, or
$PhCH_2CH_2CO$—N-Me-Val-Tbg-NHCH(2-cyclopentyl-2-oxoethyl)-CO-Asp(cyPn)-Leu-OH; or a therapeutically acceptable salt thereof.

5,552,385

cycloalkyl is a C_3–C_7 cyclic hydrocarbon group; end "acyl" is

-continued

5,552,390

PHOSPHOROTHIOATE INHIBITORS OF METASTATIC

5,552,385

PHARMACEUTICAL FORMULATION

Thorkild Christensen, Allerød; Per Balschmidt, Espergærde; Hans Sørensen, Virum; Ole Olsen, Brønshøj, and Lars Thim, Gentofte, all of, Denmark, assignors to Novo Nordisk A/S, Bagsværd, Denmark

Filed Jun. 5, 1995, Ser. No. 463,159

Int. Cl.[6] A61K *38/07;* **C07K** *5/10*

U.S. Cl. 514—18 **15 Claims**

1. A pharmaceutical formulation comprising a growth hormone and Lys-Gly-Asp-Ser (SEQ ID No: 1).

5,552,386

ANTIBIOTIC A82810

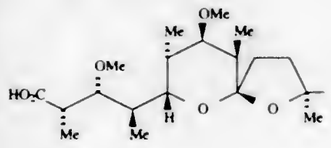
Robert L. Hamill, Greenwood, and Raymond C. Yao, Carmel, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

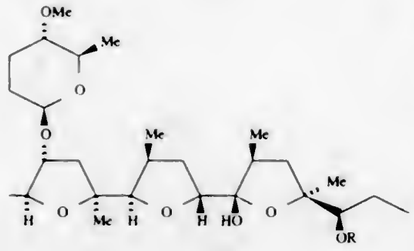
Division of Ser. No. 752,816, Aug. 30, 1991, Pat. No. 5,319,875, which is a division of Ser. No. 335,332, Apr. 10, 1989, Pat. No. 5,098,834, which is a continuation-in-part of Ser. No. 189,499, May 2, 1988, abandoned. This application Apr. 2, 1993, Ser. No. 42,343

Int. Cl.[6] A61K *31/70;* **C07K** *17/04*

U.S. Cl. 514—25 **5 Claims**

1. A compound of the formula





wherein R is —CONHR$_1$ and R$_1$ is selected from the group consisting of alkyl, aryl, alkyl-aryl, arylalkyl, haloaryl, nitroaryl, haloaryl-alkyl, alkoxyaryl, aryloxyaryl, arylcycloalkyl, acylaryl and cycloalkyl; or a pharmaceutically acceptable salt thereof, the terms alkyl, aryl, alkoxy, cycloalkyl, and acyl having the following meanings:

alkyl is a C_1–C_7 straight or branched chain hydrocarbon residue,

aryl is phenyl, pyridyl, furyl, or phenyl substituted on the 4-position by alkyl, halo, nitro, phenoxy, alkoxy, or alkylcarbonyl;

alkoxy is an —O— C_1–C_7 alkyl;

cycloalkyl is a C_3–C_7 cyclic hydrocarbon group; end "acyl" is

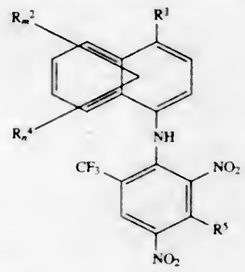
wherein R_{1a} is C_1–C_6 alkyl or hydrogen.

4. A poultry feedstuff composition comprising a first component which is a compound of claim 1 and a second component which is selected from the group consisting of

a) nicarbazin,

b) 4,4'-dinitrocarbanilide,

c) a napthalenamine of the formula



wherein:

R^2 is C_1–C_4 alkyl;

R^3 is halogen, C_1–C_4 fluoroalkyl, C_1–C_4 fluoroalkoxy or C_1–C_4 fluoroalkylthio;

R^4 is halogen;

R^5 is hydrogen or halogen;

m is 0, 1 or 2; and

n is 0 or 1;

with the proviso that, when an R^4 substituent exists, it is at other than the 2-position;

d) a benzenamine selected from the group consisting of 2,4-dinitro-N-[4-(trifluoromethoxy)phenyl]-6-(trifluoromethyl)benzenamine, 2,4-dinitro-N-[4-(1,1,2,2-tetrafluoroethoxy)phenyl]-6-(trifluoromethyl)benzenamine and 2,4-dinitro-N-[4-(pentafluoroethoxy)phenyl]-6-(trifluoromethyl)benzenamine;

e) metichlorpindol; and

f) a pharmaceutically acceptable salt of an (a)–(e) compound;

the components being present in the feedstuff in amounts which, in combination, are synergistic as to at least one coccidiosis-causing strain of Eimeria.

5,552,387

POLYCYCLIC ETHER ANTIBIOTICS

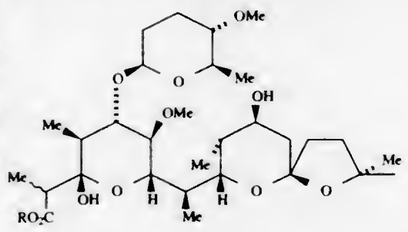
Edward A. Glazer, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 804,482, Dec. 9, 1991, abandoned. This application Aug. 2, 1994, Ser. No. 284,874

Int. Cl.[6] A61K *31/70;* **C07N** *17/04*

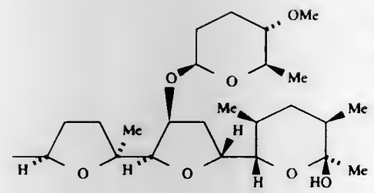
U.S. Cl. 514—25 **3 Claims**

1. An antibiotic of the formula



1

-continued



where R is sodium and Me is methyl.

3. A method for controlling coccidial infections in poultry comprising administering to said poultry an anti-coccidial amount of a compound of claim 1 effective in treating such a condition.

5,552,388

Patent Not Issued For This Number

5,552,389

SUPPRESSORY COMPOSITIONS AGAINST HEPATIC METASTASES OF TUMORS

Tetsuya Toge; Toshihiro Hirai; Akihiro Yoshimoto, all of Hiroshima, and Kenichi Yoshida, Ibaraki, all of, Japan, assignors to Senju Pharmaceutical Co., Ltd., Osaka, Japan

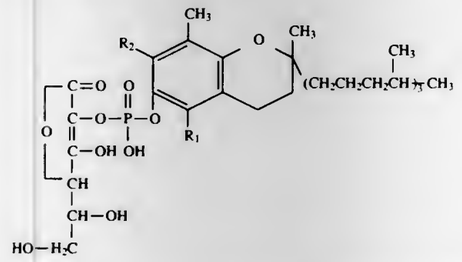
Filed Mar. 27, 1995, Ser. No. 410,842

Claims priority, application Japan, Mar. 29, 1994, 6-058671; Oct. 4, 1994, 6-240167

Int. Cl.[6] A61K *31/70;31/665*

U.S. Cl. 514—25 **1 Claim**

1. A method of suppressing hepatic metastases of tumors which comprises administering to a human subject in need of such method a pharmaceutically effective amount of phosphoric acid diester compound of the formula:



wherein R_1 and R_2 each is the same as or different from the other and represents hydrogen or methyl or a pharmacologically acceptable salt thereof.

5,552,390

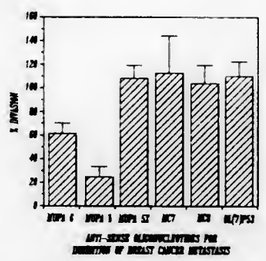
PHOSPHOROTHIOATE INHIBITORS OF METASTATIC BREAST CANCER

Eric M. Scholar, and Patrick L. Iversen, both of Omaha, Nebr., assignors to The Board of Regents of The University of Nebraska, Lincoln, Nebr.

Filed Dec. 9, 1993, Ser. No. 164,200

Int. Cl.[6] A61K *48/00;* **C07H** *21/04*

U.S. Cl. 514—44 **25 Claims**



2. A method for inhibiting basement membrane invasion by a tumor cell in vitro comprising:

contacting said cell with an oligonucleotide selected from the group consisting of: SEQ ID NO: 3, 4, 8, 13, 14, 15, 16, 17, and 18, whereby basement membrane invasion is inhibited.

5,552,391

CHEMICALLY-DEFINED NON-POLYMERIC VALENCY PLATFORM MOLECULES AND CONJUGATES THEREOF

Stephen M. Coutts, Rancho Santa Fe; David S. Jones, San Diego; Douglas A. Livingston, San Diego, and Lin Yu, San Diego, all of Calif., assignors to La Jolla Pharmaceutical Company, San Diego, Calif.

Continuation-in-part of Ser. No. 914,869, Jul. 15, 1992, Pat. No. 5,276,013, which is a continuation-in-part of Ser. No. 494,118, Mar. 13, 1990, Pat. No. 5,162,515, which is a continuation-in-part of Ser. No. 466,138, Jan. 16, 1990, abandoned, and a continuation-in-part of Ser. No. 118,055, Sep. 8, 1993, which is a continuation-in-part of Ser. No. 652,648, Feb. 8, 1991, Pat. No. 5,268,454. This application Nov. 15, 1993, Ser. No. 152,506

Int. Cl.[6] A61A *31/70;* **C07H** *19/00;19/04*

U.S. Cl. 514—44 **12 Claims**

1. A conjugate comprising (a) biological or synthetic molecules reacted with (b) a chemically-defined, non-polymeric valency platform molecule of the formula:

$$G^{[1]}\{T^{[1]}\}_{n[1]} \qquad \text{Formula 1}$$

or

$$G^{[2]}\{L^{[2]}\text{–}J^{[2]}\text{–}Z^{[2]}(T^{[2]})_{p[2]}\}_{n[2]} \qquad \text{Formula 2}$$

wherein

$G^{[1]}$ is {—C(=O)NH—$(CH_2)_5$—C(=O)NH—CH_2}N—C(=O)—O—CH_2CH$_2$—O—CH_2CH_2— O—C(=O)—N{CH_2CH_2—NHC(=O)—$(CH_2)_5$—NHC(=O)—}$_2$;

$G^{[2]}$ is —CH_2CH_2—O—CH_2CH_2—O—CH_2CH_2—;

each of the $n^{[1]}$ moieties shown as $T^{[1]}$ and each of the $p^{[2]}$ X $n^{[2]}$ moieties shown as $T^{[2]}$ is $R^{ALK}X$;

each X is independently a halogen of atomic number greater than 16 and less than 54 or other good leaving group;

each R^{ALK} is independently a linear, branched, or cyclic alkyl (1–20C) group;

each of the $n^{[2]}$ moieties shown as $J^{[2]}$ is C(=O);

$n^{[1]}$=4;

$n^{[2]}$=2;

$p^{[2]}$=2; and

each of the $n^{[2]}$ moieties shown as $Z^{[2]}$ is $—N\{CH_2CH_2—NHC(=O)—(CH_2)_5—NHC(=O)—\}_2$;
and wherein said biological or synthetic molecules comprise a polynucleotide duplex.

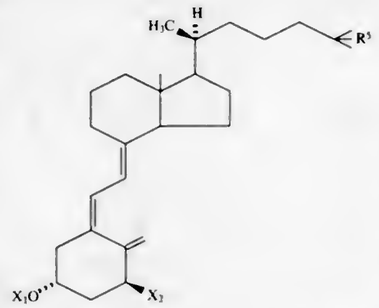
5,552,392

METHOD OF TREATING HYPOPARATHYROIDISM WITH (20S) VITAMIN D COMPOUNDS

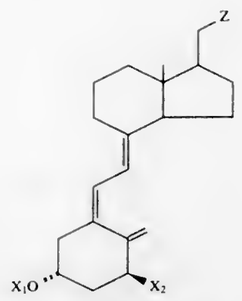
Hector F. DeLuca, Deerfield, Wis., and Jerzy Wicha, Warsaw, Poland, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Nov. 3, 1993, Ser. No. 148,203
Int. Cl.[6] A61K *31/59*
U.S. Cl. 514—167 **9 Claims**

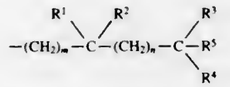
1. A method of treating hypoparathyroidism comprising administering to a patient with said disease a compound having the formula:



where the stereochemical center at carbon 20 in the side chain has the S configuration, X_1 is hydrogen or a hydroxy-protecting group, X_2 is hydrogen, hydroxy, or protected-hydroxy, and where R^5 is hydrogen, hydroxy or protected-hydroxy.



where X_1 is hydrogen or a hydroxy-protecting group, X_2 is hydrogen, hydroxy, or protected-hydroxy, and where Z is selected from Y, -OY, $-CH_2OY$, -C=CY or -CY=CHY, where the double bond may have the cis or trans stereochemical configuration, and where Y is selected from hydrogen, methyl, $-CR^5O$ or a radical of the structure



where m and n, independently represent the integers from 0 to 5, where R^1 is selected from' hydrogen, hydroxy, protected-hydroxy, fluoro trifluoromethyl, or C_{1-5} alkyl, which may be straight-chain or branched, and optionally, bear a hydroxy or protected-hydroxy substituent, and where each of R^2, R^3 and R^4, independently, is selected from hydrogen, fluoro, trifluoromethyl or C_{1-5} alkyl, which may be straight-chain or branched, and optionally bear a hydroxy or protected-hydroxy substituent, and where R^1 and R^2, taken together, represent an oxo group, or an alkylidene group, $=CR^2R^3$, or the group $-(CH_2)_p-$, where p is an integer from 2 to 5, and where R^3 and R^4 taken together, represent an oxo group, or the group $-(CH_2)_q-$, where q Is an integer from 2 to 5, and where R^5 represents hydrogen, hydroxy, protected-hydroxy or C_{1-5} alkyl.

5,552,393

METHOD OF TREATING METABOLIC BONE DISEASES WITH 21-NORVITAMIN D COMPOUNDS

Hector F. DeLuca, Deerfield, Wis., and Jerzy Wicha, Warsaw, Poland, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 329,438, Oct. 26, 1994, which is a division of Ser. No. 157,888, Nov. 24, 1993, Pat. No. 5,384,313. This application May 23, 1995, Ser. No. 447,897
Int. Cl.[6] A61K *31/59;* **C07C** *401/00*
U.S. Cl. 514—167 **8 Claims**

1. A method of treating metabolic bone disease where it is desired to maintain or increase bone mass comprising administering to a patient with said disease a compound having the formula

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5,552,394

LOW DOSE ORAL CONTRACEPTIVES WITH LESS BREAKTHROUGH BLEEDING AND SUSTAINED EFFICACY

Gary D. Hodgen, Norfolk, Va., assignor to The Medical College of Hampton Roads, Norfolk, Va.

Filed Jul. 22, 1994, Ser. No. 279,300
Int. Cl.[6] A61K *31/56*
U.S. Cl. 514—178 **12 Claims**

1. A method of female contraception which is characterized by a reduced incidence of breakthrough bleeding after the first cycle which comprises monophasicly administering a combination of estrogen and progestin for 23–25 consecutive days of a 28 day cycle in which the daily amounts of estrogen and progestin are equivalent to about 1–35 mcg of ethinyl estradiol and about 0.025 to 10 mg of norethindrone acetate, respectively, and in which the weight ratio of estrogen to progestin is at least 1:45 calculated as ethinyl estradiol to norethindrone acetate.

5,552,395

Δ9(11)-DEHYDRO-8-ISOESTRONE USED TO TREAT ALZHEIMER'S DISEASE

Frederick O. Gemmill, Jr.; Chester E. Orzech, both of Rouses Point, N.Y., and Steven J. Adelman, Doylestown, Pa., assignors to American Home Products Corporation, Madison, N.J.

Division of Ser. No. 347,742, Dec. 1, 1994, Pat. No. 5,496,814, which is a division of Ser. No. 224,849, Apr. 8, 1994, Pat. No. 5,395,831. This application May 25, 1995, Ser. No. 450,960
Int. Cl.[6] A61K *31/56;* **C07J** *1/00*
U.S. Cl. 514—179 **1 Claim**

1. A method of treating or ameliorating Alzheimer's disease in a mammal which comprises administering an effective amount of Δ9(11)-Dehydro-8-isoestrone or a pharmaceutically acceptable salt thereof to said mammal.

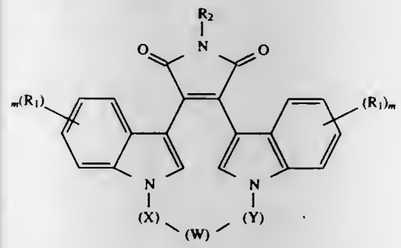
5,552,396

PROTEIN KINASE C INHIBITORS

William F. Heath, Jr., Fishers; Michael R. Jirousek, Indianapolis; John H. McDonald, III, Carmel, and Christopher J. Rito, Mooresville, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 413,735, Mar. 30, 1995, which is a continuation-in-part of Ser. No. 316,973, Oct. 3, 1994, abandoned, which is a continuation-in-part of Ser. No. 163,060, Dec. 7, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 457,000
Int. Cl.[6] C07D *269/00;413/14;* **A61K** *31/395*
U.S. Cl. 514—183 **37 Claims**

1. A compound of Formula:



wherein:
W is —O—, —S—, —SO—, $—SO_2—$, —CO—, C_2–C_6 alkylene, substituted alkylene, C_2–C_6 alkenylene, -aryl-, -aryl$(CH_2)_mO$—, -heterocycle-, -heterocycle—$(CH_2)_mO$—, -fused bicyclic-, -fused bicyclic—$(CH_2)_mO$—, $—NR_3$—, $—NOR_3$—, —CONH—, or —NHCO—;
X and y are independently C_1–C_4 alkylene, substituted alkylene, or together X, y, and W combine to form $—(CH_2)_n—AA—$;
R_1 is independently hydrogen, halo, C_1–C_4 alkyl, hydroxy, C_1–C_4 alkoxy, haloalkyl, nitro, NR_4R_5, or —NHCO(C_1– C_4 alkyl);
R_2 is hydrogen, $CH_3CO—$, NH_2, or hydroxy;
R_3 is hydrogen, $(CH_2)_m$aryl, C_1–C_4 alkyl, —COO(C_1–C_4 alkyl), $—CONR_4R_5$, —(C=NH)NH_2, —SO(C_1–C_4 alkyl), $—SO_2(NR_4R_5)$, or $—SO_2(C_1–C_4$ alkyl);
R_4 and R_5 are independently hydrogen, C_1–C_4 alkyl, phenyl, benzyl, or combine to the nitrogen to which they are bonded to form a saturated or unsaturated 5 or 6 member ring;
AA is an amino acid residue;
m is independently 0, 1, 2, or 3; and
n is independently 2, 3, 4, or 5; or
a pharmaceutically acceptable salt or solvate thereof.

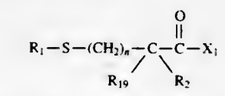
5,552,397

SUBSTITUTED AZEPINONE DUAL INHIBITORS OF ANGIOTENSIN CONVERTING ENZYME AND NEUTRAL EXDOPEPTIDASE

Donald S. Karanewsky, Chapel Hill, N.C., and Jeffrey A. Robl, Newtown, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

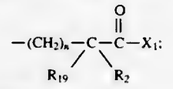
Continuation-in-part of Ser. No. 61,606, May 13, 1993, abandoned, which is a continuation-in-part of Ser. No. 884,664, May 18, 1992, abandoned. This application Dec. 1, 1993, Ser. No. 160,540
Int. Cl.[6] A61K *31/55;* **C07D** *403/12;403/14;223/12*
U.S. Cl. 514—212 **20 Claims**

1. A compound of the formula



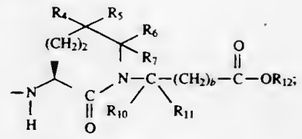
and pharmaceutically acceptable salts thereof wherein:
R_1 is hydrogen,

or $R_{18}—S—$;
R_2 and R_{19} are independently selected from the group consisting of hydrogen, alkyl, cycloalkyl—$(CH_2)_m$—, substituted alkyl, aryl-$(CH_2)_m$—, substituted aryl-$(CH_2)_m$—, and heteroaryl-$(CH_2)_m$— or R_2 and R_{19} taken together with the carbon atom to which they are attached complete a cycloalkyl ring or a benzofused cycloalkyl ring;
n is zero or one;
m is zero or an integer from 1 to 6;
R_3 is alkyl, substituted alkyl, cycloalkyl-$(CH_2)_m$—, aryl-$(CH_2)_m$—, substituted aryl-$(CH_2)_m$—, or heteroaryl-$(CH_2)_m$—;
R_{18} is alkyl, substituted alkyl, cycloalkyl-$(CH_2)_m$—, aryl-$(CH_2)_m$—, substituted aryl-$(CH_2)_m$—, or —S—R_{18} completes a symmetrical disulfide wherein R_{18} is of the formula



(II)

X_1 is of the formula



R_4 and R_5 are independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, cycloalkyl-$(CH_2)_m$—, aryl-$(CH_2)_m$—, substituted aryl-$(CH_2)_m$—, and heteroaryl-$(CH_2)_m$—, or one of R_4 and R_5 is hydrogen and the other is hydroxy, or R_4 and R_5 together with the carbon to which they are attached complete a keto substituent;
R_6 and R_{10} are independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, cycloalkyl —$(CH_2)_m$—, aryl-$(CH_2)_m$—, substituted aryl-$(CH_2)_m$—, and heteroaryl-$(CH_2)_m$—;
R_7 and R_{11} are independently selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, cycloalkyl —$(CH_2)_m$—, aryl-$(CH_2)_m$—, substituted aryl-$(CH_2)_m$— and heteroaryl-$(CH_2)_m$—;
b is zero or one;

R_{12} is hydrogen, alkyl, substituted alkyl, aryl-$(CH_2)_m$—, substi-

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5,552,398

5,552,399

wherein:

R_{12} is hydrogen, alkyl, substituted alkyl, aryl-$(CH_2)_m$—, substituted aryl-$(CH_2)_m$—, heteroaryl-$(CH_2)_m$—, or

R_{14} is hydrogen, lower alkyl, cycloalkyl, or phenyl;

R_{15} is hydrogen, lower alkyl, lower alkoxy, or phenyl;

the term "alkyl" refers to straight and branched chain radicals having one to seven carbon atoms;

the term "substituted alkyl" refers to such straight or branched chain radicals of 1 to 7 carbons wherein one or more hydrogens have been replaced by a hydroxy, amino, halo, trifluoromethyl, cyano, —NH(lower alkyl), —N(lower alkyl)$_2$, lower alkoxy, lower alkylthio or carboxy;

the term "alkenyl" refers to straight or branched chain radicals of 3 to 7 carbon atoms having one or two double bonds;

the term "substituted alkenyl" refers to such straight or branched radicals of 3 to 7 carbons having one or two double bonds wherein a hydrogen has been replaced by a hydroxy, amino, halo, trifluoromethyl, cyano, —NH(lower alkyl), —N(lower alkyl)$_2$, lower alkoxy, lower alkylthio, or carboxy;

the term "cycloalkyl" refers to saturated rings of 3 to 7 carbon atoms;

the term "aryl" refers to phenyl, 1-naphthyl, and 2-naphthyl;

the term "substituted aryl" refers to phenyl, 1-naphthyl; and 2-naphthyl having a substituent selected from lower alkyl, lower alkoxy, lower alkylthio, halo, hydroxy, trifluoromethyl, amino, —NH(lower alkyl), and —N(lower alkyl)$_2$, di- and tri-substituted phenyl, 1-naphthyl, or 2-naphthyl wherein said substituents are selected from methyl, methoxy, methylthio, halo, hydroxy, and amino;

the term "heteroaryl" refers to unsaturated monocyclic rings of 5 or 6 atoms containing one or two O and S atoms and/or one to four N atoms provided that the only other atoms in said monocyclic ring are C atoms and that the total number of O,S and N atoms is four or less and bicyclic rings wherein the five or six membered ring as defined above is fused to a phenyl or pyridyl ring, said heteroaryl ring is attached by way of an available carbon or nitrogen atom; and said monocyclic or bicyclic ring can be substituted at an available carbon atom by lower alkyl of 1 to 4 carbons, halo, hydroxy, benzyl, or cyclohexylmethyl, or can be substituted at an available nitrogen atom by benzyloxymethyl, p-toluene sulfonyl, 2,4-dinitrophenyl, lower alkyl of 1 to 4 carbons, benzyl or benzhydryl;

the term "lower alkyl" refers to straight or branched chain radicals having one to four carbons;

the term "substituted lower alkyl" refers to such straight or branched chain radicals having one to four carbons wherein one hydrogen has been replaced by a hydroxy, amino, halo, trifluoromethyl, cyano, —NH(lower alkyl), —N(lower alkyl)$_2$, lower alkoxy, lower alkylthio, or carboxy;

the terms "lower alkoxy" and "lower alkylthio" refer to such lower alkyl groups as defined above attached to an oxygen or sulfur; and

the term "halo" refers to chloro, bromo, fluoro, and iodo.

5,552,398

AZABICYCLIC COMPOUNDSW AS 5-HT4 RECEPTOR ANTAGONISTS

Francis D. King; Laramie M. Gaster, both of Bishop's Stortford; Paul A. Wyman, Epping; Gareth J. Sanger, Sawbridgeworth; Kay A. Wardle, Welwyn Garden City, and Alberto J. Kaumann, Cambridge, all of, England, assignors to Smith-Kline Beecham p.l.c., Brentford, England

PCT No. PCT/GB92/01612, § 371 Date Nov. 14, 1994, § 102(e) Date Nov. 14, 1994, PCT Pub. No. WO93/05040, PCT Pub. Date Mar. 18, 1993

PCT Filed Sep. 3, 1992, Ser. No. 204,428

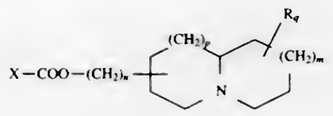
Claims priority, application United Kingdom, Sep. 12, 1991, 9119449; Oct. 23, 1991, 9122474; Jan. 23, 1992, 9201413; Mar. 20, 1992, 9206075

Int. Cl.[6] **C07D** *453/02;401/12;487/04;* **A16K** *31/55*

U.S. Cl. 514—214 **15 Claims**

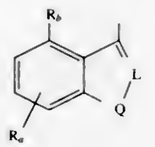
1. A compound of formula (I), or a pharmaceutically acceptable salt thereof

(I)

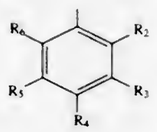


wherein X is of subformula (a) or (b):

(a)



(b)



wherein

L is N or CR_c wherein R_c is hydrogen, C_{1-6}alkoxy, halo, C_{1-6}alkyl or cyano;

Q is NR_1;

R_a is hydrogen, halo, C_{1-6}alkyl, amino, nitro or C_{1-6}alkoxy;

R_b is hydrogen, halo, C_{1-6}alkyl or C_{1-6}alkoxy;

R_1 is hydrogen, C_{1-10}alkyl, C_{2-6}alkenyl, aralkyl, C_{2-6}alkanoyl, or C_{2-6}alkanoyl C_{1-3}alkyl;

R_2 is methoxy; and

R_3 is hydrogen, chloro or fluoro;

R_4 is amino optionally substituted by a C_{1-6}alkyl group;

R_5 is halo;

R_6 is hydrogen, halo, C_{1-6}alkoxy or amino;

n is 0, 1, 2, 3, or 4;

p and m are independently 0, 1 or 2; and

R_q is hydrogen or C_{1-6}alkyl.

5,552,399

SUBSTITUTED TETRACYCLIC AZEPINE DERIVATIVES

Victor K. Sipido, Merksem, Belgium; Francisco J. Fernández-Gadea, Toledo; José I. Andrés-Gil, Madrid, both of, Spain; Theo F. Meert, Rumst, Belgium, and Pilar Gil-Lopetegui, Toledo, Spain, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Filed May 31, 1995, Ser. No. 457,968

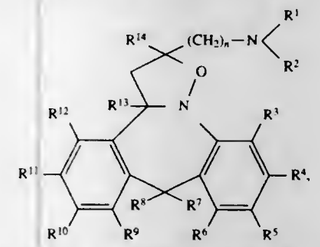
Claims priority, application European Pat. Off., Nov. 2, 1994, 94203178

Int. Cl.[6] **A61K** *31/55;* **C07D** *223/20·498/04;498/10*

U.S. Cl. 514—214 **22 Claims**

1. A compound of the formula:

(I)

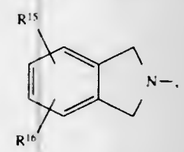


a pharmaceutically acceptable acid or base addition salt thereof, or a stereochemically isomeric form thereof, or an N-oxide form thereof, wherein:

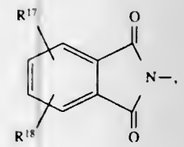
R^1 and R^2 each independently are hydrogen; C_{1-6}alkyl; C_{1-6}alkylcarbonyl; trihalomethylcarbonyl; C_{1-6}alkyl substituted with hydroxy, C_{1-6}alkyloxy, carboxyl, C_{1-6}alkylcarbonyloxy, C_{1-6}alkyloxycarbonyl or aryl; or

R^1 and R^2 taken together with the nitrogen atom to which they are attached may form a morpholinyl ring or a radical of the formula:

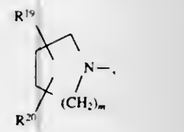
(a)



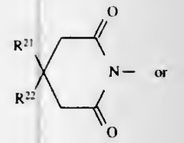
(b)



(c)

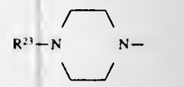


(d)



or

(e)



wherein:

R^{15}, R^{16}, R^{17} and R^{18} each independently are hydrogen halo, trifluoromethyl or C_{1-6}alkyl;

m is 1, 2 or 3;

R^{19}, R^{20}, R^{21} and R^{22} each independently are hydrogen or C_{1-6}alkyl; or

R^{21} and R^{22} taken together may form a bivalent radical C_{4-5}alkanediyl;

R^{23} is hydrogen; C_{1-6}alkyl; C_{1-6}alkylcarbonyl; trihalomethylcarbonyl; C_{1-6}alkyloxycarbonyl; aryl; di(aryl)methyl; or C_{1-6}alkyl substituted with hydroxy, C_{1-6}alkyloxy, carboxyl, C_{1-6}alkylcarbonyloxy, C_{1-6}alkyloxycarbonyl or aryl;

R^3, R^4, R^5, R^6, R^9, R^{10}, R^{11} and R^{12} each independently are hydrogen, halo, cyano, hydroxy, trifluoromethyl, trifluoromethoxy, carboxyl, nitro, amino, mono- or di(C_{1-6}alkyl) amino, C_{1-6}alkylcarbonylamino, aminosulfonyl, mono- or di(C_{1-6}alkyl) aminosulfonyl, C_{1-6}alkyl, C_{1-6}alkyloxy, C_{1-6}alkylcarbonyl or C_{1-6}alkyloxycarbonyl;

R^7 and R^8 each independently are hydrogen, hydroxy, C_{1-6}alkyl, or C_{1-6}alkyloxy; or

R^7 and R^8 taken together may form methylene; mono- or di(cyano)methylene; or a bivalent radical of the formula —$(CH_2)_2$—, —$(CH_2)_3$—, —$(CH_2)_4$—, —$(CH_2)_5$—, —O—$(CH_2)_2$—O— or —O—$(CH_2)_3$—O—; or

R^7 and R^8 taken together with the carbon to which they are attached may form a carbonyl;

R^{13} is hydrogen, C_{1-6}alkyl or trifluoromethyl;

R^{14} is hydrogen, C_{1-6}alkyl, cyano or trifluoromethyl; and

n is a number having a value of from 0 to 6, inclusive;

wherein in the foregoing aryl is phenyl or phenyl substituted with 1, 2 or 3 substituents selected from the group consisting of halo, hydroxy, C_{1-6}alkyl and trifluoromethyl.

5,552,400

FUSED-BICYCLIC LACTAMS AS INTERLEUKIN-1β CONVERTING ENZYME INHIBITORS

Roland E. Dolle, Pottstown; Prasad V. Chaturvedula, Exton; Tina M. Ross, Audubon, and Stanley J. Schmidt, Chester Springs, all of Pa., assignors to Sterling Winthrop Inc., New York, N.Y.

Filed Jun. 8, 1994, Ser. No. 255,276

Int. Cl.[6] **C07D** *487/04;513/04;471/04;* **A61K** *31/55*

U.S. Cl. 514—221 **10 Claims**

1. The compound {according to claim 1} selected from the group consisting of: [9-Benzyloxycarbonylamino)octahydro-6,10-dioxo-6H-pyridazino[1,2a][1,2]diazepine- 1-formoyl]-L-aspartic acid 2,6-dichlorobenzoyloxymethyl ketone,

(b) [9-(4-Dimethylaminomethyl)benzoylamino)octahydro-6,10-dioxo-6H-pyridazino[1,2a][1,2} diazepine-1-formoyl]-L-aspartic acid 2,6-dichlorobenzoyloxymethyl ketone, [9-(N-[4-Methylpiperazino)methyl]benzoylamino)octahydro-6,10-dioxo-6H-pyridazino[1,2a] [1,2]diazepine-1-formoyl]-L-aspartic acid 2,6-dichlorobenzoyloxymethyl ketone, [9-(4-(N-

(c) Methylpiperazinylmethyl)benzoylamino)octahydro-6,10-dioxo-6H-pyridazino[1,2a] [1,2]diazepine-1-formoyl]-L-aspartic acid 2,6-dichlorobenzoyl-oxymethyl ketone, [9-(4-(N-(2-Methyl)imidazolylmethyl)benzoyloamino)octahydro-6,10-dioxo-6H-pyridazino [1,2a] [1,2]diazepine-1-formoyl]-L-aspartic acid 2.6-dichlorobenzoyloxymethyl ketone.

7. A pharmaceutical composition comprising the compound

(d) {according to claim 1} selected from the group consisting of: [9-(5-Benzimidazoylamino)octahydro- 6,10-dioxo-6H-pyridazino[1,2a][1,2]diazepine-1-formoyl]-L-aspartic acid 2,6-dichlorobenzoyloxymethyl ketone, [9-(5-Bentriazoylamino)octahydro-6,10-dioxo-6H-pyridazino[1,2a][1,2]diazepine-1-formoyl]-L-aspartic acid 2,6-dichlorobenzoyloxymethyl ketone, [9-(N-Carboethoxy-5-bentriazoylamino)octahydro-6,10-dioxo-6H-pyridazino[

(e) 1,2a][1,2]diazepine-1-formoyl]-L-aspartic acid 2,6-dichlorobenzoyloxymethyl ketone, [9-(N-Carboethoxy-5-benzimidazoylamino)octahydro-6,10-dioxo-6H-pyridazino [1,2a][1,2] diazepine-1-formoyl]-L-aspartic acid 2,6-dichlorobenzoyloxymethyl ketone,

[9-Benzyloxycarbonylamino)octahydro-10-oxo-6H-pyridazino[1,2a][1,2]diazepine- 1-formoyl]-L-aspartic acid 2,6-

R^1, R^2 and R^3 independently represent hydrogen or C_{1-6} alkyl.

(l) N-tert-butyl-1-{3(S)-{{2,6-dimethylphenoxy)acetyl}amino}-2(R)-hydroxy-4-phenylbutyl}-4(R)-[(3-

[9-Benzyloxycarbonylamino)octahydro-10-oxo-6H-pyridazino[1,2a][1,2]diazepine- 1-formoyl]-L-aspartic acid 2,6-dichlorobenzoyloxymethyl ketone.

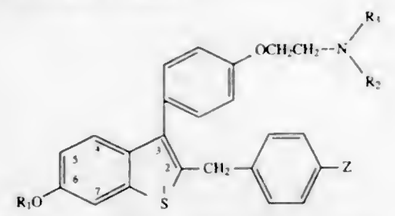
5,552,401

2-BENZYL-3-ARYLBENZOTHIOPHENES

George J. Cullinan, Trafalgar, and James J. Sales, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 28, 1995, Ser. No. 396,021
Int. Cl.[6] C07D *333/64;409/10;* **A61K** *31/38;31/445*
U.S. Cl. 514—233.5 **6 Claims**

1. A compound of formula I



(I)

wherein

R_1 is hydrogen, a hydroxy protecting group, or methyl;

R_2 and R_3 are independently C_1–C_6 alkyl, or R_2 and R_3, together with the nitrogen to which they are attached, form a heterocycle selected from the group consisting of pyrrolidino, hexamethyleneimino, morpholino, and piperidino;

Z is bromo, chloro, fluoro, hydroxy, protected hydroxy, or hydrogen; and pharmaceutically acceptable salts and solvates thereof.

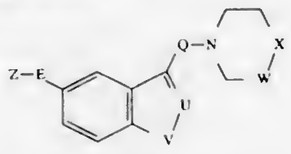
5,552,402

FIVE-MEMBERED HETEROAROMATIC COMPOUNDS AS 5-HT RECEPTOR AGONISTS

V. G. Matassa, Rome, Italy; L. J. Street, Harlow, and G. A. Showell, Welwyn Garden City, both of, England, assignors to Merck, Sharp & Dohme Ltd., Hoddesdon, England

Filed May 18, 1995, Ser. No. 443,615
Claims priority, application United Kingdom, Jun. 19, 1994, 9410027; Aug. 4, 1994, 9415745
Int. Cl.[6] A61K *31/495;31/535;* **C07D** *401/14;413/14*
U.S. Cl. 514—233.5 **7 Claims**

1. A compound of formula I, or a pharmaceutically acceptable salt or prodrug thereof:



(I)

wherein

Z represents an optionally substituted five-membered heteroaromatic ring selected from furan, thiophene, pyrrole, oxazole, thiazole, isoxazole, isothiazole, imidazole, pyrazole, oxadiazole, thiadiazole, triazole and tetrazole;

E represents a chemical bond or a straight or branched alkylene chain containing from 1 to 4 carbon atoms;

Q represents a straight or branched alkylene chain containing from 1 to 6 carbon atoms;

W represents a methylene group and X represents oxygen, sulphur or N—R^1, or —W—X— represents —CH=C(R^1)—;

U represents nitrogen or C—R^2;

V represents oxygen, sulphur or N—R^3; and

R^1, R^2 and R^3 independently represent hydrogen or C_{1-6} alkyl.

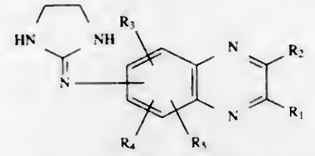
5,552,403

METHODS FOR USING (2-IMIDAZOLIN-2-YLAMINO) QUINOXALINE DERIVATIVES

James A. Burke, Tustin; Michael E. Garst, Newport Beach, and Larry A. Wheeler, Irvine, all of Calif., assignors to Allergan, Irvine, Calif.

Division of Ser. No. 135,716, Oct. 13, 1993, abandoned. This application Oct. 31, 1994, Ser. No. 332,029
Int. Cl.[6] A61K *31/495*
U.S. Cl. 514—249 **17 Claims**

1. A method of treating a mammal comprising administering to a mammal an effective amount to provide a desired therapeutic effect in said mammal of a compound selected from the group consisting of those having the formula



and pharmaceutically acceptable acid addition salts thereof and mixtures thereof, wherein R_1 and R_2 each is independently selected from the group consisting of H, alkyl radicals containing 1 to 4 carbon atoms and alkoxy radicals containing 1 to 4 carbon atoms, the 2-imidazolin-2-ylamino group may be in any of the 5-, 6-, 7- or 8-positions of the quinoxaline nucleus, and R_3, R_4 and R_5 each is located in one of the remaining 5-, 6-, 7- or 8-positions of the quinoxaline nucleus and is independently selected from the group consisting of Cl, Br, H and alkyl radicals containing 1 to 3 carbon atoms, said desired therapeutic effect being the treatment of ischemia.

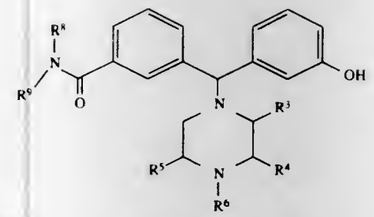
5,552,404

OPIOID COMPOUNDS AND METHODS FOR USING SAME

Kwen-Jen Chang, Chapell Hill; Dulce G. Bubacz, Cary; Ann O. Davis, Raleigh; Robert W. McNutt, Jr., and Michael J. Bishop, both of Durham, all of N.C., assignors to Delta Pharmaceuticals, Inc., Chapel Hill, N.C.

Division of Ser. No. 285,313, Aug. 3, 1994, which is a continuation-in-part of Ser. No. 169,879, Dec. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 98,333, Jul. 30, 1993, abandoned. This application Apr. 28, 1995, Ser. No. 431,377
Int. Cl.[6] A61K *31/495;31/445*
U.S. Cl. 514—255 **20 Claims**

1. A method of evaluating receptor or neurotransmitter function in an animal, or cellular or histological sample therefrom, comprising comparatively binding to receptor loci of said animal or sample, a conjugate pair of agonist/antagonist receptor combinant species comprising as one of said species a compound selected from compounds of the formula:



(I)

wherein:

R^8 and R^9 may be the same or different, and may be hydrogen, C_1–C_6alkyl, C_3–C_6cycloalkyl, C_5–C_{10}aryl, or C_5–C_{10}aryl C_1–C_6alkyl, or R^8 and R^9 together may form a ring of 5 or 6 atoms;

R^3, R^4, R^5=hydrogen or methyl, where the total number of methyl groups is one or two; and

R^6=hydrogen, C_1–C_6alkyl, C_2–C_6methoxyalkyl, or C_3–C_6cycloalkyl,

or a pharmaceutically acceptable ether, ester or salt thereof.

5,552,405

SUBSTITUTED PYRROLIDINE DERIVATIVES AS HIV PROTEASE INHIBITORS

Vida Gorys, Dollard des Ormeaux; François Soucy, Lachenaie; Christiane Yoakim, Laval, and Pierre L. Beaulieu, Montréal, all of, Canada, assignors to Bio-Mega/Boehringer Ingelheim Research, Inc., Laval, Canada

Continuation of Ser. No. 326,442, Oct. 20, 1994, abandoned, which is a continuation of Ser. No. 198,237, Feb. 18, 1994, abandoned, which is a continuation of Ser. No. 25,681, Mar. 3, 1993, abandoned, which is a continuation of Ser. No. 850,596, Mar. 13, 1992, abandoned. This application Jul. 31, 1995, Ser. No. 509,268
Int. Cl.[6] A61K *31/40;* **C07D** *207/09*
U.S. Cl. 514—269 **3 Claims**

1. A compound selected from the group consisting of:

4(S)-Benzyloxy-1-{3(S)-{{N-(benzyloxycarbonyl)valyl}amino}-2(R)-hydroxy-4-phenylbutyl} -N-tert-butylpyrrolidine-2(S)-carboxamide,

4(R)-Benzyloxy-1-{3(S)-{{N-(benzyloxycarbonyl)valyl}amino}-2(R)-hydroxy-4-phenylbutyl} -N-tert-butylpyrrolidine-2(S)-carboxamide,

4(R)-Benzyloxy-1-{3(S)-{{N-(benzyloxycarbonyl)asparaginyl}amino}-2(R)-hydroxy-4-phenylbutyl}-N-tert-butylpyrrolidine-2(S)-carboxamide,

4(S)-Benzyloxy-1-{3(S)-{{N-(benzyloxycarbonyl)asparaginyl}amino}-2(R)-hydroxy-4-phenylbutyl}-N-tert-butylpyrrolidine-2(S)-carboxamide,

4(R)-Benzyloxy-1-{3(S)-{{N-(benzyloxycarbonyl)valyl}amino}-2(R)-hydroxy-4-phenylbutyl} -N-cyclopropylpyrrolidine-2(S)-carboxamide,

4(R)-Benzyl-1-{3(S)-{{N-(benzyloxycarbonyl)asparaginyl}amino}-2(R)-hydroxy-4-phenylbutyl}-N-tert-butylpyrrolidine-2(S)-carboxamide,

4(S)-Benzyl-1-{3(S)-{{N-(benzyloxycarbonyl)asparaginyl}amino}-2(R)-hydroxy-4-phenylbutyl} -N-tert-butylpyrrolidine-2(S)-carboxamide,

N-tert-butyl-1-{2(R)-hydroxy-4-phenyl-3(S)-{{N-(2-quinolinylcarbonyl)valyl}amino} butyl}-4(R)-(2-pyrimidinylthio)pyrrolidine-2(S)-carboxamide,

N-tert-butyl-1-{2(R)-hydroxy-4-phenyl-3(S)-{{N-(2-quinolinylcarbonyl)valyl}amino} butyl}-4(R)-{(3-pyridinylmethyl)thio}pyrrolidine-2(S)-carboxamide,

N-tert-butyl-1-{2(R)-hydroxy-4-phenyl-3(S)-{{N-(2-quinolinylcarbonyl)valyl}amino} butyl}-4(R)-{(2,6-dimethyl-4-pyrimidinyl)oxy}pyrrolidine-2(S)-carboxamide,

N-tert-butyl-1-{3(S)-{{(2,6-dimethylphenoxy)acetyl}amino}-2(R)-hydroxy-4-phenylbutyl} -4(R)-(2-pyrimidinylthio)-pyrrolidine-2(S)-carboxamide, and

(I) N-tert-butyl-1-{3(S)-{{2,6-dimethylphenoxy)acetyl}amino}-2(R)-hydroxy-4-phenylbutyl} -4(R)-{(3-pyridinylmethyl)thio}pyrrolidine-2(S)-carboxamide.

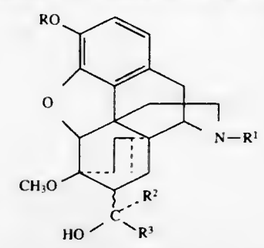
5,552,406

METHOD FOR TREATING PAIN AND BRAIN PERFUSION ABNORMALITIES USING MIXED OPIOID AGONIST-ANTAGONISTS

Jack H. Mendelson, and Nancy K. Mello, both of Rockport, Mass., assignors to The McLean Hospital Corporation, Belmont, Mass.

Filed Jun. 17, 1994, Ser. No. 261,770
Int. Cl.[6] A61K *31/56;* **C07D** *489/12*
U.S. Cl. 514—279 **7 Claims**

1. A method for treating pain and treating or preventing brain perfusion abnormalities in an animal which is at risk for brain perfusion abnormalities comprising administering to said animal an effective amount of a compound having the formula:



or a non-toxic pharmaceutically-acceptable salt thereof, wherein:

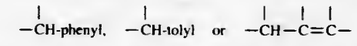
the 6,14 bridge-head carbons are bridged by an ethano or etheno group,

R is hydrogen or methyl,

R^1 is hydrogen, alkyl, alkenyl or alkynyl of up to 8 carbon atoms or cycloalkyl methyl of 4–6 carbon atoms,

R^2 is hydrogen, alkyl or alkenyl of up to 3 carbon atoms, phenyl or tolyl, and

R^3 is cycloalkyl of 5–7 carbon atoms, alkyl or alkenyl of up to 8 carbon atoms or alkyl or alkenyl of up to 8 carbon atoms substituted on one of the carbon atoms numbered 1–4 (the carbon atom numbered 1 being adjacent to the carbon atom bearing the alcoholic hydroxy group) by cycloalkyl of 5–7 carbon atoms, phenyl, tolyl, alkoxy of 1–3 carbon atoms, phenoxy or tetrahydrofuryl, provided that in the case where R is hydrogen, R^2 and R^3 do not contain the system



attached directly to the carbon atom bearing the alcoholic hydroxy group.

5,552,407

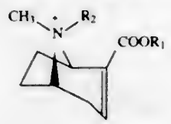
ANHYDROECGONINE COMPOUNDS AND THEIR USE AS ANTICHOLINERGIC AGENTS

Ronald W. Wood, Nyack; Hassan A. N. El-Fawal, Middletown; John F. Graefe, Greenwood Lake, all of N.Y.; Lung C. Chen, Upper Saddle River, N.J., and Jalil Shojaie, Tuxedo, N.Y., assignors to New York University Medical Center, New York, N.Y.

Filed Jun. 11, 1993, Ser. No. 76,315
Int. Cl.[6] A61K *31/44;* **C07D** *213/20*
U.S. Cl. 514—291 **31 Claims**

1. A composition useful for preventing or inhibiting bronchoconstriction in a subject comprising a compound which is a deriva-

tive or analogue of anhydroecgonine methylester having anticholinergic activity which compound has the formula:



wherein R_2 is H, C_1–C_{10} alkyl or an amidine; and
wherein R_1 is C_1–C_{10} alkyl or aryl substituted C_1–C_{10} alkyl;
with the proviso that,
when R_1 is methyl, R_2 is not H or C_1 alkyl; and
when R_2 is H, R_1 is not C_2 alkyl.

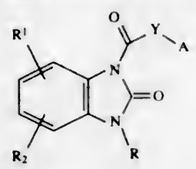
5,552,408

BENZIMIDAZOLINE-2-OXO-1-CARBOXYLIC ACID DERIVATIVES USEFUL AS 5-HT RECEPTOR ANTAGONISTS

Marco Turconi, Voghera PV; Arturo Donetti, Milano; Ernesto Montagna, San Guiliano Milanese MI; Massimo Nicola, Pavia PV; Annamaria Uberti, Milano MI; Rosamaria Micheletti, Milano MI, and Antonio Giachetti, Milano MI, all of, Italy, assignors to Boehringer Ingelheim Italia S.p.A., Florence, Italy

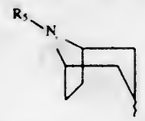
Continuation of Ser. No. 267,682, Jun. 28, 1994, abandoned, which is a division of Ser. No. 33,675, Mar. 16, 1993, Pat. No. 5,358,954, which is a division of Ser. No. 845,891, Mar. 14, 1992, Pat. No. 5,223,511, which is a continuation-in-part of Ser. No. 768,497, Sep. 30, 1991, abandoned, which is a continuation of Ser. No. 552,353, Jul. 12, 1990, abandoned, which is a continuation of Ser. No. 243,949, Sep. 13, 1988, abandoned. This application May 1, 1994, Ser. No. 432,338
Claims priority, application Italy, Sep. 23, 1987, 21997A/87
Int. Cl.[6] C07D *451/12;* **A61K** *31/46*
U.S. Cl. 514—304 **7 Claims**

1. A method for treating a human host suffering from psychosis, which method comprises administering to such host a therapeutically effective amount of a compound of the formula I



(I)

wherein,
R is hydrogen, C_{1-6} alkyl, C_{2-6} alkenyl, or C_{2-6} alkynyl;
R_1 is hydrogen;
R_2 is hydrogen, halogen, or C_{1-6} alkoxy;
Y is oxygen or N-R_3, in which R_3 is hydrogen; and,
A is a group of the formula



wherein R_5 is hydrogen, C_{1-6} alkyl, or a group of the formula —CR_6=N—R_7 in which R_6 is hydrogen, C_{1-4} alkyl or amino and R_7 is hydrogen or C_{1-6} alkyl;
or a pharmaceutically acceptable acid addition salt thereof.

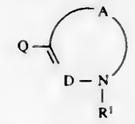
5,552,409

DIHYDROPYRIDAZINONES, PYRIDAZINONES AND RELATED COMPOUNDS AS FUNGICIDES

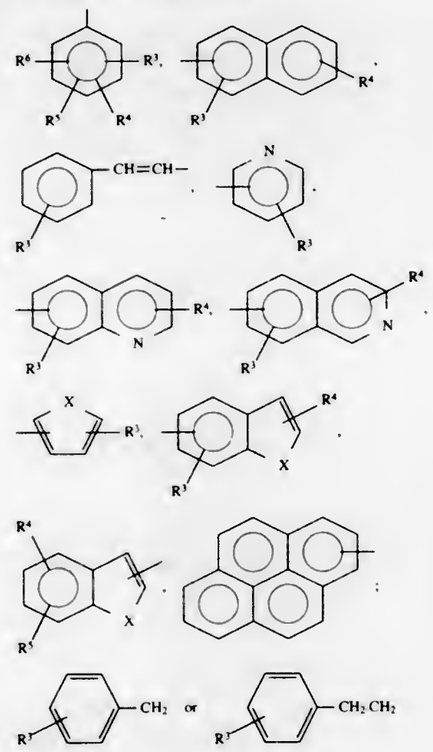
Enrique L. Michelotti; Anne R. Egan, both of Fort Washington; Ronald Ross, Jr., Jamison, and Willie J. Wilson, Chalfont, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 749,576, Aug. 28, 1991, abandoned, which is a continuation-in-part of Ser. No. 586,633, Sep. 21, 1990, abandoned. This application Mar. 31, 1994, Ser. No. 221,229
Int. Cl.[6] C07D *285/13;231/20;* **A61K** *31/415;31/425*
U.S. Cl. 514—307 **1 Claim**

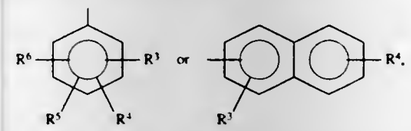
1. A method for controlling phytopathogenic fungus which comprises applying to the fungus or its habitat a fungicidally-effective amount of the formula



wherein when the compound is a five member ring
A is —CHR^7—Z—, or S—Z—;
D is nitrogen
Q is an aromatic group selected from



X is oxygen (O) or sulfur (S);
Z is carbonyl (C=O) or thiocarbonyl (C=S);
R^1 is alkyl, hydroxyalkyl, cyanoalkyl, hydrazidal, phenylcarbonyl, alkenyl, haloalkenyl, alkynylalkenyl, alkynyl, haloalkynyl, dialkynyl, cydoalkylalkynyl, alkenylalkynyl, hydroxyalkynyl, alkoxyalkynyl, alkanoyloxyalkynyl, formylalkynyl, trialkyisilylalkynyl, trialkyllinalkynyl, haloalkenylalkynyl, carboxyalkynyl, or alkoxycarbonylalkynyl;
R^3 and R^6 are each independently hydrogen, alkoxy or halo;
R^4 is hydrogen, halo, alkoxy or nitro;
R^5 is hydrogen, halo, nitro, alkyl alkoxy, alkylthio, haloalkyl, haloalkoxy, haloalkylthio, phenyl, phenoxy or cyano;
R^7 is hydrogen, (C_1–C_3)alkyl, phenyl, cyano, halo, alkynyl, alkynylalkenyl, dialkynyl, haloalkynyl or alkenylalkynyl;
R^8 is hydrogen, (C_1–C_3)alkyl, phenyl, cyano or halo;
provided when Q is phenyl, D is nitrogen, A is —CHR^7—Z— wherein Z is C=O and R^7 is hydrogen, (C_1–C_3)alkyl or phenyl and R^1 is phenylalkyl or heterocyclylalkyl, the alkyl portion of the R^1 moiety must be a straight chain; when Q is



R^1 is alkyl, A is —CHR^7—Z— and Z is C=O, R^3, R^4, R^5, R^6, and R^7 cannot all be hydrogen; and when A is S—Z—, R^1 cannot be haloalkynyl;
and agronomically acceptable salts thereof.

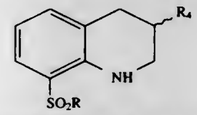
5,552,410

1,2,3,4,-TETRAHYDROQUINOLINE-8-SULPHONIC ACID CHLORIDES AND ACIDS, THEIR PREPARATION AND THEIR USE AS SYNTHETIC INTERMEDIATES

Daniel Galtier, Guyancourt, and Gilbert Lassalle, Clamart, both of, France, assignors to Synthelabo, Le Plessis Robinson, France

Filed Sep. 14, 1994, Ser. No. 305,664
Claims priority, application France, Sep. 14, 1993, 93 10905
Int. Cl.[6] C07D *215/36;* **A61K** *31/47*
U.S. Cl. 514—311 **9 Claims**

1. An optically pure compound of the formula:



(I)

in which R represents a chlorine atom or a hydroxyl group and R_4 represents a (C_1–C_4)alkyl group.

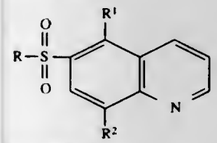
5,552,411

SULFONYLQUINOLINES AS CENTRAL NERVOUS SYSTEM AND CARDIOVASCULAR AGENTS

Dennis M. Downing, and Jonathan L. Wright, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 26, 1995, Ser. No. 452,047
Int. Cl.[6] A61K *31/47;* **C07D** *215/36*
U.S. Cl. 514—312 **10 Claims**

1. A compound of Formula I

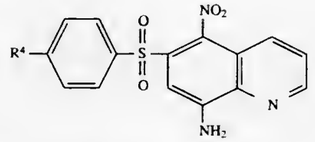


I

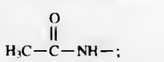
wherein R is aryl, or
R^1 is —NO_2,
—CN,
—CO_2 R^3 wherein R^3 is H alkyl, or aryl,
—SO_2R^3 wherein R^3 is as defined above

wherein R^3 is as defined above,
or

wherein R^3 is as defined above;
R^2 is —NH_2,
—OH, or
—SH; with the exclusion of



wherein R^4 is —NH_2 or



or a pharmaceutically acceptable salt thereof.

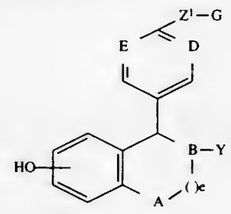
5,552,412

5-SUBSTITUED-6-CYCLIC-5,6,7,8-TETRAHYDRONAPHTHALEN2-OL COMPOUNDS WHICH ARE USEFUL FOR TREATING OSTEOPOROSIS

Kimberly O. Cameron; Paul A. Dasilva Jardine, and Robert L. Rosati, all of Groton, Conn., assignors to Pfizer Inc, New York, N.Y.

Filed Jan. 9, 1995, Ser. No. 369,954
Int. Cl.[6] C07D *211/06;* **A61K** *31/445;31/46;31/40*
U.S. Cl. 514—317 **11 Claims**

1. A compound of the formula:



I

wherein:
A is CH_2;
B, D and E are CH;
Y is
(a) phenyl, optionally substituted with 1–3 substituents independently selected from R^4;
(b) naphthyl, optionally substituted with 1–3 substituents independently selected from R^4;
(c) C_3–C_8 cycloalkyl, optionally substituted with 1–2 substituents independently selected from R_4;
(d) C_3–C_8 cycloalkenyl, optionally substituted with 1–2 substituents independently selected from R^4;

(e) a five membered heterocycle containing up to two heteroa-

R^5 and R^6 are independently C_1–C_6 alkyl or together form a

5,552,414

aryl is phenyl or

(e) a five membered heterocycle containing up to two heteroatoms selected from the group consisting of -O-, -NR^2- and -$S(O)_n$-, optionally substituted with 1–3 substituents independently selected from R^4;

(f) a six membered heterocycle containing up to two heteroatoms selected from the group consisting of -O-, -NR^2- and -$S(O)_n$- optionally substituted with 1–3 substituents independently selected from R^4; or

(g) a bicyclic ring system consisting of a five or six membered heterocyclic ring fused to a phenyl ring, said heterocyclic ring containing up to two heteroatoms selected from the group consisting of -O-, -NR^2-, NR^2- and -$S(O)_n$-, optionally substituted with 1–3 substituents independently selected from R^4.

Z^1 is

(a) -$O(CH_2)_p$ CR^5R^6-;

(b) -$O(CH_2)_pW(CH_2)_q$-; or

(c) -$OCHR^2CHR^3$-;

G is -NR^7R^8;

W is

(a) -CH_2-;

(b) -CH=CH-;

(c) -O-;

(d) -NR^2-;

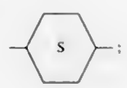
(e) -$S(O)_n$-;

(g) -$CR^2(OH)$-;

(h) -$CONR^2$-;

(i) -NR^2CO-;

(j)



or

(k) -C=C-;

R^2 and R^3 are independently

(a) hydrogen; or

(b) C_1–C_4 alkyl;

R^4 is

(a) hydrogen;

(b) halogen;

(c) C_1–C_6 alkyl;

(d) C_1–C_4 alkoxy;

(e) C_1–C_4 acyloxy;

(f) C_1–C_4 alkylthio;

(g) C_1–C_4 alkylsulfinyl;

(h) C_1–C_4 alkylsulfonyl;

(i) hydroxy (C_1–C_4)alkyl;

(j) aryl (C_1–C_4)alkyl;

(k) -CO_2H;

(l) -CN;

(m) -CONHOR;

(n) -SO_2NHR;

(o) -NH_2;

(p) C_1–C_4 alkylamino;

(q) C_1–C_4 dialkylamino;

(r) -$NHSO_2R$;

(s) -NO_2;

(t) -aryl; or

(u) -OH.

R^5 and R^6 are independently C_1–C_8 alkyl or together form a C_3–C_{10} carbocyclic ring;

R^7 and R^8 in ring form may optionally be substituted with up to three substituents independently selected from C_1–C_6 alkyl, halogen, alkoxy, hydroxy and carboxy;

a ring formed by R^7 and R^8 may be optionally fused to a phenyl ring;

e is 1 or 2;

p is 0, 1, 2 or 3;

q is 0, 1, 2 or 3;

and optical and geometric isomers thereof; and nontoxic pharmacologically acceptable acid addition salts, N-oxides, esters, and quaternary ammonium salts thereof.

5,552,413

METHODS FOR INHIBITING HYPERPROLIFERATION OF KERNTINOCYTES

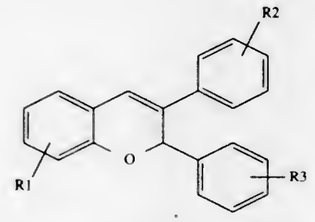
Virender M. Labroo, Mill Creek, and James R. Piggott, Bothell, both of Wash., assignors to ZymoGenetics, Inc., Seattle, Wash.

Division of Ser. No. 175,840, Dec. 30, 1993, Pat. No. 5,416,098. This application Feb. 21, 1995, Ser. No. 391,760

Int. Cl.[6] A61K *31/395;31/55;31/445;31/40*

U.S. Cl. 514—320 **12 Claims**

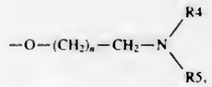
1. A method for inhibiting hyperproliferation of keratinocytes in a patient in need thereof comprising administering to said patient a compound of the formula



or a pharmaceutically acceptable salt thereof, wherein:

each of R1 and R2 is individually H, OH, linear or branched chain C_1–C_{17} alkoxy, linear or branched chain C_2–C_{18} acyloxy, or linear or branched chain C_2–C_{18} alkoxycarbonyl; and

R3 is



wherein each of R4 and R5 is individually a linear or branched chain alkyl radical of from one to 18 carbon atoms, or together with N, R4 and R5 form a three- to 10-membered ring, and n is an integer from 1 to 6,

in combination with a pharmaceutically acceptable carrier.

5,552,414

1-(1H-INDOLYLOXYALKYL)-4-(HETEROARYL) PIPERIDINES AND RELATED COMPOUNDS USEFUL AS ANTIPSYCHOTICS AND ANALGESICS

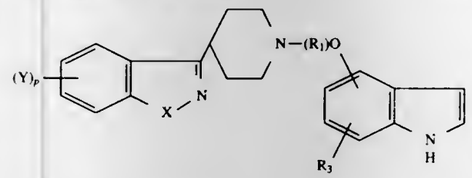
Joseph T. Strupczewksi, Flemington, N.J., and Kenneth J. Bordeau, Kintnersville, Pa., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 329,000, Oct. 25, 1994, which is a continuation-in-part of Ser. No. 144,265, Oct. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 969,383, Oct. 30, 1992, Pat. No. 5,364,866, which is a continuation-in-part of Ser. No. 788,269, Nov. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 944,705, Sep. 5, 1991, abandoned, which is a continuation of Ser. No. 619,825, Nov. 29, 1990, abandoned, which is a continuation of Ser. No. 456,790, Dec. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 354,411, May 19, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 466,246

Int. Cl.[6] A61K *31/445;* **C07D** *401/14;413/14;417/14*

U.S. Cl. 514—322 **16 Claims**

1. A compound of the formula



wherein,

X is -O-, -S-, -NH-, or -$N(R_2)$-;

R_2 is selected from the group consisting of lower alkyl, aryl lower alkyl, aryl, cycloalkyl, aroyl, alkanoyl, alkoxycarbonyl, and phenysulfonyl groups;

aryl is as defined hereinafter;

p is 1 or 2;

Y is hydrogen, lower alkyl, hydroxy, chlorine, fluorine, bromine, iodine, lower alkoxy, trifluoromethyl, nitro, or amino;

R_1 is -$CR_{24}R_{27}$-$(CR_{23}R_{24})_n$-$CR_{24}R_{27}$- where n is 0, 1, 2, or 3; or

-CHR_{24}-CH=CH-CHR_{24}-,

-CHR_{24}-C≡C-CHR_{24}-,

-CHR_{24}-CH=CH-$CR_{23}R_{24}$-CHR_{24}-,

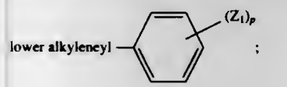
-CHR_{24}-$CR_{23}R_{24}$-CH=CH-CHR_{24}-,

-CHR_{24}-C≡C-$CR_{23}R_{24}$-CHR_{24}- , or

-CHR_{24}-$CR_{23}R_{24}$-C≡C-CHR_{24}-,

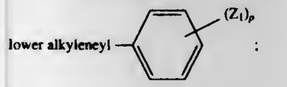
the -CH=CH- bond being cis or trans;

R_{23} is hydrogen, (C_1–C_{18}) linear alkyl, phenyl, hydroxy, (C_1–C_{18})alkoxy, aryloxy, aryl(C_1–C_{18})alkyloxy, (C_1–C_{18})alkanoyloxy, hydroxy(C_1–C_6)alkyl, (C_1–C_{18})alkoxy(C_1–C_6)alkyl, phenyl(C_1–C_6)alkoxy, aryl(C_1–C_{18})alkyloxy(C_1–C_6)alkyl, or (C_1–C_{18})alkanoyloxy(C_1–C_6)alkyl or



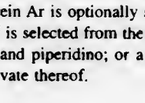
where Z_1 is lower alkyl, -OH, lower alkoxy, -CF_3, -NO_2, -NH_2, or halogen, and p is as previously defined; and

R_{24} is hydrogen, (C_1–C_{18}) linear alkyl, phenyl, hydroxy (C_1–C_6)alkyl, (C_1–C_{18})alkoxy(C_1–C_6)alkyl, phenyl(C_1–C_6)alkyloxy, aryl(C_1–C_{18})alkyloxy(C_1–C_6)alkyl, or (C_1–C_{18})alkanoyloxy(C_1–C_6)alkyl, or



where Z_1 is as previously defined, and p is as previously defined;

aryl is phenyl or



where R_5 is hydrogen, lower alkoxy, hydroxy, chlorine, fluorine, bromine, iodine, lower monoalkylamino, lower dialkylamino, nitro, cyano, trifluoromethyl, or trifluoromethoxy;

R_{27} is hydrogen or R_{24} and R_{27} taken together with the carbon to which they are attached form C=O or C=S; and

R_3 is hydrogen or -OCH_3;

and, any hydroxyl group attached to an aliphatic or aromatic carbon atom, or any primary or secondary nitrogen atom may be acylated with a (C_4–C_{18})carboxylic group, in addition, any nitrogen atom may alternatively be acylated with a (C_4–C_{18})alkoxycarbonyl group;

all geometric, optical, and stereoisomers thereof,

or a pharmaceutically acceptable acid addition salt thereof.

5,552,415

METHOD OF INHIBITING ALZHEIMER'S DISEASE

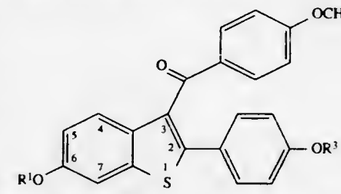
Patrick C. May, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 21, 1993, Ser. No. 171,387

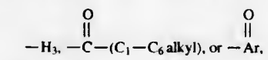
Int. Cl.[6] A61K *31/445;31/38*

U.S. Cl. 514—324 **4 Claims**

1. A method of increasing TGF-β expression in the brain comprising administering to a human in need thereof an effective amount of a compound of Formula I



wherein R^1 and R^3 are independently hydrogen,



wherein Ar is optionally substituted phenyl;

R^2 is selected from the group consisting of hexamethylenemino, and piperidino; or a pharmaceutically acceptable salt of solvate thereof.

5,552,416

METHODS OF INHIBITING DYSFUNCTIONAL UTERINE BLEEDING

Patrick Keohane, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 171,391, Dec. 21, 1993, Pat. No. 5,446,053. This application Apr. 14, 1995, Ser. No. 422,388

Int. Cl.[6] A61K *31/445;31/40;31/38*

U.S. Cl. 514—324 **3 Claims**

1. A method of inhibiting dysfunctional uterine bleeding comprising prophylactically administering to a human in need thereof an effective amount of a compound having the formula

5,552,418

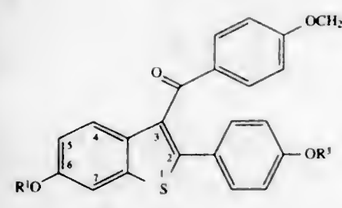
TRISUBSTITUTED NAPHTHYLALKYLAMIDES

5,552,419

ARYLSULFONAMIDO-SUBSTITUTED HYDROXAMIC

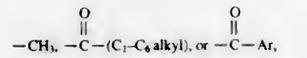
5,552,420

THERAPEUTIC PHENOXYALKYLAZOLES AND



(I)

wherein R^1 and R^3 are independently hydrogen,



wherein Ar is optionally substituted phenyl;

R^2 is selected from the group consisting of pyrrolidine, hexamethylenemino, and piperidino; or a pharmaceutically acceptable salt of solvate thereof.

5,552,417

METHODS OF INHIBITING SEXUAL PRECOCITY

Jeffrey A. Dodge, Indianopolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

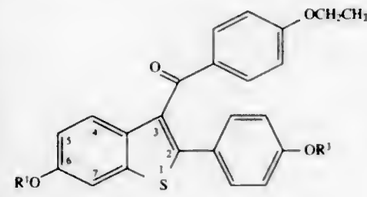
Continuation of Ser. No. 171,393, Dec. 21, 1993, Pat. No. 5,451,590. This application May 17, 1995, Ser. No. 442,707

Int. Cl.[6] **A61K** *31/445;31/40;31/38*

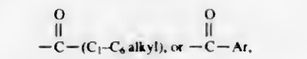
U.S. Cl. 514—324 **5 Claims**

1. A method of inhibiting sexual precocity comprising prophylactically administering to a human in need thereof an effective amount of a compound having the formula

(I)



wherein R^1 and R^3 are independently hydrogen, $-CH_3$,



wherein Ar is optionally substituted phenyl;

R^2 is selected from the group consisting of pyrrolidine, hexamthylenemino, and piperidino; or a pharmaceutically acceptable salt of solvate thereof.

5,552,418

TRISUBSTITUTED NAPHTHYLALKYLAMIDES

Patrick Depreux, Armentieres; Hamid A. Mansour, Roubaix; Daniel Lesieur, Gondecourt; François Lefoulon, Orleans; Pierre Renard, Versailles; Gúrard Adam, Le Mesnil Le Roi, and Philippe Delagrange, Issy Les Moulineaux, all of, France, assignors to Adir Et Compagnie, Courbevoie, France

Division of Ser. No. 349,914, Dec. 6, 1994. This application May 23, 1995, Ser. No. 447,886

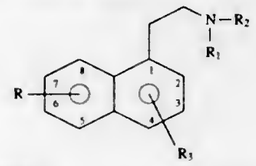
Claims priority, application France, Dec. 7, 1993, 93.14630

Int. Cl.[6] **A61K** *31/44;* **C07D** *213/16;213/26;213/63*

U.S. Cl. 514—348 **4 Claims**

1. A compound selected from those of formula (I):

(I)



in which:

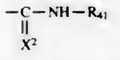
R represents hydrogen or a radical chosen from alkyl, substituted alkyl and —O—R'; with R' representing hydrogen or a radical selected from alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, cycloalkylalkyl, substituted cycloalkylalkyl, phenyl, substituted phenyl, phenylalkyl, substituted phenylalkyl, diphenylalkyl and substituted diphenylalkyl;

R_1 represents hydrogen or alkyl;

R_2 means a)

in which X^1 represents sulfur or oxygen and R_{40} represents hydrogen or a radical chosen from alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, cycloalkylalkyl, substituted cycloalkylalkyl, alkenyl, substituted alkenyl, alkynyl and substituted alkynyl;

or b)



in which X^2 represents sulfur or oxygen and R_{41} represents hydrogen or a radical chosen from alkyl, cycloalkyl and cycloalkylalkyl;

R_3 represents a radical chosen from:

R_5-alkyl-, with R_5 being substituted or unsubstituted and representing pyridyl,

R_6—CO—O—,

and R_6—CO—,

with R_6 representing a radical chosen from R_5- and R_5-alkyl- where R_5, being unsubstituted or substituted, is as defined above,

the terms "alkyl" and "alkoxy" inclusively denoting, except where otherwise mentioned, linear or branched groups of 1 to 6 carbon atoms,

the terms "alkenyl" and "alkynyl" inclusively denoting unsaturated, linear or branched groups of 2 to 6 carbon atoms,

the term "cycloalkyl" inclusively denoting a cyclic group of 3 to 8 carbon atoms,

the term "substituted" applied to "alkyl", "alkoxy", "alkenyl", "alkynyl", "cycloalkyl" or "cycloalkylalkyl" means that these groups are substituted with one or more radicals chosen from alkyl, alkoxy and halogen;

the term "substituted" associated with R_5 and with "phenyl", "phenylalkyl" or "diphenylalkyl" means that these groups are substituted with one or more radicals chosen from alkyl, alkoxy, halogen, hydroxyl and trifluoromethyl;

their enantiomers and diastereoisomers,

and their addition salts with a pharmaceutically-acceptable acid or base.

5,552,419

ARYLSULFONAMIDO-SUBSTITUTED HYDROXAMIC ACIDS

Lawrence J. MacPherson, Hampton, and David T. Parker, Livingston, both of N.J., assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 265,296, Jun. 24, 1994, which is a continuation-in-part of Ser. No. 1,136, Jan. 6, 1993, Pat. No. 5,455,258. This application Nov. 3, 1994, Ser. No. 333,676

Claims priority, application New Zealand, Dec. 20, 1993, 250517

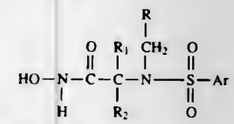
The portion of the term of this patent subsequent to Oct. 3, 2015, has been disclaimed.

Int. Cl.[6] **C07D** *213/42;* **A61K** *31/44*

U.S. Cl. 514—357 **17 Claims**

1. A compound of formula I

(I)



wherein

Ar is carbocyclic or heterocyclic aryl;

R is hydrogen, lower alkyl, carbocyclic aryl-lower alkyl, carbocyclic aryl, heterocyclic aryl, biaryl, biaryl-lower alkyl, heterocyclic aryl-lower alkyl, mono- or poly-halo-lower alkyl, C_3-C_7-cycloalkyl, C_3-C_7-cycloalkyl-lower alkyl, (oxa or thia)-C_3-C_6-cycloalkyl, (oxa or thia)-C_3-C_6-cycloalkyl]-lower alkyl, hydroxy-lower alkyl, acyloxy-lower alkyl, lower alkoxy-lower alkyl, lower alkyl-(thio, sulfinyl or sulfonyl)-lower alkyl, (amino, mono- or di-lower alkylamino)-lower alkyl, acylamino-lower alkyl, (N-lower alkyl-piperazino or N-carbocyclic or heterocyclic aryl-lower alkylpiperazino)-lower alkyl, or (morpholino, thiomorpholino, piperidino, pyrrolidino, piperidyl or N-lower alkylpiperidyl)-lower alkyl;

R_1 is hydrogen, lower alkyl, carbocyclic aryl-lower alkyl, carbocyclic aryl, heterocyclic aryl, biaryl, biaryl-lower alkyl, heterocyclic aryl-lower alkyl, mono- or poly-halo-lower alkyl, C_3-C_{10}-cycloalkyl, C_3-C_7-cycloalkyl-lower alkyl, hydroxy-lower alkyl, acyloxy-lower alkyl, lower alkoxy-lower alkyl, (carbocyclic or heterocyclic aryl)-lower alkoxy-lower alkyl, lower alkyl-(thio, sulfinyl or sulfonyl)-lower alkyl, (amino, mono- or di-lower alkylamino)-lower alkyl, (N-lower alkyl-piperazino or N-carbocyclic or heterocyclic aryl-lower alkylpiperazino)-lower alkyl, (morpholino, thiomorpholino, piperidino, pyrrolidino, piperidyl, N-acyl or N-lower alkylpiperidyl)-lower alkyl, acylamino-lower alkyl, piperidyl, (morpholino, thiomorpholino, piperidino, pyrrolidino, piperidyl, N-acyl or N-lower alkylpiperidyl)-(hydroxy or lower alkoxy) lower alkyl, pyrrolidinyl, hexahydroazepinyl, N-lower alkyl or N-acyl(hexahydroazepinyl, piperidyl or pyrrolidinyl), C_5-C_{10}-oxacycloalkyl, C_5-C_{10}-thiacycloalkyl, (hydroxy-or oxo-) C_5-C_{10}-cycloalkyl, (hydroxy- or oxo-) C_5-C_{10}-thiacycloalkyl, (hydroxy- or oxo-) C_5-C_{10}-oxacycloalkyl, (amino, mono- or dialkylamino or acylamino)-C_5-C_{10}-cycloalkyl, 2-oxo(pyrrolidinyl, piperidyl or hexahydroazepinyl); (carbocyclic or heterocyclic aryl)-(thio, sulfinyl or sulfonyl)-lower alkyl;

R_2 is hydrogen or lower alkyl;

or a pharmaceutically acceptable prodrug derivative thereof; or a pharmaceutically acceptable salt thereof.

5,552,420

THERAPEUTIC PHENOXYALKYLAZOLES AND PHENOXYALKYLAZINES

David J. Aldous, Glenmore; Thomas R. Bailey, Phoenixville; Guy D. Diana; Theodore J. Nitz, both of Pottstown, all of Pa., and Gee-Hong Kuo, Belle Mead, N.J., assignors to Sterling Winthrop Inc., New York, N.Y.

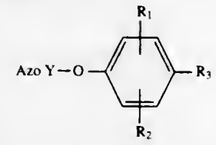
Filed May 13, 1994, Ser. No. 242,752

Int. Cl.[6] **C07D** *413/12;* **A61K** *31/41*

U.S. Cl. 514—364 **13 Claims**

1. A compound of formula:

Formula I



wherein

Azo is oxadiazolyl optionally substituted with a member of the group consisting of alkyl, alkylthio, alkoxy, hydroxy, halo, cyano, nitro, hydroxyalkyl, alkoxyalkyl, alkoxycarbonyl, alkanoyl, fluoroalkyl or the N-oxide of any of the preceding;

Y is an alkylene bridge of 3–9 carbon atoms;

R_1 and R_2 are each individually chosen from hydrogen, halo, alkyl, alkenyl, amino, alkylthio, hydroxy, hydroxyalkyl, alkoxyalkyl, alkylthioalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, alkoxy, nitro, carboxy, alkoxycarbonyl, dialkylaminoalkyl, alkylaminoalkyl, aminoalkyl, difluoromethyl, trifluoromethyl or cyano;

R_3 is alkoxycarbonyl, phenyl, alkyltetrazolyl, or a heterocycle chosen from benzoxazolyl, benzathiazolyl, thiadiazolyl, imidazolyl, dihydroimidazolyl, oxazolyl, thiazolyl, oxadiazolyl, pyrazolyl, isoxazolyl, isothiazolyl, furyl, triazolyl, thiophenyl, pyridyl, pyrimidinyl, pyrazinyl, pyridazinyl or of substituted phenyl or substituted heterocyclyl wherein the substitution is with alkyl, alkoxyalkyl, cycloalkyl, haloalkyl, hydroxyalkyl, alkoxy, hydroxy, furyl, thienyl or fluoroalkyl; the N-oxide thereof; or a pharmaceutically acceptable acid addition salt thereof.

5,552,421

LEUKOTRIENE BIOSYNTHESIS INHIBITORS

Edward S. Lazer, Trumbull; Julian Adams, Ridgefield; Clara K. Miao, Trumbull, all of Conn., and Peter Farina, North Salem, N.Y., assignors to Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, Conn.

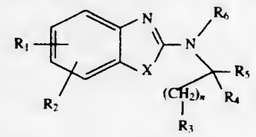
Continuation of Ser. No. 168,591, Dec. 16, 1993, abandoned, which is a division of Ser. No. 937,315, Sep. 4, 1992, Pat. No. 5,296,486, which is a continuation of Ser. No. 764,591, Sep. 24, 1991, abandoned. This application Apr. 6, 1995, Ser. No. 417,547

Int. Cl.[6] **A61K** *31/42;31/425;* **C07D** *277/82;263/48*

U.S. Cl. 514—367 **6 Claims**

1. A compound having the following formula:

Formula I



wherein

X is O or S;

R_1 and R_2 are each, independent of one another, hydrogen; C_1-C_6 alkyl; balo; CF_3; nitrile; C_1-C_6 alkoxy; $—CO_2R_7$ wherein R_7 is hydrogen or C_1-C_6 alkyl; $—C(O)NR_8R_9$ wherein R_8 and R_9 are hydrogen, C_1-C_3 alkyl or methoxy; $—NO_2$; $—NR_{10}R_{11}$ wherein R_{10} and R_{11} are hydrogen or C_1-C_6 alkyl; $—C(O)R_{12}$ wherein R_{12} is C_1-C_6 alkyl;

$—SO_2R_{12}$; $—NHC(O)R_{12}$; $—NHSO_2R_{12}$; or $—SO_2NR_{13}R_{14}$

(c) —C(OH)=CH—C=,

5,552,423

5,552,425

—SO_2R_{12}; —$NHC(O)R_{12}$; —$NHSO_2R_{12}$; or —$SO_2NR_{13}R_{14}$ wherein R_{13} and R_{14} are hydrogen or C_1-C_6 alkyl;

R_3 is cyclohexyl or an optionally substituted phenyl ring wherein the substituents are selected from halo, CF_3, C_1-C_4 alkyl and C_1-C_4 alkoxy; —S_2R_{12}; $NHC(O)R_{12}$; —$NHSO_2$-R_{12}; —$SO_2NR_{13}R_{14}$ or NO_2; or R_3 may be a pyrrolidine ring, an imidazole ring optionally substituted on nitrogen with C_1-C_4 alkyl, a 2-thiazole ring or a 2-methyl-4-thiazole ring; R_3 may also be a dialkylamine (C_1-C_4) or an alkyl ether (C_1-C_4);

R_4 is an ester —CO_2R_{16} wherein R_{16} is C_1-C_4 alkyl; or an amide of structure —$C(O)NR_{17}R_{18}$ wherein R_{17} and R_{18} are hydrogen, C_1-C_3 alkyl, or methoxy, or together with N form a pyrrolidine ring; an optionally substituted phenyl ring wherein the substituents are selected from halo, C_1-C_4 alkyl and C_1-C_4 alkoxy; a 3-methyl-1,2,4-oxadiazol-5-yl group; a 2- or 3-thienyl group; a 2-imidazole group optionally substituted on N with a methyl group; a 2-thiazole group optionally substituted on the 4-position with a methyl; a ketone $C(O)R_{19}$ wherein R_{19} is C_1-C_3 alkyl, phenyl or 1-methylimidazol-2-yl; an ether —CH_2OR_{20} where R_{20} is C_1-C_3 alkyl, a thioether, —CH_2SR_{20}; a sulfone, —$CH_2SO_2CH_3$; an amine, —$CH_2N(R_{20})_2$; an amine derivative, —$CH_2NHC(O)R_{21}$, where R_{21} is CH_3 or $NHCH_3$, —$CH_2NHSO_2Me_2$; or a carbamate, —$CH_2OC(O)NHMe$;

R_5 and R_6 are independently of each other hydrogen or methyl; and

n is an integer 0, 1 or 2,

in racemic form, or the pure or substantially pure enantiomer thereof with the provisos that the following combination of substituents do not occur simultaneously: (i) R_3 or R_2 are hydrogen, halo, C_1C_4 alkyl, C_1-C_4 alkoxy, —CN, —NO_2 or —CF_3; R_3 is an unsubstituted phenyl; and R_4 is —$C(O)OR_{16}$. R_{16} is alkyl, —$C(O)NR_{17}R_{18}$ wherein R_{17} and R_{18} are hydrogen, methoxy, or together with N form a pyrrolidine ring;

or (ii) R_4 is $C(O)OCH_3$, R_3 and R_2 are both hydrogen, and R_3 is unsubstituted phenyl or a 4-imidazole group.

5,552,422

ARYL SUBSTITUTED 5,5 FUSED AROMATIC NITROGEN COMPOUNDS AS ANTI-INFLAMMATORY AGENTS

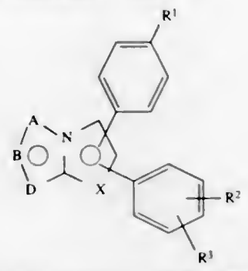
Jacques Y. Gauthier, Laval; Cheuk K. Lau, Ile Bizard; Yves LeBlanc, Kirkland; Chun-Sing Li, Dollard des Ormeaux; Patrick Roy, Dollard des Ormeaux; Michel Therien, Laval, and Zhaoyin Wang, Pierrefonds, all of, Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

Filed Jan. 11, 1995, Ser. No. 371,179

Int. Cl.[6] **C07D** *487/04;* **A61K** *31/435*

U.S. Cl. 514—368 **21 Claims**

1. A compound of Formula I



I

or a pharmaceutically acceptable salt thereof wherein:

—A—B—D— is selected from the group consisting of:

(a) —CH=CH—CH=,

(b) —CH=CH—C(OH)=,

(c) —C(OH)=CH—C=,

(d) —N=CH—CH=,

(e) —N=N—CH=,

(f) —N=N—NH—,

(g) —N=N—N=,

(h) —N=CH—NH—,

(i) —N=CH—N=,

(j) —CH=N—NH—,

(k) —CH=N—N=,

(l) —CH=N—CH=,

(m) —CH=CH—NH—,

(n) —CH=CH—N=,

(o) —S—CH=CH—,

(p) —O—CH=CH—,

(q) —CH=CH—O—,

(r) —CH=CH—S—,

(s) —CH=N—S—,

(t) —CH=N—O—,

(u) —N—CH—S—,

(v) —N=CH—O—,

(w) —S—CH=N—,

(x) —O—CH=N—,

(y) —N=N—S—,

(z) —N=N—O—,

(aa) —S—N=N—,

(bb) —O—N=N—and

(cc) —C(OH)=CH—S—;

wherein definitions (a) through (cc) of —A—B—D— is mono- or di-substituted, the substituents being independently selected from the group consisting of:

(1) hydrogen.

(2) CF_3,

(3) CN,

(4) halo, including F, Cl, Br, I,

(5) C_{1-6}alkyl,

X is N, NR^4O, or S;

R^1 is selected from the group consisting of:

(a) $S(O)_2CH_3$,

(b) $S(O)_2NH_2$,

(c) $S(O)_2NHCOCF_3$,

(d) $S(O)(NH)CH_3$,

(e) $S(O)(NH)NH_2$,

(f) $S(O)(NH)N\ HCOCF_3$,

(g) $P(O)(CH_3)OH$, and

(h) $P(O)(CH_3)NH_2$,

R^2 and R^3 are each independently selected from the group consisting of:

(a) hydrogen,

(b) halo,

(c) C_{1-6}alkoxy,

(d) C_{1-6}alkylthio,

(e) CN,

(f) C_{1-3}fluoroalkyl,

(g) C_{1-6}alkyl,

(h) N_3,

(i) —CO_2 H,

(j) —CO_2—C_{1-4}alkyl,

(k) —$C(R^5)(R^6)$—OH,

(l) —$C(R^5)(R^6)$—O—C_{1-4}alkyl, and

(m) —C_{1-6}alkyl—CO_2—R^7;

R^4 is selected from the group consisting of hydrogen, C_{1-6}alkyl, phenyl and benzyl;

R^5, R^6 and R^7 are each independently selected from the group consisting of:

(a) hydrogen, and

(b) C_{1-6}alkyl.

5,552,423

ISOTHIAZOLONE DERIVATIVE AND MICROBICIDAL COMPOSITION COMPRISING THE SAME AS ACTIVE INGREDIENT

Akiko Kakimizu, Nishinomiya; Kenji Arai, Toyonaka; Norio Kimura, and Tomohiro Teramae, both of Takarazuka, all of, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka-fu, Japan

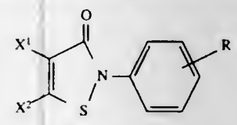
Filed Sep. 30, 1994, Ser. No. 312,962

Claims priority, application Japan, Oct. 1, 1993, 5-246639

Int. Cl.[6] **C07D** *275/03;* **A01N** *43/72*

U.S. Cl. 514—372 **6 Claims**

1. An isothiazolone derivative of the formula:



wherein X^1 and X^2 are the same or different and are independently hydrogen, chlorine or bromine; and R is haloalkoxy.

5,552,424

ISOXAZOLINES AS ANTIINFLAMMATORY AGENTS

Akemi Ando, Handa, and Rodney W. Stevens, Handa, both of, Japan, assignors to Pfizer Inc., New York, N.Y.

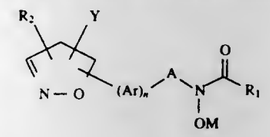
Filed May 5, 1995, Ser. No. 432,183

Claims priority, application Japan, Nov. 20, 1992, 4-312259

Int. Cl.[6] **A61K** *31/42;* **C07D** *261/04*

U.S. Cl. 514—378 **19 Claims**

1. A compound of the following chemical formula:



wherein:

R_1 is alkyl having 1 to 4 carbon atoms or —NR_3R_4;

R_3 and R_4 are each independently hydrogen or alkyl having 1 to 4 carbon atoms;

M is hydrogen or a pharmaceutically acceptable cation;

A is alkylene having 1 to 6 carbon atoms, alkenylene having 2 to 6 carbon atoms or alkynylene having 2 to 6 carbon atoms;

Ar is phenylene or mono-, di- or tri-substituted phenylene wherein the substituents are each independently selected from halogen, alkyl having 1 to 4 carbon atoms and alkoxy having 1 to 4 carbon atoms;

n is an integer of 0 or 1;

Y is hydrogen or alkyl having 1 to 4 carbon atoms;

R_2 is alkyl having 1 to 10 carbon atoms, arylalkyl having 1 to 4 carbon atoms in the alkyl moiety, arylalkenyl having 2 to 4 carbon atoms in the alkenyl moiety or aryl; and

said aryl and each aryl moiety in said arylalkyl and arylalkenyl are phenyl or naphthyl, and may be substituted by from one to three substituents independently selected from halogen, alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, halosubstituted alkyl having 1 to 4 carbon atoms, halosubstituted alkoxy having 1 to 4 carbon atoms, arylalkoxy having 1 to 4 carbon atoms in the alkoxy moiety, phenoxy and mono-, di- and tri-substituted phenoxy wherein the substituents are each independently selected from halogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms and halosubstituted alkyl having 1 to 4 carbon atoms.

5,552,425

SYNERGISTIC WATER SOLUBLE PRESERVATIVE COMPOSITIONS OF BIOCIDAL MIXTURES

John J. Merianos, Middletown, N.J., assignor to ISP Chemicals Inc., Chatham, N.J.

Continuation-in-part of Ser. No. 234,089, Apr. 28, 1994, Pat. No. 5,428,050. This application Mar. 30, 1995, Ser. No. 413,742

Int. Cl.[6] **A01N** *43/50;47/10*

U.S. Cl. 514—390 **8 Claims**

1. A water soluble preservative antimicrobial composition for addition to commercial use products at predetermined use levels to provide synergistic biocidal activity against a wide range of fungi and gram-negative and gram-positive bacteria, comprising an active liquid blend of

(1) an admixture of

(a) N-[1,3-bis (hydroxymethyl)-2,5-dioxo-4-imidazolidinyl]-N,N'-bis (hydroxymethyl) urea; and

(b) 3-iodo-2-propynylbutyl carbamate, in a weight ratio of (a):(b) of 100:1 to 2000:1, and

(2) propylene glycol or 1,3-butylene glycol.

5,552,426

METHODS FOR TREATING A PHYSIOLOGICAL DISORDER ASSOCIATED WITH β-AMYLOID PEPTIDE

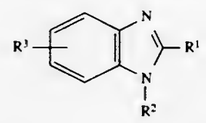
William H. W. Lunn; James A. Monn, both of Indianapolis, and Dennis M. Zimmerman, Mooresville, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 29, 1994, Ser. No. 235,400

Int. Cl.[6] **A61K** *31/415;* **C07D** *235/18;235/08*

U.S. Cl. 514—394 **6 Claims**

1. A method of treating a condition associated with β-amyloid peptide-associated neurotoxicity, which method comprises administering to a mammal in need of said treatment a compound of the formula



wherein:

R^1 is hydrogen, C_1–C_{12} alkyl, C_1–C_6 alkoxy, phenyl, C_3–C_8 cycloalkyl, naphthyl, phenyl-(C_1–C_6 alkylidenyl)-, naphthyl-(C_1–C_6 alkylidenyl)-, phenyl-(C_1–C_6 alkoxy)-, or naphthyl-(C_1–C_6 alkoxy)-,

any one of which phenyl, naphthyl, or C_3–C_8 cycloalkyl groups may be optionally substituted with one, two, or three moieties independently selected from group consisting of hydroxy, halo, C_1–C_6 alkyl, C_1–C_6 alkoxy, trifluoromethyl, nitro, amino, cyano, C_1–C_6 alkylamino, and C_1–C_6 alkylthio;

R^2 is hydrogen, C_1–C_{12} alkyl, C_1–C_6 alkoxy, phenyl, C_3–C_8 cycloalkyl, naphthyl, phenyl-(C_1–C_6 alkylidenyl)-, naphthyl-(C_1–C_6 alkylidenyl)-, phenyl-(C_1–C_6 alkoxy)-, or naphthyl-(C_1–C_6 alkoxy)-,

any one of which phenyl, naphthyl, or C_3–C_8 cycloalkyl, groups may be optionally substituted with one, two, or three moieties independenly selected from group consisting of phenyl-(C_1–C_6 alkylidenyl)-, napthyl-(C_1–C_6 alkylidenyl)-, phenyl-(C_1–C_6 alkoxy)-, naphthyl-(C_1–C_6 alkoxy)-, hydroxy, halo, C_1–C_6 alkyl, C_1–C_6 alkoxy, trifluoromethyl, nitro, amino, cyano, C_1–C_6 alkylamino, and C_1–C_6 alkylthio;

R^3 is hydrogen, nitro, C_1–C_6 alkanoyl, amino, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_3–C_8 cycloalkyl, halo, C_1–C_6 alkylthio, hydroxy-(C_1–C_6 alkylidenyl)-, hydroxy-(C_1–C_6 alkylidenyl)amino-, R^4R^5N-, R^4R^5N-(C_1–C_6 alkylidenyl)-, R^4R^5N-(C_1–C_6 alkoxy)-, hydroxy-(C_1–C_6 alkyl-, amino(C_1–C_6 alkylidenyl)-, or trifluoromethyl,

wherein R^4 and R^5 are independently selected from the group

5,552,428

where R^4 and R^5 are independently selected from the group consisting of C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_6 alkanoyl, aryl, aryl(C_1–C_6 alkylidenyl)-, and hydrogen or R^4 and R^5 combine to form C_5–C_8 cycloalkyl,

any one of which alkyl or alkoxy groups may be substituted with one or more halo, amino, or nitro, and

any one of which aryl groups may be substituted with one, two, or three moieties independently selected from group consisting of hydroxy, halo, C_1–C_6 alkyl, C_1–C_6 alkoxy, trifluoromethyl, nitro, amino, cyano, C_3–C_8 cycloalkyl, C_1–C_6 alkylamino, and C_1–C_6 alkylthio;

with the proviso that not more than one of R^1 and R^2 may be hydrogen;

or a pharmaceutically acceptable salt thereof.

5,552,427

GLUTAMINASE INHIBITORY COMPOUNDS, COMPOSITIONS, AND METHODS OF USE

Etsuya Matsutani, and Shogo Marui, both of Kobe, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

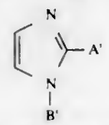
Filed Nov. 21, 1994, Ser. No. 345,425

Claims priority, application Japan, Nov. 19, 1993, 5-290278

Int. Cl.[6] **C07D** *233/64;233/20;* **A61K** *31/415*

U.S. Cl. 514—398 **18 Claims**

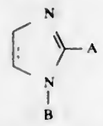
1. A compound of the formula (II):



(II)

wherein A' is —NHCOOR in which R is a lower alkyl group or a benzyl group; and B' is a lower alkyl group, a lower alkenyl group or a lower alkynyl group, each of which is unsubstituted or substituted with 1 to 3 substituents selected from the group consisting of a hydroxy, amino, carboxyl, nitro, mono- or di-C_{1-6} alkylamino, C_{1-6} alkoxy, C_{1-6} alkylcarbonyloxy and halogen; or a pharmaceutically acceptable salt thereof.

7. A method for inhibiting glutaminase which comprises administering to a mammal in need thereof an effective amount of a compound of the formula (I):



(I)

wherein A is (i) a lower alkyl group which is unsubstituted or substituted with 1 to 3 substituents selected from the group consisting of a hydroxy, amino, carboxyl, nitro, mono- or di-C_{1-6} alkylamino, C_{1-6} alkoxy, C_{1-6} alkyl-carbonyloxy and halogen, or (ii) an amino group which is unprotected or protected with a group removable by in vivo metabolism; ==== is a single bond or a double bond, and B is (i) a hydrogen atom or (ii) a lower alkyl group, a lower alkenyl group, or a lower alkynyl group, each of which is unsubstituted or substituted with 1 to 3 substituents selected from the group consisting of a hydroxy, amino, carboxyl, nitro, mono- or di-C_{1-6} alkylamino, C_{1-6} alkoxy, C_{1-6} alkyl-carbonyloxy and halogen, or a pharmaceutically acceptable salt thereof.

5,552,428

COMPOUNDS EFFECTIVE IN THE TREATMENT OF CIRCADIAN RHYTHMS AND RELATED DISORDERS, THE NOVEL PHARMACEUTICAL PREPARATIONS AND NOVEL METHOD OF APPLICATION

Franco Fraschini; Bojidar Stankov; Margherita Borgonovo; Carlo Introini, and Aldo Laguzzi, all of Milan, Italy, assignors to Instituto Farmacologico Lombardo-IFLO, S.a.S., Milan, Italy

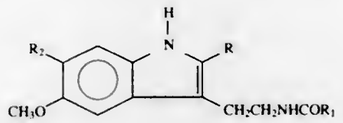
Continuation-in-part of Ser. No. 80,742, Jun. 22, 1993, abandoned, and Ser. No. 85,392, Jun. 30, 1993, abandoned. This application Feb. 15, 1994, Ser. No. 196,380

Claims priority, application Italy, Jun. 24, 1992, MI92A1556; Jul. 1, 1992, MI92A1612

Int. Cl.[6] **A61K** *31/40;* **C07D** *209/14*

U.S. Cl. 514—415 **22 Claims**

1. A compound having the ability to combat chronopathology of jet lag or delayed sleep phase syndrome of the formula:



wherein

a) R=isopropyl R_1=CH_3 R_2=H

b) R=cyclohexyl R_1=CH_3 R_2=H

c) R=methyl R_1=cyclopropyl R_2=H

d) R=phenyl R_1=cyclopropyl R_2=H

e) R=Br R_1=cyclopropyl R_2=H

f) R=Br R_1=CH_3 R_2=Br

(g) R=I R_1=cyclopropyl R_2=H

or

(h) R=Br R_1=CH_3 R_2=H.

5,552,429

POTENTIATION OF DRUG RESPONSE

David T. Wong, and Juan I. Oguiza, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 277,460, Jul. 19, 1994, abandoned, which is a continuation-in-part of Ser. No. 260,857, Jun. 16, 1994, abandoned. This application May 17, 1995, Ser. No. 442,733

Int. Cl.[6] **A61K** *31/135;31/40*

U.S. Cl. 514—415 **10 Claims**

1. A method for potentiating the action of a first component which is fluoxetine in increasing the availability of serotonin, norepinephrine and dopamine in the brain, comprising administering fluoxetine to a patient in need thereof in combination with a second component which is pindolol.

5,552,430

HETEROCYCLE-SUBSTITUTED BENZENEMETHANAMINE DERIVATIVES

Marcel A. C. Janssen, Vosselaar; Georges H. P. Van Daele, Turnhout; Jean-Paul R. M. A. Bosmans, Edegem; Marc G. C. Verdonck, Gierle, and Paul A. J. Janssen, Vosselaar, all of, Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

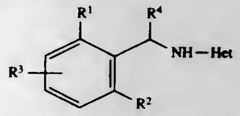
Division of Ser. No. 240,737, May 12, 1994, Pat. No. 5,480,997. This application May 2, 1995, Ser. No. 432,751

Claims priority, application European Pat. Off., Dec. 30, 1991, 91203431

Int. Cl.[6] **C07D** *333/20;333/12;207/14;* **A61K** *31/38*

U.S. Cl. 514—426 **8 Claims**

1. A compound of the formula:



(I)

a pharmaceutically acceptable acid addition salt form or a stereochemically isomeric form thereof, wherein:

R^1 and R^2 each independently are halo or methyl;

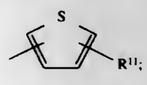
R^3 is hydrogen, halo, nitro or trifluoromethyl;

R^4 is—trifluoromethyl or methyl carbonyl; or

a radical —C(=X)—NR^5R^6 wherein X is O or S, and R^5 and R^6 each independently are hydrogen or C_{1-4}alkyl; or

a radical —Alk—R^7, wherein Alk is C_{1-4}alkanediyl; and R^7 is hydrogen or hydroxy; and

Het is a heterocyclic radical of the formula:



(b)

wherein:

R^{11} is hydrogen, nitro, halo or C_{1-4}alkyl.

5,552,431

PEPTIDE MIMETIC COMPOUNDS-USEFUL AS PLATELET AGGREGATION INHIBITORS

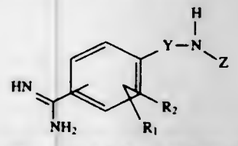
Norman A. Abood, Morton Grove; Robert B. Garland, and Masateru Miyano, both of Northbrook, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 810,791, Dec. 19, 1991, Pat. No. 5,424,334. This application Mar. 24, 1995, Ser. No. 410,441

Int. Cl.[6] **C07D** *207/327;* **A61K** *31/40*

U.S. Cl. 514—427 **10 Claims**

1. A compound of the formula



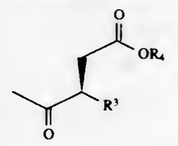
I

or a pharmaceutically acceptable salt thereof, wherein

R_1 and R_2 are each independently hydrido, alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms or halo;

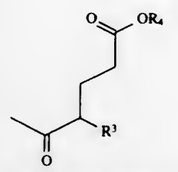
Y is alkylene having 1 to 6 carbon atoms, alkenylene having 2 to 4 carbon atoms, alkynylene having 2 to 4 carbon atoms or carboxamidoalkyl wherein the alkyl is 1 to 6 carbon atoms and

Z is a group having the formula



(Z_1)

or



(Z_2)

R_3 is 5 or 6 carbon membered cyclic ring wherein one or two of the ring carbon atoms are replaced by a hetero atom which is selected from nitrogen, oxygen and sulfur with the proviso that when two hetero atoms are present one hetero atom must be nitrogen; and

R_4 is hydrido or alkyl having 1 to 6 carbon atoms;

with the proviso that when Y is alkyl having three carbon atoms Z is Z_1.

5,552,432

Patent Not Issued For This Number

5,552,433

METHOD FOR LOWERING SERUM CHOLESTEROL

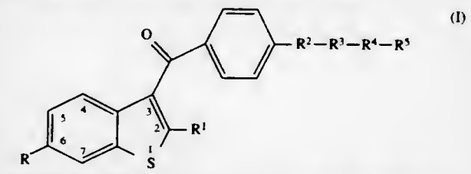
Henry U. Bryant, and Timothy A. Grese, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 138,823, Oct. 15, 1993, Pat. No. 5,482,950. This application Aug. 15, 1995, Ser. No. 515,418

Int. Cl.[6] **A61K** *31/38*

U.S. Cl. 514—443 **9 Claims**

1. A method of lowering serum cholesterol levels comprising administering to a human in need of treatment a serum cholesterol lowering amount of a compound having the formula



(I)

wherein R is hydrogen; hydroxy; C_1–C_6 alkoxy; a group of the formula —O—C(O)—R^a, wherein R^a is hydrogen, C_1–C_6 alkyl optionally substituted with amino optionally substituted once or twice with C_1–C_6 alkyl, halo, carbonyl, C_1–C_6 alkoxycarbonyl, C_1–C_7 alkanoyloxy, carbamoyl and/or aryl; or R^a is C_1–C_6 alkenyl optionally substituted with aryl; or R^a is a C_3–C_7 cycloalkyl; or R^a is aryl optionally substituted with

hydroxy, C_1–C_6 alkyl, C_1–C_6 alkoxy, and/or halo; or R^a is

X represents CH_2OH, CH_2OR_5 and CH_2O—COR_6, where

or the salt or ester of those compounds of formula I containing a carboxy group, wherein the esters contain ester groups

consisting of a halo group, a hydroxyl group, and a C_1–C_6 lower alkoxy group

hydroxy, C_1–C_6 alkyl, C_1–C_6 alkoxy, and/or halo; or R^a is —O—aryl, said aryl optionally substituted with hydroxy C_1–C_6 alkyl, C_1–C_6 alkoxy, and/or halo,

or R is a group of the formula —O—SO_2—R^b wherein R^b may be C_1–C_6 alkyl or aryl optionally substituted with C_1–C_6 alkyl;

or R is carbamoyloxy wherein the nitrogen may be substituted once or twice with C_1–C_6 alkyl;

or R is a group of the formula —O—C(O)R^c—O—(C_1–C_6 alkyl) wherein R^c is a bond or C_1–C_6 alkanediyl;

R^1 is halo, C_1–C_6 alkyl, C_1–C_7 alkyl substituted with C_1–C_6 alkyl, substituted or unsubstituted C_3–C_7 cycloalkyl, or substituted or unsubstituted C_3–C_7 cycloalkenyl;

R^2 is O or CH_2;

R^3 is CH_2 or $(CH_2)_2$;

R^4 is

CH_2, or a bond; and

R^5 is amino, or a pharmaceutically acceptable salt or solvate thereof.

5,552,434

7-(5-SUBSTITUTED CYCLOPENTYL) AND (5-SUBSTITUTED CYCLOPENTENYL) HEPTYL ALCOHOLS, HEPTYLAMINES AND HEPTANOIC ACID AMIDES, AND METHOD OF LOWERING INTRAOCULAR PRESSURE IN THE EYE OF A MAMMAL BY ADMINISTRATION OF THESE COMPOUNDS

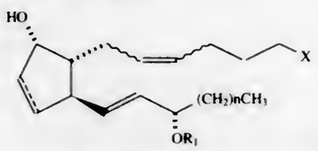
Michael E. Garst, Newport Beach, and Robert M. Burk, Irvine, both of Calif., assignors to Allergan, Waco, Tex.

Division of Ser. No. 964,223, Oct. 21, 1992, Pat. No. 5,385,945. This application Dec. 14, 1994, Ser. No. 355,463

Int. Cl.[6] C07C *405/00;* **A61K** *31/557*

U.S. Cl. 514—548 **25 Claims**

1. A compound of the formula



where the dotted line represents a bond or the absence of a bond, the wavy lines represent bonds which are either in cis or trans configuration;

R_1represents H, or CO—R_2 where R_2ids lower alkyl of 1to 6 carbons, carbocyclic aryl or heterocyclic aryl; or carbocyclic aryl or heteroaryl substituted lower alkyl group;

X represents CH_2OH, CH_2OR_3 and CH_2O—COR_4, where $R_3$and R_4 independently are H or lower alkyl, $R_5$is lower alkyl of 1 to 6 carbons, and R_6lower alkyl of 1 to 6 carbons, carbocyclic aryl or heterocyclic aryl; or carbocyclic aryl or heteroaryl substituted lower alkyl group, and

n is an integer between 0 and 8.

5,552,435

BENZOPYRAN AND RELATED LTB ANTAGONISTS

Kevin Koch, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

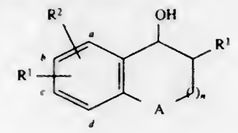
PCT No. PCT/US92/09496, § 371 Date Jan. 9, 1995, § 102(e) Date Jan. 9, 1995, PCT Pub. No. WO93/15067, PCT Pub. Date Aug. 5, 1993

Continuation-in-part of Ser. No. 824,412, Jan. 23, 1992, abandoned. This PCT application Nov. 13, 1992, Ser. No. 295,827

Int. Cl.[6] C07D *311/22;* **A61K** *31/35*

U.S. Cl. 514—456 **12 Claims**

1. A compound of the formula

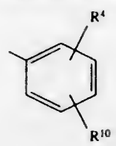


wherein

A is O, or S;

n is 1;

R^1 is a substituent at position b or c of the formula



R^2, R^8, R^9, and R^{10} are hydrogen or each independently are one or any two of the following: fluoro, chloro, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_4 perfluoroalkyl, C_1–C_4 perfluoroalkoxy, C_1–C_6 alkylthio, C_1–C_6 alkylsulfinyl or C_1–C_6 alkylsulfonyl;

R^3 is —$(CH_2)_q$CH$R^{11}R^{12}$, —$(CH_2)_qR^{12}$, —O$(CH_2)_p$CH$R^{11}R^{12}$, or —O$(CH_2)_pR^{12}$, wherein p is 0, 1, or 2 and q is 0, 1, 2, or 3;

R^4 is carboxy, tetrazolyl or $R^{13}SO_2NHCO$;

R^{11} is hydrogen, C_1–C_6 alkyl or R^8-substituted phenyl wherein R^8 is as defined above;

R^{12} and R^{13} are hydrogen or each independently are C_1–C_6 alkyl or C_3–C_8 cycloalkyl; or phenyl, thienyl, pyridyl, furyl, naphthyl, quinolyl, isoquinolyl, pyrimidinyl, or pyrazinyl, each of which is optionally substituted by phenyl, R^9, or R^9-substituted phenyl wherein R^9 is as defined above;

or the salt or ester of those compounds of formula I containing a carboxy group, wherein the esters contain ester groups selected from the group consisting of C_1–C_6 alkyl, phenyl(C_1–C_6)alkyl, C_3–C_7 cycloalkyl, and phenyl and benzyl substituted by fluoro, chloro, C_1–C_6 alkyl or C_1–C_6 alkoxy.

5,552,436

PROCESS FOR TREATING HEMANGIOMA

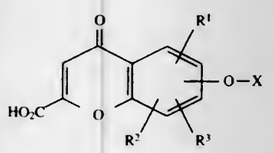
Emmett Clemente, Manchester; Robert W. Mendes, Dedham; Aloysius O. Anaebonam, Burlington, and Mumtaz Ahmed, Westford, all of Mass., assignors to Ascent Pharmaceuticals, Inc., Billerica, Mass.

Filed Apr. 3, 1995, Ser. No. 415,712

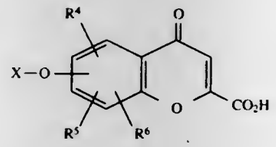
Int. Cl.[6] A61K *31/35*

U.S. Cl. 514—456 **11 Claims**

1. A process for treating hemangioma in a human in need thereof comprising topically administering to said buman at the location of the hemangioma a composition comprising a pharmacologically acceptable carrier having dissolved or dispersed therein a therapeutically effective amount of a substituted chromone compound or a pharmacologically acceptable salt, ester or amide thereof, said chromone compound having a structure represented by the formula:



I



wherein

(a) R^1, R^2, R^3, R^4, R^5, and R^6, can each be the same, or different, and each R group is selected from the group consisting of hydrogen, a halo group, a C_1–C_6 lower alkyl group, hydroxyl, C_1–C_6 lower alkoxy, substituted C_1–C_6 lower alkoxy group, and a substituted C_1–C_6 lower alkyl, where the substituent is selected from the group consisting of a hydroxyl, a lower (C_1–C_6) alkoxy group, a carboxy group, a halo group, a lower alkenyl group, a benzyl group and nitro group;

(b) the X group can be a straight or branched, saturated or unsaturated hydrocarbon chain having between 3 and 10 carbon atoms, wherein said hydrocarbon chain is optionally interrupted by a substituent selected from the group consisting of oxygen, a carbonyl group, a carbocyclic or heterocyclic ring and can contain a substituent selected from the group consisting of a halo group, a hydroxyl group, and a C_1–C_6 lower alkoxy group.

5,552,437

BISARYLCARBINOL DERIVATIVES AS INHIBITORS OF LEUKOTRIENE BIOSYNTHESIS

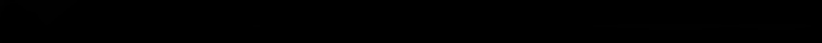
Daniel Delorme; Daniel Dubé, both of St. Lazare; Yves Ducharme, Montreal; Erich L. Grimm, Baie d'Urfe; Richard Friesen, Dollard des Ormeaux, and Carole Lepine, Laval, all of, Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

Filed Oct. 27, 1994, Ser. No. 330,036

Int. Cl.[6] A61K *31/35;* **C07D** *405/12*

U.S. Cl. 514—457 **9 Claims**

1. A compound having the formula



I

wherein

Ar^1 is phenylene substituted with one or two of the same or different R^4 groups;

Ar^2 is 2H-1-benzopyran-2-one substituted with one or two of the same or different R^5 groups;

Ar^3 is phenyl substituted with one or two of the same or different R^6 groups;

X is S, S(O), or $S(O)_2$;

R^1 is H, lower alkyl, or lower perfluoroalkyl;

R^2 is H, lower alkyl or lower perfluoroalkyl;

R^3 is H or lower alkyl;

R^4 is H, lower alkyl, lower alkoxy, lower alkylthio, NO_2, CN, CF_3, CF_3O or halogen;

R^5 is R^4, oxo or thioxo;

R^6 is R^4, lower alkylsulfinyl, lower alkylsulfonyl or CO_2R^7;

R^7 is H or lower alkyl;
or a pharmaceutically acceptable salt thereof.

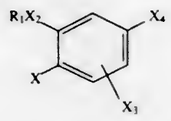
5,552,438

COMPOUNDS USEFUL FOR TREATING ALLERGIC AND INFLAMMATORY DISEASES

Siegfried B. Christensen, IV, Philadelphia, Pa., assignor to SmithKline Beecham Corporation, Philadelphia, Pa.

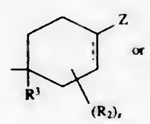
PCT No. PCT/US93/01991, § 371 Date Sep. 29, 1994, § 102(e) Date Sep. 29, 1994, PCT Pub. No. WO93/19749, PCT Pub. Date Oct. 14, 1993
Continuation-in-part of Ser. No. 968,762, Oct. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 862,830, Apr. 2, 1992, abandoned. This PCT application Mar. 5, 1993, Ser. No. 313,094
Int. Cl.[6] A61K *31/275;* **C07C** *255/50*
U.S. Cl. 514—520 **9 Claims**

1. A compound of Formula (I):



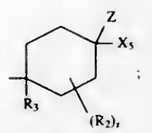
(I)

wherein:
R_1 is $—(CR_4R_5)_nC(O)O(CR_4R_5)_mR_6$, $—(CR_4R_5)_nC(O)NR_4(CR_4R_5)_mR_6$, $—(CR_4R_5)_nO(CR_4R_5)_mR_6$, or $—(CR_4R_5)_rR_6$ wherein the alkyl moieties may be optionally substituted with one or more halogens;
m is 0 to 2;
n is 1 to 4;
r is 0 to 6;
R_4 and R_5 are independently selected from hydrogen or a C_{1-2} alkyl;
R_6 is hydrogen, methyl, hydroxyl, aryl, halo substituted aryl, aryloxyC_{1-3} alkyl, halo substituted aryloxyC_{1-3} alkyl, indanyl, indenyl, C_{7-11} polycycloalkyl, tetrahydrofuranyl, furanyl, tetrahydropyranyl, pyranyl, tetrahydrothienyl, thienyl, tetrahydrothiopyranyl, thiopyranyl, C_{3-6} cycloalkyl, or a C_{4-6} cycloalkyl containing one or two unsaturated bonds, wherein the cycloalkyl and heterocyclic moieties may be optionally substituted by 1 to 3 methyl groups or one ethyl group;
provided that:
a) when R_6 is hydroxyl, then m is 2; or
b) when R_6 is hydroxyl, then r is 2 to 6; or
c) when R_6 is 2-tetrahydropyranyl, 2-tetrahydrothiopyranyl, 2-tetrahydrofuranyl, or 2-tetrahydrothienyl, then m is 1 or 2; or
d) when R_6 is 2-tetrahydropyranyl, 2-tetrahydrothiopyranyl, 2-tetrahydrofuranyl, or 2-tetrahydrothienyl, then r is 1 to 6;
e) when n is 1 and m is 0, then R_6 is other than H in $—(CR_4R_5)_nO(CR_4R_5)_mR_6$;
X is YR_2, halogen, nitro, NR_4R_5, or formyl amine;
Y is O or $S(O)_{m'}$;
m' is 0, 1, or 2;
X_2 is O or NR_8;
X_3 is hydrogen or X;
X_4 is



(a)

or



(b)

X_5 is H, R_9, OR_8, CN, $C(O)R_8$, $C(O)OR_8$, $C(O)NR_8R_8$, or NR_8R_8;
R_2 is independently selected from the group consisting of $—CH_3$ and $—CH_2CH_3$ optionally substituted by 1 or more halogens;
s is 0 to 4;
R_3 is CN;
Z' is O, NR_9, NOR_8, NCN, $C(—CN)_2$, CR_8CN, CR_8NO_2, $CR_8C(O)OR_8$, $CR_8C(O)NR_8R_8$, $C(—CN)NO_2$, $C(—CN)C(O)OR_9$, or $C(—CN)C(O)NR_8R_8$;
Z is $C(Y')R_{14}$, $C(O)OR_{14}$, $C(Y')NR_{10}R_{14}$, $C(NR_{10})NR_{10}R_{14}$, CN, $C(NOR_8)R_{14}$, $C(O)NR_8NR_8C(O)R_8$, $C(O)NR_8NR_{10}R_{14}$, $C(NOR_{14})R_8$, $C(NR_8)NR_{10}R_{14}$, $C(NR_{14})NR_8R_8$, $C(NCN)NR_{10}R_{14}$, $C(NCN)SR_9$, (2-,4- or 5-imidazolyl), (3-,4- or 5-pyrazolyl), (4- or 5-triazolyl[1,2,3]), (3- or 5-triazolyl[1,2,4]), (5-tetrazolyl), (2-,4- or 5-oxazolyl), (3-,4- or 5-isoxazolyl), (3- or 5-oxadiazolyl[1,2,4]), (2-oxadiazolyl[1,3,4]), (2-thiadiazolyl[1,3,4]), (2-,4-, or 5-thiazolyl), (2-,4-, or 5-oxazolidinyl), (2-,4-, or 5-thiazolidinyl), or (2-,4-, or 5-imidazolidinyl); wherein all of these heterocylic ring systems may be optionally substituted one or more times by R_{14};
the dotted line in formula (a) represents a single or double bond;
Y' is O or S;
R_7 is $—(CR_4R_5)_qR_{12}$ or C_{1-6} alkyl wherein the R_{12} or C_{1-6} alkyl group is optionally substituted one or more times by C_{1-2} alkyl optionally substituted by one to three fluorines, —F, —Br, —Cl, NO_2, $—NR_{10}R_{11}$, $—C(O)R_8$, $—C(O)OR_8$, $—OR_8$, —CN, $—C(O)NR_{10}R_{11}$, $—OC(O)NR_{10}R_{11}$, $—OC(O)R_8$, $—NR_{10}C(O)NR_{10}R_{11}$, $—NR_{10}C(O)R_{11}$, $—NR_{10}C(O)OR_9$, $—NR_{10}C(O)R_{13}$, $—C(NR_{10})NR_{10}R_{11}$, $—C(NCN)NR_{10}R_{11}$, $—C(NCN)SR_9$, $—NR_{10}C(NCN)SR_9$, $—NR_{10}C(NCN)NR_{10}R_{11}$, $—NR_{10}S(O)_2R_9$, $—S(O)_mR_9$, $—NR_{10}C(O)C(O)NR_{10}R_{11}$, $—NR_{10}C(O)C(O)R_{10}$, thiazolyl, imidazolyl, oxazolyl, pyrazolyl, triazolyl, or tetrazolyl;
q is 0, 1, or 2;
R_{12} is C_3–C_7-cycloalkyl, (2-, 3- or 4-pyridyl), pyrimidyl, pyrazolyl, (1- or 2-imidazolyl), thiazolyl, triazolyl, pyrrolyl, piperazinyl, piperidinyl, morpholinyl, furanyl, (2- or 3-thienyl), (4- or 5-thiazolyl), quinolinyl, naphthyl, or phenyl;
R_8 is independently selected from hydrogen or R_9;
R_8, is R_8 or fluorine;
R_9 is C_{1-4} alkyl optionally substituted by one to three fluorines;
R_{10} is OR_8 or R_{11};
R_{11} is hydrogen, or C_{1-4} alkyl optionally substituted by one to three fluorines; or when R_{10} and R_{11} are as NR_1R_{11} they may together with the nitrogen form a 5 to 7 membered ring optionally containing at least one additional heteroatom selected from O, N, or S;
R_{13} is oxazolidinyl, oxazolyl, thiazolyl, pyrazolyl, triazolyl, tetrazolyl, imidazolyl, imidazolidinyl, thiazolidinyl, isoxazolyl, oxadiazolyl, or thiadiazolyl, and each of these heterocyclic rings is connected through a carbon atom and each may be unsubstituted or substituted by one or two C_{1-2} alkyl groups;

R_{14} is hydrogen;
provided that:
f) when R_{12} is N-pyrazolyl, N-imidazolyl, N-triazolyl, N-pyrrolyl, N-piperazinyl, N-piperidinyl, or N-morpholinyl, then q is not 1;
or the pharmaceutically acceptable salts thereof.

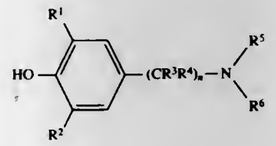
5,552,439

METHOD OF TREATING INFLAMMATORY BOWEL DISEASE

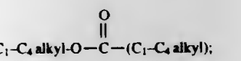
Jill A. Panetta, Zionsville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 572,286, Aug. 27, 1990, abandoned. This application Sep. 29, 1993, Ser. No. 129,003
Int. Cl.[6] A61K *31/24*
U.S. Cl. 514—534 **13 Claims**

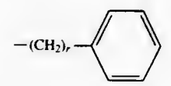
1. A method of treating inflammatory bowel disease in a mammal suffering from such disease which comprises administering to such mammal an effective amount of a compound, or a pharmaceutically acceptable salt thereof, of the formula



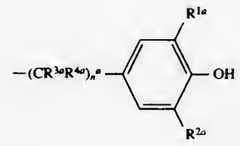
wherein:
R^1 and R^2 are each independently hydrogen, C_1–C_6 alkyl, C_1–C_6 alkoxy or



R^3 and R^4 are each independently hydrogen or C_1–C_4 alkyl;
n is an integer from 1 to 2, both inclusive; and
R^5 and R^6 are defined to be either:
A) R^5 and R^6 are each independently hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, $—(CH_2)_g$ OH, $—(CH_2)_q$ NH_2, $—(CH_2)_qNH(C_1–C_4$ alkyl), $—(CH_2)_qN(C_1–C_4$ alkyl)$_2$, $—(CH_2)_qS(C_1–C_4$alkyl) or



where q is an integer from 1 to 6, both inclusive, and r is an integer from 1 to 4, both inclusive, or
B) one of R^5 or R^6 is as defined in (A) above and the other is



wherein n^a, R^{1a}, R^{2a}, R^{3a} and R^{4a} are the same substituent as n, R^1, R^2, R^3 and R^4, respectively.

5,552,440

USE OF L-CANAVANINE AS A CHEMOTHERAPEUTIC AGENT FOR THE TREATMENT OF PANCREATIC CANCER

Peter A. Crooks, and Gerald A. Rosenthal, both of Lexington, Ky., assignors to The University of Kentucky Research Foundation, Lexington, Ky.

Filed Dec. 5, 1994, Ser. No. 353,270
Int. Cl.[6] A61K *31/185;31/70*
U.S. Cl. 514—553 **7 Claims**

1. A method of treating pancreatic cancer comprising the steps of administering a pharmaceutically effective amount of a composition comprising canavanine to a patient with pancreatic cancer.

5,552,441

LEUKOTRIENE B4 ANTAGONISTS

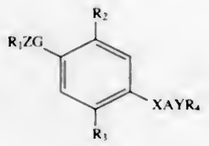
Robert D. Dillard, Zionsville; J. Scott Sawyer, Indianapolis, and Michael J. Sofia, Carmel, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 988,615, Dec. 10, 1992, Pat. No. 5,324,743. This application Feb. 14, 1994, Ser. No. 195,951

Int. Cl.[6] A61K *31/19*; **C07C** *63/04*

U.S. Cl. 514—569 **14 Claims**

1. A compound represented by the formula:



and salts thereof, wherein:

R_1 is hydrogen;

R_2 is halo, or —OR"

R_3 is C_1-C_{10} alkyl, C_1-C_6 alkanoyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, C_1-C_4 alkoxy, hydroxy substituted C_1-C_3 alkyl, or C_1-C_4 thioalkyl;

X and Y are the same or different and are selected individually at each occurrence from: —CR'$_2$—, —O—, —S—, or —NR'—;

Z is —(CH$_2$)$_n$—, —NR"— or phenylene;

A is a bond or a linear or branched chain C_1-C_{10} alkylidene;

G is —CH$_2$—,

and

wherein:

R' is independently selected, at each occurrence, from H and C_1-$_4$ alkyl;

R" is independently selected, at each occurrence, from H and —(CH$_2$)$_n$—H;

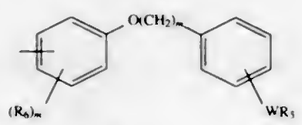
R'" is independently selected, at each occurrence, from H or C_1-C_4 alkyl;

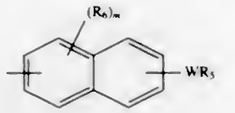
n is selected independently, at each occurrence, and ranges from 1–8;

m is selected independently, at each occurrence, and ranges from 0–4; and

wherein

R_4 is selected from the groups;





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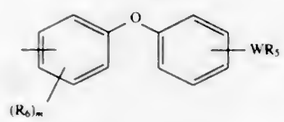
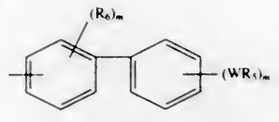
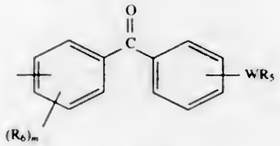
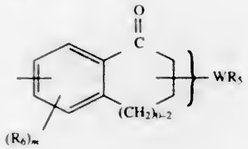
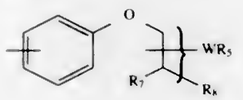


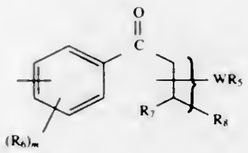








and



wherein

W is a bond, —(CHR')$_n$—, —(O[CHR']$_n$)$_m$—, —O—, —S—, or

and

R_5 is H, C_1-C_6, linear or branched alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, hydroxy, 1, 2, 4- triozol-1-yl, cyano, halo, —N_3, —NR'R'", —CO_2R', or 5-tetrazolyl optionally substituted with a C_1-C_4 alkyl group; and

R_6 is individually selected, at each occurrence, from H, C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, phenyl, benzyl, —WR_5, halo, thio (C_1-C_4 alkyl), hydroxy, or —O—(C_1-C_{10} alkoxy); and

R_7 and R_8 are both individually selected from H or C_1-C_3 alkyl; and

halo is —F, —Cl, —Br, or —I; and pharmaceutically acceptable salts thereof.

5,552,442

THERAPEUTIC APPLICATIONS OF CLENBUTEROL

Charlotte A. Maltin, Inverurie, United Kingdom, assignor to The Rowett Research Institute, Aberdeen, United Kingdom

Continuation of Ser. No. 827,839, Jan. 29, 1992, abandoned, which is a continuation of Ser. No. 266,973, Nov. 3, 1988, abandoned, which is a continuation-in-part of Ser. No. 133,702, Dec. 16, 1987, abandoned. This application Apr. 24, 1995, Ser. No. 427,663

Claims priority, application United Kingdom, Sep. 15, 1987, 8721602; Feb. 17, 1988, 8803619; European Pat. Off., Sep. 12, 1988, 88308402

Int. Cl.[6] A61K *31/165;31/135*

U.S. Cl. 514—620 **19 Claims**

1. A method of alleviating or reversing loss of function of striated muscle arising from at least one illness in the group of illnesses consisting of:

(a) a humorally mediated catabolic state;

(b) muscular trauma arising from accident:

(c) muscular trauma arising from surgery; and

(d) muscular atrophy arising from temporary disuse,

wherein said method comprises the step of administering an effective amount of a beta-adrenergic agonist and a suitable carrier or diluent;

wherein said beta-adrenergic agonist is selected from the group consisting of clenbuterol, an acid addition salt of clenbuterol, and an analog thereof.

5,552,443

SUBSTITUTED AMIDINES HAVING HIGH BINDING TO THE SIGMA RECEPTOR AND THE USE THEREOF

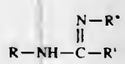
John F. W. Keana, Eugene, and Eckard Weber, Portland, both of Oreg., assignors to Oregon Health Sciences University, Portland, and The University of Oregon, Eugene, both of Oreg.

Division of Ser. No. 860,571, Mar. 30, 1992, Pat. No. 5,308,869, which is a continuation of Ser. No. 574,674, Aug. 30, 1990, Pat. No. 5,190,865. This application Jan. 18, 1994, Ser. No. 183,507

Int. Cl.[6] A61K *31/155*

U.S. Cl. 514—631 **21 Claims**

1. An N,N'-disubstituted amidine of the formula



wherein R and R" are independently a cycloalkyl group of at least 3 carbon atoms, a carbocyclic aryl group of at least 6 carbon atoms, alkaryl or aralkyl of at least 6 carbon atoms and containing 1–3 separate or fused rings and at least one of R and R" is adamantyl wherein each of R and R" may be substituted in 1–3 positions; and R' is hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, phenyl, trifluoromethyl, phenylsulfonyl, or C_1–C_6 alkylsulfonyl.

5,552,444

RING-SUBSTITUTED 2-AMINO-1,2,3,4-TETRAHYDRONAPHTHALENES, 3-AMINOCHROMANES, AND 3-AMINOTHIOCHROMANES

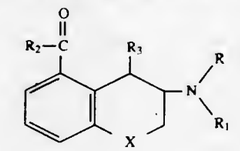
John M. Schaus, Zionsville; Craig S. Hoechstetter, Indianapolis; Diane Huser, Indianapolis; Charles J. Paget, Indianapolis, and Robert D. Titus, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 168,794, Dec. 16, 1993, Pat. No. 5,426,229, which is a division of Ser. No. 48,553, Apr. 16, 1993, Pat. No. 5,286,753, which is a continuation of Ser. No. 567,985, Aug. 18, 1990, abandoned. This application Mar. 14, 1995, Ser. No. 403,598

Int. Cl.[6] A61K *31/135*

U.S. Cl. 514—657 **6 Claims**

1. A method for effecting agonist action at the 5-HT_{1A} receptor in mammals, which comprises administering to a mammal requiring agonist action at the 5-HT_{1A} receptor a pharmaceutically effective amount of a compound of the formula



in which

R is C_1–C_4 alkyl, C_3–C_4 alkenyl, or cyclopropylmethyl;

R_3 is hydrogen; or

R and R_3 taken together are a divalent group of the formula —$CH_2CH_2CH_2$—;

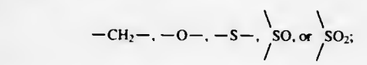
R_1 is hydrogen, C_1–C_4 alkyl, C_3–C_4 alkenyl, cycloprypylmethyl, aryl(C_1–C_4-alkyl), —COR_4, —$(CH_2)_nS(C_1$–C_4 alkyl) or —$(CH_2)_nCONR_5R_6$;

n is an integer from 1 to 4;

R_4 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, or phenyl;

R_5 and R_6 are independently hydrogen, C_1–C_4 alkyl, or C_3–C_7 cycloalkyl with the proviso that when one of R_5 or R_6 is cycloalkyl the other is hydrogen;

X is



R_2 is C_1–C_8 alkyl, substituted C_1–C_8 alkyl, C_2–C_4 alkenyl, aryl, substituted aryl, aryl(C_1–C_4-alkyl), substituted aryl(C_1–C_4 alkyl), C_3–C_7 cycloalkyl-substituted methyl, or C_3–C_7 cycloalkyl;

and pharmaceutically acceptable acid addition salts thereof.

5,552,445

COMPOSITION FOR EXTERNAL SKIN CARE

Yukihiro Ohashi, Utsunomiya; Taketoshi Fujimori; Minoru Nagai, both of Ichikaimachi; Akira Kawamata, Utsunomiya; Yukihiro Yada, Ninomiyamachi; Kazuhiko Higuchi, Ichikaimachi; Genji Imokawa, Utsunomiya; Yoshinori Takema, Ichikaimachi; Yukiko Sakaino, Utsunomiya; Ayumi Ogawa, Motegimachi, and Tsutomu Fujimura, Ichikaimachi, all of, Japan, assignors to Kao Corporation, Tokyo, Japan

PCT No. PCT/JP92/01210, § 371 Date Mar. 23, 1994, § 102(e) Date Mar. 23, 1994, PCT Pub. No. WO93/05763, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 22, 1992, Ser. No. 211,052

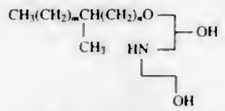
Claims priority, application Japan, Sep. 24, 1991, 3-243669; May 22, 1992, 4-130699

Int. Cl.[6] A61K *31/13*

U.S. Cl. 514—669 **8 Claims**

1. A composition for external skin care comprising in an effective amount for reducing wrinkles and/or improving keratinization

of the skin at least one amine derivative of the following formula:



(1g)

wherein m+n is 11–17, m is 4–10 and n is 5–11.

5,552,446

EMULSION CONTAINING STABILIZED ASCORBIC ACID, COSMETIC TREATMENT PROCESS USING IT AND USES THEREOF

Didier Candau, Bievres, and Nathalie Collin, Sceaux, both of, France, assignors to L'Oreal, Paris, France

Filed Feb. 3, 1995, Ser. No. 383,431

Claims priority, application France, Feb. 4, 1994, 94 01282

Int. Cl.[6] A61K *31/375;7/00*

U.S. Cl. 514—772.4 **16 Claims**

1. An emulsion consisting essentially of an aqueous phase dispersed in an oily phase using an emulsifying agent, wherein said aqueous phase consists essentially of ascorbic acid and has an acidic pH≦3.5, and wherein said emulsifying agent is a dimethiconecopolyol, an alkyldimethiconecopolyol or a mixture thereof, wherein said ascorbic acid is stabilized by inclusion in the aqueous phase, and an electrolyte salt, is present in an amount of 0% to at most 2% by weight relative to the total weight of the emulsion.

5,552,447

RIGID CLOSED CELL POLYISOCYANATE BASED FOAMS FOR USE AS POSITIVE FLOTATION MATERIALS IN WATERCRAFT

Todd J. Green, Canton, Mich., assignor to BASF Corporation, Mount Olive, N.J.

Division of Ser. No. 442,237, May 15, 1995, Pat. No. 5,488,072, which is a division of Ser. No. 383,627, Feb. 6, 1995, Pat. No. 5,449,699. This application Dec. 13, 1995, Ser. No. 571,500

Int. Cl.[6] C08G *18/18;* **C08J** *9/14*

U.S. Cl. 521—129 **16 Claims**

1. A rigid closed cell polyisocyanate based foam obtained by reacting at least:

a) an organic diisocyanate or polyisocyanate;

b) a polyol composition comprised of:

i) a polyoxyalkylene polyether polyol; and

ii) 2.5 wt. % or less of water based on the weight of the polyol composition; and

c) a frothing agent comprising 1,1,1,2-tetrafluoroethane;

wherein said polyisocyanate based foam satisfies all the flotation requirements set forth in 33 CFR §183.114 (a)–(h).

5,552,448

PLASTIC FOAM MATERIAL COMPOSED OF THERMOPLASTIC RESIN AND SILANE-MODIFIED THERMOPLASTIC RESIN AND METHOD FOR MAKING SAME

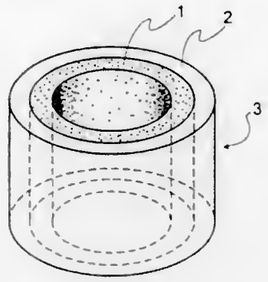
Tomoyuki Kobayashi; Kenji Miyazaki, both of Kyoto, and Masanori Nakamura, Osaka, all of, Japan, assignors to Sekisui Chemical Co., Ltd., Osaka, Japan

Filed Sep. 21, 1994, Ser. No. 309,960

Claims priority, application Japan, Sep. 21, 1993, 5-235037

Int. Cl.[6] C08G *77/00*

U.S. Cl. 521—154 **40 Claims**



1. A plastic foam material comprising:

100 parts by weight of at least two substantially incompatible thermoplastic resins selected from the group consisting of polyethylene, polypropylene, ethylene-propylene copolymer, ethylene-vinyl acetate copolymer, and polystyrene;

from about 1 to about 50 parts by weight of a silane-modified thermoplastic resin of the same polymer type as at least one of said two substantially incompatible resins;

from about 0.001 to about 2.5 parts by weight of a cross-linking catalyst effective to cross-link said silane-modified thermoplastic resin; and

from about 1 to about 20 parts by weight of a foaming agent.

5,552,449

POLYURETHANE FOAM BASED ON COMBINATION OF POLYESTER RESIN AND POLYETHER POLYOL

Joseph S. Sollers, Lutherville; Roland N. Fracalossi; Walter V. V. Greenhouse, both of Baltimore, and George J. Tolen, Ellicott City, all of Md., assignors to Wm. T. Burnett & Co., Inc., Baltimore, Md.

Continuation of Ser. No. 688,330, Apr. 22, 1991. This application Dec. 6, 1994, Ser. No. 353,996

Int. Cl.[6] C08G *18/14*

U.S. Cl. 521—155 **10 Claims**

1. A flexible polyurethane foam comprising the foam-forming reaction product of water as a foaming agent, a diisocyanate, a blend of polyether polyol and polyester pelyol which are immiscible with each other, and a foam stabilizing organo-silicone emulsifier; the ratio of polyether polyol to polyester polyol being from about 90:10 to 10:90, and said polyester polyol being based on a dicarboxylic acid and diethyleneglycol, each of said polyols having a molecular weight of from about 1500 to about 7000 and being present in an amount sufficient to impart to said flexible polyurethane foam produced increased softness relative to a flexible polyurethane foam produced solely from a polyether or polyester polyol.

5,552,450

PRODUCTION OF RIGID POLYURETHANE FOAMS

Werner Hinz, Frankenthal; Rolf Henn, Ketsch; Uwe Keppeler, Hochdorf-Assenheim, and Bernd Guettes, Saligast, all of, Germany, assignors to BASF Aktiengesellschaft, Germany

Filed Apr. 18, 1994, Ser. No. 229,255

Int. Cl.[6] C08G *18/00*

U.S. Cl. 521—174 **8 Claims**

1. A process for the production of rigid polyurethane foam comprising reacting

a) organic and/or modified organic polyisocyanates with

b) at least one high-molecular-weight compound containing at least two reactive hydrogen atoms, in the presence of

c) blowing agents, and

d) catalysts,

where the high-molecular-weight compounds (b) containing at least two reactive hydrogen atoms comprise polyoxypropylene-polyols and/or polyoxyethylene-polyoxypropylene-polyols containing up to 20% by weight, based on the weight of the alkylene oxide units, of pendant oxyethylene units, and said polyols having a functionality of from 3.8 to 4.1, a hydroxyl number of from 385 to 410 mg of KOH/g and a viscosity of from 1700 to 2400 mPa·s at 25° C., prepared by polymerization of 1,2-propylene oxide and, optionally, ethylene oxide on an initiator molecule mixture comprising sucrose, pentaerythritol and diethylene glycol

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5,552,451

REMOVABLE, LOW MELT VISCOSITY ACRYLIC PRESSURE SENSITIVE ADHESIVES

Albert I. Everaerts, Oakdale, and Jeffrey D. Malmer, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 218,841, Mar. 28, 1994, abandoned, which is a continuation of Ser. No. 816,593, Dec. 31, 1991, abandoned. This application Nov. 4, 1994, Ser. No. 334,807

Int. Cl.[6] C08F *2/46*

U.S. Cl. 522—46 **20 Claims**

1. An acrylic pressure-sensitive adhesive comprising:

a.) about 10 to about 50% by weight of at least one higher alkyl acrylate having an alkyl group which contains about 18 to about 26 carbon atoms;

b.) about 90 to about 50% by weight of at least one lower alkyl acrylate having an alkyl group which contains about 4 to about 12 carbon atoms; and

c.) a crosslinking agent present in an amount sufficient such that, when polymerized and cured, the adhesive composition is tacky at room temperature.

5,552,452

ORGANIC TISSUE GLUE FOR CLOSURE OF WOUNDS

John Khadem, Chicago, Ill., and Toan V. Truong, Anaheim Hills, Calif., assignors to Arch Development Corp., Chicago, Ill.

Filed Mar. 15, 1993, Ser. No. 33,314

Int. Cl.[6] C09J *189/00;189/04;189/06;* **C08F** *2/50*

U.S. Cl. 522—63 **34 Claims**

1. A composition comprising from about 1% (w/v) to about 50% (w/v) of a biocompatible peptide in solution and in combination with an amount of a flavin pbotosensitizer capable of producing reactive oxygen species and effective to promote the formation of an adhesive upon pbotoactivation without more than about 2° C. rise in temperature.

5,552,453

WATER-ABSORPTIVE MATERIAL AND METHOD OF PRODUCING WATER-ABSORPTIVE MOLDED PRODUCT

Takeshi Fujita, Uji; Katsuaki Matsuo, Kyoto, and Osamu Kakishita, Nagahama, all of, Japan, assignors to Mitsubishi Plastics, Inc., Tokyo, and Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, both of, Japan

Filed Dec. 16, 1994, Ser. No. 357,756

Int. Cl.[6] C08J *3/28*

U.S. Cl. 522—165 **4 Claims**

1. A water-absorptive, water-insoluble material obtained by crosslinking with an ionizing radiation or ultraviolet rays a hydrophilic high molecular compound having a weight average molecular weight of at least 10,000 obtained by reaction of (i) a polyalkylene oxide compound having an organic compound containing two active hydrogen groups addition-polymerized with an alkylene oxide comprising ethylene oxide as the main component and (ii) a polycarboxylic acid, a polycarboxylic acid anhydride, a lower alkyl ester of polycarboxylic acid or a diisocyanate.

5,552,454

NEW MATERIALS FOR BONE REPLACEMENT AND FOR JOINING BONES OR PROSTHESES

Josef Kretschmann, Langenfeld; Wolfgang Ritter, Haan, and Johann-Friedrich Fues, Grevenbroich, all of, Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

Continuation of Ser. No. 48,563, Apr. 16, 1993, abandoned, which is a continuation of Ser. No. 656,056, Feb. 8, 1991, abandoned. This application Nov. 4, 1994, Ser. No. 334,633

Claims priority, application Germany, Aug. 9, 1988, 38 26 915.5

The portion of the term of this patent subsequent to Sep. 1, 2009, has been disclaimed.

Int. Cl.[6] A61F *2/02;2/28;* **A61K** *31/74*

U.S. Cl. 523—113 **27 Claims**

1. A composition for replacing bone, joining bones and for implanting prosthesis material in living bone tissue comprising: a particulate body-compatible ceramic material in admixture with at least one body-resorbable polymer of lower hydroxy-carboxylic acid monomers wherein a molecular weight of the polymer of from 200 to 10,000 grams per mol. is regulated by coreaction with at least one co-reactant selected from the group consisting of monocarboxylic acids, polycarboxylic acids, monohydroxyl alcohols and polyhydroxyl alcohols wherein the polymer contains not more than 0.5% by weight free carboxyl groups.

5,552,455

5,552,457

5,552,459

HIGHLY FILLED EPOXY CASTING RESIN

III. 1 to 10 parts by weight of a peroxidic vulcanization agent;

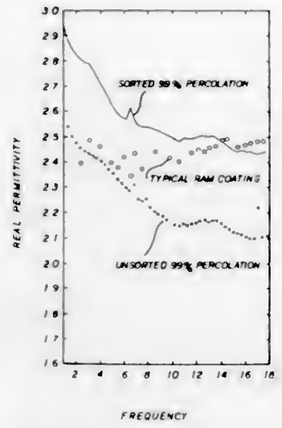
IV. 0 to 4 parts by weight of a vulcanization activator; and

5,552,455

RADAR ABSORBING MATERIAL AND PROCESS FOR MAKING SAME

Ann M. Shuler, Marina Del Rey; Burl C. Fisher, Jr., Northridge, both of Calif., and Denys D. Overholser, Carson City, Nev., assignors to Lockheed Corporation, Calabasas, Calif.

Filed Aug. 31, 1995, Ser. No. 521,165
Int. Cl.[6] G21F *1/10*; C08K *3/10*
U.S. Cl. 523—137 **10 Claims**



1. A radar absorbing material comprising a binder material containing a mixture of two groups of spheres made of a magnetic material, said first group having a specific average diameter and said second group having an average diameter generally 0.73 times the specific average diameter of said spheres of said first group, said first and second groups containing generally equal numbers of spheres and the amount of said binder material just sufficient to both bind said mixture together while maintaining said individual spheres separated from each other.

5,552,456

DRAG REDUCING RAPID SOLVATING SLURRY CONCENTRATE AND PREPARATION

Robert F. Supcoe, Annapolis; Ira M. Felsen, Greenbelt, both of Md., and William T. Donahue, Brookline Center, Minn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 26, 1974, Ser. No. 500,428
Int. Cl.[6] B05D *5/08*
U.S. Cl. 523—175 **12 Claims**

I. A method of producing a stable thixotropic drag reducing slurry by:

precoating particles of drag reducing polymer resin with a nonionic surfactant fluid;

combining methoxy triglycol, triacetin and triisopropanolamine and agitating the mixture until a clear single phase liquid solution is produced;

adding an amphoteric surfactant to the clear solution and mixing to produce a uniform two phase mixture; and,

adding the precoated polymer resin particles to the two phase mixture then agitating this mixture to achieve a micelle structure.

5,552,457

PROCESS FOR MAKING A CARBON BLACK/RESIN MASTERBATCH

Charles L. Bull, Jr., North Lawrence, and Howard A. Colvin, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 11, 1995, Ser. No. 526,351
Int. Cl.[6] C08J *3/22*; C08L *9/00*
U.S. Cl. 523—351 **11 Claims**

1. A process for making a syndiotactic-1,2-polybutadiene resin/carbon black masterbatch powder which consists of the steps of: (1) mixing the carbon black and the syndiotactic-1,2-polybutadiene resin in an aqueous medium at an elevated temperature to produce an aqueous dispersion, wherein the weight ratio of the syndiotactic-1,2-polybutadiene resin to the carbon black is within the range of about 0.01:1 to 0.8:1, with the proviso that the elevated temperature is about 5° C. to about 40° C. above the melting point of the syndiotactic-1,2-polybutadiene resin; (2) cooling the aqueous dispersion to a temperature which is below the melting point of the syndiotactic-1,2-polybutadiene resin; and (3) recovering the masterbatch powder from the aqueous dispersion.

5,552,458

PASSIFICATION OF OPTICALLY VARIABLE PIGMENT AND WATERBORNE COATING COMPOSITIONS CONTAINING THE SAME

Jon R. Hall, Howell; Clint W. Carpenter, Royal Oak, and Stuart K. Scott, Allen Park, all of Mich., assignors to BASF Corporation, Southfield, Mich.

Division of Ser. No. 247,803, May 23, 1994, Pat. No. 5,498,781. This application May 11, 1995, Ser. No. 439,532
Int. Cl.[6] C08K *3/20*; C08L *63/02*
U.S. Cl. 523—403 **9 Claims**

1. A waterborne coating composition comprising

a) optically variable pigment modified with

i) a silane functional compound having the formula

(I)

where R^1 R^2 and R^3 may be the same or different and are selected from alkyl of from one to ten carbon atoms, alkoxyl of from one to ten carbon atoms, alkoxyalkoxyl of from two to ten carbon atoms, alkanoyloxy of from two to ten carbon atoms, or halogen, with the proviso that R^1, R^2, and R^3 may not all be alkyl, the group "A" is a divalent radical selected from straight or branched alkylene of from one to twelve carbon atoms, phenylene or phenylene substituted with halogen, or alkyl or alkoxyl of from one to four carbon atoms, the group "X" is selected from the group consisting of —OH—, —SH, —NHR_4, —NCO—, epoxy, carbonate, anhydride, phenol, and mixtures thereof, wherein R^4 is hydrogen or alkyl of from 1 to 12 carbon atoms and

ii) a copolymer which is a polymeric backbone having a reactive functionality thereon selected from the group consisting of isocyanate, epoxy, anhydride, primary or secondary amine, hydroxy or carbonate functionalities and mixtures thereof and

b) a polymer resin binder.

5,552,459

HIGHLY FILLED EPOXY CASTING RESIN COMPOSITIONS

Dieter Baumann, Möhlin, Switzerland; Werner Hollstein, Freiburg; Claus W. Rabener, Oetlingen, both of, Germany, and Peter Rüger, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 158,842, Nov. 29, 1993, abandoned, which is a continuation of Ser. No. 979,957, Nov. 23, 1992, abandoned. This application May 10, 1994, Ser. No. 240,791
Claims priority, application Switzerland, Nov. 27, 1991, 3470/91
Int. Cl.[6] C08K *3/22*; C08L *63/00;63/02*
U.S. Cl. 523—427 **11 Claims**

1. A flame-retarded casting resin composition for electrical and electronic components consisting essentially of:

A) an epoxy resin mixture consisting essentially of

A1) 15–35% by weight of a liquid mixture of a bisphenol A diglycidyl ether, a bisphenol F diglycidyl ether and butane-1,4-diol diglycidyl ether,

A2) 55–85% by weight of aluminum oxide trihydrate having a particle size of D_{50} 20–25 μm as determined by sieving,

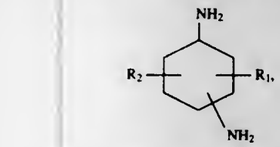
A3) 0–20% by weight of at least one further non-electrically conducting filler and

A4) 0–5% by weight of at least one further additive, selected from the group consisting of dyes, pigments, plasticizers, antifoams, flow agents, mould release agents, thixotropic agents, antioxidants, light stabilizers and adhesion promoters

B) at least one carboxylic acid anhydride

or

a cycloaliphatic diamine of the formula I or II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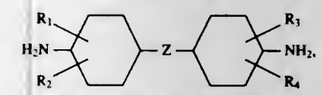

(II)

in which the radicals R_1 to R_4 independently of one another are hydrogen or C_1–C_4alkyl and Z is a direct bond, —CH_2—, —$C(CH_3)_2$—, —S—, —O—, —SO_2— or —CO—, in an amount sufficient to cure component A, the content of components A2 and A3 together being 63–80% by weight, with respect to the total weight of components A and B and

C) optionally at least one cure accelerator.

5,552,460

PROCESS FOR PRODUCING COMPOSITE ARTICLES MADE OF POLYESTERS AND ELASTOMERS

Friedrich G. Schmidt, Haltern, Germany, and Horst Heuer, Haltern, Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

Filed Mar. 30, 1995, Ser. No. 413,821
Claims priority, application Germany, Apr. 30, 1994, 44 15 302.3
Int. Cl.[6] C08K *5/29*
U.S. Cl. 523—522 **16 Claims**

1. A process for producing a composite article comprising:

i) a thermoplastic polyester hard component; and

ii) a vulcanized soft component,

comprising the step of vulcanizing a soft component while in contact with a thermoplastic polyester hard component under conventional vulcanization conditions,

wherein said soft component comprises:

I. 100 parts by weight of a rubber;

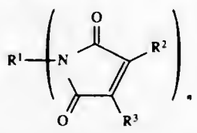
II. 0 to 300 parts by weight of a filler;

III. 1 to 10 parts by weight of a peroxidic vulcanization agent;

IV. 0 to 4 parts by weight of a vulcanization activator; and

V. 0 to 150 parts by weight of a plasticizer, wherein

a) either said hard component, said said soft component or both, further comprises from 0.5 to 12 parts by weight of a difunctional or polyfunctional maleimide of the formula



where R^1 is a divalent or higher-valent radical or a direct bond, while R^2 and R^3 are each, independently hydrogen, C_{1-20} alkyl, C_{3-20} cycloalkyl or C_{6-20} aryl; n is an integer greater than or equal to 2, and

b) wherein when said hard component contains no difunctional or polyfunctional maleimide, said rubber possesses carboxyl or acid anhydride groups.

5,552,461

COMPOSITION AND METHOD FOR IMPROVING THE EXTRUSION CHARACTERISTICS OF AQUEOUS STARCH-POLYMER MIXTURES

Randall V. Redd, Wilmington, and Paul W. Bacon, Hockessin, both of Del., assignors to Environmental Packing L.P., Wilmington, Del.

Filed Dec. 30, 1994, Ser. No. 366,652
Int. Cl.[6] C08L *3/00;89/00*; C09D *4/00*
U.S. Cl. 524—47 **9 Claims**

1. A method for improving the extrusion characteristics of starch-polymer mixtures comprising the sequential steps of:

(1) admixing finely divided particles of starch and polymer with a minor amount of water, the amount of water being such that the admixture is maintained in powder configuration;

(2) forming a hard shaped form of the starch and polymer admixture by subjecting the admixture step (1) to de-aeration and pressure compaction;

(3) milling the hard shaped form of starch and polymer admixture and classifying the particles therefrom to separate a quantity of the milled admixture in granular form having a particle size of 250–3500 micrometers and average particle size of 600–1700 micrometers from any oversized particles and fines; and

(4) admixing a lubricating compound with the separated particles having a particle size of 250–3500 micrometers and average particle size of 600–1700 micrometers to effect coating of the particles while maintaining the particles in granular configuration.

5,552,462

COMPOSITIONS INCLUDING CATIONIC POLYMERS AND ANIONIC XANTHAN GUM

Michael H. Yeh, Hamilton, N.J., assignor to Rhone-Poulenc Inc., Monmouth Junction, N.J.

Filed Nov. 22, 1993, Ser. No. 156,189
Int. Cl.[6] C08L *5/00*; C09D *4/00*; C09J *4/00*; C07H *11/04*
U.S. Cl. 524—55 **23 Claims**

1. A blend composition comprising about 1 to about 99 parts of one or more cationic polysaccharides and about 99 to about 1 parts of anionic substituted xanthan gum.

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(b) an effective stabilizing amount of a compound of formula II

of styrene, α-methyl styrene, nucleus-substituted styrene and methyl methacrylate and

a second part comprising an aqueous fountain solution contain-

5,552,463

SEMICRYSTALLINE BLENDS OF POLYALKYLENE TEREPHTHALATES AND POLYARYLATES

Murali K. Akkapeddi, Morristown, and Seng-Shiu Chung, Randolph, both of N.J., assignors to AlliedSignal Inc., Morris Township, N.J.

Continuation of Ser. No. 874,261, Apr. 24, 1992, abandoned. This application May 26, 1995, Ser. No. 451,344

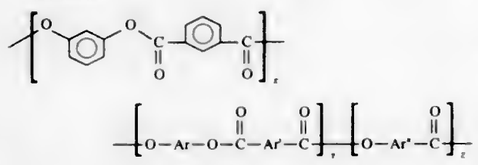
Int. Cl.[6] C08L *67/02;67/03*

U.S. Cl. 524—98 **13 Claims**

1. A miscible blend composition comprising, based on the total weight of the composition, a blend of:

from about 30 to about 90 weight % of polyalkylene terephthalate;

from about 70 to about 10 weight % of polyarylate of the formula:



wherein

the —O—Ar—O— represents units derived from an aromatic diol,

the —CO—Ar'—CO— represents units derived from a dicarboxylic acid,

the —O—Ar"—CO— represents units derived from a hydroxy benzoic acid,

x is greater than or equal to 0.5,

y is less than or equal to 0.5,

z is less than or equal to 0.5, and

x+y+z=1; and

an effective amount of a ester-interchange inhibitor selected from the group consisting of inhibitors having the formula:

wherein X_1, X_2, and X_3 are lactamyl groups, and wherein said lactamyl groups are unsubstituted or substituted with one or more alkyl groups.

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POLYMER STABILIZERS CONTAINING BOTH HINDERED AMINE AND HYDROXYLAMINE MOIETIES

Joseph Suhadolnik, Ossining; Ramanathan Ravichandran, Nanuet, both of N.Y.; Valerio Borzatta, Bologna, and Graziano Vignali, Sasso Marconi, both of, Italy, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Division of Ser. No. 3,068, Jan. 11, 1993, Pat. No. 5,410,047, which is a division of Ser. No. 606,403, Oct. 31, 1990, Pat. No. 5,202,441. This application Jan. 12, 1995, Ser. No. 371,637

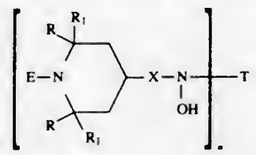
Int. Cl.[6] C08K *5/3435*

U.S. Cl. 524—99 **18 Claims**

1. A stabilized composition which comprises

(a) polymer subject to the deleterious effects of actinic light or of heat, and

(b) an effective stabilizing amount of a compound of formula II



(II)

wherein

E is hydrogen, oxyl, hydroxyl, alkyl of 1 to 18 carbon atoms, alkenyl of 3 to 18 carbon atoms, aralkyl of 7 to 9 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, hydroxyalkyl of 2 to 6 carbon atoms, alkoxyalkyl of 2 to 20 carbon atoms, alkanoyl of 1 to 18 carbon atoms, alkoxy of 1 to 18 carbon atoms, cycloalkoxy of 5 to 12 carbon atoms, aryloxy of 6 to 10 carbon atoms, hydroxyalkoxy of 2 to 6 carbon atoms, alkoxyalkoxy of 2 to 20 carbon atoms, aralkoxy of 7 to 15 carbon atoms or a bicyclo or tricycloaliphatic oxy radical of 7 to 12 carbon atoms,

R and R_1 are independently alkyl of 1 to 4 carbon atoms or together R and R_1 are pentamethylene,

X is a direct bond,

n is 1, and

T is hydrogen, alkyl of 1 to 36 carbon atoms, said alkyl interrupted by one or more oxygen atoms, cycloalkyl of 5 to 12 carbon atoms, aralkyl of 7 to 9 carbon atoms, or said aralkyl substituted by alkyl of 1 to 4 carbon atoms or by one or two halogen atoms; cyanoethyl, alkenyl of 2 to 8 carbon atoms, or alkoxycarbonylalkyl of 4 to 36 carbon atoms where alkyl is 1 to 4 carbon atoms.

5,552,465

POLYCARBONATE MOLDING COMPOUNDS STABLE TO LIGHT AGEING

Dieter Witmann, Köln; Jochen Schoeps, Krefeld; Bernd Urbanneck, Mönchengladbach; Karl Huff, Dormagen; Karl-Heinz Ott, and Horst Peters, both of Leverkusen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 355,462, Dec. 14, 1994, abandoned, which is a continuation of Ser. No. 777,986, Oct. 17, 1991, abandoned. This application Dec. 1, 1995, Ser. No. 566,030

Claims priority, application Germany, Oct. 24, 1990, 40 33 806.1

Int. Cl.[6] C08K *5/51;5/52;* **C08L** *51/00;69/00*

U.S. Cl. 524—139 **5 Claims**

1. A thermoplastic molding compositions comprising

A) 30 to 97% by weight of A+B+C, of at least one member selected from the group consisting of a thermoplastic aromatic polycarbonate, an aromatic polyester carbonate and an aromatic polyester.

B) 3 to 30% by weight relative to the total weight of A+B+C, of a graft polymer of

B.1 40 to 90% by weight relative to the weight of said graft polymer of an at least crosslinked particulate diene rubber having an average particle diameter (d_{50}) of from 0.05 μm to 2.0 μm, and

B/2 60 to 10% by weight relative to the weight of said graft polymer of at least one member selected from the group consisting of styrene, acrylonitrile, and methyl methacrylate prepared by an emulsion graft polymerization using an initiator of an organic hydroperoxide and ascorbic acid to obtain a graft yield of >60% by weight of the monomers B.2,

C) 0 to 40% by weight relative to the total weight of A+B+C, of a thermoplastic resin which is

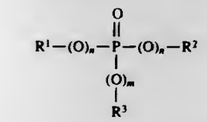
C.1 a thermoplastic copolymer of

C.1.1 50 to 95% relative to the weight of said copolymer of at least one member selected from the group consisting of styrene, α-methyl styrene, nucleus-substituted styrene and methyl methacrylate and

C.1.2 50 to 5% relative to the weight of said copolymer of at least one member selected from the group consisting of acrylonitrile, methacrylonitrile, methylmethacrylate, maleic anhydride and N-substituted maleic imide, or

C.2 a polyalkylene terephthalate,

D) 1 to 20 parts by weight, based on 100 parts by weight of A+B+C, of a phosphorus compound corresponding to formula (I)



in which

R^1, R^2 and R^3 independently of one another represent optionally halogenated C_{1-8} alkyl or optionally halogenated and/or optionally alkylated C_{6-20} aryl,

m is 0 or 1 and

n is 0 or 1,

E) 0.05 to 5 parts by weight, based on 100 parts by weight A+B+C, of a fluorinated polyolefin having an average particle diameter of 0.05 to 1000 μm, a density of 1.2 to 2.3 g/cm^3 and a fluorine content of 59 to 76% by weight.

5,552,466

PROCESSABLE SILICONE COMPOSITE MATERIALS HAVING HIGH TEMPERATURE RESISTANCE

Don A. Beckley, Newport Beach, and John Stites, Huntington Beach, both of Calif., assignors to Hitco Technologies Inc., Gardena, Calif.

Continuation-in-part of Ser. No. 169,505, Dec. 17, 1993, abandoned. This application Dec. 15, 1994, Ser. No. 356,559

Int. Cl.[6] C08K *5/54*

U.S. Cl. 524—265 **50 Claims**

1. A processable blend having high temperature, oxidation and thermal shock resistance comprising:

a resin blend comprising a silsesquioxane component comprising at least one silsesquioxane polymer and at least one polydiorganosiloxane component;

wherein said resin blend is ceramitizable at a temperature above about 1100° F.;

and wherein at 25° C. said silsesquioxane component has a viscosity of about 500,000 centipoise and above, and said polydiorganosiloxane component has a viscosity of from about 10 to about 1000 centipoise.

5,552,467

VEGETABLE OIL BASED THERMOSETTING LITHOGRAPHIC INK SYSTEM

Ralph H. Reiter, River Vale, N.J., and Narendra M. Patel, Mt. Pocono, Pa., assignors to Sun Chemical Corporation, Fort Lee, N.J.

Filed Mar. 6, 1995, Ser. No. 398,729

Int. Cl.[6] C08L *23/00;* **C08K** *5/04;* **C03C** *17/00;* **C09D** *11/06*

U.S. Cl. 524—270 **12 Claims**

1. A vegetable oil-based, heat curable lithographic printing ink system comprising:

a first part comprising a liquid lithographic printing ink containing pigment, a rosin ester containing vegetable oil, unsaturated polyester resin(s) having free carboxylic acid groups, a reducing agent comprising a lower valence state salt and a cross-linking agent comprising an organometallic salt selected from the group consisting of carboxylic acid salts of Groups IIA–VIIIA metals of the Periodic Table of the Elements plus copper, zinc, aluminum, tin and lead; and

a second part comprising an aqueous fountain solution containing an organic hydroperoxide or peroxide.

5,552,468

RUBBERY BLEND HAVING LOW PERMANENT COMPRESSION SET

Hung Ngoc, Limeil Brevannes, and Guy Duval, Paris, both of, France, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 154,053, Nov. 18, 1993, Pat. No. 5,362,787. This application Nov. 7, 1994, Ser. No. 334,991

Int. Cl.[6] C08L *9/02*

U.S. Cl. 524—297 **10 Claims**

1. A highly crosslinked nitrile rubber composition which can be blended with polyvinyl chloride to make compositions having excellent characteristics for seals and gaskets including dimensional stability, low compression set, and outstanding sealing characteristics, said highly crosslinked nitrile rubber composition being comprised of (1) a highly crosslinked nitrile rubber having repeat units which are derived from (a) about 45 weight percent to about 79 weight percent 1,3-butadiene, (b) from about 20 weight percent to about 50 weight percent acrylonitrile, and (c) from about 0.5 weight percent to about 5 weight percent of a crosslinking agent, wherein said highly crosslinked nitrile rubber has a Mooney viscosity of about 50 to about 120, a swelling index of less than about 10 percent, a mill shrinkage of less than 10 percent, and a gel content of greater than 95 percent; and (2) from about 1 to about 30 phr of a plasticizer.

5,552,469

INTERCALATES AND EXFOLIATES FORMED WITH OLIGOMERS AND POLYMERS AND COMPOSITE MATERIALS CONTAINING SAME

Gary W. Beall, McHenry; Semeon Tsipursky, Lincolnwood; Anatoliy Sorokin, Buffalo Grove, and Anatoliy Goldman, Palatine, all of Ill., assignors to AMCOL International Corporation, Arlington Heights, Ill.

Filed Jun. 7, 1995, Ser. No. 488,264

Int. Cl.[6] C08K *3/34;* **C03C** *10/14*

U.S. Cl. 524—445 **83 Claims**

1. An intercalate, capable of being exfoliated, formed by contacting a layered silicate material, having adjacent silicate platelets and having a moisture content of at least about 5% by weight, with a water-soluble intercalant polymer and water, without a coupling agent selected from the group consisting of onium ion and silane coupling agents, to form a mixture of said layered material in contact with an intercalate polymer composition, said intercalate polymer composition having a concentration of said polymer of at least about 2% by weight polymer, to achieve sorption of the water-soluble polymer between said adjacent silicate platelets of the layered silicate material to expand the spacing between a predominance of the adjacent platelets of said layered silicate material to at least about 10 Å, when measured after sorption of the water-soluble polymer.

5,552,470

THERMOPLASTIC ELASTOMER COMPOSITION

Junichi Kubo, Yokohama, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Nov. 28, 1994, Ser. No. 345,161

Claims priority, application Japan, Nov. 30, 1993, 5-326285

Int. Cl.[6] C08L *95/00*

U.S. Cl. 524—484 **3 Claims**

1. A thermoplastic elastomer composition which comprises 100 parts by weight of a thermoplastic elastomer and from 0.1 to 20 parts by weight of a hydrogenated oil derived from hydrogenation of either of:

i) a liquid product resulting from thermally treating a coal tar or

a second component which includes a functional group for

polycarboxylic or anhydride substitution being selected from

i) a liquid product resulting from thermally treating a coal tar or distillates thereof;
ii) a liquid product resulting from thermally treating a petroleum crude oil, distillates thereof, or a liquid hydrocarbon derived from catalytic cracking, hydrogenative cracking or catalytic reforming of petroleum distillates; or
iii) a thermally cracked tar resulting from thermally cracking a petroleum crude oil or distillates thereof,
the thermal treatment for said products of i) and being carried out at a temperature above 400° C. and at a pressure of 0.5 to 1.5 kg/g^2.

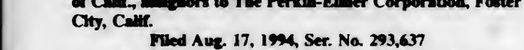
5,552,471

SOLID SUPPORT REAGENTS FOR THE SYNTHESIS OF 3'-NITROGEN CONTAINING POLYNUCLEOTIDES

Sam L. Woo, Redwood City, and Steven Fung, Palo Alto, both of Calif., assignors to The Perkin-Elmer Corporation, Foster City, Calif.

Filed Aug. 17, 1994, Ser. No. 293,637
Int. Cl.[6] C03C *12/00;* **C08L** *25/06;* **C07H** *21/04*
U.S. Cl. 524—494 **26 Claims**

1. A solid support reagent for the synthesis of polynucleotides containing a nitrogen group at the 3'-end, the solid support reagent having the structure:



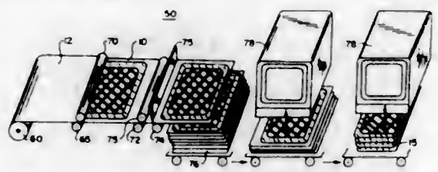
wherein:
T is an acid-cleavable hydroxyl protecting group;
Q is a linker for connecting nitrogen and oxygen;
R_1 is a nitrogen substituent;
R_2 through R_4 are separately hydrogen or lower alkyl;
Y is an atom which is electronegative with respect to carbon;
X_1 is a moiety which is electronegative with respect to carbon;
Z is a bond or spacer arm; and
W is a derivatized solid synthesis support capable of linking to Z.

5,552,472

FABRIC CONTAINING GRAFT POLYMER THEREON

Richard C. Kerr, Rutherfordton, N.C.; John R. Damewood; Jill Menzel, both of Spartanburg, S.C.; Paul Thottathil, New Hyde Park, and Mohan L. Sanduja, Flushing, both of N.Y., assignors to Reeves Brothers, Inc., Spartanburg, S.C.

Division of Ser. No. 828,082, Jan. 30, 1992, Pat. No. 5,407,728. This application Jan. 13, 1995, Ser. No. 372,733
Int. Cl.[6] J08J *3/02*
U.S. Cl. 524—500 **11 Claims**



1. A solution for forming a grafted substrate comprising an aqueous solution that contains:
a graft initiator comprising a metal ion for activating sites on a substrate having active hydrogens;
a catalyst for activating the graft initiator;
a first component which includes a functional group for reaction with an activated site on the substrate for grafting the first component thereto and for forming an active site on the first component; and
a second component which includes a functional group for reacting with an activated site on the substrate or the first component and for forming an active site on the second components;
wherein the first and second components are grafted onto a substrate which includes an active hydrogen and is contacted by the aqueous solution to form a grafted substrate; and one of the first and second components comprises a polymer which imparts increased integrity to the grafted substrate while the other component comprises a monomer which imparts increased flexibility or pliability to the grafted substrate.

5,552,473

FUNCTIONALIZED POLYMER AND RUBBER COMPOSITIONS PRODUCED FROM SOLUBILIZED ANIONIC POLYMERIZATION INITIATORS

David F. Lawson, Uniontown; Mark L. Stayer, Jr., Suffield, and David Saffles, Massillon, all of Ohio, assignors to Bridgestone Corporation, Tokyo, Japan

Division of Ser. No. 65,791, May 24, 1993, which is a continuation-in-part of Ser. No. 955,969, Oct. 2, 1992, Pat. No. 5,332,810. This application Jun. 5, 1995, Ser. No. 469,389
Int. Cl.[6] C08K *3/04;* **C08F** *8/42;36/04*
U.S. Cl. 524—575 **12 Claims**

1. A functionalized polymer comprising:
a polymer chain comprising at least one polymerization unit selected from the group consisting of conjugated dienes having from about 4 to about 12 carbon atoms, monovinyl aromatic monomers having 8 to 18 carbon atoms and trienes, said polymer chain carrying at least one functional group A selected from the group consisting of azacyclotridecane, azacycloheptadecane, 1-azacycloheptadec-9-ene, and, 1-azacycloheptadec- 8-ene, wherein A is derived from a polymerization initiator having the formula

where y is of from about 1 to about 3; and SOL is a solubilizing component selected from the group consisting of hydrocarbons, ethers, amines and mixtures thereof.

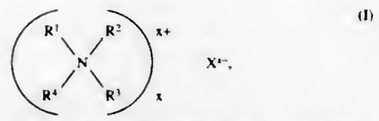
5,552,474

AQUEOUS SOLUTIONS OF ORGANOPOLYSILOXANE-AMMONIUM COMPOUNDS, METHODS OF THEIR MANUFACTURE AND USE

Peter Panster, Rodenbach, and Stefan Wieland, Offenbach, both of, Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Germany

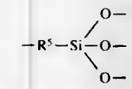
Filed Mar. 3, 1995, Ser. No. 400,790
Claims priority, application Germany, Mar. 17, 1994, 44 09 140.0
Int. Cl.[6] C08L *83/00*
U.S. Cl. 524—588 **21 Claims**

1. An aqueous alkaline solution of organopolysiloxane-ammonium compounds, said solution comprising dissolved polysiloxane compounds which consist of units with the following formula:



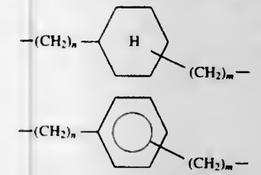
(I)

in which R^1 and R^2 are the same or different and signify a group with the formula

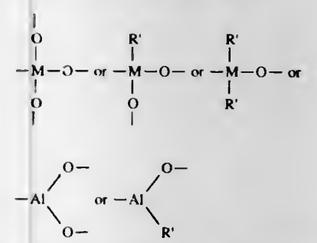


(II)

wherein the nitrogen atoms in (I) are connected via the residues R^5 with the silicon atoms in (II) and the free valences of O are partially or completely saturated by H or by alkali metal ions and R^5 represents an alkylene group with 1 to 10 C atoms, a cycloalkylene group with 5 to 6 C atoms or a unit with the formula



in which n is a number from 1 to 6 and indicates the number of methyleoe groups and m is a number from 0 to 6, wherein if said free valences of O are only partially saturated with H or by alkali metal ions then the remaining free valences of the oxygen atoms bonded to the silicon atom are saturated by silicon atoms of further groups of formula (II) and/or with the metal atoms of one or more of the crosslinking bridge members (III)



(III)

wherein M is a silicon, titanium or zirconium atom and R' is a linear or branched alkyl group with 1 to 5 C atoms and the ratio of the silicon atoms from the groups of general formula (II) to the metal atoms in the bridge members (III) is 1:0 to 1:10, in which R^3 is R^1 or R^2 or hydrogen, a linear or branched alkyl group of 1 to 20 C atoms, or a cycloalkyl group consisting of 5 to 6 C atoms, and R^4 represents hydrogen, a linear or branched alkyl group with 1 to 20 C atoms or a cycloalkyl group consisting of 5 to 8 C atoms, x is a number from 1 to 3, and X^{x-} signifies a 1- to 3-valent anion.

5,552,475

WATERBORNE POLYESTERS HAVING IMPROVED SAPONIFICATION RESISTANCE

Padmanabhan Sundararaman; Ronald R. Ambrose, both of Hampton Township; Douglas R. Camp, Gibsonia, and Truman F. Wilt, Clinton, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 4, 1993, Ser. No. 130,893
Int. Cl.[6] C08J *3/02*
U.S. Cl. 524—608 **16 Claims**

1. A water dispersion of a polyester which is the reaction product of:
at least one polycarboxylic acid or anhydride and at least one polyhydric alcohol reacted so as to provide the polyester with hydroxyl functionality,
a portion of the hydroxyl functionality being reacted with a substituted polycarboxylic acid or substituted anhydride to form half ester groups in sufficient quantity to provide the polyester with an initial acid number of at least 40, the polycarboxylic or anhydride substitution being selected from alkenyl groups having at least four carbon atoms.

5,552,476

HYDROLYZED SILANE EMULSIONS AND THEIR USE AS SURFACE COATINGS

Robert A. Halling, Wilmington, Del., assignor to E. I. Du Pont de Nemourrs and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 206,779, Mar. 4, 1994. This application May 12, 1994, Ser. No. 248,613
Int. Cl.[6] C08J *3/03;3/07;* **B05D** *1/00;* **B01F** *17/54*
U.S. Cl. 524—837 **10 Claims**

1. A reactive aqueous emulsion comprising: (a) an alkoxysilane compound emulsified in water, wherein said alkoxysilane compound is represented by the formula:

where: R is a hydrocarbon radical of 8 to 24 carbons; R' are the same or different alkyl radicals of 1 to 3 carbon atoms; and n=2 to 10 and (b) an effective amount of an emulsifier of sufficiently high HLB value to simultaneously retain said alkoxysilane compound in a hydrolyzed state and inhibit the resulting hydrolyzed alkoxysilane compound from self-condensation.

5,552,477

COATING COMPOUND, A PROCESS FOR ITS PREPARATION AND ITS USE FOR THE PRODUCTION OF COATINGS

Rolf Dbein; Knud Reuter, both of Krefeld; Lothar Bäcker, Dormagen; Manfred Bock, Leverkusen; Werner Kubitza, Leverkusen, and Joachim Probst, Leverkusen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

PCT No. PCT/EP92/01983, § 371 Date Mar. 4, 1994, § 102(e) Date Mar. 4, 1994, PCT Pub. No. WO93/05087, PCT Pub. Date Mar. 18, 1993
PCT Filed Aug. 28, 1992, Ser. No. 204,183
Claims priority, application Germany, Sep. 10, 1991, 41 29 951.5
The portion of the term of this patent subsequent to May 3, 2011, has been disclaimed.
Int. Cl.[6] C08L *75/04;75/06;* **C08G** *18/42*
U.S. Cl. 524—840 **5 Claims**

1. An aqueous two-component coating composition containing a binder which consists essentially of
a) a polyol component which is dissolved and/or dispersed in water and consists essentially of
a1) at least one water-dilutable polyacrylic resin or polyester resin having a number average molecular weight of greater than 500 and containing hydroxyl groups and chemically bonded carboxylate and/or sulphonate groups and
a2) 5 to 70% by weight, based on the weight of component a1), of at least one water-soluble reactive diluent that either is not distillable at normal pressure or has a boiling point of at least 150° C., has a number average molecular weight of less than 300 and has at least one isocyanate-reactive group, and
b) a polyisocyanate component which has a viscosity at 23° C. of 50 to 10,000 mPa.s and is present as an emulsion in the aqueous solution and/or dispersion of polyol component a), provided that when component a1) is a urethane-modified polyester resin, said polyisocyanate component is a polyisocyanate which has not been hydrophilically modified,
wherein components a) and b) are present in amounts which correspond to an equivalent ratio of isocyanate groups of component b) to isocyanate-reactive groups of component a) of 0.5:1 to 5:1.

5,552,478

LOW PROFILE ADDITIVES FOR POLYESTER RESIN SYSTEMS BASED ON ASYMMETRIC GLYCOLS AND AROMATIC DIACIDS

Dennis H. Fisher, Westerville, Ohio, assignor to Ashland Inc., Russell, Ky.

Filed Feb. 2, 1996, Ser. No. 590,033
Int. Cl.[6] C08G *63/91*
U.S. Cl. 525—41 **3 Claims**

1. A molded part having Class A surface smoothness of Ashland Index less than 100 comprising the reaction product of unsaturated polyester, unsaturated monomer, and saturated thermoplastic polyester surface quality additive resistant to transesterification with unsaturated polyester, having 3,000 to 10,000 number average molecular weight comprising the reaction product of:

a mixture of saturated difunctional compounds wherein the major portion is an aromatic compound selected from isophthalic, orthophthalic or terephthalic acid or esters and orthophthalic anhydride, and the minor portion is an aliphatic compound selected from aliphatic diacid, diester or anhydride, and a mixture of symmetrical and asymmetric glycols.

5,552,479

GAS BARRIER FILM AND PRODUCTION PROCESS THEREOF

Hideaki Tanaka; Hiroyuki Oba, both of Ibaraki-ken, and Kazuhiko Hirose, Chiba-ken, all of, Japan, assignors to Kureha Kagaku Kogyo K. K., Tokyo, Japan

Filed Jan. 24, 1994, Ser. No. 185,353
Claims priority, application Japan, Jan. 27, 1993, 5-031404
Int. Cl.[6] C08L *29/04;33/02*
U.S. Cl. 525—57 **17 Claims**

1. A gas barrier film formed from a mixture containing polyvinyl alcohol and poly(meth) acrylic acid at a weight ratio of 95:5 to 20:80, having an oxygen permeability constant of 1.25×10^{-3} ml(STP).cm/m^2.h.atm{Pa} or smaller as measured under conditions of 30° C. and 80% relative humidity, and being insoluble in boiling water.

5,552,480

THERMOPLASTIC RESIN COMPOSITION

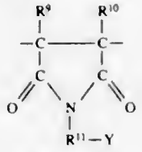
Yasuhisa Sugita, Ichihara; Naoki Kitazawa, and Hiroshi Hotta, both of Kyoto, all of, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, and Dai-ichi Kogyo Seiyaku Co., Ltd., Kyoto, both of, Japan

Filed Feb. 25, 1993, Ser. No. 22,373
Claims priority, application Japan, Feb. 28, 1992, 4-042521; Feb. 28, 1992, 4-043987
Int. Cl.[6] C08L *69/00;67/02;25/04;23/04*
U.S. Cl. 525—64 **2 Claims**

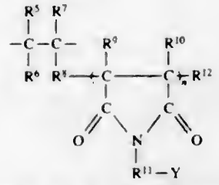
1. A thermoplastic resin composition which comprises as principal components 5 to 95% by weight of a [A] thermoplastic resin having a functional group reactive with an amino group, 95 to 5% by weight of [B] at least one polymer selected from an olefinic polymer and a styrenic polymer, the subtotal of the above [A]+[B] being 100 parts by weight, and 0.05 to 20 parts by weight of a [C] copolymer or a salt thereof, said copolymer having in a molecule thereof at least one group selected from a formamide group and an amino group, said copolymer having 20 to 99.8 mol % of the repeating unit I represented by the general formula (I); 50 to 0 mol % of the repeating unit II represented by the general formula (II); and 60 to 0.2 mol % of the repeating unit III represented by the general formula (III) or the repeating unit IV represented by the general formula (IV)

(I)

(II)

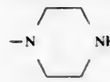


(III)

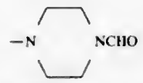


(IV)

wherein R^1, R^2, R^5, R^6 and R^7, independently of one another, are each a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, a cycloalkyl group having 3 to 8 carbon atoms, an aryl group having 6 to 10 carbon atoms, an alkenyl group having 2 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, an alkoxycarbonyl group having 1 to 18 carbon atoms, an alkylcarboxyl group having 1 to 17 carbon atoms, an alkylcarbonyl group having 1 to 6 carbon atoms, an arylcarbonyl group having 6 to 8 carbon atoms, a halogen atom or a nitrile group; R^3 and R^4, independently of one another, are each a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkenyl group having 2 to 4 carbon atoms or a halogen atom; R^8 is absent or denotes a methylene group or an ethylene group; R^9 and R^{10}, independently of one another, are each a hydrogen atom, an alkyl group having 1 to 6 carbon atoms or an aryl group having 6 to 8 carbon atoms; R^{11} is an alkylene group having 1 to 12 carbon atoms, a cycloalkylene group having 5 to 17 carbon atoms, an arylene group having 6 to 12 carbon atoms, an arylalkylene group having 7 to 12 carbon atoms or a polyoxyalkylene group having 4 to 30 carbon atoms; R^{12} is a hydrogen group or an alkyl group having 1 to 10 carbon atoms; Y is at least one kind of amino group selected from the group consisting of the general formulae (V) to (VIII),



(V)



(VI)

(VII)

(VIII)

where R^{13} in the general formula (VII) and (VIII) is an alkyl group having 1 to 6 carbon atoms; R^1 to R^{13} may be the same or different among the repeating units; and n is an integer from 1 to 10.

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VINYL CHLORIDE POLYMER/POLYOLEFIN POLYBLENDS HAVING IMPROVED RHEOLOGICAL PROPERTIES

Jean-Marc Galvez, Brussels, Belgium, and Philippe Renouard, Brionne, France, assignors to Elf Atochem S.A., Puteaux, France

Continuation of Ser. No. 884,202, May 18, 1992, abandoned. This application Aug. 3, 1994, Ser. No. 283,915
Claims priority, application France, May 16, 1991, 91 05954
Int. Cl.[6] C08L *23/00;27/06;51/06*
U.S. Cl. 525—74 **15 Claims**

1. A polyblend molding composition comprising (a) at least one vinyl chloride polymer, (b) at least one polyolefin, and (c) at least one α-monoolefin terpolymer having a vinyl chloride polymer grafted to the backbone thereof, the backbone of said graft terpolymer (c) comprising from 51% to 96% by weight of ethylene, from 3% to 40% by weight of an alkyl acrylate or methacrylate, the alkyl moiety of which having from 1 to 8 carbon atoms, and from 1% to 9% by weight of an unsaturated dicarboxylic acid anhydride.

5,552,482

THERMOPLASTIC ELASTOMERS WITH IMPROVED EXTRUSION PERFORMANCE

Dominic A. Berta, Newark, Del., assignor to Montell North America Inc., Wilmington, Del.

Filed Sep. 8, 1995, Ser. No. 525,049
Int. Cl.[6] C08L *23/26;53/00*
U.S. Cl. 525—88 **9 Claims**

1. A composition comprising a blend of

(A) about 97.5% to about 85% by weight, based on the total weight of the blend, of a dynamically partially crosslinked thermoplastic elastomer prepared from a composition comprising

(1) about 30% to about 70% of a crystalline propylene homopolymer having an isotactic index greater than 90%, or a crystalline propylene copolymer with ethylene or a 4–8 carbon alpha-olefin having a propylene content greater than 85% and an isotactic index greater than 85%;

(2) about 30% to about 60% of an amorphous rubber fraction comprising an ethylene/propylene or ethylene/butylene copolymer and, optionally, about 1% to about 10% of a diene, based on the total weight of ethylene/propylene or ethylene/butylene copolymer, wherein the rubber is xylene soluble at room temperature and contains about 30% to about 70% ethylene, and about 70% to about 30% propylene or butylene, based on the total weight of ethylene/propylene or ethylene/butylene copolymer;

(3) about 3% to about 30% of a semicrystalline ethylene/propylene or ethylene/butylene copolymer that is xylene insoluble at room temperature and contains greater than 90% ethylene, all percentages being by weight, based on the total weight of(1)+(2)+(3), and

(4) 0 to about 20 parts, based on 100 parts of (1)+(2)+(3), of a crystalline butene-1 homopolymer, wherein the ratio of polybutene-1 to rubber is less than 0.5 and,

(B) about 2.5% to about 15% by weight, based on the total weight of the blend, of an uncrosslinked olefin polymer material selected from the group consisting of

(1) a heterophasic olefin polymer composition prepared by polymerization in at least two stages comprising

(a) about 10% to about 50% of a propylene homopolymer having an isotactic index greater than 80, or a propylene copolymer selected from the group consisting of (i) propylene and ethylene, (ii) propylene, ethylene and a CH_2=CHR alpha-olefin, where R is a 2–8 carbon straight or branched alkyl, and (iii) propylene and an alpha-olefin as defined in (ii), the copolymer containing over 80% propylene and having an isotactic index greater than 80,

(b) about 5% to about 20% of a semicrystalline, essentially linear ethylene copolymer fraction having a crystallinity of about 20% to about 60%, wherein the copolymer is selected from the group consisting of (i) ethylene and propylene containing over 55% ethylene, (ii) ethylene, propylene, and an alpha-olefin as defined in (a)(ii) containing about 1% to about 10% of the alpha-olefin and over 55% of both ethylene and alpha-olefin, and (iii) ethylene and an alpha-olefin as defined in (a) (ii) containing over 55% of the alpha-olefin, which copolymer is insoluble in xylene at room or ambient temperature, and

(c) about 40% to about 80% of an ethylene copolymer fraction wherein the copolymer is selected from the group consisting of (i) ethylene and propylene containing from 20% to less than 40% ethylene, (ii) ethylene, propylene, and an alpha-olefin as defined in (a)(ii), wherein the alpha-olefin is present in an amount of about 1% to about 10% and the amount of ethylene and alpha-olefin present is from 20% to less than 40%, and (iii) ethylene and an alpha-olefin as defined in (a)(ii) containing from 20% to less than 40% of the alpha-olefin, and optionally about 0.5% to about 10% of a diene, the copolymer fraction being soluble in xylene at ambient temperature, and having an intrinsic viscosity of about 1.5 to about 4.0 dl/g,

the total of the (b) and (c) fractions, based on the total heterophasic olefin polymer composition, being about 50% to about 90%, and the weight ratio of (b)/(c) being less than 0.4, wherein the composition has a flexural modulus of less than 150 MPa,

(2) a crystalline butene-1 homopolymer, and

(3) a substantially amorphous ethylene/propylene or ethylene/butylene copolymer having an ethylene content of about 70% to about 80% and a propylene or butylene content of about 30% to about 20%; or a substantially amorphous terpolymer of (a) ethylene, (b) propylene or butylene, and (c) a nonconjugated diene, the ethylene content being about 70% to about 80%, the propylene or butylene content being about 30% to about 20%, and the diene content being about 1% to about 10%, based on the total weight of ethylene plus propylene or butylene.

5,552,483

BLOCK COPOLYMERS OF POLYSILOXANES AND COPOLYMERS OF CONJUGATED DIENES AND AROMATIC VINYL COMPOUNDS, AND MULTILAYER STRUCTURES CONTAINING SAME

William L. Hergenrother, Akron, and Daniel F. Graves, Clinton, both of Ohio, assignors to Bridgestone Corporation, Tokyo, Japan

Division of Ser. No. 146,696, Nov. 1, 1993, which is a division of Ser. No. 722,743, Jun. 28, 1991, Pat. No. 5,260,123. This application May 10, 1995, Ser. No. 438,495
Int. Cl.[6] C04L *53/00*
U.S. Cl. 525—90 **15 Claims**

1. A curable composition comprising:

(1) a natural or synthetic rubber; and

(2) from about 66% to about 900% by weight, based on the weight of (1), of a block copolymer having a number average molecular weight of at least about 100,000 and comprising alternating blocks of

(A) a polysiloxane; and

(B) a copolymer of a 1,3-conjugated diene and a monovinyl aromatic compound.

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c) a second flow control agent, different from the first flow control agent and

CH_2=CH—CH_2—$(A)_n$—OH

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STYRENE-ISOPRENE RUBBER FOR TIRE TREAD

5,552,484

VINYL CHLORIDE RESIN COMPOSITION

Masaki Enomoto, Kanagawa, Japan, assignor to Vinyl Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 32,334, Mar. 16, 1993, abandoned, which is a continuation-in-part of Ser. No. 940,479, Sep. 4, 1992, abandoned. This application Jun. 15, 1994, Ser. No. 260,024

Claims priority, application Japan, Oct. 30, 1991, 3-310014

Int. Cl.[6] C08L *53/02*

U.S. Cl. 525—98 **14 Claims**

1. A vinyl chloride resin composition, characterized in that it comprises

(A) 50 to 99.9 parts by weight of a vinyl chloride resin,

(B) 0.1 to 50 parts by weight of an aromatic vinyl compound block copolymer or a hydrogenated product thereof, and

(C) 0.01 to 1.5 parts by weight of at least one acid selected from the group consisting of saturated or unsaturated fatty acids having 6 to 18 carbon atoms and naphthenic acid, said acids being substituted or unsubstituted with a hydroxyl group, and at least one normal salt of said at least one acid, said normal salt containing a metal selected from the group consisting of lead, zinc, and cadmium, wherein the total amount of (A) and (B) is 100 parts by weight.

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ETHYLENICALLY UNSATURATED POLYMERIC ALKOXYSILANES USEFUL FOR TREATING FLUOROALUMINOSILICATE GLASS

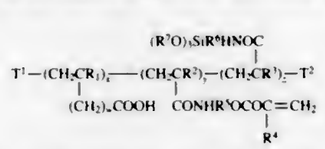
Sumita B. Mitra, West St. Paul; Scott R. Culler, Burnsville, and Bing Wang, Maplewood, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 237,035, May 3, 1994, Pat. No. 5,453,456, which is a division of Ser. No. 887,619, May 22, 1992, Pat. No. 5,332,429, which is a continuation-in-part of Ser. No. 708,467, May 31, 1991, abandoned. This application Jun. 2, 1995, Ser. No. 459,589

Int. Cl.[6] C08F *8/00*

U.S. Cl. 525—102 **4 Claims**

1. Ethylenically-unsaturated polymeric alkoxysilanes having the formula



wherein R^1, R^2, R^3, and R^4 are independently H, CH_3, COOH or CH2COOH; R^5 and R^6 are independently divalent alkylene linking groups; each R^7 is independently an alkyl group; T^1 and T^2 are independently terminating groups; w is 0 to 12; and each of x, y and z is at least one.

5,552,486

POLYMERS FROM PROPOXYLATED ALLYL ALCOHOL

Shao-Hua Guo, and Robert G. Gastinger, both of West Chester, Pa., assignors to ARCO Chemical Technology, L.P., Greenville, Del.

Division of Ser. No. 234,745, Apr. 28, 1994, Pat. No. 5,451,652. This application May 25, 1995, Ser. No. 450,747

Int. Cl.[6] C08G *18/62;63/52;* **C08L** *29/10;29/02*

U.S. Cl. 525—118 **6 Claims**

1. A propoxylated allyl alcohol polymer derivative which comprises the reaction product of:

(a) a copolymer which comprises recurring units of:

(1) allyl alcohol; and

(2) a propoxylated allyl alcohol of the formula

$$CH_2{=}CH{-}CH_2{-}(A)_n{-}OH$$

in which A is an oxypropylene group, and n, which is the average number of oxypropylene groups in the propoxylated allyl alcohol, has a value within the range of about 1 to about 5;

wherein the copolymer has an average hydroxyl functionality within the range of about 2 to about 10, and a number average molecular weight within the range of about 300 to about 5000; and

(b) a member selected from the group consisting of:

(1) an anhydride or a di- or polycarboxylic acid, to produce a thermoset polyester;

(2) a polyisocyanate or an isocyanate-terminated prepolymer, to produce a polyurethane;

(3) an anhydride- or carboxylic acid-containing polymer, to produce a thermoset resin;

(4) a melamine resin, to produce a melamine-based polymer;

(5) an unsaturated fatty acid, to produce an alkyd;

(6) an unsaturated fatty acid, a low molecular weight polyol, and a polyisocyanate to produce a polyurethane-modified alkyd;

(7) ammonia or a primary or secondary amine, to produce a polyamine;

(8) acrylic acid or an acrylic acid derivative, to produce an acrylate.

5. A polymer blend which comprises:

(a) a polymer which consists essentially of recurring units of a propoxylated allyl alcohol of the formula

$$CH_2{=}CH{-}CH_2{-}(A)_n{-}OH$$

in which A is an oxypropylene group, and n, which is the average number of oxypropylene groups in the propoxylated allyl alcohol, has a value within the range of about 1 to about 5;

wherein the polymer has an average hydroxyl functionality within the range of about 2 to about 10, and a number average molecular weight within the range of about 300 to about 5000; and

(b) one or more polymers selected from the group consisting of polyether polyols, phenolic resins, and epoxy resins.

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METHOD FOR POWDER COATINGS

Peter D. Clark, Hartland; Cynthia A. Stants, Pinckney, and Richard J. Foukes, Utica, all of Mich., assignors to BASF Corporation, Southfield, Mich.

Division of Ser. No. 239,670, May 9, 1994, Pat. No. 5,508,349. This application May 4, 1995, Ser. No. 434,696

Int. Cl.[6] B05D *1/04*

U.S. Cl. 525—131 **22 Claims**

1. A method of coating a substrate with a thermoset powder coating composition comprising the steps of

I) electrodepositing a primer layer on the surface of a metal substrate and

II) applying over the previously applied electrodeposited primer layer, a layer of thermosetting powder coating composition including

a) a film-forming resinous binder including

i) a copolymer selected from the group consisting of epoxy, polyester, and acrylic copolymers having a reactive functionality selected from the group consisting of epoxy, carboxy, and hydroxy functionalities and mixtures thereof and

ii) a crosslinking agent capable of reacting with the reactive functionality on the copolymer selected from the group consisting of aminoplasts, blocked aliphatic diisocyanates and blocked aromatic diisocyanates, polycarboxylic acids, acid anhydrides, dicyandiamide and its derivatives, polyphenols, polyamines, glycol urils, and mixtures thereof,

b) a first flow control agent which is an aliphatic or aromatic crystalline hydroxyl containing compound having a melting point between 30° C. and 150° C., and

c) a second flow control agent, different from the first flow control agent and

III) curing both the primer layer and the thermosetting powder coating layer, by baking at a temperature above the melting point of the first flow control agent.

5,552,488

PROCESS FOR PRODUCING A CROSSLINKED POLYMER USING A BETA-DICARBONYL COMPOUND

Christopher J. Bradford, Ann Arbor, and Adriana Ticu, Livonia, both of Mich., assignors to BASF Corporation, Southfield, Mich.

Division of Ser. No. 745,407, Aug. 15, 1991. This application Jun. 1, 1995, Ser. No. 457,921

Int. Cl.[6] C08L *61/06;61/28*

U.S. Cl. 525—163 **3 Claims**

1. A method of producing a crosslinked polymer, comprising the steps of:

A. reacting a crosslinker selected from the group consisting of aminoplasts, isocyanates, and phenolics, with a β-dicarbonyl functional compound,

B. mixing a crosslinkable polymer selected from the group consisting of an acrylic polymer, a polyester, a phenolic polymer, an epoxy polymer, and a polyurethane, with the reaction product of the crosslinker and β-dicarbonyl functional compound, from step A, and

C. curing the mixture from step B so that the crosslinkable polymer reacts with the reaction product of the crosslinker and the β-dicarbonyl functional compound, whereby the polymer is crosslinked.

5,552,489

TACKIFIERS AND A PROCESS TO OBTAIN TACKIFIERS

. Natalie A. Merrill, Deer Park; James M. Farley, League City, both of Tex.; Martha H. Robertson, Jackson; Charles L. Sims, Baton Rouge, both of La.; Richard B. Pannell, Kingwood, Tex., and Angelo A. Montagna, Houston, both of Tex., assignors to Exxon Chemical Patents Inc., Wilmington, Del.

Continuation of Ser. No. 278,768, Jul. 22, 1994, abandoned. This application Jan. 25, 1995, Ser. No. 378,302

Int. Cl.[6] C08L *45/00;* **C08F** *232/04;232/08*

U.S. Cl. 525—210 **33 Claims**

1. A process to produce a tackifier, said process comprising contacting an alpha-olefin, a cyclic olefin, and a catalyst comprising a cyclopentadienyl transition metal compound and a non-coordinating anion or an alumoxane in a polymerization reactor under tackifier polymerization conditions to produce the tackifier, wherein said tackifier produced is amorphous having an M_n in the range of from 300 to 2000, a T_g in the range of from 0° C. to 100° C., and a cyclic olefin content in the range of from 20 mole percent to 95 mole percent.

13. An amorphous tackifier having a Tg in the range of from 0° C. to 100° C., a Mn in the range of from 300 to 2000, said tackifier consisting of alpha-olefin monomers and cyclic olefin comonomers, said comonomers present in the tackifier in the range of from 20 mole percent to 95 mole percent.

5,552,490

STYRENE-ISOPRENE RUBBER FOR TIRE TREAD COMPOUNDS

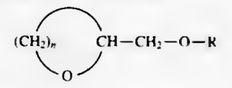
David J. Zanzig, Uniontown; Paul H. Sandstrom, Tallmadge; Joseph K. Hubbell, Akron; Wen-Liang Hsu, Copley; Adel F. Halasa, Bath, and John J. A. Verthe, Kent, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 300,907, Sep. 6, 1994, Pat. No. 5,470,929, which is a continuation-in-part of Ser. No. 37,835, Mar. 29, 1993, Pat. No. 5,359,016. This application May 12, 1995, Ser. No. 439,753

Int. Cl.[6] C08L *9/06;* **C08K** *3/36*

U.S. Cl. 525—237 **3 Claims**

1. A pneumatic tire having an outer circumferential tread where said tread is a sulfur cured rubber composition comprised of, based on 100 parts by weight of rubber, (a) from about 5 parts to about 55 parts of styrene-isoprene rubber made by a process which comprises copolymerizing a monomer mixture containing from about 2 weight percent to about 15 weight percent styrene monomer and from about 85 weight percent to about 98 weight percent isoprene monomer in an organic solvent in the presence of a catalyst system which is comprised of (a) a lithium initiator and (b) a modifier having the structural formula:



wherein n represents an integer within the range of 3 to 6, wherein R represents an alkyl group containing from 1 to about 10 carbon atoms, and wherein the molar ratio of the modifier to the lithium initiator is within the range of 2:1 to 40:1, (b) from about 10 parts to about 40 parts of natural rubber, (c) from about 15 parts to about 40 parts of styrenebutadiene rubber, (d) front about 20 parts to about 35 parts of high cis-1,4polybutadiene rubber, (e) from about 30 to about 80 parts of carbon black, and (f) from about 10 to about 20 parts of silica.

5,552,491

STAR-BRANCHED ACRYLATE AND METHACRYLATE POLYMERS

Munmaya K. Mishra; Shailaja M. Shirodkar, both of Wappinger Falls, and Alfred K. Jung, Millwood, all of N.Y., assignors to Ethyl Additives Corporation, Richmond, Va.

Division of Ser. No. 378,977, Jan. 27, 1995. This application May 31, 1995, Ser. No. 456,195

Int. Cl.[6] C08F *265/06;267/02;297/02*

U.S. Cl. 525—299 **46 Claims**

1. A concentrate for addition to a lubricating oil comprising a minor amount of a star-branched polymer comprising a core portion and polymeric arms wherein said core portion is obtained by anionic polymerization of at least one unsaturated acrylate or methacrylate ester of a polyol and said polymeric arms are obtained by anionic polymerization of at least one acrylic or methacrylic monomer and a major amount of a synthetic oil or mineral oil.

(A) at least 15 mol percent, based on the total mol percent of

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SOLID ELASTOMERIC BLOCK COPOLYMERS

Ellen B. Brandes, Plainsboro, N.J., and Frederick C. Loveless, Yardley, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 80,638, Jun. 24, 1993, Pat. No. 5,438,102. This application May 18, 1995, Ser. No. 443,742

Int. Cl.[6] C08F *297/04; 297/02*

U.S. Cl. 525—314 **31 Claims**

1. A chemically modified block copolymer which is either 1) a sulfonated polymer produced by a method comprising sulfonating an initial block copolymer as defined hereinafter, followed by neutralization of the thus formed polymeric sulfonic acid with metal ions or amines; 2) a maleated polymer produced by a method comprising contacting said initial block copolymer with maleic anhydride; or 3) a halogenated polymer by a method comprising halogenating said initial block copolymer, said initial block copolymer being a solid elastomeric block copolymer wherein the terminal blocks are each a polymer of at least one conjugated diene D (D polymer), said diene D being a hydrocarbon containing a 1,3-conjugated diene structure wherein the 2 and 3 carbon atoms are each additionally bonded to a hydrocarbyl side group, with a preponderance of polymerized D units being 1,4-units; and at least one interior block is a hydrogenated polymer of at least one conjugated diene I (I polymer), said diene I being a hydrocarbon containing a 1,3-conjugated diene structure wherein one of the 2- and 3-carbon atoms is additionally bonded to a hydrocarbyl side group and the other is additionally bonded by a hydrogen atom, substantially all of the residual double bonds of said I polymer being hydrogenated and the number of unsaturated polymerized diene D units in said D polymer blocks being sufficient to vulcanize said block copolymer, said copolymer comprising about 1 to 50 wt. % of D polymer units and about 50 to 99 wt. % of I polymer units.

5,552,493

METHOD FOR PRODUCING ASYMMETRIC RADIAL POLYMERS

Bridget A. Spence; Ronald J. Hoxmeier, and Glenn R. Himes, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 30, 1995, Ser. No. 453,039

Int. Cl.[6] C08F *297/04; C08G 81/02*

U.S. Cl. 525—314 **14 Claims**

1. A process for producing a predominately four-armed asymmetric radial block copolymer which contains predominately two arms which are copolymers of at least one conjugated diene and a vinyl aromatic hydrocarbon and two conjugated diene homopolymer or copolymer arms, said process comprising:

(a) anionically polymerizing at least one conjugated diene monomer and at least one vinylaromatic hydrocarbon monomer to form a set of living polymer arms,

(b) anionically polymerizing at least one conjugated diene monomer to form another set of living polymer arms,

(c) coupling one set of living polymer arms with a coupling agent which is selected from the group consisting of tetramethoxysilane and γ-glycidoxypropyltrimethoxysilane,

(d) substantially completing the coupling reaction while leaving, on average, two unreacted coupling sites on the coupling agent,

(e) adding the other set of living polymer arms to the product of d) and coupling the other set of living polymer arms to the first coupled set of polymer arms, and

(f) optionally hydrogenating the coupled polymer, either partially or fully.

5,552,494

QUALITY CONTROL METHOD FOR ABS-BASED RESIN AND MOLDING OF THE ABS-BASED RESIN

Mune Iwamoto; Akihiko Nakajima; Masato Takaku; Hisao Morita; Toshihiko Ando; Tomofumi Shirafuji, and Mutsuko Ichida, all of Takaishi, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Dec. 22, 1994, Ser. No. 361,489

Claims priority, application Japan, Dec. 27, 1993, 5-332396; Dec. 27, 1993, 5-332398; Dec. 27, 1993, 5-332399; Dec. 27, 1993, 5-332400; Apr. 20, 1994, 6-081429

Int. Cl.[6] C08F *279/04; C08L 51/04*

U.S. Cl. 525—316 **35 Claims**

1. A molding of an ABS-based resin, wherein rubber particles located at a depth of 0.5–1.5 μm from a surface of the molding morphologically comprise at least the following two types of particles:

(1) A particles having an a/b ratio not greater than 1.5, wherein a and b represent a major axis and a minor axis, respectively, and

(2) B particles having an a/b ratio not smaller than 5, wherein a and b have the same meanings as defined above

when a section extending at the depth in parallel with the surface of the molding is observed in an electron micrograph taken by the ultrathin sectioning technique; and assuming that the total area of the rubber particles as observed in the electron micrograph is 100%, the total area of the A particles accounts for at least 10% and that of the B particles is in a range of 0.01– 90%.

17. A method for controlling the quality of an ABS-based resin, which comprises controlling the quality of the ABS-based resin to provide a molding wherein rubber particles located at a depth of 0.5–1.5 μm from a surface of the molding morphologically comprise at least the following two types of particles:

(1) A particles having an a/b ratio not greater than 1.5, wherein a and b represent a major axis and a minor axis, respectively, and

(2) B particles having an a/b ratio not smaller than 5, wherein a and b have the same meanings as defined above

when a section extending at the depth in parallel with the surface of the molding is observed in an electron micrograph taken by the ultrathin sectioning technique; and assuming that the total area of the rubber particles as observed in the electron micrograph is 100%, the total area of the A particles accounts for at least 10% and that of the B particles is in a range of 0.01– 90%.

5,552,495

WATER-DISPERSIBLE ADHESIVE BLEND COMPOSITION

Richard A. Miller; Scott E. George, both of Kingsport; Alicia E. Barrett, Tyler; Theron E. Parsons, III, and Mark A. Montgomery, both of Kingsport, all of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Division of Ser. No. 283,011, Jul. 29, 1994, which is a continuation-in-part of Ser. No. 175,330, Dec. 29, 1993. This application Oct. 31, 1995, Ser. No. 551,050

Int. Cl.[6] C08F *20/00; C08G 63/68*

U.S. Cl. 525—437 **6 Claims**

1. A water-dispersible adhesive composition comprising:

(I) about 20 to 80 weight percent of the linear water-dispersible polyester composition made of the residues or moieties of reaction products;

(i) at least one difunctional dicarboxylic acid which is not a sulfomonomer;

(ii) about 4 to 25 mol percent, based on the total of all acid, hydroxyl and amino equivalence, of residues of at least one difunctional sulfomonomer containing at least one sulfonate group bonded to an aromatic ring wherein the functional groups are hydroxyl, carboxyl, or amino;

(iii) at least one diol or a mixture of a diol and a diamine comprising:

(A) at least 15 mol percent, based on the total mol percent of diol moieties or diol and diamine moieties, of a diol or diamine having the formula $H(—OCH_2CH_2—)_nOH$ and $HRN(-(CH_2CH_2O-))_nNHR$ wherein n is 2 to about 20 and R is hydrogen or C_1-C_6 alkyl, or

(B) about 0.1 to less than about 15 mol percent, based on the total mol percent of diol moieties or diol and diamine moieties, of moieties of a poly(ethylene glycol) having the formula $H(—OCH_2CH_2—)_nOH$ wherein n is 2 to about 500, provided that the mol percent of such moieties is inversely proportional to the value of n; and,

(iv) 0 to about 40 mol percent, moieties of a difunctional monomer reactant selected from hydroxycarboxylic acids, aminocarboxylic acids and aminoalkanols; the polymer containing substantially equal mol proportions of acid equivalents (100 mol %) and diol or diol and diamine equivalents (100 mol %) wherein at least 20 weight percent of the groups linking the moieties of the monomeric units are ester linkages and wherein the inherent viscosity is at least 0.1 dL/g measured in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. and at a concentration of about 0.25 g of polymer in 100 ml of the solvent; and

(2) about 20 to 80 weight percent of the branched water-dispersible polyester made of the moieties of reaction products;

(a) at least one difunctional dicarboxylic acid which is not a sulfomonomer;

(b) about one to 20 mol percent, based on the total of acid, hydroxyl and amino equivalents, of residues of at least one difunctional sulfomonomer containing at least one sulfonate group bonded to an aromatic ring wherein the functional groups are hydroxyl, carboxyl, or amino;

(c) at least one difunctional reactant selected from a glycol or a mixture of glycol and diamine having two —NRH groups, the glycol containing two $—C(R^1)_2—OH$ groups wherein R in the reactant is hydrogen or an alkyl group of 1 to 6 carbon atoms, and R^1 in the reactant is a hydrogen atom, an alkyl of 1 to 5 carbon atoms, or an aryl group of 6 to 10 carbon atoms;

(d) about 0 to 40 mol % of a difunctional reactant selected from hydroxycarboxylic acids having one $—C(R—)_2—OH$ group, aminocarboxylic acids having one —NRH group, aminoalcohols having one $—C(R—)_2—OH$ group and one —NRH group, or mixtures of said difunctional reactants wherein R in the reactant is hydrogen or an alkyl group of 1 to 6 carbon atoms; and

(e) 1 to 40 mol % of a multifunctional reactant containing at least three functional groups selected from the group consisting of hydroxyl, carboxyl, amino, and mixtures thereof;

wherein the polyester has a predispersion pH greater than 4 and all stated mol percents are based on the total of all acid, hydroxyl, and amino group containing reactants being equal to 200 mol percent, and wherein the polymer containing a portion of the acid-group containing reactants (100 mol percent acid) to hydroxyl and amino-group containing reactants (100 mol %) wherein the blend of the polyester of (1) and the polyester of (2) has an overall IV of 0.2 dL/g measured in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. and at a concentration of about 0.25 g of polymer blend in 100 ml of the solvent, the ring and ball softening point (RBSP) of the blend is at least 70° C., and the glass transition temperature T_g of the blend is no greater than 20° C.

5,552,496

AQUEOUS POLYURETHANE RESIN DISPERSION, PROCESSES FOR ITS PREPARATION, AND ITS USE IN AQUEOUS COATING COMPOSITIONS

Bettina Vogt-Birnbrich, Solingen; Hans-Peter Patzschke, Wuppertal; Werner Lenhard, Wuppertal, and Walter Schubert, Wuppertal, all of, Germany, assignors to Herberts Gesellschaft mit beschrankter Haftung, Wuppertal, Germany

Continuation of Ser. No. 112,182, Aug. 25, 1993, abandoned. This application Feb. 27, 1995, Ser. No. 394,553

Claims priority, application Germany, Aug. 27, 1992, 42 28 510.6

Int. Cl.[6] C08G *18/80*

U.S. Cl. 525—440 **14 Claims**

1. Aqueous coating composition which is self-drying or crosslinks by means of external agents, comprising

I) 40 to 100% by weight of a film-former in the form of an aqueous dispersion of one or more polyurethane resins having a number-average molecular mass (Mn) of from 2,500 to 1,000,000 and a content of ionic groups, groups which have been converted to ionic groups, and/or hydrophilic groups of from 5 to 200 meq per 100 g of solid resin, and at least one CH-acidic group per molecule, and a OH-number of 0 to 100, wherein some or all of the CH-acid groups can be reacted with one or more compounds which are able to react with at least two CH-acid groups for chain-lengthening, and

II) 60 to o% by weight of one or more crosslinkers which can react with at least two CH-acidic groups, formaldehyde condensation resins and/or polyisocyanates containing free or blocked isocyanate groups,

the percentages by weight of I) and II) relating to the resin solids content and adding up to 100% by weight, and optionally pigments, fillers, organic solvents and/or conventional coating additives.

5,552,497

METHOD OF PREPARING CARBAMATE-FUNCTIONAL POLYMER

Robert J. Taylor, Northville; John W. Rehfuss, West Bloomfield; Joseph Borst, Plymouth; Paul Lessek, Milford, and Donald L. St. Aubin, Commerce Township, all of Mich., assignors to BASF Corporation, Southfield, Mich.

Filed Dec. 29, 1994, Ser. No. 365,648

Int. Cl.[6] C08F *283/04*

U.S. Cl. 525—456 **11 Claims**

1. A method of preparing a carbamate-functional acrylic polymer comprising the steps of:

(A) preparing a mixture comprising:

(1) one or more acrylic monomers comprising hydroxy-functional groups or groups that can be converted to hydroxy functional groups,

(2) optionally, one or more other addition polymerizable monomers, and

(3) a carbamate compound, and

(B) heating said mixture in the presence of a free radical initiator and an esterification catalyst, thereby forming a carbamate-functional acrylic polymer.

5,552,498

PREPARATION OF AMPHOTERIC ACRYLIC ACID COPOLYMERS SUITABLE AS OIL-IN-WATER EMULSION BREAKERS

Michael L. Braden, Sugar Land, Tex., assignor to Nalco Chemical Company, Naperville, Ill.

Division of Ser. No. 311,626, Sep. 23, 1994, abandoned. This application Dec. 5, 1995, Ser. No. 567,761

Int. Cl.[6] C08F *4/04; 2/10; 220/06*

U.S. Cl. 526—73 **2 Claims**

1. A process for synthesizing amphoteric polymers for use as oil-in-water emulsion breakers, the process comprising:

adding water and sodium hydroxide to a container in a ratio of

cyclic amine radicals having the formula

R^5 and R^6 are each independently H, Cl or F, provided that when

5,552,504

adding water and sodium hydroxide to a container in a ratio of from about 99:1 to about 88:12 to form a mixture;
cooling the mixture to a temperature below 40° C.;
adding 0.100 to 24.300 percent by weight of acrylic acid to the mixture;
adding 0.700 to 24.900 percent by weight of an amine acrylate to the mixture;
adding 0.000 to 0.500 percent by weight of sodium formate dissolved in 2.0% water to the mixture, heating the mixture to a temperature of between 50° to 70° C.;
adding 0.0025 to 0.0500 percent by weight of 2,2'-Azobis(2-amidinopropane) dihydrochloride dissolved in 2.0% water to the mixture;
heating the mixture to a temperature of about 95° C. for from about 0.5 to about 3.0 to hours;
adding 0.0025 to 0.0500 percent by weight of 2,2'-Azobis(2-amidinopropane) dihydrochloride dissolved in 2.0% water to the mixture, thereby reducing the residual monomer content of the mixture to less than 10000 parts per million of acrylic acid and to less than 10000 parts per million of amine acrylate;
heating the mixture to a temperature of about 95° C. for from about 0.5 to about 3.0 hours; and
cooling the solution to a temperature of from about 100° C. to about 25° C. to produce the amphoteric polymer.

5,552,499

PROCESS OF PREPARING REDUCED HYSTERESIS PRODUCTS USING ANIONIC POLYMERIZATION INITIATORS

Takashi Kitamura, Akron; David F. Lawson, Uniontown, both of Ohio; Koichi Morita, and Yoichi Ozawa, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Division of Ser. No. 359,261, Dec. 19, 1994, which is a continuation-in-part of Ser. No. 962,373, Oct. 16, 1992, Pat. No. 5,393,721. This application Jun. 6, 1995, Ser. No. 469,151
Int. Cl.[6] C08F *4/08;8/42*
U.S. Cl. 526—174 **8 Claims**

1. A process for preparing an elastomeric compound having reduced hysteresis loss properties comprising the steps of:
forming a solution of one or more anionically polymerizable monomers in a hydrocarbon solvent; and,
polymerizing said monomer with a mixture of a lithio amine and an organic alkali metal compound selected from the group consisting of compounds having the formula R_3M, R_4OM, $R_5C(O)OM$, R_6R_7NM, and R_8SO_3M, where R_3, R_4, R_5, R_6, R_7, and R_8 are each selected from the group consisting of alkyls, cycloalkyls, alkenyls, aryls, and phenyls, having from about 1 to 12 carbon atoms, and where M is selected from the group consisting of Na, K, Rb and Cs, to form a polymer;
said lithio amine having the formula

$$(A)Li(SOL)_y$$

where y is 0 or from about 0.5 to about 3; SOL is a solubilizing component selected from the group consisting of hydrocarbons, ethers, amines and mixtures thereof; and, A is selected from the group consisting of

cyclic amine radicals having the formula

where R_2 is a divalent alkylene, bicycloalkane, substituted alkylene, oxy- or N-alkylamino-alkylene group having from about 3 to about 16 methylene groups.

8. A process for preparing an elastomeric compound having reduced hysteresis loss properties comprising the steps of:
forming a solution of one or more anionically polymerizable monomers in a hydrocarbon solvent; and,
polymerizing said monomer with a mixture of a lithio amine and an organic alkali metal compound to form a polymer;
said lithio amine having the formula

$$(A)Li(SOL)_y$$

where y is from about 0.5 to about 3; SOL is a solubilizing component selected from the group consisting of dienyl and vinyl aromatic oligomers having a degree of polymerization of from about 3 to about 300 polymerization units; and, A is selected from the group consisting of alkyl, dialkyl, cycloalkyl and dicycloalkyl amine radicals having the formula

and cyclic amine radicals having the formula

where each R_1 is independently selected from the group consisting of alkyls, cycloalkyls and aralkyls having from 1 to about 12 carbon atoms, and R_2 is a divalent alkylene, bicycloalkane, substituted alkylene, oxy- or N-alkylamino-alkylene group having from about 3 to about 16 methylene groups.

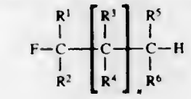
5,552,500

FLUOROALKENE/HYDROCHLOROFLUOROCARBON TELOMERS AND THEIR SYNTHESIS

Richard E. Peavy, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 24, 1995, Ser. No. 427,329
Int. Cl.[6] C08F *2/00*
U.S. Cl. 526—206 **9 Claims**

1. A process for preparing a fluorotelomer which comprises reacting a fluoroalkene monomer of from 2 to 3 carbon atoms and 2 to 6 fluorine atoms, or a mixture thereof with a copolymerizable monomer, with a hydrochlorofluorocarbon telogen in solution in said hydrochlorofluorocarbon in the presence of a free radical initiator at a temperature in excess of 105° C. and up to 200° C.,
wherein said hydrochlorofluorocarbon consists essentially of an organic compound having the formula:



6

wherein
R^1, R^2, R^3 and R^4 are each independently Cl or F;

R^5 and R^6 are each independently H, Cl or F, provided that when either of R^5 or R^6 is F, the other is H;
and n is 0 or 1.
and recovering a fluorotelomer having a number average molecular weight between 1800 and 75,000.

5,552,501

METHOD FOR THE RAPID FREE RADICAL POLYMERIZATION OF ACRYLAMIDE/CO-POLYMERS USING TETRAMETHYLAMINE CATALYSTS

Kamala D. Patel, 12831 N. Stratford Dr. #104, Oklahoma City, Okla. 73120

Continuation-in-part of Ser. No. 236,953, May 2, 1994, abandoned. This application Jun. 13, 1995, Ser. No. 489,947
Int. Cl.[6] C08F *2/00*
U.S. Cl. 526—217 **18 Claims**

1. A method for the rapid free radical copolymerization of acrylamide monomers and diacetone acrylamide monomers in an aqueous solution which consists of admixing an aqueous acrylamide monomer and diacetone acrylamide monomer solution, wherein the weight ratio of acrylamide monomer to diacetone acrylamide monomer is between about 0.4:1 to 100:1, with effective amounts of each of a free radical initiator and a tetramethylamine catalyst to form a mixture and maintaining said mixture at ambient temperature for between about 10 and 120 minutes until said polymerization is complete.

5,552,502

POLYMERIZATION PROCESS AND COMPOSITIONS THEREOF

Peter G. Odell, and Gordon K. Hamer, both of Mississauga, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 16, 1995, Ser. No. 558,996
Int. Cl.[6] C08F *2/00*
U.S. Cl. 526—234 **24 Claims**

1. A free radical polymerization process for the preparation of thermoplastic resin or resins comprising:
heating a mixture of a free radical initiator, a stable free radical agent, and at least one polymerizable monomer compound;
adding under pressure a supercritical fluid, and mixing with sulfur dioxide;
polymerizing said polymerizable monomer to form said thermoplastic resin or resins with a high monomer to polymer conversion;
cooling said mixture;
optionally isolating said thermoplastic resin or resins; and
optionally washing and drying said thermoplastic resin, or resins.

5,552,503

PHOTODEFINABLE DIELECTRIC LAYERS COMPRISING POLY(AROMATIC DIACETYLENES)

Elizabeth W. Kwock, Califon, and Timothy M. Miller, New Providence, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Dec. 22, 1993, Ser. No. 173,284
Int. Cl.[6] C08F *238/02*
U.S. Cl. 526—285 **2 Claims**

1. A photodefinable dielectric material comprising a copolymer of diethynyldiphenyl ether and 4,4'-bis(3-ethynylphenoxy)octafluorobiphenyl.

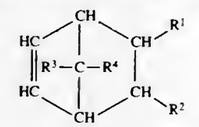
5,552,504

SEMI-CRYSTALLINE CYCLOOLEFIN COPOLYMER FILM

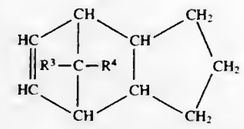
Cynthia Bennett, Alzey; Michael-Joachim Brekner, Frankfurt; Jochen Coutandin, Langenlonsheim; Otto Herrmann-Schoenherr, Bensheim, and Frank Osan, Kelkheim, all of, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 14, 1994, Ser. No. 195,077
Claims priority, application Germany, Feb. 12, 1993, 43 04 310.0
Int. Cl.[6] C08F *232/08;232/04;4/64*
U.S. Cl. 526—348.1 **21 Claims**

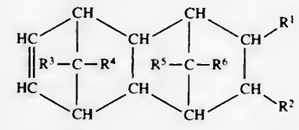
1. An oriented film having at least one layer comprising a cycloolefin copolymer which includes 0.1 to 99.9% by weight based on the total amount of monomers, of at least one monomer of the formulae I, II, III, IV, V, VI, VII, VIII or IX



(I)



(II)



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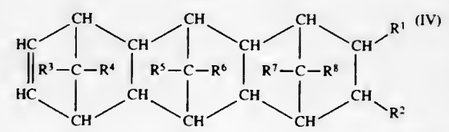

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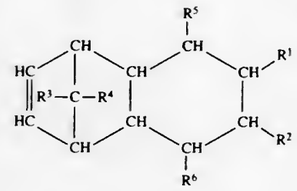

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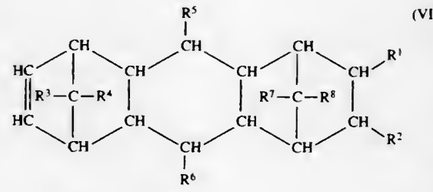

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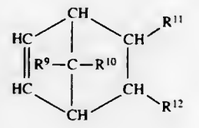

(VII)

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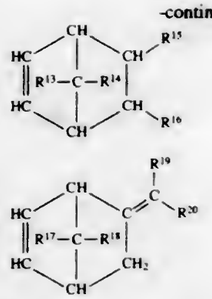
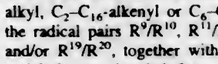


wherein:

R^1 to R^8 are the same or different and each represent a hydrogen atom, a C_6–C_{16}-aryl or a C_1–C_8-alkyl radical, wherein the various groups in the aforementioned formulae may have he same or a different meaning, and in wherein

R^9 to R^{20} are the same or different and each represent a C_1–C_{16}-alkyl, C_2–C_{16}-alkenyl or C_6–C_{16}-aryl radical, or in wherein the radical pairs R^9/R^{10}, R^{11}/R^{12}, R^{13}/R^{14}, R^{15}/R^{16}, R^{17}/R^{18} and/or R^{19}/R^{20}, together with the carbon atom or atoms to which they are bonded, form a C_4–C_8-cycloalkyl radical,

said cycloolefin copolymer further comprising from 99.9 to 0.1% by weigh, based on the total amount of monomers, of at least one acyclic olefin of the formula X



(X)

in which R^{21} is a hydrogen atom or a C_1–C_{16}-alkyl or C_6–C_{16}-aryl radical, and wherein the cycloolefin copolymer has a catalyst residue content of <100 ppm.

5,552,505

HIGH TEMPERATURE COPOLYMERS FROM INORGANIC-ORGANIC HYBRID POLYMERS AND MULTI-ETHYNYLBENZENES

Teddy M. Keller, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 3, 1995, Ser. No. 398,848

Int. Cl.[6] C08G *77/56*

U.S. Cl. 528—5 **20 Claims**

1. A copolymer formed by the copolymerization of an aromatic acetylenic component selected from the group consisting of an aromatic acetylenic monomer, a mixture of aromatic acetylenic monomers, a prepolymer made by oligomerizing an aromatic acetylenic monomer, a prepolymer made by oligomerizing a mixture of aromatic acetylenic monomers, and mixtures thereof; with a carborane-(siloxane or silane)-unsaturated hydrocarbon polymer component selected from the group consisting of a carborane(siloxane or silane)-unsaturated hydrocarbon polymer and a mixture of carborane-(siloxane or silane)-unsaturated hydrocarbon polymers.

5,552,506

ORGANOPOLYSILOXANES, MODIFIED WITH ACRYLATE GROUPS IN THE PRESENCE OF A RHODIUM CATALYST

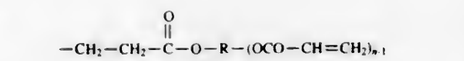
Thomas Ebbrecht, Witten; Peter Lersch, Oberhausen, and Dietmar Wewers, Bottrop, all of, Germany, assignors to Th. Goldschmidt AG, Essen, Germany

Filed Sep. 10, 1994, Ser. No. 308,016

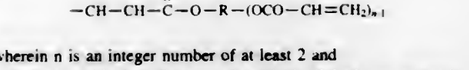
Int. Cl.[6] C08G *77/08;77/20*

U.S. Cl. 528—15 **7 Claims**

1. Organopolysiloxanes having terminally, laterally or both, at least one group of the formula



(VIII)



(IX)

wherein n is an integer number of at least 2 and

R is a multivalent linear or branched aliphatic or aromatic hydrocarbon, optionally containing alkoxy groups,

obtained by hydrosilylation of an organopolysiloxane having at least one SiH group with acrylate groups-containing compounds of the formula $R-(OCO-CH=CH_2)_n$ in equimolar amount in relation to each SiH group at a temperature of about between 60° and 130° C. in the presence of a rhodium catalyst.

5,552,507

DIISOCYANATES AND PROCESSES FOR THEIR PRODUCTION AND USE

Christian Wamprecht, Neuss; Klaus Jost, Dormagen, and Stefan Penninger, Pulheim, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

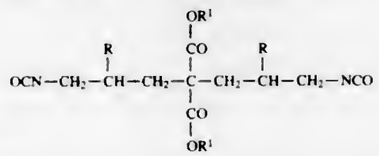
Filed May 3, 1995, Ser. No. 434,254

Claims priority, application Germany, May 17, 1994, 44 17 186.2

Int. Cl.[6] C08G *18/77;* **C07D** *251/34;* **C07C** *69/34;265/02*

U.S. Cl. 528—44 **4 Claims**

1. A diisocyanate corresponding to the formula:



(I)

in which

R represent, the same or different radicals and stand for hydrogen or an aliphatic hydrocarbon radical containing from 1 to 4 carbon atoms and

R^1 represent the same or different radicals and stand for an aliphatic, araliphatic or cycloaliphatic radical containing from 1 to 12 carbon atoms.

5,552,508

DIFUNCTIONAL BITRICYCLODECATRIENE MONOMERS

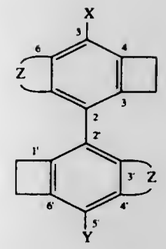
David C. Martin, Ann Arbor, Mich.; Jeffrey S. Moore, Savoy, Ill.; Larry J. Markoski, Ypsilanti, Mich.; Kenneth A. Walker, Urbana, Ill., and Gary E. Spilman, Ann Arbor, Mich., assignors to University of Michigan, The Board of Regents, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 284,006, Aug. 1, 1994, Pat. No. 5,418,312, which is a division of Ser. No. 907,430, Jul. 1, 1992, Pat. No. 5,334,752. This application May 23, 1995, Ser. No. 448,637

Int. Cl.[6] C08G *63/00*

U.S. Cl. 528—68 **6 Claims**

1. A resin which is a reaction product by polymerization or copolymerization of monomers of the general formula:



wherein Z is hydrogens or a cyclobutane ring; and X and Y are carboxyl, amino, alcohol, isocyanate, acid halide, or 4-halobenzoyl groups.

5,552,509

PHENOLIC RESIN COMPOSITIONS DERIVED FROM BISPHENOL COMPOUNDS AND THEIR CONDENSATES

Tomoko Takashima; Shigeru Iimuro, both of Aichi, and Takashi Kitamura, Kanagawa, all of, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Aug. 31, 1993, Ser. No. 114,081

Claims priority, application Japan, Sep. 4, 1992, 4-237287

Int. Cl.[6] C08G *8/04*

U.S. Cl. 528—129 **6 Claims**

1. A phenolic resin composition comprising an acid catalyzed reaction product wherein formaldehyde, at least one phenol compound A, and at least one phenolic compound B are condensed in an acid catalyzed reaction,

said at least one phenol compound A selected from the group consisting of:

(a) a bisphenol A-purification residue formed by reacting phenol with acetone in the presence of hydrochloric acid at a temperature of from 45° to 65° C., heating the resulting mixture up to a temperature of from 120° to 130° C. at a reduced pressure of from 75 to 70 mm Hg to remove hydrochloric acid, heating the resulting mixture up to 185° C. at a reduced pressure of 40 mm Hg to remove unreacted phenol and heating the resulting mixture up to a temperature of from 195° to 260° C. at a reduced pressure of from 7 to 3 mm Hg to remove bisphenol A and isomers, mad

(b) a bisphenol A-cleavage residue formed by treating the bisphenol A-purification residue of step (i)(a) in the presence of a basic or acidic catalyst at a temperature of from 180° to 250° C.; and

said at least one phenolic compound B consisting of:

(c) a trinuclear bisphenol F fraction comprising at least three condensed phenol nuclei formed by reacting a phenol with formaldehyde at a molar ratio (P/F) ranging from 6 to 40 in the presence of an acidic catalyst at a temperature of from 50° to 100° C., heating the resulting mixture to remove acidic catalyst, generated water and unreacted phenol and distilling the resulting crude bisphenol F at a temperature of from 200° to 250° C. under reduced pressure.

5,552,510

OXIRANE AND DIOXOLANE COPOLYMERS, PROCESS FOR THEIR PREPARATION AND IONIC CONDUCTION MATERIALS CONTAINING SAME

Jean-Yves Sanchez, Saint-Ismier; Michel Armand, Saint-Martin-D'Uriage; Jean-Pierre Petit, Biviers, all of, France; Yves Choquette, Saint-Julie, Canada, and Glaura Goulart Silva, Belo-Horizonte, Brazil, assignors to Centre National De La Recherche Scientifique, Paris, France, and Hydro-Quebec, Montreal, Canada

PCT No. PCT/FR93/00701, § 371 Date May 27, 1994, § 102(e) Date May 27, 1994, PCT Pub. No. WO94/02534, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 7, 1993, Ser. No. 193,134

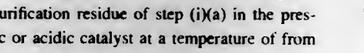
Claims priority, application France, Jul. 15, 1992, 92 08716

Int. Cl.[6] C08G *2/22;2/26*

U.S. Cl. 528—250 **4 Claims**

1. A copolymer, consisting of monomer units corresponding to the formula: $-(CH_2-O-CHR-CH_2-O)-$(I) and of monomer units corresponding to the formula $-(CH_2-CHR'-O)-$(II), in which:

R is a hydrogen atom, a linear or branched alkyl radical containing from 1 to 8 carbon atoms or a radical of the formula:



wherein $1 \leqq n \leqq 10$;

R' is a radical of the formula $CH_2=CH-(CH_2)_q-$, wherein $1 \leqq q \leqq 6$, or the radical $CH_3-(CH_2)_x-CH=CH-(CH_2)_y-$, wherein $0 \leqq x+y \leqq 5$; and wherein the amount of monomer unit (II) in the copolymer is sufficient for crosslinking of the copolymer.

5,552,511

PROCESS FOR APPLYING A WATER-DISPERSIBLE ADHESIVE COMPOSITION

Richard A. Miller; Scott E. George, both of Kingsport; Alicia E. Barrett, Tyler, and Theron E. Parsons, III, Kingsport, all of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Division of Ser. No. 283,011, Jul. 29, 1994, which is a continuation of Ser. No. 175,330, Dec. 29, 1993, abandoned. This application Oct. 31, 1995, Ser. No. 551,049

Int. Cl.[6] C08G *63/68;* **B32B** *27/06*

U.S. Cl. 528—277 **19 Claims**

1. A process comprising applying in liquid form to a surface of a substrate a water-dispersible adhesive composition comprising a branched water-dispersible polyester composition made of the moieties of reaction products;

(I) at least one difunctional dicarboxylic acid which is not a sulfomonomer;

(II) about 2 to 15 mol percent, based on the total of all acid, hydroxyl and amino equivalence, of residues of at least one difunctional sulfomonomer containing at least one sulfonate group bonded to an aromatic ring wherein the functional groups are hydroxyl, carboxyl, or amino;

(III) at least one diol or a mixture of a diol and a diamine comprising:

(A) about 0.1 to 85 mol percent, based on the total mol percent of diol moieties or diol and diamine moieties, of a diol or diamine having the formula $H(-OCH_2CH_2-)_nOH$ and $HRN(-(CH_2CH_2O))_nNHR$ wherein n is 2 to about 20 and R is hydrogen or C_1–C_6 alkyl provided that the mol percent of such moieties is inversely proportional to the value of n;

(B) about 0.1 to about 15 mol percent, based on the total mol percent of diol moieties or diol and diamine moieties, of moieties of a poly(ethylene glycol) having the formula $H(-OCH_2CH_2-)_nOH$ wherein n is 2 to about 500, provided that the mol percent of such moieties is inversely proportional to the value of n; and

(C) 0 to no greater than about 99 mol percent of the diol component or diol and diamine mixture being selected from

the group consisting of a glycol and a mixture of glycol acid diamine having two —NRH groups, the glycol containing two —$C(R^1)_2$—OH groups wherein R^1 in the reactant is a hydrogen atom, an alkyl of 1 to 5 carbon atoms, or an aryl group of 6 to 10 carbon atoms;

(IV) 0 to about 40 mol % of a difunctional monomer reactant selected from the group consisting of hydroxycarboxylic acids having one —C(R—)$_2$—OH group, aminocarboxylic acids having one —NRH group, aminoalkanols having one —C(R—)$_2$OH group and one —NRH group and mixtures of said difunctional reactants wherein R in the reactant is hydrogen or an alkyl group of 1 to 6 carbon atoms; and

(V) about 0.1 to 40 mol % of a multifunctional reactant containing at least three functional groups selected from the group consisting of hydroxyl, carboxyl, amino, and mixtures thereof;

the polymer containing substantially equal mol proportions of acid equivalents (100 mol %) and diol or diol and diamine equivalents (100 mol %) wherein at least 20 weight percent of the groups linking the moieties of the monomeric units are ester linkages and wherein the inherent viscosity is at least 0.2 dL/g measured in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. and at a concentration of about 0.25 g of polymer in 100 ml of the solvent, the glass transition temperature T_g is no greater than 20° C., and the ring and ball softening point (RBSP) is at least 70° C., and

while remaining in the liquid form, applying a second surface of a substrate to the water dispersible adhesive composition thereby forming a laminate.

5,552,512

THERMOPLASTIC COPOLYESTERS HAVING IMPROVED GAS BARRIER PROPERTIES

Bobby J. Sublett, Kingsport, Tenn., assignor to Eastman Chemical Company, Kingsport, Tenn.

Filed Oct. 6, 1995, Ser. No. 540,361

Int. Cl.[6] C08G *63/00*

U.S. Cl. 528—308 **4 Claims**

1. Copolyesters having improved barrier properties with respect to oxygen and carbon dioxide comprising repeat units from about 10 to 100 mole percent repeat units from naphthalene dicarboxylic acid, about 90 to 0 mole percent repeat units from terephthalic acid and repeat units from essentially 100 mole percent 1,4-cyclohexanedimethanol, wherein said 1,4-cyclohexanedimethanol has a cis isomer content of at least 50%, said copolyester having an I.V. of about 0.4–1.2.

5,552,513

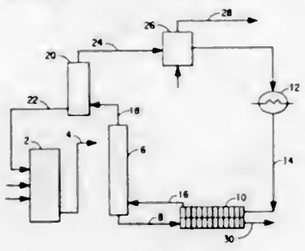
ATOMOSPHERIC PRESSURE POLYESTER PROCESS

Kamlesh K. Bhatia, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 138,312, Oct. 18, 1993, Pat. No. 5,434,239. This application May 10, 1995, Ser. No. 438,299

Int. Cl.[6] C08G *63/00*

U.S. Cl. 528—308.3 **39 Claims**



1. A process for preparing polyethylene terephthalate (PET) of at least a degree of polymerization of 50, by polymerizing dihydroxy ethyl terephthalate, or low molecular weight oligomers thereof, with the evolution of ethylene glycol and other volatile reaction by-products, the process conducted at about atmospheric pressure or above, comprising intimately contacting the dihydroxy ethyl terephthalate or low molecular weight oligomers thereof in melt form with an inert gas flowing at a velocity of 0.2 to 3 ft/sec, wherein the interfacial area between the melt and the gas phase is at least about 20 ft^2/ft^3 of the melt, and removing the volatile reaction by-products with the inert gas, wherein the polymerization is completed in less than about 5 hours of contact time while the reactants are maintained in the melt form.

5,552,514

ACID CATALYZED PROCESS FOR PREPARING AMINO ACID POLYMERS

David E. Adler, Dresher; Michael B. Freeman, Harleysville; James M. Lipovsky, Langhorne, all of Pa.; Yi H. Paik, Princeton, N.J.; Jan E. Shulman, Newtown, and Graham Swift, Blue Bell, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 213,648, Mar. 16, 1994, Pat. No. 5,457,176, which is a continuation-in-part of Ser. No. 125,052, Sep. 21, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 466,868

Int. Cl.[6] C08G *69/00*

U.S. Cl. 528—328 **5 Claims**

1. A method of inhibiting scale formation in an aqueous system by adding at least one amino acid polymer to the wherein the amino acid polymer is prepared by a process comprising:

a) forming a reaction mixture of from about 15 to about 95 percent by weight amino acid, from about 3 to about 85 percent by weight of acid catalyst, and 0 to about 50 percent by weight of a polyfunctional monomer, wherein the weight percentages are based on the total weight of the reaction mixture;

b) heating said reaction mixture from about 110° C. to about 300° C., while maintaining said reaction mixture as an intimate admixture hy; i) adding one or more processing aid to the reaction mixture; ii) using mechanical means; or iii) a combination thereof;

c) removing water from said reaction mixture; and

d) recovering amino acid polymer.

5,552,515

PROCESS FOR THE PRODUCTION OF POLY(3-HYDROXYALKANOATES)

John C. Hubbs; Marti N. Harrison, both of Kingsport; Charles Buchanan, Bluff City; Robert M. Gardner, Gray; Douglas C. Hoffman, and Alan W. White, both of Kingsport, all of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

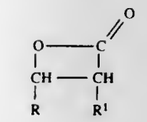
Division of Ser. No. 185,097, Jan. 21, 1994, Pat. No. 5,391,708, which is a division of Ser. No. 901,306, Jun. 19, 1992, Pat. No. 5,281,691. This application Feb. 21, 1995, Ser. No. 395,395

Int. Cl.[6] C08G *63/08*

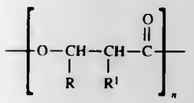
U.S. Cl. 528—354 **32 Claims**

1. A process for producing poly(3-hydroxy-alkanoates) comprising contacting a solution containing about 1 to about 100 mole percent of at least one β-substituted-β -propiolactone containing less than 2,790 ppm water with an anionic initiator under polymerization conditions to produce a poly(3-hydroxyalkanoate) wherein the β-substituted-β-propiolactone is of the formula:

(IV)



(V)



wherein n is an integer from 10 to 12,000 and R and R^1 are each independently selected from the group consisting of C_1 to C_{20} alkyls and substituted alkyls, C_3 to C_{10} aryls and substituted aryls, and C_5 to C_{10} cycloalkyls and substituted cycloalkyls and wherein R^1 is also selected from the group consisting of hydrogen.

5,552,516

SOLUBLE, CROSSLINKED POLYASPARTATES

Robert J. Ross, Elmhurst; Kim C. Low, Alsip, and Larry P. Koskan, Orland Park, all of Ill., assignors to Donlar Corporation, Bedford Park, Ill.

Filed Jun. 22, 1994, Ser. No. 263,459

Int. Cl.[6] C08G *69/00*

U.S. Cl. 528—363 **26 Claims**

1. A method of producing soluble, crosslinked polyaspartate comprising the steps of:

a) dissolving a polysuccinimide in a polar aprotic organic solvent;

b) combining the dissolved polysuccinimide with an effective crosslinking amount of an organic crosslinking agent that is an organic base containing at least two primary amine groups to form a crosslinked polysuccinimide product in the resulting reaction mixture;

c) isolating the crosslinked polysuccinimide product obtained by admixing the reaction mixture with a solvent in which the polar aprotic organic solvent is soluble and the crosslinked polysuccinimide product is not;

d) collecting the crosslinked polysuccinimide product; and

e) hydrolyzing the collected crosslinked polysuccinimide product to crosslinked polyaspartate, said crosslinked polyaspartate being soluble in polar solvent selected from the group consisting of water, alcohol or mixtures thereof.

5,552,517

PRODUCTION OF POLYSUCCINIMIDE IN AN ORGANIC MEDIUM

David A. Martin, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 3, 1995, Ser. No. 398,323

Int. Cl.[6] C08G *69/10*

U.S. Cl. 528—363 **22 Claims**

1 A process for preparing polysuccinimide by the thermal condensation of L-aspartic acid which comprises providing a high boiling organic reaction medium selected from the group consisting of high boiling straight or branched chain alkyl alcohols having from 7 to 14 carbon atoms and mixtures thereof and straight or branched chain alkanes having from 10 to 20 carbon atoms and mixtures thereof, heating the amino acid in said medium for a sufficient time to polymerize said amino acid.

5,552,518

POLYMERS OF MALEIC ACID WITH AMINES

Louis L. Wood, Rockville, and Gary J. Calton, Elkridge, both of Md., assignors to Calwood Chemical Industries, Inc., Elkridge, Md.

Division of Ser. No. 132,246, Oct. 6, 1993, Pat. No. 5,442,038. This application May 22, 1995, Ser. No. 445,678

Int. Cl.[6] C08G *69/00;73/00*

U.S. Cl. 528—363 **2 Claims**

1. A polymer produced by a process comprising polymerizing (1) one of the members of the group consisting of maleic acid, malic acid, or fumaric acid, (2) less than one equivalent of ammonia and (3) an amine, at a temperature greater than about 120° C., to produce said polymer.

5,552,519

ROSIN ESTER DERIVATIVE AS SURFACTANTS

Paul N. Hemmings, Bristol, England, and Long Wang, Taipei, Taiwan, assignors to EKA Nobel, AB, Sweden

PCT No. PCT/SE93/00970, § 371 Date May 16, 1995, § 102(e) Date May 16, 1995, PCT Pub. No. WO94/12272, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 15, 1993, Ser. No. 436,187

Claims priority, application Sweden, Nov. 20, 1992, 9203499

Int. Cl.[6] B01F *17/34;17/52;* **C08L** *93/04;* **C09J** *9/00*

U.S. Cl. 530—216 **14 Claims**

1. A method for the production of a surfactant which comprises

(1) esterifying a rosin with an alcohol to an acid value of less than 30, wherein the alcohol is a polyhydric alcohol containing 2 to 18 carbon atoms, in order to obtain a rosin ester;

(2a) grafting the rosin ester with an unsaturated carboxylic acid or anhydride, wherein the mole ratio carboxylic acid or anhydride/rosin is from about 0.05:1–5:1, to obtain a grafted rosin ester;

(3a) esterifying the grafted rosin ester with a polyethylene glycol to an acid value of less than 30, wherein said polyethylene glycol has a Mw of 4000–16000, and wherein the mole ratio glycol/free carboxylic acid group is from 0.2:1–1:1; or, as an alternative to steps (2a) and (3a),

(2b) esterifying an unsaturated carboxylic acid or anhydride with a polyethylene glycol to an acid value of less than 30, wherein said polyethylene glycol has a Mw of 4000–16000 and wherein the mole ratio glycol/free carboxylic acid group or anhydride is from 0.2:1–1:1;

(3b) and grafting the rosin ester from step (1) with the ester from step (2b), wherein the mole ratio of ester from (2b)/rosin ester is from about 0.05:1–1.5:1.

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THERAPEUTIC PEPTIDE DERIVATIVES

Sun H. Kim, Chestnut Hill; Susan R. Keyes, Boston; Sylviane Moreau, Upton; Zheng X. Dong, Framingham, and John Taylor, Upton, all of Mass., assignors to Biomeasure, Inc., Milford, Mass.

Continuation-in-part of Ser. No. 104,194, Aug. 9, 1993, abandoned. This application Aug. 9, 1994, Ser. No. 287,957

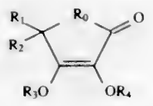
Int. Cl.[6] C07K *5/00;7/00;17/00*

U.S. Cl. 530—311 **28 Claims**

1. A peptide derivative consisting of:

a biologically active peptide moiety having a free amino group, and at least one substituent attached to said peptide moiety, wherein said substituent is selected from the group consisting of Compounds I, II, and III, wherein Compound I is:

a) reducing Compound H of the formula



wherein:

R_0 is O, S, or NR_5, wherein R_5 is H or (C_1-C_6) alkyl;

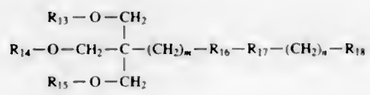
each R_1 and R_2, independently, is H, $(CH_2)_mOR_6$, or $CH(OR_7)CH_2OR_8$, wherein R_6 is H or (C_2-C_7) acyl, and each R_7 and R_8, independently, is H, (C_2-C_7) acyl, or $C(R_9)(R_{10})$, wherein each R_9 and R_{10}, independently, is H or C_1-C_6 alkyl;

or R_1 and R_2 in combination are $=CHCH_2OR_{11}$, R_{11} is H or (C_2-C_7) acyl, and m is an integer between 1 and 5, inclusive; and

one of R_3 and R_4 is $(CH_2)_nR_{12}$ or $(CH_2)_nCH(OH)R_{12}$, wherein R_{12} is CO, CH_2 or SO_2, and n is an integer between 1 and 5, inclusive;

and the other of R_3 and R_4 is H, (C_1-C_6) hydroxyalkyl, or (C_2-C_7) acyl; and

Compound II is:



wherein:

each R_{13}, R_{14}, and R_{15}, independently, is H or (C_2-C_{24}) acyl;

R_{16} is NH or absent;

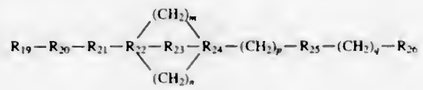
R_{17} is CO, O, or absent;

R_{18} is CO, CH_2, SO_2, or absent;

m is an integer between 1 and 5, inclusive;

n is an integer between 1 and 5, inclusive; and

Compound III is:



wherein:

R_{19} is H, NH_2, an aromatic functional group, OH, (C_1-C_6) hydroxyalkyl, $H(R_{27})(R_{28})$, SO_3H, or absent; wherein each R_{27} and R_{28}, independently, is H or (C_1-C_6) alkyl;

R_{20} is O or absent;

R_{21} is (C_1-C_6) alkyl or absent;

R_{22} is N, O, C, or CH;

R_{23} is (C_1-C_6) alkyl or absent;

R_{24} is N, CH, or C;

R_{25} is NH, O, or absent;

R_{26} is SO_2, CO, or CH_2;

m is an integer between 0 and 5, inclusive;

n is an integer between 0 and 5, inclusive;

p is an integer between 0 and 5, inclusive; and

q is an integer between 0 and 5, inclusive;

wherein said peptide moiety is attached to said substituent at R_{12}, R_{18}, or R_{26} by a CO—N, CH_2—N, or SO_2—N bond between said substituent and said free amino group.

5,552,521

PROCESS FOR PREPARING CERTAIN AZA CYCLOHEXAPEPTIDES

Kevin M. Belyk, Woodbridge; Dean R. Bender, Hazlet; Regina M. Black, Cranford; David L. Hughes, Old Bridge, and William Leonard, Watchung, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

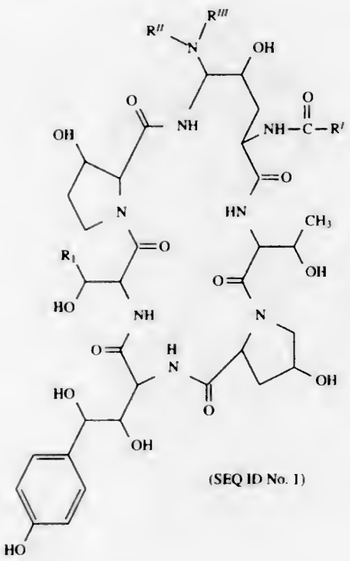
Filed Feb. 10, 1995, Ser. No. 386,618

Int. Cl.[6] C07K *7/64*

U.S. Cl. 530—317 **15 Claims**

1. A process for preparing aza cyclohexapeptide compounds of the formula

(I)



(SEQ ID No. 1)

wherein

R_1 is $CH_2CH_2NH_2$ or CH_2CONH_2;

R^I is C_9–C_{21} alkyl,

C_9–C_{21} alkenyl,

C_1–C_{10} alkoxyphenyl,

C_1–C_{10} alkoxynaphthyl, or

C_1–C_{10} alkoxyterphenyl:

R^{II} is H, C_1–C_4 alkyl,

C_3–C_4 alkenyl,

$(CH_2)_{2-4}OH$, or

$(CH_2)_{2-4}NR^{IV}R^V$;

R^{III} is H, C_1–C_4 alkyl C_3–C_4 alkenyl, $(CH_2)_{2-4}OH$, $(CH_2)_{2-4}NR^{IV}R^V$, or

R^{II} and

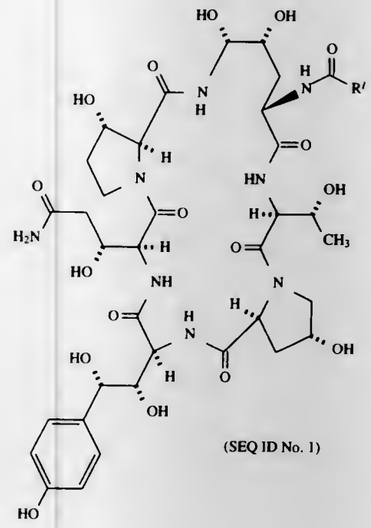
R^{III} taken together are $(CH_2)_4$, $(CH_2)_5$, $(CH_2)_2O(CH_2)_2$ or $(CH_2)_2NH(CH_2)_2$;

R^{IV} is H or C_1–C_4 alkyl;

R^V is H or C_1–C_4 alkyl; or

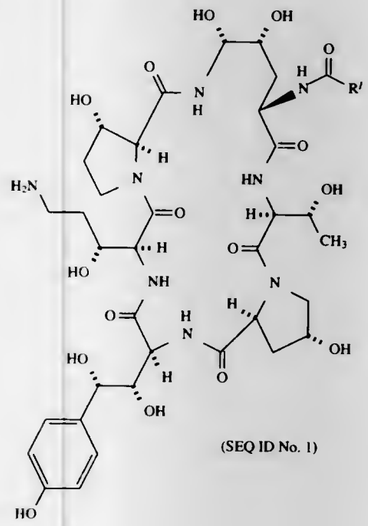
pharmaceutically acceptable acid addition salts thereof which comprises the steps of

a) reducing Compound H of the formula



(SEQ ID No. 1)

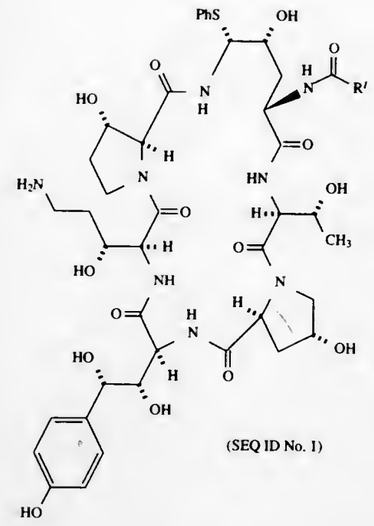
to afford Compound III of the formula



(SEQ ID No. 1)

b) converting Compound III to afford Compound IV of the formula

(II)



(SEQ ID No. 1)

(IV)

and,

c) stereoselectively converting Compound IV to Compound I by the displacement of the phenylthio group.

(III)

5,552,522

ANTI-OBESITY PROTEINS

Richard D. DiMarchi, Carmel; David B. Flora, Greenfield; William F. Health, Jr., Fishers; James A. Hoffmann, Greenwood; James E. Shields, Noblesville, and David L. Smiley, Greenfield, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 31, 1995, Ser. No. 381,040

Int. Cl.[6] A61K *38/00;* **C07K** *7/10;7/00*

U.S. Cl. 530—324 **17 Claims**

1. A biologically active peptide of the formula: SEQ ID NO: 1 or a pharmaceutically acceptable salt thereof.

5,552,523

ANTI-OBESITY PROTEINS

Margret B. Basinski, Indianapolis; Richard D. DiMarchi, Carmel; William F. Heath, Jr., Fishers, and Brigitte E. Schoner, Monrovia, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 381,458, Jan. 31, 1995, abandoned. This application Feb. 6, 1995, Ser. No. 384,183

Int. Cl.[6] A61K *38/00;* **C07K** *7/10;7/00*

U.S. Cl. 530—324 **15 Claims**

1. A protein comprising the amino acids of position 95 through position 128 of SEQ ID NO: 1 properly crosslinked to SEQ ID NO: 2, or a pharmaceutically acceptable salt thereof.

5,552,524

ANTI-OBESITY PROTEINS

amines, substituted aliphatic amine derivatives and amides, and an azo containing compound represented by the formula

(2c)

5,552,524

ANTI-OBESITY PROTEINS

Margret B. Basinski, Indianapolis; Richard D. DiMarchi, Carmel; William F. Heath, Jr., Fishers, and Brigitte E. Schoner, Mooresville, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 381,661, Jan. 31, 1995, abandoned. This application Feb. 6, 1995, Ser. No. 384,292

Int. Cl.[6] A61K *38/00*; C07K *7/00;7/10*

U.S. Cl. 530—324 15 Claims

1. A protein comprising the amino acids of position 95 through position 138 of SEQ ID NO: 1 properly crosslinked to SEQ ID NO: 2, or a pharmaceutically acceptable salt thereof.

5,552,525

TECHNETIUM-99M LABELED PEPTIDES FOR IMAGING INFLAMMATION

Richard T. Dean, Bedford, N.H., assignor to Diatech Inc., Londonderry, N.H.

Continuation-in-part of Ser. No. 653,012, Feb. 8, 1991, abandoned. This application Feb. 19, 1993, Ser. No. 19,864

Int. Cl.[6] A61K *38/00;51/00*; C07K *2/00*

U.S. Cl. 530—326 27 Claims

1. A reagent for preparing a technetium-99m (Tc-99m) radiolabeled peptide for imaging sites of inflammation within a mammalian body, comprising a specific binding peptide comprising platelet factor 4 or peptide fragments thereof wherein the peptide specifically binds to sites of inflammation, covalently linked to a Tc-99m binding moiety.

5,552,526

MDC PROTEINS AND DNAS ENCODING THE SAME

Yusuke Nakamura, Kanagawa, and Mitsuru Emi, Tokyo, both of, Japan, assignors to Cancer Institute, and Eisai Co., Ltd., both of Tokyo, Japan

Filed May 13, 1994, Ser. No. 243,542

Claims priority, application Japan, May 14, 1993, 5-136602; Sep. 22, 1993, 5-257455; Feb. 23, 1994, 6-049904; Apr. 12, 1994, 6-073328

Int. Cl.[6] C07K *14/00*

U.S. Cl. 530—350 10 Claims

5. An isolated MDC protein which comprises the protein represented by a member selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3 and SEQ ID NO:4.

5,552,527

HYPER-SENSITIVITY RELATED GENE

Laurence Godiard, Köln, Germany; Yves Marco, Castanet-Tolosan, France; Dominique Pontier, and Dominique Roby, both of Toulouse, France, assignors to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 202,854, Feb. 23, 1994. This application May 18, 1995, Ser. No. 446,923

Claims priority, application European Pat. Off., Feb. 24, 1993, 93102887

Int. Cl.[6] C07K *14/415*; C12N *15/29;15/82*

U.S. Cl. 530—379 7 Claims

3. Purified protein selected from the group consisting of

a) the amino acid sequence of SEQ ID No: 2 and,

b) an amino acid sequence of a mature plant protein which is induced during a hypersensitive response to a plant pathogen wherein said mature plant protein has an amino acid sequence which is at least 80% similar to the sequence of SEQ ID No: 2.

5,552,528

BOVINE B-ENDOTHELIAL CELL GROWTH FACTOR

Wilson Burgess, Gaithersburg, and Thomas Maciag, Rockville, both of Md., assignors to Rhone-Poulenc Rorer Pharmaceuticals Inc., Collegeville, Pa.

Continuation of Ser. No. 799,859, Nov. 27, 1991, abandoned, which is a continuation of Ser. No. 693,079, Apr. 29, 1991, abandoned, which is a continuation of Ser. No. 134,499, Dec. 18, 1987, abandoned, which is a continuation-in-part of Ser. No. 835,594, Mar. 3, 1986, Pat. No. 4,868,113. This application Nov. 3, 1994, Ser. No. 334,884

Int. Cl.[6] C07K *14/50*; A61K *38/27*

U.S. Cl. 530—399 1 Claim

1. Isolated and purified biologically active bovine β endothelial cell growth factor having an amino terminal sequence of Ala Glu Gly Glu Thr Thr Thr Phe Thr Ala Leu Thr Glu Lys Phe Asn Leu Pro Leu Gly, an apparent molecular weight of 20,000 and having a specific activity for promoting human endothelial cell growth of at least the activity obtained when purified 16,300 fold from bovine brain extract.

5,552,529

AUTOANTIGEN, PINCH

Ann Rearden, Rancho Santa Fe, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Jun. 30, 1994, Ser. No. 269,441

Int. Cl.[6] C07K *14/47;7/06*

U.S. Cl. 530—380 2 Claims

1. An isolated PINCH protein consisting of the amino acid of SEQ ID NO:2.

5,552,530

ANTIBODIES THAT SPECIFICALLY BIND TO AND INHIBIT HUMAN SYNOVIAL PHOSPHOLIPASE AZ TYPE A

Lorin K. Johnson, Pleasanton; Jeffrey J. Seilhamer, Milpitas, both of Calif.; Waldemar Pruzanski, Willowdale, and Peter Vadas, Toronto, both of, Canada, assignors to Eli Lilly & Company, Indianapolis, Ind.

Division of Ser. No. 58,988, May 5, 1993, abandoned, which is a continuation of Ser. No. 750,230, Aug. 19, 1991, abandoned, which is a continuation of Ser. No. 579,263, Sep. 4, 1990, abandoned, which is a continuation of Ser. No. 231,865, Aug. 16, 1988, abandoned, which is a continuation-in-part of Ser. No. 215,726, Jul. 6, 1988, Pat. No. 5,019,508, which is a continuation-in-part of Ser. No. 89,883, Aug. 27, 1987, abandoned. This application Aug. 1, 1994, Ser. No. 283,793

Int. Cl.[6] C07K *16/18*; C12N *5/20*

U.S. Cl. 530—387.9 8 Claims

1. A composition comprising purified polyclonal antibodies that specifically bind to an epitope located in the region of amino acids 67–85 of human synovial phospholipase A2Type A and inhibit the phospholipase activity of the synovial phospholipase A2.

5,552,531

PROCESS FOR PREPARING SUBSTITUTED AROMATIC AZO COMPOUNDS

Michael K. Stern, University City, and Brian K.-M. Cheng, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 887,060, May 22, 1992, abandoned. This application Apr. 6, 1993, Ser. No. 38,047

Int. Cl.[6] C07C *245/08*

U.S. Cl. 534—588 26 Claims

1. A process for preparing substituted aromatic azo compounds comprising:

(a) contacting a nucleophilic compound selected from the group consisting of aniline, substituted aniline derivatives, aliphatic amines, substituted aliphatic amine derivatives and amides, and an azo containing compound represented by the formula X—R_1—N=N—R_2—Y or azoxy or hydrazo derivatives thereof in the presence of a suitable solvent system, and

(b) reacting the nucleophilic compound and azo containing compound in the presence of a suitable base and a controlled amount of protic material at a reaction temperature of from about 10° C. to about 150° C. in a confined reaction zone, wherein the molar ratio of protic material to base is 0:1 to about 5:1 wherein R_1 is an aromatic group, R_2 is selected from the group consisting of aliphatic and aromatic groups, and X and Y are independently selected from the group consisting of hydrogen, halides, —NO_2, —NH_2, aryl groups, alkyl groups, alkoxy groups, sulfonate groups, —SO_3H, —OH, —COH, —COOH, and alkyl, aryl, arylalkyl or alkylaryl groups containing at least one —NH_2 group, wherein if R_2 is aliphatic, X is in the meta or ortho position on R_1 and if R_2 is aromatic, at least one of X and Y is in the meta or ortho position on R_1 and R_2, respectively, and wherein halides are selected from the group consisting of chloride, bromide and fluoride.

5,552,532

REACTIVE DYES, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Herbert Kler, Bad Krozingen-Biengen; Bernhard Müller, Efringen-Kirchen, both of, Germany; Edmond Rahlmann, Saint-Louis, France, and Athanasios Tzikas, Prattein, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

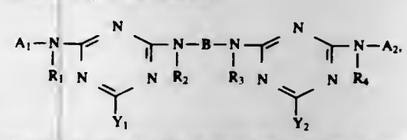
Filed May 13, 1994, Ser. No. 242,514

Claims priority, application Switzerland, May 17, 1993, 1494/93; Jun. 29, 1993, 1950/93

Int. Cl.[6] C09B *62/04;62/503*; D06P *1/38;3/66*

U.S. Cl. 534—612 11 Claims

1. A reactive dye of the formula



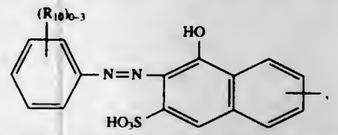
(1)

in which R_1, R_2, R_3 and R_4 independently of one another are hydrogen or substituted or unsubstituted C_1–C_4alkyl,

B is an aliphatic bridge member,

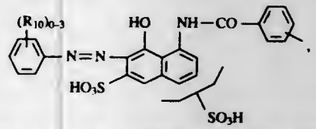
Y_1 and Y_2 independently of one another are halogen or carboxypyridinium,

A_1 is the radical of an anthraquinone, phthalocyanine, dioxazine, formazan or disazo dye, or a radical of the formula



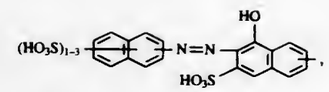
(2a)

in which R_{10} is 0 to 3 identical or different substituents selected from the group consisting of C_1–C_4alkyl, C_1–C_4alkoxy, halogen, carboxyl and sulfo,

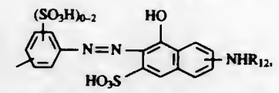


(2b)

in which R_{10} is 0 to 3 identical or different substituents selected from the group consisting of C_1–C_4alkyl, C_1–C_4alkoxy, halogen, carboxyl and sulfo,

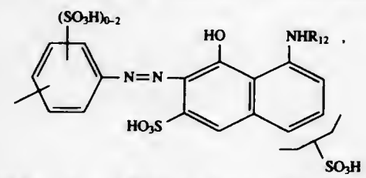


(2c)



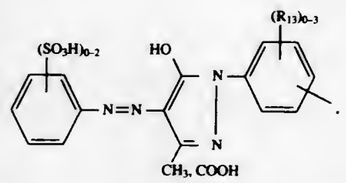
(2d)

in which R_{12} is C_1–C_4alkanoyl, benzoyl or a halotriazinyl radical, which contains no further substituents or is further substituted,



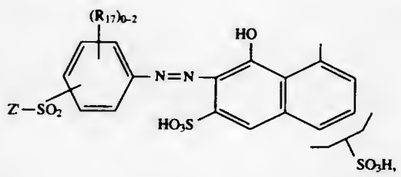
(2e)

in which R_{12} is C_1–C_4alkanoyl, benzoyl or a halotriazinyl radical, which contains no further substituents or is further substituted,



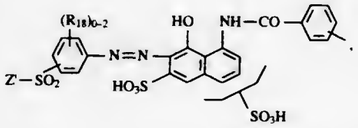
(2f)

in which R_{13} is 0 to 3 identical or different substituents selected from the group consisting of C_1–C_4alkyl, C_1–C_4alkoxy, halogen, carboxyl and sulfo,



(2g)

in which R_{17} is 0 to 2 identical or different substituents selected from the group consisting of C_1–C_4alkyl, C_1–C_4alkoxy, halogen, carboxyl and sulfo; and Z' is β-sulfatoethyl, β-thiosulfatoethyl, β-phosphatoethyl, β-acyloxyethyl, β-haloethyl or vinyl, or



(2h)

in which R_{18} is 0 to 2 identical or different substituents selected from the group consisting of C_1–C_4alkyl, C_1–C_4alkoxy, halogen, carboxyl and sulfo; and

Z' is β-sulfatoethyl, β-thiosulfatoethyl, β-phosphatoethyl, β-acyloxyethyl, β-haloethyl or vinyl, and A_2 is as defined above for A_1,

where A_1 and A_2 have different meanings to one another.

5,552,533

PREPARATION OF (8S)-8-FLUOROERYTHROMYCINS WITH N-F FLUORINATING AGENTS

Andrew J. Poss, Kenmore, and George A. Shia, Amherst, both of N.Y., assignors to AlliedSignal Inc., Morris County, N.J.

Filed Sep. 14, 1994, Ser. No. 305,626

Int. Cl.[6] C07H *17/08;15/24*

U.S. Cl. 536—7.2 **22 Claims**

1. A process for preparing (8S)-8-fluoroerythromycins comprising contacting 8,9-anhydroerythromycin 6,9-hemiacetal or an N-oxide thereof with a carboxylic acid and an N-F fluorinating agent in the absence of an inert co-solvent for a time and temperature sufficient to obtain an (8S)-8-fluoroerythromycin.

5,552,534

NON-PEPTIDE PEPTIDOMIMETICS

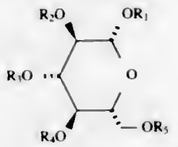
Ralph F. Hirschmann, Blue Bell, Pa.; Kyriacos C. Nicolaou, LaJolla, Calif.; Sherrie Pietranico; T. R. Reisine, both of Philadelphia, Pa.; Joseph M. Salvino, Media, Pa.; Paul Sprengeler, Philadelphia, Pa., and Catherine D. Strader, Verona, N.J., assignors to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 748,826, Aug. 22, 1991, abandoned. This application Oct. 28, 1993, Ser. No. 144,660

Int. Cl.[6] C07H *15/00;17/00*

U.S. Cl. 536—17.4 **16 Claims**

1. A compound having the structure:



wherein:

(a) R_1 is $—(CH_2)_2$(3-indole); R_2, R_3, and R_4 are benzyl; and R_5 is $—(CH_2)_5NHC(O)CH_3$; or

(b) R_1 is $—CH_3$; R_2, R_3, and R_4 are benzyl; and R_5 is $—(CH_2)_5NH_2$; or

(c) R_1 is $—CH_3$; R_2, R_3, and R_4 are benzyl; and R_5 is $—(CH_2)_5NHC(O)CH_3$; or

(d) R_1 is $—(CH_2)_2$(3-indole); R_2 and R_3 are benzyl; R_4 is —H; and R_5 is $—(CH_2)OH$; or

(e) R_1 is $—(CH_2)_2$(3-indole); R_2, R_3 and R_4 are benzyl; and R_5 is $—(CH_2)OH$; or

(f) R_1 is $—CH_3$; R_2, R_3 and R_4 are benzyl; and R_5 is $—(CH_2)OH$.

5,552,535

MULTIPLE OLIGONUCLEOTIDE CONTAINING OLIGOMERS AND THE CLEANABLE LINKERS USED IN THEIR PREPARATION

Michael J. McLean, Nantwich; David Holland, Macclesfield; Andrew J. Garman, Ashton, and Robert C. Sheppard, Cambridge, all of, Great Britain, assignors to Zeneca Limited, London, United Kingdom

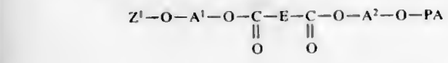
Division of Ser. No. 41,599, Apr. 5, 1993, Pat. No. 5,393,877. This application Nov. 7, 1994, Ser. No. 337,025

Claims priority, application United Kingdom, Apr. 3, 1992, 9207381

Int. Cl.[6] C07H *21/00;* **C07F** *9/02;* **C07D** *333/00;* **C07C** *69/66*

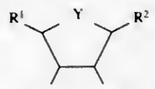
U.S. Cl. 536—23.1 **14 Claims**

1. A compound of formula (3):



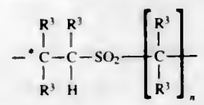
(3)

wherein one or both of A^1 and A^2 is a divalent group of the formula (a):



(a)

in which R^1 and R^2 are each independently H, optionally substituted alkyl, optionally substituted alkoxy, optionally substituted aryloxy, or an electron withdrawing group; Y is CH_2; CH_2CH_2, NH, S or O; E is an organic spacer group; and any remaining group represented by A^1 or A^2 is of the formula (b):

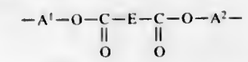


(b)

wherein:

n has a value of from 1 to 5; the carbon atom marked with an asterisk is attached to an oxygen atom shown in Formula (3); and each R^3 independently represents H or optionally substituted alkyl; Z^1 is an acid labile protecting group; and —O—PA is a phosphoramidite group, a phosphate ester group or a H-phosphonate group.

2. A compound comprising two or more oligonucleotides linked by a group or groups containing a cleavable linker moiety of formula



wherein A^1, E and A^2 are as defined in claim 1.

5,552,536

DNA ENCODING PRECURSOR OF INTERLEUKIN-1 BETA CONVERTING ENZYME - RELATED CYSTEINE PROTEINASE III (ICE REL-III)

Donald W. Nicholson, Montreal; Ambereen Ali, Pierrefonds; Neil A. Munday, Guelph, and John P. Vaillancourt, Pierrefonds, all of, Canada, assignors to Merck Frosst Canada, Inc., Quebec, Canada

Filed Apr. 8, 1994, Ser. No. 224,930

Int. Cl.[6] C07H *21/02;21/04;* **C12N** *15/70;5/10*

U.S. Cl. 536—23.1 **4 Claims**

1. An isolated DNA molecule which consists of SEQ ID NO:3.

5,552,537

IGE ISOFORMS AND METHOD OF USE

Andrew Saxon, Santa Monica; Ke Zhang, Los Angeles, both of Calif., and Edward E. Max, Bethesda, Md., assignors to The Regents of the University of California, Oakland, Calif.

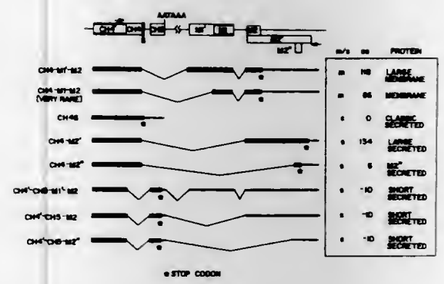
Filed Mar. 24, 1993, Ser. No. 37,579

Int. Cl.[6] C07H *21/04;21/02;* **C12Q** *1/68*

U.S. Cl. 536—24.3 **8 Claims**

1. An isolated DNA comprising a nucleotide sequence selected from the group consisting of:

CH4' (SEQ ID NO:1, 3–217) spliced to CH5 (SEQ ID NO:1, 359–440); and CH4 (SEQ ID NO:1, 3–323) spliced to M2" (SEQ ID NO:4, 420–443).



5,552,538

OLIGONUCLEOTIDES WITH CLEAVABLE SITES

Michael S. Urdea, Alamo, and Thomas Horn, Berkeley, both of Calif., assignors to Chiron Corporation, Emeryville, Calif.

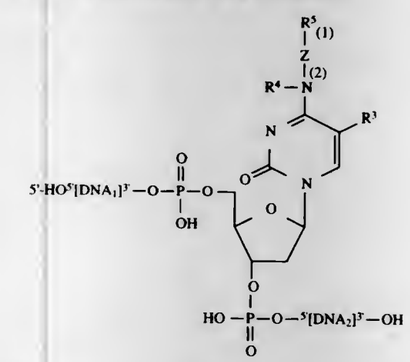
Division of Ser. No. 559,961, Jul. 27, 1990, Pat. No. 5,430,136, which is a continuation-in-part of Ser. No. 398,711, Aug. 25, 1989, Pat. No. 5,258,506, which is a continuation-in-part of Ser. No. 251,152, Sep. 29, 1988, Pat. No. 5,118,605, which is a continuation-in-part of Ser. No. 661,508, Oct. 16, 1984, Pat. No. 4,775,619. This application May 9, 1995, Ser. No. 437,581

Claims priority, application European Pat. Off., Oct. 3, 1988, 88309203; Canada, Oct. 4, 1988, 597309; Japan, Oct. 4, 1988, 63-250726

Int. Cl.[6] C07H *21/00;21/04*

U.S. Cl. 536—24.3 **1 Claim**

1. A polynucleotide reagent having the structure



wherein

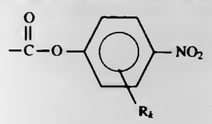
DNA_1 is a first segment of DNA;

DNA_2 is a second segment of DNA;

R^3 is selected from the group consisting of hydrogen, methyl, I, Br and F;

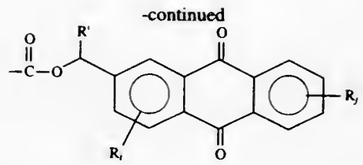
R^4 is hydrogen or methyl; and

R^5 is selected from the group consisting of levulinyl,



and

-continued



in which R' is hydrogen, aryl or aralkyl;

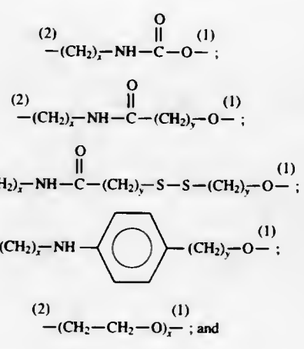
the R_i may be the same or different and are selected from the group consisting of amino, nitro, halogeno, hydroxyl, lower alkyl and lower alkoxy;

the R_j may be the same or different and are selected from the group consisting of amino, nitro, halogeno, hydroxyl, lower alkyl and lower alkoxy;

the R_k may be the same or different and are selected from the group consisting of amino, nitro, halogeno, hydroxyl, lower alkyl and lower alkoxy;

i is zero, 1, 2 or 3, j is zero, 1, 2, 3 or 4, and k is 0, 1, 2, 3 or 4; and

Z is selected from the group consisting of



wherein x and y are integers which may be the same or different and are integers in the range of 1 to 8.

5,552,539

PROCESS FOR THE SYNTHESIS OF RIBONUCLEIC ACID (RNA) USING A NOVEL DEPROTECTION REAGENT

Anne-Marie Duplaa, Echirolles; Didier Gasparutto, Paris; Thierry Livache, Grenoble; Didier Molko, Tullins-Fures, and Robert Teoule, Grenoble, all of, France, assignors to Commissariat a l'Energie Atomique, Paris, and CIS BIO International, Saclay, both of, France

PCT No. PCT/FR92/00929, § 371 Date Jul. 26, 1994, § 102(e) Date Jul. 26, 1994, PCT Pub. No. WO93/07164, PCT Pub. Date Apr. 15, 1993

PCT Filed Oct. 7, 1992, Ser. No. 211,424

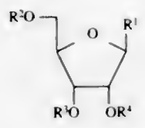
Claims priority, application France, Oct. 8, 1991, 91 12357

Int. Cl.[6] C07H *1/02;21/02*

U.S. Cl. 536—25.31 **10 Claims**

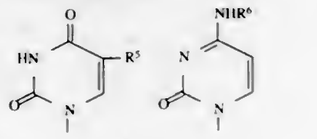
1. In a process for synthesizing RNA comprising:

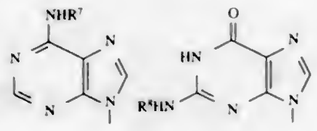
a) successively condensing on a first protected nucleoside and having formula I:

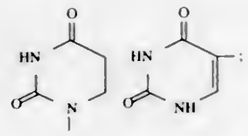


one or more protected nucleosides of Formula I having the same or different heterocyclic bases in order to form a protected synthetic ribonucleic acid molecule wherein all of the hydroxyl groups in the 2'-position are protected by R^4,

wherein R^1 is a heterocyclic radical selected from the group consisting of the following structures:







R^2 is an acid-labile protecting group;

R^3 is a solid support or a phosphorus radical appropriate for oligonucleotide synthesis;

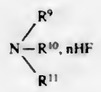
R^4 is trialkyl silyl;

R^5 is hydrogen or methyl; and

R^6, R^7, and R^8 are hydrogen or an acyl group protecting an exocyclic amino group, and

b) deprotecting all of the 2'-hydroxyls of the protected RNA molecule by treating said RNA with a deprotection reagent, the improvement comprising using a deprotection reagent of Formula II:

(II)



wherein R^9 is straight or branched C_1–C_{10} alkyl;

R^{10} and R^{11} are the same or different and are hydrogen, or a straight or branched C_1–C_{10} alkyl which may be the same as or different than R^9; and

n is a number, which may or may not be an integer, between and including 1 and 3.

5,552,540

NUCLEOSIDE DERIVATIVES

Jim Haralambidis, Victoria, Australia, assignor to Howard Florey Institute of Experimental Physiology and Medicine, Victoria, Australia

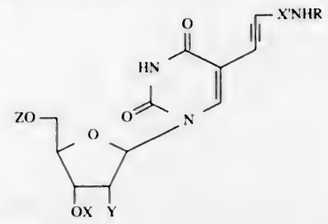
Continuation of Ser. No. 457,747, Dec. 22, 1989, abandoned. This application May 27, 1993, Ser. No. 68,604

Int. Cl.[6] **C07H** *19/06*

U.S. Cl. 536—25.34 **10 Claims**

1. A nucleoside of the formula (I):

(I)



wherein

(A) Y is H, OH or a protected hydroxy group;

(B) X is H, a phosphonate group or a phosphoramidite group of the formula

wherein

(i) R^1 and R^2 are the same or different, and are selected from branched or unbranched C_{1-30} alkyl or substituted C_{1-30} alkyl having substituents selected from the group consisting of phenyl, benzyl, acyl, methyl, propyl, ethyl, isopropyl and butyl; and

(ii) Q is a phosphate protecting group;

(C) Z is H, a phosphate group, a triphosphate group or a hydroxy-protecting group;

(D) X' is a branched or unbranched C_{1-15} alkyl group;

(E) R is an acid labile amino protecting group, an amino reactive detectable marker, or the group

Y'NHA,

wherein

(i) Y' is a branched or unbranched C_{1-40} alkyl carbonyl group; and

(ii) A is an acid labile amino protecting group, or an amino reactive detectable marker.

5,552,541

HAPTENIC PROBES FOR DETECTING CAPTURE POLYNUCLEOTIDES

Craig W. Adams, Corona, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 20, 1990, Ser. No. 541,143

Int. Cl.[6] **C07H** *21/04;21/00;* **C12Q** *1/68*

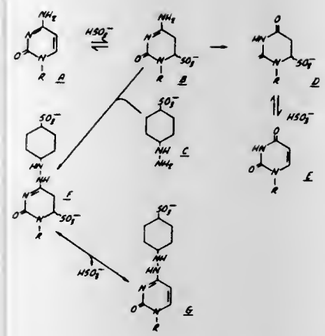
U.S. Cl. 536—22.1 **7 Claims**

1. A non-radioactive, haptenic probe for detecting a capture polynucleotide comprising:

(a) a probe polynucleotide, the probe polynucleotide having a polynucleotide sequence substantially complementary to a polynucleotide sequence of the capture polynucleotide;

(b) at least one non-radioactive, charged hapten label selected from the group consisting of benzoic acid anion, 4-(sulfonyl) benzoic acid anion, and sulfophenyl anion; and

(c) a hydrazine binding moiety covalently attaching the charged hapten to the N-4 position of a cytosine base of a nucleotide



located on the probe polynucleotide wherein detection of the capture polynucleotide is based upon an immunological reaction between the non-radioactive, charged hapten label and an antibody specific to the label.

5,552,542

PREPARATION AND USE OF 7-[(2-CARBOALKOXY-1-METHYLETHENYL)AMINO]-3-HYDROXYMETHYL-3-CEPHEM-4-CARBOXYLIC ACIDS

J. Gregory Reid, Manlius; Paul R. Brodfuehrer, and Patrick R. Smith, both of Syracuse, all of N.Y., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

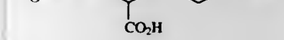
Filed May 10, 1995, Ser. No. 438,322

Int. Cl.[6] **C07D** *501/18*

U.S. Cl. 540—217 **6 Claims**

1. A process of making compound 1

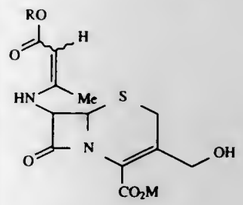
1



comprising of the steps of:

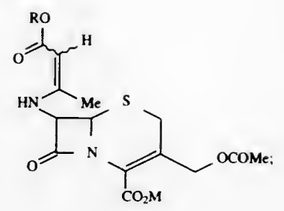
(a) acetylating a compound of formula 3

3



in which M is a metal selected from Group Ia or IIa of the periodic table, and R is C_{1-6} alkyl, with acetic anhydride to afford a compound of formula 4

4



and

(b) treating a compound of formula 4 with acid to afford compound 1.

5,552,543

SIT-MEMBERED HETERO "N" COMPOUNDS

Saul Wolfe, Kingston, and Stephen Bruder, Glenburnie, both of, Canada, assignors to Simon Fraser University, Vancouver, Canada

Continuation of Ser. No. 892,716, May 29, 1992, which is a continuation of Ser. No. 450,988, Dec. 15, 1989, which is a continuation-in-part of Ser. No. 284,502, Dec. 14, 1988, abandoned. This application Nov. 4, 1993, Ser. No. 219,803

Int. Cl.[6] **C07D** *279/12*

U.S. Cl. 544—58.4 **14 Claims**

1. A compound selected from the group consisting of compounds having antibiotic activity of the formula:

where

X=S, O, CH_2, or Se

Y=OH, NH_2, $NHCOR_9$, or SH

R_1,R_2,R_3,R_4,R_5,R_6,R_7 (which may be identical or different)=H, alkyl, or aryl

R_9=a β-lactam active side chain or pharmaceutically acceptable salts thereof, wherein the β-lactam active side chain is selected from the group consisting of:

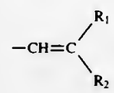
(a) a group of the formula —XO, wherein:

X=O or S, and

O=C_{1-4}alkyl, C_{2-4}alkenyl or aryl C_{1-4}; and,

2-carboxyvinyl, 2-methoxycarbonylvinyl, 2-ethoxycarbonylvinyl and 2-cyanovinyl or another group of the formula

2



wherein R_1 and R_2 may be the same or different, and are each selected from the group consisting of hydrogen, carboxy, cyano, C_{2-7}, alkoxycarbonyl and substituted or unsubstituted aliphatic groups; and,

(c) an unsubstituted or substituted methyl group of the formula —CH_2Y wherein Y is a hydrogen atom or a nucleophilic atom or nucleophilic group.

5,552,544

-continued

5,552,544

5-NITROBENZO[DE]-ISOQUINOLINE-1,3-DIONES THEIR PREPARATION AND THEIR USE

Miguel F. Brana; Jose M. C. Berlanga, both of Avenida de Burgos No. 20, 1.°M., ES-28036, Madrid; Marina M. Moset, 50 Calle Gaztambide, ES-28015 Madrid, all of, Spain; Erich Schlick, 4½ Rudolph-Wihr-Strasse, 6708 Neuhofen, and Gerhard Keilhauer, 20 Industriestrasse, 6701 Dannstadt-Schauernheim, both of, Germany

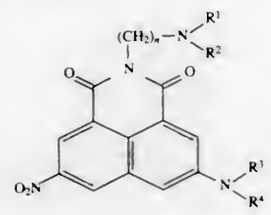
Continuation of Ser. No. 213,690, Jun. 30, 1988, abandoned, which is a division of Ser. No. 110,871, Oct. 21, 1987, abandoned. This application Jun. 4, 1990, Ser. No. 533,944

Claims priority, application Germany, Oct. 21, 1986, 36 35 711.1

Int. Cl.[6] **C07D** *413/06;221/14;* **A61K** *31/44;31/535*

U.S. Cl. 544—126 **4 Claims**

1. A 5-nitrobenzo(de)isoquinoline-1,3-dione of the formula I



where n is 1 or 2, R^1 and R^2 are identical or different and are each hydrogen, C_1–C_6-alkyl or C_1–C_6-hydroxyalkyl, and R^3 and R^4 are each hydrogen, or one is hydrogen and the other is C_1–C_6-alkyl, C_1–C_6-acyl, C_2–C_7-alkoxycarbonyl, aminocarbonyl or C_2C_7-alkylaminocarbonyl; or R^1 and R^2 together with the N atom form a pyrrolidinyl, morpholino or piperidinyl group where R^1 and R^4 are both hydrogen; or R^1 and R^2 together with the N atom form a pyrrolidinyl group where R^3 is hydrogen and R^4 is ethoxycarbonylamino; and its salts with physiologically tolerated acids.

5,552,545

5-DEAZA-10-OXO-AND 5-DEAZA-10-THIO-5,6,7,8-TETRAHYDROFOLIC ACIDS

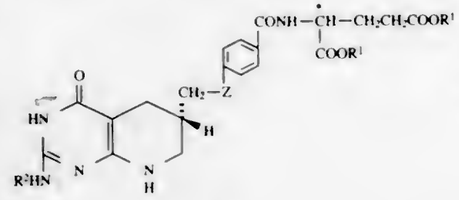
Homer L. Pearce, and Mark A. Winter, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 909,849, Jul. 7, 1992, Pat. No. 5,321,150, which is a division of Ser. No. 810,990, Dec. 20, 1991, Pat. No. 5,159,079. This application Feb. 14, 1994, Ser. No. 195,955

Int. Cl.[6] **C07D** *487/04;471/04*

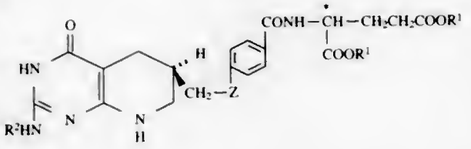
U.S. Cl. 544—279 **19 Claims**

1. A compound selected from the group consisting of a folic acid derivative having the formula:



or

-continued



wherein

Z is O or S;

R^1 is H or the same carboxyl protecting group;

R^2 is H or an amino protecting group; and

the configuration about the carbon atom designated * is L; or a pharmaceutically acceptable salt thereof.

5,552,546

PROCESS FOR THE PREPARATION OF 2-ETHOXY-4, 6-DIHYDROXYPYRIMIDINE

Douglas L. Pearson; Jon A. Orvik; Gary A. Roth; Carmen A. Scott; Ron B. Leng, all of Midland, and Dawn L. Shiang, Sanford, all of Mich., assignors to DowElanco, Indianapolis, Ind.

Filed Jul. 28, 1994, Ser. No. 282,398

Int. Cl.[6] **C07D** *239/02*

U.S. Cl. 544—299 **20 Claims**

1. A process for preparing a salt of 2-ethoxy-4,6-dihydroxypyrimidine, comprising contacting a salt of O-ethylisourea with dimethyl malonate in the presence of a methoxide base and optionally further comprising protonating the salt of 2-ethoxy-4,6-dihydroxypyrimidine obtained with an acid to form neutral 2-ethoxy-4,6-dihydroxypyrimidine.

5,552,547

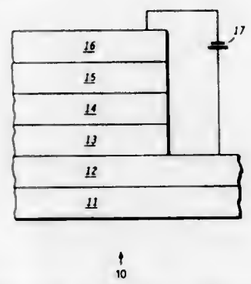
ORGANOMETALLIC COMPLEXES WITH BUILT-IN FLUORESCENT DYES FOR USE IN LIGHT EMITTING DEVICES

Song Q. Shi, 4521 E. Gold Poppy Way, Phoenix, Ariz. 85283

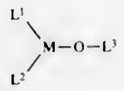
Filed Feb. 13, 1995, Ser. No. 387,691

Int. Cl.[6] **C07F** *5/06;5/00*

U.S. Cl. 546—7 **3 Claims**



1. An organometallic complex with a built-in fluorescent dye having a general formula:



where:

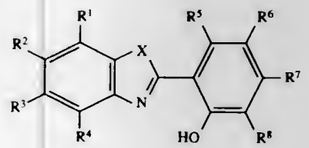
M is a trivalent metal ion;

O represents oxygen atom;

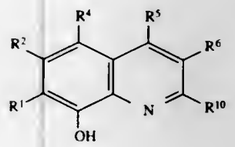
L3 is a fluorescent molecule dye;

L1 and L2 are independently selected from one of the molecules having a general formula I or II or III as shown in the following:

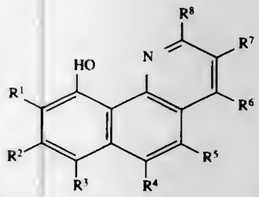
Formula I



Formula II



Formula III



Where:

X represents O, NH and CH_2; R1 to R8 represent substitution possibilities at each position and each represent hydrogen or hydrocarbon groups or functional groups selected from cyano, halogen, haloalkyl, haloalkoxy, alkoxyl, amido, amino, sulfonyl, carbonyl, carbonyloxy and oxycarbonyl; R10 represents a hydrocarbon group or a functional group such as cyano, halogen, haloalkyl, haloalkoxy, alkoxyl, amido, amino, sulfonyl, carbonyl, carbonyloxy and oxycarbonyl.

5,552,548

ENANTIOSELECTIVE OXAZABOROLIDINE CATALYSTS

George J. Quallich, North Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

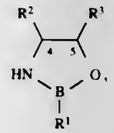
PCT No. PCT/US93/00687, § 371 Date Oct. 13, 1994, § 102(e) Date Oct. 13, 1994

Continuation of Ser. No. 883,317, May 14, 1992, abandoned. This PCT application Feb. 1, 1993, Ser. No. 318,828

Int. Cl.[6] **C07B** *53/00;* **C07F** *5/02*

U.S. Cl. 546—13 **11 Claims**

1. A chiral 1,3,2-oxazaborolidine of the formula



wherein:

R^1 is hydrogen, (C_1–C_8)alkyl, benzyl, phenyl or phenyl substituted with up to three (C_1– C_8)alkyl, (C_1–C_8)alkoxy or halo; and

R^2 and R^3 are syn and are each identically phenyl or phenyl substituted with up to three (C_1–C_8)alkyl, (C_1–C_8)alkoxy or halo.

5,552,549

PROCESS FOR THE DECHLORINATION OF CHLORINATED AROMATIC COMPOUNDS

Christian Rasp, Bergisch Gladbach; Helmut Waldmann, and Hans-Joachim Traenckner, both of Leverkusen, all of, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sep. 29, 1994, Ser. No. 315,001

Claims priority, application Germany, Oct. 6, 1993, 43 34 056.3

Int. Cl.[6] **C07D** *217/00;309/00;* **C07C** *22/00;1/20*

U.S. Cl. 546—139 **8 Claims**

1. A process for the at least partial dechlorination of at least one chlorinated aromatic compound selected from the group consisting of benzene, pyridine, naphthalene, quinoline, isoquinoline, and diphenyl ether or dioxin, which compound contains at least two chlorine atoms, which comprises heating said compound to 300° to 450° C. in a melt comprising at least one salt selected from the group consisting of lithium chloride, sodium chloride, potassium chloride, zinc chloride, copper(I) chloride, copper(II) chloride, silver chloride, thallium chloride, tin(II) chloride, aluminum chloride and iron(III) chloride, in the presence of water and carbon.

5,552,550

MONOMERIC NAPHTHYLISOQUINOLINE ALKALOIDS AND SYNTHESIS METHODS THEREOF

Gerhard Bringmann; Roland Götz, both of Wurzburg, Germany, and Michael R. Boyd, Ijamsville, Md., assignors to The United States of America, represented by the Secretary, Department of Health and Human Services, Washington, D.C.

Filed Jul. 22, 1994, Ser. No. 279,291

Int. Cl.[6] **C07D** *217/02*

U.S. Cl. 546—146 **22 Claims**

1. A method of preparing a monomeric naphthylisoquinoline alkaloid comprising:

(a) preparing a naphthalene building block with at least one activation group at a coupling site and, optionally, with at least one protective group as a precursor to a free hydroxyl group desired in said monomeric naphthylisoquinoline alkaloid,

(b) preparing an isoquinoline building block with at least one activation group at a coupling site and, optionally, with at least one protective group as a precursor to a free hydroxyl group desired in said monomeric naphthylisoquinoline alkaloid, wherein said isoquinoline building block is a tetrahydroisoquinoline, dihydroisoquinoline, or fully aromatic isoquinoline building block, and

(c) coupling said naphthalene and isoquinoline building blocks at said coupling sites to form said monomeric naphthylisoquinoline alkaloid.

5,552,551

PROTON-TRANSFER, LOW SELF-ABSORBING

5,552,553

N-(3-HYDROXY-4-PIPERIDINYL)

wherein:

R^1 is phenyl substituted with 1–2 halogen or R^1 is phenyl

and the pharmaceutically acceptable non-toxic salts and esters

5,552,551

PROTON-TRANSFER, LOW SELF-ABSORBING CHROMOPHORES FOR USE IN SCINTILLATORS

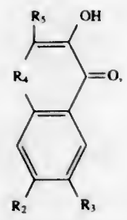
Joseph B. Schlenoff; Kurtis F. Johnson; Jayesh Dharia, and Feng Gao, all of Tallahassee, Fla., assignors to Florida State University, Tallahassee, Fla.

Continuation-in-part of Ser. No. 874,748, Apr. 27, 1992, Pat. No. 5,258,478. This application Jul. 26, 1995, Ser. No. 96,956

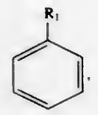
Int. Cl.[6] C07D *215/20;311/76;311/22*

U.S. Cl. 546—155 **37 Claims**

1. A chromophore of the formula:



wherein R_2 and R_3 are independently hydrogen, alkyl, aryl, cyano, nitro, or, halo R_4 is O or N—H, and R_5 is thienyl, naphthyl, furanyl, pyrrolyl, diphenyl vinyl, phenyl ethynyl, hydroxy chromonyl phenyl, didecyloxy hydroxy chromonyl phenyl, phenyl or



wherein R_1 is vinyl, vinyl phenyl, vinyl benzyl, alkyl ethenyl, or alkyl phenyl ethenyl, provided that when R_5 is phenyl and R_2 and R_3 are hydrogen, R_4 is N—H.

5,552,552

CRYSTALLINE SALTS OF OPTICALLY ACTIVE AMINOCOUMARAN DERIVATIVES, THEIR PRODUCTION AND USE

Shigenori Ohkawa, Takatsuki, and Shokyo Miki, Ikeda, both of, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 394,206, Feb. 24, 1995, abandoned, which is a continuation of Ser. No. 164,437, Dec. 9, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 467,392

Claims priority, application Japan, Dec. 9, 1992, 4-329683

Int. Cl.[6] C07D *405/06*

U.S. Cl. 546—196 **3 Claims**

1. In the compound 5-amino-2,4,6,7-tetramethyl -2-(4-phenylpiperidinomethyl) -2,3-dihydrobenzo[b]furan or a salt thereof, the improvement which comprises providing said compound in the form of (S)—(+)-5-amino-2,4,6,7-tetramethyl-2-(4-phenylpiperidinomethyl)-2,3-dihydrobenzo[b] furan or a salt thereof in its crystalline state showing its characteristic peaks at lattice spacings (d) of 13.89, 7.12, 5.36, 4.26, 4.05, 4.00, 3.31, 3.21 in the powder of x-ray diffraction pattern.

5,552,553

N-(3-HYDROXY-4-PIPERIDINYL) (DIHYROBENZOFURAN, DIHYDRO-2H-BENZOPYRAN OR DEHYDROBENZODIOXIN) CARBOXAMIDE DERIVATIVES

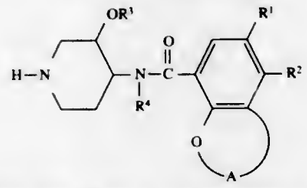
Georges H. P. Van Daele, Turnhout, and Fran M. A. Van den Keybus, Essen, both of, Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 489,419, Mar. 6, 1990, Pat. No. 5,374,637, which is a continuation-in-part of Ser. No. 326,941, Mar. 22, 1989, abandoned. This application Sep. 7, 1994, Ser. No. 301,825

Int. Cl.[6] C07D *405/14*

U.S. Cl. 546—197 **2 Claims**

1. A chemical intermediate of the formula:



(II)

an N-oxide form, a salt, or a stereochemically isomeric form thereof, wherein:

A represents a group of the formula:

$$-CH_2-O-, \quad \text{(a-4)}$$

$$-CH_2-CH_2-O-, \text{ or} \quad \text{(a-5)}$$

$$-CH_2-CH_2-CH_2-O-, \quad \text{(a-6)}$$

wherein one or two hydrogen atoms in said groups (a-4) to (a-6) may be replaced by a C_{1-6}alkyl group;

R^1 represents hydrogen, halo, C_{1-6}alkylsulfonyl, or aminosulfonyl;

R^2 represents hydrogen, amino, mono- or di(C_{1-6}alkyl) amino, arylC_{1-6}alkylamino, or C_{1-6}alkylcarbonylamino; and

R^3 and R^4 each independently represent hydrogen or C_{1-6}alkyl.

5,552,554

IMIDAZOLE AND TRIAZOLE CARBOXYLATES, AND PROCESSES FOR PREPARING 2,4-OXAZOLIDINEDIONES

Jeffrey A. Sternberg, Wilmington; King-Mo Sun, Hockessin, both of Del.; Masuo Tuji, Sewell, N.J., and Vincent Witterholt, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

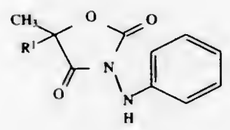
PCT No. PCT/US93/10435, § 371 Date May 9, 1995, § 102(e) Date May 9, 1995, PCT Pub. No. WO94/11359, PCT Pub. Date May 26, 1994

Continuation-in-part of Ser. No. 23,239, Feb. 25, 1993, abandoned, which is a continuation-in-part of Ser. No. 988,574, Dec. 10, 1992, abandoned, which is a continuation-in-part of Ser. No. 976,130, Nov. 13, 1992, abandoned. This PCT application Nov. 5, 1993, Ser. No. 424,467

Int. Cl.[6] C07D *263/44;233/60;249/08*

U.S. Cl. 548—226 **10 Claims**

1. A process for the preparation of 2.4-oxazolidinediones of Formula I



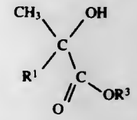
I

wherein:

R^1 is phenyl substituted with 1–2 halogen or R^1 is phenyl substituted with 4-phenoxy, 4-(1-phenethyloxy) or 4-benzyloxy with each 4-phenoxy, 4-(1-phenethyloxy) or 4-benzyloxy optionally substituted with R^2 on the phenyl ring; and

R^2 is halogen; methyl; or ethyl;

comprising 1) reacting a 2-hydroxycarboxylic acid ester of Formula II



II

wherein

R^1 and R^2 are defined as above for Formula I; and

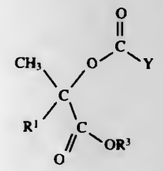
R^3 is C_1–C_4 alkyl;

with a base and a carbonylating agent of Formula III

III

wherein

Y is 1-imidazole or 1.2.4-triazolyl, provided that Y is 1,2,4-triazolyl when R^1 in Formula II is phenyl substituted with 4-(1-phenethyloxy) or 4-benzyloxy with each 4-(1-phenethyloxy) or 4-benzyloxy optionally substituted with R^2 on the phenyl ring; to yield an intermediate compound of Formula IV:



IV

wherein

R^1, R^2, R^3 and Y are defined as above: and 2) reacting a compound of Formula IV as defined above with phenylhydrazine in the presence of an acid to yield a compound of Formula I.

5,552,555

AZIDE-CONTAINING CHELATORS WHOSE AFFINITY FOR CALCIUM ION IS DECREASED BY ILLUMINATION

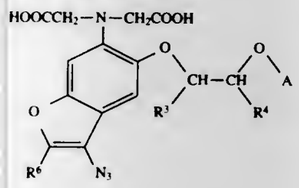
Roger Y. Tsien, La Jolla, and Stephen R. Adams, Poway, both of Calif., assignors to The Regents of University of California, Oakland, Calif.

Division of Ser. No. 968,002, Oct. 23, 1992. This application Jun. 6, 1995, Ser. No. 475,047

Int. Cl.[6] C07D *413/14*

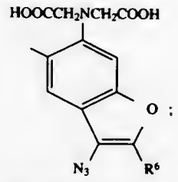
U.S. Cl. 548—236 **18 Claims**

1. A compound of the formula:



and the pharmaceutically acceptable non-toxic salts and esters thereof, wherein:

A is



R^3 and R^4 are each independently —H, Cl to C4 alkyl, —CH_2OH, —COOH, or

R^3 and R^4 together are —$(CH_2)_m$—Y—$(CH_2)_n$—where m and n are each independently 1 or 2, and Y is independently selected from —CH_2—, —O—, —S—, —S—S—, or —NR^5, where R^5 is —H, or Cl to C18 alkyl; and

R^6 is a heteroaromatic group having at least one 5-memberered, 6-membered heteroaromatic group or combinations thereof, said heteroaromatic group containing at least one sp^2- hydridized nitrogen atom at the ∝-position to the carbon atom attached to the benzofuran, said heteroaromatic group having substitutents at 0, 1 or 2 ring positions, said substitutents independently selected from —COOH or —CH_2COOH.

5,552,556

PERHYDROLYSIS-SELECTIVE BLEACH ACTIVATORS

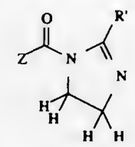
Gregory S. Miracle, Forest Park; Alan D. Willey; Kevin L. Kott, both of Cincinnati, and Michael E. Burns, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 298,906, Aug. 31, 1994. This application Jun. 7, 1995, Ser. No. 486,879

Int. Cl.[6] C07D *233/20;* **A61K** *31/41*

U.S. Cl. 548—334.1 **5 Claims**

1. A bleach activator having the formula:



wherein Z is selected from the group consisting of C_2–C_{16} linear or branched, substituted or unsubstituted alkyl, alkaryl, aralkyl and aryl, and mixtures thereof; and R' is selected from the group consisting of H, ethoxylated alkyl, carboxylated alkyl, sulfated alkyl, sulfonated alkyl, phenyl, and mixtures thereof.

5,552,557

PROCESS FOR PREPARING 2-CYANOIMIDAZOLE COMPOUNDS BY REACTION OF AN AMINO KETONE COMPOUND

Yasuhiro Fujii, and Toyoshi Tanimura, both of Shiga, Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Nov. 9, 1994, Ser. No. 337,523

Claims priority, application Japan, Nov. 12, 1993, 5-307346; Mar. 25, 1994, 6-079703

Int. Cl.[6] C07D *233/90;233/68*

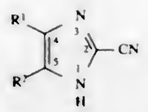
U.S. Cl. 548—337.1 **10 Claims**

1. A process for preparing a 2-cyanoimidazole compound represented by the following formula (I):

5,552,558

5,552,559

5,552,560



wherein R^1 and R^2 each independently represents hydrogen,

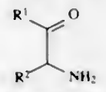
an unsubstituted alkyl group or an alkyl group substituted with at least one substituent selected from the group consisting of halogen, haloalkyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio, aryl, aryloxy, arylthio, heteroaryl, heteroaryloxy, heteroarylthio, alkylamino, and dialkylamino,

an unsubstituted phenyl group or a phenyl group substituted with at least one substituent selected from the group consisting of halogen, alkyl, haloalkyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio, aryl, aryloxy, arylthio, heteroaryl, heteroaryloxy, heteroarylthio, alkylamino, and dialkylamino, or

a 3-to-10-membered heterocyclic group which contains 1 to 4 hetero atoms selected from the group consisting of nitrogen, oxygen and sulfur and a balance of carbon atoms, and said heterocyclic group is unsubstituted or is substituted with at least one substituent selected from the group consisting of halogen, alkyl, haloalkyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio, aryl, aryloxy, arylthio, heteroaryl, heteroaryloxy, heteroarylthio, alkylamino, and dialkylamino, or

R^1 and R^2 when joined together form an alkylene group which may be substituted with at least one substituent selected from the group consisting of halogen, alkyl, haloalkyl, alkoxy, haloalkoxy, alkylthio, haloalkylthio, aryl, aryloxy, arylthio, heteroaryl, heteroaryloxy, heteroarylthio, alkylamino, and dialkylamino,

which process comprises reacting cyanogen with a compound represented by the following formula (II):



(II)

wherein R^1 and R^2 are as defined above or a salt thereof.

5,552,558

RETROVIRAL PROTEASE INHIBITING COMPOUNDS

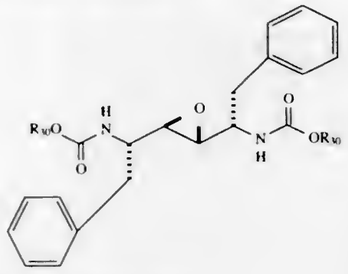
Dale J. Kempf, Libertyville; Daniel W. Norbeck, Crystal Lake; Hing L. Sham; Chen Zhao, both of Gurnee; Thomas J. Sowin, Grayslake; Daniel S. Reno, Kenosha, and Anthony R. Haight, Park City, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 158,587, Dec. 2, 1993, abandoned, which is a continuation-in-part of Ser. No. 998,114, Dec. 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 777,626, Oct. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 746,020, Aug. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 616,170, Nov. 20, 1990, abandoned, which is a continuation-in-part of Ser. No. 518,730, May 9, 1990, Pat. No. 5,142,056, which is a continuation-in-part of Ser. No. 456,124, Dec. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 405,604, Sep. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 355,945, May 23, 1989, abandoned. This application Mar. 27, 1995, Ser. No. 411,032

Int. Cl.[6] C07D *303/46*

U.S. Cl. 549—552 **2 Claims**

1. A compound of the formula:



wherein R_{x0} is loweralkyl or benzyl.

5,552,559

KEYBOARD MUSICAL INSTRUMENT EQUIPPED WITH HAMMER SENSORS CHANGING POSITION BETWEEN RECORDING MODE AND SILENT MODE

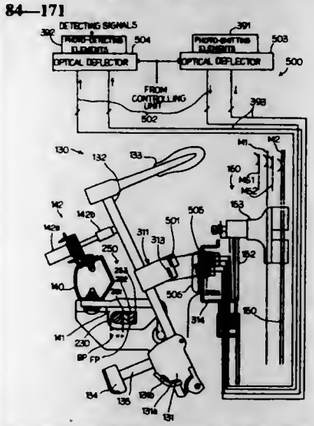
Nobuo Sugiyama, and Kiyoshi Kawamura, both of Shizuoka, Japan, assignors to Yamaha Corporation, Japan

Filed Mar. 28, 1995, Ser. No. 411,551

Claims priority, application Japan, Mar. 31, 1994, 6-085722

Int. Cl.[6] G10D *15/00*

U.S. Cl. 84—171 **26 Claims**



1. A keyboard musical instrument having at least an acoustic sound mode and an electronic sound mode, comprising:

an acoustic piano including

a plurality of keys respectively assigned notes of a scale, and selectively moved between respective rest positions and respective end positions by a player,

a plurality of key action mechanisms functionally connected to said plurality of keys, respectively, and selectively actuated said plurality of keys,

a plurality of string means vibratory for generating acoustic sounds respectively having said notes, and

a plurality of hammer means functionally connected to said plurality of key action mechanisms, respectively, and resting in respective home positions when said plurality of keys are in said respective rest positions, said plurality of hammer means being selectively driven by said plurality of key action mechanisms for striking the associated string means;

a silent system shifted between a free position in said acoustic sound mode and a blocking position in said electronic sound mode, said silent mechanism in said free position allowing said plurality of hammer means to strike said plurality of string means, said silent mechanism in said blocking position causing said plurality of hammer means driven by said plurality of key action mechanisms to return to said home positions on the way to said plurality of string means without a strike; and

an electronic system including

a plurality of hammer sensors respectively associated with said plurality of hammer means, and operative to generate detecting signals respectively indicative of motions of said plurality of hammer means,

a change-over mechanism connected to said plurality of hammer sensors, and shifting said plurality of hammer sensors between a closed position in said acoustic sound mode and a spaced position in said electronic sound mode, said closed position being closer to said plurality of string means than said spaced position, and

a data signal generating means responsive to said detecting signal for generating pieces of music data indicative of a performed music.

5,552,560

ELECTRONIC KEYBOARD MUSICAL INSTRUMENT WITH MULTIFUNCTIONAL KEYBOARD

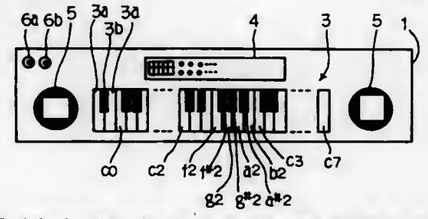
Tomoyuki Ura, Shizuoka-ken, Japan, assignor to Yamaha Corporation, Japan

Filed Sep. 22, 1994, Ser. No. 310,658

Claims priority, application Japan, Sep. 29, 1993, 5-243212

Int. Cl.[6] G10H *1/053;1/18*

U.S. Cl. 84—653 **3 Claims**



1. A keyboard musical instrument having a standard playing mode for producing electronic sounds and a setting mode for making at least two selections regarding said electronic sounds, said keyboard musical instrument comprising:

a keyboard having a plurality of keys selectively operable by a player, said plurality of keys including a first set of keys and a second set of keys;

an electronic sound producing system which detects operation of said plurality of keys by said player in said standard playing mode for producing said electronic sounds;

a power switch for causing power to be supplied to said keyboard musical instrument;

entry means for causing said keyboard musical instrument to enter into said setting mode, when said power switch is turned on while at least one of said first set of keys and said second set of keys is depressed;

first selecting means for discriminating at least one depressed first key from said first set of keys in said setting mode for making a first selection for said electronic sounds;

second selecting means for discriminating at least one depressed second key from said second set of keys in said setting mode for making a second selection for said electronic sounds;

exit means for causing said keyboard musical instrument to return to said standard playing mode from said setting mode; and

modifying means responsive to said first and second selections for modifying said electronic sounds in said standard playing mode.

5,552,561

PLAYING-STYLE DETECTING APPARATUS AND ELECTRONIC MUSICAL INSTRUMENT UTILIZING THE SAME

Akira Nakada; Takeo Shibukawa; Yasuhiro Hinago, and Junichi Mishima, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

Filed Mar. 21, 1995, Ser. No. 407,862

Claims priority, application Japan, Mar. 30, 1994, 6-084055

Int. Cl.[6] G10H *1/053;1/46*

U.S. Cl. 84—658 **26 Claims**

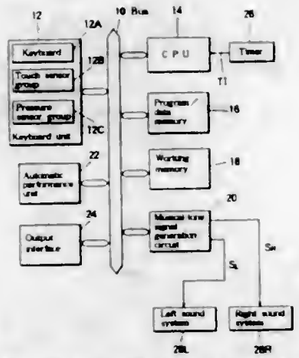
1. A playing-style detecting appratus comprising:

a key operable to undergo a movement of depression;

first detection means for detecting a first output data corresponding to a depression speed of said key;

second detection means having an aftersensor provided under said key for detecting a second output data corresponding to an initial peak of a force applied to the key after a start of the depression of said key; and

judgment means for determining a playing-style which is conducted in the depression of said key based on both of the first output data from said first detection means and the second



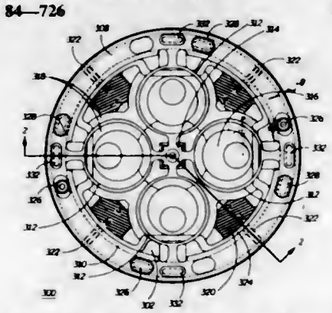
output data from said second detection means, and for outputting playing-style information which represents the determined playing-style.

5,552,562

INERTIAL ACCOUSTIC PICKUP

Allen D. Hertz, Boca Raton; John M. McKee, Hillsboro Beach; Charles W. Mooney, Lake Worth; Irving H. Holden, Boca Raton, and Gerald E. Brinkley, West Palm Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 29, 1994, Ser. No. 297,341
Int. Cl.[6] G10H *3/18*
U.S. Cl. 84—726 **20 Claims**



1. An inertial acoustic pickup for use with a device having a soundboard for delivering acoustic energy, comprising:

a chassis coupled to the soundboard and including a coil having first and second outputs for delivering an audio output signal to an external circuit;

an armature, including upper and lower planar suspension members having planar perimeter regions coupled to said chassis, said upper and lower planar suspension members comprising a plurality of independent planar non-linear spring members arranged regularly about a central planar region within said planar perimeter regions, said plurality of independent planar non-linear spring members being defined by members having maximum opposing widths which taper to minimum opposing widths at midpoints thereon, said maximum opposing widths being coupled to said central planar region and to said planar perimeter regions;

an inertial mass suspended between said upper and lower planar suspension members about said central planar region and having an axis extending therebetween; and

a plurality of permanent magnets, coupled to and arranged regularly about a perimeter of said inertial mass,

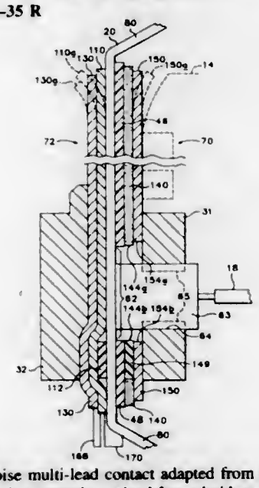
whereby acoustic energy coupled to said chassis from said soundboard is transformed through said plurality of independent planar non-linear spring members into motional energy generated in a direction parallel to said axis of said inertial mass thereby generating the audio output signal in response to movement of said plurality of magnets within said coil.

5,552,563

SHIELDED LOW NOISE MULTI-LEAD CONTACT

Jeff E. Conder, Vancouver, and Meral B. Woodberry, Ridgefield, both of Wash., assignors to Sharp Microelectronics Technology, Inc., Camas, Wash., and Sharp Kabushiki, Osaka, Japan

Filed Mar. 17, 1995, Ser. No. 407,385
Int. Cl.[6] H05K *9/00*
U.S. Cl. 174—35 R **18 Claims**



1. A low noise multi-lead contact adapted from a lead frame of the type which is mounted on a lead frame holder used in electrical component test handlers, such a lead frame including a plurality of parallel conductors for selectively completing multiple simultaneous electrical connections with interconnect points on components being tested, the lead frame having opposed inner and outer sides and being mounted on a holder in a predetermined orientation with the inner side facing the major mass of the holder, the low noise multi-lead contact comprising:

on the outer side of the lead frame, a first shield formed of an expanse of conductive material overlying a portion of the lead frame, said first shield being electrically coupled to one or more selected conductors on the lead frame, whereby such shield-coupled conductors have reduced inductance during selected component tests, the other conductors on the lead frame being shield-isolated conductors which are electrically isolated from said first shield; and

on the inner side of the lead frame, a second shield formed of an expanse of conductive material overlying a portion of the lead frame, said second shield being electrically isolated from all conductors on the lead frame.

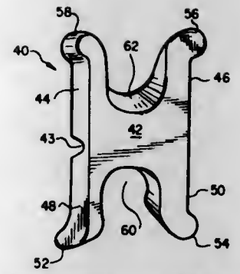
5,552,564

RANGE ENHANCEMENT FOR H-SHAPED COMPRESSION CONNECTOR

Gary E. Schrader, Londonderry; Armand T. Montminy, Manchester, and John Franzini, Salem, all of N.H., assignors to Burndy Corporation, Norwalk, Conn.

Filed Nov. 23, 1994, Ser. No. 346,235
Int. Cl.[6] H01R *4/18*
U.S. Cl. 174—84 C **8 Claims**

1. A compression connector capable of being deformed in a crimping device, comprising a body of compressive material formed in generally an H shape, said connector provided with a central body portion and first and second pairs of opposed parallel legs extending from said central body portion, each leg of said first pair of legs substantially equal in length to each other, and each leg of said second pairs of legs substantially equal in length to each other, each of said legs provided with a distal portion having tip portion, said first and second pairs of legs extending in opposite directions from said central body portion to form first and second channels therebetween, said tip portion of said distal portions of each of said legs provided with a means for reducing the amount of compressive force applied to the crimping device to completely close the connector around conductors provided in said first and second channels.

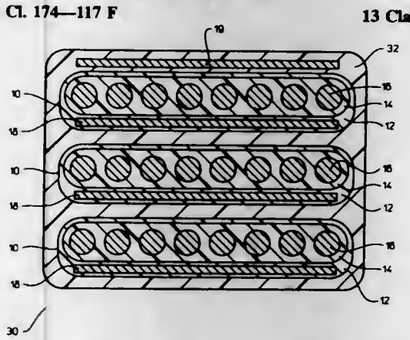


5,552,565

MULTICONDUCTOR SHIELDED TRANSDUCER CABLE

Paul Cartier, Acton; Wojtek Sudol, Burlington, both of Mass., and Gregory G. Vogel, Eliot, Me., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 31, 1995, Ser. No. 414,392
Int. Cl.[6] H01B *7/08*
U.S. Cl. 174—117 F **13 Claims**



1. A flexible transducer cable for connecting a display processor to a transducer, comprising:

multiple ribbon assemblies arranged in a stack, each ribbon assembly including,

a plurality of parallel coplanar conductors,

a continuous electrical insulator encasing and separating the parallel coplanar conductors, and

a shield conductor in contact with the electrical insulator, parallel to the parallel coplanar conductors and positioned below the parallel coplanar conductors;

a top shield conductor positioned at the top of the stack; and

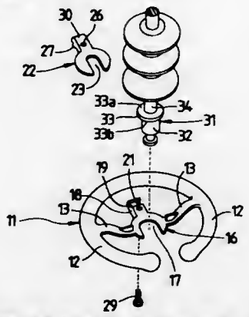
an insulating jacket encasing the ribbon assemblies and the top shield conductor.

5,552,566

APPARATUS FOR PREVENTING CORONAL DISCHARGE

Wei-Chung Lin, Birmingham; William D. Caldwell, Bessemer, and John W. Cundiff, Hueytown, all of Ala., assignors to Reliable Bethea Power Products, Pelham, Ala.

Filed Dec. 20, 1993, Ser. No. 169,016
Int. Cl.[6] H01T *19/00*
U.S. Cl. 174—144 **12 Claims**



12. An apparatus for deconcentrating an electric field surrounding a high voltage insulator comprising a corona ring having an integral cross member connecting inner edges of said ring, said cross member forming a clamp seat at a center of said ring, said clamp seat defining a first u-shaped opening and having a tab member extending rearwardly from said first u-shaped opening, said first u-shaped opening further comprising a pair of parallel walls for engaging a major diameter of an insulator end fitting, said clamp seat defining curved walls extending upwardly from said first u-shaped opening to accommodate a first surface of an annular bell of said insulator end fitting, said tab member defining a groove along an upper surface of said tab member perpendicular to said first u-shaped opening, a keeper clamp mounted adjacent said clamp seat, said keeper clamp defining an aligned second u-shaped opening of a dimension lesser than said first u-shaped opening, said second u-shaped opening comprising a pair of parallel walls for engaging a minor diameter of said insulator end fitting, said keeper clamp defining a surface outwardly extending from said second u-shaped opening to accommodate an opposite surface of said annular bell of said insulator end fitting, a fastener retaining said keeper clamp adjacent said clamp seat, said keeper clamp having a tab extending rearwardly therefrom and opposite said second u-shaped opening, said tab defining a ridge perpendicular to said second u-shaped opening, said ridge cooperatively engaging said groove of said tab member when said keeper clamp is secured adjacent said clamp seat via said fastening member.

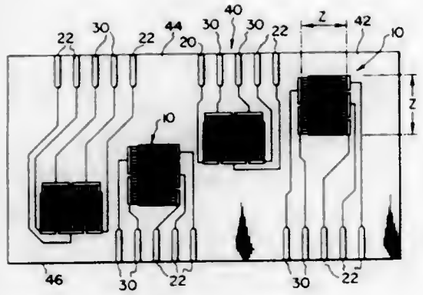
5,552,567

PRINTED CIRCUIT BOARD HAVING A PLURALITY OF CIRCUIT BOARD PATTERNS

John P. Peterson, Chapel Hill; Richard A. Szymanowski, Raleigh, and Randal T. Fox, Mebane, all of N.C., assignors to Northern Telecom Limited, Montreal, Canada

Division of Ser. No. 165,473, Dec. 13, 1993, Pat. No. 5,457,390. This application Mar. 6, 1995, Ser. No. 398,531
Int. Cl.[6] H05K *1/00*
U.S. Cl. 174—261 **7 Claims**

1. A printed circuit board comprising a dielectric substrate having one surface bearing a plurality of circuit board patterns, the patterns being spaced-apart upon the surface so as to lie upon surface band regions extending lengthwise and widthwise of the surface, the surface band regions being different from one printed circuit board pattern to another, and in which each printed circuit board pattern comprises a plurality of conductors which extend in parallel spaced-apart relationship with alternate conductors extending to at least one individual terminal and the other conductors extending to at least one other individual terminal.

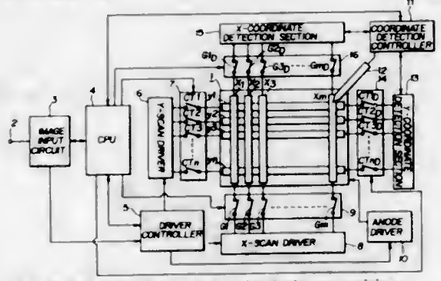


5,552,568

DISPLAY-INTEGRATED TABLET DEVICE PROVIDING COORDINATE DETECTION

Koji Onodaka; Katsuya Hiraga; Yoichi Kobori, and Satoshi Nagasawa, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Aug. 31, 1994, Ser. No. 297,540
Claims priority, application Japan, Aug. 31, 1993, 5-237165
Int. Cl.[6] G08C *21/00*; **G09G** *3/02*
U.S. Cl. 178—19 **5 Claims**



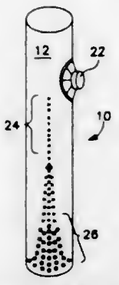
1. A display device integrated tablet device comprising:
a tablet having a plurality of X-electrodes and Y-electrodes arranged in a matrix-like manner and including a display plane;
an X-electrode drive means for driving said X-electrodes at a predetermined timing;
a Y-electrode drive means for driving said Y-electrodes at a predetermined timing;
a coordinate input means for generating a coordinate location signal for detecting a tablet coordinate of said tablet;
an X-coordinate detection signal holding means, connected to said X-electrodes, and arranged for temporarily holding X-reception signals generated in said X-electrodes by said coordinate location signal;
a Y-coordinate detection signal holding means, connected to said Y-electrodes, and arranged for temporarily holding Y-reception signals generated in said Y-electrodes by said coordinate location signal;
a coordinate detection means, coupled to said X-coordinate detection signal holding means and said Y-coordinate detection signal holding means, to which said X-reception signals and X-electrode position data and said Y-reception signals and Y-electrode position data are input, for determining an X-coordinate and a Y-coordinate at which there is a maximal value of said X-reception signals and said Y-reception signals; and
a control means for controlling said X-electrode drive means and said Y-electrode drive means during an image display period, so as to permit an image display to be carried out on said display plane of said tablet and so as to permit said coordinate input means to generate said coordinate location signal during a coordinate detection period, resulting in said X-reception signals and said Y-reception signals being received and held by said X-coordinate detection signal holding means and said Y-coordinate detection signal holding means, respectively.

5,552,569

EXPONENTIAL MULTI-PORTED ACOUSTIC ENCLOSURE

Mechislao Sapkowski, 4a Calle de Los Palos Grandes, Qta. Raytel No. 2.11.41.03, Caracas, Venezuela

Filed Mar. 8, 1995, Ser. No. 400,606
Int. Cl.[6] A47B *81/06*
U.S. Cl. 181—199 **18 Claims**



1. An acoustic enclosure for a loudspeaker for producing a broadened acoustic response comprising an elongated enclosure in the form of a tubular column with an elongated axial dimension and a hollow interior including ends and a wall extending between said ends, means adjacent to one end of said tubular enclosure for permitting the introduction of acoustic energy into said enclosure, said acoustic enclosure being terminated adjacent to the other end in a distributed port, said distributed port comprising:
a) a horn type distribution of cutout portions defining individual ports along a wall of said enclosure,
b) said horn type distribution of cutout portions comprising a plurality of individual openings along said wall of said tubular enclosure,
c) and said individual openings being arranged in a horn-shaped pattern of sized and spaced ports along said tubular enclosure to define collectively a horn type distributed port in said acoustic enclosure.

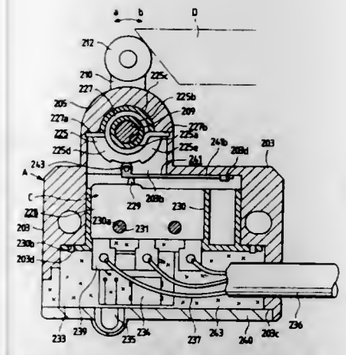
5,552,570

LIMIT SWITCH

Kenji Shinohara, Kyoto, and Shigenobu Kishi, Osaka, both of, Japan, assignors to Omron Corporation, Kyoto, Japan

Division of Ser. No. 949,274, Sep. 14, 1992, Pat. No. 5,430,264. This application Nov. 17, 1994, Ser. No. 343,902
Claims priority, application Japan, Sep. 14, 1991, 3-262696; Sep. 14, 1991, 3-262697; Sep. 14, 1991, 3-262699; Sep. 14, 1991, 3-262700
Int. Cl.[6] H01H *3/16*
U.S. Cl. 200—47 **3 Claims**

1. A limit switch comprising:
a rotational operation section having a rotary shaft and an actuator for turning said rotary shaft, said rotational operation section comprising a cam, said cam having at least one protrusion on an outer cylindrical surface thereof and mounted fixedly on said rotary shaft;
a switch section associated with said rotational operation section;
a one-piece housing comprising a tubular switch housing having two ends and a head housing, said switch housing and said head housing formed integrally together, wherein said head housing merges with a first end of said switch housing, said head housing sealingly encloses said rotational operation section such that one end of said rotary shaft projects outside said head housing, said switch housing substantially enclosing said switch section, and said switch section includes a pressure member provided within said switch housing for detecting said protrusion to provide a detection signal and a microswitch having said pressure member thereon, said microswitch is accommodated within said switch housing such that said pressure member is located at said one end of said switch housing, said cam directly operates said pressure member in conjunction with the rotation of said rotary shaft; and
a cover sealingly secured to a second end of said switch housing, said limit switch being formed by a process comprising:
(a) forming said housing having a lower opening;
(b) inserting components of said switch section and components of said rotational operation section into said housing through said lower opening in said housing; and
(c) sealing said lower opening in said housing with said cover.

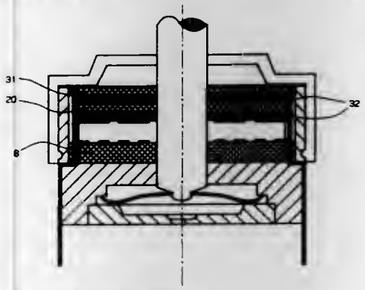


5,552,571

PUSH-BUTTON SWITCH HAVING A PLURALITY OF SIMULTANEOUSLY CLOSED CONTACTS

Klaus Range, Uhldingen, Germany, assignor to Bodenseewerk Geratetechnik GmbH, Uberlinger/Bodensee, Germany

Continuation of Ser. No. 872,018, Apr. 22, 1992, abandoned. This application Sep. 12, 1994, Ser. No. 304,606
Claims priority, application Germany, Apr. 23, 1991, 41 13 180.0
Int. Cl.[6] H01H *13/64*
U.S. Cl. 200—530 **14 Claims**



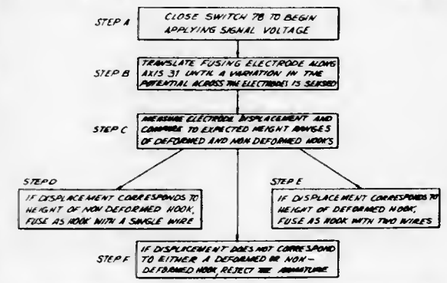
1. A push-button switch comprising:
a plurality of contact carriers movable with respect to each other, wherein:
at least one of said contact carriers defines a guide hole therein; and
one of said contact carriers has a guide pin thereon;
at least one first annular contact arranged at one of said contact carriers; and
a plurality of concentric, second annular contacts arranged at another of said contact carriers on a plane surface and having different radii, said second annular contacts being initially axially spaced from said first annular contact and substantially coaxial with said guide pin and guide holes and arranged to establish, upon axial movement of the guide pin and corresponding relative axial movement between said first annular contact and said second annular contacts, simultaneous engagement and electrical connection with said first annular contact.

5,552,572

METHODS AND APPARATUS FOR IDENTIFYING HOOKS OF ELECTRIC MOTORS

Sabatino Luciani, and Massimo Lombardi, both of Florence, Italy, assignors to Axis USA, Inc., Tampa, Fla.

Continuation of Ser. No. 074,309, Jun. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 841,083, Feb. 25, 1992, Pat. No. 5,241,486, which is a continuation of Ser. No. 444,035, Nov. 30, 1989, Pat. No. 5,122,975. This application Oct. 12, 1995, Ser. No. 541,215
Int. Cl.[6] B23K *11/24*
U.S. Cl. 219—110 **34 Claims**



1. The method of making electric motor armatures using a deforming member to deform a first portion of a workpiece and using an electronic circuit to recognize said first portion, the method comprising the steps of:
moving said deforming member relative to said workpiece in order to cause said deforming member to contact and apply force to said first portion, to deform said first portion and thereby distinguish said first portion from a second portion of said workpiece;
contacting a contact member against said workpiece;
applying a predetermined voltage signal between a sensing electrode and said contact member;
moving said sensing electrode along an axis, and simultaneously monitoring displacement of said sensing electrode movement, until said electrode reaches a predetermined displacement;
determining whether said sensing electrode is in contact with an individual portion of said workpiece at said predetermined displacement, thereby establishing a circuit path for said voltage signal;
identifying said individual portion as a first portion or a second portion based upon whether a circuit path is established; and
fusing said individual portion using a fusing operation which varies depending on whether said portion is identified as a first portion or a second portion.

5,552,573

5,552,575

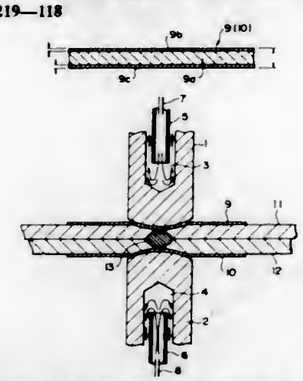
a first resilient sealed interface between said drain tube and said

5,552,573

RESISTANCE WELDING PROCESS FOR ALUMINUM AND ALUMINUM ALLOY MATERIALS

Tomiharu Okita; Mikihiro Sugimori; Masanori Ozaki, and Takao Orimo, all of Tokyo, Japan, assignors to The Furukawa Electric Co., Ltd., Japan

Filed Dec. 8, 1993, Ser. No. 167,396
Int. Cl.[6] B23K *11/11;11/16;11/30*
U.S. Cl. 219—118 7 Claims



1. A resistance welding process for aluminum and aluminum alloy materials, comprising the steps of:

providing an insert material having an overall thickness of 0.02 to 1 mm and including a sheet-like core material consisting of iron or steel and a coated layer on each surface of said core material, each coated layer having a thickness of 1 to 100 μm and consisting of any one of Ni, Ni alloy, Ti, Ti alloy, Nb, Nb alloy, Mo, Mo alloy, W, W alloy, Cr, Cr alloy, Co and Co alloy;

interposing said insert material between each of upper and lower electrodes and an overlapped portion of materials to be welded consisting of aluminum or aluminum alloy; and

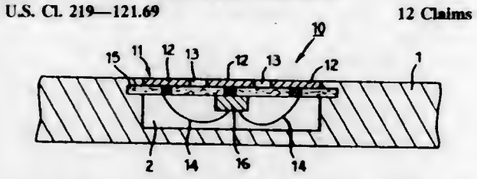
pressing said materials to be welded by said upper and lower electrodes to weld said materials together.

5,552,574

METHOD FOR THE MARKING OF A CONNECTOR OF A CHIP CARD WITH A LASER BEAM

Pierre Merlin, and Gérard Colton, both of Venelles, France, assignors to Gemplus Card International

Filed Aug. 24, 1993, Ser. No. 111,136
Claims priority, application France, Aug. 26, 1992, 92 10296
Int. Cl.[6] B23K *26/00;26/18*
U.S. Cl. 219—121.69 12 Claims



1. A method for the marking of information elements, the method comprising the steps of

providing an electronic chip card, said electronic chip card having a connector for communicating electrical signals, said connector having metal contacts for connecting to an electronic chip, said metal contacts having a main layer and a coating layer adjacent said main layer;

etching, with a laser beam, said information elements in said coating layer of said metal contacts of said connector; and

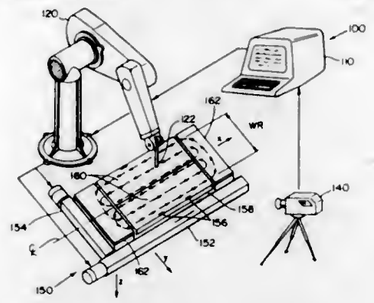
preserving the main layer of the connector.

5,552,575

SCAN WELDING METHOD AND APPARATUS

Charalabos C. Doumanidis, Somerville, Mass., assignor to Tufts University, Medford, Mass.

Continuation-in-part of Ser. No. 275,840, Jul. 15, 1994, abandoned. This application Jul. 19, 1994, Ser. No. 277,384
Int. Cl.[6] B23K *9/12*
U.S. Cl. 219—124.34 40 Claims



9. A welding method comprising:

mapping an emissivity of a surface of a workpiece;

determining an ideal temperature field distribution as a function of welding time that will yield desired weld characteristics;

applying energy to a workpiece from a weld head;

detecting electromagnetic radiation emitted by a weld region;

determining a detected temperature field distribution from the detected electromagnetic radiation;

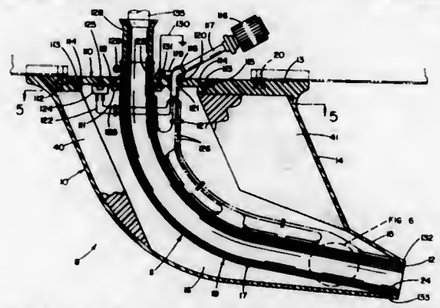
scanning the weld head to minimize the differences between the detected temperature field distribution and the ideal temperature field distribution with corrections made in response to the mapping to generate a weld pool simultaneously along a segment of the weld centerline.

5,552,576

MODULAR DRAINMAST FOR AIRCRAFT

Michael J. Gianiati, Akron, Ohio, assignor to The BF Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 839,866, Feb. 21, 1992, Pat. No. 5,290,996. This application Nov. 24, 1993, Ser. No. 157,866
Int. Cl.[6] H05B *1/00;* B64D *1/00;* B64C *1/00*
U.S. Cl. 219—201 36 Claims



1. A drainmast for discharging fluid into a surrounding airflow, comprising:

a fairing having first and second opposing ends;

a drain tube disposed within said fairing and exiting said fairing at said first and second ends, said drain tube including an electrothermal heating element;

a drain tube attachment that attaches said drain tube to said fairing; and,

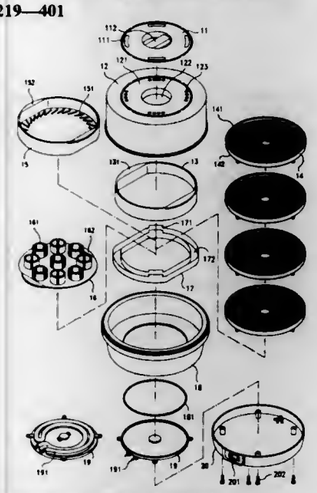
a first resilient sealed interface between said drain tube and said first end.

5,552,577

MULTI-PURPOSE COOKER FOR STEAMING, DRYING OR BOILING FOODSTUFFS

Yung-Sen Su, P.O. Box 82-144, Taipei, Taiwan

Filed Jun. 25, 1993, Ser. No. 83,368
Int. Cl.[6] H05B *3/00;* A47J *27/00*
U.S. Cl. 219—401 2 Claims



1. A multi-purpose cooker comprising:

a base having a switch;

an electric heater mounted on said base;

a bottom plate mounted on said electric heater;

a water container mounted on said bottom plate;

a water collector mounted on said water container;

a plurality of drying pans mounted on said water container;

a steaming pan mounted on said drying pans;

a cooking pan mounted on said steaming pan;

a cover mounted on said cooking pan and formed on a top with a recess having a center hole, said recess having a plurality of ventilating perforations divided into four groups; and

a lid formed with a recess adapted to be received in the center hole of said cover, a plurality of slots each being aligned with a group of the ventilating perforations, and a handle thereon.

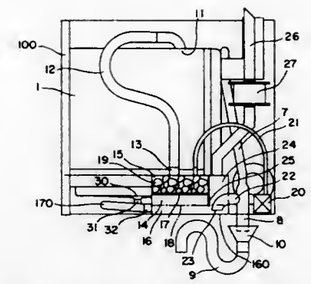
5,552,578

OVEN WITH EXCESS STEAM TREATMENT DEVICE

Violi Raymond, Mariens, France, assignor to Societe Cooperative De Production Bourgeois, Faverges, France

Filed Oct. 12, 1994, Ser. No. 321,796
Claims priority, application France, Oct. 12, 1993, 93 12381
Int. Cl.[6] A47J *27/04*
U.S. Cl. 219—401 13 Claims

1. Oven for cooking foodstuffs including an airtight enclosure having an opening closed by a door, steam generator means for conducting steam to said enclosure, condensed water capture means in communication with a lower part of said enclosure for collecting water condensing in said enclosure and discharging the water into at least one discharge pipe, an excess steam circuit in communication with said enclosure for capturing excess steam escaping from said enclosure and feeding the captured steam to treatment means in communication with said excess steam circuit including steam condenser means to convert the steam into liquid condensates, means for collecting said liquid condensates and for removing them in said at least one discharge pipe, said treatment means including at least one heater for heating steam passing through it, said at least one heater disposed in the excess steam circuit on the upstream side or on the downstream side of the steam condenser means.

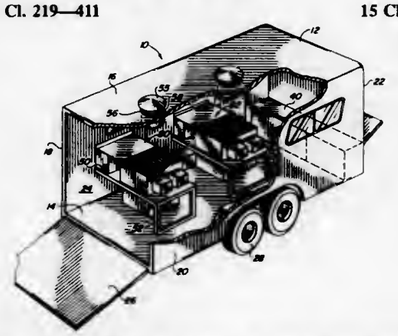


5,552,579

SYSTEM FOR SALVAGE AND RESTORATION ON ELECTRICAL COMPONENTS FROM A SUBSTRATE

Ellison Krueger, 2634 S. Gaucho, Mesa, Ariz. 85202

Filed Jul. 11, 1994, Ser. No. 273,223
Int. Cl.[6] F27D *11/02*
U.S. Cl. 219—411 15 Claims



1. A mobile apparatus for de-soldering electronic components from a substrate to which they are soldered comprising:

(a) a mobile unit including:

(i) an intake area for receiving components to be processed;

(ii) a first heating station having first infrared heating means and a work-supporting surface;

(iii) a second heating station having second infrared heating means and a work-supporting surface;

(iv) said first and second heating stations being positioned adjacent one another with a work area therebetween so that both the heating stations are operable by a single worker in the work area whereby a substrate is subjected to infrared energy at said first heating station to pre-heat said substrate to a first predetermined temperature and thereafter transferred to said second heating station to effect further heating to de-solder said components for removal; and

(v) a second work area for classifying the removed components.

5,552,580

sensing the humidity emission from the food during the cooking or

5,552,580

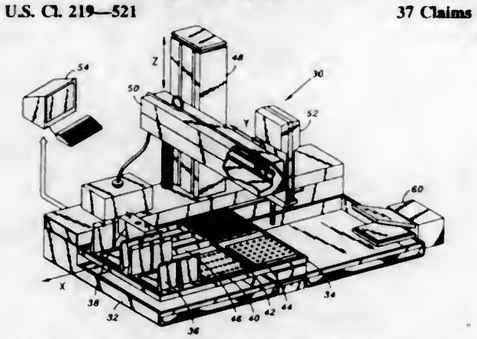
HEATED COVER DEVICE

Robert F. Pfost, Los Altos, and Nebojsa Avdalovic, Cupertino, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 455,694, Dec. 22, 1989, abandoned. This application Nov. 20, 1991, Ser. No. 798,020

Int. Cl.[6] H05B *3/04*

U.S. Cl. 219—521 **37 Claims**



1. A device for covering a receptacle containing a vaporizable substance subject to temperature control, the device comprising:

a frame;

a base supported on the frame, the base is configured to be positioned against the receptacle and having means for effecting temperature control of the substance; and

a cover supported on the frame, the cover is configured to be placed over the receptacle for reducing evaporative loss, the cover and the base are pivoted on the frame in opposing positions such that the receptacle can be positioned between the cover and the base, and the base and cover can be pivotally positioned against the bottom and top, respectively, of the receptacle.

5,552,581

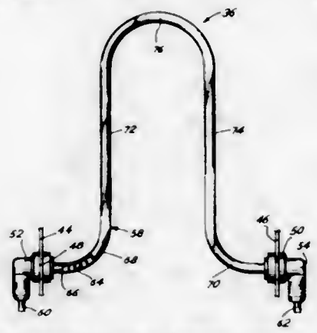
DEFROST HEATER FOR COOLING APPLIANCE

William C. Jasper, II, Frankfort; Cheryl S. Middleton, Argos, and Ronald G. Prusinski, Plymouth, all of Ind., assignors to Wirekraft Industries Inc., Mishawaka, Ind.

Filed Nov. 10, 1994, Ser. No. 337,996

Int. Cl.[6] H05B *3/06;* **F25D** *21/06*

U.S. Cl. 219—523 **10 Claims**



1. Defrost heater for a cooling appliance comprising a formed tube having opposite open ends, a heating element within said formed tube, a pair of end caps closing the open ends of said formed tube, said end caps supporting an electrical conductor connected to said heating element for supplying electrical energy thereto, supporting means for mounting the opposite ends of the tube within said appliance adjacent one set of evaporator coils, said tube having a curved portion projecting from said supporting means in a plane extending alongside said set of said evaporator coils, said supporting means mounting said end caps on a common axis, said bent portion of said tube being displaced from said axis to project in said plane along one side of said one set of evaporator coils, said tube including a pair of curved sections curved in the same direction, each of said curved sections extending from one of said end caps, and an oppositely curved section curved oppositely from the pair of section curved in the same direction, said oppositely curved section interconnecting each of said pair of curved sections to form a bell-shaped tube.

5,552,582

IMAGE HEATING APPARATUS

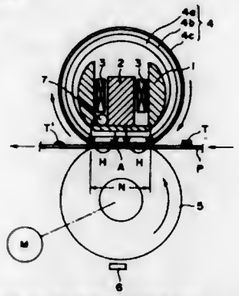
Atsuyoshi Abe; Yasumasa Ohtsuka, both of Yokohama; Yohji Tomoyuki, Ichikawa; Manabu Takano; Daizo Fukuzawa, both of Tokyo, and Kenichi Ogawa, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 22, 1995, Ser. No. 493,825

Claims priority, application Japan, Jun. 24, 1994, 6-165898

Int. Cl.[6] G03G *15/20*

U.S. Cl. 219—619 **30 Claims**



1. An image heating apparatus comprising:

magnetic flux generating means, having an excitation coil and a core member therein, for generating magnetic flux;

an electroconductive member, movable together with a recording material having and image, for generating heat by eddy current generated therein by the magnetic flux generated by said magnetic flux generating means, wherein the image is heated by the heat;

wherein said core member is divided into first and second portions in a direction substantially perpendicular to a movement direction of said electroconductive member.

5,552,583

MICROWAVE APPLICATOR DEVICE FOR CONTINUOUS HEAT TREATMENT OF ELONGATE PRODUCTS

André Berteaud, Draveil; Alain Germain, and Michel Delmotte, both of Bourg La Reine, all of, France, assignors to S.A. Microondes Energie Systemes, Fresnes Cedex, France

Filed Aug. 2, 1995, Ser. No. 510,517

Claims priority, application France, Aug. 5, 1994, 94 09747

Int. Cl.[6] H05B *6/78;6/72*

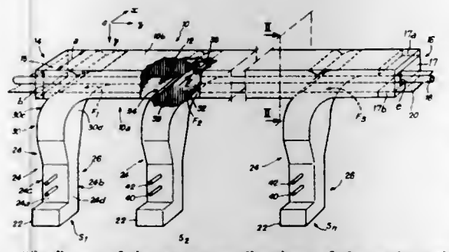
U.S. Cl. 219—693 **18 Claims**

1. A microwave applicator device for continuous heat treatment of elongate products, the device comprising:

an applicator housing defining a rectangular waveguide cavity with open longitudinal ends enabling elongate products to pass therethrough;

drive means for driving said products along the longitudinal direction of the housing;

at least one excitation system for exciting said cavity with microwaves propagating in TE_{01} transverse electric mode to create an electric field in said cavity and extending along a



"first" one of the transverse directions of the cavity, said system including a microwave generator associated with a feed waveguide connected to the cavity via a window formed through a "first" wall of said cavity, said window extending parallel to the first transverse direction, said feed waveguide having two side walls, a rear wall, and a front wall;

the front and rear walls of the feed waveguide being respectively connected to the front and rear edges of the window;

the feed waveguide being associated with a guide flap extending inside the cavity in the vicinity of the rear edge of the window, and being associated with a guide member disposed on the inside face of the wall of the cavity opposite to said first wall and being located substantially facing the window;

the front and rear walls of the feed waveguide including respective front and rear connection portions situated in the connection zone for connection to the window, and each having forward curvature that is substantially in the form of an arc of a circle;

the guide flap being situated substantially in line with the rear connection portion; and

the excitation system including means for adjusting coupling.

5,552,584

METHOD FOR HUMIDITY-EMISSION CONTROL OF A MICROWAVE OVEN, AND MICROWAVE OVEN WITH HUMIDITY-SENSOR CONTROL ACCORDING TO THE METHOD

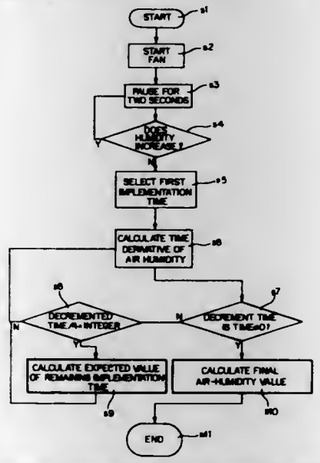
Mats G. Idebro, Linkoping, Sweden, assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 14, 1995, Ser. No. 490,267

Claims priority, application Sweden, Jun. 15, 1994, 9402107

Int. Cl.[6] H05B *6/68*

U.S. Cl. 219—707 **10 Claims**



1. A method for controlling, in a microwave oven, a procedure for cooking or heating food or a dish of food, which includes sensing the humidity emission from the food during the cooking or heating procedure, said oven comprising a cavity (8), to which is connected a microwave radiation source (7) for supplying microwave radiation to the cavity, a control unit (1) operably connected to the microwave radiation source for controlling the activation of the microwave radiation source to feed microwaves to the cavity, a humidity sensor (11) positioned within oven and connected to the control unit for returning a sensed humidity value as a control parameter to the control unit, and a device adapted to ventilate the cavity, the device being connected to the control unit, fluidly connected to the cavity and controllable by the control unit, characterized by the steps of

actuating the ventilating device for initial removal of residual humidity from the oven,

calculating an expected final air-humidity value from the residual humidity during said initial removal on the basis of the sensed humidity values and an algorithm for humidity calculation, and

using the calculated final air-humidity value as a reference value for the cooking or heating procedure.

5,552,585

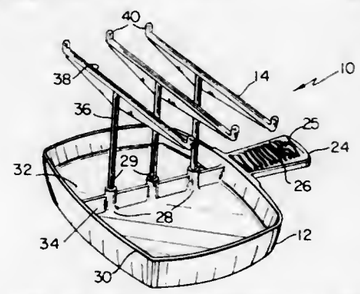
MICROWAVE COOKING VESSEL WITH REMOVABLE FOOD SUPPORTS

Jonathan E. Fleck, and Abigail M. Fleck, both of 425 Hall Ave., both of St. Paul, Minn. 55110-1828

Continuation-in-part of Ser. No. 14,674, Oct. 27, 1993, Pat. No. Des. 366,807. This application Oct. 6, 1994, Ser. No. 319,303

Int. Cl.[6] H05B *6/80*

U.S. Cl. 219—732 **8 Claims**



1. A system for improving the performance of a microwave oven, comprising:

a. a dish base unit having a lower surface for resting on the floor of the microwave oven;

b. contiguous raised sides surrounding said lower surface;

c. said sides being upstanding from said lower surface;

d. receptacles for firmly attaching upright, replaceable supports to said base unit; and

e. upright, replaceable supports sized to extend above the contiguous sides when attached to said receptacles for allowing the item desired to be irradiated to be raised above said lower surface, wherein at least one of said upright, replaceable supports comprise a substantially horizontal, elongated, cross piece supported by a centrally substantially vertical member mounted at a central location of said substantially horizontal, elongated, cross piece, the lower end of said vertical member is adapted to be received by said receptacle, said substantially horizontal, elongated, cross piece sized to support said item desired to be irradiated such that it is substantially out of contact with said vertical member.

5,552,586

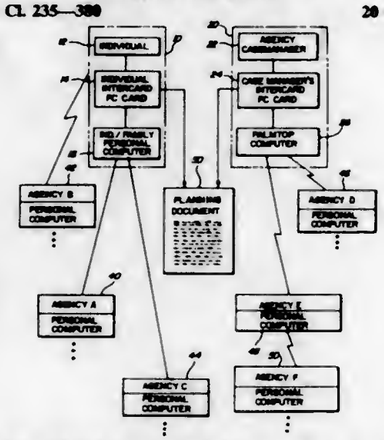
PERSONAL ID MEMORY CARD/AGENCY

Richard L. Kahnan, 2734 Lantz Ave., San Jose, Calif. 95124

Continuation of Ser. No. 260,356, Jun. 15, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 468,626

Int. Cl.[6] G06K *5/00*

U.S. Cl. 235—380 **20 Claims**



1. In a method for creating and sharing an electronic planning document during a planning meeting between an individual, needing services from and/or being eligible to receive benefits from at least one of a plurality of agencies set up to provide services to such an individual, and a case manager representing at least one of the agencies, the planning document having a set of personal information including assessments and planning records regarding the individual, each of the agencies having computer systems for storing and retrieving information, the method comprising:

providing a memory card personalized to the individual;

providing a memory card to the case manager;

providing a portable computer to the case manager whereby the planning meeting may take place at any convenient location;

inputting information constituting the planning document for said individual into the case manager's portable computer during the planning meeting;

saving the planning document in the case manager's computer to a file in the case manager's memory card; and

downloading at least a portion of the planning document in the case manager's computer into the individual's memory card, whereby the individual has ready access to said portion of the planning document and the ability to supply the information stored on his or her individual memory card to another one of said agencies for storage into said other agency's computer system, whereby the individual's dealings with other agencies is expedited.

5,552,587

MULTI-LIGHT CODED ELECTRONIC SECURITY LOCK

John H. Moorhouse, P.O. Box 236, Clear Lake, Minn. 55319

Filed Jul. 21, 1994, Ser. No. 278,243

Int. Cl.[6] G06K *5/00*

U.S. Cl. 235—382 **7 Claims**

1. A multi-light code operated security lock, having in combination

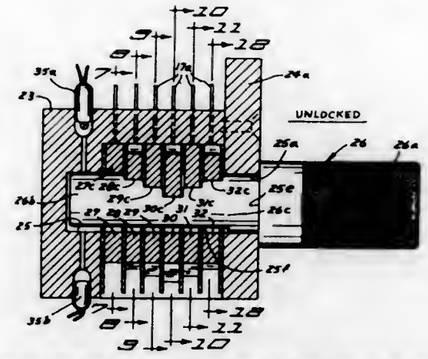
a terminal,

an axial bore in said terminal, having a reduced extension thereof through a front wall of said terminal,

a plurality of wheels disposed within said bore for axial rotation therein,

means shielding said wheels to be light proof from one another,

said wheels each having a semi-circular axial bore, the same extending through said shielding means,



a key disposable into said semi-circular bore adapted to rotate said wheels,

said terminal having opposed aligned spaced paired sets of bores,

a light source in connection with said terminal,

means transmitting light from said source to one set of said paired set of bores, said light passing directly through each bore of said one set and passing to and through the corresponding bores of said other aligned set thereof through the space therebetween,

said wheels respectively being in alignment with said bores with each wheel having a peripheral portion thereof pass through said space between the aligned of said respective bores,

each of said wheels having one or more notches and lands formed in its periphery,

said notches and lands represent elements of a secret code,

said notches being non-reflective and with said lands interrupt the light passing thereover between the aligned of said bores, said interruptions corresponding to and representing said code,

a counter in communication with the other opposed set of said bores receiving the passage of light from each bore of said other opposed set of bores, said light having passed over said wheels and having been interrupted by said notches and said lands in said passage,

said key having a series of angular segments removed therefrom respectively aligned with said wheels whereby rotation of said key rotates corresponding wheels according to the extent of the angular segments for such wheels whereupon said notches and lands in said wheels will be caused to interrupt said passage of light accordingly to manifest the code read by said counter,

said counter being adapted to receive and read said light interruptions as a code and convert the same into corresponding electrical impulses,

a computer,

said counter being in circuit with said computer transmitting said impulses thereto, and

said computer being provided with a chip receiving said impulses and making operational a program specified by said code.

5,552,588

APPARATUS FOR BUILDING A DATABASE OF THE LOCATION OF FILES STORED IN FILE HOLDERS

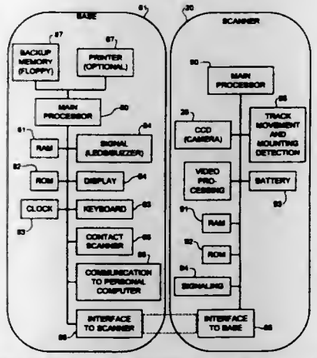
Eric D. Schneider, 17020 12th Ave. N., Plymouth, Minn. 55447, assignor to Eric D. Schneider, Plymouth, Minn.

Division of Ser. No. 237,266, May 3, 1994, Pat. No. 5,455,410. This application Oct. 26, 1995, Ser. No. 548,561

Int. Cl.[6] G06F *17/60*

U.S. Cl. 235—385 **12 Claims**

1. Apparatus for building a database of the location of files stored in file holders, the apparatus comprising:



a machine-readable code mounted to each file for uniquely identifying each file;

a machine-readable code mounted to each file holder for uniquely identifying each file holder;

guide means attached to each file holder;

database means for storing the location of each file relative to a particular file holder; and

a code-reading means in communication with the database means for reading each file holder code and each file code, the code-reading means having means for allowing for physical movement along the guide means such that as the code-reading means is directed along the guide means the machine-readable code for each file holder and file is read,

whereby as the code-reading means reads each file holder and file, the location where each file is stored is stored in the database.

5,552,589

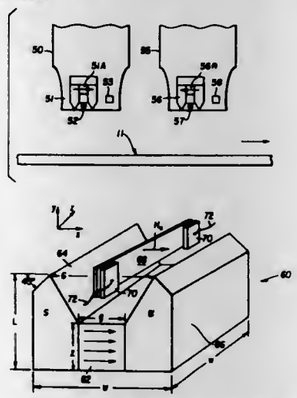
PERMANENT MAGNET ASSEMBLY WITH MR ELEMENT FOR DETECTION/AUTHENTICATION OF MAGNETIC DOCUMENTS

Neil Smith, San Diego; Frederick J. Jeffers, Escondido; Kent R. Gandola, Poway, and Peter V. Koeppe, San Diego, all of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 114,720, Aug. 31, 1993, Pat. No. 5,418,458. This application Oct. 28, 1994, Ser. No. 330,887

Int. Cl.[6] G06K *7/08*

U.S. Cl. 235—449 **7 Claims**



1. A magnetic assembly for both magnetizing and detecting magnetic documents comprising:

a permanent magnet;

first and second magnetically soft, high permeability pole pieces shaped to form a tapered variable gap-size magnetic circuit with said permanent magnet, wherein said permanent magnet is located at a first gap between said first and second pole pieces;

a magnetoresistive (MR) sensing element which is located substantially near the center of a second gap between said first and second pole pieces, wherein said second gap and said MR sensing element are proximate to a magnetic document to be sensed by said MR sensing element; and wherein said magnetic field at said MR sensing element maintains said MR element in a proper magnetic bias state for achieving adequate sensitivity for detecting magnetic fields emanating from a magnetic document to be sensed.

5,552,590

OPTICAL INFORMATION READING APPARATUS HAVING MEANS FOR JUDGING LASER DETERIORATION

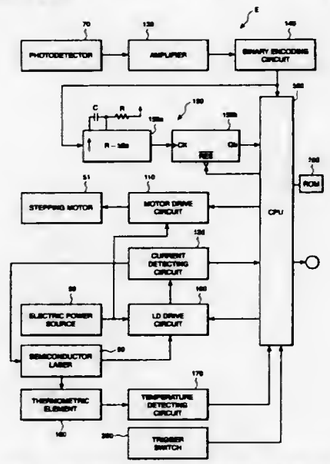
Kenzo Obata, Okazaki, and Katsunori Goto, Handa, both of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 7, 1993, Ser. No. 117,441

Claims priority, application Japan, Sep. 8, 1992, 4-239496; Sep. 9, 1992, 4-240718; May 27, 1993, 5-126206

Int. Cl.[6] G06K *7/10*

U.S. Cl. 235—455 **4 Claims**



1. An optical information reading apparatus monitoring intensity of a laser beam and controlling an operational current so as to maintain a laser output power at a constant value comprising:

a semiconductor laser emitting the laser beam in accordance with said operational current;

optical scanning means for causing the laser beam emitted from said semiconductor laser to scan an information medium;

photo receiving means for receiving a returning laser beam reflected at said information medium;

information reading means for reading out information from said information medium on the basis of said returning laser beam received by said photo receiving means;

sweep angle regulating means for restricting a sweep angle of said laser beam used in a scanning operation of said optical scanning means within a predetermined angle so as to scan only one information medium;

memory means for storing a coefficient representing temperature dependency of said operational current of said semiconductor

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SLIM SCAN MODULE WITH DUAL DETECTORS

ii. a second beam splitter parallel to the first beam splitter and spaced apart therefrom by a first distance;

memory means for storing a coefficient representing temperature dependency of said operational current of said semiconductor laser;

operational current detecting means for detecting an actual operational current value of said semiconductor laser, and correcting said actual operational current value based upon a temperature of said semiconductor laser and said coefficient stored in said memory means to produce a corrected operational current value; and

output means for generating said corrected operational current value as an information indicating deterioration of said semiconductor laser.

5,552,591

PRESENCE/ABSENCE BAR CODE

Douglas C. Bossen, Poughkeepsie; Chin-Long Chen, Wappingers Falls; Frederick H. Dill, South Salem; Douglas S. Goodman, Yorktown Heights; Mu-Yue Hsiao, Poughkeepsie; Paul V. McCann, Hopewell Junction; James M. Mulligan, Poughquag, and Ricky A. Rand, Somers, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 796,163, Nov. 22, 1991, abandoned, which is a continuation of Ser. No. 351,902, May 15, 1989, abandoned. This application Feb. 22, 1993, Ser. No. 21,298

Int. Cl.[6] G06K *7/10*

U.S. Cl. 235—462 **10 Claims**

1. An article of manufacture having identifying indicia thereon said indicia comprising adjacently positioned groups of sequences of marks, said groups including k substantially uniformly wide marks of a first width, W_1, at selectively spaced intervals within said groups, and also including an equal number of blank intervals within said groups, said blank intervals being defined by said marks, said blank intervals having a width which is substantially equal to an integral multiple of a second width, W_2, so that each sequence group has substantially the same width and the same number of said substantially uniformly wide marks in each group, and wherein the total blank interval width in each group is equal to $(n-k)\ W_2$, where n is the number of marks whose width is W_1 plus the number of blank positions whose width is W_2, and wherein there is at least one sequence group in which the number of distinctly blank interval widths, between the marks in said at least one sequence group, is at least 3.

5,552,592

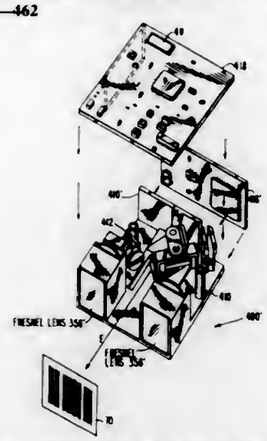
SLIM SCAN MODULE WITH DUAL DETECTORS

Paul Dvorkis, Stony Brook; David Tsi, Centereach, and Howard Shepard, Great River, all of N.Y., assignors to Symbol Technologies, Inc., Holtsville, N.Y.

Continuation-in-part of Ser. No. 952,414, Sep. 29, 1992, Pat. No. 5,367,151, which is a continuation-in-part of Ser. No. 943,232, Sep. 10, 1992, Pat. No. 5,373,148, and a continuation-in-part of Ser. No. 789,705, Nov. 8, 1991, Pat. No. 5,412,198, which is a continuation-in-part of Ser. No. 520,464, May 8, 1990, Pat. No. 5,168,149, which is a continuation-in-part of Ser. No. 428,770, Oct. 30, 1989, Pat. No. 5,099,110. This application Sep. 29, 1994, Ser. No. 315,178

Int. Cl.[6] G06K *7/10*

U.S. Cl. 235—462 **34 Claims**



1. An optical scanning system for scanning indicia having portions of differing light reflectivity comprising:

a light emitter assembly, having a single light source, for emitting a beam of light towards the indicia for reflection therefrom;

a first optical detector for receiving light reflected back from a first portion of the indicia;

a second optical detector spaced from said first optical detector to bound a channel therewith, and operative for receiving light reflected back from a second portion of the indicia;

each said optical detector including a photodetector, a lens and an aperture disposed between said photodetector and said lens; and

a scanner for scanning the beam of light in the channel between said optical detectors in scans across the indicia.

5,552,593

TEMPLATE OR RETICULE FOR QUALITY CONTROL OF A HEXAGONAL CODE HAVING AN ACQUISITION TARGET AND AN ALIGNMENT TARGET

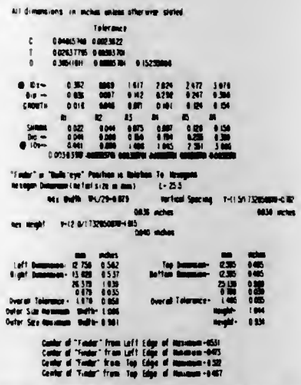
Charles E. Biss, Williamson, N.Y., assignor to PSC Inc., Webster, N.Y.

Filed May 17, 1995, Ser. No. 443,172

Int. Cl.[6] G06K *21/06*

U.S. Cl. 235—495 **28 Claims**

1. A template for use with an encoded symbol area having an acquisition target and an orientation target, said acquisition target including a first alternating pattern of contrasting colors and said orientation target including a first predetermined pattern of a predetermined color, comprising:



a substantially transparent sheet having a top surface and a bottom surface;

an acquisition pattern including a second alternating pattern of contrasting colors on said top surface of said substantially transparent sheet, said second alternating pattern having a contrasting color relationship with respect to said first alternating pattern;

an alignment pattern including said predetermined pattern of a second predetermined color, said second predetermined color having a contrasting color relationship with respect to said first predetermined color,

wherein when said alignment pattern is aligned over said orientation target, said encoded symbol area is determined to comply with predetermined specifications when said acquisition target is at a same time aligned with said acquisition pattern.

5,552,594

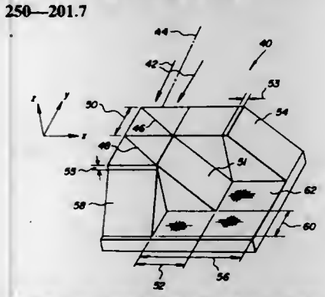
FOCUS DETECTING SYSTEM USING A BEAM SPLITTER TO FORM AN IMAGE AT NOMINAL BEST FOCUS, SLIGHTLY IN FRONT OF BEST FOCUS AND SLIGHTLY BEHIND BEST FOCUS

Donald E. Vandenberg, Brockport; Thomas W. Dey, Springwater, and James Olson, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 14, 1995, Ser. No. 388,096

Int. Cl.[6] G02B *27/40*

U.S. Cl. 250—201.7 **4 Claims**



1. A focus detecting system for detecting focus state of an image forming optical system relative to an object, comprising:

a. a beam splitter assembly for forming at least three coplanar two-dimensional images of a scene, each image having a different focus setting, wherein the beam splitter assembly comprises:

i. a first beam splitter arranged at 45 degrees to the optical axis of the optical system and perpendicular to the plane of the image sensor;

ii. a second beam splitter parallel to the first beam splitter and spaced apart therefrom by a first distance;

iii. a first mirror arranged parallel to the optical axis and 45 degrees to the plane of the image sensor to direct an image transmitted through the first beam splitter and reflected from the second beam splitter onto the image sensor, and spaced from the second beam splitter by a second distance;

iv. a second mirror arranged parallel to the optical axis and 45 degrees to the plane of the image sensor to direct an image reflected from the first beam splitter onto the image sensor, and spaced from the first beam splitter by a third distance; and

v. a third mirror arranged at 45 degrees to the optical axis and 45 degrees to the plane of the image sensor to form an image transmitted through both the first and second beam splitters on the image sensor and spaced from the second beam splitter by a fourth distance, wherein the sum of the first and second distances, the sum of the first and fourth distances, and the third distance differ by 0.4 to 4 mm;

b. an area array image sensor for sensing the images at the image forming plane; and

c. signal processing electronics for determining the sharpness of the three images and calculating an optimum focus setting tin the optical system by determining the variances of the three images and calculating a position of maximum variance corresponding to a best focus setting of the optical system.

5,552,595

NARROW BAND HIGH SENSITIVITY PHOTODETECTOR FOR INVERSE PHOTOEMISSION SPECTROSCOPY

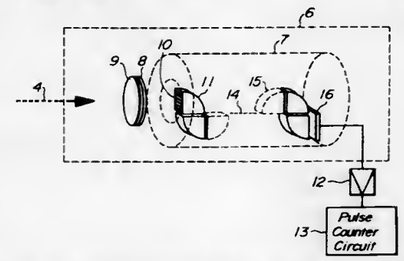
Hirofumi Namatame, Higashihiroshima, and Masaki Taniguchi, Hiroshima, both of, Japan, assignors to Hiroshima University, Hiroshima, Japan

Filed Mar. 15, 1995, Ser. No. 404,553

Claims priority, application Japan, Mar. 24, 1994, 6-053822

Int. Cl.[6] G01N *21/00;* **G02F** *1/01;* **H01L** *31/10*

U.S. Cl. 250—207 **3 Claims**



1. For use in inverse photo emission spectroscopy wherein an electron gun directs an electron beam on to a sample, a narrow band high sensitivity photo-electron detector adapted to receive light emitted by said sample when said electron beam impinges thereon, said photo-electron detector comprising:

a photo-electron multiplier including a dynode having a KCl film deposited thereon, said photo-electron multiplier further having a collector for collecting electrons emitted by said dynode;

a CaF_2 monocrystal window interposed between the sample and said dynode, said CaF_2 window having a KCl film deposited

5,552,601

a CaF_2 monocrystal window interposed between the sample and said dynode, said CaF_2 window having a KCl film deposited thereon, light emitted by the sample being transmitted through said CaF_2 window to impinge on said dynode; and

output means coupled to an output of said photo-electron multiplier for measuring the intensity of the electrons collected by said collector.

5,552,596

THREE-DIMENSIONAL RADIATION DETECTION DEVICE AND PROCESS FOR THE PRODUCTION OF SAID DEVICE HAVING ELEMENTARY READING CIRCUITS HYBRIDIZED BY WELDING MICROBEADS

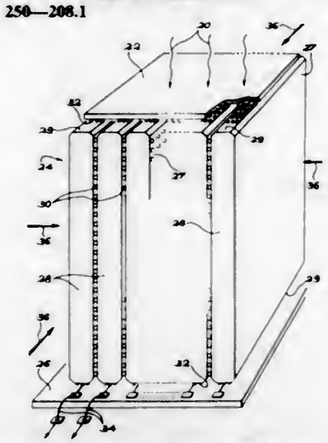
Michael Ravetto, Meylan; Francois Marion, Saint Egreve, and Jean-Marc Debono, Genoble, all of, France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Jan. 6, 1995, Ser. No. 369,747

Claims priority, application France, Jan. 19, 1994, 94 00530

Int. Cl.[6] H01L *31/14*

U.S. Cl. 250—208.1 **10 Claims**



1. Device for the detection of radiation comprising:

a detection array (**22**) for receiving the radiation and for supplying signals representing said radiation;

a circuit (**24**) for reading the signals supplied by the detection array, said reading circuit including a block having at least one stack of integrated circuits (**28**) constituting elementary reading circuits;

an electrical output component (**26**) electrically connected to the reading circuit; and

wherein said detection array and said electrical output component are respectively fixed to two separate faces of the block, said elementary reading circuits (**28**) are hybridized to one another by welding microbeads (**30**), and said detection array (**22**) and the electrical output component (**26**) are hybridized to the corresponding faces of the block by welding microbeads (**32**).

5,552,597

HAND-HELD SCANNER HAVING ADJUSTABLE LIGHT PATH

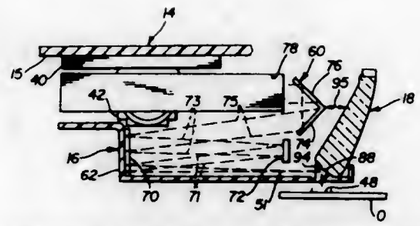
Charles McConica, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 6, 1994, Ser. No. 271,333

Int. Cl.[6] H01J *3/14*

U.S. Cl. 250—234 **24 Claims**

1. Optical scanner apparatus having a detector for detecting light reflected from an illuminated scanning area lying in a scanning plane, comprising:



a lens assembly positioned between the illuminated scanning area and the detector, said lens assembly defining a detector side light path between said lens and the detector;

a multiple reflecting assembly positioned between said lens assembly and the illuminated scanning area and defining a folded light path between said lens assembly and the illuminated scanning area, said folded light path having a length and a direction and comprising a plurality of segments; and

a prismic reflecting assembly positioned between said lens assembly and said multiple reflecting assembly, said prismic reflecting assembly being moveable so that the length and direction of the folded light path, which is incident on the detector, is changed by moving said prismic reflecting assembly.

5,552,598

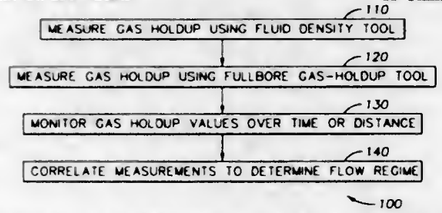
DETERMINATION OF DOWNHOLE FLOW REGIME IN A HORIZONTAL WELLBORE BY USING CENTER SAMPLE AND FULLBORE GAS-LIQUID HOLDUP MEASUREMENTS

Calvin W. Kessler, and Gary J. Frisch, both of Houston, Tex., assignors to Halliburton Company, Houston, Tex.

Filed Jun. 6, 1995, Ser. No. 467,230

Int. Cl.[6] G01V *5/12*

U.S. Cl. 250—269.3 **11 Claims**



1. A method for determining the downhole flow regime in a horizontal well borehole traversing a subterranean formation, comprising the steps of:

measuring a first gas holdup value within said borehole using a fluid density tool;

measuring a second gas holdup value within said borehole using a fullbore gas-holdup tool; and

determining said downhole flow regime as a function of said first gas holdup value and said second gas holdup value.

5,552,599

MASS SPECTROMETER HAVING AN ICP SOURCE

Ulrich Giessmann, Bremen; Gerhard Jung, Delmenhorst, and Curt Brunnée, Ritterhude, all of, Germany, assignors to Finnegan MAT GmbH, Bremen, Germany

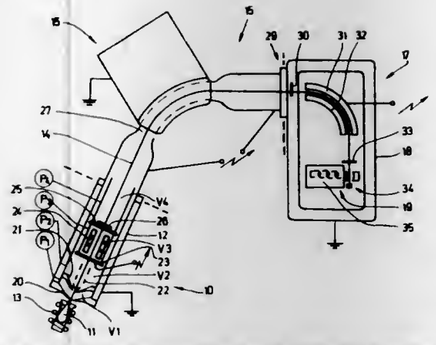
Filed Sep. 30, 1994, Ser. No. 315,569

Claims priority, application Germany, Oct. 1, 1993, 43 33 469.5

Int. Cl.[6] H01J *49/10*

U.S. Cl. 250—281 **12 Claims**

1. Mass spectrometer including:



an inductive coupled plasma ion source generating a plasma by a high frequency discharge comprising:

means for grounding said plasma;

a double-focusing analyzer having a magnetic sector including a magnet and an electric sector, and operating at an ion accelerating potential of a chosen polarity of either positive or negative which is sufficiently large to accelerate ions,

a flight tube for providing a path for said ions through said magnet, said flight tube being at said potential of chosen polarity;

means for electrically insulating at least a portion of said magnet from said flight tube, and

means for detecting said ions.

5,552,600

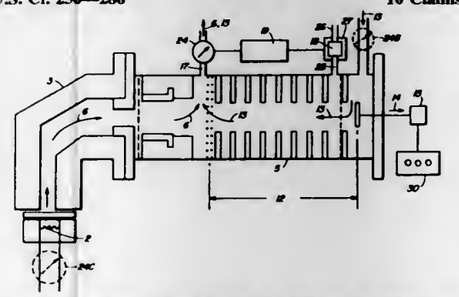
PRESSURE STABILIZED ION MOBILITY SPECTROMETER

John H. Davies; Ronald A. Jackson, both of Mississauga, and Frank J. Kuja, Brampton, all of, Canada, assignors to Barringer Research Limited, Rexdale, Canada

Filed Jun. 7, 1995, Ser. No. 477,321

Int. Cl.[6] B01D *59/44;* **H01J** *49/40*

U.S. Cl. 250—286 **10 Claims**



1. An ion mobility spectrometer for analysis of sample gas containing sample molecules comprising:

(1) a drift tube having a drift gas inlet, a drift region and electronic field generation means for establishing an electrostatic field within the drift region;

(2) a sample gas inlet;

(3) an exhaust gas outlet;

(4) pressure measurement means for detecting the pressure of drift gas in the drift region; and

(5) flow control means for controlling the flow of gas through any of the drift gas inlet, sample gas inlet, or exhaust outlet in response to said pressure measurements means,

wherein the flow control means adjusts the flow of gas to maintain the pressure in the drift region at a substantially constant value.

5,552,601

METHOD OF DRYING CELLS FOR SCANNING ELECTRON MICROSCOPY

Hie P. Beall, Durham, N.C., assignor to Duke University, Durham, N.C.

Filed Jul. 13, 1994, Ser. No. 274,629

Int. Cl.[6] H01J *37/18*

U.S. Cl. 250—307 **15 Claims**

1. A method of air drying biological specimens so as to maintain specimen integrity for scanning electron microscopy examination or imaging, said method comprising the steps of:

(a) isolating a biological specimen that has been removed from a biological subject;

(b) placing the specimen on a cover slip;

(c) fixing and dehydrating the specimen;

(d) submerging the specimen in a fluorinated carbon compound fluid for a sufficient time for the fluid to infuse into the specimen, said fluid having a low surface tension less than about 10 dynes/cm at 25° C., a low boiling point less than about 35° C., and an ozone depletion potential of 0;

(e) removing the specimen from the fluid;

(f) allowing the specimen with the fluid to air dry; and

(g) sputter coating the specimen with a conductive metal;

whereby said method is environmentally safe in that said method is free of adverse effects on the protective ozone layer of the earth.

5,552,602

ELECTRON MICROSCOPE

Hiroshi Kakibayashi, Nagareyama; Yasuhiro Mitsui, Fuchu; Hideo Tadokoro, Nishitama-gun; Katsuhiro Kuroda, Hachiouji; Masanari Koguchi, Higashikurume; Kazutaka Tsuji, Hachiouji; Tatsuo Makishima, Katsushika-ku; Mikio Ichihashi, Kodaira, and Shigeto Isakozawa, Hitachinaka, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 79,273, Jun. 21, 1993, abandoned, which is a division of Ser. No. 882,970, May 14, 1992, Pat. No. 5,278,408. This application Mar. 6, 1995, Ser. No. 398,684

Claims priority, application Japan, May 15, 1991, 3-110126

Int. Cl.[6] H01J *37/26*

U.S. Cl. 250—311 **28 Claims**

1. An electron microscope comprising:

an electron gun;

an electron optic system for illumination;

an electron deflector system;

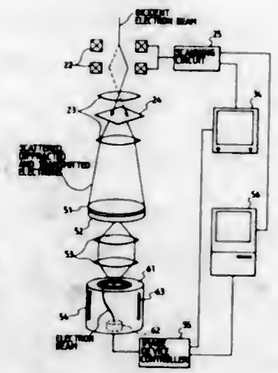
a specimen holder;

an electron detection instrument including a signal reception section in which a signal detection area detecting signals caused by electrons from the specimen is set arbitrarily; and

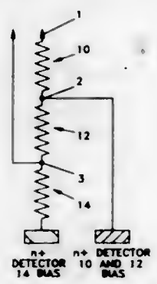
an electron detection instrument controller controlling said electron detection instrument to scan said signal detection area in said signal reception section thereof corresponding to said electron deflector system.

5,552,604

unobstructed portions of said radiation detector by automati-



5,552,603
BIAS AND READOUT FOR MULTICOLOR QUANTUM WELL DETECTORS
Burnham Stokes, Altamonte Springs, Fla., assignor to Martin Marietta Corporation, Baltimore, Md.
Filed Sep. 15, 1994, Ser. No. 306,575
Int. Cl.[6] H01L *31/09;29/15*
U.S. Cl. 250—338.4 **6 Claims**



1. A three-color optical detector having independent bias and readout for the colors comprising:

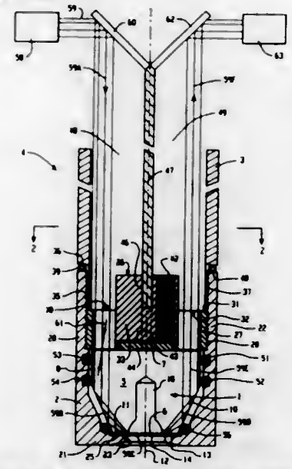
a substrate;

first, second, and third detector layers stacked one on top of another and on the substrate, wherein each detector layer is designed to operate at a respective predetermined bias and comprises a stack of a plurality of thin layers for absorbing incident light, and the first detector layer absorbs incident light having wavelengths in a first range, the second detector layer absorbs incident light having wavelengths in a second range, and the third detector layer absorbs incident light having wavelengths in a third range;

a plurality of conductive layers interleaved among the three detector layers and the substrate, whereby the respective biasses can be simultaneously applied to the detector layers and signals generated by the detector layers can be simuitaneously accessed; and

means for producing a component of light incident on the three-color detector that is polarized perpendicular to the detector layers.

5,552,604
OPTICAL SENSING WITH CRYSTAL ASSEMBLY SENSING TIP
Donald W. Sting, 358 Turtleback Rd., New Canaan, Conn. 06840, and Milan Milosevic, Fishkill, N.Y., assignors to Donald W. Sting, New Canaan, Conn.
Filed May 13, 1994, Ser. No. 242,360
Int. Cl.[6] G01N *21/35*
U.S. Cl. 250—341.2 **21 Claims**



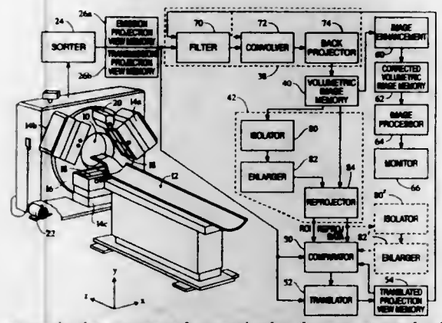
13. In a probe for an infrared energy optical system including a tube, a partition in the tube and a probe tip body coupled to the end of the tube, a crystal assembly housed in the probe tip body comprising a first crystal member having a flat transmission surface and a circumferential focusing surface, a diamond member having one surface in an optically transmitting interface with the first crystal member and a second parallel surface for contact with a sample, the infrared energy from a source sequentially passing through the tube on one side of the partition, entering the first crystal member through the transmission surface, being redirected within the first crystal member by the circumferential focusing surface to a focal ring at or near the optically transmitting interface, entering the diamond member for internal reflection within the diamond member for sample specific encoding, leaving the diamond member at a separate focal ring and reentering the first crystal member, being redirected within the first crystal member by the circumferential focusing surface to the transmission surface, leaving the first crystal member through the transmission surface, and passing through the tube on the other side of the partition to a detector.

5,552,605
MOTION CORRECTION BASED ON REPROJECTION DATA
Louis K. Arata, Mentor, Ohio, assignor to Picker International, Inc., Highland Heights, Ohio
Filed Nov. 18, 1995, Ser. No. 342,122
Int. Cl.[6] G01T *1/161;1/163*
U.S. Cl. 250—363.04 **17 Claims**

1. An imaging system comprising:

a radiation detector for receiving radiation from an examination region sequentially at a plurality of projection angles, the radiation detector producing electrical data indicative of the coordinate locations on the detector at which radiation is received, the electrical data at each of the projection angles forming a projection view of the examination region;

a reconstruction processor for reconstructing a volumetric image representation from the projection views;



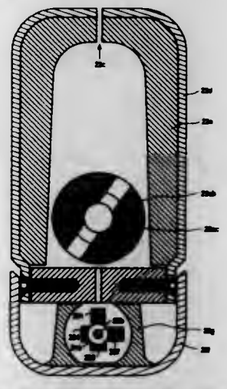
a reprojection processor for reprojecting the reconstructed volumetric image representation to produce a reprojection view along each of the plurality of projection angles;

an image isolator for isolating a subvolume of interest in the reconstructed volumetric image representation;

a view comparator for comparing the projection view with the reprojection view at each of the projection angles to determine an offset; and

a translator for translating each projection view by the corresponding offset, the translator being connected with the reconstruction processor to reconstruct the translated projection views into a corrected volumetric image representation.

5,552,606
VARIABLE FILTERS USED WITH RADIATION SOURCE TO REDUCE UNOBSTRUCTED DETECTOR AREA
Steven M. Jones, Pleasanton; Mike J. Janicki, San Jose; Thomas E. Lang, Fremont; John R. Liebig, San Jose, and Xiaohan Wang, Alameda, all of Calif., assignors to ADAC Laboratories, Inc., Milpitas, Calif.
Filed May 11, 1995, Ser. No. 439,134
Int. Cl.[6] G01T *1/00*
U.S. Cl. 250—363.04 **31 Claims**



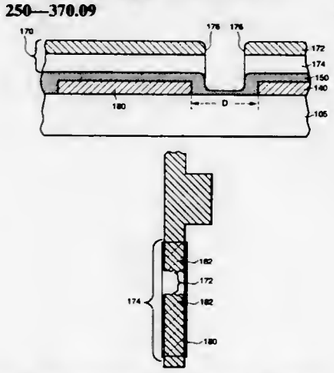
1. An apparatus for reducing count rate in unobstructed portions of a radiation detector, said apparatus comprising:

a source of radiation aligned with said radiation detector to expose said radiation detector with radiation;

an object for receiving emitted radiation from said source of radiation, said object disposed between said source of radiation and said radiation detector, wherein said unobstructed portions of said radiation detector are portions of said radiation detector that are not directly shielded from radiation by said object; and

a filter assembly comprising a plurality of radiation filters, said filter assembly for reducing count density detected within said unobstructed portions of said radiation detector by automatically installing a particular radiation filter to partially attenuate said source of radiation.

5,552,607
IMAGER DEVICE WITH INTEGRAL ADDRESS LINE REPAIR SEGMENTS
Roger S. Salisbury, Niskayuna; Ching-Yeu Wei, and Robert F. Kwasnick, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Jun. 21, 1995, Ser. No. 493,021
Int. Cl.[6] H01L *25/00;27/10;27/13*
U.S. Cl. 250—370.09 **13 Claims**



1. A solid state imager device having a plurality of pixels disposed on a substrate, the imager device comprising:

a plurality of first address lines disposed in a first layer of said imager device, said first address lines comprising conductive material and being coupled to respective ones of said pixels;

a plurality of second conductive address lines disposed in a second layer of said imager device, respective ones of said first and second address lines being disposed substantially perpendicular to one another, said second address lines further being coupled to respective ones of said pixels;

an intermediate layer disposed between said respective pluralities of said first and second address lines, said intermediate layer comprising at least one insulative material layer; and

at least one integral address line repair segment, said integral address line repair segment comprising the same conductive material comprising said first address lines, said at least one integral address line repair segment being disposed in said first layer so as to underlie a repair portion of one of said second address lines with said intermediate layer disposed therebetween, said integral address line repair segment being electrically isolated from said first address lines and having a width substantially the same as the width of said overlying second address line.

5,552,608
CLOSED CYCLE GAS CRYOGENICALLY COOLED RADIATION DETECTOR
Brian W. Gallagher, Highland Lakes; Costas Blionas, Hackensack, both of N.J.; Joseph A. Nicolosi, Bardonia, N.Y., and Richard Barbara, Oakland, N.J., assignors to Philips Electronics North America Corporation, New York, N.Y.
Filed Jun. 26, 1995, Ser. No. 494,501
Int. Cl.[6] G01T *1/00*
U.S. Cl. 250—370.15 **61 Claims**

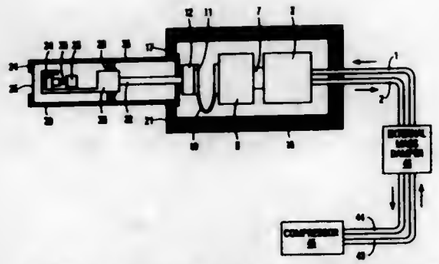
1. A cryogenic cooling apparatus for a radiation detector, comprising:

a Joule-Thomson closed cycle cryogenic cooler having a high pressure compressed refrigerant supply conduit, a flow limit-

5,552,610

5,552,611
PSEUDO-RANDOM REGISTRATION MASKS FOR

an outer peripheral surface of a side wall thereof which substantially contacts the inner peripheral surface of the



ing orifice and a refrigerant return conduit, said Joule-Thomson closed cycle cryogenic cooler producing a vibration during operation;

a thermally conductive member having a first portion and a second portion, being in thermal and mechanical communication with said Joule-Thomson closed cycle cryogenic cooler at said first portion, and having a nonunity vibration transmission function from said first portion to said second portion of said thermally conductive member; and

a cryogenic radiation detector, having a sensitivity to radiation and to vibration and having an output, mounted in thermal communication with said second portion of said thermally conductive member, said nonunity vibration transmission function modifying vibrations to which said detector is sensitive, to reduce an effect of said vibration on said output.

5,552,609

ELECTRIC-COOLED TYPE SEMICONDUCTOR RADIOACTIVE RAY DETECTOR

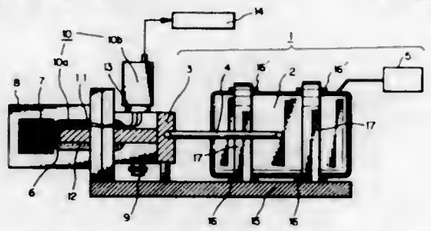
Masaki Katagiri, Ibaraki-ken, Japan, assignor to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Sep. 8, 1994, Ser. No. 302,405

Claims priority, application Japan, Sep. 9, 1993, 5-224636

Int. Cl.[6] G01T *1/24*; G12B *15/02*

U.S. Cl. 250—370.15 **14 Claims**



1. An electric-cooled semiconductor radioactive ray detector, comprising:

a vacuum vessel;

a semiconductor radioactive ray detecting means disposed in said vacuum vessel;

an electrical cooling means mechanically coupled to said semiconductor radioactive ray detecting means and including a Stirling type electric refrigerator for cooling by cyclic operation; and

a microphonics reducing means for passing therethrough signals relating to the detected radioactive rays and reducing microphonics so as to prevent microphonics generated by the semiconductor radioactive ray detecting means as a result of said Stirling type electric refrigerator from having an adverse influence on the energy resolution.

5,552,610

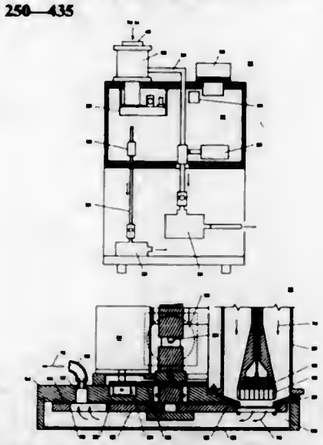
DEVICE AND METHOD FOR ACCURATELY MEASURING CONCENTRATIONS OF AIRBORNE TRANSURANIC ISOTOPES

Charles V. McIsaac; E. Wayne Killian, both of Idaho Falls; Ervin G. Grafwallner, Arco; Ronnie L. Kynaston, Blackfoot; Larry O. Johnson, Pocatello, and Peter D. Randolph, Idaho Falls, all of Id., assignors to Lockheed Idaho Technologies Company, Idaho Falls, Id.

Filed Sep. 29, 1994, Ser. No. 315,012

Int. Cl.[6] G01T *7/04*

U.S. Cl. 250—435 **18 Claims**



1. An alpha continuous air monitor (CAM) system comprising:

(a) air flow means for conducting an air stream through an alpha detector assembly;

(b) an indexing disc having a plurality of filter assemblies capable of collecting airborne alpha-emitting particles, said filter assemblies located an equal distance from the center of said indexing disc and at approximately equal distances from each other;

(c) means for vertically moving the indexing disc to physically engage and disengage the alpha detector assembly and indexing disc so that when the indexing disc and alpha detector assembly are engaged a filter assembly on the indexing disc is aligned with a minor air flow conduit within the alpha detector assembly;

(d) means for rotating the indexing disc a distance equal to the predetermined distance between filter assemblies;

(e) first alpha detector means within said minor air flow conduit for detecting alpha-emitting particles collected on the filter assembly aligned with the minor air flow conduit;

(f) a decay location located a distance from the first alpha detector equal to the distance between filter assemblies so that a filter assembly rotates from the first alpha detector means to align with the decay location, the radioactivity of said filter assembly aligned with the decay location then being allowed to decay to lower alpha levels;

(g) second alpha detector means located an equal distance from said first alpha detector means and said decay location, so that a filter assembly rotates from the decay location to align with the second alpha detector means;

(h) electronic means for controlling, monitoring, and displaying data for the air monitor system, so that the first alpha detector means measures alpha particles on the filter assembly aligned with said minor air flow conduit and the second alpha detector means measures alpha particles on the filter assembly aligned with it;

(i) calculating means for determining the transuranic isotope concentration from the alpha activity levels measured by the first and second alpha detector means.

5,552,611

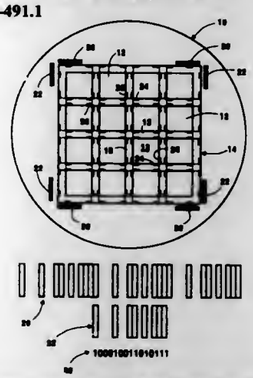
PSEUDO-RANDOM REGISTRATION MASKS FOR PROJECTION LITHOGRAPHY TOOL

William A. Enichen, Poughkeepsie, N.Y., assignor to International Business Machines, Armonk, N.Y.

Filed Jun. 6, 1995, Ser. No. 466,565

Int. Cl.[6] H01J *37/304*

U.S. Cl. 250—491.1 **16 Claims**



1. An exposure mask for a charged particle beam projection system comprising at least one mask alignment mark positioned on the exposure mask, the mask alignment mark including a plurality of openings, the openings being arranged to pass a charged particle beam to a substrate having at least one corresponding substrate alignment mark, the openings in the mask alignment mark being arranged pseudo-randomly and defining a transmission ratio and a correlation function of the mask alignment mark with the corresponding substrate alignment mark.

5,552,612

TRANSPORT CONTAINER FOR TRANSPORTING RADIATION SHIELD MEMBER

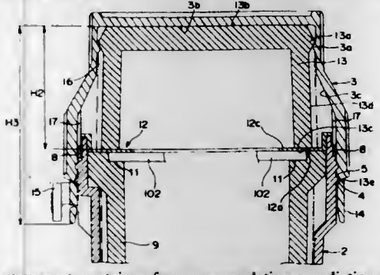
Hitoshi Katayama; Noboru Minamiguchi, and Yoshimasa Tanaka, all of Sanda, Japan, assignors to Nihon Medi-Physics Co., Ltd., Nishinomiya, Japan

Filed Dec. 22, 1994, Ser. No. 362,161

Claims priority, application Japan, Dec. 29, 1993, 5-349636

Int. Cl.[6] G21F *5/00*

U.S. Cl. 250—506.1 **13 Claims**



1. A transport container for accommodating a radiation shield member to which a syringe having radiopharmaceutical liquid filled thereinto is mounted, the radiation shield member having a wing-shaped holding member at an opening end thereof, the transport container comprising:

a cup-shaped sheath container for accommodating the radiation shield member and having an opening end, a first engaging portion formed on an outer peripheral surface thereof in the vicinity of the opening end thereof, and an inner peripheral surface;

a cup-shaped radiation shield container made of radiation shield material, having an opening end, a predetermined thickness, an outer peripheral surface of a side wall thereof which substantially contacts the inner peripheral surface of the sheath container, and a position-fixing portion, for fixing the wing-shaped holding member, to be engaged by the wing-shaped holding member at the opening end thereof;

a cup-shaped cover mounted on the opening end of the sheath container, having a cup-shaped radiation shield member made of radiation shield material and held therein, a second engaging portion which engages the first engaging portion of the sheath container, thus closing the opening of the sheath container by engagement between the first engaging portion and the second engaging portion; and

a holding frame, said holding frame including:

a portion having a frame-shaped sectional configuration and a size appropriate for contacting the inner peripheral surface of the sheath container in the vicinity of the opening end thereof;

a shield container removal-preventing portion extending from the frame-shaped sectional portion toward a center of the frame-shaped sectional portion in contact with an end surface of the opening end of the radiation shield container, thus preventing the radiation shield container from being removed from the sheath container; and

a shield member removal-preventing portion extending from the radiation shield container removal-preventing portion so as to cover the wing-shaped holding member engaged with the position-fixing portion for fixing the wing-shaped holding member, thus preventing the radiation shield member from being removed from the radiation shield container.

5,552,613

ELECTRON DEVICE

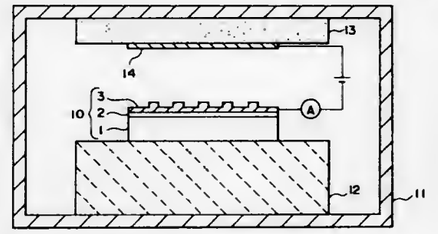
Yoshiki Nishibayashi; Tadashi Tomikawa, and Shin-ichi Shikata, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Filed Sep. 22, 1994, Ser. No. 311,463

Claims priority, application Japan, Sep. 24, 1993, 5-238571

Int. Cl.[6] H01J *1/02;1/14*

U.S. Cl. 257—10 **32 Claims**



1. An electron device comprising:

an i-type diamond layer formed on a substrate; and

an n-type diamond layer formed on said i-type diamond layer and having a first surface region and a second surface region;

which are set in a vacuum container;

wherein said first surface region is flatly formed and an emitter portion is formed in said second surface region, said emitter portion having a bottom area 10 or less μm square, formed of said n-type diamond layer, and projecting relative to said first surface region.

5,552,614

SELF-ALIGNED THIN FILM TRANSISTOR WITH

5,552,617

BIPOLAR TRANSISTOR

said first input/output cell including a first input/output circuit having circuit elements disposed on only said first and third

5,552,614

SELF-ALIGNED THIN FILM TRANSISTOR WITH SIDEWALL SPACERS

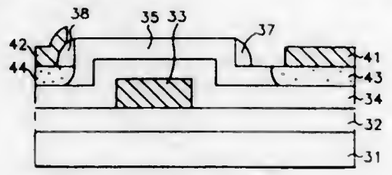
Sa K. Rha, Seoul, Rep. of Korea, assignor to LG Semicon Co., Ltd., Tokyo, Japan

Division of Ser. No. 233,870, Apr. 26, 1994, Pat. No. 5,403,761. This application Dec. 9, 1994, Ser. No. 353,446

Claims priority, application Rep. of Korea, Jun. 21, 1993, 5-11324

Int. Cl.[6] H01L *29/76;27/01*

U.S. Cl. 257—66 **11 Claims**



1. A thin film transistor (TFT) comprising:

a substrate;

a gate electrode formed on the substrate and having first and second sides;

a gate insulating layer formed over the substrate and covering the gate electrode;

a first semiconductor layer formed on the gate insulating layer, the first semiconductor layer having first and second sides adjacent the first and second sides, respectively, of the gate electrode;

first and second sidewall spacers formed on the first and second sides, respectively, of the first semiconductor layer;

first and second highly doped impurity regions formed in the first semiconductor layer adjacent the first and second sides, respectively, of the gate electrode, the first highly doped impurity region being spaced from the first sidewall spacer, and the second highly doped impurity region being overlapped by the second sidewall spacer; and

second and third semiconductor layers the first semiconductor layer near both sides of the gate, the second semiconductor layer being formed over the first highly doped impurity region, and the third semiconductor layer being formed over the second highly doped impurity region and over the second sidewall spacer.

5,552,615

ACTIVE MATRIX ASSEMBLY WITH DOUBLE LAYER METALLIZATION OVER DRAIN CONTACT REGION

Toshimoto Kodaira; Hiroyuki Oshima, and Toshihiko Mano, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

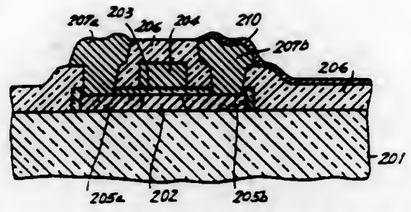
Continuation of Ser. No. 259,354, May 3, 1994, which is a continuation of Ser. No. 14,053, Feb. 15, 1993, Pat. No. 5,365,079, which is a continuation of Ser. No. 803,699, Dec. 4, 1991, abandoned, which is a continuation of Ser. No. 484,466, Feb. 22, 1990, abandoned, which is a continuation of Ser. No. 285,292, Dec. 15, 1988, abandoned, which is a continuation of Ser. No. 894,432, Jul. 16, 1986, abandoned, which is a continuation of Ser. No. 489,986, Apr. 29, 1983, abandoned. This application Mar. 23, 1995, Ser. No. 408,979

Claims priority, application Japan, Apr. 30, 1982, 57-74014; Apr. 30, 1982, 57-74015; May 6, 1982, 57-75814

Int. Cl.[6] H01L *27/13;29/786*

U.S. Cl. 257—72 **14 Claims**

1. An active matrix assembly for an electro-optical device including a plurality of liquid crystal cells, wherein data signals are supplied to the liquid crystal cells through a plurality of field effect transistors arranged in a plurality of picture elements, each of the plurality of field effect transistors comprising:



a channel region comprising a semiconductor layer, the semiconductor layer disposed over a substrate;

a source region and a drain region spaced apart by the channel region, the drain region having a contact region;

an insulating film formed over at least the channel region;

a gate electrode formed over the insulating film;

a driving electrode being directly in contact with the drain region for coupling the drain region to one of the liquid crystal cells; and

a conductive material covering a portion of the driving electrode over the contact region of the drain region.

5,552,616

SEMICONDUCTOR LIGHT DETECTING DEVICE WITH GROOVE

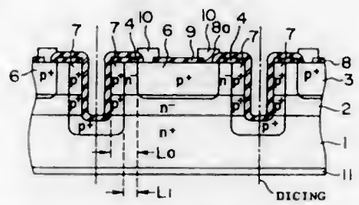
Masahiro Kobayashi, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 400,522, Mar. 7, 1995, abandoned, which is a continuation of Ser. No. 213,508, Mar. 16, 1994, abandoned. This application Dec. 7, 1995, Ser. No. 568,793

Claims priority, application Japan, Mar. 19, 1993, 5-60103

Int. Cl.[6] H01L *31/00*

U.S. Cl. 257—184 **9 Claims**



1. A light detecting device comprising:

a first semiconductor layer containing a first conductive type impurity;

a second semiconductor layer formed on said first semiconductor layer, said second semiconductor layer containing the first conductive type impurity and having a density lower than that of said first semiconductor layer;

a third semiconductor layer formed by introducing a second conductive type impurity into said second semiconductor layer to define an active region within said second semiconductor layer;

a groove formed in said second semiconductor layer and surrounding said active region, said groove having a depth reaching to said first semiconductor layer; and

a first semiconductor region containing the second conductive type impurity formed in said first, second and third semiconductor layers to surround a side surface of said groove, said first region being apart from said active region to form a pn junction therebetween.

5,552,617

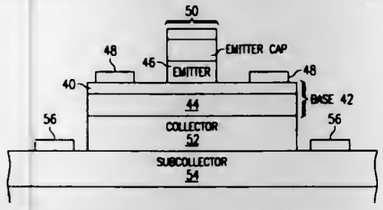
BIPOLAR TRANSISTOR

Darrell G. Hill, Plano; Timothy S. Henderson, Richardson; William U. Liu, Plano; Shou-Kong Fan, Richardson; Hin-Fai Chau, Plano; Damian Costa, Dallas, and Ali Khatibzadeh, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 287,567, Aug. 9, 1994, abandoned. This application Aug. 16, 1995, Ser. No. 515,636

Int. Cl.[6] H01L *29/73;29/10*

U.S. Cl. 257—197 **16 Claims**



1. A bipolar transistor, comprising a GaInP emitter, a base, and a collector, said base lying between said emitter and said collector and comprising first and second layers of semiconductor material of the same doping type and approximately the same doping concentration, wherein said first layer abuts said emitter and has a wider bandgap than said second layer.

5,552,618

MULTI-VOLTAGE-LEVER MASTER-SLICE INTEGRATED CIRCUIT

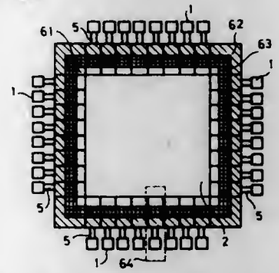
Hideki Taniguchi; Ichiro Tomioka; Kunihiko Sanada, and Masatomi Okabe, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 75,211, Jun. 10, 1993, Pat. No. 5,404,035. This application Oct. 19, 1994, Ser. No. 326,086

Claims priority, application Japan, Jun. 11, 1992, 4-152131

Int. Cl.[6] H01L *27/10;27/02*

U.S. Cl. 257—207 **1 Claim**



1. A multi-voltage-level master-slice semiconductor integrated circuit device comprising:

an input/output circuit section disposed about an edge of said device;

said input/output circuit section having a substrate divided into a first substrate segment of a first conductivity type to which a first supply voltage is to be applied, a second substrate segment of said first conductivity type to which a second supply voltage is to be applied, and a third substrate segment of a second conductivity type to which a reference voltage is to be applied;

said first substrate segment and said third substrate segment being electrically separated from each other;

said second substrate segment and said third substrate segment being electrically separated from each other;

a first input/output cell including said first, second and third substrate segments;

said first input/output cell including a first input/output circuit having circuit elements disposed on only said first and third substrate segments of said first input/output cell;

a second input/output cell including said first, second and third substrate segments;

said second input/output cell including a second input/output circuit having circuit elements disposed on only said second and third substrate segments of said second input/output cell; and

means for isolating said first and second voltage supplies including interposing said third substrate segment between said first and second substrate segments.

5,552,619

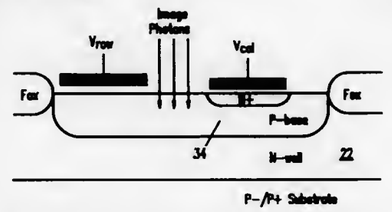
CAPACITOR COUPLED CONTACTLESS IMAGER WITH HIGH RESOLUTION AND WIDE DYNAMIC RANGE

Albert Bergemont, Palo Alto; Carver A. Mead, Pasadena; Minhwa Chi, Palo Alto, and Hosam Haggag, Santa Clara, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 10, 1995, Ser. No. 436,181

Int. Cl.[6] H01L *31/06*

U.S. Cl. 257—291 **1 Claim**



1. A capacitor coupled contactless imager structure formed in the semiconductor substrate, the imager structure comprising:

a collector region of N-type conductivity formed in the P-type semiconductor material;

a base region of P-type conductivity formed in the collector region;

an n-doped polysilicon emitter contact formed in contact with a surface of the base region such that an n+ epitaxial emitter region is formed in the base region beneath the polysilicon emitter contact;

silicon dioxide formed over the polysilicon emitter contact and exposed surfaces of the base region; and

a layer of second polysilicon about 3000–4000 Å which is formed on the silicon dioxide such that the layer of second polysilicon only partially covers the base region.

5,552,620

VERTICAL TRANSISTOR WITH HIGH DENSITY DRAM CELL AND METHOD OF MAKING

Chih-Yuan Lu, and Horng-Huei Tseng, both of Hsinchu, Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Division of Ser. No. 208,713, Mar. 11, 1994, Pat. No. 5,429,977. This application Apr. 24, 1995, Ser. No. 428,763

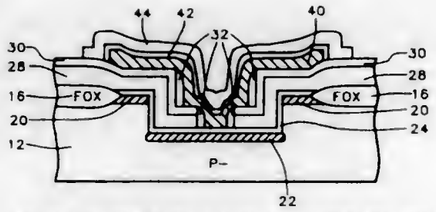
Int. Cl.[6] H01L *27/108*

U.S. Cl. 257—302 **7 Claims**

1. An army of vertical DRAM cells wherein each cell includes a field effect transistor having a gate electrode and source/drain elements and a capacitor comprising:

a pattern of field oxide isolation in a silicon substrate wherein there are a pattern of openings to the silicon substrate;

a pattern of lines of holes located within said openings to said silicon substrate, said holes of said line of holes each having a bottom and sidewalls, a pattern of parallel bit lines, wherein a



bit line surrounds a line of holes, and wherein said lines of holes and bit lines are perpendicular to one another and which said bit lines and lines of holes cross at the planned locations of said vertical DRAM cells

said bit lines are drain elements of said field effect transistor surrounding said holes in the surface of said substrate;

source elements located at the bottom of said holes;

a gate dielectric on the sidewalls and bottom surfaces of said holes;

doped polysilicon stripes on the sidewalls and bottoms of said lines of holes over said gate dielectric and over said field oxide isolation thereby forming word lines;

said doped polysilicon stripes providing gate electrodes on the sidewalls on said holes,

a silicon nitride layer over said doped polysilicon stripes;

contact openings in the bottoms of each of said holes through said silicon nitride layer and doped polysilicon stripes, said doped polysilicon stripes establishing gate electrodes in said holes and word line patterns over the said field oxide isolation;

first silicon oxide spacers over the sidewalls of each of said contact openings in said silicon nitride layer and said doped polysilicon stripes;

a capacitor node polysilicon electrode in each of said holes and in contact to said source element through said contact opening;

a capacitor dielectric over each of said capacitor node polysilicon electrodes; and

a capacitor polysilicon plate electrode over each of said capacitor dielectrics to complete said vertical DRAM cell.

5,552,621

MEMORY WITH EEPROM CELL HAVING CAPACITIVE EFFECT AND METHOD FOR THE READING OF SUCH A CELL

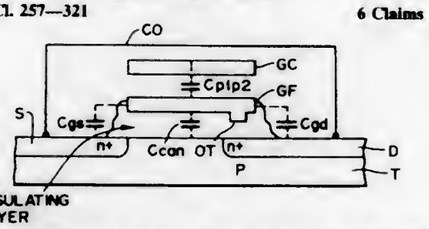
Jacek Kowalski, Trets, France, assignor to Gemplus Card International, Gemenos, France

Continuation of Ser. No. 888,639, May 27, 1992, abandoned. This application Nov. 1, 1994, Ser. No. 331,871

Claims priority, application France, May 29, 1991, 91 06466

Int. Cl.[6] H01L *29/788*

U.S. Cl. 257—321 **6 Claims**



1. A memory cell for an integrated circuit memory, the cell having components mounted on a semiconductor substrate and further comprising:

a control gate;

a floating gate, controlled by the control gate and insulated from the control gate;

an insulation layer for insulating the floating gate from the substrate and including at least one tunnel window made of a tunnel oxide;

a transistor having a channel region, as well as drain and source regions diffused in the substrate and located adjacent the channel region;

and a conductor overlying and forming a permanent connection between the drain and source regions, the conductor extending in spaced overlying relation to the substrate and the floating gate.

5,552,622

TUNNEL TRANSISTOR

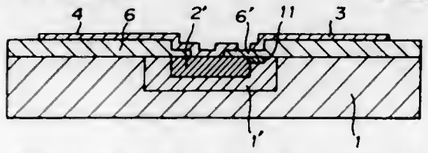
Mitsuteru Kimura, Miyagi, Japan, assignor to Mitsuteru Kimura, Miyagi, and Ricoh Seiki Company, Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 89,811, Jul. 12, 1993, abandoned. This application Jun. 23, 1995, Ser. No. 493,980

Claims priority, application Japan, Jul. 14, 1992, 4-186539

Int. Cl.[6] H01L *27/01;27/12;29/76;29/94*

U.S. Cl. 257—339 **29 Claims**



1. A tunnel transistor with a gate electrode provided through an insulating thin film on a tunnel junction between a semiconductor and a metallic layer, wherein the gate electrode is so formed that the gate electrode does not reach an ohmic electrode formed in the semiconductor, an accumulation layer having a high carrier density is formed in a side of the semiconductor to enable of the tunnel junction by adjusting an applied voltage to the gate electrode, a tunnel current passing between the metallic layer and the ohmic electrode formed in the semiconductor via the tunnel junction being controlled by the applied voltage.

5,552,623

SHORT CHANNEL MOSFET WITH BURIED ANTI-PUNCH THROUGH REGION

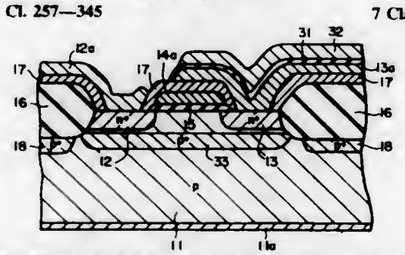
Jun-ichi Nishizawa, and Tadahiro Ohmi, both of Sendai, Japan, assignors to Handotai Kenkyu Shinkokai, Sendai, Japan

Continuation of Ser. No. 62,333, Jun. 9, 1987, Pat. No. 5,384,476, which is a continuation of Ser. No. 179,782, Aug. 20, 1988, abandoned. This application Oct. 12, 1993, Ser. No. 134,010

Claims priority, application Japan, Aug. 25, 1979, 54-108377; Sep. 7, 1979, 54-115491

Int. Cl.[6] H01L *27/108*

U.S. Cl. 257—345 **7 Claims**



1. A dynamic random access memory comprising at least one insulated gate transistor and one storage capacitor, wherein:

said transistor comprises:

an insulated-gate transistor having a semiconductor substrate, and having, closer to a surface of said substrate, a source semiconductor region of one conductivity type and a low resistivity, a drain region having said one conductivity type and a low resistivity and a channel semiconductor region of the opposite conductivity type and a high resistivity defined between said source region and drain region, and having a gate electrode formed on a surface of said channel region via a gate insulator layer, characterized in that

(a) said semiconductor substrate has a high impurity concentration and has a conductivity type opposite to that of said source region;

(b) said semiconductor device further includes, at a surface of said substrate, a region of a lesser impurity concentration than that of said substrate and of a conductivity type being the same as that of said substrate thereby to define an implanted region of higher doping concentration that is positioned lower than and effectively separated from the source region and that does not appreciably increase junction capacitance between said defined implanted region and the source region;

(c) said source region, said drain region and said channel region are formed in said region of a lesser impurity concentration;

(d) at least a portion of said gate electrode contacting said gate insulator layer is formed with a material which has a relatively high built-in voltage relative to said source region (12) and which is a metal, a metal silicide, or a highly-doped polysilicon of a conductivity type opposite to that of said source region;

(e) an effective channel length of less than 1 μm is defined by the distance between said source and said drain regions;

(f) said gate insulator layer is less than 500Å, and

(g) the relationship L/D>0.9, where L represents the channel length and D represents the depth from the surface to said semiconductor substrate.

5,552,624

MULTI-FUNCTION ELECTRONIC COMPONENT, ESPECIALLY NEGATIVE DYNAMIC RESISTANCE ELEMENT, AND CORRESPONDING METHOD OF FABRICATION

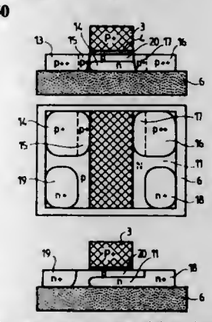
Tomasz Skotnicki, Meylan, and Gérard Merckel, Montbonnot, both of, France, assignors to France Telecom, Paris, France

Filed Jul. 2, 1993, Ser. No. 86,979

Claims priority, application France, Jul. 9, 1992, 92 08502

Int. Cl.[6] H01L *27/01*

U.S. Cl. 257—350 **25 Claims**



1. An electronic component comprising, integrated within the same semiconductor structure:

a first semiconductor area forming an insulated-gate field-effect transistor having a drain, a source, and an insulated gate;

a second semiconductor area forming a lateral bipolar transistor having an emitter, a base and a collector region;

the first and second semiconductor areas having a common semiconductor layer comprising a channel of the insulated-gate field-effect transistor and in which a base current of the bipolar transistor flows when appropriate voltages are applied to the second semiconductor area during use; the channel of the insulated-gate field-effect transistor being a P channel if the lateral bipolar transistor is an NPN transistor and the channel of the insulated-gate field-effect transistor being an N channel if the lateral bipolar transistor is a PNP transistor;

wherein the two semiconductor areas together form a structure exhibiting negative dynamic resistance when appropriate voltages are applied to the semiconductor structure during use.

5,552,625

SEMICONDUCTOR DEVICE HAVING A SEMI-INSULATING LAYER

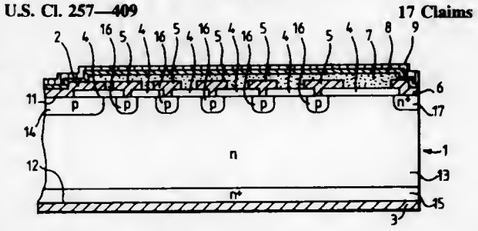
Susumu Murakami, Katsuta; Takuya Fukuda, Hitachi; Yoshiteru Shimizu, Katsuta, and Yoshitaka Sugawara, Hitachi, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 9, 1994, Ser. No. 208,138

Claims priority, application Japan, Mar. 10, 1993, 5-049005

Int. Cl.[6] H02L *29/76*

U.S. Cl. 257—409 **17 Claims**



1. A semiconductor device comprising:

a first semiconductor region, said first semiconductor region being of a first conductivity type and having a first main surface;

a second semiconductor region, said second semiconductor region being of a second conductivity type and extending into said first semiconductor region from said first main surface, a p-n junction being defined between said first and second semiconductor regions,

first and second electrodes contacting said first and second semiconductor regions respectively;

a semi-insulating layer interconnecting said first and second electrodes, said semi-insulating layer having a sheet resistivity which varies between said first and second electrodes;

a first insulating layer between said semi-insulating layer and said first main surface of said first semiconductor region;

a second insulating layer for passivation covering said semi-insulating layer and said first and second electrodes;

further including at least one third semiconductor region, said at least one third semiconductor region being of said second conductivity type and extending into said first semiconductor region from said first main surface so as to surround said second semiconductor region, wherein said first insulating layer has at least one opening therein;

at least one third electrode which extends through said at least one opening to contact said at least one third semiconductor region; and

wherein said at least one third electrode extends beyond said at least one third semiconductor region, to cover second parts of said first semiconductor region adjacent said at least one third semiconductor region, with said first insulating layer having at least one second part between said at least one third electrode and said second part of said first semiconductor region.

5,552,626

SEMICONDUCTOR DEVICE HAVING BIPOLAR TRANSISTORS WITH COMMONLY INTERCONNECTED COLLECTOR REGIONS

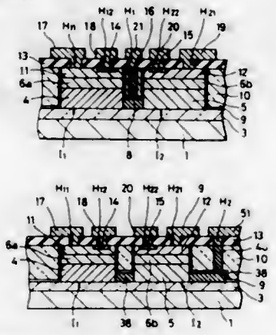
Takenori Morikawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 28, 1994, Ser. No. 330,588

Claims priority, application Japan, Oct. 28, 1993, 5-291558

Int. Cl.[6] H01L *29/732*

U.S. Cl. 257—525 **23 Claims**



1. A semiconductor device comprising:

a first insulator;

a second insulator formed on said first insulator;

a first semiconductor island region and a second semiconductor island region formed to be buried in said second insulator;

a first bipolar transistor provided in said first island region, said first transistor having an emitter region, a base region and a collector region;

a second bipolar transistor provided in said second island region, said second transistor having an emitter region, a base region and a collector region;

an interconnection conductor for electrically interconnecting said collector regions of said first and second transistors;

said interconnection conductor being formed in said second insulator so that it is in contact with said collector regions of said first and second transistors;

a third insulator formed to cover said first and second island regions and said second insulator;

first and second emitter electrodes formed on said third insulator, said first and second emitter electrodes being electrically connected with said emitter regions of said first and second transistors;

first and second base electrodes formed on said third insulator, said first and second base electrodes being electrically connected with said base regions of said first and second transistors; and

a common collector electrode formed on said third insulator, said collector electrode being electrically connected with said collector regions of said first and second transistors.

5,552,627

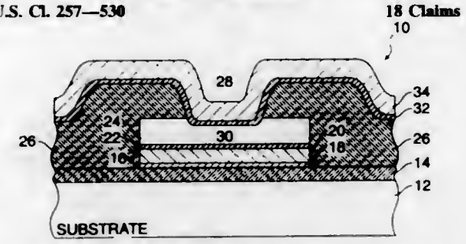
ELECTRICALLY PROGRAMMABLE ANTIFUSE INCORPORATING DIELECTRIC AND AMORPHOUS SILICON INTERLAYERS

John L. McCollum, Saratoga; Abdelshafy A. Eltoukhy, and Abdul R. Forouhi, both of San Jose, Calif., assignors to Actel Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 4,912, Jan. 19, 1993, Pat. No. 5,411,917, which is a continuation of Ser. No. 604,779, Oct. 26, 1990, Pat. No. 5,181,096, which is a continuation-in-part of Ser. No. 508,306, Apr. 12, 1990, Pat. No. 5,070,384. This application Apr. 22, 1994, Ser. No. 231,634

Int. Cl.[6] H01L *29/00*

U.S. Cl. 257—530 **18 Claims**



1. An electrically programmable antifuse element disposed on a semiconductor substrate in an integrated circuit comprising:

an insulating layer covering active circuit elements on said integrated circuit;

a first metal electrode;

a first antifuse material layer formed of a dielectric film disposed on said first electrode;

a second antifuse material layer disposed on said first antifuse material layer;

an inter-layer dielectric layer disposed on said second antifuse material layer, said inter-layer dielectric layer including an antifuse via disposed therein and extending completely therethrough;

a third antifuse material layer formed of a formed of a dielectric film disposed on said second antifuse material layer in said antifuse via; and

a second metal electrode disposed on said third antifuse material layer.

5,552,628

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

Tohru Watanabe, and Katsuya Okumura, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 82,504, Jun. 25, 1993, abandoned, which is a continuation of Ser. No. 984,720, Dec. 4, 1992, abandoned, which is a continuation of Ser. No. 679,491, Apr. 2, 1991, abandoned. This application Feb. 16, 1995, Ser. No. 389,563

Claims priority, application Japan, Apr. 2, 1990, 2-84947; Dec. 17, 1990, 2-418924

Int. Cl.[6] H01L *23/58;23/48*

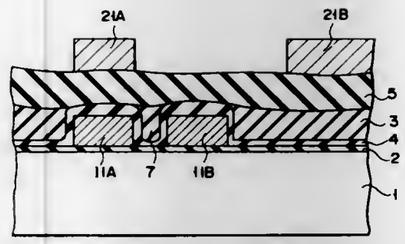
U.S. Cl. 257—632 **85 Claims**

1. A semiconductor device comprising:

a semiconductor substrate;

a first insulative layer formed on said semiconductor substrate;

a plurality of wires arranged on said first insulative layer, said plurality of wires being formed of polysilicon; and



a liquid-phase-deposited (hereinafter, LPD) layer, said LPD layer completely filling only a gap between at least two of said plurality of wires, said LPD layer comprising one of silicon oxide, tungsten oxide, and tantalum oxide.

5,552,629

SUPERLATTICE AVALANCE PHOTODIODE

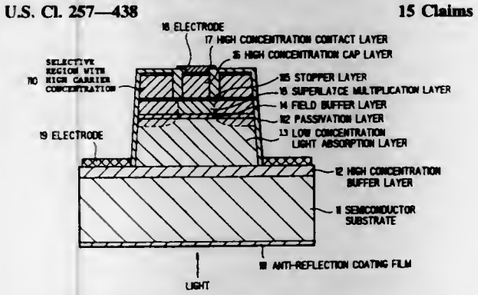
Isao Watanabe, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Mar. 22, 1995, Ser. No. 408,903

Claims priority, application Japan, Mar. 22, 1994, 6-050836; Dec. 2, 1994, 6-299996

Int. Cl.[6] H01L *31/107;29/74;31/111*

U.S. Cl. 257—438 **15 Claims**



1. A superlattice avalanche photodiode, comprising:

a first conductive type of semiconductor substrate;

a first conductive type of semiconductor buffer layer provided on the semiconductor substrate;

a first conductive type of semiconductor light absorption layer provided on the semiconductor buffer layer;

a first conductive type of semiconductor electric-field buffer layer formed on the semiconductor light absorption layer;

a superlattice multiplication layer provided on the semiconductor electric-field buffer layer;

a second conductive type of semiconductor cap layer provided on the superlattice multiplication layer;

a second conductive type of semiconductor contact layer provided on the semiconductor cap layer; and

a first conductive type of selective region selectively formed, around a region receiving light, inwardly from the surface of the contact layer so as to reach at least under the electric-field buffer layer;

wherein the selective region is formed so as to be separated from either the semiconductor cap layer and contact layer by an etched region.

5,552,630

THIN FILM TRANSISTOR HAVING METALLIC LIGHT SHIELD

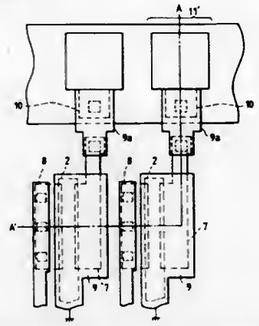
Hiroyuki Miyake, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 683,774, Apr. 11, 1991, abandoned. This application Dec. 7, 1992, Ser. No. 987,073

Claims priority, application Japan, Apr. 13, 1990, 2-96542

Int. Cl.[6] H01L *31/0232;29/04;31/036;23/552*

U.S. Cl. 257—435 **8 Claims**



1. A thin film transistor array having a plurality of thin film transistors arranged on a substrate, each of said plurality of thin film transistors comprising:

a gate electrode formed on said substrate;

a first insulating layer formed on said gate electrode;

a semiconductor layer formed on said first insulating layer over said gate electrode;

a second insulating layer formed on said semiconductor layer over said gate electrode;

a drain electrode having a first predetermined width formed on said semiconductor layer and overlapping a side portion of said second insulating layer;

a source electrode having a second predetermined width formed on said semiconductor layer opposing said drain electrode and overlapping another side portion of said second insulating layer;

a third insulating layer formed on said source electrode and said drain electrode; and

a metallic layer formed on said third insulating layer having a width greater than said first predetermined width and covering a predetermined length of said drain electrode, but not covering the entire second predetermined width of the source electrode;

wherein the drain electrode of one of two adjoining thin film transistors of the plurality of thin film transistors is adjoining to the source electrode of the other of said two adjoining thin film transistors, and part of the drain electrode of each of the plurality of thin film transistors extends in only one direction different from a direction of arrangement of said transistors.

5,552,631

SEMICONDUCTOR DEVICE ASSEMBLY INCLUDING POWER OR GROUND PLANE WHICH IS PROVIDED ON OPPOSITE SURFACE OF INSULATING LAYER FROM SIGNAL TRACES, AND IS EXPOSED TO CENTRAL OPENING IN INSULATING LAYER FOR INTERCONNECTION TO SEMICONDUCTOR DIE

John McCormick, Redwood City, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Continuation-in-part of Ser. No. 894,031, Jun. 4, 1992, abandoned. This application Dec. 20, 1993, Ser. No. 170,138

Int. Cl.[6] H01L *23/02;23/48;23/52*

U.S. Cl. 257—666 **13 Claims**

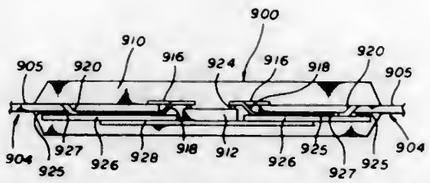
1. A semiconductor device assembly comprising:

electric contacts on a surface of the engaging section for

said side of said second semiconductor chip having said

5,552,635

HIGH THERMAL EMISSIVE SEMICONDUCTOR



a first conductive layer patterned to have a plurality of traces, each of said traces having an inner end and an outer end;

an insulating layer having an inner peripheral edge defining a central opening, said insulating layer supporting intermediate portions of said traces, with inner portions of said traces extending within said central opening so that said inner ends of said traces can be bonded to a die;

a second conductive layer provided on a side of said insulating layer opposite said traces and extending within said opening, with an inner edge portion of said second conductive layer exposed within said central opening in said insulating layer;

a leadframe having a plurality of leads with an inner end and an outer end, an inner end of at least one of said leads being electrically connected to an outer end of at least one of said traces; and

selected traces of said first conductive layer being cut at said inner peripheral edge of said insulating layer, bent past said insulating layer, and bonded to said exposed inner edge portion of said second conductive layer.

5,552,632

PLATE-SHAPED EXTERNAL STORAGE DEVICE AND METHOD OF PRODUCING THE SAME

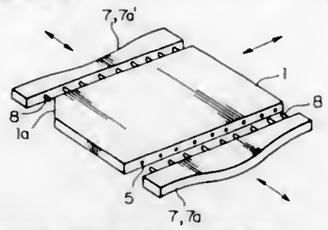
Hiroshi Iwasaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Mar. 4, 1994, Ser. No. 205,452

Claims priority, application Japan, Apr. 28, 1993, 5-102884

Int. Cl.[6] **H01L** *23/02;23/48;23/04*

U.S. Cl. 257—679 **22 Claims**



1. An external storage device unit comprising:

a plate-shaped external storage device including:

a non-volatile semiconductor memory device including input/output terminals,

external connection terminals connected to the input/output terminals, the external connection terminals having end surfaces, and

an insulator coating and sealing the memory device and the external connection terminals unitarily into a molded plate to form a plate-shaped external storage device, the end surfaces of the external connection terminals being exposed in concavities on a peripheral surface of the plate-shaped external storage device; and

a connection section including:

an engaging section disposed opposite from the peripheral surface of the plate-shaped external storage device for attachment and detachment to and from the external storage device, the engaging section mating and contacting with the end surfaces of the external connection terminals of the external storage device, and

electric contacts on a surface of the engaging section for resilient connection to and disconnection from the external connection terminals, depending on whether the engaging section attaches or detaches with the external storage device.

5,552,633

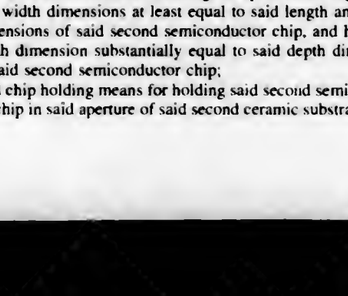
THREE-DIMENSIONAL MULTIMODULE HDI ARRAYS WITH HEAT SPREADING

Shanti S. Sharma, Marlton, N.J., assignor to Martin Marietta Corporation, Camden, N.J.

Filed Jun. 6, 1995, Ser. No. 469,053

Int. Cl.[6] **H01L** *23/02;23/053;23/34*

U.S. Cl. 257—700 **12 Claims**



1. A multichip circuit module, comprising:

a first semiconductor chip defining length, width and height dimensions, and including metallic contacts on one side thereof, said first semiconductor chip producing heat during operation thereof;

a first ceramic substrate defining mutually parallel upper and lower surfaces, and an aperture in said upper surface having length and width dimensions at least equal to said length and width dimensions of said first semiconductor chip, and having a depth dimension substantially equal to said depth dimension of said first semiconductor chip, but less than the separation between said upper and lower surfaces of said first ceramic substrate;

first chip holding means for holding said first semiconductor chip in said aperture in said first ceramic substrate, with said side of said first semiconductor chip having said contacts facing away from said aperture, whereby said side of said first semiconductor chip having said contacts is substantially coplanar with said upper surface of said first ceramic substrate, and said heat generated by said first semiconductor chip during operation is conducted, at least in part, to said first ceramic substrate;

a first sheet of dielectric film of a material having relatively low thermal conductivity, said first sheet of dielectric film overlying said upper surface of said first ceramic substrate and said side of said first semiconductor chip having said contacts, said first sheet of dielectric film supporting a pattern of electrical conductors, and also including electrically conductive through vias registered with said pattern of electrical conductors and with said contacts of said first semiconductor chip, for coupling electrical energy to said first semiconductor chip during operation;

a second semiconductor chip defining length, width and height dimensions, and also including metal contacts on one side thereof;

a second ceramic substrate defining mutually parallel upper and lower surfaces, and also defining an aperture having length and width dimensions at least equal to said length and width dimensions of said second semiconductor chip, and having a depth dimension substantially equal to said depth dimension of said second semiconductor chip;

second chip holding means for holding said second semiconductor chip in said aperture of said second ceramic substrate, with said side of said second semiconductor chip having said contacts facing away from said aperture of said second ceramic substrate, whereby said side of said second semiconductor chip having said contacts is substantially coplanar with said upper surface of said second ceramic substrate;

a second sheet of dielectric film of a material having a relatively low thermal conductivity, said second sheet of dielectric film overlying said upper surface of said second ceramic substrate and said side of said second semiconductor chip having said contacts, said second sheet of dielectric film defining a lower surface adjacent said upper surface of said second ceramic substrate and said side of said second semiconductor chip having said contacts, and an upper surface bearing a pattern of conductors, said second sheet of dielectric film also including a plurality of electrically conductive through vias extending from said upper surface to said lower surface of said second sheet of dielectric film, said through vias being registered with, and in electrical contact with, said contacts of said second semiconductor chip, said second sheet of dielectric film also including a further plurality of through apertures extending from said upper surface to said lower surface of said second sheet of dielectric film at locations remote from said aperture in said second ceramic substrate;

mechanical coupling means coupled to said second sheet of dielectric film and to said first ceramic substrate, for mechanically coupling said lower surface of said first ceramic substrate to said upper surface of said second sheet of dielectric film, whereby heat generated by said first semiconductor chip tends to be blocked by said second dielectric sheet, undesirably tending to raise the temperature of said first semiconductor chip by reducing thermal conduction from said first semiconductor chip to said second ceramic substrate;

thermally conductive means filling said further plurality of through apertures in said second dielectric sheet, for providing low-thermal-resistance paths for the flow of heat from said first semiconductor chip through said bottom surface of said first ceramic substrate, through said thermally conductive means filling said further plurality of apertures in said second dielectric sheet, to said second ceramic substrate.

5,552,634

METHOD AND APPARATUS FOR DISSIPATING HEAT IN AN ELECTRONIC DEVICE

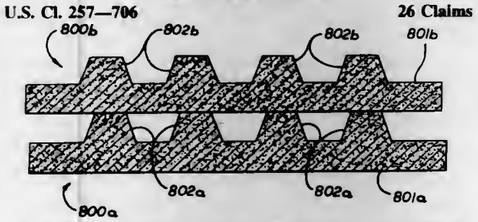
Mark R. Schneider, San Jose, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Dec. 14, 1993, Ser. No. 166,713

The portion of the term of this patent subsequent to Dec. 15, 2009, has been disclaimed.

Int. Cl.[6] **H01L** *23/34*

U.S. Cl. 257—706 **26 Claims**



1. A method of cooling a semiconductor device, comprising the steps of providing said semiconductor device with a package including a heat sink consisting essentially of a powdered metal and exposing said heat sink to a cooling fluid;

wherein the heat sink includes a plurality of posts projecting from a generally flat surface, such that at least two of said posts are formed with protrusions extending from ends thereof respectively, and a surface of said heat sink opposite to said generally flat surface is formed with apertures configured to fittingly receive respective protrusions extending from ends of posts of another heat sink which is configured similar to said heat sink.

5,552,635

HIGH THERMAL EMISSIVE SEMICONDUCTOR DEVICE PACKAGE

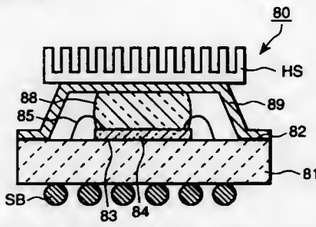
Gu S. Kim, Suwon; Jong G. Kim, Seoul; Seung H. Ahn, Suwon, and Jae M. Park, Seoul, all of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jan. 10, 1995, Ser. No. 370,389

Claims priority, application Rep. of Korea, Jan. 11, 1994, 389/1994

Int. Cl.[6] **H01L** *23/10;23/34*

U.S. Cl. 257—706 **7 Claims**



1. A high thermal emissive semiconductor device package, which comprises:

a substrate having a plurality of external connection leads, a plurality of connection lands, and wires between respective of the leads and lands;

at least one semiconductor chip mounted on the substrate, said chip having a plurality of bonding pads having respective upper surfaces;

bonding wires electrically connecting respective of the bonding pads of the chip and the connection lands of the substrate;

a heat spreader having high thermal conductivity, said heat spreader being attached to respective of the upper surfaces of the bonding pads of the chip by insulating adhesive having good thermal conductivity, said heat spreader having an upper surface; said heat spreader being made from a metallic material selected from the group consisting of copper, copper alloy, aluminum, aluminum alloy, steel and stainless steel;

a metal cap which is in contact with the upper surface of the heat spreader via a thermal compound, and which encapsulates said at least one semiconductor chip, said bonding wires, and said heat spreader, by being sealed to the substrate; and

a heat sink mounted on said metal cap.

5,552,636

DISCRETE TRANSITOR ASSEMBLY

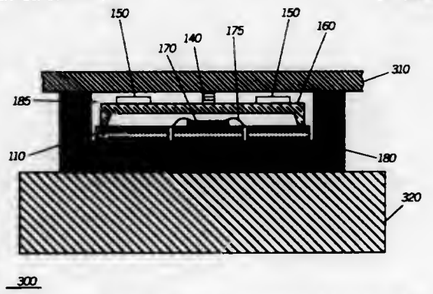
Robert E. Darveaux, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 69,332, Jun. 1, 1993, abandoned.

This application Nov. 28, 1994, Ser. No. 345,979

Int. Cl.[6] **H01L** *23/043;23/10*

U.S. Cl. 257—709 **11 Claims**



1. A configurable discrete surface mountable electronic package, comprising:

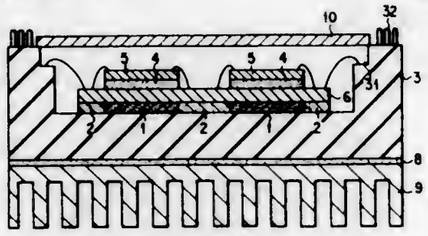
a thermal conductive member with a cavity located therein, the thermal conductive member having an interface portion for mounting the electronic package;
a substrate mounted within said cavity;
a power transistor located on said substrate;
at least two flexible leads for providing electrical connection to said substrate, each lead having first and second opposing ends, the first end being attached to the substrate, the second end being an electrical interface end, the electrical interface end being substantially coplanar with the interface portion of said thermal conductive member, said electrical interface end of said lead and said interface portion of said thermal conductive member forming a substantially planar mounting surface for the electronic package;
an externally accessible mount portion for mounting impedance compensating circuitry, the externally accessible mount portion being located on said substrate between said power transistor and one of said at least two flexible leads;
an impedance compensating circuit member mounted at said mount portion.

5,552,637

SEMICONDUCTOR DEVICE

Osamu Yamagata, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 258,829, Jun. 13, 1994, abandoned. This application May 31, 1995, Ser. No. 455,037
Claims priority, application Japan, Jun. 14, 1993, 5-165961
Int. Cl.[6] H01L *23/34;23/48;23/52;29/40*
U.S. Cl. 257—717 **3 Claims**



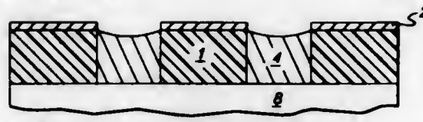
1. A semiconductor device comprising:
a package having an inner bottom surface and an opening;
a wiring board disposed on the inner bottom surface of the package and formed of a semiconductor substrate on which circuit wirings are formed;
a plurality of semiconductor elements formed on the wiring board and electrically connected to the circuit wirings of the wiring board, each semiconductor element including a surface area;
a first adhesive agent disposed between the wiring board and the inner bottom surface of the package to fix the wiring board on the package, the first adhesive agent having high thermal conductivity and being positioned in selected areas which are directly below the semiconductor elements, the size of each selected area being substantially equal to the surface area of the semiconductor element directly above the selected area;
a second adhesive agent disposed between the wiring board and the inner bottom surface of the package to fix the wiring board on the package, the second adhesive agent having low elasticity and being positioned in an area other than the selected areas; and
a cap for hermetically sealing the opening of the package.

5,552,638

METALLIZED VIAS IN POLYIMIDE

Loretta J. O'Connor, Westford; Rosemary A. Previti-Kelly, Richmond, and Thomas J. Reen, Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 38,407, Mar. 29, 1993, Pat. No. 5,397,741. This application Dec. 5, 1994, Ser. No. 349,350
Int. Cl.[6] H01L *21/465;21/283*
U.S. Cl. 257—759 **6 Claims**



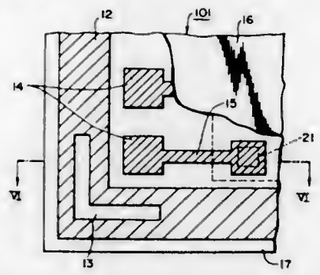
1. A layered semiconductor device comprising:
(a) at least one layer of polyimide, said layer of polyimide having a plurality of metallic inclusions; and
(b) a 200 to 500 Å thick layer of a silsesquioxane, derived at least in part from a polyaminoalkylalkoxysilane (PAAS), overlying said layer of polyimide.

5,552,639

RESIN MOLDED TYPE SEMICONDUCTOR DEVICE HAVING A CONDUCTOR FILM

Yuji Hara, Akishima; Satoru Ito, and Tatsuro Toya, both of Tokyo, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 293,559, Aug. 22, 1994, which is a continuation of Ser. No. 72,405, Jun. 7, 1993, Pat. No. 5,371,411, which is a continuation of Ser. No. 703,765, May 21, 1991, Pat. No. 5,229,642, which is a division of Ser. No. 419,007, Oct. 10, 1989, Pat. No. 5,023,699, which is a continuation of Ser. No. 191,080, May 6, 1988, abandoned, which is a continuation of Ser. No. 744,151, Jun. 13, 1985, Pat. No. 4,625,227, which is a continuation of Ser. No. 292,585, Aug. 13, 1981, abandoned. This application Jun. 1, 1995, Ser. No. 456,384
Claims priority, application Japan, Sep. 1, 1980, 58-119817
Int. Cl.[6] H01L *27/02;29/34;23/48;29/44*
U.S. Cl. 257—775 **7 Claims**



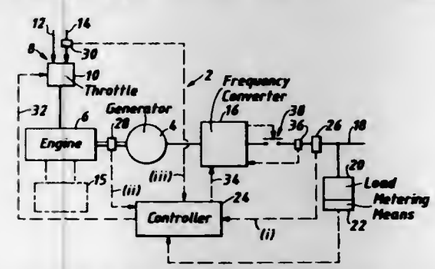
1. A semiconductor integrated circuit device comprising:
a substantially tetragonal semiconductor substrate having a major surface including a first peripheral edge and a second peripheral edge adjacent to said first peripheral edge to define a corner of said major surface of said substantially tetragonal semiconductor substrate;
a plurality of active circuit elements which are formed on said major surface of said substantially tetragonal semiconductor substrate;
a plurality of bonding pads formed on said major surface of said substantially tetragonal semiconductor substrate;
a metal wiring electrically connecting one of said plurality of active circuit elements and one of said bonding pads, and a broad metal wiring formed adjacent to said first and second peripheral edges of said major surface of said substantially tetragonal semiconductor substrate, said broad metal wiring including a first portion extending in parallel with said first peripheral edge, a second portion extending in parallel with said second peripheral edge and a connecting portion connecting said first portion with said second portion;
a silicon nitride film formed by plasma process, formed over said metal wiring and said broad metal wiring; and
a sealing resin which is formed over said silicon nitride film and which encapsulates said semiconductor substrate, wherein
said broad metal wiring having a slit formed in said broad metal wiring in said corner of said semiconductor substrate, and said broad metal wiring having side wall defining said slit,
said silicon nitride film covering said side wall of said broad metal wiring, and
said broad metal wiring being sufficient to act as wiring for supplying a power source or a ground potential for said plurality of active circuit elements.

5,552,640

ELECTRICAL POWER GENERATING ARRANGEMENT WITH COMPUTER CONTROL FOR VARYING ENGINE SPEED AS A FUNCTION OF LOAD DEMAND

Jeffrey A. Sutton, Solihull, and Iain J. Tebbutt, Ashby De La Zouch, both of, England, assignors to British Gas pcl, London, England

Filed Aug. 31, 1994, Ser. No. 296,912
Claims priority, application United Kingdom, Sep. 17, 1993, 9319323
Int. Cl.[6] F02N *11/06;* **H02P** *9/04*
U.S. Cl. 290—40 B **12 Claims**



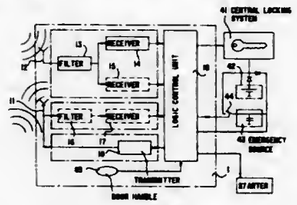
1. An electrical power generating arrangement from which an electrical power output is to be connected to electrical mains, said electrical power generating arrangement comprising:
a reciprocating internal combustion engine;
an electrical power generator rotatably driven by rotary drive from said reciprocating internal combustion engine;
frequency converter means for converting variable frequency AC from said generator to a substantially fixed frequency AC for delivery to said electrical mains; and
control means including an engine map for controlling an engine speed of said reciprocating internal combustion engine, for varying the engine speed as a function of the electrical power output to be delivered from said frequency converter means, and for operating in accordance with said engine map which represents the engine speeds as a function of the electrical power output from said frequency converter means, said engine map calculated using values of thermal power input to said reciprocating internal combustion engine and electrical power output from said frequency converter means to determine engine efficiency at varying engine speeds, said engine map providing a particular engine speed corresponding to a particular electrical power output from said frequency converter means, and said particular engine speed being an engine speed at which said reciprocating internal combustion engine is operating at substantially optimum efficiency to produce said particular electrical power output from said frequency converter means.

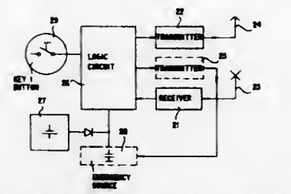
5,552,641

REMOTE-CONTROL ACCESS CONTROL DEVICE AND METHOD FOR OPERATING THE SAME

Robert Fischer, Kelheim; Johannes Ilg; Christian Schneider, both of Regensburg, and Ulrich Schrey, Laaber Ot Waldetzenberg, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 2, 1994, Ser. No. 300,480
Claims priority, application Germany, Sep. 2, 1993, 43 29 697.1
Int. Cl.[6] B60R *25/00*
U.S. Cl. 307—10.5 **26 Claims**





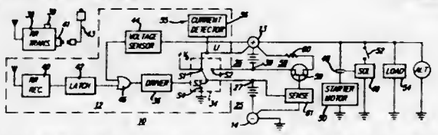
1. A remote-control access control device, comprising:
tripping means;
an unlocking unit;
a stationary transmitter and receiver unit responding to actuation of said tripping means for transmitting a question code signal with a field intensity, receiving an answer code signal, and furnishing an unlocking signal to said unlocking unit if the answer code signal matches a command code signal;
a portable transponder having a receiver receiving the question code signal, a transmitter transmitting the answer code signal, and a battery voltage; and
said stationary transmitter and receiver unit repeatedly transmitting the question code signal if no answer code signal has been received in response to an initial transmission, and means for modifying a signal parameter upon transmission of the answer code signal as a function of one of the field intensity of the question code signal and the battery voltage of the transponder.

5,552,642

PROTECTION SYSTEM WITH VOLTAGE SWITCHING

Thomas J. Dougherty, Waukesha; Debra L. Smith, West Allis; Ann L. Roche, Glendale; David A. Thuerk, Brookfield, and David J. Novak, Elm Grove, all of Wis., assignors to Globe-Union, Inc., Milwaukee, Wis.

Filed Mar. 9, 1994, Ser. No. 209,086
Int. Cl.[6] B60R *25/04*
U.S. Cl. 307—10.300 **12 Claims**



1. A protection system for a motor vehicle having a starting circuit including a starter motor for starting the engine of the vehicle, said system comprising:

battery means having first and second battery terminals, said battery means being adapted to be connected to said starting circuit to permit said starter motor to be energized by said battery means,

said battery means including a first plurality of cells electrically interconnected to form a first battery portion which provides a first voltage, and a second plurality of cells electrically interconnected to form a second battery portion which provides a second voltage;

and circuit means connecting said first and second battery portions between said first and second battery terminals, said circuit means including switching means connected between said first battery portion and said second battery portion and operable between a first condition in which said switching means connects only said first battery portion between said first and second battery terminals whereby the voltage at said first and second battery terminals corresponds to said first voltage, and a second condition in which said switching means connects said second battery portion in series with said first battery portion between said battery terminals whereby the voltage provided at said first and second terminals corresponds to the sum of said first and second voltages,

said circuit means including control means including signal receiving means coupled to said switching means and a signal transmitting device manually operable by an operator of the vehicle at a location remote from the location of said signal receiving means for generating control signals for enabling said signal receiving means to operate said switching means between said first and second conditions,

said first voltage being insufficient to operate said starter motor to start said engine and said voltage equal to said sum of said first and second voltages being sufficient to operate said starter motor to start said engine.

5,552,643

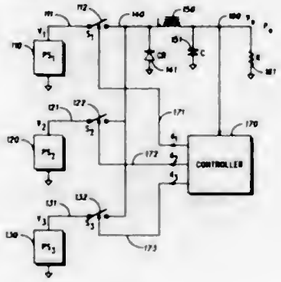
POWER SIGNAL COMBINING METHOD AND APPARATUS

Jason N. Morgan, Madison, and David H. Nabors, Huntsville, both of Ala., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 8, 1994, Ser. No. 225,019

Int. Cl.[6] H02J *3/46*

U.S. Cl. 307—81 **17 Claims**



1. A method for applying a plurality, k, of signals, (where k sequentially assumes each value from 1 to n) plurality of signals comprising a first signal having a first magnitude V_1, a second signal having a second magnitude V_2, . . . , and an nth signal having an nth magnitude V_n, the method comprising the steps of, for the kth signal:

(a) coupling the kth signal to the input of an inductor, the inductor having an inductor output, for a time interval t_k, thereby storing an energy$_k$ in the inductor, the time interval t_k based on $t_k 32 ((2\ p_k\ P_o L\ n\ T)/(V_k - V_n)^2)^{1/2}$;

(b) de-coupling the kth signal from the input of the inductor, thereby allowing the energy$_k$ to dissipate at the inductor output; and,

(c) repeating the coupling step (a) and the de-coupling step (b) for each of the plurality of n signals in sequence at a predetermined frequency, f, as k varies from 1 to n, thus forming an output signal at the inductor output, the output signal having an output voltage V_o and an output power P_o;

where:

T=1/f

P_k=a predetermined fractional power contribution for the kth signal.

L=a value of the inductor,

V_k=a magnitude of the kth signal;

and L and f are chosen so that each t_k is less than T.

5,552,644

PROXIMITY SWITCHES

Douglas W. Calder, 8 Ochiltree Court Dunblane, Perthshire FK150DG, Scotland, United Kingdom, and Arthur J. Bizley, 43 Saffron Close Wootton Bassett Swindon, Wiltshire, United Kingdom

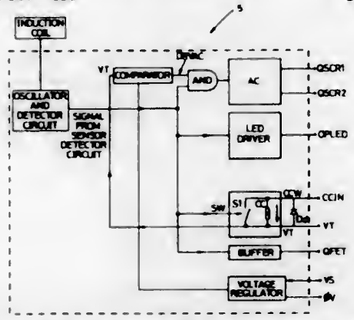
PCT No. PCT/US92/11232, § 371 Date Jan. 24, 1995, § 102(e) Date Jan. 24, 1995

PCT Filed Dec. 28, 1992, Ser. No. 244,826

Claims priority, application United Kingdom, Dec. 31, 1991, 9127571

Int. Cl.[6] H01H *35/00*

U.S. Cl. 307—116 **8 Claims**



1. A two wire AC power supply for a proximity switch integrated circuit comprising:

a bridge rectifier connected to an external AC power source;

a voltage regulator, connected in parallel with the bridge rectifier;

a thyristor, also connected in parallel with the bridge rectifier;

a diode having its anode connected to an output of the regulator;

a storage capacitor being connected between the cathode of the diode and an output of the bridge rectifier;

a comparator, having one input connected to the other output of said regulator and another input being held at a constant reference voltage; and

an AND gate, having a first input connected to an output of the comparator and a second input being connected to an output from the proximity switch indicative of the switch state, an output of the AND gate being connected to a gate of the thyristor for triggering the thyristor, wherein, the comparator and the AND gate are provided within the proximity switch integrated circuit.

5,552,645

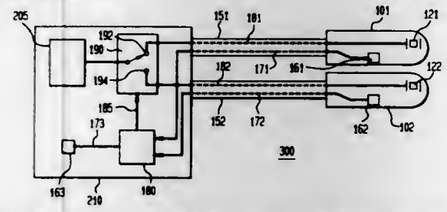
AUTOMATIC PROBE ACTIVATION

Lee Weng, Issaquah, Wash., assignor to Siemens Medical Systems, Inc., Iselin, N.J.

Filed Jun. 8, 1994, Ser. No. 255,501

Int. Cl.[6] H01H *35/14*

U.S. Cl. 307—117 **6 Claims**



1. An ultrasound imaging system providing automatic activation of a probe, which ultrasound system comprises:

motion sensor means for detecting motion of the probe and for generating a signal in response to the motion;

signal detecting means for detecting the signal; and

probe activating means for activating the probe in response to a detector signal from the detecting means;

wherein:

the motion sensor means is affixed to the probe and comprises an accelerometer, and

the signal detecting means provides information identifying the probe to the probe activating means, which information is contained in the detector signal.

5,552,646

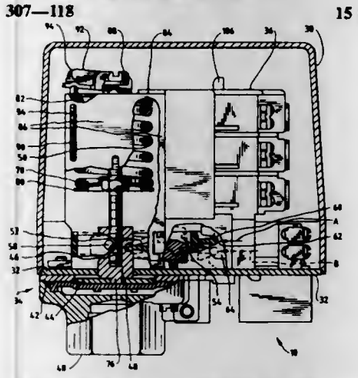
COMPACT CONTROL AND MONITORING SWITCH

Dieter Frede, Ennigerloh, Germany, assignor to Condor Werke-Gebruder Frede GmbH & Co KG, Ennigerloh, Germany

Filed Nov. 1, 1994, Ser. No. 332,996

Int. Cl.[6] H01H *35/24*

U.S. Cl. 307—118 **15 Claims**



1. A pressure control device comprising a base, means for sensing the pressure in a system mounted to said base, and a removable contact block mounted to said base, said contact block having a plurality of cells and comprising:

a contact block cover;

a plurality of fixed contacts, each mounted within a cell; and

a lock mounted onto the contact block cover, wherein the lock can be compulsorily bought to an "OFF" position in response to any of three inputs, said inputs consisting of a manual switch, a thermal release device, and a remote control device;

said thermal release device being integrated into the contact block so that electrical current:flowing through the contact block is guided over wound bimetals to the fixed contacts, said bimetals being at one end connected to the lock by a slide such that overcurrent will cause the lock to be brought to an "OFF" position.

5,552,647

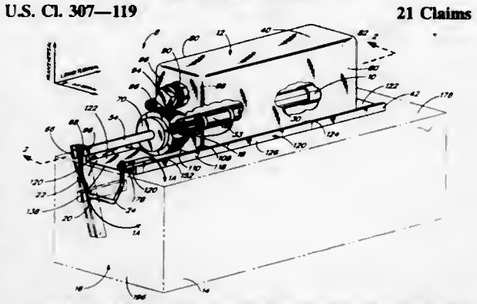
POSITION-SENSING DEVICE FOR POWER DISTRIBUTION SWITCH

Ronald B. Tinkham, Solana Beach, Calif., assignor to Systems Analysis and Integration, Inc., Orange, Calif.

Filed Apr. 12, 1994, Ser. No. 226,650

Int. Cl.[6] H01H *35/02*

U.S. Cl. 307—119 **21 Claims**



1. An actuator assembly for use with a power distribution switch of the type used with an electrical utility power grid, the distribution switch being movable to establish at least a first and a second power routing condition, said actuator assembly comprising:

an actuator having a body and an actuator shaft adapted to be coupled to a lever of the power distribution switch, said actuator shaft sliding relative to said body between at least a first position, in which the lever of the power distribution switch is positioned to establish said first power routing condition, and a second portion, in which the lever of the power distribution switch is positioned to establish said second power routing condition, said actuator shaft carrying a reference member; and

a position-sensing device attached to said actuator, said sensing device generating a signal indicative of movement of said reference member as said actuator shaft moves between said first and second positions.

5,552,648

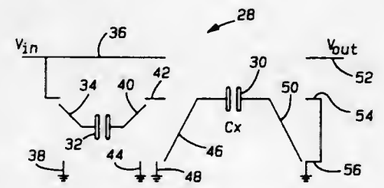
METHOD AND APPARATUS FOR THE GENERATION OF LONG TIME CONSTANTS USING SWITCHED CAPACITORS

Thomas D. Cook, Kokomo; Eugene R. Bukowski, Noblesville, and Vicki J. Voorhis, Kokomo, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Feb. 22, 1994, Ser. No. 199,929

Int. Cl.[6] H02M *3/06*

U.S. Cl. 307—125 **4 Claims**



1. A switched capacitor resistor comprising:

a first capacitor, said first capacitor including a first terminal and a second terminal;

a first switch electrically connected to the first terminal of the first capacitor;

means for applying a first input potential to the first capacitor when the first switch is in a first input position in order to charge the capacitor and bring the first terminal to the first input potential;

means for applying a second input potential to the first capacitor when the first switch is in a second input position, said second input potential being proportional to the first input potential and between the first input potential and ground potential in order to discharge the capacitor and bring the first terminal to the second input potential, wherein the first switch is switched between the first position and the second position in accordance with a first capacitor switching frequency;

a second switch electrically connected to the second terminal of the first capacitor;

means for applying an output potential to the second switch of the first capacitor when the first switch is in the first position; and

means for applying a ground potential to the second switch when the first switch is in the second position.

5,552,649

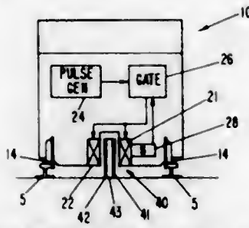
SEGMENTED RAIL LINEAR INDUCTION MOTOR

Maynard Cowan, Jr., 1107 Stagecoach Rd. SE., and Barry M. Marder, 1412 Pinnacle View Dr. NE., both of Albuquerque, N.M. 87123

Filed Nov. 8, 1994, Ser. No. 336,351

Int. Cl.[6] H02K *41/02*; **B60L** *13/03*

U.S. Cl. 310—12 **15 Claims**



1. A segmented rail linear induction motor comprising:

a prescribed path comprising:

a guideway extending along a route defining said path;

a segmented rail comprising a plurality of segments aligned along said guideway, each segment having two opposed nonferrous metal surfaces, each segment being spaced from each adjoining segment by a segment gap defined by straight edges of each segment extending perpendicular to said guideway; and

carriage means for moving along said prescribed path, said carriage means comprising:

a carriage body;

means for supporting said carriage body for movement along said guideway;

coil means for controlling movement of said carriage body along said guideway, the length of said coils in a direction parallel to said path being no greater than the segment gap;

means for guiding said carriage body along said guideway with said segments passing parallel to said coil means without touching said coil means; and

power means for applying an electric current to said coil means to induce currents in said conductive surfaces to repel said coil means from said straight edges of said conductive surfaces When said edges are adjacent said coil means.

5,552,650

DISK STORAGE DEVICE WITH MOTOR WITH AXIALLY DEEP FLANGE

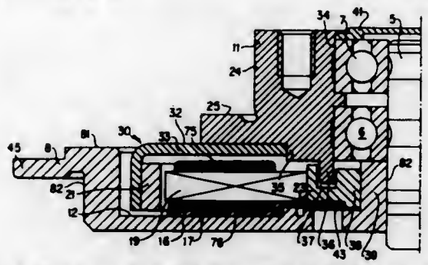
Heinrich Cap; Dieter Elsaesser, both of St. Georgen; Ulrich Koletzki, St. Georgen-Brigach, and Georg Papst, St. Georgen, all of, Germany, assignors to Papst Licensing GmbH, Spaichingen, Germany

Continuation of Ser. No. 529,573, May 29, 1990, abandoned, which is a continuation-in-part of Ser. No. 364,036, Jun. 9, 1989, abandoned. This application Feb. 25, 1994, Ser. No. 201,709

Claims priority, application Germany, Jun. 9, 1988, 8807530 U

Int. Cl.[6] H02K *7/00*

U.S. Cl. 310—67 R **15 Claims**



1. A drive motor for a disk storage device including an outer rotor which directly drives a hub for mounting one or a plurality of information disks, comprising:

a mounting flange around an axis, the flange having a base and an annular portion extending axially from the base to form a tank about the axis, the flange including a mounting rim outside the annular portion with a radial projection for mounting and with a raised rim;

a shaft mounted centrally in said flange;

the hub mounted for rotation about said shaft and having an axial underside;

the outer rotor including a rotor cup of magnetic material facing into the tank of the flange, having a backplane with a substantial radial length, and being fixed to the axial underside of the hub throughout a portion of the backplane;

said raised rim of said mounting flange being aligned essentially in the backplane of the rotor cup;

a stator within the tank and within limits of the outer rotor; and

the hub having an outer surface of non-magnetic material, said outer surface having an axially extending section and a radially-extending planar section for mounting the one information disk or the plurality of information disks.

5,552,651

ALTERNATING CURRENT GENERATOR

Thomas A. Radomski, Shelby Township, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 3, 1995, Ser. No. 497,848

Int. Cl.[6] H02K *1/22*

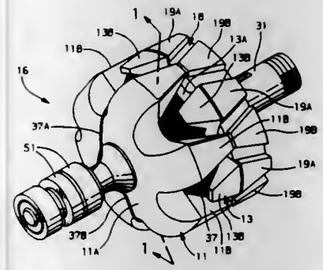
U.S. Cl. 310—181 **2 Claims**

1. An alternating current generator comprising:

a housing;

a stator assembly supported by the housing including a stator core formed of magnetic material and carrying an output winding;

a rotor assembly including a shaft rotatably supported by said housing, said shaft having fixedly secured thereto first and second claw-pole members formed of magnetic material, each claw-pole member having a respective hub and a respective plurality of circumferentially spaced and axially extending claw-pole lingers, each claw-pole finger having a proximal end at the respective hub and a distal end remote therefrom, said first and second claw-pole members being so oriented on



said shaft that the respective claw-pole fingers of said first and second claw-pole members are interleaved such that the distal ends of the claw-pole fingers of the first claw-pole member are in substantial planar alignment with the proximal ends of the claw-pole fingers of the second claw-pole member, a field coil axially intermediate said claw-pole members, a permanent magnet carrier including a hub portion carrying a circumferentially continuous flange in axial extension toward said second claw-pole member, a non-magnetic bushing fixedly coupling said permanent magnet carrier to said shaft, said permanent magnet carrier having a plurality of radially magnetized permanent magnets at an outer periphery of the flange, adjacent ones of said plurality of permanent magnets having opposite magnetic polarity, each of said plurality of permanent magnets being axially aligned with a respective claw-pole finger, each of said plurality of permanent magnet further being spaced axially from the respective axially adjacent claw-pole finger such that the spacing of the hub portion to the second claw-pole member is greater than the spacing of the plurality of permanent magnets to the second claw-pole member; and

said field coil bi-directionally energizable to establish first and second magnetic polarities of said claw-pole members, said first magnetic polarity establishing magnetically homopolar pairs of axially aligned claw-pole lingers and permanent magnets, and said second magnetic polarity establishing magnetically dipolar pairs of axially aligned claw-pole fingers and permanent magnets.

5,552,652

COMMUTATOR WITH IMPROVED CONNECTION BETWEEN CARBON AND METAL SEGMENTS

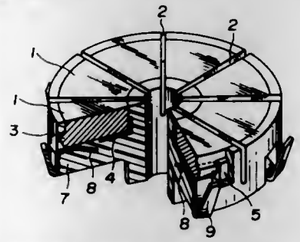
Shuji Shimoyama, Kiryu, and Iwao Yanagizawa, Suzuka, both of, Japan, assignors to Mitsuba Electric Mfg. Co., Ltd., Kiryu, and Kunimitsu Carbon Industry Co., Ltd., Suzuka, both of, Japan

Filed Dec. 1, 1994, Ser. No. 352,182

Claims priority, application Japan, Dec. 22, 1993, 5-345519

Int. Cl.[6] H01R *43/08*

U.S. Cl. 310—237 **8 Claims**



1. A flat commutator comprising:

a plurality of carbon segments formed of conductive carbon material, said carbon segments being arranged in a circular arrangement and defining a commutating surface of said commutator, and each said carbon segment having a sectorial configuration including an inner peripheral surface and an outer peripheral surface;

a plurality of metallic segments, each said metallic segment having fixing members encroaching into fixed portions of said inner and outer peripheral surfaces of a respective said carbon segment and thereby fixing said each metallic segment to said respective carbon segment; and

a hub body formed of synthetic resin and enclosing at least said fixed portions of said inner and outer peripheral surfaces of all said carbon segments.

5,552,653

ELECTRIC MOTOR WITH INCREASED T/N CHARACTERISTIC VALUE

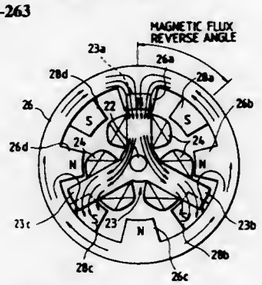
Tamotsu Nose, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Dec. 22, 1993, Ser. No. 171,625

Claims priority, application Japan, Dec. 22, 1992, 4-356824; Dec. 29, 1992, 4-361078; Dec. 29, 1992, 4-361079; Dec. 29, 1992, 4-361080; Dec. 29, 1992, 4-361081; Jan. 28, 1993, 5-032650; Jan. 28, 1993, 5-032651; Jan. 28, 1993, 5-032652; Jan. 28, 1993, 5-032653; Sep. 27, 1993, 5-262962; Sep. 27, 1993, 5-262963; Sep. 30, 1993, 5-268039

Int. Cl.[6] H02K *1/22*

U.S. Cl. 310—263 **19 Claims**



1. An electric motor comprising:

an armature including an iron core on which a plurality of phase coils are wound;

a field magnet which is so arranged as to be movable with respect to the armature, the field magnet being extended in a direction in which the field magnet is movable with respect to the armature and defining opposing end faces, and the field magnet being magnetized in a direction perpendicular to the direction in which the field magnet is extended and having a magnetic flux; and

a yoke plate mounted on each of the opposing end faces of the field magnet thus magnetized, respectively, in such a manner that each said yoke plate is extended in a direction which corresponds to the direction in which the field magnet is extended, each said yoke plate including a plurality of magnetic path forming protrusions which are arranged at predetermined intervals in the direction in which the yoke plate is extended,

wherein the iron core and the magnetic path forming protrusions are so arranged that the iron core and the magnetic path forming protrusions are moved towards and away from each other so that the magnetic flux of the field magnet is collectively extended to the iron core, and a direction of the magnetic flux passing through the iron core is reversed at every interval of the magnetic path forming protrusions as the armature and the field magnet are moved relative to each other.

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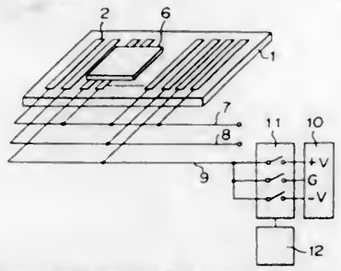
ELECTROSTATIC ACTUATOR

Shinji Konno; Takashi Fukuyama, and Masahiro Yamamoto, all of Yokohama, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Oct. 21, 1994, Ser. No. 327,415
Claims priority, application Japan, Oct. 21, 1993, 5-263764
Int. Cl.[6] H02N *1/00*
U.S. Cl. 310—309 **21 Claims**



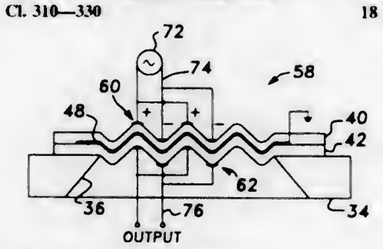
1. An electrostatic actuator which comprises:
a first member having a plurality of driving electrodes arranged in a predetermined direction and with predetermined spaced in an isolated state on an insulating supporter,
a second member, disposed in contact with the first member, which is provided with means for supplying positive and negative electric charges to an insulating sheet, and
a driving voltage control section to apply to the electrodes voltages which cause a change of a relative position of the first and second members by Coulomb's force of static electricity between the first and second members, which is produced by switching the voltages to the driving electrodes, wherein the driving voltage control section comprises a high voltage power source of direct current, a high voltage switching portion and a driving control portion; the high voltage power source of direct current comprising a transformer to raise a voltage of a high frequency signal and a rectifier to rectify an output of the transformer to obtain high positive and negative voltages of direct current.

5,552,655

LOW FREQUENCY MECHANICAL RESONATOR

Robert B. Stokes, Rancho Palos Verdes; Jay D. Cushman, Long Beach, and Drew Cushman, Lomita, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 238,113, May 4, 1994, abandoned. This application May 25, 1995, Ser. No. 450,226
Int. Cl.[6] H01L *41/08*
U.S. Cl. 310—330 **18 Claims**



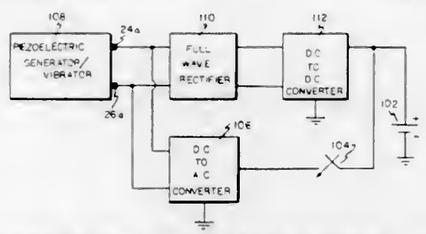
1. A flexural mode resonator comprising:
a substrate;
a piezoelectric device positioned on the substrate, said piezoelectric device including a first piezoelectric layer and a second piezoelectric layer being rigidly secured to each other, said piezoelectric device further including a first electrode positioned on one surface of the first piezoelectric layer opposite to the second piezoelectric layer, a second electrode positioned on one surface of the second piezoelectric layer, and a third electrode positioned between the first and second piezoelectric layers, said first electrode being a first interdigital transducer including a plurality of fingers, said third electrode being a ground reference electrode; and
an alternating potential signal source means for generating an alternating potential signal, said first interdigital transducer being responsive to an alternating potential input signal from the alternating potential signal source means, said alternating potential input signal having a frequency that will cause the first piezoelectric layer to be longitudinally compressed and expanded in association with the alternating potential input signal so as to cause the piezoelectric device to flex at a resonant frequency in order to produce resonant flexural waves in the piezoelectric device, wherein the alternating potential input signal applied to the first interdigital transducer causes the piezoelectric device to flex simultaneously in a plurality of locations.

5,552,656

SELF-POWERED ANTI-FOULING DEVICE FOR WATERCRAFT

George W. Taylor, Mercer County, N.J., assignor to Ocean Power Technologies, Inc., West Trenton, N.J.

Filed Aug. 7, 1995, Ser. No. 511,762
Int. Cl.[6] H01L *41/09;41/113*
U.S. Cl. 310—337 **3 Claims**



1. A system including an electroded layer of piezoelectric material mounted in a position to be stressed and strained and to then produce an alternating current (a.c.) voltage, said piezoelectric material being coupled to voltage rectifying means for converting the a.c. energy produced by the piezoelectric material when stressed and strained into direct current (d.c.) energy for charging a battery; and a direct current to alternating current converter means coupled between the battery and the said piezoelectric material for converting the direct current energy stored in the battery into an alternating current signal having a preselected frequency and applying the a.c. signal to the piezoelectric material for causing the piezoelectric material to vibrate at a rate proportional to said preselected frequency.

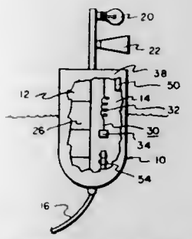
5,552,657

GENERATION OF ELECTRICAL ENERGY BY WEIGHTED, RESILIENT PIEZOELECTRIC ELEMENTS

Michael Y. Epstein, Belle Mead, and George W. Taylor, Princeton, both of N.J., assignors to Ocean Power Technologies, Inc., West Trenton, N.J.

Filed Feb. 14, 1995, Ser. No. 388,557
Int. Cl.[6] H01L *41/08*
U.S. Cl. 310—339 **5 Claims**

1. A power generating system comprising a hollow float for floating on a surface of a body of water and being movable in response to movements of the surface of the water, a resilient piezoelectric power generating element in the form of a coiled spring for being suspended within said float for oscillations of said element in response to float movements, and a weight member for being suspended from said element within said float for driving said element into said oscillations.

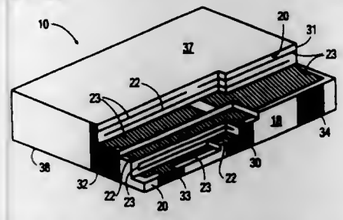


5,552,658

TORSIONAL ACTUATOR AND METHOD OF MANUFACTURING SAME

Uwe Dibbern, Hamburg, and Joseph Pankert, Aachen, both of, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 27, 1994, Ser. No. 313,497
Claims priority, application Germany, Sep. 28, 1993, 43 32 966.7
Int. Cl.[6] H01L *41/08*
U.S. Cl. 310—366 **8 Claims**



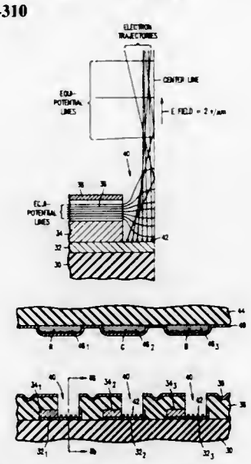
1. A torsional actuator of generally rectangular cross-section transverse to a longitudinal axis thereof, said transverse cross-section having horizontal and vertical center-lines which define first and second quadrants above the horizontal center-line and respectively to the right and left of the vertical center-line, and third and fourth quadrants below the horizontal center-line and respectively to the left and right of the vertical center-line; said actuator comprising:
a series of at least four layers of monolithic ceramic piezeoelectric material, said layers being stacked in the direction of said vertical center-line;
a series of substantially planar electrodes interleaved between the piezeo-electric layers, alternate ones of said electrodes as seen in said cross-section extending uninterrupted across said vertical center-line and serving as reference potential electrodes, the remaining electrodes being interrupted at said vertical center-line so as to form respective groups of control electrodes in each of said quadrants; and
a plurality of externally accessible head contacts for supplying reference potential and control voltages to said electrodes to cause said piezeo-electric layers to produce twisting of said actuator about said longitudinal axis; a first head contact being mounted on a right side face of said actuator and making electrical contact with each of the control electrodes in said first quadrant, a second head contact being mounted on a left side face said actuator and making electrical contact with each of the control electrodes in said second quadrant, a third head contact being mounted on a front face of said actuator to the left of said longitudinal axis and making electrical contact with each of the control electrodes in said third quadrant, a fourth head contact being mounted on the front face of said actuator to the right of said longitudinal axis and making electrical contact with each of the control electrodes in said fourth quadrant, and a fifth head contact being mounted on the front face of said actuator and making electrical contact with each of said reference potential electrodes;
said fifth head contact being for supplying reference potential to each of the reference potential electrodes, the remaining head contacts being for supplying control voltages of opposite pluralities to the control electrodes which, as seen as said cross-section, are on opposite sides of said vertical center-line.

5,552,659

STRUCTURE AND FABRICATION OF GATED ELECTRON-EMITTING DEVICE HAVING ELECTRON OPTICS TO REDUCE ELECTRON-BEAM DIVERGENCE

John M. Macaulay, Palo Alto; Christopher J. Spindt, Menlo Park; Patrick A. Corcoran, Oakland, and Lee H. Veneklasen, Castro Valley, all of Calif., assignors to Silicon Video Corporation, San Jose, Calif.

Filed Jun. 29, 1994, Ser. No. 269,312
Int. Cl.[6] H01J *1/02*
U.S. Cl. 313—310 **26 Claims**



1. An electron-emitting structure comprising:
a lower electrically non-insulating region;
an intermediate electrically non-insulating layer situated over the lower non-insulating region and electrically coupled to it;
a dielectric layer situated over the intermediate non-insulating layer, the ratio of the thickness of the dielectric layer to the thickness of the intermediate non-insulating layer being in the range of 1:1 to 4:1;
an electrically non-insulating gate layer situated over the dielectric layer, an opening extending through the three layers down to the lower non-insulating region, the ratio of the mean diameter of the opening to the thickness of the intermediate non-insulating layer being in the range of 1:1 to 10:1; and
a multiplicity of laterally separated electron-emissive elements situated over the lower non-insulating region within the opening below the bottom level of the gate layer.

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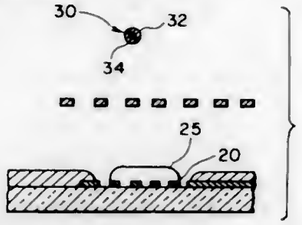
said ultraviolet reflecting layer of predominantly gamma alu-

5,552,660

FLUORESCENT DISPLAY DEVICE INCLUDING A FILAMENTARY CATHODE WITH INCREASED MECHANICAL STRENGTH AND REDUCED END COOLING EFFECT

Tadashi Mizohata, and Masashi Suzuki, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, and Toshiba Corporation, Kawasaki, both of, Japan

Filed Jan. 24, 1994, Ser. No. 185,398
Claims priority, application Japan, Jan. 22, 1993, 5-009402
Int. Cl.[6] H01J *19/06*
U.S. Cl. 313—341 **2 Claims**



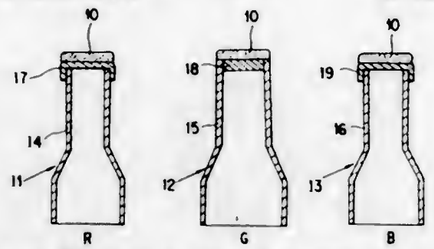
1. A fluorescent display device comprising:
an envelope;
an anode having a phosphor deposited thereon and arranged in said envelope; and
a filamentary cathode arranged in said envelope so as to act as an electron source;
said filamentary cathode including a linear filament made of Re-W alloy consisting essentially of 26 Wt % or more of Re and balance of W and an electron emission layer deposited on said linear filament.

5,552,661

ELECTRON GUN FOR CATHODE TUBE

Gyeong S. Lee, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 25, 1994, Ser. No. 279,601
Claims priority, application Rep. of Korea, Jul. 26, 1993, 1993-14199
Int. Cl.[6] H01J *29/04*
U.S. Cl. 313—346 R **10 Claims**



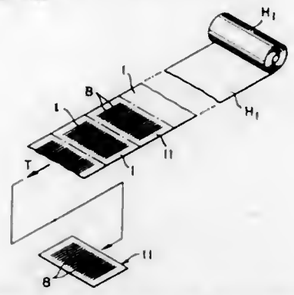
1. An electron gun for cathode tube including R, G and B-cathodes comprising:
a sleeve including a heater therein;
a base metal attached on an upper edge of said sleeve;
a hot electron emitting material deposited on said base metal; and
wherein the base metal for G-cathode is a round plate and wherein the base metals for R and B-cathode are cap shaped.

5,552,662

LIGHT WEIGHT SHADOW MASK AND METHOD OF MANUFACTURING

Akira Makita; Yutaka Matsumoto, and Takahito Aoki, all of Tokyo, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

Filed Sep. 27, 1994, Ser. No. 312,867
Claims priority, application Japan, Sep. 28, 1993, 5-263119
Int. Cl.[6] H01J *29/07;9/00*
U.S. Cl. 313—403 **2 Claims**



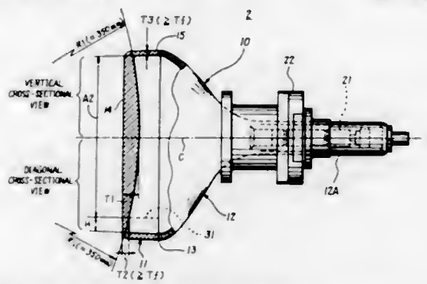
1. An aperture grill for a cathode ray tube, comprising a cold-rolled, low-carbon steel plate having a thickness of 100 μm or less, and having slits formed therethrough to define parallel adjacent tapes, said plate having a residual stress of 7.0 Kg/mm^2 or less and being made from a hoop having a rolling direction, said tapes extending in a direction coinciding with said rolling direction.

5,552,663

CATHODE RAY TUBE APPARATUS

Koichi Iida, and Michihisa Yano, both of Kanagawa, Japan, assignors to Sony Corporation, Japan

Filed Sep. 22, 1994, Ser. No. 310,325
Claims priority, application Japan, Sep. 29, 1993, 5-243344
Int. Cl.[6] H01J *29/18*
U.S. Cl. 313—461 **13 Claims**



1. A cathode ray tube apparatus, comprising:
a panel formed such that an inside portion of an inner surface of said panel forms an effective display area that displays video images;
said inside portion that forms said effective display area protruding inward along an arc shape at a predetermined radius; and
an inside portion of a non-display area of the inner surface of said panel being located outside of said effective display area, and being outside of the arc shape formed by said predetermined radius.

5,552,664

FLUORESCENT LAMPS WITH IMPRINTED COLOR LOGOS AND METHOD OF MAKING SAME

George Csoknyai, Orange, Conn., and Arpad L. Pirovic, Montvale, N.J., assignors to Light Sources, Inc., Milford, Conn.

Filed Jun. 29, 1994, Ser. No. 268,205
Int. Cl.[6] H01J *1/62*
U.S. Cl. 313—488 **11 Claims**

1. A fluorescent lamp comprising:
an elongated glass tube,
an internal light opaque coating formed on the internal surface of said glass tube, a coating of fluorescent material for emitting a variable colored light superimposed over said internal opaque coating,
a logo communicating a message formed directly in said internal coating formed on the internal surface of said glass tube,
and means for illuminating said logo in variable colors when the lamp is energized whereby only said logo appears illuminated.

5,552,665

ELECTRIC LAMP HAVING AN UNDERCOAT FOR INCREASING THE LIGHT OUTPUT OF A LUMINESCENT LAYER

Charles Trushell, Morgantown, W. Va., assignor to Philips Electronics North America Corporation, New York, N.Y.

Filed Dec. 29, 1994, Ser. No. 366,134
Int. Cl.[6] H01J *61/35;61/40*
U.S. Cl. 313—489 **20 Claims**

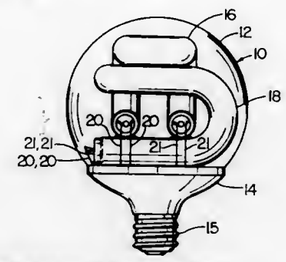
1. An electric lamp, comprising:
a. a lamp envelope having an inner surface;
b. means within the lamp envelope for generating ultraviolet radiation;
c. a layer of a luminescent material adjacent the inner surface of the lamp envelope for generating visible light when impinged by said ultraviolet radiation; and
d. an other layer, between said inner surface of said lamp envelope and said layer of luminescent material, for reflecting ultraviolet radiation which has passed through said layer of luminescent material back into said luminescent material for increasing the visible light output of said luminescent material, said ultraviolet reflecting material comprising an agglomerated particulate material of predominantly gamma alumina having a primary crystallite size of less than about 0.05 μm, said ultraviolet reflecting layer of predominantly gamma alumina having a weight/surface area of between about 0.15 mg/cm^2 and about 0.30 mg/cm^2.

5,552,666

COMPACT FLUORESCENT LAMP

Michael J. Shea, Salem; Jakob Maya, Brookline, and Dominic Barbuto, Framingham, all of Mass., assignors to Matsushita Electric Works Research and Development Laboratory Inc., Woburn, Mass.

Filed Sep. 16, 1994, Ser. No. 307,515
Int. Cl.[6] H01J *61/30*
U.S. Cl. 313—493 **17 Claims**



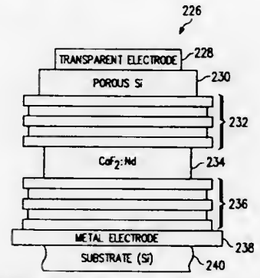
1. A compact fluorescent lamp comprising:
a bulbous envelope,
a pair of substantially U-shaped fluorescent arc tubes disposed within said envelope, said arc tubes being mounted with one leg of the U-shape of an arc tube extending between the legs of the other arc tube, and
ballast means for providing power to said arc tubes.

5,552,667

APPARATUS AND METHOD FOR GENERATING PHOTLUMINESCENCE EMISSION LINES FROM RARE-EARTH-ELEMENT-DOPED CAF2 THIN FILMS OVER A SI-BASED SUBSTRATE

Chin-Chen Cho, Richardson; Tsen H. Lin, Dallas; Shou-Kong Fan, Richardson, and Walter M. Duncan, Dallas, all of Tex., assignors to Texas Instrument Incorporated, Dallas, Tex.

Continuation of Ser. No. 187,270, Jan. 27, 1994, abandoned, which is a division of Ser. No. 954,136, Sep. 30, 1992, Pat. No. 5,306,385, which is a continuation-in-part of Ser. No. 945,991, Sep. 15, 1992, Pat. No. 5,369,657. This application Apr. 17, 1995, Ser. No. 426,413
Int. Cl.[6] H01J *1/62*
U.S. Cl. 313—498 **20 Claims**



1. An apparatus for producing photoluminescence emissions, said apparatus comprising:
a region of reflective material formed over a substrate; and
a CaF_2 film formed over said region of reflective material, said CaF_2 film doped with a rare-earth dopant.

5,552,668

SELF-WATERPROOFING ELECTROLILMINSECENT DEVICE

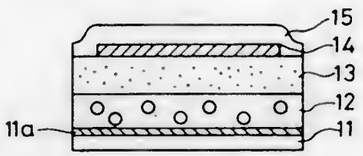
Koji Hirose, and Shigehiko Aoki, both of Tokyo, Japan, assignors to Seiko Precision Inc., Tokyo, Japan

Filed Oct. 12, 1994, Ser. No. 322,006

Claims priority, application Japan, Oct. 15, 1993, 5-258387; Jul. 26, 1994, 6-174226

Int. Cl.[6] H01J *1/62*

U.S. Cl. 313—506 **7 Claims**



1. An electroluminescent device comprising:
a transparent electrode layer;
a back electrode layer comprising a resinous binder that contains conductive particles;
a luminescent layer formed between said transparent electrode layer and said back electrode layer and comprising a resinous binder that contains electroluminescent particles;
a dielectric layer formed between said transparent electrode layer and said back electrode layer and comprising a resinous binder that contains dielectric particles;
said resinous binder of at least one of said luminescent layer and said dielectric layer being made from a fluoride resin; and
a reaction accelerator contained in said back electrode layer for promoting polymerization of said fluoride resin binder.

5,552,669

DEUTERIUM GAS DISCHARGE TUBE

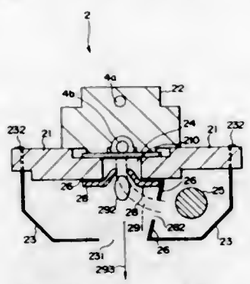
Tomoyuki Ikedo; Yoshinobu Ito, and Ryotaro Matui, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Japan

Filed Sep. 15, 1994, Ser. No. 305,972

Claims priority, application Japan, May 31, 1994, 6-118638

Int. Cl.[6] H01J *17/02*

U.S. Cl. 313—613 **24 Claims**



1. A deuterium gas discharge tube comprising:
an envelope in which deuterium gas is filled;
an anode accommodated in said envelope, for receiving thermoelectrons emitted from a thermionic cathode;
a focusing electrode accommodated in said envelope, for focusing a path of the thermoelectrons from said thermionic cathode to said anode;
a discharge shielding plate consisting of a material having electrical insulating properties, said anode being arranged in contact with one side of said discharge shielding plate, and said focusing electrode being arranged in contact with an other side opposing said one side of said discharge shielding plate;
a support plate consisting of a material having electrical insulating properties, fixed to the one side of said discharge shielding plate to have said anode therebetween; and
a front cover consisting of a conductive material and having a window for projecting light, fixed to the other side of said discharge shielding plate to oppose said focusing electrode.

5,552,670

METHOD OF MAKING A VACUUM-TIGHT SEAL BETWEEN A CERAMIC AND A METAL PART, SEALED STRUCTURE, AND DISCHARGE LAMP HAVING THE SEAL

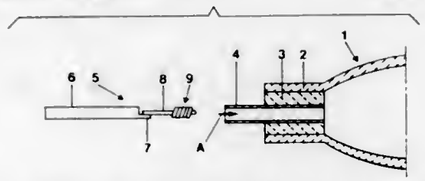
Juergen Heider, Munich; Stefan Juengst, Zorneding, and Roland Huettinger, Jesenwang, all of, Germany, assignors to Patent-Treuhand-Gesellschaft F. Elektrische Gluehlampen MBH, Munich, Germany

Filed Dec. 1, 1993, Ser. No. 160,615

Claims priority, application Germany, Dec. 14, 1992, 42 42 122.5

Int. Cl.[6] H01J *9/32;61/36;5/26*

U.S. Cl. 313—625 **22 Claims**



1. A method of making a vacuum-tight seal between a ceramic arc discharge vessel element, the inside of which is to retain an arc discharge and to be isolated from its ambient environment, said vessel having an end portion (2) formed with an end opening,
a sealing plug (3) fitted in said end opening of the ceramic element (1) and formed with a tubular opening therethrough, and
a metallic element (6) passing through the tubular opening,
wherein the thermal coefficient of expansion of the ceramic material of the sealing plug (3) is between about 6.5×10^{-6} K^{-1} and 9×10^{-6} K^{-1},
wherein the shape of the cross section of the tubular opening of the plug (3) is similar to the shape of the cross section of the metallic element, and
wherein the thermal coefficient of expansion of the metallic element (6) is less than that of the plug (3),
said method comprising, in accordance with the invention, the steps of
(a) vacuum-tightly directly sintering an open metal tube (4), having a cross-section similar to the shape of said tubular opening in the plug (3) and a thermal coefficient of expansion less than that of the ceramic material of said plug (3), into the tubular opening of the plug;
(b) introducing the metallic element (6) into said metal tube (4), said metallic element (6) fitting into said metal tube (4) with a small clearance gap to permit said introducing step; and
(c) vacuum-tightly connecting together said metal tube (4) and the metallic element (6) and closing said clearance gap between said metal tube (4) and said metallic element (6) to form a vacuum-tight connection.

5,552,671

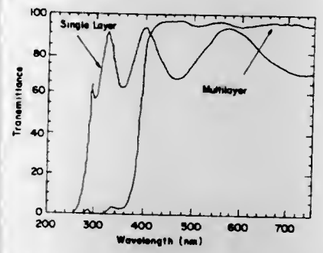
UV RADIATION-ABSORBING COATINGS AND THEIR USE IN LAMPS

Thomas G. Parham, Gates Mils, Ohio; Robert L. Bateman, Southern Sbores, N.C.; Gary R. Allen, Chesterland, and John M. Davenport, Lyndhurst, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 14, 1995, Ser. No. 388,542

Int. Cl.[6] H01J *61/40;5/16*

U.S. Cl. 313—635 **28 Claims**



1. A method for managing the thermal nonuniformity across the wall of a thick-walled arc tube in a metal halide lamp comprising:
a. providing an arc tube having a wall thickness in excess of 1 mm;
b. disposing a multi-layer coating on the exterior surface of said arc tube, said coating having a thickness of not greater than about 2.0 microns and comprising at least two different materials having different refractive indexes which, in combination, absorb deep UV radiation below 300 nm and reflect near UV radiation between 300–400 nm;
c. operating said lamp to cause UV emission; and
d. absorbing the radiant energy emitted from the arc as deep UV radiation below 300 nm uniformly along the exterior of said arc tube in said multi-layer coating and reflecting at least 90% of the radiant energy emitted from the arc as near UV radiation between 300–400 nm back into said lamp.

5,552,672

MAGNETRON CONSTRUCTION PARTICULARLY USEFUL AS A RELATIVISTIC MAGNETRON

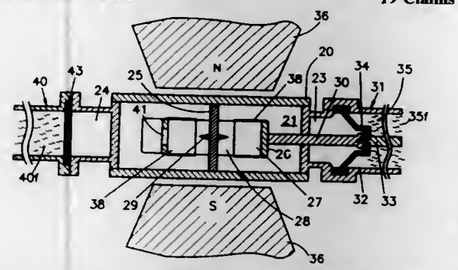
Avner Rosenberg, Beit Shaarim, Israel, assignor to State of Israel Ministry of Defense, Armament Development Authority, Rafael, Haifa, Israel

Filed Sep. 2, 1994, Ser. No. 300,734

Claims priority, application Israel, Sep. 3, 1993, 106905

Int. Cl.[6] H01J *25/50;23/05*

U.S. Cl. 315—39.51 **19 Claims**



1. A relativistic magnetron including a cathode and an anode in a vacuum chamber radially spaced from each other to define an interaction region therebetween, and means for producing a magnetic field in said interaction region; characterized in that said magnetron includes means for supplying the anode with positive high-voltage pulses of at least 100 kV, while maintaining said cathode and vacuum chamber at a reference potential.

5,552,673

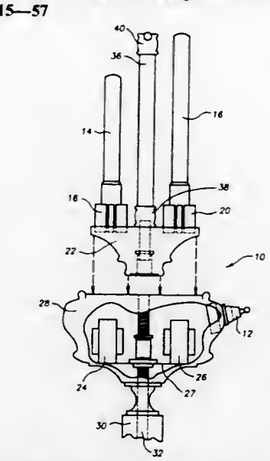
THEFT RESISTANT COMPACT FLUORESCENT LIGHTING SYSTEM

Michael Kenwood, 282 Oakland Ave., Miller Place, N.Y. 11764

Filed Oct. 4, 1994, Ser. No. 317,380

Int. Cl.[6] H01J *7/44*

U.S. Cl. 315—57 **26 Claims**



1. A fluorescent lighting system for supplying electrical energy to at least one fluorescent lamp, comprising:
lamp receiving means for supporting at least one fluorescent lamp connected thereto;
ballast transformer means electrically connected to said lamp receiving means for conveying electrical current from an electrical power supply connected to said ballast transformer means to at least one of said fluorescent lamps when said fluorescent lamps are connected to said lamp receiving means;
ballast transformer support means for supporting said ballast transformer means, said ballast transformer support means being adapted for fixed connection to a light fixture support body for maintaining said fluorescent lighting system in a selected position;
ballast transformer support connecting means for connecting said ballast support means to said lamp receiving means disposed intermediate said ballast transformer support means and said lamp receiving means, said ballast transformer support connecting means having a first end connected to said ballast support means and a second end connected to said lamp receiving means; and
electrical power supply connecting means adapted for fixedly electrically connecting said ballast transformer means to said electrical power supply.

5,552,674

CLOCKED POWER SUPPLY CIRCUIT WITH AUXILLARY LOAD

Tobias George, Wörth am Rhein; Hans-Georg Wolf, Ottersweier/Hatzenweier, and Ulrich Schlienz, Lichtenstein, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE93/00849, § 371 Date Apr. 13, 1995, § 102(e) Date Apr. 13, 1995, PCT Pub. No. WO94/07345, PCT Pub. Date Mar. 31, 1994

PCT Filed Sep. 13, 1993, Ser. No. 406,865

Claims priority, application Germany, Sep. 24, 1992, 42 31 968.4

Int. Cl.[6] H05B *37/00*

U.S. Cl. 315—82 **16 Claims**

1. A clocked power supply circuit having: a control arrangement, which provides switching signals for switching means as a func-

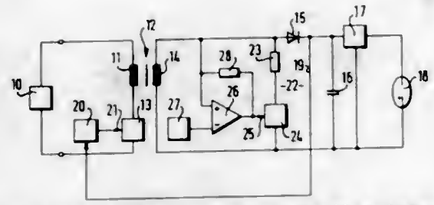
d) control means for controlling the application of electrical

5,552,677

METHOD AND CONTROL CIRCUIT PRECHARGING A

5,552,679

ELECTROLUMINESCENT AND LIGHT REFLECTIVE



tion of a load condition present on the output side; at least one inductive element; a gas discharge lamp connected on the output side as a first load; and load circuit means, connected on the output side as a second load which is independent of the gas discharge lamp, for loading the clocked power supply circuit at least prior to and until the gas discharge lamp is ignited and for causing energy to be stored in said inductive element, which energy is directly available to the gas discharge lamp during the ignition process.

5,552,675

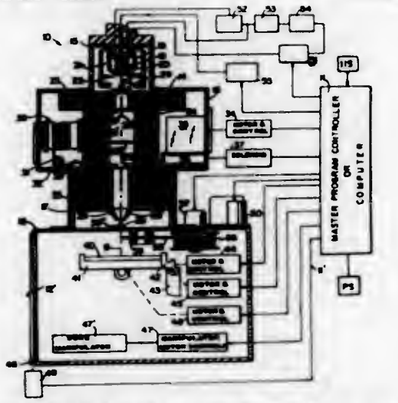
HIGH TEMPERATURE REACTION APPARATUS

Jerome H. Lemelson, 868 Tyner Way, Incline Village, Nev. 89450

Continuation-in-part of Ser. No. 696,747, May 7, 1991, Pat. No. 5,131,941, which is a continuation-in-part of Ser. No. 376,378, Jul. 7, 1989, Pat. No. 5,039,836, which is a continuation-in-part of Ser. No. 921,268, Oct. 21, 1986, Pat. No. 4,853,514, which is a continuation of Ser. No. 643,883, Aug. 24, 1984, abandoned, which is a continuation of Ser. No. 571,188, Apr. 24, 1975, abandoned, which is a continuation of Ser. No. 163,283, Jul. 16, 1971, abandoned, which is a continuation of Ser. No. 849,013, Aug. 11, 1969, abandoned, which is a continuation of Ser. No. 422,875, Nov. 25, 1964, Pat. No. 3,461,347, which is a continuation-in-part of Ser. No. 710,517, Mar. 5, 1964, abandoned. This application Mar. 10, 1992, Ser. No. 849,297

Int. Cl.[6] H01J *7/24*

U.S. Cl. 315—111.21 **22 Claims**



1. Apparatus for effecting high temperature reactions comprising:

a) a reaction chamber,

b) inlet means to said chamber for admitting reaction material to the interior of said chamber,

c) a source of electrical energy connected to said chamber and electrode means supported within said chamber for receiving and converting electrical energy from said source to a high temperature electrical plasma,

d) control means for controlling the application of electrical energy from said source to said electrode means,

e) an outlet from said chamber through which products of reaction may be passed,

f) a supply of fluent reaction material,

g) power operated means for effecting and controlling the flow of said fluent reaction material to said chamber,

h) control means for said power operated means, and

i) master control means connected to said control means for controlling the application of electrical energy to said electrode means and said control means for said power operated means to effect the automatic control of a reaction with respect to reaction material controllably fed to said chamber by the high temperature of said plasma generated at said electrode means.

5,552,676

CONTROL DEVICE FOR AN APPLIANCE CONSUMING ELECTRIC POWER

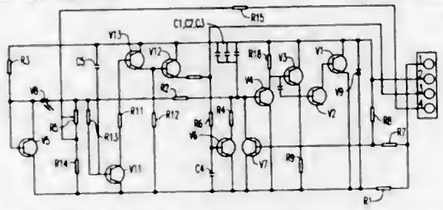
Teijo Viljanen, Kauniainen, Finland, assignor to Oy Helvar, Helsinski, Finland

Filed Oct. 25, 1994, Ser. No. 329,084

Claims priority, application Finland, Oct. 28, 1993, 934775

Int. Cl.[6] H05B *37/02*

U.S. Cl. 315—151 **27 Claims**



1. A control device for an appliance consuming electric power, especially for the control of lighting or heating, said control device including a sensor element (V8) for producing a control current as a result of a sensed external effect, circuit elements (R3, V5) to provide appropriate bias-voltage to said sensor element (V8) and to compensate for the base-emitter voltage drop of transistor (V4) over the whole operating temperature range of transistor (V4) of an amplifier element (V4-V1) that boosts the control current produced by the sensor element (V8) sufficiently in view of controlling one or a plurality of electronic ballasts (7) connected between a power source and an appliance to be controlled, wherein the electric power required by the circuit elements (R3, V5) and the amplifier element (V4-V1) of said control device (5) is supplied from said ballast (7) by means of conductors (6) connected between the ballast and the control device (5), said conductors (6) also serving as a control line between the control device (5) and the ballast (7), characterized in that the sensor element (V8) and the circuit elements (R3, V5) are connected between the base and emitter electrodes of said transistor (V4) of said amplifier element (V4-V1) in order to provide the control current to the base of transistor (V4) and to compensate for the voltage drop across the base and emitter of transistor (V4) and to enable the control device to operate with a supply voltage less than 1.0 volts, said conductors (6) being connected across the collector-emitter circuit of said transistor (V4) such that most of the voltage across said conductors (6) is applied across said base-emitter circuit when said transistor (V4) is conductive.

5,552,677

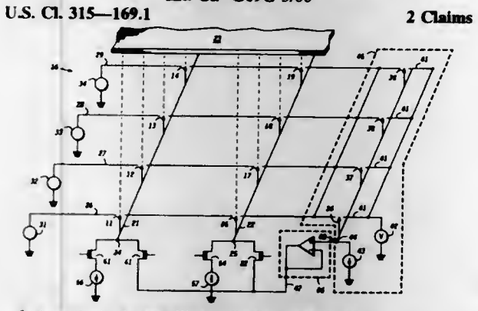
METHOD AND CONTROL CIRCUIT PRECHARGING A PLURALITY OF COLUMNS PRIOR TO ENABLING A ROW OF A DISPLAY

Andrew Pagones, Algonquin, Ill., assignor to Motorola, Schaumburg, Ill.

Filed May 1, 1995, Ser. No. 431,995

Int. Cl.[6] G09G *3/00*

U.S. Cl. 315—169.1 **2 Claims**



1. A method of controlling a display comprising:

organizing a plurality of pixels into a plurality of columns; and

precharging the plurality of columns to a reference voltage value prior to enabling a row of the display, which includes forming the reference voltage by stimulating non-visible illumination from a reference field emission emitter, using a buffer to receive a voltage value of an input of the reference field emission emitter, and coupling an output of the buffer to the plurality columns.

5,552,678

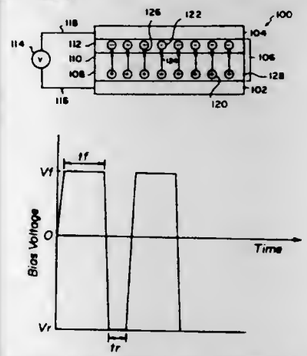
AC DRIVE SCHEME FOR ORGANIC LED

Ching W. Tang, and Steven A. Van Slyke, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 23, 1994, Ser. No. 311,619

Int. Cl.[6] H01L *33/00;* **H05B** *33/00*

U.S. Cl. 315—169.3 **5 Claims**



1. In an organic light emitting device (LED) having an anode and cathode and a light emitting structure disposed between such anode and cathode, the improvement comprising:

(a) an organic hole transporting layer;

(b) an organic luminescent layer; and

(c) means for applying an alternating voltage across the anode and cathode having a forward voltage portion which biases the LED to produce light and a reverse voltage portion in which substantially no light is produced, the voltage being selected so that the maximum forward voltage is less than or equal to the maximum reverse voltage in each AC voltage cycle, wherein the time that the forward voltage portion takes (t_f) is longer than time (t_r) the reverse voltage portion takes.

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ELECTROLUMINESCENT AND LIGHT REFLECTIVE PANEL

Matthew M. Murasko, Manhattan Beach, Calif., assignor to International En-R-Tech Incorporated, British Columbia, Canada

Continuation of Ser. No. 92,013, Jul. 15, 1993, abandoned. This application Apr. 18, 1995, Ser. No. 425,335

Int. Cl.[6] G09G *3/10*

U.S. Cl. 315—169.3 **7 Claims**

1. An electroluminescent and light reflective illumination panel, comprising:

a flexible insulator layer of electrically non-conducting material;

a flexible electrode layer of electrically conductive material disposed on said layer of electrically insulating material;

a flexible dielectric layer of electrically non-conducting material disposed on said electrode layer;

a flexible layer of microencapsulated phosphor particles disposed on said dielectric layer;

a flexible second electrode layer of electrically conductive material disposed on said layer of microencapsulated phosphor particles, said second electrode layer being substantially transparent;

a flexible layer of reflective film disposed on said second electrode layer, said layer of reflective film being transparent; and

said layers being pervious to moisture.

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DEVICE FOR OPERATING A GAS-DISCHARGE LAMP

Manfred Vogel, Ditzingen-Heimerdingen; Ulrich Drews, Vaihingen/Pulverdingen; Werner Herden, Gerlingen; Johann Konrad, and Albert Gerhard, both of Tamm, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

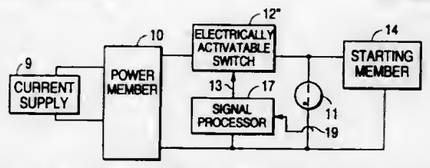
PCT No. PCT/DE92/00422, § 371 Date Nov. 12, 1993, § 102(e) Date Nov. 12, 1993, PCT Pub. No. WO92/22182, PCT Pub. Date Dec. 10, 1992

PCT Filed May 23, 1992, Ser. No. 146,175

Claims priority, application Germany, Jun. 1, 1991, 41 18 077.1

Int. Cl.[6] H05B *37/02*

U.S. Cl. 315—291 **12 Claims**



1. A device for operating a gas-discharge lamp, the device including a starting member connected to the lamp for providing a starting voltage pulse to the lamp during a starting process, and a power member for supplying energy to the lamp after a starting of the lamp, the improvement comprising a switch connected between the power member and the lamp, said switch being open at least during initiation of the starting process thereby disconnecting the power member from the lamp, and being responsive to a starting of the lamp for connecting the power member with the lamp.

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electrostatic capacitive circuit via said inverter circuit for

determining a cyclic ratio R, said cyclic ratio being a ratio of

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APPARATUS FOR STORING ENERGY GENERATED DURING BREAKING OF A VEHICLE AND FOR PROVIDING ENERGY TO THE INTERNAL COMBUSTION ENGINE OF THE VEHICLE AT OTHER TIMES

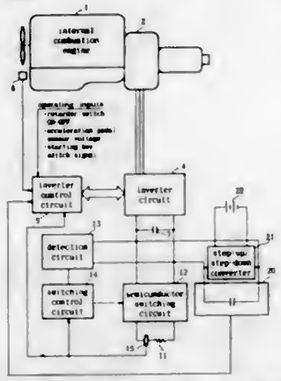
Takayuki Suzuki, Tokorozawa, and Atsuomi Obata, Hachiouji, both of, Japan, assignors to Hino Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 137,196, Oct. 22, 1993, Pat. No. 5,513,718. This application May 18, 1995, Ser. No. 443,756

Claims priority, application Japan, Mar. 6, 1992, 4-49870; Mar. 6, 1992, 4-49911; Mar. 6, 1992, 4-49932

Int. Cl.[6] H02B *3/00*

U.S. Cl. 318—139 **11 Claims**



1. Braking and auxiliary drive apparatus for an internal combustion engine in a motor vehicle, comprising:

a squirrel-cage polyphase induction machine having a polyphase AC circuit, for coupling] said squirrel-cage polyphase induction machine being operatively coupled to a rotary shaft of an internal combustion engine;

an inverter circuit operatively coupled to said polyphase AC circuit of said squirrel-cage polyphase induction machine;

an electricity storage means comprising an electrostatic capacitive circuit operatively coupled to said inverter so that said inverter couples said electrostatic capacitive circuit to said polyphase AC circuit by converting electrical energy in both directions therebetween;

a step-up/step-down converter operatively coupled to said electrostatic capacitive circuit;

a rotation sensor that detects a rotational speed of said rotary shaft;

a storage battery operatively coupled to said step-up/step-down converter so that said step-up/step-down converter electrically connects said storage battery to said electrostatic capacitive circuit, said storage battery having a lower terminal voltage than a DC terminal voltage of said inverter circuit; and

a control circuit for controlling said inverter circuit, said control circuit operating in the following control modes:

an initial charging mode wherein said electrostatic capacitive circuit is charged with energy from said storage battery through said step-up/step-down converter, if said internal combustion engine is at a standstill;

a starting mode wherein energy stored in said electrostatic capacitive circuit is provided to said squirrel-cage polyphase induction machine as an AC current via said inverter circuit so that said squirrel-cage polyphase induction machine operates as an electric motor, if said internal combustion engine is being started;

a deceleration mode wherein said squirrel-cage polyphase induction machine operates an electric generator by supplying an AC signal having a frequency that is lower than a frequency corresponding to an actual speed detected by said rotational sensor, said AC signal being provided to said electrostatic capacitive circuit via said inverter circuit for charging said electrostatic capacitive circuit, if said vehicle is being braked; and

an acceleration mode wherein said squirrel-cage polyphase induction machine operates an electric motor by supplying an AC signal having a higher frequency than a frequency corresponding to an actual speed detected by said rotational sensor, said electrostatic capacitive circuit providing energy to said squirrel-cage polyphase induction machine via said inverter circuit, if said vehicle is being accelerated.

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DEVICE FOR DETECTING ROTATIONAL POSITION OF BRUSHLESS MOTOR

Isao Ushikoshi, Komagane, Japan, assignor to Sankyo Seiki Mfg. Co., Ltd., Nagano-ken, Japan

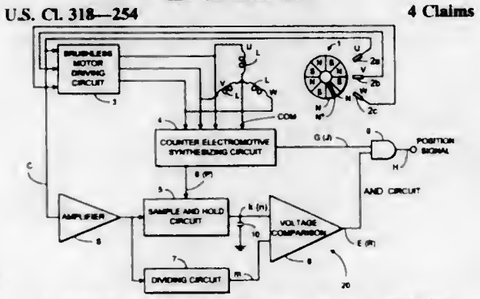
PCT No. PCT/JP94/00678, § 371 Date Mar. 6, 1995, § 102(e) Date Mar. 6, 1995, PCT Pub. No. WO94/26022, PCT Pub. Date Nov. 10, 1994

PCT Filed Apr. 25, 1994, Ser. No. 356,362

Claims priority, application Japan, Apr. 27, 1993, 5-123576

Int. Cl.[6] H02P *6/16*

U.S. Cl. 318—254 **4 Claims**



1. A brushless-motor rotational position detector comprising:

an m-phase driving coil to be reciprocally electrified in positive and negative directions;

a driving magnet which faces the driving coil, having driving magnetic poles N and S alternately polarized, and which rotates together with a rotary shaft;

homopolar position-detecting magnetic means (N+) formed on at least one of the driving magnetic poles;

magnetic detectors arranged so as to face the driving magnet to detect magnetic fields of both the driving magnetic poles (N and S) and position-detecting magnetic means (N+);

a brushless motor driving circuit for supplying a driving current to said driving coil in accordance with output signals from the magnetic detectors; and

synthesizing means for generating a rotational position signal by synthesizing output signals from the magnetic detectors, counter electromotive voltage waveforms (U, V and W) of the driving coil, and a reference voltage.

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METHOD OF CONTROLLING A REVERSIBLE ELECTRIC DEVICE

Thierry Dargent, Nozay, France, assignor to Aerospatiale Societe Nationale Industrielle, France

Filed Feb. 18, 1994, Ser. No. 198,505

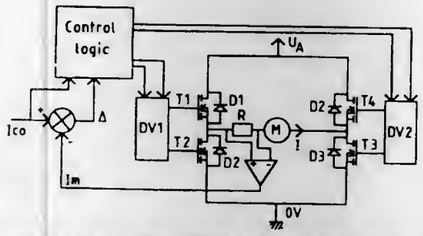
Claims priority, application France, Feb. 23, 1993, 9302050

Int. Cl.[6] G05B *11/28*

U.S. Cl. 318—287 **11 Claims**

1. A method for controlling a current being applied to a reversible electric device having an input and an output, said method comprising the steps of:

providing an H bridge having a positive terminal and a negative terminal connected to said reversible electric device;



connecting a first center terminal of said H bridge to said input of said reversible electric device and connecting a second center terminal of said H bridge to said output of said reversible electric device, connecting a first top switch of said H bridge between said input of said reversible electric device and said positive terminal of said H bridge, connecting a second top switch of said H bridge between said output of said reversible electric device and said positive terminal of said H bridge, connecting a first bottom switch of said H bridge between said input of said reversible electric device and said negative terminal of said H bridge, and connecting a second bottom switch between said output of said reversible electric device and said negative terminal of said H bridge;

determining a measured current (I_m) running through said reversible electric motor;

setting an instantaneous set point current (I_{co});

determining a current difference (Δ) between said instantaneous set point current (I_{co}) and said measured current (I_m);

selecting a control logic means having a first input from said instantaneous set point current, a second input from said current difference, a first output line connected to said first top switch for transferring a first control signal to said first top switch, a second output line connected to said second top switch for transferring a second control signal to said second top switch, a third output line connected to said first bottom switch for transferring a third control signal to said first bottom switch, and a fourth output line connected to said second bottom switch for transferring a fourth control signal to said second bottom switch;

using said control logic means to calculate each of said first, second, third, and fourth control signals to control said reversible electric device;

selecting a switching frequency determining successive cycles having a constant switching period Tc, wherein said step of calculating each of said first, second, third, and fourth control signals for transferring to said switches further comprises for each cycle of said successive cycles the steps of:

defining a reference current I having a value selected from the set of said instantaneous set point current and said measured current;

determining U_a as a difference in electrical potential between said positive terminal and said negative terminal of said H bridge;

applying a mean voltage (U_m) to said reversible electric device;.

selecting a correlation law F by the equation:

$$F(\Delta)=U_m/U_a;$$

selecting T1, T2, T3, and T4 as binary values of said first, second, third, and fourth control signals, respectively, wherein said first control signal turns said first top switch on when T1=1 and off when T1=0, wherein said second control signal turns said second top switch on when T2=1 and off when T2=0, wherein said third control signal turns said first bottom switch on when T3=1 and off when T3=0, wherein said fourth control signal turns said second bottom switch on when T4=1 and off when T4=0, and wherein T1, T2, T3, and T4 are the binary logical complements of T1, T2, T3, and T4;

dividing said cycle into a first part and a second part, said cycle having a cycle duration, said first part of said cycle defining a first part duration;

determining a cyclic ratio R, said cyclic ratio being a ratio of said first part duration and said cycle duration; and

determining binary values for T1, T2, T3, and T4 for said first part and for said second part based upon said reference current (I) and said current difference (Δ) as follows:

if I>0 and Δ>0, then

R=F(Δ) if 0<F(Δ)<1,

R=0 if F(Δ)<0,

R=1 if F(Δ)>1,

T1=T3=1 and T2=T4=0 during said first part of said switching period Tc, and

T1=T4=T2=T3 during said second part of said switching period Tc;

if I<0 and Δ<0:

R=1+F(Δ) if 0<1+F(Δ)<1,

R=0 if 1+F(Δ)<0,

R=1 if 1+F(Δ)>1,

T1=T4=T2=T3 during said first part, and

T1=T3=0 and T2=T4=1 during said second part; and

if I and Δ are of opposite sign, then

R=(1+F(Δ))/2 if 0<(1+F(Δ))/2<1,

R=0 if (1+F(Δ))/2<0,

R=1 if (1+F(Δ))/2>1,

T1=T3=1 and T2=T4=0 during said first part, and

T1=T3=0 and T2=T4=1 during said second part.

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CONTROL APPARATUS FOR REVERSIBLE MOTOR AND MOTOR-DRIVEN POWER STEERING SYSTEM FOR MOTOR VEHICLE USING THE SAME

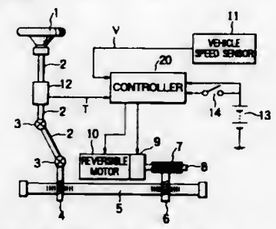
Shunichi Wada, and Masanori Takagi, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 28, 1994, Ser. No. 281,635

Claims priority, application Japan, Mar. 16, 1994, 6-046021

Int. Cl.[6] H02P *1/00*

U.S. Cl. 318—293 **25 Claims**



1. In a motor driving system for driving and controlling the operation of a reversible electric motor, which system includes a DC power source, a switching driver circuit interposed between said DC power source and said electric reversible motor for driving said reversible motor switchably between forward and reverse directions, and control means for controlling said switching driver circuit in response to a command signal, a fail-safe apparatus for preventing said electric reversible motor from erroneous operation due to the occurrence of a fault in a motor circuit during periods when said motor is being operatively driven, said fail-safe apparatus comprising:

a) terminal voltage detecting means connected in parallel to said reversible motor for detecting terminal voltages at both terminals of said reversible motor to thereby generate a first detection signal of a first level when both of said terminal voltages are substantially at a zero level and generating a second detection signal of a second level when both of said terminal voltages are not substantially at a zero level;

b) fail-safe signal generating means connected to an output of

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SERIES MOTOR, IN PARTICULAR UNIVERSAL MOTOR

overtravel unlatching means for unlatching the overtravel signal

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b) fail-safe signal generating means connected to an output of said terminal voltage detecting means for generating a fault indication signal in response to said first detection signal; and

c) switch means connected between said power source and said switching driver circuit;

d) wherein said control means responds to said fault indication signal generated by said fail-safe signal generating means by interrupting power supply to said switching driver circuit means by opening said switch means.

5,552,685

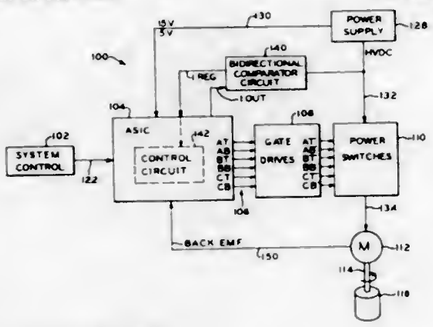
APPARATUS AND METHOD FOR DETECTION AND CONTROL OF CIRCULATING CURRENTS IN A VARIABLE SPEED DC MOTOR

Glen C. Young, Fort Wayne; Guy Bonner, Jr., Huntington, and Eric D. Schneider, Carmel, all of Ind., assignors to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 108,328, Aug. 18, 1993, Pat. No. 5,423,192. This application Mar. 28, 1994, Ser. No. 219,022

Int. Cl.[6] H02P *5/40*

U.S. Cl. 318—254 **52 Claims**



1. A motor comprising:

a stationary assembly and a rotatable assembly in magnetic coupling relation thereto, said stationary assembly including windings adapted to be energized in at least one preselected sequence;

a power supply link for connecting the windings to a power supply, said power supply link including power switching devices for selectively energizing the windings in the preselected sequence by selectively connecting the power supply link to the windings to produce an electromagnetic field for rotating the rotatable assembly, said power switching devices each having a conducting state and a nonconducting state and comprising an inverter bridge, said inverter bridge having a positive rail and a negative rail supplied by the power supply; and

a current regulation circuit including:

a timing circuit for defining periods during which each of the power switching devices may be nonconducting;

a current sensing circuit for sensing current in only one of the rails of the power supply link; and

a control circuit for controlling the power switching devices so that each of the power switching devices is nonconducting only during portions of the defined periods during which the sensed current exceeds a peak current reference level.

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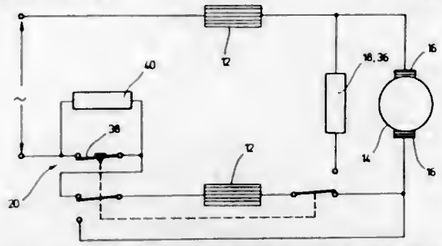
SERIES MOTOR, IN PARTICULAR UNIVERSAL MOTOR WITH BRAKE DEVICE

Wolfgang Schmid, Filderstadt; Werner Rieker; Eckerhard Stroetgen, both of Waldenbuch; Csaba Kreiter, Stuttgart, and Ottmar Seel, Leinfelden-Echterdingen, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Sep. 6, 1994, Ser. No. 301,295

Int. Cl.[6] H02P *3/00*

U.S. Cl. 318—362 **23 Claims**



1. A series motor, comprising a braking device; a stator having a field winding and a pole shoe plate pack, said pole shoe plate pack of said stator having field coils and also having further means inducing a magnetic field; a rotatable armature; means for influencing a braking operation of said field winding; a starting resistor connected before one of said field coils; and a switch having a slow release switching contact and connected in parallel with said starting resistor.

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EMERGENCY ROBOT SHUTDOWN CIRCUIT

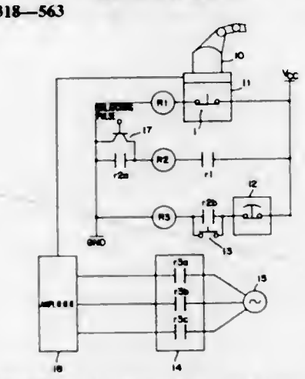
Yasuhiro Matsuo; Tomoki Ohya, both of Yamanashi, and Yoshiki Hashimoto, Hadano, all of, Japan, assignors to Fanuc, Ltd., Yamanashi, Japan

Filed Oct. 13, 1994, Ser. No. 322,151

Claims priority, application Japan, Oct. 29, 1993, 5-271131

Int. Cl.[6] G05B *9/02*

U.S. Cl. 318—563 **8 Claims**



1. An emergency robot shutdown circuit for detecting an overtravel condition of a robot with a dog located in a limit position of a normal operation range of a moveable component of the robot, to command an emergency shutdown of the robot, comprising:

detecting means for detecting an overtravel condition of the moveable component of the robot and outputting an overtravel signal in response thereto;

overtravel latching means for receiving and latching said overtravel signal output from said detecting means and inhibiting power from being supplied to the moveable component of the robot in response to the overtravel signal, and for supplying power to the moveable component of the robot in response to an unlatching command; and

overtravel unlatching means for unlatching the overtravel signal held by said overtravel latching means by transmitting the unlatching command to the overtravel latching means and for supplying power to the movable component of the robot in response to a received overtravel cancel signal.

5,552,688

MACHINING PROGRAM EXECUTION METHOD FOR AN NC DEVICE

Makoto Haga, Oshino-mura, Japan, assignor to Fanuc Ltd., Japan

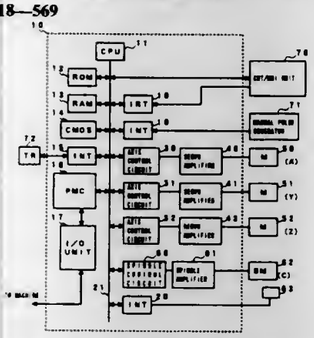
PCT No. PCT/JP94/00083, § 371 Date Sep. 22, 1994, § 102(e) Date Sep. 22, 1994, PCT Pub. No. WO94/17459, PCT Pub. Date Apr. 8, 1994

PCT Filed Jan. 21, 1994, Ser. No. 307,661

Claims priority, application Japan, Jan. 26, 1993, 5-028418

Int. Cl.[6] G05B *19/18*

U.S. Cl. 318—569 **2 Claims**



1. A machining program execution method for an NC device, comprising the steps of:

(a) for a standard machining type, storing a set of values respectively corresponding to a set of parameters required for executing machining programs by an NC device in a first memory means in the NC device;

(b) for each of a plurality of non-standard machining types, determining a group of said set of parameters of said standard machining type which need to be modified in accordance with the non-standard machining type and modifying and storing a group of said set of values respectively corresponding to said group of parameters in accordance with the non-standard machining type, in a second memory means in the NC device;

(c) programming a parameter modification command for designating one of the plurality of non-standard machining types in the machining programs;

(d) reading said parameter modification command in said machining programs;

(e) automatically replacing the group of values in said set of values stored in said first memory means corresponding to said designated one non-standard machining type with said modified group of values stored in said second memory means corresponding to said designated one non-standard machining type, when said parameter modification command is read in said machining programs during an execution of the machining programs by the NC device; and

(f) executing the machining programs by the NC device using the group of values replaced in said step (e).

5,552,689

SERVO MOTOR

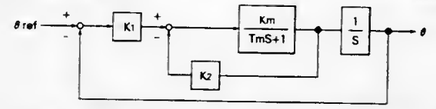
Yasuhiko Matoba, Osaka, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1994, Ser. No. 364,827

Claims priority, application Japan, Dec. 28, 1993, 5-334224

Int. Cl.[6] G05F *1/247*

U.S. Cl. 318—599 **11 Claims**



1. A servo motor comprising a motor, a motor drive means for driving said motor by outputting pulses to said motor, and a speed detecting means for calculating speed information, said servo motor further comprising:

a comparing means for comparing said speed information with command speed information and calculating deviation information therebetween,

a memory means for storing pulse correction information for modifying a duty factor of said pulses in accordance with a rotational state of said motor, and

a pulse updating means for reading said pulse correction information stored in said memory means based on said deviation information, modifying the duty factor of said pulses, and outputting the duty factor modified pulses to said motor drive means.

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CONTROL UNIT CAPABLE OF IMPROVING A RESPONSE CHARACTERISTIC AND A TRACKING PROPERTY BY SELECTING AN OPTIMUM GAIN IN ACCORDANCE WITH AN OPERATING CONDITION

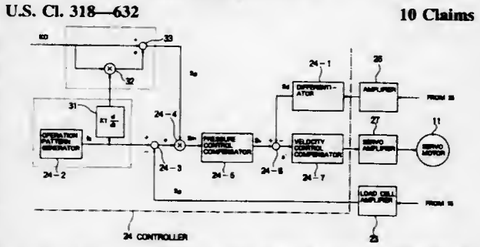
Kazuo Hiraoka, Chiba-ken, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 103,139, Aug. 9, 1993, abandoned. This application Feb. 6, 1995, Ser. No. 384,225

Claims priority, application Japan, Aug. 10, 1992, 4-212927

Int. Cl.[6] G05D *23/275*

U.S. Cl. 318—632 **10 Claims**



1. A control unit for use in an injection molding machine to carry out a control operation with reference to feedback from a controlled object, said control unit comprising:

gain providing means for providing a gain;

boundary detecting means for dividing a nonlinear characteristic of a controlled variable into a plurality of partial characteristics to detect a boundary for each said partial characteristic of said nonlinear characteristic and to produce a boundary signal representative of each boundary; and

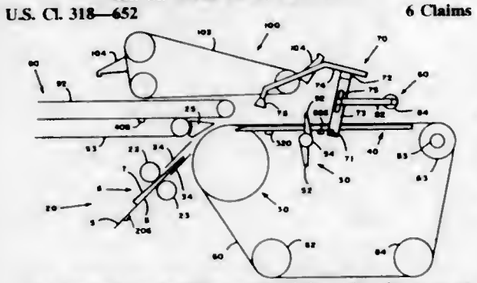
gain changing means responsive to said boundary signal for changing said gain of said gain providing means with reference to said boundary signal.

5,552,691

MICROPROCESSOR MOTOR CONTROL

Perry A. Pierce, Darien, and Peter K. Zanger, Naugatuck, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 14, 1994, Ser. No. 338,727
Int. Cl.[6] G05B *19/42*; **B65G** *43/00*
U.S. Cl. 318—652 **6 Claims**



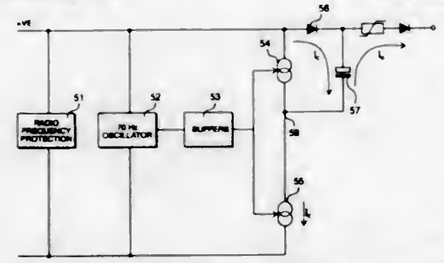
1. A method for providing motion information for a motor controller for a motor having an encoder for providing motor feedback data, the method comprising the steps of:
(a) converting a conventional distance formula means into at least one incremental encoder position formula means;
(b) determining a set of motion parameters for the encoder position formula means for a plurality of linear segments of a motion profile;
(c) storing the set of motion parameters;
(d) determining motor drive information using the set of motion parameters and the encoder position formula means for control of the motor during operation of the motor; and
(e) driving the motor in accordance with the determined information.

5,552,692

CHARGING RECHARGEABLE BATTERIES OF A MOBILE COMMUNICATION DEVICE USING A CHARGE PUMP WITH A LOW NOISE OSCILLATOR TO REDUCE INNTERFERENCE

William A. M. McKillop, Berkshire, England, assignor to Nokia Mobile Phones Ltd., Salo, Finland

Filed Jul. 13, 1994, Ser. No. 274,679
Claims priority, application United Kingdom, Dec. 22, 1993, 9326228
Int. Cl.[6] H01M *10/44*
U.S. Cl. 320—9 **15 Claims**



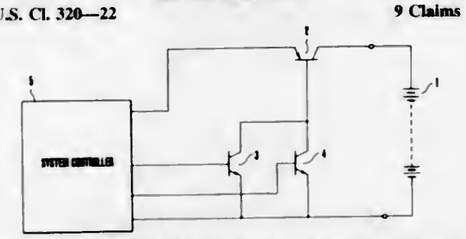
1. A voltage modifying device for charging rechargeable batteries used for powering mobile radio telephones from a DC source, comprising
means connectable to a DC power source;
means connectable to a rechargeable battery;
means connectable to a power input of a telephone transceiver;
means for connecting said DC power source to said transceiver so as to direct power to said transceiver; and
a voltage modifying circuit for applying a charging voltage to said battery,
said modifying circuit including a charge pump circuit for increasing said charging voltage, and
means for charging and discharging said charge pump circuit at substantially constant current so as to minimize telephone transceiver interference.

5,552,693

CHARGING METHOD AND APPRATUS FOR CARRYING OUT THE SAME

Tsutomu Nishikawa, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 158,146, Nov. 19, 1993, abandoned, which is a continuation of Ser. No. 14,078, Feb. 4, 1993, abandoned, which is a continuation of Ser. No. 739,673, Aug. 2, 1991, abandoned. This application Sep. 16, 1994, Ser. No. 307,049
Claims priority, application Japan, Sep. 13, 1990, 2-245720
Int. Cl.[6] H02J *7/04*
U.S. Cl. 320—22 **9 Claims**



1. A charging method for charging a secondary battery comprising:
(A) a starting step of starting a charging operation on the secondary battery;
(B) a detecting step of detecting a terminal for detecting a terminal voltage of the secondary battery during the charging operation;
(C) a continuing step of continuing the charging operation on the secondary battery when it is detected in said detecting step that the terminal voltage of the secondary battery has dropped down by a predetermined amount; and
(D) a terminating step of terminating the charging operation on the secondary battery when it is detected in said detecting step that the terminal voltage of the secondary battery has again dropped down by said predetermined amount.

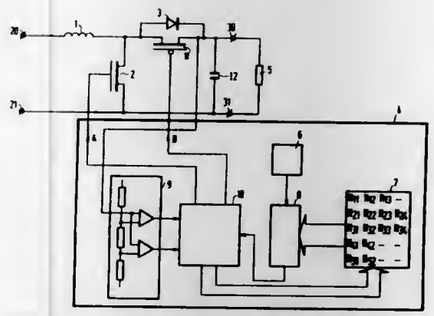
5,552,694

POWER SUPPLY WITH IMPROVED EFFICIENCY, TRANSMITTER COMPRISING SUCH A POWER SUPPLY

Koen E. J. Appeltans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 1, 1995, Ser. No. 457,954
Claims priority, application European Pat. Off., Jun. 3, 1994, 94201588
Int. Cl.[6] G05F *1/10;1/40*
U.S. Cl. 323—222 **17 Claims**

1. A power supply comprising:
an input terminal for receiving an input voltage, and an output for connecting a load,
a coil,
switching means for establishing a conduction path between the input terminal and the coil during an on-time and for interrupting the conduction path between the input terminal and the coil during an off-time,
means for sustaining a conduction path for a current through the coil upon interruption of the conduction path between the input terminal and the coil,
variation means for varying the ratio between the on-time and the off-time of the switching means (2) in response to a



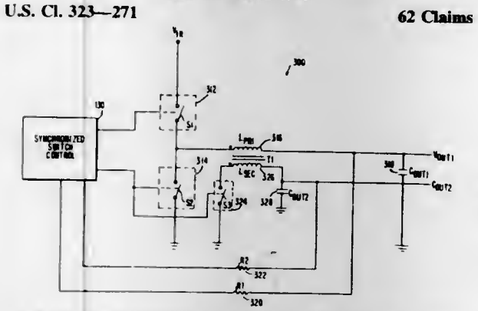
difference between an output voltage across the load (5) and a first reference voltage (V1),
wherein the variation means (4) include means for
reducing the ratio if the output voltage is larger than the first reference voltage (V1),
increasing the ratio if the output voltage is smaller than a second reference voltage (V2) whose value is smaller than the first reference voltage (V1),
maintaining the ratio constant if the output voltage lies between the first reference voltage (V1) and the second reference voltage (V2).

5,552,695

SYNCHRONOUSLY RECTIFIED BUCK-FLYBACK DC TO DC POWER CONVERTER

Peter H. Schwartz, Palo Alto, Calif., assignor to Linear Technology Corporation, Milpitas, Calif.

Filed Mar. 22, 1994, Ser. No. 215,898
Int. Cl.[6] G05F *1/40*
U.S. Cl. 323—271 **62 Claims**



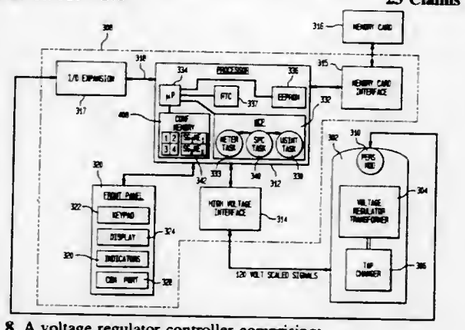
1. A circuit for providing a plurality of regulated output voltages, said circuit comprising:
first and second switches coupled in series between a source of electrical potential;
a first inductive element having a first end coupled to a node between said first and second switches, and a second end coupled to produce a first output;
a second inductive element having a first end coupled to produce a second output, and magnetically coupled with said first inductive element;
a third switch coupled in series with said second inductive element to turn current flow through said second inductive element ON and OFF; and
a control circuit coupled to synchronously control the ON and OFF duty cycles of said first, second and third switches to regulate said first and second outputs, such that said second and third switches operate in substantial phase with one another, and in substantial anti-phase with said first switch.

5,552,696

MULTIPLE SETPOINT CONFIGURATION IN A VOLTAGE REGULATOR CONTROLLER

John J. Trainor, Wake Forest, N.C.; Michael A. Bellin, Brandon, Miss., and Carl J. Laplace, Jr., Raleigh, N.C., assignors to Siemens Energy & Automation, Inc., Alpharetta, Ga.

Filed Feb. 18, 1994, Ser. No. 198,976
Int. Cl.[6] G05F *1/565;1/14*; **H02J** *3/12*
U.S. Cl. 323—275 **23 Claims**



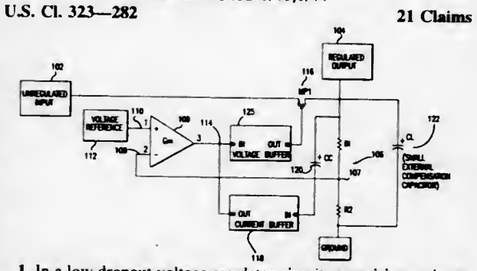
8. A voltage regulator controller comprising:
operator input means for a) defining a plurality of independent sets of discrete regulator control parameters, b) storing each of the sets in a processor driven table, and c) for each one set of the sets, defining a condition under which the one set of regulator control parameters will be identified to control operation of the voltage regulator;
a memory including the processor driven table for storing the sets of regulator control parameters and the conditions;
monitor means for monitoring the regulator for one of the conditions defined for the sets of the regulator control parameters; and,
control means coupled to the monitor means and the memory for, when the one condition occurs, for operating a voltage regulator in accordance with the defined regulator control parameters which are identified in said table with the one condition.

5,552,697

LOW VOLTAGE DROPOUT CIRCUIT WITH COMPENSATING CAPACITANCE CIRCUITRY

Shufan Chan, Anaheim Hills, Calif., assignor to Linfinity Microelectronics, Garden Grove, Calif.

Filed Jan. 20, 1995, Ser. No. 376,028
Int. Cl.[6] G05F *1/40;1/44*
U.S. Cl. 323—282 **21 Claims**



1. In a low dropout voltage regulator circuit comprising an input and an output port coupled to each other by at least one path element having a control electrode and parasitic capacitance, a reference voltage generator, a means for generating a feedback voltage dependent upon the voltage at the output port, an amplifier having an input responsive to the reference voltage generator and an input responsive to the feedback means to provide a first current based upon the difference between the feedback voltage and the reference voltage, wherein the control electrode is responsive to

the output of the amplifier such that the voltage at the output port

said engaging member and said projection engage with each other so that said engaging member is held in engagement

5,552,702

METHOD AND APPARATUS FOR DETECTING DIGITAL

the output of the amplifier such that the voltage at the output port is approximately a multiple of the reference voltage and wherein the improvement comprises:

a compensating capacitor responsive to the voltage at the output port; and

isolation means responsive to the capacitor for providing feedback to the control node without providing additional capacitive loading.

5,552,698

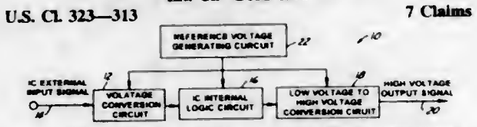
VOLTAGE SUPPLY SYSTEM FOR IC CHIPS

Chiao Y. Tai, Hsin-Chu; Yung L. Chen, Chung-Ho, and Chun-Yi Huang, Chung-Hwa, all of, Taiwan, assignors to United Microelectronics Corp., Hsin-Chu, Taiwan

Filed Jun. 29, 1995, Ser. No. 496,485

Int. Cl.[6] G05F *3/16*

U.S. Cl. 323—313 **7 Claims**



1. A voltage supply system for use on an IC chip comprising:

a voltage shifting circuit for transferring an IC chip external input voltage signal range confined between a level of a first high potential signal and a level of a second low potential signal to an operating voltage range of an IC chip internal logic circuit, said operating voltage signal range being confined between a level of a third highest positive or a level of a fourth lowest negative potential signal and a level of a corresponding signal of reference potential signals, said IC chip internal logic circuit including low voltage components contributing to major functions of said IC chip,

a low voltage signal range to high voltage signal range conversion circuit for stretching said operating voltage signal range of said IC internal logic circuit to an IC chip external output signal range confined between said level of a highest positive potential signal and said level of a lowest negative potential signal, and

a reference potential signal generating circuit for generating said reference potential signals.

5,552,699

METHOD AND APPARATUS FOR TESTING WIRES EXTENDING BETWEEN A SWITCH CABINET AND REMOTELY POSITIONED FIELD UNITS

Bernd Redmer, Wiesbaden, Germany, assignor to Technoserv GmbH, Holzstrasse, Germany

PCT No. PCT/EP92/02246, § 371 Date May 10, 1994, § 102(e) Date May 10, 1994, PCT Pub. No. WO93/07501, PCT Pub. Date Apr. 15, 1993

PCT Filed Sep. 29, 1992, Ser. No. 211,543

Claims priority, application Germany, Oct. 8, 1991, 41 33 354.3

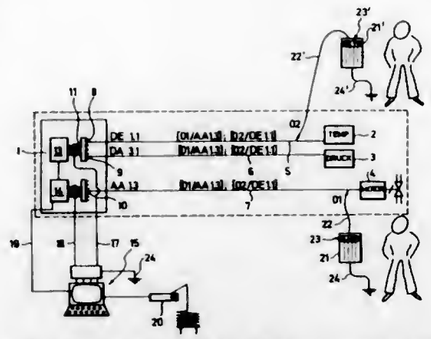
Int. Cl.[6] G01R *19/00;31/02*

U.S. Cl. 324—66 **9 Claims**

4. An apparatus for testing individual wires of a plurality of wires extending between a plurality of connection terminals in a switch cabinet and a plurality of field units installed at a remote location, the apparatus comprising:

a testing computer having a plurality of digitally addressable outputs each associated with one of the connection terminals of the switch cabinet, thereby corresponding to the wire and the field unit connected to the respective connection terminal;

at least one manual testing unit having a microprocessor for controlling the manual testing unit, a signal generator for generating an identifying signal indicative of the manual testing unit and a grounding key for applying a combination signal to one of the wires, the combination signal including



the identifying signal and the digitally addressable output associated with the respective wire; and

wherein the testing computer includes a memory for storing the combination signal, the manual testing unit further comprising an address reader for reading only the combination signals that include the identifying signal for that manual testing unit.

5,552,700

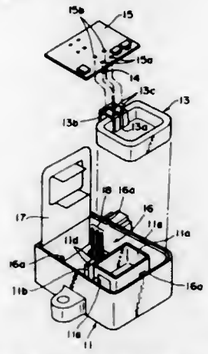
CURRENT DETECTING DEVICE WITH A CORE HAVING AN INTEGRALLY FIXED ENGAGING MEMBER

Toru Tanabe; Kazuhide Seki, both of Yokohama; Masaaki Hatsumi, and Hiroshi Shohara, both of Sagamihara, all of, Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1994, Ser. No. 315,353

Int. Cl.[6] G01R *33/00*

U.S. Cl. 324—117 H **10 Claims**



1. A current detecting device comprising:

a case assembly having a through hole for insertion therethrough of an electric wire which carries a current to be detected, said case including an interior surface having a projection extending therefrom;

a ring-shaped core disposed in said case assembly in surrounding relation to said through hole, said ring-shaped core having a gap defined therein, and further including an engaging member of an insulating material, said engaging member being integrally fixed to said core and positioned in said gap;

a printed-circuit board disposed in said case assembly;

a Hall-effect device mounted on said printed-circuit board, said Hall-effect device and said printed circuit board being oriented so that said Hall-effect device is disposed in said gap of said ring-shaped core;

a power supply circuit mounted on said printed-circuit board for supplying a current to said Hall-effect device; and

an amplifying circuit mounted on said printed-circuit board for amplifying a Hall voltage produced by said Hall-effect device; wherein

said engaging member and said projection engage with each other so that said engaging member is held in engagement with said projection and thereby positions said core relative to said case assembly,

said circuit board includes a pair of positioning holes defined therein near said Hall-effect device, and

said engaging member includes a pair of pins disposed near said gap, said pins engaging with said positioning holes to position said Hall-effect device in said gap.

5,552,701

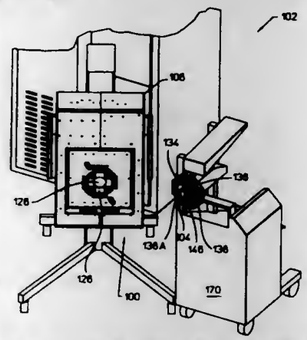
DOCKING SYSTEM FOR AN ELECTRONIC CIRCUIT TESTER

David R. Veteran; Joel D. Bickford, and Julius K. Botka, all of Santa Rosa, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 15, 1995, Ser. No. 441,563

Int. Cl.[6] G01R *1/73;1/04;1/067;15/12*

U.S. Cl. 324—158.1 **9 Claims**



6. A system for docking a fixture board of an electronic circuit test system to a test head of the test system, the fixture board comprising at least one electrical connector mounted to the fixture board, the test head comprising a load board selectively mounted to the test head and having an aperture, a connector support disk mounted to the test head within the aperture, the connector support disk having an opening, the test head further comprising a tunnel through the test head aligned with the opening, and at least one mating electrical connector mounted to the load board or the connector support disk, the docking system comprising:

male docking means mounted to one of the fixture board and the test head, the male docking means comprising:

a pulldown ring comprising a plurality of pulldown pins;

a spider connected to the pulldown ring, wherein the spider comprises an annulus having a plurality of radial spokes each having a distal end mounted to the pulldown ring, and the docking cone has a circular cross-section, the first end of the docking cone being tapered outwardly toward the second end of the docking cone, the first end of the docking cone having a first diameter and the second end of the docking cone having a second diameter, the first diameter being less than the second diameter, the second diameter being less than a diameter of the opening in the connector support disk, the second end of the docking cone being mounted to the annulus; and

a docking cone having a first end and a second end, the second end of the docking cone being mounted to the spider; and

female docking means mounted to the other of the fixture board and the test head;

the male docking means being configured to interfit in the female docking means when the fixture board is moved toward the test head to facilitate engagement of the at least one electrical connector of the fixture board with the at least one mating electrical connector of the test head.

5,552,702

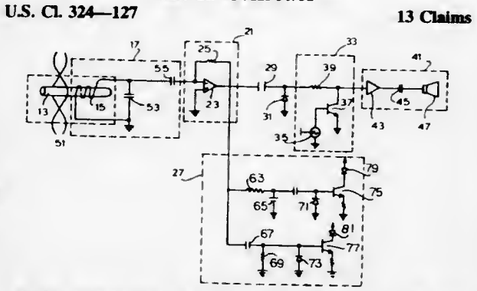
METHOD AND APPARATUS FOR DETECTING DIGITAL CARRIER SIGNALS ON TELEPHONE CABLES

Charles H. Wissman, Oceanside, Calif., assignor to Tempo Research Corporation, Vista, Calif.

Filed Mar. 4, 1994, Ser. No. 206,441

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—127 **13 Claims**



6. An apparatus for detecting a first signal in a conductor comprising:

a) a sensor for nonintrusively coupling a portion of said first signal in said conductor to said apparatus;

b) a filter coupled to said sensor for removing unwanted frequencies from said first signal;

c) a signal processing circuit coupled to said filter, for generating a DC signal proportional to said first signal and producing an output signal which is representative of the strength of said first signal in said conductor;

d) a signal identification circuit operatively coupled to said signal processing circuit, for determining the identity of said first signal.

5,552,703

INCLINATION SENSOR USING SENSING COILS WOUND ON LINEAR VESSEL PARTIALLY FILLED WITH FLUID

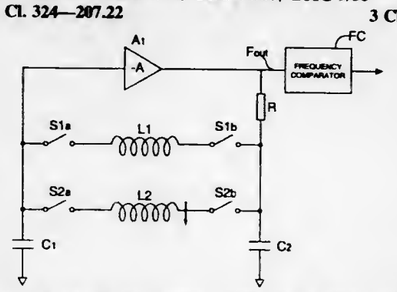
Donald L. Hore, Bristol, England, assignor to Radiodetection Limited, Bristol, England

Filed Sep. 17, 1993, Ser. No. 121,883

Claims priority, application United Kingdom, Sep. 28, 1992, 9220422

Int. Cl.[6] G01B *7/14;* **G01P** *15/00;* **G01C** *9/06*

U.S. Cl. 324—207.22 **3 Claims**



1. An inclination angle sensor comprising: a linear elongate vessel; a fluent material which only partly fills the vessel, the fluent material being selected from the group consisting of electrically conductive fluent materials and ferromagnetic fluent materials; first and second coil means wound around the vessel at respective regions thereof so that the inductance of each coil means is affected by the contents of a respective different longitudinal region of said container; capacitor means; switch means for selectively coupling said capacitor means either to said first coil means to produce a first oscillator circuit or to said second coil means to produce a second oscillator circuit; and means for comparing the frequencies

of said first and second oscillator circuits so as to derive data related to the inductances of said first and second coil means and thus indicative of the inclination of said vessel.

5,552,704

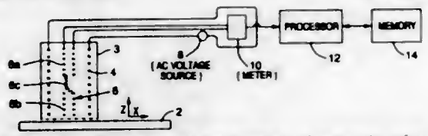
EDDY CURRENT TEST METHOD AND APPARATUS FOR MEASURING CONDUCTANCE BY DETERMINING INTERSECTION OF LIFT-OFF AND SELECTED CURVES

Chester L. Mallory, Campbell; Walter Johnson, San Jose, and Kurt Lehman, San Mateo, all of Calif., assignors to Tencor Instruments, Mountain View, Calif.

Filed Jun. 25, 1993, Ser. No. 82,661

Int. Cl.[6] G01R *33/00;33/12;* **G01N** *27/76;27/72*

U.S. Cl. 324—233 **30 Claims**



1. A method for measuring conductance of a sample using an eddy current probe comprising a drive coil and a sense coil, including the steps of:

(a) with the eddy current probe at a first separation from the sample, and with an AC voltage in the drive coil, measuring an induced voltage pair comprising in-phase and quadrature components of an induced AC voltage in the sense coil;

(b) performing N repetitions of step (a), where N is a positive integer, with the eddy current probe at a different separation from the sample during each of said repetitions;

(c) determining a conductance function relating conductance with location along the selected curve; and

(d) after steps (a), (b), and (c), processing the induced voltage pairs obtained in steps (a) and (b) to generate a lift-off curve, determining an intersection voltage pair representing intersection of the lift-off curve with a selected curve, and determining the conductance of the sample from the intersection voltage pair and the conductance function.

5,552,705

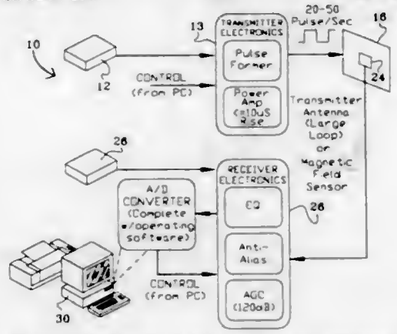
NON-OBTRUSIVE WEAPON DETECTION SYSTEM AND METHOD FOR DISCRIMINATING BETWEEN A CONCEALED WEAPON AND OTHER METAL OBJECTS

George V. Keller, 239 S. Dekker Dr., Golden, Colo. 80401

Filed Jun. 1, 1995, Ser. No. 457,535

Int. Cl.[6] G01N *27/72;* **G01R** *33/12;* **G08B** *13/24*

U.S. Cl. 324—239 **21 Claims**



1. A non-obtrusive weapon detection system for detection of and discrimination between a concealed weapon and other metal objects, the system comprising:

a transmitter for transmitting low intensity electromagnetic step pulses and causing eddy currents to flow in a metal object under observation, the eddy currents creating a plurality of scattered signals sufficient to accurately plot a "decay curve" due to the relaxation of the eddy currents;

a receiver for detecting the scattered signals from the eddy currents; and

data processing and computing equipment means connected to said receiver, said data processing and computing equipment means digitally processing the scattered signals for defining a time constant of the decay curve, the processed information of the time constant of the decay curve providing an accurate determination of a relationship to the conductive properties of the object under surveillance and the size and shape of the object using appropriate mathematical equations, the processed information allowing an observer to identify objects that are threatening or non-threatening.

5,552,706

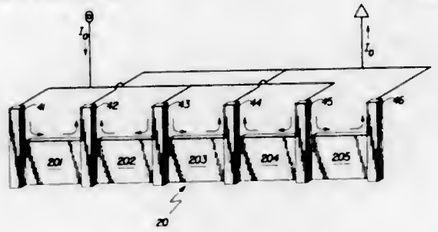
MAGNETORESISTIVE MAGNETIC FIELD SENSOR DIVIDED INTO A PLURALITY OF SUBELEMENTS WHICH ARE ARRAYED SPATIALLY IN SERIES BUT ARE CONNECTED ELECTRICALLY IN PARALLEL

Thomas D. Carr, Leucadia, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 997,850, Dec. 29, 1992. This application Apr. 27, 1995, Ser. No. 430,707

Int. Cl.[6] G01R *33/09;* **G11B** *5/39*

U.S. Cl. 324—252 **9 Claims**



1. A magnetic field sensing apparatus comprising:

an elongated magnetoresistive (MR) element for sensing the magnetic field of a single magnetic track;

a bias voltage source;

a plurality of electrical contacts spaced at regular intervals in electrical contact with said elongated MR element to divide said MR element into at least three serially arrayed subelements; and connected to said plurality of electrical contacts,

a circuit (1) for applying the same constant bias voltage from said bias voltage source across each subelement of said elongated MR element to produce a sense current in each said subelement, such that said subelements are electrically connected in parallel while arrayed spatially in series such that each subelement senses a different region across said track; and

(2) for detecting a change in the sense current through each of said subelements of said MR element produced by a magnetic field of said single magnetic track and for summing said changes in sense current to produce a sum signal which is a function of said sensed magnetic field.

5,552,707

RF PROBE WHICH CAN VARY DISTANCE BETWEEN RECEIVING COILS WHICH FACE EACH OTHER

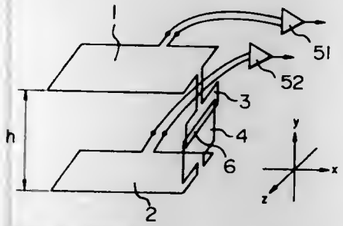
Tetsuhiko Takahashi, Soka; Hiroyuki Takeuchi, and Yoshikuni Matsunaga, both of Kashiwa, all of, Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Aug. 29, 1994, Ser. No. 297,060

Claims priority, application Japan, Aug. 30, 1993, 5-214151

Int. Cl.[6] G01R *33/28*

U.S. Cl. 324—318 **11 Claims**



1. An RF probe comprising:

a first coil and a second coil which are arranged in a magnetostatic field space for independently detecting MR signals emitted from a subject, in which said first and second coils are arranged at positions which face each other at a predetermined distance, each of said first and second coils having an output port for transforming detected MR signals to amplifier means;

means for changing the distance between said first and second coil means; and

decoupling means for reducing a high frequency coupling between said first and second coils so that a magnitude of reduction of said high frequency coupling changes in accordance with the distance between said first and second coils.

5,552,708

MAGNETIC RESONANCE IMAGING APPARATUS COMPRISING A COMMUNICATION SYSTEM

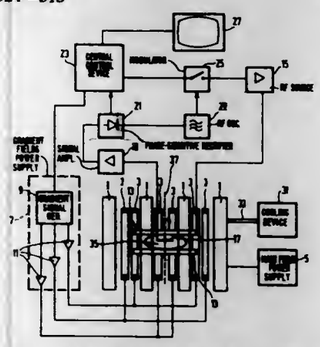
Cornelis L. G. Ham, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 30, 1994, Ser. No. 347,012

Claims priority, application Belgium, Nov. 30, 1993, 09301319

Int. Cl.[6] G01R *33/28*

U.S. Cl. 324—318 **10 Claims**



1. A magnetic resonance imaging apparatus, comprising a magnet system for generating a steady magnetic field in a measuring space, a gradient coil system for generating gradient fields in the measuring space, a power supply source for the gradient coils, and a communication system for transferring voice sound information from a first region in which the level of gradient noise generated by the gradient coils is comparatively high to a separate second region, which communication system comprises means for generating a reference signal which is dependent on the gradient noise, a microphone which is arranged in the first region so as to pick up a mixture of voice sound information desired to be communicated to the second region and gradient noise, a sound reproduction device, at least a part of which is situated in the second region, and a noise suppression device which comprises a filter device for modeling the acoustic path from the gradient coils to the microphone for converting the reference signal into a signal which corresponds substantially to the gradient noise at the area of the microphone, and a summing device for adding the output signal of the filter device to the output signal of the microphone in phase opposition, the output of the summing device being connected to the sound reproduction device to reproduce the voice sound information, characterized in that between the microphone and the summing device there is provided signal delay means for delaying the microphone signal for a predetermined period of time, and that the sound reproduction device comprises a sound reproduction member surrounded by sound-absorbing material for attenuating ambient sounds in the second region more than sounds which originate from the sound reproduction member.

5,552,709

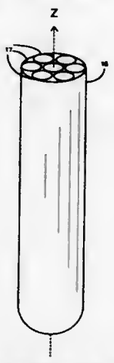
NMR SAMPLE CELL

Weston A. Anderson, Palo Alto, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Oct. 17, 1995, Ser. No. 544,222

Int. Cl.[6] G01V *3/00*

U.S. Cl. 324—321 **8 Claims**



1. In an NMR probe having an elongated aperture for holding a sample tube, where said sample tube has an axis and where said sample tube fits into said NMR probe aperture, said NMR probe designed for insertion into a fixed B_0 homogenous magnetic field produced within a cylindrically wound superconducting magnet, said probe including coil means for exciting said sample with radio frequency excitation and for receiving radio frequency energy from precessing sample nuclei, said sample tube being a thin-walled structure having a first cross-sectional area perpendicular to said axis,

THE IMPROVEMENT COMPRISING:

said coil means being constructed of superconducting material and comprising a pair of physically separated loops;

a low temperature Dewar;

said pair of separated loops being mounted within said low temperature Dewar, said low temperature Dewar including a wall having thickness, said Dewar wall being intermediate said superconducting loops and said sample tube resulting in a lower filling factor; and

means for compensating for said lower filling factor, said means for compensating for said lower filling factor including means for reducing Joule energy losses in said sample, said Joule energy loss reducing means including a plurality of parallel elongated chambers in said sample tube for containing said sample in solution in a plurality of volumes,

each volume having a cross-sectional area less than said

5,552,712

METHOD FOR IN-PLACE CIRCUIT INTEGRITY

each volume having a cross-sectional area less than said first cross-sectional area.

5,552,710

METHOD AND AUTOMATIC AUXILIARY DEVICE FOR TUNING OF AN NMR RECEIVING COIL

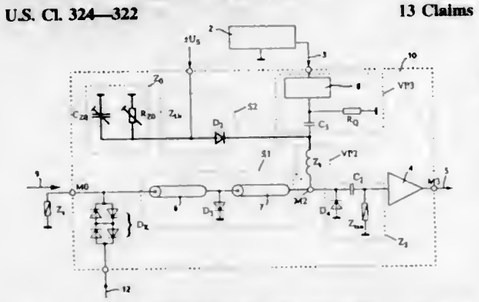
Max E. Busse-Grawitz, Zumikon; Enrico Malacarne, Dübendorf, and Walter Roeck, Zürich, all of, Switzerland, assignors to Spectrospin AG, Switzerland

Filed Jul. 10, 1995, Ser. No. 499,856

Claims priority, application Germany, Aug. 12, 1994, 44 28 579.5

Int. Cl.[6] G01V *3/00;3/14*

U.S. Cl. 324—322 **13 Claims**



1. A method for tuning a probe head impedance of an NMR receiving coil using an RF tuning signal, the receiving coil having a receiving circuit for an NMR signal, the method comprising the steps of:

a) producing a first reference signal using a real reference resistance at an input to the receiving circuit;

b) matching a reference impedance connected to a path of the RF tuning signal in the receiving circuit to produce a second reference signal simulating the first reference signal at the input; and

c) tuning the probe head impedance at the input to the second reference signal.

5,552,711

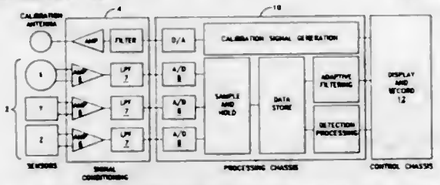
TURBINE ENGINE IMMINENT FAILURE MONITOR

Thierry Deegan, 39 Porter La., and William DiMarco, 1288 Anthony Rd., both of Portsmouth, R.I. 02871

Filed Nov. 10, 1994, Ser. No. 336,929

Int. Cl.[6] G01N *27/62*

U.S. Cl. 324—464 **7 Claims**



1. A method of measuring the imminent failure of an engine which produces an electromagnetic radiation spectrum including electromagnetic radiation from moving ions which form as a result of deteriorating engine components, comprising measuring said electromagnetic radiation, determining the spectrum of said electromagnetic radiation and processing said electromagnetic radiation spectrum to identify the ions which are indicative of the deteriorating engine components.

5,552,712

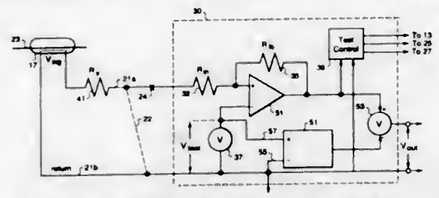
METHOD FOR IN-PLACE CIRCUIT INTEGRITY TESTING

Michael P. Weir, Ballston Lake, and Hunt A. Sutherland, Saratoga Springs, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 15, 1995, Ser. No. 388,914

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—537 **8 Claims**



1. A method for testing the integrity of a peripheral circuit having a signal wire and return wire serially connected with a resistance R_s comprising the steps of:

a) coupling an inverting input of a first amplifier having an input resistance R_{in} and a feedback resistance R_{fb} to the peripheral circuit;

b) applying a test voltage V_{test1} to a noninverting input of the 1st amplifier to produce an output signal V_{out1};

c) measuring the output signal V_{out1} at the 1st amplifier's output;

d) applying a test voltage V_{test2} to a noninverting input of the 1st amplifier to result in an output signal V_{out2};

e) measuring an output signal V_{out2} at the 1st amplifier's output;

f) calculating a testgain of the amplifier from the test voltages and output signals;

g) comparing the calculated testgain to:

i. a first test limit described by:

$$TL_1=1+R_{fb}/R_{in},$$

corresponding to the signal and return wires being shorted, a short circuit status,

ii. a second test level being one:

$$TL_2=1,$$

corresponding to a break in either the signal wire or the return wire, an open circuit status, and

iii. a third test level described by:

$$TL_3=1+R_{fb}/(R_{in}+R_S),$$

corresponding to the amplifier functioning properly and a normal circuit status to select a test level;

h) indicating the circuit status corresponding to the selected test level.

5,552,713

METHOD AND DEVICE FOR TESTING ELECTROPHYSIOLOGY CATHETER

Majid Rashidi, Beachwood, Ohio, assignor to Cardiac Assist Devices, Inc., Cleveland, Ohio

Filed Aug. 15, 1994, Ser. No. 290,148

Int. Cl.[6] G01R *31/12*

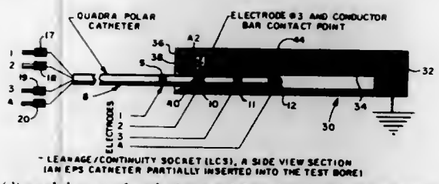
U.S. Cl. 324—555 **8 Claims**

1. A new method of testing a heart catheter/probe having a plurality of spaced surface electrical conductors each having an electrical lead attached thereto comprising:

(a) providing a base or block and forming at least one open cavity in the block;

(b) forming an access port in said block and communicating said port with said cavity and disposing an electrode in said port and extending same into said cavity;

(c) inserting said probe in said cavity and selectively positioning said probe for individually contacting selected ones of said conductors with said electrode; and,



(d) applying an electrical potential to the electrical lead associated with said selected one conductor and detecting if current flows through said electrode thereby testing each of said conductors for continuity.

5,552,714

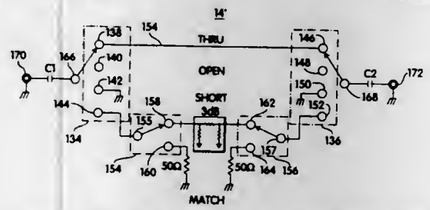
ELECTRONIC CALIBRATION METHOD AND APPARATUS

Vahe A. Adamian, Lexington; Michael T. Falcinelli, Andover, and Peter V. Phillips, Leominster, all of Mass., assignors to ATN Microwave, Inc., Billerica, Mass.

Division of Ser. No. 156,277, Nov. 22, 1993, Pat. No. 5,467,021, which is a continuation-in-part of Ser. No. 66,534, May 24, 1993, Pat. No. 5,434,511. This application Jun. 7, 1995, Ser. No. 474,748

Int. Cl.[6] G01R *35/00*

U.S. Cl. 324—601 **12 Claims**



1. A method for calibrating a network analyzer, the network analyzer having at least a first port and a second port, the method comprising the steps of:

generating a plurality of conditions as necessary to calibrate the network analyzer to at least one reference plane, the plurality of conditions being generated by multiplexing calibration standards having a known complex impedance with at least one single-pole, multi-throw switch to the at least one reference plane;

measuring the plurality of conditions; and

deriving calibration coefficients of the network analyzer based upon the measurements of the plurality of conditions.

5,552,715

APPARATUS FOR LOW COST ELECTROMAGNETIC FIELD SUSCEPTIBILITY TESTING

Wesley A. Rogers, Grosse Pointe Park, Mich., assignor to Electronic Development Inc., Grosse Pointe Park, Mich.

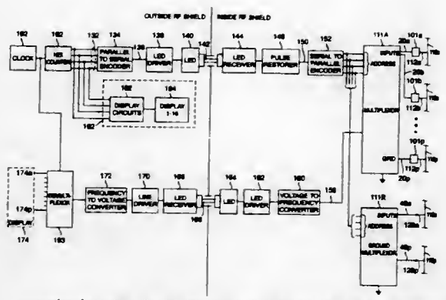
Division of Ser. No. 44,219, Apr. 7, 1993, Pat. No. 5,414,345, which is a continuation-in-part of Ser. No. 692,719, Apr. 29, 1991, abandoned. This application Feb. 13, 1995, Ser. No. 388,194

Int. Cl.[6] G01R *27/28*

U.S. Cl. 324—627 **22 Claims**

1. Apparatus for testing the susceptibility of a device to electromagnetic fields comprising:

a plurality of probe detectors having connectors for connecting to a corresponding plurality of locations of the device and



monitoring the signal level of the device at each connection location, the signal level indicating the susceptibility of the device to the electromagnetic field at the connection location;

a multiplexor having a plurality of signal inputs and a signal output, wherein each of the probe detectors is operatively connected to a signal input of the multiplexor;

means for controlling the multiplexor to provide selectively at least one of the plurality of the monitored signals to the multiplexor signal output; and

an output transmission line for passing the multiplexor signal output to a display device.

5,552,716

METHOD OF POSITIONING AN ELECTROOPTIC PROBE OF AN APPARATUS FOR THE MEASUREMENT OF VOLTAGE

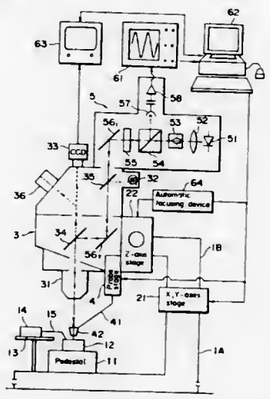
Hironori Takahashi; Shinichiro Aoshima; Isuke Hirano, and Yutaka Tsuchiya, all Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan

Filed Mar. 14, 1994, Ser. No. 213,005

Claims priority, application Japan, Mar. 15, 1993, 5-054225

Int. Cl.[6] G01R *29/12*

U.S. Cl. 324—753 **6 Claims**



1. A method of positioning an electrooptic (E-O) probe applied to an apparatus for the measurement of voltage, the probe and the apparatus including a magnifying optical system for observing a surface of a device to be measured in focus, an E-O probe, means

for producing a laser beam for the measurement of voltage of said

d) comparing said first and said second resistances to establish at

for producing a laser beam for the measurement of voltage of said device, said laser beam being applied to said device in a state where said E-O probe approximates to said device, a probe stage for moving said E-O probe in a direction of an optical axis of said magnifying optical system against said magnifying optical system, and a Z-axis stage for moving said magnifying optical system, said E-O probe and said probe stage in a direction of the optical axis of said magnifying optical system against said device, said E-O probe being positioned against the surface of said device without contact with the surface of said device, said method of positioning said E-O probe comprising the steps of:

storing a first position of said E-O probe stage in a first condition of said magnifying optical system, focusing a base plane of said E-O probe, and calculating and storing a focal point difference between a position of a focal point of said magnifying optical system against said magnifying optical system in a second condition of said E-O probe substantially out of an optical path for observing the surface of said device and a first position of a focal point of said magnifying optical system against said magnifying optical system in said first condition;

adjusting the focus of said magnifying optical system to an observation position on said device;

separating said magnifying optical system, said E-O probe, and said probe stage from said device by said focal point difference by said Z-axis stage; and

setting said probe stage in said first position.

5,552,717

Patent Not Issued For This Number

5,552,718

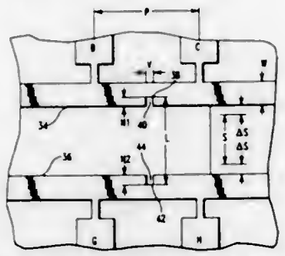
ELECTRICAL TEST STRUCTURE AND METHOD FOR SPACE AND LINE MEASUREMENT

James A. Bruce, Williston; Michael S. Hibbs, Westford, and Robert K. Leidy, Burlington, all of Vt., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jan. 4, 1995, Ser. No. 368,181

Int. Cl.[6] G01R *31/26*

U.S. Cl. 324—765 **20 Claims**



1. A method of measuring a dimensional characteristic of a feature, the method comprising the steps of:

a) forming a substantially conductive layer on a substrate;

b) forming a space representing the feature and a test structure in said layer with said test structure having at least one line in intersection with an edge of said space, said space being formed exteriorly of said line and extending into intersection therewith to form a notch in one edge thereof such that said one line is altered at said intersection in accordance with the dimensional characteristics of said space, said space being formed by removal of said conductive layer in the area of said space, and said line being formed by the removal of said conductive layer around said test structure,

c) measuring a first resistance of said line in a region remote from said intersection and a second resistance of said line in the region of said intersection; and

d) comparing said first and said second resistances to establish at least one dimensional characteristic of said space and the feature represented thereby.

5,552,719

OUTPUT BUFFER CIRCUIT HAVING GATE VOLTAGE CONTROL CIRCUIT OF GATE CURRENT CONTROLLING TRANSISTOR CONNECTED TO OUTPUT TRANSISTOR

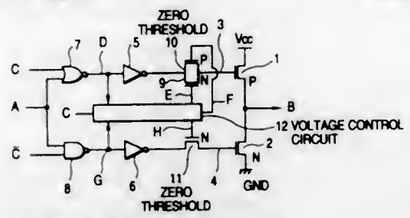
Nobuo Murakami, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 23, 1994, Ser. No. 362,896

Claims priority, application Japan, Dec. 24, 1993, 5-327061

Int. Cl.[6] H03K *19/0948*

U.S. Cl. 326—27 **9 Claims**



1. An output buffer circuit comprising:

a first output transistor which is provided between said output terminal and a first power supply terminal and receives an input signal at a gate thereof through a gate current controlling transistor; and

a voltage control circuit which supplies the gate of said gate current controlling transistor with a first voltage which causes said gate current controlling transistor to have a first current driving capability for a predetermined time in response to a change of said input signal to render said first output transistor conductive and generates a second voltage which causes said gate current controlling transistor to have a second current driving capability that is higher than said first current driving capability after elapse of said predetermined time.

5,552,720

METHOD FOR SIMULTANEOUS PROGRAMMING OF MULTIPLE ANTIFUSES

Mukesh T. Lulla, Santa Clara, and William D. Cox, Milpitas, both of Calif., assignors to QuickLogic Corporation, Santa Clara, Calif.

Filed Dec. 1, 1994, Ser. No. 349,092

Int. Cl.[6] H01H *37/76*

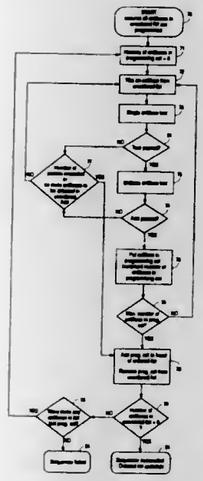
U.S. Cl. 326—38 **10 Claims**

10. A method, comprising the steps of:

reordering a list of antifuses to be programmed by placing antifuses of said list which are of a predetermined type towards one end of said list;

performing a sequencer method on said list after reordering thereby generating an ordered list of said antifuses to be programmed; and

programming said antifuses in said ordered list, wherein said sequencer method involves the simultaneous programming of multiple antifuses.



5,552,721

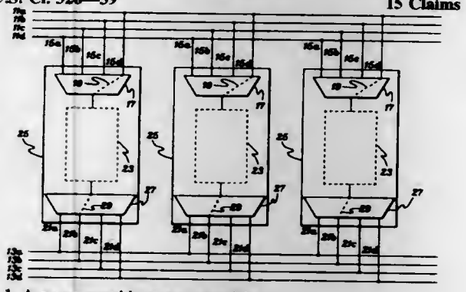
METHOD AND SYSTEM FOR ENHANCED DRIVE IN PROGRAMMMABLE GATE ARRAYS

Scott W. Gould, So. Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 5, 1995, Ser. No. 463,108

Int. Cl.[6] H03K *19/0175*

U.S. Cl. 326—39 **15 Claims**



1. A programmable array comprising:

a first logic cell having a first output; and

a second logic cell having a second output, wherein said first output and said second output are connected within said programmable array forming a combined output and carrying a common logic level to facilitate enhanced current driving capability on said combined output by said first logic cell and said second logic cell.

5,552,722

MASK REGISTOR FOR A CONFIGURABLE CELLULAR ARRAY

Thomas A. Kean, Edinburgh, Scotland, assignor to Xilinx, Inc., San Jose, Calif.

Division of Ser. No. 148,793, Nov. 5, 1993, Pat. No. 5,469,003.

This application Jun. 7, 1995, Ser. No. 486,464

Claims priority, application United Kingdom, Nov. 5, 1992, 9223226

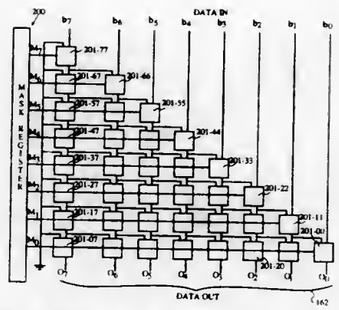
Int. Cl.[6] H03K *19/177*

U.S. Cl. 326—41 **6 Claims**

1. A register structure comprising:

a plurality of input lines;

a plurality of output lines;



a register providing a plurality of bits, the number of bits equal to the number of said plurality of input lines;

a plurality of tiered switches placed in operative relation to said input lines and said register, wherein said plurality of output lines is coupled to said plurality of input lines in a pattern determined by a value in said register.

5,552,723

CMOS OUTPUT CIRCUIT COMPENSATING FOR BACK-GATE BIAS EFFECTS

Hiroshi Shigehara, Tokyo, and Masanori Kinugasa, Yokohama, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

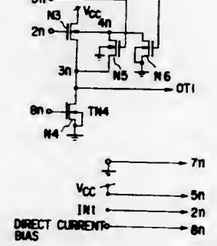
Continuation of Ser. No. 917,936, Jul. 24, 1992, abandoned.

This application Jun. 23, 1994, Ser. No. 264,853

Claims priority, application Japan, Jul. 26, 1991, 3-187569

Int. Cl.[6] H03K *19/0944;19/0185*

U.S. Cl. 326—86 **16 Claims**



1. An output circuit comprising:

an input terminal;

first and second MOS transistors of a same conductivity type connected in series between first and second power supplies to form a current path, and alternately turned on in response to an input signal from said input terminal, a level of said first power supply being higher than a level of said second power supply;

an output terminal connected to a connection point between said first and second MOS transistors;

a third MOS transistor having a first terminal connected to said output terminal and a second terminal connected to a back gate of said first MOS transistor, wherein a fixed potential is applied to a gate of said third MOS transistor; and

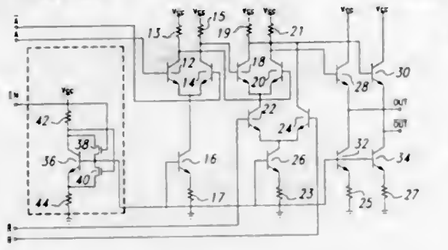
a fourth MOS transistor having a first terminal connected to said back gate of said first MOS transistor and a second terminal connected to a fixed potential, and said fourth MOS transistor being turned on in response to the input signal and making a level of a back gate of said first MOS transistor equal to the level of said second power supply, thereby reliably turning off said first MOS transistor.

5,552,724

POWER-DOWN REFERENCE CIRCUIT FOR ECL GATE CIRCUITRY

David B. Scott, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 17, 1993, Ser. No. 122,273
Int. Cl.[6] H03K *19/086*
U.S. Cl. 326—126 **13 Claims**



1. A circuit comprising:

a reference voltage sub-circuit operable to generate a reference voltage on an output line; and

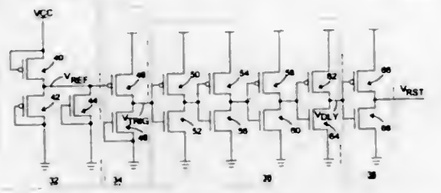
at least one current mirror operable to receive said reference voltage, said reference voltage sub-circuit including a bipolar transistor whose base is connected to said output line and a first field effect transistor, said first field effect transistor being connected at a first drain/source to a first terminal of said bipolar transistor and being connected at a second drain/source to a second terminal of said bipolar transistor, the gate of said first field effect transistor being operable to receive a signal capable of enabling said circuit.

5,552,725

LOW POWER, SLEW RATE INSENSITIVE POWER-ON RESET CIRCUIT

S. Doug Ray, and Craig M. Peterson, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 5, 1994, Ser. No. 286,685
Int. Cl.[6] H03K *17/22*
U.S. Cl. 327—143 **13 Claims**



1. A power-on reset circuit comprising:

a reference voltage circuit including a power on clamping transistor and a power off clamping transistor connected in parallel a ground voltage and a reference voltage having a reference voltage value, said reference voltage circuit further includes an off-state connected transistor coupled between said reference voltage terminal and a power supply voltage terminal;

a trigger circuit having a gate terminal of a trigger transistor connected to receive a fixed voltage value upon said reference voltage terminal which is based on the magnitude of said reference voltage value relative to said power supply voltage, wherein said trigger transistor is adapted to produce a trigger voltage;

a multiple stage delay circuit having an input adapted to receive said trigger voltage and a delay output which transitions a timed duration thereafter; and

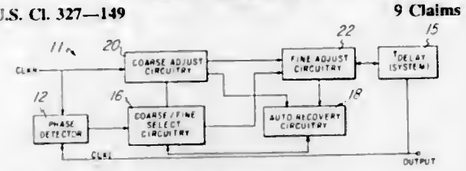
an output driver connected to receive said delay output and produce an inverted delay output signal corresponding to a reset signal.

5,552,726

HIGH RESOLUTION DIGITAL PHASE LOCKED LOOP WITH AUTOMATIC RECOVERY LOGIC

Shannon A. Wichman, Dallas, and Uming Ko, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 5, 1993, Ser. No. 58,168
Int. Cl.[6] H04L *7/08*
U.S. Cl. 327—149 **9 Claims**



2. A phase locked loop circuit, comprising:

a phase detection circuit, wherein the phase detection circuit compares the phases of an internal signal and a reference signal, the reference signal forming an input and the internal signal forming an output of the phase locked loop circuit;

a coarse/fine mode select circuit connected to the phase detection circuit, operable to determine an appropriate delay increment in response to an indication from the phase detection circuit;

a coarse adjust mode circuit connected to the coarse/fine mode select circuit and said reference input operable to adjust the phase of the internal signal in a first delay increment;

a fine adjust mode circuit connected to the coarse/fine mode select circuit and said coarse adjust circuit operable to adjust the phase of the internal signal in a second delay increment, wherein the second delay increment is less than the first delay increment;

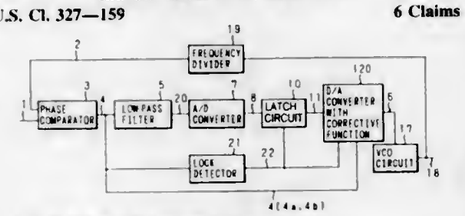
a recovery circuit connected to the coarse/fine mode select circuit, the coarse adjust mode circuit, and the fine adjust mode circuit, wherein the recovery circuit resets said phase detection circuit for phase adjustment in an event of a locking failure.

5,552,727

DIGITAL PHASE LOCKED LOOP CIRCUIT

Yuichi Nakao, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1994, Ser. No. 316,463
Claims priority, application Japan, Oct. 6, 1993, 5-250429
Int. Cl.[6] H03K *5/159;* **H03L** *7/189*
U.S. Cl. 327—159 **6 Claims**



1. A digital circuit apparatus, comprising:

voltage-controlled oscillating means for outputting a clock at a frequency corresponding to a control voltage;

phase comparing means for comparing the phase of the clock outputted from said voltage-controlled oscillating means with the phase of an external clock inputted from the outside;

a control voltage generator for receiving a signal indicating the result of phase comparison and outputting a control voltage for controlling said voltage-controlled oscillating means;

an analog-to-digital converter for subjecting the analog voltage outputted from said control voltage generator to analog-to-digital conversion;

a latch circuit, connected to the analog-to-digital converter, for storing a digital signal obtained through the analog-to-digital conversion;

a digital-to-analog converter with corrective function, connected to the latch circuit, for receiving a signal read out of said latch circuit; and

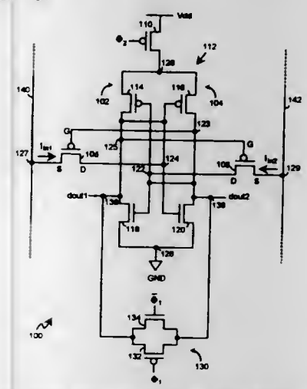
a lock detector, connected to the phase comprising means, to the latch circuit and to the digital-to-analog converter with corrective function, for detecting the matching in phase of the clock outputted from said voltage-controlled oscillating means and the external clock.

5,552,728

LATCH-TYPE CURRENT SENSE AMPLIFIER WITH SELF-REGULATING INPUTS

Jyhfong Lin, Fremont, Calif., assignor to Cirrus Logic, Inc., Fremont, Calif.

Filed May 1, 1995, Ser. No. 432,962
Int. Cl.[6] G01R *19/00*
U.S. Cl. 327—57 **37 Claims**



1. A current sense amplifier circuit for generating a latched data output indicative of a difference between first and second input currents respectively received from first and second input data lines connected respectively at first and second nodes to said current sense amplifier circuit, said current sense amplifier circuit comprising:

latching means having a first latch input characterized by a first latch input impedance, a second latch input characterized by a second latch input impedance, and a first latch output, for generating said latched data output at said first latch output in response to first and second signals respectively received at said first and second latch inputs,

first means connected between said first node and said first latch input, for receiving said first input current, generating said first signal from said first input current, and providing said first signal to said first latch input, wherein said first means in combination with said latching means is characterized at said first node, before said latched data output is generated at said first latch output of said latching means, by a first sense amplifier input impedance less than said first latch input impedance, and after said latched data output is generated at said first latch output of said latching means, by an impedance greater than said first latch input impedance if said first latched data output is a first logic state, or by an impedance substantially equal to said first latch input impedance if said first latched data output is a second logic state, and

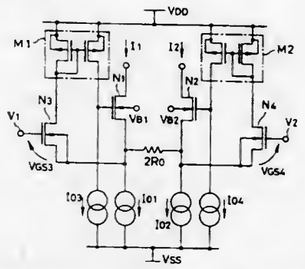
second means connected between said second node and said second latch input, for receiving said second input current, generating said second signal from said second input current, and providing said second signal to said second latch input, wherein said second means in combination with said latching means is characterized at said second node, before said latched data output is generated at said first latch output of said latching means, by a second sense amplifier input impedance less than said second latch input impedance, and after said latched data output is generated at said first latch output of said latching means, by an impedance greater than said second latch input impedance if said first latched data output is said second logic state, or by an impedance substantially equal to said second latch input impedance if said first latched data output is said first logic state.

5,552,729

MOS DIFFERENTIAL VOLTAGE-TO-CURRENT CONVERTER CIRCUIT WITH IMPROVED LINEARITY

Koji Deguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 269,789, Jul. 1, 1994. This application Jun. 2, 1995, Ser. No. 458,776
Claims priority, application Japan, Jul. 5, 1993, 5-165611; Dec. 20, 1993, 5-318871
Int. Cl.[6] H02M *11/00*
U.S. Cl. 327—103 **6 Claims**



1. A MOS differential voltage-to-current converter circuit comprising:

first and second MOS transistors;

a resistor connected between the drains of said first and second MOS transistors;

a first constant current source for supplying operation current for said first and second MOS transistors;

third and fourth MOS transistors having sources respectively connected to the drains of said first and second MOS transistors and receiving a differential input voltage at the gates thereof;

a first current-mirror circuit receiving the drain output of said third MOS transistor as a current input and having a current output terminal connected to the gate of said first MOS transistor; and

a second current-mirror circuit receiving the drain output of said fourth MOS transistor as a current input and having a current output terminal connected to the gate of said second MOS transistor for taking the current flowing through said first and second MOS transistors as a differential output.

5,552,730

MOS DIFFERENTIAL VOLTAGE-TO-CURRENT CONVERTER CIRCUIT WITH IMPROVED LINEARITY

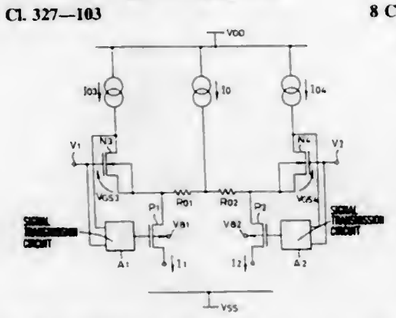
Koji Deguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 269,789, Jul. 1, 1994. This application Jun. 2, 1995, Ser. No. 458,907

Claims priority, application Japan, Jul. 5, 1993, 5-165611; Dec. 20, 1993, 5-318871

Int. Cl.[6] H02H *11/00*

U.S. Cl. 327—103 **8 Claims**



1. A MOS differential voltage-to-current converter circuit comprising:

first and second MOS transistors;

a resistor connected between the sources of said first and second MOS transistors;

a first constant current source for supplying operation current for said first and second MOS transistors;

third and fourth MOS transistors, the source of said third MOS transistor connected to the source of said first MOS transistor and the source of said fourth MOS transistor connected to the source of said second MOS transistor, said third and fourth MOS transistors receiving a differential input voltage at the gates thereof;

a first differential amplifier circuit receiving a gate input and a drain output of said third MOS transistor as inputs and applying a differential output to the gate of said first MOS transistor; and

a second differential amplifier circuit receiving a gate input and a drain output of said fourth MOS transistor as inputs and applying a differential output to the gate of said second MOS transistor, the current flowing through said first and second MOS transistors providing a differential output of said MOS differential voltage-to-current converter circuit.

5,552,731

INTEGRATED CONTROL CIRCUIT WITH A LEVEL SHIFTER FOR SWITCHING AN ELECTRONIC SWITCH

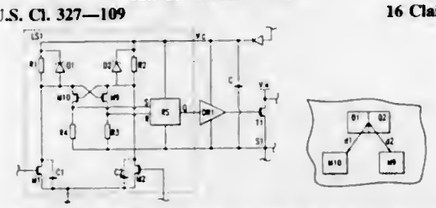
Claudio Diazzi, Milan; Fabrizio Martignoni, Varese, and Mario Tarantola, Milan, all of, Italy, assignors to SGS-Microelectronics S.r.l., Agrate Brianza, Italy

Filed Sep. 18, 1995, Ser. No. 529,882

Claims priority, application European Pat. Off., Sep. 16, 1994, 94830436

Int. Cl.[6] H03K *17/16;3/00*

U.S. Cl. 327—109 **16 Claims**



6. An integrated control circuit for switching an electronic power switch, comprising:

a control logic circuit for producing first and second voltage levels; and

a level shifter having an input connected to the control logic circuit and an output connected to the electronic power switch, the level shifter including

a bistable stage having first and second inputs, and an output defining the output of the level shifter;

a first circuit branch having an output connected to the first input, and including a first transistor and a first resistor connected to the first transistor; and

a second circuit branch having an output connected to the second input, and including a second transistor and a second resistor connected to the second transistor, the first and second transistors being switched alternately based on the first and second voltage levels produced by the control logic circuit, wherein the circuit components of the level shifter are selectively disposed such that during discharge of parasitic capacitors associated with the first and second transistors, the voltage level at the first input falls faster than the voltage level at the second input.

5,552,732

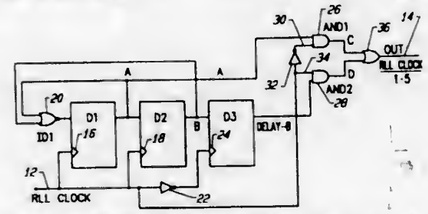
HIGH SPEED DIVIDE BY 1.5 CLOCK GENERATOR

Yibe Huang, Palo Alto, Calif., assignor to Exar Corporation, Fremont, Calif.

Filed Apr. 25, 1995, Ser. No. 428,589

Int. Cl.[6] H03B *19/00*

U.S. Cl. 327—116 **6 Claims**



1. A clock generator circuit for generating a clock edge at a rate of 1.5 times the rate of an input clock, comprising:

a first gate having a clock input coupled to said input clock;

a second gate having an input coupled to an output of said first gate, and a clock input coupled to said input clock;

a third gate having an input coupled to an output of said second gate and a clock input coupled to an inverse of said input clock;

combinational logic for providing as a circuit output both a combination of said inverse of said input clock and said first gate output, and a combination of said input clock and said third gate output; and

a circuit providing a NOR function having a first input coupled to the output of said first gate, a second input coupled to the output of said second gate, and an output coupled to an input of said first gate.

5,552,733

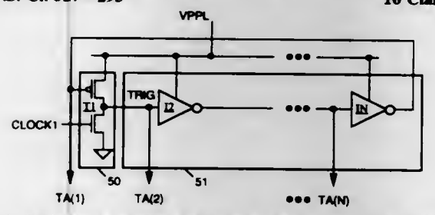
PRECISE AND AGILE TIMING SIGNAL GENERATOR BASED ON A RETRIGGERED OSCILLATOR

Gary J. Lesmeister, Hayward, Calif., assignor to Credence Systems Corporation, Fremont, Calif.

Continuation-in-part of Ser. No. 301,274, Sep. 6, 1994, which is a continuation of Ser. No. 5,651, Jan. 19, 1993, Pat. No. 5,345,186. This application Jun. 20, 1995, Ser. No. 493,238

Int. Cl.[6] H03K *5/26;* **H03L** *7/087*

U.S. Cl. 327—295 **16 Claims**



1. A triggered oscillator for producing a plurality of tap signals frequency locked to an input first clock signal and evenly distributed in phase, comprising:

phase distribution means for generating said tap signals including a reference tap signal, said phase distribution means producing in response to each pulse of an input trigger signal a succession of signal pulses having adjustable interval between each pulse of said succession, the interval being adjusted in response to a control signal supplied as input to said phase distribution means, each signal pulse of the succession being conveyed by a separate one of said tap signals, a last pulse of the succession being conveyed by said reference tap signal;

a trigger circuit, receiving said input first clock signal, for generating and transmitting said trigger signal to said phase distribution means, the trigger circuit producing a pulse in the trigger signal upon each concurrence of a pulse in said input first clock signal with a pulse in said reference tap signal; and

control means generating and supplying said control signal as input to said phase distribution means for adjusting said interval between pulses of said succession such that said tap signals are frequency locked to said input first clock signal.

5,552,734

LOCAL OSCILLATOR FREQUENCY MULTIPLIER AND MIXING CIRCUIT COMPRISING A SQUARING CIRCUIT

Katsuji Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 26, 1994, Ser. No. 329,324

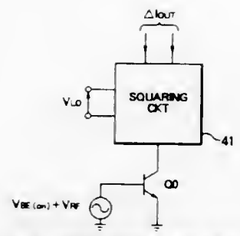
Claims priority, application Japan, Oct. 27, 1993, 5-268936; Dec. 15, 1993, 5-343171

Int. Cl.[6] G06F *7/44;* **G06G** *7/12;* **H03B** *19/00*

U.S. Cl. 327—356 **23 Claims**

1. A frequency multiplier and mixing circuit supplied with a local oscillator frequency signal of a local oscillator frequency and an input signal of an input frequency to produce an output signal which includes a frequency component specified by at least one of a sum and a difference between an integral multiple of said local oscillator frequency and said input frequency, said circuit comprising:

a squaring circuit supplied with said local oscillator frequency signal for squaring said local oscillator frequency signal to produce a circuit output signal in the form of a differential circuit output signal; and



a cross-connected, emitter-coupled transistor circuit which is connected to said squaring circuit and supplied with said input signal and driven by said differential circuit output signal for producing said output signal in the form of a differential output current.

5,552,735

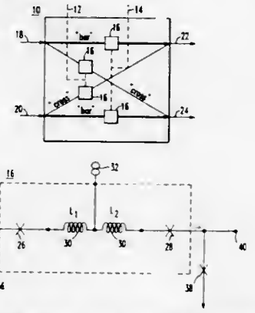
MULTI-GIGAHERTZ SINGLE FLUX QUANTUM SWITCH

Joonhee Kang, Seoul, Rep. of Korea; John X. Przybysz, Penn Hills, and Anthony H. Worsham, Pittsburgh, both of Pa., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Oct. 7, 1994, Ser. No. 319,707

Int. Cl.[6] H03K *19/195;3/38*

U.S. Cl. 327—367 **8 Claims**



1. A switch for controlling the throughput of a signal between a pair of input channels and a pair of output channels comprising:

a. means for receiving an input signal from each of said pair of input channels;

b. means for transmitting an output signal to each of said pair of output channels;

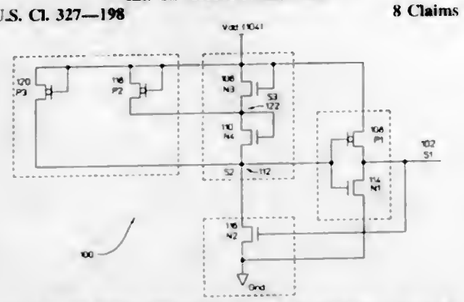
c. four line channels provided within said switch, each of said four line channels connecting one of said pair of input channels and one of said pair of output channels; and

d. four line channel switches, one line channel switch provided on each of said four line channels, each of said four line channel switches being operable by a control signal to open or close said each of said four line channels, wherein a Josephson junction is provided between each line channel switch and each of said input channels and said output channels, and wherein each of said line channel switches comprises a pair of non-hysteretic Josephson junctions and a pair of inductors wherein application of a bias current intermediate said pair of non-hysteretic Josephson junctions blocks passage of a single flux quantum pulse through said line channel.

5,552,736
POWER SUPPLY DETECT CIRCUIT OPERABLE SHORTLY AFTER AN ON/OFF CYCLE OF THE POWER SUPPLY

Alan R. Desroches, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 19, 1995, Ser. No. 424,936
Int. Cl.[6] H03K *17/22;17/20*
U.S. Cl. 327—198 **8 Claims**



1. A power supply detection circuit for an integrated circuit for indicating when a power supply voltage coupled to the circuit exceeds a predetermined value during a transition of the power supply voltage, the circuit having a first power supply terminal for receiving the power supply voltage and having a second power supply terminal for receiving a ground reference potential, the circuit having an output wherein an output signal transitions from a first state to a second state when the power supply exceeds the predetermined value, comprising:

detect means coupled to the power supply voltage for applying a sense voltage to a sensing node when the power supply voltage reaches a predetermined multiple of a transistor threshold voltage, the sense voltage being a predetermined number of transistor threshold voltages less than the supply voltage when the supply voltage is greater than the predetermined multiple of the transistor threshold voltage and less than the predetermined value;

output means coupled to the sense node and the output, for generating the transition of the output signal from the first state to the second state when the sense voltage exceeds the transistor threshold voltage which corresponds to the power supply voltage exceeding the predetermined value;

regeneration means for regeneratively coupling the output signal to the sense node to provide a discharge path for charge coupled onto the sense node due to the power supply voltage rising when the power supply voltage is below the predetermined multiple of the transistor threshold voltage and greater than the transistor threshold voltage; and

discharge means coupled to the detect means and the power supply voltage for discharging the detect means when the power supply is turned off.

5,552,737
SCANNABLE MASTER SLAVE LATCH ACTUATED BY SINGLE PHASE CLOCK

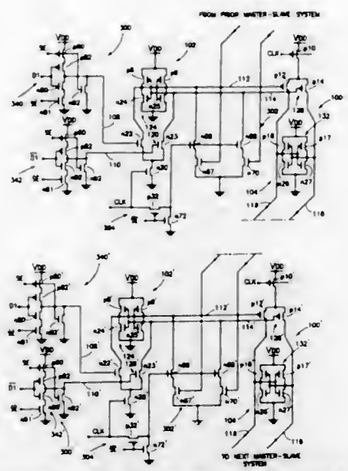
Chih-Liang Chen, Briarcliff Manor, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 11, 1994, Ser. No. 273,554
Int. Cl.[6] H03K *3/356;3/289*
U.S. Cl. 327—202 **2 Claims**

1. A static master/slave circuit system comprising:

a plurality of successive static master/slave stages, each master/slave stage including a master segment and at least one slave segment, each master segment may be actuated by a signal from external logic in a first mode of operation, or by output signals from a preceding slave segment applied to said master segment during a second mode of operation;

a scan port circuit connected between the slave stage of one master/slave and the master stage of the next successive



master/slave stage, said scan port circuits including a plurality of n-channel transistors connected to a scan clock input means including an n-channel transistor and a p-channel transistor;

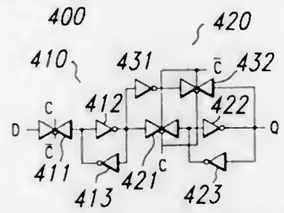
a continuous single phase clock signal which provides clocked signals to the scan port circuit, as well as to the master segment and the slave segment in each of said master/slave stages; and

control means for deactivating said signal from external logic applied to said each master segments in said first mode of operation, and activating said signals from the preceding slave segment applied to said master segment when in said second mode; said control means further deactivating said scan port circuit from said master segment, and activating said signal from external logic to said master segment, when in said first mode of operation.

5,552,738
HIGH PERFORMANCE ENERGY EFFICIENT PUSH PULL D FLIP FLOP CIRCUITS

Uming Ko, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 21, 1995, Ser. No. 426,299
Int. Cl.[6] H03K *3/356*
U.S. Cl. 327—203 **16 Claims**



1. A D flip-flop circuit having and input and an output comprising:

a master latch having an input serving as input of said D flip-flop circuit clocked in a first phase and an output;

a slave latch having an input connected to said output of said master latch clocked in a second phase opposite to said first phase and a non-clocked static output serving as output of said D flip-flop circuit; and

a push-pull circuit including

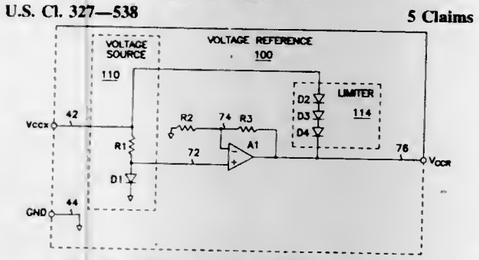
an inverter having an input connected to said output of said master latch and an output, and

a transmission gate clocked in said second phase having an input connected to said output of said inverter and an output connected to said output of said slave latch.

5,552,739
INTEGRATED CIRCUIT POWER SUPPLY HAVING PIECEWISE LINEARITY

Brent Keeth; Paul S. Zagar; Brian M. Shirley, and Stephen L. Casper, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 194,184, Feb. 8, 1994, abandoned. This application Nov. 15, 1995, Ser. No. 559,414
Int. Cl.[6] G05F *1/10*
U.S. Cl. 327—538 **5 Claims**



1. An integrated memory circuit comprising:

memory support circuitry; and

a power supply circuit comprising,

a voltage divider circuit having a resistor connected between a voltage supply and a first node of a first diode circuit, the first diode circuit having a second node connected to a reference potential,

an amplifier having a first input connected to the first node and having an output node connected to the memory support circuitry;

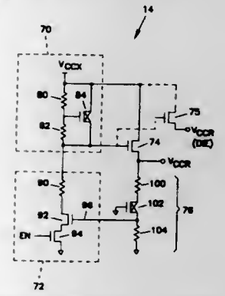
a feedback resistor connected between the output node and a second input of the amplifier, and

a second diode circuit connected between the output node and the voltage supply.

5,552,740
N-CHANNEL VOLTAGE REGULATOR

Stephen L. Casper, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation-in-part of Ser. No. 194,184, Feb. 8, 1994. This application Oct. 25, 1994, Ser. No. 328,376
Int. Cl.[6] G05F *1/10;3/02*
U.S. Cl. 327—541 **24 Claims**



1. A semiconductor circuit device powered by a power signal having a voltage level measured with respect to common, comprising:

a logic circuit; and

a power regulation circuit providing the logic circuit with a regulated power signal, the power regulation circuit including

a bias control circuit providing a bias activation signal in the direction of the power signal,

a feedback control signal,

a biasing pull-down circuit arranged in series with the bias control circuit and common, the biasing pull-down circuit activated in response to the feedback control signal,

a level sensing circuit,

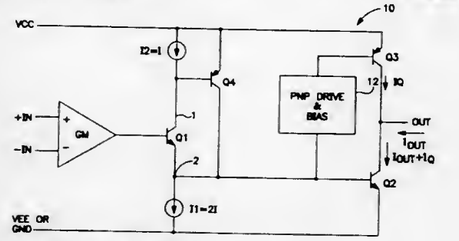
an N-channel transistor having a gate terminal coupled to the bias control circuit, having a drain terminal coupled to the power signal, and having a source terminal coupled to the level sensing circuit, the N-channel transistor activating in response to the bias activation signal exceeding a threshold level and providing the regulated power signal, and

the level sensing circuit responding to activation of the N-channel transistor, providing the threshold level, and generating the feedback control signal for controlling activation of the N-channel transistor.

5,552,741
HIGH IMPEDANCE COMMON-EMITTER AMPLIFIER STAGE

Madhav V. Kolluri, Sunnyvale, Calif., assignor to Maxim Integrated Products, Sunnyvale, Calif.

Filed Dec. 29, 1994, Ser. No. 365,902
Int. Cl.[6] G06G *7/12;* **H03K** *17/60;3/00;3/18*
U.S. Cl. 327—560 **19 Claims**



1. A high input impedance amplifier stage, comprising:

first and second power supply terminals;

an output terminal;

first and second current sources, each having a first and a second terminal;

first and second NPN transistors, each having a collector, a base and an emitter;

third PNP transistor having a collector, a base and an emitter;

the emitter of the first transistor, the base of the second transistor and the collector of the third transistor being coupled to the first terminal of the first current source;

the collector of the first transistor and the base of the third transistor being coupled to the first terminal of the second current source;

the emitter of the third transistor being coupled to the second terminal of the second current source and the first power supply terminal;

the emitter of the second transistor being coupled to the second terminal of the first current source and the second power supply terminal, the collector of the second transistor being coupled to the output terminal; and

the base of the first transistor providing the input to the amplifier stage.

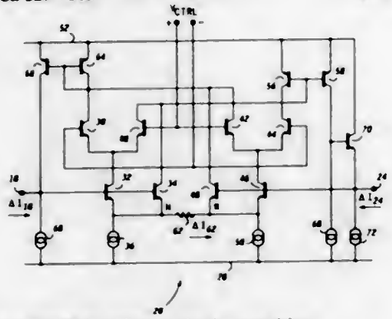
5,552,742

5,552,747
DRIVER CIRCUIT COMPATIBLE WITH LOW SUPPLY

5,552,742
CIRCUIT FOR CONTROLLING CURRENT FLOW BETWEEN TWO NODES

Geoffrey W. Perkins, Chandler, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 13, 1995, Ser. No. 387,690
Int. Cl.[6] G06G *7/26*
U.S. Cl. 327—563 **20 Claims**



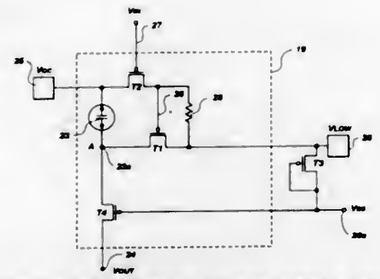
1. A controllable resistance circuit, comprising:
a first transistor having a base, an emitter and a collector, said base being coupled to a first node;
a second transistor having a base, an emitter and a collector, said base being coupled to said first node;
a first current source having an output coupled to said emitters of said first and second transistors;
a third transistor having a base, an emitter and a collector, said base being coupled to a second node, said collector being coupled to a power supply conductor;
a fourth transistor having a base, an emitter and a collector, said base being coupled to said second node;
a second current source having an output coupled to said emitters of said third and fourth transistors;
a resistor having a first end coupled to said emitters of said first and second transistors and having a second end coupled to said emitters of said third and fourth transistors;
a current mirror having an input and having an output coupled to said second node;
a first current steering circuit having a first input coupled to said input of said current mirror, a second input coupled to said power supply conductor, and an output coupled to said collector of said first transistor, said first current steering circuit being coupled for receiving a control signal at a control input for steering current between said first and second inputs of said first current steering circuit and said output of said first current steering circuit; and
a second current circuit having a first input coupled to said input of said current mirror, a second input coupled to said power supply conductor, and an output coupled to said collector of said fourth transistor, said second current steering circuit being coupled for receiving said control signal at a control input for steering current between said first and second inputs of said second current steering circuit and said output of said second current steering circuit.

5,552,743
THIN FILM TRANSISTOR REDUNDANCY STRUCTURE

Monte Manning, Kuna, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Sep. 27, 1994, Ser. No. 313,627
Int. Cl.[6] G11C *17/16;7/00*
U.S. Cl. 327—567 **15 Claims**

1. In a microcircuit device wherein a voltage differential is applied to at least one element of said microcircuit device, said voltage differential being incompatible with a plurality of said microcircuit components; means for isolating said components from said voltage differential, which comprise:

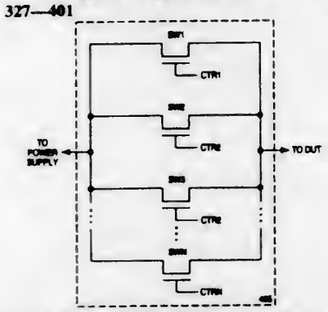


at least one first TFT switching circuit adapted to apply said voltage differential to said element; and
at least one second TFT switching circuit adapted to separate said components from said voltage differential.

5,552,744
HIGH SPEED I_{DDQ} MONITOR CIRCUIT

Phillip D. Burlison, Morgan Hill; William R. DeHaven, Los Altos, and Victor Pogrebinsky, San Jose, all of Calif., assignors to LTX Corporation, Westwood, Mass.

Division of Ser. No. 288,917, Aug. 11, 1994. This application Jun. 5, 1995, Ser. No. 472,870
Int. Cl.[6] H03K *17/28;17/62*
U.S. Cl. 327—401 **8 Claims**



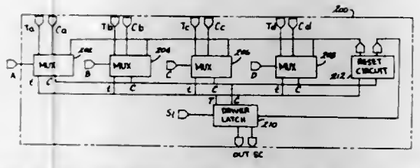
1. A process for reducing charge injection when decoupling a power supply from a first node, comprising the steps of:
providing n switches coupled in parallel between the power supply and the first node, each of the n switches having a different resistance when closed; and
sequentially opening each of the n switches, wherein a first switch having a lowest resistance is opened first and each successive switch that is opened has a greater resistance than a previous switch that has been previously opened.

5,552,745
SELF-RESETTING CMOS MULTIPLEXER WITH STATIC OUTPUT DRIVER

Antonio R. Pelella, Highland Falls, and Yuen H. Chan, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 21, 1994, Ser. No. 309,811
Int. Cl.[6] H03K *17/62;3/02;3/037*
U.S. Cl. 327—407 **16 Claims**

1. A multiplex circuit comprising:
an input circuit, having true and complement inputs and true and complement outputs;
an output circuit having true and complement inputs and an output and comprising a data latch responsive to a first latch signal to assume a first latch state and responsive to a second latch signal to assume a second latch state;

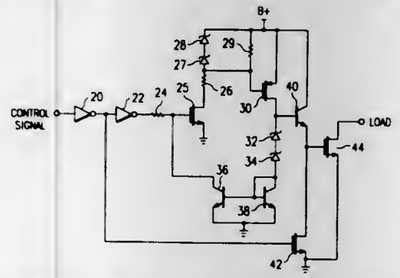


the true and complement outputs of the input circuit connected to the true and complement inputs, respectively, of the output circuit;
the output circuit further comprising a first latch control gate connected to the latch and to one of the true and complement inputs of the output circuit and a second latch control gate connected to the latch and to the other of the true and complement inputs of the output circuit and a first output gate connected to the output terminal of the output circuit and to one of the true and complement inputs of the output circuit and a second output gate connected to the output terminal of the output circuit and connected to the other of the true and complement inputs of the output circuit, the first and second latch control gates responsive to signals on the true and complement inputs of the output circuit to generate first and second latch signals, respectively, and the first and second output gates responsive to true and complement signals on the true and complement inputs of the output circuit to produce an output signal on the output of the output circuit independent of the operation of the latch.

5,552,746
GATE DRIVE CIRCUIT

Eric J. Danstrom, Farmington Hills, Mich., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Apr. 7, 1995, Ser. No. 418,548
Int. Cl.[6] H03K *17/687;3/00;5/08*
U.S. Cl. 327—427 **22 Claims**

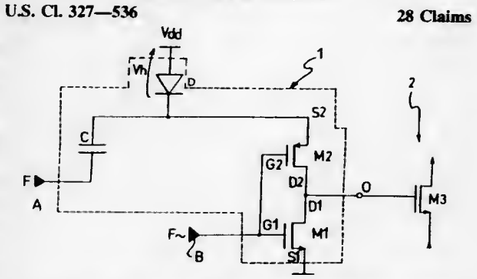


1. A gate drive circuit for driving a gate of a power transistor, the gate drive circuit comprising:
an input stage having an input for receiving a control signal and having an output,
a high side drive circuit having an input connected to the output of the input stage, having a sense node, and having an output connected to the gate of the power transistor,
a low drive circuit having an input connected to the output of the input stage and having an output connected to the gate of the power transistor, and
an active clamp circuit connected between the sense node of the high side drive circuit and the input of the high side drive circuit, for controlling the high side drive circuit responsive to an unsafe voltage level on the gate of the power transistor.

5,552,747
DRIVER CIRCUIT COMPATIBLE WITH LOW SUPPLY VOLTAGES

Luciano Tomasini, Monza; Rinaldo Castello, Arcore, and Pierangelo Confalonieri, Canonica D'Adda, all of, Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Briarza, Italy

Continuation of Ser. No. 125,644, Sep. 23, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 457,759
Claims priority, application European Pat. Off., Sep. 23, 1992, 92830513
Int. Cl.[6] G05F *1/10;3/02*
U.S. Cl. 327—536 **28 Claims**

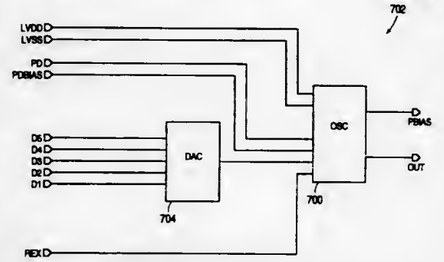


1. A clocked switch, in a CMOS integrated circuit, comprising:
a charge-pumping voltage doubler circuit, connected to be pumped by a first clock signal, and connected to provide therefrom a boosted positive voltage whenever said first clock signal is at a high level, said boosted voltage being greater than the maximum voltage of said first clock signal;
a CMOS logic gate, connected to be powered by said boosted voltage, and connected to receive, as a signal input, a second clock signal which is substantially complementary to said first clock signal; and
at least one switching transistor, having a gate connected to be driven by an output node of said logic gate.

5,552,748
DIGITALLY-TUNED OSCILLATOR INCLUDING A SELF-CALIBRATING RC OSCILLATOR CIRCUIT

Timothy G. O'Shaughnessy, Black Forest, Colo., assignor to American Microsystems, Inc., Pocatello, Id.

Filed Jun. 7, 1995, Ser. No. 479,299
Int. Cl.[6] H03B *5/24;* **H03L** *7/00*
U.S. Cl. 331—1 A **26 Claims**

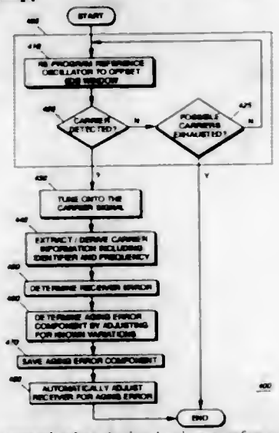


1. A digitally-tuned oscillator (DTO) comprising:
a switched-capacitor digital to analog converter (DAC); and
an RC oscillator coupled to the switched capacitor DAC.

5,552,749
METHOD FOR AUTOMATICALLY COMPENSATING FOR ACCURACY DEGRADATION OF A REFERENCE OSCILLATOR

Thomas M. Nowatski, Ft. Lauderdale, and Keith I. Zambrano, Delray Beach, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 26, 1995, Ser. No. 494,462
Int. Cl.[6] H03L *7/06;* **H04B** *1/40*
U.S. Cl. 331—14 **15 Claims**



1. In a communication device having a reference oscillator, a method for automatically compensating for accuracy degradation of the reference oscillator, comprising the steps off

programming the communication device with a first frequency value to detect a target carrier signal;

reprogramming the communication device with a second frequency value that is offset from the first frequency value by a particular offset factor, when the target carrier signal is not detected;

detecting an available carrier signal when the communication device is reprogrammed with the second frequency value;

determining relative location information for the available carrier signal; and

automatically adjusting the communication device to detect the target carrier signal using information derived from the relative location information and the particular offset factor.

5,552,750
METHOD AND APPARATUS FOR DETERMINING AN INSTANTANEOUS PHASE DIFFERENCE BETWEEN TWO SIGNALS

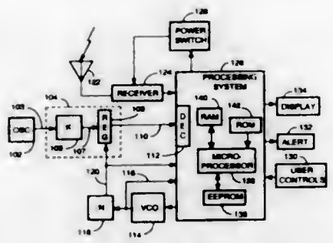
Raymond L. Barrett, Jr., Ft. Lauderdale; Barry W. Herold, Boca Raton, and Grazyna A. Pajunen, Delray Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 5, 1995, Ser. No. 523,665
Int. Cl.[6] H03L *7/091;7/18*
U.S. Cl. 331—25 **20 Claims**

1. A method of determining an instantaneous phase difference between a reference signal operating at a desired reference frequency and a controlled signal operating asynchronously at a controlled frequency, the method comprising the steps of:

deriving the reference signal by frequency dividing a first signal operating at a first frequency by a counter comprising an output having K sequential states, wherein K is an integer value equal to the first frequency divided by the desired reference frequency, and wherein the output changes by no more than one bit between any adjacent states of the K sequential states;

recording the output of the counter at a time concurrent with a first predetermined event occurring in the controlled signal,



100

thereby generating a recorded count value corresponding to a current state of the counter when the counter is not executing a change from the current state to a next sequential state at said time, and generating the recorded count value selected from (a)the recorded count value corresponding to the current state and (b) the recorded count value corresponding to the next sequential state, when the counter is executing a change from the current state to the next sequential state at said time;

decoding the recorded count value to produce a sequential state number S_E corresponding to the first predetermined event; and

determining the instantaneous phase difference (in degrees) to be equal to

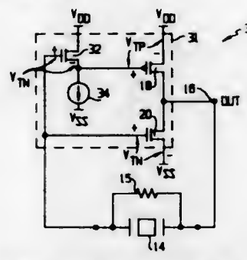
$$\frac{S_E - S_P}{K} \times 360,$$

wherein S_P is a predetermined sequential state number corresponding to a second predetermined event occurring in the reference signal.

5,552,751
LOW VOLTAGE, LOW POWER OSCILLATOR HAVING VOLTAGE LEVEL SHIFTING CIRCUIT

Russell E. Cooper, Chandler, Ariz., assignor to Microchip Technology Inc., Chandler, Ariz.

Filed Jun. 6, 1995, Ser. No. 469,176
Int. Cl.[6] H03B *5/36;5/06*
U.S. Cl. 331—116 FE **14 Claims**



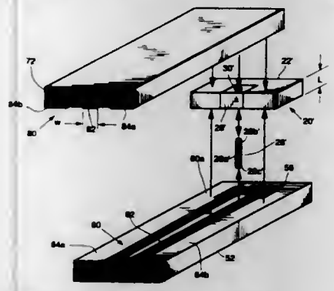
1. An oscillator circuit for providing an output signal that oscillates at a predetermined frequency, the oscillator circuit including an inverter circuit that is coupled across first and second terminals of a resonant circuit, the inverter circuit including first and second transistors having common drain electrodes coupled to the output of the oscillator circuit and to the second terminal of the resonant circuit, the source electrodes of the first and second transistors respectively coupled to first and second supply voltage terminals, the gate electrode of one of the transistors coupled to the first terminal of the resonant circuit, the improvement comprising:

circuit means coupled between the first terminal of the resonant circuit and the gate electrode of the other transistor for level shifting the voltage applied to the gate electrode of the other transistor relative to the voltage applied to the gate electrode of the one transistor to maintain the first and second transistors active and thereby allow the oscillator circuit to start-up and operate at relatively low supply voltages.

5,552,752
MICROWAVE VERTICAL INTERCONNECT THROUGH CIRCUIT WITH COMPRESSIBLE CONDUCTOR

Rick L. Sturdivant, La Mirada, and Clifton Quan, Arcadia, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 2, 1995, Ser. No. 458,839
Int. Cl.[6] H01P *3/02;1/04;5/00*
U.S. Cl. 333—243 **18 Claims**



1. A microwave transmission line, comprising:

an electrically conductive trough member, said trough member defining a trough;

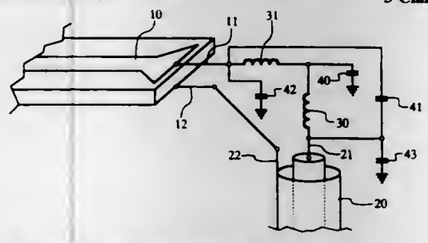
a dielectric filler element disposed within said trough, said dielectric element having formed therein an opening extending from a first end of said trough to a second end of said trough; and

a center conductor disposed within said opening, said center conductor including (i) a first compressible conductor member, said compressible conductor member formed of thin metal wire densely packed within said opening, said compressible conductor member including a first end protruding from said opening at said first trough end by a contact dimension to form a first compressible contact and (ii) a rigid conductor member disposed within said opening to define a dielectric-filled trough transmission line portion, said rigid conductor member having a first end in a compression fit with said first end of said compressible element.

5,552,753
COAX-TO-MICROSTRIP TRANSITION

Krishna K. Agarwal, Plano, and Richard R. Harlan, Wylie, both of Tex., assignors to E-Systems, Inc., Dallas, Tex.

Continuation of Ser. No. 95,542, Jul. 26, 1993. This application Dec. 28, 1994, Ser. No. 365,238
Int. Cl.[6] H03H *7/38;* **H01P** *5/00*
U.S. Cl. 333—33 **3 Claims**



3. A coaxial-to-microstrip transition, comprising:

a coaxial line having a center conductor extending beyond an end of a ground conductor shield of said coaxial line;

a microstrip line positioned on a dielectric substrate including a microstrip signal line and a microstrip ground line;

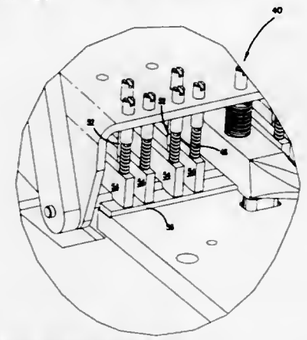
a bond wire connecting said microstrip signal line to said center conductor, said bond wire having a first end electrically connected to said microstrip signal line and a second end at least partially wrapped around said center conductor; and

said microstrip ground line terminating on the dielectric substrate at the same point as, and in electrical contact with, the end of said ground conductor shield of said coaxial line.

5,552,754
CATCH FOR ELECTRICAL CONTACT UTILIZING ELECTROMAGNETIC FORCES

Nadir Sharaf, Mounds View, Minn., assignor to Onan Corporation, Minneapolis, Minn.

Filed Jun. 5, 1995, Ser. No. 469,008
Int. Cl.[6] H01H *75/00*
U.S. Cl. 335—16 **12 Claims**



1. An electric switch, comprising:

a plurality of moveable contacts;

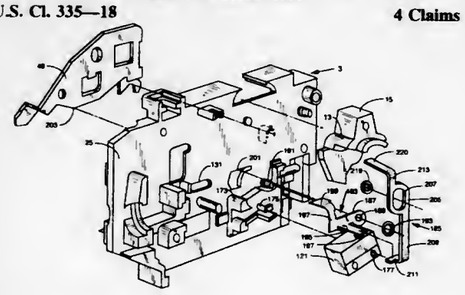
a plurality of stationary contacts which are contacted by the moveable contacts in a closed position; and

a plurality of locking pins, each locking pin being disposed between each of two adjacent moveable contacts, the locking pin being spaced apart from the moveable contacts in a normal closed position, the locking pin being engaged by the two adjacent moveable contacts when a "fault" current passes through the moveable contacts and the stationary contacts.

5,552,755
CIRCUIT BREAKER WITH AUXILIARY SWITCH ACTUATED BY CASCADED ACTUATING MEMBERS

Joseph P. Fello, Penn Hills Twp., and Michael J. Whipple, New Sewickley, both of Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 11, 1992, Ser. No. 943,803
Int. Cl.[6] H01H *73/00*
U.S. Cl. 335—18 **4 Claims**



1. A circuit breaker comprising:
a circuit breaker mechanism including:
a fixed contact;
a contact arm;
a movable contact secured to one end of said contact arm and movable by said contact arm toward and away from said fixed contact to close and open said contacts;
a pivotally mounted operating member engaging another end of said contact arm for moving, and for movement by, said contact arm between off/open and on/closed positions of said operating member and said contacts respectively, said operating member having an integral handle and a cam surface having a contour;
a pivotally mounted latchable cradle;
a spring connecting said latchable cradle and contact arm; and
a trip device latching said cradle in a latched position and unlatching said cradle in response to preset current conditions, said cradle tripping said contact arm to open said contacts and move said operating member to a tripped position when unlatched;
an auxiliary switch having a plunger;
actuating means including a first actuating member engaging said cradle and actuating said auxiliary switch when said cradle is unlatched, and a second actuating member bearing against said cam surface on said operating member, said cam surface having a contour which actuates and said auxiliary switch through said second actuating member when said operating member, and said integral handle, are in the off position, said first and second actuating members being cascaded to operate said plunger; and
a housing with first and second compartments separated by a partition, wherein said contacts, said contact arm, said spring, said cradle, and said trip device are mounted in said first compartment, and said auxiliary switch is mounted in said second compartment, wherein said operating member extends into both compartments with said cam surface located in said second compartment, said partition having an opening through which said first actuating member extends to engage said cradle and wherein said second actuating member is mounted in said second compartment to engage said camming surface and actuate said auxiliary switch.

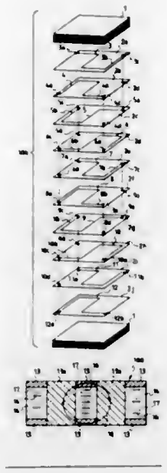
5,552,756

CHIP-TYPE COMMON MODE CHOKE COIL

Tomaoki Ushiro, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Jan. 12, 1994, Ser. No. 180,216
Claims priority, application Japan, Jan. 13, 1993, 5-022148
Int. Cl.[6] H01F *5/00*
U.S. Cl. 336—200 **4 Claims**

1. A chip type common mode choke coil, comprising:
a non-magnetic member including a plurality of laminated non-magnetic sheets and a plurality of conductor lines formed on each of said laminated non-magnetic sheets, respectively;
primary and secondary coils including a plurality of conductor lines formed on each of said laminated non-magnetic sheets, respectively, said plurality of conductor lines being connected to each other inside said non-magnetic member;
a pair of magnetic layers arranged on upper and lower surfaces of said non-magnetic member, respectively; and
magnetic cores arranged substantially at the centers of loops of said coils, said magnetic cores penetrating said non-magnetic member and being connected to said pair of magnetic layers to form a closed magnetic path which crosses said primary and secondary coils.

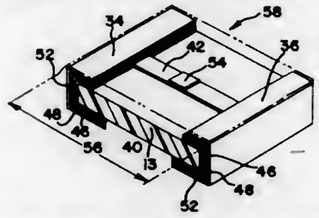


5,552,757

SURFACE-MOUNTED FUSE DEVICE

Vladimir Blecha, Aurora; Katherine M. McGuire, Clarendon Hills; Andrew J. Neuhalfen, Algonquin, and Daniel B. Onken, Centralia, all of Ill., assignors to Littelfuse, Inc., Des Plaines, Ill.

Filed May 27, 1994, Ser. No. 247,584
Int. Cl.[6] H01H *71/20;85/04;69/02*
U.S. Cl. 337—297 **17 Claims**



1. A thin film surface-mount fuse, said fuse comprising two material subassemblies:
a. the first subassembly comprising a fusible link, a supporting substrate and terminal pads with a plurality of conductive terminal pad layers, the supporting substrate having an upper surface, lower surface and opposing side surfaces, a first of the plurality of conductive terminal pad layers and the fusible link formed as a single-continuous layer and extending across the upper surface of transporting substrate, the first of the conductive terminal pad layers further extending over at least a part of the opposing side surfaces and terminating on the lower surface of the substrate; and,
b. the second subassembly comprising a single protective layer which overlies the fusible link so as to provide protection from impacts and oxidation.

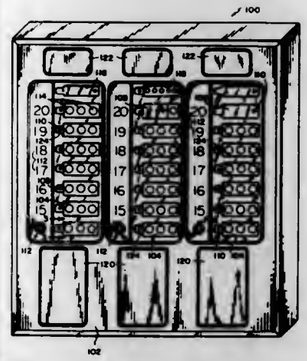
5,552,758

DARTS SCOREBOARD

Robert E. Tobin, 65 Still River Rd., P.O. Box 243, Bolton, Mass. 01740

Continuation of Ser. No. 906,684, Jun. 30, 1992, abandoned.
This application Jun. 7, 1995, Ser. No. 478,430
Int. Cl.[6] F41J *3/00*
U.S. Cl. 340—323 R **22 Claims**

17. A darts scoreboard suitable for use with a darts game comprising:



a front panel;
a plurality of horizontal openings in said panel vertically aligned on said front panel;
an indicator panel supported behind said front panel and having three indicator windows horizontally spaced across each of said openings;
a horizontal track adjacent each of said horizontal openings; and
a slide bar sitting in each of said horizontal tracks and reciprocally movable horizontally along the track from a position substantially behind said panel in which the three indicator windows behind the opening adjacent the track are visible from in front of said panel to positions along said track which progressively cover said three indicator windows, the slide bat capable of keeping score of the darts game by movement of the bar along the track.

5,552,759

ELECTRONIC SYSTEM FOR DETECTING VEHICLE WHEEL THEFT

David S. Stoyka, 27050 Cedar Rd., Apt. No. 212, Beachwood, Ohio 44122

Filed Nov. 2, 1994, Ser. No. 333,406
Int. Cl.[6] B60R *25/10;* **G08B** *13/14*
U.S. Cl. 340—426 **33 Claims**

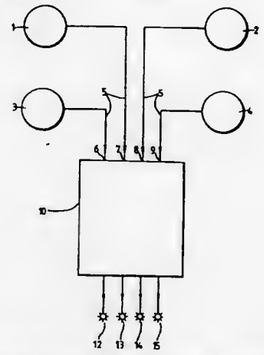
1. An alarm system for detecting unauthorized removal from a vehicle of a wheel item such as a wheel hub, a wheel assembly and a wheel accessory, the alarm system comprising:
a sensing device having a secured state when the wheel item is installed on the vehicle, and an unsecured state when the wheel item is removed from the vehicle;
alarm transmitting means, connected to the sensing device, for initiating a radio frequency (RF) alarm signal when the sensor changes from the secured state to the unsecured state; and
receiving means, located remotely from the alarm transmitting means, for generating an alarm triggering signal when the alarm transmitting means initiates the RF alarm signal.

5,552,760

METHOD OF DETECTING A DEFLATED TIRE ON A VEHICLE

David Jones, Lichfield, England, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan

Filed Oct. 3, 1994, Ser. No. 316,488
Claims priority, application United Kingdom, Oct. 9, 1993, 9320821
Int. Cl.[6] B60C *23/00*
U.S. Cl. 340—444 **33 Claims**



1. A method of detecting a deflated tire on a vehicle comprising the steps of:
rotating each tire of the vehicle;
providing one wheel speed sensor for each of the tires;
detecting the angular velocity speed of the tires by the wheel speed sensors;
comparing the rolling radii of the tires by means of comparing angular velocity speed signals C1, C2, C3 and C4 from wheel speed sensors one at the left-hand front, right-hand front, left-hand rear and right-hand rear wheel positions respectively, characterized by calculating in normal driving an error value (DEL') where

$$DEL' = \frac{[(C1 + C4)/2 - (C2 + C3)/2]}{(C1 + C2 + C3 + C4)/4} \times 100,$$

determining a correction factor (LAT), by calculating from the four angular velocity values C1, C2, C3 and C4 respective first, second, third and fourth deciding factors (MC1, MC2, MC3, MC4) where
MC1=C1
MC2=C2/[C2+C4)/(C1+C3)]
MC3=C3/[(C3+C4)/(C1+C2)]
MC4=C4/[(C2+C4)/(C1+C3)]×[(C3+C4)/(C1+C2)]],
then summing the four deciding factors and multiplying this sum by a centralizing constant (K) to give a central deciding factor (MPSD) and selecting the correction factor (LAT) as follows, if the first or second deciding factor (MC1 or MC2) is greater than the central deciding factor (MPSD) then

$$LAT = 2\times(C3-C4)\times(C1+C2+C3+C4),$$

if the third or fourth deciding factor (MC3 or MC4) is greater than the central deciding factor (MPSD) then

$$LAT = 2\times(C1-C2)\times(C1+C2+C3+C4),$$

or if none of the deciding factors (MC1, MC2, MC3 or MC4) is greater than the central deciding factor (MPSD) then

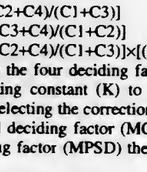
$$LAT = (C1+C3-C2-C4)\times(C1+C2+C3+C4);$$

determining vehicle related constants A, B, C for clockwise cornering and E, F, G for anti-clockwise cornering by a setup procedure from sets of values (SV1–SVn n=2,3,4 . . .) of C1–C4 obtained by driving the vehicle respectively clockwise and anti-clockwise with its four tires inflated to their normal scheduled pressure around a circle at a plurality of n constant speeds;

calculating a corrected error signal (DEL) wherein

5,552,764

ALARM DETECTING SYSTEM FOR REDUNDANCY



calculating a corrected error signal (DEL) wherein

DEL=DEL'−DELCOR

where DELCOR=(E×LAT)+(F×LAT^2)+(G×LAT^3) if the sign of the correction factor LAT is negative, or

DELCOR=(A×LAT)+(B×LAT^2)+(C×LAT^3) if the sign of the correction factor LAT is positive;

outputting a warning signal when a magnitude of the corrected error signal is in the range 0.05 to 0.5; and

operating a tire warning indicator provided in the vehicle indicating that at least one tire is deflated when said warning signal is output.

5,552,761

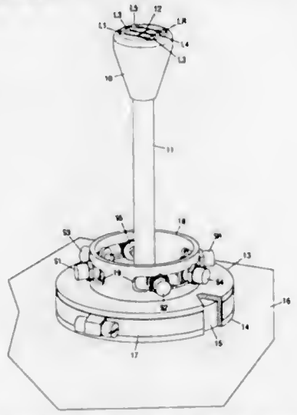
GEAR SELECTION INDICATOR FOR MANUAL TRANSMISSIONS

Thomas V. Kazyaka, P.O. Box 1161, Gualala, Calif. 95445

Filed Mar. 27, 1995, Ser. No. 411,298

Int. Cl.^{6} B60Q *1/00*

U.S. Cl. 340—456 **4 Claims**



1. A gear selection indicator for a vehicle having a manual transmission and a shift lever movable to a plurality of gear positions in a predetermined pattern, comprising:

a knob adapted to be mounted on top of said shift lever;

a plurality of lights arranged on top of said knob in said pattern, each of said gear positions being represented by only one of said lights in a corresponding position in said pattern, only one of said lights being operable at any time for indicating a corresponding gear position;

a frame positioned around a lower end of said shift lever, said frame having a horizontal slot; and

a plurality of switches arranged within said slot, each of said switches being movable laterally along said slot so that said switches are adjustable in lateral spacing from each other, each of said switches controlling only one of said lights, each of said switches being adapted to be engaged by said shift lever at a different one of said gear positions for activating a corresponding light.

5,552,762

WARNING DEVICE FOR LOGICALLY CONTROLLING HEADLIGHTS OF A MOTOR VEHICLE

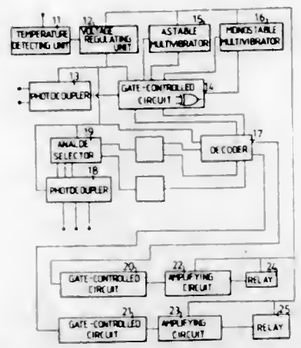
Ching Y. Tsai, P.O. Box 82-144, Taipei, Taiwan

Filed Jul. 29, 1994, Ser. No. 282,650

Int. Cl.^{6} B60Q *1/26;1/02*

U.S. Cl. 340—468 **5 Claims**

1. A warning device for logically controlling headlights of a motor vehicle comprising a photocoupler which picks up a first signal voltage from a circuitry from a horn and triggers an astable multivibrator via a gate-controlled circuit to output a second signal voltage in a predetermined time to a monostable multivibrator which outputs a continuous time-sequencing pulses to an encoding input of a decoder via the gate-controlled circuit thereby causing said decoder to produce a sequential output, said sequential output being divided by a multi-input gate-controlled circuit into two output voltages which are amplified by transistors to drive two relays connected with high beam light and low beam light thus making the high beam light and the low beam light to give light alternately.



5,552,763

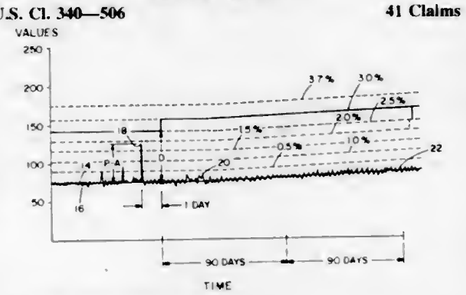
FIRE ALARM SYSTEM WITH SENSITIVITY ADJUSTMENT

Ronald H. Kirby, Harvard, Mass., assignor to Simplex Time Recorder Company, Gardner, Mass.

Filed Nov. 10, 1993, Ser. No. 150,696

Int. Cl.^{6} G08B *29/00*

U.S. Cl. 340—506 **41 Claims**



1. A fire alarm system comprising:

a fire sensor providing a sensor signal for monitoring an environmental condition; and

a processor which indicates an alarm condition when the sensor signal exceeds an alarm threshold, the alarm threshold being variable by the processor to adjust sensitivity of the alarm system to the sensor signal, the processor automatically adjusting the threshold over time responsive to individual sensor signal peak values while monitoring for an alarm condition.

5,552,764

ALARM DETECTING SYSTEM FOR REDUNDANCY CONFIGURATION CIRCUIT

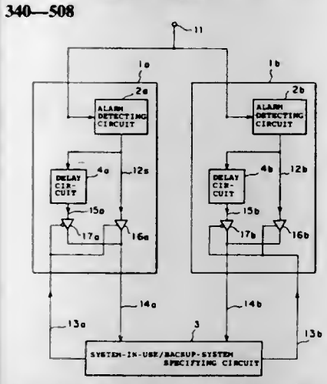
Hideyuki Tsujimoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1993, Ser. No. 8,136

Claims priority, application Japan, Feb. 3, 1992, 4-046367

Int. Cl.^{6} G08B *29/16*

U.S. Cl. 340—508 **2 Claims**



1. An alarm detecting system suitable for use in a redundancy configuration circuit, comprising:

at least two receiving circuits which respectively output alarm detection signals and is constructed in such a manner that one of said at least two receiving circuits serves as a system in use while the other of said at least two receiving circuits serves as a backup system; and

a system-in-use/backup-system specifying circuit used to reset one of said at least two receiving circuits which is serving as a system in use as a backup system and to reset the other of said at least two receiving circuits as a system in use when an alarm detection signal is first received by said specifying circuit from said one of said at least two receiving circuits serving as a system in use,

wherein each of said at least two receiving circuits includes a delay circuit for delaying only said alarm detection signal received by one of said at lest two receiving circuits serving as a system in use and for supplying said alarm detection signal to said system-in-use/backup-system specifying circuit.

5,552,765

SMOKE DETECTOR WITH INDIVIDUALLY STORED RANGE OF ACCEPTABLE SENSITIVITY

Burton W. Vane, Fairport, and David B. Lederer, Sodus Point, both of N.Y., assignors to Detection Systems, Inc., Fairport, N.Y.

Filed Jul. 12, 1993, Ser. No. 89,539

Int. Cl.^{6} G08B *29/00;17/10*

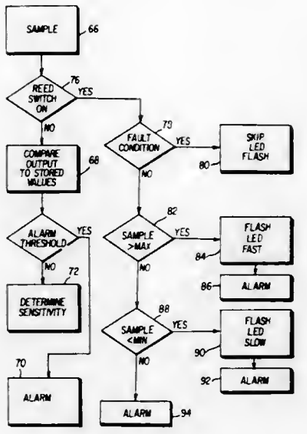
U.S. Cl. 340—515 **5 Claims**

5. A method of testing an individual smoke detector after installation for operation within an acceptable range of sensitivities, said method comprising:

storing in said individual detector, unchanged throughout the operation of said detector, empirically determined measures of an acceptable range of sensitivities;

providing an output of said detector characteristic of the level of atmospheric obscuration at the location of the detector;

testing the detector by comparing said output to said measures and issuing an out of range signal when said output is not within said range.



5,552,766

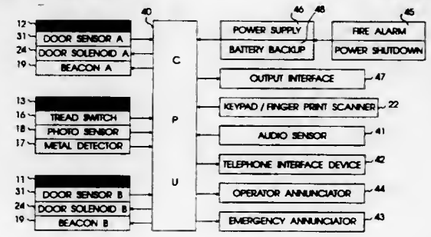
ANTI-CRIME SECURITY SYSTEM

Jung K. Lee, and Yong H. Lee, both of 2209 Old Bosley Rd., Timonium, Md. 21093

Filed Feb. 17, 1994, Ser. No. 197,888

Int. Cl.^{6} G08B *13/00*

U.S. Cl. 340—541 **20 Claims**



1. An anti-crime security system, comprising:

access means for providing an entrance and an exit to an establishment and for defining an enclosed area;

sensor means for monitoring ingress and egress of a perpetrator through said access means and conditions within said establishment; and

central processing means for receiving input from said sensor means regarding the ingress and egress of the perpetrator and the conditions within said establishment and for controlling said access means such that when the perpetrator is inside the establishment and then a warning status is established, the perpetrator must reenter the enclosed area in order to exit the establishment, wherein the enclosed area is bounded by inner and outer doors which are automatically locked when the perpetrator reenters the enclosed area, whereupon an operator of said anti-crime security system controls a locking mechanism of the inner and outer doors, and the perpetrator cannot exit the enclosed area if a control panel of said anti-crime security system is disabled or the operator of said anti-crime security system is disabled or killed.

5,552,767

ASSEMBLY FOR, AND METHOD OF, DETECTING AND

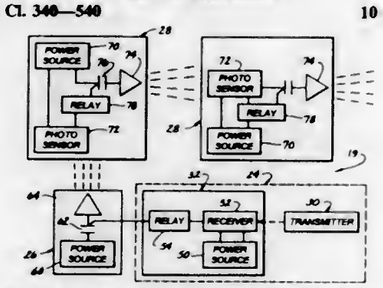
block, said suction cup being mounted with said jamming tip tilted slightly toward said suction cup to assure said jamming

electrical path from the first, sensor end of the cable to the second end of the cable; and

5,552,767
ASSEMBLY FOR, AND METHOD OF, DETECTING AND SIGNALLING WHEN AN OBJECT ENTERS A WORK ZONE

John R. Tomaa, 1202 Orchard Village La., Manchester, Mo. 63021

Filed Feb. 14, 1994, Ser. No. 194,931
Int. Cl.[6] G08B *21/00*
U.S. Cl. 340—540 **10 Claims**



1. An apparatus for visually warning personnel within a work zone when an object breaches the work zone perimeter, said apparatus comprising:

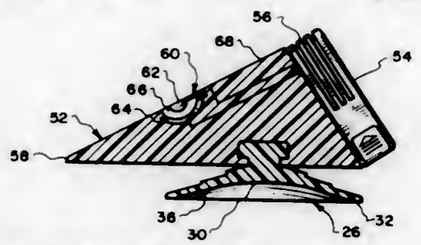
a detector for detecting said object along a section of the perimeter; and

an optical signalling device activated by said detector when said object is detected to thereby visually warn personnel within said work zone, said optical signalling device comprising an array of strobes including a primary strobe and a plurality of relay strobes connected in cascade from said primary strobe, said detector having means for activating said primary strobe, said primary strobe having means for activating at least one of said relay strobes, each strobe flashing visible light at a predetermined flash rate, and each of said relay strobes including a photo sensor for sensing said flash rate from either said primary strobe or another relay strobe to thereby activate at least one of said relay strobes.

5,552,768
PORTABLE WINDOW WEDGE WITH ALARM

Andrew Mikiel, 1142 Manhattan Ave. #151, Manhattan Beach, Calif. 90266, and Karen Usevitch, 3454 Camden Ct., Palmdale, Calif. 93551-3552

Filed Nov. 30, 1994, Ser. No. 347,649
Int. Cl.[6] G08B *13/08*
U.S. Cl. 340—546 **10 Claims**



1. A portable device for locking sliding windows and the like comprising;

a resilient triangular block having a horizontal surface and an oblique surface tapering to a jamming tip;

temporary fastening means integrally mounted on said horizontal surface for mounting said resilient triangular block on a vertical planar glass surface to allow mounting and removal quickly and easily;

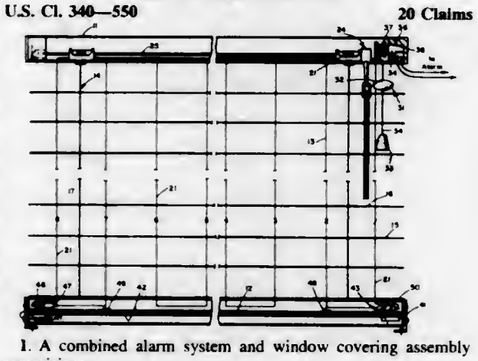
said temporary fastening means comprising a suction cup secured to said horizontal surface of said resilient triangular block, said suction cup being mounted with said jamming tip tilted slightly toward said suction cup to assure said jamming tip intercepts the frame of a sliding window when installed;

whereby said resilient triangular block can be mounted on the surface of a sliding glass window to intercept the frame and lock said sliding glass window closed or in a partially open position.

5,552,769
COMBINED ALARM SYSTEM AND WINDOW COVERING ASSEMBLY

Dennis E. Riordan, 759 Zena HighWoods Rd., Kingston (Woodstock), N.Y. 12401

Continuation-in-part of Ser. No. 920,837, Jul. 28, 1992, Pat. No. 5,440,289, which is a continuation-in-part of Ser. No. 831,861, Feb. 5, 1992, Pat. No. 5,274,357. This application Mar. 15, 1993, Ser. No. 33,205
The portion of the term of this patent subsequent to Dec. 28, 2010, has been disclaimed.
Int. Cl.[6] G08B *13/08;13/12*
U.S. Cl. 340—550 **20 Claims**



1. A combined alarm system and window covering assembly comprising:

a. a top housing;

b. a bottom rail having two ends;

c. a covering mechanically coupled to said top housing and said bottom rail;

d. an alarm element extending from said top housing down to said bottom rail and up from said bottom rail to said top housing whereby said alarm element functions as a pull cord for raising and lowering said bottom rail; and

e. two resiliently biased reed relay switches each of which is mechanically coupled to one of said two ends of said bottom rail and coupled to said alarm element.

5,552,770
GLASS BREAK DETECTION USING MULTIPLE FREQUENCY RANGES

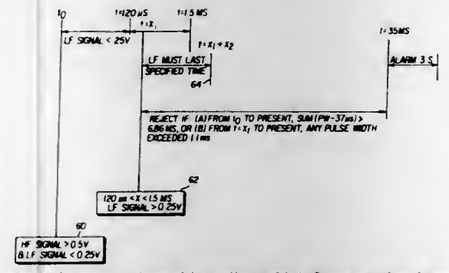
Richard L. McMaster, Rochester, N.Y., assignor to Detection Systems, Inc., Fairport, N.Y.

Division of Ser. No. 225,116, Apr. 8, 1994, Pat. No. 5,450,061. This application Mar. 10, 1995, Ser. No. 402,299
Int. Cl.[6] G08B *13/00*
U.S. Cl. 340—550 **17 Claims**

1. Apparatus for detecting glass breaking from an impact; said apparatus comprising:

a wide-band transducer for converting sound and pressure waves, characteristic of the impact, glass flexing and glass shattering, into electrical signals;

a low-frequency channel including a low frequency band-pass filter and a threshold detector for detecting signals from the transducer characteristic of the glass flexing from the impact;



a high-frequency channel including a high frequency band-pass filter and a threshold detector for detecting signals from the transducer characteristic of a) sound of the impact and b) the glass shattering;

a timing-signal generator monitoring said low and high frequency channels and responsive to the detection of said low and high frequency signals for determining first and second time intervals, said first time interval beginning with detection of the sound of the impact and continuing through the flexing and the shattering of the glass, the second time interval beginning after the flexing of the glass and continuing through the shattering of the glass;

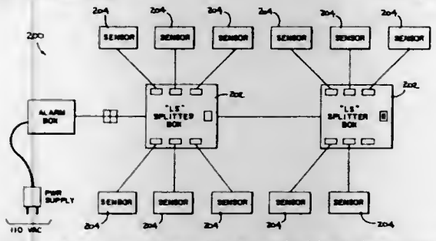
means for analyzing the detected high frequency signals based on a sum of pulse widths over said first time interval and individual pulse widths over said second time interval; and,

means for issuing an alarm signal only when: a) said low frequency signals are first detected not before said detection of said high frequency signals; and b) said sum of pulse widths is less than a predetermined value indicative of the sound of the impact followed by the glass shattering, and the individual pulse widths are less than a predetermined value indicative of the glass shattering.

5,552,771
RETRACTABLE SENSOR FOR AN ALARM SYSTEM

Roger J. Leyden, 11303 German Church Rd., Willow Springs, Ill. 60480, and Terrance J. Surma, 265 Oxford La., Bloomingdale, Ill. 60108

Filed Jun. 10, 1994, Ser. No. 258,663
Int. Cl.[6] G08B *13/14*
U.S. Cl. 340—568 **11 Claims**



1. A retractable sensor assembly, as used with an alarm system, comprising;

a housing;

means for retraction contained in said housing;

a sensor having two states, 1) secured when attached to a product and 2) unsecured when detached from said product, said sensor being outside the housing;

a multiconductor cable, having a first end attached to the sensor then extending into the housing, cooperating with the retraction means and a second end extending out of the housing;

said retraction means urging the cable into the housing and thereby urging the sensor to the retraction means, yet allowing the sensor to be pulled from the housing when an external force is exerted on the sensor, while maintaining a continuous electrical path from the first, sensor end of the cable to the second end of the cable; and

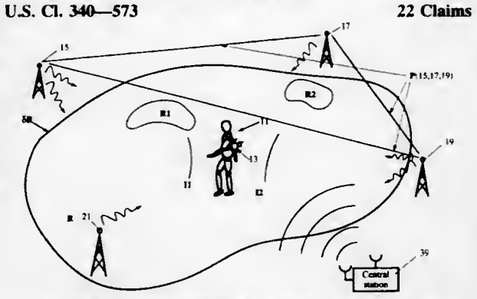
means for connecting said second end of the cable to an alarm system able to detect if said sensor is in the secured or unsecured state,

whereby a user can grasp and pull on a product attached to the sensor to place the product in a comfortable position, but if the user detaches the product from the sensor the alarm system detects the unsecured state.

5,552,772
LOCATION OF EMERGENCY SERVICE WORKERS

James M. Janky, Los Altos, and John F. Schipper, Palo Alto, both of Calif., assignors to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Dec. 20, 1993, Ser. No. 171,552
Int. Cl.[6] G08B *23/00*
U.S. Cl. 340—573 **22 Claims**



1. A method for monitoring the location of a general service worker or emergency service worker at a designated site, the method comprising the steps of:

selecting a designated site where the general or emergency service worker will perform services;

positioning a location-determining (LD) unit on the body or the garments of the worker, the LD unit including an antenna and receiver/processor for receiving a sequence of radiowave signals from three or more spaced apart electromagnetic signal transmitters whose transmitter locations are known with high accuracy, where these electromagnetic signals contain information that allows the present location of the LD unit to be determined, where the carrier frequencies of at least three of the electromagnetic signals are chosen so that these signals can be received, within a building-like structure having at least one aperture as well as outside such a structure, without substantial signal attenuation or distortion;

providing attachment means for attaching the LD unit to at least one of the worker's body and the worker's garments so that the LD unit does not interfere with performance of the worker's services;

providing a central station, having a signal receiver and processor, a signal transmitter, and an electronically sensible map of a selected portion of the Earth's surface that includes the coordinates of the designated site;

providing the LD unit with a sequence of two or more selected, spaced apart interrogation times;

causing the LD unit receiver/processor to determine the present location of the LD unit and to transmit information on the LD unit's present location to the central station receiver at the sequence of selected interrogation times;

combining means connected to the outlets of the gas flow paths

5,552,777

causing at least one of the central station and the LD unit to determine the coordinates of the present location of the LD unit and to compare these coordinates with the coordinates of the designated site; and

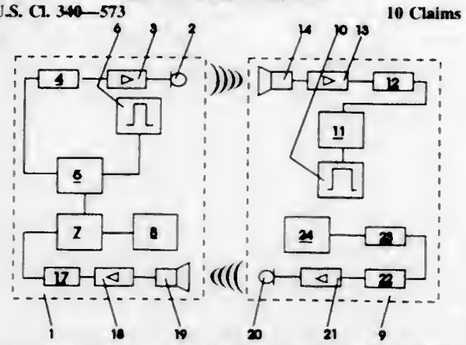
causing the central station transmitter to communicate an alarm signal, which is perceptible by at least one person other than the worker at the designated site, if/at least one] any of the following conditions is present: (i) the present location of the LD unit is not within the designated site for at least one of the interrogation times; (ii) the central station does not receive transmitted information on the present location of the LD unit for at least K consecutive interrogation times, where K is a selected integer ≥ 1; (iii) the present location of the LD unit, as sensed by the central station, changes by less than a selected threshold amount during a time interval of selected time interval length Δt_{change} that includes at least two consecutive interrogation times for the LD unit; (iv) the LD unit receives an interrogation signal requesting information on the present location of said LD unit; and (v) the accumulated time, during which the present location of the LD unit is within a selected sub-region of the designated site, exceeds a selected time $\Delta t_{exposure}$.

5,552,773

METHOD AND APPARATUS FOR THE PROTECTION OF PEOPLE OR OBJECTS

Eduard Kühnert, Sauerbreystrasse 44, 42697 Solingen, Germany

Filed Nov. 23, 1994, Ser. No. 347,139
Int. Cl.° G08B *13/22;21/00*
U.S. Cl. 340—573 **10 Claims**



1. A method of protecting people or objects by which an alarm signal is triggered in case of a prohibited approach or removal of people or objects comprising the steps of transmitting a signal, by a transmitter to a receiver determining therefrom a distance signal representative of the distance between the transmitter and the receiver; blocking the actuation of an alarm signal until the distance signal is decreased to or exceeds a predetermined value, or the transmission between the transmitter and the receiver is interrupted; and the method being characterized in that the distance signal causes a corresponding variation in pitch or volume of the actuated alarm signal.

5,552,774

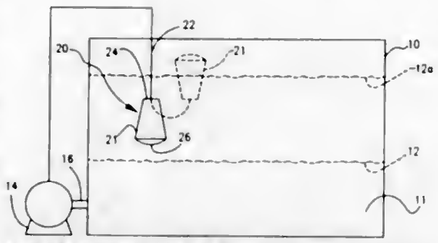
MAGNETICALLY ACTIVATED FLOAT SWITCH

R. F. Gridley, 17353 Castile Rd., Fort Myers, Fla. 33912

Filed Jun. 10, 1994, Ser. No. 258,504
Int. Cl.° G08B *21/00*
U.S. Cl. 340—623 **17 Claims**

1. A magnetically activated float switch apparatus for opening and closing an electrical circuit in response to a predetermined change in the level of the liquid, said apparatus comprising:

a float element having an interior chamber;



a capsule mounted within said chamber;

an elongate, generally bar-shaped permanent magnet mounted in said capsule and being slidable between first and second positions therein;

switching means mounted in said chamber adjacent and parallel to said capsule and electrically connected to said electrical circuit, said switching means being responsive to said permanent magnet in said first position for maintaining a first state and responsive to said permanent magnet in said second position for maintaining an opposite second state, one of said states being open and the other being closed;

suspension means attached to said float element for holding said float element upright when the liquid is below a known level such that said magnet is in said first position and said switching means are in said first state; and

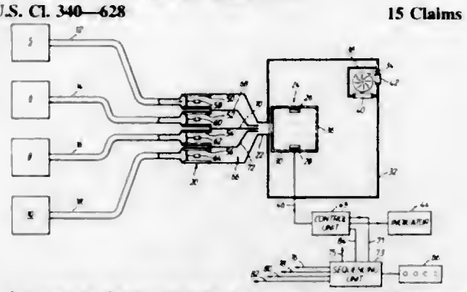
weight means attached to said float element for causing said float element to tip in the liquid when the liquid is at or above the known level such that said magnet shifts from said first position to said second position and said switching means switch to said second state, said chamber including a cylindrical portion and an adjoining, generally conical portion and in which said weight means include a cylindrical element that is received in a close tolerance fit within said cylindrical portion of said chamber, said cylindrical element including an axial bore that receives said permanent magnet capsule and said switching means, said permanent magnet capsule and said switching means being encased in an epoxy-like substance.

5,552,775

GASEOUS FLUID HANDLING APPARATUS

Philip E. Harley, Newcastle-upon-Tyne, United Kingdom, assignor to Kidde-Fenwal, Inc., Ashland, Mass.

Filed Apr. 25, 1994, Ser. No. 232,673
Claims priority, application United Kingdom, Apr. 30, 1993, 9308965
Int. Cl.° G08B *17/107*
U.S. Cl. 340—628 **15 Claims**



1. Apparatus for detecting the presence of particles in gaseous fluid derived from a plurality of monitored areas, comprising

a plurality of separate gaseous flow means defining separate gas flow paths each having an inlet for receiving gaseous fluid from a respective one of the monitored areas and each having a respective outlet,

combining means connected to the outlets of the gas flow paths of the gaseous flow means and combining the paths into a single outlet path,

particle detecting means connected to detect the presence of particles in gas flowing in the outlet path and to produce an output signal dependent thereon,

main gas flow producing means operative when energized for causing the simultaneous flow of gaseous fluid through all of the separate gas flow paths from the inlets thereof and through the single outlet path to the particle detecting means,

a respective individual gas flow producing means located in each flow path between its inlet and its outlet and operative when energized to cause the flow of gaseous fluid from the inlet to the outlet of that flow path and thence through the outlet path and to the particle detecting means, and

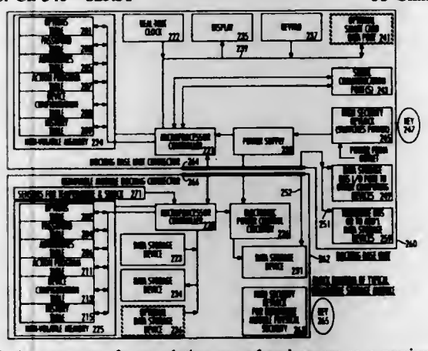
control means operative, when activated, to selectively and individually energize the individual gas flow producing means while maintaining the main gas flow producing means unenergized, whereby to enable any selected one of the flow paths to be connected to the outlet path in preference to the other or others.

5,552,776

ENHANCED SECURITY SYSTEM FOR COMPUTING DEVICES

Jack Wade, La Jolla, Calif.; William K. Szaroletta, Des Moines, Iowa, and Thomas R. Madden, San Diego, Calif., assignors to Z-Microsystems, Carlsbad, Calif.

Continuation of Ser. No. 763,915, Sep. 23, 1991, abandoned. This application Jun. 24, 1994, Ser. No. 265,517
Int. Cl.° G06F *7/04*
U.S. Cl. 340—825.31 **35 Claims**



1. An apparatus for regulating use of and access to a particular portable computing device in association with other computing devices, at least some of the computing devices including the portable computing device having a unique identifier stored within the computing device and having means for providing the unique identifier to other computing devices, the apparatus including:

a. an electronic means, configured to be coupled to the portable computing device and at least one power supply, for selectively enabling at least portions of the portable computing device;

b. a memory for storing system parameters indicative of whether selected other computing devices and users are authorized to use and access the portable computing device;

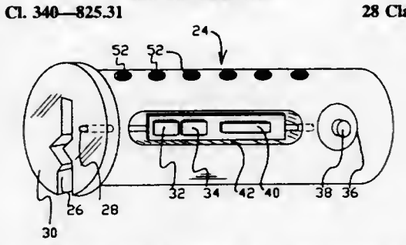
c. a controller coupled to the electronic means for enabling at least portions of the portable computing device and receiving system parameters from the memory and causing the electronic means to enable the portions of the computing device if one of a permitted group of the other computing devices or a user is attempting to use the portable computing device, and the system parameters indicate that such other computing device or user is authorized to use the portable computing device.

5,552,777

MECHANICAL/ELECTRONIC LOCK AND KEY

Asil T. Gokcebay, San Francisco, and Yucel K. Keskin, Santa Clara, both of Calif., assignors to Security People, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 836,206, Feb. 14, 1992, Pat. No. 5,367,295. This application Nov. 21, 1994, Ser. No. 342,846
Int. Cl.° G06F *7/04*
U.S. Cl. 340—825.31 **28 Claims**



1 A lock and key with a mechanical lock configuration as well as an electronic security feature comprising:

a lock including a metal lock cylinder for releasing the lock, the lock cylinder comprising

(a) a cylinder shell,

(b) a cylinder plug rotatable within the cylinder shell and having a keyway,

(c) a series of mechanical locking elements acting between the cylinder plug and the cylinder shell, and having a specific mechanical bitting pattern,

(d) a blocking pin independent of the mechanical locking elements positioned in a bore of the cylinder plug for in and out reciprocal movement in the bore and being contained essentially within the bore of the cylinder plug in a retracted condition and extending partially outwardly from the bore of the cylinder plug in a blocking condition,

(e) a recess in the interior of the cylinder shell, positioned such that the blocking pin will engage in the recess in said blocking condition to prevent rotation of the cylinder plug,

(f) electromagnetic release means in the cylinder plug for retracting the blocking pin to the retracted condition upon communication of electrical power to the electromagnetic release means, and means for normally holding the blocking pin in the blocking condition, when electrical power is not communicated to the electromagnetic

(g) electrical conductive path means, including an external contact isolated from the metal of the lock cylinder, for communicating electric power from the exterior of the lock cylinder to the electromagnetic release means with the body of the cylinder acting as a ground, and

(h) electronic means positioned in the conductive path means, for restricting communication of electric power to the electromagnetic release means and for conducting such power to the electromagnetic release means only when a prescribed data signal is received by the electronic means,

mechanical key means fitted for insertion into the lock cylinder, comprising

(a) a key blade with mechanical bitting matched to said mechanical bitting pattern of the lock cylinder,

(b) a battery of sufficient capacity to power said electromagnetic release means to retract the blocking pin,

(c) microprocessor means powered by the battery and data storage means connected to the microprocessor means, and

(d) contact means for engaging with said external contact of the lock cylinder to thereby connect with the conductive path means including the electronic means in the lock cylinder in a one-wire bus connection,

said electronic means including ID means storing an identification code for the lock, and addressable switch means connected to the electromagnetic release means and to the ID means, for switching on power from the mechanical key means to the electromagnetic release means only when said prescribed data signal is received, and

said microprocessor means including means for reading the code of the ID means when the mechanical key means is inserted

gate means for selecting between said inside transmitter and said inside receiver, and operable, to selectively couple, said

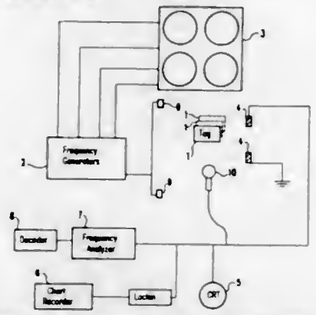
said microprocessor means including means for reading the code of the ID means when the mechanical key means is inserted into the lock and said one-wire bus connection is made, and for looking up in the data storage means the lock ID code read from the lock to determine whether the lock is a lock authorized to be opened, and if so, for looking up a switch code associated in the data storage means with the lock ID code and sending the switch code as said prescribed data signal into the conductive path means, so that the switch code is sent to the addressable switch means and is thereby effective to cause the addressable switch means to switch power to the electromagnetic release means to retract the blocking pin permitting the cylinder plug to be rotated to open the lock.

5,552,778

MULTIBIT BIMORPH MAGNETIC TAGS USING ACOUSTIC OR MAGNETIC INTERROGATION FOR IDENTIFICATION OF AN OBJECT COUPLED THERETO

Alejandro G. Schrott, and Robert J. von Gutfeld, both of New York, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1994, Ser. No. 344,771
Int. Cl.[6] H04B *1/59*
U.S. Cl. 340—825.340 **16 Claims**



1. A magnetic tag for being remotely sensed, comprising:

at least one magnetostrictive strip fixedly mounted on a bar of material to form at least one bimorph for being excited in an oscillatory field,

each said at least one bimorph responding to the oscillatory field by vibrating in a bending mode perpendicular to the plane of the interface formed by said at least one magnetostrictive strip mounted on said bar of material, to produce a unique time varying acoustic or magnetic field when said excitation has a frequency corresponding to a resonant frequency of said bar of material.

5,552,779

WATCH PAGER WITH ICONS

Garold B. Gaskill, Portland; Daniel J. Park; Robert G. Rullman, both of Beaverton; Donald T. Rose, Portland; Joseph F. Stiley, III; Lewis W. Barnum, both of Tigard, all of Oreg., and Don G. Hoff, Tiburon, Calif., assignors to Seiko Corporation & Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 568,932, Aug. 17, 1990, Pat. No. 5,168,271, which is a continuation of Ser. No. 326,491, Mar. 17, 1989, abandoned, which is a continuation of Ser. No. 101,252, Sep. 25, 1987, abandoned, which is a division of Ser. No. 802,844, Nov. 27, 1985, Pat. No. 4,713,808. This application Nov. 25, 1992, Ser. No. 981,968
Int. Cl.[6] H04Q *1/00*
U.S. Cl. 340—825.44 **6 Claims**

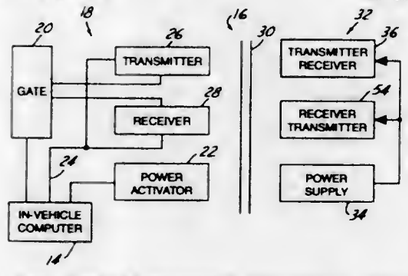
1. A radio pager which includes means for receiving and decoding paging messages, means for displaying an icon indicating that a particular type of message has been received, and means for displaying simultaneously with said icon, numeric data indicating the time the message indicated by said icon was received by said radio pager.

5,552,780

METHOD AND APPARATUS FOR TRANSMITTING CODED LIGHT THROUGH LOW TRANSMISSIBLE MATERIALS

Ronald P. Knockeart, Clarkston, Mich., assignor to Siemens Automotive Corporation, Auburn Hills, Mich.

Filed Mar. 9, 1995, Ser. No. 401,318
Int. Cl.[6] G08G *1/123*
U.S. Cl. 340—991 **23 Claims**



1. A transceiver for transmitting and receiving coded light through low transmissible material including a motor vehicle windshield, the coded light representing data communicated between a remote external destination and an in-vehicle computer, the transceiver comprising:

first means on the inside of the windshield for receiving outgoing binary-encoded data from the in-vehicle computer to be transmitted through the windshield;

a transmitter on the inside of the windshield operatively coupled to said first means for converting and transmitting coded light representing said outgoing data through the windshield;

a first receiver-transmitter on the other side of the windshield responsive to said outgoing coded light from said inside transmitter to transmit outgoing encoded light signal to said remote destination;

a second receiver-transmitter on said other side of the windshield responsive to light signals communicated from said remote destination containing incoming binary-encoded data for transmitting light signals containing said incoming binary-encoded data through said windshield;

a receiver on the inside of the windshield responsive to said second receiver-transmitter transmitted light signals for receiving said transmitted light signals containing said incoming data;

a power activator means on the inside of the windshield for transmitting an activation light signal through said windshield;

a power supply means on said other side of the windshield, said power supply means responsive to said activation light signal of said power activator means for activating said first and second receiver-transmitters;

second means coupled to said inside receiver for receiving said incoming binary encoded data; and

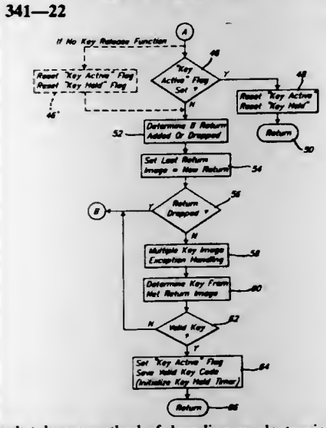
gate means for selecting between said inside transmitter and said inside receiver and operable to selectively couple said selected inside transmitter or inside receiver to said first or second means.

5,552,781

FAULT TOLERANT METHOD OF DECODING AN ELECTRONIC KEY SYSTEM

Paul M. Progar, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 31, 1994, Ser. No. 332,189
Int. Cl.[6] H03K *17/94*
U.S. Cl. 341—22 **14 Claims**



1. A fault tolerant method of decoding an electronic key system having a plurality of keys, said method comprising the steps of:

actuating at least one of the keys;

reading multiple bits of a key return code from the at least one key;

comparing the multiple bits of the read key return code to multiple bits of a previous key return code created by one of the keys previously actuated; and

determining the at least one key from comparing the multiple bits of the read key return code and the multiple bits of the previous key return code;

determining whether a change exists between the compared key return codes prior to said of determining;

determining whether the key active flag has been set if a change does exist between the compared key return codes; and

determining if the key return code was added or subtracted if the key active flag has not been set.

5,552,782

SINGLE-HAND MOUNTED AND OPERATED KEYBOARD

Martin E. Horn, 3657 - 55th SW., Seattle, Wash. 98116

Filed Nov. 4, 1994, Ser. No. 334,869
Int. Cl.[6] H03K *17/94*
U.S. Cl. 341—22 **15 Claims**

1. A keyboard apparatus mountable on a hand of a user, operable by at least three digits of the hand, the digits including at least two fingers and a thumb, each finger having a dorsal surface and a ventral surface, a first and second phalanges, the keyboard apparatus comprising:

a housing having an opening formed therein for receiving the fingers and a portion of the hand of the user;

a first finger operated keypad mounted in the opening and having at least two keys mounted therein, each registerable with an associated operating finger;

a second finger operated keypad mounted in the opening and having at least two keys mounted therein, each registerable with an associated operating finger, the keys of the second finger operated keypad being spaced vertically from and longitudinally closer to the opening than the respective keys of the first finger operated keypad; and

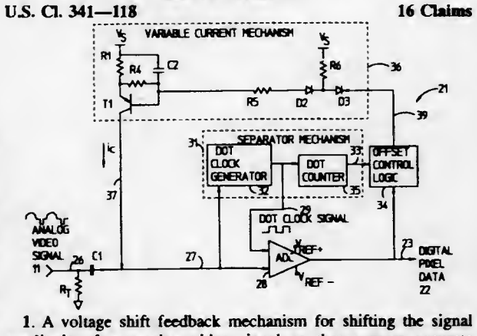
a thumb operated keypad mounted on the exterior of the housing.

5,552,783

CONSTANT CURRENT VOLTAGE RESTORATION

Steven J. Kommrusch, Ft. Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 31, 1994, Ser. No. 220,796
Int. Cl.[6] H03M *1/12*
U.S. Cl. 341—118 **16 Claims**



1. A voltage shift feedback mechanism for shifting the signal amplitude of an analog video signal so that a more accurate analog-to-digital conversion of the analog video signal is achieved, comprising:

an analog-to-digital convertor having an input for receiving said analog video signal, said analog-to-digital convertor for generating digital pixel data;

variable current means connected to said input, said variable current means for supplying a continuous current to said analog video signal so that said analog video signal is shifted in amplitude; and

an offset control means for receiving said digital pixel data, said offset control means for comparing said digital pixel data to a predetermined range, said offset control means for adjusting said continuous current so that said digital pixel data converges toward said predetermined range.

5,552,784

DISTORTION REDUCTION CIRCUIT FOR ANALOG TO DIGITAL CONVERTER SYSTEM

William P. Evans, Catonville, Md., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Jun. 30, 1994, Ser. No. 268,366
Int. Cl.[6] H03M *1/14*
U.S. Cl. 341—122 **18 Claims**

1. An analog to digital converter apparatus, comprising:

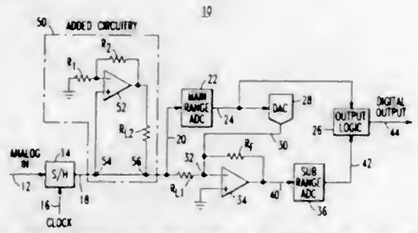
5,552,786

METHOD AND APPARATUS FOR LOGGING

means for recording and storing the digital data bit stream;

a playback unit for removing the digital data from the storage

a second quadrature combiner coupled to the third and fourth monopole antenna elements for generating third and fourth



means for sampling an input analog signal to form a first analog signal on an output line;

a first A/D converter, connected to the output line of the sampling means, for obtaining at an output a first digital signal from the first analog signal;

a digital to analog converter, connected to the output of the first A/D converter, for converting the first digital signal obtained by the first A/D converter into a second analog signal;

a second A/D converter for converting the difference between the first analog signal and the second analog signal into a second digital signal;

output logic for combining the first digital signal and the second digital signal to form a third digital signal;

a first load resistor, connected to the output of the sampling means;

a first amplifier, connected to the output of the sampling means and the first load resistor, for amplifying the first analog signal;

a second load resistor, connected between the output of the first amplifier and the first load resistor.

5,552,785

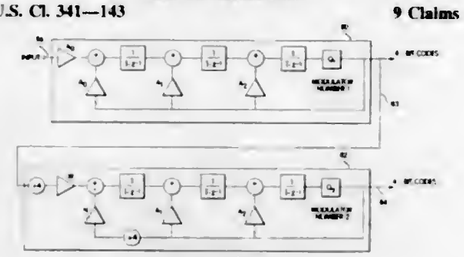
DIGITAL PHASE-LOCKED LOOP UTILIZING A HIGH ORDER SIGMA-DELTA MODULATOR

James Wilson, Sharon, and Ronald A. Cellini, Newton, both of Mass., assignors to Analog Devices, Inc., Norwood, Mass.

Division of Ser. No. 403,291, Mar. 14, 1995, which is a continuation-in-part of Ser. No. 121,104, Sep. 13, 1993, and a continuation-in-part of Ser. No. 120,957, Sep. 13, 1993, and a continuation-in-part of Ser. No. 241,059, May 11, 1994, and a continuation-in-part of Ser. No. 343,713, Nov. 22, 1994, and a continuation-in-part of Ser. No. 373,864, Nov. 17, 1995, and a continuation-in-part of Ser. No. 328,560, Oct. 25, 1994. This application Jun. 7, 1995, Ser. No. 482,938

Int. Cl.[6] H03M *3/00*

U.S. Cl. 341—143 **9 Claims**



1. A linked sigma-delta modulator, comprising:

a first sigma-delta modulator, responsive to a frequency select signal representative of a first data rate, for providing a sigma-delta modulated control signal representative of the first data rate; and

a second sigma-delta modulator, responsive to the sigma-delta modulated control signal, for providing a second sigma-delta modulated control signal representative of a second data rate which is a programmable ratio of the first sigma-delta modulated control signal and which is locked to the first sigma-delta modulated control signal.

5,552,786

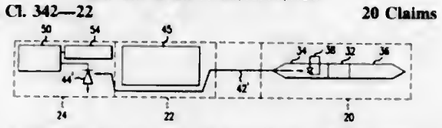
METHOD AND APPARATUS FOR LOGGING UNDERGROUND FORMATIONS USING RADAR

Jiqing Xia, Ridgefield; Tarek M. Habashy, Danbury; Richard W. Gaylor, Brookfield; David R. Mariani, deceased, late of Darien, and Nancy M. Falls, executrix, Darien, all of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 9, 1994, Ser. No. 353,462

Int. Cl.[6] G01S *13/86;13/06;7/28*

U.S. Cl. 342—22 **20 Claims**



1. A method of determining the speed of an electromagnetic signal in an underground formation from within a borehole, comprising the steps of:

a) emitting an electromagnetic signal into the formation from a first location in a borehole;

b) determining a time at which the signal is emitted:

c) at a second location spaced a known distance from the first location in the borehole, detecting a first component of the signal which has passed directly from the first location to the second location via the formation without being reflected;

d) determining a time at which the first component arrives at the second location; and

e) determining the speed of the signal in the underground formation from the time at which the signal is emitted, the time of arrival of the first component and the spacing of the first and second locations.

5,552,787

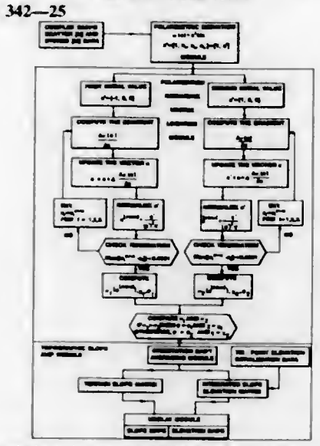
MEASUREMENT OF TOPOGRAPHY USING POLARIMETRIC SYNTHETIC APERTURE RADAR (SAR)

Dale L. Schuler, Fairfax Station, and Jong-Sen Lee, Great Falls, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 10, 1995, Ser. No. 541,392

Int. Cl.[6] G01S *13/90*

U.S. Cl. 342—25 **5 Claims**



1. A polarimetric processor for measuring azimuth direction terrain slopes comprised of:

a radar for transmitting and receiving analog electromagnetic signals of alternately horizontally and vertically polarization;

an analog-to-digital converter where the analog electromagnetic signals are converted into a digital data bit stream;

a formatter for formatting the digital bit stream;

means for recording and storing the digital data bit stream;

a playback unit for removing the digital data from the storage means;

a digital correlator for correlating the digital data bit stream;

a computer for receiving the correlated digital data bit stream and computing

(a) a Stokes-Mueller matrix, M, utilizing the digitized analog electromagnetic signals of alternately horizontally and vertically polarization extracted from the playback unit and correlated;

(b) a polarimetric signature, σ (Ψ χ), utilizing the Stokes-Mueller matrix, M;

(b) a first, a=a'=[−1,0,0], and second initial value, a'=[1,0,0], for a pixel or pixels;

(c) a first gradient utilizing the method of steepest descent for the first and second initial values;

(d) updating the first and second initial values utilizing the gradient;

(e) normalizing the first and second initial values;

(f) repeat steps (c)–(e) utilizing the normalized first and second values until the maximum has been found;

(g) σ_1 and σ_2 utilizing a new first and second values;

(h) a comparison of σ_1 and σ_2,

(i) a value for Ellipticity, $\chi=\sin^{-1}(a_3)/2$, and Orientation, $\Psi=\tan^{-1}(a_2/a_1)/2$;

(j) a combination of individual pixel maximum locations;

(k) a initialization of elevations for each row of azimuthal pixels by a known elevation point;

(l) an integration of slope values in an azimuthal direction; and

means for plotting the ellipticity and orientation to produce a presentation that is a direct measure of terrain azimuthal slopes and a derived estimate of terrain elevation.

5,552,788

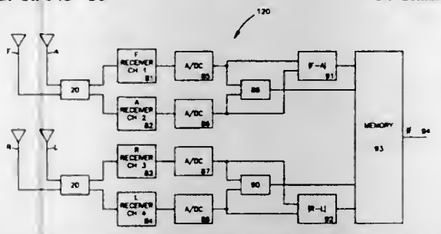
ANTENNA ARRANGEMENT AND AIRCRAFT COLLISION AVOIDANCE SYSTEM

Paul A. Ryan, Dublin, and Dean E. Ryan, Columbus, both of Ohio, assignors to Ryan International Corporation, Columbus, Ohio

Filed Jun. 30, 1995, Ser. No. 497,714

Int. Cl.[6] G01S *13/00*

U.S. Cl. 342—30 **34 Claims**



1. An antenna arrangement on a host aircraft for generating signals related to a direction from which a transponder reply signal is received from a threat aircraft, the arrangement comprising:

a first monopole antenna element and a second monopole antenna element arranged along a first axis of the host aircraft for receiving the reply signal;

a third monopole antenna element and a fourth monopole antenna element arranged along a second axis of the host aircraft for receiving the reply signal, the second axis being orthogonal to the first axis;

a first quadrature combiner coupled to the first and second monopole antenna elements for generating first and second signals from the received reply signal, respective power levels of the first and second signals being related to the direction from which the reply signal is received from the threat aircraft; and

a second quadrature combiner coupled to the third and fourth monopole antenna elements for generating third and fourth signals from the received reply signal, respective power levels of the third and fourth power signals being related to the direction from which the reply signal is received from the threat aircraft.

5,552,789

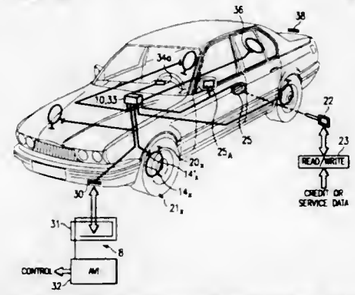
INTEGRATED VEHICLE COMMUNICATIONS SYSTEM

Josef H. Schuermann, Oberhummel, Germany, assignor to Texas Instruments Deutschland GmbH, Germany

Filed Feb. 14, 1994, Ser. No. 196,678

Int. Cl.[6] G01S *13/75*

U.S. Cl. 342—42 **32 Claims**



1. An integrated vehicle communications system for on-board use within a vehicle, the system comprising:

miniaturized, self-contained transponder means on-board said vehicle using radio frequency interrogation energy for the respective transponder operation and associated with a vehicle function;

interrogation means on-board the vehicle for interrogating and receiving signals from the transponder means;

means for providing RF communication between the interrogation means and the transponder means in response to interrogation operation of the interrogation means; and

means responsive to the interrogation means for carrying out on-board functions in response to such interrogation.

5,552,790

DEVICE FOR WIRELESS TRANSFER OF INFORMATION

Staffan Gunnarsson, Vallingby, Sweden, assignor to Saab-Scania Combitech Aktiebolag, Jonkoping, Sweden

PCT No. PCT/SE93/00031, § 371 Date Oct. 19, 1994, § 102(e) Date Oct. 19, 1994, PCT Pub. No. WO93/15418, PCT Pub. Date Aug. 5, 1993

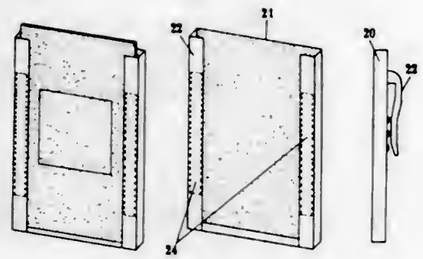
PCT Filed Jan. 21, 1993, Ser. No. 256,791

Claims priority, application Sweden, Jan. 23, 1992, 9200209; Jan. 23, 1992, 9200210; May 11, 1992, 9201475; Jun. 17, 1992, 9201864; Nov. 30, 1992, 9203590

Int. Cl.[6] G01S *13/74;* **H04B** *1/59*

U.S. Cl. 342—51 **20 Claims**

1. A device for wireless transfer of information, comprising a data carrier in the form of a thin card transponder, that receives a first microwave signal, modulates it and codes it with data, and reradiates a second microwave signal without adding new energy thereto, including at least one antenna device formed using microstrip conductors, the antenna device comprising a patch antenna with an antenna layer (**15**, **28**, **37**) that acts against a ground plane (**16**, **29**, **38**) where the antenna layer and the ground plane are of substantially equal size, characterized in that, the device is equipped with a separate card holder (**20**) with a reflective surface (**21**) that is larger than said ground plane, said reflective surface increasing the range by reradiating the second microwave signal and reducing sensitivity to back lobe reflections.

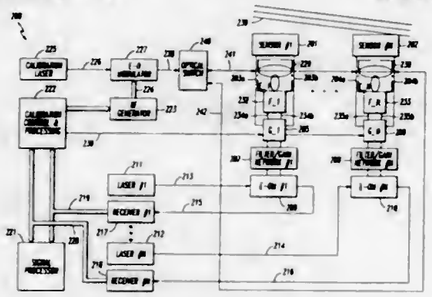


5,552,791

FIBER OPTIC TELEMETRY ARRAY CALIBRATION SYSTEM

Israel Metal, Kew Garden Hills, N.Y., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Apr. 7, 1995, Ser. No. 418,313
Int. Cl.[6] G01S *7/40*
U.S. Cl. 342—174 **16 Claims**



1. An apparatus for calibrating a plurality of sensors having a predetermined spatial distribution, comprising:

(a) a calibration signal generator, operably connected to each of said plurality of sensors, for providing a calibration signal thereto using an optical transmission medium, said calibration signal generator having a signal source for providing a carrier signal, a baseband signal generator for providing a calibration baseband signal, and a modulator connected to said signal source and said baseband signal generator for modulating said calibration baseband signal onto said carrier signal and providing said calibration signal thereby;

(b) a calibration signal detector connected to each of said plurality of sensors for detecting said calibration signal, said detector having a converter for converting said at least a portion of said calibration signal to said calibration output, and a splitter connected to said transmission medium for selectably passing said at least a portion of said calibration signal from said transmission medium to said converter;

(c) a calibration signal processor connected to said signal detector for determining at least one calibration parameter from said calibration output; and

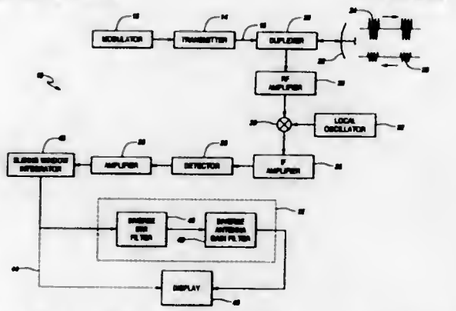
(d) a switch for selectably transmitting said calibration signal through said transmission medium in a first direction and a second direction, said switch being interposed between said signal generator and said signal detector, said first and second directions being respective of said predetermined spatial distribution.

5,552,792

NON-COHERENT RADAR SYSTEM HAVING IMPROVED RESOLUTION CAPABILITIES

Winthrop W. Smith, Greenville, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Continuation of Ser. No. 307,469, Sep. 19, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 480,669
Int. Cl.[6] G01S *7/285*
U.S. Cl. 342—195 **10 Claims**



1. A filter circuit for the receiver of a radar system having an antenna with a known gain pattern, the receiver processing a radar return signal and including a sliding window integrator, comprising:

a first inverse filter receiving the radar return signal, said filter having a filter response substantially the inverse of a response for the sliding window integrator;

a second inverse filter also receiving the radar return signal, said filter having a filter response substantially the inverse of a response for the antenna due to its known gain pattern; and

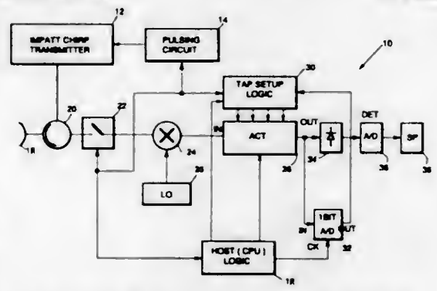
means for connecting the first and second inverse filters to receive the radar return signal.

5,552,793

SELF CALIBRATED ACT PULSE COMPRESSION SYSTEM

Scott C. McLeod, Tucson, Ariz.; Avinoam S. Zerkowitz, West Hills, Calif., and Lillian G. Lent, Gilbert, Ariz., assignors to Hughes Missile Systems Company, Los Angeles, Calif.

Filed Dec. 2, 1994, Ser. No. 348,417
Int. Cl.[6] G01S *7/28*
U.S. Cl. 342—204 **15 Claims**



1. A self-calibrating pulse compression system comprising:

first means for providing a waveform;

second means including a tapped delay line for sampling the waveform at predetermined time intervals to provide a plurality of calibration samples;

third means for storing the calibration samples; and

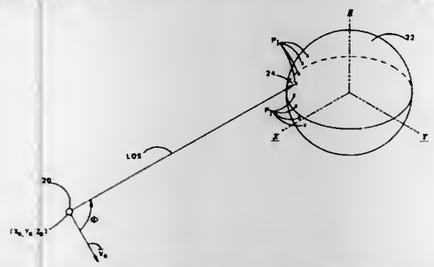
fourth means for multiplying the waveform by the stored calibration samples.

5,552,794

POSITION ESTIMATION USING SATELLITE RANGE RATE MEASUREMENTS

Jaime B. Colley, Laguna Niguel, Calif., and Thomas A. Niemi, DeWitt, Iowa, assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Apr. 29, 1994, Ser. No. 235,845
Int. Cl.[6] G01S *5/02*
U.S. Cl. 342—357 **17 Claims**



1. A method of determining approximate coordinates of a particular geographical location on the earth, the method comprising the steps of:

receiving, at the particular geographical location on the earth, signals from first and second earth-orbiting satellites, the signals including information indicating the general location of the associated satellites with respect to an earth-centered, earth-fixed (ECEF) coordinate system;

measuring an actual rate of change of the range, relative to the particular geographical location, of each satellite as the satellite orbits the earth;

estimating a clock drift error;

calculating true rates of change of the ranges of the satellites based upon the measured actual rates of change of ranges and the estimated clock drift error; and

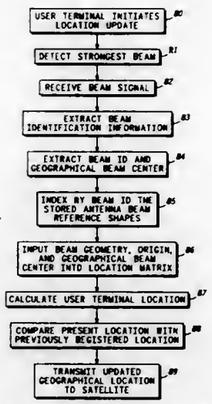
calculating first and second pluralities of points representing first and second lines on the earth's surface along which the true rates of change of ranges of the first and second satellites, respectively, are constant.

5,552,795

LOCATION DETERMINATION METHOD AND SYSTEM USING MULTI-BEAM SATELLITES

Daniel R. Tayloe, Phoenix, and Kenneth L. Sowles, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 3, 1994, Ser. No. 237,705
Int. Cl.[6] C01S *5/02;* **H04M** *11/00;* **H04B** *7/185*
U.S. Cl. 342—357 **19 Claims**



1. A method of determining a user terminal location, comprising the steps of:

(a) receiving, at said user terminal, a satellite signal comprising servicing beam information, said servicing beam information being unique to a servicing beam of a multi-beam satellite;

(b) processing, at said user terminal, a beam geometry and a geographical beam center as derived from said servicing beam information, said beam geometry describing a representation of the shape of said servicing beam, and said geographical beam center defining a geographical coordinate within said servicing beam; and

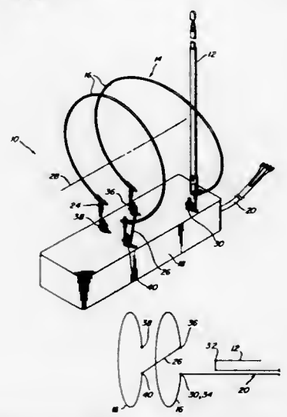
(c) calculating, at said user terminal, a user terminal region wherein said user terminal is located, said user terminal region defined by said beam geometry and said geographical beam center.

5,552,796

VHF, UHF ANTENNA

Maurice Diamond, 74 Deerfield Rd., Sharon, Mass. 02067

Filed Oct. 13, 1994, Ser. No. 322,262
Int. Cl.[6] H01Q *11/12*
U.S. Cl. 343—742 **12 Claims**



1. An antenna for receiving UHF and VHF frequency signals for use in connection with a television set, comprising:

a telescoping cylindrical monopole antenna element, rotatably mounted to a support structure to rotate freely 360° in a horizontal plane parallel to a longitudinal axis of the support structure and ±90° in a vertical plane which is perpendicular to the support structure, the monopole antenna element having s first port coupled to a first lead of a transmission line at a first end of the transmission line and wherein a second end of the transmission line is to be coupled to the television set; and

a plurality of loop elements disposed in series to form an N-turn helix between a first port and a second port, each loop of the N-turn helix being rotatably mounted to the support structure such that each turn is rotatable ±90° in the horizontal plane and ±90° in the vertical plane, the first port of the N-turn helix being coupled to a second lead of the transmission line, whereby the N-turn helix operates in an axial mode and is circularly polarized to receive the UHF signals and operates

in a normal mode and is circularly polarized to receive the

a first sub-structure having a major plane that is oriented at a

5,552,800

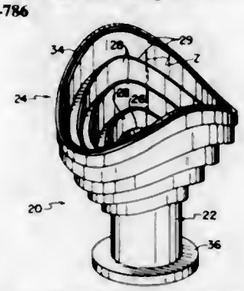
in a normal mode and is circularly polarized to receive the VHF signals, the N-turn helix resonating the monopole antenna element to form a dipole antenna in the UHF and VHF frequency bands of operation.

5,552,797

DIE-CASTABLE CORRUGATED HORNS PROVIDING ELLIPTICAL BEAMS

Scott J. Cook, Garner, N.C., assignor to Avnet, Inc., Great Neck, N.Y.

Filed Dec. 2, 1994, Ser. No. 348,790
Int. Cl.[6] H01Q 13/02
U.S. Cl. 343—786 **22 Claims**



1. A die cast, corrugated horn, radially disposed about a horn axis, and having an inner surface an outer surface and a top surface, comprising:

a plurality of ridges disposed upon the inner surface of the corrugated horn, each ridge having a horizontal ridge width and a vertical ridge height, and being oriented parallel to the horn axis, with the ridges being located at stepped intervals along the inner surface of the corrugated horn, the stepped intervals having a vertical step height, and a horizontal slot width;

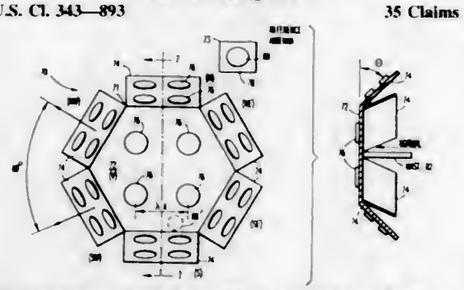
the corrugated horn having a semi-flare angle, defined as the angle between a line drawn parallel to the horn axis and a line passing through the top surfaces of adjacent ridges, the semi-flare angle changing circumferentially around the mouth of the horn so that the corrugated horn emits a non-circular beam.

5,552,798

ANTENNA FOR MULTIPATH SATELLITE COMMUNICATION LINKS

Frederick J. Dietrich, Palo Alto, and Paul A. Monte, San Jose, both of Calif., assignors to Globalstar L.P., San Jose, Calif.

Filed Aug. 23, 1994, Ser. No. 294,633
Int. Cl.[6] H01Q 1/38
U.S. Cl. 343—893 **35 Claims**



1. An antenna system for coupling a terminal to a plurality of satellites of a constellation of low earth orbit satellites, each of the plurality of satellites being oriented, at any given time when in view of the terminal, at a particular elevation angle, comprising:

a first sub-structure having a major plane that is oriented at a first angle with respect to an axis that is perpendicular to the surface of the earth;

a plurality N of second sub-structures individual ones of which have a local major plane that is disposed at a second angle to said major plane of said first sub-structure, each of said plurality N of sub-structures having an outwardly pointing normal from said local major plane that is oriented at a third angle around said axis from an outwardly pointing normal of an adjacent one of said sub-structures, said outwardly pointing normal of each of said plurality N of sub-structures being disposed so as to point away from said axis; and

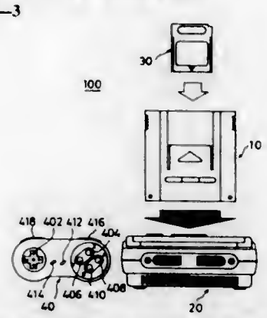
at least one antenna element supported by said first sub-structure and by each of said plurality N of second sub-structures, wherein antenna elements of said first sub-structure and at least some of said plurality N of second sub-structures enable a spread spectrum communication between said terminal and at least one low earth orbit satellite over a range of elevation angles of said low earth orbit satellite.

5,552,799

DISPLAY INFORMATION CONVERSION APPARATUS

Sadao Hashiguchi, Yokohama, Japan, assignor to Nintendo Co.,Ltd., Kyoto, Japan

Filed Jul. 25, 1994, Ser. No. 280,207
Claims priority, application Japan, Jul. 27, 1993, 5-204739; Jan. 25, 1994, 6-006104
Int. Cl.[6] G09G 5/12
U.S. Cl. 345—3 **9 Claims**



1. A display information conversion apparatus for making a storage medium which stores a first program executed by a first information processing apparatus which is constituted to display a video image on a dot-matrix display to be applied to a second information processing apparatus which is constituted to display a video image on a raster-scan display, comprising:

a first connection portion to which said storage medium is detachably attached;

a second connection portion for detachably attaching said display information conversion apparatus to said second information processing apparatus;

an information processor for executing said first program of said storage medium being attached to said first connection portion to generate first video image information for the dot-matrix display;

a video image converter for converting said first video image information into second video image information for the raster-scan display; and

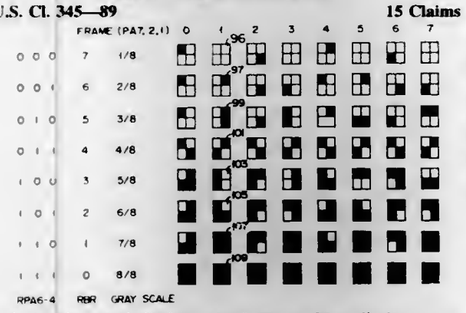
transfer circuitry for transferring said second video image information converted by said video image converter to said second information processing apparatus via said second connection portion.

5,552,800

COLOR DISPLAY CONTROL APPARATUS FOR CONTROLLING DISPLAY GRAY SCALE OF EACH SCANNING FRAME OR EACH PLURALITY OF DOTS

Hiroshi Uchikoga; Hiroki Zenda, and Hajime Shimamoto, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 740,168, Aug. 5, 1991, abandoned. This application Aug. 23, 1994, Ser. No. 294,614
Claims priority, application Japan, Aug. 9, 1990, 2-209341; Jul. 22, 1991, 3-180763
Int. Cl.[6] G09G 3/36;5/10;5/02
U.S. Cl. 345—89 **15 Claims**



1. A color panel display control system for a display screen having a plurality of dots, the column panel display control system comprising:

a color panel display device having a predetermined number of gray scale levels for each of specified primary colors;

a CRT controller for outputting display data representing the primary colors and display timing signals to control the color panel display device;

RAMDAC means for converting the display data output from the CRT controller into R-, G-, and B-data; and

color panel display controller means having:

means for receiving the R-, G-, and B-data from the RAMDAC means, for generating each of R-, G-, and B-base gray-scale data and each of R-, G- and B-next gray-scale data from the received R-, G-, and B-data, wherein the R-, G-, and B-base gray-scale data and the R-, G- and B-next gray-scale data are predetermined by voltage levels associated with the dots of the display screen, and for generating a frame rate duty cycle from a vertical sync signal, dot pattern data from a horizontal sync signal and a dot clock signal; and

frame rate control means for displaying intermediate gray-scale levels between the R-, G-, and B-base gray-scale data and the R-, G-, and B-next gray-scale data by selectively providing, using a number of the frame rate duty cycle and the dot pattern data, the R-, G-, and B-base gray-scale data and the R-, G-, and B-next gray-scale data on a certain dot of the display screen.

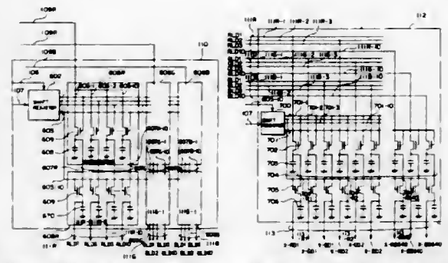
5,552,801

LIQUID CRYSTAL DISPLAY DEVICE

Tsutomu Furuhashi; Hiroyuki Mano; Terumi Takashi, all of Yokohama; Kiyokazu Nishioka, Odawara, and Toshio Futami, Mobara, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 966,563, Oct. 26, 1992, abandoned, which is a continuation of Ser. No. 556,364, Jul. 24, 1990, abandoned. This application Sep. 2, 1994, Ser. No. 299,671
Claims priority, application Japan, Jul. 28, 1989, 1-194094
Int. Cl.[6] G09G 3/36
U.S. Cl. 345—100 **16 Claims**

12. A liquid crystal display device for providing signals for application to a liquid crystal display panel having a plurality of display panel rows, to cause a display made up of a plurality of display line, each display panel row of said display panel including a plurality of switching elements, each switching element normally assuming a non-selected state and responsive to application thereto of a selecting voltage for assuming a selected state, each switching element in its selected state applying to an associated display area of the display panel a voltage corresponding to data to be displayed in the associated display area and in its non-selected state retaining the associated display area at its most recent corresponding voltage, said liquid crystal display device comprising:



a input buffer storage circuit, including a plurality m of first buffer elements, for receiving serial analog display data corresponding to a plurality of display lines and sequentially storing the received display data in said first buffer storage elements;

an input holding circuit coupled to said input buffer storage circuit, for receiving and simultaneously holding the plurality of display data stored in said input buffer storage circuit;

an output buffer storage circuit, including a plurality n of second buffer storage elements, where n is greater than m, for sequentially receiving said display data held in said input holding circuit and storing the received display data in the second buffer storage elements; and

an output holding circuit coupled to said output buffer storage circuit, for receiving and simultaneously holding the display data stored in said output buffer storage circuit and for outputting held display data for application to switching elements of the display panel.

5,552,802

DISPLAY CONTROL DEVICE

Hiroshi Nonoshita, Fujisawa; Yoshitsugu Yamanashi, Kawasaki, and Kenzoh Ina, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 255,820, Jun. 7, 1994, Pat. No. 5,436,636, which is a continuation of Ser. No. 686,771, Apr. 17, 1991, abandoned. This application May 12, 1995, Ser. No. 440,492
Claims priority, application Japan, Apr. 20, 1990, 2-105630; Apr. 20, 1990, 2-105631; Apr. 20, 1990, 2-105632
Int. Cl.[6] G09G 3/36
U.S. Cl. 345—100 **14 Claims**

1. A display control device for controlling a display on a picture surface of display unit including plural picture elements and capable of partially changing display states of the picture surface, said display control device comprising:

memory means for storing information to be displayed;

control means for providing said information from said memory means to said display unit;

entire updating means responsive to said information from said memory means for updating the display states of the picture surface of said display unit;

partial updating means responsive to partial information of said information for updating the display states of a partial portion of the picture surface;

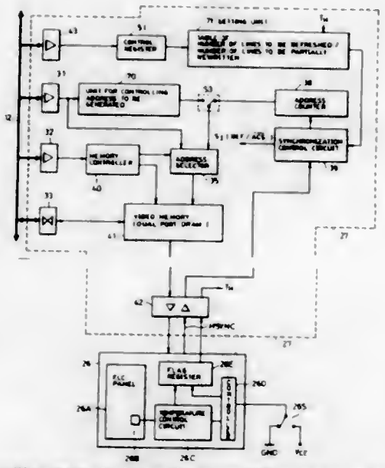
selective updating means for selective updating by said entire updating means or said partial updating means in accordance with a predetermined condition, and for deciding the number of lines to be updated by said selected entire updating means or said selected partial updating means; and

(e) providing image display parameters corresponding to said image to the image generation subsystem;

5,552,805

METHOD AND SYSTEM FOR DISPLAYING BLENDED

when the communications device is in a first geographic operating locale, automatically positioning at least a first icon on the



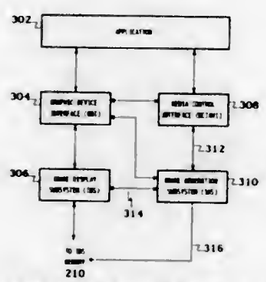
controlling means for interactively controlling operations of said entire updating means and said partial updating means on the basis of the number of the lines decided by said selective updating means.

5,552,803

METHOD AND APPARATUS FOR DISPLAYING AN IMAGE USING SYSTEM PROFILING

Ken Rhodes, Portland, and Rohan Coelho, Hillsboro, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Aug. 6, 1993, Ser. No. 103,399
Int. Cl.[6] G09G *5/14*; H04N *17/00*
U.S. Cl. 345—119 **44 Claims**



1. A method for displaying an image in a system having an image generation subsystem and an image display subsystem, comprising the steps of:

(a) providing, to the image generation subsystem, information regarding image display subsystem capabilities, wherein said image display subsystem capabilities comprise one or more image color formats and one or more data transfer modes;

(b) processing data for a set of test images by the image generation subsystem for display by the image display subsystem using a plurality of permutations of said image display subsystem capabilities, wherein data for each test image is processed and displayed using each of the permutations of the image display subsystem capabilities;

(c) generating a set of priority lists by the image generation subsystem based on the processing and displaying of said set of test images;

(d) providing digital data corresponding to said image to the image generation subsystem;

(e) providing image display parameters corresponding to said image to the image generation subsystem;

(f) selecting, by the image generation subsystem, an image color format and a data transfer mode for said image based on said set of priority lists and said image display parameters;

(g) processing, by the image generation subsystem, data for said image for display using said selected image color format and said selected data transfer mode; and

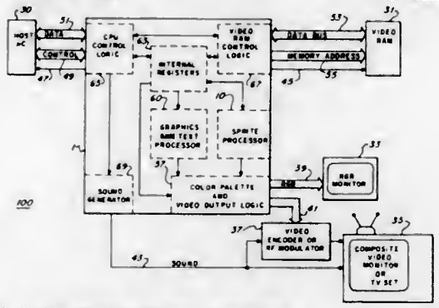
(h) displaying said image by the image display subsystem.

5,552,804

SPRITE COINCIDENCE DETECTOR INDICATING SPRITE GROUP

Jerald G. Leach, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 803,236, Dec. 5, 1991, Pat. No. 5,379,049, which is a continuation of Ser. No. 455,869, Dec. 18, 1989, Pat. No. 5,089,811, which is a continuation of Ser. No. 262,176, Oct. 20, 1988, abandoned, which is a continuation of Ser. No. 38,746, Apr. 13, 1987, abandoned, which is a continuation of Ser. No. 600,921, Apr. 16, 1984, abandoned. This application Aug. 6, 1993, Ser. No. 103,498
Int. Cl.[6] G09G *5/02*
U.S. Cl. 345—150 **18 Claims**



1. A video display processor comprising:

a memory port for reading and writing a plurality of display data from an external memory;

a graphics processor connected to said memory port for sequentially reading display data from the external memory via said memory port corresponding to respective pixels of a raster scan video display;

a plurality of sprite registers, each of said sprite registers storing a sprite horizontal location and sprite group data for a corresponding mobile pattern of a predetermined size in pixels smaller than said video display, each of said sprite registers outputting predetermined sprite display data when said raster scan of said video display has a horizontal location including said corresponding mobile pattern;

a display priority logic connected to said graphics processor and said plurality of sprite registers, said display priority logic outputting said display data from said graphics processor when none of said plurality of sprite registers output sprite display data and outputting said sprite display data from a sprite register having a highest priority in a predetermined priority of sprites when any of said plurality of sprite registers outputs sprite display data; and

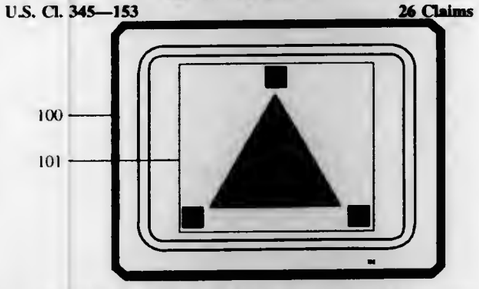
a sprite coincidence detector connected to said plurality of sprite registers for generating an indication of said sprite group data of any of said plurality of sprite registers whose mobile pattern has at least one pixel overlapping with the mobile pattern of at least one pixel of another sprite register.

5,552,805

METHOD AND SYSTEM FOR DISPLAYING BLENDED COLORS

Aaron M. Alpher, Ashburn, Va., assignor to Praxisoft, Inc., Ashburn, Va.

Filed Nov. 25, 1994, Ser. No. 347,230
Int. Cl.[6] G09G *5/02*
U.S. Cl. 345—153 **26 Claims**



1. A method for displaying blended colors on variable visual display means, comprising the steps of:

selecting, according to a first user input, a plurality of base colors to be blended;

displaying said base colors at edge portions of a geometric display region displayed on said variable visual display means, said geometric display region having a shape determined in dependence upon a number of said base colors selected;

determining a number of intermediate colors to be generated in dependence upon an area of said geometric display region;

generating said intermediate colors in dependence upon relative contributions from each one of said base colors, each one of said relative contributions being based upon a relative distance from a respective one of said intermediate colors to each one of said base colors and further based upon a biasing factor from each one of said base colors; and

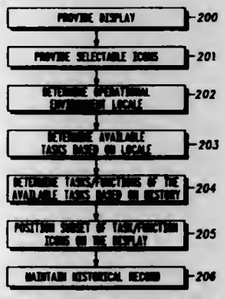
displaying a resulting blend of said base colors on said variable visual display means, said resulting blend being comprised of said intermediate colors and said base colors positioned within said geometric display region.

5,552,806

METHOD AND APPARATUS FOR POSITIONING SELECTABLE FUNCTION ICONS ON A DISPLAY

Vitaly Lenchik, Lake Zurich, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 29, 1994, Ser. No. 235,756
Int. Cl.[6] G09G *5/00*
U.S. Cl. 345—156 **7 Claims**



1. In a communications device having a display, a method for operating the communications device, the method comprising the steps of:

determining, by the communications device, a geographic operating locale of the communications device;

when the communications device is in a first geographic operating locale, automatically positioning at least a first icon on the display, the at least a first icon corresponding to at least one selectable function of the communications device that can be performed in the first geographic operating locale;

when the communications device is in a second geographic operating locale, automatically positioning at least a second icon on the display, the at least a second icon corresponding to at least one selectable function of the communications device that can be performed in the second geographic operating locale, wherein the second geographic operating local is distinct from the first geographic operating locale and the at least one selectable function corresponding to the at least a first icon is distinct from the least one selectable function corresponding to the at least a second icon;

upon selection of an icon by a user of the communications device, performing a selectable function corresponding to the selected icon; and

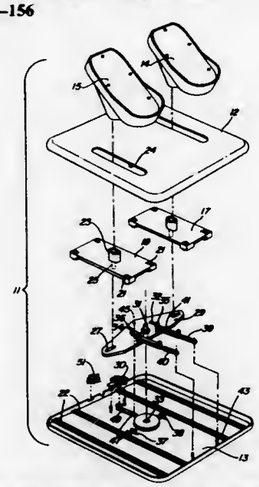
maintaining a historical record of selectable functions that have been selected by a user at each geographic operating locale.

5,552,807

FOOT PEDAL ASSEMBLY FOR USE WITH PERSONAL COMPUTER

Charles L. Hayes, 4421 Highland Ave., Carlsbad, Calif. 92008, and Thomas E. Veloskey, 6557 Corte Cisco, Carlsbad, Calif. 92009

Filed Dec. 7, 1994, Ser. No. 350,646
Int. Cl.[6] G09G *5/00*
U.S. Cl. 345—156 **33 Claims**



1. A foot operated signal producing device comprising:

(a) a left foot pedal;

(b) left support means for supporting the left foot pedal, the left support being slidable forward and backward;

(c) a right foot pedal;

(d) right support means for supporting the right foot pedal, the right support means being slidable forward and backward;

(e) means for interconnecting the two support means, the interconnecting means being rotatable clockwise and counterclockwise about an axis intermediate the left and right support means by torque applied against the foot pedals;

(f) signal means, operably coupled to the interconnecting means, for generating a signal corresponding to a rotated position of the interconnecting means; and

(g) spring means for applying opposing torque to the interconnecting means whenever the interconnecting means is rotated in either direction from a predetermined rest position.

5,552,808

POINT-AND-DRAW DEVICE COORDINATIVELY DRIVEN BY TWO GEAR SYSTEMS

means for detecting the density of the printed pattern for detect-

5,552,812

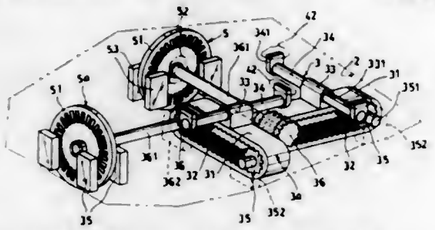
RECORDING APPARATUS HAVING AN INK MIST

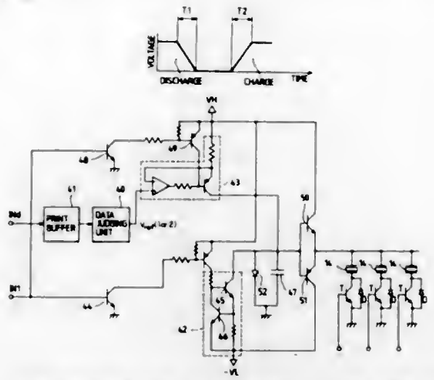
5,552,808

POINT-AND-DRAW DEVICE COORDINATIVELY DRIVEN BY TWO GEAR SYSTEMS

Caven Hsu, C/O Hung Hsing Patent Service Center, P.O. Box 55-1670, Taipei, Taiwan

Filed Mar. 9, 1995, Ser. No. 401,185
Int. Cl.[6] G09G *5/08*
U.S. Cl. 345—157 **4 Claims**





1. A point and draw device of a computer comprising:

a housing having an electronic circuit formed therein;

a driving plate slidably held on an upper portion of said housing and having an actuating portion formed on the driving plate for coordinatively manipulating said driving plate on said housing;

a X-axis driving gear system and a Y-axis driving gear system respectively mounted in said housing and orienting to be perpendicular with each other, each said driving gear system having an upper portion thereof secured to a bottom of said driving plate;

each said driving gear system connectable to an encoder for detecting a movement pulse signal during movement of the driving plate and each said driving gear system; whereby upon movement of said driving plate and each said driving gear system, a pulse signal will be encoded through the electronic circuit in said housing to a computer connected to said housing for decoding the pulse signal for moving a cursor on a cathode-ray-tube screen of the computer corresponding to the movement of the driving plate;

said housing including: a base for securing an electronic circuit board of the electronic circuit on the base, an upper cover combined with the base for encasing the two driving gear systems and said encoders in between the upper cover and the base, a sliding jacket generally rectangular shaped and defined in between an upper plate portion and a lower plate portion formed on an upper portion of the upper cover for slidably holding the driving plate in the sliding jacket, a top window cut in the upper plate portion of the upper cover and communicating with the sliding jacket for a sliding movement of the actuating portion of the driving plate along a XY coordinate, and a lower window cut in the lower plate portion for a movement of the upper portion of each said driving gear system secured to the bottom of the driving plate.

5,552,809

METHOD FOR DRIVING INK JET RECORDING HEAD AND APPARATUS THEREFOR

Satoru Hosono, and Shoichi Hiraide, both of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Jan. 25, 1994, Ser. No. 186,378
Claims priority, application Japan, Jan. 25, 1993, 5-010216; Dec. 21, 1993, 5-345355
Int. Cl.[6] B41J *2/045*
U.S. Cl. 347—10 **5 Claims**

1. A method for driving an ink jet recording head having a pressure producing chamber communicating with a nozzle opening and a piezoelectric vibrating element for expanding and contracting the pressure producing chamber, the method comprising the steps of:

expanding the pressure producing chamber under an initial condition to a predetermined volume over a first time period from an expansion start time, the first time period being longer than a natural vibration cycle of the piezoelectric vibrating element and corresponding to a size of an ink droplet to be ejected;

maintaining the pressure producing chamber as expanded for a predetermined second period of time, using the expansion start time as a reference; and

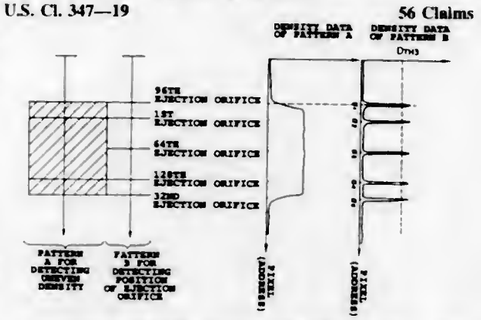
then contracting the pressure producing chamber to the initial condition over a predetermined third time period longer than the natural vibration cycle of the piezoelectric vibrating element, so that the ink droplet is ejected.

5,552,810

RECORDING APPARATUS HAVING HEAD-SHADING FUNCTION AND HEAD-SHADING METHOD

Takayuki Matsuo, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1993, Ser. No. 109,993
Claims priority, application Japan, Aug. 24, 1992, 4-224338; Aug. 17, 1993, 5-203221
Int. Cl.[6] B41J *29/393*
U.S. Cl. 347—19 **56 Claims**



1. A recording apparatus having a head-shading function comprising:

means for printing a pattern for detecting uneven density using a recording head, the recording head having a plurality of recording elements arrayed thereon,

means for printing a pattern for detecting the positions of the recording elements correlated with the pattern for detecting uneven density using at least one specifically selected recording element of the recording elements,

means for detecting the density of the printed pattern for detecting uneven density and the density of the pattern for detecting the positions,

memory means for temporarily storing density data on the pattern for detecting the positions obtained from the detection means, and

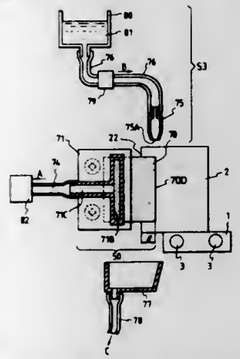
means for correlating density data on the pattern for detecting uneven density with each of the recording elements according to the address location of the pattern for detecting the positions, the pattern for detecting the positions being stored in the memory means.

5,552,811

LIQUID DISCHARGING APPARATUS AND PRINTING METHOD USING SUCH AN APPARATUS

Mitsuru Kurata; Hiroyuki Miyake, both of Kawasaki, and Tokihide Ebata, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1993, Ser. No. 70,691
Claims priority, application Japan, Jun. 26, 1992, 4-169408; Apr. 6, 1993, 5-079580
Int. Cl.[6] B41J *2/165*
U.S. Cl. 347—28 **44 Claims**



1. A liquid discharging apparatus for printing by using a liquid discharging head for discharging a liquid onto a printing medium, said apparatus comprising:

a cleaning member capable of containing a rinsing liquid and for cleaning the liquid discharging portion of said liquid discharging head, said cleaning member having a three-dimensional net structure;

rinsing liquid supplying means for supplying the rinsing liquid to said cleaning member to enable said cleaning member to contain the rinsing liquid;

liquid suction force generating means for generating a liquid suction force in said cleaning member while the rinsing liquid is contained in said cleaning member; and

position controlling means for controlling said cleaning member to be in relative contact with the liquid discharging portion of said liquid discharging head when the liquid suction force is generated while the rinsing liquid is contained in said cleaning member,

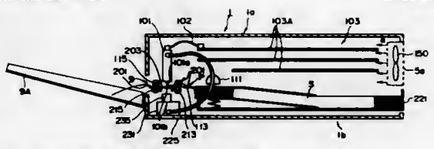
wherein said position controlling means controls the positional relation so that said cleaning member and the liquid discharging portion of said liquid discharging head butt each other correlatively to enable said cleaning member to wipe the liquid discharging portion of said liquid discharging head.

5,552,812

RECORDING APPARATUS HAVING AN INK MIST EVACUATION SYSTEM

Ryuichi Ebinuma, Kawasaki; Nobutoshi Mizusawa, Yamato, and Yuji Chiba, Isehara, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 167,159, Dec. 19, 1993, abandoned, which is a division of Ser. No. 908,861, Jul. 1, 1992, abandoned, which is a continuation of Ser. No. 416,275, Oct. 2, 1989, abandoned, which is a division of Ser. No. 131,083, Dec. 9, 1987, Pat. No. 4,893,137. This application Jun. 6, 1995, Ser. No. 465,933
Claims priority, application Japan, Dec. 10, 1986, 61-292599; Dec. 10, 1986, 61-292600; Dec. 10, 1986, 61-292601; Dec. 25, 1986, 61-307937; Dec. 25, 1986, 61-307938; Dec. 25, 1986, 61-307939; Dec. 25, 1986, 61-307940
Int. Cl.[6] B41J *2/165*
U.S. Cl. 347—34 **2 Claims**



1. A recording apparatus comprising:

a head mounting section for mounting a full-line type ink jet recording head having an array of ink discharge ports for discharging ink therethrough, said ink jet recording head for recording on an entire width of a recording medium, which is substantially perpendicular to a conveying direction of the recording medium, said array of discharge ports being disposed along the entire width of the recording medium;

a first opening section disposed remote from said ink jet recording head in a direction substantially perpendicular to said array of ink discharge ports, said first opening section for introducing air into said recording apparatus;

a second opening section disposed in the vicinity of said ink jet recording head, at an exhausting area for exhausting the recording medium from said recording apparatus, and substantially parallel to an alignment direction of said array of ink discharge ports, said second opening section exhausting the air introduced from said first opening section into said recording apparatus to outside of said recording apparatus and including an opening having a length corresponding to a length of said array of ink discharge ports; and

blower means for introducing the air into said recording apparatus and forming an air flow in said recording apparatus so that the air is exhausted out of said recording apparatus through said second opening section, said blower means supplying the air from the direction substantially perpendicular to said array of ink discharge ports, wherein a distance between said first opening section and said ink jet recording head and a distance between said blower means and said ink jet recording head are each larger than a distance between said second opening section and said ink jet recording head.

5,552,813

INK JET HEAD WITH NOZZLE ARRANGEMENT TO REDUCE VISCOUS DRAG

Shinsaku Takada; Hisayoshi Fujimoto; Nobuhisa Ishida; Yasushi Ema; Toshio Amano, and Akihiro Shimokata, all of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

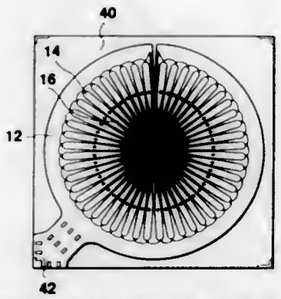
Filed Mar. 4, 1993, Ser. No. 26,550
Claims priority, application Japan, Mar. 11, 1992, 4-52844; Aug. 27, 1992, 4-228528; Sep. 10, 1992, 4-241766
Int. Cl.[6] B41J *2/045*
U.S. Cl. 347—40 **16 Claims**

1. A head for ink jet printing comprising:

a substrate;

a plurality of nozzles arranged on a flat surface of the substrate for discharging ink, the nozzles being arranged in a zig zag

a thermally and electrically insulating elastic member encas-



arrangement wherein the nozzles are arranged in only first and second straight lines on the flat surface, and wherein the nozzles arranged in the first straight line are offset with respect to the nozzles arranged in the second straight line along a direction perpendicular to a printing direction; and

path means formed in the substrate for supplying the ink to the nozzles, the path means including:

a plurality of pressure chambers formed in the substrate, and

a plurality of ink slits, having a substantially narrower width than the pressure chambers, formed in the substrate and arranged radially, each ink slit fluidly coupling one of the pressure chambers to one of the nozzles, wherein the ink slits have lengths that are similar so that a viscous drag for ink passing through the ink slits is equalized among the ink slits;

wherein a depth of each ink slit is larger than a width of each ink slit at a location near the nozzles.

5,552,814

IMAGE RECORDING APPARATUS WHEREIN TONER CARRIER MEMBER AND PARTICLE-FLOW MODULATING ELECTRODE MEMBER ARE HELD IN CONTACT WITH EACH OTHER

Masataka Maeda, Konan, and Tomoaki Hattori, Nagoya, both of, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Aug. 27, 1993, Ser. No. 112,471

Claims priority, application Japan, Sep. 1, 1992, 4-233522; Sep. 24, 1992, 4-254494

Int. Cl.[6] B41J *2/06*

U.S. Cl. 347—55 **30 Claims**

1. An image recording apparatus for forming an image on a recording medium by deposition of a toner, said apparatus including (a) a particle-flow modulating electrode member having a plurality of apertures formed therethrough and a plurality of control electrodes corresponding to said apertures, (b) a toner supply device including a toner carrier which is disposed on one of opposite sides of said electrode member and which carries a layer of said toner on an outer surface thereof, and (c) voltage applying means for applying a controlled voltage to each of said plurality of control electrodes, according to image information representative of said image, and thereby modulating flows of particles of said toner through said plurality of apertures toward said recording medium located on the other side of said electrode member, said apparatus comprising:

a biasing device for biasing corresponding portions of said toner carrier and said particle-flow modulating electrode member against each other for ensuring contact therebetween, said corresponding portions being adjacent to said plurality of apertures.

5,552,815

INK JET APPARATUS INCLUDING MEANS FOR REGULATING AN AMOUNT OF INK AND AN AMOUNT OF AIR IN AN INK TANK RELATIVE TO EACH OTHER

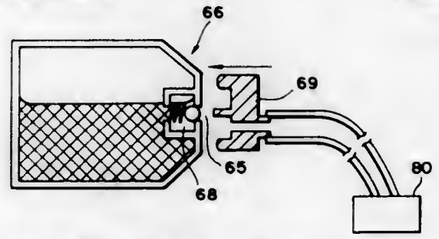
Junji Shimoda, Chigasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1992, Ser. No. 972,367

Claims priority, application Japan, Nov. 6, 1991, 3-290082

Int. Cl.[6] B41J *2/175;2/165*

U.S. Cl. 347—85 **2 Claims**



1. An ink jet recording apparatus comprising:

an exchangeable head portion for discharging ink to form an image;

an intermediate ink tank for storing ink to be supplied to said head portion, said intermediate ink tank containing an amount of ink and an amount of air;

a main ink tank for supplying ink to said intermediate ink tank;

an ink supply tube connected between said main ink tank and said intermediate ink tank;

a scanning carriage mounting said head portion and said intermediate ink tank; and

suction means for regulating the amount of said ink and the amount of said air relative to each other in said intermediate ink tank by moving into and out of contact with said intermediate ink tank, said suction means including a cap provided with a projection portion and a pump connected to the cap for sucking the ink and the air in the intermediate ink tank, wherein an opening is provided in said intermediate ink tank and can be coupled to said suction means, the opening being located above said ink supply tube connected to said intermediate ink tank and covered by an opening/closing mechanism which opens when said suction means is in contact with said intermediate ink tank, said opening/closing mechanism including a ball for sealing the opening and a spring connected to said ball which biases the ball toward the opening, and the ball is pressed by the projection portion of the cap by contacting the cap to the opening, so that said ink and said air are sucked from said intermediate ink tank by the pump as a result of the projection portion pressing on the ball.

5,552,816

INK TANK, INK-JET CARTRIDGE AND INK-JET RECORDING APPARATUS

Kazuyuki Oda; Yoshihiko Fujimura, and Jun Isozaki, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 28, 1993, Ser. No. 68,142

Claims priority, application Japan, May 29, 1992, 4-138245

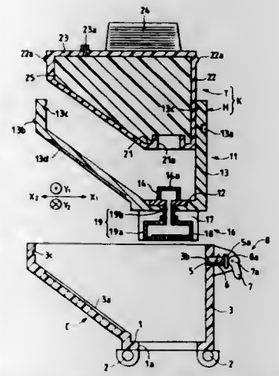
Int. Cl.[6] B41J *2/175*

U.S. Cl. 347—86 **4 Claims**

1. An ink tank assembly for use in an ink-jet recording apparatus for recording on a recording sheet with ink discharged from ink discharge nozzles of the ink-jet recording apparatus, the ink tank assembly comprising:

an ink tank having top, bottom, and sidewalls forming an enclosed chamber;

an ink joint at a lower end portion of the ink tank chamber and communicating with the ink discharge nozzles of the ink-jet recording apparatus; and



a porous ink keeper filling the ink tank chamber and in engagement with at least the sidewalls, the porous ink keeper storing ink provided to the ink joint during ink-jet recording by the ink-jet recording apparatus, an air communication hole formed at an upper end portion of the ink tank chamber, for communication with atmosphere external to the ink tank chamber, the ink tank chamber being configured to have an area in cross-section which increases from the bottom to the top of the ink tank chamber, and further, the ink tank having at least one sidewall with a surface extending in a direction of movement of a head carriage to which the tank assembly is to be mounted sloping upwards in an outward direction from a sidewall opposite said sloping sidewall.

5,552,817

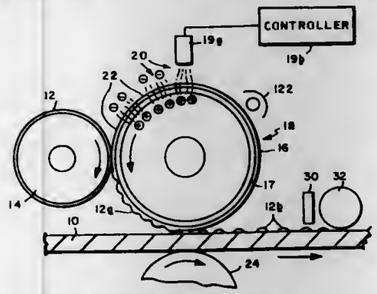
ELECTROTHERMAL PRINTING INK WITH MONODISPERSED SYNTHETIC PIGMENT PARTICLES AND METHOD AND APPARATUS FOR ELECTRONIC PRINTING THEREWITH

Manfred R. Kuehnle, Waldesruh P.O. Box 1020 Rte. 103A, New London, N.H. 03257

Division of Ser. No. 166,098, Dec. 13, 1993, Pat. No. 5,406,314. This application Mar. 2, 1995, Ser. No. 397,746

Int. Cl.[6] B41J *2/385;* **G03G** *15/01;* **G01D** *15/06*

U.S. Cl. 347—115 **14 Claims**



1. An electronic printing press comprising:

a. a plurality of print stations, each capable of applying ink of a selected color to a printing substrate;

b. means for advancing the substrate to successively encounter each print station such that ink is applied on top of ink applied by each other print station;

c. wherein such printing station comprises:

1) a generally cylindrical image member having an exterior surface for receiving ink, said image member including

a generally cylindrical rigid body having a shaft extending therefrom,

a thermally and electrically insulating elastic member encasing the body,

a metallic sleeve tightly surrounding the insulating member,

a hard, highly dielectric surface of high surface resistivity surrounding the said sleeve constituting the exterior surface of the image member, the dielectric surface being thin and flexible and exhibiting a smoothness and surface-energy characteristics to readily release ionic charges in conjunction with a removal of said printing ink therefrom;

2) a writing head disposed exteriorly of said image member and comprising an array of field-emission ionization electrode structures disposed coaxially and in full length proximate to the image member, each electrode structure being spaced a predetermined distance opposite the exterior surface of the image member; and

3) an ink source with an outer surface carrying a layer of liquid ink and moving in unison with the exterior surface of the image member, said ink source and said image member being placed in close proximity to one another to form a nip that can be filled with said ink to form an active reservoir space from which said ink can be extracted.

5,552,818

METHOD AND APPARATUS FOR CONTROLLING THE MOISTURE CONTENT OF A THERMOSENSITIVE RECORDING MEDIUM IN A THERMAL RECORDING APPARATUS

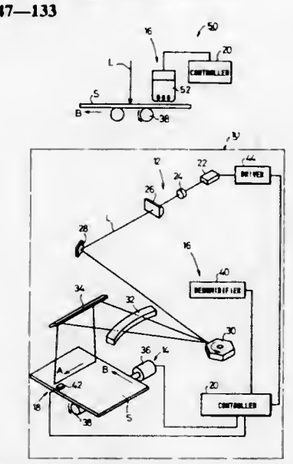
Toshitaka Agano, and Yasuhiko Goto, both of Kanagawa-ken, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 13, 1993, Ser. No. 134,905

Claims priority, application Japan, Oct. 14, 1992, 4-276236; Oct. 14, 1992, 4-276237

Int. Cl.[6] H01N *1/21*

U.S. Cl. 347—133 **27 Claims**



1. A method of thermally recording an image on a thermosensitive recording medium by applying a coloring thermal energy thereto, comprising the steps of:

adjusting the amount of moisture contained in said thermosensitive recording medium; and

applying said coloring thermal energy for thermally recording said image to said thermo-sensitive recording medium whose moisture content has been adjusted.

5,552,819

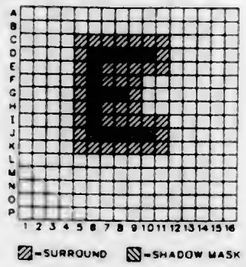
SYSTEMS AND METHOD FOR PRINTING BY APPLYING AN IMAGE-ENHANCING PRECOAT

Thomas J. Brandt, Canby, and Stephen A. Zimmerman, Wilsonville, both of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Division of Ser. No. 962,367, Oct. 16, 1992, abandoned, which is a continuation-in-part of Ser. No. 930,572, Aug. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 762,537, Sep. 18, 1991, abandoned. This application Mar. 31, 1995, Ser. No. 414,994

Int. Cl.[6] B41J *2/32*

U.S. Cl. 347—212 **15 Claims**



1. A method of printing a predetermined printed image on an image area of a substrate, comprising the steps of:

(a) determining a coating area to which an image-enhancing coating is to be applied to the substrate, said determination being made by applying a filter to said image area, said coating area being larger than said image area and said filter containing a pattern which specifies where the coating area is to be placed by determining pixels in a first area on the substrate where a colorant is to be deposited and determining pixels in a second area which is immediately adjacent to said first area, the coating being placed according to step (b) and step (c), step (b) and step (c) being performed in no particular order;

(b) depositing an image-enhancing coating over said coating area, said coating being applied to said pixels in the first area and the second area, the pixels in the second area partially overlapping said pixels in the first area; and

(c) depositing a colorant on said image area, said colorant being applied to said pixels in the first area and the second area, the pixels in the second area partially overlapping said pixels in the first area.

5,552,820

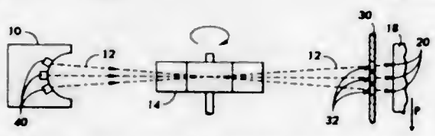
FLY'S EYE OPTICS FOR A RASTER OUTPUT SCANNER IN AN ELECTROPHOTOGRAPHIC PRINTER

Frank C. Genovese, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 64,478, May 21, 1993, abandoned. This application May 22, 1995, Ser. No. 446,966

Int. Cl.[6] B41J *2/465*; **G02B** *26/12*

U.S. Cl. 347—241 **4 Claims**



1. A raster output scanner for exposing preselected pixel locations on a photosensitive surface in accordance with digital image data, comprising:

a light beam source for emitting a plurality of writing beams along a beam path, the writing beams converging to a convergence point optically disposed between the source and the photosensitive surface, and diverging after the convergence point;

a rotating reflector, disposed between the light beam source and the photosensitive surface, reflecting the plurality of writing beams and causing the writing beams reflected thereon to move in a scan direction along the photosensitive surface, the convergence of the writing beams from the source causing each of the moving reflected writing beams to form a curved path relative to a plane perpendicular to said beam path; and

a mask disposed between the reflector and the photosensitive surface, the mask being opaque except for a plurality of light-transmissive apertures defined therein, the plurality of apertures being arranged in subsets with each one of said subsets corresponding to one of the curved paths of the reflected writing beams, each one of said plurality of apertures having a size related to a predetermined desired size of a pixel location on the photosensitive surface, the subsets of apertures being arranged on the mask so that a center of each aperture of each of said subsets of apertures is disposed along one of the curved paths of the reflected writing beams;

wherein the mask defines a linear dimension parallel to the scan direction and, at any location on the mask along said linear dimension, there is disposed no more than one aperture of any of said subsets of apertures.

5,552,821

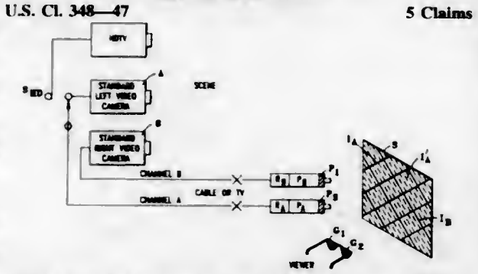
METHOD OF AND SYSTEM FOR STEREOSCOPIC TELEVISION

Isaac S. Blonder, 9 Beaver Hill Rd., Morganville, N.J. 07751

Filed Jun. 5, 1995, Ser. No. 463,193

Int. Cl.[6] H04N *13/00*

U.S. Cl. 348—47 **5 Claims**



1. A method of stereoscopic high definition television (HDTV) transmission, reception and display, that comprises, a single HDTV camera televising a scene and transmitting the a high definition image along a first channel; a single standard camera of lower definition televising the scene from an adjacent position and transmitting its image along a second channel; complementarily optically projecting the two images upon a screen; and viewing selectively with each eye the respective complimentary images on the screen to see a favored physiological predomination of the high definition image and in stereoscopic fashion.

5,552,822

APPPARATUS AND METHOD FOR SETTING DEPTH OF CUT OF MICROMETER SURGICAL KNIFE

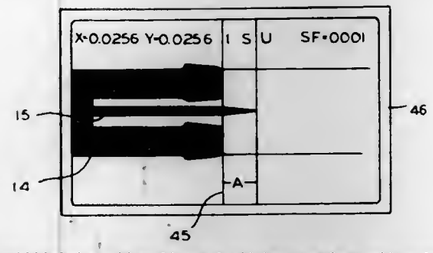
Ravi Nallakrishnan, 26 Plaza Dr., Westmont, Ill. 60559

Filed Nov. 12, 1993, Ser. No. 150,851

Int. Cl.[6] H04N *7/18*

U.S. Cl. 348—79 **8 Claims**

1. A method for setting a selected depth of cut of a surgical knife, said knife of the type having a handle, a datum surface attached to an end of said handle, a cutting blade and a mechanism for advancing said cutting blade to and beyond said datum surface, said depth of cut being determined by the distance a leading edge



of said blade is positioned beyond said datum surface, said method comprising the steps of:

(a) securing said knife in a clamp mounted to a viewing stage of a microscope;

(b) moving said clamp to bring said datum surface into a field of view of said microscope;

(c) photographing said datum surface through said microscope with a video camera to generate a video signal;

(d) transmitting said video signal to a video monitor to produce a video image of said datum surface;

(e) calibrating said video image to correlate the on-screen dimensions of said video image with the actual dimensions of said knife;

(f) superimposing on said video image a reference cursor line;

(g) aligning said reference cursor line to coincide with said datum surface;

(h) generating on said monitor a second cursor line parallel to said reference cursor line;

(i) moving said second cursor line to a position apart from said reference cursor line by an on-screen distance correlated to the actual linear dimension of said selected depth of cut; and

(j) advancing or retracting said blade until said leading blade edge reaches said second cursor line.

5,552,823

PICTURE PROCESSING APPARATUS WITH OBJECT TRACKING

Koji Kageyama, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 18,155, Feb. 16, 1993, abandoned. This application Jul. 17, 1995, Ser. No. 503,191

Claims priority, application Japan, Feb. 15, 1992, 4-061286; Feb. 17, 1992, 4-061123; Feb. 25, 1992, 4-073320

Int. Cl.[6] H04N *7/32*

U.S. Cl. 348—155 **11 Claims**

1. A target object following apparatus comprising:

imaging means having a focus and an iris, for picking up an image of an imaging area and supplying a video signal corresponding to data produced therefrom as picture data including a target object;

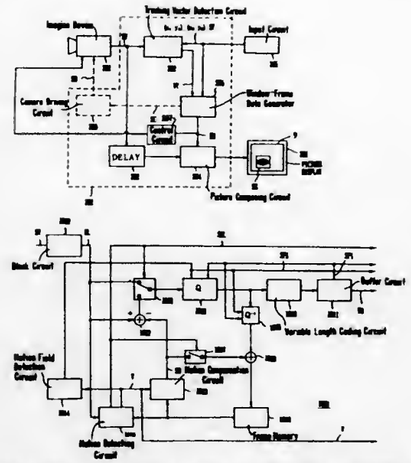
imaging area changing means for changing said imaging area of said imaging means on a basis of a predetermined control signal;

a picture data blocking circuit for dividing said picture data corresponding to said image of said imaging area which is sequentially input into blocks of a predetermined number of pixels in both a horizontal direction and a vertical direction, said picture data being supplied from said image means;

an input circuit for setting a position of an area containing said target object in said picture data according to an input by a user and supplying a position signal produced therefrom;

a detection area setting circuit for setting a tracking vector detection area including a predetermined number of said blocks in the horizontal and the vertical directions according to said position signal;

a motion detection circuit for detecting motion vectors for respective ones of said blocks in said tracking vector detection area and supplying the detected motion vectors produced therefrom;



a tracking vector detection circuit for detecting a distribution of said detected motion vectors of said respective ones of said blocks in said tracking vector detection area and then detecting a tracking vector with a moving direction and a moving quantity of a portion of a picture in said tracking vector detection area on a basis of said distribution detection result;

a detection area correction circuit for moving said tracking vector detection area in correlation with a motion of said target object in said picture data, said tracking vector detection area being moved on a basis of said tracking vector with said moving direction and said moving quantity detected by said tracking vector detection circuit;

a window-frame data generation circuit for generating window-frame picture data of a window frame corresponding to said tracking vector detection area, and for supplying said predetermined control signal to said imaging area changing means;

a picture composing circuit for superimposing said window frame represented by said window-frame picture data upon said video signal, and generating a composite video signal therefrom;

display means for receiving said composite signal, and displaying a picture with said window frame superimposed; and

control means for detecting a signal level of said video signal for said tracking vector detection area, and for supplying a second predetermined control signal to said imaging means and thereby controlling said focus and said iris of said image means on a basis of said detected signal level of said video signal.

5,552,824

LINE OBJECT SCENE GENERATION APPARATUS

Douglas J. DeAngelis, Woburn; Kirk Sigel, Cambridge, and Mike Ciholas, Somerville, all of Mass., assignors to Lynx System Developments, Inc., Woburn, Mass.

Continuation-in-part of Ser. No. 19,222, Feb. 18, 1993. This application Jun. 28, 1994, Ser. No. 265,063

Int. Cl.[6] H04N *7/12*

U.S. Cl. 348—157 **6 Claims**

1. An event recording video camera comprising

optical means for imaging a visual field;

a line sensor for converting a fixed line portion of the imaged visual field into electrical signals representative of a line of pixels of the image of said field, the line of pixels constituting a frame representative of said fixed line portion at an instant in time;

circuit means in said camera for processing said electrical signals to form a digital output stream containing digitized pixel values of a sequence of frames at a high scanning rate;

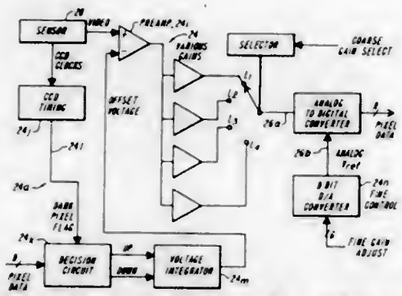
5,552,826

DIGITAL VIDEO CAMERA WITH EXTERNAL CHROMINANCE SIGNAL DIGITIZED AT SUBCARRIER

5,552,829

IMAGE SIGNAL CODING SYSTEM

Kyu J. Kim, Kyounggi-do, and Tae Y. Chung, Seoul, both of



a buffer for storing said digital output stream before transmission; and

compression means for compressing data in said buffer to reduce bandwidth thereof before it is transmitted.

5,552,825

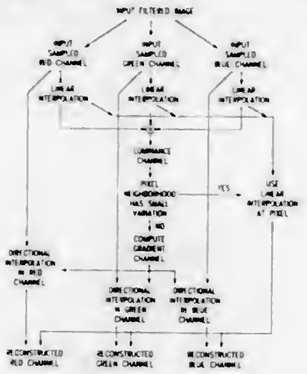
COLOR RESOLUTION ENHANCEMENT BY USING COLOR CAMERA AND METHODS

Rajendra K. Talluri, and Bruce E. Flinchbaugh, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 8, 1994, Ser. No. 335,928

Int. Cl.[6] H04M *5/228*

U.S. Cl. 348—222 **10 Claims**



1. A color camera, comprising:

an image detector, said detector with sets $S_1, S_2, \ldots S_N$ of pixels for N an integer greater than 1, wherein said pixels in a set S_J detect radiation in a corresponding sampled channel C_J for each integer J in the range 1 to N; and

a channel reconstructor coupled to an output of said detector, said reconstructor including:

a luminance generator which combines said sampled channel C_J for each integer J in the range 1 to N to a luminance channel,

a gradient generator coupled to an output of said luminance generator and which transfers said luminance channel to a gradient channel, and

a directional interpolator coupled to an output of said detector and to an output of said gradient generator and which transfers each of said sampled channel C_J for each integer J in the range 1 to N to a corresponding reconstructed channel $RC_1, RC_2, \ldots RC_N$; and

an output of the channel reconstructor.

5,552,826

DIGITAL VIDEO CAMERA WITH EXTERNAL CHROMINANCE SIGNAL DIGITIZED AT SUBCARRIER FREQUENCY MULTIPLE

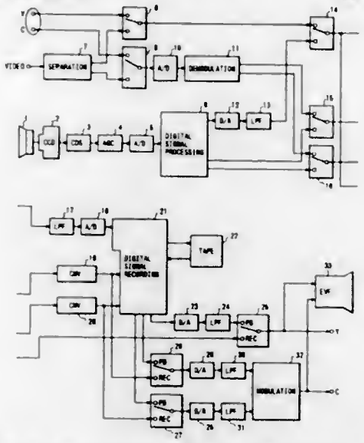
Teruo Hieda, Yokohama; Osamu Ueda, Kawasaki, and Norihiro Kawahara, Tokyo, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 213,927, Mar. 16, 1994. This application Jun. 7, 1995, Ser. No. 477,153

Claims priority, application Japan, Mar. 19, 1993, 5-85574; May 31, 1993, 5-152981; Jun. 11, 1993, 5-166318

Int. Cl.[6] H04N *5/228;9/68*

U.S. Cl. 348—222 **10 Claims**



1. A digital video camera apparatus which supplies a digital luminance signal and a digital color information signal obtained by processing an image pickup signal of an image pickup element by digital signal processing means to a digital signal recording device, and supplies an analog luminance signal and an analog color information signal which are input from an external device to said digital signal recording device, comprising:

an A/D converter for A/D-converting the externally input analog luminance signal to be supplied to said digital signal recording device at a sampling frequency of said digital signal recording device; and

an A/D converter for A/D converting the externally input analog color information signal to be supplied to said digital signal recording device at a frequency corresponding to an integer multiple of a subcarrier frequency.

5,552,827

COLOR VIDEO CAMERA WITH A SOLID STATE IMAGE SENSING DEVICE

Akihiro Maenaka, Moriguchi; Yukio Mori, Yawata; Haruhiko Murata, Takasuki; Hidefumi Okada, Daito, and Hirokazu Ide, Osaka, all of, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Aug. 30, 1994, Ser. No. 298,548

Claims priority, application Japan, Aug. 31, 1993, 5-216469; Dec. 27, 1993, 5-332323; Apr. 18, 1994, 6-078628

Int. Cl.[6] H04N *9/07*

U.S. Cl. 348—266 **11 Claims**

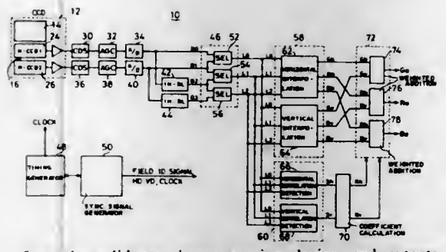
1. A color video camera, comprising:

a solid-state image sensing device having a large number of pixels arranged in a matrix fashion and color filters arranged in a mosaic fashion;

an interpolation processing circuit which performs an interpolation calculation on the basis of color signals of a specific pixel and a plurality of pixels around the specific pixel outputted from the solid-state image sensing device, and outputs a plurality of color signals of said specific pixels; and

an interpolation control circuit which controls said interpolation processing circuit in accordance with a correlation of said specific pixel with respect to said plurality of pixels,

wherein said interpolation processing circuit includes a horizontal interpolation circuit which performs an interpolation calculation in a horizontal direction on the basis of the color signals from said specific pixel and said plurality of pixels and outputs a plurality of horizontal color signals, a vertical interpolation circuit which performs an interpolation calculation in a vertical direction on the basis of the color signals from said specific pixel and said plurality of pixels and outputs a plurality of vertical color signals, and a weighted addition circuit for adding said horizontal color signals and said vertical color signals to each other for each color, said interpolation control circuit includes a coefficient output circuit which outputs at least one of a weighing coefficient for said horizontal color signals and a weighing coefficient for said vertical color signals, said at least one of weighing coefficients being applied to said weighted addition circuit.



5,552,828

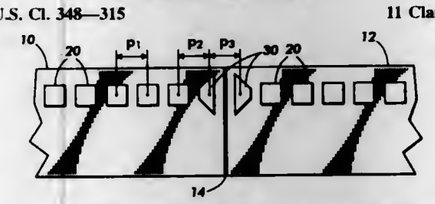
GEOMETRIES FOR PHOTOSITES IN A PHOTOSENSITIVE SILICON CHIP

Alain E. Perregaux, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 17, 1995, Ser. No. 516,223

Int. Cl.[6] H04N *5/335*

U.S. Cl. 348—315 **11 Claims**



1. A photosensitive device having a plurality of photosites disposed on a surface thereof, the photosites comprising regular photosites forming a linear array and an end photosite disposed at the end of the linear array,

each regular photosite defining at least a first side edge and a second side edge, each side edge positioned to be adjacent a neighboring photosite in the linear array, and

the end photosite defining a lead edge, a trail edge, an inner edge adjacent a neighboring photosite in the linear array, and an outer edge adjacent an edge of the surface of the device, the outer edge being longer than the inner edge.

5,552,829

IMAGE SIGNAL CODING SYSTEM

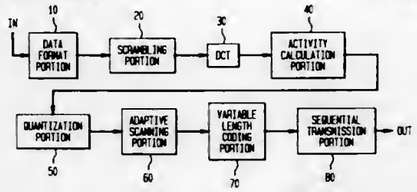
Kye J. Kim, Kyounggi-do, and Tae Y. Chung, Seoul, both of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Rep. of Korea

Filed Feb. 26, 1993, Ser. No. 24,201

Claims priority, application Rep. of Korea, Feb. 28, 1992, 92-3169; Jan. 30, 1993, 93-1212

Int. Cl.[6] H04N *7/26;7/30*

U.S. Cl. 348—392 **6 Claims**



1. An image signal coding system for coding image signals for a component television which are converted into digital signals, comprising:

a data format portion for formatting a ratio of a brightness signal and color difference signals of the image signal in a vertical subsampling line order of 4:2:0.

a scrambling means for constructing image data formatted in an order of vertical subsampling line supplied from the data format portion into a predetermined unit of blocks by extracting pixels between flat portions and variable portions thereof, and coding video data for one frame of reconstructed data to distribute a highly variable portion and substantially linear portion in the image data uniformly;

a discrete coding transform portion for coding an output from said scrambling means in a predetermined unit of blocks by using a two dimensional discrete cosine transform coding;

an activity calculation means for calculating an activity value of the blocks supplied from the discrete coding transform portion to determine a coding area and a quantization step size adaptive to the distribution of frequency for the image data and a scanning pattern of the blocks in accordance with a degree of complexity of the image signal to improve coding efficiency;

an adaptive scanning means for adaptively scanning a quantized data field in accordance with the coding area determined by the activity calculation means;

an adaptive scanning portion for adaptively scanning the quantized data field in conforming with a coding determined by the activity calculation means;

a variable length coding portion for calculating an amount of data produced by applying a variable length coding to an output of the adaptive scanning portion; and

a sequential transmission for sequentially transmitting the data coded by a variable length coding in conforming with a predetermined transmitting bit rate in a unit of a fixed length;

wherein a block having an underflow produced therein is added with 0 and transferred, while a block having an overflow produced therein is transmitted with an amount of data coincided with the transmitting bit rate.

5,552,830

Patent Not Issued For This Number

5,552,831

DIGITAL VIDEO SIGNAL DECODING APPARATUS AND PRESUMED MOTION VECTOR CALCULATING

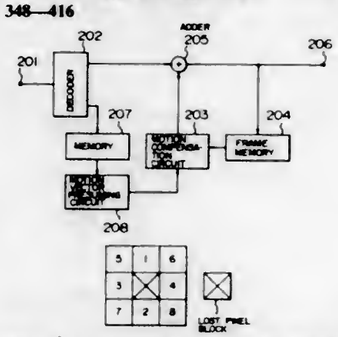
channel information processing means for processing channel information of a first character string of a first text line from a

5,552,831

DIGITAL VIDEO SIGNAL DECODING APPARATUS AND PRESUMED MOTION VECTOR CALCULATING METHOD

Yutaka Machida, and Takeshi Yukitake, both of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 83,779, Jun. 30, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 467,719
Claims priority, application Japan, Jul. 3, 1992, 4-176609
Int. Cl.[6] H04N *7/32*
U.S. Cl. 348—416 **2 Claims**



1. A method of determining a presumed motion vector for a particular frame pixel block of digital signal data comprising plural frame pixel blocks where data relating to said particular frame pixel block are lost during transmission or reception of said digital signal data, said method comprising the steps of:

(a) storing values of N (N>0) decoded motion vectors for said digital signal data in a memory, with respect to x and y directions of said digital signal data, independently for said x direction and said y direction;

(b) determining a frequency of occurrence of said values of said N decoded motion vectors independently for said x direction and said y direction;

(c) selecting a first one of said values of N decoded motion vectors having a largest frequency of occurrence in said x direction and selecting a second one of said values of N decoded motion vectors having a largest frequency of occurrence in said y direction;

(d) if said largest frequency of occurrence in said x direction or in said y direction is less than a threshold value, increasing a value of said number N and repeating said steps (a)–(d) with respect to the increased value of said number N; and

(e) determining said presumed motion vector in accordance with said first one and said second one of said values of N decoded motion vectors.

5,552,832

RUN-LENGTH ENCODING SEQUENCE FOR VIDEO SIGNALS

Brian Astle, Princeton, N.J., assignor to Intel Corporation, Santa Clara, Calif.

Filed Oct. 26, 1994, Ser. No. 329,524
Int. Cl.[6] H04N *7/26*
U.S. Cl. 348—420 **22 Claims**

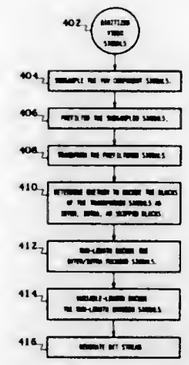
1. A computer-implemented process for encoding video signals, comprising the steps of:

(a) dividing a video frame into a plurality of regions;

(b) classifying the regions into two or more classes of regions;

(c) generating a run-length encoded signal corresponding to the classes of the regions using a run-length encoding sequence, wherein the run-length encoding sequence is a function of the content of the video frame; and

(d) generating an encoded bit stream for the video frame using the run-length encoded signal.

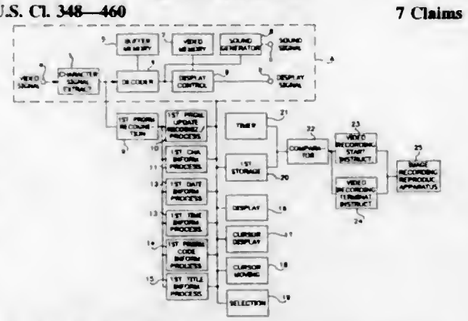


5,552,833

TRANSMISSION SYSTEM AND RECEIVER USING TELETEXT INFORMATION FOR PROGRAMMING VIDEO RECORDER

Hidemi Henmi, Ostu; Shigeru Takano, Ibaraki; Hideto Nakahigashi, Osaka, and Ken Sakamoto, Takatsuki, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP91/01056, § 371 Date Apr. 7, 1992, § 102(e) Date Apr. 7, 1992, PCT Pub. No. WO92/03018, PCT Pub. Date Feb. 20, 1992
PCT Filed Aug. 7, 1991, Ser. No. 844,611
Claims priority, application Japan, Aug. 10, 1990, 2-212879; Dec. 11, 1990, 2-401285; Dec. 11, 1990, 2-401286; Dec. 11, 1990, 2-401287
Int. Cl.[6] H04N *7/08*
U.S. Cl. 348—460 **7 Claims**



1. A receiver, comprising:

reception means for receiving teletext data from a coding transmission system, wherein (1) recognition information and program-content update information of a television-program table are formatted using a page presentation data structure and presentation update control data structure, each of which have a predetermined number of bits, and (2) channel information, date information, time information, program code information, and title information of the television-program table are formatted as video information having a predetermined screen arrangement;

program recognition means for recognizing television-program table information from a predetermined bit of the page presentation data structure;

program update recognizing means, responsive to a group of predetermined bits of the presentation update control data structure, for recognizing that the television-program table information has been updated;

channel information processing means for processing channel information of a first character string of a first text line from a screen arrangement detected by said program recognition means;

date information processing means for processing date information of a second character string of the first text line from the screen arrangement detected by said program recognition means;

time information processing means for processing time information from the screen arrangement detected by said program recognition means;

program code information processing means for processing program code information from the screen arrangement detected by said program recognition means;

title information processing means for processing the title information from the screen arrangement detected by said program recognition means;

display means for displaying onto a display unit, as a displayed television-program table, the data processed by said program update recognizing means, channel information processing means, date information processing means, time information processing means, program code information processing means and title information processing means;

cursor display means for displaying a cursor said display unit;

cursor moving means for moving the cursor displayed by said cursor display means so as to designate television programs contained in the displayed television-program table;

selection means for selecting, for reservation for video recording, ones of the programs, designated by the cursor displayed by said cursor display means;

storage means for storing television-program table information such as channel information, date information, time information, program code information and title information of the corresponding to the ones of the programs selected by said selection means;

timer means for performing time management;

comparator means for comparing the date information and time information of the table information stored in said storage means with date information and time information of said timer means;

start instruction means for instructing an image recording/reproducing apparatus to start a video-recording operation when a starting time represented by the date information and time information of the stored table information coincides with the date information and time information of said timer means; and

termination instruction means for instructing the image recording/reproducing apparatus to terminate the video-recording operation when a termination time represented by the date information and time information of the stored table information coincides with the date information and time information of said timer means.

5,552,834

APPARATUS FOR DISPLAYING AN IMAGE IN A REDUCED SCALE BY SAMPLING OUT AN INTERLACE VIDEO SIGNAL UNIFORMLY IN A VERTICAL DIRECTION WITHOUT SAMPLING OUT SUCCESSIVE LINES

Koh Matsushima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

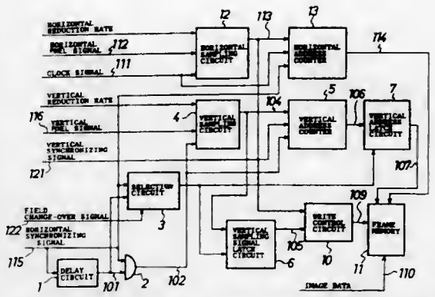
Filed Dec. 15, 1994, Ser. No. 356,846
Claims priority, application Japan, Dec. 16, 1993, 5-316153
Int. Cl.[6] H04N *5/262*
U.S. Cl. 348—581 **2 Claims**

1. An image reduction apparatus, comprising:

a frame memory for storing image data;

a delay circuit for delaying a horizontal synchronizing signal;

an AND circuit for logically ANDing the non-delayed horizontal synchronizing signal and the horizontal synchronizing signal delayed by said delay circuit and outputting a double-speed horizontal synchronizing signal having a speed double to that of the horizontal synchronizing signal;



a vertical sampling circuit for sampling the double-speed horizontal synchronizing signal in accordance with a vertical reduction rate for an image to generate a vertical sampling signal;

a vertical address counter for receiving the vertical sampling signal to generate a vertical address signal;

a selection circuit for selectively outputting one of the non-delayed horizontal synchronizing signal and the horizontal synchronizing signal delayed by said delay circuit in response to a field change-over signal;

a vertical sampling signal latch circuit for latching the vertical sampling signal from said vertical sampling circuit in response to the horizontal synchronizing signal selected by said selection circuit;

a vertical address latch circuit for latching the vertical address signal from said vertical address counter in response to the horizontal synchronizing signal selected by said selection circuit and outputting the latched vertical address signal to said frame memory; and

a write control circuit for receiving the vertical sampling signal outputted from said vertical sampling signal latch circuit to control writing into said frame memory.

5,552,835

Patent Not Issued For This Number

5,552,836

IMAGE SIGNAL PROCESSING APPARATUS IN WHICH THE ADC AND/OR THE 1DHL HAVE LOW POWER CONSUMPTION DURING VERTICAL BLANKING

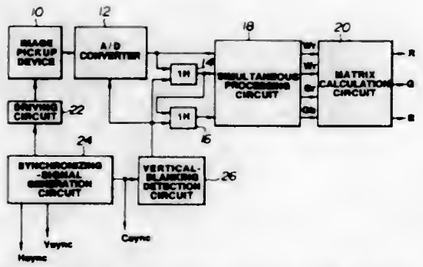
Kousuke Nobuoka, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 221,710, Jan. 31, 1994, abandoned, which is a continuation of Ser. No. 976,339, Nov. 13, 1992, abandoned. This application Sep. 26, 1994, Ser. No. 311,890
Claims priority, application Japan, Dec. 19, 1991, 3-336991
Int. Cl.[6] H04N *3/24;5/63*
U.S. Cl. 348—730 **45 Claims**

1. An image signal processing apparatus for processing image signals, said apparatus comprising:

conversion means for receiving an analog image signal, converting the received analog image signal into a digital image signal, and outputting the resultant signal;

delay means for receiving the resultant signal output by said conversion means, and for forming and outputting a plurality of different kinds of digital image signals by delaying the resultant signal;



digital image signal forming means for receiving the plurality of different kinds of digital image signals output from said delay means and the resultant signal output by said conversion means, and for generating new digital image signals from the received signals; and

control means for controlling at least one of said conversion means and said delay means so that a power-consumption state of at least one of said conversion means and said delay means is lower during a predetermined time period within the received analog image signal.

5,552,837

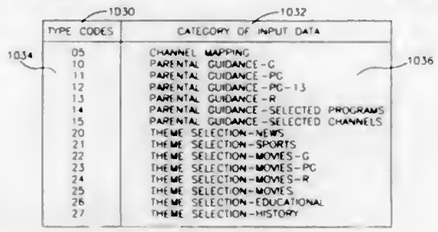
REMOTE CONTROLLER FOR SCANNING DATA AND CONTROLLING A VIDEO SYSTEM

Roy J. Mankovitz, Encino, Calif., assignor to Gemstar Development Corporation, Pasadena, Calif.

Filed Mar. 1, 1995, Ser. No. 396,559

Int. Cl.[6] H04N *5/00*

U.S. Cl. 348—734 **29 Claims**



1. A system for controlling a video system comprising:

a printed input data card comprising:

a type code printed on the input data card, the type code for representing a category of input data printed on the card; and

a plurality of input data printed on the input data card;

a command input device comprising:

means for scanning the input card containing the type code and the input data; and

means for decoding the type code to determine the category of the plurality of input data;

wherein:

the type code comprises a channel mapping category; and

the input data is arranged in pairs, a first input data of each pair representing an assigned channel number and a second input data of each pair representing a corresponding local channel number.

5,552,838

APPARATUS FOR TUNING OFFSET SIGNALS BY CONTROLLING A TUNER BASED ON A DIFFERENCE IN FREQUENCY OF SIGNALS TUNED BY THAT TUNER

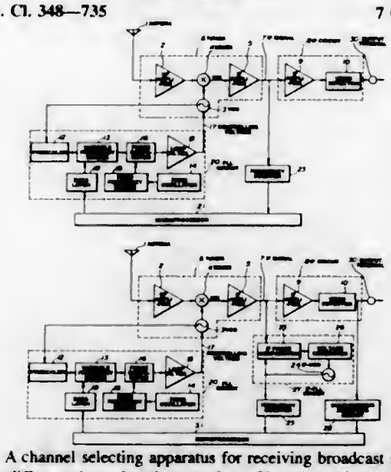
Katsuto Suizu, Saitama-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 22, 1994, Ser. No. 361,510

Claims priority, application Japan, Dec. 24, 1993, 5-328916; Aug. 10, 1994, 6-188383

Int. Cl.[6] H04N *5/50*

U.S. Cl. 348—735 **7 Claims**



1. A channel selecting apparatus for receiving broadcast signals from different channels, where carriers of broadcast signals from a first channel represent standard carriers and where carriers of broadcast signals from a second channel represent offset carriers that are offset from standard values, comprising:

a heterodyne receiver including a voltage controlled oscillating circuit for producing a predetermined local oscillating signal, and for producing a heterodyne signal having an intermediate frequency produced by mixing said local oscillating signal with a selected broadcast signal from among said broadcast signals;

demodulating means for generating a base band signal by demodulating an output signal from said heterodyne receiver;

a PLL circuit including a phase comparator for generating a phase comparing result based on a difference in phase between a reference signal of a predetermined frequency and said local oscillating signal produced by said voltage controlled oscillating circuit, for producing a controlling voltage that varies based on said phase comparing result, and for controlling an oscillating frequency of said voltage controlled oscillating circuit based on said controlling voltage;

measuring means, connected to an output terminal of said heterodyne receiver, for measuring a frequency of said heterodyne signal and for generating frequency measured data representing said measurement; and

a microprocessor for receiving said frequency measured data generated by said measuring means, and for producing a controlling signal for controlling said PLL circuit based on said frequency measured data, wherein said controlling signal represents data corresponding to a frequency difference between the heterodyne signal currently produced by said heterodyne receiver and a heterodyne signal corresponding to a standard carrier when said selected broadcast signal currently selected represents an offset carrier, said oscillating frequency of said oscillating circuit being varied based on said frequency difference.

3. A channel selecting apparatus comprising:

a heterodyne receiver for receiving both components of a broadcast signal, for mixing said components to receive a broadcast

and a signal of a first voltage controlled oscillating circuit, for producing a predetermined local oscillating signal, and for generating a heterodyne signal;

a demodulating circuit for demodulating the output signal generated by the heterodyne receiver, and for producing an output as a base band signal;

a first PLL circuit including a phase comparator for generating a phase comparing result based on a difference in phase between a reference signal having a predetermined frequency and said predetermined local oscillation signal produced by said first voltage controlled oscillating circuit, for producing a controlling voltage that varies based on said phase comparing result, and for controlling an oscillating frequency of said first oscillating circuit based on said controlling voltage;

a second PLL circuit including a second oscillating circuit having an oscillating frequency that varies such that the frequency of the heterodyne signal and the oscillating frequency by said second oscillating circuit have the same phase;

a measuring circuit, connected to an output of said second PLL circuit, for measuring a frequency of an output signal produced by said second PLL circuit, and for generating frequency measured data based on said frequency measurements; and

a microprocessor for receiving the frequency measured data from the measuring circuit, for setting a frequency for receiving a optional broadcast signal, for controlling the first PLL circuit to vary the oscillated frequency of the oscillating circuit based on a set frequency, for receiving the optional broadcast signal, for detecting the frequency difference between the frequency measured data from the measuring circuit when the broadcast signal is received and the regular frequency, and for controlling the first PLL circuit to vary the oscillated frequency of the first oscillating circuit based on the frequency difference detected.

6. A channel selected apparatus characterized by comprising:

a heterodyne receiver including a voltage controlled by oscillating circuit for producing a predetermined local oscillating signal, and for producing a heterodyne signal having an intermediate frequency produced by mixing said local oscillating signal with a selected broadcast signal from among said broadcast signals;

demodulating means for generating a base band signal by demodulating an output signal from said heterodyne receiver;

a first PLL circuit including a phase comparator for generating a phase comparing result based on a difference in phase between a reference signal having a predetermined frequency and said predetermined local oscillation signal produced by said first voltage controlled oscillating circuit, for producing a controlling voltage that varies based on said phase comparing result, and for controlling an oscillating frequency of said first oscillating circuit based on said controlling voltage;

a second PLL circuit including a second oscillating circuit having an oscillating frequency that varies such that the frequency of the heterodyne signal and the oscillating frequency by said second oscillating circuit have the same phase;

a measuring circuit, connected to an output of said second PLL circuit, for measuring a frequency of an output signal produced by said second PLL circuit, and for generating frequency measured data based on said frequency measurements; and

a microprocessor for determining the presence of a signal carrier based on the frequency measured data when any optional broadcast signal is received, and for determining the presence of a signal carrier based on the frequency measured data when another broadcast signal is received, and for receiving a specific broadcast signal by controlling the first PLL circuit to vary the oscillated frequency of the first oscillating circuit based on whether a signal carrier is determined to be present.

5,552,839

PROJECTION SYSTEM FOR ENTERTAINMENT AND GAME APPARATUS

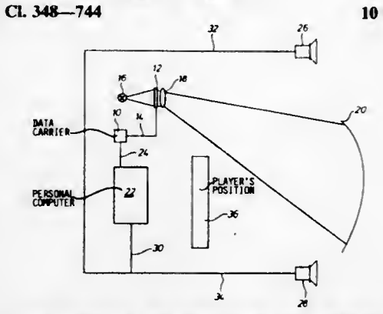
Thomas Kühl, Daxweiler, Germany, assignor to NSM Aktiengesellschaft, Bingen, Germany

Continuation of Ser. No. 137,796, Oct. 19, 1993, abandoned. This application Sep. 1, 1995, Ser. No. 522,931

Claims priority, application Germany, Oct. 26, 1992, 42 36 091.9

Int. Cl.[6] H04N *5/74*

U.S. Cl. 348—744 **10 Claims**



1. A video system for entertainment and game apparatus, comprising:

a curved screen which at least partially surrounds a user;

a data carrier on which video information relating to images of a game is stored in a pre-equalized manner to compensate for distortions connected with a later projection of the images onto the curved screen;

a liquid crystal display matrix coupled to the data carrier for displaying images of the game based on the pre-equalized information such that the images of the game displayed on the liquid crystal display are two-dimensional images containing distortions;

a lens and projection system for projecting the image displayed on the liquid crystal display matrix onto the curved screen to produce a three-dimensional image free of distortion.

5,552,840

THREE DIMENSIONAL PROJECTION DISPLAY REFLECTING DIVIDED POLARIZED LIGHT ON TO REFLECTIVE LIQUID CRYSTAL DISPLAY ELEMENTS

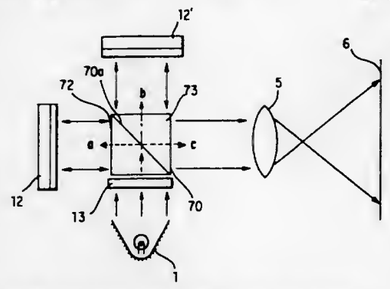
Yutaka Ishii, Nara, and Yoshitaka Yamamoto, Yamatokoriyama, both of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 11, 1993, Ser. No. 31,175

Claims priority, application Japan, Mar. 13, 1992, 4-055726

Int. Cl.[6] H04N *5/74*

U.S. Cl. 348—751 **20 Claims**



1. A projection type liquid crystal display comprising:

an optical source for generating light;

a light dividing means which divides the light into a first light

5,552,842

5,552,845

CAMERA

a light dividing means which divides the light into a first light having a first polarization direction and a second light having a second polarization direction, and allows the first and second lights to come out in different directions from each other;

a pair of reflective liquid crystal display elements formed of a first reflective liquid crystal display element and a second reflective liquid crystal display element, each of the pair of reflective liquid crystal display elements including a pair of substrates facing each other and liquid crystal sealed between the pair of substrates, the first reflective liquid crystal display element changing the first polarization direction of the first light by the liquid crystal sealed therein to allow the first light to come out thereof, and the second reflective liquid crystal display element changing the second polarization direction of the second light by the liquid crystal sealed therein to allow the second light to come out thereof;

a driving means for driving the first reflective liquid crystal display element and the second reflective liquid crystal display element with synchronization;

a light synthesizing means for receiving the first light which comes out of the first reflective liquid crystal display element and the second light which comes out of the second reflective liquid crystal display element, and synthesizing the first and second lights into image light; and

a screen on which the image light is displayed.

5,552,841

LIQUID CRYSTAL EYEGLASSES

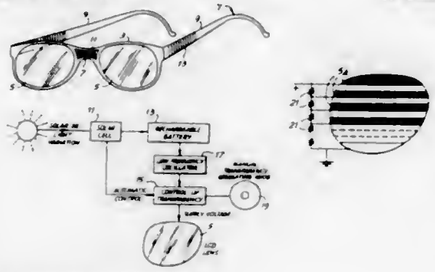
Massimo Gallorini, Arezzo; Bruno Angilella, Civitella della Chiana, and Sandro Bocci, Arezzo, all of, Italy, assignors to A B G S.r.l., Arezzo, Italy

Filed Oct. 4, 1994, Ser. No. 317,920

Claims priority, application Italy, Oct. 6, 1993, FI93A196

Int. Cl.[6] G02C *7/12*

U.S. Cl. 351—49 **15 Claims**



1. Eyeglasses, comprising:

a frame;

a pair of lenses mounted on said frame, said lenses including a liquid crystal device having a variable transparency;

voltage generator means applied on said lenses, said voltage generator means for converting luminous energy incident on said lenses into electrical energy, said voltage generator means including a film deposited on a portion of a surface of said lenses, said voltage generator including control output means connected to said liquid crystal device of said lenses for controlling said transparency of the lenses as a function of said incident luminous energy.

5,552,842

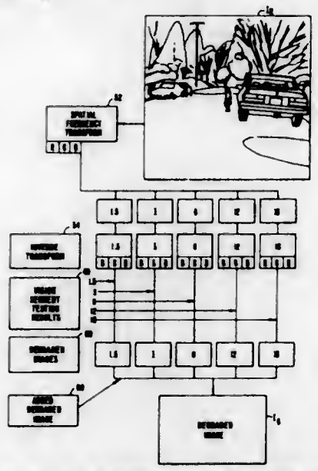
PROCESS AND APPARATUS FOR GENERATING COMPARISON IMAGE REPRESENTATIVE OF ACTUAL SUBJECT VIEW

Arthur P. Ginsburg, Danville, Calif.; Lawrence P. Tessler, Lake Orion, Mich.; Craig Fries, Oakland, and Jonathan Tifft, Berkeley, both of Calif., assignors to Vision Sciences Research Corp., San Ramon, Calif.

Filed Nov. 10, 1994, Ser. No. 337,624

Int. Cl.[6] A61B *3/10*

U.S. Cl. 351—205 **13 Claims**



11. In a process for the measurement and recordation of image visibility, the steps comprising:

selecting an image;

selecting a vision test having detected vision sensitivity in at least one segment of a preselected vision channel;

testing vision of the subject in the at least one segment of the preselected vision channel;

convolving the image into at least one modified image segment with filter functions corresponding to the tested vision of the subject in the at least one segment of the preselected vision channel; and,

replacing the modified image segments to the selected image to produce a composite modified image.

5,552,843

CAMERA CAPABLE OF READING FILM INFORMATION

Norikazu Yokonuma, Yokohama; Kazuyuki Kazami, Tokyo; Hideo Hibino, and Youichi Yamazaki, both of Kawasaki, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 390,938, Feb. 17, 1995, abandoned, which is a continuation of Ser. No. 189,646, Feb. 1, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 472,923

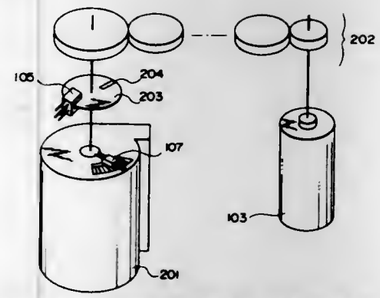
Claims priority, application Japan, Feb. 3, 1993, 5-016266

Int. Cl.[6] G03B *7/00*

U.S. Cl. 354—21 **18 Claims**

1. A camera capable of reading in film specific information represented by a bar code inscribed on a bar code display portion which rotates together with the forwarding of a film stored within a cartridge, the camera comprising:

a reading device which optically reads said bar code on said bar code display portion as said bar code display portion rotates together with the forwarding of said film, and which outputs an electrical signal of the bar code;



a comparison device which compares the output signal from said reading device with a reference value;

a calculation device which calculates a standard value based upon the output signal from said reading device;

a reference value control device which controls said reference value according to said standard value; and

a determination device which determines said film specific information based upon the output of said comparison device.

5,552,844

CAMERA EQUIPPED WITH DATA IMPRINTING DEVICE

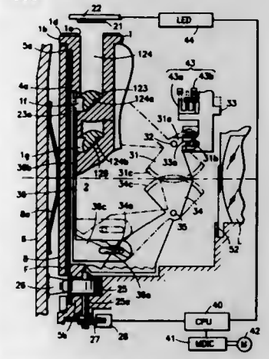
Hidenori Miyamoto; Isao Soshi, and Hiroshi Wakabayashi, all of Tokyo, Japan, assignors to Nikon Corporation, Tokyo, Japan

Division of Ser. No. 67,676, May 26, 1993, Pat. No. 5,473,397. This application Jun. 7, 1995, Ser. No. 485,828

Claims priority, application Japan, May 26, 1992, 4-133490

Int. Cl.[6] G03B *17/24*

U.S. Cl. 354—106 **16 Claims**



1. A data imprinting device for use in a camera comprising:

a light source;

a mechanism for imprinting at at least two positions with light from said light source;

a selector for selecting one of said at least two positions to imprint; and

a shaft having a plurality of tapers;

said plurality of tapers being in a plane parallel to a photosensitive surface; and

a plurality of optical elements on said plurality of tapers, whereby light from said light source is reflected at an angle and focussed toward said photosensitive surface at a plurality of positions.

5,552,845

CAMERA

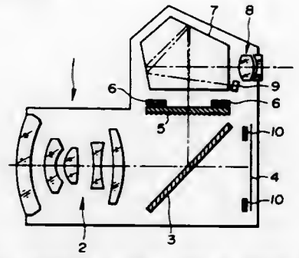
Masaki Nagao; Shinya Takahashi; Tamotsu Koiwai, and Yoshito Kobayashi, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1993, Ser. No. 104,456

Claims priority, application Japan, Aug. 10, 1992, 4-212969; Aug. 26, 1992, 4-227555; Oct. 5, 1992, 4-266170; Oct. 20, 1992, 4-281804; Oct. 28, 1992, 4-290520; Oct. 28, 1992, 4-290522; Feb. 9, 1993, 5-21511

Int. Cl.[6] G03B *17/02;13/10*

U.S. Cl. 354—159 **12 Claims**



1. A camera enabling selection of one of a normal photography mode in which an object image formed by a lens array is printed as it is or in proportional size, and a trimming photography mode in which part of the image is enlarged and printed, including:

mask means for use in confirming an object range for the trimming photography mode in a viewfinder; said mask means being formed with translucent members;

means for positioning said mask means in a field of view in the viewfinder for trimming photography; and

said mask means being formed with porous opaque members.

5,552,846

CAMERA

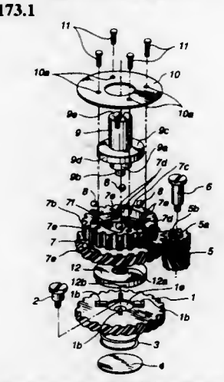
Masaki Tokui, Kanagawa-ken, Japan, assignor to Olympus Optical Co. Ltd, Tokyo, Japan

Filed Oct. 4, 1994, Ser. No. 318,054

Claims priority, application Japan, Oct. 8, 1993, 5-253285

Int. Cl.[6] G03B *1/18*

U.S. Cl. 354—173.1 **18 Claims**



1. A camera having a spool driving means for feeding film loaded in a cassette out of said cassette by rotating a spool, comprising:

a motor selectively rotatable in either of two opposing directions;

a spool drive shaft to be coupled with said spool;

a first gear for ejecting said film from said cassette on receipt of a driving force generated by said motor;

a first clutch means that when said motor rotates in a first direction, couples said first gear with said spool drive shaft so that said film is ejected from said cassette;

5,552,850

HANDLE GRIP TO BE DETACHABLY FIXED TO A DISPOSABLE CAMERA EQUIPPED WITH A SPOOL OF

a processing tank for containing a processing solution, the processing tank including a processing section to process the light-sensitive silver halide photographic material, a supply-

a first clutch means that when said motor rotates in a first direction, couples said first gear with said spool drive shaft so that said film is ejected from said cassette;

a second gear for winding said film into said cassette on receipt of a driving force generated by said motor; and

a second clutch means that when said motor rotates in a second direction, couples said second gear with said spool drive shaft via said first gear so that said film is wound into said cassette, said first and second clutch means having their axes being disposed coaxial with an axis of said spool drive shaft.

5,552,847

LENS BARREL

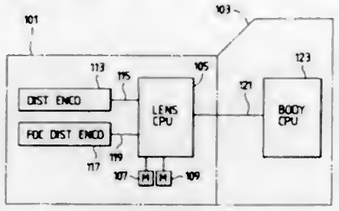
Tsuneo Watanabe, Kawasaki, and Yoshiharu Shiokama, Chiba-ken, both of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 961,333, Oct. 19, 1992, abandoned. This application Nov. 7, 1994, Ser. No. 339,285

Claims priority, application Japan, Oct. 25, 1991, 3-306514; Jan. 7, 1992, 4-018514

Int. Cl.[6] G03B *1/18;17/00*

U.S. Cl. 354—195.12 **28 Claims**



1. A lens barrel mountable on a camera body, comprising:

a phototaking lens system;

absolute position detection means for detecting the absolute position of a focusing lens group of said phototaking lens system in the axial direction;

phototaking distance data memory means storing phototaking distance data corresponding to the absolute position of said focusing lens group of said phototaking lens system;

aberration data memory means storing data of aberration between a predetermined image plane and the actual image plane of said phototaking lens system;

calculation means for calculating corrected phototaking distance data corresponding to an absolute position to which said focusing lens group is set when focused on an object, by correcting the corresponding phototaking distance data based on said aberration data; and

means for transferring the corrected phototaking distance data to said camera body.

5,552,848

FILM TRANSPORT MECHANISM FOR CAMERA

Joel S. Lawther, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

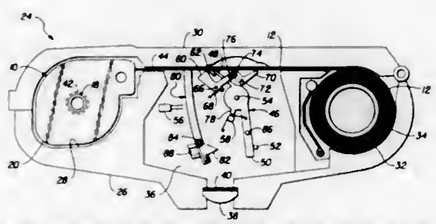
Filed Jan. 3, 1995, Ser. No. 367,660

Int. Cl.[6] G03B *17/42;1/00*

U.S. Cl. 354—206 **8 Claims**

1. A film transport mechanism for a camera comprising drive means for advancing a filmstrip beginning with a leading end portion along a defined film path from a film cartridge, and perforation sensor means located only for detecting a non-metering turn-around perforation in a trailing end portion of the filmstrip, is characterized in that:

said perforation sensor means has a sensing position in the defined film path to be received in the non-metering turn-around perforation when the non-metering turn-around perforation is advanced to the perforation sensor;



a film divertor has a diverting position in the defined film path to direct a forward edge of the leading end portion of the filmstrip over said perforation sensor means when the perforation sensor means is in its sensing position in the defined film path; and

film presence sensing means is located to sense the forward edge of the filmstrip after said film divertor directs the forward edge over said perforation sensor means, for retracting the film divertor from the defined film path to allow the perforation sensor means to be received in the turn-around perforation.

5,552,849

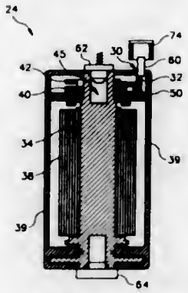
VISUAL EXPOSURE INDICATING SYSTEM

Anthony DiRisio, Rochester; Edgar G. Earnhart, Hilton, and Michael T. Wolf, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 23, 1995, Ser. No. 377,542

Int. Cl.[6] G03B *17/26*

U.S. Cl. 354—275 **30 Claims**



1. A film cassette for use with a photographic camera in making exposures, the film cassette comprising:

a cassette body having a plurality of film status windows;

a film spool, contained within the cassette body, onto which is wound an elongated strip of film that is moved within the camera as exposures are made;

a driver disk that is directly coupled to the film spool;

a flex disk that can be urged into and out of engagement with the driver disk such that the flex disk rotates with the driver disk only when engaged with it; and

a film status indicator whose position relative to the film status windows indicates the status of the film;

wherein movement of the film spool when the flex disk is engaged with the driver disk causes the flex disk to move and the position of the film status indicator relative to at least one of the film status windows to change, and movement of the film spool when the flex disk is not engaged with the driver disk causes no change in the relative position of the film status indicator.

5,552,850

HANDLE GRIP TO BE DETACHABLY FIXED TO A DISPOSABLE CAMERA EQUIPPED WITH A SPOOL OF FILM

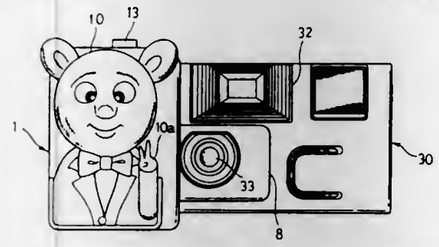
Koji Matsumoto, Chiba, Japan, assignor to Nichimen Corporation, Osaka, Japan

Filed Sep. 7, 1994, Ser. No. 301,882

Claims priority, application Japan, Sep. 7, 1993, 5-053419 U

Int. Cl.[6] G03B *11/00*

U.S. Cl. 354—295 **9 Claims**



1. A handle grip to be detachably fixed to a disposable camera equipped with a spool of film characterized in that the handle grip comprises: a box-like body whose top plate is long enough to reach the shutter button of the disposable camera, and has an aperture to be in alignment with the shutter button when the handle grip is attached to the disposable camera by inserting the shutter button side of the disposable camera body; a push button fitted in the aperture of the top plate of the handle grip body, the push button being vertically movable, and being spring-biased upward and being adapted to push the shutter button to release the shutter at the end of the downward stroke of the push button when pushed down; a voice sound generator means for electronically generating artificial voice utterance to attract the attention of children to be snapped; and a switching means to be closed by the push button on the way to the end of the downward stroke, thereby energizing the voice sound generator means.

5,552,851

AUTOMATIC PROCESSING MACHINE FOR SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

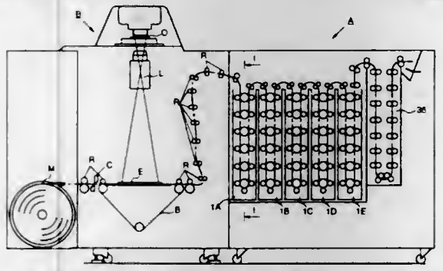
Shigeharu Koboshi; Masao Ishikawa; Yoshimasa Komatsu; Hideo Ishii; Yorikatsu Miyazawa; Yoshifumi Tsubaki; Kaneo Saito, and Hiroshi Yoshimoto, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Division of Ser. No. 382,894, Feb. 2, 1995, which is a division of Ser. No. 142,796, Oct. 25, 1993, Pat. No. 5,400,105. This application Nov. 20, 1995, Ser. No. 561,495

Claims priority, application Japan, Oct. 30, 1992, 4-293271; Oct. 30, 1992, 4-293274; Nov. 11, 1992, 4-301432

Int. Cl.[6] G03D *3/02;13/00*

U.S. Cl. 354—298 **11 Claims**



1. An apparatus for processing a light-sensitive silver halide photographic material, comprising:

a processing tank for containing a processing solution, the processing tank including a processing section to process the light-sensitive silver halide photographic material, a supplying section, and circulating means for circulating the processing solution between the processing section and the supplying section;

solid agent replenishing means for storing a solid agent and for replenishing the solid agent to the supplying section of the processing tank so that the solid agent is supplied to the processing section through the supplying section by the circulating means;

detection means for detecting an amount of processed light-sensitive silver halide photographic material;

control means for controlling the solid agent replenishing means so as to cause the solid agent replenishing means to replenish the solid agent in accordance with the detected amount of processed light-sensitive silver halide photographic material; and

water-replenishing means for replenishing water to the processing tank; and

wherein the circulating means continues circulation of the processing solution for a predetermined time period after a processing of photographic material has been completed.

5,552,852

DEVICE OF DISSOLVING AND REPLENISHING SOLID PROCESSING AGENTS FOR A SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL AND AUTOMATIC PROCESSING MACHINE FOR SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL EQUIPPED WITH THE DEVICE

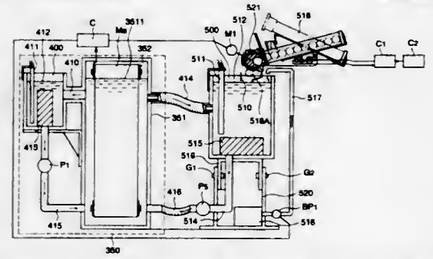
Ichiro Tsuchiya, and Tsuyoshi Haraguchi, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Nov. 28, 1994, Ser. No. 345,637

Claims priority, application Japan, Dec. 3, 1993, 5-304298

Int. Cl.[6] G03D *3/02*

U.S. Cl. 354—324 **20 Claims**



1. A device for dissolving a solid processing agent so as to make a dissolved solution and for replenishing the dissolved solution to an automatic processing apparatus for a silver halide photographic light-sensitive material,

said automatic processing apparatus having a processing tank for containing a processing solution and a processing solution circulating tank connected to the processing tank for circulating the processing solution between the processing tank and the processing solution circulating tank, said device comprising:

(a) a dissolving tank for dissolving the solid processing agent to make the dissolved solution therein;

(b) means for supplying the processing solution from said automatic processing apparatus to the dissolving tank;

(c) means for replenishing the dissolved solution from the dissolving tank to the automatic processing apparatus;

whereby the processing solution circulates between the automatic processing apparatus and said device; and

(d) adjusting means for adjusting a position of the dissolving tank.

5,552,853

AUTO FOCUSING APPARATUS IN A CAMERA

5,552,858

IMAGE FORMING APPARATUS HAVING A

5,552,853

AUTO FOCUSING APPARATUS IN A CAMERA

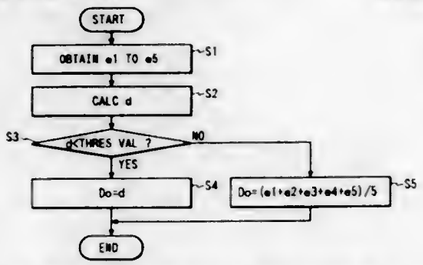
Masaru Muramatsu, Kawasaki; Shigemasa Sato, Yokohama; Seeyuki Ohishi, Shinagawa, and Tadashi Otani, Obtawara, all of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 424,610, Apr. 17, 1995, abandoned, which is a continuation of Ser. No. 148,536, Nov. 8, 1993, abandoned, which is a continuation of Ser. No. 996,687, Dec. 24, 1992, abandoned. This application Aug. 25, 1995, Ser. No. 519,177

Claims priority, application Japan, Jan. 9, 1992, 4-002415; Jan. 27, 1992, 4-011599; Jan. 27, 1992, 4-012298

Int. Cl.[6] G03B *13/36*

U.S. Cl. 354—408 **15 Claims**



1. An auto focusing apparatus in a camera comprising:

detecting means for detecting the measured distance values of an object corresponding to a plurality of areas in a photographing image field;

first determining means for determining a first measured distance value which is the measured distance value of the shortest distance from the plurality of measured distance values detected by said detecting means;

comparing means for comparing the first measured distance value determined by said first determining means with a threshold value;

second determining means for determining the mean value of the plurality of measured distance values detected by said detecting means as a second measured distance value; and

driving means for driving a photo-taking lens on the basis of said first measured distance value when it is judged by said comparing means that said first measured distance value is smaller than said threshold value, and driving the photo-taking lens on the basis of said second measured distance value when it is judged by said comparing means that said first measured distance value is equal to or greater than said threshold value.

5,552,854

VISUAL LINE DETECTION DEVICE AND CAMERA EQUIPPED THEREWITH

Hitoshi Nishimura, Komae, Japan, assignor to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 118,607, Sep. 10, 1993, abandoned. This application Nov. 16, 1994, Ser. No. 341,988

Claims priority, application Japan, Sep. 14, 1992, 4-245143

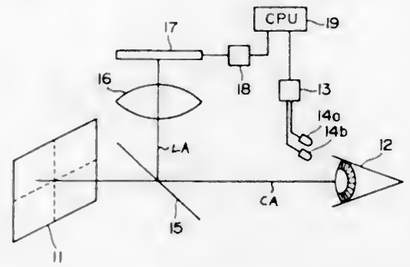
Int. Cl.[6] G03B *13/02;* **A61B** *3/113*

U.S. Cl. 354—410 **17 Claims**

1. A visual line detection device which detects the visual line of an observer, comprising:

a light source which illuminates the eyeball of said observer; and

a visual line direction calculating circuit which calculates the direction of the visual line of said observer using information related to said light source as one parameter.



5,552,855

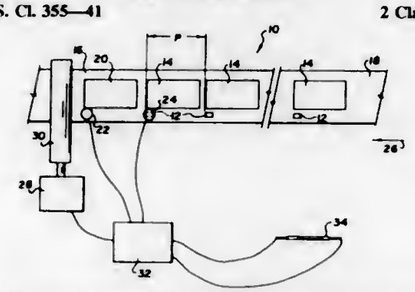
DETECTING APPARATUS FOR FINDING A REFERENCE EXPOSURE MADE ON A LEADING AND/OR TRAILING PORTION OF A FILMSTRIP

David C. Smart, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 21, 1995, Ser. No. 426,387

Int. Cl.[6] G03B *27/52*

U.S. Cl. 355—41 **2 Claims**



1. Detecting apparatus for finding a reference exposure which is made on a leading and/or trailing non-perforated portion of a filmstrip that precedes or follows a series of evenly spaced perforations in the filmstrip having a pitch slightly greater than the width of respective picture-taking exposures made on the filmstrip substantially between successive pairs of the perforations and which is located in conformity with the pitch, said detecting apparatus comprising:

a pair of sensors spaced apart a distance which is the same as the pitch of the series of perforations to be able to simultaneously detect successive pairs of the perforations; and

means for determining that one of said sensors has detected one of the perforations and the other has not to find the reference exposure made on the leading or trailing non-perforated portion of the filmstrip.

5,552,856

PROJECTION EXPOSURE APPARATUS

Naomasa Shiraishi, Kawasaki, and Shigeru Hirukawa, Kashiwa, both of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 264,253, Jun. 22, 1994, abandoned, which is a continuation of Ser. No. 076429, Jun. 14, 1993, abandoned. This application Nov. 22, 1995, Ser. No. 563,907

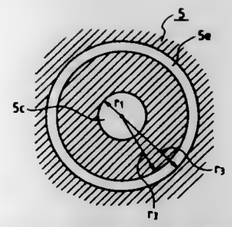
Int. Cl.[6] G03B *27/42*

U.S. Cl. 355—53 **22 Claims**

1. A projection exposure apparatus comprising:

an illumination optical system for irradiating a mask with illumination light;

a projection optical system for projecting an image of a pattern formed on said mask onto a substrate;



an optical member for defining a light quantity distribution of said illumination light on or near a Fourier transform plane to the pattern on said mask in said illumination optical system such that the illumination light is intensified in a first region inside a substantial circle of radius r_1 with a center on an optical axis of said illumination optical system and in a substantially annular second region bordered by a substantial circle of radius r_2 and a substantial circle of radius r_3 (where $r_1 \leqq r_2 < r_3$) with respective centers thereof on said optical axis, and such that a light quantity in said first region is made approximately twice or more times a light quantity in said second region; and

a spatial filter having an annular transparent portion and disposed on or near a Fourier transform plane to the pattern on said mask in said projection optical system.

5,552,857

MULTICOLOR IMAGE FORMING APPARATUS

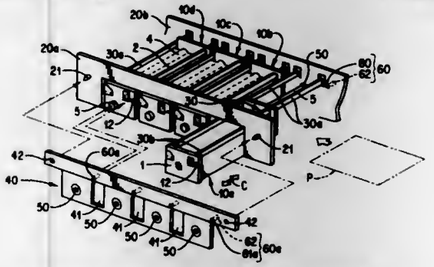
Tadashi Ishikawa, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1995, Ser. No. 417,031

Claims priority, application Japan, May 16, 1994, 6-101335

Int. Cl.[6] G03G *15/00;15/01*

U.S. Cl. 355—200 **11 Claims**



1. A multicolor image forming apparatus comprising:

a plurality of unicolor imaging units each equipped with at least a developing device anchored to a unit frame and an image carrier drum anchored removably to said unit frame, each of said unicolor imaging units being installed removably in an apparatus body;

slide rails attached to a front frame and a rear frame of the apparatus body to support said unicolor imaging units, so that toner images produced individually by said unicolor imaging units transferred onto a recording medium form a multicolor image; and

a shaft fitter receiving a shaft of the image carrier drum in each of said unicolor imaging units and a pin fitter receiving an engagement pin projecting from said unit frame are provided in the rear frame of said apparatus body and a support side plate, respectively;

wherein said pin fitter comprises a pin fitting base and a pressure jig that presses said pin fitting base toward said shaft fitter to maintain a predetermined space between said shaft fitter and said pin fitter, said support side plate being removably anchored to a predetermined position of the front frame of said apparatus body.

5,552,858

IMAGE FORMING APPARATUS HAVING A DETECHABLE EXTERNAL MEMORY UNIT

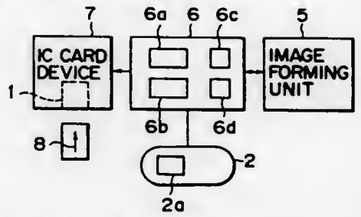
Souhei Ujiie, and Tadashi Suzuki, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 820,487, Nov. 14, 1992, abandoned, which is a division of Ser. No. 525,708, May 2, 1990, Pat. No. 5,115,273. This application Sep. 14, 1993, Ser. No. 120,226

Claims priority, application Japan, May 26, 1989, 1-131295

Int. Cl.[6] G03G *15/00*

U.S. Cl. 355—202 **6 Claims**



1. An image forming apparatus from which an external memory medium is arbitrarily detachable, said external memory medium being adapted for use in various kinds of image forming apparatus on a common basis, and being adapted to store an image formation mode registerable by said various kinds of image forming apparatus, comprising:

image forming means for forming an image on a recording material in a designatable image formation mode;

an attachment unit adapted to attach said external memory medium thereto;

detection means for detecting that said external memory medium is attached to said attachment unit;

indication means for indicating reading out or writing of the image formation mode stored in said external memory medium attached to said attachment unit; and

control means for controlling reading out or writing of the image formation mode stored in said external memory medium which is attached to said attachment unit, said control means automatically controls reading out or writing of the image formation mode stored in the external memory medium in response to a detection that said external memory medium is attached to the attachment unit.

5,552,859

SHEET SUPPLYING APPARATUS WITH MEANS FOR ROCKING SHEET STACKING PLATE

Tomohito Nakagawa, Matsudo; Masakazu Hiroi, Yokohama; Kazuhiro Matsuo, Tokyo; Hideki Orii, Yamanashi-ken; Satoru Kato, Yamanashi-ken; Akihito Dobashi, Yamanashi-ken, and Mamoru Noda, Yamanashi-ken, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1995, Ser. No. 383,432

Claims priority, application Japan, Feb. 8, 1994, 6-036573; Feb. 8, 1994, 6-036574

Int. Cl.[6] G03G *15/00;* **B65H** *5/06*

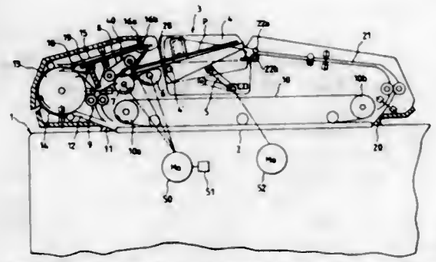
U.S. Cl. 355—207 **33 Claims**

8. A sheet supplying apparatus comprising:

a sheet stacking plate on which sheets are stacked;

drive means for vibrating said sheet stacking plate upwardly and downwardly; and

5,552,861



sheet supply means for supplying the sheet from said sheet stacking plate;

wherein said drive means is operated when a predetermined time period is elapsed after a sheet supplying operation is started.

5,552,860

MONITORING SYSTEM IN AUTO-RESTORING IMAGE REPRODUCING SYSTEM

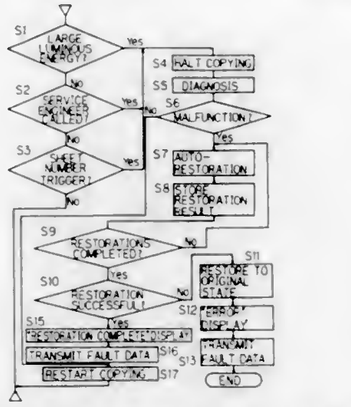
Yuji Yamashita; Jiro Nagira; Yasuhiro Hashimoto, and Fumio Aizawa, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 21, 1995, Ser. No. 560,789

Claims priority, application Japan, Nov. 30, 1994, 6-297681

Int. Cl.[6] G03G *15/00;21/00*

U.S. Cl. 355—207 **23 Claims**



15. An auto-restoration method for an image reproducing system wherein image reproducing machines have an auto-restoration capability, comprising the steps of:

detecting faults causing operational malfunction in an image reproducing machine;

preparing and executing an auto-restoration process implementing restorative operations to compensate functionally for machine faults detected in said fault detecting step;

storing restoration process data identifying the executed auto-restoration process;

interpreting as restorative state data success of restorative operations implemented by said auto-restoration function; and

displaying the restoration process data and the restorative state data.

5,552,861

IMAGE FORMING APPARATUS HAVING CONTROLLER ADJUSTING CURRENT TO MAIN CHARGER AND TRANSFER CHARGER

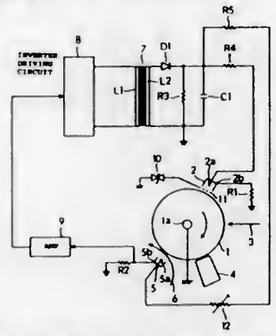
Kazuhiro Mizude; Hisahiro Kato; Hideki Ishida, and Tomohiro Tsutano, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Dec. 2, 1994, Ser. No. 352,865

Claims priority, application Japan, Dec. 10, 1993, 5-310161

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—208 **3 Claims**



1. An image forming apparatus, comprising:

a photoreceptor drum;

a main charger for charging a surface of the photoreceptor drum, the main charger including a wire, a shield, and a grid;

a transferring charger for generating an electric field toward the photoreceptor drum so that a toner image formed on the surface of the photoreceptor drum is transferred onto a sheet of paper, the transferring charger including a wire and a shield;

a high voltage transformer for supplying a high voltage to the main charger and to the transferring charger, the high voltage transformer being provided with one common secondary winding;

sensing means for sensing a shield current of the transferring charger;

primary side controlling means for controlling a primary side of the high voltage transformer based on an output of the sensing means so that the shield current is constant;

constant-voltage controlling means, connected to the grid of the main charger, for constant-voltage controlling the grid, the constant-voltage controlling means including a constant voltage device which is activated when a value of a current passing through the constant voltage device is equal to or above a predetermined value; and

means for setting a current supplied from the high voltage transformer to the main charger to be greater than a current supplied from the high voltage transformer to the transferring charger.

5,552,862

SERIAL-TYPE ELECTROPHOTOGRAPHIC DEVICE AND A METHOD FOR ADJUSTING PRINTING BASED UPON A DETECTED HUMIDITY USED THEREIN

Syuzo Masuda, Saijo, and Ryouichi Iwama, Kawasaki, both of, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 6, 1995, Ser. No. 471,531

Claims priority, application Japan, Aug. 18, 1994, 6-194443

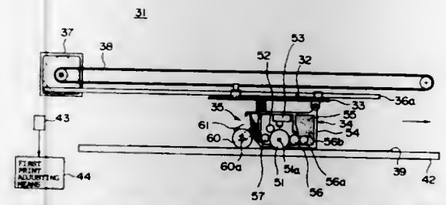
Int. Cl.[6] G03G *15/04*

U.S. Cl. 355—208 **15 Claims**

1. A serial-type electrophotographic device, comprising:

feeding means for feeding a recording paper;

a carriage having process means for forming a latent image in image retaining means and developing the latent image to a visible image;



transcription means for transcribing said developed visible image to said recording paper in a moving direction of said carriage;

conveyer means for conveying said carriage in a perpendicular direction to a feeding direction of said recording paper on said transcription means;

photographic fixing means for fixing an image transcribed to said recording paper;

environment detecting means for detecting at least a humidity around said serial-type electrophotographic device; and

print adjusting means for adjusting an amount of the recording paper fed by said feeding means in response to the detected humidity detected by said environment detecting means so as to adjust each image line width in said feeding direction of said recording paper.

5,552,863

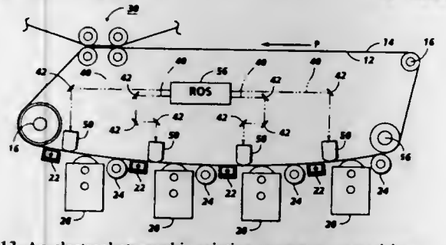
XEROGRAPHIC PRINTER WHEREIN EXPOSURE AND DEVELOPMENT ARE PERFORMED ON OPPOSITE SIDES OF THE PHOTORECEPTOR

Frank C. Genovese, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 21, 1995, Ser. No. 391,818

Int. Cl.[6] G03G *13/00*

U.S. Cl. 355—210 **20 Claims**



13. An electrophotographic printing apparatus, comprising:

a photoreceptor, in the form of a substrate defining a development surface for the retention of an electrostatic latent image thereon; and

a shoe, defining a sliding surface in slidable contact with a surface of the photoreceptor, wherein the shoe includes a cylinder lens adapted to focus light from a light source substantially at the development surface of the photoreceptor.

5,552,864

MAGNETIC SEAL WITH TAPERED SHUNTS

Jan M. Malicki; David B. Playfair, both of Rochester, and Steven C. Hart, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

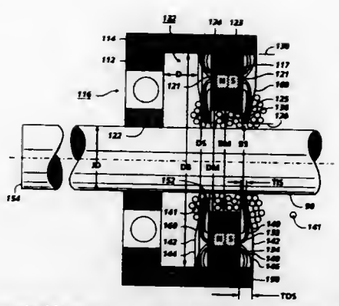
Filed Jan. 17, 1995, Ser. No. 373,717

Int. Cl.[6] G03G *21/00;15/06*

U.S. Cl. 355—215 **27 Claims**

1. A system for sealing a member rotating about an axis of a support, comprising:

a magnetic field producing member; and



a magnetizable member positioned adjacent said magnetic field producing member, said magnetizable member having at least a portion thereof progressively increasing in thickness in a direction substantially parallel to the axis as distance from the axis increases.

5,552,865

CHARGING DEVICE AND METHOD FOR CHARGING A CHARGE RECEIVING MEMBER BY A CHARGING MEMBER BY DISCHARGE THEREBETWEEN BASED ON DIFFERENCE IN ELECTRIC POTENTIAL BETWEEN THE CHARGING MEMBER AND THE CHARGE-RECEIVING MEMBER

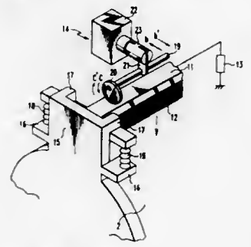
Izumi Osawa; Akihito Ikegawa, both of Osaka; Shuji Iino, Mukou, and Masaki Asano, Amagasaki, all of, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

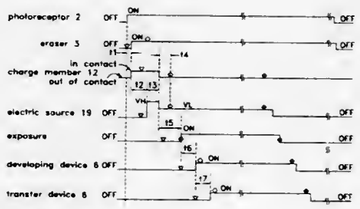
Filed Feb. 8, 1994, Ser. No. 193,276

Claims priority, application Japan, Feb. 9, 1993, 5-021122; Feb. 26, 1993, 5-037912; Feb. 26, 1993, 5-037913

Int. Cl.[6] G03G *15/02*

U.S. Cl. 355—219 **40 Claims**





33. A charging device comprising:

a charge-receiving member;

a charging member which is opposite to said charge-receiving member and charges the charger-receiving member;

a changing member which changes a distance between the charging member and the charge-receiving member; and

a controller which controls said changing member so as to change the distance between the charging member and the charge-receiving member during the charging of the charge-receiving member.

5,552,866

COPYING APPARATUS FOR THE PHOTOGRAPHIC REPRODUCTION OF A MULTI-DIMENSIONAL OBJECT

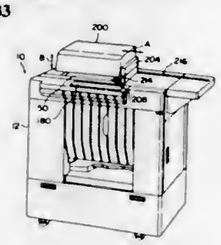
Fumio Matsumoto; Ryoichi Kato, both of Tokyo; Kazumi Tanabe, Kanagawa, and Teruo Bando, Tokyo, all of, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

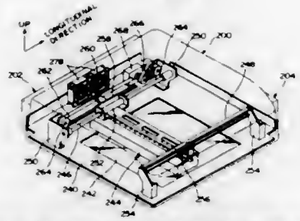
Filed Jan. 28, 1994, Ser. No. 188,236

Claims priority, application Japan, Jan. 29, 1993, 5-013202; May 31, 1993, 5-129365

Int. Cl.[6] G03G *15/28*

U.S. Cl. 355—233 **22 Claims**





1. A copying apparatus for the photographic reproduction of a multi-dimensional object capable of photocopying an original and a three-dimensional object, comprising:

a platen glass on which one of said original and said three-dimensional object is disposed to cover a primary portion of said platen glass, uncovered portion of said platen glass corresponding background portions;

a primary light source disposed such that said platen glass is disposed between said primary light source and said one of said original and said three-dimensional object, said primary light source emitting a primary light representative of an image which is reflected by said one of said original and said three-dimensional object;

an exposure section for receiving said reflected light and for exposing a photosensitive material to form the image thereon; and

a secondary light sources for illuminating a secondary light through said uncovered portions of said one of said original and said three-dimensional object, said secondary light source being disposed so as to be separated from a surface of said platen glass in a vertical direction and being disposed such that said one of said original and said three-dimensional object is positioned between said secondary light source and said platen glass, wherein said secondary light is received by said exposure section and said photosensitive material is exposed thereby.

5,552,867

TONER REGULATING BLADE HAVING A BEVELLED EDGE

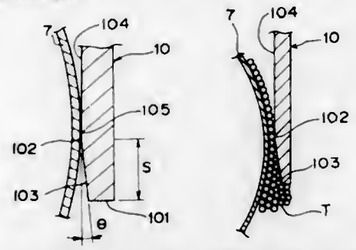
Hitoshi Sekino; Hirokatsu Shimada; Yasutsugu Takesue; Akihiro Kawasaki, and Hiroshi Toda, all of Toyokawa, Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Aug. 26, 1994, Ser. No. 295,046

Claims priority, application Japan, Aug. 27, 1993, 5-212625; Feb. 28, 1994, 6-029503

Int. Cl.[6] G03G *15/08*

U.S. Cl. 355—245 **15 Claims**



1. An electrostatic latent image developing device, comprising:

a rotatable developing roller for providing an electrostatic latent image formed on a photoreceptor with a toner so as to develop the latent image into a visual image; and

a toner regulating blade having a surface which contacts the developing roller so that the toner is regulated and then formed into a thin layer;

wherein the toner regulating blade has, extending from said surface a bevelled portion which forms, together with an outer surface of the developing roller, a wedge shaped space in an upstream side of a contact region of the blade and the developing roller with respect to a direction of a movement of the developing roller, and the bevelled portion forms an angle of 5° to 15° with an imaginary line extending from said surface of the blade.

5,552,868

ELECTROPHOTOGRAPHIC DEVICE

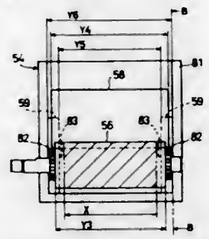
Ryouichi Iwama, Kawasaki, and Syuzo Masuda, Saijo, both of, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jul. 24, 1995, Ser. No. 506,341

Claims priority, application Japan, Aug. 29, 1994, 6-203979

Int. Cl.[6] G03G *15/08*

U.S. Cl. 355—245 **20 Claims**



1. An electrophotographic device comprising:

feeding means for feeding recording paper;

process means, having an image carrier and a developing device, for forming a latent image on the image carrier and developing said latent image to a visible image by image material through said developing device;

transcription means for transcribing said visible image to said recording paper; and

photographic fixing means for fixing said visible image transcribed to said recording paper,

wherein said developing device contacts said image carrier to develop said visible image by said image material, said developing device having a developing member wider than at least an effective imaging area of said image carrier and narrower than a charged area of said image carrier.

5,552,869

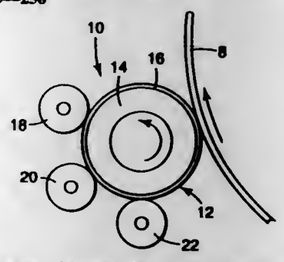
DRYING METHOD AND APPARATUS FOR ELECTROPHOTOGRAPHY USING LIQUID TONERS

Kay F. Schilli, St. Paul; Russell A. Roiko, Rogers; Kent E. Emerson, South St. Paul; Edward J. Woo, Woodbury, and Claire A. Jalbert, Cottage Grove, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 29, 1995, Ser. No. 536,880

Int. Cl.[6] G03G *15/10*

U.S. Cl. 355—256 **21 Claims**



1. An apparatus for removing excess carrier liquid from a photoreceptor comprising

an image drying element which contacts the photoreceptor, wherein the image drying element has an outer layer which absorbs carrier liquid and an inner layer having a Shore A hardness of 10 to 60 which is phobic to the carrier liquid,

a heating means which heats the surface of the image drying element for at least 0.05 seconds to no more than 5° C. below the flashpoint of the carrier liquid,

wherein the photoreceptor is moving at a speed of at least 45 mm/second.

5,552,870

DEVELOPING DEVICE FOR AN IMAGE FORMING APPARATUS

Eisaku Murakami, Hiratsuka; Kazuhiro Yuasa, Zama; Shuichi Endoh, Isehara; Iwao Matsumae, Tokyo; Yoshiaki Tanaka, Kawasaki; Hiroshi Hosokawa, Yokohama; Mugijiroh Uno, Isehara; Hiroshi Saitoh, Ayase; Eiji Takenaka, Isehara; Toshihiro Sugiyama, Atsugi; Tetsuo Yamanaka, Tokyo, and Satoru Komatsubara, Atsugi, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 28, 1994, Ser. No. 365,080

Claims priority, application Japan, Dec. 28, 1993, 5-335004; Dec. 28, 1993, 5-338674

Int. Cl.[6] G03G *15/08;15/06*

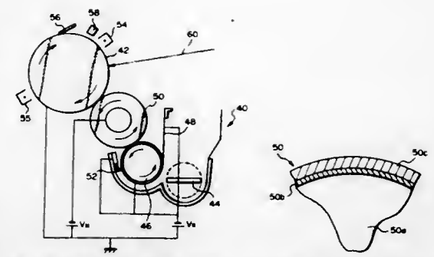
U.S. Cl. 355—259 **17 Claims**

1. A developing device for an image forming apparatus and for developing a latent image electrostatically formed on an image carrier by a single component type developer consisting only of toner, said device comprising:

first toner conveying means having a magnetized surface for depositing the toner;

toner regulating means for leveling the toner deposited on said first toner conveying means to thereby form a uniform toner layer; and

second toner conveying means for receiving the toner from said first toner conveying means to thereby form a toner layer on said second toner conveying means and then transferring said toner to the latent image formed on the image carrier, said second toner conveying means comprising an elastic surface, an electrode layer disposed on said elastic surface, and a non-conductive layer disposed on said electrode layer.



5,552,871

IMAGE TRANSFERRING DEVICE FOR IMAGE FORMING APPARATUS

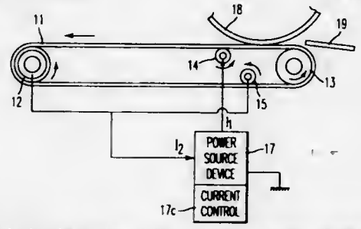
Akio Kutsuwada, Kanagawa-ken, and Masakuni Konja, Souka, both of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 242,882, May 16, 1994, Pat. No. 5,493,371. This application Jul. 5, 1995, Ser. No. 498,782

Claims priority, application Japan, Jun. 11, 1993, 5-140468

Int. Cl.[6] G03G *15/14*

U.S. Cl. 355—271 **4 Claims**



1. A device incorporated in an image forming apparatus for transferring an image from a photosensitive element to a transfer sheet, comprising:

a first supporting member;

a second supporting member;

a transfer belt for transferring a toner image formed on a latent image carrier to a transfer sheet, said transfer belt passing over said first supporting member and said second supporting member;

a bias member;

a feedback member;

a power source for applying a voltage to said bias member, and including means for controlling an output of said power source, said power source being connected to said bias member and said feedback member;

wherein an output current flowing from said power source to said transfer belt via said bias member is I-1;

wherein I-1 and I-2 satisfy the following equation:

$$I\text{-}1\text{-}I\text{-}2=K$$

where K is constant;

wherein said transfer belt includes a run for transferring said transfer sheet extending between said first supporting member and said second supporting member, and a run which does not transfer said transfer sheet extending between said first supporting member and said second supporting member, and further wherein said bias member contacts said transfer belt along said run for transferring said transfer sheet and only said feedback member contacts said transfer belt along said run which does not transfer said transfer sheet, and wherein said bias member is located downstream of a nip portion

between said photosensitive element and said transfer belt with respect to a moving direction of said transfer belt, and further wherein the feedback current flowing from said transfer belt to said power source via said feedback member and said first supporting member is 1-2.

5,552,872

SEPARATION CHARGER CONTROL FOR ELECTRO-PHOTOGRAPHIC APPARATUS

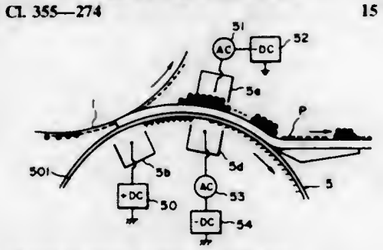
Koji Amemiya, Tokyo, and Masahiro Inoue, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 182,515, Jan. 14, 1994, which is a continuation of Ser. No. 963,262, Oct. 19, 1992, abandoned, which is a continuation of Ser. No. 531,154, May 31, 1991, abandoned. This application Jan. 25, 1994, Ser. No. 186,036

Claims priority, application Japan, May 31, 1989, 1-138189; May 31, 1989, 1-138779; Aug. 30, 1989, 1-223695

Int. Cl.[6] G03G *15/14;15/16*

U.S. Cl. 355—274 **15 Claims**



1. An image forming apparatus, comprising:

a photoconductor;

means for forming a toner image on the photoconductor;

an intermediate transfer member disposed opposite to the photoconductor for holding a sheet on its circumferential surface;

a transfer charger disposed opposite to the photoconductor through the intermediate transfer member for transferring a toner image from the photoconductor onto a sheet held on the intermediate transfer member;

a separation charger disposed at a downstream side of the transfer charger in the rotational direction of the intermediate transfer member for separating the sheet from the intermediate transfer member; and

means for setting an output of the separation charger corresponding to the number of times the toner image is transferred.

5,552,873

ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS HAVING A PRE-TRANSFER PRESSING ROLLER

Naoto Hirao, and Shinji Ohshima, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 15,447, Feb. 9, 1993, abandoned. This application Feb. 15, 1994, Ser. No. 196,530

Claims priority, application Japan, Feb. 16, 1993, 5-26653

Int. Cl.[6] G03G *15/14*

U.S. Cl. 355—274 **13 Claims**

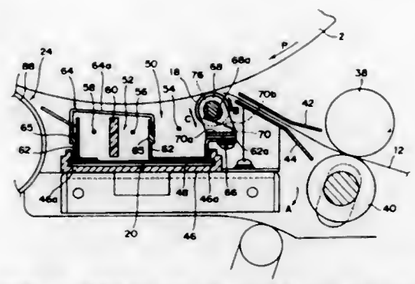
1. An image forming apparatus, comprising:

an electrostatic latent image retaining body;

means for forming an electrostatic latent image on said retaining body;

means for developing said electrostatic latent image to form a toner image on said retaining body;

transfer means for transferring said toner image from said retaining body to a sheet of paper;



means for separating from said retaining body said sheet of paper to which said toner image has been transferred by said transfer means;

means for fixing said toner image on said sheet of paper;

a pressure roller, rotatably and elastically provided on an upstream side of said transfer means, for pressing said sheet of paper against said retaining body;

biasing means, interposed between said pressure roller and said transfer means, for directly biasing said pressure roller onto said sheet of paper against said retaining body from the time said sheet of paper is fed between said pressure roller and said retaining body;

paper inverting means for inverting feeding direction of said sheet of paper after toner image on a first surface of said sheet of paper is fixed by said fixing means;

inversion path means for supplying said sheet of paper inverted by said paper inverting means to a position between said retaining body and said pressure roller; and

a cushion means, interposed between said pressure roller and said transfer, unit for absorbing vibrations of said pressure roller.

5,552,874

IMAGE FIXING APPARATUS

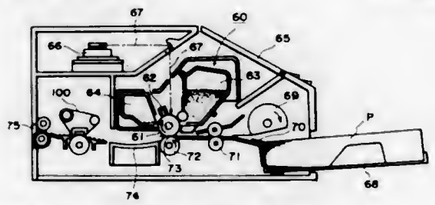
Yasumasa Ohtsuka, Yokohama; Yohji Tomoyuki, Ichikawa; Akira Hayakawa, Tokyo; Manabu Takano, Tokyo; Daizo Fukuzawa, Tokyo, and Atsuyoshi Abe, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1994, Ser. No. 234,943

Claims priority, application Japan, Apr. 28, 1993, 5-102736

Int. Cl.[6] G03G *15/20*

U.S. Cl. 355—285 **21 Claims**



1. An image fixing apparatus comprising:

a heating member for heating an unfixed image carried on a recording material; and

fixing temperature control means for controlling a temperature of said heating member at a target temperature which is variable;

wherein when the target temperature is lowered, an interval of recording material supply to said heating member is increased.

5,552,875

METHOD AND APPARATUS FOR FORMING DUPLEX IMAGES ON A SUBSTRATE

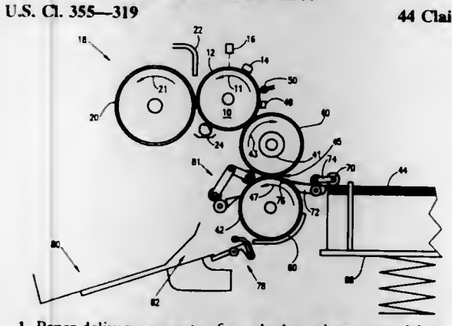
Oded Sagiv, Cochav Yair, Israel; Benzion Landa, Edmonton, Canada, and Yoram Blum, Givat Shmuel, Israel, assignors to Indigo N.V., Veldhoven, Netherlands

PCT No. PCT/NL91/00151, § 371 Date Sep. 8, 1994, § 102(e) Date Sep. 8, 1994, PCT Pub. No. WO93/04409, PCT Pub. Date Mar. 4, 1993

PCT Filed Aug. 14, 1991, Ser. No. 185,812

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—319 **44 Claims**



1. Paper delivery apparatus for a duplex printer comprising:

a shaft;

a motorized roller spaced from the shaft;

at least one pair of arms joined at a pivot and spring loaded with respect to each other at the pivot, one end portion of the pair of arms fixedly attached to the shaft and an opposite end portion having a wheel rotatably attached thereto and defining a nip with respect to the roller;

means for transporting a substrate through the nip;

a waiting station and an output station adapted to receive the substrate upon exiting from the nip; and

means for selectably rotating the shaft to first and second positions, such that at the first position the substrate exits from the nip to the waiting station and at the second position the substrate exits from the nip to the output station.

5,552,876

APPARATUS AND METHOD FOR FORMING SUPERIMPOSED IMAGES AND COPYING MACHINE EQUIPPED WITH APPARATUS

Kenichi Muroki, and Shoji Imaizumi, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 14, 1993, Ser. No. 4,594

Claims priority, application Japan, Jan. 17, 1992, 4-006499

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—326 R **33 Claims**

1. An image processing apparatus by which a first image corresponding to first image information and a second image corresponding to second image information are superimposed, said apparatus comprising:

scanning means for scanning a document line by line to output said first image information;

composing means for composing said first image information and said second image information so that said first image and said second image are superimposed;

detecting means for detecting changes of scanning speed in a direction perpendicular to a scanned line; and

controlling means for so controlling said composing means that a relative position of said second image and said first image in said direction is adjusted line by line in accordance with the detected changes of scanning speed.

5,552,877

IMAGE FORMING APPARATUS WITH CONTROLLED DRIVE FOR ACCURATELY POSITIONING DEVELOPING SECTIONS OF A ROTARY DEVELOPING DEVICE

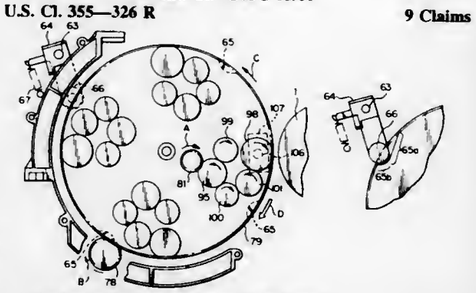
Tomoji Ishikawa; Kazuyuki Sugihara, both of Yokohama, and Katsuhiro Kosuge, Tokyo, all of, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 19, 1995, Ser. No. 424,046

Claims priority, application Japan, Apr. 20, 1994, 6-106021; Mar. 21, 1995, 7-088885

Int. Cl.[6] G03G *15/01*

U.S. Cl. 355—326 R **9 Claims**



1. An image forming apparatus comprising:

a first movable body movably mounted on a body of said apparatus;

a second movable body movably mounted on said first movable body;

first drive means for driving said first movable body in a first direction;

second drive means for exerting, when a predetermined drive input is applied to said second movable body, a moving force on said first movable body in a second direction opposite to said first direction;

a positioning device for positioning said first movable body in stationary contact therewith against a moving force acting only in said second direction; and

control means for controlling said first drive means such that said first movable body moves in said first direction over a target position of said first movable body and for controlling said first and second drive means such that first movable body reverses movement from said first direction to said second direction after passing said target position so that said positioning device is positioned stationary in contact with said first movable body at said target position.

5,552,878

ELECTRONIC VERNIER FOR LASER RANGE FINDER

Homer E. Dillard, Bridgeton, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Nov. 3, 1994, Ser. No. 333,774

Int. Cl.[6] G01C *3/08;* **G04F** *8/00;* **G01S** *13/08*

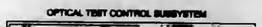
U.S. Cl. 356—5.07 **10 Claims**

1. A range finder for determining the range to a target comprising

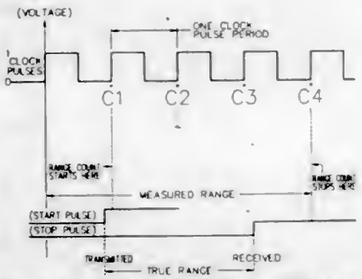
a transmitter for transmitting a ranging pulse in the direction of the target;

a receiver for receiving the ranging pulse reflected by the target back to said range finder;

reference clock means for producing a plurality of clock pulses at a predetermined frequency during the time interval between transmission of the ranging pulse by said transmitter and



5,552,883



reception of the reflected ranging pulse by said receiver, wherein said reference clock means produces the plurality of clock pulses independent and free of synchronization with the ranging pulse transmitted by said transmitter;

vernier means for subdividing the clock pulses into a predetermined plurality of equal increments corresponding to respective phases of the clock pulse; and

a controller operatively connected to said reference clock means and said vernier means for determining a corrected range to the target, wherein said controller comprises:

means for determining a vernier transmission fraction based upon the relative phase of the clock pulse at the time at which the ranging pulse was transmitted;

means for determining a vernier reception fraction based upon the relative phase of the clock pulse at the time at which the reflected ranging pulse was received;

means for determining a total integral number of clock pulses produced by said reference clock means between the transmission of the ranging pulse by said transmitter and the reception of the reflected ranging pulse by said receiver; and

means for determining the corrected range to the target based upon the total integral number of clock pulses, the vernier transmission fraction and the vernier reception fraction.

5,552,879

DOPPLER VELOCIMETER

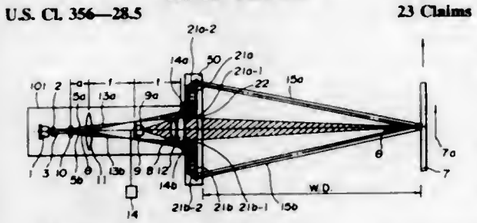
Makoto Takamiya, Tokyo; Hidejiro Kadowaki, Yokohama; Yasuhiko Ishida, Tokyo; Jun Ashiwa, Yokohama; Shigeki Kato, Tokyo, and Shinji Ueda, Yokohama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 4, 1994, Ser. No. 285,529

Claims priority, application Japan, Aug. 23, 1993, 5-229430

Int. Cl.[6] G01P *3/36*

U.S. Cl. 356—28.5 **23 Claims**



1. A Doppler velocimeter comprising:

an illuminating system for projecting a light beam for measuring velocity onto an object to be measured at a predetermined working distance;

a light-receiving system for receiving light from the object illuminated with the light beam by said illuminating system, wherein information relating to the velocity of the object is detected by a Doppler shift of the light received by said light-receiving system; and

changing means for changing the working distance of said illuminating system, with the working distance being changed by mounting and detaching said changing means.

5,552,880

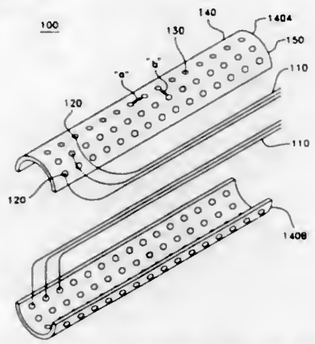
OPTICAL RADIATION PROBE

Vincent F. Shapanus, 716 Morningside Dr., Towson, Md. 21204, and Kevin J. Phipps, 1114 Halstead Rd., Baltimore, Md. 21234

Continuation-in-part of Ser. No. 210,027, Mar. 17, 1994. This application Jun. 7, 1995, Ser. No. 472,470

Int. Cl.[6] G01N *21/00*; **G01T** *1/20*; **G02B** *6/00*

U.S. Cl. 356—72 **5 Claims**



1. An optical probe for simultaneously detecting radiation emitted from a plurality of different non-overlapping areas of a device, comprising:

(A) a plurality of optical signal acquisition devices each of which is formed from at least one optical fiber strand having a terminal end portion; and

(B) a hollow tubular member with an outer cylindrical surface having a length and a perimeter perpendicular to said length, said outer cylindrical surface having a plurality of openings disposed at intervals about said perimeter, each of said plurality of openings having a different one of said terminal end portions from one of said plurality of optical acquisition devices disposed therein; wherein each of said plurality of optical acquisition devices has a different optical field of view corresponding to one of said plurality of different non-overlapping areas.

5,552,881

METHOD AND APPARATUS FOR SCANNING A FIBER OPTIC NETWORK

Scott D. Jezwinski, Buffalo Grove, and Alan T. Weir, Gurnee, both of Ill., assignors to Teradyne, Inc., Boston, Mass.

Filed Mar. 17, 1994, Ser. No. 210,315

Int. Cl.[6] G01N *21/88*

U.S. Cl. 356—73.1 **15 Claims**

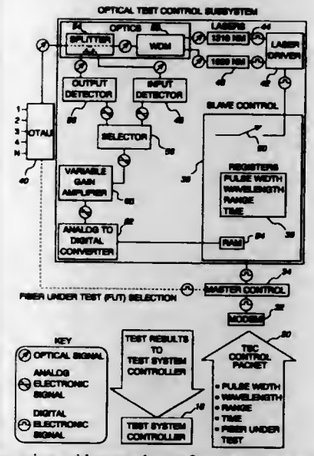
1. A method for rapidly scanning a fiber optic network for faults comprising:

(a) emitting a predetermined number of optical pulses into an optical fiber under test, said predetermined number being minimally sufficient to allow detection of a fault in the fiber under test;

(b) detecting reflected light for each of said optical pulses, and converting the reflected light into an electrical signal for each of said optical pulses;

(c) sampling said electrical signal for each of said optical pulses to generate sets of sample data points associated with said respective optical pulses;

(d) averaging corresponding points of said sets of sample data points to obtain a merged set of average sample data points;



(e) compressing said merged set of average sample data points to obtain a current set of trace data points, said compressing including dividing said merged set of average sample data points into a plurality of groups of adjacent sample data points, and averaging the adjacent sample data points in each of said groups to obtain a single trace data point for each of said groups; and

(f) comparing said current set of trace data points with a reference set of trace data points to determine whether or not a fault exists in the fiber under test.

5,552,882

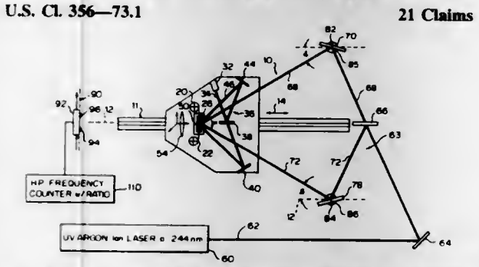
METHODS OF AND APPARATUS FOR CALIBRATING PRECISELY SPACED MULTIPLE TRANSVERSE HOLOGRAPHIC GRATINGS IN OPTICAL FIBERS

Donald R. Lyons, 100 Richmond Run, Yorktown, Va. 23693, and Zolili U. Ndlela, 8528 Annette Engle Way, Fair Oaks, Calif. 95628

Filed Mar. 28, 1995, Ser. No. 413,979

Int. Cl.[6] G01N *21/84*; **G01B** *9/021*; **G02B** *6/34*

U.S. Cl. 356—73.1 **21 Claims**



1. A method of calibrating a wavelength standard to determine precise modulation spacing of transverse holographic gratings in optical fibers, the improvement comprising the steps of:

writing a single hologram in a region of space in the optical fiber;

producing two overlapping interference patterns in the region of space occupied by the single hologram; and

uniquely determining the Bragg wavelength corresponding to one of the interference patterns by illuminating the optical fiber with a longitudinally applied laser beam.

5,552,883

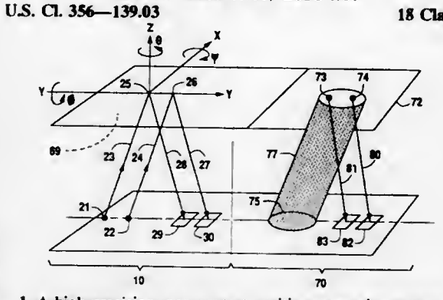
NONCONTACT POSITION MEASUREMENT SYSTEM USING OPTICAL SENSORS

Ilene Busch-Vishniac; Alvin B. Buckman; Janardhan K. Pavuluri, all of Austin, Tex.; Wanjun Wang, Baton Rouge, La.; Dahong Qian, Lowell, Mass., and Vladimir Mancevski, Austin, Tex., assignors to Board of Regenets, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 978,227, Nov. 19, 1992, Pat. No. 5,367,373. This application Nov. 21, 1994, Ser. No. 343,009

Int. Cl.[6] G01B *11/26*; **G01C** *1/00*

U.S. Cl. 356—139.03 **18 Claims**



1. A high-precision, non-contact position measuring system for determining the position and motion of a target object with respect to a sensor plane, the measuring system being located substantially entirely in or behind the sensor plane, comprising:

a target placed on an exterior surface of the target object, the target comprising at least two planar point reflectors on a substantially non-reflective background;

a first light source for producing a first beam of light directed toward the target, the first beam of light being broad enough to illuminate the at least two planar point reflectors, thereby producing a first reflected beam reflected from one of the point reflectors and a second reflected beam reflected from another of the point reflectors;

a second light source for producing a second beam of light directed toward the target, the second beam of light being broad enough to illuminate at least one of the at least two planar point reflectors, thereby producing a third reflected beam reflected from said point reflector;

a first position sensitive detector positioned in the sensor plane to determine a location of intersection between the first reflected beam and the sensor plane;

a second position sensitive detector positioned in the sensor plane to determine a location of intersection between the second reflected beam and the sensor plane; and

a third position sensitive detector positioned in the sensor plane to determine a location of intersection between the third reflected beam and the sensor plane.

5,552,884

CALIBRATION STANDARD FOR FLYING HEIGHT TESTER HAVING A HEAD MOUNTED ON A MULTILEVEL SURFACE TRANSPARENT DISC

Yufeng Li, Eden Prairie, and Peter R. Goglia, Edina, both of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Dec. 16, 1994, Ser. No. 358,204

Int. Cl.[6] G01J *1/02*

U.S. Cl. 356—243 **22 Claims**

1. A calibration standard for calibrating a flying height tester that uses optical interference techniques to determine flying heights of head assemblies, the calibration standard comprising:

a head assembly including a read/write head, the head assembly having a first surface;

a transparent disc having a first surface and a second surface, wherein both the first surface and the second surface of the

5,552,886

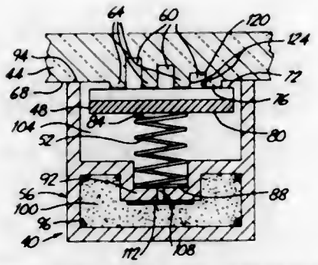
LASER BEAM TRANSMITTING APPARATUS

5,552,888

APPARATUS FOR MEASURING POSITION OF AN X-Y

5,552,889

METHOD FOR THE POLARIMETRIC EVALUATION OF



transparent disc face the first surface of the head assembly and wherein the second surface of the transparent disc is positioned on said transparent disc inward of said first surface to form a multilevel disc surface; and

holding means for holding the head assembly such that the first surface of the head assembly contacts the first surface of the transparent disc to result in being spaced from the second surface of the transparent disc.

5,552,885

MEASURING CHAMBER FOR FLOW CYTOMETER

Harald Steen, Wolffsgt. 3, Oslo N 0358, Norway

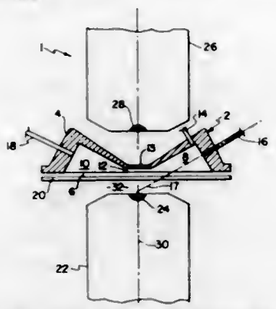
PCT No. PCT/EP94/00914, § 371 Date Nov. 22, 1994, § 102(e) Date Nov. 22, 1994, PCT Pub. No. WO94/22000, PCT Pub. Date Sep. 29, 1994

PCT Filed Mar. 17, 1994, Ser. No. 343,466

Claims priority, application Italy, Mar. 22, 1993, MI93A0539

Int. Cl.[6] G01N *1/10*

U.S. Cl. 356—246 **7 Claims**



1. A measuring chamber for a flow cytometer for measurement of fluorescent light and scattered light of individual cells and other microscopic particles, said measuring chamber comprising:

a body with a flat surface;

an inlet chamber and an outlet chamber in said body which open on said flat surface, said chambers being positioned one in front of the other and connected by a channel in said body, the inlet chamber being equipped with an inlet tube and the outlet chamber being provided with an outlet tube;

an injection tube within said inlet chamber, said injection tube having a longitudinal axis and being moveable along said longitudinal axis inside said inlet chamber;

a transparent plate placed in front of said flat surface; and

optical means placed in front of the transparent plate to direct light against the particle contained in the channel and to receive fluorescent light emitted by the particle, said optical means having an optical axis;

said measuring chamber characterized in that said longitudinal axis of said injection tube intersects said optical axis at a point outside said channel whereby a liquid and some particles injected into said inlet chamber through said inlet tube and said injection tube, respectively, flow with laminar flow through said channel.

5,552,886

LASER BEAM TRANSMITTING APPARATUS

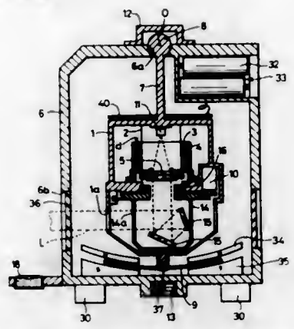
Eiichi Kitajima, and Keijun Kishi, both of Yokohama, Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Feb. 27, 1995, Ser. No. 394,815

Claims priority, application Japan, Mar. 1, 1994, 6-054853; Mar. 11, 1994, 6-067671

Int. Cl.[6] G01C *15/00;15/10*

U.S. Cl. 356—250 **13 Claims**



1. A laser beam transmitting apparatus comprising:

a beam transmitter for supplying a beam of light;

a housing for holding said beam transmitter;

a precise levelling mechanism provided between said beam transmitter and said housing;

a base for supporting said housing; and

a rough levelling mechanism provided between said housing and said base.

5,552,887

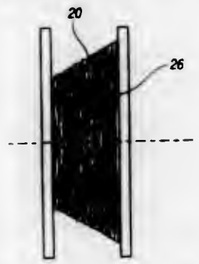
FIBER OPTIC ROTATION SENSOR OR GYROSCOPE WITH IMPROVED SENSING COIL

Richard B. Dyott, Oak Lawn, Ill., assignor to Andrew Corporation, Orland Park, Ill.

Filed Apr. 7, 1995, Ser. No. 418,946

Int. Cl.[6] G01C *19/72*

U.S. Cl. 356—350 **36 Claims**



1. In a fiber-optic gyro including a source of light, a coil of optical fiber having multiple turns, said coil being rotatable about an axis of sensitivity, means for optically coupling light from the source to the coil to create counter-propagating light beams within the coil, and photodetecting means receiving said counter-propagated light beams for producing an output signal indicative of the coil rotation rate,

the multiple turns of said coil varying in size on both sides of the mid-point of the fiber that forms the coil, said multiple turns also being collapsed in the direction of the axis of the coil.

5,552,888

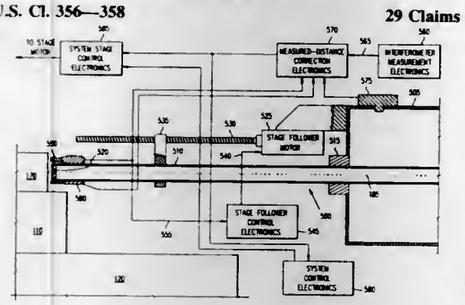
APPARATUS FOR MEASURING POSITION OF AN X-Y STAGE

Michael R. Sogard, Menlo Park, and Martin E. Lee, Saratoga, both of Calif., assignors to Nikon Precision, Inc., Belmont, Calif.

Filed Dec. 2, 1994, Ser. No. 349,733

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—358 **29 Claims**



1. Apparatus for measuring position of an XY stage, comprising:

a. a stage movable along mutually-orthogonal X and Y axes, the stage having an X-axis mirror and a Y-axis mirror;

b. a first laser interferometer for directing an X-axis measurement beam along an X-axis beam path toward the X-axis mirror and for producing a first measured-distance signal indicative of an optical path length between the first laser interferometer and the X-axis mirror;

c. a sheath enclosing the X-axis measurement beam along substantially the entire X-axis beam path to define a volume of controlled environment for the X-axis measurement beam, the sheath including an X-axis sheath portion having an effective length which varies in response to a follower system as the X-axis mirror changes position;

d. a second laser interferometer for directing a Y-axis measurement beam along a Y-axis beam path toward the Y-axis mirror and for producing a second measured-distance signal indicative of an optical path length between the second laser interferometer and the Y-axis mirror;

e. a sheath enclosing the Y-axis measurement beam along substantially the entire Y-axis beam path to define a volume of controlled environment for the Y-axis measurement beam, the sheath including a Y-axis sheath portion having an effective length which varies in response to a follower system as the Y-axis mirror changes position;

f. an X-axis follower system for varying the effective length of the X-axis sheath portion so that substantially the entire X-axis beam path remains enclosed as the X-axis mirror changes position relative to the first laser interferometer, wherein the X-axis follower system comprises a follower which follows movement of the stage while remaining out of contact with the stage, and wherein an end of the X-axis sheath portion nearest the X-axis mirror is mounted for movement with the follower such that said end of the X-axis sheath remains at a substantially constant spacing from the X-axis mirror; and

g. a Y-axis follower system for varying the effective length of the Y-axis sheath portion so that substantially the entire Y-axis beam path remains enclosed as the Y-axis mirror changes position relative to the second laser interferometer.

5,552,889

METHOD FOR THE POLARIMETRIC EVALUATION OF A POLARIZATION-MODULATED LIGHT SIGNAL

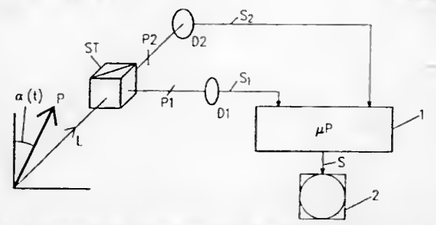
Markus Meier, Aarau, Switzerland, assignor to ABB Research Ltd., Zurich, Switzerland

Filed Dec. 20, 1994, Ser. No. 360,036

Claims priority, application Germany, Dec. 29, 1993, 43 44 855.0

Int. Cl.[6] G01J *4/00*

U.S. Cl. 356—364 **3 Claims**



1. A method for polarimetric evaluation of a polarization-modulated light signal, comprising steps of:

a) splitting light with a direction of polarization with respect to a plane of polarization α0 in a beam-splitter into two partial beams,

b) subsequently deflecting the partial beams via polarization filters onto photo-detectors,

c) which photodetectors supply, on an output side, light power signals (S_1, S_2) proportional to received light power,

d) a DC component $S_{1,DC}$, $S_{2,DC}$ and an AC component $S_{1,AC}$, $S_{2,AC}$ being derived from each of these light power signals (S_1, S_2), and

e) the DC components $S_{1,DC}$, $S_{2,DC}$ and the AC components $S_{1,AC}$, $S_{2,AC}$ being ratioed to each other, wherein

f) a modulation signal S is formed and output in accordance with:

$$S=((S_{2,AC}-S_{1,AC})/\sin(2\cdot\alpha_0))/(S_{1,DC}+S_{2,DC})$$

where

$S_{1,AC}=a_1\cdot\alpha_F\cdot\sin(2\cdot\alpha_0)\cdot\cos(\omega\cdot t)$,

$S_{2,AC}=a_2\cdot\alpha_F\cdot\sin(2\cdot\alpha_0)\cdot\cos(\omega\cdot t)$,

$S_{1,DC}=a_1\cdot 0.5\cdot(1+\cos(2\cdot\alpha_0))$,

$S_{2,DC}=a_2\cdot 0.5\cdot(1-\cos(2\cdot\alpha_0))$,

and wherein α_F=angle of rotation produced by a physical or chemical variable, α_0=angle which defines a plane of polarization, ω=angular velocity of $S_{1,AC}$ and $S_{2,AC}$, and a_1, a_2=gain factors of light transmission channels.

5,552,890

GLOSS MEASUREMENT SYSTEM

Frank P. Nanna, Crystal Lake, and John Jereb, Dundee, both of Ill., assignors to Tricor Systems, Inc., Elgin, Ill.

Continuation of Ser. No. 229,617, Apr. 19, 1994, abandoned. This application Aug. 25, 1995, Ser. No. 519,622

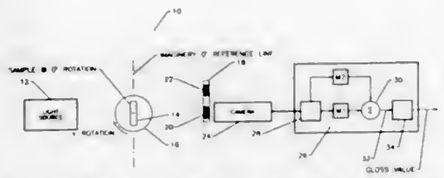
Int. Cl.[6] G01J *4/00*

U.S. Cl. 356—369 **25 Claims**

1. A method of optically measuring the gloss of an irregularly shaped object using a specular reflection component of light reflected from the irregularly shaped object, said specular reflection component including a perpendicular polarization component, and said gloss being defined in terms of a capacity of a surface to reflect more light in a specular direction as compared to other directions and said gloss being measured by the magnitude of the perpendicular polarization component, the method of optically measuring the gloss of the irregularly shaped object to provide a gloss image of the irregularly shaped object comprising the steps of:

means for comparing said detected position with a desired

of said alignment mark which is formed by said second



illuminating the irregularly shaped object with a light source providing an unpolarized, broad band light directed at an oblique angle to the irregularly shaped object;

deriving essentially only the magnitude of the perpendicular polarization component of the specular reflection component of polarized light from the irregularly shaped object while excluding light reflected in other directions to provide a derived gloss image of the irregularly shaped object, said derived gloss image including a plurality of gloss image pixels having a gloss level;

obtaining an absolute average gloss image of the irregularly shaped object from the derived gloss image, including;

statistically grouping the gloss image pixels into a plurality of groupings according to the associated gloss levels thereof; and

averaging the brightest predetermined N percent of the gloss image pixels together within each of the groupings to obtain said absolute average gloss image of the irregularly shaped object corresponding to said optically measured gloss.

5,552,891

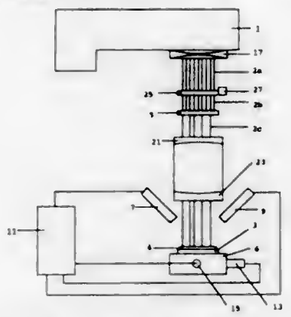
AUTOMATED MASK ALIGNMENT FOR UV PROJECTION EXPOSE SYSTEM

Peter L. Baizer, Chenango Forks, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 31, 1994, Ser. No. 332,330

Int. Cl.[6] G01B *11/00*

U.S. Cl. 356—400 **11 Claims**



1. An apparatus for aligning an image on a substrate support, said apparatus comprising:

a substrate support for supporting a substrate to be treated by radiation;

at least one radiation source for producing desired wavelengths of radiation to treat the substrate, said radiation being directed toward said substrate support;

at least one filter for filtering out selected wavelengths of said radiation, said filter being positioned between said substrate support and said radiation source;

a mask for selectively transmitting said radiation, said mask being positioned between said radiation source and said substrate support;

at least one detector for detecting a position of radiation impinging upon said substrate support and producing a signal corresponding to said sensed position;

means for comparing said detected position with a desired position of radiation impinging upon said substrate support, said comparing means receiving a signal from said at least one detector, comparing said detected position to said desired position, and producing a signal corresponding to said comparison; and

means for positioning said substrate support in a desired position for treating the substrate, said positioning means receiving said signal from said comparing means and for altering when necessary in a direction parallel to a surface of a substrate supported by said substrate support the position of said substrate support and said radiation source, mask, and filter relative to each other in accordance with said signal so that said sensed position corresponds to said desired position.

5,552,892

ILLUMINATION OPTICAL SYSTEM, ALIGNMENT APPARATUS, AND PROJECTION EXPOSURE APPARATUS USINT THE SAME

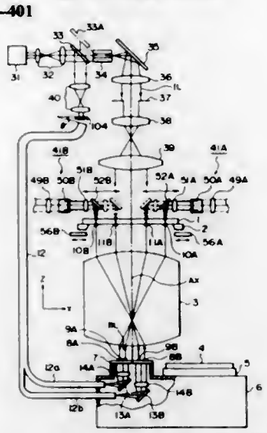
Tadashi Nagayama, Ota-ku, Japan, assignor to Nikon Corporation, Japan

Filed May 22, 1995, Ser. No. 446,346

Claims priority, application Japan, May 24, 1994, 6-132395; Sep. 6, 1994, 6-212684

Int. Cl.[6] G01B *11/00*

U.S. Cl. 356—401 **10 Claims**



1. An alignment apparatus for aligning a mask with an alignment mark and a photosensitive substrate on a substrate stage, comprising:

a first alignment illumination system for illuminating said alignment mark and a reference mark on said substrate stage with a pulse illumination light obtained upon branching a pulsed exposure light;

a second alignment illumination system for illuminating said alignment mark with a continuously emitted continuous illumination light in a wavelength range different from that of the exposure light;

a first objective optical system for focusing the continuous illumination light from said alignment mark, the pulse illumination light from said alignment mark, and the pulse illumination light from said reference mark through a projection optical system;

a wavelength selection optical system for dividing a light beam focused by said first objective optical system into a first light beam of the continuous illumination light and a second light beam of the pulse illumination light;

a second objective optical system for forming an image of said alignment mark from said first light beam;

an image position detector, having photoelectric detector, for relatively vibrating said photoelectric detector and said image

of said alignment mark which is formed by said second objective optical system, thereby detecting a position of said image of said alignment mark;

a third objective optical system for forming images of said alignment mark and said reference mark from said second light beam; and

an image pickup device for picking up said images of said alignment mark and said reference mark, said images being formed by said third objective optical system,

wherein a positional relationship of said mask with respect to said image position detector is detected on the basis of a detection result from said image position detector, and a positional shift between said alignment mark and said reference mark is detected on the basis of a detection result from said image pickup device.

5,552,893

DISTANCE MEASURING APPARATUS

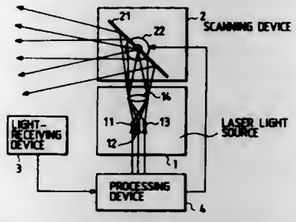
Masahira Akasu, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 15, 1994, Ser. No. 306,327

Claims priority, application Japan, Sep. 17, 1993, 5-231704

Int. Cl.[6] G01C *3/08*

U.S. Cl. 356—5.01 **6 Claims**



1. A distance measuring apparatus comprising:

projection means for projecting plural laser beams in different directions;

light receiving means for receiving the light reflected from each of objects in respective beam directions;

computation means for computing the distances to the objects on the basis of the reflected light; and

scanning means for sequentially changing the projecting directions of said plural laser beams such that a scan having a resolution of field of view of 0.5 degrees or less is performed.

5,552,894

IMAGE PROCESSING INCLUDING IDENTIFICATION OF A SPECIFIC IMAGE AND CONVERSION THEREOF IN A PREDETERMINED MANNER

Yoshinobu Aiba, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

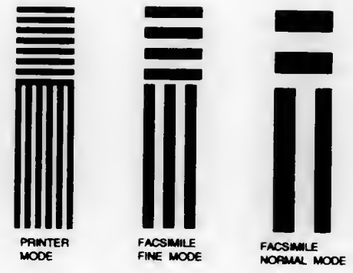
Filed Nov. 3, 1992, Ser. No. 971,064

Claims priority, application Japan, Nov. 7, 1991, 3-319863

Int. Cl.[6] H04N *1/40;1/46;* **G06K** *9/40;9/42*

U.S. Cl. 358—298 **12 Claims**

1. An image processing apparatus comprising an input line for inputting image information representing a color image, and conversion means for converting that image information into a repeated-pattern image containing a repeated pattern corresponding to at least one color of the input color image, wherein said conversion means controls a cycle of repetition of a repeated pattern corresponding to a color, in accordance with a type of output mode.



5,552,895

DOUBLE-DECK MAGNETIC RECORDING/ REPRODUCING APPARATUS

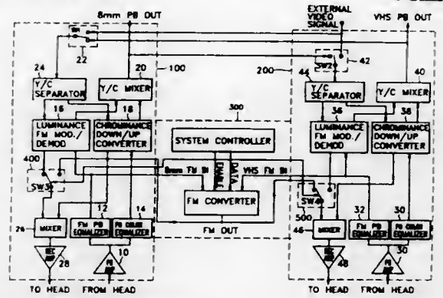
Sang-uk Kim, Suwon-city, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Dec. 30, 1994, Ser. No. 366,903

Claims priority, application Rep. of Korea, Dec. 31, 1993, 93-32294

Int. Cl.[6] H04N *9/79*

U.S. Cl. 358—310 **4 Claims**



1. A double-deck magnetic recording/reproducing apparatus for recording/reproducing a tape for a first format and a tape for a second format, comprising:

a first recording/reproducing portion for, during playback, receiving an FM video signal of a first frequency band picked up from the tape for said first format and a chrominance signal converted down into a first frequency, and mixing an FM-modulated chrominance signal and a converted up chrominance signal to output a composite video signal, and, during recording, separating an input composite video signal into a video signal and a chrominance signal, FM-modulating said separated video signal into the band of said first frequency, and converting down said separated chrominance signal into said first frequency to record the converted signal on the tape for said first format;

a second recording/reproducing portion for, during playback, receiving an FM video signal of a second frequency band picked up from the tape for said second format and a chrominance signal converted down into a second frequency, and mixing an FM-modulated video signal and a converted-up chrominance signal to output a composite video signal, and, during recording, separating an input composite video signal into a video signal and a chrominance signal, FM-modulating said separated video signal into the band of said second frequency, and converting down said separated chrominance signal into said second frequency to record the converted signal on the tape for said second format;

an FM converter for receiving playback FM video signals from said first and second recording/reproducing portions and outputting a recording FM video signal in which the frequency

band is converted from one format received according to a given copying mode to the other format;

first switching means for selectively supplying the separated video signal FM-modulated into the band of said first frequency and the recording FM video signal of said FM converter to a recording head for the tape for said first format according to said given copying mode; and

second switching means for selectively supplying the separated video signal FM-modulated into the band of said second frequency and the recording FM video signal of said FM converter to a recording head for the tape for said second format according to said given copying mode.

5,552,896

DISK RECORDING/REPRODUCING APPARATUS AND DISKS APPLIED THEREIN

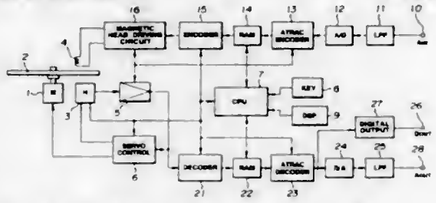
Tadao Yoshida, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 945,749, Sep. 16, 1992, abandoned. This application Nov. 18, 1993, Ser. No. 154,629

Claims priority, application Japan, Sep. 27, 1991, 3-275069

Int. Cl.[6] H04N *5/76;* **G11B** *7/24*

U.S. Cl. 358—342 **8 Claims**



1. A disk recording/reproducing apparatus comprising:

memory means into which successively inputted data in a digital form are sequentially written, and from which the written inputted data are sequentially read out as recording data having a transfer rate higher than a transfer rate of the inputted data;

recording means for dividing the recording data read out from the memory means into clusters, each of the clusters having a fixed number of sectors, and interleaving the sectors at an interleaving length which is longer than one sector but less than two sectors, each of the clusters including cluster connection sectors in which dummy data are recorded and which are together longer than the interleaving length of the interleaving process at connection portions of each of the clusters, and recording the clusters in a recording/reproducing area of a disk;

reproducing means for reproducing recorded clusters from the recording/reproducing area and prerecorded data from recorded clusters that have been prerecorded in a playback only area of the disk where the recorded clusters prerecorded in the playback only area include data recorded in the same data format as that of the recording data recorded in the recording/reproducing area and wherein the recorded clusters prerecorded in the playback only area also include addition data recorded in sectors corresponding to the cluster connection sectors; and

memory means into which reproduced data from the reproducing means are written and from which written reproduced data are sequentially read out as successive reproduced data.

5,552,897

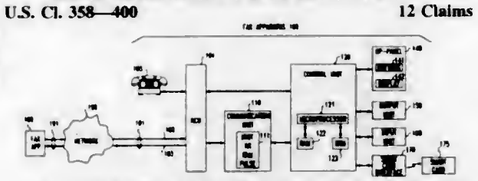
SECURE COMMUNICATION APPARATUS AND METHOD

Richard Mandelbaum, Manalapan, and B. Waring Partridge, III, Mendham, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Filed Mar. 7, 1994, Ser. No. 206,710

Int. Cl.[6] H04N *1/00;1/44;* **G03G** *21/00;* **G06F** *7/04*

U.S. Cl. 358—400 **12 Claims**



1. A communication apparatus for receiving a sender's message over a facility comprising

means for receiving and storing the message including an unrestricted portion and a restricted encrypted portion,

first output means for outputting the unrestricted portion of the received message to a user, the unrestricted portion including information identifying an encryption key used to encrypt the restricted portion,

second output means, responsive to predetermined information received from the user, for outputting the restricted portion of the message to the user,

a smart card interface means and wherein

said predetermined information includes a user-entered person identification number (PIN) entered after the user's smart card is inserted into said interface,

means responsive to said received PIN for enabling said interface means to output said encryption key identification information and said restricted encrypted portion to said smart card for use in decrypting said restricted encrypted portion by said smart card and wherein

said interface means receives a decrypted restricted portion from said smart card, via said interface, for output via said second output means.

5,552,898

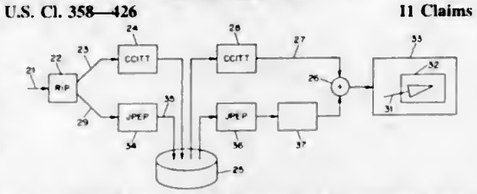
LOSSY AND LOSSLESS COMPRESSION IN RASTER IMAGE PROCESSOR

Frank A. Deschuytere, Beveren, Belgium, assignor to Agfa-Gevaert, Mortsel, Belgium

Filed Jul. 6, 1994, Ser. No. 271,369

Int. Cl.[6] H04N *1/41*

U.S. Cl. 358—426 **11 Claims**



1. A method for generating regions of a rasterized image, described by digital input commands including first instructions to fill a first said region with a solid pattern, and second instructions to fill a second said region with a halftone screen pattern, said method comprising the following steps:

converting said first instructions to a first internal representation by a first conversion;

converting said second instructions to a second internal representation by a first conversion;

storing said first and second internal representations;

retrieving said first and second stored internal representations; and

combining said first and second retrieved internal representations for generating said regions;

wherein said first conversion comprises the following steps:

generation of a bitmap for indicating a density of each recorder element within said first region;

generation of a bitmask for indicating whether each corresponding recorder element belongs to said first or second region;

first lossless compression of said bitmap into a compressed bitmap; and

second lossless compression of said bitmask into a compressed bitmask.

5,552,899

FACSIMILE TRANSMISSION/RECEPTION METHOD AND APPARATUS USING A COMMON BUS

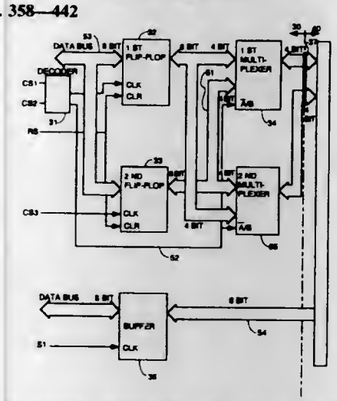
Seung Hwa Park, Kyungsangbuk-do; Jin Su Park, Junrabuk-do, and Jun Man Kim, Kyeongki-do, all of, Rep. of Korea, assignors to Hyundai Electronics, Ind Co. Ltd., Kyeongki-do, Rep. of Korea

Filed Mar. 24, 1994, Ser. No. 217,313

Claims priority, application Rep. of Korea, Mar. 27, 1993, 1993-4884

Int. Cl.[6] H04N *1/00*

U.S. Cl. 358—442 **6 Claims**



4. In the facsimile machine provided with an operation panel unit containing a light emitting diode, a keyboard and a liquid crystal display, a facsimile transmission/reception apparatus comprising a data bus, and a decoding means for receiving a key scanning output data chip selection signal and a liquid crystal display chip selection signal and for decoding said chip selection signals to generate first and second selection output signals, a first storage means having a clock input coupled to receive said first selection signal, for latching data and control signals present on said data bus in synchronism with said first selection signal generated by said decoding means, a second storage means having a clock input coupled to receive a light emitting diode chip selection signal, for latching data and control signals present on said data bus in synchronization with said light emitting diode chip selection signal, a a multiplexer means having data inputs coupled to receive data stored in said first and second storage means, and having a selection control input coupled to receive said second selection signal from said decoder means, for selectively outputting on a common output bus coupled to said operation control panel data from either said first storage means or said second storage means under control of said second selection signal from said decoding means, said common bus for transmitting the data output by multiplexer means to said light emitting diode, said keyboard and said liquid crystal display of said operation panel unit.

5,552,900

IMAGE FORMING APPARATUS HAVING MEANS TO REGISTER MARKER PENS USED FOR IMAGE EDITING

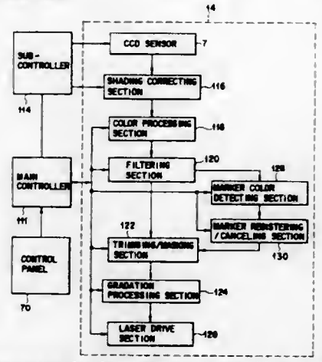
Akihiko Someya, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 10, 1994, Ser. No. 208,222

Claims priority, application Japan, Mar. 29, 1993, 5-069784

Int. Cl.[6] H04N *1/387*

U.S. Cl. 358—452 **4 Claims**



1. An apparatus for forming an edited image from an image which is read from a document, the edited image being defined with respect to an editing range designated on the document, the editing range being designated by a registered marker pen, comprising:

means for setting a registration mode in which a mark of a new marker pen different from a previously registered marker pen is registered and an editing mode in which the editing range on the document is designated with the new marker pen;

means for storing a previously registered marker pen signal corresponding to the previously registered marker pen;

first converting means for converting the mark of the new marker pen to a new marker pen signal;

means for storing one of the new marker pen signal and the previously registered marker pen signal;

second converting means for converting the image read from the document and the editing range designated on the document into an image signal;

means for comparing one of the new marker pen signal and the registered marker pen signal with the image signal to edit the image signal; and

image forming means for forming the edited image on a basis of the image signal edited by the comparing means.

5,552,901

FACSIMILE SERVER SYSTEM COMPRISING A FACSIMILE SERVER AND AT LEAST ONE REMOTE FACSIMILE

Satoshi Kikuchi, 213, Hachimanyama-Apartment, 1545, Yoshida-cho; Keiichi Nakane, 406, Co-op-Nomura-Totsuka-Shimokurata, 250-1, Shimokurata-cho; Hiromichi Itoh, I-305, Bell-Heim, 1393, Yabe-cho, and Hiroshi Kawamura, B-403, Kamikurata-Shataku, 2000, Kamikurata-cho, all of Totsuka-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Jan. 28, 1994, Ser. No. 188,085

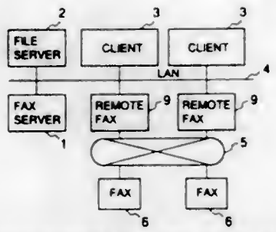
Claims priority, application Japan, Feb. 1, 1992, 5-014782

Int. Cl.[6] H04N *1/32*

U.S. Cl. 358—468 **30 Claims**

1. A facsimile server system which offers a facility of facsimile communication proceeding through a communication network, to at least one client connected to facsimile server system via a LAN (local area network), comprising:

a FAX (facsimile) server connected to said LAN, and at least one remote FAX connected to said LAN and said communication network;



said FAX server including LAN control means for controlling a communication which proceeds through said LAN, document data storage means for storing therein at least one document data transferred from the client and requested to be transmitted via said communication network by said client, a transmission document table for registering therein that destination of the document data stored in said document data storage means which has been designated by said client, data conversion means for expanding said document data stored in said document data storage means, into image data on condition that said document data is not image data, and communication management means for transferring said image data which correspond to said document data requested to be transmitted, to the appropriate remote FAX, and for giving said appropriate remote FAX a command for performing the facsimile transmission to said destination which is registered in said transmission document table in correspondence with the transferred image data;

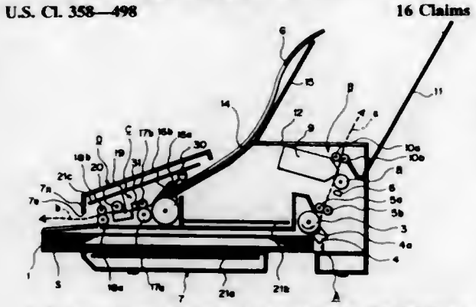
said remote FAX including a LAN control unit for controlling a communication which proceeds through said LAN, a scanner for reading a pictorial image and then generating image data, a printer for printing a pictorial image expressed by image data, and FAX communication control means for performing the commanded facsimile transmission of the image data transferred from said FAX server, to the destination through said communication network.

5,552,902

FACSIMILE APPARATUS WITH INTERNAL MECHANISM FOR CONVEYING ORIGINALS AND RECORDING PAPER

Takeshi Kohno, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 255,932, Jun. 7, 1994, abandoned. This application Feb. 9, 1996, Ser. No. 599,106
Claims priority, application Japan, Jun. 10, 1993, 5-138120
Int. Cl.[6] H04N *1/00;1/31*
U.S. Cl. 358—498 **16 Claims**



1. A facsimile apparatus having reading means for reading an image of an original, original conveying means for conveying the original to said reading means, recording means for recording a prescribed image on a recording sheet, and recording-sheet conveying means for conveying the recording sheet to said recording means, a recording-sheet supply means for supplying the recording sheet to the entrance port of said recording-sheet conveying means, and equipped with receiving, transmitting and copying functions, comprising:

a first drive motor for driving said recording-sheet conveying means;

copy-mode control means for performing control in such a manner that copying is carried out by separately performing a reading operation for reading of the original by said reading means and a recording operation for recording by said recording means so that the supplying by said recording-sheet supply means and conveyance by said original conveying means are performed separately with a time difference between them;

recording-sheet storage means for stacking a plurality of the recording sheets, each recording sheet being a cut sheet having a predetermined size and being supplied to said entrance port of said recording-sheet conveying means after being picked up in a sheet-by-sheet fashion by said recording-sheet supply means; and

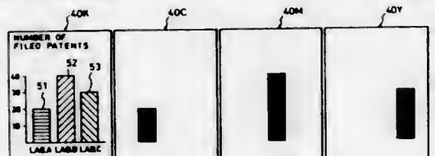
a second drive motor which is commonly used to drive selectively said original conveying means and said recording-sheet supply means.

5,552,903

IMAGE PROCESSING APPARATUS AND IMAGE PROCESSING METHOD

Masanori Sakai, Yokohama; Kunio Yoshihara, Sagamihara, and Mitsuo Nimura, Kawasaki, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 873,813, Apr. 27, 1992, abandoned. This application Feb. 6, 1995, Ser. No. 384,217
Claims priority, application Japan, May 1, 1991, 128364
Int. Cl.[6] H04N *1/46*
U.S. Cl. 358—500 **27 Claims**



1. An image processing apparatus, comprising:

image input means for inputting monochromatic image information;

memory means for storing a pattern image including a repeated pattern;

recognition means for recognizing a pattern image in the monochromatic image information by comparing the input monochromatic image information with the pattern image stored in said memory means;

synthesizing means for synthesizing a color in the region of the pattern image in the monochromatic image information according to the pattern image recognized by said recognition means; and

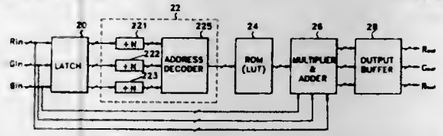
output means for outputting image information synthesized by said synthesizing means.

5,552,904

COLOR CORRECTION METHOD AND APPARATUS USING ADAPTIVE REGION SEPARATION

Sung-geol Ryoo, Kunpo, and Yang-seock Seo, Seoul, both of, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Sep. 28, 1994, Ser. No. 313,817
Claims priority, application Rep. of Korea, Jan. 31, 1994, 94-1751
Int. Cl.[6] H04N *1/56;1/60*
U.S. Cl. 358—518 **5 Claims**



5. A color correcting apparatus for dividing an RGB space into predetermined regions in accordance with a characteristic of a color reproducing system, producing a color correction coefficient with regard to respective regions, and performing color correction on input image data in accordance with a corresponding color correction coefficient, comprising:

adaptively divided region discriminating means for receiving the input image data, discriminating a region corresponding to the input image data, and producing an output;

a look-up table in which a plurality of color correction coefficients are stored for producing a specific color correction coefficient in accordance with the output of said adaptively divided region discriminating means; and

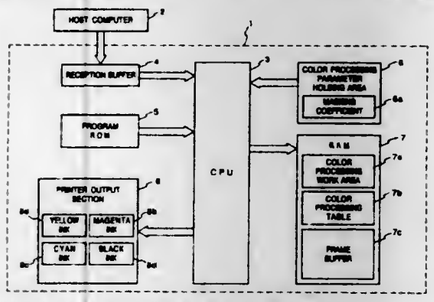
operating means for color correction by multiplying the input image data by the specific color correction coefficient extracted from the look-up table.

5,552,905

IMAGE PROCESSING APPARATUS WHICH SELECTS A TYPE OF COLOR PROCESSING FOR COLOR IMAGE DATA BASED ON A CHARACTERISTIC OF THE COLOR IMAGE DATA

Fumihiro Tanaka, Yono, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 895,008, Jun. 8, 1992, abandoned. This application Mar. 3, 1995, Ser. No. 400,382
Claims priority, application Japan, Jun. 14, 1991, 3-142892
Int. Cl.[6] G09G *5/06;* **H04N** *1/46;1/40*
U.S. Cl. 358—523 **24 Claims**



15. An image processing apparatus comprising:

first color processing means for generating a look-up table (LUT) on the basis of color image data representing an object image, and for performing color processing on the color image data using the LUT;

second color processing means for performing the color processing on the color image data using an arithmetic operation; and

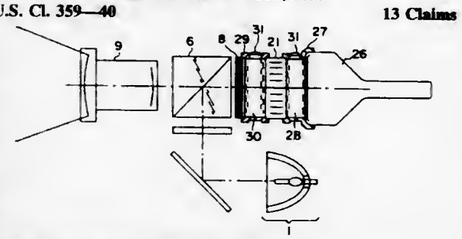
selection means for selecting, in accordance with a characteristic of the color image data, one of said first color processing means or said second color processing means to be used for color processing an object image.

5,552,906

OPTICALLY ADDRESSED PICTURE DISPLAY APPARATUS

Shigekazu Yamagishi, Takatsuki; Yoshito Miyatake, Neyagawa, and Hiroshi Miyai, Takarazuka, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 17, 1994, Ser. No. 341,360
Claims priority, application Japan, Dec. 22, 1993, 5-324928
Int. Cl.[6] G02F *1/1335;1/135*
U.S. Cl. 359—40 **13 Claims**



13. A picture display apparatus comprising:

picture display means for displaying a picture;

electro-optical means for converting an input optical image to a projected picture, said electro-optical means having a liquid crystal layer and a photoconductive layer; and

an image transfer device disposed between said electro-optical means and said picture display means so that the picture displayed on said picture display means is transferred onto said photoconductive layer of said electro-optical means, said image transfer means having a plurality of graded index lenses parallel to an optical axis intersecting said electro-optical means and said picture display means,

wherein a parallel surface glass plate is provided between said electro-optical means and said image transfer means and a liquid is disposed between said picture display device and said parallel surface glass plate, said liquid can convect in spaces between said parallel surface glass plate and said image transfer means and between said image transfer means and said picture display means.

5,552,907

LIGHT ADJUSTING SHEET HAVING A SINUSOIDAL SURFACE AND A NON-OPTICALLY FLAT SURFACE AND USEABLE WITH AN LCD

Tomohiro Yokota, Aichi-ken; Fumio Nishitani, Chita; Hiroshi Ogawara, Shiga-ken; Akihito Kubo, and Makoto Fujigami, both of Tsukuba, all of, Japan, assignors to Sekisui Chemical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 8,995, Jan. 26, 1993, Pat. No. 5,394,255. This application Sep. 8, 1994, Ser. No. 301,412
Claims priority, application Japan, Jan. 27, 1992, 4-11864; May 7, 1992, 4-114781; Jul. 27, 1992, 4-199576
Int. Cl.[6] G02F *1/1335;* **F21V** *7/04*
U.S. Cl. 359—49 **17 Claims**

14. A planar lighting device comprising:

a light guiding plate having a dot pattern on a back surface;

a linear light source placed on at least one side of said light guiding plate;

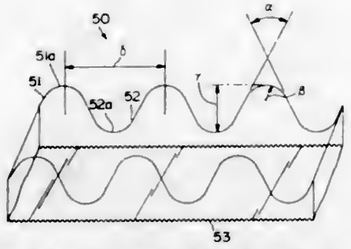
a reflector plate placed in back of said light guiding plate; and

a light adjusting sheet placed at the front of a light emitting surface of said light guiding plate, having on one surface a plurality of convex regions each having a lateral cross section of a convex arc and also on said one surface a plurality of concave regions each having a lateral cross section of a concave arc;

pressing the compensation films toward each other with a roller coating machine; and

5,552,910

LIQUID CRYSTAL DISPLAY HAVING ZINC SULFIDE



wherein each convex region and each concave region are arranged alternately and approximately parallel to each other;

adjacent concave and convex regions being connected by a flat surface having an area equal to or less than 50% of the total area of the curved surfaces;

another surface opposite to said one surface having a non-optical flat surface; and

peak lines of said convex regions and bottom lines of said concave regions of said light adjusting sheet being arranged to make a predetermined angle with an axis of said linear light source.

5,552,908

LIQUID CRYSTAL COMPENSATION CELL INCLUDING A PAIR OF COMPENSATING PLATES FOR LCD AND METHOD OF MANUFACTURING THE SAME

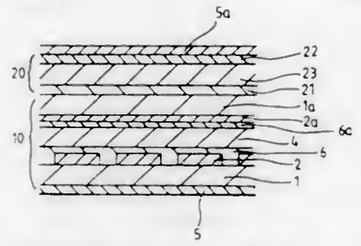
Si-hwan Kim, Seoul, and Jin-oh Kwak, Kyunggi-do, both of, Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Kyunggi-do, Rep. of Korea

Filed Jan. 23, 1995, Ser. No. 377,289

Claims priority, application Rep. of Korea, Jan. 24, 1994, 1994-1220

Int. Cl.[6] **G02F** *1/1347;1/1335;1/1337;1/1333*

U.S. Cl. 359—53 **5 Claims**



1. A compensation cell for an LCD comprising:

two compensation films each with orientation grooves formed on one surface thereof; and

liquid crystal which is between the two compensation films and is twisted in an opposite direction from a twist of liquid crystal in the LCD.

3. A method of manufacturing a compensation cell for an LCD comprising the steps of:

forming orientation grooves on opposing surfaces of two compensation films by jetting gas in a prescribed direction;

disposing the compensation films toward each other;

applying liquid crystal between the compensation films;

pressing the compensation films toward each other with a roller coating machine; and

cutting and sealing the pressed compensation films with a heat-cutting apparatus.

5,552,909

ACTIVE MATRIX LIQUID-CRYSTAL DISPLAY DEVICE HAVING ITO SIGNAL LINES AND EITHER A SYMMETRIC TFT STRUCTURE OR ELECTRODE AND SIGNAL LINE EDGES WITH TAPER ANGLES ≦ 30°

Kenichi Onisawa, Katsuta; Takashi Suzuki; Masahiko Ando, both of Hitachi; Masuyuki Ota, Katsuta; Toshiki Kaneko, Mito, and Tetsuro Minemura, Hitachiota, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 6, 1994, Ser. No. 301,202

Claims priority, application Japan, Sep. 7, 1993, 5-221873

Int. Cl.[6] **G02F** *1/136;1/1345*

U.S. Cl. 359—59 **8 Claims**

1. An active matrix type liquid-crystal display device comprising:

a plurality of gate wiring lines and drain wiring lines crossing perpendicularly to each other and laid on a first insulating substrate, the gate wiring lines and the drain wiring lines being electrically insulated from each other at crossover areas thereof;

thin-film transistors respectively arranged near the individual crossover areas with their respective source electrodes connected to corresponding transparent pixel electrodes disposed near the source electrodes, with their respective drain electrodes connected to the drain wiring lines, and with their respective gate electrodes connected to the gate wiring lines, the above structure including the first insulating substrate being covered with either only alignment layers or both protective insulating layers and alignment layers;

sets of transparent electrodes and alignment layers, each of the sets being opposite to a corresponding one of the transparent pixel electrodes, disposed on a second insulating substrate, the second insulating substrate being transparent and being located in opposition to the first insulating substrate; and

a liquid crystal is held between the two insulating substrates,

the gate wiring lines, the drain wiring lines, and the transparent electrodes opposing the wiring lines on the transparent insulating substrate, being connected to liquid-crystal driver circuits formed outside the liquid-crystal display device,

said drain wiring lines, said drain electrodes and said source electrodes of said thin-film transistors, and said transparent pixel electrodes being formed of the same material that is ITO, and said transparent pixel electrodes being thinner than the drain wiring lines,

wherein said drain wiring lines, said drain electrodes and said source electrodes of said thin-film transistors, and said transparent pixel electrodes are respectively formed with tapered edges, and a taper angle of each of the tapered edges is within 30°.

5,552,910

LIQUID CRYSTAL DISPLAY HAVING ZINC SULFIDE SWITCHING ELEMENTS AND METHOD FOR PRODUCING THE SAME

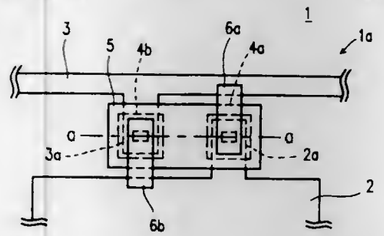
Kiyoshi Okano, Tenri, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 29, 1994, Ser. No. 346,473

Claims priority, application Japan, Nov. 29, 1993, 5-298658

Int. Cl.[6] **G02F** *1/136*

U.S. Cl. 359—60 **30 Claims**



1. A liquid crystal display apparatus for performing a display by modulating an optical characteristic of a display medium, the display apparatus comprising: a plurality of pixel electrodes for allowing the display medium to perform a display in accordance with a display signal; switching elements, respectively provided for the corresponding pixel electrodes, for applying the display signal to the respective pixel electrodes in nonlinear response to a received driving signal; and a bus line for applying the driving signal to the switching elements, wherein:

each of the switching elements includes a first active device and a second active device;

the first active device includes a lower electrode connected to a corresponding one of the pixel electrodes, an upper electrode connected to the bus line, and a nonlinear resistive layer interposed between the lower electrode and the upper electrode;

the second active device includes a lower electrode connected to the bus line, an upper electrode connected to the corresponding pixel electrode, and a nonlinear resistive layer interposed between the lower electrode and the upper electrode;

each of the nonlinear resistive layers of the first and the second active elements contains zinc sulfide as its main component main component, and

wherein the zinc sulfide which is the main component of the nonlinear resistive layers contains a rare earth element, a group III element, iron, nickel, copper, manganese, or a compound thereof.

5,552,911

COLOR LIQUID CRYSTAL DISPLAY DEVICE HAVING VARYING CELL THICKNESS AND VARYING PIXEL AREAS

Shinjiro Okada, Isehara; Yutaka Inaba, Kawaguchi; Makoto Kojima, Hino, and Kazunori Katakura, Atsugi, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1993, Ser. No. 136,268

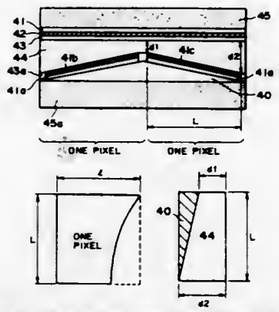
Claims priority, application Japan, Oct. 19, 1992, 4-304411

Int. Cl.[6] **G02F** *1/1343;1/1335*

U.S. Cl. 359—68 **13 Claims**

1. A liquid crystal display device, comprising:

a pair of electrode plates disposed opposite to each other and each having at least one electrode on an opposite side thereof, a liquid crystal layer disposed between the electrode plates and a layer of color filters so as to form a multiplicity of color pixels including first color pixels and second color pixels having mutually different colors, each color pixel comprising a color filter, the liquid crystal layer and a pair of electrodes sandwiching the liquid crystal,



wherein each color pixel assumes a bright or a dark state depending on a voltage applied thereto, has a locally varying liquid crystal layer thickness therein and has a width varying depending on the change in thickness of the liquid crystal layer therein, and

the widths of the first and second color pixels vary in mutually different manners depending on the change in liquid crystal layer thickness.

5,552,912

CHIRAL SMECTIC LIQUID CRYSTAL OPTICAL MODULATORS

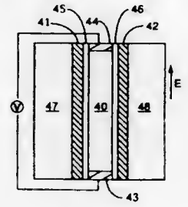
Gary D. Sharp, Boulder, and Kristina M. Johnson, Longmont, both of Colo., assignors to Board of Regents of the University of Colorado, Boulder, Colo.

PCT No. PCT/US92/09707, § 371 Date May 13, 1994, § 102(e) Date May 13, 1994, PCT Pub. No. WO93/10477, PCT Pub. Date May 27, 1993

Continuation-in-part of Ser. No. 792,284, Nov. 14, 1991, Pat. No. 5,381,253. This PCT application Nov. 5, 1992, Ser. No. 244,017

Int. Cl.[6] **G02F** *1/1335;1/1337/1343;* **C09K** *19/02*

U.S. Cl. 359—73 **10 Claims**



1. A multiple element etalon modulator for light comprising:

a multiple element intracavity modulator, which comprises:

a smectic liquid crystal cell, the optic axis of which is rotatable by application of an electric field parallel to the smectic layers of said cell;

means for applying an electric field to said smectic liquid crystal cell whereby said optic axis of said liquid crystal cell is rotated; and

a birefringent element; and

a front and a back reflective surface positioned on either side of said multiple element intracavity modulator to form an etalon.

6. A modulator which comprises a homeotropically aligned smectic liquid crystal cell, wherein the molecular director of said liquid crystal is rotatable in an analog fashion by application of an electric field parallel to the smectic layers of said cell, and lateral electrodes for applying an electric field to said liquid crystal cell parallel to the smectic liquid crystal layers of said cell.

5,552,913
LIQUID CRYSTAL DEVICE AND METHOD FOR PRODUCING THE SAME

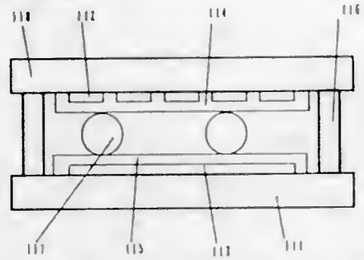
Michio Shimizu; Toshimitsu Konuma, and Takeshi Nishi, all of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Japan

Filed Jun. 1, 1994, Ser. No. 252,199

Claims priority, application Japan, Jun. 3, 1993, 5-157861; Jun. 8, 1993, 5-164145

Int. Cl.[6] G02F *1/1350;1/1339*

U.S. Cl. 359—80 **19 Claims**



1. A method for producing a liquid crystal device, comprising the steps of:

injecting a mixture of a liquid crystal material and an uncured resin material having a hydrophilicity from an injection inlet formed between a pair of substrates, to hold the uncured resin material in a vicinity of an inside of the injection inlet and fill a space between the substrates with the liquid crystal material, and

curing the uncured resin material, to seal the injection inlet,

wherein aligning means for orienting the liquid crystal material is formed on at least one of the substrates.

5,552,914
LIQUID CRYSTAL DISPLAY HAVING A FINE PARTICLE-DISPERSION LAYER ON AT LEAST ONE SIDE OF THE LIQUID CRYSTAL LAYER

Katsuhiko Shinjo, Isehara; Tetsuya Kaneko; Shuzo Kaneko, both of Yokohama, and Takeo Tsukamoto, Atsugi, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

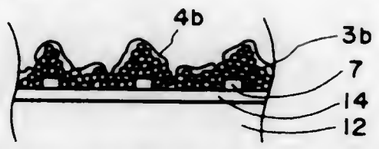
Division of Ser. No. 99,054, Jul. 29, 1993, Pat. No. 5,495,352.

This application May 26, 1995, Ser. No. 452,002

Claims priority, application Japan, Jul. 30, 1992, 4-222287; Jul. 30, 1992, 4-222288; Jul. 30, 1992, 4-222289; Dec. 28, 1992, 4-348689

Int. Cl.[6] G02F *1/1343;1/13*

U.S. Cl. 359—87 **11 Claims**



1. A liquid crystal optical device: comprising a plurality of pixels each comprising a pair of opposing electrodes and a ferroelectric liquid crystal layer disposed between the opposing electrodes, wherein at least one opposing electrode is coated with a fine particle-dispersion layer containing electroconductive ultrafine particles having an average particle size of 30–300 Å and further an alignment control layer disposed to allow a local direct contact of the fine particle dispersion layer with the ferroelectric liquid crystal layer.

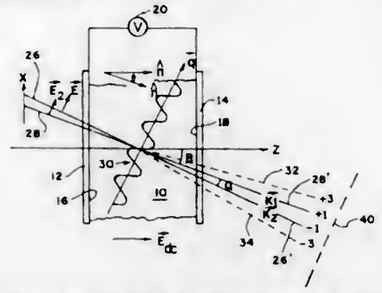
5,552,915
LIQUID CRYSTAL NON-LINEAR, PHOTOREFRACTIVE ELECTRO-OPTICAL STORAGE DEVICE HAVING A LIQUID CRYSTAL FILM INCLUDING DOPANT SPECIES OF C_{60} OR C_{70}

Iam-Choon Khoo, State College, Pa., assignor to The Penn State Research Foundation, University Park, Pa.

Filed Oct. 19, 1994, Ser. No. 325,738

Int. Cl.[6] C09K *19/52;* **G02F** *1/13*

U.S. Cl. 359—94 **7 Claims**



1. A method for inducing a persistently retrievable director axis reorientation in a liquid crystal film, comprising the steps of:

applying a dc potential across said liquid crystal film; and

exposing said liquid crystal film to a spatially varying optical intensity to induce therein a spatially varying charge field in accordance with said spatially varying optical intensity, said varying charge field resulting in corresponding persistent reorientations of director axes within said liquid crystal film and, accordingly, corresponding refractive index changes therein Said liquid crystal film including a dopant species that is absorptive at a wavelength of said varying optical intensity, said dopant species being C_{20} or C_{70} -

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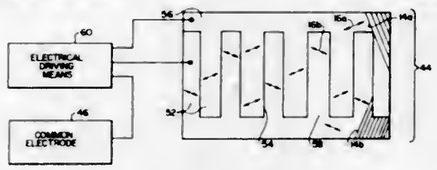
5,552,916
DIFFRADTIVE LIGHT MODULATOR

Michael J. O'Callaghan, Louisville, and Mark A. Handschy, Boulder, both of Colo., assignors to Displaytech, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 578,647, Sep. 7, 1990, Pat. No. 5,182,665. This application Jan. 25, 1993, Ser. No. 8,764

Int. Cl.[6] G02F *1/13*

U.S. Cl. 359—95 **30 Claims**



1. An apparatus for modulating light comprising:

first and second plates;

at least one birefringent layer disposed between said plates having first and second alignment regions, said birefringent layer corresponding to said first alignment region having a first optic axis selectably disposed in one of a first orientation and a second orientation, said birefringent layer corresponding to said second alignment region having a second optic axis selectably disposed in one of a third orientation and a fourth orientation, said first and third orientations having a relative difference of 90°, and said first orientation having a same angle relative to a line perpendicular to said plates as said third orientation relative to said line, light having passed through said birefringent layer at locations with said first orientation having a phase difference of an odd-integral number of half-waves from and same polarization as light having passed through locations with said third orientation independent of a polarization state of light incident on said apparatus; and

means for controlling whether said first optic axis and said second optic axis are disposed to have said relative difference of 90°, said first alignment region having a total area equal to a total area of said second alignment region, said phase difference between said first and third orientations causing complete diffraction of said light incident on said apparatus.

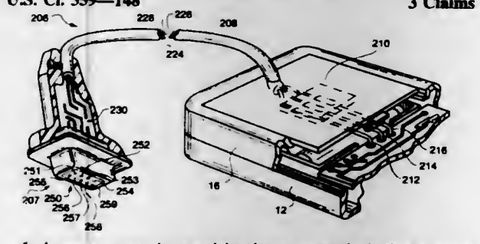
5,552,917
UNIVERSAL REMOTE CONTROL DEVICE

Paul V. Darbee, Santa Ana; Richard E. Ellis, Garden Grove; Louis S. Jansky, Long Beach, and Avram S. Grossman, Santa Ana, all of Calif., assignors to Universal Electronics Inc., Twinsburg, Ohio

Division of Ser. No. 93,512, Jul. 16, 1993, which is a continuation of Ser. No. 586,957, Sep. 24, 1990, which is a division of Ser. No. 127,999, Dec. 2, 1987, Pat. No. 4,959,810, which is a continuation-in-part of Ser. No. 109,336, Oct. 14, 1987, abandoned. This application Sep. 29, 1994, Ser. No. 314,970

Int. Cl.[6] H04B *10/00;10/24*

U.S. Cl. 359—148 **3 Claims**



1. A remote control comprising input means including a set of keys or pushbuttons for inputting commands to the remote control, infrared signal output means for supplying an infrared signal to a controlled device including IR lamp driver circuitry, a central processing unit (CPU) coupled to said input means and to said signal output means, memory means coupled to said CPU, code data for generating infrared codes stored in said memory means, and two-way data coupling means coupled to said CPU for enabling at least one of instruction codes or of infrared code data for generating infrared codes to be supplied from outside said remote control through said two-way data coupling means directly to said CPU for entry into said memory means to enable a user of the remote control to operate a selected controlled device upon inputting commands to the remote control by depressing selected keys of the remote control and to be transmitted from said remote control through said two-way data coupling means to a computer.

5,552,918
TRANSMISSION AND RECEPTION MODULE FOR A BIDIRECTIONAL OPTICAL COMMUNICATION AND SIGNAL TRANSMISSION

Joachim Krug, Neutraubling; Hans-Ludwig Althaus, Lappersdorf; Alfred Hartl, Pettendorf, and Gerhard Kuhn, Köfering, all of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 6, 1995, Ser. No. 539,832

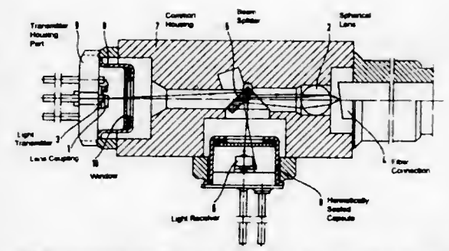
Claims priority, application Germany, Oct. 6, 1994, 44 35 768.0

Int. Cl.[6] H04B *10/00*

U.S. Cl. 359—152 **6 Claims**

1. A transmission and reception module for a bidirectional optical communication and signal transmission, comprising:

a light transmitter with a radiation-active part and an optical axis, said light transmitter having a first lens coupling optical element with an optical axis;



a fiber connection with an end surface and an optical axis, said fiber connection having a second lens coupling optical element with an optical axis for a common optical waveguide;

a beam splitter disposed in a free beam path;

a light receiver with a radiation-sensitive part, said light receiver being orthogonal to said light transmitter, said beam splitter and said fiber connection; and

a common housing defining an axis of symmetry and surrounding said light transmitter, said first optical element, said fiber connection, said second optical element, said beam splitter and said light receiver;

said light transmitter, said beam splitter, said fiber connection and said light receiver being disposed axially symmetrically;

said optical axis of said first lens coupling optical element being axially offset from said optical axis of said light transmitter, and said optical axis of said second lens coupling optical element being axially offset from said optical axis of said fiber connection, said end surface of fiber connectiou having, at a given optimal coupling-in of light, an angle of inclination relative to said optical axis of said fiber connection, and said beam splitter being inclined relative to said axis of symmetry, so that backreflected radiation strikes neither said radiation-active part of said light transmitter nor said radiation-sensitive part of said light receiver.

5,552,919
TUNABLE-FILTER CONTROL METHOD, TUNABLE-FILTER CONTROL APPARATUS AND OPTICAL COMMUNICATION SYSTEM USING THE SAME

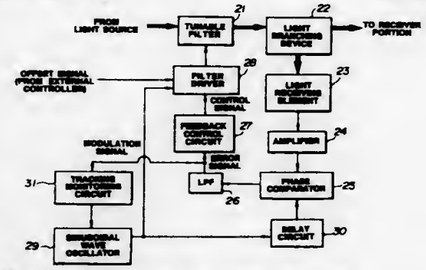
Masao Majima, Isehara, and Takeo Ono, Sagamihara, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 79,749, Jun. 22, 1993, abandoned. This application Oct. 10, 1995, Ser. No. 541,721

Claims priority, application Japan, Jun. 27, 1992, 4-192900; May 31, 1993, 5-152670

Int. Cl.[6] H04B *10/00*

U.S. Cl. 359—161 **78 Claims**



78. An optical communication system comprising:

a light transmission line;

a transmitter unit, connected to said light transmission line, for transmitting a light signal transmitted through said transmission line; and

a receiver unit, also connected to said light transmission line, for receiving a light signal transmitted through said transmission line, said receiver unit comprising:

5,552,922

(b) forming M vertically directional first trenches on the entirety

a tunable-filter having a transmission spectrum with a variable central wavelength;

a tunable-filter control apparatus for tuning the central wavelength of the transmission spectrum of the tunable-filter to a wavelength of the light signal, said tunable-filter control apparatus comprising:

modulation signal supplying means for supplying a modulation signal having a modulation amplitude for modulating the central wavelength of the transmission spectrum of said tunable-filter;

error signal generating means for generating an error signal based on an output of said tunable-filter for use in determining a tuning direction of the central wavelength of the tunable-filter;

filter control means, said filter control means using the error signal from said error signal generating means to tune the central wavelength to the light signal wavelength according to the determined tuning direction;

monitoring means for monitoring a tuning state of said filter control means, said tuning state comprising a draw-in state and a stable state;

wherein the amplitude is controlled so that the modulation amplitude in the stable state will be smaller than the modulation amplitude in the draw-in state.

5,552,920

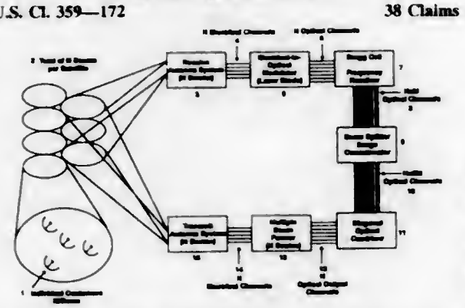
OPTICALLY CROSSLINKED COMMUNICATION SYSTEM (OCCS)

Thomas W. Glynn, 1806 Severn Grove Rd., Annapolis, Md. 21401

Filed Jun. 7, 1995, Ser. No. 480,743

Int. Cl.[6] **H04B** *10/00;7/185*

U.S. Cl. 359—172 **38 Claims**



1. A two-way optical communications switch system useful for a single elevated platform, said optical communication switch system capable of switching a large number of wide bandwidth channels, comprising:

an elevated platform for hosting said optical communications switch system;

a receive antenna system for receiving a first set of N beams, each of said first set of N beams servicing M customers;

an electrical-to-optical modulator for forming a first set of N optical channels from respective ones of said N beams;

a frequency resolver for spreading each of said first set of N optical channels in one dimension for creating a first set of N×M optical channel elements;

a beam splitter image concatenator for duplicating said first set of N×M optical channel elements to create a substantially identical second set of N×M optical channel elements, said first set of N×M optical channel elements adjacent to said second set of N×M optical channel elements to form a dual virtual array having N×2M optical channel elements and M diagonals, each of said M diagonals comprising M optical channel elements;

a diagonal optical combiner for combining said M optical channel elements for each of said M diagonals into N optical outputs for forming a second set of N beams; and

a transmit antenna system for transmitting said second set of N beams, each servicing M customers simultaneously.

5,552,921

METHOD OF COMMON TRANSFER OF DIGITAL, AUDIO AND CONTROL DATA ON A COMMON BUS LINE; BUS SYSTEM FOR IMPLEMENTING THE METHOD AND INTERFACE APPLICATION IN THE METHOD

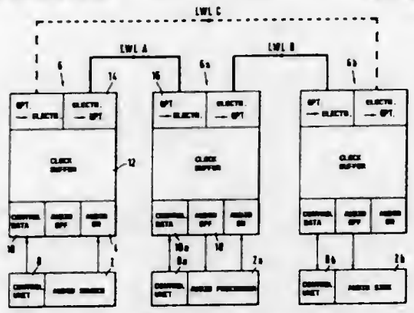
Herbert Hetzel, Karlsruhe; Hans P. Mauderer, Malsch, and Patrik Heck, Durmersheim, all of, Germany, assignors to Becker Autoradiowerk GmbH, Karlsbad, Germany

Continuation of Ser. No. 971,838, Feb. 19, 1993, abandoned. This application Mar. 8, 1995, Ser. No. 400,533

Claims priority, application European Pat. Off., Jun. 21, 1991, 91110247

Int. Cl.[6] **H04B** *10/12;* **H04J** *14/08*

U.S. Cl. 359—173 **15 Claims**



1. A method of common transfer of digital audio and control data on a common bus line in a user system which contains at least one digital audio source and at least one digital control data signal source, each user having an associated interface for connection to said bus line and said bus line being configured as a series circuit of alternating fiber optic cable sections and interfaces, each interface connecting two successive fiber optic cable sections and converting signals arriving from one fiber optic cable section into electrical signals, converting electrical signals into optical signals and feeding these optical signals into the other fiber optic cable section;

the method comprising the steps of:

transferring audio and control data in a format specifying a sequence of discrete groups of bits of equal length in which the audio data occupy a predetermined number of bits in each group and at least one bit is reserved for the control data; said sequence being clocked at a data clock frequency determined by the clock of said digital audio source;

forming at least one control data channel with said reserved bit;

assigning individual addresses to at least some of said users; and

causing each user having an assigned address to continuously interrogate said control data channels via the associated interface to respond to transferred control data when an address preceding said control data on said bus line agrees with the user address.

5,552,922

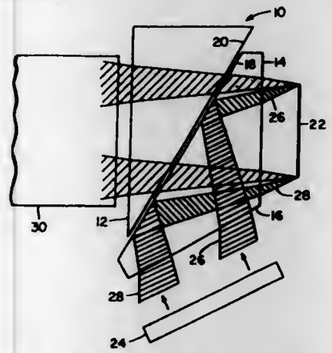
OPTICAL SYSTEM FOR PROJECTION DISPLAY

Simon Magarill, Cincinnati, Ohio, assignor to Corning Incorporated, Corning, N.Y.

Filed Apr. 12, 1993, Ser. No. 44,720

Int. Cl.[6] **G02B** *5/04;5/08;26/08;27/10*

U.S. Cl. 359—224 **4 Claims**



1. An image projection system which comprises:

a) a light source which provides illuminating light;

b) a plurality of selectively adjustable reflecting elements which are arranged in a common plane, said elements being adjustable between at least a first position and a second position;

c) a lens having a principal plane which is parallel to said common plane; and,

d) a prism positioned between said lens and said plurality of reflecting elements and further positioned to receive light from said light source, so that light from said light source is transmitted by said prism to said plurality of reflecting elements and such light reflected from said elements in said first position passes through said prism and through said lens and light reflected from said elements in said second position does not pass through said lens.

5,552,923

ARRAY OF ELECTRODISPLACIVE ACTUATED MIRRORS AND METHOD FOR THE MANUFACTURE THEREOF

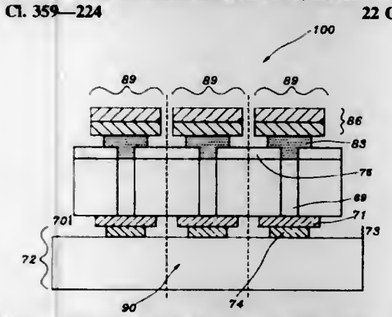
Yong-Ki Min, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Oct. 13, 1994, Ser. No. 322,812

Claims priority, application Rep. of Korea, Oct. 20, 1993, 93-21831; Dec. 16, 1993, 93-27985

Int. Cl.[6] **G02B** *7/182;26/08;* **H01L** *41/08;* **H04R** *17/00*

U.S. Cl. 359—224 **22 Claims**



1. A method for manufacturing an array of M×N electrodisplacive actuated mirrors, M and N indicating the number of columns and rows in said array, respectively, comprising the steps of:

(a) preparing a first ceramic wafer made of an electrodisplacive material and having a flat top and a flat bottom surfaces;

(b) forming M vertically directional first trenches on the entirety of the flat top surface of said first ceramic wafer, wherein each of the first trenches has a pair of side surfaces and a bottom surface and wherein two neighboring first trenches are separated by a barrier formed therebetween, said barrier having a top surface;

(c) preparing a second ceramic wafer made of said electrodisplacive material and having a flat top and a flat bottom surfaces;

(d) treating the second ceramic wafer in accordance with said step (b);

(e) covering the entirety of the flat top surfaces of the first and second ceramic wafers treated in accordance with said step (b), including the pair of side surfaces and the bottom surface of each of the first trenches, with an electrically nonconducting adhesive;

(f) bonding together the first and second ceramic wafers treated in accordance with said steps (b) and (e) in such a way that the top surfaces of the barriers in the first ceramic wafer are in contact with the bottom surfaces of the first trenches in the second ceramic wafer, thereby forming a ceramic block having a top and a bottom surfaces;

(g) obtaining a composite ceramic structure having a flat top and a flat bottom surfaces with a fixed surface area by polishing the top and bottom surfaces of said ceramic block until the bottom surfaces of the first trenches in the second ceramic wafer and the top surfaces of the barriers in the first ceramic wafer are completely removed, wherein said composite ceramic structure is comprised of M+1 blocks of the electrodisplacive material and M boundaries, each block being horizontally bounded by a pair of boundaries, each boundary being made of a pair of side surfaces separated by the electrically nonconducting adhesive, one of the pair of side surfaces being from the first ceramic wafer and the other side surface being from the second ceramic wafer;

(h) forming an array of M×N signal electrodes on the flat bottom surface of said composite ceramic structure, each of the signal electrodes having a vertically directional centerline, coinciding with one of the M boundaries, and overlapping with two neighboring blocks;

(i) mounting said composite ceramic structure treated in accordance with said steps (g) and (h) on an active matrix, having a substrate, and an array of connecting terminals, in such a way that each of the M×N signal electrodes is in contact with each corresponding one of the M×N connecting terminals;

(j) covering the entirety of the flat top surface of said composite ceramic structure treated in accordance with said steps (g) to (i) with a layer of an electrically conducting metal, wherein the layer is provided with a top surface;

(k) patterning the electrically conducting metal layer into M+1 bias electrodes by removing the layer covering the M boundaries;

(l) placing on the flat top surface of said composite ceramic structure treated in accordance with said steps (g) to (k) N identical photoresistive segments at a regular interval, each segment having an identical top surface area, wherein a combined total top surface area of the N segments does not exceed the surface area of the flat top surface of said composite ceramic structure, thereby leaving N−1 identical portions on the flat top surface thereof not covered, each of the N−1 portions running normal to the M boundaries;

(m) forming N−1 horizontally directional second trenches of a fixed depth and width at the portions not covered by the N photoresistive segments;

(n) removing the N photoresistive segments;

(o) forming a photoresist layer having a top surface by covering the entirety of the flat top surface of said composite ceramic structure treated in accordance with said steps (g) to (h), including the N−1 horizontally directional second trenches, with a photoresist;

(p) providing a transparent layer having a flat top surface on the top surface of the photoresist layer;

(q) placing m vertically directional, identical masks, each of the masks having a vertically directional centerline, on the flat top surface of the photoresist layer in such a way that the center-

line for each of the masks coincides with that of the signal electrodes in the same column and each mask overlaps with

said shutter means fabricated of a material which is electrically conductive and non-transparent to said radiation signal,

5,552,927

ALL-POLYMERIC COLD MIRROR

means for rectilinearly moving said stage toward and away from said observation optical axis on a first line perpendicular to

line for each of the masks coincides with that of the signal electrodes in the same column and each mask overlaps with two neighboring bias electrodes when projected onto the flat bottom surface of said composite ceramic structure treated in accordance with said steps (g) to (p);

(r) exposing said composite ceramic structure treated in accordance with said steps (g) to (p) under an ultraviolet light to thereby divide the photoresist layer into regions of exposed layer and unexposed layer;

(s) removing the M vertically directional masks;

(t) providing a light reflecting layer on the flat top surface of the transparent layer, thereby forming a mirror layer, including the light reflecting layer and the transparent layer;

(u) patterning the mirror layer into an array of M×N mirrors; and

(v) completing electrical connections to thereby form said array of M×N electrodisplacive actuated mirrors.

5,552,924

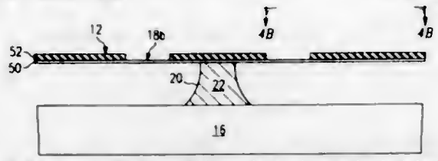
MICROMECHANICAL DEVICE HAVING AN IMPROVED BEAM

John H. Tregilgas, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 14, 1994, Ser. No. 339,363

Int. Cl.[6] G02B *26/08*

U.S. Cl. 359—224 **31 Claims**



1. An improved deformable beam for a micromechanical device of the type which includes a deflectable mass supported by the beam, which is deformable upon deflection of the mass, wherein the improvement comprises:

the beam being constituted of one or more electrically conductive aluminum compounds exhibiting fewer primary slip systems than FCC crystalline structures.

5,552,925

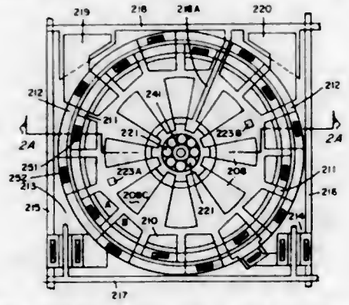
ELECTRO-MICRO-MECHANICAL SHUTTERS ON TRANSPARENT SUBSTRATES

Eugene R. Worley, Irvine, Calif., assignor to John M. Baker, Corona, Calif.

Filed Sep. 7, 1993, Ser. No. 117,532

Int. Cl.[6] G02B *26/02*

U.S. Cl. 359—230 **28 Claims**



1. Control apparatus for selectively blocking radiation comprising,

substrate means which is transparent to a radiation signal,

shutter means movably mounted on said substrate means,

said shutter means fabricated of a material which is electrically conductive and non-transparent to said radiation signal,

electrode means mounted on said substrate means adjacent to said shutter means,

said electrode means fabricated of a material which is electrically conductive,

gating means mounted on said substrate means and electrically connected to at least one of said shutter means and said electrode means, and

signal supplying means mounted on said substrate means for supplying electric signals to said electrode means and to said shutter means via said gating means to selectively apply an electric force to said shutter means in order to move said shutter means relative to said substrate means.

5,552,926

DEVICE AND METHOD FOR WAVELENGTH CONVERSION AND BBO CRYSTAL FOR WAVELENGTH CONVERSION

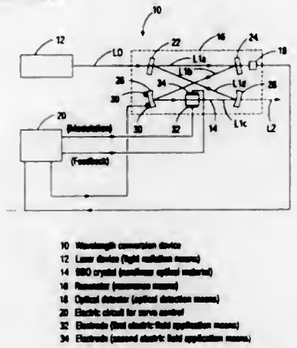
Soichi Owa, and Yoichi Taira, both of Tokyo-to, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 19, 1995, Ser. No. 492,355

Claims priority, application Japan, Oct. 7, 1994, 6-3051234

Int. Cl.[6] G02F *1/35*

U.S. Cl. 359—326 **3 Claims**



10 Wavelength conversion device
12 Laser device (light radiation means)
14 BBO crystal (nonlinear optical material)
16 Resonator (resonance means)
18 Optical detector (optical detection means)
20 Electric circuit for servo control
32 Electrode (first electric field application means)
34 Electrode (second electric field application means)

1. A wavelength conversion device for conversion of light from a light radiation source that radiates light of a fundamental wavelength, comprising:

a resonator for receiving an incident optical light beam from the source and having a resonance frequency in accordance with a resonance length of an optical path within the resonator, the resonator including a plurality of light reflection means and a nonlinear optical material located so as to be irradiated by said incident optical beam, the nonlinear optical material outputting both the incident light of a fundamental wavelength and a light of at least one converted wavelength differing from the fundamental wavelength;

an electric field application means for applying an electric field to said nonlinear optical material so that said resonance frequency can be synchronized with said light of the fundamental wavelength; and

an optical detection means located so as to be irradiated with light from said nonlinear optical material for detecting the intensity of light, wherein said electric field application means comprises a first electric field application means for applying an electric field to said nonlinear optical material to modulate said resonance frequency and a second electric field application means for applying an electric field to said nonlinear optical material in such a way that said resonance frequency obtained from the detected intensity of light equals the frequency of said light of the fundamental wavelength.

5,552,927

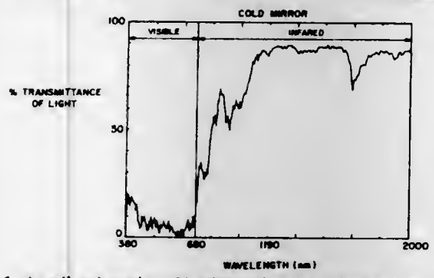
ALL-POLYMERIC COLD MIRROR

John A. Wheatly, and Gregg A. Motter, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mass.

Continuation of Ser. No. 963,305, Oct. 16, 1992, Pat. No. 5,339,198. This application Apr. 4, 1994, Ser. No. 222,028

Int. Cl.[6] G02B *1/10;5/26;5/28*

U.S. Cl. 359—359 **25 Claims**



1. An all polymeric cold mirror of at least first and second diverse polymeric materials, the mirror comprising a sufficient number of alternating layers of said first and second polymeric materials such that at least 50% of light across the visible range of wavelengths between about 380–680 nm incident on said polyemric cold mirror is reflected and at least 80% of infrared light of wavelengths of between about 680–2000 nm is transmitted or absorbed, said alternating layers of said first and second polymeric materials having a layer thickness gradient across the thickness of said mirror.

5,552,928

MICROSCOPE WITH MOVABLE STAGE AND OBJECTIVE FOR EXAMINING LARGE SAMPLE

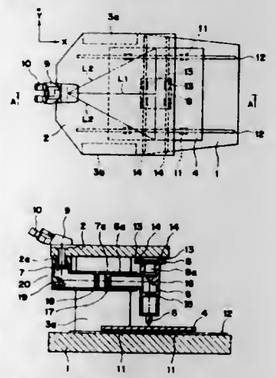
Hidehiko Furuhashi, Fujisawa, and Toshiaki Nihoshi, Tokyo, both of, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 964,958, Oct. 22, 1992, abandoned. This application Dec. 16, 1993, Ser. No. 167,616

Claims priority, application Japan, Oct. 30, 1991, 3-285141

Int. Cl.[6] G02B *21/00*

U.S. Cl. 359—379 **15 Claims**



1. A microscope comprising:

an objective optical system having an objective optical axis;

an observation optical system having an observation optical axis parallel to said objective optical axis;

coupling means for optically coupling said objective optical system with said observation optical system;

a stage for holding a sample;

means for rectilinearly moving said stage toward and away from said observation optical axis on a first line perpendicular to and intersecting with said observation optical axis; and

means for rectilinearly moving said objective optical system on a second line perpendicular to a plane defined by said observation optical axis and said first line.

5,552,929

STEREOMICROSCOPE

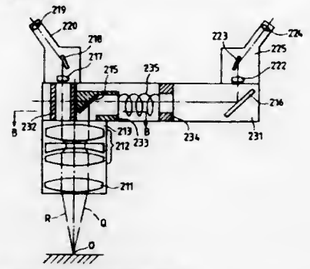
Takashi Fukaya, Hachiouji; Masami Hamada, Akishima; Shinichi Nakamura, Hachiouji; Toyoharu Hanzawa, Fuchu; Masahiko Kinukawa, Hachiouji; Tomonori Ishikawa, Hachiouji; Hiroshi Fujiwara, Hachiouji, and Shigeo Tokunaga, Hino, all of, Japan, assignors to Olympus Optical Co., Ltd., Tokyo-to, Japan

Continuation of Ser. No. 203,680, Feb. 28, 1994, abandoned, which is a continuation of Ser. No. 869,172, Apr. 16, 1992, abandoned. This application Mar. 28, 1995, Ser. No. 411,929

Claims priority, application Japan, Jul. 23, 1991, 3-182319; Oct. 31, 1991, 3-286562; Nov. 20, 1991, 3-304933; Dec. 12, 1991, 3-328779

Int. Cl.[6] G02B *21/22;21/00*

U.S. Cl. 359—380 **7 Claims**



1. A stereomicroscope comprising:

a microscope body which houses,

a single objective optical system for receiving light from an object to let said light emerge as a first parallel beam, and

a single afocal variable magnification optical system comprising a plurality of lenses for receiving said first parallel beam from said single objective optical system to let said first parallel beam emerge as a second parallel beam, at least one of said plurality of lenses included in said single afocal variable magnification optical system being movable along an optical axis of said single afocal variable magnification optical system to change spatial intervals between said plurality of lenses for making a change in magnification;

a plurality of binocular eyepiece barrels each of which houses,

a pair of imaging optical systems disposed in parallel with each other after said single afocal variable magnification optical system for receiving and imaging a pair of partial beams of said second parallel beam which are separate from each other, on a pair of imaging points, thereby a pair of images being obtained such that parallax is kept therebetween, and

a pair of eyepiece optical systems disposed after said pair of imaging optical systems for stereoscopic observation; and

means for moving at least one of said plurality of binocular eyepiece barrels with respect to said microscope body, so that said respective pair of imaging optical systems housed therein moves on a plane perpendicular to said optical axis of said single afocal variable magnification optical system while being kept inserted in said second parallel beam, thereby a pair of partial beams of said second parallel beam to be imaged by said pair of imaging optical systems housed in said binocular eyepiece barrel that is being moved shift within said second parallel beam to be imaged respectively by remaining pairs of imaging optical systems

respectively housed in remaining ones of said plurality of

respectively housed in remaining ones of said plurality of binocular eyepiece barrels, while a positional relationship between said pair of partial beams to be imaged by said pair of imaging optical systems housed in said binocular eyepiece barrel that is being moved being kept unchanged.

5,552,930

Patent Not Issued For This Number

5,552,931

FINDER OPTICAL SYSTEM

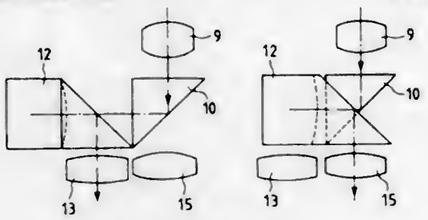
Kazuteru Kawamura, Hino, Japan, assignor to Olympuus Optical Co., Ltd, Tokyo, Japan

Filed Jul. 2, 1993, Ser. No. 85,162

Claims priority, application Japan, Apr. 6, 1992, 4-84137

Int. Cl.[6] G02B *23/00; G03B 13/10*

U.S. Cl. 359—431 **8 Claims**



1. A finder optical system comprising:

a finder objective lens;

image erecting means for erecting an image and including path selecting means being movable for defining a selected optical path through said finder optical system;

a first eyepiece for ordinary photography; and

a second eyepiece for panoramic photography adjacent to said first eyepiece, said first eyepiece and said second eyepiece being disposed at different longitudinal positions relative to a longitudinal direction of movement of said path selecting means,

wherein a first optical path for ordinary photography and an independent second optical path for panoramic photography are defined after said path selecting means and respectively lead to said first eyepiece and said second eyepiece, said path selecting means being movable in said longitudinal direction along a common optical path for both ordinary photography and panoramic photography and wherein movement thereof enables said selecting means to direct light from said finder objective lens selectively to one of said first optical path for ordinary photography through said first eyepiece and said second optical path for panoramic photography through said second eyepiece.

5,552,932

COLLAPSIBLE BINOCULAR

Cynthia A. Schultz, 302 Bella Manor Dr., Houston, Tex. 77024

Continuation-in-part of Ser. No. 44,228, Apr. 7, 1993, Pat. No. 5,353,151. This application Oct. 3, 1994, Ser. No. 316,924

Int. Cl.[6] G02B *27/02;27/22;23/00*

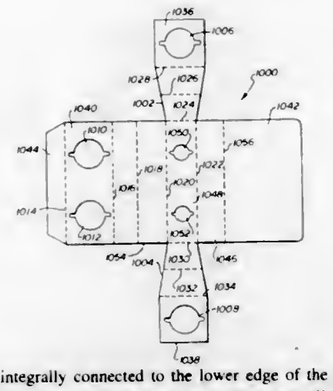
U.S. Cl. 359—480 **12 Claims**

1. A collapsible binocular comprising:

a substantially rectangular-faced open-sided housing being formed from a blank and having a front wall formed with a pair of objective lens apertures and with an upper edge and a lower edge, a rear wall formed with a pair of eyepiece lens apertures and with an upper edge and a lower edge, a bottom wall integrally connected to the lower edge of the rear wall and to the lower edge of the front wall, a top wall integrally connected to the upper edge of the rear wall, with a visor being integrally connected to the top wall via a fold line and extending from the top wall beyond the front wall, a flap integrally connected to the upper edge of the front wall for attaching the visor to the front wall such that the front wall and the rear wall are parallel to each other when the binocular is in a fixed position, with said lower edges and said upper edges defining fold lines and with the bottom wall having an intermediate transverse fold line;

a left side wall member and a right side wall member being attached to and integral with the housing and being foldable, with the left side wall member being integrally connected to a left side wall member end having an aperture and the right side wall member being integrally connected to a right side wall member end having an aperture, and the left side wall member and the right side wall member each having a lateral fold line and said left side wall member and said right side wall member being connected to one another through a centered portion with apertures;

an objective lens means comprising a pair of objective lenses, a unitary objective lens case and a unitary objective lens case clip for providing strength and durability attached to the front wall such that the objective lenses cover the objective lens apertures, and an eyepiece lens means comprising a pair of eyepiece lenses, a unitary eyepiece lens case and a unitary eyepiece lens case clip for providing strength and durability attached to the rear wall such that the eyepiece lenses cover the pair of eyepiece lens apertures, and the fold lines enabling collapsing the binocular from an extended position to a collapsed position, during which the top and bottom walls move relatively apart and the front and rear walls move relatively toward each other whereby the visor folds over the objective lens means.



5,552,933

VISIBLE LIGHT REFLECTORS AND PROCESS OF MAKING SAME

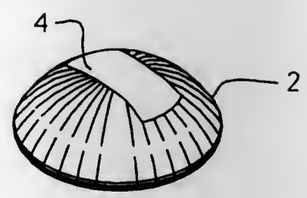
Jeanne S. Beauchamp, 10337 Azuaga St., #222, San Diego, Calif. 92129

Continuation-in-part of Ser. No. 985,667, Dec. 3, 1992, abandoned. This application Apr. 18, 1994, Ser. No. 228,930

Int. Cl.[6] G02B *5/12*

U.S. Cl. 359—515 **22 Claims**

22. A decorative light reflector comprising a stratum heated to have a convex top shape, and an area bearing a light reflective anisotropic crystal material facing outward from the top.



5,552,934

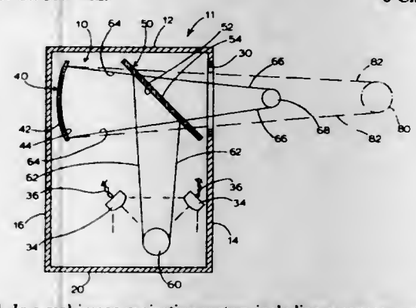
BACKGROUND REFLECTION-REDUCING PLANO-BEAM SPLITTER FOR USE IN REAL IMAGE PROJECTING SYSTEM

Jonathan Prince, New York, N.Y., assignor to SPM Corporation, New York, N.Y.

Filed Mar. 18, 1994, Ser. No. 210,603

Int. Cl.[6] G02B *27/14*

U.S. Cl. 359—629 **6 Claims**



1. In a real image projecting system including a concave mirror for reflecting a virtual image of an object and an aperture through which is projected a real image of the object into space, a beam splitter interposed the mirror and the aperture comprising:

a planar expanse having a front surface facing the aperture and a rear surface facing the mirror, the plane of said expanse being oriented at an angle to an axis defined between the mirror and the aperture;

said expanse having differential light transmissivity in either direction along the axis characterized by relatively high transmissivity of light incident thereon from the mirror and relatively low transmissivity of light incident thereon from the aperture, thereby reducing reflected external object image visibility that would clutter view of such a projected real image.

5,552,935

HEAD-UP DISPLAY DEVICE FOR MOTOR VEHICLES

Peter Knoll, Ettlingen; Winfried König, Pfinztal–Berghausen, and Rüdiger Mock-Hecker, Neu-Ulm, all of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

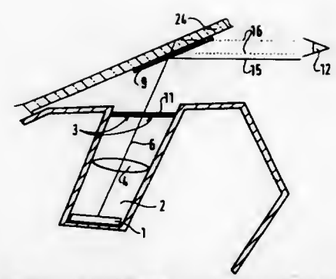
Filed Jan. 2, 1991, Ser. No. 646,758

Claims priority, application Germany, Jul. 1, 1988, 38 22 222.1

Int. Cl.[6] G02B *27/14*

U.S. Cl. 359—630 **10 Claims**

1. An optical device on a motor vehicle which has a windshield (**24**) for reflecting data in the form of displays, which are generated by display elements by means of a luminous flux in a well in the area of the instrument panel and are projected into the field of the vision of a driver of said vehicle via an optical device through an outlet opening of the well onto the windshield (**24**) of said vehicle and are reflected in this area by foils or plates, comprising



a first linear polarization filter (**11**) disposed in the path of the rays of the luminous flux (**6**) in the area of the outlet opening (**3**);

a second linear polarization filter (**9**) disposed in the area of the inside of the windshield (**24**) and extending with its direction of polarization aligned approximately perpendicularly to the polarization of the first polarization filter (**11**); and

wherein the second linear polarization filter (**9**) is disposed at the Brewster angle with respect to the path of the rays of the luminous flux (**6**).

5,552,936

TWO-UNIT ZOOM LENS

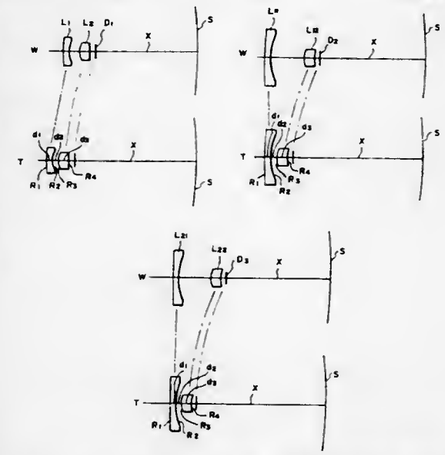
Kazunori Ohno, Ohmiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama-ken, Japan

Filed Oct. 16, 1992, Ser. No. 962,469

Claims priority, application Japan, Dec. 11, 1991, 3-327829

Int. Cl.[6] G02B *15/14;13/18*

U.S. Cl. 359—691 **3 Claims**



1. A two-unit zoom lens consisting of a first lens unit having a negative refracting power and a second lens unit having a positive refracting power, said first lens unit and said second lens unit being located in this order from the side of an object, and at least either one of said first lens unit and said second lens unit being moved such that a distance between said first lens unit and said second lens unit, which distance is taken along an optical axis, may change, whereby a focal length of the whole two-unit zoom lens is changed continuously,

wherein each of said first lens unit and said second lens unit consists of a single lens component having only two surfaces at least one of which is an aspherical surface.

5,552,937

WIDE-ANGEL ASPHERIC ZOOM LENS

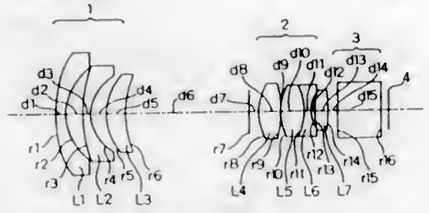
Shusuke Ono, Takatsuki; Hiroaki Okayama, Yamatotakada, and Yasuo Nakajima, Ibaraki, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 7, 1994, Ser. No. 224,567

Claims priority, application Japan, Apr. 13, 1993, 5-086151; Oct. 19, 1993, 5-260512

Int. Cl.[6] **G02B** *15/14;15/177*

U.S. Cl. 359—691 **16 Claims**



1. A wide-angle aspheric zoom lens comprising:

a first lens group having a negative refracting power and a second lens group having a positive refracting power which are arranged in order from an object side, wherein zooming is performed by changing an aerial interval between the first lens group and second lens group, and wherein each of the first lens group and the second lens group has one or more aspheric surfaces;

wherein the first lens group includes two meniscus negative lenses L1 and L2, each of which has an image side which is concave, and a first positive lens L3 whose object side is convex, wherein the two miniscus lenses L1 and L2 and the first positive lens L3 are arranged in order from the object side, and wherein the first lens group has one or more aspheric surfaces; and

the second lens group includes a second positive lens, a cemented lens having a third positive lens and a first negative lens, and a fourth position lens, which are arranged in order from the object side.

5,552,938

PROJECTION DEVICE FOR PROJECTING AN ORIGINAL IMAGE ONTO A SCREEN

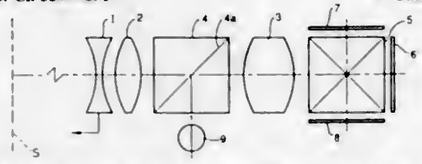
Saburo Sugawara, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 873,236, Apr. 24, 1992, abandoned. This application Mar. 28, 1995, Ser. No. 412,104

Claims priority, application Japan, Apr. 26, 1991, 3-097259

Int. Cl.[6] **G02B** *9/06;15/14;17/00;* **H04N** *9/31*

U.S. Cl. 359—691 **9 Claims**



4. A projection apparatus for projecting information from an information forming means by way of a cross dichroic prism onto a screen side, said projection apparatus:

projection lens means having, in succession from the screen side to the cross dichroic prism, a first lens unit comprising a plurality of sub-lens units, and having a positive refractive power as a whole, and a second lens unit having a plurality of lenses and a positive refractive power as a whole, wherein one of the sub-lens units is moved to effect focusing;

a light source for emitting a light beam; and

reflecting means disposed between the first lens unit and the second lens unit to reflect the light beam from said light source toward the second lens unit in order to illuminate the image information forming means.

5,552,939

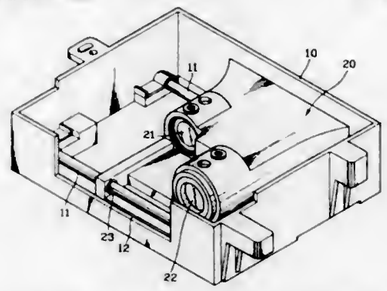
MULTI-LENS CHANGING MECHANISM FOR USE IN OPTICAL SCANNERS

Kou-Lung Tseng, and Kevin Yang, both of Hsinchu, Taiwan, assignors to UMAX Data Systems Inc., Hsinchu, Taiwan

Filed Jul. 7, 1995, Ser. No. 499,786

Int. Cl.[6] **G02B** *07/02*

U.S. Cl. 359—821 **13 Claims**



1. A multi-lens changing mechanism for use in optical scanners comprising:

a main mechanism having a bottom, first and second sides, and an aperture as an inlet for receiving, light, each of said first and second sides having a magnetic means attached thereto;

a sliding lens carriage including at least two lenses, said sliding lens carriage being slidable within said main mechanism: and

a driving mechanism including a guide rod and a swinging arm; wherein:

said guide rod is fitted at the bottom of said main mechanism, and is able to move back and forth;

said swinging arm has a first end attached to said sliding lens carriage and a second end pivotally mounted to said main mechanism such that said swinging arm will swing when it is driven by said guide rod;

said swinging arm of said driving mechanism is constructed such that a vertical movement of said guide rod is converted into a horizontal movement of said sliding lens carriage so as to switch between different lenses; and

said sliding lens carriage has first and second sides opposite said first and second sides of said main mechanism, respectively, each of said first and second sides of said sliding lens carriage is provided with a magnetic means which, in cooperation with said magnetic means provided on said main mechanism, causes said sliding lens carriage to be firmly but movably attached onto either of said first or second side of said main mechanism so as to effectuate a lens-changing function.

5,552,940

METHOD AND APPARATUS FOR DIGITAL SIGNAL RECORDING AND/OR REPRODUCTION

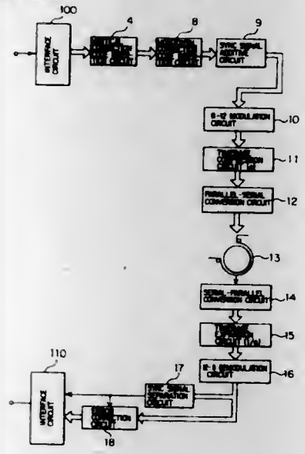
Masuo Umemoto, Tokyo; Hirotake Ishii; Hidehiko Sawamura, both of Hachioji, and Yoshizumi Eto, Sagamihara, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 165,519, Dec. 13, 1993, abandoned, which is a continuation of Ser. No. 771,104, Oct. 4, 1991, abandoned. This application May 3, 1995, Ser. No. 432,638

Claims priority, application Japan, Oct. 5, 1990, 2-266432

Int. Cl.[6] **G11B** *5/09;* **H03M** *7/46*

U.S. Cl. 360—19.1 **36 Claims**



1. A digital signal recording apparatus for forming tracks sequentially on a recording medium by use of head means mounted on a rotary cylinder and recording digital data, which includes video data, in the tracks of said recording medium, said digital signal recording apparatus comprising:

code modulation means for modulating each of said digital data, including said video data, configured in units of n bits into code words, each code word being configured in units of m bits and having at least a high-level data bit string including at least p successive high-level data bits and a low-level data bit string including at least q successive low-level data bits in such a manner that the high-level data bit string and the low-level data bit string appear alternately, and said code words are configured in such a manner that a high-level data bit string of a plurality of successive high-level data bits and a low-level data bit string of a plurality of low-level data bits appear alternately in a signal waveform on the successive code words recorded in said recording medium, wherein n, m, p and q are all integers and $n \geqq 1$; $m > n$; $p > 1$; $q > 1$; and $m \geqq (p+q)$;

compression means for compressing a timebase of said code words of all of the digital data, including the video data, which are recorded in the tracks of said recording medium and producing a compressed code word as an output,

wherein said timebase compression is performed at a compression rate of "a" satisfying the relationship $m/nd \leqq a < 1$, wherein further "d" is a predetermined number and an integer of at least two; and

means for recording said compressed code word output of said compression means in tracks of said recording medium.

5,552,941

METHOD OF RECORDING/REPRODUCING DIGITAL DATA INCLUDING RECORDING REGION ALLOCATION

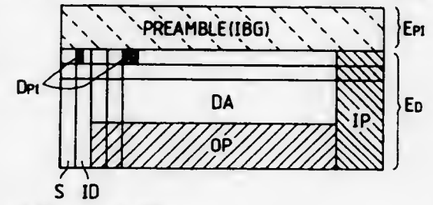
Seiji Higurashi, Tokyo, and Ohishi Takeo, Yokohama, both of, Japan, assignors to Victor Company of Japan, Ltd., Yokahama, Japan

Filed Jul. 21, 1994, Ser. No. 278,240

Claims priority, application Japan, Aug. 5, 1993, 5-213344

Int. Cl.[6] **G11B** *5/09;* **H04N** *5/76*

U.S. Cl. 360—48 **4 Claims**



3. A recording medium comprising:

a predetermined data section which is divided into a plurality of recording regions;

each recording region having a data format selected on the basis of content of an application to be recorded, said data format consisting of various data including main data, sync pattern, identification data, inner parity and outer parity; and

said recording medium memorizing format information representing the selected data format;

wherein an ordinary data region including data regions for said main data and said identification data partly contains said format information indicating presence or absence of a preamble or an interblock gap.

5,552,942

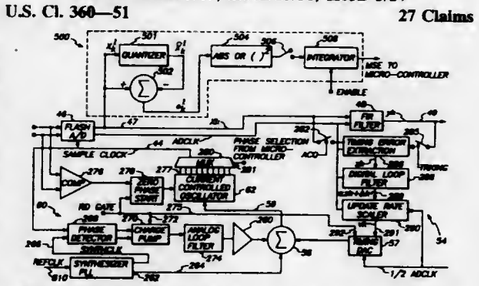
ZERO PHASE START OPTIMIZATION USING MEAN SQUARED ERROR IN A PRML RECORDING CHANNEL

Pablo A. Ziperovich, San Jose, and James Chiao, Saratoga, both of Calif., assignors to Quantum Corporation, Milpitas, Calif.

Filed Aug. 23, 1994, Ser. No. 295,505

Int. Cl.[6] **G11B** *5/09;* **H04L** *25/38;* **H03D** *3/24*

U.S. Cl. 360—51 **27 Claims**



9. A starting phase optimization circuit for determining an optimized starting phase from among a plurality of selectable phases of a timing control loop oscillator in a PRML sampled data detection channel, said optimization circuit comprising a quantizer having an input and an output, a summing junction having a positive input terminal and a negative input terminal and an output, and a mean squared error circuit for determining a mean squared error, said quantizer input and said positive input terminal of said summing junction being connected to an output of an analog to digital converter for synchronously sampling a known frequency analog signal within said sampled data detection channel said quantizer output connected to the negative terminal of said summing junction, said output of said summing junction connected to an input of the mean squared error circuit, and processing means connected to

5,552,945

to the motor driver circuit, thereby causing transducer travel

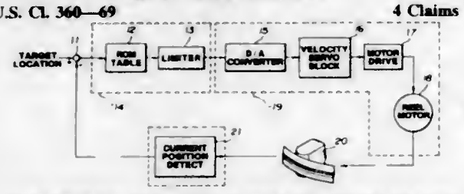
an output of the mean squared error circuit for determining a least mean squared error for thereby determining the optimized starting phase.

5,552,943

APPARATUS AND METHOD FOR ACCESSING A LOCATION ON A MAGNETIC TAPE

Yoshiaki Hirano; Teruhito Noshiro, and Takamoto Shimizu, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 9, 1991, Ser. No. 727,444
Claims priority, application Japan, Jul. 10, 1990, 2-180607
Int. Cl.[6] G11B *15/18;15/46*
U.S. Cl. 360—69 **4 Claims**



1. An apparatus for accessing a preselected location on a tape along a transportation path thereof, said tape being transported through actuation of a reel motor,

said apparatus comprising:

location detecting means for detecting a current location on said tape along said transportation path,

motor drive means for controlling a revolution velocity of said reel motor in response to a control signal corresponding with an indication revolution velocity curve for said reel motor representing instantaneous revolution velocities thereof, and

control signal producing means for producing said control signal based on a distance between said current location and said preselected location on said tape, said control signal producing means being operative to produce said control signal for at least some predetermined distances with respect to said preselected location such that said control signal is selected to compensate for estimated deviations between reel velocities represented by the indication revolution velocity curve corresponding with said control signal and actual reel velocities produced by said motor drive means in response to said control signal such that the actual reel velocities conform to a predetermined velocity profile adapted for accessing said preselected location on the tape,

wherein said control signal producing means is operative to produce said control signal such that the indication revolution velocity curve is determined for said at least some predetermined distances with respect to said preselected location in accordance with the following relationships:

$$y = a\sqrt{x - x2} \quad \text{when } x \geqq x3$$

$$y = b(x - x1) + y1 \text{ when } x1 \leqq x < x3$$

$$y = y1 \text{ when } x0 \leqq x < x1$$

$$y = 0 \text{ when } x < x0$$

$$a = \sqrt{2\alpha}$$

$$b = a\sqrt{x3 - x2}\ /x3$$

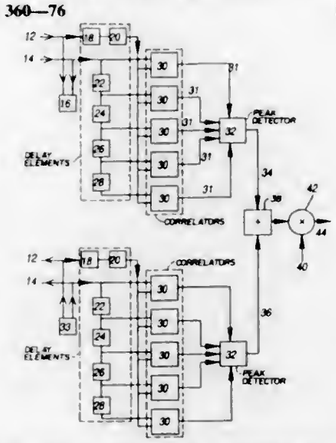
where x represents values of said at least some predetermined distances with respect to said preselected location, y represents values of said indication revolution velocity curve determined at corresponding distances x, x0 is a required accuracy in accessing said preselected location, α is a nominal acceleration of said reel motor selected on the basis of said estimated deviations between reel velocities represented by the indication revolution velocity curve and said actual reel velocities, and x1, x2 and x3 are predetermined values of x and y1 is a predetermined value of y determined on the basis of the nominal acceleration α.

5,552,944

METHOD AND APPARATUS FOR THE DETERMINATION OF AZIMUTH ERROR

Richard D. Clemow, Gerrards Cross, England, assignor to Central Research Laboratories Limited, Hayes, England

PCT No. PCT/GB94/01119, § 371 Date Feb. 21, 1995, § 102(e) Date Feb. 21, 1995, PCT Pub. No. WO95/00952, PCT Pub. Date Jan. 5, 1995
PCT Filed May 23, 1994, Ser. No. 387,779
Claims priority, application United Kingdom, Jun. 22, 1993, 9312831
Int. Cl.[6] G11B *20/20;5/56*
U.S. Cl. 360—76 **17 Claims**



7. An apparatus for determination of azimuth error between a write head and a read head moving relative to first and further signals borne by a carrier, comprising:

first time-delay means for delaying the first write signal with respect to the further signal supplied by the write head;

other first time-delay means for delaying the first read signal with respect to the further signal supplied by the read head;

further time-delay means for delaying the further signal from the write head to provide a plurality of time-delayed further signal each having a different associated time delay;

other further time-delay means for delaying the further signal from the read head to provide a plurality of other time-delayed further signals each having a different associated time delay;

correlation means for providing outputs corresponding to the best correlation between the time-delayed first write and read signals and the further signals supplied by the write and read heads and also the plurality of time delayed further signals from the further time delay means and the plurality of other time-delayed further signals from the other further time-delay means respectively;

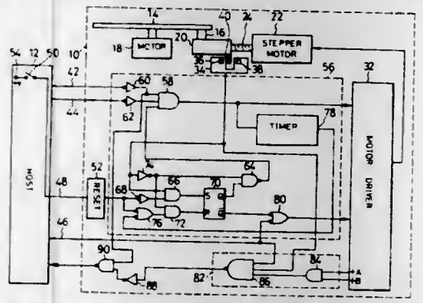
means for subtracting the time-delay value of the best-correlated read head signal from the time-delay value of the best-correlated write head signal to provide a timing error value from which the azimuth error may be derived.

5,552,945

TRANSDUCER RECALIBRATION SYSTEM AND METHOD FOR A ROTATING DISK DATA STORAGE

Tohru Miura, and Hiroshi Tsuyuguchi, both of Tokyo, Japan, assignors to TEAC Corporation, Tokyo, Japan

Continuation of Ser. No. 23,092, Feb. 26, 1993, abandoned. This application Nov. 23, 1994, Ser. No. 345,008
Claims priority, application Japan, Mar. 2, 1992, 3-080486
Int. Cl.[6] G11B *5/596*
U.S. Cl. 360—78.08 **6 Claims**



1. In an apparatus having a transducer for data transfer with a rotating data storage disk having a plurality of annular tracks arranged concentrically thereon, the tracks including a reference track and a plurality of valid tracks and a plurality of actual or virtual invalid tracks disposed on both sides of the reference track, transducer positioning means including a bi-directional stepper motor for moving the transducer across the tracks on the disk in a first direction, in which the transducer travels from the invalid toward the valid tracks, and in a second direction opposite to the first direction, first input means for inputting stepping pulses for causing the stepper motor to rotate by increments, second input means for inputting an externally generated stepping direction signal commanding the travel of the transducer in either of the first and the second directions, and a motor driver circuit for controllably driving the stepper motor in response to the stepping pulses and the stepping direction signal in order to position the transducer on any desired one of the reference track and the valid tracks on the disk, a transducer recalibration system for automatically positioning the transducer on the reference track on the disk when the apparatus is electrically turned on, the transducer recalibration system comprising:

(a) a reference track sensor for sensing whether the transducer is positioned approximately on the reference track or not;

(b) a reference track detector circuit connected to the reference track sensor and the motor driver circuit and the second input means for determining that the transducer is on the reference track, when the reference track sensor indicates that the transducer is approximately positioned on the reference track, when the stepper motor is being so energized by the motor driver circuit as to position the transducer on the reference track, and, at the same time, when the external stepping direction signal commands transducer travel in the second direction; and

(c) signal producing means for producing a signal representative of the fact that the apparatus is electrically turned on;

d) a recalibration control circuit connected between the first and the second input means and the motor driver circuit, and to the reference track sensor and the signal producing means, for inhibiting the delivery of the external stepping direction signal to the motor driver circuit when the apparatus is electrically turned on if then the external stepping direction signal commands transducer travel in the second direction and, at the same time, if then the reference track sensor indicates that the transducer is positioned approximately on the reference track, for supplying, instead, an internally generated stepping direction signal commanding transducer travel in the first direction to the motor driver circuit, thereby causing transducer travel in the first direction, and for permitting the delivery of the external stepping direction signal, commanding transducer travel in the second direction, from the second input means to the stepper motor control circuit, thereby causing transducer travel in the second direction, after the reference track sensor indicates that the transducer is no longer approximately positioned on the reference track as a result of the transducer travel in the first direction;

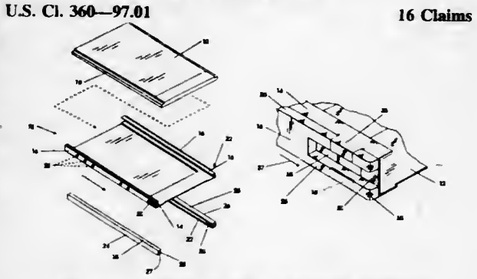
e) whereby, when the reference track sensor subsequently indicates that the transducer is approximately positioned on the reference track as a result of the transducer travel in the second direction, the reference track detector circuit correctly determines that the transducer is on the reference track, even if the transducer has been positioned on one of the invalid tracks on the disk when the apparatus is electrically turned on.

5,552,946

COMPLIANT RAIL FOR SHOCK PROTECTION OF A PCMCIA DASD

Bryan W. Bicknese, Rochester; Jeffrey F. Boigenzahn, Pine Island; Randy J. Bornhorst, Rochester; Jerome T. Coffey, Rochester; Todd P. Fracek, Rochester; Douglas W. Johnson, Rochester; Richard E. Lagergren, Rochester; James M. Rigotti, Rochester, and Marvin A. Schlimmer, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1994, Ser. No. 316,696
Int. Cl.[6] G11B *33/08*
U.S. Cl. 360—97.01 **16 Claims**



1. A disk drive mounting for shock absorption comprising:

a disk drive having a housing;

a first rail and a second rail disposed along parallel sides of said housing and being receivable in first and second guide slots, respectively, said first rail comprising a first resilient, shock absorbing rib attached to said housing, said second rail comprising a second resilient, shock absorbing rib attached to said housing, said first and second ribs having outer surfaces;

said first rib configured to form a keyway extending from one end of said housing toward the other end of said housing, said first rib extending to a point proximate said other end of said housing, said keyway being narrower than said first rib for insertion of a first key extending from the first guide slot;

said disk drive housing comprising at least a pair of reinforcement extensions extending from said first rail positioned adjacent to said one end of said housing and contiguous with at least a portion of said keyway, said extensions partially circumscribing said outer surfaces of said first rib on top of and below the keyway, respectively, and forming a gap therebetween coextensive with said keyway so that the first key passes therebetween; and

said reinforcement extensions preventing deformation of said first rib in an attempt to improperly insert said disk drive in the guide slots.

5,552,950

DIRECT ACCESS STORAGE DEVICE WITH MAGNETO-RESISTIVE TRANSDUCING HEAD

between the spark gaps in response to an electrostatic potential above a predetermined value applied to at least one of the contacts, thereby preventing the circuitry from being damaged

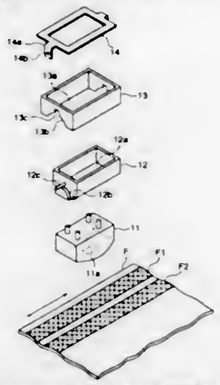
said reinforcement extensions preventing deformation of said first rib in an attempt to improperly insert said disk drive in the guide slots.

5,552,947

SUPPORTING APPARATUS FOR A MAGNETIC HEAD

Kazuhiro Nakanishi, Hachioji; Shin Isozaki, Hino; Shozo Kikugawa, Hino, and Hiroaki Yamagishi, Hino, all of, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Nov. 14, 1994, Ser. No. 340,363
Claims priority, application Japan, Nov. 16, 1993, 5-286978
Int. Cl.[6] G11B *5/48;21/20*
U.S. Cl. 360—104 **9 Claims**



1. A magnetic head supporting apparatus for supporting a magnetic head for writing and reading information on a magnetic layer of a photographic film by tracing said magnetic layer with said magnetic head in a predetermined conveyance direction of said photographic film, comprising:

a fixing frame including a solid first connecting portion;

a head supporting frame for supporting said magnetic head, said head supporting frame including a solid second connecting portion contacting said solid first connecting portion so that said head supporting frame pivots with respect to said fixing frame; and

a member for restricting movement of said head supporting frame.

5,552,948

DISK DRIVE HAVING A LIFTING MEMBER

Yuji Yokota, and Akio Hoshi, both of Chichibu, Japan, assignors to Canon Denshi Kabushiki Kaisha, Saitama, Japan

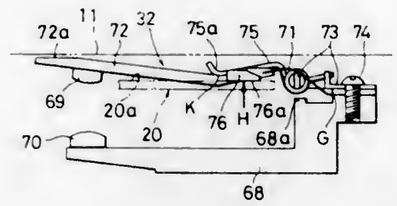
Continuation of Ser. No. 813,381, Dec. 27, 1991, abandoned. This application Jul. 22, 1994, Ser. No. 277,297
Claims priority, application Japan, Dec. 28, 1990, 2-417029; Jan. 8, 1991, 3-011465; Jan. 8, 1991, 3-011466; Feb. 5, 1991, 3-035491; Apr. 12, 1991, 3-079933; Apr. 12, 1991, 3-079937; Apr. 12, 1991, 3-079938
Int. Cl.[6] G11B *5/54;21/22*
U.S. Cl. 360—105 **16 Claims**

1. A disk drive for recording data on and/or reproducing data from a disk comprising:

a base provided with a top opening and a front opening;

a cassette guide member housed in said base, said cassette guide member being supported so as to be freely movable upward and downward between an upper position, where said disk is to be installed on or removed from said disk drive, and a lower position, where said disk is to be loaded at a predetermined loading position;

a head unit housed in said base and having a head for recording data on and/or reproducing data from said disk, and a head arm having first and second end portions, said first end portion supporting said head;



a carriage movably supporting said second end portion of said head arm on one end thereof;

a resilient member connected on one end thereof to said head arm, and on another end thereof to said carriage, said head arm being resiliently movable upward and downward relative to said carriage;

pushing means for pushing said head arm downward relative to said carriage; and

lifting means provided on said cassette guide member for elevating and lowering said head arm, said lifting means comprising:

an upper surface of said cassette guide member, and

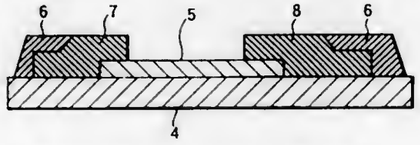
a lifter portion disposed between a position of said head arm where said pushing means pushes and said second end portion of said head arm on said head arm, said lifter portion having a contact surface parallel to said upper surface of said cassette guide member, when said head arm is located at said upper position and contacting said upper surface of said cassette guide member when said head arm is moved to said upper portion.

5,552,949

MAGNETORRSISTANCE EFFECT ELEMENT WITH IMPROVED ANTIFERROMAGNETIC LAYER

Susumu Hashimoto, Ebina; Yuzo Kamiguchi; Hitoshi Iwasaki, both of Yokohama; Atsuhito Sawabe, Yokosuka, and Masashi Sahashi, Yokohama, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Mar. 2, 1994, Ser. No. 204,676
Claims priority, application Japan, Mar. 3, 1993, 5-043025
Int. Cl.[6] G11B *5/39*
U.S. Cl. 360—113 **10 Claims**



1. A magnetoresistance effect element, comprising:

a substrate;

an exchange coupled film, formed on said substrate, comprising an antiferromagnetic layer and a ferromagnetic layer at least part of which is laminated with said antiferromagnetic layer;

electrodes for providing an electric current to said ferromagnetic layer, wherein said antiferromagnetic layer comprises $Cr_{100-x}M_x$, where M is at least one selected from the group consisting of Ga, In, Cu, Rh, Pt, Pd, Ag, Os, Ir, and Co; and

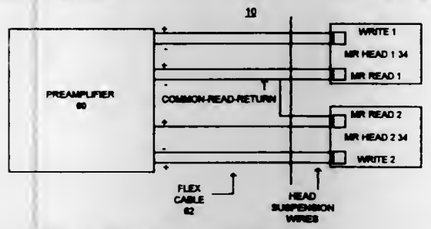
x is in the range of $0<x<30$.

5,552,950

DIRECT ACCESS STORAGE DEVICE WITH MAGNETO–RESISTIVE TRANSDUCING HEAD APPARATUS AND A COMMON READ RETURN SIGNAL LINE

Jerome T. Coffey, Rochester; Dale E. Goodman, Oronoco, and Joa M. Poss, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 30, 1994, Ser. No. 347,536
Int. Cl.[6] G11B *5/12*
U.S. Cl. 360—128 **4 Claims**



1. A direct access storage device comprising:

at least one disk mounted for rotation about an axis and having opposed disk surfaces for storing data;

magneto-resistive (MR) transducer means mounted for movement across respective disk surfaces, each for writing to and for reading data signals from a respective disk surface; each said MR transducer means including a write element and a read element,

preamplifier means, associated with said MR transducer means, for amplifying read and write signals; and

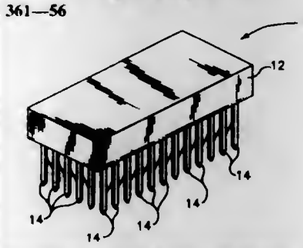
flex cable means for coupling said read and write signals between said preamplifier means and said MR transducer means, said flex cable means including a common read return signal line for each sequential pair of said MR transducer means, and said flex cable means further including two write signal lines coupled to each write element, and a read signal line and said common read return signal line for each of said MR transducer means of said sequential pair of said MR transducer means.

5,552,951

SEMICONDUCTOR PACKAGE ELECTROSTATIC DISCHARGE DAMAGE PROTECTION

Nicholas F. Pasch, Pacifica, and William Gascoyne, San Jose, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation of Ser. No. 105,833, Aug. 12, 1993, Pat. No. 5,424,896. This application Jun. 5, 1995, Ser. No. 461,133
The portion of the term of this patent subsequent to Aug. 12, 2013, has been disclaimed.
Int. Cl.[6] H02H *3/22*
U.S. Cl. 361—56 **20 Claims**



1. A semiconductor circuit device, comprising:

a package containing semiconductor circuitry;

a plurality of elongated electrical contacts which are connected to the circuitry and extend from the package; and

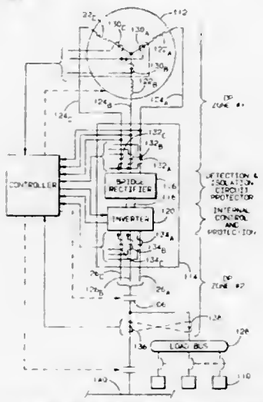
spark gap means extending partially between the pins for defining spark gaps such that electrical discharge will occur between the spark gaps in response to an electrostatic potential above a predetermined value applied to at least one of the contacts, thereby preventing the circuitry from being damaged by said electrostatic potential.

5,552,952

DETECTION AND ISOLATION CIRCUIT FOR A FAILED BRIDGE POWER RECTIFIER AND AN ELECTRICAL SYSTEM EMPLOYING SAME

Kenneth C. Kramer, and Roy S. Baker, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Oct. 21, 1994, Ser. No. 327,759
Int. Cl.[6] H02H *3/00*
U.S. Cl. 361—86 **14 Claims**



8. An electric power generating system, comprising:

a generator having a poly-phase ac output, said generator being drivably coupled to a prime mover whereby a first poly-phase ac electrical waveform having a frequency component which varies with speed is generated on said poly-phase ac output;

electric power conversion means electrically coupled to said poly-phase output for converting said first poly-phase ac electrical waveform to a second poly-phase ac electrical waveform having a controlled frequency component which may be varied independent of generator speed; and wherein

said conversion means comprises an input bridge rectifier means for converting said first waveform into a dc waveform on a dc link, and a switching network means for converting said dc waveform into said second waveform; and wherein

said conversion means further comprises means for detecting and isolating a failure in said input bridge rectifier means, said detecting and isolating means de-energizing said generator in response thereto; and wherein

said detecting and isolating means comprises:

means coupled to each phase of said first poly-phase ac waveform for monitoring phase voltages, said monitoring means generating sequential phase-to-phase voltage signals therefrom;

means coupled to said monitoring means for conducting that portion of each of said sequential phase-to-phase voltage signals having a given polarity, said conducting means generating sequential half wave voltage signals having a given polarity magnitude; and

means coupled to said conducting means for discriminating a faulted input bridge rectifier means by monitoring said given polarity magnitude of each of said sequential half wave voltage signals, said discriminating means generating a protection signal in response to one of said magnitudes being less than a threshold.

5,552,953

relay switching means connected to said relay exciter coils for

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5,552,956

5,552,953

SYSTEM FOR SUPPLYING POWER TO AN APPARATUS AND METHOD FOR THE ASSESSMENT OF THE LIFETIME AND CAPACITY OF A POWER-STORAGE DEVICE

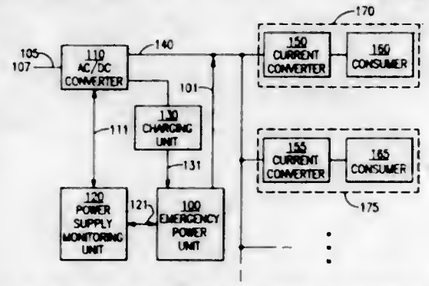
Herbert Meyerdirks, Altdorf, and Walter Pietschmann, Horb-Bittelbronn, both of, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 17, 1995, Ser. No. 373,344

Claims priority, application Germany, Jan. 29, 1994, 44 02 716.8

Int. Cl.[6] H02H *3/00*

U.S. Cl. 361—93 **15 Claims**



1. An apparatus for assessing the lifetime and capacity of a power storage means for supplying power to a device, said apparatus comprising:

a first measuring means for measuring a first electrical quantity of the power storage means;

a time determining means for determining a time on reaching a first level of the first electrical quantity characterized by:

a second measuring means for measuring a second electrical quantity of the power storage means; and

a comparator means for comparing the second electrical quantity relative to the determined time with a stored typical time characteristic of the second electrical quantity;

whereby the first electrical quantity either is a voltage or a current, the second electrical quantity then either being the current or the voltage respectively; and the measurements being applicable during a supply of the device by the power storage means.

5,552,954

METHOD FOR TRIGGERING PARALLEL RELAYS AND CIRCUIT FOR CARRYING OUT THE METHOD

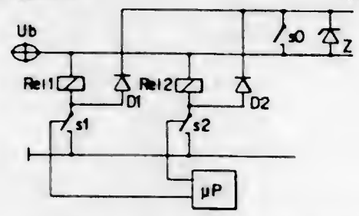
Manfred Glehr, Eggenfelden, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 28, 1994, Ser. No. 314,153

Claims priority, application Germany, Sep. 28, 1993, 43 32 995.0

Int. Cl.[6] H01H *47/04*

U.S. Cl. 361—191 **6 Claims**



6. In a device having a plurality of relay exciter coils connected parallel to a common voltage source, a circuit configuration for triggering the relay exciter coils, comprising:

relay switching means connected to said relay exciter coils for turning each of said relay exciter coils on and off;

a Zener diode connected in the blocking direction in series with the common voltage source;

diodes each being connected parallel to a respective one of the relay exciter coils and being connected in the blocking direction through said Zener diode to the common voltage source;

a common clock generator having a given clock ratio and being connected to said relay switching means for triggering the respective relay exciter coils to be turned on after reaching a response state thereof for establishing a steady state of a holding current being reduced relative to the response state; and

common OFF-switching means connected parallel to said Zener diode for turning off the relay exciter coils;

said respective relay switching means remaining closed for those relay exciter coils which are intended to continue to be operated in the steady state of the holding current after said OFF-switching means have turned off the relay exciter coils, for establishing a response current rising within a short time within the associated relay exciter coils, and the relay exciter coils being triggered again with said clock generator having the given clock ratio after a predetermined period of time.

5,552,955

SUBSTRATE REMOVAL METHOD AND MECHANISM FOR EFFECTING THE METHOD

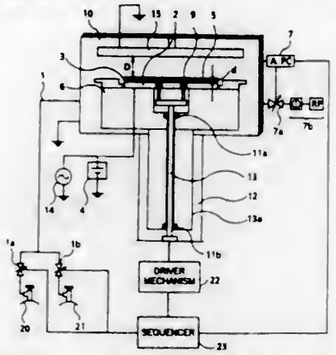
Supika Mashiro, Tokorozawa, and Tomoaki Osada, Tokyo, both of, Japan, assignors to Anelva Corporation, Fuchu, Japan

Filed Dec. 27, 1994, Ser. No. 364,314

Claims priority, application Japan, Feb. 3, 1994, 6-011798

Int. Cl.[6] H02N *13/00*

U.S. Cl. 361—234 **22 Claims**



1. A method of removing a substrate from an electrode, comprising:

forming a gap between the electrode and the substrate held thereto by electrostatic clamping;

increasing a difference in electric potential between the substrate and the electrode by forming the gap therebetween, thus generating an electric glow-discharge in a vicinity of the substrate;

reducing residual static charge on the substrate by gas particles charged by the electric-glow discharge; and

removing the substrate from the electrode after such reduction.

5,552,956

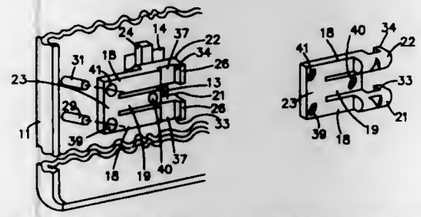
ELECTRICAL EQUIPMENT HOUSING WITH A MOVABLE DOOR COVERING A KEYPAD AND HAVING A PUSHBUTTON FOR OPERATING A KEY WHEN THE KEYPAD IS COVERED BY THE DOOR

Ralph E. Pasquarette, Jordan, and Alfred J. Gaskell, Hopkins, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 12, 1994, Ser. No. 289,871

Int. Cl.[6] H01H *3/12;13/14*

U.S. Cl. 361—680 **15 Claims**



1. In apparatus having a housing including a housing panel in which is a depressible key surface, and a cover having an interior surface and an exterior surface, said cover mounted on the housing and movable thereon from a first preselected position covering the key surface with the cover's interior surface facing the key surface, to a second preselected position exposing and allowing access to the key surface, wherein the cover has an aperture in alignment with the key surface when the keypad cover is in its first preselected position, said cover including a pushrod assembly allowing the key surface to be depressed with the cover in its first preselected position, said pushrod assembly comprising a pushrod in the aperture and projecting from the interior surface of the cover, and a cantilever support arm having first and second ends and made of a resilient material, said support arm attached at the first end thereof to the interior surface of the cover and at the second end thereof to the pushrod, whereby external pressure on the pushrod deflects the support arm and when the cover is in its first preselected position presses the pushrod against the key surface, wherein the improvement includes in the pushrod assembly a cantilever brace arm, said brace arm having a first end integral with the first end of the cantilever support arm, said brace arm lying generally along and spaced from the cantilever support arm and having a second end spaced apart from the support arm and attached to the interior surface of the cover.

5,552,957

PORTABLE COMPUTER FIELD KIT

George T. Brown, Apalachin; Vincent M. Coppola, Endicott; Walter A. Goodman, Binghamton, all of N.Y.; Frank V. Grebe, Racine, Wis.; Charles R. Hatton; David R. Hermansen, both of Endicott, N.Y.; David J. Podmajersky, Johnson City, N.Y.; Dennis P. Reynolds, Owego, N.Y.; Edward R. Ritinski, Binghamton, N.Y.; Julian D. Rizzi, Endicott, N.Y.; John H. Sherman, Glen Aubrey, N.Y., and Paul A. Wormsbecher, Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 9, 1994, Ser. No. 303,916

Int. Cl.[6] H05K *5/00;* **G01D** *15/00;* **G06F** *1/16*

U.S. Cl. 361—683 **16 Claims**

1. A packaging structure for a portable computer system comprising:

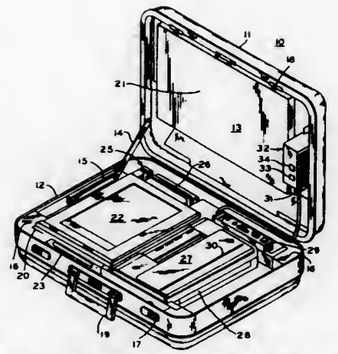
a carrying case;

a rectangular frame structure within said carrying case which provides a well having interior side walls which support a portable computer;

a multi-pin receptacle at an end of said well within said rectangular frame structure for receiving a complementary connector on said computer, said multi-pin receptacle being slidably supported to said frame for movement into and out of engagement with said connector;

a retaining member on said rectangular frame opposite said receptacle which retains an opposite end of said computer when said computer connector is engaged in said receptacle; and,

an input/output box supported on said rectangular frame, connected to said multi-pin receptacle which provides connection to said computer.



5,552,958

COMPACT ELECTRONIC APPARATUS HAVING A SPACE-MINIMIZING CONFIGURATION OF ELECTRONIC COMPONENTS, CABLES, AND CIRCUIT BOARDS

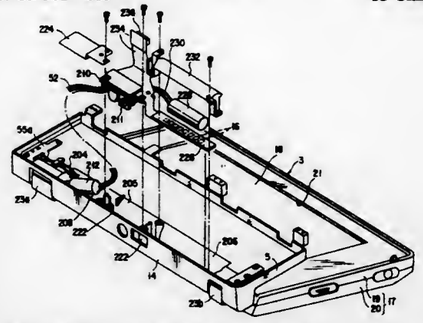
Masaru Seto, and Naohiro Yokoyama, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 377,675, Jan. 24, 1995, which is a continuation of Ser. No. 84,808, Jun. 29, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 465,735

Claims priority, application Japan, Jul. 17, 1992, 4-190352

Int. Cl.[6] G06F *1/16*

U.S. Cl. 361—683 **18 Claims**



1. A compact electronic apparatus comprising:

a base unit having a lower case, and an upper case attached to the lower case to cover a part of the lower case and having a storing portion, the base unit containing electronic components;

a display unit rotatably provided on the upper case;

a circuit board arranged in the lower case;

a sub circuit board attached to an inner surface of the upper case;

a connector cable, extending from the display unit into the base unit, accommodated in the storing portion and connected to the sub circuit board;

a battery stored in the storing portion and connected to the sub circuit board;

a single main cable extending from the sub circuit board; and

a connector attached to an extended end of the main cable and

ture, and biasing said third and fourth cylindrical members

heat conductive relationship with the heat sink, and means heat conductively connected to the circuitry member and operable as

a connector attached to an extended end of the main cable and detachably connected to the circuit board.

5,552,959

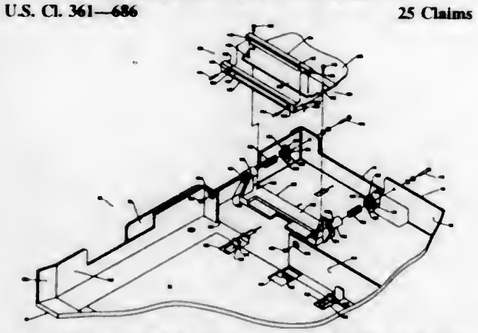
NOTEBOOK COMPUTER DOCKING STATION HAVING FLOATING CONNECTOR INTERFACE STRUCTURE

Mark Pennisman, Austin; Carmen Schlesener, Pflugerville, and Bill Inkman, Colleyville, all of Tex., assignors to Dell USA, L.P., Austin, Tex.

Continuation-in-part of Ser. No. 858, Jan. 5, 1993, Pat. No. 5,313,596. This application Mar. 29, 1994, Ser. No. 219,607

Int. Cl.[6] **G06F** *1/16;* **H01R** *13/62;* **H05K** *7/10*

U.S. Cl. 361—686 **25 Claims**



1. Connector apparatus for use in operatively and electrically coupling a first electrical connector structure carried by a portable computer to a docking station structure having a receiving area into which the portable computer may be inserted in a first direction toward a docked orientation of the computer, said connector apparatus comprising:

a second electrical connector structure telescopingly engageable with the first electrical connector structure; and

floating support means for supporting said second electrical connector structure within the receiving area in a manner such that said second electrical connector structure will be forcibly engaged by the first electrical connector structure as the computer approaches its docked orientation within the receiving area,

said floating support means being operative to resiliently bias said second electrical connector structure toward a ready-for-docking position, permit said second electrical connector structure to be translated away from said ready-for-docking position and into precise telescopingly mateable alignment with the first electrical connector structure in response to a forcible, misaligned engagement of said second electrical connector structure by the first electrical connector structure as the computer moves in said first direction toward its docked orientation, and substantially prevent rotation of said second electrical connector structure relative to the first electrical connector structure, said floating support means including:

first and second facing wall structures spaced apart in a first direction,

first and second cylindrical members disposed between said first and second facing wall structures, spaced apart in a direction transverse to said first direction, and having first ends slidably engaging said first wall structure,

third and fourth cylindrical members respectively and telescopingly engaged with said first and second cylindrical members for axial movement relative thereto,

a base member extending between and anchored to said third and fourth cylindrical members for movement therewith, said second electrical connector structure being fixedly secured to said base member for movement therewith, and

first and second springs biasing said first and second cylindrical members toward engagement with said first wall structure, and biasing said third and fourth cylindrical members toward engagement with said second wall structure.

5,552,960

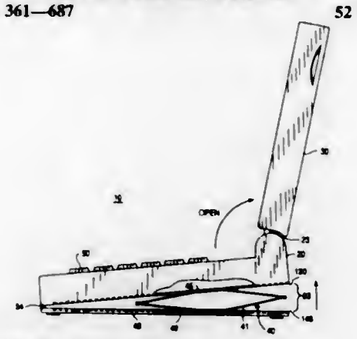
COLLAPSIBLE COOLING APPARATUS FOR PORTABLE COMPUTER

Daryl J. Nelson, and Scott L. Noble, both of Beaverton, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Apr. 14, 1994, Ser. No. 227,779

Int. Cl.[6] **H05K** *7/20;* **G06F** *1/20*

U.S. Cl. 361—687 **52 Claims**



1. A computer system, comprising:

a base casing;

a heat source in said base casing;

a bottom cover coupled to said base casing such that an open space exists between said base casing and said bottom cover in a first position of said computer system, wherein a minimal space exists between said base casing and said bottom cover in a second position of said computer system, wherein said minimal space is smaller than said open space; and

a heat sink thermally coupled to said heat source, said heat sink having an open extended position and a collapsed position, wherein movement of said computer system from said first position to said second position causes said heat sink to move from said open extended position to said collapsed position and movement of said computer system from said second position to said first position causes said heat sink to move from said collapsed position to said open extended position.

5,552,961

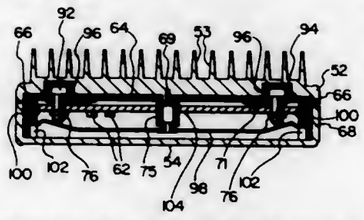
ELECTRONIC UNIT

Adrianus P. Van Gaal; Richard J. Humphreys, both of Kanata; John C. Atkinson, Ottawa; Amit Chawla, and Yee-Ning Chan, both of Nepean, all of, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 18, 1995, Ser. No. 443,515

Int. Cl.[6] **H05K** *7/20*

U.S. Cl. 361—700 **20 Claims**



1. An electronic unit comprising a housing including a heat sink, an electronic circuitry member within the housing, biasing means normally operable to urge the heat sink and the circuitry member away from relative positions in which the circuitry member is in

heat conductive relationship with the heat sink, and means heat conductively connected to the circuitry member and operable as temperature increases through specific temperature conditions to urge the circuitry member towards the heat sink to bring the circuitry member into heat conductive relationship with the heat sink and remove heat from the circuitry member, the means heat conductively connected to the circuitry member then being operable as the temperature decreases through the specific temperature conditions to allow the biasing means to urge the circuitry member away from the heat sink and out of heat conductive relationship with the heat sink, the electronic unit also including a heat conduction means disposed intermediate the heat sink and the circuitry member, the heat conduction means being compressible and increasing in heat conductive efficiency as compression increases, the heat conduction means being compressed between the heat sink and the circuitry member as the circuitry member moves towards the heat sink.

5,552,962

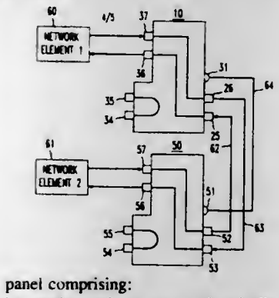
INTERCONNECT AND CROSS-CONNECT EQUIPMENT INCLUDING JACK PANEL

Clay A. Feustel, Lawrenceville, Ga., and John M. Scaglione, Denville, N.J., assignors to AT&T Corp, Murray Hill, N.J.

Filed May 27, 1994, Ser. No. 250,253

Int. Cl.[6] **H01R** *17/18;* **H04M** *5/00;* **H05K** *7/00*

U.S. Cl. 361—733 **6 Claims**



1. A jack panel comprising:

a first and second set of connectors electrically connectable to first and second telecommunications apparatus;

a plurality of electrical plug-receiving jacks on a front surface of the panel electrically connectable to patch cords, for electrically connecting one of said telecommunications apparatus to a third telecommunications apparatus coupled to another panel of the same type, the plug-receiving jacks being of a type which do not alter electrical connections in the panel when a plug is inserted therein;

means for electrically connecting the first set of connectors to the second set of connectors;

means for switching the electrical connector of the first set of connectors to the plug-receiving jacks; and

means provided in the front surface of the panel for activating said switching means.

5,552,963

BUS COMMUNICATION SYSTEM FOR STACKED HIGH DENSITY INTEGRATED CIRCUIT PACKAGES

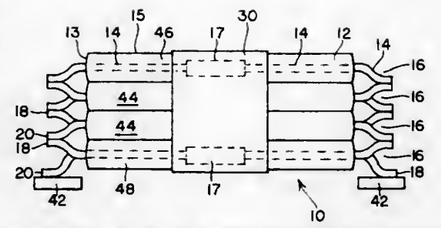
Carmen D. Burns, Austin, Tex., assignor to Staktek Corporation, Austin, Tex.

Division of Ser. No. 440,500, May 12, 1995, Pat. No. 5,479,318, which is a division of Ser. No. 206,829, Mar. 7, 1994, Pat. No. 5,455,740. This application Jul. 24, 1995, Ser. No. 506,309

Int. Cl.[6] **H05K** *7/00;* **H01L** *23/02*

U.S. Cl. 361—735 **1 Claim**

1. An integrated circuit module, comprising:



an assembly of integrated circuit packages, each of said packages having an upper and a lower surface and a perimeter edge; each of said packages including an integrated circuit die and a plurality of electrical leads coupled to said die and extending through said perimeter edge; said packages being mounted within said module with the lower surface of one adjacent the upper surface of another in stacked configuration so as to align said electrical leads of one of said packages with those of another of said packages; some of said lead being bifurcated at their distal end to provide an upper and a lower lead extension; wherein upper and lower lead extensions from adjacent packages are electrically and thermally coupled; wherein said bifurcated lead extensions comprise a first and a second lead end finger; and wherein said first or said second lead end finger on the leads of at least one of said stacked integrated circuit packages is electrically connected to a first or second lead end finger of the leads of an adjacent integrated circuit package and the remaining lead end finger is electrically connected to a lead end finger of the leads of another adjacent integrated circuit package.

5,552,964

SWITCH MOUNTED ON CIRCUIT BOARD AND METHOD OF MOUNTING SWITCH ON CIRCUIT BOARD

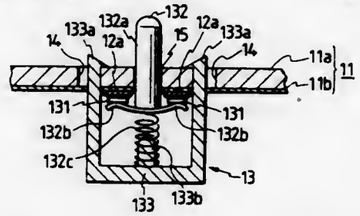
Hayato Naito, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, Japan

Filed Nov. 30, 1992, Ser. No. 982,965

Claims priority, application Japan, Nov. 29, 1991, 3-341891

Int. Cl.[6] **H05K** *7/02;* **H01H** *9/20*

U.S. Cl. 361—781 **10 Claims**



1. A switch device comprising:

a circuit board including a conductor pattern having a land portion;

a fixed contact member electrically provided on said land portion of said conductor pattern and having a fixed contact, said fixed contact member being reflow-soldered to said land portion;

a movable contact member having a movable contact movable to touch/detach with said fixed contact of said fixed contact member;

a casing for receiving therein said land portion of said conductor

5,552,967

PORTABLE ELECTRONIC APPARATUS HAVING A

reacts with the other to produce a chemiluminescent reaction, the first chamber having a first outer surface and the second chamber

a casing for receiving therein said land portion of said conductor pattern and said movable and fixed contact members, said movable contact member, said land portion, and said fixed contact member which is reflow-soldered to said land portion, all being completely enclosed within said casing;

a locking member for fitting said casing to said circuit board, said locking member being provided in said casing; and

a holding member for holding said movable contact with respect to said fixed contact in one of a touched and a detached condition, said holding member being provided in said casing.

5,552,965

CONTROL APPARATUS HAVING A COMPACT AND ACCESSIBLE ARRANGEMENT OF PRINTED CIRCUIT BOARDS

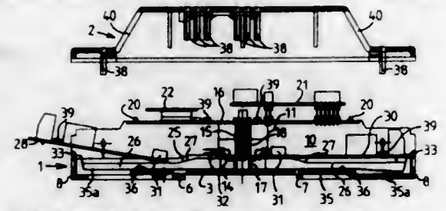
Peter Habegger, Murten, Switzerland, assignor to SAIA AG, Switzerland

Filed Apr. 4, 1994, Ser. No. 222,582

Claims priority, application European Pat. Off., Apr. 2, 1993, 93810235

Int. Cl.[6] H05K *7/14;9/00*

U.S. Cl. 361—801 **12 Claims**



1. A programmable control apparatus, comprising:

a housing of a synthetic material including a base and a cover positionable on said base;

printed circuit boards housed in said housing in at least a first plane and a second plane positioned above said first plane, a plurality of printed circuit boards adapted to be positioned in said first plane, and at least one printed circuit board fixed in said second plane;

a bus strip at said first plane and carried on said base, and said bus strip having connecting plugs on both sides thereof;

said plurality of printed circuit boards in said first plane are attachable to said connecting plugs on both sides of said bus strip and thereby positionable in said first plane; and

guides provided on said base and cooperating with said printed circuit boards for guiding said printed circuit boards of said first plane into contact with said connecting plugs of said bus strip.

5,552,966

SEMICONDUCTOR DEVICE HAVING AN INTERCONNECTING CIRCUIT BOARD AND METHOD FOR MANUFACTURING SAME

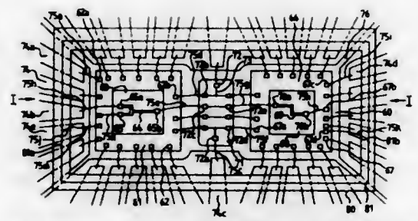
Junya Nagano, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Division of Ser. No. 253,589, Jun. 3, 1994, Pat. No. 5,473,514, which is a continuation of Ser. No. 808,848, Dec. 17, 1991, abandoned. This application Jun. 2, 1995, Ser. No. 460,559

Claims priority, application Japan, Dec. 20, 1990, 2-404429; Dec. 10, 1991, 3-326148

Int. Cl.[6] H05K *5/02*

U.S. Cl. 361—813 **2 Claims**



1. A semiconductor device having an interconnecting circuit board, the device comprising:

an island formed in a predetermined plane;

a first semiconductor chip having a plurality of electrically connecting electrode pads, the first chip being disposed on the island;

a first interconnecting circuit board having a first electrically conductive pattern and a plurality of electrically connecting electrode pads connected to the first electrically conductive pattern, the first interconnecting circuit board being disposed on the first semiconductor chip;

a second semiconductor chip having a plurality of electrically connecting electrode pads, the second chip being disposed on the island;

a second interconnecting circuit board having a second electrically conductive pattern and a plurality of electrically connecting electrode pads electrically connected to the second electrically conductive pattern, the second interconnecting circuit board being disposed on the second semiconductor chip;

an electric connecting circuit board having a plurality of electrically connecting electrode pads and a third electrically conductive pattern connected to the electrically connecting electrode pads, the electric connecting circuit board being disposed on the island and between the first semiconductor chip and the second semiconductor chip;

a plurality of inner leads disposed around the island;

a first electrically connecting means for connecting a first one of the inner leads and a first one of the electrically connecting electrode pads on the first semiconductor chip;

a second electrically connecting means for connecting a second one of the inner leads and a first one of the electrically connecting electrode pads on the first interconnecting circuit board;

a third electrically connecting means for connecting a third one of the inner leads and a first one of the electrically connecting electrode pads on the electric connecting circuit board;

a fourth electrically connecting means for connecting a second one of the electrically connecting electrode pads on the first semiconductor chip and a second one of the electrically connecting electrode pads on the electric connecting circuit board;

a fifth electrically connecting means for connecting a second one of the electrically connecting electrode pads on the first interconnecting circuit board and a third one of the electric connecting electrode pads on the electric connecting circuit board;

a sixth electrically connecting means for connecting the fourth electrically connecting electrode pads on the electrically connecting circuit board and a first one of the electrically connecting electrode pads on the second chip;

a seventh electrically connecting means for connecting a fifth one of the electrically connecting electrode pads on the electric connecting circuit board and a first one of the electrically connecting electrode pads on the second interconnecting circuit board;

an eighth electrically connecting means for connecting a second one of the electrically connecting electrode pads on the second interconnecting circuit board and a second one of the electrically connecting electrode pads on the second chip; and

a ninth electrically connecting means for connecting a third one of the electrically connecting electrode pads on the second chip and a fourth one of the inner leads.

5,552,967

PORTABLE ELECTRONIC APPARATUS HAVING A HOUSING FOR CONTAINING CIRCUITS BOARD AND FUNCTIONAL COMPONENTS

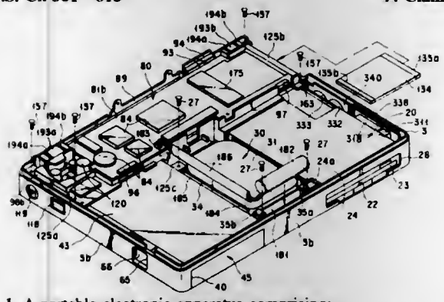
Masaru Seto; Kazuya Shibasaki, and Satoru Arai, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Mar. 23, 1994, Ser. No. 216,923

Claims priority, application Japan, Apr. 30, 1993, 5-104786; Jul. 9, 1993, 5-170063

Int. Cl.[6] H05K *9/00*

U.S. Cl. 361—818 **44 Claims**



1. A portable electronic apparatus comprising:

a box-shaped housing made of synthetic resin, and having a flat bottom;

a frame incorporated in said housing;

first and second circuit boards supported by said frame, said circuit boards being aligned and spaced apart in the vertical direction of said housing, located parallel to the bottom of said housing and facing each other, and each of the circuit boards having circuit parts which generate noise while operating;

first and second auxiliary shields supported by said first and second circuit boards and extending in the vertical direction of said housing; and

first and second shield plates supported by said frame, the first shield plate being arranged on a lower side of said frame, the second shield plate being arranged on an upper side of said frame, and the first and second shield plates cooperating with said first and second auxiliary shields to enclose said frame and said first and second circuit boards.

5,552,968

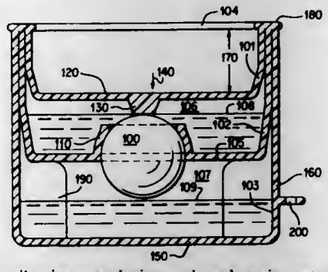
CHEMILUMINESCENT LIGHTING ELEMENT

Jacques Ladyjensky, Brussels, Belgium, assignor to Omniglow Corporation, Novato, Calif.

Division of Ser. No. 750,152, Aug. 26, 1991, Pat. No. 5,488,544. This application Jul. 2, 1993, Ser. No. 87,572

Int. Cl.[6] F21K *2/00*

U.S. Cl. 362—34 **24 Claims**



1. A chemiluminescent device made at least in part of translucent synthetic material and defining first and second chambers with each chamber containing at least one chemical product which reacts with the other to produce a chemiluminescent reaction, the first chamber having a first outer surface and the second chamber having a second outer surface, said chambers being separated by a partition wall having a closing element which is actuable under action on each chamber of a same coincident increase in external pressure of a medium in which said device is located to permit mixing of two or more chemical products that results in a production of light, the first outer surface adapted to receive pressure induced by the medium and to transmit force caused by this pressure to the closing element.

5,552,969

VEHICULAR LAMP DEVICE

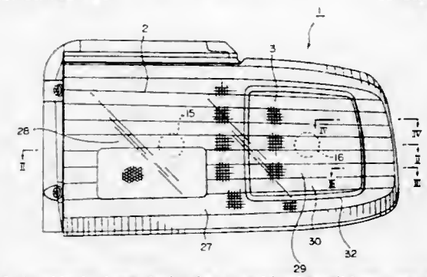
Tomokazu Murakami, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1995, Ser. No. 409,606

Claims priority, application Japan, Mar. 28, 1994, 6-079258

Int. Cl.[6] B60Q *1/00*

U.S. Cl. 362—61 **12 Claims**



1. A vehicular lamp device for a combination tail lamp comprising:

a lamp body having a cup shape and a front opening;

a bulb supported by said lamp body;

a front lens covering said front opening of said lamp body; and

a shade disposed inside said front lens between said bulb and said lens, said shade having a light transmitting area and a light blocking area, said light transmitting area being in front of said bulb, said light blocking area of the shade being operative to cut off light except for light incident on said light transmitting area.

5,552,970

VEHICULAR LAMP AND MACHINE AND METHOD FOR MOLDING SAME

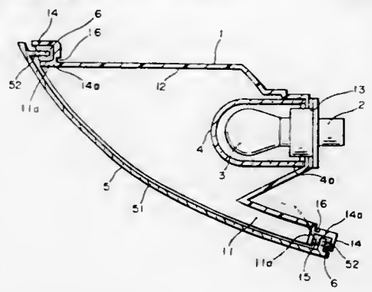
Shirou Takezawa, and Souhei Sano, both of Shizuoka, Japan, assignors to Koito Manufacturing Co. Ltd., Tokyo, Japan

Filed Apr. 13, 1995, Ser. No. 421,265

Claims priority, application Japan, Apr. 20, 1994, 6-104293

Int. Cl.[6] B60Q *1/00*

U.S. Cl. 362—61 **12 Claims**



1. A vehicular lamp, comprising:

a lamp mounted in said housing at one end and connected to said induction coil through said switch; and

5,552,975

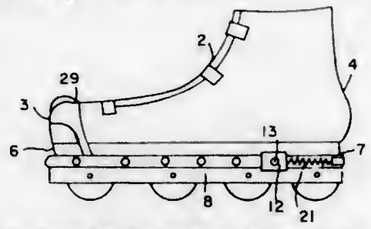
ILLUSIVE LAMP

1. A vehicular lamp, comprising:
a lamp body having a front opening, a shelf member integrally formed on an outer surface of a peripheral part of said front opening and extending entirely along said peripheral part, a seal groove defined between said shelf member and said peripheral part of said front opening, and a volume reducing groove formed adjacent to a junction of said peripheral part of said front opening and said shelf member; and
an outer lens coupled to said lamp body, said outer lens comprising a seal leg inserted in said seal groove of said lamp body and secured thereto by a sealing material, wherein
a relationship in thickness of said lamp body satisfies an equation:

$$0.6 \leqq t_2/t_1 \leqq 0.9$$

where t_1 is a thickness of said peripheral part of said lamp body and t_2 is a thickness of said shelf member at a portion where said volume reducing groove is formed.

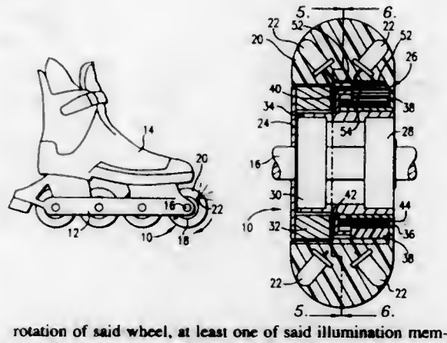
5,552,971
IN-LINE SKATE LIGHTS
Joel Madden, 522 SW. St. Lucie St., Stuart, Fla. 34997
Filed Oct. 18, 1995, Ser. No. 544,781
Int. Cl.[6] A63C *17/26*
U.S. Cl. 362—61 **10 Claims**



1. A removable light assembly for a shoe skate having a shoe with heel and toe and a skate frame attached underneath the shoe, the skate frame having a heel portion, a toe portion, and two long sides, the assembly comprising:
an elongate support arranged to snugly encircle the skate frame below the shoe, bending around the heel portion and the toe portion and extending along both long sides, the support provided with length adjustment means for adapting to skate frames of various lengths and also provided with sufficient elasticity to enable the support to firmly engage the skate frame;
a plurality of light sources mounted on the support, the light sources being spaced apart from one another and arranged to emit light outwardly from the skate frame; and
an electric power source connected to the light sources for activating the sources.

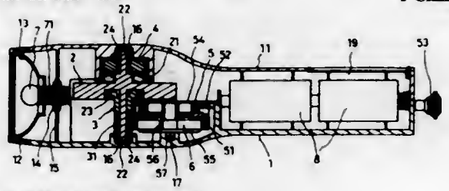
5,552,972
SELF-POWERED LIGHTED WHEEL
Vahid Rezvani, 11903 W. 148th St., Olathe, Kans. 66062
Filed Nov. 28, 1994, Ser. No. 345,905
Int. Cl.[6] F21L *13/00*
U.S. Cl. 362—78 **6 Claims**

1. A wheel rotatable about an axis of rotation comprising:
a wheel hub including a pair of electrically conductive bridges;
a traction tire removably mounted on said hub, said tire being divisible into first and second sides about a plane substantially bisecting said tire and normal to the axis of rotation;
a dynamo carried by said hub; and
a plurality of illumination members electrically coupled to said dynamo and carried by said traction tire for emitting a light in response to electrical current supplied by said dynamo during



rotation of said wheel, at least one of said illumination members being disposed on each of said sides of said plane, said illumination members including a pair of electrical leads slidably electrically connected to said bridges.

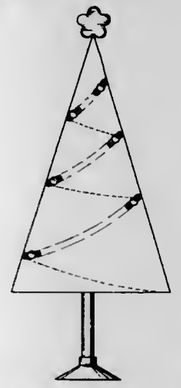
5,552,973
FLASHLIGHT WITH SELF-PROVIDED POWER SUPPLY MEANS
Chih-Hsien Hsu, Fl. 6, No. 7, Chi-Mei St., San-Chung City, Taipei County, Taiwan
Filed Jan. 16, 1996, Ser. No. 584,953
Int. Cl.[6] B60Q *1/00*
U.S. Cl. 362—192 **1 Claim**



1. A flashlight comprising:
a housing having a hub on the inside;
a flywheel having a wheel axle turned between two axle bearings inside said housing, a magnet fixedly mounted around said wheel axle, and a circular bottom recess;
an one-way rotary member mounted around the wheel axle of said flywheel at a bottom side, said one-way rotary member comprising a base disposed in the circular recess of said flywheel, and a toothed portion around the periphery, the base of said one-way rotary member comprising a sloping recess at one side, a metal plate mounted within said sloping recess, and a rotary pin moved on said metal plate in said sloping recess between the operative position in which said rotary pin is forced by centrifugal force into engagement with the periphery of the circular recess of said flywheel upon the rotary motion of said one-way rotary member in one direction, and the non-operative position in which said rotary pin is forced away from the periphery of the circular recess of said flywheel upon the rotary motion of said one-way member in the reversed direction;
an induction coil fixedly mounted inside said housing around the magnet of said flywheel;
a driving wheel turned on said hub, said driving wheel having a toothed portion around the periphery meshed with the toothed portion of said one-way rotary member, and a bottom recess;
a spiral spring mounted around said hub within the bottom recess of said driving wheel, having one end fixedly secured to said hub and an opposite end fixedly secured to said driving wheel;
a traction cable having one end fastened to said driving wheel, and an opposite end wound round said driving wheel and coupled with a handle outside said housing;
a switch;

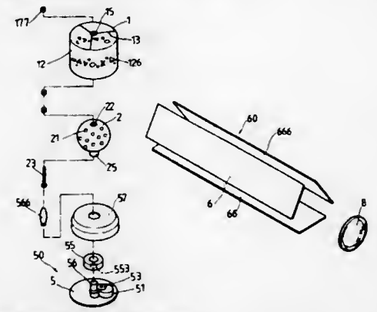
a lamp mounted in said housing at one end and connected to said induction coil through said switch; and
a battery mounted in said housing at an opposite end and connected to said induction coil through said switch in parallel to said induction coil;
wherein when said traction rope is pulled to turn said driving wheel, said one-way rotary member is driven by said driving wheel to turn said flywheel, causing said induction coil induced by said magnet to produce electricity; after each traction, said spiral spring pulls said driving wheel to take up said traction cable.

5,552,974
LIGHT STRING
George Tsai, 7F1., No. 147, Sec. 4, Jen-Ai Rd., Taipei, Taiwan
Filed Aug. 29, 1994, Ser. No. 297,302
Int. Cl.[6] F21V *21/14*
U.S. Cl. 362—250 **2 Claims**



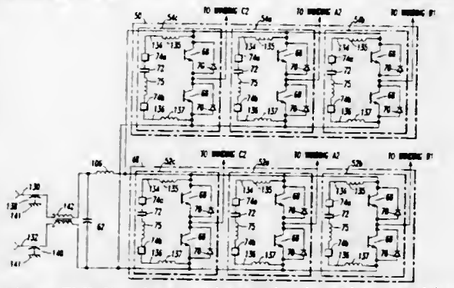
1. In a Christmas light string comprising a chain, said chain including a plurality of interconnected links, the improvement comprising:
each of said links being an elongated planar member having a substantially flat upper surface and a substantially flat lower surface with a predetermined thickness, said member having a generally centrally located socket having a light bulb assembly mounted therein, said light bulb assembly including a light bulb having a husk receivable in a socket, said socket protruding from one side of said member and said bulb protruding from the other side of said member, one of said members having an aperture extending therethrough on opposite sides of said light bulb assembly, another of said members having a protrusion extending from one side of said another of said members on opposite sides of said light bulb assembly mounted on said another of said members, each of said protrusions having an elongated resilient portion extending from said member terminating in an enlarged resilient head greater in outer diameter than the diameter of said apertures, the overall length of said elongated portion being substantially the same as the thickness of said member whereby the heads of each of said protrusions may be press fit into each of said apertures whereby said head extends through said aperture and retains one of said members to another with said members pressed against each other in a frictional relationship and said members can be retained in any desired angle relative to each other by frictional force.

5,552,975
ILLUSIVE LAMP
Chen C. Ho, P.O. Box 82-144, Taipei, Taiwan
Filed Oct. 31, 1994, Ser. No. 331,708
Int. Cl.[6] F21V *17/02*
U.S. Cl. 362—324 **1 Claim**



1. An illusive lamp comprising:
a rotating seat having a base, a motor mounted on the base, a gear connected with an output axle of the motor, a collar having a pinion fixedly mounted on a bottom of the collar with respect to the base and engaged with the gear, an electrical socket mounted on the base and extending upwardly with respect to the base through the collar, a light bulb fitted in the electrical socket and extending through an opening in a cover mounted on the base;
a cylindrical shade having a vertical surface with respect to the base provided with a plurality of holes with different shapes;
a spherical housing having a plurality of protuberances with different colors on a top portion of the spherical housing with respect to the base and a tubular neck portion at a lower portion of the spherical housing with respect to the base, said tubular neck portion extending through the opening and being fixedly fitted in said collar and enclosing said electrical socket, said spherical housing being fixedly mounted in said cylindrical shade;
a triangular mirror assembly having a first end and a second end arranged beside said cylindrical shade; and
a lens disposed at said first end of said triangular mirror assembly.

5,552,976
EMI FILTER TOPOLOGY FOR POWER INVERTERS
James L. Munro, Severna Park, and David L. Schantz, Jr., Ellicott City, both of Md., assignors to Northrop Grumman Corporation, Los Angeles, Calif.
Filed Jun. 10, 1994, Ser. No. 258,153
Int. Cl.[6] H02M *1/14*
U.S. Cl. 363—39 **25 Claims**



15. An EMI filter for a multiphase electric vehicle propulsion system including a power source, a plurality of electronic switches having first and second terminals, and first and second power

conductors electrically connecting the first and second terminals of

5,552,978

a line current coil, having at least one turn on said core, for

conductors electrically connecting the first and second terminals of the plurality of electronic switches, respectively, to the power source, comprising:

a first capacitive element electrically connected in parallel with the first and second power conductors;

a second capacitive element associated with each of the plurality of electronic switches, each of the second capacitive elements having first and second terminals and an intrinsic inductive component, the first and second terminals of each of the second capacitive elements being electrically connected to the first and second power conductors, respectively;

a first inductive element electrically connected in series with the first power conductor, the first inductive element separating the first capacitive element and the plurality of second capacitive elements; and

a first and second junction associated with each of the second capacitive elements, each of the first and second junctions connecting the first and second terminals of associated second capacitive elements to the first and second terminals of associated electronic switches, respectively, each of the plurality of first and second junctions having first and second intrinsic inductive components;

wherein a sum of inductances of the first and second intrinsic inductive components associated with each first and second junctions is less than an inductance of the intrinsic inductive component of the associated second capacitive element.

5,552,977

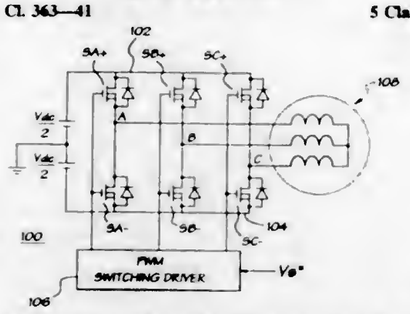
THREE PHASE INVERTER CIRCUIT WITH IMPROVED TRANSITION FROM SVPWM TOSIX STEP OPERATION

Xingyi Xu, and Doug Deng, both of Canton, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 20, 1995, Ser. No. 493,221

Int. Cl.[6] H02M *7/162*

U.S. Cl. 363—41 **5 Claims**



1. A method of controlling a three phase inverter circuit which provides improved transition from space vector PWM operation to six step operation, said method comprising the steps of:

calculating the space vector PWM times t1, t2 and t0 for space vector PWM operation, t1 and t2 corresponding to non-zero space vectors associated with a commanded space vector and t0 corresponding to a zero space vector, the sum of t1, t2 and t0 equaling a total pulse width modulation control period, TPWM;

comparing t0 to 0;

setting transition space vector PWM times t1', t2' and t0' for calculated t0 values less than 0 to preserve the non-zero space vector which is closer to the commanded space vector, truncate the non-zero space vector which is farther from the commanded space vector and eliminate the zero space vector; and

operating the inverter circuit in accordance with the transition space vector PWM times t1', t2' and t0'.

5,552,978

DEVICE FOR SUPPLYING A VOLTAGE TO AN ELECTRONIC CIRCUIT, IN PARTICULAR AN ELECTRONIC CIRCUIT ASSOCIATED WITH A CURRENT SENSOR DISPOSED ON AN ELECTRICAL LINE

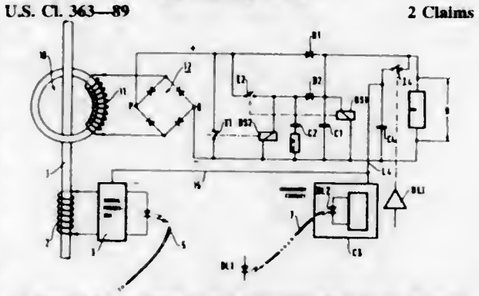
Jean-Paul Moncorge, Vaulx en Velin, France, assignor to Gec Alsthom T & D SA, Paris, France

Filed Jun. 9, 1994, Ser. No. 257,828

Claims priority, application France, Jun. 10, 1993, 93 06992

Int. Cl.[6] H02M *7/04*

U.S. Cl. 363—89 **2 Claims**



1. Device for supplying a power supply voltage to an electronic circuit, in particular to an electronic circuit associated with a current sensor for measuring the electrical current in a high-tension line, said device comprising a current transformer having a primary circuit and a secondary circuit, a rectifier bridge shunting the secondary circuit and output terminals of the rectifier bridge, a first capacitor in parallel with a first resistor across which said power supply voltage is obtained, a first switch being disposed between the output terminals of the rectifier bridge, said device comprising between the output terminals of the rectifier bridge a branch comprising in series a second capacitor, a second switch and a second resistor, the first switch being controlled by a first threshold detector shunting the second capacitor, the second switch being controlled by a second threshold detector shunting the first capacitor, the first and second threshold detectors respectively closing the first and second switches when predetermined first and second thresholds are respectively reached, said current transformer comprising two secondary windings having different numbers of turns and magnetically connected in series to the rectifier bridge through a controlled third switch.

5,552,979

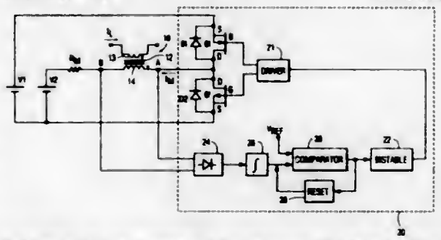
ISOLATED CURRENT SENSOR FOR DC TO HIGH FREQUENCY APPLICATIONS

Wen-Jian Gu, Croton-on-Hudson, N.Y.; Gregory T. DiVincenzo, Easton, Md., and Paulo P. Caldeira, Scarsdale, N.Y., assignors to Philips Electronics North America Corporation, New York, N.Y.

Filed Nov. 30, 1993, Ser. No. 159,394

Int. Cl.[6] H02M *3/24*; **G01R** *33/00*

U.S. Cl. 363—98 **25 Claims**



1. A device for non-contacting measurement of current in a line, comprising:

a high permeability core,

a line current coil, having at least one turn on said core, for carrying the line current to be measured,

a bucking coil on said core,

means for passing a measuring current through said bucking coil that is, at least in part, determined by said line current, and

means for controlling said measuring current to maintain flux through said core below a saturation flux value.

5,552,980

INVERTER CONTROL DEVICE

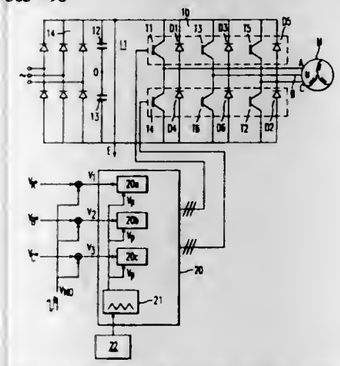
Luis Garces, Le Pecq, and Vinh T. N'Guyen Phuoc, Boulogne sur Seine, both of, France, assignors to Schneider Electric SA, Boulogne-Billancourt, France

Filed Mar. 1, 1995, Ser. No. 396,796

Claims priority, application France, Mar. 1, 1994, 94 02428

Int. Cl.[6] H02M *3/24*; *7/5387*

U.S. Cl. 363—98 **7 Claims**



1. A control device for a multi-phase inverter connected to a power supply source through a DC circuit and pulse width modulated by a control circuit, said inverter including a plurality of pairs of static switches in parallel with a respective plurality of pairs of free wheel diodes wherein a mid-point of each of said pair of switches and said pair of diodes is connected to a load, said control device comprising:

a switching device including comparator means for comparing an input signal and a triangular carrier wave output by a triangular wave generator, wherein said input signal is defined by control voltages which are a function of simple voltage set values and wherein said control device operates at a constant switching frequency and provides a parameter other than the frequency of said carrier wave wherein the value of said parameter varies in a random manner in order to provide, after operation of said switching device, said simple voltage set values between phases and a neutral of said load.

5,552,981

ELECTRONIC APPARATUS

Masanori Yamada, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 857,273, Mar. 25, 1992, abandoned. This application Jul. 14, 1994, Ser. No. 275,334

Claims priority, application Japan, Apr. 15, 1991, 3-082146

Int. Cl.[6] G05B *15/00*; **G06F** *15/163*

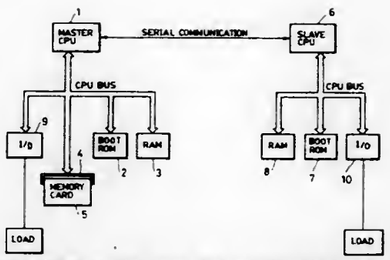
U.S. Cl. 364—132 **6 Claims**

1. An electronic apparatus comprising:

a first microcomputer and a first memory connected with each other by a first bus line;

a second microcomputer and a second memory connected with each other by a second bus line;

attaching means for detachably attaching a storage medium;



a connecting means for connecting one of the first bus line and the second bus line selectively to said attaching means;

a third memory connected to the first bus line and for storing a program initially executed by the first microcomputer; and

a fourth memory, connected to the second bus line and for storing a program initially executed by the second microcomputer,

wherein, when the first bus line is connected to said attaching means, which attaches a storage medium storing a version-up program for the first microcomputer, said first microcomputer transfer the version-up program from the attached storage medium into the first memory and executes the versioned-up program in the first memory, and when said first bus line is not connected to said attaching means, said first microcomputer executes a program in the first memory which is not versioned-up, in accordance with a program stored in the third memory, and

wherein, when the second bus line is connected to said attaching means, which attaches a storage medium storing a version-up program for the second microcomputer, said second microcomputer transfer the version-up program from the attached storage medium into the second memory and executes the versioned-up program in the second memory, and when said second bus line is not connected to said attaching means, said second microcomputer executes a program in the second memory which is not versioned-up, in accordance with a program stored in the fourth memory.

5,552,982

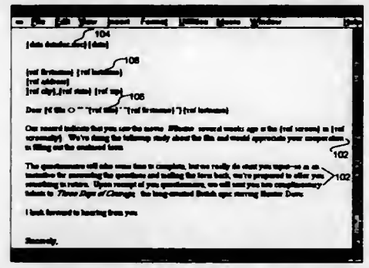
METHOD AND SYSTEM FOR PROCESSING FIELDS IN A DOCUMENT PROCESSOR

Peter C. Jackson, Seattle; William H. Gates, III, Redmond, and Bryan Loofbourrow, Seattle, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 694,801, Apr. 30, 1991, abandoned, which is a continuation of Ser. No. 607,872, Oct. 31, 1990, abandoned. This application Feb. 28, 1994, Ser. No. 205,141

Int. Cl.[6] G06F *17/22*

U.S. Cl. 364—419.1 **27 Claims**



1. An improved method of processing fields in a document processor, comprising the steps of:

inputting a plurality of characters organized as a string of text into the document processor;

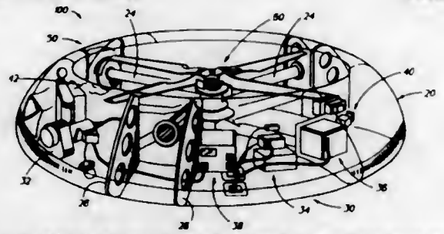
inserting a field in said string of text, said field comprising a beginning field character, a field code, and an ending field

signal generated by said speed sensor as a stored speed signal in response to operation of the setting switch of said com-

a second preloader mechanism responsive to a second command signal for retracting the seat belt from the second restraint

inserting a field in said string of text, said field comprising a beginning field character, a field code, and an ending field character, said field code specifying a behavior of the field;
placing said string of text in a document;
determining a result of said field based on said behavior specified by the field code; and
storing said result in said field within said document that contains the placed string of text having inserted field.

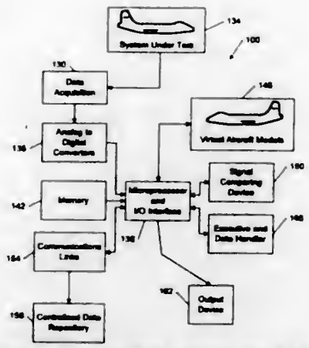
5,552,983
VARIABLE REFERENCED CONTROL SYSTEM FOR REMOTELY OPERATED VEHICLES
Christopher A. Thornberg, Newtown, and Bryan S. Cotton, Monroe, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Mar. 2, 1994, Ser. No. 204,706
Int. Cl.[6] G06F *165/00*
U.S. Cl. 364—424.01 **7 Claims**



1. A variable referenced control system for controlling the operation of a remotely operated vehicle, comprising:
control means for providing control signals;
means for selecting between a fixed frame of reference with respect to the remotely operated vehicle, a fixed frame of reference with respect to earth, and a fixed frame of reference with respect to said control means;
means for providing transformation angle signals (θ) indicative of the orientation of the remotely operated vehicle with respect to said selected frame of reference; and
transformation means responsive to said control signals and said transformation angle signals for providing transformed control signals which control the motion of the remotely operated vehicle with respect to said selected frame of reference.

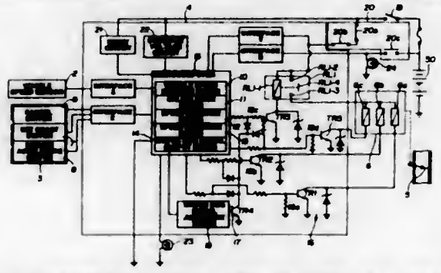
5,552,984
DIAGNOSTIC SYSTEM FOR COMPLEX SYSTEMS USING VIRTUAL COMPONENTS
Danny N. Crandall, Spring Branch; Keith P. Beastrom; Charles M. Corthues, both of San Antonio, and Brent B. Thompson, Devine, all of Tex., assignors to TRW Inc., Redondo Beach, Calif.
Filed Sep. 16, 1993, Ser. No. 122,830
Int. Cl.[6] G06F *11/277*
U.S. Cl. 364—424.03 **34 Claims**

1. A method of diagnosing failures in a complex real system including a high level function executed by a plurality of hardware components, wherein said high level function functionally transforms at least one input into at least one output, comprising the steps of:
a) allocating said high level function of said real system into a set of first level functions each functionally transforming at least one input into at least one output, wherein said at least one high level input is provided to said input of one first level function, said at least one high level output is generated by an output of another first level function, and said set of first level functions together provide a functional transformation intended for said high level function;
b) allocating at least one first level function into a set of second level functions each functionally transforming at least one



input into at least one output, wherein said at least one first level input is provided to an input of one second level function, said at least one first level output is generated by an output of another second level function, and said set of second level functions together providing a functional transformation intended for said at least one first level function;
c) allocating n^{th} level functions until said n^{th} level functions correspond to readily serviceable hardware components;
d) creating a plurality of virtual model components for simulating each real system level function, wherein said virtual models have inputs, outputs and functional behavior which parallels the level function being simulated;
e) providing said at least one high level input from said real system to a high level virtual model component; and
f) comparing said at least one high level output from said high level function of said real system to an output of a high level virtual model component.

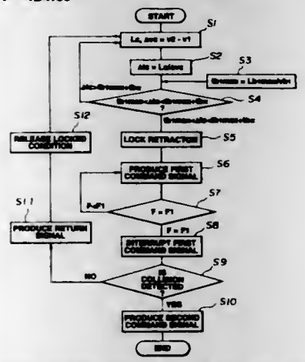
5,552,985
CRUISING CONTROL APPARATUS
Eisaku Hori, Yokohama, Japan, assignor to Jidosha Kenki Kogyo Kabushiki Kaisha, Yokohama, Japan
Filed Jun. 23, 1994, Ser. No. 264,524
Claims priority, application Japan, Jun. 24, 1993, 5-153650
Int. Cl.[6] B60K *31/04*; **G05D** *13/58*
U.S. Cl. 364—426.04 **4 Claims**



1. A constant-speed cruising controlling system for a vehicle having a throttle valve for controlling a speed thereof comprising:
a speed sensor for sensing an actual running speed of the vehicle and for generating a vehicle actual speed signal proportional to the actual running speed of the vehicle;
a command switch including a setting switch operable for generating a cruise command setting signal;
an actuator for driving the throttle valve of the vehicle;
an actuator driving circuit for driving said actuator;
a microcomputer connected with said speed sensor, said command switch and said actuator driving circuit, and having storage means, calculating means, controlling signal generating means and watchdog signal generating means, said storage means being adapted to store the vehicle actual speed

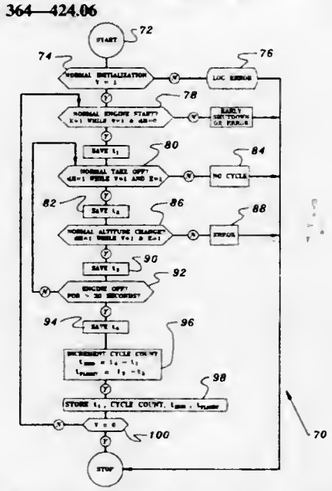
signal generated by said speed sensor as a stored speed signal in response to operation of the setting switch of said command switch, said calculating means being connected to said storage means and to said controlling signal generating means and being adapted to compare said vehicle actual speed signal with the stored speed signal stored in the storage means for generating a differential signal corresponding to a difference between the stored speed signal and the vehicle actual speed signal, said controlling signal generating means being provided with a vehicle speed increasing signal generating means and a vehicle speed decreasing signal generating means for supplying vehicle speed increasing and decreasing signals to said actuator driving circuit, and said watchdog signal generating means being adapted to generate a watchdog pulse signal with a predetermined period during normal fault free operation of the microcomputer; and
watchdog signal judgement means, connected with said microcomputer and said actuator driving circuits, adapted to monitor the watchdog pulse signal, said watchdog signal judgement means being adapted to prevent the operation of said actuator driving circuit in the event of an abnormality in the predetermined period of the watchdog pulse signal, wherein the improvement comprises;
said watchdog signal generating means of said microcomputer including monitoring means for monitoring the vehicle actual speed signal, said monitoring means being adapted to allow the generation of the watchdog pulse signal only when the value of the vehicle actual speed signal is in a range defined by predetermined lower and upper limiting values.

5,552,986
PASSENGER RESTRAINT BELT SYSTEM
Hideo Omura, Yokosuka, and Masaaki Kobayashi, Yokohama, both of, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Mar. 28, 1994, Ser. No. 218,633
Claims priority, application Japan, Mar. 31, 1993, 5-073910
Int. Cl.[6] B60R *22/46*
U.S. Cl. 364—424.05 **19 Claims**



1. A passenger restraint belt system for use with a seat installed in a conveyance, comprising:
a seat belt for restraining a passenger on the seat in a first restraint position;
a first preloader mechanism responsive to a first command signal for retracting the seat belt from the first restraint position to a second restraint position where a first degree of tension is exerted on the seat belt so as to restrain the seat passenger while allowing passenger's operations to avoid a vehicle collision;
a second preloader mechanism responsive to a second command signal for retracting the seat belt from the second restraint position to a third restraint position where a second, greater degree of tension is exerted on the seat belt so as to restrain the seat passenger against impacts caused by the vehicle collision; and
a control unit for producing the first command signal to the first preloader mechanism when the vehicle collision is anticipated and the second command signal to the second preloader mechanism when the vehicle collision is detected.

5,552,987
AIRCRAFT ENGINE CYCLE LOGGING UNIT
Randall R. Barger, 1071 Donegan Rd., No. 473, Largo, Fla. 34641, and Thomas V. Saliga, 4702 Baycrest Dr., Tampa, Fla. 33615
Filed Jul. 20, 1994, Ser. No. 278,081
Int. Cl.[6] G06F *17/40*
U.S. Cl. 364—424.06 **6 Claims**



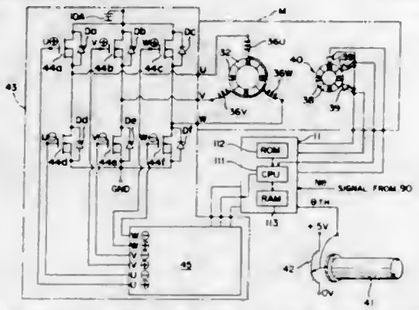
1. In an aircraft monitoring system comprising a microprocessor operatively connected to a non-volatile memory containing as a record therein a current flight cycle count, to a buffer memory, to an altitude transducer, to an acoustic transducer, to an airframe power supply voltage input, and to a timekeeping means, a method of determining an occurrence of a flight cycle, said method comprising the steps of:
a) determining a first time at which said voltage input exceeds a predetermined voltage value, and storing at said first time in said buffer memory a first value representative of an output of said altitude transducer,
b) determining a second time, after said first time, at which said acoustic output exceeds a predetermined acoustic value,
c) determining a third time, after said second time, at which said output from said altitude transducer differs from said first output by a predetermined altitude value and storing said third time in said buffer memory,
d) determining a fourth time, after said third time, at which said output from said acoustic transducer falls below said predetermined acoustic value, and
e) incrementing said flight cycle count responsive to said determination of said fourth time.

5,552,988

POWER UNIT FOR MOTOR VEHICLES

Kenji Kawaguchi, Tokyo; Shoji Motodate, Saitama; Masayuki Toriyama, Saitama; Satoshi Honda, Saitama; Takaaki Fujii, Saitama, and Toshiyuki Cho, Saitama, all of, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 939,702, Sep. 2, 1992, Pat. No. 5,406,154.
This application Dec. 6, 1994, Ser. No. 354,730
Claims priority, application Japan, Sep. 3, 1991, 3-223182; Oct. 14, 1991, 3-293693
Int. Cl.[6] B62D *61/02*
U.S. Cl. 364—426.01 **3 Claims**



1. A regenerative braking system for a motor vehicle comprising:

a revolution sensor for detecting the number of revolutions of a drive motor driving said motor vehicle;

an accelerator opening sensor for detecting an accelerator opening;

a discriminator means for discriminating between a regenerative braking mode and a drive mode based on the number of revolutions of the drive motor and the accelerator opening and for producing a signal responsive thereto;

a plurality of switching elements for switching an electric current flowing in said drive motor;

a memory means for storing on-off duty ratio data of said switching elements in the regenerative braking mode in a corresponding relation to the number of revolutions of the drive motor and the accelerator opening; and

control means for retrieving said on-off duty ratio data corresponding to the number of revolutions of the drive motor and the accelerator opening from said memory means when the signal generated by the discriminator means indicates that the system is in the regenerative braking mode, and for controlling the switching elements at an on-off duty ratio corresponding to the retrieved on-off duty ratio data to effect regenerative braking.

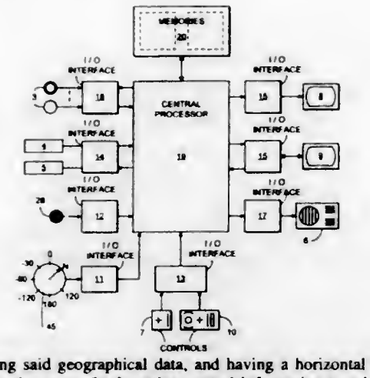
5,552,989

PORTABLE DIGITAL MAP READER

Georges Bertrand, 35, rue du Bois-des-Jones-Marins, 94120 Fontenay-sous-Bois, France

PCT No. PCT/FR92/01002, § 371 Date Apr. 28, 1994, § 102(e) Date Apr. 28, 1994, PCT Pub. No. WO93/09401, PCT Pub. Date May 13, 1993
PCT Filed Oct. 27, 1992, Ser. No. 211,924
Claims priority, application France, Oct. 30, 1991, 91 13345
Int. Cl.[6] G06F *165/00*
U.S. Cl. 364—443 **8 Claims**

1. A portable appliance for displaying geographical data, in particular topographical or road maps, recorded on magnetic or optical media and organized on a plurality of levels, the appliance comprising a central processor unit associated with memories and I/O interfaces, said central processor unit selectively displaying objects constituting said geographical data in one of said plurality of levels depending on a desired display scale, means reading said magnetic or said optical media, at least one display screen for displaying said geographical data, and having a horizontal and a vertical axis, means for inputting control information to said central processor unit, and, electrical power supply means for powering said appliance, the appliance further including a compass for measuring the angle between the vertical axis of said display screen and magnetic north, and to send corresponding control information to said central unit based on said measured angle, said central unit responding to said corresponding control information by issuing a command to the display screen to cause the displayed image to be oriented as a function of said corresponding control information, wherein data symbols and legends are selectively imposed upon the associated displayed image in order to make said symbols and said legends readable.

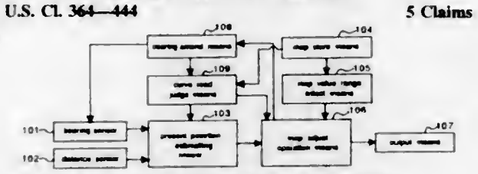


5,552,990

VEHICLE POSITION DETECTING APPARATUS WHICH COMENSATES FOR ERRORS IN ROAD MAP DATA MATCHING OPERATION

Yasuhiro Ihara, Katano; Mitsuhiro Yamashita, Osaka, and Yoshiki Ueyama, Sakai, all of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Continuation of Ser. No. 886,250, May 21, 1992, Pat. No. 5,469,360. This application May 31, 1995, Ser. No. 456,056
Claims priority, application Japan, May 21, 1991, 3-115990; Jun. 24, 1991, 3-151417; Oct. 17, 1991, 3-269216; Mar. 10, 1992, 4-51111
Int. Cl.[6] G06G *7/78;* **G08G** *1/123*
U.S. Cl. 364—444 **5 Claims**



1. A vehicle position detecting apparatus comprising:

a bearing sensor for detecting a running bearing of a vehicle;

a distance sensor for detecting a running distance of the vehicle;

a present position estimating means for estimating a present position of the vehicle with respect to a reference position in accordance with the running bearing detected by the bearing sensor and the running distance detected by the distance sensor;

a map storing means for storing road data indicative of a road map;

a map range selecting means for selecting the road data within a range of the vicinity of the present position estimated by said present position estimating means from said map storing means, and estimating an error amount of the road data within the range of the vicinity of said present position so as to select road data having a small error amount from among the road data within the selected range, and selectively utilizing said selected road data having a small error amount as a map evaluation range for use in a map match computing operation;

a map match computing means for effecting the map match computing operation so as to correct the present position on the road map with the use of the present position computed by the present position estimating means and the evaluation range selected by the map range selecting means;

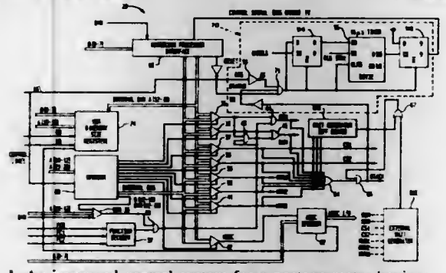
an outputting means for outputting the present position of the vehicle corrected by the map computing means.

5,552,991

CONTROL SYSTEM FOR AN ELECTRONIC PASTAGE METER HAVING A PROGRAMMABLE APPLICATION SPECIFIC INTEGRATED CIRCUIT

Young W. Lee, Orange; Sungwon Moh, Wilton, and Arno Muller, Westport, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 9, 1993, Ser. No. 163,629
Int. Cl.[6] G05B *11/01;* **G06F** *9/00*
U.S. Cl. 364—464.02 **3 Claims**



1. An improved control system for a postage meter having:

a programmable microprocessor, a bus for providing communication between a plurality of memory units and an integrated circuit, said programmable microprocessor having means for placing address data and operating data on said bus,

said integrated circuit having an address decode module for generating module control signals, clock module for generating a system clock signal, a timer module for generating a timer signal and plurality of system control modules, each of said system control modules being electronically responsive to a select one of said module control signals, and said clock signals;

one of said memory units being a program memory having stored therein program data and others of said memory units being nonvolatile memory units and having stored therein operating data,

said address decoding module having means for generating a unique combination of control signals in response to respective address data placed on said bus by said programmable microprocessor,

said memory units being enabled for reading and writing of said operating data to and in said memory units is response to other respective ones of said module control signals from said address decoder module,

wherein the improvement comprises:

said address decoder module to generate a respective one of said module control signals in response to a respective one of said address data placed on said bus by said programmable microprocessor,

said integrated circuit having a plurality of registers for receiving said operating data placed on said bus by said programmable microprocessor in response to said respective one of said address data placed on said bus by said programmable microprocessor in response to ones of said ASIC control signals,

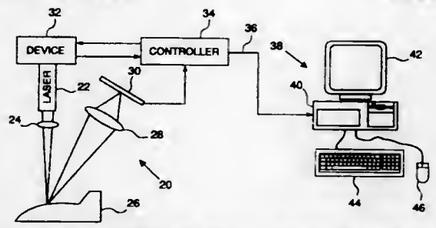
said control modules to be enabled in response to select ones of said module control signals in response to a respective data address from said programmable microprocessor and to read said operating data from corresponding ones of said registers such that said control module generates control signals in accordance with said operating data.

5,552,992

METHOD AND SYSTEM FOR REPRODUCTION OF AN ARTICLE FROM A PHYSICAL MODEL

Charles R. Hunter, Sterling Heights, Mich., assignor to Larry J. Winget, Leonard, Mich.

Filed Nov. 1, 1994, Ser. No. 332,951
Int. Cl.[6] G06F *19/00;* **G06T** *17/00*
U.S. Cl. 364—468.25 **14 Claims**



1. A method of reproducing an article based on a physical model comprising the steps of:

scanning the physical model by a light mensuration technique to obtain a set of scan data indicative of dimensional characteristics of the model;

converting the set of scan data into a first set of equations representative of characteristics of the physical model in a plurality of dimensions;

computing a second set of equations derived from predetermined data based on dimensional characteristics of the model wherein the dimensional characteristics of the second set of equations are based, at least in part, on wire frame data including trim line data and feature line data for the article; and

recording the set of equations representative of the dimensional characteristics of the physical model in a data format useful for reproduction of the article.

5,552,993

AUDIO INFORMATION APPARATUS FOR PROVIDING POSITION INFORMATION

Guy R. Buchwitz, Oxnard, and David H. Muskat, Camarillo, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 335,560, Nov. 7, 1994, Pat. No. 5,495,416. This application Dec. 5, 1994, Ser. No. 349,757
Int. Cl.[6] G06F *15/50*
U.S. Cl. 364—449 **17 Claims**

1. An audio information system for determining a present location, said audio information system comprising:

a global position system receiver for providing electrical signals representative of a plurality of ASCII data characters, said ASCII data characters including latitude and longitude spherical coordinates indicative of the present location of said global position system receiver;

a microprocessor coupled to said global position system receiver for receiving said plurality of ASCII data characters, said microprocessor, responsive to said plurality of ASCII characters, generating a voice playback signal and a logic signal having a first logic state and a second logic state;

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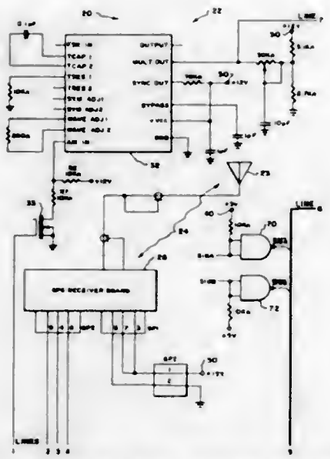
5,552,997

METHOD OF CALIBRATING AN ANALYTICAL



a voice recorder/playback circuit coupled to said microprocessor, said voice recorder/playback circuit having a message table comprising a plurality of position indicating words;

said voice recorder/playback circuit, responsive to said voice playback signal, sequencing a predetermined number of said plurality of position indicating words to form a position message signal, said position message signal including said latitude and longitude spherical coordinates;

a programmed crystal oscillator for generating a square wave signal having a first predetermined frequency;

a sinewave oscillator having an input connected to said programmed crystal oscillator for receiving said square wave signal and an output, said sinewave oscillator, responsive to said square wave signal, generating a modulated sinewave signal having a second predetermined frequency;

a demultiplexer having a first input connected to the output of said sinewave oscillator for receiving said modulated sinewave signal, a second input connected to said microprocessor for receiving said logic signal and a third input connected to said voice recorder/playback circuit for receiving said position message signal;

said demultiplexer passing said position message signal to the output of said demultiplexer when said logic signal is at said first logic state;

said demultiplexer passing said modulated sinewave signal to the output of said demultiplexer when said logic signal is at said second logic state;

a transmitter having an input connected to the output of said demultiplexer for receiving said position message signal when said logic signal is at said first logic state and said modulated sinewave signal when said logic signal is at said second logic state;

said transmitter having an antenna, said antenna transmitting said position message signal at a third predetermined frequency when said logic signal is at said first logic state, said position message signal providing an indication of the present location of said global position system receiver;

said antenna transmitting said modulated sinewave signal when said logic signal is at said second logic state; and

a speaker coupled to said voice recorder/playback circuit for receiving said position message signal, said speaker, responsive to said position message signal, broadcasting an oral voice report, said oral voice report including said latitude and longitude spherical coordinates indicative of the present location of said global position system receiver.

5,552,994

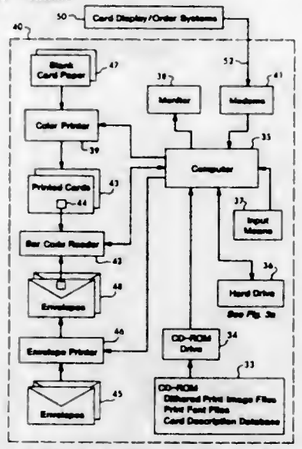
SYSTEM FOR PRINTING SOCIAL EXPRESSION CARDS IN RESPONSE TO ELECTRONICALLY TRANSMITTED ORDERS

Thomas G. Cannon, and Daniel L. DeHart, both of Loveland, Colo., assignors to Onkor, Ltd., Loveland, Colo.

Continuation-in-part of Ser. No. 949,715, Sep. 23, 1992. This application Jul. 12, 1993, Ser. No. 90,803

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—468.01 **28 Claims**



1. A system for printing social expression cards comprising:

a card printing facility having:

(a) means for electronically receiving order data for a selected card;

(b) data storage means for storing said order data and a database describing each card, including images and text for each card;

(c) a printer; and

(d) processor means for selectively retrieving order data and card description data for said selected card from said database stored in said data storage means, and printing said images and text for said selected card on said printer; and

at least one card display/order facility separate and remote from said card printing facility having:

(a) means for accessing said card description database at said card printing facility;

(b) means for inputting card parameters;

(c) means for retrieving and visually displaying cards associated with said card parameters from said card description database;

(d) means for selecting one of said displayed cards;

(e) means for inputting order information; and

(f) means for electronically transmitting an order for said selected card and said order information to said card printing facility.

5,552,995

CONCURRENT ENGINEERING DESIGN TOOL AND METHOD

Donald H. Sebastian, Parlin, N.J., assignor to The Trustees of the Stevens Institute of Technology, Hoboken, N.J.

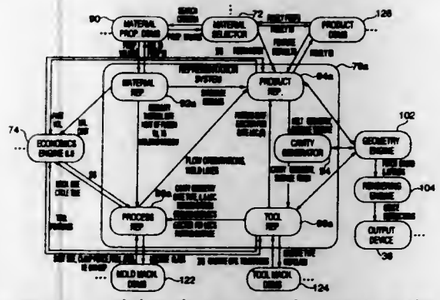
Filed Nov. 24, 1993, Ser. No. 158,125

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—468.03 **45 Claims**

1. A computer-based engineering design system to design a part, a tool to make the part, and the process to make the part, comprising:

a processor;



a memory coupled to the processor, the memory storing a plurality of feature templates, each feature template being a representation of a primitive object having a form and a function, each feature template indexed by the function of the primitive object and including a representation of a primitive geometric entity having the form of the primitive object, each feature template including information relating to a tool to make the primitive object and a process to make the primitive object;

an input device coupled to the processor receiving a request to design the part, the request including one or more predetermined functions that the part performs; and

a core design module executable by the processor, the core design module designing the part, the tool to make the part and process to make the part by accessing the plurality of feature templates in the memory to locate one or more primitive objects that perform the one or more predetermined functions.

5,552,996

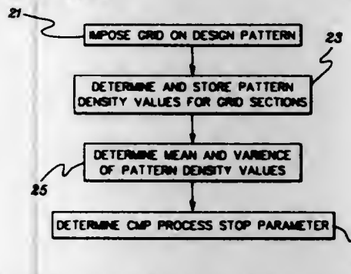
METHOD AND SYSTEM USING THE DESIGN PATTERN OF IC CHIPS IN THE PROCESSING THEREOF

Cheryl A. Hoffman, Jericho, Vt.; Mark A. Lavin, Katonah, N.Y.; William Leipold, Essex Junction, Vt.; Kathleen McGroddy, Richmond, and Daniel J. Nickel, Westford, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 16, 1995, Ser. No. 390,392

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—468.28 **21 Claims**



1. A method, using a programmed computer, for controlling a fabrication level of a fabrication process to produce an integrated circuit ("IC") chip, said fabrication level proceeding according to a design pattern, said method comprising the steps of:

(a) imposing a grid over said design pattern, said grid having a plurality of sections, each section of said plurality of sections having a portion of said design pattern contained therein;

(b) automatically establishing a pattern density value for each section of said plurality of sections based upon said portion of said design pattern contained therein; and

(c) controlling said fabrication level based upon said pattern density values established in said step (b) to improve said fabrication process.

5,552,997

METHOD OF CALIBRATING AN ANALYTICAL INSTRUMENT

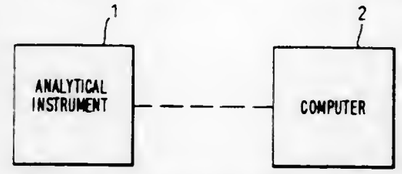
Desire J. L. Massart, Gent, Belgium, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 976,624, Nov. 16, 1992, abandoned, which is a continuation of Ser. No. 685,266, Apr. 12, 1991, Pat. No. 5,210,778. This application Jul. 14, 1994, Ser. No. 275,099

Claims priority, application United Kingdom, Apr. 20, 1990, 90 08 922.8

Int. Cl.[6] G12B *13/00*

U.S. Cl. 364—571.01 **8 Claims**



1. A method of calibrating an X-ray spectrometer comprising the steps of

(a) generating x-rays from at least one standard sample,

(b) measuring intensities of said x-rays for different concentrations of said standard sample,

(c) forming a representation of intensity versus concentration for each measured value of intensity with said different concentrations,

(d) determining if a best straight calibration line can be formed from said representation, and if not

(e) changing instrument parameters and/or sample preparation to achieve said best straight calibration line, and

(f) repeating said steps (a)–(d) to calibrate said x-ray spectrometer.

5,552,998

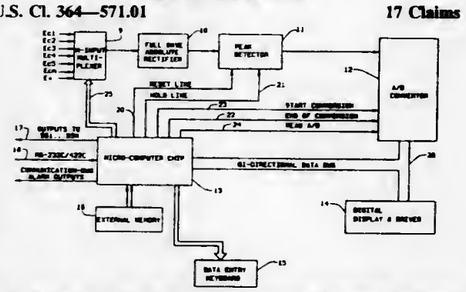
METHOD AND APPARATUS FOR CALIBRATION AND CONTROLLING MULTIPLE HEATERS

James R. Datta, Winona, Minn., assignor to Watlow/Winona, Inc., Winona, Minn.

Continuation-in-part of Ser. No. 182,716, Jan. 18, 1994, which is a continuation-in-part of Ser. No. 609,390, Nov. 15, 1990, Pat. No. 5,280,422. This application Mar. 17, 1995, Ser. No. 406,126

Int. Cl.[6] G12B *13/00*

U.S. Cl. 364—571.01 **17 Claims**



1. A process of calibrating and running a multiple positive temperature coefficient electrical resistance heater system comprising:

a. energizing a first heater;

b. sampling the energized first heater to determine voltage across the first heater and current through the heater;

c. calculating the first heater resistance;

d. assigning a temperature to the calculated first heater resistance to establish a calibrated normalized resistance value;

e. repeating steps a–d for each of the heaters;

into a plurality of bins such that said sample of said tempera-

primary nodes for determining the input critical nodes of the

5,553,002

e. repeating steps a–d for each of the heaters;
f. establishing set points for each of the heaters;
g. sampling the first heater for current and voltage;
h. calculating the resistance of said first heater;
i. dividing the first heater calculated resistance of step c by the calculated resistance determined in step h to determine a normalized resistance ratio;
j. comparing the normalized resistance ratio of step "i" to a table of normalized resistance ratios at specific temperatures for the first heater material;
k. controlling heater energization based on the comparison of step "j";
l. repeating steps a–k for each of the heaters;
m. continuously sampling each of the heaters in sequence and repeating steps g–k at each sampling; and,
n. simultaneously measuring peak voltage Ev and selected heater current EcN for measuring heater resistance.

5,552,999

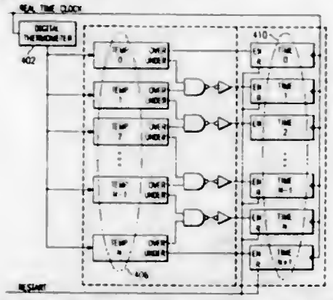
DIGITAL HISTOGRAM GENERATOR SYSTEMS AND METHODS

Thomas L. Polgreen, and Gary V. Zanders, both of Dallas, Tex., assignors to Dallas Semiconductor Corp, Dallas, Tex.

Continuation of Ser. No. 139,393, Oct. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 725,793, Jul. 9, 1991, abandoned. This application Dec. 4, 1995, Ser. No. 566,652

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—481 **7 Claims**



1. A system to monitor power consumption of a battery in a battery pack, wherein said battery has a charge, comprising:

(a) said battery, having a temperature value at a first time;

(b) temperature sensor circuitry packaged together with said battery in said battery pack, said temperature sensor circuitry sampling said temperature value at said first time to produce a sample of said temperature value, said sample of said temperature value being within a range of temperature values, said sample being in a digital format;

(c) selector circuitry and accumulating circuitry electrically coupled to said temperature sensor circuitry to receive said sample of said temperature value in said digital format, said selector circuitry and said accumulating circuitry electrically coupled together, said selector circuitry and said accumulating circuitry packaged together with said battery, in said battery pack, said selector circuitry allocating said sample of said temperature value into a corresponding counter of a counter array of said accumulating circuitry, said corresponding counter accumulating a number of occurrences of said temperature value of said sample of said temperature value, said selector circuitry dividing said range of temperature values into a plurality of bins such that said sample of said temperature value corresponds to at least one bin of said plurality of bins, said selector circuitry also allocating said sample to said corresponding counter of said counter array of said accumulating circuitry depending upon said at least one bin that said sample of said temperature value corresponds to, each corresponding counter having a counter output, said counter output of said corresponding counter combined to form a histogram recording said number of occurrences of said sample having said temperature value in said digital format; and

(d) a computer electrically coupled to said accumulating circuitry to read said counter outputs combined to form said histogram, said computer calculating a current state of said charge of said battery in said battery pack by calculating an elapsed time of said battery by substituting information conveyed by said histogram into the following equation:

$$\sum_{j=0}^{M} f_j * T_j$$

wherein f, T, j, and M are variables in which f_j denotes said number of occurrences for bin j of said at least one bin and T_j denotes total time for said bin having a number j, further wherein said number j is a number identifier identifying a specific bin j of said plurality of bins, and M is a number identifying a maximum number of j's.

5,553,000

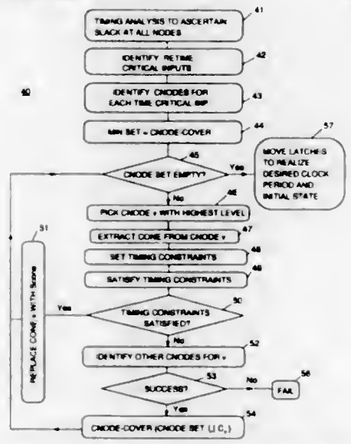
ELIMINATING RETIMING BOTTLENECKS TO IMPROVE PERFORMANCE OF SYNCHRONOUS SEQUENTIAL VLSI CIRCUITS

Sujit Dey; Miodrag Potkonjak, both of Plainsboro, N.J., and Steven G. Rothweiler, Kunkletown, Pa., assignors to NEC USA, Inc., Princeton, N.J.

Filed Nov. 5, 1992, Ser. No. 972,149

Int. Cl.[6] G06F *17/50; 1/04*

U.S. Cl. 364—488 **6 Claims**



1. A computer-implemented process for redesigning a sequential circuit having both gates and latches, by repositioning the latches in the circuit, the latches dividing the circuit into a plurality of combinational subcircuits comprising the steps of:

doing a timing analysis of the sequential circuit to determine the slack at each of the input and output primary and pseudo primary nodes for determining the input critical nodes of the circuit and from these the retime-critical inputs of the circuit;

establishing a retime-critical network consisting of all nodes with slack less than the amount of time by which the clock period of the circuit is to be reduced in the transitive fanout of the retime-critical inputs;

identify a set of c-nodes such that each path in the retime-critical network has cnode on it;

extracting the cone of each cnode, which is the subcircuit comprising all combinational paths from the cnode to the primary inputs and pseudo primary inputs;

replacing the cone of each cnode with a new subcircuit that satisfies a set of timing constraints and retains the functionality of the subcircuit for proving a transformed circuit; and

retiming the transformed circuit by repositioning the latches for realizing a final circuit with reduced clock period.

5,553,001

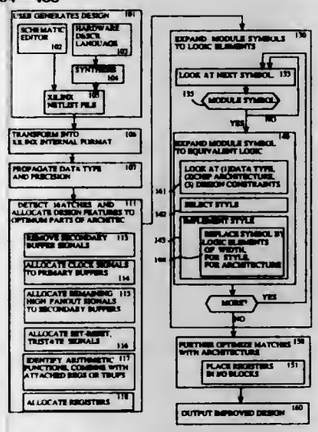
METHOD FOR OPTIMIZING RESOURCE ALLOCATION STARTING FROM A HIGH LEVEL

Jorge P. Seidel, San Jose, and Steven K. Knapp, Santa Clara, both of Calif., assignors to Xilinx, Inc., San Jose, Calif.

Continuation of Ser. No. 784,842, Oct. 30, 1991, abandoned. This application Sep. 8, 1994, Ser. No. 303,295

Int. Cl.[6] G06F *17/50*

U.S. Cl. 364—488 **6 Claims**



1. A method of allocating design features to chip resources comprising the steps of:

(a) identifying a signal currently assigned to a global secondary buffer;

(b) determining whether said signal meets criteria for reassignment, wherein said criteria includes at least one of the following:

evaluating whether said signal qualifies as a set/reset buffer signal;

evaluating whether said signal qualifies as a tristate signal; or

evaluating whether said signal qualifies as a global primary buffer signal,

(c) reassigning said signal to be either a set/reset buffer signal, a tristate signal, or a global primary buffer signal if said signal meets one of said criteria, otherwise identifying another signal; and

repeating steps (a) through (c) until no other signal is identified.

5,553,002

METHOD AND SYSTEM FOR CREATING AND VALIDATING LOW LEVEL DESCRIPTION OF ELECTRONIC DESIGN FROM HIGHER LEVEL, BEHAVIOR-ORIENTED DESCRIPTION, USIN

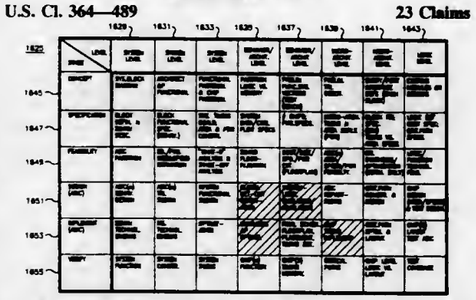
Carlos Dangelo, Los Gatos; Richard Deeley, San Jose; Vijay Nagasamy, Union City, and Manoucher Vafai, Los Gatos, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation-in-part of Ser. No. 77,294, Jun. 14, 1993, which is a continuation-in-part of Ser. No. 54,053, Apr. 26, 1993, which is a continuation of Ser. No. 507,201, Apr. 6, 1990, Pat. No. 5,222,030, said Ser. No. 77,294is a continuation-in-part of Ser. No. 917,801, Jul. 20, 1992, Pat. No. 5,220,512, which is a continuation of Ser. No. 512,129, Apr. 19, 1990, abandoned. This application Jun. 14, 1993, Ser. No. 77,403

The portion of the term of this patent subsequent to Jun. 22, 2010, has been disclaimed.

Int. Cl.[6] G06F *17/50*

U.S. Cl. 364—489 **23 Claims**



1. A method of synthesizing an electronic design, comprising:

creating a matrix of milestones, the matrix having columns representing levels of design abstraction and rows representing stages of design development;

providing at least one activity associated with each milestone, wherein completion of the at least one activity associated with a corresponding milestone indicates completion of the corresponding milestone;

upon completion of a milestone, enabling activities associated with subsequent milestones and disabling all activity associated with previous milestones.

5,553,003

DISTRIBUTED CONTROL SYSTEM

Yasushi Harada, Katsuta; Yasunori Katayama; Junzo Kawakami, both of Mito; Tadayoshi Saitou, Hitachiota; Chihiro Fukui, Hitachi; Yutaka Kokai, Katsuta, and Shigeru Tamura, Hitachiota, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 11, 1993, Ser. No. 29,610

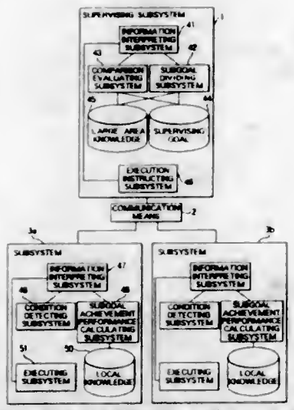
Claims priority, application Japan, Mar. 11, 1992, 4-052218

Int. Cl.[6] H02J *3/06*

U.S. Cl. 364—492 **7 Claims**

1. A method for controlling a power generating system including a plurality of power generating equipments; a supervising subsystem; and communication means for establishing communication between said power generating equipment and said supervising subsystem, all of said plurality of power generating equipment having a condition detecting subsystem for detecting local knowledge related to self performance and self condition of respective ones of said plurality of power generating equipment, and also said supervising subsystem having a supervising goal as said power generating system and large area knowledge required to supervise said power generating system, said method for controlling a power generating system comprising the steps of:

(a) dividing the supervising goal into a plurality of subgoals in said supervising subsystem and transmitting one of said subgoals to all of said plurality of power generating equipment via said communication means;



(b) calculating subgoal achievement performance of the respective subsystem with respect to said one of said subgoals transmitted to all of said plurality of power generating equipment, based upon the self local knowledge regarding the self performance and self condition of respective ones of said plurality of power generating equipment in each of said plurality of subsystems which have received said one of said subgoals transmitted to all of said plurality of power generating equipment, the calculated subgoal achievement performance being transmitted to said supervising subsystem via said communication means from all of said plurality of power generating equipment;

(c) comparing and evaluating said subgoal achievement performance respectively transmitted from all of said plurality of power generating equipment in said supervising subsystem in response to said one of said subgoals transmitted to all of said plurality of power generating equipment;

(d) redividing said supervising goal into further subgoals in said supervising subsystem if said supervision subsystem judges that the supervising goal should be redivided as a result of the comparison and evaluation in step (c), and thereafter reexecuting said steps (a) to (c) with respect to one of the redivided further subgoals; and

(e) selecting, in said supervising subsystem a subsystem which has transmitted most preferable subgoal achievement performance in response to said one of said subgoals transmitted to all of said plurality of power generating equipment and sending a subgoal execution instruction to the selected subsystem if said supervising subsystem judges that the supervising subsystem should not be redivided as a result of the comparison and evaluation in step (c).

5,553,004

CONSTRAINED LANGEVIN DYNAMICS METHOD FOR SIMULATING MOLECULAR CONFORMATIONS

Niels Gronbech-Jensen, Santa Fe, N.M., and Sebastian Doniach, Menlo Park, Calif., assignors to The Board of Trustees of the Leland Stanford Jr. University, Palo Alto, Calif.

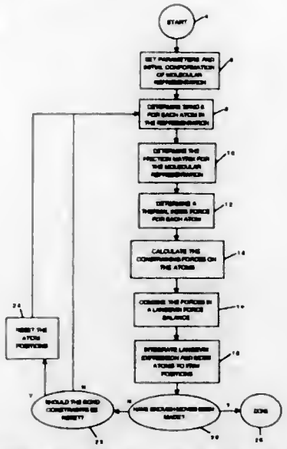
Filed Nov. 12, 1993, Ser. No. 151,278

Int. Cl.[6] G06F *17/50*

U.S. Cl. 364—496 **44 Claims**

1. A method of simulating the conformations of a molecular system with the aid of a computer system, the molecular system having a plurality of atoms partially limited in their ability to move with respect to one another by constraining forces and frictional forces, the method comprising the following steps:

(a) inputting into the computer system a computer usable representation of the molecular system, the representation having an arrangement of atoms determined, in part, by the constraining forces, the representation also having degrees of freedom;



(b) determining the interatomic non-bonding forces acting on each atom of the representation, the interatomic non-bonding forces acting on each atom caused by the other atoms in the molecular system;

(c) obtaining a total non-frictional force on the atoms by

(i) combining thermal noise forces with the interatomic non-bonding forces acting on each atom, and

(ii) projecting out of said interatomic non-bonding forces and noise forces, those force components in the directions of the constraining forces in the molecular system such that the atoms of the representation are constrained to their positions with respect to other atoms in the direction of the constraining forces; and

(d) moving the atoms of the representation into a new conformation as determined by an overdamped Langevin dynamics description of the forces acting on the atoms, the overdamped Langevin description including the total nonfrictional forces and the frictional forces, wherein movement of the atoms is used to determine one or more specified properties of the molecular system.

5,553,005

VIDEO SERVER MEMORY MANAGEMENT METHOD

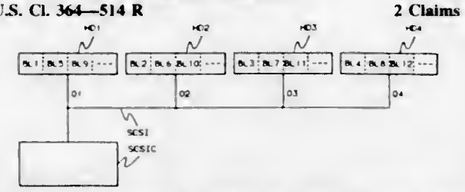
Bart F. Voeten, Beerse; Christophe D. G. Vermeulen, Ramegnies-Chin; Frank O. Van der Putten, Lede, and Frank C. M. Defoort, Aartselaar, all of, Belgium, assignors to Alcatel N.V., Rijswijk, Netherlands

Filed May 19, 1994, Ser. No. 246,182

Claims priority, application European Pat. Off., May 19, 1993, 93870086

Int. Cl.[6] G11B *5/02*

U.S. Cl. 364—514 R **2 Claims**



1. Video server memory management method comprising the steps of providing a memory constituted by a plurality of random access memories each having a single output for retrieving a video signal stored therein, subdividing said video signal into a plurality of distinct blocks corresponding to successive parts of said video signal in a predetermined sequence, storing any two consecutive blocks of said predetermined sequence in different ones of said random access memories with at least two of said blocks in each of said random access memories and, retrieving said blocks from said random access memories in said predetermined sequence for displaying the video signal, wherein said plurality of memories comprises a sequence of M consecutively numbered random access memories, wherein said method further comprises the step of providing within said video signal a spread mode indicator indicating the number M of said plurality of memories, wherein said plurality of blocks comprises a sequence of Q consecutively numbered blocks, and wherein each of said consecutively numbered blocks with a sequence number Y is stored in the random access memory with a sequence number equal to Y modulo M.

5,553,006

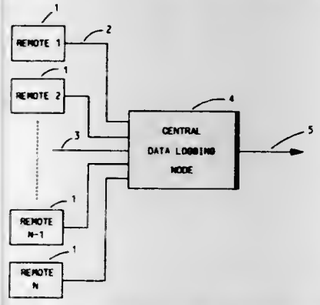
METHOD AND APPARATUS FOR BUILDING ENVIRONMENTAL COMPLIANCE

George Benda, Elk Grove Village, Ill., assignor to Chelsea Group Ltd., Itasca, Ill.

Filed Jun. 9, 1994, Ser. No. 257,157

Int. Cl.[6] G05B *11/02*; **G06F** *17/40*; **G08B** *23/00*

U.S. Cl. 364—550 **6 Claims**



1. A building environmental compliance apparatus comprising, in combination:

at least one remote data collection point, said data collection point containing at least two environmental condition sensors, wherein said remote data collection point replaces an existing thermostat;

a data logging point communicating with at least one remote data collection point, said data logging point storing historical environmental data from remote data collection points;

a set of data polling intervals, each member of said set unique to at least one remote data collection point, whereby said data logging point stores data from remote data collection points according to said data polling intervals.

5,553,007

TRAVEL COMPUTER WITH MEMORY AND MEANS FOR DETERMINING VARIOUS PERFORMANCE VARIABLES IN REAL TIME

Lawrence J. Brisson, 574 Croyden Ct., Sunnyvale, Calif. 94087

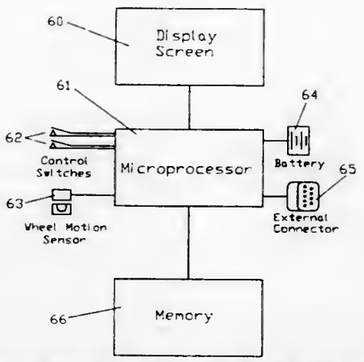
Filed Dec. 27, 1994, Ser. No. 364,293

Int. Cl.[6] G01C *23/00*

U.S. Cl. 364—561 **8 Claims**

1. A user controlled display system for a vehicle for monitoring and comparing electrical signals representative of the present performance of a rider or driver along a course travelled, against a saved prior performance, comprising:

means for measuring the distance travelled by the vehicle, and for generating a series of signals representative of the distance travelled;



clocking means providing a plurality of timing signals representative of the elapsed time from the beginning of the performance;

Input/Output means for receiving user input and selection data, and generating a corresponding input signal representative thereof, and for generating a display signal in response to a received output display signal to display data to the user;

Processor means receiving as input said distance travelled and said elapsed time input signals, for retrievably storing said distance travelled and elapsed time input signals in a portion of a memory means as a set of detailed performance data signals representative of at least the elapsed time and distance for at least one point along the present course travelled by the user,

said processor means operating under a predetermined set of user controlled instructions to store said set of performance data for the present performance of the rider or driver in said memory means, and compare said set of performance data signals against a stored set of performance data representing a saved prior performance, and generate an output display signal representative of a comparison metric therebetween to said Input/Output means.

5,553,008

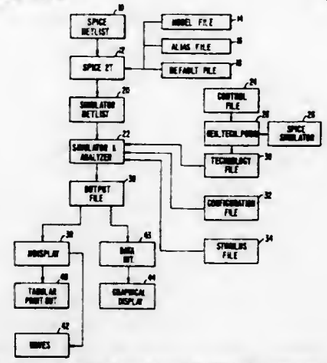
TRANSISTOR-LEVEL TIMING AND SIMULATOR AND POWER ANALYZER

Xiaoli Huang, and William H. Zhang, both of Cupertino, Calif., assignors to EPIC Design Technology Inc., Santa Clara, Calif.

Continuation of Ser. No. 40,531, Mar. 29, 1993, Pat. No. 5,446,676. This application Jul. 10, 1995, Ser. No. 500,304

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—578 **19 Claims**



1. In an appropriately programmed digital computer having a CPU, memory, user interface and printer, a method of simulating

electronic circuits and analyzing these circuits with respect to timing behavior and power consumption comprising the steps of:

calculating a score for each of the plurality of slices;

choosing one of the plurality of slices based on the scores

5,553,011

WAVEFORM GENERATING APPARATUS FOR MUSICAL

(a) generating a binary log value having a plurality of bits by

electronic circuits and analyzing these circuits with respect to timing behavior and power consumption comprising the steps of:

a) inputting a netlist of a circuit to be simulated identifying transistors and nodes;

b) inputting a technology file for characterizing transistors in said netlist, wherein said technology file initially contains a two-dimensional I-V table tabulating transistor drain to source currents at various drain-to-source and gate-to-source voltage pairs, said I-V table being subsequently converted into a two-dimensional linearization table holding piece-wise linear elements approximating MOS transistors;

c) inspecting each node in said netlist and constructing a static channel connected component at said each node where more than one transistor channel is coupled to said each node and where node quantity in said static channel connected component is below a maximum threshold value, said static channel connected component being stored in memory;

d) establishing initial voltage values at said each node in said netlist through input vectors;

e) advancing circuit simulation to a pending event next in time, wherein said pending event is a voltage change on a node that exceeds an event resolution, said voltage change being determined from a previous voltage level which caused an earlier event at said node;

f) identifying an affected transistor coupled to said node on which said pending event next in time is to occur;

g) associating an affected channel connected component with said affected transistor;

h) evaluating a response of said affected channel connected component to said pending event next in time through linear approximation, wherein each transistor contained in said affected channel connected component is replaced with a current source, resistor and transconductor retrieved from said technology file, said evaluating step including:

i) checking nodes contained in said affected channel connected component for event occurrence; and

ii) scheduling an event occurrence when detected.

5,553,009

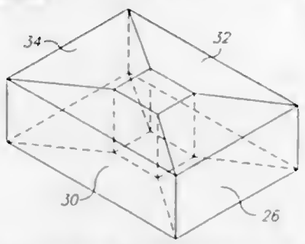
PARALLEL METHOD FOR SUBDIVISION OF ARBITRARY CURVED SOLIDS

Siavash N. Meshkat, and Susan A. Meshkat, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 119,755, Sep. 10, 1993, abandoned. This application Nov. 1, 1995, Ser. No. 551,440

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—578 **54 Claims**



1. A method of operating a data processing system to simulate subdivision of an object into regions to facilitate computer analysis of the object, the method comprising the steps of:

receiving as an input a digital representation of the object;

identifying a plurality of slices that subdivide the object into regions;

calculating a score for each of the plurality of slices;

choosing one of the plurality of slices based on the scores calculated by the step of calculating;

subdividing the object with the chosen slice; and

providing a digital output representative of the subdivided object.

5,553,010

DATA SHIFTING CIRCUIT CAPABLE OF AN ORIGINAL DATA WIDTH ROTATION AND A DOUBLE DATA WIDTH ROTATION

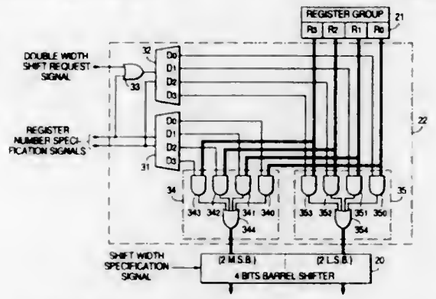
Hisamitsu Tanihira; Kazuo Nagahori, and Renri Nakano, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 6, 1992, Ser. No. 847,315

Claims priority, application Japan, Mar. 6, 1991, 3-040298

Int. Cl.[6] G06F *7/00*

U.S. Cl. 364—715.08 **4 Claims**



1. A data shifting circuit comprising:

barrel shifter means for shifting, by a plurality of bits, first data which has a width twice that of an original data width, said barrel shifter means having high order bits and low order bits, said original data width having a specified number of bits, and said high order bits and said low order bits each being the specified number of bits;

register group means having a plurality of registers for storing register data, each register having respective outputs, each respective output supplying respective register output; and

data controller means for selecting as second data, a first register output from a first register of the plurality of registers commonly supplied to the high order bits and the low order bits of said barrel shifter means, in response to a request for shifting data of said original data width, and for selecting a second register output from a second register of the plurality of registers and a third register output from a third register of the plurality of registers when a double bit data width shift request signal is input to select said second register, said third register having a selected relationship with said second register, the selected relationship being defined when said double bit width shift request signal is input, and for supplying said second register output and said third register output, as bit data, to said barrel shifter means, in response to said double bit data width request signal.

5,553,011

WAVEFORM GENERATING APPARATUS FOR MUSICAL INSTRUMENT

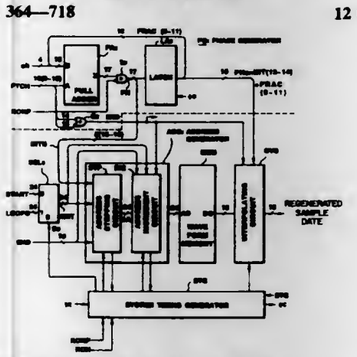
Yoshio Fujita, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Continuation of Ser. No. 620,826, Nov. 29, 1990, abandoned. This application Feb. 21, 1995, Ser. No. 391,466

Claims priority, application Japan, Nov. 30, 1989, 1-311080

Int. Cl.[6] G06F *1/02*

U.S. Cl. 364—718 **12 Claims**



1. Waveform generating apparatus comprising:

tone pitch designating means for designating a tone pitch of a waveform to be regenerated;

phase data generating means for generating phase data which corresponds to said tone pitch designated by the tone pitch designating means;

waveform data generating means for generating data of said waveform based on said phase data by a calculation cycle, the number of the data of said waveform generated during the calculation cycle being limited by a predetermined value;

interpolating means for interpolating said data of said waveform in synchronization with said calculation cycle with change of interpolation order in response to said tone pitch; and

waveform generating means for generating a waveform based on the data of waveform interpolated by the interpolating means.

5,553,012

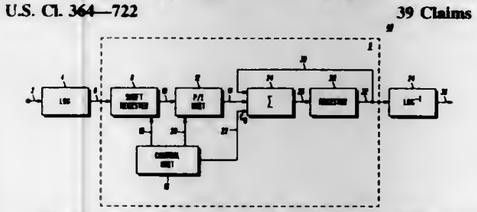
EXPONENTIATION CIRCUIT UTILIZING SHIFT MEANS AND METHOD OF USING SAME

John M. Buss, Tempe; James D. Dworkin, Chandler, both of Ariz.; Scott E. Lloyd, Hoffman Estates; Shao W. Pan, Schaumburg, both of Ill.; Stephen L. Smith, Chandler, Ariz., and Shay-Ping T. Wang, Long Grove, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 10, 1995, Ser. No. 401,515

Int. Cl.[6] G06F *1/02;7/00;15/00;* H03M *7/50*

U.S. Cl. 364—722 **39 Claims**



1. In an exponentiation circuit having an input signal x, a method for generating an exponential signal x^e, the method comprising the following steps:

(a) generating a binary log value having a plurality of bits by performing a logarithmic conversion on the input signal;

(b) shifting the plurality of bits of the binary log value to generate an intermediate value;

(c) arithmetically combining the intermediate value and a stored value to produce a combined value, wherein the step of combining is selected from the group consisting of:

(i) adding the intermediate value to the stored value to produce the combined value; and

(ii) subtracting the intermediate value from the stored value to produce the combined value; and

(d) generating the exponential signal by performing an inverse-logarithmic conversion on the combined value.

5,553,013

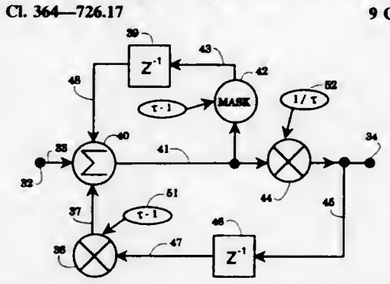
DELAY GENERATION FILTER

Leighton I. Davis, Jr., and Robert W. Matteson, both of Ann Arbor, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1994, Ser. No. 316,012

Int. Cl.[6] G06F *17/10*

U.S. Cl. 364—726.17 **9 Claims**



1. A first order infinite impulse response filter, for generating an output value time delayed from a time-varying input value, comprising:

a summing element responsive to said input value and to a first value and a second value for generating an intermediate value;

a first multiplier responsive to said summing element for generating an output value, time delayed from said input value, as a function of said intermediate value and a first weighting value, which is related to said time delay between said input value and said output value;

a residual generation element responsive to said summing element and to a resolution enhancement value, related to said first weighting value, for generating a numerical residual value indicative of a difference in resolution between said output value and said intermediate value;

a first delay element, responsive to said residual generation element for delaying said numerical residual value by a predetermined amount of time to generate said first value;

a second delay element, responsive to said first multiplier, for delaying said output value by said predetermined amount of time to generate a delayed output value; and

a second multiplier, responsive to said second delay element, for generating said second value as a function of said delayed output value and a second weighting value, which is related to said time delay between said input value and said output value.

5,553,014

ADAPTIVE FINITE IMPULSE RESPONSE FILTERING

5,553,017

ELECTRICALLY ERASABLE AND PROGRAMMABLE

5,553,019

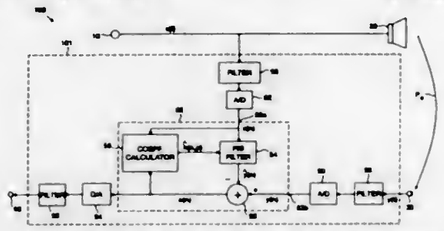
WRITE-ONCE READ-MANY MEMORY USING EEPROM

5,553,014

ADAPTIVE FINITE IMPULSE RESPONSE FILTERING METHOD AND APPARATUS

Phillip L. De León, II, Berthoud, Colo., and Dennis R. Morgan, Morristown, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Oct. 31, 1994, Ser. No. 332,224
Int. Cl.[6] G06F *15/31*
U.S. Cl. 364—724.19 **36 Claims**



1. A signal processing apparatus for use in a system having a predetermined frequency band of interest, the signal processing apparatus comprising:

a) a first means for receiving a first signal in the predetermined frequency band of interest and converting the first signal into a first input signal having a first operating bandwidth that exceeds the predetermined frequency band of interest;

b) a second means for receiving a second signal in the predetermined frequency band of interest and converting the second signal into a second input signal having the first operating bandwidth;

c) a first input operable to receive the first input signal and a second input operable to receive the second input signal;

d) an adaptive finite impulse response filter connected to the first input and the second input, said filter operable to

produce coefficients defining an impulse response, said impulse response representative of a relationship between the first input signal and the second input signal,

process the first input signal using the impulse response and produce an estimated signal therefrom,

produce an error signal representative of the difference between the estimated signal and the second input signal, and

generate an output signal corresponding to the first input signal;

wherein said signal processing apparatus is operable to provide the output signal to the system, said output signal having reduced error resulting from slow asymptotic convergence in the predetermined frequency band of interest.

5,553,015

EFFICIENT FLOATING POINT OVERFLOW AND UNDERFLOW DETECTION SYSTEM

Timothy A. Elliott; Christopher H. Olson, both of Austin, Tex., and Frank J. Palermo, Old Tappan, N.J., assignors to International Business Machines Corporation, Armonk, N.Y.

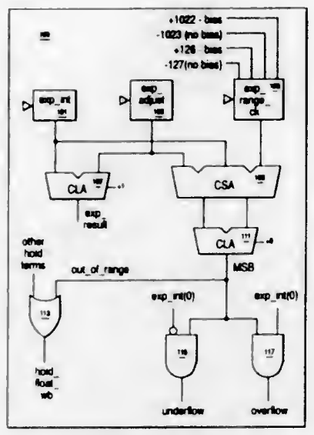
Filed Apr. 15, 1994, Ser. No. 228,480
Int. Cl.[6] G06F *7/00*
U.S. Cl. 364—748 **16 Claims**

1. A processing system, comprising:

means for computing an exponent number based on a floating point operation;

means for selecting one of a plurality of check values based on a type of instruction used in said floating point operation and whether an intermediate exponent number is positive or negative; and

means for determining, based on said check value and concurrently with said computing, whether said exponent number is within a specified one of plural ranges of values.

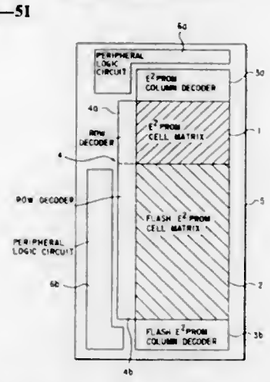


5,553,016

SEMICONDUCTOR MEMORY DEVICE

Masataka Takebuchi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 25, 1993, Ser. No. 36,692
Claims priority, application Japan, Mar. 26, 1992, 4-068272
Int. Cl.[6] G11C *17/00*
U.S. Cl. 365—51 **10 Claims**



1. A semiconductor memory device comprising:

different types of first and second memory matrices adjacently formed in the same layout in the cell matrix region on the same semiconductor substrate such that column lines of said memory matrices are aligned with each other, said column lines being disconnected from each other between said first and second memory matrices;

switching elements inserted between said column lines of said first and second memory matrices, said column lines being disconnected from each other by turning off said switching elements;

a first column decoder for alternatively selecting column lines of said first memory matrix and a first row decoder alternatively selecting row lines of said first memory matrix; and

a second column decoder for alternatively selecting column lines of said second memory matrix and a second row decoder for alternatively selecting row lines of said second memory matrix.

5,553,017

ELECTRICALLY ERASABLE AND PROGRAMMABLE READ-ONLY MEMORY CELLS WITH A SINGLE POLYSILICON LEVEL AND METHOD FOR PRODUCING THE SAME

Paolo Ghezzi, Rivolta D'Adda; Federico Pio, Milan, and Carlo Riva, Monza, all of, Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Division of Ser. No. 983,799, Nov. 24, 1992, Pat. No. 5,367,483. This application Sep. 22, 1994, Ser. No. 310,836
Claims priority, application Italy, Nov. 29, 1991, MI91A3196
Int. Cl.[6] G11C *11/34*
U.S. Cl. 365—185.01 **3 Claims**

1. An EEPROM cell comprising:

silicon substrate;

an first active area on the substrate defined by gate oxide regions which contact and lie in substantially the same plane as the first active area;

a second active area on the substrate defining transistor circuitry;

means for providing a cell breakdown voltage which is greater than a cell programming voltage;

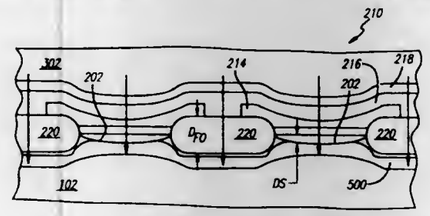
wherein the means for providing includes a combined layer of silicon oxide on the first active region and a single layer of silicon oxide on the second active area, the combined layer of silicon oxide, the combined layer having a thickness greater than the single layer.

5,553,018

NONVOLATILE MEMORY CELL FORMED USING SELF ALIGNED SOURCE IMPLANT

Hsingya A. Wang, and James J. Hsu, both of Saratoga, Calif., assignors to Advanced Micro Devices, Inc., Sunyvale, Calif.

Filed Jun. 7, 1995, Ser. No. 484,580
Int. Cl.[6] H01L *29/68*
U.S. Cl. 365—185.01 **4 Claims**



1. A high density floating gate memory cell array formed in a semiconductor substrate, where each cell comprises source, channel and drain semiconductor regions in the substrate, the array comprising:

respective columns of cells;

respective continuous strips of field oxide, interposed between adjacent columns of cells;

respective stacked-gate-word-line structures disposed extending over the field oxide strips, and overlying the channel regions of each cell in a row of cells; and

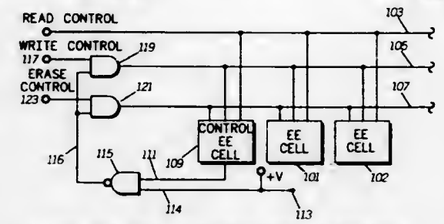
implanted interconnection regions, extending under the field oxide strips, electrically connecting the source regions of corresponding cells in adjacent columns.

5,553,019

WRITE-ONCE READ-MANY MEMORY USING EEPROM CELLS

Jerry L. Sandvos, Davie, and Kenneth D. Alton, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 23, 1995, Ser. No. 376,518
Int. Cl.[6] G11C *11/34*
U.S. Cl. 365—185.04 **9 Claims**



1. A write-once read-many memory system comprising:

a first memory cell for providing electronic storage of information;

a second memory cell for controlling writing access to said first memory cell;

access means for providing access to said second memory cell;

a first bus connected to said first memory cell and said second memory cell for proving read logic information;

a second bus connected to said first memory cell and said second memory cell for providing write logic information;

a third bus connected to said first memory cell and said second memory cell for providing erase information;

wherein said access means comprises:

a first logic gate for controlling access to said second bus;

a second logic gate for controlling access to said third bus; and

a third logic gate for controlling access to said first logic gate and said second logic gate; and

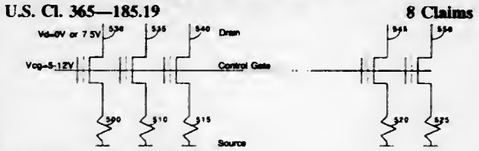
wherein said second memory cell provides selective access to said first memory cell to allow said first memory cell to write or erase said information when said second memory cell is in an appropriate logic state and further wherein said third logic gate includes an input for receiving logic information from said second memory cell and a test node.

5,553,020

STRUCTURE AND METHOD FOR LOW CURRENT PROGRAMMING OF FLASH EEPROMS

Stephen N. Keeney, Sunnyvale, and Gregory E. Atwood, San Jose, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 267,815, Jun. 28, 1994, Pat. No. 5,487,033. This application Aug. 31, 1995, Ser. No. 521,656
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—185.19 **8 Claims**



1. A system comprising:

a processor; and

a memory coupled to the processor, said memory comprising:

a memory array comprising a plurality of cells, each cell comprising a floating gate, control gate, source junction and drain junction; and

programming circuitry for programming a cell by applying an initial gate voltage to the control gate of the cell, and stepping the control gate voltage in predetermined increments to a maximum gate voltage, applying a source bias voltage to the source junction of the cell, and applying a drain voltage pulse to the drain junction of the cell to cause

hot electron injection of electrons onto the floating gate, said drain voltage pulse applied at each stepped increment

second metal-oxide semiconductor field-effect transistor coupled to one of said ground potential and supply voltage,

addressing means for receiving an address signal, a row address strobe signal, and a column address strobe for addressing said

hot electron injection of electrons onto the floating gate, said drain voltage pulse applied at each stepped increment of the control gate voltage;

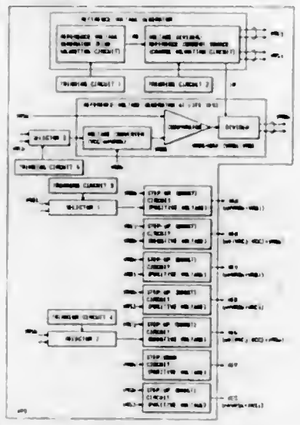
said processor issuing control signals to the programming circuitry to program the cell.

5,553,021

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE INCLUDING A VOLTAGE GENERATOR FOR PROVIDING DESIRED INTERVAL INTERNAL VOLTAGES

Shooji Kubono, Akishima, and Hitoshi Kume, Musashino, both of, Japan, assignors to Hitachi, Ltd., and Hitachi ULSI Engineering Corp., both of Tokyo, Japan

Filed Dec. 13, 1994, Ser. No. 354,623
Claims priority, application Japan, Dec. 17, 1993, 5-344152
Int. Cl.[6] G11C *11/34*
U.S. Cl. 365—185.33 **12 Claims**



1. A flash memory comprising:

a memory array wherein memory cells are disposed at intersections between a word line and a data line in a matrix, said memory cells being erased by injecting an electric charge from a substrate into a floating gate via a tunnel insulating film based on a relative potential relationship between a control gate and said substrate and programmed by discharging the electric charge from the floating gate into a drain via said tunnel insulating film based on a relative potential relationship between said control gate and said drain; and

a power supply circuit which forms a plurality of voltages necessary for programming, erasing, and reading said memory cells, wherein said power supply circuit comprises:

a reference voltage generating circuit which generates a reference voltage,

a voltage dividing circuit which forms a plurality of divided voltages based on said reference voltage;

a voltage supply circuit which outputs a desired internal voltage by adding a voltage obtained by multiplying one of said plurality of divided voltages by n to a predetermined divided voltage selected from said plurality of divided voltages for fine voltage adjustment, wherein said voltage supply circuit includes:

a charge pump circuit,

n first metal-oxide semiconductor field-effect transistors each having a diode connection and disposed in series between an output terminal of said charge pump circuit and one of a ground potential and a supply voltage,

a voltage comparator which receives said one of said plurality of divided voltages and a drain or source voltage of a second metal-oxide semiconductor field-effect transistor coupled to one of said ground potential and supply voltage, and

a gate circuit which limits an input pulse to be supplied to said charge pump circuit by an output voltage of said voltage comparator,

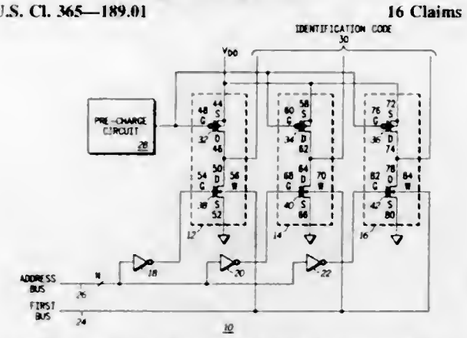
wherein one of said first metal-oxide semiconductor field-effect transistors that is inserted in said n metal-oxide semiconductor field-effect transistors in series is applied at a gate thereof with said predetermined divided voltage.

5,553,022

INTEGRATED CIRCUIT IDENTIFICATION APPARATUS AND METHOD

Kenneth C. Weng, and Chia S. Weng, both of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Dec. 27, 1994, Ser. No. 364,584
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—189.01 **16 Claims**



1. An integrated circuit identification apparatus comprising:

(a) a plurality of inverters, each inverter of the plurality of inverters including an N-channel field effect transistor and a P-channel field effect transistor, wherein the N-channel field effect transistor includes a gate node, a source node, a well node, and a drain node, and the P-channel field effect transistor includes a gate node, a source node, and a drain node, and wherein the drain node of the N-channel field effect transistor is coupled to the drain node of the P-channel field effect transistor;

(b) a plurality of gate drivers, each of the plurality of gate drivers being coupled to the gate node of the N-channel field effect transistor of a corresponding one of the plurality of inverters;

(c) a first bus operably coupled to the well node of the N-channel field effect transistor of each of the plurality of inverters; and

(d) an address bus operably coupled to the plurality of gate drivers, wherein the address bus provides a first signal to at least one of the plurality of gate drivers while the first bus provides a second signal such that each inverter of the plurality of inverters that is coupled to a gate driver of the at least one of the plurality of gate drivers is permanently altered.

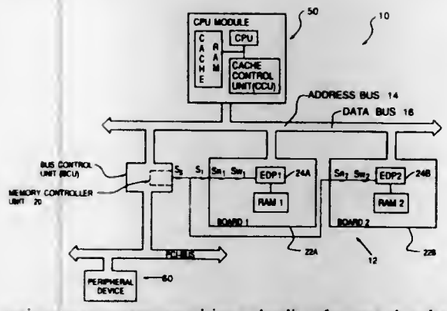
5,553,023

MEMORY PARTITIONING

Winnie K. W. Lau, Shapin, Hong Kong, and Richard Malinowski, Placerville, Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation of Ser. No. 362,409, Dec. 23, 1994. This application Apr. 13, 1995, Ser. No. 421,321
Int. Cl.[6] G11C *13/00*
U.S. Cl. 365—189.01 **14 Claims**

1. In a computer system having an address bus and a data bus, a memory storage system comprising:



main memory means comprising a plurality of memory locations for storing groups of data from the data bus and later retrieving the groups of data, each memory location having a unique address and being addressable by signals on the address bus;

memory controller means for controlling the storage of data to the main memory means from the data bus retrieval of data from the main memory, and for organizing each memory location onto a memory map comprising all addresses addressable by the computer system, said memory controller means comprising:

virtual bank register means for storing a first address associated with a first memory location and a second address associated with a second memory location different from the first memory location, said first and second addresses defining a lower boundary and a higher boundary, respectively, of a first virtual memory bank, said virtual memory bank comprising all memory locations having addresses between the lower boundary and the higher boundary; and

enable indication means for indicating whether the virtual memory bank is enabled or disabled; and

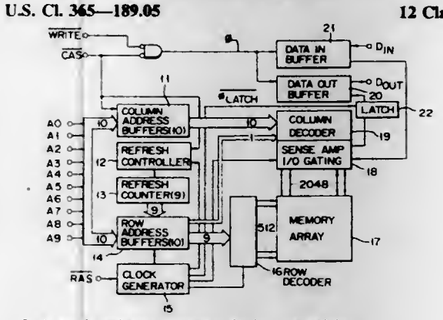
wherein the memory controller means maps all of the memory locations in the first virtual memory bank to a first area on the memory map.

5,553,024

SEMICONDUCTOR MEMORY UTILIZING RAS AND CAS SIGNALS TO CONTROL THE LATCHING OF FIRST AND SECOND READ OR WRITE DATA

Tohru Furuyama, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 203,594, Feb. 28, 1994, abandoned, which is a continuation of Ser. No. 835,119, Feb. 14, 1992, abandoned, which is a continuation of Ser. No. 541,024, Jun. 20, 1990, abandoned. This application Apr. 10, 1995, Ser. No. 419,769
Claims priority, application Japan, Jun. 21, 1989, 1-156677
Int. Cl.[6] G11C *11/407;7/00*
U.S. Cl. 365—189.05 **12 Claims**



1. A semiconductor memory device comprising:

a memory cell array;

addressing means for receiving an address signal, a row address strobe signal, and a column address strobe for addressing said memory cell array;

an output buffer for outputting data read from said memory cell array, said output buffer being controlled by one of the row address strobe signal and the column address strobe signal; and

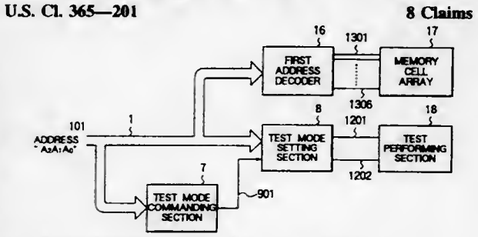
a latch circuit including a switch and a read data (RD) line connected between said switch and said output buffer, said latch circuit latching first data read out from a first memory cell of said memory cell array in response to a latch signal during one cycle of the row address strobe signal and during one cycle of the column address strobe signal, and said latch circuit outputting the first data to said output buffer and latching second data read out from a second memory cell of said memory cell array in response to the latch signal during another cycle of the row address strobe signal and during another cycle of the column address strobe signal, a leading edge of the latch signal occurring at a time different from when a leading edge of the row address strobe signal and the column address strobe signal occur, wherein said switch comprises a MOS transistor having a gate supplied with the latch signal, and wherein the first and second data are latched in said RD line.

5,553,025

SEMICONDUCTOR MEMORY DEVICE EXECUTING A MEMORY TEST IN A PLURALITY OF TEST MODES

Yoshinori Haraguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 20, 1994, Ser. No. 308,927
Claims priority, application Japan, Sep. 27, 1993, 5-239709
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—201 **8 Claims**



1. A semiconductor memory device comprising

a substrate,

a plurality of memory cells arrayed on said substrate and each having an address included in a first address group,

an address bus for supplying an address signal composed of a plurality of bits designated to one of addresses included in said first address group or one of addresses included in a second address group assigned to a plurality of test modes,

a first address decoder, operatively connected between said address bus and said memory cells, for decoding addresses of said address signal included in said first address group for said memory cells,

a second address decoder, operatively connected to said address bus, for decoding addresses of said address signal included in said second address group, and

a test performing section, operatively connected to said second address decoder, for executing a memory test in one of said test modes based on the output of said second address decoder.

5,553,026

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE

first and second electrodes, said first electrode of said at least one memory capacitor being connected during the reading

precharging said sense amplifier in response to a precharge signal.

5,553,031

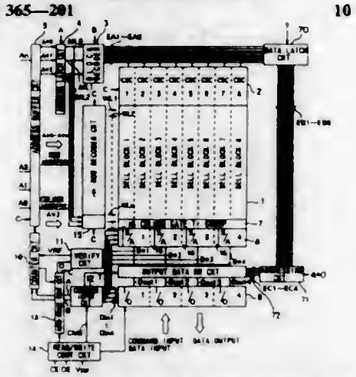
DMA OPERABLE IN COMPLIANCE WITH POINTERS.

5,553,026

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE

Hiroto Nakai, Yokohama; Tadashi Miyakawa, Adachi-Ku, and Shigeru Matsuda, Ichikawa, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Dec. 27, 1994, Ser. No. 364,348
Claims priority, application Japan, Dec. 28, 1993, 5-351340
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—201 **10 Claims**



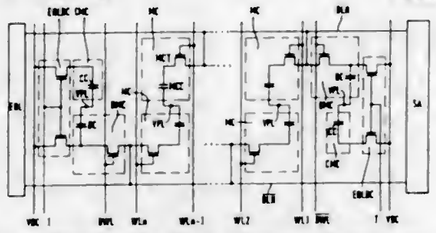
1. A method for testing a semiconductor memory device comprising a memory cell array having a plurality of cell blocks each having a plurality of memory cells and a block decoder responsive to a block address, for outputting a decoder signal, comprising:
a all bits erase test step for testing all of the memory cells; and
a block decoder test step for testing the block decoder to detect whether said block decoder outputs a correct decoded signal responsive to a updated block address.

5,553,027

INTEGRATED SEMICONDUCTOR MEMORY CIRCUIT AND METHOD FOR ITS OPERATION

Thomas von der Ropp, Germering, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 12, 1995, Ser. No. 371,829
Claims priority, application Germany, Jan. 12, 1994, 44 00 698.5
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—203 **4 Claims**



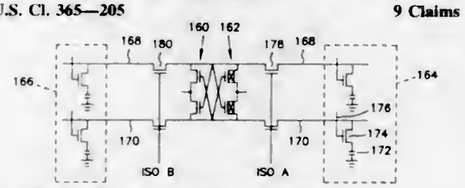
1. An integrated semiconductor memory circuit, comprising:
bit lines each being formed of two bit line halves;
word lines defining intersection points with said bit lines;
one-transistor memory cells being disposed in matrix-like fashion at said intersection points, each of said memory cells having one selection transistor and at least one memory capacitor with electrodes;
said selection transistor of each of said memory cells being connected to a respective one of said bit line halves, and one of said electrodes of said at least one memory capacitor of each of said memory cells being connected during a reading operation to a plate potential of a predetermined value;
at least one dummy memory cell having at least one memory capacitor for each respective one of said bit line halves with first and second electrodes, said first electrode of said at least one memory capacitor being connected during the reading operation to the plate potential;
a device for precharging said bit lines to a bit line potential having a given value; and
devices for causing said second electrode of said at least one memory capacitor of said at least one dummy memory cell to be acted upon during the reading operation with a precharging potential having a value being different from and greater than said given value by 5 to 35%.

5,553,028

SINGLE P-SENSE AMP CIRCUIT USING DEPLETION ISOLATION DEVICES

Loren L. McLaury, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Jun. 23, 1995, Ser. No. 494,239
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—205 **9 Claims**



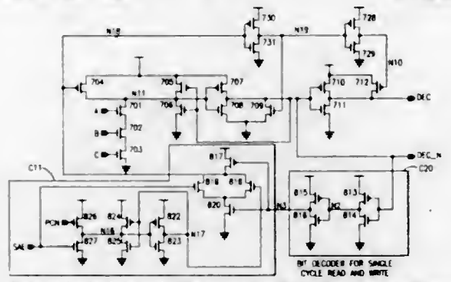
1. An integrated circuit memory comprising:
a plurality of memory arrays;
a plurality of digit lines each coupled to one of the plurality of memory arrays;
a plurality of n-channel depletion transistors each connected to one of the plurality of digit lines; and
shared sense amplifiers electrically connected to the plurality of n-channel depletion transistors for selectively coupling to one of the plurality of memory arrays.

5,553,029

PRECHARGED BIT DECODER AND SENSE AMPLIFIER WITH INTEGRATED LATCH USABLE IN PIPELINED MEMORIES

William R. Reohr, Pleasantville; Yuen H. Chan, Poughkeepsie, and Pong-Fei Lu, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 279,366, Jul. 22, 1994, Pat. No. 5,481,500. This application Jan. 13, 1995, Ser. No. 372,523
Int. Cl.[6] G11C *11/40*
U.S. Cl. 365—208 **9 Claims**



1. A method of operating a memory in a pipelined read and write operation, said memory including a sense amplifier comprising a bistable differential amplifier selectively connectable to a plurality of bit lines, an address decoder, a bit select switch means for selectively connecting bit lines of said memory to inputs of said bistable differential amplifier, said method including the steps of:

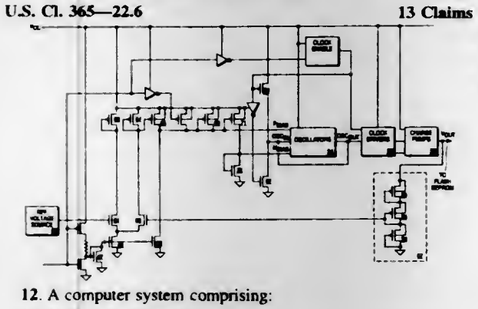
precharging said sense amplifier in response to a precharge signal,
decoding an address to provide a decoder output,
connecting at least one bit line to said bistable differential amplifier in response to said decoder output,
enabling said bistable differential amplifier to amplify a voltage difference between said bit lines connected thereto in response to a sense amplifier enable signal to perform a read operation,
latching an output of said bistable differential amplifier, and
disabling outputs of said decoder in response to a pipelined write signal to said multiplexor means to perform a write operation to said memory in a same cycle as said step of enabling.

5,553,030

METHOD AND APPARATUS FOR CONTROLLING THE OUTPUT VOLTAGE PROVIDED BY A CHARGE PUMP CIRCUIT

Kerry D. Tedrow, Orangevale, and Cesar Gallindo, Stockton, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 119,870, Sep. 10, 1993, abandoned. This application Jun. 19, 1996, Ser. No. 491,792
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—22.6 **13 Claims**



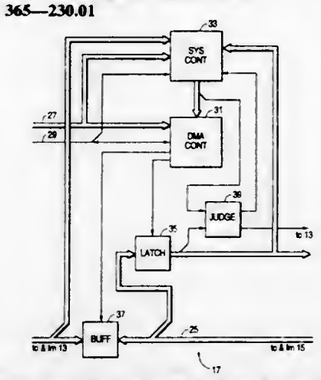
12. A computer system comprising:
(A) a central processor;
(B) a memory coupled to the central processor, comprising:
(1) an array of memory cells;
(2) a charge pump circuit comprising:
(a) an oscillator providing a plurality of staggered output signals in response to a control signal, wherein a level of the control signal controls a rate of oscillation of the oscillator;
(b) a plurality of clock drivers generating clock pulses such that a frequency of each of the clock pulses is controlled by the output signals from the oscillator;
(c) a plurality of charge pumps for providing an output voltage at a common node for the array of memory cells in response to the frequency of each of the clock pulses, wherein the charge pumps are only controlled by the clock pulses generated by the clock drivers to generate the output voltage; and
(d) a voltage regulator circuit comprising:
(i) circuitry for measuring the output voltage; and
(ii) a differential amplifier coupled (1) to the circuitry for measuring the output voltage and (2) directly to the oscillator, wherein the differential amplifier detects a difference between the output voltage and a reference voltage and correspondingly varies the rate of oscillation of the oscillator between a plurality of nonzero frequencies by varying the level of the control signal such that the output voltage remains substantially constant at a level proportional to the reference voltage.

5,553,031

DMA OPERABLE IN COMPLIANCE WITH POINTERS, EACH INCLUDING A DISCRIMINATION BIT

Takayuki Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jul. 15, 1994, Ser. No. 275,408
Claims priority, application Japan, Jul. 15, 1993, 5-175486
Int. Cl.[6] G11C *13/00*
U.S. Cl. 365—230.01 **13 Claims**



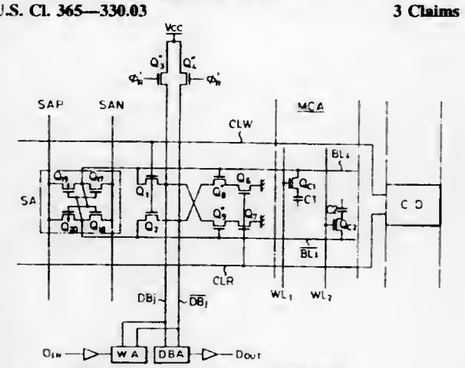
1. A direct memory access method of transferring data between a memory device and an input/output device with transfer of said data controlled by a plurality of pointers, wherein a discrimination bit is included in each of said pointers to indicate whether or not transfer of corresponding data should proceed, comprising the steps of:
storing said pointers as stored pointers, each stored pointer including a corresponding discrimination bit; and
skipping transfer of corresponding data between said memory device and said input/output device when the corresponding discrimination bit in the corresponding one of said stored pointers indicates not to proceed with said transfer.

5,553,032

DYNAMIC RANDOM ACCESS MEMORY WHEREIN TIMING OF COMPLETION OF DATA READING IS ADVANCED

Masao Taguchi, Sagamihara, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 310,369, Sep. 22, 1994, which is a continuation of Ser. No. 178,602, Jan. 7, 1994, abandoned, which is a continuation of Ser. No. 777,315, Dec. 2, 1991, abandoned. This application Apr. 19, 1995, Ser. No. 424,212
Claims priority, application Japan, Mar. 30, 1990, 2-83758
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—330.03 **3 Claims**



1. A semiconductor memory device comprising:

a memory cell array divided into a plurality of blocks, each

5,553,034

detecting change in magnetic fluxes induced by said memory

a memory cell array divided into a plurality of blocks, each block comprising:

a sense amplifier,

a memory cell,

a bit line connected to the sense amplifier and to the memory cell,

a data bus line coupled to the bit line and being used commonly for a reading operation and a writing operation,

a first column selection switch coupled between the data bus line and the bit line, and

a second column selection switch coupled between the data bus line and the bit line;

a common column decoder outputting a first decoder output and a second decoder output;

a first column selection line, coupled to the common column decoder, receiving the first decoder output, and outputting a first selection output during the reading operation; and

a second column selection line, coupled to the common column decoder, receiving the second decoder output, and outputting a second selection output during the writing operation,

said first column selection switch in each block being turned ON through said first column selection line during the reading operation, and

said second column selection switch in each block being turned ON through said second column selection line during the writing operation writing data.

5,553,033

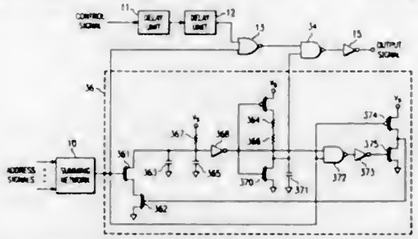
APPARATUS AND METHOD FOR AN ADDRESS TRANSITION DETECTOR SUMMING CIRCUIT

Hugh P. McAdams, McKinney, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 7, 1994, Ser. No. 320,615

Int. Cl.[6] G11C *7/00*; H03K *3/017;3/00*

U.S. Cl. 365—233.5 **13 Claims**



1. An address transition detection summing circuit comprising:

a summing network coupled to a plurality of address lines, said summing network providing a summation signal which is a combination of address signals applied to said address lines, leading edge of said summation signal providing a leading edge of an output signal from said address transition detection summing circuit;

a delay network responsive to said leading edge of said summation signal for providing an extended signal; and

a combining network responsive to a presence of both a trailing edge of said summation signal and a trailing edge of said extended signal for providing a trailing edge of said output signal, said output signal having a preferred signal width when said summation signal has a duration less than said preferred signal width, said output signal having a duration of said summation signal when said summation signal has a duration greater than said preferred signal width.

5,553,034

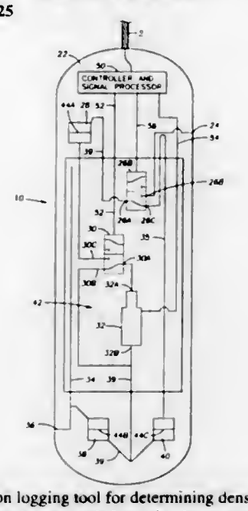
DIFFERENTIAL PRESSURE FLUID DENSITY INSTRUMENT

Stanley C. Jones, Littleton, Colo., and Daniel T. Georgi, Houston, Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Continuation of Ser. No. 359,581, Dec. 20, 1994, abandoned. This application Feb. 8, 1996, Ser. No. 597,356

Int. Cl.[6] E21B *49/10*

U.S. Cl. 367—25 **13 Claims**



1. A production logging tool for determining density of a fluid in a wellbore penetrating an earth formation by measuring a differential pressure between spaced apart locations along said tool, said tool comprising:

an elongated housing adapted to traverse said wellbore, said housing having two ports at spaced apart locations along said housing, said ports in hydraulic communication with said wellbore;

a differential pressure transducer disposed within said housing, said transducer having two pressure inputs;

a reference tube disposed within said housing, said reference tube having two ends, said reference tube filled with a liquid of known density; and

a valve, interconnected to said transducer, said valve selectively operable to hydraulically connect together said two inputs of said transducer to shunt said transducer, said valve selectively operable to hydraulically connect said reference tube across said inputs of said transducer to calibrate said transducer, said valve selectively operable to connect said ports across said inputs of said transducer to enable measurement of said fluid in said wellbore.

5,553,035

METHOD OF FORMING INTEGRAL TRANSDUCER AND IMPEDANCE MATCHING LAYERS

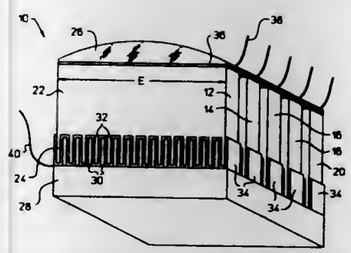
Mir S. Seyed-Bolorforosh, Palo Alto; Hewlett E. Melton, Sunnyvale, both of Calif., and Martha G. Wilson, Andover, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 77,188, Jun. 15, 1993, Pat. No. 5,371,717, and a continuation-in-part of Ser. No. 77,530, Jun. 15, 1993, Pat. No. 5,434,827, and a continuation-in-part of Ser. No. 77,179, Jun. 15, 1993, Pat. No. 5,392,259. This application Oct. 21, 1994, Ser. No. 327,167

Int. Cl.[6] H04R *17/00*

U.S. Cl. 367—140 **21 Claims**

1. A method of fabricating a transducer device comprising:



providing a piezoelectric member having a thickness from a first face to a second face, said first and second faces being on opposed sides of said piezoelectric member;

selecting at least a region of said piezoelectric member to form a first piezoelectric element;

dividing said thickness of said selected region into a transducer portion for converting between electrical and acoustic wave energy and an acoustic impedance matching portion, including forming grooves into said acoustic impedance matching portion such that said grooves extend through said first face, thereby forming said acoustic impedance matching portion to include a plurality of spaced apart segments extending integrally from said transducer portion; and

forming electrodes in electrical communication with opposed sides of said piezoelectric member for selectively applying an electrical potential across said transducer portion.

5,553,036

APPARATUS AND METHOD FOR WRITING AND READING DIGITAL INFORMATION ON A MAGNETIC MEMORY INCLUDING A SUPERCONDUCTING MATERIAL

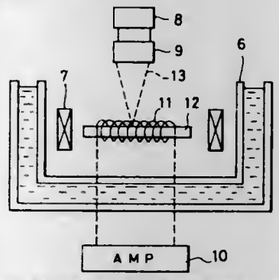
Yasuhiko Takemura, Atsugi, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Filed Mar. 22, 1991, Ser. No. 673,380

Claims priority, application Japan, Mar. 27, 1990, 2-77791

Int. Cl.[6] G11B *11/10*

U.S. Cl. 369—13 **22 Claims**



4. A method for reading digital information on a magnetic memory comprising the steps of:

scanning superconducting storage domains having non-superconducting openings therein and formed on a memory consisting of a superconducting material in which magnetic fluxes have been selectively trapped by said storage domains in accordance with information stored in said memory, said scanning being performed in a magnetic field having the same direction to the magnetic fluxes, said scanning further being carded out by irradiation in order to cause phase transition of said material between its superconducting phase and its normal conducting phase through elevation and fall of the temperature of the domain being irradiated; and

detecting change in magnetic fluxes induced by said memory during said scanning, wherein the digital information in said magnetic memory is determined from said change in magnetic fluxes.

5,553,037

MAGNETO-OPTICAL RECORDING-REPRODUCING SYSTEM IN WHICH A MAGNETIC HEAD BOTTOM SURFACE ROUGHNESS IS RELATED TO A RECORDING MEDIUM PROTECTIVE FILM SURFACE ROUGHNESS

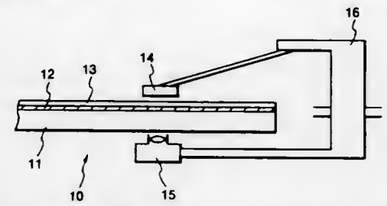
Shinichi Tachibana, Yamato, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1994, Ser. No. 358,097

Claims priority, application Japan, Dec. 20, 1993, 5-320291

Int. Cl.[6] G11B *11/14;13/04*

U.S. Cl. 369—13 **5 Claims**



1. A magnetic field modulation type overwrite magneto-optical recording-reproducing system for effecting the recording of information on a magneto-optical recording medium with the bottom surface of a magnetic head floated and moved relative to a protective film formed on the surface of said magneto-optical recording medium, wherein the surface roughness α of the bottom surface of said magnetic head represented by the center line average peak beight (R_{pm}) and the surface roughness β of the protective film of said magneto-optical recording medium satisfy the relational expression that $0.15\ \mu m \leqq (\alpha+\beta) \leqq 1.0\ \mu m$.

5,553,038

MAGNETO-OPTICAL RECORD CARRIER WITH RECORDING TRACK STRUCTURE SUITED FOR HIGH DENSITY RECORDING

Johannes Spruit; Bernardus Jacobs, and Cornelis Van Uijen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, NY, N.Y.

Division of Ser. No. 166,804, Dec. 14, 1993, Pat. No. 5,442,597, which is a continuation of Ser. No. 790,107, Nov. 8, 1991, abandoned, which is a continuation of Ser. No. 347,610, May 2, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 488,537

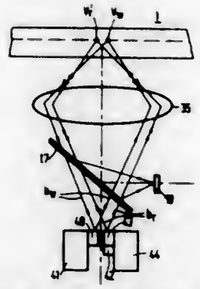
Claims priority, application Netherlands, Feb. 15, 1989, 8900362

Int. Cl.[6] G11B *11/00*

U.S. Cl. 369—13 **10 Claims**

1. A record carrier having a magneto-optical information layer in which information can be written and subsequently read therefrom by means of diode laser radiation, which radiation is focused to a diffraction-limited radiation spot on the information layer, and movement of said radiation spot and the record carrier relative to each other; information being written by locally changing, at the location of the radiation spot formed by a diode laser write beam, the direction of magnetization of areas formed in the information layer by said write beam in combination with a magnetic field; the information areas thus formed being read by detection of the variation, caused by the information areas, of the state of polarization of a diode laser read beam;

each of the information areas is smaller in the direction of movement than the write radiation spot, and are written by switching the magnetic field in time intervals which are



shorter than the time interval required to move the record carrier and the radiation spot with respect to each other over a distance which is equal to the dimension of the radiation spot in the direction of movements;

the wavelength of the diode laser read beam is shorter than that of the diode laser write beam; and

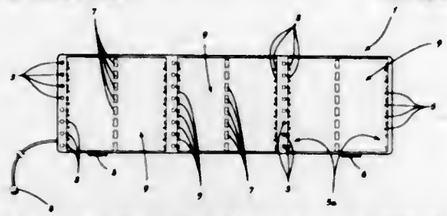
the record carrier has a structure of recording tracks on which the information areas are formed, the width of the information areas being determined by the width of the recording tracks.

5,553,039

MULTIPLE-DISC PLAYER CONTROL AND DISPLAY DEVICE USING EMPTY DISC CASES

Adam Wolff, 82 Spring St., Metuchen, N.J. 08840

Filed Aug. 23, 1994, Ser. No. 294,341
Int. Cl.[6] G11B *31/00;33/04*
U.S. Cl. 369—20 **12 Claims**



1. A storage, selection and indication device for operation in conjunction with a multiple-disc disc player, said multiple-disc player being capable of electro-mechanically accessing any of a plurality of discs, comprising:

(a) a housing having a plurality of disc case storage locations for storage of a plurality of disc cases of said plurality of discs accessible by said multiple-disc player, each of said disc case storage locations having a physical dimension enabling a disc case of said disc cases to be inserted and held in said location so that a labeled face of said disc case remains exposed so as to provide a means to identify the subject of the disc that said disc case is designated to contain, each said disc case storage location in said housing being paired with one of said plurality of discs accessible by said multiple-disc player;

(b) a connecting system that adjoins said housing to said multiple-disc player enabling the transfer of electronic information from said multiple-disc player to said disc case storage locations and/or from said disc case storage locations to said multiple-disc player;

(c) a selection system having a means of making selections from said plurality of discs and informing said multiple-disc player of said selections, said selection system comprising a plurality of buttons, each button being paired with one of said disc case storage locations, each button when pressed selecting the disc paired with the disc case storage location paired with the button, said selection system communicating with said multiple-disc player through said connecting system; and

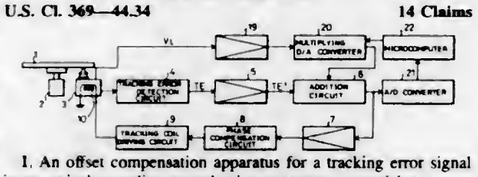
(d) an indication system being capable of electronically highlighting a specific disc case storage location or a plurality of specific disc case storage locations simultaneously, said indication system communicating with said multiple-disc player through said connecting system.

5,553,040

OFFSET COMPENSATION APPARATUS FOR TRACKING ERROR SIGNAL OF OPTICAL RECORDING REPRODUCTION APPARATUS

Masaaki Hanano, and Masaru Nomura, both of Tenri, Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Jun. 13, 1994, Ser. No. 258,714
Claims priority, application Japan, Jun. 21, 1993, 5-149436
Int. Cl.[6] G11B *7/09*
U.S. Cl. 369—44.34 **14 Claims**



1. An offset compensation apparatus for a tracking error signal in an optical recording reproduction apparatus, comprising:

means for providing a first signal which is proportional to intensity of a light beam to be irradiated to an optical recording medium;

means for providing a tracking error signal, said tracking error signal representing a position difference between a track of the optical recording medium and a light beam spot on the optical recording medium; and

offset canceling means for compensating for offsets of the tracking error signal based upon said first signal, said offset canceling means including:

output means for determining a magnitude and a polarity of an offset based upon the tracking error signal and for outputting corresponding multiplication data;

multiplication means for multiplying said first signal by the multiplication data to produce a multiplication result; and

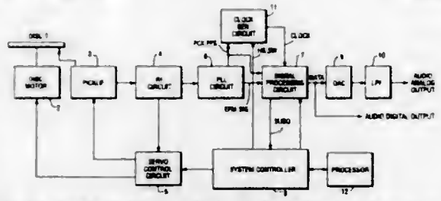
addition means for combining the multiplication result and the tracking error signal so as to effect a cancellation of an existing offset.

5,553,041

DISC DATA REPRODUCING APPARATUS AND SIGNAL PROCESSING UNIT FOR PREVENTING UNDERFLOW AND OVERFLOW

Juo Inagawa; Masahide Nagumo, and Kunihiko Kodoma, all of Kanagawa-ken, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Continuation of Ser. No. 159,601, Nov. 30, 1993, abandoned. This application Apr. 10, 1995, Ser. No. 419,272
Claims priority, application Japan, Dec. 28, 1992, 4-359941
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—48 **13 Claims**



1. An apparatus for reproducing information data stored on a disc comprising:

means for reading out information data from a rotating disc on which the information data is stored;

means for generating a digitized signal by quantizing the read out information data in accordance with a rotation of the disc;

means for generating a first clock signal synchronous with the digitized signal;

means for demodulating the digitized signal in synchronism with the first clock signal and for outputting a demodulated data;

means for storing the demodulated data;

means for generating a second clock signal having a frequency controlled in accordance with an amount of data stored in the storing means, wherein the amount of data stored in the storing means is represented by a difference between current read and write addresses of the storing means; and

means for controlling a writing operation to the storing means in synchronism with the first clock signal and for controlling a reading operation from the storing means in synchronism with the second clock signal;

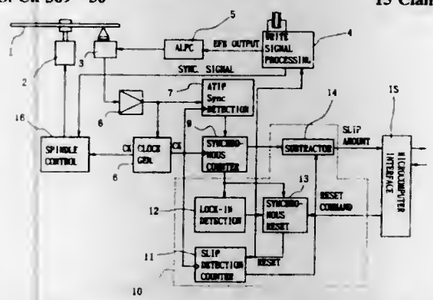
wherein the second signal generating means includes first counting means for counting frames in the first clock signal as a first result, second counting means for counting frames in the second clock signal as a second result, and means for calculating a difference between the first and second results.

5,553,042

OPTICAL DISK RECORDING DEVICE

Akira Usui, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jun. 17, 1994, Ser. No. 261,631
Claims priority, application Japan, Jul. 1, 1993, 5-189245
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—50 **15 Claims**



1. An optical disk recording device capable of recording data by projecting a laser pulse onto a disk on which time or address information used for writing is prerecorded while controlling a drive of a spindle for rotating the disk by using the time or address information, the optical disk recording device comprising:

synchronizing signal detection means for detecting a synchronizing signal from the prerecorded time or address information read from the disk;

clock generation means for generating a clock from the detected synchronizing signal using a locking PLL (phase lock loop);

a first counter for counting the clock generated by the clock generation means during a period between respective synchronizing signals detected by the synchronizing signal detection means; and

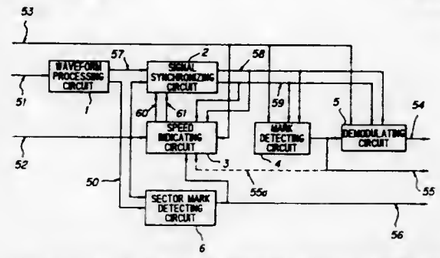
slip detection means for detecting a slip in the PLL of the clock generation means when a count of the first counter differs from a predetermined value.

5,553,043

INFORMATION REGENERATING APPARATUS

Takeshi Yamaguchi, Sakai; Hiroshi Fuji, Soraku-gun; Hiroshige Hirashima, and Shigeo Terashima, both of Tenri, all of, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 15, 1994, Ser. No. 358,073
Claims priority, application Japan, Dec. 17, 1993, 5-318105
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—50 **3 Claims**



1. An information regenerating apparatus, wherein recorded data constructed of a sector mark and a following header section having a plurality of data sets each having a pull-in pattern, an address mark and address information, is read out to form a regenerative signal which in turn is used to regenerate information, comprising:

a phase-locked loop circuit for performing phase-synchronization with said regenerative signal at two different pull-in speeds;

a mark detecting circuit which detects said address mark on synchronized data obtained by sampling said regenerative signal in synchronization with a regenerative clock produced in said phase-locked loop circuit; and

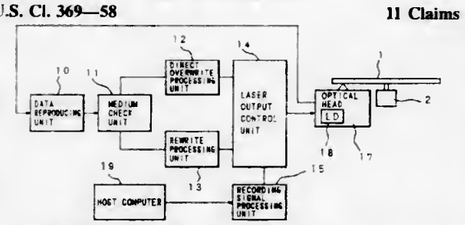
a speed indicating circuit which, based on the counting of the number of clock pulses from a reference clock signal from a time of the generation of a sector mark detection signal showing the detection of said sector mark as a reference point, gives an instruction to said phase-locked loop circuit to accelerate the response speed thereof every time said pull-in pattern appears on said regenerative signal, and which instructs said phase-locked loop circuit to slow down the response speed thereof every time said mark detecting circuit indicates the detection of an address mark.

5,553,044

OPTICAL RECORDING METHOD AND APPARATUS FOR ENABLING INTERCHANGE OF DISSIMILAR RECORDING MEDIA

Kunimaro Tanaka, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 694,146, May 1, 1991, abandoned. This application Feb. 15, 1994, Ser. No. 196,998
Claims priority, application Japan, May 16, 1990, 2-127686; Oct. 25, 1990, 2-290466
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—58 **11 Claims**



1. An optical recording system, comprising:

a medium having pre-recorded control tracks in which medium information including information related to two kinds of

light power, and discriminating information which discriminates formats related to a recording method used with said optical recording medium, said optical recording medium having

an initialization magnetic film;

a control magnetic film disposed on said initialization magnetic film, for controlling transmission of an exchange coupling force from said initialization magnetic film;

a first additional magnetic layer disposed on the control magnetic film;

a second additional magnetic layer disposed on the first additional magnetic layer; and

said control tracks including

discriminating information which shows whether said optical recording medium is a direct overwrite light modulation recording medium, that is recorded by two kinds of high and low power levels,

said optical recording medium of a first type having information recorded thereon by a recording method using different light powers for recording and erasing respectively, the light powers used corresponding to the information related to two kinds of light power of said medium information, in the case where said discriminating information shows that the medium is not a direct overwrite light modulation recording medium, and

said optical recording medium of a second type having information recorded thereon by a recording method using two different light power levels for the direct overwrite recording of the information recorded thereon, the light powers used corresponding to the information related to two kinds of light power of said medium information, in the case where said discriminating information shows that the medium is a direct overwrite light modulation recording medium; and

an optical recording apparatus having

means for reading the medium information;

means for judging the recording method corresponding to one of the first type and the second type of medium in accordance with the medium information read by the means for reading;

means for setting the light power level for the recording method judged by the means for judging, in accordance with the medium information read by the means for reading;

means responsive to the means for setting, for overwriting information in the optical recording medium using the light power level and the recording method set by the means for setting.

5,553,045

DISK RECORDING METHOD AND APPARATUS FOR INDENTIFYING AND SKIPPING DEFECTIVE CLUSTERS

Hideo Obata, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP93/01072, § 371 Date Mar. 25, 1994, § 102(e) Date Mar. 25, 1994, PCT Pub. No. WO94/03891, PCT Pub. Date Feb. 17, 1994

PCT Filed Jul. 30, 1993, Ser. No. 211,260

Claims priority, application Japan, Jul. 31, 1992, 4-205594; Nov. 2, 1992, 4-294317

Int. Cl.[6] G11B *3/90*

U.S. Cl. 369—58 **8 Claims**

6. A recording method for recording predetermined data on a disc having tracks which are divided into predetermined sections called clusters, the recording method comprising the steps of:

discriminating whether or not data of a predetermined cluster amount is stored in a memory;

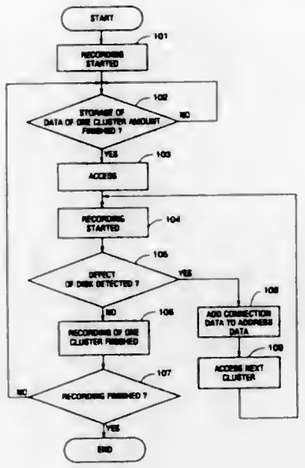
commencing recordation of the data into the clusters on the disc;

discriminating whether each cluster subject to recordation is defective before recordation of said data thereto;

stopping said recording in case of a defect being discriminated in a cluster subject to recordation on the disc;

calculating a position offset by a predetermined length from said defective cluster; and

restarting the recording from said calculated position again.



5,553,046

OPTICAL RECORDING MEDIUM AND PLAYBACK METHOD UTILIZING PITS ON TRACK CENTER AND WOBBLE PITS

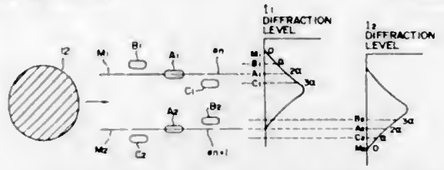
Hideyoshi Horimai, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 75,828, Jun. 11, 1993, Pat. No. 5,416,766. This application Sep. 15, 1994, Ser. No. 306,457

Claims priority, application Japan, Jun. 15, 1992, 4-178887

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—58 **3 Claims**



1. A method for playback of an optical recording medium where tracks are formed at such a track pitch that at least two tracks are scanned simultaneously by a spot of a light beam irradiated onto the recording surface, each track having wobble pits formed at positions deviated from the track center and a multiplicity of pits formed on the track center to to correspond to data, the method comprising the procedure of:

irradiating the light beam onto the recording surface in such a manner as to scan a first track on the optical recording medium and a second track adjacent to the first track;

receiving the light beam reflected from the optical recording medium, and generating a difference signal corresponding to the difference between detection signals outputted from first and second light receiving areas of an optical detector divided along the tangential direction of the tracks on the optical recording medium, and also generating a sum signal corresponding to the sum of the detection signals outputted from the first and second light receiving areas; and

reproducing the data by determining the combination of the difference signal and the sum signal, whereby the combination of the difference signal and the sum signal varies depending on whether each of the first and second tracks has a mirror portion, a wobble pit, or a pit formed on the track center.

5,553,047

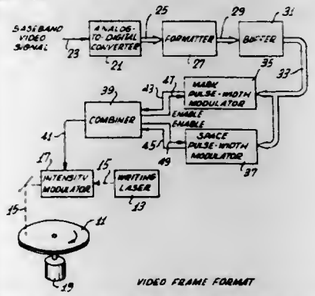
SYSTEM FOR RECORDING DIGITAL INFORMATION IN A PULSE-LENGTH MODULATION FORMAT

Jack H. Bailey, Villa Park, Calif., assignor to DiscoVision Associates, Irvine, Calif.

Division of Ser. No. 119,655, Sep. 13, 1993, which is a continuation of Ser. No. 75,275, Jun. 11, 1993, Pat. No. 5,321,680, which is a continuation of Ser. No. 948,267, Sep. 21, 1992, Pat. No. 5,253,244, which is a continuation of Ser. No. 825,640, Jan. 24, 1992, abandoned, which is a continuation of Ser. No. 645,638, Jan. 25, 1991, Pat. No. 5,084,852, which is a continuation of Ser. No. 499,217, Mar. 16, 1990, Pat. No. 5,003,526, which is a continuation of Ser. No. 782,156, Oct. 2, 1985, abandoned, which is a continuation of Ser. No. 169,238, Jul. 16, 1980, abandoned. This application May 23, 1994, Ser. No. 247,233

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—59 **6 Claims**



1. An optical disc recorder for recording digital information on an optical disc, the optical disc recorder comprising:

a modulator, which receives a succession of original binary bits of digital information to be recorded, and produces a succession of coded signals to be recorded by encoding portions of the succession of original binary bits into corresponding encoded portions using a first encoding operation to encode information contained in each portion of the succession of original binary bits, the encoded portions including a succession of alternating marks and spaces, each of the successive marks and spaces having a length which is discretely varied between a minimum length and a maximum length in accordance with information contained in the final code, the length of each of the successive marks and spaces being limited in run length to be not less than the minimum length and to be not greater than the maximum length, the maximum length being greater than double the minimum length;

a formatter, including a register for storing a current position on the disc being recorded, to produce a pattern of alternating marks and spaces having predetermined lengths indicative of the current position on the disc, as part of the succession of coded signals to be recorded; and

a writing device which produces a beam for writing information on the disc, said information being indicative of the succession of coded signals including the information to be recorded and the pattern of marks and spaces indicative of the current position.

5,553,048

MEMORY CONTROL DEVICE AND REPRODUCING AND/OR RECORDING APPARATUS

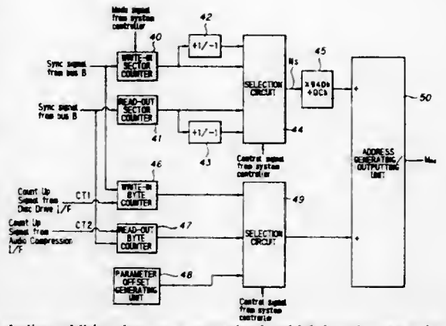
Yasuaki Maeda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 20, 1994, Ser. No. 230,115

Claims priority, application Japan, Apr. 23, 1993, 5-119304

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—60 **14 Claims**



including additive data, on a sector basis which is to be transmitted to or from a recording medium, the memory control device comprising:

a means for receiving and transmitting a sector sync signal and a byte count signal;

first write-in counting means for counting a sector number on the basis of the sector sync signal to be used in obtaining an address for a data write-in operation into the memory means;

first read-out counting means for counting a sector number on the basis of the sector sync signal to be used for obtaining an address for a data read-out operation from the memory means;

first selecting means for selecting a count value Ns from among the sector numbers received from the first write-in counting means and the first read-out counting means;

calculating means for calculating a sector address in accordance with said count value Ns according to a predetermined calculation;

second write-in counting means for counting a byte value on the basis of the sector sync signal and the byte count signal to be used for obtaining a byte address for a data write-in operation into the memory memos;

second read-out counting means for counting a byte value on the basis of the sector sync signal and the byte count signal to be used in obtaining a byte address for a data read-out operation from the memory means;

offset byte generating means for generating a byte value which has an offset corresponding to the byte address of the additive data within a data sector;

second selecting means for selecting one of byte values from among byte values received from the second write-in counting means, second read-out counting means, and offset byte generating means; and

an address generating/outputting means for adding the sector address output from the calculating means with the selected byte value output from the second selecting means to calculate an access address, and for outputting the calculated access address to the memory means.

5,553,049

REPRODUCTION OF DIGITAL AUDIO DATA OPTICALLY RECORDED IN A MOTION PICTURE FILM

Takashi Nakao, Saitama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 27, 1994, Ser. No. 330,374

Claims priority, application Japan, Oct. 28, 1993, 5-270441

Int. Cl.[6] G11B *3/76;7/00;* G03B *31/06*

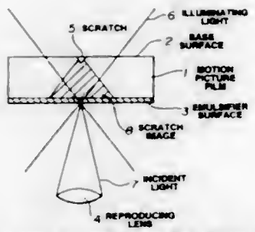
U.S. Cl. 369—100 **9 Claims**

1. An apparatus for reproducing digital audio signals optically recorded on a motion picture film with the aid of an illuminating light, said film having a base surface and an emulsifier surface, comprising:

5,553,051

INCREASED INENSITY OPTICAL RECORDING

recording of information on and reproduction of information from the recording medium;



illuminating means for radiating a light beam onto said base surface of said film to aid in the reproduction of said digital audio signals,

an objective lens for condensing a reproducing light from said emulsifier surface of said film, and

means for producing electrical signals of an audio signal level related to a volume of light collected by said objective lens.

5,553,050

OPTICAL PICKUP SYSTEM

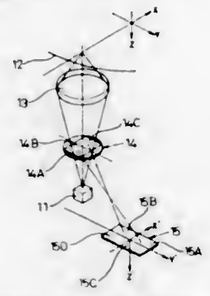
Keun Y. Yang, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Continuation of Ser. No. 193,585, Feb. 8, 1994, abandoned. This application Aug. 28, 1995, Ser. No. 520,294

Claims priority, application Rep. of Korea, Feb. 8, 1993, 1993-1658

Int. Cl.[6] G11B *07/00*

U.S. Cl. 369—103 **9 Claims**



1. An optical pickup system having means for detecting focus and tracking errors without using a diffraction grating comprising:

a laser diode for emitting laser beams;

an objective lens for focusing the laser beam from the laser diode onto an optical disc;

a two division hologram positioned between the laser diode and the objective lens for diffracting beams after separating a reflected beam reflected at the optical disc and passed through the objective lens into a first laser beam and a second laser beam along an tangential lens to track of the optical disc; and

a four division photodetector including a first to a fourth light reception areas, said four division photodetector having focused thereon the two laser beams diffracted by the two division hologram wherein the two division hologram has a first and a second hologram, a position of an objective beam of the first hologram is at a position after the photodetector, and a holographic focus point of the second hologram is at a position before the photodetector.

5,553,051

INCREASED INENSITY OPTICAL RECORDING MEDIUM WITH ADJACENT GROOVES OF DIFFERENT OPTICAL DEPTH AND A METHOD AND APPARATUS FOR REPRODUCING THE SAME

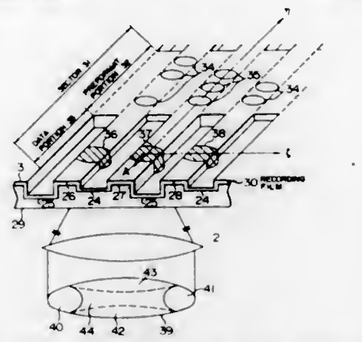
Hisataka Sugiyama, Kodaira; Takeshi Maeda, Kokubunji; Hiroshi Ide, Kodaira; Kazuo Shigematsu, Saitama-ken, and Masaru Ito, Sagamihara, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 582,095, Sep. 14, 1990, abandoned, which is a continuation-in-part of Ser. No. 239,289, Sep. 1, 1988, Pat. No. 4,980,877. This application Mar. 10, 1995, Ser. No. 402,304

Claims priority, application Japan, Sep. 18, 1989, 1-239979

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—109 **24 Claims**



1. An optical recording medium on which information is recorded by irradiating said medium with a light spot focused through a focusing lens to cause a local characteristic change therein and recorded information is reproduced by said light spot irradiation and detection of reflected light from the medium through said focusing lens, said optical recording medium including: groves formed in a same substantially horizontal surface of said medium extending substantially in parallel to a base surface of said medium, adjacent grooves having different optical depths from each other with respect to said same substantially horizontal surface and which extend in a direction in which said light spot is moved relative to said medium and which are alternately and periodically formed in a direction perpendicular to said relative movement direction of said light spot such that the adjacent grooves thereof can be simultaneously covered by said light spot; and recording regions provided on areas of said substantially horizontal surface which is a track center formed between said adjacent grooves.

5,553,052

INCLINATION OF AN OBJECTIVE LENS IN AN OPTICAL INFORMATION SYSTEM

Masahiro Oono; Hisashi Konno; Toshiyuki Kase; Katsuki Hayashi, and Hiroshi Nishikawa, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 2, 1994, Ser. No. 204,655

Claims priority, application Japan, Mar. 2, 1993, 5-066009; Mar. 2, 1993, 5-066010; Mar. 2, 1993, 5-066011; Mar. 2, 1993, 5-066012; Mar. 19, 1993, 5-085637; Apr. 14, 1993, 5-111103

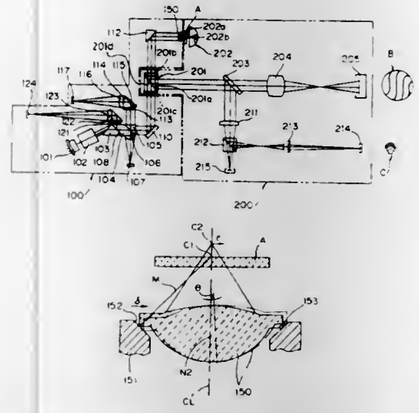
Int. Cl.[6] G11B *7/00*; G02B *7/00*

U.S. Cl. 369—112 **50 Claims**

22. A lens supporting apparatus which supports an objective lens of an optical data recording and reproducing apparatus in which data is optically recorded on and reproduced from a recording medium, which is placed parallel to a reference surface, comprising:

an oblique annular lens supporting surface inclined relative to a peripheral edge of said objective lens for supporting said objective lens in a manner such that an inclination of said objective lens can be adjusted with respect to said reference surface;

means for moving said lens supporting surface to bring a peripheral edge of said objective lens into contact with an adjusting device to thereby move said objective lens along said lens supporting surface in order to vary an inclination of said objective lens relative to said reference surface.



5,553,053

OPTICAL DISK DEVICE INCLUDING A SUPPORT MEMBER FOR MOVABLY SUPPORTING AN OBJECTIVE LENS IN FOCUSING AND RADIAL DIRECTIONS WITH RESPECT TO AN OPTICAL DISK AND A DETECTING DEVICE FOR DETECTING A POSITION OF THE OBJECTIVE LENS

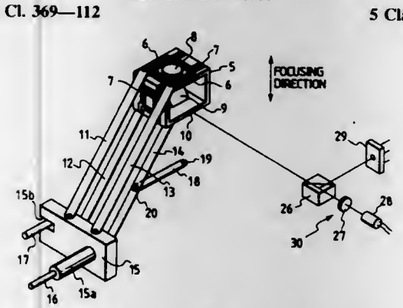
Nobuaki Date, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 275,659, Jul. 15, 1994, Pat. No. 5,450,386, which is a continuation of Ser. No. 857,841, Mar. 26, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 477,644

Claims priority, application Japan, Apr. 5, 1991. 3-100506; Apr. 5, 1991, 3-100507; Apr. 5, 1991, 3-100508; Jun. 25, 1991, 3-178897

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—112 **5 Claims**



1. An optical disk device for effecting at least one of recording of information on and reproduction of information from a recording medium by use of a light beam emitted from a light source, said disk device comprising:

a light source for generating a light beam to irradiate the recording medium, said light source being immovable with respect to a device mount;

an objective lens for focusing the light beam from said light source onto the recording medium to effect at least one of recording of information on and reproduction of information from the recording medium;

a box body for holding said objective lens;

a support member for supporting said box body to be movable with respect to said device mount in tracking, focusing and seek directions;

a mirror, provided in said box body, for guiding the light beam from said light source to said objective lens;

detecting means for detecting a displacement of said box body in a focusing direction of the light beam with respect to the device mount; and

an optical axis displacement mechanism for causing displacement of an optical axis of the light beam on the basis of a detection by said detecting means.

5,553,054

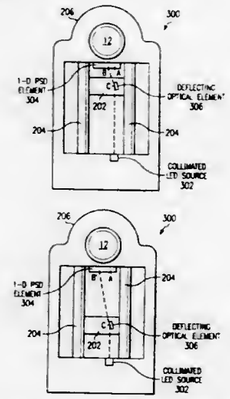
COARSE POSITION SENSOR, AND METHOD FOR LOCATING SAME, IN AN OPTICAL DISK DRIVE

Timothy S. Gardner, Tucson, Ariz.; Tomoaki Kimura, Fujisawa, Japan, and Delbert A. Hansen, Tucson, Ariz., assignors to International Business Machines Croporation, Armonk, N.Y.

Filed Feb. 6, 1995, Ser. No. 384,176

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—117 **11 Claims**



1. A coarse position sensor for an optical disk drive, comprising:

a coarse carriage movable radially relative to an optical recording disk between inner and outer limits in a carriage frame;

a light source mounted proximate the outer limit of the carriage frame to project a light beam towards the inner limit;

a position sensitive device, mounted proximate the inner limit of the carriage frame, having a photosensitive surface facing said light source and a substantially linear output representative of a location of a beam spot irradiated from the light beam on said photosensitive surface relative to a reference position;

a deflecting optical element mounted to said coarse carriage to deflect the light beam at a fixed angle thereto whereby the location of the beam spot on said photosensitive surface varies with the distance of said coarse carriage from the inner limit; and

a coarse position signal generator coupled to said position sensitive device for generating a coarse position signal representative of the position of said coarse carriage.

5,553,055

a remote bus transporting data representative of each accessed

ATM cell transmission stopping means for stopping an operation

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5,553,055

DISC PLAYBACK METHOD

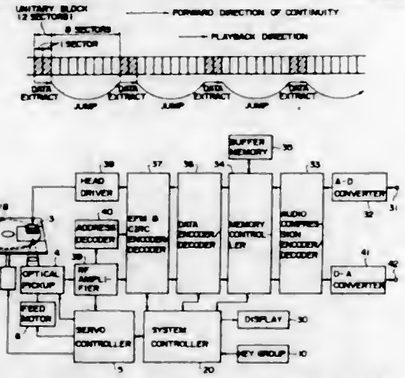
Teppei Yokota, Chiba; Nobuyuki Kihara, Tokyo, and Junichi Aramaki, Chiba, all of, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 150,413, Nov. 10, 1993, abandoned. This application Apr. 19, 1995, Ser. No. 426,464

Claims priority, application Japan, Nov. 12, 1992, 4-327209

Int. Cl.[6] G11B *7/00;11/00;20/00*

U.S. Cl. 369—124 **22 Claims**



1. A method for fast playback in cue/review modes of a disc to reproduce therefrom compressed audio data read burstly in a predetermined amount as a unit, said method comprising the steps of:

predetermining a unitary block of data which consists of n times (where n is a positive integer) the decodable minimum unitary amount of the compressed data;

sequentially extracting, out of the informationally continuous data on said disc, the data of said unitary block at an interval of m unitary blocks (where m is a positive integer greater than 1) in the forward direction of the continuity of the data; and

producing audio signals from the extracted data.

5,553,056

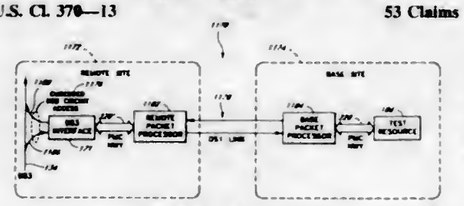
PACKETIZED REMOTE TEST SYSTEM FOR A TELEPHONE NETWORK

Jeffery S. Bronte; Mark J. Lever, both of San Diego; Kevin T. Pope, Poway, and Paul R. Hartmann, Escondido, all of Calif., assignors to Applied Digital Access, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 118,443, Sep. 7, 1993, and Ser. No. 862,470, Apr. 2, 1992, abandoned. This application Oct. 24, 1994, Ser. No. 330,214

Int. Cl.[6] H04B *17/00*

U.S. Cl. 370—13 **53 Claims**



DSX TO DSX ARCHITECTURE

1. A system for remotely accessing any one of a plurality of asynchronous signals embedded in a signal, comprising:

a communications channel connecting a base subsystem to a remote subsystem;

the remote subsystem, comprising:

an access circuit receiving and accessing the asynchronous signals embedded in the signal;

a remote bus transporting data representative of each accessed asynchronous signal;

a remote packet processor connected to the remote bus and the communications channel, wherein said remote packet processor packetizes the data received from the remote bus and transmits the packetized data to the base subsystem across the communications channel, and wherein said remote packet processor receives packetized data from the base subsystem across the communications channel and de-packetizes the packetized data for transmission to the remote bus;

the base subsystem, comprising:

a base bus transporting data representative of each accessed asynchronous signal;

a base packet processor connected to the base bus and the communications channel, wherein said base packet processor receives packetized data from the remote subsystem across the communications channel and de-packetizes the packetized data for transmission to the base bus, and wherein said base packet processor packetizes the data received from the base bus and transmits the packetized data to the remote subsystem across the communications channel;

a test resource that receives data from the base bus, wherein said test resource provides testing functions, and wherein said test resource transmits data to the base bus.

5,553,057

AIS TRANSMISSION METHOD IN ATM COMMUNICATION SYSTEM, TRANSMISSION SIDE ATM UNIT AND ATM COMMUNICATION SYSTEM

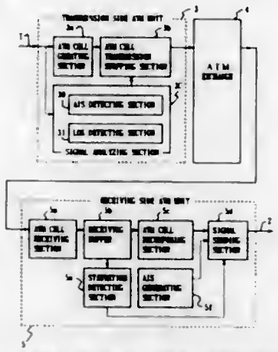
Mikio Nakayama, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Dec. 1, 1994, Ser. No. 347,950

Claims priority, application Japan, Feb. 10, 1994, 6-016173

Int. Cl.[6] H04Q *11/04*

U.S. Cl. 370—13 **19 Claims**



11. An AIS (Alarm Indication Signal) transmission unit in an ATM communication system wherein a transmission side ATM unit is disposed between a communication line on a transmission side and a switching unit, and a receiving side ATM unit is disposed between said switching unit and a communication line on a receiving side; the transmission side ATM unit comprising:

ATM cell generating means for converting a signal received from said communication line on the transmission side into ATM cells and for transmitting the cells to said receiving side ATM unit via said ATM switching unit;

signal analyzing means for analyzing the signal transmitted from said communication line on the transmission side to detect whether an analyzed signal is an AIS (Alarm Indication Signal) signal indicating a loss of service on the transmission side and for issuing an ATM cell stop command when said signal is the AIS signal; and

ATM cell transmission stopping means for stopping an operation of said ATM cell generating means for a certain period of time when the ATM cell stop command is issued from said signal analyzing means; and

said receiving said ATM unit comprising;

ATM cell receiving means for receiving the ATM cells transmitted from said transmission side ATM unit;

a receiving buffer for temporarily storing the ATM cells received by said ATM cell receiving means and for appropriately outputting the ATM cells;

ATM cell decomposing means for decomposing the ATM cells output by said receiving buffer to restore to a signal transmittable to said communication line on the receiving side;

starvation detecting means for monitoring a storage state of said receiving buffer and for issuing an AIS transmission command when said starvation detecting means detects that no ATM cells are stored in said receiving buffer;

AIS generating means for generating the AIS signal indicating a loss of service in accordance with the AIS transmission command issued by said starvation detecting means; and

signal sending means for sending the AIS signal generated by said AIS generating means to said communication line on the receiving side.

5,553,058

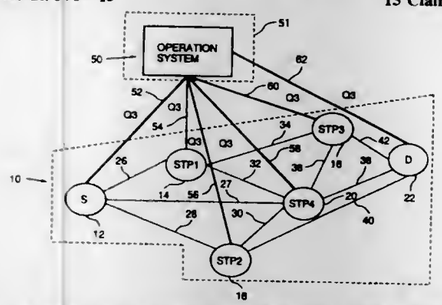
CENTRALIZED LOAD MINIMIZING METHOD FOR PERIODICAL ROUTING VERIFICATION TESTS SCHEDULING

Roch Glitho, Montreal, Canada, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jul. 10, 1995, Ser. No. 499,814

Int. Cl.[6] H04L *12/56;* **H04J** *3/14*

U.S. Cl. 370—13 **15 Claims**



1. A method for scheduling verification tests to audit routing information in a packet switching network comprising a plurality of packet switching nodes and a plurality of bi-directional links each interconnecting a distinct pair of said nodes, the packet switching network having associated therewith a telecommunications management network comprising an operation system connected to each of said nodes through respective interfacing links, said method being controlled by the operation system and comprising the steps of:

selecting a test time duration period for scheduling the verification tests of the routing information in the network,

selecting a number of nodes to be tested and determining sub-tests to be made to all destination nodes from each node in the network to be tested,

generating a time test interval based on the quotient of the test time duration period and a total number of sub-tests to be conducted from each node to be tested, and

scheduling the verification tests during the time duration period by staggering starting of each verification test by an interval which is a function of the time test interval so as to disperse the traffic loading induced on the network by the verification tests.

5,553,059

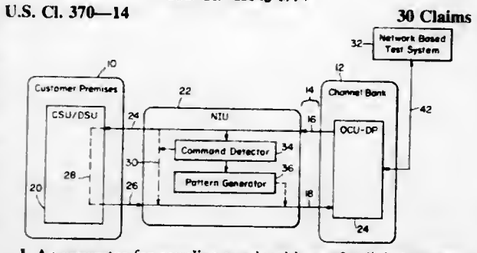
NETWORK INTERFACE UNIT REMOTE TEST PATTERN GENERATION

Earl A. Emerson, Somerset; Henry J. Gonzalez, Piscataway, and Kyung-Yeop Hong, Belle Mead, all of N.J., assignors to Integrated Network Corporation, Bridgewater, N.J.

Continuation of Ser. No. 159,807, Nov. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 29,876, Mar. 11, 1993, Pat. No. 5,394,145. This application May 26, 1995, Ser. No. 440,297

Int. Cl.[6] H04J *3/14*

U.S. Cl. 370—14 **30 Claims**



1. An apparatus for coupling to a local loop of a digital communication channel having first and second directions of transmission comprising:

a) a monitor circuit for monitoring said communication channel for a digital control command transmitted from a remote test system in said first direction of transmission; said control command comprising a generate-pattern command or a loopback-test command;

b) a loopback circuit for receiving digital test signals transmitted by said test system in said first direction of transmission and for returning said digital test signals to said test system in said second direction of transmission in response to said loopback-test command; and wherein the digital test signals that are returned are used by said test system to determine if communication errors occur in either said first or said second directions of transmission; and

c) a pattern-generation circuit for generating a plurality of predetermined digital test data sequences which are transmitted to said test system over said communication channel in said second direction of transmission in response to said generate-pattern command; and wherein said test data sequences are used by said test system to determine if communication errors occur in said second direction of transmission.

5,553,060

METHOD FOR MAINTAINING VIRTUAL CONNECTIONS GIVEN AN AT LEAST PARTIAL OUTAGE OF CONNECTING PATHS

Sebastian Obermanns, Munich, and Richard Schoonhoven, Olching, both of, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

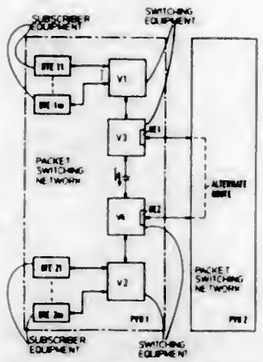
Continuation of Ser. No. 265,657, Jun. 24, 1994, abandoned. This application Sep. 28, 1995, Ser. No. 534,923

Claims priority, application European Pat. Off., Jun. 25, 1993, 93110218

Int. Cl.[6] H04L *12/56*

U.S. Cl. 370—16 **16 Claims**

1. A method for setting up virtual connections between a calling subscriber equipment and a called subscriber equipment, wherein the calling subscriber equipment is connected to a first switching equipment of a first packet switching network and the called subscriber equipment is connected to a second switching equipment of the first packet switching network, a third switching equipment of the first packet switching network is connected to the first switching equipment of the first packet switching network and a fourth switching equipment is connected to the second switching equipment of the first packet switching network, a first network interface location connects the third switching equipment of the first packet switching network to a second packet switching net-



work and a second network interface location connects the second packet switching network to the fourth switching equipment of the first packet switching network, said method comprising the steps of:

transmitting a first call request from the calling subscriber equipment to the first switching equipment of the first packet switching network requesting connection with the called subscriber equipment;

storing address information identifying the second network interface location at the third switching equipment of the first packet switching network;

defining a virtual connection path for the first call request between the third switching equipment of the first packet switching network and fourth switching equipment of the first packet switching network within the first packet switching network;

determining that the virtual connection path between the third and fourth switching equipment of the first packet switching network within the first packet switching network is unavailable;

after determining that the virtual connection path between the third and fourth switching is unavailable, automatically transmitting a second call request from the first network interface location to a first switching equipment of the second packet switching network, the second call request containing the address information identifying the second network interface location;

performing a search for a virtual connection path within the second packet switching network, from the first switching equipment of the second packet switching network to the second network interface location; and

creating a virtual connection between the first and second network interface locations within the second packet switching network.

5,553,061

PACKET PROCESSOR HAVING SERVICE PRIORITY AND LOSS PRIORITY FEATURES

William N. Waggener, Jr., and Nimish Shah, both of Sarasota, Fla., assignors to Loral Fairchild Corporation, Syosset, N.Y.

Filed Jun. 27, 1994, Ser. No. 265,968

Int. Cl.[6] H04J *3/14*

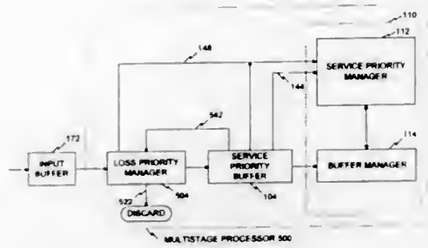
U.S. Cl. 370—17 **26 Claims**

15. A method for admitting a packet into a buffer, comprising the steps of:

(a) determining a loss priority and a service priority for a received packet;

(b) examining loss priority fullness and total buffer fullness of the buffer; and

(c) storing said received packet in the buffer based on said service priority of said received packet if said loss priority fullness and said total buffer fullness are below predetermined levels.



5,553,062

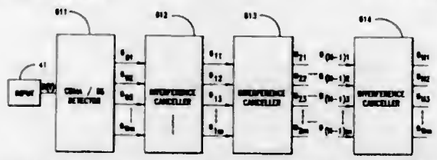
SPREAD SPECTRUM CDMA INTERFERENCE CANCELER SYSTEM AND METHOD

Donald L. Schilling, Sands Point; John Kowalski, and Shimon Moshavi, both of New York, all of N.Y., assignors to Inter-Digital Communication Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 51,017, Apr. 22, 1993, Pat. No. 5,363,403. This application Jul. 26, 1994, Ser. No. 279,477

Int. Cl.[6] H04B *1/707*; **H04T** *13/04*

U.S. Cl. 370—18 **22 Claims**



16. A spread-spectrum code division multiple access (CDMA) interference-canceler system for reducing interference in a spread-spectrum CDMA receiver having N channels, with each of the N channels identified by a distinct chip-code signal, comprising:

a CDMA/DS detector for detecting and despreading a received spread-spectrum signal having a plurality of channels as a plurality of despread, spread-spectrum channels;

a plurality of serially connected interference cancelers each for processing the plurality of despread, spread-spectrum channels and for outputting a respective plurality of estimates of the plurality of channels; and and

a combiner for combining, using the outputs of the plurality of interference cancelers, a plurality of estimates of a particular channel to generate an averaged estimate.

5,553,063

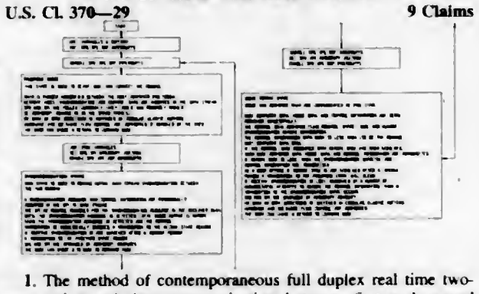
VOICE OVER DATA COMMUNICATION SYSTEM

William D. Dickson, 17955 Caminito Pinero, San Diego, Calif. 92128

Filed Sep. 12, 1994, Ser. No. 304,403

Int. Cl.[6] H04B *1/56*; **H04L** *5/24*;*7/04*

U.S. Cl. 370—29 **9 Claims**



1. The method of contemporaneous full duplex real time two-way voice and data communication between first and second computer terminal locations comprising:

establishing a value for the number of bytes in a data packet;

establishing, for each communication session values for the number of bytes and the location within each data packet dedicated to the transmission of voice information, control information, and data transmission respectively;

transmitting from each of the first and second computer terminal locations a sequence of data packets with synchronization bytes in certain ones of the voice byte locations, the transmitting step including modulating carrier signal with the data packets and transmitting the modulated carrier signal over a voice transmission path;

receiving at each of the first and second computer terminal locations the transmitted sequence of data packets, and upon verified receipt thereof transmitting an acknowledgement of the receipt to indicate the establishment of synchronization between the two locations, the step of receiving including demodulating the modulated carrier signal to recover the data packets; and

thereafter transmitting from each of the first and second computer terminal locations a sequence of data packets with the voice byte locations thereof dedicated to the transmission of voice information.

5,553,064

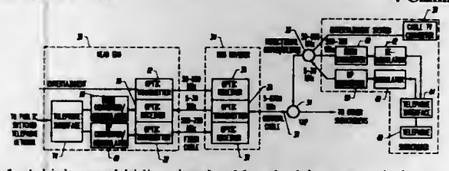
HIGH SPEED BIDIRECTIONAL DIGITAL CABLE TRANSMISSION SYSTEM

Thomas M. Paff, Los Altos, and Hatch Graham, Morgan Hill, both of Calif., assignors to Stanford Telecommunications, Inc., Sunnyvale, Calif.

Filed Apr. 5, 1994, Ser. No. 223,487

Int. Cl.[6] H04J *4/00*

U.S. Cl. 370—50 **4 Claims**



1. A high speed bidirectional cable television transmission system for providing voice interface between a public switched telephone network and system subscribers comprising

a television transmission cable,

a head end unit for continuous transmission of voice and video data on said cable to a plurality of cable television subscriber receivers attached to said cable, said continuous transmission including time division multiplexing of data in a plurality of frequency bands, said head end unit including a telephone interface for transmitting and receiving voice data, a quadrature phase shift keyed (QPSK) modulator for receiving and modulating digitized voice data form a public switched telephone network, a mixer for increasing frequency of said QPSK modulated data, a digital to analog conversion means for converting said QPSK modulated data to analog form for transmission on said cable, a burst demodulator including sine and cosine mixers to extract in-phase and quadrature phase encoded data, a transversal matched filter to identify a Barker code at the beginning of a burst of data, and a differential detector operating in synchronization with a detected Barker code for detecting in-phase and quadrature phase encoded data,

a plurality of transceivers, each attached to said cable for receiving said continuous transmission of voice and video data, each of said transceivers being assigned an identification number and at least one voice channel for selectively accessing data, each transceiver including transmitting means for transmitting voice data through said cable and said head end unit to the public switched telephone network using time division multiple access transmission of bursts of data in said plurality of frequency bands, a quadrature phase shift keyed (QPSK) modulator for receiving and modulating digitized voice data from a telephone, a mixer for increasing frequency of said QPSK modulated data, and a digital to analog conversion means for converting said QPSK modulated to analog form for transmission on said cable to said head end unit.

5,553,065

Patent Not Issued For This Number

5,553,066

DATA TRANSFER SYSTEM INCLUDING EXCHANGE

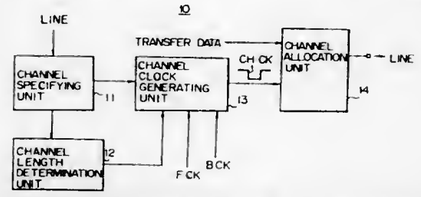
Yoshiharu Kato; Ryouzi Takano; Takashi Nara; Takashi Hatano, all of Kawasaki, and Yoshio Morita, Yokohama, all of, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 951,776, Sep. 28, 1992, abandoned. This application Sep. 16, 1994, Ser. No. 307,109

Claims priority, application Japan, Sep. 27, 1991, 3-249121

Int. Cl.[6] H04J *3/16*

U.S. Cl. 370—58.1 **9 Claims**



1. An exchange performing a data transfer between a plurality of subscriber terminal equipment by sharing a plurality of channels in time division multiplex, comprising:

a channel length specifying means for receiving respective channels and specifying a variable total bit length of each channel;

a clock supplying means for supplying a channel clock in synchronism with the variable total bit length specified by the channel length specifying means, said channel clock indicating a breakpoint between adjacent channels; and

an allocation means for allocating respective channels a consecutive serial bit train included in a data frame of a time division multiplex mode in synchronization with said channel clock supplied from said clock supplying means.

5,553,067

GENERATION OF CHECKING DATA

Christopher P. H. Walker, Portishead, and Peter W. Thompson, Horfield, both of, United Kingdom, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Israel

Continuation of Ser. No. 258,979, Jun. 10, 1994, abandoned. This application Oct. 7, 1994, Ser. No. 319,951

Claims priority, application United Kingdom, Jun. 11, 1993, 9312135

Int. Cl.[6] H04J *3/24*

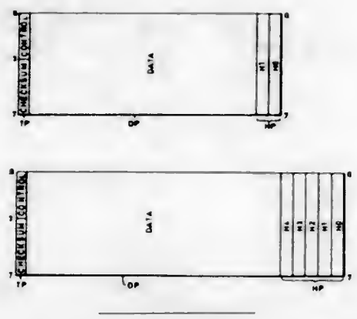
U.S. Cl. 370—60 **23 Claims**

1. A method of modifying a message packet which comprises a plurality of sets of information bits constituting an information portion and a set of checking bits, all sets containing the same number of bits in a sequence of bit locations between a bit location of least significance to a bit location of most significance, and each checking bit having been generated by taking the logical sum of bits having the same significance in all of the sets. the method comprising:

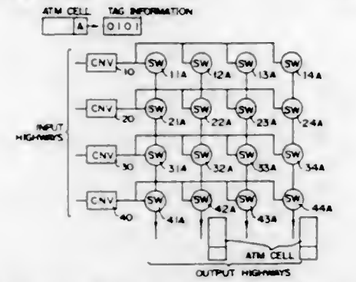
modifying the information portion of said message packet; and

altering the checking bits by using only the set of checking bits in the unmodified message packet and the modifications to the information portion.

plurality of occurrences of an address time slot associated with the data link module; and



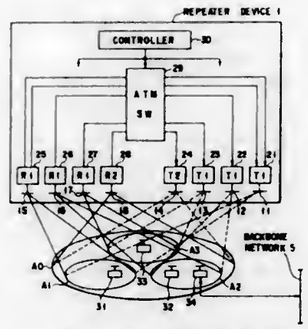
5,553,068
ATM CELL BROADCASTING SYSTEM
Yasuhiro Aso, Tokyo; Atsuhisa Takahashi, Kawasaki; Satoshi Kakuma, Kawasaki, and Yoshihiro Uchida, Kawasaki, all of, Japan, assignors to Fujitsu Limited, Kanagawa, Japan
Continuation of Ser. No. 375,221, Jan. 19, 1995, abandoned, which is a continuation of Ser. No. 671,526, Mar. 19, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 479,865
Claims priority, application Japan, Mar. 19, 1990, 2-066834
Int. Cl.[6] H04Q 11/04
U.S. Cl. 370—60 13 Claims



1. An asynchronous transfer mode cell broadcasting system comprising:
a switch module including a plurality of switches for exchanging asynchronous transfer mode cells inputted from an input line connected to N switches of said plurality of switches; and
a tag information adder, provided in the input line, for adding tag information including N bits, each bit being respectively allocated to a corresponding one of said N switches, said tag information indicating whether each of said N switches outputs a cell from the input line according to a respective identifier assigned to an asynchronous transfer mode cell so that said asynchronous transfer mode cells are outputted to a plurality of output lines connected to the switches designated by the tag information.

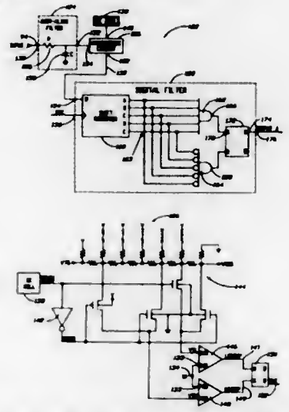
5,553,069
RADIOCOMMUNICATION SYSTEM
Motoharu Ueno, Yokohama; Yoshinari Kumaki; Katsuya Nonin, both of Kawasaki; Eiji Kamagata, Yokohama, and Shigeo Matsuzawa, Tokyo, all of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jul. 29, 1994, Ser. No. 282,747
Claims priority, application Japan, Jul. 30, 1993, 5-190269
Int. Cl.[6] H04B 7/204; H04L 12/56
U.S. Cl. 370—75 36 Claims

1. A radiocommunication system comprising:
a repeater for providing a radiocommunication service over a predetermined service area; and



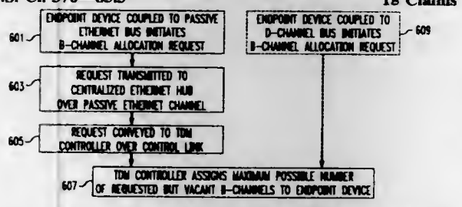
a radiocommunication terminal for communicating with said repeater, wherein said repeater comprises:
first communicating means for providing a radio channel by a wide beam covering the whole of said service area; and
second communicating means for providing a radio channel by spot beams covering subareas within said service area, and wherein said radiocommunication terminal can be directly communicated with said first communicating means and said second communicating means.

5,553,070
DATA LINK MODULE FOR TIME DIVISION MULTIPLEXING CONTROL SYSTEMS
Robert E. Riley, 1131 Winarose St., Jackson, Miss. 39211
Filed Sep. 13, 1994, Ser. No. 305,253
Int. Cl.[6] H04J 3/02
U.S. Cl. 370—85.1 5 Claims



1. In a data link module having means for producing output control signals in response to input signals received on a data bus input terminal on a time division basis during an associated one of a plurality of time division multiplexing time slots, the improvement being an input signal conditioner comprising:
A. means for initiating generation of an intermediate data pulse in response to an input signal present at the data bus input terminal and exceeding a pulse initiation threshold voltage;
B. means for terminating generation of the intermediate data pulse in response to an input signal present at the data bus input terminal and decreasing beneath a pulse termination threshold voltage different from the pulse initiation threshold voltage;
C. an intermediate pulse continuity checker for determining whether the intermediate data pulse is extant at each of a plurality of occurrences of an address time slot associated with the data link module; and
D. means responsive to the intermediate pulse continuity checker for producing a conditioned input signal only when it is determined whether the intermediate data pulse is extant during each of said address time slots.

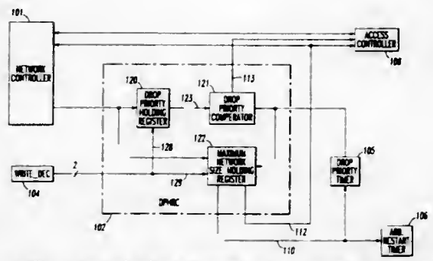
5,553,071
COMMUNICATION SYSTEM TOPOLOGY PROVIDING DYNAMIC ALLOCATION OF B-CHANNELS
William L. Aranguren, Ocean Township, Monmouth County, and Albert D. Baker, Lincroft, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.
Filed Oct. 14, 1994, Ser. No. 323,184
Int. Cl.[6] H04L 12/413
U.S. Cl. 370—85.3 18 Claims



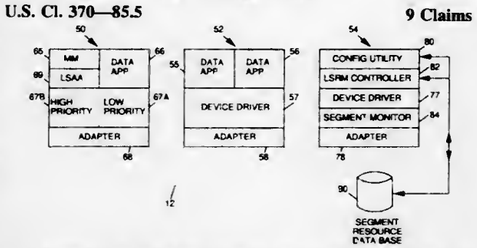
1. A centralized Ethernet hub being adapted for use in a communications system including:
(i) a TDM bus adapted for connection to one or more endpoint devices;
(ii) a TDM bus controller for providing a set of B-Channels comprised of a plurality of time-division multiplexed B-Channels on the TDM bus;
(iii) a passive bus for providing access to the set of B-Channels; and
(iv) a plurality of endpoint devices, each endpoint device including channel allocation request means coupled to at least one of the passive bus and the TDM bus for requesting one or more B-Channels from the set of B-Channels;
characterized in that the Ethernet hub provides:
(a) a control link for coupling the centralized Ethernet hub to the TDM bus controller;
(b) a plurality of Ethernet communication channels; and
(c) channel allocation means responsive to the channel allocation request means of an endpoint device to allocate one or more individual B-Channels of a single B-Channel set amongst a plurality of endpoint devices.

5,553,072
COMMUNICATION APPARATUS AND METHOD
Kenneth E. Daggett; Albert W. Crew, both of Murrysville, and James M. Mussler, Bethel Park, all of Pa., assignors to Northrop Grumman Corporation, Los Angeles, Calif.
Filed Jan. 30, 1995, Ser. No. 380,383
Int. Cl.[6] H04L 12/413
U.S. Cl. 370—85.3 22 Claims

1. An apparatus for media access control of a first node in a network, comprising:
a. a priority controller for providing a transmit authorization signal authorizing said first node to transmit to said network through a powerline communication medium responsive to a powerline carrier signal, said authorization signal being responsive to a priority of said first node in relation to other nodes in said network, said priority controller receiving said priority from a node network controller in said first node; and
b. an access controller for receiving said transmit authorization signal, said access controller being connected to said priority controller and said node network controller, said access controller communicating a transmit request signal to said node network controller responsive to said transmit authorization signal.



5,553,073
TOKEN RING NETWORK
Keith Barraclough, Romsey; Peter Cripps, Locks Heath Southampton; Adrian Gay, Fareham, and Alan Jones, Eastleigh, all of, United Kingdom, assignors to IBM Corporation, Armonk, N.Y.
Continuation of Ser. No. 245,092, May 17, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 474,826
Claims priority, application United Kingdom, May 17, 1993, 9310119
Int. Cl.[6] H04L 12/42
U.S. Cl. 370—85.5 9 Claims



1. A method of operating a token ring local area network, in which a plurality of nodes are arranged in a ring configuration for circulating a token, a node communicating by sending a transmission over the network when it has control of the token, the network supporting at least three levels of communication, designated first, second and third in decreasing order of importance, wherein said first and second priority level communications require a guaranteed bandwidth and latency if important for said first priority level communications, but wherein said second priority level communications are relatively insensitive to latency, the network including a LAN segment resource manager (LSRM) for maintaining information about the first and second priority level communications currently in progress, the method comprising he steps of:
assigning maximum throughput allocations to the three priority levels, and storing said allocations in the LSRM;
sending a request from a node to the LSRM for permission to commence a first or second priority level communication, together with a desired throughput allocation;
determining at the LSRM whether or not to award the requesting node the desired throughput allocation, dependent on currently available throughput, and responding accordingly to the requesting node;
determining at the LSRM, for first priority level communications, the maximum time for which the requesting node can retain control of the token for a single transmission before release of the token, and responding accordingly to the requesting node;
recording at the LSRM any new allocation of throughput;
commencing communications at the requesting node in accordance with the response from the LSRM and

monitoring at the LSRM communications on the token ring, and

5,553,077
METHOD AND DEVICE FOR AUTOMATIC

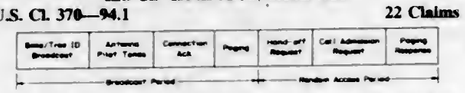
of said second group of network protocol data units corre-

monitoring at the LSRM communications on the token ring, and comparing the token ring communications with the recorded throughput allocations to verity that nodes are adhering to their throughput allocations.

5,553,074
TRANSMISSION FORMAT IN PACKET BASED COMMUNICATIONS

Anthony S. Acampora, Freehold, N.J., assignor to Trustees of Columbia University in the City of New York, Morningside Heights, N.Y.

Filed Mar. 4, 1994, Ser. No. 206,442
Int. Cl.[6] H04L *12/56;* **H04B** *7/26*
U.S. Cl. 370—94.1 **22 Claims**



1. A packet based communications method for communicating between at least one base station and a plurality of users, comprising:

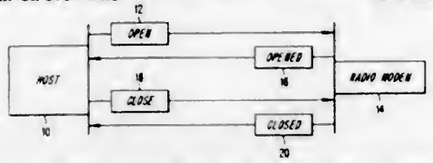
using a transmission frame to carry formatted, time-sequenced messages, the transmission frame comprising (i) a frame marker field which delimits the transmission frame, (ii) a signaling field which comprises communications system information, and (iii) a communication field which comprises user-provided/destined information, the frame marker field, signaling field and communication field being in a predetermined order and each one of the fields having a predetermined length; and

transmitting the transmission frame carrying the formatted messages over at least one communications channel between users and the at least one base station.

5,553,075
PACKET DATA PROTOCOL FOR WIRELESS COMMUNICATION

Hakan Westin, Marsta, Sweden, assignor to Ericsson GE Mobile Communications Inc., Research Triangle Park, N.C.

Filed Jun. 22, 1994, Ser. No. 264,056
Int. Cl.[6] H04J *3/24*
U.S. Cl. 370—94.1 **11 Claims**



1. A method for communicating over a network between a host and a remote unit comprising the steps of:

transmitting one of a first group of network protocol data units for communicating in a host-to-remote unit direction, said first group including an open protocol data unit for establishing a connection with said remote unit, a data protocol data unit including data for receipt by said remote unit, a control protocol data unit for sending control commands to said remote unit and a close protocol data unit for closing said connection with said remote unit; and

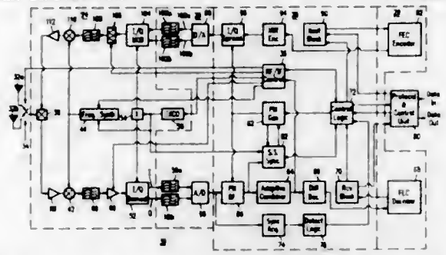
providing a second group of network protocol data units for communicating in a remote unit-to-host direction, said second group including an opened protocol data unit for confirming a connection established by said open protocol data unit, a data report protocol data unit for indicating if forwarding of said data by said data protocol data unit was successful, a control report protocol data unit for indicating a result associated with said control protocol data unit, a status protocol data unit for indicating changes in status of said remote unit, and a closed protocol data unit responsive to said close protocol unit, each of said second group of network protocol data units corresponding to one of the network protocol data units in said first group, respectively; and

transmitting a corresponding one of said network protocol data units in said second group to said host in response to said one of said first group of network protocol data units received by said remote unit.

5,553,076
METHOD AND APPARATUS FOR A WIRELESS LOCAL AREA NETWORK

Saman Behtash, Berkeley; Christopher Flores, Oakland, and Adel Ghanem, Danville, all of Calif., assignors to TCSI Corporation, Berkeley, Calif.

Filed May 2, 1994, Ser. No. 236,588
Int. Cl.[6] H04J *3/16*
U.S. Cl. 370—95.3 **45 Claims**



1. A method for wireless communication between a plurality of wireless terminals and a base station, said method comprising:

transmitting periodically by said base station, at the start of a first period of time, a synchronization signal and a status signal, transmitted over an initial period of time measured from the commencement of said first period of time, wherein said synchronization signal is a clocking signal and wherein said status signal represents command signal controlling communication to or from said base station;

transmitting a request signal by one of said plurality of wireless terminals, in a second period of time after a predetermined period measured from the commencement of said second period of time, said request signal indicating the identity of the one of said plurality of wireless terminals requesting subsequent transmission, the identity of one or more wireless terminals to whom the subsequent transmission is intended, the number of periods of time required for the subsequent transmission, and the frequency of the subsequent transmission;

receiving by said base station said request signal and responding thereto by transmitting at the start of a third period of time, different from said first period of time, a synchronization signal, a busy status signal, and an authorization signal, indicating the identity of the one wireless terminal authorized to transmit, the identity of one or more wireless terminals authorized to receive, a starting period of time, and the number of periods of time;

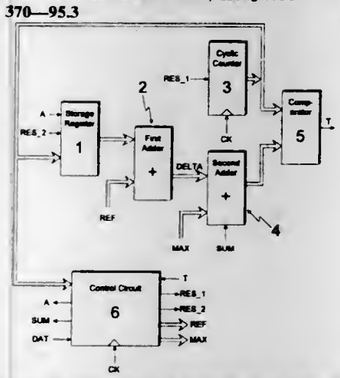
transmitting by said base station at the start of said starting period of time, a synchronization signal and a first reserve status signal; and

transmitting a data signal by the one wireless terminal immediately after the transmission of said first reserve status signal by said base station.

5,553,077
METHOD AND DEVICE FOR AUTOMATIC SYNCHRONISATION OF DATA BURSTS

Francisco J. Martinez Garcia, Madrid, and Francisco Diaz Molina, Portal, both of, Spain, assignors to Alcatel N.V., Rijswijk, Netherlands

Filed Dec. 27, 1994, Ser. No. 364,129
Claims priority, application Spain, Dec. 31, 1993, 9302743
Int. Cl.[6] H04B *7/212;* **H04J** *3/06*
U.S. Cl. 370—95.3 **6 Claims**



1. A device for automatic synchronisation of dam bursts in a time division multiple access communication protocol, the device to compensate for drifting with respect to an external reference that generates an external timebase, the device for synchronizing an internal timebase corresponding to when a data burst can be accurately received and transmitted by a cordless terminal, the device comprising:

a) a counter (3) that cyclically counts,

b) a control circuit (6) that receives a data signal (DAT) generated from the external reference on a periodic basis and for only some of the time, and that generates a burst reception signal (A) based upon the detection of the burst header in the data signal (DAT);

c) means responsive to the burst reception signal (A), the count of the counter (3), and a reference count (REF), representing the bit count when the burst reception signal (A) should be generated based upon the external timebase, for compensating the internal timebase based upon the difference between the count of the counter when the burst reception signal (A) was generated and the reference count (REF).

5,553,078
COMMUNICATION CONTROL SYSTEM BETWEEN PARALLEL COMPUTERS

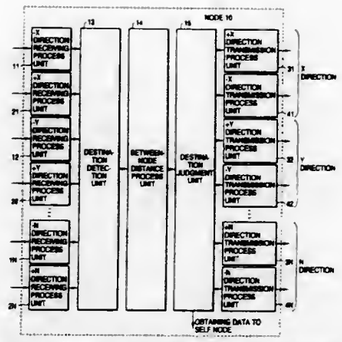
Takeshi Horie, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 584,052, Sep. 18, 1990, abandoned. This application Jan. 13, 1995, Ser. No. 372,825
Claims priority, application Japan, Oct. 26, 1989, 1-279055; Sep. 18, 1990, 1-240186
Int. Cl.[6] H04J *3/26*
U.S. Cl. 370—94.3 **11 Claims**

1. A communication control system provided in parallel nodes including adjacent nodes for performing a broadcast communication in an n-dimensional network between the parallel nodes, said communication control system comprising:

data receiving means for receiving data including scope information having node dimension directions transmitted from the adjacent nodes in respective directions;

destination detecting means for detecting destination information responsive to said scope information and said node dimension directions indicating destination nodes for receiving the data having a distance from a particular computer node not greater than said scope information;



between-node distance processing means for obtaining distance information between the particular computer node and the destination nodes, based on the destination information;

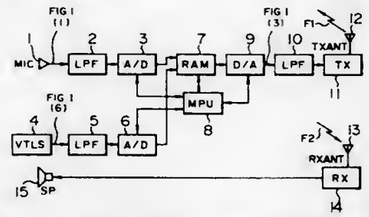
destination judgment means for determining whether the data should be maintained by a local node and transmitted to the adjacent nodes or the data should be maintained by a local node, and for determining a direction of transmission, based on the distance information; and

transmitting process means for transmitting the data to the adjacent nodes with regard to a particular direction when said destination judgment means determines that the data is to be further transmitted.

5,553,079
RADIO COMMUNICATION APPARATUS AND METHOD FOR MULTIPLEX TRANSMISSION OF VOICE AND DATA SIGNALS

Atsuyoshi Niki, Koganei; Tsyneyuki Minowa, Mitaka; Ichiro Maeda, Tama, and Sakari Ohira, Sendai, all of, Japan, assignors to Hitachi Denshi Kabushiki Kaisha, Tokyo, and Tohoku Electric Power Co., Inc., Miyagi-ken, both of, Japan

Filed Mar. 30, 1995, Ser. No. 413,265
Claims priority, application Japan, Apr. 4, 1994, 6-089156
Int. Cl.[6] H04J *3/18*
U.S. Cl. 370—110.4 **22 Claims**



1. An apparatus for multiplex transmission of a voice signal and an analog data signal, comprising:

sampling means for sampling said voice signal and said analog data signal and generating a digital voice signal and a digital data signal, respectively;

time division means for dividing said digital voice signal and said digital data signal on the basis of a predetermined period;

modulation means for modulating said divided digital data signal by a predetermined digital modulation scheme;

means for compressing said divided digital voice signal at a predetermined compression factor to generate a compressed voice signal;

means for combining said divided and compressed voice signal

5,553,081

5,553,083
METHOD FOR QUICKLY AND RELIABLY

a receiver that receives the output signal and produces a data

means for combining said divided and compressed voice signal and said divided and digitally modulated digital data signal to generate a multiplex signal in which the divided and digitally modulated digital data signal precedes the divided and compressed voice signal in each of a plurality of the predetermined period;

means for modulating a carrier signal by said multiplex signal; and

means for transmitting said modulated carrier signal.

5,553,080

SPEECH DECODING APPARATUS COMPRISING ALARM SIGNAL GENERATOR OPERABLE ON DETERIORATION OF TRANSMISSION PATH QUALITY

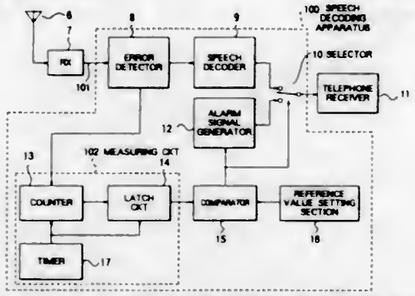
Ryuhei Fujiwara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 105,953, Aug. 13, 1993, abandoned. This application Jan. 31, 1995, Ser. No. 381,274

Claims priority, application Japan, Aug. 13, 1992, 4-237811

Int. Cl.[6] G06F *11/00*

U.S. Cl. 371—5.1 **14 Claims**



1. A speech decoding apparatus supplied with an input speech signal comprising successive blocks, each comprising a digital speech signal and an error detecting code signal which succeeds said digital speech signal and is for use in detecting an error in said digital speech signal, said speech decoding apparatus decoding the digital speech signals of said successive blocks into an analog speech signal, said speech decoding apparatus comprising:

an error detector supplied with said input speech signal for detecting said error in said digital speech signal by the use of said error detecting code signal for each of said successive blocks to produce error detection pulses whenever said error detector detects said error, said error detector furthermore producing the digital speech signals of said successive blocks;

a speech decoder connected to said error detector for decoding the digital speech signals of said successive blocks into said analog speech signal;

a measuring circuit connected to said error detector for measuring, as a measured value, the number of said error detection pulses during a predetermined time interval;

a comparator connected to said measuring circuit for comparing said measured value with a reference value to produce a command signal representative of said measured value when said measured value is greater than said reference value; and

an alarm signal generator connected to said comparator for generating, in response to said command signal, an alarm signal proportional to the measured value represented by said command signal.

5,553,081

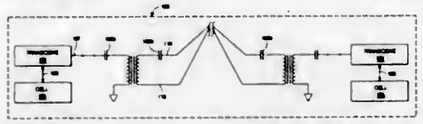
APPARATUS AND METHOD FOR DETECTING A SIGNAL IN A COMMUNICATIONS SYSTEM

Walter J. Downey, Los Gatos; Philip H. Sutterlin, San Jose; Amy O. Huribut, San Francisco; J. Marcus Stewart, San Jose; Benjamin W. Chui, Sunnyvale, and Robert A. Dolin, Jr., Menlo Park, all of Calif., assignors to Echelon Corporation, Palo Alto, Calif.

Filed Apr. 8, 1994, Ser. No. 224,903

Int. Cl.[6] H04M *11/04*; **H04J** *3/02*

U.S. Cl. 371—6 **65 Claims**



1. A method for detecting a valid message signal, said method comprising the steps of:

setting a threshold at an initial level for qualifying a received signal;

counting from a first count to a second count, said first count and said second count defining a time interval;

determining a number of false signals that were detected during said counting step;

pausing said counting step during reception of a data packet; and

adjusting said threshold according to said number of false signals that were detected during said counting step.

5,553,082

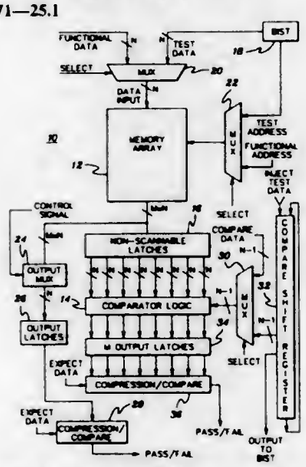
BUILT-IN SELF-TEST FOR LOGIC CIRCUITRY AT MEMORY ARRAY OUTPUT

John P. Connor, Burlington, and Luiqi Ternullo, Jr., Colchester, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 1, 1995, Ser. No. 432,310

Int. Cl.[6] G01R *31/28*

U.S. Cl. 371—25.1 **22 Claims**



1. A system for testing embedded logic circuitry coupled to a memory array, said system comprising:

a Built-In Self-Test (BIST) for generating a test pattern for testing said logic circuitry; and

means for providing said test pattern to said logic circuitry including means for writing at least a portion of said test pattern into said memory array and then applying said portion of said test pattern out of said memory array to said logic circuitry for testing said logic circuitry.

5,553,083

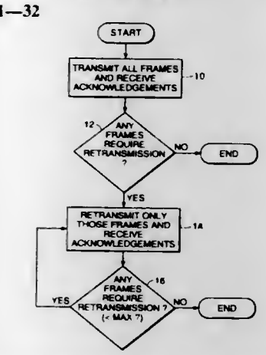
METHOD FOR QUICKLY AND RELIABLY TRANSMITTING FRAMES OF DATA OVER COMMUNICATIONS LINKS

C. Kenneth Miller, Concord, Mass., assignor to Starburst Communications Corporation, Concord, Mass.

Filed Jan. 19, 1995, Ser. No. 375,493

Int. Cl.[6] H04L *1/16*

U.S. Cl. 371—32 **10 Claims**



1. A method for transmitting data over a communications link, comprising:

(A) partitioning the data into a plurality of blocks, each block including a plurality of frames;

(B) transmitting all of the frames to one or more recipients;

(C) during transmission, receiving acknowledgments from the recipients which include indications of frames requiring retransmission; and

(D) repeating steps (B), (C), and (D) for only those frames which the acknowledgments indicate require retransmission.

5,553,084

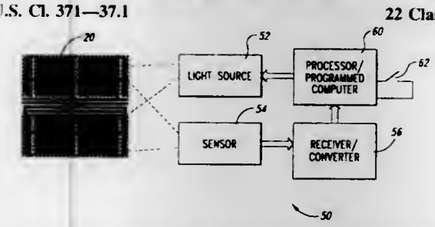
ERROR CORRECTION ENHANCEMENT FOR CODE ONE AND OTHER MACHINE-READABLE SYMBOLOGIES

H. Sprague Ackley, Seattle, and Christopher A. Wiklof, Everett, both of Wash., assignors to Intermec Corporation, Everett, Wash.

Filed Jan. 6, 1995, Ser. No. 369,731

Int. Cl.[6] H03M *13/00*; **G06K** *5/00*

U.S. Cl. 371—37.1 **22 Claims**



8. An apparatus for decoding a machine-readable symbol representing encoded information, the symbol having symbol characters, a series of repeating characters, and error correction characters derived from the symbol and repeating characters, the apparatus comprising:

a sensor that receives light reflected by the symbol and produces an output signal therefore;

a receiver that receives the output signal and produces a data signal indicative of at least some of the symbol characters, repeating characters and error correction characters, but which fails to accurately indicate at least some of the symbol and repeating characters; and

a processor for processing the data signal and producing a signal indicative of the information encoded in the symbol, the processor being programmed to (i) attempt to decode the symbol, (ii) determine if the symbol has any repeating characters if the symbol cannot be decoded, (iii) locate at least two repeating characters in the symbol, (iv) replace the repeating characters that failed to be accurately indicated in the data signal with accurately indicated repeating characters, and (v) attempt to decode the symbol again alter replacing the repeating character with accurately indicated repeating characters that failed to be indicated in the data signal.

5,553,085

METHOD AND APPARATUS FOR GENERATING A 48-BIT FRAME CHECK SEQUENCE

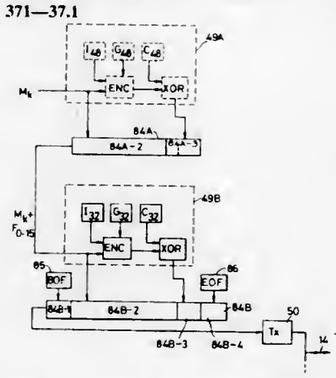
Anthony G. Lauck, Wellsley, Mass.; Ian M. C. Shand, Cobham, and John Harper, Reading, both of, England, assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 193,683, Feb. 8, 1994, abandoned, which is a continuation of Ser. No. 647,959, Jan. 30, 1991, Pat. No. 5,307,355. This application Jun. 7, 1995, Ser. No. 482,166

Claims priority, application United Kingdom, Feb. 6, 1990, 9002643

Int. Cl.[6] H03M *13/00*; **G06F** *11/10*

U.S. Cl. 371—37.1 **5 Claims**



1. A system for transmitting digital messages comprising:

a transmitter encoder unit operating with a predetermined bit length effective to produce a frame check sequence from a message and to append the frame check sequence to the message, and the message and its appended frame check sequence being capable of being checked by a receiver encoder unit operating in a first mode having a first bit length shorter than said predetermined bit length and by a receiver encoder unit operating in a second mode having a second bit length shorter than said predetermined bit length, said first-bit length unequal in length to said second bit length;

a line driver for transmitting the message and its appended frame check sequence over a communication link;

a line receiver for receiving the message and its appended frame check sequence from the communication link; and

a receiver encoder unit for checking the message and its

5,553,087

FREQUENCY STABILISED LASER DIODE

a solid body comprising a laser-active material arranged in a

5,553,090

a receiver encoder unit for checking the message and its appended frame check sequence, the receiver encoder unit operating in one of the two modes.

5,553,086

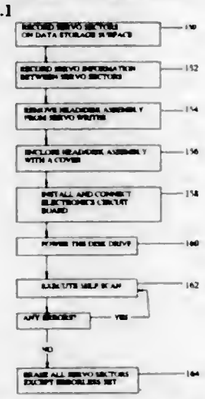
MULTIPLE SERVO SECTOR SETS WRITE WITH SELF-VERIFICATION FOR DISK DRIVE

Mark A. Sompel, San Jose; William W. Clawson, Tracy, and Jason Hong, Cupertino, all of Calif., assignors to Quantum Corporation, Milpitas, Calif.

Filed Jan. 28, 1994, Ser. No. 187,845

Int. Cl.[6] H01S *3/19*

U.S. Cl. 371—47.1 **10 Claims**



1. A method for reducing time required for servo writing of embedded servo sectors on a data storage surface of a head/disk assembly of a disk drive using a servo writer during disk drive assembly, comprising the steps of:

recording a plurality of sets of spaced apart servo sectors on the data storage surface of the head/disk assembly with a head of the head/disk assembly under positional control of the servo writer,

recording servo set identification information with the head in predetermined locations between the sets of servo sectors with the servo writer which indicates at least the plurality of sets of servo sectors which have been written,

removing the head/disk assembly from the servo writer,

enclosing the head/disk assembly with a cover, thereby to seal the interior of the head/disk assembly including the head,

installing and connecting a drive electronics circuit board to the head/disk assembly following the recording steps, to complete assembly of the disk drive,

applying power to the disk drive to cause the disk drive to operate,

causing the drive to execute a self scan control program routine for synchronizing a head position servo loop to one of the sets of servo sectors, and verifying with the disk drive the said one of the sets of servo sectors until an error is found,

in the event that an error is found, resynchronizing the head position servo loop to a next set of servo sectors and verifying with the disk drive the next set of servo sectors,

repeating the steps of resynchronizing and verifying until an errorless set of servo sectors is identified by the disk drive, or until all of the sets of servo sectors have been determined to be defective, and

following identification of an errorless set of servo sectors, erasing with the disk drive head all sets of servo sectors other than the identified errorless set.

5,553,087

FREQUENCY STABILISED LASER DIODE

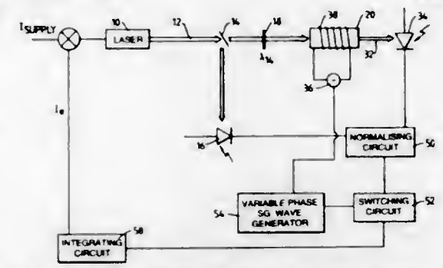
Helmut H. Telle, Swansea, United Kingdom, assignor to Renishaw plc, Gloucestershire, United Kingdom

Continuation of Ser. No. 231,057, Apr. 22, 1994, abandoned. This application Jan. 6, 1995, Ser. No. 369,336

Claims priority, application United Kingdom, Apr. 24, 1993, 9308519

Int. Cl.[6] H01S *3/133*; **H03L** *7/26*

U.S. Cl. 372—32 **3 Claims**



1. A method of obtaining a constant absolute frequency of emitted laser light from a laser diode upon switch-on of the laser diode by the passing of a drive current therethrough, the method comprising the steps of sequentially:

adjusting a temperature of the laser diode to a level which ensures that the frequency of emitted laser light will be either above or below a frequency of a predetermined group of transition lines of a predesignated substance;

adjusting the temperature of the laser diode until the frequency of emitted laser light lies within a bandwidth of a first predetermined transition line of said predetermined group;

maintaining the temperature of the laser diode at a constant level; and

adjusting the drive current of the laser diode based on a response of the predesignated substance to the emitted laser light until the frequency of emitted laser light from the laser diode is maintained at a constant frequency relative to a bandwidth of a second predetermined transition line of the predetermined group of transition lines of the predesignated substance.

5,553,088

LASER AMPLIFYING SYSTEM

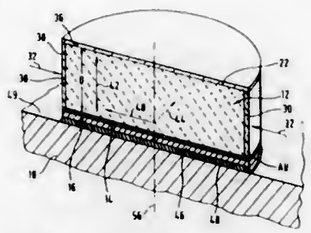
Uwe Brauch, Stuttgart; Adolf Giesen, Renningen; Andreas Voss, and Klaus Wittig, both of Stuttgart, all of, Germany, assignors to Deutsche Forschungsanstalt fuer Luft-und Raumfahrt e.V., Bonn, and Universitaet Stuttgart Institut fuer Strahlwerkzeuge, Stuttgart, both of, Germany

Filed Dec. 22, 1993, Ser. No. 172,126

Claims priority, application Germany, Jul. 2, 1993, 43 22 094.0

Int. Cl.[6] H01S *3/04*

U.S. Cl. 372—34 **50 Claims**



1. A laser amplifying system comprising:

a solid body comprising a laser-active material arranged in a laser radiation field, said solid body being in the shape of a thin plate with an upper or lower side comprising a cooling surface having an extension greater in a first direction than a thickness of the solid body measured at right angles to said cooling surface,

a pumping light source for pumping the laser-active material, and

a solid cooling element forming a carrier for said solid body, said solid body transferring heat created therein areally to said solid cooling element via said cooling surface so that a temperature gradient results in said solid body in a direction towards said cooling surface, said laser radiation field propagating approximately parallel to the temperature gradient in the solid body.

5,553,089

SEMICONDUCTOR LASER STACK WITH LENS AND METHOD OF MANUFACTURING THE SAME

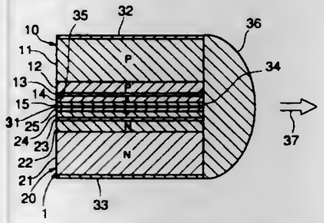
Akinori Seki; Toyokazu Ohnishi, both of Toyota, and Jiro Nakano, Okazaki, all of, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 18, 1994, Ser. No. 324,706

Claims priority, application Japan, Oct. 19, 1993, 5-261086

Int. Cl.[6] H01S *3/18*

U.S. Cl. 372—43 **7 Claims**



1. A method of manufacturing a semiconductor laser comprising the steps of:

forming a first laser chip by stacking in sequence on a first semiconductor substrate of a first conductive type defining a first clad layer: a first active layer and a second semiconductor layer of a second conductive type defining a second clad layer;

forming a second laser chip by stacking in sequence on a second semiconductor substrate of said second conductive type defining a third clad layer: a second active layer and a fourth semiconductor layer of said first conductive type defining a fourth clad layer;

joining said first laser chip and said second laser chip such that said first and said second laser chips so joined define a semiconductor laser element, said first and said second laser chips being arranged and connected such that said first active layer and said second active layer are sandwiched between said first semiconductor substrate and said second semiconductor substrate and are located substantially in a central portion of said semiconductor laser element in a stacking direction thereof;

forming a partially light transmissible reflecting surface at a first end of said first and said second active layers of said laser element; and

attaching a convex lens of a light transmissible material to said partially light transmissible reelecting surface, wherein a height of said convex lens is substantially equal to a height of said semiconductor laser element.

5,553,090

SEMICONDUCTOR MULTIQUANTUM WELL STRUCTURE AND SEMICONDUCTOR LASER THEREWITH

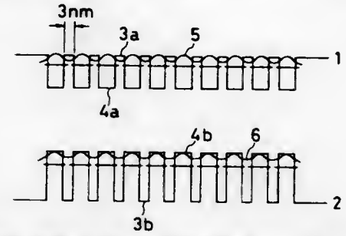
Hirohito Yamada, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 11, 1994, Ser. No. 208,683

Claims priority, application Japan, Mar. 11, 1993, 5-050278

Int. Cl.[6] H01S *3/18*

U.S. Cl. 372—45 **13 Claims**



4. A semiconductor multiquantum well structure comprising:

semiconductor well layers for forming quantum wells;

semiconductor barrier layers for forming potential barriers of said quantum wells;

each of said barrier layers being arranged between adjacent two of said well layers;

each of said barrier layers being at most 3 nm in thickness; and

a number of said well layers being selected to be at least 10 so that carriers are injected into said respective quantum wells substantially uniformly;

said barrier layers being made of InGaAsP and said well layers being made of InGaAs.

5,553,091

OPTICAL COMPONENT HAVING A PLURALITY OF BRAGG GRATINGS AND PROCESS FOR THE PRODUCTION OF SAID COMPONENTS

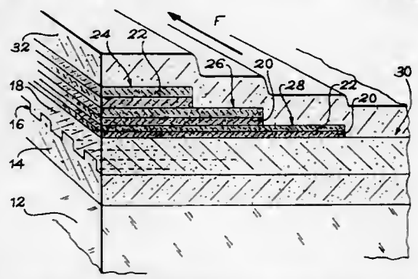
Franck Delorme, Villejuif, France, assignor to France Telecom Etablissement Autonome De Droit Public, Paris, France

Filed Dec. 5, 1994, Ser. No. 349,567

Claims priority, application France, Dec. 6, 1993, 93 14588

Int. Cl.[6] H01S *3/19;3/082*

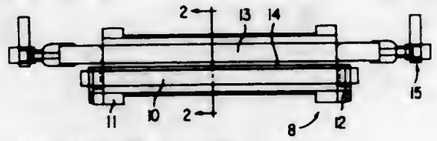
U.S. Cl. 372—50 **8 Claims**



1. Optical component comprising a light guide with a plurality of Bragg gratings formed therein which respectively have different and predetermined Bragg wavelengths, said light guide including a single diffraction grating and a plurality of stacked zones associated with said diffraction grating to respectively form said plurality of Bragg gratings, said zones having respective optical indices to obtain, in cooperation with said diffraction grating, the Bragg wavelengths, each of said zones inducing a local modification of the effective optical index of the light guide, and at least one of said zones including a stack of at least two layers of materials having different optical indices.

5,553,092
SOLID STATE LASER WITH INTEGRAL OPTICAL DIFFUSER PLATE TO HOMOGENIZE OPTICAL PUMPING

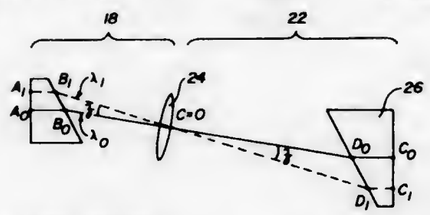
Lennox C. Bruce, Parsippany, and William R. Rapoport, Bridgewater both of N.J., assignors to AlliedSignal Inc., Morris Township, N.J.

Continuation of Ser. No. 245,176, May 17, 1994, Pat. No. 5,331,652. This application Dec. 14, 1994, Ser. No. 356,040
Int. Cl.[6] H01S 3/093
U.S. Cl. 372—72 **11 Claims**

1. A solid-state laser pump chamber, comprising:
(a) a solid state laser rod;
(b) a light source pump means for providing light excitation of said laser rod;
(c) a generally coplanar diffuser plate operatively disposed between said laser rod and said pumping means;
(d) a specular reflector generally surrounding said laser rod, said light source and said diffuser plate; and
(e) cooling means for circulating a cooling gas within said pump chamber;
wherein said diffuser plate homogenizes the pump light to reduce pumping inhomogeneities and does not perturb the cooling gas flow stream.

5,553,093
DISPERSION-COMPENSATED LASER USING PRISMATIC END ELEMENTS

Mallini Ramaswamy, Boston, and James G. Fujimoto, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 239,541, May 9, 1994, abandoned. This application Jun. 5, 1995, Ser. No. 467,135
Int. Cl.[6] H01S 3/08
U.S. Cl. 372—100 **30 Claims**

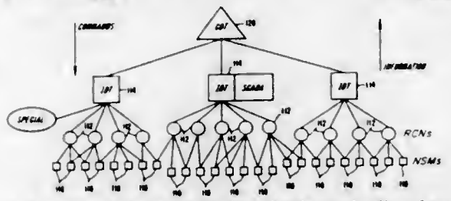


1. A laser comprising:
a resonant cavity defined by a set of reflective end elements positioned to together form a closed optical path,
a gain medium positioned along the closed optical path,
means for exciting the gain medium to produce a laser beam within the cavity,
at least one focusing element, the focusing element being positioned within the resonant cavity in optical alignment with the gain medium to shape a spatial mode for each wavelength in the laser beam that is supported by the laser, and
a prism positioned as at least one of the end elements of the cavity and providing angular dispersion of the laser beam, said at least one prism having two surfaces at an angle with respect to each other, at least one of the two prism surfaces being coated with a reflective coating,
all of the resonant cavity elements being positioned with respect to each other such that the resonant cavity supports a coexistence of a plurality of laser modes that each have a distinct propagation axis, such that propagation axes of modes having relatively longer wavelengths traverse more of the prism than propagation axes of modes having relatively shorter wavelengths, thereby resulting in addition of a negative component to the resonant cavity group velocity dispersion.

5,553,094
RADIO COMMUNICATION NETWORK FOR REMOTE DATA GENERATING STATIONS

Dennis F. Johnson; Michael Wiebe; Erwin Holowick; Nathan R. Jacob; Michael F. Murphy; James J. Schellenberg, and Michael S. Stasenski, all of Winnipeg, Canada, assignors to Iris Systems, Inc., Manitoba, Canada

Continuation of Ser. No. 124,495, Sep. 22, 1993, abandoned, which is a continuation of Ser. No. 732,183, Jul. 19, 1991, abandoned, which is a continuation-in-part of Ser. No. 480,573, Feb. 15, 1990, Pat. No. 5,056,107. This application Jul. 7, 1994, Ser. No. 271,545
Int. Cl.[6] H04B 1/69;15/00; G08C 17/00
U.S. Cl. 375—200 **159 Claims**



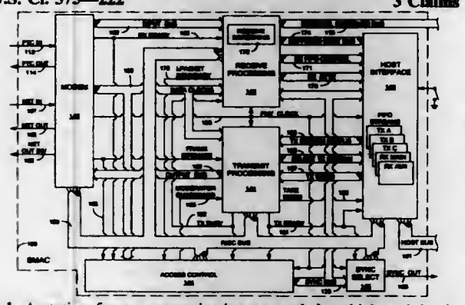
1. A communications network for collecting a plurality of network service module (NSM) data generated by a plurality of physical devices located within a geographic area, comprising:
a plurality of network service modules, with each network service module coupled to a respective physical device generating respective NSM data, with each network service module including an NSM receiver for receiving a command signal, an NSM controller responsive to the received command signal for setting a carrier frequency, and an NSM transmitter for transmitting by wireless radio at the carrier frequency the respective NSM data from the respective physical device as an NSM-packet signal at a time pseudorandomly selected within a predetermined time period;
a plurality of remote cell nodes (RCN) located within the geographic area and spaced, with each network service module of said plurality of network service modules within a range of at least two remote cell nodes of said plurality of remote cell nodes, for simultaneously receiving the transmitted NSM-packet signal by said at least two remote cell nodes of said plurality of remote cell nodes, with each remote cell node including
an RCN transmitter for transmitting by wireless radio the command signal;
an RCN receiver for receiving a multiplicity of NSM-packet signals transmitted from a multiplicity of network service modules, respectively, with the multiplicity of network service modules including a subset of said plurality of network service modules; and
an RCN memory for storing the received multiplicity of NSM-packet signals, with said RCN transmitter responsive to a first polling signal for transmitting by wireless radio the stored multiplicity of NSM-packet signals as an RCN-packet signal;
a plurality of intermediate data terminals (IDT), with each intermediate data terminal including
a first IDT transmitter for transmitting by wireless radio the first polling signal using a first polling-access protocol to each of said plurality of remote cell nodes;
a first IDT receiver for receiving a multiplicity of RCN-packet signals transmitted from a multiplicity of remote cell nodes, respectively, with the multiplicity of remote cell nodes including a subset of said plurality of remote cell nodes;

an IDT memory for storing the received multiplicity of RCN-packet signals;
a second IDT receiver for receiving a second polling signal; and
a second IDT transmitter, responsive to the second polling signal, for transmitting the stored multiplicity of RCN-packet signals as an IDT-packet signal; and
a central data terminal (CDT) having a CDT transmitter for transmitting the second polling signal using a second polling access protocol to said plurality of intermediate data terminals, a CDT receiver for receiving a plurality of IDT-packet signals, a CDT processor for decoding the plurality of IDT-packet signals as the plurality of NSM data, and a CDT memory for storing the plurality of NSM data in a data base.

5,553,095
METHOD AND APPARATUS FOR EXCHANGING DIFFERENT CLASSES OF DATA DURING DIFFERENT TIME INTERVALS

Jonathan R. Engdahl, Chardon, Ohio; David J. Gee, Ann Arbor, Mich.; Mark A. Lucak, Hudson, and Shawn L. Adams, Rocky River, both of Ohio, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Filed Apr. 28, 1993, Ser. No. 54,582
Int. Cl.[6] H04B 1/38; H04J 3/02
U.S. Cl. 375—222 **3 Claims**

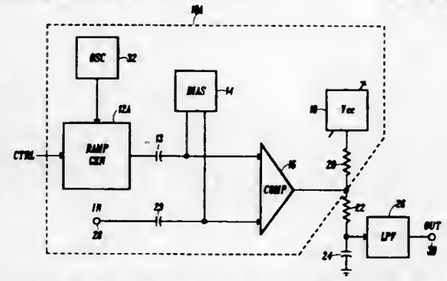


1. A station for a communication network in which activity is divided into periodic time intervals of equal duration, comprising:
a receiver coupled to the communication network to receive data therefrom;
a transmitter coupled to send data over the communication network;
an interface circuit connected to said receiver and said transmitter to exchange data with an external device; and
an access controller connected to said transmitter and to said receiver, and having a storage device to store network control information that is received from the communication network during a first segment of each periodic time interval, wherein when the network control information is revised from previous transmissions, the network control information further includes a countdown value designating a number of periodic intervals that must occur before the revised network control information is to be used in communicating over the communication network and said access controller further including means for temporarily storing the revised network control information, and for loading the revised information into said storage device for controlling network communications when a number of periodic intervals equal to the countdown value have occurred, the access controller performing a pair of functions comprising:
(a) enabling the transmitter to send data of a first class over the communication network during a second segment in each periodic time interval when data received from the network indicates that a preceding station in a predefined transmission order has finished transmitting, and enabling the transmitter to send data of a second class over the communication network during a third segment in a periodic time interval when an amount of time remaining in that periodic interval is at least as great as an amount of time required to send the data of the second class, and when either (1) the network control information indicates that the station is to transmit first during the third segment or (2) data received from the communication network indicates that a preceding station in a predetermined transmission order has finished transmitting data of the second class.

5,553,096
GAIN CONTROL USING PWM

Bruce E. Messman, Lake In The Hills, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Aug. 30, 1994, Ser. No. 298,256
Int. Cl.[6] H04B 3/46
U.S. Cl. 375—238 **8 Claims**

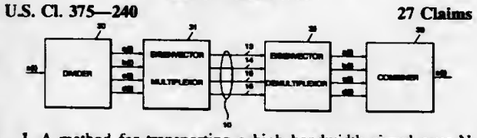


1. A method of processing an input signal comprising the steps of:
modulating a pulse width modulator (PWM) with said input signal;
supplying a direct current voltage to the output of said PWM;
integrating the output of said PWM to recover a processed replica of said input signal by charging a capacitor from said direct current voltage; and
changing said direct current voltage to change the amplitude of said processed replica of said input signal.

5,553,097
SYSTEM AND METHOD FOR TRANSPORTING HIGH-BANDWIDTH SIGNALS OVER ELECTRICALLY CONDUCTING TRANSMISSION LINES

Jerry Dagher, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 1, 1994, Ser. No. 252,034
Int. Cl.[6] H04B 1/66
U.S. Cl. 375—240 **27 Claims**



1. A method for transporting a high bandwidth signal over N electrically conducting transmission lines to a receiving terminal, wherein N>1, said method comprising the steps of:
subdividing said signal into N sub-signals, wherein each of said N sub-signals has a bandwidth less than said high bandwidth signal;
encoding said N sub-signals to have N orthogonal modes of propagation;
transmitting said encoded N sub-signals over said N transmission lines to said receiving terminal;
decoding said transmitted encoded N sub-signals into said N sub-signals; and
recombining said decoded N sub-signals to form said signal at said receiving terminal.

5,553,098
DEMODULATOR WITH SELECTABLE COHERENT AND

square wave pulse train having first transitions and second

a counter oscillator, said counter oscillator receiving a signal from said BLR logic unit when said counter register reaches a

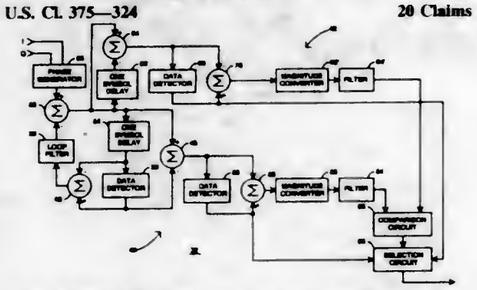
receiving, via a plurality of reception paths, a plurality of signals

5,553,098

DEMODULATOR WITH SELECTABLE COHERENT AND DIFFERENTIAL DATA

Bruce A. Cochran, Mesa; John M. Liebetreu, and Ronald D. McCallister, both of Scottsdale, all of Ariz., assignors to Sicom, Inc., Scottsdale, Ariz.

Filed Apr. 12, 1994, Ser. No. 226,669
Int. Cl.[6] H04L *27/14*
U.S. Cl. 375—324 **20 Claims**



1. An apparatus for demodulating a carrier signal that has been differentially modulated to convey a stream of digital data symbols, said apparatus comprising:

a first data detector responsive to said carrier signal and configured to produce differentially demodulated data;

a second data detector responsive to said carrier signal and configured to produce coherently demodulated data;

means, coupled to said first and second data detectors, for selecting between said differentially demodulated and coherently demodulated data; and

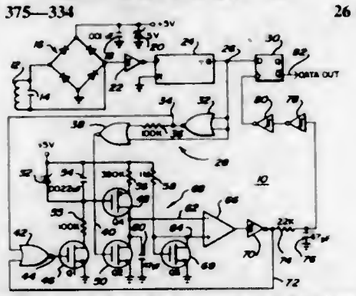
a comparison circuit coupled to said first data detector, to said second data detector, and to said selecting means, for evaluating phase errors occurring at said first and second data detectors.

5,553,099

FSK DETECTOR FOR DETERMINING AN INCREASING TIME PERIOD BETWEEN ADJACENT PULSES OF AN FSK MODULATED SQUARE WAVE PULSE TRAIN

Gary T. Carroll, Boulder, and J. Donald Pauley, Estes Park, both of Colo., assignors to Racom Systems, Inc., Englewood, Colo.

Filed Feb. 10, 1994, Ser. No. 194,708
Int. Cl.[6] H03D *3/00*; **H03C** *3/00*
U.S. Cl. 375—334 **26 Claims**



1. An FSK detector circuit for demodulating a data signal from a first generally square wave pulse train having first transitions and second transitions, comprising:

a pulse generator circuit receiving said first generally square wave pulse train, and providing a series of time-spaced output pulses, each of said output pulses within said series of output pulses being generally coincident with a said first transition of said first generally square wave pulse train;

a frequency shifting circuit responsive to said series of time-spaced output pulses, and producing a second generally square wave pulse train having first transitions and second transitions, said first transitions of said second generally square wave pulse train being time delayed in response to an increased time period between adjacent ones of said time-spaced output pulses; and

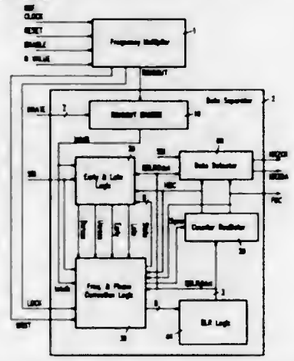
a signal coincidence detector having a first input coupled to receive said first generally square wave pulse train, and having a second input coupled to receive said second generally square wave pulse train, said signal coincidence detector producing a data signal having a first logic level in response to said first transitions of said first and second generally square wave pulse trains being in time coincident, and producing a second logic level in response to said the absence of first transitions of said first and second generally square wave pulse trains being in time coincident.

5,553,100

FULLY DIGITAL DATA SEPARATOR AND FREQUENCY MULTIPLIER

Rami Saban, Holon; Alon Shacham, Tel-Aviv; Avner Efendovich, Jerusalem, and Varda Karpati, Netanya, all of, Israel, assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 1, 1994, Ser. No. 221,618
Int. Cl.[6] H03D *1/00*; **H04L** *7/02*;*7/00*
U.S. Cl. 375—340 **42 Claims**



1. A digital data separator for receiving a data input signal over a serial data in (SDI) line and delivering a clock signal output, said digital data separator comprising:

an early and late logic unit, said early and late logic unit comprising:

a phase shift accumulator (PSA) register having an input, said PSA register being actuated via said input so as to change a binary value stored in said PSA register when a phase difference exists between said data input signal and said clock signal output, and

a limit detector connected to said PSA register, said limit detector delivering an output when the binary value stored in said PSA register reaches a predetermined limit;

a bit length register (BLR) logic unit, said BLR logic unit comprising a counter register, said counter register counting at a fast clock rate, said output from said limit detector controlling the magnitude of a binary value to be loaded into said counter register; and

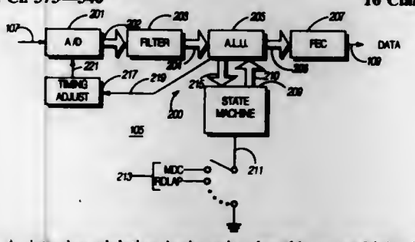
a counter oscillator, said counter oscillator receiving a signal from said BLR logic unit when said counter register reaches a selected binary value, said counter oscillator delivering said clock signal output in response to said signal from said BLR logic unit.

5,553,101

DEMODULATION LOGIC UNIT ADAPTABLE TO MULTIPLE DATA PROTOCOLS

Ricardo Lim, Richmond, and Marek Dutkiewicz, Delta, both of, Canada, assignors to Motorola, Schaumburg, Ill.

Continuation of Ser. No. 144,929, Oct. 28, 1993, abandoned. This application Oct. 16, 1995, Ser. No. 543,353
Int. Cl.[6] H03D *1/00*
U.S. Cl. 375—340 **16 Claims**



1. A data demodulation logic unit adaptable to multiple data modulation protocols for decoding data, comprising in combination:

an arithmetic logic unit including an input, a plurality of registers and an output controllably operable to convert a base band signal, coupled to said input, to a demodulated data signal representing an estimate of decoded data at said output,

a state machine embodied in electronic hardware, coupled to said arithmetic logic unit, said state machine operating in a mode to control said arithmetic logic unit and to select one or more of said plurality of registers for outputting to the output, said mode selectively corresponding to a data modulation protocol and

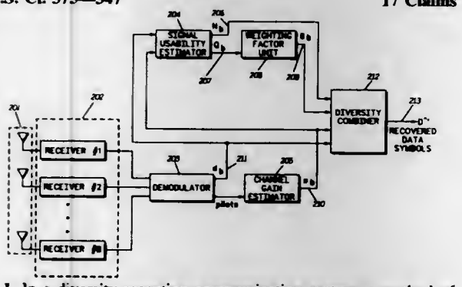
an error correcting circuit coupled to the arithmetic logic unit for receiving the estimate of the decoded data from at least the one or more selected registers.

5,553,102

DIVERSITY RECEPTION COMMUNICATION SYSTEM WITH MAXIMUM RATIO COMBINING METHOD

Steven C. Jasper, Hoffman Estates; Mark A. Birchler, Roselle, and Nicholas C. Oros, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 1, 1994, Ser. No. 348,027
Int. Cl.[6] H04B *7/10*
U.S. Cl. 375—347 **17 Claims**



1. In a diversity reception communication system, a method of recovering data symbols from a transmitted signal comprising the steps of:

receiving, via a plurality of reception paths, a plurality of signals representing the transmitted signal;

determining, for each of the plurality of signals, a noise value that corresponds to noise for each of the plurality of reception paths;

determining a channel quality value that corresponds to channel quality for each of the plurality of reception paths;

determining a weighting factor for each of the plurality of reception paths as a function of at least two channel quality values, each comprising a channel quality value for a separate reception path;

determining a channel gain estimate for each of the plurality of reception paths;

processing the plurality of signals using diversity combining, which diversity combining includes the channel gain estimate, and an application of the weighting factor to a function of the noise value for each of the plurality of reception paths, to provide a resultant signal that more likely represents the transmitted signal than any of the plurality of signals alone; and

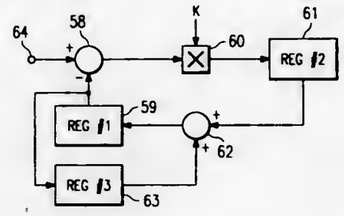
recovering data symbols from the resultant signal.

5,553,103

CIRCUIT INCLUDING A SUBTRACTOR, AN ADDER, AND FIRST AND SECOND CLOCKED REGISTERS CONNECTED IN SERIES

Jason B. E. Julyan, Turvey, England, and Stephen J. Hubbins, Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 201,846, Feb. 25, 1994. This application Jun. 7, 1995, Ser. No. 484,764
Int. Cl.[6] H04B *1/10*
U.S. Cl. 375—350 **10 Claims**



1. A digital filter circuit comprising:

a first input for samples of a digital signal,

a subtractor, an adder and a first clocked register connected in series, the first input of the circuit being connected to the minuend input of the subtractor and the output of the first clocked register being connected to the subtrahend input of the subtractor,

a second clocked register connected in series at a position between the output of the subtractor and a first input of the adder to store the difference from the subtractor or a value proportional to it, and

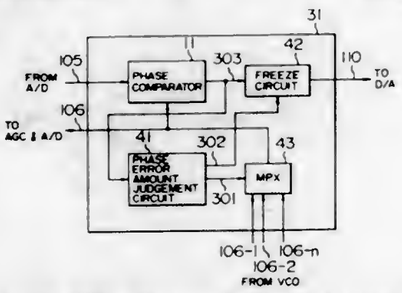
a third clocked register connected to latch the value in the first clocked register and supply it as a second input to the adder, the filtered output being taken from the first or third register.

5,553,104

INFORMATION RECORDING/REPRODUCING APPARATUS HAVING A CLOCK TIMING EXTRACTION CIRCUIT FOR EXTRACTING A CLOCK SIGNAL FROM AN INPUT DATA SIGNAL

Terumi Takashi, Odawara; Kazunori Iwabuchi, Yokohama; Hideyuki Yamakawa, Fujisawa; Yoshiteru Ishida, Chigasaki; Kazuhisa Shiraishi, Odawara, and Kazutoshi Ashikawa, Machida, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 29, 1994, Ser. No. 266,779
Claims priority, application Japan, Jun. 29, 1993, 5-159515
Int. Cl.[6] H03D *3/24*
U.S. Cl. 375—373 **12 Claims**



1. A clock timing extraction circuit for generating a clock signal synchronized with a reproduced signal in an apparatus for recording/reproducing data in/form an information recording medium, comprising:

a phase comparator for comparing said reproduced signal with a selected clock signal to generate a phase error signal;

a clock signal generation circuit, having an output signal whose frequency is adjusted in order to cause said phase error signal to approach zero, and outputting a plurality of clock signals having mutually different phase differences;

a selection circuit for outputting one of said plurality of clock signals as the selected clock signal on the basis of a selection signal;

a phase difference judgment circuit for receiving said reproduced signal and for determining one of said plurality of clock signals having a minimum phase error and generating the selection signal for selection of the selected clock signal; and

a freeze circuit for blocking an output of said phase comparator until said selected clock signal having the minimum phase error is selected.

5,553,105

POLYCHANNEL MULTIPLE-TOTAL-EXTERNAL REFLECTION NEUTRON RADIOGRAPHY

Qi-Fan Xiao, Albany, N.Y., assignor to X-Ray Optical Systems, Inc., Albany, N.Y.

Filed Oct. 31, 1994, Ser. No. 332,410
Int. Cl.[6] G01N *23/05*
U.S. Cl. 376—159 **1 Claim**

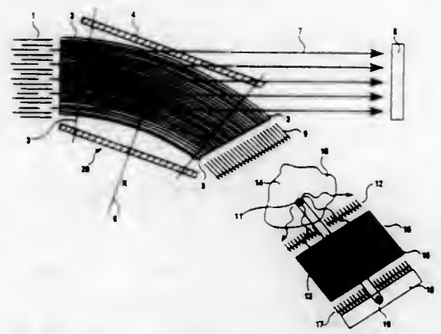
1. A method of generating a neutron-radiographic image of a sample which comprises:

(a) generating a neutron beam;

(b) passing the neutron beam through a multiple-channel, multiple-total-external reflection neutron bender/filter manipulator, which includes at least one multiple-channel element;

(c) directing an output beam from the neutron bender/filter manipulator onto the sample;

(d) passing a neutron beam exiting the sample through a multiple-channel, multiple-total-external reflection neutron scatter-rejection manipulator which includes at least one multiple-channel element, the multiple-channel element being comprised of a material containing a nuclear isotope which is



highly absorptive to neutrons with energies less than approximately 10,000 eV; and

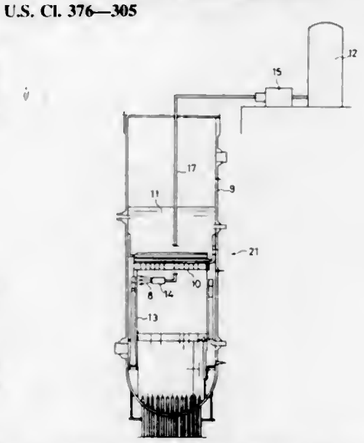
(e) detecting a beam which exits the scatter-rejection manipulator.

5,553,106

RESIDUAL STRESS IMPROVING METHOD FOR MEMBERS IN REACTOR PRESSURE VESSEL

Kunio Enomoto, Ibaraki-ken; Masahiro Otaka, Hitachi; Kazuo Amano, Hitachi; Koichi Kurosawa, Hitachi; Eisaku Hayashi, Hitachi; Ren Morinaka, Hitachi; Shigeo Hattori, Ibaraki-ken, and Kasunori Sato, Kure, all of, Japan, assignors to Hitachi, Ltd., and Babcock-Hitachi Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 14, 1995, Ser. No. 490,245
Claims priority, application Japan, Jun. 15, 1994, 6-132746
Int. Cl.[6] G21C *19/00*
U.S. Cl. 376—305 **11 Claims**



1. A residual stress improving method for members in reactor pressure vessel, comprising:

a first step of ejecting, toward a first region in a surface of members in reactor pressure vessel submerged in reactor water, a water jet in the form of a high speed submerged water jet at temperature lower than any temperatures of said reactor water and said members in reactor pressure vessel from a nozzle to impinge against said first region in water environment; and

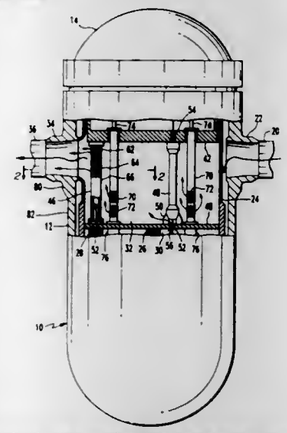
a second step of stopping the impingement of said water jet against said first region, allowing said first region to be heated again.

5,553,107

PRESSURIZED WATER REACTOR VESSEL WITH SLOTTED SUPPORT COLUMNS

Richard E. Schwirian, Pleasant Hills, and Theo van de Venne, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 30, 1995, Ser. No. 380,785
Int. Cl.[6] G21C *1/04*
U.S. Cl. 376—352 **5 Claims**



1. A pressurized water nuclear reactor pressure vessel, comprising:

an upper core support plate having passageways for the passage of coolant;

an upper support plate above the upper core support plate, the upper support plate and the upper core support plate defining a plenum; and

peripheral hollow support columns extending upwardly through the plenum above the passageways in the upper core support plate with each of the peripheral hollow support columns being aligned with a passageway for supporting the upper support plate above the upper core support plate and for guiding coolant from the passageways into the plenum,

each peripheral support column having an unslotted axial lower portion for guiding the coolant flowing through the aligned passageway upwardly through the peripheral support column and having a peripherally slotted upper axial portion for guiding the coolant in the peripheral support column into the plenum.

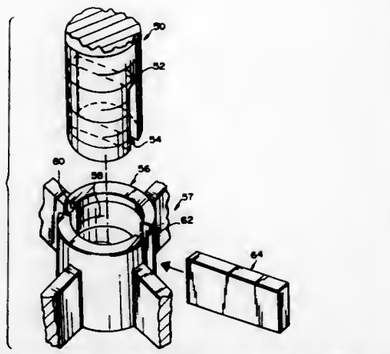
5,553,108

WATER ROD ATTACHMENT IN A NUCLEAR REACTOR FUEL BUNDLE

Eric B. Johansson, Wrightsville Beach, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 3, 1994, Ser. No. 334,388
Int. Cl.[6] G21C *3/322*
U.S. Cl. 376—444 **4 Claims**

1. In a fuel bundle assembly for a nuclear reactor wherein a plurality of fuel rods and at least one water rod extend between an upper tie plate and a lower tie plate, the improvement comprising a



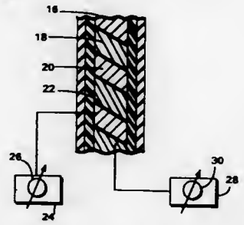
fixed connection between said water rod and the lower tie plate, the fixed connection including a threaded lower end plug on the water rod and a threaded hole in a boss formed in the lower tie plate adapted to receive said threaded lower end plug, said threaded lower end plug formed with a diametrical slot therein and said boss formed with a pair of slots extending from opposite sides of said hole such that said diametrical slot and said pair of slots are alignable when said threaded lower end plug is threaded into said boss; and a key insertable within the aligned diametrical slot and pair of slots to thereby fix said water rod against rotational movement.

5,553,109

APPARATUS AND METHODS FOR SIMULATING A CHANGE IN AXIAL POWER SHAPE DURING A NUCLEA FUEL ROD BUNDLE TRANSIENT

Bruce Matzner, San Jose, Calif., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 25, 1994, Ser. No. 328,435
Int. Cl.[6] G21C *17/00*
U.S. Cl. 376—463 **8 Claims**



7. A method for simulating a nuclear fuel rod bundle transient in a vessel having a plurality of nuclear fuel rod simulating members, each member having two heating elements, comprising the steps of:

independently supplying power to said heating elements of each said member; and

controlling said supply of power to said heating elements independently of one another to vary the power supply over time to each element to simulate a change over time in both the (i) power output and (ii) axial flux shape of a nuclear fuel bundle.

5,553,110

X-RAY MASK STRUCTURE, PROCESS FOR

shearing tissue disposed therebetween plates without direct manipulation of said tissue.

5,553,113

5,553,115

5,553,110

X-RAY MASK STRUCTURE, PROCESS FOR PRODUCTION THEREOF APPARATUS AND METHOD FOR X-RAY EXPOSURE WITH THE X-RAY MASK STRUCTURE, AND SEMICONDUCTOR DEVICE PRODUCED BY THE X-RAY EXPOSURE METHOD

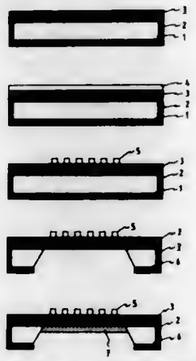
Koichi Sentoku, Kanagawa-ken; Kenji Saito, Atsugi; Keiko Chiba, Isehara, and Hiroshi Maehara, Yokahama, all of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1994, Ser. No. 345,395

Claims priority, application Japan, Nov. 19, 1993, 5-312749; Nov. 19, 1993, 5-312750; Nov. 11, 1994, 6-301688

Int. Cl.[6] H01L *39/00*

U.S. Cl. 378—35 **15 Claims**



1. An X-ray mask structure for X-ray lithography, comprising:
a pattern;
an X-ray transmissive film for holding the pattern;
a frame for supporting the X-ray transmissive film; and
a light-scattering prevention film formed on at least a part of the surface of the X-ray transmissive film, wherein the light scattering prevention film is formed on at least one of a top face and a back face of the X-ray transmissive film and has a refractive index substantially equal to the refractive index of the X-ray transmissive film.

5,553,111

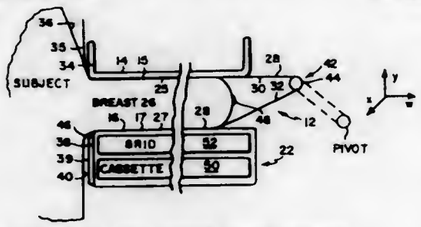
APPARATUS AND METHOD FOR IMPROVED TISSUE IMAGING

Richard Moore, Concord, and Daniel B. Kopans, Waban, both of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Filed Oct. 26, 1994, Ser. No. 329,295

Int. Cl.[6] A61B *6/04*

U.S. Cl. 378—37 **32 Claims**



1. An improved tissue imaging device comprising:
a compression plate affixed to a base;
a support plate affixed to said base and spaced apart from said compression plate for positioning tissue to be imaged therebetween; and
means for shearing tissue operationally arranged relative to said plates such that said means for shearing tissue is capable of shearing tissue disposed therebetween plates without direct manipulation of said tissue.

5. An imaging device comprising:
a compression plate and a support plate defining a compression/imaging space therebetween;
at least one layer of radiolucent material dimensioned and constructed such that said at least one layer can pass between surfaces of either or both of said compression plate and said support plate and a tissue inserted within said compression/imaging space, said material having sufficient tensile strength that said at least one layer can slide without tearing against said surfaces when tension is exerted on said layer, and
at least one puller capable of exerting tension on said at least one layer so as to slide said at least one layer against said surfaces such that said tissue moves relative to said surfaces so as to effect at least one of (a) pulling the tissue into the imaging device without substantially moving other portions of a patient's body to which the tissue is attached, and (b) shearing of the tissue.

20. A method of shearing tissue disposed between a compression plate and a support plate of a tissue imaging device comprising laterally translating either or both of said compression plate and said support plate relative to each other.

21. A method of shearing tissue disposed between a compression plate and a support plate of a tissue imaging device comprising twisting either or both of said compression plate and said support plate relative to each other.

5,553,112

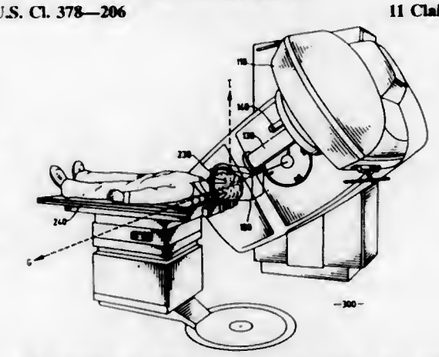
LASER MEASURING APPARATUS AND METHOD FOR RADIOSURGERY/STEREOTACTIC RADIOTHERAPY ALIGNMENT

Tyrone L. Hardy, Del Mar, and Laura R. D. Brynildson, San Diego, both of Calif., assignors to Medical Instrumentation and Diagnostics Corp., San Diego, Calif.

Filed Jun. 6, 1995, Ser. No. 466,240

Int. Cl.[6] A61B *6/08*

U.S. Cl. 378—206 **11 Claims**



5. A method for aligning a stereotactic system, said system including a linear accelerator having a gantry, a laser measuring device mounted on said gantry, a stereotactic reference system, a reference fixture affixed to said stereotactic reference system, said stereotactic reference system having a stereotactic coordinate system, said method comprising:
determining an origin of said stereotactic coordinate system relative to said laser measuring device;
measuring an isocenter of a target structure located within said stereotactic reference system; and
adjusting said stereotactic reference system within said reference fixture so that said isocenter is positioned at said origin.

5,553,113

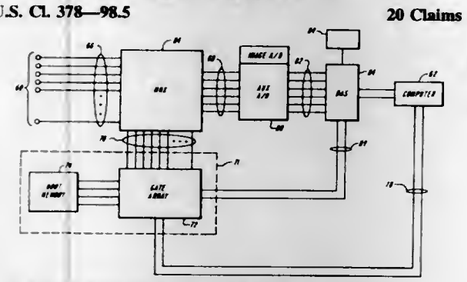
AUXILIARY DATA ACQUISITION IN A MEDICAL IMAGING SYSTEM

Hans Weedon, Salem, Mass., assignor to Analogic Corporation, Peabody, Mass.

Filed Nov. 18, 1994, Ser. No. 342,311

Int. Cl.[6] H05G *1/64*

U.S. Cl. 378—98.5 **20 Claims**



1. A medical imaging system comprising:
means for generating a plurality of image analog signals representative of image data acquired by said system;
means for generating at least one non-image analog signal representative of at least one operating parameter or condition of said system;
analog-to-digital converter means for converting image and non-image analog signals to corresponding image and non-image digital signals; and
programmable means, responsive to a program signal, for selectively applying select ones of two or more of said analog signals to said analog-to-digital converter means in either one of at least two predetermined modes of operation as a function of said program signal.

5,553,114

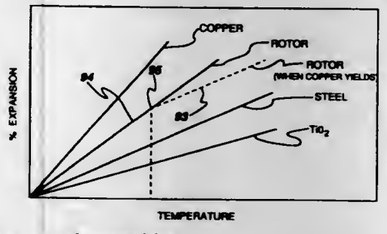
EMISSIVE COATING FOR X-RAY TUBE ROTORS

Paul A. Siemers, Clifton Park, N.Y.; Richard W. Lindberg, Milwaukee, Wis., and Stephen F. Rutkowski, Duanesburg, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 4, 1994, Ser. No. 222,780

Int. Cl.[6] H01J *35/10*

U.S. Cl. 378—129 **31 Claims**



1. An x-ray tube comprising:
a glass envelope;
a cathode, operatively positioned in the glass envelope;
an anode assembly operatively positioned in the envelope, the anode assembly including a rotor operatively positioned relative to a stator; and a target, operatively positioned relative to the cathode, the rotor comprising:
a metal inner core;
a metal outer core; and
a ductile, metal coating having a stable, adherent oxide selected from the group consisting of: Fe, Cr, Al or Ni, operatively positioned on the outer surface of the outer core.

5,553,115

MEDICAL X-RAY APPARATUS, IRRADIATION TUBE, MEDICAL POSITION INDICATING APPARATUS, AND LIGHT SOURCE CONTROL CIRCUIT FOR USE IN COMBINATION WITH THE FOREGOING APPARATUSES

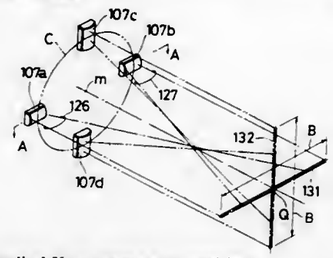
Masaki Odaka; Eiichi Arai; Yoshihide Okagami, and Akira Yuba, all of Kyoto, Japan, assignors to J. Morita Manufacturing Corporation, Kyoto, Japan

Filed Jun. 8, 1994, Ser. No. 255,477

Claims priority, application Japan, Jun. 16, 1993, 5-032427 U; Sep. 30, 1993, 5-053231 U; Mar. 7, 1994, 6-036090

Int. Cl.[6] A61B *6/14*

U.S. Cl. 378—206 **4 Claims**



1. A medical X-ray apparatus comprising:
an X-ray generating unit;
an irradiation tube, formed of a light-permeable material, for defining an X-ray radiation cone from the X-ray generating unit, the irradiation tube mounted on the X-ray generating unit so as to angularly displace around the axis of the X-ray with respect to the X-ray generating unit and the irradiation tube having therein visible optical means disposed at intervals in the peripheral direction thereof and outside of the radiation cone, the visible optical means emitting visible light of a fan beam shape to an X-ray exposure subject to indicate an X-ray irradiation position on the X-ray exposure subject and comprising four light sources symmetrically disposed with respect to the X-ray irradiation axis, each formed of a light-emitting diode, and focusing means, formed of lenses, the focusing means focusing the light from each light source to cross the axis of the X-ray orthogonally and to form a cross slit image on the focusing plane,
wherein at least one of the irradiation tube and the X-ray generation unit has a flat switch disposed on the outer circumference thereof to control on/off of the visible optical means, and when the flat switch is turned on, the light sources are lit up for a predetermined period.

5,553,116

TELEPHONE LINE MONITORING APPARATUS AND METHOD

Shlomo Avni, Givataim, Israel, assignor to Teletron Ltd., Petah Tikva, Israe;

Division of Ser. No. 775,128, Sep. 5, 1991, Pat. No. 5,347,572. This application Jun. 13, 1994, Ser. No. 259,305

Claims priority, application Israel, Sep. 6, 1990, 095601; Sep. 6, 1990, 095602

Int. Cl.[6] H04M *1/29;3/68;3/22*

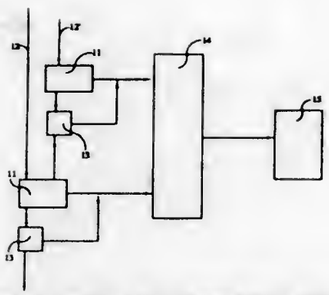
U.S. Cl. 379—34 **6 Claims**

1. A method for monitoring and analyzing an activity of a telephone line, comprising:
continuously sampling a voltage of the telephone line to be monitored;
calculating a mean value of the voltage from a plurality of samplings taken during a given time interval;
comparing the mean value of the voltage with a reference voltage defined as a mean voltage obtained during a previous time interval;
replacing a value of the reference voltage with the mean value;

frequency demodulator, and the two-way radio unit is an FM

determining the degree of traffic through said plurality of speech

5,553,121



if a difference between a last calculated mean value and the reference value exceeds a predetermined value:

stopping replacement of the reference voltage with the calculated mean value of the voltage;

activating signal recording means to record signals transmitted through the telephone line; and

continuously comparing the calculated mean value with the reference value; and if the difference between the two compared values is below a predetermined minimal value:

deactivating the signal recording means; and

resuming the replacement of the value of the reference voltage with the calculated mean value of the voltage, and the subsequent steps.

5,553,117

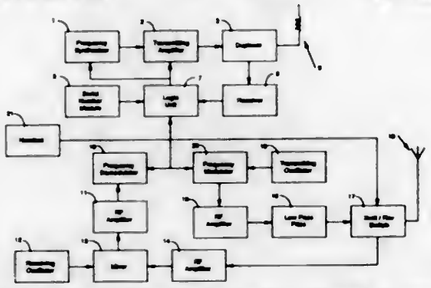
VEHICULAR COMMUNICATIONS SYSTEM

Danny R. Peterson, HC75, Box 22A, Hitchcock, S. Dak. 57348, and Clement A. George, III, Glenshaw, Pa., assignors to Danny R. Peterson, Hitchcock, S. Dak.

Filed Jan. 3, 1994, Ser. No. 176,827

Int. Cl.[6] H04B *1/40;* **H04M** *11/00*

U.S. Cl. 379—58 **6 Claims**



1. A vehicular communications system comprising a cellular telephone unit and a two-way radio unit having a common control unit, wherein:

(a) the common control unit is a handset having means for selectively activating either the cellular telephone unit or the two-way radio unit and the handset has an integral microphone and receiver; and

(b) the cellular telephone unit comprises a logic unit, a frequency synthesizer, a transmitting amplifier, a duplexer, a serial number module, and a receiver, and the cellular telephone unit receives frequencies in the range from about 870 MHz to about 890 MHZ, and the cellular telephone units receives about 666 channels, and the frequency synthesizer at the direction of the logic unit generates a signal which is amplified at the direction of the logic unit to a required transmitting strength; and

(c) the two-way radio comprises a frequency demodulator, at least one RF amplifier, a receiving oscillator and a low pass filter, and the handset is connected in circuit with the logic unit if the cellular telephone and the frequency modulator and frequency demodulator, and the two-way radio unit is an FM radio operating at a frequency of from about 26.965 MHz to about 27.405 MHz, and the two-way radio unit operates on about 40 channels, and transmitted voice signals from the handset are modulated in the frequency modulator of the two-way radio unit, and in the two-way radio unit the transmitting oscillator creates a frequency for a selected channel, and the signal from the frequency modulator is amplified in one of the RF amplifiers after which the signal is sent through the low pass filter, and signals received in the two way radio unit are applied to a second RF amplifier and then to the mixer which operates at a frequency determined by the receiving oscillator after which they are buffered by a third RF amplifier after which they are demodulated by the frequency demodulator and then heard by means of the speaker in the handset, and the handset is equipped with and a power ON-OFF switch, a cellular telephone and two-way radio switch and a push button switch for transmitting on the two-way radio.

5,553,118

Patent Not Issued For This Number

5,553,119

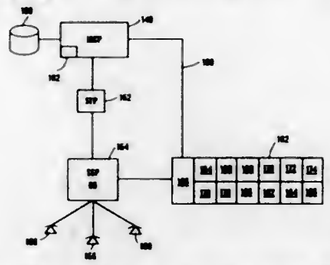
INTELLIGENT RECOGNITION OF SPEECH SIGNALS USING CALLER DEMOGRAPHICS

Alex McAllister, Silver Spring, and Laird Wise, Ellicott City, both of Md., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

Filed Jul. 7, 1994, Ser. No. 271,885

Int. Cl.[6] H04M *3/64;* **G10L** *9/06*

U.S. Cl. 379—67 **21 Claims**



1. In a switching system for connecting a calling station to a called station a method of establishing completion of said connection comprising the steps of:

responsive to said calling station dialing a destination identifier, establishing the identity of said calling station and using said identity to address a data base;

deriving from said data-base information relating to demographics of said calling station;

selecting from a plurality of speech recognition resources a first resource indicated by said demographic information;

establishing connection to said off-hook station;

inputting a spoken command from a caller at said calling station to said selected resource;

outputting from said first speech recognition resource a first output signal responsive to said spoken command;

selecting from said plurality of speech recognition resources a second resource responsive to said first output signal;

outputting from said second speech recognition resource a second output signal;

inputting a second spoken command from said caller at said calling station to said second resource;

outputting from said second speech recognition resource a third output signal responsive to the second spoken command;

determining the degree of traffic through said plurality of speech recognition resources;

comparing the determined degree of traffic to a predetermined traffic load; and

responsive to said determined degree of traffic being below said predetermined load, inputting at least one of said spoken commands to a plurality of said resources in parallel.

5,553,120

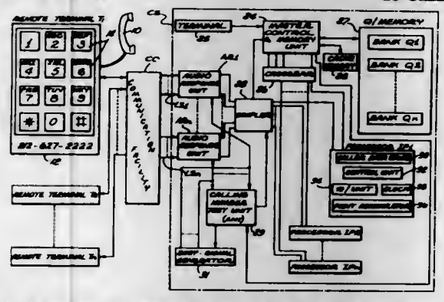
TELEPHONIC-INTERFACE GAME CONTROL SYSTEM

Ronald A. Katz, 570 S. Mapleton Dr., Los Angeles, Calif. 90024

Continuation of Ser. No. 534,907, Jun. 8, 1990, Pat. No. 5,218,631, which is a continuation-in-part of Ser. No. 335,923, Apr. 10, 1989, which is a continuation of Ser. No. 194,258, May 16, 1988, Pat. No. 4,845,739, which is a continuation-in-part of Ser. No. 18,244, Feb. 24, 1987, Pat. No. 4,792,968, which is a continuation-in-part of Ser. No. 753,299, Jul. 10, 1985, abandoned. This application Jun. 7, 1993, Ser. No. 73,585

Int. Cl.[6] H04M *1/66;3/50;11/08*

U.S. Cl. 379—88 **18 Claims**



1. A process for statistical analysis of data for use with a communication facility including remote terminal apparatus for individual callers, wherein said remote terminal apparatus may comprise a conventional telephone instrument including voice communication means and digital input means in the form of an array of alphabetic numeric buttons for providing certain identification and statistical data, said process including the steps of:

interfacing said communication facility to provide voice signals and receive digital data developed by said terminal apparatus under control of said callers;

generating voice signals and supplying said voice signals to actuate said terminal apparatus, as to provide vocal operating instructions to a caller;

providing sequence signals representative of sequence data including a computer generated number indicative of the sequence of a call with reference to calls from other callers;

initiating files and storing data for qualified callers including,

(1) said sequence data, and

(2) identification data as indicated by identification signals relating to said terminal apparatus;

providing external data signals distinct from said sequence data; and

comparing said sequence data for an individual caller and analyzing said sequence data for an individual caller with said external data signals in combination to isolate a select subset of said callers wherein said step of comparing further includes interrelated processing of said sequence data with reference to said external data signals.

5,553,121

VOICE RESPONSE SYSTEM

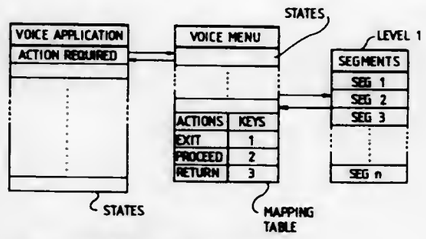
David G. Martin, Eastleigh, and Lawrence L. Porter, Lyndhurst, both of, United Kingdom, assignors to IBM Corporation, Armonk, N.Y.

Filed Jun. 6, 1995, Ser. No. 467,328

Claims priority, application United Kingdom, Aug. 19, 1994, 9416823

Int. Cl.[6] H04M *3/00*

U.S. Cl. 379—88 **9 Claims**



1. A voice response system comprising:

means for conducting a telephone call with a user,

means for storing a plurality of sets of voice prompts, each voice prompt comprising at least one voice segment which is capable of being played to said user,

means for selecting one from said plurality of sets of voice prompts for use during the telephone call,

means for outputting a voice prompt from said selected set of voice prompts to said user and for receiving a response thereto from the user, said response indicating to the system the user's requirements,

means for determining the competence with which said user interacts with said system, and wherein said means for selecting selects a voice prompt according to the determined competence of the user,

means for determining the response time between playing a voice prompt and receiving said response thereto, and wherein said means for selecting is responsive to said means for determining a response time to select a set of voice prompts according to the response time.

5,553,122

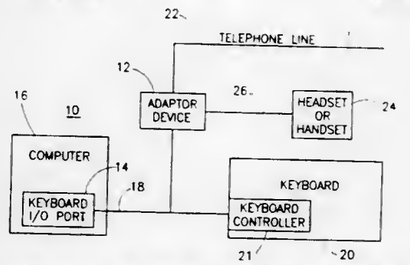
UNIVERSAL WEDGE-TYPE TELEPHONE ADAPTOR FOR COMPUTER SYSTEM

Alan P. Haber, and Simon M. Kahn, both of Jerusalem, Israel, assignors to ITI Innovative Technology Ltd., Jerusalem, Israel

Filed Jan. 28, 1994, Ser. No. 187,522

Int. Cl.[6] H04M *11/00*

U.S. Cl. 379—90 **20 Claims**



1. A universal wedge-type telephone adaptor device for terminating a telephone line and connecting a telephone handset/headset

thereto under control of a computer system having a standard

5,553,124

with a common identifying code word for reception of trans-

thereto under control of a computer system having a standard keyboard including a keyboard controller, and a computer, said device comprising:

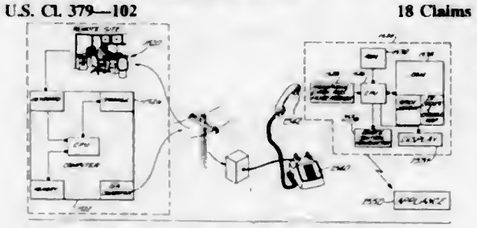
a telephone controller means comprising a scan code interpreter, located external to and separate from the standard keyboard and computer, said telephone controller means being coupled to the telephone line and the telephone handset/headset and being coupled, by a wedge-type connection, to a keyboard bus connecting the controller of the standard keyboard and computer, said telephone controller means being responsive to unique, dedicated scan codes not otherwise recognized by the controller of the standard keyboard, said unique, dedicated scan codes being generated by the computer and transmitted on said keyboard bus as commands to be identified and interpreted by said scan code interpreter of said telephone controller means for controlling the interconnection of the telephone line and telephone handset/headset.

5,553,123

METHOD FOR DOWNLOADING SETUP DATA VIA TELEPHONE TO AN APPLIANCE CONTROLLER

Philip W. Chan, Arcadia, Calif., and Kwong S. Sin, Tai Po, Hong Kong, assignors to Gemstar Development Corporation, Pasadena, Calif.

Filed Jun. 9, 1994, Ser. No. 257,413
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—102 **18 Claims**



1. A method of downloading initial setup data to an apparatus for controlling at least one appliance comprising the steps of:

a user initiating a telephone call on a telephone to a remote site having a computer;

the user communicating background information to the remote site;

the remote site converting the background information into data for downloading;

the remote site transmitting the download data at nominal frequencies to the telephone;

the remote site transmitting test data at each of a plurality of test frequencies to the telephone;

the apparatus for controlling at least one appliance receiving from the telephone via a microphone on the apparatus the transmitted download data at nominal frequencies and the test data at each of the plurality of test frequencies;

the apparatus for controlling at least one appliance displaying an indication that the download data was properly received at the nominal frequencies, if the download data was properly received, or an indication of which one of the plurality of test frequencies on which the test data was received, if the test data was properly received on one of the plurality of test frequencies and the download data was not properly received on the nominal frequencies, or an indication that no data was received, if neither the download data nor the test data were properly received; and

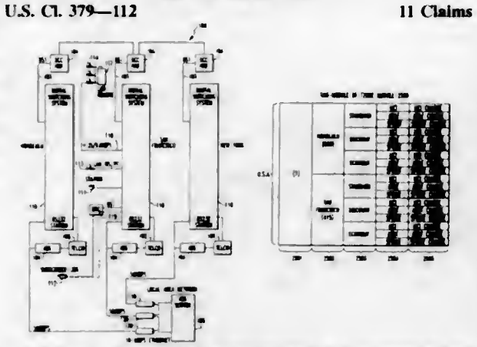
the user communicating the displayed indication to the remote site.

5,553,124

COMPUTER-CONTROLLED TELECOMMUNICATIONS SYSTEM

Edward A. Brinskele, 12200 Pt. Reyes Petaluma Rd., Nicasio, Calif. 94946

Continuation of Ser. No. 979,940, Nov. 23, 1992, Pat. No. 5,425,084. This application May 31, 1995, Ser. No. 455,204
Int. Cl.[6] H04M *15/00*
U.S. Cl. 379—112 **11 Claims**



1. A method of causing the establishment of a communications link between a first party located in a first telecommunications charge zone and a second party located in a second telecommunications charge zone different than the first telecommunications charge zone, the method being performed through the use of a computer-controlled telecommunications system having a plurality of switches, each of the switches being capable of establishing a different communications link between the first party and the second party, and each of the switches being located in a different telecommunications charge zone, and each of the telecommunications charge zones having a charge associated with a particular call, the method comprising the steps of:

initiating a request at the first party for a communications link between the first and second parties;

determining the telecommunications charge zone for the second party;

determining which of the charges for the communications links is lowest at a selected time; and

generating and outputting a switch control command to the switch in the telecommunications charge zone for the communications link having the lowest charge at the selected time to establish a communications link between the first party and the second party.

5,553,125

TELEPHONE APPARATUS WITH CALLING LINE IDENTIFICATION

N. E. Martensson, Woking, England, assignor to Nokia Mobile Phones (U.K.) Limited, United Kingdom

Continuation of Ser. No. 84,076, Jun. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 816,209, Jan. 2, 1992, abandoned. This application Jul. 1, 1994, Ser. No. 270,232
Claims priority, application United Kingdom, Jan. 11, 1991, 9100611
Int. Cl.[6] H04M *15/00;1/56;1/66;11/00*
U.S. Cl. 379—140 **25 Claims**

1. A radio telephone apparatus comprising:

a transceiver;

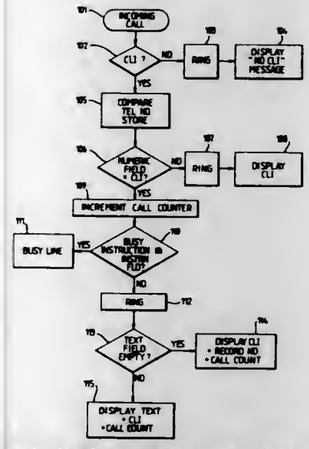
means, connected to the transceiver, for responding to a received signal conveying a telephone number identifying a source of an incoming telephone call;

memory means storing a list comprised of a plurality of records each having a plurality of fields, each record having a first field for storing a telephone number and a second field for storing an instruction associated with the telephone number stored in the first field, said instruction relating to the operation of said radio telephone apparatus;

means, responsive to at least one input signal from a user, for selectively accessing one of the stored records of said list and speed dialing the telephone number stored in the first field of the accessed record;

means, coupled to said responding means, for automatically searching said same stored list of records to identify a stored record having a telephone number stored in said first field that matches a received telephone number; and

control circuitry comprising means for responding to the instruction stored in the associated second field of an identified stored record for modifying the operation of said radio telephone apparatus in accordance with the instruction.

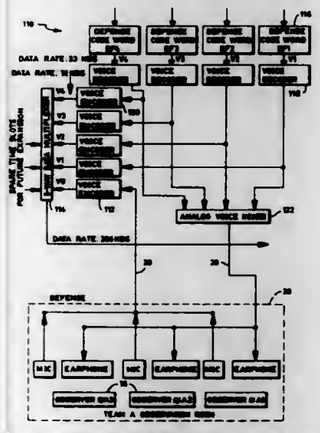


5,553,126

SECURE ANTI-JAMMING WIRELESS PARTY LINE

Douglas D. Tang, Chelmsford, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 20, 1995, Ser. No. 375,876
Int. Cl.[6] H04M *13/00;11/00;* **H04J** *13/00*
U.S. Cl. 379—185 **12 Claims**



1. A wireless party line for radiotelecommunications, comprising:

at least two radio-telephones, each programmed with an identifying code word for inclusion in each of its transmissions and with a common identifying code word for reception of transmissions from other sources;

a fixed wireless repeater capable of receiving telephonic communications from a plurality of radio-telephones within its radio coverage, each with its unique identifying code word, and capable of retransmitting by radio each of said telephonic communications to a plurality of mobile radio-telephones simultaneously using a common identifying code word;

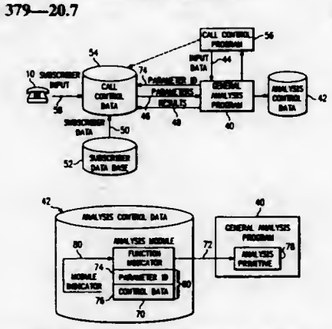
whereby said fixed wireless repeater provides a party line by means of which each mobile radio-telephone receives all retransmitted communications from said wireless mobile radio-telephones.

5,553,127

SYSTEM AND METHOD FOR PROCESSING AND ANALYZING TELEPHONE CALLS IN A TELEPHONE EXCHANGE

Lennart B. Norell, Älvsjö, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Division of Ser. No. 974,165, Nov. 10, 1992. This application Apr. 11, 1995, Ser. No. 420,026
Int. Cl.[6] H04M *3/42*
U.S. Cl. 379—20.7 **35 Claims**



13. A system for processing telephone calls in a telephone exchange comprising:

means for storing a call record containing a plurality of parameters for each telephone call processed in said exchange;

means for performing a plurality of analyses on said call record, each of said analyses being performed by executing a plurality of control-level analysis modules using a plurality of corresponding high-level analysis primitives, with the first analysis module in the analysis being predetermined and subsequent analysis modules in the analysis being selected for execution based on the outcome of the execution of prior analysis modules, and with at least one of said analysis primitives using at least one of said parameters when executing one of the corresponding analysis modules; and

means for storing the results of each analysis in said call record to be used in further processing of said telephone call.

5,553,128

CONTROL OF CALL FORWARDING BY A TARGET TELEPHONE

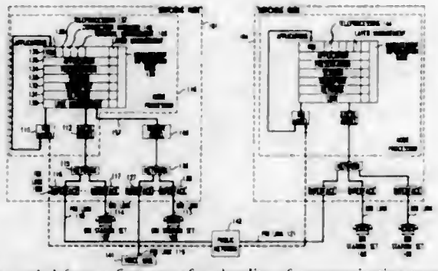
Gary J. Grimes, Birmingham, Ala., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 329,582, Oct. 26, 1994, abandoned. This application Dec. 6, 1995, Ser. No. 567,812
Int. Cl.[6] H04M *3/54;3/58*
U.S. Cl. 379—211 **24 Claims**

19. A telecommunication switching system for controlling calls

identifying, using the assigned search key, within the determined

5,553,132



forwarded from a first one of a plurality of communication terminals to a second one of the plurality communication terminals and the telecommunication switching system interconnecting the plurality of communication terminals and a call coverage system, the telecommunication switching system comprising:

means for terminating all calls on the second one of the plurality of communication terminals that originated by the first one of the plurality of communication terminals to the second one of the plurality of communication terminals;

means for accessing a table upon receipt of an indication of a forwarded call for which the first one of the plurality of communication terminals is the destination communication terminal;

means for determining from the accessed table if the second one of the plurality of communication terminals is accepting all forwarded calls from all of the plurality communication terminals;

means for terminating the forwarded call on the second one of the plurality of communication terminals upon the accessed table indicating that the second one of the plurality of communication terminals is accepting all forwarded calls from all of the plurality of communication terminals;

means for accessing a first list in the table upon receipt of an indication of the forwarded call for which the first one of the plurality of communication terminals is the destination communication terminal and the accessed table indicating that the second one of the plurality of communication terminals is accepting forwarded calls from ones of the plurality of communication terminals designated in the first list;

means for determining from the accessed first list if an identification of the first one of the plurality of communication terminals is present in the first list;

means for terminating the forwarded call on the second one of the plurality of communication terminals upon the first list indicating that the identification of the first one of the plurality of communication terminals is present in the first list; and

means for sending the forwarded call to the call coverage system upon the accessed first list indicating that the identification of the first one of the plurality of communication terminals is not present in the first list.

5,553,129

METHOD AND APPARATUS FOR TREATING CALLS BASED ON RECEIPT OF TELECOMMUNICATIONS CARRIER CODE INDICATIONS

B. Waring Partridge, III, Mendham, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed Jul. 2, 1993, Ser. No. 86,956
Int. Cl.[6] H04M *7/00*
U.S. Cl. 379—220 **17 Claims**

12. Apparatus for use in completing a telephone call between a calling party and a called party through a telephone network, comprising:

means for receiving at a network of a telecommunications carrier information, from a network of a local service provider, about a number dialed by the calling party, said dialed number (i) potentially including specific digits for designating a particular telecommunications carrier to complete said call, and (ii) digits designating a telephone number of the telephone of the called party, said information being supplied by a local service provider as part of interoffice signaling; and

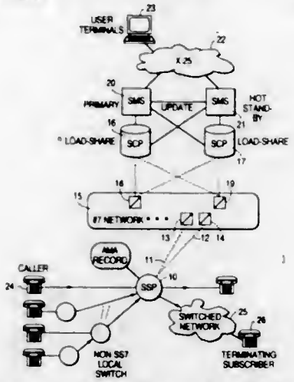
means in said network of said telecommunications carrier for completing said telephone call to a telephone other than said telephone of the called party in response to said received information indicating that said dialed number included digits designating the telecommunications carrier and the telephone number of the telephone of the called party and for completing said telephone call to the telephone of the called party in response to said received information indicating the absence in said dialed number of digits designating said telecommunications carrier designating information.

5,553,130

NUMBER TRANSLATION SERVICES MATRIX

George W. Turner, Nepean, Canada, assignor to Bell Sygma Inc., Toronto, Canada

Filed May 22, 1995, Ser. No. 445,538
Claims priority, application Canada, Apr. 25, 1995, 2147776
Int. Cl.[6] H04M *7/00*
U.S. Cl. 379—220 **20 Claims**



1. In a telephone network having a number of telephone switching offices equipped with SSPs (Service Switching Points) operating with AIN (Advanced Intelligent Network) application software, and a remotely located SCP (Service Control Point) adapted to receive SS7 (Signaling System 7) messages from the SSPs, a method of translating a dialed number at the SCP no enable the routing of a call on the telephone network to a called station, comprising the steps of:

receiving at a first SSP a number of digits sent from a calling station;

identifying an access code from the received digits using the SSP's IN trigger;

formulating an SS7 message appropriate to the IN trigger used;

transmitting the SS7 message from the first SSP to the remotely located SCP via a CCS (Common Channel Signaling) transport facility;

pre-translating at the SCP the received SS7 message to determine the appropriate numbering plan and an assigned search key;

identifying, using the assigned search key, within the determined numbering plan a routing number associated with said called station;

formulating another SS7 message at the SCP containing the routing number; and

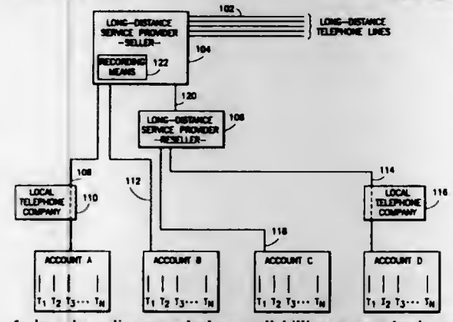
transmitting the formulated SS7 message to the first SSP to instruct the telephone network how the complete the call.

5,553,131

PROVIDING THE MOST COST-EFFECTIVE LONG-DISTANCE TELEPHONE SERVICE BASED ON MILAGE BAND RATES

Richard J. Minervino, Jr., Branford; Charles J. Veranis, Meriden, and Anthony J. Andrade, Wolcott, all of Conn., assignors to Mountain International Corporation, Wallingford, Conn.

Filed Jul. 9, 1993, Ser. No. 89,264
Int. Cl.[6] H04M *15/18*
U.S. Cl. 379—221 **12 Claims**



1. In a long-distance telephone call billing system having an electronically stored call record for each of a plurality of long-distance telephone calls for an account, each call record including origination telephone number, destination telephone number, start time and date, and duration, a method of providing the benefit of the most cost-effective long-distance telephone service based on a comparison of at least a first service plan and a second service plan, said method comprising the steps of:

determining an approximate distance between the location of the origination telephone number and the location of the destination telephone number for each call;

accumulating the time duration of each call within one of a set of predetermined mileage bands based on the determined approximate distance of each call;

calculating a first cost associated with each mileage band for each mileage band in the set of predetermined mileage bands, based on the accumulated time duration within each of the respective mileage bands and a predetermined fee schedule set by the first service plan;

calculating a second cost associated with each mileage band for each mileage band in the set of predetermined mileage bands, based on the accumulated time duration within each of the respective mileage bands and a predetermined fee schedule set by the second service plan;

comparing the first calculated cost with the second calculated cost for each mileage band;

selecting the lowest calculated cost between the first and the second calculated cost for each mileage band;

accumulating the selected lowest calculated cost for each mileage band; and

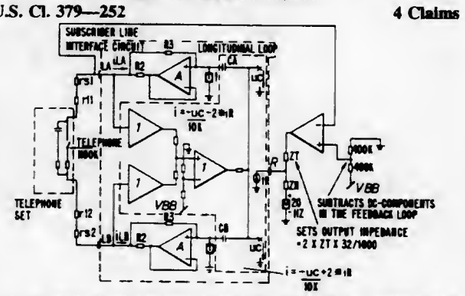
invoicing the account based on the accumulated lowest calculated cost for each mileage band, thereby providing the benefit of the most cost-effective long-distance telephone service to the account based on a comparison of the first and the second service plans.

5,553,132

METHOD AND AN ARRANGEMENT FOR GENERATING A RINGING SIGNAL

Torbjorn I. Randahl, Nacka, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jan. 20, 1995, Ser. No. 375,687
Claims priority, application Sweden, Jan. 21, 1994, 9400185
Int. Cl.[6] H04M *3/00;9/00*
U.S. Cl. 379—252 **4 Claims**



1. A method of generating a ringing signal by means of a subscriber line interface circuit, which comprises

applying a voltage which is a function of an output voltage of the subscriber line interface circuit over a first resistor, to generate a first current;

applying the output voltage of a signal generator over a second resistor, to generate a second current; and

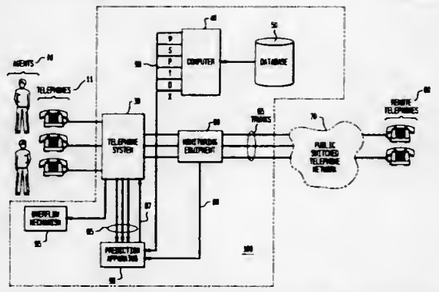
adding the first and the second currents together to obtain an input current to final stages of the subscriber line interface circuit so as to drive said final stages to generate the ringing signal.

5,553,133

SYSTEM AND METHOD FOR PREDICTIVE OUTDIALING

Mark M. Perkins, Cupertino, Calif., assignor to Siemens Rolm Communications, Inc., Santa Clara, Calif.

Filed Jun. 30, 1994, Ser. No. 268,470
Int. Cl.[6] H04Q *3/64*
U.S. Cl. 379—265 **35 Claims**



13. A system for providing a communication path between each of a plurality of agents and a target entity by predicting the availability of said plurality of agents and initiating a plurality of communications between a communications network and a plurality of target entities ahead of the availability of said plurality of agents, comprising:

availability means for monitoring the number of available agents;

minimum determination means, responsive to said availability means, for determining a minimum number of calls which must be placed in a setup state, thereby establishing a minimum number of required initiated communications;

maximum determination means, responsive to said availability means, for determining a maximum number of calls permitted

to be in a setup state, thereby establishing a maximum number of permitted initiated communications;

call monitoring means coupled to said communication network for determining the current number of calls that are in a setup state;

connection determination means for determining, in response to said minimum and said maximum determination means and to said call monitoring means, a number of additional communications to be initiated, thereby having at least said minimum number of required initiated communications, and for determining a number of already initiated but unanswered communications to be disconnected, thereby having at most said maximum number of permitted initiated communications; and

means, coupled to said communications network and to said connection determination means, for initiating said number of additional communications and for disconnecting said number of already initiated but unanswered communications;

whereby the number of communications in a setup state is at least equal to said minimum number of required initiated communications and is at most equal to said maximum number of permitted initiated communications.

5,553,134

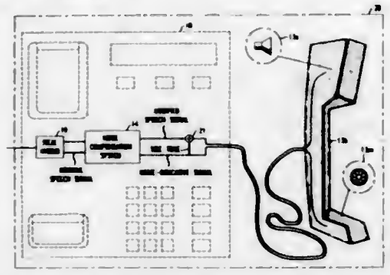
BACKGROUND NOISE COMPENSATION IN A TELEPHONE SET

Jonathan B. Allen, Mountainside, and Donald J. Youtkus, Scotch Plains, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 175,038, Dec. 29, 1993. This application May 18, 1995, Ser. No. 443,512

Int. Cl.[6] H04M 9/08

U.S. Cl. 379—387 **18 Claims**



1. A method of processing an original speech signal in a telephone set to produce a modified speech signal, the original speech signal having been communicated over a telephone network to a destination at which the telephone set is located, the destination having background noise thereat, the original speech signal being substantially free of the background noise, the method comprising the steps of:

receiving the original speech signal from the telephone network at the destination;

generating a background-noise-indicative signal indicative of the background noise at the destination; and

applying a gain to the original speech signal to produce the modified speech signal, wherein the gain is a function of the background-noise-indicative signal.

5,553,135

POINT-TO-MULTIPOINT COMMUNICATION SYSTEM AND METHOD

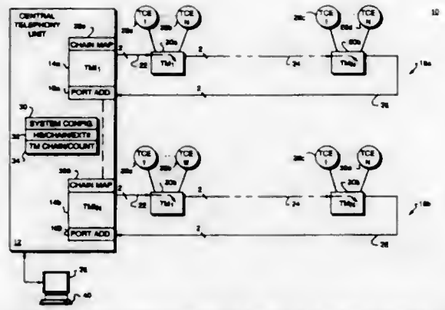
Xie-Hao Xing, 9 Myrtle St., Somerville, Mass. 02145

Filed Mar. 31, 1994, Ser. No. 221,893

Int. Cl.[6] H04J 3/16

U.S. Cl. 379—399 **17 Claims**

1. A point-to-multipoint communication system, comprising:



a central data terminal equipment unit, operative for sending and receiving at least voice communication signals, said central unit including at least one communication equipment module interface;

at least one set of communication equipment modules, each set including at least first and second communication equipment modules, said first communication equipment module coupled to said at least one communication equipment module interface by means of a first communication circuit wire segment, said second communication equipment module coupled to said first communication equipment module by means of a second communication circuit segment, and coupled to said communication equipment module interface by means of a third communication circuit segment; and

each of said at least first and second communication equipment modules including a plurality of terminal equipment interfaces, each of said plurality of terminal equipment interfaces adapted for transmitting and receiving said at least voice communication signals to and from at least one coupled terminal communication equipment.

5,553,136

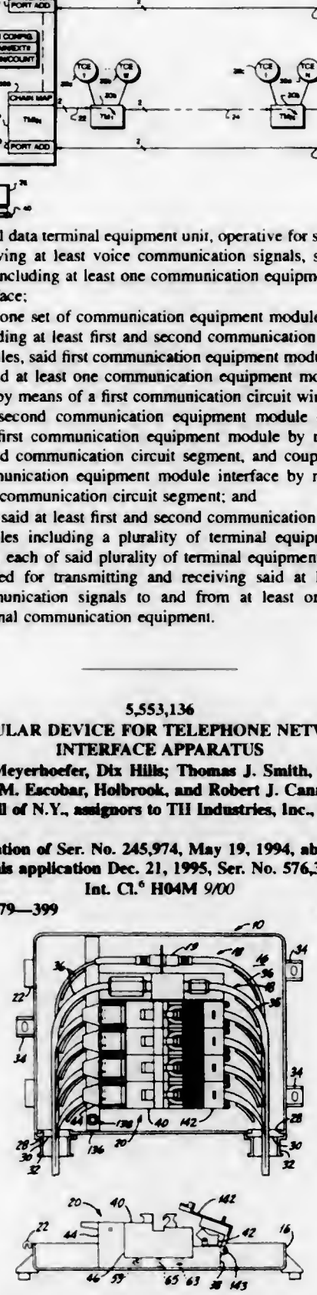
MODULAR DEVICE FOR TELEPHONE NETWORK INTERFACE APPARATUS

Carl H. Meyerhoefer, Dix Hills; Thomas J. Smith, Bayshore; Adolfo M. Escobar, Holbrook, and Robert J. Cannetti, Deer Park, all of N.Y., assignors to TII Industries, Inc., Copiague, N.Y.

Continuation of Ser. No. 245,974, May 19, 1994, abandoned. This application Dec. 21, 1995, Ser. No. 576,398

Int. Cl.[6] H04M 9/00

U.S. Cl. 379—399 **63 Claims**



1. A modular device adapted to be mounted in an enclosure with a plurality of similar devices and suitable for use in a telephone network interface apparatus for connecting at least one subscriber line and at least one telephone company line, each line comprising at least two wires, the modular device comprising:

(a) a housing;

(b) a first line termination device mounted on the housing for terminating the telephone company line, the line termination device comprising at least two insulation displacement contacts;

(c) a second line termination device mounted on the housing for terminating the subscriber line, the line termination device including at least two insulation displacement contacts; and

(d) a socket having an electrical switch, the switch having two sets of first, second and third contacts, the first contacts of both sets for being connected to the telephone company line, the second contacts of both sets for being connected to the subscriber line, the first and second contacts of each set being normally connected in the absence of a plug being inserted in the socket, thereby connecting the telephone company and subscriber lines, the first contacts of both sets being disconnected from the second contacts of both sets and being connected to the third contacts of both sets when a plug is inserted in the socket, thereby disconnecting the telephone company line from the subscriber line and connecting the telephone company line to the third contacts of both sets which in turn connect with contacts in the plug and provide a demarcation point between the telephone company and subscriber lines.

5,553,137

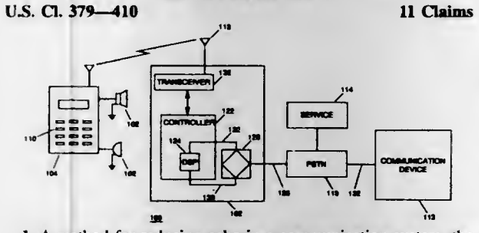
METHOD AND APPARATUS FOR ECHO CANCELING IN A COMMUNICATION SYSTEM

Scott O. Nyhart, Keller, and Tan V. Doan, Fort Worth, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 5, 1994, Ser. No. 349,336

Int. Cl.[6] H04M 9/08

U.S. Cl. 379—410 **11 Claims**



1. A method for reducing echo in a communication system, the communication system including a portable handset and a base station, the base station including an echo canceller, the echo canceller generating a noise signal in response to a noise coefficient, wherein said base station is configured to be coupled to a telephone network line, the method comprising the steps of:

receiving a dial tone at the portable handset;

dialing digits into the portable handset;

receiving audible reflected digit tones during the step of dialing; and

in response to the audible reflected digit tones, updating the noise coefficient of the echo canceller between the dialing of the digits.

5,553,138

TELEPHONE LINE SOURCED POWER SUPPLY

Arthur D. Heald; Paul R. Fulton, and Said S. Saadeh, All of Plano, Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed May 13, 1994, Ser. No. 242,314

Int. Cl.[6] H04M 19/00

U.S. Cl. 379—413 **13 Claims**

1. A power supply for a device with circuitry requiring a supply voltage of a generally constant voltage, the device connectable to a telephone line, the circuitry including logic for indicating the device is requesting to be taken off-hook, comprising:

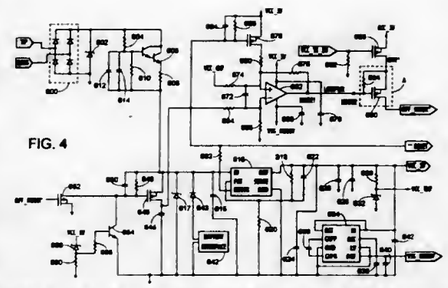


FIG. 4

means for providing the supply voltage to the circuitry, said supply voltage means including a power input;

a capacitor for providing power to said power input of said supply voltage means, a voltage being present across the capacitor;

means for providing voltage from the telephone line to said capacitor when the device is off-hook;

means for determining when the voltage across said capacitor falls below a first predetermined threshold; and

off-hook circuitry for forcing the device off-hook responsive to said means for determining when the voltage across said capacitor has fallen below said first predetermined threshold.

5,553,139

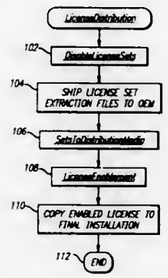
METHOD AND APPARATUS FOR ELECTRONIC LICENSE DISTRIBUTION

Cliff D. Ross, Pleasant Grove, and Neil W. Taylor, Springville, both of Utah, assignors to Novell, Inc., Orem, Utah

Filed Apr. 4, 1994, Ser. No. 223,093

Int. Cl.[6] H04L 9/00; 9/32

U.S. Cl. 380—4 **4 Claims**



1. A method of electronic licensing distribution comprising the steps of:

creating a plurality of electronic license sets, each of said electronic license sets associated with one of said plurality of products, each electronic license set comprised of a plurality of electronic license;

disabling said plurality of electronic licenses in said plurality of electronic license sets;

transferring electronic copies of a plurality of products to a final distribution medium;

transferring electronic copies of said plurality of electronic license sets to said final distribution medium;

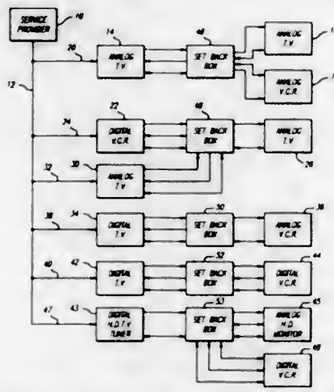
distributing said final distribution medium to an enduser.

5,553,140

DIGITAL AND ANALOG INTERFACE FOR SET BACK BOX

Yukio Kubota, Tokyo, Japan; Hajime Inoue, San Jose, and Chuen-Chien Lee, Fremont, both of Calif., assignors to Sony Corporation of Japan & Sony Electronics, Inc., Park Ridge, N.J.

Filed May 26, 1994, Ser. No. 250,564
Int. Cl.[6] H04N *7/16;7/167*
U.S. Cl. 380—10 **45 Claims**



6. An apparatus for interfacing broadcast signals from a signal source with at least one electronic device, comprising:

broadcast signal receiving means coupled to said electronic device for receiving analog and digital broadcast signals;

intermediate frequency generation means coupled to said broadcast receiving means for converting said received analog broadcast signal into an intermediate frequency (IF) signal;

tuned digital signal generation means coupled to said broadcast receiving means for tuning said received digital broadcast signal;

signal generation means coupled to receive said IF signal and further coupled to receive said tuned digital signal for generating from said IF signal and said tuned digital signal a plurality of analog audio and video signals, including separate luminance and chrominance signals, and a digital audio and video signal, and providing said plurality of audio and video signals and said digital audio and video signal to said electronic device.

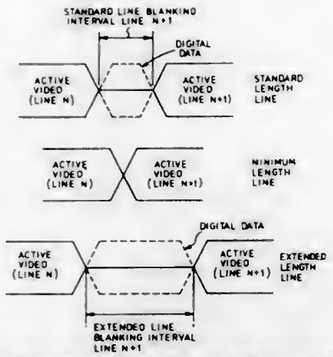
5,553,141

ENCRYPTION AND DECRYPTION (SCRAMBLING AND UNSCRAMBLING) OF VIDEO SIGNALS

John D. Lowry, Toronto, and Keith Lucas, Oak Ridges, both of, Canada, assignors to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Jun. 24, 1983, Ser. No. 507,565
Claims priority, application United Kingdom, Jul. 12, 1982, 8220588
The portion of the term of this patent subsequent to May 21, 2005, has been disclaimed.
Int. Cl.[6] H04N *7/167*
U.S. Cl. 380—14 **55 Claims**

1. A method for encrypting a line-scanned television signal of a type wherein in each line there is a first period during which video information is present and a second period where no video information is present, which method comprises encrypting said television signal in accordance with an encryption key by varying the durations of at least some of said second periods to both increase



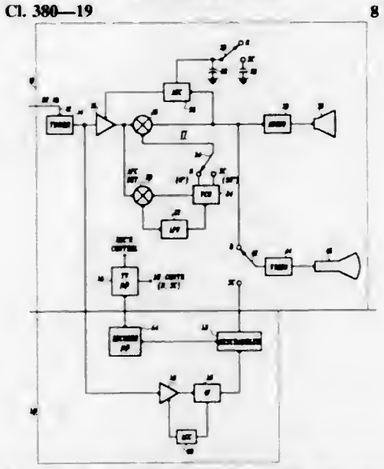
and decrease the same in accordance with said encryption key, the extent of variations in the durations of said second periods being such that over a predetermined period of time the total of increases in said durations equals the total of decreases in said durations, and during at least some of said second periods synchronization information necessary for faithful reproduction of the television signal is removed, wherein said second periods are line blanking intervals.

5,553,142

AUDIO RECOVERY FROM SCRAMBLED VIDEO IN A CABLE COMPATIBLE TELEVISION RECEIVER

David S. Tait, Wood Dale, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Feb. 8, 1995, Ser. No. 385,858
Int. Cl.[6] H04N *7/167*
U.S. Cl. 380—19 **8 Claims**



1. A method of operating a television receiver and a decoder for selectively generating a video signal and an audio signal from scrambled and unscrambled television signals, comprising:

operating a demodulator to develop said audio signal and said video signal from said unscrambled television signal;

operating said demodulator to develop substantially only said audio signal from said scrambled television signal; and

operating said decoder to develop said video signal from said scrambled television signal.

5,553,143

METHOD AND APPARATUS FOR ELECTRONIC LICENSING

Cliff D. Ross, Pleasant Grove; Neil W. Taylor, Springville; Kevin W. Kingdon, Orem; Howard R. Davis, Salem, and Drew Major, Orem, all of Utah, assignors to Novell, Inc.

Filed Feb. 4, 1994, Ser. No. 192,166
Int. Cl.[6] H04K *1/00*
U.S. Cl. 380—25 **40 Claims**

1. A method of electronic licensing comprising the steps of:

creating, using a first computer system, a plurality of licenses independent of a manufacture of a product, each of said plurality of licenses stored in a license document;

storing said plurality of licenses in a database in a second computer system;

extracting from said database one or more licenses from said plurality of licenses;

installing said one or more licenses on a third computer system independent of an installation of said product, wherein said third computer system operates independently of and separate from said first and second computer systems; and

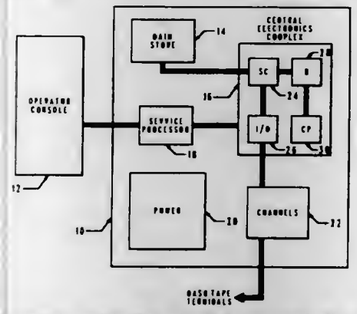
validating said one or more licenses using a license enforcement process executing in said third computer system.

5,553,144

METHOD AND SYSTEM FOR SELECTIVELY ALTERING DATA PROCESSING SYSTEM FUNCTIONAL CHARACTERISTICS WITHOUT MECHANICAL MANIPULATION

Frank A. Almquist, Kingston; David F. Anderson, LaGrangeville; John E. Campbell, Hurley; Michael J. Chan, Kingston; Stephen W. Flaherty, Fishkill; Steven F. Hajek, West Hurley; John F. Larsen, Kingston; Charles H. Milligan, Hopewell Junction; Cyril A. Price, Stone Ridge; Andrew M. Simon, Hopewell Junction; William F. Washburn, Hyde Park; George A. Williams, II, Lake Katrine, and Roy A. Wood, Saugerties, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 29,856, Mar. 11, 1993, abandoned. This application Mar. 7, 1995, Ser. No. 439,934
Int. Cl.[6] H04L *9/00;9/32*
U.S. Cl. 380—25 **14 Claims**



13. A control module for selectively electronically enabling functional capabilities of hardware elements in a data processing system, wherein respective ones of said hardware elements are manufactured with a predetermined set of functional capabilities, said control module comprising:

a nonvolatile storage device, said nonvolatile storage device being mounted within said data processing system;

memory means within said nonvolatile storage device for storing a multibit alterable code; and

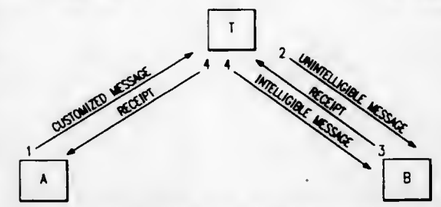
control means within said control module for enabling a selected subset of said set of functional capabilities each time power is applied to said data processing system in response to a state of said multibit alterable code.

5,553,145

SIMULTANEOUS ELECTRONIC TRANSACTIONS WITH VISIBLE TRUSTED PARTIES

Silvia Micali, 459 Chestnut Hill Ave., Brookline, Mass. 02146

Continuation-in-part of Ser. No. 408,551, Mar. 21, 1995. This application Aug. 4, 1995, Ser. No. 511,518
Int. Cl.[6] H04L *9/30*
U.S. Cl. 380—30 **49 Claims**



1. An electronic communications method between a first and a second party, with assistance from at least a trusted party, enabling an electronic transaction in which the first party has a message for the second party, comprising the steps of:

having the first party transmit to the trusted party a custom version of the message intelligible to the second party but not by the trusted party;

in response, having the trusted party verify that the first party transmitted the custom version of the message and that the second party is the intended recipient thereof;

having the trusted party transmit to the second party information that identifies the first party and from which the second party can retrieve the message; and

having the trusted party transmit to the first party a sending receipt indicating that the message has been transmitted to the second party;

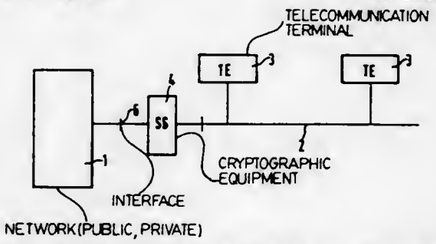
wherein at least one of the transmissions is carried out electronically and the first party does not communicate an encryption of the message directly to the second party to facilitate said electronic transaction.

5,553,146

METHOD FOR EXCHANGING INFORMATION BETWEEN ISDN TERMINAL EQUIPMENT, THAT IS, DATA TERMINALS, TERMINALS, OR TELECOMMUNICATION SYSTEMS

Horst Flake, Oberhaching, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 16, 1994, Ser. No. 291,104
Claims priority, application Germany, Aug. 16, 1993, 43 27 538.9
Int. Cl.[6] H04L *9/12;9/00*
U.S. Cl. 380—48 **14 Claims**



1. A method for exchanging information on a per call basis using basic call procedures, whereby cryptographic call statuses are synchronized between ISDN terminal equipment having ISDN standard interfaces without special functions and having associated cryptographic equipment, said ISDN standard interfaces connected to a network via said associated cryptographic equipment, a calling ISDN terminal equipment reaching a specific intermediate call

status during a call setup with a called ISDN terminal equipment

5,553,149

at least two modulating means for modulating said at least one

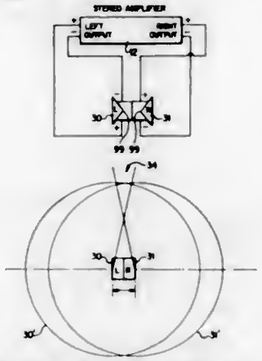
status during a call setup with a called ISDN terminal equipment, and the calling cryptographic equipment of said calling ISDN terminal equipment producing a connection to a called cryptographic equipment of the called ISDN terminal equipment in the intermediate call status across the network and communicating a required auxiliary information, and, subsequently, the called cryptographic equipment initiating a call setup to an associated called ISDN terminal equipment, in-band communicated auxiliary information being also employed in the call setup, comprising the steps of: after said intermediate call status wherein the network has already setup a connection between the calling and called cryptographic equipment, but before the calling ISDN terminal equipment, the called ISDN terminal equipment, and the network are synchronized with one another with respect to call statuses of the calling ISDN terminal equipment, of the called ISDN terminal equipment, and of the network, controlling via said calling cryptographic equipment and said called cryptographic equipment further call setup and thereby emulating the network, whereby an existing B-channel is used for mutual control; executing basic call procedures of the D-channel at the ISDN equipment interfaces of the called and calling ISDN terminal equipment by utilizing the B-channel at network interfaces and using in-band B-channel coordination between signalling processes of the called and calling cryptographic equipment.

5,553,147

STEREOPHONIC REPRODUCTION METHOD AND APPARATUS

Joseph E. M. Pineau, Calgary, Canada, assignor to One Inc., Alberta, Canada

Filed May 11, 1993, Ser. No. 60,339
Int. Cl.[6] H04R *5/02*
U.S. Cl. 381—24 **19 Claims**



1. A stereophonic sound system comprising:

a transducer means for producing first and second acoustic waves, in accordance with first and second stereophonic signals applied thereto, to effect a virtual point source acoustic pattern as perceived at a listening distance;

said transducer means having first and second acoustic transducers for producing said first and second acoustic waves respectively;

means for fixing said first and second acoustic transducers apart from each other a distance up to and not greater than a wavelength at substantially a highest operational frequency of said transducer means;

said means for fixing disposing said first and second acoustic transducers along a substantially common axis and with said first and second transducers each having respective backsides facing each other; and

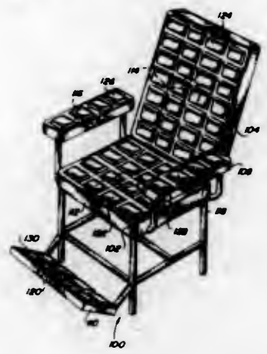
means for applying first and second different stereophonic signals to first and second acoustic transducers to emit said first and second acoustic waves in correspondence with said first and second different stereophonic signals respectively.

5,553,148

APPARATUS AND METHOD FOR PRODUCING VIBRATORY SENSATIONS TO ACCOMPANY AUDIBLE SOUNDS IN A PROPERLY PHASED RELATIONSHIP

Ben Werle, 4531 Alda Place, Woodland Hills, Calif. 91364

Filed Jun. 20, 1994, Ser. No. 261,800
Int. Cl.[6] H04R *5/02*
U.S. Cl. 381—24 **2 Claims**



1. A system for producing vibratory sensations to accompany sound waves generated in response to electronic signals supplied by an audio signal source, which sound waves are heard by a listener, said system comprising:

a signal delay circuit having the electronic signals as an input thereto, said signal delay circuit being operational to delay said electronic signals for a preselected amount of time, said signal delay circuit thereby producing as an output delayed electronic signals;

an amplifier having said delayed electronic signals as an input thereto, said amplifier amplifying said delayed electronic signals, said amplifier thereby producing as an output amplified, conditioned electronic signals;

a transducer having said amplified, delayed electronic signals as an input thereto, said transducer producing vibratory stimulations in response to said amplified, delayed electronic signals;

means for coupling said vibratory stimulations produced by said transducer to the body of the listener;

a second signal delay circuit having second electronic signals from a second audio signal source as an input thereto, said second signal delay circuit being operational to delay said second electronic signals for a preselected amount of time, said second signal delay circuit thereby producing as an output second delayed electronic signals;

a second amplifier having said second delayed electronic signals as an input thereto, said second amplifier amplifying said second delayed electronic signals, said second amplifier thereby producing as an output second amplified, conditioned electronic signals;

a second transducer having said second amplified, delayed electronic signals as an input thereto, said second transducer producing second vibratory stimulations in response to said second amplified, delayed electronic signals; and

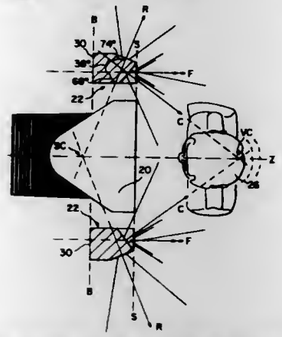
second means for coupling said second vibratory stimulations produced by said second transducer to the body of the listener at a location on the body of the listener different from the location at which vibratory stimulations produced by said transducer are coupled to the body of the listener.

5,553,149

THEATER SOUND FOR MULTIMEDIA WORKSTATIONS

Tommyca Freadman, Goshen, N.Y., assignor to Sparkomatic Corp., Milford, Pa.

Filed Nov. 2, 1994, Ser. No. 333,273
Int. Cl.[6] H04R *5/00*
U.S. Cl. 381—24 **9 Claims**



1. A speaker enclosure for providing theater sound for an audio-visual system when placed as one of a pair of enclosures on either side of a viewing screen connected to display visual output to a viewer using the system, said enclosure comprising:

a front-channel speaker opening defining a front-channel plane;

a center-channel speaker opening defining a center-channel plane that is rotated toward the screen so as to form a 38-degree angle with said front-channel plane; and

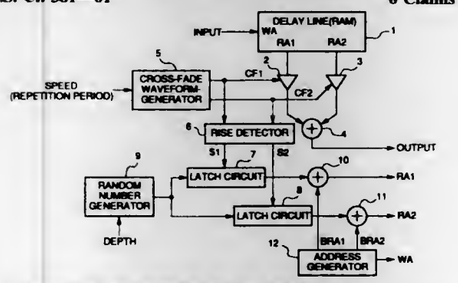
a surround-channel speaker opening defining a surround-channel plane that is rotated away from the screen so as to form a 68-degree angle with said front-channel plane and a 74-degree angle with said center-channel plane.

5,553,150

REVERBERATION - IMPARTING DEVICE CAPABLE OF MODULATING AN INPUT SIGNAL BY RANDOM NUMBERS

Koichi Kozuki, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Filed Aug. 10, 1994, Ser. No. 288,294
Claims priority, application Japan, Oct. 21, 1993, 5-285681
Int. Cl.[6] H03G *3/00*
U.S. Cl. 381—61 **6 Claims**



1. A reverberation-imparting device comprising:

memory means for storing a signal to which a reverberation effect is to be imparted, said memory means having at least one reading location determining timing for reading out said signal stored therein;

determining means for determining said at least one reading location;

random number generator means for generating at least two different random numbers;

at least two modulating means for modulating said at least one reading location by said at least two different random numbers generated by said random number generator means;

cross-fade means for cross-fading at least two signals read from said memory means, based on results of said modulation by said at least two modulating means, such that said at least two signals are alternately intensified and attenuated with a predetermined phase difference; and

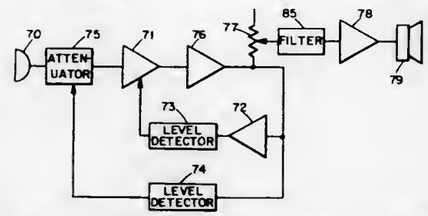
output means for outputting a result of said cross-fading of said at least two signals.

5,553,151

ELECTROACOUSTIC SPEECH INTELLIGIBILTY ENHANCEMENT METHOD AND APPARATUS

Hyman Goldberg, 5096 Alejo St., San Diego, Calif. 92124

Continuation of Ser. No. 944,209, Sep. 11, 1992, abandoned.
This application Jun. 15, 1994, Ser. No. 260,317
Int. Cl.[6] H04R *25/00*
U.S. Cl. 381—68.4 **22 Claims**



1. A hearing aid for a hearing-impaired person having a diminished dynamic range of hearing relative to a normal dynamic range of hearing, wherein the normal dynamic range of hearing has a center-point level corresponding to a sound pressure level within the diminished dynamic range of hearing at which the hearing-impaired person has no difficulty hearing, said hearing aid for enhancing the intelligibility of an acoustic input of a plurality of frequencies and having a plurality of sound pressure levels, said hearing aid comprising:

an amplifier block (**71**) having an electronically-controllable gain responsive to a feedback signal, said amplifier block (**71**) having an input signal derived from said acoustic input and for generating an output signal;

a first level detector (**73**) for detecting a level of said output signal corresponding to an input sound pressure level within said plurality of sound pressure levels and for generating said feedback signal therefrom, for controlling said electronically-controllable gain, wherein said electronically-controllable gain is fixed at a first fixed gain value when said input sound pressure level is below a first lower limit, said electronically-controllable gain is fixed at a second fixed gain value smaller than said first fixed gain value when said input sound pressure level is above a first upper limit, said first upper limit being at or below said center-point level, and said feedback signal controls said electronically-controllable gain according to a first leveling compressor when said input sound pressure level falls within a first compression range between said first lower limit and said first upper limit, wherein said electronically-controllable gain responds to said feedback signal when said input sound pressure level falls within said first range by decreasing as said input sound pressure level increases from said first lower limit to said first upper limit;

a power amplifier (**78**) for receiving and amplifying said output signal; and

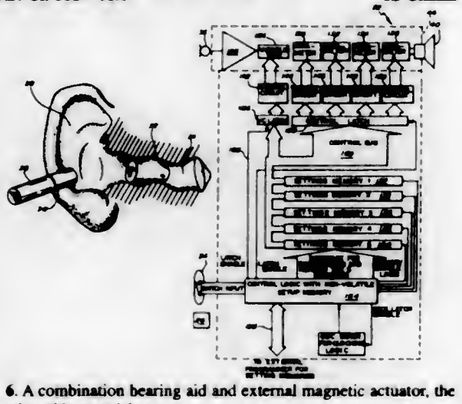
output means (**79**) for converting said output signal into an acoustic output.

5,553,152

APPARATUS AND METHOD FOR MAGNETICALLY CONTROLLING A HEARING AID

James R. Newton, Burnsville, Minn., assignor to Argosy Electronics, Inc., Eden Prairie, Minn.

Filed Aug. 31, 1994, Ser. No. 298,774
Int. Cl.[6] H04R 25/00
U.S. Cl. 381—68.6 **12 Claims**



6. A combination bearing aid and external magnetic actuator, the hearing aid comprising:

a) a microphone for generating electrical signals from acoustical input;

b) a magnetic switch actuatable by the magnetic actuator when said actuator is moved into proximity to but not in contact with the hearing aid;

c) an output transducer for transforming processed electrical signals into a user compatible form;

d) hearing aid circuitry connected to the microphone, the output transducer, and the magnetic switch, the hearing aid circuitry comprising signal processing circuitry and control processing circuitry, the signal processing circuitry configured for processing said electrical signals generated by the microphone, the signal processing circuitry having a plurality of adjustable operational parameters, the control processing circuitry comprising a plurality of memories for storing groups of settings of the operational parameters, the control processor circuitry configured to sense actuation of the magnetic switch and independently adjust at least one operational parameter and to switch among the plurality of memories dependant exclusively upon actuations of the magnetic switch.

5,553,153

METHOD AND SYSTEM FOR ON-LINE SYSTEM IDENTIFICATION

Graham P. Eatwell, Cambridge, United Kingdom, assignor to Noise Cancellation Technologies, Inc., Linthicum, Md.

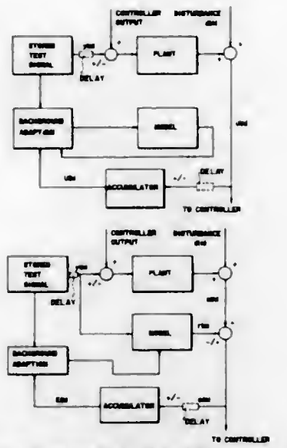
Filed Feb. 10, 1993, Ser. No. 15,195
Int. Cl.[6] A61F 11/06
U.S. Cl. 381—71 **18 Claims**

1. An active noise or vibration control system with on-line system identification for identifying the response of a physical system, said control system comprising

control means producing control signals, said control means including control adaption means responsive to residual signals,

test signal generating means for generating test signals, wherein the test signal generating means includes means for delaying or inverting a fixed test signal of length determined by the response time of the physical system, including actuator means and sensing means,

said actuation means responsive to a combination of the control signals and the test signals and producing a canceling noise or vibration, one component of which counters or partially counters an unwanted first noise or vibration,



said sensing means responsive to the combination of said canceling noise or vibration and said first noise or vibration and producing input signals,

compensation filter means responsive to said test signals and producing compensation signals, said compensation filter means including a filter adaption means responsive to said test signals and said residual signals and configured to minimize the correlation between the residual signals and the test signals,

signal subtraction means for subtracting said compensation signals from said input signals to produce said residual signals,

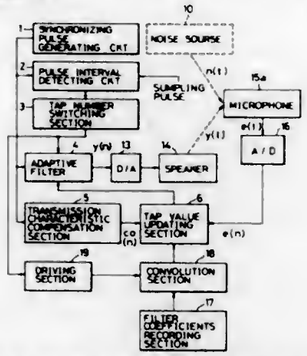
characterized in that the compensation signals substantially cancel the components of the input signal due to the test signals.

5,553,154

VEHICLE INTERNAL NOISE REDUCTION SYSTEM AND THE METHOD THEREOF

Manpei Tamamura, Obta; Hiroshi Iidaka, Tokyo, and Eiji Shibata, Oura, all of, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1994, Ser. No. 357,118
Claims priority, application Japan, Dec. 28, 1993, 5-334709
Int. Cl.[6] A61F 11/06; H03B 29/00
U.S. Cl. 381—71 **4 Claims**



1. A vehicle internal noise reduction system for reducing an internal noise generated from a noise source having, an adaptive filter responsive to a noise signal picked up from said noise source for generating a canceling signal based on a tap number, a speaker

responsive to said canceling signal for generating a canceling sound to cancel said internal noise in a passenger compartment, a microphone provided in said passenger compartment for receiving said internal noise and said canceling sound and for outputting an error signal as a result of a difference of said canceling sound and said internal noise, a transmission characteristic compensation section for generating a compensation signal to compensate a transmission characteristic of a propagation path between said adaptive filter and said microphone, and a tap value updating section for updating said tap value based on said compensation signal and said error signal and for transmitting said updated tap value to said adaptive filter, comprising:

synchronizing pulse generating means responsive to said noise signal for generating a synchronizing pulse synchronized with a period of said noise signal;

pulse interval detecting means for detecting an interval of said synchronizing pulse generated;

tap number switching means responsive to said interval for generating a cut-off number equal to a number of sampling pulses within said interval and for generating a signal of said cut-off number;

filter coefficients recording means for recording a filter coefficient to cut a specific frequency domain contained in said canceling signal;

convolution means for convoluting said filter coefficient into said tap value of said adaptive filter up to a number of times equal to said cut-off number and for out-putting said convoluted tap value to said tap value updating section so as to shorten a number of times of calculations for convolution; and

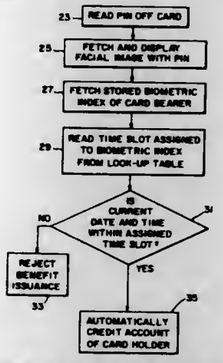
driver means responsive to said signal of said cut-off number for driving said convolution means each time when said period of said noise is changed.

5,553,155

LOW COST METHOD EMPLOYING TIME SLOTS FOR THWARTING FRAUD IN THE PERIODIC ISSUANCE OF FOOD STAMPS, UNEMPLOYMENT BENEFITS OR OTHER GOVERNMENTAL HUMAN SERVICES

Roger J. Kuhns, Tower Rd., Lincoln, Mass. 01773, and Robert L. Nathans, 36 Stag Dr., Billerica, Mass. 01821

Filed Mar. 11, 1992, Ser. No. 850,350
Int. Cl.[6] G06K 9/00
U.S. Cl. 382—115 **34 Claims**



1. Method of utilizing an electronically controlled data processor means to prevent fraud in the issuance of periodically dispensed benefits to enrollees at a plurality of benefit issue stations comprising the steps of:

(a) inputting biometric data indicative of at least one particular type of biometric characteristic of each enrollee into said electronically controlled data processor means;

(b) utilizing the biometric data to assign a particular periodically recurring time slot period, selected from at least several time slot periods, to each enrollee in accordance with and under the control of the biometric data of each enrollee;

(c) detecting the presence of each enrollee at an issue station; and

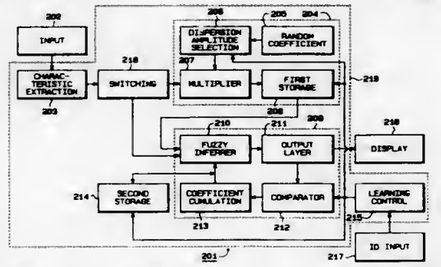
(d) issuing a benefit to each enrollee only if the enrollee reports to an issue station during that periodically recurring time slot period assigned to the enrollee.

5,553,156

SIGNATURE RECOGNITION APPARATUS WHICH CAN BE TRAINED WITH A REDUCED AMOUNT OF SAMPLE DATA

Kenzo Obata, Okazaki; Yoshiki Uchikawa, Nagoya; Takeshi Furuhashi, Nagoya, and Shigeru Watanabe, Nagoya, all of, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 22, 1994, Ser. No. 231,465
Int. Cl.[6] G06K 9/62
U.S. Cl. 382—119 **24 Claims**



1. A signature recognition apparatus comprising:

input means for reading a handwritten signature and outputting handwriting data corresponding to the read handwritten signature;

characteristic extraction means for extracting characteristics from the handwriting data outputted from the input means and outputting characteristic handwriting data in accordance with the extracted characteristic elements;

sample generating means for receiving the characteristic handwriting data and generating a plurality of truth sample data corresponding to a qualified person's true handwritten signature and a plurality of falsehood sample data corresponding to other than the qualified person's true handwritten signature, each of said truth sample data and said falsehood sample data being the mathematical product of the received characteristic handwriting data multiplied by each of a plurality of different specified coefficients;

learning control means for outputting a teacher signal representative of whether the characteristic hand-writing data is a qualified-person's true one; and

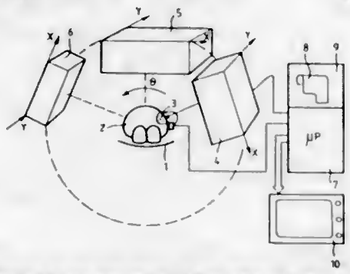
neural net means for receiving the sample data plurally generated from the sample generating means, learning a more suitable coupling load coefficient by comparing the sample data and the teacher signal, and according to the coupling load coefficient determined through a learning operation, judging whether or not newly inputted characteristic handwriting data of a handwritten signature is the qualified-person's true handwritten signature.

5,553,157

data representing linear images detected by the linear image detec-

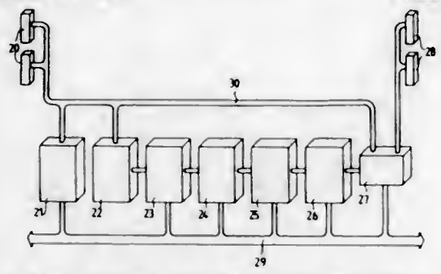
said neural network, each of the second group of neurons being connected to each of the neurons of one of said clusters,

5,553,157
METHOD FOR THE PROCESSING OF THE IMAGES OF A BATCH OF IMAGES
Michel Bourguignon, Sceaux; Hafida Berrah, Vitry/Seine, and Christoph Thil, Ostarville, all of, France, assignors to Sopha Medical, Bac Cedex, France
Filed Dec. 22, 1993, Ser. No. 171,459
Claims priority, application France, Dec. 24, 1992, 92 15721
Int. Cl.[6] G06K 9/00
U.S. Cl. 382—131 **20 Claims**



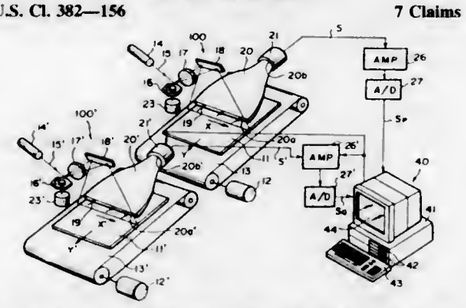
1. A method for the processing of the images of an original batch of N images having at least two spatial dimensions, to remove the noise therefrom, the N images of this batch representing N states of a periodic phenomenon, wherein said method comprises the following steps:
a 2D spatial analytic transform is carried out on the images of the original batch to obtain a batch of N transformed images, each transformed image comprising a real part and an imaginary part;
the N transformed images are time filtered by combining each image element of these transformed images with corresponding image elements in the other transformed images in order to obtain a batch of filtered transformed images, and
a reverse 2D spatial analytic transform is carried out on the images of the batch of filtered transformed images to obtain a batch of N original filtered images.

5,553,158
DEVICE FOR THE DATA PROCESSING OF LINEAR IMAGES OF GENERATRICES OF AN ARTICLE HAVING AN AXIS OF REVOLUTION
Bachar Bittar, Joinville, France, assignor to Est. Gilles Lerouz, France
PCT No. PCT/FR92/00367, § 371 Date Feb. 22, 1994, § 102(e) Date Feb. 22, 1994, PCT Pub. No. WO92/20034, PCT Pub. Date Mar. 23, 1993
PCT Filed Apr. 23, 1992, Ser. No. 955,852
Claims priority, application France, Apr. 24, 1991, 91 05364
Int. Cl.[6] G06K 9/00
U.S. Cl. 382—142 **5 Claims**



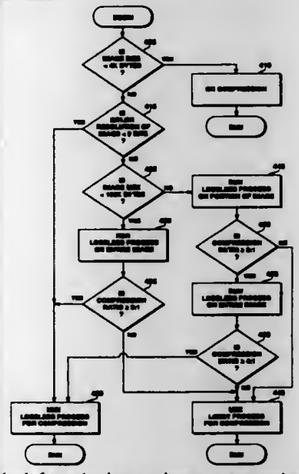
1. A data processing device for processing linear images of generatrices of an article having an axis of revolution, the linear images being detected by a linear image detector having photosensitive points for detecting linear images and for outputting image data representing linear images detected by the linear image detector, the device comprising:
a calculator for calculating for each point of the linear image detector an average value of the image data output from a respective photosensitive point of the linear image detector during a first period of processing, the first period corresponding to a complete revolution of the article;
an average memory for storing the average value for each point of the linear image detector;
a severity memory for storing a plurality of severity tables containing a plurality of severity coefficients and for storing for each photosensitive point of the image detector a severity table number selected for a respective photosensitive point and n number of severity coefficients contained in one of said plurality of severity tables corresponding to the severity table number, where n is an integral number equal to or greater than one, the severity coefficients being expressed in a percentage of variation from the average value stored in the average value memory; and
a threshold calculator for calculating n number of thresholds for each photosensitive point of the linear image detector by multiplying the average value for a respective photosensitive point by each of the n number of severity coefficients for the respective photosensitive point.

5,553,159
RADIATION IMAGE PROCESSING METHOD UTILIZING NEURAL NETWORKS
Hideya Takeo, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 10, 1992, Ser. No. 867,060
Claims priority, application Japan, Apr. 16, 1991, 3-084160
Int. Cl.[6] G06K 9/62
U.S. Cl. 382—156 **7 Claims**



1. A radiation image processing method utilizing a neural network, in which an image signal, representing a radiation image, is fed into a neural network, image processing is carried out on the image signal by the neural network, an output, representing the results of the image processing, is obtained from the neural network;
wherein the improvement comprises the steps of:
(i) providing the neural network with: 1) an input layer of neurons, said input layer of neurons being made up of clusters of neurons, each of said clusters of neurons corresponding to a different part of the radiation image, 2) an intermediate layer of neurons, said intermediate layer of neurons being made up of a first group of neurons and a second group of neurons, and 3) an output layer of neurons;
(ii) carrying out the image processing on said image signal, with respect to the whole region of said radiation image, using the first group of neurons of the intermediate layer of said neural network, each of said first group of neurons being connected to each of the neurons of the input layer, and
(iii) carrying out the image processing on said image signal, with respect to parts of the region of said radiation image, using the second group of neurons of the intermediate layer of said neural network, each of the second group of neurons being connected to each of the neurons of one of said clusters,
iv combining results of the image processing carried out in steps ii and iii above to obtain the output representing the results of the image processing.

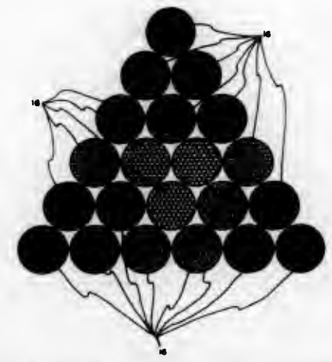
5,553,160
METHOD AND APPARATUS FOR DYNAMICALLY SELECTING AN IMAGE COMPRESSION PROCESS BASED ON IMAGE SIZE AND COLOR RESOLUTION
Bryan J. Dawson, Aloha, Oreg., assignor to Intel Corporation, Santa Clara, Calif.
Filed Sep. 1, 1994, Ser. No. 299,893
Int. Cl.[6] G06K 9/00
U.S. Cl. 382—166 **25 Claims**



1. A method for selecting an image compression process to compress an image, said method comprising the steps of:
(a) determining an uncompressed size of said image;
(b) determining a color resolution of said image; and
(c) selecting said image compression process based on the uncompressed size of said image and the color resolution of said image.

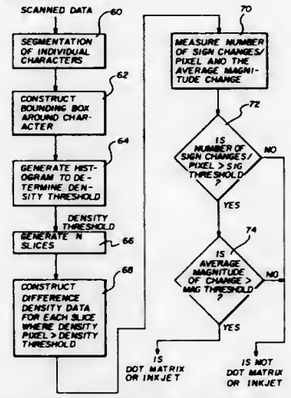
5,553,161
COPY REPRODUCTION APPARATUS FOR SCREEN PRINTING WITH COLOR CORRECTION
Hannes Fischer, Wörgl, Austria, assignor to Schablonentechnik Kufstein Aktiengesellschaft, Kufstein, Austria
Filed May 18, 1994, Ser. No. 245,693
Claims priority, application European Pat. Off., Jun. 29, 1993, 93110370
Int. Cl.[6] G06K 9/00; H04N 1/54
U.S. Cl. 382—167 **9 Claims**

1. A process for creating a data base for the reproduction of a color copy or original on a web of material, characterized by the following steps:
(a) on a sample of the web material, creating a test chart by applying to each of a plurality of predetermined areas a unique quantitative proportion of pigments of the primary colors, the quantitative proportions being representative of all possible combinations of said pigments covering quantitative ranges for each pigment;
(b) generating equations for calculating color vector values considering non-linear effects resulting from the quantitative proportions of primary colors as used in said test chart areas;



(c) colorimetrically measuring the various areas of said test chart to determine actual color vectors resulting from such applied quantitative proportions of primary colors;
(d) using the generated equations for calculating color vector correction values for each area of said test chart, based on the data obtained in step (c);
(e) colorimetrically measuring the copy or original to be reproduced, dot-by-dot, to determine color vector values to be reproduced;
(f) determining the proportion of said pigments to be applied, for each dot of said original or copy to be reproduced, based on the measured color vector values of step (e) and the results of step (d);
(g) storing the results of step (f).

5,553,162
METHOD FOR DETECTING INK JET OR DOT MATRIX PRINTING
Roger S. Gaborski, and Lori L. Barski, both of Pittsford, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 23, 1991, Ser. No. 764,415
Int. Cl.[6] G06K 9/46
U.S. Cl. 382—192 **9 Claims**



1. A method of preprocessing document images to identify the text as being printed by either a dot matrix or ink jet type printing device, comprising the steps of:
a) optically scanning said document images so as to produce image data signals representing picture elements of said document images;
b) digitizing said image data signals; and by means of a processor:

c) segmenting pixel data associated with a character from a

an error correction means to correct an input multigradation

c) segmenting pixel data associated with a character from a matrix of pixel data so as to enable the pixel data associated with an individual character to be isolated from the rest;
d) forming a bounding box around the characters so isolated;
e) generate a grey level histogram of the character within the bounding box to establish a density threshold;
f) generate a plurality of slices through the bounding box;
g) store the density per pixel position along each slice;
h) generate difference density data for each slice using adjacent pixels and the density per pixel position measured for each slice;
i) count the number of sign changes per pixel and the average magnitude change of difference data for each slice;
j) establish a threshold for the number of sign changes per pixel and the average magnitude of change; and
k) identify text printing device as either being a dot matrix or inkjet device when the sign changes per pixel and average magnitude both exceed their respective threshold.

5,553,163

POLYTOMOUS SEGMENTATION PROCESS

François Nivelle, Tours, France, assignor to Thomson-CSF, Puteaux, France

Continuation of Ser. No. 996,636, Dec. 24, 1992, abandoned. This application Feb. 3, 1995, Ser. No. 383,652
Claims priority, application France, Dec. 26, 1991, 91 16160
Int. Cl.[6] G06K *9/68*
U.S. Cl. 382—227 **11 Claims**

1. A segmentation and classification process, comprising the steps of:
determining if a data base includes classes of representative sample units to be discriminated for which a statistical law exists defining said classes of representative sample units;
estimating statistical laws defining said classes of representative sample units, when said determining step determines that said statistical law is not available;
ordering said classes of representative sample units using characteristic variables of said classes;
segmenting said database in at least as many parts as appear in said database by determining splits discriminating the ordered classes by comparing the ordered classes with each other; and
classifying an input sample by performing the steps of:
determining a probability of said input sample being included in each of said classes by evaluating at least one characteristic variable of said input sample;
classifying said sample into one of said classes having a highest probability of including said sample;
wherein said method is a shape recognition and discrimination method and the sample units contain physical features used for shape recognition and discrimination and said at least one characteristic variable which is evaluated includes at least one of color, size, surface, and volume.

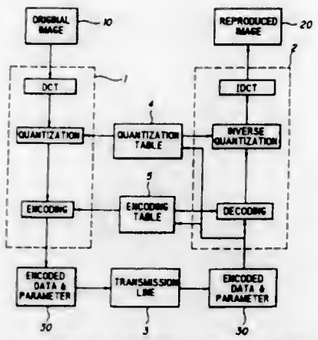
5,553,164

METHOD FOR COMPRESSING AND EXTENDING AN IMAGE BY TRANSFORMING ORTHOGONALLY AND ENCODING THE IMAGE

Fumihiko Itagaki, Hokkaido, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 14,208, Feb. 5, 1993, abandoned. This application Oct. 7, 1994, Ser. No. 320,134
Claims priority, application Japan, Feb. 7, 1992, 4-055999
Int. Cl.[6] G06K *9/36*
U.S. Cl. 382—232 **3 Claims**

1. An apparatus for compressing and extending a video image signal by orthogonally transforming and encoding the image, said video image signals formed by image blocks of pixels, said images having a brightness and distribution of brightness which may vary from image to image, said apparatus comprising:



means for non-linearly compressing said video image signals by a compression factor including stored data which is determined as a result of an image evaluation proportional to human visual sensation responsive to a stimulus of brightness, said brightness stimulus including said visual response to a distribution of said brightness;
means for transforming an original image signal to provide transformed image by using DCT;
means for providing a block distortion standard at a boundary between image blocks;
means for correcting said compression factor in accordance with said block distortion standard;
means for quantizing said transformed image signal to provide a quantized image in response to using said store data which is in the form of a quantization table storing said compression factor, said data stored in said quantization table being proportional to said human visual sensation responsive to a stimulus of brightness; and
means for encoding said quantized image signal to provide an encoded image signal in response using an encoding table;
means for extending said compressed image comprising:
means for decoding said encoded image signal to provide said quantized image signal in response to using an encoding table;
means for inversely quantizing said quantized image signal to provide said transformed image in response to using said quantization table; and
means for inversely transforming said quantized image signal to provide a reproduced image signal in response to using said DCT.

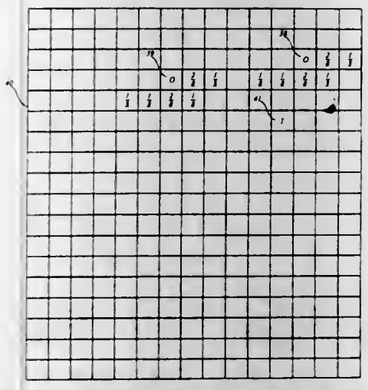
5,553,165

PARALLEL ERROR DIFFUSION METHOD AND APPARATUS

Michael Webb, Lane Cove, and William C. Naylor, Jr., Mount Kuring, both of, Australia, assignors to Canon, Inc., Tokyo, Japan

Filed Jan. 4, 1994, Ser. No. 177,306
Claims priority, application Australia, Jan. 11, 1993, PL6763
Int. Cl.[6] G06K *9/36*
U.S. Cl. 382—252 **7 Claims**

1. A method of reducing the rate at which an image formed by input pixels is error diffused, said image comprising at least one line of input pixels, said method comprising the steps of:
(a) dividing the input pixels to be error diffused into at least two groups, said groups comprising different portions of the same at least one line of said image;
(b) with a first one of the groups, performing a first series of sub-steps comprising:
(b1) receiving the first group of input pixels and combining the first group of input pixels with a first group of previously calculated error diffusion data from neighbouring pixels to produce a first group of input corrected pixels;



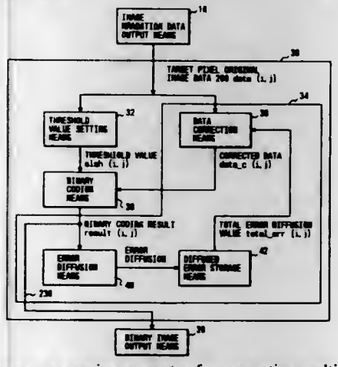
(b2) determining for each input corrected pixel of the first group a first display output value and associated error diffusion value to obtain a first group of display output data and a first group of error diffusion data,
(b3) storing the first group of error diffusion data in a first storage means,
(c) simultaneously with step (b), with a second one of the groups of input pixels, performing a second series of sub-steps comprising:
(c1) error diffusing a second group of previously calculated input corrected pixels to obtain a second group of error diffusion data and a second group of display output data;
(c2) receiving the second group of input pixels and combining the second group of input pixels with the second group of error diffusion data to obtain a second group of input corrected pixels; and
(c3) storing the second group of input corrected pixels in a storage means.

5,553,166

IMAGE PROCESSING APPARATUS

Toshiaki Kakutani, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Jun. 23, 1994, Ser. No. 264,364
Claims priority, application Japan, Jun. 24, 1993, 5-153566; Dec. 28, 1993, 5-352898
Int. Cl.[6] G06K *9/40*
U.S. Cl. 382—252 **9 Claims**



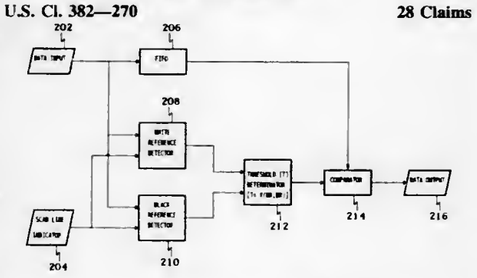
1. An image processing apparatus for converting multigradation image data into bigradation image data of a first and second gradation value comprising:
an error correction means to correct an input multigradation image data of a target pixel (data) by adding an error diffused from a proximal previously binary-coded pixel to said input to produce a corrected pixel data;
a threshold value setting means for setting a binary threshold value based on a gradation value of said input; and
a binary coding means which accepts said binary threshold value and said corrected pixel data and outputs said bigradation image data based on said threshold value and said corrected pixel data; wherein said first and second gradation value have a median m and said threshold value setting means sets said binary coding threshold value slsh, satisfying at least one of the tolerance ranges shown in the following equations:
in the case where the value of input data is close to said first gradation value, data≦slsh≦((m+data)/2), and in the case where the value of input data is close to said second gradation value, ((m+data)/2)≦slsh≦data.

5,553,167

METHOD AND APPARATUS FOR THRESHOLDING IMAGES IN PIPELINE FASHION UTILIZING AGING FUNCTIONS

John H. Dowling, Brookfield, Conn., assignor to United Parcel Service of America, Inc., Atlanta, Ga.

Continuation of Ser. No. 9,881, Jan. 27, 1993, abandoned. This application May 3, 1994, Ser. No. 237,323
Int. Cl.[6] G06K *9/38*
U.S. Cl. 382—270 **28 Claims**



10. An apparatus for generating a thresholded image signal from an input image signal having a plurality of pixel signals having multiple levels, the input image signal having been generated by imaging a physical scene with a camera, comprising:
(a) means for generating a first threshold signal and a second threshold signal in accordance with one or more aging functions, wherein at least one of said one or more aging functions is defined by a non-linear function;
(b) means for transforming a first pixel signal of said input image signal into a first thresholded pixel signal by thresholding said first input pixel signal according to said first threshold signal and for generating a second pixel signal of said input image signal into a second thresholded pixel signal by thresholding said second input pixel signal according to said second threshold signal; and
(c) means for generating said thresholded image signal in accordance with said first and second thresholded pixel signals, wherein:
said first input pixel signal and said second input pixel signal are from a single row of said input image signal; and

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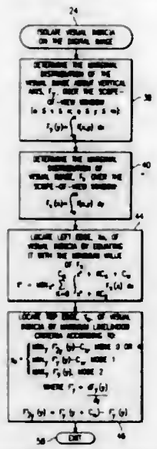
said first and second threshold signals are generated, said first and second input pixel signals are transformed, and said thresholded image signal is generated all in pipeline fashion as the single row of said input image signal is generated by a video camera without buffering all of the input pixels signals of the single row at one time.

5,553,168

SYSTEM AND METHOD FOR RECOGNIZING VISUAL INDICIA

Kathleen A. Hennessey; YouLing Lin; Howard V. Hastings, II; Jerome R. Lovelace, all of Lubbock, Tex., and Ning S. Chang, Sunnyville, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 21, 1994, Ser. No. 185,610
Int. Cl.[6] G06K 9/36
U.S. Cl. 382—276 **4 Claims**



1. A method of identifying visual characters against a noisy background on a semiconductor wafer comprising the steps of;

capturing a video image of a scope-of-view window containing the characters;

converting the video image to a digital image by using a video-to-digital converter;

isolating the visual characters on the digital image;

converting the visual characters to image primitives;

comparing the image primitives for each character to a plurality of sets of grammar primitives in a grammar database containing known characters to determine the known character whose grammar primitives are least different from the image primitives of each character; and

identifying each visual character with the known character whose grammar primitives were least different from the image primitives, wherein the characters comprise a predetermined number of SEMI font characters and wherein the step of isolating the visual character on the digital image comprises the steps of:

determining the upper left corner (X_o, Y_o) of the character by:

determining the marginal distribution F_y relative to the vertical axis of the scope-of-view window $(0 \leq x \leq n;\ 0 \leq y = m)$ where the visual image is $Y = f(x,y)$;

determining the marginal distribution F_x relative to the horizontal axis of the scope-of-view window;

determining the minimum value of F_x over the scope-of-view window and equating X_o with the minimum value of F_x; and

determining the maximum value of F_y over the scope-of-view window where $F_{y'} = dF_y(y)/dy$ and equating Y_o with the y value at that point; and

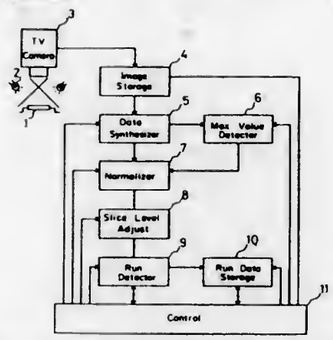
creating a character window for each character with the left upper corner of the character window located at (X_o, Y_o).

5,553,169

POSITION DETECTING DEVICE USING RUN POSITION AND RUN LENGTH OF NORMALIZED PROJECTION DATA

Seiji Mizuoka, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Continuation of Ser. No. 644,732, Jan. 18, 1991, abandoned. This application Aug. 10, 1992, Ser. No. 925,420
Claims priority, application Japan, Jan. 22, 1990, 2-12942
Int. Cl.[6] G06K 9/20
U.S. Cl. 382—282 **8 Claims**



1. A position recognizing device for recognizing the position of a three-dimensional target object, comprising:

an image pick-up device for viewing the three-dimension target object to obtain a two-dimensional image of the target object and for generating corresponding image information denoting tones or gradations of the two-dimensional image of the three-dimensional target object;

storage means for storing the image information generated by said image pick up device;

data synthesizing means for synthesizing first and second projection data from the image information stored in said storage means, the first and second projection data denoting image information along respective first and second axes of the two-dimensional image of the target object;

normalizing means for determining a normalizing constant from respective maximum values of the first and second projection data synthesized by said data synthesizing means and for setting first and second slice intervals by dividing the respective maximum values of the first and second projection data by the normalizing constant;

run detecting means for detecting a run position and a run length of each of the first and second projection data at first and second slice levels corresponding to the respective first and second since intervals set by said normalizing means; and

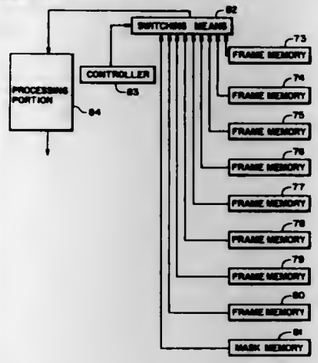
position detecting means for detecting a position of the three-dimensional target object based on the run position and the run length of each of the first and second projection data.

5,553,170

HIGH SPEED IMAGE PROCESSING SYSTEM HAVING A PREPARATION PORTION AND A CONVERTING PORTION GENERATING A PROCESSED IMAGE BASED ON THE PREPARATION PORTION

Ryohei Kumagai, Tama, Japan, assignor to Ezel, Inc., Tokyo, Japan

Continuation of Ser. No. 126,019, Sep. 24, 1993, abandoned, which is a continuation of Ser. No. 796,451, Nov. 21, 1991, abandoned, which is a division of Ser. No. 602,379, Oct. 24, 1990, Pat. No. 5,283,866, which is a continuation of Ser. No. 217,544, Jul. 11, 1988, abandoned, which is a continuation-in-part of Ser. No. 141,534, Jan. 7, 1988, abandoned. This application Nov. 14, 1994, Ser. No. 340,315
Claims priority, application Japan, Jul. 9, 1987, 62-171790; Jul. 9, 1987, 62-171791; Oct. 9, 1987, 62-255511; Oct. 19, 1987, 62-263265; Oct. 20, 1987, 62-264797; Oct. 22, 1987, 62-266718; Oct. 22, 1987, 62-266720; Nov. 2, 1987, 62-278039; Feb. 9, 1988, 63-27935
Int. Cl.[6] G06K 9/36
U.S. Cl. 382—283 **5 Claims**



1. An image processing system comprising:

a plurality of frame memories, each storing a plurality of items of image data at respective addresses thereof, the image data in frame memory representing a single complete image;

a mask memory, having addresses corresponding to each of said addresses of said plurality of frame memories, and storing masking data therein at locations in said mask memory corresponding to said addresses;

mask selecting means, coupled to receive: 1) an output of one of said frame memories and 2) and output of said mask memory, said output of said mask memory being said masking data corresponding to said one frame memory address, for producing an image output signal, said image output signal for each said address of said frame memories corresponding to said image data at said address in said one frame memories when said masking data at said corresponding address indicates no masking, and said image memories corresponding to predetermined value when said masking data at said corresponding address indicates masking;

controller means for selecting said one of said frame memories whose data is to be passed through said mask selecting means; and

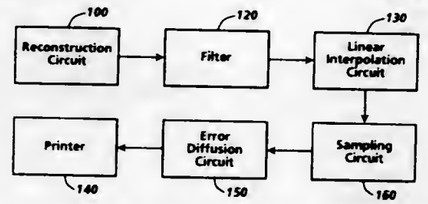
a data processing portion which receives and output of said mask selecting means.

5,553,171

APPARATUS AND METHOD FOR ARBITRARY BINARY RESOLUTION CONVERSION

Ying-wei Lin, Penfield, and Jeng-Nan Shiau, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 143,734, Nov. 1, 1993, abandoned. This application Jul. 26, 1995, Ser. No. 507,064
Int. Cl.[6] G06K 9/36
U.S. Cl. 382—299 **14 Claims**



1. A method for converting a binary image signal having a first resolution to a gray image signal having a desired resolution, comprising the steps of:

(a) receiving the binary image signal having the first resolution;

(b) electronically simulating, using the received binary image signal, a printing process using a function resembling a Gaussian function to generate a first continuous gray image signal from the received binary image signal;

(c) sampling the first continuous gray image signal at a second resolution to produce a sampled gray image signal, the second resolution being higher than the first resolution;

(d) filtering the sampled gray image signal to produce a band-limited gray image signal;

(e) linearly interpolating the bandlimited gray image signal to produce a second continuous gray image signal; and

(f) sampling the second continuous gray image signal at a certain frequency, thereby producing a gray image signal having the desired resolution.

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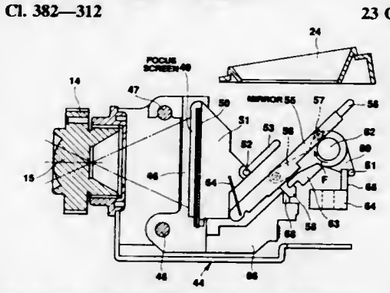
ELECTRONIC IMAGE PICKUP APPARATUS HAVING MOVABLE FOCUS SCREEN AND MOVABLE MIRROR AND WHICH IS CAPABLE OF MINIATURIZATION

Satoshi Kimura, Oome; Hideki Miyazaki, Fussa; Hiroto Shimizu, Komae; Kazuto Yamamoto, Akishima, and Tsuyoshi Kato, Hamura, all of, Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 986,247, Dec. 7, 1992, abandoned. This application Nov. 29, 1994, Ser. No. 346,353
Claims priority, application Japan, Dec. 11, 1991, 3-327586; Sep. 24, 1992, 4-279440; Oct. 9, 1992, 4-298091
Int. Cl.[6] G06K 9/20
U.S. Cl. 382—312 **23 Claims**



1. An electronic image pickup apparatus, comprising:

image data creating means for outputting image data in units of lines by forming an object image and scanning an image formation plane of an optical system using a line sensor;

a focus screen, for forming said object image in an image

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an actuator responsive to a control signal operable to the control

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a focus screen, for forming said object image in an image formation position, said focus screen being movable to said image formation position and to a retreat position where said object image is retreated from said image formation position;

a mirror movable to a reflection position where said object image formed on said focus screen is reflected on a finder for monitoring said object image, and to a shielding position where a light from said finder is shielded;

driving means for respectively driving said focus screen to said retreat position and said mirror to said shielding position when an image picking up operation of said image data creating means is started, and for respectively driving said focus screen to said image formation position and said mirror to said reflection position when said image picking up operation is finished;

a line buffer for storing one-line image data output by said image data creating means;

data generating means for generating data to be synthesize with the image data, in units of lines;

Synthesized data creating means for creating synthesized data by synthesizing the one-line data generated by said data generating means with one-line image data output by said image data creating means and stored in said line buffer; and

synthesized data output means for outputting the synthesized data created by said synthesized data creating means.

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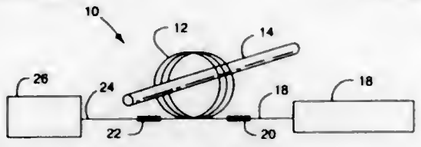
FARADAY-EFFECT SENSING COIL WITH STABLE BIREFRINGENCE AND METHOD OF MAKING SAME

Dale R. Lutz, Maplewood, Minn.; Trevor W. MacDougall, Cedar Park; William L. Taylor, Round Rock, both of Tex.; Wayne F. Varner, Woodbury, Minn., and Robert A. Wandmacher, Cedar Park, Tex., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 205,899, Mar. 3, 1994, Pat. No. 5,463,312. This application Feb. 23, 1995, Ser. No. 393,413

Int. Cl.[6] G02B *6/00;* **G01R** *19/00;* **B65H** *18/28*

U.S. Cl. 382—12 **15 Claims**



1. An optical current transducer comprising:

an optical fiber being formed into a Faraday-effect sensing coil having linear birefringence and circular birefringence, each of said linear birefringence and said circular birefringence changing less than 20% over a temperature range of about 0° C. to about 20° C.;

light means connected to a first end of said fiber coil, for sending a light signal of known polarization; and

detector means connected to a second end of said fiber coil, for sensing the polarization of said light signal after passing through said coil.

8. A method of making a fiber optic, Faraday-effect sensing coil, comprising the steps of:

obtaining a spun optical fiber having a core of generally radially symmetrical cross-section;

forming a coil from said optical fiber;

annealing said coil at a temperature in the range between 550° C. to 1250° C.; and

cooling said coil at a rate less than 25° C. per hour.

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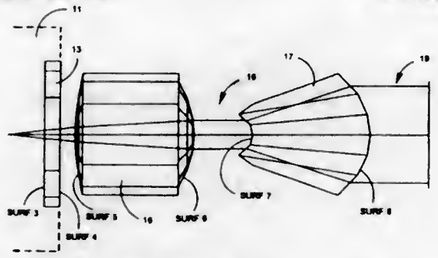
MONOLITHIC CYLINDRICAL OPTIC

James J. Snyder, San Jose, Calif., assignor to Blue Sky Research, Incorporated, Santa Cruz, Calif.

Continuation-in-part of Ser. No. 20,584, Feb. 22, 1993. This application Jul. 14, 1993, Ser. No. 91,779

Int. Cl.[6] G02B *6/26*

U.S. Cl. 385—15 **12 Claims**



1. A monolithic optic comprising:

a cylindrical lens comprised of a transparent material, said lens having a longitudinal axis, an optical axis orthogonal to said longitudinal axis, and a constant cross-section in a plane orthogonal to said longitudinal axis, said lens having a negative power cylindrical surface and having a positive power cylindrical surface opposite said negative power cylindrical surface, wherein said negative power cylindrical surface and said positive power cylindrical surface have focal lines that substantially coincide.

5,553,175

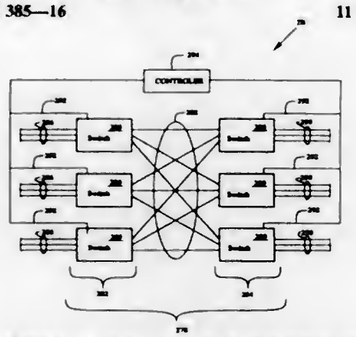
APPARATUS FOR SPLITTING OPTICAL SIGNALS AND METHOD OF OPERATION

Richard H. Laughlin, 1906 Campbell Trail, Richardson, Tex. 75082

Division of Ser. No. 251,837, May 27, 1994, Pat. No. 5,444,801. This application May 18, 1995, Ser. No. 444,305

Int. Cl.[6] G02B *6/26*

U.S. Cl. 385—16 **11 Claims**



1. An apparatus for variably splitting an input optical signal to a plurality of output optical locations, the apparatus comprising:

a lens for collimating the input optical signal into a collimated beam;

a first refractor having a first reflective surface for reflecting the collimated beam by total internal reflection and for changing the angle of the collimated beam by a selected amount in order to direct the beam to the output optical location;

a second refractor having a contact surface and a reflective surface;

an actuator responsive to a control signal operable to the control spacing between the second refractor and the first refractor so as to partially frustrate the total internal reflection of the collimated beam by the first refractor's reflective surface and so that a portion of the collimated beam enters the second refractor and is not directed to the output optical location; and

wherein the lens is further operable to decollimate and focus the collimated beam.

5,553,176

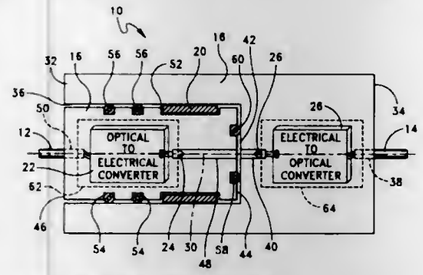
SINGLE IN-LINE FIBER-OPTIC ROTARY JOINT

James S. DeMarco, Jr., Waterford, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 14, 1995, Ser. No. 502,406

Int. Cl.[6] G02B *6/26*

U.S. Cl. 385—26 **10 Claims**



7. A fiber optic rotary joint comprising:

inner and outer concentric body portions having a common longitudinal axis, said outer body portion having first and second ends, a cylindrical opening in said first end, an axial bore extending inwardly from said cylindrical opening, and means for securing an output optic fiber at said second end, said inner body portion being cylindrical in shape and having first and second ends, said inner body portion further including an axial bore extending inwardly from said first end, and means for securing an input optic fiber at said second end, said first end of said inner body portion being slidably received into said cylindrical opening in said outer body portion so that said axial bores are in closely spaced axial alignment;

bearing means for permitting relative rotational movement between said inner and outer body portions;

optical to electrical signal converter means in said inner body portion for receiving an incoming optical signal from said input optic fiber and for converting said incoming optical signal to a corresponding first electrical signal;

a light source positioned in said axial bore in said inner body portion, said light source receiving said first electrical signal and emitting a corresponding light signal along said axial bore;

a light detector positioned in said axial bore in said outer body portion, said light detector receiving said light signal and generating a corresponding second electrical signal; and

electrical to optical converter means in said outer body portion for receiving said second electrical signal and for converting said second electrical signal to an outgoing optical signal for output to said output optic fiber.

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OPTICAL FIBER DEVICE WHICH INCREASES LIGHT INTENSITY

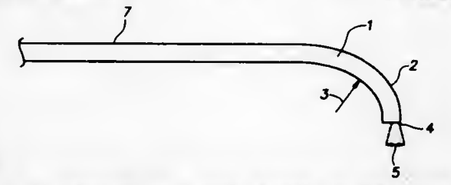
Peter Hering, Garching, and Michael Haisch, Munich, both of, Germany, assignors to CeramOptec Industries, Inc., East Longmeadow, Mass.

Filed Jul. 14, 1994, Ser. No. 274,912

Claims priority, application Germany, Jan. 15, 1992, 4200887C1; WIPO, Jan. 14, 1993, PCT/DE93/00022

Int. Cl.[6] G02B *6/26;* **F21V** *7/04*

U.S. Cl. 385—31 **19 Claims**



1. A lightguiding device which increases the light intensity exiting from its distal end, comprising:

a bent lightguide section being at an end of a lightguide having a diameter, a core section and a clad section, and having a bend angle and a bend radius;

said bend radius being as small as possible without exceeding said fiber's waveguiding limit;

said bent lightguide section, being stress free, and having a homogeneous refractive index throughout said core section;

said bent lightguide section and straight lightguide section having numerical apertures; and

said bent lightguide section being an integral part of a preceding straight lightguide.

5,553,178

LASER MODULE USING ASYMMETRICAL LENS

Shu Namiki, Tokyo, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan

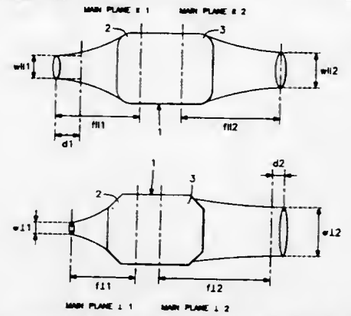
PCT No. PCT/JP93/00446, § 371 Date Apr. 22, 1994, § 102(e) Date Apr. 22, 1994, PCT Pub. No. WO93/20468, PCT Pub. Date Oct. 14, 1993

PCT Filed Apr. 6, 1993, Ser. No. 150,194

Claims priority, application Japan, Apr. 6, 1992, 4-113089

Int. Cl.[6] G02B *3/02;6/32*

U.S. Cl. 385—33 **5 Claims**



1. An asymmetrical lens showing different sets of optical characteristics as projected on two planes that are parallel to the optical axis of the lens and perpendicular to each other and satisfying the following simultaneous system of equations:

$$(w\perp 2)/(w\perp 1)=(f\perp 2)/f\perp 1) \quad [2]$$

$$(w\parallel 2)/(w\parallel 1)=(f\parallel 2)/(f\parallel 1) \quad [3]$$

$$(d1)=\perp(s\perp 1)-(s\parallel 1)| \quad [4]$$

$$(d2)=|(s\perp 2)-(s\parallel 2)| \quad [5]$$

$$(1/f\perp)=(1/f\perp 1)+(1/f\perp 2)$$

[6] twisting of said surrounding fibers about said central fiber in said coupling region;

separate spring means mounted an the body and adapted for cooperating with the body to bias the fiber optic connectors to

a thermal transfer material disposed within the passageway defined in said optical fiber carrier, said thermal transfer

$$(1/f\perp)=(1/f\perp 1)+(1/f\perp 2) \quad [6]$$

$$(1/f\parallel)=(1/f\parallel 1)+(1/f\parallel 2) \quad [7]$$

where,

(f⊥1) and (f⊥2) respectively represent the distances between the two principal surface planes of the lens as projected on one of the planes and the image forming spot, being a symbol indicating a vertical direction,

(s⊥1) and (s⊥2) respectively represent work distances corresponding to the above distances,

(f‖1) and (f‖2) respectively represent the distances between the two principal surface planes of the lens as projected on the other plane and the image forming spot, being a symbol indicating a horizontal direction,

(s‖1) and (s‖2) respectively represent work distances corresponding to the above distances,

(w⊥1) and (w⊥2) respectively represent the major and minor axes of the image forming spots having elliptic and/or circular forms on light emitting terminals of optical waveguides connected by way of the lens for matching of their respective waveguide modes,

(d1) and (d2) respectively represents the degrees of astigmatism of the optical waveguides connected by way of the lens,

(f⊥) and (f‖) respectively represent the focal lengths for vertical and horizontal directions of the lens, and

symbols "⊥" and "‖" respectively representing the vertical and horizontal directions.

5,553,179

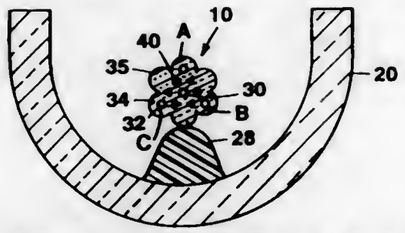
VARIED INSERTION LOSS FIBER OPTIC COUPLING AND METHOD OF MAKING SAME

Colm V. Cryan, Arlington; David W. Stowe, Milford, and Margaret M. Parslow, Auburn, all of Mass., assignors to Porta Systems Corp., Syosset, N.Y.

Continuation-in-part of Ser. No. 169,512, Dec. 17, 1993, Pat. No. 5,408,554. This application Feb. 22, 1994, Ser. No. 200,780

Int. Cl.[6] G02B *6/28*; C03B *37/15*

U.S. Cl. 385—43 **30 Claims**



1. A fiber optic coupler for coupling optical power from an input optical fiber to at least two output optical fibers, said coupler formed from constituent fibers comprising:

a central fiber, said central fiber being an optical fiber having an optical core and a surrounding cladding; and

multiple surrounding fibers extending along said central fiber and arranged in at least one close-packed ring around said central fiber in a coupling region, each of said multiple surrounding fibers touching neighboring surrounding fibers and said central fiber, said multiple surrounding fibers and said central fiber being drawn a selected length while being fused together in said coupling region to form a coupler of generally circular cross-section,

at least a plurality of said constituent fibers comprising optical fibers each having an optical core and a surrounding cladding,

one of said optical fibers being an input fiber and at least two of said optical fibers being output fibers,

said coupler being constructed and arranged with at least one of:

bending of said coupling region in a preselected plane;

twisting of said surrounding fibers about said central fiber in said coupling region;

selection of a first of said output optical fibers to have a different cross-sectional diameter than a second of said output optical fibers;

selection of a first of said output fibers to have a different refractive index profile than a second of said output optical fibers;

selection of at least one of said surrounding fibers as a spacer fiber having no optical core;

in order to cause optical power in said input optical fiber to couple nonuniformly to said at least two output optical fibers, whereby said coupler, in a unitary structure, provides a difference in the respective insertion losses between said input fiber and at least two of said output fibers;

wherein said central fiber and said surrounding fibers are fused together in a manner characterized by a normalized fused width of between about 0.2 and 0.6.

24. A method for forming a fiber optic coupler comprising the steps of:

(a) providing a plurality of fibers, one of said plurality of fibers being an input optical fiber, and at least two of said plurality of fibers being output optical fibers, each of said optical fibers having an optical core and a surrounding cladding;

(b) arranging one of said plurality fibers as a central fiber and at least some of the remaining fibers as surrounding fibers in sufficient number to provide at least one close-packed ring of fibers, wherein each of the fibers in said ring touches neighboring surrounding fibers and said central fiber;

(c) drawing said surrounding fibers and said central fiber a desired length, while fusing; and

(d) bending said coupling region in a preselected plane, the radius of curvature and the orientation of said preselected plane being selected to substantially achieve a difference in the respective insertion losses between said input fiber and said at least two output optical fibers,

whereby said method provides, in a unitary structure, a fiber optic coupler having a difference in the respective insertion losses between at least two of said output optical fibers and said input optical fiber.

5,553,180

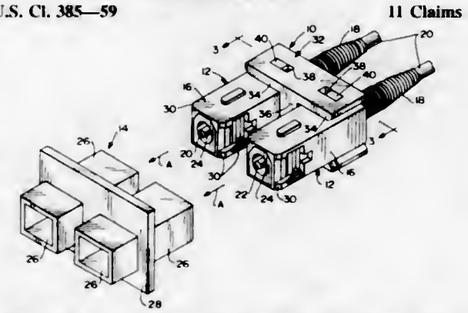
ADAPTER ASSEMBLY FOR FIBER OPTIC CONNECTORS

Yuriy Belenkiy, Niles; Igor Grois, Northbrook; Irina Gumin, Skokie; Ilya Makhlin, Wheeling; Mark Margolin, Lincolnwood, and Michael J. Pescetto, Hanover Park, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Jan. 17, 1995, Ser. No. 373,175

Int. Cl.[6] G02B *6/36*

U.S. Cl. 385—59 **11 Claims**



1. An adapter assembly for holding two individual fiber optic connectors in generally parallel side-by-side alignment, comprising:

a body having a pair of holding portions adapted for holding said fiber optic connectors in a substantially side-by-side relationship;

separate spring means mounted an the body and adapted for cooperating with the body to bias the fiber optic connectors to a substantially parallel relationship; and

wherein said body is generally H-shaped with two opposing pairs of leg portions defining said pair of holding portions.

5,553,181

FIBRE OPTIC CONNECTOR AND METHOD OF FORMING A FIBRE CONNECTION

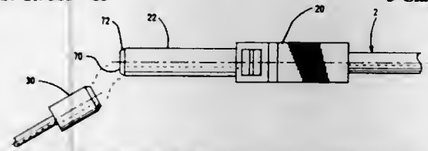
Egbertus T. C. M. van Woesik, s'-Hertogenbosch, Netherlands, assignor to The Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 163,788, Dec. 9, 1993, abandoned. This application Mar. 23, 1995, Ser. No. 409,625

Claims priority, application United Kingdom, Jan. 7, 1993, 9300207

Int. Cl.[6] G02B *6/36*

U.S. Cl. 385—85 **5 Claims**



1. A method of forming a fibre connection, characterized by the steps of:

providing a connector housing having a front mating end and a cable receiving end with the housing having a bore therein for the receipt of a bared fibre end and a portion of a fibre cable, the front mating end having a notch towards a front end thereof;

inserting the portion of the fibre cable and the bared fibre end into the cable receiving end until the bared fibre end extends beyond said notch;

retaining the fibre cable in the connector; and

cutting off a section of the front mating end and the bared fibre end at said notch thereby providing a planar mating face.

5,553,182

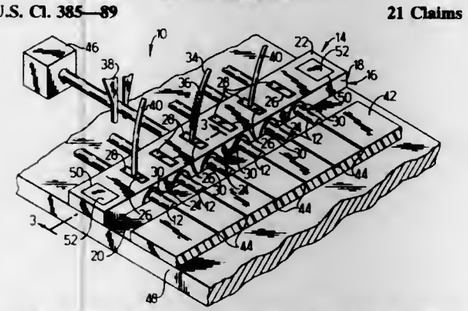
ALIGNMENT FIXTURE AND ASSOCIATED METHOD FOR CONTROLLABLY POSITIONING ON OPTICAL FIBER

John M. Hanke, St. Charles, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Feb. 14, 1995, Ser. No. 388,609

Int. Cl.[6] G02B *6/36*

U.S. Cl. 385—89 **21 Claims**



1. An alignment fixture for controllably positioning an optical fiber, the alignment fixture comprising:

an optical fiber carrier defining at least one channel extending thereacross, the channel extending inwardly from a first surface of said optical fiber carrier and defining a longitudinal axis, said optical fiber carrier also defining at least one passageway from a second surface of said optical fiber carrier, opposite the first surface, to the channel;

a thermal transfer material disposed within the passageway defined in said optical fiber carrier, said thermal transfer material having a greater thermal conductivity than said optical fiber carrier; and

an optical fiber bonding material disposed within the channel and adapted for bonding the optical fiber to said optical fiber carrier, said optical fiber bonding material having a predetermined melting temperature wherein said optical fiber bonding material is at least partially malleable at temperatures above the predetermined melting temperature so that the optical fiber can be positioned therein and wherein said optical fiber bonding material is solidified at temperatures below the predetermined melting temperature so that the position of the optical fiber is fixed therein, said optical fiber bonding material being in thermal contact with said thermal transfer material such that the malleability of said optical fiber bonding material is controlled by thermal energy applied to said thermal transfer material.

5,553,183

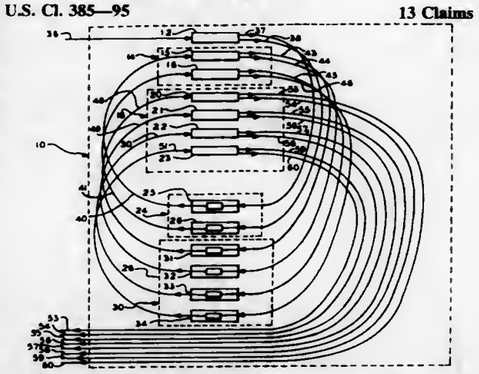
APPARATUS FOR AND METHODS OF SPLITTING FIBER OPTIC SIGNALS

Ronald D. Bechamps, Jackson, N.J., assignor to ANTEC Corp., Rolling Meadows, Ill.

Filed Apr. 3, 1995, Ser. No. 415,194

Int. Cl.[6] G02B *6/255*

U.S. Cl. 385—95 **13 Claims**



4. Fiber optic signal splitter apparatus, comprising:

an individual fiber optic signal splitter for receiving and splitting an incoming fiber optic signal into a first plurality of fiber optic signals, said splitter including an input lead through which said incoming fiber optic signal is received and a plurality of output leads equal in number to said first plurality of fiber optic signals and through which said first plurality of fiber optic signals are transmitted;

a plurality of fiber optic signal splitters equal in number to said first plurality of fiber optic signals, each splitter of said plurality of fiber optic signal splitters including an input lead and a plurality of output leads; and

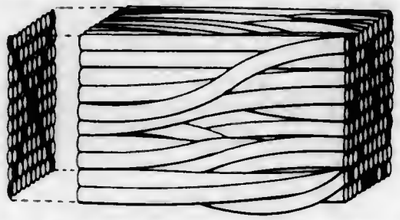
a plurality of fiber optic splicing members equal in number to said first plurality of fiber optic signals, each splicing members of said first plurality of splicing means for splicing an output lead of said individual fiber optic signal splitter to an input lead of one of said fiber optic signal splitters of said plurality of fiber optic signal splitters whereby said plurality of fiber optic signal splitters receives and splits said first plurality of fiber optic signals into a plurality of output fiber optic signals greater in number than said first plurality of fiber optic signals, said second output leads of said splitters of said plurality of fiber optic signal splitters equal in number to said plurality of output fiber optic signals and said plurality of output fiber optic signals transmitted through said output leads of said plurality of fiber optic signal splitters.

5,553,184

PROCESS FOR THE APPLICATION OF FIBER OPTICAL BUNDLES COMPRISING OPTICAL FIBERS

Eckard Elkelmann, Würselen; Stefan Keller, and Tilo Pfeifer, both of Aachen, all of, Germany, assignors to Fraunhofer-Gesellschaft Zur Forderung Der Angewandten Forschung E.V., Munich, Germany

Filed Dec. 7, 1994, Ser. No. 351,009
Int. Cl.[6] G02B *6/04*
U.S. Cl. 385—115 **51 Claims**



1. Process for applying fiber optical bundles comprising optical fibers for visual and measurement-related purposes, in which process light is coupled into the fiber optical bundle on a launching side and is extracted from said fiber optical bundle on an output side,

the individual optical fibers are labelled on the output side and their output-side coordinates are determined,

whereupon each of the optical fibers determined on the output side is defined on the launching end and their launching side coordinates are determined; and finally the output sided coordinates for each optical fiber are converted to the launching side coordinates, wherein

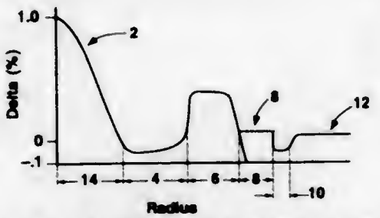
for the purpose of defining the output side coordinates of the optical fibers on the launching side, light is fed into the fiber optical bundles and the optical fibers are separated in their representation on the output end by means of threshold formation.

5,553,185

CONTROLLED DISPERSION OPTICAL WAVEGUIDE

A. Joseph Antos, Elmira; Evelyn M. DeLiso, Corning; Yanming Liu, Horseheads; Mark A. Newhouse, Corning; David K. Smith, Painted Post, and Carlton M. Truesdale, Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Dec. 27, 1994, Ser. No. 364,797
Int. Cl.[6] G02B *6/22*
U.S. Cl. 385—127 **14 Claims**



1. A single mode optical waveguide fiber for high performance telecommunication systems comprising:

a core surrounded by a cladding layer, said cladding layer having a refractive index n_c;

said core comprising:

a central region having a refractive index profile, and a radius r_1; and,

a plurality of annular regions surrounding said central region, each said annular region having a refractive index profile and a width, a portion of the refractive index profile of at least one of said annular regions being less than n_c;

said optical waveguide fiber having a cut off wavelength greater than 1300 nm and an attenuation less than about 0.25 dB/km;

characterized in that the refractive index profile and radius of said central region, and the refractive index profiles and widths of said annular regions, are chosen to provide an absolute value of total dispersion, of said optical waveguide fiber, in the range of about 0.50 ps/nm-km to 3.5 ps/nm-km and an absolute value of total dispersion slope no greater than about 0.05 ps/nm^2-km over a pre-selected wavelength range;

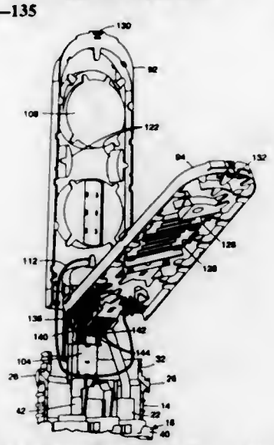
wherein the total dispersion is non-zero over the pre-selected wavelength range.

5,553,186

FIBER OPTIC DOME CLOSURE

William G. Allen, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 31, 1995, Ser. No. 414,955
Int. Cl.[6] G02B *6/36*
U.S. Cl. 385—135 **20 Claims**



1. An article for supporting a plurality of optical fibers and associated interconnection devices, comprising:

an elongate transition tray having spool means for receiving excess fiber slack, and having first and second pivot pins at one end thereof,

a first, elongate splice tray having first and second hubs at one end thereof, engaging said first and second pivot pins, respectively, of said transition tray, thereby hingedly attaching said first splice tray directly to said transition tray, said first splice tray further having third and fourth pivot pins at said one end thereof, proximate said first and second hubs; and

a second, elongate splice tray having third and fourth hubs at one end thereof, engaging said third and fourth pivot pins, respectively, of said first splice tray, thereby hingedly attaching said second splice tray directly to said first splice tray at the same end of said first splice tray that is attached to said transition tray.

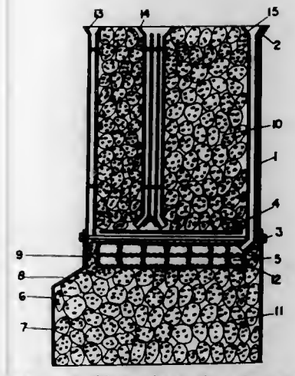
5,553,187

BOOSTER MECHANISM FOR SAUNA GENERATOR'S ROCKPILE UTILIZING WATER-DIRECTING BYPASS STRUCTURE

Veikko A. Lippo, 15101 Interlachen Dr., Apt. 606, Silver Spring, Md. 20906

Filed Jun. 2, 1994, Ser. No. 253,265
Int. Cl.[6] F22B *1/28;* **H05B** *1/00*
U.S. Cl. 392—342 **3 Claims**

1. Apparatus for increasing the dryness and temperature of steam generated by rockpile type sauna generators, comprised of a single



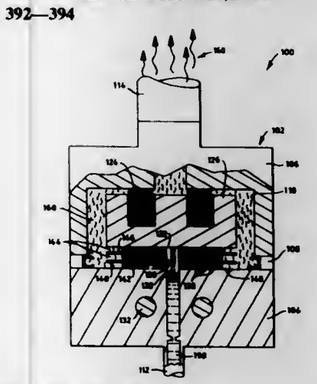
enclosed compartment with openings only at the top and bottom of said compartment, two layers of rocks inside said enclosed compartment, and an empty space between said layers of rocks inside said enclosed compartment with: (a) a first horizontal grid or net as a floor holding the lower layer of rocks for steam generation, with large holes to permit hot gases from the sauna generator to rise through the rocks, (b) a second horizontal grid in the middle of said enclosed compartment holding the upper layer of rocks for steam drying and superheating, said second horizontal grid having large holes to permit gases to rise therethrough, (c) an empty space, clear of rocks, under the upper grid between the rockpile layers for water to spread out over a large area over the rocks in the lower layer of the rockpile and for steam to expand to a wide space under the rocks in the upper layer, and (d) one or more bypasser plates fastened to the walls of said enclosed compartment forming narrow bypassing passages between the walls of said enclosed compartment and the plates to allow water poured on top of the rockpile to run from the top of the rockpile through the rocks in the upper layer of the rockpile down to the space between the rockpile layers and on top of the rocks in the lower layer of the rockpile without touching the hot rocks in the upper layer.

5,553,188

VAPORIZER AND LIQUID DELIVERY SYSTEM USING SAME

James H. Ewing, Lexington, Mass., assignor to MKS Instruments, Inc., Andover, Mass.

Filed Feb. 24, 1995, Ser. No. 393,723
Int. Cl.[6] F22B *1/28;27/00*
U.S. Cl. 392—394 **29 Claims**



1. A liquid vaporizer comprising:

means for providing an enclosed vaporizing chamber having an inlet and an outlet;

a stack of coaxially-aligned, thermally-conductive, thin, flat disks comprising a first plurality of larger diameter disks of a first diameter D_1 stacked with a second plurality of smaller diameter disks of a second diameter D_2 smaller than D_1, thereby defining a smaller diameter disks of a second diameter D_2 smaller than D_1, thereby defining a vaporization area including those portions of the surfaces of the larger diameter disks which extend beyond the outer periphery of the smaller diameter disks,

wherein said stack is positioned within said chamber between said inlet and said outlet so that a liquid entering said inlet is forced between adjacent disks of said stack and into said vaporization area so as to vaporize said liquid into a vapor prior to exiting said outlet;

biasing means for axially compressing the disks of said stack together; and

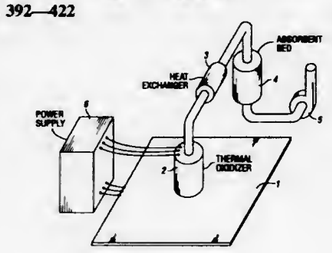
heating means for heating the disks to a temperature sufficient to vaporize said liquid.

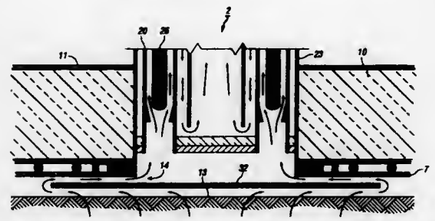
5,553,189

RADIANT PLATE HEATER FOR TREATMENT OF CONTAMINATED SURFACES

George L. Stegemeier; Harold J. Vinegar, and Frederick G. Carl, Jr., all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 18, 1994, Ser. No. 324,950
Int. Cl.[6] H05B *3/34*
U.S. Cl. 392—422 **2 Claims**





1. A radiant plate surface heater for remediation of contamination near a contaminated surface, the heater comprising:

a) a continuous metal sheet effective to radiate heat to the contaminated surface, said continuous metal sheet having a bottom face, a top face, and a sheet edge;

b) means for heating the continuous metal sheet;

c) insulation occupying a volume above the continuous metal sheet;

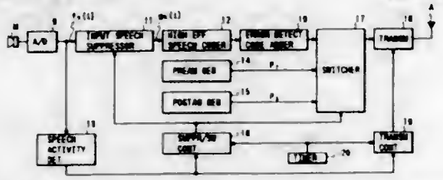
d) a baffle system to maintain a subatmospheric pressure below the continuous metal sheet, which baffle system removes vapors from below the continuous metal sheet by routing the vapors first along the bottom face of the continuous metal sheet, over the sheet edge, and subsequently along the top face of the continuous metal sheet; and

e) a vapor barrier effective to prevent significant leakage to the volume occupied by the insulation.

5,553,190
SPEECH SIGNAL TRANSMISSION METHOD PROVIDING FOR CONTROL

Tomoyuki Ohya; Shinji Uebayashi, both of Yokosuka, and Toshio Miki, Yokohama, all of, Japan, assignors to NTT Mobile Communications Network, Inc., Tokyo, Japan

Continuation of Ser. No. 964,899, Oct. 22, 1992, abandoned.
This application May 10, 1994, Ser. No. 240,394
Claims priority, application Japan, Oct. 28, 1991, 3-307229
Int. Cl.[6] G10L *3/02*
U.S. Cl. 395—2.1 **18 Claims**



1. A method of communicating a speech signal over a communication medium, said speech signal including at least one speech-active duration in which actual speech exists and one silent duration in which no actual speech exists, comprising:

at a transmitting side, the steps of:

digitizing said speech signal into a digital speech signal;

analyzing said digital speech signal for each of successive frames thereof to determine whether or not each frame is in said speech-active duration, each of said frames having a fixed time period;

detecting a speech starting frame and a speech ending frame of said speech-active duration of said speech signal;

producing a preamble as a coded data indicative of the beginning of said speech-active duration of said speech signal in response to the detection of a speech starting frame of said speech-active duration;

coding said digital speech signal for each of successive frames thereof to produce a series of successive coded data of said speech signal, one coded data for each frame;

switching the coded data of said speech starting frame to said preamble, in response to the detection of a speech starting frame of said speech-active duration, to transmit it in place of the coded data of said speech starting frame;

transmitting said preamble and the successive coded data of said speech signal subsequent to said speech starting frame in the form of a series of successive frames;

stopping the transmitting of the successive coded data of said speech signal in response to the detection of a speech ending frame of said speech-active duration, and transmitting a postamble as a coded data indicative of the beginning of said silent duration of said speech signal; and

at a receiving side, the steps of:

receiving the successive coded data of said speech signal with said preamble at the head thereof and said postamble at the tail thereof transmitted from said transmitting side;

decoding said received successive coded data of said speech signal to produce decoded results;

detecting said coded data of said actual speech which exists in said speech-active duration from said received successive coded data of said speech signal;

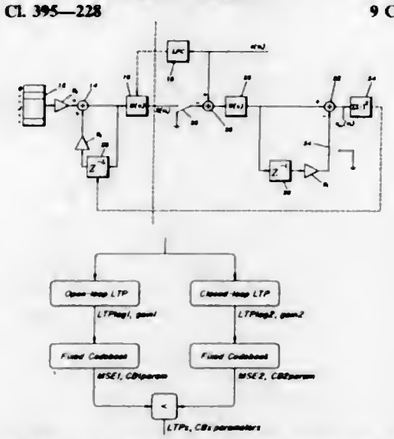
detecting said preamble from said received successive coded data of said speech signal and outputting the decoded results of said coded actual speech data subsequent to said detected preamble as a speech signal; and

deciding, when a predetermined number of successive coded actual speech data have been detected without having detected a preamble preceding thereto, that the decoded results of said coded actual speech data are in a speech-active duration and outputting the decoded results of said coded actual speech data as a speech signal.

5,553,191
DOUBLE MODE LONG TERM PREDICTION IN SPEECH CODING

Tor B. Minde, Gammelstad, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jan. 26, 1993, Ser. No. 9,245
Claims priority, application Sweden, Jan. 27, 1992, 9200217
Int. Cl.[6] G10L *9/00*
U.S. Cl. 395—228 **9 Claims**



1. A method of coding a speech signal vector, said method comprising the steps of:

(a) sampling said speech signal;

(b) forming a first estimate signal of a long term predictor vector in an open loop analysis using said sampled speech signal;

(c) forming a second estimate signal of the long term predictor vector in a closed loop analysis using said sampled speech signal;

(d) linearly combining the first estimate signal with each individual code vector in a fixed codebook and selecting a first excitation vector estimate which gives the best coding of the sampled speech signal vector;

(e) linearly combining the second estimate signal with each individual code vector in the fixed codebook and selecting a second excitation vector estimate which gives the best coding of the sampled speech signal vector;

(f) selecting from the first excitation vector estimate and the second excitation vector estimate an excitation vector that gives the best coding of the sampled speech signal vector; and

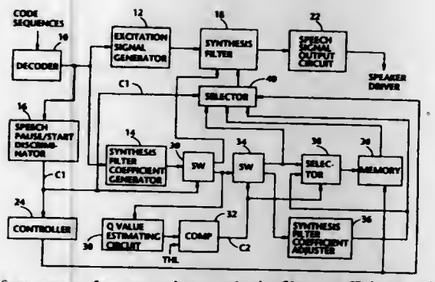
(g) coding said sampled signal vector using said excitation vector.

5,553,192
APPARATUS FOR NOISE REMOVAL DURING THE SILENCE PERIODS IN THE DISCONTINUOUS TRANSMISSION OF SPEECH SIGNALS TO A MOBILE UNIT

Toshihiro Hayata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 12, 1993, Ser. No. 133,864
Claims priority, application Japan, Oct. 12, 1992, 4-272173
Int. Cl.[6] G10L *9/00*
U.S. Cl. 395—237 **3 Claims**

1. An arrangement for demodulating speech code sequences discontinuously transmitted from a mobile unit and for demodulating background noise code sequences transmitted from said mobile unit while said speech code sequences pause, said arrangement receiving speech pause/start indicators, said arrangement comprising:



first means for generating synthesis filter coefficients using either of said speech code sequence or said background noise code sequence;

second means for synthesizing either of speech signals or background noise signals using said synthesis filter coefficients;

third means for discriminating speech pause and speech start using said speech pause/start indicators;

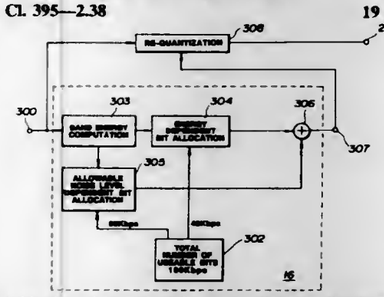
fourth means for estimating Q value of said secood means using said synthesis filter coefficients and generating an estimated Q value if said third means discriminates said speech pause; and

fifth means for generating reduced synthesis filter coefficients by reducing said synthesis filter coefficients if said estimated Q value is larger than a threshold level, said fifth means supplying said second means with said reduced synthesis filter coefficients.

5,553,193
BIT ALLOCATION METHOD AND DEVICE FOR DIGITAL AUDIO SIGNALS USING AURAL CHARACTERISTICS AND SIGNAL INTENSITIES

Kenzo Akagiri, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 3, 1993, Ser. No. 56,193
Claims priority, application Japan, May 7, 1992, 4-141103
Int. Cl.[6] G10L *3/02;9/00*
U.S. Cl. 395—2.38 **19 Claims**



1. A bit allocation method for use in digital audio signal compression in which a digital audio signal is divided into frames at a predetermined time interval and each of the frames is divided into plural frequency bands to form a set of blocks so as to divide the digital audio signal in both time and frequency, and in which compression is performed using a bit allocation number determined for each of the blocks, the method comprising steps of:

dividing a total number of bits into at least two portions for bit allocation among the blocks in the set, the portions including a first portion and a second portion, each of the portions including at least one of the total number of bits;

allocating the bits of the first portion among the blocks dependent upon an allowable noise spectrum based on aural characteristics;

calculating respective signal intensities for the blocks;

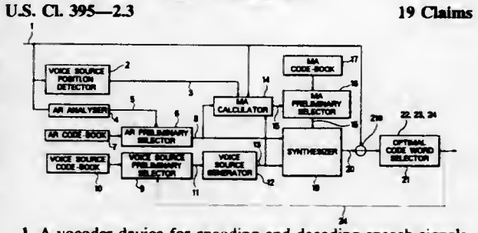
allocating the bits of the second portion among the blocks dependent upon the respective signal intensities calculated in the calculating step; and

combining the bits of the two portions together for each one of the blocks to determine the bit allocation number for the one of the blocks.

5,553,194
CODE-BOOK DRIVEN VOCODER DEVICE WITH VOICE SOURCE GENERATOR

Katsushi Seza; Hirohisa Tasaki, and Kunio Nakajima, all of Kamakura, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1992, Ser. No. 951,727
Claims priority, application Japan, Sep. 25, 1991, 3-245666; Mar. 11, 1992, 4-087849
Int. Cl.[6] G10L *9/00*
U.S. Cl. 395—2.3 **19 Claims**



1. A vocoder device for encoding and decoding speech signals, comprising:

an encoder unit for encoding an input speech signal including:

(a) a first spectral code-book storing a plurality of spectral code words each corresponding to a set of spectral parameters and identified by a spectral code word identification number;

(b) a first voice source code-book storing a plurality of voice source code words each representing a voice source waveform over a pitch period, the voice source waveform to be defined as the derivative of a glottal flow waveform and identified by a voice source code word identification number; (c) voice source generator means for generating voice source waveforms representative of the derivative of a glottal flow for each pitch period on the basis of said voice source code words; (d) speech synthesizer means for producing synthesized speech waveforms using the set of spectral parameters corresponding to said spectral code words to modify said voice source waveforms corresponding to said voice source code words in response to said spectral code words and said voice source waveforms; (e) optimal code word selector means including a subtractor receiving the input speech signal and the synthesized speech waveforms, and producing differences therebetween, for selecting a combination of a spectral code word and a voice source code word corresponding to a synthesized speech waveform having a smallest difference from said input speech signal, said optimal code word selector means outputting said spectral code word identification number and said voice source code word identification number corresponding to said spectral code word and said voice source code word, respectively, of said combination selected by said optimal code word selector means; and

a decoder unit for reproducing a synthesized speech from each combination of said spectral code word and said voice source code word encoding said input speech signal, said decoder unit including: (f) a second spectral code-book identical to said first spectral code-book; (g) a second voice source code-book identical to said first voice source code-book; (h) spectral inverse quantizer means for selecting from said second spectral code-book a spectral code word corresponding to said spectral code word identification number; (i) voice source inverse quantizer means for selecting from said voice source code-book a voice source code word corresponding to said voice source code word identification number; (j) voice source generator means for generating a voice source wave-

form for each pitch period on the basis of said voice source code word selected by said voice source inverse quantizer; and (k) speech synthesizer means for producing a synthesized speech waveform on the basis of said spectral code word selected by said spectral inverse quantizer means and said voice source waveform generated by said voice source generator means.

5,553,195
DYNAMIC NEURAL NET

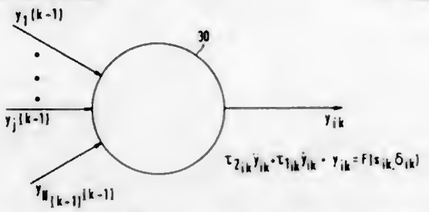
Peter B. L. Meijer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 29, 1994, Ser. No. 315,158

Claims priority, application European Pat. Off., Sep. 30, 1993, 93202792

Int. Cl.[6] G06E *1/00;3/00*

U.S. Cl. 395—24 **13 Claims**



1. An information processing system comprising a processor and memory coupled to the processor arranged to form a feed-forward neural net including a plurality of interconnected neurons, each neuron having a plurality of inputs to receive a respective plurality of neuron input signals and calculating means for producing an output signal, that is a function of at least one of said neuron input signals and of at least one of following quantities: a rate of change of at least one of said neuron input signals; and a rate of change of the particular neuron output signal.

5,553,196
METHOD FOR PROCESSING DATA USING NEURAL NETWORK HAVING A NUMBER OF LAYERS EQUAL TO AN ABSTRACTION DEGREE OF THE PATTERN TO BE PROCESSED

Sunao Takatori; Ryohei Kumagai; Koji Matsumoto, and Makoto Yamamoto, all of Tokyo, Japan, assignors to Yozan, Inc., Tokyo, and Sharp Corporation, Osaka, both of, Japan

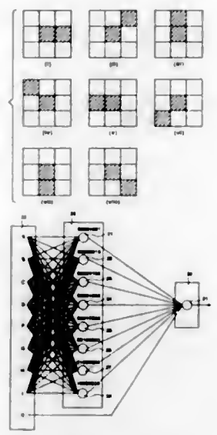
Continuation of Ser. No. 243,448, May 16, 1994, abandoned, which is a continuation of Ser. No. 721,822, Jun. 26, 1991, abandoned, which is a continuation-in-part of Ser. No. 504,809, Apr. 5, 1990, abandoned. This application Jun. 5, 1995, Ser. No. 461,538

Claims priority, application Japan, Apr. 5, 1989, 1-084783; Apr. 28, 1989, 1-107150; May 6, 1989, 1-112818; May 6, 1989, 1-112819; May 6, 1989, 1-112820; May 6, 1989, 1-112821; May 23, 1989, 1-127953; May 16, 1989, 1-120249; May 16, 1989, 1-120250; May 16, 1989, 1-120251; May 16, 1989, 1-120252; May 16, 1989, 1-120253; May 17, 1989, 1-121583

Int. Cl.[6] G06F *15/18*

U.S. Cl. 395—24 **9 Claims**

1. A method for processing data including the steps of:
- inputting a plurality of input data to be processed, each input data having an associated abstraction degree;
- forming a neural network, a number of processing layers within said neural network corresponding to a number of different abstraction degrees associated with said input data;
- generating an output from said neural network corresponding to said input data using said neural network; and
- determining a pattern of features of said input data corresponding to said output generated from said neural network.



5,553,197
DEVICES FOR USE IN NEURAL PROCESSING

Trevor G. Clarkson, and John G. Taylor, both of London, United Kingdom, assignors to University College London, and King's College London, both of London, England

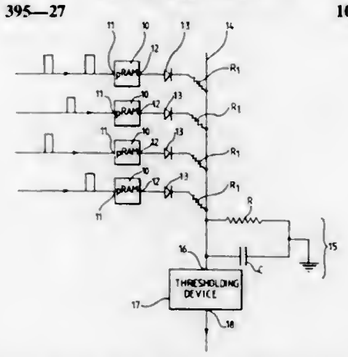
PCT No. PCT/GB92/01086, § 371 Date Feb. 18, 1994, § 102(e) Date Feb. 18, 1994, PCT Pub. No. WO93/00654, PCT Pub. Date Jan. 7, 1993

PCT Filed Jun. 17, 1992, Ser. No. 167,884

Claims priority, application United Kingdom, Jun. 21, 1991, 9113554; Mar. 11, 1992, 9205319; Jun. 5, 1992, 9211909

Int. Cl.[6] G06F *15/18*

U.S. Cl. 395—27 **10 Claims**



1. A neural device which comprises a plurality of neural elements each of which has a memory having a plurality of storage locations at each of which locations a number representing a probability is stored, means for addressing the storage locations, and means for causing to appear at an output of the neural element, when the storage locations are addressed, an element output signal, the probability of the element output signal having a given one of first and second values being determined by the number stored at the addressed location, the neural elements having their outputs connected in common to means for accumulating the element output signals thereof and for decaying the result of the accumulation; and thresholding means for receiving at its input the decayed result and generating an output signal at its output when the said decayed result exceeds a predetermined level.

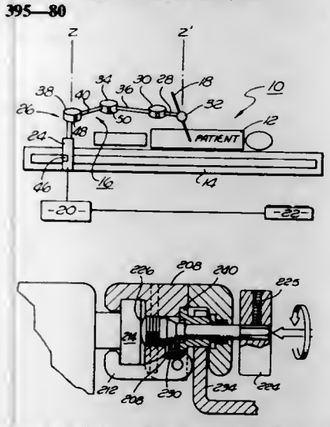
5,553,198
AUTOMATED ENDOSCOPE SYSTEM FOR OPTIMAL POSITIONING

Yulun Wang, Goleta, and Keith P. Laby, Santa Barbara, both of Calif., assignors to Computer Motion, Inc., Goleta, Calif.

Division of Ser. No. 167,704, Dec. 15, 1993, abandoned. This application Nov. 29, 1994, Ser. No. 346,537

Int. Cl.[6] A61B *1/06;6/00*

U.S. Cl. 395—80 **6 Claims**



1. A system that allows a user to remotely control the movement of a surgical instrument relative to an operating table, comprising:
- a cart which has a flange that has a pair of ears separated by a slot;
- a mounting plate coupled to said cart;
- a pivot clamp pivotally connected to said mounting plate, said pivot clamp rotates between an open position and a close position, wherein said pivot clamp grasps the operating table in the close position;
- a screw that extends through said mounting plate, said screw having a cam surface coupled to said pivot clamp such that said pivot clamp rotates between the open and closed positions when said screw moves relative to said mounting plate;
- a cart clamp that is captured by said screw and located within said slot of said cart flange, said cart clamp having a shoulder that can be pressed into said cart flange to secure said mounting plate to said cart when said screw moves relative to said mounting plate;
- a robotic arm coupled to said mounting plate;
- an end effector attached to said robotic arm;
- an input device adapted to provide an input signal;
- control means for receiving said input signal from said input device, computing an incremental movement of said robotic arm from said input signal and generating an output signal to move said robotic arm the incremental movement.

5,553,199
METHOD AND APPARATUS FOR CALIBRATING A FOUR COLOR PRINTER

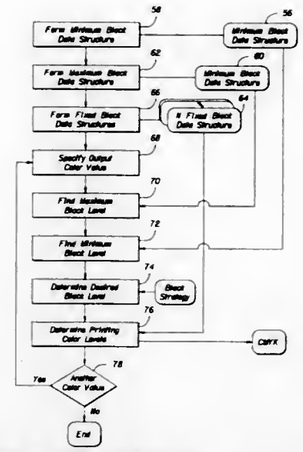
Kevin E. Spaulding, Spencerport; Douglas W. Couwenhoven, and Rodney L. Miller, both of Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 3, 1994, Ser. No. 237,072

Int. Cl.[6] G06K *15/00*

U.S. Cl. 395—109 **13 Claims**

1. A method of calibrating a four color printer capable of printing three colors and black, comprising the steps of:
- a) forming a minimum black data structure representing a minimum black strategy;
- b) forming a maximum black data structure representing a maximum black strategy;
- c) for each printable black level, forming a fixed black data structure; and
- d) for a specific output color value:
  - i) finding the minimum and maximum black levels using the minimum and maximum black data structures;
  - ii) determining a desired black level between the minimum and maximum black levels according to a defined black strategy; and
  - iii) determining the three printing color levels from the fixed black data structure corresponding to the desired black level.



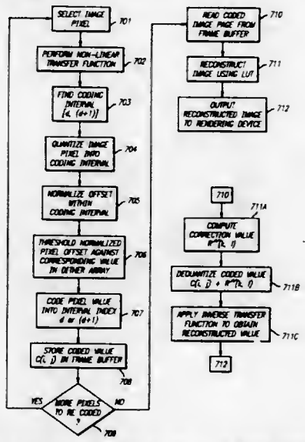
5,553,200
METHOD AND APPARATUS FOR PROVIDING BIT-RATE REDUCTION AND RECONSTRUCTION OF IMAGE DATA USING DITHER ARRAYS

Yigal Accad, Millbrae, Calif., assignor to Electronics For Imaging, Inc., San Mateo, Calif.

Filed Mar. 3, 1995, Ser. No. 398,369

Int. Cl.[6] H04N *1/405;1/413*

U.S. Cl. 395—109 **24 Claims**



1. A method for reducing the bit-rate of original image data into coded image data, and for reconstructing said coded image data into output image data, said original image data comprising an original color component comprising a first plurality of N-bit original pixels, said coded image data comprising a coded color component comprising a second plurality of M-bit coded pixels, said output image data comprising an output color component

comprising a third plurality of N'-bit output pixels, the possible range of each of said N-bit input pixels consisting of a plurality of

store means for storing a plurality of different image enlarging/reducing manners of processing digital original image data

output exclusively as part of an address signal and outputs the address signal via the address signal line of the connec-

comprising a third plurality of N'-bit output pixels, the possible range of each of said N-bit input pixels consisting of a plurality of equally sized contiguous intervals, the number of said intervals determined by M, said method comprising the steps of:

(a) storing a threshold array in a first memory, said threshold array comprising a fourth plurality of threshold pixels;

(b) pixel-wise generating a corresponding coded pixel in said second plurality for each original pixel in said first plurality until said second plurality is determined, said step of generating said coded pixel for said original pixel comprising the steps of:

(i) determining an interval in said plurality of intervals, and an offset in said interval, for said original pixel; and

(ii) generating said coded pixel for said original pixel, said coded pixel determined by said interval and by said offset and by the value of a threshold pixel in said fourth plurality, the location of said threshold pixel in said fourth plurality determined by the location of said original pixel in said first plurality;

(c) selecting a coded pixel in said second plurality;

(d) computing a correction value for said selected coded pixel, said correction value determined by the code of said selected coded pixel and by the value of a corresponding threshold pixel of said fourth plurality, the location of said corresponding threshold pixel determined by the location of said selected coded pixel in said second plurality; and

(e) applying said correction value to said selected coded pixel to produce an output pixel of said third plurality.

5,553,201

DIGITAL IMAGE PROCESSING DEVICE FOR AUTOMATICALLY SELECTING ONE OF A PLURALITY OF DIFFERENT IMAGE ENLARGING/REDUCING MANNERS

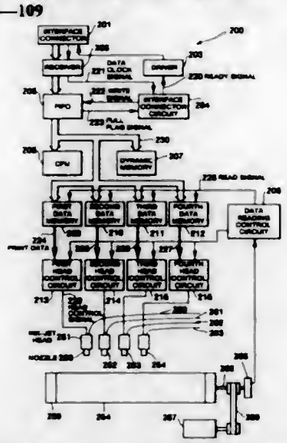
Kiyoji Muramatsu, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi-ken, Japan

Continuation of Ser. No. 8,981, Jan. 26, 1993, abandoned. This application May 15, 1995, Ser. No. 441,419

Claims priority, application Japan, Jan. 27, 1992, 4-12310; Feb. 19, 1992, 4-32181; Feb. 19, 1992, 4-32182

Int. Cl.[6] G06F *15/12*; **G03G** *13/34*

U.S. Cl. 395—109 **23 Claims**



1. A digital image processing device for enlarging or reducing an actual original image, said digital image processing device comprising:

input means for receiving actual digital original image data representative of an actual original image and a value of a desired magnification/reduction ratio from all possible magnification/reduction ratios with which the actual original image is to be enlarged or reduced;

store means for storing a plurality of different image enlarging/reducing manners of processing digital original image data representative of an original image which are inputtable by said input means to thereby achieve enlargement or reduction of the original image with the value of the desired magnification/reduction ratio input by said input means;

selection means for automatically selecting one of the plurality of different image enlarging/reducing manners in accordance with data of information on at least one of the input desired magnification/reduction ratio value and the actual original image; and

image enlarging/reducing means for processing the actual digital original image data with the selected one of the plurality of different image enlarging/reducing manners to thereby enlarge or reduce the actual original image with the input desired magnification/reduction ratio value, wherein said selection means includes:

judge means for judging which one of the plurality of different image enlarging/reducing manners is consistent with the data of information on at least one of the desired magnification/reduction ratio value and the actual original image; and

manner selection means for selecting the one of the plurality of different image enlarging/reducing manners consistent with the data of information on at least one of the desired magnification/reduction ratio value and the actual original image.

5,553,202

ACCESSORY CONTROL DEVICE WHICH TRANSFERS DATA FROM ELECTRONIC DEVICE USING PART OF ADDRESS SIGNAL AND LATCH

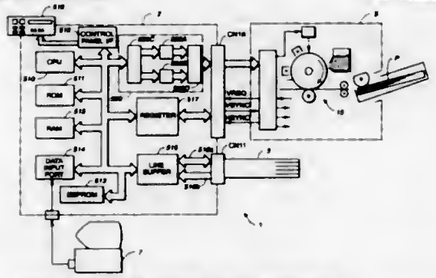
Kenichi Wakabayashi; Chitoshi Takayama, and Tadashi Shiozaki, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Jul. 8, 1992, Ser. No. 910,590

Claims priority, application Japan, Mar. 19, 1992, PCT/JP92/00330

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—115 **22 Claims**



1. An information processing device comprising:

a) an electronic device comprising a first processor capable of logic operation, a first memory means for storing the programs executed by the processor and a connector connected to address signal and data signal lines of the first processor; and

b) an accessory control device connected to the connector; wherein

the electronic device further comprises a multiple data output means that sequentially outputs multiple data to be transferred to the accessory control device;

the accessory control device comprises a memory means for storing the written data in a prescribed order; and a data write means that writes the multiple data output from the electronic device to the memory means for transfer;

said multiple data output means of said electronic device is a transfer data output means that transfers the data to be output exclusively as part of an address signal and outputs the address signal via the address signal line of the connector; and

the accessory control device further comprises a data hold means that fetches and holds the data reflected in the address signal output from the electronic device, and a write drive means that operates the data write means at a prescribed timing when data is being held in the data-hold means.

5,553,203

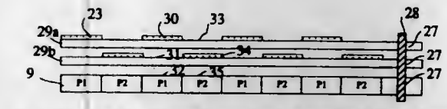
PIXEL DATA PROCESSING SYSTEM AND METHOD FOR PRODUCING AND GRAPHICALLY PRESENTING SPATIALLY MULTIPLEXED IMAGES OF 3-D OBJECTS FOR STEREOSCOPIC VIEWING THEREOF

Sadeg M. Faris, Pleasantville, N.Y., assignor to Reveo, Inc., Hawthorne, N.Y.

Continuation of Ser. No. 587,664, Sep. 26, 1990, Pat. No. 5,165,013. This application Nov. 16, 1992, Ser. No. 976,518

Int. Cl.[6] G06K *15/00*

U.S. Cl. 395—115 **27 Claims**



1. A pixel data processing system for producing a spatial multiplexed image of a 3-D object for use in stereoscopic viewing thereof, comprising:

first pixel data storage means for storing a first pixel data set representing a first perspective image of said object;

second pixel data storage means for storing a second pixel data set representing a second perspective image of said object;

first pixel data processing means for processing said first pixel data set according to a first spatial modulation pattern so as to produce a third pixel data set representing a first spatially modulated image of said object consisting of a first pixel pattern;

third pixel data storage means for storing said third pixel data set representing said first spatially modulated image;

second pixel data processing means for processing said second pixel data set according to a second spatial modulation pattern so as to produce a fourth pixel data set representing a second perspective image of said object consisting of a second pixel pattern, wherein said second spatial modulation pattern is the compliment pattern of said first spatial modulation pattern;

fourth pixel data storage means for storing said fourth pixel data set representing said second spatially modulated image;

third pixel data processing means for processing said third and fourth pixel data sets so as to produce a fifth pixel data set representing a spatially multiplexed image of said object composed of said first and second pixel patterns; and

fifth pixel data storage means for storing said fifth pixel data set representing said spatially multiplexed image for use in graphically presenting said spatially multiplexed image and stereoscopic viewing of said object.

5,553,204

IMAGE OUTPUT APPARATUS FOR GRADATION IMAGE DATA

Kaneda Hiroyuki, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

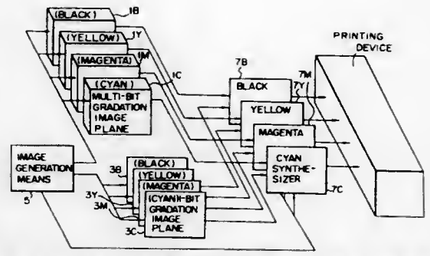
Filed May 20, 1993, Ser. No. 63,958

Claims priority, application Japan, May 20, 1992, 4-127414

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—115 **2 Claims**

1. An image output apparatus for outputting a gradation image based on image data, the gradation image having a plurality of pixels, in which a gradation level of every pixel can be controlled, the image output apparatus comprising:



multi-bit gradation image storing means for storing first expanded image data in a form corresponding to coordinates of output image, each pixel of the first expanded image data having multi-bit data representing the gradation level of the pixel;

1-bit gradation image storing means for storing second expanded image data in a form corresponding to the coordinates of output image, each pixel of the second expanded image data having 1-bit data representing one of an ON state or an OFF state for each pixel of the second expanded image data, the gradation level of an area of the gradation image, composed of said plurality of pixels is represented by a ratio of pixels of the ON state to the OFF state;

expansion means for generating said first expanded image data and said second expanded image data from the image data according to attribute data related to the image data, the attribute data including the kind of the image data and expansion positions corresponding to the coordinates of output image said first expanded image data being stored in said multi-bit gradation image storing means and said second expanded image data being stored in said 1-bit gradation image storing means; and;

synthesis means for synthesizing the first expanded image data from said multi-bit gradation image storing means with the second expanded image data from said 1-bit gradation image storing means and outputting a multi-bit gradation image.

5,553,205

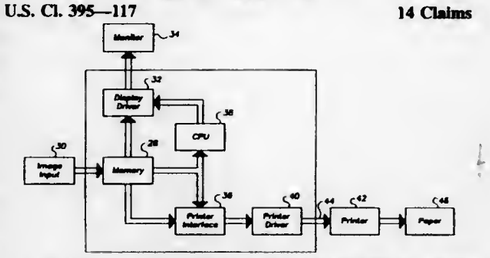
SYSTEM AND METHOD OF TRANSFERRING A BIT-MAPPED IMAGE USING RASTER COLUMNS

Ronald C. Murray, Redmond, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 870,932, Apr. 20, 1992, abandoned. This application Oct. 11, 1995, Ser. No. 540,898

Int. Cl.[6] G06K *15/00*

U.S. Cl. 395—117 **14 Claims**



1. In a computer system having a computer and an output device, a method of transferring a bit-mapped image that is divisible into rows and columns from the computer to the output device, said output device having adjustable column margins, said adjustable margins including an adjustable left margin and an adjustable right margin, comprising the computer-system implemented steps of:

(a) identifying in the computer a first raster column and a second raster column within the bit-mapped image, said first raster column and said second raster column each containing a subset of less than all of the columns in a number of the rows in the bit-mapped image to be output on the output device, including a leftmost column and a rightmost column;

(b) determining with the computer and adjusting the adjustable left margin to bound the leftmost column in the first raster column and determining with the computer and adjusting the adjustable right margin to bound the rightmost column of the first raster column with the computer;

(c) sending image data for the first raster column from the computer, to the output device to be output on the output device between the adjustable left margin and the adjustable right margin;

(d) determining with the computer and adjusting the adjustable left margin to bound the leftmost column in the second raster column and determining with the computer and adjusting the adjustable right margin to bound the rightmost column of the second raster column with the computer; and

(c) sending image data for the second raster column from the computer to the output device to be output on the output device between the adjustable left margin and the adjustable right margin.

5,553,206

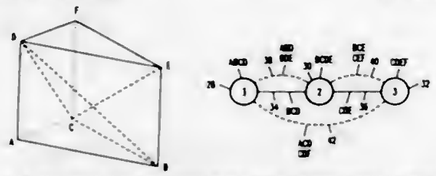
METHOD AND SYSTEM FOR PRODUCING MESH REPRESENTATIONS OF OBJECTS

Siavash N. Meshkat, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 12, 1993, Ser. No. 17,074

Int. Cl.[6] G06T *17/20*

U.S. Cl. 395—123 **12 Claims**



1. A finite element modeling method for determining a physical attribute of an object using a mesh representation of the object the mesh including elements from a predetermined set of first and second elements, the method comprising the steps of:

decomposing the object into a mesh including a set of tetrahedra;

identifying a group of first elements of the mesh as being suitable for merging into a second element from the predetermined set;

merging the identified group of first elements into the second element from the predetermined set;

displaying a representation of the physical attribute of the object based on the mesh representation of the object produced by the steps of decomposing, identifying, and merging; and

representing the tetrahedra produced in the step of decomposing in the form of a graph which shows (i) nodes representing the tetrahedra, (ii) first node connectors representing faces shared in common between pairs of the tetrahedra, and (iii) second node connectors representing two faces, each face being of different tetrahedra which have an edge in common and have an angle therebetween which satisfies a predetermined condition.

5,553,207

METHOD OF AND APPARATUS FOR REGION EXTRACTION IN THREE-DIMENSIONAL VOXEL DATA

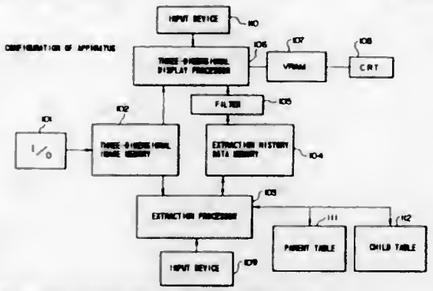
Hiroyuki Sekiguchi, Kawasaki; Koichi Sano, Yokohama, and Tetsuo Yokoyama, Tokyo, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 888,539, May 26, 1992, abandoned. This application May 24, 1994, Ser. No. 249,045

Claims priority, application Japan, May 27, 1991, 3-120794

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—124 **9 Claims**



8. A region extracting apparatus comprising:

means for extracting, from three-dimensional voxel data, a desired region by use of a concatenated region expansion processing;

means for storing extraction history data indicating, for each voxel region extracted by said extracting means, a time stage when said voxel region is extracted in said concatenated region processing;

three-dimensional display processing means for referencing the extraction history data and the three-dimensional voxel data and thereby outputting a three-dimensional display image of the extracted voxel region, including the desired region, at an arbitrary time;

indicating means for indicating a point in an overflow region which overflows the desired region into an external region and obtaining coordinates thereof;

identifying means for achieving an identifying operation from the indicated point in the overflow region by reverse-order tracing of said concatenated region expansion processing on the extraction history data, thereby identifying a connection part between the overflow region and the desired region in the extracted voxel region; and

means for deleting the overflow region from the extracted voxel region in accordance with the connection part so as to obtain only said desired region.

5,553,208

IMAGE SYNTHESIZING SYSTEM HAVING A FIELD BUFFER UNIT THAT STORES TEXTURE COORDINATES

Hiroyuki Murata, Tokyo, and Takashi Yokota, Yokohama, all of, Japan, assignors to Namco Ltd., Tokyo, Japan

PCT No. PCT/JP93/01206, § 371 Date Apr. 1, 1994, § 102(e) Date Apr. 1, 1994, PCT Pub. No. WO94/04990, PCT Pub. Date Mar. 3, 1994

PCT Filed Aug. 26, 1993, Ser. No. 211,395

Claims priority, application Japan, Aug. 26, 1992, 4-252139

Int. Cl.[6] G09B *9/08*

U.S. Cl. 395—125 **28 Claims**

1. An image synthesizing system for perspeetive-transforming a three-dimensional image consisting of a plurality of polygons onto a projection plane to synthesize a pseudo three-dimensional image, said image synthesizing system comprising:

a processor unit, responsive to image data of vertices of the plurality of the polygons, for determining positional coordinates of a plurality of dots for each of the polygons and a plurality of texture coordinates corresponding to the positional coordinates of each of said plurality of dots,

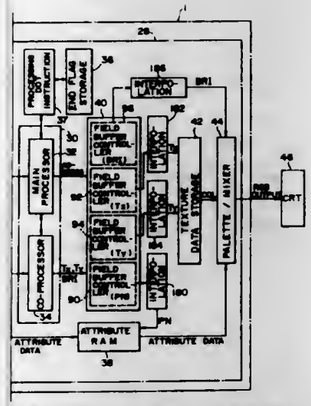
a field buffer unit for storing said plurality of texture coordinates determined by said processor unit at an address specified by said positional coordinates of each of said plurality of dots,

a rendering data storage unit for storing rendering data at an address specified by said texture coordinates, and

an image data forming unit for reading said texture coordinates from said field buffer unit and for forming image data representative of the pseudo three-dimensional image by reading the rendering data from said rendering data storage unit based on the texture coordinates read from said field buffer unit,

said processor unit including a subsampling unit for computing positional coordinates of a plurality of subsampled dots and corresponding plurality of texture coordinates,

said image data forming unit including an interpolation unit for interpolating texture coordinates of an ignored dot ignored by subsampling, based on the texture coordinates of dots adjacent to the ignored dot stored in said field buffer unit.



5,553,209

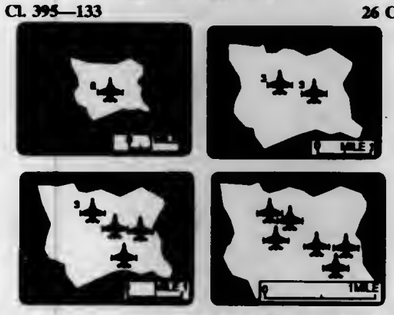
METHOD FOR AUTOMATICALLY DISPLAYING MAP SYMBOLS

Kenneth R. Johnson, Brea, and Willard H. Barrett, Garden Grove, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 28, 1994, Ser. No. 187,953

Int. Cl.[6] G06F *15/20*

U.S. Cl. 395—133 **26 Claims**



1. A method for displaying symbols from a data base to a physical display comprising:

retrieving a plurality of symbols from the data base;

computing a degree of clutter between said symbols;

automatically modifying the symbols to reduce the degree of clutter based upon said computation; and

displaying the modified symbols on the physical display.

5,553,210

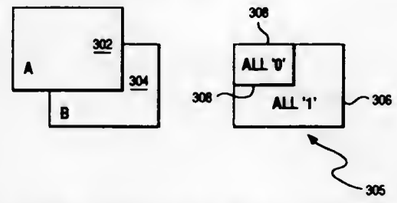
SYSTEM AND METHOD FOR IMMEDIATE PER WINDOW GRAPHICS CLIPPING

Chandrasekhar Narayanaswami, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 121,139, Sep. 14, 1993, Pat. No. 5,485,562. This application Jul. 28, 1995, Ser. No. 508,516

Int. Cl.[6] G06T *15/30*

U.S. Cl. 395—134 **6 Claims**



1. A computer program product having a computer readable medium having computer program logic recorded thereon for clipping graphic images in a graphics system having a processor, display device and memory, wherein the graphic images are written to a frame buffer in said memory and displayed in one of a plurality of windows on the display device, said computer program product comprising:

means for allocating a window clipping buffer from said memory;

means for initializing said window clipping buffer to a first value;

means for determining regions of said one window that are obscured by others of said plurality of windows;

means for writing a second value to said window clipping buffer only in areas of said window clipping buffer corresponding to one or more portions of said window that are visible;

means for testing said window clipping buffer before writing graphic image data to said frame buffer and writing said graphic image data only if said buffer indicates a visible region.

5,553,211

OVERLAPPING GRAPHIC PATTERN DISPLAY SYSTEM

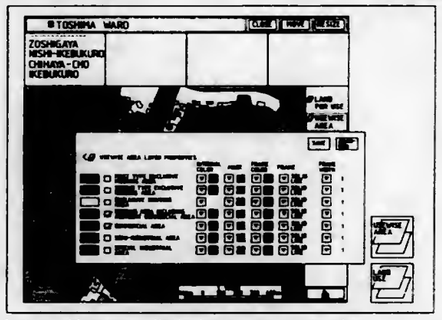
Akira Uotani, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 914,557, Jul. 17, 1992, abandoned. This application Apr. 17, 1995, Ser. No. 425,242

Claims priority, application Japan, Jul. 20, 1991, 3-204920

Int. Cl.[6] G06F *3/153*

U.S. Cl. 395—135 **18 Claims**

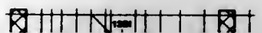


1. A graphic pattern displaying system, comprising:

first memory means for storing graphic data having a plurality of graphic layers composed of a plurality of graphic elements having assigned graphic element type attributes, said graphic element type attributes indicating types of said graphic ele-

5,553,213

METHOD AND APPARATUS FOR DISPLAYING A



(a) determining an area of a minimum rectangle that contains the cell group;

element type attributes indicating types of said graphic elements, said types being predefined for each of said graphic layers;

displaying means for displaying said graphic data; selecting means for selecting the plurality of graphic layers to be displayed on said displaying means;

setting means for each of said plurality of graphic layers for setting display attributes when graphic elements on the plurality of graphic layers selected by the selecting means are displayed on said displaying means in superposition in response to an AND operation of the graphic layers; and

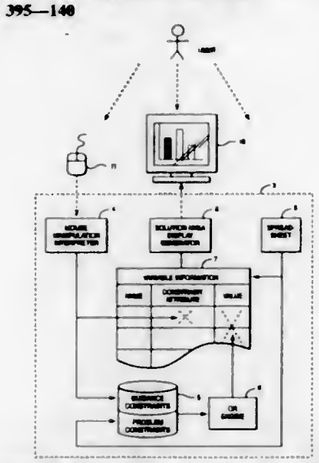
display control means for reading the plurality of graphic layers selected by said selecting means from said first memory means and for displaying the graphic layers in superposition relationship on a display screen of said displaying means in response to an AND operation on the basis of a result of setting by said setting means.

5,553,212

METHOD AND APPARATUS FOR SOLVING NUMERICAL PLANNING PROBLEMS WITH INEQUALITIES ON A COMPUTER SYSTEM

Hiroaki Etoh, Kawasaki, and Keiichi Maruyama, Ohmiya, both of, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1992, Ser. No. 884,348
Claims priority, application Japan, May 17, 1991, 3-140710
Int. Cl.[6] G06T *11/00*
U.S. Cl. 395—140 **12 Claims**



1. A computer implemented method for solving a numerical problem with user input comprising the steps of:

a) receiving restrictions from computer memory including constraint expressions with at least one inequality; and

b) iteratively solving said numerical problem with a computer processor including the steps of:

i) determining a solution of said numerical problem with variable values that satisfy restrictions;

ii) displaying graphical objects representing said variable values on a computer display; said step of displaying including displaying said variable values as bar charts; and

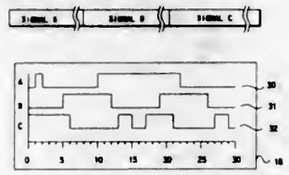
iii) manipulating said displayed graphical objects based on user input provided through a computer input device to obtain additional restrictions; said step of manipulating including obtaining constraints on said variable values, and said step of manipulating including obtaining additional restrictions as said displayed bar charts are manipulated.

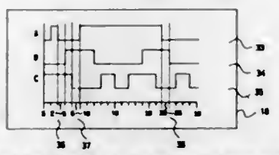
5,553,213

METHOD AND APPARATUS FOR DISPLAYING A PLURALITY OF SIGNAL WAVEFORMS APPEARING AT DIFFERENT TIME INTERVALS

Kayoko Sano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 31, 1994, Ser. No. 331,756
Claims priority, application Japan, Oct. 29, 1993, 5-271105
Int. Cl.[6] G06T *3/00*
U.S. Cl. 395—140 **17 Claims**





12. A method for displaying signal waveforms comprising the steps of:

detecting a fist time interval, when a first signal remains a constant level for an period longer than a predetermined constant time;

storing a first start time and a first end time each representing start and end points of said first time interval, said first end time indicating a time point when said first signal changes;

detecting a second time interval, when a second signal remains a constant level after said first start time;

setting a second start time to be equal to said first start time and setting a second end time to be equal to an end point of said second time interval of said second signal;

storing a first ending point being equal to one of said first end time and said second end time which precedes the other; and

displaying waveforms of said first and second signals each having a portion corresponding to an interval which starts at said first start time and ends at said first ending point, the portion being replaced by a predetermined displaying pattern, said predetermined displaying pattern having a width corresponding to a time shorter than said time interval which is replaced, and said predetermined displaying pattern being labeled with figures representing time values of said first start time and said first ending point.

5,553,214

SYSTEM FOR DELINEATING AND ANNOTATING AREAL REGIONS

Joseph W. Marks, Belmont; Murray S. Mazer, Somerville, both of Mass.; Kathleen Ryall, Carle Place, N.Y., and Stuart M. Shieber, Cambridge, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 24, 1993, Ser. No. 111,153
Int. Cl.[6] G06F *15/62*
U.S. Cl. 395—141 **40 Claims**

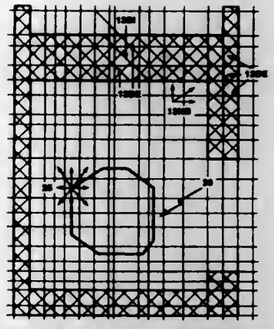
1. An annotation system including:

A. a display unit for displaying a map with various boundaries depicted on said map;

B. a processor for (i) segmenting said map into cells and (ii) assigning each cell an energy value by assigning cells corresponding to boundary edges predetermined minimum energy values, cells corresponding to boundary interiors predetermined maximum energy values and non-boundary cells values in between the minimum and the maximum values;

C. designation means for designating an initial position on said map for a deformable polygonal template and an initial shape for said template, said template having a plurality of vertices and attached sides, said designation means designating initial positions for said vertices; and

D. manipulation means for deforming said template by moving a template vertex from said initial position of said template vertex to a position toward and along said boundaries, said manipulation means determining where to move said vertex to minimize a potential function based in part on a total energy score, said total energy score relating to a sum of said values assigned to the cells through which said attached template sides pass.



(a) determining an area of a minimum rectangle that contains the cell group;

(b) determining the number of columns bounded by the area;

(c) determining the number of rows bounded by the area;

(d) determining if the number of columns bounded by the area is greater than N, N being an integer:

(1) if the number of columns bounded by the area is greater than N;

(A) partitioning the area into sub-areas each having X columns except for a last sub-area which has the remainder of the columns of the area, X being an integer not greater than N;

(B) determining if the number of rows bounded by the area is greater than M, M being an integer:

(1) if the number of rows bounded by the area is greater than M, partitioning the sub-areas into formula boxes each having Y rows except for a last formula box of each sub-area which has the remainder of the rows of the sub-area, Y being an integer not greater than M; or

(2) if the number of rows bounded by the area is not greater than M, each sub-area forming a formula box;

(2) if the number of columns bounded by the area is not greater than N, determining if the number of rows bounded by the area is greater than M, M being an integer:

(A) if the number of rows bounded by the area is greater than M, partitioning the area into formula boxes each having Y rows except for a last formula box of the area which has the remainder of the rows of the area, Y being an integer not greater than M; or

(B) if the number of rows bounded by the area is not greater than M, the area forming a formula box;

(e) determining a shared formula for each formula box; and

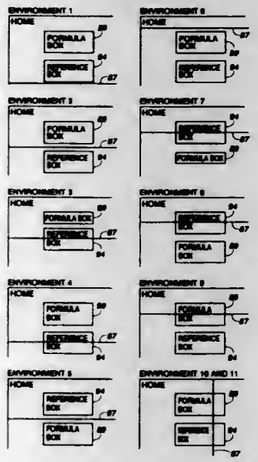
(f) storing the shared formula of each formula box.

5,553,215

METHOD AND SYSTEM OF SHARING COMMON FORMULAS IN A SPREADSHEET PROGRAM AND OF ADJUSTING THE SAME TO CONFORM WITH EDITING OPERATIONS

Richard L. Kaethler, Belleuve, Wash., assignor to Microsoft Corporation, Redmond, Wash.

Filed Sep. 21, 1994, Ser. No. 310,248
Int. Cl.[6] G06F *17/00*
U.S. Cl. 395—144 **21 Claims**



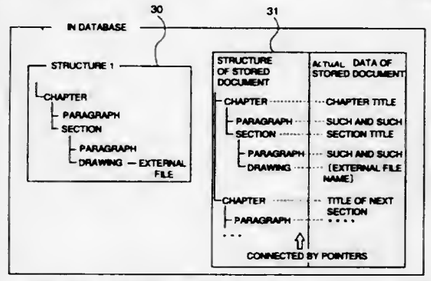
1. A method in a spreadsheet program of sharing common formulas of a cell group in a worksheet, the method comprising the steps of:

5,553,216

STRUCTURED DATABASE SYSTEM TOGETHER WITH STRUCTURE DEFINITION FRAME STORING DOCUMENT BODY DATA

Makoto Yoshioka; Hiroaki Negishi; Gengo Tazaki; John W. Mackin, and Mitsuhiro Kokubun, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Feb. 24, 1994, Ser. No. 202,193
Claims priority, application Japan, Feb. 26, 1993, 5-038715
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—145 **15 Claims**



1. A structured database system enabling a plurality of operators to share a structured document through a check-in or check-out of the structured document, said structured database system comprising:

a plurality of instances each defining an element of a structured document, wherein each instance is settable to an editable state and an edit inhibited state with respect to respective ones of a plurality of operators;

a plurality of edit blocks, each edit block storing a plurality of edit block pointers;

a plurality of storage blocks, each storage block storing a plurality of storage block pointers designating respectively corresponding instances of said plurality of instances and

said plurality of edit block pointers, of each edit block, indicating connections to respectively corresponding stor-

5,553,218

GRAPHICAL USER INTERFACE FOR RELATING KEY

second means for generating, from said data corresponding to said outline segments, first pixel data corresponding to an area

5,553,221

SYSTEM AND METHOD FOR ENABLING THE

said plurality of edit block pointers, of each edit block, indicating connections to respectively corresponding storage blocks;

a plurality of storage blocks, each storage block storing a plurality of storage block pointers respectively associated with said plurality of instances and said edit block pointers indicating connections to a respectively corresponding storage blocks;

selecting means for selecting an edit block, of said plurality of edit blocks, in response to the check-in of the structured document by a first operator of said plurality of operators, thereby designating remaining operators of said plurality of operators, the plurality of edit block pointers of the selected edit block thereby indicating the connections to respectively corresponding storage blocks and the respectively associated plurality of instances;

means for setting the corresponding, selected instances to the editable state with respect to the first operator and to the edit inhibited state with respect to the remaining operators of the plurality of operators; and

deselecting means for deselecting the selected edit block in response to a check-out of the structured document by the first operator, and for setting the corresponding, deselected instances to the editable state with respect to all operators.

5,553,217

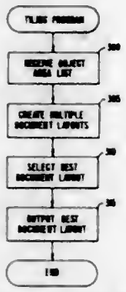
DOCUMENT LAYOUT USING TILING

Peter E. Hart, Menlo Park; Jeffrey K. Chilton, Mountain View, and Mark Peairs, Menlo Park, all of Calif., assignors to Ricoh Company, Ltd., Tokyo, Japan, and Ricoh Corporation, Menlo Park, Calif.

Filed Sep. 23, 1993, Ser. No. 125,958

Int. Cl.[6] G06F *17/21*

U.S. Cl. 395—148 **25 Claims**



1. A method of creating a document layout using a computer processing system comprising the steps of:

(a) receiving an ordered list of object areas, each of said object areas comprising at least one X,Y coordinate pair, data representing an electronic image of a document portion, and a type indicator representing whether said object area corresponds to a picture area or a text area;

(b) creating a plurality of document layouts by recursion, where each invocation of said recursion produces a document layout, each document layout including all of said object areas in said ordered list positioned in a document, by successively placing each of said object areas in said document, according to its order in said list, at one of a set of possible locations for said object area, each location being determined by a rule of placement, said recursion continuing until each of said object areas has been placed at every one of said possible locations in said set; and

(c) selecting, according to a criteria, a particular document layout from said plurality of document layouts.

5,553,218

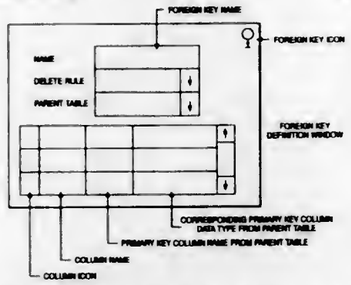
GRAPHICAL USER INTERFACE FOR RELATING KEY INDEX PROPERTIES TO DATABASE TABLE COLUMNS

Shih-Gong Li, and Theodore J. L. Shrader, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 848,496, Mar. 9, 1992, abandoned. This application Apr. 19, 1995, Ser. No. 424,764

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—148 **6 Claims**



1. A user interface for defining the structure of a relational database in a computer system, comprising:

means for generating and displaying a first matrix which shows columns from a first table of the relational database;

means for generating and displaying a second matrix which shows columns from a second table of the relational database;

means for generating and displaying, in concurrence with the display of the first matrix, a primary key matrix showing columns from the first table in an order defining a primary key;

means for generating and display a foreign key matrix of table columns from the second matrix and table columns from the primary key matrix; and

means for a user of the interface to select and order table columns to define relationships in the foreign key matrix.

5,553,219

FONT OUTLINE AND BIT MAP GENERATOR SYNTHESIZING FILLING DATA WITH SELECTED OUTLINE DATA OR DUPLICATE OUTLINE DATA

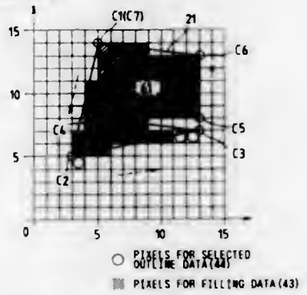
Kosuke Kurashige, Kanagawa, Japan, assignor to Fujl Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 880,000, May 8, 1992, abandoned. This application Dec. 7, 1994, Ser. No. 350,701

Claims priority, application Japan, May 10, 1991, 3-135700

Int. Cl.[6] G06T *9/20*

U.S. Cl. 395—150 **6 Claims**



1. A font data generator for a computer, comprising:

first means for tracing data corresponding to outline segments of an image;

second means for generating, from said data corresponding to said outline segments, first pixel data corresponding to an area surrounded by said outline segments;

third means for generating, from said data corresponding to said outline segments, second pixel data corresponding to said outline segments;

fourth means for selecting at least one of (A) only one of a right to left tracing direction and a left to right tracing direction, and (B) only one of a top to bottom tracing direction and a bottom to top tracing direction;

fifth means for selecting, from said second pixel data, third pixel data corresponding to outline segments that, during one of a clockwise and counterclockwise tracing, are at least partially traced in the selected tracing direction; and

sixth means for synthesizing said first pixel data and said third pixel data.

5,553,220

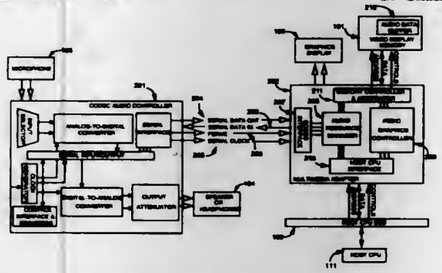
MANAGING AUDIO DATA USING A GRAPHICS DISPLAY CONTROLLER

David Keene, San Mateo, Calif., assignor to Cirrus Logic, Inc., Fremont, Calif.

Filed Sep. 7, 1993, Ser. No. 118,153

Int. Cl.[6] G06F *17/00*

U.S. Cl. 395—154 **27 Claims**



1. A computer-based multimedia system, comprising:

a host CPU;

a display device;

an audio transducer;

an audio codec to transfer audio signals to or from said audio transducer;

a digital, random access video display memory having a plurality of buffer segments, at least one said buffer segment for video data and at least one said buffer segment for audio data;

a video graphics controller, responsive to said host CPU, to control the display of said video data on said display device;

an audio resources manager, responsive to said host CPU, to control said audio codec and to control the transfer of said audio data between said host CPU and said video display memory and between said video display memory and said audio codec;

a video memory controller, responsive to said video graphics controller and to said audio resources manager, to store and retrieve said video data and said audio data within said video display memory; and

a host CPU interface to couple said host CPU to both said video graphics controller and to said audio resources manager.

5,553,221

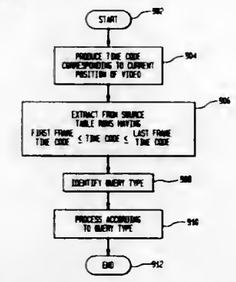
SYSTEM AND METHOD FOR ENABLING THE CREATION OF PERSONALIZED MOVIE PRESENTATIONS AND PERSONALIZED MOVIE COLLECTIONS

James A. Reimer, Morgan Hill, and Roger A. Reinsch, Cupertino, both of Calif., assignors to International Business Machine Corporation, Armonk, N.Y.

Division of Ser. No. 407,305, Mar. 20, 1995. This application Jun. 1, 1995, Ser. No. 457,775

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—154 **19 Claims**



1. A computer program product comprising a computer readable medium having computer program logic recorded thereon for enabling a processor in a computer system to allow a user to view a personalized version of a movie, and to allow the user to query a foundation information database while the personalized version of the movie is being presented to the user, the foundation information database storing primary information and secondary information pertaining to content and creation of the movie, said computer program product comprising:

movie presenting means, responsive to a request from the user, for enabling said processor to present to the user the personalized version of the movie;

means for enabling said processor to allow the user to query the foundation information database for information pertaining to the content and creation of the movie while the personalized version of the movie is being presented to the user;

frame identification means for enabling said processor to identify a frame of the personalized version of the movie that was being presented to the user when the user issued said query;

secondary information identification means for enabling said processor to identify portions of the secondary information in the foundation information database pertaining to the content and creation of the personalized version of the movie as identified by said frame and as specified by said query;

secondary information retrieval means for enabling said processor to retrieve from the foundation information database said portions of the secondary information; and

means for enabling said processor to present to the user said retrieved portions of the secondary information.

5,553,222

MULTIMEDIA SYNCHRONIZATION SYSTEM

Steve H. Milne, Palo Alto; Matthew L. Denman, Los Gatos; James M. Tindell, LaHonda; John C. Tobias, II, Sunnyvale; Michael R. Dilts, Saratoga, and Bradley A. Edelman, Cupertino, all of Calif., assignors to Taligent, Inc., Cupertino, Calif.

Continuation of Ser. No. 60,771, May 10, 1993, abandoned. This application Dec. 19, 1995, Ser. No. 575,002

Int. Cl.[6] G06T *1/00*

U.S. Cl. 395—154 **13 Claims**

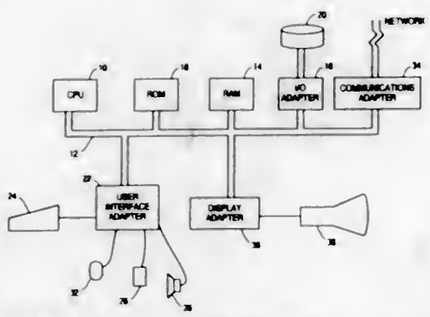
1. A computer system for synchronizing presentation of a time-based media sequence in response to a synchronization request specifying a new clock rate of presentation of the time-based media sequence the system comprising:

an intelligent terminal capable of interacting with objects as well as creating and storing objects, said host computer and said intelligent

means for decomposing said graphical image entered onto said display means into abstract elemental objects;

5,553,226

SYSTEM FOR DISPLAYING CONCEPT NETWORKS



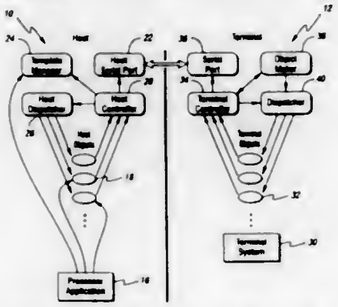
(a) a storage:
(b) means for providing a master time signal:
(c) a clock object for providing a current time value, the clock object residing in the storage and including
current time means for computing the current time value according to a clock function of the master time signal, an original clock rate value, and an original offset value,
(d) meadia sequence presentation means, cooperating with the clock object, for presenting the time-based meadia sequence in synchronism with the current time value; and
(e) clock synchronization means, responsive to the synchronization request, for synchronizing the clock object so that the presentation means may present the media sequence at the new clock rate while keeping the current time value unchanged at the instant of synchronization, the clock synchronization means including;
means for computing a new offset value according to a new clock function of the master time signal, the new clock rate, the original clock rate value, and the original offset value and
means for replacing the original clock rate values and the original clock offset value of the clock object with the new clock rate and the new offset value, respectively.

5,553,223

METHOD AND SYSTEM OF SELECTIVELY TRANSMITTING DISPLAY FORMATS AND DATA BETWEEN A HOST COMPUTER AND AN INTELLIGENT TERMINAL

Russell L. Greenlee, Denver; James H. Alexander, Highlands Ranch; Emilie A. Young, and Gary M. Smithrud, both of Boulder, all of Colo., assignors to U S West Advanced Technologies, Inc., Englewood, Colo.

Continuation of Ser. No. 503,735, Apr. 3, 1990, abandoned. This application Jun. 8, 1993, Ser. No. 73,973
Int. Cl.[6] G06F *15/17*
U.S. Cl. 395—155 **19 Claims**



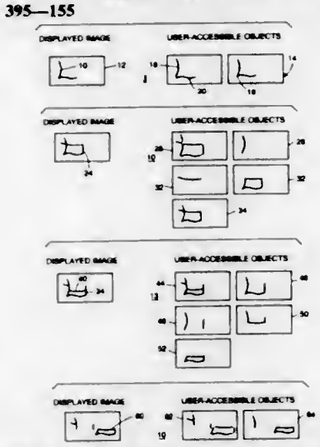
1. For use with a host computer having a plurality of user interface objects corresponding to a plurality of user interfaces and an intelligent terminal capable of interacting with objects as well as creating and storing objects, said host computer and said intelligent terminal being interconnected over a telecommunications network in an on-line mode for data transmission therebetween and in an off-line mode wherein no data is transmitted therebetween, a method of processing and transmitting data corresponding to one of the plurality of user interface objects between the host computer and the intelligent computer, the method comprising the steps of:
determining whether the one of the plurality of user interface objects is stored in the intelligent computer;
if the one of the plurality of user interface objects is not stored in the intelligent computer, generating interface data representing the one of the plurality of user interface objects, the interface data providing full user interface utilities;
transmitting said interface data over the telecommunications network in the on-line mode to the intelligent terminal;
storing said interface data in the intelligent terminal;
modifying the interface data in real time with user manipulated commands and actions by utilizing the intelligent Terminal in the off-line mode to obtain transitory interface data and modified interface data, the transitory interface data representing user manipulations not requiring intervention from said host computer, and the modified interface data representing user manipulations resulting in an alteration of the user interface and requiring intervention from said host computer;
filtering said modified interface data from said transitory interface data in real time through the use of gating commands; and
transmitting only the modified interface data upon a first occurrence of the modified interface data from the intelligent terminal to the host computer over the telecommunications network.

5,553,224

METHOD FOR DYNAMICALLY MAINTAINING MULTIPLE STRUCTURAL INTERPRETATIONS IN GRAPHICS SYSTEM

Eric Saund, San Carlos; Thomas P. Moran, and Craig D. Becker, both of Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 4, 1993, Ser. No. 101,646
Int. Cl.[6] G06F *3/14*
U.S. Cl. 395—155 **18 Claims**



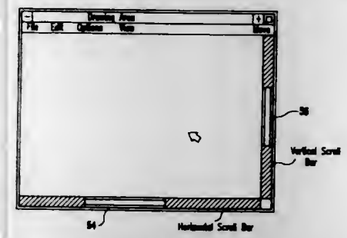
1. A graphical input and display system for creating and manipulating an abstract graphical image comprising:
input means, display means, memory means and function selection means, said input means being user manipulable for entering said graphical image onto said display means and for selecting functions on said function selection means for manipulating said graphical image;
means for decomposing said graphical image entered onto said display means into abstract elemental objects;
means for organizing said elemental objects into abstract groups of elemental objects, such that each elemental object belongs to one or more groups and each group contains one or more elemental objects;
means for reorganizing all or part of said groups of elemental objects into one or more new abstract groups of elemental objects in response to a user manipulation of all or part of said graphical image; and
at least one data structure stored in said memory means in which said elemental objects and said groups of elemental objects are linked.

5,553,225

METHOD AND APPARATUS FOR COMBINING A ZOOM FUNCTION IN SCROLL BAR SLIDERS

Phil M. Perry, Bearsville, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 25, 1994, Ser. No. 329,123
Int. Cl.[6] G06F *3/00*
U.S. Cl. 395—157 **21 Claims**



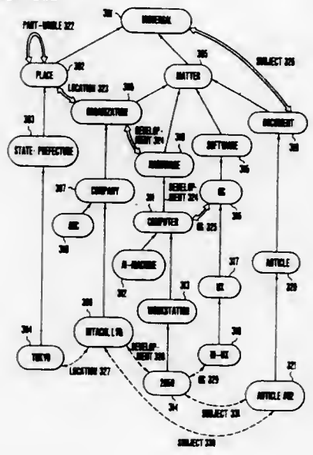
1. A method of changing a scale of a drawing in a computer graphics application program comprising the steps of:
displaying scroll bars along a plurality of axes of the drawing, said scroll bars each including a slider a position of which within the bar indicates a relative location of a working area relative to a virtual screen and a size of which indicates a relative size of the working area as a function of a total size of the virtual screen;
responding to a user selection of a slider of a first one of said scroll bars and performing a resizing operation on the slider; and
changing a scale of the drawing as a function of the resizing of the slider while constraining a center of interest of the drawing to a fixed location within the working area of the drawing by
calculating a size and location of the selected slider within the scroll bar as a result of the resizing operation,
comparing the calculated size and location of the selected slider with maximum and minimum limits,
ignoring a change in scale of the drawing beyond the maximum and minimum limits, thereby constraining the center of interest of the drawing,
computing sizes of sliders of other scroll bars as a function of the resizing of the selected slider,
computing the computed sizes of said sliders with maximum and minimum limits, and
ignoring a change in scale of the drawing beyond the maximum and minimum limits of any of said sliders, thereby constraining the center of interest of the drawing.

5,553,226

SYSTEM FOR DISPLAYING CONCEPT NETWORKS

Itsuko Kiuchi, Tokyo; Hiromichi Fujisawa, Tokorozawa; Atsushi Hatakeyama, and Minoru Wakabayashi, both of Kokubunji, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 276,384, Nov. 25, 1988, abandoned, which is a continuation-in-part of Ser. No. 844,123, Mar. 26, 1986, Pat. No. 4,868,733. This application Oct. 30, 1989, Ser. No. 430,241
Claims priority, application Japan, Oct. 31, 1988, 63-272974; Jun. 14, 1989, 1-149629
Int. Cl.[6] G06T *1/00*
U.S. Cl. 395—161 **22 Claims**



1. A concept network display system for representing knowledge-based information in a combination of concept nodes and relation links, comprising:
input means for inputting data to indicate a current concept;
knowledge base storage means for holding said knowledge-based information;
display means for displaying concepts stored in said knowledge base storage means;
first means for controlling said display means to display a concept tree window for showing concepts in a hierarchical tree arrangement including a current concept indicated by said input means;
second means for controlling said display means to display a superconcept window for showing a superconcept of said current concept;
third means for controlling said display means to display a subnetwork window for showing at least one concept combined with said current concept in any of instance relation and generic relation;
select means responding to an input of data via said input means for selecting a concept of said concepts displayed on one of said windows by said display means to designate the selected concept as a new current concept; and
rewrite means responsive to said new current concept for rewriting said concept tree window, said superconcept window and said subnetwork window based on said new current concept.

5,553,227

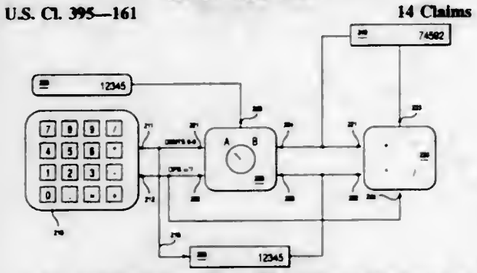
a display adapter connected to said CPU and including a hard-

a plurality of input leads for receiving a plurality of clock

5,553,227
METHOD AND SYSTEM FOR VISUALLY PROGRAMMING STATE INFORMATION USING A VISUAL SWITCH

Richard E. Berry, Georgetown, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 26, 1994, Ser. No. 296,783
Int. Cl.[6] G06F *3/14*
U.S. Cl. 395—161 **14 Claims**

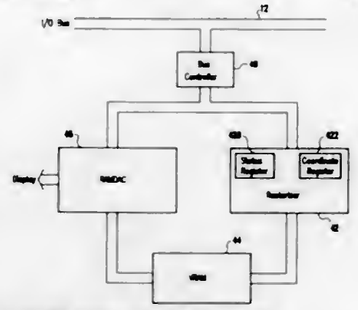


1. A computer-implemented method for visually programing on a computer display using a visual switch object in a visual programming development tool, the visual switch object having at least one first input to receive input from input devices, a plurality of second inputs to receive input from said switch object or applications connected to said switch object, and at least one output, comprising the steps of:
displaying said visual switch object on the computer display in the visual programming development tool; and
in response to user controls, visually connecting on the computer display a visual activation object to said input of said switch object;
in response to activating said visual activation object by user controls, visually connecting said output of said switch object to a selected one of said second inputs such that information received on the selected one of said second inputs is received by said output.

5,553,228
ACCELERATED INTERFACE BETWEEN PROCESSORS AND HARDWARE ADAPTERS

David J. Erb, and Xiaoshan Zhou Odom, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 19, 1994, Ser. No. 308,340
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—162 **6 Claims**

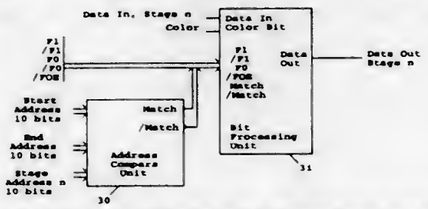


1. A computer graphics system comprising:
a central processing unit (CPU) having an architecture which does not enforce an order of memory accesses;
a random access memory (RAM) storing a graphics software program including processes for drawing graphics primitives, said CPU accessing the RAM to run the graphics software; and
a display adapter connected to said CPU and including a hardware rasterizer having a coordinate register and a status register respectively storing graphics primitives coordinates and a status address, said CPU writing coordinates of said graphics primitives and reading the status by accessing a same address of said display adapter, the display adapter responding to the write and read accesses of the CPU to provide a hardware interface that makes writes and reads appear to be accessing the same address, thus guaranteeing that the order of write and read are correct.

5,553,229
ROW ADDRESSABLE GRAPHICS MEMORY WITH FLASH FILL

Jed Margolin, 3570 Pleasant Echo Dr., San Jose, Calif. 95148

Continuation of Ser. No. 153,200, Nov. 15, 1993, Pat. No. 5,422,998. This application Mar. 6, 1995, Ser. No. 398,994
Int. Cl.[6] G06F *12/06*
U.S. Cl. 395—166 **19 Claims**



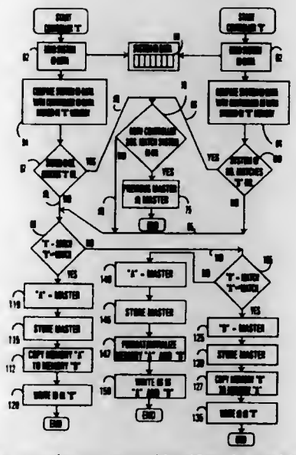
1. An apparatus for addressing and modifying display information for display on a display screen, said apparatus comprising:
(a) a row addressable memory for storing a plurality of lines of image data, said row addressable memory for receiving a row address, range data, and manipulation data, said range data defining a portion of image data at said row address to be modified according to said manipulation data;
(b) row address circuitry for selecting a particular row in said row addressable memory; and
(c) a plurality of circuit stages for accessing said row of image data, each circuit stage comprising a compare unit and a bit processing unit for each bit plane of said row addressable memory, said compare unit comprising:
(i) a first range circuit for comparing a first data of said range data with a fixed address corresponding to said circuit stage;
(ii) a second range circuit for comparing a second data of said range data with said fixed address; and
(iii) a first logic circuit responsive to outputs of said first range circuit and said second range circuit for determining if said fixed address of said circuit stage is within said range data; and
(d) said bit processing unit comprising a second logic circuit, responsive to said first logic circuit, for modifying data from said row of image data according to said manipulation data provided said fixed address of said circuit stage is within said range data.

5,553,230
IDENTIFYING CONTROLLER PAIRS IN A DUAL CONTROLLER DISK ARRAY

Mark D. Petersen, and Barry J. Oldfield, both of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 18, 1995, Ser. No. 375,097
Int. Cl.[6] G06F *11/34*
U.S. Cl. 395—180 **20 Claims**

16. In a dual controller disk storage system, a method of selecting a master controller and a slave controller comprising:

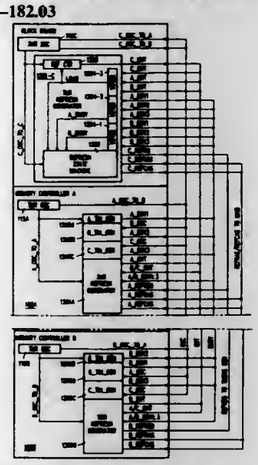


(a) reading a unique system identifier data within the disk storage system by a first and second disk controller;
(b) comparing the system identifier data with stored controller data in non-volatile memory within the first and second disk controller, thereby determining whether a match exists, a match indicative that the respective controller was previously used in the disk storage control system; and,
(c) selecting a master controller based on compare results for each controller from the comparing step.

5,553,231
FAULT TOLERANT MEMORY SYSTEM

Robert L. Papenberg; Runchan D. Yang; David H. Wotring; Mohammad F. Rydhan; Paul Voloshin, all of San Jose, and Mohamed M. Talaat, Mountain View, all of Calif., assignors to Zitel Corporation, Fremont, Calif.

Division of Ser. No. 277,491, Jul. 19, 1994, which is a division of Ser. No. 954,169, Sep. 29, 1992, Pat. No. 5,379,415. This application Jun. 6, 1995, Ser. No. 470,154
Int. Cl.[6] G01R *31/28;* **G06F** *11/00*
U.S. Cl. 395—182.03 **8 Claims**

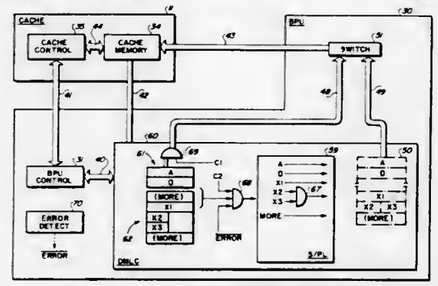


1. A redundant clock circuit comprising:
a plurality of synchronized clock generation circuits, each comprising:
a plurality of input leads for receiving a plurality of clock signals from each of said plurality of synchronized clock generation circuits;
a voter for selecting one of a plurality of matching ones of said plurality of clock signals; and
an oscillation circuit comprising:
a first inverter having an input lead serving as an input lead of said oscillation circuit, coupled to receive said selected one of said plurality of clock signals, and an output lead;
a crystal having a first lead coupled to said output lead of said first inverter, and having an output lead;
a second inverter having an input lead coupled to said output lead of said crystal, and having an output lead serving as an output lead of said oscillation circuit for providing a clock signal output; and
a resistor coupled in series between said output lead of said crystal and said input lead of said second inverter to establish a desired duty cycle of said clock signal.

5,553,232
AUTOMATED SAFESTORE STACK GENERATION AND MOVE IN A FAULT TOLERANT CENTRAL PROCESSOR

John E. Wilhite, and Ronald E. Lange, both of Glendale, Ariz., assignors to Bull HN Informations Systems Inc., Billerica, Mass.

Filed Jun. 13, 1994, Ser. No. 259,216
Int. Cl.[6] G06F *11/34*
U.S. Cl. 395—182.04 **4 Claims**



1. A fault tolerant central processing unit comprising:
A) data manipulation circuitry including a plurality of software visible registers, each said software visible register temporarily storing information contents as data is manipulated by said data manipulation circuitry;
B) a shadow set of said software visible registers;
C) shadowing, packing and validity verification means coupled intermediate said software visible registers and said shadow set for copying the information contents of said plurality of software visible registers, after a data manipulation operation, into said shadow set after the validity of such contents have been verified, said shadowing, packing and validity verification means including combining means for packing information from at least two of said software visible registers, each of which do not exceed half word length, into a single word constituent in said shadow set: and
D) resumption of activity means coupled intermediate said shadow set and said software visible registers for replicating the contents of said shadow set in said software visible registers during recovery from a detected fault.

5,553,233
MANAGEMENT APPARATUS FOR VOLUME-MEDIUM

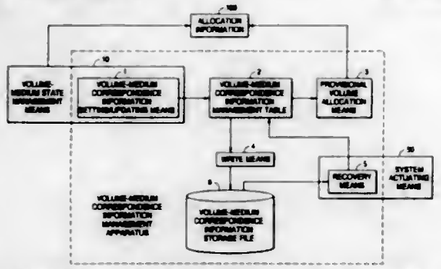
5,553,234
SYSTEM AND METHOD FOR INCLUDING STORED

providing data to the test controller which is used to indicate whether the CPU clock conductor is coupled to or isolated

5,553,233
MANAGEMENT APPARATUS FOR VOLUME-MEDIUM CORRESPONDENCE INFORMATION FOR USE IN DUAL FILE SYSTEM

Akio Ikeda, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 174,407, Dec. 28, 1993, abandoned. This application Aug. 4, 1995, Ser. No. 511,098
Claims priority, application Japan, Dec. 28, 1992, 4-360618
Int. Cl.[6] G06F *15/00; 11/22*
U.S. Cl. 395—182.11 **17 Claims**



1. A management apparatus for volume-medium correspondence information for use in a dual file system, comprising:

a system actuating means responsive to manipulation by an operator, for actuating a dual file system operation, and for reactuating the dual file system operation;

a volume-medium correspondence information management table operable to store volume-medium correspondence information including correspondence between volume name and medium name of a dual file;

a volume-medium correspondence information storage file;

a write means, responsive to an updating of the volume-medium correspondence information in the volume-medium correspondence information management table, for writing a most recent volume-medium correspondence information in the volume-medium correspondence information management table to the volume-medium correspondence information storage file during the dual file system operation;

a volume-medium correspondence information setting/updating means for initializing the volume-medium correspondence information in the volume-medium correspondence information management table; and updating the volume-medium correspondence information into the volume-medium correspondence information management table, responsive to an alteration in allocation information;

a volume-medium state management means for recognizing at least two media constituting dual files via a state of the volume, the name of the volume and the name of the medium; for setting allocation information indicating that the volumes are allocated as dual files; and upon detection of a failure of one of said media in one of said volumes, for placing said failed volume in an off-line state and said failed media in a blockaded state; wherein the dual file system operation is stopped as a result;

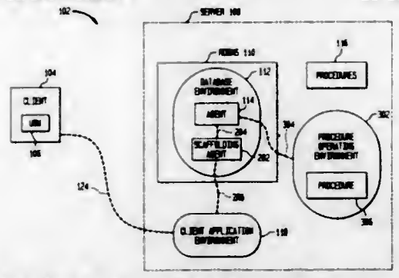
a recovery means for recovering the volume-medium correspondence information stored in the volume-medium correspondence information storage file to the volume-medium correspondence information management table responsive to the re-actuation of the dual file system operation; and

a provisional volume allocation means, responsive to the re-actuation of the dual file system operation, for setting allocation information provisionally allocating a volume in an off-line state to dual files including a blockaded medium based on the volume-medium correspondence information management table.

5,553,234
SYSTEM AND METHOD FOR INCLUDING STORED PROCEDURES, USER-DEFINED FUNCTIONS, AND TRIGGER PROCESSING IN AN EXISTING UNIT OF WORK

Curt L. Cotner; Robert J. Heaps, both of Gilroy; Wendy L. Koontz; Benjamin R. Little, both of San Jose, and Thomas J. Toomire, Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 23, 1994, Ser. No. 311,035
Int. Cl.[6] G06F *13/00; 3/00*
U.S. Cl. 395—182.14 **21 Claims**



18. A method for incorporating an external predefined procedure into an existing unit of work, said existing unit of work being part of a client application process, said method comprising the steps of:

(a) creating, in a database environment, a "logical representation" of said client application process, that is connected to said client application process;

(b) creating, in said database environment, a scaffolding agent;

(c) connecting said scaffolding agent to said client application process, such that termination of said client application process may be monitored via said scaffolding agent;

(d) disconnecting said "logical representation" from said client application process;

(e) connecting said "logical representation" to a procedure operating environment to execute external programs;

(f) executing said external predefined procedure in said procedure operating environment;

(g) disconnecting said "logical representation" from said procedure operating environment;

(h) disconnecting said scaffolding agent from said client application process; and

(i) reconnecting said "logical representation" to said client application process, to incorporate the external predefined procedure into the existing unit of work.

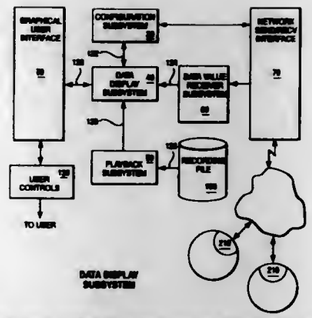
5,553,235
SYSTEM AND METHOD FOR MAINTAINING PERFORMANCE DATA IN A DATA PROCESSING SYSTEM

James N. Chen, Austin, and Joseph C. Ross, Georgetown, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 965,982, Oct. 23, 1992. This application May 1, 1995, Ser. No. 434,906
Int. Cl.[6] G06F *11/00*
U.S. Cl. 395—182.18 **20 Claims**

1. A method, in a network having a plurality of data processing systems, of allowing a user to graphically determine performance diagnostics for at least one of said data processing systems said method comprising the steps of:

creating, for a first one of said data processing systems, a console window having at least one instrument window, said at least one instrument window having an instrument graphical context, and said console window having a console graphical context;



generating time sampled values from at least one statistic for a second one of said data processing systems;

graphically displaying on said first data processing system, using said console window, said time sampled values according to said instrument graphical context;

storing, during said displaying, said console window and said time sampled values;

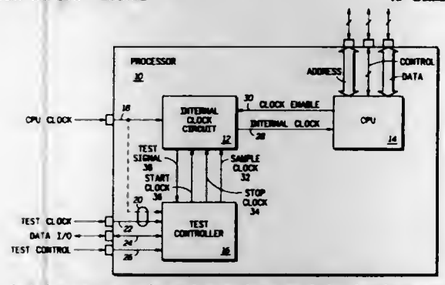
retrieving said stored console window and said stored time sampled values; and

graphically displaying on said first data processing system, with said retrieved console window, said retrieved time sampled values using said retrieved instrument graphical context so that said retrieved time sampled values appear as live data.

5,553,236
METHOD AND APPARATUS FOR TESTING A CLOCK STOPPING/STARTING FUNCTION OF A LOW POWER MODE IN A DATA PROCESSOR

Juan G. Revilla, and Alfred L. Crouch, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 3, 1995, Ser. No. 399,113
Int. Cl.[6] G06F *11/34*
U.S. Cl. 395—183.01 **45 Claims**



1. A data processor formed on an integrated circuit substrate, the data processor comprising:

a central processing unit (CPU);

an internal clock circuit coupled to the CPU that provides a CPU clock signal to the CPU when in a normal mode of operation and selectively disconnects the CPU clock signal from the CPU to place the CPU in a low power mode, the CPU clock signal being provided via a CPU clock conductor;

a test controller formed on the integrated circuit substrate which is in the normal mode of operation when the CPU is in the low power mode of operation, the test controller being coupled to the internal clock circuit wherein the test controller provides at least one test signal to the internal clock circuit while the CPU is in the low power mode of operation;

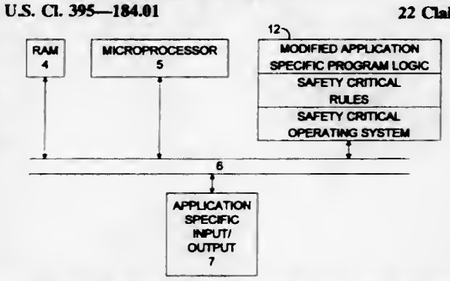
wherein the internal clock circuit, when in the low power mode of operation, responds to the at least one test signal by providing data to the test controller which is used to indicate whether the CPU clock conductor is coupled to or isolated from the CPU; and

wherein the internal clock circuit, when in the normal mode of operation, responds to the at least one test signal by providing data to the test controller to indicate whether the CPU clock conductor is coupled to or isolated from the CPU.

5,553,237
SAFETY CRITICAL MONITORING OF MICROPROCESSOR CONTROLLED EMBEDDED SYSTEMS

Alan J. Eisenberg, Monmouth Junction, N.J.; Alexander M. Adelson, Peekskill, N.Y., and James A. Eby, Pennington, N.J., assignors to Base Ten Systems, Inc., Trenton, N.J.

Filed Dec. 13, 1994, Ser. No. 354,971
Int. Cl.[6] G06F *11/00*
U.S. Cl. 395—184.01 **22 Claims**



1. A safety critical monitoring system for a microprocessor controlled embedded system, comprising:

a central processing unit comprising a microprocessor and a non-volatile memory accessible by the microprocessor and having an operating system stored therein for performing application specific embedded executive functions and application specific program logic stored therein for controlling an application system;

an input/output circuit for providing an interface between the central processing unit and the application system;

wherein the application specific program logic includes a defined set of safety critical rules for the application system corresponding to criteria for safety critical operations to be performed by the microprocessor in accordance with the application specific program logic; and

wherein the operating system has means linked to the stored set of safety critical rules for verifying that the safety critical operations performed by the microprocessor in accordance with the application specific program logic meet the criteria set by the safety critical rules and means for indicating a failure to meet said criteria.

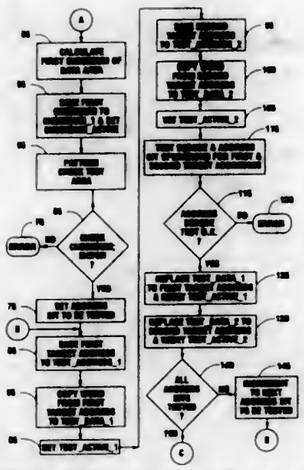
5,553,238
POWERFAIL DURABLE NVRAM TESTING

Marvin D. Nelson, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 19, 1995, Ser. No. 376,322
Int. Cl.[6] G06F *11/00;* **G11C** *29/00*
U.S. Cl. 395—185.07 **14 Claims**

1. A method for providing powerfail durable testing of a memory device having data in a first subset of a plurality of storage locations in the memory device, the method comprising the steps of:

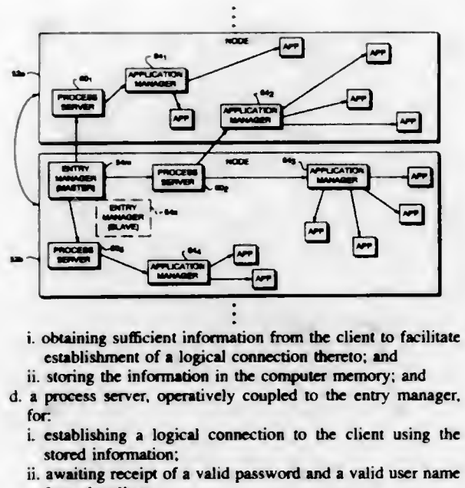
(a) detecting and setting a valid contents status signal in a reserved storage location within the first subset, the valid contents status signal indicative of the validity status of the data in the first subset;



(b) calculating a first checksum for the data in the first subset of storage locations, the first checksum calculated to include the valid contents status signal, and further saving the first checksum to a first reserved test storage location within a second subset of the plurality of locations in the memory device;
(c) copying a first word of the data and its address from a selected target location within the first subset of storage locations to a second and third reserved test storage location, respectively, in the second subset of the plurality of locations in the memory device;
(d) setting a test-status signal in a fourth reserved test storage location within the second subset, the test-status indicative of a memory test in progress for the target location;
(e) testing the target location;
(f) replacing the first word from the second reserved test storage location back to the target location;
(g) resetting the test-status signal in the fourth reserved test storage location, the resetting indicative of completion of the memory test for the target location;
(h) repeating steps (c) through (g) for each word of the data to be tested; and,
(i) calculating a second checksum for the data in the first subset of locations, and comparing the second checksum with the first checksum whereby if no match occurs an error is detected and recorded by setting the valid contents status signal accordingly.

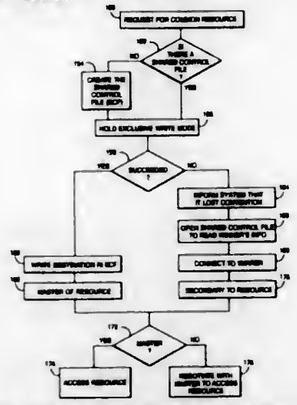
5,553,239
MANAGEMENT FACILITY FOR SERVER ENTRY AND APPLICATION UTILIZATION IN A MULTI-NODE SERVER CONFIGURATION
David M. Heath, Nashua, N.H.; Michael F. Kraley, Lexington, and Sangam Pant, Winchester, both of Mass., assignors to AT&T Corporation, Basking Ridge, N.J.
Filed Nov. 10, 1994, Ser. No. 337,943
Int. Cl.[6] G06F *11/34*
U.S. Cl. 395—187.01 **21 Claims**

1. Apparatus for managing access to applications, resident on a central host computer, by a plurality of clients, the apparatus comprising:
a. communication means for establishing and maintaining physical telecommunication connections between the host and a plurality of clients, each connection being capable of supporting a plurality of logical connections;
b. a computer memory;
c. an entry manager for controlling access to the host after establishment of a physical connection between a client and the host via the communication means by:



i. obtaining sufficient information from the client to facilitate establishment of a logical connection thereto; and
ii. storing the information in the computer memory; and
d. a process server, operatively coupled to the entry manager, for:
i. establishing a logical connection to the client using the stored information;
ii. awaiting receipt of a valid password and a valid user name from the client;
iii. receiving, from the client, at least one request for connection to an application resident on the host, the application being capable of supporting a plurality of logical connections;
iv. causing establishment of a logical connection between each requested application and the client; and
v. terminating the physical connection if a valid password and a valid user name are not received.

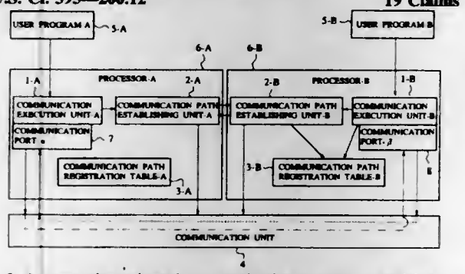
5,553,240
DETERMINING A WINNER OF A RACE IN A DATA PROCESSING SYSTEM
Hari H. Madduri, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 961,750, Oct. 16, 1992, Pat. No. 5,469,575.
This application Jun. 26, 1995, Ser. No. 494,868
Int. Cl.[6] G06F *12/14*
U.S. Cl. 395—200.03 **9 Claims**



1. A computer program product on a computer memory readable by a computer system having a plurality of peers, a system determining whether a the product peer has won a race for a system privilege comprising:
program code means for searching for a share control file in a predetermined location in the system, the share control file containing an address of a master peer which has the system privilege;

program code means responsive to the absence of the share control file for creating a share control file in the predetermined location, the share control file containing an address of the peer to become the master peer;
program means for placing an exclusive write lock on the share control file; and,
program code means for maintaining the exclusive write lock on the share control file.

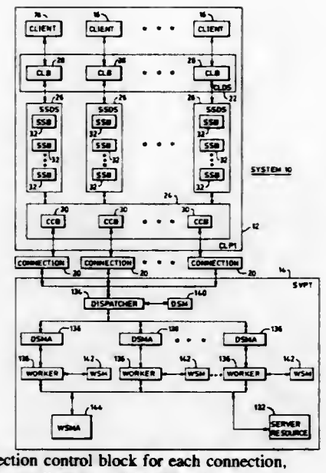
5,553,241
CONNECTION-ORIENTED COMMUNICATION SYSTEM WITH COMMUNICATION PATH RE-ESTABLISHMENT MECHANISM
Toshio Shirakihara, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Aug. 27, 1993, Ser. No. 113,858
Claims priority, application Japan, Aug. 28, 1992, 4-229788
Int. Cl.[6] G06F *13/14*
U.S. Cl. 395—200.12 **19 Claims**



1. A connection-oriented communication system, comprising:
communication means for providing connection-oriented communication paths; and
first communication execution means for making a connection request for requesting a communication port of a connected communication path for replacing a currently used communication path in the communication means;
communication path establishing means for creating the connected communication path and returning one communication port of the connected communication path to the first communication execution means, in response to the connection request made by the first communication execution means; and
second communication execution means for receiving another communication port of the connected communication path from the communication path establishing means, such that mutually communicating programs connected with the first and second communication execution means continue to communicate through said one and another communication ports of the connected communication path replacing the currently used communication path.

5,553,242
CLIENT/SERVER CONNECTION SHARING
Edward A. Russell, Acton, and Raymond Ting-Foo Tang, Chelmsford, both of Mass., assignors to Wang Laboratories, Inc., Billerica, Mass.
Filed Nov. 3, 1993, Ser. No. 143,162
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—200.12 **18 Claims**

1. In a data processing system including a least one server, a plurality of clients for generating operations calls, each operation call specifying an operation to be performed between a client and a server, and at least one connection for providing a communication path between a client and a server, a connection mechanism responsive to an operation call for providing connection between the client and the server, comprising:



a connection control block for each connection,
at least one client control block, and
at least one session control block,
each connection control block including
an identification of a corresponding connection,
each client control block including
an identification of a corresponding client, and
an identification of a corresponding session control block, and
each session control block corresponding to a client control block and establishing a session between a client identified in the corresponding client control block and a connection to a server for executing an operation between the client and the server through the connection and including
an identification of the session,
an identification of the connection,
an identification of the server, and
a connection manager responsive to the connections for providing the connection control blocks and the operation calls for providing the client control blocks and session control blocks, wherein each session between a client and a connection to a server is established solely through a corresponding session control block and wherein each operation is identified by the corresponding session identification to relate the operation to a client, a connection and a session.

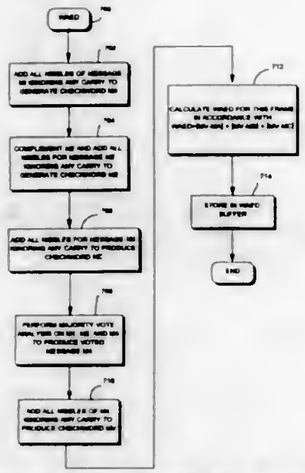
5,553,243
METHOD AND APPARATUS FOR DETERMINING WITH HIGH RESOLUTION THE FIDELITY OF INFORMATION RECEIVED ON A COMMUNICATIONS CHANNEL
Stephen D. Harrison, and George D. Rose, both of Lynchburg, Va., assignors to Ericsson GE Mobile Communications Inc., Research Triangle Park, N.C.
Filed Jan. 7, 1994, Ser. No. 178,547
Int. Cl.[6] H04Q *7/28*
U.S. Cl. 375—224 **37 Claims**

1. A method for determining a weighted average error dispersion of data signals received over a current communication channel, comprising:
(a) detecting a frame of information on the current communications channel that includes plural redundant messages;
(b) determining a voted message from the redundant messages;
(c) splitting each redundant message and the voted message into multi-bit words and determining a weighted value for each word;
(d) summing the weighted values for each redundant message and the voted message to generate a corresponding checkword;

section and coupling a peripheral data bus to the first peripheral

a control processor, coupled to the device identifier store, to the signature store, to the family store, and to the peripheral bus,

and outputting a detection signal indicating the detected bus state; and



(e) determining a weighted average error dispersion for the received communications signal based on the sum of the differences between the voted message checkword and each redundant message checkword; and

(f) searching for another communications channel if the weighted average error dispersion is outside of a desired range.

5,553,244

REFELXIVELY SIZING MEMORY BUS INTERFACE

Thomas M. Norcross, and William V. Miller, both of Arlington, Tex., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 975,765, Nov. 13, 1992, abandoned. This application Feb. 10, 1995, Ser. No. 387,964

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—280 **46 Claims**

1. A memory bus interface on a first peripheral board that is configured to be connected to a first expansion slot of a computer motherboard having a plurality of expansion slots for connecting to a plurality of peripheral boards, the expansion slots being interfaced to a bus system having a memory address space divided into a plurality of separately-addressed sections, first peripheral board having a memory address space corresponding to a first addressed section and coupling a peripheral data bus to the first peripheral board, the memory bus interface comprising:

a buffer circuit coupled to a plurality of data lines of a peripheral circuit integral to the first peripheral board and to a first set of lines of the peripheral data bus to selectively communicate data between the plurality of data lines of the peripheral circuit and the first set of lines of the peripheral data bus;

a data storage element coupled to the plurality of data lines of the peripheral circuit and to a second set of lines of the peripheral data bus to selectively store data and communicate stored data between the plurality of data lines of the peripheral circuit and the second set of lines of the peripheral data bus; and

a data format controller coupled to receive and monitor a data feedback signal generated by a peripheral board, the signal being indicative of a data width format and a memory address space of the peripheral board, wherein the data format controller provides control signals to the buffer circuit and to the data storage element when a read or write access of the peripheral circuit is initiated and the memory address space of a second periphery board is the first addressed section such that data is selectively coupled between the peripheral circuit and the peripheral data bus in the same width format as the data width format of the second peripheral board.

5,553,245

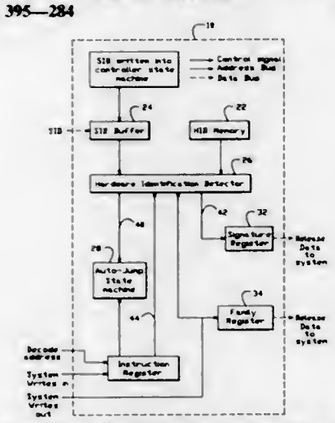
AUTOMATIC CONFIGURATION OF MULTIPLE PERIPHERAL INTERFACE SUBSYSTEMS IN A COMPUTER SYSTEM

Ming-Chang Su, and Jenn-Liang Chang, both of Kaohsiung, Taiwan, assignors to Macronix International Co., Ltd., Hsin-chu, Taiwan

Filed May 11, 1994, Ser. No. 240,996

Int. Cl.[6] G06F *13/36*

U.S. Cl. 395—284 **11 Claims**



1. In a particular peripheral device supporting an automatic configuration of multiple peripheral devices on a peripheral bus in a data processing system, the automatic configuration including assignment of a base address on the peripheral bus for the particular peripheral device, an apparatus comprising:

a device identifier store which stores a device identifier for the particular peripheral device;

a signature store, accessible across the peripheral bus and having a first prespecified offset address, which when accessed across the peripheral bus returns a device type identifier for the particular peripheral device;

a family store, accessible across the peripheral bus and having a second prespecified offset address, which when accessed across the peripheral bus returns one of a sequence of family values which correspond to respective cycles of processing in the automatic configuration, and correspond to prespecified base addresses;

a control processor, coupled to the device identifier store, to the signature store, to the family store, and to the peripheral bus, the control processor responding to a predictor received on the peripheral bus in a particular cycle of the autoconfiguration process by comparing the device identifier with the predictor, and if a match is detected, then issuing a lock control signal and releasing the device type identifier in the signature store for access across the peripheral bus in response to the first offset address;

the control processor responding to an autoconfigure instruction in the particular cycle in the autoconfiguration process, by storing a family value corresponding to the particular cycle in the device family store, or if the lock control signal is asserted when the autoconfigure instruction is received by maintaining the family value corresponding to a previous cycle in the device family store; and

the control processor responding to a lock enable instruction indicating successful access to the signature store and the family store when the lock control signal is asserted, by locking the base address of the particular peripheral device at a value corresponding to the family value in the family store, and disabling responses to subsequent autoconfigure instructions.

5,553,246

SHARED BUS MEDIATION SYSTEM FOR MULTIPROCESSOR SYSTEM

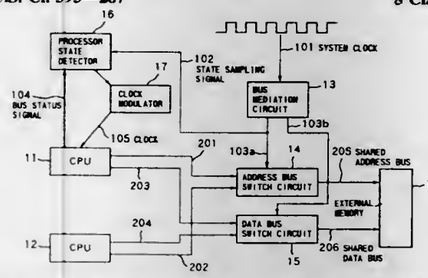
Hiromi Suzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 1, 1993, Ser. No. 144,352

Claims priority, application Japan, Oct. 30, 1992, 4-292835

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—287 **8 Claims**



1. A shared bus control system for multiprocessor system having shared buses for a plurality of processors comprising:

bus mediation means for outputting a switch control signal to switch with a regular cycle an occupation of said shared buses by said plurality of processors synchronizing with a predetermined system clock;

bus selection means for receiving addresses and data from said plurality of processors and selecting the address and data output from one processor to output them to said shared buses according to the switch control signal from said bus mediation means;

state detection means for receiving bus status signal output from a particular processor among said plurality of processors and detecting whether a bus state of said particular processor is the bus state for accessing said shared buses at a timing where said shared buses are occupied by said particular processor, and outputting a detection signal indicating the detected bus state; and

clock modulation means for shifting the bus state of said particular processor by modulating an operation clock for said particular processor so that the bus state of said particular processor becomes the bus state for accessing said shared buses at the timing where said shared buses are occupied by said particular processor according to the detection signal output from said state detection means.

5,553,247

METHOD FOR UNBLOCKING A MULTIBUS MULTIPROCESSOR SYSTEM

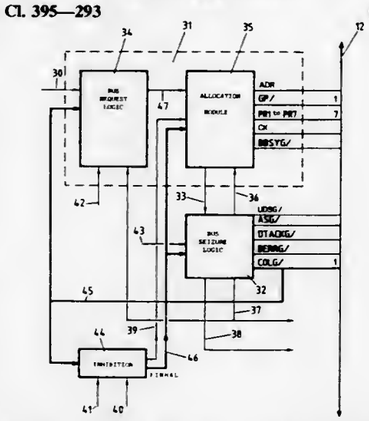
Philippe Lallement, Le Chesnay, France, assignor to Alcatel Cit, Paris, France

Continuation of Ser. No. 51,283, Apr. 23, 1993, abandoned, which is a continuation of Ser. No. 459,410, Dec. 29, 1989, abandoned. This application Dec. 12, 1994, Ser. No. 355,280

Claims priority, application France, Dec. 30, 1988, 88 17506

Int. Cl.[6] G06F *13/364*

U.S. Cl. 395—293 **9 Claims**



1. A method of unblocking a multiprocessor system, the system including at least one processing module having a plurality of processors each connected to a single main bus, means for arbitrating access requests from said processors and issuing a result, each of said processors requesting access to the bus, issuing the result of arbitration of all the accesses requested during a first phase; said result allocating the bus to a processor for a second phase, when the bus becomes available, including:

a main bus access management device;

means connected to said access management device for supplying to each processor of said module that requests an access to the bus a result of an arbitration of access requests made by the processors of said module, wherein the result is one of a positive and a negative result; and

means for providing access to the bus by sending a bus ownership signal to one of said plurality of processors receiving a positive result,

wherein said multiprocessor system can become blocked,

the unblocking method comprising the steps of:

detecting the blocking of the means for supplying a result of an arbitration and of the means for providing access to the bus, caused by a disturbance of these means,

sending to all the processors of said module one single decon-

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5,553,249

DUAL BUS ADAPTABLE DATA PATH INTERFACE

(ii) multiple multiplexer means for transmitting selected ones of said commands, data and messages to said first

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5,553,251

CENTRALIZED MANAGEMENT SYSTEM UTILIZING A

sending to all the processors of said module one single decongesting signal if said blocking is detected; and

immediately cancelling any positive result and any bus ownership signal in response to said decongesting signal terminating the access to the bus of said one of said plurality of processors.

5,553,248

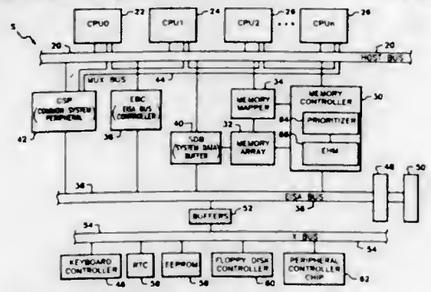
SYSTEM FOR AWARDING THE HIGHEST PRIORITY TO A MICROPROCESSOR RELEASING A SYSTEM BUS AFTER ABORTING A LOCKED CYCLE UPON DETECTING A LOCKED RETRY SIGNAL

Maria L. Melo, Houston; Jeff W. Wolford; Michael Moriarty, both of Spring; Paul R. Culley, Cypress, and Arnold T. Schnell, Pflugerville, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Oct. 2, 1992, Ser. No. 956,034

Int. Cl.[6] G06F *13/20;13/26*

U.S. Cl. 395—296 **3 Claims**



1. A computer system, comprising:

a host bus;

an I/O bus coupled to said host bus;

a device coupled to said I/O bus;

an I/O bus controller coupled to said host bus and said I/O bus, said I/O bus controller including means for detecting when said device coupled to said I/O bus has control of said I/O bus and for asserting a locked retry signal while said device has control of said I/O bus;

a plurality of microprocessors coupled to said host bus, each said microprocessor including means for requesting and gaining control of said host bus and further including means for performing a locked cycle to said I/O bus while having control of said host bus, wherein a microprocessor having control of said host bus and initiating a locked cycle aborts its locked cycle and releases control of said host bus if said locked retry signal is asserted, wherein said microprocessor again requests control of said host bus when said locked retry signal is next negated; and

a prioritizer coupled to said plurality of microprocessors for prioritizing between those of said plurality of microprocessors requesting control of said host bus and awarding control of said host bus to a highest priority microprocessor, said prioritizer including means for detecting a microprocessor aborting its locked cycle due to said locked retry signal and setting a reservation in response, wherein when said locked retry signal is next negated said prioritizer overrides normal priority and awards priority to said aborted microprocessor over said highest priority microprocessor when said host bus is next available if said aborted microprocessor is requesting control of said host bus.

5,553,249

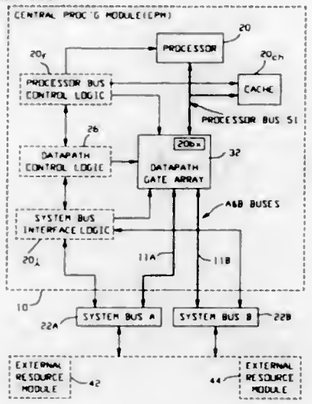
DUAL BUS ADAPTABLE DATA PATH INTERFACE SYSTEM

Wayne C. Datwyler; Dan T. Tran, both of Laguna Niguel, and Long V. Ha, Walnut, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Mar. 8, 1995, Ser. No. 400,700

Int. Cl.[6] G06F *13/42*

U.S. Cl. 395—308 **6 Claims**



1. A data path gate array interface linking a central processor means, operating at a first clock rate and first protocol, to first and second system bus means of a dual system bus means operating at a second clock rate and second protocol, said interface comprising:

(a) a single chip gate array including:

(a1) input pathway means for said dual system bus means to said central processor means, said input pathway means including:

(i) a first input port means connected to said first system bus means, and including:

(ia) first data register means for holding a 4 word packet of data received from said first system bus means;

(ib) message register means for holding messages received from said first system bus means;

(ii) a second input port means connected to said second system bus means, and including:

(iia) second data register means for holding a 4 word packet of data received from said second system bus means;

(iib) message register means for holding messages received from said second system bus means;

(iii) wherein said first and second input port means operate at said second clock rate and said second protocol;

(iv) translation logic means for converting incoming data from said dual system bus means from said second clock rate and second protocol to said first clock rate and first protocol for subsequent transmission to said processor means;

(a2) output pathway means for transmitting commands, data, and messages to said first and second dual system bus means, including:

(i) multiple register means for receiving commands, data and messages from said central processor means at said first clock rate and said first protocol;

(ii) multiple multiplexer means for transmitting selected ones of said commands, data and messages to said first and second system bus means including:

(iia) a translation multiplexer means for converting said commands, data and messages to said second clock rate and said second protocol.

5,553,250

BUS TERMINATING CIRCUIT

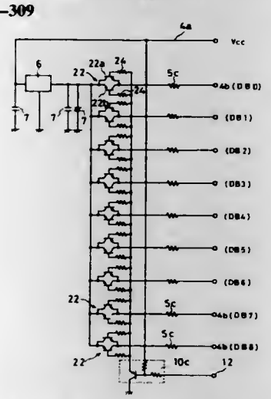
Takao Miyagawa; Akinori Kashio; Ken Hashimoto; Makoto Yasuda; Hidenobu Sakai, and William C. Kutsche, all of Kyoto-fu, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation of Ser. No. 109,402, Aug. 19, 1993, abandoned, which is a continuation of Ser. No. 811,708, Dec. 20, 1991, abandoned. This application Jul. 27, 1994, Ser. No. 281,259

Claims priority, application Japan, Dec. 20, 1990, 2-413559; Mar. 1, 1991, 3-061174; Jul. 19, 1991, 3-204948; Sep. 5, 1991, 3-254499; Oct. 11, 1991, 3-292154; Dec. 10, 1991, 3-350890

Int. Cl.[6] G06F *13/40*

U.S. Cl. 395—309 **20 Claims**



1. A bus terminating circuit for terminating a bus line, the bus line including a power source line, a first signal line for transmitting a first data signal, a second signal line for transmitting a second data signal that is the inverse of said first data signal, and a ground line, the bus terminating circuit comprising:

a first series connection of a first terminating resistor and a first active switch connected between said power source line and said second signal line, said first active switch having a control input for being turned-on or -off by a first control signal;

a second series connection of a second terminating resistor and a second active switch connected between said first signal line and said ground line, said second active switch having a control input for being turned-on or -off by a second control signal;

an external terminal for receiving an external control signal from an external source and in response thereto, applying said first control signal and said second control signal to simultaneously turn on or off said first active switch and said second active switch, respectively; and

a third series connection of a third terminating resistor and a bi-directional third active switch, connected between said first terminating resistor and said second terminating resistor, and thereby turned-on or -off in response to turning on or off said first and second active switches.

5,553,251

CENTRALIZED MANAGEMENT SYSTEM UTILIZING A BUS INTERFACE UNIT

Soon H. Kwon; Yoon S. Oh; Heo Y. Lee, and Jeong N. Yoon, all of Seoul, Rep. of Korea, assignors to Korea Telecommunication Authority, Rep. of Korea

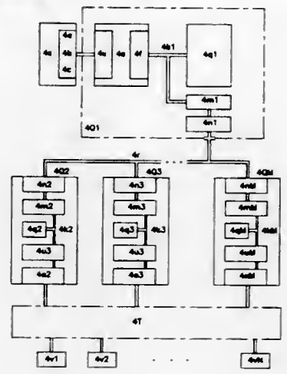
PCT No. PCT/KR93/00055, § 371 Date Aug. 25, 1994, § 102(e) Date Aug. 25, 1994, PCT Pub. No. WO94/01962, PCT Pub. Date Jan. 20, 1994

PCT Filed Jul. 2, 1993, Ser. No. 204,156

Claims priority, application Rep. of Korea, Jul. 2, 1992, 1992-11717

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—310 **1 Claim**



1. A centralized management system for controlling and managing a large number of terminal devices using a bus interface unit, said terminal devices being connected to a public communication network, the system comprising:

a computer coupled to communicate with said terminal devices to control and manage said terminal devices, said computer having a plurality of buses including an address bus, a data bus and a control bus;

a multipoint bus for interfacing data communication in a high level data link control communication method of an unbalanced regular response level;

a first-level station operatively connected between said plurality of buses of said computer and said multipoint bus for interfacing communication between said computer and said multipoint bus in response to data sent from said computer, said first-level station including

a) a dual port random access memory for performing read and write functions by a semaphore logic and controlling operation between said computer and said first-level station using interrupt generation logic, said dual port random access memory having first and second bus interface devices, said first bus interface device connected to said plurality of buses of said computer for interfacing data communication between said computer and said dual port random access memory,

b) a first micro-controller bus connected to said second bus interface device on said dual port random access memory, such that said dual port random access memory is connected between said plurality of buses of said computer and said first micro-controller bus.

c) a first high level data link control procedure (HDLC)

5,553,254

c) a first high level data link control procedure (HDLC) communication device connected to said first micro-controller bus for interfacing data between said first micro-controller bus and said multipoint bus by said high level data link control communication method of an unbalanced regular response level,

d) a micro-processor connected to said first micro-controller bus for controlling communication operation between said dual port random access memory and said first HDLC communication device in response to control data from said computer through said dual port random access memory, and

e) a first multipoint interface connected between said first HDLC communication device and said multipoint bus for driving said multipoint bus by a polling method to allow data communication between said first HDLC communication device and said multipoint bus; and

a plurality of second-level stations connected between said multipoint bus and said public communication network for communicating sequentially with said first-level station by a polling method, for controlling and managing independently said terminal devices according to control data from said first-level station, and for collecting data and information from said terminal devices, each of said second-level stations including

a) a second multipoint interface connected to said multipoint bus for communicating with said second multipoint interface,

b) a second micro-controller bus,

c) a second HDLC communication device, operatively connected to said second multipoint interface and said second micro-controller bus, for interfacing data communication between said second multipoint interface and said second micro-controller bus by said high level data link control communication method for an unbalanced regular response level,

d) a modem for interfacing data communication between said second micro-controller bus and said public communication network,

e) a serial communication device connected between said second micro-controller bus and said modem, and

f) a second micro processor connected to said second micro-controller bus for controlling communication operation between said second HDLC communication device and said serial communication device in response to control data from said first-level station through said multipoint bus, said second multipoint interface and said second micro-controller bus.

5,553,252

DEVICE FOR CONTROLLING DATA TRANSFER BETWEEN CHIPS VIA A BUS

Kazunori Takayanagi, Sagamihara, and Shinpei Watanabe, Yokohama, both of, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 2, 1994, Ser. No. 284,873

Claims priority, application Japan, Aug. 11, 1993, 5-199550

Int. Cl.[6] G06K *19/06*

U.S. Cl. 395—310 19 Claims

1. A device for controlling data transfer between chips in a computer system, comprising:

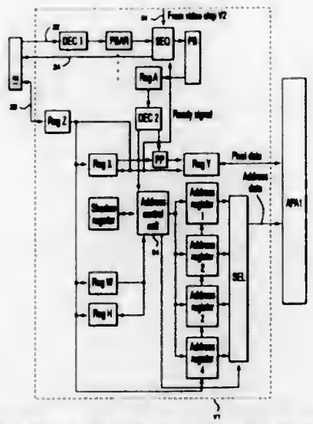
a first chip;

a plurality of second chips;

a data bus having a predetermined bit width connecting said first chip and said plurality of second chips to transfer data between said first chip and said plurality of second chips;

a signal bus connecting said first chip and said plurality of second chips to transfer signals of predetermined bit values between said first chip and said plurality of second chips;

a plurality of first registers provided in each of said plurality of second chips, each of said first registers storing a code which controls data transfer operation of said data bus;



selecting means for selecting one of said first registers based on a bit value of a signal transferred by said signal bus; and

control means for controlling the data transfer operation of said data bus based on said code stored in said first register selected by said selector means.

5,553,253

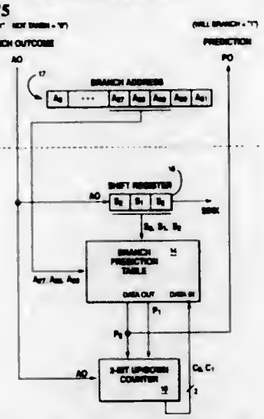
CORRELATION-BASED BRANCH PREDICTION IN DIGITAL COMPUTERS

Shien-Tai Pan, and Kimming So, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 749,771, Aug. 26, 1991, abandoned. This application Mar. 30, 1994, Ser. No. 221,283

Int. Cl.[6] G06F *9/32*

U.S. Cl. 395—375 8 Claims



3. In a programmable workstation having an addressable memory and multiple processors, a branch processor comprising:

means for storing branch prediction data in the memory;

means for updating the branch prediction data in the memory;

means for storing a data sequence representing a succession of multiple prior branch outcomes; and

means for selecting branch prediction data stored in memory using an address created from a combination of a new branch instruction and the data sequence representing a succession of prior branch outcomes.

5,553,254

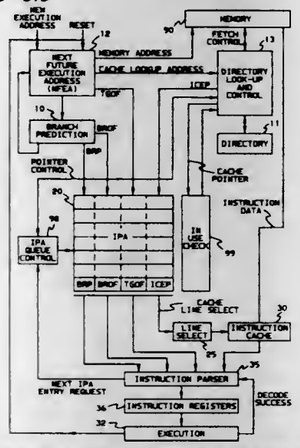
INSTRUCTION CACHE ACCESS AND PREFETCH PROCESS CONTROLLED BY A PREDICTED INSTRUCTION-PATH MECHANISM

Viktors Berstis, Croton-on-Hudson, N.Y., and Raymond J. Pedersen, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 4,814, Jan. 15, 1993, abandoned. This application Dec. 28, 1994, Ser. No. 359,718

Int. Cl.[6] G06F *9/38;12/08*

U.S. Cl. 395—375 8 Claims



1. An apparatus for controlling execution sequencing of computer instructions stored within a cache memory, said apparatus comprising:

an instruction cache memory storing a plurality of individually addressable cache lines for a plurality of instruction sequences;

a first-in-first-out memory array queue storing a plurality of queue elements for controlling the operations of said instruction cache memory;

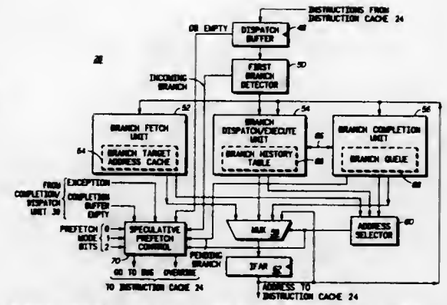
pointer means for providing an indication of a current one of the elements in said queue;

means for selecting a current one of the elements in said memory array queue;

said selected one of the elements in said memory array queue containing a plurality of fields for controlling the operation of said instruction cache memory;

a first one of said fields identifying an entry point which indicates one of said cache lines in said instruction cache memory for one of said instruction sequences; and

a second one of said fields in said memory array queue identifying an address of an instruction contained within said selected instruction sequence for selecting the first instruction of said selected instruction sequence which is to be decoded and executed.



a programmable register storing a first number representative of a maximum number of unresolved branch instructions beyond which said data processor may not fetch instructions;

a branch prediction unit coupled to said programmable register, said branch prediction unit generating a fetch address responsive to a sequence of programmed instructions regardless of the first number, said branch prediction unit storing a completion signal representative of a number of unresolved branch instructions, said branch prediction unit asserting a control signal if said completion signal is representative of a number of unresolved branch instructions less than or equal to said first number, said branch prediction unit de-asserting said control signal if said completion signal is representative of a number of unresolved branch instructions greater than said first number;

a cache memory storing a plurality of insreactions to be executed by the data processor, the cache memory outputting an instruction indexed by the fetch address if the instruction is stored in the cache memory regardless of the first number,

an execution unit coupled to the cache memory, the execution unit executing the instruction indexed by the fetch address if the instruction is stored in the cache memory regardless of the first number; and

an instruction fetch circuitry coupled to said branch prediction unit, said instruction fetch circuitry fetching the instruction from an external memory system if said branch prediction unit asserts said control signal and if the instruction is not stored in the cache memory.

5,553,255

DATA PROCESSOR WITH PROGRAMMABLE LEVELS OF SPECULATIVE INSTRUCTION FETCHING AND METHOD OF OPERATION

Danny K. Jain; David S. Levitan, and Paul C. Rossbach, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill., and International Business Machines, Armonk, N.Y.

Continuation of Ser. No. 169,262, Dec. 20, 1993, abandoned. This application Apr. 27, 1995, Ser. No. 429,439

Int. Cl.[6] G06F *9/38*

U.S. Cl. 395—375 6 Claims

1. A data processor with speculative instruction fetching for use with an external memory system, the data processor comprising:

5,553,256

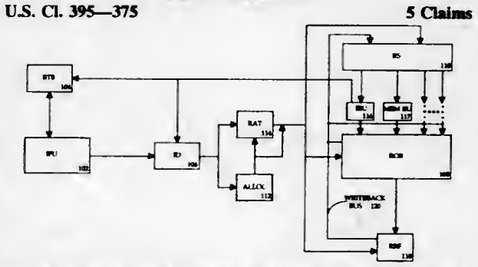
APPARATUS FOR PIPELINE STREAMLINING WHERE RESOURCES ARE IMMEDIATE OR CERTAINLY RETIRED

Michael A. Fetterman, Hillsboro; Glenn J. Hinton, Portland; Robert W. Martell, Hillsboro, and David B. Papworth, Beaverton, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 202,947, Feb. 28, 1994. This application Jun. 5, 1995, Ser. No. 464,571

Int. Cl.[6] G06F *9/06*

U.S. Cl. 395—375 5 Claims



1. A processor for processing a plurality of instructions, each instruction specifying an opcode and being associated with at least one source operand location designator indicating the storage loca-

tion of a source operand, each instruction further associated with a destination location designator indicating the storage location of a result of the execution of the instruction, wherein each of at least one dependent instruction is dependent upon at least one source instruction such that at least one source operand location designator of the at least one dependent instruction is identical to a corresponding destination location designator of the at least one source instruction, the processor comprising:

at least one execution unit for executing instructions, each execution unit having at least one source input, each source input for receiving a source operand, each execution unit further having a result data output for outputting the result of the execution of an instruction, the at least one execution unit including a first execution unit for outputting a first result of the execution of a first source instruction, wherein a first destination location designator indicates the storage location of the first result;

a reservation station array including at least one row corresponding to an instruction, each row having a plurality of fields including an opcode field for storing the opcode of the instruction, each row further having at least one source data field for storing a source operand of the instruction, each row further having at least one source data valid field for storing a source valid bit, the reservation station further including at least one associative array having at least one array line, each array line corresponding to a row, each array line for storing the at least one source operand location designator of the at least one source operand of the corresponding row, the at least one associative array further including an input for receiving the first destination location designator, an input for receiving a second destination location designator of a second result of the execution of a second source instruction by a second execution unit, the associative array further having circuitry for providing at least one second match signal in response to a match between the received second destination location designator and at least one source operand location designator, the associative array for providing at least one match signal in response to a match between the received first destination location designator and a source operand location designator;

a register alias table circuit for setting the source valid bit corresponding to an immediate source operand upon allocation of the at least one row to the reservation station;

a ready logic circuit for determining as a function of the at least one match signal and the at least one second match signal, that at least one row is ready for dispatch to an execution unit when said source valid bit is set when said source operand is a retired or immediate value; and

an execution bypass multiplexer for providing the first result from the result data output of the first execution unit to the source input of an execution unit to which a ready row is to be dispatched, the first result being provided when the outputting of the first result from the first execution unit occurs after the dispatch of the ready row, the execution bypass multiplexer further including circuitry for providing the second result from the result data output of a second execution unit to the source input of the execution unit to which the ready row is to be dispatched the second result being provided when the outputting of the second result from the second execution unit occurs after the dispatch of the ready row.

5,553,257

ADDRESS GENERATING CIRCUIT OF A TWO-DIMENSIONAL CODING TABLE

Hideo Ishida, and Yasushi Ooi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

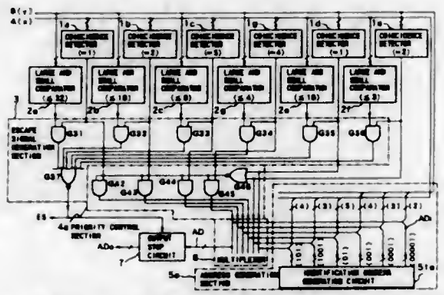
Filed Feb. 1, 1994, Ser. No. 189,680

Claims priority, application Japan, Feb. 3, 1993, 5-016013

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—401 **12 Claims**

1. An address generating circuit of a two-dimensional coding table comprising:



a two-dimensional coding table having respective coded words corresponding to a combination of x and y where the value of event A is determined as x and the value of event B as y (wherein x and y are positive integers) between two events A and B and storing the coded words in an address corresponding to each combination of x and y;

coincidence detection means for inputting the values x and y of the events A and B and detecting whether said values x and y coincide with numbers in an integer range of 1 to S (wherein S is the maximum number among the integers satisfying $S+\log_2 S<P$ and P is a positive integer);

first comparing means for detecting whether the inputted value y of the event B satisfies $x+\log_2 y \leqq P$ with respect to the integer range of 1 to S of the value x of the event A;

second comparing means for detecting whether the inputted value x of the event A satisfies $y+\log_2 x \leqq P$ with respect to the integer range of 1 to S of the value y of the event B;

escape signal generating means for outputting an escape signal and supplying said escape signal to the two-dimensional coding table when the value x of the event A or the value y of the event B does not fall within said integer range of 1 to S according to a detected result of the coincidence detection means, and when the value y of the event B does not satisfy $x+\log_2 y \leqq P$ or the value x of the event A does not satisfy $y+\log_2 x \leqq P$ according to a detected result of the first and second comparing means;

address generation means for generating and outputting an address signal from the values of said x and y and an identification address for identifying a value within said integer range when at least one of the value x of the event A or the value y of the event B falls within said integer range according to the detected result of the coincidence detection means; and

selection means for selecting and outputting the address signal according to the output of the address generation means and supplying said address signal to the two-dimensional coding table.

5,553,258

METHOD AND APPARATUS FOR FORMING AND EXCHANGE ADDRESS FOR A SYSTEM WITH DIFFERENT SIZE CACHES

Nitin D. Godiwala, Boylston; Kurt M. Thaller, Acton, and Barry A. Maskas, Sterling, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

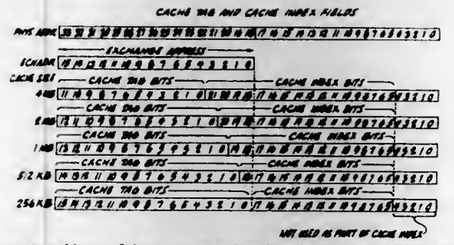
Continuation of Ser. No. 873,927, Apr. 24, 1992, abandoned.

This application Nov. 15, 1994, Ser. No. 340,125

Int. Cl.[6] G06F *12/08*

U.S. Cl. 395—403 **4 Claims**

1. A method for performing exchange transactions between a plurality of caches in a corresponding plurality of processing systems and a main memory, the plurality of caches and the main memory coupled by a bus, one of the plurality of caches having fewer addressable locations than the remaining caches of the plurality of caches, wherein associated with each cache of said plurality of caches is a tag store for storing the upper bits of a



memory address of data corresponding location of said each cache, the method comprising the steps of:

retrieving upper bits of a memory address from a location of the associated tag store of one of the plurality of caches, in response to a memory read operation by one of the processing systems said memory read operation providing an operation address;

forming an exchange address by appending a portion of an index used to access a cache location to the upper bits of the memory address in the event that the index used to access the cache location has more bits than an index used to access a location in the cache having the fewest addressable locations, the portion of the index being determined by the number of bits of the index which are in excess of the number of bits of the index used to access the cache having the fewest addressable locations; and

transmitting the operation address, the exchange address, and the data stored at the cache location to memory on said bus.

5,553,259

APPARATUS AND METHOD FOR SYNCHRONIZING THE SIMULTANEOUS LOADING OF CACHE PROGRAM WORD ADDRESSES IN DUAL SLICE REGISTERS

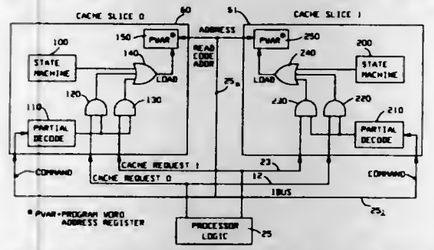
David M. Kalish, Laguna Niguel; Saul Barajas, Mission Viejo, and Paul B. Ricci, Laguna Niguel, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Continuation of Ser. No. 93,429, Jul. 16, 1993, abandoned.

This application Oct. 24, 1995, Ser. No. 547,577

Int. Cl.[6] G06F *12/08*

U.S. Cl. 395—403 **5 Claims**



1. In a cache memory having a first cache unit chip holding a first program word address register for receiving even addresses, and a second cache unit chip holding a second program word address register for receiving odd addresses, a system for insuring that the even address residing in said first program word address register is coherent with the odd address residing in said second program word address register at all time periods of operation, said system comprising:

(a) said first cache unit chip including:

(a1) a first data memory holding a first group of data words having even addresses;

(a2) a first tag memory holding a group of even addresses corresponding to said first group of data words;

(a3) first cache controller means for addressing said first tag memory;

(a4) said first program word address register for holding the next even address of the program word to be executed;

(b) said second cache unit chip including:

(b1) a second data memory holding a second group of data words having odd addresses;

(b2) a second tag memory holding a group of odd addresses corresponding to said second group of data words;

(b3) second cache controller means for addressing said second tag memory;

(b4) said second program address word register for holding the next odd address of the program word to be executed;

(c) intercommunication means between said first and second cache unit chip to simultaneously maintain coherency of address content, at all time periods, between said first and second program address word registers.

5,553,260

APPARATUS FOR EXPANDING COMPRESSED BINARY DATA

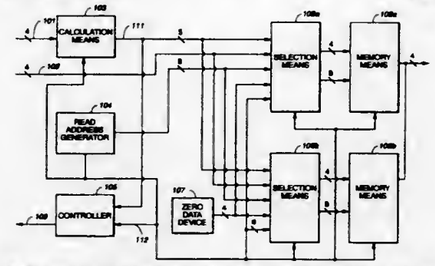
Toshiki Miyane, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo-to, Japan

Filed Jun. 1, 1993, Ser. No. 70,121

Claims priority, application Japan, Jun. 1, 1992, 4-140333

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—421.1 **19 Claims**



19. A method for expanding a data block that includes a plurality of pairs of number-of-zeroes data and numeric data, the number-of-zeroes data representing the number of a series of successive zeroes, the method comprising:

storing zeroes at each address of a memory device at initialization;

calculating an address value by adding together the number-of-zeroes data, a previously calculated address value and a constant value of 1, said previously calculated address value being an address value calculated immediately before a current calculation, said previously calculated address value being −1 at initialization; and

storing numeric data at the associated calculated address in the memory device in expansion operations;

wherein the steps of calculating the address value and storing numeric data are repeated until all the number-of-zeroes data have been processed in the calculating step and stored in the memory device.

5,553,261

METHOD OF PERFORMING CLEAN-UP OF A SOLID STATE DISK WHILE EXECUTING A READ COMMAND

Robert N. Hasbun, Shingle Springs, and Richard P. Garner, Cameron Park, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Apr. 1, 1994, Ser. No. 221,802

Int. Cl.[6] G06F *12/00*

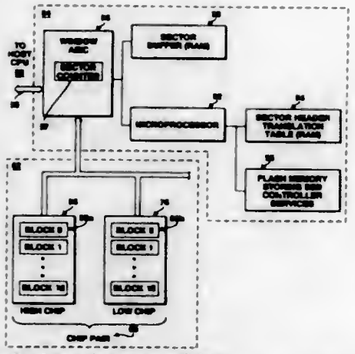
U.S. Cl. 395—430 **18 Claims**

1. A solid state memory disk comprising:

a) a flash memory array storing valid sectors of data, free memory, and invalid sectors of data;

holding means for holding an access type signal of said data

said address switching means being responsive to said cache



b) a buffer for storing sectors of data;

c) a counter having a count, the count being incremented when a sector of data is written into the buffer and the count being decremented when a sector of data is read from the buffer; and

d) a memory array controller for controlling the reading and clean-up of the flash memory array, the memory array controller performing clean-up of the flash memory array while executing a command from the host to read a first number of sectors of data, the memory array controller including:

1) a clean-up state machine for converting invalid sectors of data into free memory, the clean-up state machine including a multiplicity of states, each state of the clean-up state machine modifying a next state pointer so that the next state pointer points to a next state to be executed; and

2) a read controller for executing the read command, the read controller writing the first number of sectors of data into the sector buffer and enabling execution of the next state of the clean-up state machine while the host is reading a sector of data from the buffer.

5,553,262

MEMORY APPARATUS AND METHOD CAPABLE OF SETTING ATTRIBUTE OF INFORMATION TO BE CACHED

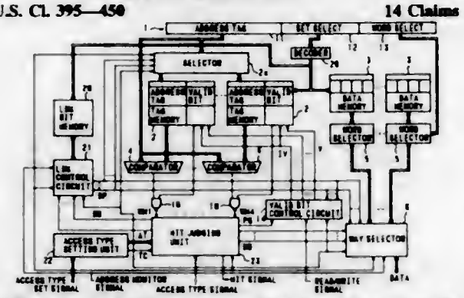
Itsuko Ishida; Masayuki Hata, and Tatsuo Yamada, all of Hyogo-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 730,147, Jul. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 535,240, Jun. 7, 1990, abandoned, which is a continuation of Ser. No. 297,289, Jan. 17, 1989, abandoned. This application Apr. 22, 1994, Ser. No. 231,963

Claims priority, application Japan, Jan. 21, 1988, 63-11224

Int. Cl.[6] G06F *12/12;12/08*

U.S. Cl. 395—450 **14 Claims**



12. A cache memory apparatus having data storage means for storing therein a data signal in each of a predetermined plurality of ways, comprising:

holding means for holding an access type signal of said data signal to be stored in each of said plurality of ways, said access type signal indicating if said data signal is an instruction or data;

instruction means for instructing a change in said access type signal held in said holding means; and

nullification means, responsive to said instruction means, for nullifying all the data signals store in said data storage means.

5,553,263

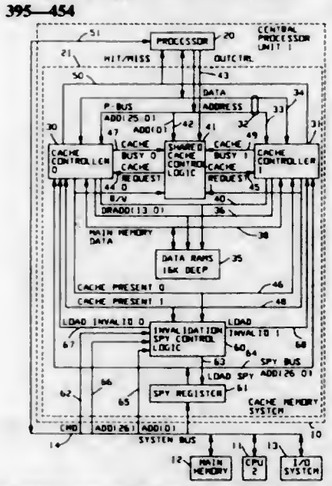
CACHE MEMORY SYSTEM WITH FAULT TOLERANCE HAVING CONCURRENTLY OPERATIONAL CACHE CONTROLLERS PROCESSING DISJOINT

David M. Kalish, Laguna Niguel; Saul Barajas, Mission Viejo, and Paul B. Ricci, Laguna Niguel, all of Calif., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Jul. 16, 1993, Ser. No. 92,835

Int. Cl.[6] G06F *12/02;12/08;13/00;11/20*

U.S. Cl. 395—454 **15 Claims**



1. In a computer system having a processor, a main memory and a cache memory system for use by said processor, said main memory storing main memory data at main memory locations accessible by a main memory address having a predetermined number of main memory address bits, said cache memory system comprising:

cache data storage means for storing cached data from said main memory,

first and second cache controllers including failure detection logic for generating cache present signals to determine if either said first or said second cache controller has failed,

said main memory address bits comprising first and second portions and further comprising a least significant bit identifying even and odd main memory addresses, and

address switching means responsive to input main memory addresses and to said least significant bit for directing, under control of and in accordance with said least significant bit, even and odd input main memory addresses to said first and second cache controllers for processing, respectively, when said cache present signals indicate said first and said second cache controllers are operational,

said first and second cache controllers including respective first and second tag storage sections for storing tags indicating if said cache data storage means is storing cached data from said input main memory addresses directed thereto,

said first and second tag storage sections being addressed by said first portion of said main memory address bits, said stored tags comprising said second portion and said least significant bit of said main memory address bits,

said address switching means being responsive to said cache present signals for directing all of said even and odd input main memory addresses to an operational cache controller when said cache present signals indicate said first or said second cache controller has failed,

said least significant bit controlling to which of said first and second cache controllers to direct said even and odd input main memory addresses for processing, respectively, when said first and second cache controllers are operational, said least significant bit thereby functioning as an addressing bit,

said least significant bit being included in said stored tags to distinguish between said even and odd input main memory addresses in an operational cache controller when either said first or said second cache controller has failed, said least significant bit thereby functioning as a stored tag bit.

5,553,264

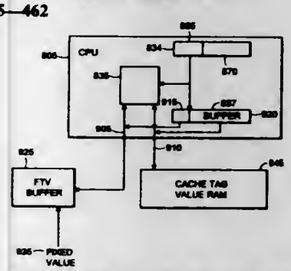
METHOD AND APPARATUS FOR EFFICIENT CACHE REFILLING BY THE USE OF FORCED CACHE MISSES

Cüneyt M. Özveren, Somerville; Robert J. Walsh, Ashland, and Greg Waters, Groton, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 24, 1994, Ser. No. 265,543

Int. Cl.[6] G06F *12/12*

U.S. Cl. 395—462 **6 Claims**



1. An apparatus for forcing a cache miss, comprising:

a CPU having a comparator means;

a main memory linked to said CPU;

a cache memory having a cache address, said cache address having a first plurality of fields where at least one of said first plurality of fields is set to a fixed value; and,

address means of said CPU for specifying a read address, said read address having a second plurality of fields, said address means specifying said at least one said of second plurality of fields a comparison value, said comparator means of said CPU compares said fixed value with said comparison value, said CPU reads data from said cache memory if said fixed value equals said comparison value, said CPU reads data from said main memory if said fixed value does not equal said comparison value.

5,553,265

METHODS AND SYSTEM FOR MERGING DATA DURING CACHE CHECKING AND WRITE-BACK CYCLES FOR MEMORY READS AND WRITES

Richard P. Abato, Brookline, N.H.; William R. Greer, Waterville, Vt., and Christopher M. Herring, Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 21, 1994, Ser. No. 326,973

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—470 **43 Claims**

39. In a computer system having a main memory and a first store-in cache associated therewith for storing cached data, said cached data having associated therewith a first update indicator for indicating whether a data element of the cached data has been updated with respect to a corresponding data element in main memory, a method for responding to a request from a secondary processor to read at least one memory data element from said main memory, said method comprising the steps of:

(a) checking the first update indicator associated with the cached data in said first store-in cache in response to said request; and

(b) simultaneous with said checking step (a), using a buffer to temporarily store the at least one memory data element, the at least one memory data element being pre-fetched from said main memory into said buffer.

5,553,266

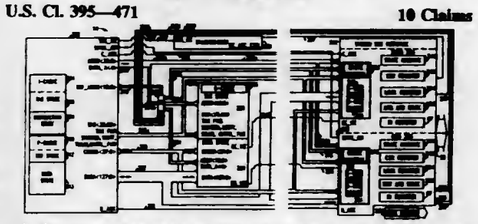
UPDATE VS. INVALIDATE POLICY FOR A SNOOPY BUS PROTOCOL

Jeffrey A. Metzger, Leominster, and Barry A. Maskas, Sterling, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 874,265, Apr. 24, 1992, abandoned. This application Nov. 16, 1994, Ser. No. 341,281

Int. Cl.[6] G06F *12/08*

U.S. Cl. 395—471 **10 Claims**



1. A computer apparatus for use in a multiprocessor computer system having a main memory for storing a plurality of data items, wherein the computer apparatus is coupled to the main memory by a bus and wherein a plurality of other devices are also coupled to said bus for communication with said main memory, the bus being operated according to a SNOOPY protocol, the computer apparatus comprising:

a processor;

a cache memory coupled to the processor and containing a subset of the data items stored in the main memory, for access by the processor;

the cache memory including a TAG store comprising a plurality of VALID indicators, one VALID indicator for each of the data items currently stored in the cache memory;

a bus interface coupled to the cache memory and adapted for coupling to the bus, the bus interface operating according to the SNOOPY protocol to monitor transactions on the bus for write transactions corresponding to data items in the cache memory having set VALID indicators, said bus interface further comprising:

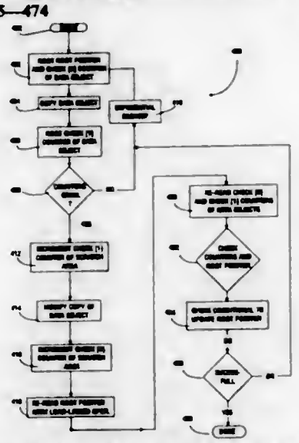
means for identifying which one of said plurality of other devices initiated a write transaction on the bus, said means for identifying further comprising means for determining a type of said identified device;

means, responsive to said determined type of said identified

said sensor information to a format compatible with said computer; and wherein

means, responsive to said determined type of said identified device, for either invalidating or updating a data item in the cache memory corresponding to the write transaction on the bus.

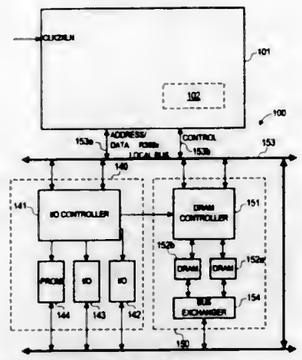
5,553,267
METHOD AND APPARATUS FOR COORDINATING ACCESS TO AND MODIFYING MULTIPLE ELEMENT DATA OBJECTS IN A SHARED MEMORY
Maurice P. Herlihy, Brookline, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.
Filed Jul. 1, 1992, Ser. No. 907,330
Int. Cl.[6] G06F *13/00;13/18;13/42*
U.S. Cl. 395—474 **22 Claims**



1. A method of modifying an original data object that is located in a shared memory, the original data object having a memory address indicated by a first pointer, the shared memory being accessible by multiple processors, wherein each processor attempting to modify the original data object performs steps comprising:
(a) copying the original data object into a first memory area of the shared memory whose memory address is indicated by a second pointer;
(b) determining whether the original data object has been modified since the beginning of step (a), and if no such modification has occurred, proceeding to step (c); alternatively, starting over at step (a);
(c) modifying the copied data object;
(d) determining whether the original data object or the first pointer has been modified since step (a), and if neither has been modified, proceeding to step (e); otherwise starting over at step (a);
(e) modifying the first pointer to indicate the memory address of the first memory area; and
(f) modifying the second pointer to indicate the memory address of the original data object.

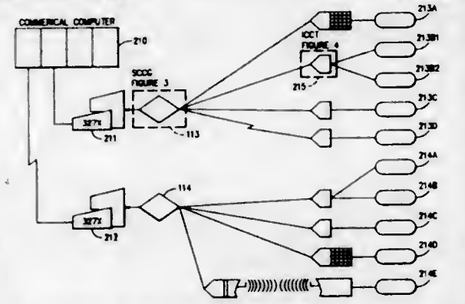
5,553,268
MEMORY OPERATIONS PRIORITY SCHEME FOR MICROPROCESSORS
Avigdor Willenz, Campbell; Philip Bourekas, San Jose, and Yehayahu Mor, Cupertino, all of Calif., assignors to Integrated Device Technology, Inc., Santa Clara, Calif.
Filed Jun. 14, 1991, Ser. No. 715,294
Int. Cl.[6] G06F *13/18*
U.S. Cl. 395—485 **10 Claims**

1. A structure for granting use of a memory bus in a computer system, comprising:
means for receiving an instruction read request;



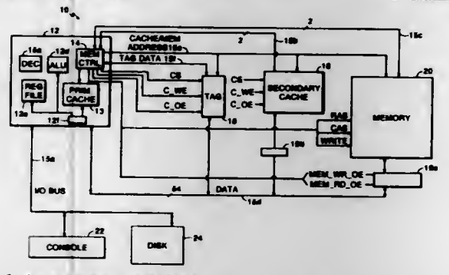
means for receiving a data read request;
means for receiving a write request;
means for receiving a clock signal;
means for granting use of said memory bus at a transition of said clock signal accord; to the decreasing priority order; (i) any said instruction read request received; (ii) any said write request received; and (iii) any said data read request received.

5,553,269
APPARATUS FOR MONITORING SENSOR INFORMATION FROM DIFFEERENT TYPES OF SOURCES
Antonio C. D. Nunes, Florianpolis, Brazil, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 17, 1991, Ser. No. 761,180
Claims priority, application Brazil, Sep. 19, 1990, 9004680
Int. Cl.[6] G06F *1/12;3/05;13/42*
U.S. Cl. 395—500 **8 Claims**



1. Apparatus for input of digital sensor information from a plurality of sources to a computer for processing, each of said sources having a digital interface format and a clock for transmission of the digital sensor information, the clocks being asynchronous relative to each other and the formats being different than each other, said apparatus comprising:
a plurality of collector means for receiving digital sensor information from the plurality of sources, respectively, in the respective formats of the sources and with timing based on the respective clocks of the sources;
scan generator means, coupled to said plurality of collector means and having a clock which is different than and asynchronous to the clock(s) of said sources, for selecting each of said collector means;
converter means, coupled to the clock of said scan generator means and coupled to receive said sensor information from said plurality of collector means, for receiving said sensor information from each of said collector means when selected by said scan generator means and converting the format of said sensor information to a format compatible with said computer; and wherein
each of said plurality of collector means includes means for transmitting the respective sensor information to said converter means based on timing signals provided by the clock of said scan generator means.

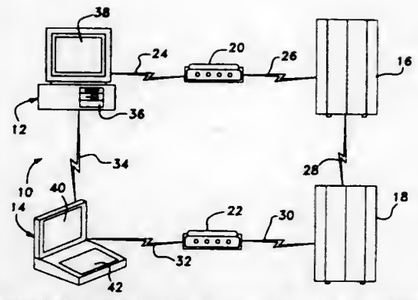
5,553,270
APPARATUS FOR PROVIDING IMPROVED MEMORY ACCESS IN PAGE MODE ACCESS SYSTEMS WITH PIPELINED CACHE ACCESS AND MAIN MEMORY ADDRESS REPLAY
Mark B. Rosenbluth, Hudson, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.
Continuation of Ser. No. 115,922, Sep. 1, 1993, abandoned.
This application Nov. 27, 1995, Ser. No. 562,713
Int. Cl.[6] G06F *12/02*
U.S. Cl. 395—496 **5 Claims**



1. An apparatus comprising:
a processor for processing an instruction set, said processor including a first small fast memory;
a first address bus coupled to said processor;
a data bus coupled to said processor;
a second memory, larger and slower than said first small fast memory, coupled to receive an address on said first address bus and to transmit and receive data on said data bus for storing data to be used by said processor;
a third memory, larger and slower than said second memory, coupled to said first address bus and said data bus, with said second memory including a plurality of addressable locations each for temporarily storing data from said third memory;
control means for controlling accesses to said second and third memories, said control means further comprising:
means for determining whether data required by said processor is stored in said second memory;
means for providing data to said processor on said data bus from either said second memory or said third memory; and
a second address bus comprising at least one bit, coupled between said processor and said third memory, for providing a copy of a portion of said address on said first address bus to said third memory such that said third memory is addressed using address bits from both said first address bus and said second address bus.

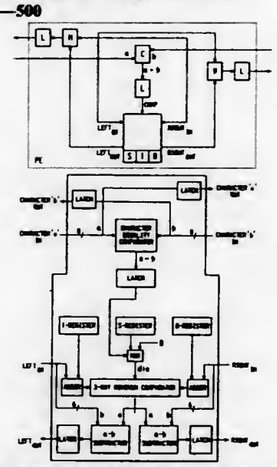
5,553,271
AUTO-DETECT SYSTEM AND METHOD FOR DATA COMMUNICATION
John K. Hile, Monroe, and Michael R. Ward, Ann Arbor, both of Mich., assignors to Hilgraeve Incorporated, Monroe, Mich.
Filed Jul. 11, 1994, Ser. No. 273,481
Int. Cl.[6] G06F *9/455*
U.S. Cl. 395—500 **11 Claims**

9. A method of automatically configuring the communication settings of a computer to emulate one of a plurality of computer terminal types without requiring any advance knowledge of the



communication settings used to transmit data or the information contained in said data, comprising the steps of:
receiving a data stream by said computer;
interpreting the presence of characters from multiple-bit sequences in said data stream;
processing combinations of said interpreted characters through a state machine having a plurality of different table levels that progress toward the identification of a unique emulation mode;
causing said computer to execute combinations of said interpreted characters which satisfy one of a plurality of emulation modes that satisfy said combinations until a unique emulation mode has been determined;
determining a unique emulation mode from the results of said processing step; and
causing said computer to lock in said determined emulation mode.

5,553,272
VLSI CIRCUIT STRUCTURE FOR DETERMINING THE EDIT DISTANCE BETWEEN STRINGS
Nagarajan Ranganathan, Tampa, Fla., and Raghu Sastry, Campbell, Calif., assignors to The University of South Florida, Tampa, Fla.
Filed Sep. 30, 1994, Ser. No. 316,320
Int. Cl.[6] G06F *3/00;15/00*
U.S. Cl. 395—500 **22 Claims**



1. A VLSI circuit structure for use in determining an edit distance between two strings, comprising
(a) a systolic array of processing elements;
(b) each processing element receiving as inputs a pair of string symbols;
(c) each processing element including a comparator which compares the pair of string symbols input to the processing

element and outputs a signal which has a first value if the pair

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5,553,274

a first flip-flop having a first data input, a first clock input, a first

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5,553,277

element and outputs a signal which has a first value if the pair of string symbols match and a second value if the pair of the string symbols do not match;

(d) each processing element further including a difference computation module which receives difference values associated with the pair of string symbols input to the processing element and also receives the output of the comparator, said difference computation module having stored therein editing costs for predetermined editing operations associated with the string symbols, said difference computation module producing a pair of outputs for the pair of string symbols, each of the outputs comprising a new difference value related to the editing cost for the pair of string symbols that was input and compared by the comparator, and

(e) each processing element producing a pair of outputs, each of which comprises one string symbol of the pair of string symbols and the new difference value related to the editing cost for the pair of string symbols.

5,553,273

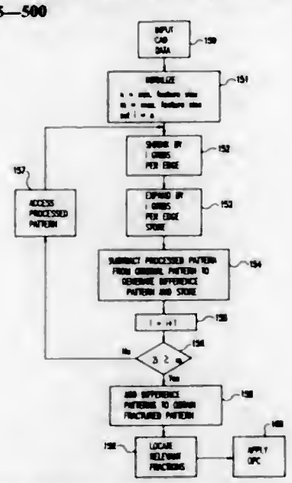
VERTEX MINIMIZATION IN A SMART OPTICAL PROXIMITY CORRECTION SYSTEM

Lars W. Liebmann, Poughquag, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 17, 1995, Ser. No. 423,597

Int. Cl.[6] H01L *21/027*; **G03F** *7/00*

U.S. Cl. 395—500 **5 Claims**



1. An optical proximity correction method for controlling accuracy in VLSI patterning operations, said method comprising the steps of:

inputting an original design data set of a chip design;

subjecting a level of the input design data set to a fracturing procedure including a series of shrink, expand and subtraction operations to fracture the design data set into a plurality of basic geometric shapes abutting at vertices existent in the original design dam set;

sorting the plurality of basic geometric shapes by width;

locating and identifying relevant fractions of the sorted plurality of basic geometric shapes which are critical regions to the original design data set; and

applying optical proximity correction biasing all of fractions having been identified as critical regions to the original design dam set.

5,553,274

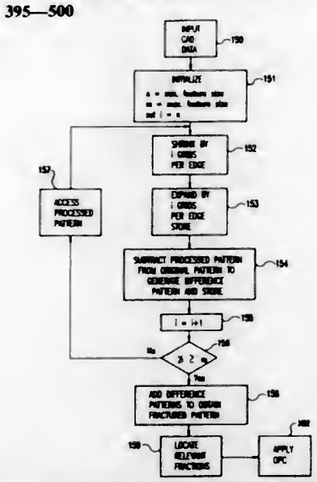
VERTEX MINIMIZATION IN A SMART OPTICAL PROXIMITY CORRECTION SYSTEM

Lars W. Liebmann, Poughquag, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 423,597, Apr. 17, 1995. This application Jun. 6, 1995, Ser. No. 470,728

Int. Cl.[6] H01L *21/027*; **G03F** *7/00*

U.S. Cl. 395—500 **3 Claims**



1. A system for applying an optical proximity correction to chip designs to control accuracy in VLSI patterning operations, said system comprising:

graphics design means for generating an original design data set of a chip design;

shapes processor means for subjecting a level of the original design data set to a fracturing procedure including a series of shrink, expand and subtraction operations to fracture the design data set into a plurality of basic geometric shades abutting at vertices existent in the original design data set and sort the plurality of basic geometric shapes by width, said processor means locating and identifying relevant fractions of the sorted plurality of basic geometric shapes which are critical regions to the original design data set; and

postprocessor means for applying optical proximity correction biasing all of tractions having been identified as critical regions to the design data set.

5,553,275

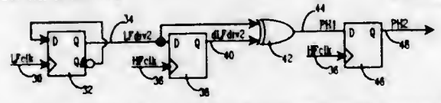
METHOD AND APPARATUS FOR SYNCHRONOUSLY DETECTING PHASE RELATIONSHIPS BETWEEN A HIGH-FREQUENCY CLOCK AND A LOW-FREQUENCY CLOCK

Brian K. Langendorf, El Dorado Hills, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jul. 13, 1993, Ser. No. 90,592

Int. Cl.[6] G06F *1/12*

U.S. Cl. 395—550 **4 Claims**



1. An apparatus for detecting phase relationships between a low-frequency clock and a high-frequency clock, the apparatus comprising:

a first flip-flop having a first data input, a first clock input, a first non-inverting output, and a first inverting output, the first inverting output being coupled to the first data input, the first clock input being coupled to the low-frequency clock, the first non-inverting output being coupled to a first signal;

a second flip-flop having a second data input, a second clock input, and a second non-inverting output, the second data input being coupled to the first signal, the second clock input being coupled to the high-frequency clock, the second non-inverting output being coupled to a second signal; and

an XOR gate having a first and second XOR inputs and an XOR output, the first XOR input being coupled to the first signal, the second XOR input being coupled to the second signal, the XOR output being coupled to a first phase signal, a transition of the first phase signal indicating that a first rising edge of the low-frequency clock corresponds to a second rising edge of the high-frequency clock.

5,553,276

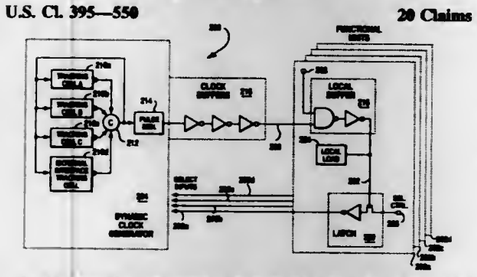
SELF-TIME PROCESSOR WITH DYNAMIC CLOCK GENERATOR HAVING PLURALITY OF TRACKING ELEMENTS FOR OUTPUTTING SEQUENCING SIGNALS TO FUNCTIONAL UNITS

Mark E. Dean, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 85,539, Jun. 30, 1993, abandoned. This application Aug. 31, 1994, Ser. No. 299,035

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—550 **20 Claims**



1. A system for outputting a sequencing signal to a functional unit, comprising:

a functional unit for executing a functional unit operation having a functional unit operation delay, said functional unit comprising a functional unit processing path for executing at least a portion of said functional unit operation, said portion having a delay at least as great as said functional unit operation delay, and said functional unit processing path comprising a plurality of functional unit processing path components;

a tracking element comprising a tracking element processing path for executing a tracking element operation and for outputting a tracking signal in response to said tracking element operation, said tracking element processing path comprising a plurality of tracking element processing path components duplicating said functional unit processing path components, wherein said tracking operation has a delay at least as great as said delay of said portion of said functional unit operation; and

sequencing circuitry coupled to said functional unit and said tracking element for inputting said tracking signal and outputting a sequencing signal to said functional unit in response to said tracking signal.

5,553,277

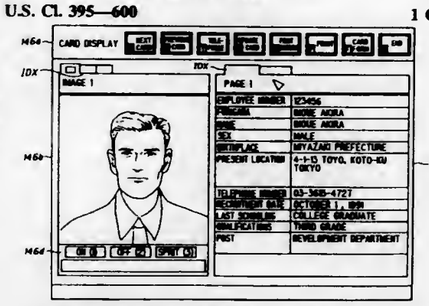
IMAGE SEARCH METHOD FOR SEARCHING AND RETRIEVING DESIRED IMAGE FROM MEMORY DEVICE

Toru Hirano; Kazumi Monden; Masumi Hosokawa; Kazuhiro Imaki, and Akihide Shima, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 29, 1992, Ser. No. 997,930

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 **1 Claim**



1. An image search method which comprises the steps of:

forming one unit of image/text information composed of N—number of images and associated text information;

forming a data base by storing a number of items of the image/text information in a memory device;

retrieving one or more items of image/text information, which satisfy search conditions, from the data base by referring to text information when the search conditions have been inputted;

reducing and juxtaposing each of the images in the items of image/text information retrieved and displaying the reduced and juxtaposed images that have been thus obtained on a display device;

selecting a desired item of image/text information from the reduced and juxtaposed images;

displaying only a first image of N—number of images and first item of text information in the selected item of image/text information on the display device;

displaying N—number of page-turning indices in the proximity of a displayed image;

making the sizes of the indices larger the smaller N becomes; and

displaying only one of the N—number of images which is selected by the page-turning index corresponding thereto with the N—number of page-turning indices.

5,553,278

METHOD AND SYSTEM FOR MANIPULATION OF DATABASE AND ISSUING REPORT THEREOF

Hiroyuki Suzuki, Hiratsuka; Yoichi Yokoyama, Ebina, and Toshifumi Okamoto, Yokohama, all of, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Software Engineering Co., Yokohama, both of, Japan

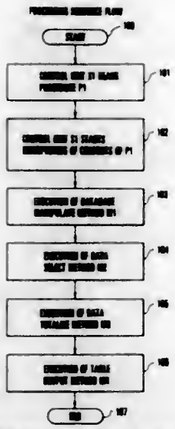
Filed Sep. 15, 1993, Ser. No. 121,739

Claims priority, application Japan, Sep. 21, 1992, 4-250970

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 **11 Claims**

1. In a computer system equipped with a database, a method for



manipulating said database and issuing a report, the method comprising the steps of:

providing a plurality of methods, each method performing a single data manipulation of data in said database;

selecting one of said methods and input conditions for imposing limitation to the processing of said selected method and input/output file names as required;

repeating said selecting step for a number of times required for the processing;

generating and storing a procedure file defining a sequence of methods and relations among the methods, the conditions imposed into the methods and the input/output file names on the basis of the methods, conditions and the input/output file names as inputted by the user;

activating said methods in response to said procedure file identification information in the sequence defined in said procedure to thereby execute the respective processings;

issuing said report;

redefining at least one of (i) one or more of the methods and (ii) the sequence of methods and relations among the methods;

generating and storing a second procedure file defining the redefined sequence of methods and relations among the methods;

activating said redefined methods in response to said second procedure file identification information in the redefined sequence defined in said second procedure to thereby execute different respective processings; and

issuing another report.

5,553,279

LOSSLESS DISTRIBUTION OF TIME SERIES DATA IN A RELATIONAL DATA BASE NETWORK

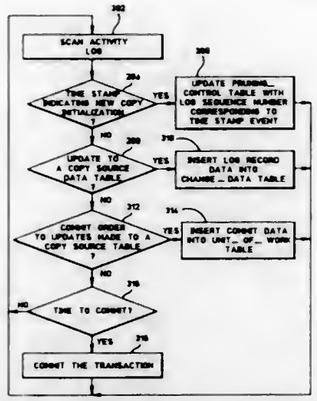
Robert D. Goldring, Morgan Hill, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 8, 1993, Ser. No. 134,229

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 **13 Claims**

1. A method of propagating a sequence of data base table changes that have occurred since a predetermined time in a computing system from a source data table to multiple target tables, the tables being stored in a memory unit of the computing system, the computing system further having a central processor unit operating under control of a system clock for controlling input and output to the memory, receiving transactional updates comprising data change operations from a plurality of concurrent processes, recording time stamp data and the transactional updates in an activity log of a storage medium connected to the central processor unit, and implementing the data change operations, the method comprising the steps of:



(a) defining a change data table for each source data table and target table, each change data table having a column for storing the data change operations for a transactional update received by the central processor and columns for a commit sequence number, an intent sequence number, and an indicator of the data change operation;

(b) reading recorded events from the activity log and identifying a time stamp value more recent than the predetermined time;

(c) reading recorded events from the activity log having a time stamp value more recent than the predetermined time and identifying committed transactional updates to the source data table from the activity log;

(d) assigning a commit sequence number to the committed transactional updates;

(e) updating the change data table by recording each data change operation of the committed transactional updates in the change data table;

(f) copying the data change operations recorded in the change data table of the updated source data table into the change data table of the target table; and

(g) applying the recorded data change operations to the source data table.

5,553,280

METHOD FOR PROVIDING CRITICAL TIME REACTIVE MANAGEMENT OF DATABASE TRANSACTIONS FOR SYSTEMS PROCESS

Paul J. Fortier, Portsmouth, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 17, 1994, Ser. No. 292,443

Int. Cl.[6] B06F *17/30*

U.S. Cl. 395—600 **18 Claims**

1. A method for providing critical time reactive management of database transactions, comprising the steps of:

providing a database distributed over a plurality of sites, each site being partitioned into a plurality of objects;

providing a number of transactions to be performed on said database;

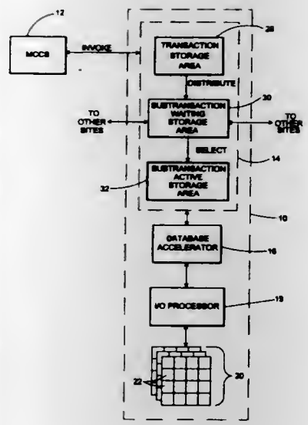
providing a number of predetermined scheduling factors for each transaction of said number of transactions;

determining a dynamic weight by combining said number of predetermined scheduling factors;

assigning said dynamic weight to each transaction of said number of transactions;

distributing said number of transactions to at least one of said plurality of sites of said database; and

executing said transactions according to said dynamic weight.



5,553,281

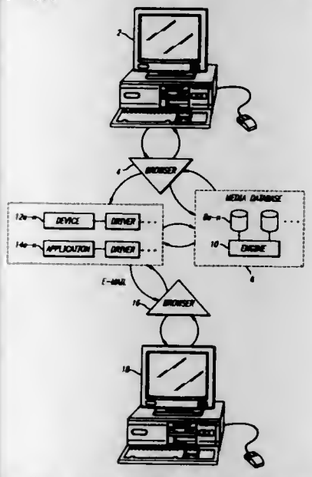
METHOD FOR COMPUTER-ASSISTED MEDIA PROCESSING

Alan Brown, Manhattan Beach, Calif.; Terry Timko, Cincinnati, Ohio, and Bo Ferger, Burbank, Calif., assignors to Visual f/x, Inc., Los Angeles, Calif.

Continuation of Ser. No. 216,587, Mar. 21, 1994, abandoned. This application Oct. 28, 1994, Ser. No. 330,706

Int. Cl.[6] G06F *17/30;17/50*

U.S. Cl. 395—600 **10 Claims**



1. A method for computer-assisted media processing by an end-user, for use with a database of stored media content, said content being indexed by a plurality of attributes, said method comprising the steps of:

specifying, under control of said end-user, a set of desired values for one or more of said attributes;

searching within said database for one or more matching portions of media content corresponding to said set of desired attribute values, each of said portions comprising a plurality of frames;

displaying, to said end-user, a list identifying said matching portions of media content;

after said step of displaying a list identifying said matching portions of media content, designating, tinder control of said end-user, one or more of said matching portions of media content;

after said step of designating one or more of said matching portions of media content, further designating, under control of said end-user, one or more beginning frames and one or more ending frames for said one or more designated portions of media content, thereby defining selected media content;

requesting, under control of said end-user, one or more media processing functions to be performed upon said selected media content;

performing said media processing functions upon said selected media content.

5,553,282

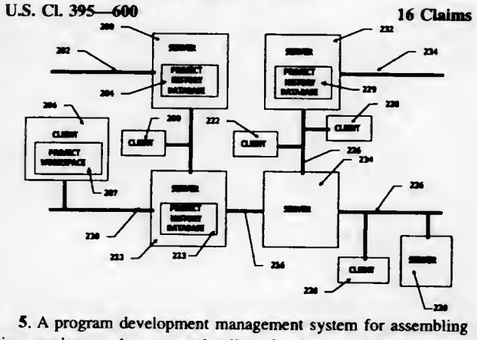
SOFTWARE PROJECT HISTORY DATABASE AND METHOD OF OPERATION

Jeff W. Parrish, Los Altos; Farzin Maghoul, Hayward, and P. Thyagarajan, Campbell, all of Calif., assignors to Taligent, Inc., Cupertino, Calif.

Filed Dec. 9, 1994, Ser. No. 353,026

Int. Cl.[6] G06F *15/76*

U.S. Cl. 395—600 **16 Claims**



5. A program development management system for assembling in a project workspace, a plurality of software program components comprising a program configuration, the system operating on a client-server network and comprising:

a history server connected to the network and comprising a program component database for storing a plurality of program component drafts and a root component identifying program components associated with the program configuration;

a client terminal connected to the network and containing means for creating the project workspace and means for locating the history server on the network;

means located in the client terminal for creating an agent object, the agent object comprising means for assembling client terminal information relating to a program component request, means for establishing a communication path from the client terminal to the history server and means for retrieving program component drafts from the program component database using the root component to identify program component drafts belonging to the program configuration;

means located at the client terminal for generating a copy of the agent object;

means located at the client terminal for sending the agent object copy to the history server to retrieve program component drafts; and

means for destroying the agent object copy at the history server.

5,553,283

STORED MAPPING DATA WITH INFORMATION FOR

branch subsequences that precede the accessed branch subsequence in the order, and keep a count of suffix endings that

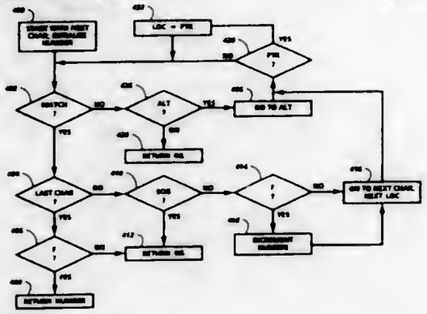
5,553,285

FILE SYSTEM FOR A PLURALITY OF STORAGE

5,553,283
STORED MAPPING DATA WITH INFORMATION FOR SKIPPING BRANCHES WHILE KEEPING COUNT OF SUFFIX ENDINGS

Ronald M. Kaplan, Palo Alto, and Martin Kay, Menlo Park, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 776,909, Oct. 16, 1991, which is a continuation of Ser. No. 563,885, Aug. 6, 1990, abandoned, which is a continuation of Ser. No. 54,462, May 26, 1987, abandoned. This application May 30, 1995, Ser. No. 453,612
Int. Cl.[6] G06F *17/30;17/22*
U.S. Cl. 395—600 **6 Claims**



1. An article of manufacture for use in a machine that includes a processor, the article comprising:

memory for storing data, the data stored in the memory being accessible by the processor when the article is used in the machine; and

mapping data stored in the memory; the mapping data indicating a set of strings of elements; the mapping data comprising;

data units arranged in a sequence and indicating information about strings in the set such that the mapping data can be used by the processor to perform mapping between each string in the set and a respective number by keeping count os suffix endings; the data units including:

a branching subsequence of data units from which the processor can continue to any of N branch subsequences of data units during mapping, where N is greater than one; the N branch subsequences having an order;

branch skipping information that the processor can obtain from the branching subsequence; the branch skipping information indicating, for each of the N branch subsequences, a number of suffix endings;

the number of suffix endings for each branch subsequence being equal to a number of suffix endings that would be skipped if the processor skips the branch subsequences preceding the branch subsequence in the order; and

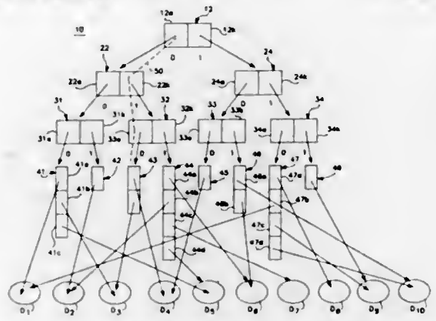
branch taking information that the processor can obtain from the branching subsequence; the branch taking information indicating, for each of the N branch subsequences, a location at which the processor can access the branch subsequence;

the branch skipping information and the branch taking information together providing sufficient information that the processor can access any of the N branch subsequences, skip any branch subsequences that precede the accessed branch subsequence in the order, and keep a count of suffix endings that accurately reflects any suffix endings skipped.

5,553,284
METHOD FOR INDEXING AND SEARCHING HANDWRITTEN DOCUMENTS IN A DATABASE

Daniel Barbara, Princeton, and Walid Aref, Monmouth Junction, both of N.J., assignors to Panasonic Technologies, Inc., Princeton, N.J.

Continuation of Ser. No. 248,392, May 24, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 469,803
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—600 **19 Claims**



1. A method for indexing a plurality of electronic handwritten documents, each of which includes a plurality of output symbols ordered in an output sequence, each document being modeled by a respective Hidden Markov Model (HMM), the Hidden Markov Models having a common alphabet including n symbols, and a common output sequence length of T symbols, where n and T are integers, the method comprising the steps of:

(a) establishing an index of symbols, each symbol being a feature vector, the index having T levels, each level between zero and T−1 having a respective minimum probability value, each level having at least one node;

(b) indexing the symbols in one of the documents without translating the symbols into one of a known character and a known pictograph by performing, for each node in one of the levels of the index, the steps of:

(1) determining a probability that a symbol stored in said node represents a corresponding output symbol in the one document, using the respective HMM for the one document,

(2) adding a node in a next level of the index, if the probability determined in step (b)(1) exceeds the minimum probability value of the one level and the next level is between the oneth level and the T−1th level,

(3) executing step (b) for the added node in the next level, if the node is added in step (b)(2), and

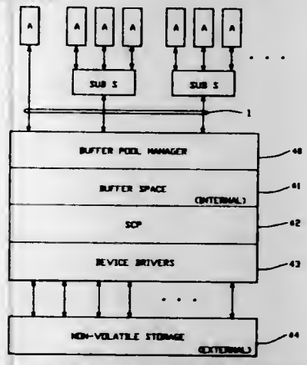
(4) adding a pointer to the one document in a list of pointers stored in a node in the Tth level of the index, if the next level is the Tth level and the probability determined in step (b)(1) is greater than the minimum probability value of the T−1th level; and

(c) repeating step (b), for each of the plurality of documents other than the one document.

5,553,285
FILE SYSTEM FOR A PLURALITY OF STORAGE CLASSES

Arno S. Krakauer, San Jose; Dieter Gawlick, Palo Alto; John A. Colgrove, Mountain View, and Richard B. Wilmot, II, Lafayette, all of Calif., assignors to Amdahl Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 162,378, Dec. 3, 1993, abandoned, which is a continuation of Ser. No. 867,279, Apr. 9, 1992, abandoned, which is a continuation of Ser. No. 655,311, Feb. 11, 1991, abandoned, which is a division of Ser. No. 185,179, Apr. 22, 1988, Pat. No. 4,993,030. This application Jun. 9, 1995, Ser. No. 489,267
Int. Cl.[6] G06F *11/00;13/00;* **G11C** *8/00*
U.S. Cl. 395—600 **21 Claims**



1. An apparatus in a data processing system comprising:

external storage including a plurality of external storage units for storing data in data files wherein each data file includes a plurality of data cells and wherein the data cells for a data file have a cell sequence;

internal storage for storing the data of the data cells of a data file and the data cell sequence of the data file;

a plurality of access paths for transferring data between internal storage and external storage, each path for concurrently transferring a different data cell from a data file;

request means for generating access requests to external storage for transfer of the data between data files in the external storage and the internal storage;

transfer means responsive to the access requests for managing concurrent transfers of data cells for a data file between internal storage and external storage through the plurality of access paths where the location of a data cell in the data cell sequence is transferred with the data for the data cell to preserve the data cell sequence for the data file;

designation means for designating an external storage unit as a failing external storage unit when errors are associated with the external storage unit;

allocation means for allocating failed-unit data from a failing external storage unit to a non-failing external storage unit; and

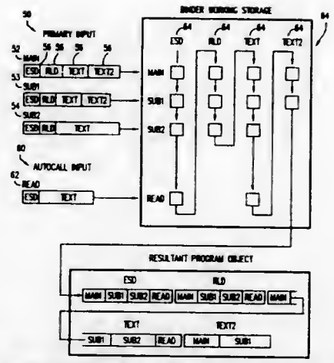
reconstruction means for reconstructing the failed-unit data in the non-failing external storage unit to remove errors from the failed-unit data.

5,553,286
SYSTEM AND METHOD FOR PREPARING A COMPUTER PROGRAM FOR EXECUTION

Richard E. Lee, Milpitas, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 17, 1994, Ser. No. 214,735
Int. Cl.[6] G06F *9/445*
U.S. Cl. 395—650 **8 Claims**

1. In a computer system having a central processing unit (cpu), memory, and a storage device, a method of preparing at least one



object module of data for a computer program, for execution comprising the steps performed by the cpu of:

(a) arranging in memory data from said at least one object module, organized according to a set of pre-determined data classes;

(b) writing out from memory, data, from said at least one object module; to the storage device, keeping data from the same data class, of said set of pre-determined data classes, stored together;

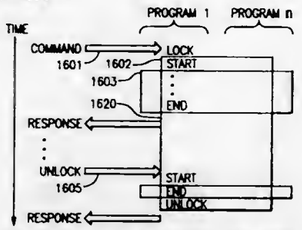
(c) loading into memory from the storage device, data, from said at least one object module, from each data class, of said set of pre-determined data classes, used to begin executing the program; and

(d) while executing the program, loading into memory, data, from the storage device, data, from said at least one object module, in each class, of said set of pre-determined data classes, used to continue executing the program.

5,553,287
METHODS AND APPARATUS FOR DYNAMICALLY USING FLOATING MASTER INTERLOCK

Christopher J. Bailey, Bearsville; Lynn M. Dirks, Boiceville; William R. Firm, Kingston, and Lawraine J. Vallee, Saugerties, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 963,163, Oct. 19, 1992, abandoned, which is a division of Ser. No. 444,190, Nov. 28, 1989, abandoned. This application Jun. 16, 1994, Ser. No. 261,316
Int. Cl.[6] G06F *9/46;13/00*
U.S. Cl. 395—650 **10 Claims**



6. In a computer system that supports distributed application processing, where an application is embodied in multiple instances of a computer program where said computer program has a plurality of users capable of entering either single or multi-command processes, a method by which each instance of such program is assured that once it has been named owner of a lock other instances of the program will be prevented from entering processes from other users for the duration of that instances ownership of the lock, said method comprising the steps of:

a) initially having all of the multiple instances act as members of a peer group allowing any instance of the group to accept a command from a user;

b) thereafter entering a LOCK command of a multi-command

respectively, and wherein said monitor unit can access each of the dedicated memory areas of the memory unit.

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SOFTWARE PACKAGING STRUCTURE HAVING

b) thereafter entering a LOCK command of a multi-command process from one user through one of the any instances of the group;
c) activating, in the name of said one instance, a lock which prevents entry of processes by other instances;
d) allowing the entry by other users of a GETLOCK command through another instance of the program;
e) transferring said lock to the name of such another instance on the occurrence of a step d);
f) maintaining the name of said one instance upon transfer of the lock to said another instance for informing said one instance that the lock was transferred to the one another instance;
g) allowing any other instance of said program to enter a LOCK command from another user upon completion of said process without the occurrence of a step d) during the process; and
h) activating a lock as set forth in step c) in the name of such any other instance of the program.

5,553,288

CONTROL DEVICE FOR IMAGE FORMING APPARATUS

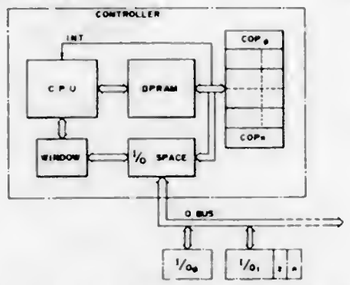
Masao Hosaka, Sagamihara, and Hisashi Sakamaki, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 26,090, Mar. 4, 1993, abandoned, which is a continuation of Ser. No. 793,291, Nov. 14, 1991, abandoned, which is a continuation of Ser. No. 518,232, May 7, 1990, abandoned, which is a continuation of Ser. No. 59,018, Jun. 8, 1987, abandoned. This application Mar. 8, 1995, Ser. No. 400,483

Claims priority, application Japan, Jun. 13, 1986, 61-138859

Int. Cl.[6] G06F *9/00*

U.S. Cl. 395—650 **11 Claims**



1. A control device for an image forming apparatus with plural loads, comprising:
a program memory for storing a plurality of programs;
plural control execution units, COP0, COP1, COP2 . . . COPn, for executing plural processes in accordance with at least one of the plurality of programs stored in said program memory;
a monitor unit, CPU, for controlling an image forming sequence and monitoring processing operations of said plural control execution units in accordance with at least one of the plurality of programs stored in said program memory;
an input unit for inputting data required for the operations of said plural control execution units;
a system-bus to which said plural control execution units and said monitor unit access; and
a memory unit, contents of which can be read out and written in by said plural control execution units and said monitor unit, said memory unit having a plurality of dedicated memory areas to which said plural control execution units access, respectively, and wherein said monitor unit can access each of the dedicated memory areas of the memory unit,
wherein said monitor unit and said plural control execution units access said system-bus in a time-divisional manner such that said monitor unit and said plural control execution units appear to be operated in turn such that an order of access to the system bus is CPU—COP0—CPU—COP1— CPU . . . COPn, and said monitor unit selects fewer of said execution units when a task to be allocated requires a quick processing response time,
wherein said monitor unit determines tasks to be executed in the image forming sequence, identifies an idle control execution unit and allocates the determined tasks to the idle control execution unit for execution, and
wherein said monitor unit communicates with said plural execution control units by accessing said plurality of dedicated memory areas.

5,553,289

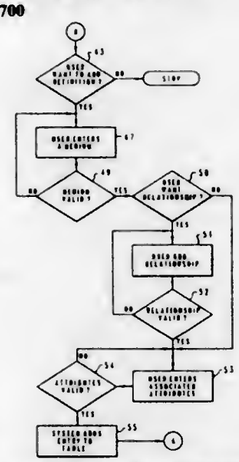
SYSTEM FOR AUTOMATICALLY ASSIGNING ATTRIBUTES TO OBJECTS OF MULTIMEDIA DISTRIBUTION WHEN THE OBJECTS BEING WITHIN A PREDETERMINED RELATIONSHIP

William J. Johnson, Flower Mound, and Marvin L. Williams, Lewisville, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1991, Ser. No. 814,019

Int. Cl.[6] G06F *15/40*

U.S. Cl. 395—700 **24 Claims**



1. A method of automatically assigning attributes to multimedia distributions in a data processing system, each of said multimedia distributions having a plurality of objects, each of said objects with a specific media type, comprising the steps of:
associating specific attributes to specific types of media respectively;
automatically determining the media type of each one of said objects in said multimedia distributions for those objects being within a predetermined relationship; and
if said media type has an associated attribute, automatically assigning said associated attribute to said each object; otherwise automatically assigning a null attribute thereto.

5,553,290

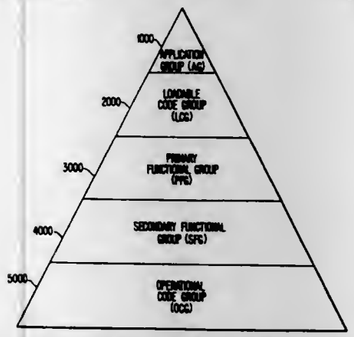
SOFTWARE PACKAGING STRUCTURE HAVING HIERARCHICAL REPLACEABLE UNITS

Nathaniel Calvert; James S. Eflie; David L. Johnston; James L. Naylor; Helen M. Olson-Williams; Robert H. Satin; Dennis L. Shaffer, and Gary A. Turk, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 122,293, Nov. 18, 1987, Pat. No. 5,237,688. This application Apr. 23, 1993, Ser. No. 34,449

Int. Cl.[6] G06F *9/44*

U.S. Cl. 395—700 **13 Claims**



1. A computer program embodied on a computer-readable medium having a hierarchical software management structure, said computer program comprising:
a first replaceable unit further comprising a first header and first body, said first header comprising first identification data, said first header further comprising a first list of hardware on which said first replaceable unit is dependent for proper operation;
a second replaceable unit further comprising a second header and a second body, said second header comprising second identification data;
said first body comprising said second identification data, thereby allowing said first replaceable unit to link to said second replaceable unit in a hierarchical fashion;
said second body comprising operational code necessary to run said computer program;
said first body contains no operational code necessary to run said computer program; and
said first header further comprising a description of the function of said operational code.

5,553,291

VIRTUAL MACHINE CONTROL METHOD AND VIRTUAL MACHINE SYSTEM

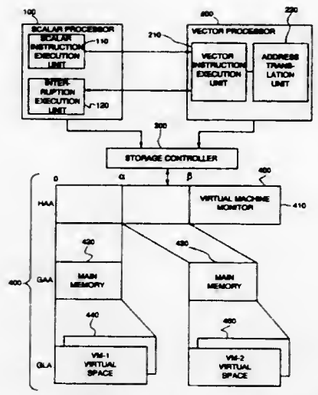
Shunji Tanaka, Sagamihara; Hidenori Umeno, Hadano; Nobuyoshi Sugama, Chigasaki, and Masaru Sato, Izumi-ku, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 14, 1993, Ser. No. 120,472

Claims priority, application Japan, Sep. 16, 1992, 4-246730

Int. Cl.[6] G06F *9/44*

U.S. Cl. 395—700 **33 Claims**



1. A virtual machine control method for a computer on which a plurality of operating systems are available to be run on virtual machines under control of a virtual machine monitor running on the computer, said computer having scalar and vector processors wherein the vector processor starts executing vector processor instructions in accordance with an execution instruction which the scalar processor sends to the vector processor in response to an execute vector processor instruction issued by an operating system whereby a virtual machine to which the operating system is assigned uses the vector processor, said method executed by the virtual machine monitor comprising the steps of:
selecting one of the operating systems for running on the computer;
determining whether any of the virtual machines other than a virtual machine to which the selected operating system is assigned is using the vector processor;
suspending the running of the selected operating system on the scalar processor when it is determined that one of the other virtual machines is using the vector processor; and
dispatching the scalar processor for exclusive use by the selected operating system when it is determined that none of the other virtual machines is using the vector processor.

5,553,292

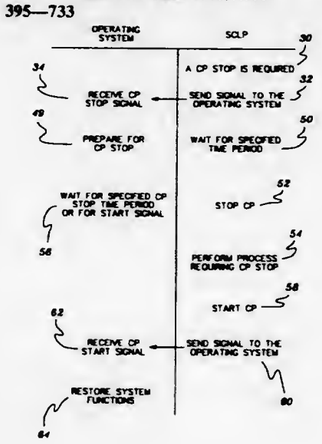
METHOD AND SYSTEM FOR MINIMIZING THE EFFECTS OF DISRUPTIVE HARDWARE ACTIONS IN A DATA PROCESSING SYSTEM

James C. Daly, Millbrook; Jonel George, Pleasant Valley; Paul G. Greenstein, Fishkill, and John T. Rodell, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 30,761, Mar. 12, 1993, abandoned. This application Dec. 21, 1994, Ser. No. 361,179

Int. Cl.[6] G06F *9/46;11/00*

U.S. Cl. 395—733 **29 Claims**



1. A method for minimizing the effects of disruptive hardware

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PORTABLE COMPUTER POWERED BY

transfer state; and operative when said first touch input is not

1. A method for minimizing the effects of disruptive hardware actions in a data processing system having an operating system, said method comprising:

providing advance notification to said operating system that a disruptive action may occur;

acknowledging, by said operating system, the occurrence of said disruptive action;

performing said disruptive action if said operating system allows said disruptive action to occur and after said advance notification is provided; and

continuing processing within said data processing system when said operating system does not allow said disruptive action to occur.

5,553,293

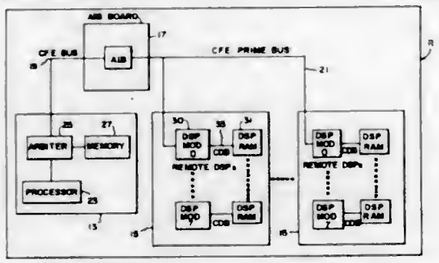
INTERPROCESSOR INTERRUPT PROCESSING SYSTEM

Lawrence P. Andrews; Baiju D. Mandalia, both of Boca Raton; Oscar E. Ortega, Miami Beach; John C. Sinibaldi, Pompano Beach; Kevin B. Williams, North Lauderdale, all of Fla., and Christopher D. Touch, Augusta, Ga., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1994, Ser. No. 353,016

Int. Cl.[6] G06F *13/24*

U.S. Cl. 395—734 **12 Claims**



1. A multi-processing system, comprising:

a) a first processing unit;

b) a second processing unit having a processor which is controlled by a second processing unit operating system or kernel, said second processing unit having a memory, said processor having means for generating interrupts for communication to said first processing unit, said processor comprising means for storing information regarding said interrupts in said memory, said processor comprising means for creating an information address buffer in said memory;

c) a communications channel over which said first and second processing units communicate;

d) said second processing unit having means for processing said interrupts provided by said processor, said means for processing said interrupts operating independent of said processor of said second processing unit and its operating system or kernel, said means for processing said interrupts communicating said interrupts from said second processing unit to said first processing unit over said communications channel, said means for processing said interrupts comprising means for retrieving said information from said memory for communication to said first processing unit, said means for processing said interrupts also comprising means for accessing said information address buffer to retrieve memory addresses of information stored in said memory.

5,553,294

PORTABLE COMPUTER POWERED BY RECHARGEABLE BATTERIES

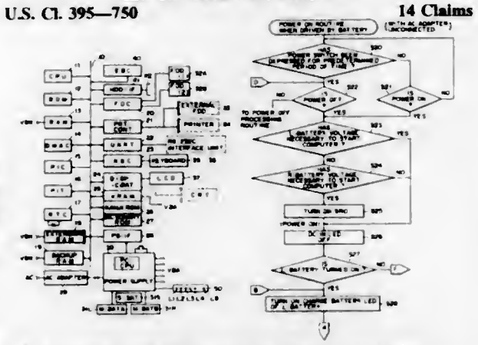
Nobuyuki Nanno; Kazuo Akashi; Makoto Ando; Kouichirou Takeguchi; Yuji Yamanaka; Toshimitsu Saito; Mayumi Oka; Atsuhiro Ootake; James Mason, and Yoshiaki Suzuki, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 718,359, Jun. 24, 1991, abandoned. This application Jun. 7, 1993, Ser. No. 72,689

Claims priority, application Japan, Jun. 25, 1990, 2-166205; Jun. 25, 1990, 2-166206; Jun. 25, 1990, 2-166207; Jun. 25, 1990, 2-166211; Jun. 25, 1990, 2-166212

Int. Cl.[6] G06F *1/00;* **H02J** *9/06*

U.S. Cl. 395—750 **14 Claims**



9. A portable computer powered by batteries comprising:

a computer main body;

a first rechargeable battery detachably installed in said computer main body;

a second rechargeable battery detachably installed in said computer main body;

operating power generating means for selecting one of said first and second rechargeable batteries and generating operating power from said selected one of said first and second rechargeable batteries;

first detecting means for detecting whether each of said first and second rechargeable batteries is installed in said computer main body;

second detecting means for detecting whether each of said first and second rechargeable batteries needs charging;

indicating means for indicating a charging state of each said first and second rechargeable batteries, said charging state being one of (a) not installed, (b) need of charging, and (c) completion of charging, and (d) low battery when both of said first and second rechargeable batteries need charging.

5,553,295

METHOD AND APPARATUS FOR REGULATING THE OUTPUT VOLTAGE OF NEGATIVE CHARGE PUMPS

Dimitris Pantelakis, Folsom, and Kerry Tedrow, Orangevale, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 23, 1994, Ser. No. 217,094

Int. Cl.[6] G06F *1/26;* **H02M** *3/18*

U.S. Cl. 395—750 **10 Claims**

1. A regulation circuit, comprising:

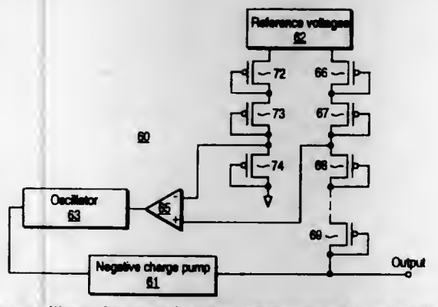
a source of a reference voltage,

a charge pump circuit,

a first voltage divider circuit connected between an output of the charge pump and the source of reference voltage for furnishing a first voltage,

a second voltage divider connected between the source of reference voltage and a known voltage level for furnishing a second voltage,

a comparator for comparing the output of the charge pump circuit with the reference voltage, and



an oscillator for operating the charge pump when the first voltage is less than the second voltage and for interrupting operation of the charge pump when the first voltage is greater than the second voltage.

5,553,296

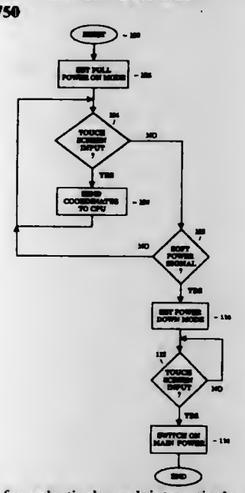
TOUCH SCREEN POWER CONTROL IN A COMPUTER SYSTEM

Craig S. Forrest, San Francisco, and Edward H. Frank, Portola Valley, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 68,983, May 28, 1993, abandoned. This application Feb. 17, 1995, Ser. No. 390,935

Int. Cl.[6] G06F *1/26*

U.S. Cl. 395—750 **16 Claims**



1. A method for selectively and interactively controlling the supply of power to a battery-powered computer system by means of a finite-state machine, said computer system comprising a central processing unit (CPU) coupled to a touch screen controller which controls a touch sensitive display screen, said method comprising the steps of:

a. responsive to a reset signal, transitioning said touch screen controller to a reset state;

b. operative when said touch screen controller is in said reset state, transitioning said touch screen controller to a second state;

c. operative when said touch screen controller is in said second state, setting an internal full power on mode flag and transitioning said touch screen controller to a first decision state;

d. operative when said touch screen controller is in said first decision state, checking for a first touch input from said touch sensitive display screen; operative when said first touch input is present, transitioning said touch screen controller to a transfer state; and operative when said first touch input is not present, transitioning said touch screen controller to a second decision state;

e. operative when said touch screen controller is in said transfer state, interrupting said CPU, transferring the X, Y, and Z coordinates of said first touch input to said CPU, and transitioning said touch screen controller back to said first decision state;

f. operative when said touch screen controller is in said second decision state, checking for the assertion of a soft power signal; operative when said soft power signal is not asserted, transitioning said touch screen controller back to said first decision state; and operative when said soft power signal is asserted, transitioning said touch screen controller to a shutdown state;

g. operative when said touch screen controller is in said shutdown state, setting an internal power down mode flag, deasserting a power on signal, transitioning said touch screen controller to a third decision state;

h. operative when said touch screen controller is in said third decision state, checking for a second touch input and, operative when said second touch input is present, transitioning to a power-up state;

i. operative when said touch screen controller is in said power-up state, asserting said power on signal.

5,553,297

INDUSTRIAL CONTROL APPARATUS

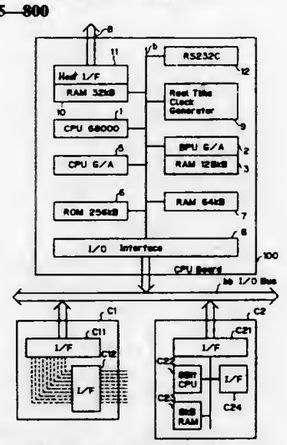
Masaaki Yonezawa; Kiyoshi Hasegawa; Yasunori Kawata; Kouji Matsuoka, and Takasi Kadowaki, all of Tokyo, Japan, assignors to Yokogawa Electric Corporation, Musashino, Japan

Continuation of Ser. No. 513,454, Apr. 23, 1990, abandoned. This application Sep. 9, 1993, Ser. No. 119,322

Claims priority, application Japan, Apr. 24, 1989, 1-104052; May 23, 1989, 1-129707; Oct. 23, 1989, 1-275512; Oct. 23, 1989, 1-275513

Int. Cl.[6] G06F *15/16*

U.S. Cl. 395—800 **7 Claims**



1. A programmable controller comprising:

one or more I/O boards for transferring and receiving multiple information to and from a control object; and

a processor board for imparting a control signal to the control object via the I/O boards, the processor board comprising:

first processor means for controlling the processor board, for executing commands of a sequence control program type, and for executing commands of a BASIC program type for performing general-purpose arithmetic processing, information

processing, or a control operation, by starting executing the commands of sequence control program type and making an end instruction;

program memory means for storing the commands of sequence control program type;

1-bit processor means, connected directly to the program memory means, for executing commands to be executed that are sequentially read from the program memory means and transmitting the commands to be executed to the first processor means if the commands to be executed are of the sequence control program type to be executed by the first processor means;

a random access memory (RAM) for temporarily storing data;

a read only memory (ROM) for storing a self-diagnostic program;

a communication interface for communicating with a host computer;

an I/O bus through which I/O boards for transferring and receiving multiple information are connected;

an I/O interface connected to the I/O bus; and

an internal bus for mutually connecting the first processor means, the 1-bit processor means, the RAM, the ROM, the communication interface, and the I/O interface.

5,553,298

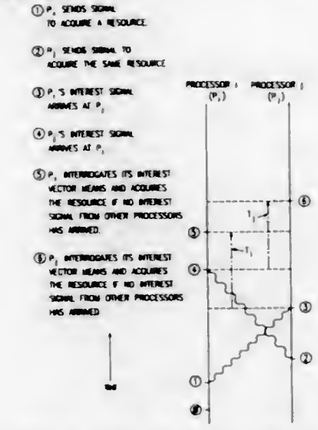
METHOD AND APPARATUS FOR MUTUAL EXCLUSION IN SELF-DIRECTED DISTRIBUTED SYSTEMS

Philip I. Merryman, deceased, late of Santa Ana, Calif., and Diana G. Merryman, administrator, 2203B E. Santa Clara Ave., Santa Ana, Calif. 92705

Filed Apr. 14, 1994, Ser. No. 227,668

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—800 **18 Claims**



16. A system for control of access to a shared resource in a multi-processing computing environment, comprising:

(a) at least two processors;

(b) an interconnection system interconnecting the processors, whereby each processor can communicate with all other processors;

(c) a resource for shared access by the processors;

(d) communication means for each processor for sending an interest signal to all other processors for signalling an interest of that processor in acquiring the resource;

(e) receiving means and interest vector means for each processor for receiving and storing the interest signal of other processors;

(g) interrogation means for each processor for interrogating the interest vector means in that processor to determine the availability of the resource; and

(h) acquiring means for each processor for acquiring the resource after that processor signals its interest in acquiring the resource;

(i) first control means for allowing the acquiring means for each processor to acquire the resource only if that processor's interrogation of its interest vector means indicates no interest in acquiring the resource by any other processor; and

(j) second control means for delaying the interrogation means of each processor such that for every pair of processors, P1 and P2, processor P1's interrogation of its interest vector means is delayed a sufficient time from the time the processor P1's interest signal is sent, that a time gap between the processor P1's interrogation of its interest vector means and the arrival of the processor P1's interest signal at the processor P2 (T1) is at least equal to a time gap between the processor P2's interrogation of its interest vector means and the time the processor P2's interest signal arrives at the processor P1 (T2).

5,553,299

PROGRAMMING/REPROGRAMMING A POINT TO POINT COMMUNICATION APPARATUS

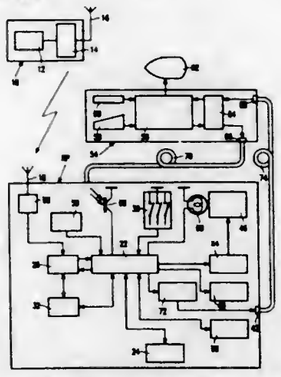
Andrew D. McPherson, Cambridge, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 1, 1994, Ser. No. 252,503

Claims priority, application United Kingdom, Jun. 2, 1993, 9311379

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—800 **11 Claims**



1. A point-to-point communication apparatus comprising

radio receiving means,

signal decoding means coupled to the radio receiving means,

processing means for controlling the operation of the radio receiving means and the decoding means,

a program memory coupled to the processing means,

an electrically programmable store coupled to the processing means,

optical radiation sensing means coupled to the processing means for providing an electrical version of received optical radiation,

a liquid crystal display (LCD) panel for displaying data,

drive means for driving the LCD panel, the drive means being coupled to the processing means, and

means for back lighting the LCD panel;

the processing means being responsive to electrical versions of coded optical radiation signals received by the sensing means to cause said electrically programmable store to be programmed or reprogrammed and the output of the optical radiation sensing means also being used by the processing means to sense ambient light conditions, said processing means causing the back lighting means to be energized when data is to be displayed on the LCD panel under adverse ambient light conditions.

5,553,300

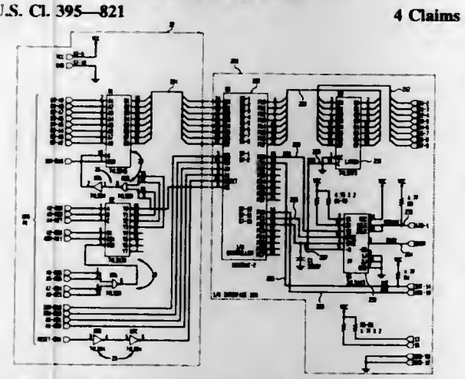
SEMICONDUCTOR MICROSCOPE DATA INTERFACE FOR COMPUTER

Wen-Chong Lu, Erhchung-Pu Chutung, Taiwan, assignor to United Microelectronics Corporation, Hsin-Chu, Taiwan

Filed Apr. 26, 1994, Ser. No. 233,643

Int. Cl.[6] G06F *13/14*

U.S. Cl. 395—821 **4 Claims**



1. An interface for connecting data from a microscope printer port to a bus of a computer comprising:

a latch which is directly connected to data output lines of said microscope printer port for receiving data transferred thereon,

an I/O controller circuit directly connected to said latch for transferring data stored therein to a bus of said computer, for receiving an interrupt signal directly from said printer port of said microscope and for outputting an acknowledgment signal directly to said printer port of said microscope in response thereto,

a first flip-flop circuit, for storing a busy flag that indicates whether or not said I/O controller is busy, said first flip-flop circuit having a clock input connected directly to a strobe signal outputted from said microscope printer port and its synchronous data inputs connected directly to ground and Vcc so as to cause said busy flag to transition to indicate that said I/O controller is busy in response to said strobe signal, said first flip-flop outputting said busy flag directly to said microscope printer port, and

a second flip-flop for storing a transfer flag that indicates whether or not said microscope printer port is transferring data to said latch, said second flip-flop having a clock input connected directly to said strobe signal outputted from said microscope printer port and its synchronous data inputs directly connected to ground and Vcc so as to cause said transfer flag to transition to indicate that said microscope printer port is transferring said data to said latch in response to said strobe signal, said second flip-flop outputting said transfer flag directly to said I/O controller and a complement of said transfer flag directly to a clock input of said latch so as to cause said latch to store a data value outputted from said microscope printer port when said transfer flag transitions in response to said strobe signal,

wherein said I/O controller is directly connected to first and second asynchronous preset inputs of said first and second flip-flop circuits, respectively, said I/O controller initially asynchronously presetting said busy and transfer flags stored in said first and second flip-flops via said first and second asynchronous preset inputs to indicate that said I/O controller is not busy and that said microscope printer port is not transferring data, wherein, in response to said transfer flag, said I/O controller asynchronously presets said transfer flag via said second preset input to indicate that said microscope printer port is not transferring data and transfers said data from said latch when said bus is available for said transfer, and wherein said I/O controller asynchronously presets said busy flag via said first preset input to indicate that said I/O controller is not busy transferring data after, an in response to, transferring said data onto said bus.

5,553,301

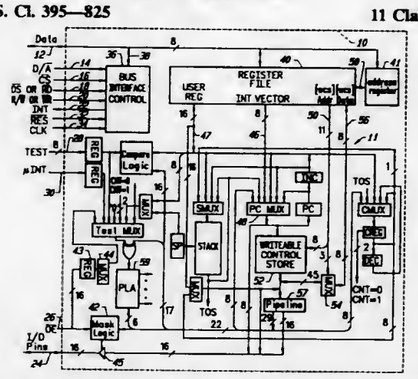
PROGRAMMABLE SEQUENCHER HAVING INTERNAL COMPONENTS WHICH ARE MICROPROCESSOR READ/WRITE INTERFACABLE

Bernard J. New, Los Gatos, and Philip Freidin, Sunnyvale, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 601,039, Oct. 23, 1990, abandoned, which is a continuation of Ser. No. 401,522, Aug. 28, 1989, abandoned, which is a continuation of Ser. No. 167,592, Mar. 14, 1988, abandoned. This application Mar. 1, 1993, Ser. No. 24,819

Int. Cl.[6] G06F *13/20*

U.S. Cl. 395—825 **11 Claims**



1. A programmable sequencer which is accessible by a host processor, the sequencer comprising:

a bidirectional bus for carrying host processor compatible address, data, and control signals to and from the host processor;

sequencing elements including one or more first elements for receiving control signals, second elements for generating an address in accordance with the control signals, and a third element for supplying the address; and

duplicate registers, each duplicate register being connected to the bidirectional bus and to one of the second elements to enable the host processor to access contents of the second elements and avoid making predictions to determine the contents of the second elements based on the control signals.

5,553,302

SERIAL I/O CHANNEL HAVING INDEPENDENT AND ASYNCHRONOUS FACILITIES WITH SEQUENCE RECOGNITION, FRAME RECOGNITION, AND FRAME RECEIVING MECHANISM FOR RECEIVING CONTROL AND USER DEFINED DATA

Douglas E. Morrissey, Exton; Edward T. Cavanagh, Jr., Norristown; Gene T. Wieder, Coopersburg; Kin H. Ng, Glenmoore, and William E. Oldham, Pottstown, all of Pa., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Dec. 30, 1993, Ser. No. 176,805

Int. Cl.[6] G06F *13/00;13/12*

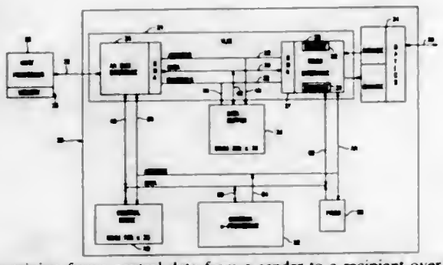
U.S. Cl. 395—825 **19 Claims**

1. In an Input/Output (I/O) channel for transferring frames

(e) determining a step of steps of the procedure which should be executed to correct the initial violation;

(f) executing the program stack in order to evaluate all equations

determining a second state for said state indicator, said second state replacing said first state during said first thread execution;



containing frame control data from a sender to a recipient over a serial data transfer medium to a parallel storage medium, frame processing apparatus, comprising:

sequence recognition means for receiving and identifying any one of a plurality of digital data bit sequences representing channel status information from the data transfer medium and for providing an interrupt signal derived therefrom;

frame recognition means responsive to the interrupt signal for receiving and identifying one of a start-of-frame delimiter and an end-of-frame delimiter from the data transfer medium, and for providing a frame status signal;

frame receiving means responsive to the frame status signal including: (1) means for receiving and identifying a frame header comprising frame control data from the data transfer medium, (2) means for verifying link and device level I/O protocol compliance asynchronously while any user defined data that are included in the frame are being received, (3) means for storing the user defined data in the parallel storage medium concurrently with the verifying if any user defined data are included and (4) masking means for selecting a subset of the frame control data that are to be compared to frame header data for an expected frame and for providing a signal when the selected subset of the frame control data matches the expected frame header data.

5,553,303

DATABASE PROCESSING SYSTEM FOR DYNAMICALLY SWITCHING ACCESS CONTROL PROCESS AND FOR PERFORMING RECOVERY PROCESS

Katsumi Hayashi; Kazuhiko Saitou; Hiroshi Obata; Masaaki Mitani, all of Numazu; Tomohiro Hayashi; Takashi Obata, both of Mishima; Yutaka Sekine, Numazu; Mitsuhiro Ura, Suntou-gun, and Takuji Ishii, Numazu, all of, Japan, assignors to Fujitsu Limited, Japan

Division of Ser. No. 745,233, Aug. 14, 1991, Pat. No. 5,408,652. This application Dec. 20, 1994, Ser. No. 360,033

Claims priority, application Japan, Aug. 31, 1990, 2-231446; Aug. 31, 1990, 2-231452

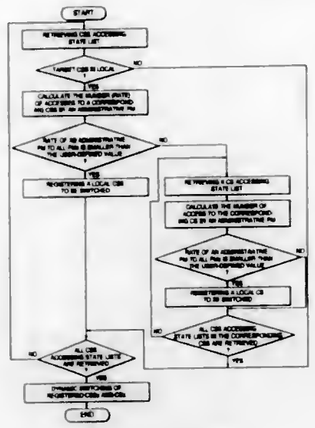
Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 **10 Claims**

1. A database processing system using a multiprocessor including a plurality of processor modules each having a local memory connected to an external shared memory, said database processing system comprising:

a composite structure definition control part for defining an administrative processor module for controlling an access to a composite structure of a database which has a storage structure independent of a logical structure; and

a maintenance/selection control part in an optimum control processor for providing a function of access-controlling a shared process and a local process when an access request arises for a database composite structure, and for dynamically switching the access control process for said composite structure according to an access frequency notified by each said processor module.



5,553,304

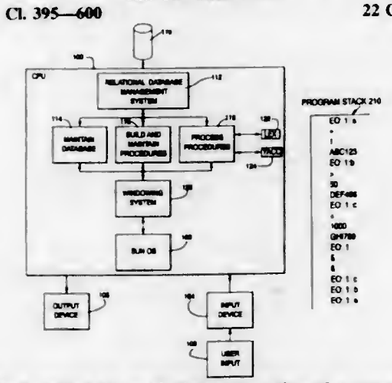
METHOD FOR GENERATING AND EXECUTING COMPLEX OPERATING PROCEDURES

Melvin H. Lipner, Monroeville; Francine S. Pitcairn, Pittsburgh, and Roger A. Mundy, North Huntingdon, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 821,734, Jan. 17, 1992, abandoned. This application Nov. 10, 1994, Ser. No. 337,580

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 **22 Claims**



19. A method for monitoring an operation of a power plant facility, the method comprising the steps of:

(a) inputting parameters including representations of operating conditions in the facility; generating entry condition equations, procedure step equations and parallel information equations from the parameters; and producing a program stack on-line from the equations which have a dynamic relationship based upon the parameters; wherein said parameters including representations of operating conditions in the facility are stored in a relational database; wherein the dynamic relationship is defined when the equations are generated; and wherein the equations represent conditions in the operation of the facility;

(b) executing the program stack in order to evaluate the entry condition equations and determine if an initial violation has occurred, wherein the initial violation is an abnormal condition in the operation of the facility;

(c) monitoring the entry condition equations tc automatically determine a procedure of a plurality of procedures which will correct the initial violation;

(d) repeating steps (b) and (c) until the initial violation occurs;

(e) determining a step of steps of the procedure which should be executed to correct the initial violation;

(f) executing the program stack in order to evaluate all equations of all of the steps of the procedure;

(g) monitoring a result of the procedure step equations corresponding to the step;

(h) determining whether a procedure step violation occurred, wherein the procedure step violation is an abnormal condition in the operation of the facility;

(i) providing a procedure step message if the procedure step violation occurred;

(j) executing the program stack in order to evaluate all of the parallel information equations simultaneously with executing steps (e)–(i);

(k) monitoring the parallel information equations associated with the step and the parallel information equations;

(l) determining whether a parallel information violation of the facility occurs from a result of the monitoring in step (k), wherein the parallel information violation is an abnormal condition in the operation of the facility; and

(m) providing a parallel information violation message if the parallel information violation occurs.

5,553,305

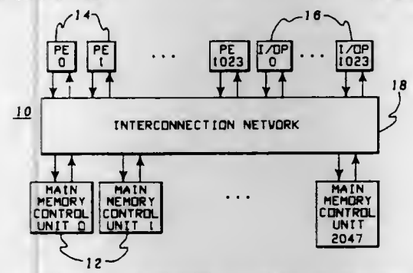
SYSTEM FOR SYNCHRONIZING EXECUTION BY A PROCESSING ELEMENT OF THREADS WITHIN A PROCESS USING A STATE INDICATOR

Steven L. Gregor, Endicott, N.Y., and Robert A. Iannucci, Andover, Mass., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 868,410, Apr. 14, 1992, abandoned. This application Jul. 15, 1992, Ser. No. 914,686

Int. Cl.[6] G06F *15/16*

U.S. Cl. 395—826 **30 Claims**



1. A method for synchronizing execution by a processing element of threads within at least one process, said method comprising the steps of:

executing a first thread and a second thread within the at least one process on said processing element, said processing element having associated therewith at least a portion of a main memory;

fetching during said first thread execution from a local frame operand cache a datum field;

fetching from a state bit cache a state indicator, said state indicator being associated with said datum field and having a first state value;

determining based on said first state value whether said datum field includes a first datum comprising an operand available for use by said first thread;

deferring execution of said first thread when said first datum is unavailable and continuing execution of said second thread on said processing element; and

determining a second state for said state indicator, said second state replacing said first state during said first thread execution;

wherein said second state determining step includes the steps of:

selecting from said first thread a state function to be used in determining said second state;

using said state function to select from one of a plurality of tables one or more possible second states for said indicator; and

using said first state to choose from said one or more possible second states said second state for said indicator.

5,553,306

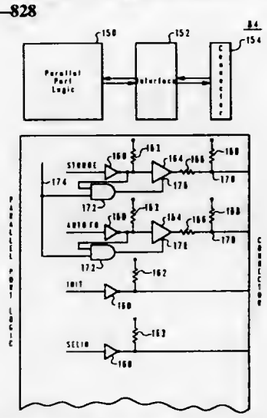
METHOD AND APPARATUS FOR CONTROLLING PARALLEL PORT DRIVERS IN A DATA PROCESSING SYSTEM

Margaret Claffey-Cohen, Jupiter; Phat T. Le, Boca Raton; Timothy J. Louie, Boca Raton; Alan F. Neel, II, Boca Raton, and James P. Ward, Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 998,175, Dec. 29, 1992, abandoned. This application Sep. 7, 1994, Ser. No. 301,512

Int. Cl.[6] G06F *3/00;13/00*

U.S. Cl. 395—828 **4 Claims**



1. A parallel port interface for utilization between a first device and a second device for transmitting a digital signal between said first device and said second device, said parallel port interface comprising:

a switchable driver circuit for transmitting said digital signal, said switchable driver circuit including:

first circuit means for emulating an open collector circuit for providing active pull up;

second circuit means for emulating a totem pole circuit for providing a high-impedance load;

polling means for polling said second device to determine whether said second device is configured to receive digital signals from said first circuit means or said second circuit means; and

a logic control circuit for automatically selecting either said first circuit means or said second circuit means for transmitting said digital signal in response to the determination made by said polling means.

5,553,307

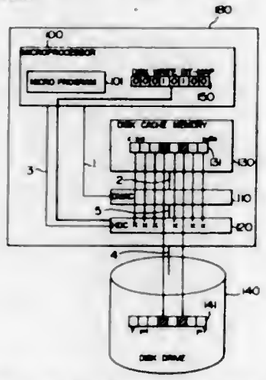
5,553,308

5,553,307

METHOD AND DEVICE FOR TRANSFERRING NONCONTIGUOUS BLOCKS IN ONE TRANSFER START BY CREATING BIT-MAP INDICATING WHICH BLOCK IS TO BE TRANSFERRED

Tetsuhiko Fujii, Kawasaki; Akira Yamamoto, Sagamihara; Tetsuzo Kobushi; Masahiko Sato, Both of Odawara, and Takao Satoh, Sagamihara, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 16, 1993, Ser. No. 46,563
Claims priority, application Japan, Apr. 17, 1992, 4-097658
Int. Cl.[6] G06F *13/14*
U.S. Cl. 395—845 **30 Claims**



1. A data transfer method for transferring data of discontinuous storage blocks in a first storage area consisting of a plurality of continuous storage blocks in a first storage unit and data of discontinuous storage blocks in a second storage area consisting of a plurality of continuous storage blocks between said first and said second storage units interactively, said plurality of storage blocks in said first storage area corresponding to said plurality of storage blocks in said second storage area, respectively, said data transfer method comprising the steps of:

creating a first bit-map having a plurality of bit locations for said plurality of continuous storage blocks inside of the first storage area and setting a predetermined bit value to the bit locations for discontinuous storage blocks the data of which is to be transferred from said first storage unit to said second storage unit;

creating a second bit-map having a plurality of bit locations corresponding to said plurality of storage blocks in said second storage area and setting a predetermined bit value to the bit locations for discontinuous storage blocks the data of which is to be transferred to said first storage unit from said second storage unit;

reading said plurality of continuous storage blocks from said first storage area by first control means;

selectively writing said discontinuous storage blocks the data of which is to be transferred to said second storage unit, selected from said read storage blocks, into the corresponding discontinuous storage blocks of said second storage area in said second storage unit by second control means, based on the content of said first bit-map;

selectively reading said discontinuous storage blocks the data of which is to be transferred to said first storage unit, from said second storage area, based on the content of said second bit-map, by said second control means;

writing said selectively read discontinuous storage blocks the data of which is to be transferred to said first storage unit onto the corresponding discontinuous storage blocks to said first storage area in said first storage unit by means of first control means, based on the content of said second bit-map;

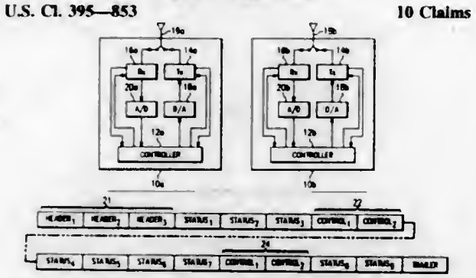
wherein the data transfer of said discontinuous storage blocks is allowed between said first and said second storage units through the effect of one data transfer start.

5,553,308

SERIAL COMMUNICATION FORMAT AND METHODOLOGY

Nelson J. Vink, Garland, Tex., assignor to Alcatel Network Systems, Inc., Richardson, Tex.

Filed Mar. 5, 1993, Ser. No. 26,601
Int. Cl.[6] G06F *13/42*
U.S. Cl. 395—853 **10 Claims**



1. A method of communicating serial information from a source to a destination along a medium, comprising the steps of:

commencing transmission of a serial stream of status information from said source to said destination, said serial stream of status information having an arbitrary number of status units including a first status unit and a last status unit and a plurality of serially ordered status units therebetween, wherein said commencing step comprises sending said first status unit and a first portion of said plurality of status units;

inserting, after said commencing step, an entire serial stream of control information from said source to said destination, said entire serial stream of control information having a predetermined number of control units, beginning with a first control unit and ending with a last control unit;

transmitting, after said inserting step, said entire serial stream of control information from said source to said destination;

first, receiving by said destination said first status unit and said first portion of said plurality of status units of said serial stream of status information;

second, detecting by said destination receipt of said entire serial stream of control information after said first receiving step; and

third, receiving a second portion of said plurality of status units and said last status unit of said serial stream of status information by said destination after said detecting step, wherein said status and control streams are communicated from said source to said destination along the same medium and such that said entire serial stream of control information is interspersed between said first status unit and said last status unit.

5,553,309

DEVICE FOR HIGH SPEED EVALUATION OF LOGICAL EXPRESSIONS AND HIGH SPEED VECTOR OPERATIONS

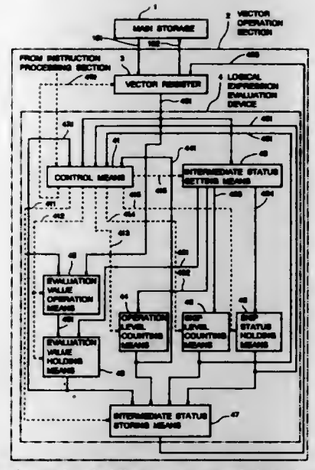
Kiyoshi Asai, Ibaraki; Takeshi Nishikawa, and Yoshiki Seo, both of Tokyo, all of, Japan, assignors to Japan Atomic Energy Research Institute, and NEC Corporation, both of Tokyo, Japan

Continuation of Ser. No. 972,020, Nov. 9, 1992, abandoned.
This application Jun. 6, 1995, Ser. No. 465,902
Claims priority, application Japan, Nov. 8, 1991, 3-321165; Dec. 25, 1991, 3-342780
Int. Cl.[6] G06F *9/308;9/315;9/305*
U.S. Cl. 395—854 **11 Claims**

1. A logical expression evaluation device, comprising:

a logical expression storing means for storing a logical expression having components in a vector data format;

an evaluation value operation means coupled to the logical expression storing means for processing intermediate evaluation values of said logical expression and a logical means element as a component of said logical expression;



an evaluation value holding means coupled to the evaluation value operation means for holding an operation result obtained by said evaluation value operation means as an intermediate evaluation value of the logical expression;

an operation level counting means for counting a nesting depth of said logical expression under evaluation;

a skip status holding means for setting a part of the logical expression which corresponds to secondary operated data of a particular operator in said logical expression to a skip status;

a skip level counting means for counting a nesting depth of said logical expression in the skip status; and

a control means connected to the logical expression storing means, the evaluation value operation means, the evaluation value holding means, the operation level counting means, the skip status holding means and the skip level counting means, for sequentially reading out the components of said logical expression, judging a type of the read component and controlling the logical expression storing means, evaluation value operation means, evaluation value holding means, operation level counting means, skip status holding means and skip level counting means based on the judgment result and the status of the logical expression storing means, evaluation value operation means, evaluation value holding means, operation level counting means, skip status holding means and skip level counting means, and for evaluating said logical expression and omitting the operation by said evaluation value operation means for the part of the logical expression corresponding to the secondary operated data of said particular operator.

5,553,310

SPLIT TRANSACTIONS AND PIPELINED ARBITRATION OF MICROPROCESSORS IN MULTIPROCESSING COMPUTER SYSTEMS

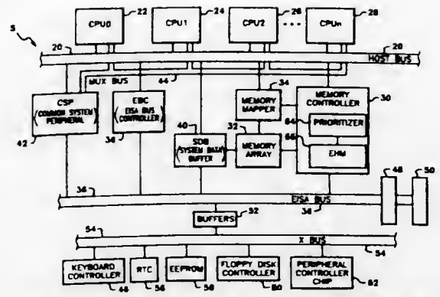
Mark Taylor, Houston; Paul R. Culley, Cypress; Maria L. Melo, and Roger E. Tipley, both of Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Oct. 2, 1992, Ser. No. 955,930
Int. Cl.[6] G06F *13/14;13/18*
U.S. Cl. 395—860 **9 Claims**

1. A computer system, comprising:

a system bus including a busy line, a plurality of request lines and a plurality of acknowledge lines;

a plurality of microprocessors coupled to said system bus, said plurality of microprocessors numbering n, each said microprocessor including means for providing a request signal on a corresponding one of said system bus request lines, means for detecting an acknowledge signal on a corresponding one of said system bus acknowledge lines, and means for detecting and providing a busy signal on said system busy line; and



a prioritizer coupled to said system bus for receiving said request signals, for receiving said busy signal and providing said acknowledge signals, said prioritizer prioritizing between said plurality of microprocessors based on said received request signals, providing said acknowledge signals on said system bus acknowledge lines wherein only one acknowledge signal is provided at a time on one of said acknowledge lines corresponding to said microprocessor having the highest priority, said prioritizer further including:

means for providing a plurality of bus control signals, each said bus control signal indicating whether a corresponding microprocessor has control of said system bus;

a plurality of relative priority storage means, each said relative priority storage means corresponding to a unique pair of said plurality of microprocessors, each said unique pair being formed by combining a first microprocessor with a second microprocessor, each microprocessor being paired n−1 times, each microprocessor combining with a different microprocessor, each said relative priority storage means for providing a relative priority signal indicative of the relative priority between said microprocessors of said corresponding unique pair, each said relative priority storage means receiving said bus control signal corresponding to the first said microprocessor of said unique pair, each said relative priority storage means including an update input receiving an update signal for indicating that said value of said microprocessor bus control signal is to be stored, said stored value indicating the relative priority between said microprocessors of said corresponding unique pair;

means receiving the plurality of microprocessor bus control signals for providing an update signal to a particular relative priority storage means storage update input when either of said microprocessors corresponding to said unique pair of microprocessors of said particular relative priority storage means has had control of said system bus; and

means receiving all of said relative priority signals for combining said relative priority signals relating to each individual microprocessor and for indicating that a particular microprocessor has the highest priority of all of said plurality of microprocessors if all of said relative priority signals for said particular microprocessor indicate said particular microprocessor has priority relative to the other microprocessor of said unique pair,

wherein each of said plurality of relative priority storage means further receives the request signals corresponding to the particular microprocessors of said unique pair and provides an output signal indicative of said stored value and further includes a passing and inverting means receiving said stored value output signal and said corresponding request signals and providing said relative priority signal for passing said stored value output signal as said relative priority signal if said stored value output signal indicates a particular microprocessor and said particular microprocessor request signal is provided and for inverting said stored value output signal and providing said inverted signal as said relative priority signal if said stored value output signal indicates a particular micro-

processor, said particular microprocessor request signal is not provided and said other microprocessor request signal is provided and

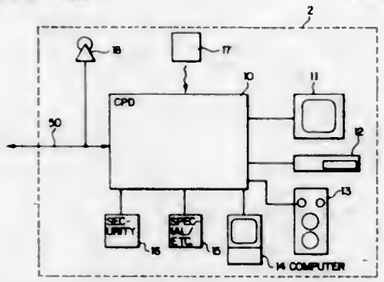
wherein said microprocessor means for detecting and providing a busy signal removes said busy signal when said microprocessor releases control of said bus and provides said busy signal when said acknowledge line for said microprocessor is provided and said bus signal is removed.

5,553,311

CUSTOMER PREMISE DEVICE FOR CONTROLLING DATA TRANSMISSIONS BY STORING A LIMITED NUMBER OF OPERATION ALGORITHMS AND RECEIVING OPERATION INSTRUCTIONS FROM EXTERNAL SOURCES

Robert McLaughlin, Arlington, Va., and M. James Bullen, Oakville, Canada, assignors to Image Telecommunications Inc., Westport, Conn.

Filed Feb. 17, 1994, Ser. No. 197,810
Int. Cl.[6] G06F *13/14*
U.S. Cl. 395—884 **49 Claims**



1. A customer premise device for controlling transmissions, including data streams representing interactive services information carried over a communications medium, between a central information source configured to administrate the interactive services information and customer premise equipment housed at a remote station, comprising:

a first interface linked to the communications medium;

a second interface linked to the customer premise equipment; and

an interface controller linking said first interface and said second interface, said interface controller comprising:

an operations memory for storing a limited number of operations algorithms;

an instructions memory for temporarily storing operation instructions received via at least one of said interfaces; and

a processor for accessing any of said operations memory, said instructions memory and said interfaces,

for processing the operations algorithms and operation instructions, thereby generating prompt signals and processing results,

for routing the prompt signals to at least one of said interfaces or one of said memories in accordance with the processing results, whereby said processor routes at least a portion of the prompt signals to the communications medium via said first interface for the purpose of soliciting at least a portion of the operation instructions from the central information source, and

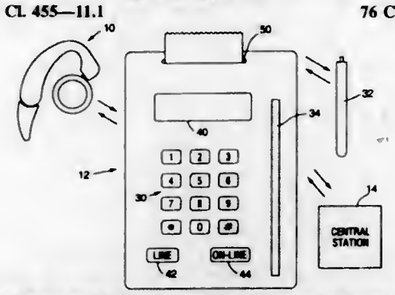
for routing the data streams, supplied over the communications medium, from said first interface to said second interface, in accordance with the processing results.

5,553,312

DATA TRANSFER AND COMMUNICATION NETWORK

Phillip A. Gattey, Los Gatos; Dwight D. Lynn, Santa Cruz, and Barry K. Yuen, Fremont, all of Calif., assignors to ACS Wireless, Inc., Scotts Valley, Calif.

Filed Jun. 20, 1994, Ser. No. 262,596
Int. Cl.[6] H04B *7/15*
U.S. Cl. 455—11.1 **76 Claims**



1. A data transfer and communications system comprising:

a headset including means for transmitting analog voice signals;

a hand-held relay terminal having means for receiving analog voice signals from the headset, said terminal including at least one data entry means, said terminal further including means for the wireless transmission of voice and data signals which are not processed other than for a purpose related to the transmission thereof; and

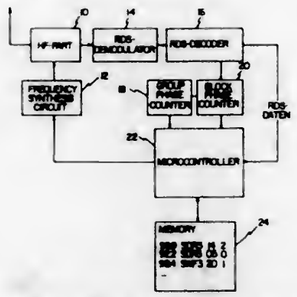
a central controller having means for receiving the voice and data signals from the terminal, said controller further including a processor for analyzing the voice and data signals received from the terminal.

5,553,313

METHOD FOR DETECTING INFORMATION IN A RDS DATA FLOW

Rainer Klos, Ettlingen, Germany, assignor to Becker GmbH, Germany

Filed Oct. 20, 1994, Ser. No. 326,643
Claims priority, application Germany, Nov. 10, 1993, 43 38 412.9
Int. Cl.[6] H04B *7/00*
U.S. Cl. 455—51.1 **6 Claims**



1. A method for detecting information expected to be present in a defined data block of an RDS data flow, transmitted as a predetermined number of groups which follow one another periodically, with a radio receiver tuned-in, one after the other, to a number of senders to be tested and whose RDS decoder is synchronized with the RDS data flow of the respective tuned-in sender, comprising:

a) a counter, incremented by an RDS clock cycle and whose count status has a random relation to a block sequence of the RDS data flow, is respectively reset upon reaching a count status corresponding to one of the number of bits in a group;

b) upon carrying out synchronisation of the RDS decoder with the RDS data flow of the respective tuned-in sender, the count status of the counter is set in relation to the block sequence of the received RDS data flow and a reference number characterising said relation is stored in a sender table along with characteristic data on the tuned-in sender; and

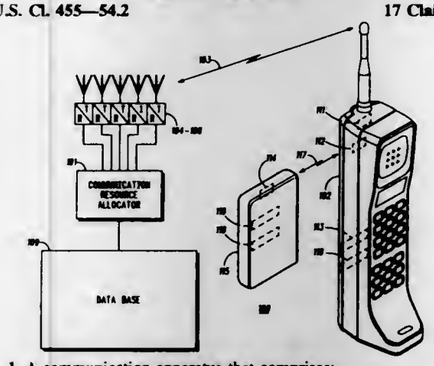
c) with renewed tuning-in to a sender whose characteristic data along with the related reference number are already recorded in the sender table, a synchronization of the RDS decoder does not take place and the temporal position of the data block, in which the information is expected to be, is calculated from the actual count status and the reference number of the tuned-in sender read out from the sender table.

5,553,314

METHOD OF CONFIGURING A COMMUNICATION UNIT USING A WIRELESS PORTABLE CONFIGURATION DEVICE

Gary W. Grube, Palatine, and Timothy W. Markison, Hoffman Estates, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 12, 1994, Ser. No. 226,808
Int. Cl.[6] H04B *1/38*
U.S. Cl. 455—54.2 **17 Claims**



1. A communication apparatus that comprises:

a communication unit that includes a communication processor, a first transceiver that transceives information to a communication system on a first wireless communication path and a second transceiver that transceives configuration information on a second wireless communication path;

a wireless portable configuration device that includes a configuration information storage element and a transceiver that transceives, upon valid request from the communication unit, the configuration information on the second wireless communication path to the communication unit, wherein the second wireless communication path is a short-range wireless communication path; and

a volatile memory storage element, disposed within the communication unit, arranged and constructed to store the configuration information received on the second wireless communication path.

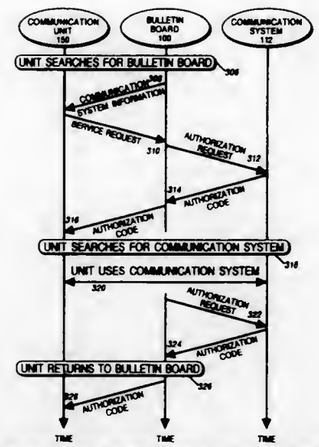
5,553,315

METHOD OF MAINTAINING ACCESS AUTHORIZATION USING A BULLETIN BOARD COMMUNICATION RESOURCE

Arun Sobti, and Richard A. Comroe, both of South Barrington, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 8, 1994, Ser. No. 336,367
Int. Cl.[6] H04B *7/00*
U.S. Cl. 455—56.1 **18 Claims**

1. A method of maintaining access authorization of communication services for a radio, comprising the steps of:



using communication resources that correspond to the communication services for which the radio has previously gained a service authorization;

accessing a bulletin board communication resource to extend the service authorization for at least one of the communication services;

receiving, from the bulletin board communication resource, an authorization code corresponding to the at least one of the communication services; and

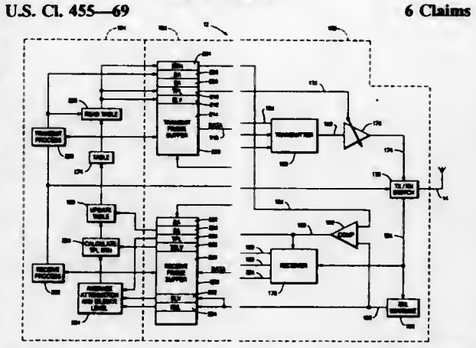
returning to the communication resources for at least the communication service for which service extension was authorized.

5,553,316

POWER CONTROL METHOD IN A WIRELESS COMMUNICATION SYSTEM

Wilhelmus J. M. Diepstraten, Diessen, and Johannes P. N. Haagh, Eindhoven, both of, Netherlands, assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 992,956, Dec. 18, 1992, abandoned.
This application Jan. 16, 1996, Ser. No. 587,172
Claims priority, application United Kingdom, Jul. 3, 1992, 9214107
Int. Cl.[6] H04B *7/26*
U.S. Cl. 455—69 **6 Claims**



1. A method of operating a wireless local area network including a plurality of stations (12) utilizing a common wireless communication channel, said stations communicating through the transmission of information packets (80) having an adjustable transmit power level, said stations employing a CSMA/CA (carrier sense multiple access with collision avoidance) protocol wherein a station desiring access to the transmission medium will first sense the

medium to determine whether there is a carrier signal present higher than a predetermined defer threshold value and will defer its

5,553,318

TRANSMITTER HAVING ENVELOPE FEEDBACK LOOP

wherein the frequency-tunable resonator filter and mixer provides one of odd and even harmonic mixing.

medium to determine whether there is a carrier signal present higher than a predetermined defer threshold value and will defer its transmission until the medium is sensed to be available, said method comprising the steps of:

providing, in each transmitted information packet (**80**) a transmit power level value (**92**) representing the power level at which the packet (**80**) is transmitted;

measuring a receive power level at which a transmitted information packet (**80**) is received;

dynamically adjusting the power level of information packets (**80**) transmitted between any two stations (**12**), in dependence on the difference between said transmit power level and said receive power level for said two stations; and

dynamically adjusting the defer threshold value for transmissions between said any two stations (**12**), in dependence on the difference between said transmit power level and said receive power level for said two stations.

5,553,317

QUADRATURE MODULATOR FOR TDMA/TDD RADIO COMMUNICATION APPARATUS

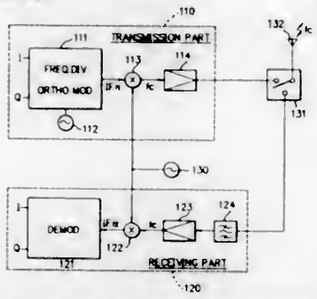
Toshihiro Hara, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 17, 1992, Ser. No. 946,551

Claims priority, application Japan, Sep. 18, 1991, 3-238333

Int. Cl.[6] H04B *1/44*

U.S. Cl. 455—83 **8 Claims**



1. A radio telephone apparatus having transmitting means and receiving means for conducting communications, wherein the transmitting means includes:

a frequency divider quadrature modulator for receiving as an input thereto a local signal, for dividing the local signal and mixing it with information signal inputted so as to produce therefrom an intermediate frequency;

an amplifier for amplifying a carrier frequency with which the intermediate frequency is mixed;

the local signal has a frequency which is four times greater than the intermediate frequency;

said frequency divider quadrature modulator comprises a frequency divider for receiving as an input thereto the local signal and generating a carrier wave having a phase shifted from that of the local signal by 90°,

the frequency divider including two D flip flop circuits, and having a control terminal for terminating generation of the carrier wave.

5,553,318

TRANSMITTER HAVING ENVELOPE FEEDBACK LOOP AND AUTOMATIC LEVEL CONTROL LOOP

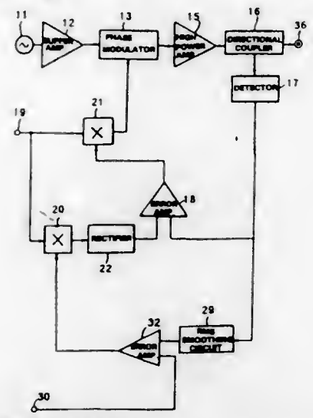
Shinichi Ohmagari, and Osamu Yamamoto, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Sep. 29, 1995, Ser. No. 536,342

Claims priority, application Japan, Sep. 30, 1994, 6-236314

Int. Cl.[6] H04B *1/04*

U.S. Cl. 455—126 **5 Claims**



1. A transmitter, comprising:

a modulator for linearly modulating a carrier from an oscillator with a modulating signal and outputting a modulated wave;

a power amplifier for power amplifying the output modulated wave of said modulator;

a directional coupler for branching the power amplified modulated wave from said power amplifier into two branched modulated waves, one of which is outputted to a transmission outputting element;

a detector for detecting an envelope of the other branched modulated wave from said directional coupler;

first error signal generating means for generating and outputting an error signal between a smoothed signal of the output detection signal of said detector and a first reference voltage;

a first multiplier for multiplying the error output signal of said first error signal generating means and a band-limited base band signal;

second error signal generating means for generating and outputting an error signal between the output detection signal of said detector and a full wave rectified signal of an output signal of said first multiplier; and

a second multiplier for multiplying the error output signal of said second error signal generating means and the base band signal and supplying a result of the multiplication as the modulating signal to said modulator.

5,553,319

ROUTING YIG-TUNED MIXER

Hassan Tanbakuchi, Santa Rosa, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

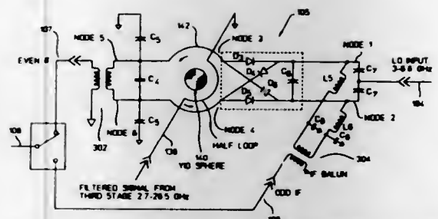
Continuation of Ser. No. 94,833, Jul. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 924,698, Jul. 29, 1992, abandoned. This application Jan. 23, 1995, Ser. No. 378,884

Int. Cl.[6] H04B *1/26*

U.S. Cl. 455—326 **23 Claims**

1. A frequency-tunable resonator filter and mixer to provide a tunable bandpass filter and image-enhanced, double-balanced mixer in response to a radio-frequency (RF) input signal having a given frequency at an RF input, comprising:

at least one frequency-tunable resonator, comprising:



an input coupling loop coupled to the RF input for receiving the RF input signal;

a ferrimagnetic sphere proximate to the input coupling loop; and

an output coupling loop proximate to the ferrimagnetic sphere for receiving the RF input signal when a resonance frequency of the at least one frequency-tunable resonator approximates the given frequency of the RF input signal, the output coupling loop being terminated at a first end by a first intermediate-frequency (IF) balun having an input connected to the first end of the output coupling loop to provide an even harmonic IF balun, the output of the first IF balun being connected to an even IF port, and the output coupling loop being terminated at a second end by a diode bridge comprising four diodes;

an electromagnet for producing a DC magnetic field that is uniform over the at least one frequency-tunable resonator for tuning the resonance frequency of the at least one frequency-tunable resonator;

first and second capacitors connected between the respective junctions of the output coupling loop and the first IF balun, on the one hand, and ground, on the other hand;

third and fourth capacitors connected in series across the outputs of the diode bridge;

a swept local oscillator (LO) input for generating an LO signal, the junction between the third and fourth capacitors being connected to the LO input;

first and second inductors having first ends connected to the respective junctions of the diode bridge and the third and fourth capacitors, respectively; and

a second IF balun having an input connected across second ends of the first and second inductors to provide a fundamental and odd harmonic IF balun, an output of the second IF balun being connected to an odd IF port;

wherein the frequency-tunable resonator filter and mixer provides one of odd and even harmonic mixing.

5,553,320

AUTOMATIC CASH TRANSACTION MACHINE

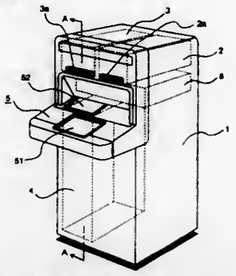
Nobuhiko Matsuura, Owariasahi; Kunihisa Matsuura, Amagun; Yntaka Kako, Owariasahi, and Minoru Kadowaki, Toyota, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 9, 1995, Ser. No. 401,970

Claims priority, application Japan, Mar. 16, 1994, 6-045354

Int. Cl.[6] G06F *3/00*

U.S. Cl. 235—379 **18 Claims**



1. An automatic cash transaction machine comprising a outer box which has an upper front plate and a lower front plate and in which the horizontal cross-sectional shape at an optional location in the vertical direction is almost square, a bill recycle box which is installed inside the lower part of said outer box, on the operator's side viewed from front, and in the neighborhood of said lower front plate, and a customer operation table which is installed between the upper part of said outer box and the lower part of the outer box and has a cash gateway on the innermost side viewed from front and an operation display at the central part on the operator's side, wherein the leading edge of said operation display of said customer operation table is protruded froward from said lower front plate of said outer box and said cash gateway of said customer operation table is positioned right above said bill recycle box.

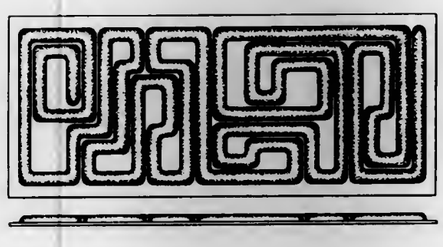
DESIGNS

SEPTEMBER 3, 1996

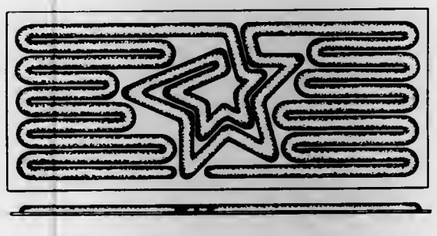
DESIGNS

SEPTEMBER 3, 1996

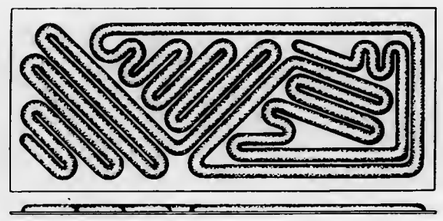
373,231
COMBINED FOOD PRODUCT AND SUPPORT BOARD THEREFOR
Timothy J. Gluszak, Eden Prairie, and Craig E. Zimmermann, Waconia, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.
Filed Aug. 28, 1995, Ser. No. 43,156
Term of patent 14 years
U.S. Cl. D1—125



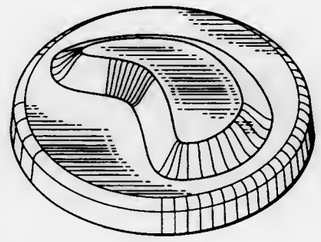
373,232
COMBINED FOOD PRODUCT AND SUPPORT BOARD THEREFOR
Timothy J. Gluszak, Eden Prairie, and Craig E. Zimmermann, Waconia, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.
Filed Aug. 28, 1995, Ser. No. 43,157
Term of patent 14 years
U.S. Cl. D1—125



373,233
COMBINED FOOD PRODUCT AND SUPPORT BOARD THEREFOR
Timothy J. Gluszak, Eden Prairie, and Craig E. Zimmermann, Waconia, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.
Filed Aug. 28, 1995, Ser. No. 43,158
Term of patent 14 years
U.S. Cl. D1—125



373,234
EGG PATTY
Michelle M. Manderfeld, Plymouth, Minn., assignor to Cargill, Incorporated, Minneapolis, Minn.
Filed Aug. 9, 1995, Ser. No. 42,370
Term of patent 14 years
U.S. Cl. D1—130



373,235

373,237

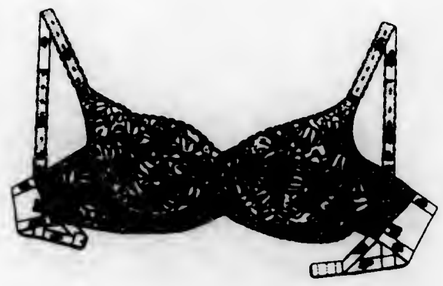
373,239
HEADWEAR

373,241
ELECTRONIC BEEPER CASE

373,235
MUFF
Daniel Caponelli, and Robin Landholm, both of 7053 Mohawk St., San Diego, Calif. 92115
Filed Jul. 17, 1995, Ser. No. 41,515
Term of patent 14 years
U.S. Cl. D2—613

373,236
BRASSIERE
Rachael Vass-Betts, West Hunsbury, United Kingdom, assignor to Courtaulds Textiles (Holdings) Limited, United Kingdom
Filed Nov. 24, 1993, Ser. No. 15,668
Claims priority, application United Kingdom, Jul. 2, 1993, 2032133
Term of patent 14 years
U.S. Cl. D2—710

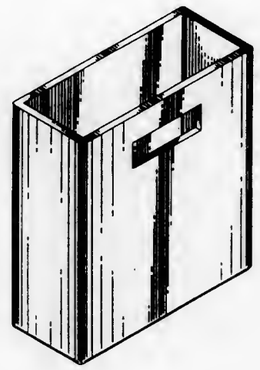
373,237
BRASSIERE
Rachael Vass-Betts, West Hunsbury, United Kingdom, assignor to Courtaulds Textiles (Holdings) Limited, United Kingdom
Filed Nov. 24, 1993, Ser. No. 15,669
Claims priority, application United Kingdom, May 27, 1993, 2031335
Term of patent 14 years
U.S. Cl. D2—710



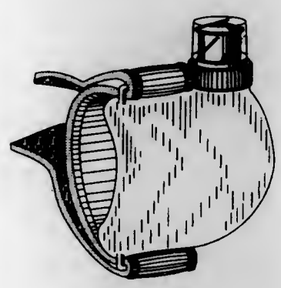
373,238
CAP
Frank A. Ricciardi, 9 Juniper Dr., Cedar Knolls, N.J. 07927
Filed Jul. 3, 1995, Ser. No. 41,057
Term of patent 14 years
U.S. Cl. D2—866

373,239
HEADWEAR
John A. McClean, 16 Ferndale Rd., Clengormley, County Antrim, BT36 8AH, Ireland
Filed Dec. 6, 1994, Ser. No. 32,384
Claims priority, application Ireland, Jun. 9, 1994, Design 150/94
Term of patent 14 years
U.S. Cl. D2—869

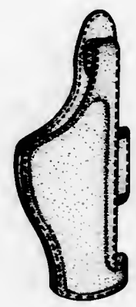
373,241
ELECTRONIC BEEPER CASE
Jolene M. Chavez, and Nora S. Johnson, both of 1768 Joliet St., Aurora, Colo. 80010-2425
Filed Sep. 20, 1995, Ser. No. 44,192
Term of patent 14 years
U.S. Cl. D3—218



373,240
COMBINED WATER BOTTLE AND WRIST BAND
Julie Parnell, 8440 Delongpre Ave., #105, West Hollywood, Calif. 90069
Filed Jul. 11, 1995, Ser. No. 41,279
Term of patent 14 years
U.S. Cl. D3—202



373,242
HOLSTER FOR AN AUTOMATIC PISTOL
Robert J. Beletsky, Temecula, Calif., assignor to Bianchi International, Temecula, Calif.
Filed Apr. 11, 1994, Ser. No. 21,881
Term of patent 14 years
U.S. Cl. D3—222



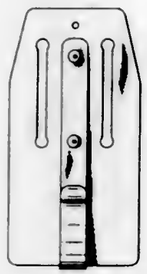
373,243
HOLSTER FOR SUPPORTING A CARPENTER'S AIR-

373,245
TIRE CHAIN BOX

373,247
WORKBOX
Thomas Dickinson, and Bradley D. Gale, both of St. Louis,

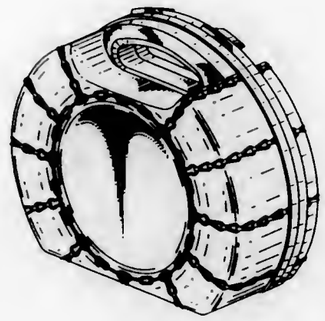
373,249
LOCKING COVER FOR SUITCASES
Leonard Richardson, 7016 Crabapple La. #6, Kansas City, Mo.

373,243
HOLSTER FOR SUPPORTING A CARPENTER'S AIR-NAILING GUN
John R. Tovey; Thomas J. Desmet, and Edward P. Desmet, all of Hampton, N.H., assignors to Coastal Tool Company, Inc., Salem, N.H.
Filed May 8, 1995, Ser. No. 38,556
Term of patent 14 years
U.S. Cl. D3—228



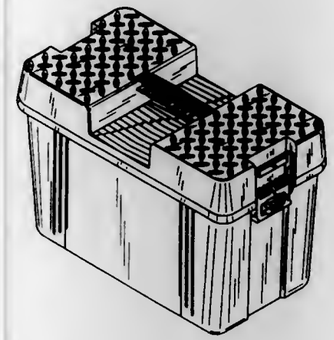
373,244
HOLDER FOR FISHING LURES
Wesley W. Hackman, 12 Marine Ave., Jamestown, R.I. 02835
Filed Mar. 24, 1995, Ser. No. 36,653
Term of patent 14 years
U.S. Cl. D3—260

373,245
TIRE CHAIN BOX
Frederick J. Brindisi, York, Pa., assignor to Cooper Industries, Inc., Houston, Tex.
Filed Jul. 20, 1995, Ser. No. 41,650
Term of patent 14 years
U.S. Cl. D3—271

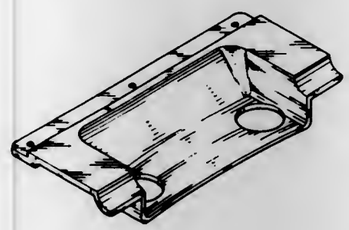


373,246
SUITCASE
Adrian D. Stokes, Kingston Upon Thames; David Banham, Haslemere, and Stephen Green, London, all of, United Kingdom, assignors to Carlton International PLC, Enfield, United Kingdom
Filed Dec. 9, 1994, Ser. No. 31,954
Claims priority, application United Kingdom, Jun. 10, 1994, 2039627
Term of patent 14 years
U.S. Cl. D3—279

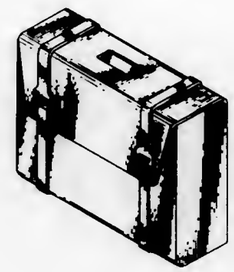
373,247
WORKBOX
Thomas Dickinson, and Bradley D. Gale, both of St. Louis, Mo., assignors to Contico International, Inc., St. Louis, Mo.
Filed Nov. 14, 1994, Ser. No. 30,968
Term of patent 14 years
U.S. Cl. D3—282



373,248
SUITCASE BRACKET
King-sheng Wang, No. 17, Lane 116, Ta An Gan Rd., Tachia Chen, Taichung Hsien, Taiwan
Filed Mar. 22, 1995, Ser. No. 36,509
Term of patent 14 years
U.S. Cl. D3—318



373,249
LOCKING COVER FOR SUITCASES
Leonard Richardson, 7016 Crabapple La. #6, Kansas City, Mo. 64129
Filed Dec. 15, 1994, Ser. No. 32,304
Term of patent 14 years
U.S. Cl. D3—321



373,250
TOOTHBRUSH
Paolo Cavazza, Rome, Italy, assignor to Avantgarde S.p.A., Pomezia, Italy
Filed May 20, 1994, Ser. No. 23,235
Claims priority, application Italy, Nov. 22, 1993, MI93 0 0619
Term of patent 14 years
U.S. Cl. D4—104

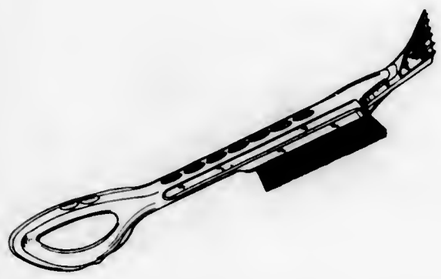
373,251
FIXED HANDLE ICE SCRAPER AND SNOW BRUSH

373,253
ARM CHAIR WITH ORNAMENTAL BACK

373,255
ARMCHAIR

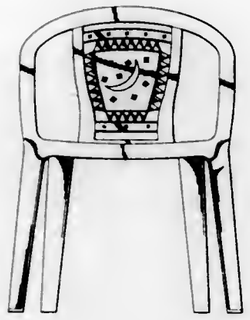
373,258
CANOPY BED

373,251
FIXED HANDLE ICE SCRAPER AND SNOW BRUSH COMBINATION
Michael W. K. Young, Flushing, N.Y., assignor to Injectron Corporation, Plainfield, N.J.
Filed Dec. 29, 1994, Ser. No. 32,845
Term of patent 14 years
U.S. Cl. D4—118



373,252
KNITTED FABRIC
Mette N. Handberg, Bromstadekra, Norway, assignor to Dale Garn & Trikotasje A/S, Dalekvam, Norway
Filed Oct. 18, 1994, Ser. No. 29,877
Term of patent 14 years
U.S. Cl. D5—7

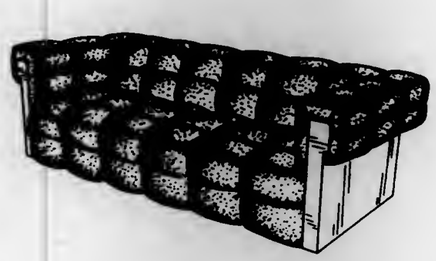
373,253
ARM CHAIR WITH ORNAMENTAL BACK
Drew Maple, Alexandria, Ind., assignor to Resin Partners, Inc., Alexandria, Ind.
Filed Sep. 26, 1995, Ser. No. 44,545
Term of patent 14 years
U.S. Cl. D6—358



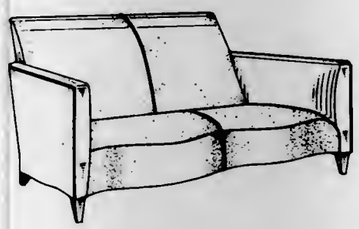
373,254
SEAT
Peter Savnik, Pod hrasti 34, 61000 Ljubljana, Slovenia
Filed Jul. 5, 1995, Ser. No. 41,086
Term of patent 14 years
U.S. Cl. D6—366

373,255
ARMCHAIR
Stanley Gresens, Homewood, Ill., assignor to Syroco, Inc., East Boston, Mass.
Filed May 11, 1994, Ser. No. 22,731
Term of patent 14 years
U.S. Cl. D6—379

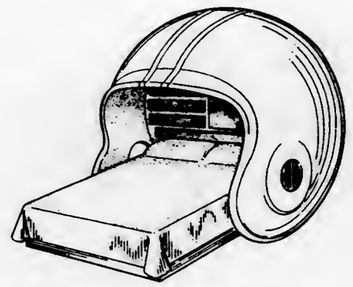
373,256
SEAT
Sally S. Lewis, 715 N. Canon Dr., Beverly Hills, Calif. 90210
Filed Jul. 25, 1995, Ser. No. 41,824
Term of patent 14 years
U.S. Cl. D6—381



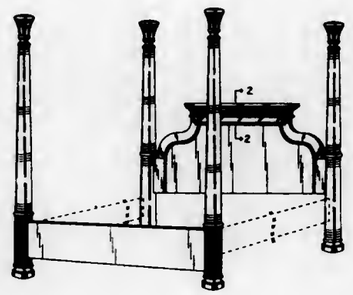
373,257
SERPENTINE CLUB SOFA
John Hutton, New York, N.Y., assignor to Donghia Furniture, New York, N.Y.
Filed Sep. 26, 1995, Ser. No. 44,522
Term of patent 14 years
U.S. Cl. D6—381



373,258
CANOPY BED
Jack L. Egbers, 7901 Lazy Lane Rd., North Richland Hills, Tex. 76180
Filed Jul. 26, 1995, Ser. No. 43,441
Term of patent 14 years
U.S. Cl. D6—388

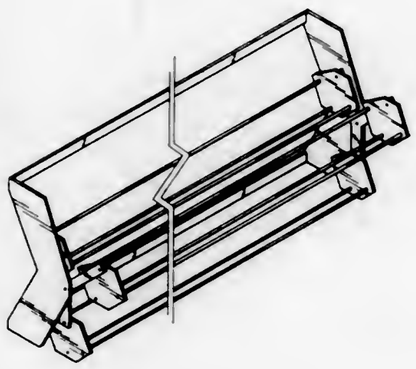


373,259
HEADBOARD AND FOOTBOARD SET
H. Thomas Keller, High Point, N.C., assignor to Bernhardt Furniture Company, Lenoir, N.C.
Filed Sep. 13, 1994, Ser. No. 28,362
Term of patent 14 years
U.S. Cl. D6—393



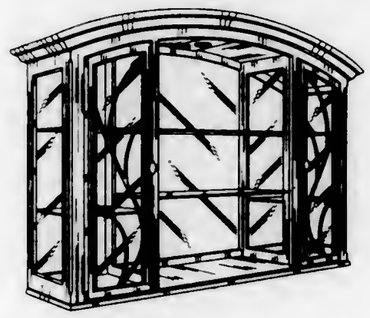
373,260
BED
William A. James, Newport Beach, Calif., assignor to Universal Furniture Industries, Inc., High Point, N.C.
Filed Apr. 4, 1995, Ser. No. 37,136
Term of patent 14 years
U.S. Cl. D6—393

373,261
ROTATING COMPACT DISC HOLDER
Vike F. Hager, and Aaron V. Hager, both of 4242 NE. 107th St., Seattle, Wash. 98125
Filed Jul. 18, 1995, Ser. No. 41,582
Term of patent 14 years
U.S. Cl. D6—407

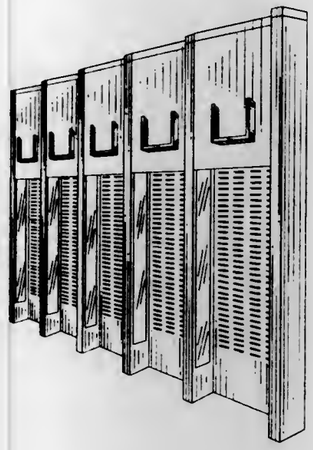


373,262
DESK
Phuoc H. Luong; Kei Wada, both of Fountain Valley, and Ho Robinson, Lakewood, all of Calif., assignors to Elite Manufacturing Corporation, Gardena, Calif.
Filed Jan. 31, 1995, Ser. No. 34,286
Term of patent 14 years
U.S. Cl. D6—423

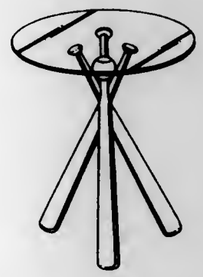
373,263
HUTCH
H. Thomas Keller, High Point, N.C., assignor to Bernhardt Furniture Company, Lenoir, N.C.
Filed Jul. 31, 1995, Ser. No. 42,087
Term of patent 14 years
U.S. Cl. D6—436



373,264
WALL DISPLAY DEVICE
Paul R. Lechleiter, Powell, and Mark B. Artus, Beechwold, both of Ohio, assignors to Blockbuster Entertainment Corporation, Ft. Lauderdale, Fla.
Filed Aug. 29, 1994, Ser. No. 27,738
Term of patent 14 years
U.S. Cl. D6—449

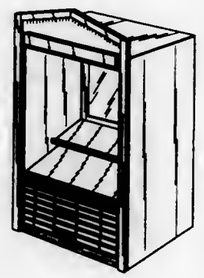


373,265
TABLE
Wayne Horvath, #9-7165 Pandora Street, Burnaby, British Columbia, Canada
Filed Aug. 31, 1994, Ser. No. 27,769
Claims priority, application Canada, Jul. 12, 1994, 1994-1357
Term of patent 14 years
U.S. Cl. D6—451



373,266
INTERACTIVE INFORMATION KIOSK ASSEMBLY
Alan Pellenberg; Thomas A. Lamar, III, both of Atlanta; David L. Wikle, Smyrna; W. Glenn Nix, Duluth, and Stephen Jaworski, Jr., Smyrna, all of Ga., assignors to Miller/Zell, Inc., Atlanta, Ga.
Filed Jan. 20, 1995, Ser. No. 33,841
Term of patent 14 years
U.S. Cl. D6—470

373,267
CORNER DISPLAY UNIT FOR FLOOR COVERING SAMPLES
Deborah H. Rose, Lititz, Pa.; James D. Adams, Seattle, Wash., and Steven Thole, Madison, Wis., assignors to Armstrong World Industries, Inc., Lancaster, Pa.
Filed Apr. 27, 1995, Ser. No. 38,054
Term of patent 14 years
U.S. Cl. D6—473



170–918 O.G.–96–26: QL3

373,268

373,270

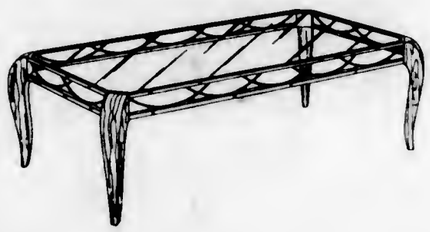
373,272

373,274
CHAIR ARM

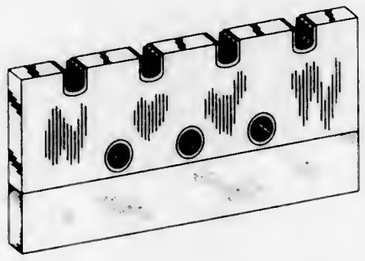
373,268
DISPLAY STAND
Stephen R. Thompson, Leicester, United Kingdom, assignor to Invicta Plastic Ltd., Leicester, United Kingdom
Filed Jul. 12, 1993, Ser. No. 10,618
Claims priority, application United Kingdom, Apr. 2, 1993, 2028905
Term of patent 14 years
U.S. Cl. D6—474

373,270
TABLE
Brian D. T. Alexander, Fennville; Roque M. Corpuz, Jr., Grand Rapids, and Paul A. Glashouwer, Byron Center, all of Mich., assignors to Haworth, Inc., Holland, Mich.
Filed Jun. 2, 1995, Ser. No. 39,690
Term of patent 14 years
U.S. Cl. D6—487

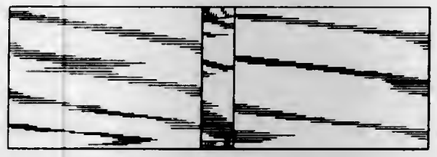
373,269
COFFEE TABLE
Carl A. Muller, Altadena, Calif., assignor to Elite Manufacturing Corporation, Gardena, Calif.
Filed Jun. 12, 1995, Ser. No. 40,174
Term of patent 14 years
U.S. Cl. D6—484



373,271
FISHING ROD HOLDER FOR A FISHING ROD LOCKER
James M. Rosh, and Lillie A. M. Rosh, both of 1850 County Rd. 384, Crossville, Ala. 35962
Filed Aug. 30, 1995, Ser. No. 43,259
Term of patent 14 years
U.S. Cl. D6—491



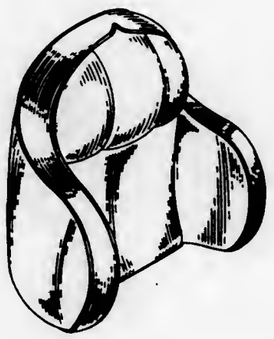
373,272
FRONT OF A DRAWER
Terry R. Saunders, Pembroke, Canada, assignor to Krueger International, Inc., Green Bay, Wis.
Filed Apr. 11, 1995, Ser. No. 37,343
Term of patent 14 years
U.S. Cl. D6—492



373,274
CHAIR ARM
Paul A. James, Rochester, N.Y., assignor to The Gunlocke Company, Wayland, N.Y.
Filed Jun. 9, 1995, Ser. No. 40,057
Term of patent 14 years
U.S. Cl. D6—501

373,273
SEAT
Otto W. Zapf, Herzog-Adolph-Strasse 5, D-6240 Königstein, Germany
Division of Ser. No. 18,988, Feb. 18, 1994, Pat. No. Des. 360,786. This application Jul. 3, 1995, Ser. No. 39,306
Term of patent 14 years
U.S. Cl. D6—500

373,275
VEHICLE HEAD NECK REST
Edward A. Bell, and Nannette C. Bell, both of 115 W. Weber, Muncie, Ind. 47303
Filed Jun. 29, 1995, Ser. No. 40,602
Term of patent 14 years
U.S. Cl. D6—501



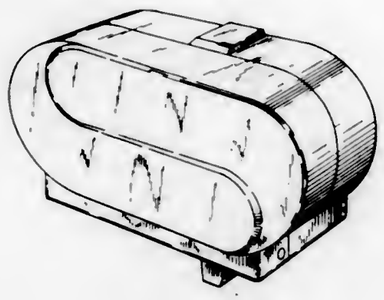
373,276
TOILET TISSUE DISPENSER

373,278
INFLATABLE PILLOW

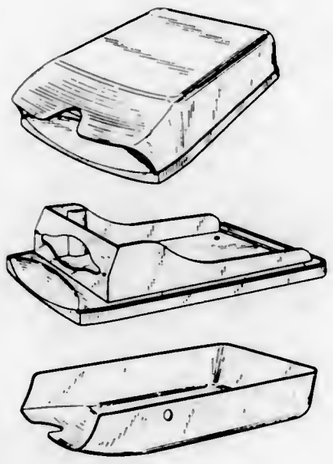
373,280
FROZEN BEVERAGE DISPENSER

373,282
BARBEQUE GRILL

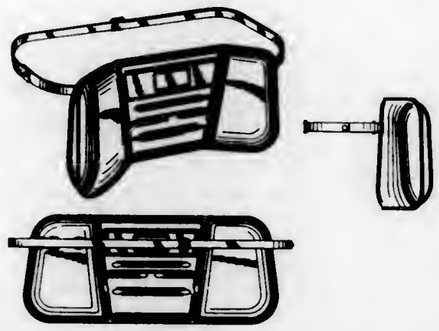
373,276
TOILET TISSUE DISPENSER
Paul a. Omdoll, Waukesha, and Scott J. Collins, Brown Deer, both of Wis., assignors to Lake Geneva Spindustries, Lake Geneva, and Fort Howard Corporation, Green Bay, both of Wis.
Filed Aug. 23, 1995, Ser. No. 43,003
Term of patent 14 years
U.S. Cl. D6—520



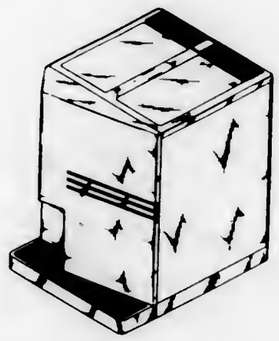
373,277
DISPENSER FOR PAPER TOWELS
Giorgetto Giugiaro, Turin, Italy, assignor to Mölnlycke AB, Göteborg, Sweden
Filed Nov. 1, 1994, Ser. No. 30,111
Claims priority, application Sweden, May 2, 1994, 94-1005
Term of patent 14 years
U.S. Cl. D6—522



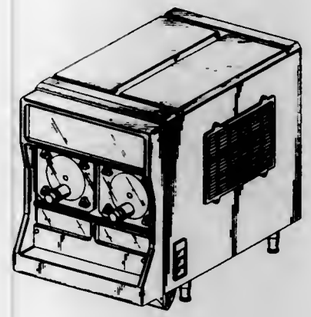
373,278
INFLATABLE PILLOW
Pok Y. J. Chow, 12/F., Union Industrial Bldg. 116 Wai Yip Street, Kwun Tong, Kln, Hong Kong
Filed Jun. 7, 1995, Ser. No. 39,978
Term of patent 14 years
U.S. Cl. D6—604



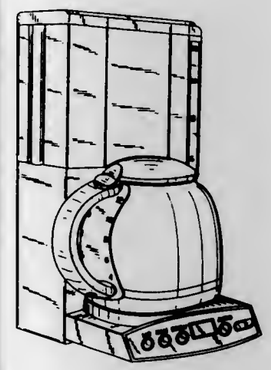
373,279
BEVERAGE DISPENSER
Chaw-Ming Chen, Taipei, Taiwan, assignor to Bright Garden Industrial Co., Ltd., Taiwan
Filed Jul. 3, 1995, Ser. No. 41,059
Term of patent 14 years
U.S. Cl. D7—306



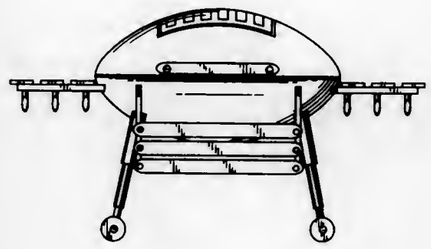
373,280
FROZEN BEVERAGE DISPENSER
Greg A. Johnson, 16002 Gardenhill, Houston, Tex. 77095
Filed May 18, 1995, Ser. No. 39,809
Term of patent 14 years
U.S. Cl. D7—307



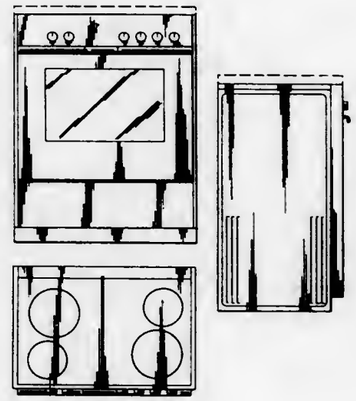
373,281
COFFEE MAKER
Sean H. Simmons, Sea Cliff, N.Y., assignor to Sunbeam Products, Inc., Fort Lauderdale, Fla.
Filed Jan. 13, 1995, Ser. No. 33,467
Term of patent 14 years
U.S. Cl. D7—309



373,282
BARBEQUE GRILL
Benjamin C. Cordero, 6225 Kawaihae Pl., Honolulu, Hi. 96825
Filed Oct. 24, 1994, Ser. No. 30,215
Term of patent 14 years
U.S. Cl. D7—334



373,283
ELECTRIC RANGE
Gerd Wilsdorf, Olching, Germany, assignor to Bosch-Siemens Hausgeraete GmbH, Munich, Germany
Filed Aug. 16, 1993, Ser. No. 11,865
Claims priority, application Germany, Feb. 15, 1993, M 93 01 278.0
Term of patent 14 years
U.S. Cl. D7—340



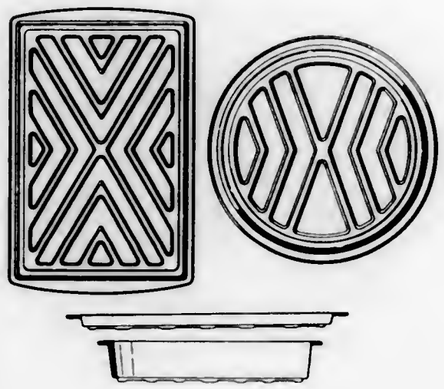
373,284
BAKING TIN

373,286
COOKWARE

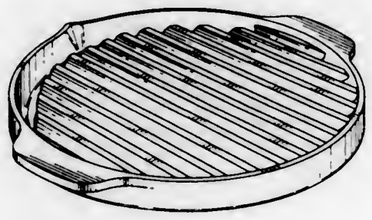
373,288
HANDLE FOR KNIVES, KITCHEN TOOLS AND

373,290
COMBINED BEER STEIN AND BOTTLE OPENER

373,284
BAKING TIN
Colin Hirst, Burnley, England, assignor to George Wilkinson (Burnley) Limited, Lancashire, United Kingdom
Filed Feb. 18, 1993, Ser. No. 5,823
Claims priority, application United Kingdom, Oct. 20, 1992, 2026580; Oct. 20, 1992, 2026581
Term of patent 14 years
U.S. Cl. D7—354



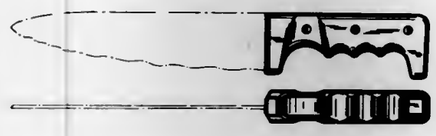
373,285
BARBECUE PLATE
John Coroama, 6691 Hazad Ave., Westminster, Calif. 92683, and John P. Yasuda, 18985 Vista Portola, Trabuco Canyon, Calif. 92679-1102, assignors to John Coroama; Mircea Lupu, and John P. Yasuda, all of Trabuco Canyon, Calif.
Filed Oct. 4, 1993, Ser. No. 13,831
Term of patent 14 years
U.S. Cl. D7—359



373,286
COOKWARE
Molinari Antonio, Brescia, Italy, assignor to Rondine Italia, S.p.A., Brescia, Italy
Filed Dec. 1, 1993, Ser. No. 15,891
Term of patent 14 years
U.S. Cl. D7—361

373,287
COOKWARE
Molinari Antonio, Brescia, Italy, assignor to Rondine Italia, S.p.A., Brescia, Italy
Filed Dec. 1, 1993, Ser. No. 15,894
Term of patent 14 years
U.S. Cl. D7—361

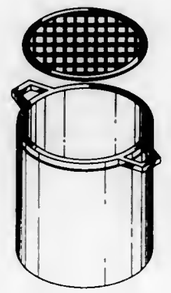
373,288
HANDLE FOR KNIVES, KITCHEN TOOLS AND GADGETS
Milton L. Cohen, Hewlett Bay Park, and Jeff Siegel, Great Neck, both of N.Y., assignors to Lifetime Hoan Corporation, Westbury, N.Y.
Filed Aug. 14, 1995, Ser. No. 42,572
Term of patent 14 years
U.S. Cl. D7—395



373,289
SMALL KNIFE HANDLE
Paul E. Gebhardt, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Jul. 17, 1995, Ser. No. 41,476
Term of patent 14 years
U.S. Cl. D7—401.2

373,290
COMBINED BEER STEIN AND BOTTLE OPENER
Scott Ballin, 228 W. 71st St., New York, N.Y. 10023
Filed Aug. 18, 1995, Ser. No. 42,849
Term of patent 14 years
U.S. Cl. D7—536

373,291
SIFTER FOR SEPARATING DEBRIS FROM GARDEN SOIL
Byron R. Auker, 74-5086 Hanahanai Loop, Kailua Kona, Hi. 96740
Filed Mar. 7, 1995, Ser. No. 35,805
Term of patent 14 years
U.S. Cl. D8—1



373,292
SNOW SHOVEL

373,295
TOOL HOLDER

373,297
ROLLER SKATE TOOL KIT

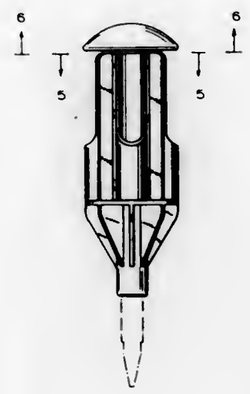
373,299
OPERATING HANDLE FOR A CLAMPING VISE

373,292
SNOW SHOVEL
Jeffrey A. Motley, 138 Navajo Dr., Auburn, Pa. 17922
Filed Jun. 22, 1995, Ser. No. 40,636
Term of patent 14 years
U.S. Cl. D8—10

373,293
GARDEN IMPLEMENT HEAD
Howard D. Lockhart, 2114 Joann Dr., West Plains, Mo. 65775
Filed Feb. 8, 1995, Ser. No. 34,580
Term of patent 14 years
U.S. Cl. D8—13

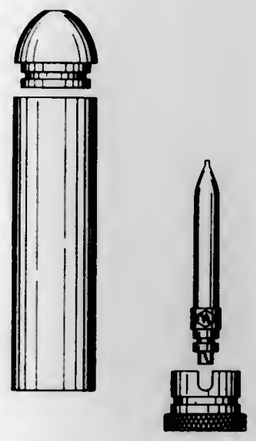
373,294
TOOL HANDLE
Daniel M. Eggert, Kenosha, and Christopher D. Thompson, Milwaukee, both of Wis., assignors to Snap-on Technologies, Inc., Crystal Lake, Ill.
Filed Oct. 12, 1994, Ser. No. 29,659
Term of patent 14 years
U.S. Cl. D8—52

373,295
TOOL HOLDER
James D. DiResta, Woodmere, N.Y., assignor to Natural Science Industries, Ltd., West Hempstead, N.Y.
Filed Nov. 1, 1994, Ser. No. 30,558
Term of patent 14 years
U.S. Cl. D8—71

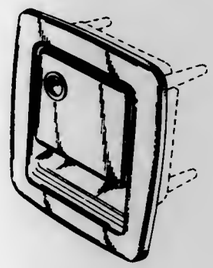


373,296
FOLDING KNIFE
Lynn C. Thompson, 2747 Seahorse, Ventura, Calif. 93001
Filed Feb. 7, 1995, Ser. No. 34,532
Term of patent 14 years
U.S. Cl. D8—99

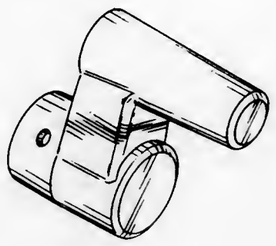
373,297
ROLLER SKATE TOOL KIT
Martin H. Hill, Syracuse, N.Y., assignor to Built for Speed, Inc., Syracuse, N.Y.
Filed May 19, 1993, Ser. No. 8,520
Term of patent 14 years
U.S. Cl. D8—105



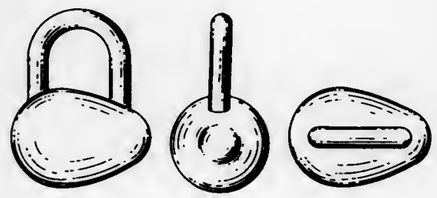
373,298
FLUSH DOOR LATCH ASSEMBLY
Donald R. Miehe, Waterloo, and Marvin L. Larsen, New Hampton, both of Iowa, assignors to Tri/Mark Corporation, New Hampton, Iowa
Continuation-in-part of Ser. No. 655,115, Feb. 14, 1991, Pat. No. 5,058,937. This application Jul. 16, 1991, Ser. No. 731,030
Term of patent 14 years
U.S. Cl. D8—302



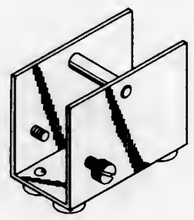
373,299
OPERATING HANDLE FOR A CLAMPING VISE
Roberta S. Hall, Sparks, Md., and Michael D. Dolson, Millbrook, Canada, assignors to Black & Decker Inc., Newark, Del.
Filed Aug. 12, 1994, Ser. No. 27,105
Term of patent 14 years
U.S. Cl. D8—309



373,300
PADLOCK
Michael S. Zane, Brookline, Mass., assignor to Kryptonite Corporation, Canton, Mass.
Filed Sep. 7, 1995, Ser. No. 43,665
Term of patent 14 years
U.S. Cl. D8—334



373,301
SPOOL HOLDER
Brad J. Burch, 12311 Advance, Houston, Tex. 77065
Division of Ser. No. 23,616, May 27, 1994, Pat. No. Des. 368,423. This application Jun. 7, 1995, Ser. No. 39,945
Term of patent 14 years
U.S. Cl. D8—359



373,302

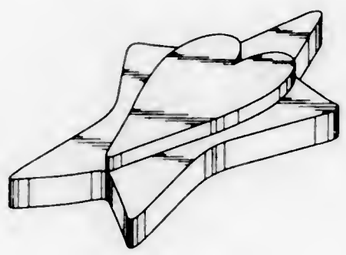
373,305

373,307

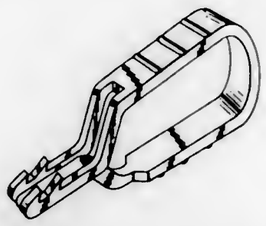
373,310

373,302
END CLIP FOR AN EXERCISE BAND
Tim W. Chen, Dallas, Tex., assignor to Keys Fitness Products, Inc., Dallas, Tex.
Filed Jul. 21, 1995, Ser. No. 41,700
Term of patent 14 years
U.S. Cl. D8—367

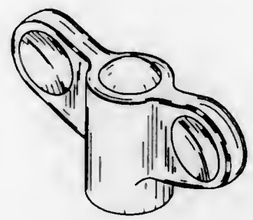
373,303
MAGNET
Donald Bailey, 475 W. Indiana Ave., Sebring, Ohio 44672
Filed Jan. 20, 1995, Ser. No. 33,799
Term of patent 14 years
U.S. Cl. D8—373



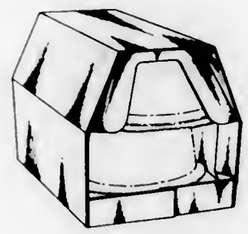
373,304
CLIP
Michael T. Russo, 1139 Meadowglen Ct., Bloomfield Hills, Mich. 48304
Filed Apr. 13, 1994, Ser. No. 21,282
Term of patent 14 years
U.S. Cl. D8—395



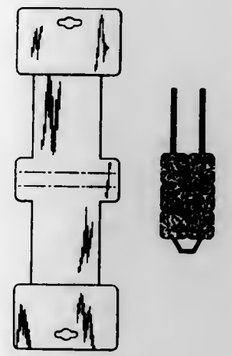
373,305
WING NUT
Giorgio Decursu, and Alberto Bertani, both of Milan, Italy, assignors to Elesa S.p.A., Milan, Italy
Filed Jan. 25, 1995, Ser. No. 34,021
Claims priority, application Hague Agreement, Aug. 8, 1994, DM/030369
Term of patent 14 years
U.S. Cl. D8—398



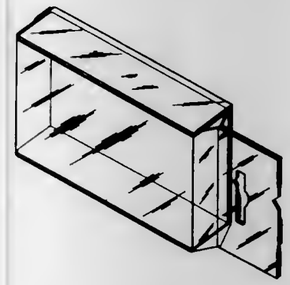
373,306
CARTON FOR CUPS OR SIMILAR OBJECTS
Ronald A. Baxter, Douglasville, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Sep. 15, 1994, Ser. No. 28,470
Term of patent 14 years
U.S. Cl. D9—346



373,307
MERCHANDISING PACKAGE
Neal M. Menaged, South Hampton, Pa., assignor to Lewis M. Hendler, Huntingdon Valley, Pa.
Filed Sep. 16, 1994, Ser. No. 28,518
Term of patent 14 years
U.S. Cl. D9—415

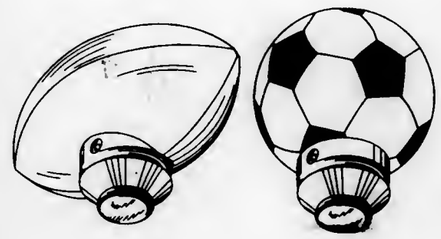


373,308
DISPLAY HOLDER
Steven S. Chapman, Corfu, and Daniel C. Jackson, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Sep. 27, 1994, Ser. No. 28,958
Term of patent 14 years
U.S. Cl. D9—415

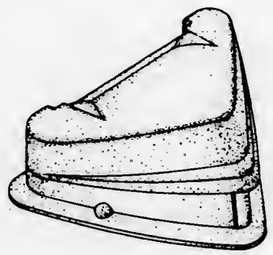


373,309
Patent Not Issued For This Number

373,310
BOTTLE CLOSURE
Heinz Trautmann, Waldstrasse 19, D-64689 Grasellenbach 3, Germany
Filed Sep. 27, 1994, Ser. No. 28,986
Claims priority, application Germany, Apr. 7, 1994, M 94 02 887.7
Term of patent 14 years
U.S. Cl. D9—441



373,311
CONTAINER SPOUT
Jean-Marie Hotz, Prèles, Switzerland, assignor to Tetra Alfa Holdings S.A., Pully, Switzerland
Division of Ser. No. 918,379, Jul. 24, 1992, Pat. No. Des. 358,771. This application Feb. 10, 1995, Ser. No. 34,695
Claims priority, application Switzerland, Jan. 24, 1992, 119-527
The portion of the term of this patent subsequent to May 30, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—447



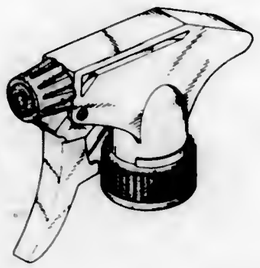
373,312
DISPENSER HEAD

373,315
SPECTRO PHOTOMETER

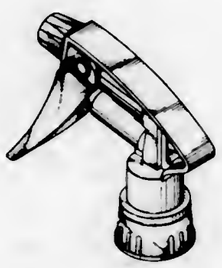
373,317
REMOTE CONTROL TRANSMITTER

373,319
BOOMERANG SHAPED REMOTE CONTROL

373,312
DISPENSER HEAD
Jeng-Song Lin, No. 247-1, Kuang Hsing Rd., Taiping Hsiang, Taichung Hsien, Taiwan
Filed Jan. 5, 1995, Ser. No. 33,124
Term of patent 14 years
U.S. Cl. D23—226

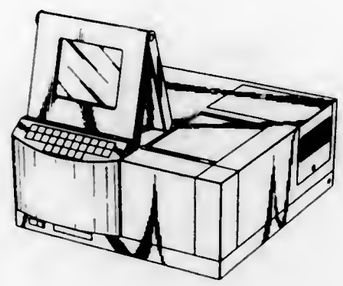


373,313
DISPENSER HEAD
Jeng-Song Lin, No. 247-1, Kuang Hsing Rd., Taiping Hsiang, Taichung Hsien, Taiwan
Filed Jan. 5, 1995, Ser. No. 33,157
Term of patent 14 years
U.S. Cl. D9—448

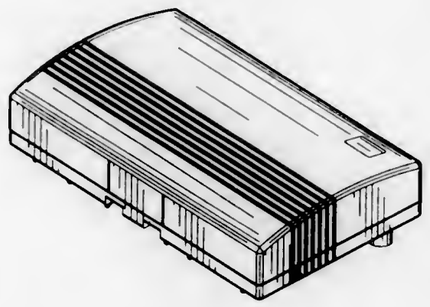


373,314
ANIMATED CLOCK
John J. Staszak, N9589 Deer La., Merrillan, Wis. 54754
Filed Jun. 26, 1995, Ser. No. 40,743
Term of patent 14 years
U.S. Cl. D10—8

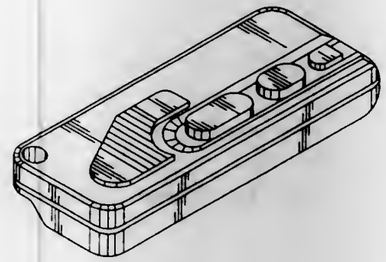
373,315
SPECTRO PHOTOMETER
Atsushi Ninomiya; Isamu Takekoshi, both of Tokyo, and Masaya Kojima, Mito, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 27, 1995, Ser. No. 41,934
Term of patent 14 years
U.S. Cl. D10—75



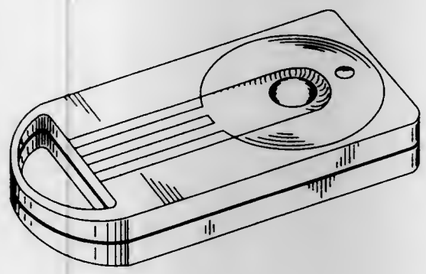
373,316
ELECTRONIC CONTROL MODULE FOR OPERATING A WINDOW
Philip J. Walters, Wellington, New Zealand, assignor to Interlock Industries Limited, Wellington, New Zealand
Filed Dec. 19, 1994, Ser. No. 32,436
Claims priority, application New Zealand, Jun. 20, 1994, 25984
Term of patent 14 years
U.S. Cl. D10—104



373,317
REMOTE CONTROL TRANSMITTER
Shun-Tsain Feng, and Wei-Kang Kan, both of Taipei Hsien, Taiwan, assignors to Multistar Industries Co., Ltd., Taipei, Taiwan
Filed Jan. 3, 1995, Ser. No. 32,984
Term of patent 14 years
U.S. Cl. D10—104



373,318
REMOTE CONTROL DEVICE
Mark E. Berch, Riverwoods, and Charles Bain, West Dundee, both of Ill., assignors to Sequel Security Systems, Inc., Deerfield, Ill.
Filed Jan. 3, 1995, Ser. No. 32,989
Term of patent 14 years
U.S. Cl. D10—106



373,319
BOOMERANG SHAPED REMOTE CONTROL TRANSMITTER
Mark Dziersk, Chicago, Ill., assignor to Audiovox Corporation, Hauppauge, N.Y.
Filed Jan. 6, 1995, Ser. No. 33,245
Term of patent 14 years
U.S. Cl. D10—106

373,320
BUOY
Aarno Jaakkola, Pellinki, Finland, assignor to Oy Sabik AB, Pellinki, Finland
Filed May 18, 1995, Ser. No. 38,979
Claims priority, application Finland, Nov. 24, 1994, 810/94
Term of patent 14 years
U.S. Cl. D10—107

373,321
BELL

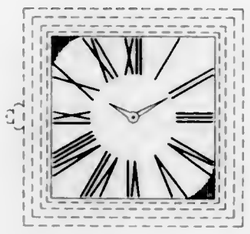
373,323
CHAIN
Elio Bonarini, and Domenico Fornaini, both of Arezzo, Italy,

373,326
MEDALLION
Peter V. Ilaria, East Hanover, and William Macawski, Cald-

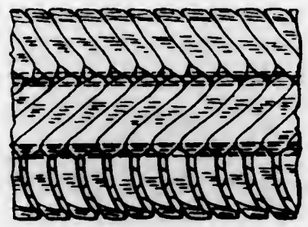
373,328
PLANT SAUCER FOR MULTIPLE PLANT GROUPINGS
Kathleen R. Sellers, 228 E. Boca Raton Rd., Boca Raton, Fla.

373,321
BELL
Chung-Shyan Huang, No. 1-1, Chang Mar Street, Hsiu Shui Hsiang, Chang Hua Hsien, Taiwan
Filed Jan. 12, 1995, Ser. No. 40,190
Term of patent 14 years
U.S. Cl. D10—116

373,322
WATCH FACE
Jacques C. Helleu, Garches, France, assignor to Chanel, Inc., New York, N.Y.
Division of Ser. No. 14,431, Oct. 5, 1993, Pat. No. Des. 358,554, which is a division of Ser. No. 583,703, Sep. 14, 1990, Pat. No. Des. 342,985. This application Apr. 11, 1995, Ser. No. 37,398
Term of patent 14 years
U.S. Cl. D10—125



373,323
CHAIN
Elio Bonarini, and Domenico Fornaini, both of Arezzo, Italy, assignors to Uno A Erre Italia S.p.A., Arezzo, Italy
Filed Jul. 7, 1995, Ser. No. 41,167
Claims priority, application Italy, Jan. 11, 1995, FI9500002
Term of patent 14 years
U.S. Cl. D11—13

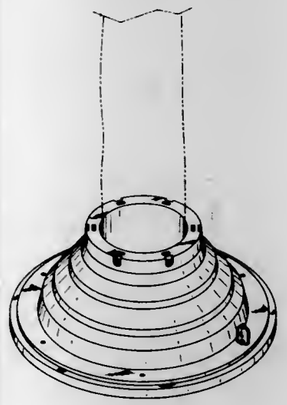


373,324
IDENTIFICATION MEMBER FOR A WRIST BRACELET
Leslie C. Harrell, 9328 Laurel Pl., Littleton, Colo. 80123
Filed Oct. 12, 1994, Ser. No. 29,629
Term of patent 14 years
U.S. Cl. D11—86

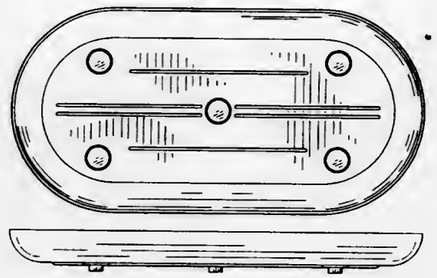
373,325
CLASP SET
Melvin R. Koven, P.O. Box 52, Chama, N.M. 87520
Division of Ser. No. 7,056, Apr. 12, 1993, Pat. No. Des. 360,848. This application Jul. 6, 1995, Ser. No. 41,163
Term of patent 14 years
U.S. Cl. D11—87

373,326
MEDALLION
Peter V. Ilaria, East Hanover, and William Macowski, Caldwell, both of N.J., assignors to Tropar Manufacturing Company, Inc., Florham Park, N.J.
Filed Jun. 27, 1995, Ser. No. 40,796
Term of patent 14 years
U.S. Cl. D11—96

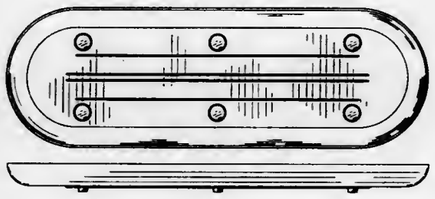
373,327
ARTIFICIAL AND NATURAL CHRISTMAS TREE HOLDER AND TURNTABLE
Raymond Rush, 20 Booth Ave., Englewood Cliffs, N.J. 07632, and Warren Rush, 309 Willow Ave., Lyndhurst, N.J. 07071
Filed Jan. 23, 1995, Ser. No. 33,909
Term of patent 14 years
U.S. Cl. D11—130.1



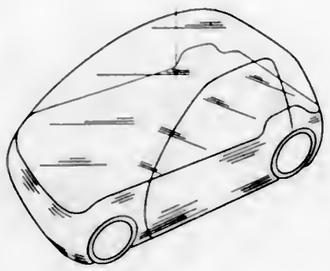
373,328
PLANT SAUCER FOR MULTIPLE PLANT GROUPINGS
Kathleen R. Sellers, 228 E. Boca Raton Rd., Boca Raton, Fla. 33432
Filed Apr. 19, 1995, Ser. No. 37,733
The portion of the term of this patent subsequent to Feb. 20, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—164



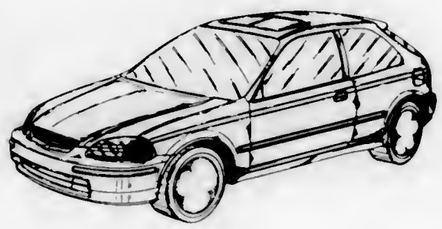
373,329
PLANT SAUCER FOR MULTIPLE PLANT GROUPINGS
Kathleen R. Sellers, 228 E. Boca Raton Rd., Boca Raton, Fla. 33432
Filed Apr. 19, 1995, Ser. No. 37,764
The portion of the term of this patent subsequent to Feb. 20, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—164



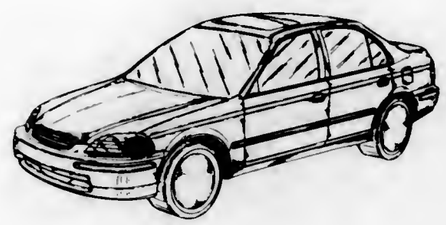
373,330
PASSENGER VEHICLE
Terry E. Haiajko, Winnipeg, Canada, assignor to KOR Product Design Inc., Winnipeg, Canada
Filed Jun. 21, 1994, Ser. No. 24,798
Term of patent 14 years
U.S. Cl. D12—90



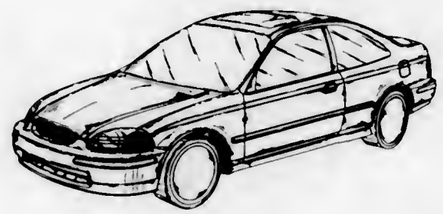
373,331
AUTOMOBILE
Tomoyuki Ohkura, and Harumi Okano, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 16, 1995, Ser. No. 36,249
Claims priority, application Japan, Sep. 16, 1994, 6-28253
Term of patent 14 years
U.S. Cl. D12—91



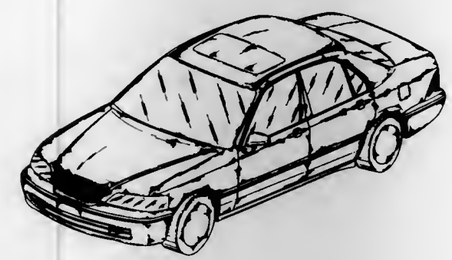
373,332
AUTOMOBILE
Masakazu Udagawa, and Yoshikazu Kigoshi, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 16, 1995, Ser. No. 36,276
Claims priority, application Japan, Sep. 16, 1994, 6-28252
Term of patent 14 years
U.S. Cl. D12—92



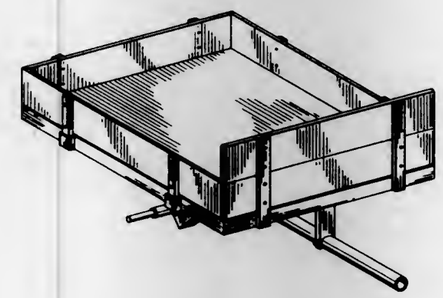
373,333
AUTOMOBILE
Hiroshi Ishibashi; Hideyuki Ikeda, and Ricky J. Hsu, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 16, 1995, Ser. No. 36,290
Claims priority, application Japan, Sep. 16, 1994, 6-28254
Term of patent 14 years
U.S. Cl. D12—92



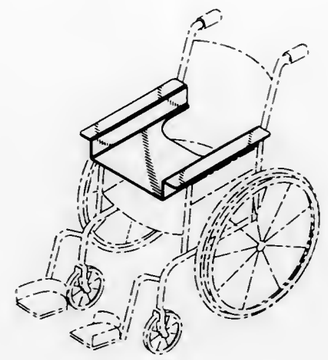
373,334
AUTOMOBILE
Mitsuhiro Honda, and Tamotsu Okamoto, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 4, 1995, Ser. No. 38,492
Claims priority, application Japan, Nov. 4, 1994, 6-33758
Term of patent 14 years
U.S. Cl. D12—92



373,335
FLAT BED TRAILER
Neil D. Repke, P.O. Box 326, Palmer, Mich. 49871
Continuation-in-part of Ser. No. 11,722, Aug. 13, 1993, Pat. No. Des. 361,047. This application Aug. 1, 1995, Ser. No. 42,112
Term of patent 14 years
U.S. Cl. D12—101



373,336
WHEELCHAIR ACCESSORY
Elizabeth F. Classen, 561 E. Northmont Way, Salt Lake City, Utah 84103
Filed Aug. 8, 1995, Ser. No. 42,354
Term of patent 14 years
U.S. Cl. D12—133



373,337
COMBINED AIRCRAFT TIRE AND WHEEL
Colin R. Hunt, 16 Barellan Close, Lake Placid, Cairns, Queensland, Australia
Filed Sep. 2, 1994, Ser. No. 28,243
Term of patent 14 years
U.S. Cl. D12—135

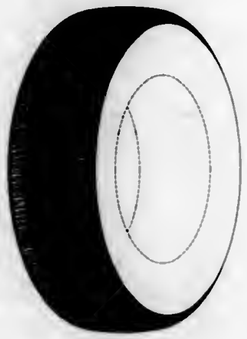
373,338
TIRE TREAD

373,340
BRAKE CALIPER

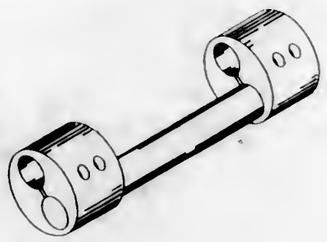
373,342
EXTERIOR SURFACE FOR A VEHICLE LIFTGATE/

373,344
MOTORCYCLE ARM SUPPORT

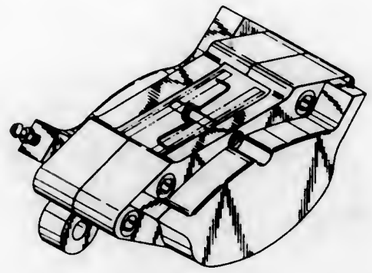
373,338
TIRE TREAD
John S. Attinello, Hartville, Ohio; Maurice Graas, Reichlange, Luxembourg, and Karl E. Sundkvist, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Division of Ser. No. 18,173, Jan. 31, 1994, Pat. No. Des. 366,858. This application Sep. 28, 1995, Ser. No. 44,649
Term of patent 14 years
U.S. Cl. D12—146



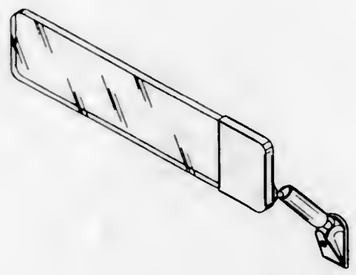
373,339
BICYCLE HANDLEBAR
Chao-Hwu Chen, Taichung Hsien, Taiwan, assignor to Kalloy Industrial Co., Ltd., Taichung Hsien, Taiwan
Filed Nov. 22, 1994, Ser. No. 31,546
Term of patent 14 years
U.S. Cl. D12—178



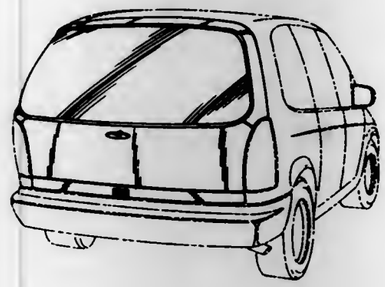
373,340
BRAKE CALIPER
Perry W. Sands, Paramount, Calif., assignor to Performance Machine Inc., Paramount, Calif.
Filed Dec. 6, 1994, Ser. No. 31,778
Term of patent 14 years
U.S. Cl. D12—180



373,341
VEHICLE VISOR ASSEMBLY
Maynard E. Nelson, 160 S. Estates Dr., Salina, Kans. 67401
Filed Feb. 27, 1995, Ser. No. 35,394
Term of patent 14 years
U.S. Cl. D12—191

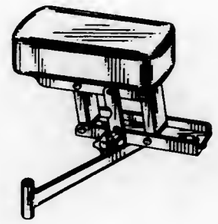


373,342
EXTERIOR SURFACE FOR A VEHICLE LIFTGATE/TAILGATE PANEL
Michael G. Moore, Shelby Township, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.
Filed Mar. 15, 1995, Ser. No. 36,223
Term of patent 14 years
U.S. Cl. D12—196

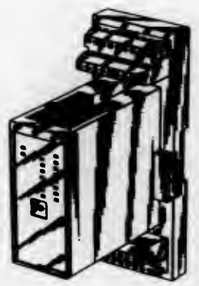


373,343
AIRPLANE WHEEL ACCELERATOR ATTACHMENT
Linda J. Malkowski, and Ronald J. Letky, both of 1089 Shoecraft Rd., Webster, N.Y. 14580
Filed Feb. 27, 1995, Ser. No. 36,421
Term of patent 14 years
U.S. Cl. D12—213

373,344
MOTORCYCLE ARM SUPPORT
Stanley E. Wissen, Jr, Orlando, Fla., assignor to S. E. Robin, Inc., Orlando, Fla.
Filed Jul. 31, 1995, Ser. No. 42,066
Term of patent 14 years
U.S. Cl. D12—421



373,345
PROCESS MONITORING CONTROLLER
Mikio Hamada, Tokyo, and Mitsugu Ueno, Iruma, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Aug. 9, 1995, Ser. No. 42,409
Claims priority, application Japan, Feb. 27, 1995, 7-05163
Term of patent 14 years
U.S. Cl. D13—163



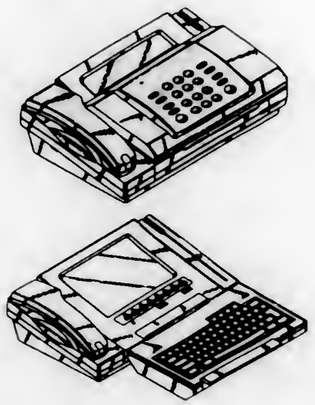
373,346
MACHINE FOR DATA COMMUNICATION HAVING A CARD DETECTOR

373,348
COMBINED COVER AND AIR FILTER FOR A COMPUTER HOUSING

373,350
COMPUTER MOUSE
Kris Verstockt, Antwerp, Belgium, assignor to Primax Elec-

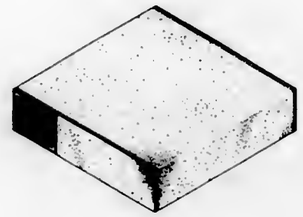
373,352
TELEVISION SET
Sung-Kil Park, Kyunggi-Do, Rep. of Korea, assignor to Dae-

373,346
MACHINE FOR DATA COMMUNICATION HAVING A CARD DETECTOR
Jung-Hwan Hwang, Anyang, Rep. of Korea, assignor to First Technology Co., Ltd., Seoul, Rep. of Korea
Filed Jun. 22, 1995, Ser. No. 40,570
Claims priority, application Rep. of Korea, Feb. 21, 1995, 95-2923
Term of patent 14 years
U.S. Cl. D14—101

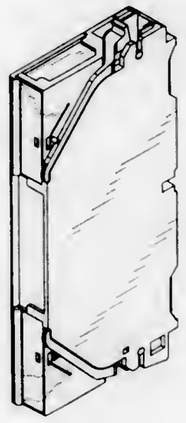


373,347
PORTABLE ELECTRONIC COMMUNICATION DEVICE
Phillip M. Ashley, Ilkley, and Edmund D. Gill, Leeds, both of, United Kingdom, assignors to Phillip Martin Ashley, Ilkley, United Kingdom
Filed May 10, 1995, Ser. No. 38,648
Claims priority, application United Kingdom, Nov. 18, 1994, 2043370
Term of patent 14 years
U.S. Cl. D14—106

373,348
COMBINED COVER AND AIR FILTER FOR A COMPUTER HOUSING
Edward W. Carlson, 3009 E. Lake St., Minneapolis, Minn. 55406
Filed Feb. 9, 1995, Ser. No. 34,665
Term of patent 14 years
U.S. Cl. D14—114

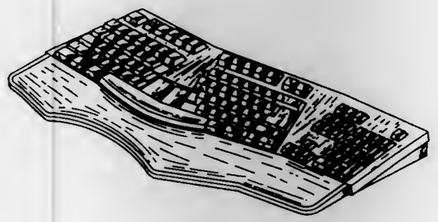


373,349
MASS TERMINATION BLOCK
Robert A. Millard, Loveland, Colo., assignor to Hewlett-Packard Co., Palo Alto, Calif.
Filed May 5, 1995, Ser. No. 38,440
Term of patent 14 years
U.S. Cl. D14—114

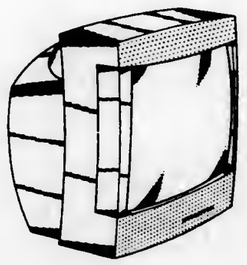


373,350
COMPUTER MOUSE
Kris Verstockt, Antwerp, Belgium, assignor to Primax Electronics Ltd., Taipei, Taiwan
Filed Jun. 1, 1995, Ser. No. 39,666
Term of patent 14 years
U.S. Cl. D14—114

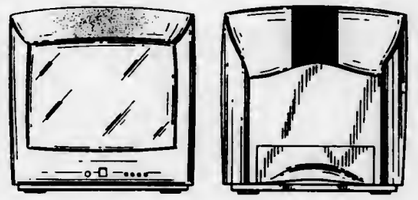
373,351
KEYBOARD
Frank Chen, Taipei, Taiwan, assignor to Silitek Corporation, Taipei, Taiwan
Filed Mar. 28, 1995, Ser. No. 36,804
Term of patent 14 years
U.S. Cl. D14—115



373,352
TELEVISION SET
Sung-Kil Park, Kyunggi-Do, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea
Filed Jan. 30, 1995, Ser. No. 34,169
Claims priority, application Rep. of Korea, Jul. 30, 1994, 94-16735
Term of patent 14 years
U.S. Cl. D14—126



373,353
TELEVISION SET
Philippe Starck, Paris, France, assignor to Thomson Consumer Electronics (Societe Anonyme), Courbevoie, France
Division of Ser. No. 26,656, Aug. 2, 1994, Pat. No. Des. 365,557. This application Sep. 21, 1995, Ser. No. 44,280
Claims priority, application France, Feb. 4, 1994, 94 0627
Term of patent 14 years
U.S. Cl. D14—126



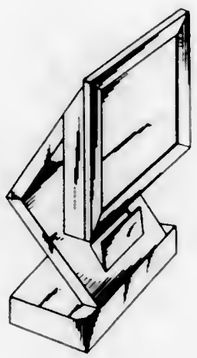
373,354
REAR SCREEN VIDEO DISPLAY SYSTEM WITH AN

373,356
CONSOLE TELEVISION RECEIVER

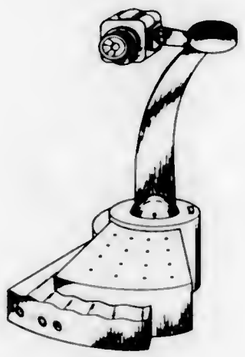
373,358
REMOTE PAGER

373,360
HEADPHONE

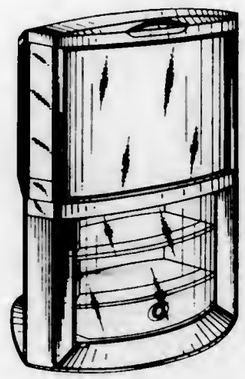
373,354
REAR SCREEN VIDEO DISPLAY SYSTEM WITH AN EXPOSED BEAM PATH
Marvin Maslow, New York, N.Y., assignor to Projectavision, Inc., New York, N.Y.
Filed Apr. 10, 1995, Ser. No. 37,327
Term of patent 14 years
U.S. Cl. D14—128



373,355
VIDEO TELEPHONE
Shu-Chen Huang, Taoyuan; Yu-Lin Chao, and Jeng-Yeong Tyan, both of Hsinchu, all of, Taiwan, assignors to Industrial Technology Research Institute, Taiwan
Filed Dec. 2, 1994, Ser. No. 31,918
Term of patent 14 years
U.S. Cl. D14—130

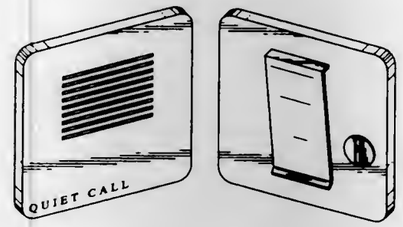


373,356
CONSOLE TELEVISION RECEIVER
Edward L. Boyd, Montvale, N.J., assignor to Sony Corporation of America, Park Ridge, N.J.
Filed Mar. 22, 1995, Ser. No. 36,525
Term of patent 14 years
U.S. Cl. D14—133

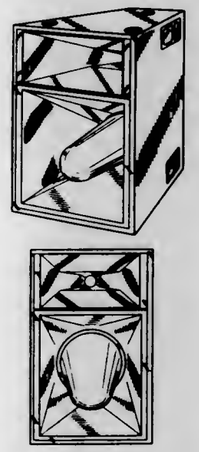


373,357
CLOCK RADIO
Shu K. Wong, Hong Kong, Hong Kong, assignor to Ballanda Limited, Kwai Chung, Hong Kong
Filed Jan. 10, 1995, Ser. No. 33,315
Term of patent 14 years
U.S. Cl. D14—170

373,358
REMOTE PAGER
Cindy Sherwood, 501 Foltz La., Muskogee, Okla. 74403
Filed Aug. 25, 1995, Ser. No. 43,098
Term of patent 14 years
U.S. Cl. D14—191

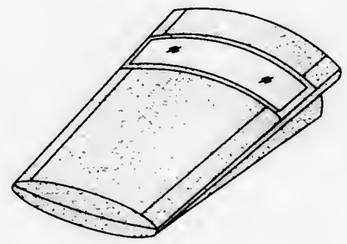


373,359
LOUDSPEAKER
John D. Meyer, and Peter Soper, both of Berkeley, Calif., assignors to Meyer Sound Laboratories Incorporated, Berkeley, Calif.
Filed Dec. 13, 1994, Ser. No. 32,064
Term of patent 14 years
U.S. Cl. D14—204

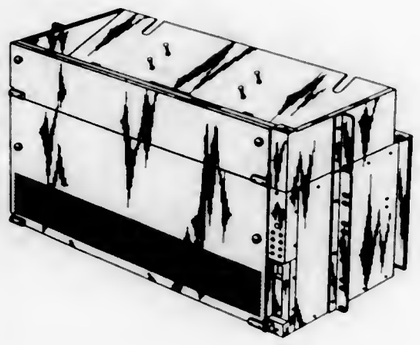


373,360
HEADPHONE
Ryuta Kanno, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jan. 31, 1995, Ser. No. 34,236
Claims priority, application Japan, Aug. 1, 1994, 6-22882
Term of patent 14 years
U.S. Cl. D14—205

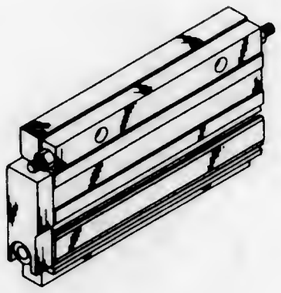
373,361
TELEPHONE CALLER-ID MODULE
Mark Biasotti, San Jose; Michael J. Nuttall, Portola Valley, both of Calif., and John H. Schaffeld, New Vernon, N.J., assignors to AT&T IDM Corp., Coral Gables, Fla.
Filed Jan. 4, 1995, Ser. No. 33,039
The portion of the term of this patent subsequent to Aug. 13, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—240



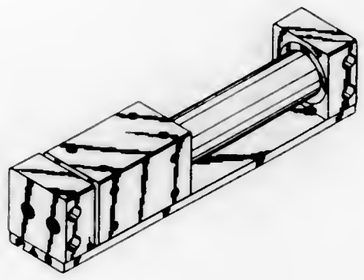
373,362
COMMUNICATION APPARATUS
Yukio Kuroiwa, Higashimurayama; Toshiyuki Utsuki, Tachikawa, and Hiroshi Yoshikawa, Fujisawa, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 28, 1995, Ser. No. 40,483
Claims priority, application Japan, Jan. 11, 1995, 7-221
Term of patent 14 years
U.S. Cl. D14—240



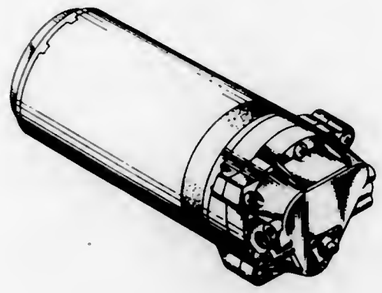
373,363
AIR CYLINDER WITH A SLIDE TABLE
Hiroshi Miyachi; Mitsutoshi Araki; Yoshiteru Ueno, and Norihide Yamase, all of Ibaraki-ken, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 18, 1994, Ser. No. 31,134
Claims priority, application Japan, May 18, 1994, 6-14089
Term of patent 14 years
U.S. Cl. D15—5



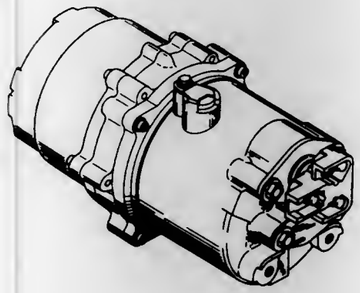
373,364
RODLESS CYLINDER
Takashi Abe, Yawara-mura, Japan, assignor to SMC Corporation, Tokyo, Japan
Filed May 30, 1995, Ser. No. 40,253
Claims priority, application Japan, Nov. 30, 1994, 6-36463
Term of patent 14 years
U.S. Cl. D15—7



373,365
WOBBLE PLATE PUMP AND MOTOR HOUSING
Ivar L. Schoenmeyr, San Juan Capistrano, Calif., assignor to Aquatec Water Systems, Inc., Anaheim, Calif.
Filed Aug. 7, 1995, Ser. No. 42,304
Term of patent 14 years
U.S. Cl. D15—7

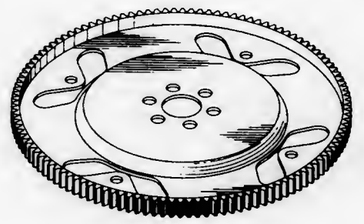


373,366
REFRIGERANT COMPRESSOR
Hirofumi Wada; Takayuki Kudo, and Shinichi Otake, all of Isesaki, Japan, assignors to Sanden Corp., Isesaki, Japan
Filed Jun. 26, 1995, Ser. No. 40,761
Claims priority, application Japan, Feb. 24, 1995, 7-5005
Term of patent 14 years
U.S. Cl. D15—9

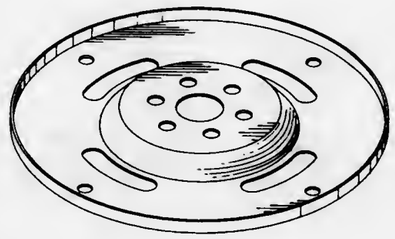


373,367
COLLAPSIBLE SPREADER
Paul M. Haviovitz, Escondido, Calif., assignor to Republic Tool & Mfg. Corp., Carlsbad, Calif.
Filed Dec. 16, 1994, Ser. No. 32,394
Term of patent 14 years
U.S. Cl. D15—13

373,368
DRIVE PLATE FOR A MOTOR VEHICLE
Hideki Matsui; Mitsuyoshi Matsuno; Eiji Okamoto, and Hiroshi Watanabe, all of Shizuoka-ken, Japan, assignors to Fujikiko Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 27, 1995, Ser. No. 40,822
Claims priority, application Japan, Dec. 27, 1994, 6-39531; Jan. 31, 1995, 7-1976; Feb. 28, 1995, 7-5131; Feb. 28, 1995, 7-5132; Feb. 28, 1995, 7-5133; Feb. 28, 1995, 7-5134; Feb. 28, 1995, 7-5135; Feb. 28, 1995, 7-5136; Feb. 28, 1995, 7-5137
Term of patent 14 years
U.S. Cl. D15—148



373,369
DRIVE PLATE FOR A MOTOR VEHICLE
Hideki Matsui, and Eiji Okamoto, both of Shizuoka-ken, Japan, assignors to Fujikiko Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 27, 1995, Ser. No. 40,921
Claims priority, application Japan, Jan. 31, 1995, 7-1974; Jan. 31, 1995, 7-1975; Mar. 31, 1995, 7-8669
Term of patent 14 years
U.S. Cl. D15—148



373,370
REINFORCEMENT MEMBER FOR PISTON RETAINER

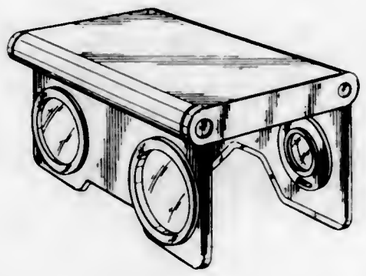
373,372
SUNGLASSES

373,374
LUCIDA CASUAL TYPEFACE

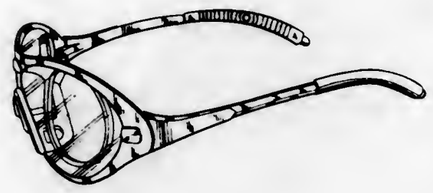
373,376
PAPER SUPPLYING DEVICE FOR COPYING MACHINE

373,370
REINFORCEMENT MEMBER FOR PISTON RETAINER IN A VEHICLE AUTOMATIC TRANSMISSION
William L. Anthony, Schaumburg, Ill., assignor to Toledo Trans-Kit, Inc., Toledo, Ohio
Filed Jul. 14, 1995, Ser. No. 41,445
Term of patent 14 years
U.S. Cl. D15—148

373,371
PAIR OF BINOCULARS
Kwong C. Chan, Flat A, 7th Floor, Manning Industrial Building, 118 How Ming Street, Kwung Tong, Kowloon, Hong Kong
Filed Oct. 27, 1995, Ser. No. 45,752
Claims priority, application United Kingdom, May 1, 1995, 2047149
Term of patent 14 years
U.S. Cl. D16—133



373,372
SUNGLASSES
Luciano Simioni, Montebelluna, Italy, assignor to Killer Loop S.p.A., Pederobba, Italy
Filed Oct. 23, 1995, Ser. No. 46,813
Claims priority, application Italy, Apr. 28, 1995, TV950000021
Term of patent 14 years
U.S. Cl. D16—304



373,373
LUCIDA CASUAL ITALIC TYPEFACE
Charles A. Bigelow, and Kris A. Holmes, both of Atherton, Calif., assignors to Bigelow & Holmes Inc., Atherton, Calif.
Filed Mar. 15, 1994, Ser. No. 19,958
Term of patent 14 years
U.S. Cl. D18—24

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373,374
LUCIDA CASUAL TYPEFACE
Charles A. Bigelow, and Kris A. Holmes, both of Atherton, Calif., assignors to Bigelow & Holmes Inc., Atherton, Calif.
Filed Mar. 15, 1994, Ser. No. 20,042
Term of patent 14 years
U.S. Cl. D18—24

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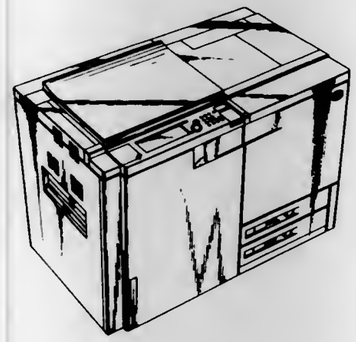
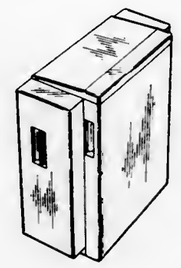
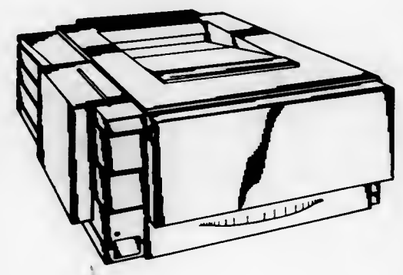
373,375
COPYING MACHINE
Ei Yamamoto, and Hisakazu Shimizu, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 25, 1995, Ser. No. 39,251
Claims priority, application Japan, Nov. 28, 1994, 6-36097
Term of patent 14 years
U.S. Cl. D18—39



373,376
PAPER SUPPLYING DEVICE FOR COPYING MACHINE
Ei Yamamoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 25, 1995, Ser. No. 39,250
Claims priority, application Japan, Nov. 28, 1994, 6-36098
Term of patent 14 years
U.S. Cl. D18—44



373,377
DOCUMENT PRINTER
Will G. Fetheroff, Boise, Id., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Mar. 3, 1995, Ser. No. 35,654
Term of patent 14 years
U.S. Cl. D18—50



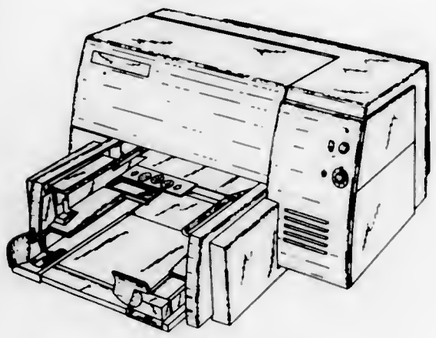
373,378
COLOR INKJET PRINTER

373,380
INKJET PRINTER

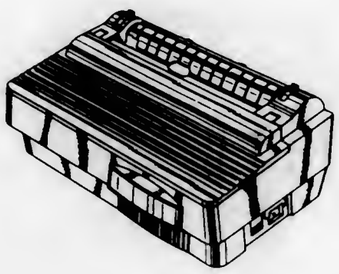
373,382
POSTCARD

373,384
APPLICATOR WITH SLIDE RING ACTIVATOR

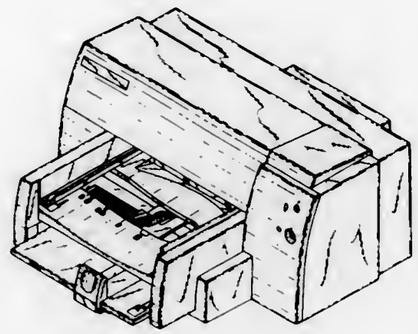
373,378
COLOR INKJET PRINTER
Stephen C. Brown, Vancouver; Donald R. Bloyer, Brush Prairie; Stephen D. Dorow, Vancouver; Sandra Y. Okazaki, Redmond; Larry A. Jackson; Richard E. Berriman, both of Vancouver; Donald R. McClelland, Brush Prairie, all of Wash.; David M. Thorpe; Jan Hippen, both of Portland, Oreg.; John A. Christianson; Richard A. Kelley, both of Vancouver, Wash.; Daniel R. Dwyer, Washougal, Wash.; Steve O. Rasmussen, Vancouver, Wash.; Larry G. Neubauer, Vancouver, Wash., and Henry Y. Chin, Portland, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Mar. 2, 1995, Ser. No. 35,557
Term of patent 14 years
U.S. Cl. D18—55



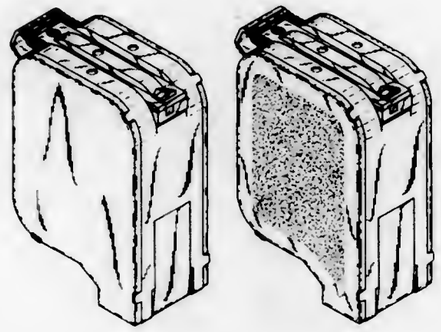
373,379
PRINTER FOR ELECTRONIC COMPUTER
Isao Sugimoto, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Sep. 21, 1994, Ser. No. 28,746
Term of patent 14 years
U.S. Cl. D18—50



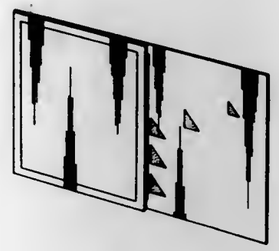
373,380
INKJET PRINTER
Daniel R. Dwyer, Washougal; Gene D. Jones, Yacolt; Thomas E. McCue, Jr., Vancouver; Michael K. Bowen, Vancouver, and Michael M. Leon, Washougal, all of Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Mar. 2, 1995, Ser. No. 35,642
Term of patent 14 years
U.S. Cl. D18—55



373,381
PRINT CARTRIDGE
John M. Altendorf, and Joseph R. Elliot, both of Corvallis, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Feb. 17, 1995, Ser. No. 35,064
Term of patent 14 years
U.S. Cl. D18—56



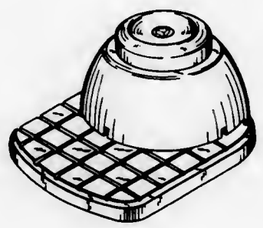
373,382
POSTCARD
Myriam Nielsen, 20 Rue Smolett, and Jean-Charles Dusanter, 8 Place Garibaldi, both of 06300 Nice, France
Filed Dec. 30, 1994, Ser. No. 32,915
Term of patent 14 years
U.S. Cl. D19—1



373,383
CAP FOR WRITING INSTRUMENT
Hiromichi Izushima, Kawagoe, Japan, assignor to Kotobuki & Co., Ltd., Kyoto, Japan
Filed Aug. 15, 1995, Ser. No. 42,630
Claims priority, application Japan, May 29, 1995, 7-14761
Term of patent 14 years
U.S. Cl. D19—57

373,384
APPLICATOR WITH SLIDE RING ACTIVATOR
Thomas G. Frazier, 17 Welden Dr., Doylestown, Pa. 18901
Filed Apr. 17, 1995, Ser. No. 37,684
Term of patent 14 years
U.S. Cl. D19—66

373,385
PUNCH TOOL
Douglas J. Birkholz, Deforest, Wis., assignor to Fiskars Inc., Madison, Wis.
Filed Oct. 4, 1994, Ser. No. 29,395
Term of patent 14 years
U.S. Cl. D19—72



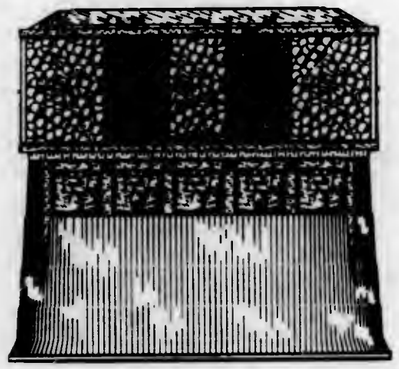
373,386

373,388

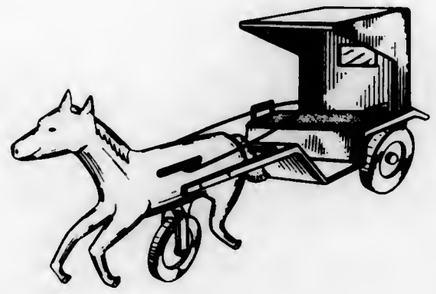
373,390

373,392

373,386
TEN SECTION GUMBALL VENDING MACHINE
Jamie Beene, 701 Brandon Dr., Cleburne, Tex. 76031
Filed Aug. 4, 1995, Ser. No. 42,221
Term of patent 14 years
U.S. Cl. D20—7

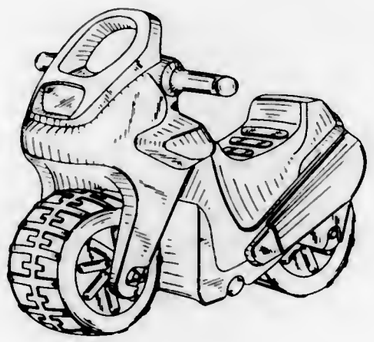


373,388
ANIMAL DRAWN RIDING TOY
Nazarian Kevork, 1062 Edgewood La., Fort Lee, N.J. 07024
Filed Feb. 27, 1995, Ser. No. 35,430
Term of patent 14 years
U.S. Cl. D21—74

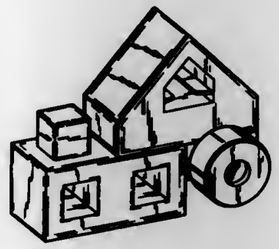


373,387
LIGHT EMITTING DIODE OPEN SIGN
Chen-Ho Wu, Los Altos Hills, Calif., assignor to Leotek Electronics Corporation, Taipei, Taiwan
Filed Oct. 31, 1995, Ser. No. 45,858
Term of patent 14 years
U.S. Cl. D20—10

373,389
TOY MOTORCYCLE
Jay M. Bro; Peter J. Myers, and Philip M. Baerenwald, all of Plano, Tex., assignors to Today's Kids, Inc., Booneville, Ark.
Filed Feb. 4, 1994, Ser. No. 18,402
Term of patent 14 years
U.S. Cl. D21—81

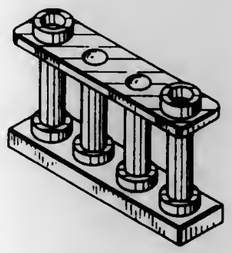


373,390
CONSTRUCTION GAME
Peter Larws, Schlappmühlerpfad, 61250 Usingen, Germany
Filed Aug. 24, 1994, Ser. No. 27,574
Claims priority, application Hague Agreement, Feb. 28, 1994, 69524/01-06
Term of patent 14 years
U.S. Cl. D21—108

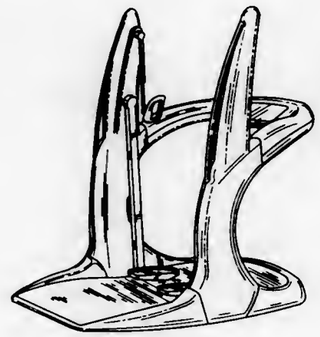


373,392
HIMALAYAN LADAKHI DOLL
Rajinder K. Taneja, 8615 Cross Chase Ct., Fairfax Station, Va. 22039
Filed Aug. 21, 1995, Ser. No. 42,927
Term of patent 14 years
U.S. Cl. D21—180

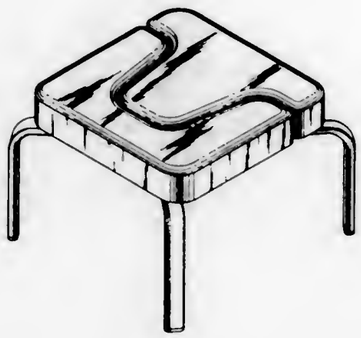
373,391
TOY BUILDING ELEMENT
Ib T. Skov, Billund, Denmark, assignor to INTERLEGO AG, Baar, Switzerland
Filed Sep. 14, 1995, Ser. No. 43,997
Term of patent 14 years
U.S. Cl. D21—108



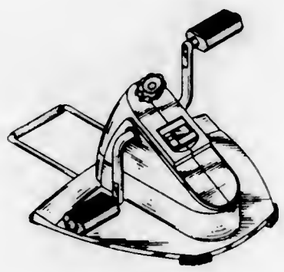
373,393
EXERCISE MACHINE
Fernando A. Montijo, Newport Beach; Bryan H. Vollmer, Trabuco Canyon, and Mark A. West, Laguna Beach, all of Calif., assignors to Sport Specific of America, Inc., Dallas, Tex.
Filed Nov. 28, 1994, Ser. No. 31,432
Term of patent 14 years
U.S. Cl. D21—191



373,394
EXERCISE STOOL
Lawrence I. Jacobs, 729 W. 16th St., #B9, Costa Mesa, Calif. 92627
Filed Jun. 2, 1995, Ser. No. 39,703
Term of patent 14 years
U.S. Cl. D21—191

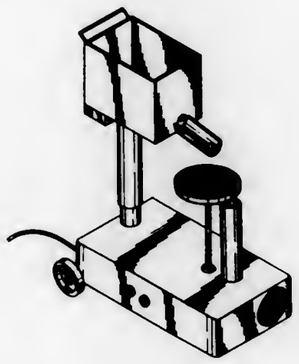


373,395
EXERCISER
Chih-liang Chen, No. 10, Lane 1431, Kuanghsin Rd., Peteh Hsiang, Taoyuan Hsien, Taiwan
Filed Jun. 6, 1995, Ser. No. 39,857
Term of patent 14 years
U.S. Cl. D21—194



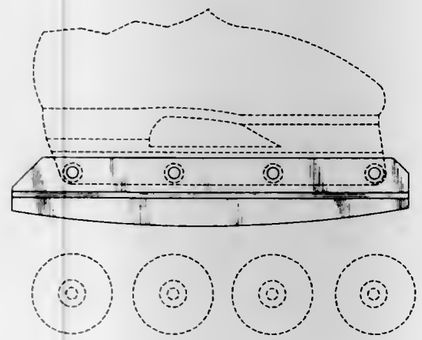
373,396
BASEBALL SWING-TRAINING DEVICE
Lonnie D. Malwitz, 9840 250th Street West, Lakeville, Minn. 55044
Filed Jan. 5, 1995, Ser. No. 33,158
Term of patent 14 years
U.S. Cl. D21—199

373,397
TENNIS BALL POSITIONING DEVICE
Travis C. DeBardelaben, 1018 Stableway Rd., Pike Road, Ala. 36064
Filed Apr. 28, 1995, Ser. No. 38,172
Term of patent 14 years
U.S. Cl. D21—199



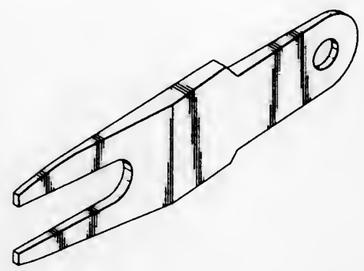
373,398
FOOT TOY
Marty M. Sedighzadeh, P.O. Box 36250, Denver, Colo. 80236
Filed Sep. 18, 1995, Ser. No. 44,100
Term of patent 14 years
U.S. Cl. D21—203

373,399
ADAPTOR ICE SKATE BLADE FOR AN INLINE SKATE
Clifford Both, 55 Colfax Dr., Pequannock, N.J. 07440
Filed Nov. 24, 1995, Ser. No. 46,998
Term of patent 14 years
U.S. Cl. D21—225



373,400
SKATE BOARD
Randy T. Ogata; Primo C. Lagundino, and Kellin A. Achuara, all of Rte. 2, Box 906, Laferia, Tex. 78559
Filed Oct. 13, 1994, Ser. No. 29,677
Term of patent 14 years
U.S. Cl. D21—227

373,401
GOLF BALL MARK REPAIR TOOL
H. Edmund Schempp, P.O. Box 1181, Ephrata, Wash. 98823
Filed Oct. 4, 1994, Ser. No. 29,377
Term of patent 14 years
U.S. Cl. D21—234

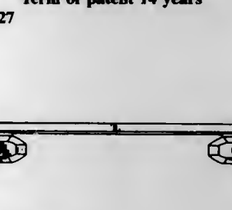


373,402
GOLFER'S PLUMB
Manley D. Williamson, 5 Oakland Dr., Castle Hayne, N.C. 28429
Filed Oct. 4, 1994, Ser. No. 29,396
Term of patent 14 years
U.S. Cl. D21—234

373,403
CYLINDRICAL HUNTING BLIND
Jeffrey Lee Hall, 1 Hall Rd., Lebanon, Maine 04027
Filed Jun. 6, 1995, Ser. No. 39,858
Term of patent 14 years
U.S. Cl. D21—194

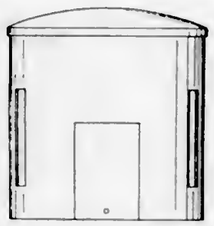
373,405
WATER DISTRIBUTION BOX FOR SNOW MAKING
Jean-Pierre Bonnet, 1 Rue Du Pont, Bonneville, France
Filed Jun. 6, 1995, Ser. No. 39,859
Term of patent 14 years
U.S. Cl. D21—199

373,407
FAUCET CONNECTOR
Jeffrey Lee Hall, 1 Hall Rd., Lebanon, Maine 04027
Filed Jun. 6, 1995, Ser. No. 39,860
Term of patent 14 years
U.S. Cl. D23—300

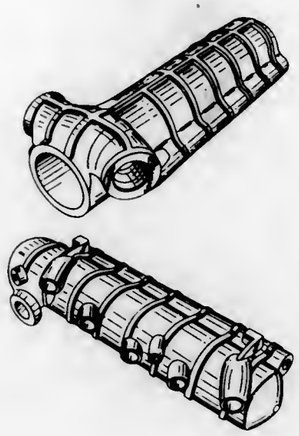


373,409
FLUSHING ADAPTER FOR FLUSHING A VEHICLE
Jeffrey Lee Hall, 1 Hall Rd., Lebanon, Maine 04027
Filed Jun. 6, 1995, Ser. No. 39,861
Term of patent 14 years
U.S. Cl. D23—300

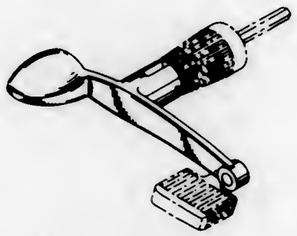
373,403
CYLINDRICAL HUNTING BLIND
Rocky A. Hall, P.O. Box 1340, Henderson, Tex. 75653
Continuation-in-part of Ser. No. 112,250, Aug. 25, 1993, Pat. No. 5,371,966. This application Dec. 9, 1994, Ser. No. 31,969
Term of patent 14 years
U.S. Cl. D21—253



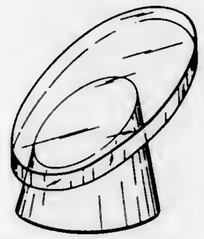
373,405
WATER DISTRIBUTION BOX FOR SNOW MAKING MACHINE
Lennart Nilsson, Box 3084, S-831 03 Ostersund, Sweden
Filed Dec. 27, 1993, Ser. No. 16,787
Claims priority, application Sweden, Jul. 2, 1993, 93-1527
Term of patent 14 years
U.S. Cl. D23—200



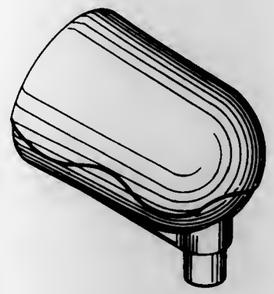
373,404
CRANK HANDLE FOR A FISHING REEL
Randy L. Atherton; Kent L. Zwayer, both of Tulsa, and Perry A. Freeman, Big Cabin, all of Okla., assignors to Zebco Division of Brunswick Corporation, Tulsa, Okla.
Filed Sep. 15, 1995, Ser. No. 44,062
Term of patent 14 years
U.S. Cl. D22—140



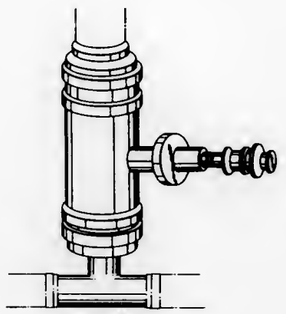
373,406
FAUCET HANDLE
Adolf Gottwald, Iserlohn, and Veit Bechte, Holzwickede, both of, Germany, assignors to Friedrich Grohe Aktiengesellschaft, Hemer, Germany
Filed Aug. 25, 1995, Ser. No. 43,369
Claims priority, application Germany, Feb. 27, 1995, M9501629.5
Term of patent 14 years
U.S. Cl. D23—252



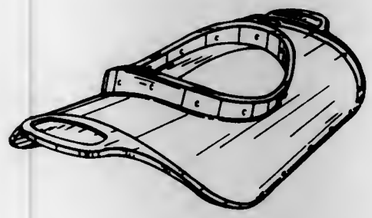
373,407
FAUCET CONNECTOR
Thomas J. Macek, Chicago, and Frank Santapa, Rosemont, both of Ill., assignors to Selfix, Inc., Chicago, Ill.
Filed Aug. 1, 1995, Ser. No. 42,122
Term of patent 14 years
U.S. Cl. D23—255



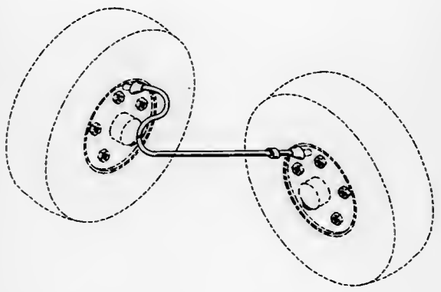
373,409
FLUSHING ADAPTER FOR FLUSHING A VEHICLE COOLING SYSTEM
Raymond Shifflet, and Henrietta Shifflet, both of HCR 81, Box 29, Irvine, Ky. 40336-9201
Filed Feb. 28, 1994, Ser. No. 19,282
Term of patent 14 years
U.S. Cl. D23—263



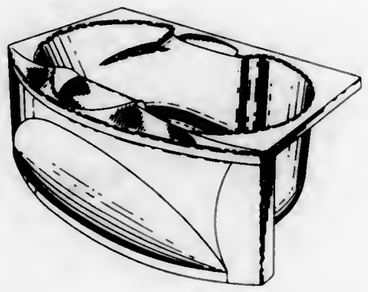
373,408
COLLAR FOR A PIPE INLET
Eric Wood, Kirk Michael, Isle of Man, assignor to Insituform (Netherlands) BV, Rotterdam, Netherlands
Continuation of Ser. No. 15,525, Nov. 19, 1993, abandoned. This application Sep. 18, 1995, Ser. No. 44,096
Claims priority, application United Kingdom, May 19, 1993, 2031177
Term of patent 14 years
U.S. Cl. D23—260



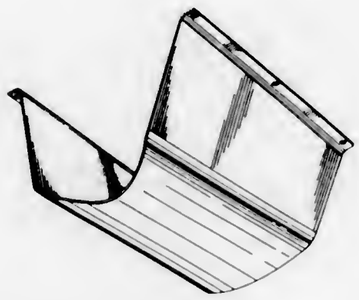
373,410
TIRE INFLATION HOSE
Armando Diaz, 536 Taylor, Bronx, N.Y. 10473
Filed Sep. 11, 1995, Ser. No. 43,705
Term of patent 14 years
U.S. Cl. D23—266



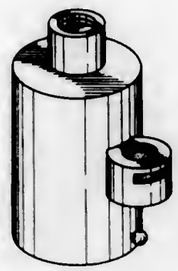
373,411
BATH TUB
Jean-Marie Eeckhoudt, Beauce, Canada, assignor to Maax, Inc., Quebec, Canada
Filed May 1, 1995, Ser. No. 38,219
Term of patent 14 years
U.S. Cl. D23—277



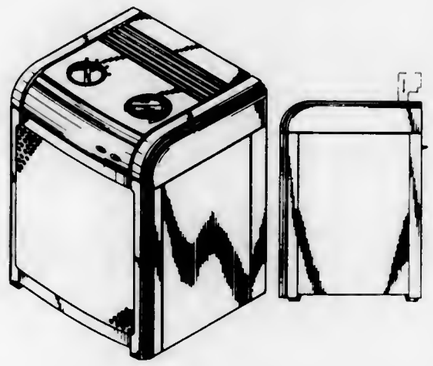
373,412
PROTECTIVE UNDERSINK ENCLOSURE
Thomas W. Trueb, and Steven R. Trueb, both of Ellington, Conn., assignors to TrueBro, Inc., Ellington, Conn.
Filed Jun. 21, 1995, Ser. No. 40,563
Term of patent 14 years
U.S. Cl. D23—308



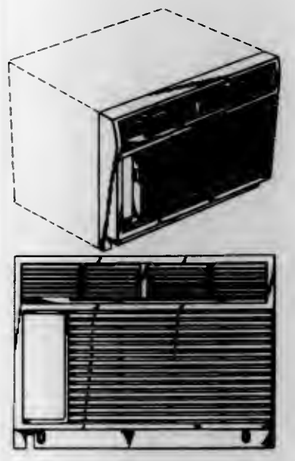
373,413
COMBINATION TOILET CLEANER AND WATER CONSERVATION DEVICE
Quoc V. Ngo, 197 Carolbreen Square, Scarborough, Ontario, Canada
Filed Jun. 22, 1995, Ser. No. 40,642
Term of patent 14 years
U.S. Cl. D23—309



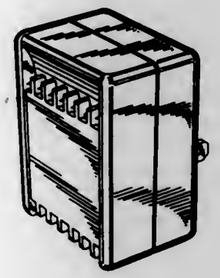
373,414
HEATER FAN
John C. Bucher, Coral Springs; Shih T. Wu, Lighthouse Point, both of Fla.; Ta-Yao Tao, Taipei, Taiwan, and John C Elliott, Tamarac, Fla., assignors to Chien Luen Industries Company, Ltd., Inc., Ft. Lauderdale, Fla.
Division of Ser. No. 2,824, Dec. 21, 1992, Pat. No. Des. 358,636. This application Apr. 15, 1994, Ser. No. 21,375
Term of patent 14 years
U.S. Cl. D23—335



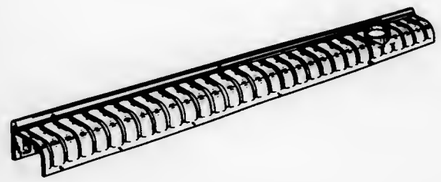
373,415
FRONT PANEL FOR A ROOM AIR CONDITIONER
Christopher M. Thompson, Nashville, and Brian J. Phillips, Smyrna, both of Tenn., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Division of Ser. No. 7,406, Apr. 22, 1993, Pat. No. Des. 365,627. This application Sep. 13, 1995, Ser. No. 43,861
Term of patent 14 years
U.S. Cl. D23—354



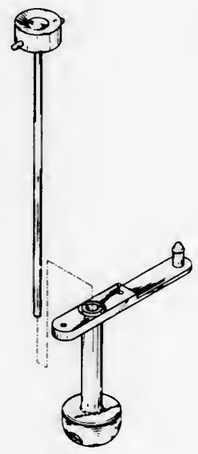
373,416
PLUG-IN IONIZER
Joseph E. Ford, Cary; Ronald O. Hilger, Elmhurst, both of Ill., and Raymond Chan, Vancouver, Canada, assignors to Jing Mei Industrial Holdings, Ltd.
Filed Oct. 17, 1994, Ser. No. 29,794
Term of patent 14 years
U.S. Cl. D23—364



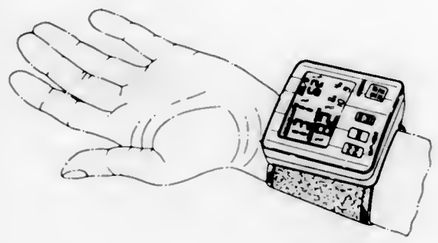
373,417
PORTION OF A CONDENSER TANK USED ON A VEHICLE
In-Jun Lee, Taegu, Rep. of Korea, assignor to DaeWoo Automotive Component, Ltd., Rep. of Korea
Filed Jul. 22, 1994, Ser. No. 26,239
Claims priority, application Rep. of Korea, Jan. 22, 1994, 94-1407
Term of patent 14 years
U.S. Cl. D23—386



373,418
GASTROSTOMY DEVICE WITH OBTURATOR
Anthony J. Szpak, Parma, Ohio, assignor to Applied Medical Technology, Inc., Independence, Ohio
Filed Dec. 1, 1994, Ser. No. 31,618
Term of patent 14 years
U.S. Cl. D24—112

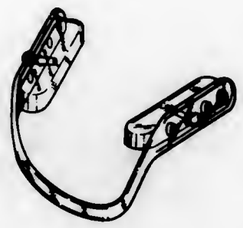


373,419
SPHYGMOMANOMETER
Etsushi Muramatsu, Osaka, Japan; Florian Seiffert, Wiesbaden, Germany, and Keiichi Kitagawa, Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Mar. 6, 1995, Ser. No. 35,946
Claims priority, application Japan, Sep. 12, 1994, 27822/94
Term of patent 14 years
U.S. Cl. D24—165

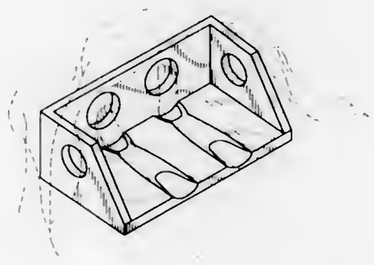


373,420
EXTENSION MIRROR WITH ATTACHED LIGHT
James L. Ingram, NDSCS Box 1680,, Wahpeton, N. Dak. 58076, and Wesley L. Ingram, CMR 467 Box 3081, Apo
Filed Apr. 3, 1995, Ser. No. 37,024
Term of patent 14 years
U.S. Cl. D24—176

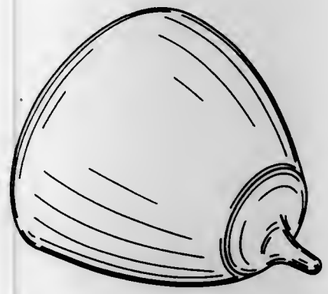
373,421
ORTHOPEDIC MOUTHPIECE FOR DENTAL OCCLUSION CONTROL
Thomas J. Brown, 1146 Guinevere, Liberty, Mo. 64068
Filed Aug. 8, 1995, Ser. No. 42,348
Term of patent 14 years
U.S. Cl. D24—180



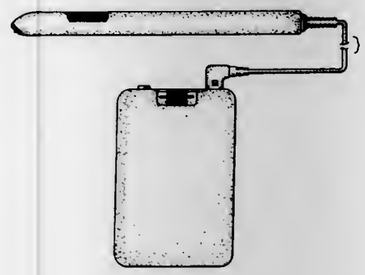
373,422
ORTHOPEDIC THERAPEUTIC PROP
Harold G. Adams, 4408 Durango La., McKinney, Tex. 75070
Filed Apr. 24, 1995, Ser. No. 37,883
Term of patent 14 years
U.S. Cl. D24—192



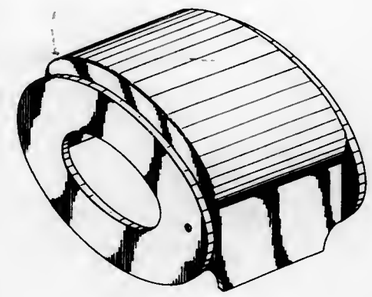
373,423
BABY BOTTLE
Gregg Mazade, and Gary Mazade, both of P.O. Box 593, Victor, Mont. 59875
Filed Sep. 10, 1995, Ser. No. 44,105
Term of patent 14 years
U.S. Cl. D24—198



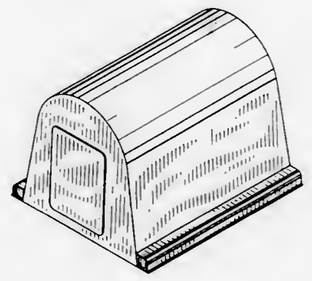
373,424
DEVICE FOR STIMULATING ACUPUNCTURE POINT
Ronnie H. Colsen, and Andrew L. Deller, both of Tokyo, Japan, assignors to Waco Corporation Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 33,077, Jan. 4, 1995, abandoned.
This application Jun. 6, 1995, Ser. No. 39,938
Claims priority, application Japan, Jul. 25, 1994, 6-22322
Term of patent 14 years
U.S. Cl. D24—200



373,425
COMBINED BACK EXERCISER AND MASSAGER
Londi A. Palmisano, 3645 Vinton Ave., #5, Los Angeles, Calif. 90034, and John S. Erickson, Chaska, Minn., assignors to Londi A. Palmisano, Torrance, Calif.
Continuation of Ser. No. 27,645, Aug. 26, 1994, abandoned.
This application Sep. 27, 1995, Ser. No. 44,622
Term of patent 14 years
U.S. Cl. D24—211



373,426
ENCLOSURE FOR A WELL PRESSURE TANK
John L. Maxwell, 5200 Leisure La., Placerville, Calif. 95667
Filed Apr. 11, 1994, Ser. No. 21,131
Term of patent 14 years
U.S. Cl. D25—18



373,427
TREE STAND

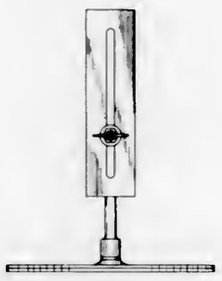
373,429
LINEAR ATTACHMENT

373,432
AUXILIARY BRAKE LAMP

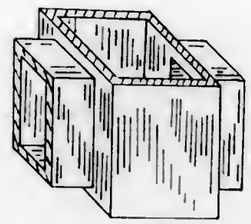
373,434
FLEXIBLE FLASHLIGHT

373,427
TREE STAND
Terry L. Russom, 2404 Greene 624 Rd., Paragould, Ark. 72450
Filed May 8, 1995, Ser. No. 38,545
Term of patent 14 years
U.S. Cl. D25—62

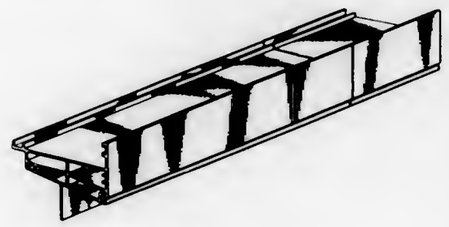
373,428
ADJUSTABLE STABILIZER FOOT FOR A LADDER
Paul A. Nashleanas, and Eileen L. Nashleanas, both of 14919 McIntosh La., Tenino, Wash. 98589
Filed Jan. 26, 1995, Ser. No. 34,039
Term of patent 14 years
U.S. Cl. D25—68



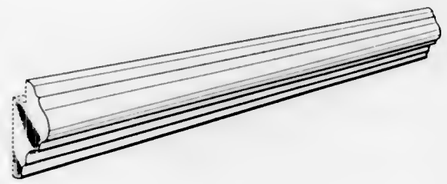
373,429
LINEAR ATTACHMENT
Benoit Sauve, 360 RR. Ste Marie-Ouest, St-Timothee, Québec, Canada
Filed Nov. 14, 1994, Ser. No. 30,947
Term of patent 14 years
U.S. Cl. D25—118



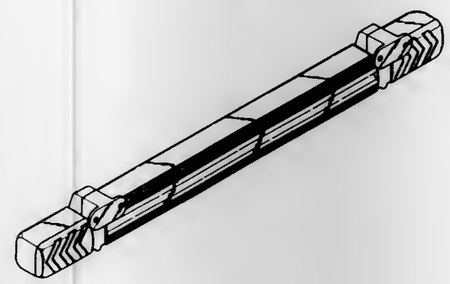
373,430
WINDOW SILL
Domenic Colitto, Bolton, Canada, assignor to Royal Extrusions Limited, Woodbridge, Canada
Filed May 31, 1995, Ser. No. 39,448
Term of patent 14 years
U.S. Cl. D25—124



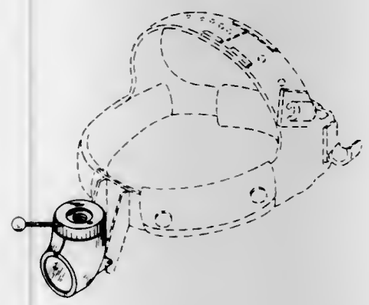
373,431
MOULDING FACADE
Dennis R. Douglas, 98 Monte Vista Dr., Napa, Calif. 94559, and Deborah M. Robertson, 6 Huntington Ct., Napa, Calif. 94558
Filed Feb. 10, 1994, Ser. No. 18,592
Term of patent 14 years
U.S. Cl. D25—136



373,432
AUXILIARY BRAKE LAMP
Jun-Da Wu, P.O. Box 1032, Tainan, Taiwan
Filed Jun. 20, 1995, Ser. No. 40,506
Term of patent 14 years
U.S. Cl. D26—28

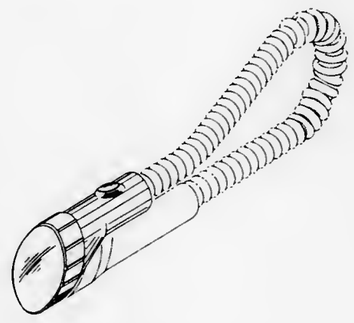


373,433
SURGICAL HEADLIGHT
Richard E. Feinbloom, New York, N.Y., assignor to Designs For Vision, Inc., Ronkonkoma, N.Y.
Filed Mar. 8, 1995, Ser. No. 35,948
Term of patent 14 years
U.S. Cl. D26—39

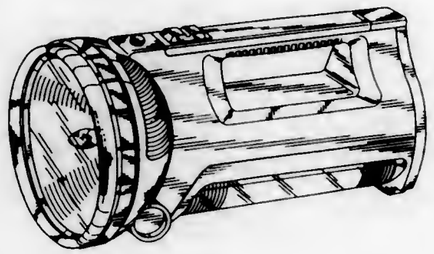


373,434
FLEXIBLE FLASHLIGHT
Patrick Nolan, Westport, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Feb. 21, 1995, Ser. No. 35,077
Term of patent 14 years
U.S. Cl. D26—43

373,435
HEAD FOR A FLEXIBLE FLASHLIGHT
Patrick B. Nolan, Westport, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Apr. 17, 1995, Ser. No. 37,598
Term of patent 14 years
U.S. Cl. D26—43



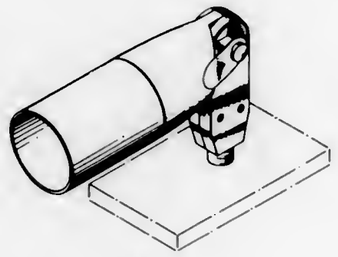
373,436
COMBINED FLASHLIGHT AND FLUORESCENT LAMP
Wai-Hung Li, Tai Po, and Chi-Kwong Lam, Kwai Chung, both of, Hong Kong, assignors to Bright Commence Industrial Ltd., Hong Kong
Filed May 2, 1995, Ser. No. 38,256
Term of patent 14 years
U.S. Cl. D26—44

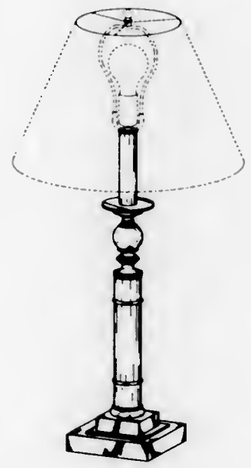


373,438
DESK LAMP
Kelly J. McCann-Compton, Grand Haven, and Thomas M. Edwards, Spring Lake, both of Mich., assignors to Light Corporation, Grand Haven, Mich.
Filed Oct. 11, 1994, Ser. No. 28,628
Term of patent 14 years
U.S. Cl. D26—65

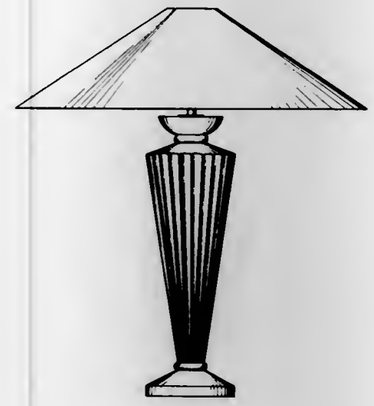
373,439
TABLE LAMP BASE
David H. Porter, Chagrin Falls, Ohio, assignor to The L.D. Kichler Co., Cleveland, Ohio
Filed Dec. 8, 1994, Ser. No. 31,936
Term of patent 14 years
U.S. Cl. D26—93

373,437
OUTDOOR LIGHTING FIXTURE INCLUDING PIVOTABLE SUPPORT
Hiroshi Kira, Westlake Village, Calif., assignor to Lumiere Design & Manufacturing, Inc., Westlake Village, Calif.
Filed Nov. 2, 1995, Ser. No. 45,912
Term of patent 14 years
U.S. Cl. D26—63

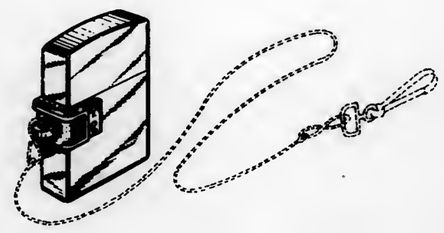




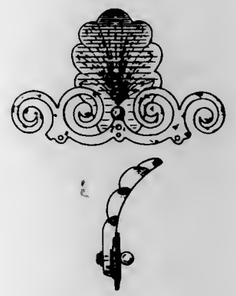
373,440
TABLE LAMP
Sally S. Lewis, 715 N. Canon Dr., Beverly Hills, Calif. 90210
Filed Jul. 28, 1995, Ser. No. 41,989
Term of patent 14 years
U.S. Cl. D26—110



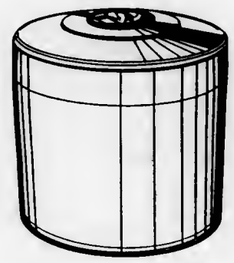
373,442
BIKER LIGHTER
Mark L. Thomas, 4622 N. Hermitage, Chicago, Ill. 60640
Filed Jun. 30, 1995, Ser. No. 40,949
Term of patent 14 years
U.S. Cl. D27—141



373,441
GLASS LEAF STYLE TRIM PIECE FOR LIGHTING FIXTURE
John M. Lucas, Cadyville, N.Y., assignor to Schonbek Worldwide Lighting Inc., Plattsburgh, N.Y.
Filed Jan. 6, 1995, Ser. No. 33,240
Term of patent 14 years
U.S. Cl. D26—156



373,443
CIGARETTE TOBACCO CONTAINER
Frank Gottvald, and Robert Capling, both of Toronto, Canada, assignors to Imperial Tobacco Limited, Quebec, Canada
Division of Ser. No. 33,053, Jan. 4, 1995. This application Nov. 17, 1995, Ser. No. 46,512
Claims priority, application Canada, Sep. 27, 1994, 1994-1870
Term of patent 14 years
U.S. Cl. D27—189



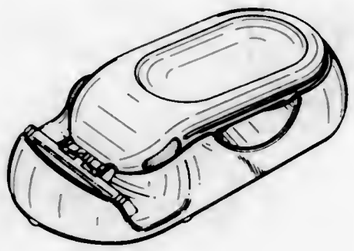
373,444

373,446

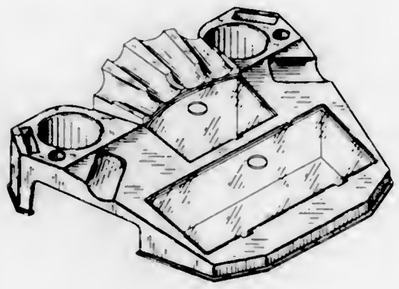
373,448
PET FEEDER

373,450
CHEW TOY FOR DOGS

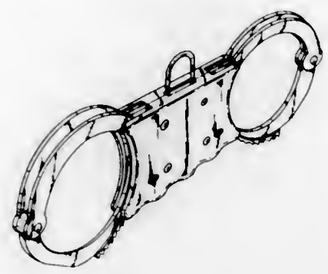
373,444
COMBINED RAZOR HANDLE AND HOLDER THEREFOR
Jill M. Shurtleff, South Boston, and Gerald T. Swanson, Kingston, both of Mass., assignors to The Gillette Company, Boston, Mass.
Filed Jun. 5, 1995, Ser. No. 39,819
Term of patent 14 years
U.S. Cl. D28—48



373,445
MANICURE SUPPORT STAND
Leanna Wright-Godley, 11701 Mara Lynn #254, Little Rock, Ark. 72211
Filed May 4, 1995, Ser. No. 38,352
Term of patent 14 years
U.S. Cl. D28—61

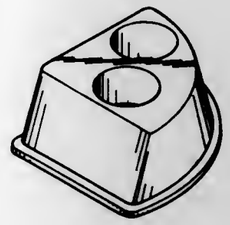


373,446
HANDCUFF
Gee-Sook Kim, Yoksam Lucky Apartment 102-807, 963 Dogok-Dong, Kangnam-Ku, Seoul; Jung-Soo Kwan, Gyosoo Apartment 3- 504, 492 - 197 Shindaebang-Dong, Dongjak-Ku, Seoul, and Jong-Won Lee, Inchon, all of, Rep. of Korea, assignors to Gee-Sook Kim, and Jung-Soo Kwan, Seoul, Rep. of Korea
Filed Aug. 29, 1994, Ser. No. 27,565
Claims priority, application Rep. of Korea, Mar. 24, 1994, 94-5749
Term of patent 14 years
U.S. Cl. D29—100

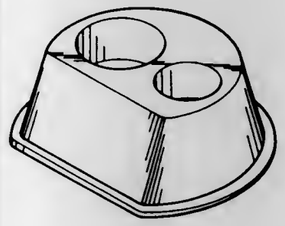


373,447
SPORT FACE MASK WHICH INCLUDES A FRAME AND IN SITU MOLDED UPPER FOREHEAD AND LOWER FACIAL POLYMERIC PADS
Mike C.-F. Chen, 17, Kung 6, Road, Linkou 2nd Industrial Park, Taipei, Hsien, Taiwan
Filed Jun. 13, 1995, Ser. No. 40,226
Term of patent 14 years
U.S. Cl. D29—111

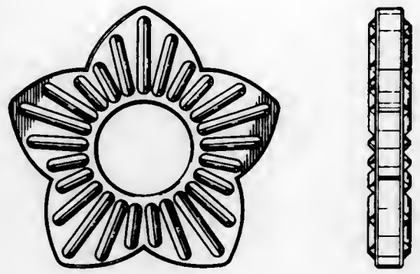
373,448
PET FEEDER
Yin-Tsang Chen, No. 51, Lane 490, Chung Cheng S. Rd., Yung Kang, Tainan, Taiwan
Filed May 17, 1995, Ser. No. 38,954
Term of patent 14 years
U.S. Cl. D30—130



373,449
PET FEEDER
Yin-Tsang Chen, No. 51, Lane 490, Chung Cheng S. Rd., Yung Kang, Tainan, Taiwan
Filed May 17, 1995, Ser. No. 38,955
Term of patent 14 years
U.S. Cl. D30—130



373,450
CHEW TOY FOR DOGS
Anthony O'Rourke, Malibu, and Charles Byrne, Mammoth Lakes, both of Calif., assignors to Booda Products, Inc., Gardena, Calif.
Continuation of Ser. No. 9,910, Jun. 23, 1993, abandoned, and a continuation-in-part of Ser. No. 1,782, Nov. 24, 1992, Pat. No. Des. 355,746. This application Aug. 20, 1993, Ser. No. 12,065
Term of patent 14 years
U.S. Cl. D30—160



LIST OF PATENTEES

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3rd DAY OF SEPTEMBER, 1996

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A B G S.r.l.: *See—*
Gallorini, Massimo; Angilella, Bruno; and Bocci, Sandro, 5,552,841, Cl. 351-49.000.

Aarre, Arne; and Oaland, Knut S. Swivel link. 5,551,794, Cl. 403-374.000.

Abato, Richard P.; Greer, William R.; and Herring, Christopher M., to International Business Machines Corporation. Methods and system for merging data during cache checking and write-back cycles for memory reads and writes. 5,553,265, Cl. 395-470.000.

ABB Flakt AB: *See—*
Hugbart, Jean-Paul, 5,551,838, Cl. 415-206.000.

ABB K-Flow Inc.: *See—*
Kane, Martin; Pratt, Wayne; Alesz, Jozsef; Biro, Zoltan; and Varga, Zoltan, 5,551,307, Cl. 73-861.356.

ABB Kent-Taylor Limited: *See—*
Coe, David E., 5,552,025, Cl. 205-785.500.

ABB Research Ltd.: *See—*
Meier, Markus, 5,552,889, Cl. 356-364.000.

ABB Vetco Gray, Inc.: *See—*
Pallini, Joseph W., Jr.; and Jennings, Charles E., 5,551,803, Cl. 405-223.100.

Abbott Laboratories: *See—*
Iles, Kenneth E., 5,551,828, Cl. 414-757.000.
Kempf, Dale J.; Norbeck, Daniel W.; Sham, Hing L.; Zhao, Chen; Sowin, Thomas J.; Reno, Daniel S.; and Haight, Anthony R., 5,552,558, Cl. 549-552.000.
Vurek, Gerald G.; and Christianson, Harlow B., 5,551,300, Cl. 73-706.000.
Wong, Martin; Ramp, John M.; and Brackett, John M., 5,552,297, Cl. 435-26.000.

Abe, Atsuyoshi; Ohtsuka, Yasumasa; Tomoyuki, Yohji; Takano, Manabu; Fukuzawa, Daizo; and Ogawa, Kenichi, to Canon Kabushiki Kaisha. Image heating apparatus. 5,552,582, Cl. 219-619.000.

Abe, Atsuyoshi: *See—*
Ohtsuka, Yasumasa; Tomoyuki, Yohji; Hayakawa, Akira; Takano, Manabu; Fukuzawa, Daizo; and Abe, Atsuyoshi, 5,552,874, Cl. 355-285.000.

Abel, Gunther. Apparatus for separating solid material and liquid. 5,552,044, Cl. 210-252.000.

Abood, Norman A.; Garland, Robert B.; and Miyano, Masateru, to G. D. Searle & Co. Peptide mimetic compounds useful as platelet aggregation inhibitors. 5,552,431, Cl. 514-427.000.

Abraham, Peter: *See—*
Puettmer, Hermann; and Abraham, Peter, 5,551,677, Cl. 269-266.000.

Abshire, Cam W.: *See—*
Keir, Richard M.; Brigham, William L., Jr.; Ballew, Barry S.; and Abshire, Cam W., 5,551,226, Cl. 57-406.000.

Abt, Daniel C.: *See—*
Kish, Frederick A.; Golinkin, Herbert S.; and Abt, Daniel C., 5,551,632, Cl. 238-283.000.

Acampora, Anthony S., to Trustees of Columbia University in the City of New York. Transmission format in packet based communications. 5,553,074, Cl. 370-94.100.

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Accuride International, Inc.: *See—*
Parvin, Jackie D., 5,551,775, Cl. 312-334.110.

Achter, Eugene K.: *See—*
Rounbehler, David P.; Achter, Eugene K.; Lieb, David P.; Fine, David H.; Hainsworth, Eugenie; Carroll, Alf L.; and Wendell, Gregory J., 5,551,278, Cl. 73-1.00G.

Ackermann, Robert A.; Herd, Kenneth G.; Laskaris, Evangelos T.; and Ranze, Richard A., to General Electric Company. Ceramic superconducting lead resistant to breakage. 5,552,211, Cl. 428-209.000.

Ackermann, Robert A.; Herd, Kenneth G.; Laskaris, Evangelos T.; and Ranze, Richard A., to General Electric Company. Ceramic superconducting lead resistant to breakage. 5,552,372, Cl. 505-163.000.

Ackley, H. Sprague; and Wiklof, Christopher A., to Intermec Corporation. Error correction enhancement for code one and other machine-readable symbologies. 5,553,084, Cl. 371-37.100.

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Gattey, Phillip A.; Lynn, Dwight D.; and Yuen, Barry K., 5,553,312, Cl. 455-11.100.

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McCollum, John L.; Eltoukhy, Abdelshafy A.; and Forouhi, Abdul R., 5,552,627, Cl. 257-530.000.

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Wright, J. Nelson; Holley, Gregory L.; and Langdon, Donald R., 5,551,433, Cl. 128-660.070.

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Jones, Steven M.; Janicki, Michael J.; Lang, Thomas E.; Liebig, John R.; and Wang, Xiaohan, 5,552,606, Cl. 250-363.040.

Adachi, Mitsuru; Sato, Satoru; and Sasaki, Hiroto, to Ube Industries, Ltd. Si-containing magnesium alloy for casting with melt thereof. 5,551,996, Cl. 148-420.000.

Adam, Gérard: *See—*
Depreux, Patrick; Ait Mansour, Hamid; Lesieur, Daniel; Lefoulon, François; Renard, Pierre; Adam, Gérard; and Delagrange, Philippe, 5,552,418, Cl. 514-348.000.

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Adams, Julian: *See—*
Lazer, Edward S.; Adams, Julian; Miao, Clara K.; and Farina, Peter, 5,552,421, Cl. 514-367.000.

Adams, Shawn L.: *See—*
Engdahl, Jonathan R.; Gee, David J.; Lucak, Mark A.; and Adams, Shawn L., 5,553,095, Cl. 375-222.000.

Adams, Stephen R.: *See—*
Tsien, Roger Y.; and Adams, Stephen R., 5,552,555, Cl. 548-236.000.

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Townsend, Richard L., 5,551,128, Cl. 24-302.000.

Adanti, Roy A.: *See—*
Galka, Dale A.; and Adanti, Roy A., 5,551,667, Cl. 251-212.000.

Adelman, Steven J.: *See—*
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Adelson, Alexander M.: *See—*
Eisenberg, Alan J.; Adelson, Alexander M.; and Eby, James A., 5,553,237, Cl. 395-184.010.

Adema, Enno; Gebert, Ulrike; and Herz, Reinhard, to Boehringer Mannheim GmbH. Method for the determination of coagulation parameters. 5,552,296, Cl. 435-13.000.

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Depreux, Patrick; Ait Mansour, Hamid; Lesieur, Daniel; Lefoulon, François; Renard, Pierre; Adam, Gérard; and Delagrange, Philippe, 5,552,418, Cl. 514-348.000.

Adler, David E.; Freeman, Michael B.; Lipovsky, James M.; Paik, Yi H.; Shulman, Jan E.; and Swift, Graham, to Rohm and Haas Company. Acid catalyzed process for preparing amino acid polymers. 5,552,514, Cl. 528-328.000.

Adra, Chaker N.: *See—*
Lim, Bing; Adra, Chaker N.; and Lelias, Jean-Michel, 5,552,312, Cl. 435-240.200.

Advanced Electrostatic Technologies, Inc.: *See—*
Dunn, John P., 5,551,642, Cl. 241-47.000.

Advanced Extraction Technologies, Inc.: *See—*
Wood, Glenn C.; and Mehra, Yuv R., 5,551,972, Cl. 95-192.000.

Advanced Micro Devices, Inc.: *See—*
Bartlett, Steve, 5,551,136, Cl. 29-239.000.
Hsu, James J.; and Longcor, Steven W., 5,552,331, Cl. 437-40.000.
New, Bernard J.; and Freidin, Philip, 5,553,301, Cl. 395-825.000.
Ray, S. Doug; and Peterson, Craig M., 5,552,725, Cl. 327-143.000.
Wang, Hsingya A.; and Hsu, James J., 5,553,018, Cl. 365-185.010.

Advanced Waste Reduction: *See—*
Fanning, Chris E., 5,552,058, Cl. 210-669.000.

Aerosonic Corporation: *See—*
Miller, Ronald M., Sr.; and Nielson, Brian T. K., 5,551,289, Cl. 73-182.000.

Aerospatiale Societe Nationale Industrielle: *See—*
Dargent, Thierry, 5,552,683, Cl. 318-287.000.

Afeyan, Noubar B.; Regnier, Fred E.; and Dean, Robert C., Jr., to PerSeptive Biosystems, Inc. Perfusive chromatography. 5,552,041, Cl. 210-198.200.

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AG Technology Co., Ltd.: *See—*
Ichii, Tomoko; Suzuki, Keiichiro; and Okumiya, Masataro, 5,552,349, Cl. 501-9.000.

Agano, Toshitaka; and Goto, Yasuhiko, to Fuji Photo Film Co., Ltd. Method and apparatus for controlling the moisture content of a thermosensitive recording medium in a thermal recording apparatus. 5,552,818, Cl. 347-133.000.

Agar Corporation Inc.: *See—*

Akzo Novel N.V.: *See—*
Milliken, Larry D., 5,551,806, Cl. 405-266.000.

Albanese, Michael Q. Hand restraint device. 5,551,086, Cl. 2-158.000.

Albrecht Equipamentos Industriais Ltda.: *See—*

Allsopp, Reginald C., to Louver-Lite Ltd. Pleated blind. 5,551,500, Cl. 160-84.040.

Almquist, Frank A.; Anderson, David F.; Campbell, John E.; Chan, Michael L.; Flaherty, Stephen W.; Heink, Steven F.; Larson, John F.; Milligan,

Analetto, James: *See—*
Arsenault, Joseph; and Analetto, James, 5,551,517, Cl. 169-57.000.

Analog Devices, Inc.: *See—*
Wilson, James; and Cellini, Ronald A., 5,552,785, Cl. 341-143.000.

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Agar Corporation Inc.: *See*—
Farchi, David; and Agar, Joram, 5,551,305, Cl. 73-861.040.

Agar, Joram: *See*—
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Arai, Hirohiko; Tanie, Kazuo; and Hayashibara, Yasuo, 5,551,308, Cl. 73-862.541.

Agfa-Gevaert: *See*—
Deschuytere, Frank A., 5,552,898, Cl. 358-426.000.

Agostinelli, John A.; Mir, Jose M.; Lubberts, Gerrit; and Chen, Samuel, to Eastman Kodak Company. Josephson junction device comprising high critical temperature crystalline copper superconductive layers. 5,552,373, Cl. 505-190.000.

Ahlert, Richard H.; Howard, James K.; Ullah, Muhammad I.; and Umphress, Richard D., to International Business Machines Corporation. Magnetic disk with boron carbide overcoat layer. 5,552,204, Cl. 428-65.500.

Ahmed, Mumtaz: *See*—
Clemente, Emmett; Mendes, Robert W.; Anaebonam, Aloysius O.; and Ahmed, Mumtaz, 5,552,436, Cl. 514-456.000.

Ahn, Seung H.: *See*—
Kim, Gu S.; Kim, Jong G.; Ahn, Seung H.; and Park, Jae M., 5,552,635, Cl. 257-706.000.

Aiba, Tatsuya, to Ltd. Aibagiken. Detector of the clasp region of a denture. 5,551,873, Cl. 433-72.000.

Aiba, Yoshinobu, to Canon Kabushiki Kaisha. Image processing including identification of a specific image and conversion thereof in a predetermined manner. 5,552,894, Cl. 358-298.000.

Aida, Toshiyuki: *See*—
Nishino, Toshikazu; Kawabe, Ushio; Tarutani, Yoshinobu; Kominami, Shinya; Aida, Toshiyuki; Fukazawa, Tokuumi; and Hatano, Mutsuko, 5,552,375, Cl. 505-330.000.

Aikawa, Haruhiko: *See*—
Hirose, Chisai; Kanamori, Hiroo; Urano, Akira; Ishikawa, Shinji; Aikawa, Haruhiko; and Saito, Masahide, 5,551,966, Cl. 65-377.000.

Aikins, James E.: *See*—
Ochs, Gregory L.; and Aikins, James E., 5,551,251, Cl. 62-380.000.

Aircraft Braking Systems Corp.: *See*—
Smithberger, Joe E.; Nemcheck, Thomas E.; Moradi, Kamran Z.; and Hall, John M., 5,551,534, Cl. 188-71.500.

Ait Mansour, Hamid: *See*—
Depreux, Patrick; Ait Mansour, Hamid; Lesieur, Daniel; Lefoulon, François; Renard, Pierre; Adam, Gérard; and Delagrange, Philippe, 5,552,418, Cl. 514-348.000.

Aizawa, Fumio: *See*—
Yamashita, Yuji; Nagira, Jiro; Hashimoto, Yasuhiro; and Aizawa, Fumio, 5,552,860, Cl. 355-207.000.

Ajinomoto Co., Inc.: *See*—
Toride, Yasuhiko; Onishi, Norimasa; and Togashi, Yoichiro, 5,552,145, Cl. 424-245.100.

Ajroldi, Giuseppe: *See*—
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Terajima, Kokichi; and Aotsu, Shinichi, 5,551,292, Cl. 73-504.120.

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Nanno, Nobuyuki; Akashi, Kazuo; Ando, Makoto; Takeguchi, K ouchirou; Yamanaka, Yuji; Saito, Toshimitsu; Oka, Mayumi; Ootake, Atsuhiro; Mason, James; and Suzuki, Yoshiaki, 5,553,294, Cl. 395-750.000.

Akashi, Yoshihiro; Takiuchi, Kaoru; and Okamoto, Setsuo, to Sumitomo Sitix Corporation. Apparatus for producing single crystal. 5,551,978, Cl. 117-222.000.

Akasu, Masahira, to Mitsubishi Denki Kabushiki Kaisha. Distance measuring apparatus. 5,552,893, Cl. 356-5.010.

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Yamanashi, Makoto; and Akeda, Nobuyuki, 5,551,885, Cl. 439-157.000.

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Akkapeddi, Murali K.; and Chung, Seng-Shiu, to AlliedSignal Inc. Semicrystalline blends of polyalkylene terephthalates and polyarylates. 5,552,463, Cl. 524-98.000.

Akuzawa, Kenji; and Inagaki, Hiromi, to Honda Giken Kogyo Kabushiki Kaisha. Process for controlling wheel longitudinal force in vehicle. 5,551,771, Cl. 303-186.000.

Akzo Nobel N.V.: *See*—
Maat, Hendrik T.; Cloos, Peter J.; Van Der Werff, Harm; and Lommerts, Bert J., 5,552,218, Cl. 428-357.000.

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Milliken, Larry D., 5,551,806, Cl. 405-266.000.

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Albrecht, Kárnly: *See*—
Ott, István; Klupp, Tibor; Molnár, István; Patthy, András; Barta, István; Barkó née Tóth, Zsuzsa; Ambrus, Gábor; Salát, János; Tegdes, Anikó; Moravcsik, Imre; Együd, Cecilia; Albrecht, Kárnly; Könczöl, Kálmán; Vincze, Attila; Barabás, Éva; Máté, György; Kiss, György B.; Kiss, Péter; Pólya, Kálmán; Erdei, János; Gulyás, Éva; and Zilahi, Erika, 5,552,299, Cl. 435-69.100.

Albright, Larry E.: *See*—
Berg, Gerald M.; and Albright, Larry E., 5,551,523, Cl. 180-273.000.

Alcatel Cit: *See*—
Lallement, Philippe, 5,553,247, Cl. 395-293.000.

Alcatel N.V.: *See*—
Martinez Garcia, Francisco J.; and Diaz Molina, Francisco, 5,553,077, Cl. 370-95.300.
Voeten, Bart F.; Vermeulen, Christophe D. G.; Van der Putten, Frank O.; and Defoort, Frank C. M., 5,553,005, Cl. 364-514.00R.

Alcatel Network Systems, Inc.: *See*—
Vink, Nelson J., 5,553,308, Cl. 395-853.000.

Alderman, Robert J.; and Taylor, James E., to Owens Corning Fiberglas Technology, Inc. Method for forming an insulated roof structure having a heat reflective layer. 5,551,203, Cl. 52-746.110.

Aldous, David J.; Bailey, Thomas R.; Diana, Guy D.; Nitz, Theodore J.; and Kuo, Gee-Hong, to Sterling Winthrop Inc. Therapeutic phenoxyalkylazoles and phenoxyalkylazines. 5,552,420, Cl. 514-364.000.

Aldrich Chemical Company, Inc.: *See*—
Brown, Herbert C., 5,552,081, Cl. 252-182.120.

Alesz, Jozsef: *See*—
Kane, Martin; Pratt, Wayne; Alesz, Jozsef; Biro, Zoltan; and Varga, Zoltan, 5,551,307, Cl. 73-861.356.

Alexander, James H.: *See*—
Greenlee, Russell L.; Alexander, James H.; Young, Emilie A.; and Smithrud, Gary M., 5,553,223, Cl. 395-155.000.

Alexander, Joshua. Shock absorbing blade roller skates. 5,551,713, Cl. 280-11.190.

Ali, Ambereen: *See*—
Nicholson, Donald W.; Ali, Ambereen; Munday, Neil A.; and Vaillancourt, John P., 5,552,536, Cl. 536-23.100.

Allardice, Andrea S.: *See*—
Manning, Monna M.; Allardice, Andrea S.; and Friedh, Floyd, 5,552,137, Cl. 424-70.100.

Allen-Bradley Company, Inc.: *See*—
Engdahl, Jonathan R.; Gee, David J.; Lucak, Mark A.; and Adams, Shawn L., 5,553,095, Cl. 375-222.000.

Allen, Gary R.: *See*—
Parham, Thomas G.; Bateman, Robert L.; Allen, Gary R.; and Davenport, John M., 5,552,671, Cl. 313-635.000.

Allen, Jonathan B.; and Youtkus, Donald J., to Lucent Technologies Inc. Background noise compensation in a telephone set. 5,553,134, Cl. 379-387.000.

Allen, Lesley M., to PPG Industries, Inc. Packaging units for packaging a plurality of generally cylindrical objects. 5,551,563, Cl. 206-394.000.

Allen, William C., to Union Oil Company of California. Superplasticizer-concrete composition for waste disposal. 5,551,976, Cl. 106-696.000.

Allen, William G., to Minnesota Mining and Manufacturing Company. Fiber optic dome closure. 5,553,186, Cl. 385-135.000.

Allergan: *See*—
Burke, James A.; Garst, Michael E.; and Wheeler, Larry A., 5,552,403, Cl. 514-249.000.
Garst, Michael E.; and Burk, Robert M., 5,552,434, Cl. 514-548.000.

Allevard: *See*—
Cailliau, Joël, 5,551,631, Cl. 238-115.000.

Allied Gator, Inc.: *See*—
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AlliedSignal Europe Services Techniques: *See*—
Gautier, Jean-Pierre; Verbo, Ulysse; and Perez Revilla, Miguel, 5,551,317, Cl. 74-560.000.
Mery, Jean Claude; and Maligne, Jean Charles, 5,551,537, Cl. 188-73.390.

AlliedSignal Inc.: *See*—
Akkapeddi, Murali K.; and Chung, Seng-Shiu, 5,552,463, Cl. 524-98.000.
Bruce, Lennox C.; and Rapoport, William R., 5,553,092, Cl. 372-72.000.
Lin, Leroy C.-T.; Wilson, Laura G.; Bharnagar, Ashok; and Li, Hsin L., 5,552,208, Cl. 428-113.000.
Poss, Andrew J.; and Shia, George A., 5,552,533, Cl. 536-7.200.
Zhou, Shaojun J., 5,552,023, Cl. 203-18.000.

Allison, Quincy D.: *See*—
Jerolimov, Mark J.; and Allison, Quincy D., 5,551,829, Cl. 414-757.000.

Alliston, Michael G.: *See*—
Wu, Song; Probst, Samuel G.; Edvardsson, Christina M.; and Alliston, Michael G., 5,551,357, Cl. 110-344.000.

Allred, John F., Jr., to Wilmington Machinery. Dual parison stacked clamp blow molding apparatus. 5,551,862, Cl. 425-532.000.

Allred, Wesley R.: *See*—
Noack, Timothy; and Allred, Wesley R., 5,551,665, Cl. 251-58.000.

Allsopp, Reginald C., to Louver-Lite Ltd. Pleated blind. 5,551,500, Cl. 160-84.040.

Almquist, Frank A.; Anderson, David F.; Campbell, John E.; Chan, Michael J.; Flaherty, Stephen W.; Hajek, Steven F.; Larsen, John F.; Milligan, Charles H.; Price, Cyril A.; Simon, Andrew M.; Washburn, William F.; Williams, George A., II; and Wood, Roy A., to International Business Machines Corporation. Method and system for selectively altering data processing system functional characteristics without mechanical manipulation. 5,553,144, Cl. 380-25.000.

Alpha Enterprises, Inc.: *See*—
Weisburn, James T.; and Straslicka, Bruce C., 5,551,560, Cl. 206-310.000.

Alpher, Aaron M., to Praxisoft, Inc. Method and system for displaying blended colors. 5,552,805, Cl. 345-153.000.

Alps Electric Co., Ltd.: *See*—
Hori, Fumihisa, 5,551,685, Cl. 271-245.000.

Alsman, Edward R., to Polyair Tires, Inc. Formed wheel tire and method. 5,551,763, Cl. 301-64.700.

Althaus, Hans-Ludwig: *See*—
Krug, Joachim; Althaus, Hans-Ludwig; Hartl, Alfred; and Kuhn, Gerhard, 5,552,918, Cl. 359-152.000.

Altman, Peter A. Implantable device for the effective elimination of cardiac arrhythmogenic sites. 5,551,427, Cl. 128-642.000.

Alton, Kenneth D.: *See*—
Sandvos, Jerry L.; and Alton, Kenneth D., 5,553,019, Cl. 365-185.040.

Altrock, Bruce: *See*—
Chang, David; and Altrock, Bruce, 5,552,286, Cl. 435-7.200.

Alwine, K. Troy, to OSRAM Sylvania Inc. Electrical contact. 5,551,897, Cl. 439-850.000.

Alza Corporation: *See*—
Lattin, Gary A.; and Riddle, Thomas A., 5,551,953, Cl. 604-20.000.

Amano, Junkichi; Yamazaki, Tetsuji; and Hara, Takashi, to Yamaha Hatsudoki Kabushiki Kaisha. Induction system for engine. 5,551,393, Cl. 123-306.000.

Amano, Kazuo: *See*—
Enomoto, Kunio; Otaka, Masahiro; Amano, Kazuo; Kurosawa, Koichi; Hayashi, Eisaku; Morinaka, Ren; Hattori, Shigeo; and Sato, Kasunori, 5,553,106, Cl. 376-305.000.

Amano, Toshio: *See*—
Takada, Shinsaku; Fujimoto, Hisayoshi; Ishida, Nobuhisa; Ema, Yasushi; Amano, Toshio; and Shimokata, Akihiro, 5,552,813, Cl. 347-40.000.

Ambrose, Ronald R.: *See*—
Sundararaman, Padmanabhan; Ambrose, Ronald R.; Camp, Douglas R.; and Wilt, Truman F., 5,552,475, Cl. 524-608.000.

Ambrus, Gábor: *See*—
Ott, István; Klupp, Tibor; Molnár, István; Patthy, András; Barta, István; Barkó née Tóth, Zsuzsa; Ambrus, Gábor; Salát, János; Tegdes, Anikó; Moravcsik, Imre; Együd, Cecilia; Albrecht, Kárnly; Könczöl, Kálmán; Vincze, Attila; Barabás, Éva; Máté, György; Kiss, György B.; Kiss, Péter; Pólya, Kálmán; Erdei, János; Gulyás, Éva; and Zilahi, Erika, 5,552,299, Cl. 435-69.100.

AMCOL International Corporation: *See*—
Beall, Gary W.; Tsipsursky, Semeon; Sorokin, Anatoliy; and Goldman, Anatoliy, 5,552,469, Cl. 524-445.000.

Amcor Limited: *See*—
Wunder, Heiko; Scott-Young, Robert E.; Maddern, Kenneth N.; and Scukovic, Jack, 5,552,099, Cl. 264-117.000.

Amdahl Corporation: *See*—
Krakauer, Arno S.; Gawlick, Dieter; Colgrove, John A.; and Wilmot, Richard B., II, 5,553,285, Cl. 395-600.000.

Amemiya, Koji; and Inoue, Masahiro, to Canon Kabushiki Kaisha. Separation charger control for electro-photographic apparatus. 5,552,872, Cl. 355-274.000.

Ament, Eduard, to Baumeister +Ostler GmbH & Co. Safety net system for a motor vehicle to separate a cargo compartment from a passenger compartment. 5,551,726, Cl. 280-749.000.

American Cyanamid Company: *See*—
Woodruff, Keith F., 5,551,603, Cl. 222-325.000.

American Home Products Corporation: *See*—
Gemmill, Frederick O., Jr.; Orzech, Chester E.; and Adelman, Steven J., 5,552,395, Cl. 514-179.000.

American Microsystems, Inc.: *See*—
O'Shaughnessy, Timothy G., 5,552,748, Cl. 331-1.00A.

American Safety Razor Company: *See*—
Prochaska, Frank H., 5,551,155, Cl. 30-50.000.

Amoco Corporation: *See*—
Hecht, Daniel H.; and Schulz, David A., 5,552,008, Cl. 156-174.000.
Weisburg, William G.; and Pelletier, Dale A., 5,552,279, Cl. 435-6.000.

Amphenol Corporation: *See*—
Morse, Ronald W.; and Johnescu, Douglas M., 5,551,147, Cl. 29-764.000.

Amtrol Inc.: *See*—
Mazur, Mark; Silva, Joseph F.; and Heilman, Albert R., 5,551,590, Cl. 220-465.000.

Amundson, Allen B.: *See*—
Jacobs, Dwight W.; Puttler, Oliver L.; Georgakis, Evangelos G.; Amundson, Allen B.; and Jordan, Russell A., 5,552,177, Cl. 427-2.290.

Anaebonam, Aloysius O.: *See*—
Clemente, Emmett; Mendes, Robert W.; Anaebonam, Aloysius O.; and Ahmed, Mumtaz, 5,552,436, Cl. 514-456.000.

Analetto, James: *See*—
Arsenault, Joseph; and Analetto, James, 5,551,517, Cl. 169-57.000.

Analog Devices, Inc.: *See*—
Wilson, James; and Cellini, Ronald A., 5,552,785, Cl. 341-143.000.

Analogic Corporation: *See*—
Weedon, Hans, 5,553,113, Cl. 378-98.500.

Anderson, Carl E. PVC building trim. 5,551,201, Cl. 52-717.050.

Anderson, David F.: *See*—
Almquist, Frank A.; Anderson, David F.; Campbell, John E.; Chan, Michael J.; Flaherty, Stephen W.; Hajek, Steven F.; Larsen, John F.; Milligan, Charles H.; Price, Cyril A.; Simon, Andrew M.; Washburn, William F.; Williams, George A., II; and Wood, Roy A., 5,553,144, Cl. 380-25.000.

Anderson, David M.: *See*—
Fodge, Douglas W.; Anderson, David M.; and Pettey, Thomas M., 5,551,515, Cl. 166-300.000.

Anderson, Dirk: *See*—
Grabstein, Kenneth; Anderson, Dirk; Eisenman, June; Fung, Victor; and Rauch, Charles, 5,552,303, Cl. 435-69.510.

Anderson, Hugh G., Jr.; Shawn, Roy T.; and Currence, Elmer F., Jr., to Emergency Public Safety Services, L.L.C. Moveable barrier. 5,551,796, Cl. 404-6.000.

Anderson, John T.; Nagesh, V. K.; and Ruby, Richard C., to Hewlett-Packard Company. Silver additives for ceramic superconductors. 5,552,370, Cl. 505-124.000.

Anderson, Jon E.: *See*—
Cioca, Gheorghe; Anderson, Jon E.; Cohen, Isaac D.; Tadlock, Charles C.; and Bevacqua, Andrew J., 5,552,135, Cl. 424-59.000.

Anderson, Marc A.; and Peterson, Reid A., to Wisconsin Alumni Research Foundation. Ceramic membranes having macroscopic channels. 5,552,351, Cl. 501-81.000.

Anderson, Patricia A.: *See*—
Roach, Kenneth J.; and Anderson, Patricia A., 5,552,079, Cl. 510-446.000.

Anderson, Robert L.: *See*—
Williamson, Mark E.; Newbrough, Jerry W.; Anderson, Robert L.; Castleberry, Jeffrey P.; Heim, Warren P.; and Stracener, Steve W., 5,551,850, Cl. 417-474.000.

Anderson, Roger N.; Hey, H. Peter W.; Beinglass, Israel; and Venkatesan, Mahalingam, to Applied Materials, Inc. Semiconductor wafer process chamber with susceptor back coating. 5,551,982, Cl. 118-715.000.

Anderson, Weston A., to Varian Associates, Inc. NMR sample cell. 5,552,709, Cl. 324-321.000.

Ando, Akemi; and Stevens, Rodney W., to Pfizer Inc. Isoxazolines as antiinflammatory agents. 5,552,424, Cl. 514-378.000.

Ando, Makoto: *See*—
Nanno, Nobuyuki; Akashi, Kazuo; Ando, Makoto; Takeguchi, K ouichirou; Yamanaka, Yuji; Saito, Toshimitsu; Oka, Mayumi; Ootake, Atsuhiro; Mason, James; and Suzuki, Yoshiaki, 5,553,294, Cl. 395-750.000.

Ando, Masahiko: *See*—
Onisawa, Kenichi; Suzuki, Takashi; Ando, Masahiko; Ota, Masuyuki; Kaneko, Toshiki; and Minemura, Tetsuro, 5,552,909, Cl. 359-59.000.

Ando, Toshihiko: *See*—
Iwamoto, Mune; Nakajima, Akihiko; Takaku, Masato; Morita, Hisao; Ando, Toshihiko; Shirafuji, Tomofumi; and Uchida, Mutsuko, 5,552,494, Cl. 525-316.000.

Andrade, Anthony J.: *See*—
Minervino, Richard J., Jr.; Veranis, Charles J.; and Andrade, Anthony J., 5,553,131, Cl. 379-221.000.

Andrés-Gil, José I.: *See*—
Sipido, Victor K.; Fernández-Gadea, Francisco J.; Andrés-Gil, José I.; Meert, Theo F.; and Gil-Lopetegui, Pilar, 5,552,399, Cl. 514-214.000.

Andrew Corporation: *See*—
Dyott, Richard B., 5,552,887, Cl. 356-350.000.

Andrews, Lawrence P.; Mandalia, Baiju D.; Ortega, Oscar E.; Sinibaldi, John C.; Williams, Kevin B.; and Touch, Christopher D., to International Business Machines Corporation. Interprocessor interrupt processing system. 5,553,293, Cl. 395-734.000.

Andrieu, Jean-Marie; and Lu, Wei, to Aremas (Association pour la Recherche, l'Etude, le Traitment et la Prevention des Maladies Malignes du Sang). Means for the quantitative determination of retrovirus, method for its preparation, and diagnostic kit containing said means. 5,552,269, Cl. 435-5.000.

Andrzejewski, Max C., Jr.; Steranko, John D.; and Steranko, Richard K. Lead screw and linear drive assemblies using such lead screw. 5,551,314, Cl. 74-459.000.

Anelva Corporation: *See*—
Mashiro, Supika; and Osada, Tomoaki, 5,552,955, Cl. 361-234.000.

Angell, Scott L.: *See*—
Heath, James E.; and Angell, Scott L., 5,551,670, Cl. 266-87.000.

Angilella, Bruno: *See*—
Gallorini, Massimo; Angilella, Bruno; and Bocci, Sandro, 5,552,841, Cl. 351-49.000.

Anliker, Markus: *See*—
Reyhanloo, Shahryar; Hermann, Markus; and Anliker, Markus, 5,551,988, Cl. 134-22.100.

Anscher, Joseph, to National Molding Corp. Buckle which is releasable by depression of a hinged member and having improved locking capability. 5,551,131, Cl. 24-614.000.

Antal, Michael J., Jr., to University of Hawaii. Process for charcoal production from woody and herbaceous plant material. 5,551,958, Cl. 44-629.000.

ANTEC Corp.: *See*—
Barbara, Daniel; and Aref, Walid, 5,553,284, Cl. 395-600.000.

Aremas (Association pour la Recherche, l'Etude, le Traitment et la Prevention des Maladies Malignes du Sang): *See*—

Atalla, Rajai H.: *See*—
Weinstock, Ira A.; Hill, Craig L.; and Atalla, Rajai H., 5,552,019, Cl. 162-29.000.

Bacon, Paul W.: *See*—
Redd, Randall V.; and Bacon, Paul W., 5,552,461, Cl. 524-47.000.

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Antal, Michael J., Jr., to University of Hawaii. Process for charcoal production from woody and herbaceous plant material. 5,551,958, Cl. 44-629.000.
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Bechampa, Ronald D., 5,553,183, Cl. 385-95.000.
Anthony, Thomas R.; Knemeyer, Friedel S.; and Williams, Bradley E., to General Electric Company. Annular diamond bodies. 5,551,277, Cl. 72-467.000.
Antos, A. Joseph; DeLiso, Evelyn M.; Liu, Yanming; Newhouse, Mark A.; Smith, David K.; and Truesdale, Carlton M., to Corning Incorporated. Controlled dispersion optical waveguide. 5,553,185, Cl. 385-127.000.
Anzulewicz, David T.: *See—*
Veilleux, Leo J., Jr.; Anzulewicz, David T.; and Dyer, Gerald P., 5,551,478, Cl. 137-596.150.
Ao, Kenichi: *See—*
Uenoyama, Hirofumi; Ao, Kenichi; Suzuki, Yasutoshi; Yoshino, Yoshimi; and Suzuki, Motofumi, 5,551,586, Cl. 216-22.000.
Aoki, Shigehiko: *See—*
Hirose, Koji; and Aoki, Shigehiko, 5,552,668, Cl. 313-506.000.
Aoki, Takahito: *See—*
Makita, Akira; Matsumoto, Yutaka; and Aoki, Takahito, 5,552,662, Cl. 313-403.000.
Aoshima, Shinichiro: *See—*
Takahashi, Hironori; Aoshima, Shinichiro; Hirano, Isuke; and Tsuchiya, Yutaka, 5,552,716, Cl. 324-753.000.
Aotsu, Shinichi: *See—*
Terajima, Kotichi; and Aotsu, Shinichi, 5,551,292, Cl. 73-504.120.
Apogee, Jon: *See—*
Ray, Ralph D.; Ireland, Richard L.; and Apogee, Jon, 5,551,617, Cl. 224-321.000.
Apollo Research Corp.: *See—*
Chutkow, Jerry G.; Flanagan, Patrick; and Riggs, Michael T., 5,551,446, Cl. 128-782.000.
Appeltans, Koen E. J., to U.S. Philips Corporation. Power supply with improved efficiency, transmitter comprising such a power supply. 5,552,694, Cl. 323-222.000.
Applied Digital Access, Inc.: *See—*
Bronte, Jeffery S.; Lever, Mark J.; Pope, Kevin T.; and Hartmann, Paul R., 5,553,056, Cl. 370-13.000.
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Messih, Isis A.; and Aquino, Charles F., 5,551,410, Cl. 123-679.000.
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Seto, Masaru; Shibasaki, Kazuya; and Arai, Satoru, 5,552,967, Cl. 361-818.000.
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Newton, James R., 5,553,152, Cl. 381-68.600.
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Hoffman, Andrew T.; Hoffman, Christopher J.; Webster, Tracy D.; and Arnold, John D., 5,551,447, Cl. 128-869.000.
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Arsenault, Joseph; and Analetto, James. Automatic fire extinguishing discharge valve. 5,551,517, Cl. 169-57.000.
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Oono, Masahiro; Konno, Hisashi; Kase, Toshiyuki; Hayashi, Katsuki; and Nishikawa, Hiroshi, 5,553,052, Cl. 369-112.000.
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ASE Americas, Inc.: *See—*
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Takashi, Terumi; Hirano, Akihiko; Iwabuchi, Kazunori; Yamakawa, Hideyuki; Ishida, Yoshiteru; Shiraishi, Kazuhisa; and Ashikawa, Kazutoshi, 5,553,104, Cl. 375-373.000.
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Ashland Inc.: *See—*
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Heath, David M.; Kraley, Michael F.; and Pant, Sangam, 5,553,239, Cl. 395-187.010.
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Svoma, Rodney; Speros, James; and Broadman, Gene A., 5,551,689, Cl. 273-73.00C.
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Van Gaal, Adrianus P.; Humphreys, Richard J.; Atkinson, John C.; Chawla, Amit; and Chan, Yee-Ning, 5,552,961, Cl. 361-700.000.
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ATN Microwave, Inc.: *See—*
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Keeney, Stephen N.; and Atwood, Gregory E., 5,553,020, Cl. 365-185.190.
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Brewer, Jonathan L.; Denham, Keith; and Sherry, Neil J., 5,551,816, Cl. 411-43.000.
Avendano, Jose G.; Katz, Robert; and Voll, Scott R., to Maytag Corporation. Refrigerator door seal assembly. 5,551,192, Cl. 49-484.100.
Avero, Manuel B. Compact solar energy collector. 5,551,991, Cl. 136-248.000.
Avery, Noyes L.; Axelrod, Joan C.; Carey, James T.; Hiebert, John; and Horodysky, Andrew G., to Mobil Oil Corporation. Additives for fuels and lubricants. 5,552,069, Cl. 508-229.000.
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Avni, Shlomo, to Teletron Ltd. Telephone line monitoring apparatus and method. 5,553,116, Cl. 379-34.000.
Awade, Abalo: *See—*
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Axis USA, Inc.: *See—*
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Bacon, Paul W.: *See—*
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Badger Meter, Inc.: *See—*
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Cherry, Brian W.; Smith, James E.; Mucino, Victor E.; Clark, Nigel N.; Thompson, Gregory; and Badgley, Patrick R., 5,551,853, Cl. 418-148.000.
Bae, Young C.; Lim, Fredric J.; Ottoboni, Thomas B.; and Soane, David S., to Soane Technologies, Inc. Plastic molds for ophthalmic devices and methods for forming same. 5,551,663, Cl. 249-115.000.
Baehler, Thomas W.; Vanderzyden, Henry R.; and Baker, Kenneth N., to Sundstrand Corporation. Method of increasing service life of oil and a filter for use therewith. 5,552,040, Cl. 210-168.000.
Baeuerle, Michael: *See—*
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Li, Changming; Lian, Keryn; Bai, Lijun; and Kincs, Joseph G., 5,552,245, Cl. 429-188.000.
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Bailey, Christopher J.; Dirks, Lynn M.; Firm, William R.; and Vallee, Lawraine J., to International Business Machines Corporation. Methods and apparatus for dynamically using floating master interlock. 5,553,287, Cl. 395-650.000.
Bailey, Donald C. Method and apparatus for cleaning with high pressure liquid at low flow rates. 5,551,909, Cl. 451-75.000.
Bailey, Jack H., to DiscoVision Associates. System for recording digital information in a pulse-length modulation format. 5,553,047, Cl. 369-59.000.
Bailey, Theodore B., to Martin Marietta Corporation. Hybrid thermoelectric/Joule-Thomson cryostat for cooling detectors. 5,551,244, Cl. 62-51.200.
Bailey, Thomas R.: *See—*
Aldous, David J.; Bailey, Thomas R.; Diana, Guy D.; Nitz, Theodore J.; and Kuo, Gee-Hong, 5,552,420, Cl. 514-364.000.
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Bajraszewski, Alexander; Dodds, David H.; Muessig, Charles E.; and Nagpal, Vijay, to Ford Motor Company. Extrusion forming of internal helical splines. 5,551,270, Cl. 72-21.300.
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Baker, Albert D.: *See—*
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Roof, Glenn L., 5,552,060, Cl. 210-749.000.
Smith, Sidney K., 5,551,512, Cl. 166-212.000.
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Baker, Kenneth N.: *See—*
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Baker, Roy S.: *See—*
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Balschmidt, Per: *See—*
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Balzer, Peter L., to International Business Machines Corporation. Automated mask alignment for UV projection expose system. 5,552,891, Cl. 356-400.000.
Bamman, Harvey W. Floor and carpet cleaning system for multiple level buildings. 5,551,117, Cl. 15-302.000.
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Baneyx, Francois; Gatenby, Anthony A.; and Kalbach, Cathy E., to Du Pont de Nemours, E. I., and Company. Process for enchancing the production of heterologous protein in biologically active conformation in a transformed E. coli dnaK mutant host cell. 5,552,301, Cl. 435-69.100.

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Kessler, Bezalel; Frenkel, Chaim; Frenkel, Daphna; and Kessler, Abraham, 5,552,307, Cl. 435-171.000.

Barabás, Éva: *See—*
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Kalish, David M.; Barajas, Saul; and Ricci, Paul B., 5,553,263, Cl. 395-454.000.

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Barbara, Richard: *See—*
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Barbassa, Elisabetta: *See—*
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Barber, John S.: *See—*
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Barbieri, Claudio: *See—*
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Barger, Randall R.; and Saliga, Thomas V. Aircraft engine cycle logging unit. 5,552,987, Cl. 364-424.060.

Barino, Luisa: *See—*
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Bartó née Tóth, Zsuzsa: *See—*
Ott, István; Klupp, Tibor; Molnár, István; Patthy, András; Barta, István; Bartó née Tóth, Zsuzsa; Ambrus, Gábor; Salát, János; Tegdes, Anikó; Moravcsik, Imre; Egytid, Cecilia; Albrecht, Károly; Könczöl, Kálmán; Vincze, Attila; Barabás, Éva; Máté, György; Kiss, György B.; Kiss, Péter; Pólya, Kálmán; Erdei, János; Gulyás, Éva; and Zilahi, Erika, 5,552,299, Cl. 435-69.100.

Barlow, Ealie O. Hairpiece with adjustable support loop. 5,551,452, Cl. 132-54.000.

Barmag AG: *See—*
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Barna, Eileen C.; Hamilton, Elizabeth M.; Lalli, Eric W.; Lubin, Cindy B.; Sparks, Wanda F.; and Waterland, Alfred F., III, to W. L. Gore & Associates, Inc. Composite gasket for sealing flanges and method for making and using same. 5,551,706, Cl. 277-229.000.

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Barnett, Wayne, to Excel Industries, Inc. Window assembly blade seal. 5,551,193, Cl. 49-496.100.

Barnum, Lewis W.: *See—*
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Barraclough, Keith; Cripps, Peter; Gay, Adrian; and Jones, Alan, to IBM Corporation. Token ring network. 5,553,073, Cl. 370-85.500.

Barreca, Robert; and Hurley, Karen. Greeting cards. 5,551,730, Cl. 283-117.000.

Barrett, Alicia E.: *See—*
Miller, Richard A.; George, Scott E.; Barrett, Alicia E.; and Parsons, Theron E., III, 5,552,511, Cl. 528-277.000.

Barrett, George R.: *See—*
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Barrett, Raymond L., Jr.; Herold, Barry W.; and Pajunen, Grazyna A., to Motorola, Inc. Method and apparatus for determining an instantaneous phase difference between two signals. 5,552,750, Cl. 331-25.000.

Barrett, Willard H.: *See—*
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Barringer Research Limited: *See—*
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Barski, Lori L.: *See—*
Gaborski, Roger S.; and Barski, Lori L., 5,553,162, Cl. 382-192.000.

Barta, István: *See—*
Ott, István; Klupp, Tibor; Molnár, István; Patthy, András; Barta, István; Bartó née Tóth, Zsuzsa; Ambrus, Gábor; Salát, János; Tegdes, Anikó; Moravcsik, Imre; Egytid, Cecilia; Albrecht, Károly; Könczöl, Kálmán; Vincze, Attila; Barabás, Éva; Máté, György; Kiss, György B.; Kiss, Péter; Pólya, Kálmán; Erdei, János; Gulyás, Éva; and Zilahi, Erika, 5,552,299, Cl. 435-69.100.

Barth, Glen A.: *See—*
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Barthel, Fritz; and Dummer, Josef, to silvretta-sherpas Sportartikel GmbH. Gliding board. 5,551,728, Cl. 280-818.000.

Bartholomew, Donald D., to Proprietary Technology, Inc. Quick connector. 5,551,732, Cl. 285-93.000.

Bartlett, Derek, to IHW Limited. Hinge assembly. 5,551,123, Cl. 16-257.000.

Bartlett, Steve, to Advanced Micro Devices, Inc. Pad removal device. 5,551,136, Cl. 29-239.000.

Barton, Bradley D.; and Ellis, Jimi, to Radio Cap Company, Inc. Beverage holder. 5,551,592, Cl. 220-571.000.

Baruffato, Roberto; Trebbi, Claudio; Barbieri, Claudio; and Vigna, William, to I.M.A. Industria Macchine Automatiche S.p.A. Automatic carousel machine for the metered feeding and packaging of fluid products. 5,551,491, Cl. 141-145.000.

Baruzzi, Giovanni: *See—*
Morini, Giampiero; Barino, Luisa; Scordamaglia, Raimondo; Barbassa, Elisabetta; and Baruzzi, Giovanni, 5,552,359, Cl. 502-123.000.

Base Ten Systems, Inc.: *See—*
Eisenberg, Alan J.; Adelson, Alexander M.; and Eby, James A., 5,553,237, Cl. 395-184.010.

BASF Aktiengesellschaft: *See—*
Hinz, Werner; Henn, Rolf; Keppeler, Uwe; and Guettes, Bernd, 5,552,450, Cl. 521-174.000.
Mueller, Winfried; Spengler, Reinhard; Grabowski, Sven; and Sanner, Axel, 5,552,159, Cl. 424-464.000.

BASF Corporation: *See—*
Bradford, Christopher J.; and Ticu, Adriana, 5,552,488, Cl. 525-163.000.
Clark, Peter D.; Stants, Cynthia A.; and Foukes, Richard J., 5,552,487, Cl. 525-131.000.
Green, Todd J., 5,552,447, Cl. 521-129.000.
Hall, Jon R.; Carpenter, Clint W.; and Scott, Stuart K., 5,552,458, Cl. 523-403.000.
Hills, William H., 5,551,588, Cl. 216-56.000.
Taylor, Robert J.; Rehfuss, John W.; Borst, Joseph; Lessek, Paul; and St. Aubin, Donald L., 5,552,497, Cl. 525-456.000.

BASF Magnetics GmbH: *See—*
Brodt, Gregor; Vass, Attila; Loch, Werner; Lehner, August; Lenz, Werner; and Schneider, Norbert, 5,552,229, Cl. 428-425.900.

Basinski, Margret B.; DiMarchi, Richard D.; Heath, William F., Jr.; and Schoner, Brigitte E., to Eli Lilly and Company. Anti-obesity proteins. 5,552,523, Cl. 530-324.000.

Basinski, Margret B.; DiMarchi, Richard D.; Heath, William F., Jr.; and Schoner, Brigitte E., to Eli Lilly and Company. Anti-obesity proteins. 5,552,524, Cl. 530-324.000.

Baskett, Ira E., to Motorola, Inc. Method for setting sensing polarity of a sensor device. 5,551,304, Cl. 73-769.000.

Bass, Henry W.: *See—*
Boston, Rebecca S.; Bass, Henry W.; and OBrian, Gregory R., 5,552,140, Cl. 424-94.610.

Bastawros, Adel F.; Speer, John G.; Deistler, Leo J.; and Schuchert, Eugene H., to Bethlehem Steel Corporation. Embossed cold rolled steel with improved corrosion resistance, paintability, and appearance. 5,552,235, Cl. 428-687.000.

Basteck, Andreas. Single-blade reamer. 5,551,812, Cl. 408-199.000.

Bateman, Robert L.: *See—*
Parham, Thomas G.; Bateman, Robert L.; Allen, Gary R.; and Davenport, John M., 5,552,671, Cl. 313-635.000.

Batistic, Ivica: *See—*
Fennel, Helmut; Batistic, Ivica; and Latarnik, Michael, 5,551,768, Cl. 303-122.060.

Bauer, Lothar; Lemme, Werner; Rechberg, Reinhard; Strusch, Wolfgang; Fuchs, Heinz W.; and Wahnschaffe, Jürgen, to Klöckner-Humboldt-Deutz AG. Cooling system for an internal combustion engine. 5,551,382, Cl. 123-41.82R.

Bauerle, David D.; and Liske, Kevin R., to Coltec Industries Inc. Fuel injection system for marine engines. 5,551,404, Cl. 123-514.000.

Baumann, Dieter; Hollstein, Werner; Rabener, Claus W.; and Rüger, Peter, to Ciba-Geigy Corporation. Highly filled epoxy casting resin compositions. 5,552,459, Cl. 523-427.000.

Baumeister +Ostler GmbH & Co.: *See—*
Ament, Eduard, 5,551,726, Cl. 280-749.000.

Baxter International Inc.: *See—*
Brown, Richard I.; Williamson, Warren P.; and Di Perna, Paul M., 5,551,942, Cl. 494-45.000.
Shannon, Donald; Kuo, Chris; Peterson, Robert; and McCollam, Chris, 5,552,100, Cl. 264-127.000.
Williamson, Mark E.; Newbrough, Jerry W.; Anderson, Robert L.; Castleberry, Jeffrey P.; Heim, Warren P.; and Stracener, Steve W., 5,551,850, Cl. 417-474.000.

Bay Mills Limited: *See—*
Porter, John F.; Kittson, Mark O.; Tucker, Mark; Ferris, Larry; and LePage, Steve, 5,552,207, Cl. 428-109.000.

Bayer AG: *See—*
Perchenek, Nils, 5,552,356, Cl. 501-153.000.
Thurm, Siegfried; Sommer, Klaus; Bier, Peter; Elschner, Andreas; Kowitz, Manfred; and Sandquist, Axel, 5,552,226, Cl. 428-412.000.

Bayer Aktiengesellschaft: *See—*
Berneth, Horst; Klug, Günter; and Weisser, Jürgen, 5,552,365, Cl. 503-213.000.
Dhein, Rolf; Reuter, Knud; Bäcker, Lothar; Bock, Manfred; Kubitza, Werner; and Probst, Joachim, 5,552,477, Cl. 524-840.000.

Findeisen, Kurt; Linker, Karl-Heinz; Kluth, Joachim; Müller, Klaus-Helmut; Riebel, Hans-Jochem; König, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,552,369, Cl. 504-273.000.
Immel, Otto; and Müller, Harald, 5,552,362, Cl. 502-308.000.
Kraus, Helmut; Klausener, Alexander; and Landscheidt, Heinz, 5,552,130, Cl. 423-386.000.
Rasp, Christian; Waldmann, Helmut; and Traenckner, Hans-Joachim, 5,552,549, Cl. 546-139.000.
Wamprecht, Christian; Jost, Klaus; and Penninger, Stefan, 5,552,507, Cl. 528-44.000.

Bayer Atkiengesellschaft: *See—*
Witmann, Dieter; Schoeps, Jochen; Urbanneck, Bernd; Huff, Karl; Ott, Karl-Heinz; and Peters, Horst, 5,552,465, Cl. 524-139.000.

Bayer Corporation: *See—*
Yokota, Hiroshi; and Takahashi, Keiji, 5,552,116, Cl. 422-63.000.

Bayerische Motoren Werke AG: *See—*
Heil, Michael; and Eder, Karl-Heinz, 5,551,914, Cl. 454-146.000.

Baylor College of Medicine: *See—*
Caskey, C. Thomas; Fu, Ying-Hui; Friedman, David L.; Pizzuti, Antonio; and Fenwick, Raymond G., 5,552,282, Cl. 435-6.000.

Beachead Products Company: *See—*
Armstrong, Jeffrey A.; and Sortino, Roger L., 5,551,110, Cl. 5-656.000.

Beall, Gary W.; Tsipsursky, Semeon; Sorokin, Anatoliy; and Goldman, Anatoliy, to AMCOL International Corporation. Intercalates and exfoliates formed with oligomers and polymers and composite materials containing same. 5,552,469, Cl. 524-445.000.

Beall, Hie P., to Duke University. Method of drying cells for scanning electron microscopy. 5,552,601, Cl. 250-307.000.

Beastrom, Keith P.: *See—*
Crandall, Danny N.; Beastrom, Keith P.; Cortines, Charles M.; and Thompson, Brent B., 5,552,984, Cl. 364-424.030.

Beatty, Theodore J. Barbecue with support stand for smoke plates. 5,551,332, Cl. 99-446.000.

Beauchamp, Jeanne S. Visible light reflectors and process of making same. 5,552,933, Cl. 359-515.000.

Beaulieu, Pierre L.: *See—*
Gorys, Vida; Soucy, François; Yoakim, Christiane; and Beaulieu, Pierre L., 5,552,405, Cl. 514-269.000.

Bechamps, Ronald D., to ANTEC Corp. Apparatus for and methods of splitting fiber optic signals. 5,553,183, Cl. 385-95.000.

Beck, Niels J.; Pena, James A.; Roach, Alan R.; and Johnston, Bevan H., to Servojet Electronic Systems, Ltd. Accumulator fuel injection system. 5,551,391, Cl. 123-305.000.

Becker Autoradiowerk GmbH: *See—*
Hetzel, Herbert; Mauderer, Hans P.; and Heck, Patrik, 5,552,921, Cl. 359-173.000.

Becker, Craig D.: *See—*
Saund, Eric; Moran, Thomas P.; and Becker, Craig D., 5,553,224, Cl. 395-155.000.

Becker GmbH: *See—*
Klos, Rainer, 5,553,313, Cl. 455-51.100.

Becker, Joseph G.: *See—*
Carr, Charles D.; Bolkan, Steven A.; and Becker, Joseph G., 5,552,078, Cl. 510-351.000.

Becker, Robert: *See—*
Disse, Bernd; Weller, Eberhard; and Becker, Robert, 5,552,161, Cl. 424-557.000.

Beckley, Don A.; and Stites, John, to Hitco Technologies Inc. Processable silicone composite materials having high temperature resistance. 5,552,466, Cl. 524-265.000.

Beckman Instruments, Inc.: *See—*
Adams, Craig W., 5,552,541, Cl. 536-22.100.
Pfost, Robert F.; and Avdalovic, Nebojsa, 5,552,580, Cl. 219-521.000.
Xie, Youqin; and Harman, John N., III, 5,552,032, Cl. 205-789.000.

Becton Dickinson and Company: *See—*
Burns, James A., 5,552,117, Cl. 422-102.000.

Bednarczyk, Adam: *See—*
Maute, Robert E.; Thompson, Laird B.; Bednarczyk, Adam; and Symmons, David, 5,551,287, Cl. 73-152.020.

Beere Precision Medical Instruments, Inc.: *See—*
Beere, Richard F.; and Bradshaw, Guy L., 5,551,323, Cl. 81-489.000.

Beere, Richard F.; and Bradshaw, Guy L., to Beere Precision Medical Instruments, Inc. Screwdriver handle. 5,551,323, Cl. 81-489.000.

Beers, William W.: *See—*
Srivastava, Alok M.; and Beers, William W., 5,552,082, Cl. 252-301.40R.

Beeson, Dwayne W.: *See—*
Riggs, Dennis M.; Beeson, Dwayne W.; and Conner, Billy T., 5,551,451, Cl. 131-359.000.

Behl, Charanjit R., to Hoffman-La Roche Inc. Pharmaceutical composition for transdermal delivery. 5,552,153, Cl. 424-449.000.

Behrens, William L., to Chrysler Corporation. Manual transmission shifter to ignition interlock. 5,551,266, Cl. 70-247.000.

Behtash, Saman; Flores, Christopher; and Ghanem, Adel, to TCSI Corporation. Method and apparatus for a wireless local area network. 5,553,076, Cl. 370-95.300.

Beinglass, Israel: *See—*
Anderson, Roger N.; Hey, H. Peter W.; Beinglass, Israel; and Venkatesan, Mahalingam, 5,551,982, Cl. 118-715.000.

Belcher, James F.: *See—*
Frank, Steven N.; Belcher, James F.; Stanford, Charles E.; Owen, Robert A.; and Kyle, Robert J. S., 5,552,326, Cl. 437-3.000.

Belenkiy, Yuriy; Grois, Igor; Gumin, Irina; Makhlin, Ilya; Margolin, Mark; and Pescetto, Michael J., to Molex Incorporated. Adapter assembly for fiber optic connectors. 5,553,180, Cl. 385-59.000.

Bell Atlantic Network Services, Inc.: *See—*
McAllister, Alex; and Wise, Laird, 5,553,119, Cl. 379-67.000.

Bell Communications Research, Inc.: *See—*
Gozdz, Antoni S.; Schmutz, Caroline N.; Tarascon, Jean-Marie; and Warren, Paul C., 5,552,239, Cl. 429-94.000.

Bell Sygma Inc.: *See—*
Turner, George W., 5,553,130, Cl. 379-220.000.

Bellin, Michael A.: *See—*
Trainor, John J.; Bellin, Michael A.; and Laplace, Carl J., Jr., 5,552,696, Cl. 323-275.000.

Beloit Technologies, Inc.: *See—*
Montgomery, James R., 5,551,825, Cl. 414-412.000.

Belyk, Kevin M.; Bender, Dean R.; Black, Regina M.; Hughes, David L.; and Leonard, William, to Merck & Co., Inc. Process for preparing certain aza cyclohexapeptides. 5,552,521, Cl. 530-317.000.

Benda, George, to Chelsea Group Ltd. Method and apparatus for building environmental compliance. 5,553,006, Cl. 364-550.000.

Bender, Dean R.: *See—*
Belyk, Kevin M.; Bender, Dean R.; Black, Regina M.; Hughes, David L.; and Leonard, William, 5,552,521, Cl. 530-317.000.

Bennett, Cynthia; Brekner, Michael-Joachim; Coutandin, Jochen; Herrmann-Schoenherr, Otto; and Osan, Frank, to Hoechst Aktiengesellschaft. Semi-crystalline cycloolefin copolymer film. 5,552,504, Cl. 526-348.100.

Bennett, Leonard L., Jr.: *See—*
Sorscher, Eric J.; Parker, William B.; and Bennett, Leonard L., Jr., 5,552,311, Cl. 435-240.200.

Bennett, Robert N.: *See—*
Taylor, John; Hicks, Michael; Lamb, Richard; Bennett, Robert N.; Nixon, Keith; Ashcroft, Ian; Parkes, Adrian S.; and Smith, John P., 5,551,704, Cl. 277-208.000.

Benoit, Roland; Beverly, Eugene M.; Love, Charles M.; and Mack, Gregory J., to United Technologies Corporation. Abrasive blade tip. 5,551,840, Cl. 416-241.00B.

Beren, James R.: *See—*
DeNicola, Anthony J., Jr.; Mayfield, John W.; McLaughlin, Thomas F.; and Beren, James R., 5,552,104, Cl. 264-456.000.

Berencsi, Klara: *See—*
Plotkin, Stanley A.; Ricciardi, Robert P.; Gonczol, Ewa; Berencsi, Klara; and Rando, Robert F., 5,552,143, Cl. 424-199.100.

Beretta, Ugo G., to Fabrica D'Armi P. Beretta S.p.A. Carrier-suitcase for sports guns, their spare parts and equipment for the user. 5,551,562, Cl. 206-317.000.

Berg, Gerald M.; and Albright, Larry E., to Clark Equipment Company. Traction lock. 5,551,523, Cl. 180-273.000.

Bergemont, Albert; Mead, Carver A.; Chi, Min-hwa; and Haggag, Hosam, to National Semiconductor Corporation. Capacitor coupled contactless imager with high resolution and wide dynamic range. 5,552,619, Cl. 257-291.000.

Berger, Ronald D.: *See—*
Hummel, John D.; and Berger, Ronald D., 5,551,426, Cl. 128-642.000.

Berger, Yossef, to State of Israel, Ministry of Defence, Rafael Armament Development Authority, The. Portable tripod. 5,551,655, Cl. 248-168.000.

Bernart, Francis: *See—*
Sedlack, Mark A.; and Bernart, Francis, 5,551,751, Cl. 297-256.130.

Berneth, Horst; Klug, Günter; and Weisser, Jürgen, to Bayer Aktiengesellschaft. Pressure-sensitive recording material which comprises natural oils and/or derivatives thereof. 5,552,365, Cl. 503-213.000.

Berrah, Hafida: *See—*
Bourguignon, Michel; Berrah, Hafida; and Thöl, Christoph, 5,553,157, Cl. 382-131.000.

Berry, Richard E., to International Business Machines Corporation. Method and system for visually programming state information using a visual switch. 5,553,227, Cl. 395-161.000.

Berstis, Viktors; and Pedersen, Raymond J., to International Business Machines Corporation. Instruction cache access and prefetch process controlled by a predicted instruction-path mechanism. 5,553,254, Cl. 395-375.000.

Berta, Dominic A., to Montell North America Inc. Thermoplastic elastomers with improved extrusion performance. 5,552,482, Cl. 525-88.000.

Berteaud, André; Germain, Alain; and Delmotte, Michel, to S.A. Microondes Energie Systemes. Microwave applicator device for continuous heat treatment of elongate products. 5,552,583, Cl. 219-693.000.

Berthlex, Inc.: *See—*
Bethlendy, George, 5,551,605, Cl. 222-402.250.

Bertrand, Georges. Portable digital map reader. 5,552,989, Cl. 364-443.000.

Besselink, Petrus A.; and Sachdeva, Rohit C. L. Temperature-sensitive medical/dental apparatus. 5,551,871, Cl. 433-5.000.

Besselink, Petrus A.: *See—*
Brouwer, Nicolaas D.; and Besselink, Petrus A., 5,551,187, Cl. 49-1.000.

Best, Paul S. Bicycle rack with integral lock holder. 5,551,609, Cl. 224-440.000.

Beth Israel Hospital Boston: *See—*
Lim, Bing; Adra, Chaker N.; and Lelias, Jean-Michel, 5,552,312, Cl. 435-240.200.

Bethel, Robert K.; Grayson, Michael B.; and Ellis, James, to Western Atlas International, Inc. Dual redundant detonating system for oil well perforators. 5,551,520, Cl. 175-4.540.

Bethlehem Steel Corporation: *See*—
Bastawros, Adel F.; Speer, John G.; Deistler, Leo J.; and Schuchert, Eugene H., 5,552,235, Cl. 428-687.000.
Schmidt, Manfred, 5,551,672, Cl. 266-229.000.

Bethlendy, George, to Berthlex, Inc. Sealing and dispensing device. 5,551,605, Cl. 222-402.250.

Bettinger, David S. Dynamic polymer composites. 5,552,197, Cl. 428-34.900.

Bettini, John E.: *See*—
Schwartz, Andrew W.; Hayes, William K.; and Bettini, John E., 5,551,722, Cl. 280-689.000.

Bevacqua, Andrew J.: *See*—
Cioca, Gheorghe; Anderson, Jon E.; Cohen, Isaac D.; Tadlock, Charles C.; and Bevacqua, Andrew J., 5,552,135, Cl. 424-59.000.

Beverly, Eugene M.: *See*—
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Beyer, Hans-Joachim; Jung, Hans J.; and Wild, Manfred, to Nestec S.A. Apparatus utilizing CO_2 snow for preparing layered food products. 5,551,207, Cl. 53-127.000.

BF Goodrich Company, The: *See*—
Giannati, Michael J., 5,552,576, Cl. 219-201.000.

BGK Finishing Systems, Inc.: *See*—
Heath, James E.; and Angell, Scott L., 5,551,670, Cl. 266-87.000.

Bhatia, Kamleah K., to Du Pont de Nemours, E. I., and Company. Atomospheric pressure polyester process. 5,552,513, Cl. 528-308.300.

Bhatnagar, Ashok: *See*—
Lin, Leroy C.-T.; Wilson, Laura G.; Bhatnagar, Ashok; and Li, Hsin L., 5,552,208, Cl. 428-113.000.

Bickford, Joel D.: *See*—
Veteran, David R.; Bickford, Joel D.; and Botka, Julius K., 5,552,701, Cl. 324-158.100.

Bicknese, Bryan W.; Boigenzahn, Jeffrey F.; Bornhorst, Randy J.; Coffey, Jerome T.; Fracek, Todd P.; Johnson, Douglas W.; Lagergren, Richard E.; Rigotti, James M.; and Schlimmer, Marvin A., to International Business Machines Corporation. Compliant rail for shock protection of a PCMCIA DASD. 5,552,946, Cl. 360-97.010.

Bidwell, Jeffrey L.: *See*—
Hui, Kam M.; and Bidwell, Jeffrey L., 5,552,275, Cl. 435-6.000.

Bier, Peter: *See*—
Thurm, Siegfried; Sommer, Klaus; Bier, Peter; Elschner, Andreas; Kowitz, Manfred; and Sandquist, Axel, 5,552,226, Cl. 428-412.000.

Biermaier, Hans. Cleaning and disinfection machine for medical devices having narrow channels, particularly endoscopes. 5,551,462, Cl. 134-166.00C.

Bill, Karlheinz: *See*—
Kircher, Dieter; Rieth, Peter E.; Bill, Karlheinz; Balz, Juergen; Kunze, Lothar; and Halasy-Wimmer, Georg, 5,551,764, Cl. 303-3.000.

Billings, Zeb; and Henning, Michael. Successive image display device. 5,551,905, Cl. 446-151.000.

Binder, Klaus: *See*—
Raab, Alois; Binder, Klaus; and Augustin, Ulrich, 5,551,634, Cl. 239-96.000.

Binette, Steve D. Portable gluteus maximus exercise mat. 5,551,934, Cl. 482-123.000.

Bio-Mega Boehringer Ingelheim Research Inc.: *See*—
Déziel, Robert; and Guindon, Yvan, 5,552,384, Cl. 514-17.000.

Bio-Mega/Boehringer Ingelheim Research, Inc.: *See*—
Gorys, Vida; Soucy, François; Yoakim, Christiane; and Beaulieu, Pierre L., 5,552,405, Cl. 514-269.000.

Bio Merieux: *See*—
Cleuziat, Philippe L.; Awade, Abalo; Robert-Baudouy, Jeannine; and Gayral, Jean-Pierre, 5,552,273, Cl. 435-6.000.

BioChem Technology, Inc.: *See*—
Yang, Xin; Lee, Jaw F.; Maneshin, Sergey K.; and Kolb, Marcus E., 5,552,319, Cl. 435-286.500.

Biogal Gyogyszergyar Rt.: *See*—
Ott, István; Klupp, Tibor; Molnár, István; Patthy, András; Barta, István; Bartó née Tóth, Zsuzsa; Ambrus, Gábor; Salát, János; Tegdes, Anikó; Moravcsik, Imre; Együd, Cecilia; Albrecht, Kárnly; Könczöl, Kálmán; Vincze, Attila; Barabás, Éva; Máté, György; Kiss, György B.; Kiss, Péter; Pólya, Kálmán; Erdei, János; Gulyás, Éva; and Zilahi, Erika, 5,552,299, Cl. 435-69.100.

Biomeasure, Inc.: *See*—
Kim, Sun H.; Keyes, Susan R.; Moreau, Sylviane; Dong, Zheng X.; and Taylor, John, 5,552,520, Cl. 530-311.000.

Bioptechs Inc.: *See*—
Focht, Daniel C., 5,552,321, Cl. 435-286.100.

Biostar, Inc.: *See*—
Bogart, Gregory R., 5,552,272, Cl. 435-6.000.

Birchler, Mark A.: *See*—
Jasper, Steven C.; Birchler, Mark A.; and Oros, Nicholas C., 5,553,102, Cl. 375-347.000.

Bird, John: *See*—
Palkovich, Alex; Bird, John; and Clarke, Neil, 5,551,243, Cl. 62-51.100.

Birkle, Siegfried; Kammermaier, Johann, deceased (by Rosemarie Kammermaier, heir); and Schulte, Rolf, to Siemens Aktiengesellschaft. Working electrode for electrochemical enzymatic sensor systems. 5,552,027, Cl. 204-290.00F.

Biro, Zoltan: *See*—
Kane, Martin; Pratt, Wayne; Alesz, Jozsef; Biro, Zoltan; and Varga, Zoltan, 5,551,307, Cl. 73-861.356.

Bishop, Michael J.: *See*—
Chang, Kwen-Jen; Bubacz, Dulce G.; Davis, Ann O.; McNutt, Robert W., Jr.; and Bishop, Michael J., 5,552,404, Cl. 514-255.000.

Biss, Charles E., to PSC Inc. Template or reticule for quality control of a hexagonal code having an acquisition target and an alignment target. 5,552,593, Cl. 235-495.000.

Bittar, Bachar, to Est. Gilles Lerouz. Device for the data processing of linear images of generatrices of an article having an axis of revolution. 5,553,158, Cl. 382-142.000.

Bizen, Takehiko: *See*—
Sasaki, Yasuyuki; Bizen, Takehiko; Miyama, Hiroshi; Morisako, Takeshi; and Tsukada, Hiroko, 5,551,600, Cl. 222-81.000.

Bizley, Arthur J.: *See*—
Calder, Douglas W.; and Bizley, Arthur J., 5,552,644, Cl. 307-116.000.

Black & Decker Inc.: *See*—
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Black, Regina M.: *See*—
Belyk, Kevin M.; Bender, Dean R.; Black, Regina M.; Hughes, David L.; and Leonard, William, 5,552,521, Cl. 530-317.000.

Blakeley, Douglas M.; and Molyneaux, David A., to Picker International, Inc. RF coil identification and testing interface for NMR systems. 5,551,430, Cl. 128-653.200.

Blanc, Pierre-Alain: *See*—
Winter, Beat; Blanc, Pierre-Alain; and Lamboley, Serge, 5,552,379, Cl. 512-12.000.

Blank, Jay L. Retractable window crank. 5,551,316, Cl. 74-547.000.

Blazek, Christopher F.: *See*—
Kountz, Kenneth J.; and Blazek, Christopher F., 5,551,490, Cl. 141-21.000.

Blecha, Vladimir; McGuire, Katherine M.; Neuhalfen, Andrew J.; and Onken, Daniel B., to Littelfuse, Inc. Surface-mounted fuse device. 5,552,757, Cl. 337-297.000.

Blionas, Costas: *See*—
Gallagher, Brian W.; Blionas, Costas; Nicolosi, Joseph A.; and Barbara, Richard, 5,552,608, Cl. 250-370.150.

Bliss, Gary S.: *See*—
Budzynski, Danny L.; and Bliss, Gary S., 5,551,860, Cl. 425-504.000.

Blonder, Isaac S. Method of and system for stereoscopic television. 5,552,821, Cl. 348-47.000.

Blong, Thomas J.; and Lavallée, Claude, to Minnesota Mining and Manufacturing Company. Melt-processable electroconductive fluoroplastic. 5,552,199, Cl. 428-36.900.

Bloom, Iris B. K.; Minns, Richard A.; and Zahka, Cynthia L., to Polaroid Corporation. Adhesive composition, and imaging medium comprising this adhesive composition. 5,552,259, Cl. 430-253.000.

Blue Sky Research, Incorporated: *See*—
Snyder, James J., 5,553,174, Cl. 385-15.000.

Blum, Yoram: *See*—
Sagiv, Oded; Landa, Benzion; and Blum, Yoram, 5,552,875, Cl. 355-319.000.

Blutstein, Morton; and Ulrich, Darwin, to Reliable Knitting Works. Hat and face mask combination. 5,551,087, Cl. 2-173.000.

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Busch-Vishniac, Ilene; Buckman, Alvin B.; Pavuluri, Janardhan K.; Wang, Wanjun; Qian, Dahong; and Mancevski, Vladimir, 5,552,883, Cl. 356-139.030.
Hansen, Eric J.; Helminen, Merja; and Maciver, Isobel, 5,552,146, Cl. 424-251.100.

BOC Group, Inc., The: *See*—
Jain, Ravi, 5,551,257, Cl. 62-644.000.

BOC Group plc, The: *See*—
Rathbone, Thomas, 5,551,258, Cl. 62-646.000.

Bocci, Sandro: *See*—
Gallorini, Massimo; Angilella, Bruno; and Bocci, Sandro, 5,552,841, Cl. 351-49.000.

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Runge, Klaus, 5,552,571, Cl. 200-530.000.

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Simonsen, Jan H.; and Boecker, Dirk, 5,551,422, Cl. 128-633.000.

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Turconi, Marco; Donetti, Arturo; Montagna, Ernesto; Nicola, Massimo; Uberti, Annamaria; Micheletti, Rosamaria; and Giachetti, Antonio, 5,552,408, Cl. 514-304.000.

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Lazer, Edward S.; Adams, Julian; Miao, Clara K.; and Farina, Peter, 5,552,421, Cl. 514-367.000.

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Adema, Enno; Gebert, Ulrike; and Herz, Reinhard, 5,552,296, Cl. 435-13.000.

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Hedges, Daniel E.; Meserole, Jere S., Jr.; and Rorabaugh, Michael E., 5,551,904, Cl. 445-47.000.
Jensen, David G.; and Tichenor, Daniel R., 5,552,249, Cl. 430-5.000.
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Slininger, Patricia J.; Schisler, David A.; and Bothast, Rodney J., 5,552,315, Cl. 435-253.300.

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Veteran, David R.; Bickford, Joel D.; and Botka, Julius K., 5,552,701, Cl. 324-158.100.

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Huang, Jen-chi; and Bourgeois, Daniel M., 5,551,585, Cl. 216-11.000.

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Goujard, Stéphane; Dupel, Pascal; Pailler, René; and Bourrat, Xavier, 5,552,220, Cl. 428-367.000.

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Braden, Michael L., to Nalco Chemical Company. Preparation of amphoteric acrylic acid copolymers suitable as oil-in-water emulsion breakers. 5,552,498, Cl. 526-73.000.

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Brandt, Thomas J.; and Zimmerman, Stephen A., to Tektronix, Inc. Systems and method for printing by applying an image-enhancing precoat. 5,552,819, Cl. 347-212.000.

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Brown, J. Ernest: *See*—
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Bullard, James R. Multifunctional intubating guide stylet and laryngoscope. 5,551,946, Cl. 600-194.000.

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Hergenrother, William L.; and Graves, Daniel F., 5,552,483, Cl. 525-90.000.
Kitamura, Takashi; Lawson, David F.; Morita, Koichi; and Ozawa, Yoichi, 5,552,499, Cl. 526-174.000.
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Hemsley, Stephen R., 5,551,450, Cl. 131-359.000.

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Giessmann, Ulrich; Jung, Gerhard; and Brunnée, Curt, 5,552,599, Cl. 250-281.000.

Brunnmair, Erwin; Bubik, Alfred; Hess, Harald; Holik, Herbert; Leitenberger, Werner; Merath, Thomas; Moser, Johann; Steib, Helmut; and Weisshuhn, Elmer, to Voith Sulzer Papiermaschinen GmbH. Drying section with an adjacent finishing roller. 5,551,164, Cl. 34-117.000.

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Wardecki, Norbert; and Feldmeier, Herwig, 5,551,345, Cl. 102-340.000.

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Hess, Anton J.; Holle, Wolfgang; and Buhle, Klaus, 5,551,896, Cl. 439-701.000.

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Burkhart, Steven A., Sr. Locking electrical outlet. 5,551,884, Cl. 439-140.000.

Burlison, Phillip D.; DeHaven, William R.; and Pogrebinsky, Victor, to LTX Corporation. High speed I_{DDQ} monitor circuit. 5,552,744, Cl. 327-401.000.

Burndy Corporation: *See*—
Schrader, Gary E.; Montminy, Armand T.; and Franzini, John, 5,552,564, Cl. 174-84.00C.

Burns, Carmen D., to Staktek Corporation. Bus communication system for stacked high density integrated circuit packages. 5,552,963, Cl. 361-735.000.

Burns, James A., to Becton Dickinson and Company. Collection assembly having a cap lifting mechanism. 5,552,117, Cl. 422-102.000.

Burns, Michael E.: *See*—
Miracle, Gregory S.; Willey, Alan D.; Kott, Kevin L.; and Burns, Michael E., 5,552,556, Cl. 548-334.100.

Burshteyn, Alexander: *See*—
Siiman, Olavi; Burshteyn, Alexander; and Cayer, Marilyn, 5,552,086, Cl. 252-408.100.

Busato, Murray F.: *See*—
Everingham, Gary; Cook, John E.; Perry, Paul D.; and Busato, Murray F., 5,551,406, Cl. 123-520.000.

Buscemi, Paul J.; Stejskal, Elizabeth A.; and Doyle, Erin S., to Scimed Life Systems, Inc. Biodegradable drug delivery vascular stent. 5,551,954, Cl. 623-1.000.

Busch-Vishniac, Ilene; Buckman, Alvin B.; Pavuluri, Janardhan K.; Wang, Wanjun; Qian, Dahong; and Mancevski, Vladimir, to Board of Regents, The University of Texas System. Noncontact position measurement system using optical sensors. 5,552,883, Cl. 356-139.030.

Bush, Robert L.: *See*—
Horn, Allen F., III; Bush, Robert L.; and St. Lawrence, Michael E., 5,552,210, Cl. 428-209.000.

Buss, John M.; Dworkin, James D.; Lloyd, Scott E.; Pan, Shao W.; Smith, Stephen L.; and Wang, Shay-Ping T., to Motorola, Inc. Exponentiation circuit utilizing shift means and method of using same. 5,553,012, Cl. 364-722.000.

Busse-Grawitz, Max E.; Malacarne, Enrico; and Roeck, Walter, to Spectrospin AG. Method and automatic auxiliary device for tuning of an NMR receiving coil. 5,552,710, Cl. 324-322.000.

Bussell, Mark H.: *See*—
Gurasich, William G.; and Bussell, Mark H., 5,551,756, Cl. 297-440.200.

Butler, George D., III. Portable baby cushion and cover combination. 5,551,108, Cl. 5-655.000.

Caherec, Alain, to Whitaker Corporation, The. Patch panel IDC connector. 5,551,890, Cl. 439-409.000.

Cailliau, Joël, to Allevard. Rail support device for unballasted railway track. 5,551,631, Cl. 238-115.000.

Caja, Josip: *See*—
Mamantov, Gleb, deceased; Caja, Josip; and Dunstan, Thanthrimudalige D. J., 5,552,241, Cl. 429-103.000.

Calabro, Anthony. Adjustable ear clip. 5,551,259, Cl. 63-14.500.

Calbi, Domenick, to Calbi, Domenick A. 3-level fluorescent light adapter. 5,551,895, Cl. 439-642.000.

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Calbi, Domenick, 5,551,895, Cl. 439-642.000.

Caldeira, Paulo P.: *See*—
Gu, Wen-Jian; DiVincenzo, Gregory T.; and Caldeira, Paulo P., 5,552,979, Cl. 363-98.000.

Calder, Douglas W.; and Bizley, Arthur J. Proximity switches. 5,552,644, Cl. 307-116.000.

Caldwell Manufacturing Company: *See*—
Westfall, Norman R., 5,551,189, Cl. 49-76.000.

Caldwell, William D.: *See*—
Lin, Wei-Chung; Caldwell, William D.; and Cundiff, John W., 5,552,566, Cl. 174-144.000.

Caley, David J., to Orbital Engine Company (Australia) Pty. Limited. Valve member for fuel injection nozzles. 5,551,638, Cl. 239-453.000.

California Aquariaum Supply: *See*—
Dewalt, Craig A., 5,551,378, Cl. 119-247.000.

Calton, Dean S.; Coellner, James A.; Heimann, Paul R.; and Scott, Douglas C., to Engelhard/ICC. Hybrid air-conditioning system and method of operating the same. 5,551,245, Cl. 62-90.000.

Calton, Gary J.: *See*—
Wood, Louis L.; and Calton, Gary J., 5,552,518, Cl. 528-363.000.

Calvert, Nathaniel; Effie, James S.; Johnston, David L.; Naylor, James L.; Olson-Williams, Helen M.; Satin, Robert H.; Shaffer, Dennis L.; and Turk, Gary A., to International Business Machines Corporation. Software packaging structure having hierarchical replaceable units. 5,553,290, Cl. 395-700.000.

Calvet, James P.; Hou, Xiaoying; Magenheimer, Brenda S.; and Maser, Robin L., to Kansas University. DNA encoding mouse phosphotriesterase-related protein. 5,552,313, Cl. 435-252.330.

Calwood Chemical Industries, Inc.: *See*—
Wood, Louis L.; and Calton, Gary J., 5,552,518, Cl. 528-363.000.

Cambro Manufacturing Company: *See*—
Campbell, Argyle; and Maddux, Larry D., 5,551,774, Cl. 312-284.000.

Camburn, Philip A., to SmithKline Beecham p.l.c. Process for solubilising an alpha-glucan containing foodstuff. 5,552,175, Cl. 426-615.000.

Cameron, James F.: *See*—
Pfahl, Magnus; Zhang, Xiao-kun; Lehmann, Jürgen M.; Dawson, Marcia I.; Cameron, James F.; Hobbs, Peter D.; and Jong, Ling, 5,552,271, Cl. 435-6.000.

Cameron, Kimberly O.; Dasilva Jardine, Paul A.; and Rosati, Robert L., to Pfizer Inc. 5-substitued-6-cyclic-5,6,7,8-tetrahydronaphthalen2-ol compounds which are useful for treating osteoporosis. 5,552,412, Cl. 514-317.000.

Cameron-Price, Ernest J. Carbonated beverage package. 5,552,168, Cl. 426-106.000.

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Camm, Stephen J.: *See*—
Camm, James O.; and Camm, Stephen J., 5,551,601, Cl. 222-94.000.

Camp, Douglas R.: *See*—
Sundararaman, Padmanabhan; Ambrose, Ronald R.; Camp, Douglas R.; and Wilt, Truman F., 5,552,475, Cl. 524-608.000.

Campbell, Argyle; and Maddux, Larry D., to Cambro Manufacturing Company. Food bar with modular support system. 5,551,774, Cl. 312-284.000.

Campbell, John E.: *See*—
Almquist, Frank A.; Anderson, David F.; Campbell, John E.; Chan, Michael J.; Flaherty, Stephen W.; Hajek, Steven F.; Larsen, John F.; Milligan, Charles H.; Price, Cyril A.; Simon, Andrew M.; Washburn, William F.; Williams, George A., II; and Wood, Roy A., 5,553,144, Cl. 380-25.000.

Canadian Forest Products Ltd.: *See*—
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Canadian Luge Association: *See*—
Rauf, Wally; Gratz, Derek; and Smith, Bruce, 5,551,714, Cl. 280-18.000.

Cancer Institute: *See*—
Nakamura, Yusuke; and Emi, Mitsuru, 5,552,526, Cl. 530-350.000.

Candau, Didier; and Collin, Nathalie, to L'Oreal. Emulsion containing stabilized ascorbic acid, cosmetic treatment process using it and uses thereof. 5,552,446, Cl. 514-772.400.

Cannetti, Robert J.: *See*—
Meyerhoefer, Carl H.; Smith, Thomas J.; Escobar, Adolfo M.; and Cannetti, Robert J., 5,553,136, Cl. 379-399.000.

Cannon, Thomas G.; and DeHart, Daniel L., to Onkor, Ltd. System for printing social expression cards in response to electronically transmitted orders. 5,552,994, Cl. 364-468.010.

Canon Denshi Kabushiki Kaisha: *See*—
Yokota, Yuji; and Hoshi, Akio, 5,552,948, Cl. 360-105.000.

Canon, Inc.: *See*—
Webb, Michael; and Naylor, William C., Jr., 5,553,165, Cl. 382-252.000.

Canon Kabushiki Kaisha: *See*—
Abe, Atsuyoshi; Ohtsuka, Yasumasa; Tomoyuki, Yohji; Takano, Manabu; Fukuzawa, Daizo; and Ogawa, Kenichi, 5,552,582, Cl. 219-619.000.
Aiba, Yoshinobu, 5,552,894, Cl. 358-298.000.
Amemiya, Koji; and Inoue, Masahiro, 5,552,872, Cl. 355-274.000.
Asaoka, Masanobu; Takao, Hideaki; Togano, Takeshi; and Kojima, Makoto, 5,552,193, Cl. 428-1.000.
Date, Nobuaki, 5,553,053, Cl. 369-112.000.
Ebinuma, Ryuichi; Mizusawa, Nobutoshi; and Chiba, Yuji, 5,552,812, Cl. 347-34.000.
Hieda, Teruo; Ueda, Osamu; and Kawahara, Norihiro, 5,552,826, Cl. 348-222.000.
Hosaka, Masao; and Sakamaki, Hisashi, 5,553,288, Cl. 395-650.000.
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Kashiwazaki, Akio; Sato, Hiroshi; Shirota, Katsuhiro; Yokoi, Hideto; and Shiba, Shoji, 5,552,192, Cl. 427-492.000.

Kohno, Takeshi, 5,552,902, Cl. 358-498.000.
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Bouton, Frank M.; Carter, Robert L.; Hoffman, Clarence A.; Juve, Eric K.; and Kimmel, Rodney W., 5,551,701, Cl. 463-36.000.

Central Research Laboratories Limited: *See*—
Clemow, Richard D., 5,552,944, Cl. 360-76.000.

Bossen, Douglas C.; Chen, Chin-Long; Dill, Frederick H.; Goodman, Douglas S.; Hsiao, Mu-Yue; McCann, Paul V.; Mulligan, James M.;

Kohno, Takeshi, 5,552,902, Cl. 358-498.000.
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Majima, Masao; and Ono, Takeo, 5,552,919, Cl. 359-161.000.
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Nakagawa, Tomohito; Hiroi, Masakazu; Matsuo, Kazuhiro; Orii, Hideki; Kato, Satoru; Dobashi, Akihito; and Noda, Mamoru, 5,552,859, Cl. 355-207.000.
Nishikawa, Tsutomu, 5,552,693, Cl. 320-22.000.
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Nonoshita, Hiroshi; Yamanashi, Yoshitsugu; and Ina, Kenzoh, 5,552,802, Cl. 345-100.000.
Ohtsuka, Yasumasa; Tomoyuki, Yohji; Hayakawa, Akira; Takano, Masabu; Fukuzawa, Daizo; and Abe, Atsuyoshi, 5,552,874, Cl. 355-285.000.
Okada, Shinjiro; Inaba, Yutaka; Kojima, Makoto; and Katakura, Kazumori, 5,552,911, Cl. 359-68.000.
Sakai, Masaaori; Yoshihara, Kunio; and Nimura, Mitsuo, 5,552,903, Cl. 358-500.000.
Sata, Junichi, 5,551,684, Cl. 271-110.000.
Sentoku, Koichi; Saito, Kenji; Chiba, Keiko; and Maehara, Hiroshi, 5,553,110, Cl. 378-35.000.
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Shinjo, Katsuhiko; Kaneko, Tetsuya; Kaneko, Shuzo; and Tsukamoto, Takeo, 5,552,914, Cl. 359-87.000.
Sugawara, Saburo, 5,552,938, Cl. 359-691.000.
Tachibana, Shinichi, 5,553,037, Cl. 369-13.000.
Takamiya, Makoto; Kadowaki, Hidejiro; Ishida, Yasuhiko; Ashiwa, Jun; Kato, Shigeki; and Ueda, Shinji, 5,552,879, Cl. 356-28.500.
Tanaka, Fumihiro, 5,552,905, Cl. 358-523.000.
Ujiie, Soubei; and Suzuki, Tadashi, 5,552,858, Cl. 355-202.000.
Yamada, Masaaori, 5,552,981, Cl. 364-132.000.
Yoshida, Takehiro; and Miyake, Shoji, 5,551,679, Cl. 270-58.090.

Cantrill, James E.; and Doyle, Thomas R., to Novacor Chemicals (International) S.A. Particulator. 5,551,859, Cl. 425-317.000.

Cap, Heinrich; Elsaesser, Dieter; Koletzki, Ulrich; and Papst, Georg, to Papst Licensing GmbH. Disk storage device with motor with axially deep flange. 5,552,650, Cl. 310-67.00R.

Carborundum Company, The: *See*—
Casey, Jon A.; Cordero, Carla N.; Fasano, Benjamin V.; Goland, David B.; Hannon, Robert; Harris, Jonathan H.; Herron, Lester W.; Johnson, Gregory M.; Patel, Niranjan M.; Reitter, Andrew M.; Shinde, Subhash L.; Vallabhaneni, Rao V.; and Youngman, Robert A., 5,552,232, Cl. 428-547.000.

Card, Roger J.: *See*—
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Cardiac Assist Devices, Inc.: *See*—
Rashidi, Majid, 5,552,713, Cl. 324-555.000.

Cardiometrics, Inc.: *See*—
Cowan, Mark W., 5,551,301, Cl. 73-708.000.

Carey, James T.: *See*—
Avery, Noyes L.; Axelrod, Joan C.; Carey, James T.; Hiebert, John; and Horodysky, Andrew G., 5,552,069, Cl. 508-229.000.

Carl, Frederick G., Jr.: *See*—
Stegemeier, George L.; Vinegar, Harold J.; and Carl, Frederick G., Jr., 5,553,189, Cl. 392-422.000.

Carlin, Richard T.; and Fuller, Joan, to United States of America, Air Force. Stabilized rechargeable cell in MSE and method therefor. 5,552,238, Cl. 429-50.000.

Carnaudmetalbox PLC: *See*—
De'Ath, Roderick M.; and Griffiths, Donald E., 5,551,141, Cl. 29-527.300.

Carnes, Vince S.; and Saldana, Javier, to Chrysler Corporation. Retainer assembly for a lock cylinder. 5,551,268, Cl. 70-370.000.

Caroma Industries Limited: *See*—
De Pieri, Timothy, 5,551,466, Cl. 137-1.000.

Carpenter, Clint W.: *See*—
Hall, Jon R.; Carpenter, Clint W.; and Scott, Stuart K., 5,552,458, Cl. 523-403.000.

Carr, Charles D.; Bolkan, Steven A.; and Becker, Joseph G., to Church & Dwight Co., Inc. Carbonate built laundry detergent composition. 5,552,078, Cl. 510-351.000.

Carr, Thomas D., to Eastman Kodak Company. Magnetoresistive magnetic field sensor divided into a plurality of subelements which are arrayed spatially in series but are connected electrically in parallel. 5,552,706, Cl. 324-252.000.

Carroll, Alf L.: *See*—
Roumbehler, David P.; Achter, Eugene K.; Lieb, David P.; Fine, David H.; Hainsworth, Eugenie; Carroll, Alf L.; and Wendell, Gregory J., 5,551,278, Cl. 73-1.00G.

Carroll, Gary T.; and Pauley, J. Donald, to Racom Systems, Inc. FSK detector for determining an increasing time period between adjacent pulses of an FSK modulated square wave pulse train. 5,553,099, Cl. 375-334.000.

Carter, Richard D.: *See*—
Freeman, Gary M.; Moller, Kurt H.; and Carter, Richard D., 5,551,975, Cl. 106-485.000.

Carter, Richard W.: *See*—
Noureldin, Abdel H.; Carter, Richard W.; and Noureldin, Ahmed M., 5,551,421, Cl. 128-207.170.

Carter, Robert L.: *See*—
Bouton, Frank M.; Carter, Robert L.; Hoffman, Clarence A.; Juve, Eric K.; and Kimmel, Rodney W., 5,551,701, Cl. 463-36.000.

Carter, Stephen A.; Kozole, Karl-Heinz; and Hannaby, Richard T., to Ortech Corporation. Tuned intake manifold for OTTO cycle engines. 5,551,387, Cl. 123-184.420.

Cartier, Paul; Sudol, Wojtek; and Vogel, Gregory G., to Hewlett-Packard Company. Multiconductor shielded transducer cable. 5,552,565, Cl. 174-117.00F.

Cartossi, Ferdinando, to Cartossi S.R.L. Capsular base laterally carrying graphic elements, for a cooking utensil. 5,551,415, Cl. 126-390.000.

Cartossi S.R.L.: *See*—
Cartossi, Ferdinando, 5,551,415, Cl. 126-390.000.

Cascade Designs, Inc.: *See*—
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Case Corporation: *See*—
Shubinsky, Vladimir D., 5,551,548, Cl. 192-106.00F.

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Pettit, Donald W.; and Plourd, Terrence W., 5,551,692, Cl. 273-143.00R.

Casio Computer Co., Ltd.: *See*—
Kimura, Satoshi; Miyazaki, Hideki; Shimizu, Hiroto; Yamamoto, Kazuto; and Kato, Tsuyoshi, 5,553,172, Cl. 382-312.000.

Caskey, C. Thomas; Fu, Ying-Hui; Friedman, David L.; Pizzuti, Antonio; and Fenwick, Raymond G., to Baylor College of Medicine. Diagnosis of myotonic muscular dystrophy. 5,552,282, Cl. 435-6.000.

Casper, Stephen L., to Micron Technology, Inc. N-channel voltage regulator. 5,552,740, Cl. 327-541.000.

Casper, Stephen L.: *See*—
Keeth, Brent; Zagar, Paul S.; Shirley, Brian M.; and Casper, Stephen L., 5,552,739, Cl. 327-538.000.

Castellano Berlanga, José M.: *See*—
Braña, Miguel F.; Castellano Berlanga, José M.; Morán Moset, Marina; Schlick, Erich; and Keilhauer, Gerhard, 5,552,544, Cl. 544-126.000.

Castello, Rinaldo: *See*—
Tomasini, Luciano; Castello, Rinaldo; and Confalonieri, Pierangelo, 5,552,747, Cl. 327-536.000.

Castle, Harold L.: *See*—
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Castleberry, Jeffrey P.: *See*—
Williamson, Mark E.; Newbrough, Jerry W.; Anderson, Robert L.; Castleberry, Jeffrey P.; Heim, Warren P.; and Stracener, Steve W., 5,551,850, Cl. 417-474.000.

Catalano, Anthony W., Jr. Shoe hook spike and method of utilizing same for securing a tackless strip against a wall when installing carpet. 5,551,820, Cl. 411-485.000.

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Creger, Todd D.; League, Richard B.; Mitchell, Randall M.; Spurlock, David M.; Talbott, James R.; and Williamson, Gregory L., 5,551,930, Cl. 477-130.000.
Garman, Ronald H.; Garnett, Stephen C.; and Groth, Steven L., 5,551,265, Cl. 70-177.000.
Gibson, Dennis H.; Hefler, Gregory W.; Shinogle, Ronald D.; and Sommars, Mark F., 5,551,398, Cl. 123-446.000.
Haselkorn, Michael H.; and Long, Michael C., 5,552,196, Cl. 428-34.500.
Peifer, Gary S., 5,551,913, Cl. 454-121.000.
Stratton, Kenneth L., 5,551,518, Cl. 172-4.500.

Cattano, Janice M.: *See*—
Estes, Mark C.; and Cattano, Janice M., 5,551,418, Cl. 128-204.230.

Cava, Robert J.; Krajewski, James J.; and Peck, William F., to AT&T Corp. Compensation of the temperature coefficient of the dielectric constant of barium strontium titanate. 5,552,355, Cl. 501-137.000.

Cavanagh, Edward T., Jr.: *See*—
Morrissey, Douglas E.; Cavanagh, Edward T., Jr.; Wieder, Gene T.; Ng, Kin H.; and Oldham, William E., 5,553,302, Cl. 395-825.000.

Cayer, Marilyn: *See*—
Siiman, Olavi; Burshteyn, Alexander; and Cayer, Marilyn, 5,552,086, Cl. 252-408.100.

Celestech, Inc.: *See*—
Shepard, Cecil B., Jr.; Heuser, Michael S.; Raney, Daniel V.; Quirk, William A.; and Bak-Boychuk, Gregory, 5,551,983, Cl. 118-723.00R.

Cellini, Ronald A.: *See*—
Wilson, James; and Cellini, Ronald A., 5,552,785, Cl. 341-143.000.

Cementos Mexicanos, S.A.: *See*—
Artemjev, Vladimir K.; and Garcia-Segovia, Amando J., 5,551,639, Cl. 241-5.000.

Central Glass Company, Limited: *See*—
Ito, Tosikazu; and Yamauchi, Yutaka, 5,552,194, Cl. 428-31.000.

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Vodoor, Sam B.; and Rivlin, Jonathan B., 5,551,648, Cl. 242-615.300.

Central Research Laboratories Limited: *See*—
Clemow, Richard D., 5,552,944, Cl. 360-76.000.

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Sanchez, Jean-Yves; Armand, Michel; Petit, Jean-Pierre; Choquette, Yves; and Goulart Silva, Glaura, 5,552,510, Cl. 528-250.000.

Century Products Company: *See*—
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Ceramco Inc.: *See*—
Hornor, John A., 5,552,350, Cl. 501-64.000.

CeramOptec Industries, Inc.: *See*—
Hering, Peter; and Haisch, Michael, 5,553,177, Cl. 385-31.000.

Chachowski, Rosemary K.; Setcavage, Thomas M.; and Reis, Kathleen J., to Ortho Diagnostic Systems, Inc. Column agglutination assay and device using biphasic centrifugation. 5,552,064, Cl. 210-787.000.

Chaddetton, John; Child, David; and Deighton, John, to Engelhard Corporation. Particulate filter, and system and method for cleaning same. 5,551,971, Cl. 95-15.000.

Chamberlin, Davis W.: *See*—
Niles, Gerald J.; and Chamberlin, Davis W., 5,551,568, Cl. 206-509.000.

Chambers, Mark D. Comfort insole. 5,551,173, Cl. 36-44.000.

Chamblee, J. Wayne; and Karlson, Eskil L., to Kamyr, Inc. Dielectric coating for ozone generator electrodes. 5,552,125, Cl. 422-186.070.

Chan, Michael J.: *See*—
Almquist, Frank A.; Anderson, David F.; Campbell, John E.; Chan, Michael J.; Flaherty, Stephen W.; Hajek, Steven F.; Larsen, John F.; Milligan, Charles H.; Price, Cyril A.; Simon, Andrew M.; Washburn, William F.; Williams, George A., II; and Wood, Roy A., 5,553,144, Cl. 380-25.000.

Chan, Philip W.; and Sin, Kwong S., to Gemstar Development Corporation. Method for downloading setup data via telephone to an appliance controller. 5,553,123, Cl. 379-102.000.

Chan, Shufan, to Linfinity Microelectronics. Low voltage dropout circuit with compensating capacitance circuitry. 5,552,697, Cl. 323-282.000.

Chan, Yee-Ning: *See*—
Van Gaal, Adrianus P.; Humphreys, Richard J.; Atkinson, John C.; Chawla, Amit; and Chan, Yee-Ning, 5,552,961, Cl. 361-700.000.

Chan, Yuen H.: *See*—
Pelella, Antonio R.; and Chan, Yuen H., 5,552,745, Cl. 327-407.000.
Reohr, William R.; Chan, Yuen H.; and Lu, Pong-Fei, 5,553,029, Cl. 365-208.000.

Chang, Clarence D.; Santiesteban, Jose G.; Shihabi, David S.; Stevenson, Scott A.; and Vartuli, James C., to Mobil Oil Corporation. Selective catalytic reduction of nitrogen oxides. 5,552,128, Cl. 423-235.000.

Chang, David; and Altrock, Bruce, to Kirin-Amgen, Inc. Hybridoma cell lines and their monoclonal antibodies to human pluripotent granulocyte colony stimulating factor. 5,552,286, Cl. 435-7.200.

Chang, Jenn-Liang: *See*—
Su, Ming-Chang; and Chang, Jenn-Liang, 5,553,245, Cl. 395-284.000.

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Chang, Ning S.: *See*—
Hennessey, A. Kathleen; Lin, YouLing; Hastings, Howard V., II; Lovelace, Jerome R.; and Chang, Ning S., 5,553,168, Cl. 382-276.000.

Chang, Te; and Harris, Stephen H., to ARCO Chemical Technology, L.P. Process for recovering dipropylene glycol tert-butyl ethers. 5,552,024, Cl. 203-64.000.

Chapin, Michael. Fluorescent tube breaker apparatus. 5,551,643, Cl. 241-99.000.

Chapman, James D.: *See*—
Godlewski, Wayne W.; Chapman, James D.; Diana, Gary M.; Hiss, Steven P.; Volo, Jane M.; Weil, Richard; and Underwood, Lance H., 5,551,428, Cl. 128-653.100.

Charboneau, Kenneth R. Pipe liner and monitoring system. 5,551,484, Cl. 138-104.000.

Chassis Systems, Inc.: *See*—
Corbett, Nelson H., 5,551,831, Cl. 414-786.000.

Chaturvedula, Prasad V.: *See*—
Dolle, Roland E.; Chaturvedula, Prasad V.; Ross, Tina M.; and Schmidt, Stanley J., 5,552,400, Cl. 514-221.000.

Chau, Chieh-Chun: *See*—
So, Ying H.; Martin, Steven J.; Chau, Chieh-Chun; Wessling, Ritchie A.; Sen, Ashish; Kato, Katsuhiko; Roitman, Daniel B.; and Rochefort, Willie E., 5,552,221, Cl. 428-373.000.

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Hill, Darrell G.; Henderson, Timothy S.; Liu, William U.; Fan, Shou-Kong; Chau, Hin-Fai; Costa, Damian; and Khatibzadeh, Ali, 5,552,617, Cl. 257-197.000.

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Van Gaal, Adrianus P.; Humphreys, Richard J.; Atkinson, John C.; Chawla, Amit; and Chan, Yee-Ning, 5,552,961, Cl. 361-700.000.

Chelsea Group Ltd.: *See*—
Benda, George, 5,553,006, Cl. 364-550.000.

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Fodge, Douglas W.; Anderson, David M.; and Pettey, Thomas M., 5,551,515, Cl. 166-300.000.

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Morris, Marion C.; Bomber, Robert R.; Chen, Franklin M. C.; and Wideman, Ronald H., 5,552,012, Cl. 156-272.400.

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Wood, Ronald W.; El-Fawal, Hassan A. N.; Graefe, John F.; Chen, Lung C.; and Shojaie, Jalil, 5,552,407, Cl. 514-291.000.

Chen, Otis Y.: *See*—
Tredway, William K.; Musson, Craig W.; and Chen, Otis Y., 5,552,215, Cl. 428-298.000.

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Agostinelli, John A.; Mir, Jose M.; Lubberts, Gerrit; and Chen, Samuel, 5,552,373, Cl. 505-190.000.

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Chenevard, Alexis: *See*—
Molina, Ernest; and Chenevard, Alexis, 5,551,209, Cl. 53-168.000.

Cheney, Michael C.: *See*—
Znaiden, Alexander P.; Cheney, Michael C.; and Rose, Walter, 5,552,147, Cl. 424-401.000.

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Stern, Michael K.; and Cheng, Brian K.-M., 5,552,531, Cl. 534-588.000.

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Znaiden, Alexander P.; Cheney, Michael C.; and Rose, Walter, 5,552,147, Cl. 424-401.000.
Znaiden, Alexander P.; Crotty, Brian; and Johnson, Anthony, 5,552,148, Cl. 424-401.000.

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Evans, Susan T., 5,552,132, Cl. 423-701.000.
Vitkauskas, John D., 5,551,367, Cl. 114-74.00R.

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Bergemont, Albert; Mead, Carver A.; Chi, Min-hwa; and Haggag, Hosam, 5,552,619, Cl. 257-291.000.

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Sentoku, Koichi; Saito, Kenji; Chiba, Keiko; and Maehara, Hiroshi, 5,553,110, Cl. 378-35.000.

Chiba, Yuji: *See*—
Ebinuma, Ryuichi; Mizusawa, Nobutoshi; and Chiba, Yuji, 5,552,812, Cl. 347-34.000.

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Takemoto, Takatoshi; Chida, Tosikazu; Kano, Noriaki; Ito, Eizi; Murakami, Koji; Itagaki, Takasi; Sekimoto, Kozo; and Suzuki, Masanori, 5,551,912, Cl. 453-56.000.

Chief Manufacturing, Inc.: *See*—
Dittmer, Jay S., 5,551,658, Cl. 248-329.000.

Child, David: *See*—
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Chilton, Jeffrey K.: *See*—
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Chiou, Ming-Shyang: *See*—
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Chiron Corporation: *See*—
Urdea, Michael S.; and Horn, Thomas, 5,552,280, Cl. 435-6.000.
Urdea, Michael S.; and Horn, Thomas, 5,552,538, Cl. 536-24.300.

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Cho, Toshiyuki: *See*—

Kawaguchi, Kenji; Motodate, Shoji; Toriyama, Masayuki; Honda, Satoshi; Fujii, Takaaki; and Cho, Toshiyuki, 5,552,988, Cl. 364-426.010.

Choquette, Yves: *See*—
Sanchez, Jean-Yves; Armand, Michel; Petit, Jean-Pierre; Choquette, Yves; and Goulart Silva, Glaura, 5,552,510, Cl. 528-250.000.

Chow, Suezone, to Canadian Forest Products Ltd. Process to decontaminate soil containing chlorophenols. 5,552,059, Cl. 210-747.000.

Christensen, Dale A.; and Nash, Peter. Chromogen agar color reactive test sheet. 5,552,288, Cl. 435-7.900.

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Christensen, Thorkild; Balschmidt, Per; Sørensen, Hans; Olsen, Ole; and Thim, Lars, to Novo Nordisk A/S. Pharmaceutical formulation. 5,552,385, Cl. 514-18.000.

Christiansen, Chris C., to Medtronic, Inc. Medication delivery device and method of construction. 5,551,849, Cl. 417-472.000.

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Vurek, Gerald G.; and Christianson, Harlow B., 5,551,300, Cl. 73-706.000.

Christianson, Todd J., to Minnesota Mining and Manufacturing Company. Article for polishing stone. 5,551,960, Cl. 51-295.000.

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Wheeler, Edward L.; D'Amelia, Ronald P.; Leveille, Gilbert A.; Otterburn, Michael S.; Klemann, Lawrence P.; Finley, John W.; Roden, Allan D.; Chrysam, Michael M.; Pelloso, Turiddu A.; and Given, Peter S., Jr., 5,552,174, Cl. 426-607.000.

Chrysler Corporation: *See*—
Behrens, William L., 5,551,266, Cl. 70-247.000.
Carnes, Vince S.; and Saldana, Javier, 5,551,268, Cl. 70-370.000.
Sanders, Brian V., 5,551,409, Cl. 123-572.000.
Zielinski, Thomas E.; Eisenmann, Gregg A.; Kennedy, Robert D.; O'Bransovic, Nickolas; and Sian, Sucha S., 5,551,150, Cl. 29-882.000.

Chu, Tino. Slider of a zipper. 5,551,129, Cl. 24-429.000.

Chua, Kaw-Yan: *See*—
Thomas, Wayne R.; and Chua, Kaw-Yan, 5,552,142, Cl. 424-185.100.

Chuang, Hut N.: *See*—
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Chung, David Y.: *See*—
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Chung, Tae Y.: *See*—
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Church & Dwight Co., Inc.: *See*—
Carr, Charles D.; Bolkan, Steven A.; and Becker, Joseph G., 5,552,078, Cl. 510-351.000.
Lajoie, M. Stephen; and Sargent, Robin C., 5,552,084, Cl. 252-385.000.

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Baumann, Dieter; Hollstein, Werner; Rabener, Claus W.; and Rüger, Peter, 5,552,459, Cl. 523-427.000.
Klier, Herbert; Müller, Bernhard; Ruhlmann, Edmond; and Tzikas, Athanassios, 5,552,532, Cl. 534-612.000.
MacPherson, Lawrence J.; and Parker, David T., 5,552,419, Cl. 514-357.000.
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Ciholas, Mike: *See*—
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Cioca, Gheorghe; Anderson, Jon E.; Cohen, Isaac D.; Tadlock, Charles C.; and Bevacqua, Andrew J., to Estee Lauder, Inc. Sunscreens containing plant extracts. 5,552,135, Cl. 424-59.000.

Cipolla, Jeffrey L.; Waclawik, Ronald E.; and Elste, Charles L., to United States of America, Navy. Underwater vehicle and a combination directional control and cable interconnect means. 5,551,363, Cl. 114-23.000.

Cipolla, Jeffrey L.; and Waclawik, Ronald E., to United States of America, Navy. Underwater vehicle and combination directional control and cable interconnect device. 5,551,364, Cl. 114-23.000.

Cipolla, Jeffrey L.; Waclawik, Ronald E.; and Elste, Charles L., to United States of America, Navy. Water vehicle and a directional control means therefor. 5,551,365, Cl. 114-23.000.

Cipolla, Mark E.; and Wert, David M., to Royal Appliance Mfg. Co. Conversion assembly for vacuum cleaners. 5,551,120, Cl. 15-333.000.

Cirrus Logic, Inc.: *See*—
Keene, David, 5,553,220, Cl. 395-154.000.
Lin, Jyhfong, 5,552,728, Cl. 327-57.000.

CIS BIO International: *See*—
Duplaa, Anne-Marie; Gasparutto, Didier; Livache, Thierry; Molko, Didier; and Teoule, Robert, 5,552,539, Cl. 536-25.310.

Claffey-Cohen, Margaret; Le, Phat T.; Louie, Timothy J.; Neel, Alan F., II; and Ward, James P., to International Business Machines Corporation. Method and apparatus for controlling parallel port drivers in a data processing system. 5,553,306, Cl. 395-828.000.

Clapp, Timothy G.; and Barrett, George R., to North Carolina State University. Sewing machine having presser bar system for maintaining constant contact force between presser foot and fabric. 5,551,361, Cl. 112-475.010.

Clark Equipment Company: *See*—
Berg, Gerald M.; and Albright, Larry E., 5,551,523, Cl. 180-273.000.

Clark, James T.: *See*—
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Cherry, Brian W.; Smith, James E.; Mucino, Victor E.; Clark, Nigel N.; Thompson, Gregory; and Badgley, Patrick R., 5,551,853, Cl. 418-148.000.

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Clarke, Neil: *See*—
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Clavin, Timothy J., to Hartwell Corporation. Single-point self-closing latch. 5,551,737, Cl. 292-169.000.

Clawson, William W.: *See*—
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Clean Burn, Inc.: *See*—
Smoker, Benjamin K.; Yoder, David J.; Smoker, Benuel F.; and Phillips, Frederick W., 5,551,868, Cl. 431-208.000.

Clearing Niagara, Inc.: *See*—
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Clemente, Emmett; Mendes, Robert W.; Anaebonam, Aloysius O.; and Ahmed, Mumtaz, to Ascent Pharmaceuticals, Inc. Process for treating hemangioma. 5,552,436, Cl. 514-456.000.

Clemow, Richard D., to Central Research Laboratories Limited. Method and apparatus for the determination of azimuth error. 5,552,944, Cl. 360-76.000.

Cleuziat, Philippe L.; Awade, Abalo; Robert-Baudouy, Jeannine; and Gayral, Jean-Pierre, to Bio Merieux. Polypeptides containing sequences characteristic of pyrrolidone carboxylyl peptidases, polynucleotides containing a sequence coding for such polypeptides, and their use, in particular for diagnostic purposes. 5,552,273, Cl. 435-6.000.

Clifton, Norman E., Jr. Truncheon holster. 5,551,610, Cl. 224-197.000.

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Cochran, Bruce A.; Liebetreu, John M.; and McCallister, Ronald D., to Sicom, Inc. Demodulator with selectable coherent and differential data. 5,553,098, Cl. 375-324.000.

Cody, Daniel J., to DEC International, Inc. Pasteurizer. 5,551,334, Cl. 99-470.000.

Coe, David E., to ABB Kent-Taylor Limited. Sensors. 5,552,025, Cl. 205-785.500.

Coelho, Rohan: *See*—
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Coellner, James A.: *See*—
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Coffelt Manufacturing, Inc.: *See*—
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Coffey, Jerome T.; Goodman, Dale E.; and Poss, Joe M., to International Business Machines Corporation. Direct access storage device with magneto–resistive transducing head apparatus and a common read return signal line. 5,552,950, Cl. 360-128.000.

Coffey, Jerome T.: *See*—
Bicknese, Bryan W.; Boigenzahn, Jeffrey F.; Bornhorst, Randy J.; Coffey, Jerome T.; Fracek, Todd P.; Johnson, Douglas W.; Lagergren, Richard E.; Rigotti, James M.; and Schlimmer, Marvin A., 5,552,946, Cl. 360-97.010.

Cohen, Isaac D.: *See*—
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Coiton, Gérard: *See*—
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Colgate-Palmolive Co.: *See*—
Misselyn, Anne-Marie; Mahieu, Marianne; Yianakopoulos, Georges; and Erilli, Rita, 5,552,089, Cl. 510-417.000.

Colgrove, John A.: *See*—
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Colley, Jaime B.; and Niemi, Thomas A., to Rockwell International Corporation. Position estimation using satellite range rate measurements. 5,552,794, Cl. 342-357.000.

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Collingborn, Peter A. G., to Lucas Industries public limited company. Advance piston mounting. 5,551,399, Cl. 123-450.000.

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Collot, André C. F.; Ferte, Jean-Pierre; and Jolly, Roger, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "SNECMA" . Process for welding two blade parts. 5,551,623, Cl. 228-112.100.

Coltec Industries Inc.: *See*—
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Colvin, Howard A.: *See*—
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Colwell, Michael J.: *See*—
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Commissariat a l'Energie Atomique: *See*—
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Melo, Maria L.; Wolford, Jeff W.; Moriarty, Michael; Culley, Paul R.; and Schnell, Arnold T., 5,553,248, Cl. 395-296.000.
Taylor, Mark; Culley, Paul R.; Melo, Maria L.; and Tipley, Roger E., 5,553,310, Cl. 395-860.000.

Computer Motion, Inc.: *See*—
Wang, Yulun; and Laby, Keith P., 5,553,198, Cl. 395-80.000.

Comroe, Richard A.: *See*—
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Conceptus, Inc.: *See*—
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Conder, Jeff E.; and Woodberry, Meral B., to Sharp Microelectronics Technology, Inc.; and Sharp Kabushiki. Shielded low noise multi-lead contact. 5,552,563, Cl. 174-35.00R.

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Conley, Willard E., Jr.: *See*—
Aviram, Ari; Brunsvold, William R.; Bucca, Daniel; Conley, Willard E., Jr.; and Seeger, David E., 5,552,256, Cl. 430-192.000.

Conner, Billy T.: *See*—
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Connor, John P.; and Ternullo, Luigi, Jr., to International Business Machines Corporation. Built-in self-test for logic circuitry at memory array output. 5,553,082, Cl. 371-25.100.

Conradson, Scott A.: *See*—
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Consolidated Engineering Company, Inc.: *See*—
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Contico International, Inc.: *See*—
Foster, Donald D.; and Nelson, Philip L., 5,551,636, Cl. 239-333.000.

Converse, William L. Wall mounted golf equipment storage caddy. 5,551,579, Cl. 211-70.200.

Convey, Inc.: *See*—
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Conzentino, Philip, Jr.: *See*—
Liversidge, Gary G.; Conzentino, Philip, Jr.; Cundy, Kenneth C.; and Sarpotdar, Pramod P., 5,552,160, Cl. 424-489.000.

Cook, Bernard L.; and Dilley, David D., to Plastic Trim, Inc. Trim strip and method for making same. 5,552,195, Cl. 428-31.000.

Cook, John E.: *See*—
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Cook, Robert C.: *See*—
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Cook, Scott J., to Avnet, Inc. Die-castable corrugated horns providing elliptical beams. 5,552,797, Cl. 343-786.000.

Cook, Thomas D.; Bukowski Jr., Eugene R.; and Voorhis, Vicki J., to Delco Electronics Corporation. Method and apparatus for the generation of long time constants using switched capacitors. 5,552,648, Cl. 307-125.000.

Cooke, Richard D. M.; and Struve, Benjamin C., to Automotive Products, plc. Friction facing and carrier assembly. 5,551,549, Cl. 192-107.00R.

Cooper, Russell E., to Microchip Technology Inc. Low voltage, low power oscillator having voltage level shifting circuit. 5,552,751, Cl. 331-116.0FE.

Coppola, Vincent M.: *See*—
Brown, George T.; Coppola, Vincent M.; Goodman, Walter A.; Grebe, Frank V.; Hatton, Charles R.; Hermansen, David R.; Podmajersky, David J.; Reynolds, Dennis P.; Ritinski, Edward R.; Rizzi, Julian D.; Sherman, John H.; and Wormsbecher, Paul A., 5,552,957, Cl. 361-683.000.

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Corder, Jerry W.: *See*—
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Casey, Jon A.; Cordero, Carla N.; Fasano, Benjamin V.; Goland, David B.; Hannon, Robert; Harris, Jonathan H.; Herron, Lester W.; Johnson, Gregory M.; Patel, Niranjan M.; Reitter, Andrew M.; Shinde, Subhash L.; Vallabhaneni, Rao V.; and Youngman, Robert A., 5,552,232, Cl. 428-547.000.

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Corning Incorporated: *See*—
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Karanewsky, Donald S.; and Robl, Jeffrey A., 5,552,397, Cl. 514-212.000.

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Agarwal, Krishna K.; and Harlan, Richard R., 5,552,753, Cl. 333-33.000.
Smith, Winthrop W., 5,552,792, Cl. 342-195.000.

Early, Derrick A. Digitally controlled magneto ignition system with alternate timing. 5,551,397, Cl. 123-418.000.

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Hubbs, John C.; Harrison, Marti N.; Buchanan, Charles; and White, Alan W., 5,552,515, Cl. 528-354.000.
Miller, Richard A.; Parsons, Theron E., III; and Montgomery, Mark A., 5,552,495, Cl. 525-437.000.
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Sublett, Bobby J., 5,552,512, Cl. 528-308.000.

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Agostinelli, John A.; Mir, Jose M.; Lubberts, Gerrit; and Chen, Samuel, 5,552,373, Cl. 505-190.000.
Bredoux, Francois J.; and Pfaff, Maurice E., 5,552,265, Cl. 430-379.000.
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Cullinan, Ann M.; Darmon, Charles M.; Sauter, Rosa P.; and Leith, Charles F., 5,552,264, Cl. 430-372.000.
DiRisio, Anthony; Earnhart, Edgar G.; and Wolf, Michael T., 5,552,849, Cl. 354-275.000.
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Godlewski, Wayne W.; Chapman, James D.; Diana, Gary M.; Hiss, Steven P.; Volo, Jane M.; Weil, Richard; and Underwood, Lance H., 5,551,428, Cl. 128-653.100.
Koelsch, Michael L.; McIntyre, Dennis A.; and Roy, James B., 5,551,213, Cl. 53-434.000.
Lawther, Joel S., 5,552,848, Cl. 354-206.000.
Smart, David C., 5,552,855, Cl. 355-41.000.
Smith, Neil; Jeffers, Frederick J.; Gandola, Kent R.; and Koeppe, Peter V., 5,552,589, Cl. 235-449.000.
Spaulding, Kevin E.; Courwenhoven, Douglas W.; and Miller, Rodney L., 5,553,199, Cl. 395-109.000.
Stanley, Paul L. R.; and Watts, Christina M., 5,552,266, Cl. 430-546.000.
Tang, Ching W.; and Van Slyke, Steven A., 5,552,678, Cl. 315-169.300.
Vandenberg, Donald E.; Dey, Thomas W.; and Olson, James, 5,552,594, Cl. 250-201.700.

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Fello, Joseph P.; and Whipple, Michael J., 5,552,755, Cl. 335-18.000.
White, Jay D., 5,551,761, Cl. 301-6.300.

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Inoue, Naoyuki, 5,551,254, Cl. 62-489.000.

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Kurata, Mitsuru; Miyake, Hiroyuki; and Ebata, Tokihide, 5,552,811, Cl. 347-28.000.

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Ebert, Siegfried; and Ebert, Ilona. Automatic tensioning and damping element for endless chain drives. 5,551,926, Cl. 474-101.000.

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Edgerton, Cathy J.: *See—*
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Edling, Jack V.: *See—*
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Wu, Song; Probst, Samuel G.; Edvardsson, Christina M.; and Alliston, Michael G., 5,551,357, Cl. 110-344.000.

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Madabhushi, Ramakrishna S.; Menchen, Steven M.; Efcavitch, J. William; and Grossman, Paul D., 5,552,028, Cl. 204-451.000.

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Saban, Rami; Shacham, Alon; Efendovich, Avner; and Karpati, Varda, 5,553,100, Cl. 375-340.000.

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Egyűd, Cecilia: *See—*
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Eilrich, Uwe: *See—*
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Eisenman, June: *See—*
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Eisenmann, Gregg A.: *See—*
Zielinski, Thomas E.; Eisenmann, Gregg A.; Kennedy, Robert D.; O'Branovic, Nickolas; and Sian, Sucha S., 5,551,150, Cl. 29-882.000.

EKA Nobel, AB: *See—*
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Electro Energy, Inc.: *See—*
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Electro Scientific Industries, Inc.: *See—*
Shealey, Evart D., 5,551,979, Cl. 118-70.000.

Electrochemical Systems, Inc.: *See—*

Mamantov, Gleb, deceased; Caja, Josip; and Dunstan, Thanthrimudalige D. J., 5,552,241, Cl. 429-103.000.

ElectroCom Automation L.P.: *See—*
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Burkhardt, Robert W.; Walch, John W.; Owens, Ricky A.; and Mancl, Dennis J., 5,551,122, Cl. 15-344.000.
Gray, Steven L.; Hoekstra, Peter; Martin, Michael F.; and Moyher, George C., Jr., 5,551,731, Cl. 285-7.000.

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Mahon, Steven S.; Brophy, Martin J.; and Hoskins, Michael J., 5,552,335, Cl. 437-53.000.

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Rogers, Wesley A., 5,552,715, Cl. 324-627.000.

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Elf Atochem North America, Inc.: *See—*
Bolmer, Michael S., 5,552,080, Cl. 510-412.000.

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Galvez, Jean-Marc; and Renouard, Philippe, 5,552,481, Cl. 525-74.000.

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Wood, Ronald W.; El-Fawal, Hassan A. N.; Graefe, John F.; Chen, Lung C.; and Shojaie, Jalil, 5,552,407, Cl. 514-291.000.

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Bryant, Henry U.; and Grese, Timothy A., 5,552,433, Cl. 514-443.000.
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DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Shields, James E.; and Smiley, David L., 5,552,522, Cl. 530-324.000.
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Hamill, Robert L.; and Yao, Raymond C., 5,552,386, Cl. 514-25.000.
Heath, William F., Jr.; Jirousek, Michael R.; McDonald, John H., III; and Rito, Christopher J., 5,552,396, Cl. 514-183.000.
Johnson, Lorin K.; Seilhamer, Jeffrey J.; Pruzanski, Waldemar; and Vadas, Peter, 5,552,530, Cl. 530-387.900.
Keohane, Patrick, 5,552,416, Cl. 514-324.000.
Lunn, William H. W.; Monn, James A.; and Zimmerman, Dennis M., 5,552,426, Cl. 514-394.000.
May, Patrick C., 5,552,415, Cl. 514-324.000.
Panetta, Jill A., 5,552,439, Cl. 514-534.000.
Pearce, Homer L.; and Winter, Mark A., 5,552,545, Cl. 544-279.000.
Schaus, John M.; Hoechsetter, Craig S.; Huser, Diane; Paget, Charles J.; and Titus, Robert D., 5,552,444, Cl. 514-657.000.
Wong, David T.; and Oguiza, Juan I., 5,552,429, Cl. 514-415.000.

ELIN Energieversorgung Gesellschaft M.B.H.: *See—*
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Ellenbogen, David M. Article for improving correspondence letter writing skills. 5,551,878, Cl. 434-165.000.

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Smith, James W.; Ellenor, David T. R.; and Harbinson, John N., 5,552,061, Cl. 210-750.000.

Eller, James M.: *See—*
McBrayer, Roy N., Jr.; Deaton, James E.; and Eller, James M., 5,552,039, Cl. 210-90.000.

Elliott, Timothy A.; Olson, Christopher H.; and Palermo, Frank J., to International Business Machines Corporation. Efficient floating point overflow and underflow detection system. 5,553,015, Cl. 364-748.000.

Ellis, James: *See—*
Bethel, Robert K.; Grayson, Michael B.; and Ellis, James, 5,551,520, Cl. 175-4.540.

Ellis, Jimi: *See—*
Barton, Bradley D.; and Ellis, Jimi, 5,551,592, Cl. 220-571.000.

Ellis, Richard E.: *See—*
Darbee, Paul V.; Ellis, Richard E.; Jansky, Louis S.; and Grossman, Avram S., 5,552,917, Cl. 359-148.000.

Elmer, Stefan, to Schmid & Wezel GmbH & Co. Revolving blade skinning device. 5,551,156, Cl. 30-276.000.

Elrod, Alvon C., Jr., to HR Textron Inc. Method of manufacturing direct drive servovalve and direct drive servovalve resulting therefrom. 5,551,481, Cl. 137-625.650.

Elroy, Charles W., Jr.: *See—*
Cowgill, John H.; and Elroy, Charles W., Jr., 5,551,177, Cl. 40-610.000.

Elsaesser, Dieter: *See—*
Cap, Heinrich; Elsaesser, Dieter; Koletzki, Ulrich; and Papst, Georg, 5,552,650, Cl. 310-67.00R.

Elschner, Andreas: *See—*
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Elscint Ltd.: *See—*
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Elste, Charles L.: *See—*
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Cipolla, Jeffrey L.; Waclawik, Ronald E.; and Elste, Charles L., 5,551,365, Cl. 114-23.000.

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Ema, Yasushi: *See—*
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Emerson, Kent E.: *See—*
Schilli, Kay F.; Roiko, Russell A.; Emerson, Kent E.; Woo, Edward J.; and Jalbert, Claire A., 5,552,869, Cl. 355-256.000.

Emhart Inc.: *See—*
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Emi, Mitsuru: *See—*
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Emory University: *See—*
Weinstock, Ira A.; Hill, Craig L.; and Atalla, Rajai H., 5,552,019, Cl. 162-79.000.

Empire Industries, Inc.: *See—*
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Endoh, Shuichi: *See—*
Murakami, Eisaku; Yuasa, Kazuhiro; Endoh, Shuichi; Matsumae, Iwao; Tanaka, Yoshiaki; Hosokawa, Hiroshi; Uno, Mugijiroh; Saitoh, Hiroshi; Takenaka, Eiji; Sugiyama, Toshihiro; Yamanaka, Tetsuo; and Komatsubara, Satoru, 5,552,870, Cl. 355-259.000.

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Engdahl, Jonathan R.; Gee, David J.; Lucak, Mark A.; and Adams, Shawn L., to Allen-Bradley Company, Inc. Method and apparatus for exchanging different classes of data during different time intervals. 5,553,095, Cl. 375-222.000.

Engelhard Corporation: *See—*
Chadderton, John; Child, David; and Deighton, John, 5,551,971, Cl. 95-15.000.
Farrauto, Robert J.; Feeley, Jennifer S.; Simone, Dianne O.; Lui, Yiu K.; and Kennelly, Teresa, 5,552,360, Cl. 502-178.000.
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Engelhardt, Reiner: *See—*
Lösel, Georg; Kraupa, Werner; and Engelhardt, Reiner, 5,551,381, Cl. 122-510.000.

Engen, Robbyn L.; Spencer, Douglas S.; and Ford, Jeffrey E., to Minnesota Mining and Manufacturing Company. Abrasive articles and methods of making same. 5,551,961, Cl. 51-298.000.

Engibarov, Eddy. Tool holder support assembly. 5,551,795, Cl. 403-381.000.

Enichen, William A., to International Business Machines. Pseudo-random registration masks for projection lithography tool. 5,552,611, Cl. 250-491.100.

Enoki, Masatoshi; Tokunaga, Osamu; Yamato, Shinichi; and Imazono, Masahiko, to Toto Ltd. Hot and cold water mixing discharge device. 5,551,630, Cl. 236-12.130.

Enomoto, Kunio; Otaka, Masahiro; Amano, Kazuo; Kurosawa, Koichi; Hayashi, Eisaku; Morinaka, Ren; Hattori, Shigeo; and Sato, Kasunori, to Hitachi, Ltd.; and Babcock-Hitachi Kabushiki Kaisha. Residual stress improving method for members in reactor pressure vessel. 5,553,106, Cl. 376-305.000.

Enomoto, Masaki, to Vinyl Industry Co., Ltd. Vinyl chloride resin composition. 5,552,484, Cl. 525-98.000.

Entenmann, Robert H.; Unland, Stefan; Phil.,pp, Matthias; Haeming, Werner; Surjadi, Iwan; Rothhaar, Ulrich; and Baeuerle, Michael, to Robert Bosch GmbH. System for the closed-loop control of the supercharging of an internal-combustion engine. 5,551,235, Cl. 60-602.000.

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Donner, Arno; Gill, Norbert; Lange, Jürgen; Schröbel, Volker; and Schade, Rolf, 5,551,303, Cl. 73-726.000.

Envirex Inc.: *See—*
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Environmental Marketing Services, Ltd.: *See—*
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Environmental Packing L.P.: *See—*
Redd, Randall V.; and Bacon, Paul W., 5,552,461, Cl. 524-47.000.

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Enzmann, Bernd; and Maus, Hansjörg, to IMS Morat Sohne GmbH. Gear mechanism for accumulator driven electric drill or electric screwdriver. 5,551,927, Cl. 475-265.000.

EPIC Design Technology Inc.: *See—*

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Epstein, Michael Y.; and Taylor, George W., to Ocean Power Technologies, Inc. Generation of electrical energy by weighted, resilient piezoelectric elements. 5,552,657, Cl. 310-339.000.
Erb, David J.; and Odom, Xiaoshan Z., to International Business Machines Corporation. Accelerated interface between processors and hardware adapters. 5,553,228, Cl. 395-162.000.
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Erilli, Rita: *See—*
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Ershov, Gennady M.: *See—*
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Eschner, Axel, to Didier-Werke AG. Refractory fiber structures. 5,552,213, Cl. 428-283.000.
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Est. Gilles Lerouz: *See—*
Bittar, Bachar, 5,553,158, Cl. 382-142.000.
Estee Lauder, Inc.: *See—*
Cioca, Gheorghe; Anderson, Jon E.; Cohen, Isaac D.; Tadlock, Charles C.; and Bevacqua, Andrew J., 5,552,135, Cl. 424-59.000.
Estes, Mark C.; and Cattano, Janice M., to Respironics, Inc. Sleep apnea treatment apparatus with reset circuitry. 5,551,418, Cl. 128-204.230.
Ethicon, Inc.: *See—*
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Ethyl Additives Corporation: *See—*
Mishra, Munmaya K.; Shirodkar, Shailaja M.; and Jung, Alfred K., 5,552,491, Cl. 525-299.000.
Ethyl Corporation: *See—*
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Eto, Yoshizumi: *See—*
Umemoto, Masuo; Ishii, Hirotake; Sawamura, Hidehiko; and Eto, Yoshizumi, 5,552,940, Cl. 360-19.100.
Etoh, Hiroaki; and Maruyama, Keiichi, to International Business Machines Corporation. Method and apparatus for solving numerical planning problems with inequalities on a computer system. 5,553,212, Cl. 395-140.000.
Evans, David A.; and Nguyen, Uy, to Norac Technologies Inc. Skin care composition. 5,552,158, Cl. 424-450.000.
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Evans, William P., to Northrop Grumman Corporation. Distortion reduction circuit for analog to digital converter system. 5,552,784, Cl. 341-122.000.
Everaerts, Albert I.; and Malmer, Jeffrey D., to Minnesota Mining and Manufacturing Company. Removable, low melt viscosity acrylic pressure seasitive adhesives. 5,552,451, Cl. 522-46.000.
Everingham, Gary; Cook, John E.; Perry, Paul D.; and Busato, Murray F., to Siemens Electric Limited. Canister purge system having improved purge valve. 5,551,406, Cl. 123-520.000.
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Ewing, James H., to MKS Instruments, Inc. Vaporizer and liquid delivery system using same. 5,553,188, Cl. 392-394.000.
Exar Corporation: *See—*
Huang, Yihe, 5,552,732, Cl. 327-116.000.
Excel Industries, Inc.: *See—*
Barnett, Wayne, 5,551,193, Cl. 49-496.100.
Excellon Automation Co.: *See—*
Hall, Hendley W., 5,551,821, Cl. 414-18.000.
Extrufix Inc.: *See—*
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Thompson, Robert H., 5,551,405, Cl. 123-516.000.
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Förster, Andreas; and Wirth, Alfred, to Fichtel & Sachs AG. Vibration damper and a vibration damper with a valve actuation device. 5,551,540, Cl. 188-299.000.
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Pauley, Douglas E.; D'Abate, Gary D.; Ishikawa, Kazushi; and Lopez, John M., 5,551,707, Cl. 277-233.000.
Freyssinet, Georges L.: *See*—
Thomas, Terry L.; Reddy, Avutu S.; Nuccio, Michael; and Freyssinet, Georges L., 5,552,306, Cl. 435-134.000.
Friebe, Eberhard; Moritz, Matthias; and Schoenbacher, Sepp, to Robert Bosch GmbH. Method and device for the radio-frequency connection of active subsections of a radio-frequency transmission system. 5,551,653, Cl. 246-167.00R.
Friedli, Floyd: *See*—
Manning, Monna M.; Allardice, Andrea S.; and Friedli, Floyd, 5,552,137, Cl. 424-70.100.
Friedman, David L.: *See*—
Caskey, C. Thomas; Fu, Ying-Hui; Friedman, David L.; Pizzuti, Antonio; and Fenwick, Raymond G., 5,552,282, Cl. 435-6.000.
Fries, Craig: *See*—
Ginsburg, Arthur P.; Tessler, Lawrence P.; Fries, Craig; and Tifft, Jonathan, 5,552,842, Cl. 351-205.000.
Friesen, Richard: *See*—
Delorme, Daniel; Dubé, Daniel; Ducharme, Yves; Grimm, Erich L., Friesen, Richard; and Lepine, Carole, 5,552,437, Cl. 514-457.000.
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Frisch, Gary J.: *See*—
Kessler, Calvin W.; and Frisch, Gary J., 5,552,598, Cl. 250-269.300.
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Kumpf, Friedhelm; and Haberberger, Peter, 5,551,224, Cl. 57-293.000.
Fritsch, Joseph E. Differential traction drive transmission. 5,551,929, Cl. 476-67.000.
Fritz, Edward: *See*—
Ogden, Andrew M.; Burkat, Alexander; Snoddy, Jon H.; and Fritz, Edward, 5,551,920, Cl. 472-59.000.
Fritz Schäfer Gesellschaft mit beschränkter Haftung: *See*—
Schäfer, Gerhard, 5,551,594, Cl. 220-675.000.

Froehlich, James P.; Mitchell, Joseph N.; and Jones, Stephen M., to DeVilbiss Health Care, Inc. Control for CPAP apparatus. 5,551,419, Cl. 128-204.230.
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Fu, James C.: *See*—
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Fuchs, Thomas; Slotta, Johannes; and Wagner, Dieter, to MAN Roland Druckmaschinen AG. Method for controlling the ink guidance in a printing machine. 5,551,342, Cl. 101-484.000.
Fues, Johann-Friedrich: *See*—
Kretschmann, Josef; Ritter, Wolfgang; and Fues, Johann-Friedrich, 5,552,454, Cl. 523-113.000.
Fuji Electric Co., Ltd.: *See*—
Goto, Hisashi; Hirano, Tatsuya; and Kobayashi, Shinichi, 5,551,333, Cl. 99-450.600.
Tamai, Mitsuru; Yao, Hironobu; and Saitoh, Masao, 5,551,299, Cl. 73-706.000.
Yamaguchi, Kiyoto; Yamasaki, Hisashi; and Matsui, Yoshifumi, 5,552,217, Cl. 428-332.000.
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Fuji Jukogyo Kabushiki Kaisha: *See*—
Tamamura, Manpei; Iidaka, Hiroshi; and Shibata, Eiji, 5,553,154, Cl. 381-71.000.
Yamaji, Toshio; and Tanaka, Nobumitsu, 5,551,392, Cl. 123-306.000.
Fuji Oozx, Inc.: *See*—
Harada, Katsuhiko, 5,551,908, Cl. 451-72.000.
Fuji Photo Film Co., Ltd.: *See*—
Agano, Toshitaka; and Goto, Yasuhiko, 5,552,818, Cl. 347-133.000.
Matsumoto, Fumio; Kato, Ryoichi; Tanabe, Kazumi; and Bando, Teruo, 5,552,866, Cl. 355-233.000.
Suzuki, Yoshinori; Tsujimoto, Tadahiro; and Fujisaki, Satoru, 5,552,188, Cl. 427-402.000.
Takeo, Hideya, 5,553,159, Cl. 382-156.000.
Fuji Photo Optical Co., Ltd.: *See*—
Ohno, Kazunori, 5,552,936, Cl. 359-691.000.
Fuji Xerox Co., Ltd.: *See*—
Ishikawa, Tadashi, 5,552,857, Cl. 355-200.000.
Kurashige, Kosuke, 5,553,219, Cl. 395-150.000.
Miyake, Hiroyuki, 5,552,630, Cl. 257-435.000.
Oda, Kazuyuki; Fujimura, Yoshihiko; and Isozaki, Jun, 5,552,816, Cl. 347-86.000.
Shinozaki, Kengo; Wakabayashi, Kimihiro; Murakami, Hiroki; and Araki, Masaaki, 5,551,618, Cl. 225-96.000.
Uotani, Akira, 5,553,211, Cl. 395-135.000.
Fujigami, Makoto: *See*—
Yokota, Tomohiro; Nishitani, Fumio; Ogawara, Hiroshi; Kubo, Akihito; and Fujigami, Makoto, 5,552,907, Cl. 359-49.000.
Fujii, Takaaki: *See*—
Kawaguchi, Kenji; Motodate, Shoji; Toriyama, Masayuki; Honda, Satoshi; Fujii, Takaaki; and Cho, Toshiyuki, 5,552,988, Cl. 364-426.010.
Fujii, Tatsuo; and Tanaka, Kimio, to TDK Corporation. Method for manufacturing plastic case. 5,552,101, Cl. 264-163.000.
Fujii, Tetsuhiko; Yamamoto, Akira; Kobashi, Tetsuzo; Sato, Masahiko; and Satoh, Takao, to Hitachi, Ltd. Method and device for transferring noncontiguous blocks in one transfer start by creating bit-map indicating which block is to be transferred. 5,553,307, Cl. 395-845.000.
Fujii, Toshiro; Kato, Yuichi; Iwama, Kazuaki; and Ohyama, Katsuya, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Reciprocating compressor with double headed pistons. 5,551,844, Cl. 417-269.000.
Fujii, Yasuhiro; and Tanimura, Toyoshi, to Ishihara Sangyo Kaisha, Ltd. Process for preparing 2-cyanoimidazole compounds by reaction of an amino ketone compound. 5,552,557, Cl. 548-337.100.
Fujimori, Taketoshi: *See*—
Ohashi, Yukihiro; Fujimori, Taketoshi; Nagai, Minoru; Kawamata, Akira; Yada, Yukihiro; Higuchi, Kazuhiko; Imokawa, Genji; Takema, Yoshinori; Sakaino, Yukiko; Ogawa, Ayumi; and Fujimura, Tsutomu, 5,552,445, Cl. 514-669.000.
Fujimoto, Hisayoshi: *See*—
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Fujimoto, James G.: *See*—
Ramaswamy, Mailini; and Fujimoto, James G., 5,553,093, Cl. 372-100.000.
Fujimoto, Kanna, to Procter & Gamble Company, The. Granular substance storing and dispensing container. 5,551,629, Cl. 229-125.150.
Fujimura, Tsutomu: *See*—
Ohashi, Yukihiro; Fujimori, Taketoshi; Nagai, Minoru; Kawamata, Akira; Yada, Yukihiro; Higuchi, Kazuhiko; Imokawa, Genji; Takema, Yoshinori; Sakaino, Yukiko; Ogawa, Ayumi; and Fujimura, Tsutomu, 5,552,445, Cl. 514-669.000.
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Fujino, Naohiko: *See*—
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Fujioka, Osamu; Miyauchi, Tokuhisa; and Neko, Noriaki, to Fanuc Ltd. Cylinder temperature controller for an injection molding machine. 5,551,857, Cl. 425-143.000.
Fujisaki, Satoru: *See*—
Suzuki, Yoshinori; Tsujimoto, Tadahiro; and Fujisaki, Satoru, 5,552,188, Cl. 427-402.000.
Fujisawa, Hiromichi: *See*—
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Fujita, Takeshi; Matsuo, Katsuaki; and Kakishita, Osamu, to Mitsubishi Plastics, Inc.; and Dai-Ichi Kogyo Seiyaku Co., Ltd. Water-absorptive material and method of producing water-absorptive molded product. 5,552,453, Cl. 522-165.000.
Fujita, Tatsuo: *See*—
Sakatani, Hideaki; Nishida, Hirofumi; Uetani, Yoji; Kuroki, Yoichi; Hata, Keiko; Fujita, Tatsuo; Kikawa, Tatsuo; Ueno, Seichi; and Hayashida, Yukio, 5,551,170, Cl. 34-549.000.
Fujita, Yoshio, to Yamaha Corporation. Waveform generating apparatus for musical instrument. 5,553,011, Cl. 364-718.000.
Fujitsu, Ltd.: *See*—
Asano, Koji, 5,552,127, Cl. 422-245.100.
Aso, Yasuhiro; Takahashi, Atsuhisa; Kakuma, Satoshi; and Uchida, Yoshihiro, 5,553,068, Cl. 370-60.000.
Hayashi, Katsumi; Saitou, Kazuhiko; Ohsato, Hiroshi; Mitani, Masaaki; Hayashi, Tomohiro; Obata, Takashi; Sekine, Yutaka; Ura, Mitsuhiro; and Ishii, Takuji, 5,553,303, Cl. 395-600.000.
Hirano, Toru; Monden, Kazumi; Hosokawa, Masumi; Imaki, Kazuhiro; and Shima, Akihide, 5,553,277, Cl. 395-600.000.
Hirao, Naoto; and Ohshima, Shinji, 5,552,873, Cl. 355-274.000.
Hiroyuki, Kaneda, 5,553,204, Cl. 395-115.000.
Horie, Takeshi, 5,553,078, Cl. 370-94.300.
Iwama, Ryouichi; and Masuda, Syuzo, 5,552,868, Cl. 355-245.000.
Kato, Yoshiharu; Takano, Ryouzi; Nara, Takashi; Hatano, Takashi; and Morita, Yoshio, 5,553,066, Cl. 370-58.100.
Kobayashi, Masahiro, 5,552,616, Cl. 257-184.000.
Masuda, Syuzo; and Iwama, Ryouichi, 5,552,862, Cl. 355-208.000.
Nakayama, Mikio, 5,553,057, Cl. 370-13.000.
Taguchi, Masao, 5,553,032, Cl. 365-230.030.
Takaike, Eiji, 5,552,203, Cl. 428-65.500.
Tanihira, Hisamitsu; Nagahori, Kazuo; and Nakano, Renri, 5,553,010, Cl. 364-715.080.
Yoshioka, Makoto; Negishi, Hiroaki; Tazaki, Gengo; Mackin, John W.; and Kokubun, Mitsuhiro, 5,553,216, Cl. 395-145.000.
Fujiwara, Hiroshi: *See*—
Fukaya, Takashi; Hamada, Masami; Nakamura, Shinichi; Hanzawa, Toyoharu; Kinukawa, Masahiko; Ishikawa, Tomonori; Fujiwara, Hiroshi; and Tokunaga, Shigeo, 5,552,929, Cl. 359-380.000.
Fujiwara, Ryuhei, to NEC Corporation. Speech decoding apparatus comprising alarm signal generator operable on deterioration of transmission path quality. 5,553,080, Cl. 371-5.100.
Fukano, Atsushi, to Tenyo Co., Ltd. Coin magic device. 5,551,921, Cl. 472-69.000.
Fukasawa, Hideyuki: *See*—
Kazui, Shinichi; Matsuoka, Makoto; Fukasawa, Hideyuki; Tamura, Mitsunori; Shirai, Mitsugu; and Sasaki, Hideaki, 5,551,148, Cl. 29-843.000.
Fukaya, Takashi; Hamada, Masami; Nakamura, Shinichi; Hanzawa, Toyoharu; Kinukawa, Masahiko; Ishikawa, Tomonori; Fujiwara, Hiroshi; and Tokunaga, Shigeo, to Olympus Optical Co., Ltd. Stereomicroscope. 5,552,929, Cl. 359-380.000.
Fukazawa, Tokuumi: *See*—
Nishino, Toshikazu; Kawabe, Ushio; Tarutani, Yoshinobu; Kominami, Shinya; Aida, Toshiyuki; Fukazawa, Tokuumi; and Hatano, Mutsuko, 5,552,375, Cl. 505-330.000.
Fukuda, Masao, to Ishida Co., Ltd. Detection of objects where package-making film sheets are sealed. 5,551,206, Cl. 53-75.000.
Fukuda, Takuya: *See*—
Murakami, Susumu; Fukuda, Takuya; Shimizu, Yoshiteru; and Sugawara, Yoshitaka, 5,552,625, Cl. 257-409.000.
Fukui, Chihiro: *See*—
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Fukushima, Hirotaka, to Kabushiki Kaisha Daikin Seisakusho. Power train flywheel assembly with flexible input-side incorporating damping mechanism. 5,551,318, Cl. 74-574.000.
Fukuyama, Takashi: *See*—

Konno, Shinji; Fukuyama, Takashi; and Yamamoto, Masahiro, 5,552,654, Cl. 310-309.000.
Fukuzawa, Daizo: *See*—

Smith, Neil; Jeffers, Frederick J.; Gandola, Kent R.; and Koeppe, Peter V., 5,552,589, Cl. 235-449.000.
Ganno, Yasuhiko: *See*—

Gauthier, Jacques Y.; Lau, Cheuk K.; LeBlanc, Yves; Li, Chun-Sing; Roy, Patrick; Therien, Michel; and Wang, Zhaoyin, to Merck Frosst Canada, Inc.

Weir, Michael P.; and Sutherland, Hunt A., 5,552,712, Cl. 324-537.000.
Young, Glen C.; Bonner, Guy, Jr.; and Schneider, Eric D., 5,552,685, Cl.

Konno, Shinji; Fukuyama, Takashi; and Yamamoto, Masahiro, 5,552,654, Cl. 310-309.000.

Fukuzawa, Daizo: *See*—
Abe, Atsuyoshi; Obtsuka, Yasumasa; Tomoyuki, Yohji; Takano, Manabu; Fukuzawa, Daizo; and Ogawa, Kenichi, 5,552,582, Cl. 219-619.000.
Obtsuka, Yasumasa; Tomoyuki, Yohji; Hayakawa, Akira; Takano, Manabu; Fukuzawa, Daizo; and Abe, Atsuyoshi, 5,552,874, Cl. 355-285.000.

Fuller, Joan: *See*—
Carlin, Richard T.; and Fuller, Joan, 5,552,238, Cl. 429-50.000.

Fulmer, Brian H.: *See*—
Armstrong, Charles W., III; Rink, Linda M.; Hatt, Wesley L.; Parker, Todd S.; and Fulmer, Brian H., 5,551,724, Cl. 280-737.000.

Fulton, Paul R.: *See*—
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Fung, Steven: *See*—
Woo, Sam L.; and Fung, Steven, 5,552,471, Cl. 524-494.000.

Fung, Victor: *See*—
Grabstein, Kenneth; Anderson, Dirk; Eisenman, June; Fung, Victor; and Rauch, Charles, 5,552,303, Cl. 435-69.510.

Funk, Reiner: *See*—
Hauke, Gunter; Specht, Rainer; Krotz, Ralf; Funk, Reiner; Martin, Peter; and Nies, Berthold, 5,551,778, Cl. 366-139.000.

Furuhashi, Hidehiko; and Nihoshi, Toshiaki, to Nikon Corporation. Microscope with movable stage and objective for examining large sample. 5,552,928, Cl. 359-379.000.

Furuhashi, Takeshi: *See*—
Obata, Kenzo; Uchikawa, Yoshiki; Furuhashi, Takeshi; and Watanabe, Shigeru, 5,553,156, Cl. 382-119.000.

Furuhashi, Tsutomu; Mano, Hiroyuki; Takashi, Terumi; Nishioka, Kiyokazu; and Futami, Toshio, to Hitachi, Ltd. Liquid crystal display device. 5,552,801, Cl. 345-100.000.

Furukawa Electric Co., Ltd., The: *See*—
Namiki, Shu, 5,553,178, Cl. 385-33.000.
Okita, Tomiharu; Sugimori, Mikihiro; Ozaki, Masanori; and Orimo, Takao, 5,552,573, Cl. 219-118.000.

Furusawa, Hironobu; Kokubu, Tokio; Kamata, Sakashi; and Ueno, Hitoshi, to Toyo Boseki Kabushiki Kaisha. Resin shock absorber. 5,551,673, Cl. 267-160.000.

Furuyama, Tohru, to Kabushiki Kaisha Toshiba. Semiconductor memory utilizing RAS and CAS signals to control the latching of first and second read or write data. 5,553,024, Cl. 365-189.050.

Futaba Denshi Kogyo K.K.: *See*—
Mizohata, Tadashi; and Suzuki, Masashi, 5,552,660, Cl. 313-341.000.
Onodaka, Koji; Hiraga, Katsuya; Kobori, Yoichi; and Nagasawa, Satoshi, 5,552,568, Cl. 178-19.000.

Futami, Toshio: *See*—
Furuhashi, Tsutomu; Mano, Hiroyuki; Takashi, Terumi; Nishioka, Kiyokazu; and Futami, Toshio, 5,552,801, Cl. 345-100.000.

G. D. Searle & Co.: *See*—
Abood, Norman A.; Garland, Robert B.; and Miyano, Masateru, 5,552,431, Cl. 514-427.000.

G.D Societá per Azioni: *See*—
Draghetti, Fiorenzo, 5,551,544, Cl. 198-404.000.

Gaborski, Roger S.; and Barski, Lori L., to Eastman Kodak Company. Method for detecting ink jet or dot matrix printing. 5,553,162, Cl. 382-192.000.

Gaiser Tool Co.: *See*—
Tibbet, Michael D., 5,551,676, Cl. 269-43.000.

Gale, Charles O., to Summit Valley Equipment and Engineering. Rotating kiln seal. 5,551,870, Cl. 432-115.000.

Galindo, Cesar: *See*—
Tedrow, Kerry D.; and Galindo, Cesar, 5,553,030, Cl. 365-226.000.

Galka, Dale A.; and Adanti, Roy A., to Ford Motor Company. Variable length pivoting air duct door. 5,551,667, Cl. 251-212.000.

Gallagher, Brian W.; Bionas, Costas; Nicolosi, Joseph A.; and Barbara, Richard, to Philips Electronics North America Corporation. Closed cycle gas cryogenically cooled radiation detector. 5,552,608, Cl. 250-370.150.

Gallaher, Dale M.; and Smith, Mark A., to Shell Offshore Inc. Hyjack platform with compensated dynamic response. 5,551,801, Cl. 405-204.000.

Gallorini, Massimo; Angilella, Bruno; and Bocci, Sandro, to A B G S.r.l. Liquid crystal eyeglasses. 5,552,841, Cl. 351-49.000.

Galtier, Daniel; and Lassalle, Gilbert, to Synthelabo. 1,2,3,4,-tetrahydroquinoline-8-sulphonic acid chlorides and acids, their preparation and their use as synthetic intermediates. 5,552,410, Cl. 514-311.000.

Galvez, Jean-Marc; and Renouard, Philippe, to Elf Atochem S.A. Vinyl chloride polymer/polyolefin polyblends having improved rheological properties. 5,552,481, Cl. 525-74.000.

Gaman, Milton: *See*—
Lundeen, Marcee G.; Lundeen, Daniel N.; and Gaman, Milton, 5,551,376, Cl. 119-167.000.

Gambardella, Bruce C. Intake system for V-type engine. 5,551,386, Cl. 123-184.350.

Gamblin, Alan; and Hewett, Richard H., to Rhone-Poulenc Agriculture Ltd. Synergistic herbicidal compositions comprising 4-benzoylisoxazole and dinitroaniline herbicides. 5,552,367, Cl. 504-138.000.

Gamota, Daniel R.; Mueller, Brian L.; and Filisko, Frank E., to University of Michigan, The Regents of the. Anhydrous amorphous ceramics as the particulate phase in electrorheological fluids. 5,552,076, Cl. 252-74.000.

Gandola, Kent R.: *See*—
Smith, Neil; Jeffers, Frederick J.; Gandola, Kent R.; and Koeppe, Peter V., 5,552,589, Cl. 235-449.000.

Ganno, Yasuhiko: *See*—
Kajikawa, Teruo; Ganno, Yasuhiko; Takeda, Junichi; and Yonezawa, Syuichi, 5,552,010, Cl. 156-231.000.

Gannon, Jeffrey C.; and Payne, John J., to United States of America, Energy. Leak checker data logging system. 5,551,285, Cl. 73-40.700.

Gantner, Gebhard; and Mark, Fritz, to Hilti Aktiengesellschaft. Mixing apparatus for counterbalancing flowable masses. 5,551,779, Cl. 366-217.000.

Gao, Feng: *See*—
Schlenoff, Joseph B.; Johnson, Kurtis F.; Dharia, Jayesh; and Gao, Feng, 5,552,551, Cl. 546-155.000.

Garces, Luis; and N'Guyen Phuoc, Vinh T., to Schneider Electric SA. Inverter control device. 5,552,980, Cl. 363-98.000.

Garcia-Segovia, Amando J.: *See*—
Artemjev, Vladimir K.; and Garcia-Segovia, Amando J., 5,551,639, Cl. 241-5.000.

Gardiner, John P.: *See*—
Lewis, Thomas E.; Williams, Richard A.; Pensavecchia, Frank G.; Kline, John F.; Gardiner, John P.; Nowak, Michael T.; and Robichaud, Kenneth T., 5,551,341, Cl. 101-453.000.

Gardlik, John M.: *See*—
Trinh, Toan; and Gardlik, John M., 5,552,378, Cl. 512-3.000.

Gardner, G. Byron. Disposable toilet seat cover apparatus. 5,551,096, Cl. 4-245.400.

Gardner, Richard K.; and Knecht, Robert J., to Ingersoll-Rand Company. Lost motion pilot valve for diaphragm pump. 5,551,847, Cl. 417-393.000.

Gardner, Timothy S.; Kimura, Tomoaki; and Hansen, Delbert A., to International Business Machines Corporation. Coarse position sensor, and method for locating same, in an optical disk drive. 5,553,054, Cl. 369-117.000.

Garland, Robert B.: *See*—
Abood, Norman A.; Garland, Robert B.; and Miyano, Masateru, 5,552,431, Cl. 514-427.000.

Garman, Andrew J.: *See*—
McLean, Michael J.; Holland, David; Garman, Andrew J.; and Sheppard, Robert C., 5,552,535, Cl. 536-23.100.

Garman, Ronald H.; Garnett, Stephen C.; and Groth, Steven L., to Caterpillar Inc. Restraint mechanism for a control lever. 5,551,265, Cl. 70-177.000.

Garner, Richard P.: *See*—
Hasbun, Robert N.; and Garner, Richard P., 5,553,261, Cl. 395-430.000.

Garnett, Stephen C.: *See*—
Garman, Ronald H.; Garnett, Stephen C.; and Groth, Steven L., 5,551,265, Cl. 70-177.000.

Garst, Michael E.; and Burk, Robert M., to Allergan. 7-(5-substituted cyclopentyl) and (5-substituted cyclopentenyl) heptyl alcohols, heptylamines and heptanoic acid amides, and method of lowering intraocular pressure in the eye of a mammal by administration of these compounds. 5,552,434, Cl. 514-548.000.

Garst, Michael E.: *See*—
Burke, James A.; Garst, Michael E.; and Wheeler, Larry A., 5,552,403, Cl. 514-249.000.

Garton, Rick: *See*—
Markey, Dennis P.; Pietranton, Joe; Nagy, Nick; Garton, Rick; Swinhart, Philip; Rensberger, Ron; and Herbst, Walter, 5,551,371, Cl. 119-499.000.

Garvin-Mazzarisi, Joni M. Bag dispenser and temporary pet waste receptacle. 5,551,569, Cl. 206-554.000.

Gas Research Institute: *See*—
Kountz, Kenneth J.; and Blazek, Christopher F., 5,551,490, Cl. 141-21.000.

Gascoyne, William: *See*—
Pasch, Nicholas F.; and Gascoyne, William, 5,552,951, Cl. 361-56.000.

Gaskell, Alfred J.: *See*—
Pasquarette, Ralph E.; and Gaskell, Alfred J., 5,552,956, Cl. 361-680.000.

Gaskill, Garold B.; Park, Daniel J.; Rullman, Robert G.; Rose, Donald T.; Stiley, Joseph F., III; Barnum, Lewis W.; and Hoff, Don G., to Seiko Corporation; and Seiko Epson Corporation. Watch pager with icons. 5,552,779, Cl. 340-825.440.

Gasparutto, Didier: *See*—
Duplaa, Anne-Marie; Gasparutto, Didier; Livache, Thierry; Molko, Didier; and Teoule, Robert, 5,552,539, Cl. 536-25.310.

Gaster, Laramie M.: *See*—
King, Francis D.; Gaster, Laramie M.; and Wyman, Paul A., 5,552,398, Cl. 514-214.000.

Gastinger, Robert G.: *See*—
Guo, Shao-Hua; and Gastinger, Robert G., 5,552,486, Cl. 525-118.000.

Gatenby, Anthony A.: *See*—
Baneyx, Francois; Gatenby, Anthony A.; and Kalbach, Cathy E., 5,552,301, Cl. 435-69.100.

Gates, William H., III: *See*—
Jackson, Peter C.; Gates, William H., III; and Loofbourrow, Bryan, 5,552,982, Cl. 364-419.100.

Gattey, Phillip A.; Lynn, Dwight D.; and Yuen, Barry K., to ACS Wireless, Inc. Data transfer and communication network. 5,553,312, Cl. 455-11.100.

Gaul, Stephen J.: *See*—
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Cleuziat, Philippe L.; Awade, Abalo; Robert-Baudouy, Jeannine; and Gayral, Jean-Pierre, 5,552,273, Cl. 435-6.000.

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Merlin, Pierre; and Coiton, Gérard, 5,552,574, Cl. 219-121.690.

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Chan, Philip W.; and Sin, Kwong S., 5,553,123, Cl. 379-102.000.
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Matzner, Bruce, 5,553,109, Cl. 376-463.000.
McKenzie, Gerald W., 5,551,671, Cl. 266-156.000.
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Bourlier, Ken A.; and Mulrenin, Peggy S., 5,552,186, Cl. 427-385.500.

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Goffin, Robert: *See*—
Langelin, Henri-Rene; and Goffin, Robert, 5,552,366, Cl. 504-116.000.
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Goland, David B.: *See*—
Casey, Jon A.; Cordero, Carla N.; Fasano, Benjamin V.; Goland, David B.; Hannon, Robert; Harris, Jonathan H.; Herron, Lester W.; Johnson, Gregory M.; Patel, Niranjan M.; Reitter, Andrew M.; Shinde, Subhash L.; Vallabhaneni, Rao V.; and Youngman, Robert A., 5,552,107, Cl. 419-13.000.
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Göldner, Wolfgang, to Herberts GmbH. Process of producing multilayer coatings with cationic layers of primer surface. 5,552,227, Cl. 428-423.100.
Goldring, Robert D., to International Business Machines Corporation. Lossless distribution of time series data in a relational data base network. 5,553,279, Cl. 395-600.000.
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Lyu, Jae C.; Kang, Chang S.; Park, Gwan R.; and Kim, Kyeong H., 5,551,261, Cl. 68-23.600.
Yang, Keun Y., 5,553,050, Cl. 369-103.000.
Goldstein, Fredric. Ribbon curling and ribbon splitting device. 5,551,646, Cl. 242-419.000.
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Gonzalez, Henry J.: *See*—
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Goodman, Dale E.: *See*—
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Brown, George T.; Coppola, Vincent M.; Goodman, Walter A.; Grebe, Frank V.; Hatton, Charles R.; Hermansen, David R.; Podmajersky, David J.; Reynolds, Dennis P.; Ritinski, Edward R.; Rizzi, Julian D.; Sherman, John H.; and Wormsbecher, Paul A., 5,552,957, Cl. 361-683.000.
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Ngoc, Hung D.; and Duval, Guy P. R., 5,552,468, Cl. 524-297.000.
Zanzig, David J.; Sandstrom, Paul H.; Hubbell, Joseph K.; Hsu, Wen-Liang; Halasa, Adel F.; and Verthe, John J. A., 5,552,490, Cl. 525-237.000.
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Goren, Raphael: *See*—
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Gostic, William J., to United Technologies Corporation. Cyclic recovery heat treatment. 5,551,999, Cl. 148-562.000.
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Goujard, Stéphane; Dupel, Pascal; Pailler, René; and Bourrat, Xavier, to Societe Europeene de Propulsion. Method of manufacturing a composite material having a pyrolytic carbon interphase of lamellar microtexture between reinforcing fibers and a matrix, and a material as obtained by the method. 5,552,220, Cl. 428-367.000.
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Grande, Michael L.: *See*—
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Graver Chemical Company: *See*—
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Graverholt, James M.: *See*—
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Hartline, Michael F., to Super Sagless Corporation. Collapsible sofa bed mattress. 5,551,104, Cl. 5-13.000.
Hartman, Scott E.; and Hightower, Archie L., to Wm. Wrigley Jr. Company. Gum base in chewing gum having improved compatibility and flavor.

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Hiltner, James E.; Fargher, James M.; and Herman, James N., to Owens-Illinois Plastic Products. Plastic container made from post consumer plastic film. 5,552,198, Cl. 428-35.700.
Himes, Glenn R.: *See*—
Spence, Bridget A.; Hoxmeier, Ronald J.; and Himes, Glenn R., 5,552,493, Cl. 525-314.000.
Hinago, Yasuhiro: *See*—
Nakada, Akira; Shibukawa, Takeo; Hinago, Yasuhiro; and Mishima, Junichi, 5,552,561, Cl. 84-658.000.
Hines, Robert D., Jr.: *See*—
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Hinton, Glenn J.: *See*—
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Gray, Steven L.; Hoekstra, Peter; Martin, Michael F.; and Moyher, George C., Jr., 5,551,731, Cl. 285-7.000.
Hofele, Hans; Michael, Wolfgang; Strommer, Kurt; and Thudium, Karl, to
Honda, Satoshi: *See*—
Kawaguchi, Kenji; Motodate, Shoji; Toriyama, Masayuki; Honda, Satoshi; Fujii, Takaaki; and Cho, Toshiyuki, 5,552,988, Cl. 364-

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Fetterman, Michael A.; Hinton, Glenn J.; Martell, Robert W.; and Papworth, David B., 5,553,256, Cl. 395-375.000.

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Giovanella, Beppino C.; Hinz, Hellmuth R.; Kozielski, Anthony J.; and Stehlin, John S., 5,552,154, Cl. 424-449.000.

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Onodaka, Koji; Hiraga, Katsuya; Kobori, Yoichi; and Nagasawa, Satoshi, 5,552,568, Cl. 178-19.000.

Hirai, Toshihiro: *See*—
Toge, Tetsuya; Hirai, Toshihiro; Yoshimoto, Akihiro; and Yoshida, Kenichi, 5,552,389, Cl. 514-25.000.

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Hirano, Isuke: *See*—
Takahashi, Hironori; Aoshima, Shinichiro; Hirano, Isuke; and Tsuchiya, Yutaka, 5,552,716, Cl. 324-753.000.

Hirano, Tatsuya: *See*—
Goto, Hisashi; Hirano, Tatsuya; and Kobayashi, Shinichi, 5,551,333, Cl. 99-450.600.

Hirano, Toru; Monden, Kazumi; Hosokawa, Masumi; Imaki, Kazuhiro; and Shima, Akihide, to Fujitsu Limited. Image search method for searching and retrieving desired image from memory device. 5,553,277, Cl. 395-600.000.

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Yamaguchi, Takeshi; Fuji, Hiroshi; Hirashima, Hiroshige; and Terashima, Shigeo, 5,553,043, Cl. 369-50.000.

Hiroi, Masakazu: *See*—
Nakagawa, Tomohito; Hiroi, Masakazu; Matsuo, Kazuhiro; Orii, Hideki; Kato, Satoru; Dobashi, Akihito; and Noda, Mamoru, 5,552,859, Cl. 355-207.000.

Hirono, Kazuhisa: *See*—
Mori, Masaharu; Ueno, Hideo; Hirono, Kazuhisa; and Niwa, Akihiko, 5,551,785, Cl. 400-76.000.

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Hirose, Kazuhiko: *See*—
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Hirose, Koji; and Aoki, Shigehiko, to Seiko Precision Inc. Self-waterproofing electroluminescent device. 5,552,668, Cl. 313-506.000.

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Hiroyuki, Kaneda, to Fujitsu Limited. Image output apparatus for gradation image data. 5,553,204, Cl. 395-115.000.

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Shiraishi, Naomasa; and Hirukawa, Shigeru, 5,552,856, Cl. 355-53.000.

Hisa, Yoshihiro, to Mitsubishi Denki Kabushiki Kaisha. Method of producing lambda/4-shifted diffraction grating. 5,551,584, Cl. 216-2.000.

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Godlewski, Wayne W.; Chapman, James D.; Diana, Gary M.; Hiss, Steven P.; Volo, Jane M.; Weil, Richard; and Underwood, Lance H., 5,551,428, Cl. 128-653.100.

Hitachi Denshi Kabushiki Kaisha: *See*—
Niki, Atsuyoshi; Minowa, Tsyneyuki; Maeda, Ichiro; and Ohira, Sakari, 5,553,079, Cl. 370-110.400.

Hitachi Electronics Engineering Co., Ltd.: *See*—
Nemoto, Ryozi; and Mishina, Yoshinori, 5,552,322, Cl. 435-287.200.

Hitachi, Ltd.: *See*—
Enomoto, Kunio; Otaka, Masahiro; Amano, Kazuo; Kurosawa, Koichi; Hayashi, Eisaku; Morinaka, Ren; Hattori, Shigeo; and Sato, Kasunori, 5,553,106, Cl. 376-305.000.

Fujii, Tetsuhiko; Yamamoto, Akira; Kobashi, Tetsuzo; Sato, Masahiko; and Satoh, Takao, 5,553,307, Cl. 395-845.000.

Furuhashi, Tsutomu; Mano, Hiroyuki; Takashi, Terumi; Nishioka, Kiyokazu; and Futami, Toshio, 5,552,801, Cl. 345-100.000.

Hara, Yuji; Ito, Satoru; and Toya, Tatsuro, 5,552,639, Cl. 257-775.000.

Harada, Yasushi; Katayama, Yasunori; Kawakami, Junzo; Saitou, Tadayoshi; Fukui, Chihiro; Kokai, Yutaka; and Tamura, Shigeru, 5,553,003, Cl. 364-492.000.

Kakibayashi, Hiroshi; Mitsui, Yasuhiro; Tadokoro, Hideo; Kuroda, Katsuhiro; Koguchi, Masanari; Tsuji, Kazutaka; Makishima, Tatsuo; Ichihashi, Mikio; and Isakozawa, Shigeto, 5,552,602, Cl. 250-311.000.

Kazui, Shinichi; Matsuoka, Makoto; Fukasawa, Hideyuki; Tamura, Mitsunori; Shirai, Mitsugu; and Sasaki, Hideaki, 5,551,148, Cl. 29-843.000.

Kiuchi, Itsuko; Fujisawa, Hiromichi; Hatakeyama, Atsushi; and Wakabayashi, Minoru, 5,553,226, Cl. 395-161.000.

Kubono, Shooji; and Kume, Hitoshi, 5,553,021, Cl. 365-185.330.

Matsuura, Nobuhiko; Matsuura, Kunihisa; Kako, Yutaka; and Kadowaki, Minoru, 5,553,320, Cl. 235-379.000.

Murakami, Susumu; Fukuda, Takuya; Shimizu, Yoshiteru; and Sugawara, Yoshitaka, 5,552,625, Cl. 257-409.000.

Nishino, Toshikazu; Kawabe, Ushio; Tarutani, Yoshinobu; Kominami, Shinya; Aida, Toshiyuki; Fukazawa, Tokuumi; and Hatano, Mutsuko, 5,552,375, Cl. 505-330.000.

Onisawa, Kenichi; Suzuki, Takashi; Ando, Masahiko; Ota, Masuyuki; Kaneko, Toshiki; and Minemura, Tetsuro, 5,552,909, Cl. 359-59.000.

Sekiguchi, Hiroyuki; Sano, Koichi; and Yokoyama, Tetsuo, 5,553,207, Cl. 395-124.000.

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Hitachi Medical Corporation: *See*—
Takahashi, Tetsuhiko; Takeuchi, Hiroyuki; and Matsunaga, Yoshikuni, 5,552,707, Cl. 324-318.000.

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Hitachi Software Engineering Co.: *See*—
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Hitco Technologies Inc.: *See*—
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HMS Manufacturing Company: *See*—
Sofy, Hugh M., 5,551,659, Cl. 248-523.000.

Ho, Chen C. Illusive lamp. 5,552,975, Cl. 362-324.000.

Ho, Kwok-Lun, to Minnesota Mining Manufacturing Company. Abrasive articles and method of making abrasive articles. 5,551,962, Cl. 51-306.000.

Ho, Kwok-Lun, to Minnesota Mining and Manufacturing Company. Coated grinding aid particle. 5,552,225, Cl. 428-403.000.

Ho, Sa V.; Greenley, Robert Z.; and Michaels, Alan S., to Monsanto Company. Solid poly-amphiphilic polymer having use in a separation process. 5,552,053, Cl. 210-640.000.

Hobbs, Peter D.: *See*—
Pfahl, Magnus; Zhang, Xiao-kun; Lehmann, Jürgen M.; Dawson, Marcia I.; Cameron, James F.; Hobbs, Peter D.; and Jong, Ling, 5,552,271, Cl. 435-6.000.

Hobelsberger, Maximilian. Device with adjustable buoyancy with pressure compensation. 5,551,800, Cl. 405-186.000.

Hochfeld, Stanley, to Holtz, Leonard. Stick-on condom package assembly. 5,551,612, Cl. 224-219.000.

Hochstrasser, Ferdinand, to KWC AG. Backflow-preventer. 5,551,483, Cl. 137-846.000.

Hock, Christopher; Snyder, Brian T.; Rink, Linda M.; and Letendre, Guy R., to Morton International, Inc. Special geometry generant bodies for automotive gas bag inflator. 5,551,343, Cl. 102-288.000.

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Hodgson, Sarah. Dog teaching lead and method. 5,551,380, Cl. 119-795.000.

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Bennett, Cynthia; Brekner, Michael-Joachim; Coutandin, Jochen; Herrmann-Schoenherr, Otto; and Osan, Frank, 5,552,504, Cl. 526-348.100.

Hoechst-Roussel Pharmaceuticals, Inc.: *See*—
Strupczewksi, Joseph T.; and Bordeau, Kenneth J., 5,552,414, Cl. 514-322.000.

Hoechstetter, Craig S.: *See*—
Schaus, John M.; Hoechstetter, Craig S.; Huser, Diane; Paget, Charles J.; and Titus, Robert D., 5,552,444, Cl. 514-657.000.

Hoekstra, Peter: *See*—

Gray, Steven L.; Hoekstra, Peter; Martin, Michael F.; and Moyher, George C., Jr., 5,551,731, Cl. 285-7.000.

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Hoffman, Cheryl A.; Lavin, Mark A.; Leipold, William; McGroddy, Kathleen; and Nickel, Daniel J., to International Business Machines Corporation. Method and system using the design pattern of IC chips in the processing thereof. 5,552,996, Cl. 364-468.280.

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Hoffman, Clarence A.: *See*—
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Hoffmann, James A.: *See*—
DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Shields, James E.; and Smiley, David L., 5,552,522, Cl. 530-324.000.

Holden, Irving H.: *See*—
Hertz, Allen D.; McKee, John M.; Mooney, Charles W.; Holden, Irving H.; and Brinkley, Gerald E., 5,552,562, Cl. 84-726.000.

Holdengräber, Curt: *See*—
Efraim, Itzhak; Lampert, Shalom; and Holdengraber, Curt, 5,552,126, Cl. 423-199.000.

Holewski, Donald J.: *See*—
Rajala, Gregory J.; Rabe, Gerald L.; Niemi, Paul M.; and Holewski, Donald J., 5,552,007, Cl. 156-164.000.

Holik, Herbert: *See*—
Brunnmair, Erwin; Bubik, Alfred; Hess, Harald; Holik, Herbert; Leitenberger, Werner; Merath, Thomas; Moser, Johann; Steib, Helmut; and Weisshuhn, Elmer, 5,551,164, Cl. 34-117.000.

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Holley, Gregory L.: *See*—
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Hollis, Thomas J. System for heating temperature control fluid using the engine exhaust manifold. 5,551,384, Cl. 123-142.50R.

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Holmes, Philip, to Exxon Research and Engineering Company. Method and apparatus for contacting solid particles and fluid. 5,552,119, Cl. 422-144.000.

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Lee, James; Holmes, William E.; and Wood, William I., 5,552,284, Cl. 435-6.000.

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Lindholm, Leif G.; Holmgren, Jan; and Lind, Peter, 5,552,293, Cl. 435-7.230.

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Johnson, Dennis F.; Wiebe, Michael; Holowick, Erwin; Jacob, Nathan R.; Murphy, Michael F.; Schellenberg, James J.; and Stasenski, Michael S., 5,553,094, Cl. 375-200.000.

Holtby, Quinn A. J. Drilling fluid containment apparatus for use in disconnecting a kelly from a drill string. 5,551,511, Cl. 166-81.100.

Holtz, Leonard: *See*—
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Isaacs, Claudia A.; and Schorr, Keith M., 5,551,395, Cl. 123-339.130.

Honda Giken Kogyo K.K. (Honda Motor Co., Ltd, in English): *See*—
Shimizu, Daisuke; Miyashita, Kotaro; Hara, Yoshihisa; and Ikeba, Hiroshi, 5,551,408, Cl. 123-571.000.

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Kawaguchi, Kenji; Motodate, Shoji; Toriyama, Masayuki; Honda, Satoshi; Fujii, Takaaki; and Cho, Toshiyuki, 5,552,988, Cl. 364-426.010.
Suzuki, Norio; and Tachibana, Yousuke, 5,551,396, Cl. 123-399.000.
Tsuge, Masakuni; and Nagase, Hidenobu, 5,551,390, Cl. 123-198.0DB.
Yoshimura, Nobuyoshi, 5,551,750, Cl. 297-250.100.

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Hong, Jason: *See*—
Sompel, Mark A.; Clawson, William W.; and Hong, Jason, 5,553,086, Cl. 371-47.100.

Hong, Kuochih. Materials for hydrogen storage, hydride electrodes and hydride batteries. 5,552,246, Cl. 429-218.000.

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Emerson, Earl A.; Gonzalez, Henry J.; and Hong, Kyung-Yeop, 5,553,059, Cl. 370-14.000.

Hoover, Gregory A.; Hoover, Roger A.; Rowe, E. Riley; and Rowe, David L. Method for producing inflated dunnage. 5,552,003, Cl. 156-147.000.

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Hoover Universal, Inc.: *See*—
Baldi, Massenzio, 5,551,861, Cl. 425-527.000.

Hopkins, Andrew D.: *See*—
Stimpson, Philip G.; and Hopkins, Andrew D., 5,551,416, Cl. 128-200.160.

Hor, Ah-Mee: *See*—
Kovacs, Gregory J.; Neville Connel, G. A.; Hor, Ah-Mee; and Popovic, Zoran D., 5,552,253, Cl. 430-57.000.

Hore, Donald L., to Radiodetection Limited. Inclination sensor using sensing coils wound on linear vessel partially filled with fluid. 5,552,703, Cl. 324-207.220.

Hori, Eisaku, to Jidosha Kenki Kogyo Kabushiki Kaisha. Cruising control apparatus. 5,552,985, Cl. 364-426.040.

Hori, Fumihisa, to Alps Electric Co., Ltd. Paper feed mechanism in recording apparatus. 5,551,685, Cl. 271-245.000.

Horie, Takeshi, to Fujitsu Limited. Communication control system between parallel computers. 5,553,078, Cl. 370-94.300.

Horimai, Hideyoshi, to Sony Corporation. Optical recording medium and playback method utilizing pits on track center and wobble pits. 5,553,046, Cl. 369-58.000.

Horinka, Paul R.; and Korecky, Martin J., to Morton International, Inc. Triboelectric coating powder and process. 5,552,191, Cl. 427-475.000.

Horiuchi, Kuniyasu: *See*—
Maruoka, Kiyoto; Horiuchi, Kuniyasu; and Yabuki, Yoshikazu, 5,552,190, Cl. 427-457.000.

Horn, Allen F., III; Bush, Robert L.; and St. Lawrence, Michael E., to Rogers Corporation. Ceramic filled composite polymeric electrical substrate material exhibiting high dielectric constant and low thermal coefficient of dielectric constant. 5,552,210, Cl. 428-209.000.

Horn, Martin E. Single-hand mounted and operated keyboard. 5,552,782, Cl. 341-22.000.

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Urdea, Michael S.; and Horn, Thomas, 5,552,280, Cl. 435-6.000.
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Hornor, John A., to Ceramco Inc. Low-fusing temperature porcelain. 5,552,350, Cl. 501-64.000.

Horobec, Bill R.; and Horobec, Judy K. System for the removing of threaded fasteners. 5,551,320, Cl. 81-53.200.

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Horobec, Bill R.; and Horobec, Judy K., 5,551,320, Cl. 81-53.200.

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Avery, Noyes L.; Axelrod, Joan C.; Carey, James T.; Hiebert, John; and Horodysky, Andrew G., 5,552,069, Cl. 508-229.000.

Horrobin, David F.; and Huang, Yung-Sheng, to Efamol Holdings PLC. Compostions containing di-linoleoyl-mono-gamma-linolenyl-glycerol. 5,552,150, Cl. 424-439.000.

Horstman, Justus A. W.: *See*—
Konshak, Michael V.; and Horstman, Justus A. W., 5,551,139, Cl. 29-432.200.

Hosaka, Masao; and Sakamaki, Hisashi, to Canon Kabushiki Kaisha. Control device for image forming apparatus. 5,553,288, Cl. 395-650.000.

Hoshi, Akio: *See*—
Yokota, Yuji; and Hoshi, Akio, 5,552,948, Cl. 360-105.000.

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Yoshida, Sadato; Nakai, Hiroshi; Hoshiba, Akihiko; and Shibata, Yasuhiko, 5,551,385, Cl. 123-184.210.

Hoskins, Michael J.: *See*—
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Hosokawa, Hiroshi: *See*—
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Hirano, Toru; Monden, Kazumi; Hosokawa, Masumi; Imaki, Kazuhiro; and Shima, Akihide, 5,553,277, Cl. 395-600.000.

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Hosoya, Kinji: *See*—

Takayanagi, Akira; Kumagai, Toshihiro; and Hosoya, Kinji, 5,551,735, Cl. 285-323.000.

Hoss, Gregg M.; Thompson, James E.; Johnson, Thomas F.; Kirbie, Martin; Hubbell, Joseph K.: *See*—
Zanzig, David J.; Sandstrom, Paul H.; Hubbell, Joseph K.; Hsu, Wen-Liang; Halasa, Adel F.; and Verthe, John J. A., 5,552,490, Cl.

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Baruffato, Roberto; Trebbi, Claudio; Barbieri, Claudio; and Vigna, William, 5,551,491, Cl. 141-145.000.

Illinois Tool Works Inc.: *See*—
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Fischer, Robert; Ilg, Johannes; Schneider, Christian; and Schrey, Ulrich, 5,552,641, Cl. 307-10.500.

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Hotta, Hiroshi: *See*—
Sugita, Yasuhisa; Kitazawa, Naoki; and Hotta, Hiroshi, 5,552,480, Cl. 525-64.000.
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Tedrow, Kerry D.; and Galindo, Cesar, 5,553,030, Cl. 365-226.000.
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Cotner, Curt L.; Heaps, Robert J.; Koontz, Wendy L.; Little, Benjamin R.; and Toomire, Thomas J., 5,553,234, Cl. 395-182.140.
Dagher, Jerry, 5,553,097, Cl. 375-240.000.
Daly, James C.; George, Jonel; Greenstein, Paul G.; and Rodell, John T., 5,553,292, Cl. 395-733.000.
Dean, Mark E., 5,553,276, Cl. 395-550.000.
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Goldring, Robert D., 5,553,279, Cl. 395-600.000.
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Nunes, Antonio C. D., 5,553,269, Cl. 395-500.000.
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Pelella, Antonio R.; and Chan, Yuen H., 5,552,745, Cl. 327-407.000.
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Reohr, William R.; Chan, Yuen H.; and Lu, Pong-Fei, 5,553,029, Cl. 365-208.000.
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Takayanagi, Kazunori; and Watanabe, Shinpei, 5,553,252, Cl. 395-310.000.
International En-R-Tech Incorporated: *See—*
Murasko, Matthew M., 5,552,679, Cl. 315-169.300.
International Environmental Systems, Inc.: *See—*
Wang, Lawrence K.; Kurylko, Lubomyr; and Hyrcyk, Orest, 5,552,051, Cl. 210-604.000.
International Flavors & Fragrances Inc.: *See—*
Sprecker, Mark A.; Weiss, Richard A.; and Hanna, Marie R., 5,552,380, Cl. 512-20.000.
Interport International, Inc.: *See—*
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Ireland, Richard L.: *See—*
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Johnson, Dennis F.; Wiebe, Michael; Holowick, Erwin; Jacob, Nathan R.; Murphy, Michael F.; Schellenberg, James J.; and Stasenski, Michael S., 5,553,094, Cl. 375-200.000.
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Iscar, Ltd.: *See—*
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Fukuda, Masao, 5,551,206, Cl. 53-75.000.
Ishida, Hideki: *See—*

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Ishida, Yasuhiko: *See—*
Takamiya, Makoto; Kadowaki, Hidejiro; Ishida, Yasuhiko; Ashiwa, Jun; Kato, Shigeki; and Ueda, Shinji, 5,552,879, Cl. 356-28.500.
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Ishiguro, Kuniaki: *See—*
Ohmichi, Yoshiki; Ishiguro, Kuniaki; and Yasuda, Kenichi, 5,551,680, Cl. 270-58.080.
Ishihara Sangyo Kaisha, Ltd.: *See—*
Fujii, Yasuhiro; and Tanimura, Toyoshi, 5,552,557, Cl. 548-337.100.
Ishii, Hideo: *See—*
Koboshi, Shigeharu; Ishikawa, Masao; Komatsu, Yoshimasa; Ishii, Hideo; Miyazawa, Yorikatsu; Tsubaki, Yoshifumi; Saito, Kaneo; and Yoshimoto, Hiroshi, 5,552,851, Cl. 354-298.000.
Ishii, Hirotake: *See—*
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Ishii, Takuji: *See—*
Hayashi, Katsumi; Saitou, Kazuhiko; Ohsato, Hiroshi; Mitani, Masaaki; Hayashi, Tomohiro; Obata, Takashi; Sekine, Yutaka; Ura, Mitsuhiro; and Ishii, Takuji, 5,553,303, Cl. 395-600.000.
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Inamura, Susumu, 5,551,702, Cl. 277-11.000.
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Pauley, Douglas E.; D'Abate, Gary D.; Ishikawa, Kazushi; and Lopez, John M., 5,551,707, Cl. 277-233.000.
Ishikawa, Masakuni: *See—*
Saito, Susumu; Takagi, Nobukazu; Harada, Kiyohiro; Kazahaya, Yukio; Kuchiki, Seiji; Ishikawa, Masakuni; and Nakajima, Nobuyuki, 5,551,852, Cl. 418-98.000.
Ishikawa, Masao: *See—*
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Ishikawa, Tadashi, to Fuji Xerox Co., Ltd. Multicolor image forming apparatus. 5,552,857, Cl. 355-200.000.
Ishikawa, Tomoji; Sugihara, Kazuyuki; and Kosuge, Katsuhiro, to Ricoh Company, Ltd. Image forming apparatus with controlled drive for accurately positioning developing sections of a rotary developing device. 5,552,877, Cl. 355-326.00R.
Ishikawa, Tomonori: *See—*
Fukaya, Takashi; Hamada, Masami; Nakamura, Shinichi; Hanzawa, Toyoharu; Kinukawa, Masahiko; Ishikawa, Tomonori; Fujiwara, Hiroshi; and Tokunaga, Shigeo, 5,552,929, Cl. 359-380.000.
Iskarous, Moenes Z.: *See—*
Pack, Robert T.; Iskarous, Moenes Z.; and Kawamura, Kazuhiko, 5,551,525, Cl. 180-8.600.
Isobe, Masaaki: *See—*
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ISP Chemicals Inc.: *See—*
Merianos, John J., 5,552,425, Cl. 514-390.000.
Itagaki, Fumihiko, to Canon Kabushiki Kaisha. Method for compressing and extending an image by transforming orthogonally and encoding the image. 5,553,164, Cl. 382-232.000.
Itagaki, Takasi: *See—*
Takemoto, Takatoshi; Chida, Tosikazu; Kano, Noriaki; Ito, Eizi; Murakami, Koji; Itagaki, Takasi; Sekimoto, Kozo; and Suzuki, Masanori, 5,551,912, Cl. 453-56.000.
ITI Innovative Technology Ltd.: *See—*
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Ito, Eizi: *See—*
Takemoto, Takatoshi; Chida, Tosikazu; Kano, Noriaki; Ito, Eizi; Murakami, Koji; Itagaki, Takasi; Sekimoto, Kozo; and Suzuki, Masanori, 5,551,912, Cl. 453-56.000.
Ito, Hideo: *See—*
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Ito, Masaru: *See—*
Sugiyama, Hisataka; Maeda, Takeshi; Ide, Hiroshi; Shigematsu, Kazuo; and Ito, Masaru, 5,553,051, Cl. 369-109.000.
Ito, Satoru: *See—*
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Ito, Toshikazu: *See—*
Yada, Yukihiko; and Ito, Toshikazu, 5,551,855, Cl. 425-113.000.
Ito, Tosikazu; and Yamauchi, Yutaka, to Central Glass Company, Limited; and Tokai Kogyo Kabushiki Kaisha. Extrusion die, method of forming molding on platelike article and platelike article with molding. 5,552,194, Cl. 428-31.000.
Ito, Yoshinobu: *See—*
Ikedo, Tomoyuki; Ito, Yoshinobu; and Matui, Ryotaro, 5,552,669, Cl. 313-613.000.
Itoh, Hiromichi: *See—*
Kikuchi, Satoshi; Nakane, Keiichi; Itoh, Hiromichi; and Kawamura, Hiroshi, 5,552,901, Cl. 358-468.000.
Itou, Hiroyasu; Morisita, Tosiyuki; and Simamoto, Takanori, to Nippondenso Co., Ltd. Method for producing a contact hole in a semiconductor device using reflow and etch. 5,552,342, Cl. 437-195.000.
Itou, Takaaki: *See—*
Tanaka, Hiroshi; Itou, Takaaki; Takeda, Keiso; Ohnaka, Hidemi; Kunitake, Kazuhisa; and Tanahashi, Toshio, 5,551,231, Cl. 60-289.000.
ITT Automotive Europe GmbH: *See—*
Fennel, Helmut; Batistic, Ivica; and Latarnik, Michael, 5,551,768, Cl. 303-122.060.
Kahrs, Manfred; and Kunz, Gerhard, 5,551,389, Cl. 123-196.00R.
Kircher, Dieter; Rieth, Peter E.; Bill, Karlheinz; Balz, Juergen; Kunze, Lothar; and Halasy-Wimmer, Georg, 5,551,764, Cl. 303-3.000.
Ivanov, Igor B.: *See—*
Khrapko, Konstantin R.; Khorlin, Alexandr A.; Ivanov, Igor B.; Ershov, Gennady M.; Lysov, Jury P.; Florentiev, Vladimir L.; and Mirzabekov, Andrei D., 5,552,270, Cl. 435-6.000.
Ivers, Douglas E.: *See—*
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Iversen, Patrick L.: *See—*
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Iwabuchi, Kazunori: *See—*
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Iwama, Kazuaki: *See—*
Fujii, Toshiro; Kato, Yuichi; Iwama, Kazuaki; and Ohyama, Katsuya, 5,551,844, Cl. 417-269.000.
Iwama, Ryouichi; and Masuda, Syuzo, to Fujitsu Limited. Electrophotographic device. 5,552,868, Cl. 355-245.000.
Iwama, Ryouichi: *See—*
Masuda, Syuzo; and Iwama, Ryouichi, 5,552,862, Cl. 355-208.000.
Iwamoto, Aikichi: *See—*
Yoshikura, Hiroshi; Shimizu, Yohko; Iwamoto, Aikichi; and Hijikata, Minako, 5,552,310, Cl. 435-235.100.
Iwamoto, Mune; Nakajima, Akihiko; Takaku, Masato; Morita, Hisao; Ando, Toshihiko; Shirafuji, Tomofumi; and Uchida, Mutsuko, to Mitsui Toatsu Chemicals, Inc. Quality control method for ABS-based resin and molding of the ABS-based resin. 5,552,494, Cl. 525-316.000.
Iwasaki, Hiroshi, to Kabushiki Kaisha Toshiba. Plate-shaped external storage device and method of producing the same. 5,552,632, Cl. 257-679.000.
Iwasaki, Hitoshi: *See—*
Hashimoto, Susumu; Kamiguchi, Yuzo; Iwasaki, Hitoshi; Sawabe, Atsuhito; and Sahashi, Masashi, 5,552,949, Cl. 360-113.000.
Izett, George G.; and Ciccarone, Jay. Two-shafted golf putter club and method for using same. 5,551,696, Cl. 473-226.000.
J. M. Huber Corporation: *See—*
Freeman, Gary M.; Moller, Kurt H.; and Carter, Richard D., 5,551,975, Cl. 106-485.000.
J. Morita Manufacturing Corporation: *See—*
Odaka, Masaki; Arai, Eiichi; Okagami, Yoshihide; and Yuba, Akira, 5,553,115, Cl. 378-206.000.
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Jackson, Peter C.; Gates, William H., III; and Loofbourrow, Bryan, to Microsoft Corporation. Method and system for processing fields in a document processor. 5,552,982, Cl. 364-419.100.
Jackson, Ronald A.: *See—*
Davies, John H.; Jackson, Ronald A.; and Kuja, Frank J., 5,552,600, Cl. 250-286.000.
Jacob, Nathan R.: *See—*
Johnson, Dennis F.; Wiebe, Michael; Holowick, Erwin; Jacob, Nathan R.; Murphy, Michael F.; Schellenberg, James J.; and Stasenski, Michael S., 5,553,094, Cl. 375-200.000.

Jacobs, Bernardus A. J.: *See*—
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Jacobs, Dwight W.; Puttler, Oliver L.; Georgakis, Evangelos G.; Amundson, Allen B.; and Jordan, Russell A., to Minnesota Mining and Manufacturing Company. Method for applying adhesive to the base of an orthodontic appliance. 5,552,177, Cl. 427-2.290.

Jacobson, Lynn M.: *See*—
Handelsman, Jo; Jacobson, Lynn M.; Johnson, David W.; Smith, Kevin P.; Goodman, Robert M.; and Stabb, Eric V., 5,552,138, Cl. 424-93.460.

Jaeger, Edward A. Buoyant water course marker. 5,551,901, Cl. 441-6.000.

Jäger, Anton. Adjustable spray nozzle for pressure washer. 5,551,635, Cl. 239-240.000.

Jain, Danny K.; Levitan, David S.; and Rossbach, Paul C., to Motorola, Inc.; and International Business Machines. Data processor with programmable levels of speculative instruction fetching and method of operation. 5,553,255, Cl. 395-375.000.

Jain, Manoj K., to Taxas Instruments Incorporated. Mechanical scrubbing for particle removal. 5,551,986, Cl. 134-6.000.

Jain, Ravi, to BOC Group, Inc., The. Production of ultrahigh purity nitrogen. 5,551,257, Cl. 62-644.000.

Jakobsen, James W.: *See*—
Wall, Robert; and Jakobsen, James W., 5,551,338, Cl. 101-148.000.

Jalbert, Claire A.: *See*—
Schilli, Kay F.; Roiko, Russell A.; Emerson, Kent E.; Woo, Edward J.; and Jalbert, Claire A., 5,552,869, Cl. 355-256.000.

James, Robert B., Jr.: *See*—
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Jang, Dong-Sik: *See*—
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Jang, Syun-Ming; and Yu, Chen-Hua, to Taiwan Semiconductor Manufacturing Company. Method for improving the process uniformity in a reactor by asymmetrically adjusting the reactant gas flow. 5,552,017, Cl. 156-643.100.

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Janicki, Michael J.: *See*—
Jones, Steven M.; Janicki, Michael J.; Lang, Thomas E.; Liebig, John R.; and Wang, Xiaohan, 5,552,606, Cl. 250-363.040.

Janky, James M.; and Schipper, John F., to Trimble Navigation Limited. Location of emergency service workers. 5,552,772, Cl. 340-573.000.

Jansky, Louis S.: *See*—
Darbee, Paul V.; Ellis, Richard E.; Jansky, Louis S.; and Grossman, Avram S., 5,552,917, Cl. 359-148.000.

Janssen, David C.; and Osborne, Thomas G., to Briggs & Stratton Corporation. Anti-magnetic tampering system for automobile ignition lock. 5,551,267, Cl. 70-252.000.

Janssen, Marcel A. C.; Van Daele, Georges H. P.; Bosmans, Jean-Paul R. M. A.; Verdonck, Marc G. C.; and Janssen, Paul A. J., to Janssen Pharmaceutica N.V. Heterocycle-substituted benzenemethanamine derivatives. 5,552,430, Cl. 514-426.000.

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Janssen Pharmaceutica N.V.: *See*—
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Sipido, Victor K.; Fernández-Gadea, Francisco J.; Andrés-Gil, José I.; Meert, Theo F.; and Gil-Lopetegui, Pilar, 5,552,399, Cl. 514-214.000.
Van Daele, Georges H. P.; and Van den Keybus, Fran M. A., 5,552,553, Cl. 546-197.000.

Japan Atomic Energy Research Institute: *See*—
Katagiri, Masaki, 5,552,609, Cl. 250-370.150.

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Asai, Kiyoshi; Nishikawa, Takeshi; and Seo, Yoshiki, 5,553,309, Cl. 395-854.000.

Japan Energy Corporation: *See*—
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Japan Process Engineering Ltd.: *See*—
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Jasinski, Raymond J.: *See*—
Norman, William D.; Jasinski, Raymond J.; and Nelson, Erik B., 5,551,516, Cl. 166-308.000.

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Jay, Dave: *See*—
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Jayatilleke, Elizabeth: *See*—
Herbert, Victor D.; Shaw, Spencer; and Jayatilleke, Elizabeth, 5,552,268, Cl. 435-4.000.

Jeffers, Frederick J.: *See*—
Smith, Neil; Jeffers, Frederick J.; Gandola, Kent R.; and Koeppe, Peter V., 5,552,589, Cl. 235-449.000.

Jennings, Carol A.: *See*—
Oliver, John F.; Martin, Trevor I.; Jennings, Carol A.; Johnson, Eric G.; and Breton, Marcel P., 5,551,973, Cl. 106-22.00B.

Jennings, Charles E.: *See*—
Pallini, Joseph W., Jr.; and Jennings, Charles E., 5,551,803, Cl. 405-223.100.

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Takayanagi, Akira; Kumagai, Toshihiro; and Hosoya, Kinji, 5,551,735, Cl. 285-323.000.

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Fukushima, Hirotaka, 5,551,318, Cl. 74-574.000.
Mizukami, Hiroshi; Uehara, Hiroshi; and Okada, Shinichi, 5,551,547, Cl. 192-89.230.

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Kanno, Yohichi; Uchisawa, Osamu; and Yamazaki, Sigekazu, 5,551,477, Cl. 137-553.000.

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Naito, Hayato, 5,552,964, Cl. 361-781.000.
Nose, Tamotsu, 5,552,653, Cl. 310-263.000.

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Furuyama, Tohru, 5,553,024, Cl. 365-189.050.
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Iinuma, Kazuhiro, 5,551,434, Cl. 128-661.090.
Inagawa, Jun; Nagumo, Masahide; and Kodama, Kunihiko, 5,553,041, Cl. 369-48.000.
Iwasaki, Hiroshi, 5,552,632, Cl. 257-679.000.
Nagano, Junya, 5,552,966, Cl. 361-813.000.
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Nanno, Nobuyuki; Akashi, Kazuo; Ando, Makoto; Takeguchi, Kouichirou; Yamanaka, Yuji; Saito, Toshimitsu; Oka, Mayumi; Ootake, Atsuhiro; Mason, James; and Suzuki, Yoshiaki, 5,553,294, Cl. 395-750.000.
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Someya, Akihiko, 5,552,900, Cl. 358-452.000.
Suizu, Katsuto, 5,552,838, Cl. 348-735.000.
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Kadowaki, Hidejiro: *See*—
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Kaethler, Richard L., to Microsoft Corporation. Method and system of sharing common formulas in a spreadsheet program and of adjusting the same to conform with editing operations. 5,553,215, Cl. 395-144.000.

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Kahrs, Manfred; and Kunz, Gerhard, to ITT Automotive Europe GmbH. Hydraulic pump driven by an internal combustion engine. 5,551,389, Cl. 123-196.00R.
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Kajikawa, Teruo; Gunno, Yasuhiko; Takeda, Junichi; and Yonezawa, Syuichi, to Sumitomo Orimono Kabushiki Kaisha; and Nippon Petrochemicals Co., Ltd. Method for producing tile carpet. 5,552,010, Cl. 156-231.000.
Kakibayashi, Hiroshi; Mitsui, Yasuhiro; Tadokoro, Hideo; Kuroda, Katsuhiro; Koguchi, Masanari; Tsuji, Kazutaka; Makishima, Tatsuo; Ichihashi, Mikio; and Isakozawa, Shigeto, to Hitachi, Ltd. Electron microscope. 5,552,602, Cl. 250-311.000.
Kakimizu, Akiko; Arai, Kenji; Kimura, Norio; and Teramae, Tomohiro, to Sumitomo Chemical Company, Limited. Isothiazolone derivative and microbicidal composition comprising the same as active ingredient. 5,552,423, Cl. 514-372.000.
Kakishita, Osamu: *See*—
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Kakutani, Toshiaki, to Seiko Epson Corporation. Image processing apparatus. 5,553,166, Cl. 382-252.000.
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Kalina, Harry B., to FM Industries, Inc. Single acting sliding sill cushioning unit. 5,551,581, Cl. 213-8.000.
Kalish, David M.; Barajas, Saul; and Ricci, Paul B., to Unisys Corporation. Apparatus and method for synchronizing the simultaneous loading of cache program word addresses in dual slice registers. 5,553,259, Cl. 395-403.000.
Kalish, David M.; Barajas, Saul; and Ricci, Paul B., to Unisys Corporation. Cache memory system with fault tolerance having concurrently operational cache controllers processing disjoint groups of memory. 5,553,263, Cl. 395-454.000.
Kalman, Richard L. Personal ID memory card/agency. 5,552,586, Cl. 235-380.000.
Kalnes, Tom N.; and James, Robert B., Jr., to UOP. Process for the treatment of two halogenated hydrocarbon streams. 5,552,037, Cl. 208-262.100.
Kamada, Kenji, to Marsushita Electric Works, Ltd. Axial-flow fan. 5,551,841, Cl. 417-89.000.
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Kanamori, Hiroo: *See*—
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Onisawa, Kenichi; Suzuki, Takashi; Ando, Masahiko; Ota, Masuyuki; Kaneko, Toshiki; and Minemura, Tetsuro, 5,552,909, Cl. 359-59.000.
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Kang, Joonhee; Przybysz, John X.; and Worsham, Anthony H., to Northrop Grumman Corporation. Multi-gigahertz single flux quantum switch. 5,552,735, Cl. 327-367.000.
Kang, Wonjae L., to Intel Corporation. Method of using latchup current to blow a fuse in an integrated circuit. 5,552,338, Cl. 437-170.000.
Kanie, Hideki, to Emhart Inc. Fastener for attaching in one direction. 5,551,817, Cl. 411-107.000.
Kannankeril, Charles P.; and Norris, Carol A., to Sealed Air Corporation. Food package adapted for microwave or other cooking. 5,552,169, Cl. 426-107.000.
Kanner, Rowland W.; and Davis, Richard M., to Ryder International Corporation. Activation arrangement with safety lock-out for tissue sampling instrument. 5,551,442, Cl. 128-754.000.
Kanno, Yohichi; Uchisawa, Osamu; and Yamazaki, Sigekazu, to Kabushiki-Kaisha Motoyama Seisakusho. Diaphragm-type flow control valve and manual control valve apparatus. 5,551,477, Cl. 137-553.000.
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Ohashi, Yukihiro; Fujimori, Taketoshi; Nagai, Minoru; Kawamata, Akira; Yada, Yukihiro; Higuchi, Kazuhiko; Imokawa, Genji; Takema, Yoshinori; Sakaino, Yukiko; Ogawa, Ayumi; and Fujimura, Tsutomu, 5,552,445, Cl. 514-669.000.
Kao, Jar-Lin: *See*—
Potter, Mark J.; Kao, Jar-Lin; Cross, Virginia R.; Vanderspurt, Thomas H.; Dienes, Edward K.; Riley, Robert E.; Tungate, Freddie L.; and Bortinger, Arie, 5,552,035, Cl. 208-135.000.
Kaplan, Ronald M.; and Kay, Martin, to Xeros Corporation. Stored mapping data with information for skipping branches while keeping count of suffix endings. 5,553,283, Cl. 395-600.000.
Kaptein, Dick, to Fokker Aircraft B.V. Propeller blade position controller. 5,551,649, Cl. 244-1.00N.
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Schacht, Laurie A.; and Karson, Laura, 5,551,106, Cl. 5-99.100.
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Mochida, Ei; Miyauchi, Yasuhiko; Matsuura, Takashi; and Katamine, Tomoaki, 5,552,276, Cl. 435-6.000.
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Katayama, Yasunori: *See*—
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So, Ying H.; Martin, Steven J.; Chau, Chieh-Chun; Wessling, Ritchie A.; Sen, Ashish; Kato, Katsuhiko; Roitman, Daniel B.; and Rochefort, Willie E., 5,552,221, Cl. 428-373.000.
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Katz, Ronald A. Telephonic-interface game control system. 5,553,120, Cl. 379-88.000.
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Ikeda, Kenji, 5,551,359, Cl. 112-292.000.
Kavanaugh, E. Clinch. Seaplane docking facility and telescoping hangar. 5,551,366, Cl. 114-45.000.
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Okawa, Akira; and Sugaya, Yuji, 5,551,789, Cl. 401-199.000.
Kawakami, Junzo: *See*—
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Ohashi, Yukihiro; Fujimori, Taketoshi; Nagai, Minoru; Kawamata, Akira; Yada, Yukihiro; Higuchi, Kazuhiko; Imokawa, Genji; Takema, Yoshinori; Sakaino, Yukiko; Ogawa, Ayumi; and Fujimura, Tsutomu, 5,552,445, Cl. 514-669.000.
Kawamura, Hiroshi: *See*—
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Kawamura, Kazuhiko: *See*—
Pack, Robert T.; Iskarous, Moenes Z.; and Kawamura, Kazuhiko, 5,551,525, Cl. 180-8.600.
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Kondoh, Eiichi; Mitomo, Toru; Yamamoto, Hiroshi; and Ohta, Tomohiro, 5,552,181, Cl. 427-248.100.
Kawase, Hajime: *See*—
Nankoh, Yuichi; and Kawase, Hajime, 5,551,887, Cl. 439-188.000.
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Kay, Martin: *See*—
Kaplan, Ronald M.; and Kay, Martin, 5,553,283, Cl. 395-600.000.
Kazahaya, Yukio: *See*—
Saito, Susumu; Takagi, Nobukazu; Harada, Kiyohiro; Kazahaya, Yukio; Kuchiki, Seiji; Ishikawa, Masakuni; and Nakajima, Nobuyuki, 5,551,852, Cl. 418-98.000.
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Yokonuma, Norikazu; Kazami, Kazuyuki; Hibino, Hideo; and Yamazaki, Youichi, 5,552,843, Cl. 354-21.000.
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Kazyaka, Thomas V. Gear selection indicator for manual transmissions. 5,552,761, Cl. 340-456.000.
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Hagopian, Gerald M., 5,551,577, Cl. 211-4.000.
KDI American Products Company: *See*—
Maiwandi, Farid, 5,551,191, Cl. 49-465.000.
Keady, Paul A. Stone post guide system. 5,551,662, Cl. 249-51.000.
Kean, Thomas A., to Xilinx, Inc. Mask registor for a configurable cellular array. 5,552,722, Cl. 326-41.000.
Keana, John F. W.; and Weber, Eckard, to Oregon Health Sciences University; and University of Oregon, The. Substituted amidines having high binding to the sigma receptor and the use thereof. 5,552,443, Cl. 514-631.000.
Keene, David, to Cirrus Logic, Inc. Managing audio data using a graphics display controller. 5,553,220, Cl. 395-154.000.
Keeney, Stephen N.; and Atwood, Gregory E., to Intel Corporation. Structure and method for low current programming of flash EEPROMs. 5,553,020, Cl. 365-185.190.
Keeth, Brent; Zagar, Paul S.; Shirley, Brian M.; and Casper, Stephen L., to Micron Technology, Inc. Integrated circuit power supply having piecewise linearity. 5,552,739, Cl. 327-538.000.
Keffer, Michael E. Jewelry frame. 5,551,772, Cl. 312-114.000.
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Brana, Miguel F.; Castellano Berlanga, José M.; Morán Moset, Marina; Schlick, Erich; and Keilhauer, Gerhard, 5,552,544, Cl. 544-126.000.
Keir, Richard M.; Brigham, William L., Jr.; Ballew, Barry S.; and Abshire, Cam W., to Keir, Richard M.; and Brigham, Jr., William L. Disk for open end spinning. 5,551,226, Cl. 57-406.000.
Keith, Carl W.; and Mensa-Wilmot, Graham, to Smith International, Inc. Drill bit having stability enhancing cutting structure. 5,551,522, Cl. 175-420.200.
Keller, George V. Non-obtrusive weapon detection system and method for discriminating between a concealed weapon and other metal objects. 5,552,705, Cl. 324-239.000.
Keller, Stefan: *See*—
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Keller, Teddy M., to United States of America, Navy. High temperature copolymers from inorganic-organic hybrid polymers and multiethynylbenzenes. 5,552,505, Cl. 528-5.000.
Kelly, Carla D. Heat reflecting parasol. 5,551,464, Cl. 135-33.200.
Kelly, Gregory J. Method and apparatus for stacking golf balls. 5,551,832, Cl. 414-788.000.
Kelm, Brian R.: *See*—
Taylor, Roderick D.; and Kelm, Brian R., 5,551,846, Cl. 417-308.000.
Kelsey-Hayes Company: *See*—
Luckevich, Mark S., 5,551,769, Cl. 303-149.000.
Kembaiyan, K. T., to Smith International, Inc. Method of making bearing component for rotary cone rock bit. 5,552,106, Cl. 419-5.000.
Kempf, Dale J.; Norbeck, Daniel W.; Sham, Hing L.; Zhao, Chen; Sowin, Thomas J.; Reno, Daniel S.; and Haight, Anthony R., to Abbott Laboratories. Retroviral protease inhibiting compounds. 5,552,558, Cl. 549-552.000.
Kendrick, Kathleen S. Beverage can carrier and storage device. 5,551,565, Cl. 206-427.000.
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Zielinski, Thomas E.; Eisenmann, Gregg A.; Kennedy, Robert D.; O'Branovic, Nickolas; and Sian, Sucha S., 5,551,150, Cl. 29-882.000.
Kennelly, Teresa: *See*—
Farrauto, Robert J.; Feeley, Jennifer S.; Simone, Dianne O.; Lui, Yiu K.; and Kennelly, Teresa, 5,552,360, Cl. 502-178.000.
Kenwood, Michael. Theft resistant compact fluorescent lighting system. 5,552,673, Cl. 315-57.000.
Keohane, Patrick, to Eli Lilly and Company. Methods of inhibiting dysfunctional uterine bleeding. 5,552,416, Cl. 514-324.000.
Keppel, Anton; Schlatmann, Rutger; and Verhoeven, Jan, to U.S. Philips Corporation. Multilayer mirror with a variable refractive index. 5,551,587, Cl. 216-24.000.
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Hinz, Werner; Henn, Rolf; Keppeler, Uwe; and Guettes, Bernd, 5,552,450, Cl. 521-174.000.
Kern, Francois; and Burgener, Derek. Modular sticky food dispenser. 5,551,604, Cl. 222-349.000.
Kerr, Richard C.; Damewood, John R.; Menzel, Jill; Thottathil, Paul; and Sanduja, Mohan L., to Reeves Brothers, Inc. Fabric containing graft polymer thereon. 5,552,472, Cl. 524-500.000.
Keskin, Yucel K.: *See*—
Gokcebay, Asil T.; and Keskin, Yucel K., 5,552,777, Cl. 340-825.310.
Kessler, Abraham: *See*—
Kessler, Bezalel; Frenkel, Chaim; Frenkel, Daphna; and Kessler, Abraham, 5,552,307, Cl. 435-171.000.
Kessler, Bezalel; Frenkel, Chaim; Frenkel, Daphna; and Kessler, Abraham, to Bar-Ilan University; and Rutgers, The State University of New Jersey. Method of using an elicitor to increase production of metabolites in biological cells. 5,552,307, Cl. 435-171.000.
Kessler, Calvin W.; and Frisch, Gary J., to Halliburton Company. Determination of downhole flow regime in a horizontal wellbore by using center sample and fullbore gas-liquid holdup measurements. 5,552,598, Cl. 250-269.300.
Keyes, Susan R.: *See*—
Kim, Sun H.; Keyes, Susan R.; Moreau, Sylviane; Dong, Zheng X.; and Taylor, John, 5,552,520, Cl. 530-311.000.
Keystone Retaining Wall Systems, Inc.: *See*—
Forsberg, Paul J., 5,551,809, Cl. 405-285.000.
Khadem, John; and Truong, Toan V., to Arch Development Corp. Organic tissue glue for closure of wounds. 5,552,452, Cl. 522-63.000.
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Hill, Darrell G.; Henderson, Timothy S.; Liu, William U.; Fan, Shou-Kong; Chau, Hin-Fai; Costa, Damian; and Khatibzadeh, Ali, 5,552,617, Cl. 257-197.000.
Khatkhate, Ateen A.: *See*—
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Khoo, Iam-Choon, to Penn State Research Foundation, The. Liquid crystal non-linear, photorefractive electro-optical storage device having a liquid crystal film including dopant species of C_{60} or C_{70}. 5,552,915, Cl. 359-94.000.
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Khrapko, Konstantin R.; Khorlin, Alexandr A.; Ivanov, Igor B.; Ershov, Gennady M.; Lysov, Jury P.; Florentiev, Vladimir L.; and Mirzabekov, Andrei D., 5,552,270, Cl. 435-6.000.
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Harley, Philip E., 5,552,775, Cl. 340-628.000.
Kidder, Roger: Mounting frame construction for a sheet of plastic, screen guard or the like. 5,551,205, Cl. 52-800.130.
Kihara, Nobuyuki: *See*—
Yokota, Teppei; Kihara, Nobuyuki; and Aramaki, Junichi, 5,553,055, Cl. 369-124.000.
Kikawa, Tatsuo: *See*—
Sakatani, Hideaki; Nishida, Hirofumi; Uetani, Yoji; Kuroki, Yoichi; Hata, Keiko; Fujita, Tatsuo; Kikawa, Tatsuo; Ueno, Seichi; and Hayashida, Yukio, 5,551,170, Cl. 34-549.000.
Kikinis, Ron: *See*—
Wells, William M., III, and Kikinis, Ron, 5,551,431, Cl. 128-653.200.
Kikuchi, Satoshi; Nakane, Keiichi; Itoh, Hiromichi; and Kawamura, Hiroshi. Facsimile server system comprising a facsimile server and at least one remote facsimile. 5,552,901, Cl. 358-468.000.
Kikugawa, Shozo: *See*—
Nakanishi, Kazuhiro; Isozaki, Shin; Kikugawa, Shozo; and Yamagishi, Hiroaki, 5,552,947, Cl. 360-104.000.
Killar, Erich, to Killar, Erich. Process for coating or printing a plastic film with water or solvent-containing coating agents or mixtures thereof, U/V-curable paints or inks and PVC pastes. 5,552,183, Cl. 427-271.000.
Killian, E. Wayne: *See*—
McIsaac, Charles V.; Killian, E. Wayne; Grafwallner, Ervin G.; Kynaston, Ronnie L.; Johnson, Larry O.; and Randolph, Peter D., 5,552,610, Cl. 250-435.000.
Kim, Gu S.; Kim, Jong G.; Ahn, Seung H.; and Park, Jae M., to Samsung Electronics Co., Ltd. High thermal emissive semiconductor device package. 5,552,635, Cl. 257-706.000.
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Seo, Kang-Il; Jang, Dong-Sik; Kim, Heon-Soo; and Jeong, Su-Min, 5,552,178, Cl. 427-64.000.
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Kim, Jong Y., to Samsung Electronics Co., Ltd. Oil separator for air conditioner. 5,551,253, Cl. 62-470.000.
Kim, Jun M.: *See*—
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Kim, Kye J.; and Chung, Tae Y., to Samsung Electronics Co., Ltd. Image signal coding system. 5,552,829, Cl. 348-392.000.
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Lyu, Jae C.; Kang, Chang S.; Park, Gwan R.; and Kim, Kyeong H., 5,551,261, Cl. 68-23.600.
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Kim, Sang-uk, to Samsung Electronics Co., Ltd. Double-deck magnetic recording/reproducing apparatus. 5,552,895, Cl. 358-310.000.
Kim, Si-hwan; and Kwak, Jin-oh, to Samsung Display Devices Co., Ltd. Liquid crystal compensation cell including a pair of compensating plates for LCD and method of manufacturing the same. 5,552,908, Cl. 359-53.000.
Kim, Sun H.; Keyes, Susan R.; Moreau, Sylviane; Dong, Zheng X.; and Taylor, John, to Biomeasure, Inc. Therapeutic peptide derivatives. 5,552,520, Cl. 530-311.000.
Kim, Yong, to Interport International, Inc. Infrared massage device. 5,551,949, Cl. 601-15.000.
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Ehlert, Thomas D.; and Stegelmann, Norman R., 5,552,013, Cl. 156-555.000.
Morris, Marion C.; Bomber, Robert R.; Chen, Franklin M. C.; and Wideman, Ronald H., 5,552,012, Cl. 156-272.400.
Rajala, Gregory J.; Rabe, Gerald L.; Niemi, Paul M.; and Holewski, Donald J., 5,552,007, Cl. 156-164.000.
Smith, Michael J.; Schroeder, Wen Z.; and Shanklin, Gary L., 5,552,020, Cl. 162-164.400.
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Kimura, Hiromi: *See*—
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Kimura, Katsuji, to NEC Corporation. Local oscillator frequency multiplier and mixing circuit comprising a squaring circuit. 5,552,734, Cl. 327-356.000.
Kimura, Mitsuteru, to Mitsuteru Kimura; and Ricoh Seiki Company, Ltd. Tunnel transistor. 5,552,622, Cl. 257-339.000.
Kimura, Norio: *See*—
Kakimizu, Akiko; Arai, Kenji; Kimura, Norio; and Teramae, Tomohiro, 5,552,423, Cl. 514-372.000.
Kimura, Satoshi; Miyazaki, Hideki; Shimizu, Hiroto; Yamamoto, Kazuto; and Kato, Tsuyoshi, to Casio Computer Co., Ltd. Electronic image pickup apparatus having movable focus screen and movable mirror and which is capable of miniaturization. 5,553,172, Cl. 382-312.000.
Kimura, Takayuki, to NEC Corporation. DMA operable in compliance with pointers, each including a discrimination bit. 5,553,031, Cl. 365-230.010.
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Gardner, Timothy S.; Kimura, Tomoaki; and Hansen, Delbert A., 5,553,054, Cl. 369-117.000.
Kincs, Joseph G.: *See*—
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Kindred, Jack E. Mud sweep and spacer composition. 5,552,377, Cl. 507-209.000.
Kindrick, Ronald S. Bath bench. 5,551,100, Cl. 4-578.100.
King, Francis D.; Gaster, Laramie M.; and Wyman, Paul A., to SmithKline Beecham p.l.c. Azabicyclic compounds as 5-HT4 receptor antagonists. 5,552,398, Cl. 514-214.000.
Kingdon, Kevin W.: *See*—
Ross, Cliff D.; Taylor, Neil W.; Kingdon, Kevin W.; Davis, Howard R.; and Major, Drew, 5,553,143, Cl. 380-25.000.
King's College London: *See*—
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Kinukawa, Masahiko: *See*—
Fukaya, Takashi; Hamada, Masami; Nakamura, Shinichi; Hanzawa, Toyoharu; Kinukawa, Masahiko; Ishikawa, Tomonori; Fujiwara, Hiroshi; and Tokunaga, Shigeo, 5,552,929, Cl. 359-380.000.
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Hoss, Gregg M.; Thompson, James E.; Johnson, Thomas F.; Kirbie, Martin; and Speer, Andrew J., III, 5,551,759, Cl. 298-22.00P.
Kirby, Ronald H., to Simplex Time Recorder Company. Fire alarm system with sensitivity adjustment. 5,552,763, Cl. 340-506.000.
Kircher, Dieter; Rieth, Peter E.; Bill, Karlheinz; Balz, Juergen; Kunze, Lothar; and Halasy-Wimmer, Georg, to ITT Automotive Europe GmbH. Brake system for automotive vehicles with electric drive. 5,551,764, Cl. 303-3.000.
Kirin-Amgen, Inc.: *See*—
Chang, David; and Altrock, Bruce, 5,552,286, Cl. 435-7.200.
Kirk, Richard A. Weighted pool cover perimeter anchor. 5,551,099, Cl. 4-503.000.
Kish, Frederick A.; Golinkin, Herbert S.; and Abt, Daniel C., to Illinois Tool Works Inc. Elastomeric pad between railroad rail and railroad tie. 5,551,632, Cl. 238-283.000.
Kish, Frederick A.; and Rancich, Michael J., to Illinois Tool Works, Inc. Elastomeric pad between railroad rail and railroad tie. 5,551,633, Cl. 238-283.000.
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Kishimoto, Yoshio, to Matsushita Electric Industrial. Self-metabolic functional material. 5,552,111, Cl. 422-5.000.
Kiss, György B.: *See*—
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Ott, István; Klupp, Tibor; Molnár, István; Patthy, András; Barta, István; Barkó née Tóth, Zsuzsa; Ambrus, Gábor; Salát, János; Tegdes, Anikó; Moravcsik, Imre; Együd, Cecilia; Albrecht, Kárnly; Könczöl, Kálmán; Vincze, Attila; Barabás, Éva; Máté, György; Kiss, György B.; Kiss, Péter; Pólya, Kálmán; Erdei, János; Gulyás, Éva; and Zilahi, Erika, 5,552,299, Cl. 435-69.100.
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Kitamura, Takashi; Lawson, David F.; Morita, Koichi; and Ozawa, Yoichi, to Bridgestone Corporation. Process of preparing reduced hysteresis products using anionic polymerization initiators. 5,552,499, Cl. 526-174.000.
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Sugita, Yasuhisa; Kitazawa, Naoki; and Hotta, Hiroshi, 5,552,480, Cl. 525-64.000.
Kittson, Mark O.: *See*—
Porter, John F.; Kittson, Mark O.; Tucker, Mark; Ferris, Larry; and LePage, Steve, 5,552,207, Cl. 428-109.000.
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Klein, Berthold; and Ostertag, Hans-Joachim, to Mercedes-Benz AG. Arrangement of a rear lid or the like on the body frame of a motor vehicle. 5,551,743, Cl. 296-76.000.
Klein, Martin, to Electro Energy, Inc. Bipolar electrochemical battery of stacked wafer cells. 5,552,243, Cl. 429-157.000.
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Wheeler, Edward L.; D'Amelia, Ronald P.; Leveille, Gilbert A.; Otterburn, Michael S.; Klemann, Lawrence P.; Finley, John W.; Roden, Allan D.; Chrysam, Michael M.; Pelloso, Turiddu A.; and Given, Peter S., Jr., 5,552,174, Cl. 426-607.000.
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Bauer, Lothar; Lemme, Werner; Rechberg, Reinhard; Strusch, Wolfgang; Fuchs, Heinz W.; and Wahnschaffe, Jürgen, 5,551,382, Cl. 123-41.82R.
Klos, Rainer, to Becker GmbH. Method for detecting information in a RDS data flow. 5,553,313, Cl. 455-51.100.
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Berneth, Horst; Klug, Günter; and Weisser, Jürgen, 5,552,365, Cl. 503-213.000.
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Seidel, Jorge P.; and Knapp, Steven K., 5,553,001, Cl. 364-488.000.
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Anthony, Thomas R.; Knemeyer, Friedel S.; and Williams, Bradley E., 5,551,277, Cl. 72-467.000.
KNF Neuberger GmbH: *See*—
Hauser, Erwin, 5,551,843, Cl. 417-234.000.
Knockeart, Ronald P., to Siemens Automotive Corporation. Method and apparatus for transmitting coded light through low transmissible materials. 5,552,780, Cl. 340-991.000.
Knoerzer, Anthony R., to Mobil Oil Corporation. High barrier film combination. 5,552,212, Cl. 428-213.000.
Knoke, Jürgen; and Jöst, Manfred, to Firma Carl Freudenberg. Non-woven composite interlining fabric. 5,552,206, Cl. 428-102.000.
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Lovegrove, Ross; and Peart, Stephen, 5,551,752, Cl. 297-284.500.
Knoll, Peter; König, Winfried; and Mock-Hecker, Rüdiger, to Robert Bosch GmbH. Head-up display device for motor vehicles. 5,552,935, Cl. 359-630.000.
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Van Gemert, Barry; and Knowles, David B., 5,552,090, Cl. 252-586.000.
Knudson, Gary A. Half-round gutter making apparatus. 5,551,272, Cl. 72-181.000.
Knutson, Brian C. Slidable storage wall-mount. 5,551,580, Cl. 211-94.000.
Ko, Uming, to Texas Instruments Incorporated. High performance energy efficient push pull D flip flop circuits. 5,552,738, Cl. 327-203.000.
Ko, Uming: *See*—
Wichman, Shannon A.; and Ko, Uming, 5,552,726, Cl. 327-149.000.
Kobashi, Tetsuzo: *See*—
Fujii, Tetsuhiko; Yamamoto, Akira; Kobashi, Tetsuzo; Sato, Masahiko; and Satoh, Takao, 5,553,307, Cl. 395-845.000.
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Omura, Hideo; and Kobayashi, Masaaki, 5,552,986, Cl. 364-424.050.
Kobayashi, Masahiro, to Fujitsu Limited. Semiconductor light detecting device with groove. 5,552,616, Cl. 257-184.000.
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Goto, Hisashi; Hirano, Tatsuya; and Kobayashi, Shinichi, 5,551,333, Cl. 99-450.600.
Kobayashi, Tomoyuki; Miyazaki, Kenji; and Nakamura, Masanori, to Sekisui Chemical Co., Ltd. Plastic foam material composed of thermoplastic resin and silane-modified thermoplastic resin and method for making same. 5,552,448, Cl. 521-154.000.
Kobayashi, Yoshito: *See*—
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Koblitz, Klaus: *See*—
Schädlich, Ralf; Reichenbach, Klaus; Koblitz, Klaus; and Meier, Udo, 5,551,339, Cl. 101-216.000.
Kobomura, Kenji; Kimura, Hiromi; Osone, Hideo; Shima, Mikio; Hayashida, Michiya; and Tsuji, Nobuyuki, to Nippon Steel Corporation; and Nippon Steel Chemical Co., Ltd. Unidirectional prepreg and carbon fiber reinforced composite materials comprising pitch-based carbon fibers and polyacrylonitrile-based carbon fibers. 5,552,214, Cl. 428-294.000.
Kobori, Yoichi: *See*—
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Koboshi, Shigeharu; Ishikawa, Masao; Komatsu, Yoshimasa; Ishii, Hideo; Miyazawa, Yorikatsu; Tsubaki, Yoshifumi; Saito, Kaneo; and Yoshimoto, Hiroshi, to Konica Corporation. Automatic processing machine for silver halide photographic light-sensitive materials. 5,552,851, Cl. 354-298.000.
Koch, Kevin, to Pfizer Inc. Benzopyran and related LTB antagonists. 5,552,435, Cl. 514-456.000.
Kodaira, Toshimoto; Oshima, Hiroyuki; and Mano, Toshihiko, to Seiko Epson Corporation. Active matrix assembly with double layer metallization over drain contact region. 5,552,615, Cl. 257-72.000.
Kodama, Kunihiko: *See*—
Inagawa, Jun; Nagumo, Masahide; and Kodama, Kunihiko, 5,553,041, Cl. 369-48.000.
Koelsch, Michael L.; McIntyre, Dennis A.; and Roy, James B., to Eastman Kodak Company. Apparatus and method for vacuum sealing pouches. 5,551,213, Cl. 53-434.000.
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Michalik, Horst B.; and Weschenfelder, Otto T., 5,551,678, Cl. 270-20.100.
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Bolza-Schünemann, Hans-Bernhard; Bolza-Schünemann, Claus A.; Fischer, Christian M. M.; and Kutzner, Willi A. P., 5,551,340, Cl. 101-395.000.
Koeppe, Peter V.: *See*—
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Kakibayashi, Hiroshi; Mitsui, Yasuhiro; Tadokoro, Hideo; Kuroda, Katsuhiro; Koguchi, Masanari; Tsuji, Kazutaka; Makishima, Tatsuo; Ichihashi, Mikio; and Isakozawa, Shigeto, 5,552,602, Cl. 250-311.000.
Kohara, Hidekatsu: *See*—
Kato, Tetsuya; Takahashi, Kouichi; Kohara, Hidekatsu; and Nakayama, Toshimasa, 5,552,255, Cl. 430-165.000.
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Kohno, Takeshi, to Canon Kabushiki Kaisha. Facsimile apparatus with

Konrad, Johann: *See*—
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Cava, Robert J.; Krajewski, James J.; and Peck, William F., 5,552,355, Cl. 501-137.000.
Krakauer, Arno S.; Gawlick, Dieter; Colgrove, John A.; and Wilmot, Richard
Kuhns, Roger J.; and Nathans, Robert L. Low cost method employing time slots for thwarting fraud in the periodic issuance of food stamps, unem-

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Koito Manufacturing Co., Ltd.: *See*—
Murakami, Tomokazu, 5,552,969, Cl. 362-61.000.
Takezawa, Shirou; and Sano, Souhei, 5,552,970, Cl. 362-61.000.
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Kojima, Makoto: *See*—
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Otada, Shinjiro; Inaba, Yutaka; Kojima, Makoto; and Katakura, Kazunori, 5,552,911, Cl. 359-68.000.
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Kokubun, Mitsuhiro: *See*—
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Kolb, Marcus E.: *See*—
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Koletzki, Ulrich: *See*—
Cap, Heinrich; Elsaesser, Dieter; Koletzki, Ulrich; and Papst, Georg, 5,552,650, Cl. 310-67.00R.
Kolluri, Madhav V., to Maxim Integrated Products. High impedance common-emitter amplifier stage. 5,552,741, Cl. 327-560.000.
Komada, Hideki; Muramatsu, Takahiro; and Yamamoto, Yuji, to Suzuki Motor Corporation. Air suction system for internal combustion engine. 5,551,401, Cl. 123-472.000.
Komatsu, Yoshimasa: *See*—
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Murakami, Eisaku; Yuasa, Kazuhiro; Endoh, Shuichi; Matsumae, Iwao; Tanaka, Yoshiaki; Hosokawa, Hiroshi; Uno, Mugijiroh; Saitoh, Hiroshi; Takenaka, Eiji; Sugiyama, Toshihiro; Yamanaka, Tetsuo; and Komatsubara, Satoru, 5,552,870, Cl. 355-259.000.
Komatsuki, Masato, to Sumitomo Rubber Industries, Ltd. Pneumatic tire with hybrid steel/aramid belt cord. 5,551,498, Cl. 152-527.000.
Kominami, Shinya: *See*—
Nishino, Toshikazu; Kawabe, Ushio; Tarutani, Yoshinobu; Kominami, Shinya; Aida, Toshiyuki; Fukazawa, Tokuumi; and Hatano, Mutsuko, 5,552,375, Cl. 505-330.000.
Kommrusch, Steven J., to Hewlett-Packard Company. Constant current voltage restoration. 5,552,783, Cl. 341-118.000.
Kőnczöl, Kálmán: *See*—
Ott, István; Klupp, Tibor; Molnár, István; Patthy, András; Barta, István; Bartó née Tóth, Zsuzsa; Ambrus, Gábor; Salát, János; Tegdes, Anikó; Moravcsik, Imre; Egyűd, Cecília; Albrecht, Károly; Kőnczöl, Kálmán; Vincze, Attila; Barabás, Éva; Máté, György; Kiss, György B.; Kiss, Péter; Pólya, Kálmán; Erdei, János; Gulyás, Éva; and Zilahi, Erika, 5,552,299, Cl. 435-69.100.
Kondoh, Eiichi; Mitomo, Toru; Yamamoto, Hiroshi; and Obta, Tomohiro, to Kawasaki Steel Corporation. Method for supplying liquid material and process for forming thin films using the liquid material supplying method. 5,552,181, Cl. 427-248.100.
Konefal, Robert S., to Owens-Brockway Plastic Products Inc. Injection blow molding machine with stacked molds. 5,552,105, Cl. 264-538.000.
Konermann, Herbert, to Du Pont de Nemours, E. I., and Company. Process for production of photopolymerizable flexographic printing plates. 5,552,262, Cl. 430-306.000.
Konica Corporation: *See*—
Koboshi, Shigeharu; Ishikawa, Masao; Komatsu, Yoshimasa; Ishii, Hideo; Miyazawa, Yorikatsu; Tsubaki, Yoshifumi; Saito, Kaneo; and Yoshimoto, Hiroshi, 5,552,851, Cl. 354-298.000.
Nakanishi, Kazuhiro; Isozaki, Shin; Kikugawa, Shozo; and Yamagishi, Hiroaki, 5,552,947, Cl. 360-104.000.
Tsuchiya, Ichiro; and Haraguchi, Tsuyoshi, 5,552,852, Cl. 354-324.000.
König, Klaus: *See*—
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König, Winfried: *See*—
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Konja, Masakuni: *See*—
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Konno, Hisashi: *See*—
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Konno, Shinji; Fukuyama, Takashi; and Yamamoto, Masahiro, to Mitsubishi Chemical Corporation. Electrostatic actuator. 5,552,654, Cl. 310-309.000.
Konrad, Johann: *See*—
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Konshak, Michael V.; and Horstman, Justus A. W., to Storage Technology Corporation. Shear clamping method. 5,551,139, Cl. 29-432.200.
Konuma, Toshimitsu: *See*—
Shimizu, Michio; Konuma, Toshimitsu; and Nishi, Takeshi, 5,552,913, Cl. 359-80.000.
Kooken, Gale A.; Murphy, John W.; and Fleming, Roger D., to Dayton-Phoenix Group, Inc. Stator lamination jig system. 5,551,142, Cl. 29-564.300.
Koontz, Wendy L.: *See*—
Cotner, Curt L.; Heaps, Robert J.; Koontz, Wendy L.; Little, Benjamin R.; and Toomire, Thomas J., 5,553,234, Cl. 395-182.140.
Koops, Geert-Hendrik; Mulder, Marcellinus H. V.; and Smolders, Cornelis A., to Deutsche Carbone AG Membran-Trennverfahren GFT. Composite membrane, its application and process for the dehydration of organic solvents. 5,552,054, Cl. 210-640.000.
Kopans, Daniel B.: *See*—
Moore, Richard; and Kopans, Daniel B., 5,553,111, Cl. 378-37.000.
Köppel, Norbert, to SFS Industrie Holding AG. Self-drilling fastener. 5,551,818, Cl. 411-387.000.
Kordecki, John R.: *See*—
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Kordecki, Michael E.; and Kordecki, John R., to Kordecki, Michael E. Pushable golf cart. 5,551,716, Cl. 280-47.180.
Korea Telecommunication Authority: *See*—
Kwon, Soon H.; Oh, Yoon S.; Lee, Heo Y.; and Yoon, Jeong N., 5,553,251, Cl. 395-310.000.
Korecky, Martin J.: *See*—
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Koreswa, Sumio; Yamazaki, Masanori; and Imaide, Hidetoshi, to Babcock-Hitachi Kabushiki Kaisha. Target practice apparatus. 5,551,876, Cl. 434-16.000.
Korff, Joachim: *See*—
Schäfer, Volker; Kohler, Robert; Schilling, Günter; Pauli, Alfred; Röhrs, Ingo; and Korff, Joachim, 5,552,070, Cl. 508-224.000.
Koskan, Larry P.: *See*—
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Kosuda, Masanori: *See*—
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Kosuge, Katsuhiro: *See*—
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Kotoh, Satoru: *See*—
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Kott, Kevin L.: *See*—
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Kountz, Kenneth J.; and Blazek, Christopher F., to Gas Research Institute. Apparatus and method for controlling the charging of NGV cylinders from natural gas refueling stations. 5,551,490, Cl. 141-21.000.
Kovacs, Gregory J.; Neville Connel, G. A.; Hor, Ah-Mee; and Popovic, Zoran D., to Xerox Corporation. Multiple layer photoreceptor for color xerography. 5,552,253, Cl. 430-57.000.
Kowalski, Jacek, to Gemplus Card International. Memory with EEPROM cell having capacitive effect and method for the reading of such a cell. 5,552,621, Cl. 257-321.000.
Kowalski, John: *See*—
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Kowitz, Manfred: *See*—
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Koyama, Yoshinari: *See*—
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Kozel, Charles A.; and Edgerton, Cathy J., to Methode Electronics, Inc. Low profile insulation displacement connection programmable block and wire to board connector. 5,551,889, Cl. 439-404.000.
Kozielski, Anthony J.: *See*—
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Kozole, Karl-Heinz: *See*—
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Kozuki, Koichi, to Yamaha Corporation. Reverberation - imparting device capable of modulating an input signal by random numbers. 5,553,150, Cl. 381-61.000.
Kraft Jacobs Suchard, AG: *See*—
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Kragle, Harry A.; Lambert, David W.; and Lipp, G. Daniel, to Corning Incorporated. Method and apparatus for extruding large honeycombs. 5,552,102, Cl. 264-177.110.
Krajewski, James J.: *See*—

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Krakauer, Arno S.; Gawlick, Dieter; Colgrove, John A.; and Wilmot, Richard B., II, to Amdahl Corporation. File system for a plurality of storage classes. 5,553,285, Cl. 395-600.000.
Kraley, Michael F.: *See*—
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Krambeck, Frederick J.: *See*—
Buchanan, J. Scott; Harandi, Mohsen N.; Krambeck, Frederick J.; and Schatz, Klaus W., 5,552,121, Cl. 422-171.000.
Kramer, Kenneth C.; and Baker, Roy S., to Sundstrand Corporation. Detection and isolation circuit for a failed bridge power rectifier and an electrical system employing same. 5,552,952, Cl. 361-86.000.
Kraska, Ursula A.; Weikart, Udo; and Simon, Reimund, to Du Pont de Nemours, E. I., and Company. Recycling the recording layer of flexographic printing plates. 5,552,261, Cl. 430-273.100.
Kraupa, Werner: *See*—
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Kraus, Helmut; Klausener, Alexander; and Landscheidt, Heinz, to Bayer Aktiengesellschaft. Process for the continuous preparation of nitrosyl chloride. 5,552,130, Cl. 423-386.000.
Kreiter, Csaba: *See*—
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Kremer, Ross A.: *See*—
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Kretschmann, Josef; Ritter, Wolfgang; and Fues, Johann-Friedrich, to Henkel Kommanditgesellschaft auf Aktien. New materials for bone replacement and for joining bones or prostheses. 5,552,454, Cl. 523-113.000.
Krolo, Mirko; and Röcker, Robert, to Fleader-Himmelwerk GmbH. Device for ensuring safety by preventing mechanically raised and lowered components from crashing down. 5,551,535, Cl. 188-72.200.
Krotz, Ralf: *See*—
Hauke, Gunter; Specht, Rainer; Krotz, Ralf; Funk, Reiner; Martin, Peter; and Nies, Berthold, 5,551,778, Cl. 366-139.000.
Krueger, Ellison. System for salvage and restoration on electrical components from a substrate. 5,552,579, Cl. 219-411.000.
Krug, Eugene E. Elongated integral truss brace. 5,551,200, Cl. 52-696.000.
Krug, Joachim; Althaus, Hans-Ludwig; Hartl, Alfred; and Kuhn, Gerhard, to Siemens Aktiengesellschaft. Transmission and reception module for a bidirectional optical communication and signal transmission. 5,552,918, Cl. 359-152.000.
Krull, Mark A. Toy having multiple tags. 5,551,687, Cl. 273-58.00K.
KSB Aktiengesellschaft: *See*—
Hergt, Peter, 5,551,837, Cl. 415-206.000.
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Maehara, Hiroshi: *See*—
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Makita, Akira; Matsumoto, Yutaka; and Aoki, Takahito, to Dai Nippon Printing Co., Ltd. Light weight shadow mask and method of manufacturing. 5,552,662, Cl. 313-403.000.

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Martrés, Jacques: *See*—
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Markowitz, Leah: *See*—
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Stokes, Burnham, 5,552,603, Cl. 250-338.400.
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Maruoka, Kiyoto; Horiuchi, Kuniyasu; and Yabuki, Yoshikazu, to Sumitomo Rubber Industries, Ltd. Golf ball and method of manufacturing the same. 5,552,190, Cl. 427-457.000.
Maruyama, Asao, to Tsubakimoto Chain Co. Transfer apparatus having traction pin moved with height difference. 5,551,823, Cl. 414-280.000.
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Masson, Guy. Device for sampling and pumping liquids contained in a chemical reaction vessel, drum or storage tank. 5,551,312, Cl. 73-863.810.
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Matassa, V. G.; Street, L. J.; and Showell, G. A., to Merck, Sharp & Dohme Ltd. Five-membered heteroaromatic compounds as 5-HT receptor agonists. 5,552,402, Cl. 514-233.500.
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Matsubayashi, Nobuyuki; and Takeshita, Toru, to Mazda Motor Corporation. Pressurizing control method and pressurizing control system for low-pressure casting. 5,551,502, Cl. 164-457.000.
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Matsumoto, Akio, to Mazda Motor Corporation. Method of and system for gear shift controlling for an automatic transmission. 5,551,931, Cl. 477-149.000.
Matsumoto, Chihiro, to Sanshin Kogyo Kabushiki Kaisha. Discharge nozzle arrangement for water jet propulsion unit. 5,551,898, Cl. 440-41.000.
Matsumoto, Fumio; Kato, Ryoichi; Tanabe, Kazumi; and Bando, Teruo, to Fuji Photo Film Co., Ltd. Copying apparatus for the photographic reproduction of a multi-dimensional object. 5,552,866, Cl. 355-233.000.
Matsumoto, Hajime, to Mitsubishi Denki Kabushiki Kaisha. Automatic conveyance system. 5,551,348, Cl. 104-88.020.
Matsumoto, Koji, to Nichimen Corporation. Handle grip to be detachably fixed to a disposable camera equipped with a spool of film. 5,552,850, Cl. 354-295.000.
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Matsuo, Takayuki, to Canon Kabushiki Kaisha. Recording apparatus having head-shading function and head-shading method. 5,552,810, Cl. 347-19.000.
Matsuo, Yasuhiro; Ohya, Tomoki; and Hashimoto, Yoshiki, to Fanuc, Ltd. Emergency robot shutdown circuit. 5,552,687, Cl. 318-563.000.
Matsuoka, Kouji: *See*—
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Numoto, Hironao; and Terashima, Tetuo, 5,552,123, Cl. 422-180.000.
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May, Patrick C., to Eli Lilly and Company. Method of inhibiting Alzheimer's Disease. 5,552,415, Cl. 514-324.000.
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May, Timothy J., to Reynolds Consumer Products Inc. Tear guide arrangement. 5,552,202, Cl. 428-43.000.
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McAllister, Alex; and Wise, Laird, to Bell Atlantic Network Services, Inc. Intelligent recognition of speech signals using caller demographics. 5,553,119, Cl. 379-67.000.
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McBrayer, Roy N., Jr.; Swan, Jimmy G.; and Barber, John S., to RPC Waste Management Services, Inc. d/b/a Eco Waste Technologies. Pressure reduction system and method. 5,551,472, Cl. 137-114.000.
McBrayer, Roy N., Jr.; Deaton, James E.; and Eller, James M., to RPC Waste Management Services, Inc. Turbulent flow cold-wall reactor. 5,552,039, Cl. 210-90.000.
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Melo, Maria L.; Wolford, Jeff W.; Moriarty, Michael; Culley, Paul R.; and Merryman, Philip I., deceased; and Merryman, Diana G., administrator, 5,553,298, Cl. 395-800.000.

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McGill, Scott D., to Vanguard Automation, Inc. Method and apparatus for filling a ball grid array. 5,551,216, Cl. 53-473.000.
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McKenzie, Gerald W., to General Electric Company. Hot argon cleaning and protective coating of components made of metal or alloy. 5,551,671, Cl. 266-156.000.
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Loesch, Stanley B.; St. John, James C.; and Mints, Danny K., 5,551,242, Cl. 62-50.300.
Mir, Jose M.: *See*—
Agostinelli, John A.; Mir, Jose M.; Lubberts, Gerrit; and Chen, Samuel, 5,552,373, Cl. 505-190.000.
Miracle, Gregory S.; Willey, Alan D.; Kott, Kevin L.; and Burns, Michael E., to Procter & Gamble Company, The. Perhydrolysis-selective bleach activators. 5,552,556, Cl. 548-334.100.
Mirzabekov, Andrei D.: *See*—
Khrapko, Konstantin R.; Khorlin, Alexandr A.; Ivanov, Igor B.; Ershov, Gennady M.; Lysov, Jury P.; Florentuev, Vladimir L., and Mirzabekov, Andrei D., 5,552,270, Cl. 435-6.000.
Mishima, Junichi: *See*—
Nakada, Akira; Shibukawa, Takeo; Hmago, Yasuhiro; and Mishima, Junichi, 5,552,561, Cl. 84-658.000.
Mishina, Yoshinori: *See*—
Nemoto, Ryozi; and Mishina, Yoshinori, 5,552,322, Cl. 435-287.200.
Mishra, Munmaya K.; Shirodkar, Shailaja M.; and Jung, Alfred K., to Ethyl Additives Corporation. Star-branched acrylate and methacrylate polymers. 5,552,491, Cl. 525-299.000.

Mishra, Satchidanand: *See*—
Mammino, Joseph; Mishra, Satchidanand; Hwang, Shyshung S.; and Domm, Edward A., 5,552,005, Cl. 156-157.000.
Misselyn, Anne-Marie; Mahieu, Marianne; Yianakopoulos, Georges; and Erilli, Rita, to Colgate-Palmolive Co. Liquid cleaning compositions with grease release agent. 5,552,089, Cl. 510-417.000.
Mita Industrial Co., Ltd.: *See*—
Mizude, Kazuhiro; Kato, Hisahiro; Ishida, Hideki; and Tsutano, Tomohiro, 5,552,861, Cl. 355-208.000.
Yamashita, Yuji; Nagira, Jiro; Hashimoto, Yasuhiro; and Aizawa, Fumio, 5,552,860, Cl. 355-207.000.
Mitani, Masaaki: *See*—
Hayashi, Katsumi; Saitou, Kazuhiko; Ohsato, Hiroshi; Mitani, Masaaki; Hayashi, Tomohiro; Obata, Takashi; Sekine, Yutaka; Ura, Mitsuhiro; and Ishii, Takuji, 5,553,303, Cl. 395-600.000.
Mitchell, Joseph N.: *See*—
Froehlich, James P.; Mitchell, Joseph N.; and Jones, Stephen M., 5,551,419, Cl. 128-204.230.
Mitchell, Randall M.: *See*—
Creger, Todd D.; League, Richard B.; Mitchell, Randall M.; Spurlock, David M.; Talbott, James R.; and Williamson, Gregory L., 5,551,930, Cl. 477-130.000.
Mitchell, William D.: *See*—
Haines, Ralph; Heidelberger, Klaus; Lang, Brian; Mitchell, William D.; and Stancu, Petar, 5,551,355, Cl. 110-242.000.
Mitomo, Toru: *See*—
Kondoh, Eiichi; Mitomo, Toru; Yamamoto, Hiroshi; and Ohta, Tomohiro, 5,552,181, Cl. 427-248.100.
Mitra, Sumita B.; Culler, Scott R.; and Wang, Bing, to Minnesota Mining and Manufacturing Company. Ethylenically unsaturated polymeric alkoxysilanes useful for treating fluoroaluminosilicate glass. 5,552,485, Cl. 525-102.000.
Mitsuba Electric Mfg. Co., Ltd.: *See*—
Shimoyama, Shuji; and Yanagizawa, Iwao, 5,552,652, Cl. 310-237.000.
Mitsubishi Chemical Corporation: *See*—
Konno, Shinji; Fukuyama, Takashi; and Yamamoto, Masahiro, 5,552,654, Cl. 310-309.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Akasu, Masahira, 5,552,893, Cl. 356-5.010.
Hisa, Yoshihiro, 5,551,584, Cl. 216-2.000.
Ishida, Itsuko; Hata, Masayuki; and Yamada, Tatsuo, 5,553,262, Cl. 395-450.000.
Matsumoto, Hajime, 5,551,348, Cl. 104-88.020.
Nakao, Yuichi, 5,552,727, Cl. 327-159.000.
Ohmori, Masashi; Tanaka, Hiroshi; Nishimoto, Akira; Sasai, Hiroshi; Fujino, Naohiko; and Kotoh, Satoru, 5,551,459, Cl. 134-61.000.
Seza, Katsushi; Tasaki, Hirohisa; and Nakajima, Kunio, 5,553,194, Cl. 395-2.300.
Tanaka, Kunimaro, 5,553,044, Cl. 369-58.000.
Taniguchi, Hideki; Tomioka, Ichiro; Sanada, Kunihiko; and Okabe, Masatomi, 5,552,618, Cl. 257-207.000.
Tsujimoto, Hideyuki, 5,552,764, Cl. 340-508.000.
Wada, Shunichi; and Takagi, Masanori, 5,552,684, Cl. 318-293.000.
Watanabe, Hiroshi; and Hasegawa, Hiroaki, 5,551,830, Cl. 414-786.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Moriyama, Noboru; Ogura, Tsugitoshi; and Hiraki, Akio, 5,551,956, Cl. 44-301.000.
Mitsubishi Plastics, Inc.: *See*—
Fujita, Takeshi; Matsuo, Katsuaki; and Kakishita, Osamu, 5,552,453, Cl. 522-165.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Iwamoto, Mune; Nakajima, Akihiko; Takaku, Masato; Morita, Hisao; Ando, Toshihiko; Shirafuji, Tomofumi; and Uchida, Mutsuko, 5,552,494, Cl. 525-316.000.
Takashima, Tomoko; Iimuro, Shigeru; and Kitamura, Takashi, 5,552,509, Cl. 528-129.000.
Mitsui, Yasuhiro: *See*—
Kakibayashi, Hiroshi; Mitsui, Yasuhiro; Tadokoro, Hideo; Kuroda, Katsuhiro; Koguchi, Masanari; Tsuji, Kazutaka; Makishima, Tatsuo; Ichihashi, Mikio; and Isakozawa, Shigeto, 5,552,602, Cl. 250-311.000.
Mitsuteru Kimura: *See*—
Kimura, Mitsuteru, 5,552,622, Cl. 257-339.000.
Miura, Tohru; and Tsuyuguchi, Hiroshi, to TEAC Corporation. Transducer recalibration system and method for a rotating disk data storage. 5,552,945, Cl. 360-78.080.
Miura, Yasuhiro; Shiomi, Yutaka; and Sunada, Mituaki, to Sumitomo Chemical Company, Limited. Pipe clogging detecting device. 5,551,297, Cl. 73-658.000.
Miyagawa, Takao; Kashio, Akinori; Hashimoto, Ken; Yasuda, Makoto; Sakai, Hidenobu; and Kutsche, William C., to Murata Manufacturing Co., Ltd. Bus terminating circuit. 5,553,250, Cl. 395-309.000.
Miyai, Hiroshi: *See*—
Yamagishi, Shigekazu; Miyatake, Yoshito; and Miyai, Hiroshi, 5,552,906, Cl. 359-40.000.
Miyakawa, Tadashi: *See*—
Nakai, Hiroto; Miyakawa, Tadashi; and Matsuda, Shigeru, 5,553,026, Cl. 365-201.000.
Miyake, Hiroyuki, to Fuji Xerox Co., Ltd. Thin film transistor having metallic light shield. 5,552,630, Cl. 257-435.000.
Miyake, Hiroyuki: *See*—
Kurata, Mitsuru; Miyake, Hiroyuki; and Ebata, Tokihide, 5,552,811, Cl. 347-28.000.
Miyake, Shoji: *See*—
Yoshida, Takehiro; and Miyake, Shoji, 5,551,679, Cl. 270-58.090.
Miyama, Hiroshi: *See*—
Sasaki, Yasuyuki; Bizen, Takehiko; Miyama, Hiroshi; Morisako, Takeshi; and Tsukada, Hiroko, 5,551,600, Cl. 222-81.000.
Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, to Nikon Corporation. Camera equipped with data imprinting device. 5,552,844, Cl. 354-106.000.
Miyane, Toshiki, to Seiko Epson Corporation. Apparatus for expanding compressed binary data. 5,553,260, Cl. 395-421.100.
Miyano, Masateru: *See*—
Abood, Norman A.; Garland, Robert B.; and Miyano, Masateru, 5,552,431, Cl. 514-427.000.
Miyashita, Kotaro: *See*—
Shimizu, Daisuke; Miyashita, Kotaro; Hara, Yoshihisa; and Ikeba, Hiroshi, 5,551,408, Cl. 123-571.000.
Miyatake, Yoshito: *See*—
Yamagishi, Shigekazu; Miyatake, Yoshito; and Miyai, Hiroshi, 5,552,906, Cl. 359-40.000.
Miyauchi, Tokuhisa: *See*—
Fujioka, Osamu; Miyauchi, Tokuhisa; and Neko, Noriaki; 5,551,857, Cl. 425-143.000.
Miyauchi, Yasuhiko: *See*—
Mochida, Ei; Miyauchi, Yasuhiko; Matsuura, Takashi; and Katamine, Tomoaki, 5,552,276, Cl. 435-6.000.
Miyawaki, Yoshinori, to OMRON Corporation. Electronic blood pressure meter. 5,551,440, Cl. 128-681.000.
Miyazaki, Hideki: *See*—
Kimura, Satoshi; Miyazaki, Hideki; Shimizu, Hiroto; Yamamoto, Kazuto; and Kato, Tsuyoshi, 5,553,172, Cl. 382-312.000.
Miyazaki, Kenji: *See*—
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Miyazawa, Yorikatsu: *See*—
Koboshi, Shigeharu; Ishikawa, Masao; Komatsu, Yoshimasa; Ishii, Hideo; Miyazawa, Yorikatsu; Tsubaki, Yoshifumi; Saito, Kaneo; and Yoshimoto, Hiroshi, 5,552,851, Cl. 354-298.000.
Mizohata, Tadashi; and Suzuki, Masashi, to Futaba Denshi Kogyo K.K.; and Toshiba Corporation. Fluorescent display device including a filamentary cathode with increased mechanical strength and reduced end cooling effect. 5,552,660, Cl. 313-341.000.
Mizude, Kazuhiro; Kato, Hisahiro; Ishida, Hideki; and Tsutano, Tomohiro, to Mita Industrial Co., Ltd. Image forming apparatus having controller adjusting current to main charger and transfer charger. 5,552,861, Cl. 355-208.000.
Mizukami, Hiroshi; Uehara, Hiroshi; and Okada, Shinichi, to Kabushiki Kaisha Daikin Seisakusho. Clutch cover assembly. 5,551,547, Cl. 192-89.230.
Mizuoka, Seiji, to Matsushita Electric Industrial Co., Ltd. Position detecting device using run position and run length of normalized projection data. 5,553,169, Cl. 382-282.000.
Mizusawa, Nobutoshi: *See*—
Ebinuma, Ryuichi; Mizusawa, Nobutoshi; and Chiba, Yuji, 5,552,812, Cl. 347-34.000.
Mizutani, Takehito: *See*—
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MKS Instruments, Inc.: *See*—
Ewing, James H., 5,553,188, Cl. 392-394.000.
Mobil Oil Corporation: *See*—
Avery, Noyes L.; Axelrod, Joan C.; Carey, James T.; Hiebert, John; and Horodysky, Andrew G., 5,552,069, Cl. 508-229.000.
Brandes, Ellen B.; and Loveless, Frederick C., 5,552,492, Cl. 525-314.000.
Chang, Clarence D.; Santiesteban, Jose G.; Shihabi, David S.; Stevenson, Scott A.; and Vartuli, James C., 5,552,128, Cl. 423-235.000.
Farnos, Maria D.; and McWilliams, John P., 5,552,129, Cl. 423-239.200.
Knoerzer, Anthony R., 5,552,212, Cl. 428-213.000.
Lago, Rudolph M.; Marler, David O.; McCullen, Sharon B.; and Olson, David H., 5,552,357, Cl. 502-63.000.
Maute, Robert E.; Thompson, Laird B.; Bednarczyk, Adam; and Symmons, David, 5,551,287, Cl. 73-152.020.
Rudnick, Leslie R.; Kremer, Ross A.; and Law, Derek A., 5,552,071, Cl. 508-581.000.
Shih, Stuart S., 5,552,033, Cl. 208-89.000.
Yan, Tsoung Y., 5,552,063, Cl. 210-763.000.
Mochida, Ei; Miyauchi, Yasuhiko; Matsuura, Takashi; and Katamine, Tomoaki, to Mochida Pharmaceutical Co., Ltd. Apparatus and process for simplified measurement. 5,552,276, Cl. 435-6.000.
Mochida Pharmaceutical Co., Ltd.: *See*—
Mochida, Ei; Miyauchi, Yasuhiko; Matsuura, Takashi; and Katamine, Tomoaki, 5,552,276, Cl. 435-6.000.
Mock-Hecker, Rüdiger: *See*—
Knoll, Peter; König, Winfried; and Mock-Hecker, Rüdiger, 5,552,935, Cl. 359-630.000.
Modernfold, Incorporated: *See*—
McRoberts, Jerald A., 5,551,499, Cl. 160-40.000.
Moehlenbrock, Andrew W.: *See*—

McDonald, Gregory E.; Moehlenbrock, Andrew W.; and Foster, John D., 5,551,215, Cl. 53-459.000.
Moore, Richard; and Kopans, Daniel B., to General Hospital Corporation, The. Apparatus and method for improved tissue imaging. 5,553,111, Cl.

Morrison, James P.; and Yue, Samual K., to pHox Medical Optics, Inc. Fetal probe apparatus. 5,551,424, Cl. 128-634.000.
Morrissey, Douglas F.; Cavanagh, Edward T., Jr.; Wieder, Gene T.; Ng, Kin
Minervino, Richard J., Jr.; Veranis, Charles J.; and Andrade, Anthony J., 5,553,131, Cl. 379-221.000.
Moyher, George C., Jr.: *See*—

McDonald, Gregory E.; Moehlenbrock, Andrew W.; and Foster, John D., 5,551,215, Cl. 53-459.000.
Moh, Sungwon: *See*—
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Molecular Biosystems, Inc.: *See*—
Lambert, Karel J.; Jablonski, Edward G.; and Hulle, Carl, 5,552,133, Cl. 424-9.520.
Molex Incorporated: *See*—
Belenkiy, Yuriy; Grois, Igor; Gumin, Irina; Makhlin, Ilya; Margolin, Mark; and Pescetto, Michael J., 5,553,180, Cl. 385-59.000.
Molina, Ernest; and Chenevard, Alexis, to Sapal Societe Anonyme Des Plieuses Automatiques. Production line for packaging rows or layers of products and production line recycling device. 5,551,209, Cl. 53-168.000.
Molitor, Daniel J. Ladder stabilizer. 5,551,529, Cl. 182-204.000.
Molko, Didier: *See*—
Duplaa, Anne-Marie; Gasparutto, Didier; Livache, Thierry; Molko, Didier; and Teoule, Robert, 5,552,539, Cl. 536-25.310.
Moller, Kurt H.: *See*—
Freeman, Gary M.; Moller, Kurt H.; and Carter, Richard D., 5,551,975, Cl. 106-485.000.
Molnár, István: *See*—
Ott, István; Klupp, Tibor; Molnár, István; Patthy, András; Barta, István; Barkó née Tóth, Zsuzsa; Ambrus, Gábor; Salát, János; Tegdes, Anikó; Moravcsik, Imre; Együd, Cecilia; Albrecht, Kárnly; Könczöl, Kálmán; Vincze, Attila; Barabás, Éva; Máté, György; Kiss, György B.; Kiss, Péter; Pólya, Kálmán; Erdei, János; Gulyás, Éva; and Zilahi, Erika, 5,552,299, Cl. 435-69.100.
Molyneaux, David A.: *See*—
Blakeley, Douglas M.; and Molyneaux, David A., 5,551,430, Cl. 128-653.200.
Moncorge, Jean-Paul, to Gec Alsthom T & D SA. Device for supplying a voltage to an electronic circuit, in particular an electronic circuit associated with a current sensor disposed on an electrical line. 5,552,978, Cl. 363-89.000.
Monden, Kazumi: *See*—
Hirano, Toru; Monden, Kazumi; Hosokawa, Masumi; Imaki, Kazuhiro; and Shima, Akihide, 5,553,277, Cl. 395-600.000.
Moni, Maria T., heir: *See*—
Fraschini, Franco; Stankov, Bojidar; Borgonovo, Margherita; Introini, Carlo; Laguzzi, Aldo; Duranti, Ermanno, deceased; and Moni, Maria T., heir, 5,552,428, Cl. 514-415.000.
Monn, James A.: *See*—
Lunn, William H. W.; Monn, James A., and Zimmerman, Dennis M., 5,552,426, Cl. 514-394.000.
Monsanto Company: *See*—
De Keyser, François, 5,552,185, Cl. 427-358.000.
Ho, Sa V.; Greenley, Robert Z.; and Michaels, Alan S., 5,552,053, Cl. 210-640.000.
Martin, David A., 5,552,517, Cl. 528-363.000.
Stern, Michael K.; and Cheng, Brian K.-M., 5,552,531, Cl. 534-588.000.
Monsma, Frederick J., Jr.: *See*—
Sibley, David R.; Monsma, Frederick J., Jr.; McVittie, Loris D.; and Mahan, Lawrence C., 5,552,289, Cl. 435-7.210.
Montagna, Angelo A.: *See*—
Merrill, . Natalie A.; Farley, James M.; Robertson, Martha H.; Sims, Charles L.; Pannell, Richard B.; and Montagna, Angelo A., 5,552,489, Cl. 525-210.000.
Montagna, Ernesto: *See*—
Turconi, Marco; Donetti, Arturo; Montagna, Ernesto; Nicola, Massimo; Uberti, Annamaria; Micheletti, Rosamaria; and Giachetti, Antonio, 5,552,408, Cl. 514-304.000.
Monte, Paul A.: *See*—
Dietrich, Frederick J.; and Monte, Paul A., 5,552,798, Cl. 343-893.000.
Montell North America Inc.: *See*—
Berta, Dominic A., 5,552,482, Cl. 525-88.000.
DeNicola, Anthony J., Jr.; Mayfield, John W.; McLaughlin, Thomas F.; and Beren, James R., 5,552,104, Cl. 264-456.000.
Morini, Giampiero; Barino, Luisa; Scordamaglia, Raimondo; Barbassa, Elisabetta; and Baruzzi, Giovanni, 5,552,359, Cl. 502-123.000.
Montgomery, James R., to Beloit Technologies, Inc. Live bottom shear deck refuse bag opener. 5,551,825, Cl. 414-412.000.
Montgomery, Mark A.: *See*—
Miller, Richard A.; Parsons, Theron E., III; and Montgomery, Mark A., 5,552,495, Cl. 525-437.000.
Montminy, Armand T.: *See*—
Schrader, Gary E.; Montminy, Armand T.; and Franzini, John, 5,552,564, Cl. 174-84.00C.
Moon, Sung S., to Hanyang Chemical Ind., Co. Palladium alloy plating compositions. 5,552,031, Cl. 205-247.000.
Mooney, Charles W.: *See*—
Hertz, Allen D.; McKee, John M.; Mooney, Charles W.; Holden, Irving H.; and Brinkley, Gerald E., 5,552,562, Cl. 84-726.000.
Moore, David N.; and Ullrich, Jeffrey F., to Phoenix Closures, Inc. Closure assembly with tabbed liner. 5,551,608, Cl. 222-542.000.
Moore, Jeffrey S.: *See*—
Martin, David C.; Moore, Jeffrey S.; Markoski, Larry J.; Walker, Kenneth A.; and Spilman, Gary E., 5,552,508, Cl. 528-68.000.
Moore, Joseph F: *See*—
Prater, James L.; and Moore, Joseph F., 5,551,564, Cl. 206-409.000.
Moore, Richard; and Kopans, Daniel B., to General Hospital Corporation, The. Apparatus and method for improved tissue imaging. 5,553,111, Cl. 378-37.000.
Moore, Scott W.: *See*—
Hejhal, Thomas J.; and Moore, Scott W., 5,551,176, Cl. 38-44.000.
Moorhouse, John H. Multi-light coded electronic security lock. 5,552,587, Cl. 235-382.000.
Mooty, Glenn J. Scalable measuring apparatus and displacement display device, system and method. 5,551,159, Cl. 33-228.000.
Mor, Yehayahu: *See*—
Willenz, Avigdor; Bourekas, Philip; and Mor, Yehayahu, 5,553,268, Cl. 395-485.000.
Moradi, Kamran Z.: *See*—
Smithberger, Joe E.; Nemcheck, Thomas E.; Moradi, Kamran Z.; and Hall, John M., 5,551,534, Cl. 188-71.500.
Moran, Thomas P.: *See*—
Saund, Eric; Moran, Thomas P.; and Becker, Craig D., 5,553,224, Cl. 395-155.000.
Morán Moset, Marina: *See*—
Brana, Miguel F.; Castellano Berlanga, José M.; Morán Moset, Marina; Schlick, Erich; and Keilhauer, Gerhard, 5,552,544, Cl. 544-126.000.
Moravcsik, Imre: *See*—
Ott, István; Klupp, Tibor; Molnár, István; Patthy, András; Barta, István; Barkó née Tóth, Zsuzsa; Ambrus, Gábor; Salát, János; Tegdes, Anikó; Moravcsik, Imre; Együd, Cecilia; Albrecht, Kárnly; Könczöl, Kálmán; Vincze, Attila; Barabás, Éva; Máté, György; Kiss, György B.; Kiss, Péter; Pólya, Kálmán; Erdei, János; Gulyás, Éva; and Zilahi, Erika, 5,552,299, Cl. 435-69.100.
Moreau, Sylviane: *See*—
Kim, Sun H.; Keyes, Susan R.; Moreau, Sylviane; Dong, Zheng X.; and Taylor, John, 5,552,520, Cl. 530-311.000.
Morgan, Alan R.; and Selman, Steven H., to University of Toledo; and Medical College of Ohio. Uses of benzochlorins, verdins and porphyrin derivatives and of compositions containing such benzochlorins, verdins and porphyrin derivatives. 5,552,134, Cl. 424-9.610.
Morgan, Brian R. Tamper indication device. 5,551,729, Cl. 283-94.000.
Morgan, Dennis R.: *See*—
De León, Phillip L., II; and Morgan, Dennis R., 5,553,014, Cl. 364-724.190.
Morgan, Jason N.; and Nabors, David H., to Motorola, Inc. Power signal combining method and apparatus. 5,552,643, Cl. 307-81.000.
Mori, Masaharu; Ueno, Hideo; Hirono, Kazuhisa; and Niwa, Akihiko, to Brother Kogyo Kabushiki Kaisha. Divisionally-printable label producing apparatus. 5,551,785, Cl. 400-76.000.
Mori, Yukio: *See*—
Maenaka, Akihiro; Mori, Yukio; Murata, Haruhiko; Okada, Hidefumi; and Ide, Hirokazu, 5,552,827, Cl. 348-266.000.
Moriarty, Michael: *See*—
Melo, Maria L.; Wolford, Jeff W.; Moriarty, Michael; Culley, Paul R.; and Schnell, Arnold T., 5,553,248, Cl. 395-296.000.
Morikawa, Takenori, to NEC Corporation. Semiconductor device having bipolar transistors with commonly interconnected collector regions. 5,552,626, Cl. 257-525.000.
Morinaka, Ren: *See*—
Enomoto, Kunio; Otaka, Masahiro; Amano, Kazuo; Kurosawa, Koichi; Hayashi, Eisaku; Morinaka, Ren; Hattori, Shigeo; and Sato, Kasunori, 5,553,106, Cl. 376-305.000.
Morini, Giampiero; Barino, Luisa; Scordamaglia, Raimondo; Barbassa, Elisabetta; and Baruzzi, Giovanni, to Montell North America Inc. Components and catalyst for the polymerization of olefins. 5,552,359, Cl. 502-123.000.
Morisako, Takeshi: *See*—
Sasaki, Yasuyuki; Bizen, Takehiko; Miyama, Hiroshi; Morisako, Takeshi; and Tsukada, Hiroko, 5,551,600, Cl. 222-81.000.
Morisita, Tosiyuki: *See*—
Itou, Hiroyasu; Morisita, Tosiyuki; and Simamoto, Takanori, 5,552,342, Cl. 437-195.000.
Morita, Hisao: *See*—
Iwamoto, Mune; Nakajima, Akihiko; Takaku, Masato; Morita, Hisao; Ando, Toshihiko; Shirafuji, Tomofumi; and Uchida, Mutsuko, 5,552,494, Cl. 525-316.000.
Morita, Koichi: *See*—
Kitamura, Takashi; Lawson, David F.; Morita, Koichi; and Ozawa, Yoichi, 5,552,499, Cl. 526-174.000.
Morita, Kouichi, to NSK Ltd. Tone wheel for rotational speed detection unit. 5,551,291, Cl. 73-494.000.
Morita, Yoshio: *See*—
Kato, Yoshiharu; Takano, Ryouzi; Nara, Takashi; Hatano, Takashi; and Morita, Yoshio, 5,553,066, Cl. 370-58.100.
Moritz, Matthias: *See*—
Friebe, Eberhard; Moritz, Matthias; and Schoenhacher, Sepp, 5,551,653, Cl. 246-167.00R.
Moriyama, Noboru; Ogura, Tsugitoshi; and Hiraki, Akio, to Kao Corporation; and Mitsubishi Jukogyo Kabushiki Kaisha. Superheavy oil emulsion fuel and method for generating deteriorated oil-in-water superheavy oil emulsion fuel. 5,551,956, Cl. 44-301.000.
Morris, Marion C.; Bomber, Robert R.; Chen, Franklin M. C.; and Wideman, Ronald H., to Kimberly-Clark Corporation. Placement of electric-field-responsive material onto a substrate. 5,552,012, Cl. 156-272.400.
Morris, Paul L. Roofing torch. 5,552,014, Cl. 156-577.000.

Morrison, James P.; and Yue, Samual K., to pHox Medical Optics, Inc. Fetal probe apparatus. 5,551,424, Cl. 128-634.000.
Morrissey, Douglas E.; Cavanagh, Edward T., Jr.; Wieder, Gene T.; Ng, Kin H.; and Oldham, William E., to Unisys Corporation. Serial I/O channel having independent and asynchronous facilities with sequence recognition, frame recognition, and frame receiving mechanism for receiving control and user defined data. 5,553,302, Cl. 395-825.000.
Morse, Harry R., Jr. Tornado protection system. 5,551,916, Cl. 454-340.000.
Morse, Ronald W.; and Johnescu, Douglas M., to Amphenol Corporation. Tool for removing a repairable electrical connector insert. 5,551,147, Cl. 29-764.000.
Morton International, Inc.: *See*—
Armstrong, Charles W., III; Rink, Linda M.; Hatt, Wesley L.; Parker, Todd S.; and Fulmer, Brian H., 5,551,724, Cl. 280-737.000.
Hock, Christopher; Snyder, Brian T.; Rink, Linda M.; and Letendre, Guy R., 5,551,343, Cl. 102-288.000.
Horinka, Paul R.; and Korecky, Martin J., 5,552,191, Cl. 427-475.000.
Morvant, John D. Pack off seal. 5,551,703, Cl. 277-188.00R.
Moser, James P.: *See*—
Whiteman, Robert N., Jr.; Walker, Robert W.; and Moser, James P., 5,551,882, Cl. 439-21.000.
Moser, Johann: *See*—
Brunnmair, Erwin; Bubik, Alfred; Hess, Harald; Holik, Herbert; Leitenberger, Werner; Merath, Thomas; Moser, Johann; Steib, Helmut; and Weisshuhn, Elmer, 5,551,164, Cl. 34-117.000.
Moses, John A. Method and apparatus for determining blood pressure. 5,551,438, Cl. 128-672.000.
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Schilling, Donald L.; Kowalski, John; and Moshavi, Shimon, 5,553,062, Cl. 370-18.000.
Mosmann, Timothy: *See*—
Lee, Frank; Yokota, Takashi; Arai, Ken-ichi; Mosmann, Timothy; and Rennick, Donna, 5,552,304, Cl. 435-69.520.
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Sachathamakul, Rakeshwar; and Duggal, Gurpinder, 5,551,583, Cl. 215-386.000.
Motley, Curtis B., to Procter & Gamble Company, The. Gel stick compositions comprising optically enriched gellants. 5,552,136, Cl. 424-68.000.
Motodate, Shoji: *See*—
Kawaguchi, Kenji; Motodate, Shoji; Toriyama, Masayuki; Honda, Satoshi; Fujii, Takaaki; and Cho, Toshiyuki, 5,552,988, Cl. 364-426.010.
Motoki, Yoshihiro: *See*—
Harada, Takashi; Suzawa, Akira; and Motoki, Yoshihiro, 5,551,691, Cl. 473-323.000.
Motorola: *See*—
Lim, Ricardo; and Dutkiewicz, Marek, 5,553,101, Cl. 375-340.000.
Pagones, Andrew, 5,552,677, Cl. 315-169.100.
Tehrani, Saied N.; Goronkin, Herbert; Shen, Jun; and Zhu, Xiaodong T., 5,552,330, Cl. 437-39.000.
Waldo, Whitson G., III; and Thompson, Matthew A., 5,552,247, Cl. 430-5.000.
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Barrett, Raymond L., Jr.; Herold, Barry W.; and Pajunen, Grazyna A., 5,552,750, Cl. 331-25.000.
Baskett, Ira E., 5,551,304, Cl. 73-769.000.
Buss, John M.; Dworkin, James D.; Lloyd, Scott E.; Pan, Shao W.; Smith, Stephen L.; and Wang, Shay-Ping T., 5,553,012, Cl. 364-722.000.
Darveaux, Robert F., 5,552,636, Cl. 257-709.000.
Grube, Gary W.; and Markison, Timothy W., 5,553,314, Cl. 455-54.200.
Hertz, Allen D.; McKee, John M.; Mooney, Charles W.; Holden, Irving H.; and Brinkley, Gerald E., 5,552,562, Cl. 84-726.000.
Jain, Danny K.; Levitan, David S.; and Rossbach, Paul C., 5,553,255, Cl. 395-375.000.
Jasper, Steven C.; Birchler, Mark A.; and Oros, Nicholas C., 5,553,102, Cl. 375-347.000.
Leicht, John L.; and Bratschun, William R., 5,551,627, Cl. 228-180.220.
Lenchik, Vitaly, 5,552,806, Cl. 345-156.000.
Li, Changming; Lian, Keryn; Bai, Lijun; and Kines, Joseph G., 5,552,245, Cl. 429-188.000.
Morgan, Jason N.; and Nabors, David H., 5,552,643, Cl. 307-81.000.
Nowatski, Thomas M.; and Zambrano, Keith I., 5,552,749, Cl. 331-14.000.
Nyhart, Scott O.; and Doan, Tan V., 5,553,137, Cl. 379-410.000.
Perkins, Geoffrey W., 5,552,742, Cl. 327-563.000.
Revilla, Juan G.; and Crouch, Alfred L., 5,553,236, Cl. 395-183.010.
Sandvos, Jerry L.; and Alton, Kenneth D., 5,553,019, Cl. 365-185.040.
Sobti, Arun; and Comroe, Richard A., 5,553,315, Cl. 455-56.100.
Tayloe, Daniel R.; and Sowles, Kenneth L., 5,552,795, Cl. 342-357.000.
Tseng, Hsing-Huang; Tobin, Philip J.; Tsui, Paul G. Y.; Sun, Shih W.; and Poon, Stephen S., 5,552,332, Cl. 437-41.000.
Weng, Kenneth C.; and Weng, Chia S., 5,553,022, Cl. 365-189.010.
Mott, Philip J.; and White, David C., to Borg-Warner Automotive, Inc. Chain assemblies with minimal pin projection. 5,551,925, Cl. 474-85.000.
Motter, Gregg A.: *See*—
Wheatly, John A.; and Motter, Gregg A., 5,552,927, Cl. 359-359.000.
Moulton, John L.; and Harrison, Peter T., to General Electric Company. System and method of detecting partial flame out in a gas turbine engine combustor. 5,551,227, Cl. 60-39.060.
Mountain International Corporation: *See*—
Minervino, Richard J., Jr.; Veranis, Charles J.; and Andrade, Anthony J., 5,553,131, Cl. 379-221.000.
Moyher, George C., Jr.: *See*—
Gray, Steven L.; Hoekstra, Peter; Martin, Michael F.; and Moyher, George C., Jr., 5,551,731, Cl. 285-7.000.
Moysan, Stephen R., III; and Sugg, Rolin W., to Baldwin Hardware Corporation. Article having a decorative and protective multilayer coating simulating brass. 5,552,233, Cl. 428-627.000.
MTU Motoren- Und Turbinen-Union Friedrichshafen GmbH: *See*—
Schmidt, Guenther, 5,551,403, Cl. 123-510.000.
Mucino, Victor E.: *See*—
Cherry, Brian W.; Smith, James E.; Mucino, Victor E.; Clark, Nigel N.; Thompson, Gregory; and Badgley, Patrick R., 5,551,853, Cl. 418-148.000.
Mueller, Brian L.: *See*—
Gamota, Daniel R.; Mueller, Brian L.; and Filisko, Frank E., 5,552,076, Cl. 252-74.000.
Mueller, Winfried; Spengler, Reinhard; Grabowski, Sven; and Sanner, Axel, to BASF Aktiengesellschaft. Solid depot drug form. 5,552,159, Cl. 424-464.000.
Muessig, Charles E.: *See*—
Bajraszewski, Alexander; Dodds, David H.; Muessig, Charles E.; and Nagpal, Vijay, 5,551,270, Cl. 72-21.300.
Muhlestein, Kerry D.: *See*—
Roberts, Thomas D.; Muhlestein, Kerry D.; and Slemons, Greg T., 5,551,974, Cl. 106-271.000.
Mulder, Marcellinus H. V.: *See*—
Koops, Geert-Hendrik; Mulder, Marcellinus H. V.; and Smolders, Cornelis A., 5,552,054, Cl. 210-640.000.
Muller, Arno: *See*—
Lee, Young W.; Moh, Sungwon; and Muller, Arno, 5,552,991, Cl. 364-464.020.
Müller, Bernhard: *See*—
Klier, Herbert; Müller, Bernhard; Ruhlmann, Edmond; and Tzikas, Athanassios, 5,552,532, Cl. 534-612.000.
Müller, Harald: *See*—
Immel, Otto; and Müller, Harald, 5,552,362, Cl. 502-308.000.
Müller, Klaus-Helmut: *See*—
Findeisen, Kurt; Linker, Karl-Heinz; Kluth, Joachim; Müller, Klaus-Helmut; Riebel, Hans-Jochem; König, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,552,369, Cl. 504-273.000.
Müller Umwelttechnik GMBH & Co. KG: *See*—
Müller, Wolfgang; and Herzog, Dirk, 5,552,038, Cl. 210-86.000.
Müller, Wolfgang; and Herzog, Dirk, to Müller Umwelttechnik GMBH & Co. KG. Apparatus for dewatering organic sewage sludge, industrial sludge and special waste sludge of varying composition by pressure. 5,552,038, Cl. 210-86.000.
Mulligan, James M.: *See*—
Bossen, Douglas C.; Chen, Chin-Long; Dill, Frederick H.; Goodman, Douglas S.; Hsiao, Mu-Yue; McCann, Paul V.; Mulligan, James M.; and Rand, Ricky A., 5,552,591, Cl. 235-462.000.
Mulrenin, Peggy S.: *See*—
Bourlier, Ken A.; and Mulrenin, Peggy S., 5,552,186, Cl. 427-385.500.
Munday, Neil A.: *See*—
Nicholson, Donald W.; Ali, Ambereen; Munday, Neil A.; and Vaillancourt, John P., 5,552,536, Cl. 536-23.100.
Mundy, Roger A.: *See*—
Lipner, Melvin H.; Pitcairn, Francine S.; and Mundy, Roger A., 5,553,304, Cl. 395-600.000.
Munro, James L.; and Schantz, David L., Jr., to Northrop Grumman Corporation. EMI filter topology for power inverters. 5,552,976, Cl. 363-39.000.
Murakami, Eisaku; Yuasa, Kazuhiro; Endoh, Shuichi; Matsumae, Iwao; Tanaka, Yoshiaki; Hosokawa, Hiroshi; Uno, Mugijiroh; Saitoh, Hiroshi; Takenaka, Eiji; Sugiyama, Toshihiro; Yamanaka, Tetsuo; and Komatsubara, Satoru, to Ricoh Company, Ltd. Developing device for an image forming apparatus. 5,552,870, Cl. 355-259.000.
Murakami, Hiroki: *See*—
Shinozaki, Kengo; Wakabayashi, Kimihiro; Murakami, Hiroki; and Araki, Masaaki, 5,551,618, Cl. 225-96.000.
Murakami, Koji: *See*—
Takemoto, Takatoshi; Chida, Tosikazu; Kano, Noriaki; Ito, Eizi; Murakami, Koji; Itagaki, Takasi; Sekimoto, Kozo; and Suzuki, Masanori, 5,551,912, Cl. 453-56.000.
Murakami, Nobuo, to NEC Corporation. Output buffer circuit having gate voltage control circuit of gate current controlling transistor connected to output transistor. 5,552,719, Cl. 326-27.000.
Murakami, Susumu; Fukuda, Takuya; Shimizu, Yoshiteru; and Sugawara, Yoshitaka, to Hitachi, Ltd. Semiconductor device having a semi-insulating layer. 5,552,625, Cl. 257-409.000.
Murakami, Tomokazu, to Koito Manufacturing Co., Ltd. Vehicular lamp device. 5,552,969, Cl. 362-61.000.
Muramatsu, Kiyoji, to Brother Kogyo Kabushiki Kaisha. Digital image processing device for automatically selecting one of a plurality of different image enlarging/reducing manners. 5,553,201, Cl. 395-109.000.
Muramatsu, Masaru; Sato, Shigemasa; Ohishi, Sueyuki; and Otani, Tadashi, to Nikon Corporation. Auto focusing apparatus in a camera. 5,552,853, Cl. 354-408.000.
Muramatsu, Takahiro: *See*—
Komada, Hideki; Muramatsu, Takahiro; and Yamamoto, Yuji, 5,551,401, Cl. 123-472.000.

Murasko, Matthew M., to International En-R-Tech Incorporated. Electroluminescent and light reflective panel. 5,552,679, Cl. 315-169.300.
Murata, Haruhiko: *See*—
Maenaka, Akihiro; Mori, Yukio; Murata, Haruhiko; Okada, Hidefumi; and Ide, Hirokazu, 5,552,827, Cl. 348-266.000.
Murata, Hiroyuki; and Yokota, Takashi, to Namco Ltd. Image synthesizing system having a field buffer unit that stores texture coordinates. 5,553,208, Cl. 395-125.000.
Murata Kikai Kabushiki Kaisha: *See*—
Kawarabashi, Tsukasa, 5,551,222, Cl. 57-105.000.
Maruki, Hiroshige; and Mekata, Tsutomu, 5,551,225, Cl. 57-328.000.
Murata, Kosei: *See*—
Ishii, Shigeru; Shinso, Yoshihide; Murata, Kosei; Shimanaka, Shigeki; Kurokawa, Shuji; Yamamoto, Hideharu; and Shiomori, Makoto, 5,551,932, Cl. 477-168.000.
Murata Manufacturing Co., Ltd.: *See*—
Kawabata, Toshio; Takeuchi, Hiroyuki; Katsurada, Hisashi, Nakamura, Kazutaka; and Ushiro, Tomoaki, 5,551,146, Cl. 29-608.000.
Miyagawa, Takao; Kashio, Akinori; Hashimoto, Ken; Yasuda, Makoto; Sakai, Hidenobu; and Kutsche, William C., 5,553,250, Cl. 395-309.000.
Taira, Hiroaki; Iha, Michiaki; and Takagi, Hiroshi, 5,551,955, Cl. 29-623.300.
Ushiro, Tomoaki, 5,552,756, Cl. 336-200.000.
Muroki, Kenichi; and Imaizumi, Shoji, to Minolta Camera Kabushiki Kaisha. Apparatus and method for forming superimposed images and copying machine equipped with apparatus. 5,552,876, Cl. 355-326.00R.
Murphy, John W.: *See*—
Kooken, Gale A.; Murphy, John W.; and Fleming, Roger D., 5,551,142, Cl. 29-564.300.
Murphy, Kevin C. Symbolic language display sign utilizing tactile and visual pattern discrimination. 5,551,877, Cl. 434-113.000.
Murphy, Michael F.: *See*—
Johnson, Dennis F.; Wiebe, Michael; Holowick, Erwin; Jacob, Nathan R.; Murphy, Michael F.; Schellenberg, James J.; and Stasenski, Michael S., 5,553,094, Cl. 375-200.000.
Murphy, Patrick J.: *See*—
Parisi, Richard H.; and Murphy, Patrick J., 5,551,936, Cl. 482-142.000.
Murphy, Terry D. Device for athletic shoe cleat care. 5,551,111, Cl. 7-138.000.
Murray, Gary P.: *See*—
Manz, Kenneth W.; Heisler, Allan F., II; Murray, Gary P.; Murray, Walter D.; and Olds, Daniel L., 5,551,247, Cl. 62-149.000.
Murray, Ronald C., to Microsoft Corporation. System and method of transferring a bit-mapped image using raster columns. 5,553,205, Cl. 395-117.000.
Murray, Walter D.: *See*—
Manz, Kenneth W.; Heisler, Allan F., II; Murray, Gary P.; Murray, Walter D.; and Olds, Daniel L., 5,551,247, Cl. 62-149.000.
Muscle Memory Sports: *See*—
Zumtobel, Daniel C., 5,551,924, Cl. 473-238.000.
Muskat, David H.: *See*—
Buchwitz, Guy R., and Muskat, David H., 5,552,993, Cl. 364-449.000.
Mussler, James M.: *See*—
Daggett, Kenneth E.; Crew, Albert W.; and Mussler, James M., 5,553,072, Cl. 370-85.300.
Musson, Craig W.: *See*—
Tredway, William K.; Musson, Craig W.; and Chen, Otis Y., 5,552,215, Cl. 428-298.000.
Mychajlowsky, Walter; Sacripante, Guerino G.; McAneney, T. Brian; and Veregin, Richard P. N., to Xerox Corporation. Amic acid based toner compositions. 5,552,254, Cl. 430-109.000.
Myers, Barbara L.: *See*—
Mantone, Deborah R.; and Myers, Barbara L., 5,551,144, Cl. 29-599.000.
Myers, Gary L.; and Haiduc, Aurelia C., to Fort Lock Corporation. Lock with dead bolt camming action on 90 degree lock cylinder rotation. 5,551,263, Cl. 70-86.000.
Myers, Michael E.: *See*—
Rack, Daniel J.; and Myers, Michael E., 5,551,492, Cl. 141-147.000.
Nabisco, Inc.: *See*—
Taylor, James B.; Richar, Thomas M.; Wilhelm, Carolyn L., Chrysam, Michael M.; Otterburn, Michael; and Leveille, Gilbert A., 5,552,167, Cl. 426-99.000.
Wheeler, Edward L., D'Amelia, Ronald P., Leveille, Gilbert A.; Otterburn, Michael S.; Klemann, Lawrence P.; Finley, John W.; Roden, Allan D.; Chrysam, Michael M.; Pelloso, Turiddu A.; and Given, Peter S., Jr., 5,552,174, Cl. 426-607.000.
Nabors, David H.: *See*—
Morgan, Jason N.; and Nabors, David H., 5,552,643, Cl. 307-81.000.
Nadeau, Robert J.: *See*—
Foley, James P.; Nadeau, Robert J., Ostendorf, Jan P.; and Whitehead, Lawrence J., 5,551,178, Cl. 40-610.000.
Nagahori, Kazuo: *See*—
Tanihira, Hisamitsu; Nagahori, Kazuo; and Nakano, Renri, 5,553,010, Cl. 364-715.080.
Nagai, Minoru: *See*—
Ohashi, Yukihiro; Fujimori, Taketoshi; Nagai, Minoru; Kawamata, Akira; Yada, Yukihiro; Higuchi, Kazuhiko; Imokawa, Genji; Takema, Yoshinori; Sakaino, Yukiko; Ogawa, Ayumi; and Fujimura, Tsutomu, 5,552,445, Cl. 514-669.000.
Nagano, Junya, to Kabushiki Kaisha Toshiba. Semiconductor device having an interconnecting circuit board and method for manufacturing same. 5,552,966, Cl. 361-813.000.
Nagao, Masaki; Takahashi, Shinya, Koiwai, Tamotsu; and Kobayashi, Yoshito, to Olympus Optical Co., Ltd. Camera. 5,552,845, Cl. 354-159.000.
Nagasamy, Vijay: *See*—
Dangelo, Carlos; Deeley, Richard; Nagasamy, Vijay; and Vafai, Manoucher, 5,553,002, Cl. 364-489.000.
Nagasawa, Masahiro: *See*—
Hasegawa, Yo; Nagasawa, Masahiro; and Tsukamoto, Masahide, 5,551,626, Cl. 228-179.100.
Nagasawa, Satoshi: *See*—
Onodaka, Koji; Hiraga, Katsuya; Kobori, Yoichi; and Nagasawa, Satoshi, 5,552,568, Cl. 178-19.000.
Nagase, Hidenobu: *See*—
Tsuge, Masakuni, and Nagase, Hidenobu, 5,551,390, Cl. 123-198.0DB.
Nagayama, Tadashi, to Nikon Corporation. Illumination optical system, alignment apparatus, and projection exposure apparatus using the same. 5,552,892, Cl. 356-401.000.
Nagayoshi, Hideaki, to Hitachi Metals, Ltd. Spheroidal graphite cast iron for crank shafts and a crank shaft manufactured from such cast iron. 5,551,995, Cl. 148-321.000.
Nagesh, V. K.: *See*—
Anderson, John T.; Nagesh, V. K.; and Ruby, Richard C., 5,552,370, Cl. 505-124.000.
Nagira, Jiro: *See*—
Yamashita, Yuji; Nagira, Jiro; Hashimoto, Yasuhiro; and Aizawa, Fumio, 5,552,860, Cl. 355-207.000.
Nagpal, Vijay: *See*—
Bajraszewski, Alexander; Dodds, David H.; Muessig, Charles E.; and Nagpal, Vijay, 5,551,270, Cl. 72-21.300.
Nagumo, Masahide: *See*—
Inagawa, Jun; Nagumo, Masahide; and Kodama, Kunihiko, 5,553,041, Cl. 369-48.000.
Nagy, Nick: *See*—
Markey, Dennis P.; Pietranton, Joe; Nagy, Nick; Garton, Rick, Swinhart, Philip; Rensberger, Ron; and Herbst, Walter, 5,551,371, Cl. 119-499.000.
Naito, Hayato, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Switch mounted on circuit board and method of mounting switch on circuit board. 5,552,964, Cl. 361-781.000.
Nakada, Akira; Shibukawa, Takeo; Hinago, Yasuhiro; and Mishima, Junichi, to Yamaha Corporation. Playing-style detecting apparatus and electronic musical instrument utilizing the same. 5,552,561, Cl. 84-658.000.
Nakagawa, Tomohito; Hiroi, Masakazu; Matsuo, Kazuhiro; Orii, Hideki; Kato, Satoru; Dobashi, Akihito; and Noda, Mamoru, to Canon Kabushiki Kaisha. Sheet supplying apparatus with means for rocking sheet stacking plate. 5,552,859, Cl. 355-207.000.
Nakahigashi, Hideto: *See*—
Henmi, Hidemi; Takano, Shigeru; Nakahigashi, Hideto; and Sakamoto, Ken, 5,552,833, Cl. 348-460.000.
Nakai, Hiroshi: *See*—
Yoshida, Sadato; Nakai, Hiroshi; Hoshiba, Akihiko; and Shibata, Yasuhiko, 5,551,385, Cl. 123-184.210.
Nakai, Hiroto; Miyakawa, Tadashi; and Matsuda, Shigeru, to Kabushiki Kaisha Toshiba. Non-volatile semiconductor memory device. 5,553,026, Cl. 365-201.000.
Nakajima, Akihiko: *See*—
Iwamoto, Mune; Nakajima, Akihiko; Takaku, Masato; Morita, Hisao; Ando, Toshihiko; Shirafuji, Tomofumi; and Uchida, Mutsuko, 5,552,494, Cl. 525-316.000.
Nakajima, Kunio: *See*—
Seza, Katsushi; Tasaki, Hirohisa; and Nakajima, Kunio, 5,553,194, Cl. 395-2.300.
Nakajima, Nobuyuki: *See*—
Saito, Susumu; Takagi, Nobukazu; Harada, Kiyohiro; Kazahaya, Yukio; Kuchiki, Seiji; Ishikawa, Masakuni; and Nakajima, Nobuyuki, 5,551,852, Cl. 418-98.000.
Nakajima, Yasuo: *See*—
Ono, Shusuke; Okayama, Hiroaki; and Nakajima, Yasuo, 5,552,937, Cl. 359-691.000.
Nakamura, Kazutaka: *See*—
Kawabata, Toshio; Takeuchi, Hiroyuki; Katsurada, Hisashi; Nakamura, Kazutaka; and Ushiro, Tomoaki, 5,551,146, Cl. 29-608.000.
Nakamura, Masanori: *See*—
Kobayashi, Tomoyuki; Miyazaki, Kenji; and Nakamura, Masanori, 5,552,448, Cl. 521-154.000.
Nakamura, Masayoshi, to Sumitomo Wiring Systems, Ltd. Locking construction of electrical connection box. 5,551,589, Cl. 220-326.000.
Nakamura, Shinichi: *See*—
Fukaya, Takashi; Hamada, Masami; Nakamura, Shinichi; Hanzawa, Toyoharu; Kinukawa, Masahiko; Ishikawa, Tomonori; Fujiwara, Hiroshi; and Tokunaga, Shigeo, 5,552,929, Cl. 359-380.000.
Nakamura, Yusuke; and Emi, Mitsuru, to Cancer Institute; and Eisai Co., Ltd. MDC proteins and DNAS encoding the same. 5,552,526, Cl. 530-350.000.
Nakane, Keiichi: *See*—
Kikuchi, Satoshi; Nakane, Keiichi; Itoh, Hiromichi; and Kawamura, Hiroshi, 5,552,901, Cl. 358-468.000.

Nakanishi, Kazuhiro; Isozaki, Shin; Kikugawa, Shozo; and Yamagishi, Hiroaki, to Konica Corporation. Supporting apparatus for a magnetic head. 5,552,947, Cl. 360-104.000.
Nakano, Jiro: *See*—
Seki, Akinori; Ohnishi, Toyokazu; and Nakano, Jiro, 5,553,089, Cl. 372-43.000.
Nakano, Renri: *See*—
Tanihira, Hisamitsu; Nagahori, Kazuo; and Nakano, Renri, 5,553,010, Cl. 364-715.080.
Nakao, Takashi, to Sony Corporation. Reproduction of digital audio data optically recorded in a motion picture film. 5,553,049, Cl. 369-100.000.
Nakao, Yuichi, to Mitsubishi Denki Kabushiki Kaisha. Digital phase locked loop circuit. 5,552,727, Cl. 327-159.000.
Nakata, Kazushi: *See*—
Yamamoto, Shigeru; Matsushita, Shigenori; Nakata, Kazushi; and Kamikawa, Nobuhisa, 5,551,524, Cl. 180-6.620.
Nakayama, Mikio, to Fujitsu Limited. AIS transmission method in ATM communication system, transmission side ATM unit and ATM communication system. 5,553,057, Cl. 370-13.000.
Nakayama, Toshimasa: *See*—
Kato, Tetsuya; Takahashi, Kouichi; Kohara, Hidekatsu; and Nakayama, Toshimasa, 5,552,255, Cl. 430-165.000.
Nalco Chemical Company: *See*—
Babaian-Kibala, Elizabeth, 5,552,085, Cl. 252-389.230.
Braden, Michael L., 5,552,498, Cl. 526-73.000.
Nallakrishnan, Ravi. Apparatus and method for setting depth of cut of micrometer surgical knife. 5,552,822, Cl. 348-79.000.
Namatame, Hirofumi; and Taniguchi, Masaki, to Hiroshima University. Narrow band high sensitivity photodetector for inverse photoemission spectroscopy. 5,552,595, Cl. 250-207.000.
Namco Ltd.: *See*—
Murata, Hiroyuki; and Yokota, Takashi, 5,553,208, Cl. 395-125.000.
Namiki, Shu, to Furukawa Electric Co., Ltd., The. Laser module using asymmetrical lens. 5,553,178, Cl. 385-33.000.
Nankoh, Yuichi; and Kawase, Hajime, to Sumitomo Wiring Systems, Ltd. Connector. 5,551,887, Cl. 439-188.000.
Nanna, Frank P.; and Jereb, John, to Tricor Systems, Inc. Gloss measurement system. 5,552,890, Cl. 356-369.000.
Nanno, Nobuyuki; Akashi, Kazuo; Ando, Makoto; Takeguchi, Kouichirou; Yamanaka, Yuji; Saito, Toshimitsu; Oka, Mayumi; Ootake, Atsuhiro; Mason, James; and Suzuki, Yoshiaki, to Kabushiki Kaisha Toshiba. Portable computer powered by rechargeable batteries. 5,553,294, Cl. 395-750.000.
NanoSystems L.L.C.: *See*—
Liversidge, Gary G.; Conzentino, Philip, Jr.; Cundy, Kenneth C.; and Sarpotdar, Pramod P., 5,552,160, Cl. 424-489.000.
Nanya Plastics Corporation: *See*—
Lin, Allen F., 5,552,011, Cl. 156-244.170.
Nara, Takashi: *See*—
Kato, Yoshiharu; Takano, Ryouzi; Nara, Takashi; Hatano, Takashi; and Morita, Yoshio, 5,553,066, Cl. 370-58.100.
Narayanaswami, Chandrasekhar, to International Business Machines Corporation. System and method for immediate per window graphics clipping. 5,553,210, Cl. 395-134.000.
Narron, Jessie R., to Bridgestone/Firestone, Inc. Tread strip centering guide for tire building machines. 5,551,619, Cl. 226-17.000.
Nash, Peter: *See*—
Christensen, Dale A.; and Nash, Peter, 5,552,288, Cl. 435-7.900.
Nashner, Lewis M., to NeuroCom International, Inc. Apparatus and method for movement coordination analysis. 5,551,445, Cl. 128-782.000.
Nathans, Robert L.: *See*—
Kuhns, Roger J.; and Nathans, Robert L., 5,553,155, Cl. 382-115.000.
National Molding Corp.: *See*—
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National Semiconductor Corporation: *See*—
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Nelson, Daryl J.; and Noble, Scott L., to Intel Corporation. Collapsible cooling apparatus for portable computer. 5,552,960, Cl. 361-687.000.
Nelson, Erik B.; Brown, J. Ernest; and Card, Roger J., to Dowell, a division of Schlumberger Technology Corp. Sand control without requiring a gravel pack screen. 5,551,514, Cl. 166-280.000.
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Nelson, Martindale, to W. R. Grace & Co.-Conn. Food-containing sustained shrink force cook-in film. 5,552,170, Cl. 426-113.000.
Nelson, Marvin D., to Hewlett-Packard Company. Powerfail durable NVRAM testing. 5,553,238, Cl. 395-185.070.
Nelson, Paul K.; and Hammer, Jerry K., Jr., to Specialty Mfg. Co., The. Pressure relief valve. 5,551,475, Cl. 137-509.000.
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Nelson, William G.; Isaacs, William B.; and Lee, Wen-Hsiang, to Johns Hopkins University School of Medicine, The. Genetic diagnosis of prostate cancer. 5,552,277, Cl. 435-6.000.
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Neyman, Joseph H. Removing lint from flatwork ironer temperature sensors. 5,551,175, Cl. 38-44.000.
Ng, Bok S., to Otis Elevator Company. Audio direction and information for elevator passengers. 5,551,533, Cl. 187-391.000.
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Nishizawa, Jun-ichi; and Ohmi, Tadahiro, to Handotai Kenkyu Shinkokai. Short channel mosfet with buried anti-punch through region. 5,552,623, Cl. 257-345.000.
Niss, Jan-Anders. Dispensing device for flawing substances having a pressure controlled pump arrangement. 5,551,599, Cl. 222-63.000.
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Noordam, Bertus; Stark, Jacobus; De Haan, Ben R.; and Tan, Hong Sheng, to Gist-brocades B.V. Stable natamycin suspensions. 5,552,151, Cl. 424-439.000.
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Metal, Israel, 5,552,791, Cl. 342-174.000.
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Nose, Tamotsu, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Electric motor with increased T/N characteristic value. 5,552,653, Cl. 310-263.000.
Noshiro, Teruhito: *See*—
Hirano, Yoshiaki; Noshiro, Teruhito; and Shimizu, Takamoto, 5,552,943, Cl. 360-69.000.
Noureldin, Abdel H.; Carter, Richard W.; and Noureldin, Ahmed M. Device for securement of an endotracheal tube in a patient's mouth. 5,551,421, Cl. 128-207.170.
Noureldin, Ahmed M.: *See*—
Noureldin, Abdel H.; Carter, Richard W.; and Noureldin, Ahmed M., 5,551,421, Cl. 128-207.170.
Novacor Chemicals (International) S.A.: *See*—
Cantrill, James E.; and Doyle, Thomas R., 5,551,859, Cl. 425-317.000.
Novak, David J.: *See*—
Dougherty, Thomas J.; Smith, Debra L.; Roche, Ann L.; Thuerk, David A.; and Novak, David J., 5,552,642, Cl. 307-10.300.
Novak, Paul: *See*—
Toronto, Salvatore; and Novak, Paul, 5,551,718, Cl. 280-252.000.
Novell, Inc.: *See*—
Ross, Cliff D.; and Taylor, Neil W., 5,553,139, Cl. 380-4.000.
Ross, Cliff D.; Taylor, Neil W.; Kingdon, Kevin W.; Davis, Howard R.; and Major, Drew, 5,553,143, Cl. 380-25.000.
Novo Nordisk A/S: *See*—
Christensen, Thorkild; Balschmidt, Per; Sørensen, Hans; Olsen, Ole; and Thim, Lars, 5,552,385, Cl. 514-18.000.
Novotny, Rudolph J. Internal combustion engine utilizing pistons. 5,551,383, Cl. 123-51.0BD.
Nowak, Michael T.: *See*—
Lewis, Thomas E.; Williams, Richard A.; Pensavecchia, Frank G.; Kline, John F.; Gardiner, John P.; Nowak, Michael T.; and Robichaud, Kenneth T., 5,551,341, Cl. 101-453.000.
Nowatski, Thomas M.; and Zambrano, Keith I., to Motorola, Inc. Method for automatically compensating for accuracy degradation of a reference oscillator. 5,552,749, Cl. 331-14.000.
Nowygrod, Roman: *See*—
Stern, David M.; Oz, Mehmet C.; Nowygrod, Roman; Koga, Shin; and Pinsky, David J., 5,552,267, Cl. 435-1.100.
Nozue, Hiroshi, to NEC Corporation. Method of manufacturing reticle. 5,552,250, Cl. 430-5.000.
NSK Ltd: *See*—
Morita, Kouichi, 5,551,291, Cl. 73-494.000.
NSM Aktiengesellschaft: *See*—
Kühl, Thomas, 5,552,839, Cl. 348-744.000.
NTT Mobile Communications Network, Inc.: *See*—
Ohya, Tomoyuki; Uebayashi, Shinji; and Miki, Toshio, 5,553,190, Cl. 395-2.100.
Nuccio, Michael: *See*—
Thomas, Terry L.; Reddy, Avutu S.; Nuccio, Michael; and Freyssinet, Georges L., 5,552,306, Cl. 435-134.000.
Null, Robert L. Trailer brake system with release apparatus. 5,551,538, Cl. 188-112.00R.
Numoto, Hironao; and Terashima, Tetuo, to Matsushita Electric Industrial Co., Ltd. Catalyst device and combustion apparatus provided therewith. 5,552,123, Cl. 422-180.000.
Nunes, Antonio C. D., to International Business Machines Corporation. Apparatus for monitoring sensor information from diffeerent types of sources. 5,553,269, Cl. 395-500.000.
Nyhart, Scott O.; and Doan, Tan V., to Motorola, Inc. Method and apparatus for echo canceling in a communication system. 5,553,137, Cl. 379-410.000.
Nynäs, Håkan: *See*—
Liljenfeldt, Gösta; Jay, Dave; and Nynäs, Håkan, 5,551,402, Cl. 123-500.000.
O. R. Solutions, Inc.: *See*—
Faries, Durward I., Jr.; and Licata, Mark, 5,551,240, Cl. 62-3.600.
Oaland, Knut S.: *See*—
Aarre, Arne; and Oaland, Knut S., 5,551,794, Cl. 403-374.000.
Oba, Hiroyuki: *See*—
Tanaka, Hideaki; Oba, Hiroyuki; and Hirose, Kazuhiko, 5,552,479, Cl. 525-57.000.
Obata, Atsuomi: *See*—
Suzuki, Takayuki; and Obata, Atsuomi, 5,552,681, Cl. 318-139.000.
Obata, Hideo, to Sony Corporation. Disk recording method and apparatus for indentifying and skipping defective clusters. 5,553,045, Cl. 369-58.000.
Obata, Kenzo; and Goto, Katsunori, to Nippondenso Co., Ltd. Optical information reading apparatus having means for judging laser deterioration. 5,552,590, Cl. 235-455.000.
Obata, Kenzo; Uchikawa, Yoshiki; Furuhashi, Takeshi; and Watanabe, Shigeru, to Nippondenso Co., Ltd. Signature recognition apparatus which can be trained with a reduced amount of sample data. 5,553,156, Cl. 382-119.000.

Obata, Takashi: *See*—
Hayashi, Katsumi; Saitou, Kazuhiko; Ohsato, Hiroshi; Mitani, Masaaki; Hayashi, Tomohiro; Obata, Takashi; Sekine, Yutaka; Ura, Mitsuhiro; Ohira, Sakari: *See*—
Niki, Atsuyoshi; Minowa, Tsyneyuki; Maeda, Ichiro; and Ohira, Sakari, 5,553,079, Cl. 370-110.400.

Okamoto, Toshifumi: *See*—
Suzuki, Hiroyuki; Yokoyama, Yoichi; and Okamoto, Toshifumi,
Blecha, Vladimir; McGuire, Katherine M.; Neuhalfen, Andrew J.; and Onken, Daniel B., 5,552,757, Cl. 337-297.000.

Obata, Takashi: *See*—
Hayashi, Katsumi; Saitou, Kazuhiko; Ohsato, Hiroshi; Mitani, Masaaki, Hayashi, Tomohiro; Obata, Takashi; Sekine, Yutaka; Ura, Mitsuhiro; and Ishii, Takuji, 5,553,303, Cl. 395-600.000.

Obermanns, Sebastian; and Schoonhoven, Richard, to Siemens Aktiengesellschaft. Method for maintaining virtual connections given an at least partial outage of connecting paths. 5,553,060, Cl. 370-16.000.

O'Branovic, Nickolas: *See*—
Zielinski, Thomas E.; Eisenmann, Gregg A.; Kennedy, Robert D.; O'Branovic, Nickolas; and Sian, Sucha S., 5,551,150, Cl. 29-882.000.

OBrian, Gregory R.: *See*—
Boston, Rebecca S.; Bass, Henry W.; and OBrian, Gregory R., 5,552,140, Cl. 424-94.610.

O'Callaghan, Michael J.; and Handschy, Mark A., to Displaytech, Inc. Diffractive light modulator. 5,552,916, Cl. 359-95.000.

Oce-Nederland, B.V.: *See*—
Deckers, Rudolf J. H. R., 5,551,939, Cl. 493-442.000.

Ocean Power Technologies, Inc.: *See*—
Epstein, Michael Y.; and Taylor, George W., 5,552,657, Cl. 310-339.000.
Taylor, George W., 5,552,656, Cl. 310-337.000.

Ochozki, Horst. Process for running a marine diesel engine. 5,551,234, Cl. 60-599.000.

Ochs, Gregory L.; and Aikins, James E., to York Food Systems. Impingement freezer. 5,551,251, Cl. 62-380.000.

O'Connor, Loretta J.; Previti-Kelly, Rosemary A.; and Reen, Thomas J., to International Business Machines Corporation. Metallized vias in polyimide. 5,552,638, Cl. 257-759.000.

Oda, Kazuyuki; Fujimura, Yoshihiko; and Isozaki, Jun, to Fuji Xerox Co., Ltd. Ink tank, ink-jet cartridge and ink-jet recording apparatus. 5,552,816, Cl. 347-86.000.

Odaka, Masaki; Arai, Eiichi; Okagami, Yoshihide; and Yuba, Akira, to J Morita Manufacturing Corporation. Medical x-ray apparatus, irradiation tube, medical position indicating apparatus, and light source control circuit for use in combination with the foregoing apparatuses. 5,553,115, Cl. 378-206.000.

O'Dea, John: *See*—
Merrick, Edwin B.; Gee, Glen N.; O'Mahony, John; and O'Dea, John, 5,551,417, Cl. 128-203.250.

Odell, Peter G., and Hamer, Gordon K., to Xerox Corporation. Polymerization process and compositions thereof. 5,552,502, Cl. 526-234.000.

Odenthal, Heinz F., to Ostma Maschinenbau GmbH. Method of packaging articles. 5,551,212, Cl. 53-397.000.

Odom, Xiaoshan Z.: *See*—
Erb, David J.; and Odom, Xiaoshan Z., 5,553,228, Cl. 395-162.000.

O'Donnell, Norman J. Portable pet booster seat apparatus. 5,551,373, Cl. 119-28.500.

Ogata, Hiroki: *See*—
Goto, Teiyu; and Ogata, Hiroki, 5,551,693, Cl. 463-37.000.

Ogawa, Ayumi: *See*—
Ohashi, Yukihiro; Fujimori, Taketoshi; Nagai, Minoru; Kawamata, Akira; Yada, Yukihiro; Higuchi, Kazuhiko; Imokawa, Genji; Takema, Yoshinori; Sakaino, Yukiko; Ogawa, Ayumi; and Fujimura, Tsutomu, 5,552,445, Cl. 514-669.000.

Ogawa, Kazufumi: *See*—
Ohtake, Tadashi; Mino, Norihisa; and Ogawa, Kazufumi, 5,552,236, Cl. 428-692.000.

Ogawa, Kenichi: *See*—
Abe, Atsuyoshi; Ohtsuka, Yasumasa; Tomoyuki, Yohji; Takano, Manabu; Fukuzawa, Daizo; and Ogawa, Kenichi, 5,552,582, Cl. 219-619.000.

Ogawa, Masaki: *See*—
Yoshizawa, Yukio; Sato, Sumio; Ogawa, Masaki; and Ohno, Masakazu, 5,551,858, Cl. 425-217.000.

Ogawara, Hiroshi: *See*—
Yokota, Tomohiro; Nishitani, Fumio; Ogawara, Hiroshi; Kubo, Akihito; and Fujigami, Makoto, 5,552,907, Cl. 359-49.000.

Ogden, Andrew M.; Burkat, Alexander; Snoddy, Jon H.; and Fritz, Edward, to Walt Disney Company, The. Motion base. 5,551,920, Cl. 472-59.000.

Ogden, Michael W.; and Heavner, David L., to R. J. Reynolds Tobacco Company. Air sampling system and flow calibration system for same. 5,551,311, Cl. 73-863.310.

Oguiza, Juan I.: *See*—
Wong, David T.; and Oguiza, Juan I., 5,552,429, Cl. 514-415.000.

Ogura, Tsugitoshi: *See*—
Moriyama, Noboru; Ogura, Tsugitoshi; and Hiraki, Akio, 5,551,956, Cl. 44-301.000.

Oh, Yoon S.: *See*—
Kwon, Soon H.; Oh, Yoon S.; Lee, Heo Y.; and Yoon, Jeong N., 5,553,251, Cl. 395-310.000.

Ohashi, Yukihiro; Fujimori, Taketoshi; Nagai, Minoru; Kawamata, Akira; Yada, Yukihiro; Higuchi, Kazuhiko; Imokawa, Genji; Takema, Yoshinori, Sakaino, Yukiko; Ogawa, Ayumi; and Fujimura, Tsutomu, to Kao Corporation. Composition for external skin care. 5,552,445, Cl. 514-669.000.

Ohguchi, Junichi: *See*—
Tabayama, Masashi; Tabuchi, Yasuo; and Ohguchi, Junichi, 5,551,546, Cl. 192-84.960.

Ohi Seisakusho Co., Ltd.: *See*—
Yamagishi, Jun; Kaminaga, Atsushi; and Goutani, Yousuke, 5,551,190, Cl. 49-360.000.

Ohio State University: *See*—
Burke, Thomas G., 5,552,156, Cl. 424-450.000.

Ohira, Sakari: *See*—
Niki, Atsuyoshi; Minowa, Tsyneyuki; Maeda, Ichiro; and Ohira, Sakari, 5,553,079, Cl. 370-110.400.

Ohishi, Nobuko: *See*—
Yagi, Kunio; Noda, Hitoshi; Ohishi, Nobuko; and Kurono, Masayasu, 5,552,157, Cl. 424-450.000.

Ohishi, Sueyuki: *See*—
Muramatsu, Masaru; Sato, Shigemasa; Ohishi, Sueyuki; and Otani, Tadashi, 5,552,853, Cl. 354-408.000.

Ohkawa, Shigenori; and Miki, Shokyo, to Takeda Chemical Industries, Ltd. Crystalline salts of optically active aminocoumaran derivatives, their production and use. 5,552,552, Cl. 546-196.000.

Ohmagari, Shinichi; and Yamamoto, Osamu, to NEC Corporation. Transmitter having envelope feedback loop and automatic level control loop. 5,553,318, Cl. 455-126.000.

Ohmi, Tadahiro: *See*—
Nishizawa, Jun-ichi; and Ohmi, Tadahiro, 5,552,623, Cl. 257-345.000.

Ohmichi, Yoshiki; Ishiguro, Kuniaki; and Yasuda, Kenichi, to Minolta Co., Ltd. Sheet sorting apparatus with rotating cam member. 5,551,680, Cl. 270-58.080.

Ohmori, Masashi; Tanaka, Hiroshi; Nishimoto, Akira; Sasai, Hiroshi; Fujino, Naohiko; and Kotoh, Satoru, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor cleaning apparatus and wafer cassette. 5,551,459, Cl. 134-61.000.

Ohnaka, Hidemi: *See*—
Tanaka, Hiroshi; Itou, Takaaki; Takeda, Keiso; Ohnaka, Hidemi; Kunitake, Kazuhisa; and Tanahashi, Toshio, 5,551,231, Cl. 60-289.000.

Ohnishi, Toyokazu: *See*—
Seki, Akinori; Ohnishi, Toyokazu; and Nakano, Jiro, 5,553,089, Cl. 372-43.000.

Ohno, Kazunori, to Fuji Photo Optical Co., Ltd. Two-unit zoom lens. 5,552,936, Cl. 359-691.000.

Ohno, Masakazu: *See*—
Yoshizawa, Yukio; Sato, Sumio; Ogawa, Masaki; and Ohno, Masakazu, 5,551,858, Cl. 425-217.000.

Ohsato, Hiroshi: *See*—
Hayashi, Katsumi; Saitou, Kazuhiko; Ohsato, Hiroshi; Mitani, Masaaki; Hayashi, Tomohiro; Obata, Takashi; Sekine, Yutaka; Ura, Mitsuhiro; and Ishii, Takuji, 5,553,303, Cl. 395-600.000.

Ohshima, Shinji: *See*—
Hirao, Naoto; and Ohshima, Shinji, 5,552,873, Cl. 355-274.000.

Ohta, Tomohiro: *See*—
Kondoh, Eiichi; Mitomo, Toru; Yamamoto, Hiroshi; and Ohta, Tomohiro, 5,552,181, Cl. 427-248.100.

Ohtake, Tadashi; Mino, Norihisa; and Ogawa, Kazufumi, to Matsushita Electric Industrial Co., Ltd. Organic magnetic film and method of manufacturing the same. 5,552,236, Cl. 428-692.000.

Ohtsuka, Yasumasa; Tomoyuki, Yohji; Hayakawa, Akira; Takano, Manabu; Fukuzawa, Daizo; and Abe, Atsuyoshi, to Canon Kabushiki Kaisha. Image fixing apparatus. 5,552,874, Cl. 355-285.000.

Ohtsuka, Yasumasa: *See*—
Abe, Atsuyoshi; Ohtsuka, Yasumasa; Tomoyuki, Yohji; Takano, Manabu; Fukuzawa, Daizo; and Ogawa, Kenichi, 5,552,582, Cl. 219-619.000.

Ohya, Tomoki: *See*—
Matsuo, Yasuhiro; Ohya, Tomoki; and Hashimoto, Yoshiki, 5,552,687, Cl. 318-563.000.

Ohya, Tomoyuki; Uebayashi, Shinji; and Miki, Toshio, to NTT Mobile Communications Network, Inc. Speech signal transmission method providing for control. 5,553,190, Cl. 395-2.100.

Ohyama, Katsuya: *See*—
Fujii, Toshiro; Kato, Yuichi; Iwama, Kazuaki; and Ohyama, Katsuya, 5,551,844, Cl. 417-269.000.

OilGuard Company LLC, The: *See*—
Meddock, Mark T.; Meddock, Leroy J.; and Johnson, Charles W., 5,552,065, Cl. 210-808.000.

Ojala, Russell, to Croll-Reynolds Company, Inc. Centrifugal liquid separator and defoamer. 5,551,246, Cl. 62-100.000.

Oka, Mayumi: *See*—
Nanno, Nobuyuki; Akashi, Kazuo; Ando, Makoto; Takeguchi, K ouichirou; Yamanaka, Yuji; Saito, Toshimitsu; Oka, Mayumi; Ootake, Atsuhiro; Mason, James; and Suzuki, Yoshiaki, 5,553,294, Cl. 395-750.000.

Okabe, Masatomi: *See*—
Taniguchi, Hideki; Tomioka, Ichiro; Sanada, Kunihiko; and Okabe, Masatomi, 5,552,618, Cl. 257-207.000.

Okada, Hidefumi: *See*—
Maenaka, Akihiro; Mori, Yukio; Murata, Haruhiko; Okada, Hidefumi; and Ide, Hirokazu, 5,552,827, Cl. 348-266.000.

Okada, Shinichi: *See*—
Mizukami, Hiroshi; Uehara, Hiroshi; and Okada, Shinichi, 5,551,547, Cl. 192-89.230.

Okada, Shinjiro; Inaba, Yutaka; Kojima, Makoto; and Katakura, Kazunori, to Canon Kabushiki Kaisha. Color liquid crystal display device having varying cell thickness and varying pixel areas. 5,552,911, Cl. 359-68.000.

Okagami, Yoshihide: *See*—
Odaka, Masaki; Arai, Eiichi; Okagami, Yoshihide; and Yuba, Akira, 5,553,115, Cl. 378-206.000.

Okamoto, Setsuo: *See*—
Akashi, Yoshihiro; Takiuchi, Kaoru; and Okamoto, Setsuo, 5,551,978, Cl. 117-222.000.

Okamoto, Toshifumi: *See*—
Suzuki, Hiroyuki; Yokoyama, Yoichi; and Okamoto, Toshifumi, 5,553,278, Cl. 395-600.000.

Okano, Kiyoshi, to Sharp Kabushiki Kaisha. Liquid crystal display having zinc sulfide switching elements and method for producing the same. 5,552,910, Cl. 359-60.000.

Okawa, Akira; and Sugaya, Yuji, to Kawakami Giken Co Ltd. Cosmetic material container. 5,551,789, Cl. 401-199.000.

Okayama, Hiroaki: *See*—
Ono, Shusuke; Okayama, Hiroaki; and Nakajima, Yasuo, 5,552,937, Cl. 359-691.000.

OKI Electric Industry Co., Ltd.: *See*—
Takano, Osamu; and Matsumi, Koji, 5,552,347, Cl. 437-228.000.

Okita, Tomiharu; Sugimori, Mikihiro; Ozaki, Masanori; and Orimo, Takao, to Furukawa Electric Co., Ltd., The. Resistance welding process for aluminum and aluminum alloy materials. 5,552,573, Cl. 219-118.000.

Okumiya, Masataro: *See*—
Ichii, Tomoko; Suzuki, Keiichiro; and Okumiya, Masataro, 5,552,349, Cl. 501-9.000.

Okumura, Katsuya: *See*—
Watanabe, Tohru; and Okumura, Katsuya, 5,552,628, Cl. 257-632.000.

Okumura, Takashi: *See*—
Miki, Takashi; and Okumura, Takashi, 5,551,337, Cl. 101-128.400.

Oldfield, Barry J.: *See*—
Petersen, Mark D.; and Oldfield, Barry J., 5,553,230, Cl. 395-180.000.

Oldham, William E.: *See*—
Morrissey, Douglas E.; Cavanagh, Edward T., Jr.; Wieder, Gene T.; Ng, Kin H.; and Oldham, William E., 5,553,302, Cl. 395-825.000.

Olds, Daniel L.: *See*—
Manz, Kenneth W.; Heisler, Allan F., II; Murray, Gary P.; Murray, Walter D.; and Olds, Daniel L., 5,551,247, Cl. 62-149.000.

Olin Corporation: *See*—
Goossens, Dirk; and Boeglin, Herman J., 5,551,309, Cl. 73-863.000.

Oliver, John F.; Martin, Trevor I.; Jennings, Carol A.; Johnson, Eric G.; and Breton, Marcel P., to Xerox Corporation. Photochromic microemulsion ink compositions. 5,551,973, Cl. 106-22.00B.

Olsen, Ole: *See*—
Christensen, Thorkild; Balschmidt, Per; Sørensen, Hans; Olsen, Ole; and Thim, Lars, 5,552,385, Cl. 514-18.000.

Olson, Christopher H.: *See*—
Elliott, Timothy A.; Olson, Christopher H.; and Palermo, Frank J., 5,553,015, Cl. 364-748.000.

Olson, David H.: *See*—
Lago, Rudolph M.; Marler, David O.; McCullen, Sharon B.; and Olson, David H., 5,552,357, Cl. 502-63.000.

Olson, James: *See*—
Vandenberg, Donald E.; Dey, Thomas W.; and Olson, James, 5,552,594, Cl. 250-201.700.

Olson-Williams, Helen M.: *See*—
Calvert, Nathaniel; Effle, James S.; Johnston, David L.; Naylor, James L.; Olson-Williams, Helen M.; Satin, Robert H.; Shaffer, Dennis L.; and Turk, Gary A., 5,553,290, Cl. 395-700.000.

Olympus Optical Co., Ltd.: *See*—
Fukaya, Takashi; Hamada, Masami; Nakamura, Shinichi; Hanzawa, Toyoharu; Kinukawa, Masahiko; Ishikawa, Tomonori; Fujiwara, Hiroshi; and Tokunaga, Shigeo, 5,552,929, Cl. 359-380.000.
Nagao, Masaki; Takahashi, Shinya; Koiwai, Tamotsu; and Kobayashi, Yoshito, 5,552,845, Cl. 354-159.000.
Tokui, Masaki, 5,552,846, Cl. 354-173.100.
Yabe, Hisao; Iida, Yoshihiro; Suzuki, Akira; Ito, Hideo; Tashiro, Yoshio; Yamazaki, Minoru; and Tamada, Osamu, 5,551,945, Cl. 600-122.000.

Olympuus Optical Co., Ltd: *See*—
Kawamura, Kazuteru, 5,552,931, Cl. 359-431.000.

O'Mahony, John: *See*—
Merrick, Edwin B.; Gee, Glen N.; O'Mahony, John; and O'Dea, John, 5,551,417, Cl. 128-203.250.

Omniglow Corporation: *See*—
Ladyjensky, Jacques, 5,552,968, Cl. 362-34.000.

OMRON Corporation: *See*—
Miyawaki, Yoshinori, 5,551,440, Cl. 128-681.000.
Shinohara, Kenji; and Kishi, Shigenobu, 5,552,570, Cl. 200-47.000.

Omura, Hideo; and Kobayashi, Masaaki, to Nissan Motor Co., Ltd. Passenger restraint belt system. 5,552,986, Cl. 364-424.050.

Ona, Isao: *See*—
Mikami, Ryuzo; and Ona, Isao, 5,552,223, Cl. 428-391.000.

Onan Corporation: *See*—
Sharaf, Nadir, 5,552,754, Cl. 335-16.000.

One Inc.: *See*—
Pineau, Joseph E. M., 5,553,147, Cl. 381-24.000.

O'Neill, David G.: *See*—
Martin, Lawrence L.; O'Neill, David G.; and David, Moses M., 5,551,959, Cl. 51-295.000.

Onisawa, Kenichi; Suzuki, Takashi; Ando, Masahiko; Ota, Masuyuki; Kaneko, Tbshiki; and Minemura, Tetsuro, to Hitachi, Ltd. Active matrix liquid-crystal display device having ITO signal lines and either a symmetric TFT structure or electrode and signal line edges with taper angles ≦ 30°. 5,552,909, Cl. 359-59.000.

Onishi, Norimasa: *See*—
Toride, Yasuhiko; Onishi, Norimasa; and Togashi, Yoichiro, 5,552,145, Cl. 424-245.100.

Onken, Daniel B.: *See*—
Blecha, Vladimir; McGuire, Katherine M.; Neuhalfen, Andrew J.; and Onken, Daniel B., 5,552,757, Cl. 337-297.000.

Onkor, Ltd.: *See*—
Cannon, Thomas G.; and DeHart, Daniel L., 5,552,994, Cl. 364-468.010.

Ono, Sbusuke; Okayama, Hiroaki; and Nakajima, Yasuo, to Matsushita Electric Industrial Co., Ltd. Wide-angel aspheric zoom lens. 5,552,937, Cl. 359-691.000.

Ono, Takeo: *See*—
Majima, Masao; and Ono, Takeo, 5,552,919, Cl. 359-161.000.

Onoda, Motonobu: *See*—
Shimizu, Kazuo; Onoda, Motonobu; Tsuchiya, Takeji; and Watanabe, Tohru, 5,552,030, Cl. 205-105.000.

Onodaka, Koji; Hiraga, Katsuya; Kobori, Yoichi; and Nagasawa, Satoshi, to Futaba Denshi Kogyo K.K. Display-integrated tablet device providing coordinate detection. 5,552,568, Cl. 178-19.000.

Ooi, Yasushi: *See*—
Ishida, Hideo; and Ooi, Yasushi, 5,553,257, Cl. 395-401.000.

Oomori, Shigenori, to YKK Corporation. Parts feeding apparatus for selectively feeding parts of different types. 5,551,596, Cl. 221-113.000.

Oono, Masahiro; Konno, Hisashi; Kase, Toshiyuki; Hayashi, Katsuki; and Nishikawa, Hiroshi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Inclination of an objective lens in an optical information system. 5,553,052, Cl. 369-112.000.

Ootake, Atsuhiro: *See*—
Nanno, Nobuyuki; Akashi, Kazuo; Ando, Makoto; Takeguchi, K ouichirou; Yamanaka, Yuji; Saito, Toshimitsu; Oka, Mayumi; Ootake, Atsuhiro; Mason, James; and Suzuki, Yoshiaki, 5,553,294, Cl. 395-750.000.

Ophardt, Heiner: *See*—
Ophardt, Herman; and Ophardt, Heiner, 5,551,552, Cl. 198-465.100.

Ophardt, Herman; and Ophardt, Heiner. Modular shuttle conveyor. 5,551,552, Cl. 198-465.100.

Oppen, Peter. Rehabilitation method. 5,551,950, Cl. 601-35.000.

Orbital Engine Company (Australia) Pty. Limited: *See*—
Caley, David J., 5,551,638, Cl. 239-453.000.

Oregon Health Sciences University: *See*—
Keana, John F. W.; and Weber, Eckard, 5,552,443, Cl. 514-631.000.

Orii, Hideki: *See*—
Nakagawa, Tomohito; Hiroi, Masakazu; Matsuo, Kazuhiro; Orii, Hideki; Kato, Satoru; Dobashi, Akihito; and Noda, Mamoru, 5,552,859, Cl. 355-207.000.

Orimo, Takao: *See*—
Okita, Tomiharu; Sugimori, Mikihiro; Ozaki, Masanori; and Orimo, Takao, 5,552,573, Cl. 219-118.000.

Orlowski, Thomas E.; and Vandebroek, Sophie V., to Xerox Corporation. Method of fabrication of porous silicon light emitting diode arrays. 5,552,328, Cl. 437-23.000.

Oros, Nicholas C.: *See*—
Jasper, Steven C.; Birchler, Mark A.; and Oros, Nicholas C., 5,553,102, Cl. 375-347.000.

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Pensavecchia, Frank G.: *See—*
Lewis, Thomas E.; Williams, Richard A.; Pensavecchia, Frank G.; Kline, John F.; Gardiner, John P.; Nowak, Michael T.; and Robichaud, Kenneth T., 5,551,341, Cl. 101-453.000.

Perchenek, Nils, to Bayer AG. Boron subphosphide/aluminum oxide composite materials, processes for the production thereof and use thereof. 5,552,356, Cl. 501-153.000.

Perez Revilla, Miguel: *See—*
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Perkin-Elmer Corporation, The: *See—*
Madabhushi, Ramakrishna S.; Menchen, Steven M.; Efcavitch, J. William; and Grossman, Paul D., 5,552,028, Cl. 204-451.000.
Woo, Sam L.; and Fung, Steven, 5,552,471, Cl. 524-494.000.

Perkins, Geoffrey W., to Motorola, Inc. Circuit for controlling current flow between two nodes. 5,552,742, Cl. 327-563.000.

Perkins, Mark M., to Siemens Rolm Communications, Inc. System and method for predictive outdialing. 5,553,133, Cl. 379-265.000.

Perregaux, Alain E., to Xerox Corporation. Geometries for photosites in a photosensitive silicon chip. 5,552,828, Cl. 348-315.000.

Perrissoud, Claude, to S.A. Salomon. Alpine ski boot with foot tightening device. 5,551,174, Cl. 36-50.500.

Perry, Paul D.: *See—*
Everingham, Gary; Cook, John E.; Perry, Paul D.; and Busato, Murray F., 5,551,406, Cl. 123-520.000.

Perry, Phil M., to International Business Machines Corporation. Method and apparatus for combining a zoom function in scroll bar sliders. 5,553,225, Cl. 395-157.000.

PerSeptive Biosystems, Inc.: *See—*
Afeyan, Nouber B.; Regnier, Fred E.; and Dean, Robert C., Jr., 5,552,041, Cl. 210-198.200.

Persson, Leif A.: *See—*
Tyren, Carl; and Persson, Leif A., 5,551,158, Cl. 33-1.00N.

Pescetto, Michael J.: *See—*
Belenkiy, Yuriy; Gros, Igor; Gumin, Irina; Makhlin, Ilya; Margolin, Mark; and Pescetto, Michael J., 5,553,180, Cl. 385-59.000.

Peters, Horst: *See—*
Witmann, Dieter; Schoeps, Jochen; Urbanneck, Bernd; Huff, Karl; Ott, Karl-Heinz; and Peters, Horst, 5,552,465, Cl. 524-139.000.

Petersen, Mark D.; and Oldfield, Barry J., to Hewlett-Packard Company. Identifying controller pairs in a dual controller disk array. 5,553,230, Cl. 395-180.000.

Peterson, Craig M.: *See—*
Ray, S. Doug; and Peterson, Craig M., 5,552,725, Cl. 327-143.000.

Peterson, Danny R.; and George, Clement A., III, to Peterson, Danny R. Vehicular communications system. 5,553,117, Cl. 379-58.000.

Peterson, John P.; Szymanowski, Richard A.; and Fox, Randal T., to Northern Telecom Limited. Printed circuit board having a plurality of circuit board patterns. 5,552,567, Cl. 174-261.000.

Peterson, Reid A.: *See—*
Anderson, Marc A.; and Peterson, Reid A., 5,552,351, Cl. 501-81.000.

Peterson, Robert: *See—*
Shannon, Donald; Kuo, Chris; Peterson, Robert; and McCollam, Chris, 5,552,100, Cl. 264-127.000.

Petijean, Luc: *See—*
Couet, Benoit; Petijean, Luc; and Ayestaran, Luis C., 5,551,344, Cl. 102-312.000.

Petit, Jean-Pierre: *See—*
Sanchez, Jean-Yves; Armand, Michel; Petit, Jean-Pierre; Choquette, Yves; and Goulart Silva, Glaura, 5,552,510, Cl. 528-250.000.

Petri AG: *See—*
Zeller, Gregor; and Bonn, Helmut, 5,551,886, Cl. 439-164.000.

Pettey, Thomas M.: *See—*
Fodge, Douglas W.; Anderson, David M.; and Pettey, Thomas M., 5,551,515, Cl. 166-300.000.

Pettit, Donald W.; and Plourd, Terrence W., to Casino Coin Company, Inc. Electronic game promotion device. 5,551,692, Cl. 273-143.00R.

Pfaff, Maurice E.: *See—*
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Pfahl, Magnus; Zhang, Xiao-kun; Lehmann, Jürgen M.; Dawson, Marcia I.; Cameron, James F.; Hobbs, Peter D.; and Jong, Ling, to La Jolla Cancer Research Foundation. RXR homodimer formation. 5,552,271, Cl. 435-6.000.

Pfeifer, Thomas J.; and Rotlevi, Ziv S., to Grindmaster Corporation. Espresso apparatus with improved heating of the brew head and boiler. 5,551,331, Cl. 99-280.000.

Pfeifer, Tilo: *See—*
Eikelmann, Eckard; Keller, Stefan; and Pfeifer, Tilo, 5,553,184, Cl. 385-115.000.

Pfizer Inc: *See—*
Cameron, Kimberly O.; Dasilva Jardine, Paul A.; and Rosati, Robert L., 5,552,412, Cl. 514-317.000.

Pfizer Inc.: *See—*
Ando, Akemi; and Stevens, Rodney W., 5,552,424, Cl. 514-378.000.
Glazer, Edward A., 5,552,387, Cl. 514-25.000.
Koch, Kevin, 5,552,435, Cl. 514-456.000.
Quallich, George J., 5,552,548, Cl. 546-13.000.

Pfost, Robert F.; and Avdalovic, Nebojsa, to Beckman Instruments, Inc. Heated cover device. 5,552,580, Cl. 219-521.000.

Pham, Phong: *See—*
Sepetka, Ivan; Pham, Phong; That, Dai T.; and Nikolchev, Julian, 5,551,443, Cl. 128-772.000.

Pharmacia Aktiebolag: *See—*
Lindholm, Leif G.; Holmgren, Jan; and Lind, Peter, 5,552,293, Cl. 435-7.230.

Phase Change Laboratories, Inc.: *See—*
Salyer, Ival O., 5,552,075, Cl. 252-70.000.

Philipp, Matthias: *See—*
Entenmann, Robert H.; Unland, Stefan; Philipp, Matthias; Haeming, Werner; Surjadi, Iwan; Rothhaar, Ulrich; and Baeuerle, Michael, 5,551,235, Cl. 60-602.000.

Philips Electronics North America Corporation: *See—*
Gallagher, Brian W.; Blionas, Costas; Nicolosi, Joseph A.; and Barbara, Richard, 5,552,608, Cl. 250-370.150.
Gu, Wen-Jian; DiVincenzo, Gregory T.; and Caldeira, Paulo P., 5,552,979, Cl. 363-98.000.
Trushell, Charles, 5,552,665, Cl. 313-489.000.

Phillips, Frederick W.: *See—*
Smoker, Benjamin K.; Yoder, David J.; Smoker, Benuel F.; and Phillips, Frederick W., 5,551,868, Cl. 431-208.000.

Phillips, Peter V.: *See—*
Adamian, Vahe A.; Falcinelli, Michael T.; and Phillips, Peter V., 5,552,714, Cl. 324-601.000.

Phillips Petroleum Company: *See—*
Buchanan, J. Scott; Harandi, Mohsen N.; Krambeck, Frederick J.; and Schatz, Klaus W., 5,552,121, Cl. 422-171.000.

Phipps, Kevin J.: *See—*
Shapanus, Vincent F.; and Phipps, Kevin J., 5,552,880, Cl. 356-72.000.

Phoenix Closures, Inc.: *See—*
Moore, David N.; and Ullrich, Jeffrey F., 5,551,608, Cl. 222-542.000.

pHox Medical Optics, Inc.: *See—*
Morrison, James P.; and Yue, Samual K., 5,551,424, Cl. 128-634.000.

Pickard, Albert. Two position utility basket. 5,551,715, Cl. 280-43.240.

Picker International, Inc.: *See—*
Arata, Louis K., 5,552,605, Cl. 250-363.040.
Blakeley, Douglas M.; and Molyneaux, David A., 5,551,430, Cl. 128-653.200.

Pickrell, John W.: *See—*
Zanzig, Jerald G.; Stragier, Marcel G.; and Pickrell, John W., 5,551,824, Cl. 414-408.000.

Pierce, Perry A.; and Zanger, Peter K., to Pitney Bowes Inc. Microprocessor motor control. 5,552,691, Cl. 318-652.000.

Pietranico, Sherrie: *See—*
Hirschmann, Ralph F.; Nicolaou, Kyriacos C.; Pietranico, Sherrie; Reisine, T. R.; Salvino, Joseph M.; Sprengeler, Paul; and Strader, Catherine D., 5,552,534, Cl. 536-17.400.

Pietranton, Joe: *See—*
Markey, Dennis P.; Pietranton, Joe; Nagy, Nick; Garton, Rick; Swinhart, Philip; Rensberger, Ron; and Herbst, Walter, 5,551,371, Cl. 119-499.000.

Pietschmann, Walter: *See—*
Meyerdirks, Herbert; and Pietschmann, Walter, 5,552,953, Cl. 361-93.000.

Piggott, James R.: *See—*
Labroo, Virender M.; and Piggott, James R., 5,552,413, Cl. 514-320.000.

Pikoulas, George W. Automatic gear changing system. 5,551,315, Cl. 74-502.200.

Pineau, Joseph E. M., to One Inc. Stereophonic reproduction method and apparatus. 5,553,147, Cl. 381-24.000.

Pinsky, David J.: *See—*
Stern, David M.; Oz, Mehmet C.; Nowygrod, Roman; Koga, Shin; and Pinsky, David J., 5,552,267, Cl. 435-1.100.

Pio, Federico: *See—*
Ghezzi, Paolo; Pio, Federico; and Riva, Carlo, 5,553,017, Cl. 365-185.010.

Pippin, James M.; and Erwin, Jerry D., to ElectroCom Automation L.P. Order filling system with cartridge dispenser. 5,551,822, Cl. 414-273.000.

Pirovic, Arpad L.: *See—*
Csoknyai, George; and Pirovic, Arpad L., 5,552,664, Cl. 313-488.000.

Pitcairn, Francine S.: *See—*
Lipner, Melvin H.; Pitcairn, Francine S.; and Mundy, Roger A., 5,553,304, Cl. 395-600.000.

Pitesky, Isadore. Injection pick holder apparatus. 5,551,441, Cl. 128-743.000.

Pitney Bowes Inc.: *See—*
Lee, Young W.; Moh, Sungwon; and Muller, Arno, 5,552,991, Cl. 364-464.020.
Pierce, Perry A.; and Zanger, Peter K., 5,552,691, Cl. 318-652.000.
Thompson, Brian S.; Marzullo, Joseph H.; and Makarchuk, Irena, 5,551,834, Cl. 414-798.700.

Pizzuti, Antonio: *See—*
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Placek, Douglas G., to FMC Corporation. Thermally stabilizing organic functional fluids in the absence of oxygens. 5,552,067, Cl. 508-433.000.

Planet Products Corporation: *See—*
Marshall, Robert H.; and Wallace, Gary L., 5,551,550, Cl. 198-432.000.

Plastic Trim, Inc.: *See—*
Cook, Bernard L.; and Dilley, David D., 5,552,195, Cl. 428-31.000.

Playfair, David B.: *See—*
Malicki, Jan M.; Playfair, David B.; and Hart, Steven C., 5,552,864, Cl. 355-215.000.

Plotkin, Stanley A.; Ricciardi, Robert P.; Gonczol, Ewa; Berencsi, Klara; and Rando, Robert F., to Wistar Institute of Anatomy & Biology, The; and United States of America, Health and Human Services. Recombinant cytomegalovirus vaccine. 5,552,143, Cl. 424-199.100.

Plourd, Terrence W.: *See—*
Pettit, Donald W.; and Plourd, Terrence W., 5,551,692, Cl. 273-143.00R.

Plumb, William L.: *See—*
Roth, Richard; Miller, Paul D.; and Plumb, William L., 5,551,559, Cl. 206-308.100.

Plunkett, Tom P., to Dana Corporation. Multiple layer cylinder head gasket with a wire ring. 5,551,709, Cl. 277-235.00B.

Poag, Frank: *See—*
Turner, Virgil Q.; Light, William D.; Trevino, Hilario T.; Guldi, Richard L.; Poag, Frank; and Paradis, Douglas E., 5,551,165, Cl. 34-404.000.

Podmajersky, David J.: *See—*
Brown, George T.; Coppola, Vincent M.; Goodman, Walter A.; Grebe, Frank V.; Hatton, Charles R.; Hermansen, David R.; Podmajersky, David J.; Reynolds, Dennis P.; Ritinski, Edward R.; Rizzi, Julian D.; Sherman, John H.; and Wormsbecher, Paul A., 5,552,957, Cl. 361-683.000.

Pogrebinsky, Victor: *See—*
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Poikolainen, Antti: *See—*
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Polaroid Corporation: *See—*
Bloom, Iris B. K.; Minns, Richard A.; and Zahka, Cyothia L., 5,552,259, Cl. 430-253.000.

Polgreen, Thomas L.; and Zanders, Gary V., to Dallas Semiconductor Corp. Digital histogram generator systems and methods. 5,552,999, Cl. 364-481.000.

Pollock, Daniel A.: *See—*
Gladieux, Michael J.; and Pollock, Daniel A., 5,551,555, Cl. 198-836.300.

Pólya, Kálmán: *See—*
Ott, István; Klupp, Tibor; Molnár, István; Patthy, András; Barta, István; Barkó née Tóth, Zsuzsa; Ambrus, Gábor; Salát, János; Tegdes, Anikó; Moravcsik, Imre; Együd, Cecilia; Albrecht, Kárnly; Könczöl, Kálmán; Vincze, Attila; Barabás, Éva; Máté, György; Kiss, György B.; Kiss, Péter; Pólya, Kálmán; Erdei, János; Gulyás, Éva; and Zilahi, Erika, 5,552,299, Cl. 435-69.100.

Polyair Tires, Inc.: *See—*
Alsman, Edward R., 5,551,763, Cl. 301-64.700.

Polyshot Corporation: *See—*
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Pomini S.p.A.: *See—*
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Pontier, Dominique: *See—*
Godiard, Laurence; Marco, Yves; Pontier, Dominique; and Roby, Dominique, 5,552,527, Cl. 530-379.000.

Poon, Stephen S.: *See—*
Tseng, Hsing-Huang; Tobin, Philip J.; Tsui, Paul G. Y.; Sun, Shih W.; and Poon, Stephen S., 5,552,332, Cl. 437-41.000.

Pope, Kevin T.: *See—*
Bronte, Jeffery S.; Lever, Mark J.; Pope, Kevin T.; and Hartmann, Paul R., 5,553,056, Cl. 370-13.000.

Popovic, Zoran D.: *See—*
Kovacs, Gregory J.; Neville Connel, G. A.; Hor, Ah-Mee; and Popovic, Zoran D., 5,552,253, Cl. 430-57.000.

Porta Systems Corp.: *See—*
Cryan, Colm V.; Stowe, David W.; and Parslow, Margaret M., 5,553,179, Cl. 385-43.000.

Porter, John F.; Kittson, Mark O.; Tucker, Mark; Ferris, Larry; and LePage, Steve, to Bay Mills Limited. Open grid fabric for reinforcing wall systems, wall segment product and methods of making same. 5,552,207, Cl. 428-109.000.

Porter, Lawrence L.: *See—*
Martin, David G.; and Porter, Lawrence L., 5,553,121, Cl. 379-88.000.

Poss, Andrew J.; and Shia, George A., to AlliedSignal Inc. Preparation of (8S)-8-fluoroerythromycins with N-F fluorinating agents. 5,552,533, Cl. 536-7.200.

Poss, Joe M.: *See—*
Coffey, Jerome T.; Goodman, Dale E.; and Poss, Joe M., 5,552,950, Cl. 360-128.000.

Posselius, John H., Jr.: *See—*
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Post, Joseph R., to Powerhouse Technology, Inc. Two piece grate clip for use as a power generator maintenance part. 5,551,356, Cl. 110-269.000.

Potkonjak, Miodrag: *See—*
Dey, Sujit; Potkonjak, Miodrag; and Rothweiler, Steven, 5,553,000, Cl. 364-488.000.

Potter, Mark J.; Kao, Jar-Lin; Cross, Virginia R.; Vanderspurt, Thomas H.; Dienes, Edward K.; Riley, Robert E.; Tungate, Freddie L.; and Bortinger, Arie, to Exxon Research and Engineering Company. Zeolite aggregates and catalysts. 5,552,035, Cl. 208-135.000.

Pottier, Charles; and Varien, Richard. Non-ozone depleting malodorous composition of matter and warning system. 5,552,088, Cl. 116-214.000.

Powerhouse Technology, Inc.: *See—*
Post, Joseph R., 5,551,356, Cl. 110-269.000.

Powers, John, III. Method of fabricating a metal purlin and method of fabricating a building therewith. 5,551,135, Cl. 29-6.100.

PPG Industries, Inc.: *See—*
Allen, Lesley M., 5,551,563, Cl. 206-394.000.
Finley, James J.; Arbab, Mehran; and Waynar, Thomas J., 5,552,180, Cl. 427-165.000.
Kumar, Anil, 5,552,091, Cl. 252-586.000.
Sundararaman, Padmanabhan; Ambrose, Ronald R.; Camp, Douglas R.; and Wilt, Truman F., 5,552,475, Cl. 524-608.000.
Van Gemert, Barry; and Knowles, David B., 5,552,090, Cl. 252-586.000.

Prasit, Petpiboon: *See—*
Ducharme, Yves; Gauthier, Jacques Y.; Prasit, Petpiboon; Leblanc, Yves; Wang, Zhaoyin; Leger, Serge; and Therien, Michel, 5,552,432, Cl. 514-438.000.

Prater, James L.; and Moore, Joseph F. Roll package convertible to a dispenser. 5,551,564, Cl. 206-409.000.

Pratt, Jerrold A.: *See—*
Zimmer, Michael T.; Kakoczki, Richard J.; Davis, James A.; Pratt, Jerrold A.; and Reinbold, Edward O., 5,551,236, Cl. 60-605.100.

Pratt, Wayne: *See—*
Kane, Martin; Pratt, Wayne; Alesz, Jozsef; Biro, Zoltan; and Varga, Zoltan, 5,551,307, Cl. 73-861.356.

Praxisoft, Inc.: *See—*
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Presstek, Inc.: *See—*
Lewis, Thomas E.; Williams, Richard A.; Pensavecchia, Frank G.; Kline, John F.; Gardiner, John P.; Nowak, Michael T.; and Robichaud, Kenneth T., 5,551,341, Cl. 101-453.000.

Previti-Kelly, Rosemary A.: *See—*
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Price, Cyril A.: *See—*
Almquist, Frank A.; Anderson, David F.; Campbell, John E.; Chan, Michael J.; Flaherty, Stephen W.; Hajek, Steven F.; Larsen, John F.; Milligan, Charles H.; Price, Cyril A.; Simon, Andrew M.; Washburn, William F.; Williams, George A., II; and Wood, Roy A., 5,553,144, Cl. 380-25.000.

Primary Delivery Systems, Inc.: *See—*
DeJonge, Stuart, Sr.; and Harrold, John E., 5,551,607, Cl. 222-505.000.

Prince Corporation: *See—*
Lindberg, Kenneth M., 5,551,755, Cl. 297-411.460.

Prince, Jonathan, to SPM Corporation. Background reflection-reducing plano-beam splitter for use in real image projecting system. 5,552,934, Cl. 359-629.000.

Probst, Joachim: *See—*
Dhein, Rolf; Reuter, Knud; Bäcker, Lothar; Bock, Manfred; Kubitza, Werner; and Probst, Joachim, 5,552,477, Cl. 524-840.000.

Probst, Samuel G.: *See—*
Wu, Song; Probst, Samuel G.; Edvardsson, Christina M.; and Alliston, Michael G., 5,551,357, Cl. 110-344.000.

Process System International, Inc.: *See—*
Gram, Anker, 5,551,488, Cl. 141-18.000.

Prochaska, Frank H., to American Safety Razor Company. Movable blade shaving cartridge with coated retaining clips. 5,551,155, Cl. 30-50.000.

Prochut, Richard: *See—*
Kennedy, Paul; Prochut, Richard; Löfstedt, Jörgen; Yokoyama, Ikuro; and Nilsson, Christer, 5,551,211, Cl. 53-371.700.

Procter & Gamble Company, The: *See—*
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Miracle, Gregory S.; Willey, Alan D.; Kott, Kevin L.; and Burns, Michael E., 5,552,556, Cl. 548-334.100.
Motley, Curtis B., 5,552,136, Cl. 424-68.000.
Trinh, Toan; and Gardlik, John M., 5,552,378, Cl. 512-3.000.

Progar, Paul M., to Ford Motor Company. Fault tolerant method of decoding an electronic key system. 5,552,781, Cl. 341-22.000.

Progressive Rail Services Corporation: *See—*
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Promega Corporation: *See—*
Lewis, Martin K.; and Shultz, John W., 5,552,302, Cl. 435-692.000.

Proprietary Technology, Inc.: *See—*
Bartholomew, Donald D., 5,551,732, Cl. 285-93.000.

Prosperi, Giulio: *See—*
D'Addario, Ezio; Fascetti, Eugenio; Patricelli, Alberto; Prosperi, Giulio; and Robertiello, Andrea, 5,551,987, Cl. 134-10.000.

Prueitt, Melvin L. Hydro-air renewable power system. 5,551,238, Cl. 60-643.000.

Prusinski, Ronald G.: *See—*
Jasper, William C., II; Middleton, Cheryl S.; and Prusinski, Ronald G., 5,552,581, Cl. 219-523.000.

Pruzan, Dan A.: *See—*

Geraldi, Joseph J.; Hickman, Gail A.; Khatkhate, Ateen A.; and Pruzan, Dan A., 5,551,288, Cl. 73-170.260.

Rahman, Mohammad A.; Hung, Anthony; and Wu, Shang-Ken, to Lever Brothers Company, Division of Conopco, Inc. Ribose diester quaternary

Bauer, Lothar; Lemme, Werner; Rechberg, Reinhard; Strusch, Wolfgang; Fuchs, Heinz W.; and Wahnschaffe, Jürgen, 5,551,382, Cl. 123-41.82R.

Depreux, Patrick; Ait Mansour, Hamid; Lesieur, Daniel; Lefoulon, François; Renard, Pierre; Adam, Gérard; and Delagrange, Philippe, 5,552,418, Cl. 514-348.000.

Geraldi, Joseph J.; Hickman, Gail A.; Khatkhate, Ateen A.; and Pruzan, Dan A., 5,551,288, Cl. 73-170.260.

Pruzanski, Waldemar: *See*—
Johnson, Lorin K.; Seilhamer, Jeffrey J.; Pruzanski, Waldemar; and Vadas, Peter, 5,552,530, Cl. 530-387.900.

Przybysz, John X.: *See*—
Kang, Joonhee; Przybysz, John X.; and Worsham, Anthony H., 5,552,735, Cl. 327-367.000.

PSC Inc.: *See*—
Biss, Charles E., 5,552,593, Cl. 235-495.000.

Puettmer, Hermann; and Abraham, Peter, to Goetz GmbH Metall- und Anlagenbau. Profiled clamping jaw for clamping workpieces. 5,551,677, Cl. 269-266.000.

Puritan Bennett Corporation: *See*—
Merrick, Edwin B.; Gee, Glen N.; O'Mahony, John; and O'Dea, John, 5,551,417, Cl. 128-203.250.

Pustaver, Mark R.; Shmukler, David A.; and Winter, Lewis S., III, to QL, Inc. Exercise device for the lower back. 5,551,935, Cl. 482-142.000.

Puttler, Oliver L.: *See*—
Jacobs, Dwight W.; Puttler, Oliver L.; Georgakis, Evangelos G.; Amundson, Allen B.; and Jordan, Russell A., 5,552,177, Cl. 427-2.290.

Qian, Dahong: *See*—
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QL, Inc.: *See*—
Pustaver, Mark R.; Shmukler, David A.; and Winter, Lewis S., III, 5,551,935, Cl. 482-142.000.

Quallich, George J., to Pfizer Inc. Enantioselective oxazaborolidine catalysts. 5,552,548, Cl. 546-13.000.

Quan, Clifton: *See*—
Sturdivant, Rick L.; and Quan, Clifton, 5,552,752, Cl. 333-243.000.

Quantum Corporation: *See*—
Sompel, Mark A.; Clawson, William W.; and Hong, Jason, 5,553,086, Cl. 371-47.100.
Ziperovich, Pablo A.; and Chiao, James, 5,552,942, Cl. 360-51.000.

Queens Group Inc.: *See*—
Roth, Richard; Miller, Paul D.; and Plumb, William L., 5,551,559, Cl. 206-308.100.

Qui, Zhongqi, to Brother Kogyo Kabushiki Kaisha. Vibration control device for sewing machine. 5,551,360, Cl. 112-470.010.

Quick, Donald C. Impact gauge. 5,551,279, Cl. 73-12.010.

Quick, John, to Hunter Energy and Technologies, Inc. Seal and installation improvements. 5,551,414, Cl. 126-85.00B.

QuickLogic Corporation: *See*—
Lulla, Mukesh T.; and Cox, William D., 5,552,720, Cl. 326-38.000.

Quiclave, LLC: *See*—
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Quirk, William A.: *See*—
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Quixote Associates, Inc.: *See*—
Herbert, Victor D.; Shaw, Spencer; and Jayatilleke, Elizabeth, 5,552,268, Cl. 435-4.000.

R. A. Jones & Company, Inc.: *See*—
Huening, William A.; and Radigan, Richard E., 5,551,217, Cl. 53-474.000.
Rack, Daniel J.; and Myers, Michael E., 5,551,492, Cl. 141-147.000.

R. H. Associates, Ltd.: *See*—
Brown, Andrew J., 5,551,690, Cl. 273-73.000.

R. J. Reynolds Tobacco Company: *See*—
Ogden, Michael W.; and Heavner, David L., 5,551,311, Cl. 73-863.310.
Riggs, Dennis M.; Beeson, Dwayne W.; and Conner, Billy T., 5,551,451, Cl. 131-359.000.

Raab, Alois; Binder, Klaus; and Augustin, Ulrich, to Mercedes-Benz A.G. Fuel injection nozzle for an internal combustion engine. 5,551,634, Cl. 239-96.000.

Rabe, Gerald L.: *See*—
Rajala, Gregory J.; Rabe, Gerald L.; Niemi, Paul M.; and Holewski, Donald J., 5,552,007, Cl. 156-164.000.

Rabener, Claus W.: *See*—
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Rack, Daniel J.; and Myers, Michael E., to R.A. Jones & Co. Inc. Rotary disc feeder. 5,551,492, Cl. 141-147.000.

Racom Systems, Inc.: *See*—
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Radigan, Richard E.: *See*—
Huening, William A.; and Radigan, Richard E., 5,551,217, Cl. 53-474.000.

Radio Cap Company, Inc.: *See*—
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Radiodetection Limited: *See*—
Hore, Donald L., 5,552,703, Cl. 324-207.220.

Radius Medical Technologies, Inc.: *See*—
Finlayson, Maureen, 5,551,444, Cl. 128-772.000.

Radomski, Thomas A., to General Motors Corporation. Alternating current generator. 5,552,651, Cl. 310-181.000.

Ragosta, Joseph M., to Graver Chemical Company. Filter element having an ion exchange yarn winding layer. 5,552,056, Cl. 210-660.000.

Rahman, Mohammad A.; Hung, Anthony; and Wu, Shang-Ken, to Lever Brothers Company, Division of Conopco, Inc. Ribose diester quaternary useful as a fabric conditioner. 5,552,066, Cl. 252-8.630.

Rai, Charn; and Wertz, Barry R. Dispenser. 5,551,606, Cl. 222-460.000.

Rainbow, Terence H.; and Long, James, to General Electic Company. Stanchion for supporting moving and loading/unloading highway semi-trailers on rail cars. 5,551,815, Cl. 410-58.000.

Rajala, Gregory J.; Rabe, Gerald L.; Niemi, Paul M.; and Holewski, Donald J., to Kimberly-Clark Corporation. Conveying continous web having cross-direction tension. 5,552,007, Cl. 156-164.000.

Rajchel, Marcus E. Method of concentrating fine coal slurries. 5,551,640, Cl. 241-21.000.

Ramakrishnan, M. R.: *See*—
Sandling, Michael; Klotter, David E.; Scheid, Edward; and Ramakrishnan, M. R., 5,551,471, Cl. 137-74.000.

Ramaswamy, Mailini; and Fujimoto, James G., to Massachusetts Institute of Technology. Dispersion-compensated laser using prismatic end elements. 5,553,093, Cl. 372-100.000.

Ramp, John M.: *See*—
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Ramun, John R., to Allied Gator, Inc. Method for treating concrete. 5,552,179, Cl. 427-136.000.

Rancich, Michael J.: *See*—
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Bossen, Douglas C.; Chen, Chin-Long; Dill, Frederick H.; Goodman, Douglas S.; Hsiao, Mu-Yue; McCann, Paul V.; Mulligan, James M.; and Rand, Ricky A., 5,552,591, Cl. 235-462.000.

Randahl, Torbjorn I., to Telefonaktiebolaget LM Ericsson. Method and an arrangement for generating a ringing signal. 5,553,132, Cl. 379-252.000.

Randall, Brian G.: *See*—
Green, George W.; and Randall, Brian G., 5,552,187, Cl. 427-389.800.

Rando, Robert F.: *See*—
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Randolph, Peter D.: *See*—
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Raney, Daniel V.: *See*—
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Ranganathan, Nagarajan; and Sastry, Raghu, to University of South Florida, The. VLSI circuit structure for determining the edit distance between strings. 5,553,272, Cl. 395-500.000.

Ranze, Richard A.: *See*—
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Ackermann, Robert A.; Herd, Kenneth G.; Laskaris, Evangelos T.; and Ranze, Richard A., 5,552,372, Cl. 505-163.000.

Rapoport, William R.: *See*—
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Rashidi, Majid, to Cardiac Assist Devices, Inc. Method and device for testing electrophysiology catheter. 5,552,713, Cl. 324-555.000.

Rasp, Christian; Waldmann, Helmut; and Traenckner, Hans-Joachim, to Bayer Aktiengesellschaft. Process for the dechlorination of chlorinated aromatic compounds. 5,552,549, Cl. 546-139.000.

RasWILL Representative Pte. Ltd.: *See*—
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Rathbone, Thomas, to BOC Group plc, The. Air separation. 5,551,258, Cl. 62-646.000.

Rauch, Charles: *See*—
Grabstein, Kenneth; Anderson, Dirk; Eisenman, June; Fung, Victor; and Rauch, Charles, 5,552,303, Cl. 435-69.510.

Rauf, Wally; Gratz, Derek; and Smith, Bruce, to Canadian Luge Association. Snow luge. 5,551,714, Cl. 280-18.000.

Ravetto, Michael; Marion, François; and Debono, Jean-Marc, to Commissariat A L'Energie Atomique. Three-dimensional radiation detection device and process for the production of said device having elementary reading circuits hybridized by welding microbeads. 5,552,596, Cl. 250-208.100.

Ravichandran, Ramanathan: *See*—
Suhadolnik, Joseph; Ravichandran, Ramanathan; Borzatta, Valerio; and Vignali, Graziano, 5,552,464, Cl. 524-99.000.

Ray, Ralph D.; Ireland, Richard L.; and Apogee, Jon, to Sport Carriers, Inc. Track mount system. 5,551,617, Cl. 224-321.000.

Ray, S. Doug; and Peterson, Craig M., to Advanced Micro Devices, Inc. Low power, slew rate insensitive power-on reset circuit. 5,552,725, Cl. 327-143.000.

Rayment, Kevin D., to Ford Motor Company. Identification of vibration induced noises on vehicles. 5,551,298, Cl. 73-669.000.

Raynie, Arthur D.; Rodriguez, Raul G.; Forister, Gary L.; and Crawford, Alexander B., to Dream Weaver J.V. Dream state teaching machine. 5,551,879, Cl. 434-236.000.

Reagent Chemical & Research, Inc.: *See*—
Sonntag, Donald W.; and Bonner, James, 5,551,493, Cl. 141-263.000.

Rearden, Ann, to University of California, The Regents of the. Autoantigen, pinch. 5,552,529, Cl. 530-380.000.

Rechberg, Reinhard: *See*—

Bauer, Lothar; Lemme, Werner; Rechberg, Reinhard; Strusch, Wolfgang; Fuchs, Heinz W.; and Wahnschaffe, Jürgen, 5,551,382, Cl. 123-41.82R.

Redd, Randall V.; and Bacon, Paul W., to Environmental Packing L.P. Composition and method for improving the extrusion characteristics of aqueous starch-polymer mixtures. 5,552,461, Cl. 524-47.000.

Reddy, Avutu S.: *See*—
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Redmer, Bernd, to Technoserv GmbH. Method and apparatus for testing wires extending between a switch cabinet and remotely positioned field units. 5,552,699, Cl. 324-66.000.

Reed, Dewayne. Fishing lure. 5,551,185, Cl. 43-42.390.

Reen, Thomas J.: *See*—
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Reeves Brothers, Inc.: *See*—
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Regi U.S., Inc.: *See*—
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Regnier, Fred E.: *See*—
Afeyan, Noubar B.; Regnier, Fred E.; and Dean, Robert C., Jr., 5,552,041, Cl. 210-198.200.

Reher, Judy M.; and Hanson, Cindy. Child support cushion. 5,551,749, Cl. 297-219.120.

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Reid, J. Gregory; Brodfuehrer, Paul R.; and Smith, Patrick R., to Bristol-Myers Squibb Company. Preparation and use of 7-[(2-carboalkoxy-1-methyletheayl)amino]-3-hydroxymethyl-3-cephem-4-carboxylic acids. 5,552,542, Cl. 540-217.000.

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Reimer, James A.; and Reinsch, Roger A., to International Business Machine Corporation. System and method for enabling the creation of personalized movie presentations and personalized movie collections. 5,553,221, Cl. 395-154.000.

Reinbold, Edward O.: *See*—
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Reindl, Lucian: *See*—
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Reinklou, Lars A., to Reinklou Innovation AB. Guard rail fittings. 5,551,669, Cl. 256-65.000.

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Reiter, Ralph H.; and Patel, Narendra M., to Sun Chemical Corporation. Vegetable oil based thermosetting lithographic ink system. 5,552,467, Cl. 524-270.000.

Reitter, Andrew M.: *See*—
Casey, Jon A.; Cordero, Carla N.; Fasano, Benjamin V.; Goland, David B.; Hannon, Robert; Harris, Jonathan H.; Herron, Lester W.; Johnson, Gregory M.; Patel, Niranjan M.; Reitter, Andrew M.; Shinde, Subhash L.; Vallabhaneni, Rao V.; and Youngman, Robert A., 5,552,107, Cl. 419-13.000.
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Reliable Bethea Power Products: *See*—
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Remington Arms Company, Inc.: *See*—
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Renard, Pierre: *See*—
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Reohr, William R.; Chan, Yuen H.; and Lu, Pong-Fei, to International Business Machines Corporation. Precharged bit decoder and sense amplifier with integrated latch usable in pipelined memories. 5,553,029, Cl. 365-208.000.

Repp, R. Scott; and Stallman, Pamela M., to Donnelly Corporation. Flush-mounted articulated/hinged window assembly. 5,551,197, Cl. 52-204.620.

Repucci, Richard M. Skate brake and braking system. 5,551,712, Cl. 280-11.200.

Research Development Corporation of Japan: *See*—
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Research Foundation of State University of New York, The: *See*—
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Respironics, Inc.: *See*—
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Rettger, Harry C., Jr. Pedal-propelled tricycle vehicle having two modes of steering. 5,551,719, Cl. 280-282.000.

Reuche, Marc, to Luchaire Defense SA. Dispersible countermass system for a recoilless weapon. 5,551,330, Cl. 89-1.701.

Reuter, Knud: *See*—
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Reyhanloo, Shahryar; Hermann, Markus; and Anliker, Markus, to Jura Elektroapparate AG. Method and apparatus for cleaning a brewing device, especially of a coffee machine. 5,551,988, Cl. 134-22.100.

Reynolds Consumer Products Inc.: *See*—
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May, Timothy J., 5,552,202, Cl. 428-43.000.

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Rezvani, Vahid. Self-powered lighted wheel. 5,552,972, Cl. 362-78.000.

Rha, Sa K., to LG Semicon Co., Ltd. Self-aligned thin film transistor with sidewall spacers. 5,552,614, Cl. 257-66.000.

Rhein Chemie Rheinau GmbH: *See*—
Schäfer, Volker; Kohler, Robert; Schilling, Günter; Pauli, Alfred; Röhrs, Ingo; and Korff, Joachim, 5,552,070, Cl. 508-224.000.

Rhoades, Christopher; Reindl, Lucian; and Leschke, Harald, to Mercedes-Benz AG. Side window arrangement for a vehicle. 5,551,746, Cl. 296-146.200.

Rhodes, Ken; Coelho, Rohan; and Yee, Wendy, to Intel Corporation. Method and apparatus for displaying an image using system profiling. 5,552,803, Cl. 345-119.000.

Rhodes, Rockney J., Sr. Surface-piercing electrical connector protector. 5,551,888, Cl. 439-369.000.

Rhone-Poulenc Agriculture Ltd.: *See*—
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Rhone-Poulenc Inc.: *See*—
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Rhone-Poulenc Rorer Pharmaceuticals Inc.: *See*—
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Ribi, Hans O. Polymeric immunological adjuvants. 5,552,141, Cl. 424-184.100.

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Kalish, David M.; Barajas, Saul; and Ricci, Paul B., 5,553,263, Cl. 395-454.000.
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Murakami, Eisaku; Yuasa, Kazuhiro; Endoh, Shuichi; Matsumae, Iwao; Tanaka, Yoshiaki; Hosokawa, Hiroshi; Uno, Mugijiroh; Saitoh, Hiroshi; Takenaka, Eiji; Sugiyama, Toshihiro; Yamanaka, Tetsuo; and Komatsubara, Satoru, 5,552,870, Cl. 355-259.000.
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Rieser, Klaus; Weber, Christoph; and Welsh, William A., to W. R. Grace & Co.-Conn. Aluminum phosphate composition with high pore volume and large pore diameter, process for its production and use thereof. 5,552,361, Cl. 502-208.000.
Rieth, Peter E.: *See—*
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Riggs, Michael T.: *See—*
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Rigotti, James M.: *See—*
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Friebe, Eberhard; Moritz, Matthias; and Schoenbacher, Sepp, 5,551,653, Cl. 246-167.00R.
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Cleuziat, Philippe L.; Awade, Abalo; Robert-Baudouy, Jeannine; and Gayral, Jean-Pierre, 5,552,273, Cl. 435-6.000.
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D'Addario, Ezio; Fascetti, Eugenio; Patricelli, Alberto; Prosperi, Giulio; and Robertiello, Andrea, 5,551,987, Cl. 134-10.000.
Roberts, Thomas D.; Muhlestein, Kerry D.; and Slemons, Greg T., to Eastman Chemical Company. Process for the maleation of polyethylene waxes. 5,551,974, Cl. 106-271.000.
Robertson, Martha H.: *See—*
Merrill, , Natalie A.; Farley, James M.; Robertson, Martha H.; Sims, Charles L.; Pannell, Richard B.; and Montagna, Angelo A., 5,552,489, Cl. 525-210.000.
Robichaud, Kenneth T.: *See—*
Lewis, Thomas E.; Williams, Richard A.; Pensavecchia, Frank G.; Kline, John F.; Gardiner, John P.; Nowak, Michael T.; and Robichaud, Kenneth T., 5,551,341, Cl. 101-453.000.
Robinson, Clayton L., to Rexam Closures. Child resistant twist off closure and container. 5,551,582, Cl. 215-216.000.
Robl, Jeffrey A.: *See—*
Karanewsky, Donald S.; and Robl, Jeffrey A., 5,552,397, Cl. 514-212.000.
Roby, Dominique: *See—*
Godiard, Laurence; Marco, Yves; Pontier, Dominique; and Roby, Dominique, 5,552,527, Cl. 530-379.000.
Roche, Ann L.: *See—*
Dougherty, Thomas J.; Smith, Debra L.; Roche, Ann L.; Thuerk, David A.; and Novak, David J., 5,552,642, Cl. 307-10.300.
Rochefort, Willie E.: *See—*
So, Ying H.; Martin, Steven J.; Chau, Chieh-Chun; Wessling, Ritchie A.; Sen, Ashish; Kato, Katsuhiko; Roitman, Daniel B.; and Rochefort, Willie E., 5,552,221, Cl. 428-373.000.
Röcker, Robert: *See—*
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Rockwell International Corporation: *See—*
Colley, Jaime B.; and Niemi, Thomas A., 5,552,794, Cl. 342-357.000.
Meng, Sen Y., 5,551,230, Cl. 60-259.000.
Rodell, John T.: *See—*
Daly, James C.; George, Jonel; Greenstein, Paul G.; and Rodell, John T., 5,553,292, Cl. 395-733.000.
Roden, Allan D.: *See—*
Wheeler, Edward L.; D'Amelia, Ronald P.; Leveille, Gilbert A.; Otterburn, Michael S.; Klemann, Lawrence P.; Finley, John W.; Roden, Allan D.; Chrysam, Michael M.; Pelloso, Turiddu A.; and Given, Peter S., Jr., 5,552,174, Cl. 426-607.000.
Rodgers, Paula M.: *See—*
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Raynie, Arthur D.; Rodriguez, Raul G.; Forister, Gary L.; and Crawford, Alexander B., 5,551,879, Cl. 434-236.000.
Roe, Incorporated: *See—*
Gladieux, Michael J.; and Pollock, Daniel A., 5,551,555, Cl. 198-836.300.
Roeck, Walter: *See—*
Busse-Grawitz, Max E.; Malacarne, Enrico; and Roeck, Walter, 5,552,710, Cl. 324-322.000.
Roger and Bonita Lieb Trust: *See—*
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Rogers Corporation: *See—*
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Rogers, Wesley A., to Electronic Development Inc. Apparatus for low cost electromagnetic field susceptibility testing. 5,552,715, Cl. 324-627.000.
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Adler, David E.; Freeman, Michael B.; Lipovsky, James M.; Paik, Yi H.; Shulman, Jan E.; and Swift, Graham, 5,552,514, Cl. 528-328.000.
Michelotti, Enrique L.; Egan, Anne R.; Ross, Ronald, Jr.; and Wilson, Willie J., 5,552,409, Cl. 514-307.000.
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Röhrs, Ingo: *See—*
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Roiko, Russell A.: *See—*
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Roitman, Daniel B.: *See—*
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Shoseyov, Oded; Roiz, Levava; Ozeri, Uzi; Bravdo, Ben-Ami; and Goren, Raphael, 5,552,139, Cl. 424-944.000.
Ronkainen, James W.: *See—*
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Roof, Glenn L., to Baker Hughes Incorporated. Abatement of hydrogen sulfide with epoxides. 5,552,060, Cl. 210-749.000.
Roopngam, Yong. Auxiliary wheel assembly. 5,551,762, Cl. 301-40.300.
Rorabaugh, Michael E.: *See—*
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Rosati, Robert L.: *See—*
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Rose, Walter: *See—*
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Rosenberg, Avner, to State of Israel Ministry of Defense, Armament Development Authority, Rafael. Magnetron construction particularly useful as a relativistic magnetron. 5,552,672, Cl. 315-39.510.
Rosenbluth, Mark B., to Digital Equipment Corporation. Apparatus for providing improved memory access in page mode access systems with pipelined cache access and main memory address replay. 5,553,270, Cl. 395-496.000.
Rosenthal, Donald M. Wax pencil holding device and sharpener. 5,551,787, Cl. 401-50.000.
Rosenthal, Gerald A.: *See—*
Crooks, Peter A.; and Rosenthal, Gerald A., 5,552,440, Cl. 514-553.000.
Ross, Cliff D.; and Taylor, Neil W., to Novell, Inc. Method and apparatus for electronic license distribution. 5,553,139, Cl. 380-4.000.
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Ross, Joseph C.: *See—*
Chen, James N.; and Ross, Joseph C., 5,553,235, Cl. 395-182.180.
Ross, Robert J.; Low, Kim C.; and Koskan, Larry P., to Donlar Corporation. Soluble, crosslinked polyaspartates. 5,552,516, Cl. 528-363.000.
Ross, Ronald, Jr.: *See—*
Michelotti, Enrique L.; Egan, Anne R.; Ross, Ronald, Jr.; and Wilson, Willie J., 5,552,409, Cl. 514-307.000.
Ross, Tina M.: *See—*
Dolle, Roland E.; Chaturvedula, Prasad V.; Ross, Tina M.; and Schmidt, Stanley J., 5,552,400, Cl. 514-221.000.
Rossbach, Paul C.: *See—*
Jain, Danny K.; Levitan, David S.; and Rossbach, Paul C., 5,553,255, Cl. 395-375.000.
Roth, Gary A.: *See—*
Pearson, Douglas L.; Orvik, Jon A.; Roth, Gary A.; Scott, Carmen A.; Leng, Ron B.; and Shiang, Dawn L., 5,552,546, Cl. 544-299.000.
Roth, James E.; and Zimmermann, Louis H., to Revcor, Inc. High pressure combustion blower assembly. 5,551,836, Cl. 415-204.000.
Roth, Richard; Miller, Paul D.; and Plumb, William L., to Queens Group Inc. Media disk storage container with printed paperboard sheets. 5,551,559, Cl. 206-308.100.
Rothfleisch, Peter I., to United States of America, Commerce. Accumulator distillation insert for zeotropic refrigerant mixtures. 5,551,255, Cl. 62-502.000.
Rothhaar, Ulrich: *See—*
Entenmann, Robert H.; Unland, Stefan; Philipp, Matthias; Haeming, Werner; Surjadi, Iwan; Rothhaar, Ulrich; and Baeuerle, Michael, 5,551,235, Cl. 60-602.000.
Rothweiler, Steven: *See—*
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Rotlevi, Ziv S.: *See—*
Pfeifer, Thomas J.; and Rotlevi, Ziv S., 5,551,331, Cl. 99-280.000.
Rounbehler, David P.; Achter, Eugene K.; Lieb, David P.; Fine, David H.; Hainsworth, Eugenie; Carroll, Alf L.; and Wendell, Gregory J., to Thermedics Inc. Vapor collector/desorber with non-conductive tube bundle. 5,551,278, Cl. 73-1.00G.
Rowe, David L.: *See—*
Hoover, Gregory A.; Hoover, Roger A.; Rowe, E. Riley; and Rowe, David L., 5,552,003, Cl. 156-147.000.
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Hoover, Gregory A.; Hoover, Roger A.; Rowe, E. Riley; and Rowe, David L., 5,552,003, Cl. 156-147.000.
Rowett Research Institute, The: *See—*
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Rowland Institute for Science: *See—*
Scarpetti, Julius J., 5,552,182, Cl. 427-256.000.
Roy, James B.: *See—*
Koelsch, Michael L.; McIntyre, Dennis A.; and Roy, James B., 5,551,213, Cl. 53-434.000.
Roy, Patrick: *See—*
Gauthier, Jacques Y.; Lau, Cheuk K.; LeBlanc, Yves; Li, Chun-Sing; Roy, Patrick; Therien, Michel; and Wang, Zhaoyin, 5,552,422, Cl. 514-368.000.
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Cipolla, Mark E.; and Wert, David M., 5,551,120, Cl. 15-333.000.
RPC Waste Management Services, Inc.: *See—*
McBrayer, Roy N., Jr.; Deaton, James E.; and Eller, James M., 5,552,039, Cl. 210-90.000.
RPC Waste Management Services, Inc. d/b/a Eco Waste Technologies: *See—*
McBrayer, Roy N., Jr.; Swan, Jimmy G.; and Barber, John S., 5,551,472, Cl. 137-114.000.
RSO Corporation N.V.: *See—*
Tyren, Carl; and Persson, Leif A., 5,551,158, Cl. 33-1.00N.
Ruby, Richard C.: *See—*
Anderson, John T.; Nagesh, V. K.; and Ruby, Richard C., 5,552,370, Cl. 505-124.000.
Rudnick, Leslie R.; Kremer, Ross A.; and Law, Derek A., to Mobil Oil Corporation. Alkylated diphenyl ether lubricants. 5,552,071, Cl. 508-581.000.
Rudolph, Axel: *See—*
Simuttis, Arnold; Hettler, Werner; and Rudolph, Axel, 5,551,675, Cl. 267-293.000.
Ruffinengo, Piero G. Apparatus for selectively varying the stiffness of a ski. 5,551,720, Cl. 280-602.000.
Rüger, Peter: *See—*
Baumann, Dieter; Hollstein, Werner; Rabener, Claus W.; and Rüger, Peter, 5,552,459, Cl. 523-427.000.
Ruhlmann, Edmond: *See—*
Klier, Herbert; Müller, Bernhard; Ruhlmann, Edmond; and Tzikas, Athanassios, 5,552,532, Cl. 534-612.000.
Rullman, Robert G.: *See—*
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Rumbach, Karl F., to Standardwerk Eugen Reis GmbH. System for handling coins. 5,551,911, Cl. 453-3.000.
Runge, Klaus, to Bodenseewerk Geratetechnik GmbH. Push-button switch having a plurality of simultaneously closed contacts. 5,552,571, Cl. 200-530.000.
Runion, Derwood L. Poultry nest pad cleaning method and apparatus. 5,551,460, Cl. 134-62.000.
Russell a Division of Ardco, Inc.: *See—*
Vogel, Kenneth E., 5,551,507, Cl. 165-82.000.
Russell, Edward A.; and Tang, Raymond Ting-Foo, to Wang Laboratories, Inc. Client/server connection sharing. 5,553,242, Cl. 395-200.120.
Rutgers, The State University of New Jersey: *See—*
Kessler, Bezalel; Frenkel, Chaim; Frenkel, Daphna; and Kessler, Abraham, 5,552,307, Cl. 435-171.000.
Rutkowski, Stephen F.: *See—*
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Ruybal, Eligio: *See—*
Brandsma, William J.; and Ruybal, Eligio, 5,551,112, Cl. 12-123.000.
RWE Entsorgung: *See—*
Wintrich, Franz; Kaiser, Dieter; Eisenloher, Holger; and Mindermann, Kurt-Henry, 5,551,780, Cl. 374-45.000.
Ryall, Kathleen: *See—*
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Ryan, Dean E.: *See—*
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Ryan International Corporation: *See—*
Ryan, Paul A.; and Ryan, Dean E., 5,552,788, Cl. 342-30.000.

Ryan, Paul A.; and Ryan, Dean E., to Ryan International Corporation. Antenna arrangement and aircraft collision avoidance system. 5,552,788, Cl. 342-30.000.

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Kanner, Rowland W.; and Davis, Richard M., 5,551,442, Cl. 128-754.000.

Rydhan, Mohammad F.: *See*—
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Paredes, Ivan; and Barth, Glen A., 5,551,196, Cl. 52-204.100.

Ryoo, Sung-geol; and Seo, Yang-seock, to Samsung Electronics Co., Ltd. Color correction method and apparatus using adaptive region separation. 5,552,904, Cl. 358-518.000.

S.A. Microondes Energie Systemes: *See*—
Berteaud, André; Germain, Alain; and Delmotte, Michel, 5,552,583, Cl. 219-693.000.

S.A. Salomon: *See*—
Perrissoud, Claude, 5,551,174, Cl. 36-50.500.

Saab-Scania Combitech Aktiebolag: *See*—
Gunnarsson, Staffan, 5,552,790, Cl. 342-51.000.

Saadeh, Said S.: *See*—
Heald, Arthur D.; Fulton, Paul R.; and Saadeh, Said S., 5,553,138, Cl. 379-413.000.

Saban, Rami; Shacham, Alon; Efendovich, Avner; and Karpati, Varda, to National Semiconductor Corporation. Fully digital data separator and frequency multiplier. 5,553,100, Cl. 375-340.000

Sachathamakul, Rakeshwar; and Duggal, Gurpinder, to Mother's Love Pte. Ltd. Adjustable orientation device for connecting a nipple to a baby bottle. 5,551,583, Cl. 215-386.000.

Sachdeva, Rohit C. L.: *See*—
Besselink, Petrus A.; and Sachdeva, Rohit C. L., 5,551,871, Cl. 433-5.000.

Sacripante, Guerino G.: *See*—
Mychajlowsky, Walter; Sacripante, Guerino G.; McAneney, T. Brian; and Veregin, Richard P. N., 5,552,254, Cl. 430-109.000.

Saffles, David: *See*—
Lawson, David F.; Stayer, Mark L., Jr.; and Saffles, David, 5,552,473, Cl. 524-575.000.

Sagiv, Oded; Landa, Benzion; and Blum, Yoram, to Indigo N.V. Method and apparatus for forming duplex images on a substrate. 5,552,875, Cl. 355-319.000.

Sahashi, Masashi: *See*—
Hashimoto, Susumu; Kamiguchi, Yuzo; Iwasaki, Hitoshi; Sawabe, Atsuhito; and Sahashi, Masashi, 5,552,949, Cl. 360-113.000.

SAIA AG: *See*—
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Saito, Hitoshi: *See*—
Endo, Takayoshi; Sakai, Hitoshi; and Saito, Hitoshi, 5,551,892, Cl. 439-587.000.

Saito, Kaneo: *See*—
Koboshi, Shigeharu; Ishikawa, Masao; Komatsu, Yoshimasa; Ishii, Hideo; Miyazawa, Yorikatsu; Tsubaki, Yoshifumi; Saito, Kaneo; and Yoshimoto, Hiroshi, 5,552,851, Cl. 354-298.000.

Saito, Kenji: *See*—
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Saito, Masahide: *See*—
Hirose, Chisai; Kanamori, Hiroo; Urano, Akira; Ishikawa, Shinji; Aikawa, Haruhiko; and Saito, Masahide, 5,551,966, Cl. 65-377.000.

Saito, Susumu; Takagi, Nobukazu; Harada, Kiyohiro; Kazahaya, Yukio; Kuchiki, Seiji; Ishikawa, Masakuni; and Nakajima, Nobuyuki, to Zexel Corporation. Scroll type compressor having a seal bearing unit. 5,551,852, Cl. 418-98.000.

Saito, Toshimitsu: *See*—
Nanno, Nobuyuki; Akashi, Kazuo; Ando, Makoto; Takeguchi, Kouichirou; Yamanaka, Yuji; Saito, Toshimitsu; Oka, Mayumi; Ootake, Atsuhiro; Mason, James; and Suzuki, Yoshiaki, 5,553,294, Cl. 395-750.000.

Saitoh, Hiroshi: *See*—
Murakami, Eisaku; Yuasa, Kazuhiro; Endoh, Shuichi; Matsumae, Iwao; Tanaka, Yoshiaki; Hosokawa, Hiroshi; Uno, Mugijiroh; Saitoh, Hiroshi; Takenaka, Eiji; Sugiyama, Toshihiro; Yamanaka, Tetsuo; and Komatsubara, Satoru, 5,552,870, Cl. 355-259.000.

Saitoh, Masao: *See*—
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Saitou, Kazuhiko: *See*—
Hayashi, Katsumi; Saitou, Kazuhiko; Ohsato, Hiroshi; Mitani, Masaaki; Hayashi, Tomohiro; Obata, Takashi; Sekine, Yutaka; Ura, Mitsuhiro; and Ishii, Takuji, 5,553,303, Cl. 395-600.000.

Saitou, Tadayoshi: *See*—
Harada, Yasushi; Katayama, Yasunori; Kawakami, Junzo; Saitou, Tadayoshi; Fukui, Chihiro; Kokai, Yutaka; and Tamura, Shigeru, 5,553,003, Cl. 364-492.000.

Sakai, Hidenobu: *See*—
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Sakai, Hitoshi: *See*—
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Sakai, Masanori; Yoshihara, Kunio; and Nimura, Mitsuo, to Canon Kabushiki Kaisha. Image processing apparatus and image processing method. 5,552,903, Cl. 358-500.000.

Sakaino, Yukiko: *See*—
Ohashi, Yukihiro; Fujimori, Taketoshi; Nagai, Minoru; Kawamata, Akira; Yada, Yukihiro; Higuchi, Kazuhiko; Imokawa, Genji; Takema, Yoshinori; Sakaino, Yukiko; Ogawa, Ayumi; and Fujimura, Tsutomu, 5,552,445, Cl. 514-669.000.

Sakakura, Teruyo: *See*—
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Sakamaki, Hisashi: *See*—
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Sakamoto, Ken: *See*—
Henmi, Hidemi; Takano, Shigeru; Nakahigashi, Hideto; and Sakamoto, Ken, 5,552,833, Cl. 348-460.000.

Sakatani, Hideaki; Nishida, Hirofumi; Uetani, Yoji; Kuroki, Yoichi; Hata, Keiko; Fujita, Tatsuo; Kikawa, Tatsuo; Ueno, Seichi; and Hayashida, Yukio, to Matsushita Electric Industrial Co., Ltd. Refuse treating apparatus. 5,551,170, Cl. 34-549.000.

Salát, János: *See*—
Ott, István; Klupp, Tibor; Molnár, István; Patthy, András; Barta, István; Barkó née Tóth, Zsuzsa; Ambrus, Gábor; Salát, János; Tegdes, Anikó; Moravcsik, Imre; Egyúd, Cecilia; Albrecht, Károly; Könczöl, Kálmán; Vincze, Attila; Barabás, Éva; Máté, György; Kiss, György B.; Kiss, Péter; Pólya, Kálmán; Erdei, János; Gulyás, Éva; and Zilahi, Erika, 5,552,299, Cl. 435-69.100.

Saldana, Javier: *See*—
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Sales, James J.: *See*—
Cullinan, George J.; and Sales, James J., 5,552,401, Cl. 514-233.500.

Saliga, Thomas V.: *See*—
Barger, Randall R.; and Saliga, Thomas V., 5,552,987, Cl. 364-424.060.

Salisbury, Roger S.; Wei, Ching-Yeu; and Kwasnick, Robert F., to General Electric Company. Imager device with integral address line repair segments. 5,552,607, Cl. 250-370.090.

Salomon S.A.: *See*—
Renaud-Goud, Gilles; Szafranski, Pierre; and Merino, Jean-Francois, 5,551,721, Cl. 280-605.000.

Salvino, Joseph M.: *See*—
Hirschmann, Ralph F.; Nicolaou, Kyriacos C.; Pietranico, Sherrie; Reisine, T. R.; Salvino, Joseph M.; Sprengeler, Paul; and Strader, Catherine D., 5,552,534, Cl. 536-17.400.

Salyer, Ival O., to Phase Change Laboratories, Inc. Compositions for thermal energy storage or thermal energy generation. 5,552,075, Cl. 252-70.000.

Sampsell, Jeffrey B.: *See*—
Boysel, Robert M.; and Sampsell, Jeffrey B., 5,551,293, Cl. 73-514.140.

Samsonite Corporation: *See*—
Ham, SooJung, 5,551,614, Cl. 224-264.000.

Samsung Display Devices Co., Ltd.: *See*—
Kim, Si-hwan; and Kwak, Jin-oh, 5,552,908, Cl. 359-53.000.
Seo, Kang-Il; Jang, Dong-Sik; Kim, Heon-Soo; and Jeong, Su-Min, 5,552,178, Cl. 427-64.000.

Samsung Electronics Co., Ltd.: *See*—
Kim, Gu S.; Kim, Jong G.; Ahn, Seung H.; and Park, Jae M., 5,552,635, Cl. 257-706.000.
Kim, Jong Y., 5,551,253, Cl. 62-470.000.
Kim, Kye J.; and Chung, Tae Y., 5,552,829, Cl. 348-392.000.
Kim, Sang-uk, 5,552,895, Cl. 358-310.000.
Kwon, Kee-won; and Kang, Chang-seok, 5,552,337, Cl. 437-60.000.
Lee, Sang-in, 5,552,341, Cl. 437-192.000.
Lee, Sun Gyou, 5,551,252, Cl. 62-441.000.
Ryoo, Sung-geol; and Seo, Yang-seock, 5,552,904, Cl. 358-518.000.
Seo, Je-Man, 5,551,262, Cl. 68-23.700.

Samsung Heavy Industry Co., Ltd.: *See*—
Lee, Deok-Gyu; and Huh, Byung-Yun, 5,551,313, Cl. 74-336.00R.

Samuel, James E.; and Gordon, Valery M., to MicroCarb, Inc.; and United States of America, Army. Immunogenic shiga-like toxin II variant mutants. 5,552,144, Cl. 424-236.100.

Sanada, Kunihiko: *See*—
Taniguchi, Hideki; Tomioka, Ichiro; Sanada, Kunihiko; and Okabe, Masatomi, 5,552,618, Cl. 257-207.000.

Sanchez, Hector J.; Serio, John P.; and Tomory, Ronald S., to Xerox Corporation. Printing and mailbox system for shared users with bins almost full sensing. 5,551,686, Cl. 271-298.000.

Sanchez, Jean-Yves; Armand, Michel; Petit, Jean-Pierre; Choquette, Yves; and Goulart Silva, Glaura, to Centre National De La Recherche Scientifique; and Hydro-Quebec. Oxirane and dioxolane copolymers, process for their preparation and ionic conduction materials containing same. 5,552,510, Cl. 528-250.000.

Sandanasamy, Richard D.; and Siu, Joaquim P., to RasWILL Representative Pte. Ltd. Interlocking joint. 5,551,808, Cl. 405-279.000.

Sanders, Brian V., to Chrysler Corporation. Oil separator for engine vent system. 5,551,409, Cl. 123-572.000.

Sanderson-Macleod, Inc.: *See*—
Hartel, Franklin J., 5,551,456, Cl. 132-218.000.

Sandling, Michael; Klotter, David E.; Scheid, Edward; and Ramakrishnan, M. R., to Xomox Corporation. Valve with consumable vent hole seal device. 5,551,471, Cl. 137-74.000.

Sandoz Ltd.: *See*—

Godiard, Laurence; Marco, Yves; Pontier, Dominique; and Roby, Dominique, 5,552,527, Cl. 530-379.000.

Sandquist, Axel: *See*—
Thurm, Siegfried; Sommer, Klaus; Bier, Peter; Elschner, Andreas; Kowitz, Manfred; and Sandquist, Axel, 5,552,226, Cl. 428-412.000.

Sandstrom, Paul H.: *See*—
Zanzig, David J.; Sandstrom, Paul H.; Hubbell, Joseph K.; Hsu, Wen-Liang; Halasa, Adel F.; and Verthe, John J. A., 5,552,490, Cl. 525-237.000.

Sanduja, Mohan L.: *See*—
Kerr, Richard C.; Damewood, John R.; Menzel, Jill; Thottathil, Paul; and Sanduja, Mohan L., 5,552,472, Cl. 524-500.000.

Sandvik AB: *See*—
Weini, Gerold; and Oskarsson, Rolf, 5,552,108, Cl. 419-15.000.

Sandvos, Jerry L.; and Alton, Kenneth D., to Motorola, Inc. Write-once read-many memory using EEPROM cells. 5,553,019, Cl. 365-185.040.

Sanford, Paul C. Underground drainage sump system and method of retrofitting for protecting a floor slab. 5,551,797, Cl. 405-36.000.

Sankyo Seiki Mfg. Co., Ltd.: *See*—
Ushikoshi, Isao, 5,552,682, Cl. 318-254.000.

Sankyokasei Kabushiki Kaisha: *See*—
Yoshizawa, Yukio; Sato, Sumio; Ogawa, Masaki; and Ohno, Masakazu, 5,551,858, Cl. 425-217.000.

Sanner, Axel: *See*—
Mueller, Winfried; Spengler, Reinhard; Grabowski, Sven; and Sanner, Axel, 5,552,159, Cl. 424-464.000.

Sano, Kayoko, to NEC Corporation. Method and apparatus for displaying a plurality of signal waveforms appearing at different time intervals. 5,553,213, Cl. 395-140.000.

Sano, Koichi: *See*—
Sekiguchi, Hiroyuki; Sano, Koichi; and Yokoyama, Tetsuo, 5,553,207, Cl. 395-124.000.

Sano, Souhei: *See*—
Takezawa, Shirou; and Sano, Souhei, 5,552,970, Cl. 362-61.000.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Matsumoto, Chihiro, 5,551,898, Cl. 440-41.000.

Sanshin Koygo Kabushiki Kaisha: *See*—
Yoshida, Sadato; Nakai, Hiroshi; Hoshiba, Akihiko; and Shibata, Yasuhiko, 5,551,385, Cl. 123-184.210.

Santel, Hans-Joachim: *See*—
Findeisen, Kurt; Linker, Karl-Heinz; Kluth, Joachim; Müller, Klaus-Helmut; Riebel, Hans-Jochem; König, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,552,369, Cl. 504-273.000.

Santiesteban, Jose G.: *See*—
Chang, Clarence D.; Santiesteban, Jose G.; Shihabi, David S.; Stevenson, Scott A.; and Vartuli, James C., 5,552,128, Cl. 423-235.000.

Sanyo Electric Co., Ltd.: *See*—
Maenaka, Akihiro; Mori, Yukio; Murata, Haruhiko; Okada, Hidefumi; and Ide, Hirokazu, 5,552,827, Cl. 348-266.000.

Sapal Societe Anonyme Des Plieuses Automatiques: *See*—
Molina, Ernest; and Chenevard, Alexis, 5,551,209, Cl. 53-168.000.

Sapkowski, Mechislao. Exponential multi-ported acoustic enclosure. 5,552,569, Cl. 181-199.000.

Saranac Tank, Inc.: *See*—
Grieves, Gregory B., 5,552,029, Cl. 205-80.000.

Sargent, Robin C.: *See*—
Lajoie, M. Stephen; and Sargent, Robin C., 5,552,084, Cl. 252-385.000.

Sarpotdar, Pramod P.: *See*—
Liversidge, Gary G.; Conzentino, Philip, Jr.; Cundy, Kenneth C.; and Sarpotdar, Pramod P., 5,552,160, Cl. 424-489.000.

Sasai, Hiroshi: *See*—
Ohmori, Masashi; Tanaka, Hiroshi; Nishimoto, Akira; Sasai, Hiroshi; Fujino, Naohiko; and Kotoh, Satoru, 5,551,459, Cl. 134-61.000.

Sasaki, Hideaki: *See*—
Kazui, Shinichi; Matsuoka, Makoto; Fukasawa, Hideyuki; Tamura, Mitsunori; Shirai, Mitsugu; and Sasaki, Hideaki, 5,551,148, Cl. 29-843.000.

Sasaki, Hiroto: *See*—
Adachi, Mitsuru; Sato, Satoru; and Sasaki, Hiroto, 5,551,996, Cl. 148-420.000.

Sasaki, Yasuyuki; Bizen, Takehiko; Miyama, Hiroshi; Morisako, Takeshi; and Tsukada, Hiroko, to Dai Nippon Printing Co., Ltd. Bag-in-carton and pouring spout thereof. 5,551,600, Cl. 222-81.000.

Sastry, Raghu: *See*—
Ranganathan, Nagarajan; and Sastry, Raghu, 5,553,272, Cl. 395-500.000.

Sata, Junichi, to Canon Kabushiki Kaisha. Sheet-material automatic feeding device. 5,551,684, Cl. 271-110.000.

Satin, Robert H.: *See*—
Calvert, Nathaniel; Effle, James S.; Johnston, David L.; Naylor, James L.; Olson-Williams, Helen M.; Satin, Robert H.; Shaffer, Dennis L.; and Turk, Gary A., 5,553,290, Cl. 395-700.000.

Sato, Hiroshi: *See*—
Kashiwazaki, Akio; Sato, Hiroshi; Shirota, Katsuhiro; Yokoi, Hideto; and Shiba, Shoji, 5,552,192, Cl. 427-492.000.

Sato, Kasunori: *See*—
Enomoto, Kunio; Otaka, Masahiro; Amano, Kazuo; Kurosawa, Koichi; Hayashi, Eisaku; Morinaka, Ren; Hattori, Shigeo; and Sato, Kasunori, 5,553,106, Cl. 376-305.000.

Sato, Kenichi: *See*—
Kato, Takeshi; and Sato, Kenichi, 5,552,376, Cl. 505-433.000.

Sato, Masahiko: *See*—
Fujii, Tetsuhiko; Yamamoto, Akira; Kobashi, Tetsuzo; Sato, Masahiko; and Satoh, Takao, 5,553,307, Cl. 395-845.000.

Sato, Masaru: *See*—
Tanaka, Shunji; Umeno, Hidenori; Sugama, Nobuyoshi; and Sato, Masaru, 5,553,291, Cl. 395-700.000.

Sato, Satoru: *See*—
Adachi, Mitsuru; Sato, Satoru; and Sasaki, Hiroto, 5,551,996, Cl. 148-420.000.

Sato, Shigemasa: *See*—
Muramatsu, Masaru; Sato, Shigemasa; Ohishi, Sueyuki; and Otani, Tadashi, 5,552,853, Cl. 354-408.000.

Sato, Sumio: *See*—
Yoshizawa, Yukio; Sato, Sumio; Ogawa, Masaki; and Ohno, Masakazu, 5,551,858, Cl. 425-217.000.

Satoh, Takao: *See*—
Fujii, Tetsuhiko; Yamamoto, Akira; Kobashi, Tetsuzo; Sato, Masahiko; and Satoh, Takao, 5,553,307, Cl. 395-845.000.

Satran, Amir; and Margulis, Rafael, to Iscar, Ltd. Tool assembly having interfitting male and female coupling members. 5,551,811, Cl. 407-40.000.

Saund, Eric; Moran, Thomas P.; and Becker, Craig D., to Xerox Corporation. Method for dynamically maintaining multiple structural interpretations in graphics system. 5,553,224, Cl. 395-155.000.

Sauter, Rosa P.: *See*—
Cullinan, Ann M.; Darmon, Charles M.; Sauter, Rosa P.; and Leith, Charles F., 5,552,264, Cl. 430-372.000.

Savage, Christopher M., to Environmental Marketing Services, Ltd. Clarifying *E. coli* fermentation broths with a combination of anionic and cationic flocculants. 5,552,316, Cl. 435-261.000.

Saval, Joseph E.; and Brunetz, Timothy J., to Ford Motor Company. Rotor shaft having lead wire passage slots and method of forming collar support by cold heading. 5,551,143, Cl. 29-598.000.

Sawabe, Atsuhito: *See*—
Hashimoto, Susumu; Kamiguchi, Yuzo; Iwasaki, Hitoshi; Sawabe, Atsuhito; and Sahashi, Masashi, 5,552,949, Cl. 360-113.000.

Sawamura, Hidehiko: *See*—
Umemoto, Masuo; Ishii, Hirotake; Sawamura, Hidehiko; and Eto, Yoshizumi, 5,552,940, Cl. 360-19.100.

Sawyer, J. Scott: *See*—
Dillard, Robert D.; Sawyer, J. Scott; and Sofia, Michael J., 5,552,441, Cl. 514-569.000.

Saxon, Andrew; Zhang, Ke; and Max, Edward E., to University of California, The Regents of the. IgE isoforms and methods of use. 5,552,537, Cl. 536-24.300.

Scaglione, John M.: *See*—
Feustel, Clay A.; and Scaglione, John M., 5,552,962, Cl. 361-733.000.

Scarpa, Thomas J., to Hersey Measurement Company. Magnetic flowmeter. 5,551,306, Cl. 73-861.160.

Scarpetti, Julius J., to Rowland Institute for Science. Inking methods and compositions for production of digitized stereoscopic polarizing images. 5,552,182, Cl. 427-256.000.

Schaaf, Cecil F.; and Schaaf, Craig R. Sound collecting block and sound absorbing wall system. 5,551,198, Cl. 52-604.000.

Schaaf, Craig R.: *See*—
Schaaf, Cecil F.; and Schaaf, Craig R., 5,551,198, Cl. 52-604.000.

Schablonentechnik Kufstein Aktiengesellschaft: *See*—
Fischer, Hannes, 5,553,161, Cl. 382-167.000.

Schacht, Laurie A.; and Karson, Laura. Portable foldable recreational enclosure. 5,551,106, Cl. 5-99.100.

Schade, Rolf: *See*—
Donner, Arno; Gill, Norbert; Lange, Jürgen; Schröbel, Volker; and Schade, Rolf, 5,551,303, Cl. 73-726.000.

Schädlich, Ralf; Reichenbach, Klaus; Koblitz, Klaus; and Meier, Udo, to Man Roland Druckmaschinen AG. Process and device for register-correct positioning of printing form sleeves. 5,551,339, Cl. 101-216.000.

Schäfer, Gerhard, to Fritz Schäfer Gesellschaft mit beschränkter Haftung. Box-shaped container of plastics material. 5,551,594, Cl. 220-675.000.

Schäfer, Volker; Kohler, Robert; Schilling, Günter; Pauli, Alfred; Röhrs, Ingo; and Korff, Joachim, to Rhein Chemie Rheinau GmbH. Phosphorylation of epoxides. 5,552,070, Cl. 508-224.000.

Schantz, David L., Jr.: *See*—
Munro, James L.; and Schantz, David L., Jr., 5,552,976, Cl. 363-39.000.

Schatz, Klaus W.: *See*—
Buchanan, J. Scott; Harandi, Mohsen N.; Krambeck, Frederick J.; and Schatz, Klaus W., 5,552,121, Cl. 422-171.000.

Schaus, John M.; Hoechstetter, Craig S.; Huser, Diane; Paget, Charles J.; and Titus, Robert D., to Eli Lilly and Company. Ring-substituted 2-amino-1,2,3,4-tetra-hydronaphthalenes, 3-aminochromanes, and 3-aminothiochromanes. 5,552,444, Cl. 514-657.000.

Scheid, Edward: *See*—
Sandling, Michael; Klotter, David E.; Scheid, Edward; and Ramakrishnan, M. R., 5,551,471, Cl. 137-74.000.

Schellenberg, James J.: *See*—
Johnson, Dennis F.; Wiebe, Michael; Holowick, Erwin; Jacob, Nathan R.; Murphy, Michael F.; Schellenberg, James J.; and Stasenski, Michael S., 5,553,094, Cl. 375-200.000.

Schering Corporation: *See*—
Lee, Frank; Yokota, Takashi; Arai, Ken-ichi; Mosmann, Timothy; and Rennick, Donna, 5,552,304, Cl. 435-69.520.

Schiffmann, Robert F.; and Held, Jeffery S., to Quielave, LLC. Method and system for sterilizing medical instruments. 5,552,112, Cl. 422-21.000.

Schilli, Kay F.; Roiko, Russell A.; Emerson, Kent E.; Woo, Edward J.; and Jalbert, Claire A., to Minnesota Mining and Manufacturing Company.

Young, Glen C.; Bonner, Guy, Jr.; and Schneider, Eric D., 5,552,685, Cl. 318-254.000.

Schultz, Cynthia A. Collapsible binocular. 5,552,932, Cl. 359-480.000.

Schultz, Scott A.: *See*—
Williams, John R.; Schultz, Scott A.; and Lyons, Terry L., 5,551,851, Cl.

Kodaira, Toshimoto; Oshima, Hiroyuki; and Mano, Toshihiko, 5,552,615, Cl. 257-72.000.

Miyane, Toshiki, 5,553,260, Cl. 395-421.100.

Schilli, Kay F.; Roiko, Russell A.; Emerson, Kent E.; Woo, Edward J.; and Jalbert, Claire A., to Minnesota Mining and Manufacturing Company. Drying method and apparatus for electrophotography using liquid toners. 5,552,869, Cl. 355-256.000.

Schilling, Donald L.; Kowalski, John; and Moshavi, Shimon, to InterDigital Communication Corporation. Spread spectrum CDMA interference canceler system and method. 5,553,062, Cl. 370-18.000.

Schilling, Günter: *See*—
Schäfer, Volker; Kohler, Robert; Schilling, Günter; Pauli, Alfred; Röhrs, Ingo; and Korff, Joachim, 5,552,070, Cl. 508-224.000.

Schipper, John F.: *See*—
Janky, James M.; and Schipper, John F., 5,552,772, Cl. 340-573.000.

Schippers, Heinz, to Barmag AG. Method and apparatus for heating a synthetic filament yarn. 5,552,097, Cl. 264-103.000.

Schisler, David A.: *See*—
Slininger, Patricia J.; Schisler, David A.; and Bothast, Rodney J., 5,552,315, Cl. 435-253.300.

Schlaak, Helmut: *See*—
Arndt, Frank; and Schlaak, Helmut, 5,552,015, Cl. 216-2.000.

Schlatmann, Rutger: *See*—
Keppel, Anton; Schlatmann, Rutger; and Verhoeven, Jan, 5,551,587, Cl. 216-24.000.

Schlenoff, Joseph B.; Johnson, Kurtis F.; Dharia, Jayesh; and Gao, Feng, to Florida State University. Proton-transfer, low self-absorbing chromophores for use in scintillators. 5,552,551, Cl. 546-155.000.

Schlesener, Carmen: *See*—
Penniman, Mark; Schlesener, Carmen; and Inkman, Bill, 5,552,959, Cl. 361-686.000.

Schlick, Erich: *See*—
Braña, Miguel F.; Castellano Berlanga, José M.; Morán Moset, Marina; Schlick, Erich; and Keilhauer, Gerhard, 5,552,544, Cl. 544-126.000.

Schlienz, Ulrich: *See*—
George, Tobias; Wolf, Hans-Georg; and Schlienz, Ulrich, 5,552,674, Cl. 315-82.000.

Schlimmer, Marvin A.: *See*—
Bicknese, Bryan W.; Boigenzahn, Jeffrey F.; Bornhorst, Randy J.; Coffey, Jerome T.; Fracek, Todd P.; Johnson, Douglas W.; Lagergren, Richard E.; Rigotti, James M.; and Schlimmer, Marvin A., 5,552,946, Cl. 360-97.010.

Schlumberger Technology Corporation: *See*—
Booer, Anthony K., 5,551,286, Cl. 73-152.450.
Couet, Benoit; Petitjean, Luc; and Ayestaran, Luis C., 5,551,344, Cl. 102-312.000.
Xia, Jiqing; Habashy, Tarek M.; Mariani, David R., deceased; and Gaylor, Richard W., 5,552,786, Cl. 342-22.000.

Schmid & Wezel GmbH & Co.: *See*—
Elmer, Stefan, 5,551,156, Cl. 30-276.000.

Schmid, Christoph: *See*—
Burkhard, Theo; Schmid, Christoph, and Sobolewski, Hans, 5,551,358, Cl. 110-346.000.

Schmid, Werner; and Treter, Manfred, to Robert Bosch GmbH. Unit for delivering fuel from a supply tank to the internal combustion engine of a motor vehicle. 5,551,842, Cl. 417-203.000.

Schmid, Wolfgang; Rieker, Werner; Stroetgen, Eckerhard; Kreiter, Csaba; and Seel, Ottmar, to Robert Bosch GmbH. Series motor, in particular universal motor with brake device. 5,552,686, Cl. 318-362.000.

Schmidt, Friedrich G.; and Heuer, Horst, to Huels Aktiengesellschaft. Process for producing composite articles made of polyesters and elastomers. 5,552,460, Cl. 523-522.000.

Schmidt, Guenther, to MTU Motoren- Und Turbinen-Union Friedrichshafen GmbH. Fuel supply quantity limiting arrangement. 5,551,403, Cl. 123-510.000.

Schmidt, Hans, to Linde Aktiengesellschaft. Process for liquefaction of natural gas. 5,551,256, Cl. 62-614.000.

Schmidt, Manfred, to Bethlehem Steel Corporation. Apparatus for controlling molten metal flow in a tundish to enhance inclusion float out from a molten metal bath. 5,551,672, Cl. 266-229.000.

Schmidt, Robert R.: *See*—
Findeisen, Kurt; Linker, Karl-Heinz; Kluth, Joachim; Müller, Klaus-Helmut; Riebel, Hans-Jochem; König, Klaus; Santel, Hans-Joachim; and Schmidt, Robert R., 5,552,369, Cl. 504-273.000.

Schmidt, Stanley J.: *See*—
Dolle, Roland E.; Chaturvedula, Prasad V.; Ross, Tina M.; and Schmidt, Stanley J., 5,552,400, Cl. 514-221.000.

Schmutz, Caroline N.: *See*—
Gozdz, Antoni S.; Schmutz, Caroline N.; Tarascon, Jean-Marie; and Warren, Paul C., 5,552,239, Cl. 429-94.000.

Schnabel Foundation Company: *See*—
Franceski, John A.; Deaton, Hubert J., III; and Ludwig, Claus J., 5,551,810, Cl. 405-286.000.

Schneider, Christian: *See*—
Fischer, Robert; Ilg, Johannes; Schneider, Christian; and Schrey, Ulrich, 5,552,641, Cl. 307-10.500.

Schneider, Eberhard, to P. C. Turck GmbH & Co. KG. Ball joint. 5,551,791, Cl. 403-144.000.

Schneider Electric SA: *See*—
Garces, Luis; and N'Guyen Phuoc, Vinh T., 5,552,980, Cl. 363-98.000.

Schneider, Eric D., to Schneider, Eric D. Apparatus for building a database of the location of files stored in file holders. 5,552,588, Cl. 235-385.000.

Schneider, Eric D.: *See*—
Young, Glen C.; Bonner, Guy, Jr.; and Schneider, Eric D., 5,552,685, Cl. 318-254.000.

Schneider, Mark R., to LSI Logic Corporation. Method and apparatus for dissipating heat in an electronic device. 5,552,634, Cl. 257-706.000.

Schneider, Norbert: *See*—
Brodt, Gregor; Vass, Attila; Loch, Werner; Lehner, August; Lenz, Werner; and Schneider, Norbert, 5,552,229, Cl. 428-425.900.

Schneider, Wilfried; and Steiner, Dieter, to Lamello AG. Device for making patches, especially of wood, and for patching resin galls on pieces of wood. 5,551,494, Cl. 144-24.160.

Schneider, William E.: *See*—
Upton, William K., III; Schneider, William E.; Brown, Stuart H.; Stetz, Steven A.; Gotich, Emily J.; and McCrea, Jack L., 5,551,641, Cl. 241-46.170.

Schnell, Arnold T.: *See*—
Melo, Maria L.; Wolford, Jeff W.; Moriarty, Michael; Culley, Paul R.; and Schnell, Arnold T., 5,553,248, Cl. 395-296.000.

Schober, Manfred; and Schröder, Hans-Leander, to Du Pont de Nemours, E. I., and Company. Process for preparing flexographic printing plates. 5,552,263, Cl. 430-306.000.

Schoenbacher, Sepp: *See*—
Friebe, Eberhard; Moritz, Matthias; and Schoenbacher, Sepp, 5,551,653, Cl. 246-167.00R.

Schoeps, Jochen: *See*—
Witmann, Dieter; Schoeps, Jochen; Urbanneck, Bernd; Huff, Karl; Ott, Karl-Heinz; and Peters, Horst, 5,552,465, Cl. 524-139.000.

Scholar, Eric M.; and Iversen, Patrick L., to University of Nebraska, The Board of Regents of The. Phosphorothioate inhibitors of metastatic breast cancer. 5,552,390, Cl. 514-44.000.

Schoner, Brigitte E.: *See*—
Basinski, Margret B.; DiMarchi, Richard D.; Heath, William F., Jr.; and Schoner, Brigitte E., 5,552,523, Cl. 530-324.000.
Basinski, Margret B.; DiMarchi, Richard D.; Heath, William F., Jr.; and Schoner, Brigitte E., 5,552,524, Cl. 530-324.000.

Schönrock, Hans-Martin: *See*—
Klostermann, Peter; Schönrock, Hans-Martin; Schröter, Klaus; and Kutzner, Thomas, 5,552,184, Cl. 427-284.000.

Schoonhoven, Richard: *See*—
Obermanns, Sebastian; and Schoonhoven, Richard, 5,553,060, Cl. 370-16.000.

Schorr, Keith M.: *See*—
Isaacs, Claudia A.; and Schorr, Keith M., 5,551,395, Cl. 123-339.130.

Schrader, Gary E.; Montminy, Armand T.; and Franzini, John, to Burndy Corporation. Range enhancement for H-shaped compression connector. 5,552,564, Cl. 174-84.00C.

Schrantz, Gregory A.; Gaul, Stephen J.; and Linn, Jack H., to Harris Corporation. Die separation method for silicon on diamond circuit structures. 5,552,345, Cl. 437-227.000.

Schrey, Ulrich: *See*—
Fischer, Robert; Ilg, Johannes; Schneider, Christian; and Schrey, Ulrich, 5,552,641, Cl. 307-10.500.

Schriever, Matthias P., to Boeing Company, The. Non-chromated oxide coating for aluminum substrates. 5,551,994, Cl. 148-273.000.

Schröbel, Volker: *See*—
Donner, Arno; Gill, Norbert; Lange, Jürgen; Schröbel, Volker; and Schade, Rolf, 5,551,303, Cl. 73-726.000.

Schröder, Hans-Leander: *See*—
Schober, Manfred; and Schröder, Hans-Leander, 5,552,263, Cl. 430-306.000.

Schroeder, Wen Z.: *See*—
Smith, Michael J., Schroeder, Wen Z.; and Shanklin, Gary L., 5,552,020, Cl. 162-164.400.

Schröter, Klaus: *See*—
Klostermann, Peter; Schönrock, Hans-Martin; Schröter, Klaus; and Kutzner, Thomas, 5,552,184, Cl. 427-284.000.

Schrott, Alejandro G.; and von Gutfeld, Robert J., to International Business Machines Corporation. Multibit bimorph magnetic tags using acoustic or magnetic interrogation for identification of an object coupled thereto. 5,552,778, Cl. 340-825.340.

Schubert, Walter: *See*—
Vogt-Birnbrich, Bettina; Patzschke, Hans-Peter; Lenhard, Werner; and Schubert, Walter, 5,552,496, Cl. 525-440.000.

Schuchert, Eugene H.: *See*—
Bastawros, Adel F.; Speer, John G.; Deistler, Leo J.; and Schuchert, Eugene H., 5,552,235, Cl. 428-687.000.

Schuermann, Josef H., to Texas Instruments Deutschland GmbH. Integrated vehicle communications system. 5,552,789, Cl. 342-42.000.

Schuler, Ann M.; Fisher, Burl C., Jr.; and Overholser, Denys D., to Lockheed Corporation. Radar absorbing material and process for making same. 5,552,455, Cl. 523-137.000.

Schuler, Dale L.; and Lee, Jong-Sen, to United States of America, Navy. Measurement of topography using polarimetric synthetic aperture radar (SAR). 5,552,787, Cl. 342-25.000.

Schuler Pressen GmbH: *See*—
Hofele, Hans; Michael, Wolfgang; Strommer, Kurt; and Thudium, Karl, 5,551,275, Cl. 72-450.000.

Schuller International, Inc.: *See*—
Shamp, Donald E., 5,551,867, Cl. 431-154.000.

Schulte, Rolf: *See*—
Birkle, Siegfried; Kammermaier, Johann, deceased; and Schulte, Rolf, 5,552,027, Cl. 204-290.00F.

Schultz, Cynthia A. Collapsible binocular. 5,552,932, Cl. 359-480.000.

Schultz, Scott A.: *See*—
Williams, John R.; Schultz, Scott A.; and Lyons, Terry L., 5,551,851, Cl. 418-55.100.

Schulz, David A.: *See*—
Hecht, Daniel H.; and Schulz, David A., 5,552,008, Cl. 156-174.000.

Schuster, Oliver; Riel, Axel; and Seitz, Kurt, to KSB Aktiengesellschaft. Pump housing for rotary pumps. 5,551,839, Cl. 415-212.100.

Schutt, Donald. Tire cutting machine. 5,551,325, Cl. 83-133.000.

Schwartz, Andrew W.; Hayes, William K.; and Bettini, John E., to MacLean-Fogg Company. Vehicle suspension link. 5,551,722, Cl. 280-689.000.

Schwartz, Peter H., to Linear Technology Corporation. Synchronously rectified buck-flyback DC to DC power converter. 5,552,695, Cl. 323-271.000.

Schweikert, Wolfgang, to H. Krantz-TKT GmbH. Floor mounted air distribution outlet. 5,551,915, Cl. 454-290.000.

Schwirian, Richard E.; and van de Venne, Theo, to Westinghouse Electric Corporation. Pressurized water reactor vessel with slotted support columns. 5,553,107, Cl. 376-352.000.

Schy, Jeffrey H.: *See*—
Jezwinski, Scott D.; Weir, Alan T.; and Schy, Jeffrey H., 5,552,881, Cl. 356-73.100.

Scientific-Atlanta, Inc.: *See*—
Lowry, John D.; and Lucas, Keith, 5,553,141, Cl. 380-14.000.

Scimed Life Systems, Inc.: *See*—
Buscemi, Paul J.; Stejskal, Elizabeth A.; and Doyle, Erin S., 5,551,954, Cl. 623-1.000.

Scios Nova Inc.: *See*—
Kyle, Donald J.; and Mavunkel, Babu J., 5,552,383, Cl. 514-15.000.

Scope Products, Inc.: *See*—
Mariño, Richard P., 5,552,176, Cl. 426-641.000.

Scordamaglia, Raimondo: *See*—
Morini, Giampiero; Barino, Luisa; Scordamaglia, Raimondo; Barbassa, Elisabetta; and Baruzzi, Giovanni, 5,552,359, Cl. 502-123.000.

Scott, Carmen A.: *See*—
Pearson, Douglas L.; Orvik, Jon A.; Roth, Gary A.; Scott, Carmen A.; Leng, Ron B.; and Shiang, Dawn L., 5,552,546, Cl. 544-299.000.

Scott, David B., to Texas Instruments Incorporated. Power-down reference circuit for ECL gate circuitry. 5,552,724, Cl. 326-126.000.

Scott, Douglas C.: *See*—
Calton, Dean S.; Coellner, James A.; Heimann, Paul R.; and Scott, Douglas C., 5,551,245, Cl. 62-90.000.

Scott, Jeffrey B.: *See*—
Lim, Alexander I.; DeVos, Richard; and Scott, Jeffrey B., 5,551,508, Cl. 165-122.000.

Scott, Stuart K.: *See*—
Hall, Jon R.; Carpenter, Clint W.; and Scott, Stuart K., 5,552,458, Cl. 523-403.000.

Scott-Young, Robert E.: *See*—
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Kobayashi, Tomoyuki; Miyazaki, Kenji; and Nakamura, Masanori, 5,552,448, Cl. 521-154.000.
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Shimizu, Michio; Konuma, Toshimitsu; and Nishi, Takeshi, 5,552,913, Cl. 359-80.000.
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Toge, Tetsuya; Hirai, Toshihiro; Yoshimoto, Akihiro; and Yoshida, Kenichi, 5,552,389, Cl. 514-25.000.

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Sepetka, Ivan; Pham, Phong; That, Dai T.; and Nikolchev, Julian, to Conceptus, Inc. Guidewire-type device axially moveable by torque or axial force and methods for use thereof. 5,551,443, Cl. 128-772.000.

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Sanchez, Hector J.; Serio, John P.; and Tomory, Ronald S., 5,551,686, Cl. 271-298.000.

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Beck, Niels J.; Pena, James A.; Roach, Alan R.; and Johnston, Bevan H., 5,551,391, Cl. 123-305.000.

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Denstrom, Eric J., 5,552,746, Cl. 327-427.000.

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Tomasini, Luciano; Castello, Rinaldo; and Confalonieri, Pierangelo, 5,552,747, Cl. 327-536.000.
Walker, Christopher P. H.; and Thompson, Peter W., 5,553,067, Cl. 370-60.000.

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Waggener, William N., Jr.; and Shah, Nimish, 5,553,061, Cl. 370-17.000.

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Kempf, Dale J.; Norbeck, Daniel W.; Sham, Hing L.; Zhao, Chen; Sowin, Thomas J.; Reno, Daniel S.; and Haight, Anthony R., 5,552,558, Cl. 549-552.000.

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Lauck, Anthony G.; Shand, Ian M. C.; and Harper, John, 5,553,085, Cl. 371-37.100.

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Smith, Michael J.; Schroeder, Wen Z.; and Shanklin, Gary L., 5,552,020, Cl. 162-164.400.

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Sharma, Shanti S., to Martin Marietta Corporation. Three-dimensional multimodule HDI arrays with heat spreading. 5,552,633, Cl. 257-700.000.

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Conder, Jeff E.; and Woodberry, Meral B., 5,552,563, Cl. 174-35.00R.

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Hanano, Masaaki; and Nomura, Masaru, 5,553,040, Cl. 369-44.340.
Ishii, Yutaka; and Yamamoto, Yoshitaka, 5,552,840, Cl. 348-751.000.
Okano, Kiyoshi, 5,552,910, Cl. 359-60.000.
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Conder, Jeff E.; and Woodberry, Meral B., 5,552,563, Cl. 174-35.00R.

Shaw, Spencer: *See*—
Herbert, Victor D.; Shaw, Spencer; and Jayatilleke, Elizabeth, 5,552,268, Cl. 435-4.000.

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Anderson, Hugh G., Jr.; Shawn, Roy T.; and Currence, Elmer F., Jr., 5,551,796, Cl. 404-6.000.

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Gallaher, Dale M.; and Smith, Mark A., 5,551,801, Cl. 405-204.000.

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Spence, Bridget A.; Hoxmeier, Ronald J.; and Himes, Glenn R., 5,552,493, Cl. 525-314.000.
Stegemeier, George L.; Vinegar, Harold J.; and Carl, Frederick G., Jr., 5,553,189, Cl. 392-422.000.

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Rice, Peter C.; Franchitto, Anthony L.; and Shen, Jingming J., 5,551,400, Cl. 123-470.000.

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Brown, George T.; Coppola, Vincent M.; Goodman, Walter A.; Grebe, Frank V.; Hatton, Charles R.; Hermansen, David R.; Podmajersky, David J.; Reynolds, Dennis P.; Ritinski, Edward R.; Rizzi, Julian D.; Sherman, John H.; and Wormsbecher, Paul A., 5,552,957, Cl. 361-683.000.

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Brewer, Jonathan L.; Denham, Keith; and Sherry, Neil J., 5,551,816, Cl. 411-43.000.

Shi, Song Q. Organometallic complexes with built-in fluorescent dyes for use in light emitting devices. 5,552,547, Cl. 546-7.000.

Shia, George A.: *See*—
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Pearson, Douglas L.; Orvik, Jon A.; Roth, Gary A.; Scott, Carmen A.; Leng, Ron B.; and Shiang, Dawn L., 5,552,546, Cl. 544-299.000.

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Lin, Ying-wei; and Shiau, Jeng-Nan, 5,553,171, Cl. 382-299.000.

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Kashiwazaki, Akio; Sato, Hiroshi; Shirota, Katsuhiro; Yokoi, Hideto; and Shiba, Shoji, 5,552,192, Cl. 427-492.000.

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Yoshida, Sadato; Nakai, Hiroshi; Hoshiba, Akihiko; and Shibata, Yasuhiko, 5,551,385, Cl. 123-184.210.

Shibukawa, Takeo: *See*—
Nakada, Akira; Shibukawa, Takeo; Hinago, Yasuhiro; and Mishima, Junichi, 5,552,561, Cl. 84-658.000.

Shibuya, Yoshiyuki: *See*—
Arase, Takuya; Kamiya, Fumihiro; Tsuji, Masayuki; Ino, Tadashi; Kitamura, Ikuo; Shibuya, Yoshiyuki; and Daimon, Shigeo, 5,552,072, Cl. 252-62.51R.

Shieber, Stuart M.: *See*—
Marks, Joseph W.; Mazer, Murray S.; Ryall, Kathleen; and Shieber, Stuart M., 5,553,214, Cl. 395-141.000.

Shields, James E.: *See*—
DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Shields, James E.; and Smiley, David L., 5,552,522, Cl. 530-324.000.

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Shih, Stuart S., to Mobil Oil Corporation. Integrated process for increasing C_6 to C_8 aromatics content in reformate prepared from C_6- aromatics-containing feed. 5,552,033, Cl. 208-89.000.

Shihabi, David S.: *See*—
Chang, Clarence D.; Santiesteban, Jose G.; Shihabi, David S.; Stevenson, Scott A.; and Vartuli, James C., 5,552,128, Cl. 423-235.000.

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Nishibayashi, Yoshiki; Tomikawa, Tadashi; and Shikata, Shin-ichi, 5,552,613, Cl. 257-10.000.

Shima, Akihide: *See*—
Hirano, Toru; Monden, Kazumi; Hosokawa, Masumi; Imaki, Kazuhiro; and Shima, Akihide, 5,553,277, Cl. 395-600.000.

Shima, Mikio: *See*—
Kobomura, Kenji; Kimura, Hiromi; Osone, Hideo; Shima, Mikio; Hayashida, Michiya; and Tsuji, Nobuyuki, 5,552,214, Cl. 428-294.000.

Shimada, Hirokatsu: *See*—
Sekino, Hitoshi; Shimada, Hirokatsu; Takesue, Yasutsugu; Kawasaki, Akihiro; and Toda, Hiroshi, 5,552,867, Cl. 355-245.000.

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Uchikoga, Hiroshi; Zenda, Hiroki; and Shimamoto, Hajime, 5,552,800, Cl. 345-89.000.

Shimanaka, Shigeki: *See*—
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Kimura, Satoshi; Miyazaki, Hideki; Shimizu, Hiroto; Yamamoto, Kazuto; and Kato, Tsuyoshi, 5,553,172, Cl. 382-312.000.

Shimizu, Jun: *See*—
Kudo, Junichiro; and Shimizu, Jun, 5,552,098, Cl. 264-106.000.

Shimizu, Kazuo; Onoda, Motonobu; Tsuchiya, Takeji; and Watanabe, Tohru, to Nippon Piston Ring Co., Ltd. Method of making a magnetic material in the form of a multilayer film by plating. 5,552,030, Cl. 205-105.000.

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Hirano, Yoshiaki; Noshiro, Teruhito; and Shimizu, Takamoto, 5,552,943, Cl. 360-69.000.

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Yoshikura, Hiroshi; Shimizu, Yohko; Iwamoto, Aikichi; and Hijikata, Minako, 5,552,310, Cl. 435-235.100.

Shimizu, Yoshiteru: *See*—
Murakami, Susumu; Fukuda, Takuya; Shimizu, Yoshiteru; and Sugawara, Yoshitaka, 5,552,625, Cl. 257-409.000.

Shimoda, Junji, to Canon Kabushiki Kaisha. Ink jet apparatus including means for regulating an amount of ink and an amount of air in an ink tank relative to each other. 5,552,815, Cl. 347-85.000.

Shimokata, Akihiro: *See*—
Takada, Shinsaku; Fujimoto, Hisayoshi; Ishida, Nobuhisa; Ema, Yasushi; Amano, Toshio; and Shimokata, Akihiro, 5,552,813, Cl. 347-40.000.

Shimomura, Takeshi: *See*—
Oyama, Noboru; Yamaguchi, Shuichiro; Shimomura, Takeshi; and Miki, Keizaburo, 5,552,274, Cl. 435-6.000.

Shimoyama, Shuji; and Yanagizawa, Iwao, to Mitsuba Electric Mfg. Co., Ltd.; and Kunimitsu Carbon Industry Co., Ltd. Commutator with improved connection between carbon and metal segments. 5,552,652, Cl. 310-237.000.

Shinde, Subhash L.: *See*—
Casey, Jon A.; Cordero, Carla N.; Fasano, Benjamin V.; Goland, David B.; Hannon, Robert; Harris, Jonathan H.; Herron, Lester W.; Johnson, Gregory M.; Patel, Niranjan M.; Reitter, Andrew M.; Shinde, Subhash L.; Vallabhaneni, Rao V.; and Youngman, Robert A., 5,552,107, Cl. 419-13.000.
Casey, Jon A.; Cordero, Carla N.; Fasano, Benjamin V.; Goland, David B.; Hannon, Robert; Harris, Jonathan H.; Herron, Lester W.; Johnson, Gregory M.; Patel, Niranjan M.; Reitter, Andrew M.; Shipde, Subhash L.; Vallabhaneni, Rao V.; and Youngman, Robert A., 5,552,232, Cl. 428-547.000.

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Shinogle, Ronald D.: *See*—
Gibson, Dennis H.; Hefler, Gregory W.; Shinogle, Ronald D.; and Sommars, Mark F., 5,551,398, Cl. 123-446.000.

Shinohara, Kenji; and Kishi, Shigenobu, to Omron Corporation. Limit switch. 5,552,570, Cl. 200-47.000.

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Nemoto, Hisashi, 5,551,572, Cl. 206-725.000.

Shinozaki, Kengo; Wakabayashi, Kimihiro; Murakami, Hiroki; and Araki, Masaaki, to Fuji Xerox Co., Ltd. Apparatus for cutting plate-shaped brittle material. 5,551,618, Cl. 225-96.000.

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Ishii, Shigeru; Shinso, Yoshihide; Murata, Kosei; Shimanaka, Shigeki; Kurokawa, Shuji; Yamamoto, Hideharu; and Shiomori, Makoto, 5,551,932, Cl. 477-168.000.

Shiokama, Yoshiharu: *See*—
Watanabe, Tsuneo; and Shiokama, Yoshiharu, 5,552,847, Cl. 354-195.120.

Shiomi, Yutaka: *See*—
Miura, Yasuhiro; Shiomi, Yutaka; and Sunada, Mituaki, 5,551,297, Cl. 73-658.000.

Shiomori, Makoto: *See*—
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Lin, San-Yi; Shyu, Song-Gen; and Wu, Tong-Pei, 5,551,740, Cl. 292-338.000.

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Flake, Horst, 5,553,146, Cl. 380-48.000.
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Everingham, Gary; Cook, John E.; Perry, Paul D.; and Busato, Murray F., 5,551,406, Cl. 123-520.000.

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Trainor, John J.; Bellin, Michael A.; and Laplace, Carl J., Jr., 5,552,696, Cl. 323-275.000.

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Weng, Lee, 5,552,645, Cl. 307-117.000.

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Simon, Reimund: *See*—
Kraska, Ursula A.; Weikart, Udo; and Simon, Reimund, 5,552,261, Cl. 430-273.100.

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Crawford, William C., 5,551,551, Cl. 198-453.000.
Wilson, Quentin L.; and Dawson, George H., III, 5,551,554, Cl. 198-636.000.

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Roberts, Thomas D.; Muhlestein, Kerry D.; and Slemons, Greg T., 5,551,974, Cl. 106-271.000.

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Smart, David C., to Eastman Kodak Company. Detecting apparatus for finding a reference exposure made on a leading and/or trailing portion of a filmstrip. 5,552,855, Cl. 355-41.000.

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DiMarchi, Richard D.; Flora, David B.; Heath, William F., Jr.; Hoffmann, James A.; Shields, James E.; and Smiley, David L., 5,552,522, Cl. 530-324.000.

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Dougherty, Thomas J.; Smith, Debra L.; Roche, Ann L.; Thuerk, David A.; and Novak, David J., 5,552,642, Cl. 307-10.300.

Smith, Dee R.: *See*—
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Smith, Kevin P.: *See*—
Handelsman, Jo; Jacobson, Lynn M.; Johnson, David W.; Smith, Kevin P.; Goodman, Robert M.; and Stabb, Eric V., 5,552,138, Cl. 424-93.460.

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Smith, Patrick R.: *See*—
Reid, J. Gregory; Brodfuehrer, Paul R.; and Smith, Patrick R., 5,552,542, Cl. 540-217.000.

Smith, Sidney K., to Baker Hughes Incorporated. Running tool. 5,551,512, Cl. 166-212.000.

Smith, Stephen L.: *See*—
Buss, John M.; Dworkin, James D.; Lloyd, Scott E.; Pan, Shao W.; Smith, Stephen L.; and Wang, Shay-Ping T., 5,553,012, Cl. 364-722.000.

Smith, Thomas J.: *See*—
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Christensen, Siegfried B., IV, 5,552,438, Cl. 514-520.000.

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Camburn, Philip A., 5,552,175, Cl. 426-615.000.
King, Francis D.; Gaster, Laramie M.; and Wyman, Paul A., 5,552,398, Cl. 514-214.000.

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Greenlee, Russell L.; Alexander, James H.; Young, Emilie A.; and Smithrud, Gary M., 5,553,223, Cl. 395-155.000.

Smoker, Benjamin K.; Yoder, David J.; Smoker, Benuel F.; and Phillips, Frederick W., to Clean Burn, Inc. Preheater block for multi oil furnaces. 5,551,868, Cl. 431-208.000.

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Smollar, Marvin: *See*—
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Sellitto, Thomas A., 5,551,981, Cl. 118-621.000.

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Hild, Berghold, 5,551,276, Cl. 72-453.100.

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Mikic, Frank; and Hoff, Jeffrey H., 5,551,322, Cl. 81-186.000.

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Ogden, Andrew M.; Burkat, Alexander; Snoddy, Jon H.; and Fritz, Edward, 5,551,920, Cl. 472-59.000.

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Hock, Christopher; Snyder, Brian T.; Rink, Linda M.; and Letendre, Guy R., 5,551,343, Cl. 102-288.000.

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Pan, Shien-Tai; and So, Kimming, 5,553,253, Cl. 395-375.000.

So, Ying H.; Martin, Steven J.; Chau, Chieh-Chun; Wessling, Ritchie A.; Sen, Ashish; Kato, Katsuhiko; Roitman, Daniel B.; and Rochefort, Willie E., to Dow Chemical Company, The. Polybenzazole fibers having improved tensile strength retention. 5,552,221, Cl. 428-373.000.

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Bae, Young C.; Lim, Fredric J.; Ottoboni, Thomas B.; and Soane, David S., 5,551,663, Cl. 249-115.000.

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Goujard, Stéphane; Dupel, Pascal; Pailler, René; and Bourrat, Xavier, 5,552,220, Cl. 428-367.000.

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Collot, André C. F.; Ferte, Jean-Pierre; and Jolly, Roger, 5,551,623, Cl. 228-112.100.

Sofia, Michael J.: *See*—
Dillard, Robert D.; Sawyer, J. Scott; and Sofia, Michael J., 5,552,441, Cl. 514-569.000.

Sofy, Hugh M., to HMS Manufacturing Company. Tree stand. 5,551,659, Cl. 248-523.000.

Sogard, Michael R.; and Lee, Martin E., to Nikon Precision, Inc. Apparatus for measuring position of an X-Y stage. 5,552,888, Cl. 356-358.000.

Solem, Donald G. Hands-free fishing system. 5,551,183, Cl. 43-17.000.

Soliday, Patrick K.; Thomas, Gary W.; McGlaun, Monte A.; and Taylor, Michael J., to Cummins Power Generation, Inc. Method of making a stretched membrane mirror from film with anistropy properties. 5,552,006, Cl. 156-160.000.

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Solvay Interox (Societe Anonyme): *See*—
Devenyns, Johan, 5,552,018, Cl. 162-76.000.

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Harada, Takashi; Suzawa, Akira; and Motoki, Yoshihiro, 5,551,691, Cl. 473-323.000.

Someya, Akihiko, to Kabushiki Kaisha Toshiba. Image forming apparatus having means to register marker pens used for image editing. 5,552,900, Cl. 358-452.000.

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Sommer, Klaus: *See*—
Thurm, Siegfried; Sommer, Klaus; Bier, Peter; Elschner, Andreas; Kowitz, Manfred; and Sandquist, Axel, 5,552,226, Cl. 428-412.000.

Sompel, Mark A.; Clawson, William W.; and Hong, Jason, to Quantum Corporation. Multiple servo sector sets write with self-verification for disk drive. 5,553,086, Cl. 371-47.100.

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Goto, Teiyu; and Ogata, Hiroki, 5,551,693, Cl. 463-37.000.
Hirano, Yoshiaki; Noshiro, Teruhito; and Shimizu, Takamoto, 5,552,943, Cl. 360-69.000.
Horimai, Hideyoshi, 5,553,046, Cl. 369-58.000.
Iida, Koichi; and Yano, Michihisa, 5,552,663, Cl. 313-461.000.
Kageyama, Koji, 5,552,823, Cl. 348-155.000.
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Maeda, Yasuaki, 5,553,048, Cl. 369-60.000.
Nakao, Takashi, 5,553,049, Cl. 369-100.000.
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Sony Electronics, Inc.: *See*—
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Bourguignon, Michel; Berrah, Hañda; and Thöl, Christoph, 5,553,157, Cl. 382-131.000.

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Christensen, Thorkild; Balschmidt, Per; Sørensen, Hans; Olsen, Ole; and Thim, Lars, 5,552,385, Cl. 514-18.000.

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Beall, Gary W.; Tsipursky, Semeon; Sorokin, Anatoliy; and Goldman, Anatoliy, 5,552,469, Cl. 524-445.000.

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Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, 5,552,844, Cl. 354-106.000.

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Gorys, Vida; Soucy, François; Yoakim, Christiane; and Beaulieu, Pierre L., 5,552,405, Cl. 514-269.000.

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Sorscher, Eric J.; Parker, William B.; and Bennett, Leonard L., Jr., 5,552,311, Cl. 435-240.200.

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Weder, Donald E.; Straeter, Joseph G.; and Straeter, William F., 5,551,140, Cl. 29-450.000.

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Sowles, Kenneth L.: *See*—
Traylor, Daniel R.; and Sowles, Kenneth L., 5,552,795, Cl. 342-357.000.

Sparkomatic Corp.: *See*—
Freadman, Tommyca, 5,553,149, Cl. 381-24.000.

Sparks, Douglas R., to Delco Electronics Corporation. One-chip integrated sensor process. 5,552,336, Cl. 437-59.000.

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Barna, Eileen C.; Hamilton, Elizabeth M.; Lalli, Eric W.; Lubin, Cindy B.; Sparks, Wanda F.; and Waterland, Alfred F., III, 5,551,706, Cl. 277-229.000.

Spatola, Adelle. Hair repair kit. 5,551,455, Cl. 132-212.000.

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Spaulding, Darwin; Stanton, Andrew J.; and Fleury, Byron, 5,551,319, Cl. 81-9.220.

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Specialty Mfg. Co., The: *See*—
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Spectrospin AG: *See*—
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Speer, Andrew J., III: *See*—
Hoss, Gregg M.; Thompson, James E.; Johnson, Thomas F.; Kirbie, Martin; and Speer, Andrew J., III, 5,551,759, Cl. 298-22.00P.

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Speich, Gerald A., to Torrington Company, The. Vehicle steering columns. 5,551,727, Cl. 280-777.000.

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Engen, Robbyn L.; Spencer, Douglas S.; and Ford, Jeffrey E., 5,551,961, Cl. 51-298.000.

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Mueller, Winfried; Spengler, Reinhard; Grabowski, Sven; and Sanner, Axel, 5,552,159, Cl. 424-464.000.

Speros, James: *See*—
Svoma, Rodney; Speros, James; and Broadman, Gene A., 5,551,689, Cl. 273-73.00C.

Spiegel, Bill. Leak detector. 5,551,290, Cl. 73-311.000.

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Martin, David C.; Moore, Jeffrey S.; Markoski, Larry J.; Walker, Kenneth A.; and Spilman, Gary E., 5,552,508, Cl. 528-68.000.

Spindt, Christopher J.: *See*—
Macaulay, John M.; Spindt, Christopher J.; Corcoran, Patrick A.; and Veneklasen, Lee H., 5,552,659, Cl. 313-310.000.

SPM Corporation: *See*—
Prince, Jonathan, 5,552,934, Cl. 359-629.000.

Sport Carriers, Inc.: *See*—
Ray, Ralph D.; Ireland, Richard L.; and Apogee, Jon, 5,551,617, Cl. 224-321.000.

Sportniks, Inc.: *See*—
Cowgill, John H.; and Elroy, Charles W., Jr., 5,551,177, Cl. 40-610.000.

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Frigon, Richard J.; and Stronczek, Steven J., 5,551,232, Cl. 60-494.000.

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Hirschmann, Ralph F.; Nicolaou, Kyriacos C.; Pietranico, Sherrie, Reisine, T. R.; Salvino, Joseph M.; Sprengeler, Paul; and Strader, Catherine D., 5,552,534, Cl. 536-17.400.

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SPX Corporation: *See*—
Manz, Kenneth W.; Heisler, Allan F., II; Murray, Gary P.; Murray, Walter D.; and Olds, Daniel L., 5,551,247, Cl. 62-149.000.

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Staktek Corporation: *See*—
Burns, Carmen D., 5,552,963, Cl. 361-735.000.

Stallman, Pamela M.: *See*—
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Stamet, Inc.: *See*—
Hay, Andrew G., 5,551,553, Cl. 198-624.000.

Stancu, Petar: *See*—
Haines, Ralph; Heidelberger, Klaus; Lang, Brian; Mitchell, William D.; and Stancu, Petar, 5,551,355, Cl. 110-242.000.

Standardwerk Eugen Reia GmbH: *See*—
Rumbach, Karl F., 5,551,911, Cl. 453-3.000.

Standart 90: *See*—
Artemjev, Vladimir K.; and Garcia-Segovia, Amando J., 5,551,639, Cl. 241-5.000.

Stanford, Charles E.: *See*—
Frank, Steven N.; Belcher, James F.; Stanford, Charles E.; Owen, Robert A.; and Kyle, Robert J. S., 5,552,326, Cl. 437-3.000.

Stanford Telecommunications, Inc.: *See*—
Paff, Thomas M.; and Graham, Hatch, 5,553,064, Cl. 370-50.000.

Stanker, Larry H.; Sheffield, Cynthia L.; and DeLoach, John R., to United States of America, Agriculture. Monoclonal antibodies to bovine haptoglobin and methods for detecting serum haptoglobin levels. 5,552,295, Cl. 435-7.920.

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Fraschini, Franco; Stankov, Bojidar; Borgonovo, Margherita; Introini, Carlo; Laguzzi, Aldo; Duranti, Ermanno, deceased; and Moni, Maria T., heir, 5,552,428, Cl. 514-415.000.

Stanley-Bostitch, Inc.: *See*—
Vallee, Glenn E., 5,551,620, Cl. 227-8.000.
Vallee, Glenn E., 5,551,621, Cl. 227-8.000.

Stanley, David B. Decorative computer keyboard cover. 5,551,497, Cl. 150-154.000.

Stanley Electric Co., Ltd.: *See*—
Tanabe, Toru; Seki, Kazuhide; Hatsumi, Masaaki; and Shohara, Hiroshi, 5,552,700, Cl. 324-117.00H.

Stanley, Paul L. R.; and Watts, Christina M., to Eastman Kodak Company. Photographic material comprising a magenta dye image forming coupler combination. 5,552,266, Cl. 430-546.000.

Stanton, Andrew J.: *See*—
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Stants, Cynthia A.: *See*—
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Starburst Communications Corporation: *See*—
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Stark, Jacobus: *See*—
Noordam, Bertus; Stark, Jacobus; De Haan, Ben R.; and Tan, Hong Sheng, 5,552,151, Cl. 424-439.000.

Starnes, Dennis P.; Mason, John C.; and Thompson, Stephen M., to STM, Inc. Neck protecting device. 5,551,081, Cl. 2-2.000.

Stasenski, Michael S.: *See*—
Johnson, Dennis F.; Wiebe, Michael; Holowick, Erwin; Jacob, Nathan R.; Murphy, Michael F.; Schellenberg, James J.; and Stasenski, Michael S., 5,553,094, Cl. 375-200.000.

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Berger, Yossef, 5,551,655, Cl. 248-168.000.

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St. Aubin, Donald L.: *See*—
Taylor, Robert J.; Rehfuss, John W.; Borst, Joseph; Lessek, Paul; and St. Aubin, Donald L., 5,552,497, Cl. 525-456.000.

Stayer, Mark L., Jr.: *See*—
Lawson, David F.; Stayer, Mark L., Jr.; and Saffles, David, 5,552,473, Cl. 524-575.000.

Steen, Harald. Measuring chamber for flow cytometer. 5,552,885, Cl. 356-246.000.

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Stegemeier, George L.; Vinegar, Harold J.; and Carl, Frederick G., Jr., to Shell Oil Company. Radiant plate heater for treatment of contaminated surfaces. 5,553,189, Cl. 392-422.000.

Stehlin Foundation for Cancer Research, The: *See*—
Giovanella, Beppino C.; Hinz, Hellmuth R.; Kozielski, Anthony J.; and Stehlin, John S., 5,552,154, Cl. 424-449.000.

Stehlin, John S.: *See*—
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Steib, Helmut: *See*—
Brunnmair, Erwin; Bubik, Alfred; Hess, Harald; Holik, Herbert; Leitenberger, Werner; Merath, Thomas; Moser, Johann; Steib, Helmut; and Weisshuhn, Elmer, 5,551,164, Cl. 34-117.000.

Stein, Mark I.: *See*—
Griffin, Dennis B.; Stein, Mark I.; and Greis, Don F., 5,551,336, Cl. 100-53.000.

Steindorf, Hans-Joachim: *See*—
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Steiner, Dieter: *See*—
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Steiner, Walter. Sunshade. 5,551,465, Cl. 135-98.000.

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Buscemi, Paul J.; Stejskal, Elizabeth A.; and Doyle, Erin S., 5,551,954, Cl. 623-1.000.

Stempien, Joseph W.: *See*—
Webster, Ronald B.; Logan, David J.; Niland, Jay T.; Loos, William; and Stempien, Joseph W., 5,551,786, Cl. 400-616.300.

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Yingst, Thomas E.; Stensrud, Gerald J.; and Davis, Ronald S., 5,551,250, Cl. 62-234.000.

Stepp, Sharon. Shampoo shield. 5,551,088, Cl. 2-174.000.

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Steranko, Richard K.: *See*—
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Steris Corporation: *See*—
Malchesky, Paul S., 5,552,115, Cl. 422-28.000.

Sterling Winthrop Inc.: *See*—
Aldous, David J.; Bailey, Thomas R.; Diana, Guy D.; Nitz, Theodore J.; and Kuo, Gee-Hong, 5,552,420, Cl. 514-364.000.
Dolle, Roland E.; Chaturvedula, Prasad V.; Ross, Tina M.; and Schmidt, Stanley J., 5,552,400, Cl. 514-221.000.

Stern, David M.; Oz, Mehmet C.; Nowygrod, Roman; Koga, Shin; and Pinsky, David J., to Trustees of Columbia University in the City of New York, The. Solution for prolonged organ preservation. 5,552,267, Cl. 435-1.100.

Stern, E. George. End plate for railway crossties, scaffolding planks, and other wood products and methods of use. 5,551,819, Cl. 411-466.000.

Stern, Michael K.; and Cheng, Brian K.-M., to Monsanto Company. Process for preparing substituted aromatic azo compounds. 5,552,531, Cl. 534-588.000.

Sternberg, Jeffrey A.; Sun, King-Mo; Toji, Masuo; and Witterholt, Vincent, to Du Pont de Nemours, E. I., and Company. Imidazole and triazole carboxylates, and processes for preparing 2,4-oxazolidinediones. 5,552,554, Cl. 548-226.000.

Stetz, Steven A.: *See*—
Upton, William K., III; Schneider, William E.; Brown, Stuart H.; Stetz, Steven A.; Gotich, Emily J.; and McCrea, Jack L., 5,551,641, Cl. 241-46.170.

Stevens Institute of Technology, The Trustees of the: *See*—
Sebastian, Donald H., 5,552,995, Cl. 364-468.030.

Stevens, John K.: *See*—
Diamandis, Eleftherios; Dunn, James M.; and Stevens, John K., 5,552,283, Cl. 435-6.000.

Stevens, Rodney W.: *See*—
Ando, Akemi; and Stevens, Rodney W., 5,552,424, Cl. 514-378.000.

Stevenson, Sanford M. Method for treatment of waste water contaminated with cyanide ion. 5,552,062, Cl. 210-758.000.

Stevenson, Scott A.: *See*—
Chang, Clarence D.; Santiesteban, Jose G.; Shihabi, David S.; Stevenson, Scott A.; and Vartuli, James C., 5,552,128, Cl. 423-235.000.

Stewart, Craig; and Fredericks, Christopher W. A. Mobile decontamination and containment unit. 5,551,102, Cl. 4-612.000.

Stewart, David H.; and Lehner, Sheila C., to Crash Pads, Inc. Protective athletic pants having diagonal protect pads around hip, buttocks and thigh areas. 5,551,082, Cl. 2-2.000.

Stewart, Edward G.; Dower, William V.; Palazzotto, Michael C.; Wolk, Martin B.; and Manzara, Anthony P., to Minnesota Mining and Manufacturing Company. Thermal decomposition of azide-containing materials. 5,552,257, Cl. 430-201.000.

Stewart, J. Marcus: *See*—
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Stiefvater, Thomas L.: *See*—
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Stiley, Joseph F., III: *See*—
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Stimpson, Philip G.; and Hopkins, Andrew D., to Medix Limited. Nebuliser and nebuliser control system. 5,551,416, Cl. 128-200.160.

Sting, Donald W.; and Milosevic, Milan, to Sting, Donald W. Optical sensing with crystal assembly sensing tip. 5,552,604, Cl. 250-341.200.

Stites, John: *See*—
Beckley, Don A.; and Stites, John, 5,552,466, Cl. 524-265.000.

Stitt, Robert: *See*—
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St. John, James C.: *See*—
Loesch, Stanley B.; St. John, James C.; and Mints, Danny K., 5,551,242, Cl. 62-50.300.

St. Lawrence, Michael E.: *See*—
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STM, Inc.: *See*—
Starnes, Dennis P.; Mason, John C.; and Thompson, Stephen M., 5,551,081, Cl. 2-2.000.

St. Martin, Marty. Produce washer. 5,551,461, Cl. 134-111.000.

Stockburger, Hermann. Method and apparatus using ultrasonic and light waves for identification of test specimens. 5,551,295, Cl. 73-602.000.

Stockli, Rudolf. Process and apparatus for identifying coins. 5,551,542, Cl. 194-334.000.

Stokes, Burnham, to Martin Marietta Corporation. Bias and readout for multicolor quantum well detectors. 5,552,603, Cl. 250-338.400.

Stokes, Robert B.; Cushman, Jay D.; and Cushman, Drew, to TRW Inc. Low frequency mechanical resonator. 5,552,655, Cl. 310-330.000.

Stone, James L., to Tenneco Packaging. Recloseable container with press-bonded collar. 5,551,938, Cl. 493-96.000.

Storage Technology Corporation: *See*—
Konshak, Michael V.; and Horstman, Justus A. W., 5,551,139, Cl. 29-432.200.

Stowe, David W.: *See*—
Cryan, Colm V.; Stowe, David W.; and Parslow, Margaret M., 5,553,179, Cl. 385-43.000.

Stoyka, David S. Electronic system for detecting vehicle wheel theft. 5,552,759, Cl. 340-426.000.

Stracener, Steve W.: *See*—
Williamson, Mark E.; Newbrough, Jerry W.; Anderson, Robert L.; Castleberry, Jeffrey P.; Heim, Warren P.; and Stracener, Steve W., 5,551,850, Cl. 417-474.000.

Strader, Catherine D.: *See*—
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Straeter, Joseph G.: *See*—
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Straeter, William F.: *See*—
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Stragier, Marcel G.: *See*—
Zanzig, Jerald G.; Stragier, Marcel G.; and Pickrell, John W., 5,551,824, Cl. 414-408.000.

Straslicka, Bruce C.: *See*—
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Stratagene: *See*—
Greener, Alan L., 5,552,314, Cl. 435-252.330.

Stratton, Kenneth L., to Caterpillar Inc. Tilt rate compensation implement system and method. 5,551,518, Cl. 172-4.500.

Street, L. J.: *See*—
Matassa, V. G.; Street, L. J.; and Showell, G. A., 5,552,402, Cl. 514-233.500.

Stricker, Mildred L. Extra protection undergarment. 5,551,093, Cl. 2-406.000.

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Schmid, Wolfgang; Ricker, Werner; Stroetgen, Eckerhard; Kreiter, Csaba; and Seel, Ottmar, 5,552,686, Cl. 318-362.000.

Strommer, Kurt: *See*—
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Stronczek, Steven J.: *See*—
Frigon, Richard J.; and Stronczek, Steven J., 5,551,232, Cl. 60-494.000.

Struble, James E., to JS Research and Development, Inc. Hand-held gap and contour measuring gauge. 5,551,162, Cl. 33-548.000.

Strupczewksi, Joseph T.; and Bordeau, Kenneth J., to Hoechst-Roussel Pharmaceuticals, Inc. 1-(1H-indolyloxyalkyl)-4-(heteroaryl) piperidines and related compounds useful as antipsychotics and analgesics. 5,552,414, Cl. 514-322.000.

Strusch, Wolfgang: *See*—
Bauer, Lothar; Lemme, Werner; Rechberg, Reinhard; Strusch, Wolfgang; Fuchs, Heinz W.; and Wahnschaffe, Jürgen, 5,551,382, Cl. 123-41.82R.

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Stulc, Leonard J.: *See*—
Vogel, Dennis E.; and Stulc, Leonard J., 5,552,260, Cl. 430-270.100.

Sturdivant, Rick L.; and Quan, Clifton, to Hughes Aircraft Company. Microwave vertical interconnect through circuit with compressible conductor. 5,552,752, Cl. 333-243.000.

Sturla, Jean-Michel, to L'Oreal. Process for the temporary reshaping of keratinous fibres. 5,551,453, Cl. 132-206.000.

Su, Ming-Chang; and Chang, Jenn-Liang, to Macronix International Co., Ltd. Automatic configuration of multiple peripheral interface subsystems in a computer system. 5,553,245, Cl. 395-284.000.

Su, Yin-Jia, to Applied Materials, Inc. Stationary focus ring for plasma reactor. 5,552,124, Cl. 156-345.000.

Komada, Hideki; Muramatsu, Takahiro; and Yamamoto, Yuji, 5,551,401, Cl. 123-472.000.

Maruoka, Kiyoto; Horiuchi, Kuniyasu; and Yabuki, Yoshikazu, 5,552,190, Cl. 427-457.000.

Suzuki, Norio; and Tachibana, Yousuke, 5,551,396, Cl. 123-399.000.

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Su, Yin-Jia, to Applied Materials, Inc. Stationary focus ring for plasma reactor. 5,552,124, Cl. 156-345.000.
Su, Yung-Sen. Multi-purpose cooker for steaming, drying or boiling foodstuffs. 5,552,577, Cl. 219-401.000.
Sublett, Bobby J., to Eastman Chemical Company. Thermoplastic copolyesters having improved gas barrier properties. 5,552,512, Cl. 528-308.000.
Sudau, Jörg, to Fichtel & Sachs AG. Torsional vibration damper with a planetary gearset. 5,551,928, Cl. 475-347.000.
Sudol, Wojtek: *See*—
  Cartier, Paul; Sudol, Wojtek; and Vogel, Gregory G., 5,552,565, Cl. 174-117.00F.
Suezaki, Minoru: *See*—
  Sugimoto, Toshiya; Suezaki, Minoru; Shitiri, Tokushige; and Maruyama, Kouji, 5,552,216, Cl. 428-328.000.
Sugama, Nobuyoshi: *See*—
  Tanaka, Shunji; Umeno, Hidenori; Sugama, Nobuyoshi; and Sato, Masaru, 5,553,291, Cl. 395-700.000.
Sugawara, Saburo, to Canon Kabushiki Kaisha. Projection device for projecting an original image onto a screen. 5,552,938, Cl. 359-691.000.
Sugawara, Yoshitaka: *See*—
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Sugaya, Yuji: *See*—
  Okawa, Akira; and Sugaya, Yuji, 5,551,789, Cl. 401-199.000.
Sugg, Rolin W.: *See*—
  Moysan, Stephen R., III; and Sugg, Rolin W., 5,552,233, Cl. 428-627.000.
Sugihara, Kazuyuki: *See*—
  Ishikawa, Tomoji; Sugihara, Kazuyuki; and Kosuge, Katsuhiro, 5,552,877, Cl. 355-326.00R.
Sugimori, Mikihiro: *See*—
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Sugimoto, Toshiya; Suezaki, Minoru; Shitiri, Tokushige; and Maruyama, Kouji, to Sekisui Chemical Co., Ltd. Electrically conductive composition. 5,552,216, Cl. 428-328.000.
Sugita, Yasuhisa; Kitazawa, Naoki; and Hotta, Hiroshi, to Idemitsu Petrochemical Co., Ltd.; and Dai-ichi Kogyo Seiyaku Co., Ltd. Thermoplastic resin composition. 5,552,480, Cl. 525-64.000.
Sugiura, Keiichi, to Nihon Kohden Corporation. Pulse oximeter probe. 5,551,423, Cl. 128-633.000.
Sugiyama, Hisataka; Maeda, Takeshi; Ide, Hiroshi; Shigematsu, Kazuo; and Ito, Masaru, to Hitachi, Ltd. Increased intensity optical recording medium with adjacent grooves of different optical depth and a method and apparatus for reproducing the same. 5,553,051, Cl. 369-109.000.
Sugiyama, Nobuo; and Kawamura, Kiyoshi, to Yamaha Corporation. Keyboard musical instrument equipped with hammer sensors changing position between recording mode and silent mode. 5,552,559, Cl. 84-171.000.
Sugiyama, Toshihiro: *See*—
  Murakami, Eisaku; Yuasa, Kazuhiro; Endoh, Shuichi; Matsumae, Iwao; Tanaka, Yoshiaki; Hosokawa, Hiroshi; Uno, Mugijiroh; Saitoh, Hiroshi; Takenaka, Eiji; Sugiyama, Toshihiro; Yamanaka, Tetsuo; and Komatsubara, Satoru, 5,552,870, Cl. 355-259.000.
Suhadolnik, Joseph; Ravichandran, Ramanathan; Borzatta, Valerio; and Vignali, Graziano, to Ciba-Geigy Corporation. Polymer stabilizers containing both hindered amine and hydroxylamine moieties. 5,552,464, Cl. 524-99.000.
Suizu, Katsuto, to Kabushiki Kaisha Toshiba. Apparatus for tuning offset signals by controlling a tuner based on a difference in frequency of signals tuned by that tuner. 5,552,838, Cl. 348-735.000.
Suller, Attila; and Tóth, Árpád. Enviromentally safe cutting mechanism for stalks or stems of plants and/or grass like vegetation. 5,551,220, Cl. 56-11.900.
Sullivan, Lawrence B.: *See*—
  Henderson, Gerald J.; Johnson, Peter C., and Sullivan, Lawrence B., 5,551,881, Cl. 434-299.000.
Sulzer-Escher Wyss GmbH: *See*—
  Dahl, Hans, 5,551,171, Cl. 34-625.000.
Sulzyc, George; and Venghaus, Horst, to Grau GmbH. Connection assembly for the connection of a pipe to a plastic housing. 5,551,734, Cl. 285-174.000.
Suminoe Orimono Kabushiki Kaisha. *See*—
  Kajikawa, Teruo; Ganno, Yasuhiko; Takeda, Junichi; and Yonezawa, Syuichi, 5,552,010, Cl. 156-231.000.
Sumitomo Chemical Company, Limited: *See*—
  Kakimizu, Akiko; Arai, Kenji; Kimura, Norio; and Teramae, Tomohiro, 5,552,423, Cl. 514-372.000.
  Miura, Yasuhiro; Shiomi, Yutaka; and Sunada, Mituaki, 5,551,297, Cl. 73-658.000.
Sumitomo Electric Industries, Ltd.: *See*—
  Hirose, Chisai; Kanamori, Hiroo; Urano, Akira; Ishikawa, Shinji, Aikawa, Haruhiko; and Saito, Masahide, 5,551,966, Cl. 65-377.000.
  Kato, Takeshi; and Sato, Kenichi, 5,552,376, Cl. 505-433.000.
  Nishibayashi, Yoshiki; Tomikawa, Tadashi; and Shikata, Shin-ichi, 5,552,613, Cl. 257-10.000.
  Tanaka, So; and Ilyama, Michitomo, 5,552,374, Cl. 505-193.000.
Sumitomo Heavy Industries, Ltd.: *See*—
  Hiraoka, Kazuo, 5,552,690, Cl. 318-632.000.
Sumitomo Rubber Industries, Ltd.: *See*—
  Jones, David, 5,552,760, Cl. 340-444.000.
  Komatsuki, Masato, 5,551,498, Cl. 152-527.000.
  Maruoka, Kiyoto; Horiuchi, Kuniyasu; and Yabuki, Yoshikazu, 5,552,190, Cl. 427-457.000.
Sumitomo Sitix Corporation: *See*—
  Akashi, Yoshihiro; Takiuchi, Kaoru; and Okamoto, Setsuo, 5,551,978, Cl. 117-222.000.
Sumitomo Wiring Systems, Ltd.: *See*—
  Nakamura, Masayoshi, 5,551,589, Cl. 220-326.000.
  Nankoh, Yuichi; and Kawase, Hajime, 5,551,887, Cl. 439-188.000.
Summers, Richard: *See*—
  Walters, William; and Summers, Richard, 5,551,346, Cl. 102-476.000.
Summit Valley Equipment and Engineering: *See*—
  Gale, Charles O., 5,551,870, Cl. 432-115.000.
Sun Chemical Corporation: *See*—
  Huang, Jen-chi; and Bourgeois, Daniel M., 5,551,585, Cl. 216-11.000.
  Reiter, Ralph H.; and Patel, Narendra M., 5,552,467, Cl. 524-270.000.
Sun, King-Mo: *See*—
  Sternberg, Jeffrey A.; Sun, King-Mo; Toji, Masuo; and Witterholt, Vincent, 5,552,554, Cl. 548-226.000.
Sun Microsystems, Inc.: *See*—
  Forrest, Craig S.; and Frank, Edward H., 5,553,296, Cl. 395-750.000.
Sun, Shih W.: *See*—
  Tseng, Hsing-Huang; Tobin, Philip J.; Tsui, Paul G. Y.; Sun, Shih W.; and Poon, Stephen S., 5,552,332, Cl. 437-41.000.
Sunada, Mituaki: *See*—
  Miura, Yasuhiro; Shiomi, Yutaka; and Sunada, Mituaki, 5,551,297, Cl. 73-658.000.
Sund, Lloyd P. Replaceable pick-up tooth assembly for crop pick-up. 5,551,221, Cl. 56-400.000.
Sundararaman, Padmanabhan; Ambrose, Ronald R.; Camp, Douglas R.; and Wilt, Truman F., to PPG Industries, Inc. Waterborne polyesters having improved saponification resistance. 5,552,475, Cl. 524-608.000.
Sundstrand Corporation: *See*—
  Baehler, Thomas W.; Vanderzyden, Henry R.; and Baker, Kenneth N., 5,552,040, Cl. 210-168.000.
  Kramer, Kenneth C.; and Baker, Roy S., 5,552,952, Cl. 361-86.000.
Supcoe, Robert F.; Felsen, Ira M.; and Donahue, William T., to United States of America, Navy. Drag reducing rapid solvating slurry concentrate and preparation. 5,552,456, Cl. 523-175.000.
Supelco, Inc.: *See*—
  Liu, Francis P., 5,552,324, Cl. 436-132.000.
Super Sagless Corporation: *See*—
  Hartline, Michael F., 5,551,104, Cl. 5-13.000.
Surjadi, Iwan: *See*—
  Entenmann, Robert H.; Unland, Stefan; Philipp, Matthias; Haeming, Werner; Surjadi, Iwan; Rothhaar, Ulrich; and Baeuerle, Michael, 5,551,235, Cl. 60-602.000.
Surles, Billy W.; and McKinzie, Howard L., to Texaco Inc. Prepacked screen. 5,551,513, Cl. 166-278.000.
Surma, Terrance J.: *See*—
  Leyden, Roger J.; and Surma, Terrance J., 5,552,771, Cl. 340-568.000.
Sutherland, Hunt A.: *See*—
  Weir, Michael P.; and Sutherland, Hunt A., 5,552,712, Cl. 324-537.000.
Sutherland, Robert L., to Riverwood International Corporation. Wrap-around carrier with bar code blocking end panels. 5,551,556, Cl. 206-147.000.
Sutherland, Robert L., to Riverwood International Corporation. Can clip carrier. 5,551,566, Cl. 206-427.000.
Sutterlin, Philip H.: *See*—
  Downey, Walter J.; Sutterlin, Philip H.; Hurlbut, Amy O.; Stewart, J. Marcus; Chui, Benjamin W.; and Dolin, Robert A., Jr., 5,553,081, Cl. 371-6.000.
Sutton, Jeffrey A.; and Tebbutt, Iain J., to British Gas plc. Electrical power generating arrangement with computer control for varying engine speed as a function of load demand. 5,552,640, Cl. 290-40.00B.
Suzawa, Akira: *See*—
  Harada, Takashi; Suzawa, Akira; and Motoki, Yoshihiro, 5,551,691, Cl. 473-323.000.
Suzuki, Akira: *See*—
  Yabe, Hisao; Iida, Yoshihiro; Suzuki, Akira; Ito, Hideo; Tashiro, Yoshio; Yamazaki, Minoru; and Tamada, Osamu, 5,551,945, Cl. 600-122.000.
Suzuki, Hiromi, to NEC Corporation. Shared bus mediation system for multiprocessor system. 5,553,246, Cl. 395-287.000.
Suzuki, Hiroyuki; Yokoyama, Yoichi; and Okamoto, Toshifumi, to Hitachi, Ltd.; and Hitachi Software Engineering Co. Method and system for manipulation of database and issuing report thereof. 5,553,278, Cl. 395-600.000.
Suzuki, Keiichiro: *See*—
  Ichii, Tomoko; Suzuki, Keiichiro; and Okumiya, Masataro, 5,552,349, Cl. 501-9.000.
Suzuki, Keitaro: *See*—
  Watanabe, Yoshitane; Suzuki, Keitaro; Koyama, Yoshinari; and Iijima, Motoko, 5,552,083, Cl. 252-309.000.
Suzuki, Masanori: *See*—
  Takemoto, Takatoshi; Chida, Tosikazu; Kano, Noriaki; Ito, Eizi; Murakami, Koji; Itagaki, Takasi; Sekimoto, Kozo; and Suzuki, Masanori, 5,551,912, Cl. 453-56.000.
Suzuki, Masashi: *See*—
  Mizohata, Tadashi, and Suzuki, Maseshi, 5,552,660, Cl. 313-341.000.
Suzuki, Motofumi: *See*—
  Uenoyama, Hirofumi; Ao, Kenichi; Suzuki, Yasutoshi; Yoshino, Yoshimi; and Suzuki, Motofumi, 5,551,586, Cl. 216-22.000.
Suzuki Motor Corporation: *See*—

  Komada, Hideki; Muramatsu, Takahiro; and Yamamoto, Yuji, 5,551,401, Cl. 123-472.000.
Suzuki, Norio; and Tachibana, Yousuke, to Honda Giken Kogyo Kabushiki Kaisha. Device for coping with sensor abnormal state in electronic control system for internal combustion engine. 5,551,396, Cl. 123-399.000.
Suzuki, Tadashi: *See*—
  Ujiie, Souhei; and Suzuki, Tadashi, 5,552,858, Cl. 355-202.000.
Suzuki, Takashi: *See*—
  Onisawa, Kenichi; Suzuki, Takashi; Ando, Masahiko; Ota, Masuyuki; Kaneko, Toshiki; and Minemura, Tetsuro, 5,552,909, Cl. 359-59.000.
Suzuki, Takayuki; and Obata, Atsuomi, to Hino Jidosha Kogyo Kabushiki Kaisha. Apparatus for storing energy generated during breaking of a vehicle and for providing energy to the internal combustion engine of the vehicle at other times. 5,552,681, Cl. 318-139.000.
Suzuki, Yasutoshi: *See*—
  Uenoyama, Hirofumi; Ao, Kenichi; Suzuki, Yasutoshi; Yoshino, Yoshimi; and Suzuki, Motofumi, 5,551,586, Cl. 216-22.000.
Suzuki, Yasuyuki: *See*—
  Iba, Hideki; Maeda, Chikatoshi; Takeuchi, Tadashi; and Suzuki, Yasuyuki, 5,552,110, Cl. 420-406.000.
Suzuki, Yoshiaki: *See*—
  Nanno, Nobuyuki; Akashi, Kazuo; Ando, Makoto; Takeguchi, K ōuichirou; Yamanaka, Yuji; Saito, Toshimitsu; Oka, Mayumi; Ootake, Atsuhiro; Mason, James; and Suzuki, Yoshiaki, 5,553,294, Cl. 395-750.000.
Suzuki, Yoshinori; Tsujimoto, Tadahiro; and Fujisaki, Satoru, to Fuji Photo Film Co., Ltd. Method and apparatus for high speed, thin layer coating. 5,552,188, Cl. 427-402.000.
Svoma, Rodney; Speros, James; and Broadman, Gene A., to Athletic Alternatives Inc. String suspension and frame construction for sports rackets. 5,551,689, Cl. 273-73.00C.
Swan, Jimmy G.: *See*—
  McBrayer, Roy N., Jr.; Swan, Jimmy G.; and Barber, John S., 5,551,472, Cl. 137-114.000.
Sweeney, Michael: *See*—
  Lurie, Keith G.; Sweeney, Michael; and Gold, Barbara, 5,551,420, Cl. 128-205.130.
Swiezbin, Joseph R.: *See*—
  Miller, John D.; Williamson, Kenneth M.; and Swiezbin, Joseph R., 5,552,048, Cl. 210-489.000.
Swift-Eckrich, Inc.: *See*—
  Singh, Prem S.; and Trujillo, William A., 5,552,173, Cl. 426-417.000.
Swift, Graham: *See*—
  Adler, David E.; Freeman, Michael B.; Lipovsky, James M.; Paik, Yi H.; Shulman, Jan E.; and Swift, Graham, 5,552,514, Cl. 528-328.000.
Swinhart, Philip: *See*—
  Markey, Dennis P.; Pietranton, Joe; Nagy, Nick; Garton, Rick; Swinhart, Philip; Rensberger, Ron; and Herbst, Walter, 5,551,371, Cl. 119-499.000.
Symbol Technologies, Inc.: *See*—
  Dvorkis, Paul; Tsi, David; and Shepard, Howard, 5,552,592, Cl. 235-462.000.
Symmons, David: *See*—
  Maute, Robert E.; Thompson, Laird B.; Bednarczyk, Adam; and Symmons, David, 5,551,287, Cl. 73-152.020.
Synectics Medical, Inc.: *See*—
  Essen-Moller, Anders, 5,551,425, Cl. 128-635.000.
Synthelabo: *See*—
  Galtier, Daniel; and Lassalle, Gilbert, 5,552,410, Cl. 514-311.000.
System Testing Materials Ltd.: *See*—
  Taran, Vladimir, 5,551,296, Cl. 73-628.000.
Systems Analysis and Integration, Inc.: *See*—
  Tinkham, Ronald B., 5,552,647, Cl. 307-119.000.
Szafranski, Pierre: *See*—
  Renaud-Goud, Gilles; Szafranski, Pierre; and Merino, Jean-Francois, 5,551,721, Cl. 280-605.000.
Szaroletta, William K.: *See*—
  Wade, Jack; Szaroletta, William K.; and Madden, Thomas R., 5,552,776, Cl. 340-825.310.
Szczesny, Ronald W.: *See*—
  Josephs, Harold; and Szczesny, Ronald W., 5,551,866, Cl. 431-153.000.
Szott, Michael J.: *See*—
  Chen, Colin; Madison, Keith; and Szott, Michael J., 5,551,705, Cl. 277-206.00A.
Szymanowski, Richard A.: *See*—
  Peterson, John P.; Szymanowski, Richard A.; and Fox, Randal T., 5,552,567, Cl. 174-261.000.
T Cell Sciences, Inc.: *See*—
  Makrides, Savvas C.; and Kung, Patrick C., 5,552,300, Cl. 435-69.100.
T&N Technology Limited: *See*—
  Slee, Roger H., 5,551,388, Cl. 123-193.600.
Tabayama, Masashi; Tabuchi, Yasuo; and Ohguchi, Junichi, to Nippondenso Co., Ltd. Electromagnetic clutch. 5,551,546, Cl. 192-84.960.
Tabuchi, Yasuo: *See*—
  Tabayama, Masashi; Tabuchi, Yasuo; and Ohguchi, Junichi, 5,551,546, Cl. 192-84.960.
Tachibana, Shinichi, to Canon Kabushiki Kaisha. Magneto-optical recording-reproducing system in which a magnetic head bottom surface roughness is related to a recording medium protective film surface roughness. 5,553,037, Cl. 369-13.000.
Tachibana, Yousuke: *See*—
  Suzuki, Norio; and Tachibana, Yousuke, 5,551,396, Cl. 123-399.000.
Tadlock, Charles C.: *See*—
  Cioca, Gheorghe; Anderson, Jon E.; Cohen, Isaac D.; Tadlock, Charles C.; and Bevacqua, Andrew J., 5,552,135, Cl. 424-59.000.
Tadokoro, Hideo: *See*—
  Kakibayashi, Hiroshi; Mitsui, Yasuhiro; Tadokoro, Hideo; Kuroda, Katsuhiro; Koguchi, Masanari; Tsuji, Kazutaka; Makishima, Tatsuo; Ichihashi, Mikio: and Isakozawa, Shigeto, 5,552,602, Cl. 250-311.000.
Taguchi, Kazuhiro: *See*—
  Yamada, Yoshihiko; and Taguchi, Kazuhiro, 5,551,350, Cl. 104-293.000.
Taguchi, Masao, to Fujitsu Limited. Dynamic random access memory wherein timing of completion of data reading is advanced. 5,553,032, Cl. 365-230.030.
Tai, Chiao Y.; Chen, Yung L.; and Huang, Chun-Yi, to United Microelectronics Corp. Voltage supply system for IC chips. 5,552,698, Cl. 323-313.000.
Taira, Hiroaki; Iha, Michiaki; and Takagi, Hiroshi, to Murata Manufacturing Co., Ltd. Solid oxide fuel cell and manufacturing method thereof. 5,551,955, Cl. 29-623.300.
Taira, Yoichi: *See*—
  Owa, Soichi; and Taira, Yoichi, 5,552,926, Cl. 359-326.000.
Tait, David S., to Zenith Electronics Corporation. Audio recovery from scrambled video in a cable compatible television receiver. 5,553,142, Cl. 380-19.000.
Taiwan Semiconductor Manufacturing Company: *See*—
  Hsieh, Shih-Huang, 5,552,339, Cl. 437-190.000.
  Hsu, Iman, 5,552,343, Cl. 437-195.000.
  Huang, Yuan-Chang; and Wang, Chin-Kun, 5,552,346, Cl. 437-228.000.
  Jang, Syun-Ming; and Yu, Chen-Hua, 5,552,017, Cl. 156-643.100.
  Jang, Syun-Ming; and Yu, Chen-Hua D., 5,552,344, Cl. 437-195.000.
Takada, Shinsaku; Fujimoto, Hisayoshi; Ishida, Nobuhisa; Ema, Yasushi; Amano, Toshio; and Shimokata, Akihiro, to Rohm Co., Ltd. Ink jet head with nozzle arrangement to reduce viscous drag. 5,552,813, Cl. 347-40.000.
Takagi, Hiroshi: *See*—
  Taira, Hiroaki; Iha, Michiaki; and Takagi, Hiroshi, 5,551,955, Cl. 29-623.300.
Takagi, Masanori: *See*—
  Wada, Shunichi; and Takagi, Masanori, 5,552,684, Cl. 318-293.000.
Takagi, Nobukazu: *See*—
  Saito, Susumu; Takagi, Nobukazu; Harada, Kiyohiro; Kazahaya, Yukio; Kuchiki, Seiji; Ishikawa, Masakuni; and Nakajima, Nobuyuki, 5,551,852, Cl. 418-98.000.
Takahashi, Atsuhisa: *See*—
  Aso, Yasuhiro; Takahashi, Atsuhisa; Kakuma, Satoshi; and Uchida, Yoshihiro, 5,553,068, Cl. 370-60.000.
Takahashi, Hironori; Aoshima, Shinichiro; Hirano, Isuke; and Tsuchiya, Yutaka, to Hamamatsu Photonics K.K. Method of positioning an electrooptic probe of an apparatus for the measurement of voltage. 5,552,716, Cl. 324-753.000.
Takahashi, Ichirou, to Japan Process Engineering Ltd. Apparatus for separating and removing a dangerous substance from an exhaust gas. 5,551,965, Cl. 55-228.000.
Takahashi, Keiji: *See*—
  Yokota, Hiroshi; and Takahashi, Keiji, 5,552,116, Cl. 422-63.000.
Takahashi, Kouichi: *See*—
  Kato, Tetsuya; Takahashi, Kouichi; Kohara, Hidekatsu; and Nakayama, Toshimasa, 5,552,255, Cl. 430-165.000.
Takahashi, Shinya: *See*—
  Nagao, Masaki; Takahashi, Shinya; Koiwai, Tamotsu; and Kobayashi, Yoshito, 5,552,845, Cl. 354-159.000.
Takahashi, Tetsuhiko; Takeuchi, Hiroyuki; and Matsunaga, Yoshikuni, to Hitachi Medical Corporation. RF probe which can vary distance between receiving coils which face each other. 5,552,707, Cl. 324-318.000.
Takaike, Eiji, to Fujitsu Limited. Magnetic disk having a protective layer of sputtered particles of two differently controlled grain sizes. 5,552,203, Cl. 428-65.500.
Takaku, Masato: *See*—
  Iwamoto, Mune; Nakajima, Akihiko; Takaku, Masato; Morita, Hisao; Ando, Toshihiko; Shirafuji, Tomofumi; and Uchida, Mutsuko, 5,552,494, Cl. 525-316.000.
Takamiya, Makoto; Kadowaki, Hidejiro; Ishida, Yasuhiko; Ashiwa, Jun; Kato, Shigeki; and Ueda, Shinji, to Canon Kabushiki Kaisha. Doppler velocimeter. 5,552,879, Cl. 356-28.500.
Takano, Hideaki: *See*—
  Tomiku, Yasushi; Takano, Hideaki; and Bando, Yoshichika, 5,552,073, Cl. 252-62.550.
Takano, Manabu: *See*—
  Abe, Atsuyoshi; Ohtsuka, Yasumasa; Tomoyuki, Yohji; Takano, Manabu; Fukuzawa, Daizo; and Ogawa, Kenichi, 5,552,582, Cl. 219-619.000.
  Ohtsuka, Yasumasa; Tomoyuki, Yohji; Hayakawa, Akira; Takano, Manabu; Fukuzawa, Daizo; and Abe, Atsuyoshi, 5,552,874, Cl. 355-285.000.
Takano, Osamu; and Matsumi, Koji, to OKI Electric Industry Co., Ltd. Fabrication process for a semiconductor pressure sensor for sensing pressure applied thereto. 5,552,347, Cl. 437-228.000.
Takano, Ryouzi: *See*—
  Kato, Yoshiharu; Takano, Ryouzi; Nara, Takashi; Hatano, Takashi; and Morita, Yoshio, 5,553,066, Cl. 370-58.100.

Takano, Shigeru: *See*—
  Henmi, Hidemi; Takano, Shigeru; Nakahigashi, Hideto; and Sakamoto, Ken, 5,552,832, Cl. 348-469.000.
Papenberg, Robert L.; Yang, Runchan D.; Wotring, David H.; Rydhan, Mohammad F.; Voloshin, Paul; and Talaat, Mohamed M., 5,553,231, Cl. 395-182.030.

Tanbakuchi, Hassan, to Hewlett-Packard Company. Routing YIG-tuned mixer. 5,553,319, Cl. 455-326.000.
Tang, Ching W.; and Van Slyke, Steven A., to Eastman Kodak Company. AC
TCSI Corporation: *See*—
  Behtash, Saman; Flores, Christopher; and Ghanem, Adel, 5,553,076, Cl. 370-95.300.

Takano, Shigeru: *See*—
Henmi, Hidemi; Takano, Shigeru; Nakahigashi, Hideto; and Sakamoto, Ken, 5,552,833, Cl. 348-460.000.

Takao, Hideaki: *See*—
Asaoka, Masanobu; Takao, Hideaki; Togano, Takeshi; and Kojima, Makoto, 5,552,193, Cl. 428-1.000.

Takashi, Terumi; Hirano, Akihiko; Iwabuchi, Kazunori; Yamakawa, Hideyuki; Ishida, Yoshiteru; Shiraishi, Kazuhisa; and Ashikawa, Kazutoshi, to Hitachi, Ltd. Information recording/reproducing apparatus having a clock timing extraction circuit for extracting a clock signal from an input data signal. 5,553,104, Cl. 375-373.000.

Takashi, Terumi: *See*—
Furuhashi, Tsutomu; Mano, Hiroyuki; Takashi, Terumi; Nishioka, Kiyokazu; and Futami, Toshio, 5,552,801, Cl. 345-100.000.

Takashima, Tomoko; Iimuro, Shigeru; and Kitamura, Takashi, to Mitsui Toatsu Chemicals, Inc. Phenolic resin compositions derived from bisphenol compounds and their condensates. 5,552,509, Cl. 528-129.000.

Takatori, Sunao; Kumagai, Ryohei; Matsumoto, Koji; and Yamamoto, Makoto, to Yozan, Inc.; and Sharp Corporation. Method for processing data using a neural network having a number of layers equal to an abstraction degree of the pattern to be processed. 5,553,196, Cl. 395-24.000.

Takayama, Chitoshi: *See*—
Wakabayashi, Kenichi; Takayama, Chitoshi; and Shiozaki, Tadashi, 5,553,202, Cl. 395-115.000.

Takayanagi, Akira; Kumagai, Toshihiro; and Hosoya, Kinji, to Tokai Rubber Industries, Ltd.; and Kabushiki Kaisha AOI. Tube fitting. 5,551,735, Cl. 285-323.000.

Takayanagi, Kazunori; and Watanabe, Shinpei, to International Business Machines Corporation. Device for controlling data transfer between chips via a bus. 5,553,252, Cl. 395-310.000.

Takebuchi, Masataka, to Kabushiki Kaisha Toshiba. Semiconductor memory device. 5,553,016, Cl. 365-51.000.

Takeda Chemical Industries, Ltd.: *See*—
Matsutani, Etsuya; and Marui, Shogo, 5,552,427, Cl. 514-398.000.
Ohkawa, Shigenori; and Miki, Shokyo, 5,552,552, Cl. 546-196.000.

Takeda, Junichi: *See*—
Kajikawa, Teruo; Ganno, Yasuhiko; Takeda, Junichi; and Yonezawa, Syuichi, 5,552,010, Cl. 156-231.000.

Takeda, Keiso: *See*—
Tanaka, Hiroshi; Itou, Takaaki; Takeda, Keiso; Ohnaka, Hidemi; Kunitake, Kazuhisa; and Tanahashi, Toshio, 5,551,231, Cl. 60-289.000.

Takeguchi, Kouichirou: *See*—
Nanno, Nobuyuki; Akashi, Kazuo; Ando, Makoto; Takeguchi, Kouichirou; Yamanaka, Yuji; Saito, Toshimitsu; Oka, Mayumi; Ootake, Atsuhiro; Mason, James; and Suzuki, Yoshiaki, 5,553,294, Cl. 395-750.000.

Takema, Yoshinori: *See*—
Ohashi, Yukihiro; Fujimori, Taketoshi; Nagai, Minoru; Kawamata, Akira; Yada, Yukihiro; Higuchi, Kazuhiko; Imokawa, Genji; Takema, Yoshinori; Saitaino, Yukiko; Ogawa, Ayumi; and Fujimura, Tsutomu, 5,552,445, Cl. 514-669.000.

Takemoto, Takatoshi; Chida, Tosikazu; Kano, Noriaki; Ito, Eizi; Murakami, Koji; Itagaki, Takasi; Sekimoto, Kozo; and Suzuki, Masanori, to Kagushiki Kaisha Ace Denken. Coin conveying apparatus. 5,551,912, Cl. 453-56.000.

Takemura, Yasuhiko, to Semiconductor Energy Laboratory Co., Ltd. Apparatus and method for writing and reading digital information on a magnetic memory including a superconducting material. 5,553,036, Cl. 369-13.000.

Takenaka, Eiji: *See*—
Murakami, Eisaku; Yuasa, Kazuhiro; Endoh, Shuichi; Matsumae, Iwao; Tanaka, Yoshiaki; Hosokawa, Hiroshi; Uno, Mugijiroh; Saitoh, Hiroshi; Takenaka, Eiji; Sugiyama, Toshihiro; Yamanaka, Tetsuo; and Komatsubara, Satoru, 5,552,870, Cl. 355-259.000.

Takeo, Hideya, to Fuji Photo Film Co., Ltd. Radiation image processing method utilizing neural networks. 5,553,159, Cl. 382-156.000.

Takeo, Ohishi: *See*—
Higurashi, Seiji; and Takeo, Ohishi, 5,552,941, Cl. 360-48.000.

Takeshita, Toru: *See*—
Matsubayashi, Nobuyuki; and Takeshita, Toru, 5,551,502, Cl. 164-457.000.

Takesue, Yasutsugu: *See*—
Sekino, Hitoshi; Shimada, Hirokatsu; Takesue, Yasutsugu; Kawasaki, Akihiro; and Toda, Hiroshi, 5,552,867, Cl. 355-245.000.

Takeuchi, Hiroyuki: *See*—
Kawabata, Toshio; Takeuchi, Hiroyuki; Katsurada, Hisashi; Nakamura, Kazutaka; and Ushiro, Tomoaki, 5,551,146, Cl. 29-608.000.
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Milne, Steve H.; Denman, Matthew L.; Tindell, James M.; Tobias, John C., II; Dilts, Michael R.; and Edelman, Bradley A., 5,553,222, Cl. 395-154.000.
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Miura, Tohru; and Tsuyuguchi, Hiroshi, 5,552,945, Cl. 360-78.080.

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Tifft, Jonathan: *See—*
Ginsburg, Arthur P.; Tessler, Lawrence P.; Fries, Craig; and Tifft, Jonathan, 5,552,842, Cl. 351-205.000.

Till Industries, Inc.: *See—*
Meyerhoefer, Carl H.; Smith, Thomas J.; Escobar, Adolfo M.; and Cannetti, Robert J., 5,553,136, Cl. 379-399.000.

Till, Volker, to GEA Till GmbH & Co. Sterilization of kegs. 5,552,114, Cl. 422-26.000.

Timko, Terry: *See—*
Brown, Alan; Timko, Terry; and Ferger, Bo, 5,553,281, Cl. 395-600.000.

Tindell, James M.: *See—*
Milne, Steve H.; Denman, Matthew L.; Tindell, James M.; Tobias, John C., II; Dilts, Michael R.; and Edelman, Bradley A., 5,553,222, Cl. 395-154.000.

Tingley, Wayne F.; and Getzinger, John M. Pillow for holding and feeding an infant. 5,551,109, Cl. 5-655.000.

Tinkham, Ronald B., to Systems Analysis and Integration, Inc. Position-sensing device for power distribution switch. 5,552,647, Cl. 307-119.000.

Tipley, Roger E.: *See—*
Taylor, Mark; Culley, Paul R.; Melo, Maria L.; and Tipley, Roger E., 5,553,310, Cl. 395-860.000.

Titus, Robert D.: *See—*
Schaus, John M.; Hoechstetter, Craig S.; Huser, Diane; Paget, Charles J.; and Titus, Robert D., 5,552,444, Cl. 514-657.000.

TIW Corporation: *See—*
Braddick, Britt O., 5,551,509, Cl. 166-55.700.

Tjahjadi, Mahari; and Foster, Robert W., to General Electric Company. Single screw extruder capable of generating chaotic mixing. 5,551,777, Cl. 366-100.000.

Tobias, John C., II: *See—*
Milne, Steve H.; Denman, Matthew L.; Tindell, James M.; Tobias, John C., II; Dilts, Michael R.; and Edelman, Bradley A., 5,553,222, Cl. 395-154.000.

Tobin, Philip J.: *See—*
Tseng, Hsing-Huang; Tobin, Philip J.; Tsui, Paul G. Y.; Sun, Shih W.; and Poon, Stephen S., 5,552,332, Cl. 437-41.000.

Tobin, Robert E. Darts scoreboard. 5,552,758, Cl. 340-323.00R.

Toda, Hiroshi: *See—*
Sekino, Hitoshi; Shimada, Hirokatsu; Takesue, Yasutsugu; Kawasaki, Akihiro; and Toda, Hiroshi, 5,552,867, Cl. 355-245.000.

Todd, Robert R.; and Ashcroft, Dale A., to New Holland North America, Inc. Skid steer loader cab mounting apparatus. 5,551,826, Cl. 414-685.000.

Todd, Robert W. Method for determining gas hold-up. 5,551,281, Cl. 73-19.010.

Togano, Takeshi: *See—*
Asaoka, Masanobu; Takao, Hideaki; Togano, Takeshi; and Kojima, Makoto, 5,552,193, Cl. 428-1.000.

Togashi, Yoichiro: *See—*
Toride, Yasuhiko; Onishi, Norimasa; and Togashi, Yoichiro, 5,552,145, Cl. 424-245.100.

Toge, Tetsuya; Hirai, Toshihiro; Yoshimoto, Akihiro; and Yoshida, Kenichi, to Senju Pharmaceutical Co., Ltd. Suppressory compositions against hepatic metastases of tumors. 5,552,389, Cl. 514-25.000.

Tohoku Electric Power Co., Inc.: *See—*

Niki, Atsuyoshi; Minowa, Tsyneyuki; Maeda, Ichiro; and Ohira, Sakari, 5,553,079, Cl. 370-110.400.

Toji, Masuo: *See—*
Sternberg, Jeffrey A.; Sun, King-Mo; Toji, Masuo; and Witterholt, Vincent, 5,552,554, Cl. 548-226.000.

Tokai Kogyo Kabushiki Kaisha: *See—*
Ito, Tosikazu; and Yamauchi, Yutaka, 5,552,194, Cl. 428-31.000.
Yada, Yukihiko; and Ito, Toshikazu, 5,551,855, Cl. 425-113.000.

Tokai Rubber Industries, Ltd.: *See—*
Takayanagi, Akira; Kumagai, Toshihiro; and Hosoya, Kinji, 5,551,735, Cl. 285-323.000.

Tokui, Masaki, to Olympus Optical Co. Ltd. Camera. 5,552,846, Cl. 354-173.100.

Tokunaga, Osamu: *See—*
Enoki, Masatoshi; Tokunaga, Osamu; Yamato, Shinichi; and Imazono, Masahiko, 5,551,630, Cl. 236-12.130.

Tokunaga, Shigeo: *See—*
Fukaya, Takashi; Hamada, Masami; Nakamura, Shinichi; Hanzawa, Toyoharu; Kinukawa, Masahiko; Ishikawa, Tomonori; Fujiwara, Hiroshi; and Tokunaga, Shigeo, 5,552,929, Cl. 359-380.000.

Tokyo Electron Kabushiki Kaisha: *See—*
Tanahashi, Takashi, 5,551,984, Cl. 118-724.000.

Tokyo Electron Tohoku Kabushiki Kaisha: *See—*
Tanahashi, Takashi, 5,551,984, Cl. 118-724.000.

Tokyo Ohka Kogyo Co., Ltd.: *See—*
Kato, Tetsuya; Takahashi, Kouichi; Kohara, Hidekatsu; and Nakayama, Toshimasa, 5,552,255, Cl. 430-165.000.

Tolen, George J.: *See—*
Sollers, Joseph S.; Fracalossi, Roland N.; Greenhouse, Walter V. V.; and Tolen, George J., 5,552,449, Cl. 521-155.000.

Toman, John R. Assembly for, and method of, detecting and signalling when an object enters a work zone. 5,552,767, Cl. 340-540.000.

Tomasini, Luciano; Castello, Rinaldo; and Confalonieri, Pierangelo, to SGS-Thomson Microelectronics S.r.l. Driver circuit compatible with low supply voltages. 5,552,747, Cl. 327-536.000.

Tomatsu, Yoshitaka; and Mizutani, Takehito, to Nippondenso Co., Ltd. Valve driving system. 5,551,480, Cl. 137-625.290.

Tomikawa, Tadashi: *See—*
Nishibayashi, Yoshiki; Tomikawa, Tadashi; and Shikata, Shin-ichi, 5,552,613, Cl. 257-10.000.

Tomiku, Yasushi; Takano, Hideaki; and Bando, Yoshichika, to Seisan Kaihatsu Kagaku Kenkyusho; and Kyodo Oxygen Co., Ltd. Ferromagnetic fine particles of ϵ iron carbide and method for producing the same. 5,552,073, Cl. 252-62.550.

Tominaga, Yutaka; and Yoshida, Hiroshi, to YKK Corporation. Hook structure of molded surface fastener. 5,551,130, Cl. 24-452.000.

Tomioka, Ichiro: *See—*
Taniguchi, Hideki; Tomioka, Ichiro; Sanada, Kunihiko; and Okabe, Masatomi, 5,552,618, Cl. 257-207.000.

Tomoiu, Constantine. Thermal cycle for operation of a combustion engine. 5,551,233, Cl. 60-595.000.

Tomory, Ronald S.: *See—*
Sanchez, Hector J.; Serio, John P.; and Tomory, Ronald S., 5,551,686, Cl. 271-298.000.

Tomoyuki, Yohji: *See—*
Abe, Atsuyoshi; Ohtsuka, Yasumasa; Tomoyuki, Yohji; Takano, Manabu; Fukuzawa, Daizo; and Ogawa, Kenichi, 5,552,582, Cl. 219-619.000.
Ohtsuka, Yasumasa; Tomoyuki, Yohji; Hayakawa, Akira; Takano, Manabu; Fukuzawa, Daizo; and Abe, Atsuyoshi, 5,552,874, Cl. 355-285.000.

Tong-Lung Metal Industry Co., Ltd.: *See—*
Fann, Yaw-Shin, deceased; Kuo, Ching-Chuan; and Chiou, Ming-Shyang, 5,551,736, Cl. 292-1.500.
Fann, Yaw-Shin; Lin, San-Yi; Kuo, Ching-Chuan; Don, Lan-Kun; and Chiou, Ming-Shyang, 5,551,264, Cl. 70-134.000.
Lin, San-Yi; Shyu, Song-Gen; and Wu, Tong-Pei, 5,551,740, Cl. 292-338.000.

Toomey, Francis J. Adjustable hand rail. 5,551,194, Cl. 52-184.000.

Toomire, Thomas J.: *See—*
Cotner, Curt L.; Heaps, Robert J.; Koontz, Wendy L.; Little, Benjamin R.; and Toomire, Thomas J., 5,553,234, Cl. 395-182.140.

Toride, Yasuhiko; Onishi, Norimasa; and Togashi, Yoichiro, to Ajinomoto Co., Inc. Feed composition and a method for decreasing piglet mortality in piglets. 5,552,145, Cl. 424-245.100.

Toriyama, Masayuki: *See—*
Kawaguchi, Kenji; Motodate, Shoji; Toriyama, Masayuki; Honda, Satoshi; Fujii, Takaaki; and Cho, Toshiyuki, 5,552,988, Cl. 364-426.010.

Toronto, Salvatore; and Novak, Paul. Pedal mechanism for cycle and exercise equipment. 5,551,718, Cl. 280-252.000.

Torrex Equipment Corporation: *See—*
Brors, Daniel L.; and Cook, Robert C., 5,551,985, Cl. 118-725.000.

Torrington Company, The: *See—*
Cherpician, Berci, 5,551,919, Cl. 464-92.000.
Speich, Gerald A., 5,551,727, Cl. 280-777.000.

Torvund, Lawrence J. Fishing rod reel respooling device. 5,551,645, Cl. 242-395.000.

Toshiba Corporation: *See—*
Mizohata, Tadashi; and Suzuki, Masashi, 5,552,660, Cl. 313-341.000.

Tóth, Árpád: *See—*
Suller, Attila; and Tóth, Árpád, 5,551,220, Cl. 56-11.900.

Toto Ltd.: *See—*
Enoki, Masatoshi; Tokunaga, Osamu; Yamato, Shinichi; and Imazono, Masahiko, 5,551,630, Cl. 236-12.130.

Touch, Christopher D.: *See—*
Andrews, Lawrence P.; Mandalia, Baiju D.; Ortega, Oscar E.; Sinibaldi, John C.; Williams, Kevin B.; and Touch, Christopher D., 5,553,293, Cl. 395-734.000.

Townsend, Richard L., to Adams USA, Inc. Strap for holding laundry. 5,551,128, Cl. 24-302.000.

Toya, Tatsuro: *See—*
Hara, Yuji; Ito, Satoru; and Toya, Tatsuro, 5,552,639, Cl. 257-775.000.

Toyo Boseki Kabushiki Kaisha: *See—*
Furusawa, Hironobu; Kokubu, Tokio; Kamata, Sakashi; and Ueno, Hitoshi, 5,551,673, Cl. 267-160.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Iba, Hideki; Maeda, Chikatoshi; Takeuchi, Tadashi; and Suzuki, Yasuyuki, 5,552,110, Cl. 420-406.000.
Seki, Akinori; Ohnishi, Toyokazu; and Nakano, Jiro, 5,553,089, Cl. 372-43.000.
Tanaka, Hiroshi; Itou, Takaaki; Takeda, Keiso; Ohnaka, Hidemi; Kunitake, Kazuhisa; and Tanahashi, Toshio, 5,551,231, Cl. 60-289.000.

Traenckner, Hans-Joachim: *See—*
Rasp, Christian; Waldmann, Helmut; and Traenckner, Hans-Joachim, 5,552,549, Cl. 546-139.000.

Trainor, John J.; Bellin, Michael A.; and Laplace, Carl J., Jr., to Siemens Energy & Automation, Inc. Multiple setpoint configuration in a voltage regulator controller. 5,552,696, Cl. 323-275.000.

Tran, Dan T.: *See—*
Datwyler, Wayne C.; Tran, Dan T.; and Ha, Long V., 5,553,249, Cl. 395-308.000.

Tran, Minh N.: *See—*
Hrovat, Davorin D.; and Tran, Minh N., 5,551,770, Cl. 303-167.000.

Traulsen & Co. Inc.: *See—*
Yingst, Thomas E.; Stensrud, Gerald J.; and Davis, Ronald S., 5,551,250, Cl. 62-234.000.

Trebbi, Claudio: *See—*
Baruffato, Roberto; Trebbi, Claudio; Barbieri, Claudio; and Vigna, William, 5,551,491, Cl. 141-145.000.

Tredway, William K.; Musson, Craig W.; and Chen, Otis Y., to United Technologies Corporation. Fiber reinforced glass matrix composites with secondary matrix reinforcement. 5,552,215, Cl. 428-298.000.

Tregilgas, John H., to Texas Instruments Incorporated. Micromechanical device having an improved beam. 5,552,924, Cl. 359-224.000.

Treter, Manfred: *See—*
Schmid, Werner; and Treter, Manfred, 5,551,842, Cl. 417-203.000.

Trevino, Hilario T.: *See—*
Turner, Virgil Q.; Light, William D.; Trevino, Hilario T.; Guldi, Richard L.; Poag, Frank; and Paradis, Douglas E., 5,551,165, Cl. 34-404.000.

Tricor Systems, Inc.: *See—*
Nanna, Frank P.; and Jereb, John, 5,552,890, Cl. 356-369.000.

Trimble Navigation Limited: *See—*
Janky, James M.; and Schipper, John F., 5,552,772, Cl. 340-573.000.

Trinh, Toan; and Gardlik, John M., to Procter & Gamble Company, The. Solid consumer product compositions containing small particle cyclodextrin complexes. 5,552,378, Cl. 512-3.000.

Trofast, Eva A. C.; and Falk, Erik J., to Astra Aktiebolag. Agglomeration of finely divided powders. 5,551,489, Cl. 141-18.000.

Truesdale, Carlton M.: *See—*
Antos, A. Joseph; DeLiso, Evelyn M.; Liu, Yanming; Newhouse, Mark A.; Smith, David K.; and Truesdale, Carlton M., 5,553,185, Cl. 385-127.000.

Trujillo, William A.: *See—*
Singh, Prem S.; and Trujillo, William A., 5,552,173, Cl. 426-417.000.

Truong, Toan V.: *See—*
Khadem, John; and Truong, Toan V., 5,552,452, Cl. 522-63.000.

Trushell, Charles, to Philips Electronics North America Corporation. Electric lamp having an undercoat for increasing the light output of a luminescent layer. 5,552,665, Cl. 313-489.000.

Trustees of Columbia University in the City of New York: *See—*
Acampora, Anthony S., 5,553,074, Cl. 370-94.100.
Stern, David M.; Oz, Mehmet C.; Nowygrod, Roman; Koga, Shin; and Pinsky, David J., 5,552,267, Cl. 435-1.100.

TRW Inc.: *See—*
Crandall, Danny N.; Beastrom, Keith P.; Cortines, Charles M.; and Thompson, Brent B., 5,552,984, Cl. 364-424.030.
Stokes, Robert B.; Cushman, Jay D.; and Cushman, Drew, 5,552,655, Cl. 310-330.000.

Tsai, Ching Y. Warning device for logically controlling headlights of a motor vehicle. 5,552,762, Cl. 340-468.000.

Tsai, George. Light string. 5,552,974, Cl. 362-250.000.

Tseng, Horng-Huei, to Vanguard International Semiconductor Company. Method for fabricating a Y-shaped capacitor in a DRAM cell. 5,552,334, Cl. 437-52.000.

Tseng, Horng-Huei: *See—*
Lin, Jenq-Tyan; and Tseng, Horng-Huei, 5,551,571, Cl. 206-710.000.
Lu, Chih-Yuan; and Tseng, Horng-Huei, 5,552,620, Cl. 257-302.000.

Tseng, Hsing-Huang; Tobin, Philip J.; Tsui, Paul G. Y.; Sun, Shih W.; and Poon, Stephen S., to Motorola, Inc. Process for fabricating a MOSFET device having reduced reverse short channel effects. 5,552,332, Cl. 437-41.000.

Tseng, Kou-Lung; and Yang, Kevin, to UMAX Data Systems Inc. Multi-lens changing mechanism for use in optical scanners. 5,552,939, Cl. 359-821.000.
Tseng, Mingchih M., to Gillette Company, The. Shaving system. 5,551,152, Cl. 30-41.000.
Tsi, David: *See*—
Dvorkis, Paul; Tsi, David; and Shepard, Howard, 5,552,592, Cl. 235-462.000.
Tsien, Roger Y.; and Adams, Stephen R., to Regents of University of California, The. Azide-containing chelators whose affinity for calcium ion is decreased by illumination. 5,552,555, Cl. 548-236.000.
Tsipursky, Semeon: *See*—
Beall, Gary W.; Tsipursky, Semeon; Sorokin, Anatoliy; and Goldman, Anatoliy, 5,552,469, Cl. 524-445.000.
Tsubaki, Yoshifumi: *See*—
Kobushi, Shigeharu; Ishikawa, Masao; Komatsu, Yoshimasa; Ishii, Hideo; Miyazawa, Yorikatsu; Tsubaki, Yoshifumi; Saito, Kaneo; and Yoshimoto, Hiroshi, 5,552,851, Cl. 354-298.000.
Tsubakimoto Chain Co.: *See*—
Maruyama, Azao, 5,551,823, Cl. 414-280.000.
Tsuchiya, Ichiro; and Haraguchi, Tsuyoshi, to Konica Corporation. Device of dissolving and replenishing solid processing agents for a silver halide photographic light-sensitive material and automatic processing machine for silver halide photographic light-sensitive material equipped with the device. 5,552,852, Cl. 354-324.000.
Tsuchiya, Takeji: *See*—
Shimizu, Kazuo; Onoda, Motonobu; Tsuchiya, Takeji; and Watanabe, Tohru, 5,552,030, Cl. 205-105.000.
Tsuchiya, Yutaka: *See*—
Takahashi, Hironori; Aoshima, Shinichiro; Hirano, Isuke; and Tsuchiya, Yutaka, 5,552,716, Cl. 324-753.000.
Tsuge, Masakuni; and Nagase, Hidenobu, to Honda Giken Kogyo Kabushiki Kaisha. Fuel injection control system for internal combustion engines. 5,551,390, Cl. 123-198.0DB.
Tsui, Paul G. Y.: *See*—
Tseng, Hsing-Huang; Tobin, Philip J.; Tsui, Paul G. Y.; Sun, Shih W.; and Poon, Stephen S., 5,552,332, Cl. 437-41.000.
Tsuji, Kazutaka: *See*—
Kakibayashi, Hiroshi; Mitsui, Yasuhiro; Tadokoro, Hideo; Kuroda, Katsuhiro; Koguchi, Masanari; Tsuji, Kazutaka; Makishima, Tatsuo; Ichihashi, Mikio; and Isakozawa, Shigeto, 5,552,602, Cl. 250-311.000.
Tsuji, Masayuki: *See*—
Arase, Takuya; Kamiya, Fumihiro; Tsuji, Masayuki; Ino, Tadashi; Kitamura, Ikuo; Shibuya, Yoshiyuki; and Daimon, Shigeo, 5,552,072, Cl. 252-62.51R.
Tsuji, Nobuyuki: *See*—
Kobomura, Kenji; Kimura, Hiromi; Osone, Hideo; Shima, Mikio; Hayashida, Michiya; and Tsuji, Nobuyuki, 5,552,214, Cl. 428-294.000.
Tsujimoto, Hideyuki, to Mitsubishi Denki Kabushiki Kaisha. Alarm detecting system for redundancy configuration circuit. 5,552,764, Cl. 340-508.000.
Tsujimoto, Tadahiro: *See*—
Suzuki, Yoshinori; Tsujimoto, Tadahiro; and Fujisaki, Satoru, 5,552,188, Cl. 427-402.000.
Tsukada, Hiroko: *See*—
Sasaki, Yasuyuki; Bizen, Takehiko; Miyama, Hiroshi; Morisako, Takeshi; and Tsukada, Hiroko, 5,551,600, Cl. 222-81.000.
Tsukamoto, Masahide: *See*—
Hasegawa, Yo; Nagasawa, Masahiro; and Tsukamoto, Masahide, 5,551,626, Cl. 228-179.100.
Tsukamoto, Takeo: *See*—
Shinjo, Katsuhiko; Kaneko, Tetsuya; Kaneko, Shuzo; and Tsukamoto, Takeo, 5,552,914, Cl. 359-87.000.
Tsutano, Tomohiro: *See*—
Mizade, Kazuhiro; Kato, Hisahiro; Ishida, Hideki; and Tsutano, Tomohiro, 5,552,861, Cl. 355-208.000.
Tsutsui, Kyoji; and Yamaguchi, Takehito, to Ricoh Company, Ltd. Reversible thermosensitive coloring recording method, recording medium and recording apparatus for the recording method. 5,552,364, Cl. 503-201.000.
Tsuyuguchi, Hiroshi: *See*—
Miura, Tohru; and Tsuyuguchi, Hiroshi, 5,552,945, Cl. 360-78.080.
Tucker, Mark: *See*—
Porter, John F.; Kittson, Mark O.; Tucker, Mark; Ferris, Larry; and LePage, Steve, 5,552,207, Cl. 428-109.000.
Tufts University: *See*—
Doumanidis, Charalabos C., 5,552,575, Cl. 219-124.340.
Tungate, Freddie L.: *See*—
Potter, Mark J.; Kao, Jar-Lin; Cross, Virginia R.; Vanderspurt, Thomas H.; Dienes, Edward K.; Riley, Robert E.; Tungate, Freddie L.; and Borsinger, Arie, 5,552,035, Cl. 208-135.000.
Turconi, Marco; Donetti, Arturo; Montagna, Ernesto; Nicola, Massimo; Uberti, Annamaria; Micheletti, Rosamaria; and Giachetti, Antonio, to Boehringer Ingelheim Italia S.p.A. Benzimidazoline-2-oxo-1-carboxylic acid derivatives useful as 5-ht receptor antagonists. 5,552,408, Cl. 514-304.000.
Turk, Gary A.: *See*—
Calvert, Nathaniel; Effle, James S.; Johnston, David L.; Naylor, James L.; Olson-Williams, Helen M.; Satin, Robert H.; Shaffer, Dennis L.; and Turk, Gary A., 5,553,290, Cl. 395-700.000.
Turnbo, James R. Holder for supporting doors to be treated. 5,551,980, Cl. 118-500.000.
Turner, George W., to Bell Sygma Inc. Number translation services matrix. 5,553,130, Cl. 379-220.000.
Turner, Virgil Q.; Light, William D.; Trevino, Hilario T.; Guldi, Richard L.; Poag, Frank; and Paradis, Douglas E., to Texas Instruments Incorporated. Enhanced cleansing process for wafer handling implements. 5,551,165, Cl. 34-404.000.
Turpeinen, Pasi: *See*—
Ilvespää, Heikki; Jaakkola, Jyrki; Linsuri, Ari; Partanen, Erkki; Poikolainen, Antti; Turpeinen, Pasi; and Verkasalo, Lauri, 5,552,021, Cl. 162-203.000.
Tyndall, Rick J. Trousers with integral seating components. 5,551,091, Cl. 2-227.000.
Tyren, Carl; and Persson, Leif A., to RSO Corporation N.V. Method for measuring position and angle. 5,551,158, Cl. 33-1.00N.
Tzikas, Athanassios: *See*—
Klier, Herbert; Müller, Bernhard; Ruhlmann, Edmond; and Tzikas, Athanassios, 5,552,532, Cl. 534-612.000.
U S West Advanced Technologies, Inc.: *See*—
Greenlee, Russell L.; Alexander, James H.; Young, Emilie A.; and Smithrud, Gary M., 5,553,223, Cl. 395-155.000.
Ube Industries, Ltd.: *See*—
Adachi, Mitsuru; Sato, Satoru; and Sasaki, Hiroto, 5,551,996, Cl. 148-420.000.
Uberti, Annamaria: *See*—
Turconi, Marco; Donetti, Arturo; Montagna, Ernesto; Nicola, Massimo; Uberti, Annamaria; Micheletti, Rosamaria; and Giachetti, Antonio, 5,552,408, Cl. 514-304.000.
Uchida, Kazuo; and Mashiba, Shinichi, to Ikagaku Co., Ltd. Method of screening for colorectal cancer. 5,552,292, Cl. 435-7.230.
Uchida, Mutsuko: *See*—
Iwamoto, Mune; Nakajima, Akihiko; Takaku, Masato; Morita, Hisao; Ando, Toshihiko; Shirafuji, Tomofumi; and Uchida, Mutsuko, 5,552,494, Cl. 525-316.000.
Uchida, Yoshihiro: *See*—
Aso, Yasuhiro; Takahashi, Atsuhisa; Kakuma, Satoshi; and Uchida, Yoshihiro, 5,553,068, Cl. 370-60.000.
Uchikawa, Yoshiki: *See*—
Obata, Kenzo; Uchikawa, Yoshiki; Furuhashi, Takeshi; and Watanabe, Shigeru, 5,553,156, Cl. 382-119.000.
Uchikoga, Hiroshi; Zenda, Hiroki; and Shimamoto, Hajime, to Kabushiki Kaisha Toshiba. Color display control apparatus for controlling display gray scale of each scanning frame or each plurality of dots. 5,552,800, Cl. 345-89.000.
Uchisawa, Osamu: *See*—
Kanno, Yohichi; Uchisawa, Osamu; and Yamazaki, Sigekazu, 5,551,477, Cl. 137-553.000.
Uebayashi, Shinji: *See*—
Ohya, Tomoyuki; Uebayashi, Shinji; and Miki, Toshio, 5,553,190, Cl. 395-2.100.
Ueda, Osamu: *See*—
Hieda, Teruo; Ueda, Osamu; and Kawahara, Norihiro, 5,552,826, Cl. 348-222.000.
Ueda, Shinji: *See*—
Takamiya, Makoto; Kadowaki, Hidejiro; Ishida, Yasuhiko; Ashiwa, Jun; Kato, Shigeki; and Ueda, Shinji, 5,552,879, Cl. 356-28.500.
Uehara, Hiroshi: *See*—
Mizukami, Hiroshi; Uehara, Hiroshi; and Okada, Shinichi, 5,551,547, Cl. 192-89.230.
Ueno, Hideo: *See*—
Mori, Masaharu; Ueno, Hideo; Hirono, Kazuhisa; and Niwa, Akihiko, 5,551,785, Cl. 400-76.000.
Ueno, Hitoshi: *See*—
Furusawa, Hironobu; Kokubu, Tokio; Kamata, Sakashi; and Ueno, Hitoshi, 5,551,673, Cl. 267-160.000.
Ueno, Motoharu; Kumaki, Yoshinari; Nonin, Katsuya; Kamagata, Eiji; and Matsuzawa, Shigeo, to Kabushiki Kaisha Toshiba. Radiocommunication system. 5,553,069, Cl. 370-75.000.
Ueno, Seichi: *See*—
Sakatani, Hideaki; Nishida, Hirofumi; Uetani, Yoji; Kuroki, Yoichi; Hata, Keiko; Fujita, Tatsuo; Kikawa, Tatsuo; Ueno, Seichi; and Hayashida, Yukio, 5,551,170, Cl. 34-549.000.
Uenoyama, Hirofumi; Ao, Kenichi; Suzuki, Yasutoshi; Yoshino, Yoshimi; and Suzuki, Motofumi, to Nippondenso Co., Ltd. Method for manufacturing an electromagnetic conversion device and a displacement detector which uses an electromagnetic conversion device. 5,551,586, Cl. 216-22.000.
Uetani, Yoji: *See*—
Sakatani, Hideaki; Nishida, Hirofumi; Uetani, Yoji; Kuroki, Yoichi; Hata, Keiko; Fujita, Tatsuo; Kikawa, Tatsuo; Ueno, Seichi; and Hayashida, Yukio, 5,551,170, Cl. 34-549.000.
Ueyama, Yoshiki: *See*—
Ihara, Yasuhiro; Yamashita, Mitsuhiro; and Ueyama, Yoshiki, 5,552,990, Cl. 364-444.000.
Ujiie, Souhei; and Suzuki, Tadashi, to Canon Kabushiki Kaisha. Image forming apparatus having a detachable external memory unit. 5,552,858, Cl. 355-202.000.
Ullah, Muhammad I.: *See*—
Ahlert, Richard H.; Howard, James K.; Ullah, Muhammad I.; and Umphress, Richard D., 5,552,204, Cl. 428-65.500.
Ullrich, Jeffrey F.: *See*—

Moore, David N.; and Ullrich, Jeffrey F., 5,551,608, Cl. 222-542.000.
Ulrich, Darwin: *See*—
Blutstein, Morton; and Ulrich, Darwin, 5,551,087, Cl. 2-173.000.
UMAC Incorporated: *See*—
McGinnis, Joseph M., 5,551,476, Cl. 137-517.000.
UMAX Data Systems Inc.: *See*—
Tseng, Kou-Lung; and Yang, Kevin, 5,552,939, Cl. 359-821.000.
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Umeno, Hidenori: *See*—
Tanaka, Shunji; Umeno, Hidenori; Sugama, Nobuyoshi; and Sato, Masaru, 5,553,291, Cl. 395-700.000.
Umphress, Richard D.: *See*—
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Underwood, Lance H.: *See*—
Godlewski, Wayne W.; Chapman, James D.; Diana, Gary M.; Hiss, Steven P.; Volo, Jane M.; Weil, Richard; and Underwood, Lance H., 5,551,428, Cl. 128-653.100.
Uni Colloid Kabushiki Kaisha: *See*—
Harada, Seiki; and Ikeda, Masayuki, 5,552,166, Cl. 426-89.000.
Union Oil Company of California: *See*—
Allen, William C., 5,551,976, Cl. 106-696.000.
Unisys Corporation: *See*—
Darwyler, Wayne C.; Tran, Dan T.; and Ha, Long V., 5,553,249, Cl. 395-308.000.
Kalish, David M.; Barajas, Saul; and Ricci, Paul B., 5,553,259, Cl. 395-403.000.
Kalish, David M.; Barajas, Saul; and Ricci, Paul B., 5,553,263, Cl. 395-454.000.
Morrissey, Douglas E.; Cavanagh, Edward T., Jr.; Wieder, Gene T.; Ng, Kin H.; and Oldham, William E., 5,553,302, Cl. 395-825.000.
United Laboratories, Inc.: *See*—
Mesteteky, Pat A., 5,551,989, Cl. 134-22.120.
United Microelectronics Corporation: *See*—
Lu, Wen-Chong, 5,553,300, Cl. 395-821.000.
Tai, Chiao Y.; Chen, Yung L.; and Huang, Chun-Yi, 5,552,698, Cl. 323-313.000.
United Parcel Service of America, Inc.: *See*—
Dowling, John H., 5,553,167, Cl. 382-270.000.
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Agriculture: *See*—
Slininger, Patricia J.; Schisler, David A.; and Bothast, Rodney J., 5,552,315, Cl. 435-253.300.
Stanker, Larry H.; Sheffield, Cynthia L.; and DeLoach, John R., 5,552,295, Cl. 435-7.920.
Weinstock, Ira A.; Hill, Craig L.; and Atalla, Rajai H., 5,552,019, Cl. 162-79.000.
Air Force: *See*—
Carlin, Richard T.; and Fuller, Joan, 5,552,238, Cl. 429-50.000.
America: *See*—
Sibley, David R.; Monsma, Frederick J., Jr.; McVittie, Loris D.; and Mahan, Lawrence C., 5,552,289, Cl. 435-7.210.
Army: *See*—
Frymiare, Brian E., 5,551,539, Cl. 188-112.00R.
Samuel, James E.; and Gordon, Valery M., 5,552,144, Cl. 424-236.100.
Walters, William; and Summers, Richard, 5,551,346, Cl. 102-476.000.
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Rothfleisch, Peter I., 5,551,255, Cl. 62-502.000.
Energy: *See*—
Gannon, Jeffrey C.; and Payne, John J., 5,551,285, Cl. 73-40.700.
Health and Human Services: *See*—
Bringmann, Gerhard; Götz, Roland; and Boyd, Michael R., 5,552,550, Cl. 546-146.000.
Hoffman, Beth J.; Mezey, Eva; and Brownstein, Michael J., 5,552,308, Cl. 435-172.300.
Plotkin, Stanley A.; Ricciardi, Robert P.; Gonczol, Ewa; Berencsi, Klara; and Rando, Robert F., 5,552,143, Cl. 424-199.100.
Interior: *See*—
Hicks, Gary W.; and Cornell, William L., 5,551,574, Cl. 209-164.000.
Kwong, Kyei-Sing, 5,552,353, Cl. 501-89.000.
Navy: *See*—
Bodzin, Leon J., 5,551,349, Cl. 104-138.200.
Buchwitz, Guy R.; and Muskat, David H., 5,552,993, Cl. 364-449.000.
Cipolla, Jeffrey L.; Waclawik, Ronald E.; and Elste, Charles L., 5,551,363, Cl. 114-23.000.
Cipolla, Jeffrey L.; and Waclawik, Ronald E., 5,551,364, Cl. 114-23.000.
Cipolla, Jeffrey L.; Waclawik, Ronald E.; and Elste, Charles L., 5,551,365, Cl. 114-23.000.
DeMarco, James S., Jr., 5,553,176, Cl. 385-26.000.
Fortier, Paul J., 5,553,280, Cl. 395-600.000.
Keller, Teddy M., 5,552,505, Cl. 528-5.000.
Schuler, Dale L.; and Lee, Jong-Sen, 5,552,787, Cl. 342-25.000.
Shaffer, Stephen G.; Thome, Connie L.; and Clark, Timothy F., 5,551,875, Cl. 434-13.000.
Shen, Young T., 5,551,369, Cl. 114-274.000.
Supcoe, Robert F.; Felsen, Ira M.; and Donahue, William T., 5,552,456, Cl. 523-175.000.
Upton, William K., III; Schneider, William E.; Brown, Stuart H.; Stetz, Steven A.; Gotich, Emily J.; and McCrea, Jack L., 5,551,641, Cl. 241-46.170.
U.S. Philips Corporation: *See*—
Appeltans, Koen E. J., 5,552,694, Cl. 323-222.000.
Dibbern, Uwe; and Pankert, Joseph, 5,552,658, Cl. 310-366.000.
Ham, Cornelis L. G., 5,552,708, Cl. 324-318.000.
Keppel, Anton; Schlatmann, Rutger; and Verhoeven, Jan, 5,551,587, Cl. 216-24.000.
Massart, Desire J. L., 5,552,997, Cl. 364-571.010.
McPherson, Andrew D., 5,553,299, Cl. 395-800.000.
Meijer, Peter B. L., 5,553,195, Cl. 395-24.000.
Snoeyen, Anthonius J. H., 5,551,625, Cl. 228-174.000.
Spruit, Johannes H. M.; Jacobs, Bernardus A. J.; and Van Uijen, Cornelis, 5,553,038, Cl. 369-13.000.
Van Gerven, Johannes A. H.; and De Langen, Michael T. W., 5,551,628, Cl. 228-248.100.
Zager, Stephen A.; and Shvartsman, Felix P., 5,552,009, Cl. 156-220.000.
United States Surgical Corporation: *See*—
Matula, Paul A.; McCabe, William J.; McCourtney, Gerald T.; Gemmell, Dennis; Hamlin, Jerry; and Winslow, Graeme, 5,551,448, Cl. 128-897.000.
United Technologies Corporation: *See*—
Benoit, Roland; Beverly, Eugene M.; Love, Charles M.; and Mack, Gregory J., 5,551,840, Cl. 416-241.00B.
Gostic, William J., 5,551,999, Cl. 148-562.000.
Melton, Patrick B., 5,551,790, Cl. 403-28.000.
Thornberg, Christopher A.; and Cotton, Bryan S., 5,552,983, Cl. 364-424.010.
Tredway, William K.; Musson, Craig W.; and Chen, Otis Y., 5,552,215, Cl. 428-298.000.
Veilleux, Leo J., Jr.; Anzulewicz, David T.; and Dyer, Gerald P., 5,551,478, Cl. 137-596.150.
Universal Electronics Inc.: *See*—
Darbee, Paul V.; Ellis, Richard E.; Jansky, Louis S.; and Grossman, Avram S., 5,552,917, Cl. 359-148.000.
Universal Furniture Industries, Inc.: *See*—
Glover, Lanny R., 5,551,757, Cl. 297-440.230.
Universal Shield Ltd.: *See*—
Burgess, Donald M.; and Legh-Heppel, Nicholas P. R., 5,552,201, Cl. 428-43.000.
Universitaet Stuttgart Institut fuer Strahlwerkzeuge: *See*—
Brauch, Uwe; Giesen, Adolf; Voss, Andreas; and Wittig, Klaus, 5,553,088, Cl. 372-34.000.
University College London: *See*—
Clarkson, Trevor G.; and Taylor, John G., 5,553,197, Cl. 395-27.000.
University of Alabama at Birmingham Research Foundation: *See*—
Sorscher, Eric J.; Parker, William B.; and Bennett, Leonard L., Jr., 5,552,311, Cl. 435-240.200.
University of California, The Regents of the: *See*—
Rearden, Ann, 5,552,529, Cl. 530-380.000.
Saxon, Andrew; Zhang, Ke; and Max, Edward E., 5,552,537, Cl. 536-24.300.
University of Colorado, Board of Regents of the: *See*—
Sharp, Gary D.; and Johnson, Kristina M., 5,552,912, Cl. 359-73.000.
University of Hawaii: *See*—
Antal, Michael J., Jr., 5,551,958, Cl. 44-629.000.
University of Kentucky Research Foundation, The: *See*—
Crooks, Peter A.; and Rosenthal, Gerald A., 5,552,440, Cl. 514-553.000.
University of Massachusetts Medical Center: *See*—
Michelson, Alan D.; and Barnard, Marc. R., 5,552,290, Cl. 435-7.210.
University of Michigan, The Board of Regents: *See*—
Martin, David C.; Moore, Jeffrey S.; Markoski, Larry J.; Walker, Kenneth A.; and Spilman, Gary E., 5,552,508, Cl. 528-68.000.
University of Michigan, The Regents of the: *See*—
Gamota, Daniel R.; Mueller, Brian L.; and Filisko, Frank E., 5,552,076, Cl. 252-74.000.
University of Nebraska, The Board of Regents of The: *See*—
Scholar, Eric M.; and Iversen, Patrick L., 5,552,390, Cl. 514-44.000.
University of Oregon, The: *See*—
Keana, John F. W.; and Weber, Eckard, 5,552,443, Cl. 514-631.000.
University of Pennsylvania, The Trustees of the: *See*—
Hirschmann, Ralph F.; Nicolaou, Kyriacos C.; Pietranico, Sherrie; Reisine, T. R.; Salvino, Joseph M.; Sprengeler, Paul; and Strader, Catherine D., 5,552,534, Cl. 536-17.400.
University of South Florida, The: *See*—
Ranganathan, Nagarajan; and Sastry, Raghu, 5,553,272, Cl. 395-500.000.
University of Toledo: *See*—
Morgan, Alan R.; and Selman, Steven H., 5,552,134, Cl. 424-9.610.
University of Washington: *See*—
Dash, J. Gregory, 5,551,799, Cl. 405-128.000.
Unland, Stefan: *See*—
Entenmann, Robert H.; Unland, Stefan; Philipp, Matthias; Haeming, Werner; Surjadi, Iwan; Rothhaar, Ulrich; and Baeuerle, Michael, 5,551,235, Cl. 60-602.000.
Uno, Mugijiroh: *See*—

Murakami, Eisaku; Yuasa, Kazuhiro, Endoh, Shuichi; Matsumae, Iwao; Tanaka, Yoshiaki; Hosokawa, Hiroshi; Uno, Mugijiroh; Saitoh, Hiroshi; Takenaka, Eiji; Sugiyama, Toshihiro; Yamanaka, Tatsuo; and
Van Daele, Georges H. P.; and Van den Keybus, Fran M. A., to Janssen Pharmaceutica N.V. N-(3-hydroxy-4-piperidinyl) (dihydrobenzofuran,

Varner, Wayne F.: *See*—
Lutz, Dale R.; MacDougall, Trevor W.; Taylor, William L.; Varner, Wayne F.; and Wandmacher, Robert A., 5,553,173, Cl. 382-12.000.
Vindex Tubemakers Pty. Limited: *See*—
Henwood, James V., 5,551,733, Cl. 285-155.000.
Vinegar, Harold J.: *See*—

Murakami, Eisaku; Yuasa, Kazuhiro; Endoh, Shuichi; Matsumae, Iwao; Tanaka, Yoshiaki; Hosokawa, Hiroshi; Uno, Mugijiroh; Saitoh, Hiroshi; Takenaka, Eiji; Sugiyama, Toshihiro; Yamanaka, Tetsuo; and Komatsubara, Satoru, 5,552,870, Cl. 355-259.000.

UOP: *See*—
Kalnes, Tom N.; and James, Robert B., Jr., 5,552,037, Cl. 208-262.100.
Le Febre, David A.; Lansbarkis, James R.; and Semerdjian, Roy V., 5,552,042, Cl. 210-198.200.
Sechrist, Paul A.; Lomas, David A.; and Haun, Edward C., 5,552,120, Cl. 422-144.000.

Uotani, Akira, to Fuji Xerox Co., Ltd. Overlapping graphic pattern display system. 5,553,211, Cl. 395-135.000.

Upjohn Company, The: *See*—
Shen, Robert W., 5,552,152, Cl. 424-441.000.

Upton, Bruce M., to McDonald Upton Limited. Gun lock. 5,551,181, Cl. 42-70.110.

Upton, William K., III; Schneider, William E.; Brown, Stuart H.; Stetz, Steven A.; Gotich, Emily J.; and McCrea, Jack L., to United States of America, Navy. Non-pulpables collection chamber with removable basket for solid waste pulpers. 5,551,641, Cl. 241-46.170.

Ura, Mitsuhiro: *See*—
Hayashi, Katsumi; Saitou, Kazuhiko; Ohsato, Hiroshi; Mitani, Masaaki; Hayashi, Tomohiro; Obata, Takashi; Sekine, Yutaka; Ura, Mitsuhiro; and Ishii, Takuji, 5,553,303, Cl. 395-600.000.

Ura, Tomoyuki, to Yamaha Corporation. Electronic keyboard musical instrument with multifunctional keyboard. 5,552,560, Cl. 84-653.000.

Urano, Akira: *See*—
Hirose, Chisai; Kanamori, Hiroo; Urano, Akira; Ishikawa, Shinji; Aikawa, Haruhiko; and Saito, Masahide, 5,551,966, Cl. 65-377.000.

Urbanneck, Bernd: *See*—
Witmann, Dieter; Schoeps, Jochen; Urbanneck, Bernd; Huff, Karl; Ott, Karl-Heinz; and Peters, Horst, 5,552,465, Cl. 524-139.000.

Urdea, Michael S.; and Horn, Thomas, to Chiron Corporation. Hydrophobic nucleic acid probes. 5,552,280, Cl. 435-6.000.

Urdea, Michael S.; and Horn, Thomas, to Chiron Corporation. Oligonucleotides with cleavable sites. 5,552,538, Cl. 536-24.300.

Urruti, Eric H., to Corning Incorporated. Method for controlling fiber diameter during drawing. 5,551,967, Cl. 65-378.000.

Usevitch, Karen: *See*—
Mikiel, Andrew; and Usevitch, Karen, 5,552,768, Cl. 340-546.000.

Ushikoshi, Isao, to Sankyo Seiki Mfg. Co., Ltd. Device for detecting rotational position of brushless motor. 5,552,682, Cl. 318-254.000.

Ushiro, Tomoaki, to Murata Manufacturing Co., Ltd. Chip-type common mode choke coil. 5,552,756, Cl. 336-200.000.

Ushiro, Tomoaki: *See*—
Kawabata, Toshio; Takeuchi, Hiroyuki; Katsurada, Hisashi; Nakamura, Kazutaka; and Ushiro, Tomoaki, 5,551,146, Cl. 29-608.000.

Usui, Akira, to Yamaha Corporation. Optical disk recording device. 5,553,042, Cl. 369-50.000.

Utsunomiya, Hajime; and Kosuda, Masanori, to TDK Corporation. Magnetooptical recording medium. 5,552,237, Cl. 428-634.0ML.

Vadas, Peter: *See*—
Johnson, Lorin K.; Seilhamer, Jeffrey J.; Pruzanski, Waldemar; and Vadas, Peter, 5,552,530, Cl. 530-387.900.

Vafai, Manoucher: *See*—
Dangelo, Carlos; Deeley, Richard; Nagasamy, Vijay; and Vafai, Manoucher, 5,553,002, Cl. 364-489.000.

Vail, William B., III. Method and apparatus for cementing drill strings in place for one pass drilling and completion of oil and gas wells. 5,551,521, Cl. 175-65.000.

Vaillancourt, John P.: *See*—
Nicholson, Donald W.; Ali, Ambereen; Munday, Neil A.; and Vaillancourt, John P., 5,552,536, Cl. 536-23.100.

Valentin, Franz, to Hans Huber GmbH & Co. KG. Device for the removal of clarified waste water from rectangular basins. 5,552,050, Cl. 210-525.000.

Valentine, Peter L.: *See*—
Jones, Peter J.; Valentine, Peter L.; and Lawrie, Duncan J., 5,551,918, Cl. 464-80.000.

Vallabhaneni, Rao V.: *See*—
Casey, Jon A.; Cordero, Carla N.; Fasano, Benjamin V.; Goland, David B.; Hannon, Robert; Harris, Jonathan H.; Herron, Lester W.; Johnson, Gregory M.; Patel, Niranjan M.; Reitter, Andrew M.; Shinde, Subhash L.; Vallabhaneni, Rao V.; and Youngman, Robert A., 5,552,107, Cl. 419-13.000.
Casey, Jon A.; Cordero, Carla N.; Fasano, Benjamin V.; Goland, David B.; Hannon, Robert; Harris, Jonathan H.; Herron, Lester W.; Johnson, Gregory M.; Patel, Niranjan M.; Reitter, Andrew M.; Shinde, Subhash L.; Vallabhaneni, Rao V.; and Youngman, Robert A., 5,552,232, Cl. 428-547.000.

Vallee, Glenn E., to Stanley-Bostitch, Inc. Convertible contact/sequential trip trigger. 5,551,620, Cl. 227-8.000.

Vallee, Glenn E., to Stanley-Bostitch, Inc. Convertible contact/sequential trip trigger with double actuation prevention structure. 5,551,621, Cl. 227-8.000.

Vallee, Lawraine J.: *See*—
Bailey, Christopher J.; Dirks, Lynn M.; Firm, William R.; and Vallee, Lawraine J., 5,553,287, Cl. 395-650.000.

Valmet Corporation: *See*—
Ilvespää, Heikki; Jaakkola, Jyrki; Linsuri, Ari; Partanen, Erkki, Poikolainen, Antti; Turpeinen, Pasi; and Verkasalo, Lauri, 5,552,021, Cl. 162-203.000.

Van Daele, Georges H. P.; and Van den Keybus, Fran M. A., to Janssen Pharmaceutica N.V. N-(3-hydroxy-4-piperidinyl) (dihydrobenzofuran, dihydro-2H-benzopyran or dehydrobenzodioxin) carboxamide derivatives. 5,552,553, Cl. 546-197.000.

Van Daele, Georges H. P.: *See*—
Janssen, Marcel A. C.; Van Daele, Georges H. P.; Bosmans, Jean-Paul R. M. A.; Verdonck, Marc G. C.; and Janssen, Paul A. J., 5,552,430, Cl. 514-426.000.

Vandebroek, Sophie V.: *See*—
Orlowski, Thomas E.; and Vandebroek, Sophie V., 5,552,328, Cl. 437-23.000.

Vandenberg, Donald E.; Dey, Thomas W.; and Olson, James, to Eastman Kodak Company. Focus detecting system using a beam splitter to form an image at nominal best focus, slightly in front of best focus and slightly behind best focus. 5,552,594, Cl. 250-201.700.

Van den Keybus, Fran M. A.: *See*—
Van Daele, Georges H. P.; and Van den Keybus, Fran M. A., 5,552,553, Cl. 546-197.000.

Vanderbilt University: *See*—
Pack, Robert T.; Iskarous, Moenes Z.; and Kawamura, Kazuhiko, 5,551,525, Cl. 180-8.600.

Vander Heyden, William H., to Badger Meter, Inc. Method and apparatus for measuring volume correction using molar quantities. 5,551,282, Cl. 73-30.030.

Van der Putten, Frank O.: *See*—
Voeten, Bart F.; Vermeulen, Christophe D. G.; Van der Putten, Frank O.; and Defoort, Frank C. M., 5,553,005, Cl. 364-514.00R.

Vanderspurt, Thomas H.: *See*—
Potter, Mark J.; Kao, Jar-Lin; Cross, Virginia R.; Vanderspurt, Thomas H.; Dienes, Edward K.; Riley, Robert E.; Tungate, Freddie L.; and Bortinger, Arie, 5,552,035, Cl. 208-135.000.

Vanderstukken, Robert, to Glaverbel. Fire-retarding window assembly. 5,551,195, Cl. 52-171.300.

Van Der Werff, Harm: *See*—
Maat, Hendrik T.; Cloos, Peter J.; Van Der Werff, Harm; and Lommerts, Bert J., 5,552,218, Cl. 428-357.000.

Vanderzyden, Henry R.: *See*—
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van de Venne, Theo: *See*—
Schwirian, Richard E.; and van de Venne, Theo, 5,553,107, Cl. 376-352.000.

Van Dijk, Willem R., to Lever Brothers Company, Division of Conopco, Inc. Enzymatic dishwashing and rinsing composition. 5,551,990, Cl. 134-25.200.

Vane, Burton W.; and Lederer, David B., to Detection Systems, Inc. Smoke detector with individually stored range of acceptable sensitivity. 5,552,765, Cl. 340-515.000.

Van Erden, Donald, to Minigrip, Inc. Method for applying zipper to film at tube on a form-fill-and-seal. 5,551,208, Cl. 53-139.200.

van Fossen, Larry, to Iowa State University Research Foundation, Inc. Continuous-flow grain steeping and cooling method and apparatus. 5,551,167, Cl. 34-491.000.

Van Fossen, Larry, to Iowa State University Research Foundation, Inc. Continuous-flow grain steeping and cooling system. 5,551,168, Cl. 34-491.000.

Van Gaal, Adrianus P.; Humphreys, Richard J.; Atkinson, John C.; Chawla, Amit; and Chan, Yee-Ning, to Northern Telecom Limited. Electronic unit. 5,552,961, Cl. 361-700.000.

Van Gemert, Barry; and Knowles, David B., to PPG Industries, Inc. Photochromic naphthopyran compounds. 5,552,090, Cl. 252-586.000.

Van Gerven, Johannes A. H.; and De Langen, Michael T. W., to U.S. Philips Corporation. Solder-coating method, and solder paste suitable for use therein. 5,551,628, Cl. 228-248.100.

Vanguard Automation, Inc.: *See*—
McGill, Scott D., 5,551,216, Cl. 53-473.000.

Vanguard International Semiconductor Company: *See*—
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Vanguard International Semiconductor Corp.: *See*—
Lee, Ching-Ying; Hsia, Shaw-Tzeng; and Yen, Haw, 5,552,340, Cl. 437-190.000.
Lin, Jenq-Tyan; and Tseng, Horng-Huei, 5,551,571, Cl. 206-710.000.

Van Slyke, Steven A.: *See*—
Tang, Ching W.; and Van Slyke, Steven A., 5,552,678, Cl. 315-169.300.

Van Steenburgh, Leon R., Jr. Liquid chiller with bypass valves. 5,551,249, Cl. 62-196.400.

Van Uijen, Cornelis: *See*—
Spruit, Johannes H. M.; Jacobs, Bernardus A. J.; and Van Uijen, Cornelis, 5,553,038, Cl. 369-13.000.

van Woesik, Egbertus T. C. M., to Whitaker Corporation, The. Fibre optic connector and method of forming a fibre connection. 5,553,181, Cl. 385-85.000.

Varga, Zoltan: *See*—
Kane, Martin; Pratt, Wayne; Alesz, Jozsef; Biro, Zoltan; and Varga, Zoltan, 5,551,307, Cl. 73-861.356.

Varian Associates, Inc.: *See*—
Anderson, Weston A., 5,552,709, Cl. 324-321.000.

Varien, Richard: *See*—
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Varn Products Company, Inc.: *See*—
Wall, Robert; and Jakobsen, James W., 5,551,338, Cl. 101-148.000.

Varner, Wayne F.: *See*—
Lutz, Dale R.; MacDougall, Trevor W.; Taylor, William L.; Varner, Wayne F.; and Wandmacher, Robert A., 5,553,173, Cl. 382-12.000.

Vartuli, James C.: *See*—
Chang, Clarence D.; Santiesteban, Jose G.; Shihabi, David S.; Stevenson, Scott A.; and Vartuli, James C., 5,552,128, Cl. 423-235.000.

Vass, Attila: *See*—
Brodt, Gregor; Vass, Attila; Loch, Werner; Lehner, August; Lenz, Werner; and Schneider, Norbert, 5,552,229, Cl. 428-425.900.

Vazquez, Rafael, Jr. Squeegee-type mopping device. 5,551,121, Cl. 15-341.000.

Veilleux, Leo J., Jr.; Anzulewicz, David T.; and Dyer, Gerald P., to United Technologies Corporation. Multiplexing hydraulic control network with latching valves. 5,551,478, Cl. 137-596.150.

Veitsch-Radex Aktiengesellschaft fur Feuerfeste Erzeugnisse: *See*—
Harmuth, Harald; Heindl, Roland; and Deutsch, Josef, 5,552,354, Cl. 501-94.000.

Veloskey, Thomas E.: *See*—
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Veneklasen, Lee H.: *See*—
Macaulay, John M.; Spindt, Christopher J.; Corcoran, Patrick A.; and Veneklasen, Lee H., 5,552,659, Cl. 313-310.000.

Venghaus, Horst: *See*—
Sulzyc, George; and Venghaus, Horst, 5,551,734, Cl. 285-174.000.

Venkatesan, Mahalingam: *See*—
Anderson, Roger N.; Hey, H. Peter W.; Beinglass, Israel; and Venkatesan, Mahalingam, 5,551,982, Cl. 118-715.000.

Ventana Medical Systems, Inc.: *See*—
Zeheb, Ron; and Rodgers, Paula M., 5,552,087, Cl. 252-408.100.

Veranis, Charles J.: *See*—
Minervino, Richard J., Jr.; Veranis, Charles J.; and Andrade, Anthony J., 5,553,131, Cl. 379-221.000.

Verbo, Ulysse: *See*—
Gautier, Jean-Pierre; Verbo, Ulysse; and Perez Revilla, Miguel, 5,551,317, Cl. 74-560.000.

Verdonck, Marc G. C.: *See*—
Janssen, Marcel A. C.; Van Daele, Georges H. P.; Bosmans, Jean-Paul R. M. A.; Verdonck, Marc G. C.; and Janssen, Paul A. J., 5,552,430, Cl. 514-426.000.

Veregin, Richard P. N.: *See*—
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Yamada, Hirohito, to NEC Corporation. Semiconductor multiquantum well structure and semiconductor laser therewith. 5,553,090, Cl. 372-45.000.

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Pierce, Perry A.; and Zanger, Peter K., 5,552,691, Cl. 318-652.000.
Zanzig, David J.; Sandstrom, Paul H.; Hubbell, Joseph K.; Hsu, Wen-Liang; Halasa, Adel F.; and Verthe, John J. A., to Goodyear Tire & Rubber Company, The. Styrene-isoprene rubber for tire tread compounds. 5,552,490, Cl. 525-237.000.
Zanzig, Jerald G.; Stragier, Marcel G.; and Pickrell, John W., to Heil Company, The. Articulated refuse collection apparatus. 5,551,824, Cl. 414-408.000.
Zeheb, Ron; and Rodgers, Paula M., to Ventana Medical Systems, Inc. High temperature evaporation inhibitor liquid. 5,552,087, Cl. 252-408.100.
Zeller, Gregor; and Bonn, Helmut, to Petri AG. Current transfer element for steering wheels of motor vehicles. 5,551,886, Cl. 439-164.000.
Zenda, Hiroki: *See*—
Uchikoga, Hiroshi; Zenda, Hiroki; and Shimamoto, Hajime, 5,552,800, Cl. 345-89.000.
Zeneca Limited: *See*—
McLean, Michael J.; Holland, David; Garman, Andrew J.; and Sheppard, Robert C., 5,552,535, Cl. 536-23.100.
Zenith Electronics Corporation: *See*—
Messman, Bruce E., 5,553,096, Cl. 375-238.000.
Tait, David S., 5,553,142, Cl. 380-19.000.
Zeringue, Clay M. Faucet safety handle. 5,551,124, Cl. 16-121.000.
Zerkowitz, Avinoam S.: *See*—
McLeod, Scott C.; Zerkowitz, Avinoam S.; and Lent, Lillian G., 5,552,793, Cl. 342-204.000.
Zexel Corporation: *See*—
Nishishita, Kunihiko, 5,551,506, Cl. 165-76.000.
Saito, Susumu; Takagi, Nobukazu; Harada, Kiyohiro; Kazahaya, Yukio; Kuchiki, Seiji; Ishikawa, Masakuni; and Nakajima, Nobuyuki, 5,551,852, Cl. 418-98.000.
Zhang, Ke: *See*—
Saxon, Andrew; Zhang, Ke; and Max, Edward E., 5,552,537, Cl. 536-24.300.
Zhang, William H.: *See*—
Huang, Xiaoli; and Zhang, William H., 5,553,008, Cl. 364-578.000.
Zhang, Xiao-kun: *See*—
Pfahl, Magnus; Zhang, Xiao-kun; Lehmann, Jürgen M.; Dawson, Marcia I.; Cameron, James F.; Hobbs, Peter D.; and Jong, Ling, 5,552,271, Cl. 435-6.000.
Zhao, Chen: *See*—
Kempf, Dale J.; Norbeck, Daniel W.; Sham, Hing L.; Zhao, Chen; Sowin, Thomas J.; Reno, Daniel S.; and Haight, Anthony R., 5,552,558, Cl. 549-552.000.
Zhou, Shaojun J., to AlliedSignal Inc. Recovery of spent deicing fluid. 5,552,023, Cl. 203-18.000.
Zhu, Xiaodong T.: *See*—
Tehrani, Saied N.; Goronkin, Herbert; Shen, Jun; and Zhu, Xiaodong T., 5,552,330, Cl. 437-39.000.
Zielinski, Thomas E.; Eisenmann, Gregg A.; Kennedy, Robert D.; O'Branovic, Nickolas; and Sian, Sucha S., to Chrysler Corporation. Method of fabricating an electrical terminal. 5,551,150, Cl. 29-882.000.
Zifferer, L. Robert, to Packless Metal Hose, Inc. Heat exchange element. 5,551,504, Cl. 165-156.000.
Zilahi, Erika: *See*—
Ott, István; Klupp, Tibor; Molnár, István; Parthy, András; Barta, István; Barkó née Tóth, Zsuzsa; Ambrus, Gábor; Salát, János; Tegdes, Anikó; Moravcsik, Imre; Együd, Cecilia; Albrecht, Károly; Könczöl, Kálmán; Vincze, Attila; Barabás, Éva; Máté, György; Kiss, György B.; Kiss, Péter; Pólya, Kálmán; Erdei, János; Gulyás, Éva; and Zilahi, Erika, 5,552,299, Cl. 435-69.100.
Zimmer, Michael T.; Kakoczki, Richard J.; Davis, James A.; Pratt, Jerrold A.; and Reinbold, Edward O., to Dresser Industries, Inc. Turbocharger control management system. 5,551,236, Cl. 60-605.100.
Zimmerman & Jansen GmbH: *See*—
Irnich, Franz-Josef, 5,551,666, Cl. 251-160.000.
Zimmerman, Dennis M.: *See*—
Lunn, William H. W.; Monn, James A.; and Zimmerman, Dennis M., 5,552,426, Cl. 514-394.000.
Zimmerman, Harold M. Telescoping discharge chute for concrete trucks. 5,551,776, Cl. 366-68.000.
Zimmerman, Stephen A.: *See*—
Brandt, Thomas J.; and Zimmerman, Stephen A., 5,552,819, Cl. 347-212.000.
Zimmermann, Louis H.: *See*—
Roth, James E.; and Zimmermann, Louis H., 5,551,836, Cl. 415-204.000.
Zinser Textilmaschinen GmbH: *See*—
Nickolay, Helmut, 5,551,223, Cl. 57-264.000.
Ziperovich, Pablo A.; and Chiao, James, to Quantum Corporation. Zero phase start optimization using mean squared error in a PRML recording channel. 5,552,942, Cl. 360-51.000.
Zitel Corporation: *See*—
Papenberg, Robert L.; Yang, Runchan D.; Wotring, David H.; Rydhan, Mohammad F.; Voloshin, Paul; and Talaat, Mohamed M., 5,553,231, Cl. 395-182.030.
Znaiden, Alexander P.; Cheney, Michael C.; and Rose, Walter, to Chesebrough-Pond's USA Co., Division of Conopco, Inc. Petroleum jelly with alpha hydroxy carboxylic acids. 5,552,147, Cl. 424-401.000.
Znaiden, Alexander P.; Crotty, Brian; and Johnson, Anthony, to Chesebrough-Pond's USA Co., Division of Conopco, Inc. Petroleum jelly with inositol phosphates. 5,552,148, Cl. 424-401.000.
Zumtobel, Daniel C., to Muscle Memory Sports. Putting training apparatus. 5,551,924, Cl. 473-238.000.
Zurba, Peter: *See*—
Drozdowich, Bryan G.; and Zurba, Peter, 5,551,103, Cl. 4-631.000.
ZymoGenetics, Inc.: *See*—
Labroo, Virender M.; and Piggott, James R., 5,552,413, Cl. 514-320.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3rd DAY OF SEPTEMBER, 1996

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bailly, Jean-Claude A.; and Speakman, John G., to BP Chemicals Limited. Prepolymers of olefins containing a chromium oxide and a granular refractory oxide support. Re. 35,324, Cl. 428-407.000.
BP Chemicals Limited: *See*—
Bailly, Jean-Claude A.; and Speakman, John G., Re. 35,324, Cl. 428-407.000.
Hannay, Richard C.: *See*—
Owen, Richard A.; and Hannay, Richard C., Re. 35,322, Cl. 52-741.140.
Jespersen, Mark R.: *See*—
Wass, Charles W.; and Jespersen, Mark R., Re. 35,325, Cl. 439-412.000.
Nippon Thompson Co., Ltd.: *See*—
Ohtake, Masaichi, Re. 35,323, Cl. 384-15.000.
Ohtake, Masaichi, to Nippon Thompson Co., Ltd. Linear motion guide unit having an adjustable retainer plate. Re. 35,323, Cl. 384-15.000.
Owen, Richard A.; and Hannay, Richard C., to Hannay, Richard C. Method and apparatus for composite pole repair. Re. 35,322, Cl. 52-741.140.
PSI Telecommunications, Inc.: *See*—
Wass, Charles W.; and Jespersen, Mark R., Re. 35,325, Cl. 439-412.000.
Richburg, James B. Meat deboning apparatus and method. Re. 35,326, Cl. 452-135.000.
Speakman, John G.: *See*—
Bailly, Jean-Claude A.; and Speakman, John G., Re. 35,324, Cl. 428-407.000.
Wass, Charles W.; and Jespersen, Mark R., to PSI Telecommunications, Inc. Terminal block. Re. 35,325, Cl. 439-412.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bregeault, Jean-Marie; El-Ali, Bassam; and Martin, Jacques, to Rhone-Poulenc Chimie. Preparation of aliphatic carboxylic acids by oxidation of monocyclic ketones. B1 4,983,767, Cl. 562-528.000.
Ditzik, Richard J.: *See*—
Zenk, George E.; and Ditzik, Richard J., B1 4,066,854, Cl. 200-5.00A.
El-Ali, Bassam: *See*—
Bregeault, Jean-Marie; El-Ali, Bassam; and Martin, Jacques, B1 4,983,767, Cl. 562-528.000.
Elographics, Inc.: *See*—
Gibson, William A.; and Talmage, John E., Jr., B1 4,220,815, Cl. 178-18.000.
Flintab AB: *See*—
Nordstrom, Kjell H., B1 4,804,053, Cl. 177-211.000.
Gibson, William A.; and Talmage, John E., Jr., to Elographics, Inc. Nonplanar transparent electrographic sensor. B1 4,220,815, Cl. 178-18.000.
Indium Corporation of America, The: *See*—
Slattery, James A.; and White, Charles E. T., B1 5,256,370, Cl. 420-557.000.
Martin, Jacques: *See*—
Bregeault, Jean-Marie; El-Ali, Bassam; and Martin, Jacques, B1 4,983,767, Cl. 562-528.000.
Nordstrom, Kjell H., to Flintab AB. Rocker pin load cell. B1 4,804,053, Cl. 177-211.000.
Rhone-Poulenc Chimie: *See*—
Bregeault, Jean-Marie; El-Ali, Bassam; and Martin, Jacques, B1 4,983,767, Cl. 562-528.000.
Slattery, James A.; and White, Charles E. T., to Indium Corporation of America, The. Lead-free alloy containing tin, silver and indium. B1 5,256,370, Cl. 420-557.000.
St. Clair Intellectual Property Consultants, Inc.: *See*—
Zenk, George E.; and Ditzik, Richard J., B1 4,066,854, Cl. 200-5.00A.
Talmage, John E., Jr.: *See*—
Gibson, William A.; and Talmage, John E., Jr., B1 4,220,815, Cl. 178-18.000.
White, Charles E. T.: *See*—
Slattery, James A.; and White, Charles E. T., B1 5,256,370, Cl. 420-557.000.
Zenk, George E.; and Ditzik, Richard J., to St. Clair Intellectual Property Consultants, Inc. Membrane-type touch panel employing insulating grid anti-short means. B1 4,066,854, Cl. 200-5.00A.

LIST OF DESIGN PATENTEES

Abe, Takashi, to SMC Corporation. Rodless cylinder. 373,364, Cl. D15-7.000.
Achuara, Kellin A.: *See*—
Ogata, Randy T.; Lagundino, Primo C.; and Achuara, Kellin A., 373,400, Cl. D21-227.000.
Adams, Harold G. Orthopedic therapeutic prop. 373,422, Cl. D24-192.000.
Adams, James D.: *See*—
Rose, Deborah H.; Adams, James D.; and Thole, Steven, 373,267, Cl. D6-473.000.
Alexander, Brian D. T.; Corpuz, Roque M., Jr.; and Glashouwer, Paul A., to Haworth, Inc. Table. 373,270, Cl. D6-487.000.
Altendorf, John M.; and Elliot, Joseph R., to Hewlett-Packard Company. Print cartridge. 373,381, Cl. D18-56.000.
Anthony, William L., to Toledo Trans-Kit, Inc. Reinforcement member for piston retainer in a vehicle automatic transmission. 373,370, Cl. D15-148.000.
Antonio, Molinari, to Rondine Italia, S.p.A. Cookware. 373,286, Cl. D7-361.000.
Antonio, Molinari, to Rondine Italia, S.p.A. Cookware. 373,287, Cl. D7-361.000.
Applied Medical Technology, Inc.: *See*—
Szpak, Anthony J., 373,418, Cl. D24-112.000.
Aquatec Water Systems, Inc.: *See*—
Schoenmeyr, Ivar L., 373,365, Cl. D15-7.000.
Araki, Mitsutoshi: *See*—
Miyachi, Hiroshi; Araki, Mitsutoshi; Ueno, Yoshiteru; and Yamase, Norihide, 373,363, Cl. D15-5.000.
Armstrong World Industries, Inc.: *See*—
Rose, Deborah H.; Adams, James D.; and Thole, Steven, 373,267, Cl. D6-473.000.
Artus, Mark B.: *See*—
Lechleiter, Paul R.; and Artus, Mark B., 373,264, Cl. D6-449.000.
Ashley, Philip M.; and Gill, Edmund D., to Ashley, Phillip Martin. Portable electronic communication device. 373,347, Cl. D14-106.000.
Ashley, Phillip Martin: *See*—
Ashley, Philip M.; and Gill, Edmund D., 373,347, Cl. D14-106.000.
AT&T IDM Corp.: *See*—
Biasotti, Mark; Nuttall, Michael J.; and Schaffeld, John H., 373,361, Cl. D14-240.000.
Atherton, Randy L.; Zwayer, Kent L.; and Freeman, Perry A., to Zebco Division of Brunswick Corporation. Crank handle for a fishing reel. 373,404, Cl. D22-140.000.
Attinello, John S.; Graas, Maurice; and Sundkvist, Karl E., to Goodyear Tire & Rubber Company, The. Tire tread. 373,338, Cl. D12-146.000.
Audiovox Corporation: *See*—
Dzierak, Mark, 373,319, Cl. D10-106.000.
Auker, Byron R. Sifter for separating debris from garden soil. 373,291, Cl. D8-1.000.
Avantgarde S.p.A.: *See*—
Cavazza, Paolo, 373,250, Cl. D4-104.000.
Baerenwald, Philip M.: *See*—

Bro, Jay M.; Myers, Peter J.; and Baerenwald, Philip M., 373,389, Cl. D21-81.000.
Bailey, Donald. Magnet. 373,303, Cl. D8-373.000.
Bain, Charles: *See*—
Berch, Mark E.; and Bain, Charles, 373,318, Cl. D10-106.000.
Ballanda Limited: *See*—
Wong, Shu K., 373,357, Cl. D14-170.000.
Ballin, Scott. Combined beer stein and bottle opener. 373,290, Cl. D7-536.000.
Banham, David: *See*—
Stokes, Adrian D.; Banham, David; and Green, Stephen, 373,246, Cl. D3-279.000.
Baxter, Ronald A., to Mead Corporation, The. Carton for cups or similar objects. 373,306, Cl. D9-346.000.
Bechte, Veit: *See*—
Gottwald, Adolf; and Bechte, Veit, 373,406, Cl. D23-252.000.
Beese, Jamie. Ten section gumball vending machine. 373,386, Cl. D20-7.000.
Beletsky, Robert J., to Bianchi International. Holster for an automatic pistol. 373,242, Cl. D3-222.000.
Bell, Edward A.; and Bell, Nannette C. Vehicle head neck rest. 373,275, Cl. D6-501.000.
Bell, Nannette C.: *See*—
Bell, Edward A.; and Bell, Nannette C., 373,275, Cl. D6-501.000.
Berch, Mark E.; and Bain, Charles, to Sequel Security Systems, Inc. Remote control device. 373,318, Cl. D10-106.000.
Bernhardt Furniture Company: *See*—
Keller, H. Thomas, 373,259, Cl. D6-393.000.
Keller, H. Thomas, 373,263, Cl. D6-436.000.
Berriman, Richard E.: *See*—
Brown, Stephen C.; Bloyer, Donald R.; Dorow, Stephen D.; Okazaki, Sandra Y.; Jackson, Larry A.; Berriman, Richard E.; McClelland, Donald R.; Thorpe, David M.; Hippen, Jan; Christianson, John A.; Kelley, Richard A.; Dwyer, Daniel R.; Rasmussen, Steve O.; Neubauer, Larry G.; and Chin, Henry Y., 373,378, Cl. D18-55.000.
Bertani, Alberto: *See*—
Decursu, Giorgio; and Bertani, Alberto, 373,305, Cl. D8-398.000.
Bianchi International: *See*—
Beletsky, Robert J., 373,242, Cl. D3-222.000.
Biasotti, Mark; Nuttall, Michael J.; and Schaffeld, John H., to AT&T IDM Corp. Telephone caller-ID module. 373,361, Cl. D14-240.000.
Bigelow & Holmes Inc.: *See*—
Bigelow, Charles A.; and Holmes, Kris A., 373,373, Cl. D18-24.000.
Bigelow, Charles A.; and Holmes, Kris A., 373,374, Cl. D18-24.000.
Bigelow, Charles A.; and Holmes, Kris A., to Bigelow & Holmes Inc. Lucida casual italic typeface. 373,373, Cl. D18-24.000.
Bigelow, Charles A.; and Holmes, Kris A., to Bigelow & Holmes Inc. Lucida casual typeface. 373,374, Cl. D18-24.000.
Birkholz, Douglas J., to Fiskars Inc. Punch tool. 373,385, Cl. D19-72.000.
Black & Decker Inc.: *See*—
Hall, Roberta S.; and Dolson, Michael D., 373,299, Cl. D8-309.000.
Nolan, Patrick, 373,434, Cl. D26-43.000.
Nolan, Patrick B., 373,435, Cl. D26-43.000.
Blockbuster Entertainment Corporation: *See*—
Lechleiter, Paul R.; and Artus, Mark B., 373,264, Cl. D6-449.000.
Bloyer, Donald R.: *See*—
Brown, Stephen C.; Bloyer, Donald R.; Dorow, Stephen D.; Okazaki, Sandra Y.; Jackson, Larry A.; Berriman, Richard E.; McClelland, Donald R.; Thorpe, David M.; Hippen, Jan; Christianson, John A.; Kelley, Richard A.; Dwyer, Daniel R.; Rasmussen, Steve O.; Neubauer, Larry G.; and Chin, Henry Y., 373,378, Cl. D18-55.000.
Bonarini, Elio; and Fornaini, Domenico, to Uno A Erre Italia S.p.A. Chain. 373,323, Cl. D11-13.000.
Booda Products, Inc.: *See*—
O'Rourke, Anthony; and Byrne, Charles, 373,450, Cl. D30-160.000.
Bosch-Siemens Hausgeraete GmbH: *See*—
Wilsdorf, Gerd, 373,283, Cl. D7-340.000.
Both, Clifford. Adaptor ice skate blade for an inline skate. 373,399, Cl. D21-225.000.
Bowen, Michael K.: *See*—
Dwyer, Daniel R.; Jones, Gene D.; McCue, Thomas E., Jr.; Bowen, Michael K.; and Leon, Michael M., 373,380, Cl. D18-55.000.
Boyd, Edward L., to Sony Corporation of America. Console television receiver. 373,356, Cl. D14-133.000.
Bright Commence Industrial Ltd.: *See*—
Li, Wai-Hung; and Lam, Chi-Kwong, 373,436, Cl. D26-44.000.
Bright Garden Industrial Co., Ltd.: *See*—
Chen, Chaw-Ming, 373,279, Cl. D7-306.000.
Brindisi, Frederick J., to Cooper Industries, Inc. Tire chain box. 373,245, Cl. D3-271.000.
Bro, Jay M.; Myers, Peter J.; and Baerenwald, Philip M., to Today's Kids, Inc. Toy motorcycle. 373,389, Cl. D21-81.000.
Brown, Stephen C.; Bloyer, Donald R.; Dorow, Stephen D.; Okazaki, Sandra Y.; Jackson, Larry A.; Berriman, Richard E.; McClelland, Donald R.; Thorpe, David M.; Hippen, Jan; Christianson, John A.; Kelley, Richard A.; Dwyer, Daniel R.; Rasmussen, Steve O.; Neubauer, Larry G.; and Chin, Henry Y., to Hewlett-Packard Company. Color inkjet printer. 373,378, Cl. D18-55.000.
Brown, Thomas J. Orthopedic mouthpiece for dental occlusion control. 373,421, Cl. D24-180.000.
Bucher, John C.; Wu, Shih T.; Tao, Ta-Yao; and Elliott, John C, to Chien Luen Industries Company, Ltd., Inc. Heater fan. 373,414, Cl. D23-335.000.
Built for Speed, Inc.: *See*—
Hill, Martin H., 373,297, Cl. D8-105.000.
Burch, Brad J. Spool holder. 373,301, Cl. D8-359.000.
Byrne, Charles: *See*—
O'Rourke, Anthony; and Byrne, Charles, 373,450, Cl. D30-160.000.
Canon Kabushiki Kaisha: *See*—
Yamamoto, Ei; and Shimizu, Hisakazu, 373,375, Cl. D18-39.000.
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Capling, Robert: *See*—
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Caponelli, Daniel; and Landholm, Robin. Muff. 373,235, Cl. D2-613.000.
Cargill, Incorporated: *See*—
Manderfeld, Michelle M., 373,234, Cl. D1-130.000.
Carlson, Edward W. Combined cover and air filter for a computer housing. 373,348, Cl. D14-114.000.
Carlton International PLC: *See*—
Stokes, Adrian D.; Banham, David; and Green, Stephen, 373,246, Cl. D3-279.000.
Cavazza, Paolo, to Avantgarde S.p.A. Toothbrush. 373,250, Cl. D4-104.000.
Chan, Kwong C. Pair of binoculars. 373,371, Cl. D16-133.000.
Chan, Raymond: *See*—
Ford, Joseph E.; Hilger, Ronald O.; and Chan, Raymond, 373,416, Cl. D23-364.000.
Chanel, Inc.: *See*—
Helleu, Jacques C., 373,322, Cl. D10-125.000.
Chao, Yu-Lin: *See*—
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Chapman, Steven S.; and Jackson, Daniel C., to Eastman Kodak Company. Display holder. 373,308, Cl. D9-415.000.
Chavez, Joilene M.; and Johnson, Nora S. Electronic beeper case. 373,241, Cl. D3-218.000.
Chen, Chau-Hwu, to Kalloy Industrial Co., Ltd. Bicycle handlebar. 373,339, Cl. D12-178.000.
Chen, Chaw-Ming, to Bright Garden Industrial Co., Ltd. Beverage dispenser. 373,279, Cl. D7-306.000.
Chen, Chih-liang. Exerciser. 373,395, Cl. D21-194.000.
Chen, Frank, to Silitek Corporation. Keyboard. 373,351, Cl. D14-115.000.
Chen, Mike C.-F. Sport face mask which includes a frame and in situ molded upper forehead and lower facial polymeric pads. 373,447, Cl. D29-111.000.
Chen, Tim W., to Keys Fitness Products, Inc. End clip for an exercise band. 373,302, Cl. D8-367.000.
Chen, Yin-Tsang. Pet feeder. 373,448, Cl. D30-130.000.
Chen, Yin-Tsang. Pet feeder. 373,449, Cl. D30-130.000.
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Bucher, John C.; Wu, Shih T.; Tao, Ta-Yao; and Elliott, John C, 373,414, Cl. D23-335.000.
Chin, Henry Y.: *See*—
Brown, Stephen C.; Bloyer, Donald R.; Dorow, Stephen D.; Okazaki, Sandra Y.; Jackson, Larry A.; Berriman, Richard E.; McClelland, Donald R.; Thorpe, David M.; Hippen, Jan; Christianson, John A.; Kelley, Richard A.; Dwyer, Daniel R.; Rasmussen, Steve O.; Neubauer, Larry G.; and Chin, Henry Y., 373,378, Cl. D18-55.000.
Chow, Pok Y. J. Inflatable pillow. 373,278, Cl. D6-604.000.
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Citizen Watch Co., Ltd.: *See*—
Sugimoto, Isao, 373,379, Cl. D18-50.000.
Classen, Elizabeth F. Wheelchair accessory. 373,336, Cl. D12-133.000.
Coastal Tool Company, Inc.: *See*—
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Cohen, Milton L.; and Siegel, Jeff, to Lifetime Hoan Corporation. Handle for knives, kitchen tools and gadgets. 373,288, Cl. D7-395.000.
Colitto, Domenic, to Royal Extrusions Limited. Window sill. 373,430, Cl. D25-124.000.
Collins, Scott J.: *See*—
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Colsen, Ronnie H.; and Deller, Andrew L., to Waco Corporation Kabushiki Kaisha. Device for stimulating acupuncture point. 373,424, Cl. D24-200.000.
Contico International, Inc.: *See*—
Dickinson, Thomas; and Gale, Bradley D., 373,247, Cl. D3-282.000.
Cooper Industries, Inc.: *See*—
Brindisi, Frederick J., 373,245, Cl. D3-271.000.
Cordero, Benjamin C. Barbeque grill. 373,282, Cl. D7-334.000.
Coroama, John; and Yasuda, John P., to Coroama, John; Lupu, Mircea; and Yasuda, John P. Barbecue plate. 373,285, Cl. D7-359.000.
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Alexander, Brian D. T.; Corpuz, Roque M., Jr.; and Glashouwer, Paul A., 373,270, Cl. D6-487.000.
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Vass-Betts, Rachael, 373,236, Cl. D2-710.000.
Vass-Betts, Rachael, 373,237, Cl. D2-710.000.
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Dale Garn & Trikotasje A/S: *See*—
Handberg, Mette N., 373,252, Cl. D5-7.000.
DeBardelaben, Travis C. Tennis ball positioning device. 373,397, Cl. D21-199.000.
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Deller, Andrew L.: *See*—
Colsen, Ronnie H.; and Deller, Andrew L., 373,424, Cl. D24-200.000.
Designs For Vision, Inc.: *See*—
Feinbloom, Richard E., 373,433, Cl. D26-39.000.
Desmet, Edward P.: *See*—
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Desmet, Thomas J.: *See*—
Tovey, John R.; Desmet, Thomas J.; and Desmet, Edward P., 373,243, Cl. D3-228.000.
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Cain, Paul A.; Chou, David T.; D'Silva, Themistocles D. J.; Gant, Daniel B.; and Herman, Nancy D., to Rhône-Poulenc Inc. Pesticide substituted diketonitriles. H1,596, Cl. 514-521.000.

Chou, David T.: *See*—
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Chou, David T.-W.: *See*—
Cain, Paul A.; Chou, David T.-W.; D'Silva, Themistocles D. J.; Grant, Daniel B.; and Herman, Nancy D., H1,595, Cl. 514-520.000.

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Grant, Daniel B.: *See*—
Cain, Paul A.; Chou, David T.-W.; D'Silva, Themistocles D. J.; Grant, Daniel B.; and Herman, Nancy D., H1,595, Cl. 514-520.000.

Haraga, Hideaki; and Iwagaki, Masaru. Silver halide color light-sensitive material and photographing unit package. H1,593, Cl. 430-496.000.

Herman, Nancy D.: *See*—
Cain, Paul A.; Chou, David T.-W.; D'Silva, Themistocles D. J.; Grant, Daniel B.; and Herman, Nancy D., H1,595, Cl. 514-520.000.
Cain, Paul A.; Chou, David T.; D'Silva, Themistocles D. J.; Gant, Daniel B.; and Herman, Nancy D., H1,596, Cl. 514-521.000.

Ishikawa, Sadayasu: *See*—
Sekiya, Tadanobu; and Ishikawa, Sadayasu, H1,594, Cl. 430-506.000.

Iwagaki, Masaru: *See*—
Haraga, Hideaki; and Iwagaki, Masaru, H1,593, Cl. 430-496.000.

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Sekiya, Tadanobu; and Ishikawa, Sadayasu, H1,594, Cl. 430-506.000.

Nicholson, Myron D., to Viskase Corporation. Cellulosic food casing. H1,592, Cl. 428-34.800.

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Rhône-Poulene Inc.: *See*—
Cain, Paul A.; Chou, David T.-W.; D'Silva, Themistocles D. J.; Grant, Daniel B.; and Herman, Nancy D., H1,595, Cl. 514-520.000.

Rosenthal, David A., to United States of America, Navy. Combined video and text data distribution system. H1,589, Cl. 364-420.000.

Sekiya, Tadanobu; and Ishikawa, Sadayasu, to Konica Corporation. Silver halide color photographic light-sensitive material. H1,594, Cl. 430-506.000.

Shell Oil Company: *See*—
Erickson, James R., H1,597, Cl. 522-158.000.

United States of America
Army: *See*—
Fellows, William G.; and Weinberger, Lester, H1,586, Cl. 252-582.000.
Navy: *See*—
Rosenthal, David A., H1,589, Cl. 364-420.000.
Van Valkenburgh, Norman S.; and Van Valkenburgh, Gary L., H1,587, Cl. 280-789.000.

Van Valkenburgh, Gary L.: *See*—
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Weinberger, Lester: *See*—
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CLASSIFICATION OF PATENTS

ISSUED SEPTEMBER 3, 1996

NOTE—First number, class; second number, subclass; third number, patent number

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2 5,551,081
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19 5,551,083
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578.2 5,551,647
615.3 5,551,648

CLASS 244
1 N 5,551,649
54 5,551,650
215 5,551,651
220 5,551,652

CLASS 246
167 R 5,551,653

CLASS 248
99 5,551,654
168 5,551,655
176.1 5,551,656
205.2 5,551,657
276.1 5,551,660
329 5,551,658
523 5,551,659
634 5,551,661

CLASS 249
51 5,551,662
115 5,551,663

CLASS 250
201.7 5,552,594
207 5,552,595
208.1 5,552,596
234 5,552,597
269.3 5,552,598
281 5,552,599
286 5,552,600
307 5,552,601
311 5,552,602
338.4 5,552,603
341.2 5,552,604
363.04 5,552,605
5,552,606
370.09 5,552,607
370.15 5,552,608
5,552,609
435 5,552,610
491.1 5,552,611
506.1 5,552,612

CLASS 251
30.03 5,551,664
58 5,551,665
160 5,551,666
212 5,551,667

CLASS 252
8.63 5,552,066
62.51 R 5,552,072
62.55 5,552,073
67 5,552,074
70 5,552,075
74 5,552,076
182.12 5,552,081
301.4 R 5,552,082
309 5,552,083
385 5,552,084
389.23 5,552,085
408.1 5,552,086
5,552,087
586 5,552,090
5,552,091

CLASS 254
8 B 5,551,668

CLASS 256
65 5,551,669

CLASS 257
10 5,552,613
66 5,552,614
72 5,552,615
184 5,552,616
197 5,552,617
207 5,552,618
291 5,552,619
302 5,552,620
321 5,552,621
339 5,552,622
345 5,552,623
350 5,552,624
409 5,552,625
435 5,552,630
438 5,552,629
525 5,552,626
530 5,552,627
632 5,552,628
666 5,552,631
679 5,552,632
700 5,552,633
706 5,552,634
5,552,635
709 5,552,636
717 5,552,637
759 5,552,638
775 5,552,639

CLASS 264
1.24 5,552,092
3.1 5,552,093
40.5 5,552,094
46.4 5,552,095
85 5,552,096
103 5,552,097
106 5,552,098
117 5,552,099
127 5,552,100
163 5,552,101
177.11 5,552,102
334 5,552,103
456 5,552,104
538 5,552,105

CLASS 266
87 5,551,670
156 5,551,671
229 5,551,672

CLASS 267
160 5,551,673
168 5,551,674
293 5,551,675

CLASS 269
43 5,551,676
266 5,551,677

CLASS 270
20.1 5,551,678
52.18 5,551,682
58.08 5,551,680
5,551,681
58.09 5,551,679

CLASS 271
9.09 5,551,683
110 5,551,684
245 5,551,685
298 5,551,686

CLASS 273
38 K 5,551,687
61 R 5,551,688
73 C 5,551,689
73 J 5,551,690
143R 5,551,692
244 5,551,697
246 5,551,698
5,551,699
296 5,551,700

CLASS 277
11 5,551,702
81 R 5,551,708
188 R 5,551,703
206 A 5,551,705
208 5,551,704
229 5,551,706
233 5,551,707
235 B 5,551,709

CLASS 279
20 5,551,710

CLASS 280
11.19 5,551,713
11.2 5,551,711
5,551,712
18 5,551,714
43.24 5,551,715
47.18 5,551,716
87.042 5,551,717
252 5,551,718
282 5,551,719
602 5,551,720
605 5,551,721
689 5,551,722
737 5,551,723
5,551,724
5,551,725
749 5,551,726
777 5,551,727
818 5,551,728

CLASS 283
94 5,551,729
117 5,551,730

CLASS 285
7 5,551,731
93 5,551,732
155 5,551,733
174 5,551,734
323 5,551,735

CLASS 290
40 B 5,552,640

CLASS 292
1.5 5,551,736
169 5,551,737
262 5,551,738
264 5,551,739
338 5,551,740

CLASS 294
7 5,551,741

CLASS 296
39.2 5,551,742
76 5,551,743
97.4 5,551,744
111 5,551,745
146.2 5,551,746
180.1 5,551,747

CLASS 297
170 5,551,748
219.12 5,551,749
250.1 5,551,750
256.13 5,551,751
284.5 5,551,752
314 5,551,753
353 5,551,754
411.46 5,551,755
440.20 5,551,756
440.23 5,551,757
451.3 5,551,758

CLASS 298
22 P 5,551,759

CLASS 299
105 5,551,760

CLASS 301
6.3 5,551,761
40.3 5,551,762
64.7 5,551,763

CLASS 303
3 5,551,764
7 5,551,765
22.2 5,551,766
87 5,551,767
122.06 5,551,768
149 5,551,769
167 5,551,770
186 5,551,771

CLASS 307
10.300 5,552,642
10.5 5,552,641
81 5,552,643
116 5,552,644
117 5,552,645
118 5,552,646
119 5,552,647
125 5,552,648

CLASS 310
12 5,552,649
67 R 5,552,650
181 5,552,651
237 5,552,652
263 5,552,653
309 5,552,654
330 5,552,655
337 5,552,656
339 5,552,657
366 5,552,658

CLASS 312
114 5,551,772
249.8 5,551,773
284 5,551,774
334.11 5,551,775

CLASS 313
310 5,552,659
341 5,552,660
346 R 5,552,661
403 5,552,662
461 5,552,663
488 5,552,664
489 5,552,665
493 5,552,666
498 5,552,667
506 5,552,668
613 5,552,669
625 5,552,670
635 5,552,671

CLASS 315
39.51 5,552,672
57 5,552,673
82 5,552,674
111.21 5,552,675
151 5,552,676
169.1 5,552,677
169.3 5,552,678
5,552,679
291 5,552,680

CLASS 318
139 5,552,681
254 5,552,682
5,552,685
287 5,552,683
293 5,552,684
362 5,552,686
563 5,552,687
569 5,552,688
599 5,552,689
632 5,552,690
652 5,552,691

CLASS 320
9 5,552,692
22 5,552,693

CLASS 323
222 5,552,694
271 5,552,695
275 5,552,696
282 5,552,697
313 5,552,698

CLASS 324
66 5,552,699
117 H 5,552,700
127 5,552,702
158.1 5,552,701
207.22 5,552,703
233 5,552,704
239 5,552,705
252 5,552,706
318 5,552,707
5,552,708
321 5,552,709
322 5,552,710
464 5,552,711
537 5,552,712
555 5,552,713
601 5,552,714
627 5,552,715
753 5,552,716
765 5,552,718

CLASS 326
27 5,552,719
38 5,552,720
39 5,552,721
41 5,552,722
86 5,552,723
126 5,552,724

CLASS 327
57 5,552,728
103 5,552,729
5,552,730
109 5,552,731
116 5,552,732
143 5,552,725
149 5,552,726
159 5,552,727
198 5,552,736
202 5,552,737
203 5,552,738
295 5,552,733
356 5,552,734
367 5,552,735
401 5,552,744
407 5,552,745
427 5,552,746
536 5,552,747
538 5,552,739
541 5,552,740
560 5,552,741
563 5,552,742
567 5,552,743

CLASS 331
1 A 5,552,748
14 5,552,749
25 5,552,750
116 FE 5,552,751

CLASS 333
33 5,552,753
243 5,552,752

CLASS 335
16 5,552,754
18 5,552,755

CLASS 336
200 5,552,756

CLASS 337
297 5,552,757

CLASS 340
323 R 5,552,758
426 5,552,759
444 5,552,760
456 5,552,761
468 5,552,762
506 5,552,763
508 5,552,764
515 5,552,765
540 5,552,767
541 5,552,766
546 5,552,768
550 5,552,769
5,552,770
568 5,552,771
573 5,552,772
5,552,773
623 5,552,774
628 5,552,775
825.21 5,552,776
5,552,777
825.340 5,552,778
825.44 5,552,779
991 5,552,780

CLASS 341
22 5,552,781
5,552,782
118 5,552,783
122 5,552,784
143 5,552,785

CLASS 342
22 5,552,786
25 5,552,787
30 5,552,788
42 5,552,789
51 5,552,790
174 5,552,791
195 5,552,792
204 5,552,793
357 5,552,794
5,552,795

CLASS 343
742 5,552,796
786 5,552,797
893 5,552,798

CLASS 345
3 5,552,799
89 5,552,800
100 5,552,801
5,552,802
119 5,552,803
150 5,552,804
153 5,552,805
156 5,552,806
5,552,807
157 5,552,808

CLASS 347
10 5,552,809
19 5,552,810
28 5,552,811
34 5,552,812
40 5,552,813
55 5,552,814
85 5,552,815
86 5,552,816
115 5,552,817
133 5,552,818
212 5,552,819
241 5,552,820

CLASS 348
47 5,552,821
79 5,552,822
155 5,552,823
157 5,552,824
222 5,552,825
5,552,826
266 5,552,827
315 5,552,828
392 5,552,829
416 5,552,831
420 5,552,832
460 5,552,833
581 5,552,834
730 5,552,836
734 5,552,837
735 5,552,838
744 5,552,839
751 5,552,840

CLASS 351
49 5,552,841
205 5,552,842

CLASS 354
21 5,552,843
106 5,552,844
159 5,552,845
173.1 5,552,846
195.12 5,552,847
206 5,552,848
275 5,552,849
295 5,552,850
298 5,552,851
324 5,552,852
408 5,552,853
410 5,552,854

CLASS 355
41 5,552,855
53 5,552,856
200 5,552,857
202 5,552,858
207 5,552,859
5,552,860
208 5,552,861
5,552,862
210 5,552,863
215 5,552,864
219 5,552,865
233 5,552,866
245 5,552,867
5,552,868
256 5,552,869
259 5,552,870
271 5,552,871
274 5,552,872
5,552,873
285 5,552,874
319 5,552,875
326 R 5,552,876
5,552,877

CLASS 356
5.01 5,552,893
5.07 5,552,878
28.5 5,552,879
72 5,552,880
73.1 5,552,881
5,552,882
139.03 5,552,883
243 5,552,884
246 5,552,885
250 5,552,886
350 5,552,887
358 5,552,888
364 5,552,889
369 5,552,890
400 5,552,891
401 5,552,892

CLASS 358
298 5,552,894
310 5,552,895
342 5,552,896
400 5,552,897
426 5,552,898
442 5,552,899
452 5,552,900
468 5,552,901
498 5,552,902
500 5,552,903
518 5,552,904
523 5,552,905

CLASS 359
40 5,552,906
49 5,552,907
53 5,552,908
59 5,552,909
60 5,552,910
68 5,552,911
73 5,552,912
80 5,552,913
87 5,552,914
94 5,552,915
95 5,552,916
148 5,552,917
152 5,552,918
161 5,552,919
172 5,552,920
173 5,552,921
224 5,552,922
5,552,923
5,552,924
230 5,552,925
326 5,552,926
359 5,552,927
379 5,552,928
380 5,552,929
431 5,552,931
480 5,552,932
515 5,552,933
629 5,552,934
630 5,552,935
691 5,552,936
5,552,937
5,552,938
821 5,552,939

CLASS 360
19.1 5,552,940
48 5,552,941
51 5,552,942
69 5,552,943
76 5,552,944
78.08 5,552,945
97.01 5,552,946
104 5,552,947
105 5,552,948
113 5,552,949
128 5,552,950

CLASS 361
56 5,552,951
86 5,552,952
93 5,552,953
191 5,552,954
234 5,552,955
680 5,552,956
683 5,552,957
5,552,958
686 5,552,959
687 5,552,960
700 5,552,961
733 5,552,962
735 5,552,963
781 5,552,964
801 5,552,965
813 5,552,966
818 5,552,967

CLASS 362
34 5,552,968
61 5,552,969
5,552,970
5,552,971
78 5,552,972
192 5,552,973
250 5,552,974
324 5,552,975

CLASS 363
39 5,552,976
41 5,552,977
89 5,552,978
98 5,552,979
5,552,980

CLASS 364
132 5,552,981
419.1 5,552,982
424.01 5,552,983
424.03 5,552,984
424.05 5,552,986
424.06 5,552,987
426.01 5,552,988
426.04 5,552,985
443 5,552,989
444 5,552,990
449 5,552,993
464.02 5,552,991
468.01 5,552,994
468.03 5,552,995
468.25 5,552,992
468.28 5,552,996
481 5,552,999
488 5,553,000
5,553,001
489 5,553,002
492 5,553,003
496 5,553,004
514 R 5,553,005
550 5,553,006
561 5,553,007
571.01 5,552,997
5,552,998
578 5,553,008
5,553,009
715.08 5,553,010
718 5,553,011
722 5,553,012
724.19 5,553,014
726.17 5,553,013
748 5,553,015

CLASS 365
51 5,553,016
185.01 5,553,017
5,553,018
185.04 5,553,019
185.19 5,553,020
185.33 5,553,021
189.01 5,553,022
5,553,023
189.05 5,553,024
201 5,553,025
5,553,026
203 5,553,027
205 5,553,028
208 5,553,029
226 5,553,030
230.01 5,553,031
230.03 5,553,032
233.5 5,553,033

CLASS 366
68 5,551,776
100 5,551,777
139 5,551,778
217 5,551,779

CLASS 367
25 5,553,034
140 5,553,035

CLASS 369
13 5,553,036
5,553,037
5,553,038
20 5,553,039
44.34 5,553,040
48 5,553,041
50 5,553,042
5,553,043
58 5,553,044
5,553,045
5,553,046
59 5,553,047
60 5,553,048
100 5,553,049
103 5,553,050
109 5,553,051
112 5,553,052
5,553,053
117 5,553,054
124 5,553,055

CLASS 370
13 5,553,056
5,553,057
5,553,058
14 5,553,059
16 5,553,060
17 5,553,061
18 5,553,062
29 5,553,063
50 5,553,064
58.1 5,553,066
60 5,553,067
5,553,068
75 5,553,069
85.1 5,553,070
85.3 5,553,071
5,553,072
85.5 5,553,073
94.1 5,553,074
5,553,075
94.3 5,553,078
95.3 5,553,076
5,553,077
110.4 5,553,079

CLASS 371
5.1 5,553,080
6 5,553,081
25.1 5,553,082
32 5,553,083
37.1 5,553,084
5,553,085
47.1 5,553,086

CLASS 372
32 5,553,087
34 5,553,088
43 5,553,089
45 5,553,090
50 5,553,091
72 5,553,092
100 5,553,093

CLASS 374
45 5,551,780

CLASS 375
200 5,553,094
222 5,553,095
224 5,553,243
238 5,553,096
240 5,553,097
324 5,553,098
334 5,553,099
340 5,553,100
5,553,101
347 5,553,102
350 5,553,103
373 5,553,104

CLASS 376
159 5,553,105
305 5,553,106

CLASS 392
342 5,553,187
394 5,553,188

650 5,553,286
5,553,287
5,553,288

CLASS 416
241 B 5,551,840

89 5,552,166
99 5,552,167
106 5,552,168

5,552,263
372 5,552,264
379 5,552,265

59 5,552,336
60 5,552,337
170 5,552,338
190 5,552,339

51.1 5,553,313
54.2 5,553,314
56.1 5,553,315
69 5,553,316

89 5,552,353
94 5,552,354
137 5,552,355
153 5,552,356

214 5,552,398
5,552,399
221 5,552,400
233.5 5,552,401

CLASS 524
47 5,552,461
55 5,552,462
98 5,552,463

5,552,523
5,552,524
326 5,552,525
350 5,552,526

CLASS 376

159 5,553,105
305 5,553,106
352 5,553,107
444 5,553,108
463 5,553,109

CLASS 378

35 5,553,110
37 5,553,111
98.5 5,553,113
129 5,553,114
206 5,553,112
5,553,115

CLASS 379

20.7 5,553,127
34 5,553,116
58 5,553,117
67 5,553,119
88 5,553,120
5,553,121
90 5,553,122
102 5,553,123
112 5,553,124
140 5,553,125
185 5,553,126
211 5,553,128
220 5,553,129
5,553,130
221 5,553,131
252 5,553,132
265 5,553,133
387 5,553,134
399 5,553,135
5,553,136
410 5,553,137
413 5,553,138

CLASS 380

4 5,553,139
10 5,553,140
14 5,553,141
19 5,553,142
25 5,553,143
5,553,144
30 5,553,145
48 5,553,146

CLASS 381

24 5,553,147
5,553,148
5,553,149
61 5,553,150
68.4 5,553,151
68.6 5,553,152
71 5,553,153
5,553,154

CLASS 382

12 5,553,173
115 5,553,155
119 5,553,156
131 5,553,157
142 5,553,158
156 5,553,159
166 5,553,160
167 5,553,161
192 5,553,162
227 5,553,163
232 5,553,164
252 5,553,165
5,553,166
270 5,553,167
276 5,553,168
282 5,553,169
283 5,553,170
299 5,553,171
312 5,553,172

CLASS 383

205 5,551,781

CLASS 384

15 Re.35,323
294 5,551,782
536 5,551,783

CLASS 385

15 5,553,174
16 5,553,175
26 5,553,176
31 5,553,177
33 5,553,178
43 5,553,179
59 5,553,180
85 5,553,181
89 5,553,182
95 5,553,183
115 5,553,184
127 5,553,185
135 5,553,186

CLASS 392

342 5,553,187
394 5,553,188
422 5,553,189

CLASS 395

2.1 5,553,190
2.3 5,553,194
2.38 5,553,193
24 5,553,195
5,553,196
27 5,553,197
80 5,553,198
109 5,553,199
5,553,200
5,553,201
115 5,553,202
5,553,203
5,553,204
117 5,553,205
123 5,553,206
124 5,553,207
125 5,553,208
133 5,553,209
134 5,553,210
135 5,553,211
140 5,553,212
5,553,213
141 5,553,214
144 5,553,215
145 5,553,216
148 5,553,217
5,553,218
150 5,553,219
154 5,553,220
5,553,221
5,553,222
155 5,553,223
5,553,224
157 5,553,225
161 5,553,226
5,553,227
162 5,553,228
166 5,553,229
180 5,553,230
182.03 5,553,231
182.04 5,553,232
182.11 5,553,233
182.14 5,553,234
182.18 5,553,235
183.01 5,553,236
184.01 5,553,237
185.07 5,553,238
187.01 5,553,239
200.03 5,553,240
200.12 5,553,241
5,553,242
228 5,553,191
237 5,553,192
280 5,553,244
284 5,553,245
287 5,553,246
293 5,553,247
296 5,553,248
308 5,553,249
310 5,553,251
5,553,252
375 5,553,253
5,553,254
5,553,255
5,553,256
401 5,553,257
403 5,553,258
5,553,259
421.1 5,553,260
430 5,553,261
450 5,553,262
454 5,553,263
462 5,553,264
470 5,553,265
471 5,553,266
474 5,553,267
485 5,553,268
496 5,553,270
500 5,553,269
5,553,271
5,553,272
5,553,273
5,553,274
550 5,553,275
5,553,276
600 5,553,277
5,553,278
5,553,279
5,551,280
5,553,281
5,553,282
5,553,283
5,553,284
5,553,285
5,553,303
5,553,304

650 5,553,286
5,553,287
5,553,288
700 5,553,289
5,553,290
5,553,291
733 5,553,292
734 5,553,293
750 5,553,294
5,553,295
5,553,296
800 5,553,297
5,553,298
5,553,299
821 5,553,300
825 5,553,301
5,553,302
826 5,553,305
828 5,553,306
845 5,553,307
853 5,553,308
854 5,553,309
860 5,553,310
884 5,553,311

CLASS 400

76 5,551,785
616.3 5,551,786

CLASS 401

50 5,551,787
116 5,551,788
199 5,551,789

CLASS 403

28 5,551,790
144 5,551,791
241 5,551,792
322 5,551,793
374 5,551,794
381 5,551,795

CLASS 404

6 5,551,796

CLASS 405

36 5,551,797
124 5,551,798
128 5,551,799
186 5,551,800
204 5,551,801
223.1 5,551,802
5,551,803
227 5,551,804
259.6 5,551,805
266 5,551,806
267 5,551,807
279 5,551,808
285 5,551,809
286 5,551,810

CLASS 407

40 5,551,811

CLASS 408

199 5,551,812

CLASS 409

134 5,551,813
200 5,551,814

CLASS 410

58 5,551,815

CLASS 411

43 5,551,816
107 5,551,817
387 5,551,818
466 5,551,819
485 5,551,820

CLASS 414

18 5,551,821
273 5,551,822
280 5,551,823
408 5,551,824
412 5,551,825
685 5,551,826
746.1 5,551,827
757 5,551,829
757 5,551,828
786 5,551,830
5,551,831
788 5,551,832
793.4 5,551,833
798.7 5,551,834

CLASS 415

55.1 5,551,835
204 5,551,836
206 5,551,837
5,551,838
212.1 5,551,839

CLASS 416

241 B 5,551,840

CLASS 417

89 5,551,841
203 5,551,842
234 5,551,843
269 5,551,844
290 5,551,845
308 5,551,846
393 5,551,847
437 5,551,848
472 5,551,849
474 5,551,850

CLASS 418

55.1 5,551,851
98 5,551,852
148 5,551,853
265 5,551,854

CLASS 419

5 5,552,106
13 5,552,107
15 5,552,108
53 5,552,109

CLASS 420

405 5,552,110
557 B1 5,256,370

CLASS 422

5 5,552,111
21 5,552,112
26 5,552,113
5,552,114
28 5,552,115
63 5,552,116
102 5,552,117
103 5,552,118
144 5,552,119
5,552,120
171 5,552,121
180 5,552,123
186.07 5,552,125
245.1 5,552,127

CLASS 423

199 5,552,126
235 5,552,128
239.2 5,552,129
386 5,552,130
584 5,552,131
701 5,552,132

CLASS 424

9.52 5,552,133
9.61 5,552,134
59 5,552,135
68 5,552,136
70.1 5,552,137
93.46 5,552,138
94.61 5,552,140
184.1 5,552,141
185.1 5,552,142
199.1 5,552,143
236.1 5,552,144
245.1 5,552,145
251.1 5,552,146
401 5,552,147
5,552,148
408 5,552,149
439 5,552,150
5,552,151
441 5,552,152
449 5,552,153
464 5,552,159
489 5,552,160
557 5,552,161
646 5,552,162
944 5,552,139

CLASS 425

78 5,551,856
113 5,551,855
143 5,551,857
217 5,551,858
317 5,551,859
504 5,551,860
527 5,551,861
532 5,551,862
549 5,551,863
556 5,551,864

CLASS 426

3 5,552,163
80 5,552,164
5,552,165

89 5,552,166
99 5,552,167
106 5,552,168
107 5,552,169
113 5,552,170
231 5,552,171
232 5,552,172
417 5,552,173
607 5,552,174
615 5,552,175
641 5,552,176

CLASS 427

2.29 5,552,177
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165 5,552,180
248.1 5,552,181
256 5,552,182
271 5,552,183
284 5,552,184
358 5,552,185
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389.8 5,552,187
402 5,552,188
421 5,552,189
457 5,552,190
475 5,552,191
492 5,552,192

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35.7 5,552,198
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41.9 5,552,200
43 5,552,201
5,552,202
65.5 5,552,203
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102 5,552,206
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113 5,552,208
209 5,552,209
5,552,210
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357 5,552,218
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403 5,552,226
407 Re.35,324
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425.9 5,552,229
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547 5,552,232
627 5,552,233
633 5,552,234
634 ML 5,552,237
687 5,552,235
692 5,552,236

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50 5,552,238
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5,552,245
218 5,552,246

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39 5,552,252
57 5,552,253
109 5,552,254
165 5,552,255
192 5,552,256
201 5,552,257
204 5,552,258
253 5,552,259
270.1 5,552,260
273.1 5,552,261
306 5,552,262

5,552,263
372 5,552,264
379 5,552,265
546 5,552,266

CLASS 431

33 5,551,865
153 5,551,866
154 5,551,867
208 5,551,868
285 5,551,869

CLASS 432

115 5,551,870

CLASS 433

5 5,551,871
37 5,551,872
72 5,551,873

CLASS 434

13 5,551,875
16 5,551,876
113 5,551,877
165 5,551,878
236 5,551,879
5,551,880
299 5,551,881

CLASS 435

1.1 5,552,267
4 5,552,268
5 5,552,269
6 5,552,270
5,552,271
5,552,272
5,552,273
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5,552,290
7.23 5,552,292
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7.32 5,552,294
7.4 5,552,287
7.9 5,552,288
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28 5,552,298
69.1 5,552,299
69.51 5,552,303
69.52 5,552,304
129 5,552,305
134 5,552,306
171 5,552,307
172.3 5,552,308
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235.1 5,552,310
240.2 5,552,311
5,552,312
252.33 5,552,313
5,552,314
253.3 5,552,315
261 5,552,316
280 5,552,317
5,552,318
286.1 5,552,321
286.5 5,552,319
287.2 5,552,322
287.4 5,552,320
692 5,552,302
723 5,552,291

CLASS 436

18 5,552,323
132 5,552,324
177 5,552,325

CLASS 437

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23 5,552,328
29 5,552,329
39 5,552,330
40 5,552,331
41 5,552,332
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52 5,552,334
53 5,552,335

59 5,552,336
60 5,552,337
170 5,552,338
190 5,552,339
5,552,340
192 5,552,341
195 5,552,342
5,552,343
5,552,344
227 5,552,345
228 5,552,346
5,552,347

CLASS 439

21 5,551,882
65 5,551,883
140 5,551,884
157 5,551,885
164 5,551,886
188 5,551,887
369 5,551,888
404 5,551,889
409 5,551,890
412 Re.35,325
419 5,552,348
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587 5,551,892
620 5,551,893
621 5,551,894
642 5,551,895
701 5,551,896
850 5,551,897

CLASS 440

6 5,551,899
41 5,551,898
111 5,551,900

CLASS 441

6 5,551,901

CLASS 445

7 5,551,902
24 5,551,903
47 5,551,904

CLASS 446

151 5,551,905

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8 5,551,906
41 5,551,907
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75 5,551,909

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135 Re.35,326
149 5,551,910

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3 5,551,911
56 5,551,912

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121 5,551,913
146 5,551,914
290 5,551,915
340 5,551,916

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11.1 5,553,312
5,553,313
54.2 5,553,314
56.1 5,553,315
69 5,553,316
83 5,553,317
126 5,553,318
326 5,553,319

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36 5,551,701
37 5,551,693

CLASS 464

46 5,551,917
80 5,551,918
92 5,551,919

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59 5,551,920
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117 5,551,922
137 5,551,923

CLASS 473

226 5,551,696
234 5,551,694
236 5,551,695
238 5,551,924
323 5,551,691

CLASS 474

85 5,551,925
101 5,551,926

CLASS 475

265 5,551,927
347 5,551,928

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67 5,551,929

CLASS 477

130 5,551,930
149 5,551,931
168 5,551,932

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357 5,552,219

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44 5,551,933
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142 5,551,935
5,551,936
144 5,551,937

CLASS 493

96 5,551,938
442 5,551,939

CLASS 494

11 5,551,940
16 5,551,941
45 5,551,942
53 5,551,943

CLASS 501

9 5,552,349
64 5,552,350
81 5,552,351
88 5,552,352
89 5,552,353
94 5,552,354
137 5,552,355
153 5,552,356

CLASS 502

63 5,552,357
117 5,552,358
123 5,552,359
178 5,552,360
208 5,552,361
308 5,552,362
337 5,552,363

CLASS 503

201 5,552,364
213 5,552,365

CLASS 504

116 5,552,366
138 5,552,367
211 5,552,368
273 5,552,369

CLASS 505

124 5,552,370
160 5,552,371
163 5,552,372
190 5,552,373
193 5,552,374
330 5,552,375
433 5,552,376

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209 5,552,377

CLASS 508

224 5,552,070
229 5,552,069
435 5,552,067
436 5,552,068
581 5,552,071

CLASS 510

351 5,552,078
412 5,552,080
417 5,552,089
446 5,552,079

CLASS 512

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12 5,552,379
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17 5,552,384
18 5,552,385
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5,552,387
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5,552,391
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5,552,393
178 5,552,394
179 5,552,395
183 5,552,396
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214 5,552,398
5,552,399
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233.5 5,552,401
5,552,402
249 5,552,403
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279 5,552,406
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304 5,552,408
307 5,552,409
311 5,552,410
312 5,552,411
317 5,552,412
320 5,552,413
322 5,552,414
324 5,552,415
5,552,416
5,552,417
348 5,552,418
357 5,552,419
364 5,552,420
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368 5,552,422
372 5,552,423
378 5,552,424
390 5,552,425
394 5,552,426
398 5,552,427
415 5,552,428
5,552,429
426 5,552,430
427 5,552,431
438 5,552,432
443 5,552,433
456 5,552,435
5,552,436
5,552,437
5,552,438
534 5,552,439
548 5,552,434
553 5,552,440
569 5,552,441
620 5,552,442
631 5,552,443
657 5,552,444
669 5,552,445
772.4 5,552,446

CLASS 521

129 5,552,447
154 5,552,448
155 5,552,449
174 5,552,450

CLASS 522

46 5,552,451
63 5,552,452
165 5,552,453

CLASS 523

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175 5,552,456
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403 5,552,458
427 5,552,459
522 5,552,460

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55 5,552,462
98 5,552,463
99 5,552,464
139 5,552,465
265 5,552,466
270 5,552,467
297 5,552,468
445 5,552,469
484 5,552,470
494 5,552,471
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575 5,552,473
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57 5,552,479
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74 5,552,481
88 5,552,482
90 5,552,483
98 5,552,484
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118 5,552,486
131 5,552,487
163 5,552,488
210 5,552,489
237 5,552,490
299 5,552,491
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5,552,493
316 5,552,494
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440 5,552,496
456 5,552,497

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174 5,552,499
206 5,552,500
217 5,552,501
234 5,552,502
285 5,552,503
348.1 5,552,504

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5 5,552,505
15 5,552,506
44 5,552,507
68 5,552,508
129 5,552,509
250 5,552,510
277 5,552,511
308 5,552,512
308.3 5,552,513
328 5,552,514
354 5,552,515
363 5,552,516
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5,552,518

CLASS 530

216 5,552,519
311 5,552,520
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7.2 5,552,533
17.4 5,552,534
22.1 5,552,541
23.1 5,552,535
5,552,536
24.3 5,552,537
5,552,538
25.31 5,552,539
25.34 5,552,540

CLASS 540

217 5,552,542

CLASS 544

58.4 5,552,543
126 5,552,544
279 5,552,545
299 5,552,546

CLASS 546

7 5,552,547
13 5,552,548
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146 5,552,550
155 5,552,551
196 5,552,552
197 5,552,553

CLASS 548

226 5,552,554
236 5,552,555
334.1 5,552,556
337.1 5,552,557

CLASS 549

552 5,552,558

CLASS 562

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CLASS 600

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194 5,551,946

CLASS 601

15 5,551,949
35 5,551,950
115 5,551,951
139 5,551,952

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373,319
116 373,321
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373,350
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		373,374		108	373,390		226	373,312		180	373,421		63	373,437			
	39	373,375			373,391		252	373,406		192	373,422		65	373,438			
	44	373,376		180	373,392		255	373,407		198	373,423		93	373,439			
	50	373,377		191	373,393		260	373,408		200	373,424		110	373,440			
		373,379			373,394		263	373,409		211	373,425		156	373,441			
	55	373,378		194	373,395		266	373,410	D25—	18	373,426	D27—	141	373,442			
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	5,551,442	5,551,353	5,552,016	5,552,647	5,553,064	5,551,272
	5,552,311	5,551,367	5,552,028	5,552,655	5,553,076	5,551,461
	5,552,353	5,551,378	5,552,032	5,552,659	5,553,081	5,551,570
	5,552,566	5,551,379	5,552,042	5,552,679	5,553,086	5,551,593
	5,552,643	5,551,391	5,552,065	5,552,695	5,553,109	5,551,640
	5,553,128	5,551,427	5,552,088	5,552,697	5,553,112	5,551,711
04 :	5,551,135	5,551,433	5,552,093	5,552,701	5,553,120	5,551,810
	5,551,175	5,551,435	5,552,100	5,552,702	5,553,123	5,551,895
	5,551,179	5,551,441	5,552,118	5,552,704	5,553,124	5,552,238
	5,551,216	5,551,443	5,552,124	5,552,706	5,553,133	5,552,272
	5,551,304	5,551,447	5,552,132	5,552,709	5,553,140	5,552,597
	5,551,377	5,551,468	5,552,133	5,552,720	5,553,148	5,552,705
	5,551,507	5,551,481	5,552,134	5,552,728	5,553,151	5,552,748
	5,551,689	5,551,482	5,552,141	5,552,732	5,553,174	5,552,783
	5,551,880	5,551,487	5,552,176	5,552,733	5,553,198	5,552,912
	5,552,087	5,551,530	5,552,204	5,552,736	5,553,200	5,552,916
	5,552,330	5,551,553	5,552,244	5,552,741	5,553,206	5,552,994
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	373,301		373,389		373,422	53	: 373,261		373,401		373,294
	373,302		373,400	49	: 373,336		373,378		373,428		373,314
	373,386		373,403	51	: 373,392		373,380	55	: 373,276		373,385

PLANT PATENTS

17	: 9,639	36	: 9,638	37	: 9,640						

STATUTORY INVENTION REGISTRATIONS

06	: H1587		H1589	17	: H1592	37	: H1595	48	: H1591		
	H1588		H1590	24	: H1586		H1596		H1597		

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September 10, 1996 Volume 1190 Number 2

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Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1187 O.G. 49, on June 18, 1996.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective July 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1187 O.G. 73, on June 25, 1996.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective July 1, 1996, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	220.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed	660.00
— Corresponding prior U.S. national application filed	430.00
— Supplemental search fee, per additional invention (payable only upon invitation)	190.00
European Patent Office as ISA	1585.00
International fees	
Basic fee	677.00
Basic supplemental fee (for each page over 30)	13.00
Designation fee per country or region	
— For the first 11 national or regional offices designated	164.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	164.00
— Confirmation fee	82.00
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	207.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	470.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	710.00
— Additional examination fee, per additional invention (payable only upon invitation)	250.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	47.00	94.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	340.00	680.00
USPTO was ISA but not IPEA	375.00	750.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	505.00	1010.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	440.00	880.00
Other National fees		
— For each independent claim in excess of 3	39.00	78.00
— For each claim in excess of 20	11.00	22.00
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June 4, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on September 7, 1993 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,241,703 through 5,243,705
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on September 5, 1989 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,862,517 through 4,864,652
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on September 3, 1985 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,538,301 through 4,539,712
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $495.00
By other than a small entity $990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $995.00
By other than a small entity $1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,495.00
By other than a small entity $2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $660.00
(2) unintentional $1,550.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED July 3, 1996
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,637	06/881,759	04/05/88
(4,457,867)	(06/450,721)	(07/03/84)
4,457,024	06/370,881	07/03/84
4,457,030	06/495,174	07/03/84
4,457,040	06/456,963	07/03/84
4,457,042	06/453,364	07/03/84
4,457,044	06/431,948	07/03/84
4,457,050	06/345,027	07/03/84
4,457,052	06/350,303	07/03/84
4,457,063	06/409,148	07/03/84
4,457,067	06/370,550	07/03/84
4,457,072	06/366,149	07/03/84
4,457,076	06/427,656	07/03/84
4,457,077	06/510,797	07/03/84
4,457,083	06/329,818	07/03/84
4,457,091	06/368,377	07/03/84
4,457,092	06/320,834	07/03/84
4,457,102	06/424,807	07/03/84
4,457,115	06/286,882	07/03/84
4,457,125	06/487,732	07/03/84
4,457,128	06/432,924	07/03/84
4,457,134	06/289,988	07/03/84
4,457,135	06/485,398	07/03/84
4,457,141	06/367,224	07/03/84
4,457,145	06/479,961	07/03/84
4,457,148	06/267,813	07/03/84
4,457,150	06/347,705	07/03/84
4,457,155	06/354,368	07/03/84
4,457,158	06/461,782	07/03/84
4,457,160	06/343,079	07/03/84
4,457,162	06/419,231	07/03/84
4,457,164	06/412,083	07/03/84
4,457,165	06/413,926	07/03/84
4,457,167	06/417,972	07/03/84
4,457,168	06/474,064	07/03/84
4,457,174	06/376,891	07/03/84
4,457,177	06/460,321	07/03/84
4,457,181	06/365,679	07/03/84
4,457,188	06/309,599	07/03/84
4,457,205	06/328,887	07/03/84
4,457,209	06/443,341	07/03/84
4,457,211	06/350,705	07/03/84
4,457,214	06/447,638	07/03/84
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4,457,233	06/427,526	07/03/84
4,457,237	06/295,491	07/03/84
4,457,245	06/525,909	07/03/84
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4,457,247	06/426,484	07/03/84
4,457,253	06/440,265	07/03/84
4,457,254	06/429,371	07/03/84
4,457,255	06/516,958	07/03/84
4,457,261	06/371,853	07/03/84
4,457,262	06/410,076	07/03/84
4,457,264	06/291,279	07/03/84
4,457,275	06/433,436	07/03/84
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4,457,738	06/369,779	07/03/84
4,457,742	06/261,937	07/03/84
4,457,746	06/456,513	07/03/84
4,457,754	06/343,855	07/03/84
4,457,760	06/335,100	07/03/84
4,457,763	06/548,928	07/03/84
4,457,772	06/468,457	07/03/84
4,457,774	06/303,658	07/03/84
4,457,775	06/496,350	07/03/84
4,457,777	06/413,872	07/03/84
4,457,783	06/435,525	07/03/84
4,457,787	06/420,740	07/03/84
4,457,788	06/353,324	07/03/84
4,457,799	06/467,341	07/03/84
4,457,801	06/466,278	07/03/84
4,457,804	06/223,986	07/03/84
4,457,806	06/393,005	07/03/84
4,457,813	06/472,354	07/03/84
4,457,816	06/458,715	07/03/84
4,457,819	06/453,958	07/03/84
4,457,824	06/368,254	07/03/84
4,457,828	06/363,557	07/03/84
4,457,833	06/427,356	07/03/84
4,457,836	06/494,539	07/03/84
4,457,837	06/401,340	07/03/84
4,457,839	06/305,717	07/03/84
4,457,849	06/530,027	07/03/84
4,457,850	06/492,280	07/03/84
4,457,858	06/396,149	07/03/84
4,457,863	06/377,490	07/03/84
4,457,865	06/355,378	07/03/84
4,457,869	06/376,085	07/03/84
4,457,871	06/420,185	07/03/84
4,457,873	06/478,192	07/03/84
4,457,880	06/466,527	07/03/84
4,457,883	06/444,008	07/03/84
4,457,885	06/461,803	07/03/84
4,457,888	06/351,064	07/03/84
4,457,897	06/425,638	07/03/84
4,457,904	06/406,681	07/03/84
4,457,908	06/406,609	07/03/84
4,457,909	06/424,188	07/03/84
4,457,911	06/404,964	07/03/84
4,457,913	06/350,550	07/03/84
4,457,915	06/434,539	07/03/84
4,457,917	06/374,554	07/03/84
4,457,918	06/377,446	07/03/84
4,457,919	06/379,066	07/03/84
4,457,920	06/404,960	07/03/84
4,457,925	06/403,279	07/03/84
4,457,929	06/363,313	07/03/84
4,457,930	06/526,930	07/03/84
4,457,931	06/424,512	07/03/84
4,457,933	06/329,839	07/03/84
4,457,939	06/438,200	07/03/84
4,457,947	06/464,207	07/03/84
4,457,955	06/454,325	07/03/84
4,457,967	06/391,977	07/03/84

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4,457,971	06/411,626	07/03/84	4,458,251	06/265,214	07/03/84
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4,457,975	06/391,348	07/03/84	4,458,258	06/355,198	07/03/84
4,457,977	06/307,054	07/03/84	4,458,259	06/320,242	07/03/84
4,457,987	06/419,307	07/03/84	4,458,263	06/340,180	07/03/84
4,457,989	06/306,904	07/03/84	4,458,266	06/395,076	07/03/84
4,457,994	06/440,782	07/03/84	4,458,268	06/338,464	07/03/84
4,457,996	06/309,526	07/03/84	4,458,270	06/370,402	07/03/84
4,457,997	06/337,277	07/03/84	4,458,276	06/315,962	07/03/84
4,457,999	06/425,387	07/03/84	4,458,277	06/292,072	07/03/84
4,458,000	06/425,388	07/03/84	4,458,278	06/373,070	07/03/84
4,458,002	06/495,254	07/03/84	4,458,282	06/314,912	07/03/84
4,458,005	06/391,132	07/03/84	4,458,289	06/443,624	07/03/84
4,458,007	06/330,888	07/03/84	4,458,305	06/377,422	07/03/84
4,458,009	06/456,971	07/03/84	4,458,341	06/256,896	07/03/84
4,458,017	06/393,589	07/03/84	4,458,343	06/328,335	07/03/84
4,458,023	06/438,599	07/03/84	4,458,344	06/477,483	07/03/84
4,458,024	06/346,439	07/03/84	4,458,346	06/319,279	07/03/84
4,458,026	06/498,146	07/03/84	4,458,348	06/380,775	07/03/84
4,458,028	06/405,373	07/03/84	4,458,349	06/388,830	07/03/84
4,458,029	06/419,661	07/03/84	4,458,351	06/247,141	07/03/84
4,458,031	06/356,309	07/03/84	4,458,358	06/451,799	07/03/84
4,458,037	06/552,872	07/03/84	4,458,361	06/377,248	07/03/84
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4,458,048	06/391,214	07/03/84	4,752,971	07/060,504	06/28/88
4,458,051	06/419,662	07/03/84	4,752,973	07/070,630	06/28/88
4,458,054	06/443,456	07/03/84	4,752,978	06/929,059	06/28/88
4,458,058	06/433,547	07/03/84	4,752,979	07/044,240	06/28/88
4,458,061	06/426,550	07/03/84	4,752,983	07/071,416	06/28/88
4,458,064	06/505,595	07/03/84	4,752,984	07/022,767	06/28/88
4,458,067	06/336,612	07/03/84	4,752,985	06/874,018	06/28/88
4,458,074	06/393,381	07/03/84	4,752,987	06/871,078	06/28/88
4,458,078	06/377,841	07/03/84	4,752,989	06/924,889	06/28/88
4,458,080	06/415,630	07/03/84	4,752,990	07/063,669	06/28/88
4,458,086	06/393,388	07/03/84	4,753,000	06/908,605	06/28/88
4,458,090	06/311,896	07/03/84	4,753,003	07/052,393	06/28/88
4,458,091	06/431,558	07/03/84	4,753,006	06/841,883	06/28/88
4,458,092	06/344,164	07/03/84	4,753,009	07/023,233	06/28/88
4,458,094	06/341,679	07/03/84	4,753,013	06/926,116	06/28/88
4,458,095	06/429,369	07/03/84	4,753,024	07/041,604	06/28/88
4,458,101	06/366,626	07/03/84	4,753,025	07/013,872	06/28/88
4,458,109	06/346,227	07/03/84	4,753,027	06/870,103	06/28/88
4,458,117	06/411,296	07/03/84	4,753,028	06/941,388	06/28/88
4,458,118	06/361,350	07/03/84	4,753,031	07/066,269	06/28/88
4,458,126	06/363,705	07/03/84	4,753,036	07/021,301	06/28/88
4,458,129	06/356,951	07/03/84	4,753,039	07/009,499	06/28/88
4,458,134	06/393,694	07/03/84	4,753,042	07/070,054	06/28/88
4,458,135	06/361,243	07/03/84	4,753,045	06/840,439	06/28/88
4,458,136	06/339,049	07/03/84	4,753,046	06/796,574	06/28/88
4,458,138	06/216,330	07/03/84	4,753,054	07/042,302	06/28/88
4,458,139	06/400,399	07/03/84	4,753,062	07/060,675	06/28/88
4,458,143	06/370,624	07/03/84	4,753,071	06/812,254	06/28/88
4,458,147	06/316,719	07/03/84	4,753,073	07/110,320	06/28/88
4,458,149	06/283,359	07/03/84	4,753,074	06/927,818	06/28/88
4,458,154	06/488,715	07/03/84	4,753,075	06/918,974	06/28/88
4,458,159	06/392,189	07/03/84	4,753,076	07/021,677	06/28/88
4,458,164	06/383,076	07/03/84	4,753,077	07/056,591	06/28/88
4,458,166	06/249,306	07/03/84	4,753,078	06/850,996	06/28/88
4,458,170	06/328,698	07/03/84	4,753,082	07/084,470	06/28/88
4,458,171	06/448,471	07/03/84	4,753,083	07/012,144	06/28/88
4,458,177	06/218,931	07/03/84	4,753,089	06/832,579	06/28/88
4,458,185	06/500,217	07/03/84	4,753,097	06/926,635	06/28/88
4,458,189	06/405,866	07/03/84	4,753,098	07/030,367	06/28/88
4,458,190	06/390,601	07/03/84	4,753,102	06/871,782	06/28/88
4,458,191	06/388,335	07/03/84	4,753,103	06/802,003	06/28/88
4,458,192	06/474,335	07/03/84	4,753,108	07/024,347	06/28/88
4,458,195	06/354,024	07/03/84	4,753,114	06/935,482	06/28/88
4,458,200	06/438,090	07/03/84	4,753,115	06/933,978	06/28/88
4,458,201	06/365,194	07/03/84	4,753,117	06/823,914	06/28/88
4,458,210	06/276,597	07/03/84	4,753,121	07/046,141	06/28/88
4,458,211	06/413,772	07/03/84	4,753,124	07/042,913	06/28/88
4,458,218	06/387,986	07/03/84	4,753,128	07/023,691	06/28/88
4,458,228	06/317,765	07/03/84	4,753,130	06/938,278	06/28/88
4,458,234	06/339,848	07/03/84	4,753,135	07/058,709	06/28/88
4,458,237	06/317,714	07/03/84	4,753,137	07/033,590	06/28/88
4,458,238	06/343,441	07/03/84	4,753,143	06/881,456	06/28/88
4,458,242	06/302,162	07/03/84	4,753,146	06/935,012	06/28/88
			4,753,148	06/936,634	06/28/88
			4,753,153	06/934,273	06/28/88

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4,753,168	07/035,616	06/28/88	4,753,427	07/016,855	06/28/88
4,753,170	06/705,154	06/28/88	4,753,435	06/934,622	06/28/88
4,753,174	07/078,892	06/28/88	4,753,438	06/882,533	06/28/88
4,753,175	07/023,826	06/28/88	4,753,442	07/039,981	06/28/88
4,753,176	07/025,264	06/28/88	4,753,443	07/088,372	06/28/88
4,753,178	07/052,823	06/28/88	4,753,446	07/067,057	06/28/88
4,753,180	07/001,062	06/28/88	4,753,449	07/056,865	06/28/88
4,753,182	07/058,555	06/28/88	4,753,450	07/061,959	06/28/88
4,753,186	06/943,450	06/28/88	4,753,454	07/076,860	06/28/88
4,753,187	07/071,571	06/28/88	4,753,466	06/367,585	06/28/88
4,753,188	06/381,168	06/28/88	4,753,469	07/045,372	06/28/88
4,753,191	06/692,866	06/28/88	4,753,471	07/037,614	06/28/88
4,753,193	07/012,022	06/28/88	4,753,473	07/089,072	06/28/88
4,753,196	06/893,775	06/28/88	4,753,478	06/942,835	06/28/88
4,753,198	06/893,227	06/28/88	4,753,479	06/659,627	06/28/88
4,753,205	06/285,893	06/28/88	4,753,481	06/853,045	06/28/88
4,753,207	06/925,571	06/28/88	4,753,487	06/935,872	06/28/88
4,753,211	07/010,070	06/28/88	4,753,489	07/002,406	06/28/88
4,753,214	07/060,867	06/28/88	4,753,490	06/846,258	06/28/88
4,753,225	06/931,595	06/28/88	4,753,491	07/008,601	06/28/88
4,753,228	06/885,303	06/28/88	4,753,494	06/857,332	06/28/88
4,753,239	06/894,043	06/28/88	4,753,498	06/841,757	06/28/88
4,753,241	06/838,518	06/28/88	4,753,504	06/759,603	06/28/88
4,753,248	07/066,047	06/28/88	4,753,508	06/487,405	06/28/88
4,753,249	07/015,112	06/28/88	4,753,509	06/924,318	06/28/88
4,753,255	07/044,653	06/28/88	4,753,518	06/860,652	06/28/88
4,753,258	06/762,789	06/28/88	4,753,523	06/898,097	06/28/88
4,753,259	07/034,476	06/28/88	4,753,524	06/868,849	06/28/88
4,753,265	06/869,278	06/28/88	4,753,528	06/770,970	06/28/88
4,753,268	07/084,210	06/28/88	4,753,533	06/773,588	06/28/88
4,753,271	07/048,254	06/28/88	4,753,535	07/025,967	06/28/88
4,753,272	06/916,633	06/28/88	4,753,537	06/945,394	06/28/88
4,753,279	07/083,523	06/28/88	4,753,538	07/024,305	06/28/88
4,753,283	06/934,658	06/28/88	4,753,545	07/050,458	06/28/88
4,753,287	07/111,265	06/28/88	4,753,546	06/286,430	06/28/88
4,753,288	06/921,477	06/28/88	4,753,547	06/921,742	06/28/88
4,753,289	06/768,494	06/28/88	4,753,556	06/823,735	06/28/88
4,753,290	06/886,994	06/28/88	4,753,560	06/796,092	06/28/88
4,753,296	06/778,799	06/28/88	4,753,568	06/906,982	06/28/88
4,753,297	06/854,989	06/28/88	4,753,591	06/891,505	06/28/88
4,753,300	07/016,980	06/28/88	4,753,594	07/082,282	06/28/88
4,753,307	07/109,224	06/28/88	4,753,597	06/873,187	06/28/88
4,753,308	06/824,791	06/28/88	4,753,600	07/047,120	06/28/88
4,753,314	07/035,631	06/28/88	4,753,601	06/639,604	06/28/88
4,753,319	06/918,830	06/28/88	4,753,602	07/085,232	06/28/88
4,753,323	07/053,865	06/28/88	4,753,606	07/109,322	06/28/88
4,753,330	06/881,615	06/28/88	4,753,609	06/764,948	06/28/88
4,753,331	06/823,505	06/28/88	4,753,613	06/810,378	06/28/88
4,753,332	06/929,107	06/28/88	4,753,614	07/009,087	06/28/88
4,753,333	06/911,261	06/28/88	4,753,615	06/907,357	06/28/88
4,753,334	06/918,329	06/28/88	4,753,616	07/047,104	06/28/88
4,753,344	07/078,089	06/28/88	4,753,620	07/009,749	06/28/88
4,753,346	07/081,997	06/28/88	4,753,626	06/945,183	06/28/88
4,753,347	06/861,324	06/28/88	4,753,628	06/947,032	06/28/88
4,753,350	06/933,001	06/28/88	4,753,629	06/921,580	06/28/88
4,753,352	06/866,796	06/28/88	4,753,633	06/935,948	06/28/88
4,753,363	07/060,007	06/28/88	4,753,636	06/836,089	06/28/88
4,753,366	07/138,097	06/28/88	4,753,638	07/001,642	06/28/88
4,753,367	07/109,875	06/28/88	4,753,658	07/073,860	06/28/88
4,753,368	06/934,163	06/28/88	4,753,660	06/840,034	06/28/88
4,753,371	07/091,292	06/28/88	4,753,663	06/244,912	06/28/88
4,753,379	06/690,818	06/28/88	4,753,664	06/886,065	06/28/88
4,753,388	07/077,375	06/28/88	4,753,665	06/900,084	06/28/88
4,753,390	07/006,888	06/28/88	4,753,666	06/889,975	06/28/88
4,753,391	07/088,551	06/28/88	4,753,671	07/049,055	06/28/88
4,753,394	06/902,947	06/28/88	4,753,672	07/006,434	06/28/88
4,753,402	06/814,604	06/28/88	4,753,677	06/747,832	06/28/88
4,753,404	06/894,258	06/28/88	4,753,682	06/899,715	06/28/88
4,753,405	06/787,540	06/28/88	4,753,688	06/935,902	06/28/88
4,753,406	06/842,364	06/28/88	4,753,689	06/839,181	06/28/88
4,753,410	07/056,428	06/28/88	4,753,712	07/058,840	06/28/88
4,753,411	07/086,777	06/28/88	4,753,714	07/085,324	06/28/88
4,753,414	06/851,775	06/28/88	4,753,725	06/301,242	06/28/88
4,753,417	06/695,585	06/28/88	4,753,726	07/023,213	06/28/88
4,753,418	07/072,697	06/28/88	4,753,733	06/885,396	06/28/88
			4,753,747	07/049,760	06/28/88
			4,753,748	06/901,221	06/28/88

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[illegible]	06/693,657	06/28/88	4,754,030	06/697,172	06/28/88
			4,754,034	06/789,686	06/28/88
			4,754,036	06/871,940	06/28/88

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4,754,337	06/945,978	06/28/88	5,125,357	07/497,986	06/30/92
4,754,342	[illegible]		5,125,359	07/470,830	06/30/92
			5,125,364	[illegible]	

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4,753,767	06/847,786	06/28/88
4,753,770	07/014,225	06/28/88
4,753,773	06/813,598	06/28/88
4,753,774	06/826,523	06/28/88
4,753,779	06/761,995	06/28/88
4,753,780	06/536,059	06/28/88
4,753,783	06/802,633	06/28/88
4,753,786	07/010,372	06/28/88
4,753,792	06/928,571	06/28/88
4,753,795	06/623,601	06/28/88
4,753,796	06/883,470	06/28/88
4,753,800	06/784,280	06/28/88
4,753,801	06/791,282	06/28/88
4,753,810	06/863,074	06/28/88
4,753,814	07/067,667	06/28/88
4,753,821	07/103,761	06/28/88
4,753,824	06/818,816	06/28/88
4,753,826	07/020,008	06/28/88
4,753,836	07/026,046	06/28/88
4,753,838	07/079,620	06/28/88
4,753,841	06/929,411	06/28/88
4,753,843	06/858,329	06/28/88
4,753,850	07/104,552	06/28/88
4,753,852	06/842,647	06/28/88
4,753,854	06/869,185	06/28/88
4,753,860	06/747,090	06/28/88
4,753,863	06/926,681	06/28/88
4,753,875	06/759,355	06/28/88
4,753,879	06/644,537	06/28/88
4,753,880	06/685,677	06/28/88
4,753,884	07/094,998	06/28/88
4,753,887	06/894,302	06/28/88
4,753,892	06/879,075	06/28/88
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4,753,904	06/898,119	06/28/88
4,753,908	06/940,087	06/28/88
4,753,914	07/022,139	06/28/88
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4,753,931	06/884,832	06/28/88
4,753,937	07/111,656	06/28/88
4,753,938	06/787,704	06/28/88
4,753,942	06/943,317	06/28/88
4,753,944	07/101,898	06/28/88
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5,126,441	07/655,776	06/30/92
5,126,445	07/506,920	06/30/92
5,126,450	07/607,707	06/30/92
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5,126,454	07/561,641	06/30/92
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5,127,083	07/669,006	06/30/92
5,127,088	07/372,740	06/30/92
5,127,104	06/947,230	06/30/92

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Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,431,999	06/396,200	07/08/82	02/14/84	06/28/96
4,507,289	06/566,222	12/28/83	03/26/85	07/01/96
4,670,775	06/701,383	02/14/85	06/02/87	07/01/96
4,720,917	06/947,352	12/29/86	01/26/88	07/01/96
4,722,779	07/012,467	02/09/87	02/02/88	06/28/96
4,723,980	07/077,966	07/24/87	02/09/88	07/02/96
4,953,810	07/476,688	02/08/90	09/04/90	07/01/96
4,958,321	07/247,887	09/22/88	09/18/90	06/28/96
5,046,614	07/559,398	07/26/90	09/10/91	07/03/96
5,046,856	07/406,212	09/12/89	09/10/91	07/01/96
5,057,095	07/437,182	11/16/89	10/15/91	06/28/96
5,057,099	07/523,473	05/14/90	10/15/91	06/28/96
5,065,512	07/432,844	11/07/89	11/19/91	06/28/96
5,084,690	07/695,148	04/29/91	01/28/92	06/28/96
5,092,240	07/486,017	02/28/90	03/03/92	06/28/96
5,092,507	07/552,025	07/13/90	03/03/92	06/28/96
5,092,648	07/545,989	06/29/90	03/03/92	06/28/96
5,101,770	07/608,918	11/05/90	04/07/92	07/03/96
5,108,514	07/652,565	02/08/91	04/28/92	07/03/96
5,108,819	07/479,897	02/14/90	04/28/92	06/28/96
				07/03/96

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Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,401,326	06/331,111	12/16/81	08/30/83	07/09/96
5,052,930	07/489,691	03/07/90	10/01/91	07/11/96

Patents Reinstated Due To The Acceptance of a Late Maintenance Fee From 7/12/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,350,426	06/240,423	03/04/81	09/21/82	07/16/96
4,377,869	06/259,496	05/01/81	03/22/83	07/18/96
4,436,090	06/291,998	08/11/81	03/13/84	07/17/96
4,470,274	06/487,002	04/21/83	09/11/84	07/17/96
4,604,516	06/515,161	07/19/83	08/05/86	07/16/96
4,707,281	06/740,658	06/03/85	11/17/87	07/17/96
4,713,623	06/330,672	12/14/81	12/15/87	07/17/96
4,731,251	06/877,989	06/24/86	03/15/88	07/17/96
4,891,901	07/025,521	03/13/87	01/09/90	07/17/96
4,929,028	07/193,774	05/13/88	05/29/90	07/15/96
4,943,993	07/403,294	09/05/89	07/24/90	07/18/96
5,035,443	07/500,298	03/27/90	07/30/91	07/17/96
5,060,262	07/519,856	05/07/90	10/22/91	07/17/96
5,061,480	07/432,386	11/03/89	10/29/91	07/17/96
5,071,819	07/236,763	08/26/88	12/10/91	07/17/96
5,093,921	07/452,358	12/19/89	03/03/92	07/17/96

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

5,297,364, Re. S.N. 08/624,783, March 27, 1996, Cl. 451/527, POLISHING PAD WITH CONTROLLED ABRASION RATE, Mark E. Tuttle, Owner of Record: *Micron Technology, Inc., Boise, Id.*, Attorney or Agent: Joseph A. Walkowski, Ex. Gp.: 3203

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,866,854, Reexam. No. 90/004,332, May 23, 1996, Cl. 200/005A, MEMBRANE-TYPE TOUCH PANEL EMPLOYING INSULATING GRID ANTI-SHORT MEANS, George E. Zenk, et. al., Owner of Record: *St. Clair Intellectual Property Consultants, Inc., Grosse Pointe, Mich.*, Attorney or Agent: Thomas W. Baumgarten, Jr., St. Clair Intellectual Property Consultants, Inc., Grosse Pointe, Mich., Ex. Gp.: 2109, Requester: Charles Gorenstein & Terrell C. Birch, Birch Stewart Kolasch & Birch, Falls Church, Va.

4,866,855, Reexam. No. 90/004,333, May 23, 1996, Cl. 200/005A, VENTED MEMBRANE-TYPE TOUCH PANEL, George E. Zenk, Owner of Record: *St. Clair Intellectual Property Consultants, Inc., Grosse Pointe, Mich.*, Attorney or Agent: Thomas W. Baumgarten, Jr., St. Clair Intellectual Property Consultants, Inc., Grosse Pointe, Mich., Ex. Gp.: 2109, Requester: Charles Gorenstein & Terrell C. Birch, Birch Stewart Kolasch & Birch, Falls Church, Va.

4,493,870, Reexam. No. 90/004,328, Aug. 9, 1996, Cl. 428/245, FLEXIBLE LAYERED PRODUCT, Cornelius M.F. Yrouenraets, Owner of Record: *AKZO N.V., Arnhem, The Netherlands*, Attorney or Agent: Stevens Davis Miller & Mosher, Alexandria, Va., Ex. Gp.: 1504, Requester: E.I. Du Pont de Memours & Co., Wilmington, Del.

4,514,497, Reexam. No. 90/004,326, Aug. 7, 1996, Cl. 435/235.1, MODIFIED LIVE PSEUDORABIES VIRUSES, Malon Kit, et. al., Owner of Record: *Novagene, Inc., Houston, Tex.*, Attorney or Agent: Gordon Kit, Shugrue Mion MacPeak & Seas, Washington, D.C., Ex. Gp.: 1802, Requester: Syntro Corp. & Syntrovet Inc., c/o John P. White, Cooper & Dunham, New York, N.Y.

4,693,843, Reexam. No. 90/004,329, Aug. 9, 1996, Cl. 052/211, DECORATIVE WINDOW ASSEMBLY, Michael E. Knapp, Owner of Record: *Anderson Corp., Bayport, Minn.*, Attorney or Agent: Andrew D. Sorensen, Merchant Gould Smith Edell Welter & Schmidt, St. Paul, Minn., Ex. Gp.: 3504, Requester: Owner

4,780,998, Reexam. No. 90/004,330, Aug. 9, 1996, Cl. 052/211, DECORATIVE WINDOW ASSEMBLY, Michael E. Knapp, Owner of Record: *Anderson Corp., Bayport, Minn.*, Attorney or Agent: Andrew D. Sorensen, Merchant Gould Smith Edell Welter & Schmidt, St. Paul, Minn., Ex. Gp.: 3504, Requester: Owner

4,952,845, Reexam. No. 90/004,325, Aug. 5, 1996, Cl. 351/160R, CORNEAL CONTACT LENS AND METHOD FOR TREATING MYOPIA, Nick Stoyan, Owner of Record: *Contex, Inc., Sherman Oaks, Calif.*, Attorney or Agent: David J. Oldenkamp, Poms Smith Lande & Rose, Los Angeles, Calif., Ex. Gp.: 2515, Requester: Roy W. Hardin, Harris Tucker & Hardin, Dallas, Tex.

5,191,365, Reexam. No. 90/004,323, Aug. 2, 1996, Cl. 351/160R, CORNEAL CONTACT LENS AND METHOD FOR TREATING MYOPIA, Nick Stoyan, Owner of Record: *Contex, Inc., Sherman Oaks, Calif.*, Attorney or Agent: David J. Oldenkamp, Poms, Smith, Lande & Rose, Los Angeles, Calif., Ex. Gp.: 2516, Requester: Roy W. Hardin, Harris Tucker & Hardin, Dallas, Tex.

5,226,235, Reexam. No. 90/004,324, Aug. 5, 1996, Cl. 029/890.047, METHOD OF MAKING A VEHICLE RADIATOR, Phillip G. Lesage, Owner of Record: *Inventor*, Attorney or Agent: R.L. Westell, Toronto, Canada, Ex. Gp.: 3206, Requester: Lloyd L. Zickert, Chicago, Ill.

5,288,048, Reexam. No. 90/004,327, Aug. 8, 1996, Cl. 248/251, ERGONOMIC HANDRAIL, Thomas A. Shreiner, Owner of Record: *Construction Specialties, Inc., Cranford, N.J.*, Attorney or Agent: Thomas R. Nesbitt, Brumbaugh, Graves, Donohue & Raymond, New York, N.Y., Ex. Gp.: 3505, Requester: Owner

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED APRIL 22, 1996
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
105,322	71/082,066	07/20/1915
105,358	71/082,144	07/20/1915
314,576	71/348,712	07/03/1934
326,105	71/361,290	07/16/1935
326,108	71/361,132	07/16/1935
326,138	71/363,176	07/16/1935
326,141	71/363,236	07/16/1935
326,150	71/362,698	07/16/1935
326,151	71/362,674	07/16/1935
326,158	71/362,474	07/16/1935
326,171	71/362,097	07/16/1935
326,176	71/362,015	07/16/1935
326,177	71/362,014	07/16/1935
326,185	71/354,891	07/16/1935
326,197	71/348,201	07/16/1935
326,204	71/361,732	07/16/1935
326,205	71/361,727	07/16/1935
326,207	71/361,677	07/16/1935
326,222	71/357,900	07/16/1935
326,237	71/355,050	07/16/1935
608,931	71/670,160	07/19/1955
608,941	71/673,576	07/19/1955
608,944	71/665,157	07/19/1955
608,948	71/679,120	07/19/1955
608,957	71/662,200	07/19/1955
608,962	71/665,321	07/19/1955
608,974	71/673,468	07/19/1955
608,981	71/675,284	07/19/1955
608,986	71/661,132	07/19/1955
608,988	71/663,308	07/19/1955
608,992	71/672,759	07/19/1955
609,000	71/672,527	07/19/1955
609,017	71/661,779	07/19/1955
609,020	71/664,306	07/19/1955
609,021	71/665,150	07/19/1955
609,032	71/664,033	07/19/1955
609,036	71/670,305	07/19/1955
609,041	71/671,703	07/19/1955
609,046	71/673,611	07/19/1955
609,062	71/662,033	07/19/1955
609,063	71/662,180	07/19/1955
609,064	71/663,105	07/19/1955
609,066	71/663,983	07/19/1955
609,067	71/667,790	07/19/1955
609,086	71/659,645	07/19/1955
609,098	71/671,622	07/19/1955
609,110	71/656,036	07/19/1955
609,119	71/670,629	07/19/1955
609,127	71/675,817	07/19/1955
609,137	71/675,856	07/19/1955
609,149	71/665,237	07/19/1955
609,176	71/674,633	07/19/1955
609,189	71/652,792	07/19/1955
609,191	71/648,211	07/19/1955
609,208	71/669,239	07/19/1955
609,209	71/669,740	07/19/1955
609,226	71/665,527	07/19/1955
609,233	71/671,559	07/19/1955
609,235	71/671,806	07/19/1955
609,236	71/671,812	07/19/1955
609,239	71/672,729	07/19/1955
609,242	71/672,830	07/19/1955
609,261	71/669,920	07/19/1955
609,266	71/661,938	07/19/1955
609,273	71/668,081	07/19/1955
609,280	71/671,127	07/19/1955
609,282	71/671,407	07/19/1955
609,300	71/642,486	07/19/1955
609,311	71/665,943	07/19/1955
609,329	71/658,070	07/19/1955
609,334	71/659,102	07/19/1955
609,338	71/662,820	07/19/1955
609,339	71/663,170	07/19/1955
1,012,029	73/018,234	06/03/1975
1,015,558	73/000,641	07/15/1975
1,015,560	73/011,390	07/15/1975
1,015,561	73/011,401	07/15/1975
1,015,562	73/012,663	07/15/1975
1,015,565	73/015,834	07/15/1975
1,015,572	73/025,851	07/15/1975
1,015,574	73/027,779	07/15/1975
1,015,576	73/030,643	07/15/1975
1,015,578	73/032,165	07/15/1975
1,015,581	73/035,512	07/15/1975
1,015,582	73/035,896	07/15/1975
1,015,592	73/013,628	07/15/1975
1,015,593	73/018,388	07/15/1975
1,015,598	73/020,316	07/15/1975
1,015,601	73/022,860	07/15/1975
1,015,602	73/022,862	07/15/1975
1,015,603	73/025,063	07/15/1975
1,015,605	73/032,017	07/15/1975
1,015,607	73/033,170	07/15/1975
1,015,609	73/037,016	07/15/1975
1,015,610	73/037,388	07/15/1975
1,015,618	73/019,555	07/15/1975
1,015,626	73/026,811	07/15/1975
1,015,636	73/000,459	07/15/1975
1,015,637	73/007,009	07/15/1975
1,015,638	73/008,870	07/15/1975
1,015,642	73/019,409	07/15/1975
1,015,643	73/022,068	07/15/1975
1,015,644	73/022,252	07/15/1975
1,015,646	73/001,770	07/15/1975
1,015,647	73/004,207	07/15/1975
1,015,648	73/008,891	07/15/1975
1,015,650	73/011,281	07/15/1975
1,015,656	73/031,529	07/15/1975
1,015,660	73/035,066	07/15/1975
1,015,667	73/033,657	07/15/1975
1,015,669	73/000,352	07/15/1975
1,015,672	73/006,144	07/15/1975
1,015,673	73/007,049	07/15/1975
1,015,674	73/007,052	07/15/1975
1,015,679	73/012,755	07/15/1975
1,015,680	73/013,611	07/15/1975
1,015,684	73/018,603	07/15/1975
1,015,685	73/019,112	07/15/1975
1,015,690	73/020,261	07/15/1975
1,015,692	73/022,686	07/15/1975
1,015,693	73/022,992	07/15/1975

Reg. Number	Serial Number	Reg. Date
1,015,695	73/023,275	07/15/1975
1,015,698	73/024,398	07/15/1975
1,015,702	73/027,315	07/15/1975
1,015,705	73/029,859	07/15/1975
1,015,706	73/029,860	07/15/1975
1,015,708	73/030,729	07/15/1975
1,015,711	73/033,235	07/15/1975
1,015,712	73/033,781	07/15/1975
1,015,719	73/016,307	07/15/1975
1,015,723	73/036,238	07/15/1975
1,015,724	73/036,279	07/15/1975
1,015,740	73/029,562	07/15/1975
1,015,741	73/030,104	07/15/1975
1,015,742	73/030,840	07/15/1975
1,015,744	73/039,549	07/15/1975
1,015,745	73/039,658	07/15/1975
1,015,755	73/034,248	07/15/1975
1,015,756	73/034,594	07/15/1975
1,015,757	73/009,377	07/15/1975
1,015,759	73/016,830	07/15/1975
1,015,766	73/027,067	07/15/1975
1,015,772	73/003,754	07/15/1975
1,015,775	73/007,311	07/15/1975
1,015,787	73/023,093	07/15/1975
1,015,788	73/024,894	07/15/1975
1,015,790	73/029,091	07/15/1975
1,015,791	73/031,035	07/15/1975
1,015,792	73/022,422	07/15/1975
1,015,795	73/033,654	07/15/1975
1,015,799	73/034,572	07/15/1975
1,015,800	73/034,735	07/15/1975
1,015,802	73/011,763	07/15/1975
1,015,803	73/012,712	07/15/1975
1,015,807	73/016,165	07/15/1975
1,015,809	73/029,407	07/15/1975
1,015,813	73/005,398	07/15/1975
1,015,814	73/014,643	07/15/1975
1,015,818	73/029,149	07/15/1975
1,015,819	73/003,490	07/15/1975
1,015,821	73/013,339	07/15/1975
1,015,823	73/021,254	07/15/1975
1,015,825	73/035,850	07/15/1975
1,015,829	73/003,839	07/15/1975
1,015,830	73/007,960	07/15/1975
1,015,834	73/016,462	07/15/1975
1,015,838	73/021,769	07/15/1975
1,015,845	73/027,848	07/15/1975
1,015,847	73/030,639	07/15/1975
1,015,848	73/030,754	07/15/1975
1,015,850	73/033,280	07/15/1975
1,015,858	73/025,422	07/15/1975
1,015,865	73/007,546	07/15/1975
1,015,870	73/017,669	07/15/1975
1,015,872	73/020,957	07/15/1975
1,015,875	73/028,528	07/15/1975
1,015,877	73/031,405	07/15/1975
1,015,881	73/036,697	07/15/1975
1,015,882	73/036,698	07/15/1975
1,015,883	73/002,042	07/15/1975
1,015,884	73/006,823	07/15/1975
1,015,888	73/021,863	07/15/1975
1,015,889	73/022,517	07/15/1975
1,015,890	73/023,105	07/15/1975
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1,015,896	73/028,457	07/15/1975
1,015,897	73/028,541	07/15/1975
1,015,900	73/032,174	07/15/1975
1,015,903	73/033,004	07/15/1975
1,015,904	73/033,227	07/15/1975
1,015,906	73/035,919	07/15/1975
1,015,907	73/035,968	07/15/1975
1,015,908	73/003,143	07/15/1975
1,015,910	73/018,467	07/15/1975
1,015,911	73/019,363	07/15/1975
1,015,922	73/032,932	07/15/1975
1,015,923	73/033,759	07/15/1975
1,015,925		07/15/1975
1,015,927		07/15/1975
1,015,928		07/15/1975
1,015,930		07/15/1975
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73/014,964		07/15/1975
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73/022,478		07/15/1975
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73/030,914		07/15/1975
73/031,527		07/15/1975
73/029,755		07/15/1975
73/020,009		07/15/1975
73/022,968		07/15/1975
73/026,129		07/15/1975
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72/465,621		07/15/1975
72/429,861		07/15/1975
72/460,480		07/15/1975
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72/439,956		07/15/1975
72/451,295		07/15/1975
72/462,043		07/15/1975
72/462,416		07/15/1975
72/463,470		07/15/1975
72/452,191		07/15/1975
72/455,706		07/15/1975

Reg. Number	Serial Number	Reg. Date
1,016,108	72/461,435	07/15/1975
1,016,111	72/459,986	07/15/1975
1,016,116	72/417,026	07/15/1975
1,016,119	72/428,533	07/15/1975
1,016,123	72/415,413	07/15/1975
1,016,124	72/415,984	07/15/1975
1,016,127	72/451,907	07/15/1975
1,016,128	72/463,416	07/15/1975
1,016,134	72/452,994	07/15/1975
1,016,141	72/462,738	07/15/1975
1,016,142	72/464,738	07/15/1975
1,016,143	72/466,841	07/15/1975
1,016,144	72/467,000	07/15/1975
1,016,145	72/465,821	07/15/1975
1,016,146	72/442,768	07/15/1975
1,016,150	72/433,003	07/15/1975
1,016,151	72/435,381	07/15/1975
1,016,152	72/464,279	07/15/1975
1,016,154	72/345,977	07/15/1975
1,016,159	72/457,611	07/15/1975
1,016,160	72/457,618	07/15/1975
1,016,170	72/444,792	07/15/1975
1,016,171	72/457,027	07/15/1975
1,016,172	72/458,118	07/15/1975
1,016,176	72/454,828	07/15/1975
1,016,178	72/457,138	07/15/1975
1,016,180	72/449,263	07/15/1975
1,016,181	72/460,290	07/15/1975
1,016,186	72/463,121	07/15/1975
1,016,192	73/001,308	07/15/1975
1,016,194	73/022,124	07/15/1975
1,016,197	73/020,253	07/15/1975
1,016,198	73/022,054	07/15/1975
1,016,200	73/043,135	07/15/1975
1,016,201	73/006,332	07/15/1975
1,016,203	73/020,025	07/15/1975
1,016,205	72/450,052	07/15/1975
1,016,206	72/463,534	07/15/1975
1,016,209	72/426,100	07/15/1975
1,016,211	72/443,341	07/15/1975

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A variety of trademark search tools and references are now available for purchase from the U.S. Patent and Trademark Office on the *Trademarks ASSIST* CD-ROM. This new product offers the following text searchable applications:

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- Goods and Services Manual
- Trademark Trial and Appeal Board Manual of Procedure
- Trademark Statute and Rules (Trademark Law of 1946, as amended)
- Trademark Examination Guide and Notes
- Trademark Telephone Index
- Information Dissemination Organizations Products & Services Catalog

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Office of Electronic Information Products
Crystal Park 3, Suite 441
Washington, D.C. 20231

Phone: (703) 306-2600
Fax: (703) 306-2737

Errata

In the list of patents which expired on January 21, 1996, due to failure to pay maintenance fees, in the O.G. of April 02, 1996, the following patent should not have appeared:

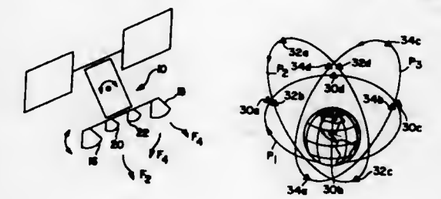
Patent Number	Serial Number	Issue Date	Filing Date
4,426,876	06/261,188	08/22/80	01/24/84

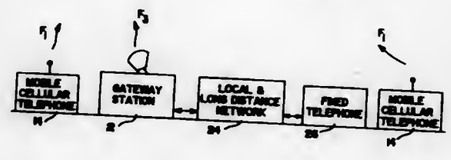
Omission

The following Utility patent was inadvertently omitted from the September 3, 1996 *Official Gazette*.

5,551,624
MEDIUM-EARTH-ALTITUDE SATELITE-BASED CELLULAR TELECOMMUNICATIONS
Michael Horstein, Los Angeles; Peter H. Cress, Manhattan Beach; Roger J. Rusch, Palos Verdes Estates, all of Calif., assignors to TRW Inc., Redondo Beach, Calif
Continuation of Ser. No. 134,838, Oct. 12, 1993, Pat. No. 5,439,190, which is a continuation in part of Ser. No. 890,510, May 28, 1992, Pat. No. 5,433,726, which is a continuation in part of Ser. No. 688,412, Apr. 22, 1991, abandoned. This application May 12, 1995, Ser. No. 440,311

Int. Cl.[6] B64G *1/10*
U.S. Cl. 244—158 R
33 Claims





1. A constellation of telecommunication satellites which provides 24-hour cellular telephone communication coverage over a predetermined latitude range around the world for a cellular transceiver having an omni-directional antenna operating at a power level as low as 1/2 watt, comprising:

a plurality of less than 9 telecommunication satellites providing 24-hour cellular telephone communication coverage over a predetermined latitude range around the world which is less than whole earth coverage, each of said satellites having a plurality of multibeam antennas for enabling simultaneous bi-directional communication links with a plurality of cellular-based telecommunication devices;

each of said satellites residing in one of a plurality of predetermined orbits, with the number of said predetermined orbits being different than the number of said satellites in each of said predetermined orbits; and

each of said predetermined orbits being related to the other orbits such that each of said predetermined orbits has a predetermined inclination angle with respect to the equator, a predetermined altitude of between approximately 5600 nmi and 7500 nmi, and a predetermined ascending node spacing between satellites in different orbital planes.

Service by Publication

A petition to cancel the registrations identified below having

issued a directive to Federal agencies regarding their responsibilities under his Regulatory Reform Initiative. This initiative is part of the National Performance Review and calls for immediate comprehensive regulatory reform. The President directed

Contact:
Samir M. Sabbara
3348 Derwood Dr.
Anaheim, Calif. 92804

5,504,592	5,512,442	5,518,729	5,525,845
5,504,838	5,512,569	5,518,934	5,525,926
5,505,068	5,512,591	5,518,952	5,526,016
5,505,143	5,512,855	5,519,389	5,526,020

Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

The Murmurs, Metairie, La., Reg. No. 1,609,384, for the mark "THE MURMURS AND DESIGN", Canc. No. 23,001.

Thomas & Betts Corp., Bridgewater, N.J., Reg. No. 1,590,646, for the mark "DELTBC", Canc. No. 24,312.

Timothy A. Domenico, Marina Del Ray, Calif., Reg. No. 1,712,945, for the mark "FREEFALL PERFUME", Canc. No. 24,405.

Shelburne Shirt Co., Inc., New York, N.Y., Reg. No. 1,226,030, for the mark "PERSUADE", Canc. No. 24,706.

Ideal Industries, Ontario, Canada, Reg. No. 1,021,030, for the mark "IDEAL", Canc. No. 24,811.

Joseph S. Pickett & Sons, Inc., Dubuque, Iowa, Reg. No. 623,233, for the mark "E & B", Canc. No. 24,212.

The Cookie Man Co., Inc., Franklin Lakes, N.J., Reg. No. 1,068,646, for the mark "THE COOKIE MAN", Canc. No. 24,326.

Daniel E. Nienhauser, Dobbs Ferry, N.Y., Reg. No. 1,756,926, for the mark "I WEAR AND DESIGN", Canc. No. 24,379.

Sleepsafe Industries, Inc., Klamath Falls, Oreg., Reg. No. 1,218,998, for the mark "SLEEPSAFE", Canc. No. 25,124.

The Sabo Corp., Flint, Mich., Reg. No. 1,253,196, for the mark "ACTION AUTO" and Design, Canc. No. 25,083.

JEAN BROWN
Technical Support Manager,
Trademark Trial
and Appeal Board, for
ROBERT M. ANDERSON
Deputy Assistant Commissioner
for Trademarks

Department of Commerce
Patent and Trademark Office

37 CFR Parts 15 and 15a
[Docket No. 960722200-6200-01]
RIN 0651-XX07

Service of Process; Testimony by Employees and the Production of Documents in Legal Proceedings

Agency: Patent and Trademark Office, Commerce.
Action: Final rule.
Summary: This final rule removes parts dealing with service of process on Patent and Trademark Office (PTO) employees in their official capacity and with testimony by employees and production of documents in legal proceedings. The PTO will rely on analogous Commerce Department regulations found in title 15 of the Code of Federal Regulations.
Effective Date: August 19, 1996
For Further Information Contact: Kenneth Corsello by telephone at (703) 305-9041; by mail marked to his attention and addressed to the Office of the Solicitor, Box 8, Washington, D.C. 20231; by electronic mail to corsello@uspto.gov; or by fax marked to his attention at (703) 305-9373.
Supplementary Information: In March 1995, President Clinton issued a directive to Federal agencies regarding their responsibilities under his Regulatory Reform Initiative. This initiative is part of the National Performance Review and calls for immediate, comprehensive regulatory reform. The President directed all agencies to undertake, as part of this initiative, an exhaustive review of all of their regulations—with an emphasis on eliminating or modifying those that are osbolete or otherwise in need of reform. This final rule is part of the Regulatory Reform Initiative.

The Department of Commerce regulations dealing with service of process (15 CFR Part 15) and with employee testimony and the production of documents (15 CFR Part 15a) apply to the PTO. Therefore, the PTO is removing 37 CFR Parts 15 and 15a because they are unnecessary and duplicative.

This rule is not a significant rule for the purposes of Executive Order 12866. Notice and comment is not required for this rulemaking because it relates to agency management or personnel, 5 U.S.C. 553(a)(2), and thus no regulatory flexibility analysis is required, 5 U.S.C. 603(a). This rule does not change the paperwork burden imposed on the public. *See* 44 U.S.C. 3501 *et seq.*

List of Subjects

37 CFR Part 15

Attorneys, Administrative practice and procedure, Courts, Government employees.

37 CFR Part 15a

Attorneys, Administrative practice and procedure, Courts, Government employees.

For the reasons set forth in the preamble, and pursuant to the authority contained in 35 U.S.C. 6, 37 CFR Chapter 1 is amended as follows:

Part 15 — [Removed and Reserved]

1. Part 15 is removed and reserved.

Part 15a — [Removed and Reserved]

1. Part 15a is removed and reserved.

August 13, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and
Commissioner of Patents and Trademarks

Patents Available For License or Sale

5,092,549 INFANT BOTTLE HOLDER ATTACHMENT DEVICE FOR INFANT SUPPORT

Contact: Ida Beech
A486 Kosciusko St.
Rochester, N.Y. 14621
(voice): (716) 467-4526

5,343,712 TEMPERATURE CONTROLLER AND METHOD FOR FACILITATING THE STORAGE OF WINE AND LIKE PERISHABLES

Contact: William A. Gowan
Precision Storage, Inc.
P.O. Box 6326
Raleigh, N.C. 27628-6326
(voice): (919) 834-0250
(fax): (919) 832-0558

5,483,923 TIMER CONTROLLED PET FEEDER

Contact: Samir M. Sabbara
3348 Derwood Dr.
Anaheim, Calif. 92804
(voice): (714) 827-0125
(fax): (714) 445-2408

5,509,844 LEGLESS STORAGE AND PLAY TABLE FOR USE BY CHILDREN

Contact: Robert P. Simpson
Jaeckle, Fleischmann & Mugel
Fleet Bank Building
12 Fountain Plaza
Buffalo, N.Y. 14202-2292
(voice): (716) 856-0600
(other): ext. 212

5,526,179 LIGHT GLARE REDUCING DEVICE

Contact: Charles A. Keech
72 Red Lion Ave.
Felton, Pa. 17322

Certificates of Corrections
For Week of September 10, 1996

B1 5,160,146	5,357,702	5,453,886	5,487,831
P. 09,462	5,364,862	5,454,831	5,487,878
Re. 34,976	5,364,872	5,454,883	5,488,465
Re. 35,243	5,367,081	5,455,245	5,488,733
D. 362,832	5,369,129	5,456,317	5,489,082
D. 365,814	5,369,896	5,456,561	5,489,415
D. 367,102	5,371,378	5,456,612	5,489,434
D. 367,909	5,374,678	5,458,248	5,489,966
D. 369,934	5,375,834	5,458,632	5,490,521
4,329,549	5,376,313	5,458,781	5,490,884
4,430,796	5,380,832	5,458,950	5,490,952
4,856,340	5,385,610	5,462,883	5,492,163
4,910,007	5,397,789	5,464,841	5,492,425
4,912,631	5,403,516	5,464,853	5,492,476
4,952,476	5,405,975	5,465,062	5,492,627
4,965,159	5,411,941	5,466,721	5,492,859
5,017,335	5,416,224	5,469,266	5,493,593
5,083,137	5,417,671	5,470,207	5,493,667
5,162,908	5,418,075	5,470,801	5,493,888
5,193,968	5,418,291	5,470,977	5,494,124
5,213,828	5,418,701	5,471,209	5,494,338
5,214,794	5,419,812	5,472,670	5,494,390
5,244,372	5,421,008	5,474,574	5,494,461
5,246,278	5,427,632	5,474,743	5,495,560
5,246,648	5,427,957	5,476,083	5,496,893
5,249,006	5,428,406	5,476,136	5,497,384
5,255,378	5,430,292	5,476,781	5,497,983
5,258,079	5,431,900	5,477,608	5,498,457
5,268,151	5,432,904	5,477,664	5,498,707
5,268,291	5,436,103	5,478,158	5,498,906
5,269,981	5,436,268	5,478,418	5,500,023
5,272,290	5,436,587	5,479,529	5,500,550
5,280,469	5,436,856	5,479,614	5,500,840
5,285,877	5,437,276	5,480,905	5,500,897
5,291,736	5,438,998	5,481,850	5,501,514
5,301,298	5,442,147	5,481,956	5,501,730
5,305,567	5,443,663	5,482,182	5,502,083
5,308,269	5,443,750	5,483,104	5,502,262
5,310,200	5,444,644	5,483,382	5,502,464
5,317,375	5,444,651	5,483,468	5,502,692
5,318,340	5,444,684	5,484,402	5,502,794
5,320,850	5,446,079	5,484,550	5,502,967
5,320,861	5,446,560	5,484,576	5,503,261
5,324,720	5,446,848	5,484,993	5,504,111
5,324,739	5,447,411	5,485,044	5,504,210
5,351,318	5,447,803	5,486,303	5,504,213
5,352,775	5,449,595	5,486,454	5,504,328
5,353,495	5,452,258	5,486,529	5,504,506
5,353,918	5,453,428	5,486,850	5,504,565
5,504,592	5,512,442	5,518,729	5,525,845
5,504,838	5,512,569	5,518,934	5,525,926
5,505,068	5,512,591	5,518,952	5,526,016
5,505,143	5,512,855	5,519,380	5,526,020
5,505,647	5,513,324	5,519,416	5,526,414
5,505,880	5,513,544	5,519,738	5,526,625
5,505,963	5,513,822	5,519,806	5,526,851
5,506,085	5,513,994	5,519,983	5,526,981
5,506,112	5,514,350	5,520,135	5,526,982
5,506,601	5,514,379	5,520,208	5,527,157
5,507,132	5,514,433	5,520,212	5,527,442
5,507,624	5,514,465	5,520,671	5,527,536
5,507,757	5,515,140	5,521,185	5,527,552
5,508,046	5,515,252	5,521,352	5,527,646
5,508,615	5,515,262	5,522,231	5,527,690
5,508,718	5,515,698	5,522,374	5,528,013
5,508,725	5,515,784	5,522,600	5,528,246
5,508,943	5,516,044	5,522,662	5,528,454
5,509,090	5,516,048	5,522,708	5,528,614
5,509,172	5,516,645	5,522,723	5,528,691
5,509,218	5,516,678	5,522,836	5,528,890
5,509,547	5,516,857	5,522,850	5,529,094
5,509,642	5,517,128	5,522,881	5,529,359
5,509,826	5,517,226	5,522,919	5,529,468
5,509,925	5,517,232	5,522,960	5,529,529
5,509,976	5,517,238	5,523,374	5,529,571
5,510,135	5,517,260	5,524,000	5,529,930
5,510,371	5,517,307	5,524,073	5,530,801
5,510,483	5,517,622	5,524,301	5,531,197
5,510,640	5,517,724	5,524,306	5,531,352
5,511,006	5,517,752	5,524,322	5,531,718
5,511,066	5,517,812	5,524,497	5,531,740
5,511,773	5,517,821	5,524,872	5,532,386
5,511,816	5,518,039	5,524,930	5,532,517
5,512,172	5,518,667	5,525,388	

Summary of Final Decisions
Issued by the
Trademark Trial and Appeal Board
June 24-28, 1996

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision
6-24	EX	74/424,787	TR Financial Corp.	2(d)	Refusal Affirmed
6-26	EX	74/315,351	Boy Scouts of America	whether the matter asserted for registration functions as a trademark and service mark for the goods and services recited in the application	Refusal Affirmed
6-26	OPP	91,963	CCA Industries, Inc. v. Dena Corp.	2(d)	Opposition Sustained
6-28	EX	74/378,083	Buffs-N-Puffs, Ltd.	2(d)	Refusal Affirmed

(1)EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (SJ) = SUMMARY JUDGMENT; (R) = REQ. FOR RECONSIDERATION

Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
	design of a rose [banking services]	design of a rose [mutual fund investment and advisory services]	No
	"SCOUT OATH-ON MY HONOR I WILL DO MY BEST TO DO MY DUTY TO GOD AND MY COUNTRY AND TO OBEY THE SCOUT LAW; TO HELP OTHER PEOPLE AT ALL TIMES; TO KEEP MYSELF PHYSICALLY STRONG, MENTALLY AWAKE, AND MORALLY STRAIGHT" [framed certificate plaques; association services in the nature of promoting an organization for boys, and the guidelines and attitudes in connection therewith]		No
"WASH 'N CURL" [hair shampoo]			No
	"CARPET EXPRESS" [motor vehicle carpet and upholstery cleaning preparations sold only directly to, and for use by, professional motor vehicle washing and detailing establishment and not for retail sale to the public or for residential use]	"CARPET EXPRESS" [carpet or upholstery cleaning preparations; carpet or cleaning machines; rental of carpet or upholstery cleaning machines; cleaning carpets or upholstery]	No

(1)EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (SJ) = SUMMARY JUDGMENT; (R) = REQ. FOR RECONSIDERATION

Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
	"FRANKLIN & CO. OPTICIANS" [optician services]	"F O — FRANKLIN OPTICAL COMPANY — PRESCRIPTION OPTICIANS SINCE 1933" (and design) [eyeglasses; optician services]	No
	"PLYOTONIC" [physical fitness instruction]		No
"ALASKAN" [beer and ale]; "ALASKAN PALE ALE" (and design) [ale]; "ALASKAN AMBER BEER" (and design) [beer]	"ALASKAN GLACIER WATER — WE CAN'T GIVE YOU OUR AIR BUT WE CAN GIVE YOU OUR WATER" (in stylized presentation) [glacier water]		No

(1)EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (SJ) = SUMMARY JUDGMENT; (R) = REQ. FOR RECONSIDERATION

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Assistant Commissioner for Patents
Washington, D.C. 20231

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Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box Missing Parts	Response to the Notice to File Missing Parts of Application and associated papers and fees.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filing of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

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Assistant Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

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Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOUs) and extension requests.
Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

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Commissioner of Patents and Trademarks
Washington, D.C. 20231

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Box 4	Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation and disciplinary proceedings*; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
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Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box M Fee	Correspondence regarding patent maintenance fees and related matter.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks
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Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries—(continued)

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The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4488
	Sunnyvale Center for Innovation, Invention and Ideas	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6249
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
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	Miami-Dade Public Library	(305) 375-2665
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	Tampa Campus Library, University of South Florida	(813) 974-2726
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Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
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Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Media Union Library, University of Michigan	(313) 647-5735
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
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New Hampshire	Concord: New Hampshire State Library	Not Yet Operational
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
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North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Akron - Summit County Public Library	Not Yet Operational
	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
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	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	(503) 768-6786
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaquez General Library, University of Puerto Rico	Not Yet Operational
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(803) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University	Not Yet Operational
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN E. KITTLE, Director	308-0661	10/20/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	07/20/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director	308-0651	09/19/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	01/12/95
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	07/29/94
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	09/13/94
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	01/17/95
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—BOBBY R. GRAY, Director	305-9600	10/21/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	08/08/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	01/20/95
TELECOMMUNICATIONS, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	12/13/94
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	01/16/95
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director	308-1113	06/02/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director	308-1148	10/06/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	05/22/95
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	04/20/95
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	10/18/94

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of August 1, 1996

Law Office	Oldest Date New*	Oldest Date Amendment Filed
Law Office 101—Ron Williams, Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	12/14/95	04/10/96
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/22/96	02/12/96
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/05/96	06/26/96
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/22/96	04/01/96
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/27/96	05/01/96
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/06/96	02/08/96
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/17/96	01/30/96
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/14/96	03/18/96
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/15/96	05/15/96
**Collective Marks—Class 200		
**Certification Marks—Classes A & B		
Office of Trademark Services—Vacant (703) 308-9100		
Trademark Assistance Center—(703) 308-9000		
Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188		
Intent-To-Use—(ITU)—(703) 308-9500		
Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	01/26/96	—0—
Renewals (All Classes)	05/02/96	—0—
Section 12(c) Publications (All Classes)	02/29/96	—0—

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

SEPTEMBER 10, 1996

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 Re. 33,162 (2985th)

METHOD AND APPARATUS FOR GUIDANCE OF AN OPERATION OF OPERATING POWER PLANTS

Kenichi Yoshida, Hachioji; Takao Watanabe, Hitachi, and Takashi Kiguchi, Mito, all of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Reexamination Request No. 90/003,187, Sep. 3, 1993.

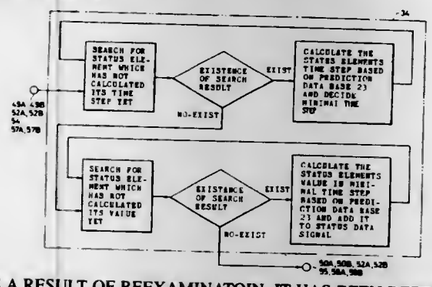
Reexamination Certificate for Reissue Patent Re. 33,162, issued Feb. 13, 1990, Ser. No. 141,304, Jan. 6, 1988.

Original No. 456,374, dated Jan. 7, 1986, Ser. No. 433,908, Oct. 12, 1982.

Claims priority, application Japan, Oct. 14, 1981, 56-164632

Int. Cl.[6] **G06F** *15/18;* **G07B** *13/02*

U.S. Cl. 364—492



AS A RESULT OF REEXAMINATOIN, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–28** is confirmed.

Claims **29–30, 36–37, 43, 45, 50, 52, 57–58, 64–66,** and **71** are determined to be patentable as amended.

Claims **31–35, 38–42, 44, 46–49, 51, 53–56, 59–63,** and **67–70** dependent on an amended claim, are determined to be patentable.

New claims **72–95** are added and determined to be patentable.

29. An apparatus including a computer comprising:

(1) memory means for storing information forming a knowledge base, *said knowledge base* including:

(a) data [as] *made up of* facts [expressed as], *each fact having* at least one identifier portion indicative of a state of an object and a corresponding value portion, *said data also including information concerning at least one fact which permits the change of its value portion with time to be determined;* and

(b) rules including IF parts and corresponding THEN parts, each of the IF parts and corresponding THEN parts including an identifier portion and a corresponding value *portion*; and

(2) means for [carrying out] *executing* a processing program [including interpretation of] *to interpret* the knowledge base for guidance, *said means for executing* including:

(a) means for searching the knowledge base in accordance with a predetermined fact [for], *said means for searching* comparing facts and rules [so as to obtain] *and obtaining* at least one of an IF part or THEN part of a rule as a result of the comparison[,];

(b) means [responsive to the searching means] for utilizing the comparison result *of said means for searching* as a new fact for searching of the knowledge base *further* by [the searching] *said* means[,] *for searching in response to the comparison result of said means for searching;*

(c) *means for predicting the status of members of the object after a given period of time has passed in accordance with the comparison result of said means for searching;*

[(c)] (*d*) means [responsive to no comparison result from the searching means] for terminating the search of the knowledge base[.] *when no comparison result is obtained from said means for searching;* and

[(d)] (*e*) means [responsive to termination of the search of the knowledge base by the terminating means] for outputting a result of [carrying out] the processing program *execution when the search of the knowledge base is terminated by said means for terminating.*

B1 4,066,855

Patent Not Issued For This Number

B1 4,640,933 (2987th)

EXPANDABLE POLYOLEFIN COMPOSITIONS AND PREPARATION PROCESS UTILIZING ISOBUTANE BLOWING AGENT

Chung P. Park, Pickerington, Ohio, assignor to The Dow Chemical Company, Midland, Mich.

Reexamination Request Nos. 90/003,340, Feb. 18, 1994 and 90/003,530, Aug. 15, 1994.

Reexamination Certificate for Patent 4,640,933, issued Feb. 3, 1987, Ser. No. 868,395, May 27, 1986.

Division of Ser. No. 843,422, Mar. 24, 1986, which is a division of Ser. No. 813,315, Dec. 24, 1985.

Int. Cl.[6] **C08J** *9/14*

U.S. Cl. 521—94

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **3** is confirmed.

Claims **1, 2** and **4** are cancelled.

New claims **5–14** are added and determined to be patentable.

3. The foam of claim **1** in which said olefin polymer resin is low density polyethylene.

B1 4,655,771 (2988th)

PROSTHESIS COMPRISING AN EXPANSIBLE OR CONTRACTILE TUBULAR BODY

Hans I. Wallsten, Denens, Switzerland, assignor to AMS Medinvent S.A., Crissier, Switzerland

Reexamination Request No. 90/003,752, Mar. 20, 1995.

Reexamination Certificate for Patent 4,655,771, issued Apr. 7, 1987, Ser. No. 571,549, Apr. 11, 1983.

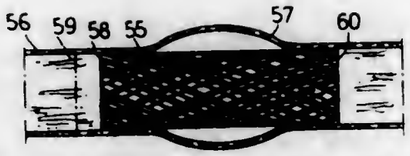
PCT No. PCT/SE83/00131, § 371 Date Dec. 7, 1983, § 102(e) Date Dec. 7, 1983, PCT Pub. No. WO83/03752, PCT Pub. Date Nov. 10, 1983

Int. Cl.[6] **A61F** *2/06*

U.S. Cl. 623—1

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

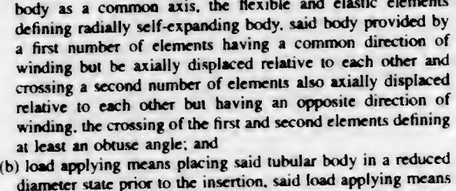
The patentablility of claims **1–12** is confirmed.



New claims **13–23** are added and determined to be patentable.

1. An implantation device to complete insertion and implantation of a prosthesis in a body vessel comprising in combination:
(a) the prosthesis having a radially and axially flexible, elastic tubular body with a predetermined diameter that is variable under axial movement of ends of the body relative to each other and which is composed of a plurality of individually rigid but flexible and elastic thread elements each of which extends in helix configuration along the center line of the body as a common axis, the flexible and elastic elements defining radially self-expanding body, said body provided by a first number of elements having a common direction of winding but be axially displaced relative to each other and crossing a second number of elements also axially displaced relative to each other but having an opposite direction of winding, the crossing of the first and second elements defining at least an obtuse angle; and
(b) load applying means placing said tubular body in a reduced diameter state prior to the insertion, said load applying means removed from said body after said insertion of the tubular body so as to permit said tubular body to radially self-expand in the vessel.

B1 4,976,368 (2989th)
CONCENTRIC CONVENIENCE OPENING BEVERAGE CAN END
Gerald B. Klein, 13451 Stuart Ct., Broomfield, Colo. 80020
Reexamination Request No. 90/003,500, Jul. 18, 1994.
Reexamination Certificate for Patent 4,976,368, issued Dec. 11, 1990, Ser. No. 425,309, Oct. 23, 1989.
Int. Cl.[6] B65D *17/32*
U.S. Cl. 220—268



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **16** and **31** are cancelled.

Claims **1–4**, **18–20**, **22–25**, **27**, **29**, **30**, **32** and **33** are determined to be patentable as amended.

Claims **5–15**, **17**, **21**, **26** and **28**, dependent on an amended claim, are determined to be patentable.

New claims **34–39** are added and determined to be patentable.

1. In a beverage can end of drawn metal with a peripheral connection means about the expansion panel of the can end adapted to connect the can end to a can body, the improvement comprising:
(a) a lipped opening proportioned to facilitate drinking and pouring from a can, [having] *the lipped opening including* a substantially vertical and circular wall upstanding from the expansion panel;
(b) [a gate seating and hinging means within the embrace of] *a radially-extending annular flange spaced radially inwardly from* the [lipped opening] wall *and defining a passageway for drinking and pouring*;
(c) means *within the perimeter of the outer wall* connecting the [seating and hinging means within the confines of the lip] *annular flange and the outer wall*; and
(d) a closure gate [at the underside of the gate seating and hinging means,] *for the passageway* seated [thereto] *at its periphery on the underside of the annular flange and* being [opened by pushing it] *hinged to the annular flange* to swing downwardly [about the hinging means, as from the seating means and] to one side of the [lipped opening wall] *passageway when opened by pushing*.

B1 5,031,245 (2990th)
GLOVES, THEIR MANUFACTURE AND USE
Richard Milner, Bishops Stortford, United Kingdom, assignor to Smith & Nephew plc, London, United Kingdom
Reexamination Request No. 90/003,147, Jul. 22, 1993.
Reexamination Certificate for Patent 5,031,245, issued Jul. 16, 1991, Ser. No. 341,946, Apr. 20, 1989.
Int. Cl.[6] A41D *19/00;13/10*
U.S. Cl. 2—168

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:
Claim **5** is cancelled.

Claims **1**, **6** and **10** are determined to be patentable as amended.

Claims **2**, **3**, **4**, **7**, **8**, **9** and **11**, dependent on an amended claim, are determined to be patentable.

New claims **12–21** are added and determined to be patentable.

1. A *thin, disposable,* medical natural rubber glove, *for one time donning use,* which comprises an antimicrobially effective amount of *a non-ionic, sparingly water soluble antimicrobial agent which is* 2,4,4'-trichloro-2'-hydroxydiphenyl ether [within] *distributed throughout* the natural rubber, *whereby an antimicrobially effective amount of the antimicrobial agent is released onto the hand of the wearer during said use of the glove.*

B1 5,070,240 (2991st)
APPARATUS AND METHODS FOR TRACE COMPONENT ANALYSIS
Milton L. Lee, Pleasant Grove, and Chung H. Sin, Provo, both of Utah, assignors to Brigham Young University, Provo, Utah
Reexamination Request No. 90/004,095, Jan. 16, 1996.
Reexamination Certificate for Patent 5,070,240, issued Dec. 3, 1991, Ser. No. 574,638, Aug. 29, 1990.
Int. Cl.[6] H01J *49/40*
U.S. Cl. 250—288

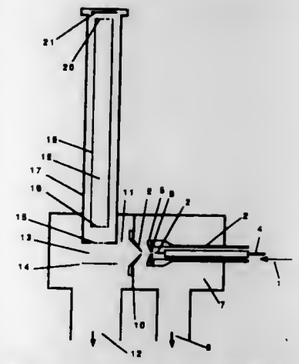
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **38** is cancelled.

Claims **1**, **11** and **33** are determined to be patentable as amended.

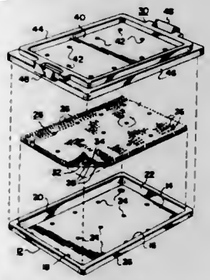
Claims **2–10**, **12–32**, **34–37** and **39–51**, dependent on an amended claim, are determined to be patentable.

1. An apparatus for chemical species analysis using a time-of-flight mass spectrometer comprising:
ion production means for [the production of ions or introduction of already produced] *receiving a selected sample of chemical species to be analyzed and producing* ions *therefrom* in a region exterior to a vacuum region of the said time-of-flight mass spectrometer;



introduction means for permitting the produced ions to flow *continuously* from the ion production region into said vacuum region of said time-of-flight mass spectrometer, such that the ion flow forms a supersonic jet *which narrows the distribution of kinetic and internal energies of the produced ions*; and
ion flow directing means for changing the ion flow direction from a supersonic jet flow axis into a flight tube of said time-of-flight mass spectrometer where the ions are separated and detected.

B1 5,098,676 (2992nd)
STERILIZATION AND STORAGE CONTAINER TRAY
John A. Brooks, Jr., Manchester, N.H., assignor to Poly-Vac, Inc., Manchester, N.H.
Reexamination Request No. 90/004,187, Mar. 20, 1996.
Reexamination Certificate for Patent 5,098,676, issued Mar. 24, 1992, Ser. No. 637,625, Jan. 4, 1991.
Int. Cl.[6] A61L *2/00*
U.S. Cl. 422—292

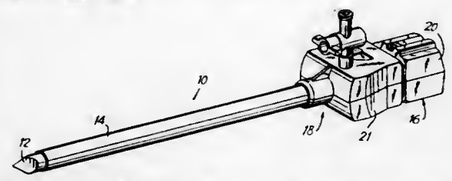


AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended.

1. A sterilization tray assembly for sterilizing, transporting, and storing instrumentns, comprising:
a tray, having;
an upper tray section including a plurality of upper tray ports spaced in a predetermined pattern;
a lower tray section including a plurality of lower tray ports spaced in a pedetermined pattern;
locking means for engaging said upper tray section and said lower tray section to form a sealing contact between said tray sections; and
a *flexible* mat made of silicone rubber and sized to fit said tray, said mat being positioned between said tray sections and having an upper surface and a lower surface, said mat including;
a plurality of mat ports in said mat spaced in a predetermined pattern wherein said mat ports and said lower tray ports are in vertical alignment;
a plurality of upwardly tapered, vertical projections spaced in a predetermined pattern on said upper surface, said vertical projections having tips at their free ends to provide support for instruments above said upper surface;
a pluality of downwardly projecting support feet depending from said lower surface spaced in a predetermined pattern for spacing said lower surface above said lower tray section.

B1 5,116,353 (2993rd)
SAFETY TROCAR
David T. Green, Westport, Conn., assignor to Digital Voice Systems, Inc., Cambridge, Mass.
Reexamination Request No. 90/003,466, Jun. 13, 1994.
Reexamination Certificate for Patent 5,116,353, issued May 26, 1992, Ser. No. 593,676, Oct. 5, 1990.
Int. Cl.[6] A61B *17/32*
U.S. Cl. 606—184



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **15**, **16** and **17** is confirmed.

Claims **1**, **4**, **10**, **11**, **13**, **18** and **20** are determined to be patentable as amended.
Claims **2**, **3**, **5–9**, **12**, **14**, and **19**, dependent on an amended claim, are determined to be patentable.

New claims **21–25** are added and determined to be patentable.

1. A trocar comprising:
(a) a cannula assembly comprising a cannula and a cannula housing defining an internal cannula passage;
(b) a trocar assembly adapted to cooperate with said cannula assembly, said trocar assembly comprising a sharp trocar tip, an obturator shaft, and a trocar housing, said trocar tip and at least a portion of said obturator shaft being configured and dimensioned for entry into said internal cannula passage;
(c) releasable obturator means [associated with] *mounted to* the obturator shaft which releasably maintains the trocar tip in an extended position relative to said cannula;
(d) *pawl* means for releasing the releasable obturator means, *said pawl means being mounted to said trocar assembly for rotational movement with respect to said releasable obturator means*; and
(e) biasing means for retracting the trocar tip from said extended position to a retracted position in response to release of the releasable obturator means.

B1 5,196,404 (2994th)

INHIBITORS OF THROMBIN

John M. Maraganore, Concord, Mass.; John W. Fenton, II, Malden Bridge, and Toni Kline, New York, both of N.Y., assignors to Biogen, Inc., Cambridge, Mass., and Health Research, Inc., Albany, N.Y.

Reexamination Request No. 90/003,511, Jul. 27, 1994.
Reexamination Certificate for Patent 5,196,404, issued Mar. 23, 1993, Ser. No. 549,388, Jul. 6, 1990.
Continuation-in-part of Ser. No. 395,482, Aug. 18, 1989, abandoned.
Int. Cl.[6] A61K *38/02;38/00;* **C07K** *7/08;14/00*
U.S. Cl. 514—13

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–37** is confirmed.

1. A thrombin inhibitor consisting of:

a) a catalytic site-directed moiety that binds to and inhibits the active site of thrombin; wherein said catalytic site-directed moiety is selected from serine proteinase inhibitors, heterocyclic protease inhibitors, thrombin-specific inhibitors, transition state analogues, benzamidine, DAPA, NAPAP, argipidine, or moieties of the formulae:

$$X—A_1—A_2—A_3—Y \text{ or } X—C_1—C_2—A_3—Y,$$

wherein X is hydrogen or is characterized by a backbond chain consisting of from 1 to 35 atoms;

A_1 is Arg, Lys or Orn; A_2 is a non-amide bond;

A_3 is characterized by a backbone chain consisting of from 1 to 9 atoms, Y is a bond; C_1 is a derivative of Arg, Lys or Orn comprising a carboxylate moiety that is reduced, or displaced from the α-carbon by a moiety characterized by a backbone chain consisting of from 1 to 10 atoms; and C_2 is a non-cleavable bond;

b) a linker moiety characterized by a backbone chain having a calculated length of between about 18 Å and about 42 Å; and

c) an anion binding exosite associating moiety;

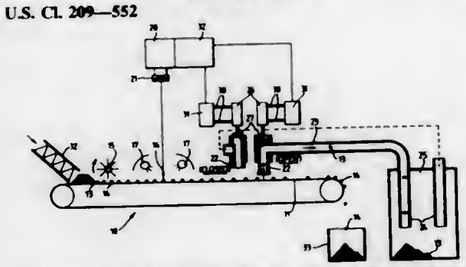
said catalytic site-directed moiety being bound to said linker moiety and said linker moiety being bound to said anion bonding exosite associating moiety; wherein said inhibitor is capable of simultaneously binding to the catalytic site and the anion binding exosite of thrombin.

B1 5,242,059 (2995th)

METHOD AND APPARATUS FOR SORTING MATERIAL

John M. Low, Hertfordshire, and John E. Milbank, London, both of, England, assignors to Sortex, Ltd., London, England

Reexamination Request No. 90/003,793, Apr. 14, 1995.
Reexamination Certificate for Patent 5,242,059, issued Sep. 7, 1993, Ser. No. 707,452, May 30, 1991.
Int. Cl.[6] B07C *5/00*
U.S. Cl. 209—552



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

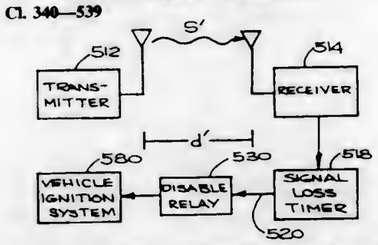
Claims **1–6** are cancelled.

B1 5,349,329 (2996th)

VEHICLE SECURITY APPARATUS AND METHOD

Jerry R. Smith, Littleton, Colo., assignor to Ideaz International, Inc., Englewood, Colo.

Reexamination Request No. 90/003,980, Sep. 14, 1995.
Reexamination Certificate for Patent 5,349,329, issued Sep. 20, 1994, Ser. No. 59,448, May 7, 1993.
Int. Cl.[6] G08B *1/08;* **B60R** *25/10*
U.S. Cl. 340—539



AS A RESULT OF REEXAMINATION IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–26** is confirmed.

1. Anti-theft apparatus adapted to interconnect with an electronic control circuit of a motor-powered vehicle and operative to selectively disrupt the control circuit to disable said vehicle, comprising:

(a) a transmitter adapted to be carried by a driver of the vehicle and operative to produce a broadcast signal of selected frequency;

(b) a receiver adapted to be carried by said vehicle and operative to receive the broadcast signal when said transmitter is within a communication range, said receiver including timer circuitry and operative to produce an out-of-range signal when said receiver fails to receive the broadcast signal only after said receiver fails to receive said broadcast signal for a selected time duration; and

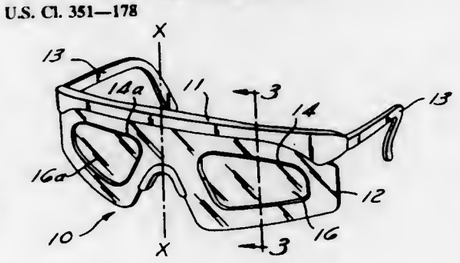
(c) a switch circuit including a switch element interposed in the control circuit of said vehicle, said switch element having a switch active state wherein the control circuit of said vehicle is operative and a switch inactive state wherein the control circuit of said vehicle is disrupted, said switch circuit operative in response to said out-of-range signal to cause said switch element to change from the switch active state to the switch inactive state thereby disrupting said control circuit to disable said vehicle.

B1 5,387,950 (2997th)

PRESCRIPTION EYEWEAR MADE FROM NON-PRESCRIPTION LENS SHIELD MATERIAL

Alfred Weltmann, 9052 A Niles Central Rd., Skokie, Ill. 60076

Reexamination Request No. 90/003,904, Jul. 17, 1995.
Reexamination Certificate for Patent 5,387,950, issued Feb. 7, 1995, Ser. No. 934,119, Aug. 21, 1992.
Continuation of Ser. No. 565226, Aug. 9, 1990, abandoned.
Int. Cl.[6] G02C *13/00*
U.S. Cl. 351—178



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–9** is confirmed.

1. A process for forming prescription eyewear from a unitary non-prescription generally planar lens shield which is optically defective, comprising the steps of:

(a) providing a unitary non-prescription generally planar lens shield having a pair of apertures formed therein which lie in front of the eyes of the wearer, each aperture having a first peripheral ridge formed along its peripheral edges;

(b) fabricating a pair of prescription lens sized to fit in said pair of apertures, each having a second peripheral groove designed to interfit with said first peripheral surface; and

(c) permanently affixing said pair of prescription lenses in said pair of apertures in said lenses shield by heating said lens shield and the apertures therein, installing said prescription lenses in said heated apertures, and cooling said lens shield to thereby permanently affix said prescription lenses in said lens shield.

REISSUES

SEPTEMBER 10, 1996

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,327

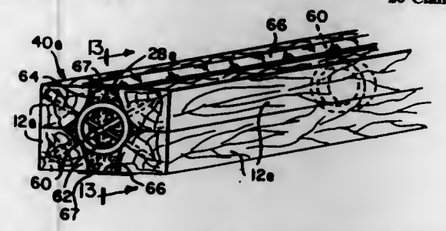
METHOD OF CONVERTING LOGS AND RESULTANT PRODUCT

Peter Sing, P.O. Box 11532, Winslow, Wash. 98110

Original No. 5,115,609, dated May 26, 1992, Ser. No. 725,296, Jul. 3, 1991. Application for reissue Mar. 9, 1994, Ser. No. 208,341

Int. Cl.[6] **B27C** *9/00*; **E04C** *1/00*; **B27M** *1/08*

U.S. Cl. 52—309.9 **20 Claims**



1. The method of converting logs into finished dressed lumber, which comprises the steps of: trimming and debarking the logs; cutting each log longitudinally and diametrically into four equal right-angled segments; transversely cutting quartered logs into selected lengths; kiln-drying the quartered logs; plane milling the cut surfaces of the quartered logs; [and] assembling the quartered logs into such position that the arcuate surfaces of [the] four log quarters [from each log] face toward each other and the cut, planed surfaces *thereof* face outwardly and are arranged to form a cross-sectional peripheral configuration which is rectangular[.; *and inserting selectively placed support braces at intervals in the interior space created when the log quarters are oriented into position; and fixedly joining both the arranged log quarters and the spaced support braces in the rectangular configuration.*

Re. 35,328

IDLING ROTATION MECHANISM USED IN THE HOUSING OF A VIDEO CASSETTE TAPE RECORDER

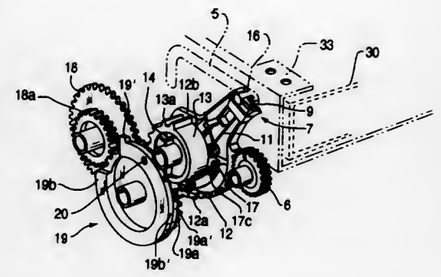
Young-Chan Kim, Kyungki-do, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Original No. 4,992,895, dated Feb. 12, 1991, Ser. No. 252,512, Sep. 30, 1988. Application for reissue Feb. 11, 1993, Ser. No. 16,287

Claims priority, application Rep. of Korea, Sep. 30, 1987, 1987/16926

Int. Cl.[6] **G11B** *15/68*

U.S. Cl. 360—96.5 **44 Claims**



1. An idling rotation mechanism in a housing of a video cassette tape recorder comprising:

a speed-variation means drivingly connectable to a motor so as to vary [the] *a* transmitted rotational speed thereof;

a cassette transporting holder engagable with a video cassette tape, said transporting holder is movable between an initial position and a mounted position;

a drive means connectable to the cassette transporting holder and the speed-variation means so as to move the transporting holder between *the initial position and the* mounted position;

a cut off means on said drive means to cut off the transmission of rotational forces from the motor to the drive means so as to prevent the transporting holder from continuing to move after reaching the mounted position;

said speed-variation means comprising[:]

a worm drivingly connectable to an output shaft of said motor;

a worm gear in meshing engagement with said worm; and

a bevel gear, mounted on a first shaft extending from the housing, in meshing engagement with said worm gear to vary the transmitted rotational speed of said motor, and

said means for cutting off rotation comprising:

a timing gear, rotatably mounted on a second shaft extending from said housing, in meshing engagement with a small gear on a back side of said bevel gear, said timing gear having a gear part, with a portion of the gear *part* covered by a sliding part, and a rotating plate having a cut out portion; and

an arm gear, rotatably mounted on a third shaft extending from said housing, having a geared part that can be in meshing engagement with said gear part, said geared part having a pin at an end portion so that when said pin is rotated, along with the arm gear, the pin passes through the cut out portion so as to contact an edge part of the rotating plate and cut off the transmission of rotational forces of said motor after the geared part has been disengaged from the gear part.

PLANT PATENTS

GRANTED SEPTEMBER 10, 1996

PLANT PATENTS

GRANTED SEPTEMBER 10, 1996

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,641

SHRUB ROSE PLANT NAMED 'POULFAN'

Pernille Olesen, and Mogens Olesen, both of Fredensborg, Denmark, assignors to DeVor Nurseries, Inc., Watsonville, Calif.

Filed Mar. 31, 1995, Ser. No. 414,533
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—1 **1 Claim**

1. A new and distinct shrub rose variety, substantially as herein shown and described.

9,642

ASTER PLANT NAMED 'SUNBIRD'

Klara Dehan, Holon, Israel, assignor to Danzigler "Dan" Flower Farm, Moshav Mishmar Hashiva, Israel

Filed Jun. 6, 1995, Ser. No. 471,562
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—68.1 **1 Claim**

1. A new and distinct cultivar of Aster plant named Sunbird, as illustrated and described.

PATENTS

GRANTED September 10, 1996

ERRATA

For CLASS	See PATENT NO.
072–013	5,553,469
084–319	5,553,527
114–043	5,553,562
267–221	5,553,713
439–472	5,553,787
267–140	5,553,834
473–373	5,553,852
473–209	5,553,857
473–294	5,553,858
463–031	5,553,864
047–048	5,553,970
439–582	5,554,072
483–062	5,554,087
340–990	5,554,152
065–060	5,554,204
162–301	5,554,267
205–494	5,554,270
508–111	5,554,307
508–181	5,554,308
508–312	5,554,309
508–591	5,554,310
510–175	5,554,312
510–121	5,554,313
510–220	5,554,314
510–535	5,554,315
510–398	5,554,321
261–098	5,554,329
428–307	5,554,354
428–631	5,554,390

ERRATA–CONTINUED

For CLASS	See PATENT NO.
424–001	5,554,602
530–328	5,554,724
530–330	5,554,725
548–237	5,554,757
340–933	5,555,036
348–107	5,555,092
355–041	5,555,181
340–825	5,555,183
355–259	5,555,184
355–256	5,555,185
359–040	5,555,186
348–571	5,555,197
324–121	5,555,207
360–099	5,555,211
326–093	5,555,213
359–103	5,555,219
354–317	5,555,234
356–350	5,555,235
347–086	5,555,238
359–082	5,555,240
338–017	5,555,246
324–319	5,555,251
354–106	5,555,252
370–060	5,555,256
370–095	5,555,257
370–029	5,555,258
370–084	5,555,260
370–103	5,555,261
370–102	5,555,262
370–017	5,555,263
370–017	5,555,264
370–060	5,555,265
370–095	5,555,266
370–085	5,555,267
371–005	5,555,269
371–027	5,555,270
372–045	5,555,271
354–222	5,555,431
340–332	5,555,454
340–627	5,555,455

ERRATA–CONTINUED

For CLASS	See PATENT NO.
340–635	5,555,456
340–870	5,555,457
340–945	5,555,458
343–702	5,555,459
345–203	5,555,460
347–033	5,555,461
347–218	5,555,462
348–560	5,555,463
348–022	5,555,464
348–571	5,555,465
348–008	5,555,466
354–106	5,555,467
354–225	5,555,468
355–298	5,555,469
356–035	5,555,470
356–357	5,555,471
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358–299	5,555,473
356–381	5,555,474
358–462	5,555,475
359–040	5,555,476
359–115	5,555,477
359–118	5,555,478
359–355	5,555,479
359–822	5,555,480
419–030	5,555,481
360–125	5,555,482
361–090	5,555,483
361–144	5,555,484
361–272	5,555,485
361–680	5,555,487
361–820	5,555,488
361–683	5,555,489
361–686	5,555,490
361–686	5,555,491
362–293	5,555,492
362–318	5,555,493
363–017	5,555,494
364–148	5,555,495
364–401	5,555,496

ERRATA–CONTINUED

For CLASS	See PATENT NO.
364–407	5,555,497
364–424	5,555,498
364–426	5,555,499
364–424	5,555,500
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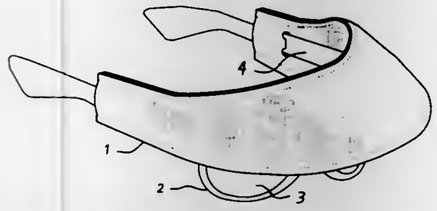
364–550	5,555,513
364–602	5,555,514
364–604	5,555,515
364–724	5,555,516
364–746	5,555,517
364–770	5,555,518
367–004	5,555,519
365–063	5,555,520
365–149	5,555,521
365–185	5,555,522
365–200	5,555,523
365–203	5,555,524
365–221	5,555,525
385–143	5,555,526
365–203	5,555,527
365–222	5,555,528
365–227	5,555,529
365–230	5,555,530
367–230	5,555,531
367–015	5,555,532
367–088	5,555,533
367–132	5,555,534
367–135	5,555,535
368–232	5,555,536

PATENTS

GRANTED SEPTEMBER 10, 1996

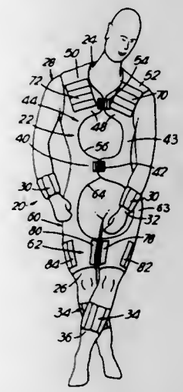
GENERAL AND MECHANICAL

5,553,321
EYEGLASSES VISOR AND CASE
Steven B. Cassel, 60 Mirabel, Mill Valley, Calif. 94941
Filed Oct. 13, 1994, Ser. No. 323,493
Int. Cl.[6] B65D *85/38;* **G02C** *3/02*
U.S. Cl. 2—13 **2 Claims**



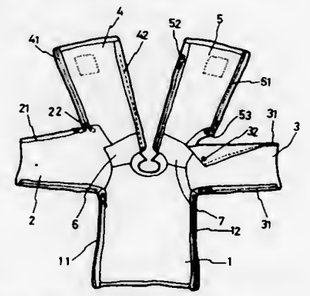
1. A sun visor and eyeglasses case for attaching to the temples of eyeglasses comprising:
a) a two ply crescent shaped bill member secured in an overlying relationship along respective perimeters thereof, each bill member having a concave edge forming a back side for placement adjacent to the forehead of an individual and a convex edge forming a front side wherein the concave and convex edges of the respective bill members terminate to form respective right and left sides;
b) a first slit in the lower ply adapted to allow eyeglasses to pass through the slit to be stored between the plies, wherein a lower ply of said bill member detaches from an upper ply providing direct lens only storage, second slit means in the lower ply located on opposite sides of said first slit whereby the temple arms do not need to be separated from the visor between deployed and stored configurations.

5,553,322
WEIGHTED EXERCISING GARMENT
Mark Cebo-Johnson, 10 Harley St., London W1N 1AA, United Kingdom
Filed Dec. 28, 1994, Ser. No. 365,576
Int. Cl.[6] A41D *1/06*
U.S. Cl. 2—69 **12 Claims**



1. An exercising garment for carrying weights, formed of a resilient, flexible material and having, in use;
a central portion worn around the torso or waist of a user;
an upper portion passing over the user's shoulders and having a front upper panel portion over the user's upper chest and a rear upper panel portion over the user's upper back;
two upper side portions linking the central portion to the upper portion;
two respective thigh portions positioned around the user's thighs;
two lower side portions, each linking the central portion to a respective thigh portion; and
means for removably carrying weights provided on the front and rear upper panel portions and the thigh portions; wherein
a front cut-out region is defined above the central portion between edges of the central portion, upper side portions and front upper panel portion;
a rear cut-out region is defined above the central portion between edges of the central portion, upper side portions and rear upper panel portion; and
a lower cut-out region is defined below the central portion over the crutch of the user, between edges of the central portion, lower side portions and thigh portions;
the garment being a snug fit on the user's body.

5,553,323
FULL-OPEN TYPE UPPER GARMENT FOR PATIENTS
Chia-Tien Chou, 5th Fl., No. 2-9, Lane 159, Sec. 4 Mu Jah Rd., Taipei, and Chao-Mu Chao, No. 2, Lane 197, Sec. 2, Her Tsuoh Rd., Her May Town, Chang Hwa, both of Taiwan
Filed Jul. 11, 1994, Ser. No. 273,190
Int. Cl.[6] A41B *1/00;* **A41D** *1/00*
U.S. Cl. 2—114 **1 Claim**



1. An upper garment for an apoplectic or paralytic patient comprising a back panel for covering over the back of the patient, a left sleeve panel for covering over the left arm of the patient, a right sleeve panel for covering over the right arm of the patient, a front left panel for covering over the front left side of the upper body of the patient, a front right panel for covering over the front right side of the upper body of the patient, a left shoulder panel for covering over the left shoulder of the patient, a right shoulder panel for covering over the right shoulder of the patient, wherein:
said back panel is sewn up with said left and right sleeve panels and said front left and right panels and said left and right shoulder panels, having a first zipper element and a second zipper element respectively longitudinally disposed along two opposite sides thereof;
said left sleeve panel is sewn up with said back panel and said left shoulder panel, having a zipper longitudinally fastened to two opposite sides thereof for fastening through a down stroke engagement said left sleeve panel around the left arm of the patient, and a tape of loop and hook material on said left sleeve panel;
said right sleeve panel is sewn up with said back panel and said right shoulder panel, having a zipper longitudinally fastened

to two opposite sides thereof for fastening through a down stroke engagement said right sleeve panel around the left arm

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HAT WITH ADJUSTABLE DUAL VISOR
Sheila S. Gutierrez, 324 Regal Dr., Laredo, Tex. 78041

adapted for receiving and releasably interlockingly engaging said longitudinal male member profile, such that when said

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AUTOMATICALLY DEPLOYABLE AND RETRACTABLE

to two opposite sides thereof for fastening through a down stroke engagement said right sleeve panel around the left arm of the patient, and a tape of loop and hook material on said right sleeve panel;

said front left panel is sewn up with said left shoulder panel and said back panel, having a first zipper element along an outer side thereof for fastening up with the first zipper element of said back panel through a down stroke engagement, a second zipper element along an inner side thereof, and a tape of loop and hook material for fastening up with the tape of loop and hook material on said left sleeve panel; and

said front right panel is sewn up with said right shoulder panel and said back panel, having a first zipper element along an outer side thereof for fastening up with the second zipper element of said back panel through a down stroke engagement, a second zipper element along an inner side thereof for fastening up with the second zipper element of said front left panel, and a tape of loop and hook material for fastening up with the tape of loop and hook material on said right sleeve panel,

whereby any one of the left sleeve, the right sleeve, the front left panel, the front right panel can be opened for examination purposes.

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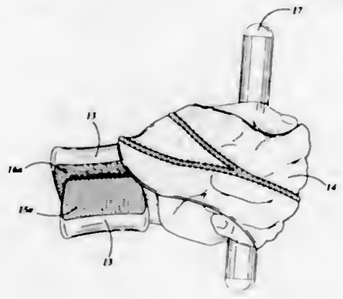
GRIPPING AID

Samuel J. Emerson, 2209 2nd St., White Bear Lake, Minn. 55110

Continuation-in-part of Ser. No. 136,706, Oct. 15, 1993, abandoned. This application Dec. 1, 1994, Ser. No. 312,560

Int. Cl.[6] A41D *13/08; 19/01*

U.S. Cl. 2—158 **9 Claims**



1. A device for supporting a wearer's hand and wrist, comprising:

(a) an elongated elastic wrist band having a width of at least two inches to sufficiently support the wearer's wrist when worn; and

(b) an elastic gripping band which extends around the knuckles of the hand, said gripping band being coupled to a mid-section of said wrist band and extending therefrom to a free end, said free end including first securing means for selectively securing said free end back to second securing means, located on said gripping band adjacent to both the wrist band and a lateral edge of said gripping band, after the gripping band has been firmly wrapped around the wearer's hand holding an object to be gripped.

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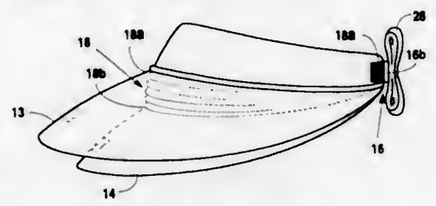
HAT WITH ADJUSTABLE DUAL VISOR

Shelley S. Gutierrez, 324 Regal Dr., Laredo, Tex. 78041

Filed Dec. 12, 1994, Ser. No. 354,498

Int. Cl.[6] A42B *1/20*

U.S. Cl. 2—171 **11 Claims**



1. An adjustable, dual-visor hat, comprising:

A first substantially rigid visor;

a second substantially rigid visor disposed adjacent to said first visor;

a flexible member secured to the first and second visors to position the first and second visors adjacent each other when said flexible member is in a folded position and spaced from each other when said flexible member is in an unfolded position.

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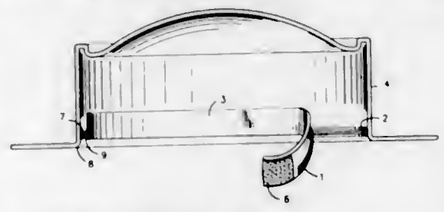
REMOVABLE, WASHABLE SWEATBAND FOR HATS

Gary L. Moore, 2506 Robin Dr., Plant City, Fla. 33566

Continuation of Ser. No. 153,874, Nov. 16, 1993, abandoned. This application Dec. 16, 1994, Ser. No. 357,530

Int. Cl.[6] A42C *5/02*

U.S. Cl. 2—181 **14 Claims**



1. A hat having a crown and including:

a first strip of material having a front side and a back side, said back side of said first strip of material affixed to the lower internal periphery of said crown, said front side of said first strip of material having an outwardly facing first mating closure element extending along substantially the entire length of said strip of material, said mating closure element having a uniform continuous longitudinally-extending profile, said profile of said outwardly facing continuous first mating closure element interlockable with an opposing longitudinally extending profile of a second mating closure element integral with a second strip of material; and

a hat liner provided with a second strip of material having a front side and a back side, said front side having a second mating closure element, said second mating closure element having a uniform continuous longitudinally-extending profile, said second mating closure element extending along substantially the entire length of said strip of material and interlockable with said longitudinally extending profile of said first mating closure element and adapted for releasably, interlockingly engaging with said first mating closure element, wherein one of said first and second longitudinally-extending profiles is a male member profile and the other of said first and second longitudinally-extending profiles is a female member profile provided with a longitudinally extending channel extending the length of the strip of material with which it is integral and adapted for receiving and releasably interlockingly engaging said longitudinal male member profile, such that when said male and female elements are aligned and pressed together into an engaging relationship they form a continuous longitudinal engagement which attaches said hat band to said crown of said hat;

and wherein the total thickness measured from the back side of said strip of material provided with the first mating closure element to the back side of said strip of material provided with said second mating closure element when said mating closure elements are engaged is less than 3 mm.

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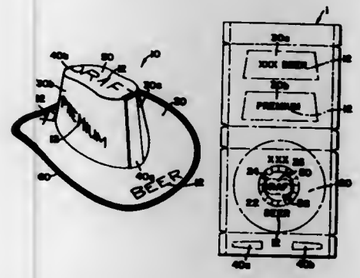
HAT MADE FROM CARDBOARD BEVERAGE CONTAINER AND METHOD OF MAKING THE SAME

Anthony R. Koecher, 8500 170th St. N., Hugo, Minn. 55038, and Kevin M. Schoeller, Hugo, Minn., assignors to Anthony R. Koecher, Hugo, Minn.

Filed Oct. 6, 1994, Ser. No. 319,118

Int. Cl.[6] A42C *1/00*

U.S. Cl. 2—200.3 **16 Claims**



1. A method of making a hat, comprising the steps of:

(a) cutting a plurality of hat elements from cardboard product container material including graphics disposed on an exterior surface thereof, wherein the cutting step comprises the steps of:

(1) cutting a brim, first and second side members, first and second connecting members and a top member from the material according to predetermined patterns, wherein the side members include top, bottom, front and rear edges; and

(2) forming an aperture in the brim; and

(b) assembling the hat elements to form a hat, wherein the graphics printed on the exterior surface of the container material are disposed on visible exterior surfaces of the hat, and wherein the assembly step includes the steps of:

(1) joining bottom edges of the first and second side members to the brim such that the side members circumscribe the aperture in the brim;

(2) joining opposing front and rear edges of the first and second side members together by overlapping the front and rear edges with the first and second connecting members, respectively; and

(3) joining the top member to the first and second side members proximate top edges thereof.

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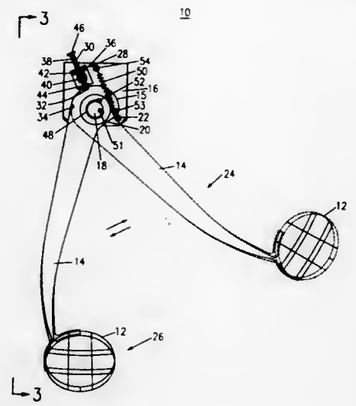
AUTOMATICALLY DEPLOYABLE AND RETRACTABLE COMBINER MECHANISM

Gordon C. Hall, Fremont; Steven D. Smith, San Jose, and Jerome T. Carollo, Carlsbad, all of Calif., assignors to Kaiser Aerospace and Electronics, Foster City, Calif.

Filed Mar. 17, 1994, Ser. No. 221,059

Int. Cl.[6] A42B *3/04;* **C02B** *27/10*

U.S. Cl. 2—422 **14 Claims**



5. A device for deploying and retracting a combiner for a visored helmet comprising:

a bracket, wherein the bracket is adapted to be attached to the helmet;

a combiner arm, said combiner arm being rotatably connected to said bracket;

deploying and retracting means coupled to said combiner arm, said deploying and retracting means including at least first and second countervailing spring means that exert opposite, but unequal, forces;

said first spring means comprising a helical spring;

said second spring means comprising a coiled spring made of an shape memory alloy material having a quiescent state and, when heated, a memorized state;

said first spring means positioned to urge said combiner arm into the deployed position and exert a force stronger than that of second spring means when in said quiescent state;

said second spring means positioned so as to urge said combiner arm into the retracted position and exert a force stronger than that of said first spring means upon being heated to said memorized state; and

selecting means for locking and unlocking said combiner arm into either deployed or retracted position, said selecting means being coordinated to act in conjunction with said deploying and retracting means,

said selecting means selectively energizing and de-energizing said second spring means for locking and unlocking of said combiner to permit the deployment and retraction of said combiner.

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CRASH HELMET FOR MOTORCYCLISTS AND THE

front of the head; and the full reaction force from the wall is transmitted through the helmet casing, including through its

surface of said base portion is in the same plane as the lower planar surface of said handle portion; wherein said handle

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CRASH HELMET FOR MOTORCYCLISTS AND THE LIKE, PROVIDED WITH A SAFETY DEVICE FOR LOCKING THE VISOR

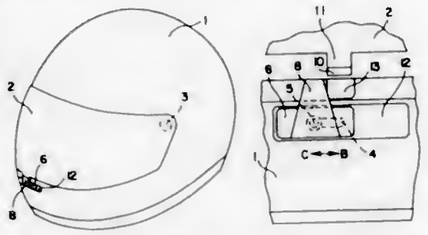
Gabriele Casartelli, Clamart, France, assignor to E.D.C. Sarl, Issy les Moulineaux, France

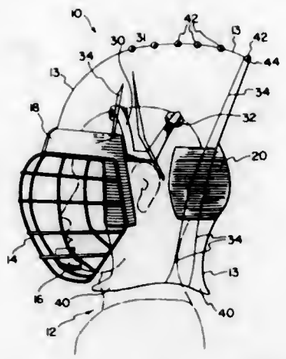
Filed Jun. 1, 1995, Ser. No. 456,933

Claims priority, application European Pat. Off., Jun. 7, 1994, 401253

Int. Cl.[6] A42B *3/18*

U.S. Cl. 2—424 **5 Claims**





1. A crash helmet for participants in sports activities comprising:
a protective shell with a large front opening for visibility having a lower edge and a horizontal slot below said lower edge defining a sliding and guide seat;
a horizontally-movable sliding element having a guide pin disposed within the slot for guided horizontal movement therein and a flange having a restraining element facing the helmet, said sliding element having a first terminal position and a second terminal position at opposite ends of the slot; and
a visor, mounted to said protective shell and pivotable between a lowered position covering the front opening and a raised position exposing the front opening, said visor having a lower edge and a downwardly-extending flap protruding from said lower edge, said flap having a step portion facing away from the helmet for positive engagement with said restraining element in the lowered position, when said visor is in said lowered position, said sliding element positively engages said step in said first terminal position, and upon movement of said sliding element to said second terminal position, said step is disengaged.

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PROTECTIVE HOCKEY HELMET

William H. Carveth, 8118 Rowland Rd., Edmonton, Alberta, Canada

Filed Mar. 7, 1994, Ser. No. 207,135

Claims priority, application Canada, Feb. 18, 1993, 2091936

Int. Cl.[6] A42B *3/00*

U.S. Cl. 2—425 **12 Claims**

1. A helmet for prevention of injuries, including severe neck injuries, during the game of ice-hockey, comprising:
(a) a high-impact plastic casing formed to fit overtop, and loosely follow the contours of, a human head, excepting that a gap is left at the face of the head; and additionally comprising:
an outwardly flaring flange at the bottom conforming generally to the surface of the human torso surrounding and just below the neck;
an upwards extension rising substantially above the top of the head;
a tip at the rearwards extent of the extension, said tip rising farther from the head than the portion of the extension above the front of the top of the head; and
stiffening ridges moulded integrally in the casing so that the casing is stiffer under the tip and above the front of the head than above the middle of the top of the head;
(b) rollers on the top of the extension, the rollers having axis of rotation parallel to a line between the centers of the ears of the head; that is, substantially horizontal when the head is upright;
(c) a front energy-absorbing liner, affixed inside the casing and contacting the forehead and temples of the head;
(d) a rear energy-absorbing liner, similarly affixed and contacting the rear of the head at approximately ear-level;
(e) flexible cantilever supports affixed inside the casing and extending outwardly overtop the head;
(f) cantilever pads affixed below the ends of the cantilever supports and having a lower surface appropriate to contact the top of the head;
(g) a face-guard affixed to the casing and extending in front of the face of the head; and
(h) a chin cup affixed to the inside of the face-guard, to snugly hold the chin of the head;
wherein during regular play, that is, not during a collision, the helmet is supported on the head by the cantilever supports, cantilever pads, and front and rear energy-absorbing liners, and the casing extends downwards to just above, but does not touch, the torso;
and wherein the casing is strong enough so that an approximately 4,000 pound force on the top of the extension, such as sustained by a player wearing the helmet skating head-first into hockey boards, causing the helmet to shift downwards and press the flange against the torso, will not press the helmet against the top of the head of the player;
and whereby a hockey player may make use of the helmet to prevent injuries, in at least the two following ways,
the first being during regular play in which there are knocks and hits to the outside of the helmet such as pucks, sticks, or gloves, and in which the strength of the casing, in combination with the chin cup, face-guard, cantilever pads, cantilever supports, front energy-absorbing liner, and rear energy-absorbing liner will substantially reduce or eliminate any injury from such knocks and hits, including pucks striking at neck level; and
the second being during a head-first collision between the player and a wall such as hockey arena boards, in which the player is commonly face-down and approaches the wall with the axis of the cervical spine parallel to the ice or tilted front-down somewhat, so that the outermost portion of the extension strikes the wall with the tip being vertically higher than the axis of rotation of the helmet about the head, so that the momentum of the head and torso causes a reaction force against the cantilever pads and therethrough to the cantilevers and so to the casing, causing the helmet to begin to rotate in a direction that takes the tip vertically upwards, following which the rollers facilitate the movement of the helmet upwards along the surface of the wall; the head, neck, and a small portion of the torso move forward inside the helmet pushing the flexible cantilevers to the side; the flange settles against and symmetrically around the torso, stabilized against the stiffer portions of the casing under the tip and above the front of the head; and the full reaction force from the wall is transmitted through the helmet casing, including through its integral stiffening ridges, to the torso, thereby preventing axial load on, and injury in, the neck of the player.

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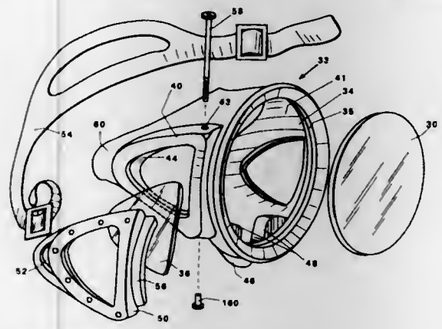
UNIVERSAL FIT FACE MASK

Robert Gentile, 30 Wyman St., Billerica, Mass. 01821

Filed Nov. 2, 1993, Ser. No. 146,329

Int. Cl.[6] A61F *9/02*

U.S. Cl. 2—430 **6 Claims**



1. An underwater diving mask comprising:
a pliable body having means for forming an air tight seal to a wearer's face;
a frontal lens located anteriorly in said body; and
a pair of pocket hinges located laterally in said body further comprising:
a pair of rigid frames over said pocket hinges.

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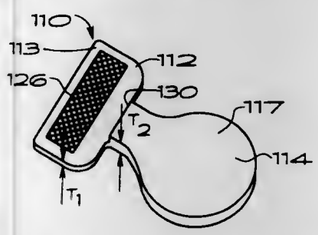
TOILET SEAT HANDLE OF UNITARY CONSTRUCTION

James T. Hazard, 347 Kenwood Way, Louisville, Ky. 40215

Continuation-in-part of Ser. No. 906,562, Jun. 20, 1992, abandoned. This application Oct. 31, 1994, Ser. No. 331,700

Int. Cl.[6] A47K *13/10*

U.S. Cl. 4—246.1 **5 Claims**



1. A toilet seat handle device for attachment to a toilet seat as an aid to raising and lowering the toilet seat comprising:
a base portion with upper and lower planar surfaces configured so as to fit with said upper planar surface against the bottom side of the toilet seat;
means for attaching the base portion to the bottom side of the toilet seat;
a flexible handle portion with upper and lower planar surfaces unitarily constructed with said base portion so as to have a first end affixed to said base portion and a second end extending outwardly from said base portion, the handle portion being thicker than said base portion and said lower planar surface of said base portion is in the same plane as the lower planar surface of said handle portion; wherein said handle portion is from 0.15 to 0.30 inches in thickness and said base portion is from 0.10 to 0.20 inches in thickness;
wherein at the juncture of the handle portion with the base portion the narrowest width at said juncture is from 0.15 to 0.45 inches;
including a ledge at the juncture of said handle portion with said base portion, said ledge configured to engage with a outer edge of a toilet seat;
and, wherein said handle portion is movable by a force of from 0.1 to 1.0 pounds against said handle portion.

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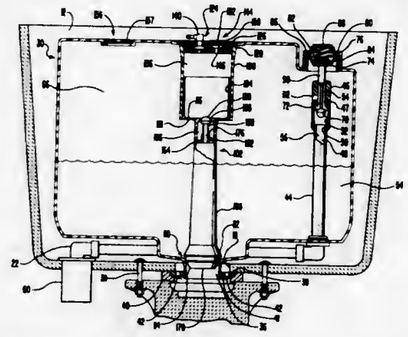
PRESSURIZED WATER CLOSET FLUSHING SYSTEM

Sven E. Andersson, 203 Yoakum Pkwy., Bldg. 1–221, Alexandria, Va. 22304

Continuation-in-part of Ser. No. 129,966, Sep. 30, 1993. This application Aug. 17, 1994, Ser. No. 292,429

Int. Cl.[6] E03D *3/04;3/10*

U.S. Cl. 4—354 **21 Claims**



1. A flushing apparatus for flushing a bowl with a fluid under pressure, the flushing apparatus comprising:
a pressurizable reservoir adapted to house the fluid and an overlying pocket of air, the pocket of air defining a primary pressure zone;
a housing positioned within the reservoir and having a secondary pressure zone formed therein;
inlet means for providing a fluid introduction path from a fluid supply source into the reservoir;
outlet means for providing a fluid egress path from within the reservoir into the bowl;
piston means, movably disposed within the reservoir, for effecting the opening and closing of the fluid egress path; and
overpressure protection means for releasing air from within the reservoir into the bowl through the outlet means when air pressure within the reservoir exceeds a predetermined limit.

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TOILET DESIGNED TO FACILITATE BOWEL MOVEMENTS

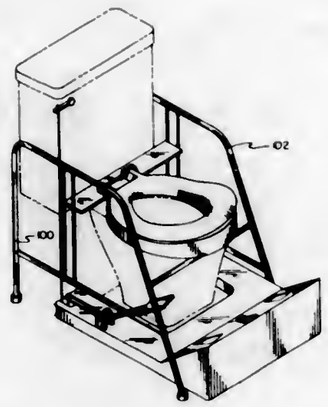
Betty R. Hillman, 5750 Edmeston Dr., Fayetteville, N.C. 28311

Filed Sep. 28, 1994, Ser. No. 314,318

Int. Cl.[6] E03D *11/02*

U.S. Cl. 4—420 **1 Claim**

1. A new and improved curved toilet bowl specifically adapted to protect a user's colon comprising, in combination:
a bowl having a fist side, a second side, a forward portion, a rearward portion, and an oval upper opening having a forward extent and a rearward extent, the bowl further including a lower base and a hollow interior, the oval upper opening



gradually sloping upwardly from the rearward extent to the forward extent, the upper opening having a peripheral thickness which increases from the rearward extent to the forward extent, the forward extent of the upper opening functioning to support the knees and the underside of the upper legs of the user;

a footrest having a top surface, an upwardly inclined forward portion, and a rearward portion, the rearward portion including a recessed edge, the recessed edge specifically adapted to be removably secured to the lower base of the bowl, the top surface of the upwardly inclined forward portion including a right recessed foot area and a left recessed foot area;

a toilet bowl actuation lever having a first end, a second end and an intermediate extent therebetween, the first end of the lever is adapted to be pressed by a foot of the user of the toilet bowl, the intermediate extent being secured to the rearward portion of the footrest, the actuation lever functions such that when the user presses the first end of the lever the second end of the lever effects flushing of the toilet bowl;

a U-shaped first hand rail having a front leg, a rear leg, and an intermediate handrail extending therebetween, the U-shaped hand rail secured on the first side of the bowl and

a U-shaped second hand rail having a front leg, a rear leg, and an intermediate handrail extending therebetween, the U-shaped second hand rail secured on the second side of the bowl.

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LIFTING DEVICE FOR SICK OR MOTION-HANDICAPPED PERSON

Veli-Tapani Lahtinen, FIN-33980 Pirkkala, Koivo, Finland

PCT No. PCT/FI93/00024, § 371 Date Sep. 9, 1994, § 102(e) Date Sep. 9, 1994, PCT Pub. No. WO93/14732, PCT Pub. Date Aug. 5, 1993

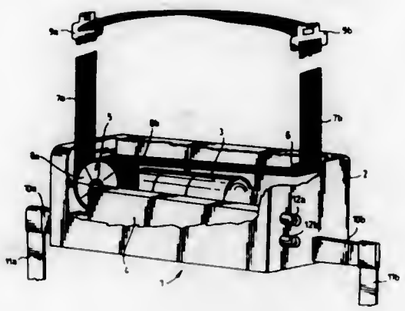
PCT Filed Jan. 27, 1993, Ser. No. 256,958

Claims priority, application Finland, Jan. 27, 1992, U920073; May 11, 1992, U928347

Int. Cl.[6] A61G *7/10*

U.S. Cl. 5—81.1 C **14 Claims**

1. A device for lifting a sick or motion-handicapped person, comprising a housing (2), a lifting motor (3) disposed within the housing (2), a belt reel (5) connected for rotation by the lifting motor (3), a controller (12*a*, 12*b*) for selecting a direction of rotation of the lifting motor, (3) and diverter pulleys (6*a*, 6*b*) for guiding a belt onto the belt reel, (5) wherein the belt (7) comprises a pair of belts (7*a*,7*b*) fixed onto the same belt reel (5) in such a way that the pair of belts (7*a*,7*b*) is wound on the belt reel (5) smoothly and spirally, one belt on top of the other, characterized in that the pair of belts, (7*a*,7*b*) forms a unitary belt loop (7).



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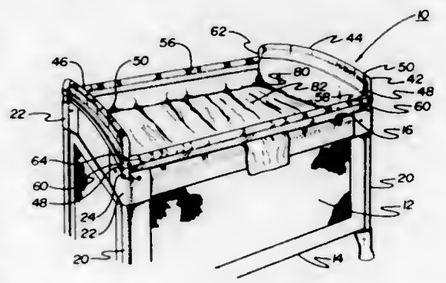
PLAYYARD AND BASSINET COMBINATION

John V. Mariol, Cincinnati, Ohio, assignor to Lisco, Inc., Tampa, Fla.

Filed Nov. 4, 1994, Ser. No. 334,841

Int. Cl.[6] A47D *9/00*

U.S. Cl. 5—93.1 **5 Claims**



1. A new and improved playyard and bassinet combination comprising:

a playyard having a horizontally disposed lower frame member in a rectangular configuration and a horizontally disposed upper frame member in a rectangular configuration defining an opening therebetween, four vertically extending rails coupling the upper and lower frame members at their corners with corner pieces joining the corners of the upper frame member with the upper ends of the rails and with a vertically extending cylindrical well formed in each of the brackets defining a support of a predetermined diameter and depth;

a bassinet having a pair of inverted U-shaped end members with vertical legs and a cross rail coupling the vertical legs, each vertical leg having a hollow lower end positionable within a cylindrical well of the playyard, the bassinet also having a pair of parallel horizontally disposed side rails which with the cross rails form a generally rectangular configuration and constitute a supplemental frame member supported by the vertical legs, the bassinet also including a bracket with a release mechanism removably secured to each vertical leg and also slidably receiving and supporting the side rails between the U-shaped end members, the bassinet also including a fabric liner with a central rectangular region positioned within the supplemental frame member with vertically extending fabric side panels extending upwardly and around the side rails and the cross rails of the supplemental frame member and with a rigid subfloor centrally positioned within the fabric member; and

a supplemental platform selectively positionable in the playyard and bassinet upon the rigid subfloor.

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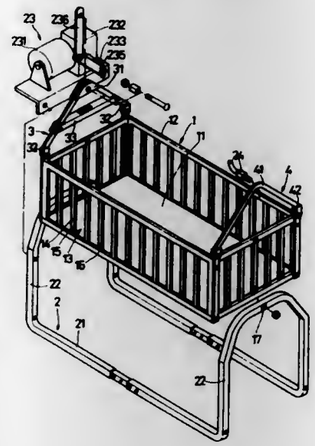
ELECTRIC CRADLE

Chien-Tao Lin, P.O. Box 2103, Taichung City, Taiwan

Filed Oct. 2, 1995, Ser. No. 538,008

Int. Cl.[6] A47D *7/00;9/00*

U.S. Cl. 5—93.2 **4 Claims**



1. An electric cradle comprising:

a crib including a bottom board and side fences upward extending from a periphery of said bottom board, each side fence including a plurality of extensible members;

a main support including a base seat horizontally placed on the ground and two supporting stands which are upward bent and extended from two ends of the base seat, said supporting stands being connected to two opposite ends of said crib with said base seat positioned under said crib, said base seat being extensible for adjusting a distance between said supporting stands;

a first swinging frame having an upper end coupled with one of said supporting stands and a forked lower end pivotally connected to one end of said crib, a swinging mechanism being disposed on said supporting stand of said main support to drivingly regularly swing said first swinging frame, making said lower end of said first swinging frame swingingly drive said crib; and

a second swinging frame coupled with the other supporting stand of said main support, a hanging section being disposed at a top end of said other supporting stand for hanging an upper end of said second swinging frame thereon, a forked lower end of said second swinging frame being pivotally connected to the other end of said crib, making said second swinging frame swing along with said crib, said first and second swinging frames being separable from said supporting stands and said crib and said base seat of said main support being extensible/contractable for adjusting the distance between said supporting stands and permitting direct securing thereof to two ends of said crib, said side fences being adjustable in height for meeting a standing height of an infant, whereby said electric cradle is transformed into a fixed crib for the infant.

5,553,338

PRONE-POSITION SURFACE WITH AT LEAST THREE LATHWORK LAYERS

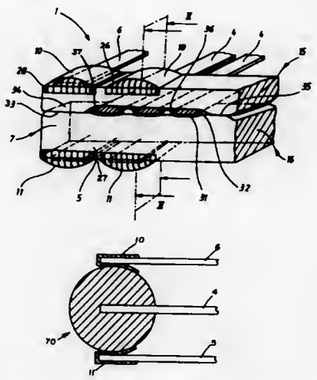
Günther Amann, Frastanz, Austria, assignor to Lokosana AG, Rheineck, Switzerland

Filed Jun. 15, 1994, Ser. No. 260,342

Claims priority, application Germany, Jun. 18, 1993, 43 20 168.7

Int. Cl.[6] A47C *23/06;27/16;27/15*

U.S. Cl. 5—236.1 **16 Claims**



1. Slatted grid lying support comprising an upper layer of mutually parallel spaced-apart slats, a lower layer of mutually parallel spaced-apart slats, an additional layer of slats arranged between said upper and lower layers of slats and at least two mutually spaced elastic bodies with slat fastening straps on upper and lower sides thereof, wherein said elastic bodies extend perpendicular to said slats and between said upper and lower layers of slats and ends of said upper and lower slats are fastened by insertion into said straps;

said elastic bodies being provided in the longitudinal direction with a horizontal dividing plane which divides said elastic bodies into upper and lower portions, each of which is constructed as an individual cushion body and clad with a cover, and wherein at least one said cushion body includes on its side facing towards said dividing plane, straps for supporting slats of said additional layer, and cushion bodies constituting an elastic body are connected to each other at least in sections along edges adjoining said dividing plane.

5,553,339

ADJUSTABLE AIR MATTRESS SLEEPING BAG

Roy C. Thomas, 11735 S. Glen #168, Houston, Tex. 77099

Filed Feb. 24, 1995, Ser. No. 393,656

Int. Cl.[6] A47G *9/08*

U.S. Cl. 5—413 AM **3 Claims**

1. An adjustable air mattress sleeping bag comprising:

a sleeping bag means for receiving and insulating an individual;

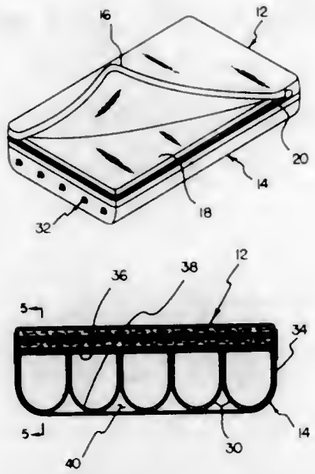
a pneumatic support means coupled to a lower surface of the sleeping bag means for supporting the sleeping bag means in a spaced relationship relative to a ground surface,

wherein the sleeping bag means comprises a sleeping bag including an upper composite web; a lower composite web coupled to the upper composite web; and a zipper extending between peripheries of the upper and lower composite webs to removably couple the webs together,

wherein the upper composite web comprises a pair of spaced upper fabric webs having upper insulation residing between the upper fabric webs, and the lower composite web comprises a pair of spaced lower fabric webs having lower insulation positioned therebetween,

ing washers fitted over said bolts and engaging opposite ends of the respective bosses, and nuts threaded onto said bolts against said washers.

tive position flush with said deck, and means responsive to deck position to automatically raise said barrier when said



wherein the pneumatic support means comprises a plurality of elongated air tubes coupled to a lower surface of the lower composite web of the sleeping bag means which are oriented so as to extend substantially parallel to a longitudinal length of the sleeping bag means,

wherein each of the air tubes is positioned in communication with one of a plurality of valve means for facilitating ingress and egress of air relative an interior of the air tubes such that each of the air tubes can be selectively and individually inflated and deflated,

wherein the pneumatic support means further comprises an exterior covering coupled to the sleeping bag means and extending across and around the air tubes so as to encapsulate the air tubes,

wherein the air tubes are each shaped so as to define an elongated planar portion positioned flatly against the lower surface of the lower composite web of the sleeping bag means; and a U-shaped channel portion coupled to the elongated planar portion, wherein the U-shaped channel portions of the air tubes cooperate to define a plurality of compression spaces between the air tubes.

5,553,340

UTILITY TOOL FOR POWER CHAIN SAW

James D. Brown, Jr., 6 Donnan Rd., Taylors, S.C. 29687

Filed Nov. 25, 1994, Ser. No. 344,895

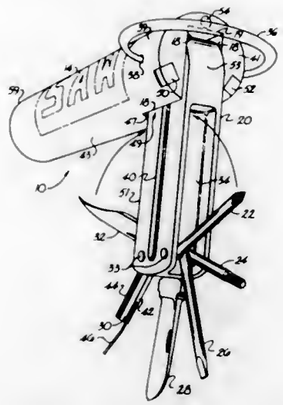
Int. Cl.[6] B26B *11/00*

U.S. Cl. 7—118 **19 Claims**

1. An apparatus for effecting mechanical repairs and/or adjustments to a power chain saw having an oil hole for receiving oil, a spark plug, a chain bearing sawblades, a chain bar disposed to tension the chain and having a groove, a chain bar housing secured by a fastener, and an adjustment mechanism for regulating the tension applied by the chain bar to the chain of the power chain saw, the apparatus comprising:

a first elongated member including a plurality of interleaved members wherein at least one interleaved member is pivotally attached at one end thereof to said elongated member and is configured in the form of a tool adaptable for making repairs and/or adjustments to the power chain saw, said tool being selectively pivotable about said one end for selectively deploying said tool in an operational mode; and

a second elongated member having a closed end disposed on one side thereof, said closed end defining a socket configured with a shape to receive the fastener on the power chain saw, said second elongated member being operatively connected to said first elongated member such that said first elongated member



may be operatively disposed at an angle less than 180 degrees with respect to said second elongated member, whereby a force perpendicularly applied to said first elongated member creates a torque at said socket.

5,553,341

ROLLER CARRIAGE FOR PORTABLE BRIDGES

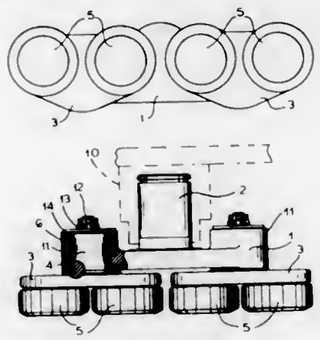
Hans-Norbert Wiedeck, Mülheim/Ruhr, and Heinz Füchtey, Essen, both of Germany, assignors to Krupp Fordertechnik GmbH, Duisburg, Germany

Filed Apr. 10, 1995, Ser. No. 419,028

Claims priority, application Germany, Apr. 12, 1994, 9406015 U

Int. Cl.[6] E01D *21/00*

U.S. Cl. 14—2.4 **3 Claims**



3. A roller carriage for a portable bridge structure, said roller carriage comprising:

a rocker carrier elongated in a direction of travel of the roller carriage and formed with a lateral support stud rotatably connecting said rocker carrier with said structure;

a pair of rocker bodies each having a central lateral support pin formed in one piece inseparably with the respective rocker body and engaging laterally in a respective end of said rocker carrier, whereby said pair of rocker bodies have lateral support pins; and

a respective pair of rollers journaled on each of said rocker bodies, said rocker carrier is formed with respective cylindrical bosses receiving said pins, each of said rocker bodies engaging one end of the respective boss, said pins being formed with threaded bolts, the rocker carrier further comprising washers fitted over said bolts and engaging opposite ends of the respective bosses, and nuts threaded onto said bolts against said washers.

5,553,342

BRIDGE STRUCTURE INCLUDING SHOCK TRANSMISSION UNITS

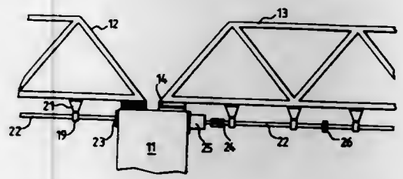
Gerald H. Townsend, London, United Kingdom, assignor to Colebrand Limited, London, England

Filed Apr. 28, 1995, Ser. No. 431,051

Claims priority, application United Kingdom, Apr. 29, 1994, 9408635

Int. Cl.[6] E01D *19/00*

U.S. Cl. 14—13 **3 Claims**



1. A bridge structure comprising at least two piers, a deck structure between each pair of adjacent piers supported to allow for relative movement longitudinally of the deck between at least one pier and the deck, a connecting bar and a shock transmission unit in series connected between each pair of adjacent piers, the bar being supported for longitudinal movement independently of the deck.

5,553,343

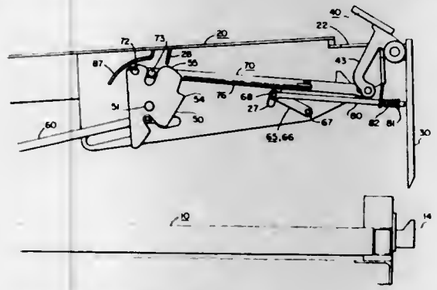
DOCK LEVELER WITH FOLDING BARRIER LIP

James C. Alexander, London, Canada, assignor to United Dominion Industries, Inc., Charlotte, N.C.

Filed Mar. 6, 1995, Ser. No. 399,223

Int. Cl.[6] E01D *1/00*

U.S. Cl. 14—71.1 **26 Claims**



1. A dock leveler comprising:

a frame mounted at a dock, a deck pivoted at one end to said frame, a lip pivotally attached to said deck at the other end thereof, said deck movable between a first operative position where said deck is substantially horizontal and said lip extended, a second operative position where said lip hangs pendant and said deck is declined, a third operative position where said deck is substantially horizontal and said lip hangs pendant in a stored position, and an inoperative position where said deck is substantially horizontal with said lip hanging pendant and store, a barrier pivotally attached to said deck at the same position of attachment of said lip to have a raised operative position protruding above said deck and an inoperative position flush with said deck, and means responsive to deck position to automatically raise said barrier when said deck is in said inoperative position and to permit said barrier to be lowered to its inoperative position when said deck is in any operative position.

5,553,344

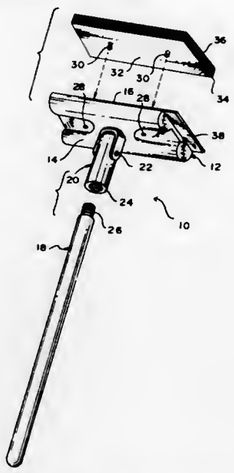
PICK-UP DEVICE

Evelyn Rosenkratz, 4915 Tyrone Ave. 203, Sherman Oaks, Calif. 91423

Filed Nov. 16, 1994, Ser. No. 340,582

Int. Cl.[6] A47L *13/00*

U.S. Cl. 15—104.002 **7 Claims**



1. A pick-up device for picking up lint and other light substances, comprising:

a) a support platform including a plurality of openings therein, said support platform having a first side and a second side;

b) au elongated handle connectable to said first side;

c) a rigid planar backing base mountable upon said second side of said support platform, said backing base including a first side surface and a second side surface,

a plurality of male elements extending from said first side surface, said male elements for being receivable by said plurality of openings so as to provide a snap fit therebetween; and

d) a plurality of sheets of adhesive material, said sheets arranged in a sandwich type fashion, each sheet having an outwardly facing tacky, adhesive surface that is adapted to be exposed when a preceding outermost sheet is removed, said tacky adhesive surface serving to pick up lint and other light substances when placed against it.

5,553,345

CLIP-ON TOWEL

Steven Bell, 5523 Miles Ct., Springfield, Va. 22151

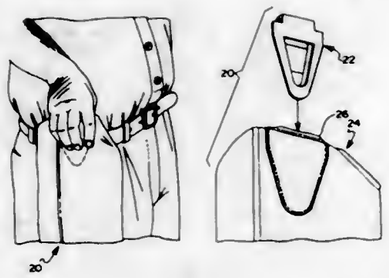
Continuation-in-part of Ser. No. 92,838, Jul. 16, 1993, abandoned. This application Sep. 21, 1994, Ser. No. 310,015

Int. Cl.[6] A47K *10/02;10/12*

U.S. Cl. 15—209.1 **18 Claims**

10. A clip-on towel, comprising:

a clip and a towel, said towel including a slot there through having a first width, said clip including a body portion having a second width, a neck portion extending from said body portion having a third width, said neck portion extending



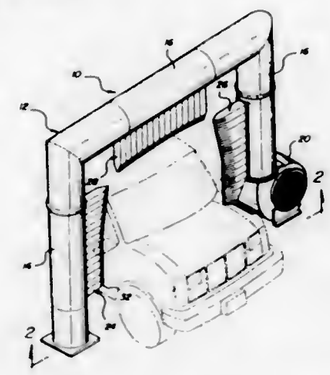
downwardly to form a retaining finger having a fourth width, wherein said second width is greater than said third width and said third width is not greater than said first width wherein said retaining finger is adapted to extend through said slot in said towel and is adapted to be supported from an apparel of a wearer.

5,553,346

TAPERED BAG BLOWER SYSTEM

Lucian G. McElroy, 3315 Brocker Rd., Metamora, Mich. 48455

Filed Mar. 21, 1995, Ser. No. 407,184
Int. Cl.[6] B60S *3/04*
U.S. Cl. 15—316.1 **20 Claims**



1. An apparatus for blowing fluids from a surface of an object, said apparatus comprising:

a support plenum (12) for directing pressurized air therethrough;

a blower (20) connected to said support plenum (12) for producing said pressurized air;

at least one flexible bag (24, 26, 28) of substantially rectangular cross-section connected to said support plenum (12) for receiving the pressurized air and directing the pressurized air toward the object;

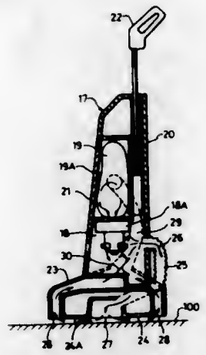
said apparatus characterized by said flexible bag (24, 26, 28) including an elongated inlet (30) of a first width and thickness, said bag extending and tapering to an outlet nozzle (32) of a second thickness less than said first thickness and of said first width, said flexible bag (24, 26, 28) and said outlet nozzle (32) comprising exclusively a flexible material.

5,553,347

UPRIGHT VACUUM CLEANER

Takayuki Inoue, Kawanishi; Masami Fukumoto, Ikeda, and Izumi Yamaura, Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Apr. 18, 1995, Ser. No. 423,198
Claims priority, application Japan, Apr. 19, 1994, 6-080530
Int. Cl.[6] A47L *9/00*
U.S. Cl. 15—327.3 **9 Claims**



1. An upright vacuum cleaner comprising:

a main body having a motor fan for generating a suction force, and a dust collection chamber for collecting dust,

a floor nozzle unit, which is disposed under said main body, and provided for drawing in dust from a floor to be cleaned into said dust collection chamber by the suction force of said motor fan,

a grip handle for moving said upright vacuum cleaner, and

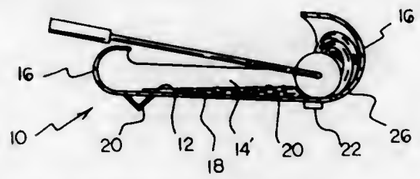
a floor-opposing face located on the floor nozzle unit having an outlet port positioned to direct a discharge air flow from said motor fan to said floor to elevate said upright vacuum cleaner from said floor, and at least one inlet port arranged to at least substantially encircle said outlet port of said floor-opposing face to draw air with dust into said dust collection chamber through a suction air path, said at least one inlet port being arranged at an outer portion of said floor-opposing face and having one of a stepped face and a sloped face along an inner edge of said at least one inlet port.

5,553,348

DRYWALL TEXTURING MATERIAL STORAGE DEVICE

Thomas J. Brandenburger, 221 N. Park St., Genoa, Nebr. 68640

Filed Jun. 19, 1995, Ser. No. 492,186
Int. Cl.[6] B44D *3/12*
U.S. Cl. 15—257.06 **8 Claims**



1. A new and improved storage apparatus for holding a volume of drywall texturing material for use with a wallboard texturing cylindrical applicator comprising, in combination:

a pan having paired, straight upstanding longitudinal walls and paired, arcuate upstanding transverse front and rear walls, the rear wall having a radius of curvature essentially equal to that of said applicator with the front wall having a radius of curvature essentially twice that of the rear wall and a floor therebetween for forming a reservoir for holding the volume of the drywall texturing material; and

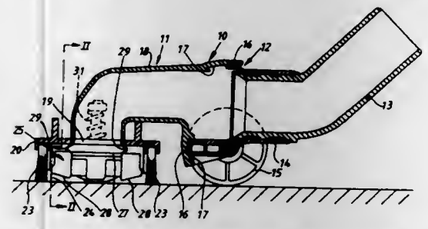
a plurality of channels attached to an underside of the pan, the channels being in a transverse relationship with the pan.

5,553,349

VACUUM CLEANER NOZZLE

Lars G. Kilström, Täby; Nils T. Lindquist, Farsta, and Rolf G. Sjöberg, Kungsängen, all of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Feb. 6, 1995, Ser. No. 383,975
Claims priority, application Sweden, Feb. 21, 1994, 9400590
Int. Cl.[6] A47L *9/02*
U.S. Cl. 15—360 **14 Claims**



1. A vacuum cleaner nozzle comprising a first nozzle part (11) which has brush elements (23) facing a floor and defining a space (24) in which a second nozzle part (25) is movably arranged with respect to the first part (11), the second nozzle part having at least one suction opening (27) through which air flows to an outlet tube (13) which is connected to the nozzle, wherein the second nozzle part (25) is supported from the first nozzle part (11) by means of a resilient element (31), and the resilient element is operable to maintain the second nozzle part (25) above the floor when the nozzle is moved on a rigid surface and permits the second nozzle part (25) to move toward the floor when the nozzle is moved on a yieldable surface.

5,553,350

TELESCOPIC HANDLE WITH FREELY ADJUSTABLE LENGTH

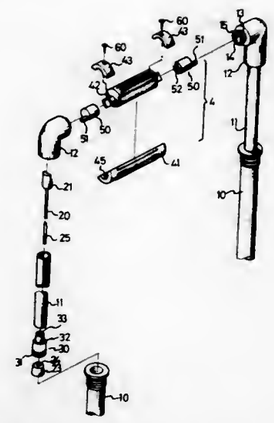
Fu-Jung Chang, 8 Fl.-5, No. 191, Fu Hsing N. Rd., Taipei, Taiwan

Filed Oct. 12, 1994, Ser. No. 322,196
Int. Cl.[6] B25G *1/04*
U.S. Cl. 16—115 **11 Claims**

1. A handle set comprising:

two telescopic handles, each including a telescopic handle with a freely adjustable length comprising a first tube, a second tube into which the first tube is telescopically insertable, a tubular anchor including an upper tip attached to a lower tip of the first tube and with a lower portion defining a plurality of slits so that the lower portion of the tubular anchor can be expanded easily, a link insertable through the first tube, a plug attached to a lower tip of the link, wherein by pulling the link the plug can be moved to an upper position for abutting the lower portion of the tubular anchor against the first tube for restraining the first tube relative to the second tube, wherein by pushing the link, the plug can be moved to a lower position for releasing the lower portion of the tubular anchor from the second tube for allowing the movement of the first tube in respect to the second tube;

two angled tubes each including a horizontal tubular portion and a vertical tubular portion in which the first tube of each of the telescopic handles is secured;



a grip connected between the horizontal tubular portions of the angled tubes; and

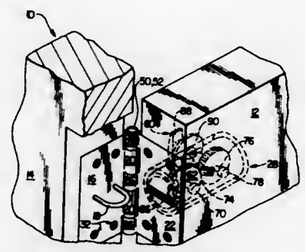
two link-driving devices for driving the links.

5,553,351

HINGE-LOCK SECURITY SYSTEM

William R. Starks, 6814 Lakeshore Dr., Dallas, Tex. 75214

Filed Feb. 13, 1995, Ser. No. 387,570
Int. Cl.[6] E05D *11/10*
U.S. Cl. 16—223 **15 Claims**



1. Apparatus for preventing relative motion between a door and a door frame, comprising:

a) a door having a chamber therein;

b) a door frame;

c) a hinge for attachment to and providing relative motion between said door and said door frame, said hinge comprising a first leaf for attachment to said door frame and a second leaf for attachment to said door, said first leaf comprising a latch and said second leaf comprising a slot for receiving said latch within said chamber, said first leaf and said second leaf each comprising at least one cylindrical knuckle having a bore extending therethrough, said cylindrical knuckles of said first leaf and said second leaf being axially aligned to define a cylindrical aperture extending therethrough, wherein a pin for preventing disengagement of said first leaf and said second leaf extends within said cylindrical aperture;

d) locking means for preventing relative motion between said door and said door frame, said locking means being disposed within said door chamber adjacent said hinge, and being alternately movable between a first unlocked position, whereby relative motion between said door and said door frame is permitted, and a second locked position, wherein said locking means engages said latch and prevents relative motion between said door and said door frame.

5,553,352

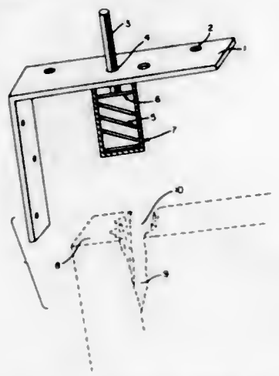
BIFOLD DOOR REPAIR APPARATUS

ring and said piston rod, said gap being sealed by said ring when said piston is moved toward said bottom of said cylinder.

5,553,352
BIFOLD DOOR REPAIR APPARATUS

John D. Bolton, 6 Waterway, Irvine, Calif. 92714

Filed Sep. 26, 1994, Ser. No. 312,035
Int. Cl.[6] E05D 7/10
U.S. Cl. 16—229 1 Claim

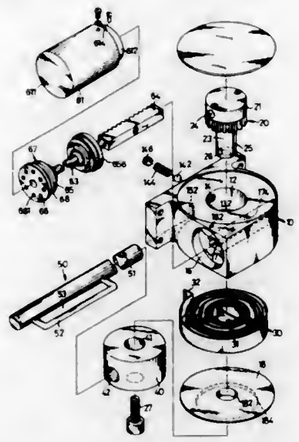


1. A bifold door repair apparatus consisting of:
an L-shaped bracket having two arms, one of said arms having a through opening;
a pin having an upper portion and a lower portion, said lower portion having an enlarged base; said pin being slidably received in said opening;
a tube housing having a closed lower end and an open upper end, said open upper end being attached to said one arm concentrically around said through opening; the lower portion of said pin being enclosed in said tube housing, and
a compressed spring being placed between the closed lower end of said tube housing and the enlarged base of said pin so that the compressed spring tends to force the pin through and out of said through opening.

5,553,353
DOOR DAMPING SYSTEM

Wu-shoun Lin, 1st Fl., No. 46, La 178, Sungchu Rd., Taichung, Taiwan

Filed Oct. 13, 1995, Ser. No. 543,131
Int. Cl.[6] E05F 5/02
U.S. Cl. 16—82 3 Claims

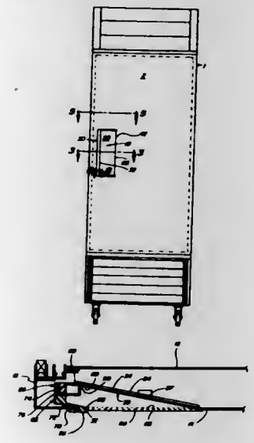


1. A door damping system comprising a base, a fixing element, a rod connecting between said base and said fixing element which is fixed to a door and a cylinder, said base being fixed to a wall and having a first recess defined in an upper side thereof and said first recess being defined by a bottom which has a first hole defined therein, a second recess defined in a bottom side of said base and said second recess coaxially communicating with said first hole, a side slot defined in said base near an outer side of said base and opposite to said wall and extending perpendicular to an axis of said first recess, said side slot extending from a front surface of said base through said base and to a rear surface of said base wherein said side slot communicating with said first recess via a middle hole defined in said base and located between said first recess and said side slot, a first slit defined in said bottom side of said base and communicating with said second recess and opposite to said outer side of said base;
a pinion having a T-shaped configuration and including a head and a shank, said shank having a second slit defined longitudinally therein and extending from a bottom of said shank, a threaded recess defined in said shank and extending from said bottom of said shank, said head being received in said first recess and said shank extending downwardly through said first hole of said base;
a coil spring received in said second recess of said base and having a first end formed in a center of said coil and a second end, said first end received in said second slit of said shank and said second end received in said first slit of said base;
a lower cap mounted to said bottom side of said base and supporting said coil spring, said lower cap having a second hole defined centrally therein and having a third recess defined in a bottom thereof receiving a connecting block therein which has a through hole defined longitudinally therein and a side hole defined radially from a periphery thereof, said side hole communicating with said through hole;
said rod having a first end and a second end, said first end thereof having a fourth hole defined radially therethrough, said first end of said rod being inserted into said side hole of said connecting block and a bolt extending through said through hole, said fourth hole and engaged with said threaded recess of said shank of said pinion, said second end thereof having a frame formed thereto so as to define an elongated space between the rod and the frame for receiving a stud extending from said fixing element therein;
said cylinder securely disposed to said front surface of said base and having a first end and a second end, said first end thereof having an end plug to close said first end and said second end thereof having a bottom, said end plug having a central hole defined therethrough and a piston rod being slidably received therein, said piston rod having a first end and a second end, said first end thereof having a rack inserted in said side slot of said base for an engagement with said pinion, said second end thereof having a piston disposed thereto, said piston having a first clearance defined between said piston rod and said piston and having a first flange and a second flange respectively extending radially from an outer periphery thereof and defining a first groove between said first and said second flanges, said first flange having an outer diameter smaller than an inner diameter of said cylinder such that a gap is defined between said first flange and said cylinder, said second flange having a plurality of sixth holes defined therein, a ring movably disposed between the first flange and the second flange and being able to be moved to contact against the first flange and the second flange depending upon a movement of said piston rod, a second clearance defined between an inner periphery of said ring and said piston rod, said gap being sealed by said ring when said piston is moved toward said bottom of said cylinder.

5,553,354
HANDLE FOR REFRIGERATION UNIT DOOR

Robert J. Trulaske, Sr., St. Louis, Mo., assignor to True Manufacturing Co., Inc., O'Fallon, Mo.

Filed May 3, 1995, Ser. No. 434,058
Int. Cl.[6] A47B 95/02; B65D 25/28
U.S. Cl. 16—110 R 17 Claims



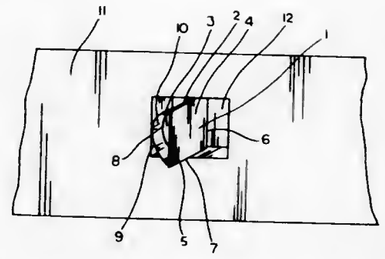
1. A recessed handle for a refrigeration unit door, comprising:
(a) a front wall having a planar surface and including a wall portion defined by a bend line, an upper margin, a lower margin and a connecting margin disposed in spaced relation from the bend line, said wall portion being cut from the front wall and bent inwardly about the bend line out of the plane of the front wall to provide an opening having an upper margin, a lower margin and a connecting margin extending between the upper and lower margin to provide an inner recess wall,
(b) framing means including an outer U-shaped frame having a bight member disposed adjacent the opening connecting margin, an upper arm member disposed adjacent the opening upper margin and a lower arm member disposed adjacent the opening lower margin, and an inner U-shaped frame having a bight member disposed adjacent the wall portion connecting margin, an upper arm member disposed adjacent the wall portion upper margin and a lower arm member disposed adjacent the wall portion lower margin, and
(c) means connecting said inner and outer U-shaped frames.

5,553,355
HANDLE FOR THE HANDICAP

Cheryll A. Baty, 2207 Bruton Rd., Plant City, Fla. 33565

Filed Jul. 24, 1995, Ser. No. 505,880
Int. Cl.[6] A47B 95/02
U.S. Cl. 16—110 R 1 Claim

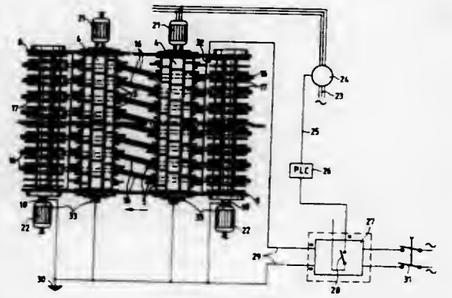
1. A handicap handle for allowing disabled persons to open drawers and the like comprising:
(a) a substantially rectangular base portion having a front surface, a rear surface, a top edge, a bottom edge, and two side edges,
(b) a handle affixed to the front surface of said rectangular base having a substantially curved construction forming half circle opening between said handle and said base,
(c) a pair of pins affixed to said top and bottom edges of said base,
(d) a protective cover rotatably affixed to said pins, said protective cover having a substantially box like construction thereby allowing said rectangular base to rotate therein, said protective cover having means of being affixed to a drawer or the like.



5,553,356
DEVICE FOR DETECTING EXTRANEOUS CONDUCTING BODIES IN FIBRE BALES

Claudio Locatelli, and Mario Mascheretti, both of Palazzolo Sull'Oglio, Italy, assignors to Fratelli Marzoli & C. S.p.A., Bergamo, Italy

Filed Jul. 6, 1995, Ser. No. 499,666
Claims priority, application Italy, Jul. 14, 1994, MI94A1471
Int. Cl.[6] D01G 31/00; 7/06
U.S. Cl. 19—80 R 7 Claims



1. A device for detecting extraneous conducting bodies in fibre bales processed in bale opening machines provided with a beater arm undergoing to-and-fro travel strokes along the bale working surface, comprising:
a suction hood (3) which conveys the withdrawn fibres;
one or more beaters (4) rotating at high speed and provided with teeth (5) which withdraw the fibres from the bale working surface;
a series of parallel bars which bear on the bales being worked and move in a traversing direction of the beater arm, and being positioned alternating with the rotating beaters (4);
a pair of rotating fibre conveying members positioned external to the beaters (4);
conductance sensors connected into an electrical circuit arranged to halt the device;
wherein the bearing bars consist of shoes (16) which extend longitudinally into a region containing the rotating members for conveying the fibres, the rotating conveying members consisting of grooved wheels or toothed discs (17) operating in gaps between the shoes (16), the electrical conductance measuring circuit being connected with one pole to the shoes

(16) and with the other pole to rotating members operating on the fibres and inserted into the gaps between the shoes.

5,553,357

HIGH BULKY WOOL SPUN YARN AND A DRAFTING APPARATUS FOR PREPARING THE YARN

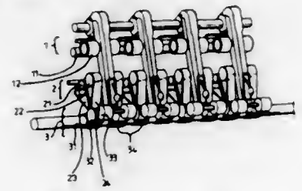
Kun-hye Kim; Soo-ho Son; Young-huy Yoon, and Chang-jig Lee, all of Seoul, Rep. of Korea, assignors to Cheil Industries, Inc., Taegu, Rep. of Korea

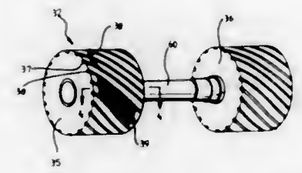
Filed Jan. 3, 1995, Ser. No. 367,595

Claims priority, application Rep. of Korea, Nov. 16, 1994, 94-30021

Int. Cl.[6] D01H *5/78*

U.S. Cl. 19—258 **16 Claims**





1. A drafting roller assembly for a spinning machine, the drafting roller assembly comprising:

a back roller part;

a middle roller part; and

a front roller part, said front roller part consists of a front bottom roller, a front top roller assembly, and a cleaning roller, said front top roller assembly having at least one groove roller having a top surface, at least one of said groove rollers having multiple grooves and multiple slanting grooves formed on said top surface, said multiple grooves being formed generally perpendicular to the axis of the froot top roller assembly and said multiple slanting grooves being formed at a slant of about 45° relative to the axis of said front top roller assembly; and at least one of said multiple slanting grooves having an abrasion resistant filler inserted and fixed therein.

5,553,358

BAND CLAMP FITTING

Lionel Caimettes, Romorantin Lanthenay; Pascal Detable, Gievres, and Michel Andre, Romorantin Lanthenay, all of France, assignors to Etablissements Caillau, Issy Les Moulineaux, France

Filed May 11, 1994, Ser. No. 241,611

Claims priority, application France, May 19, 1993, 93 06045

Int. Cl.[6] F16L *33/02*

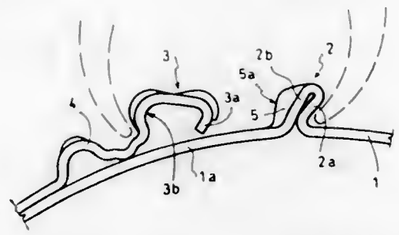
U.S. Cl. 24—20 TT **4 Claims**

1. A clamp fitting comprising:

a metal band wound on itself defining an inner end and an outer end;

a complementary fastening means on the inner end and the outer end of said metal band, said fastening means including a hook formed at the outer end on said metal band, said hook including a first inner surface at a free end of said hook and a second inner surface opposite the free end of said hook; and an ear integrally formed in said metal band and projecting radially outward therefrom near the inner end, said ear having a hook bearing zone opposite the inner end for engaging the first inner surface of said hook; and

a stop member formed in said inner end near the ear of said fastening means, said stop member projecting longitudinally opposite to the hook bearing zone of the ear and radially outward from said metal band, said stop member further forming a stop contact zone toward the inner end of said metal band such that the stop contact zone may engage the second inner surface of said hook to prevent further relative displacement of the hook with respect to the ear as soon as the first inner surface of the hook is conveniently engaging the hook bearing zone of the ear.



5,553,359

FASTENER FOR CONVEYOR BELTS

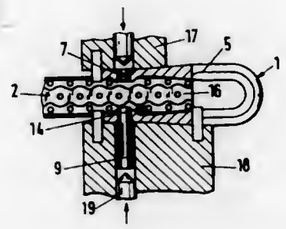
Wolfgang Herold, Offenbach Am Main, Germany, assignor to Mato Maschinen-und Metallwarenfabrik Curt Matthaei GmbH & Co. KG, Offenbach, Germany

Filed Jun. 3, 1994, Ser. No. 254,292

Claims priority, application Germany, Jun. 7, 1993, 43 18 836.2

Int. Cl.[6] F16G *3/09*

U.S. Cl. 24—33 P **20 Claims**



1. A fastener for conveyor belts and the like, comprising:

a body element having a generally U-shaped side configuration which defines a coupling eyelet for receiving a connecting pin therein; said body element including a pair of legs shaped for positioning on opposite sides of an associated belt end, wherein each of said legs has a fastener aperture therethrough positioned such that the fastener apertures on said legs are mutually aligned when said body element is clenched on the belt end;

a rigid fastening pin having a cylindrical sidewall, with one end portion thereof closely received and frictionally retained in the fastener aperture of one of said legs to interconnect the same in a selected pre-clenched condition; said fastening pin having a blunt end associated with said one end portion which when said body element is clenched on the belt end is driven through an adjacent previously unapertured portion of the belt end, and closely received in the fastener aperture of the other one of said legs, and subsequently upset to positively interconnect the same.

5,553,360

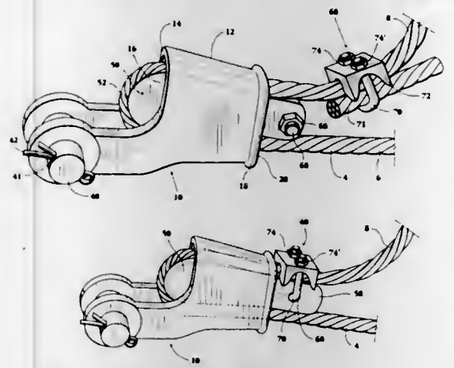
EXTENDED WEDGE SOCKET ASSEMBLY

Charles E. Lucas, Tulsa, Okla., and Douglas E. Wilson, LaMesa, Calif., assignors to The Crosby Group, Inc., Tulsa, Okla.

Filed May 19, 1995, Ser. No. 446,537

Int. Cl.[6] F16G *11/00*

U.S. Cl. 24—136 K **4 Claims**



1. A wedge socket assembly, comprising:

a wedge socket having,

an elongated, longitudinal hollow basket having a large opening at a first end, a small opening at a second end, and an interior cross-section tapering from said large opening to said small opening, and

a pair of jaws connected to said basket and extending from opposite side of said first end, said jaws each having a transverse opening therethrough, said openings being aligned with one another;

first pin means for insertion through said pair of openings, and first retaining means for retaining said first pin means in said pair of openings;

a unitary wedge, having,

a wedge portion having a large end and a small end, said wedge portion being of substantially the same shape as said interior of said basket, and having a peripheral groove to receive a wire rope therearound creating, beyond said small end, a live end and a dead end,

said wedge portion having an extended portion connected to said small end of said first wedge portion and having a transverse opening therein, said extended portion being sized such that when said wedge is positioned within said basket said extended portion extends beyond said small opening at said second end; and

a first wedge retaining means for insertion into said transverse opening in said extended portion, and second retaining means for retaining said wedge retaining means in said opening in said extended portion.

5,553,361

FASTENING DEVICE FOR SPORTS SHOES

Maurizio Tacchetto, Villa D'Asolo, and Mirco Battistella, Spresiano, both of Italy, assignors to Nordica S.p.A., Trevignano, Italy

Filed Mar. 3, 1995, Ser. No. 398,016

Claims priority, application Italy, Mar. 16, 1994, TV94A0033

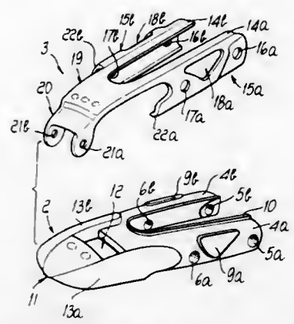
Int. Cl.[6] A43C *11/14*

U.S. Cl. 24—68 SK **11 Claims**

1. Fastening device for sports shoes, particularly for ski boots or skates, comprising;

a substantially U-shaped plastic body;

a substantially U-shaped metal element, said metal element constituting a containment frame for said plastic body,



guiding means, centering means and locking means defined by said metal element, for mutual centering, interpenetration and interlocking of said plastic body and said metal element;

first wings defined by said plastic body, said first wings having lateral surfaces and lower surfaces;

a first pair of through holes and a second pair of through holes formed in said first wings;

second wings defined by said metal element and located adjacent said first wings defined by said plastic body;

first tabs each connected to one of said second wings and surrounding said lateral surfaces and partially surrounding said lower surfaces of said first wings;

a third pair of through holes and a fourth pair of through holes formed in said first tabs and being coaxial with respect to said first pair of through holes and said second pair of through holes formed in said first wings of said plastic body.

5,553,362

WRAPPING DEVICE FOR SHAPING FABRICS TO 3-D CONTOURS

Kenneth V. Stevens, Brooklyn, N.Y., assignor to PRescient Partners L.P., New York, N.Y.

Filed Dec. 1, 1995, Ser. No. 565,834

Int. Cl.[6] A47C *31/00*

U.S. Cl. 24—326 **14 Claims**

1. An apparatus for fitting an unstructured fabric cover to a structure, the cover having excess fabric at a corner area of the structure, the apparatus comprising:

an elongated triangular wrapping member having a short base area and two adjacent sides extending outwardly from the base area and being connected to each other at an end of the triangular wrapping member which is opposite from the base area, the wrapping member having a longitudinal axis extending between the base area and the opposite end;

catch means at the base area for catching a portion of the excess fabric at the corner area of the structure, so that when the wrapping member is rotated around the longitudinal axis, the excess fabric is gathered around the wrapping member and toward the corner area; and

holding means for holding the wrapping member and gathered excess fabric therearound, against the corner area of the structure.

5,553,363

PAPER CLIP SAFETY PIN

Kelvin K. Chen, 17012 Royal View Rd., Hacienda Heights, Calif. 91745

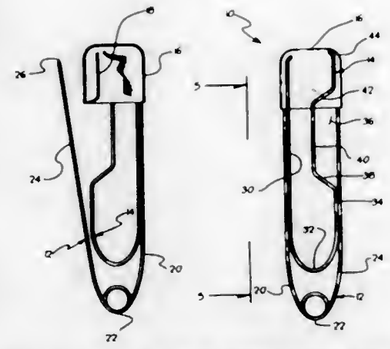
Filed Jul. 17, 1995, Ser. No. 503,275

Int. Cl.[6] A44B *21/00*

U.S. Cl. 24—353 **6 Claims**

1. A paper clip safety pin comprising:

a safety pin member for piercingly engaging a plurality of objects so as to secure the objects together, the safety pin



member comprises an end cap having a receiving slot directed thereinto; a fixed member extending from the end cap and continuing into a spring; a pivoting member extending from the spring and being biased thereby into the open position, the pivoting member being shaped so as to define a piercing tip, with the pivoting member being positionable against a force of the spring into the receiving slot of the end cap;

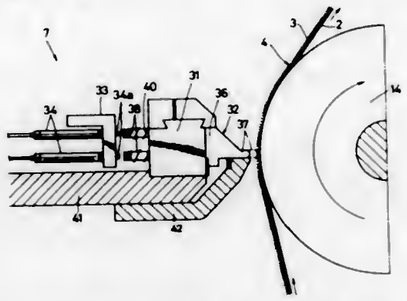
a paper clip extending from the safety pin member and cooperating therewith so as to frictionally engage and retain a plurality of planar objects between the paper clip and a portion of the safety pin member, the paper clip comprises a first member projecting from the end cap, the first member continuing an integral bend; a second member projecting from the integral bend and towards the end cap, the second member being coupled to the end cap and cooperating with the first member and the integral bend so as to define an elongated loop which cooperates with the safety pin member so as to frictionally engage and retain planar objects therebetween.

5,553,364

HEAT PROCESSING APPARATUS FOR PILE SHEET

Chieko Nakagawa, 442-3, Ooazaawaga, Annocho, Aki-gun, Mie-Pref., Japan

Filed May 31, 1995, Ser. No. 456,047
Int. Cl.[6] D06C *23/00;23/04*
U.S. Cl. 26—2 R **7 Claims**



5. A heat processing apparatus for pile sheet, comprising:

conveying means for conveying a pile sheet comprising a plurality of piles on a base cloth;

heating means for heating the pile sheet while being conveyed by said conveyor means; and

pressing means provided adjacent said conveying means for pressing said plurality of piles to said base cloth by pressing said heated pile sheet; wherein said pressing means comprises:

a plurality of elements having a thin wall main body slidably accomodated in a slit in an element block and a thick wall head for pressing said plurality of piles to said base cloth, and being formed integrally with said thin wall main body, said thick wall heads of said plurality of elements being disposed in the length direction of said plurality of piles;

leg parts integrally formed opposite to said thick wall head in said thin wall main body so as to offset each other in adjacent locations; and

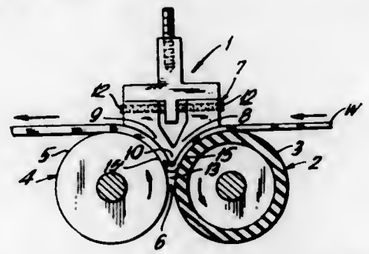
a cylinder mounting block provided on one side of said thick wall head of said element block and provided with a piston rod and confronting each leg part.

5,553,365

MEANS FOR CONTROLLING DEFLECTION IN A TWO-ROLL FABRIC SHRINKER

Frank Catallo, 75 Channel Dr., Port Washington, N.Y. 11050

Filed Dec. 6, 1994, Ser. No. 350,340
Int. Cl.[6] D06C *21/00*
U.S. Cl. 26—18.6 **4 Claims**



1. An apparatus for the compressive treatment of a fibrous web material where the apparatus comprises a first movable surface having opposite end portions, means for moving said first movable surface at a first rate of speed, a second movable surface spaced from said first movable surface, means for moving said second movable surface at a second rate of speed, a confining means having two opposite wing like surfaces spaced from said first and second movable surfaces and cooperating therewith to form a stuffing chamber into which fibrous web material is adapted to be moved by said first movable surface and from which said fibrous web material is adapted to be moved by said second movable surface, said stuffing chamber also being formed between one of said movable surfaces and one of said wing like surfaces and the other movable surface and the opposite wing like surface to define a passageway for said web material, and means connected to each end of one of said movable surfaces to adjust said movable surfaces to a predetermined position so that the passageways of said stuffing chamber are adjusted to substantially the same dimension when deflection of a movable surface occurs causing a distortion in the passageway dimension.

5,553,366

VIBRATION COMPACTED FABRICS FOR ORTHOPEDIC CASTING TAPES

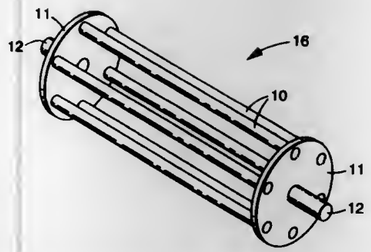
James C. Novack, St. Paul; Scott A. Neamy, Hugo, and Matthew T. Scholz, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 142,177, Oct. 25, 1993, abandoned. This application Mar. 27, 1995, Ser. No. 411,013
Int. Cl.[6] D06H *7/22;* **A61F** *5/04*
U.S. Cl. 28—170 **10 Claims**

1. A method of making an orthopedic casting bandage, comprising the steps of:

knitting a fiberglass yarn and a stretched elastomeric yarn to form a fabric;

releasing the tension on the elastomeric yarn as the knit fabric comes off the knitting machine;



vibrating the fabric thereby uniformly compacting said fabric;

heat setting said compacted fabric thereby removing said elastomeric yarn; and

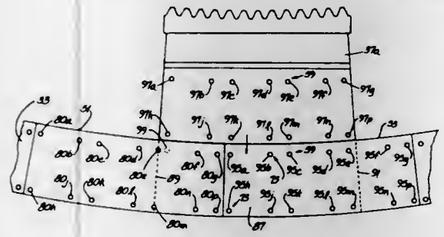
coating said fabric with a curable or hardenable liquid resin, wherein said compacted fabric has from about 10% to about 200% extensibility in the elongated direction when a 2.63 N load or force is applied across a 1 cm section of the fabric.

5,553,367

METHOD FOR REPAIRING A MACHINE HAVING A SUPPORT STRUCTURE AND WORN COMPONENTS

John P. Mahoney, Milwaukee, Wis., assignor to Harnischfeger Corporation, Brookfield, Wis.

Filed Sep. 6, 1994, Ser. No. 300,753
Int. Cl.[6] B23P *6/00*
U.S. Cl. 29—402.08 **6 Claims**



1. A method for repairing a machine having a support structure and a worn component at each of first and second places on such structure, and wherein the support structure includes plural apertures at the first place and plural apertures at the second place, the method including the steps of:

removing the worn components from the first and second places;

providing a new component having first and second groups of apertures;

placing the new component at a site spanning the first and second places by positioning the new component so that (a) at least one aperture in the first group of apertures of the new component is in registry with an aperture at the first place to thereby form a first set of apertures, and (b) at least one aperture in the second group of apertures is in registry with in aperture at the second place to thereby form a second set of apertures; and

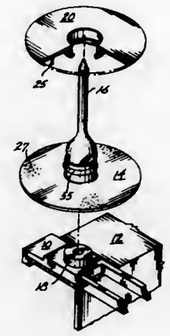
attaching the new machine component at the site.

5,553,368

PIERCING GROMMET HAVING DETACHABLE TOOL FOR INSTALLATION

David M. Barry, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 91,388, Jul. 14, 1993, Pat. No. 5,435,679. This application Jan. 13, 1995, Ser. No. 372,742
Int. Cl.[6] B23P *17/00;11/00;* **F16B** *19/00;21/00*
U.S. Cl. 29—423 **1 Claim**



1. A method of installing an insulation blanket on an aircraft stringer comprising the steps of:

clipping a mounting bracket onto the aircraft stringer;

press-fitting a standoff disk support member on said mounting bracket;

positioning the insulation blanket down over a blanket piercing portion of said standoff disk support member;

coaxially disposing an apertured disk member about the blanket piercing portion of said standoff disk support member in snap-fit relationship with said standoff disk support member; and then,

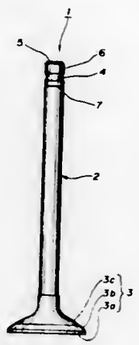
breaking off said tool piercing portion of said standoff disk support member.

5,553,369

METHOD FOR PRODUCING AN ENGINE VALVE

Takao Shimizu; Noboru Yamamoto, and Hiroaki Suzuki, all of Nagoya, Japan, assignors to Daido Tokushuko Kabushiki Kaisha, Nagoya, Japan

Division of Ser. No. 9,147, Jan. 26, 1993, Pat. No. 5,370,092.
Claims priority, application Japan, Jan. 29, 1992, 4-014148
Int. Cl.[6] B23P *15/00*
U.S. Cl. 29—888.46 **4 Claims**



1. A method for producing an engine valve comprising:

forming a valve stem and a valve head in an integrated single body from a Ti—Al based allow; and

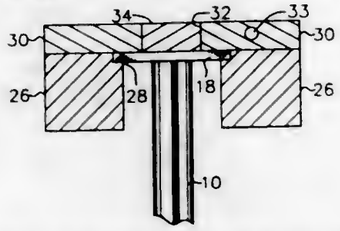
joining a stem end member made from heat resisting steel at the end away from the valve head by brazing with a Ni-based brazing filler metal.

5,553,370

METHOD FOR REPAIR OF STEAM TURBINE BLADES

John Pepe, 11671 Rabaul Dr., Cypress, Calif. 90630

Filed Feb. 9, 1995, Ser. No. 385,964
Int. Cl.[6] B23P 15/00
U.S. Cl. 29—889.1 8 Claims



1. A method for fashioning an end of a turbine blade comprising:

securing at least one blade to a backing plate to present the blade end through one side of the plate;

positioning the backing plate and blade in a holding fixture, said fixture including at least one restraining strip abutting the plate one side to define in cooperation with the plate a space adjoining the presented turbine blades ends;

depositing a plurality of layered weldments in the space and on the backing plate and presented turbine blade end to build-up weldment on the blade end;

removing the backing plate and deposited weldment from the fixture;

and

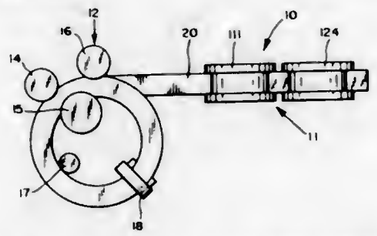
machining the weldment and freeing the blade from the backing plate to fashion the turbine blade end.

5,553,371

METHOD OF MANUFACTURING FRICTION PLATES

Ryuichi Uchino, Kariya; Tadashi Higuchi, Aichi-ken; Takaaki Nakano, Kariya, and Shigenobu Tara, Anjyo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 24, 1995, Ser. No. 449,872
Claims priority, application Japan, May 25, 1994, 6-111401; Apr. 27, 1995, 7-103828
Int. Cl.[6] B21B 1/46
U.S. Cl. 29—527.2 2 Claims



1. A method of manufacturing friction plates comprising the steps of:

spraying powdered or particulate frictional materials onto at least one side surface of a metal strip to form a thin frictional film thereonto;

feeding and compressing the metal strip having the thin frictional film between a compression roller and a feed roller by moving the compression roller in the direction of the feed roller to compress the thin frictional film;

transforming the straight metal strip into a generally circular profile by means of a metal strip bending means;

severing one point of the metal strip of the circular profile; and

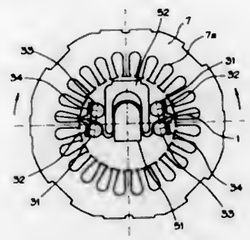
welding free ends of the circular profile to form a disc profile friction plate.

5,553,372

APPARATUS FOR INSERTING INSULATION SHEETS INTO SLOTS OF A STATOR CORE

Takayuki Tsugawa, Kanagawa-ken, and Masahiro Tomita, Gunma-ken, both of Japan, assignors to Odawara Engineering KK, Japan

Filed Oct. 4, 1994, Ser. No. 317,571
Int. Cl.[6] H02K 15/10
U.S. Cl. 29—734 6 Claims



1. An apparatus for inserting a pair of connecting portions of a flexible insulation sheet into slots in a stator core, in which the insulation sheet has a one-piece structure and includes a pair of body portions connected at opposite ends by the connecting portions, the apparatus comprising:

a gripping means for gripping the insulation sheet at positions spaced slightly inward from the opposite end areas of each body portion so as to bring the opposite end areas into alignment with said predetermined slots;

a first member having an "U"-shaped cross section;

a second member receivable in the first member to elastically deform the intermediate area of each body portion into a "U" shape; and

an inserter for inserting the deformed sheet into the stator core so that the connecting portions of the sheet are inserted into the predetermined slots.

5,553,373

PHOTOELECTRIC CONTROL MODULE INSTALLATION DEVICE

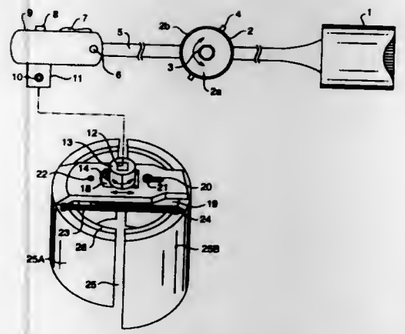
James M. Sprayberry, 1094 Jennings Rd., Sylacauga, Ala. 35150

Filed Nov. 23, 1994, Ser. No. 344,733
Int. Cl.[6] B23P 19/04
U.S. Cl. 29—758 3 Claims

1. A gripping device for installing and replacing photoelectric control modules, said photoelectric control modules being selected from a group consisting of overhead photoelectric control modules and overhead light bulbs, said device comprising:

a gripping member having a pair of opposing, rotatable grips, said grips having a ductile lining affixed to an inner surface of each of said grips for gripping said photoelectric control modules;

a pair of overlapping plates each having an end attached to a top end of each of said grips, said plates being slidably mounted with respect to each other and having at least one elongated



elastic contractor affixed to each side of each of said plates for inwardly tensioning said plates, said plates further having openings with one end of a rotatable barcam disposed therein for expanding, contracting and rotating said plates and said grips, the opposite end of said barcam having a cavity for attaching an interconnected drive member thereto;

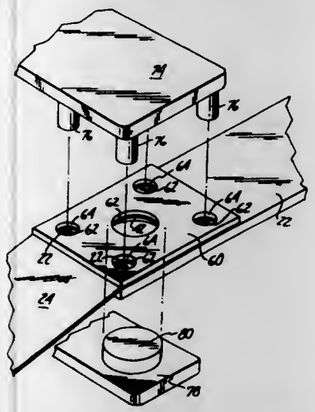
said drive member having a first end, a flexible head ratchet wrench with a reversible ratchet drive disposed at said first end and having a handle with a distal end extending therefrom, said ratchet drive being removably attached to said cavity of said barcam, said ratchet wrench further having a universal attaching head, said attaching head having adjustable mated splines disposed at one end thereof for affixing to said distal end of said handle, the opposite end of said attaching head having a telescopic pole attached thereto for operating said drive member and said gripping member.

5,553,374

TOOL FOR A DE-SWAGING HEAD GIMBAL ASSEMBLY

Lawrence E. Hanks, Eagan; Dennis R. Nielsen, Apple Valley, and David D. Koester, Chanhassen, all of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Division of Ser. No. 976,369, Nov. 13, 1992, Pat. No. 5,347,413. This application Jul. 20, 1994, Ser. No. 277,659
Int. Cl.[6] G11B 5/42
U.S. Cl. 29—762 4 Claims



1. An apparatus for separating a transducer carrying arm from a support arm, the transducer carrying arm being attached to a mounting plate having a tubular member adapted to extend through a first hole in the support arm to form a ball stake mount which secures the transducer carrying arm to the support arm, the transducer carrying arm having a plurality of first tool receiving holes arranged in a pattern around the first hole in the support arm, the mounting plate having a plurality of second tool receiving holes arranged in the pattern around the first hole in the support arm and aligned with the plurality of first tool receiving holes to create a plurality of passageways through the transducer carrying arm and the mounting plate, the support arm having a surface exposed to the plurality of passageways, the apparatus comprising:

a first disassembly tool having a plurality of raised portions of a size and shape and being so disposed and arranged on the first disassembly tool so that each of the plurality of raised portions pass through one of the plurality of passageways to apply a force to the surface of the support arm exposed to the plurality of passageways, thereby separating the transducer carrying arm from the support arm; and

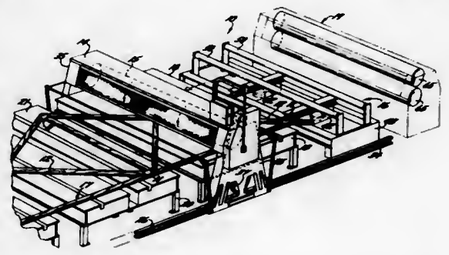
a second disassembly tool having a raised portion of a size and shape and being so disposed on the second disassembly tool so that the raised portion of the second disassembly tool is inserted into the first hole in the support arm to apply a force to a surface of the tubular member, thereby separating the transducer carrying arm from the support arm.

5,553,375

APPARATUS FOR MANUFACTURING TRUSSES AND ASSOCIATED METHOD

Frederick P. Powers, Edenton, N.C., assignor to Tee-Lok Corporation, Edenton, N.C.

Filed Sep. 21, 1994, Ser. No. 309,810
Int. Cl.[6] B30B 15/16;3/02
U.S. Cl. 29—798 26 Claims



1. The apparatus for manufacturing a truss by pressing truss plates into prepositioned wood pieces, said apparatus comprising:

a platform for supporting the prepositioned wood pieces;

a pair of guide tracks extending alongside said platform, said pair of guide tracks having respective end portions adjacent an end of said platform and being movable in a generally vertical direction;

a gantry frame supported on said pair of guide tracks for back and forth movement along said platform;

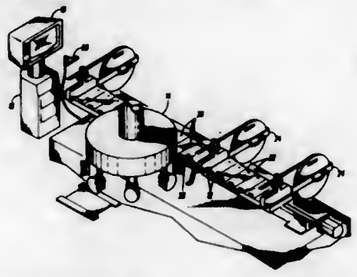
a roller rotatably mounted on said gantry frame for pressing the truss plates into the prepositioned wood pieces as said gantry frame moves along said platform; and

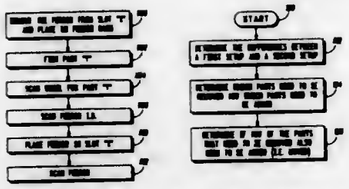
lifting means for simultaneously lifting the end portions of said pair of guide tracks, said gantry frame, and said roller relative to said platform to facilitate removal of the truss from the end of said platform by passing the truss under the lifted roller.

5,553,376
METHOD OF AND APPARATUS FOR CHANGING A PRODUCTION SETUP

Ranvir S. Solanki, Cary; Eric J. Gassmann, Round Lake Beach; Joseph R. Kane, Lake Zurich, all of Ill.; Edward P. Griffin, Lacey's Spring, and Andrew M. Gantt, Huntsville, both of Ala., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 15, 1995, Ser. No. 388,775
Int. Cl.[6] B23P *19/04;* **H05K** *3/30*
U.S. Cl. 29—833 **5 Claims**





1. A method of loading a plurality of parts required for assembling a second product by an assembly machine, the assembly machine including an assembly table having a plurality of locations for receiving the plurality of parts, a first production setup specifying pads and their locations for assembling a first product, a second production setup specifying parts and their locations for assembling a second product, the assembly table being pre-loaded with the specified parts at their locations according to the first production setup, the method comprising the steps of:

determining locations where parts specified by the first production setup differ from parts specified by the second production setup;

determining, as remove parts, parts pre-loaded at the determined locations;

determining, as add parts, parts specified by the second production setup that are specified for the determined locations;

determining, as move parts, the remove parts that are common to the add parts;

removing the remove parts, excluding the move parts, from the assembly table;

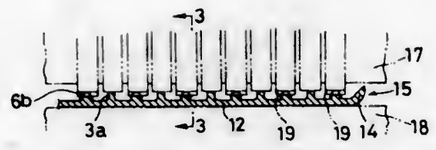
moving the move parts from their pre-loaded locations to the locations specified by the second production setup; and

adding the add parts to the locations specified by the second production setup.

5,553,377
METHOD OF MAKING REFRIGERANT TUBES FOR HEAT EXCHANGERS

Hirosaburo Hirano; Yuji Yamamoto, and Shinji Ito, all of Tochigi, Japan, assignors to Showa Aluminum Corporation, Sakai, Japan

Division of Ser. No. 77,869, Jun. 16, 1993. This application Aug. 1, 1994, Ser. No. 283,504
Claims priority, application Japan, Mar. 26, 1993, 5-068578
Int. Cl.[6] B23P *15/00*
U.S. Cl. 29—890.053 **7 Claims**

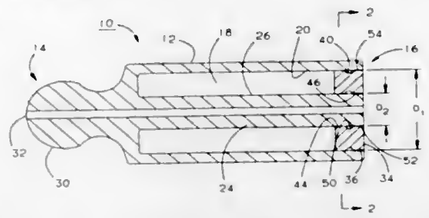


1. A method of producing a refrigerant tube for use in heat exchangers comprising a flat aluminum tube having parallel refrigerant passages in its interior and comprising flat upper and lower walls and a plurality of reinforcing walls connected between the upper and lower walls, the reinforcing walls extending longitudinally of the tube and being spaced apart from one another by a predetermined distance, the method comprising the step of rolling an aluminum sheet blank having a thickness greater than the wall thickness of the refrigerant tube to be produced with a pair of upper and lower rolling rolls one of which has parallel annular grooves symmetrically on opposite sides of the middle of its length and thereby reducing the thickness of the blank to the specified tube wall thickness with the peripheral surfaces of the rolling rolls to form a flat portion and to cause the annular grooves to form ridges projecting from the flat portion integrally therewith and bend at least one of opposite side edges of the blank in the direction of projection of the ridges, the step of passing the rolled aluminum sheet between a pair of upper and lower rolls one of which has protrusions approximately semicircular in cross section and arranged at a predetermined spacing at a position corresponding to each of the parallel annular grooves in the rolling roll used in the preceding step to form in upper edges of the ridges approximately semicircular cutouts at the predetermined spacing, and the step of folding the aluminum sheet having the cutouts in the ridges at the middle of its width like a hairpin and joining opposite side edges of the sheet together in butting contact with each other to thereby form the flat aluminum tube, joining upward ridges to downward ridges to form the reinforcing walls and combining the cutouts of the upward and downward ridges to form communication holes for causing the parallel refrigerant passages to communicate with one another therethrough.

5,553,378
METHOD OF MANUFACTURING A PISTON

Mahendra B. Parekh; Leon Kitzmiller, both of Rockford; Richard C. Costello, Kirkland; C. Allen Grow, Rockford; Gordon Pinchott, Rockford; Dennis O'Leary, Rockford; Louis M. MacDougall, Rockford; David W. Okey, Rockford, and Edward J. Fowler, Rockford, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Division of Ser. No. 299,726, Sep. 1, 1994. This application May 22, 1995, Ser. No. 445,836
Int. Cl.[6] B23P *15/00*
U.S. Cl. 29—888.044 **10 Claims**



1. A method of manufacturing a piston, comprising the steps of:

providing a substantially cylindrical member having a first end and a second end;

forming an open cavity in the cylindrical member extending axially from the second end to adjacent the first end such that the second end has an inner annular surface defined by an inner diameter;

providing a disk having a radially outer surface defined by an outer diameter substantially equal to the inner diameter of the inner annular surface of the second end of the cylindrical member;

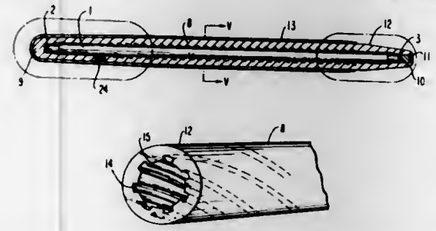
forming a circumferentially extending recessed area in the radially outer surface of the disk; and

welding the disk to the second end of the cylindrical member by welding to the recessed area of the radially outer surface of the disk such that particles produced while welding the disk to the second end of the cylindrical member are received and contained within the recessed area.

5,553,379
MALLEABLE PENILE PROSTHESIS

John W. Westrum, Jr., Prior Lake; Mark S. Chace, St. Anthony, and Charles C. Kuyava, Eden Prairie, all of Minn., assignors to American Medical Systems, Inc., Minnetonka, Minn.

Division of Ser. No. 287,439, Aug. 8, 1994, Pat. No. 5,512,033. This application Jul. 13, 1995, Ser. No. 502,614
Int. Cl.[6] A61F *2/26*
U.S. Cl. 29—450 **6 Claims**



1. A method of forming a malleable penile prosthesis comprising an elongated core, a sleeve enveloping said core and an outer tube accommodating said sleeve and core, which method comprises forming said elongated core, enveloping said core with a sleeve of braided biocompatible material, forming an outer tube of elastomeric material having a wall with an inner surface and an outer surface and a bore defined by the inner surface of the wall, which inner surface has a profile formed of alternate grooves and ribs in a substantially helical arrangement, and inserting said sleeve and core within said bore.

5,553,380
MOWER HEAD ROLLER ASSEMBLY

James Rice, 22008 Vine Rd., Brier, Wash. 98036

Filed Jul. 18, 1994, Ser. No. 277,249
Int. Cl.[6] A01D *34/53*
U.S. Cl. 29—895.2 **2 Claims**

1. A method of assembling a roller body for a mower head having a length of at least twenty inches, including the steps of:

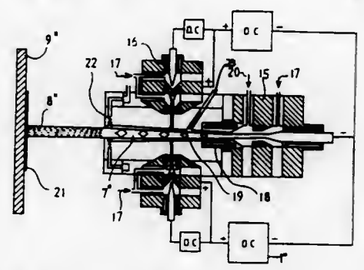
forming at least two roller body sections having a maximum length of fifteen inches, each said roller body section being formed out of an ultra high molecular weight polyethylene plastic, wherein each said section is partially formed by drilling a center bore through each said section and wherein the ends of each said roller body sections are disposed toward each other and are formed with slots;

mating each said roller body sections, including a step of placing a mid collar between each said roller body sections, said mid collar having a plurality of lips dimensioned for being inserted into each said roller body section slots.

5,553,381
METHOD FOR COATING A ROLL OF A PAPER MACHINE

Pentti Lehtonen, Jyväskylä , Finland, assignor to Valmet Corporation, Helsinki, Finland

Division of Ser. No. 14,652, Feb. 8, 1993, abandoned. This application Oct. 17, 1994, Ser. No. 302,530
Claims priority, application Finland, Feb. 6, 1992, 920501
Int. Cl.[6] B23P *15/00*
U.S. Cl. 29—895.32 **14 Claims**



1. A method for coating a roll of a paper machine with a powder comprising a thermo-plastic and/or specialty plastic, comprising the steps of:

introducing plasma into an interior space of a plasma spray system defined between two oppositely charged electrodes to form a plasma flame having a hypersonic velocity,

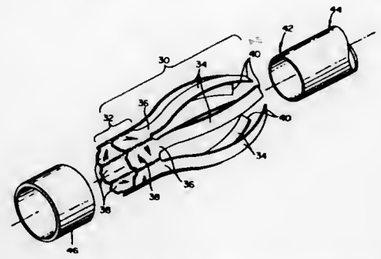
directing the hypersonic plasma flame toward a surface of a roll to be coated, and

introducing a powder comprising only particles of a thermo-plastic and/or specialty plastic into the hypersonic plasma flame to be directed thereby onto the surface of the roll to form a homogenous and uniform plastic coating on the surface of the roll.

5,553,382
METHOD FOR PRODUCING A SHAFT CLUTCH COMPONENT

James R. Miller, Yakima, Wash., assignor to Manhasset Specialty Co., Yakima, Wash.

Division of Ser. No. 850,662, Mar. 12, 1992, Pat. No. 5,375,445. This application Sep. 22, 1994, Ser. No. 310,860
Int. Cl.[6] B23P *11/00*
U.S. Cl. 29—896.9 **5 Claims**



1. A method for producing a shaft clutch component, said method comprising the steps of:

creating a blank from a continuous strip of material, said blank

5,553,384
DISPOSABLE RAZOR

5,553,386
FOLDABLE SAW

creating a blank from a continuous strip of material, said blank having an upper body and a plurality of fingers separated by intervening gaps and attached to and arrayed along said upper body;

initially bending said upper body of said blank at a first gap between two adjacent fingers to form a crease in said upper body;

further, iteratively bending said upper body at one or more remaining gaps until said upper body has a cross section having a substantially closed polygonal shape; and

swaging said upper body against a polygonal mandrel during the initial bending and further, iterative bending steps, to create obtusely angled creases at each said gap to form said substantially closed polygonal shape, said polygonal mandrel having two flat sections defining an obtusely angled bending edge between the flat sections.

5,553,383

SHAVING FOIL MOUNTING STRUCTURE FOR A DRY SHAVING APPARATUS

Matthias Wetzel, Frankfurt, Germany, assignor to Braun Aktiengesellschaft, Kronberg, Germany

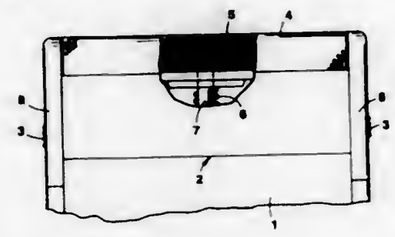
PCT No. PCT/EP93/00987, § 371 Date Mar. 28, 1995, § 102(e) Date Mar. 28, 1995, PCT Pub. No. WO93/23213, PCT Pub. Date Nov. 25, 1993

PCT Filed Apr. 23, 1993, Ser. No. 335,790

Claims priority, application Germany, May 11, 1992, 42 15 398.0

Int. Cl.[6] B26B *19/04*

U.S. Cl. 30—43.92 **8 Claims**



1. A shaving head for a dry shaving apparatus, the shaving head comprising:

a shaving head frame having bolts and rib members;

a shaving foil of arched form having two longitudinal sides and a perforated area, the shaving foil having on the outer surface of each longitudinal side a strip member, each strip member provided with mounting members cooperating with the bolts of the shaving head frame such that the shaving foil is attached to the shaving head frame, wherein the mounting members of each strip member are configured as two cutouts open in the direction of the perforated area, each of the cutouts having a detent movable in a plane defined by each strip member during engagement of a bolt with the cutout, and each strip member having a slot open in the direction of the perforated area and in engagement with a rib member formed on the shaving head frame with the shaving foil in an assembled condition; and

an inner cutter operating in a reciprocating motion resiliently engaged against the shaving foil.

5,553,384

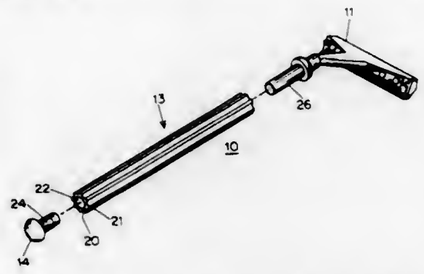
DISPOSABLE RAZOR

Jisu Kim, Yonkers, N.Y., assignor to Tritec International Corporation, New York, N.Y.

Continuation of Ser. No. 766,807, Sep. 26, 1991, Pat. No. 5,403,534. This application Apr. 3, 1995, Ser. No. 415,524

Int. Cl.[6] B26B *21/14*

U.S. Cl. 30—85 **5 Claims**



1. A disposable razor having a shaving head holding at least one razor blade in appropriate shaving position, and a rubberized handle attached to said shaving head, said rubberized handle comprising:

an extruded substantially rigid inner core of thermoplastic material and

a rubberizing layer covering said inner core, said covering layer comprising a compatible thermoplastic rubber coextruded with said rigid inner wherein the rubberized handle is a one-piece coextruded razor handle.

5,553,385

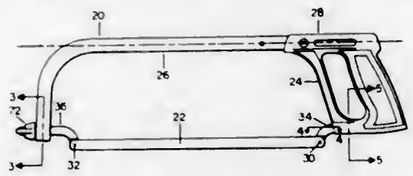
HACKSAW WITH OFFSET BLADE

Daniel J. Crozier, 30 Martha Court, Welland, Ontario, Canada

Filed Nov. 17, 1994, Ser. No. 338,424

Int. Cl.[6] B27B *21/00;21/06*

U.S. Cl. 30—508 **7 Claims**



5. A frame for a hacksaw, the frame comprising:

a handle member;

a frame member coupled to the handle member;

the handle member and the frame member defining respective first and second similar generally star shaped openings in alignment one with the other;

a first and second blade attaching components having respective end portions shaped to fit in the star shaped openings in one of several possible angular orientations;

each of the blade attaching components including a pin to receive an end of a conventional hacksaw blade, and a curved portion between the respective pins and end portions to offset the pins from the end portions;

the first blade attaching component being releasably coupled to the handle member;

the second blade attachment component being slidably engaged in the star shaped opening in the frame member and including a threaded adjuster to tension a hacksaw blade mounted in the frame, whereby the hacksaw blade can be assembled with the cutting edge clear of the frame for completely cutting through an object placed on a supporting surface.

5,553,386

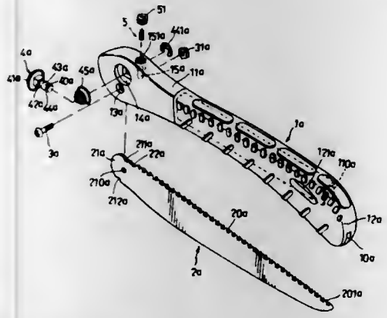
FOLDABLE SAW

An-Sun Hsu, No. 99, Yu-Al St., Tainan, Taiwan

Filed Nov. 15, 1995, Ser. No. 559,739

Int. Cl.[6] B26B *3/06*

U.S. Cl. 30—161 **2 Claims**



1. A foldable saw including

an elongated handle member having opposite side walls and a top wall which bridges said side walls, said side walls confining a longitudinal slit therebetween,

a saw blade formed as an elongated flat plate with a teethed edge, said saw blade having a tip and a rounded end portion which is opposite to said tip and which is mounted pivotally on said handle member such that said saw blade is pivotable between a folded position, wherein said saw blade is concealed within said slit of said handle member, and an unfolded position, wherein said saw blade is extended from said handle member, and

a locking unit mounted on said handle member and operable so as to engage releasably said rounded end portion of said saw blade to lock said saw blade in a selected one of said folded and unfolded positions,

wherein:

said saw blade has an indented section located between said rounded end portion and said teethed edge, said top wall of said handle member being formed with a through hole which extends to said slit and which is aligned with said indented section of said saw blade when said saw blade is in said folded position, said through hole having a release spring disposed therein, said through hole further having an internally threaded upper section which engages an externally threaded plug that abuts against one end of said release spring, said release spring being compressed by said saw blade when said saw blade is locked by said locking unit in said folded position, said release spring expanding to cause said tip of said saw blade to project out of said slit of said handle member when said locking unit is operated to unlock said saw blade from said folded position, said rounded end portion of said saw blade being sized so as to abut against said release spring when said saw blade is in said unfolded position.

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AIRCRAFT HOLDING PATTERN WIND COMPENSATOR

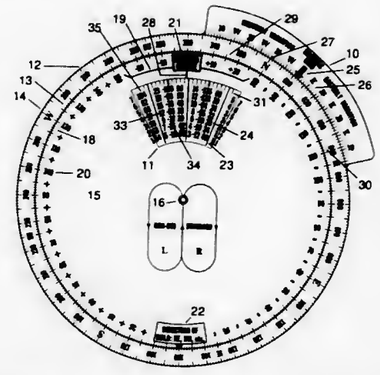
John H. Newcomb, 545 Wistar Rd., K-22, Fairless Hills, Pa. 19030

Filed Apr. 19, 1995, Ser. No. 424,187

Int. Cl.[6] G01C *21/20*

U.S. Cl. 33—1 SD **4 Claims**

1. An aircraft navigational aid for compensating for the drift effects of a moving body of air on an aircraft's holding pattern, comprising a plurality of discs concentrically mounted and free to rotate in relation to each other around their circle centers or central points, the first of said discs having addition and subtraction holding pattern correction scales graduated along its circumference reading against a graduated inner compass scale on a second disc,



said correction scales indicating outbound leg and inbound leg compass headings to be flown when said scales are read against said second disc's inner compass scale using outbound leg and inbound leg angular corrections given by a user-identified number-set of a display printed on the third or base disc in angular sections with each said section having 3 number columns extending radially from the center of the base disc with said number-sets read circularly across the columns in numerous rows, each said section bearing specific orientation to a wind direction pointer on said base disc read against a graduated outer compass scale on said second disc, said wind direction pointer itself centered on a magnetic variation scale on said base disc read against the true wind direction to be located by the user on said outer compass scale on said second disc, also, each said number-set on said base disc having a third number representing the outbound leg time to be flown, and when said third and said first discs are oriented to said compass scales on said second disc, several number-set sections show through a window on said first disc, allowing an appropriate number-set from the centermost section appearing in said window to be used in conjunction with and in relation to an appropriate and corresponding wind speed and aircraft speed combination selected from a table printed on said navigational device with a common percentage base or common categorical identification heading each table column and identifying each window number-set row for the purpose of allowing the user to identify the correct number-set in relation to said wind speed and aircraft speed combination, said window also having a marker centrally printed on top of the window reading against a marker scale graduated in tenths between like markers printed radially at the top center of each number-set section on said third disc and visible in said window so that with any orientation of the 3 discs where said markers do not align perfectly, and thus the number-sets shown do not present an exact solution, said markers will facilitate optional visual interpolation between like numbers of 2 appropriate number-sets of common categorical identification in adjacent sections, allowing, in most cases, more accurate approximations to be applied to said holding pattern correction scales, and to the outbound timing, than would be available from using said number-sets in the centermost section alone.

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DEVICE FOR MEASURING THE DISTANCE BETWEEN THE TOOL TIP AND THE SURFACE OF MATERIAL TO BE WORKED WITH AN ELECTRONIC PANTOGRAPH

Gianluigi Meneghini, Via Caravaggio, 6, Albignasego, Italy

Filed Jan. 11, 1995, Ser. No. 371,434

Claims priority, application Italy, Jan. 19, 1994, VE94A0001

Int. Cl.[6] B43L *13/10;* **G01B** *5/14*

U.S. Cl. 33—23.01 **9 Claims**

1. A device for measuring a distance between a tool tip and a surface of material to be worked comprising:

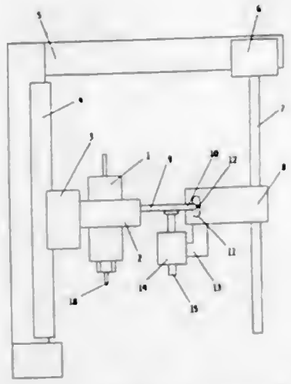
sensor apparatus for measuring the toe of a second wheel on said axle;

means for storing a specification value for the toe of the first

a scanner unit for scanning said incremental graduations of said first and second portions, wherein said scanner unit has two groups of scanner elements spaced apart by

5,553,392

PROCESS AND APPARATUS FOR DRYING SHEET



an arbor slidable vertically along a guide and provided with a tool,

a transporting element for vertically moving said arbor, wherein said arbor has a member movable relative to said transporting element between two vertical end positions to achieve mutual sliding along a vertical axis,

at least one sensor activated by travel of said member along said transporting element when in a position different from said two vertical end positions,

an actuator controlled by said at least one sensor, when activated to raise said member against an upper end-of-travel position, and

a control unit which calculates a first distance between a beginning of descent of said transporting element and a point in which, following contact with said tool tip with said material to be worked, said member is raised until stopped and due to said descent of said transporting element said member faces said sensor, and which also calculates a second distance through which said transporting element rises from said position in which said sensor is activated to said upper end-of-travel position, a distance to be measured being a sum of said first and said second calculated distances.

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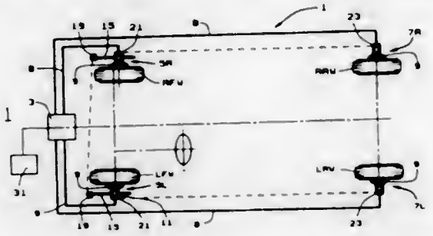
APPARTUS AND METHOD FOR ADJUSTING VEHICLE TOE ALIGNMENT ANGLES

Matthew R. Winslow, Arnold, Md.; Douglas E. Woolverton, Yardley, Pa., and Daniel B. January, St. Peters, Mo., assignors to Hunter Engineering Company, Bridgeton, Mo.

Filed May 5, 1994, Ser. No. 239,592

Int. Cl.[6] G01B *21/22;5/24;7/30;11/26*

U.S. Cl. 33—203.18 **21 Claims**



12. Vehicle wheel alignment apparatus for guiding the adjustment of toe of a pair of wheels on the same axle of a vehicle, comprising:

sensor apparatus for measuring the toe of a first wheel on a first axle of a vehicle;

sensor apparatus for measuring the toe of a second wheel on said axle;

means for storing a specification value for the toe of the first wheel;

determining means responsive to the sensor apparatus and to the storing means for subtracting the specification value from the measured value of toe for the first wheel and for storing the result in the storing means as a first toe comparison value;

said storing means having stored therein a specification value for total toe for said axle of said vehicle, the total toe being the sum of the toe for said first wheel and for the second wheel on said axle;

said determining means being responsive to the sensor apparatus for the first wheel and to the sensor apparatus for the second wheel to compute total toe and to update the computation of total toe as additional measurements of the toe of the first wheel and the second wheel are made by the sensor apparatus, said determining means being further responsive to the stored specification of total toe to compute the difference between measured total toe and the total toe specification, said difference being updated by the determining means as additional toe measurements are made by the sensor apparatus;

means responsive to the determining means for visually guiding the adjustment of the toe of the second wheel to a point where the total toe of the first and second wheels minus the total toe specification value equals the first toe comparison value, the total toe minus the total toe specification value being adjusted total toe;

said determining means being responsive to the adjusted total toe falling within a predetermined tolerance of the first toe comparison value for controlling the visually guiding means to visually guide the adjustment of the toe of the first wheel until the adjusted total toe is substantially zero.

5,553,390

LENGTH MEASURING SYSTEM

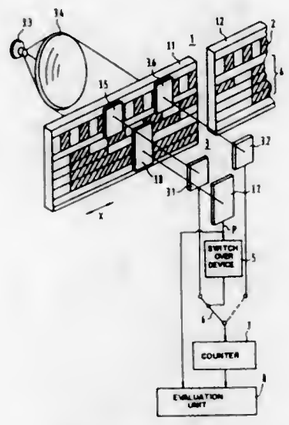
Alfons Ernst, Traunreut, and Günther Nelle, Bergen, both of Germany, assignors to Dr. Johannes Heidenhain GmbH, Traunreut, Germany

Filed Nov. 14, 1994, Ser. No. 339,982

Claims priority, application European Pat. Off., Dec. 8, 1993, 93119731

Int. Cl.[6] G01B *11/04*

U.S. Cl. 33—706 **16 Claims**



1. A length measuring system, comprising:

a scale having a first portion and a second portion separated by a gap having a width, said first portion and said second portion-each having incremental graduations;

a scanner unit for scanning said incremental graduations of said first and second portions, wherein said scanner unit has two groups of scanner elements spaced apart by a distance greater than said width of said gap;

a control track parallel to and next to said incremental graduations of said first and second portions;

a further scanner element to scan said control track and produce an output signal, wherein said output signal is a function of the absolute position of said scanner unit relative to said first and second portions and controls a switchover from one group of scanner elements to the other group of scanner elements;

wherein the absolute position of said scanner unit relative to said first and second portions is derived from said control track over the entire measurement length of said scale; and

wherein a measurement increment of said control track is greater than a measurement increment of said incremental graduations of said first and second portions.

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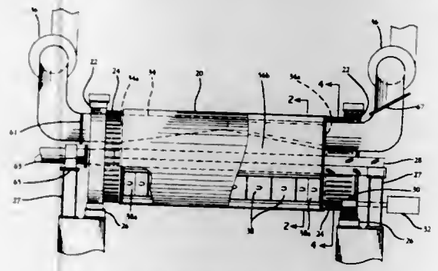
METHOD AND APPARATUS FOR HEAT TREATING WEBS

Sharon F. Bakalar, 510 Regenhard Ave., Moorestown, N.J. 08057

Filed Jun. 5, 1995, Ser. No. 462,755

Int. Cl.[6] F26B *11/02*

U.S. Cl. 34—110 **21 Claims**



1. Apparatus for heat-treating webs, including a cylinder mounted for rotation about a horizontal axis and having an outer web-engaging surface and an inner prominently heat-absorbing surface, a drive for rotating the cylinder, and a stationary structure within the cylinder including an IR burner complement which has a combustion surface that is characteristically incandescent when in operation, said combustion surface confronting but being separated by an exhaust-gas receiving space from said inner heat-absorbing surface and extending essentially end-to-end of said inner surface of the cylinder lengthwise but the area of said combustion surface being limited so as to confront substantially less than the area of said heat-absorbing inner surface, only that portion of the cylinder's inner surface which is confronted by said combustion area being heated thereby instantaneously, all of the cylinder's inner surface being heated by radiation from said combustion area during continued rotation of the cylinder.

20. A method of heat-treating a web that traverses a path partway around and in contact with a heated rotating cylinder, wherein the cylinder is heated by an internal stationary complement of IR burners extending end-to-end in the cylinder and whose extent around the cylinder is limited to have a predetermined limited capacity of delivering heat to the web via the cylinder when the rate of supply of air-fuel mixture to the IR burner complement is at least near maximum, i.e., flame lift-off rate, said method including the steps of rotating the cylinder at a routine maximum rate for thereby heat-treating the web at a routine maximum rate while the cylinder is contacted by the web and while the complement of IR burners is being supplied with air-fuel mixture at least near said maximum rate, and reducing the speed of the web and of cylinder rotation while progressively reducing the rate of air-fuel mixture supply to the complement of IR burners through a turn-down range from said at-least near maximum rate to the minimum rate that supports combustion.

170–919 O.G.–96–3: QL3

5,553,392

PROCESS AND APPARATUS FOR DRYING SHEET MATERIALS

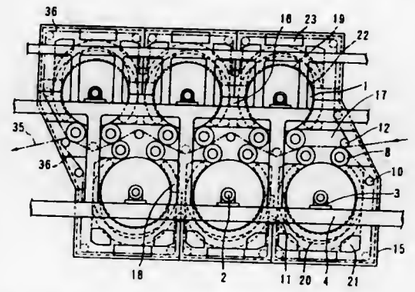
Morimasa Hanaya, Mishima, Japan, assignor to Tokushu Paper Mfg. Co., Ltd., Shizuoka-ken, Japan

Filed Nov. 15, 1994, Ser. No. 340,383

Claims priority, application Japan, Nov. 15, 1993, 5-309774; Jun. 6, 1994, 6-147059; Jun. 6, 1994, 6-147060

Int. Cl.[6] F26B *11/02*

U.S. Cl. 34—115 **14 Claims**



1. A process for drying a wet sheet material, comprising the steps of:

(a) introducing a drying medium into a closed chamber surrounding a plurality of heated dryer cylinders in series and a gas permeable fabric belt to produce a drying atmosphere in the closed chamber, said drying medium being selected from the group consisting of a superheated steam of no less than 100° C. and a heated moist air of a dew point of no less than 80° C.;

(b) admitting the wet sheet material into said closed chamber;

(c) transporting the wet sheet material in said drying atmosphere in said closed chamber while restraining the sheet material from both sides thereof by using said dryer cylinders and said fabric belt, to thereby effect a restrained drying to evaporate moisture of the sheet material from a curved continuous evaporating surface to dry the sheet material;

(d) removing the steam evaporated from the wet sheet material through said gas permeable fabric belt so as to recirculate the steam for reuse; and

(e) existing the dried sheet material from the closed chamber.

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DRYER SECTION OF A PAPER MACHINE INCLUDING CYLINDER GROUPS WITH SINGLE-WIRE DRAW

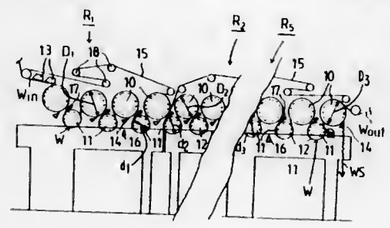
Ville Korhonen, Jyväskylä ; Allan Liedes, Palokka, and Jouko Yli-Kauppila, Muurame, all of Finland, assignors to Valmet Corporation, Helsinki, Finland

Filed Mar. 24, 1995, Ser. No. 410,090

Claims priority, application Finland, Mar. 25, 1994, 941392

Int. Cl.[6] F26B *11/02*

U.S. Cl. 34—117 **21 Claims**



19. A method for drying a web in a dryer section, comprising the steps of

heat transfer medium flow passing through said nozzle cham-

5,553,396

a plurality of depressions formed in said

passing the web through at least one initial single-wire draw cylinder group comprising smooth-faced heated drying cylinders against which the web to be dried enters into direct contact, a reversing roll situated between each adjacent pair of said drying cylinders, guide rolls, and a drying wire for carrying the web while being guided in a loop by said guide rolls, said drying cylinders and said reversing rolls;

passing the web from said at least one initial group to at least one intermediate single-wire draw cylinder group comprising smooth-faced heated drying cylinders against which a web to be dried enters into direct contact, a reversing roll situated between each adjacent pair of said drying cylinders, guide rolls, and a drying wire for carrying the web while being guided in a loop by said guide rolls, said drying cylinders and said reversing rolls;

passing the web from said at least one intermediate group to at least one final single-wire draw cylinder group comprising smooth-faced heated drying cylinders against which a web to be dried enters into direct contact, a reversing roll situated between each adjacent pair of said drying cylinders, guide rolls, and a drying wire for carrying the web while being guided in a loop by said guide rolls, said drying cylinders and said reversing rolls;

varying the ratio of the diameter of said drying cylinders to the diameter of said reversing rolls between said groups;

selecting the diameter ratio of said at least one initial group to be greater that the diameter ratio of said at least one intermediate group; and

selecting the diameter ratio of said at least one final group to be greater that the diameter ratio of said at least one intermediate group.

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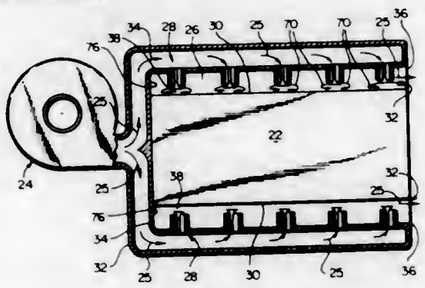
RADIAL JET REATTACHMENT NOZZLE HEAT SINK MODULE FOR COOLING ELECTRONICS

Michael Cosley, Crystal Lake, Ill., assignor to Reliance/Comm Tech Corporation, Mayfield Heights, Ohio

Filed May 11, 1995, Ser. No. 438,691

Int. Cl.[6] F26B *19/00;25/06;* **B05B** *1/26*

U.S. Cl. 34—218 **15 Claims**



1. A radial jet nozzle assembly for use in cooling subject bodies, said radial jet nozzle assembly directing heat transfer medium flow across a target surface of said subject body to increase said heat transfer from the subject body to the heat transfer medium flow to improve the cooling of said subject body, said radial jet nozzle assembly comprising:

an axially oriented duct having at least one wall defining an entry port, a discharge port, and a nozzle chamber therebetween, heat transfer medium passing from said entry port through said nozzle chamber and out through said discharge port;

a flow diverter body generally coaxially positioned in said duct, said flow diverter body having a tapered surface for directing heat transfer medium flow passing through said nozzle chamber radially outwardly away from said duct at said discharge port; and

support struts attached to and extending between an inside surface of said duct and an outside surface of said flow diverter body for supporting said flow diverter body in said heat transfer medium flow in said nozzle chamber.

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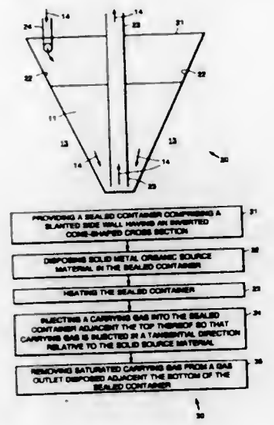
BUBBLER FOR SOLID METAL ORGANIC SOURCE MATERIAL AND METHOD OF PRODUCING SATURATED CARRYING GAS

Cheng P. Wen, Mission Viejo; Randy K. Rolph, Palos Verdes Estates, and Timothy T. Zielinski, Torrance, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 31, 1995, Ser. No. 455,879

Int. Cl.[6] F26B *3/08;17/00*

U.S. Cl. 34—359 **8 Claims**



5. A method of producing a carrying gas saturated with source material that is injected into an epitaxial reactor, said method comprising the steps of:

providing a sealed container comprising a slanted side wall having an inverted cone-shaped cross section;

disposing solid metal organic source material in the sealed container;

heating the sealed container;

injecting a carrying gas into the inverted cone-shaped container adjacent the top thereof so that carrying gas is injected in a tangential direction relative to the solid source material, and wherein a whirlpool effect is generated by the tangential gas flow that imparts a centrifugal force to gas molecules thereof, pushing the source material against the wall of the bubbler to promote heat flow from the heat bath to sustain high rate sublimation; and

removing saturated carrying gas from a gas outlet disposed adjacent the bottom of the inverted cone-shaped container;

whereby gravitational forces cause source material to refill empty spaces, thus reducing channel formation and preventing thermal isolation of the source material at the center of the bubbler.

5,553,396

VACUUM PROCESSING APPARATUS AND OPERATING METHOD THEREFOR

Shigekazu Kato, Kudamatsu; Kouji Nishihata, Tokuyama; Tsunehiko Tsubone, Hikari, and Atsushi Itou, Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

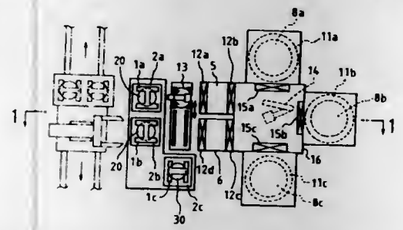
Division of Ser. No. 302,443, Sep. 9, 1994, Pat. No. 5,457,896, which is a continuation of Ser. No. 96,256, Jul. 26, 1993, Pat. No. 5,349,762, which is a continuation of Ser. No. 751,951, Aug. 29, 1991, Pat. No. 5,314,509. This application May 17, 1995, Ser. No. 443,839

Claims priority, application Japan, Aug. 29, 1990, 2-225321

The portion of the term of this patent subsequent to May 24, 2011, has been disclaimed.

Int. Cl.[6] B08B *3/00;* **C23C** *16/00*

U.S. Cl. 34—406 **10 Claims**



1. A method of operating a vacuum processing apparatus having a vacuum processing chamber for which a dry cleaning processing is effected after a substrate member to be processed has been processed under a vacuum condition, comprising the steps of:

measuring an intensity of a plasma light permeating through said vacuum processing chamber, so as to provide a measured value;

judging a time for dry cleaning of said vacuum processing chamber by comparing said measured value with a predetermined value, so as to provide a dry cleaning time judgment; and

carrying out the dry cleaning for said vacuum processing chamber in accordance with said dry cleaning time judgment.

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DEVICE FOR DRYING PRINTED SHEETS OR WEB IN PRINTING PRESSES

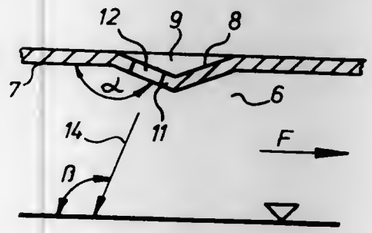
Volkmar R. Schwitzky, Würzburg, and Jürgen A. Stiel, Ostheim, both of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

Filed Mar. 3, 1995, Ser. No. 398,896

Claims priority, application Germany, Mar. 3, 1993, 44 06 846.8

Int. Cl.[6] F26B *25/00*

U.S. Cl. 34—640 **4 Claims**



1. A device for drying a printed medium in a printing press comprising:

a blower box having a blower box wall spaced above a printed medium guide surface;

a plurality of depressions formed in said blower box wall and extending outwardly from said wall toward said printed medium guide surface;

a wall surface formed in each of said depressions, each said wall surface being outwardly inclined with respect to said blower box wall at an angle of 150° to 170° with respect to said blower box wall; and

a blower opening formed in each of said depression wall surfaces, each of said blower openings directing dry air supplied to said blower box toward said printed medium guide surface as a blower stream.

5,553,398

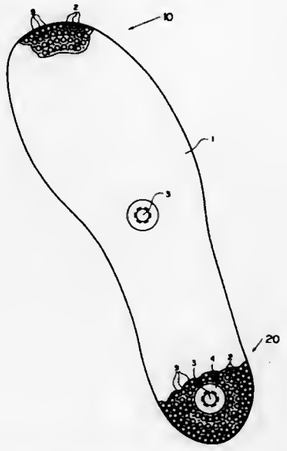
ELASTICALLY RESILIENT SHOE INSOLE HAVING A NUBBED SURFACE

Margrit Schnewlin-Maier, Hauptstrasse 68, CH-8437, Zurzach, Switzerland

Filed Dec. 27, 1994, Ser. No. 365,610

Int. Cl.[6] A43B *13/40*

U.S. Cl. 36—43 **4 Claims**



1. An improved insole for shoes, having an elastically resilient material with a nubbly surface, at least one metallic magnetic head (3) connected with the insole, the improvement comprising: a baseplate (1) having a maximum thickness of up to about 1.5 mm in a hubbed area, a nub height of each of a plurality of hubs (2) of approximately equal size and up to approximately 2 mm, an overall shape of each of the hubs (2) being approximately cone-shaped, the baseplate (1) having a plurality of breathing openings (9) positioned next to the nubs (2), the baseplate (1) having a nub-free thickened area (4) around each of the at least one metallic magnetic head (3) such that the baseplate (1) approximately attains the nub height of the surrounding hubs (2); and

the at least one metallic magnetic head (3) releasably connected with the baseplate (1), the baseplate (1) having a plurality of pocket-shaped receiving openings (6), each of the at least one metallic magnetic head (3) having a widened collar (33) mounted in one of said pocket-shaped receiving openings (6), and a padding material (8) positioned under the at least one metallic magnetic head (3) when mounted in said one of said pocket-shaped receiving openings (6).

5,553,399

5,553,402

SKI-BOOT WITH IMPROVED PADDING AND SUPPORT

1. A skishoe, comprising:

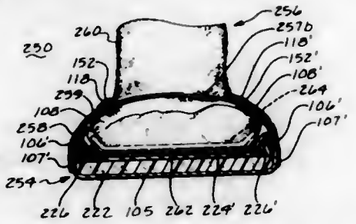
5,553,399
LIGHTWEIGHT FOOTWEAR ARTICLE PROVIDING IMPROVED TRACTION

Molly Strong, P.O. Box 1425, Bigfork, Mont. 59911

Continuation of Ser. No. 952,947, Sep. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 462,637, Jan. 9, 1990, Pat. No. 5,150,536. This application Nov. 14, 1994, Ser. No. 337,963

Int. Cl.[6] A43B *1/02;3/16;* **A43C** *15/06*

U.S. Cl. 36—9 R **33 Claims**



1. A footwear article for use to be worn on a foot of a user, comprising:

a lower portion comprising (a) a first sole part made of a fibrous material that is pliable, the fibrous first sole part having a generally planar ground contact surface, and (b) a second sole part made of a fibrous material that is pliable, the fibrous second sole part having an upper edge and a lower edge defining a height, the lower edge of the fibrous second sole part being attached near the periphery of the fibrous first sole part such that the fibrous second sole part extends upwardly from the fibrous first sole part to form a cavity; and,

an insole

having (a) sides (b) a foot contact receiving surface, (c) an abutment ridge extending around the outer perimeter of the foot contact receiving surface, including along the sides of the insole, the abutment ridge having a base portion and having a height projecting upwardly to an elevation above the foot contact surface sufficient to serve as an abutment to contain the user's foot, and (d) a generally planar lower contact surface extending below the foot contact receiving surface as well as beneath the base of the abutment ridge;

the insole comprising at least one layer of material that is at least partially liquid-impermeable; and

the insole being inserted in the cavity formed by the fibrous first and second sole parts such that the inner side of the fibrous first sole part substantially covers the lower contact surface of the insole and the fibrous second sole part is oriented substantially parallel to the sides of the insole.

5,553,400
PRESSURE-DISTRIBUTING PLATES FOR A SKI BOOT

Heinz Wittmann, Vienna, Austria; Francesco Caeran, Montebelluna, Italy, and Martin Elsner, Graz, Austria, assignors to HTM Sport-und Freizeitgeraete Aktiengesellschaft, Schwechat, Austria

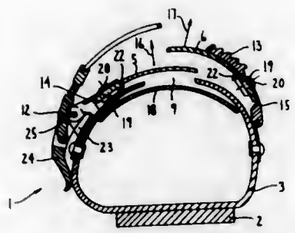
Filed Sep. 26, 1994, Ser. No. 312,390

Claims priority, application Austria, Sep. 27, 1993, 1945/93

Int. Cl.[6] A43B *5/04*

U.S. Cl. 36—50.5 **12 Claims**

1. In a ski boot having a sole, a frontwardly open upper part and an upwardly open front instep area with two pressure-distributing plates arranged on an outside area of said upper part and said front instep area, said plates extending from a toe area of said ski boot over said front instep area and are bent upwardly along a front side of said upper part of said ski boot and are supported in said front instep area for movement in a longitudinal direction of said ski boot relative to said upper part and for movement in a transverse direction of said ski boot, and overlap to close said open front instep area and said open upper part, the improvement comprising



wherein at least one of said pressure-distributing plates is hingedly mounted in said front instep area for movement about at least one fixed hinge on said front instep area of said ski boot, said at least one fixed hinge enabling a pivoting movement of one of said pressure-distributing plates away from the other of said pressure-distributing plates for facilitating an opening of said front instep area and said upper part.

5,553,401
PRESSURE-DISTRIBUTING PLATES FOR THE INSTEP REGION OF A SKI BOOT

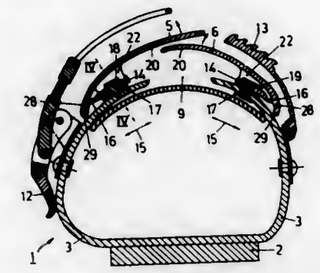
Heinz Wittmann, Wien, Austria; Francesco Caeran, Montebelluna, Italy, and Martin Elsner, Graz, Austria, assignors to HTM Sport-und Freizeitgeraete Aktiengesellschaft, Schwechat, Austria

Filed Oct. 21, 1994, Ser. No. 327,102

Claims priority, application Austria, Oct. 21, 1993, 2127/93

Int. Cl.[6] A43B *5/04;5/16*

U.S. Cl. 36—117.6 **11 Claims**



1. In a ski boot having a sole and an upper part secured to said sole, an upper region of said upper part defining a shaft of said ski boot, said upper part having an open front instep region, first and second pressure-distributing plates being provided in said instep region, each of said first and second pressure-distributing plates extending from a toe area of said ski boot over said instep region to close said instep region, said first and second pressure-distributing plates being bent upwardly along the front side of said shaft of said ski boot with support means being provided for supporting said first and second pressure-distributing plates for movement both in a transverse direction and in a longitudinal direction of said ski boot and with respect to said upper part, said support means including flaps on each of said first and second pressure-distributing plates which extend in said transverse direction of said ski boot, said first and second pressure-distributing plates overlapping one another in said closed instep region of said ski boot, the improvement wherein said flaps are integrally formed in one piece with each of said first and second pressure-distributing plates and are connected through means defining a hinge to each of said first and second pressure-distributing plates, said hinge enabling a movement of said first and second pressure-distributing plates in said transverse direction of said ski boot, and wherein said flaps are supported for movement in said longitudinal direction of said ski boot on said upper part of said ski boot.

5,553,402
SKI-BOOT WITH IMPROVED PADDING AND SLIDABLE TONGUE

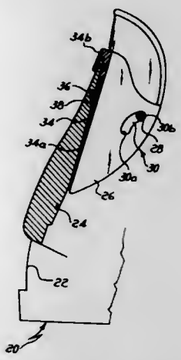
Antonello Marega, and Mario Sartor, both of Volpago, Italy, assignors to TECNICA Spa, Treviso, Italy

Filed Dec. 5, 1994, Ser. No. 353,331

Claims priority, application Italy, Dec. 7, 1993, TV93A0112; Dec. 7, 1993, TV93U0055

Int. Cl.[6] A43B *5/04;23/26*

U.S. Cl. 36—117.7 **17 Claims**



1. In a ski-boot (**20**) having a rigid shell (**22**), a boot leg (**24**) with a rear part vertically fixed to the shell (**22**) but hingedly movable with respect to the shell (**22**) in a longitudinal direction of the shell, a longitudinal opening in a front part of the ski-boot (**20**) extending from a toe portion (**114**) of the ski-boot (**20**) and defined by edges (**124***a*, **124***b*, **126***a*, **126***b*) of the shell (**22**) and the boot leg (**24**), and an inner lining shoe (**122**), the improvement comprising:

(a) an inner padding (**26**) movably fixed to an inside portion of the rear part of the boot leg (**24**) by connection means (**28**, **30**) such that the inner padding (**26**) is vertically movable with respect to a top edge of the boot leg (**24**) from a lowered limit position where at least a portion of a rear surface of the padding is in contact with an adjacent inner surface of the boot leg to a pulled-up limit position where the rear surface of the padding is not in contact with the adjacent inner surface of the boot leg; and

(b) a shell tongue (**132**) disposed between the inner lining shoe (**122**) and the edges (**124***a*, **124***b*, **126***a*, **126***b*) so as to cover the longitudinal opening (**128**) and being slidably fastened to the shell (**22**) at a lower end thereof so as to be movable for a predetermined distance in a longitudinal direction with respect to the shell (**22**).

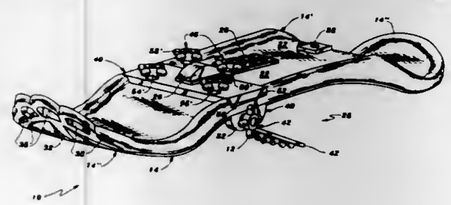
5,553,403
SKISHOES WITH BRAKES AND EXTENSION AND RETRACTION LIMIT STOPS THEREFOR

John H. McManus, 1758 Indian Way, Oakland, Calif. 94611

Filed Jul. 15, 1994, Ser. No. 275,640

Int. Cl.[6] A43B *5/04;* **A63C** *13/00;5/00*

U.S. Cl. 36—124 **7 Claims**



1. A skishoe, comprising:

a body member having an upper face and a lower, snow-contacting face opposed thereto, and having a central arch portion, an upwardly curved toe portion, and an upwardly curved heel portion;

said arch portion defining a downwardly concave camber;

snow-engaging brake blade means pivotably mounted for pivoting about a pivot axis which passes through said camber and extends transversely of said body member;

resilient biasing means for pivotally biasing said brake means about said pivot axis to extend an outer portion of said brake blade means remote from said pivot axis outwardly from said camber;

adjustable extension limit stop means for adjustably limiting the extension of said outer portion of said brake blade means from said camber; and

adjustable retraction limit stop means for adjustable limiting the retraction of said outer portion of said brake blade means into said camber;

said retraction limit stop means being adjustable by a user standing on said skishoe and a skishoe paired therewith to vary the maximum retraction of said outer portion of said brake blade means into said camber.

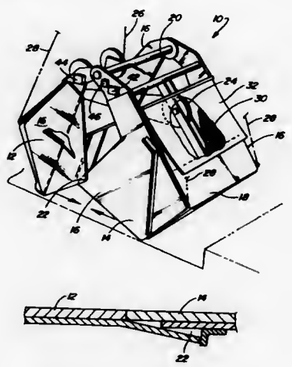
5,553,404
POWER BUCKET

Raymond C. Bergeron, 3452 W. Jefferson, Trenton, Mich. 48183

Continuation-in-part of Ser. No. 245,240, May 17, 1994, Pat. No. 5,501,024. This application Apr. 11, 1995, Ser. No. 420,223

Int. Cl.[6] B66C *3/02*

U.S. Cl. 37—184 **17 Claims**



1. A bucket for a power shovel comprising:

a first bucket half and second bucket half, each bucket half having spaced sidewalls and an endwall extending between said sidewalls, said sidewalls and endwall for each bucket half forming a scoop,

means for pivotally mounting said bucket halves together between an open position in which said scoops are spaced apart from each other and face each other and a closed position in which said endwalls abut each other and form a closed bottom for the bucket,

at least one bucket half having an upper surface with an opening,

valve means provided on said upper surface of said at least one bucket half for enabling air and water to exhaust from an interior of said scoops through said opening, said valve means being movable between an open position in which said valve means allows air to escape from said bucket halves through said opening and a closed position in which said valve means covers said opening and retains solid material within said interior of said scoops.

a box secured with respect to the lower end of the post, the box

geological, position, and operational information, and the

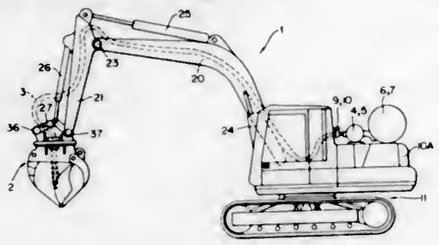
an anchor for fixed welded attachment

5,553,405

POWER-ASSISTED SHOVEL TRUCK EQUIPPED WITH A WATER-FEEDING DEVICE AND A WATER-DRAINING DEVICE

Hiroshi Hayashi, Yamaguchi-ken, and Tadashi Miyoshi, Kudamatsu, both of Japan, assignors to Toshihiro Industry Co., Ltd., Yanai, and Miyoshi Co., Ltd., Kudamatsu, both of Japan

Filed Jul. 21, 1994, Ser. No. 278,895
Int. Cl.[6] F02F 3/24
U.S. Cl. 37—189 17 Claims



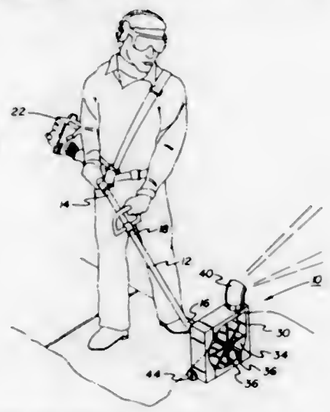
1. A power-assisted shovel truck comprising:
a swiveling truck;
a rotary bucket attached to the truck by a movable arm;
a water feed pump and a water feed tank provided on the truck for pumping water towards the rotary bucket; and
a conduit communicating with the water feed pump and running along the arm to the bucket to feed a stream of water to the rotary bucket, said conduit having an end retractably located within the interior of the rotary bucket.

5,553,406

SMALL LIGHTWEIGHT SNOW FLINGER

Dell L. Ceray, 602 N. Carroll St., P.O. Box 306, Arnold, Nebr. 69120

Filed Jun. 20, 1995, Ser. No. 492,458
Int. Cl.[6] E01H 5/00
U.S. Cl. 37—259 1 Claim



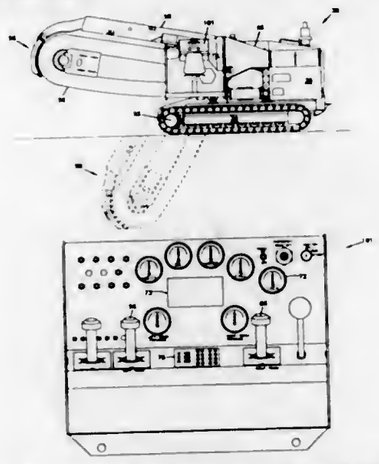
1. A small lightweight snow flinger, comprising, in combination:
a central post with an upper end, a lower end and an intermediate extent therebetween adapted to be held by a user, the post having a bend of about 30 degrees adjacent to the lower end;
a motor fixedly mounted on the upper end of the post for providing power;
motion imparting mechanisms extending from the motor to the lower end of the post;
a box secured with respect to the lower end of the post, the box having a central aperture therethrough a horizontal orientation;
a plurality of blades rotatable about a horizontal axis coextensive with the aperture of the box with power mechanisms at the lower end of the tube to rotate the blades within the aperture and move snow entering the aperture between the rotating blades and to direct it upwardly through an arcuate tube at an upper extent of the box for passage of the snow therethrough, the upper extent having an annular projection disposed thereon for coupling with an annular recess within the arcuate tube to facilitate rotation thereof;
a pair of wheels mounted adjacent to a lower extent of the box to facilitate movement thereof; and
a releasable clamp coupling the lower end of the post with a central extent of the box, the releasable clamp including a pair of generally U-shaped members having inner arcuate members removably coupling the lower end of the post to a cylindrical member on the box by a pair screws.

5,553,407

EXCAVATOR DATA ACQUISITION AND CONTROL SYSTEM AND METHOD OF USE

Greg Stump, Oakland, Ill., assignor to Vermeer Manufacturing Company, Pella, Iowa

Filed Jun. 19, 1995, Ser. No. 491,679
Int. Cl.[6] E02F 5/06; E02D 3/12
U.S. Cl. 37—348 25 Claims



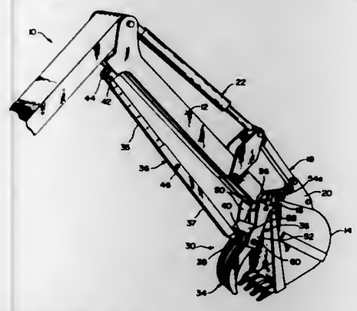
1. A data acquisition and control system for an excavator, the excavator including propulsion means and excavation means for respectively propelling the excavator and excavating along a predetermined excavation route, the system comprising:
geologic imaging means for acquiring geological information along the predetermined excavation route;
position determining means for determining a position of the excavator along the predetermined excavation route;
excavator control means for coordinating the operation of the propulsion means and the excavating means;
a main user interface for receiving input commands from an operator of the excavator and for displaying information to the operator; and
a main controller for receiving the acquired geological information from the geologic imaging means, for receiving position information from the position determining means, and for receiving operational information from the excavator control means;
wherein the main controller includes means for estimating excavator performance parameters in response to the received geological, position, and operational information, and the excavator control means includes means for modifying the operation of the propulsion means and excavating means in response to the estimated excavator performance parameters.

5,553,408

EXCAVATOR BUCKET ATTACHMENT

Edward H. Townsend, P.O. Box 958, Big Fork, Mont. 59911

Filed Apr. 21, 1995, Ser. No. 426,108
Int. Cl.[6] E02F 3/76
U.S. Cl. 37—406 9 Claims



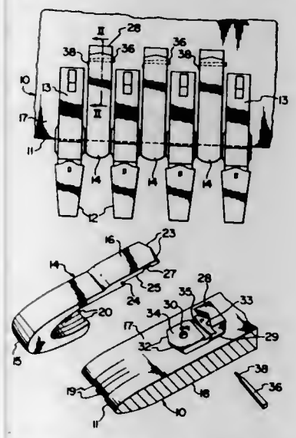
1. An excavating bucket attachment assembly comprising mounting means providing a pair of side arms and a tooth-mounting box; attachment means for attaching said side arms to an excavating bucket pivot pin without removing either the pivot pin or an excavating bucket to which the pivot pin is attached; and tooth means providing at least one tooth mounted in said tooth-mounting box for cooperative operation with the excavating bucket.

5,553,409

SHROUD ANCHOR SYSTEM

Harry F. Irving, Calgary, Canada, assignor to Foothills Steel Foundry Ltd., Canada

Filed Aug. 22, 1995, Ser. No. 517,979
Int. Cl.[6] E02F 3/36; A01B 15/00
U.S. Cl. 37—446 10 Claims



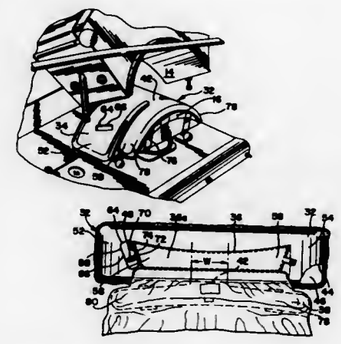
1. A wear protector system for shielding from wear a portion of a leading edge of an earthmoving implement, said system including:
an anchor for fixed welded attachment to a surface of said implement at a predetermined location rearwardly of said leading edge, said anchor comprising a block having a bottom surface for attachment to said implement surface, an undercut transverse forward first abutment surface, and an upper surface; and
a shroud having a U-shaped nose and a rearwardly extending tail, said tail defining a transverse rearwardly facing second abutment surface that is complementary to said first abutment surface, said anchor and said shroud being configured to interengage when said anchor is fixed to the implement at said location such that the nose of the shroud lies against and extends around said leading edge;
said anchor and said shroud having respective complementary channels, which, when said anchor and shroud are interengaged, together define a transverse passageway; through which a tapered cotter pin can be inserted to retain said shroud in engagement with said anchor and with the leading edge of the implement.

5,553,410

COLLAR PRESSING PAD FOR DRESS SHIRTS

Jeanine Derby, 920 N. Brainard, Naperville, Ill. 60663

Filed Jun. 2, 1995, Ser. No. 459,750
Int. Cl.[6] D06F 71/22;83/00
U.S. Cl. 38—13 9 Claims



1. A pressing device for use on a collar pressing apparatus, the pressing apparatus having a lower buck and a pressing head adapted to press against the buck to iron a collar placed in an open position between the buck and head, the collar having an outer fold portion forming a lateral edge and a button attached to a cloth extender which extends laterally outward from the lateral edge, said device comprising:
a pad removably attached to and covering a portion of the buck, said pad having a first thickness, said pad formed with a first section configured to allow the collar in the open position to be placed thereon, said first section having a side portion forming an area for receiving the button attached to the extender when the open collar is laid upon said first section, said area having a thickness less than said first thickness to accommodate the button when the pressing head is pressed against the collar on said pad.

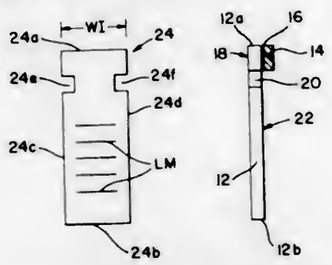
5,553,411

further defining a downward opening groove on said front

5,553,414

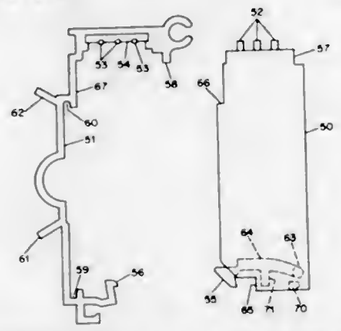
SOIL STERILIZER AND METHOD

5,553,411
BELT MARKETING INDICATOR
Chester Kolton, Westfield, and Stuart S. Spater, Livingston, both of N.J., assignors to B&G Plastics, Inc., Newark, N.J.
Continuation-in-part of Ser. No. 960,941, Oct. 14, 1992, Pat. No. 5,339,552, which is a continuation-in-part of Ser. No. 817,750, Jan. 7, 1992, Pat. No. 5,334,274. This application May 10, 1994, Ser. No. 240,331
Int. Cl.[6] G09F *23/00*
U.S. Cl. 40—640 **2 Claims**



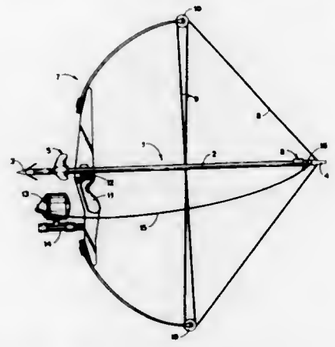
1. A marketing indicator comprised of an integral elongate sheet member of synthetic plastic material having first and second longitudinally spaced ends with first and second margins extending therebetween, first and second cuts respectively in said first and second margins equidistant from said first sheet member end, and marketing information imprinted on a side of said sheet member between said first and second margins and an adhesive layer disposed on a rear side of said sheet member, said adhesive layer extending with said sheet member from said first end thereof in non-overlapping relation to said first and second cuts.

5,553,412
INFORMATION DISPLAY RAIL SYSTEM
George T. Briechle, New Canaan; David H. Lubowe, Westport; Alfred D. Dobras, Trumbull; Raymond F. DeLuca, Stamford, all of Conn., and Marvin Ackerman, Sunnyvale, Calif., assignors to Electronic Retailing Systems International, Inc., Wilton, Conn.
Filed Mar. 25, 1993, Ser. No. 36,950
Int. Cl.[6] G09F *3/18*
U.S. Cl. 40—642 **60 Claims**



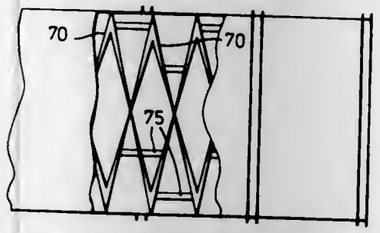
1. A system for removably mounting electronic price labels to an edge of a horizontally extending shelf comprising:
a rail having a back side for mounting against said edge, a front side for mounting said electronic price labels, a top, a bottom and two ends, said rail being of substantially constant cross section when viewed endwise, said rail defining an upward opening groove on said front side, said upward opening groove extending substantially from end to end, said rail further defining a downward opening groove on said front side, said downward opening groove being located above said upward opening groove, whereby a flexible insert can be held in place by said grooves;
means in front of said grooves for removably mounting an electronic price label; and
means for supplying electric power and signals along the length of said rail whereby an electronic price label mounted to said rail at any of a multiplicity of points can receive electric power and signals;
further comprising a plastic cover having inside and outside faces, said cover being pivotally coupled along a horizontal axis to said rail, said cover being sized and placed so that it closely covers electronic price labels removably mounted to said rail when in a closed position and provides substantially unhindered access to said labels when in an open position;
wherein said plastic cover is flexible and further comprises a lengthwise extending ridge projecting from said inside face of said plastic cover whereby pressing inwards on said plastic cover when it is in a closed position causes said ridge to engage and activate a button on an electronic price label if located under an area being pressed.

5,553,413
FISHING ARROW AND PASSTHROUGH PREVENTION DEVICES
Gregory T. Gannon, P.O. Box 780462, San Antonio, Tex. 78278
Filed Feb. 4, 1993, Ser. No. 13,424
Int. Cl.[6] A63B *65/02*; **A01K** *81/00*
U.S. Cl. 43—6 **18 Claims**



1. An arrow comprising:
an arrow shaft having a leading end and a trailing end;
a sliding-stop having a neutral hydrodynamic and aerodynamic profile slidably disposed on said shaft, said sliding-stop having a plurality of radially extending vanes oriented parallel to a long axis of a base, said base provided with a central opening parallel to its said long axis loosely overlying said shaft, said base including a leading portion facing towards a point of said arrow, which said leading portion includes a forward edge of minimal cross-sectional surface area and a trailing, fixed-stop impacting area of substantially larger surface area than that of said forward edge; and
a fixed-stop secured on said arrow shaft to retard sliding-stop translation on said shaft.

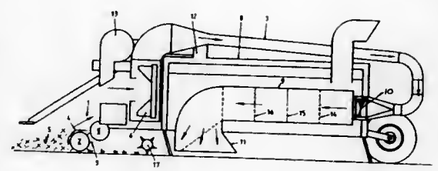
5,553,414
SOIL STERILIZER AND METHOD
Maurice I. Chapman, Lincolnshire, and David Nicholson, Norfolk, both of England, assignors to UK Sterilisers Ltd., Norfolk, England
Filed Jul. 22, 1994, Ser. No. 278,965
Int. Cl.[6] A01B *77/00*
U.S. Cl. 47—1.42 **3 Claims**



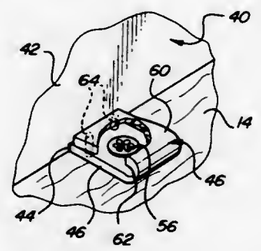
1. Apparatus for destroying soil-borne pests comprising:
a) frame means;
b) mobility means mounted on and supporting the frame means for movement of the frame means in a given direction;
c) a hollow drum having a boundary wall rotationally supported on the frame means about a substantially horizontal axis parallel to the given direction, the drum having a forward and rearward end;
d) ground-engaging means supported by the frame means for continuously removing at least about the top 100 mm of soil from the ground in the path of the apparatus as the frame means moves in the given direction;
e) a continuous conveyor supported on the frame means for moving the removed soil from the ground-engaging means and delivering it to the forward end of the drum;
f) flame-and-exhaust-gas-producing means in an end of the drum directed inward of the drum along the upper portion of the drum to heat the wall of the drum;
g) means for moving the removed soil from the forward end of the drum to the rearward end toward discharge including helical baffle means fixedly secured to the wall of the drum add extending toward the axis and having trip plates also affixed to the wall longitudinally of the drum between adjacent sections of the helical baffle means, whereby the helical baffle means serves to convey the removed soil and also to arrest the flow of flame and exhaust gas along the upper portion of the rotating drum to expose said wall for a longer period to the heat of the flame and gas and more efficiently increase the temperature of the wall, and the trip plates serve to tumble the removed soil to assure thorough contact of the soil with the hot wall.

5,553,415
BURNERS
Adrian M. Harvey, Shoreham-by-Sea; Christopher J. Harvey, Uckfield, and Philip K. Bush, Halstead, all of United Kingdom, assignors to Harvey Bush Ltd., United Kingdom
PCT No. PCT/GB93/01414, § 371 Date Feb. 28, 1994, § 102(e) Date Feb. 28, 1994, PCT Pub. No. WO94/01723, PCT Pub. Date Jan. 20, 1994
PCT Filed Jul. 1, 1993, Ser. No. 199,209
Claims priority, application United Kingdom, Jul. 1, 1992, 9213949
Int. Cl.[6] A01M *15/00*
U.S. Cl. 47—1.44 **19 Claims**

1. A stubble burning apparatus comprising a chassis capable of moving over an area of ground to be treated, a pick-up device to collect a swath of vegetable matter from the ground, a feed device to feed the vegetable matter to a chopper, and a blower to transport the vegetable matter to a combustion chamber of a burner, said combustion chamber having an upstream and a downstream end, said blower discharging air and cut vegetable matter into the upstream end of the combustion chamber, and wherein the stubble burning apparatus further comprises an igniter positioned at the upstream end of the combustion chamber, and a plurality of screens extending across the combustion chamber and spaced from each other in the flow direction, the mesh size of the screens decreasing in the flow direction, and wherein combustion gases from the burner are directed via a discharge device onto the surface of the ground.



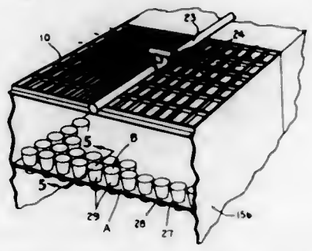
5,553,416
COVER FOR TREE INJECTOR CAPSULE AND FEEDER ASSEMBLY TUBE
Michael J. Jasso, Jr., 5329 Clintonville Rd., Clarkston, Mich. 48346
Filed Mar. 22, 1995, Ser. No. 408,481
Int. Cl.[6] A01G *29/00*
U.S. Cl. 47—57.5 **5 Claims**



5. A method of treating trees with a liquid agent comprising the steps of:
(1) forming an opening in the root collar of the tree that extends to the xylem thereof,
(2) inserting an agent feeding tube into the opening so that it firmly anchors in the tree and extends generally radially from the xylem thereof to a terminal end spaced outward of said tree,
(3) mounting a capsule containing the liquid agent on the terminal end of the feeding tube at an initial point so that the liquid agent is downstream of the feeding tube,
(4) turning the capsule on the feeding tube to a feeding position so that the liquid agent can feed into the feeding tube, and
(5) mounting a housing on the tree and over the capsule and feeding tube and fixing the housing to said tree to maintain said capsule in said feeding position and to prevent said capsule from being displaced from said feeding position.

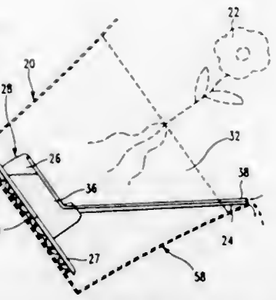
top surface of the riser and extending inwardly toward the

5,553,417
FLUID DISTRIBUTION PANEL AND METHOD
John E. Chambers, P.O. Box 6747, Greenville, S.C. 29606
Continuation-in-part of Ser. No. 973,535, Nov. 9, 1992, abandoned, which is a continuation of Ser. No. 842,748, Feb. 27, 1992, which is a continuation of Ser. No. 631,769, Dec. 24, 1990, which is a continuation of Ser. No. 385,922, Jul. 25, 1989, which is a continuation of Ser. No. 195,451, May 12, 1988, which is a continuation of Ser. No. 889,592, Jul. 25, 1986, which is a continuation of Ser. No. 616,498, Jun. 4, 1984. This application Apr. 26, 1995, Ser. No. 429,081
Int. Cl.[6] A01G 9/02
U.S. Cl. 47—60 9 Claims



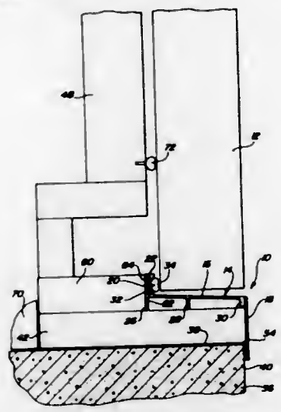
1. The method of uniformly distributing air from a source of air at a first pressure to a zone of air at a lower pressure comprising the steps of:
providing a panel having spaced opposed surfaces defining open entrance ends and open exit ends respectively for passageways extending therethrough;
positioning a plurality of said passageways having spaced conical surfaces extending through said panel located between said source and said zone forming continuously open and uninterrupted conical passageways which are free of obstruction as might produce turbulence spaced across said panel;
providing an included angle of from about 6° to about 20° between opposite side portions of said conical passageways so as to form an angle of natural expansion to thereby minimize the pressure drop and reduce turbulence to provide controlled air flow through said conical passageways of said panel;
sealing spaced areas between said conical surfaces across said panel;
positioning said conical passageways for receiving air through said open entrance ends in said conical passageways expanding the volume of same during its passage through said conical surfaces tapering outwardly in an ever-increasing cross section from said open entrance to said open exit ends entering into said zone of lower pressure thereby delivering a controlled air flow through said open ends into said zone; and
spacing said conical passageways in such close proximity as to substantially reduce boundary layer separation and stalled flow as a result of the effect of air flowing from adjacent passageways producing minimized pressure drop across said panel;
whereby air is distributed across said panel from said source for use in said zone of lower pressure.

5,553,418
DECREASED-TILT FLOWER POT DRAIN
Linda J. Mason, and John P. Mason, both of 24 Woodland Rd., Stone Ridge, N.Y. 12484
Filed Jan. 9, 1995, Ser. No. 370,523
Int. Cl.[6] A01G 31/02
U.S. Cl. 47—79 26 Claims



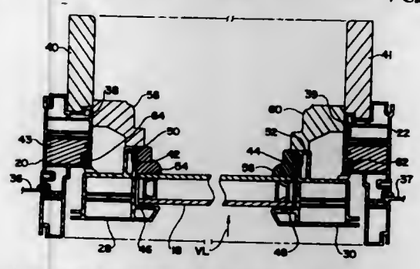
1. A flower pot and drainage reservoir comprising in combination
a flower pot having a bottom with a central axis, and a continuous wall surrounding said bottom with an upper edge and a lower edge secured to said bottom,
a reservoir provided on said bottom of said flower pot generally to one side of said central axis and having two sides, a first side proximate a first portion of said continuous wall and a second side adjacent said central axis, and
a tube extending from said second side of said reservoir toward the upper edge of said continuous wall at a location generally opposite said first portion of said continuous wall whereby tilting said flower pot with said first portion of said continuous wall positioned upper most will cause water to drain from said reservoir through said tube.

5,553,419
DOOR THRESHOLD ASSEMBLY
Thomas E. Jenkins, II, Laguna Niguel, Calif., assignor to Renaissance French Doors & Sash, Inc., Fullerton, Calif.
Filed Jun. 30, 1994, Ser. No. 269,188
Int. Cl.[6] E06B 1/70
U.S. Cl. 49—469 5 Claims



1. A threshold assembly for an exterior swinging door which is installed in a building having a foundation support, said threshold assembly comprising:
a metal saddle having a tread with an interior end and an exterior end, the exterior end having a down turned flange connected thereto, the interior end of the tread having a vertical riser connected thereto, an exterior face of the riser having a slot therein, said saddle being mounted on a top surface of the foundation support adjacent an end surface which is exposed to an exterior environment, said downturned flange extending beyond the top surface of the foundation support to cover any gaps between the saddle and the foundation support surface thereby preventing moisture from entering an interior of the building;
a cap having an exterior side abutting an interior facing side of the riser, said cap having a top surface essentially flush with a top surface of the riser and extending inwardly toward the interior of the building to thereby provide an aesthetically pleasing appearance that blends with the material from which the door is made; and
sealing means in the slot of the riser which abuts a lower interior portion of the door to prevent moisture from entering the interior of the building.

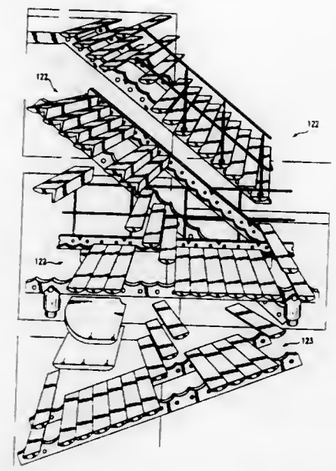
5,553,420
CASEMENT WINDOW
David J. Klimek, Wausau, Wis., assignor to SNE Enterprises, Inc., New York, N.Y.
Filed Aug. 29, 1994, Ser. No. 297,012
Int. Cl.[6] E06B 3/00
U.S. Cl. 49—501 7 Claims



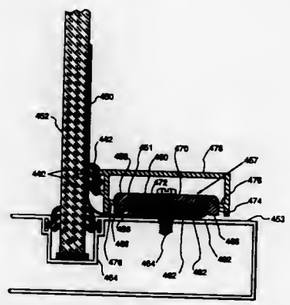
1. A casement style window assembly having a peripheral frame adapted to be secured to a building at an opening and a pane-carrying sash pivotally connected to the peripheral frame, wherein the improvement comprises:
the peripheral frame constructed of a plurality of extruded multi-chambered structural plastic members arranged for exterior exposure and a plurality of decorative wooden members for securement to peripheral frame structural members and arranged for interior exposure;
the sash having a sash frame constructed of a plurality of extruded multi-chambered structural plastic members arranged for exterior exposure and of decorative wooden members for securement to the sash frame structural members and arranged for interior exposure;
the sash having a pane shaped to fit within and be retained by the sash frame;
a plurality of wooden stop members each member constructed to be secured to the sash frame and cooperate in retaining the pane within the sash;
the sash frame structural members forming pane retaining sections, each section having a first leg and a second leg which terminates in an inwardly extending section, the first leg constructed to retain a peripheral side surface of the pane; the second leg constructed to retain a peripheral edge of the pane and for mounting said wooden stop members; and the inwardly extending section and said wooden stop members constructed to engage at least one of said decorative members of the peripheral frame so as to provide a stop to movement of the sash toward the peripheral frame; and
the pane being positioned between and retained by the first leg and the wooden stop members.

5,553,421
STRUCTURAL BUILDING COMPONENTS
Aloth U. Stratford, 31A Frere Road, Vincent, East London, South Africa
Filed May 18, 1994, Ser. No. 245,493
Claims priority, application South Africa, Sep. 11, 1993, 93/1739; Sep. 21, 1993, 93/4422; Sep. 21, 1993, 93/6954
Int. Cl.[6] E04F 11/00
U.S. Cl. 52—182 4 Claims

1. A device adaptable for forming a staircase, walkway and ramp, the device comprising: a stringer which is lengthwise provided with successive, integrally formed, scallops, each of which scallops has a lengthwise shape conforming to an arc of a circle, each scallop begins at the end of a previous scallop on the same longitudinal line of the stringer; and treads, each tread having an integral underside, the integral underside has a co-acting shape to that of the scallops such that the scallops can accommodate at least part of the underside of the tread, wherein each tread has a width which is equal to, or slightly less than, a pitch of the scallops.



5,553,422
GLASS RESTRAINT SYSTEM FOR WINDOWS
Vaden S. Gazaway, 882 Clarkston Dr., San Jose, Calif. 95136
Continuation-in-part of Ser. No. 176,537, Jan. 3, 1994, Pat. No. 5,426,897. This application Mar. 30, 1995, Ser. No. 413,177
Int. Cl.[6] E06B 1/04
U.S. Cl. 52—204.53 19 Claims



1. A glass restraint system for securing a sheet of glass within a frame comprising:
a sheet of flexible plastic film for covering the sheet of glass to be restrained, the film being larger in dimension than the glass sheet so that each edge thereof extends beyond each edge of the glass sheet;
baseplate means having one or more segments with an accumulated length substantially equal to the perimeter of the glass-containing frame and having first and second opposing baseplate sides with captivating grooves running along a substantial part of the length of said baseplate means, said baseplate means being configured to sandwich the bordering portions of the film between it and the frame;

fastening means for fastening said baseplate means to the frame to clamp said bordering portions between said baseplate means and the frame;

cap means of an elongated trough-like shape and of a length sufficient to cover said baseplate means, said cap means having a top portion, a first skirt portion extending from one side of said top portion and having an outer surface facing the glass sheet, and a second skirt portion extending from an opposite side of said top portion, said first and second skirt portions having inwardly protruding ribs configured to be forcibly engaged with said captivating grooves of said baseplate means, whereby the film can be securely fastened between said baseplate means and the frame by said fastening means and said cap means can be snapped into covering engagement with said baseplate means.

5,553,423

MOLDING FOR FRONT GLASS FOR VEHICLES

Katsuhiko Kato, Kitasouma-gun, Japan, assignor to Tokiwa Chemical Industries Co., Ltd., Chiba, and System Technical Co., Ltd., Ibaragi, both of Japan

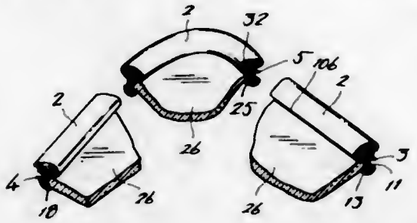
Continuation of Ser. No. 683,175, Apr. 9, 1991, abandoned.

This application Jan. 17, 1995, Ser. No. 373,463

Claims priority, application Japan, Nov. 19, 1990, 2-313464; Nov. 27, 1990, 2-124562

Int. Cl.[6] B60B *3/00; B60R 13/06*

U.S. Cl. 52—204.597 **6 Claims**



1. A front glass molding for a vehicle front glass having opposing side edges each of a first given length, and an upper edge of a second given length, said front glass molding comprising:

a pair of first legs adapted to be disposed on the opposing side edges of the front glass, respectively;

a second leg adapted to be disposed on the upper edge of the front glass;

a head molding mounted in covering relation to said pair of first legs and said second leg;

wherein each of said pair of first legs, said second leg and said head molding are separate and discrete components;

wherein each of said first legs includes a head portion and a leg portion extending perpendicularly and downwardly from said head portion, said leg portion of each of said first legs having a rainwater guiding means formed at an upper end of a first side face thereof for guiding rainwater along said front glass molding, and a glass panel receiving groove defined at a lower end of said first side face thereof;

wherein said second leg includes a head portion and a leg portion extending perpendicularly and downwardly from said head portion, said leg portion of said second leg having a supporting piece formed at a lower end of a first side face thereof such that a glass receiving groove is defined between said supporting piece and said head portion of said second leg;

wherein said head molding has a groove formed longitudinally therealong and opening through a lower surface thereof, and engaging projections are formed on opposing sides, respectively, of said groove and extending toward one another;

wherein said head portions of said first legs and said second leg are inserted into said groove of said head molding;

wherein each of said first legs has a first predetermined length adapted to correspond to the first given length of the opposing side edges of the vehicle front glass;

wherein said second leg has a second predetermined length adapted to correspond to the second given length of the vehicle front glass;

wherein said head molding has a third predetermined length at least corresponding to a total of said first predetermined lengths of said first legs and said second predetermined length of said second leg;

wherein said head molding is formed in an inverted U-shape having an upper portion adapted to extend along the upper edge of the front glass and opposing side portions depending from respective ends of said upper portion and adapted to extend along the opposing side edges, respectively, of the front glass;

wherein said head portions of said first legs are inserted in said groove of said head molding along said opposing side portions of said inverted U-shape of said head molding, respectively, and said head portion of said second leg is inserted in said groove of said head molding along said upper portion of said inverted U-shape of said head molding; and

wherein, for each of said first legs, said rainwater guiding means of said leg portion of said first leg comprises a rainwater guiding ridge formed at an upper end of said first side face of said leg portion of said first leg, a rainwater guiding depression being formed along a side face of said rainwater guiding ridge.

5,553,424

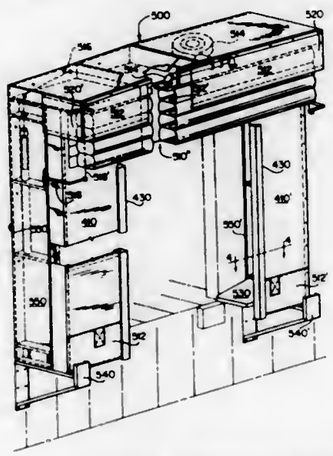
STORAGE TERMINAL SHELTER INCLUDING SIDE CURTAIN AND HEAD BAG ASSEMBLIES FOR TRUCK/TRAILER HINGE GAP AND ROOF CLOSURE

Thomas R. Brockman, Kenton, and Mark Dillon, Upper Sandusky, both of Ohio, assignors to Berwick Industries, Inc., Upper Sandusky, Ohio

Filed Dec. 13, 1994, Ser. No. 355,133

Int. Cl.[6] E04H *14/00*

U.S. Cl. 52—2.12 **3 Claims**



1. A storage terminal having a combination of a dock and a truck shelter wherein opposed rigid shelter side frames project from the dock, opposed mirror image shelter side curtain assemblies for truck hinge gap closure, attached to said rigid shelter side frames comprising:

a) opposed and mirror image truck hinge units, each unit comprising an elongated single leaf hinge, the hinge being fixed and anchored to the outer extremity of the rigid shelter side frame, said hinge unit being restrained by torsion extension-compression means, said hinge having curtain clamping means on a free end of each unit;

b) a reinforced side curtain clamped at a proximal end thereof to the hinge, said side curtain being laterally reinforced by transversely disposed stays and longitudinally reinforced by at least one vertically disposed stay;

c) a compressible hinge gap side frame weather seal, resiliently attached to a distal end of each said side curtain, said seal comprising an elongated, tubular member, formed of a fabric supported sheet which in horizontal cross-section defines a substantially continuous unbroken curved line which is U-shaped and bent upon itself, an inner unbroken leg of the seal being longer than an outer leg thereof, elongated sides of the seal being anchored to a resilient extension of the distal end of the side curtain;

d) an inflatable head bag assembly anchored to a shelter above and between the side frames thereof, whereby upon induced compression from the truck, the head bag assembly reacts in a downward movement to create a complemental seal against the top of the truck.

5,553,425

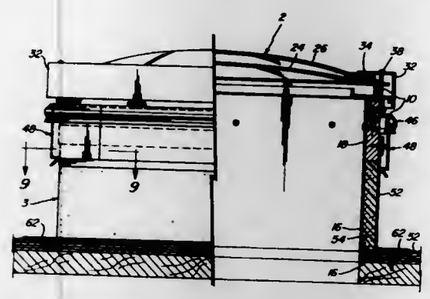
FLASHING AND COUNTERFLASHING

Robert C. Sampson, Alfred, and Sean T. Flanigan, Falmouth, both of Me., assignors to Wasco Products, Inc., Sanford, Me.

Filed Nov. 17, 1994, Ser. No. 341,473

Int. Cl.[6] E04D *13/14;13/03*

U.S. Cl. 52—58 **41 Claims**



1. A skylight apparatus, comprising:

curb frame defining an opening of a building construction;

translucent cover member for covering the opening;

a retainer for securing the translucent member to the curb frame, the retainer including a sill;

a substantially rigid counterflashing piece for providing weather tightness between the sill and the building construction,

said sill having a downwardly-facing channel, having intercoupled first and second sides and a narrowed opening, for receiving the counterflashing piece; and a retaining member, disposed in said channel and engaged between said counterflashing piece and said first side of said channel, said counterflashing piece also being engaged with said second side of said channel so that said counterflashing piece is securely held by a friction force between said counterflashing piece and said second side of said channel.

5,553,426

GRAVESITE ACCESSIBLE MEMORABILIA STORAGE SYSTEM

Denton L. Ostergaard, 11033 Washington St., Omaha, Nebr. 68137

Filed Jun. 28, 1993, Ser. No. 82,792

Int. Cl.[6] E04L *13/00*

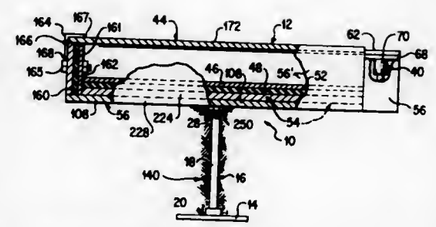
U.S. Cl. 52—103 **10 Claims**

1. A gravesite accessible memorabilia storage system comprising:

A. a container having

1. a lid,

2. a bottom wall beneath the lid,



3. an annular sidewall attached to the bottom wall and extending upward therefrom, the lid being movable toward and away from the sidewall for opening and closing the container, and

4. a hinge means attached between the lid and the sidewall;

B. releasable locking means intercorrelated between the lid and the sidewall, on the opposite side of the container from the hinge, for releasably securing the lid to the sidewall, said locking means comprising

1. a barrel attached to the lid and having a keyhole accessible from the outside of the lid

2. a catch attached to the bottom wall, and

3. a latch, attached to the barrel and releasably engageable with the catch to lock and unlock the lid;

C. a gasket means between the lid and the sidewall, capable of causing the container to be substantially waterproof when locked; and

D. an anchor disposable beneath the container, substantially spaced therefrom, and a means for connecting the anchor to the container, for deterring theft of the container.

5,553,427

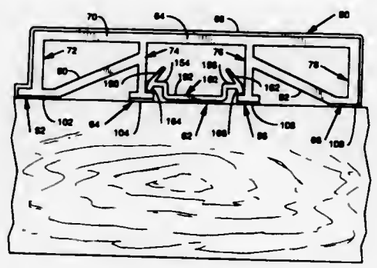
PLASTIC EXTRUSIONS FOR USE IN FLOOR ASSEMBLIES

Thomas Andres, North Versailles, Pa., assignor to Thermal Industries, Inc., Pittsburgh, Pa.

Filed Mar. 1, 1995, Ser. No. 397,002

Int. Cl.[6] E04F *15/22*

U.S. Cl. 52—177 **9 Claims**



1. A floor assembly which is secured to a rigid underlying support, said floor assembly comprising:

a plurality of elongated extrusions, each said extrusion including a pair of outer leg members and a pair of inner leg members, each said inner leg member including a foot section having a portion thereof in substantial contact with said rigid underlying support;

a snap connector having an elongated base portion and a pair of flanges attached to opposed major sides of said base portion, said flanges extending outwardly from said base and defining, along with said rigid underlying support, a recessed space that receives said foot section; and

said inner leg members are made of a resilient material and bend outwardly when said extrusion is pressed onto said snap connector and then snap inwardly to interlock with said snap

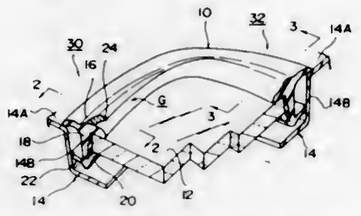
connector in order to secure said extrusion to said snap connector and said rigid underlying support.

5,553,428

MOLDING FOR A FRONT GLASS

Koji Watanabe; Toru Sugita; Yasutomo Kobayashi; Masaharu Shibao, and Akimitsu Mita, all of Yokohama, Japan, assignors to Nifco Inc., Japan

Filed Nov. 1, 1993, Ser. No. 143,781
Claims priority, application Japan, Nov. 4, 1992, 4-295137
Int. Cl.[6] E06B *3/62*; **B60J** *10/00*
U.S. Cl. 52—208 **13 Claims**



1. A molding for mounting in a gap between an outer periphery of a front glass and a window frame of an automobile, comprising:

a section of material including a first pillar section extending into a first corner section, and a second pillar section extending into a second corner section, the corner sections being interconnected via a roof section, a cross-section of said section of material comprising (i) a leg portion having an upper end and first and second opposite sides, said leg portion being adapted to be received in a gap between an outer periphery of a front glass and a window frame of an automobile; (ii) a head portion extending from the upper end of the leg portion and overhanging the leg portion, said head portion being adapted to traverse the gap and including upper and lower surfaces; (iii) a glass lip projecting from the first side of the leg portion, whereby the molding is adapted to receive the outer periphery of the front glass between the glass lip and the lower surface of the head portion; (iv) a panel lip projecting from the second side of said leg portion, said panel lip being adapted to elastically abut and engage the window frame; and (v) a groove lip extending over a length of each of the pillar sections, said groove lip projecting from the upper surface of the head portion, wherein

a height of the groove lip above the head portion becomes gradually shorter as said groove lip extends to the respective corner section, said leg portion, said head portion, said glass lip, said panel lip and said groove lip are integrally extrusion molded, and said groove lip is comprised of a material that is different from the respective materials of the leg portion, the head portion, the glass lip and the panel lip.

5,553,429

BI-DIRECTIONAL BUILDING ARRANGEMENT

Jerry W. Schuster, 902 Queensbury Cir., Durham, N.C. 27713

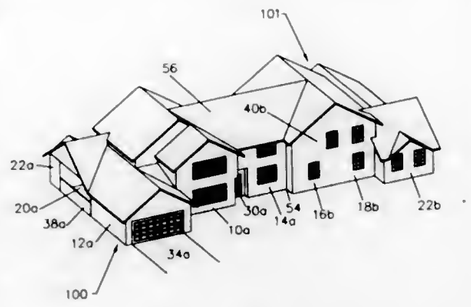
Filed Aug. 10, 1994, Ser. No. 288,922
Int. Cl.[6] E04H *1/04*
U.S. Cl. 52—234 **16 Claims**

1. A bi-directional building arrangement comprising:

(a) a composite building structure including exactly two separate units having a common wall assembly therebetween,

(b) said separate units being arranged wherein the main entry of the first unit is substantially on the opposite side of the building from the second unit,

(c) said common wall assembly comprises a minimum of three individual wall segments all joined together to bisect the structure, thereby providing a continuous common wall between said separate units.

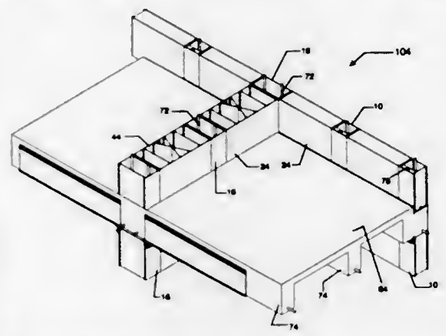


5,553,430

METHOD AND APPARATUS FOR ERECTING BUILDING STRUCTURES

Anton B. Majnaric, Copley, and William M. Bjerke, Hudson, both of Ohio, assignors to Majnaric Technologies, Inc., Copley, Ohio

Filed Aug. 19, 1994, Ser. No. 293,038
Int. Cl.[6] E04B *2/00*; *5/00*
U.S. Cl. 52—236.8 **19 Claims**



1. A building structure, comprising:

a first plurality of wall panels;

a second plurality of column connectors interposed between and among selected ones of said wall panels and interconnecting said selected ones of said wall panels;

a third plurality of wall caps extending over top surfaces of said wall panels and column connectors, said plurality of wall caps having a side plate extending upwardly therefrom; and

a fourth plurality of floor form assemblies received by and extending from said wall caps, wherein a top surface of said floor form assemblies receives concrete at a fixed thickness established by said side plate.

5,553,431

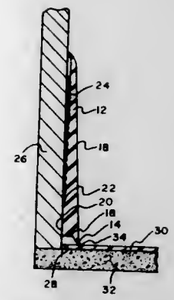
COVE BASE WITH ANTIMICROBIAL AGENT AND METHOD FOR INSTALLING THE SAME

Frank Pelosi, Jr., and Lee J. Pelosi, both of 32 Orchard La., Marlton, N.J. 08053

Filed May 25, 1994, Ser. No. 249,795
Int. Cl.[6] E04F *19/04*
U.S. Cl. 52—287.1 **11 Claims**

1. A cove base adapted to be secured to a wall base and to cooperate with the outer edges of a floor covering to give the floor covering a finished look when installed, said cove base comprising:

an elongated substantially flat member having a height dimension which is substantially greater than the thickness thereof and including an antimicrobial agent carried by said member, said antimicrobial agent being capable of being slowly released from said member over an extended period of time.

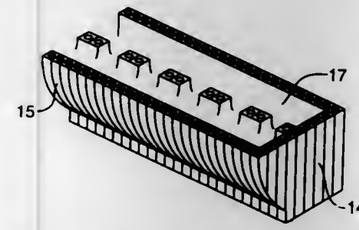


5,553,432

HORIZONTAL FORMING BLOCK WITH CURVED SIDE WALL FOR ARCHITECTURAL STRUCTURES

Michael Levin, 701 Brickell Ave., Suite 2600, Miami, Fla. 33131

Filed Sep. 9, 1994, Ser. No. 303,536
Int. Cl.[6] E04C *1/41*
U.S. Cl. 52—309.12 **15 Claims**



1. A curved block formwork element for use in forming structures, comprising:

a substantially rectangular shaped block having two oppositely disposed side walls and two oppositely disposed end walls creating a hollow cavity inside, wherein a first of said side walls comprises a flat surface and a second of said side walls comprises a curved surface, said curved surface of said side wall comprising a quarter circular element having a closed circular bottom and an open horizontal top;

means for vertically interlocking said block with a plurality of rectangular block formwork elements along a top and bottom surface of said block; and

means for horizontally interlocking said blocks.

5,553,433

FURRING APPARATUS AND METHOD FOR APPLYING SAME TO CYLINDRICAL COLUMNS

William M. Lang, 11 Shelter Harbor Ct., Wading River, N.Y. 11792

Filed Dec. 30, 1993, Ser. No. 174,329
Int. Cl.[6] E04C *3/30*; **E04B** *1/94*
U.S. Cl. 52—483.1 **13 Claims**

1. A furring apparatus in combination with wallboard and a cylindrical column, comprising:

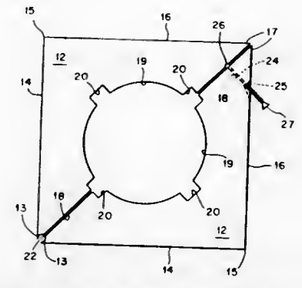
a plurality of means spaced along a cylindrical column for mounting said wallboard, with each of said means surrounding said column and secured thereon;

each said means comprising a pair of generally triangular support members, each having two sides which define a pair of outer walls joined at a first corner and a third side defining an inner wall joined at opposite ends to said first two sides at a second and third corner, respectively, said third side having a generally semicylindrical channel formed therein configured and dimensioned to allow receipt of the same about said cylindrical column in close fitting relationship thereto;

hinge means for hingeably securing said support members together at said second corners thereof so as to allow said members to be pivoted between a closed position in which said inner sides of said members abut one another and are disposed with said channels thereof positioned to allow receipt of the same about said cylindrical column in close fitting relationship thereto, and an open position, in which said inner sides of said members and said third corners thereof are pivoted apart from one another;

fastening means for fastening said support members together when in said closed position at a point adjacent to said third corners thereof so as to permit said members to be securely fastened on the column; and

corresponding outer walls of said support members being aligned with each other and accommodating wallboard being mounted thereon.

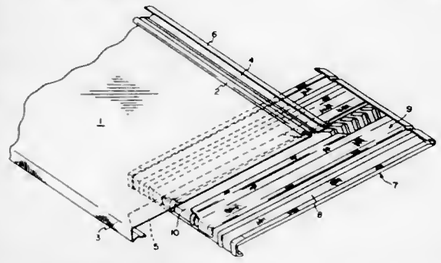


5,553,434

PLATE FOR CONNECTING ELONGATED PLATES

Tadao Tamura, Fujisawa, Japan, assignor to Kabushiki Kaisha Chugiken, Kanagawa, Japan

Filed Aug. 31, 1994, Ser. No. 298,191
Int. Cl.[6] E04D *1/34*; **E04B** *1/38*
U.S. Cl. 52—545 **2 Claims**



1. A metal plate for sequentially connecting elongated metal plates, comprising:

a central connection portion formed by turning up two ends of a rectangular metal plate to cause said two ends to approach while maintaining a small gap so that a flat-pipe-like shape is formed and by slightly cutting ends of two turned members above said gap so that a wide gap is formed;

a base which is wider than said central connection portion and to which said central connection portion is bonded to the upper surface of the central portion of the base;

drain boards formed by slightly backwards bending two ends of said base;

a portion for joining an upper last elongated plate formed by

wardly for abutment with said front face of said adjacent

5,553,437

STRUCTURAL BEAM

a portion for joining an upper last elongated plate formed by upwards bending an upper portion of said base;

a portion for joining a lower following elongated plate roof formed by downwards bending a lower portion of said base into a L-shape; and

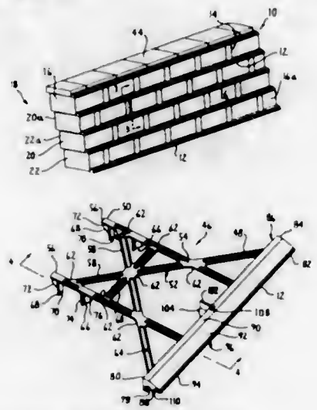
an insertion member formed by downwards bending a lengthwise end of each of said elongated plates, said insertion members being inserted into said central gap of said central connection portion from two directions so that the connection is established.

5,553,435

BLOCK SPACER SYSTEM

Jon H. Eickhoff, 2330 Plymouth La., Kalamazoo, Mich. 49008

Filed Dec. 9, 1994, Ser. No. 353,435
Int. Cl.[6] E04B *1/21*
U.S. Cl. 52—698 **31 Claims**



1. A mortarless wall structure, comprising:

a plurality of blocks arranged end to end in a lateral direction so as to form a lower tier and an upwardly adjacent upper tier of the mortarless wall structure, each said block of said upper and lower tiers having a rear face facing in a rearward direction transverse to said lateral direction and a front face facing in a forward direction opposite said rearward direction, said front faces of said blocks defining an outward facing surface of the mortarless wall structure; and

a block spacer system for locating and supporting said blocks having at least one block spacer member, said block spacer member comprising:

a base support member having a first end positioned toward said front face of said blocks of said wall structure in said forward direction, a second end positioned in said rearward direction, a bottom surface positioned on top of at least one of said blocks of said lower tier downwardly adjacent thereto, and a top surface adapted to support at least one of said blocks of said upper tier upwardly adjacent thereto;

position determining means between said first and second ends of said base support member for operatively interconnecting with said downwardly adjacent block of said lower tier for preventing at least forward displacement of said base support member when positioned on said lower tier; and

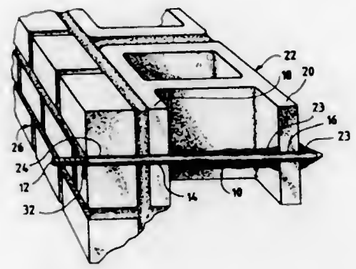
a frontal support member at said first end of said base support member having a first end and a second end which are oriented proximate said front face of said downwardly adjacent block of said lower tier when said position determining means is in interconnecting relation with downwardly adjacent said block, said frontal support member having a front surface, a bottom surface, and an upstanding locator wall surface which are disposed forwardly of said adjacent block of said upper tier, said upstanding locator wall facing rearwardly for abutment with said front face of said adjacent block of said upper tier to define a forward locator position for said upper tier and prevent forward displacement of said upper tier relative to said lower tier, at least a portion of said bottom surface of said frontal support member extending coplanar from said bottom surface of said base support member.

5,553,436

SCREEN FOR ANCHORING A FASTENER TO A HOLLOW BLOCK WITH AN ADHESIVE

Frederick A. Kish, Wheeling; Michael A. Rancich, Mundelein; Richard J. Ernst, Palatine, and Mark S. Timmerman, Elgin, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Sep. 16, 1994, Ser. No. 280,088
Int. Cl.[6] E04C *5/00*
U.S. Cl. 52—704 **25 Claims**



6. A screen assembly for anchoring a fastener within a wall structure having first and second apertures defined therein, comprising:

a screen member, comprising a plastic material for resisting corrosion, having an elongated tubular portion, first and second opposite ends, and a substantially uniform diameter along its length, said second end of said screen member being open so as to permit adhesive to be deposited into said screen member, and said first end of said screen member having a substantially conical configuration for facilitating insertion of said screen member into and through said first and second apertures of said wall structure, and being closed such that when a fastener is inserted into said screen member, said adhesive, disposed within said screen member, will be prevented from being axially discharged from said substantially conical end of said screen member and will be forcedly discharged radially through mesh portions of said elongated tubular portion of said screen member so as to fixedly bond said screen member and said fastener to said wall structure;

at least one reinforcement portion provided along substantially the entire length of said elongated tubular portion of said screen member so as to impart a sufficient amount of rigidity to said screen member such that said elongated tubular portion of said screen member is able to be inserted within said first aperture of said wall structure and to maintain said amount of rigidity so as to permit insertion of said screen member into said second aperture of said wall structure; and

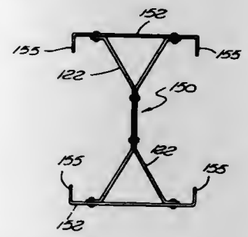
a sleeve member, including a pull tab, disposed about at least a portion of said screen member for enabling proper, easy filling of said screen member with said adhesive, and clean installation of said screen member into and through said first and second apertures of said wall structure after removal of said sleeve member from said screen member.

5,553,437

STRUCTURAL BEAM

Ram Navon, 1347 Alta Vista #11, Los Angeles, Calif. 90046

Continuation-in-part of Ser. No. 948,389, Sep. 21, 1992, which is a continuation-in-part of Ser. No. 674,549, Mar. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 518,554, May 3, 1990, abandoned. This application May 3, 1994, Ser. No. 238,213
Int. Cl.[6] E04C *3/30*
U.S. Cl. 52—729.1 **9 Claims**



1. An elongate structural member for building construction consisting of four members and comprising:

a pair of web members each having a center section that is substantially planar, each said web member having a height dimension that is substantially identical and each said center section having a height that is at least approximately fifty percent of said height dimension, each center section having first and second ends extending the length of said structural member, each center section having a leg extending at an acute angle from each of said ends, each pair of legs of each center section having an outer end and a flange mount extending from said respective outer end with said flange mounts of a said center section extending parallel to each other, said center sections being joined together directly and without any intermediate article at spaced apart locations along the length of said structural member with said flange mounts of said respective legs, which diverge from the corresponding ends of said respective center section, extending substantially in the same plane to define a respective first and a second mounting pair,

a first and a second plate member, one of said plate members being attached to said first mounting pair of flange mounts extending in said same plane and the other of said plate members being attached to said second mounting pair of flange mounts extending in the respective same plane, each plate member having opposite side edges, said side edges of one of said plate members being bent toward said other plate member and said side edges of the other of said plate member being bent toward said one plate member, said plate members including said bent side edges having substantially the same width dimension with said width dimension being of such an extent that said bent side edges are spaced from said respective flange mounts.

5,553,438

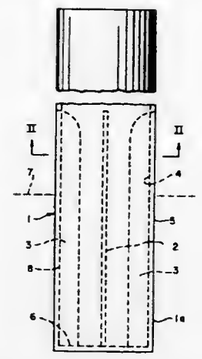
METHODS OF EXTENDING WOOD POLE SERVICE LIFE

Wu-Hsiung E. Hsu, Ottawa, Canada, assignor to Forintek Canada Corp., Vancouver, Canada

Filed Jul. 18, 1994, Ser. No. 276,249
Int. Cl.[6] E04C *3/36*
U.S. Cl. 52—736.4 **11 Claims**

1. A wooden pole that is adapted to be erected with a bottom end section thereof buried in the ground, comprising:

slot means extending longitudinally of the pole over substantially the entire length of said bottom end section to a distance that will extend at least two feet above ground level when said pole is installed, said slot means comprising slot portions that open from the peripheral surface of the pole at a plurality of locations spaced angularly about said peripheral surface, each said slot portion penetrating said pole to a depth of at least 2 inches, and at least some of said slot portions penetrating at least half the distance from said peripheral surface to the center of the pole, said pole, including surfaces thereof that define said slot means, being impregnated with rot-inhibiting preservative, the entire bottom end section including the lower end surface of the pole to a height beyond the location of said slot means being enveloped in a non-degradable shell that is bonded to the peripheral and lower end surfaces of the pole to provide a barrier to the passage of liquids, fungus, bacteria, or insects.

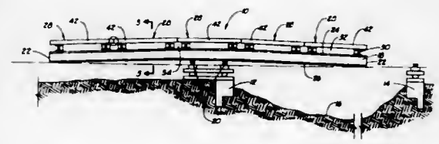


5,553,439

COMPOSITE, PRESTRESSED STRUCTURAL MEMBERS AND METHODS OF FORMING SAME

Stanley J. Grossman, 10408 Greenbriar Pl., Oklahoma City, Okla. 73159

Continuation-in-part of Ser. No. 14,852, Feb. 8, 1993, Pat. No. 5,305,575, which is a division of Ser. No. 884,418, May 18, 1992, Pat. No. 5,301,483, which is a division of Ser. No. 662,467, Feb. 28, 1991, Pat. No. 5,144,710. This application Apr. 25, 1994, Ser. No. 233,114
Int. Cl.[6] E04C *3/26;3/294*
U.S. Cl. 52—745.2 **12 Claims**



1. A method of constructing a prestressed structural member comprising the steps of:

positioning a plurality of girders in position such that opposite ends thereof are supported, said girders extending in a longitudinal direction;

supporting a substantially central portion of said girders such that at least a portion of a lower flange of the girders is placed in compression;

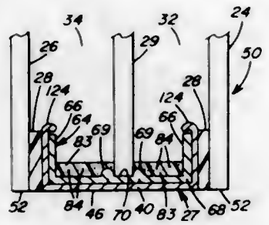
positioning a deck unit adjacent to upper portions of said girders; and

attaching said deck unit to said girders to form a complete structural member such that when support of said central portion is removed, at least a portion of said deck unit is placed in compression in said longitudinal direction.

5,553,440
MULTI-SHEET GLAZING UNIT AND METHOD OF MAKING SAME

Mark L. Bulger, McCandless Township, Allegheny County, and Albert E. Thompson, Jr., Allegheny Township, Westmoreland County, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 20, 1994, Ser. No. 326,565
Int. Cl.[6] E04C *2/54*
U.S. Cl. 52—786.13 **27 Claims**

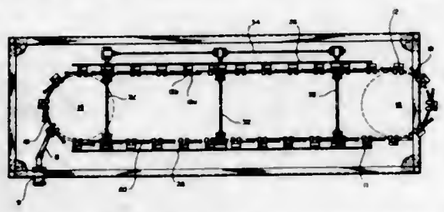


1. A multi-sheet glazing unit comprising:
a spacer frame having a base, a first upright leg connected to the base and a second upright leg connected to the base and spaced from the first upright leg, the first and second upright legs and the base having a generally U-shaped configuration, the base having a first surface and a second surface opposite to the first surface with the second surface facing interior of the spacer frame, the first and second upright legs each having a surface facing away from the interior of the spacer frame defined as an outer surface;
a pair of outer sheets, one of the outer sheets secured to the outer surface of the first upright leg and the other one of the outer sheets secured to the outer surface of the second upright leg;
a sheet retaining member having a first surface and a second surface opposite to the first surface, the first surface having edge retaining means, the sheet retaining member being between the upright legs of the spacer frame with the second surface of the sheet retaining member facing the second surface of the base, and
a third sheet having marginal and peripheral edges wherein the edge retaining means of the sheet retaining member engages portions of the marginal and peripheral edges of the third sheet to position the third sheet within the spacer frame spaced from the outer sheets.

5,553,441
CARTON CONVEYOR AND LOADING APPARATUS WITH ADJUSTABLE GUIDE MEMBERS

Thomas L. Ivansco, Jr., Hoffman Estates; Robert S. Kilian, Franklin Park, both of Ill., and Phillip M. Elliott, Kenosha, Wis., assignors to The Paxall Group, Inc., Skokie, Ill.

Filed Nov. 7, 1994, Ser. No. 336,671
Int. Cl.[6] B65B *59/00*
U.S. Cl. 53—249 **9 Claims**

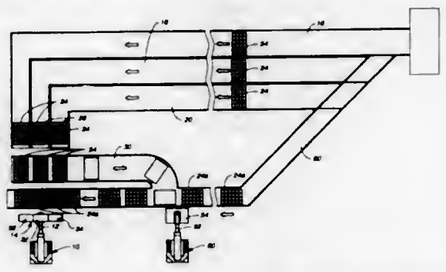


1. A carton conveyor and loading apparatus in which cartons are vertically oriented and upwardly open when loading and in which cartons are transported from receiving station to a filling station and to a carton discharge station comprising:
means defining an endless pathway in a generally horizontal plane;
an endless carton conveyor for transporting cartons from a first location to a second location and back toward the first location:
a first and a second generally horizontal longitudinally extending parallel guide members for fixing the position of carton as it is transported along a portion of said pathway with said first of said guide members fixed in position with respect to said pathway and with said second of said guide members adjustable inwardly and outwardly with respect to said first guide member for accommodating cartons of different thicknesses;
an intermediate member essentially equally spaced from said first and said second guide rails and carton finishing apparatus disposed on said intermediate members; and
means for simultaneously moving said intermediate member and said second of said guide rails laterally with respect to said first guide rail so that the distance moved by said intermediate member is one half of the distance moved by said second of said guide rails.

5,553,442
ROBOTIC SYSTEM FOR MIXING ARTICLES IN CONTAINERS

Saadat Fadaie, Antioch, Calif., assignor to James River Paper Company, Inc., Richmond, Va.

Filed Oct. 6, 1994, Ser. No. 319,160
Int. Cl.[6] B65B *35/36*
U.S. Cl. 53—445 **12 Claims**

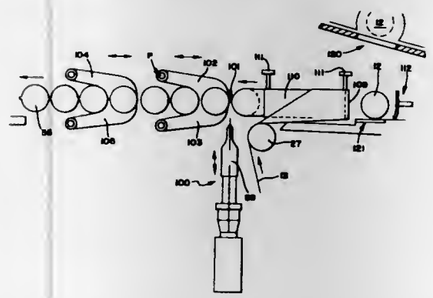


1. A method of mixing articles having differing physical characteristics in a plurality of containers, said method comprising the steps of:
conveying a first set of containers to a mixing station, at least one container of said first set of containers containing a plurality of articles having physical characteristics differing from physical characteristics of a plurality of articles in other containers of said first set of containers, said plurality of articles in at least one of said plurality of containers of said first set of containers being disposed in a plurality of rows;
transporting a second set of containers to said mixing station, each of said containers of said second set of containers defining a space for accommodating a layer of articles;
at said mixing station, substantially simultaneously removing at least one row of articles from each of the containers of said first set of containers;
at said mixing station and after said removal step, moving the rows of articles removed from the containers of said first set of containers relative to one another to consolidate said rows;
substantially simultaneously inserting the removed and consolidated rows of articles into at least one container of said second set of containers at said mixing station to at least partially form a layer of articles therein comprised of a mix of articles from all the containers of said first set of containers;
introducing empty containers from said first set of containers into said second set of containers after all of the articles have been removed from containers at said mixing station, at least some of the containers of said second set of containers comprising supplemental containers transported to said mixing station from a source of supplemental containers completely filled with articles;
partially emptying the completely filled supplemental containers at a predetermined location spaced from said mixing station by removing articles therefrom; and
transporting the partially emptied supplemental containers from said predetermined location to said mixing station.

5,553,443
METHOD FOR CREATING STRINGS OF POCKETED COIL SPRINGS

Albert R. St. Clair, Lilburn, and Paul H. Brannock, Duluth, both of Ga., assignors to Simmons Company, Atlanta, Ga.

Division of Ser. No. 304,921, Aug. 15, 1994. This application Jun. 5, 1995, Ser. No. 461,111
Int. Cl.[6] B65B *9/06;63/02;63/08*
U.S. Cl. 53—450 **6 Claims**



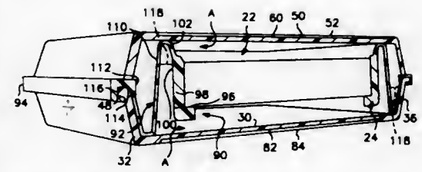
1. A method for creating a string of pocketed coil springs, comprising the steps of:
a) forming a tube of fabric;
b) inserting a coil spring within said tube;
c) gripping said coil spring and said fabric with jaw members having generally semicylindrical surfaces structured and dimensioned to engage said coil spring and to enable wrapping of said fabric around said coil spring and envelop said spring with fabric;
d) welding a transverse seam across said tube of fabric to partially form a pocket in said fabric for containing said coil spring;
e) indexing said jaws to likewise index said spring and fabric; and
f) releasing said jaws from said spring and fabric.

5,553,444
STORAGE CONTAINER FOR A MEMORY DEVICE AND METHOD OF MAKING

Craig Lovecky, Old Orchard Beach; Richard Rolfe, Biddeford, both of Me.; Alan B. Lowry, Canton, Mass., and Robert Steller, Old Orchard Beach, Me., assignors to Shape Inc., Biddeford, Me.

Filed Sep. 15, 1994, Ser. No. 306,466
Int. Cl.[6] B65B *23/00;* **B65D** *81/16*
U.S. Cl. 53—453 **44 Claims**

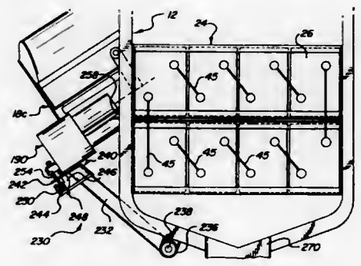
28. A method for forming a storage container for a sensitive device, comprising the steps of:
molding a base and a cover from a first material, each having a perimeter, and a separate tray from a second more resilient material, the tray having a receptacle for the sensitive device and a perimeter; and
placing the tray in the base such that the perimeter of the tray is connected to and extends beyond the perimeters of the base and cover, and the receptacle is spaced from the cover and base.



5,553,445
RIDING MOWER WITH SWINGOUT CENTER MOWER HEAD

Mark E. Lamb, and David E. Merchant, both of Lincoln, Nebr., assignors to Ransomes America Corporation, Lincoln, Nebr.

Division of Ser. No. 418,936, Apr. 7, 1995, which is a division of Ser. No. 191,553, Feb. 3, 1994, Pat. No. 5,406,778. This application Oct. 10, 1995, Ser. No. 541,922
Int. Cl.[6] A01D *34/44;34/58*
U.S. Cl. 56—7 **7 Claims**



1. A gang mower comprising:
a frame member supported upon a plurality of ground engaging wheels;
a prime mover adapted to provide driving torque to at least one of the ground engaging wheels; and
a plurality of reel-type lawn mowers supported from the frame, at least one of the reel type lawn mowers being secured to an arm member having first and second ends, the first end being secured to the reel-type mower, and the send end being pivotally secured to the frame member such that the one reel type lawn mower may be moved from an operative position below the frame member to a service position adjacent the frame member.

5,553,446
APPARATUS FOR BALING BULK FIBROUS MATERIAL

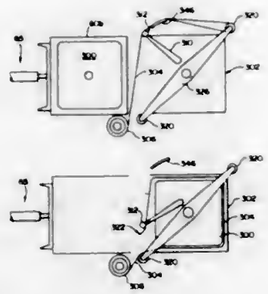
Duane L. Sibley, H.C.R. 67 Box 169, and Dwight A. Sibley, H.C.R. 67 Box 161, both of Nashua, Mont. 59248

Continuation-in-part of Ser. No. 32,645, Mar. 17, 1993, Pat. No. 5,337,481. This application Dec. 28, 1994, Ser. No. 365,152
Int. Cl.[6] A01F *15/02;* **B65B** *11/02;13/02*
U.S. Cl. 56—341 **20 Claims**

1. Apparatus for forming fibrous bulk material or the like into bales which comprises bale forming means for forming said material into an elongated continuous mass and bale wrapping means

on said low pressure turbine being connected to said low pressure compressor by a second shaft except that said derivative gas turbine engine is characterized by the absence of said

normal first level of cooling during at least a portion of the descent operative condition of the aircraft;



for receiving said mass of material from a discharge end of said bale-forming compartment and wrapping said mass into discrete bales;

said bale forming means comprising a bale-forming compartment with an infeed end and a discharge end, and material flow restricting means located between the infeed and discharge ends for resisting the movement of said mass of material; auger feeding means oriented longitudinally in line with said bale-forming compartment for cooveying said material into the infeed end of said bale-forming compartment; and compacting roller means oriented transverse to said bale-forming compartment and so constructed and arranged with respect to said auger feeding means and the infeed end of said bale-forming compartment so that material is conveyed through said compacting roller means into said bale-forming compartment and distributed arcuately against the adjacent end of said mass of material, said compacting roller means and said material flow restricting means cooperatively functioning to create said mass of material in a compacted condition with material being added to said mass of material at the bale-forming compartment infeed end and compressed thereinto by said compacting roller means;

said bale wrapping means comprising a bale transfer compartment oriented in line with said bale-forming compartment and in communication with said bale-forming compartment discharge end for receiving said compacted mass of material, and material flow resisting means for resisting the movement of said mass of material from said bale-forming compartment into said bale transfer compartment so as to maintain the mass of material in said bale transfer compartment in a state of compaction; plastic film wrap-applying means for wrapping discrete bales in a sheet of plastic film; and bale transfer means for transferring discrete bales from said bale transfer compartment into said wrap-applying means.

5,553,447

COUPLER OF A RAKE

Shih-Hao Hsu, No. 426, Dou Yen East Road, Her Fong Village, Bi Tou Hsiang, Chang Hua Hsien, Taiwan

Filed Jun. 12, 1995, Ser. No. 489,556

Int. Cl.[6] A01D *7/04*; **F16B** *7/10*

U.S. Cl. 56—400.18 **2 Claims**

1. A rake comprising:

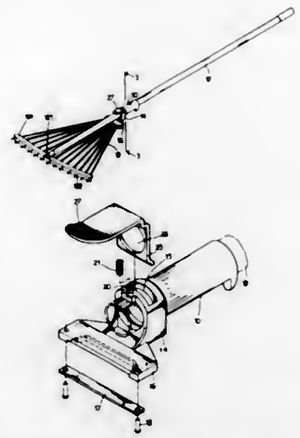
a tube including a bore formed therein and including a first end having a puncture formed therein,

a handle slidably engaged in said tube,

a plurality of tines including a first end secured to said first end of said tube and including a middle portion and a second end,

a plate engaged in said puncture of said tube and including an opening formed therein and defined by a peripheral edge, said handle being inserted through said opening and selectively engageable with said peripheral edge of said opening, said plate including a knob means provided thereon for moving said plate relative to said handle, and

means for biasing said plate to engage with said handle so as to secure said handle to said tube,



said handle being disengaged from said plate when said plate is moved against said biasing means by said knob means.

5,553,448

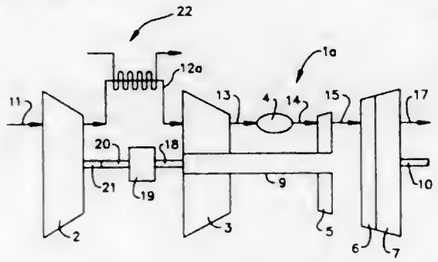
INTERCOOLED GAS TURBINE ENGINE

William M. Farrell, and Gary L. Leonard, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 139,329, Oct. 20, 1993, abandoned, which is a continuation of Ser. No. 883,322, May 14, 1992, abandoned. This application Sep. 6, 1994, Ser. No. 301,363

Int. Cl.[6] F02C *1/06*

U.S. Cl. 60—39.161 **19 Claims**



1. A derivative gas turbine engine derived from a non-intercooled gas turbine engine designed for a specified non-intercooled Brayton engine cycle comprising:

a low pressure compressor;

a high pressure compressor disposed downstream of said low pressure compressor;

a combustor disposed downstream of said high pressure compressor in direct flow communication therewith;

a high pressure turbine disposed downstream of said combustor and connected to said high pressure compressor by a first shaft;

a low pressure turbine disposed downstream of said high pressure turbine in flow communication therewith;

said low pressure compressor, high pressure compressor, combustor, high pressure turbine, and low pressure turbine originating from said non-intercooled engine and being effective for operating in said non-intercooled cycle having a specified design point for combustion gases discharged from said combustor into said high pressure turbine, said design point including a design temperature, a design pressure, and a design mass flow, and said non-intercooled cycle being based on said low pressure turbine being connected to said low pressure compressor by a second shaft except that said derivative gas turbine engine is characterized by the absence of said second shaft;

said low pressure compressor instead being connected to said high pressure compressor by a speed reduction gear box for driving said low pressure compressor at a lower speed than said high pressure compressor;

an intercooler disposed in flow communication between said low pressure compressor and said high pressure compressor for cooling compressed air discharged from said low pressure compressor and provided to said high pressure compressor to reduce horsepower required for said high pressure compressor;

said combustor being effective for providing additional heating by additional fuel so that said intercooled cycle includes at least said design point of said non-intercooled cycle, and said high pressure turbine is effective for producing about the same horsepower as in said non-intercooled cycle and for powering both said high pressure compressor and said low pressure compressor at said design point, with horsepower developed in said low pressure turbine being available for powering a load.

5,553,449

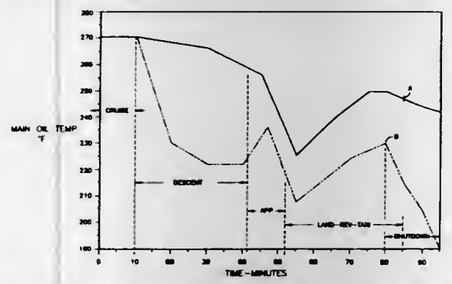
METHOD OF OPERATING A GAS TURBINE ENGINE POWERPLANT FOR AN AIRCRAFT

Joseph H. Rodgers, Vernon, and Robert F. Kasprow, Wethersfield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1993, Ser. No. 171,143

Int. Cl.[6] F02C *7/06;7/12*

U.S. Cl. 60—204 **11 Claims**



1. A method of operating a powerplant for powering an aircraft, the powerplant including a turbofan gas turbine engine including a lubricating system for the engine having a lubricating fluid and having a cooling system for the lubricating fluid, the powerplant further including 1) a nacelle which extends circumferentially about the engine and which is spaced from the engine leaving a core compartment therebetween, and 2) a source of cooling air external of the core compartment which is in flow communication with the cooling system for the lubricating fluid, the aircraft further having several operative conditions, each operative condition having a first level of cooling for the core compartment and the lubricating fluid which is associated with normal operation, the normal operative conditions including a cruise operative condition, a descent operative condition, a landing operative condition, a fan reverser operative condition, a taxi operative condition and a deplaning operative condition, the engine having a component having a failure operative mode and having means for sensing the failure operative mode of the component and which controls the level of cooling for the lubricating fluid, comprising the steps of:

detecting a failure operative mode of a component by sensing a failure signal from the component with the means for sensing the failure operative mode of the component; and,

providing a second amount of cooling to the lubricating fluid which is greater than the amount of cooling to achieve the normal first level of cooling during at least a portion of the descent operative condition of the aircraft;

wherein the additional cooling provided reduces the temperature of the interior of the core compartment and the component having the failure operative mode to provide access to and replacement of the component earlier than if only the first level of cooling were provided at the operative conditions of the engine.

5,553,450

METHOD AND APPARATUS FOR JUDGING THE FUNCTIONING OF A CATALYTIC CONVERTER

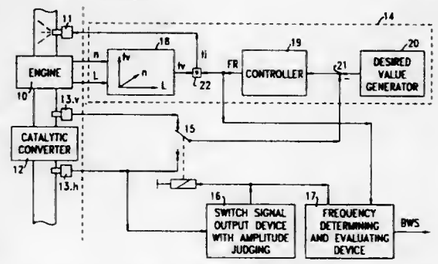
Eberhard Schnaibel, Hemmingen; Erich Schneider, Kirchheim, and Frank Blischke, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 31, 1994, Ser. No. 331,761

Claims priority, application Germany, Nov. 5, 1993, 43 37 793.9

Int. Cl.[6] F01N *3/20*

U.S. Cl. 60—274 **8 Claims**



1. A method of judging a functioning of a catalytic converter in an exhaust-gas line of an internal combustion engine, with a first oxygen probe arranged in front of the catalytic converter and a second oxygen probe arranged behind the catalytic converter, comprising the steps of:

a) performing a first two-position mixture control for the engine with a first signal of the first probe as a first actual control signal;

b) judging any control oscillation detected by the second probe behind the catalytic converter;

c) performing a second two-position mixture control for the engine with a second signal of the second probe as a second actual control signal, upon detecting a control oscillation of the second signal which satisfies a predetermined signal amplitude condition;

d) determining a control frequency of the second two-position mixture control;

e) comparing the control frequency to a frequency threshold value; and

f) indicating that the catalytic converter is not functioning properly if the control frequency is greater than the frequency threshold value.

5,553,451

ELECTRICALLY HEATED CATALYTIC CONVERTER SYSTEM FOR AN ENGINE

Kenichi Harada, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

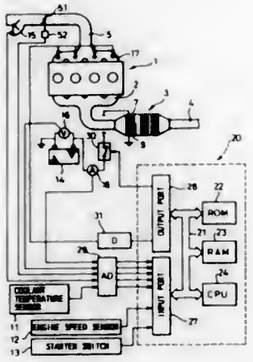
Filed May 16, 1995, Ser. No. 441,854

Claims priority, application Japan, May 30, 1994, 6-116679

Int. Cl.[6] F01N *3/10*

U.S. Cl. 60—277 **8 Claims**

5. A method for controlling an electrically heated catalytic converter system for an engine having an exhaust passage, comprising the steps of:



a) controlling an electricity supply to supply electricity to an electric heater for a predetermined time period after the engine starts, to thereby increase the temperature of the catalytic converter;

b) detecting that a failure has occurred in controlling the electricity supply such that the electricity supply continues to supply electricity to the electric heater after said predetermined time period has lapsed; and

c) suppressing an excessive temperature rise of the catalytic converter when detecting a failure in controlling the electricity supply.

5,553,452

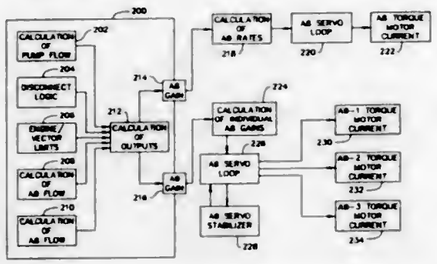
CONTROL SYSTEM FOR A JET ENGINE HYDRAULIC SYSTEM

Barton H. Snow, Wyoming; David M. Leighton, Loveland, and Michael J. Steckler, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 86,069, Jul. 6, 1993, Pat. No. 5,379,585. This application Oct. 11, 1994, Ser. No. 321,343

Int. Cl.[6] F16D *31/02*

U.S. Cl. 60—327 **2 Claims**



1. A method for controlling output of multiple hydraulic loads of a pump to a plurality of actuation systems with associated actuators, the method comprising the steps of:

generating control signals for maintaining total flow of hydraulic fluids to the actuators; and

controlling rates of change of each of the multiple hydraulic loads in response to the control signals to optimize capacity of the pump to the plurality of actuation systems, whereby the actuators can receive a reduction in flow down to zero flow.

5,553,453

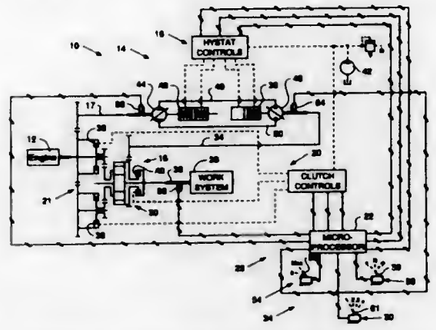
METHOD FOR PROVIDING DIFFERENT SPEED RANGES FOR A SPEED PEDAL

Alan R. Coutant, Chillicothe, and Sanjay Rajagopalan, Peoria, both of Ill., assignors to Caterpillar, Inc., Peoria, Ill.

Filed May 18, 1995, Ser. No. 443,843

Int. Cl.[6] F16D *31/00;* **B60K** *17/00*

U.S. Cl. 60—327 **5 Claims**



1. A method for providing different operating speed ranges for a speed pedal in a machine having a continuously variable transmission with a closed loop control, comprising the steps of:

monitoring the output speed of the continuously variable transmission;

monitoring the position of the speed pedal relative to the transmission output speed;

establishing a first predetermined control map that is effective to accelerate or retard the continuously variable transmission in response to the position of the speed pedal to maintain a zero point along a zero line on the first predetermined control map for a first predetermined output speed range of the continuously variable transmission, the first predetermined control map having a first region relating to acceleration of the continuously variable transmission and a second region relating to retarding of the continuously variable transmission with the zero line defined therebetween along which there is no accelerating or retarding of the continuously variable transmission;

establishing a second predetermined control map that is effective to accelerate or retard the continuously variable transmission in response to the position of the speed pedal to maintain a zero point along a zero line on the second predetermined control map for a second predetermined output speed range of the continuously variable transmission, the second predetermined control map having a first region relating to acceleration of the continuously variable transmission and a second region relating to retarding of the continuously variable transmission with the zero line defined therebetween along which there is no accelerating or retarding of the continuously variable transmission; and

selecting the desired one of the first and second predetermined output speed ranges.

5,553,454

COMPRESSED AIR ENGINE SYSTEM AND METHOD FOR GENERATING ELECTRICAL ENERGY FROM THE CONTROLLED RELEASE OF COMPRESSED AIR

Sol E. Mortner, 345 Helmstrand Ct., Saddlebrook, N.J. 07663

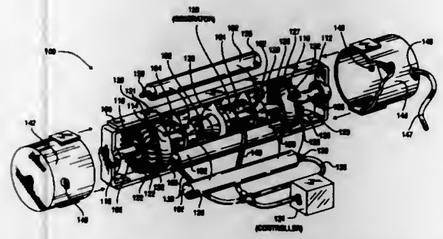
Filed Mar. 20, 1995, Ser. No. 406,731

Int. Cl.[6] F16D *31/02*

U.S. Cl. 60—409 **4 Claims**

1. A compressed air engine having a source of air under pressure, comprising:

a frame having support beams and endports;



a drive shaft rotatably mounted within said endports of said frame;

turbine means fixedly mounted to said drive shaft for axially rotating said drive shaft when said turbine means is rotated;

ringed guide means for receiving pressurized air through a plurality of guide input ports to be directed through a guide output port in operative direction to axially rotate said turbine means which is fixedly mounted to said drive shaft, thereby to operatively drive said drive shaft, wherein said ringed guide means is fixedly mounted within said frame with said drive shaft passing therethrough;

a plurality of tanks mounted about said frame at said support beams, each of said plurality of tanks having an input port for introducing air under pressure and a tank output port for releasing said air under pressure into said guide input port of said ringed guide means through conduit means for connecting said tank to said ringed guide means;

generator means fixedly mounted within said frame and operatively connected with said drive shaft for generating electrical energy from the axial rotation of said drive shaft; and

controller means for controlling the flow of pressurized air flow released through each of said tank output ports according to a power output reading from said generator means, whereby said controller means is operatively connected to said generator means and to each of said tank output ports.

5,553,455

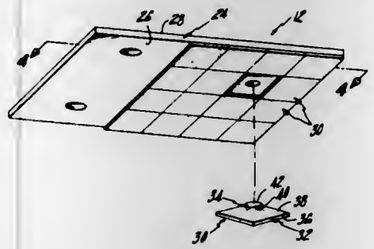
HYBRID CERAMIC ARTICLE

Harold M. Craig, and Otis Y. Chen, both of West Hartford, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 21, 1987, Ser. No. 136,307

Int. Cl.[6] F42C *7/00*

U.S. Cl. 60—753 **14 Claims**



1. A hybrid ceramic article, comprising a fiber reinforced glass, glass ceramic or ceramic matrix composite substrate, said substrate having a proximal surface and a distal surface, and an array of refractory ceramic tiles substantially covering the proximal surface of the substrate to thermally insulate the substrate, said tiles each having a protective region covering a section of the proximal surface of the substrate and a supportive region extending from the protective region toward the distal surface of the substrate and embedded in the substrate to secure the tile to the substrate, and said thermal barrier exhibiting high thermal stability and elevated temperature load bearing ability.

5,553,456

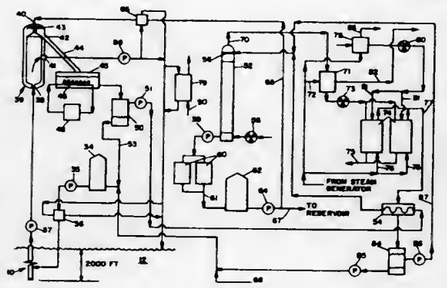
CLATHRATE FREEZE DESALINATION APPARATUS AND METHOD

Richard A. McCormack, La Jolla, Calif., assignor to Ramco, Inc., San Diego, Calif.

Filed May 17, 1995, Ser. No. 443,384

Int. Cl.[6] B01D *9/04;* **F25D** *3/00*

U.S. Cl. 62—59 **22 Claims**



1. Clathrate freeze desalination apparatus, comprising:

an outer pipeline of predetermined length having a first outer diameter, the outer pipeline having a first, inlet end for submerging under the sea to a depth at which the ocean water is at a predetermined temperature, and a second, outlet end for connecting above the water surface;

a concentric, inner pipe of smaller diameter than the outer pipeline extending within the outer pipeline along at the majority of its length, the inner pipe having an inlet end adjacent the second end of the outer pipeline and an outlet end adjacent the first end of the outer pipeline;

a supply of clathrate forming agent connected to the inlet end of the inner pipe, the clathrate forming agent having a predetermined clathrate forming temperature when mixed with seawater, and the predetermined ocean temperature being lower than said clathrate forming temperature;

first pumping means for pumping said clathrate forming agent from the inlet end to the outlet end of the inner pipe;

second pumping means connected to the outlet end of the outer pipeline for pumping an ice slurry of clathrate ice and brine from the first, submerged end of the outer pipeline to the second end;

a washing unit connected to the second end of the outer pipeline for receiving the ice slurry and washing the brine from the clathrate ice, the washing unit having a first, clathrate ice outlet and a second, brine water outlet;

a melting unit connected to the clathrate ice outlet of the washing unit for receiving the separated, clathrate ice, the melting unit having a heater for melting the clathrate ice, and an outlet; and

a separator unit connected to the outlet of the melting unit for separating the melted water from the clathrate forming agent, the unit having a first outlet for the separated water and a second outlet for the clathrate forming agent.

5,553,457

COOLING DEVICE

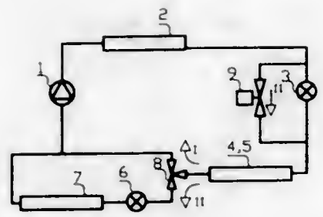
Lev Reznikov, 1510 Ocean Pky., #A17, Brooklyn, N.Y. 11230

Filed Sep. 29, 1994, Ser. No. 314,767

Int. Cl.[6] F25B *41/00*

U.S. Cl. 62—81 **3 Claims**

3. A device for producing high temperature cold and low temperature cold, comprising a first stage for generating high temperature cold and a second stage for generating low temperature cold, said first stage for generating high temperature cold including first means for compressing vapors of refrigerant, first means for condensing the vapors, first means for expanding the compressing, condensed refrigerant, and first means for subsequent evaporation



of the refrigerant with transfer of cold objects to be cooled, said second stage for generating low temperature cold including second means for condensing the vapors, second means for expanding the compressed condensed refrigerant, and second means for its subsequent evaporation with transfer of cold to objects to be cooled, said first and second stage being connected so that during periods of reduction and a demand for generation of high temperature cold in said first stage, cold produced in said first stage is supplied to said second condensing means for condensing the vapors of refrigerant in said second stage, said connecting means including means for switching flows of the refrigerant from said first stage to said second stage so that said first evaporating means of said first stage become said second condensing means of said second stage; and means for reducing pressure of said second stage.

5,553,458

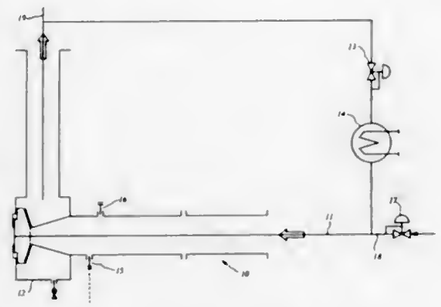
NONCONTAMINATING ENERGY DISIPATOR AND A METHOD FOR OPTIMIZING TURBOEXPANDERS

Reza R. Aghi, Granada Hills, and Behrooz Ershaghi, Irvine, both of Calif., assignors to Rotoflow Corporation, Gardena, Calif.

Continuation of Ser. No. 207,877, Mar. 8, 1994, abandoned. This application Sep. 27, 1995, Ser. No. 534,734

Int. Cl.[6] F25B *9/00*

U.S. Cl. 62—87 **15 Claims**



1. In a fluid circuit having a turboexpander wherein energy is to be dissipated at times from the turboexpander, the improvement comprising a noncontaminating energy dissipating system including

a compressor mechanically coupled to said turboexpander;

a pressure reduction valve;

a heat exchanger; and

a closed-loop conduit including said compressor, said pressure reduction valve, said heat exchanger and said compressor in seriatim, said heat exchanger configured to dissipate heat from said closed-loop conduit and said turboexpander not being included in said closed-loop conduit.

5,553,459

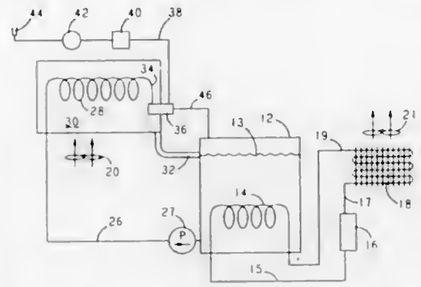
WATER RECOVERY DEVICE FOR RECLAIMING AND REFILTERING ATMOSPHERIC WATER

Larry G. Harrison, Garland, Tex., assignor to The Watermarker Corp., Garland, Tex.

Filed Jul. 26, 1994, Ser. No. 280,290

Int. Cl.[6] F25D *17/06*

U.S. Cl. 62—93 **14 Claims**



1. An apparatus for obtaining potable water from the ambient air, comprising:

a water tank for holding the potable water;

a compressor for compressing a refrigerant;

a condenser for condensing said refrigerant received from said compressor;

an evaporator coil disposed in said water tank, receiving on one end thereof compressed refrigerant from said condenser, said evaporator for evaporating said refrigerant and thereby cooling the potable water in said water tank, the other end of said condenser connected to said compressor to input the uncompressed refrigerant thereto;

drip coils having an intake end and an efferent end for condensing the potable water from the ambient air, the cooled potable water from said water tank passing through said drip coils before returning to said water tank;

a fan for blowing the ambient air about said drip coils and said condenser;

a collection device for collecting condensed water from said drip coils and directing it to said water tank;

a discharge device connected to said efferent end of said drip coils for discharging the cooled potable water after passing through said drip coils;

a pump for pumping the cooled potable water through said drip coils and said discharge device;

a filter and ultra-violet light source disposed between said drip coils and said discharge device for sterilizing the cooled potable water prior to discharge and after passing through said drip coils; and

a non-toxic insulating coating disposed on the exterior of said drip coils and the exterior of said evaporator coil, such that the toxic metals which may be contained in said drip coils or said evaporator coil will be contained and not dispersed into the potable water, said non-toxic coating comprising 25 to 35 percent titanium oxide.

5,553,460

HORIZONTAL OIL SEPARATOR/RESERVOIR

Paul E. Isaacs, Auburn, Ill., assignor to AC & R Components, Inc., Chatham, Ill.

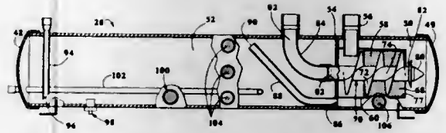
Filed Jun. 14, 1995, Ser. No. 490,389

Int. Cl.[6] B01D *19/00;* **F25B** *43/02*

U.S. Cl. 62—129 **20 Claims**

1. An oil separator for separating liquid oil from a gaseous refrigerant in a refrigerant system comprising:

an oil separator chamber and an oil reservoir chamber arranged horizontally adjacent to one another;



said oil separator chamber containing an oil separator having an inlet for receiving a refrigerant/oil mixture, a separating device for separating said gas and oil from said oil/gas mixture, a gas outlet, and an oil outlet leading from near a bottom of said oil separator chamber into said oil reservoir chamber;

said oil reservoir chamber containing an oil return inlet opening near a bottom of said oil reservoir chamber leading to an outside of said oil reservoir chamber; and

a device associated with said oil outlet for allowing a flow of oil from said oil separator chamber to said oil reservoir chamber, but preventing a flow of oil from said oil reservoir chamber to said oil separator chamber.

5,553,461

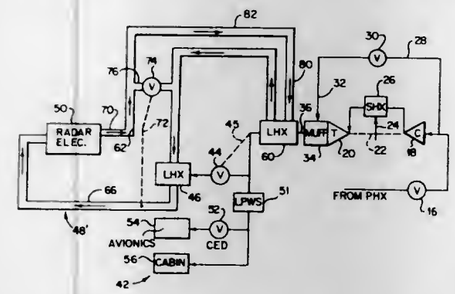
ANTI-ICING HEAT EXCHANGER FOR AIRCRAFT AIR CYCLE PERFORMANCE ENHANCEMENT

Richard W. Hitzigrath, Sayville, and Melvin Schreiber, Roslyn, both of N.Y., assignors to Grumman Aerospace Corporation, Los Angeles, Calif.

Filed Jan. 11, 1995, Ser. No. 371,431

Int. Cl.[6] F25D *9/00*

U.S. Cl. 62—150 **4 Claims**



1. An open loop aircraft cooling air system, the system employing an air source which is associated with a loss of thrust from the engine, an air cycle which cools the air to temperatures which are potentially below freezing temperatures (<32° F.) at the turbine outlet, and further comprising:

a liquid/air heat exchanger connected at the exit of the air cycle turbine which transfers heat to the turbine exhaust air in an amount sufficient to heat the air to above 40° F. at its exhaust, the heat exchanger being designed to maintain fin and wall surfaces at or above 40° F., given a source of liquid coolant flow supplied at a relatively high temperature compared to 40° F.;

a valve located downstream of the liquid/air heat exchanger in the air stream which is used to modulate the air stream pressure, and thus the air temperature at the exit of the liquid/air heat exchanger to a value which is marginally above freezing, the valve responding to a controller and temperature sensor located in the air stream downstream of the liquid/air heat exchanger;

an anti-icing bypass around the air cycle turbine and compressor assembly which normally supplies a small flow of hot air intended to anti-ice the walls of the turbine exit and provides a back-up mode capability wherein a larger flow of hot air is sent to mix with turbine exit air in the event of an abnormally small liquid coolant system heat load which is not capable of heating turbine exhaust air to 40° F.;

means for connecting the turbine outlet to an air intake of the liquid/air heat exchanger;

means for connecting the heat exchanger air outlet to the valve inlet and to an air distribution ducting system, the valve located in any leg of the air distribution system which has relatively low resistance to air flow between the valve and the outlet of the open system, resulting in relatively low back pressure on the turbine when the valve is fully open; and

a liquid flow bypass and valve which permits a regulated flow of hot liquid to flow directly from the inlet of the liquid/air heat exchanger to the exit of the liquid/air heat exchanger, thus regulating the temperature of the liquid coolant on the cold side of the liquid coolant loop.

5,553,462

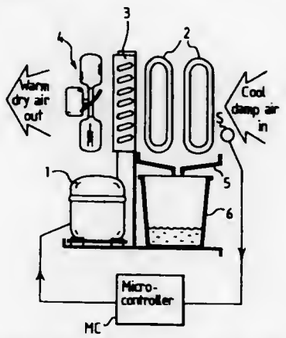
DEHUMIDIFIERS

Simon A. Taylor, Bishop Auckland, Great Britain, assignor to Ebac Limited, United Kingdom

Filed Mar. 14, 1995, Ser. No. 404,091

Int. Cl.[6] F25D *21/06*

U.S. Cl. 62—155 **9 Claims**



1. A dehumidifier comprising a refrigerant circuit containing a refrigerant, a compressor for circulating the refrigerant around the refrigerent circuit, an evaporator which becomes cold, and a condenser which becomes warm; means for drawing air through the evaporator to pass over the evaporator followed by the condenser so that any moisture in the air condenses on the evaporator, following which the air is warmed by the condenser; means for sensing the operating temperature of the dehumidifier; and control means arranged to operate the compressor in accordance with the sensed operating temperature such that the dehumidifier operates with alternating run and defrost periods, in which the length of the defrost period is varied in a predetermined relationship with said sensed operating temperature.

5,553,463

EFFICIENCY DIRECTED EVAPORATIVE TYPE SUPPLEMENT CONDENSING SYSTEM FOR HIGH AMBIENT REFRIGERATION OPERATION

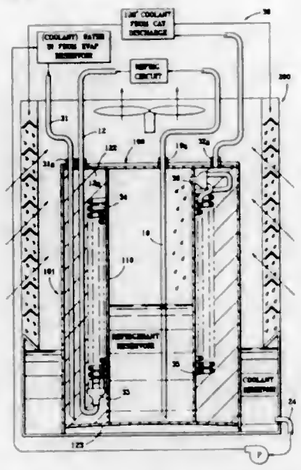
Ronald J. Pointer, 430 Glen Canyon, Garland, Tex. 75040

Continuation-in-part of Ser. No. 11,002, Jan. 29, 1993, Pat. No. 5,297,397. This application Mar. 29, 1994, Ser. No. 219,513

Int. Cl.[6] F25B *27/02*

U.S. Cl. 62—238.6 **8 Claims**

1. A refrigeration system comprising a compressor, a primary air cooled condenser, an evaporator, and an evaporative supplemental support condensing cooling tower, comprising in combination therewith:



a. integrated supplemental condensing means in operative relation with said primary condenser for causing both the efficiency trend of said system to increase and the power demand trend of said system to decrease, as the ambient temperature increases above about ninety degrees Fahrenheit, and

b. wherein said condensing means comprises a supplemental condensing system having a first tank and a second tank adjacent thereto and sealed therefrom,

c. said second tank being a reservoir for containing varying levels of vapor and liquid refrigerant,

d. an incoming and exiting coulant line to said first tank,

e. means for receiving incoming hot refrigerant gas from said compressor, and for exiting cooler refrigerant gas and accumulated vapor condensate into said second tank,

f. concentric line coils surrounding said second tank, and ultimately delivering said refrigerant into said second tank,

g. an exit line from said second tank to deliver partially cooled and partially condensed refrigerant to said primary condenser, wherein

h. said partially condensed refrigerant at this point being either a vapor, a condensate or both, when entering said primary condenser,

i. and wherein the operating characteristics of said system are such as to counteract the detrimental effect of said ambient temperature increases,

j. said integrated supplemental condensing means comprising a first supplemental condenser physically located within the structure of said cooling tower.

5,553,464

AUGER TYPE ICE MAKING MACHINE

Susumu Tatematsu, Nagoya; Kazuhiro Mori, Toyoake, and Hideyuki Ikari, Kariya, all of Japan, assignors to Hoshizaki Denki Kabushiki Kaisha, Toyoaki, Japan

Filed Dec. 1, 1994, Ser. No. 352,181

Claims priority, application Japan, Dec. 6, 1993, 5-65048

Int. Cl.[6] F25C *5/12*

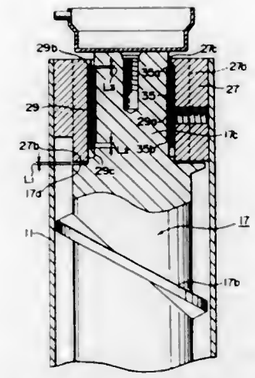
U.S. Cl. 62—354 **5 Claims**

1. An auger type ice making machine, comprising:

a refrigeration casing around which a refrigerant evaporation pipe is wound;

an auger rotatably disposed in said refrigeration casing and having a helical blade formed on the periphery thereof;

a press head fixed to the inside of said refrigeration casing at an upper end thereof, said press head having a center hole through which an upper rotary shaft of said auger passes and an axial ice compression passage;



drive means for driving said auger in rotation during which a force is imparted to said auger tending to move said auger axially relative to said press head;

a high-hardness metal layer fixedly formed on the periphery of said upper rotary shaft of said auger; and

a resin slide bearing fixed to said press head within said center hole thereof and coming into contact with said high-hardness metal layer in such a manner that opposite ends of said slide bearing project from boundaries of said high-hardness metal layer at opposite ends thereof to cover the entire surface of said high-hardness metal layer.

5,553,465

REFRIGERATION APPARATUS CONTAINING LUBRICANT COMPOSITION

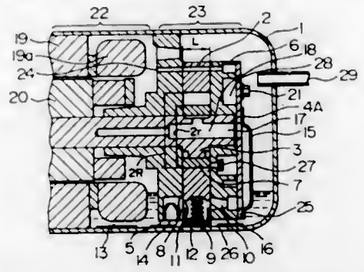
Katsumi Fukuda, Tochigi-ken; Tadashi Iizuka, Ashikaga; Reishi Naka, Tochigi-ken; Hiroaki Hata, Tochigi-ken; Masahiko Gommori, Tochigi-ken, and Yoshiharu Homma, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 32,663, Mar. 17, 1993, Pat. No. 5,417,872, which is a division of Ser. No. 762,601, Sep. 19, 1991, abandoned. This application Oct. 13, 1994, Ser. No. 322,558

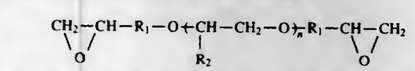
Claims priority, application Japan, Jan. 30, 1991, 3-009721; Apr. 30, 1991, 3-098845

Int. Cl.[6] C09K *5/00*

U.S. Cl. 62—468 **24 Claims**



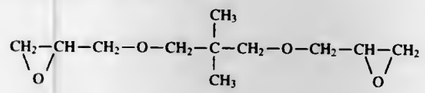
1. A hermetic refrigerant compressor comprising a closed vessel containing a lubricant composition at the bottom and housing therein a motor comprising a rotor and a stator, a rotating shaft fixed on the rotor, a compressing means connected to the motor via the rotating shaft and a refrigerant in said compressing means, said lubricant composition comprising as a base oil at least one member selected from the group consisting of ester oils, alkylbenzene oils and mineral oils, and an epoxy compound having at least two epoxy groups, wherein the epoxy compound is at least one member selected from the group consisting of an alkylene glycol diglycidyl ether and an alicyclic epoxy compound; the alkylene glycol diglycidyl ether being at least one member selected from the group consisting of compounds of the formula:



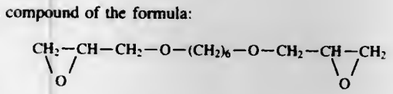
(1)

wherein R_1 is an alkylene group; R_2 is a hydrogen atom or an alkyl group; and n is an integer of 1 to 22,

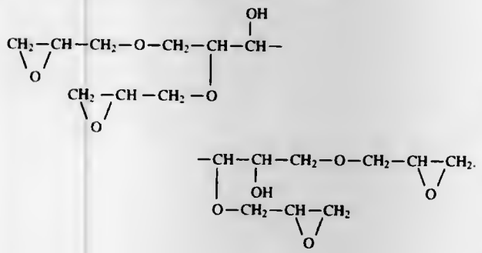
a compound of the formula:



a compound of the formula:



and a compound of the formula:



5,553,466

REFRIGERATION APPARATUS

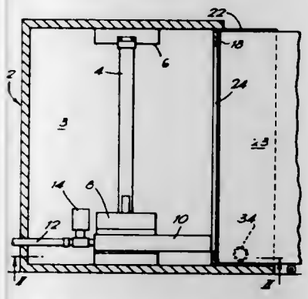
John N. S. Kuzniarski, Hampshire; Peter F. Goodall, Forest Row, and Brian King, Godalming, all of England, assignors to The BOC Group plc, Windlesham, England

Filed Jan. 19, 1994, Ser. No. 183,555

Claims priority, application United Kingdom, Jan. 22, 1993, 9301235

Int. Cl.[6] F25J *1/00*

U.S. Cl. 62—602 **4 Claims**



1. Apparatus for depositing solid carbon dioxide on items to be refrigerated, comprising a source of liquid carbon dioxide, conversion means operatively connected to the source of liquid carbon dioxide for converting a stream of the liquid carbon dioxide into a forward flow of gaseous carbon dioxide containing entrained particles of solid carbon dioxide, a movable carriage for supporting the conversion means mounted thereon, guide means for enabling the carriage to be translated in opposite directions, and translating means for translating the carriage along the guide means.

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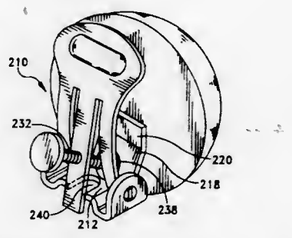
ADJUSTABLE EAR CLIP

Anthony S. Calabro, 51 Church Hill Dr., Cranston, R.I. 02920

Continuation-in-part of Ser. No. 437,574, May 9, 1995. This application Mar. 25, 1996, Ser. No. 618,029

Int. Cl.[6] A44C *7/00*

U.S. Cl. 63—14.5 **5 Claims**



1. An adjustable pressure ear clip, comprising:

a base plate;

a pair of ears connected to opposing ends of said base plate; said ears being positioned substantially perpendicular to said base plate and each ear including a pivot aperture therethrough;

a mounting plate connected to said base plate;

said base plate including a bolt notch in a side opposite a side connected to said mounting plate; said bolt notch including a bottom portion; said stop bolt residing in said bolt notch when the clip is in an opened condition;

a stop plate connected to said base plate at a location adjacent to said bottom portion of said bolt notch;

an ornamental member connected to said mounting plate;

an ear engaging member;

a pair of arms connected to said ear engaging member; said arms each including protrusions at ends thereof not connected to said ear engaging member; said protrusions being positioned in said pivot apertures, respectively;

a spring tongue connected to said ear engaging member and disposed between said arms; said spring tongue including a stop bolt aperture therethrough; said spring tongue resting on a end of said base plate opposite the end on which said mounting plate is connected; and

a stop bolt, having male threading thereon, threadably positioned through said stop bolt aperture and engageable with said stop plate to limit travel of said ear engaging member toward said ornamental member.

5,553,468

BRASSIERE BLANK, BRASSIERE AND METHODS OF MAKING SAME

Harold G. Osborne, Boomer, N.C., assignor to Alba-Waldensian, Inc., Valdese, N.C.

Continuation of Ser. No. 237,114, May 3, 1994, Pat. No. 5,479,791. This application Sep. 22, 1995, Ser. No. 532,535

Int. Cl.[6] D04B *1/24;* **A41C** *3/00;* **A41D** *27/00*

U.S. Cl. 66—171 **10 Claims**

1. A method of making a brassiere using a circular knit blank comprising the steps of:

knitting a series of courses defining a first cylindrical tubular fabric torso encircling portion in the form of a turned welt;

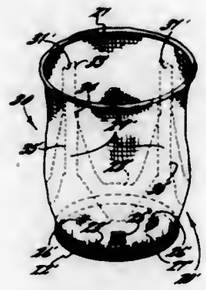
knitting to the turned welt portion a series of courses defining a cylindrical tubular fabric upper torso portion including a rear torso portion and a front torso portion having a pair of breast cups defined by two areas in which the courses are simple knit with the areas being separated one from another, wherein said

5,553,470

WARP KNITTING MACHINE WITH

5,553,473

ROTARY LOCKING CYLINDER FOR A SAFETY LOCK



series of courses defining the front torso portion differentially shapes the breast cups;

knitting to said torso portion a shoulder portion having a cylindrical tubular front and back fabric strap region, each having an elongated area in which the courses are simple knit with the areas being divided by an elongated panel area;

cutting and removing from the cylindrical blank areas for the arms and first and second neck portions so as to form pairs of shoulder straps each extending from adjacent a breast cup portion and from a rear torso portion; and

sewing together the straps so as to form the completed brassiere.

5,553,469

METHOD OF CONTROLLING THERMALLY ALTERABLE PROFILE OF WORKING ROLLS

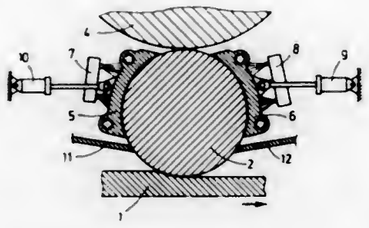
Jürgen Seidel, Kreuztal, Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Germany

Filed Nov. 24, 1993, Ser. No. 157,770

Claims priority, application Germany, Nov. 25, 1992, 42 39 529.1

Int. Cl.[6] B21B *27/06*

U.S. Cl. 72—13.4 **7 Claims**



1. A method of controlling a thermally alterable profile of a working roll during rolling of a strip material, said method comprising the steps of:

providing at least one pair of thermally isolating cover shells for the working roll;

determining a position of opposite edges of the rolled strip material on the working roll;

determining a position of the cover shells in which the cover shells are spaced from each other and cover respective opposite longitudinal regions of the working roll in contact with respective opposite edges of the rolled strip material; and

displacing the cover shells to cover the respective opposite edge-contacting longitudinal regions of the working rolls and respective adjacent outside longitudinal regions of the working rolls which do not contact the rolled strip material during rolling of the strip material.

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WARP KNITTING MACHINE WITH PIEZOELECTRICALLY CONTROLLED BENDING TRANSDUCERS FOR THE THREAD GUIDES

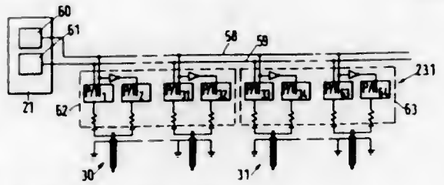
Hans-Jurgen Hohne, Hainburg, and Kresimir Mista, Heusenstamm, both of Germany, assignors to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Germany

Filed Nov. 7, 1995, Ser. No. 554,678

Claims priority, application Germany, Nov. 30, 1994, 44 42 555.4

Int. Cl.[6] D04B *27/26;27/32*

U.S. Cl. 66—205 **15 Claims**



1. Warp knitting machine comprising:

at least one guide bar;

a plurality of guides;

a plurality of piezoelectric bending transducers mounted on said guide bar for deflectably supporting the guides, each of the transducers having a control line for producing in response to control potential thereon a displacement over one needle space of said guides; and

a control arrangement coupled to the control lines for establishing a predetermined pattern comprising:

a computer having a common data and command bus; and

a potential generating means for providing, in dependence upon the predetermined pattern, a control potential to the control lines, said potential generating means comprising:

a plurality of serial to parallel converters distributed over the full width of the warp knitting machine and having (a) a plurality of data and command inputs connected to said common data and command bus, and (b) a plurality of outputs connected through the control lines to the bending transducers, the serial to parallel converters being operable to store some data sent sequentially along said bus and upon the occurrence of a switching command from said computer simultaneously release stored data by applying the control potential to data-selected ones of said control lines.

5,553,471

MOTORCYCLE CENTER STAND WITH LOCKING DEVICE

William D. Hanners, 4493 Hockmaple Ct., Concord, Calif. 94521

Continuation-in-part of Ser. No. 215,908, Mar. 22, 1994, abandoned. This application May 30, 1995, Ser. No. 453,873

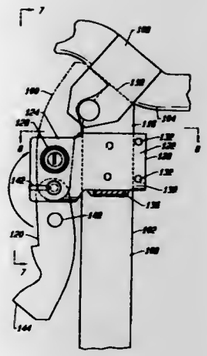
Int. Cl.[6] B62H *5/00*

U.S. Cl. 70—235 **6 Claims**

1. A locking mechanism for a motorcycle stand of a motorcycle, the motorcycle having a frame with a coupling block and a center stand for supporting the motorcycle in an upright position when the center stand is downwardly pivoted from a substantially horizontal retraceted position to a substantially vertically operable position, with at least one leg of the stand pivotally connected to the coupling block, the block having a stop limiting pivotal displacement of the leg with the coupling block having bracket elements with a pivot pin and the leg having a sleeve pivotally engageable with the pivot pin for limited displacement of the leg from a downward support position to an upward retracted position, the locking mechanism comprising:

a bracket unit having a housing portion and a bracket portion with bracket means for securing the bracket unit to the leg of the motorcycle stand, a detent arm with pivot means for pivotally connecting the detent arm to the housing portion of the bracket unit, the detent arm being pivotal between a lock position and an unlock position and having a distal end outside of the bracket unit engageable with the stop of the coupling block when pivoted into the lock position; and,

locking means in the housing portion of the bracket unit for locking the detent arm in the lock position.



5,553,472

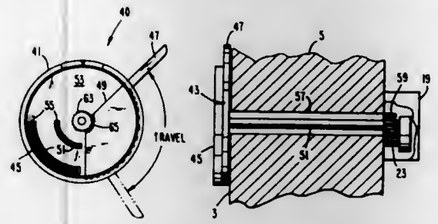
DRIVE APPARATUS AND PORTABLE POWER SOURCE FOR COMPUTERIZED COMBINATION LOCKS

Thomas E. Jasper, Bryantsville, Ky., assignor to Lockmasters, Inc., Nicholasville, Ky.

Division of Ser. No. 58,080, May 7, 1993, Pat. No. 5,493,882. This application Feb. 9, 1995, Ser. No. 385,943

Int. Cl.[6] E05B *49/00*

U.S. Cl. 70—278 **5 Claims**



1. A computerized combination lock for a security container comprising:

a) a combination dial and a dial ring mounted on a face of said security container;

b) an electrical generator;

c) a drive apparatus for imparting motion to said electrical generator;

d) a microprocessor and lock assembly arranged within said security container and being powered by said electrical generator for operation of said computerized combination lock;

e) wherein said dial ring is rotatably mounted to said face of said security container for rotational movement, said combination dial being rotatable independently of said dial ring; and

f) said drive apparatus further comprises an element coupling said rotational movement of said dial ring to said electrical generator for powering said microprocessor and lock assembly, wherein said electrical generator is mounted adjacent of a flange of said dial ring and said flange includes a geared portion for transmitting said rotational movement imparted to said dial ring to said electrical generator by engagement with said electrical generator.

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ROTARY LOCKING CYLINDER FOR A SAFETY LOCK

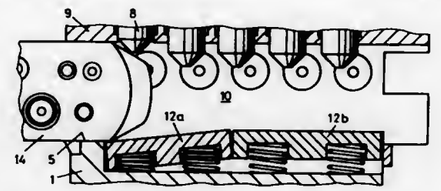
Ernst Keller, Untere Schwandenstrasse 22, CH-8805 Richterswil, Switzerland

Filed Aug. 19, 1994, Ser. No. 293,382

Claims priority, application European Pat. Off., Oct. 5, 1993, 93810702

Int. Cl.[6] E05B *27/06*

U.S. Cl. 70—358 **12 Claims**



1. In a rotary locking cylinder for a safety lock including a housing, a rotor, pin tumblers, and biasing means for the pin tumblers, the housing having an end, a length and a bore for receiving the rotor, the rotor providing an opening for receiving a key, the pin tumblers being supported in bore holes in the housing and being moveable within radially positioned openings in the rotor and a cylinder housing, the spring-loaded tumblers being displaceable by a key inserted into a key-groove, the improvement comprising:

a blocking insert which is supported in the housing and which is biased toward the opening for receiving the key, the opening for receiving the key being constructed as a longitudinal slot, said blocking insert being slideable between a blocked and a non-blocked state, said blocking insert occupying said blocked state when a portion of said blocking insert engages the longitudinal slot in said rotor and said blocking insert occupying said non-blocked state when said blocking insert occupies a position wholly within a corresponding longitudinal slot in said housing, the longitudinal slot in said housing extending a distance substantially equal to the length of said housing and being open to the end of said housing; and

said blocking insert being adapted to occupy said non-blocked state when the key is inserted in the opening to permit rotation of said rotor.

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APPARATUS FOR SHAPING SUPERPLASTIC METAL WORKPIECE

Kunio Nokajima; Shizuo Kimura; Yasuo Hashimoto, and Makoto Urano, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 10, 1995, Ser. No. 402,059

Claims priority, application Japan, Mar. 30, 1994, 6-060815

Int. Cl.[6] B21D *26/02*

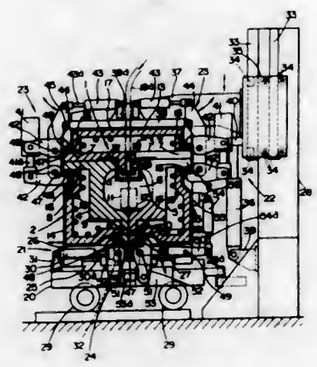
U.S. Cl. 72—60 **5 Claims**

1. An apparatus for shaping a workpiece of a superplastic metal, comprising:

a shaping die assembly for holding the workpiece therein to shape the workpiece with a pressurized gas while the workpiece is being heated, said shaping die assembly comprising a plurality of dies separable from and joinable to each other, said dies having flanges extending from mating surfaces thereof;

a furnace assembly surrounding outer surfaces of said dies, said furnace assembly comprising a plurality of furnaces separable from and joinable to each other, said furnaces being detachably mounted on said dies, respectively, said shaping die assembly being housed in said furnace assembly with said flanges projecting out of said furnace assembly when said dies are joined to each other;

heating means for heating said shaping die assembly, said heating means being mounted on inner wall surfaces of said



furnaces in a space defined between said furnace assembly and said shaping die assembly; and

clamping means for gripping said flanges while the workpiece is being held between said dies which are joined to each other.

5,553,475

METHOD FOR DETECTING SETTING ERRORS OF CLEARANCE BETWEEN ROLLERS IN UNIVERSAL ROLLING MILL, AND METHOD FOR ROLLING H-SHAPED STEEL HAVING FAVORABLE FLANGE DIMENSIONS UTILIZING SAME DETECTING METHOD

Hiroyuki Hayashi; Takaaki Iguchi, both of Chiba, and Shinji Imamura, Kurashiki, all of Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

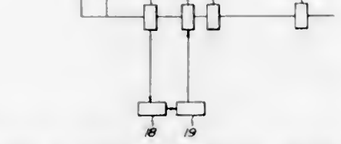
PCT No. PCT/JP93/00369, § 371 Date Sep. 21, 1994, § 102(e) Date Sep. 21, 1994, PCT Pub. No. WO93/19861, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 26, 1993, Ser. No. 307,747

Claims priority, application Japan, Mar. 27, 1992, 4-071308; Apr. 7, 1992, 4-085555

Int. Cl.[6] B21B *1/08;37/12*

U.S. Cl. 72—225 **3 Claims**



1. A method for detecting setting errors of clearances between rollers of a universal rolling mill during a rolling of an H-shaped steel, wherein a roughly shaped billet subjected to a breakdown rolling and having a web and flanges is formed into a shape steel having H-shaped cross section by passing the roughly shaped billet through an array of rolling facilities for a shape steel constituted by combining a universal rough rolling mill with a universal finish rolling mill, said rough rolling mill comprised of an upper and a lower horizontal roller and a left and a right vertical roller, each of said horizontal rollers arranged along a respective radial axle and a center position, and each of said vertical barrel rollers having a respective aperture and central position, comprising the steps of:

providing an instrument for measuring a thickness of each flange at four locations, said locations comprised of a right and a left and an upper and a lower location of the roughly shaped billet and then using said instrument to measure a hot dimension at said form locations, said instrument arranged in proximity with the rough universal rolling mill using the results of the measurement, to compute an axial deviation of said upper and lower horizontal rollers relative to each other, and a deviation of the apertures of said left and right vertical rollers with respect to each other, and a deviation of the center position of a clearance between the upper and lower horizontal rollers with respect to the central position of the vertical roller barrels.

5,553,476

PROCESS FOR THE PRODUCTION OF OUTER ATTACHMENT FACES ON JOINT IMPLANTS

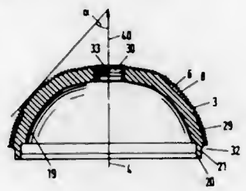
Jürg Oehy, Winterthur, and Mustafa Yurtsever, Kreuzlingen, both of Switzerland, assignors to Sulzer Medizinaltechnik AG, Winterthur, Switzerland

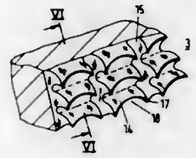
Filed Jun. 10, 1994, Ser. No. 258,629

Claims priority, application European Pat. Off., Aug. 18, 1993, 93810583

Int. Cl.[6] B21D *28/00;53/00*

U.S. Cl. 72—325 **10 Claims**





1. A process for producing an attachment surface on a joint implant made from a plastically deformable metal for implantation by moving the implant in an insertion direction into contact with bone tissue, the process comprising the steps of providing the implant with its attachment surface oriented thereon so that connection to bone tissue is effected by movement of the implant in an insertion direction; forming a multiplicity of side-by-side, spaced-apart shoulders on the attachment surface which are oriented substantially perpendicular to the insertion direction; positioning a plurality of spaced-apart ribs proximate the attachment surface and orienting the ribs substantially parallel to the insertion direction; and cutting spaced-apart troughs through the shoulders by moving the ribs relative to the shoulders in a direction substantially parallel to the insertion direction; whereby the ribs plastically deform portions of the shoulders intermediate the troughs into cupular shapes including convex shoulder portions facing in the insertion direction and a concave shoulder portion facing in a direction opposite the insertion direction.

5,553,477

PROGRESSIVE DIE APPARATUS AND METHOD FOR FORMING SURGICAL INCISION MEMBERS

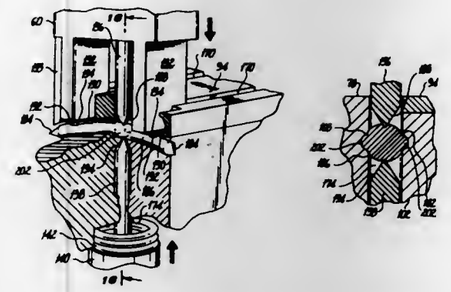
Terry C. Eisensmith, Guilford, Conn.; Donald A. Morin, Goffstown, N.H., and George R. Proto, West Haven, Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 7, 1994, Ser. No. 320,015

Int. Cl.[6] B21G *1/00*

U.S. Cl. 72—403 **20 Claims**

1. An apparatus for forming a surgical incision member comprising:



a) a first die mechanism including a pair of opposed surfaces,the pair of opposed surfaces including a convex surface and a concave surface which together define a groove therein and are configured to support a needle blank therebetween; and

b) a notching die mounted for movement into and out of engagement with a needle blank positioned in the first die mechanism to impart at least one notch therein.

5,553,478

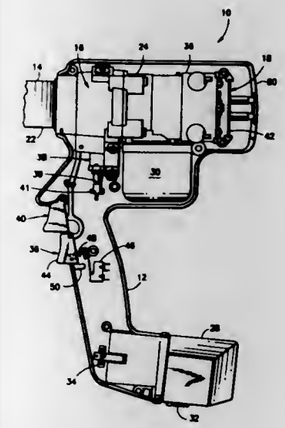
HAND-HELD COMPRESSION TOOL

Gary W. Di Troia, Nashua, N.H., assignor to Burndy Corporation, Norwalk, Conn.

Filed Apr. 8, 1994, Ser. No. 224,825

Int. Cl.[6] B21J *9/14;9/18*

U.S. Cl. 72—453.15 **20 Claims**



1. A compression apparatus comprising:

a compression head;

a hydraulic pump operably connected to the compression head;

an electric motor operably connected to the hydraulic pump;

a power source electrically connectable to the electric motor to drive the motor;

a sensor connected to the power source for sensing voltage of the power source; and

means for disabling operation of the motor, the means for disabling being connected to the sensor to disable operation of the motor when the sensor senses a predetermined inadequate low voltage level of the power source.

5,553,479

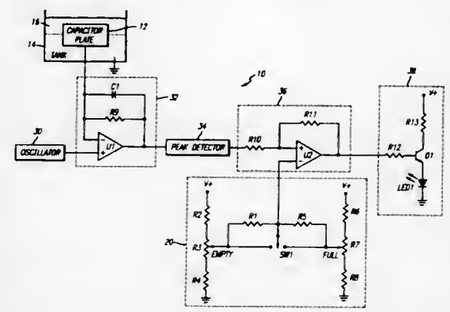
THRESHOLD LEVEL CALIBRATION METHOD AND APPARATUS

George P. Rauchwerger, Sunnyvale, Calif., assignor to Flowline Inc., Seal Beach, Calif.

Filed Mar. 24, 1993, Ser. No. 36,495

Int. Cl.[6] G01D *18/00;* **G01F** *25/00;23/26;* **G01R** *35/00*

U.S. Cl. 73—1 R **21 Claims**



1. A method of comparing a variable parameter with a selected threshold, the method using a measuring circuit for monitoring the variable parameter which represents a range of conditions and a calibration circuit for providing the selected threshold, comprising the steps of:

causing the variable parameter to assume a first condition at a predetermined high value of the range, whereupon the measuring circuit monitoring the variable parameter provides a first signal;

adjusting the calibration circuit to provide a first calibration value to be equal to the first signal;

causing the variable parameter to assume a second condition at a predetermined low value of the range, whereupon the measuring circuit monitoring the variable parameter provides a second signal;

adjusting the calibration circuit to provide a second calibration value to be equal to the second signal;

setting the calibration circuit to combine the first and second calibration values to produce a reference value midway between the first and second signals without causing the variable parameter to assume a condition that corresponds to the reference value, when the reference value is set, the reference value representing the selected threshold; and

monitoring the variable parameter using the measuring circuit to provide a measurement signal representative of the condition of the variable parameter and comparing the measurement signal with the reference value to provide an indication of the condition of the variable parameter.

5,553,480

APPARATUS FOR CALIBRATING AN INDICATING POINTER RELATIVE TO INSTRUMENT DIAL PLATE GRADUATIONS

Vincent H. Rose, 420 N. Civic Dr. #407, Walnut Creek, Calif. 94596

Filed Mar. 21, 1995, Ser. No. 408,729

Int. Cl.[6] G01D *11/06*

U.S. Cl. 73—1 R **5 Claims**

1. A gauge comprising:

a gauge having means responsive to a sensed condition, said means being translated to a rotatable shaft;

an indicating pointer;

an inner hub attached to said rotatable shaft, said pointer being rotatably and frictionally retained to said inner hub; and

said inner hub having an outer cylindrical body, said body having an axial slot of width "A" within which said indicating

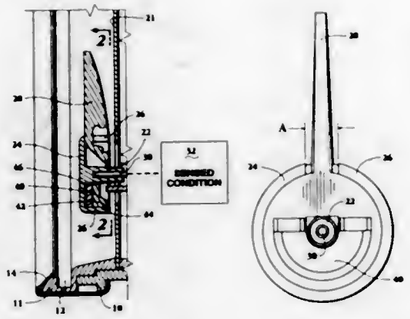
5,553,482

LEAK DETECTOR

a fluid passageway having one end open to said interior chamber of the test chamber and a second end open to atmosphere,

means for pressurizing said cavity with a gas

c) a common header manifold formed from a carrier gas feed line and a return line where said header manifold is mounted



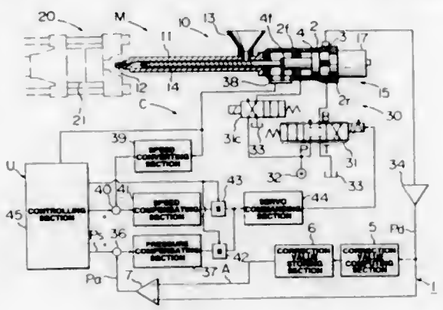
pointer is nested for relative rotation therewith without removal of said inner hub.

5,553,481

PRESSURE DETECTING APPARATUS OF INJECTION MOLDING MACHINE

Tyuyoshi Arai, Nagano, Japan, assignor to Nissei Plastic Industrial Co., Ltd., Nagano-ken, Japan

Filed Feb. 23, 1995, Ser. No. 392,513
Claims priority, application Japan, Mar. 4, 1994, 6-060300
Int. Cl.[6] G01L *27/00*
U.S. Cl. 73—4 R **5 Claims**



1. A pressure detecting apparatus of an injection molding machine, comprising:

a pressure sensor for detecting the oil pressure of an injection cylinder;

a correction value computing section for computing a correction value based on a detected pressure value according to an output of the pressure sensor in a predetermined period after initialization due to power supply completion or a predetermined period after an injection process is completed, each of which is a period in which the oil pressure theoretically becomes zero;

a correction value storing section for storing the correction value; and

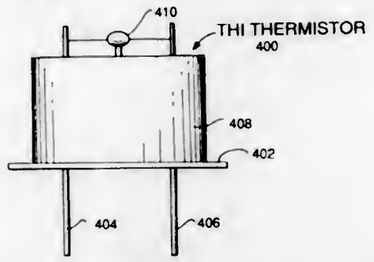
a pressure correcting section for correcting a detected pressure value by the correction value according to the output of the pressure sensor at the time of pressure detection.

5,553,482

LEAK DETECTOR

Wayne Mathews, Milford, Pa., and William V. Hughes, Randolph, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 273,559, Jul. 11, 1994, abandoned.
This application Jul. 3, 1995, Ser. No. 498,711
Int. Cl.[6] G08B *21/00;* **G01M** *03/26*
U.S. Cl. 73—40 **1 Claim**



1. A leak detector, for detecting a leak opening in a seam of a mortar increment container or the like of material being porous or non-porous, said leak detector comprising:

a sensor means positioned adjacent said seam at a selected location thereof to test for presence of a leak in such seam location, said sensor means having at least one thermistor for providing a signal dependent upon gas flowing from the leak through said selected location because of a temperature change in said at least one thermistor caused by the temperature of such flowing gas affecting said at least one thermistor;

a first process means connected to an output conductor of said at least one thermistor, said first process means having a first output conductor for providing a first signal indicating detection of a leak at said selected location, and a second output conductor for providing a second signal indicating said at least one thermistor is defective;

a process latch means connected to receive said first signal, for holding said first signal level as a first latch signal;

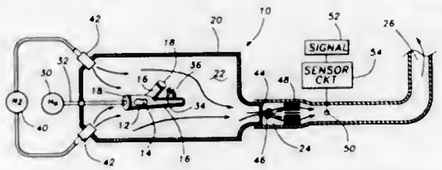
a second process means having a first input conductor to receive said first latch signal and a second input conductor to receive said second signal from said first process means, said second process means having light emission means for displaying respectively, the detection of a leak condition, a no-leak condition, or detection of a defective thermistor condition.

5,553,483

LEAK DETECTION SYSTEM

Charles J. Armentrout, Ann Arbor, and Carl E. Strandberg, Troy, both of Mich., assignors to Pilot Industries, Inc., Dexter, Mich.

Filed Aug. 15, 1995, Ser. No. 515,270
Int. Cl.[6] G01M *3/04*
U.S. Cl. 73—40 **20 Claims**



1. A system for detecting a leak in a part having an interior cavity and at least one opening open to the interior cavity comprising:

a closable test chamber having an interior chamber in which the part is placed,

a fluid passageway having one end open to said interior chamber of the test chamber and a second end open to atmosphere,

means for pressurizing said cavity with a preselected gas,

a pressurized source of a carrier gas, said carrier gas being different than said preselected gas,

means for pressurizing said interior chamber of said test chamber to a sufficient pressure above atmospheric pressure with said carrier gas so that said carrier gas becomes intermixed with any of the preselected gas escaping from the interior cavity of the part and so that said carrier gas and any intermixed preselected gas flows through said passageway,

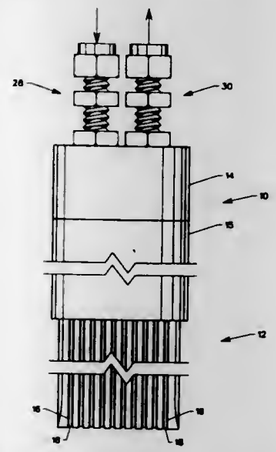
means in said passageway, for detecting the presence of said preselected gas above a preselected threshold intermixed with said carrier gas.

5,553,484

HIGH FLOW MEMBRANE PROBE

William J. H. Bender, Baton Rouge; Gary D. DeLeo, Donaldsonville; Theodore N. Westlake, III, Baton Rouge; Emanuel L. Daigle, Gonzales, and Carolyn W. Ribes, Baton Rouge, all of La., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 12, 1995, Ser. No. 439,909
Int. Cl.[6] G01N *1/10;* **B01D** *15/00*
U.S. Cl. 73—53.01 **2 Claims**



1. A high flow rate sampling apparatus having a carrier gas inlet, a gas return line outlet and a multitude of fluid flow paths disposed therebetween for use in determining the presence and/or concentration of one or more selected materials in a matrix stream or aggregation of flowable materials comprising:

a) a support member having a first, internal end for inserting into said matrix stream to facilitate fluid flow sampling when said apparatus is placed in service and a second end positioned externally of said matrix stream and wherein said support member underlies and defines a plurality of grooves in and along an external surface thereof of which at least a portion extends into said matrix stream in use;

b) a plurality of conduits which define a multitude of flow paths adapted to be placed in fluid communication with an analytical device external of said matrix stream each of which conduits are positioned and supported individually and substantially wholly within one different groove of said plurality of grooves in said support member extending into said matrix stream whereby said plurality of conduits with associated multitude of flow paths that may be placed in contact with said matrix stream while being protected by and supported within said plurality of grooves; and

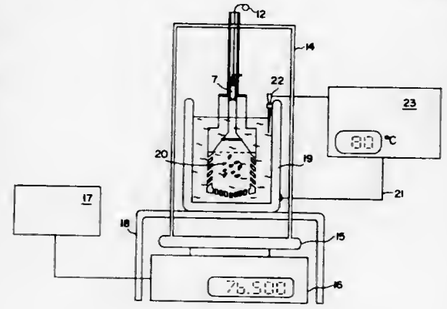
c) a common header manifold formed from a carrier gas feed line and a return line where said header manifold is mounted in-between the location of said support member and said feed line and said return line for mixing together of said multitude of fluid flow paths.

5,553,485

APPARATUS FOR MONITORING REHYDRATION KINETICS OF DEHYDRATED PRODUCTS

Carine Kaabi, Lausanne; Pierre Lambelet; Yvan Rossier, both of Saint Legier, and Alfred Seiler, Lausanne, all of Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Filed Feb. 14, 1994, Ser. No. 195,534
Claims priority, application European Pat. Off., Mar. 11, 1993, 93103928
Int. Cl.[6] G01N *5/02*
U.S. Cl. 73—73 **12 Claims**



1. An apparatus assembly for monitoring rehydration characteristics of dehydrated products comprising:

a cage and a cover which is movable for, together with the cage, forming a cage and cover enclosure wherein:

the cage has a lattice-work base portion and has a lattice-work side portion which extends from the base portion to an edge which defines a cage opening which opposes the base portion and wherein the side portion lattice-work is configured so that when the cage is immersed in water so that the cage opening is positioned vertically above the base portion, the side portion lattice-work allows water to pass therethrough but prevents air from escaping from the cage therethrough; and

the cover has a solid cover portion which surrounds a cover portion surface which defines a hole opening through the cover portion and has a hollowed rod portion which extends from the cover portion so that the hollow of the hollowed rod portion extends the cover portion hole opening and wherein the cover portion and hollowed rod portion are configured and positioned so that when the cover covers the cage opening to form the enclosure, the cover portion hole opening opposes the cage base portion and the hollowed rod portion extends in a direction away from the cage base portion;

a balance having a balance pan positioned beneath the enclosure; and

means for connecting the balance pan and the hollowed rod portion for, when the cover covers the cage opening, suspending the cage and cover enclosure above the balance pan so that the cover is disposed vertically above the cage base portion.

5,553,486

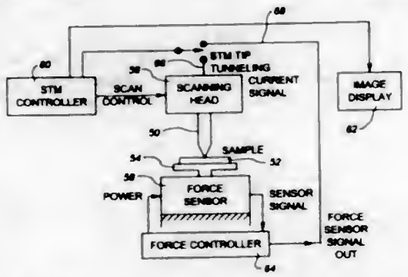
APPARATUS FOR MICROINDENTATION HARDNESS TESTING AND SURFACE IMAGING INCORPORATING A MULTI-PLATE CAPACITOR SYSTEM

Wayne A. Bonin, North Oaks, Minn., assignor to Hysitron Incorporated, Minneapolis, Minn.

Continuation-in-part of Ser. No. 131,405, Oct. 1, 1993, abandoned. This application Oct. 24, 1994, Ser. No. 327,979

Int. Cl.[6] G01B *5/28;* **G01N** *3/42*

U.S. Cl. 73—105 **40 Claims**



1. In a scanned probe microscope apparatus having a probe and a scanning head arranged for operative engagement of a surface of a sample for measuring a surface topography thereof, the improvement comprising:

a. said probe having a hardness greater than a sample to be tested;

b. a force sensor operatively located to measure the force between said sample and said probe, said force sensor having an output signal, wherein said force sensor includes,

i. a pair of capacitive transducers, each transducer including a separate drive plate, the first of said drive plates having a hole centrally disposed therethrough, and a shared pick-up plate, said pick-up plate positioned between said separate drive plates and separated from each drive plate by an insulating spacer, said drive plates having spaced opposing conductive surfaces when said pick-up plate is mounted therebetween, said pick-up plate further including a conductive central plate suspended by spring means between said drive plates, wherein said central plate is capable of deflection between the conductive surfaces of each of said drive plates; and

ii. means for transmitting force from a point remote from said central plate to said central portion; and

c. means for measuring the output signal of said force sensor and utilizing said output signal to control a vertical movement of said scanning head to maintain a constant force on a sample as said surface topography is measured.

5,553,487

METHODS OF OPERATING ATOMIC FORCE MICROSCOPES TO MEASURE FRICTION

Virgil B. Elings, Santa Barbara, Calif., assignor to Digital Instruments, Inc., Santa Barbara, Calif.

Continuation of Ser. No. 301,588, Sep. 7, 1994, abandoned, which is a division of Ser. No. 974,603, Nov. 12, 1992, Pat. No. 5,400,647. This application Jul. 14, 1995, Ser. No. 502,368

Int. Cl.[6] G01B *11/30;* **G01N** *19/02*

U.S. Cl. 73—105 **5 Claims**

1. In a method of operating an atomic force microscope having a probe tip attached to a free end of a lever which is fixed at the other end, a sample on which the probe tip is placed, scanning means for producing lateral motion of the tip or sample, and detection means for detecting the bending of the lever, the improvement comprising:

a) producing lateral motion of the tip or sample such that during part of the motion, the tip and sample move together because of lateral force between the tip and sample;

b) measuring by means of the detection means deflection of the lever during the part of the motion in step a); and

c) determining a calibration of the detection means from the known motion in step a) and the deflection measured in step b).

5,553,488

DIAGNOSIS APPARATUS FOR VEHICLE CONTROL SYSTEM

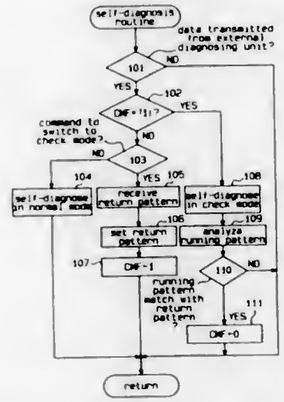
Satoshi Ishii, Toyota, and Takao Akatsuka, Aichi-ken, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 287,395, Jul. 27, 1994, abandoned. This application Nov. 6, 1995, Ser. No. 554,205

Claims priority, application Japan, Jul. 30, 1993, 5-190565

Int. Cl.[6] G01M *15/00;17/00;* **B60R** *16/02;* **F02D** *45/00*

U.S. Cl. 73—116 **20 Claims**



1. A diagnosing apparatus for use in a control system of a vehicle for controlling actuators based on signals from sensors transferred to a microcomputer to diagnose a malfunction of said control system by means of said microcomputer, wherein said microcomputer operates in a selected operation mode from a group consisting of a first mode and a second mode, said second mode being used for the diagnosis requiring a higher precision than the diagnosis according to the first mode, said apparatus comprising:

first memory means for storing a first program for detecting the malfunction of said control system and a second program having a higher detection precision than said first program;

first selecting means for selecting the operation mode of the microcomputer in accordance with an extent of the malfunction of the control system;

executing means for executing the diagnosis according to the first program when the selecting means selects the first mode, and executing diagnosis according to the second program when the selecting means switches the operation mode from the first mode to the second mode;

second memory means for storing a plurality of condition patterns of said control system for returning the operation mode of the microcomputer to the first mode from the second mode;

second selecting means for selecting a specific condition pattern among said plurality of condition patterns stored in the second memory means;

setting means for setting a condition of said control system based on the specific condition pattern selected by the second selecting means;

detecting means for detecting a status of said control system when the diagnosis is performed in the second mode; and

return means for forcibly returning said diagnosis mode to the first mode from the second mode when the status detected by the detecting means matches with the conditions set by the setting means when the second mode is carried out.

5,553,489

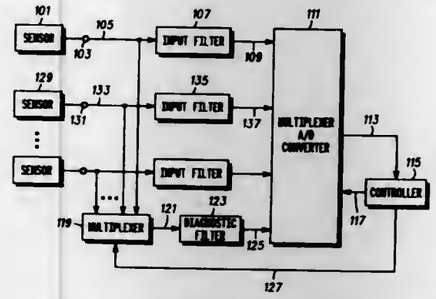
SENSOR DIAGNOSTIC SYSTEM

Lawrence E. Connell, Naperville, and Neal W. Hollenbeck, Schaumburg, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 1, 1995, Ser. No. 384,502

Int. Cl.[6] G01M *15/00*

U.S. Cl. 73—118.1 **4 Claims**



1. A diagnostic system for measuring behaviour of signals provided by a plurality of sensors comprising:

a plurality of filter circuits for receiving signals from each of the plurality of sensors and for providing a plurality of filtered sensor signals each derived from the received signals, wherein each of the plurality of filtered sensor signals have a signal bandwidth lower than a signal bandwidth of the associated received signal;

a selection circuit for receiving the signals from each of the plurality of sensors and, dependent on a selection signal, for providing a selected sensor signal derived from one of the received signals, wherein the selected sensor signal has a signal bandwidth greater than a signal bandwidth of one of the plurality of filtered sensor signals; and

a converter circuit for receiving each of the plurality of filtered sensors signals and the selected sensor signal and for providing a converted signal dependent on another selection signal.

2. A diagnostic system for measuring behaviour of signals provided by a plurality of sensors comprising:

a plurality of filter circuits for receiving signals from each of the plurality of sensors and for providing a plurality of filtered sensor signals each derived from the received signals, wherein each of the plurality of filtered sensor signals have a signal bandwidth lower than a signal bandwidth of the associated received signal; and

a selection circuit for receiving the signals from each of the plurality of sensors and, dependent on a selection signal, for providing a selected sensor signal derived from one of the received signals, wherein the selected sensor signal has a signal bandwidth greater than a signal bandwidth of one of the filtered sensor signals derived from the one of the received signals,

a diagnostic filter circuit, and wherein the provided selected sensor signal is filtered by the diagnostic filter circuit.

5,553,490

VOLUMETRIC METERING EQUIPMENT

Paul Nicholls, Akeley, and Aaron Walsh, West Hunsbury, both of Great Britain, assignors to Lucas Industries Public Limited Company, West Midlands, England

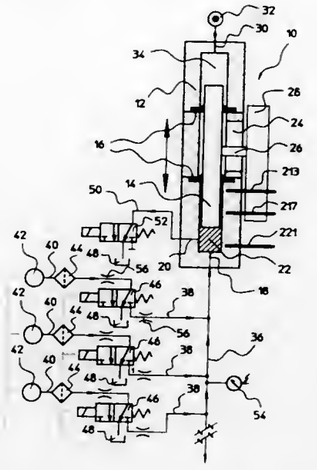
PCT No. PCT/GB92/01905, § 371 Date Jul. 5, 1994, § 102(e) Date Jul. 5, 1994, PCT Pub. No. WO93/08401, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 16, 1992, Ser. No. 211,735

Claims priority, application United Kingdom, Oct. 16, 1991, 9121988

Int. Cl.[6] G01M *15/00*

U.S. Cl. 73—119 A **11 Claims**



1. Volumetric metering equipment, especially but not exclusively for use in metering the volume of fluid pumped through one or more injectors by a diesel-engine fuel injection pump, the equipment comprising (a) a metering unit having a chamber-defining part and a movable part, within the chamber-defining part, which is moveable in a given direction to increase the size of the chamber defined by the chamber-defining part and in the opposite direction to decrease the size of the chamber, (b) input and output port means of the chamber-defining part, the input and output port means being in communication with the chamber, (c) at least one input line connected to the input port means, (d) an input fluid-flow valve included in the said at least one input line, (e) an outlet line connected to the said output port means and (f) a drain fluid-flow valve included in the output line, the equipment being such as to require a predetermined minimum operating pressure of fluid within the chamber, in which end-approach signal means are connected to the metering unit and are so constructed as to provide an end-approach signal when the moveable part is a predetermined distance away from the physical end of the available travel in the said opposite direction, and in which drain valve control means are directly or indirectly connected to the end-approach signal means and the drain valve and are so constructed as to close the drain valve upon receipt of an end-approach signal from the end-approach signal means, whereby (i) the inertia of the moveable part creates an increase in pressure of fluid in the chamber, to a required minimum operating pressure, by the time the speed of movement of the moveable part in the said opposite direction falls to zero, and/or (ii) the return force applied to the moveable member to move it in the said opposite direction remains transmitted to fluid in the chamber when the speed of movement of the moveable part in that direction falls to zero.

5,553,491

TIRE AIR PRESSURE DETECTING DEVICE

a plurality of transducers for placement in the plurality of wells, wherein at least one transducer is placed below the water table

c) means for storing said digital values in a retrievable memory to accumulate a plurality of digital values representative of N

5,553,495

IMPEDANCE DETECTOR, IN PARTICULAR FOR

5,553,491

TIRE AIR PRESSURE DETECTING DEVICE

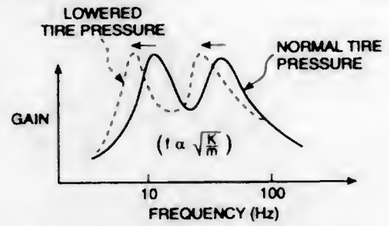
Toshiharu Naito, Okazaki; Takeyasu Taguchi, Obu; Masahiko Kamiya, Anjo, and Kenji Fujiwara, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation-in-part of Ser. No. 133,448, Oct. 8, 1993, which is a continuation-in-part of Ser. No. 87,703, Jul. 9, 1993, abandoned. This application Dec. 17, 1993, Ser. No. 168,093

Claims priority, application Japan, Nov. 11, 1991, 3-294622; Feb. 4, 1992, 4-18983; Feb. 18, 1992, 4-57521; Mar. 16, 1992, 4-55942; Apr. 17, 1992, 4-125623; Apr. 17, 1992, 4-125624; Apr. 20, 1992, 4-128078; Apr. 20, 1992, 4-128079; May 30, 1992, 4-164186; Oct. 8, 1992, 4-297969; Oct. 9, 1992, 4-297843; Dec. 18, 1992, 4-338649

Int. Cl.[6] B60C *23/02*

U.S. Cl. 73—146.5 **7 Claims**



1. A tire air pressure detecting device comprising:

output means installed on a vehicle, for outputting a signal including a vibration frequency component of a tire while said vehicle is moving;

deriving means for deriving gains in regard to each frequency of said vibration frequency component;

extracting means for extracting a plurality of said gains which correspond to a predetermined frequency band;

estimation means for estimating a resonance frequency at which a peak gain exists, based on a distribution of said plurality of gains; and

detecting means for detecting a tire air pressure condition based on said resonance frequency having said peak gain.

5,553,492

MEASURING SYSTEM FOR MEASURING REAL TIME GROUNDWATER DATA

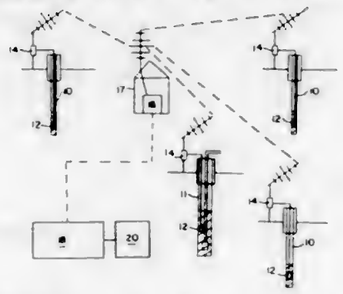
Daniel P. Barrett, Minneapolis, Minn.; Roger J. Davis, Hudson, Wis.; John E. Dustman, Inver Grove Heights, Minn.; Dawn R. Gibas, Minneapolis, Minn.; Bradley G. L. Stevens, Plymouth, Minn., and Barry T. Wilson, St. Paul, Minn., assignors to Summit Envirosolutions, Inc., Minneapolis, Minn.

Filed May 1, 1995, Ser. No. 432,025

Int. Cl.[6] E21B *49/08;* **E91B** *47/00*

U.S. Cl. 73—152.29 **4 Claims**

1. A measuring system for measuring real time groundwater data



from a plurality of wells and graphically depicting the data, the system comprising:

a plurality of transducers for placement in the plurality of wells, wherein at least one transducer is placed below the water table in each well;

a plurality of remote terminal units for collecting data from the transducers, wherein one remote terminal unit is positioned proximate each well and wherein each remote terminal unit is electrically connected to the at least one transducer in its corresponding well and wherein each remote terminal unit contains a radio frequency transmitter and receiver;

a plurality of central terminal units for remotely collecting, reducing and processing data from the plurality of remote terminal units wherein a single central terminal unit services a group of remote terminal units, and wherein each single central terminal unit is positioned substantially central to, but remote from, the corresponding group of remote terminal units, wherein the plurality of central terminal units contain a radio frequency transmitter and receiver for communication with the plurality of remote terminal units, and wherein the plurality of central terminal units contain a remote telecommunications unit;

a home base unit containing a geographic information system for compiling, storing, manipulating and outputting mapped data, the home base unit being remote from the plurality of central terminal units and wherein the home base unit contains a remote telecommunications unit for communicating with the remote telecommunications unit of the plurality of central terminal units; and

a display unit connected to the home base unit for displaying the mapped data output from the home base unit in real time.

5,553,493

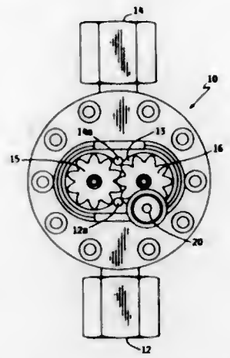
HIGH RESOLUTION FLOWMETER WITH WEAR DETECTION

Gary W. Box, Golden Valley, Minn., and Michael D. Elberson, Elm Grove, Wis., assignors to Graco Inc., Golden Valley, Minn.

Filed Mar. 2, 1994, Ser. No. 204,544

Int. Cl.[6] G01F *3/10*

U.S. Cl. 73—261 **12 Claims**



1. An apparatus for measuring volume flow through a gear-type liquid flowmeter, comprising:

a) a magnet and magnetic field sensor fixedly positioned in relation to the rotatable gears in said flowmeter; whereby the gear teeth of said rotatable gears influence the magnetic field detected by said sensor; said sensor developing an electrical output signal representative of the detected magnetic field and therefore representative of the shape of the gear teeth passing through said magnetic field;

b) sampling means for periodically sampling said electrical output signal, and for developing a digital value equivalent to each periodic sample;

c) means for storing said digital values in a retrievable memory to accumulate a plurality of digital values representative of N incremental positions of each tooth in said flowmeter;

d) means for correlating the volume flow through said flowmeter to an incremental position N; and

e) means for monitoring successive ones of said digital values, and for signaling when each digital value corresponding to N is detected; thereby to provide a signal corresponding to the volume flow through said flowmeter for each of said N incremental positions.

5,553,494

FLUID LEVEL SENSING SYSTEMS

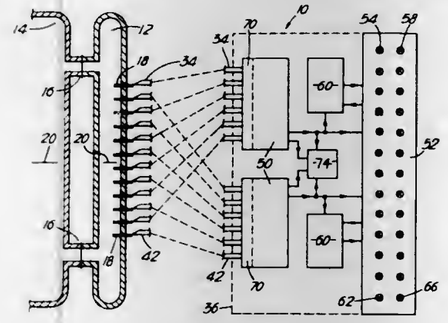
Paul N. Richards, Basingstoke, England, assignor to Solartron Group Limited, England

Filed May 27, 1994, Ser. No. 250,007

Claims priority, application United Kingdom, May 29, 1993, 9311187

Int. Cl.[6] G01F *23/00*

U.S. Cl. 73—304 R **10 Claims**



1. A fluid level sensing system for sensing a level of an interface between a first fluid and a second fluid, the first fluid being beneath and of lower electrical impedance than the second fluid, the system comprising an electrically conductive vessel for containing the fluids and a plurality of vertically spaced sensors including an interface sensor and at least one additional sensor positioned below the interface sensor, said interface sensor being either at the interface or immediately below the interface when none of said sensors is at the interface, wherein each of said sensors has a sensing portion which projects into and is electrically insulated from the vessel and which is arranged to produce a signal representative of the impedance of the fluid between the sensing portion and the vessel, further comprising output means responsive to said impedance-representative signals for producing a first signal which is dependent upon a ratio between an impedance sensed by the interface sensor and a value for an impedance of the first fluid derived from said additional sensor, and for combining said first signal with a second signal dependent upon the level of the interface sensor so as to produce an output signal representative of the level of said interface within the vessel.

5,553,495

IMPEDANCE DETECTOR, IN PARTICULAR FOR RADIOSONDE OPERATION AND PROCESS FOR MANUFACTURE OF AN IMPEDANCE DETECTOR

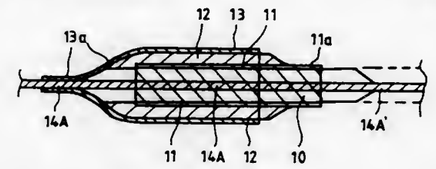
Ari Paukkunen, Vuorilehdonkuja B 1, 01200 Vantaa, Finland, and Jorma Ponkala, Ylönkyläntie 32, 25610 Ylönkylä , Finland

Filed Sep. 16, 1994, Ser. No. 307,057

Claims priority, application Finland, Sep. 29, 1993, 934266

Int. Cl.[6] H01G *13/00;* **G01N** *27/22;* **G01W** *1/00*

U.S. Cl. 73—335.030 **9 Claims**



1. Impedance detector, in particular for radiosonde operation, which detector comprises a substrate (**10** . . . **10E**) made of an insulating material, onto which substrate the electrode and contact patterns (**11**, **11***a*, **13**) necessary for the formation and connecting of the detector impedance electrodes (**11**, **13**) have been applied, and in which detector between the detector impedance electrodes (**11**, **13**) there is an active film (**12**) whose impedance values are a function of the physical quantity measured by means of the detector, characterized in that:

the substrate of the detector is an oblong core filament (**10**;**10B**;**10C**;**10D**;**10E**) of an insulating material, onto and around which core filament said electrodes (**11**,**13**) and said active insulating film (**12**) have been applied;

the core filament (**10C**) of the detector is made of dielectric ceramic glass, which operates as the dielectric for the measurement of the temperature of the detector;

in connection with said core (**10B**), contact patterns or equivalent are provided, between which the temperature-dependent capacitance can be measured, and;

the outer layer (**16**) of the core filament (**10C**) is selected from the group consisting of a glass layer and another insulating layer (FIG. **4C**).

5,553,496

APPARATUS AND A METHOD FOR DETECTING THE GENERATION OF DUST PARTICLES AND A CLEAN ROOM EQUIPPED WITH THE APPARATUS

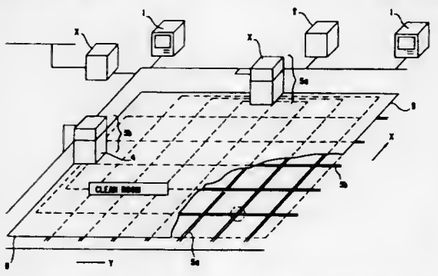
Hiroaki Nishiyama, and Katsuyuki Nakano, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Nov. 30, 1994, Ser. No. 350,177

Claims priority, application Japan, Jan. 24, 1994, 6-005486

Int. Cl.[6] G01N *15/00;* **B01L** *1/04*

U.S. Cl. 73—432.1 **10 Claims**



1. An apparatus for detecting particles which are generated in a space partitioned by walls including a first wall and a second wall

facing in parallel to each other, wherein air cleaned in advance is

5,553,498

PIPE AND DUCT RUN LOCATOR

with said previously-set threshold value so as to produce an "ON" output signal when the threshold value is exceeded; means for

facing in parallel to each other, wherein air cleaned in advance is sent into the space from the first wall so as to flow toward the second wall and to be discharged outside of the space through a plurality of openings formed in the second wall, the openings corresponding to each of regions defined on the second wall so as to be arranged in rows and columns, the apparatus comprising:

a plurality of sampling tubes disposed outside of the space so as to be adjacent to the second wall and in parallel to the second wall, said plurality of sampling tubes including a first group of sampling tubes extending so as to correspond to respective rows of openings and a second group of sampling tubes extending so as to correspond to respective columns of openings, wherein each of the sampling tubes has an open end and a plurality of perforations formed on a side thereof so as to correspond to respective regions in at least one of a corresponding row and column;

a counter for counting a number of particles in the air which is discharged outside of the space through the openings corresponding to the regions in each of the rows and the columns, the air being sucked in corresponding sampling tubes through the perforations formed thereon and sent to the counter via a corresponding sampling tube; and

a facility for sequentially connecting each of the sampling tubes through the corresponding open end to the counter so that the air sucked in each of the sampling tubes is sent to the counter at a different timing.

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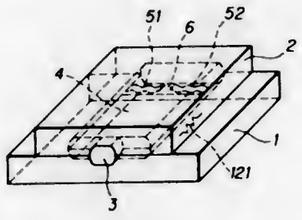
GAS FLOW TYPE ANGULAR VELOCITY SENSOR

Mizuho Doi; Tomoyuki Nishio, and Nobuhiro Fueki, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 17, 1995, Ser. No. 390,875
Claims priority, application Japan, Feb. 23, 1994, 6-064318
Int. Cl.[6] G01P *9/00*
U.S. Cl. 73—504.06 **6 Claims**



1. A gas flow angular velocity sensor for sensing an angular velocity acting on a sensor body of the sensor, comprising (a) a control bridge circuit (14) for detecting gas flow to be controlled by an unbalanced output of an angular velocity detecting bridge circuit (10) and (b) a gas flow control circuit (15) for controlling drive of a pump to maintain a constant flow rate of gas, the angular velocity detecting bridge circuit having paired primary thermosensitive resistance elements (51,52) disposed as arms on opposite sides of the angular velocity detecting bridge circuit in a gas path through the sensor body and paired primary reference resistance elements (81, 82) disposed outside of the gas path, said output appearing when resistances of the paired primary thermosensitive resistance elements (51, 52) change when a flow of gas directed toward said paired primary thermosensitive resistance elements (51, 52) deflects by action of the angular velocity on the sensor body, wherein a temperature compensating circuit (12) is connected to the angular velocity detecting bridge circuit (10) in series with a power supply of the control bridge circuit and said temperature compensating circuit comprises a secondary thermosensitive resistance element (121) and a secondary reference resistance element (122).

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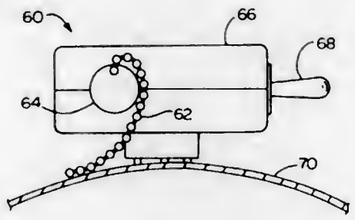
PIPE AND DUCT RUN LOCATOR

Alex Zelczer, and Ruth Zelczer, both of 3840 Severn Rd., Cleveland Heights, Ohio 44118

Continuation-in-part of Ser. No. 508,900, Apr. 12, 1990, abandoned. This application May 31, 1994, Ser. No. 251,473
Int. Cl.[6] G01H *17/00*
U.S. Cl. 73—584 **4 Claims**



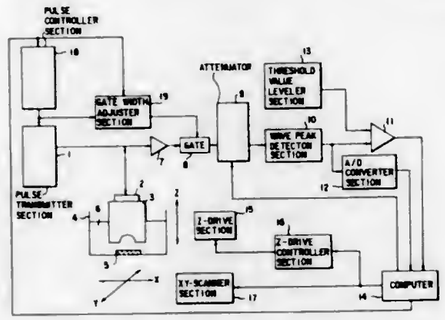
1. A portable apparatus for identifying a heating and/or cooling duct at a second location in a building remote from a known first location of the heating and/or cooling duct, said apparatus comprising a housing, an electrical vibration device mounted in said housing and including means for generating human audible sound vibrations in the range of 20–10,000 Hz, means for connecting said electrical vibration device to a battery, and means for detachably securing said housing to a wall of the heating and/or cooling duct, and wherein said electrical vibration device includes a motor driven chain whip for repeatedly striking the duct.

5,553,499

ULTRASONIC MICROSCOPE HAVING AN AUTOMATIC FOCUSING ADJUSTMENT MECHANISM

Naboko Hisata, and Tomio Endo, both of Hachiouji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 835,460, Feb. 24, 1992, abandoned. This application Sep. 2, 1994, Ser. No. 300,064
Claims priority, application Japan, Sep. 7, 1990, 2-238010; WIPO, Sep. 7, 1991, PCT/JP91/01191
Int. Cl.[6] G01N *29/04*
U.S. Cl. 73—606 **2 Claims**



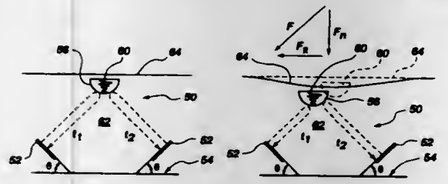
1. An ultrasonic microscope wherein ultrasonic waves converged by an acoustic lens are made incident onto a sample, reflected waves from the sample are received and converted into received electric signals, and the ultrasonic wave image of the sample is formed using the received signals, comprising: a means for adjusting the distance of the acoustic lens relative to the sample; a means for picking up those of the received electric signals which correspond to a part of the reflected signals from the sample; an attenuator receiving an output signal from the pickup means; a means for storing a previously set threshold value; a means for comparing a peak value of an output of the attenuator with said previously-set threshold value so as to produce an "ON" output signal when the threshold value is exceeded; means for adjusting an attenuation amount of said attenuator so as to vary the signal input/output ratio of said attenuator in order to change the "ON" output signal of the comparing means to "OFF"; and means for calculating the focus position of said acoustic lens to produce a calculation result on the basis of an attenuation curve obtained as said attenuation amount with regard to one position of said acoustic lens when said acoustic lens is moved from another position to said one position, remote from its focus position, to said sample and for outputting a drive signal, responsive to said calculation result, to said distance adjuster means.

5,553,500

TRIAXIAL NORMAL AND SHEAR FORCE SENSOR

Allen R. Grahn, and Josephine M. Grahn, both of Salt Lake City, Utah, assignors to Bonneville Scientific Incorporated, Salt Lake City, Utah

Filed Oct. 26, 1994, Ser. No. 329,465
Int. Cl.[6] G01L *1/25;* **G01N** *29/26*
U.S. Cl. 73—628 **31 Claims**



29. A method of determining shear and normal force components of a force, comprising:

arranging an acoustically-reflective target;

providing at least two ultrasonic transducers horizontally and vertically offset from said target in a common plane, and aiming said transducers at said target from a common distance;

compliantly supporting said target with a structure having known compliancy characteristics in a substantially acoustically-transparent, substantially acoustically-nonrefractive medium extending between each of said transducers and said target, said medium having known speed-of-sound;

applying said force to said target;

emitting an ultrasonic signal from each transducer toward said target, and timing the transit time between emission of each said signal and the emitted signal's return to the transducer from which the signal was emitted; and

calculating shear and normal force components of said force from said transit times and said known speed-of-sound and compliancy characteristics.

5,553,501

VIBRATION TESTING ON ROTATING MACHINE COMPONENTS

William T. Gaddis, Palm Beach Gardens; Kennneth I. Nelson, Stuart, both of Fla., and Gary W. Thomas, Louisville, Ky., assignors to United Technologies Corporation, Hartford, Conn.

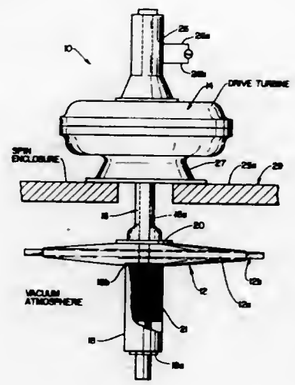
Filed Dec. 5, 1994, Ser. No. 350,217
Int. Cl.[6] G01M *7/02*
U.S. Cl. 73—662 **7 Claims**

6. A method for testing a rotating component comprising:

placing the component in a jig on a shaft and spinning the shaft;

imparting vibrations to the shaft from piezoelectric crystals mounted on the shaft in response to an electric signal; and

providing said electrical signal as the shaft rotates.

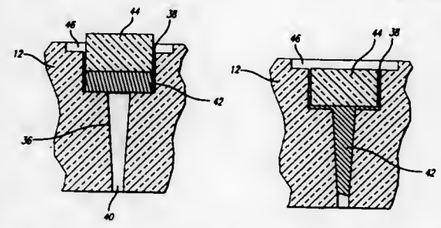


5,553,502

CAPACITIVE PRESSURE SENSOR WITH EXTRUDED INDIUM VACUUM SEAL

Youfong Hsieh, Camarillo, Calif., assignor to Kavlico Corporation, Moorpark, Calif.

Filed Dec. 22, 1994, Ser. No. 362,656
Int. Cl.[6] G01L *9/12;* **B23K** *20/02*
U.S. Cl. 73—724 **16 Claims**



10. A method for hermetically sealing a capacitive pressure sensor comprising a plate formed substantially of alumina and having a conductive layer on one surface thereof and an evacuation passage formed therethrough, a diaphragm formed substantially of alumina and having a conductive layer on one surface thereof facing said conductive layer of said plate, and an annular hermetic seal defining a chamber between said plate and said diaphragm, comprising the steps of:

forming a recess in an outer portion of said evacuation passage; and

extruding indium in into said recess and said evacuation passage.

5,553,503

MEASUREMENT OF FLUID PRESSURE SUCH AS BLOOD PRESSURE

Raymond J. Surdut, East Providence; Edwin H. Benz, Sr., Providence, both of R.I., and James P. Skoutas, Palm Beach Gardens, Fla., assignors to ManometRx Group Ltd, East Providence, R.I.

Filed Oct. 11, 1994, Ser. No. 320,331
Int. Cl.[6] G01B *7/16*
U.S. Cl. 73—778 **21 Claims**

1. A piezoelectric sensor comprising:

a housing having a chamber, said chamber having only one opening;

a flexible piezoelectric material having first and second sides covering said opening;

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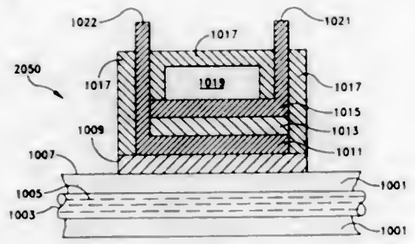
ELECTRONIC FLUID FLOW METER

an airborne particulate intake for accepting air flow containing airborne particulate;



a compressible fluid within said chamber; and means for measuring electrical charges on said first side.

5,553,504

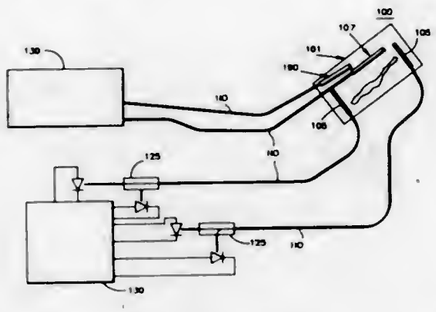
INTRUMENTED PATCH FOR REPAIR OF FATIGUE DAMAGED OR SENSITIVE STRUCTURE

Donald R. Lyons, Melville, N.Y.; Stanley M. Reich, Jericho, and Peter Shyprykevich, Margate, both of N.J., assignors to Grumman Aerospace Corporation, Los Angeles, Calif.

Continuation of Ser. No. 155,822, Nov. 23, 1993, abandoned. This application Oct. 19, 1995, Ser. No. 545,167

Int. Cl.[6] G01N *19/08*

U.S. Cl. 73—799 **15 Claims**



1. An apparatus for preventing and detecting formation or propagation of a crack in a structural member, said apparatus comprising:

a patch, adapted to be fixed to a surface of a structural member, which forms a means for reducing stress levels in a patch-covered area on the surface of the member by bearing a substantial portion of a load on said surface; and

strain-sensing means integrally formed with said patch for sensing a strain field in a fatigue sensitive region within the patch-covered area, said strain-sensing means providing a signal indicative of changes in the strain field in said fatigue sensitive region.

5,553,505

ELECTRONIC FLUID FLOW METER

Noel Bignell, Annandale; Anthony F. Collings, Turramurra; Kenneth J. Hewa-Taylor, West Pymble; Barry J. Martin, Guildford; Colin W. Brasthen, Naremburn, and Charles M. Welsh, Kariong, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

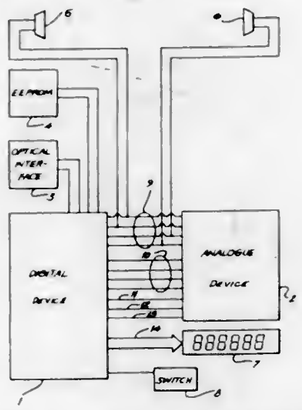
PCT No. PCT/AU92/00314, § 371 Date Mar. 15, 1994, § 102(e) Date Mar. 15, 1994, PCT Pub. No. WO93/00569, PCT Pub. Date Jan. 7, 1993

PCT Filed Jun. 25, 1992, Ser. No. 175,361

Claims priority, application Australia, Jun. 25, 1991, PK6893

Int. Cl.[6] G01F *1/00*

U.S. Cl. 73—861.28 **33 Claims**



1. A method of detecting the time of arrival of an acoustic wave packet comprising at least three cycles and not more than five cycles transmitted at a particular frequency, said method comprising the steps of detecting the wave packet and forming a received signal therefrom, rectifying and filtering the received signal to form an envelope signal, detecting when said envelope signal crosses a detection threshold to thereby enable the detection of a transition across a predetermined level by said received signal, the transition across said predetermined level occurring during said cycles and representing a determinable number of cycles of said received signal at said particular frequency after the arrival of said acoustic wave packet, said determinable number of cycles being two and one half cycles.

5,553,506

FORCE SENSOR AND A METHOD FOR MANUFACTURING A FORCE SENSOR

Gerhard Benz, Boeblingen; Franz Laermer, Stuttgart; Andrea Schilp, Schwaebisch; Erich Zabler, Stutensee; Jürgen Schirmer, Heidelberg, and Werner Uhler, Bruchsal, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Sep. 8, 1994, Ser. No. 303,099

Claims priority, application Germany, Sep. 29, 1993, 43 33 099.1

Int. Cl.[6] G01L *1/00*

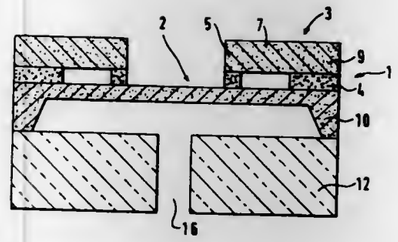
U.S. Cl. 73—862.59 **10 Claims**

1. A force sensor comprising:

a bending element that is deformable by action of a force;

a first mechanical resonator disposed on the bending element, a vibratory frequency of the first resonator being influenced by deformation of the bending element;

a dielectric layer disposed between the bending element and the first resonator; and wherein



at least a portion of the bending element and the first resonator is composed solely of silicon.

5,553,507

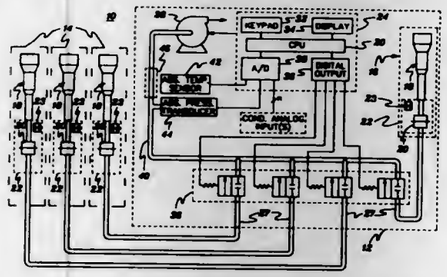
AIRBORNE PARTICULATE

Lauren R. Basch, East Greenbush, and Harvey Patashnick, Voorheesville, both of N.Y., assignors to Rupprecht & Patashnick Company, Inc., Albany, N.Y.

Continuation of Ser. No. 370,554, Jan. 9, 1995, abandoned, which is a continuation of Ser. No. 74,930, Jun. 10, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 461,130

Int. Cl.[6] G01N *1/24*

U.S. Cl. 73—863.01 **37 Claims**



1. A manual sampling monitor for collecting airborne particulate, said manual sampling monitor comprising:

at least two airborne particulate intakes;

at least two particulate filters, each particulate filter being paired with and coupled to a different one of said at least two intakes for collecting airborne particulate;

vacuum pump means for establishing air flow into a selected one of said at least two intakes, said selected one of said at least two intakes accepting particulate in the established air flow for collection at its paired particulate filter;

a single automated sampling control means electromechanically coupled to each intake and particulate filter pairing and to said vacuum pump means for control of said vacuum pump means' establishing of air flow into said selected one of said at least two airborne particulate intakes;

multiple filter holder/exchange mechanisms and associated housings, each filter holder/exchange mechanism having a pivoting mechanism and being actuatable using said pivoting mechanism between a filter sample position and a filter exchange position, and wherein each of said at least two particulate filters is beld within its own filter holder/exchange mechanism, and each filter holder/exchange mechanism resides within its own associated housing; and

means for controlling temperature within said filter holder/exchange mechanism housings, said temperature control means being coupled to and controlled by said sampling control means.

20. A manual sampling monitor for collecting airborne particulate, said manual sampling monitor comprising:

an airborne particulate intake for accepting air flow containing airborne particulate;

a particulate filter coupled to said airborne particulate intake for sampling accepted airborne particulate;

vacuum pump means for establishing air flow into said intake, said air flow containing airborne particulate for sampling by said particulate filter; and

automated sampling control means coupled to said vacuum pump means for control of said vacuum pump means' establishing of air flow into said airborne particulate intake, said sampling control means having means for receiving external condition dependent data and for employing at least some of said external condition dependent data for conditional activation of said vacuum pump means' establishing of air flow into said airborne particulate intake.

23. A monitor for manual sampling of airborne particulate, said monitor comprising:

an airborne particulate intake for accepting air flow containing airborne particulate;

a particulate filter coupled to said airborne particulate intake for sampling accepted airborne particulate;

means for establishing air flow containing airborne particulate into said airborne particulate intake; and

means for raising the temperature of air flow within said monitors, wherein once said particulate filter is manually removed from said manual sampling monitor, particulate collected by said filter can be immediately analyzed.

5,553,508

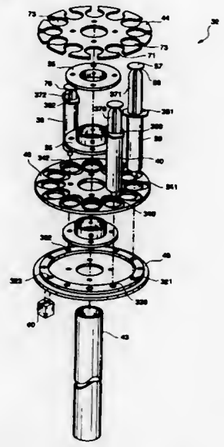
PORTABLE INTELLIGENT WHOLE AIR SAMPLING SYSTEM

Walter F. Dabberdt; Kenneth D. Norris, both of Boulder; Steven R. Semmer, Westminster; Anthony C. Delany, Eldorado Springs, and Jack R. Fox, Broomfield, all of Colo., assignors to University Corporation For Atmospheric Research, Boulder, Colo.

Filed Mar. 24, 1995, Ser. No. 410,339

Int. Cl.[6] G01N *1/26*

U.S. Cl. 73—63.02 **24 Claims**



1. An air sampling system comprising:

means for removably affixing a plurality of sample containers in a removable carousel within a housing;

means for controlling said air sampling system from within said housing according to at least one programmable sampling parameter selected from the group consisting of: flow rate, time of day, time period, occurrence of an event, and total volume, independently for each one of said plurality of sample containers; and

means, responsive to said controlling means, for variably capturing a whole air sample in a precise amount that can be less

end portion of the arm being penetrated by a pair of slanting holed which meet at an opening of the stem-binding cylinder; a pair of skew blocks are fitted in the slanting holes, one of the

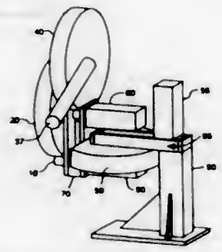
a output link that is connected to said first and second cam followers and the output shaft, said first and second cams are

means, responsive to said controlling means, for variably capturing a whole air sample in a precise amount that can be less than an entire sample container volume for any of said plurality of sample containers by way of an air sample port through said housing.

5,553,509
THREE DEGREE OF FREEDOM ROBOTIC MANIPULATOR CONSTRUCTED FROM ROTARY DRIVES

Steven D. Somes, 8840 Eagle Rd., Kirtland, Ohio 44094

Continuation-in-part of Ser. No. 63,952, May 20, 1993, Pat. No. 5,429,015. This application Jun. 2, 1995, Ser. No. 458,721
Int. Cl.[6] B25J *9/04*
U.S. Cl. 74—89.2 **18 Claims**



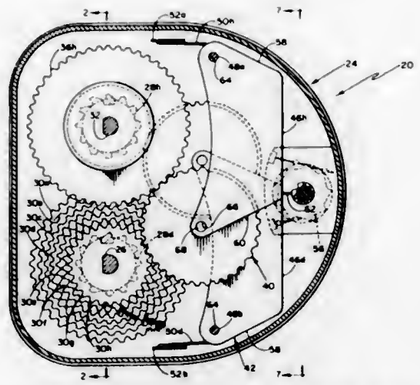
1. A three degree-of-freedom positioning and manipulating apparatus, comprising:
a first driven member rotatable about a first driven axis;
first driving means coupled to said first driven member for rotating said first driven member about said first driven axis;
a second driven member rotatably mounted to said first driven member for rotating about a second driven axis, with said second driven axis generally perpendicular to said first driven axis;
a second driving means coupled to said second driven member for rotating said second driven member about said second driven axis;
a third driven member rotatably mounted in close proximity to said second driven member for rotating about a third driven axis;
third driving means coupled at a drive point to said third driven member for rotating said third driven member about said third driven axis; and
wherein said drive point is generally coincident with said second driven axis.

5,553,510
MULTI-SPEED TRANSMISSION

Alan C. Balbern, 361 S. Fork, Plainwell, Mich. 49080

Filed Feb. 27, 1995, Ser. No. 395,093
Int. Cl.[6] F16D *23/00*; F16H *3/34*
U.S. Cl. 74—354 **21 Claims**

21. A multi-speed transmission for transmitting power between a first shaft and a second shaft, the transmission comprising:
a plurality of first gears rotatably disposed about the first shaft;
a plurality of second gears coupled to the second shaft;
a plurality of uni-directional free wheeling mechanisms between the first gears and the first shaft, wherein rite plurality of uni-directional free wheeling mechanisms simultaneously engage the plurality of first gears and wherein each uni-directional free wheeling mechanism permits its corresponding first gear to freely rotate about the first shaft when its corresponding first gear rotates in a first direction relative to the rotation of the first shaft and couples its corresponding first gear to the first shaft at all other times; and

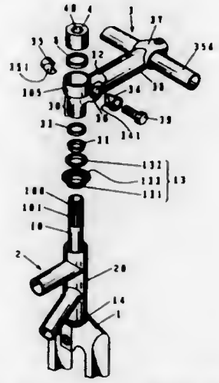


means for interconnecting at least one of the first and second gears and for simultaneously interconnecting a pair of the first gears with a pair of the second gnats during shifting.

5,553,511
HANDLE STEM FIXING DEVICE IN A BICYCLE

Kohei Marui, Kobe, Japan, assignor to Marui Co., Ltd., Hyogo-ken, Japan

Filed Sep. 23, 1994, Ser. No. 311,123
Claims priority, application Japan, Oct. 5, 1993, 5-249533
Int. Cl.[6] B62K *21/12*
U.S. Cl. 74—551.1 **16 Claims**

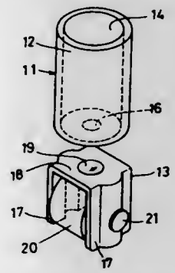


1. An improved device for fixing a handle stem of a bicycle to a fork stem of the bicycle, the fork stem being rotatably inserted into a head pipe of a frame of the bicycle, the head pipe having an upper end and the fork stem having an upper portion which projects out from the upper end of the head pipe, the upper portion of the pipe stem having an outer surface, the handle stem including a stem-binding cylinder having an inner surface, and the stem-binding cylinder being fixed on the upper portion of the fork stem, with the outer surface of the upper portion of the fork stem being pressed by the inner surface of the stem-binding cylinder so that the stem-binding cylinder does not rotate on the fork stem, wherein the improvement comprises:
a large number of small protrusions are provided on the outer surface of the fork stem where the outer surface of the fork stem is pressed by the stem-binding cylinder, the protrusions comprising ribs which are parallel to the fork stem;
the handle stem additionally includes an arm having an end portion which is connected to the stem-binding cylinder, the end portion of the arm being penetrated by a pair of slanting holed which meet at an opening of the stem-binding cylinder;
a pair of skew blocks are fitted in the slanting holes, one of the skew blocks having a bore and the other of the skew blocks having a threaded hole which is aligned with the bore; and
a bolt extends through the bore and engages the thread hole;
wherein the skew blocks and the slanting holes are configured so that the skew blocks approach each other while sliding into the slanting holes when the bolt is tightened into the threaded hole.

5,553,512
ROLLER TAPPET HAVING YOKE MEMBER WITH FLAT TOP PLATE

Kazuyoshi Harimoto, Iwata, Japan, assignor to NTN Corporation, Osaka, Japan

Filed Sep. 14, 1993, Ser. No. 120,419
Int. Cl.[6] F01L *1/14*
U.S. Cl. 74—569 **7 Claims**

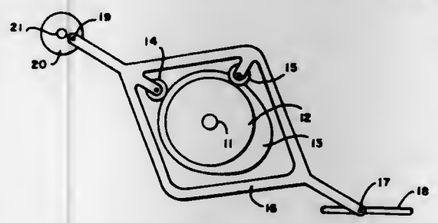


1. A roller tappet comprising a cup-shaped, closed bottom case member for receiving and supporting the bottom end of a push rod; a yoke member comprising a top plate immorably coupled to a bottom surface of said case member and side walls extending from said top plate in a direction away from said case member; and a roller mounted in said yoke member and having a shaft supported on said side walls of said yoke member.

5,553,513
MECHANICAL MOTION TRANSFER OR INDEXING DEVICE

Arnold T. Eventoff, Pleasantville, N.Y., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 23, 1995, Ser. No. 409,382
Int. Cl.[6] F16H *53/08;27/04;35/02*
U.S. Cl. 74—569 **8 Claims**

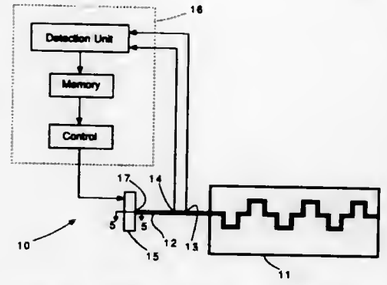


1. A linkage device for coupling an input shaft with an output shaft, said device comprising:
a first cam that is coupled to a first cam follower, said first cam is connected to the input shaft;
a second cam that is coupled to a second cam follower, said second cam is connected to the input shaft; and
a output link that is connected to said first and second cam followers and the output shaft, said first and second cams are shaped to force said output link to trace out a circular path causing said output link to rotate the output shaft.

5,553,514
ACTIVE TORSIONAL VIBRATION DAMPER

Janusz Walkowc, Cordova, Tenn., assignor to Stahl International, Inc., Memphis, Tenn.

Filed Jun. 6, 1994, Ser. No. 254,123
Int. Cl.[6] F16F *15/10;15/00*
U.S. Cl. 74—574 **12 Claims**



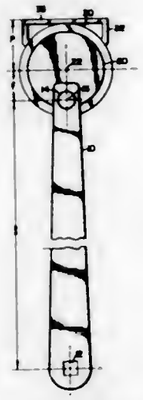
1. A method of damping resonance torsional vibrations in a system having a member capable of transmitting a torque, the method comprising the steps of:
detecting a resonance torsional vibration in the member;
estimating time periods when the resonance torsional vibration is between peak angular amplitudes at a damping location;
imparting a plurality of successive torsional impulses to the member at said damping location, wherein each of said torsional impulses being imparted over a portion of one of said time periods in a direction opposite to a twisting motion from the resonance torsional vibration; and
sizing said torsional impulses to have sufficient energy to damp the resonance torsional vibration such that said peak angular amplitudes are maintained less than a thresbold amplitude.

5,553,515
BICYCLE PEDAL

Young M. Yang, Ku-ri-si, Su-tak-dong 556-5, Kyung-ki-do, Rep. of Korea, and Young H. Kim, 7465 Columbia Ct., Woodbury, Minn. 55125

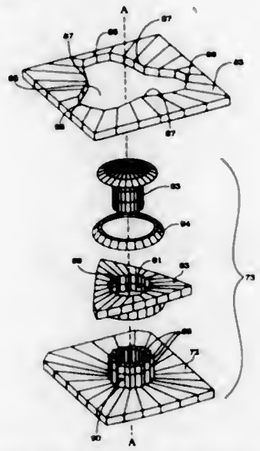
Continuation-in-part of Ser. No. 16,774, Feb. 11, 1993, abandoned. This application Aug. 2, 1993, Ser. No. 101,537
Int. Cl.[6] G05G *1/14*
U.S. Cl. 74—594.3 **17 Claims**

1. A device in combination with a crank arm of the type having a proximal end rotating about a fixed axis, a distal end having a bore, and a fixed crank length defined by a distance between the fixed axis and a centerline through the bore, said device comprising:
an axle defining an axis of rotation;
means for mounting said axle to the crank arm with said axis of rotation offset from the bore of the crank arm at a fixed first distance, said means for mounting maintaining said axis of rotation fixed relative to, and parallel to, the fixed axis of the crank arm;
a housing coupled to said axle and rotating about said axis of rotation, said housing having an outer force engaging surface spaced a fixed second distance from said axis of rotation and fixed relative to said housing; and
means for retaining said outer force engaging surface upright relative to a surface of the ground with said axis of rotation



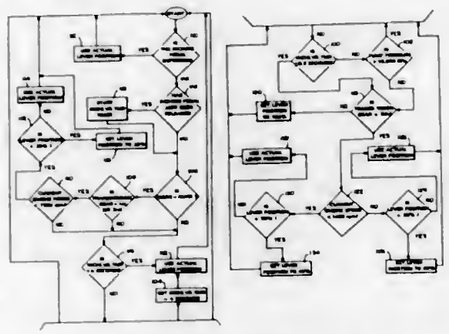
interposed between said outer force engaging surface and the surface of the ground.

5,553,516
AUTOMATIC PEDAL
Jonathan Weiss, 3675 Clarington Ave. #1, Los Angeles, Calif. 90034
Filed Feb. 7, 1994, Ser. No. 192,261
Int. Cl.[6] G05G 1/14
U.S. Cl. 74—594.6 6 Claims



1. An apparatus for attaching a bicycle rider's shoe to a bicycle pedal mechanism having a pedal arm extending between a sprocket and a pedal axis, said apparatus comprising:
a peg having a first end and a second end;
a peg connector for connecting the first end of the peg to the shoe in a fixed position with respect to the shoe;
a bracket having a surface provided with an aperture therein, the aperture being shaped to receive the peg upon insertion of the peg downward through the aperture, the aperture having an edge which constantly abuts the peg upon the peg being received in the aperture;
a bracket connector for connecting the bracket to the pedal arm so as to substantially preclude upward vertical movement of the bracket with respect to the pedal axis; and
attaching means, provided on the peg and spaced from the first end of the peg, for attaching the peg to the bracket upon inserting the peg in the aperture and turning the peg with respect to the bracket while the peg is connected to the shoe and while the bracket is connected to the pedal;
wherein the attaching means includes means for attaching the peg, at a particular riding position, to the bracket; and
wherein the peg includes adjustment means for adjusting the particular riding position.

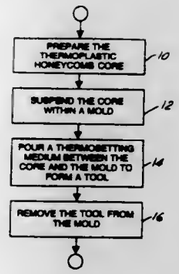
5,553,517
ALL WHEEL DRIVE TORQUE CONTROL LEVER OVERRIDE
Leon P. Yesel, East Peoria, and John P. Kitzerow, Metamora, both of Ill., assignors to X Caterpillar Inc., Peoria, Ill.
Filed Jul. 15, 1994, Ser. No. 275,858
Int. Cl.[6] F16H 47/02
U.S. Cl. 74—731.1 17 Claims



1. A method for overriding a torque control lever in an all wheel drive machine having an engine, an inching pedal, transmission and pump for supplying pressurized fluid for effecting all wheel drive, said machine having automatic and manual modes of operation, comprising the steps of:
determining current engine speed;
using actual torque control lever position when the inching pedal is depressed to control said pump and thereby control wheel torque;
determining whether the inching pedal has just been released;
starting a timer when the inching pedal has just been released;
determining the mode of operation of said transmission; and
overriding the torque control lever and setting the actual torque control lever position to a first lever value to control wheel torque when the mode is automatic, the transmission is in one of first and second gears, the current engine speed is less than a first preselected rpm value and the actual lever position is greater than said first lever value.

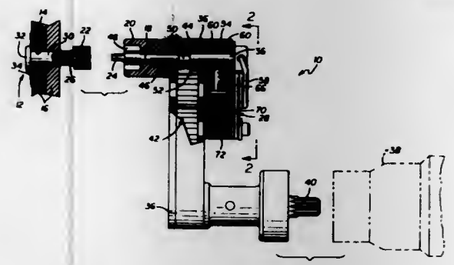
5,553,518
INDUSTRIAL TOOL FOR FORMING METAL HAVING A THERMOPLASTIC HONEYCOMB CORE
Rebecca D. Henry, Holt, and William Livingston, Eaton Rapids, both of Mich., assignors to Akemi, Inc., Eaton Rapids, Mich.
Filed Jul. 21, 1994, Ser. No. 278,619
Int. Cl.[6] B29C 39/00
U.S. Cl. 76—107.1 10 Claims

1. A method of manufacturing a tool, which comprises:
preparing a thermoplastic honeycomb core;
suspending the core within a mold;
pouring a thermosetting medium between the core and the mold to form a core encapsulated by the medium at room temperature; and
removing the core encapsulated by the medium from the mold.



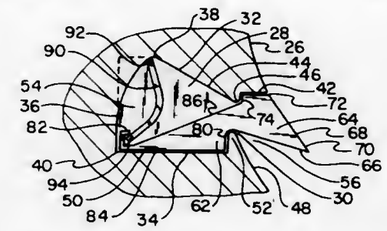
8. A tool for stretch forming an object, the tool comprising:
a thermoplastic honeycomb core, the core being comprised of plural honycomb pieces having a density of about 14–15 lbs. per cubic foot; and a thermoset medium encapsulating the core to define a surface of the tool.

5,553,519
FASTENER INSTALLATION TOOL
Jack E. Pettit, Jr., 2254 Conestoga Dr., Carson City, Nev. 89706
Filed May 26, 1995, Ser. No. 451,183
Int. Cl.[6] B25B 23/157
U.S. Cl. 81—56 12 Claims



1. In a fastener installation tool having a socket for receiving and supporting a threaded nut, drive means for rotatably driving the socket for installing the nut onto a threaded fastener, and a fixture pin having a land of noncircular cross section formed therein and said fixture pin being disposed generally coaxially within the socket for engaging and supporting the threaded fastener against rotation during drive installation of the nut onto the fastener, the improvement comprising:
a clutch assembly for rotatably supporting the fixture pin within the socket to permit fixture pin rotation in response to a torque load applied to the fixture pin in excess of a predetermined limit, whereby said clutch assembly safeguards the fixture pin against breakage in response to a torque load applied thereto;
said clutch assembly comprising a cam wheel having a bore therein of noncircular cross section for mating and longitudinal sliding reception of said fixture pin, said cam wheel defining a plurality of radially outwardly open detent seats, a cam pin, and spring means for biasing said cam pin to a position with one end thereof seated within one of the detent seats in said cam wheel, said cam wheel being rotatable with said fixture pin in response to a torque load applied to the fixture pin in excess of the predetermined limit to cause said cam pin to retract against said spring means.

5,553,520
OPEN-END SELF-ADJUSTING RATCHET WRENCH
Leonard P. Jacobs, 328 Dogwood Rd., Millersville, Md. 21108
Filed Feb. 21, 1995, Ser. No. 391,934
Int. Cl.[6] B25B 13/28
U.S. Cl. 81—90.1 3 Claims



1. An open-end self-adjusting ratchet wrench for tightening and loosening fasteners such as nuts, bolts, and the like comprising, in combination:
a rigid handle having a C-shaped head portion defining a holding space sized for receiving a fastener therein, a base end, and an intermediate holdable portion extended in curvature therebetween, the head portion further having a pair of opposed side faces with a ratcheting surface extended therebetween and facing the holding space and with the ratcheting surface having a plurality of circumferentially spaced notches formed therealong and placed in communication with the holding space, each notch defining a hollow interior and an opening to the interior and with the interior bounded by an upper surface portion, a lower surface portion, and a curved guiding surface portion extended therebetween to further define an upper seating juncture and a lower seating juncture, the upper surface portion further having a planar upper pressure application surface, an angled upper locking surface, and a downwardly protruding outboard lock therebetween, the lower surface portion further having an angled recessed surface positioned below the upper pressure application surface and extended to the ratcheting surface, a planar lower pressure application surface positioned below the upper locking surface, an upwardly protruding inboard lock positioned therebetween and located in general opposition to the outboard lock and with the locks dividing the interior into an inner part and an outer part;
a plurality of rigid teeth, each tooth separately disposed within one of the notches, each tooth having an inboard portion and an outboard portion, each inboard portion disposed within the inner part of the associated notch, each outboard portion disposed within and extendable from the outer part of the associated notch of the head portion, each outboard portion further having a leading edge, a trailing edge extended to the leading edge to define a gripping point for gripping a fastener disposed within the holding space, an upper abutment edge extended from the trailing edge and positionable in facing contact with the upper pressure application surface of the head portion, and an upper locking surface extended downwards from the upper abutment edge and positioned in contact with the outboard lock of the head portion, each inboard portion having a lower locking surface positioned in facing contact with the inboard lock of the head portion, a seat with a J-shaped cross-section positioned in slidable contact with the guiding surface of the head portion and movable thereallong between the upper seating juncture and the lower seating juncture, a lower abutment edge extended between the seat and the lower locking surface and positionable in facing contact with the lower pressure application surface of the head portion, and a trailing edge extended from the seat to the upper locking surface;
an elongated flexible spring disposed within the inner part of each notch of the head portion, each spring having one end positioned in forcible contact within the upper seating juncture of the head portion and another end positioned in forcible

contact with the seat of the associated tooth, the spring positionable in a rest configuration with the lower abutment edge of the associated tooth positioned in facing contact with the lower pressure application surface of the head portion and thereby extending the gripping point of the associated tooth outwards for contact with a fastener disposed within the holding space, the spring further positionable in a biased configuration with the leading edge of the associated tooth positioned in facing contact with the associated recessed surface of the head portion and thereby retracting the gripping point from contact with a fastener disposed within the holding space; and

a pair of opposed C-shaped rigid mounting plates with each plate coupled to the one of the side faces of the head portion and with the mounting plates thereby sealing the inner parts of the notches.

5,553,521

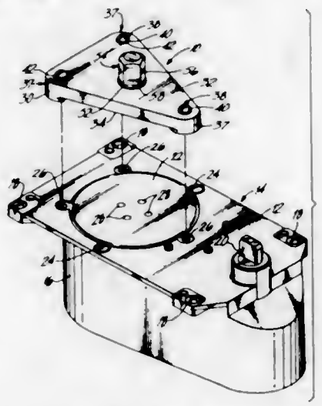
DOOR SPRING ADJUSTING TOOL

David S. Dunn, 5409 Marshburn Ave., Arcadia, Calif. 91006

Filed Jul. 13, 1994, Ser. No. 274,223

Int. Cl.[6] B25B *33/00*

U.S. Cl. 81—484 **17 Claims**



1. A device for adjusting a spring mechanism in a door closer while the door closer remains in a floor mounted position, the device comprising:

a body;

a number of mounting screws extending through mounting screw openings in the body, wherein the mounting screw openings are positioned at locations corresponding to selected locking screws in the door closer; and

an adjustment assembly rotatably disposed within a cavity near the center of the body, wherein the body comprises a planer front side surface and a backside surface having a first flat portion that is recessed from second flat portions, wherein the mounting screws are located at the second flat portions.

5,553,522

METHOD AND DEVICE FOR CHANGING STRIP MATERIAL ON A PRODUCTION MACHINE

Fulvio Boidrini, Ferrara; Lorenzo Cocchi, and Antonio Gamberini, both of Bologna, all of Italy, assignors to G.D. Societa+Per Azioni, Bologna, Italy

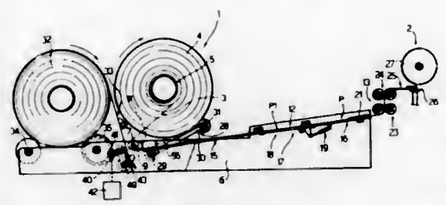
Filed Jul. 5, 1994, Ser. No. 270,922

Claims priority, application Italy, Jul. 5, 1993, B093A0313

Int. Cl.[6] B65B *41/10;* **B65H** *20/02;19/20*

U.S. Cl. 83—13 **15 Claims**

1. A method of changing strip material, comprising:



cutting a first strip (3), said first strip (3) being connected to traction means (13) for being drawn and fed at a first given speed (V1) along a given path (P), said cutting of said first strip (3) defining a trailing portion (92) thereof;

upon passage of said trailing portion (92) of said first strip (3) through a given point along said path (P), pushing a second strip (33) along said path (P) at a second given speed (V2);

shifting said trailing portion (92) of said first strip (3) in relation to said path (P);

controlling said second speed (V2) as a function of said first speed (V1) so that a leading portion (91) of said second strip (33) reaches and is superimposed on said trailing portion (92) of said first strip (3); and

restoring said trailing portion (92) with said superimposed leading portion (91) to said path (P).

5,553,523

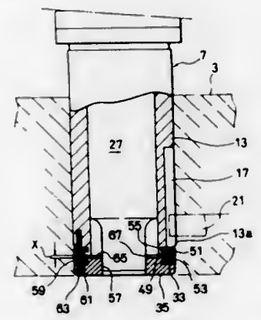
UPPER TOOL FOR A PRESS

Hiroshi Saito, Odawara, Japan, assignor to Amada Metrecs Company, Limited, Kanagawa, Japan

Continuation of Ser. No. 98,030, Jul. 28, 1993, Pat. No. 5,410,926. This application Dec. 1, 1994, Ser. No. 352,123

Int. Cl.[6] B26F *1/02*

U.S. Cl. 83—136 **2 Claims**



1. An upper tool for a punch press which includes an upper tool holding member, comprising:

a punch guide adapted to be mounted on the umber tool holding member so as to be movable up and down, the punch guide having a lower end portion, the lower end portion having a lower surface;

a shock damping member mounted on the lower end portion of the punch guide;

a stripper plate mounted on the shock damping member, the stripper plate having an upper surface;

an air gap between the lower surface and the upper surface, the air gap being dimensioned so that the air gap is equal to the maximum deformation of the damping member and the upper surface collides with the lower surface if the shock damping member is deformed excessively, and a plurality of stop pins inserted vertically into the punch guide through the stripper plate and the shock damping member.

5,553,524

STRIPPER DEVICE AND PUNCH ASSEMBLY USING SAME

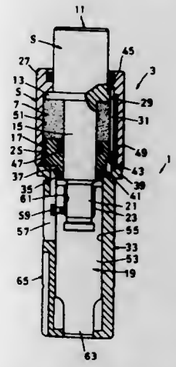
Oriya Fujita, Hadano, Japan, assignor to Amada Metrecs Company, Limited, Kanagawa, Japan

Filed Sep. 27, 1994, Ser. No. 312,806

Claims priority, application Japan, Oct. 1, 1993, 5-246875; Jul. 18, 1994, 6-165356

Int. Cl.[6] B21D *45/08;* **B26F** *01/02*

U.S. Cl. 83—137 **11 Claims**



1. A stripper device for a punching tool, comprising:

a gas cylinder filled with a gas having:

a cylinder head; and

a cylinder end attached in airtight fashion to a lower portion of said cylinder head;

a piston having:

a punch head; and

a piston rod;

an engagement flange formed between said piston rod and said punch head and located in an inner space of said gas cylinder for restricting an axial movement of said piston in said gas cylinder filled with the gas, said engagement flange having an engagement hole formed therein; and

an axial rod provided between said cylinder head and said cylinder end loosely passed through said engagement hole for restricting a rotational movement of said piston in said gas cylinder;

a stripper device, wherein a stripping force of the stripper device is obtained by a resilient force generated whenever the gas is compressed by said piston within said gas cylinder for each punching operation.

5,553,525

PUNCH PRESS MACHINE

Desmond Mailey; Jose J. Rodriguez; Jerry P. Fregoe; Curtis L. Stevens; Frank M. Dettmers, Sr., all of San Diego; Glenn L. Brown, Escondino; Gary L. Kitzer, Lemon Grove; James G. Miller, Coronado, all of Calif.; Martin J. Hillbrands; Carl F. Strebel, both of Grand Rapids, Mich., and Thomas A. King, Lakeside, Calif., assignors to Solar Turbines Incorporated, San Diego, Calif.

Filed Jun. 28, 1994, Ser. No. 266,808

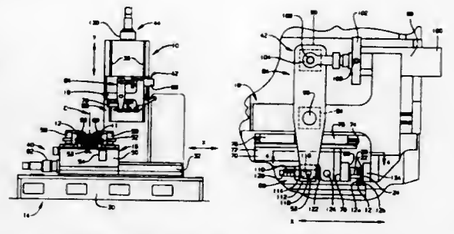
Int. Cl.[6] B21D *28/30*

U.S. Cl. 83—184 **6 Claims**

1. A punch press machine for punching a hole in a work piece, comprising:

a main frame having a machine base having a generally horizontal base mounting defining an axis x and a column having a generally vertical column mounting defining an axis y and said axis x being perpendicular to said axis y;

clamping means for holding a work product, said clamping means being slidably supported on the base mounting and adapted for movement along the axis x;



a punch press frame being slidably supported on the column mounting and adapted for movement along the axis y to a predetermined position, said punch press frame includes a carriage having a punch connected to said carriage, a die having an opening for receiving the punch, said carriage being slidably supported on the punch press frame for movement parallel to the axis x; and

actuation means for controllably moving the punch through the work piece.

5,553,526

CLAMP AND LOWER BLADE MECHANISM FOR A STEEL PIPE TRAVELLING CUTTING MACHINE

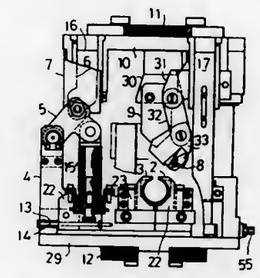
Yukio Kusakabe, and Yorio Shikata, both of Kobe, Japan, assignors to Kusakabe Electric & Machinery Co., Ltd., Kobe, Japan

Filed Mar. 17, 1994, Ser. No. 210,227

Claims priority, application Japan, Dec. 7, 1993, 5-306489; Dec. 7, 1993, 5-306490

Int. Cl.[6] B23D *21/00;25/04*

U.S. Cl. 83—319 **3 Claims**



1. A clamp mechanism for a travelling cutting machine which clamps and cuts a continuously manufactured and longitudinally transported steel pipe at a given length when moving from a home position at the same speed and in the same direction as said steel pipe, and which returns to said home position after cutting said steel pipe, said clamp mechanism comprising:

a base frame;

a lifting base plate which moves in a vertical direction;

a lower blade mechanism for clamping said steel pipe, provided on said base frame, said lower blade mechanism composed of two blade portions, in which said blade portions are capable of accommodating said steel pipe therebetween and clamping said steel pipe with a sliding motion of one blade portion towards the other blade portion;

a wedge mechanism for horizontally pushing said one blade portion towards the other blade portion by a downward movement of said wedge mechanism, said wedge mechanism comprising:

an upper wedge unit having a wedge piston which moves in a vertical direction

a lower wedge unit having a seat wedge, said seat wedge horizontally moving said one blade portion towards the

other blade portion to clamp said steel pipe placed therebe-

other blade portion to clamp said steel pipe placed therebetween, when being pushed downward; and

a biasing spring placed between part of said upper wedge unit and said lower wedge unit, said biasing spring pushing said lower wedge unit downward when downward movement of said upper wedge unit causes said biasing spring to be pushed downward;

a cam follower arm having a cam follower, said cam follower arm being pivoted at a fixed point with respect to said base frame, said cam follower arm being pivotally attached to said wedge mechanism so that the movement of said cam follower is transmitted to said wedge mechanism; and

a cam guide having a cam groove into which said cam follower is fitted, said cam guide being fixed to the underside of said lifting base plate, in such a way that when said cam guide moves downward in association with movement of said lifting base plate, said wedge mechanism moves downward via said cam follower arm so as to accomplish clamping of said steel pipe with said blade portions.

5,553,527

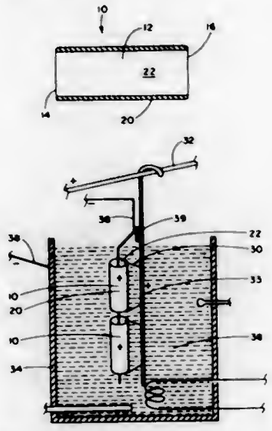
MICRO SMOOTH GUITAR SLIDE

Sterling T. Harrison, 4410 O'Meara, Houston, Tex. 77035

Continuation of Ser. No. 37,249, Mar. 24, 1993, abandoned. This application May 23, 1994, Ser. No. 247,508

Int. Cl.[6] G10D *3/00*

U.S. Cl. 84—319 **10 Claims**



1. An apparatus for playing guitar strings having an electropolished micro smooth finish, comprising:

a metallic guitar slide including an outer surface having a finish in a range of one to nineteen microinches.

5,553,528

SLITTER FOR A DESKTOP PAGE PRINTER

John D. Zeltner, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 13, 1995, Ser. No. 403,046

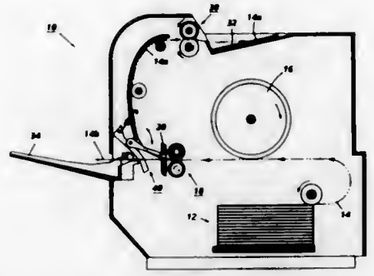
Int. Cl.[6] B26D *7/06;* **B65H** *39/10*

U.S. Cl. 83—443 **6 Claims**

1. An apparatus for cutting sheets emitted in an output direction from an output slot of a printing machine, comprising:

a slitter, which receives a sheet fed therethrough in a process direction and creates a cut in the sheet parallel to the process direction;

a diverter, the diverter being positionable in a first position to direct a sheet emitted from the output slot through the slitter, and alternately positionable in a second position to direct a sheet emitted in the output direction from the output slot away from the slitter; and



an output tray including a lug thereon, the lug engaging the diverter to position the diverter in the second position.

5,553,529

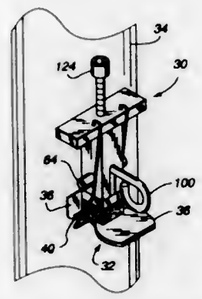
THUMBREST RING ADAPTER FOR MUSICAL INSTRUMENT

Leland B. Smith, 8278 E. Hinsdale Ave., Englewood, Colo. 80112

Continuation-in-part of Ser. No. 378,198, Jan. 25, 1995. This application Mar. 30, 1995, Ser. No. 413,386

Int. Cl.[6] G10D *7/10;7/08*

U.S. Cl. 84—453 **16 Claims**



1. A ring adapter assembly for a musical instrument having a thumbrest which includes a horizontal projection extending outward from the instrument toward a musician and under which a thumb of the musician is conventionally placed, said assembly comprising:

a body;

attachment apparatus for connecting the body to the thumbrest without interfering with placement and position of the musician's thumb under the horizontal projection; and

an eye fixed to the body at a position above the horizontal projection of the thumbrest.

5,553,530

PNEUMATIC BOOSTER

Mitsuhiro Endo; Kiyoshi Shirahata, and Hiromi Ando, all of Yamanashi-ken, Japan, assignors to Tokico Ltd., Kanagawa-ken, Japan

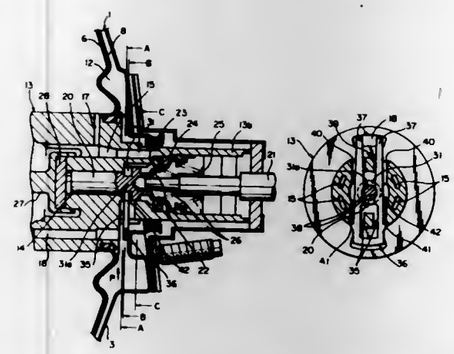
Filed May 22, 1995, Ser. No. 447,049

Claims priority, application Japan, May 23, 1994, 132549

Int. Cl.[6] B60T *13/52*

U.S. Cl. 91—369.3 **3 Claims**

1. A pneumatic booster, comprising:



a housing partitioned into a constant pressure chamber and a variable pressure chamber by a power piston having a diaphragm;

a valve body having a negative pressure passage which communicates the constant pressure chamber to the variable pressure chamber and an atmosphere passage which communicates the variable pressure chamber to the outside of the housing, the valve body being supported by the power piston;

a plunger movably provided in an axial bore which has a step and is formed in the valve body, the plunger being movable in response to the movement of an input shaft;

a valve mechanism for selectively establishing and cutting off communication in the negative pressure passage and the atmosphere passage according to the movement of the plunger, the valve mechanism being placed between the valve body and the plunger;

at least one radial hole formed in the valve body; and

a plate type stop key loosely inserted in the radial hole, a distal end portion of the stop key fitting in a circumference channel of the plunger to restrict the movement of the plunger,

characterized in that the pneumatic booster further comprises a guide portion formed on the periphery of the valve body for guiding side surfaces of the stop key to prevent the rotational movement of the stop key, and that said radial hole is formed to have a circular cross section by machining to place the surface of said step of the axial bore of the valve body in the radial hole.

5,553,531

COOKING DEVICE

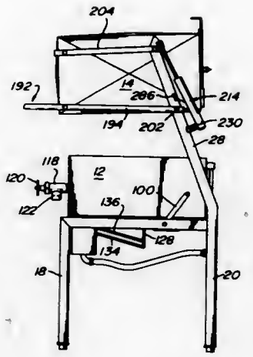
Charles A. Brown, Dallas, Pa., assignor to Legion Industries, Inc., Dallas, Pa.

Filed Dec. 21, 1994, Ser. No. 361,070

Int. Cl.[6] A47J *37/10*

U.S. Cl. 99—340 **25 Claims**

1. A cooking device having a hollow base and a hollow lid, with said base and said lid adapted to mate to provide an enclosed space, heating means associated with said base to heat the base, said base being adapted to be filled with water, with said water being heatable by said heating means in order to vaporize the water and create steam to fill said enclosed space, said lid having a lower edge, said lower edge having a notch formed therein, said base having an upper edge, with said upper edge adapted to be received within said notch, vent means in said lid to permit the passage of excess steam from said enclosed space to the atmosphere, means for lifting the lid relative to the base and means for maintaining the lid at a set position relative to the base.



5,553,532

APPARATUS FOR COOKING FOOD PRODUCTS USING VERY LOW AND LOW FREQUENCY RADIO WAVES

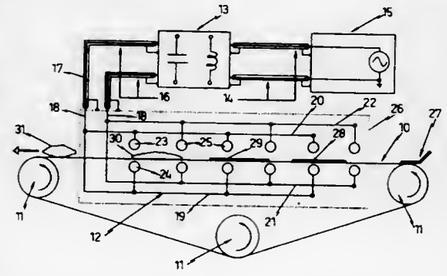
Jose de la Luz-Martinez, Puebla; Jesus Gonzalez-Hernandez, Mexico City; Feliciano Sanchez-Sinencio, Col. Tecamachalco; Juan de Dios Figueroa C., Valle Hermoso; Fernando Martinez-Bustos, Orizaba, and Maximiano Ruiz-Torres, Morelia, all of Mexico, assignors to Centro de Investigacion y de Estudios Avanzados del I.P.N., Col. San Pedro Zacatesso, Mexico

Division of Ser. No. 322,015, Oct. 11, 1994. This application Jun. 2, 1995, Ser. No. 459,664

Claims priority, application Mexico, Oct. 12, 1993, 936330

Int. Cl.[6] A21D *8/00;* **H05B** *6/00*

U.S. Cl. 99—358 **5 Claims**



1. An apparatus for cooking food products comprising:

a) a radio frequency generator which generates radio frequency waves of variable frequency;

b) a coupling transformer connected to said radio frequency generator;

c) a cooking compartment arranged within a radio frequency nondissipitive cage which avoids radio frequency interference;

d) a food product conveyor arranged to transport the food products through said cooking compartment;

e) a variable speed drive mechanism coupled to said food product conveyor; and

f) an antenna arranged within said cooking compartment and connected to said coupling transformer, said antenna irradiating said radio frequency waves evenly on the two sides of said food products when the food products are conveyed through the cooking compartment by the food product conveyor.

5,553,533

cylinder, said flow ways being defined by a housing cross-

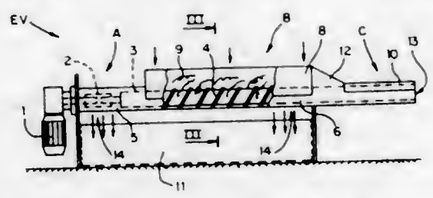
5,553,536

SCREEN PRINTING APPARATUS WITH VACUUM CONVEYOR BELT

5,553,533
FLOUR DUSTER
Christopher J. Loechtenfeldt, Cincinatti, and Bernardus W. Muller, Loveland, both of Ohio, assignors to Interko, Inc., Blythewood, S.C.
Filed Oct. 21, 1994, Ser. No. 327,358
Int. Cl.[6] A23B *4/02*
U.S. Cl. 99—494 **19 Claims**

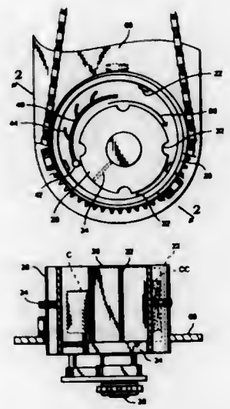
1. A flour duster, comprising a bin for containing flour, said bin having a bottom, said bottom defining an opening for the output of flour contained therein, a conveyor-belt having a top and an underside, the bottom of said bin being supported above the top of said conveyor belt, structure for supporting said bin and said conveyor belt, said conveyor belt being positioned relative to said opening to substantially close said opening, and drive member coupled to said conveyor belt for rotating said conveyor belt to drag flour from said bin toward the underside of said conveyor belt and disperse said flour on a ribbon of dough positioned below said conveyor belt.

5,553,534
METHOD AND APPARATUS FOR THE EVACUATION, CONVEYANCE, COMPACTING AND DISCHARGE OF BULK MATERIALS, ESPECIALLY SHAVINGS AND SWARF
Fabio Soavi, Castelmaggiore, Italy, assignor to Trasportatori Gevosi S.r.l., Cento, Italy
Continuation of Ser. No. 613,652, Nov. 9, 1990, abandoned. This application Jul. 21, 1994, Ser. No. 278,978
Claims priority, application Italy, May 11, 1988, 40072A/88
Int. Cl.[6] B30B *3/00;* **B65G** *33/00*
U.S. Cl. 100—145 **19 Claims**



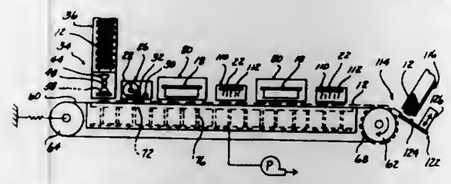
1. Method for the conveyance, compacting and discharge of bulk compactable materials comprising:
feeding in an inflow of bulk materials onto a screw feeder enclosed in a conveyor tube and driven by a motor, wherein the conveyor screw is rotated within a housing having a front, middle and rear section and the screw axially extends through substantially an entire length of said front, middle and rear section; and
providing a plurality of longitudinal flow ways defined between said housing having a non-constant and outside a theoretical cylinder circumscribed about said screw and open toward said cylinder, said flow ways being defined by a housing cross-section and a periphery which is non-concentric with said cylinder.

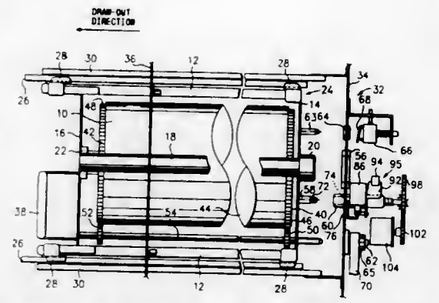
5,553,535
ALUMINUM BEVERAGE CAN CRUSHER
Steven Lucas, 32390 W. Peters & Nall Rd., Maricopa, Ariz. 85239
Filed Oct. 16, 1995, Ser. No. 543,371
Int. Cl.[6] B30B *3/06;9/32*
U.S. Cl. 100—157 **13 Claims**



1. An aluminum beverage can crusher comprising, in combination:
a catch drum comprising a right cylinder having open ends, an axis, an inner cylindrical surface, an outer cylindrical surface;
means for mounting the catch drum with the axis thereof fixed in a vertical orientation to thereby define an upper open end and a bottom open end of the drum;
means for rotating the catch drum about said axis in a predetermined direction of rotation;
a resilient crusher roller comprising a right cylinder having a diameter of from about one-half to about two-thirds the internal diameter of the catch drum, an external generally cylindrical surface and a central axis;
means mounting the resilient crusher roller inside the catch drum with the axis of the crusher roller displaced from the axis of the drum and defining, on one side of the crusher roller, a nip of about one-haft inch between the external surface of the resilient crusher roller and the inner cylindrical surface of the catch drum and, on the other side of the crusber roller, a can receiving space for receiving uncrushed aluminum beverage cans in the catch drum between the internal wall of the drum and the external wall of the crusher roller;
means for rotating the resilient crusher roller about its axis at a rotational rate that results in external surface velocity of the resilient crusher being approximately the same as the velocity of the internal surface of the catch drum for reducing shear forces in the nip; and
means for supporting uncrushed cans in the receiving space while permitting crushed cans to drop from the bottom open end of the catch drum.

5,553,536
SCREEN PRINTING APPARATUS WITH VACUUM CONVEYOR BELT
Arlen Van Os, Grandville, Mich., assignor to Van Os Enterprises, Jenison, Mich.
Filed Oct. 3, 1994, Ser. No. 317,121
Int. Cl.[6] B41F *15/20*
U.S. Cl. 101—44 **11 Claims**



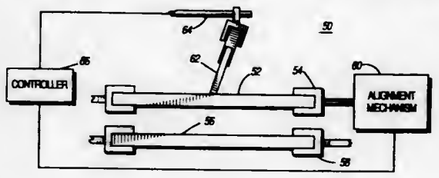


1. A screen printing apparatus for transferring an image onto a substrate comprising:
feed means for simultaneously moving a plurality of discrete, individual substrates along a fixed linear path spaced longitudinally from one another;
vacuum means for continuously holding each discrete, individual substrate in position with respect to said feed means as each substrate travels along the fixed path, said vacuum means including a longitudinally extending groove extending substantially along an entire longitudinal length of said fixed path for maintaining continuous vacuum pressure with respect to each of said discrete, individual substrates through said feed means as each substrate travels along said fixed path;
printing means for transferring the image onto each substrate, the printing means including a printing station for each color to be applied disposed spaced longitudinally from one another along the fixed path;
curing means for curing the image transferred to each substrate, the curing means disposed spaced longitudinally along the fixed path at locations downstream from each of the printing stations of the printing means;
loading means for transferring a substrate to the feed means in a predetermined position, wherein the loading means further includes a storage housing for receiving a plurality of stacked, individual, planar substrates, support means for releasably retaining a lowermost substrate in the stack of substrates within the housing, and substrate manipulator means for engaging the lowermost substrate in the stack of substrates and for removing the engaged substrate from the housing such that the support means engages a substrate previously disposed immediately above the engaged substrate to be removed; and
means for reciprocating the manipulator means along a linear path between first and second end limits of movement and for rotating the manipulator means about an axis generally perpendicular to the linear path for positioning the substrate between the manipulator means and the feed means while placing the substrate on the feed means in a predefined position.

5,553,537
METHOD OF CONTROLLING A LINKAGE DRIVE SECTION IN A STENCIL PRINTING MACHINE
Yoshikazu Hara, Tokyo, Japan, assignor to Riso Kagaku Corporation, Tokyo, Japan
Filed Mar. 10, 1995, Ser. No. 402,332
Claims priority, application Japan, Mar. 10, 1994, 6-040098
Int. Cl.[6] B41L *13/04*
U.S. Cl. 101—116 **2 Claims**

1. A method of controlling a linkage drive section in a stencil printing machine, said stencil printing machine comprising: a printing drum; a printing machine frame; a printing drum holding device which rotatably supports said printing drum, and which is suspended from said printing machine frame in such a manner that said device is movable along the axis of said printing drum to move said printing drum between an operating position in the printing machine and a draw out position outside the printing machine; and print image position adjusting means for finely adjusting the position of said printing drum in the direction of the axis of said printing drum with respect to said printing machine frame, said print image position adjusting means having a first coupling element provided on the side of said printing drum holding device, a second coupling element provided on the side of said printing machine frame, and said linkage drive section provided on the side of said second coupling element for driving said second coupling element along the direction of the axis of said printing drum with respect to said printing machine frame, one of said first and second coupling elements having a lateral groove which is extended perpendicular to the direction of the axis of said printing drum, while the other being provided with a movable locking piece which is selectively engaged with said lateral groove to prevent the relative movement of said first and second coupling elements in the direction of the axis of said printing drum,
said method comprising the steps of:
(a) detecting whether or not said printing drum is located near a standard position with respect to said printing machine frame when said printing drum is set in said printing machine frame;
(b) detecting whether or not said locking piece is engaged with said lateral groove;
(c) moving said second coupling element a first distance in a first direction in parallel with the direction of the axis of said printing drum when it is detected that said printing drum is located near said standard position and that said locking piece is not engaged with said lateral groove; and
(d) after the step (c), moving said second coupling element a second distance in a second direction opposite to said first direction.

5,553,538
METHOD AND APPARATUS FOR STENCIL PRINTING PRINTED CIRCUIT BOARDS
Brandon R. Freitag, Bartlett, Ill., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jan. 30, 1995, Ser. No. 380,476
Int. Cl.[6] B41M *1/12;* **B41F** *15/12*
U.S. Cl. 101—123 **16 Claims**



16. A method of printing solder paste, the method comprising the steps of:

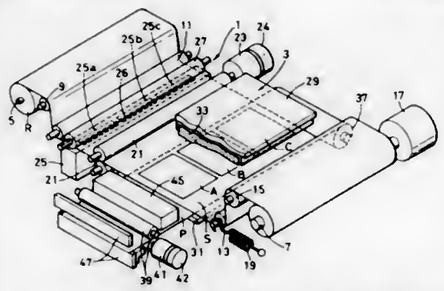
a) loading circuit boards;
b) receiving the circuit boards at a printing machine; and
c) at the printing machine, periodically dispensing a volume of solder paste onto a stencil at a constant rate, the volume of solder paste being dispensed onto the stencil regardless of whether a circuit board has been received at the printing machine, the volume of solder paste being printed onto a test board when no circuit board has been received at the printing machine.

5,553,539

MASTER PLATE MAKING PRINTING DEVICE

Takanori Hasegawa, Minato-ku, Japan, assignor to Riso Kagaku Corporation, Japan

Division of Ser. No. 47,521, Apr. 19, 1993, Pat. No. 5,450,789. This application Apr. 12, 1995, Ser. No. 420,593
Claims priority, application Japan, Apr. 20, 1992, 4-99627
Int. Cl.[6] B05C *17/06*
U.S. Cl. 101—128.21 **12 Claims**



1. A master plate making printing device for stencil printing on a print object, comprising:
a stencil master plate holding member;
master plate making means for making a plurality of stencil master plates in different locations of a stencil master plate sheet supported by said stencil mater plate holding member in a pre-defined mutual positional relationship;
displacing means for causing a relative displacement between said stencil master plate sheet and the print object so as to place the print object to positions corresponding to said different stencil master plates formed in said stencil master plate sheet; and
stencil printing means for carrying out a process of stencil printing on the print object by using each of said different stencil master plates formed in said stencil master plate sheet.

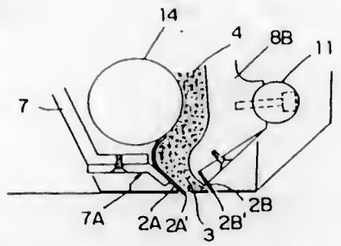
5,553,540

METHOD FOR SCREEN PRINTING OF VISCOUS MATERIALS

Okie Tani, Tokyo, Japan, assignor to Tani Denkikogyo Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 243,809, May 17, 1994, Pat. No. 5,452,655. This application Jun. 7, 1995, Ser. No. 478,612
Int. Cl.[6] B41M *1/12*
U.S. Cl. 101—129 **16 Claims**

1. A method for printing onto a surface of a board through a screen comprising the steps of:
providing a viscous material dispenser including a chamber having a rear wall and a slit-like bottom aperture communicating with said chamber, said rear wall of said dispenser comprising a fixed upper wall section and a height-adjustable lower wall section connected thereto, a screen having an upper surface and openings therein, a pair of blades having a space therebetween and including a leading blade and a trailing blade and depending from the dispenser on substantially opposite sides of said bottom aperture so as to be in contact with the upper surface of said screen, said trailing blade serving as a squeegee blade and fixed to said lower wall section of said rear wall, and a manually operable height-adjustable means mounted on said dispenser and operatively connected to said lower rear wall section for raising and lowering said lower rear wall section with said trailing blade within a predetermined range of height.
feeding a viscous material into said chamber of said viscous material dispenser;
dispensing the viscous material contained in said chamber onto said upper surface of the screen through said bottom aperture and through said space between said pair of blades;
moving the dispenser in a direction of travel so that said trailing blade urges the viscous material dispensed from the dispenser through said openings in said screen and onto the surface of said board; and
adjusting the contacting pressure of the lower end of said trailing blade to be applied against the upper surface of said screen by raising or lowering said trailing blade by means of said manually operable height-adjustable means.

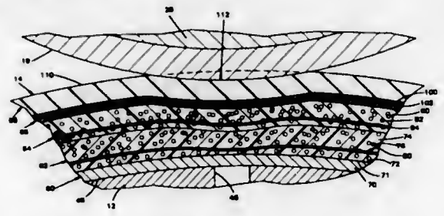


5,553,541

GAPLESS TUBULAR PRINTING BLANKET

James B. Vrotacoe, 35 Lexington St., Dover, N.H. 03820; Glenn A. Guaraldi, 11 Long Pond Rd., Kingston, N.H. 03848; James R. Carlson, 5625 San Dell Way, Racine, Wis. 53402, and Gregory T. Squires, 1200 13th Ave., Union Grove, Wis. 53182

Continuation of Ser. No. 699,668, May 14, 1991, abandoned, which is a continuation-in-part of Ser. No. 417,587, Oct. 5, 1989, abandoned. This application Sep. 29, 1993, Ser. No. 129,551
Int. Cl.[6] B41N *10/04*
U.S. Cl. 101—217 **1 Claim**



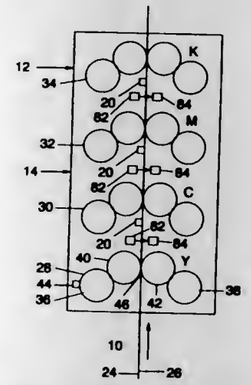
1. A printing blanket comprising:
a cylindrical tubular body for mounting around a blanket cylinder, said cylindrical tubular body being gapless for rotational symmetry thereby minimizing vibration at high speeds, said cylindrical tubular body comprising:
a gapless inner layer of compressible material operative for disposition around an outer surface of a blanket cylinder;
a gapless layer of inextensible material disposed around said inner layer of compressible material; and
a gapless outer printing layer disposed around said layer of inextensible material, said outer printing layer being operative to print ink onto paper.

5,553,542

SYSTEM FOR CONTROLLING A WEB IN A PRINTING PRESS

John C. Jackson, Preston, United Kingdom; Andrew L. Moore, Chicago, and Thaddeus A. Niemiro, Lisle, both of Ill., assignors to Rockwell International Corporation, Seal Beach, Calif.

Continuation of Ser. No. 788,637, Nov. 6, 1991, abandoned. This application Jul. 28, 1993, Ser. No. 98,761
Int. Cl.[6] B41F *13/02*
U.S. Cl. 101—228 **4 Claims**



1. A control system for a web in a printing press, comprising:
at least one printing unit for printing the web;
first means for determining the lateral location of at least one edge of the web prior to passage of the web to said printing unit;
second means for determining the lateral location of at least the same one edge of the web as determined by the first determining means after passage of the web from the printing unit, said second determining means being longitudinally spaced from the first determining means along the web; and
means responsive to the first and second determining means for applying pressure against a surface of the web at a location spaced inwardly from opposed side edges of the web to modify the effective width of the web by deflecting a portion of the web spaced inwardly from opposed side edges of the web.

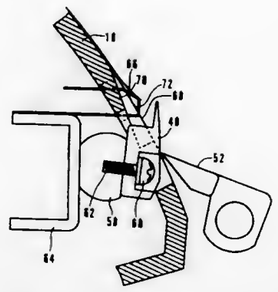
5,553,543

PRINT SHEET LEADING END MOUNTING DEVICE HAVING MEANS FOR LIFTING RELEASED LEADING END

Yasuhiro Takahashi, and Koji Nakayama, both of Tokyo, Japan, assignors to Riso Kagaku Corporation, Tokyo, Japan

Filed Dec. 26, 1995, Ser. No. 578,488
Claims priority, application Japan, Dec. 28, 1994, 6-339108
Int. Cl.[6] B41F *1/30*
U.S. Cl. 101—409 **5 Claims**

1. A device for mounting a leading end of a print sheet of a rotary stencil printer having a printing drum for carrying a stencil sheet therearound and a back press means having a surface opposing said printing drum for supporting the print sheet such that the print sheet is transferred through between said printing drum and said back press means with the leading end thereof being mounted to said back press means by said print sheet leading end mounting device so as to be applied with a stencil printing thereon, comprising a combination of a claw-like clamp member for selectively clamping the leading end of the print sheet to said back press means and a print sheet leading end lifting means for pushing the leading end of the print sheet to be floated up from the print sheet supporting surface of said back press means.

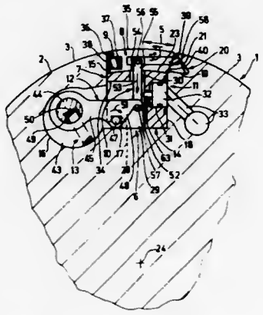


5,553,544

PLATE CYLINDER

Bertrum S. Ramsay, Wolfboro, N.H., assignor to Heidelberg Harris Inc., Dover, N.H., and Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Apr. 12, 1995, Ser. No. 420,392
Int. Cl.[6] B41F *21/00*
U.S. Cl. 101—415.1 **12 Claims**



1. A plate cylinder of a rotary printing press comprising:
a cylindrical body having an outer surface and having a receiving gap which is open towards the outer surface and extends transversely to a circumferential direction of the cylindrical body, the cylindrical body having a first wall region defining one end of the receiving gap at the outer surface and a cylindrical body clamping wall defining the other end of the receiving gap at the outer surface;
a clamping element located in the gap, the clamping element having a clamping element clamping wall adjacent to the cylindrical body clamping wall at the outer surface, the clamping element being moveable circumferentially with respect to the cylindrical body for the fastening or loosening of a printing plate; and
a first spring device for forcing the clamping element away from the first wall region.

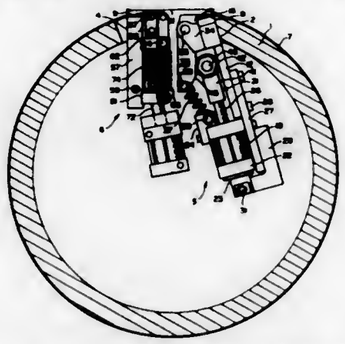
5,553,545

PLATE CLAMPING AND TENSIONING APPARATUS FOR

moving the web laterally during the wash cycle to assist in cleaning the printing cylinder.

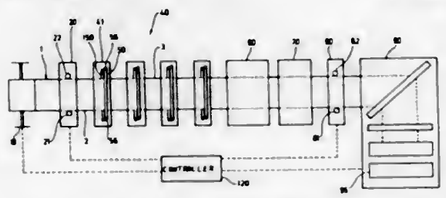
each including a pair of legs disposed perpendicular to one another with each leg having an inwardly directed face defining an

5,553,545
PLATE CLAMPING AND TENSIONING APPARATUS FOR ROTARY PRINTING PRESS
Michael R. Turner, Renton, Wash., assignor to Heath Custom Press, Inc., Renton, Wash.
Filed Sep. 26, 1995, Ser. No. 534,050
Int. Cl.[6] B41F 27/06
U.S. Cl. 101—415.1 19 Claims



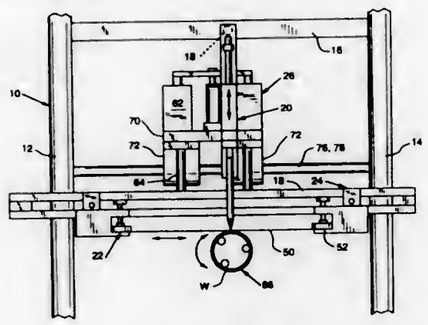
1. A plate clamping system for clamping a flexible plate on a rotary cylinder comprising in combination;
a first clamping assembly on said cylinder for engaging a first end of said plate,
said first clamping assembly including linkage for moving said assembly between clamped and released positions, and a first fluid pressure actuator therefor,
a second clamping assembly on said cylinder for engaging the opposite end of said plate,
said second clamping assembly including linkage for moving said assembly between a clamped position holding said plate in tension and a released position, and a second fluid pressure actuator therefor, and
fluid pressure control means remote from said cylinder for controlling application and release of fluid pressure separately to said first and second fluid pressure actuators.

5,553,546
PRINTING PRESS AND METHOD FOR REMOVING INK BUILD-UP
Howard W. Hoff, Lee, N.H., assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany, and Heidelberg Harris, Inc., Dover, N.H.
Division of Ser. No. 394,094, Feb. 24, 1995, Pat. No. 5,490,459. This application Oct. 26, 1995, Ser. No. 548,503
Int. Cl.[6] B41F 35/00
U.S. Cl. 101—483 6 Claims



1. A method of cleaning a printing cylinder of a printing press having a web running over the printing cylinder, the web being laterally narrower than a width of the printing cylinder, the method comprising the steps of:
initiating a wash cycle for cleaning of the printing cylinder of the web press;
applying a cleaning liquid to the printing cylinder; and
moving the web laterally during the wash cycle to assist in cleaning the printing cylinder.

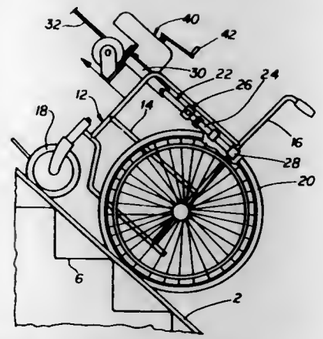
5,553,547
LASER CONTROLLED INDEXER FOR PRINTING ON WARE
William J. Miller, Forest Hills, Pa., assignor to Miller Process Coating Co., East Pittsburgh, Pa.
Filed Jun. 6, 1995, Ser. No. 488,703
Int. Cl.[6] B41F 1/34
U.S. Cl. 101—485 15 Claims



8. A method to index ware for printing thereon, said method including the steps of:
supporting the ware at an indexing plane for rotation about an axis perpendicular to said indexing plane;
establishing an indexing reference site on the ware;
directing a laser beam on the ware for intersection by said indexing reference site during rotation of the ware about said axis;
arranging a detector to respond to laser radiation incident on said indexing reference site;
generating an electrical signal in response to laser radiation incident on said detector while rotating the ware about said axis; and
applying printing to said ware in response to said electrical signal.

5,553,548
SYSTEM AND METHOD FOR MOVING AN OCCUPIED WHEELCHAIR BETWEEN TWO LEVELS
Kenneth C. Eaton, 1114 Cathcart Boulevard, Sarnia, Ontario, Canada
Filed Apr. 12, 1995, Ser. No. 420,771
Int. Cl.[6] B62B 9/02; B61J 3/04
U.S. Cl. 104—183 31 Claims

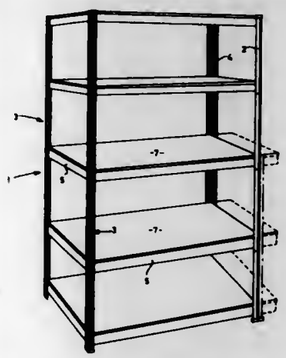
1. A method of moving a wheelchair occupied by an occupant between an upper level and a lower level, said wheelchair having a front, two front wheels, two rear wheels, a seat and a back, said wheelchair moving along tracks having a main slope, said tracks being spaced apart so that each track receives a front wheel and rear wheel of said chair, said tracks having guide means thereon to prevent the chair from slipping off either of said tracks, winding means that can be removably secured to said chair, a cable having an upper end and a lower end, said lower end being connected to said winding means and said upper end being securely anchored above and beyond said upper level, said upper end being anchored and said winding means being secured to said chair at a height so that said cable is substantially parallel to said main slope and substantially aligned with said center of gravity of said chair and occupant when said chair is on said main slope, said method comprising:



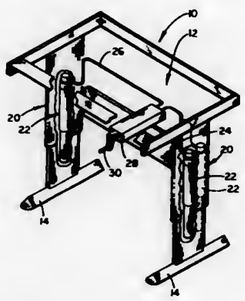
(a) commencing with the chair at the lower level, moving said chair to align said front wheels of said chair with said tracks, connecting said cable and said winding means to said chair, operating said winding means to tighten said cable until said cable is taut, continuing to operate said winding means to retract said cable and to pull said chair in a forward motion onto said tracks and gently up said main slope, with said cable substantially parallel to said tracks, until said chair exits from said tracks onto said upper level, releasing said cable and said winding means from said chair;
(b) commencing with the chair at said upper level, orienting said chair to align said rear wheels of said chair with said tracks and backing said chair towards said tracks, attaching said cable and said winding means to said chair at a height substantially through a center of gravity of said chair and said occupant, operating said winding means to extend said cable slightly, moving said chair backward along said tracks until rear wheels of said chair are on said main slope, when said cable is taut further operating said winding means to extend said cable to allow said chair to move rearwards gently down said main slope with said cable substantially parallel to said main slope until said chair exits from said tracks onto said lower level, releasing said cable and said winding means from said chair.

5,553,549
FRAMEWORK FOR SHELVING UNIT
Finn Nilsson, Sharkston, Canada, assignor to Spacemaker Limited, Canada
Continuation-in-part of Ser. No. 41,508, Apr. 1, 1993, Pat. No. 5,463,966. This application Mar. 31, 1994, Ser. No. 221,417
Int. Cl.[6] A47B 9/00
U.S. Cl. 108—110 21 Claims

1. A framework comprising a plurality of post members mutually spaced from one another in generally parallel relationship and each including a pair of legs disposed perpendicular to one another with each leg having an inwardly directed face defining an included angle therebetween and a pair of spaced webs defining a cavity disposed behind said face, a plurality of support members extending between respective pairs of said post members, each of said support members including an abutment face and being delimited at opposite ends by an edge extending normal to longitudinal axis of said support member, attachment means for connecting said support members to said post members with portions of said abutment face of a support member and a face of the post member being juxtaposed and a locking member extending between said post member and support member to inhibit relative sliding movement therebetween, said attachment means comprising a generally keyhole shaped aperture in a respective one of said inwardly directed faces and having a hole and a slot extending therefrom and a neck with a head portion extending therefrom projecting from a respective one of said abutment faces, said head portion being cooperatively shaped to be received in said cavity and slide within said slot, said neck portion and slot being configured to bring said edge of said support member into abutment with an abutment surface on the post member upon relative sliding movement of said neck portion within said slot and thereby inhibiting further sliding of the neck portion within the slot.



5,553,550
TELESCOPING UPRIGHT
James E. Doyle, Grandville, Mich., assignor to Suspa Incorporated, Grand Rapids, Mich.
Filed Mar. 30, 1994, Ser. No. 220,156
Int. Cl.[6] A47B 9/00
U.S. Cl. 108—144 14 Claims



1. An upright support comprising:
a first, vertically elongated, extruded, integral, outer upright member having a first axial end and a second axial end;
a second, vertically elongated, extruded, inner upright member having a first axial end and a second axial end;
said first and second members being telescopically arranged with each other to allow said first axial ends to correlate with each other and said second axial ends to correlate with each other;
said outer member in cross section having a pair of spaced side walls, and a pair of spaced end walls integral with said side walls to define a hollow interior receiving said inner member;
said outer member having a pair of elongated, spaced protrusions extending into said hollow interior and defining a first pair of spaced outer bearing channels;
said inner member having a pair of elongated, spaced projections extending adjacent said pair of protrusions and defining a second pair of bearing channels;
a first pair of bearings positioned in said first pair of bearing channels and extending laterally into said second pair of bearing channels;
said first pair of bearings being adjacent said second axial end of said outer extruded member;

a second pair of bearings positioned in said second pair of bearing channels and extending laterally into said first pair of bearing channels; and

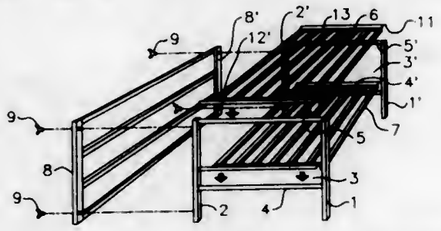
said second pair of bearings being at said first axial end of said inner member.

5,553,551

INTERLOCKING MODULAR BENCH SYSTEM

Terry Crombie, 1204 Peterson Dr., Northfield, Minn. 55057

Filed Aug. 25, 1993, Ser. No. 111,441
Int. Cl.[6] A47B *3/00*
U.S. Cl. 108—181 **7 Claims**



1. A modular bench system usable as a display or work counter comprising a plurality of upright bench units, each comprising a pair of rectangular opposing end sections, each said end section consisting of a pair of vertical upright legs joined together in parallel spaced relationships by parallel top and bottom horizontal cross pieces and bottom cross pieces, opposing end sections being joined together by rectangular, planar members which extend between said respective cross pieces; two opposing sides of each of said planar members each forming a groove which engages one of said cross pieces; each of said bench units having at least one end section which it shares in common with an adjacent unit when assembled into said system and each of said units having an upright rectangular layer stiffening means attached between opposing legs on its end sections.

5,553,552

ELECTRONIC STORAGE CABINET AND LIGHTED SIGN ASSEMBLY FOR AN AUTOMATIC TELLER MACHINE

Daniel R. Bauer, Hudson, Wis., and Kristofer G. Kosmider, Woodbury, Minn., assignors to Diversified Bank Installations, Inc., Hudson, Wis.

Continuation of Ser. No. 158,582, Nov. 29, 1993, abandoned. This application Nov. 13, 1995, Ser. No. 558,940
Int. Cl.[6] G07G *5/00*
U.S. Cl. 109—24.1 **8 Claims**

2. An electronic storage cabinet for abutment against and attachment to the back portion of an automatic teller machine (ATM), said ATM having a front customer service portion and a top, back, bottom and right and left side portions, and a Support leg, said cabinet comprising:

(a) a hollow box-like stand having a front, a back, right and left sides, a top and a bottom,

said front being substantially open,

said back being closed, and

said right and left sides being closed except for at least one of said sides having an opening therein;

(b) a first horizontally disposed equipment support means positioned within and secured to said cabinet, and adjacent to at least one said side opening;

(c) a side door removably connected to said side of said stand so as to close off at least one said side opening; and

(d) means for attaching said cabinet to an ATM whereby said substantially open front of said stand is abutted against and

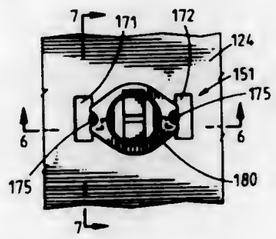
secured to a back portion of said ATM, said attachment means including bracket means linking said cabinet to an ATM support leg, said bracket means being adjustably connected at said back of said stand.

5,553,553

FURNACE AND METHOD FOR SECURING A THERMOSTAT TO A FURNACE

Russell W. Hoeffken, Belleville, Ill., assignor to Goodman Manufacturing Company, L.P., Houston, Tex.

Division of Ser. No. 311,176, Sep. 23, 1994. This application Oct. 17, 1995, Ser. No. 543,923
Int. Cl.[6] F23N *5/02*
U.S. Cl. 110—190 **7 Claims**



1. A warm air furnace comprising:

a housing, including a plurality of walls, at least one wall having an inner and an outer wall surface;

at least one heat exchanger;

a burner assembly, for producing combustion gases which flow into the at least one heat exchanger;

a blower, adapted to blow air over the at least one heat exchanger;

at least one wall having a first opening therethrough;

at least one thermostat disposed in the first opening, the at least one thermostat including a temperature sensor means disposed within the first opening and disposed adjacent the inner wall surface of the at least one wall;

the at least one wall further having second and third opening disposed adjacent the first openings and opposed from each other, with a portion of the at least one wall forming a tab disposed within each of the second and third openings;

the at least one thermostat further including a mounting flange, disposed in an abutting relationship with the outer wall surface of the at least one wall, the mounting flange having first and second ends with an opening disposed adjacent each end; and

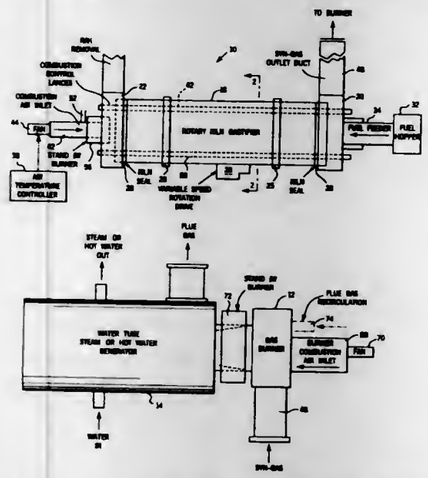
a portion of each of the first and second ends of the mounting flange are forced inwardly into the second and third openings, with the openings of the first and second ends of the mounting flange having the tabs in the second and third openings being received by, and disposed within, the openings of the first and second ends of the mounting flange, whereby the at least one thermostat is secured to the outer wall surface of the at least one wall.

5,553,554

WASTE DISPOSAL AND ENERGY RECOVERY SYSTEM AND METHOD

Albert E. Urich, Jr., 4731 N. Oakland Ave., Whitefish Bay, Wis. 53211

Filed Oct. 4, 1994, Ser. No. 317,904
Int. Cl.[6] F23B *5/00*
U.S. Cl. 110—211 **27 Claims**



1. A method of recovering energy from waste fuels comprising the steps of:

introducing waste fuel into a rotating kiln from a first end of the kiln;

flowing a sub-stoichiometric amount of combustion air into the rotating kiln from a second end of the kiln that is lower than the first end of the kiln;

partially combusting the waste fuel in the kiln with the combustion air in the kiln to generate a high temperature synthetic gas by rotating the kiln so that the waste fuel gradually migrates downhill from the first end of the kiln to the second end of the kiln, the fuel initially reacting with air to form high temperature synthetic gas and a fuel-ash mixture, and by actively mixing combustion air with the fuel-ash mixture exclusively in a portion of the kiln located by the second end of the kiln to enhance reaction of fuel in the fuel-ash mixture with air to form high temperature synthetic gas and other products of combustion;

allowing the high temperature synthetic gas to exit through an outlet duct in the kiln; and

combusting the high temperature synthetic gas from the outlet duct in the kiln to form combustion products including flue gas; and

recovering heat energy from the combustion products.

27. A fuel energy recovery system comprising:

a gasification chamber within a generally cylindrical kiln wall enclosed by a fuel feed end panel and an ash discharge end panel and supported in such a manner that the kiln wall is lower at the ash discharge end panel than at the fuel feed end panel;

a drive for rotating the cylindrical kiln wall;

a fuel feed that provides fuel into the gasification chamber through the fuel feed end panel;

a combustion air inlet through which a sub-stoichiometric amount of combustion air can be provided into the combustion chamber, the combustion air inlet being located through the ash discharge end panel so that the fuel and the combustion air are in a counterflow configuration;

means for enhancing the mixing of combustion air in the gasification chamber with a fuel-ash mixture, the mixing means being located exclusively in the lower end of the gasification chamber by the ash discharge end panel;

a synthetic gas outlet duct located by the fuel feed end panel through which a synthetic gas can exit from the upper end of the gasification chamber;

a burner that can receive the synthetic gas from the synthetic gas outlet duct, and mix and ignite the synthetic gas for combustion to yield combustion products including flue gas; and,

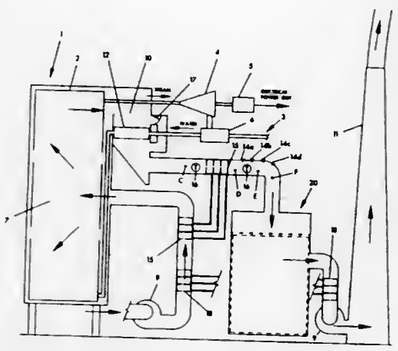
a heat recovery unit that can recover heat energy from the combustion products.

5,553,555

SYSTEM AND METHOD FOR FLUE GAS PURIFICATION FOR THERMAL POWER UNITS

Albert E. Gosselin, Jr., Glendale; Edward R. Bate, Jr., and Dale F. Johnson, both of Pasadena, all of Calif., assignors to Dasibi Environmental Corporation, Glendale, Calif.

Filed Apr. 28, 1994, Ser. No. 234,546
Int. Cl.[6] F23J *15/00*
U.S. Cl. 110—215 **6 Claims**



1. A system for purifying the exhaust gases of a thermal power plant, including preheating fuel, combustion air, or boiler water, removing pollutants from combustion gases and discharging the purified combustion gases into the ambient air, wherein said thermal power plant comprises a boiler, a feedwater supply system which provides feedwater to the boiler through a feedwater supply line, a firebox, a combustion air intake system which provides combustion air to the firebox, a fuel injection system which provides fuel to the firebox, a combustion gas exhaust line for exhausting combustion gases including a flue downstream in the from the firebox, a filter downstream of the flue, and an exhaust stack downstream of the filter, said system comprising:

a first heat exchanger in the exhaust line downstream of the flue, said first heat exchanger capable of cooling the combustion gases to a first temperature range in which at least one combustion byproduct is readily oxidized by an oxidant;

a first oxidant injection system operably connected to the exhaust line and capable of injecting an oxidant into the combustion gases in the exhaust line;

a second heat exchanger located downstream of the first heat

5,553,557

METHOD OF DECREASING NO$_x$ EMISSIONS FROM A

5,553,560

SEWING MACHINE AND WORK FABRIC HOLDER

a second heat exchanger located downstream of the first heat exchanger, said heat exchanger being capable of cooling the combustion gases to a second temperature range, said second temperature range being an optimum oxidation temperature range for at least one combustion by-product, and

a second oxidant injection system operably connected to the exhaust line to inject oxidants into the exhaust line downstream of the second heat exchanger;

a basic solution injection system operably connected to the exhaust line and capable of injecting a basic solution into combustion gases in the exhaust line to create neutralization products;

a filter for filtering the oxidized combustion by-products and neutralization products formed by the injection of the basic solution from the combustion gases in the exhaust line,

said filter being downstream of the points in the exhaust line at which the oxidants and basic solution are injected,

a third heat exchanger downstream of the filter, said third heat exchanger being capable of cooling the filtered combustion gases to a temperature range below the dew point of water.

5,553,556

METHOD FOR BURNING SOLID MATTER

Jörg Krüger, Schwandorf, Germany, assignor to Mullkraftwerk Schwandorf Betriebsgesellschaft mbH, Schwandorf, Germany

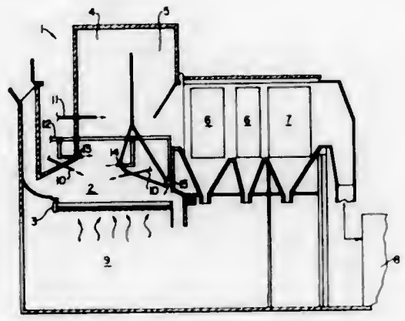
PCT No. PCT/EP92/02280, § 371 Date Aug. 15, 1994, § 102(e) Date Aug. 15, 1994, PCT Pub. No. WO93/07422, PCT Pub. Date Apr. 15, 1993

PCT Filed Oct. 2, 1992, Ser. No. 211,727

Claims priority, application Germany, Oct. 8, 1991, 41 33 239.3

Int. Cl.[6] F23J *11/00;15/00*

U.S. Cl. 110—345 **16 Claims**



1. A method for combusting solid matter in a combustion boiler, which comprises at least one combustion chamber and at least one afterburner chamber, the method comprising the steps of introducing steam by injection under an elevated pressure into the combustion boiler where the combustion gases leave the combustion chamber, to create turbulence adequate to thoroughly mix the combustion gasses, so that aside from the primary, no further combustion air enters into the combustion boiler.

5,553,557

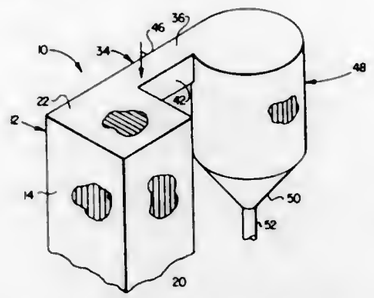
METHOD OF DECREASING NO_x EMISSIONS FROM A FLUIDIZED BED REACTOR

Iqbal F. Abdulally, Randolph, N.J., assignor to Foster Wheeler Energy Corporation, Clinton, N.J.

Division of Ser. No. 259,883, Jun. 13, 1994, Pat. No. 5,462,718. This application Mar. 29, 1995, Ser. No. 413,068

Int. Cl.[6] F23T *11/00;15/00;* **F23D** *1/00*

U.S. Cl. 110—345 **6 Claims**



1. A combustion method for decreasing NO_x emissions, the method comprising the steps of:

introducing fuel particles into an enclosure;

combusting the fuel particles material in the enclosure;

introducing an oxygen-containing, fluidizing gas into the enclosure to support combustion of the fuel particles and to fluidize the fuel particles so that the fluidizing gas combines with gaseous products of combustion to form flue gases that entrain a portion of the fuel particles and pass upwardly through the enclosure;

providing a duct in an upper portion of the enclosure in gas flow communication with the enclosure, the duct having an upper portion, a lower portion, and two side portions;

locating the duct relative to the enclosure so, as the flue gases pass through the duct, they tend to pass closer to one side portion thereof than the other side portion; and so, as the fuel particles pass through the duct, they tend to pass closer to the other side portion than the one side portion; and

injecting a reactant into the duct nearer to the one side portion than to the other side portion for decreasing NO_x levels in the flue gases passing through the duct.

5,553,558

EQUIPMENT AND PROCESS FOR SURFACE TREATMENT OF HAZARDOUS SOLIDS AND SLURRIES WITH MOLTEN ALLOY

Anthony S. Wagner, 13709 Hwy. 71 West, Bee Caves, Tex. 78738-3117

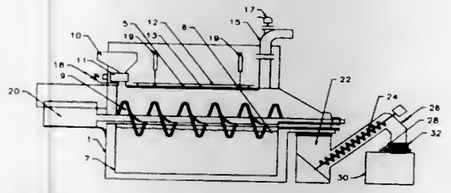
Continuation-in-part of Ser. No. 103,122, Aug. 9, 1993, Pat. No. 5,359,947, which is a continuation-in-part of Ser. No. 982,450, Nov. 27, 1992, Pat. No. 5,271,341, which is a continuation-in-part of Ser. No. 699,756, May 14, 1991, Pat. No. 5,171,546, which is a continuation-in-part of Ser. No. 524,278, May 16, 1990, Pat. No. 5,000,101. This application Apr. 1, 1994, Ser. No. 221,521

Int. Cl.[6] F23G *7/04*

U.S. Cl. 110—346 **12 Claims**

1. Equipment for surface treatment of hazardous solids and semi-solids with molten alloy comprising:

a) An equipment means to move said solids across said molten alloy surface, to provide a path to contact off gases with said molten alloy, to discharge said solids after treatment and to scrub said off gas and to remove Carbon eluted in said off gas while purging said equipment means to essentially have an absence of air; said equipment means comprising;



1) a dual compartment with high temperature refractory lined chamber;

2) a burner in a first compartment of said chamber to heat a reactive alloy to maintain said alloy as molten liquid at about 850° C.;

3) a baffle means between said first compartment and a second compartment in said dual compartment chamber, said baffle means allowing flow of said molten liquid between said first and said second chamber;

4) a feed means to meter a solid flow and a transport means to transport solids in said solid flow across a surface of said molten liquid to a discharge opening in said second chamber.

5,553,559

SEWING MACHINE AND RECORDING MEDIUM FOR USE IN COMBINATION WITH THE SAME

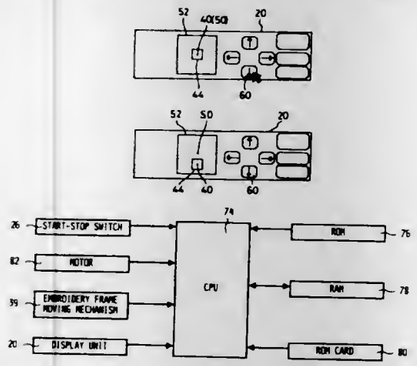
Tomo Inoue, and Takashi Hirata, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 22, 1994, Ser. No. 199,805

Claims priority, application Japan, May 14, 1993, 5-113212

Int. Cl.[6] D05B *21/00*

U.S. Cl. 112—102.5 **26 Claims**



1. A sewing machine for stitching patterns on a workpiece, comprising:

a stitching means for forming stitches, said stitching means comprising a needle capable of vertical reciprocation;

a workpiece moving means for longitudinally and laterally moving a workpiece relative to said needle; and

a control means for reading pattern data representing a stitching pattern and controlling said stitching means and said workpiece moving means to perform a stitching operation in which said stitching pattern is formed on said workpiece and a stitching operation in which a reference mark for said stitching pattern is formed on said workpiece at a position which indicates an initial position of said workpiece moving means.

5,553,560

SEWING MACHINE AND WORK FABRIC HOLDER DEVICE THEREOF

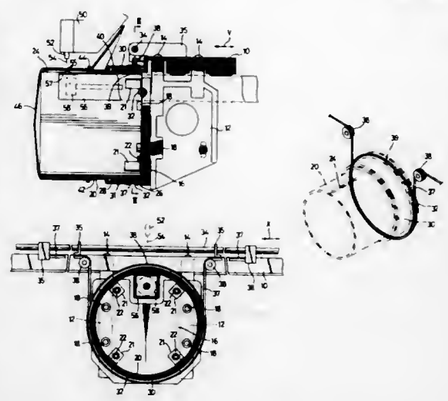
Ikuo Tajima; Terutada Kojima; Tomoaki Anezaki; Masayoshi Hirate, and Shigeo Suzuki, all of Kasugai, Japan, assignors to Tokai Kogyo Mishin Kabushiki Kaisha, Japan

Filed Oct. 6, 1994, Ser. No. 319,038

Claims priority, application Japan, Oct. 8, 1993, 5-253118; Jan. 19, 1994, 6-004158; Feb. 25, 1994, 6-028397; Mar. 17, 1994, 6-047160; Apr. 15, 1994, 6-077454

Int. Cl.[6] D05C *9/04*

U.S. Cl. 112—103 **20 Claims**



1. A sewing machine for forming stitches on a curved work fabric by an upper and a lower thread through cooperation of a shuttle and a needle vertically reciprocally driven, comprising:

holder means for retaining the work fabric to be sewn;

support means for rotatably supporting said holder means within a plane in parallel to X axis, said support means being movable in a direction of Y axis, said X axis and said Y axis being perpendicular to each other within a plane extending substantially perpendicular to the driving direction of the needle;

X axis drive means for rotating said holder means within said plane in parallel to said X axis; and

Y axis drive means for moving said support means in the direction of said Y axis, so that said holder means is moved in said Y axis as said support means is moved in said Y axis;

said holder means having a supporting surface for supporting the work fabric thereon, said supporting surface having a circumferential length corresponding to substantially the circumferential length of the work fabric; and

said X axis drive means being operable to rotate said holder means by about at least one revolution.

5,553,561

SLEEVE INSERTION SYSTEM WITH EDGE GUIDE FEATURE

Ernst Schramayr, Barneveld, and Tadeusz A. Olewicz, Clinton, both of N.Y., assignors to Jet Sew Technologies, Inc., Bowling Green, Ky.

Continuation-in-part of Ser. No. 294,095, Aug. 22, 1994. This application Oct. 25, 1994, Ser. No. 328,738

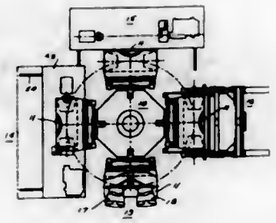
Int. Cl.[6] D05B *35/10;27/10*

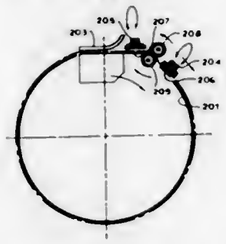
U.S. Cl. 112—306 **8 Claims**

1. Apparatus for assembling and sewing sleeve sections to shirt bodies, which comprises

(a) a load fixture comprising a body form and a pair of sleeve cones,

(b) said sleeve cones being adapted for the loading of tubular sleeve sections on external surface portions thereof,





(c) said body form having opposite ends and a hollow interior for receiving said sleeve cones at said opposite ends with said cones arranged in spaced apart relation aligned substantially on a common axis, and said body form having an exterior for supporting shoulder areas of a shirt body in surrounding relation to said sleeve sections, and

(d) sewing means engageable with said sleeve sections and said shirt body for securing said sleeve sections to said shirt body while said shirt body and said sleeve sections are mounted on said body form and said sleeve cones respectively, and

(e) bi-directionally controllable edge guide means associated with said sewing means and engageable with edge margins of at least said shirt body for effecting progressive alignment of said edge margins with respect to said sewing means in advance of sewing.

5,553,562

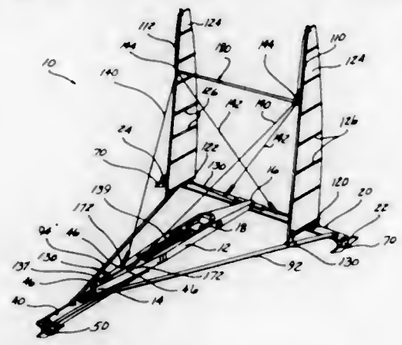
DOUBLE MAST ICEBOAT

John F. Jacobs, Jr., 16169 Anstell Ct., Mt. Clemens, Mich. 48044

Filed Jun. 2, 1995, Ser. No. 458,362

Int. Cl.[6] B62B *15/00*

U.S. Cl. 114—43 **11 Claims**



1. An iceboat comprising:

a hull having forward and rearward ends;

a plank attached to the rear end of the hull and having first and second opposed ends extending outwardly from opposite sides of the hull;

a plurality of skates, one skate attached to the front end of the hull and one skate attached to each of the first and second ends of the plank;

first and second struts, each extending from a fixed mount on the forward end of the hull to the first and second ends of the plank, respectively;

a first mast and a second mast respectively mounted on the first strut and the second strut; and

a sail mounted on each of the first mast and the second mast.

5,553,563

SEWING MACHINE WITH ROTARY STITCH REGULATOR

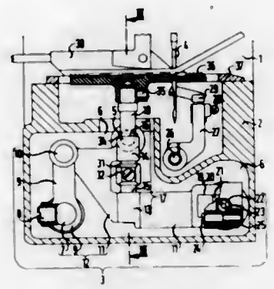
Dieter Schopf, Gerlingen, Germany, assignor to Union Special GmbH, Germany

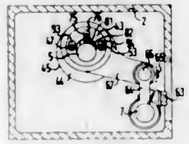
Filed Jan. 17, 1995, Ser. No. 373,624

Claims priority, application Germany, Jan. 20, 1994, 44 01 551.8

Int. Cl.[6] D05B *27/02*

U.S. Cl. 112—315 **2 Claims**





1. A sewing machine of the type having an adjustable, rotating stitch length regulator, disposed on a rotating shaft, for adjusting the horizontal movement of the feed dog comprising an eccentric that is connected to and drives the feed dog, wherein the improvement comprises:

said eccentric being disposed around and radially adjustable relative to said rotating shaft;

said eccentric having an axially extending shoulder member that has an internally threaded bore formed therein;

a threaded spindle supported for rotary movement on said rotating shaft such that it is in threaded engagement with said internally threaded bore;

a flange having an end face is secured to said rotating shaft;

an annular body disposed around said rotating shaft and having an end face; and

said eccentric being located between and in sliding contact with the end face of said annular body and said end face of said flange such that as it is radially adjusted in it is guided by and in frictional engagement with said end faces.

5,553,564

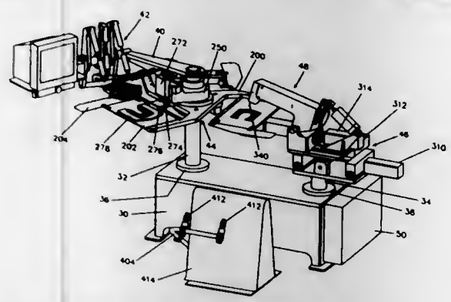
AUTOMATIC SEWING MACHINE SYSTEM AND METHOD FOR LOADING AND SEWING WORKPIECES

Lawrence B. Putney, Swatara Township, Pa., assignor to American Sewing Machine, Inc., Lebanon, Pa.

Continuation of Ser. No. 100,277, Aug. 2, 1993, abandoned. This application Oct. 10, 1995, Ser. No. 541,875

Int. Cl.[6] D05B *21/00;33/00*

U.S. Cl. 112—470.13 **18 Claims**



1. An automatic sewing machine comprising:

(a) a base having a loading station and a sewing station;

(b) a turntable support column having a column axis and a column radius extending outwardly from said column axis, said turntable support column mounted on said base;

(c) a turntable arm rotationally mounted on said turntable support column so as to rotate about said column axis between said loading station and said sewing station;

(d) a work plate having a first end and a second end, said first end fixedly attached to said turntable arm, said second end disposed outwardly from said turntable arm and upwardly from said first end;

(e) a clamp rotationally mounted on said turntable support column and having a stroke release position and a stroke clamp position contiguous to said work plate, so that when said clamp is in the clamp position said clamp exerts downward pressure on said work plate and deflects said work plate to a horizontal position.

(f) a moveable sewing head attached to said base at said sewing station.

5,553,565

WORK MOVING DEVICE IN SEWING MACHINE

Yasushi Ono; Yojiro Takase, and Minoru Wada, all of Tokyo, Japan, assignors to Juki Corporation, Tokyo, Japan

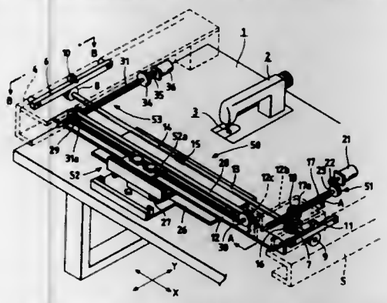
Filed Jul. 18, 1995, Ser. No. 503,690

Claims priority, application Japan, Jul. 19, 1994, 6-188847

Int. Cl.[6] D05B *21/00;* **F16H** *1/18*

U.S. Cl. 112—470.18 **8 Claims**

1. A work moving device for a sewing machine which moves a



work to be sewed with respect to a sewing needle which stitches a seam on the work, said work moving device comprising:

a pair of stationary racks spaced from each other, said stationary racks being set in parallel with each other in a first direction of moving the work;

a coupling shaft having gears engaged with said stationary racks, respectively;

coupling-shaft rotating means for rotating said coupling shaft, said coupling-shaft rotating means including,

a first spiral gear secured to one end of said coupling shaft,

a second spiral gear engaging with said first spiral gear,

a first drive shaft which is rotated together with said second spiral gear and slidably supporting said second spiral gear thereon, and

a first electric motor for rotating said first drive shaft;

a movable frame rotatably supporting said coupling shaft, said movable frame being movable back and forth in the first direction according to rotating said coupling shaft;

a carriage supported by said movable frame, said carriage being movable back and forth in a second direction perpendicular to the first direction;

means for moving said carriage back and forth in the second direction; and

a pallet supported by said carriage, for carrying the work.

5,553,566

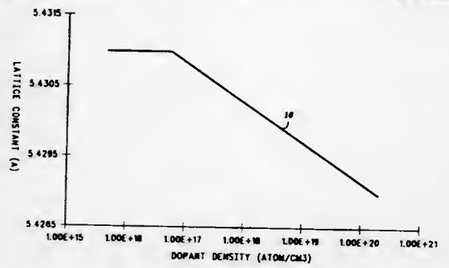
METHOD OF ELIMINATING DISLOCATIONS AND LOWERING LATTICE STRAIN FOR HIGHLY DOPED N+ SUBSTRATES

Hering-Der Chiou, Tempe, and Geoffrey J. Crabtree, Chandler, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jun. 22, 1995, Ser. No. 493,607

Int. Cl.[6] C30B *15/04*

U.S. Cl. 117—2 **6 Claims**



1. A method for fabricating a highly doped n type semiconductor substrate essentially free of dislocations and lattice strain comprising the steps of:

forming a melt from silicon chunks and a first dopant having a first concentration;

doping the melt with a second dopant having a second concentration, wherein the first dopant compensates for the lattice strain created by the second dopant and the second dopant lowers resistivity of the melt;

growing a crystalline boule from the melt; and

forming substrates from the crystalline boule.

5,553,567

PULSATOR UNIT FOR A MILKING MACHINE

Allan W. Wilson, and James F. Pharaoh, both of Hamilton, New Zealand, assignors to Carter Holt Harvey Plastic Products Group Limited, Hamilton, New Zealand

Filed Aug. 19, 1994, Ser. No. 292,767

Claims priority, application New Zealand, Aug. 19, 1993, 248444

Int. Cl.[6] A01J *5/14*

U.S. Cl. 119—14.28 **16 Claims**

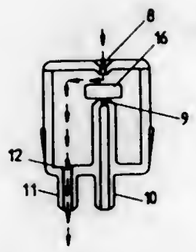
1. A pulsator unit for incorporation into a milking machine said pulsator unit comprising:

vertical axis of the body, and means for locking the base to the body at any of a plurality of positions along the vertical axis.

a container on the bottom body plate surface for releasably holding a food item,

the container comprising a sidewall extending downwardly from

plug placed in said cylinder head assembly generally centrally in said combustion chamber, at least three poppet-type valves sup-



housing means defining a chamber having a first, second and third port, said first and second ports being provided with a valve seat inside said chamber,

arm means mounted for movement within the chamber of said housing means, said arm means having a distal end region movable so that each of two opposite sides of said distal end region is seatable on only one said valve seat of said first and second ports at any one time to close only one of said first and second ports,

biasing means for biasing said arm means to close one of said first port and said second port, and

electrically actuable means for moving said arm means to open said one of said first and second ports closed by said biasing means acting on said arm means and to close the other of said first and second ports so that when said arm means closes said second port, said first and third ports are in communication via said chamber, and, when said arm means closes said first port, said second and third ports are in communication via said chamber,

said electrically actuable means having at least one pair of electrical connections engageable externally of said chamber of said housing means,

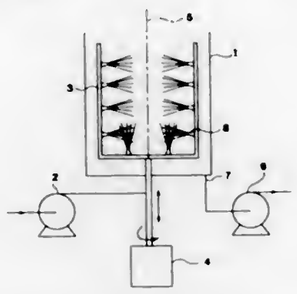
said first and third ports being located on a common side of said housing means to allow a plug engagement of the pulsator unit into a receiver which provides a vacuum source to said first port and a connection to said third port while the second port is connectable to or vents from a gas source.

5,553,568

CAGE FOR AUTOMATICALLY CLEANING BIRDS

Bruno Verschuere, Palavas, and Jean-Pierre Jacques, Allouville-Bellefosse, all of France, assignors to Elf Aquitaine, Courbevoie, France

Division of Ser. No. 318,116, Oct. 5, 1994, Pat. No. 5,009,197. This application Mar. 9, 1995, Ser. No. 401,936
Claims priority, application France, Oct. 13, 1993, 9312183
Int. Cl.[6] A01K *31/00*
U.S. Cl. 119—460 **13 Claims**



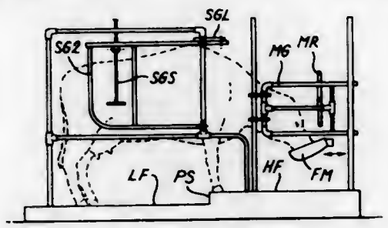
1. A bird cleaning cage comprising a vertically extending open mesh body having a lateral opening, a base movable along a vertical axis of the body, and means for locking the base to the body at any of a plurality of positions along the vertical axis.

5,553,569

ANIMAL STALL

Michael J. Street, Bedford, and Toby T. F. Mottram, Buckland St. Mary, both of England, assignors to British Technology Group Limited, London, England

Continuation of Ser. No. 66,145, May 26, 1993, Pat. No. 5,469,808. This application Mar. 16, 1995, Ser. No. 406,103
Claims priority, application United Kingdom, Oct. 19, 1990, 9022804
Int. Cl.[6] A01K *1/12*
U.S. Cl. 119—525 **11 Claims**



1. A closeable animal stall for milking including:

a closeable entry; and

fixed floor means in a floor of a stall, said fixed floor means comprising a rear entry floor part and a forward floor part extending substantially to a front of said stall, said forward floor part being fixed higher than said rear entry floor part whereby a step is formed between said forward floor part and said rear entry floor part;

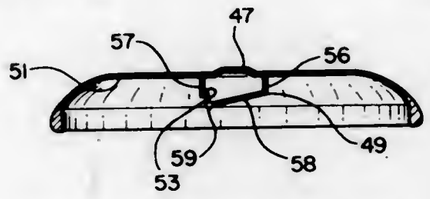
said forward floor part and said rear entry floor part being dimensioned such that when the animal is presented for milking it is positioned with the rear legs on said rear entry floor part of said stall and encouraged to raise its fore-part with respect to its rear part and thereby increase an angle between the rear legs and an underside body of the animal, thereby improving milking access to an udder and teats of the animal.

5,553,570

DISC-SHAPED ANIMAL RETRIEVAL TOY HAVING TREAT CONTAINER

Charlie H. VanNatter, III, Rt 1 Box 1925, Pearland, Tex. 77584, and Guy L. McClung, III, 16690 Champion Forest Dr. Suite 347, Houston, Tex. 77068

Filed Nov. 14, 1994, Ser. No. 338,675
Int. Cl.[6] A01K *29/00*
U.S. Cl. 119—709 **1 Claim**



1. A flying retrievable animal toy for use with an animal, the toy comprising:

a body plate with a top body plate surface and a bottom body plate surface,

a container on the bottom body plate surface for releasably holding a food item,

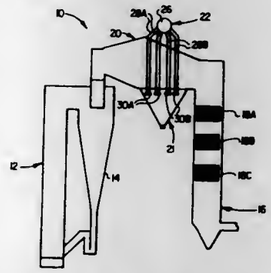
the container comprising a sidewall extending downwardly from the bottom body plate surface, the sidewall having a lower edge defining a container opening of the container through which the food item is movable, and a hinged lid movably connected to the sidewall and the hinged lid releasably securable to the side wall to selectively close off the container opening.

5,553,571

RAPPABLE STEAM GENERATOR TUBE BANK

Walter R. Campbell, Union; John W. Pinalen, Somerville, both of N.J., and Stephen J. Goldich, Palmerton, Pa., assignors to Foster Wheeler Energy Corporation, Clinton, N.J.

Filed Dec. 7, 1994, Ser. No. 350,574
Int. Cl.[6] F22B *37/18*
U.S. Cl. 122—379 **12 Claims**



1. A steam generator tube bank comprising:

a steam drum;

a plurality of spaced rows of tubes in fluid flow communication with said steam drum and extending downwardly from said steam drum; and

a plurality of rows of headers extending below and substantially parallel to said steam drum;

said tubes extending to said headers to place said headers into fluid flow communication with said steam drum;

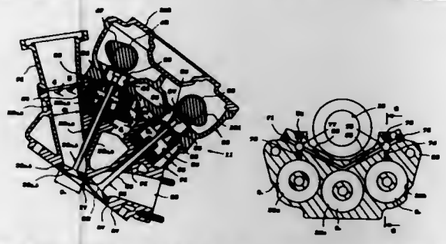
said headers being sized to permit deposits accumulating on said plurality of tubes to be removed from said tubes by inducing vibration of said headers and said tubes.

5,553,572

MULTI-VALVE ENGINE

Katsumi Ochiai, Iwata, Japan, assignor to Sony Corporation, Tokyo, Japan, and Materials Research Corporation, Orangeburg, N.Y.

Filed Sep. 30, 1994, Ser. No. 316,249
Claims priority, application Japan, Sep. 30, 1993, 5-244990
Int. Cl.[6] F01L *1/24;9/02;* **F02B** *1/00*
U.S. Cl. 123—90.14 **29 Claims**



1. An air spring arrangement for the cylinder head of an internal combustion engine having a combustion chamber with a spark plug placed in said cylinder head assembly generally centrally in said combustion chamber, at least three poppet-type valves supported for reciprocation within said cylinder head assembly in surrounding relationship to said spark plug, said air spring arrangement comprising at least three air chambers formed in said cylinder head assembly, each surrounding at least in part a stem of a respective one of said poppet valves, and a V-shaped air passage formed in said cylinder head between said spark plug and said air chambers and communicating with said air chambers.

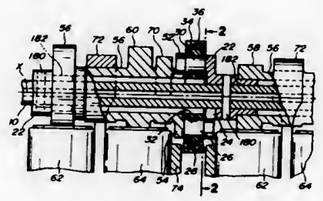
23. A cylinder head assembly for an internal combustion engine comprising a first cylinder head member slidably supporting the stems of at least two poppet type valves, a second cylinder head member detachably affixed to said first cylinder head member, one of said cylinder head members having a recess surrounding said valve stems, and an insert piece retained in said recess between said cylinder head members and defining a pair of bores each receiving a piston affixed to the stem of a respective one of said valves for forming an air spring for urging said valves to their closed positions.

5,553,573

VALVE DURATION CONTROL SYSTEM FOR FOUR-CYCLE ENGINE

Seinosuke Hara, and Naoki Tomisawa, both of Atsugi, Japan, assignors to Unisia Jecs Corporation, Atsugi, Japan

Filed Aug. 2, 1995, Ser. No. 510,561
Claims priority, application Japan, Aug. 8, 1994, 6-185057
Int. Cl.[6] F01L *13/00*
U.S. Cl. 123—90.15 **10 Claims**



1. In a system for controlling valve open duration of an intake valve of an automobile four-cycle internal combustion engine having an exhaust valve and a throttle which opens in degrees, comprising:

a cam drive mechanism including a driving shaft rotatable about a shaft axis and driven to rotate about said shaft axis in response to crankshaft rotation of the engine, and

a cam in driving connection with the intake valve to open the intake valve, said cam being rotatable, about said shaft axis, relative to said driving shaft, said cam having a drive connection from said driving shaft which includes a drive member rotatable with said driving shaft, a support, and an intermediate member supported in said support for rotation about an axis thereof, said drive member being coupled with said intermediate member by a first coupling at a first position spaced from said shaft axis, and said cam being coupled with said intermediate member by a second coupling at a second position angularly spaced from the first position with respect to said shaft axis, each of said first and second coupling having a movable connection with said intermediate member to permit variation in its distance from said axis of said intermediate member during operation;

said support being positionable in response to a control signal

said members being associated with said rod for movement therewith, the other category of said members being fixed

5,553,578

WASHERLESS BLOCK HEATER

said support being positionable in response to a control signal between a concentric position in which said intermediate member is concentric with said driving shaft and an eccentric position in which said axis of said intermediate member is eccentric with said shaft axis of said driving shaft; and

controller means developing said control signal for positioning said support in response to varying operating conditions of the engine, the improvement wherein:

said controller means generates said control signal for positioning said support to said eccentric position during engine operation at low speed with low load,

said controller means generates said control signal for positioning said support to said eccentric position in response to a shift from engine operation at low speed with low load to engine operation at low speed with high load, and

said controller means generates said control signal for positioning said support to said concentric position in response to a shift from engine operation at low speed with low load to engine operation at low speed with middle load that is higher than the low load but lower than the high load.

5,553,574

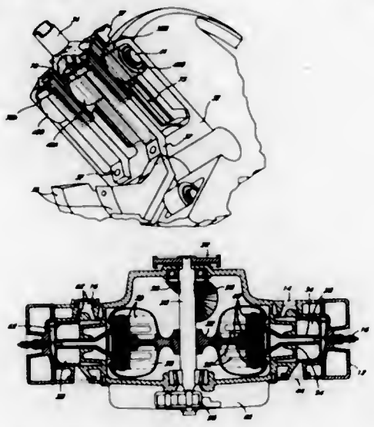
RADIAL CAM INTERNAL COMBUSTION ENGINE

D. James Duncalf, Fremont, Calif., assignor to Advanced Automotive Technologies, Inc., Laguna Beach, Calif.

Continuation of Ser. No. 244,590, Jun. 1, 1994, abandoned, which is a continuation-in-part of Ser. No. 803,156, Dec. 5, 1991, abandoned. This application Feb. 27, 1995, Ser. No. 395,839

Int. Cl.[6] F02B *75/32;* **F01B** *1/06*

U.S. Cl. 123—197.2 **9 Claims**



1. A radial internal combustion engine with

an engine block; a drive shaft rotatably disposed along a centerline of the engine block; a rotatable cam unit, said rotatable cam unit having a plurality of cam extensions, each of said cam extensions having a rising edge and a falling edge, said rotatable cam unit being mounted to said drive shaft, said cam unit being rotatable in a plane substantially perpendicular to said drive shaft;

a plurality of cylinders, pistons and piston rods arranged in a radial pattern around said rotatable cam unit;

at least one cam follower coupled to the end of each rod located opposite the end attached to said piston, said cam follower adapted to engage said cam extensions on said rotatable cam unit;

rod guide means for maintaining alignment of said rods and limiting the movement of said each rod in all directions except along its longitudinal axis, said guide means comprising male and female engagement members, one category of said members being associated with said rod for movement therewith, the other category of said members being fixed with respect to said rod, the improvement in the said guide means comprising:

four elongate members attached to each rod, said members being arranged in two pairs, one member in each pair facing in the opposite direction from the other.

5,553,575

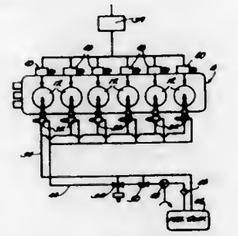
LAMBDA CONTROL BY SKIP FIRE OF UNTHROTTLED GAS FUELED ENGINES

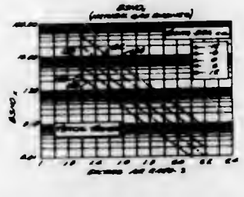
Niels J. Beck, Bonita; Kresimir Gebert, San Diego, and Hoi C. Wong, Carlsbad, all of Calif., assignors to Servojet Products International, San Diego, Calif.

Filed Jun. 16, 1995, Ser. No. 491,275

Int. Cl.[6] F02B *77/00*

U.S. Cl. 123—198 F **34 Claims**





1. A method of optimizing the excess air ratio (λ) for a gaseous fuel-powered internal combustion engine, said engine having a number (N) of cylinders, said method comprising:

(A) ascertaining prevailing engine operating conditions;

(B) determining, based upon said prevailing engine operating conditions, an optimum fraction of cylinders (OFF) required to be fired to cause an actual value of λ to at least approach an optimum value of λ (λ_{OPT}); then

(C) determining a number (M) of cylinders that the firing of which must be skipped to produce said OFF, M being less than N; and then

(D) eliminating a firing and fueling cycle in said M number of cylinders only.

5,553,576

VEHICLE MOTORIZATION UNIT

Jean Nikly, Saint-Cyr au Mont d'Or, France, assignor to Wartsila Sacam Diesel S.A., Mulhouse, France

Filed Aug. 3, 1995, Ser. No. 509,760

Claims priority, application France, Aug. 11, 1994, 94 10058

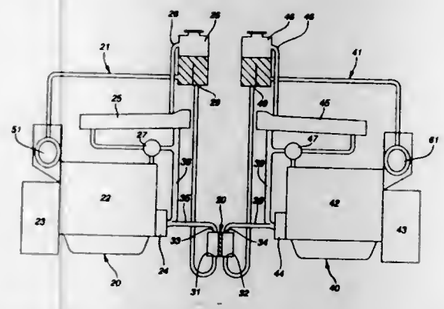
Int. Cl.[6] F01P *9/00*

U.S. Cl. 123—41.01 **6 Claims**

1. A motorization unit, for road, rail, and aquatic vehicles, comprising:

at least two internal combustion engines, each of the engines having an independent cooling circuit; and

a control means for operating the at least two engines at least one of alternately and simultaneously;



wherein at least one heat exchanger is thermally coupled to the cooling circuits of each of the engines, to, in the event that one of the at least two engines is running and the other of the at least two engines is not running, transfer heat from the cooling circuit of the engine that is running to the cooling circuit of the engine that is not running and heat the engine that is not running.

5,553,577

APPARATUS FOR CHECKING THE TIGHTNESS OF A TANK VENTING SYSTEM

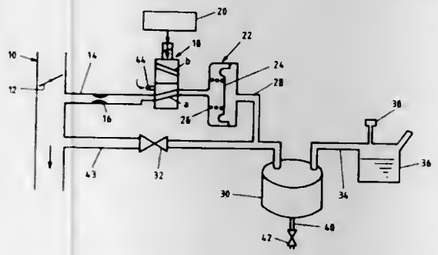
Helmut Denz, Stuttgart, and Andreas Blumenstock, Ludwigsburg, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Sep. 30, 1994, Ser. No. 316,459

Claims priority, application Germany, Oct. 15, 1993, 43 35 126.3

Int. Cl.[6] F02M *37/04*

U.S. Cl. 123—198 D **18 Claims**



1. An apparatus for checking the tightness of a fuel tank venting system, which serves to vent a fuel tank of a motor vehicle having an intake tube of an engine, an absorption filter connected to a ventilation line, a shutoff valve in said ventilation line which is closed during a fuel valve tightness check, a purging line which is closed by means of a regenerating valve during a fuel tank tightness check, and at least first and second pressure control devices for A production of an overpressure in the fuel tank, said at least first and second pressure control devices using only a fluid medium within the fuel tank venting system for producing pressure during fuel tank tightness check, the at least first pressure embodied as actuatable by means of a vacuum from a vacuum source control device (**18**) is actuatable to control an actuatable pressure on said at least one second pressure control device (**22**) from a vacuum source or from atmospheric pressure.

170-919 O.G.-96-5: QL3

5,553,578

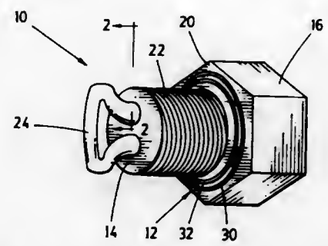
WASHERLESS BLOCK HEATER

Vinh L. Nguyen, Toronto, Canada, assignor to Pyroil Canada, Mississauga, Canada

Filed Oct. 24, 1995, Ser. No. 547,474

Int. Cl.[6] F02N *17/02*

U.S. Cl. 123—142.5 E **6 Claims**



1. A block heater for an automotive engine, said block heater including a body of a hard malleable metal including an externally threaded nipple portion, an outer end portion having a diametric dimension greater than that of said nipple portion, and a sharp shoulder portion connecting said nipple portion and said end portion:

first and second spaced apart ribs raised on said shoulder portion concentric with said nipple portion;

said nipple portion being receivable in a threaded bore in a wall of the block of an automotive engine to compress said ribs against said wall and form a damping seal therewith.

5,553,579

FUEL INJECTION SYSTEM FOR TWO-CYCLE ENGINE

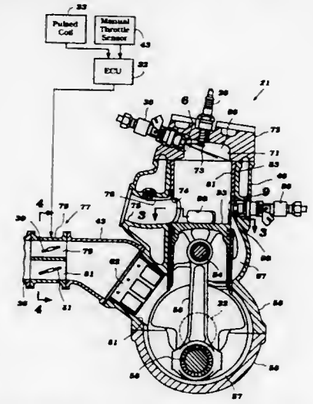
Ryoichi Hirai, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 22, 1994, Ser. No. 362,799

Claims priority, application Japan, Dec. 28, 1993, 5-336428

Int. Cl.[6] F02D *9/08;* **F02B** *17/00*

U.S. Cl. 123—295 **34 Claims**



1. A direct fuel injection system for an engine having a combustion chamber at an upper end thereof, a spark plug having a spark gap extending into said combustion chamber, and a fuel injector supported to one side of said spark plug and spraying fuel into said combustion chamber in a direction generally transverse to said combustion chamber and said spark plug, said fuel injector having a first spray port directed toward said spark plug gap and at least two other spray ports directed in an area in said combustion chamber spaced from said spark gap.

5,553,580

STRATIFIED CHARGE ENGINES AND METHOD FOR

means for delivering fuel to said one cylinder in unequal concentrations through said at least two intake passages such that

(g) drive said gating circuit with appropriately determined said injection and ignition signals to actuate said injectors

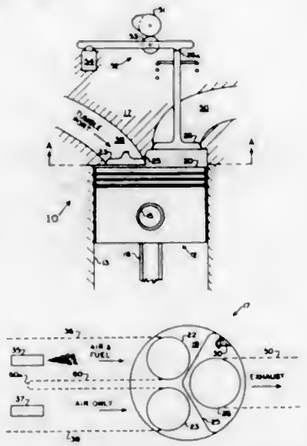
5,553,583

ROCKER ARM LUBRICATION ARRANGEMENT

5,553,580
STRATIFIED CHARGE ENGINES AND METHOD FOR THEIR OPERATION

David P. Ganoung, 2800½ Candelaria, NW, Albuquerque, N.M. 87107

Filed Jan. 13, 1995, Ser. No. 372,300
Int. Cl.[6] F02B *23/08*
U.S. Cl. 123—308 **25 Claims**

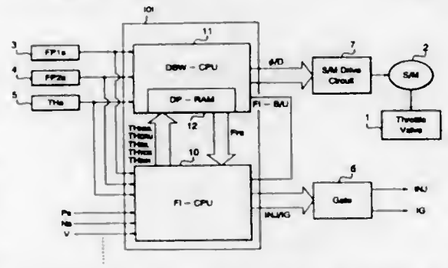


1. A four-stroke, spark-ignition engine comprising:
at least one cylinder,
at least two separate intake passages for intermittently conducting gaseous flow into said one cylinder with a tumbling motion about an axis substantially perpendicular to the geometric axis of said one cylinder,
at least one exhaust passage for intermittently conducting gaseous flow from said one cylinder,
means for closing said one cylinder at one end and for connecting said intake and exhaust passages to said one cylinder,
a piston which reciprocates in said cylinder to thereby seal off a variable thermodynamic working volume between a crown portion of said piston and said cylinder closing means,
means located opposite said cylinder closing means for reciprocating said piston within said one cylinder,
one poppet valve for selectively enabling communication for gaseous flow from each of said at least two intake passages into said one cylinder,
at least one poppet valve for selectively enabling communication for gaseous flow from said one cylinder into said at least one exhaust passage,
said cylinder closing means cooperating with said piston crown to form a main squish area covering at least 75 percent of the total circular area of all of said intake valves serving said one cylinder, said valve circular area being that which generally faces said piston crown when said reciprocating means is in a position bringing said piston closest to said cylinder closing means, said main squish area also being equal to at least 40 percent of the circular area of said piston; and said cylinder closing means also cooperating with said piston crown to form a combustion chamber volume when said reciprocating means is in said position bringing said piston closest to said cylinder closing means, all circular areas of all of said exhaust valves that serve said one cylinder and generally face said piston crown being included as boundary surfaces of said combustion chamber volume, but said combustion chamber volume boundary surfaces being exclusive from all squish areas formed between said piston crown and said cylinder closing means,
means for delivering fuel to said one cylinder in unequal concentrations through said at least two intake passages such that barrel stratification exists in said one cylinder with varying mixture strength at different positions along said axis of tumbling motion,
and at least a first spark ignition means located at a position in said combustion chamber volume where said varying mixture strength is distinctly richer than its average value for said one cylinder, said first spark position also being closer to the wall of said one cylinder, including a geometric extension thereof, than to said geometric axis, including an extension thereof, of said one cylinder,
whereby combustion in said one cylinder of a charge highly diluted on an overall basis is enhanced by extensive squish action as well as by barrel stratification.

5,553,581
CONTROL SYSTEM FOR INTERNAL-COMBUSTION ENGINE

Kazuo Hirabayashi; Yosuke Tachibana, and Norio Suzuki, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1994, Ser. No. 190,925
Claims priority, application Japan, Feb. 5, 1993, 5-042035
Int. Cl.[6] F02D *7/00*
U.S. Cl. 123—399 **3 Claims**



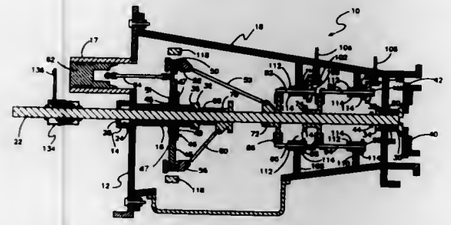
1. A control device for controlling an intake air quantity and a fuel amount for an internal combustion engine comprising:
a first accelerator pedal angle sensor for detecting a first accelerator pedal angle and generating a first output signal representative thereof;
a second accelerator pedal angle sensor for detecting a second accelerator pedal angle and generating a second output signal representative thereof;
a microprocessor controller for controlling said intake air quantity provided to said internal combustion engine by controlling an actuator which drives said throttle valve and for controlling said fuel amount, said microprocessor controller functioning to
(a) generate a target value for said actuator according to an accelerator pedal angle;
(b) selecting, as said accelerator pedal angle, a lower value of one of said first and second accelerator pedal angle output signals;
(c) driving said throttle valve to said target value in accordance with said lower value of said first and second pedal angle output signals to minimize potentiometer noise due to aging degradation;
(d) control a gating circuit for actuating fuel injectors and ignition circuits;
(e) generate injection signals for the gating circuit operation as a function of preselected engine parameters;
(f) generate ignition signals for the gating circuit as a function of preselected engine parameters and

(g) drive said gating circuit with appropriately determined said injection and ignition signals to actuate said injectors and ignition circuit.

5,553,582
NUTATING DISC ENGINE

Danny E. Speas, P.O. Box 715, Haiku, Hi. 96708

Filed Jan. 4, 1995, Ser. No. 368,599
Int. Cl.[6] F02B *75/26*
U.S. Cl. 123—56.4 **18 Claims**

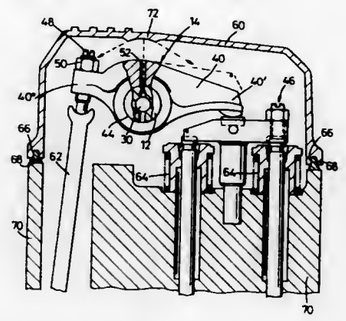


1. An engine comprising:
a housing having a longitudinal axis, a first end, and a second end;
a main shaft rotatably supported by said housing, said main shaft having a longitudinal axis coincident with the longitudinal axis of said housing;
a plurality of cylinders supported by said housing, said plurality of cylinders being radially disposed about said shaft;
a plurality of pistons corresponding in number to said plurality of cylinders, each of said plurality of pistons disposed within a respective one of said plurality of cylinders, each of said plurality of pistons reciprocating within said respective one of said plurality of cylinders;
a nutating member having a central opening, said main shaft passing through said central opening, said nutating member being in nutational motion in response to said plurality of pistons reciprocating within respective ones of said plurality of cylinders;
means for rotationally constraining said nutating member, said means for rotationally constraining said nutating member substantially preventing forces, generated in reaction to torque output from said engine, from being borne by said plurality of cylinders, said means for rotationally constraining said nutating member being a constant velocity joint disposed within said central opening, said constant velocity joint including,
an inner ball portion having external splines, said external splines forming grooves therebetween,
an outer socket portion having internal splines, said internal splines forming grooves therebetween,
a plurality of ball bearings, each of said plurality of ball bearings engaging a respective groove on said inner ball portion and a respective groove in said outer socket portion to thereby prevent relative rotation between said inner ball portion and said outer socket portion, and
a cage located intermediate said inner ball portion and said outer socket portion, whereby said cage retains said plurality of ball bearings within said constant velocity joint; and
means for converting the nutational motion of said nutating member into rotational motion of said main shaft.

5,553,583
ROCKER ARM LUBRICATION ARRANGEMENT

Derek Jones, Pontesbury, Great Britain, assignor to Perkins Limited, Cambridgeshire, United Kingdom

Filed Jan. 27, 1995, Ser. No. 379,706
Claims priority, application United Kingdom, Jan. 28, 1994, 9401645
Int. Cl.[6] F01M *9/10*
U.S. Cl. 123—90.34 **21 Claims**



1. A rocker arm lubrication arrangement comprising a rocker arm assembly comprising a number of rocker arms mounted for pivotal movement about a longitudinally extending support shaft formed with a longitudinally extending lubricant supply bore and a number of radially substantially vertically extending lubricant supply bores communicating therewith, wherein at least one of said radially substantially vertically extending bores at least selectively communicates with an upwardly extending lubricant supply bore in a corresponding one of said rocker arms such that lubricant passing under pressure through said longitudinally extending supply bore to said radially substantially vertically extending supply bore forms a jet of lubricant which rises substantially vertically through said corresponding bore in the rocker arm to impinge upon an underside of an engine cover and to be returned as a spray to lubricate contact points between opposed ends of the rocker arm and at least two other engine components located adjacent the opposed ends of the rocker arm.

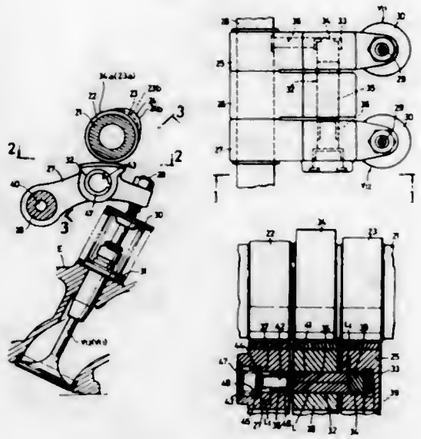
5,553,584
VALVE OPERATING DEVICE FOR INTERNAL COMBUSTION ENGINE

Tsuneo Konno, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1994, Ser. No. 364,337
Claims priority, application Japan, Dec. 24, 1993, 5-328417; Dec. 24, 1993, 5-328420; Dec. 28, 1993, 5-336613
Int. Cl.[6] F01L *13/00*
U.S. Cl. 123—90.16 **2 Claims**

1. A valve operating device for an internal combustion engine, comprising: a plurality of rocker arms including at least first, second and third rocker arms adjacently disposed for swinging movement about a common axis; a plurality of cams provided on a cam shaft in independent correspondence to said rocker arms; and a connection switchover means capable of switching over between a connection and a disconnection of said rocker arms in various combinations, wherein
said connection switchover means includes: a switchover piston slidably fitted into said first rocker arm operatively connected to an engine valve and having one end facing a hydraulic pressure chamber; a switchover pin slidably fitted into said second rocker arm adjacent said first rocker arm and having one end abutting against the other end of said switchover

5,553,587
AIR CLEANER HOUSING



piston; and a limiting mechanism which is slidably fitted into said third rocker arm operatively connected to another engine valve and adjoining said second rocker arm on an opposite side from said first rocker arm, and said limiting mechanism abuts against the other end of said switchover pin; said limiting mechanism including a spring biasing mechanism provided in said third rocker arm for biasing said limiting mechanism toward said switchover pin, said spring biasing mechanism enabling a sliding stroke of each of said switchover piston, said switchover pin and said limiting mechanism to be changed at two stages in response to increasing of the hydraulic pressure at two stages in said hydraulic pressure chamber; said switchover pin having an axial length such that when a one axial end of the switchover pin has been fitted into one of said first and third rocker arms, the other axial end of the switchover pin is located between the other of said first and third rocker arms and said second rocker arm, wherein at least two of said rocker arms are held in a connected state by said switchover pin in all operation ranges of the engine and said second rocker arm is one of said at least two of said rocker arms.

5,553,585

ANTI-POLISHING RING

Daniel Paro, Kveviax, Finland, assignor to Wartsila Diesel International Ltd OY, Helsinky, Finland

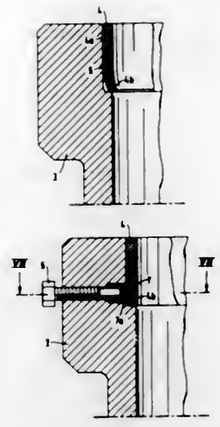
Filed May 16, 1995, Ser. No. 441,934

Claims priority, application Finland, May 27, 1994, 942498

Int. Cl.[6] F16J *1/04*

U.S. Cl. 123—193.2 **17 Claims**

1. An anti-polishing ring to be used in a cylinder of a diesel engine that includes a cylinder liner and a piston fitted in the cylinder liner, the piston having an upper portion and the upper portion of the piston having a mantle surface, the anti-polishing ring being supported to the cylinder liner for the purpose of removing possible carbon deposit and carbon residue from the upper portion of the piston, wherein the anti-polishing ring has an upper portion and a lower edge and the lower edge of the anti-polishing ring is pressed radially inward of the cylinder toward the mantle surface of the upper portion of the piston.



5,553,586

ENGINE AND OUTBOARD ENGINE STRUCTURE

Kouji Koishikawa; Masaki Tsunoda, and Hitoshi Suzuki, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

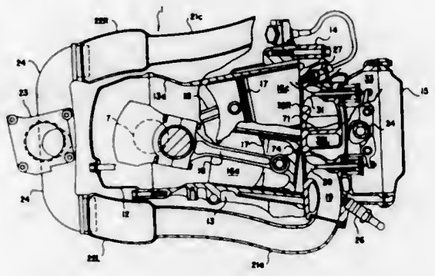
Filed Dec. 16, 1994, Ser. No. 357,513

Claims priority, application Japan, Dec. 18, 1993, 5-343907; Dec. 18, 1993, 5-343908; Dec. 18, 1993, 5-343909

Int. Cl.[6] F02F *7/00*

U.S. Cl. 123—195 P **17 Claims**

1. An engine comprising:



(a) a cylinder block having a plurality of cylinders formed in a V-shaped configuration, each of said cylinders having a piston therein;

(b) a cylinder head mounted on said cylinder block;

(c) exhaust passages formed in said cylinder head, said exhaust passages being located in a space formed by inner sides of said V-shaped configuration so as to be at a central portion of said V-shaped configuration, said exhaust passages opening into said cylinders;

(d) intake passages formed in said cylinder head, so as to open at one ends thereof to opposite outer sides of said cylinder head on opposite sides of said V-shaped configuration and at other ends into said cylinders respectively;

(e) fuel injection nozzles provided in said intake passages; and

(f) a crankshaft operatively coupled to said pistons and oriented perpendicular to the axes of said cylinders.

5,553,587

AIR CLEANER HOUSING

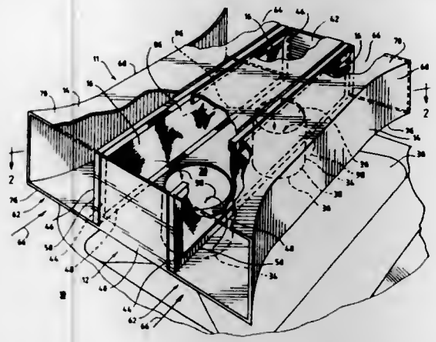
Rosario J. Conoscenti, 1622 E. Walnut, DesPlaines, Ill. 60016

Continuation-in-part of Ser. No. 448,117, May 23, 1995. This application Oct. 17, 1995, Ser. No. 545,361

Int. Cl.[6] F02B *77/00*

U.S. Cl. 123—198 E **16 Claims**

1. An air cleaner apparatus for an internal combustion engine,



the air cleaner having a filter element with a generally planar face disposed parallel to a direction of a flow of air, the air cleaner comprising:

a housing having a central portion and an air guide disposed adjacent the central portion, said central portion communicating with the air guide through the filter element;

the central portion having at least one air inlet in operative communication with the engine for permitting the flow of air from the air guide through the filter element and into the engine;

the air guide having an air scoop and an air exhaust, each disposed in a plane generally perpendicular to the direction of the flow of air relative to the housing;

the air scoop and the air exhaust disposed at opposite ends of the filter element, a portion of the flow of air moving in the air guide through the air scoop entering the central portion through the face of the filter element and a remainder of the flow of air exiting the air guide through the air exhaust; and

air movement generating means operatively coupled to the air guide, said air movement generating means increasing the velocity of the portion of the flow of air moving in the air guide between the air scoop and the air exhaust.

5,553,588

SPARK-IGNITED DIRECT CYLINDER FUEL INJECTION ENGINE

Takeshi Gono, Suntou-gun, and Souichi Matsushita, Susono, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 17, 1995, Ser. No. 503,443

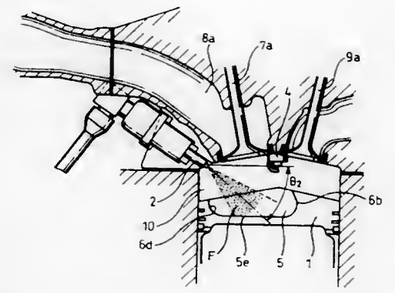
Claims priority, application Japan, Jul. 27, 1994, 6-175577

Int. Cl.[6] F02F *3/26*

U.S. Cl. 123—276 **4 Claims**

1. A direct cylinder fuel injection type spark-ignited engine having a combustion chamber formed in the shape of a depression in a top surface of a piston, a direct cylinder fuel injection valve which injects a fuel mist into said combustion chamber during the compression stroke of a piston, a spark plug, and a means for causing a swirling flow of intake air in inside the combustion chamber, a configuration of a wall of said combustion chamber, comprising:

a first region formed in an approximately arc shape along said swirling flow;



a second region formed in an approximately linear shape which continues to said first region from the downstream side of said swirling flow; and

a third region, formed in an approximately arc shape which continues to said second region from downstream side of said swirling flow,

said spark plug being disposed so that its electrodes protrude into said combustion chamber at a portion near the wall in said second region when the piston is positioned near its top dead center, and said fuel injection valve having an injection port which injects fuel into said combustion chamber on said first region side of the spark plug.

5,553,589

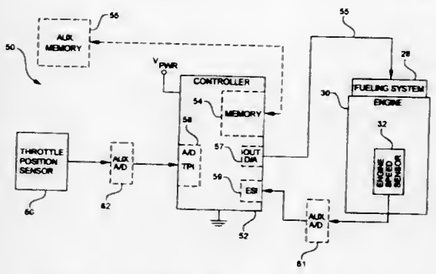
VARIABLE DROOP ENGINE SPEED CONTROL SYSTEM

Paul L. Middleton, Blaine, Minn., and John L. Zeller, Hiroshima, Japan, assignors to Cummins Electronics Company, Inc., Columbus, Ind.

Filed Jun. 7, 1995, Ser. No. 475,854

Int. Cl.[6] F02D *41/14;17/04;31/00*

U.S. Cl. 123—352 **19 Claims**



1. A method of controlling the engine speed of an internal combustion engine having a throttle position sensor associated therewith for sensing throttle position, an engine speed sensor for sensing actual engine speed, and a fuel system responsive to a fuel control signal to fuel the engine, the method comprising the steps of:

(1) sensing throttle position and determining a desired engine speed therefrom;

(2) sensing actual engine speed;

(3) determining an error speed to be the difference between the desired engine speed and the actual engine speed;

(4) generating a fuel control signal from the error speed that is a function of at least the magnitude, duration and rate of change of the error speed, the fuel control signal further being proportional to engine load such that the actual engine speed decreases as engine load increases; and

(5) fueling the engine in accordance with the fuel control signal to thereby control the actual engine speed.

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INTAKE CONTROL VALVE

b) means for cooling said high pressure air output to partially liquefied air having a mass fraction of less than 30% liquid;

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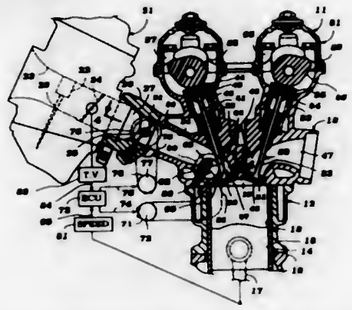
FUEL SYSTEM WITH FUEL VAPOR ESTIMATING FEATURE

5,553,590

INTAKE CONTROL VALVE

Mitso Suzuki; Masahiro Ito, and Yoshiyuki Higaki, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jul. 13, 1993, Ser. No. 91,605
Claims priority, application Japan, Jul. 14, 1992, 4-186501
Int. Cl.[6] F02B *31/00*; F02P *5/00*
U.S. Cl. 123—415 **43 Claims**



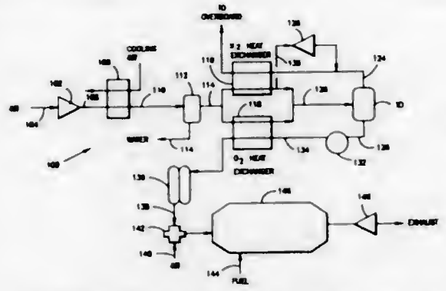
1. An internal combustion engine having a combustion chamber, an intake passage communicating at a valve seat with said combustion chamber, a control valve positioned within said intake passage and moveable between opened position wherein the flow into said combustion chamber is substantially unrestricted and in a first direction and a closed position wherein the flow into said combustion chamber is restricted to increase the flow velocity and to redirect the flow from said first direction, means for sensing at least two different engine conditions, and means for holding said control valve in one of its positions when one of said sensed engine conditions is below a predetermined first value and regardless of the magnitude of the other of said sensed engine conditions and for operating said control valve between said closed position, a plurality of intermediate positions and said opened position at all other conditions in response to both of the sensed engine conditions.

5,553,591

ENGINE POWER ENHANCEMENT/POLLUTION CONTROL SYSTEM UTILIZING VORTEX AIR SEPARATOR

Alex C. Yi, Cerritos, Calif., assignor to Rockwell International Corp., Seal Beach, Calif.

Filed Jun. 20, 1994, Ser. No. 262,709
Int. Cl.[6] F02B *75/10*
U.S. Cl. 123—585 **7 Claims**



1. An engine power enhancement/pollution control system, comprising:

a) a compressor for receiving air from the environment and providing high pressure air output;

b) means for cooling said high pressure air output to partially liquefied air having a mass fraction of less than 30% liquid;

c) a vortex air separation apparatus for separating said partially liquefied air into gaseous nitrogen enriched air and liquid oxygen enriched air; and,

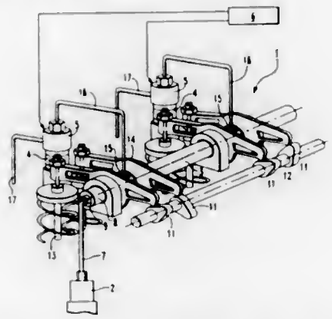
d) means for introducing said oxygen enriched air to an internal combustion engine, thereby enhancing the power of said engine and minimizing pollution thereof.

5,553,592

FUEL INJECTION ARRANGEMENT FOR A MULTICYLINDER INTERNAL COMBUSTION ENGINE

Emil Bäuerle, Esslingen, and Magnus Korte, Leonberg, both of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Aug. 8, 1995, Ser. No. 512,536
Claims priority, application Germany, Sep. 29, 1994, 44 34 783.9
Int. Cl.[6] F02M *41/00*
U.S. Cl. 123—456 **3 Claims**



1. A fuel injection arrangement for a multicylinder internal combustion engine having for each cylinder intake and exhaust valves, a rocker arm support shaft, rocker arms pivotally mounted on said rocker arm support shaft for operating said intake and exhaust valves, electromagnetically operable injectors mounted on said cylinders for supplying fuel to said cylinders, and a high pressure fuel supply system for supplying fuel under pressure to said fuel injectors, said fuel supply system comprising said rocker arm support shaft which is hollow and serves as a fuel distribution conduit, a high pressure fuel pump having a fuel discharge line connected to said rocker arm support shaft and fuel distribution lines extending from said rocker arm support shaft to said injectors.

5,553,593

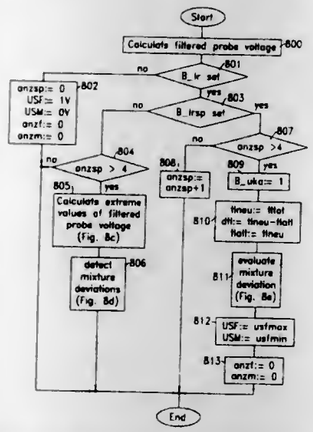
CONTROL SYSTEM AND METHOD FOR METERING THE FUEL IN AN INTERNAL COMBUSTION ENGINE

Eberhard Schnaibel, Hemmingen; Rolf-Hermann Mergenthaler, Leonberg; Lutz Reuschenbach, Stuttgart; Hans Veil, Eberdingen, and Eduard Weiss, Metterzimmern, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jun. 7, 1995, Ser. No. 488,355
Claims priority, application Germany, Jun. 16, 1994, 44 20 946.0
Int. Cl.[6] F02D *41/00*
U.S. Cl. 123—682 **12 Claims**

1. A method for metering fuel in an internal combustion engine, comprising the steps of:

providing a basic fuel injection quantity signal on the basis of an operating state of the internal combustion engine;



providing a mixture correction signal for correcting a deviation of an air/fuel ratio from a desired value;

determining an adaptive correction factor by comparing the mixture correction signal with a reference;

generating a transition compensation signal as a function of the adaptive correction factor; and

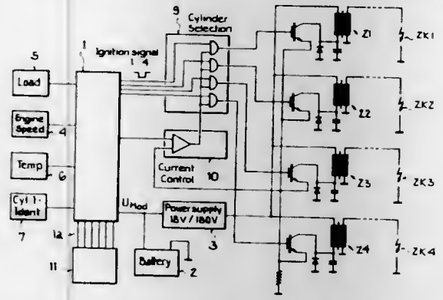
generating a fuel injection quantity signal by logically combining the transition compensation signal and the basic fuel injection quantity signal.

5,553,594

CONTROLLABLE IGNITION SYSTEM

Karsten Ehlers, Wolfsburg-Neuhaus; Christoph Dömland, Wolfsburg, and Andreas Sprysch, Braunschweig, all of Germany, assignors to Volkswagen AG, Wolfsburg, and Deutsche Automobilgesellschaft mbH, Braunschweig, both of Germany

Filed Aug. 16, 1994, Ser. No. 291,535
Claims priority, application Germany, Aug. 25, 1993, 43 28 524.4
Int. Cl.[6] F02P *9/00*
U.S. Cl. 123—609 **12 Claims**



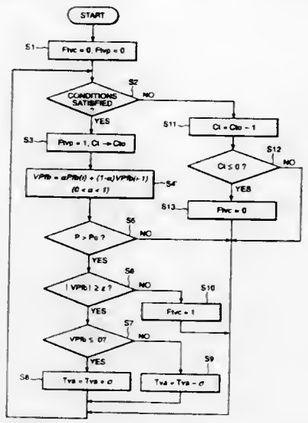
1. A method for controlling an ignition system for an internal combustion engine comprising at least one ignition output stage for the excitation of at least one ignition coil that generates a sparking current, and wherein the value of the sparking current and the sparking current can be set; said method including the steps of: determining momentary values of various operating parameters of the internal combustion engine during operation of the engine; and independently controlling the value of the sparking current and the value of its sparking period according to the determined values of the engine parameters during normal operation of the engine.

5,553,595

FUEL SYSTEM WITH FUEL VAPOR ESTIMATING FEATURE

Futoshi Nishioka; Tetsushi Hosokai, both of Hiroshima, and Kazuo Tanaka, Okayama, all of Japan, assignors to Mazda Motor Corporation, Hiroshima-ken, Japan

Filed Mar. 30, 1995, Ser. No. 413,703
Claims priority, application Japan, Mar. 30, 1994, 6-061549
Int. Cl.[6] F02M *51/00*
U.S. Cl. 123—698 **35 Claims**



1. A fuel system comprising:

air-to-fuel ratio control means for detecting an air-to-fuel ratio and feedback controlling said air-to-fuel ratio according to a feedback control parameter determined based on a deviation of said air-to-fuel ratio from a target air-to-fuel ratio so as to maintain an ideally combustible air-fuel mixture;

evaporation control means included in said fuel system and having a purge valve for storing fuel vapors from a fuel tank and purging fuel vapors into an intake system therefrom; and

fuel control means for calculating an average of said feedback control parameters, estimating an amount of said fuel vapors stored in said evaporation control means based on said average feedback control parameter, calculating an amount of fuel vapors replenished into said intake system based on said estimated amount of fuel vapors, and calculating a difference between an amount of fuel necessary to provide an ideally combustible air-fuel mixture and said replenished amount of fuel vapors, whereby causing said fuel system to deliver fuel of an amount equal to said difference into said intake system.

5,553,596

CROSSBOW VIBRATION DAMPING DEVICE

William J. Bednar, Akron, Ohio, assignor to Hunter's Manufacturing, Suffield, Ohio

Filed Jan. 4, 1995, Ser. No. 368,701
Int. Cl.[6] F41B *5/12*
U.S. Cl. 124—25 **19 Claims**

14. A vibration damping mechanism for a crossbow having a pair of bow limbs carrying a bowstring therebetween, a limb mounting member for supporting the bow limbs, and a stock portion held by the user for firing of the crossbow, the vibration damping mechanism comprising,

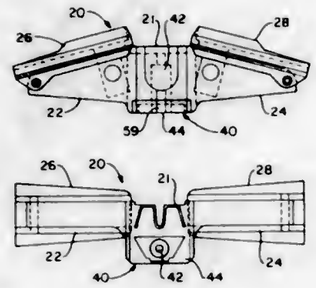
at least one bushing member mounted in association with said limb mounting member in at least one location between said bow limbs and said stock portion to damp vibrations generated by said bow limbs upon firing of said crossbow,

said at least one bushing member being made of a compressible material and forming an interface at said at least one location between said bow limbs and said stock portion.

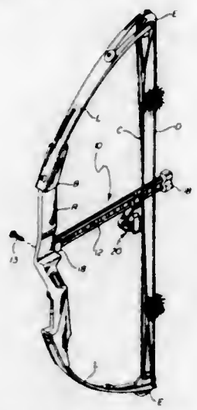
as the spaced distance between the ends of the cylindrical wall of the collapsible cup, a first portion extending along at least

5,553,601

BARBECUE



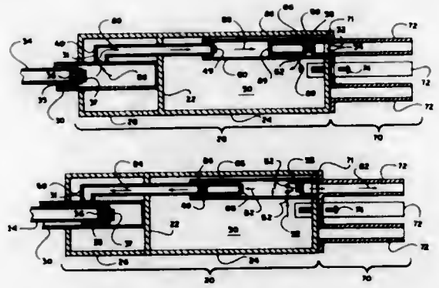
5,553,597
OVERDRAW FOR A COMPOUND BOW
Rodney L. Sparks, 113 Jolomic La., Georgetown, Ky. 40324
Filed Dec. 29, 1994, Ser. No. 366,175
Int. Cl.[6] F41B 5/22
U.S. Cl. 124—44.5 19 Claims



1. An overdraw apparatus for a compound bow including a bow body, drawstring and tension cable system, comprising:
a frame;
means for mounting said frame to the bow body;
a guideway carried on said frame, said guideway including a pair of spaced, parallel, elongated rods;
an arrow rest carriage received for sliding movement along said guideway and displaceable between a rest position and a fully drawn position, said arrow rest carriage including a slide block for receiving and sliding along said rods; and
means for directly connecting said arrow rest carriage to the tension cable system whereby said arrow rest carriage is displaced along said guideway as the drawstring is drawn back to shoot an arrow.

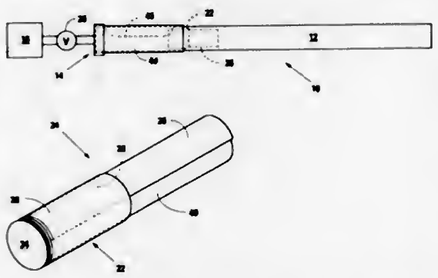
5,553,598
PNEUMATIC LAUNCHER FOR A TOY PROJECTILE AND THE LIKE
Lonnie G. Johnson, Smyrna, and John T. Applewhite, Atlanta, both of Ga., assignors to Johnson Research and Development Co., Inc., Smyrna, Ga.
Filed Apr. 6, 1994, Ser. No. 223,559
Int. Cl.[6] F41B 11/00
U.S. Cl. 124—63 20 Claims

1. A launcher for a projectile comprising:
a pump for forcefully directing a continuous flow of fluid;



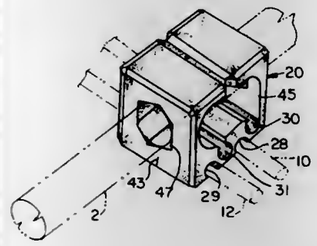
a reservoir for receiving and storing the fluid;
a mount having a bore therethrough for receiving the projectile for launching and for directing the fluid against the projectile so as to disengage and launch the projectile; and
a piston structure having a reciprocally translatable piston housed within a piston sleeve which is in fluid-flow communication with said pump, said reservoir and said mount such that said piston is translated to and remains in a first position wherein said piston obstructs a first fluid passageway between said piston sleeve and said mount, permitting fluid flow between said pump and said reservoir, and prohibiting fluid flow between said reservoir and said mount and between said pump and said mount as said reservoir is being pressurized, and when said reservoir becomes substantially pressurized and said pump is not forcefully directing said flow of fluid, said piston translated by said fluid exiting said reservoir to a second position whereby said piston obstructs a second fluid passageway between said pump and said reservoir, permitting fluid flow between said mount and said reservoir and prohibiting fluid flow between said reservoir and said pump and between said pump and said mount.

5,553,599
HANDBILL ASSEMBLY AND DELIVERY SYSTEM FOR HANDBILLS
Armando W. Benavides, 142 Ithaca Dr., San Antonio, Tex. 78227
Filed May 23, 1995, Ser. No. 447,823
Int. Cl.[6] F41B 11/00; B65G 51/06;51/02
U.S. Cl. 124—73 11 Claims



1. A handbill assembly for a pneumatic ejection system, comprising:
a cup member consisting of a readily collapsible cylindrical wall formed of cardboard and having a predefined internal diameter and two ends spaced apart at a predetermined distance, a nonstructural bottom member extending across one of said ends of the cylindrical wall and forming a closed end of said cup, and art open top at the other of said ends; and
a handbill consisting of at least one sheet of paper rolled to form a coil having a length no more than about three times as long as the spaced distance between the ends of the cylindrical wall of the collapsible cup, a first portion extending along at least one-third of said coil length, a second portion extending along the remainder of said length, and an unrestrained diameter greater than the internal diameter of the cylindrical wall component of said cup, said first portion extending being disposed within the cup and said second portion extending outwardly from the open end of said cup.

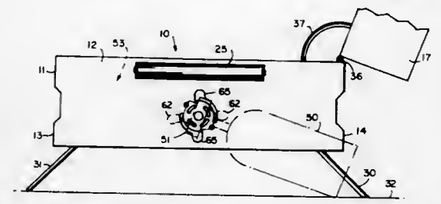
5,553,600
CABLE GUARD SLIDE
Allen W. Miller, 32 Champagne Dr., Lake St. Louis, Mo. 63367
Filed Sep. 26, 1994, Ser. No. 312,136
Int. Cl.[6] F41B 5/10
U.S. Cl. 124—86 15 Claims



1. In combination with a compound bow having a handle section and a pair of bow limbs, a bow string and a pair of cables extending between the outer end of the bow limbs in lateral spaced relationship with respect to the plane of the bow and bow string, and a cable guard comprising a rod connected at one end to said handle section and extending therefrom parallel to said plane and in outward spaced relationship with that side of said cables opposite said bow string to a free end beyond said cables when the bow is fully drawn, and a cable retaining member comprising means for slidably mounting said cable retaining member on said rod, and means for holding an intermediate portion of the length of said cables selectively either on the side of said rod contiguous said string or on the side of said rod opposite said string, said means for holding said cables comprising a wall having spaced cable-receiving channels on an inside surface of said wall for bolding said cables on a side of said rod contiguous said string and spatted cable-receiving channels on an outside surface of said wall, opening outwardly, for holding said cables on the side of the rod opposite said string.

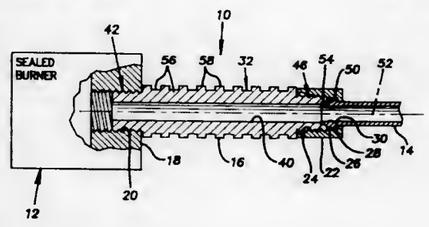
2. In combination with a compound bow having a handle section and a pair of bow limbs, a bow string and a pair of cables extending between the outer end of the bow limbs in lateral spaced relationship with respect to the plane of the bow and bow string, and a cable guard comprising a rod connected at one end to said handle section and extending therefrom parallel to said plane and in outward spaced relationship with that side of said cables opposite said bow string to a free end beyond said cable when the bow is fully drawn, and a cable retaining member slidably mounted on said rod, said retaining member having means for holding an intermediate portion of the length of said cables selectively either on the side of said rod contiguous said string or on the side of said rod opposite said string, said rod being circular in cross section through the span on which the retaining member is mounted and the retaining member having through it a passage formed by walls defining a polygon, whereby the bearing surfaces of the retaining member on said rod are flat surfaces tangent to an outer surface of said rod.

5,553,601
BARBECUE
Nicholas S. Parker, Sun Valley, Id., and Philip C. Carbone, Groveland, Mass., assignors to Parker, Inc., Sun Valley, Id.
Division of Ser. No. 221,645, Apr. 1, 1994. This application Jun. 7, 1994, Ser. No. 255,049
Int. Cl.[6] F24C 5/20
U.S. Cl. 126—38. 26 Claims



1. In a gas-fired portable barbecue using fuel from a pressurized source and having base means with a floor, a first wall having a plurality of spaced apertures and a second wall, parallel to and spaced from the first wall for forming a combustion chamber, the improvement of combustion means for heating said barbecue comprising:
A. burner tube means having an open end and a plurality of gas ports formed therein for producing a flame, said burner tube means extending between said first and second walls parallel to and spaced from said combustion chamber floor with said open end being spaced from said first wall,
B. regulator means for connection to the pressurized source for controlling the discharge of gas into said burner tube means,
C. a discharge pipe extending from said regulator means and terminating at a free end,
D. a first connection means fixed to said discharge pipe proximate said free end, and
E. a complementary second connection means formed by first apertures at said first wall for releasably engaging said first connection means for positioning said regulator and the connected pressurized source with said free end of said discharge tube being located coaxially with said burner tube means in an operable relationship with respect to said burner tube means for directing the pressurized gas into said burner tube means.

5,553,602
HEAT-DISSIPATING EXTENDER
Ralph G. Ridenour, Mansfield, Ohio, assignor to Universal Enterprises, Inc., Mansfield, Ohio
Filed Nov. 3, 1995, Ser. No. 552,829
Int. Cl.[6] F24C 3/00
U.S. Cl. 126—91 A 20 Claims



1. A joint comprising:
a high-temperature gas burner having a burner fitting;
a tube for supplying gas to the burner having a tube fitting; and
a heat-dissipating extender including a body having a first end and a second end, an interior passage extending between said first end and said second end for communicating the gas from said tube to said burner, a first extender fitting at said first end

interfitting with said burner fitting to provide a seal against

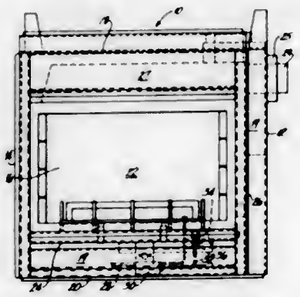
interfitting with said burner fitting to provide a seal against leakage of fluid pressure, and a second extender fitting at said second end interfitting with said tube fitting to provide a seal against leakage of fluid pressure, wherein said body is adapted for providing a substantial temperature differential between said first end and said second end during operation of said burner such that the seal provided by said second extender fitting and said tube fitting is maintained against leakage.

5,553,603

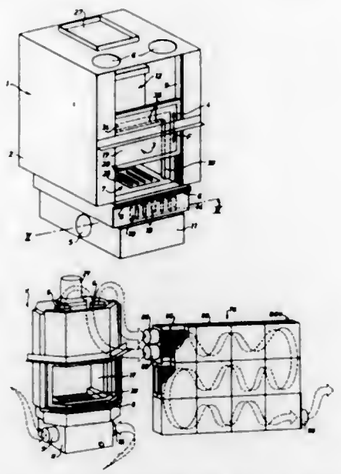
AIR TO FUEL RATIO ADJUSTMENT DEVICE FOR SEALED-COMBUSTION TYPE FIREPLACES

Samir E. Barudi, Huntington Beach; John T. French, Yorba Linda, and Hardial S. Gore, Buena Park, all of Calif., assignors to Superior Fireplace Company, Fullerton, Calif.

Filed Apr. 25, 1995, Ser. No. 428,019
Int. Cl.[6] F24C *3/00*
U.S. Cl. 126—512 **38 Claims**



1. A sealed-combustion chamber fireplace comprising:
(a) a sealed housing;
(b) a combustion chamber within the sealed housing; and
(c) a combustion air-to-fuel ratio adjustment means which comprises:
(i) an air-fuel mixing body within the sealed housing including a fuel source inlet, and at least one combustion air inlet port; and
(ii) air adjusting means within the sealed housing for adjusting the amount of air entering the air-fuel mixing body, said air adjusting means being operable independently from any means for adjusting the amount of fuel entering the air-fuel mixing body; and
(iii) means, outside of the sealed housing, for operating the air adjusting means by a user during operation of the fireplace.



combustion air inlet means (**10**, **19**) for controlled supply of combustion air to the combustion chamber (**3**);
air duct means (**23**, **24**) coupled to the air inlet means (**10**, **19**) to supply air from the air inlet means to the combustion chamber (**3**);
a panel retention frame system (**4**, **42**) to retain said panel element (**17**) for vertical sliding movement between a covered position covering said opening (**7**), and an open position,
a plurality of hollow heat storage and radiating blocks (**80**, **80***a* . . .) pneumatically coupled to the heated air outlet means (**6**), said blocks being coupled together and connected for continuous heated air flow through said coupled hollow blocks, said coupled blocks forming a heatable wall or heat panel structure;
wherein said hollow heat storage blocks **180**, **80***a* . . .) are of essentially rectangular, optionally square outline, and are formed of dual mirror-symmetrical matching block elements, rigidly connected together; and
wherein the surfaces of said hollow blocks defining the interior hollow space are formed with interior air flow obstructions (**86**), integral with the material of the respective block element, to generate turbulence in the heated air flow passing through the interior space.

5,553,605

TRANSPARENT EXTERNAL NASAL DILATOR

Jerome D. Muchin, 320 Comstock Ave., Los Angeles, Calif. 90024

Filed Aug. 31, 1995, Ser. No. 521,631
Int. Cl.[6] A61F *5/56;5/08;* **A61M** *15/08;* **A62B** *7/00*
U.S. Cl. 128—200.24 **55 Claims**

47. A nasal dilator comprising:
an elongated spring member for bridging a human nose;
a substantially transparent flexible pad having a surface area, the pad engaging the spring member, and wherein the surface area includes a substantially transparent adhesive means for adhering to skin of the nose; and
an adhesive between the spring member and the pad, the spring member on one of its engaging surfaces adheres with the pad, the arrangement being such that when the spring member is located over the bridge of the nose, the spring member extends over the bridge of the nose and at least partly beyond the bridge on both sides of the bridge, and the surface area of the pad adheres to the skin of the nose, and wherein the spring member and the pad, in use, substantially conform to the skin of the nose, and wherein, in use, the spring member is positioned between the pad and the nose.

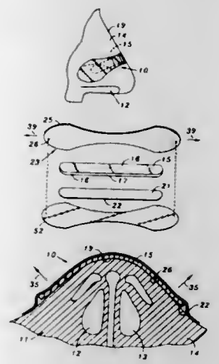
5,553,604

SPACE HEATING SYSTEM, HEATER, AND COMBUSTION CHAMBER

Martin Frei, Hangetweg 24, CH-9434 Au/SG, Switzerland

Filed Apr. 14, 1994, Ser. No. 227,602
Int. Cl.[6] F24B *1/188*
U.S. Cl. 126—523 **19 Claims**

1. A space heating system comprising
a space heater (1, 1') having
a housing (2) including a combustion chamber (3) and a front wall formed with a fuel inlet opening (7) leading to the combustion chamber (3);
a movable panel element (17) selectively covering said inlet opening, or leaving it accessible for introduction of fuel;
a heat exchanger (12) located above the combustion chamber (3) and having exchange heat inlet means (5) leading to the heat exchanger (12) and exchanged heat outlet means (6) for conducting heated air away from the heat exchanger;

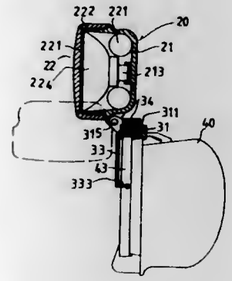


5,553,606

SNORKEL FACE MASK HAVING A LIGHT DEVICE

Johson Chen, Floor 7, No. 85, Li-Kung Road, Taiping Hsiang, Tatchung County, Taiwan

Filed Nov. 6, 1995, Ser. No. 553,855
Int. Cl.[6] A61B *1/06;* **F21L** *15/14*
U.S. Cl. 128—202.13 **4 Claims**



1. A face mask for a snorkel device, said face mask comprising an upper portion and a center portion, and said face mask comprising:
a beam engaged on the upper portion of the face mask and including a middle portion having a cavity formed therein and including two end portions each having an extension extended therefrom for securing to the face mask,
a retaining member including an upper leg engaged in said cavity of said beam and including a lower leg having a hook means formed thereon for engaging with the center portion of the face mask so as to be secured onto the face mask,
means for securing said upper leg to said beam so as to secure said beam to the face mask, and
a light means secured to said beam for lighting purposes.

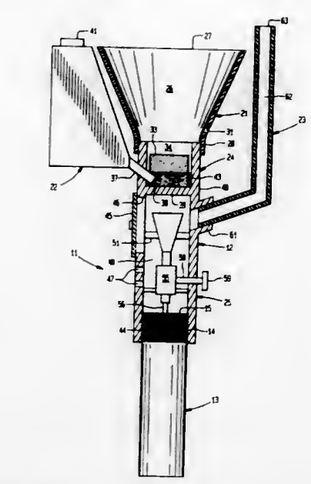
5,553,607

PORTABLE STEAM INHALATOR

Bernard Chiu, Wellesley; Randolph E. Maxwell, Upton, both of Mass.; Stephen M. Gatchell, Warwick; Jerald Bradley, East Providence, both of R.I.; John Longan, Natick, and Rodney Jané, Westboro, both of Mass., assignors to Duracraft Corporation, Southborough, Mass.

Filed Apr. 17, 1995, Ser. No. 425,010
Int. Cl.[6] A61M *16/10*
U.S. Cl. 128—203.26 **7 Claims**

1. A portable inhalator comprising:



a housing defining an inhalation chamber with a discharge opening adapted to receive a breath supporting body portion, an exhaust passage terminating with an exhaust opening and isolated from said inhalation chamber, a reservoir for retaining a liquid and communicating with said inhalation chamber, and a burner cavity communicating with said exhaust passage and hermetically isolated from said inhalation chamber;
a burner retained in said burner cavity and disposed to heat liquid in said reservoir;
a fuel canister removably supported by said housing means;
a valve for controlling fuel flow between said canister and said burner and a tank for retaining liquid and having liquid supply opening communicating with said reservoir; and wherein said housing comprises a heat exchanger tube defining said reservoir and extending between said burner cavity and said inhalation chamber; said tube being substantially filled with absorbent material, having one end disposed in said inhalation chamber and defining an outlet port, and an opposite end defining an inlet port communicating with said supply opening.

5,553,608

FACE MASK WITH ENHANCED SEAL AND METHOD

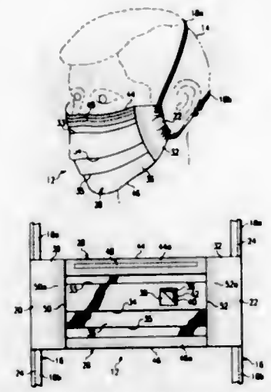
George D. Reese, Arlington; Albert R. Rich, Jr., Watauga, and Kevin K. Brunson, Argyle, all of Tex., assignors to Tecnol Medical Products, Inc., Fort Worth, Tex.

Filed Jul. 20, 1994, Ser. No. 278,930
Int. Cl.[6] A62B *18/08;7/10;23/02;18/02*
U.S. Cl. 128—206.24 **27 Claims**

13. A method for preventing liquids and aerosols from contacting the face of a person wearing a flexible, non-molded surgical style face mask having a plurality of layers of selected materials, comprising the steps of:
placing each layer of material having a generally rectangular shape and a top edge, a bottom edge, and lateral sides in juxtaposition to form a filter body for the mask;
pleating the layers of material;
connecting the layers of material along the top edge, bottom edge and the lateral sides of the generally rectangular shape to form the filter body;
forming a pair of flexible flaps from material that is different from the selected material used to form the filter body;
attaching the flaps to respective sides of the filter body;
providing means for gathering said flaps into sealing contact with a wearer's face, said means for gathering comprising securing means extending through each flap for holding the mask on the face of a wearer for gathering said flexible flap

said first modem in response to a corresponding plurality of

a sealing member engageable with the surface to define a vacuum chamber open to the surface;



material, and for preventing undesired fluid flow to between the respective sides of the mask body and a wearer's face

providing an elongated malleable member in the top edge of the mask body for conforming the top edge to the contours of a wearer's nose and cheeks; and

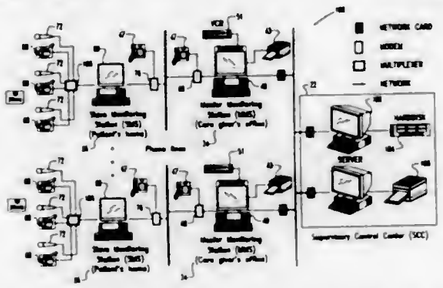
positioning said mask body over the nose and mouth of a wearer such that the bottom edge of the mask body extends under the chin of the wearer, to prevent undesired fluid flow between the top edge, the bottom edge, and a wearer's face.

5,553,609

INTELLIGENT REMOTE VISUAL MONITORING SYSTEM FOR HOME HEALTH CARE SERVICE

Yaobin Chen, and Thomas G. Mintun, both of Indianapolis, Ind., assignors to Visiting Nurse Service, Inc., Indianapolis, and Indiana University Foundation, Bloomington, both of Ind.

Filed Feb. 9, 1995, Ser. No. 386,015
Int. Cl.[6] A61B *5/02*
U.S. Cl. 128—630 **51 Claims**



1. A remote monitoring system for permitting a health care professional to provide health care to a patient in the patient's home from a remote location, said system comprising:

a main database system including a first database having patient data stored therein and a second database having health care professional data stored therein;

a supervisory control computer in communication with said main database system, said supervisory control computer having means for assigning at least one patient in said first database to a health care professional in said second database for providing health care thereto;

a master monitoring computer located remote from the patient's home and in communication with said supervisory control computer, said master monitoring computer having a first telephone modem associated therewith for transmitting and receiving data, said master monitoring computer being operable to provide a plurality of operator command signals at said first modem in response to a corresponding plurality of operator commands provided by the health care professional; and

a slave monitoring computer located in the patient's home, said slave monitoring computer having a second telephone modem associated therewith for transmitting and receiving data, said slave monitoring system being in communication with said master monitoring computer via a telephone link established between said first and second modems, said slave monitoring computer being responsive to said plurality of operator command signals to transmit real-time multimedia data relating to the patient to said master monitoring computer;

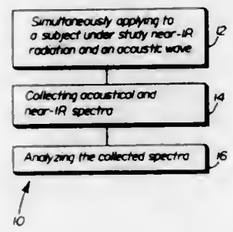
wherein the health care professional may provide real-time health care to the patient in the patient's home from a remote location.

5,553,610

APPARATUS AND METHOD FOR NONINVASIVE CHEMICAL ANALYSIS

Robert A. Lodder, Nicholasville, Ky., assignor to University of Kentucky Research Foundation, Lexington, Ky.

Continuation of Ser. No. 26,705, Mar. 5, 1993, Pat. No. 5,402,782. This application Feb. 7, 1995, Ser. No. 385,244
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—633 **6 Claims**



1. A method for acoustic-resonance, near-IR spectroscopy comprising the steps of:

simultaneously applying to a subject under study near-IR radiation and an acoustic wave;

collecting acoustical and near-IR spectra emitted from the subject under study as a result of the applied near-IR radiation and acoustic wave; and

analyzing the collected spectra.

5,553,611

ENDOCARDIAL MEASUREMENT METHOD

Jeffrey R. Budd, St. Paul; John A. Hauck, Shoreview, and Graydon E. Beatty, St. Paul, all of Minn., assignors to Endocardial Solutions, Inc., St. Paul, Minn.

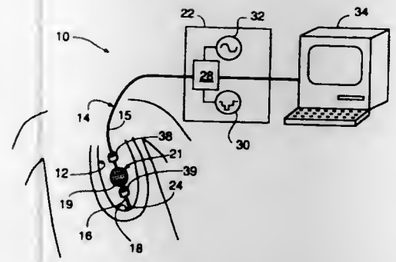
Continuation of Ser. No. 178,128, Jan. 6, 1994, abandoned. This application Jan. 20, 1995, Ser. No. 376,067
Int. Cl.[6] A61B *5/05*
U.S. Cl. 128—642 **7 Claims**

1. A method of measuring distance within the heart using a programmable data processing system, comprising data input means, display means, and data storage means, the method comprising the steps of:

(a) defining a blood exclusion volume within said heart;

(b) positioning a first excitation electrode and a second excitation electrode within said heart, proximate said blood exclusion volume such that said blood exclusion volume is between said first excitation electrode and said second excitation electrode;

(c) placing a first measurement set of electrodes within said heart proximate said blood exclusion volume, said first measurement set having at least a first electrode and a second electrode forming an index set of electrodes;



(d) placing a second measurement set of electrodes within said heart proximate said blood exclusion volume, said second measurement set having at least a third electrode and a fourth electrode, said first measurement set being opposed from said second measurement set;

(d) using the data input means to provide the programmable data processing system with data signals gathered from the first, second, third, and fourth electrodes;

(e) storing the data signals gathered from the first, second, third, and fourth electrodes in the data storage means; and

(f) using the programmable data processing system to perform the steps of:

(1) measuring the impedance between said first and second electrodes forming a first resistance measurement (R1);

(2) measuring the impedance between said third and fourth electrodes forming a second resistance measurement (R2);

(3) applying a first empirically derived coefficient to said first resistance measurement, forming a first measure term;

(4) applying a second empirically derived coefficient to said second resistance measurement, forming a second measure term;

(5) combining said first measure term and said second measure term to determine the distance (D) to said wall from said index electrode set;

(6) displaying on the display means a value representing the distance (D) to said wall from said index electrode set.

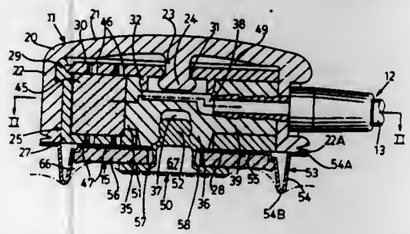
5,553,612

DEVICE FOR SECURING AN OBJECT TO A SURFACE BY VACUUM

Stig Lundbäck, Vaxholm, Sweden, assignor to Humanteknik AB, Stockholm, Sweden

PCT No. PCT/SE93/00134, § 371 Date Aug. 22, 1994, § 102(e) Date Aug. 22, 1994, PCT Pub. No. WO93/16633, PCT Pub. Date Sep. 2, 1993
PCT Filed Feb. 19, 1993, Ser. No. 290,911
Claims priority, application Sweden, Feb. 20, 1992, 9200516; Apr. 28, 1992, 9201336; Oct. 16, 1992, 9203045
Int. Cl.[6] A61B *5/0416*
U.S. Cl. 128—643 **20 Claims**

1. A device including an object holder and an object held



therein, the object holder for retaining the object against a surface by vacuum pressure, the object holder comprising:

a vacuum port;

a sealing member engageable with the surface to define a vacuum chamber open to the surface;

a vacuum passage providing fluid communication between the vacuum chamber and the vacuum port;

a first contaminant absorber disposed in the vacuum chamber between the sealing member and the object;

a socket in the object holder; and

a connector member configured to be received in the socket, the connector member being secured to the object;

whereby the absorber, the object and the connector member form a unit which is releasably connectable with the socket.

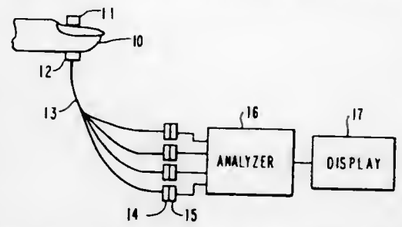
5,553,613

NON INVASIVE BLOOD ANALYTE SENSOR

Dawood Parker, Whitland, Wales, assignor to Pfizer Inc., New York, N.Y.

Filed Aug. 17, 1994, Ser. No. 291,632
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—633 **10 Claims**

1. A device for non-invasive measurement of concentration of a



specific analyte in arterial blood flowing in a patient's body part, which device comprises a first portion having a surface profile adapted to be held against said body part, a low-cost, self-focused, white light source of near infrared radiation mounted in a second portion associated with said first portion such that a wide band of white light optical radiation illuminates the body part and near infrared radiation is transmitted through or reflected from said body part to provide an absorption spectrum of said arterial blood, a third portion containing detection means located to receive radiation transmitted through or reflected from said body part, which detection means comprises a radiation collector to which is attached a bundle of optical fibers, each of which fibers has a distal end connected to one of at least two filters, including a first filter selective for a first radiation signal having a first wavelength identifiable with the specific analyte and a second filter selective for a second radiation signal having a second wavelength corresponding to a reference signal, said first and second signals being obtained from a pulsatile component of the absorption spectrum only, and a detector adapted to receive and process said first and second signals to provide a ratio representative of the desired concentration.

5,553,614

EXAMINATION OF BIOLOGICAL TISSUE USING FREQUENCY DOMAIN SPECTROSCOPY

Britton Chance, Philadelphia, Pa., assignor to Non-Invasive Technology, Inc., Philadelphia, Pa.

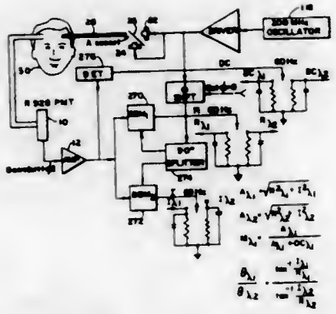
Continuation of Ser. No. 645,590, Jan. 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 287,847, Dec. 21, 1988, Pat. No. 5,119,815, and a continuation-in-part of Ser. No. 578,063, Sep. 5, 1990, Pat. No. 5,122,974, which is a continuation of Ser. No. 307,066, Feb. 6, 1989, Pat. No. 4,972,331. This application Jun. 14, 1993, Ser. No. 76,370
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—633 **40 Claims**

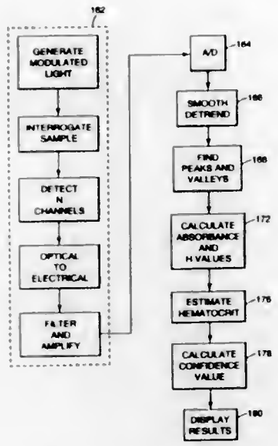
1. A phase modulation spectroscopic system for examination of biological tissue of a subject, the scattering and absorptive proper-

generating an input beam of light of a wavelength and intensity not harmful to an eye of a subject;

directing the input beam of light into the eye of the subject;

measuring a spectral response of the





ties of the examined tissue being determined by photons migrating between an optical input port and an optical detection port of said system, said system comprising:

an optical input port located at a first location to introduce light to biological tissue;

an optical detection port located at a second location at the tissue spaced apart from said input port;

an oscillator, connected to a driver, that generates a carrier waveform of a selected frequency compatible with time delay of photon migration from said input port to said detection port;

a light source, connected to said input port and connected to receive from said oscillator or said driver said carrier waveform, said light source generates over time optical radiation of a selected wavelength that is intensity modulated at said frequency and introduces said optical radiation to the tissue at said input port;

an optical detector, connected to said detection port, said detector detects over time scattered photons of the introduced radiation that has migrated in said tissue of the subject between said input and detection ports and produces a detector signal;

a phase splitter connected to receive said carrier waveform from said oscillator or said driver and produce first and second reference phase signals of predefined substantially different phases;

first and second double balanced mixers connected to receive over time from said phase splitter said first and second reference phase signals, respectively, and connected to receive from said detector said detector signal and produce therefrom a real output signal and an imaginary output signal, respectively; and

a signal processor connected to said double balanced mixers, said processor receives said real output signal and said imaginary output signal and determines therefrom a selected characteristic related to scattering or absorptive properties of said biological tissue.

5,553,615

METHOD AND APPARATUS FOR NONINVASIVE PREDICTION OF HEMATOCRIT

Hatim M. Carim, West St. Paul; Orlin B. Knudson, Vadnais Heights; Bruce P. Ekholm, Inver Grove Heights; David P. Erickson, Stillwater; William J. Kelliher, Jr., Shoreview, and Michael J. Rude, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 31, 1994, Ser. No. 189,600

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—633 **28 Claims**

28. A method for the noninvasive prediction of hematocrit using photoplethysmography, comprising the steps of:

(a) selecting a plurality of wavelengths according to wavelength selection criteria, wherein the wavelength selection criteria comprise:

(1) a wavelength where the absorbance of water is at or near a measurable peak;

(2) at least one wavelength where the absorbance of oxyhemoglobin and deoxyhemoglobin are predictable and represent total hemoglobin content;

(3) a wavelength where the absorbance of water greatly exceeds the absorbance of all forms of hemoglobin; and

(4) a wavelength where the absorbance of all forms of hemoglobin greatly exceeds the absorbance of water;

wherein each of the wavelength selection criteria must be satisfied, wherein each selected wavelength can satisfy one or more than one of the wavelength selection criteria, and wherein at least one selected wavelength is in the range 1150–2100 nm;

(b) irradiating without mechanical invasion mammalian tissue with light at the selected wavelengths;

(c) detecting light transmitted through the mammalian tissue at the selected wavelengths;

(d) measuring attenuated light intensity values of at least one peak and and at least one valley of the transmitted light and at least one direct current value of the transmitted light for each selected wavelength;

(e) calculating H Values of pseudo-absorption for each selected wavelength;

(f) forming a hematocrit prediction equation based on true hematocrit values and the H Values from step (e); and

(g) predicting hematocrit using the hematocrit prediction equation.

5,553,616

DETERMINATION OF CONCENTRATIONS OF BIOLOGICAL SUBSTANCES USING RAMAN SPECTROSCOPY AND ARTIFICIAL NEURAL NETWORK DISCRIMINATOR

Fredric M. Ham, and Glenn M. Cohen, both of Indialantic, Fla., assignors to Florida Institute of Technology, Melbourne, Fla.

Filed Nov. 30, 1993, Ser. No. 160,033

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—633 **2 Claims**

1. A method of non-invasively deriving a measure of the concentration of glucose in a human body fluid comprising the steps of:

(a) irradiating a human body tissue containing said human body fluid with monochromatic light in the near infrared spectral region emitted by a monochromatic light source, thereby causing said glucose within the irradiated human body tissue to produce Raman scattering of said monochromatic light into multiple, spatially separated, frequency shifted wavelength components associated with molecular characteristics of said glucose;

(b) tracking variations in light emitted by said monochromatic light source;

(c) directing said multiple, spatially separated, frequency shifted wavelength components resulting from said Raman scattering through a holographic notch filter, which removes the Rayleigh component of scattered light, onto a photosensitive detector, which produces electrical output signals representative of said multiple, spatially separated, frequency shifted wavelength components associated with molecular characteristics of said glucose;

(d) generating ratio signals representative of the ratios of said electrical output signals representative of said multiple, spatially separated, frequency shifted wavelength components resulting from said Raman scattering produced in step (c) to variations in monochromatic light emitted by said monochromatic light source tracked in step (b), so as to eliminate effects of variations of said monochromatic light source; and

(e) processing said ratio signals by means of a fuzzy adaptive resonance theory artificial neural network discriminator that has been trained with a plurality of training exemplars, corresponding to scattered light components representative of different concentrations of glucose, and which is robust to a human body fluid sample not previously encountered, and quantitatively deriving therefrom concentrations of said glucose in human body fluid based upon the spectral intensities of detected wavelengths of said spatially separated, frequency shifted wavelength components.

5,553,617

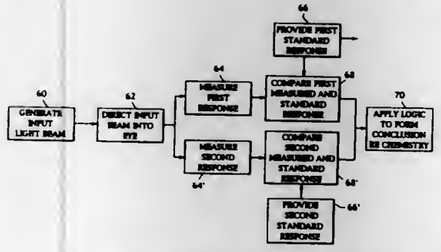
NONINVASIVE METHOD AND APPARATUS FOR DETERMINING BODY CHEMISTRY

Michael E. Barkenhagen, Norco, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

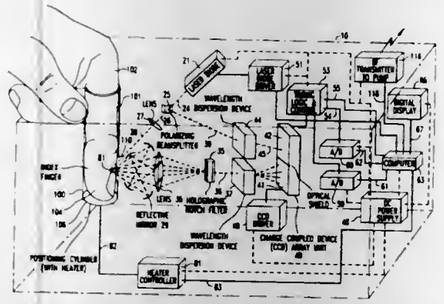
Filed Jan. 20, 1995, Ser. No. 375,742

Int. Cl.[6] A61B *3/10*

U.S. Cl. 128—633 **20 Claims**



1. A method for determining body chemistry, comprising the steps of:



generating an input beam of light of a wavelength and intensity not harmful to an eye of a subject;

directing the input beam of light into the eye of the subject;

measuring a spectral response of the eye to the input beam of light due to optical interactions of the input beam with a fluid chemistry of the eye, the response being selected from the group consisting of an ultraviolet reflection spectral response, an ultraviolet fluorescence spectral response, and a Raman scattering response;

providing a standard spectral response of a chemical state of the eye to the input beam of light produced by optical interactions of a light beam with the fluid chemistry of a chemical whose presence in the subject is to be determined, the type of standard response being selected to correspond to the type of response selected in the step of measuring;

comparing the measured response to the standard response; and

forming a conclusion as to the body chemistry of the subject from the comparison made in the step of comparing.

5,553,618

METHOD AND APPARATUS FOR ULTRASOUND MEDICAL TREATMENT

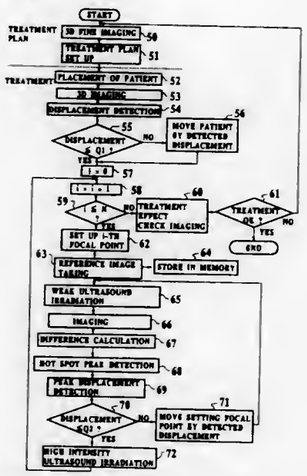
Takuji Suzuki, Kanagawa-ken; Satoshi Aida, Tokyo; Katsuhiko Fujimoto; Mariko Shibata, both of Kanagawa-ken; Yoshiharu Ishibashi, Tokyo; Mamoru Izumi, Tokyo; Shiroh Saitoh, Tokyo, and Kazuya Okamoto, Saitama-ken, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 14, 1994, Ser. No. 209,528

Claims priority, application Japan, Mar. 12, 1993, 5-052683; Aug. 5, 1993, 5-194359; Aug. 5, 1993, 5-194360; Sep. 14, 1993, 5-228744

Int. Cl.[6] A61B *6/00*

U.S. Cl. 128—653.1 **10 Claims**



1. A medical treatment apparatus, comprising:

an imaging device to obtain image data of a treatment portion containing a treatment target;

an irradiation device to apply radiation onto the treatment target; and

a control device to control said imaging device and said irradiation device, said control device controlling said irradiation device to apply the radiation at a prescribed level and then controlling said imaging device to obtain hot spot detection image data, said control device detecting from the hot spot detection image data a hot spot indicating a change due to a temperature change caused by the radiation at the prescribed level, and said control device controlling said irradiation

device to adjust a focal point of said irradiation device according to the detected hot spot and applying treatment radiation at a treatment level higher than the prescribed level.

5,553,619

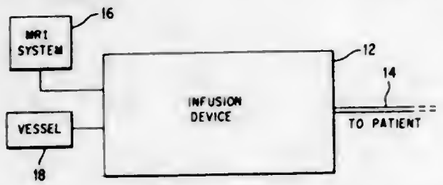
METHOD AND APPARATUS FOR ADMINISTRATION OF CONTRAST AGENTS FOR USE IN MAGNETIC RESONANCE ARTERIOGRAPHY

Martin R. Prince, 2745 Windwood Dr., Apt. 240, Ann Arbor, Mich. 48105

Continuation-in-part of Ser. No. 71,970, Jun. 7, 1993, Pat. No. 5,417,213. This application Jan. 25, 1995, Ser. No. 378,384

Int. Cl.[6] A61B *5/055*

U.S. Cl. 128—653.4 **51 Claims**



1. A method of imaging an artery in a patient using magnetic resonance imaging, comprising,

collecting image data; and

administering a magnetic resonance contrast agent to the patient prior to collecting image data, by intravenous infusion, at a rate of infusion sufficient to provide a substantially elevated concentration of the contrast agent in the artery during collection of image data representative of a center of k-space.

5,553,620

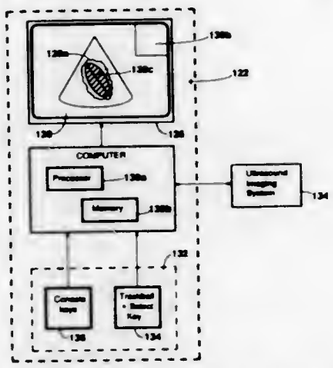
INTERACTIVE GOAL-DIRECTED ULTRASOUND MEASUREMENT SYSTEM

A. Rebecca Snider, Cockeysville, Md.; Richard M. Bennett, Half Moon Bay, Calif.; Laurence J. McCabe, Sunnyvale, Calif.; Peter J. Magsig, Mountain View, Calif.; Kane L. Ng, Hayward, Calif.; Lynn M. Purdy, Issaquah, Wash., and Joseph W. Ruffles, San Jose, Calif., assignors to Acuson Corporation, Mountain View, Calif.

Filed May 2, 1995, Ser. No. 432,870

Int. Cl.[6] A61B *8/00*

U.S. Cl. 128—660.04 **28 Claims**



1. An ultrasound measurement system for performing a plurality of ultrasound measurements, the system comprising:

a display screen; and

an input device, wherein the input device uses a plurality of measurement menus allowing for the selection of ultrasound measurements off of the display screen, some of the measurement menus being associated with potential conditions, at least one of the measurement menus associated with a potential condition enabling the selection of at least some of a set of suggested ultrasound measurements of the plurality of ultrasound measurements, the set of suggested measurements being appropriate for the potential condition associated with that measurement menu.

5,553,621

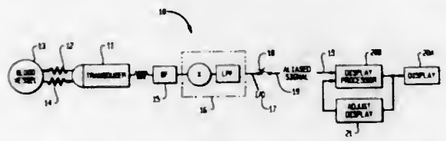
DOPPLER AUDIO DEALIASING

Scott D. Otterson, Issaquah, Wash., assignor to Siemens Medical Systems, Inc., Iselin, N.J.

Filed Mar. 31, 1995, Ser. No. 414,979

Int. Cl.[6] A61B *8/00*

U.S. Cl. 128—661.09 **30 Claims**



1. A method for generating a dealiased audio output signal in a doppler ultrasound system having a transducer which transmits and receives ultrasound signals, said transducer generating an ultrasound signal and receiving an echo of said ultrasound signal, wherein said echo is sampled by a sampler to generate a first stream of input sample signal pairs, wherein each input sample signal pair comprises an in-phase signal and a quadrature phase signal, wherein a first frequency spectrum of said first stream of input sample signal pairs comprises a set of unaliased first frequencies and a set of aliased second frequencies, said method comprising the steps of:

inserting a zero-frequency sample value between each pair of said input sample signal pairs to form a new signal stream of sample signals, wherein a second frequency spectrum of the new signal stream comprises the first frequency spectrum, a set of unaliased second frequencies and a set of aliased first frequencies; and

filtering said new signal stream to remove said set of aliased second frequencies and said set of aliased first frequencies and generate an audio output signal having a third frequency spectrum comprising said set of unaliased first frequencies and said set of unaliased second frequencies.

5,553,622

SYSTEM AND METHOD FOR CONTROLLING THE TEMPERATURE OF A CATHETER-MOUNTED HEATER

Russell C. McKown, 9696 Walnut, No. 1517, Dallas, Tex. 75243; Michael D. Quinn, 3121 Amesbury Dr., Plano, Tex. 75093, and Mark L. Yelderman, 5205 Terrace View, Plano, Tex. 75093

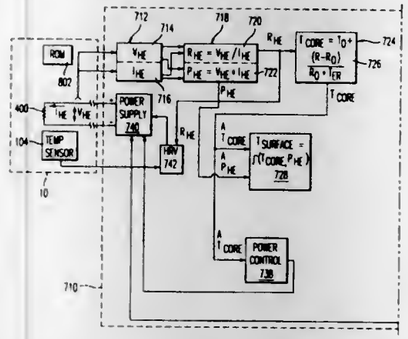
Continuation of Ser. No. 833,013, Feb. 10, 1992, abandoned, which is a continuation-in-part of Ser. No. 647,578, Jan. 29, 1991, abandoned. This application Nov. 4, 1994, Ser. No. 334,443

Int. Cl.[6] A61B *05/00*

U.S. Cl. 128—692 **23 Claims**

1. A system for keeping a surface temperature of a blood contacting surface of a thermodilution catheter within safe physiological limits, comprising:

a core temperature monitor for monitoring a core temperature of a core of an electric resistance-type thermodilution heater element of the thermodilution catheter;



a power source for supplying electric power to said thermodilution heater element;

a power monitor for monitoring an amount of the electric power that is supplied to said thermodilution heater element;

surface temperature calculating means, in communication with said core temperature monitor and said power monitor, for calculating the surface temperature;

condition determining means, in communication with said surface temperature calculating means, for determining when a potentially physiologically harmful temperature condition exists; and

control means, in communication with said core temperature monitor, said power monitor, said power source, and said condition determining means, for controlling the amount of the electric power that is supplied to said thermodilution heater element by said power source, to keep the surface temperature within safe physiological limits;

wherein said condition determining means comprises

(i) means for detecting when the surface temperature exceeds a predetermined physiologically safe temperature limit, and

(ii) time-temperature product determining means, for determining a time-temperature product of (1) time during which the surface temperature is above the predetermined physiologically safe temperature limit and (2) extent to which the surface temperature exceeds the predetermined physiologically safe temperature limit,

(iii) a time based integrator for collecting and storing the time-temperature product; and

(iv) means, in communication with said time based integrator, for comparing the time-temperature product to a predetermined maximum time-temperature value; and

the system further comprising condition indicating means, in communication with said condition determining means, for indicating when the time-temperature product exceeds the predetermined maximum time-temperature value.

5,553,623

METHOD FOR CALIBRATING A SYSTEM FOR RECORDING AND PLAYING BACK ECG SIGNALS

Dennis E. Ochs, McMinnville, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 31,437, Mar. 12, 1993, Pat. No. 5,406,955. This application Jan. 26, 1995, Ser. No. 378,338

Int. Cl.[6] A61B *5/04;19/00*

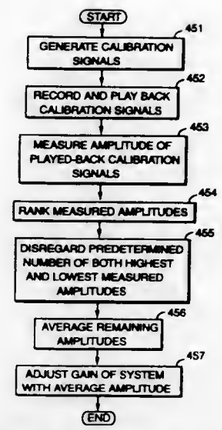
U.S. Cl. 128—711 **4 Claims**

1. A method for calibrating a system for recording and playing back ECG signals, said system having a gain capable of adjustment, said method comprising the steps of:

generating a plurality of calibration signals;

recording and playing back the calibration signals, thereby creating played-back calibration signals;

measuring the amplitude of the played-back signals, thereby creating measured amplitudes;



ranking the measured amplitudes from a highest measured amplitude to a lowest measured amplitude;

disregarding a predetermined number of both the highest and lowest measured amplitudes, wherein those measured amplitudes not disregarded are remaining amplitudes;

averaging the remaining amplitudes, thereby creating an average amplitude, and

using the average amplitude to adjust the gain of the system.

5,553,624

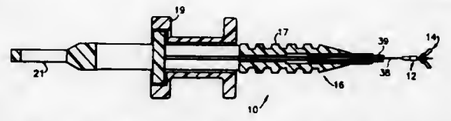
ENDOSCOPIC BIOPSY FORCEPS JAWS AND INSTRUMENTS INCORPORATING SAME

Jose L. Francese, Miami Springs, and John R. Whittier, Miami, both of Fla., assignors to Symbiosis Corporation, Miami, Fla.

Continuation-in-part of Ser. No. 177,536, Jan. 5, 1994, Pat. No. 5,394,885, and a continuation-in-part of Ser. No. 256,217, Jun. 23, 1994, which is a continuation of Ser. No. 16,595, Feb. 11, 1993, abandoned. This application Sep. 22, 1994, Ser. No. 310,857

Int. Cl.[6] A61B *17/28*

U.S. Cl. 128—751 **22 Claims**



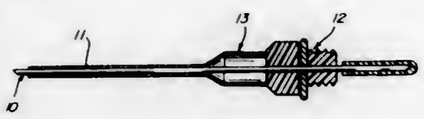
1. An endoscopic biopsy forceps jaw for use with an endoscopic biopsy forceps instrument having a hollow member with a control member extending therethrough, actuating means coupled to the proximal ends of the hollow member and control member for reciprocally moving the control member through the hollow member, and a pair of forceps jaws, at least one of said pair being said endoscopic biopsy forceps jaw, said endoscopic biopsy forceps jaw comprising:

a) a distal jaw cup having an outer edge and an interior hollow portion;

b) a proximal coupling means for coupling said distal jaw cup to at least one of the control member and the hollow member of the biopsy forceps instrument such that the pair of forceps jaws will open and close with the reciprocally moving control member, wherein

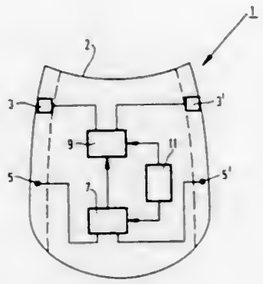
said distal jaw cup has a plurality of teeth extending from said outer edge, each tooth having at least two surfaces which intersect along a line which is angled upward from said outer edge and which terminates at a vertex which is located upward and inward from said outer edge.

5,553,625
INTRAVENOUS BLOOD SAMPLING NEEDLE AND INTRAVENOUS THERAPY
N. Vasanth Rao, Foster, R.I., assignor to Imaging and Display Systems Technology, Inc., Foster, R.I.
Filed Dec. 7, 1994, Ser. No. 350,837
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—763 **6 Claims**



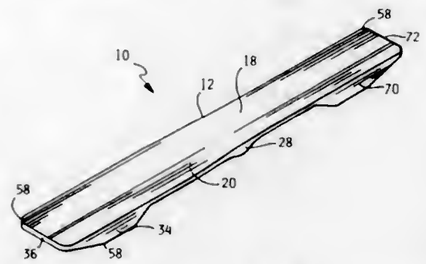
1. A needle assembly for use in blood sampling and intravenous infusion comprising:
a blood sampling assembly comprising a needle and a subassembly, said needle being connected to said subassembly, wherein said subassembly comprises attachment means to which a blood sampling test tube can be attached and detached, and
an adapter assembly for intravenous infusion comprising a tubing at one end which substantially surrounds said needle, and a transparent container at an opposite end which contacts said subassembly, said container being for revealing blood flow and for connection to infusion tubing, wherein after blood sampling is performed said blood sampling assembly is pulled out of said adapter assembly leaving said tubing in the patient.

5,553,626
DEVICE FOR PREVENTING BRUXISM
Michael A. Burger, Pasqualinistraat S, 5622 AW Eindhoven, and Rigobertus W. Martens, Schweitzerlaan 2S, 5644 DL Eindhoven, both of Netherlands
PCT No. PCT/NL94/00133, § 371 Date Feb. 9, 1995, § 102(e) Date Feb. 9, 1995, PCT Pub. No. WO94/28828, PCT Pub. Date Dec. 22, 1994
PCT Filed Jun. 9, 1994, Ser. No. 382,000
Int. Cl.[6] A61B *5/103*
U.S. Cl. 128—777 **14 Claims**



1. An anti-bruxism device, comprising:
a splint adapted to be secured to a tooth of a user; and
a biofeedback system mounted on said splint, said biofeedback system including;
a detector for detecting bruxism; and
a stimulation device for stimulating the user responsive to detection of bruxism by said detector, said stimulation device including at least one splint anchor mounted on said splint for conducting said stimulation to the user;
whereby said stimulation by said stimulation device causes the user to stop bruxating.

5,553,627
TONGUE DEPRESSOR
Darrel D. Newkirk, 2737 No. 102 St., Kansas City, Kans. 66109
Filed Dec. 4, 1995, Ser. No. 567,051
Int. Cl.[6] A61C *5/14*
U.S. Cl. 128—860 **21 Claims**

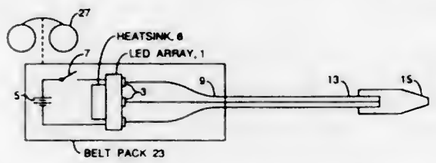


1. An improved tongue depressor comprising:
a) a flat elongated blade having a first end, a second end, a substantially flat, upper horizontal surface and a substantially flat, lower horizontal surface,
b) a first tongue-contact section having a front end, a rear end, a substantially flat, upper horizontal surface, and a lower surface having a plurality of slopes, where the rear end is integrally attached to the first end of said blade, and
c) a second tongue-contact section having a front end, a rear end, a substantially flat upper horizontal surface, and a lower surface having a plurality of slopes, where the rear end is integrally attached to the second end of said blade.

5,553,628

Patent Not Issued For This Number

5,553,629
PORTABLE MEDICAL LASER PACK SYSTEM
Andreas G. Keipert, and Michael S. Allen, both of Albuquerque, N.M., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Mar. 11, 1993, Ser. No. 31,257
Int. Cl.[6] A61B *17/36*
U.S. Cl. 128—898 **6 Claims**



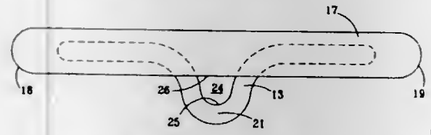
1. A method of employing a medical laser device comprising the steps of:
(a) providing said medical device which includes a semiconductor laser diode means for generating infra-red radiation;
(a-1) a power source for energizing said semiconductor laser diode means; and
(a-2) a fiber optic cable having a first terminal portion optically coupled to the semiconductor laser diode means and having a second terminal portion for applying said infra-red radiation to the body of a person for surgical purposes;

(b) providing medically trained personnel carrying said medical laser device with a viewing device for making a scene illuminated by infra-red radiation visible;
(c) directing infra-red radiation exiting the second terminal portion of said fiber optic cable at the nearby body of a person for surgical purposes; and
(d) alternatively, directing infra-red radiation exiting the second terminal portion of said fiber optic cable at a scene for viewing the scene with the aid of said viewing device.

5,553,630
USE OF METAL OXIDE NANOPIGMENTS FOR PROTECTING HAIR KERATIN AGAINST ATMOSPHERIC ATTACK, ESPECIALLY LIGHT, METHOD OF PROTECTING HAIR AND GEL COMPOSITION USING THESE NANOPIGMENTS
Christine Dupuis, Paris, and Claude Dubief, Le Chesnay, both of France, assignors to L'Oreal, Paris, France
PCT No. PCT/FR92/00486, § 371 Date May 9, 1994, § 102(e) Date May 9, 1994
PCT Filed Jun. 2, 1992, Ser. No. 157,093
Claims priority, application France, Jun. 4, 1991, 91 06745
Int. Cl.[6] A61K *7/06*
U.S. Cl. 132—202 **27 Claims**

21. Method for protecting hair keratin against atmospheric attack, especially against light, comprising applying to the hair 0.2 to 2% by weight of at least one metal atomospheric attack protecting oxide nanopigment selected from the group consisting of titanium, zinc, cerium and zirconium oxides having an average diameter of less than 100 nanometers, in a cosmetic support.

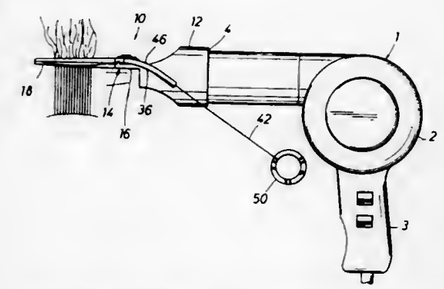
5,553,631
HAIR STYLING DEVICE
Bernadine Schach, 905 Rainbow Dr., Richardson, Tex. 75081
Filed Apr. 19, 1995, Ser. No. 423,823
Int. Cl.[6] A45D *7/00*
U.S. Cl. 132—210 **15 Claims**



1. An improved hair styling device comprising an elongated deformable structure capable of being repeatedly bent to form said device into a variety of shapes, an outer covering loosely enclosing said elongated deformable structure to permit movement of said structure with respect to said outer covering, said outer covering including a central opening exposing a central portion of said structure and permitting partial withdrawal of said central portion to the exterior of said outer covering while covering the remainder of said deformable structure.

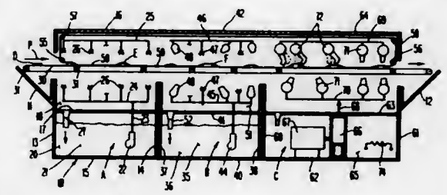
5,553,632
HAIR STYLING DEVICE
Charles W. Burkhardt, 285 Cape Royale, Coldspring, Tex. 77331
Filed Mar. 3, 1995, Ser. No. 397,905
Int. Cl.[6] A45D *20/48*
U.S. Cl. 132—271 **7 Claims**

1. A hair styling device for use with a blow dryer comprising:
a nozzle having a first end for attachment over the air exit port of a hair dryer and a second end defining a nozzle exit port;



a first comb having a base portion and a toothed portion wherein the first comb is secured to the nozzle such that the toothed portion extends outwardly alongside said nozzle exit port;
a second comb substantially similar to the first comb, having a base portion and a toothed portion, and mounted in facing relation to the first comb for lateral movement relative to the first comb so that movement of the combs relative to one another causes the teeth of the toothed portions to engage and disengage along at least a portion of their facing edges; and
a mechanism for selectively moving at least one of the pair of combs relative to the other to cause adjacent teeth on the respective combs to selectively engage and disengage.

5,553,633
APPARATUS FOR TREATMENT OF PRINTED CIRCUIT BOARDS AND THE LIKE
Paul W. Ciccarelli, Jr., Huntingdon; Charles Seager, Jr., Alexandria, and Ricky Himes, Boalsburg, all of Pa., assignors to Atotech USA, Inc., State College, Pa.
Division of Ser. No. 199,563, Feb. 22, 1994, Pat. No. 5,494,529. This application Oct. 31, 1995, Ser. No. 551,067
Int. Cl.[6] B08B *3/02*
U.S. Cl. 134—72 **16 Claims**



1. Apparatus for treating printed circuit boards having zones of varying thickness, comprising:
a) a first generally foraminous, generally horizontally disposed conveyor means for engaging the lower surfaces of boards placed thereon, for horizontally moving the boards through the treatment apparatus;
b) a second foraminous, generally horizontally disposed conveyor means for engaging upper surfaces of the boards;
c) means for moving the first and second conveyor means and thereby conveying the boards in a generally horizontal direction through the treatment apparatus;
d) with at least one of the conveyor means including means conforming it to different vertical thicknesses of zones of the boards;
e) means for treating the boards with at least one treatment liquid as they are conveyed through the treatment apparatus;
f) means for drying the boards after the boards are treated with a treatment apparatus; said means for drying including:
i) means delivering warm air to at least one warm air discharge tube in the apparatus;

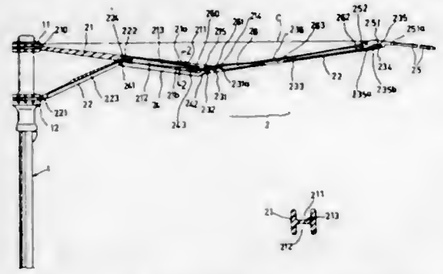
ii) means discharging the warm air through a discharge opening in the air discharge tube as the boards are carried past

5,553,635
MICROVALVE FOR FLUID DELIVERY SYSTEM

said supply line section for ultimate flow to said drain line, as

ii) means discharging the warm air through a discharge opening in the air discharge tube as the boards are carried past the discharge opening of the air discharge tube;
iii) follower means whereby the discharge tube follows the conveyor means as it conforms to different vertical thicknesses of zones of boards and with the discharge opening of the discharge tube likewise substantially conforming to different vertical thicknesses of boards; and
iv) means enabling a pivotal rotating of the discharge tube to automatically rotate amounts responsive to different vertical thicknesses of zones of boards as conformed to by the opening of the discharge tube.

5,553,634
COMPACTLY MOLDED RIB MEANS FOR MULTIPLE-FOLD UMBRELLA
Chi-Kuo Yang, c/o Hung Hsing Patent Service Center P.O. Box 55-1670, Taipei, Taiwan
Filed Jan. 17, 1996, Ser. No. 586,156
Int. Cl.[6] A45B *19/10*
U.S. Cl. 135—25.3 **2 Claims**

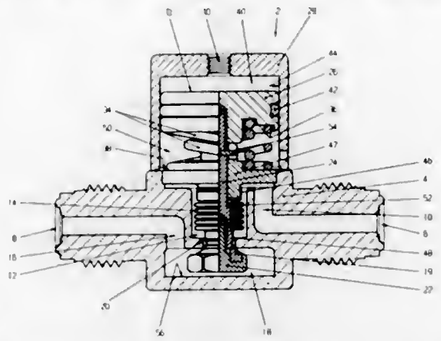


1. A rib means for multiple-fold umbrella comprising: a top rib pivotally secured to an upper notch secured on a top portion of a central shaft of an umbrella, a stretcher rib pivotally secured to a lower runner slidably held on the central shaft and pivotally secured to the top rib, an outer groove recessed in the stretcher rib, an intermediate rib pivotally secured between the top rib and a tail rib, an auxiliary connecting rib generally positioned under the top rib and pivotally secured between the stretcher rib and the intermediate rib with said auxiliary connecting rib received in said outer groove in said stretcher rib when closing an umbrella and folding the rib means, and a spring rib pivotally secured between the auxiliary connecting rib and the tail rib to be slidably held in a longitudinal groove in the intermediate rib; the improvement which comprises:

said top rib including: an upper groove longitudinally recessed in an upper surface of the top rib for receiving the intermediate rib when closing the umbrella and folding the rib means from an opened umbrella, a lower groove longitudinally recessed in a lower surface of the top rib for receiving the stretcher rib and a central partition separating the upper groove and the lower groove of the top rib; and

said intermediate rib including: a web portion integrally formed on a central upper portion of the intermediate rib and transversely connecting two longitudinal side walls confining the longitudinal groove longitudinally recessed in the intermediate rib for limiting a central spring portion of the spring rib slidably held in the longitudinal groove in the intermediate rib, an end partition portion formed in an outer fork end of the intermediate rib having an upper recess above the end partition for seating an innermost end of the tail rib when opening the umbrella, and having a lower recess below the end partition portion for receiving an inner pivotal portion of the tail rib when closing the umbrella for minimizing a folded volume of a closed umbrella; with said top rib and said intermediate rib integrally formed and made of plastic material.

5,553,635
MICROVALVE FOR FLUID DELIVERY SYSTEM
Roger J. Gregoire, Bulverde, Tex., assignor to Praxair Technology, Inc., Danbury, Conn.
Filed Jul. 18, 1994, Ser. No. 276,578
Int. Cl.[6] F16K *31/126;31/122*
U.S. Cl. 137—1 **20 Claims**



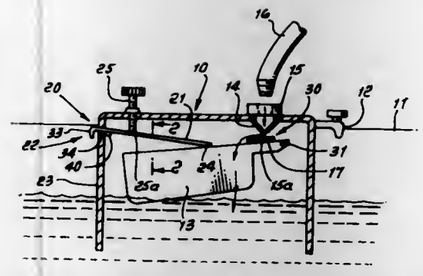
15. A method for providing a fluid delivery system in which pressurized fluid fed into an input port and discharged from an output port can be regulated upon an application of a force independent of the pressure of the fluid, said method comprising the steps:

(a) providing an enclosed first chamber for receiving an input fluid; providing an enclosed second chamber for receiving the input fluid from the first chamber; and providing a passage between said first chamber and said second chamber;
(b) providing a moveable valve seal means for closing or opening said passage and providing biasing means to maintain said valve seal in the closed position;
(c) providing bellows in said first chamber attached to the moveable valve seal means so that an incoming fluid will exert a force directly on the bellows that will be directed on the moveable valve seal means to open it and providing said bellows so that the force exerted by the bellows from the incoming fluid to the moveable valve seal means is equal to or greater than the force exerted directly on the moveable valve seal means by the incoming fluid; and
(d) supply an incoming pressurized fluid to the first chamber and a separate force against the moveable valve seal means to open it so that said incoming fluid is fed into said second chamber for discharge and said flow is continued or stopped depending on the separate force applied against the moveable valve seal means independent of the force of the incoming pressurized fluid.

5,553,636
WATERING THROUGH FILL VALVE CONTROL
Herbert W. Hoeptner, III, 15085 Venetian Way, Morgan Hill, Calif. 95037; Herbert W. Hoeptner, Jr., and Rahl E. Hoeptner, both of Eagle Point, Oreg., assignors to Herbert W. Hoeptner, III, Morgan Hill, Calif.
Filed Jun. 20, 1994, Ser. No. 262,558
Int. Cl.[6] F16K *31/70;31/22;33/00*
U.S. Cl. 137—59 **13 Claims**

1. A watering trough fill control valve assembly having a float structure located to rise as water is filled into the trough via the valve, and to effect closing of the valve when the trough is filled to a predetermined level, the float structure then located to fall as the water level lowers in the trough to normally open the float valve, the float structure controlling a water inlet subject to a freezing condition, the improvement comprising:

a) an apparatus operatively connectible with the float structure for biasing said structure, so that it cannot completely close



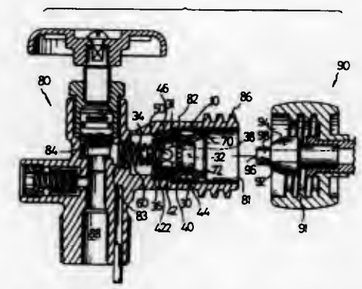
off ingress of water at said inlet as ambient temperature drops below a water freezing level,
b) said apparatus including an arm and a bimetallic control element associated therewith, said arm having one end portion supported by a housing for receiving said float structure, said arm having another end portion slidably engaging and biasing said float structure along a portion thereof, said arm having an intermediate portion and there being adjustable control means for engaging said arm intermediate portion, to compensate for differences in water freezing temperature levels at different altitudes, whereby the float structure is biased against the predetermined fill level to maintain said water inlet open to allow water ingress at said inlet under freezing conditions as the bimetallic control element is affected by the freezing conditions.

5,553,637
FROST-FREE WATER SUPPLY
Herbert W. Hoeptner, III, 15085 Venetian Way, Morgan Hill, Calif. 95037
Filed Mar. 31, 1995, Ser. No. 414,228
Int. Cl.[6] E03B *9/04;9/14*
U.S. Cl. 137—281 **3 Claims**

1. In a freeze-resistant water supply system, the combination comprising:

a) a drinking water outlet having an ON-OFF control,
b) a water supply line to said outlet and having a section subjected to cold temperature, and a drain line associated with said outlet to receive discharge water supplied via said outlet, and
c) apparatus operatively coupled with said water supply line and drain line for periodically effecting evacuation of water from said supply line section for ultimate flow to said drain line, as a function of the operation of said ON-OFF control,
d) said apparatus including a master and slave piston and cylinder unit, driven in response to changes in pressure of water in said supply line, and operatively associated with said supply line section to periodically receive water evacuated therefrom and to discharge said evacuated water to said drain line,
e) said unit including a water storage chamber, sand there being two additional lines, each communicating with said water storage chamber, one of said additional lines communicating with said drain line, and the other of said additional lines, communicating with said water supply line,
f) whereby in said control OFF condition, supply water pressure drives said unit in one direction to cause water in said other additional line to flow to said water storage chamber,
g) and in said control ON condition, supply water flows from said supply line to said drinking water outlet and said unit is driven tin the opposite direction to cause water in said water storage chamber to flow via the said one additional line to said drain line.

5,553,638
PRESSURE-LOADED CYLINDER VALVE INSERT
William Horne, 9Fl.-3, No. 374, Sec. 2, Pa Teh Rd., Taipei, Taiwan
Filed Apr. 24, 1995, Ser. No. 427,604
Int. Cl.[6] F16L *37/28*
U.S. Cl. 137—327 **12 Claims**



1. A valve insert adapted to be mounted in a first fluid conduit to enable a flow of fluid therethrough when a second fluid conduit is sufficiently engaged therewith and to prevent such fluid flow when the two fluid conduits are separated from each other, comprising:

a tubular housing member having two generally L-shaped notches formed on an outer periphery thereof, said notches being adapted to matingly receive a wrench with a hooked end and a flat end to rotate said housing member when the valve insert is positioned within the first conduit;
a body member hermetically mounted within said tubular housing member, defining a base portion with a seat facing toward the normal direction of fluid flow, a hole, and a recess with an inner diameter larger than that of said hole, said hole and said recess passing through said body member, and said recess positioned on a downstream site of the normal direction of fluid flow;
a sleeve-like docking member fixedly mounted in said recess, defining a tapered portion flaring from a center of said docking member and facing away from the normal direction of fluid flow;
a valve member movable relative to said body member and said docking member, comprising a first portion having a biasing member mounting means and a sealing member mounting means, and further comprising a second portion located in said body member for defining a fluid passage communicating with the first fluid conduit, said second portion having an abutment face facing away from the normal direction of fluid flow;

a biasing member within said tubular housing connected to said biasing member mounting means for exerting a force to push

5,553,640
STAINLESS STEEL STRIP PLATED WITH BRAZING

a braking means including a frustum-shaped braking body supportable frontally and coaxially to a drum of the weft feeder

shifting the binding guides to a top dead center position and displacing the locking mesh in translation at right angles to

a biasing member within said tubular housing connected to said biasing member mounting means for exerting a force to push said valve member toward said body member;

a sealing member within said tubular housing mounted on said sealing member mounting means; and

coupling means for selectively holding the first and second fluid conduits together when the second fluid conduit is engaged with the valve insert;

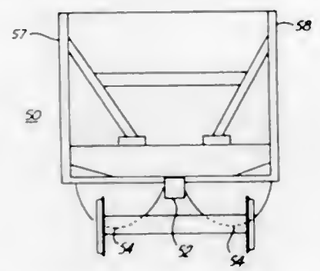
whereby when the first and second fluid conduits are separated from each other, said biasing member will act on said valve member to urge said sealing member hermetically seated on an edge of said seat of said body member to form a blockage to prevent fluid from flowing from said first portion to said fluid passage of said second portion of said valve member, and when the first and second fluid conduits are connected together, the second fluid conduit will firstly form a hermetical engagement with said tapered portion of said docking member and then pusb said valve member by engaging with said abutment face and communicating with said fluid passage to release said blockage achieved by said sealing member and said seat so that fluid is permitted to flow from said first portion to said fluid passage of said second portion of said valve member to enter into the second fluid conduit.

5,553,639

CONTAINER AND METHOD FOR TRANSPORTING FINELY DIVIDED OR DRIED COAL

Stewart E. Erickson, Marietta, Pa., assignor to SEEC, Inc., Mendota Heights, Minn.

Filed Feb. 3, 1994, Ser. No. 190,989
Int. Cl.[6] B61D *5/00*
U.S. Cl. 137—347 **12 Claims**



1. A container for transporting finely divided coal, comprising:

a generally flexible, substantially oxygen impermeable barrier defining an encapsulated cavity;

a port passing through the barrier for passing a flowable material through the barrier, said port including a coupling adapted to substantially prevent exposing a spontaneously combustible flowable material to oxygen while loading such material into or out of the encapsulated cavity through the port;

a cap for sealing said port;

a one way, pressure-activated valve positioned on the barrier for venting gasses within the cavity while substantially preventing the introduction of ambient air into the cavity; and

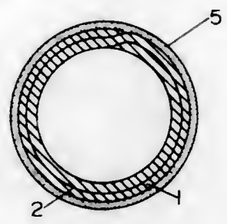
an infrastructure supporting the barrier and defining the shape of the cavity.

5,553,640

STAINLESS STEEL STRIP PLATED WITH BRAZING ALLOY FOR MULTILAYER TUBE MANUFACTURING

Nikolaus Ferenczy, and Dieter Junkers, both of Haan, Germany, assignors to Hille & Müller, Düsseldorf, Germany

Filed Feb. 26, 1993, Ser. No. 24,155
Claims priority, application Germany, Jun. 27, 1992, 42 21 167.0
Int. Cl.[6] F16L *9/14*
U.S. Cl. 138—154 **6 Claims**



1. A multi-layer metal tube comprised of:

a flat steel band having a brazing layer fixedly connected to at least one side of said steel band, wherein said brazing layer is comprised of a copper alloy;

said copper alloy consisting of, in addition to copper, one further metal selected from the group consisting of tin, zinc, and silver;

wherein tin is present in an amount of 13% to 15% and said copper alloy containing tin has a brazing temperature of 800° to 820° C., zinc is present in an amount of 32.5% to 37% and said copper alloy containing zinc has a brazing temperature of just above 902° C., and silver is present in an amount of 15% to 18% and said copper alloy containing silver has a brazing temperature below 1000° C.;

wherein said steel band is comprised of alloyed stainless steel containing at least 2% manganese, at most 10.5% nickel, and substantially an amount of chromium selected from 16.5%, 17.0%, and 17.5% chromium; and

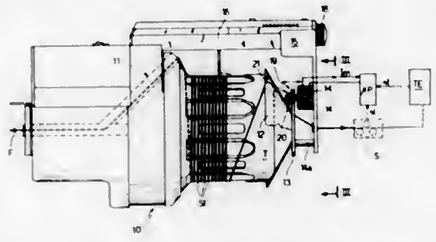
wherein said tube is produced by deforming said flat steel band into a tubular shape and by subsequently brazing said steel band to form said multi-layer metal tube.

5,553,641

POSITIVE MODULATED BRAKING OF THE THREAD FOR WEFT FEEDERS

Pietro Zenoni, Leffe, Italy, assignor to L.G.L. Electronics S.p.A., Bergamo, Italy

Filed Oct. 2, 1995, Ser. No. 537,499
Claims priority, application Italy, Oct. 10, 1994, TO94A0805
Int. Cl.[6] D03D *47/34*
U.S. Cl. 139—452 **14 Claims**



1. A device for positive modulated braking of a thread in a weft feeder, the device comprising:

a braking means including a frustum-shaped braking body supportable frontally and coaxially to a drum of the weft feeder for directly and indirectly engaging the thread unwinding from said drum;

a fixed support connectable to the weft feeder;

a movable support movably supported and guided on said fixed support, and said frustum-shaped body being rigidly coupled to said movably support such that said frustum-shaped body is movable in an axial direction of the drum of the weft feeder;

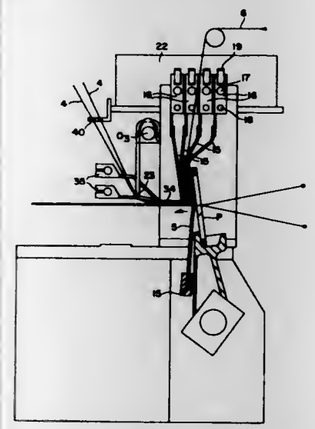
an electromechanical actuation means for moving said frustum-shaped body in the axial direction, said actuation means comprising: means for supplying a modulated excitation current that is modulated so as to match a variation in mechanical tension of the thread during a weaving process; a reversible motor supported by said fixed support and being supplied with said modulated excitation current; and a mechanical coupling between said motor and said movable support for converting angular movements of a shaft of the motor into corresponding translatory motions of the movable support with respect to the fixed support so as to move said frustum-shaped body in the axial direction.

5,553,642

PROCESS AND DEVICE FOR MAKING DECORATED WOVEN-KNITTED TEXTILE BACKING

Georges Tillon, La Tuilière, F-42580, La Tour-en-Jarez, and Jean Laurent, Le Solita, 21 rue Llafranc F-42100, Saint Etienne, both of France

Filed Oct. 7, 1994, Ser. No. 302,789
Claims priority, application France, Mar. 11, 1992, 92/03256
Int. Cl.[6] D04B *39/06*
U.S. Cl. 139—11 **8 Claims**



1. Method for automatically manufacturing a textile backing on an automatic loom, the textile backing having weft yarns and warp yarns, a warp yarn lap and a decorative weft, comprising:

providing bonding needles, locking mesh yarn and binding guides for forming a locking mesh having a plurality of loops,

raising the bonding needle across the warp yarn lap of the textile backing,

retracting the bonding needles under the textile backing,

inserting the decorative weft at right angles to the warp yarns of the textile backing,

shifting and raising the bonding needles and simultaneously shifting the locking mesh yarn in a circular arc using binding guides so as to twill the path of the bonding needles, thereby forming the locking mesh and flattening the decorative weft against the bonding needles,

shifting the binding guides to a top dead center position and displacing the locking mesh in translation at right angles to the warp,

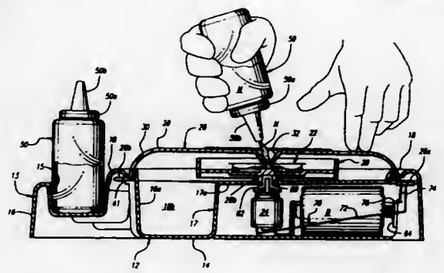
simultaneously lowering the needles and the binding guides thereby carrying the locking mesh yarn and creating a loop of the locking mesh which encloses the decorative weft, wherein the decorative weft is held by the locking mesh so as to define portions of a floating decorative weft parallel to the warp, thereby constituting loops of decorative weft which are variable in amplitude and length, in accordance with a predetermined program and wherein the textile backing is simultaneously formed along with the decorative effect.

5,553,643

APPARATUS AND METHOD FOR RAPIDLY ROTATING CONTAINERS TO PRODUCE MULTI-ASPECT DESIGNS

Adolph E. Goldfarb, Westlake Village; David A. Jackson, Sherman Oaks; Martin I. Goldfarb, Santa Monica, all of Calif.; Fred D. Eddins, Mapleville, and Linwood E. Doane Jr., Cumberland, both of R.I., assignors to Hasbro, Inc., Pawtucket, R.I.

Filed Feb. 10, 1995, Ser. No. 387,025
Int. Cl.[6] B65B *1/14*
U.S. Cl. 141—34 **28 Claims**



22. An enclosed transparent container for use with an apparatus for producing objects with visually multi-aspect designs, the apparatus including a support with connector element for holding a container for common rotation, the apparatus including motor means for rapidly rotating the support and thus the container about a generally upright axis, the apparatus also including a plurality of dispensers each containing a quantity of visually different flowable material that can be selectively and sequentially introduced into the rotating container,

said container comprising:

a relatively large top wall having a generally central upright axis of rotation and an entrance opening through said top wall at about said central axis,

a relatively large bottom wall having generally the same size and shape as said top wall,

an upright side wall connecting said top wall to said bottom wall to form the enclosed container,

said bottom wall also having a connector element for releasibly interlocking with the connector element on the rotatable support for common rotation.

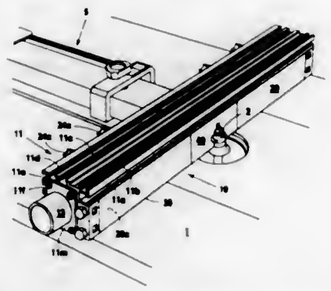
5,553,644

FENCE FOR WOODWORKING MACHINE

Phillip A. Adams, 11665 Elm Ridge Rd., San Antonio, Tex. 78230

Filed Jun. 8, 1995, Ser. No. 488,563
Int. Cl.[6] B27B *31/00*
U.S. Cl. 144—253.2 **15 Claims**

1. Apparatus for accurately positioning a workpiece guide fence relative to a cutter rotatable about a vertical axis and having a



cutting portion projecting vertically above a horizontal table surface, comprising, in combination:

an elongated fence detachably mountable on said table surface to guide a workpiece into engagement with the periphery of said cutter;

said fence having an opening positionable on the table surface to enclose a diametrical vertical half of said cutting portion, said opening being substantially larger in height and length than the height and diameter of said cutting portion;

a gauging plate snugly and detachably mounted in said opening;

said gauging plate having a cutter contoured opening formed by moving said fence laterally at least to a position of alignment with the central vertical plane of said cutting portion while said cutter is rotated, thereby forming a cutter contoured opening in said gauging plate;

whereby each time that said cutter is subsequently utilized to cut a workpiece, said precut cutter contoured opening in said gauging plate may be moved laterally by said fence to snugly surround said cutting portion of said cutter to achieve lateral alignment of said fence relative to said cutting tool.

5,553,645

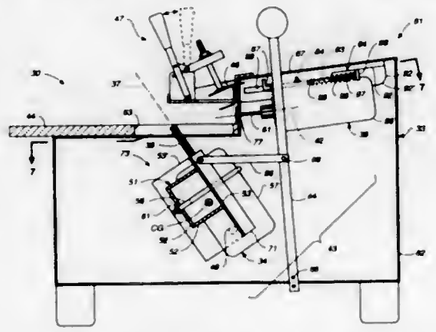
DRILLING AND COUNTERBORING APPARATUS AND METHOD FOR FORMING SCREW POCKETS

Max W. Durney, Penngrove, Calif., assignor to Castle Tool Machinery, Incorporated, Petaluma, Calif.

Filed Mar. 10, 1995, Ser. No. 401,952

Int. Cl.[6] **B27M** *1/08;* **B27C** *1/00*

U.S. Cl. 144—365 **28 Claims**



1. An apparatus for forming an obliquely oriented counterbore in a surface of a workpiece and a fastener receiving passage proximate an edge of said workpiece, said apparatus comprising:

a support frame;

a router assembly having a router bit, and movably mounted to said frame and oriented with the router bit rotational axis generally perpendicular to the direction of motion of said router assembly, said router assembly being mounted for arcuate movement between a stored position, out of contact with said workpiece, and a routing position, contacting said workpiece along a progressively inwardly path to cut a tapering recess in said surface terminating in a shoulder transverse to said surface proximate and in spaced relation to said edge to form said obliquely oriented counterbore;

a drill assembly having a drill bit, and being movably mounted to said frame and oriented with the drill bit rotational axis generally perpendicular to the router bit rotation axis when said router bit is situated in said routing position, said drill assembly being mounted for linear movement between a recessed position, out of contact with said workpiece, and a drilling position, engaging said workpiece in a direction generally opposing said router bit to drill said passage from said edge into said workpiece a sufficient distance causing said passage to communicate with said counterbore;

a biasing assembly independently biasing said router assembly and said drill assembly in generally opposite directions toward said stored position and said recessed position, respectively, to maintain said router bit and said drill bit out of engaging contact with one another.

5,553,646

HEAVY DUTY PNEUMATIC RADIAL TIRES WITH SPECIFIED TREAD PROFILE

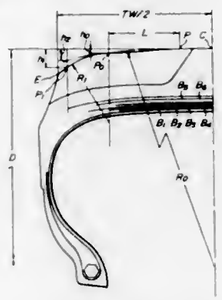
Shuji Ando, and Yoichi Honbo, both of Kodaira, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Mar. 3, 1995, Ser. No. 397,926

Claims priority, application Japan, Mar. 4, 1994, 6-034311

Int. Cl.[6] **B60C** *3/00;9/20;11/00;11/01*

U.S. Cl. 152—209 R **3 Claims**



1. A heavy duty pneumatic radial tire comprising; a radial carcass containing at least one rubberized cord, a belt comprised of at least two main cross belt layers and at least one protection belt layer and a tread portion, in which the belt has a maximum width corresponding to 60–98% of a tread width, and the main cross belt layers contain a plurality of substantially inextensible cords arranged at a cord angle of 15°–30° with respect to an equatorial plane of the tire, the cords of which layers being crossed with each other with respect to the equatorial plane, the improvement wherein: in a radial section of the tread portion inclusive of a rotating axis of the tire, when a widthwise central point of an outer profile of the tread portion is C, a first point of intersection of a normal line drawn from a rotating axis of the tire and passing through an end of a main cross belt layer having a second wide width among the main cross belt layers, and at which end exists a maximum width of a crossed cord region between adjoining main cross belt layers, with the outer profile of the tread portion is P_0 and a second point of intersection of a normal line drawn from the rotating axis of the tire and passing through an end of a belt layer having a maximum belt width with the outer profile of the tread portion is P_1, the point P_0 is located at a region that a first fall height (h_0) obtained by subtracting a radius of the point P_0 normal to the rotating axis of said tire from ½ of an outer diameter D of the tire is within a range corresponding to 0.45–0.55% of the outer diameter D; and the point P_1 is located at a region that a second fall height (h_1) obtained by subtracting a radius of the point P_1 normal to the rotating axis of said tire from ½ of the outer diameter D is within a range corresponding to 135–200% of a third fall height (h_2) obtained by subtracting a radius normal to said rotating axis of said tire of a third point of intersection of an arc with a radius R_0 centered on the equatorial plane of the tire and passing through the point P_0 and the point C with the normal line passing through the point P_1, from ½ of the outer diameter D and the outer profile of the tread portion in the radial section is a composite arc shape obtained by (1) forming a region between the point C and the Point P_0 with an arc of the radius R_0 or forming a region from the point C to an optional point P between the point C and the point P_0 with an arc of the radius R_0 and forming a region L between the point P and the point P_0 with a straight line, (2) forming a region between the point P_0 and the point P_1 with an arc of a radius R_1 smaller than the radius R_0 tangent to the arc of the radius R_0 at the point P_0, and (3) forming a region between the point P_1 and each side edge of the tread portion with an arc of the radius R_1 and connecting to a buttress line of the tread portion at the side edge or through an arc of a radius r smaller than the radius R_1.

5,553,647

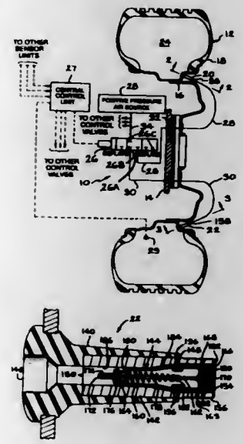
CENTRAL TIRE INFLATION SYSTEM

Miroslav Jaksic, Ypsilanti, Mich., assignor to Hayes Wheels International, Inc., Romulus, Mich.

Filed Dec. 14, 1994, Ser. No. 355,725

Int. Cl.[6] **B60C** *23/00*

U.S. Cl. 152—415 **6 Claims**



1. A system for controlling air pressure in a tire of a vehicle comprising:

a vehicle wheel assembly including a tire mounted on a vehicle wheel and defining a pressurized tire air chamber;

a positive pressure air source;

a normally closed inflation valve connected between said pressurized tire air chamber and said positive pressure air source, and a single air supply line connecting said positive pressure air source to said inflation valve to both actuate said inflation valve, wherein said inflation valve is moved to an open position in response to an air actuation signal at a selected positive pressure, and to supply pressurized air from said positive pressure air source to thereby increase the air pressure in said pressurized tire air chamber; and

a normally closed deflation valve connected between said pressurized tire air chamber and atmosphere, said deflation valve responsive to an air actuation signal at a selected positive pressure for moving said deflation valve to an open position to thereby decrease the air pressure in said pressurized tire air chamber.

5,553,648

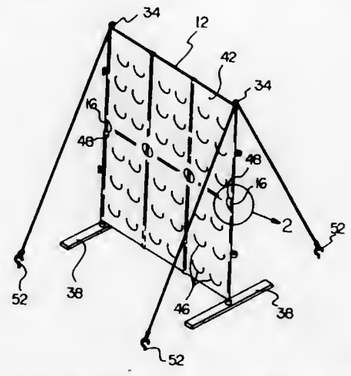
PORTABLE WALL SYSTEM

Ardavan Goharjou, 615 N. Elm St., Woodland Park, Colo. 80863

Filed Aug. 14, 1995, Ser. No. 514,684

Int. Cl.[6] **A47G** *5/00;* **A47H** *23/00;* **E04H** *15/02;17/16*

U.S. Cl. 160—135 **4 Claims**



1. A portable wall system formed of a plurality of single units coupleable together, each unit comprising:

a pair of cylindrical vertical posts, each post having an upper component and a lower component, with each post having a hollow aperture extending therethrough, each post having a downwardly extending smaller cylindrical section at the bottom of the upper component and a complimentary cylindrical recess at the top of the lower component for receiving the smaller cylindrical section;

an elastic band within each aperture extending along the length therethrough and slightly beyond;

a ring at the upper end of each upper component coupled to the upper end of its associated band;

a base component at the lower end of each lower component coupled to the lower end of its associated band;

a flexible sheet having parallel upper and lower horizontal edges, parallel vertical end edges, and opposite side therebetween coupled to the posts, the flexible sheet having half-moon wind flaps cut therein and openings at regions where the upper and lower components join;

stabilizing cords coupled at their upper extents to an associated ring and having hooks adapted to be secured to the ground at the lower ends of the stabilizing cords on opposite sides of the sheet for providing stability to the system; and

a plurality of outwardly extending fingers projecting downwardly from one component and a plurality of complimentary eyelets on the other component of each unit for allowing the coupling together of units in a systems configuration.

5,553,649

BLIND APPARATUS

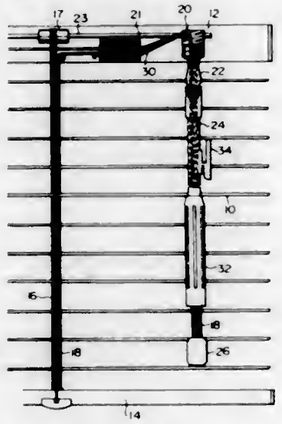
Yukinori Chisaka; Masaki Daizen; Yutaka Okamura; Yukihiro Tajima; Mamoru Katsuka; Akira Sone, and Kimihisa Nishino, all of Tokyo, Japan, assignors to Kabushiki Kaisha Nichibei, Tokyo, Japan

Filed Jun. 30, 1994, Ser. No. 269,457

Claims priority, application Japan, Jul. 5, 1993, 5-191955; Sep. 17, 1993, 5-254815; Dec. 28, 1993, 5-075482 U; Jan. 31, 1994, 6-001270 U; Jan. 31, 1994, 6-029077; Jan. 31, 1994, 6-029078; Feb. 1, 1994, 6-001240 U; Feb. 24, 1994, 6-053078; Mar. 15, 1994, 6-069969

Int. Cl.[6] E06B *9/30*

U.S. Cl. 160—168.1 **12 Claims**



1. A blind apparatus, comprising:

a head box having opposite longitudinal side edges;

a bracket for mounting said head box on a wall or the like and having means for retaining said opposite longitudinal side edges;

a bottom rail vertically spaced from said head box;

a plurality of vertically spaced slats extending substantially parallel to each other in a space between said head box and said bottom rail;

a plurality of ladder cords extending between said head box and said bottom rail for supporting said plurality of slats;

a rotary drum located inside said head box, said ladder cords being connected, at one end thereof, to said rotary drum for being wound on and rewound from said rotary drum upon rotation of said drum in opposite directions;

tilter means for tilting of said plurality of seats and including:

a tilter input shaft extending downward at one end of said head box;

a tilter disposed in said head box for transmitting rotation of said tilter input shaft to said rotary drum;

a hollow rotating operation rod coupled to said tilter input shaft for rotating same,

a universal joint for coupling said hollow rotating operation rod to said tilter input shaft, and

a hollow grip provided at a lower end of said operation rod for rotating same;

lifting cords connected at one end thereof to said bottom rail and extending through holes formed in said plurality of slats for lifting a blind formed by said plurality of slats, said lifting cords extending through said head box and then through an interior of said hollow rotating operation rod and said hollow grip, and said lifting cords having another end thereof extending from a lower end of said hollow grip;

a stopper device located in said head box for preventing said lifting cords from moving; and

a stopper device releasing cord connected at one end thereof to said stopper device and extending through the interior of said hollow rotating operation rod and said hollow grip;

wherein said stopper device includes:

a shopper case fixed to said head box and opened at an upper end thereof,

a cord nozzle provided at one end of said stopper case,

means for preventing movement of said cord nozzle in a longitudinal direction,

a cord stopper provided on said stopper case, means for enabling movement of said cord stopper in the longitudinal direction and for preventing rotation of said cord stopper, and

a spring for biasing said cord stopper toward said cord nozzle; and

wherein said cord stopper includes:

a bottom portion fitted to said stopper case and having a bore through which said lifting cords extend,

a conical end projecting from said bottom portion and cooperating with said cord nozzle for clamping the lifting cord therebetween,

a first insertion hole extending from said bottom portion to an outer peripheral surface of said conical end near an apex of said conical end, and

a second insertion hole formed in said bottom portion radially outwardly of said first insertion hole, said stopper release cord extending through said first insertion hole, said outer peripheral surface of said conical end, and then through said second insertion hole so as to be fastened to said cord stopper at a side of said bottom portion opposite said conical end.

5,553,650

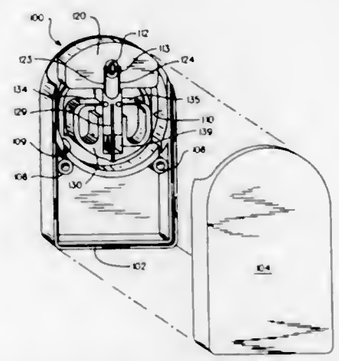
CHILD SAFETY DEVICE FOR LOOPED CORDS

Ralph Jelic, Valencia, Pa., assignor to Verosol USA Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 293,021, Aug. 19, 1994. This application Jan. 12, 1995, Ser. No. 372,165

Int. Cl.[6] E06B *9/38*

U.S. Cl. 160—178.1 **8 Claims**



1. A safety device for use on at least one cord having a loop therein that passes through a cord channel through the safety device comprising:

a. a base having opposite sides defining a portion of the cord channel, a landing having at least one notch therein sized and positioned to receive an end of a base positioning spring and a travel pin sized and positioned to receive a slot in a plunger;

b. a slide assembly comprised of:

i. a slide assembly base having at least one base positioning spring extending therefrom, the base positioning spring having a distal end fitted within the notch of the landing;

ii. an anvil attached to the slide assembly base;

iii. a central housing attached to the slide assembly base opposite the anvil to define the second portion of the cord channel, the central housing having,

at least one plunger positioning spring extending therefrom,

a plunger guide slot sized to receive a leg of a plunger, and

a blade slot sized and positioned to permit a blade attached to a plunger fitted within the plunger guide slot to enter the cord channel when the leg of the plunger moves through the plunger guide slot toward the cord channel;

c. a plunger having a leg fitted within the plunger guide slot and at least one notch into which a distal end of the at least one plunger positioning spring is fitted, and a slot through which the travel pin extends, the slot being sized to permit the plunger to move relative to the travel pin;

d. a blade attached to the plunger being sized and positioned so that the blade is above the anvil and the plunger can be moved relative to the slide assembly in a manner to pass through the blade slot and cut any cords which are within the cord channel; and

e. a cover fitted over the base.

5,553,651

INTERCONNECTING ELEMENT FOR CONNECTING PANELS

Bjørn W. Olsen, Kjøpmannsvik, N-4770 Høvåg, Norway

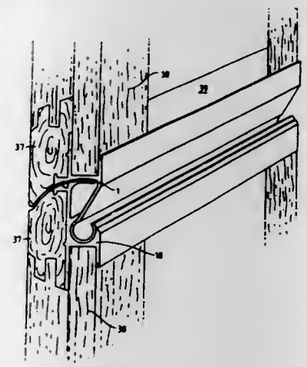
PCT No. PCT/NO93/00131, § 371 Date Apr. 6, 1995, § 102(e) Date Apr. 6, 1995, PCT Pub. No. WO94/05887, PCT Pub. Date Mar. 17, 1994

PCT Filed Aug. 31, 1993, Ser. No. 392,883

Claims priority, application Norway, Sep. 1, 1992, 923416

Int. Cl.[6] E06B *3/12*

U.S. Cl. 160—235 **7 Claims**



1. A device for interconnecting first and second panels, said device comprising an upper profile part and a lower profile part, the profile parts having respective curved sections which slidably interact with each other at a distance from a pivotal joint provided on the inside of the first and second panels and which constitutes a rotation point about which the curved section of the upper profile part is rotatable, said lower profile part having a socket which receives the pivotal joint in such a way that the pivotal joint is rotatable with respect to the socket, the curved section of the lower profile part being arranged at a distance from the socket for sliding interaction with the curved section of the upper profile part, wherein one side edge of the curved section of the upper profile part is connectable to the first panel and the other, opposite side edge includes a flange which extends at an angle to the pivotal joint and wherein the curved sections are located at an inside of the panels on end edges thereof as an extension of end profiles of the panels.

5,553,652

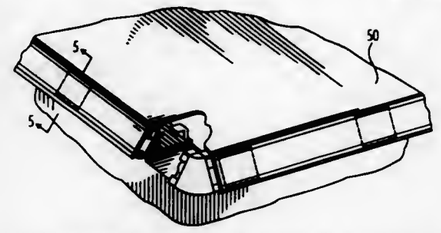
TONNEAU COVER SYSTEM

Steve Rushford, Granada Hills, Calif., assignor to Covercraft Industries, Pauls Valley, Okla.

Filed Jun. 27, 1994, Ser. No. 266,223

Int. Cl.[6] A47H *23/00*

U.S. Cl. 160—354 **20 Claims**



1. In a system for covering an opening in a structure, the opening having a periphery, the structure having sidewalls surrounding the opening and extending along the periphery of the opening, and the system including means defining a frame mountable on the sidewall so as to surround the opening, a flexible sheet having a plurality of sides for covering the opening, and connecting means for securing the sheet to the frame, the improvement wherein said connecting means comprises:

an elongated channel formed in said frame; and

a plurality of flexible fasteners on each of the plurality of sides of the sheet, each having a base portion and being permanently secured to the sheet by the base portion, which are received by said elongated channel for securely but detachably retaining each of said plurality of fasteners to said frame anywhere along said elongated channel in said frame so that the plurality of fasteners are adjustable in the elongated channel of the frame.

5,553,653

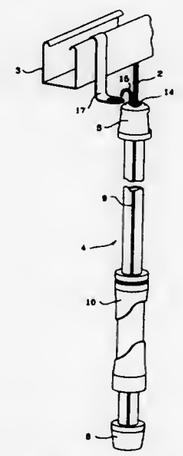
CORD RETRACTOR FOR WINDOW BLINDS

David Rozon, Russell, Canada, assignor to 2844788 Canada Ltee, Quebec, Canada

Filed Jun. 20, 1994, Ser. No. 262,575

Int. Cl.[6] F06B *9/30*

U.S. Cl. 160—173 **7 Claims**



1. A cord retractor for attachment to a window blind cord for the taking up of said cord, said cord having a free end, said cord retractor comprising:

a) an elongate, generally hollow retractor body having an axial slot through the wall thereof extending generally the length thereof and communicating between the interior and exterior of the retractor body, said retractor body having upper and lower ends;

b) cord fastening means fixedly engaging said free end of said cord to one of said ends of said retractor body;

c) a sliding engagement member slideably disposed within said retractor body and longitudinally displaceable between said upper and lower ends of said retractor body, said sliding engagement member slideably engaging said cord and drawing a loop comprising at least first and second strands of said cord into said retractor body and longitudinally displacing said first and second strands in opposing directions from each other to cooperate with said cord fastening means to lengthen said loop as said loop is drawn into said retractor body by the longitudinal displacement of said engagement member; and

d) a handle external to said retractor body and connected to said sliding engagement member through said slot to permit said sliding engagement member to be axially displaced within said retractor body by the axial sliding movement of said handle along said retractor body.

5,553,654

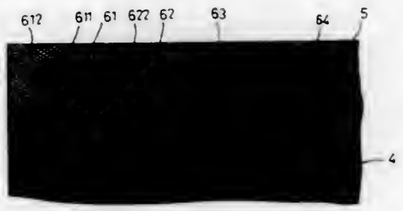
SUNSHIELDING CURTAIN

Hans Wu, 2F, No. 2, Alley 97, Lane 226, Sec. 3; Tung-Men Rd., Tainan, Taiwan

Filed Jul. 11, 1994, Ser. No. 273,502

Int. Cl.[6] B60J *9/00*

U.S. Cl. 160—370.21 **6 Claims**



1. A sunshielding curtain including a sunshielding sheet and a pressure sensitive adhesive sheet attached to said sunshielding sheet and having an interior face lying against said sunshielding sheet and an exterior face opposite to said interior face, wherein

said pressure sensitive adhesive sheet has a plurality of separate concave portions integrally formed on said exterior face, each of said concave portions being surrounded by substantially planar portions of said adhesive sheet, and said interior face is fixed to said sunshielding sheet at positions corresponding to said separate concave portions, and said interior face of said sheet in the area corresponding to said planar portions is unattached to said sunshielding sheet.

5,553,655

METHOD FOR CONVEYING MOULDING BOXES AND FOUNDRY MOULDING INSTALLATION OPERATING ACCORDING TO THE METHOD

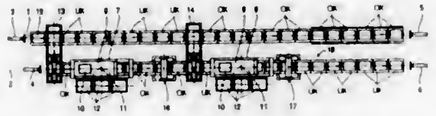
Berthold Heidler, Gernsbach, Germany, assignor to BMD BAdische Maschinenfabrik Durlach GmbH, Karlsruhe, Germany

Filed Aug. 13, 1993, Ser. No. 105,640

Claims priority, application Germany, Aug. 13, 1992, 42 26 778.1

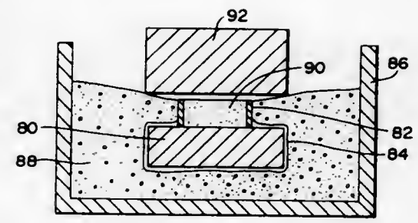
Int. Cl.[6] B22C *25/00*

U.S. Cl. 164—29 **9 Claims**



1. A method for conveying moulding boxes, each comprising an upper box and a lower box, in a foundry moulding installation including first and second parallel conveyors having the same conveying direction, a first moulding machine for the upper box and a second moulding machine for the lower box disposed along the second conveyor, and first and second transfer stations for respectively transferring the upper boxes and lower boxes from one conveyor to the other conveyor, the method comprising the steps of supplying empty upper and lower moulding boxes to the first conveyor, separating the upper box from the lower box of the supplied empty moulding boxes, transferring only the upper box from the first conveyor on to the second conveyor at the first transfer station, supplying the separated upper box to the first moulding machine to form a first moulded upper box while moving the empty lower box on the first conveyor to the second transfer station positioned between the first and second moulding machines, transferring the empty lower box to an empty location on the second conveyor immediately downstream of the first moulded upper box exiting from the first moulding machine, moving the first moulded upper box in a following working cycle into the second transfer station and transferring the first moulded upper box to the first conveyor while moving the empty lower box into the second moulding machine to form a moulded lower box, and moving the moulded lower box from the second moulding machine to a core inserting line, wherein the upper and lower moulded boxes are moved on the first and second conveyors with a displaced conveying cycle having the same cycle length corresponding to a length of the moulding box, as viewed in a conveying direction of the moulding boxes.

5. A foundry moulding installation for moulding boxes each including an upper box and a lower box, the foundry moulding installation including first and second parallel conveyors, drives for driving the first and second parallel conveyors, first and second moulding machines positioned along the second conveyor, first and second transfer stations for moving the upper and lower boxes from one conveyor to the other conveyor, wherein one of the first and second transfer stations is positioned upstream of the first moulding machine, as viewed in a conveying direction of the moulding boxes, and is adapted to separate the upper moulding boxes from the lower moulding boxes supplied on the first conveyor, and to supply the empty upper boxes to the second conveyor, the first moulding machine moulding each upper box to form a moulded upper box, the second moulding machine moulding each lower box to form a moulded lower box, the second transfer station is located between the first and second moulding machines, and each empty lower box on the first conveyor is transferred to an empty location on the second conveyor by the second transfer station at a position immediately downstream of the moulded upper box, the second transfer station transfers the moulded upper box from the second conveyor to the first conveyor following the transporting of a lower box to the second moulding machine, the drives for the first and second conveyors move in a time-displaced working cycle by, in each case, one length of the respective moulding boxes as viewed in the conveying direction of the moulding boxes, and wherein each moulded lower box is conveyed by said second conveyor to a core insert line disposed downstream of the second moulding machine, as viewed in the conveying direction of the moulding boxes.



5,553,656

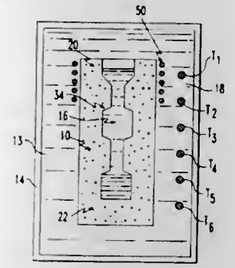
METHOD OF DIRECTIONALLY COOLING USING A FLUID PRESSURE INDUCED THERMAL GRADIENT

Arnold J. Cook, Mt. Pleasant, Pa., assignor to PCC Composites, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 58,407, May 7, 1993, Pat. No. 5,398,745. This application Mar. 20, 1995, Ser. No. 405,745

Int. Cl.[6] B22D *27/04;18/00*

U.S. Cl. 164—66.1 **17 Claims**



1. A method of direction cooling comprising the steps of:

positioning material in a liquid state within a chamber; and

providing pressurized fluid about the chamber to form a thermal gradient across the chamber to directionally cool the material within.

5,553,657

GATING MEANS FOR METAL MATRIX COMPOSITE MANUFACTURE

Michael K. Aghajanian; Ralph A. Langensiepen; Christopher R. Kennedy; Michael A. Rocazella; Robert J. Wiener; Gregory E. Hanon; John J. Crowther, all of Newark, and Allyn L. McCormick, Bear, all of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 961,680, Jan. 8, 1993, abandoned, which is a continuation-in-part of Ser. No. 521,196, May 9, 1990, Pat. No. 5,119,864, which is a continuation-in-part of Ser. No. 269,315, Nov. 10, 1988, Pat. No. 5,007,474. This application May 31, 1994, Ser. No. 261,694

Int. Cl.[6] B22D *19/14;19/02*

U.S. Cl. 164—97 **26 Claims**

1. A method for making a metal matrix composite, comprising:

providing a permeable mass comprising a filler or a preform;

providing a source of molten matrix metal; interposing a gating means between said source of molten matrix metal and said permeable mass, thereby forming at least one interface selected from the group of interfaces consisting of (1) an interface between said gating means and said matrix metal and (2) an interface between said gating means and said permeable mass;

providing a separation facilitator to at least a portion of said at least one interface; and

infiltrating a portion of said molten matrix metal into at least a portion of said permeable mass through said gating means and said separation facilitator.

5,553,658

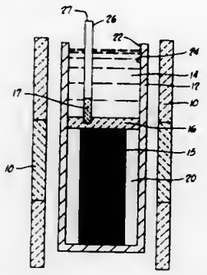
METHOD AND APPARATUS FOR CASTING

James A. Cornie, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 60,449, May 10, 1993, Pat. No. 5,322,109. This application Apr. 1, 1994, Ser. No. 221,874

Int. Cl.[6] B22D *19/14;27/09*

U.S. Cl. 164—97 **35 Claims**



1. A method for pressure infiltration casting comprising:

(1) providing a mold cavity and an infiltrant charge;

(2) preheating said mold cavity and said infiltrant charge in a heating vessel to form a preheated mold cavity and molten infiltrant charge;

(3) positioning a vent tube in fluidic contact with said preheated mold cavity;

(4) providing a pressure vessel separated from and unconnected with said heating vessel and transferring said preheated mold cavity and said molten infiltrant charge to said pressure vessel and removing said vent tube before transferring said preheated mold cavity and said molten infiltrant charge from said heating vessel to said pressure vessel;

(5) pressurizing said pressure vessel by introduction of a pressurized gas so that said molten infiltrant charge fills said preheated mold cavity to form a filled mold cavity; and

(6) cooling said filled mold cavity so that said molten infiltrant charge solidifies to form a finished article.

5,553,659

DIE CASTING MACHINE WITH SAFETY BAR

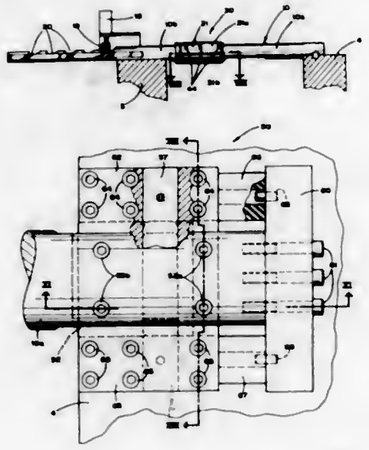
Robert W. Hegel, Holland; Melvin C. Hawke, Norton Shores; William P. Damian, Holland, and Jon R. Mullen, West Olive, all of Mich., assignors to Prince Machine Corporation, Holland, Mich.

Filed Jan. 9, 1995, Ser. No. 370,209

Int. Cl.[6] B22D *17/20*

U.S. Cl. 164—153 **27 Claims**

1. In a die casting machine having a front platen, a rear platen, a movable platen located between said front and rear platens, an actuator for moving said movable platen between open and closed positions; and a safety bar mechanism operatively connected



between said movable platen and said rear platen for stopping the movement of said movable platen short of said closed position as it is moving toward closed position; the improvement comprising:

a cushioning mechanism associated with said safety bar to absorb the inertial forces generated by the movement of said movable platen toward said front platen as it is being stopped.

5,553,660

METHOD FOR CONTINUOUSLY CASTING COPPER ALLOYS

Andreas Krause, and Horst Gravemann, both of Osnabruck, Germany, assignors to KM-Kabelmetal Aktiengesellschaft, Osnabruck, Germany

Continuation of Ser. No. 60,283, May 7, 1993, abandoned, which is a continuation-in-part of Ser. No. 832,923, Feb. 10, 1992, Pat. No. 5,265,666. This application Nov. 28, 1994, Ser. No. 345,288

Claims priority, application Germany, Feb. 9, 1991, 41 03 963.7

Int. Cl.[6] B22D *27/02*

U.S. Cl. 164—468 **14 Claims**

1. A method for continuously casting thin copper alloyed semi-finished products from copper alloys comprising 2 to 40% nickel and 2 to 18% tin, comprising the steps of:

(a) electromagnetically agitating a melt inside an ingot mold; and

(b) pulling-off a casting strand from the ingot mold;

wherein the copper alloy contains a quantity of at least one element selected from the group consisting of iron, cobalt, manganese, zinc, zirconium, chromium, molybdenum and niobium, wherein the total quantity of said elements is less than or equal to 1%.

5,553,661

SOLAR POSITION CORRECTION FOR CLIMATE CONTROL SYSTEM

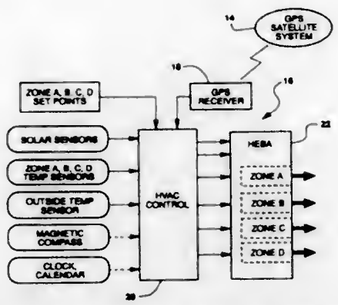
David G. Beyerlein, Carmel, and Bruce D. Rohn, Kokomo, both of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Oct. 23, 1995, Ser. No. 547,003

Int. Cl.[6] F25B *13/00*

U.S. Cl. 165—203 **22 Claims**

1. In an automotive vehicle HVAC system, a control for air temperature and air flow having data collectors for data relevant to



sun position for determining sun position and solar sensors for sensing solar load, the method of adjusting for sun load comprising the steps of:

sensing sun brightness;

collecting data pertaining to sun position;

calculating from the data sun position relative to the vehicle;

establishing an empirical table of solar illumination factors (SIF) for various sun positions;

selecting a SIF from the table on ithe basis of the sun position; and

adjusting the air temperature in accordance with the SIF and the sun brightness.

5,553,662

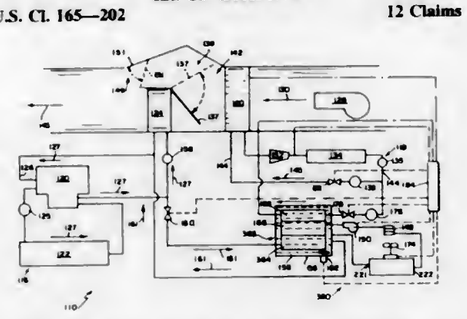
PLUMBED THERMAL ENERGY STORAGE SYSTEM

William J. Longardner; Joseph A. Gustin; Alexander P. Rafalovich; Gilbert P. Keller, and Thomas C. Schmidter, all of Indianapolis, Ind., assignors to Store Heat & Products Energy, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 165,257, Dec. 10, 1993, abandoned. This application Aug. 11, 1994, Ser. No. 289,063

Int. Cl.[6] B60H *3/00*

U.S. Cl. 165—202 **12 Claims**



1. Thermal energy storage for a vehicle compartment which comprises:

a first coolant loop comprising an engine and a heater coil with hot coolant supplied from the engine to the heater coil to provide positive thermal potential to the heater coil;

a main air conditioning loop comprising a compressor, a condenser, a refrigerant receiver, a metering device, an evaporator, and first means to interrupt refrigerant flow to the evaporator and arranged to provide negative thermal potential to the evaporator;

a vehicle air supply duct and a blower, the duct having an inlet and outlet, the heater coil and the evaporator both located in the duct;

thermal energy storage means comprising an enclosed volume of thermal storage medium to store at least one of negative thermal potential and positive thermal potential; a refrigerant direct expansion coil to deliver to the thermal storage medium

negative thermal potential during a negative thermal potential charging cycle; a coolant coil to deliver to the thermal storage medium positive thermal potential during a positive thermal potential charging cycle; a supplemental fan arranged to flow air to recover thermal potential from the thermal energy storage means to condition the air, and to return the conditioned air to the compartment during a thermal potential discharging cycle;

a supplemental refrigerant loop comprising said refrigerant direct expansion coil in direct contact with the thermal storage medium to provide negative thermal potential to the thermal storage medium, the supplemental refrigerant loop arranged in communication with the compressor, the condenser, and the refrigerant receiver of the main air conditioning loop to supply refrigerant flow to the direct expansion coil and second means to interrupt this flow to the direct expansion coil;

a second coolant loop for providing hot coolant flow to the thermal storage medium, the second coolant loop comprising third means to interrupt hot coolant supply to the second coolant loop, the third means arranged for fluid communication with the first coolant loop;

an air conditioning first control means for activating the compressor and the first means; and,

a control system to select one of the negative thermal potential charging cycle and activate the compressor and the second means to store negative thermal potential, and the positive thermal potential charging cycle and activate the third means in the second coolant loop to store positive thermal potential, and to deactivate both the second and third means when not in a thermal potential charging cycle,

the control system controlling the flow of refrigerant through the supplemental refrigerant loop to permit flow of refrigerant through the refrigerant direct expansion coil and the resulting storage of negative thermal potential in the thermal storage medium without regard to whether the control system is permitting coolant flow through the heater coil to heat the vehicle compartment, and the control system controlling the flow of coolant through the coolant coil to permit storage of positive thermal potential in the thermal storage medium without regard to whether the control system is permitting coolant flow through the heater coil and the resulting heating of the vehicle compartment and without regard to whether the control system is permitting refrigerant flow through the main air conditioning loop to remove heat from the vehicle compartment,

the control system controlling operation of the supplemental fan to flow air to recover thermal potential from the thermal energy storage means to condition the air, and to return the conditioned air to the compartment during a thermal potential discharging cycle without regard to the status of the blower.

5,553,663

HEAT EXCHANGE FOR AIR CONDITIONER

Si-Hong Yu, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Jul. 19, 1995, Ser. No. 504,369

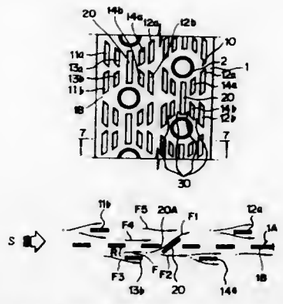
Claims priority, application Rep. of Korea, Jul. 21, 1994, 94-17699

Int. Cl.[6] F28D *1/04*; F28F *1/32*

U.S. Cl. 165—151 **9 Claims**

1. A heat exchanger for an air conditioner, comprising a plurality of regularly spaced fins arranged in parallel for forming an air flow channel between each adjacent pair of fins, the air flowing from a forward end to a rearward end of said channel, and a heat transfer pipe arrangement for conducting fluid that is to exchange heat with said air, said pipe arrangement including spaced apart parallel pipe segments extending through said fins across said channels, the improvement wherein each fin includes:

a row of air flow disrupting elements arranged one behind the other in the direction of air flow, each said element disposed outwardly of a respective side of its respective fin such that some of said elements are disposed adjacent a side of said fin



opposite a side to which others of said elements are disposed, said row including an upstream end and a downstream end, said row being located adjacent a respective pipe segment such that said upstream end of said row is disposed forwardly of said pipe segment, and said downstream end of said row is located rearwardly of said pipe segment, said elements causing flowing air to become turbulent at locations forwardly and rearwardly of said pipe segment; and

an air flow diverting member arranged in said row intermediate said upstream and downstream ends thereof such that there is a said element located forwardly and rearwardly thereof on each side of said fin, said member disposed in a through-hole formed in said fin and arranged to force some of the air flow from one side of said fin to the other side of said fin through said through-hole, said member arranged intermediate upstream and downstream sides of said pipe segment.

5,553,664

LAMINATED HEAT EXCHANGER

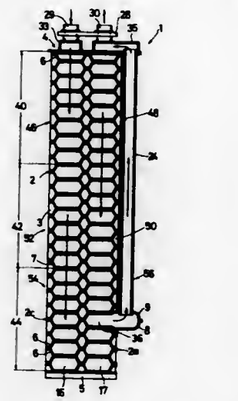
Kunihiko Nishishita, and Takashi Kinugawa, both of Konan, Japan, assignors to Zexel Corporation, Tokyo, Japan

Filed May 17, 1994, Ser. No. 243,769

Claims priority, application Japan, May 20, 1993, 5-141460; Dec. 2, 1993, 5-338824

Int. Cl.[6] F28D *1/02*

U.S. Cl. 165—153 **18 Claims**



1. A heat exchanger, comprising:

a laminated assembly comprising a plurality of laminated heat exchanging elements laminated alternately with corrugated fins, each of said plurality of laminated heat exchanging elements comprising formed plates bonded so as to face each other and defining therebetween a pair of tanks and a U-shaped passage communicating said pair of tanks with each other, said laminated assembly having opposite ends;

a pair of end plates provided on said opposite ends of said

a ring surrounding said plurality of tubes; and

a plurality of support members positioned in at least a portion of

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PARTICULATE SEPARATOR FOR FLUID PRODUCTION WELLS

a pair of end plates provided on said opposite ends of said laminated assembly, one of said end plates comprising a pipe insertion hole;

wherein said heat exchanging elements are laminated in a direction of lamination and said laminated assembly has one side on which one of said tanks of each said pair of tanks is located and an other side on which the other of said tanks of each said pair of tanks is located;

a coolant path defined by said tanks and said U-shaped passages,

wherein said coolant path comprises a plurality of adjacent said tanks on one side of said laminated assembly being in fluid communication with each other, said tanks on the one side also being partitioned at at least one position, whereby a plurality of tank groups on the one side are defined,

wherein said coolant path further comprises a plurality of adjacent said tanks on the other side of said laminated assembly being in fluid communication with each other, and said tanks on the other side also being partitioned at at least one position, whereby a plurality of tank groups on the other side are defined, and

wherein said coolant path further comprises a plurality of layers of coolant routes defined by said plurality of tank groups on the sides of said laminated assembly and said U-shaped passages, wherein each of said layers of coolant routes comprises one of said tank groups on one side of said laminated assembly, one of said tank groups on the other side of said laminated assembly, and said U-shaped passages connecting said tanks of said one of said tank groups on the one side of said laminated assembly to said tanks of said one of said tank groups on the other side of said laminated assembly, wherein some of said tank groups located adjacent to each other in said direction of lamination are in fluid communication such that said plurality of layers of coolant routes are fluidly connected in series;

an entrance/exit section having a fluid entrance side and a fluid exit side;

an intake/out,let passage forming plate bonded onto said one of said end plates, said intake/outlet passage forming plate comprising a plate having a first coolant passage formed therein communicating one end of said coolant path with one of said sides of said entrance/exit section and a second coolant passage communicating the other side of said entrance/exit section with said pipe insertion hole; and

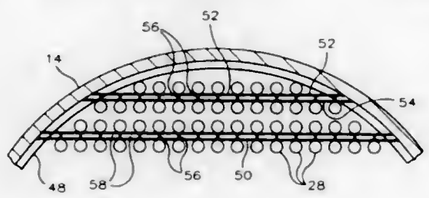
a communicating pipe having one end bonded to said pipe insertion hole for communication with said second coolant passage and an other end communicating with the other end of said coolant path.

5,553,665

ROD BAFFLE HEAT EXCHANGERS UTILIZING DUAL SUPPORT STRIP

Cecil C. Gentry, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 10, 1995, Ser. No. 370,921
Int. Cl.[6] F28F *9/013*
U.S. Cl. 165—162 **7 Claims**



1. An apparatus comprising:

a plurality of parallel tubes with a common axis of alignment arranged to form a plurality of tube rows lanes between adjacent tube rows;

a ring surrounding said plurality of tubes; and

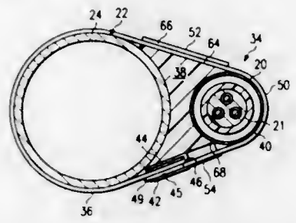
a plurality of support members positioned in at least a portion of said lanes, with each support member having a first strip, a second strip and a plurality of support struts, wherein said first strip has a first end and a second end which are fixedly secured to said ring so that said first strip extends along a first chord of said ring with said first chord lying in one of said lanes between said adjacent tube rows such that said first strip is in contact with substantially all said tubes in the first row of said adjacent tube rows forming said lane, wherein said second strip has a first end and a second which are fixedly secured to said ring so that said second strip extends along a second chord of said ring with said second chord lying in said lane between said adjacent tube rows such that said second strip is in contact with substantially all said tubes in the second row of said row of said adjacent tube rows forming said lane, and wherein said support struts are spaced along said first strip and said second strip such that each support strut extends from the first strip to the second strip and has a first end fixedly secured to said first and second end fixedly secured to said second strip and such that said support struts are located at each tube location.

5,553,666

STANDOFF INSULATOR AND METHOD FOR WELL PUMP CABLE

Chris J. Hartman, Garden Grove, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jun. 6, 1995, Ser. No. 467,942
Int. Cl.[6] E21B *36/00*
U.S. Cl. 166—60 **13 Claims**



1. For use in a fluid production well including a tubing string connected to an electric submersible pump, said pump being operable to receive electric power transmission through an elongated power cable, a standoff insulator and support device for supporting said power cable at one or more predetermined positions along said tubing string, said support device including:

a flexible strap adapted to be trained around said power cable and said tubing string and tensioned to secure said power cable to said tubing string; and

a thermal insulator adapted to be disposed between said power cable and said tubing string and between opposed legs of said strap for holding said power cable in a standoff position with respect of said tubing string to minimize heat transfer between said tubing string and said power cable.

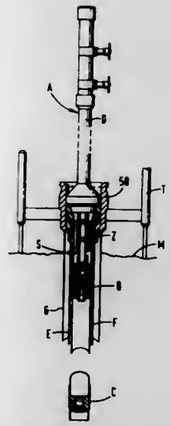
5,553,667

CEMENTING SYSTEM

Peter Budde, Vlaardingen, Netherlands, and Richard L. Giroux, Katy, Tex., assignors to Weatherford U.S., Inc., Houston, Tex.

Filed Apr. 26, 1995, Ser. No. 429,763
Int. Cl.[6] E21B *33/05*
U.S. Cl. 166—70 **20 Claims**

1. A plug holding device for releasably holding a plug to a plug holder, the plug holder having a holder bore and a holder recess



around the holder bore, the plug holder having holding apparatus releasably holding a plug, the plug having a plug bore therethrough in fluid communication with the holder bore, the plug holding device comprising

a tubular sleeve with a sleeve bore disposable in fluid communication with the holder bore,

the tubular sleeve having an external lock ring therearound and projecting therefrom for reception in the holder recess, the tubular sleeve positionable for preventing release of the holding apparatus from the plug, and

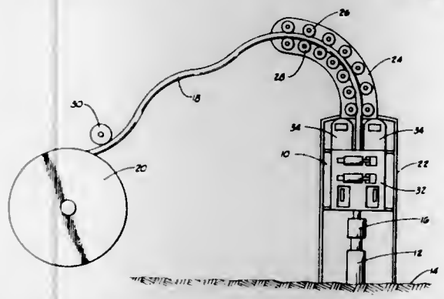
the external lock ring shearable in response to pressure on the tubular sleeve, the tubular sleeve movable upon shearing of the external lock ring to permit movement of the holding apparatus to release the plug.

5,553,668

TWIN CARRIAGE TUBING INJECTOR APPARATUS

Malcolm N. Council, Richardson, and Carl H. Johnson, Carrollton, both of Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Jul. 28, 1995, Ser. No. 508,411
Int. Cl.[6] E21B *19/22*
U.S. Cl. 166—77.3 **20 Claims**



1. A coiled tubing injector apparatus comprising:

a superstructure;

a carriage substructure mounted to the superstructure, the carriage being transversely movable with respect to the superstructure; and

a gripper chain drive system mounted on the carriage substructure and movable therewith, the gripper chain drive system being adapted for engaging coiled tubing extending through the superstructure when the carriage substructure is moved toward the tubing.

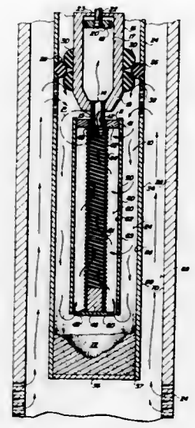
170-919 O.G.-96-6: QL3

5,553,669

PARTICULATE SEPARATOR FOR FLUID PRODUCTION WELLS

C. W. Trainer, 8090 E. Kalil, Scottsdale, Ariz. 85260

Filed Feb. 14, 1995, Ser. No. 389,124
Int. Cl.[6] E21B *43/00*
U.S. Cl. 166—105.1 **18 Claims**



1. A particulate separator for use with fluid production equipment which includes a sucker rod assembly insertable in production tubing, said particulate separator comprising:

a hollow velocity tube having first and second ends;

a hollow strainer mandrel having first and second ends and having one or more gaps defined therethrough for allowing fluid to flow therethrough, said strainer mandrel being disposed within said velocity tube in spaced concentric relationship thereto to define an annular fluid flow region therebetween, the inlet to said annular fluid flow region being defined by the space between said second end of said velocity tube and said second end of said strainer mandrel, and said strainer mandrel having means for disallowing fluid flow into said second end of said strainer mandrel;

connection means for securing said first end of said strainer mandrel to and within said first end of said velocity tube, said connection means being solid for disallowing fluid flow therethrough; and

attachment means for attaching said particulate separator to said sucker rod assembly for use in said production tubing.

5,553,670

OPTIMIZING BLAST FURNACE SLAG CEMENTS

Kenneth M. Cowan, Sugar Land, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 30, 1993, Ser. No. 176,156
The portion of the term of this patent subsequent to Apr. 25, 2012, has been disclaimed.
Int. Cl.[6] E21B *33/13*
U.S. Cl. 166—293 **114 Claims**

1. A method for cementing a well, comprising:

combining constituents comprising water, blast furnace slag having a particle size within the range of 2,000 to 15,000 cm^2/g, and an activator comprising a phosphate ion-containing compound, to form a cement slurry;

displacing the cement slurry into the well; and

allowing the cement slurry to set.

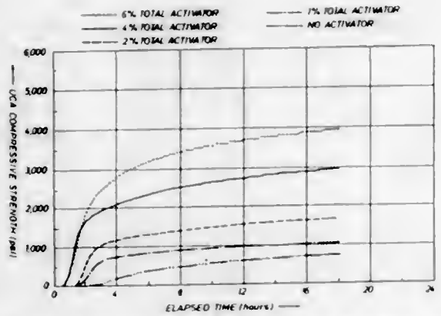
61. A method for cementing a well, comprising:

combining constituents comprising water, a blast furnace slag having a particle size within the range of 2,000 to 15,000 cm^2/g, and an activator to form a cement slurry;

5,553,673

MODULAR SELF-CONTAINED PUMP UNIT FOR VEHICLE MOUNTING

Scott D. Hackman, New Holland, Pa., assignor to Simon Lednium, Inc., Lancaster, Pa.



adjusting the weight ratio of activator-to-slag to achieve optimum compressive strength of the cement;

displacing the cement slurry into the well; and

allowing the cement slurry to set.

5,553,671

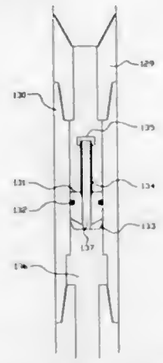
PISTON SUB FOR ISOLATING DRILLING FLUIDS FROM HYDRAULIC FLUIDS

Bobby G. Sieber, Rte. 1, Arp, Tex. 75750

Continuation-in-part of Ser. No. 201,800, Feb. 25, 1994, Pat. No. 5,425,419. This application Apr. 11, 1995, Ser. No. 420,101

Int. Cl.[6] E21B *23/00;43/00*

U.S. Cl. 166—381 **13 Claims**



10. A method of using an improved piston sub apparatus for isolating drilling fluids from hydraulic fluid, for setting hydraulic anchor-packers in downhole operations having all upper sub mated to a lower sub containing a sliding piston and riser having a riser cap; the piston, riser, and riser cap providing isolation between the hydraulic fluid and the drilling fluid comprising:

a) removing the riser cap;

b) filing the lower portion of the piston sub with hydraulic fluid;

c) filing the riser with heavy lubricant.

5,553,672

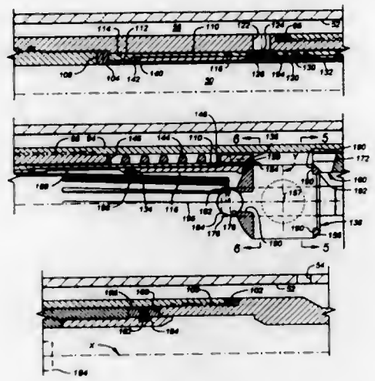
SETTING TOOL FOR A DOWNHOLE TOOL

Sidney K. Smith, Jr., Conroe, and Danny J. Holder, Spring, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Oct. 7, 1994, Ser. No. 320,056

Int. Cl.[6] E21B *23/01;23/04*

U.S. Cl. 166—382 **41 Claims**



1. A setting tool for setting a least hydraulically actuated downhole tool, comprising:

a body having a bore therethrough and a lateral opening selectively open or closed for selective flow or pressure communication between said bore and a hydraulically actuated tool;

obstruction means in said bore for selective obstruction thereof to allow pressurization of the hydraulically actuated tool through said lateral opening, said obstruction means selectively movable from a first to a second position in said bore to provide, in said second position, a substantially unobstructed passage in said bore,

actuation of said obstruction means from said first toward said second position actuates a change in orientation of said open or closed lateral opening;

actuation of said obstruction means from said first to said second position shifts a sleeve mounted on said body and having a lateral port thereon, from a first position, where said opening and said port are aligned for fluid communication, to a second position, where said opening and said port are misaligned to prevent fluid communication;

a wash tool connected to said body below said obstruction means and in fluid communication with said bore, whereupon placement of said sleeve in said second position additional hydraulically actuated tools can be actuated through applied pressure through said bore in said body through said wash tool without need to remove said body from the wellbore.

30. A method of hanging a liner, comprising:

suspending a liner on a setting tool;

inserting the liner having a hydraulically actuated hanger into preexisting casing in a wellbore;

closing off a bore in the setting tool;

dropping a ball onto a seat in a movable member to accomplish said closing off;

applying pressure into the bore of the setting tool;

communicating said applied pressure through the body of said setting tool to said hydraulically actuated hanger;

setting said hanger against the casing;

guiding said movable member to translate when a predetermined pressure is exceeded;

breaking a frangible member to allow said translation;

unlocking the movable member to rotate after a predetermined translation;

initiating rotation of said movable member after said translation;

aligning a bore in said movable member with said bore in said setting tool due to said rotation;

opening said bore in said setting tool;

closing pressure communication from said bore in said setting tool to said hanger through said body of said setting tool, as a result of said opening said bore step.

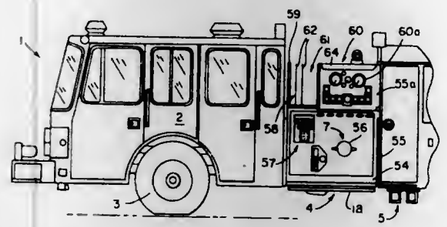
5,553,673

MODULAR SELF-CONTAINED PUMP UNIT FOR VEHICLE MOUNTING

Scott D. Hackman, New Holland, Pa., assignor to Simon Ladder Towers, Inc., Ephrata, Pa.

Filed Mar. 22, 1994, Ser. No. 215,681

Int. Cl.[6] A62C *27/00*



U.S. Cl. 169—24 **17 Claims**

1. A mobile fire fighting apparatus for over-the-road travel, comprising a wheeled support structure having laterally spaced chassis rails with a mechanically driven power unit located therebetween, a vehicle drive structure secured to a first portion of the support structure, fire fighting equipment secured to a second portion of the support structure, a pump module secured to a third portion of the structure, said pump module comprising a rigid frame structure including a front wall structure, a back wall structure and first and second side wall structures connecting the opposite side edges of said front wall and said back wall, said pump module including a pump mount support secured as an integrated part within said rigid frame structure, said pump mount support having mount elements laterally spaced in accordance with the chassis rails of said vehicle, each of said rails having chassis mount elements rigidly secured to the rail, said chassis mount elements on said chassis rails being spaced in accordance with the pump mount elements of said pump mount support and in alignment with said pump mount elements, and connectors including vibration isolating coupling members interconnecting said aligned mount elements, said connectors being releasable and forming the primary physical interconnection of said pump module to said vehicle chassis, and whereby said pump module is mounted to said chassis as a self-contained pumping unit and is removable from said chassis as a self-contained pumping unit.

5,553,674

BALLAST CLEANING MACHINE

Josef Theurer, Vienna; Herbert Wörgötter, Gallneukirchen, and Friedrich Oellerer, Linz, all of Austria, assignors to Franz Plasser Bahnbaumaschinen–Industriegesellschaft mbH, Vienna, Austria

Filed Dec. 13, 1994, Ser. No. 354,635

Claims priority, application WIPO, Jan. 5, 1994, PCT/AT94/00001; Austria, Apr. 7, 1994, 719/94; Aug. 22, 1994, 1619/94

Int. Cl.[6] E01B *27/10*

U.S. Cl. 171—16 **11 Claims**

1. A machine for cleaning ballast supporting a track, which comprises a machine frame supported on undercarriages running on the track and carrying

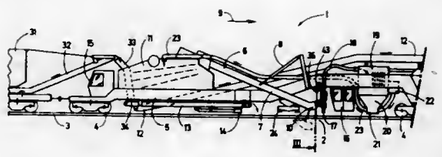
(b) a ballast screening arrangement,

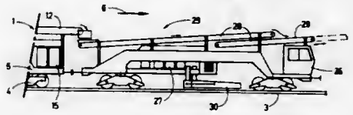
(c) a ballast excavating device including a revolvable excavating chain arranged to deliver excavated ballast to the screening arrangement for cleaning the excavated ballast,

(d) a conveyor arrangement disposed to receive the cleaned ballast from the screening arrangement and to discharge the cleaned ballast for support of the track,

(e) a laterally and vertically adjustable suction pipe having a suction opening at one end for receiving ballast, and

(f) a vacuum device connected to an opposite end of the suction pipe for applying sub-atmospheric pressure to the suction opening and thereby to suck up ballast through the suction pipe.





5,553,675

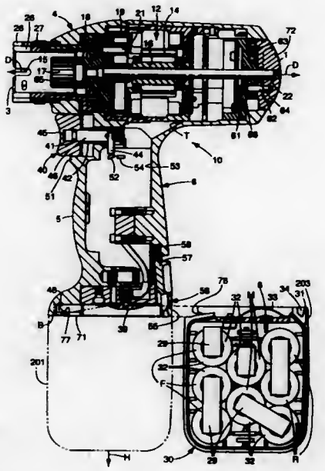
ORTHOPEDIC SURGICAL DEVICE

James F. Pitzen, Maplewood; Jeffrey D. Smith, Marine on St. Croix, both of Minn., and Charles E. Alexson, River Falls, Wis., assignors to Minnesota Mining And Manufacturing Company, St. Paul, Minn.

Filed Jun. 10, 1994, Ser. No. 258,338

Int. Cl.[6] A61B *17/32*

U.S. Cl. 173—217 **16 Claims**



7. A drive assembly for driving orthopedic surgical instruments, said drive assembly comprising:

a housing comprising elongate drive and handle portions defining drive and handle portion longitudinal axes, said handle portion projecting from said drive portion;

a drive comprising:

a motor having a motor shaft,

a transmission for transmitting the power of the motor shaft to the surgical instrument, said transmission including a drive member,

said drive portion having surfaces defining a wire receiving chamber adapted to receive an orthopedic wire adapted to be driven during an orthopedic surgical procedure;

a trigger assembly movable relative to said handle portion;

electrical circuit means operatively associated with said trigger assembly for controlling the motor;

said handle portion comprising:

a releasably attachable battery comprising at least one cell, a battery housing, and a pair of battery contacts,

a handgrip portion having a battery receiving portion with battery terminals adapted to engage said battery contacts when said battery is received in said battery receiving portion;

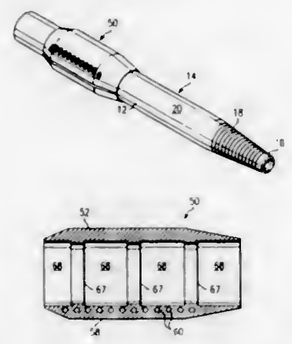
said handgrip portion having outer surfaces that are sized and shaped to be grasped by a user without touching the battery, and inner surfaces defining a handgrip cavity,

a movable thrust member partly projecting outwardly of said cavity for engagement with the surrounding formation of the

and means for modulating the pressure of fluid supplied to the chamber in synchronism with rotation of the body structure

said handgrip portion having outer surfaces that are sized and shaped to be grasped by a user without touching the battery, and inner surfaces defining a handgrip cavity,
releasable attachment means for releasably attaching the battery to the battery receiving portion in a direction other than the direction of elongation of the handle portion,
wherein said handgrip cavity is free of said transmission, said motor and any cells of said battery when said battery is received in said battery receiving portion,
biasing means for biasing said battery terminals toward a rest position, and
mounting means for mounting said battery terminals for deflection from said rest position.

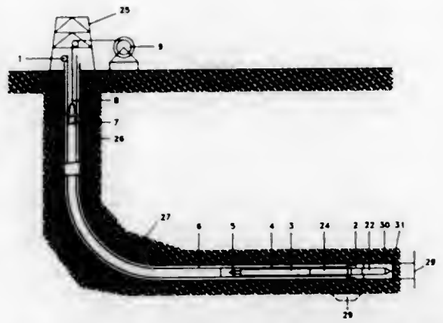
5,553,676
REVERSIBLE EXPANDER
Kelvin P. Self, Rte. 7, Box 27, and Dirk A. Wilson, 1824 Wildwood Dr., both of Stillwater, Okla. 74075
Continuation of Ser. No. 34,298, Mar. 22, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 461,967
Int. Cl.[6] E21B *7/28*
U.S. Cl. 175—19 **17 Claims**



1. An expander for an underground boring tool having an outer diameter, comprising:
a member interference fit to the outer diameter of the tool, the member defining an inner surface to engage the outer diameter of the tool in the interference fit, the inner surface defined by a series of rings and grooves, the rings in interference fit with the tool to concentrate the interference fit forces.

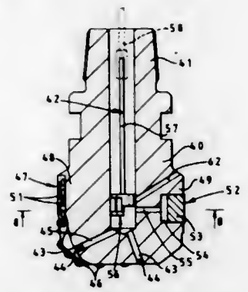
5,553,677
SURVEY PROCESS FOR CABLE CORE BORINGS AND DEVICE FOR IMPLEMENTING IT
Clemens Hinz, Marl-Sinsen, Germany, assignor to Bergwerksverband GmbH, Essen, Germany
Filed Feb. 10, 1995, Ser. No. 351,387
Claims priority, application Germany, Jun. 27, 1992, 42 21 221.9
Int. Cl.[6] E21B *47/00*
U.S. Cl. 175—40 **7 Claims**

1. A survey process for cable core borings comprising steps of:
(a) providing an inner core tube (3) having an outer core tube coupling (12,13) secured to one end thereof;
(b) providing a bore hole (26) having an outer core tube (4) situated therein, said outer core tube (4) having a boring ring (2) formed on one end and an inner core coupling (10,11) formed on another end thereof and having at least one core boring rod (6) coupled thereto;
(c) providing a self-contained measuring probe (24) for measuring sensed data and recording said sensed data;



(d) coupling said measuring probe (24) of step (c) to said inner core tube (3) of step (a);
(e) introducing said inner core tube (3) and said measuring probe (24) secured thereto into said outer core tube (4) of step (b);
(f) coupling said inner core coupling (10,11) of said outer core tube (4) with said outer core coupling (12,13) of said inner core tube (3);
(g) extracting said least one core boring rod and said outer core tube (4) coupled therewith and said inner core tube (3) and said measuring probe (24) coupled with said outer core tube (4) from said bore hole;
(h) recording simultaneously with said extracting step (g) sensed data with said measurement probe (24) in a manner correlatable over time; and
(i) transferring said sensed data from said measuring probe (24) to a portable computer for subsequent correlation with elapsed time.

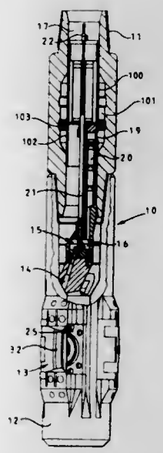
5,553,678
MODULATED BIAS UNITS FOR STEERABLE ROTARY DRILLING SYSTEMS
John D. Barr, Cheltenham; Mark W. Burrell, London; Robert A. Russell, Barnwood; Richard Thorp, Bristol; David Boast, Colerne, and John Clegg, Redland, all of England, assignors to Camco International Inc., Houston, Tex.
Continuation-in-part of Ser. No. 901,748, Jun. 22, 1992, Pat. No. 5,265,682. This application Aug. 27, 1992, Ser. No. 937,061
Claims priority, application United Kingdom, Aug. 30, 1991, 9118618
Int. Cl.[6] E21B *7/08*
U.S. Cl. 175—73 **35 Claims**



1. A modulated bias unit, for controlling the direction of drilling of a rotary drill bit when drilling boreholes in subsurface formations, comprising:
a body structure having an outer peripheral surface;
at least one cavity located at and facing outwardly of said outer peripheral surface;

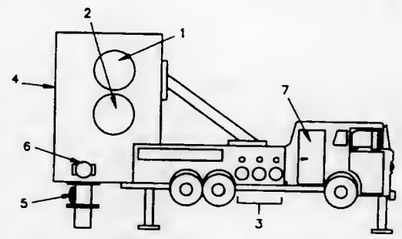
a movable thrust member partly projecting outwardly of said cavity for engagement with the surrounding formation of the borehole being drilled;
means for supplying fluid under pressure to said cavity from a source of fluid under pressure to displace said movable member outwardly and thereby displace the bias unit away from the region of the formation which the movable member engages; and
means for modulating the pressure of fluid supplied to the cavity in synchronism with rotation of the body structure, and in selected phase relation thereto, whereby said movable member is displaced outwardly at a selected rotational orientation of the body structure; and
a controllable input element coupled to said pressure modulating means, the condition of said input element determining the phase relation of the modulation of the fluid pressure to the rotation of the body structure, whereby said phase relation, and hence said rotational orientation at which said movable member is outwardly displaced, may be selected to any desired value by adjustment of the condition of said input element.

5,553,679
MODULATED BIAS UNIT FOR ROTARY DRILLING
Richard E. Thorp, Bristol, England, assignor to Camco Drilling Group Limited, Stonehouse, England
Filed May 31, 1995, Ser. No. 455,270
Claims priority, application United Kingdom, Jun. 4, 1994, 9411228
Int. Cl.[6] E21B *7/08*
U.S. Cl. 175—73 **9 Claims**



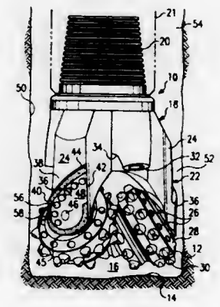
1. A modulated bias unit, for controlling the direction of drilling of a rotary drill bit when drilling boreholes in subsurface formations, comprising:
a body structure having an outer peripheral surface;
at least one chamber located adjacent said outer peripheral surface;
inlet means for supplying fluid under pressure to said chamber from a source of fluid under pressure, and outlet means for delivering fluid from said chamber to a lower pressure zone;
a movable thrust member mounted for movement outwardly and inwardly with respect to the body structure, in response to fluid pressure in said chamber;
a formation-engaging member at least partly overlying the thrust member whereby outward movement of the thrust member causes outward movement of the formation-engaging member;
and means for modulating the pressure of fluid supplied to the chamber in synchronism with rotation of the body structure, and in selected phase relation thereto whereby, as the bias unit rotates in use, said formation-engaging member is moved outwardly at a selected rotational orientation of the bias unit;
the aforesaid outlet means including at least one passage extending from said chamber outwardly through said thrust member to deliver fluid to a region where the formation-engaging member overlies the thrust member, so as to wash that region.

5,553,680
HORIZONTAL DRILLING APPARATUS
Michael D. Hathaway, 3559A Red Cloud Ct., Ft. Meade, Md. 20755
Filed Jan. 31, 1995, Ser. No. 381,567
Int. Cl.[6] E21B *7/02;7/04*
U.S. Cl. 175—78 **16 Claims**



1. A horizontal drilling apparatus for use in a predrilled vertical well bore casing having a casing head comprising a self contained vehicle provided with a sealed cable delivery container having therein cable means for raising and lowering a multi-directional horizontal drilling tool, said vehicle also provided with a fluid pumping system for pumping drilling fluid to the drilling tools, said sealed cable delivery container having means for direct attachment to the casing head of the vertical well bore, said apparatus including a computerized drilling control station for the operator control of all drilling operations, and said apparatus further including a multi-directional horizontal drilling tool that is lowered into the predrilled well bore by said cable means from the self contained vehicle.

5,553,681
ROTARY CONE DRILL BIT WITH ANGLED RAMPS
Alan D. Huffstutler, and Harry M. Campos, Jr., both of Grand Prairie, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.
Filed Dec. 7, 1994, Ser. No. 350,910
Int. Cl.[6] E21B *10/18*
U.S. Cl. 175—339 **22 Claims**



1. A rotary cone drill bit for forming a borehole, comprising:

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5,553,684
SINGLE-UNIT SYSTEM FOR CONTROLLING VEHICLE

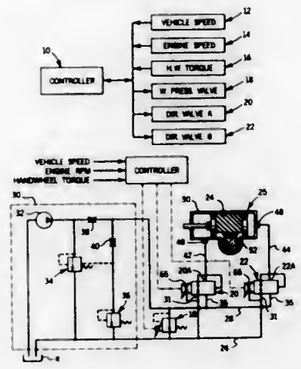
1. A lifeline roof anchor comprising:

1. A rotary cone drill bit for forming a borehole, comprising:
a bit body having an upper end portion adapted for connection to a drill string for rotation of said bit body;
a number of support arms extending from said bit body, each of said support arms having a leading edge, a trailing edge, an exterior surface disposed therebetween, and a lower shirttail portion;
a number of cutter cone assemblies equaling said number of support arms and rotatably mounted respectively on said support arms projecting generally downwardly and inwardly with respect to its associated support arm; and
a ramp formed on the exterior surface of each of said support arms, said ramps having a top surface inclined at an angle from said leading edge of said respective support arm toward said trailing edge of said respective support arm, said ramp extending along said exterior surface of said support arm between said top surface of said ramp and said shirtail of said support arm such that said ramps cooperate with each other to direct cuttings and fluid upwardly in the borehole.

5,553,682
ROCK DRILL
Rainer Batliner, Schaanwald, Liechtenstein; Anton Knoller, Landsberg, and Axel Neukirchen, München, both of Germany, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein
Filed Jun. 7, 1995, Ser. No. 474,846
Claims priority, application Germany, Jun. 4, 1994, 44 19 641.5
Int. Cl.[6] E21B *10/40*
U.S. Cl. 175—395 **9 Claims**

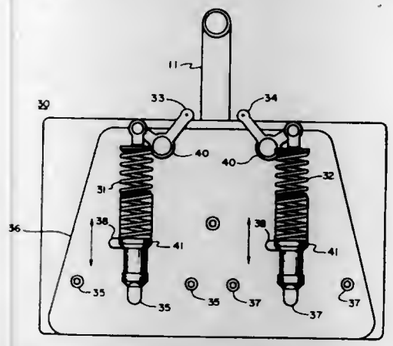
1. Rock drill comprising an axially elongated shank having a chucking shank part (1) at a first end, and a drilling shank part (2) extending from said chucking shank part with at least four conveying flutes (4, 5, 6, 7) formed in an outside surface of said drilling shank and extending parallel to one another, and a drilling head (3, 13, 23) at a second end secured to said drilling shank part and formed of a hard metal, said drilling head having four removal flutes (8, 9, 10, 11, 14, 15, 16, 17, 24, 25, 26, 27) extending in the axial direction of said shank and spaced apart about an outside circumferential surface thereof; said removal flutes (8, 9, 10, 11, 14, 15, 16, 17, 24, 25, 26, 27) and conveying flutes (4, 5, 6, 7) are in register at a transition from said drilling head (3, 13, 23) to said drilling shank part (2) wherein the improvement comprises that said removal flutes (8, 9, 10, 11, 14, 15, 16, 17, 24, 25, 26, 27) have transverse cross-sections of different sizes.

5,553,683
VARIABLE ASSIST POWER STEERING SYSTEM WITH ELECTRO-HYDRAULIC WORKING PRESSURE AND DIRECTIONAL PRESSURE CONTROL
Craig E. Wenzel, Menomonee Falls; Thomas J. Stobbs, Brookfield, and James R. Ward, Milwaukee; all of Wis., assignors to Applied Power Inc., Butler, Wis.
Filed Jan. 20, 1995, Ser. No. 376,181
Int. Cl.[6] B62D *6/00*
U.S. Cl. 180—417 **4 Claims**



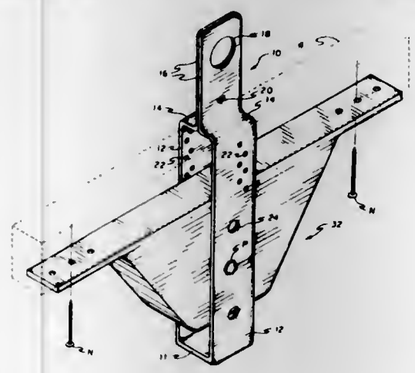
1. A variable assist power steering system for a motor vehicle, comprising:
hydraulic motor means for moving in either of two directions in response to two hydraulic pressure inputs, one of said inputs being for moving said motor in one direction and the other said input being for moving said motor in the other direction;
a source of hydraulic pressure for producing a source pressure;
a hydraulic working pressure line in communication with said source;
a pressure relief line;
means for sensing hand wheel torque and producing a hand wheel torque signal in response thereto;
an electro-hydraulic working pressure valve in communication with said working pressure line and said pressure relief line for variably controlling the hydraulic communication between said working pressure line and said pressure relief line so as to reduce said source pressure to a hydraulic working pressure in said working pressure line, said working pressure valve normally maintaining said working pressure at a relatively low relief pressure in said pressure relief line when said vehicle is not being steered and being actuable by an electrical signal input to increase said pressure to a working pressure level which is between said relief pressure and said source pressure in response to said hand wheel torque signal;
a pair of electro-hydraulic direction control valves in hydraulic communication with said working pressure line, each said motor input being in hydraulic communication with a different one of said direction control valves, each said direction control valve being selectively actuable by an electrical signal input to control the magnitude of pressure communicated from said working pressure line no a corresponding motor input; and
a controller for generating electrical signals to actuate said working pressure valve and said direction control valves.

5,553,684
SINGLE-UNIT SYSTEM FOR CONTROLLING VEHICLE ACCELERATION AND BRAKING
Scott A. Bolduc, 1284 Ashland Dr., Baton Rouge, La. 70806
Filed Aug. 29, 1994, Ser. No. 298,207
Int. Cl.[6] B60K *26/00*
U.S. Cl. 180—333 **5 Claims**



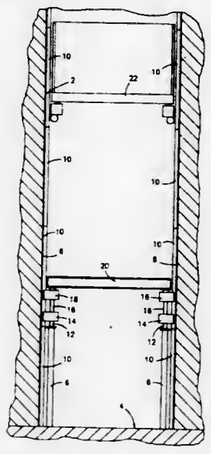
1. A control device for a vehicle having an accelerator pedal and a brake pedal, said device comprising:
a. a human-interface device;
b. an electronic servo connected to said human-interface device, wherein said electronic servo translates mechanical movement of said human-interface device into a first electronic signal;
c. command means connected to said electronic servo, wherein said command means receives and processes said first electronic signal;
d. an acceleration/braking assembly coupled to said command means and having a first assembly component coupled to said accelerator and a second assembly component coupled to said brake pedal of said vehicle, wherein said command means transmits to said acceleration/braking assembly a second electronic signal corresponding to said first electronic signal so as to effect movement of said gas pedal and/or said brake pedal; and
e. feedback means connected to said human-interface device, wherein said feedback means regulates resistance to movement of said human-interface device.

5,553,685
ROOF SAFETY ANCHOR
Alan R. Cook, 7005 Trappers Ct., Manassas, Va. 22111
Filed Dec. 28, 1994, Ser. No. 365,018
Int. Cl.[6] A62B *35/00*
U.S. Cl. 182—45 **11 Claims**



1. A lifeline roof anchor comprising:
a unitary, rafter encircling, rigid member, said member including a boop portion for encircling a rafter, and a tab portion extending upwardly from said hoop portion, said tab portion having means defining an aperture for connection of a safety lifeline, and
a mounting means for securing the roof anchor to the rafter, said mounting means including a rigid, continuous, bracing member formed with two ends, said bracing member having a bend at each of a pair of points equidistant from the center of said bracing member, said bracing member running perpendicularly downward to form a pair of flanging members which interlock with the lower portion of said hoop portion, there further being a return bend on each of said flanging members at an upward acute angle to form a pair of struts, there being a bend on each of said struts forming a pair of contact members, said contact members each having means defining at least one tacking aperture for passage of a fastener therethrough.

5,553,686
INSTALLATION OF ELEVATOR RAILS IN A HOISTWAY
Andrew M. Jensen, Hamilton, Canada, assignor to Otis Elevator Company, Farmington, Conn.
Filed Dec. 13, 1994, Ser. No. 354,979
Int. Cl.[6] B66B *7/02*
U.S. Cl. 187—408 **11 Claims**



1. A method of erecting guide rails in an elevator hoistway, said method comprising the steps of:
a) providing a supply of guide rails on a floor of a pit of the hoistway;
b) providing a stack of interconnected guide rails on a wall of the hoistway, said stack of rails extending into the pit of the hoistway;
c) placing a first guide rail from said supply thereof at a bottom end of said stack of guide rails and securing said first guide rail to a lowermost guide rail in said stack thereof;
d) gripping said first guide rail and jacking up said first guide rail and the overlying guide rail stack from the pit a distance which is less than the length of said first guide rail to raise said first guide rail to a first level above the pit floor;
e) holding said first guide rail at said first level;
f) re-gripping said first guide rail and jacking up said first guide rail and the overlying guide rail stack a distance which is less than the length of said first guide rail to raise said first guide rail to a second level which is above said first level;
g) holding said first guide rail at said second level; and

h) repeating steps d)–g) until said first guide rail has been raised above the pit floor a distance which allows placement of a second guide rail below said first guide rail.

a floating metal structure interposed between said first disk and the pistons of said plurality of jacks, for distributing pressure exerted on the stack of disks;
wherein said floating metal structure has a generally circular

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MECHANICALLY ACTUATED DRUM BRAKE
Jean Claude Mery, Pavillons Sous Bois, and Pierre Pressaco, La Courneuve, both of France, assignors to AlliedSignal

h) repeating steps d)–g) until said first guide rail has been raised above the pit floor a distance which allows placement of a second guide rail below said first guide rail.

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METHOD FOR ASSEMBLYING AND ADJUSTING A DRUM BRAKE

Christian Ricult, Paris, France, assignor to AlliedSignal Aftermarket Europe, Drancy, France

Continuation of Ser. No. 420,271, Apr. 11, 1995, abandoned, which is a continuation-in-part of Ser. No. 252,853, Jun. 2, 1994, abandoned. This application Jan. 31, 1996, Ser. No. 594,480

Int. Cl.[6] F16D *65/56*

U.S. Cl. 188—79.54 **1 Claim**

1. A method of assembling a subassembly for a brake of the type having a drum of given inside diameter and which comprises: a backplate; two shoes, each of which exhibits a lower end and an upper end; return springs urging the shoes toward one another; a wheel cylinder secured to the backplate and capable of moving the upper ends of the shoes away from one another; an anchoring unit of given width secured to the backplate and on which the lower ends of the shoes rest; and a strut of adjustable length limiting the degree to which the shoes come together, the assembly method comprising preassembling and adjusting the subassembly of the brake prior to assembly of said brake on the backing plate and consisting of the steps of:

placing the two brake shoes on a surface;

locating the adjustable-length strut between the shoes;

adjusting the length of the strut to a value for which the shoes are separated by a maximum diametral distance which is less than the inside diameter of the drum;

fastening the return springs to the shoes; and

locating between the shoes, at a distance from the strut, a removable wedge the length of which is such that a stress is applied to the return springs.

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CUTOFF VALVE FOR PISTONS OF HYDRAULIC SELF-ADJUSTING DEVICES

Carlos Gabas, 180, calle Rocafort, 08029 Barcelona, Spain

PCT No. PCT/ES94/00037, § 371 Date Jan. 20, 1995, § 102(e) Date Jan. 20, 1995, PCT Pub. No. WO95/01514, PCT Pub. Date Jan. 12, 1995

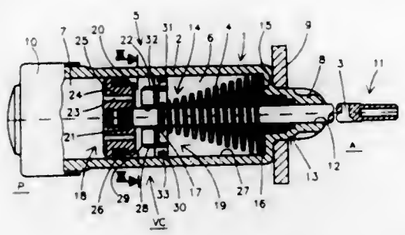
PCT Filed Apr. 12, 1994, Ser. No. 374,668

Claims priority, application Spain, Jun. 30, 1993, 9301467

Int. Cl.[6] F16C *1/22;* **F16D** *13/75*

U.S. Cl. 188—196 A **12 Claims**

1. A cutoff valve for a piston of a hydraulic self-adjusting device which includes a substantially cylindrical hollow body with a liquid fluid, an adjustment rod with an internal end provided with the piston and an external end protruding outside of the main body, an adjustment compression spring arranged inside the main body and having one end resting against an end of the main body from



which the rod protrudes and another end resting against an internal end of the adjustment rod through a transverse support shoulder provided on the rod, the cutoff comprising an essentially cylindrical through element, an essentially cylindrical cutoff element, said through element being attachable to the internal end of the adjustment rod and having a plurality of longitudinal through holes through which the liquid fluid contained in the main body can flow, said cutoff element being slidable on the adjustment rod between said through element and the transverse support shoulder, said cutoff element having an end which faces said through element and is provided with a coaxial front groove; a cutoff joint arranged in said coaxial front groove and having such a size that when the valve is in a closed position it blocks said through holes of said through element thus preventing the liquid fluid from flowing, said cutoff element having a peripheral thickening with a plurality of longitudinal channels through which the liquid fluid contained within the main body can flow freely, said thickening having a coaxial groove provided with a sealing element which presses constantly against an inner surface of the main body.

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ADDITIONAL STRUCTURE FOR IMPROVING THE PRESSURE DISTRIBUTION ON THE DISKS OF AN AIRCRAFT BRAKE

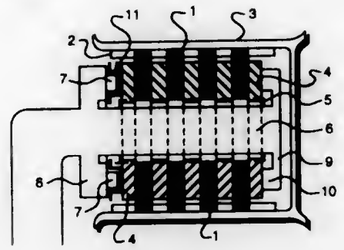
Jean-Louis Chareire, 66 rue Aristide Briand, 92300 Levallois, France

Filed Sep. 19, 1994, Ser. No. 308,846

Claims priority, application France, Sep. 17, 1993, 9311087

Int. Cl.[6] F16D *55/36*

U.S. Cl. 188—217 **12 Claims**



1. An aircraft brake comprising:

a wheel rim;

a wheel hub;

rotor disks adapted to rotate with the wheel rim;

stator disks adapted to be locked in rotation by the wheel hub, and arranged in alternating manner with rotor disks, whereby to form a stack of disks arranged along a common axis;

a first ring integral with the wheel hub and facing a first end of the stack of disks;

a retaining ring facing another end of the stack of disks;

a plurality of jacks each having a cylinder carried by the first ring and a piston adapted to engage a first disk of said stack of disks; and

a floating metal structure interposed between said first disk and the pistons of said plurality of jacks, for distributing pressure exerted on the stack of disks;

wherein said floating metal structure has a generally circular shape, is arranged coaxially with the disks and has substantially a U shape in cross-section, said floating metal structure thus having a flat base, two substantially parallel sides, and internal and external concentric rings extending towards the outside of the U shape in cross-section, substantially parallel to the flat base;

wherein the cylinders of the jacks are inserted between the sides of said floating metal structure, with a given clearance; and

wherein all the pistons of the jacks bear on the flat base of said floating metal structure.

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LOCKING DEVICE FOR FLUID PRESSURE CYLINDER

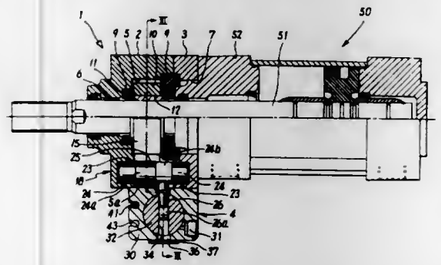
Hidehito Takahashi, Yawara-mura, Japan, assignor to SMC Corporation, Tokyo, Japan

Filed Jul. 6, 1995, Ser. No. 498,799

Claims priority, application Japan, Aug. 1, 1994, 6-199037

Int. Cl.[6] F16F *9/44;* **A47B** *9/10*

U.S. Cl. 118—300 **9 Claims**



1. A locking device for a fluid pressure cylinder, comprising:

a body mounted on the fluid pressure cylinder in such manner that a piston rod of the cylinder passes therethrough;

a shoe holder arranged inside said body, said shoe holder having a shoe mounting hole with a diameter reducible by providing a slit, and said rod is passed through said shoe mounting hole when said body is mounted on the fluid pressure cylinder;

a brake shoe mounted in a shoe mounting hole of said shoe holder and for finely holding the rod as the brake shoe is reduced in diameter when the mounting hole is reduced in diameter; and

eccentric cam means for reducing the shoe mounting hole in diameter by exerting pressure on said shoe holder, said eccentric cam means comprising a cam shaft rotatably supported at a given position on said body, a cam member arranged eccentrically on said cam shaft and pressing said shoe holder in a direction to reduce the shoe mounting hole in diameter when said cam shaft is rotated in a locking direction, and releasing the pushing pressure when the cam shaft is rotated in an unlocking direction, and a brake arm extending from said cam shaft in a lateral direction and for rotating said cam shaft in said locking and unlocking directions.

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MECHANICALLY ACTUATED DRUM BRAKE

Jean Claude Mery, Pavillons Sous Bois, and Pierre Pressaco, La Courneuve, both of France, assignors to AlliedSignal Europe Services Techniques, Drancy, France

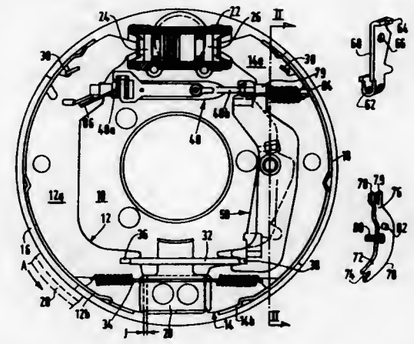
PCT No. PCT/FR93/00978, § 371 Date Mar. 15, 1995, § 102(e) Date Mar. 15, 1995, PCT Pub. No. WO94/10473, PCT Pub. Date May 11, 1994

PCT Filed Oct. 5, 1993, Ser. No. 133,101

Claims priority, application France, Oct. 30, 1992, 92 13049

Int. Cl.[6] F16D *51/50*

U.S. Cl. 188—338 **3 Claims**



1. A drum brake comprising a support plate; first and second shoes slidably mounted on the support plate and each one comprising a web and a rim, each rim having opposite the drum a face bearing a friction lining; a hydraulic actuation device capable of acting on a first end of the web of each shoe to press the friction linings against the drum; a first spacer of variable length arranged between the shoes in the vicinity of the first ends of the webs to determine the separation of the shoes; a bearing component secured to the support plate and capable of acting as a bearing face for second ends of the webs of each shoe; and a mechanical actuation device comprising a first actuating lever, a second force-distributing lever, and a second spacer arranged between the shoes in the vicinity of the second ends of the webs, said first lever having a first end capable of receiving an actuation force and an opposite second end via which the lever can press, under the effect of the actuation force, against the first shoe to force the first shoe toward the drum, said second lever having first and second ends bearing on the respective ends of the first and second spacers which are located adjacent said first shoe, and said first and second levers being articulated on one another at an articulation point which is intermediate between the respective lever ends.

5,553,692

MOBILE CARRYING CASE

Samuel R. Sheiman, Rockville Center, N.Y., assignor to Crest Lock Co., Inc., Brooklyn, N.Y.

Filed Jan. 17, 1995, Ser. No. 373,067

Int. Cl.[6] A45C *5/14;13/26*

U.S. Cl. 190—18 A **8 Claims**

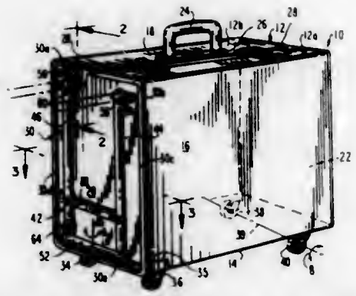
1. A mobile carrying case, comprising:

a) a container including top, bottom and side walls having peripheral end flanges, and end walls bounding end cavities with the peripheral end flanges, all of said walls bounding an interior;

b) a carrying handle on the top wall;

c) a plurality of wheels on the bottom wall;

d) a steering handle assembly exteriorly mounted on one of the end walls for movement between a stowed position in which the assembly is essentially contained within one of the end cavities, and a plurality of steering positions in each of which the assembly extends outwardly of said one end cavity, said



steering handle assembly including a pair of storage tubes mounted on said one end wall for pivoting movement among said positions, and one of said tubes having three exterior abutment surfaces; and

e) means for holding the assembly in each of said positions, said holding means including a spring mounted between said one tube and said one end wall for holding said one tube in a selected one of said positions, said spring engaging one of the abutment surfaces the stowed position, another of the abutment surfaces in a first steering position, and still another of the abutment surfaces in a second steering position.

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HYDROKINETIC TORQUE CONVERTER WITH LOCK-UP CLUTCH

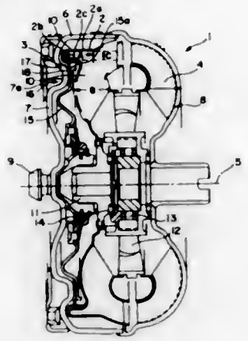
Bernd Schöder, Münnerstadt; Johannes Sossnitza, Unterspiesheim; Jürgen Demgensky, Schweinfurt; Josef Riedmann, Arnstein; Horst Jädicke, Gochsheim; Wilfried Glock, Dittelbrunn-Hambach, and Friedrich Schramm, Schonungen-Forst, all of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Jun. 22, 1994, Ser. No. 263,772

Claims priority, application Germany, Jun. 23, 1993, 43 20 768.5; May 7, 1994, 44 16 263.4

Int. Cl.[6] F16H *45/02*

U.S. Cl. 192—3.29 **20 Claims**



1. A hydrokinetic lockup torque converter such as for a motor vehicle, said torque converter comprising:

a longitudinal axis;

said torque converter being disposed substantially concentrically about said longitudinal axis;

a housing;

said housing comprising:

a first housing wall portion having means for being disposed adjacent a source of torque;

a second housing wall portion disposed at an axial distance from said first housing wall portion;

a pump wheel, said pump wheel being disposed adjacent said second housing wall portion;

a turbine wheel, said turbine wheel being disposed between said pump wheel and said first housing wall portion;

said turbine wheel having means for being disposed on an output shaft;

a lockup clutch disposed between said first housing wall portion and said turbine wheel;

said lockup clutch comprising:

at least one friction plate disposed between said turbine wheel and said first housing wall portion;

said turbine wheel comprising:

a turbine wall portion;

said turbine wall portion comprising:

a first portion and a second portion;

an inner turbine wall surface comprising:

a first portion disposed adjacent blades of said turbine wheel and disposed towards said pump wheel; and

a second portion extending axially outwardly towards said first housing wall portion;

an outer turbine wall surface disposed opposite said inner turbine wall surface and disposed away from the blades of said turbine wheel;

said first portion of said inner turbine wall surface being disposed on said first portion of said turbine wall portion;

said second portion of said inner turbine wall surface being disposed on said second portion of said turbine wall portion; and

means for connecting said turbine wall portion to said at least one friction plate, said means for connecting being at least substantially adjacent to said second portion of said turbine wall portion.

5,553,694

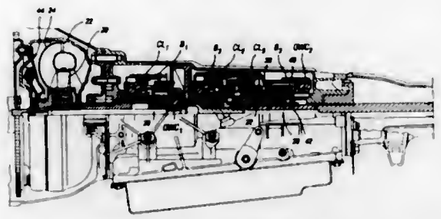
MULTIPLE RATIO AUTOMATIC TRANSMISSION AND TORQUE CONVERTER

Winfried F. Schulz, Pulheim; Johann Kirchhoffer, and Hans-Peter Wirtz, both of Cologne, all of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 323,464, Oct. 14, 1994. This application Sep. 11, 1995, Ser. No. 526,457

Int. Cl.[6] B60K *41/04*

U.S. Cl. 192—3.3 **7 Claims**



1. An automatic control for a hydrokinetic, multiple ratio transmission for delivering torque from an engine to a driven member comprising a hydrokinetic torque converter and multiple ratio gearing, said torque converter having an impeller driven by said engine and a turbine connected to a torque input element of said gearing, a torque output portion of said gearing being connected to said driven member;

said transmission including fluid pressure-operated clutch and brake means for establishing and disestablishing torque ratio changes in said gearing;

a pressure source, a control valve system connecting said pressure source to said clutch and brake means;

a pressure-operated torque converter torque bypass clutch in said converter, said bypass clutch establishing a friction torque flow path between said turbine and said impeller when it is engaged, said bypass clutch comprising a clutch piston in said

converter and defining in said converter a bypass clutch release pressure chamber and a bypass clutch apply pressure chamber;

said clutch piston being engaged with a torque transmitting capacity that is dependent upon pressure differential across said clutch piston;

a bypass clutch apply pressure passage communicating with said converter, a bypass clutch release pressure passage communicating with said release pressure chamber;

main pressure regulator valve means in said valve system for regulating control pressure in said valve system;

accumulator valve means in said valve system communicating with said main pressure regulator valve means for establishing an accumulator threshold pressure in said release chamber;

a converter fluid cooler and transmission lubrication circuit including converter cooler and lubrication portions;

converter clutch control valve means, movable between first and second positions, communicating with said apply pressure passage for delivering pressure in said apply pressure passage to said cooler and lubrication circuit when it assumes said first position;

a converter pressure solenoid valve means communicating with said main pressure regulator valve means and said converter clutch control valve means, said bypass clutch apply pressure passage communicating with said converter pressure solenoid valve means when said converter clutch control valve means assumes said second position for varying pressure differential across said clutch piston; and

electronic control means responsive to operating variables for energizing said solenoid control means whereby said bypass clutch capacity is controlled to effect smooth engagement and release.

5,553,695

FRICTION CLUTCH FOR A TRANSMISSION OF A MOTOR VEHICLE AND A FRICTION LINING FOR A FRICTION CLUTCH

Dieter Lutz; Franz-Josef Hörth, both of Schweinfurt; Hartmut Heide, Zeil; Hilmar Göbel, Grafenrheinfeld, all of Germany; Alan E. L. Littell, Sao Bernardo do Campo, Brazil; Josef Vonderau, Bad Neustadt, Germany; Armin Held, Schweinfurt, Germany, and Erich Scheer, Prosselsheim, Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

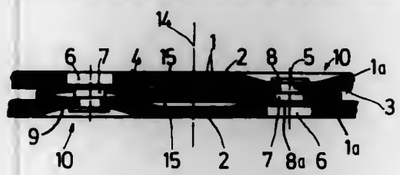
Filed Oct. 13, 1994, Ser. No. 322,771

Claims priority, application Germany, Oct. 15, 1993, 43 35 208.1

Int. Cl.[6] F16D *13/64*

U.S. Cl. 192—70.14 **20 Claims**

1. A friction clutch, for a transmission for a motor vehicle, said



friction clutch comprising:

a housing;

a clutch disc disposed within said housing, said clutch disc defining an axis of rotation and an axial direction parallel to said axis of rotation;

pressure plate means disposed within said housing and movable in said axial direction, said pressure plate means for applying an axial force to said clutch disc along the axial direction;

biasing means for biasing said pressure plate means in the axial direction to apply said axial force to said clutch disc;

said clutch disc comprising:

a hub, said hub comprising means for engaging shaft means of a transmission, and said hub having a diameter and a circumference;

a hub disc disposed concentrically about said hub and extending radially away from said hub, said hub disc having a first side and a second side;

at least one friction lining disposed concentrically about said hub and adjacent said hub disc, said at least one friction lining for being engaged between said pressure plate means and a rotating member of an engine;

said at least one friction lining having a mass; and

means for supporting said at least one friction lining between said pressure plate means and a rotating member of an engine;

said at least one friction lining having a first surface for being engaged by one of:

said pressure plate means and a rotating member of an engine, and a second surface disposed opposite said first surface;

said first surface comprising a plurality of depressions therein;

said depressions comprising a first portion within said friction lining, and said depressions comprising a second portion adjacent said first surface;

said first portion having a cross-section;

said first cross-section having an area;

said second portion having a cross-section;

said second cross-section having an area;

said first cross-section having a diametral dimension, said first diametral dimension being disposed across said first portion, and said first diametral dimension being substantially parallel to said first surface;

said second cross-section having a diametral dimension, said second diametral dimension being disposed across said second portion, and said second diametral dimension being substantially parallel to said first surface;

said first cross-section area being disposed substantially parallel to said first surface;

said second cross-section area being substantially parallel to said first surface;

said second cross-section area being disposed about said first cross-section area;

said cross-section area of said second portion being substantially greater than said cross-section area of said first portion;

said second diametral dimension being substantially greater than said first diametral dimension;

said depressions being of sufficient size to substantially reduce the overall mass of said friction lining in comparison to an identical friction lining without said depressions;

said friction clutch further comprising:

a plurality of rivets for fastening said at least one friction lining to said means for supporting; and

said plurality of rivets each comprising a head portion, said head portion contacting its corresponding first portion of its corresponding depression.

5,553,696

SECURITY DEVICE FOR BILL CHANGERS

Benard Burson, Jr., 3000 Skylark Dr., Austin, Tex. 78757

Filed Jan. 13, 1995, Ser. No. 372,601

Int. Cl.[6] G07F *9/02;7/04*

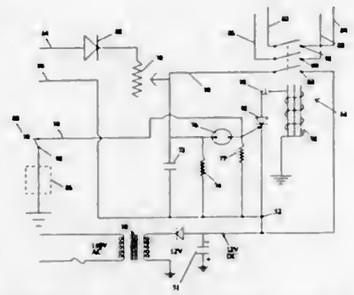
U.S. Cl. 194—201 **18 Claims**

10. A security device for use with a bill changer comprising:

electrically responsive switching means adapted to be connected with operating circuitry of the bill changer, said switching means having a mode for disabling the operation of the circuitry,

timing means responsive to electrical pulses provided by the circuitry in correspondence to an abnormal delivery of coinage by the changer, said timing means having an alarm condition caused by receipt of said electrical pulses caused by said abnormal coinage delivery, and

said first end of said first pawl connected to said first end of said



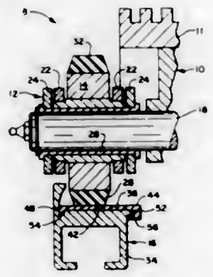
control means for directing the switching means to said disabling mode when the timing means reaches said alarm condition.

5,553,697

OVERLAY FOR A PASSENGER CONVEYOR ROLLER TRACK

Arthur McClement, Bloomington, Ind., assignor to Otis Elevator Company, Farmington, Conn.

Filed Jun. 15, 1995, Ser. No. 491,004
Int. Cl.[6] B66B *23/12*
U.S. Cl. 198—332 **21 Claims**



10. A roller track for a passenger conveyor, the passenger conveyor including a plurality of sequentially connected platforms for bearing passengers, each of the platforms including a pair of rollers, the interconnected platforms moving through a path defined by engagement between the plurality of rollers and the roller track, the roller track including a plurality of segments and an overlay, the plurality of segments joined sequentially to form a plurality of joints between adjacent segments, the overlay extending over the plurality of segments and joints, the overlay having an engagement surface for the plurality of rollers.

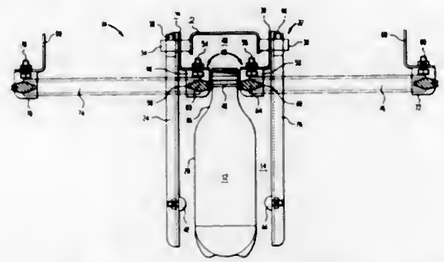
5,553,698

CONVEYOR BELT APPARATUS FOR BOTTLES

John R. Patois, Wayne, N.J., and Jack D. Warren, Oshkosh, Wis., assignors to J and J Container Handling Systems, Little Falls, N.J.

Filed Dec. 28, 1994, Ser. No. 365,558
Int. Cl.[6] B65G *15/14*
U.S. Cl. 198—626.1 **31 Claims**

1. A conveyor apparatus for bottles, comprising:
a housing comprising:
a guide path therein, the guide path including:
an inlet area,
an outlet area, and
a transport area intermediate the inlet area and the outlet area;



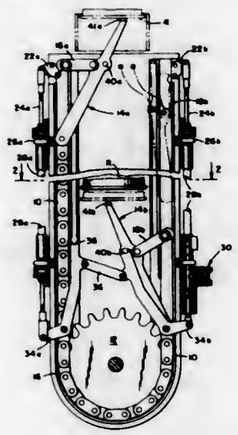
a support block extending between the inlet area and the outlet area of the guide path, the support block comprising:
a first portion formed to define a first region of a support path,
a second portion formed to define a second region of the support path, and
fastening means connecting the first portion to the second portion to provide coaction between the first region and the second region to form the support path; and
conveying means disposed for movement in the support path, the conveying means comprising:
a groove extending along the length of the conveying means, the groove having opposed sides with an inherent resiliency and constructed and arranged to extend from the support path to open the groove when the conveying means is in the inlet area and the outlet area, and to close the groove when the conveying means is in the transport area.

5,553,699

HIGH CYCLE RATE TRANSFER DEVICE

Kenneth W. Hummel, Coon Rapids, and David S. Warwick, Mounds View, both of Minn., assignors to FMC Corp., Chicago, Ill.

Filed Oct. 6, 1994, Ser. No. 317,623
Int. Cl.[6] B65G *25/00*
U.S. Cl. 198—737 **4 Claims**



1. A high cycle rate transfer device comprising:
a chain having a first and a second end disposed in a track;
means for driving said chain;
a first pawl with a first end, an intermediate section and a second end;
a second pawl with a first end, an intermediate section and a second end;

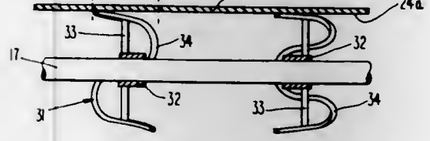
said first end of said first pawl connected to said first end of said chain;
said first end of said second pawl connected to said second end of said chain;
a first guide pin connected to said first pawl at said intermediate section;
a second guide pin connected to said intermediate section of said second pawl;
a first pawl support link connected to said intermediate section of said first pawl
a second pawl support link connected to said intermediate section of said second pawl;
a first pawl cam arm connected to a first cam arm control cable;
a second pawl cam arm connected to a second cam arm control cable;
said first pawl cam arm located to guide said first pawl support link in said track wherein said chain is disposed:
said second pawl cam arm located to guide said second pawl support link in said track wherein said chain is disposed;
a first pawl control arm connected to a first lower control cable;
said first pawl control arm further connected to said chain and having an extended section disposed in another track adjacent to said track in which said chain is disposed;
said first pawl control arm further having connections with a second pawl control arm; and
said pawl control arm overlapping said second pawl and connected to said chain at said second end and further connected to a second lower cam arm control cable.

5,553,700

TREATMENT METHOD AND APPARATUS FOR PRINTED CIRCUIT BOARDS AND THE LIKE

Stanley B. Smith, Boalsburg, and G. Allen Blakeslee, Bellefonte, both of Pa., assignors to Atotech USA, Inc., State College, Pa.

Filed Apr. 10, 1995, Ser. No. 419,717
Int. Cl.[6] B65G *13/02*; **C23C** *14/00*; **C25B** *9/00*; *11/00*
U.S. Cl. 198—780 **5 Claims**



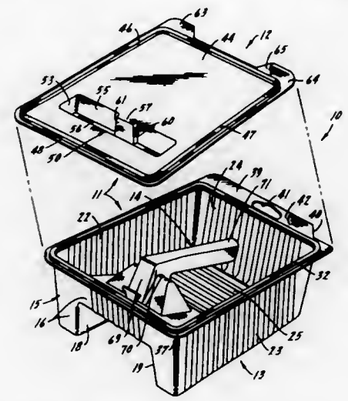
5. An apparatus for use in transporting articles which are to be treated in an etching, rinsing or other chemical treatment operation associated with the preparation of printed circuit boards, said apparatus comprising:
a) a treatment zone;
b) transport means in the treatment zone for defining a generally longitudinal path of travel through said apparatus;
c) treatment delivery means in the treatment zone for delivering a treatment of a chemical processing step to said articles;
d) wherein said transport means includes conveying means, said conveying means comprising a plurality of rotatable rods, each having a plurality of spaced apart rotation members;
e) said rotation members each having a hub mounted on and in driven relation to a rod, a peripheral rim, and support means between the hub and the rim for supporting the rim;
f) with the rim of each rotation member being configured to define on an article being conveyed, an aggregate contact path in each revolution of the rotation member, which contact path is greater that the circumference of the rotation member;
g) wherein said rotation member rim is provided having a continuous sinuous configuration; and
h) wherein said support means comprise a plurality of spokes connecting said hub with said rim.

5,553,701

PAINT KIT INCLUDING SEALABLE TRAY ASSEMBLY

James J. Jarecki, and Bruce C. Polzin, both of Greendale, Wis., assignors to Newell Operating Company, Rockford, Ill.

Filed Aug. 29, 1994, Ser. No. 298,026
Int. Cl.[6] A45D *44/18*; **B05C** *21/00*
U.S. Cl. 206—15.2 **10 Claims**



1. In a paint tray assembly,
a lid having an upper surface and a lower surface, and
a tray,
said tray having a continuous peripheral rib about its upper periphery,
said lid having a continuous, peripheral rib about its periphery, said lid defining a covering portion therewithin, no portion of said covering portion extending above said peripheral rib,
said lid rib having a contour which is complementary to the tray rib contour whereby the tray lid may be received in the lid rib, the inner width dimension of the lid rib being slightly less than the outer width dimension of the tray rib,
said lid and tray rib being formed from a flexible material having the flexure and memory characteristics of plastic,
whereby, when said lid rib is brought into engagement with said tray rib the lid rib flexes with respect to the tray rib and, upon engagement, remains in tension in a deformed condition to thereby lock said rib to said tray in a sealing relationship,
said lid having applicator abutment means extending downwardly from the lower surface of the lid and into the tray when said lid is assembled to said tray,
said applicator abutment means being located to block movement of an applicator having a handle contained within the assembled lid and tray in a direction parallel to the axis of the handle.

7. In a paint kit,
a paint applicator
a paint tray having side walls and ends, and
a paint lid having an upper surface and a lower surface,
said paint applicator being of a size and configuration to be received within the paint tray when said lid is assembled to said tray to form a three-part kit, said applicator and said lid having positioning means cooperable with one another when the kit is in an assembled condition which maintains the applicator in generally the same relative position with respect to the paint tray in all relative positions of the kit to the horizontal,
said applicator being a conventional paint pad carried by a handle,
said lid positioning means including a recess in the lid located above the pad area of the paint pad when the lid, tray and pad are assembled,
said recess being located in front of and generally aligned with the front surface of a support structure of the pad beneath the lower surface of the lid whereby motion of the pad in a

direction toward the recess is precluded in all relative positions of the lid to the horizontal,

said recess further having associated therewith a pair of generally vertically disposed members which extend downwardly from the lower surface of the lid and flank a portion of the pad support structure,

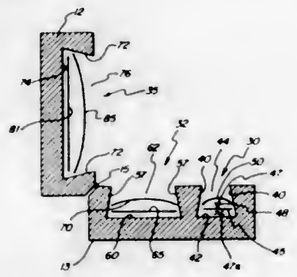
whereby motion of the pad in a direction toward either side wall of the tray is precluded in all relative positions of the kit to the horizontal.

5,553,702

KEEPSAKE HOLDER

Karen Walsh, 1 High Trail, New Milford, Conn. 06776

Filed Jun. 2, 1995, Ser. No. 460,312
Int. Cl.[6] A45C *15/00*
U.S. Cl. 206—38 **20 Claims**



1. A keepsake holder for holding a keepsake, comprising:

a first housing section;

a second housing section;

at least one hinge mounted adjacent to an edge of said first and second housing sections for allowing relative movement therebetween;

at least one keepsake compartment formed in said second housing section for receiving the keepsake, each keepsake compartment including tapered side walls which terminate in a rear surface of each keepsake compartment, said tapered side walls defining an opening in each keepsake compartment, said rear surface of each keepsake compartment having wider dimensions than said opening in each keepsake compartment; and

retention means received in said keepsake compartment for retaining the keepsake in said keepsake compartment, said retention means being formed of a transparent material for allowing viewing of the keepsake within said keepsake compartment.

5,553,703

Patent Not Issued For This Number

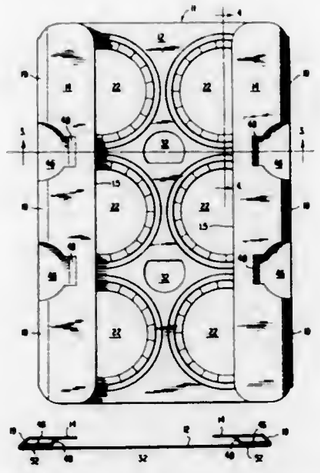
5,553,704

STACKABLE CAN CARRIER

Robert L. Gordon, Monroe, and Linda A. Bernstein, Campbell Hall, both of N.Y., assignors to International Paper, Purchase, N.Y.

Filed Oct. 11, 1994, Ser. No. 321,199
Int. Cl.[6] B65D *75/00*
U.S. Cl. 206—158 **5 Claims**

1. A stackable can carrier formed from a unitary paperboard blank, said carrier having a generally flat bottom panel having an upper surface, said bottom panel having two opposed longitudinal edges, said bottom panel having a plurality of openings, each said opening having a periphery, each said periphery having resilient fingers for receiving chimes of individual cans, a flap at each of said opposed bottom longitudinal panel edges, each said flap being folded over said bottom panel upper surface so as to be substantially parallel thereto, each said flap having a free edge, each said flap having at least one pair of spaced cuts therethrough, each cut of each of said pairs of cuts having a corresponding first terminal end, a primary fold line extending between respective intermediate portions of each cut of each of said pairs of cuts, said cuts extending from said longitudinal edges of said bottom panel to a region of each of said flaps, a secondary fold line extending between corresponding second terminal ends of each cut of each of said pairs of cuts, said pairs of cuts each defining respective ears located between said respective longitudinal edges of said bottom panel and respective said primary fold lines, said ears being glued to said upper surface of said bottom panel, each said flap free edge overlying less than one half of a respective said bottom panel opening.

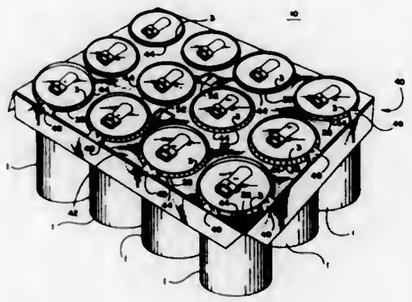


5,553,705

CLIP-TYPE CARRIER FOR FLANGED ARTICLE

Martinus C. M. Bakx, Goes., Netherlands, assignor to The Mead Corporation, Dayton, Ohio

Filed Dec. 21, 1994, Ser. No. 361,346
Int. Cl.[6] B65D *75/00*
U.S. Cl. 206—158 **7 Claims**



1. A clip-type carrier for at least one flanged article comprising:

a composite top wall including an inner panel disposed over an outer panel having at least a portion of each of said inner and outer panels that overlap to define a lap portion for each of said panels;

said inner panel having at least one inner article-receiving aperture within said lap portion thereof, said at least one inner article-receiving aperture defining an inner aperture diameter, and defining an inner aperture edge having formed therein a plurality of cuts extending radially outwardly from said inner aperture edge terminating to define a second diameter which is greater than said inner aperture diameter defining a plurality of container gripping tabs; and

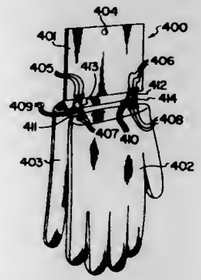
said outer panel having at least one outer article-receiving aperture within said lap portion thereof corresponding to and concentrically aligned with said at least one inner article-receiving aperture and defining an outer aperture diameter that is greater than said inner aperture diameter and less than said second diameter, at least one said at least one outer article-receiving aperture having at least one locking tab extending thereinto.

5,553,706

PACKAGING SYSTEM

Danny Gold, 27 Barker St, Apt E/2, Hong Kong, Hong Kong

Continuation-in-part of Ser. No. 739,085, Aug. 1, 1991, Pat. No. 5,193,676. This application Feb. 1, 1994, Ser. No. 190,382
Int. Cl.[6] B65D *85/18*
U.S. Cl. 206—296 **23 Claims**



1. A packaging system for displaying merchandise on a rack system having a rack member, comprising:

at least two pieces of merchandise for display together on the rack system, each of the two pieces of merchandise having two adjoining surfaces at an end surface;

header means adapted to engage the rack member and be supported on or below the rack as a result of said engagement;

at least two openings in said header means, proximate a merchandise coupling edge;

at least two openings in one of the adjoining surfaces of each of said pieces of merchandise proximate the end surface thereof;

coupling means for coupling the pieces of merchandise to each other and to the header means, the coupling means extending through the openings in the header and the openings in the one of the adjoining surfaces of each of the pieces of merchandise, said coupling means not extending through the other of the adjoining surfaces of each of the pieces of merchandise;

whereby the at least two pieces of merchandise can be displayed on the rack system by hanging the header means on the rack member and the at least two pieces can be removed from the rack member with the header means and inspected and then tested without affecting the attachment of the pieces of merchandise to each other or the header means.

8. A packaging system for displaying merchandise on a rack system having a rack member, comprising:

at least two pieces of merchandise for display together on the rack system;

header means adapted to engage the rack member and be supported on or below the rack as a result of said engagement;

at least two openings in said header means, proximate a merchandise coupling edge;

at least two openings in each of said pieces of merchandise proximate an end surface thereof;

coupling means for coupling the pieces of merchandise to each other and to the header means, the coupling means extending through the openings in the header and the openings in each of the pieces of merchandise, wherein the coupling means includes two linear members, each extending through at least one opening in the header means and one opening in each of the pieces of merchandise wherein the first linear member extends through three openings proximate a first end of the coupling edge of the header means and three openings in each of the pieces of merchandise and the second linear member extends through three openings proximate a second end of the coupling edge of the header means and three additional openings in each of the pieces of merchandise, whereby the pieces of merchandise are balanced while hanging from the header means;

whereby the at least two pieces of merchandise can be displayed on the rack system by hanging the header means on the rack member and the at least two pieces can be removed form the rack member with the header means and inspected and then tested without affecting the attachment of the pieces of merchandise to each other or the header means.

11. A packaging system for displaying pairs of gloves or mittens on a rack system having a rack member, comprising:

at least two gloves or mittens for display together on the rack system, each of the gloves or mittens having two adjoining surfaces at an open end of the glove or mitten when in a flattened state;

header means adapted to engage the rack member and be supported on or below the rack as a result of said engagement;

at least two openings in said header means, proximate a merchandise coupling edge;

at least two openings in one of the adjoining surfaces of each of said gloves or mittens proximate the end surface thereof;

coupling means for coupling the pair of gloves or mittens to each other and to the header means, the coupling means extending through the openings in the header and the openings in the one of the adjoining surfaces of each of the gloves or mittens, said coupling means not extending through the other of the adjoining surfaces of each of the gloves or mittens;

whereby the pair of gloves or mittens can be displayed on the rack system by hanging the header means on the rack member and the pair of gloves or mittens can be removed from the rack member with the header means and inspected and then tried on a hand without affecting the attachment of the gloves or mittens to each other or the header means.

5,553,707

GOLF BALL HOLDING DEVICE

Ronald K. Lion, 375 Summit Rd., Watsonville, Calif. 95076

Filed Oct. 10, 1995, Ser. No. 541,614
Int. Cl.[6] B65D *85/58*
U.S. Cl. 206—315.9 **10 Claims**

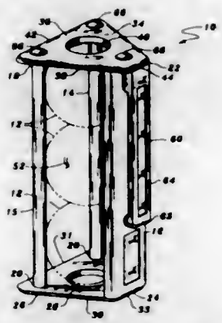
1. A portable container for golf balls, comprising;

three elongated elements, each of said three elongated elements having a top end and a bottom end;

a base having a top face, a bottom face, a front side, and a rear side; said base being secured to said bottom end of each of said three elongated elements; the three elongated elements being positioned in relation to one another on said so as to form a triangular enclosure;

a top having a top face, a bottom face, a front side, and a rear side; said top being secured to said top end of each of said three elongated elements;

means for securing together a plurality of said portable containers for golf balls; said means for securing together a plurality



of said portable containers for golf balls being positioned on said base and said top; and

means for detachably securing the portable container for golf balls to an animate or inanimate object; said means for detachably securing the portable container for golf balls being secured on one of said three elongated elements.

5,553,708

PACKAGING FOR SHIPPING SPENT FLUORESCENT LAMPS

Bruce J. Lawrence, Coopersburg; John M. Boyle, Slatedale, and Scott A. Schreffler, Bethlehem, all of Pa., assignors to Bethlehem Apparatus Co., Inc., Hellertown, Pa.

Filed Jun. 5, 1995, Ser. No. 461,201
Int. Cl.[6] B65D *85/42;85/20*
U.S. Cl. 206—419 **15 Claims**

1. Packaging for elongated glass lamps, comprising:

a container having end and side walls arranged to define a receptacle, one of the end walls defining a mouth for access to the receptacle, with a closure proximate edges of the side walls by which the mouth is open and shut, and another of the end walls being closed;

a liner having an opening and being placed in the container to line the end and side walls and with the opening of the liner being substantially coextensive with the mouth;

a plurality of elongated sleeves, each having opposite ends and being dimensioned for removable insertion of one of the lamps, the sleeves arranged laterally adjacent to one another in an array in the liner in the container;

end pads arranged in the liner in the container, one of the end pads being removably placeable at the mouth, the end pads being arranged to receive respective ends of the lamps, and to absorb shocks imparted to the container relative to the lamps when in the sleeves;

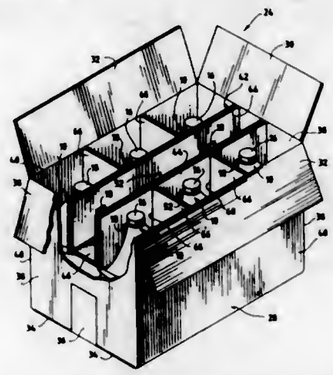
wherein the sleeves are sized to closely encircle the lamps, the liner is sized to extend around and enclose the combined sleeves and end pads, and the container when the closure is shut is sized and arranged to grip the lamps such that the lamps are carried in the sleeves in relatively immovable positions.

5,553,709

CONTAINER ASSEMBLY FOR PLASTIC BOTTLES AND THE LIKE

Paul B. Wharton, Jr., Lake Forest, and James M. Wharton, Prospect Heights, both of Ill., assignors to Kinetics Container Corporation, Des Plaines, Ill.

Filed Dec. 21, 1994, Ser. No. 381,331
Int. Cl.[6] B65D *85/20*
U.S. Cl. 206—446 **12 Claims**



1. A container assembly for holding at least one plastic bottle which includes a capped top and a side handle with an upwardly facing flat area adjacent the handle, comprising:

a container having a top wall structure, a bottom wall structure and a side wall structure spanning the top and bottom wall structures, the side wall structure having a height greater than the height of the bottle so that the capped top of the bottle is spaced from the top wall structure when the bottle rests upright on the bottom wall structure; and

a bracing structure within the container in abutting interengagement between the flat area of the bottle and the top wall structure of the container to maintain the capped top of the bottle spaced from the top wall structure of the container, said bracing structure including a substantially rigid planar wall in edge engagement with the flat area of the bottle and the top wall structure said planar wall including a slot for accommodating the side handle of the bottle, and said container and said bracing structure being fabricated of corrugated paper board material.

5,553,710

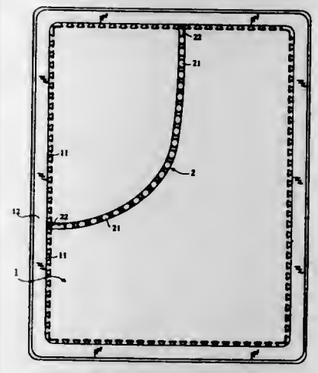
ARTICLE STORING TRAY CONVENIENT FOR VARIOUS PARTITIONING

Yukio Takama, Sabae, Japan, assignor to Sakase Chemical Industry Co., Ltd, Fukui-ken, Japan

Continuation-in-part of Ser. No. 871,051, Apr. 20, 1992, abandoned. This application Nov. 14, 1994, Ser. No. 339,893
Claims priority, application Japan, Apr. 22, 1991, 3-90831
Int. Cl.[6] B65D *1/34;1/36*
U.S. Cl. 206—561 **5 Claims**

1. An article storing tray convenient for various partitioning, comprising:

a tray body comprising a base having four sides, and opposing sidewalls extending upwardly from the four sides of the base, the base and side walls defining an internal space, each



sidewall being provided with a plurality of drop-in dovetail grooves having a predetermined depth, each drop-in dovetail groove having a shape capable of accommodating a dovetail tenon;

at least one comb-toothed partition board having opposite ends with dovetail tenons at the opposite ends so that the partition board can be dovetailed in two of the drop-in dovetail grooves of the tray body, each comb-toothed partition board being provided with a plurality of through dovetail grooves extending completely through the comb-toothed partition board in the direction of board thickness, the through dovetail grooves having the same depth as the drop-in dovetail grooves of the tray body, each through dovetail groove having a shape capable of simultaneously accommodating two dovetail tenons with longitudinal sides of the dovetail tenons facing each other, the through dovetail grooves providing flexibility to the comb-toothed partition board; and

at least one sub-partition board having opposite ends with dovetail tenons at the opposite ends so that the sub-partition board can be dovetailed in any of the drop-in dovetail grooves of the tray body and can be dovetailed in any of the through dovetail grooves of the comb-toothed partition board, whereby the internal space of the tray body can be divided into various shapes by the at least one flexible comb-toothed partition board.

5,553,711

STORAGE CONTAINER FOR INTEGRATED CIRCUIT SEMICONDUCTOR WAFERS

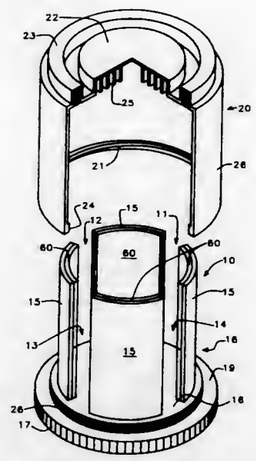
Chih-Ching Lin, and Jin-Chys Tai, both of Hsin-Chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsinchu, Taiwan

Filed Jul. 3, 1995, Ser. No. 498,662
Int. Cl.[6] B65D *85/30*
U.S. Cl. 206—710 **5 Claims**

1. An integrated circuit wafer container comprising:

a wafer container having an enclosure member and a body member, said body member having a base, a plurality of arcuate, longitudinally directed members supported on said base and adapted to encircle wafers stacked on said base, said arcuate members spaced from each other by uniform width longitudinal slots, a layer of resilient material having a high electrical resistivity on the inside arcuate surface of each of said arcuate members that provides a cushioning action to wafers stacked on said base, said enclosure member having a top wall and a cylindrically shaped wall to encompass and enclose said plurality of arcuate members, and means to secure said body member and said enclosure member together, and a

retainer element having a flat central portion, and a plurality of flexible radially extending flaps depending from said central portion, said flaps inclined downwardly from the plane of said flat central portion, each of said flaps having opposed notches in the outer end that provide parallel surfaces that engage said slots between arcuate members, and abutting surfaces that engage said layer of resilient material.

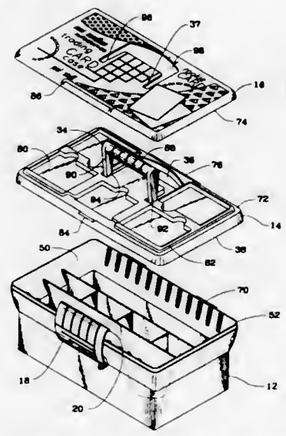


5,553,712

TRADING CARD CARRYING AND DISPLAY CASE

Thomas A. Tisbo, Barrington Hills; Stephen P. Whitehead, Elgin, and Michael G. Uffner, Naperville, all of Ill., assignors to Suncast Corporation, Batavia, Ill.

Filed May 5, 1995, Ser. No. 435,874
Int. Cl.[6] B65D *51/18;43/16*
U.S. Cl. 206—752 **20 Claims**



1. A plastic trading card storage and display container comprising: a bin defined by a front wall, two side walls, a rear wall and a bottom wall forming a storage cavity with an upper first peripheral edge forming an opening to said storage cavity; a lid hingedly attached to said bin and having an upper surface with a second peripheral edge and a lower surface with a third peripheral edge operatively associated with said first peripheral edge forming complementary mating edges; handle means rotatably coupled to said upper surface of said lid; a cover hingedly attached to said lid and having a top surface with a centrally disposed U-shaped aperture allowing said handle means to rotate into a recessed storage position being flush with said top surface and an upright

carrying position extending through said aperture, and a bottom surface with a fourth peripheral edge operatively associated with said second peripheral edge forming a complementary mating edges; and latch means for holding said cover to said bin securing said lid therebetween.

14. A plastic trading card storage and display container comprising:

a bin defined by a front wall, two side walls, a rear wall, and a bottom wall forming a storage cavity with an upper first peripheral edge forming an opening to said storage cavity, a pair of spaced apart fixed dividers coupled to each said side wall positioned a fixed distance from said front wall and said rear wall forming a front longitudinal chamber and a rear longitudinal chamber and three cross connects positioned between said dividers forming center chambers, said bottom wall of said front and rear chambers having a first height and said bottom wall of said center chamber having a second height less than the first height;

a lid hingedly attached to said bin and having an upper surface with a second peripheral edge and a lower surface with a third peripheral edge operatively associated with said first peripheral edge forming complementary mating edge, said upper surface having a plurality of recessed compartments sized to accept trading cards in a horizontal plane; handle means having a handle grip extending between first and second handle arms, one end of said arms rotatably coupled to said upper surface of said lid with a locking notch disposed on a side surface of said arms;

a cover hingedly attached to said lid and having a top surface with a centrally disposed U-shaped aperture having a locking lug to engage said locking notch when said handle is in a carrying position locking said cover to said lid, and a bottom surface with a fourth peripheral edge operatively associated with said second peripheral edge forming a complementary mating edges; and

latch means for holding said cover to said bin securing said lid therebetween, said latch means having a face plate pivotally connected to the front wall of said bin and a locking end engagable with a locking lip in the top surface of said cover.

5,553,713

VIBRATION DAMPER ASSEMBLY HAVING A SPRING SUPPORT WITH ADJUSTABLE SPRING PLATE, AND A SPRING SUPPORT WITH ADJUSTABLE SPRING PLATE

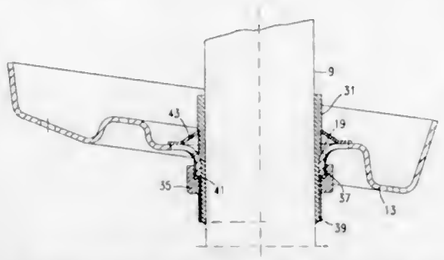
Heinz Sydekum, Dittelbrunn; Manfred Angles, Oerlenbach, and Frank Hassmann, Schweinfurt, all of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Nov. 23, 1994, Ser. No. 344,745

Claims priority, application Germany, Nov. 26, 1993, 43 40 494.4

Int. Cl.[6] **B60G** *13/00*

U.S. Cl. 267—221 **19 Claims**



1. Vibration damper assembly for being mounted in a motor vehicle, said vibration damper assembly comprising:

a cylinder defining a chamber therein, said cylinder for containing a damping fluid;

said cylinder defining a longitudinal axis therethrough;

a first end apparatus and a second end apparatus; said cylinder being disposed between said first end apparatus and said second end apparatus;

means, provided at said first end apparatus of said vibration damper assembly, for connecting said vibration damper assembly to a motor vehicle body;

means, provided at said second end apparatus of said vibration damper assembly, for connecting said vibration damper assembly to a motor vehicle suspension;

a piston rod, said piston rod sealingly projecting into said cylinder and being axially displaceable with respect to said cylinder;

a piston being attached to said piston rod, said piston being slidably disposed within said cylinder to sealingly divide said chamber into first and second chambers;

means for supporting a motor vehicle suspension spring, such a motor vehicle suspension spring for being disposed external to said cylinder;

said supporting means comprising a spring plate;

said spring plate comprising means for accommodating an end of such a motor vehicle suspension spring;

means for axially adjusting said spring plate to adjust the tension of such a motor vehicle suspension spring accommodated by said spring plate;

said axial adjustment means comprising:

means for axially fixing said spring plate in a first, predetermined axial position;

means for axially fixing said spring plate in a second, predetermined axial position;

means for loosening said spring plate with respect to said first, predetermined axial position to permit axial displacement of said spring plate from said first, predetermined axial position and to said second, predetermined axial position;

said second, predetermined axial position being different from said first, predetermined axial position;

said loosening means comprising a ring-shaped retaining member;

said ring-shaped retaining member being movable to permit movement of said spring plate from said first, predetermined position to said second, predetermined axial position, substantially solely in an axial direction;

said ring-shaped retaining member being movable in a solely axial direction; and

said ring-shaped retaining member being solely mechanically movable.

5,553,714

METHOD FOR DETECTING AND SEPARATING THERMOPLATIC CONTAINERS WITH NEAR INFRARED FLUOROSPHORES

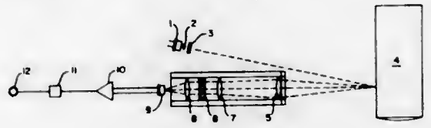
Michael R. Cushman; James J. Krutak; William W. Parham; Clarence A. Coates; Max A. Weaver, all of Kingsport, Tenn., and Gabor Patonay, Stone Mountain, Ga., assignors to Eastman Chemical Company, Kingsport, Tenn.

Continuation of Ser. No. 789,570, Nov. 8, 1991, abandoned.

This application Nov. 14, 1994, Ser. No. 339,318

Int. Cl.[6] **B07C** *5/10*; **C08K** *5/34*

U.S. Cl. 209—577 **1 Claim**



1. A method for detecting and separating thermoplastic containers, said containers comprising a thermoplastic material having admixed therein or copolymerized therein a compound or residue having detectible fluorescence when exposed to near infrared radiation, which comprises the following steps:

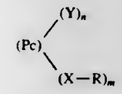
(a) exposure of a mixture of thermoplastic containers to near infrared radiation having wavelengths of about 670–2,500 nm, with the provision that at least one of said thermoplastic container compositions has admixed therein or copolymerized therein one or more near infrared tagging compounds or copolymerized residues having substantial near infrared absorbance and which is (are) present in sufficient quantity to impart fluorescence when exposed to radiation having wavelengths of about 670–2,500 nm, provided by light sources;

(b) detection of the emitted (fluorescent) light via near infrared light detection means; and

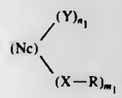
(c) separating the fluorescing containers from the non-fluorescing containers or containers flourescing at a detectibly different wavelength or wavelengths by mechanical means;

wherein the near infrared fluorescing compound or residue thereof is selected from the classes of phathalocyanines, naphthalocyanines and squaraines and correspond to Formulae II, III and IV:

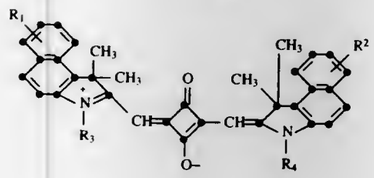
(II)



(III)

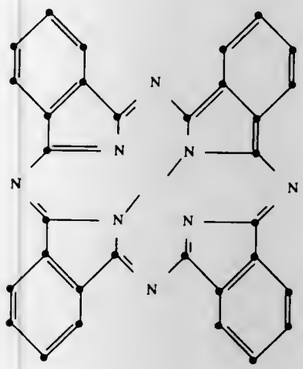


IV



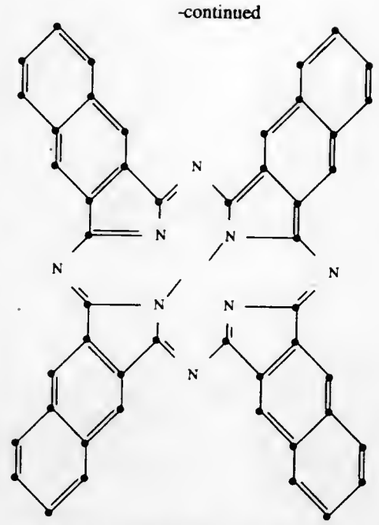
wherein Pc and Nc represent the phthalocyanine and 2,3-naphthalocyanine moieties of Formulae IIa and IIIa,

IIa



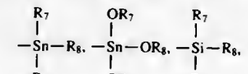
-continued

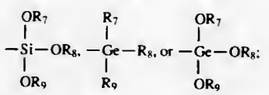
IIIa



respectively, covalently bonded to hydrogen or to various metals, halometals, organometallic groups, and oxymetals selected from the group consisting of AlCl, AlBr, AlF, AlOH, $AlOR_5$, $AlSR_5$, Ca, Co, CrF, Cu, Fe, Ge, Ga, InCl, Mg, Mn, Ni, Pb, Pt, Pd, $SiCl_2$, SiF_2, $SnCl_2$, $Sn(OR_6)_2$, $Si(OR_6)_2$, $Sn(SR_6)_2$, $Si(SR_6)_2$, Sn, TiO, VO and Zn,

wherein R_5 and R_6 are selected from hydrogen, alkyl, aryl, lower alkanoyl, trifluoroacetyl or groups of the formulae



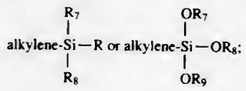


R_7, R_8 and R_9 are independently selected from alkyl, phenyl or phenyl substituted with lower alkyl, lower alkoxy or halogen;

X is selected from oxygen, sulfur, selenium, tellurium or a group of the formula —N—R_{10}, wherein R_{10} is hydrogen, cycloalkyl, alkyl, acyl, alkylsulfonyl, or aryl or R_{10} and R taken together form an aliphatic or aromatic ring with the nitrogen atom to which they are attached;

Y is selected from alkyl, halogen or hydrogen;

R is selected from unsubstituted alkyl or substituted alkyl selected from the group consisting of alkyls containing 1–12 carbon atoms and containing as substituents 1 or 2 groups selected from hydroxy, halogen, carboxy, cyano, C_1–C_4 alkoxy, aryl, C_1–C_4 alkylthio, arylthio, aryloxy, C_1–C_4 alkoxycarbonyl, or C_1–C_4 alkanoyloxy, alkenyl, alkynyl, C_3–C_8 cycloalkyl, aryl, heteroaryl,



or

—(X—R)$_m$ is alkylsulfonylamino, arylsulfonylamino, or a group selected from the formulae —$X(C_2H_4O)_rR^1$

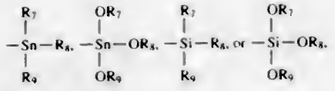
5,553,717

PORTABLE ORGANIZER

Steven W. Minneman, Clayton, and Allen J. Minneman, Dav-

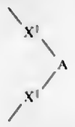
portion of an automobile and straps with hooks disposed thereon for releasably securing the rack to the automobile, the wall mount

comprising:



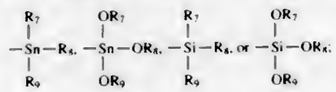
wherein R^1 is hydrogen or R as defined above; Z is an integer of from 1–4;

or two —(X—R)$_m$ groups can be taken together to form divalent substituents of the formula



wherein each X^1 is independently selected from —O—, —S—, or —N—R_{10} and A is selected from ethylene; propylene; trimethylene; and such groups substituted With C_1–C_4 alkyl, C_1–C_4 alkoxy, aryl and cycloalkyl; 1,2-phenylene and 1,2-phenylene containing 1–3 substituents selected from C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen;

R_1 and R_2 are independently selected from hydrogen, lower alkyl, lower alkoxy, halogen, aryloxy, lower alkylthio, arylthio, lower alkylsulfonyl; arylsulfonyl; lower alkylsulfonylamino, arylsulfonylamino, cycloalkylsulfonylamino, carboxy, unsubstituted carbamoyl and substituted carbamoyl selected from the group consisting of a radicals having the formula —CONR $_{12}R_{13}$, wherein R_{12} and R_{13} are selected from unsubstituted or substituted alkyl, alkenyl, alkynyl as defined above, cycloalkyl, aryl, or heteroaryl, and unsubstituted sulfamoyl and substituted sulfamoyl selected from the group consisting of radicals having the formula —$SO_2NR_{12}R_{13}$, wherein R_{12} and R_{13} are as defined above, lower alkoxycarbonyl, hydroxy or lower alkanoyloxy,

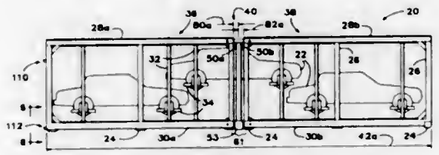


R_3 and R_4 are independently selected from hydrogen, lower alkyl, alkenyl or aryl; n is an integer from 0– 12; n_1 is an integer from 0–24, m is an integer from 4– 16; m_1 is an integer from 0–16; provided that the sums of n+m and n_1+m_1 are 16 and 24, respectively.

5,553,715
BICYCLE STAND
Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081
Filed Feb. 21, 1995, Ser. No. 391,987
Int. Cl.^{6} A47F *7/00*
U.S. Cl. 211—5 **9 Claims**

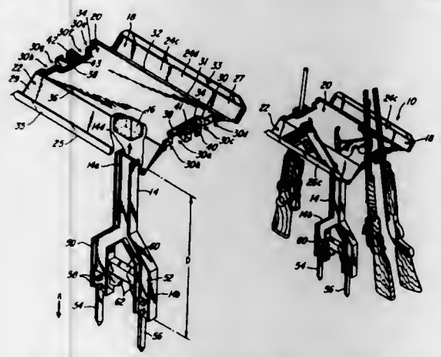
1. A bicycle stand for supporting a bicycle above the ground, said bicycle having a frame and a kickstand, comprising:
a casing embedded in said ground;
an articulative member having a first end and a second end, said member pivotally attached at said first end to said casing; and
bicycle frame engagement means disposed at said second end of said articulative member, said member having a first and a second mode of use such that when in its first mode said member is pivoted downward to rest within said casing and in its second mode, said member is pivoted upwards from said casing and said bicycle frame engagement means is engaged to a portion of said bicycle frame.

5,553,716
ADJUSTABLE VEHICLE-CARRYING FRAME
Peter Gearin, Portland, and Everett A. Leech, Oregon City, both of Oreg., assignors to G & G Intellectural Properties, Inc., Portland, Oreg.
Continuation of Ser. No. 433,629, May 3, 1995, Pat. No. 5,470,490, which is a continuation of Ser. No. 871,288, Apr. 20, 1992, Pat. No. 5,417,332, which is a continuation-in-part of Ser. No. 720,893, Jun. 25, 1991, Pat. No. 5,105,951, which is a continuation of Ser. No. 500,476, Mar. 28, 1990, Pat. No. 5,040,938, which is a continuation of Ser. No. 261,504, Oct. 24, 1988, Pat. No. 4,963,067, which is a continuation-in-part of Ser. No. 943,688, Dec. 18, 1986, Pat. No. 4,797,049. This application Aug. 28, 1995, Ser. No. 520,747
Int. Cl.^{6} A47F *7/00*
U.S. Cl. 211—13 **34 Claims**



1. A system for loading and transporting wheeled vehicles comprising:
(a) an elongate three-dimensional cargo-carrying enclosure having a closable opening;
(b) an elongate three-dimensional frame having transversely-spaced longitudinally-oriented upright sides and having respective transversely elongate front and rear vehicle wheel support members capable of supporting at least a first vehicle upon said frame in an elevated condition and vehicle wheel support members capable of supporting a second vehicle upon said frame at a level below said first vehicle, said frame being matingly insertable into said enclosure through said opening while said first and second vehicles are supported upon said frame by said wheel support members; and
(c) at least one of said front and rear vehicle wheel support members being adjustable vertically with respect to the other so as to position at least one of the front and rear ends of said first vehicle at variable elevations relative to the other end.

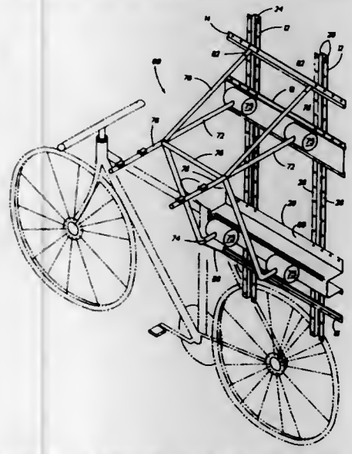
5,553,717
PORTABLE ORGANIZER
Steven W. Minneman, Clayton, and Allen J. Minneman, Dayton, both of Ohio, assignors to MTM Molded Products Company, Dayton, Ohio
Filed Nov. 17, 1993, Ser. No. 153,883
Int. Cl.^{6} A47F *7/00*
U.S. Cl. 211—13 **35 Claims**



1. An organizer for organizing weapon articles, said organizer comprising:
a tray member for receiving said weapon articles;
an elongated support for supporting the tray member on the ground; and
a connector for detachably connecting said tray member to said support;
said tray member comprising structure defining a plurality of organizing areas for receiving said weapon articles in order to organize them into a predetermined order;
wherein said plurality of organizing areas comprises at least one trough.

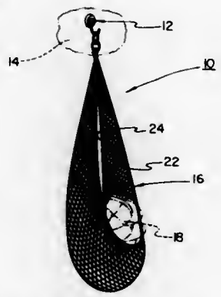
5,553,718
WALL MOUNT FOR AUTOMOTIVE BICYCLE RACK
Peter E. Robar, 121 Sanford St., East Longmeadow, Mass. 01028
Filed Nov. 21, 1994, Ser. No. 342,886
Int. Cl.^{6} A47F *7/00*
U.S. Cl. 211—18 **10 Claims**

1. A wall mount for an automotive bicycle rack of the type



having a plurality of upper and lower feet for engaging the rear portion of an automobile and straps with hooks disposed thereon for releasably securing the rack to the automobile, the wall mount comprising:
a plurality of rails for fastening to a generally vertical surface in generally coplanar orientation to one another;
an upper cross-beam member and a lower cross-beam member horizontally disposed onto said rails in vertically spaced relation for releasably receiving the books of the bicycle rack; and
an upper cross bar and a lower bumper horizontally disposed onto said rails in vertically spaced relation between said upper cross-beam member and said lower cross-beam member, each of said upper cross bar and lower bumper having a generally vertical front engagement surface for engaging the feet of the rack, said front engagement surface of said lower bumper extending further from said rails than said front engagement surface of said upper cross bar for supporting the lower feet of the rack further from said rails than the upper feet of the rack by a predetermined distance.

5,553,719
FLEXIBLE HAT STORAGE DEVICE
Rosita Campbell, 10071 E. Mary Dr., Tucson, Ariz. 85730
Filed Dec. 16, 1994, Ser. No. 357,851
Int. Cl.^{6} A47F *7/00*
U.S. Cl. 211—30 **6 Claims**



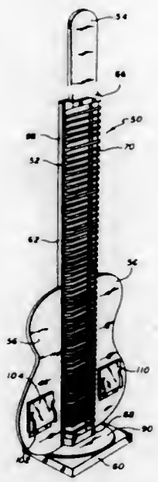
1. A flexible hat storage device comprising:
a mounting means for securing to a vertical support surface; and,
a flexible receiving means coupled to the mounting means and depending therefrom for receiving and supporting a plurality of objects therewithin, said flexible receiving means comprising a substantially hemi-spherical web having a front U-shaped perimeter spaced from a rear U-shaped perimeter; a first lateral web coupled to a first side of the hemi-spherical web and extending between the front and rear U-shaped perimeters thereof; and a second lateral web coupled to a second side of the hemi-spherical web and extending between the front and rear U-shaped perimeters thereof, with the lateral webs extending from the hemi-spherical web and towards the mounting means, the lateral webs being attached to the mounting means.

5,553,720
STORAGE AND DISPLAY ASSEMBLY FOR MUSICAL MEDIA OR THE LIKE
Shahriar Dardashti, c/o Atlantic, Inc., 10240 Matern Pl., Santa Fe Springs, Calif. 90670-0399
Filed Jan. 6, 1994, Ser. No. 177,683
Int. Cl.^{6} A47F *7/00*
U.S. Cl. 211—40 **38 Claims**

1. A storage assembly for holding selectively disc cases, tapes, cartridges and cassettes, said assembly comprising:
a storage unit including first and second side frame members and a plurality of ribs attached to and extending laterally between said side members and spaced longitudinally to thereby form

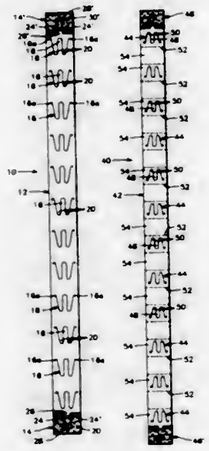
1. A strip merchandiser comprising a strip of plastic sheet material having an elongate main body portion and a mounting portion at each end of the body portion for hanging the strip from

5,553,725
GLASS HAVING INNER AND OUTER COMPARTMENT
Keith P. Clemens, 17417 Red Oak Dr. #120, Houston, Tex.



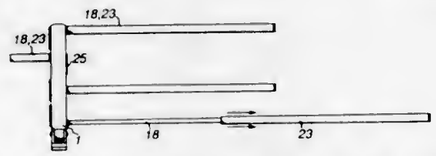
a plurality of receiving slots, each said slot being adapted to hold selectively the disc cases, tapes, cartridges and cassettes;
a top member secured to said storage unit and extending up from the top thereof;
a first side member secured to said storage unit and extending laterally out from a lower portion thereof; and
a second side member secured to said storage unit and extending laterally out from a lower portion thereof in the opposite lateral direction as said first side member;
wherein said top member, said first side member, said second side member and said storage unit are configured and positioned relative to one another such that in a front elevational view they define a readily recognizable shape of a stringed musical instrument having an elongated neck and frets; and
wherein said ribs form the frets and said frame members form at least in part the neck.

5,553,721
REVERSIBLE STRIP MERCHANDISER
John Gebka, Coral Springs, Fla., assignor to Fast Industries, Inc., Ft. Lauderdale, Fla.
Filed Dec. 15, 1994, Ser. No. 356,714
Int. Cl.[6] A47F *5/00*
U.S. Cl. 211—59.1 **17 Claims**



1. A strip merchandiser comprising a strip of plastic sheet material having an elongate main body portion and a mounting portion at each end of the body portion for hanging the strip from a merchandise display shelf and the like, the body portion including at least one product suspension means including a first suspension formation for suspending a first kind of product from the strip with one of the mounting portions used for hanging the strip, and a second suspension formation distinguished from the first suspension formation for suspending a second kind of product from the strip with the strip reversed lengthwise and with the other of said mounting portions used for hanging the strip, wherein each mounting portion included universal mounting means for selectively hanging the strip on different articles, said suspension means comprising a W-shaped slit in the strip defining a central flexible finger pointing towards said one of the mounting portions, said central flexible finger defining the first suspension formation, and a pair of outer flexible fingers pointing towards said other of said mounting portions and straddling the central finger, said outer flexible fingers together defining said second suspension formation, said slits being replicated at intervals lengthwise along the body portion, said body portion being divided lengthwise by transverse fold lines into a plurality of contiguous panels, and said slits being provided in selected ones of said panels.

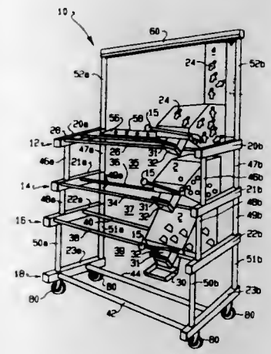
5,553,722
TOWEL RACK
Ching-Keung Lam, Flat B-6, 4/F, Eastern Block, Pearl Island Villas, Pearl Island, Castle Peak, NT, Hong Kong
Filed Feb. 1, 1995, Ser. No. 382,279
Int. Cl.[6] A47F *7/00*
U.S. Cl. 211—99 **9 Claims**



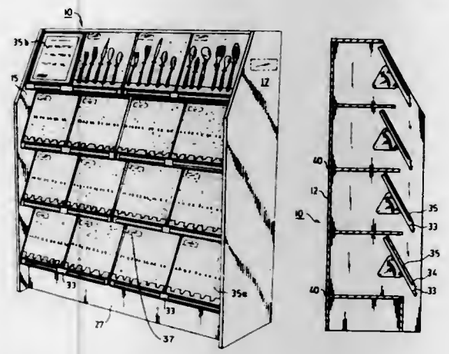
1. A towel rack comprising, a support member, said support member being adapted to be mounted to a wall in use so as to extend away from said wall, and a plurality of towel rails adapted to receive towels thereon when in use, said support member being provided with a plurality of engagement locations, and said rails being adapted to be releasably engageable with said support member at a said engagement location.

5,553,723
RACK SYSTEM FOR DISPLAYING AND DISPENSING CANDY
Andrew M. Stein, Massapequa Park, N.Y., assignor to Six Corners Development Company, Amityville, N.Y.
Filed Oct. 24, 1994, Ser. No. 328,326
Int. Cl.[6] A47T *3/14*; A47J *47/00*
U.S. Cl. 211—133 **25 Claims**

1. A rack structure for displaying and dispensing candy which comprises:
a plurality of enclosed containers arranged in a first row, each container being totally enclosed on all sides and having a base, a supply of candy and a downwardly extending outlet for dispensing candy from the supply; and
a support structure for retaining the containers in spaced relation in the first row and including first and second horizontally disposed rods each having first and second ends, said enclosed containers being supported on said first and second horizontally disposed rods; means for engaging the rod ends to maintain the rods in substantially parallel spaced relation for supporting the base of each container; means for positioning the support structure to enhance the visibility of the containers; and at least one catch basin supported on the first horizontal rod in position under one or more of the container outlets for receiving candy that has been improperly dispensed, thus preventing spills of the same.

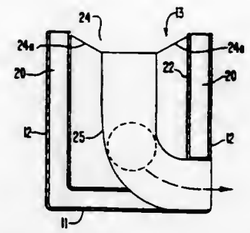


5,553,724
RACK FOR DISPLAYING TABLEWARE
Robert Moher, Oneida, N.Y., and Thomas J. Nook, Grand Haven, Mich., assignors to Oneida Ltd., Oneida, N.Y.
Filed Mar. 16, 1994, Ser. No. 214,143
Int. Cl.[6] A47F *7/00*
U.S. Cl. 211—70.7 **16 Claims**



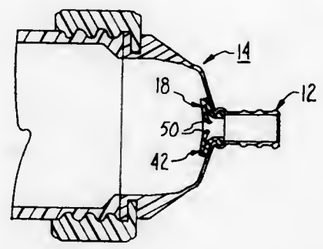
1. An improved display rack for the commercial display of tableware comprising:
a back panel;
two side panels attached to said back panel;
a plurality of full shelves in parallel relationship to one another, each abutting said back panel and side panels;
at least one rotatably hinged front panel corresponding to each full shelf, each said at least one front panel positioned so that a bottom edge of said at least one front panel is aligned with a corresponding full shelf;
a display pad detachably affixed to said at least one front panel;
at least one hinge means for rotatably affixing each said front panel to the rack; and
at least one retaining means for retaining tableware on a front of said display pad for display thereof.

5,553,725
GLASS HAVING INNER AND OUTER COMPARTMENT
Keith P. Clemons, 17417 Red Oak Dr., #139, Houston, Tex. 77090
Filed Nov. 15, 1994, Ser. No. 341,882
Int. Cl.[6] A63F *7/00*; *7/30*
U.S. Cl. 215—6 **3 Claims**



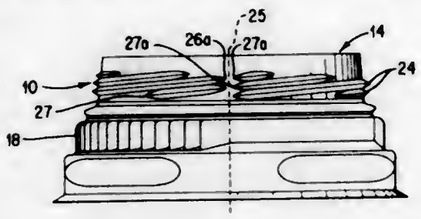
1. A glass comprising:
a first compartment for receiving a liquid, said first compartment being defined by an outer wall and an inner wall;
a second compartment for receiving an object, said second compartment located inwardly of said first compartment and being defined by said inner wall, and
a slot connected to said second compartment and extending from an upper portion of said second compartment through a portion of said outer wall of the glass to permit said object entering said second compartment to exit through said outer wall of said glass.

5,553,726
DRIPLESS FEEDER NIPPLE SYSTEM WITH DETACHABLE VALVE
Ki H. Park, 1721 Monarch Ridge Cir., El Cajon, Calif. 92019
Filed Nov. 8, 1993, Ser. No. 149,603
Int. Cl.[6] A61J *11/00*
U.S. Cl. 215—11.4 **11 Claims**



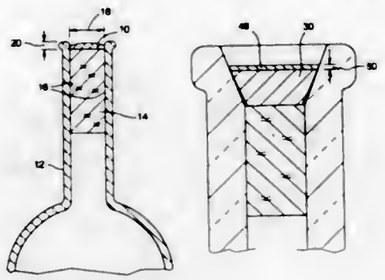
1. A feeder nipple system attachable to a container, wherein said container is used for holding a fluid, wherein said feeder nipple system comprises:
a nipple body removably attached to said container, said nipple body comprising a first end, a second end, and a mating portion connected to said first end;
a teat portion having a first and second end, said second end having a plurality of apertures, said first end of said teat portion connected to said first end of said nipple body;
a detachable valve removably connected to said mating portion of said nipple body, so as to allow fluid flow from the container to the teat portion when a sucking force is applied, and prevent leakage of fluid through said teat portion when the teat portion is not in use and to permit cleaning of said valve; and
mating free formed seating elements on said first end of said teat portion and said valve to hold said valve in a specific location at said teat portion first end.

5,553,727
TAMPER-EVIDENT CAP AND NECK FINISH
Luca Molinaro, New Castle, Pa., assignor to Consumer Cap Corporation, New Castle, Pa.
Filed Apr. 27, 1995, Ser. No. 430,019
Int. Cl.[6] B65B *7/28*
U.S. Cl. 215—44 **16 Claims**



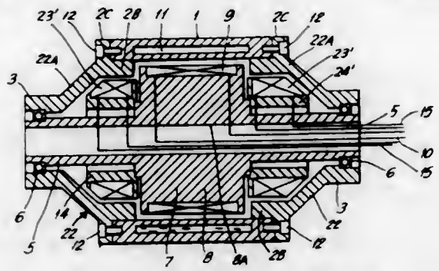
1. A neck finish for a container comprising:
a. an annular wall with an outer surface and an inner surface defining a cylindrical opening therethrough, said annular wall having a first and second end, said first end being open to provide access to said cylindrical opening and having an annular flange extending from said inner surface of said annular wall into said opening in said first end;
b. at least one set of ratchet teeth positioned around a portion of said outer surface of said annular wall at said second end;
c. at least ten threads angularly positioned on said annular wall between said first end and said ratchet teeth each of said treads extending around said surface less than 90° and wherein said threads are discotinuous at a mold parting line; and
d. a first annular ring flange on and extending substantially around said outer surface of said annular wall adjacent to said set of ratchet teeth, said first annular ring flange adopted to engage an associated ring flange on a cap to sealing position said cap onto said neck.

5,553,728
METHODS AND COMBINATIONS FOR SEALING CORKED BOTTLES
Stephan J. Finke, 542 Ave. Del Oro, Sonoma, Calif. 95476
Continuation of Ser. No. 374,810, Jan. 19, 1995, Pat. No. 5,449,080, which is a continuation of Ser. No. 98,744, Jul. 28, 1993, Pat. No. 5,447,246, which is a continuation of Ser. No. 842,237, Feb. 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 814,863, Dec. 30, 1991, abandoned. This application Aug. 4, 1995, Ser. No. 511,709
Int. Cl.[6] B65D *39/00*
U.S. Cl. 215—233 **20 Claims**



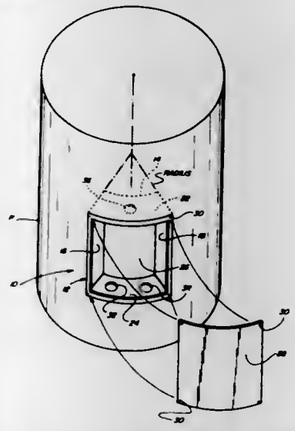
1. A combination comprising:
a) a corked bottle having a cylindrical neck terminating in a mouth having a top edge, said neck having a continuous cylindrical interior surface:
b) a solid cylindrical cork having a height, a continuous top flat surface and a continuous bottom surface, wherein said top surface has a diameter and wherein said top surface is located at a distance from said top edge of said mouth, said cork being displaced entirely within said neck; and
c) a solid cylindrical disc having a top height less than said cork height, a top surface, a flat bottom surface having a diameter substantially equivalent to said cork top surface diameter, and an outer surface, said disc being displaced entirely within said neck above said cork, wherein said disc bottom surface is partially melted and removably secured to said cork top surface and wherein said flat bottom surface of said cylindrical disc in the partially melted condition maintains a diameter substantially equivalent to said cork top surface diameter.

5,553,729
INDUCTION HEATING ROLLER APPARATUS
Yoshio Kitano, and Kozo Okamoto, both of Kyoto, Japan, assignors to Tokuden Co., Ltd., Kyoto, Japan
Filed Aug. 23, 1995, Ser. No. 518,369
Claims priority, application Japan, Aug. 30, 1994, 6-243500
Int. Cl.[6] H05B *6/14*
U.S. Cl. 219—619 **2 Claims**



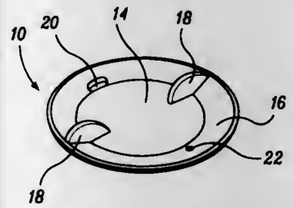
1. An induction heating roller apparatus comprising:
a rotatable hollow cylindrical roller body made of magnetic material.
a pair of end frames for closing the opposite opening ends of said roller body, having roller driving shafts projected from the outer central regions thereof, said driving shaft having axial through-holes,
magnetic flux generating means comprising an induction coil wound on an iron core body positioned between said pair of end frames and in the hollow portion of said roller body,
a pair of sleeve-like rods projecting from the opposite end surfaces of said iron core body and inserted for relative rotation into the axial through-holes of said shafts, and
a pair of auxiliary magnetic flux generating means comprising auxiliary induction coils wound on annular iron cores positioned inside said end frames and fixed at the base portion at which said sleeve-like rods are connected to said iron core body,
an arrangement being such that exciting currents are fed to said induction coil and auxiliary induction coils through a plurality of lead wires disposed to pass through the hollow portions of the sleeve-like rods, thereby producing a magnetic flux passing through the roller body and end frames, thus causing said body and end frames to generate heat by eddy currents,
said induction heating roller apparatus being characterized in that said end frames comprise fitting edges fitted in the opposite openings in said roller body, flange portions continuous with said fitting edges and adapted to be applied to the opening end edges of the roller body, and conical bodies projecting, while decreasing in diameter, from the integral common locations between the fitting portions and flange portions toward said roller driving shafts, and
that the axial lengths of at least said annular iron cores in such said auxiliary magnetic flux generating means is such that the annular end surfaces opposite to the base portions at which said iron cores are connected to the iron core body are positioned within the range of the conical portions of said end frames.

5,553,730
ELECTRICAL JUNCTION BOX FOR USE IN CURVED STRUCTURES
Stephen J. Kohnen, 2160 Pyrenees, Florissant, Mo. 63033
Filed Oct. 3, 1994, Ser. No. 316,944
Int. Cl.[6] H02G *3/08*
U.S. Cl. 220—3.2 **14 Claims**



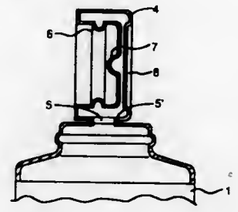
1. An electrical junction box adaptable for mounting within a curved structure comprising a housing member having a rear wall portion, opposed side wall portions, a front wall portion, and opposed top and bottom wall portions extending respectively therebetween, the front wall portion of said housing member being substantially open and providing access to the space formed by and between the wall portions forming said housing member, the front wall portion of said housing member being curved so as to conform to the curvature of the outer surface of the curved structure into which said housing member will be mounted, a face plate member attachable to the front wall portion of said housing member for controlling access to the space formed in said housing member, said face plate member being similarly curved so as to conform to the curvature of the front wall portion of said housing member, and means for attaching said face plate member to the front wall portion of said housing member.

5,553,731
ADAPTABLE CLOSURE FOR DRINKING CONTAINERS
Richard D. Schuyler, Beaverton, Oreg., assignor to Starbucks Corporation, Seattle, Wash.
Continuation of Ser. No. 184,848, Jan. 21, 1994, abandoned. This application May 26, 1995, Ser. No. 451,745
Int. Cl.[6] A47G *19/22*
U.S. Cl. 220—719 **13 Claims**



1. A closure for preventing liquid spills from a drinking container having an inside surface, said closure comprising a generally concave disk having an upper surface and a lower surface, said concave disk comprising:
(a) a resilient central portion bendable in any direction such that said central portion may increase in concavity to securely fit into the drinking container;
(b) an angled flange extending upwardly and outwardly from central portion around the periphery of said central portion, said flange having an upper surface and a lower surface, said flange having free outer edges and being flexible and resilient, the outer edges of said flange having a thickness less than that of said central portion and being free to flex inwardly, said lower surface of said flange having the shape of an inverted frustum of a cone for sealingly engaging the inside surface of the drinking container;
(c) a drinking hole offset from the center of said disk and a vent hole offset from the center of said disk approximately opposite said drinking hole; and
(d) a disk removal means attached to the top of said central portion and said flange for aiding in the removal of the disk from the drinking container.

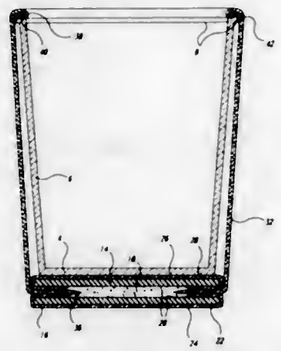
5,553,732
SYNTHETIC RESIN RECEPTACLE AND METHOD FOR PRODUCING SAME
Koji Kani, Kagamihara, Japan, assignor to Nikko Seika Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 13, 1995, Ser. No. 372,184
Int. Cl.[6] B05D *51/22*
U.S. Cl. 220—212 **1 Claim**



1. A receptacle molded from a synthetic resin material inserted and held between a pair of mating mold halves and then inflated by air forced thereinto comprising:
a hollow receptacle body, having an opening at one end of said receptacle body for filling contents and having a reduced diameter cap portion on one end thereof, said reduced diameter portion having a first sealing rib formed on the periphery thereof,
a closure cap fitting portion formed integrally with the receptacle body and connected to said reduced diameter portion by a connecting bridge of material which can be cut, said closure cap and connecting bridge formed at the top end of the receptacle body, said closure cap having a reversed-C like shape with a hollow configuration so as to form a chamber within said reversed-C like shape, said connecting bridge having a channel formed therein forming a fluid communication path between said hollow receptacle body and said chamber in said closure cap, said closure cap having a shape and size so as to fit over said reduced diameter cap portion of said receptacle body, said closure cap having a second sealing rib formed peripherally around a surface which mates with said reduced diameter cap portion in a position such that when said closure cap is placed over said reduced diameter cap portion, said first and second sealing ribs form a seal sufficient to prevent fluid in said receptacle body from escaping,
a blow molding fluid injection port in said closure cap through which fluid may be forced into said receptacle body through said channel in said connecting bridge to blow mold said synthetic material placed in said mold halves,
a projection provided centrally in the inner surface of said closure cap body having the same shape and approximately the same size as said channel in said connecting bridge such

that when said closure cap is removed by cutting said connecting bridge and placed over said reduced diameter cap portion of said receptacle body, said projection enters said channel and plugs it thereby sealing the contents of said receptacle body therein.

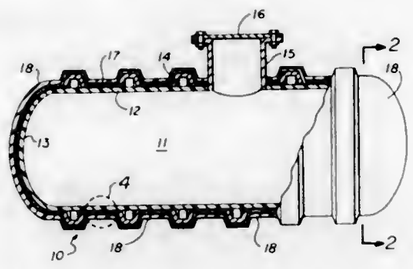
5,553,733
ARTICLE COVER
Linda M. Rosenthal, 4517 SW. Hemlock Way, Seattle, Wash. 98136
Filed Aug. 25, 1994, Ser. No. 296,229
Int. Cl.[6] B65D *90/06*
U.S. Cl. 220—400 **10 Claims**



1. A cover for an article having first and second opposite ends and at least one sidewall extending between said ends, comprising:
a substantially rigid end dimensioned to have a periphery substantially coextensive with the periphery of said first end of the article;
a tubular pleated sidewall having a first end secured to said rigid end, and a second end defining a variable size opening for receiving the article therethrough; said pleated sidewall being dimensioned to cover said sidewall of the article and peripheral portions of said second end of the article when the article has been inserted into the cover through said second end of said pleated sidewall to position said rigid end closely adjacent to said first end of the article, and said pleated sidewall being sufficiently pliant to permit the cover to be folded into a flattened configuration; and
a closure extending around said second end of said pleated sidewall to pull said second end of said pleated sidewall over the periphery of said second end of the article to retain the cover on the article;
in which said rigid end comprises a pair of members having confronting surfaces secured together, and said first end of said pleated sidewall extends inwardly between and is secured to said confronting surfaces; and
in which one of said members has an outer surface opposite said confronting surface and covered by a material matching said pleated sidewall.

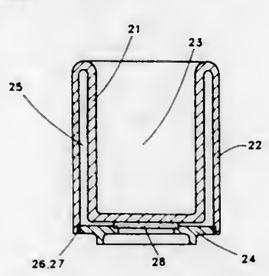
5,553,734
DOUBLE WALLED STORAGE TANK SYSTEMS WITH ENHANCED WALL INTEGRITY
Bruce R. Sharp, 126 Leland Way, Marco Island, Fla. 33937
Filed Aug. 31, 1994, Ser. No. 298,615
Int. Cl.[6] G01M *3/32*
U.S. Cl. 220—414 **42 Claims**

1. A double walled storage tank system having two closely associated discreet walls held together in a manner which creates a closed communication space, said storage tank system comprising:



(a) a tank;
(b) an overlying continuous wall of a resinous material closely associated with at least a portion of the tank; and
(c) an array of interlocking filament bundles disposed between the tank and the overlying continuous wall, whereby a first face of the array is bonded to the tank, a second face of the array is bonded to the continuous wall and a mid-portion of the array is in a substantially unbonded state to provide a closed communication space for the detection of any leakage through a wall, wherein the bonding of the array of interlocking filament bundles to the walls and the inherent strength of the array of interlocking filament bundles hold the tank wall and the continuous wall together.

5,553,735
VESSEL WITH DISPLAY FUNCTION
Fumiyo Kimura, 1-804 Komiya-cho, Hachioji-city, Tokyo, Japan
Filed Mar. 8, 1994, Ser. No. 208,340
Int. Cl.[6] B65D *25/54*
U.S. Cl. 220—469 **6 Claims**



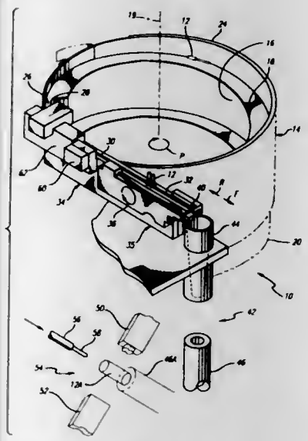
1. A vessel comprising an outer shell, an inner shell and means connecting the outer and inner shell, said outer shell and inner shell forming a cavity between them, at least said outer shell being of optically transparent material, the cavity being capable of storing decorations or information and including removable cavity closing means for sealing the cavity, and further including a venting filter means positioned between the cavity and the exterior of the vessel, for passing air but not water, for equalizing pressure between the sealed cavity and the exterior.

5,553,736
VENDING APPARATUS
Frank G. Healis, Box 133, Wagontwn Rd., Wagontown, Pa. 19376
Filed Dec. 5, 1994, Ser. No. 349,527
Int. Cl.[6] G07F *11/36*
U.S. Cl. 221—62 **19 Claims**

1. A vending apparatus comprising:
(a) an enclosure having front, back, and side surfaces;

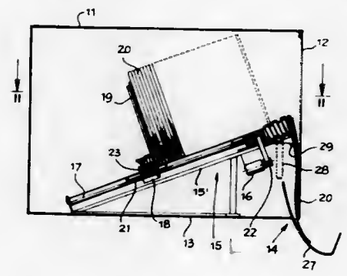
(b) means for sequentially moving a plurality of articles within the enclosure in a substantially horizontal direction substantially parallel with the front surface of the enclosure to a position from which the articles drop through a substantially vertical shaft located adjacent to one of said side surfaces of the enclosure to a delivery area, wherein said means for sequentially moving said plurality of articles is disposed on a substantially horizontal shelf comprising means for adjusting the position from which the articles drop to facilitate the delivery of articles of different sizes; and
(d) means for allowing removal of the articles from the delivery area.

5,553,737
CONTACT FEED SYSTEM
Dale D. Kelly, Wilmington, Calif., assignor to ITT Corporation, New York, N.Y.
Filed Jan. 5, 1995, Ser. No. 368,933
Int. Cl.[6] B23Q *7/12*
U.S. Cl. 221—167 **7 Claims**



1. Apparatus for feeding first electrical contacts of a particular shape and size, which includes a feeder bowl that advances contacts to a feeder bowl outlet, a first track assembly which includes a first track housing that forms a first track with a rear track end that is connected to said bowl outlet to receive contacts therefrom, said track being constructed to confine said contacts to a particular orientation and in single file movement in a forward direction along said track to a front track end that is spaced in a forward direction from said rear track end, with said apparatus including a final processor which processes individual ones of said contacts, characterized by:
said first track assembly includes a first release mechanism which has a moveable release member mounted on said track housing with said release member having a release end lying at said track front end and being moveable to release a contact lying at said track front end so the contact can fall into said final processor, said release mechanism including an actuator mounted on said first track housing and having a first energizing input which receives an energizing flow that operates said actuator;
said first track assembly also has a sensor that detects contacts in an improper position along said first track, and a blowoff device that blows off said track a contact that has been detected by said sensor to be in an improper position, said sensor and blowoff device having second and third energizing inputs, respectively, that each receives an energizing input;
a control which has a plurality of outputs which are detachably coupled to said first, second, and third energizing inputs;
said first track assembly, with said first track housing and said first release mechanism and said sensor and said blowoff device, being detachable and reattachable as a unit from said feeder bowl and said control.

5,553,738
AUTOMATIC VENDING MACHINE FOR NEWSPAPERS, MAGAZINES AND THE LIKE
Pietro Roselli, Cogozzo, Italy, assignor to Officine Meccaniche Roselli S.R.L., Cogozzo, Italy
Filed Jun. 2, 1995, Ser. No. 459,695
Claims priority, application Italy, Jun. 3, 1994, BS94A0060
Int. Cl.[6] B65H *3/00*
U.S. Cl. 221—195 **10 Claims**



1. An automatic vending machine for newspapers, magazines and the like, comprised of a casing (**11**) with at least a door (**12**) at the front, a bottom base (**13**) and a pick-up opening (**14**) in the bottom base adjacent to the front wall and in which a coin slot is provided to receive the countervalue of each newspaper or item to dispense and activate operation of the dispensing mechanism, characterized in that:
a support (**15'**) resting on the internal bottom of the casing and supporting a pair of parallel side bars (**17**);
a carriage (**18**) sliding along these guide bars (**17**) backwards and forwards and destined to feed a series of newspapers or magazines standing sideways on said guide bars;
a rotating screw (**21**) arranged in parallel with said guide bars (**17**) and driven in rotation by an electric gearmotor (**16**);
at least a split nut (**23**) on board of said carriage (**18**) and interacting with said rotating screw (**21**) for progressive move of the carriage from its back to front position;
an expulsion cam (**26**) coupled and rotating with said screw (**21**) and destined to receive, every time, the copy of the newspaper (**2**) ranking first in the stack of newspapers moving with the carriage and to convey it onto a delivery chute to the pick-up opening (**14**) at the bottom of said casing (**11**);
the gearmotor (**16**) driving said screw (**21**) and said expulsion cam (**23**) coupled to it is activated when it receives an authorization signal from the prepayment slot and stopped when the newspaper drops into the pick-up opening and on arrival of the next copy of newspaper on the expulsion cam, being the expulsion cam and/or delivery chute associated with switching means to open the electric circuit on the motor unit to stop the carriage after expulsion of each newspaper.

5,553,739

TABLET DISPENSER

Thomas Munk Plum, Skodsborg; Kim Steengaard, Hvidovre, and Jens Møller-Jensen, Copenhagen, all of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

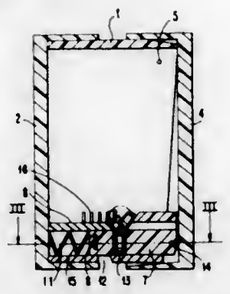
PCT No. PCT/DK92/00361, § 371 Date Jun. 9, 1994, § 102(e) Date Jun. 9, 1994, PCT Pub. No. WO93/11057, PCT Pub. Date Jun. 10, 1993

PCT Filed Dec. 2, 1992, Ser. No. 244,572

Claims priority, application Denmark, Dec. 5, 1991, 1963/91

Int. Cl.[6] G07F *11/18*

U.S. Cl. 221—196 **1 Claim**



1. A dispenser for tablets, comprising a box-shaped housing having a first and a second narrow side wall, a first and a second broad side wall, a first and a second open end, a partition parallel with the first and second narrow side walls, a drawer element displaceable between the second narrow side wall and the partition, wherein the partition bars an inlet to a through-going opening of the drawer element when the dispenser is operated, and the second narrow side wall has an opening serving as a dispensing opening when the through-going opening of the drawer element aligns with this opening during operation of the dispenser, a first and a second trough-shaped shell closing the first and second open ends of the box-shaped housing, respectively, wherein the first trough-shaped shell is rigidly secured to the box-shaped housing and the trough-shaped second shell, having a first and a second end, which is hinged at the first end to the box-shaped housing and is hinged at the second end to the drawer element, wherein the second open end of the box-shaped housing is obliquely cut so that the first narrow side wall adjacent to the hinging of the second shell to the housing is longer than the second narrow side wall.

5,553,740

APPARATUS AND METHOD FOR PUMPING CONTROLLED AMOUNTS OF FLOWABLE MATERIAL FROM A FLEXIBLE BAG

Kenyon M. King, Rancho Cucamonga; Barry J. Brummett, Santa Ana; Gregory D. King, Rancho Cucamonga, and Douglas S. Hutchings, Alta Loma, all of Calif., assignors to Restaurant Automation Development Co., Rancho Cucamonga, Calif.

Filed Nov. 18, 1994, Ser. No. 342,347

Int. Cl.[6] G01E *11/00*

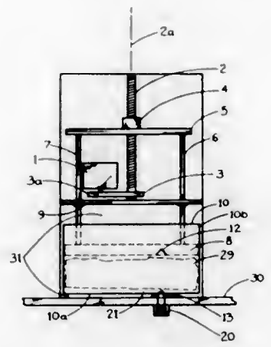
U.S. Cl. 222—1 **22 Claims**

1. A device for pumping controlled amounts of variable viscosity flowable materials stored in a first flexible walled sealed container comprising:

a base having bottom, top and side walls, each said wall having inside and outside surfaces;

second container means to hold the first flexible walled sealed container, said second container being supported by said base and having at least front, bottom and side walls, each said wall having inside and outside surfaces;

piston means connected to the base, said piston means being disposed within said second container means to apply force to at least one top wall of said first flexible walled container so



as to compress said first flexible walled container between said piston means and the walls of said second container;

actuation means attached to said base and connected to said piston means to drive said piston means;

exit nozzle means disposed on said walls of said base in order to discharge the flowable material, said exit nozzle means comprising:

nozzle body means connected to said inside of said bottom wall of said base, said nozzle body having a plurality of aperture means for fluid communication therethrough;

exit diaphragm means for dispensing said variable viscosity flowable materials;

cap means for support of said exit diaphragm means, said cap means being disposed under the outside of said bottom wall of said base and removably attached to nozzle body means; and

first sealing means to prevent leakage of said flowable materials from around said nozzle body;

cutting means disposed on said nozzle means to pierce and open said first flexible walled sealed container after compression of said first flexible walled container by said piston means; and

second sealing means to seal around the opening cut in said first flexible walled container so that said variable viscosity flowable materials are constrained to only flow through said nozzle means.

18. A method of pumping controlled amounts of variable viscosity flowable materials stored in a first flexible walled sealed container comprising:

providing a base having bottom, top and side walls, each said wall having inside and outside surfaces;

holding the first flexible walled sealed container in a second container means, said second container being supported by said base and having at least front, bottom and side walls, each said wall having inside and outside surfaces;

connecting a piston means to the base, said piston means being disposed within said second container means to apply force to at least one top wall of said first flexible walled container so as to compress said first flexible walled container between said piston means and the walls of said second container;

driving said piston means by actuation means attached to said base and connected to said piston means;

disposing exit nozzle means on a wall of said base in order to discharge the flowable material said exit nozzle means comprising:

nozzle body means connected to said inside of said bottom wall of said base said nozzle body having a plurality of aperture means for fluid communication therethrough;

exit diaphragm means for dispensing said variable viscosity flowable materials;

cap means for support of said exit diaphragm means, said cap means being disposed under the outside of said bottom wall of said base and removably attached to nozzle body means; and

first sealing means to prevent leakage of said flowable materials from around said nozzle body:

piercing said first flexible walled sealed container with cutting means disposed on said nozzle means so as to open said first flexible walled sealed container after compression of said first flexible walled container by said piston means; and

sealing around the opening cut in said first flexible walled container with second sealing means so that said variable viscosity flowable materials are constrained to only flow through said nozzle means.

5,553,741

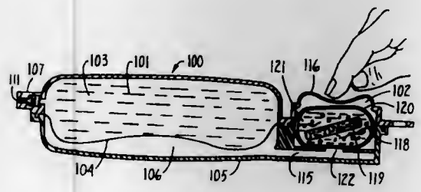
LIQUID DELIVERY DEVICE

Gregory E. Sancoff, Rancho Santa Fe, and Mark C. Doyle, San Diego, both of Calif., assignors to River Medical, Inc., San Diego, Calif.

Division of Ser. No. 105,327, Aug. 6, 1993, Pat. No. 5,398,851. This application Dec. 23, 1994, Ser. No. 372,818

Int. Cl.[6] B65D *83/14*

U.S. Cl. 222—1 **6 Claims**



1. A method for dispensing a liquid, comprising the steps of:

providing an infusion device baving a liquid chamber and a propellant chamber, said chambers being separated by a flexible barrier, and wherein said chambers and said flexible barrier are enclosed in a casing, with a liquid suitable for infusion into a patient contained in said liquid chamber, and said liquid chamber having a port to the outside of said infusion device;

combining a solid chemical and a liquid chemical that are contained in a third chamber that is separate from said propellant and liquid chambers, said solid and liquid chemicals being reactive to form a propellant gas;

introducing said propellant gas from said third chamber into said propellant chamber and thereby pressurizing said liquid chamber by virtue of propellant gas pressure applied to said flexible barrier such that said liquid flows out of said liquid chamber through said port; and

maintaining a controlled propellant gas pressure on said liquid chamber while said liquid is flowing out of said liquid chamber.

5,553,742

FLUID FEED APPARATUS AND METHOD

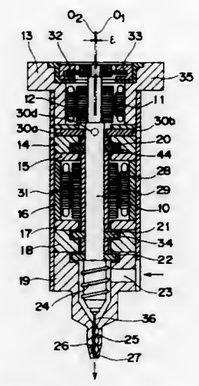
Teruo Maruyama, Hirakata; Yoshikazu Abe, Neyagawa, and Yoshihiro Ikemoto, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Mar. 23, 1995, Ser. No. 408,945

Claims priority, application Japan, Mar. 23, 1994, 6-051807

Int. Cl.[6] G01F *11/00*

U.S. Cl. 222—1 **9 Claims**



1. A fluid feed apparatus comprising:

a suction hole and a discharge bole for a fluid;

a fluid transfer part provided between a rotor and a stationary member containing the rotor;

a shaft coupled with the rotor;

a rotation actuator for rendering a relative rotating motion between the shaft and the stationary member in a surface perpendicular to an axis of the shaft;

a driving power supply for the rotation actuator;

a rotating motion control unit for the rotation actuator;

a swing actuator for rendering a relative swinging motion between the shaft and the stationary member;

a driving power supply for the swing actuator; and

a swinging motion control unit for the swing actuator,

wherein synchronous control is performed by the rotating motion control unit and the swinging motion control unit so that the rotating motion and the swinging motion are synthesized to implement a revolving motion.

9. A fluid feed method using a fluid feed apparatus comprising: a suction hole and a discharge hole for a fluid; a fluid transfer part provided between a rotor and a stationary member containing the rotor; a shaft coupled with the rotor; a rotation actuator for rendering a relative rotating motion between the shaft and the stationary member in a surface perpendicular to an axis of the shaft; a driving power supply for the rotation actuator; a rotating motion control unit for the rotation actuator; a swing actuator for rendering a relative swinging motion between the shaft and the stationary member; a driving power supply for the swing actuator; and a swinging motion control unit for the swing actuator,

the method comprising steps of:

rotating the shaft by the rotation actuator and swinging the shaft by the swing actuator; and

performing synchronous control by the rotating motion control unit and the swinging motion control unit so that the rotating motion and the swinging motion are synthesized to implement a revolving motion.

5,553,743

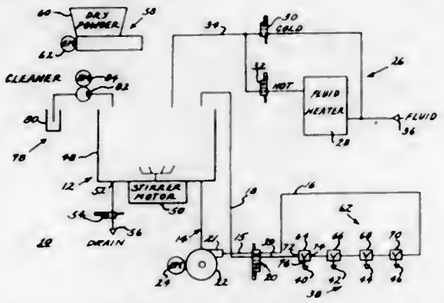
LIQUID DIET DELIVERY SYSTEM AND CONTROL VALVE FOR USE THEREIN

(a) a cabinet;

(b) a container mounted on said cabinet for containing purified water;

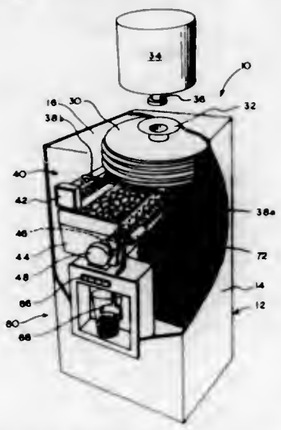
position sealingly engaging a respective one of said valve seats and an open position allowing fluid flow through said inlet and said outlet;

5,553,743
LIQUID DIET DELIVERY SYSTEM AND CONTROL VALVE FOR USE THEREIN
William H. Thompson, Mt. Prospect; Roger Arentson, Crystal Lake, and Trevor Tomkins, Sycamore, all of Ill., assignors to Milk Specialties Company, Dundee, Ill.
Filed Oct. 27, 1994, Ser. No. 330,509
Int. Cl.[6] B65D *88/54*
U.S. Cl. 222—52 **17 Claims**



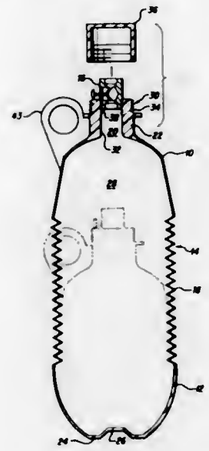
8. A system for dispensing a fluid from a source of said fluid to at least one delivery station, the system comprising:
fluid conductor means for communicating said fluid, said fluid conductor means having a first end and a second end, at least one end of said first end and said second end being in fluid communication with said source;
reversing valve means for selectively establishing a fluid flow in said fluid conductor means in one direction of a first flow direction and a second flow direction; and
control valve means responsive to said fluid flow for selectively establishing fluid communication between one delivery station of said at least one delivery station and said second end of said fluid conductor means.

5,553,744
BOTTLED-WATER DISPENSER WITH ICE MAKER AND CRUSHER
Miles G. Sawyer, III, P.O. Box 578, Carrboro, N.C. 27510
Continuation of Ser. No. 164,415, Dec. 9, 1993, Pat. No. 5,405,052. This application Mar. 30, 1995, Ser. No. 413,841
Int. Cl.[6] B67D *5/08*
U.S. Cl. 222—64 **20 Claims**



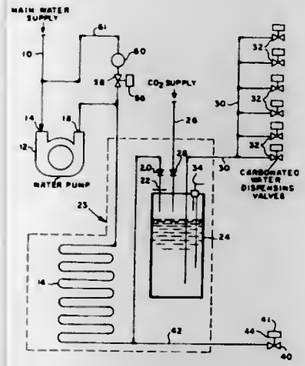
1. A bottled-water dispenser for dispensing cold water or ice comprising:
(a) a cabinet;
(b) a container mounted on said cabinet for containing purified water;
(c) a water receiver disposed in the cabinet for receiving purified water from said container;
(d) a water dispensing valve connected to the water receiver for dispensing purified water from the water receiver;
(e) an ice maker unit disposed in the cabinet and connected to said water receiver for making ice from the purified water in said water receiver;
(f) a storage bin for storing the ice made from the purified water;
(g) a discharge assistant for discharging ice from the storage bin; and
(h) activating means for selectively activating the water dispensing valve and the discharge assistant to selectively dispense either cold water or ice;
(i) wherein said ice maker and water dispensing valve are disposed below said water receiver such that water flows downwardly from the water receiver to the ice maker and dispensing valve.

5,553,745
BEVERAGE CONTAINER AND DISPENSER
Ray M. McMillian, 12060 Springdale Lake Dr., Cincinnati, Ohio 45246
Filed Jan. 27, 1995, Ser. No. 379,775
Int. Cl.[6] B65D *35/08*
U.S. Cl. 222—92 **18 Claims**



1. A container for holding carbonated beverages comprising:
a top portion having a discharge opening formed therein;
a bottom portion;
a side wall portion extending from said top portion to said bottom portion, said side wall portion being in the form of a collapsible tubular bellows, said top portion, said bottom portion, and said side wall portion defining an interior;
a valve for dispensing fluid communicating with said interior, said valve having a valve housing defining a chamber, said chamber having an opposing fluid inlet and fluid outlet, said valve having a longitudinal axis centrally extending through said inlet and said outlet;
said valve having two oppositely disposed valve seats, said valve seats positioned adjacent said inlet and said outlet respectively;
said valve having two oppositely disposed poppet valves, each of said poppet valves having a stem extending therefrom, each of said poppet valves cooperatively movable between a closed position sealingly engaging a respective one of said valve seats and an open position allowing fluid flow through said inlet and said outlet;
said poppet valves coupled to a shaft by said stems, said shaft arranged to move linearly in a direction perpendicular to said longitudinal axis of said valve, said shaft movable between a first position and a second position, said shaft urging each of said poppet valves into said open position when said shaft is in said second position.

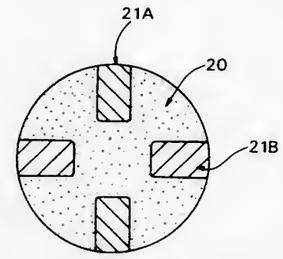
5,553,746
PLAIN WATER PRESSURE BOOST SYSTEM FOR A CARBONATED BEVERAGE DISPENSER
Brian C. Jones, Collinsville, Conn., assignor to Wilshire Partners, Cleveland, Ohio
Filed Dec. 30, 1994, Ser. No. 366,474
Int. Cl.[6] B67D *5/62*
U.S. Cl. 222—129.1 **19 Claims**



13. In a carbonated beverage dispenser comprising a water pump having an inlet and an outlet and a nominal pressure rise, a carbonator adapted to receive water from said pump outlet, at least one carbonated beverage dispensing valve and at least one non-carbonated beverage dispensing valve, the improvement comprising:
said non-carbonated dispensing valve being adapted to receive water from said pump outlet,
said carbonated dispensing valve adapted to receive carbonated water from said carbonator,
a pressure regulator connected between said pump inlet and said pump outlet, said regulator adapted to maintain the pressure rise across said pump at a selected pressure rise less than said nominal pressure rise of said pump,
an isolation valve adapted to allow flow into said regulator when said non-carbonated beverage dispensing valve is actuated and to stop flow into said regulator when said non-carbonated beverage dispensing valve is not actuated; and,
means energizing said pump when said non-carbonated beverage dispensing valve is actuated.

5,553,747
CONTAINER FOR MULTISEGMENTAL TOOTHPASTE
Charles E. Raba, Westfield, and Joseph A. Gabriele, Whippany, both of N.J., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.
Filed Dec. 7, 1994, Ser. No. 350,930
Int. Cl.[6] B65D *35/22*
U.S. Cl. 222—94 **2 Claims**

1. A tubular toothpaste container, containing a plurality of differently constituted, toothpaste materials, in which a first toothpaste material is disposed within the container in the form of a central core of toothpaste material, and one or more second toothpaste materials are disposed in the container in the form of segments arranged around the central core, with an outer surface of the segments of second toothpaste material in contact with the container wall, with an inner surface of the segments of second toothpaste material adjacent to the core, and wherein the cross section of the segments does not converge toward the centre of the container.



5,553,748
REFILLABLE LIQUID DISPENSER
John R. Battle, 11306 W. Pool Ct., Crystal River, Citrus County, Fla. 32629
Continuation of Ser. No. 266,017, Jun. 27, 1994, abandoned, which is a continuation of Ser. No. 982,449, Nov. 27, 1992, Pat. No. 5,328,055. This application Nov. 27, 1995, Ser. No. 562,797
Int. Cl.[6] B65D *35/22*
U.S. Cl. 222—94 **18 Claims**

1. A replaceable liquid container for use with an outer substantially rigid hollow housing wherein the outer substantially rigid hollow housing includes an upper neck having an opening formed therein and a cap to selectively seal the opening, said replaceable liquid container comprises a closed flexible enclosure including a reduced upper end having an upper mounting portion to secure said replaceable liquid container to the outer rigid hollow housing and an intermediate portion to be disposed within the upper neck between said upper mounting portion and a lower bladder to retain liquid therein, said upper mounting portion selectively movable from an extended position to an inverted position relative to said intermediate portion and said lower bladder and the upper neck such that when said lower bladder is positioned within the outer

substantially rigid hollow housing and said intermediate portion disposed within the upper neck and said upper mounting portion is

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5,553,750
LIQUID DISPENSER HAVING ADAPTOR FOR REMOTE

a pump on the housing and operatively connected to the trigger for pumping liquid from a container into the housing is

substantially rigid hollow housing and said intermediate portion disposed within the upper neck and said upper mounting portion is secured to the upper neck by moving said upper mounting portion from said extended position to said inverted position in surrounding relationship relative to the upper neck with said reduced upper end in said inverted position pressed between the cap and the upper neck and further including an installation means coupled thereto to facilitate the installation and placement of said replaceable liquid container in the outer substantially rigid hollow housing, said installation means comprises an elongated substantially rigid member coupled to said upper mounting portion.

5,553,749

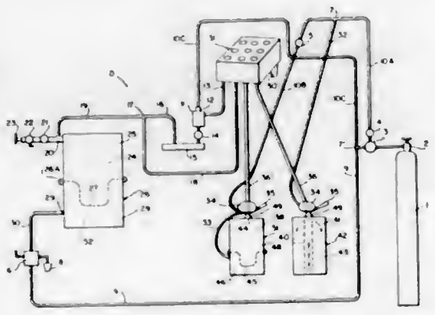
SELF-CONTAINED BEVERAGE DISPENSING SYSTEM

Edward N. Oyler, Newnan, and Harold F. Stover, Grantville, both of Ga., assignors to S.O.B. Partnership, Newnan, Ga.

Continuation of Ser. No. 113,805, Aug. 31, 1993, Pat. No. 5,411,179. This application Feb. 6, 1995, Ser. No. 386,802

Int. Cl.[6] B67D *5/56*

U.S. Cl. 222—129.1 **12 Claims**



1. A self-contained beverage dispensing system comprising:

a) housing means;

b) a refillable source of CO_2 gas under pressure and disposed in said housing means;

c) a refillable water storage means, disposed in said housing means, for storing flat water and including a water isolation means for dividing said water storage means into a water storage portion and a separate portion, said separate portion including means for biasing said water isolation means and operative to force said flat water out of said water storage portion, said water storage means including a water refill inlet and a flat water outlet both being communicated with the water storage portion;

d) a flat water line connected to said water storage portion of said water storage means via said flat water outlet;

e) isolation storage means, disposed in said housing means, for storing a non-carbonated beverage and including a beverage isolation means for separating said isolation storage means into a beverage storage portion and a separate portion, said separate portion of said isolation storage means including means for biasing said beverage isolation means and operative to force said non-carbonated beverage out of said beverage storage portion;

f) a carbonator, in communication with said CO_2 gas source and also with said flat water line, for carbonating at least a portion of said flat water supplied from said water storage means;

g) dispensing valve means for dispensing a selected one of said flat water, said carbonated water and said non-carbonated beverage; and

h) means for communicating said dispensing valve means with each of said water storage means, said carbonator and said isolation storage means.

5,553,750

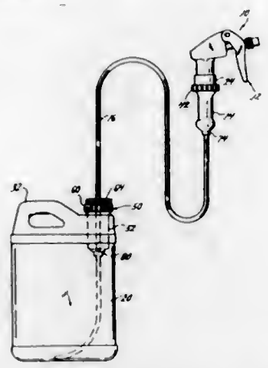
LIQUID DISPENSER HAVING ADAPTOR FOR REMOTE OPERATION

Donald D. Foster, St. Charles, Mo., assignor to Contico International, Inc., St. Louis, Mo.

Continuation of Ser. No. 358,692, Dec. 19, 1994, Pat. No. 5,485,942, which is a division of Ser. No. 227,565, Apr. 14, 1994, Pat. No. 5,373,973, which is a continuation of Ser. No. 984,876, Dec. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 829,759, Jan. 31, 1992, abandoned. This application May 23, 1995, Ser. No. 447,727

Int. Cl.[6] B67D *5/42*

U.S. Cl. 222—179.5 **18 Claims**



1. An assembly for dispensing liquid from a container holding liquid, the container having an opening providing access to the container interior, the assembly comprising:

a conduit for extension into the container, said conduit having a flexible portion;

a hand-held trigger dispenser having a handle portion configured for gripping of the handle portion by a person's hand, the dispenser being connected to the conduit and having a pump operable for drawing liquid from the container by way of the conduit when the conduit is extended into liquid held within the container; and

an adaptor having a connector for releasably fastening the adapter to the container at the container opening and the adapter having a portion extending into the interior of the container when the adaptor is fastened to the container at the opening;

the dispenser and adaptor having connectors releasably fastening the dispenser to the adaptor with the conduit extending from the dispenser through the adaptor and into the container when the adaptor is fastened to the container, the conduit flexible portion providing extension upon disconnecting the dispenser from the adaptor for remote operation of the dispenser from the adaptor;

whereby, the fastening of the dispenser, adaptor and container together provides a stationary attachment of the dispenser relative to the container.

5,553,751

WATER DISPENSER

Doug Mowers, Worcester, N.Y., assignor to Mountainside Springs Corporation, Worcester, N.Y.

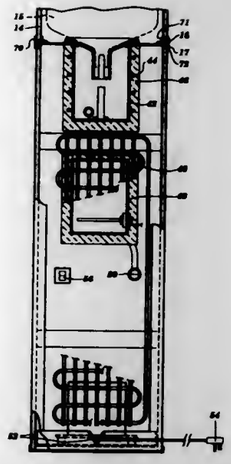
Filed Aug. 12, 1994, Ser. No. 289,416

Int. Cl.[6] B67D *5/06*

U.S. Cl. 222—183 **5 Claims**

1. A water dispenser comprising:

a base formed from a first material construction susceptible to water damage and having an upper surface, a lower surface, an outer surface and an inner surface, said base including a surface molding, formed from a second material construction,



disposed on said upper surface and having a lip on an outer periphery extending exterior said base outer surface for protecting said first material construction of said base;

a well disposed inside said base for holding fluid;

a dispenser disposed on said base for dispensing fluid from said well;

a cap having an upper surface, a lower surface, an inner surface and an outer surface, said cap including a skirt disposed on said lower surface, whereby said skirt is engagable with said surface molding of said base when said cap is positioned on said base.

5,553,752

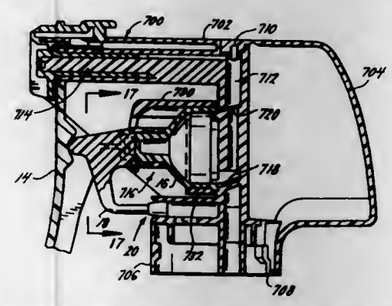
SPRING FOR TRIGGER SPRAYER

Donald D. Foster, St. Charles, and Philip L. Nelson, Ellisville, both of Mo., assignors to Contico International, Inc.

Continuation of Ser. No. 242,326, May 13, 1994, Pat. No. 5,425,482, which is a continuation-in-part of Ser. No. 964,158, Oct. 21, 1992, Pat. No. 5,385,302, which is a continuation-in-part of Ser. No. 603,281, Oct. 25, 1990, Pat. No. 5,234,166. This application Jun. 2, 1995, Ser. No. 459,036

Int. Cl.[6] B67D *5/42*

U.S. Cl. 222—340 **17 Claims**



1. A trigger sprayer apparatus for dispensing liquid from a container, the apparatus comprising:

a sprayer housing having a liquid discharge passage extending therethrough, the discharge passage having an orifice for dispensing liquid;

a trigger mounted on the sprayer housing for movement of the trigger between a retracted position and an extended position of the trigger relative to the sprayer housing;

a pump on the housing and operatively connected to the trigger for pumping liquid from a container into the housing in response to the trigger being moved to its extended position, and for pumping liquid from the housing and through the discharge passage orifice in response to the trigger being moved to its retracted position; and

an elastomeric spring operatively connected to the trigger for biasing the trigger toward its extended position, the spring having a rounded collar portion that attaches the spring in a fixed position relative to the housing.

5,553,753

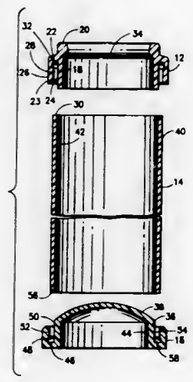
METHOD OF MANUFACTURING A PLASTIC AEROSOL CONTAINER HAVING PLASTIC END CLOSURES

Robert H. Abplanalp, 10 Hewitt Ave., Bronxville, N.Y. 10708

Continuation of Ser. No. 298,371, Aug. 30, 1994, abandoned, which is a continuation of Ser. No. 68,602, May 27, 1993, abandoned, which is a continuation of Ser. No. 937,439, Aug. 27, 1992, abandoned, which is a continuation of Ser. No. 837,653, Feb. 14, 1992, abandoned, which is a continuation of Ser. No. 730,567, Jul. 15, 1991, abandoned, which is a continuation of Ser. No. 634,927, Dec. 26, 1990, abandoned, which is a continuation of Ser. No. 517,553, Apr. 24, 1990, abandoned, which is a continuation of Ser. No. 406,879, Sep. 13, 1989, abandoned, which is a continuation of Ser. No. 296,407, Jan. 9, 1989, abandoned, which is a continuation of Ser. No. 136,553, Dec. 22, 1987, abandoned. This application May 25, 1995, Ser. No. 450,395

Int. Cl.[6] B67D *5/42*

U.S. Cl. 222—387 **23 Claims**



1. A method for manufacturing a container (**10**) suitable for dispensing pressurized products and comprising an extruded seamless plastic body portion (**14**) capable of withstanding pressures associated with the product to be dispensed, the body portion have protuberances (**70**) at each end, and plastic end closure members (**12, 16**) each having an annular recess (**28, 54**) with an undercut (**32, 58**) for receiving the respective end (**30, 56**) and protuberance (**70**) of the body portion (**14**) and thereby forming a fluid tight seal between the body portion (**14**) and the end closure members (**12, 16**), characterized in that the protuberances (**70**) on the ends (**30, 56**) of the tubular body portion (**14**) are formed in situ in said recesses (**28, 54**) by heating said ends to flow the plastics of the tubular body portion (**14**) into said undercuts (**32, 58**).

170-919 O.G.-96-7: QL3

5,553,754

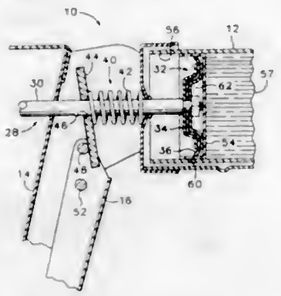
CAULK GUN

inverted U-shaped bridge having a bight and legs bestriding the passage and unitary with the partition, the bight of the

5,553,758

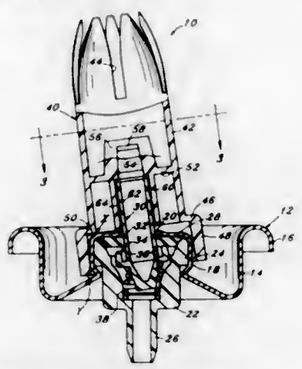
NOZZLE ADAPTOR FOR APPLYING HOT MELT ADHESIVE

5,553,754
CAULK GUN
Christopher G. Dentler, Portland, Oreg., assignor to Z-Pro International, Inc., Portland, Oreg.
Filed Jun. 30, 1994, Ser. No. 269,063
Int. Cl.[6] B67D *5/42*
U.S. Cl. 222—391 **30 Claims**



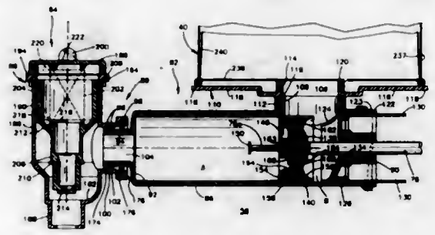
1. A caulk gun, comprising:
(a) a body; and
(b) a plunger slidably connected to the body and having a rod and a piston wherein the piston has a central rigid portion and a radially located flexible rim wherein the rigid portion includes a blunt surface for pushing against a movable abutment.

5,553,755
WHIPPED CREAM DISPENSER
Chris Bonewald, New London, and Robert A. Coerver, Bedford, both of N.H., assignors to Summit Packaging Systems, Inc., Manchester, N.H.
Filed Jun. 9, 1995, Ser. No. 489,121
Int. Cl.[6] B65D *83/14*
U.S. Cl. 222—402.21 **4 Claims**



1. In a whipped cream dispenser comprising:
a. an aerosol container having at its upper end a tilt-type valve disposed in a metal valve pedestal having a side and a top and a central aperture receiving an upwardly directed tubular discharge stem, and the container enclosing a whipped-cream-producing product and propellant means,
b. a unitary tubular whipped-cream actuator molded of rigid plastic and defined by an outer tubular body including a base end with an outward skirt disposed over the valve pedestal and a discharge end having spaced fingers, a support partition in the body intermediate the ends of the body formed with a central passage having a downward tubular nipple surrounding and fitting snugly over the aerosol discharge stem, and an inverted U-shaped bridge having a bight and legs bestriding the passage and unitary with the partition, the bight of the inverted U-shaped bridge being spaced from the central passage and comprising deflector means confronting the passage, the improvement wherein the skirt is defined by a short rigid radial outward flange having a downwardly facing shoulder and a generally downward annular wall following and surrounding the pedestal, the shoulder being adapted during dispensing to engage the top of the pedestal at a point of engagement when the actuator and valve stem are tipped, the point of engagement serving as a stop to limit further tilting of the actuator to avoid breaking of the stem.

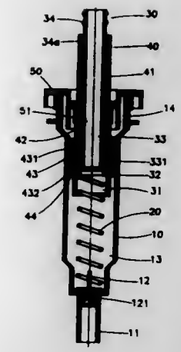
5,553,756
DISPENSER WITH PRESSURE OPERATED, SPRING BIASED, RECIPROCATING PISTON VALVE
Robert T. Topper, Heber Springs; John W. Gilliom, Wooster, and James M. Tucker, Conway, all of Ark., assignors to White Consolidated Industries, Inc., Cleveland, Ohio
Division of Ser. No. 166,236, Dec. 10, 1993, Pat. No. 5,494,194. This application May 30, 1995, Ser. No. 452,966
Int. Cl.[6] B65D *37/00*
U.S. Cl. 222—496 **5 Claims**



1. A dispensing valve for discharging viscous material pushed toward and moved away from the valve comprising:
a valve body providing an inlet port, an outlet port, and a chamber in fluid communication with said ports, said viscous material being flowable from said inlet port to said outlet port via said chamber when said valve is in an open condition;
a poppet member contained within the valve body and being movable between a closed position when seated and sealed against said outlet port to preclude viscous material flow therethrough, and an open position when unseated and spaced from said outlet port to permit viscous material flow therethrough, said movable poppet member providing a surface acted upon by said viscous material within said chamber; and
a biasing member contained within said valve body and biasing said poppet member toward its closed position seated and sealed against said outlet port, said poppet member being movable to its open position solely by viscous material pressure against said surface wherein said valve opens, said poppet member being movable to its closed position by the combination of said biasing and a negative pressure or suction force applied to said surface by said viscous material as a portion of said viscous material is withdrawn from said chamber via said inlet port, wherein said valve closes.

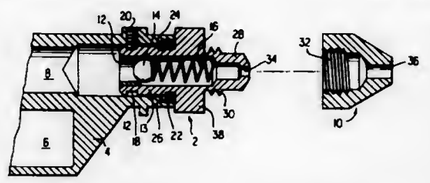
5,553,757
CREAM DISPENSER HEAD
Ming-Teh Wang, 6F, No. 31, Lane 131, Sec.2, Chung Shan Rd., Chung Ho City, Taipei Hsien, Taiwan
Filed Mar. 14, 1995, Ser. No. 403,949
Int. Cl.[6] G01F *11/02*
U.S. Cl. 222—321.9 **1 Claim**

1. A dispensing head for a cream dispenser, comprising:
a cap having a center tube, said center tube having a longitudinally extended through bore;



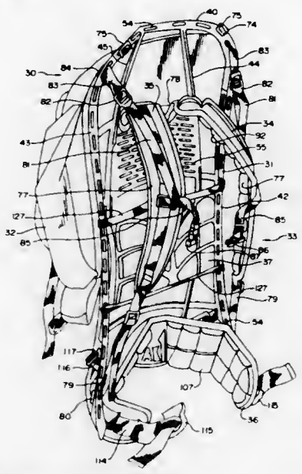
a shell having a cylindrical wall forming a longitudinally extended cavity defining an accumulator chamber, said shell having a bottom end and open top end coupled to said cap;
a one piece sleeve having opposing first and second ends and a through passage extending longitudinally between said first and second ends, said first end being slidingly displaceably engaged within said through bore of said center tube, said sleeve having an outwardly extending annular flange between said first and second ends, said outwardly extending annular flange having a predetermined diameter greater than a diameter of said center tube whereby said outwardly extending annular flange acts as a stop against said center tube, said second end of said sleeve having an outside flange integrally formed therein, said outside annular flange being formed with an upper annular groove and a lower annular groove, said outside flange sealingly engaging an inner surface of said cylindrical wall of said shell;
a piston formed by a cylindrical wall having first and second longitudinally displaced ends and having a longitudinal bore extending from said piston first end for expelling a cream therefrom, said piston being slidingly displaceably disposed within said through passage of said sleeve, said cylindrical wall of said piston having an outer surface with a raised portion sealingly engaging an inner surface of said sleeve through passage, said piston second end having a spring holder integrally formed thereon, said piston having at least one through-hole located adjacent said second end in open communication with said longitudinal bore of said piston, said outer surface of said piston cylindrical wall having projecting portions extending therefrom intermediate said second end thereof and said through-hole for forming a stop against said sleeve second end, whereby displacement of said piston from a first position to a second position relative to said sleeve exposes said through-hole to a cream contained within said accumulator chamber, and concurrent displacement from said second position of said piston and said sleeve relative to said center tube to a third position compresses and forcibly displaces the cream through said through-hole, and through said piston bore;
a valve disposed within an opening formed in said bottom end of said shell;
a dip tube extending longitudinally from said bottom end of said shell; and,
a spring disposed between said spring holder and said bottom end of said shell for applying a biasing force to said piston and said sleeve for displacement thereof from said accumulator chamber and thereby creating a vacuum in said accumulator chamber to draw more cream into said accumulator through said dip tube and said valve.

5,553,758
NOZZLE ADAPTOR FOR APPLYING HOT MELT ADHESIVE
Peter S. Melendy, and Richard A. Belanger, both of 3 Merrill Industrial Dr., Hampton, N.H. 03842
Filed Jan. 27, 1995, Ser. No. 378,820
Int. Cl.[6] B67D *5/06*
U.S. Cl. 222—533 **9 Claims**



1. A nozzle for dispensing liquid material comprising a nozzle body for passing said liquid material therethrough, means for engaging a holder for said nozzle body, and for securing said nozzle body to said holder longitudinally while permitting rotation of said body with respect to said holder, seal means for providing a liquid seal between said nozzle body and said holder, and means for removably attaching a nozzle cap to said nozzle body, said means for removably attaching providing a rotationally fixed attachment between said nozzle cap and said nozzle body, whereby said means for securing permits adjustment of the orientation of a said cap with respect to said bolder.

5,553,759
BACKPACK ASSEMBLY
James McMaster, and Michael Petersen, both of Florence, S.C., assignors to The Coleman Company, Inc., Wichita, Kans.
Filed Jul. 12, 1994, Ser. No. 273,879
Int. Cl.[6] A45F *3/08;3/10*
U.S. Cl. 224—631 **6 Claims**



1. A backpack assembly comprising:
a frame having top and bottom frame members and a pair of side frame members which extend between the top and bottom frame members, each of the side frame members having an elongated longitudinal channel therein,
a sack having a pair of elongated attaching members secured thereto, each of the attaching members being slidably received in one of the channels, and

each of said channels having a generally keyhole-shaped transverse cross section, each said channel being provided in a main channel portion having:

a pair of opposed side walls which form a plurality of restrictive mouth portions, said mouth portions spaced longitudinally along said main channel portion; and,

a plurality of longitudinally spaced bottom walls connecting said side walls and located at portions of the channel between said mouth portions, said mouth portions located at portions of the channel between said bottom walls; whereby,

said channel can be injection molded in the side member of the frame.

5,553,760

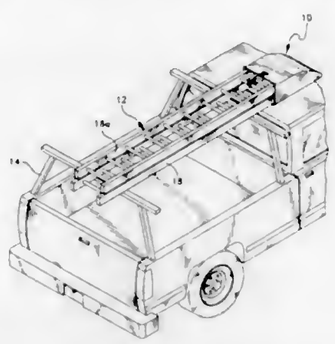
LADDER SHIELD

Kevin J. Wright, 2480 Winthrop St., North Dighton, Mass. 02764, and Stephen T. Wright, 14 Highland Ave., Barrington, R.I. 02806

Filed Jul. 10, 1995, Ser. No. 500,338

Int. Cl.[6] B60R *9/00*

U.S. Cl. 224—316 **9 Claims**



1. An air shield for attachment to a forward end of a generally longitudinally extending ladder having a forward end and a transverse extent when said ladder is transported by a vehicle, said shield including a hollow body and having connected top and bottom walls forming an envelope for receipt of said ladder forward end, said body also having forward and rear ends each of a transverse extent slightly greater than the transverse extent of a ladder wherein the body rear end is open for receipt of said ladder forward end and the body forward end terminates in a closed wall of a height materially less than a height of said rear end and wherein said body top wall upwardly rearwardly tapers in a longitudinal direction from said forward end to said rear end, said body including an outer surface which is smooth and rigid and further including attachment means for attaching said shield to said ladder wherein said attachment means includes an elongated flexible element having a loop at one end thereof and adapted to extend about a rung of the ladder located rearwardly of said body rear end when said shield is attached to said ladder and means for connecting said flexible element to said body at the other end thereof.

5,553,761

LUGGAGE RACK FOR MOTOR VEHICLE

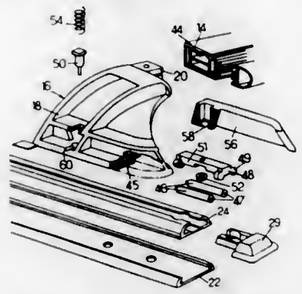
Philippe Audoire, Trappes Cedex, and Michel Memeteau, Bressuire Cedex, both of France, assignors to Matra Automobile, Paris, France, and Farnier Penin, Bressuire Cedex, France

Continuation of Ser. No. 277,282, Jul. 21, 1994, abandoned. This application Mar. 20, 1996, Ser. No. 618,724

Claims priority, application France, Jul. 22, 1993, 93 09047

Int. Cl.[6] B60R *9/00*

U.S. Cl. 224—321 **10 Claims**



1. Luggage rack for a motor vehicle comprising:

a pair of rails constructed to be fixed flat and mutually parallel and spaced on a bodywork of a vehicle, each rail including a longitudinal member formed with a groove of predetermined cross-section having an opening via a longitudinal slot and mutually divergent flanks; and

at least one crossmember, said crossmember having:

a bar,

two end legs each secured to a respective end of said bar and each slidably engageable with a respective one of said rails, and

two locking mechanisms, each for locking one of said legs on the respective one of said rails and each including rollers trapped in said groove of the respective one of said rails, and a manual control member manually movable between a first position where it causes wedging of the rollers against the flanks of the groove and a second position where it releases said rollers.

5,553,762

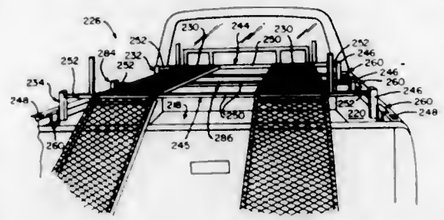
VECHICLE CARRIER AND RAMP ASSEMBLY

Charles Brown, 3016 Joanna Dr., Farmers Branch, Tex. 75234

Continuation-in-part of Ser. No. 220,206, Mar. 30, 1994, abandoned. This application Sep. 23, 1994, Ser. No. 311,326

Int. Cl.[6] B60R *9/042*

U.S. Cl. 224—403 **6 Claims**



1. A vehicle carrier and ramp assembly for use with a truck having a rectangular bed and laterally spaced side walls provided with an upwardly opening stake pocket proximate each corner of said bed, comprising:

a pair of laterally spaced platforms for supporting a vehicle;

a plurality of braces joined to said spaced platforms for maintaining said spaced platforms at a fixed height above the bed of the truck, each of said braces including a pair of vertical columns, each column adapted for engagement with one of the laterally spaced side walls;

a bracket joined to each of said vertical columns for engagement with the top of one of the laterally spaced side walls, each said bracket including:

a bar having a vertical leg, secured to said vertical column, and a horizontal leg integrally joined to the top of said vertical leg, said horizontal leg being adapted for engagement with the top of one of the laterally spaced side walls; and,

a U-bolt secured to said bans for clamping said bracket in a fixed position upon ooe of the laterally spaced side walls; and

a pair of ramps, each of which are detachably connected to a respective one of said spaced platforms for facilitating the moving of a vehicle onto or from said spaced platforms.

5,553,763

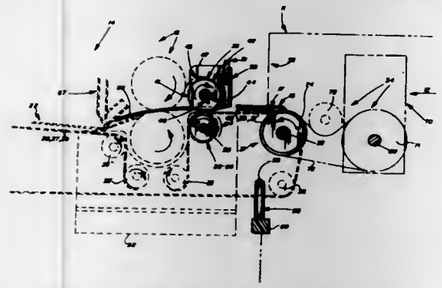
FEEDING OF OFFSET, COLLATED FORMS

Robert S. Ring, Rochester, N.H., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Division of Ser. No. 127,380, Sep. 28, 1993, Pat. No. 5,417,360. This application Jan. 27, 1995, Ser. No. 378,829

Int. Cl.[6] B26F *3/02*; **B65H** *20/02*

U.S. Cl. 225—4 **16 Claims**



1. A method of feeding offset continuous collated business form webs to a burster having slow rolls and fast rolls, each business form web including top and bottom webs, comprising the steps of:

(a) feeding the top and bottom webs together in a first direction at a first speed;

(b) engaging one of the top and bottom webs with a plurality of puller wheels, distinct from the slow rolls and fast rolls of the burster, driven at a second speed greater than the first speed, in such a way that excessive pull of the one web does not occur; and

(c) directing the webs from the puller wheels directly to the burster so that all webs are reliably fed between the slow rolls of the burster.

5,553,764

GAS RETURN CYLINDER FOR A RECIPROCATING DRIVER IN A TOOL

David L. Remerowski, Cincinnati, Ohio, assignor to Sencorp, Newport, Ky.

Filed Jun. 5, 1995, Ser. No. 462,240

Int. Cl.[6] B25C *1/08*

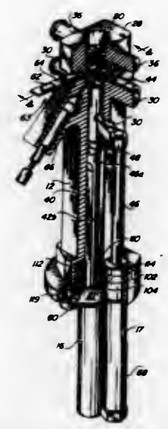
U.S. Cl. 227—10 **2 Claims**

1. A propellant tool for driving an object, comprising:

(a) a body;

(b) a combustion chamber within the body;

(c) a driver cylinder, the driver cylinder being in fluid communication with the combustion chamber;



(d) a driver reciprocally movable between retracted and extended positions within the driver cylinder, the driver being movable toward its extended position in response to a pressure increase in the combustion chamber;

(e) a closed-ended gas spring return cylinder containing a sealed compressible fluid that is independent of fluid in the driver cylinder; and

(f) a structural member within the gas spring cylinder, the structural member being mechanically interconnected to and reciprocally driven by the driver to compress and increase the pressure of the compressible fluid in the gas return cylinder when the driver is moved toward its extended position, the structural member being operative when the pressure in the combustion chamber is reduced to return the driver to its retracted position in response to the increased pressure of the sealed compressible fluid in the gas return cylinder created when the driver is moved to its extended position.

5,553,765

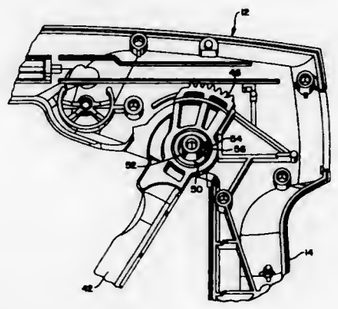
SURGICAL STAPLER WITH IMPROVED OPERATING LEVER MOUNTING ARRANGEMENT

Bryan D. Knodel, Cincinnati; Dale R. Schulze, Lebanon, and Richard P. Nuchols, Loveland, all of Ohio, assignors to Ethicon Endo-Surgery, Inc., Cincinnati, Ohio

Filed Apr. 28, 1995, Ser. No. 431,105

Int. Cl.[6] A61B *17/068*

U.S. Cl. 227—176.1 **8 Claims**



5. A surgical instrument, comprising:

a frame including a handle portion;

a portion joined to and extending from said frame for effecting a plurality of surgical steps;

a first operating linkage for effecting a first surgical step;

a second operating linkage for effecting a second surgical step;

a first mounting boss on said frame defining a first generally annular bearing surface, and a second mounting boss on said frame defining a second generally annular bearing surface axially spaced from and having an effective diameter substantially less than an effective diameter of said first bearing surface, said second mounting boss being positioned generally within and in spaced relationship to said first mounting boss, said first annular bearing surface being positioned closer to a wall of said frame than said second annular bearing surface; and

first and second operating levers respectively operatively connected with said first and second operating linkages, and respectively pivotally mounted on said first and second mounting bosses.

5,553,766

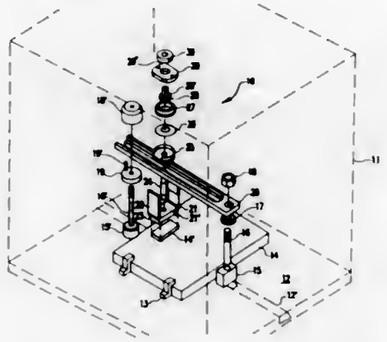
IN-SITU DEVICE REMOVAL FOR MULTI-CHIP MODULES

Raymond A. Jackson, Poughkeepsie; Kathleen A. Lidestri, Hopewell Junction; David C. Linnell, Poughkeepsie, and Raj N. Master, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1994, Ser. No. 342,563

Int. Cl.[6] H05K *3/34*; B23K *3/00*

U.S. Cl. 228—13 **20 Claims**



1. Apparatus for removing a semiconductor chip from a substrate including, in combination:

a chip lifting assembly; and

means for supporting said chip lifting assembly above a substrate to which at least one chip is attached by means of solder, wherein said chip lifting assembly comprises:

means for gripping a chip; and

means for applying a lifting force to said means for gripping a chip only at a temperature equal to or exceeding a softening temperature of said solder,

wherein said means for supporting said at least one chip lifting assembly comprises a slotted jig.

5,553,767

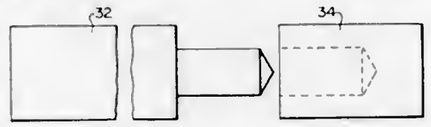
SOLDERING IRON TIP MADE FROM A COPPER/IRON ALLOY COMPOSITE

Carl E. Weller, Nokomis, Fla., assignor to Donald Fegley, and Emily I. Weller, both of Pottstown, Pa.

Filed Aug. 17, 1994, Ser. No. 291,944

Int. Cl.[6] B23K *3/02*

U.S. Cl. 228—54 **9 Claims**



1. A soldering tip comprising a composite comprising a sintered mixture of 50–95 weight percent uncoated copper particles and 5–50 weight percent iron particles.

5,553,768

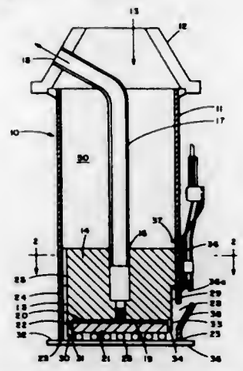
HEAT-CONTROL PROCESS AND APPARATUS FOR ATTACHMENT/DETACHMENT OF SOLDERED COMPONENTS

Clifford S. Lasto, Woodbridge, and Jeffrey S. Duhaime, Bethany, both of Conn., assignors to Air-Vac Engineering Company, Inc., Seymour, Conn.

Continuation-in-part of Ser. No. 125,118, Sep. 21, 1993, Pat. No. 5,419,481. This application Feb. 24, 1995, Ser. No. 394,138

Int. Cl.[6] H05K *3/34*; B23K *1/00*

U.S. Cl. 228—102 **18 Claims**



15. A soldering/desoldering apparatus comprising a means for supplying a continuous flow of gas, flow rate-regulating means for said gas, heater means for said gas, means for controlling said flow rate-regulating and said heater means, and a unitary vacuum/hot gas nozzle device for supporting an electrical component, having a meltable solder lead array on the undersurface thereof, in contact with or closely-spaced above a corresponding circuit array present on the surface of a printed circuit board, and for directing a continuous flow of said gas from said supply means at a predetermined temperature and flow rate to circulate through said solder lead array and melt said solder leads uniformly and substantially simultaneously, said nozzle device comprising a housing having an upper wall section enclosing an internal hot gas chamber and a lower wall section enclosing a block member having a central component-supporting recess in the undersurface thereof, vacuum conduit means, through said housing and block member to said recess, to retain a said component within said recess, inlet means for receiving the hot gas into said hot gas chamber, means for channeling the hot gas from said chamber to at least a portion of the outer periphery of said recess, a narrow hot gas orifice for

directing said channeled hot gas horizontally in at least one direction through the meltable solder lead array on the undersurface of a component retained by said vacuum means within said recess, at least one hot gas outlet for venting the hot gas which has passed through said solder lead array, and a temperature sensing means associated with said outlet and with said control means for automatically actuating said flow regulating means and said heater means, to adjust the temperature or the flow rate of hot gas through the meltable solder lead array at a predetermined sensed temperature below the melting temperature of the solder lead array, to produce uniform and gradual melting thereof while the component is retained in said recess for the desired dwell time, with the solder lead array adjacent to or bonded to a corresponding circuit array present on the surface of a printed circuit board.

5,553,769

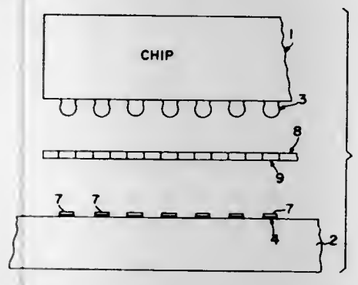
INTERCONNECTION OF A CARRIER SUBSTRATE AND A SEMICONDUCTOR DEVICE

James V. Ellerson, Endicott; Joseph Funari, Vestal, and Jack A. Varcoe, Endwell, all of N.Y., assignors to International Business Machine Corporation, Armonk, N.Y.

Division of Ser. No. 974,493, Nov. 12, 1992. This application May 19, 1995, Ser. No. 445,382

Int. Cl.[6] H01L *21/50*

U.S. Cl. 228—123.1 **12 Claims**



1. A method of increasing the fatigue life of solder interconnections between a semiconductor device and a supporting substrate comprising providing on a supporting substrate a plurality of electrodes; providing on the surface of said electrodes that is remote from said supporting substrate a low melting solder material having a melting point which will liquify to which the interconnections are subjected during use; positioning a semiconductor so that said device solder connections are located between said semiconductor device and electrodes; applying heat to thereby cause the solder connections to liquify; then removing said heat to thereby cause the solder material to solidify and interconnect said semiconductor device supporting substrate.

5,553,770

HEAT EXCHANGER ASSEMBLIES-MATERIAL FOR USE THERIN, AND A METHOD OF MAKING THE MATERIAL

Sunil C. Jha, North Attleboro, Mass., and James A. Forster, Barrington, R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

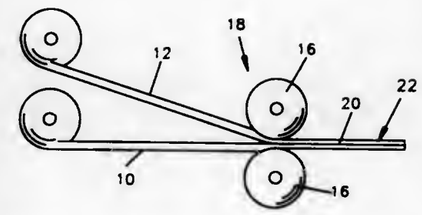
Filed Mar. 7, 1994, Ser. No. 207,456

Int. Cl.[6] B23K *20/04*; B21D *53/04*

U.S. Cl. 228—190 **11 Claims**

1. A method for making a self-brazing composite material for use in a heat exchanger using a corrosive heat exchanger fluid comprising:

providing a first substrate layer of a first material chosen from the group consisting of stainless steels and nickel super alloys;



providing a second layer of a second material comprising a multicomponent material chosen from the group consisting of a nickel or nickel alloy and a titanium or titanium alloy materials capable of having good high temperature and corrosion properties and melting at a temperature well below that of the first material;

metallurgically bonding said first and second layers together to form a bonded composite material being readily formable; and

reacting said bonded composite material by controlled heating so as to render the second layer of the nickel or nickel alloy to alloy with the titanium or high titanium alloy to form a lower melting point brazing alloy layer for the first layer with excellent high temperature and corrosion properties.

5,553,771

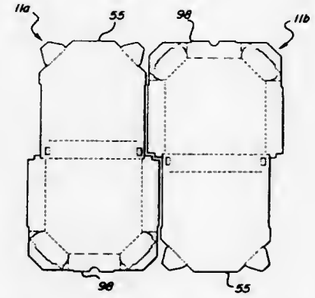
RESOURCE SAVING BOX

John D. Correll, 8459 Holly Dr., Canton, Mich. 48187

Continuation-in-part of Ser. No. 69,830, Jun. 1, 1993, Pat. No. 5,381,949, Ser. No. 145,248, Nov. 1, 1993, and Ser. No. 272,677, Jul. 8, 1994. This application Aug. 11, 1994, Ser. No. 289,306

Int. Cl.[6] B65D *5/24*; *5/42*

U.S. Cl. 229—110 **17 Claims**



1. A one-piece blank of resilient foldable material cut and scored to define:

a bottom panel,

a rear wall hingedly attached to said bottom panel at a rear wall fold line, said rear wall having a top edge,

a cover hingedly attached to the top edge of said rear wall at a cover fold line,

first, second, third, and fourth side walls hingedly attached to said bottom panel at first, second, third, and fourth side wall fold lines, respectively, and each having a top edge, bottom edge, front end, and rear end and having a maximum length extending from an outermost point on said front end to an outermost point on said rear end, said third and fourth side wall fold lines being disposed at an oblique angle to said first and second side wall fold lines, respectively, said first and second side wall fold lines being disposed between said rear wall fold line and said third and fourth side wall fold lines, respectively,

at least one of said first and third side walls and at least one of said second and fourth side walls being of non-rectangular

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5,553,773

HINGE-LID BOX FOR CIGARETTES OR THE LIKE

Heinz Focke, Verden, and Hans-Jürgen Bretthauer, Bremen,

at least one of said first and third side walls and at least one of said second and fourth side walls being of non-rectangular shape with the maximum length of the wall being longer than the bottom edge of the wall,

a cover-to-third-and-fourth-wall interlock means wherein, after said blank has been folded into a box, said cover interlockingly engages with said third and fourth side walls,

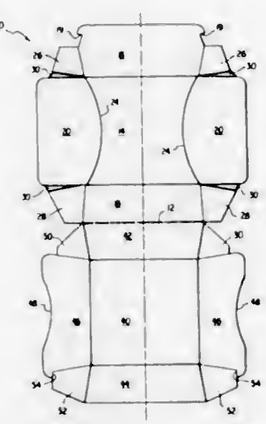
the above-described components being of such shape and position that, after said blank is folded into a box and said cover-to-third-and-fourth-wall interlock means is engaged, at least a portion of the rear end of said third and fourth side walls extends beyond a plane of said first and second side walls, respectively, whereby said third and fourth side walls are held in a predetermined position by being interlockingly engaged to said cover, said first and second side walls are held in a predetermined position by a resilient property of the foldable material pushing them against the third and fourth side walls, respectively, and said rear wall is held in a predetermined position by being hingedly attached to said cover.

5,553,772

PAPERBOARD CLAMSHELL CARTON

Kurt D. Jensen, Newburgh, N.Y., assignor to International Paper, Purchase, N.Y.

Filed Oct. 31, 1995, Ser. No. 558,565
Int. Cl.[6] B65D *5/22*
U.S. Cl. 229—148 **6 Claims**



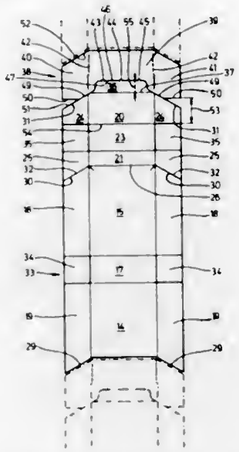
1. A one piece clamshell carton having a bottom tray including a bottom panel, two upstanding side panels, a rear panel and a front panel, said carton also having a crown including a top panel, two side panels, a rear panel and a front panel, said tray and crown rear panels being foldably joined about a common rear horizontal axis, said crown side walls being concave towards each other, said crown being swingable about said rear horizontal axis to close said tray, a portion of respective said side panels of said crown extending downwardly beyond a portion of respective said tray side panels.,said crown side panels located outwardly of said tray side panels, said crown front wall located outwardly of said tray front wall, a lowest portion of said crown front wall extending downwardly relative to a portion of said tray front wall.

5,553,773

HINGE-LID BOX FOR CIGARETTES OR THE LIKE

Heinz Focke, Verden, and Hans-Jürgen Bretthauer, Bremen, both of Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Germany

Filed Mar. 28, 1995, Ser. No. 413,461
Claims priority, application Germany, Mar. 30, 1994, 44 10 803.6
Int. Cl.[6] B65D *17/32*
U.S. Cl. 229—224 **2 Claims**



1. A hinge-lid cigarette box comprising a box part (**12**), a lid (**13**) pivotably connected to said box part, and a collar (**38**) which is anchored in the box part (**12**) and which has a sub-region that projects out of the box part, wherein:

a) in a region of a from wall (**20**) of the lid, the lid (**13**) is connected to a front wall (**39**) of the collar by a plurality of thin material webs (**43, 44, 45**) which are severable in response to a first opening of the lid (**13**) from a closed position thereof;

b) the lid has an inner tab (**36**) which is fitted on the lid from wall (**20**) and is fastened to an inner side thereof, and the collar front wall (**39**) is connected to the lid inner tab (**36**) by the material webs (**43, 44, 45**);

c) the lid inner tab (**36**) has a shape and size that corresponds to that of a depression (**48**) in the collar from wall (**39**);

d) the depression (**48**) is located in a central region of the collar from wall (**39**) which has a transversely directed collar edge (**46**), and the lid inner tab (**36**) has a transversely directed border (**47**) which extends parallel to the collar edge (**46**); and

e) in a region of the depression (**48**), said plurality of material webs (**43, 44, 45**) are located only on the transversely directed collar edge (**46**) and the transversely directed border (**47**) of the lid inner tab (**36**).

5,553,774

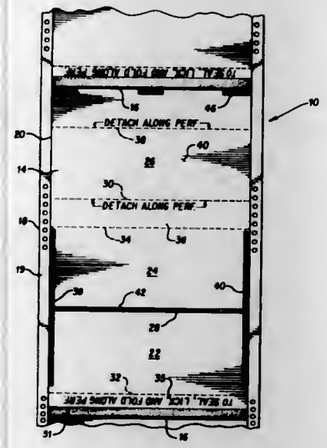
PRESSURE SEAL C-FOLDED MAILER

Brian Goodno, Manchester, N.H., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Feb. 27, 1995, Ser. No. 394,478
Int. Cl.[6] B65D *27/06*
U.S. Cl. 229—303 **17 Claims**

1. A mailer with integral return envelope comprising:

an elongated sheet having first, second and third panels spaced longitudinally one from the other along said sheet and connected to one another along first and second longitudinally spaced, laterally extending foldlines between said first and second panels and said second and third panels, respectively;



lines of pressure seal adhesive applied along longitudinally extending lateral margins of said first and second panels and along laterally extending adjoining margins of said first and second panels on opposite sides of said first foldline, said adhesive applied on one face of said sheet;

said first and second panels being folded about said first foldline into registry with one another with said longitudinally extending lines of adhesive adhered to one another along opposite laterally spaced margins thereof and said laterally extending lines of adhesive adjacent margins of the first and second panels adhered to one another to form a return envelope for said mailer with an opening therefor adjacent said second foldline;

a first pattern of pressure seal adhesive applied to said third panel along said one face of said sheet and adjacent an end margin of said sheet and said third panel;

a second pattern of pressure seal adhesive applied to said first panel on a face of said sheet opposite said one face and adjacent said first foldline;

said third panel being folded about said second foldline to register with and overlie said first panel along the opposite face of said sheet with said first and second patterns of adhesive registering with and adhering to one another to form a completed mailer.

5,553,775

AIR CONDITIONER SYSTEM FOR VEHICLE

Keno Kato; Ikutaro Noji, both of Yokohama; Masashi Arai, and Makoto Fukubayashi, both of Isehara, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 22, 1994, Ser. No. 346,170
Claims priority, application Japan, Nov. 25, 1993, 5-295593
Int. Cl.[6] B61D *27/00*; **F24F** *7/00*
U.S. Cl. 236—49.3 **2 Claims**

1. In a vehicle including an occupant compartment including a driver's occupying area and a front passenger's occupying area, an air conditioner system comprising:

a duct adapted to conduct a conditioned air, said duct defining a first passage opening to the driver's occupying area and a second passage opening to the front passenger's occupying area;

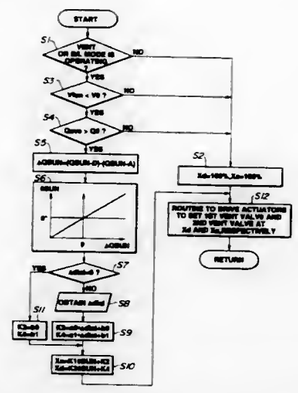
a first vent valve disposed within said first passage;

a second vent valve disposed within said second passage;

a first actuator drivingly connected to said first vent valve;

a second actuator drivingly connected to said second vent valve;

a first sensor so constructed and arranged as to detect insolation magnitude within the driver's occupying area and generate a



first sensor signal indicative of said detected insolation magnitude within the driver's occupying area;

a second sensor so constructed and arranged as to detect insolation magnitude within the front passenger's occupying area and generate a second sensor signal indicative of said detected insolation magnitude within the front passenger's occupying area; and

means for determining target degrees of opening which said first and second vent valves are to take in response to said first and second sensor signals and providing first and second outputs to said first and second actuators, respectively, to set said first and second vent valves at said determined target degrees of opening, respectively;

wherein said means includes a memory storing a control routine, said control routine including the steps of calculating a difference between said first and second sensor signals, determining a sun light incident angle based on said calculated difference, obtaining a manually operable amount, and calculating predetermined equations based on said determined sun light incident angle and said manually operable amount to provide said determined target degrees of opening.

5,553,776

METHOD AND CONTROL SYSTEM FOR ECONOMICALLY CONTROLLING AN AUTOMOTIVE HVAC SYSTEM

Leighton I. Davis, Jr.; Robert W. Matteson, both of Ann Arbor, and Gerhard A. Dage, Franklin, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

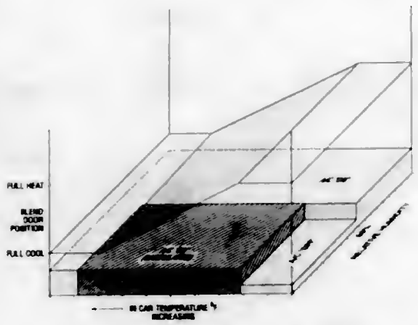
Continuation-in-part of Ser. No. 83,757, Jun. 30, 1993, Pat. No. 5,427,313, Ser. No. 83,587, Jun. 30, 1993, Ser. No. 83,589, Jun. 30, 1993, and Ser. No. 83,756, Jun. 30, 1993. This application Dec. 22, 1994, Ser. No. 361,407
Int. Cl.[6] F24F *7/00*
U.S. Cl. 236—49.3 **10 Claims**

1. A method for economically controlling a heating, ventilation and air conditioning (HVAC) system of a vehicle which discharges a flow of air to a passenger cabin of the vehicle, the system including a variable speed blower, ducting, cooling means for cooling air in the ducting, a control element having control positions for varying refrigerating capacity of the cooling means, actuators having various control position for controlling the direction of air flow and the ratio of fresh air to recirculated air, a humidity sensor for sensing relative humidity within the cabin and providing a corresponding relative humidity signal, and temperature sensors for sensing temperature within the cabin and providing a corresponding temperature signal, and for sensing ambient temperature and a target set point temperature, the method comprising the steps of:

processing the temperature and relative humidity signals to obtain processed temperature and relative humidity signals;

allowing said adhesive agent to cure.

liquid even when the operator and the spray device are located remotely from the liquid storage tank.



estimating a single enthalpy of air within the cabin based on the processed temperature and relative humidity signals;

defining membership functions and fuzzy rules between the single enthalpy of air within the cabin and the control positions of the control element; and

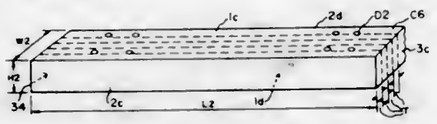
generating a control signal to control the positions of the control element to cause the system to economically discharge air into the cabin having a desired temperature and flow based on the single enthalpy of air within the cabin, the membership functions and the fuzzy rules.

5,553,777

RAILROAD TIE PRODUCT AND METHOD THEREFOR

David A. Lampe, 228 E. Meyers Ave., Pittsburgh, Pa. 15210

Filed Sep. 12, 1994, Ser. No. 304,375
Int. Cl.[6] E01B *3/00*
U.S. Cl. 238—35 **16 Claims**



1. A method of recycling used wooden railroad ties to form a new railroad tie, each of said used railroad ties having a top surface for receiving a railroad track, a side surface and an end surface, said method comprising the steps of:

removing an unrecyclable surface portion of a used railroad tie;

longitudinally cutting said used railroad tie into a plurality of usable wooden pieces having complementary dimensions whereby said wooden pieces may be assembled into a beam having a width and height of a railroad tie without leaving substantial space between any two adjacent wooden pieces, wherein said step of cutting said railroad ties includes the steps of:

rip-cutting said railroad ties longitudinally to produce wooden pieces with substantially the same thickness, said thickness is determined by dividing the height of a railroad tie by an integer,

cross-cutting said railroad ties to remove an unrecyclable portion, and

rip-cutting said wooden pieces to obtain usable wooden pieces with complementary widths such that said wooden pieces may be placed adjacent to one another on a plane to produce a width appropriate for a railroad tie;

applying adhesive agent to a surface on each of said usable wooden pieces;

assembling said usable wooden pieces into a beam having a plurality of substantially horizontal layers of said usable wooden pieces which are formed by said longitudinal cutting of said used railroad tie, and having a width and height of a railroad tie; and

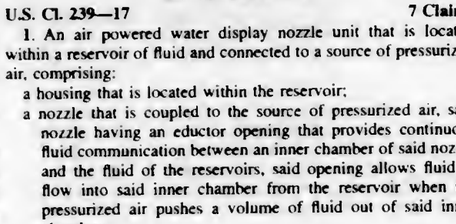
allowing said adhesive agent to cure.

5,553,778

ADVANCED SOOTBLOWER NOZZLE DESIGN

Mohomed I. Jameel, Tucker, Ga.; Donald E. Cormack, Scarborough, and Hoc N. Tran, Toronto, both of Canada, assignors to 3003442 Canada Inc., Toronto, Canada

Continuation-in-part of Ser. No. 15,902, Feb. 10, 1993, abandoned. This application Feb. 14, 1994, Ser. No. 194,877
Int. Cl.[6] F22B *37/54*
U.S. Cl. 239—1 **22 Claims**



1. A device for removal of deposits from contaminated surfaces by the application of gas jets to said surface, comprising:

a source of gas and

a nozzle operatively connected to said source of gas for formation of said gas jets,

said nozzle being constructed and arranged such that the pressure of the gas emanating from the nozzle (p_e) bears a relation to the ambient pressure (p_{am}) surrounding the nozzle wherein the ratio of p_e/p_{am} is less than about 2,

said nozzle comprising;

a body member and an insert member,

said body member comprising a downstream convergent portion terminating in a lip,

said insert member having a right; conical body portion coaxially located with respect to the body member and having a decreasing cross-sectional area in the intended flow direction through the nozzle,

said insert member having its maximum cross-sectional dimension located within said body member upstream of the lip of said downstream convergent portion and protruding through the lip of said body member to define a throat between the lip of said convergent portion and an adjacent outer surface of said insert member,

whereby a shock wave normal to the flow of the gas jets is not formed.

5,553,779

AIR POWERED WATER DISPLAY NOZZLE UNIT

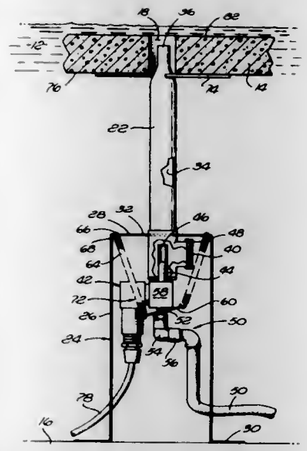
Mark Fuller, Studio City, and Alan Robinson, El Monte, both of Calif., assignors to Wet Design, Universal City, Calif.

Continuation of Ser. No. 179,981, Jan. 10, 1994, Pat. No. 5,480,094. This application Jul. 14, 1995, Ser. No. 502,369
Int. Cl.[6] B05B *17/08*
U.S. Cl. 239—17 **7 Claims**

1. An air powered water display nozzle unit that is located within a reservoir of fluid and connected to a source of pressurized air, comprising:

a housing that is located within the reservoir;

a nozzle that is coupled to the source of pressurized air, said nozzle having an eductor opening that provides continuous fluid communication between an inner chamber of said nozzle and the fluid of the reservoirs, said opening allows fluid to flow into said inner chamber from the reservoir when the pressurized air pushes a volume of fluid out of said inner chamber;



a valve that controls the introduction of pressurized air into said inner chamber of said nozzle; and,

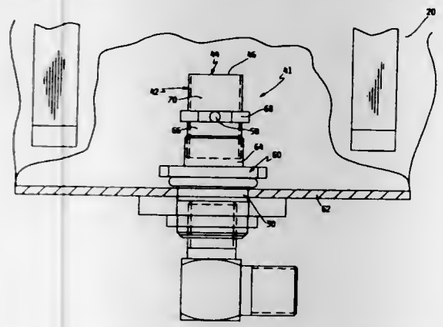
an air tube coupled to said valve so that said air tube introduces the pressurized air to said inner chamber of said nozzle to eject the volume of fluid from said nozzle, said air tube having an opening located adjacent to said eductor opening so that the air does not flow back through said eductor opening when the pressurized air is introduced to said inner chamber.

5,553,780

SPRAYING SYSTEM WITH LOW LIQUID LEVEL WARNING

Harlan T. Gjerde, Minneapolis, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed Feb. 3, 1995, Ser. No. 384,260
Int. Cl.[6] G01F *23/00*
U.S. Cl. 239—71 **15 Claims**



1. A spraying system for spraying a liquid under pressure, which comprises:

a liquid storage tank;

a spray device which may be selectively manipulated by an operator to allow the operator to direct a spray of the liquid in desired directions;

liquid delivery means connecting the spray device to the liquid storage tank for supplying liquid under pressure to the spray device from the liquid storage tank; and

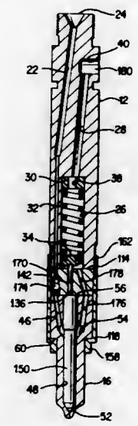
means for causing a warning, at the location of the spray device, that a level of the liquid in the liquid storage tank has reached a low level, whereby the operator is alerted to discontinue using the spray device and to refill the liquid storage tank with liquid even when the operator and the spray device are located remotely from the liquid storage tank.

5,553,781

CONVERSION OF JERK TYPE INJECTOR TO ACCUMULATOR TYPE INJECTOR

Robert L. Barkhimer, Poway, and Niels J. Beck, Bonita, both of Calif., assignors to Servojet Products International, San Diego, Calif.

Filed Jan. 3, 1995, Ser. No. 367,599
Int. Cl.[6] F02M *47/00*
U.S. Cl. 239—88 **16 Claims**



13. An accumulator type fuel injector comprising:

(A) an injector body which has a pressurized fuel orifice formed in an outer surface thereof and which has a passage formed therethrough for the passage of pressurized fuel, said passage having an inlet in constant, substantially unrestricted fluid communication with said pressurized fuel orifice and having an outlet in constant, substantially unrestricted fluid communication with said inlet;

(B) a nozzle body having formed therein (a) a central axial bore forming a lower nozzle cavity and an upper cavity, and (b) a passage in fluid communication with said nozzle cavity;

(C) a nozzle needle disposed in said axial bore, said nozzle needle including a lower needle valve and an upper axial end above which is disposed said upper cavity, said nozzle needle sealing said nozzle cavity from said upper cavity;

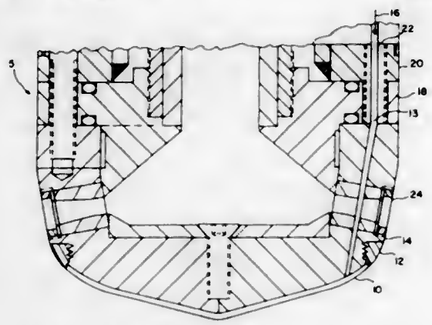
(D) a spacer which is disposed between said injector body and said nozzle body, said spacer having

(1) a first passage formed therein and connecting said nozzle body passage to said outlet of said injector body passage,

(2) a second passage formed therein, connecting said injector body passage to said upper cavity, and permitting two-way fluid flow therethrough, and

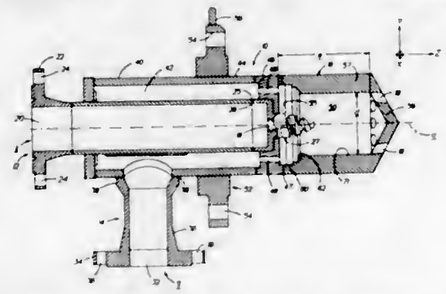
(3) a non-return element which is disposed in said first passage and which at least substantially prevents return fluid flow therethrough.

5,553,782
EXPANDABLE DIAPHRAGM FOR SCRUBBER ATOMIZER CAPS
Morten Licht, Canton; George B. Watson, Alliance; Robert B. Myers, Norton, and Dennis W. Johnson, Barberton, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Nov. 4, 1994, Ser. No. 334,504
Int. Cl.[6] B05B *15/02*
U.S. Cl. 239—107 **12 Claims**



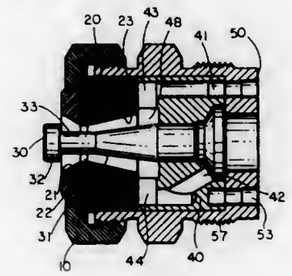
1. An improved atomizer, comprising:
a housing;
means for channeling a fluid containing solids through the housing;
a spraying head attached to one end of the housing and constructed to receive the fluid containing solids and directing the fluid containing solids from the housing;
an end cap connected to the spraying head of the housing, the end cap having an outer surface that receives deposits from the fluid containing solids which adhere thereto;
expandable means provided on the outer surface of the end cap for being expanded between a relaxed position and an expanded position for removing the deposits from the end cap; and
means for expanding the expandable means between the relaxed position and the expanded position, the means for expanding the expandable means including means for channeling fluid through the end cap to the expandable means.

5,553,783
FLAT FAN SPRAY NOZZLE
James Slavas, Wendell; Matthew Betsold, Northfield; Douglas Dziadzio, Montague; Robert Bedaw, Sr., Tuners Falls, all of Mass., and Vernon Bernard, Winchester, N.Y., assignors to Bete Fog Nozzle, Inc., Greenfield, Mass.
Filed Jan. 9, 1995, Ser. No. 370,096
Int. Cl.[6] B05B *7/04*
U.S. Cl. 239—403 **44 Claims**



14. A nozzle for mixing a liquid with a gas, comprising:
at least one inlet conduit for introducing the liquid and gas into the nozzle;
a mixing chamber coupled in fluid communication with the at least one inlet conduit for receiving and mixing the liquid and gas; and
means coupled in fluid communication with the mixing chamber for atomizing a plurality of spray jets of the liquid-gas mixture angularly spaced relative to each other about an axis of the mixing chamber, and for directing approximately all of the plurality of spray jets to converge in a spray pattern toward a target, wherein the spray pattern extends in a flow direction across the target and the target is substantially located within a plane extending in the flow direction of the spray pattern.

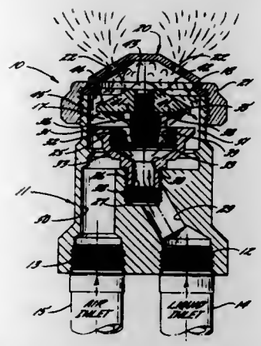
5,553,784
DISTRIBUTED ARRAY MULTIPOINT NOZZLE
Werner Theurer, Lebanon, N.J., assignor to Hago Industrial Corp., Mountainside, N.J.
Filed Dec. 9, 1994, Ser. No. 353,188
Int. Cl.[6] B05B *7/10*
U.S. Cl. 239—403 **14 Claims**



13. A nozzle for intermixing liquid and gas to create a finely divided mist, comprising:
an inlet for receiving separate gas and liquid streams;
an angled array of distributed concentric fluid outlets directed towards a central mixing chamber;
a fluid constriction passage downstream of and in fluid communication with said mixing chamber; and
an exhaust impact plate downstream of and in fluid communication with said fluid constriction passage.

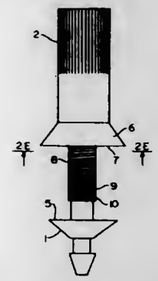
5,553,785
ENHANCED EFFICIENCY APPARATUS FOR ATOMIZING AND SPRAYING LIQUID
James Haruch, Naperville, Ill., assignor to Spraying Systems Co., Wheaton, Ill.
Filed Jan. 10, 1995, Ser. No. 371,086
Int. Cl.[6] B05B *1/30*
U.S. Cl. 239—432 **9 Claims**

1. Apparatus for atomizing liquid and for discharging a finely atomized liquid spray, said apparatus comprising a body having a liquid inlet for a stream of pressurized liquid and a gas inlet for a stream of pressurized gas, said body having an annular wall defining a chamber with upstream and downstream ends, a spray nozzle having a discharge orifice communicating with the downstream end of said chamber, a member fixed within said chamber and being formed with a plurality of circumferentially spaced orifices for dividing said liquid stream into a plurality of circumferentially spaced liquid jets which are discharged out of said member and substantially axially into said chamber, a deflector fixed in said chamber downstream of said member, said deflector being formed with a plurality of holes in alignment with said orifices with the downstream ends of said holes being closed whereby the liquid jets emerging from said orifices enter said



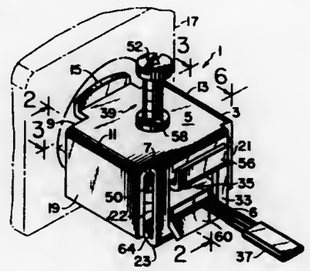
holes, impinge against closed ends thereof, and bounce back toward said member, said deflector having a surface for forming the liquid between said member and said deflector into a turbulent sheet and for guiding said sheet outwardly toward said wall, means located in said chamber and having a peripheral edge disposed downstream of said deflector surface and spaced radially inwardly from said wall whereby the sheet of liquid leaving the deflector surface impinges against said edge and is further broken into fine droplets, said chamber communicating with said gas inlet, and means in said chamber for forming said gas stream into a high velocity annular curtain which impacts against and further atomizes said liquid as said liquid flows between said edge and said wall.

5,553,786
LOW VOLUME IRRIGATION DEVICE FOR HORTICULTURE AND AGRICULTURE CROPS
Chermoni Israel, 20, Shoham Street, Haifa, Israel
Filed Jul. 21, 1994, Ser. No. 278,215
Claims priority, application Israel, Jul. 28, 1993, 106510
Int. Cl.[6] B05B *1/12;1/32;1/26*
U.S. Cl. 239—456 **10 Claims**



1. A spray and drip-irrigation device connectable to a low volume irrigation tube, comprising: a lower member formed with a threaded section along an outer surface thereof and means for connecting said lower member to the irrigation tube, an upper member threadedly connected to the lower member and being moveable along the lower member through screwed rotation; a circular, o-shaped stopping band mounted to the lower member, wherein said lower member includes a water inlet orifice at a bottom portion thereof, an axial water passage extending through the lower member and being formed with an inclined, upward angled passage terminating in an outlet orifice, located within said threaded section, said lower member including a peripheral flange located below said threaded section for collecting a water flow discharged from the outlet orifice to enable said collected water to drip from said flange when said upper and lower members are in a predetermined position relative to each other, said stopping band being disposed on said flange, said upper member including a central cylindrical cavity being open at a bottom end thereof to receive the threaded section of the lower member, with walls of said cavity including threads for threaded engagement with said threaded section, said upper member further including a peripheral projection having a peripheral edge being moveable upon screwed rotation of the upper member, to contact a fluid flow ejected from the outlet orifice and thereby regulate section, height and distance of the spray.

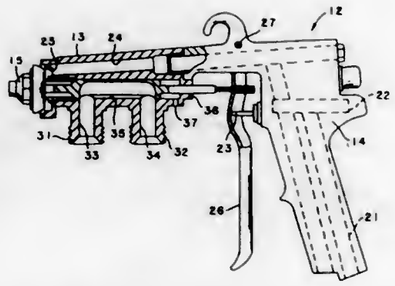
5,553,787
ELECTRICAL CONNECTOR
Frank A. Guginsky, Commack, N.Y., assignor to General Signal Corporation, Stamford, Conn.
Filed Dec. 27, 1994, Ser. No. 364,309
Int. Cl.[6] H01R *13/595*
U.S. Cl. 439—472 **14 Claims**



1. An electrical connector for use in connecting a cable to an outlet box comprises:
a connector body having a substantially rectangular or square box configuration, said connector body comprising: a top portion which comprises a rear edge, a front edge, a first side edge, a second side edge, and a first tab portion disposed about said front edge of said top portion; a first side wall connected to said first side edge of said top portion; a second side wall connected to said second side edge of said top portion; a bottom portion which comprises a rear edge, a front edge, a first side edge, a second side edge, and a second tab portion disposed about said front edge of said bottom portion, said tab portions adapted to engage opposing edges of an opening in said outlet box to secure said connector body to said outlet box; and a rear end which is connected to the rear edges of both said top and bottom portions, said rear end comprises a through-bole for receiving said cable therein; and
a means for concurrently securing said cable disposed within said connector body and securing said connector body to said outlet box.

5,553,788
SPRAY GUN ASSEMBLY AND SYSTEM FOR FLUENT MATERIALS
Peter V. Del Gaone, Drexel Hill, Pa.; Walter Dany, Riverdale, N.J.; R. Paul Rossi, Jr., San Carlos, Calif.; Ronald R. Scotchmor, Schiller Park, and Ernest F. Watts, Riverside, both of Ill., assignors to Binks Manufacturing Company, Franklin Park, Ill.
Continuation-in-part of Ser. No. 138,473, Oct. 15, 1993, Pat. No. 5,370,315. This application Oct. 14, 1994, Ser. No. 323,154
Int. Cl.[6] B05B *7/02;1/28*
U.S. Cl. 239—527 **52 Claims**

1. A spray gun for spraying fluent materials comprising:
a valve chamber;
a nozzle connected to said chamber at one end thereof;
inlet and outlet ports communicating with said valve chamber;



a valve element having a hollow interior displaceable in said chamber between closed and open positions;

said valve element operable in the closed position to extend between said inlet and said outlet ports; said inlet and said outlet ports affording flow of material through said inlet port into said hollow interior of the valve element and out through said outlet port; and

said valve element in the open position operable to split the flow through said inlet port into a first partial flow through said hollow interior of said valve element and out through said outlet port, and a second partial flow through said nozzle, whereby the flow through said outlet port is uninterrupted when said inlet port is receiving the materials under pressure.

5,553,789

ORIFICE ELEMENT

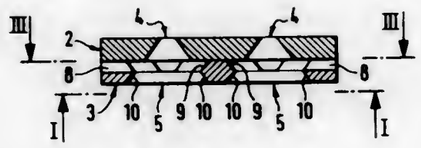
Guenther Findler, Stuttgart; Juergen Buchholz, Lauffen, and Udo Jauernig, Reutlingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Sep. 19, 1994, Ser. No. 308,319

Claims priority, application Germany, Oct. 1, 1993, 43 33 519.5

Int. Cl.[6] A62C *2/08*

U.S. Cl. 239—548 **15 Claims**



1. An orifice element comprising:

an upper silicon plate having a plurality of injection orifices;

a lower silicon plate joined to the upper silicon plate, the lower silicon plate having a plurality of passthrough orifices, each of the plurality of passthrough orifices being associated with a respective one of the plurality of injection orifices, the lower silicon plate further having a plurality of recesses, each of the plurality of recesses extending from at least one of the plurality of passthrough orifices to an outer periphery of the lower silicon plate, the recesses forming conduits between the lower and upper silicon plates.

5,553,790

ORIFICE ELEMENT AND VALVE WITH ORIFICE ELEMENT

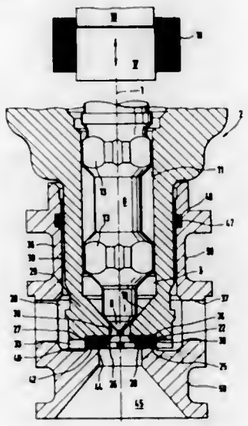
Guenther Findler, Stuttgart; Juergen Buchholz, Lauffen, and Udo Jauernig, Reutlingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Sep. 19, 1994, Ser. No. 308,720

Claims priority, application Germany, Sep. 20, 1993, 43 31 851.7

Int. Cl.[6] B05B *1/30*

U.S. Cl. 239—585.1 **19 Claims**



1. An orifice element for injecting a medium, the orifice element comprising:

a) an upper plate, the upper plate having at least one injection orifice;

b) a lower plate, the lower plate

i) being arranged downstream from the upper plate,

ii) having a passthrough opening and a jet splitter which divides the passthrough opening into at least two passthrough openings, and

iii) having an upper end face;

wherein the at least one injection orifice of the upper plate is arranged such that the at least one injection orifice at least partially overlaps the at least two passthrough openings and the jet splitter, and in the upper end face of the lower plate a cross-section of the jet splitter is smaller than each cross-section of the at least two passthrough openings.

5,553,791

FORMING FINE PARTICLES

Dennis R. Alexander, Lincoln, Nebr., assignor to The Board of Regents of the University of Nebraska, Lincoln, Nebr.

Division of Ser. No. 371, Jan. 4, 1993, Pat. No. 5,390,864, and a continuation-in-part of Ser. No. 712,724, Jun. 10, 1991, Pat. No. 5,176,328, which is a division of Ser. No. 492,928, Mar. 13, 1990, Pat. No. 5,044,565. This application Feb. 21, 1995, Ser. No. 391,058

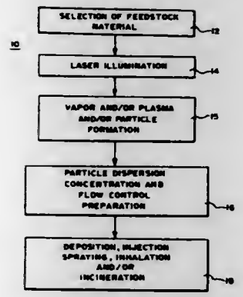
Int. Cl.[6] B02C *19/00*

U.S. Cl. 241—1 **19 Claims**

1. A process for forming and applying small particles to a patient comprising the steps of:

selecting a feedstock material to be supplied to an interior part of the patient's body;

irradiating the feedstock material with radiant energy having a predetermined angle of incidence to the material at a predetermined point, having a predetermined wavelength and having sufficient intensity to cause the material to be formed into particles while in the patient's body; and



guiding a direction of movement of the particles, whereby they may be applied to a particular part of the patient's body;

the step of forming fine particles including the step of vapor explosion and/or plasma formation of said material, whereby the particles are low velocity at least after moving a distance less than one inch from the predetermined point.

5,553,792

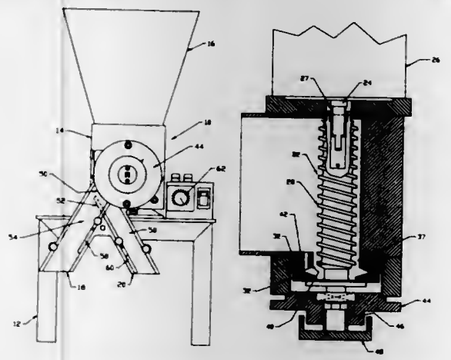
VARIABLE ANALYTICAL SAMPLING MILL AND METHOD

Thomas R. Romer, and Kraig K. Bond, both of Washington, Mo., assignors to Romer Labs, Inc., Union, Mo.

Filed Jun. 2, 1995, Ser. No. 459,412

Int. Cl.[6] B02C *7/06; 7/14*

U.S. Cl. 241—29 **19 Claims**



12. A method for uniformly grinding a solid foodstuff to obtain a small representative sample comprising charging discrete particles of said foodstuff to worm gear enclosed in a congruent passage, through said worm gear charging said foodstuff to a first burr member having a central opening, said first burr member being closely aligned with an opposed facing second burr member, at least one of said burr members being rotated to grind said foodstuff between said burr members, discharging said foodstuff centrifugally outward to an outlet opening dividing a first portion of said ground foodstuff from said outlet opening in a main discharge passage and a second portion from said outlet opening into a test sample passage, and restricting said second passage to provide a test sample of small percentage of the total ground foodstuff for analysis to the test sample passage and a major percentage of the foodstuff to said main discharge passage.

5,553,793

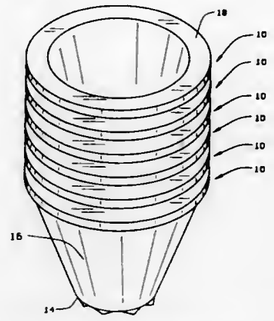
COMBINATION PILL CRUSHING AND DISPENSING CUP

Jeffrey D. Klearman, and Robert Bronson, both of St. Louis, Mo., assignors to Lake Medical Products, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 168,019, Dec. 15, 1993, Pat. No. 5,376,072. This application Aug. 10, 1994, Ser. No. 288,599

Int. Cl.[6] B02C *19/08*

U.S. Cl. 241—30 **17 Claims**



16. A method of crushing a pill and dispensing the pill crushings suspended in a fluid, wherein first and second cups are provided, at least one of the cups including a knurled surface, the method comprising the steps of:

placing a pill in the first cup;

nesting the second cup into the first cup so that the knurled surface

twisting the cups with respect to each other as the second cup is advanced into the first cup to cause the knurled surface to grind and thereby crush the pill;

mixing the pill crushings with a fluid thereby suspending the pill crushings; and

dispensing the suspension.

5,553,794

SEWAGE HANDLING SYSTEM

Darrel S. Oliver, Tulsa, Okla., and Deborah C. Wynn, Ellicott City, Md., assignors to Tarby Inc, Claremore, Okla.

Filed Dec. 22, 1994, Ser. No. 361,292

Int. Cl.[6] B02C *25/00;* **G01F** *23/00;* **F16K** *21/18*

U.S. Cl. 241—36 **7 Claims**

1. An improved sewage handling system comprising:

a sewage collection tank having a sidewall, a closed bottom and an open top, the sidewall having a sewage inlet opening therein;

a top plate closing said collection tank open top and having a central opening therethrough;

an electric motor driven pump supported by a pump housing, the pump housing being dimensioned to removably pass through said top plate central opening, the pump having a discharge outlet;

a pump housing flange affixed to an upper end of said pump housing having a diameter greater than said top plate central opening whereby said pump housing is removably supported within said sewage collection tank;

a discharge conduit connected to said pump discharge outlet and extending upwardly through an opening in said pump housing flange;

an upright manway housing having a lower open end, an open top and a sidewall, the lower end being sealably affixed to said top plate, the sidewall having an outlet opening therein;

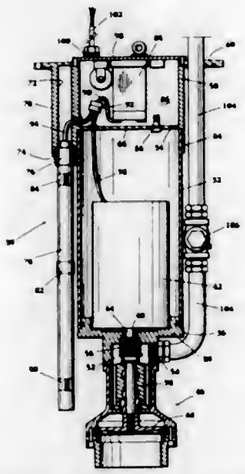
piping within said manway housing removably connecting said discharge conduit with said sidewall outlet opening;

a top cover removably and sealably closing said manway housing open top;

with a diameter greater than a diameter of the protruding nozzle, a diameter of the orifice plate being approximately

5,553,799

AUXILIARY YARN RELEASING APPARATUS



electrical conductors extending sealably through said manway housing sidewall and into said pump housing having connection with said pump through a control circuit;

a liquid level detector supported by said pump housing and extending downwardly and parallel to said pump within said lower sewage collection tank, the liquid level detector having means to detect and provide circuit actuation at three liquid levels, the first level being a liquid lower level at which said pump is turned off, the second being an intermediate level at which said pump is turned on, and the third being a high level that is reached only when said pump has failed to pump sewage from collection tank upon the sewage level reaching said intermediate level; and

a warning signal conductor extending sealably through said manway housing sidewall and into said pump housing and connected to said liquid level detector for providing a warning signal when the liquid level in said sewage collection tank reaches said high level.

5,553,795

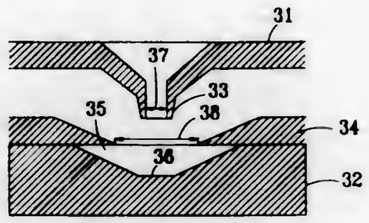
INERTIAL IMPACTOR WITH A SPECIALLY DESIGNED IMPACTION PLATE

Chuen J. Tsai, and Yu H. Cheng, both of Hsinchu, Taiwan, assignors to National Science Council of Republic of China, Taiwan

Filed May 8, 1995, Ser. No. 436,727

Int. Cl.[6] B02C *19/06*

U.S. Cl. 241—40 **2 Claims**



1. An inertial impactor with an impaction plate, comprising:

a nozzle element comprising a nozzle protruding from a nozzle plate; and

an impaction plate formed with a conical recess partially covered by an orifice plate having an orifice, the conical recess having a circular impaction plane at a bottom of the recess with a diameter greater than a diameter of the protruding nozzle, a diameter of the orifice plate being approximately four times the diameter of the protruding nozzle so as to prevent loss of particles if the orifice size is too small, prevent loss of particles due to blowing out if the orifice size is too large, and to effectively retain the particles within the conical recess and prevent particles from being blown out of the conical recess by an air stream so that the particles can be accumulated quickly on the bottom of the conical recess and the collection efficiency can be improved accordingly.

5,553,796

ROLLER MILL

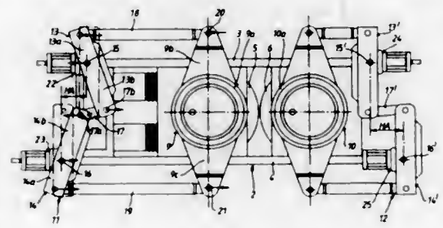
Jörg Bettenworth, Ennigerloh, Germany, assignor to Krupp Polysius AG, Beckum, Germany

Filed Jan. 10, 1995, Ser. No. 370,640

Claims priority, application Germany, Feb. 14, 1994, 44 04 634.0

Int. Cl.[6] B02C *4/02;4/32*

U.S. Cl. 241—230 **13 Claims**



1. A roller mill construction comprising a frame; a pair of rollers mounted on said frame for relative linear movements toward and away from each other and for rotation in opposite directions relative to said frame; a pair of gear units operatively coupling said rollers for imparting rotation to one roller in response to rotation of the other; and first torque absorbing means associated with at least one of said rollers for absorbing rotational torque loads and minimizing transfer of such loads to said frame, said first torque absorbing means comprising a pair of two armed levers pivoted on said frame for rotation about spaced apart axes between opposite ends of the respective levers, one end of one of said levers occupying a position adjacent one end of the other of said levers, first force transmitting means pivotally coupling the adjacent ends of said levers to one another and second force transmitting means coupling the other ends of said levers at spaced points to the gear unit of said one of said rollers.

5,553,797

GRANULATING MACHINE

Sven-Inge S. Axelsson, and Ake I. Karlsson, both of Bredaryd, Sweden, assignors to Meltic AB, Sweden

PCT No. PCT/SE93/00754, § 371 Date Mar. 16, 1995, § 102(e) Date Mar. 16, 1995, PCT Pub. No. WO94/06559, PCT Pub. Date Mar. 31, 1994

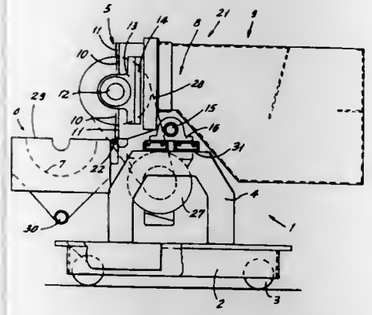
PCT Filed Aug. 16, 1993, Ser. No. 403,781

Claims priority, application Sweden, Sep. 16, 1992, 9202671

Int. Cl.[6] B02C *19/00*

U.S. Cl. 241—285.3 **6 Claims**

1. A granulating mill, comprising: a cutter disposed for rotation in a granulate container, a collection hopper having a feed opening for supplying to the granulate container pieces of material to be comminuted, shaft ends of said cutter being rotatably mounted on a centrally disposed subframe, said subframe being pivotably mounted on a main pivot shaft which is mounted on a main frame of the granulating mill, a high pressure pump being provided for generating an air stream to convey ready comminuted granulate



out from the granulate container, the cutter, collection hopper and granulate container being hingedly connected to each other via first and second pivot means, and the cutter, collection hopper and granulate container being pivotable about the main shaft via the central subframe carrying the cutter, wherein a line of action of a common center of gravity of the cutter, collection hopper and granulate container, substantially passing through said main shaft such that said cutter, collection hopper and granulate container are statically balanced about it, thereby requiring only minor force to pivot the cutter, collection hopper and granulate container into position for opening the mill for service and/or cleaning.

5,553,798

METHOD AND APPARATUS FOR RELEASING AN END YARN FROM ENTANGLED PORTIONS

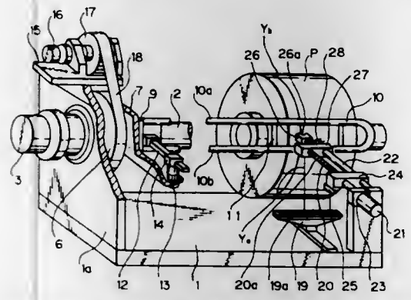
Noriyuki Kobayashi, and Masayuki Tamura, both of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 22,686, Mar. 1, 1993, Pat. No. 5,356,085. This application Apr. 6, 1994, Ser. No. 223,542

Claims priority, application Japan, Mar. 3, 1992, 4-45539; Oct. 29, 1992, 4-291465

Int. Cl.[6] B65H *54/00;69/04*

U.S. Cl. 242—18.00 R **4 Claims**



1. A method for releasing a yarn end from an entangled portion of a yarn package in which the yarn end is entangled and fixed with an outermost yarn layer of a package, comprising the following steps:

drawing the outermost yarn layer so as to float the same above the package surface with both ends thereof connected to the package;

severing the floating outermost yarn layer from the package at a portion of on one side of the outermost yarn layer;

rotating the package in the unwinding direction so as to draw the other portion of the outermost yarn layer;

severing the outermost yarn layer from the package at a portion on the other side of the outermost yarn layer; and

rotating the package in the winding direction so as to withdraw a fresh yarn end.

5,553,799

AUXILIARY YARN RELEASING APPARATUS

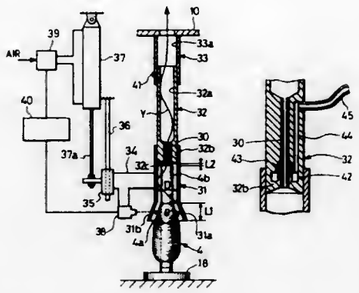
Yuji Todo, Nagaokakyo, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Feb. 17, 1994, Ser. No. 197,886

Claims priority, application Japan, Feb. 24, 1993, 5-012589 U

Int. Cl.[6] B65H *49/00;69/04*

U.S. Cl. 242—128 **5 Claims**



2. An auxiliary yarn releasing apparatus having a balloon control for releasing yarn from a chase portion of a yarn supply bobbin and for controlling ballooning of such released yarn, comprising:

a tubular body having axially aligned tubular upper and lower portions;

said tubular upper portion having a lower open end slidable in the upper open end of said tubular lower portion;

said tubular lower portion having an open upper end slidably adjustable on the outer surface of the lower end of said upper portion and a lower umbrella shaped open end portion for forming a housing around a chase portion of a yarn supply bobbin axially aligned with the axis of said tubular body;

means for adjusting said lower tubular portion relative to said upper tubular portion;

a restriction portion between said lower end of said tubular upper portion and said upper end of said tubular lower portion, said restriction portion having a bore extending axially from said tubular lower portion into said tubular upper portion; and

at least one injection hole extending obliquely upwardly into said bore for supplying compressed air into said bore for feeding yarn removed from said chase portion of yarn supply bobbin upwardly through said bore and through said intermediate and upper tubular portions and through said guide hole in said guide plate.

5,553,800

APPARATUS FOR WINDING A TAPE-LIKE MATERIAL

Gerhard Falk, Rossdorf, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 22, 1994, Ser. No. 293,983

Claims priority, application Germany, Aug. 28, 1993, 43 29 045.0

Int. Cl.[6] B65H *20/00*

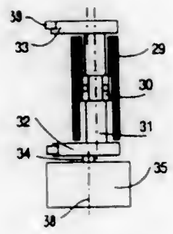
U.S. Cl. 242—353 **17 Claims**

1. An apparatus for winding a tape from a supply reel onto a take-up reel, comprising a tape-guide element for guiding the tape along a tape-guide path, and a winding device for driving the take-up reel,

characterized in that the device further comprises means, operating at a selected frequency, for imparting oscillatory translation at said selected frequency to a portion of the tape in the tape longitudinal direction, thereby initiating tape tension oscillations.

accident, and an additional drive (**15**) connected to the belt winding reel (**12**) via a clutch (**20**), wherein the additional drive (**15**) is normally separated drivewise from the belt winding reel (**12**) by

rotatable in a belt unwinding direction about its longitudinal central axis to enable the belt webbing to be extended about



5,553,801
TAPE TENSION MEASURING DEVICE FOR USE IN A TAPE RECORDER INCLUDING A GUIDE POLE WITH A PIEZOELECTRIC COATING

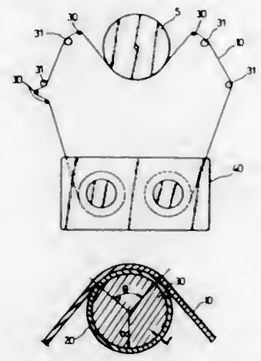
Hyun-Moo Lee, Incheon, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Aug. 23, 1994, Ser. No. 294,521

Claims priority, application Rep. of Korea, Aug. 24, 1993, 93-16479

Int. Cl.[6] G11B *15/43*

U.S. Cl. 242—357 **4 Claims**



1. A device for measuring tape tension for use in a tape recorder, which comprises:

a guide pole, at least an external portion thereof being coated with a layer of a piezoelectric material, wherein said piezoelectric material layer is adapted to produce an electrical signal as the tape is biased thereagainst; and

means for processing the electrical signal to calculate the tape tension.

5,553,802
OPPRESSIVE SENSATION REDUCER FOR SAFETY BELT OF AUTOMOBILE

Jang W. Park; Sung W. Jin, and Tae B. Kwag, all of Kangwon-do, Rep. of Korea, assignors to Sungwoo Allied Signal Corp., Seoul, Rep. of Korea

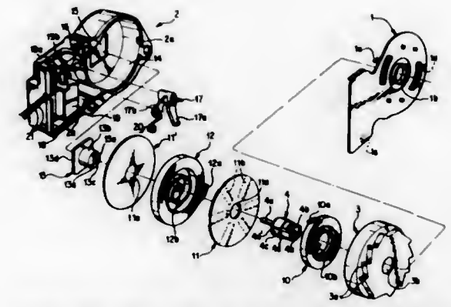
Filed Oct. 18, 1994, Ser. No. 324,612

Claims priority, application Rep. of Korea, Dec. 3, 1993, 93-26184; Oct. 6, 1994, 94-25503

Int. Cl.[6] B60R *22/44*

U.S. Cl. 242—372 **12 Claims**

1. An oppressive sensation reducer for safety belt wherein a spring holder having a ratchet is rotatably installed centering on a bush shaft in a case coupled to a retainer, said reducer comprising a reducer spring, a normal spring, a solenoid and a rotation blocking lever,



wherein said reducer spring and normal spring are respectively installed in a reducer spring container and a normal spring container formed in said spring holder, said reducer spring having an outer end fixed to said reducer spring container, and said normal spring having an outer end fixed to said normal spring container,

wherein a spring plate and spring spacing plate are installed on both sides of said normal spring, and said spring spacing plate is placed in contact with a plate mounting surface formed in said spring holder, and

wherein said bush shaft and a stay shaft are respectively installed in the center portion of said reducer spring and normal spring, with an inner end of said reducer spring fixed to said bush shaft and an inner end of said normal spring fixed to said stay shaft.

5,553,803
BELT TENSIONER FOR SAFETY BELTS FOR MOTOR VEHICLES

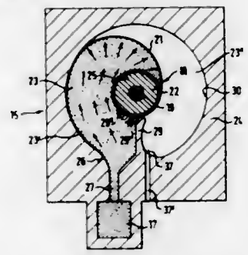
Jürgen Mitzkus, Eldringen, Germany; Martin Wifling, Graz, Austria; Robert Kopetzky, Lonsee, Germany; Georg Bannert, Ummendorf, Germany; Andreas Wengert, Heuchlingen, Germany; Ulrich Diepold, Ulm, Germany; Thomas Kempfle, Bibertal, Germany; Erik Emmert, Ulm, Germany, and Hermann Steffan, Graz, Austria, assignors to Takata Vehicle Safety Technology GmbH, Ulm, Germany

Filed Feb. 1, 1995, Ser. No. 381,777

Claims priority, application Germany, Sep. 13, 1994, 44 32 594.0; Sep. 13, 1994, 44 32 593.2; Dec. 15, 1994, 44 44 775.2

Int. Cl.[6] B60R *22/46*

U.S. Cl. 242—374 **34 Claims**



1. Belt tensioner for safety belt arrangements in motor vehicles having a holder (11) secured to the vehicle chassis and on the holder a belt winding reel (12) with a safety belt (13) wound thereon, a retraction spring arrangement (14, 14') by means of with the safety belt (13) is continuously and lightly so pretensioned in the retraction direction that it only lies loosely on the vehicle occupant secured by it, a blocking arrangement between the belt winding reel (12) and the holder (11) of the vehicle chassis which blocks the safety belt (13) against being pulled out if suddenly pulled, and/or in the event of an acceleration resulting from an

accident, and an additional drive (15) connected to the belt winding reel (12) via a clutch (20), wherein the additional drive (15) is normally separated drivewise from the belt winding reel (12) by the disengaged clutch (20), but is abruptly activated in the event of a acceleration resulting from an accident and is rotationally fixedly coupled with the belt winding reel (12) via the then engaged clutch (20) in order, before the vehicle occupant accelerates against the safety belt (13), to wind up such a length of the safety belt that the safety belt lies tightly on the vehicle occupant, with the additional drive (15) having a pressure source which is triggered or ignited by the accident dependent response of an acceleration sensor and which, on being triggered, abruptly builds up a high pressure in a pressure chamber (17), a torque generating device (18) which is energised by the pressure in the pressure chamber (17) and a drive shaft (19) connected to the torque generating device (18) which is rotationally fixedly connected with the belt winding reel (12) via the clutch (20), characterised in that the torque generating device (18) has at least one flexible tension band (21) which is secured at one end at a first mounting point (25) to the periphery of the drive shaft (19), or to the drive reel (22) which is concentrically mounted thereon, and is partially wound onto the drive shaft (19), or onto the drive reel (22), and is secured at the other end at second mounting point (26) to the peripheral wall (30) of a band running chamber (23) which is arranged within a housing (24) around the drive shaft (19), or around the drive reel (22) and has a width corresponding to the width of the draw band (21) in such a way that the draw band (21) extends through the band running chamber (23) while subdividing the band running chamber (23) into two partial chambers (23', 23") sealed off relative to one another; and in that the partial chamber (23') which on being subjected to pressure brings about an unwinding of the tension band (21) from the rotating drive shaft (19) or drive reel (22) is connected to the pressure space (17) and with the other partial space (23") is vented; and in that for the pressure-wise decoupling of the partial chambers (23', 23"), at least one sealing wall (29) is provided which extends between the housing (24) and the periphery of the flexible draw band (21) which is wound onto the drive shaft (19), or onto the drive reel (22) concentrically mounted thereon wherein the flexible draw band (21) extends through the band running chamber (23) up to its peripheral wall (30) with the same direction of curvature which it has as a result of being wound onto the drive shaft (19) or onto the drive reel (22).

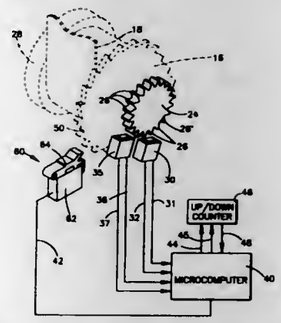
5,553,804
SEAT BELT RETRACTOR WITH A CINCH MECHANISM

Russell E. Hamann, Rochester Hills, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Mar. 17, 1995, Ser. No. 405,880

Int. Cl.[6] B60R *22/343;22/353*

U.S. Cl. 242—382.4 **18 Claims**



1. A seat belt retractor for use by an occupant of a vehicle, said seat belt retractor comprising:

a rotatable spool with seat belt webbing wound around said spool, said spool having a longitudinal central axis and being rotatable in a belt unwinding direction about its longitudinal central axis to enable the belt webbing to be extended about the occupant;

actuatable locking means for, when actuated, preventing said spool from rotating in the belt unwinding direction about its longitudinal central axis;

means for rotating in response to rotation of said spool about its longitudinal central axis;

sensing means for sensing rotation of said means for rotating in response to rotation of said spool, said sensing means including means for generating at least one signal indicative of said means for rotating in response to rotation of said spool passing by said sensing means as said means for rotating, in response to rotation of said spool, rotates; and

means for actuating said locking means to prevent said spool from rotating in the belt unwinding direction about its longitudinal central axis when said sensing means senses that said means for rotating in response to rotation of said spool has rotated a predetermined number of revolutions in the belt unwinding direction.

5,553,805
PROCESS AND APPARATUS FOR WINDING SHEET MATERIAL

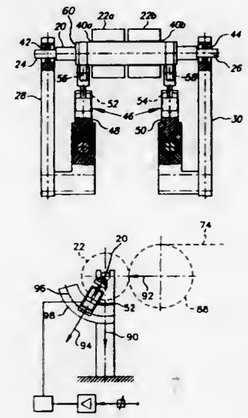
Anton Rüegg, St. Gallerstrasse 34, 8716 Schmerikon, Switzerland

Filed Nov. 25, 1994, Ser. No. 348,888

Claims priority, application Switzerland, Nov. 26, 1993, 03 537/93

Int. Cl.[6] B65H *18/08;18/16*

U.S. Cl. 242—534 **34 Claims**



1. A method for winding sheet material from an assisting roller onto a roll carried on a shaft, said shaft having two ends and being disposed to rotate on bearings, said bearings being spaced apart and disposed near said two ends to define a winding space between said bearings, wherein at least one of a gravitational force of said roll and a contact force from said assisting roller exert a bending stress on said shaft, said method comprising the steps of:

exerting a compensating force on said shaft within said winding space adjacent said bearings; and

directing said compensating force in a compensating direction to at least partially counteract said bending stress.

5,553,806
SUPPORT OR PRESSURE ROLL FOR A PAPER ROLL

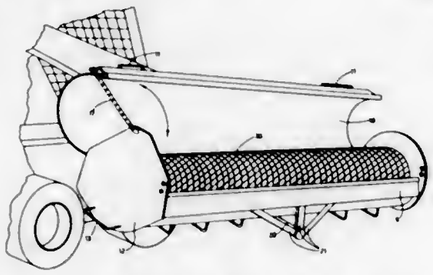
said gap, said drum having no less than one rotatable support pole attached to the underside thereof for attachment to a mechanical

extending axially across the outer peripheries of said first and second flanges, said end portions having radially inner sides each facing the outer periphery of the corresponding one of said flanges

5,553,806
SUPPORT OR PRESSURE ROLL FOR A PAPER ROLL WINDER
Robert G. Lucas, Pittsfield, Mass., assignor to Beloit Technologies, Inc.
Filed May 19, 1994, Ser. No. 246,898
Int. Cl.[6] B65H *18/26*
U.S. Cl. 242—542.4 **11 Claims**

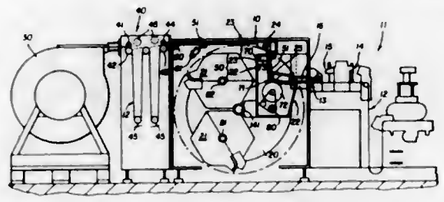
1. A roll for use in a winder for a papermaking machine as a support drum for winding a traveling paper web into a wound wed roll by maintaining supporting nip engagement therewith, the support drum comprising, in combination:
a shaft body member having an outer surface and a longitudinal axis;
a cover on the outer surface of the body member, the cover having an outer surface defining the cylindrical shape and surface of the support drum and comprising an elastomeric material having a Poisson's ratio of about 0.47, or greater, and an absolute hardness of about 65 Shore "A", or less;
a pattern in the outer surface of the cover, the cover having a volumetric void open to the outer surface thereof and intermediate the pattern, the pattern arranged such that the percent of the volumetric void for a unit volume of an outer portion of the cover which includes the volumetric void and the pattern is such that the cover has an effective hardness of about 55 Shore "A", or less;
whereby a nip instant center is created which is within the wound web roll.

5,553,807
FENCE INSTALLATION METHOD AND DEVICE
Enrique R. Lopez, 3411 S. Fruit, Fresno, Calif. 93706
Filed Oct. 27, 1994, Ser. No. 331,011
Int. Cl.[6] B65H *16/02*
U.S. Cl. 242—557 **7 Claims**



1. A device for upright installation of coiled fence materials comprising a cylindrical drum adapted to receive a coil of fence material having a closable door along its length such that a gap is provided between said drum and said door when closed so that the leading edge of said coiled fence material may pass freely through said gap, said drum having no less than one rotatable support pole attached to the underside thereof for attachment to a mechanical lifting means, said drum being provided with a plurality of handles to assist in opening and rotating said drum.

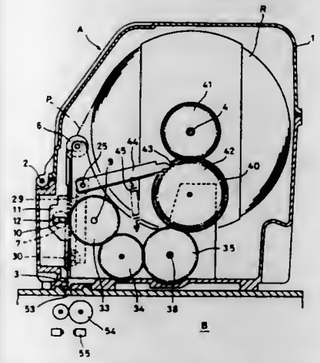
5,553,808
FEEDING OF A MACHINE WITH A TURRET SUPPORTING REMOVABLE MAGAZINES DISTRIBUTING STRIPS BY MEANS OF AN EXTERNAL SOURCE
Alain A. Vassos, Crissey, and Daniel G. Thibert, Chatenoy-le-Royal, both of France, assignors to Eastman Kodak Company, Rochester, N.Y.
PCT No. PCT/FR93/00710, § 371 Date Mar. 7, 1995, § 102(e) Date Mar. 7, 1995, PCT Pub. No. WO95/02206, PCT Pub. Date Jan. 19, 1995
PCT Filed Jul. 9, 1993, Ser. No. 397,142
Int. Cl.[6] B65H *19/10*
U.S. Cl. 242—559.2 **6 Claims**



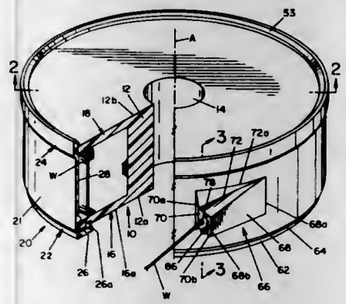
1. A machine comprising:
a) an inlet slot for receiving a strip and directing the strip to a station where the strip is to be used;
b) a feed device provided with a rotary turret able to receive a plurality of movable feed magazines containing rolls of material in strip form;
c) a means for driving, towards the inlet slot, a strip coming from one of said plurality of feed magazines; and
d) a means for interrupting the feed of the strip for the purpose of changing the feed magazines used;
e) an interfacing device arranged so as to connect the inlet slot to an external strip feed source,
said interfacing device including a guide path for the strip coming from the external strip feed,
said guide path including a part able to rotate with the turret.

5,553,809
PAPER MAGAZINE
Hiroshi Oku, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan
Filed Jun. 14, 1994, Ser. No. 261,043
Claims priority, application Japan, Jun. 15, 1993, 5-143561; Apr. 27, 1994, 6-089681
Int. Cl.[6] B65H *26/06;43/00;20/02*
U.S. Cl. 242—563.1 **21 Claims**

1. A paper magazine, comprising:
a paper magazine case rotatably supporting a paper roll core therein, said paper magazine case having a paper outlet and a paper feed path extending from said paper roll core to said paper outlet;
a pair of press rollers provided in said paper magazine case along said paper feed path, one of said press rollers being movably mounted so as to be pressable against and separable from the other of said press rollers with said paper feed path therebetween;
a paper detection roller movably mounted between said press rollers and said paper outlet along said paper feed path for contact with paper fed along said paper feed path so as to detect the presence or absence of paper in said paper feed path according to the position of said paper detection roller;
a cam means associated with said paper detection roller for pressing said press rollers against each other and separating said press rollers from each other according to the position of said paper detection roller;
power transmission means coupled to said paper roll core and said press rollers for transmitting directional external driving force to said paper roll core and said press rollers; and
changeover means provided in said power transmission means for selectively transmitting the directional external driving force to said paper roll core and said press rollers according to the direction of the directional external driving force such that said press rollers are pressed against each other with paper therebetween when said paper roll core is rotated in a direction to feed the paper forward therefrom and said press rollers are separated from each other when said paper roll core is not rotated in a direction to feed the paper forward therefrom.

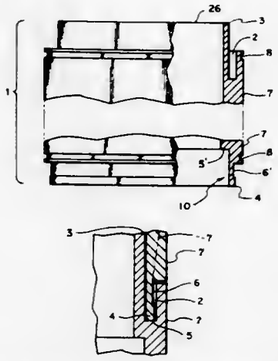


5,553,810
COVERS FOR WELDING WIRE REELS
James D. Bobeczko, Concord, Ohio, assignor to The Lincoln Electric Company, Cleveland, Ohio
Filed Feb. 23, 1994, Ser. No. 200,388
Int. Cl.[6] B65H *75/30*
U.S. Cl. 242—601 **28 Claims**



1. A cover for a reel of welding wire, said reel including a hub having an axis and axially spaced apart first and second flanges each extending radially outwardly from said hub and having a radially outer periphery, said hub and flanges providing a space for winding wire about said hub between said flanges, said cover comprising wall means including a wall adapted to extend circumferentially about and axially across said outer peripheries of said first and second flanges, said wall means including means for sealing said space against the ingress of ambient air thereinto, said wall is a sleeve having first and second end portions respectively extending axially across the outer peripheries of said first and second flanges, said end portions having radially inner sides each facing the outer periphery of the corresponding one of said flanges, and said means for sealing said space includes means on said inner sides of each said first and second end portions respectively interengaging with said first and second flanges, wherein said means on said inner sides of said first and second end portions includes a radially inwardly open circumferentially extending recess in each end portion receiving the outer periphery of the corresponding one of said first and second flanges, said radially outer periphery of each said flange includes an axially extending peripheral surface, each said recess having a bottom wall spaced radially outwardly from the peripheral surface of the corresponding one of said first and second flanges, and sealing means in each said recess between said bottom wall thereof and the peripheral surface of the corresponding flange.

5,553,811
LAP CREEL
Manfred Hahm, and Jürgen Hahm, both of Caral-Siedlung 8, 52070 Aachen, Germany
PCT No. PCT/EP93/00096, § 371 Date Aug. 15, 1994, § 102(e) Date Aug. 15, 1994, PCT Pub. No. WO93/15013, PCT Pub. Date Aug. 5, 1993
PCT Filed Jan. 16, 1993, Ser. No. 256,641
Claims priority, application Germany, Jan. 25, 1992, 42 02 029.8
Int. Cl.[6] B65H *75/18;75/10;* **D06F** *17/00*
U.S. Cl. 242—605 **14 Claims**



1. An axially stackable lap creel for yarn, said lap creel comprising
a) a rotationally symmetrical body having an outer surface to support the yarn, said outer surface having an insertion end and a receiving end;
b) a first collar extending axially from the insertion end of said outer surface of said body, said collar comprising a bunching groove on an outer surface of said collar; and
c) a seat located at the receiving end of said outer surface, said seat comprising
(i) a shoulder stop arranged radially inwardly of said outer surface of said body, said outer surface extending axially beyond said shoulder stop to form an extension, and
(ii) a second collar located radially inwardly of said shoulder stop and extending axially at least to the end of said extension;
wherein said seat is configured such that said first collar of a first lap creel can be inserted into the seat of a second, identical lap creel, and the axial dimension of the first collar is longer than the axial dimension of the extension, such that when a first collar of a first lap creel is inserted into a seat of a second lap creel, said bunching groove on said first collar is located radially inwardly of said extension, and a gap is formed between the insertion end of

said outer surface of the first lap creel and the receiving end of the outer surface of the second lap creel.

a seat frame; at least one cross member fixed to said seat frame, feet supporting said cross members; cushion carriers for car-

5,553,817
TURN COORDINATION INHIBIT FOR ROTARY WING

said outer surface of the first lap creel and the receiving end of the outer surface of the second lap creel.

14. A method for useing the lap creel of claim 1, comprising the steps of

providing said lap creel, and

winding yarn on the entire outer surface of said lap creel including said extension and on said bunching groove.

5,553,812

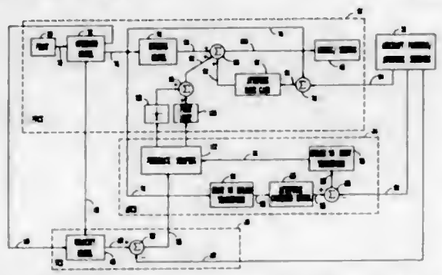
INERTIAL VELOCITY COMMAND SYSTEM

Phillip J. Gold, Shelton; Donald L. Fogler, Jr., Milford, both of Conn., and James B. Dryfoos, Wallingford, Pa., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jun. 3, 1994, Ser. No. 253,477

Int. Cl.[6] **B64C** *11/34*; **G05D** *1/08*; *1/10*

U.S. Cl. 244—76 R **12 Claims**



1. An aircraft flight control system for providing control surface command signals to the aircraft control surfaces thereby controlling the yaw, pitch, roll and lift attitude axes of the aircraft in flight, comprising:

velocity stabilization means for providing a velocity stabilization signal in response to the activation of a velocity stabilization mode; and

velocity command means responsive to the presence of said velocity stabilization signal for maintaining a constant aircraft velocity with respect to an inertial reference.

5,553,813

AIRPLANE PASSENGER SEAT ROW

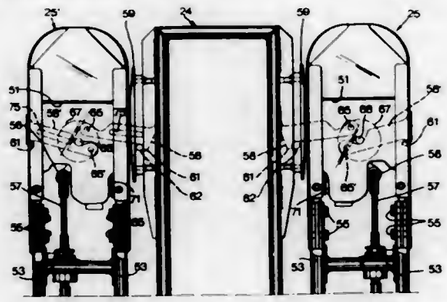
Harald Merensky, Hamburg, Germany, assignor to Keiper Recaro GmbH & Co., Remscheid, Germany

Filed Nov. 3, 1994, Ser. No. 335,399

Claims priority, application Germany, Nov. 6, 1993, 43 37 941.9

Int. Cl.[6] **B60N** *02/28*; **B64D** *11/06*

U.S. Cl. 244—118.6 **10 Claims**



1. An airplane passenger seat row, having a plurality of seats such as a center seat and laterally adjoining seats, comprising:

a seat frame; at least one cross member fixed to said seat frame, feet supporting said cross members; cushion carriers for carrying seat cushions; seat dividers carried by said cross members; adjustable backrests; one of said seat cushion carriers and at least one of said backrests are moveable in at least two positions by predetermined distances in the longitudinal direction of said cross member; the backrest of said center seat includes a center section situated between two side sections;

each side section has a locking mechanism, said locking mechanism includes moveable components for engaging said side sections shape-lockingly to the center section to form sections of the center seat, and to engage the side sections shape-lockingly to said seat backrest to form section of said laterally adjoining seats; each locking mechanism having a moveable gripper arm to interact with the center section or the backrest of the laterally adjoining seat and a gearing arrangement intended for a combined sliding and swivelling movement of said gripper arm.

5,553,814

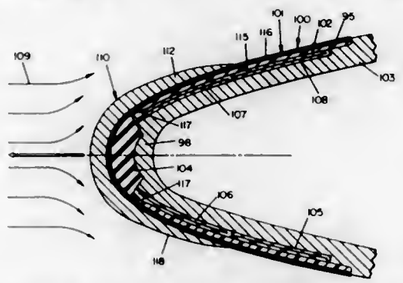
SKIN FOR A DEICER

Richard L. Rauckhorst, III, North Canton, and Kevin L. Leffel, Akron, both of Ohio, assignors to The B.F. Goodrich Company, Akron, Ohio

Division of Ser. No. 998,360, Dec. 30, 1992, Pat. No. 5,356,096. This application Jun. 2, 1994, Ser. No. 253,027

Int. Cl.[6] **B64D** *15/00*

U.S. Cl. 244—134 A **19 Claims**



1. A composite comprised of a high strength fabric impregnated with a nitrile phenolic resin, wherein said composite transfers force with increased resistance to fatigue.

5,553,815

DE-ICER ADAPTED FOR INSTALLMENT ON THE SURFACE OF A STRUCTURAL MEMBER

Lowell J. Adams, Dayton; Norbert A. Weisend, Jr., Cuyahoga Falls; Nathan Pisarski, Stow, and Steven C. Simshauser, Akron, all of Ohio, assignors to The BF Goodrich Company, Akron, Ohio

Filed Apr. 7, 1994, Ser. No. 224,223

Int. Cl.[6] **B64D** *15/16*

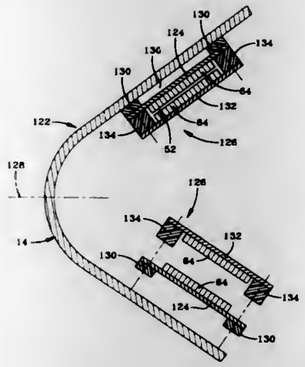
U.S. Cl. 244—134 R **50 Claims**

1. A de-icer module especially adapted for installment on an inner surface of a structural member, the structural member having an outer surface upon which ice accumulates, the de-icer module comprising:

a support sheet delimited by a support area;

a single pancake shaped separation means for developing a transient electro-mechanical separation force between said support sheet and the structural member distributed over said support area to dislodge accumulated ice, said separation means being immediately adjacent said support sheet; and,

attachment means contiguously extending from said support sheet for attaching said support sheet to the inner surface of the structural member with the support sheet in close proximity to the inner surface of the structural member and the separation means sandwiched between said support sheet and the structural member.



5,553,816

SATELLITE TELECOMMUNICATIONS AND REMOTE SENSING SYSTEM BASED ON THE USE OF SHORT-PERIOD SUN-SYNCHRONOUS ELLIPTICAL ORBITS

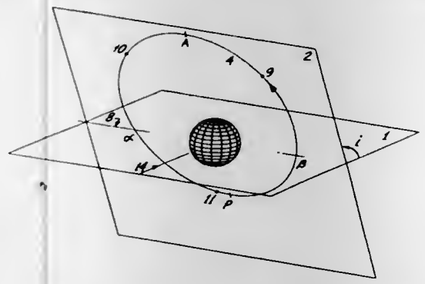
Giorgio Perrotta, Rome, Italy, assignor to Alenia Spazio SpA, L'Aquila, Italy

Filed Sep. 26, 1994, Ser. No. 312,297

Claims priority, application Italy, Sep. 24, 1993, RM93A0643

Int. Cl.[6] **B64G** *1/24*; **H04B** *7/185*

U.S. Cl. 244—158 R **14 Claims**



1. A satellite telecommunications and remote sensing system comprising a plurality of satellites arranged above Earth in at least one short-period elliptical sun-synchronous orbit having the following Keplerian parameters:

an orbit inclination of 116.6° on an equatorial plane of the Earth;

a daily rotation of a nodal line of 0.9863°; and

an orbital period such that N orbital periods fit into M sidereal days.

5,553,817

TURN COORDINATION INHIBIT FOR ROTARY WING AIRCRAFT CONTROL SYSTEM

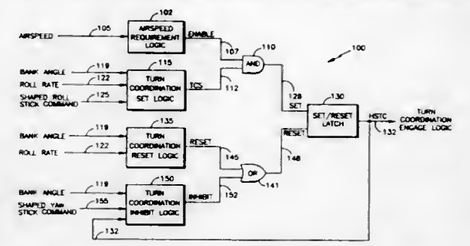
Phillip J. Gold, Shelton; Donald L. Fogler, Jr., Milford; Joseph Skonieczny, Madison, all of Conn., and James F. Keller, Media, Pa., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 3, 1994, Ser. No. 237,540

Int. Cl.[6] **B64C** *13/16*

U.S. Cl. 244—195 **19 Claims**

1. A turn coordination inhibit system for inhibiting a helicopter



control system from providing turn coordination, the inhibit system comprising:

turn coordination indicating means for providing a turn coordination signal when the control system is operating in a turn coordination mode;

bank angle indicating means for providing a bank angle signal indicative of helicopter bank angle; and

signal processing means responsive to the absence of said turn coordination signal and the magnitude of said bank angle signal exceeding an inhibit threshold magnitude for inhibiting the control system from operating in said turn coordination mode.

5,553,818

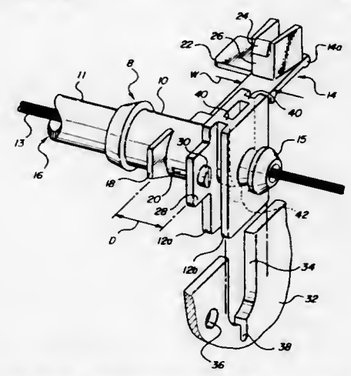
CONDUIT END FITTING WITH LOCK CONDITION INDICATOR

Brian J. Wild, Royal Oak, Mich., assignor to Hi-Lex Corporation, Battle Creek, Mich.

Filed Aug. 29, 1994, Ser. No. 297,363

Int. Cl.[6] **F16L** *5/00*

U.S. Cl. 248—56 **6 Claims**



1. An end fitting mounting a linear actuation cable on a bracket wherein the end fitting includes a main body portion which surrounds the linear actuation cable and locking means integral with the main body portion and operative in coaction with the bracket to enable the end fitting when properly mounted on the bracket to achieve a locking configuration with the bracket, characterized in that:

the end fitting further includes a lock condition indicator integral with the main body portion, separate from and operable independently of the locking means, and articulated with respect to the main body portion for movement between a first position indicating that the locking configuration has been achieved and a second position indicating that the locking configuration has not been achieved.

5,553,819

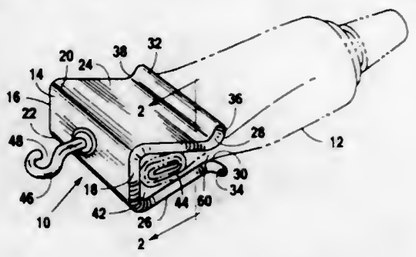
DEVICE FOR HOLDING FLEXIBLE TUBE DISPENSERS

James A. Smajdek, P.O. Box 184, Spring Branch, Tex. 78070

Continuation of Ser. No. 45,367, Apr. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 534,730, Jun. 7, 1990, abandoned, which is a continuation of Ser. No. 274,397, Nov. 21, 1988, abandoned. This application Jun. 13, 1995, Ser. No. 480,513

Int. Cl.[6] B65D *35/56*

U.S. Cl. 248—108 **6 Claims**



1. A combination of a removable and reusable retaining clip and an elongated dispensing tube for containing a squeezable product, said tube comprising:

elastomeric opposing side walls adaptable to be flattened and folded into increasingly larger folds until substantially the entire length of said tube may be flattened and folded, said retaining clip comprising:

a substantially rigid base;

two substantially rigid side walls connected to said base at opposing edges thereof, each wall and said base forming a substantially rigid corner at the place of connection, and each said wall having an end spaced away from said corner where said wall is connected to said base to a minimum separation distance whereby a gap is formed between said ends of said two side walls, said minimum separation distance being of sufficient dimension to accommodate a flattened portion of said squeezable product dispensing tube and to restrict the rearward flow of said product in said tube without fully compressing said tube side walls against each other, said walls and base forming an elongated chamber for enclosing the entire width of a flattened and folded portion of said product dispensing tube on three sides thereof, whereby said flattened and folded portion of said tube is prevented from folding or unfolding, said walls and base further forming two side openings for receiving said flattened and folded portion of said squeezable tube, said chamber sized to enclose substantially said entire length of said product dispensing tube when said substantial length of said tube is flattened and folded; and

a lip connected to each said side wall at said end thereof, said lips diverging away from each other from said minimum separation distance, said walls and lips further comprising hemispherically shaped, radiused edges extending the outer entire edge of said side openings, said radiused edges sloped sufficiently to cooperate with said increasingly larger folds of said flattened and folded portion of said product dispensing tube to enable said dispensing tube to be inserted and removed from said gap without damaging said tube, said squeezable product capable of being dispensed when said entire width of said flattened and folded portion is enclosed with said chamber.

5,553,820

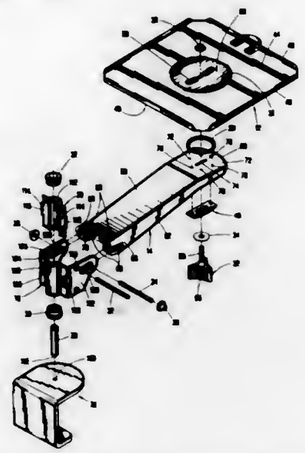
ADJUSTABLE MONITOR ARM

Stuart Karten, Venice, and Dennis Schroeder, Hermosa Beach, both of Calif., assignors to Rubbermaid Office Products Inc., Maryville, Tenn.

Filed Oct. 17, 1994, Ser. No. 322,479

Int. Cl.[6] A47F *5/00*

U.S. Cl. 248—286.1 **23 Claims**



1. An adjustable support arm assembly for a computer monitor or the like, comprising:

an arm member having a first end, a remote second end, and an elongate slot extending through the second arm end;

anchor means for supporting the first arm end;

a support socket affixed to an upper surface of the arm second end, the support socket having a central, upwardly opening cavity defined by a support surface, and the socket cavity communicating with the arm member slot;

an adjustable tray rotatably affixed to the support surface, the tray having a dependent concave bearing surface seated within the support cavity and an elongate tray slot extending through the bearing surface and at least partially overlapping the arm member slot, the tray moving within the support socket into variable angular and rotational positions relative to the support pocket;

releasable locking means for fixing the angular and rotational position of the tray relative to the support socket.

5,553,821

COUNTERBALANCING UNIT

Masao Ishikawa, Saitama, Japan, assignor to Heiwa Seiki Kogyo Co., Ltd., Saitama, Japan

Filed Aug. 9, 1994, Ser. No. 287,896

Int. Cl.[6] F16M *11/00*

U.S. Cl. 248—292.11 **6 Claims**

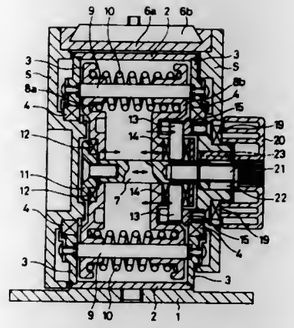
1. A counterbalancing unit comprising:

a base;

a longitudinal member connected to said base;

a central horizontal shaft extending through said longitudinal member and having a first end and a second end, said first end having an interiorly threaded bore;

a first strut rotatably supported on said longitudinal member and surrounding said first end of said central horizontal shaft;



a second strut rotatably supported on said longitudinal member;

a mounting plate supported by said first and second struts;

a rotary member connected to said first strut and having a cam face, said rotary member coaxially surrounding said central horizontal shaft;

a first holder slidably mounted on said first end of said central horizontal shaft;

a second holder fixedly connected to said second end of said central horizontal shaft;

at least one pin connected to said first holder and operatively engaged with said cam face;

at least one elastic body located between and compressed by said first and second bolders;

a rotatable knob having an exteriorly threaded member engaged with said threaded bore of said first end of said central horizontal shaft, wherein rotation of said knob moves said central horizontal shaft to increase or decrease the compression of said at least one elastic member.

5,553,822

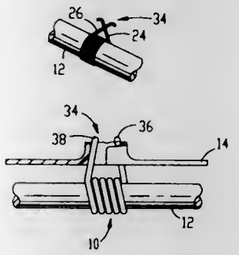
SUPPORT MEANS FOR CONDUIT

Michael A. Barnard, and Marvin L. Cox, both of Wichita, Kans., assignors to Wescon Products Company, Wichita, Kans.

Filed Jan. 13, 1995, Ser. No. 372,389

Int. Cl.[6] F16L *3/08*

U.S. Cl. 248—302 **1 Claim**



1. In combination:

an elongated shaft defining a longitudinal axis;

a structural element including an opening of a predetermined diameter and defining a central axis extending in a direction perpendicular to the longitudinal axis; and

a fastening means for fastening the shaft to the structural element, the fastening means including a helical coil of wire including a central coiled section having three to seven coils, and two opposed end sections extending tangentially from the coiled section,

the coiled section being sized of a diameter smaller than the shaft to grip the shaft and to prevent relative axial movement between the helical coil and the shaft when the coil is mounted on the shaft,

the end sections including hook-shaped tips that are spaced apart from one another by a distance greater than the predetermined diameter of the opening so that the tips, when received in the opening, fasten the elongated shaft to the structural element,

the opposed end sections of the coil each intersecting a plane defined by the longitudinal axis of the shaft and the central axis of the opening so that as the tips of the two end sections are pushed through the opening in the structural element, the tips are deflected toward one another and the coiled section is forced to partially unwind until the tips are pushed completely through the opening.

5,553,823

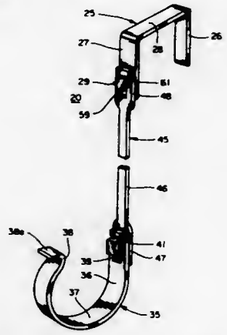
WREATH HANGER

William F. Protz, Jr., Lake Forest, Ill., assignor to Santa's Best, Northfield, Ill.

Filed Feb. 9, 1995, Ser. No. 386,078

Int. Cl.[6] F16B *45/00*

U.S. Cl. 248—304 **12 Claims**



1. An extendible hanger assembly, comprising:

a U-shaped mounting member having two legs interconnected by a thin bight to fit over the top of a door for mounting said extendible hanger to a door; a hook member for holding a decorative object such as a wreath or garland; and one or more extension members connectable to each other and to said mounting member and to said hook member to provide an extendible hanger assembly removably mountable on a door for holding a decorative object such as a wreath or garland , one of said legs carrying a device thereon for removable connection to one of said extension members.

5,553,824

ADJUSTABLE LENGTH LAPTOP COMPUTER TRAY ASSEMBLY

Joseph G. Dutra, Jr., 4568 Thornton Ave., Fremont, Calif. 94536-5662

Filed Aug. 1, 1994, Ser. No. 283,813

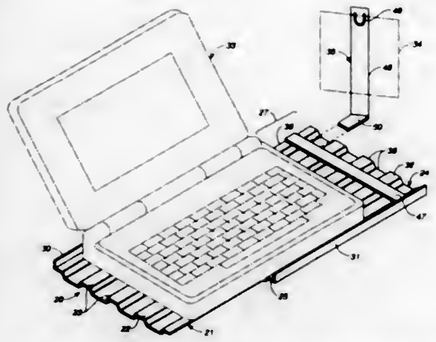
Int. Cl.[6] A47G *29/00*

U.S. Cl. 248—346.07 **24 Claims**

1. An adjustable length portable computer tray assembly comprising:

a relatively thin platform member having a contacting surface and defining a plurality of relatively shallow, parallel, strengthening ribs which are laterally spaced-apart across said platform member and extending longitudinally therealong;

a relatively thin support member having a top sliding surface and a bottom sliding surface each defining a plurality of



relatively shallow, parallel, support ribs which are laterally spaced-apart across said support member, said support ribs of said bottom sliding surface being formed for sliding interengagement with said strengthening ribs of said platform member in a manner substantially preventing lateral motion of said support member laterally along said platform member while providing longitudinal sliding support for selectively positioning between a retracted position and an extended position;

a relatively thin engaging member having an engaging surface defining a plurality of relatively shallow, parallel, engaging ribs which are laterally spaced-apart across said engaging member, said engaging ribs of said bottom sliding surface being formed for sliding interengagement with said support ribs of top sliding surface in a manner substantially preventing lateral motion of said engaging member laterally along said support member while providing longitudinal sliding support for selectively positioning between a retracted position and an extended position, said support member and said engaging member aggregately cooperating to provide a substantially flat, length adjustable support surface; and

an upstanding first lip and an opposite upstanding second lip each extending upwardly from said support surface, and each extending longitudinally along one of said platform member, said support member and said engaging member, on opposed sides of said support surface.

5,553,825

MECHANICAL CAMPER JACK

C. Martin Rasmussen, 374 S. Stirling Dr., Fruit Heights, Utah 84037

Continuation-in-part of Ser. No. 983,073, Nov. 30, 1992, Pat. No. 5,348,258. This application Jul. 15, 1994, Ser. No. 275,597

Int. Cl.[6] B66F *7/00*

U.S. Cl. 248—354.3 **27 Claims**

1. An extensible camper jack comprising:

a jack housing adapted to be affixed to a load to be raised or lowered;

a jack leg, slidably received within the jack housing so as to be moveable in a telescoping fashion therein;

a threaded nut mounted to the jack leg in a manner so as to be held against rotation relative to the jack leg;

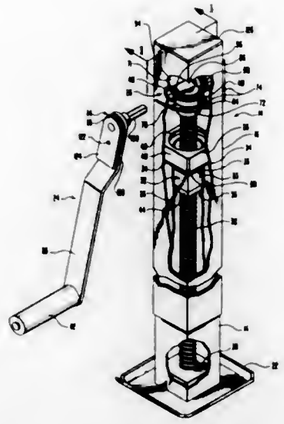
an elongate lead screw threadedly received by the nut such that rotation of the lead screw causes the nut to move axially along the lead screw, thereby causing the jack leg to move in the telescoping manner within the jack housing;

gear means, completely disposed within the jack housing, for rotating the lead screw;

crank means for effecting the rotation of the lead screw; and

socket means, coupled to the gear means, for detachably coupling the crank means to the gear means, said socket means being configured such that:

the coupling of the crank means and the gear means occurs inside the jack housing, and



the socket means extends through a portion of an outer wall of the jack housing in a manner that maintains said portion of the outer wall substantially flush with adjacent portions of the outer wall so that said portion does not protrude outwardly.

5,553,826

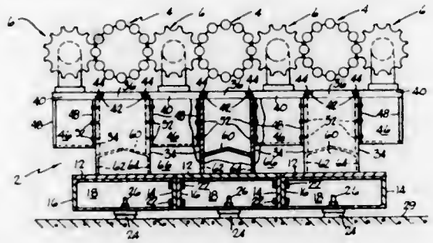
NECKING APPARATUS SUPPORT

Robert H. Schultz, Golden, Colo., assignor to Coors Brewing Company, Golden, Colo.

Filed May 10, 1995, Ser. No. 438,894

Int. Cl.[6] F16M *9/00*

U.S. Cl. 248—678 **18 Claims**



5. Modular supports for supporting a plurality of necking-in stations and a plurality of transfer stations comprising:

a plurality of modular supports in a side-by-side relationship;

each of said plurality of modular supports comprising:

a hollow elongated longitudinally extending base;

said elongated longitudinally extending base having at least a top wall, opposite sidewalls and opposite end walls;

at least two spaced apart support columns projecting from and secured to said top wall;

a first elongated longitudinally extending support plate being supported on and secured to said at least two spaced apart support columns;

a second elongated longitudinally extending support plate for supporting at least one transfer station;

said second elongated longitudinally extending support plate having a longitudinal extent substantially less than the longitudinal extent of said first elongated longitudinally extending support plate;

said second elongated longitudinally extending support plate being supported on at least a portion of said first elongated longitudinally extending support plate;

a plurality of support means each comprising at least two opposite sidewalls, two opposite end walls and a bottom wall secured to and projecting from said second elongated longitudinally extending support plate in a direction toward said hollow elongated longitudinally extending base;

second releasable securing means for securing together said opposite sidewalls of at least one of said plurality of support means to an adjacent one of said at least two spaced apart support columns; and

first releasable securing means for releasably securing together the hollow elongated longitudinally extending bases of adjacent ones of said plurality of modular supports.

5,553,827

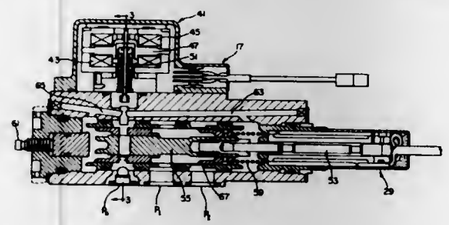
LOW CURRENT ELECTRO-HYDRAULIC METERING MODULE

Russell C. Perkey, Granger, Ind., assignor to AlliedSignal Inc., Morristown, N.J.

Filed Nov. 17, 1993, Ser. No. 153,689

Int. Cl.[6] F16K *31/124*

U.S. Cl. 251—30.01 **4 Claims**



1. In a fluid flow control device having a housing with a bore therein for retaining a spool valve, said housing having an inlet port connected to a first source of fluid having a constant fluid pressure, an outlet port connected to a fuel supply system and a return port connected to a storage reservoir, adjustment means connected to said housing and extending into said bore, a spring for urging said spool valve into engagement with said adjustment means to define a metering area between said housing and said spool valve to assure that a minimum volume of fluid is communicated from said first source to said system through said outlet port, a torque motor located in said housing and responsive to a driving signal for moving from a neutral position to a desired operational position, a movable fluidic control directly connected to said torque motor and fluidicly connected to said spool valve, said movable control moving with said torque motor for communicating a second source of pressurized fluid to said bore, said second source of pressurized fluid acting on said spool valve and after overcoming said spring moving said spool valve to change said metering area and divide the quantity of said first source of pressurized fluid supplied to said inlet port into a supply fluid and a return fluid, said supply fluid being supplied to said system through said outlet port while said return fluid is returned to said reservoir, first feedback means including a sensor for sensing the position of the spool valve and providing an output signal indicative thereof to a controller, and an electrical feedback circuit responsive to said output signal for modifying said driving signal, the improvement comprising second feedback means including a single resilient mechanical coupling responsive to the position of the spool valve for independently positioning said fluidic control as a function of the position of said spool valve such that a minimum flow of pressurized fluid from said first source occurs through said outlet port when said spool valve engages said adjustment means.

5,553,828

ELECTRO-HYDRAULIC ACTUATOR

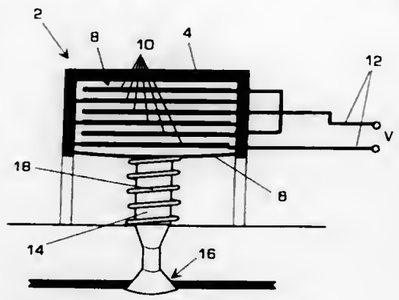
Peter Jaenker, Garching, Germany, assignor to Deutsche Aerospace AG, Germany

Filed Oct. 5, 1994, Ser. No. 318,164

Claims priority, application Germany, Oct. 5, 1993, 43 33 871.2

Int. Cl.[6] F16K *31/02*

U.S. Cl. 251—129.01 **20 Claims**



1. Electro-hydraulic actuator device comprising:

a working chamber;

an electrostrictive fluid contained in said working chamber;

an electric field generator arranged in communication with said electrostrictive fluid;

means for controlling an electric field generated by said electric field generator to provide a variable electric field acting on said electrostrictive fluid; and

actuator output means for generating a displacement in direct response to volumetric expansion of said electrostrictive fluid in said working chamber.

5,553,829

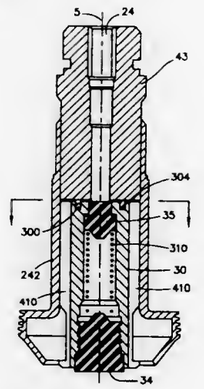
SOLENOID VALVE WITH SOUND DAMPENING FEATURE

Steven J. Hemsen, Southington, Conn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 25, 1995, Ser. No. 378,207

Int. Cl.[6] F16K *31/02*

U.S. Cl. 251—129.21 **17 Claims**



1. A valve, comprising:

a sleeve assembly having a central axis;

a plunger slideably disposed within said sleeve assembly;

means for causing said plunger to move axially along said central axis;

a stop member having an opening formed therethrough, said plunger having a seal attached thereto, said seal being config-

a centrifugal brake mounted to one end of said drum reel having an element moved radially outward upon rotation of said

5,553,834

LATERAL AND AXIAL VIBRATION ISOLATORS

a stop member having an opening formed therethrough, said plunger having a seal attached thereto, said seal being configured to prevent the passage of a fluid through said opening when said plunger is moved toward said stop member and said seal is moved against said opening; and

a resilient member attached to said plunger between said plunger and said stop member, said resilient member being disposed to prevent direct contact between said plunger and said stop member when said plunger is moved toward said stop member, said resilient member comprising a plurality of discontinuities formed therein, said plurality of discontinuities extending in a direction away from said plunger and toward said stop member.

5,553,830

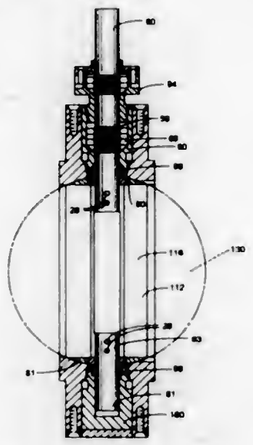
PIPELINE VALVE APPARATUS

Gary M. Stary, 636 Thorn Hollow Dr., Cornopolis, Pa. 15108

Division of Ser. No. 194,821, Feb. 14, 1994. This application Nov. 18, 1994, Ser. No. 342,281

Int. Cl.[6] F16K *41/02*

U.S. Cl. 251—214 **2 Claims**



1. Apparatus for preventing a pressure medium in a valve body from escaping around a valve shaft rotatably supported in a tapered threaded opening provided in the valve body comprising a stuffing box having a bore for rotatably receiving and supporting a portion of said valve shaft therein and a means for creating a substantially fluid-tight seal around the shaft, said stuffing box having an external threaded portion adapted to be threadedly received in said tapered threaded opening in said valve body, said external threaded portion of said stuffing box and said tapered threaded opening in said valve body being tapered to different degrees to create a sealing engagement therebetween.

5,553,831

BALL VALVE

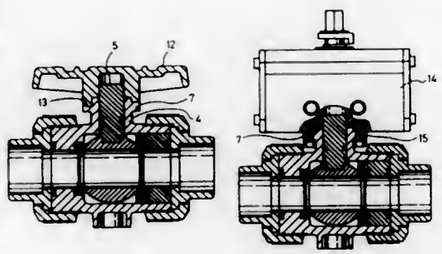
Yoshito Ozaki, and Katsuhiro Onishi, both of Nobeoka, Japan, assignors to Asahi Yukizai Kogyo Co., Ltd., Miyazaki, Japan

Filed Dec. 20, 1994, Ser. No. 356,307

Claims priority, application Japan, Apr. 21, 1993, 5-020705 U

Int. Cl.[6] F16K *5/06*

U.S. Cl. 251—292 **12 Claims**



1. A ball valve which is opened and shut through rotation of a spindle to rotate a valve ball engaged with the spindle, wherein a neck portion of a valve body bearing the spindle is integrally provided with a top flange for mounting either of a handle or an actuator for the operation of the spindle, wherein the valve body includes a stand integrally formed in one piece with the valve body, said stand being positioned on a side of the valve body opposite the neck portion, said stand including means for securing the ball valve.

5,553,832

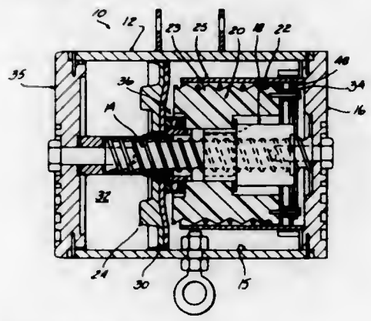
SAFETY DEVICE FOR AN AIR BALANCING HOIST

James Zaguroli, Jr., Drayton Plains, Mich., assignor to Knight Industries, Inc., Auburn Hills, Mich.

Continuation-in-part of Ser. No. 30,768, Mar. 12, 1993, Pat. No. 5,370,367, and a continuation-in-part of Ser. No. 260,194, Jun. 15, 1994, abandoned. This application Aug. 2, 1994, Ser. No. 284,800

Int. Cl.[6] B66D *1/00;1/10;* F16D *51/00*

U.S. Cl. 254—267 **1 Claim**



1. An air balancing hoist comprising:

a housing having an interior bore therein;

a ball screw mounted in said housing to extend axially through said interior bore;

a ball nut received over said ball screw;

a drum reel fixed to one of said ball nut and said ball screw to move therewith, the other of said one of said ball screw and said ball nut fixed to said housing;

a cable attached to said drum reel so as to be wound thereon and unwound therefrom upon rotation of said drum reel in either direction;

a movable element axially movable in said housing interior bore and sealed therein to define a pressure chamber on one side thereof, the other side drivingly engaging one end of said drum reel to create an axial force thereon when said chamber is pressurized;

a source of regulated air pressure in communication with said chamber applying a pressure level sufficient to at least substantially balance an axial force exerted by said cable supporting a load acting through said ball screw and nut to generate an axial force on said drum reel acting oppositely to said axial force generated by said regulated air pressure acting in said chamber;

a centrifugal brake mounted to one end of said drum reel having an element moved radially outward upon rotation of said drum reel at a predetermined rate corresponding to loss of said load on said cable;

a cylindrical fixed surface surrounding said drum reel and centrifugal brake to be engaged by said element by said radially outward movement;

said centrifugal brake element comprising an elongated arm, a pivotal support adjacent one end thereof, said arm having a radially outwardly projecting rounded end surface at said pivoted end, said arm further having a tail portion extending circumferentially away from said pivoted end, said pivot being eccentrically located with respect to said rounded surface so as to bring successive sections thereof radially outward as said tail portion moves radially outward, and wherein an inner surface of said fixed surface is formed with a series of recesses configured to be adapted to receive and interfit with said end surface upon activation of said brake by movement of said tail portion outwardly and initial frictional engagement of said rounded surface until one of said recesses becomes aligned with said rounded end surface;

whereby said centrifugal brake allows substantially unimpeded rotation of said drum reel during normal winding and unwinding of said cable thereon but substantially locks said drum reel against rotation thereof under a condition wherein said load is suddenly lost.

5,553,833

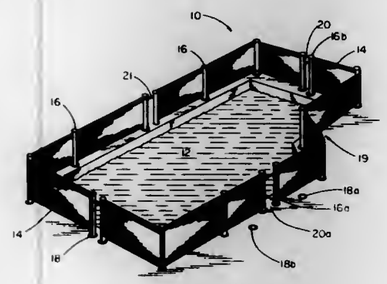
SAFETY BARRIER MOUNT

F. Russell Bohen, Palm Harbor, Fla., assignor to Protect-A-Child Pool Fence Systems, Inc., Pompano, Fla.

Filed Jan. 3, 1994, Ser. No. 176,223

Int. Cl.[6] E04H *17/22*

U.S. Cl. 256—65 **2 Claims**



1. In a fence comprising two or more multi-panel sections, each of the sections extending intermediate two gate poles, each of the sections comprising a plurality of flexible panels, each of the panels attached intermediate a pair of poles removably inserted respectively into corresponding ones of a plurality of receptacles, an improvement comprising:

a key element adjacent the bottom of each of the poles;

a keyway formed in each of the receptacles,

the keyway of the receptacle into which the first gate pole of the first section is inserted having a first rotational orientation relative to a line perpendicular to the fence at that receptacle,

the keyway of each of the remaining receptacles into which the corresponding poles of the first section are inserted counter-oriented with respect to the keyway in which the first gate pole of the first section is inserted; and

a latch connecting the first gate pole of the first section to one of the gate poles of the second section,

whereby a uniform panel tension is maintained in the panels of the first section.

5,553,834

LATERAL AND AXIAL VIBRATION ISOLATORS UTILIZING LEAF SPRINGS

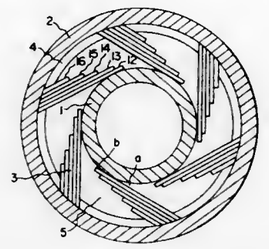
Yang-Gyu Je, Daejeon-si, and Jong-Su Kim, Basan-Si, both of Rep. of Korea, assignors to Korea Institute of Machinery and Metals, Daejeon-Si, Rep. of Korea

Filed Nov. 9, 1994, Ser. No. 338,190

Claims priority, application Rep. of Korea, Nov. 12, 1993, 93-24034; Jan. 18, 1994, 94-835

Int. Cl.[6] F16F *9/14*

U.S. Cl. 267—140.12 **8 Claims**



1. A vibration isolator for isolating vibrations resulting in translational displacements between concentrically spaced elements including a movable element and a stationary element, said vibration isolator comprising a chamber containing walls formed by said movable and stationary elements, a body of hydraulic fluid in said chamber, a plurality of leaf spring packs spaced about the circumference of said chamber to form circumferentially spaced hydraulic fluid compartments thereabout, said leaf spring packs containing a plurality of stacked resilient leaf spring plates having one end fixed to said stationary element and their other ends freely engaging said movable element to permit translational motion therebetween, and hydraulic fluid passage means extending between said compartments for feeding hydraulic fluid from one side of each said leaf spring pack to the other side thereof to dampen vibration between said moving elements as said movable element moves translationally relative to said stationary element.

5,553,835

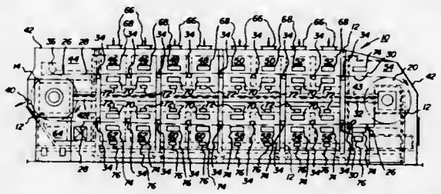
METHOD FOR DRYING SOLVENT BASED FILM

Carl F. Dresie, Rochester; Edward S. Jones, E. Rochester; Stephen R. Shelley, Spencerport; Kurt H. Strobl, Webster; Shamal L. Suthar, Pittsford, all of N.Y., and Harold C. Worden, Santee, S.C., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 142,271, Oct. 25, 1993. This application Apr. 7, 1995, Ser. No. 418,740

Int. Cl.[6] B29C *39/42;41/28*

U.S. Cl. 264—204 **14 Claims**



1. In a method for producing a thin polymeric film, the method being of the type including steps of providing a source of a solution of polymer and solvent; providing an endless casting belt having a width, an outer surface for receiving a cast layer of polymer and solvent and an opposite, inner surface; advancing the endless belt while casting the layer of polymer and solvent onto the outer surface at a location along the casting belt, the layer having a

transverse width somewhat narrower than the width of the casting belt; directing a flow of dryer gas to the layer to evaporate solvent; and removing gas and solvent from the vicinity of the casting belt, the improvement wherein the directing and removing steps comprise:

at first locations extended substantially across the width of the casting belt downstream of the first locations along the casting belt, directing flows of gas toward the outer surface of the casting belt to remove solvent evaporating from the cast layer of polymer and solvent, the first locations being spaced from each other along at least a first portion of the length of the outer surface; and

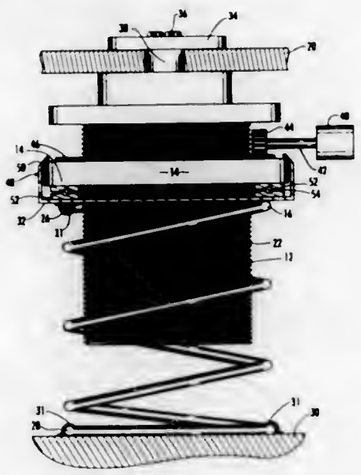
at least at one, second location extended substantially across the width of the belt between the first locations, receiving flows of gas and solvent and directing the gas and solvent away from the layer along flow paths substantially normal to the outer surface.

5,553,836

ADJUSTABLE SUSPENSION SYSTEM

W. Keith Ericson, Nashville, Tenn., assignor to Patentials Incorporated, Nashville, Tenn.

Filed May 11, 1995, Ser. No. 439,158
Int. Cl.[6] B60G *1/00*
U.S. Cl. 267—286 **9 Claims**



1. An adjustable vehicle suspension system to level a body of a motorized vehicle, comprising:

a post having an externally threaded surface;

a collar having a threaded interior surface configured to cooperate with the threaded surface of the post;

a spring interpositioned between the collar and an axle of the motorized vehicle;

a geared adjustment mechanism provided to initiate the compression and decompression of the spring; and

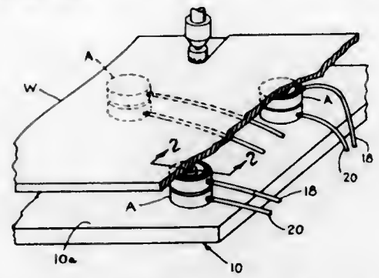
a heating assembly including a collar jacket rotatably and permanently attached to the collar, spaced apart bearing plates, a bearing component interpositioned between the bearing plates, and cooperating beveled surfaces associated with the collar and the collar jacket to ensure the collar jacket and collar remain attached to one another and move in unison along the post in response to rotations of the collar.

5,553,837

VACUUM WORKPIECE HOLDING DEVICE FOR A WORK TABLE

David A. Kahle, P.O. Box 227HC1, Leeper, Pa. 16233

Filed Jan. 17, 1995, Ser. No. 373,570
Int. Cl.[6] B25B *11/00*
U.S. Cl. 269—21 **24 Claims**



1. A vacuum cell for holding a workpiece on a work surface comprising:

a first vacuum unit having vacuum chamber surrounded by a workpiece interface for engaging said workpiece;

a second vacuum unit having vacuum chamber surrounded by a work surface interface for engaging said work surface;

said workpiece interface and said work surface interface facing in opposing directions for holding said workpiece and work surface, respectively, by vacuum; and

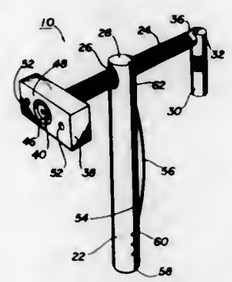
a manually operable adjustment mechanism interconnecting said first and second vacuum units for positively moving said first vacuum chamber relative to said second vacuum chamber to adjust the axial spacing between said first and second vacuum units to define a total cell height for said vacuum cell.

5,553,838

CLAMPING BENCH DOG

Leonard G. Lee, Ottawa, Canada, assignor to Lee Valley Tools Ltd., Ottawa, Canada

Continuation-in-part of Ser. No. 816,924, Jan. 3, 1992, Pat. No. Des. 339,728, Ser. No. 927,327, Aug. 10, 1992, Pat. No. 5,275,391, Ser. No. 927,326, Aug. 10, 1992, Pat. No. 5,301,934, Ser. No. 961,489, Oct. 16, 1992, Pat. No. 5,284,311, and Ser. No. 180,031, Jan. 11, 1994, Pat. No. 5,467,972. This application Sep. 12, 1994, Ser. No. 304,588
Int. Cl.[6] B25B *1/00*
U.S. Cl. 269—93 **10 Claims**



1. A clamping bench dog comprising:

a. a post having two ends, a longitudinal axis, and a threaded bore near one the ends of the post located on an axis rotated approximately eighty-seven degrees (87°) from the post longitudinal axis,

b. a screw having two ends and journaled in the throughbore,

c. a pad rotatably fixed on one of the ends of the screw,

f. means on the other end of the screw for rotating the screw, and

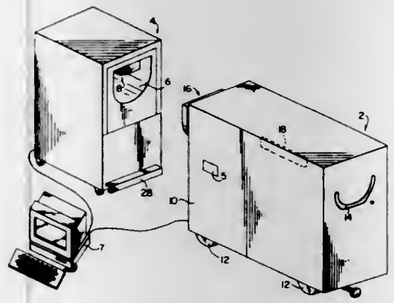
g. means for increasing friction between the post and a dog hole within which it is positioned.

5,553,839

SYSTEM FOR HANDLING CURVED FORM MEDIA AND CASSETTE THEREFOR

S. Lawrence Wolfson, West Hartford; Joseph Conlan, Rocky Hill, both of Conn., and Philip W. Cenedella, East Douglas, Mass., assignors to Gerber Systems Corporation, South Windsor, Conn.

Division of Ser. No. 71,567, Jun. 1, 1993, Pat. No. 5,484,139. This application Aug. 7, 1995, Ser. No. 511,656
Int. Cl.[6] B65H *85/00*
U.S. Cl. 271—3.11 **19 Claims**



1. A media handling system for a photoplotter wherein sheets of media are exposed one at a time by bringing each sheet from a first station to an exposure station, by exposing each sheet while it remains at the exposure station, and by then removing each sheet from the exposure station to a second station, with each sheet during its exposure being supported in a partially cylindric condition by engagement with an internal support surface of a support drum at the exposure station, which internal support surface is partially cylindric about a generally horizontal central axis of the drum and has a generally upwardly facing mouth, said media handling system comprising:

a positioning carriage movable along a path positioned above the level of said horizontal central axis of said drum between said exposure station and at least one of said first and second stations,

a media lifting means carried by said positioning carriage and movable vertically relative to said positioning carriage between a lowered position and a raised position,

said lifting means having a plurality of vacuum openings arranged in a partially cylindric surface generally complementary to said support surface of said support drum and with said vacuum openings facing said support surface of said support drum when said positioning carriage is positioned at said exposure station and said lifting carriage is in said lowered position,

a vacuum supply means, and

a switching means for controllably switching said vacuum openings into and out of communication with said vacuum supply means to selectively supply or not supply vacuum pressure to said vacuum openings,

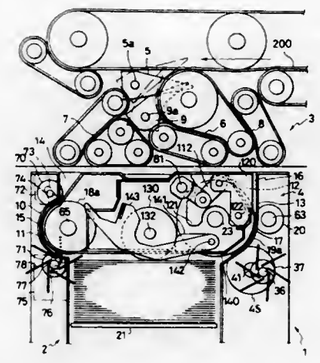
whereby a media sheet can be releasably held by said vacuum openings to said lifting means in a partially cylindric shape conforming to said support surface and by vertical movement of said lifting means relative to said positioning carriage said media sheet can be moved vertically relative to said support surface while maintained in said partially cylindric shape by said vacuum openings.

5,553,840

BILL RECEIVING AND FEEDING-OUT APPARATUS

Junichi Arikawa, Kawaguchi, Japan, assignor to Laurel Bank Machines Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 121,893, Sep. 16, 1993, abandoned. This application Dec. 6, 1994, Ser. No. 353,985
Claims priority, application Japan, Sep. 17, 1992, 4-248267; Sep. 9, 1993, 5-224151
Int. Cl.[6] B07C *5/02*
U.S. Cl. 271—3.08 **20 Claims**



1. A bill receiving and feeding-out apparatus for a bill receiving and dispensing machine connectable to a transporting passage in the bill receiving and dispensing machine comprising a bill accommodating box for accommodating bills, a bill reversing mechanism which comprises a bill reversing passage for reversing and feeding bills into the bill accommodating box, a bill non-reversing passage for feeding bills into the bill accommodating box without reversing them, a bill feeding-out passage for feeding out bills from the bill accommodating box to the transporting passage, a first gate means for selectively taking in acceptable bills in accordance with the results of discrimination made by a discriminating means provided in the transporting passage as to whether or not bills are acceptable, the denominations of bills and whether the front sides or the back sides of bills face upwardly and second gate means for selectively feeding bills to either the bill reversing passage or the bill non-reversing passage based upon the results of discrimination made by the discriminating means, and a bill receiving and feeding-out mechanism which comprises a bill accommodating passage connected to the downstream end portion of the bill reversing passage and connected to the upper portion of the bill accommodating box at the downstream end portion thereof for feeding bills from the bill reversing passage to the bill accommodating box, a bill receiving and feeding-out opening facing the downstream end portion of the bill non-reversing passage and the upstream end portion of the bill feeding-out passage and a bill accommodating and feeding-out passage connected to the bill receiving and feeding-out opening at one end and to the upper portion of the bill accommodating box at the other end and adapted for feeding bills into the bill accommodating box and feeding out bills from the bill accommodating box, said bill reversing mechanism being disposed above the bill receiving and feeding-out mechanisms, said bill receiving and feeding-out apparatus further comprising an adjusting means for enlarging the bill receiving and feeding-out opening so as to face the bill non-reversing passage and the bill feeding-out passage when accommodating bills into the bill accommodating box and narrowing the bill receiving and feeding-out opening so as to face only the bill feeding-out passage when feeding out bills from the bill accommodating box.

5,553,841

DEVICE FOR PREVENTING MULTIPLE REMOVAL OF PRINTING MATERIAL FROM A SHEET PILE

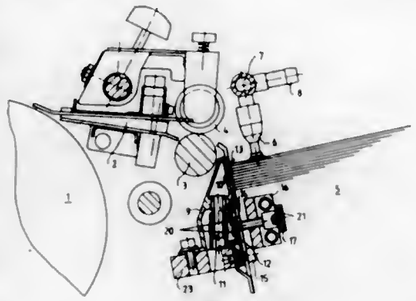
Martin Greive, Heidelberg, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Sep. 26, 1994, Ser. No. 312,320

Claims priority, application Germany, Sep. 24, 1993, 43 32 515.7

Int. Cl.[6] B65A *3/34*

U.S. Cl. 271—104 **4 Claims**



1. Device for preventing removal of more sheets than a single sheet from a sheet pile, comprising fingers distributed on a front stop in the vicinity of the surface of the sheet pile along a front side of the sheet pile for separating the sheets in a separating process, bearing means carrying said fingers, and resilient supports for supporting said bearing means, said bearing means having first and second ends, said resilient supports being adjustable independently of one another with respect to the sheet pile, and including adjusting screws operatively engageable with said bearing means in the vicinity of said first and second ends for deflecting said bearing means.

5,553,842

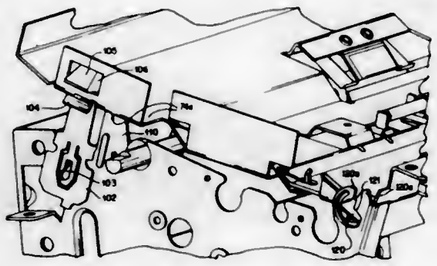
PRECISION REFERENCING/LATCHING SYSTEM FOR DOCUMENT SEPARATION AND TRANSPORT IN A SCANNING UNIT

Darren W. Wilcox, and Dennis Sonnenburg, both of San Diego, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 17, 1994, Ser. No. 324,822

Int. Cl.[6] B65H *3/06*

U.S. Cl. 271—109 **20 Claims**



1. A scanning unit such as a facsimile machine having a pick roller for selectively feeding individual document sheets along a document path past a scanning station, comprising:

a frame having a pick roller thereon in the document path;

post-scanning arms fixedly attached to and extending upwardly from said frame and having pivot slots;

a rigid upper guide member having a separator assembly thereon located upstream from said pick roller and including pivoting legs for engaging said pivot slots;

pre-scanning arms fixedly attached to and extending upwardly from said frame and having first datum surfaces in the Z-axis and second datum surfaces in the Y-axis;

Z-axis datums on said guide member for engaging said first datum surfaces and Y-axis datums on said guide member for engaging said second datum surfaces, whenever said upper guide member is moved from an open position allowing manual access to the document path to a closed position allowing scanning of document sheets, to achieve optimum positioning of said separator assembly relative to said pick roller.

5,553,843

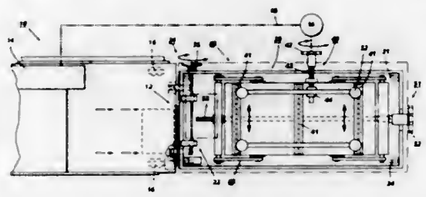
ADAPTER SYSTEM TO INTEGRATE REPRODUCTION APPARATUS TO SHEET OUTPUT PROCESSING APPARATUS WITH LATERAL REGISTRATION

Richard C. Schenk, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 13, 1994, Ser. No. 354,580

Int. Cl.[6] B65H *9/00;31/20*

U.S. Cl. 271—226 **2 Claims**



1. In a reproduction system in which a reproduction apparatus with an output of printed sheets at a sheet output position is operatively connected to an output sheet processing apparatus having a sheet input position for sequentially receiving and processing the printed sheets from the reproduction apparatus; the improvement comprising:

a lateral alignment system for laterally aligning said sheet input position of said output sheet processing apparatus directly with said sheet output position of said reproduction apparatus without an intermediate sheet transport;

said lateral alignment system comprising a mounting system for mounting said output sheet processing apparatus or said reproduction apparatus on said lateral alignment system for lateral movement thereon, and a lateral repositioning system for laterally repositioning said mounting system so as to laterally reposition said output sheet processing apparatus relative to said reproduction apparatus;

wherein said lateral repositioning system comprises a slide rail mounting of said mounting system.

5,553,844

SHEET SORTING APPARATUS

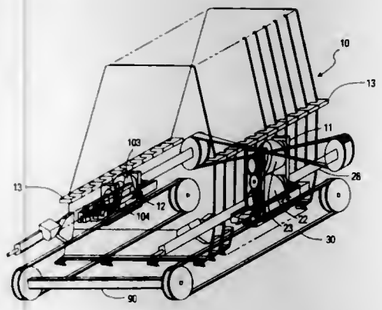
Jack Aaron, 17231 Corla Ave., Tustin, Calif. 92680

Filed Oct. 6, 1994, Ser. No. 317,683

Int. Cl.[6] B65H *39/10*

U.S. Cl. 271—293 **16 Claims**

1. A movable tray sorter, said sorter including a plurality of trays and means for enabling movement of said trays along an axis, said sorter also including control means for moving a subset of said tray set one position for forming a relatively large separation between any selected tray and the next adjacent tray where said subset comprises from 1 to N−1 trays for an N tray sorter, said sorter also including a paper chute and means for moving said paper chute along said axis directly from it's present position to a position in alignment with said separation for delivering a paper sheet to said selected tray wherein the trays of said tray set are arranged generally vertically and said axis is a horizontal axis, said trays being in closely spaced positions and said paper chute is positioned beneath said tray set.



5,553,845

PAPER FEED ROLLER

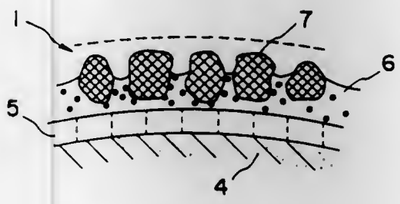
Tsutomu Sawa, Fujisawa; Hiroyuki Takenoshita, Yokohama; Toshiki Hada, Fujisawa, and Hirohide Komatsu, Machida, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y., and K R D Corporation, Kanagawa-ken, Japan

Filed Jul. 19, 1994, Ser. No. 275,737

Claims priority, application Japan, Jul. 20, 1993, 5-179294

Int. Cl.[6] B65H *29/20*

U.S. Cl. 271—314 **26 Claims**



1. A paper feed roller which comprises:

a cylindrical core made of a foamed material, and having a cylindrical surface;

a layer of an elastic material coated on said cylindrical surface of said cylindrical core;

a layer of an elastic bonding agent form by coating an elastic bonding agent having viscoelasicity on said layer of elastic material; and

a plurality of ceramic particles embedded and fixed in said layer of elastic bonding agent so that the individual ceramic particles can behave freely to some extent, said plurality of ceramic particles having end portions which project beyond an outer surface of said layer of elastic bonding agent so as to increase the coefficient of friction of said paper feed roller.

5,553,846

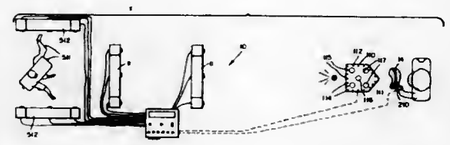
SYSTEM FOR TRAINING A PITCHER TO PITCH A BASEBALL

William H. Frye, 7461 San Blanco, Goleta, Calif. 93117, and Randall J. Peck, 3575 Durham Cir., Oceanside, Calif. 92056

Filed Jan. 28, 1993, Ser. No. 11,641

Int. Cl.[6] A63B *69/40*

U.S. Cl. 273—26C **6 Claims**



1. A system for training a pitcher to pitch a baseball, said system comprising:

a. a mitt worn by a catcher, said mitt being a movable target to which a pitcher pitches a baseball;

b. a movement detector coupled to said mitt whereby said movement detector measures the distance which a said mitt is moved from its initial target position to a position required to catch a pitched baseball;

c. a processor coupled to said movement detector for calculating the accuracy of a pitched baseball as determined by said distance said mitt is moved from said initial target position to said position required to catch a pitched baseball; and

d. a display coupled to said processor for visually displaying information as to the accuracy of a pitch as determined by said processor.

5,553,847

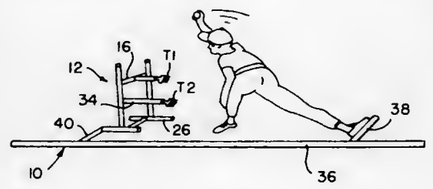
VERSATILE PITCHER TRAINING AND PROFICIENCY DEVICE

Tim Surrency, 11311 N.E. 40th Street Rd., Silver Springs, Fla. 34488

Filed May 19, 1995, Ser. No. 444,675

Int. Cl.[6] A63B *69/40*

U.S. Cl. 273—26 R **15 Claims**



1. A versatile pitcher training and proficiency device for imparting muscle memory to a baseball pitcher thereby to insure a conditioned arm movement in throwing the ball, comprising,

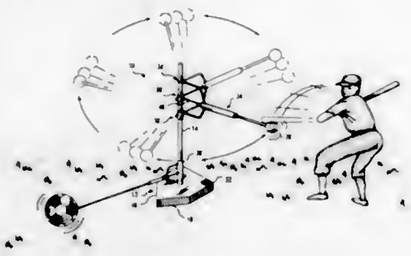
an upstanding framework of predetermined height,

means for supporting the framework on a subjacent surface in a selected position,

a manually engageable target mounted on said framework and projecting forwardly thereof for brief contact with the hand of a trainee pitcher performing a baseball pitching motion of the arm toward the target, and,

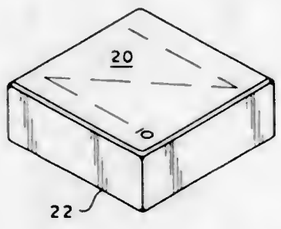
means cooperatively associated with said framework and engaging said surface for indicating a positioning area as a pitching rubber zone to the trainee in laterally spaced relation to and forwardly of said target.

5,553,848
MULTIPLE SPORT PRACTICE APPARATUS
Scott L. Amron, 77 Horton Pl., Syosset, N.Y. 11797
Filed Apr. 10, 1995, Ser. No. 419,367
Int. Cl.[6] A63B *69/00*
U.S. Cl. 273—26 E **10 Claims**



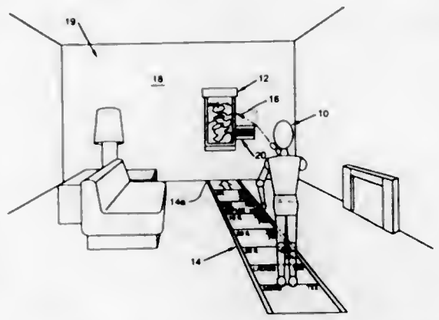
1. A captive ball apparatus for practice purposes comprising:
an elongated, flexible rod assembly having a proximal end region, a distal end region, and an intermediate region extending therebetween, said proximal region defining at least one opening dimensioned to accommodate a substantially vertical post and to permit rotation therearound:
a practice ball securable to the distal end region of said flexible rod assembly;
a first anchoring member securable to the substantially vertical post to define a lower limit of movement of the proximal end region during rotation of the flexible rod assembly;
a second anchoring member securable to the substantially vertical post; and
at least one elastic member for coupling the proximal end region of the rod assembly to the second anchoring member on the substantially vertical post, such that said distal end region and a ball secured thereto is returned to a position for subsequent striking after being initially struck.

5,553,849
COMBINATION FERROUS METAL-EDGED GAME PIECES AND MAGNETIC REMOVAL WAND
Carolyn S. Slone, 6, Oak Glen Dr., Delaware, Ohio 43015; Jeanna K. Slone, 312 E. Cherry St., Sunbury, Ohio 43074, and Marjorie J. Moreland, 43 Winter Pine Dr., Delaware, Ohio 43015
Filed Oct. 19, 1994, Ser. No. 325,931
Int. Cl.[6] A63F *3/00*
U.S. Cl. 273—239 **5 Claims**



1. In combination, a plurality of game pieces each including a ferrous metal portion, and a magnetic wand, each of said plurality of game pieces comprising:
a square tile having top and bottom surfaces joined by four peripheral edges; and
a non-magnetic ferrous metal member attached to only two adjacent peripheral edges of said four peripheral edges; and
said magnetic wand comprising:
an elongated member having a first handle end, and a second magnetic end, said second end including a magnetic member attached thereto; whereby
said plurality of game pieces can be lifted from said peripheral edge by said magnetic wand via magnetic interaction between said magnetic member and said ferrous metal member attached to said peripheral edge.

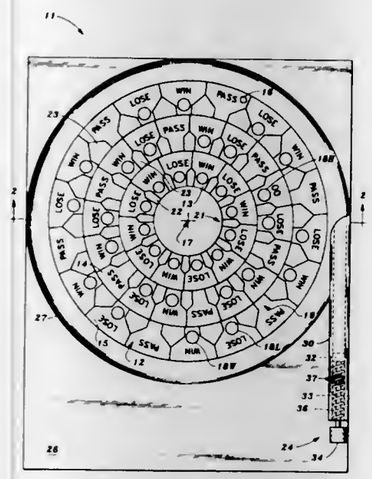
5,553,850
GOLFING GAME DART BOARD, GOLFING DART GAME AND AN ASSOCIATED METHOD
Jeffrey L. Savu, and Timothy Tarcha, both of Butler, Pa., assignors to Adventure In Mind, Inc., Butler, Pa.
Filed Jun. 5, 1995, Ser. No. 462,785
Int. Cl.[6] F41J *3/00*; **A63F** *7/06*
U.S. Cl. 273—317.2 **20 Claims**



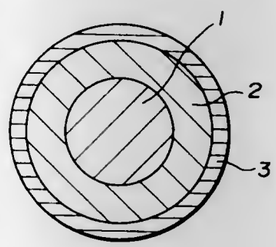
1. A golfing game dart board including a plurality of landing zones having distance indicia thereon which correspond to distance indicia on a plurality of floor markers spaced from said golfing game dart board.

5,553,851
REVOLVING RINGS GAMING APPARATUS
Alex Malavazos; Gregory Malavazos, and Constantine Malavazos, all of San Leandro, Calif., assignors to Quick Silver Development Co., Inc., San Leandro, Calif.
Filed May 17, 1995, Ser. No. 443,213
Int. Cl.[6] A63F *5/02;5/04;7/30*
U.S. Cl. 273—142 E **20 Claims**

1. Gaming apparatus comprising a ball, at least a pair of rings of differing diameters which rings are centered on a vertical vertical axis, a first of said rings having a first top surface and having a plurality of spaced apart first apertures which are of sufficient size to enable said ball to enter said first apertures, a second of said rings having a second top surface and having a plurality of second apertures which are of sufficient size to enable said ball to enter said second apertures, at least a portion of the apertures of said second plurality thereof being spaced apart to define pass zones at which said ball may roll across said second top surface without entering one of said second apertures, said first and second top surfaces being positioned to enable travel of said ball across said second top surface at said pass zones and onto said first top surface, and support means for enabling rotation of said second ring relative to said first ring about said vertical axis.

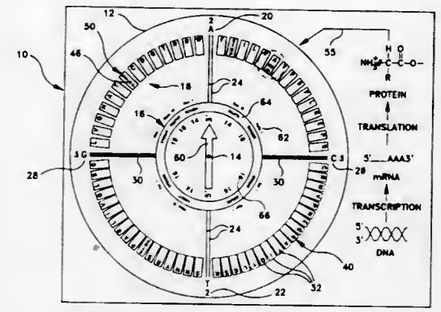


5,553,852
THREE-PIECE SOLID GOLF BALL
Hiroshi Higuchi; Hisashi Yamagishi, both of Yokohama; Yoshinori Egashira, Hidaka, and Tadatoshi Yamada, Mitaka, all of Japan, assignors to Bridgestone Sports Co., Ltd., Tokyo, Japan
Filed Jul. 8, 1994, Ser. No. 271,953
Claims priority, application Japan, Jul. 8, 1993, 5-193065
Int. Cl.[6] A63B *37/06*
U.S. Cl. 473—373 **8 Claims**



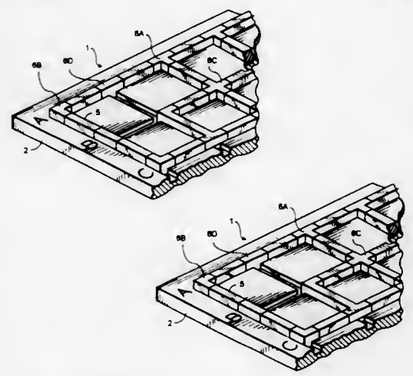
1. A three-piece solid golf ball comprising:
a center core, an intermediate layer, and a cover enclosing the core through the intermediate layer,
said center core having a diameter of at least 29 mm and a specific gravity of less than 1.4,
said intermediate layer having a thickness of at least 1 mm, a specific gravity of less than 1.2, and a hardness of at least 85 on JIS C scale, the specific gravity of said intermediate layer being lower than the specific gravity of said center core, and
said cover having a thickness of 1 to 3 mm and being softer than said intermediate layer.

5,553,853
GAME APPARATUS AND METHOD OF PLAY FOR TEACHING DNA RELATED TECHNOLOGIES
Solomon K. Sackitey, 1011 New Hope St. Apt. 18c, Norristown, Pa. 19401
Filed Aug. 28, 1995, Ser. No. 520,315
Int. Cl.[6] A63F *3/00*
U.S. Cl. 273—236 **18 Claims**



1. A game apparatus for teaching DNA related technologies, comprising:
selection means for repeatedly selecting at least one nucleotide from a first plurality of nucleotides; and
recording means for repeatedly recording said at least one nucleotide selected by said random selection means, thereby producing a nucleotide sequence.

5,553,854
GAME BOARD GAME AND METHOD PLAYING THE GAME
Wojciech M. Rum, 57 Conselyea St., Brooklyn, N.Y. 11211
Filed Mar. 16, 1995, Ser. No. 406,008
Int. Cl.[6] A63F *3/00*
U.S. Cl. 273—275 **19 Claims**



10. A game comprising:
A game board formed of raised squares, said raised squares defining recesses therebetween;
playing pieces which can be inserted in said recesses of said raised squares, said playing pieces defining paths that a player can take;
said playing pieces including pawns and connectors, said connectors each having at least one leg defining a further path for placement of a next pawn, said recesses each having a side with a length substantially equal to a length of one of said pawns and a length of two legs of one of said connectors;

said game board having a center portion defined by some of said recesses;

a cross-shaped piece adapted to be disposed in some of said recesses in said center portion of said game board, said cross-shaped piece having four legs defining four possible starting paths for a player to move on said game board;

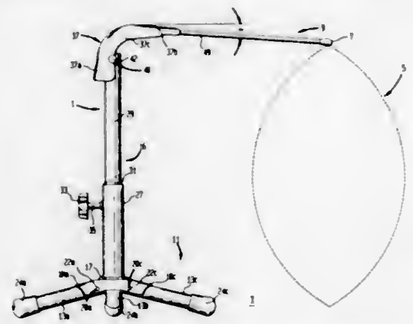
said connectors each having at least one leg which is placed next to a pawn in said game board and at least one additional leg defining a further path for a player to follow by placing a pawn next to said at least one additional leg of said connector and said pawns having one end to be located on said game board next to either one of said legs of a connector or next to one of said legs of said centrally located cross piece and having another end next to which a connector is placed wherein each player receives one set of playing pieces.

5,553,855

FOOTBALL KICKING PRACTICE DEVICE

Harry Balestrieri, Plantation, Fla., assignor to M. R. Carretta Co., Inc., Allamuchy, N.J.

Filed Sep. 1, 1994, Ser. No. 299,734
Int. Cl.[6] A63B *69/00*
U.S. Cl. 273—55 B **19 Claims**



1. A football holding device for assisting in place kicking a football comprising stand means having a lower end for stable placement on the ground and an upper end, and a pivotable arm pivotally attached to said upper end of said stand means, said pivotable arm having a first end and a second end, said first end of said pivotable arm being pivotally attached to said upper end of said stand means and said second end of said pivotable arm being adapted for frictional engagement with one end of said football so as to maintain said football in a proper place kicking configuration, said pivotable arm rigidly extending from said first end to said second end and being freely swingable between a first portion wherein said pivotable arm extends substantially horizontally and a second position wherein said pivotable arm extends substantially vertical with respect to said first position, whereby said pivotable arm may hold said football in said place kicking configuration in said first position and can freely swing downwardly to said second position under the force of gravity upon said football being kicked.

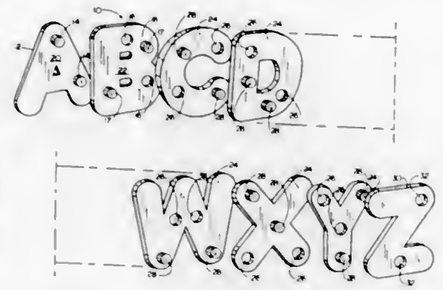
5,553,856

STACKABLE PUZZLE AND A METHOD FOR STACKING CHARACTERS OF A SET TO FORM THE PUZZLE

Craig Barnard, Winnetka, Ill., assignor to Fundustry, Inc., Winnetka, Ill.

Filed Nov. 10, 1994, Ser. No. 337,075
Int. Cl.[6] A63F *9/12*; **G09B** *1/06*
U.S. Cl. 273—156 **17 Claims**

1. An assembly of known characters arrangeable in a known order, the assembly comprising:



a plurality of pieces, each piece distinctly shaped to represent one of the known characters;

two pegs having a cross-sectional area projecting perpendicularly from each of the plurality of pieces; and

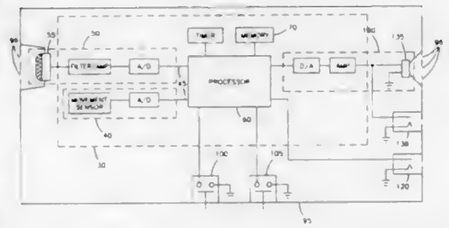
two apertures defining a cross-sectional area slightly larger than the cross-sectional area of each of the pegs, the two apertures constructed and arranged through each of the plurality of pieces such that the two pegs projecting from one of the plurality of pieces only fit through the two apertures of another one of the plurality of pieces such that the pieces are arranged consecutively in the known order.

5,553,857

PHYSICAL ACTIVITY TRAINING DEVICE AND METHOD

Leonard A. Fish, P.O. Box 7891, Newport Beach, Calif. 92658

Filed Dec. 6, 1993, Ser. No. 163,367
Int. Cl.[6] A63B *69/36*
U.S. Cl. 473—209 **25 Claims**



1. A training device for a person performing a physical activity comprising:

means for sensing a trigger event, such trigger event being related to the interaction of the person directly or indirectly with an object,

means for sensing and recording a movement of the person as data, said movement data being sensed and recorded for a time duration, said time duration beginning at least before the occurrence of the trigger event and ending either a short duration after the trigger event or after the occurrence of a predetermined amount of time;

means for programmed processing of the data, including a memory means for recording the data;

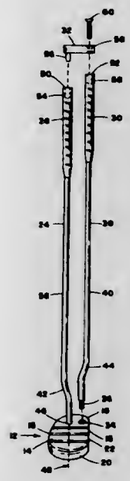
and means for presenting processed results to the person.

5,553,858

GOLF PUTTER

Carl T. McKoon, 1501 Knightsbridge Ct., Winston-Salem, N.C. 27127, and Michael T. McKoon, 845 Apt. E Stadium Dr., Wake Forest, N.C. 27587

Filed Jun. 28, 1995, Ser. No. 440,070
Int. Cl.[6] A63B *69/36*; *53/16*; *53/02*; *53/12*
U.S. Cl. 473—294 **6 Claims**



1. A golf putter comprising:

a putter head having an elongated body with a striking side and a back side, a heel portion and a toe portion, and a substantially planar putting face for striking a golf ball, the putter head having an internally threaded opening formed proximate the heel portion;

a fixed shaft and a removable shaft having substantially equal lengths and substantially parallel to each other and extending from positions on the putter head proximate the heel portion, each shaft having a gripping section adapted to be gripped by one of a golfer's hands to move the golf putter, and the removable shaft having a threaded section corresponding to the internally threaded putter head opening removably engageable in the putter head opening; and

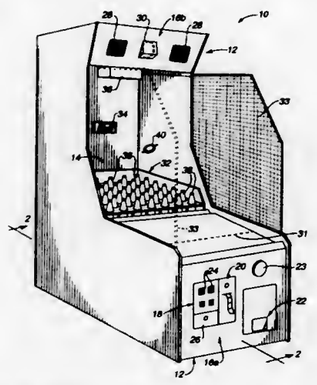
an elongate connector having a longitudinal axis and joining the gripping sections and detachably fastenable to the gripping sections, each of the gripping sections having a terminal end, one of the gripping section terminal ends having portions defining a smooth bore opening and the other of the gripping section terminal ends having portions defining an internally threaded opening, the connector having opposing end portions with a dowel member extending from one end portion and receivable in the smooth bore opening of said one of the gripping section terminal ends and having an opening formed through the other end portion of the connector, and a threaded fastener receivable through the opening in said other connector end portion and engageable in the internally threaded opening of said other of the gripping section terminal ends with the longitudinal axis of the elongate connector substantially perpendicular to said planar putting face and with the gripping section terminal ends in spaced apart side-by-side relationship to one another.

5,553,859

ARCADE GAME FOR SENSING AND VALIDATING OBJECTS

Bryan M. Kelly, Almo; Matthew F. Kelly, San Ramon; John G. Kroeckel, San Leandro; Joseph J. Haas, Pleasanton, and Jayash J. Lad, San Jose, all of Calif., assignors to Lazor-Tron Corporation, Pleasanton, Calif.

Filed Mar. 22, 1995, Ser. No. 408,618
Int. Cl.[6] A63B *67/06*
U.S. Cl. 273—338 **89 Claims**



1. A game apparatus comprising:

a sensor for validating a moving playing piece for said game apparatus, said playing piece being directed by a player, wherein said validation determines whether said playing piece is appropriate for use with said game apparatus or whether said playing piece is a false playing piece;

a target field for receiving said moving playing piece, wherein said sensor determines a final position of said moving playing piece at rest after said playing piece is engaged with said target field; and

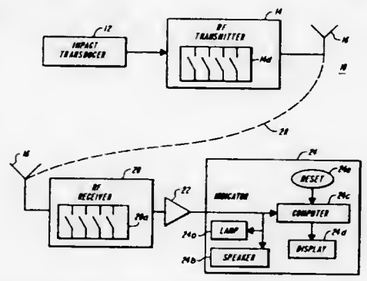
a scoring mechanism coupled to said sensor and operative to provide a game score based on said validation of said playing piece and said final position of said playing piece engaged with said target field.

5,553,860

SPORTS IMPACT SENSOR APPARATUS FOR PROXIMATE OPERATION

Rami Zelikovich, 146 Poskus St., Stoughton, Mass. 02072

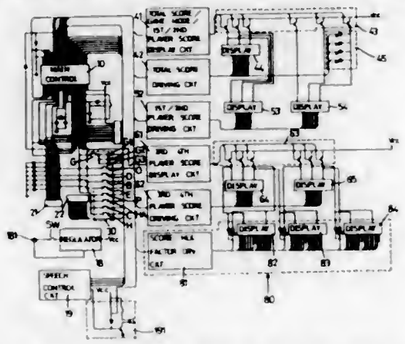
Filed Aug. 31, 1994, Ser. No. 299,283
Int. Cl.[6] F41J *5/02*; **A63B** *69/34*
U.S. Cl. 273—371 **4 Claims**



1. Sports target apparatus for operation without signal interference with other proximately located such apparatus, said apparatus comprising

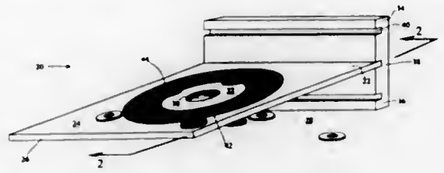
a) a first piezo film impact transducer having a surface exposed for impact by a sports implement and producing an impact responsive electrical signal in response to impact,
b) an impact reporting transmitter connected to respond to an impact responsive signal from said impact transducer for broadcasting a selected modulated carrier signal, said transmitter including first selection means for broadcasting only one of a first set of different modulated carrier signals,
c) an impact reporting receiver arranged for receiving the selected modulated carrier signal and for producing in response thereto an impact responsive output signal, said impact reporting receiver including second selection means for receiving only one of said first set of different modulated carrier signals, and
d) an output unit for responding to the import responsive output signal from said receiver to produce a selected perceptible report of impact on the transducer,
so that first and second proximately located target apparatus can each operate with different modulated carrier signals and thereby avoid signal interference with one another.

5,553,861
AUTOMATIC COUNTING APPARATUS FOR A DART GAME WITH HANDICAP FEATURE
Francis Pan, No. 7, Tatun 15th St., Taichung, Taiwan
Filed Jun. 23, 1995, Ser. No. 494,173
Int. Cl.[6] F41J *5/20*
U.S. Cl. 273—371 **2 Claims**



1. An automatic counting apparatus for a dart game which includes a set of darts and a dart board, comprising a main control circuit (**10**), a conventional dart sensing circuit (**20**) connected to the main control circuit (**10**) for sensing a dart impacting onto the dart board and transmitting corresponding thrown information to the main control circuit (**10**), a key set (**30**) including at least a first key (G), a second key (P), a third key (O), and a fourth key (HA) being connected to the main control circuit (**10**) for setting a plurality of inputs to the main control circuit (**10**), a plurality of displays for displaying the inputs already set by the key set (**30**), the improvement comprising:
the main control circuit (**10**) comprising a preprogrammed microprocessor (**11**), a read-only memory (**12**) for storing a firmware, an oscillator (**13**) connected to the microprocessor (**11**), two data buffers (**14** and **15**) and two encoder/decoder circuits (**16** and **17**) connected to the microprocessor (**11**) for communicating with the dart sensing circuit (**20**), the key set (**30**) and the displays via two buses (BUS1 and BUS2);
the inputs from the key set (**30**) includes:
a first input for determining a game mode from a plurality of available game modes by a manual operation on the first key (G);
a second input for determining a total number of players from a plurality of available total numbers of players according to a manual operation on the second key (P) of the key set (**30**);
a third input for determining a common object score for all the players according to a manual operation on the third key (O) of the key set (**30**); and
a fourth input for adding a handicap on any one of the players by a manual operation on the fourth key (HA) thus causing the object score of the specific player to change from that originally set in the third input.

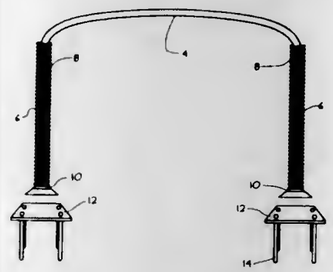
5,553,862
TOSS GAME APPARATUS
William Konotopsky, 2797-13 Ave. S.E., Medicine Hat, Alberta, Canada
Filed Oct. 5, 1994, Ser. No. 318,242
Int. Cl.[6] A63B *67/06*
U.S. Cl. 273—402 **4 Claims**



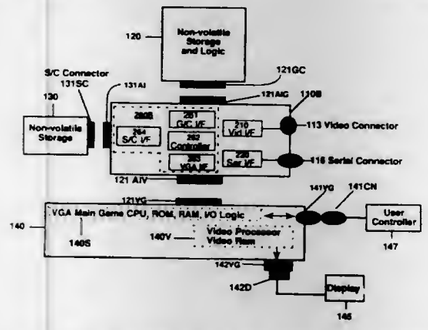
1. An apparatus for a toss game used on a playing surface comprising:
a planar member having opposite planar sides, opposite edge portions, one of which rests on the playing surface, and a hole through a central portion thereof between the opposite sides;
an upright edge support member having a lower end portion seated on the playing surface and a central portion connected to the edge portion of the planar member opposite that which rests on the playing surface, so that the planar member is held in an inclined position, said upright edge support member having a horizontal lateral groove partially therethrough across a central portion thereof, said groove adapted to closely receive the edge portion of the planar member opposite that which rests on the playing surface;
said upright support member having two or more lateral grooves arranged at differing heights so that the planar member may be inclined therefrom at differing angles of inclination;
and wherein the opposite planar sides of the planar member have differing coefficients of friction so that when the more slippery side is turned upwardly it is more difficult to maintain the washers thereon.

5,553,863
FLEXIBLE TWO-SIDED MULTIPLE-SPORT GOAL
Martin O. Wynne, 3972 Rosemond Rd., Cleveland Heights, Ohio 44121
Filed Dec. 11, 1995, Ser. No. 570,532
Int. Cl.[6] A63B *63/00*
U.S. Cl. 273—402 **6 Claims**

1. A game goal apparatus comprising:
(a) a round chord made of elastic materials and
(b) two springs having an interior diameter equal to or slightly larger than the diameter of said chord, and
(c) two staples, one crimped at each end of said chord, the length of said staple being greater than the interior diameter and less than the exterior diameter of said springs and
(d) two suction cups and
(e) two base pieces composed of a flat, smooth surfaced material on one side and on the opposite side of each said base piece is extended a plurality of spikes.



5,553,864
USER IMAGE INTEGRATION INTO AUDIOVISUAL PRESENTATION SYSTEM AND METHODOLOGY
David H. Sitrick, 820 Burchell Ave., Highland Park, Ill. 60035
Filed May 22, 1992, Ser. No. 887,715
Int. Cl.[6] A63F *9/22*
U.S. Cl. 463—31 **59 Claims**



1. A method of integration of a user image into a predefined audiovisual image source, the method comprising the steps of:
providing a user image;
first providing a presentation output from the audiovisual image source;
then selecting a portion of the presentation output as a selected portion for user image associative integration;
then analyzing the presentation output associated with the selected portion;
then integrating the user image with the selected portion; and
providing a modified presentation output wherein the user image is associated with and integrated into the selected portion in the presentation output.

5,553,865
ROTARY PUSH ARCADE GAME
Stephen P. Shoemaker, Jr., 140 The Village #401, Redondo Beach, Calif. 90277; Joseph L. Tallerico, Livermore; Todd Schricker, Sunnyvale; Matthew F. Kelly, San Ramon, and Bryan M. Kelly, Alamo, all of Calif., assignors to Stephen P. Shoemaker, Redondo Beach, Calif.
Filed Nov. 22, 1994, Ser. No. 343,759
Int. Cl.[6] A63F *9/00*
U.S. Cl. 273—448 **49 Claims**

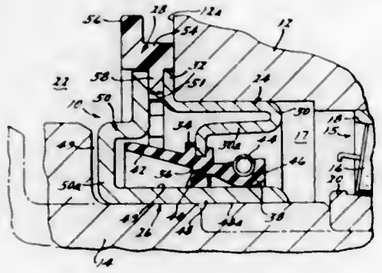
1. An arcade game apparatus comprising:
a rotating member having a surface and a central aperture, said rotating member being coupled to a support and including a turntable which is rotated about a central axis;
a movable arm member positioned above said rotating member and having a tip engageable with said surface of said rotating member, wherein said arm member can be moved to force an object off said rotating member by engaging said object with said arm member near said tip;
a collector positioned to receive said object when said object has been forced off of said rotating member; and
an object dispenser for dispensing additional objects onto said surface of said rotating member through said central aperture of said rotating member, said object dispenser including an elongated tube or holding said objects, said tube having a pusher element for dispensing said objects onto said turntable.
25. A method for playing a push game with flat objects, the method comprising the steps of:
(a) providing a rotating surface having a plurality of flat objects disposed thereupon;
(b) providing an arm member to engage with said rotating surface which can be pivoted in an arc over said rotating surface, wherein said arm member can push a first flat object on said rotating surface by engaging a tip of said arm member with said first flat object, such that said first flat object is moved off said rotating surface into a collector, wherein said tip includes a tip cover which engages said rotating surface and which is loosely attached to said end of said arm member such that when said tip cover loses material at a point of contact with said rotating surface, said tip cover slides down said end of said arm member to remain engaged with said rotating surface;
(c) providing said first flat object to a player from said collector; and
(d) dispensing a second flat object onto said rotating surface from a center opening in said rotating surface when said first flat object is received by said collector.

5,553,866
CARTRIDGE-TYPE LIP SEAL WITH REMOVABLE SPACER
Stephen R. Heinzen, Arlington Heights, Ill., assignor to Freudenberg-NOK General Partnership, Plymouth, Mich.
Filed Nov. 30, 1994, Ser. No. 346,684
Int. Cl.[6] F16J *15/32*
U.S. Cl. 277—9.5 **22 Claims**

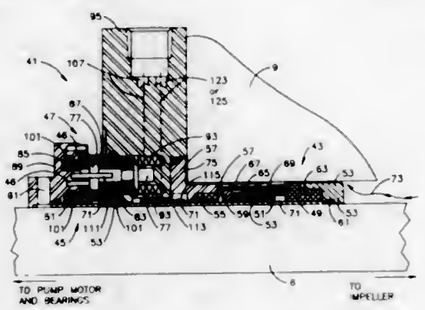
1. A seal assembly providing a dynamic fluid seal between a housing and a shaft having relative rotating motion therebetween comprising:
a seal element, said seal element including a support portion and a seal lip;
a sleeve, said sleeve including a sealing surface, said seal lip positioned to engage said sealing surface; and
a spacer, said spacer removably positioned to provide a spaced relationship between said support portion and said sleeve such that removal of said spacer prior to use of said seal assembly results in an axial gap between the support portion and the sleeve, wherein said spacer includes a ring having a plurality of inwardly radially projecting portions.

said barrier chamber adapted to be filled with a barrier liquid which acts to lubricate said second and third sealing assemblies;

along one of the sealing surfaces that is carried by the other component, the first seal lip being spaced slightly from the one



5,553,867
TRIPLE CARTRIDGE SEAL HAVING ONE INBOARD AND TWO CONCENTRIC SEALS FOR CHEMICAL PROCESSING PUMP
Robert E. Rockwood, Windham, N.H., assignor to Environamics Corporation, Hudson, N.H.
Filed Apr. 21, 1995, Ser. No. 426,783
Int. Cl.[6] F16J *15/34*
U.S. Cl. 277—15 **9 Claims**



1. An environmentally safe seal arrangement adapted to be positioned in a pump having a central rotatable shaft for driving a fluid pumping member, the seal arrangement comprising:

first, second, and third annular sealing assemblies adapted to be positioned in the pump so as to surround the shaft, said second and third sealing assemblies being concentric and axially spaced along the shaft from said first sealing assembly;

said first sealing assembly including a first annular rotating sealing member adapted to be affixed to the shaft for rotation therewith, and a first stationary annular sealing member positioned adjacent said first rotating sealing member so as to provide a fluid seal therebetween;

said second sealing assembly including a second annular rotating sealing member adapted to be affixed to the shaft for rotation therewith, and a second stationary annular sealing member positioned adjacent said second rotating sealing member so as to provide a fluid seal therebetween;

said third sealing assembly including a third annular rotating sealing member adapted to be affixed to the shaft for rotation therewith, and a third stationary annular sealing member positioned adjacent said third rotating sealing member so as to provide a fluid seal therebetween;

a first fluid passageway disposed between and in communication with the inner diametric side of said first sealing assembly and the inner diametric side of said second sealing assembly, said first passageway adapted to be filled with a barrier fluid which acts to prevent the pumped fluid from reaching said second sealing assembly;

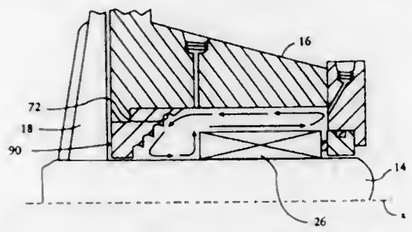
an annular barrier chamber located radially between and in communication with said second and third sealing assemblies, said barrier chamber adapted to be filled with a barrier liquid which acts to lubricate said second and third sealing assemblies;

a barrier chamber circulation system for circulating said barrier liquid to and from said annular barrier chamber, said barrier chamber circulation system including a rotating pumping member located in said barrier chamber for forcing said barrier liquid out of said barrier chamber;

wherein said barrier chamber circulation system further comprises a barrier chamber outlet port and a barrier chamber inlet port arranged so that the barrier liquid is forced by said rotating pumping member out of said barrier chamber via said outlet port and reenters said barrier chamber via said inlet port; and

a stationary annular gland adapted to surround the shaft, said gland having first, second, third, and fourth radially extending gland fluid passageways defined therein, said first gland fluid passageway being in fluid communication with said barrier chamber outlet port and said second gland fluid passageway being in fluid communication with said barrier chamber inlet port.

5,553,868
SEAL CAVITY THROAT BUSHING
Joseph R. Dunford, 1310 Rocky La. Dr., Waverly, Nova Scotia, Canada
Filed Nov. 3, 1994, Ser. No. 334,363
Int. Cl.[6] F16J *15/34*
U.S. Cl. 277—24 **23 Claims**



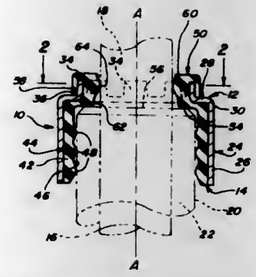
1. A seal cavity throat bushing for use with rotary fluid equipment having a seal cavity which is defined by a rotary shaft having an axis, a shaft housing surrounding at least a portion of the shaft, and seal means engaging the shaft and said housing at one end of the cavity, said bushing comprising an annular element adapted for a tight fit in said housing at an entrance to said cavity opposite said one end, said element having a radially outer cylindrical surface for contacting a cavity wall of said housing, a radially inner cylindrical surface having a diameter greater than that of said shaft to define a gap therebetween, and an annular face surface which, with said bushing in position at said entrance, faces said cavity and slopes inwardly towards said entrance from said bushing outer surface to said bushing inner surface, said sloping face surface serving to direct fluid and contaminants within said cavity towards said gap during operation of said rotary equipment.

5,553,869
BONDED VALVE STEM SEAL WITH RETAINER TANGS
Mark A. Stamback, Cambridge City, Ind., assignor to Dana Corporation, Toledo, Ohio
Filed Dec. 12, 1994, Ser. No. 354,186
Int. Cl.[6] F16J *15/32;* **F01L** *3/08*
U.S. Cl. 277—33 **14 Claims**

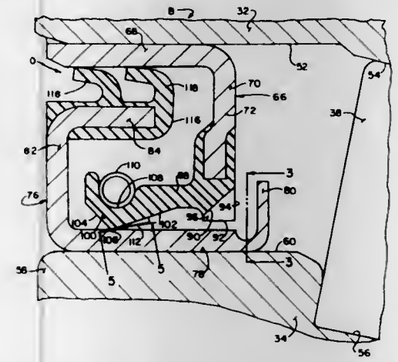
1. A valve stem seal assembly adapted for securement to a valve guide of an internal combustion engine, comprising:

a metal cylindrical retainer extending along a longitudinal axis with a lower shell portion and an end wall, said end wall defining an opening and including a plurality of tangs extending longitudinally away from said shell portion and having a radial extent inwardly of said lower shell portion; and

a resilient seal body bonded to and receiving structural support from said retainer, said seal body including a base portion defining a valve stem aperture, an inner periphery of said aperture including at least one integrally formed annular lip that projects radially inwardly into said aperture, said end wall and said base portion forming a retention sub-assembly that sealingly engages a sealing surface of the valve stem by means of an interference fit.

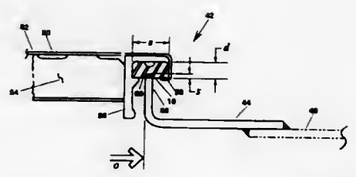


5,553,870
LIP SEAL SEPARATING OIL AND GREASE
Edward S. Czekansky, North Canton, and Dennis L. Otto, Malvern, both of Ohio, assignors to The Timken Company, Canton, Ohio
Filed Feb. 16, 1994, Ser. No. 195,699
Int. Cl.[6] F16J *15/32*
U.S. Cl. 277—134 **24 Claims**



1. In combination with a first machine component and a second machine component that has a hollow interior which receives the first machine component and further contains a lubricant in the form of oil, and with an antifriction bearing for enabling one of the machine components to rotate relative to the other machine component, the bearing having an inner race located around the first machine component, an outer race within the second machine component and encircling the inner race such that an annular space exists between the races to form the interior of the bearing, and rolling elements arranged in a circular row between the races, the annular space of the bearing containing a lubricant in the form of grease, sealing surfaces carried by at least one of the components and located within the hollow interior of the second component, a seal for isolating the grease within the annular space of the bearing from the oil in the hollow interior of the second component, said seal comprising: a first seal lip in the form of a labyrinth carried by one of the components and establishing a dynamic fluid barrier along one of the sealing surfaces that is carried by the other component, the first seal lip being spaced slightly from the one sealing surface and being exposed to the annular space between the races and to the grease in that annular space, the first lip being configured to pump grease which encounters it back toward the annular space; a second lip carried by one of the components and contacting a sealing surface carried by the other component to form another dynamic fluid barrier beyond the first lip, so that the first lip is located between the annular space between the races and the second lip, the second lip being exposed through the space between the first lip and its sealing surface to the annular space between the races, so that a small amount of grease will migrate to the second lip on occasion; and a third lip carried by one of the components and contacting a sealing surface to form still another dynamic fluid barrier beyond the second lip, so that the second lip is interposed between the first and third lips, the third lip being exposed to the oil in the interior of the second machine component, at least the second and third lips being formed from an elastomeric material.

5,553,871
FLUIDTIGHT DOOR GASKET
Marlin D. Rowe, Newark, Del., and Francis A. McMullin, Upper Darby, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed May 12, 1994, Ser. No. 241,919
Int. Cl.[6] F16J *15/50;* **E06B** *7/16*
U.S. Cl. 277—177 **15 Claims**



1. In a closure-sealing assembly of the type wherein a gasket is coupled with a perimetric channel having a substantially flat base surface which is approximately parallel to the imaginary plane which is approximately defined by said closure, and wherein when said closure is sealed said gasket is compressed by a perimetric flange in a direction which is approximately normal to said base surface and said imaginary plane, an improved gasket comprising:

a solid rectangular-parallelepipedoid member made of silicone rubber material and having a selected finite length and a height approximately 40% its width;

said member characterized by having two longitudinal chamfers and one longitudinal groove, thereby deviating from approximately rectangular-parallelepiped form;

said member having a first lengthwise-widthwise surface and a second lengthwise-widthwise surface which are approximately parallel to each other;

each said chamfer having a breadth approximately 5% said width of said member and being located opposite, with respect to said first lengthwise-widthwise surface of said member, the other said chamfer, at an approximately 45°

angle along a lengthwise junction of said first lengthwise-widthwise surface with a lengthwise-heightwise surface of said member;

said groove being approximately semicircularly cylindrical and being located approximately parallel to and approximately intermediate said chamfers, said groove defining an imaginary approximately straight center line which approximately bisects said first lengthwise-widthwise surface, said groove having a radius which is approximately 15% said width of said member;

whereby, when said gasket is coupled with said perimetric channel, said first lengthwise-widthwise surface substantially abuts said base surface; and

whereby, when said closure sealed, said gasket is compressed by said perimetric flange, contactingly with said second lengthwise-widthwise surface, in a direction which is approximately normal to said imaginary plane, said base surface, said first lengthwise-widthwise surface and said second lengthwise-widthwise surface.

5,553,872

SEAL FOR A RECIPROCALLY MOVING BODY

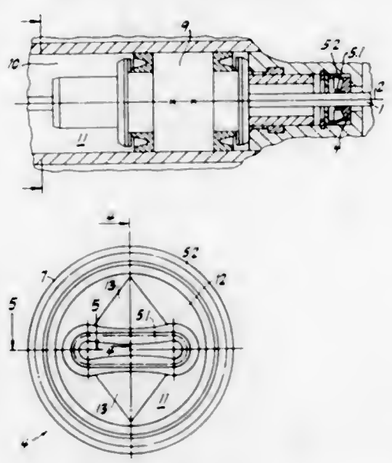
Anita Gies, Neustadt; Wolfgang Lipphardt, and Ulrich Wüstenhagen, both of Schwalmstadt, Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Filed Dec. 2, 1992, Ser. No. 984,404

Claims priority, application Germany, Dec. 4, 1991, 41 39 919.6

Int. Cl.[6] F16J *15/32*

U.S. Cl. 277—205 **2 Claims**



1. A seal for a reciprocally moving body that has at least one essentially flat boundary surface extending parallel to its longitudinal axis, said seal comprising:

a sealing member having a first sealing lip formed of polymer material, said first sealing lip extending substantially parallel to the longitudinal axis and abutting said boundary surface, wherein the cross-section of said first sealing lip, taken in a plane perpendicular to the longitudinal axis, is larger near a middle portion of the flat boundary surface of the reciprocally moving body than in an area of lateral edges of the reciprocally moving body, and wherein the axial extent of said first sealing lip is designed to be shorter near the middle portion than in an area of the lateral edges.

5,553,873

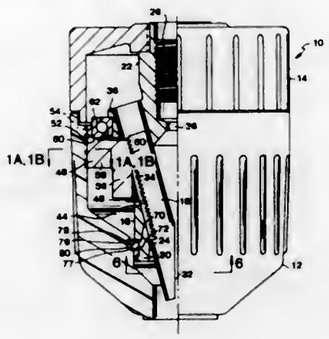
KEYLESS CHUCK

Glenn L. Salpaka, Salem; Valerie D. Owens, Townville, and Willie C. Mullinax, Central, all of S.C., assignors to Power Tool Holders Incorporated, Wilmington, Del.

Filed Jul. 1, 1994, Ser. No. 269,553

Int. Cl.[6] B23B *31/12*

U.S. Cl. 279—62 **34 Claims**



1. A chuck for use with a manual or powered driver having a rotatable drive shaft, said chuck comprising:

a generally cylindrical body member, said body member having a forward section and a rearward section, said rearward section having an axial bore formed therein to mate with said drive shaft of said driver and said forward section having an axial bore formed therein and a plurality of angularly disposed passageways formed therethrough and intersecting said axial bore;

a plurality of jaws slidably positioned in each of said angularly disposed passageways, each of said jaws having a jaw face formed on one side thereof and threads formed on the opposite side thereof;

a unitary nut rotatably mounted relative to said body so as to engage said jaw threads;

a retaining member located on said body member, said retaining member located so as to contact a portion of said unitary nut to prevent axial movement of said nut in the forward direction, said retaining member being received in a groove in the forward section of said body; and

a generally cylindrical sleeve member received over the forward section of said body for engaging said nut so that when said sleeve member is rotated, said nut will be rotated therewith to operate said jaws.

5,553,874

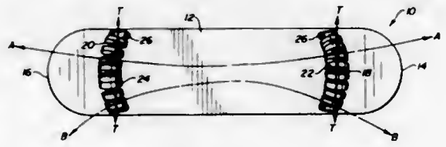
TRUCK ASSEMBLY FOR ROLLER BOARD APPARATUS

Pieter Schouten, 1018 7th St., Hermosa Beach, Calif. 90254, and Michael Siminian, 9759 El Arco Dr., Whittier, Calif. 90603

Filed Sep. 6, 1994, Ser. No. 300,743

Int. Cl.[6] A63C *17/04*

U.S. Cl. 280—11.28 **11 Claims**



7. A roller board apparatus comprising:

a) an elongated, user support platform having first and second opposed, major, substantially planar surfaces, and longitudinal and transverse axes, said first surface being a user support surface;

b) at least two rigid, curvi-linear axles having respective first and second ends, respectively, securely attached to said second surface of said platform, said axles extending substantially transversely across said platform;

c) a plurality of wheels rotatably, radially mounted on each of said at least two axles; and

d) means for attaching each of said axles to said second surface of said platform.

5,553,875

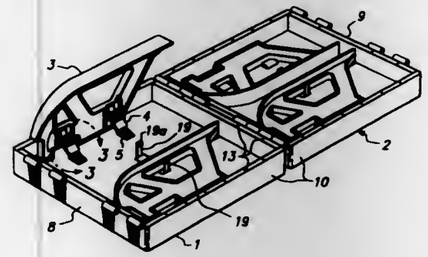
COLLAPSIBLE SLED WITH AUTOMATIC LOCKING MEANS, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Joseph A. Ulicne, 9662 Waterway, Grosse Ile, Mich. 48138, and Al Morris, Warren, Mich., assignors to Joseph A. Ulicne, Grosse Ile, and John Hamilton, Northville, both of Mich.

Filed Mar. 2, 1994, Ser. No. 204,651

Int. Cl.[6] B62B *13/16*

U.S. Cl. 280—20 **14 Claims**



1. A collapsible sled for transporting items, comprising:

a front section;

a rear section pivotally attached to said front section so as to position said front and rear sections in both a collapsed position and an operable position;

a plurality of runners pivotally attached to said front and rear sections so as to allow said runners to be positioned in both said collapsed and operable positions relative to said front and rear sections;

first locking means, connected to each of said runners and said front and rear sections, for automatically locking said runners in said operable position upon movement of said runners into said operable position from said collapsed position, said first locking means including a biased locking member having one end pivotally connected to one of a respective runner and one of said sections and an opposite end selectively engagable with an engagement member fixed to the other one of a respective runner and one of said sections, and second locking means for automatically locking said runners in said collapsed position upon movement of said runners into said collapsed position from said operable position;

a major surface of said rear section being positioned substantially against said front section in said collapsed position so as to form a box-like structure, and said runners being positioned within said front and rear sections in said collapsed position; and

said rear section being positioned substantially planar with a major surface of said front section in said operable position, and said runners being laterally outwardly extended from an inner surface of said front and rear sections in substantially perpendicular relation to said major surfaces in said operable position.

5,553,876

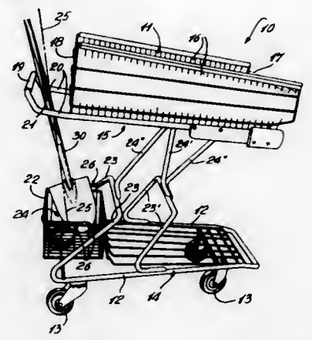
NESTABLE SHOPPING CART WITH IMPROVED LOWER CONTAINMENT MEANS

Antoine Trubiano, Montreal, Canada, assignor to Cari-All Inc., Montreal, Canada

Filed Feb. 22, 1995, Ser. No. 392,189

Int. Cl.[6] B62B *3/14*

U.S. Cl. 280—33.991 **9 Claims**



1. A nestable shopping cart comprising a main containment basket supported elevated by a frame, casters secured to said frame to displace said shopping cart on a floor surface; said containment basket having a bottom wall, side walls, a front wall and a rear wall; a handle bar secured rearwardly spaced from said rear wall by spaced side attachments members at opposed ends thereof; a restraining open area defined between said rear wall, handle bar and a spaced side attachment members; a lower secondary containment basket secured between a pair of upwardly extending rear frame members in a lower section of said frame and having at least a portion of a top open end thereof aligned substantially on a vertical axis passing through said restraining open area, said secondary basket and said restraining open area being dimensioned to position and retain elongated objects supported in said secondary basket and extending through said restraining open area whereby said object is transported substantially upright by said shopping cart in a rear portion thereof and within the containment space of said restraining open area, said secondary basket being secured and spaced inwardly of said pair of rear frame members by nesting support brackets, said nesting support brackets having a pair of attachment members disposed and spaced in parallel vertical planes running longitudinally along said cart and interconnected by an integral intermediate bridge member, a nesting space defined between said vertical planes for receiving therein a respective one of a pair of frame members of another shopping cart.

5,553,877

FOLDABLE TOY SHOPPING TROLLEY

Ming-tai Huang, 4th Fl., No. 302, Sec. 7, Chengteh Rd., Taipei, Taiwan

Filed Oct. 16, 1995, Ser. No. 543,360

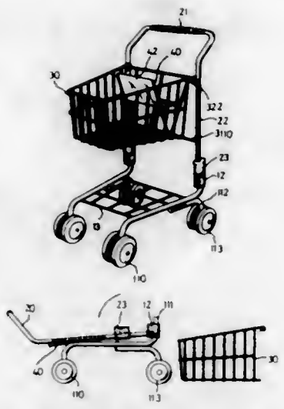
Int. Cl.[6] B62B *7/06*

U.S. Cl. 280—33.997 **1 Claim**

1. A foldable toy shopping trolley comprising:

a base which includes a pair of frames, each of the frames having a front end and having a front wheel rotatably disposed to said front end, and a rear end comprising an upper end and a lower end which has a rear wheel rotatably disposed thereto, a U-shaped connecting element transversely connected to said upper end by a pin extending through said connecting element and said upper end, a plurality of rods connected between said pair of frames;

a handle being a U-shaped element comprising a gripping portion and two legs, each one of said legs extending from a respective one of two ends of said gripping portion, each one



of the two legs having an end and each one of said ends arranged adjacent to said respective upper end of said respective frame and pivotally engaged to said connecting element and near an open end of said connecting element, each one of said legs having a hole defined in a periphery thereof;

a bracket comprising a bottom, two sides each extending from a respective one of two sides of said bottom and a front side such that said bracket has an open rear end and an open top, each one of said sides having an upper edge, said upper edge of each of said two sides having a hook extending longitudinally from a rear end thereof and said bottom having a bar extending laterally from a rear end thereof, said bar having a distal stud portion extending longitudinally from each one of two ends thereof, a length between said distal portions of said bar being longer than a distance between said two legs of said handle, and

a seat comprising a first part and a second part, said first part being an inverted U-shaped element and comprising a first top rod and two first legs, each one of said two first legs extending from a respective one of two ends of said first top rod and having a first hook portion formed to a distal end thereof, a first middle rod connected between said two first legs, said second part being a rectangular element and having a second top rod, two second legs each extending from a respective one of two ends of said second top rod, a second middle rod connected between said two second legs and a bottom rod connected between a lower end of each one of said two second legs, each one of said two first hooks engaged to said bottom rod, a fabric interconnected between said first top rod and said second middle rod via said first middle rod, said second top rod having an extension portion extending longitudinally from each one of two ends thereof respectively so as to be received in said respective hole of said respective leg of said handle, each one of said hooks of said bracket engaged to said respective extension portion of said second part of said seat and each one of said stud portions contacting against said respective leg of said handle.

5,553,878

ADJUSTABLE RIDING TOY WITH WAVE RIDE WHEEL

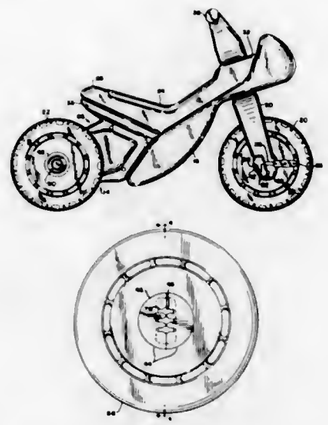
Barry J. Davingnon, Robinson; Duane J. Niemeyer, and Christopher W. Sloss, both of Olney, all of Ill., assignors to Roadmaster Corporation, Olney, Ill.

Continuation of Ser. No. 430,726, Apr. 28, 1995, Ser. No. 35,039, Feb. 17, 1995, Ser. No. 34,324, Feb. 1, 1995, abandoned, and Ser. No. 33,934, Jan. 24, 1995, Pat. No. Des. 369,331. This application Jun. 2, 1995, Ser. No. 459,751

Int. Cl.[6] B62K *17/00*

U.S. Cl. 280—229 **17 Claims**

1. A wheeled riding toy having an engageable wave ride wheel comprising:



a) a body;

b) a first rear wheel rotatably attached to the body;

c) a front mounting arm pivotally connected to the body with a steering mechanism connected thereto;

d) a front wheel rotatably attached to the front mounting arm; and

e) at least one of the front or first rear wheels comprising a wave ride wheel having an outer wheel and a spacer, the wave ride wheel having a center and at least two wheel axle apertures, at least one of said wheel axle apertures not being at the center of the wheel, the outer wheel having a holder aperture for receiving the spacer, and the spacer comprising the wheel axle apertures.

5,553,879

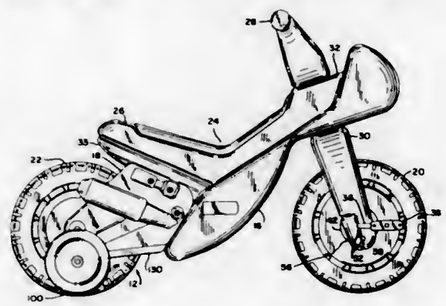
ADJUSTABLE RIDING TOY WITH AN ADJUSTABLE AXLE HEIGHT CONNECTION

Duane J. Niemeyer, Olney; Barry J. Davignon, Robinson, and Christopher W. Sloss, Olney, all of Ill., assignors to Roadmaster Corporation, Olney, Ill.

Continuation of Ser. No. 430,726, Apr. 28, 1995, and a continuation-in-part of Ser. No. 35,039, Feb. 17, 1995, Ser. No. 34,324, Feb. 1, 1995, abandoned, and Ser. No. 33,934, Jan. 24, 1995, Pat. No. Des. 369,331. This application Jun. 2, 1995, Ser. No. 459,737

Int. Cl.[6] B62K *25/02*

U.S. Cl. 280—279 **20 Claims**



1. A wheeled riding toy with an adjustable height axle connection comprising:

a) a body;

b) at least a first and second wheel rotatably attached to the body;

c) a mounting arm connected to the body, the mounting arm having a first and second prong piece, the first and second prong piece each having first and second edge cut outs, the first prong piece mounted to the second prong piece;

d) at least the first wheel having an axle and being rotatably connected to the mounting arm, wherein;

i) the mounting arm has at least two axle apertures, the first and second edge cut outs on the first and second prong pieces aligning to form the axle apertures; and

ii) the axle is disposed within one of the axle apertures.

5,553,880

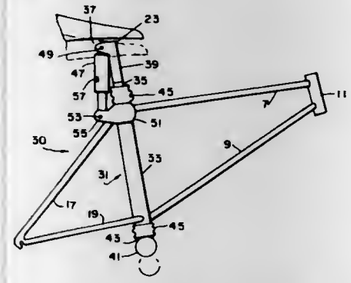
ENERGY-ABSORBER FOR A BICYCLE FRAME

Mark P. McJunkin, 3846 Ridge Ave., Macon, Ga. 31204, and H. P. McJunkin, Jr., 862 Alta Rd., Charleston, W. Va. 25314

Filed Dec. 6, 1994, Ser. No. 354,050

Int. Cl.[6] B62K *3/02*

U.S. Cl. 280—283 **17 Claims**



1. An energy-absorbing bicycle apparatus comprising a bicycle frame, a telescoping portion and at least one resilient coupler, the telescoping portion further comprising an outer tube, an inner tube housed inside and coupled to the outer tube, the inner tube having a top end and a bottom end, a seat post connected to the top end and a crank axle housing connected to the bottom end, the outer tube mounted in the bicycle frame, and wherein the coupler joins the inner tube and the outer tube such that movement of the inner tube, the seat post and the crank axle housing is damped relative to the frame proper and such that the seat post and the crank axle housing maintain a constant spacial relationship and move as a unit, wherein the coupler further comprises an air cylinder, the air cylinder having an upper portion and a lower portion, the upper portion connected to the inner tube and the lower portion connected to the outer tube.

5,553,881

BICYCLE REAR SUSPENSION SYSTEM

James B. Klassen, and Jamie W. Calon, both of Calgary, Canada, assignors to Outland Design Technologies, Inc., Lynden, Wash.

Filed Jan. 25, 1995, Ser. No. 377,931

Int. Cl.[6] B62K *25/00*

U.S. Cl. 280—284 **22 Claims**

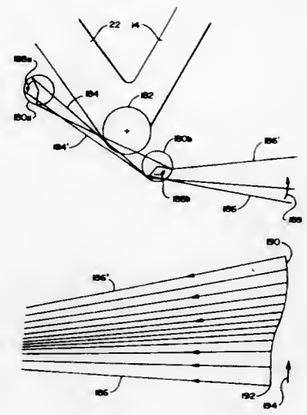
1. A bicycle, comprising:

a forward frame section having a crankset mounted thereto; and

a compressible rear suspension section, said rear suspension section comprising:

means for mounting a rear wheel axle rearwardly of said crankset, said crankset and said axle being interconnected by a drive chain to which drive tension is applied by said crankset; and

means for moving said rear wheel in a generally upward direction along generally S-shaped path as said rear suspension section compresses in response to an external force



which is received by said suspension section, said generally S-shaped path comprising:

a curved lower portion which is at least partially convex on a forward side toward said crankset;

a curved upper position which is at least partially concave on said forward side; and

a predetermined pedalling position located proximate an inflexion zone at which said path transitions from said lower curved portion to said upper curved portion, so that there is an increasing rate of chainstay lengthening as said axle moves along said path toward said predetermined pedalling position, and so that there is a decreasing rate of chainstay lengthening as said axle moves upwardly along said path above said predetermined pedalling position;

said means for moving said rear wheel along said predetermined path comprising:

a control arm member having a rearward end to which said wheel is mounted and a forward end; and

a pivot assembly mounted to said forward end of said control arm member, said pivot assembly comprising:

cam means having a first portion mounted to said pivot assembly and a second portion mounted to said forward frame section, said cam means being configured to direct said rear wheel along said S-shaped path in response to compression of said suspension section.

5,553,882

SNOWMOBILE SECUREMENT SYSTEM

Stephen N. Unruh, 1061 Kenneth St., Eagan, Minn. 55121

Filed Aug. 26, 1994, Ser. No. 296,424

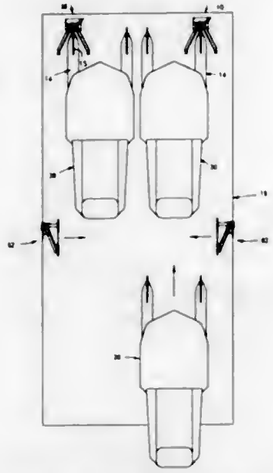
Int. Cl.[6] B60P *7/08*

U.S. Cl. 280—508 **19 Claims**

1. A hitch for securing a snowmobile to a trailer, comprising:

(a) a base for connection to the trailer; and

(b) an actuator supported in a fixed position by said base for releasable latching of the snowmobile, said actuator having a vertical oriented shaft assembly, a contact member pivotally connected to said shaft assembly and comprising a first portion having a linear configuration of a predetermined length, said first portion being for contact with the connection member of the snowmobile, a second portion having a U-shaped configuration and being connected to one end of said first portion, said second portion being for connection to said shaft assembly, and a third portion having a linear configuration and of a predetermined length, and being connected at one end to one end of said second portion, said third portion being for enclosing the connection member of the snowmobile, said contact member adapted for movable contact with and enclo-



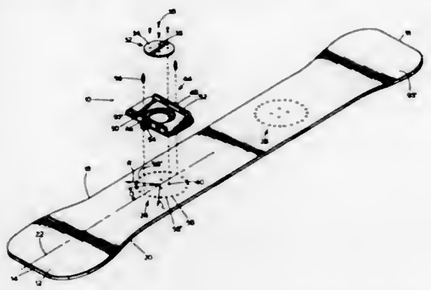
sure of a connection member on the snowmobile, said actuator further comprising a latch member for holding the contact member in a predetermined latched position.

5,553,883

SNOWBOARD BINDING WHICH PERMITS ANGULAR REORIENTATION OF A USER'S FOOT WHILE MAINTAINING THAT FOOT ATTACHED TO THE SNOWBOARD

George A. Erb, 2086 Cervato Dr., Camarillo, Calif. 93012

Filed Apr. 6, 1995, Ser. No. 418,253
Int. Cl.[6] A63C *9/081*
U.S. Cl. 280—607 **15 Claims**



1. A binding for attaching a snowboarder's foot to a snowboard comprising:

A) a footplate having an outer perimeter and means for attaching said footplate directly to a snowboarder's boot when the snowboarder's foot is in the boot, said footplate having a bottom surface and said means positioning said bottom surface in direct contact with a top surface of the snowboard thereby placing a wearer's foot immediately adjacent to the top surface of the snowboard;

B) anchor means for rotatably attaching said footplate with the foot-containing boot attached thereto to a snowboard and maintaining said footplate and foot-containing boot continuously attached to said snowboard even when said footplate is rotated through an angle of ninety degrees or more with respect to a longitudinal centerline of the snowboard; and

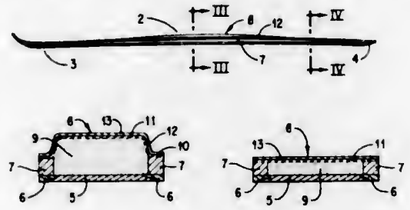
C) securing means for accurately and repeatably securing said footplate in a selected angular orientation, said securing means including a plurality of holes defined in the snowboard, said holes being arcuately arranged on the snowboard to be located outside of the outer perimeter of a user's foot on said footplate.

5,553,884

SKI COMPRISING NARROW SIDES AND AN UPPER SHELL

Roger Abondance, La Murette, France, assignor to Skis Rossignol S.A., Voiron, France

Continuation of Ser. No. 221,935, Apr. 1, 1994, abandoned.
This application Dec. 19, 1995, Ser. No. 576,168
Claims priority, application France, Apr. 16, 1993, 93 04728
Int. Cl.[6] A63C *5/04; 5/14*
U.S. Cl. 280—609 **16 Claims**



1. A ski, comprising:

a lower face including a central sliding sole delimited by two edges, the edges being located on opposite sides of the sliding sole;

at least two reinforcement elements extending in a longitudinal direction of the ski over at least first and second longitudinally displaced zones of the ski, each reinforcement element being supported on one of the edges;

a core located on the lower face and between inner lateral sides of the reinforcement elements; and

a shell having a cross-sectional width and a central portion and two lateral portions, the central portion and the two lateral portions extending in the longitudinal direction of the ski, the two lateral portions of the shell being supported by the reinforcement elements, wherein in the first zone of the ski the shell is flat across the cross-sectional width and extends substantially parallel to the lower face, and wherein in the second zone of the ski the central portion of the shell is spaced above at least one of said lateral portions, the central portion being connected to the at least one lateral portion by at least one lateral side portion, said second zone of the ski having a non-rectangular cross-section.

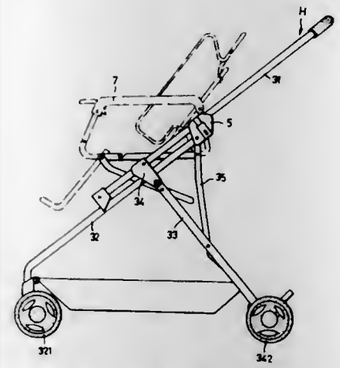
5,553,885

FOLDABLE STROLLER FRAME

Cheng-Tso Chang, No. 2, Lane 519, Chung-Cheng Rd., Yung-Kang City, Tainan Hsien, Taiwan

Filed Apr. 25, 1995, Ser. No. 428,694
Int. Cl.[6] B62B *7/08*
U.S. Cl. 280—642 **4 Claims**

1. A foldable stroller frame, including a pair of front wheel support rods, each of which has an upper end portion and a lower end portion adapted to be connected to a front wheel, a U-shaped handle with two arms, each of which has a lower end portion and each of which is adapted to be slidable relative to a respective one of said front wheel support rods between a first position, wherein said stroller frame is unfolded and wherein each of said arms is locked to said respective one of said front wheel support rods so as to prevent movement relative to said respective one of said front wheel support rods, and a second position, wherein said stroller frame is folded, and a pair of rear wheel support rods, each of



which has an upper end portion and a lower end portion adapted to be connected to a rear wheel; wherein the improvement comprises:

a lock device fixed to said upper end portion of each of said front wheel support rods and connected slidably to a respective one of said arms in order to lock said respective one of said arms in said first position against movement relative to said front wheel support rods when said stroller frame is unfolded;

a pivot link mounted slidably to each of said front wheel support rods between said upper and lower end portions thereof and fixed to said respective one of said arms at a position between said lock device and said lower end portion of said respective one of said arms, said upper end portion of a respective one of said rear wheel support rods being pivoted to said pivot link;

a pair of connecting rods, each of which has an upper end portion pivoted to said lock device and a lower end portion pivoted to said respective one of said rear wheel support rods; and

said lock device including a mounting seat fixed to said upper end portion of a respective one of said front wheel support rods and pivoted to said upper end portion of a respective one of said connecting rods, said mounting seat having a through hole through which a respective one of said arms passes slidably in a position parallel to said respective one of said front wheel support rods, a positioning member which is fixed to said respective one of said arms and which can be received removably in said through hole while said respective one of said arms is placed in said first position, a locking element received movably in said mounting seat and extendible into said through hole, and a compression spring for biasing said locking element in order to permit said locking element to engage said positioning member so as to lock said respective one of said arms in said first position against movement relative to said respective one of said front wheel support rods when said stroller frame is unfolded.

5,553,886

FLANGELESS AIRBAG INFLATOR WITH MOUNTING ADAPTOR

Brian D. Gunn, Ogden, and Aaron V. Cranney, Benson, both of Utah, assignors to Morton International, Inc., Chicago, Ill.

Filed Aug. 22, 1995, Ser. No. 518,029
Int. Cl.[6] B60R *21/16*
U.S. Cl. 280—728.2 **18 Claims**

1. An inflator for use in an airbag module assembly including a reaction canister having a front canister endplate and an inflator-receiving aperture in a rear canister endplate, the inflator comprising:

an inflator housing having a generally cylindrical sidewall, a front housing end with means for mounting the front housing end to the front canister endplate, and a rear housing end; and

a mounting adaptor fitting over the sidewall of the inflator housing adjacent the rear housing end and secured to the housing by a snap engagement between-a snap projection of one of the housing and the adaptor and a snap receptor of the other of the housing and the adaptor, the mounting adaptor sized and adapted to extend through the inflator-receiving aperture of the rear canister endplate and having a radially extending, annular flange sized and adapted to engage the rear canister endplate surrounding the inflator-receiving aperture;

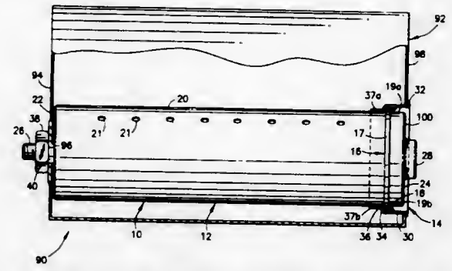
whereby the front housing end mounting means and the adaptor, in combination, secure the inflator within the reaction canister and allow the inflator to withstand tensional loading between the canister endplates of the reaction canister.

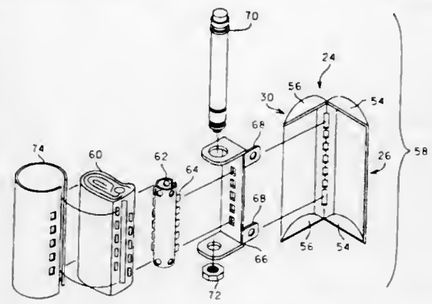
5,553,887

INFLATABLE RESTRAINT MODULAR HOUSING WITH DEPLOYMENT DIRECTING FEATURE

James P. Karlow, Milford; Mohamed Boumarafi, Rochester Hills, and Jonathan Hurford, Lake Orion, all of Mich., assignors to Takata Inc., Auburn Hills, Mich.

Filed Sep. 29, 1995, Ser. No. 536,962
Int. Cl.[6] B60R *21/22*
U.S. Cl. 280—730.2 **19 Claims**





1. An inflatable restraint housing for enclosing an air cushion assembly capable of deploying an air cushion into a vehicle interior, said housing comprising:

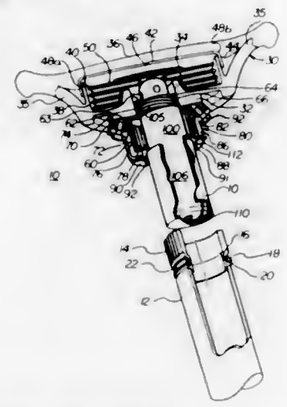
a first half;

a second half hingedly secured to said first half along a hinged edge, said first and second halves defining a tapered interior chamber which converges towards a deployment edge opposite said hinged edge; and

a stiffening rib extending from said housing adjacent said deployment edge:

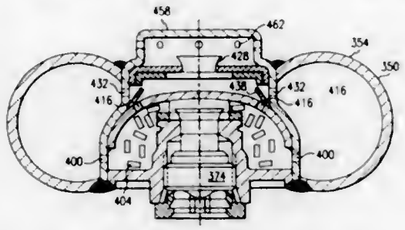
said first and second halves configured for enclosing the air cushion assembly in a closed condition such that said tapered interior chamber can focus the energy generated by the inflation of the air cushion towards said deployment edge causing said first half to rotate with respect to said second half to an open condition and allow the air cushion to be deployed therefrom, said tapered interior chamber further configured for directing the deployment of said air cushion into a vehicle interior.

5,553,888
SNAP-ON, REMOVABLE STEERING WHEEL WITH INTEGRAL AIRBAG HOUSING
Darin J. Turner, Warren; Daniel G. Zelenak, Lake Orion, and John A. Musiol, Southfield, all of Mich., assignors to Allied-Signal Inc., Morristown, N.J.
Filed Jun. 26, 1995, Ser. No. 495,058
Int. Cl.[6] B60R *21/16*
U.S. Cl. 280—731 **9 Claims**



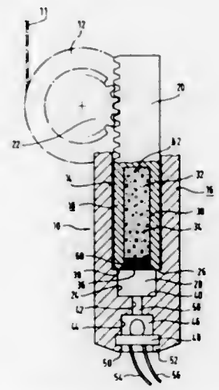
1. An assembly (**10**) comprising:
a steering wheel (**30**) including a hub (**32**), the hub including a center opening (**34**), an insert member (**60**) adjacent the hub including a first fastening portion (**64**) thereon, an inflator (**100**), detachably mounted to the insert member including a second fastening portion engagable with the first fastening portion, a collar member (**80**) engagable with the insert for detachable securing the steering wheel to a column (**12**), the collar including a first locking part.

5,553,889
HYBRID INFLATOR WITH RAPID PRESSURIZATION-BASED FLOW INITIATION ASSEMBLY
Brian K. Hamilton, Littleton, and Brent A. Parks, Englewood, both of Colo., assignors to OEA, Inc., Aurora, Colo.
Continuation-in-part of Ser. No. 328,657, Oct. 25, 1994, which is a continuation-in-part of Ser. No. 210,668, Mar. 18, 1994. This application Feb. 16, 1996, Ser. No. 389,297
Int. Cl.[6] B60R *21/26*
U.S. Cl. 280—736 **105 Claims**



1. A hybrid inflator for an automotive inflatable safety system comprising an air/safety bag, said inflator comprising:
an inflator housing which contains a pressurized medium;
a gas generator comprising a gas generator housing, a propellant contained within said gas generator housing, at least one gas generator inlet port which fluidly interconnects said gas generator housing and said inflator housing, and at least one gas generator outlet port which fluidly interconnects said gas generator housing and the air/safety bag;
a propellant ignition assembly interconnected with said gas generator; and
valve means, operatively associated with said at least one gas generator inlet port, for substantially inhibiting flow between said inflator housing and said gas generator housing through said at least one gas generator inlet port until a pressure within said inflator housing exceeds a pressure within said gas generator housing by a predetermined degree.

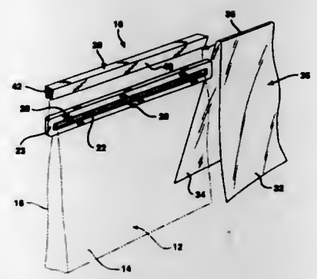
5,553,890
PRETENSIONER FOR A SAFETY BELT DRIVE
Erwin Bühr, Schwäbisch Gmünd; Volker Holzapfel, St. Wendel; Jürgen Petzi, Geislingen-Eybach, and Klaus Böhmler, Schwäbisch Gmünd, all of Germany, assignors to TRW Repa GmbH, Alfdorf, Germany
Filed Feb. 10, 1995, Ser. No. 387,282
Claims priority, application Germany, Feb. 11, 1994, 44 04 462.3
Int. Cl.[6] B60R *22/46*
U.S. Cl. 280—806 **5 Claims**



1. A safety belt pretensioner drive comprising a cylinder and a hollow piston slidably accommodated in said cylinder, said hollow piston defining an internal cylindrical space, a pyrotechnical charge being filled into said space, said cylinder having a bottom wall spaced from said piston, a cylindrical chamber defined between said bottom wall and said piston, said bottom wall having a through opening and a fuse being seated in said through opening axially spaced from said pyrotechnical charge.

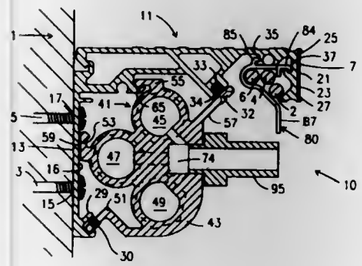
5,553,891
DOCUMENT COVER
Bon S. Ong, P.O. Box 4247, Torrance, Calif. 90510
Filed Aug. 29, 1994, Ser. No. 297,371
Int. Cl.[6] B42D *17/00*
U.S. Cl. 281—43 **18 Claims**

1. In combination, a soft document having a plurality of pages; a stiff, elongated member defining an elongated linear document slot therewithin that receives therethrough some of said pages of said document such that said plurality of pages are split into two sections disposed on opposite sides of said member; a jacket formed of a single sheet of flexible material folded at its center and draped over said elongated member, and forming a pair of covers that are disposed on opposite sides of said elongated member and on opposite sides of said pages of said document so as to enclose said document therewithin; and a clasp that frictionally grips and



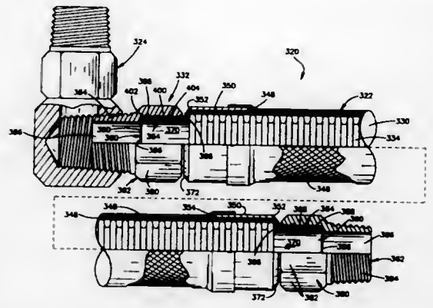
holds said jacket therewithin against said elongated member, whereby said jacket is fastened to said elongated member by said clip.

5,553,892
MULTIPLE-CHANNEL PLURAL-POSITION GAS RAIL AND BRACKET MOUNT THEREFOR
Eric V. Pitchford; Gerald E. Proctor, both of Pittsburgh, and William Boehmer, Clairton, all of Pa., assignors to Fairfield Medical Products Corporation, Tampa, Fla.
Filed Oct. 5, 1994, Ser. No. 317,696
Int. Cl.[6] F16L *25/08*
U.S. Cl. 285—12 **14 Claims**



1. A combination bracket mount and gas rail comprising:
a) a bracket mount of generally L-shaped configuration having a substantially vertical portion adapted to be attached to a substantially vertical surface and a substantially horizontal portion depending therefrom, said vertical portion having a orienting groove spaced from said horizontal portion and said horizontal portion having a supporting groove spaced from said vertical portion;
b) a gas rail comprising a body including a plurality of fluid conduits therein, coupling means for coupling said conduits with respective sources and end users of fluid;
said gas rail having a first supporting flange and a second supporting flange angularly disposed with respect to one another, each of said flanges having a depending termination complementary with said supporting groove;
d) said gas rail having a first locking flange and a second locking flange;
e) said gas rail being mountable on said bracket mount in either one of two orientations with respect thereto, a first orientation whereby said first supporting flange is received by said supporting groove and said first locking flange is mounted to said orienting groove, and a second orientation whereby said second supporting flange is received by said supporting groove and said second locking flange is mounted to said orienting groove.

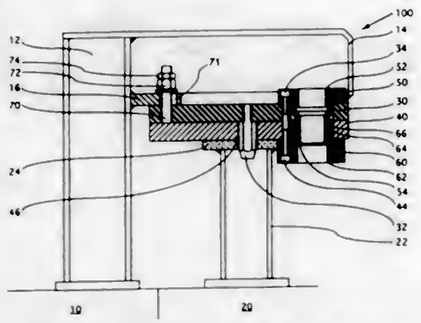
5,553,893
CONNECTOR FOR GAS APPLIANCES
Sam J. Foti, Lyndhurst, Ohio, assignor to Hose Master, Inc., Cleveland, Ohio
Continuation-in-part of Ser. No. 161,971, Dec. 6, 1993, Pat. No. 5,478,121. This application Mar. 14, 1994, Ser. No. 212,128
Int. Cl.[6] F16L *27/02*
U.S. Cl. 285—168 **8 Claims**



1. A flexible connector for delivering fluid at superatmospheric pressure from one end proximal to a stationary supply line, the connector straightening, flexing and tending to twist as the distal connector end moves toward and away from the supply line, said connector comprising:
a first swivel fitting connected to the supply line and comprising a body and a swivel member connected together for movement relative to each other and conducting fluid from the supply line;
a second swivel fitting at the distal connector end and comprising a second body and a second swivel member connected together for movement relative to each other and conducting fluid from the distal connector end; and,
a hose assembly extending between said first and second swivel fittings, said hose assembly comprising;
a flexible metal hose member; and,
an antitorsion fitting forming one end of said hose assembly connected to one of said first and second swivel fittings;
said antitorsion fitting comprising a pintle member hermetically fixed to the hose member, a nipple member fixed to the swivel fitting and a bearing and sealing arrangement between said pintle and nipple members, said pintle and nipple members defining aligned fluid flow passages therethrough having substantially the same flow areas, with said nipple member mounted on said pintle member for rotation relative thereto, said bearing and seal arrangement disposed between said pintle and nipple members for facilitating relative rotation between said nipple member and said pintle member while blocking fluid flow from said passages along the juncture of said nipple and pintle members, said nipple and pintle members rotating relative to each other to prevent torsional stress in said hose member when said distal end moves relative to said supply line.

5,553,894
CONDUIT CONNECTION TO A CASSETTE FOR PERFORATING SHEETS
Gerhard Klaassen, Chavannes, Switzerland, assignor to Peters Maschinenfabrik, Hamburg, Germany
Filed Sep. 7, 1994, Ser. No. 302,055
Claims priority, application Switzerland, Sep. 7, 1993, 02653/93
Int. Cl.[6] F16L *55/00*
U.S. Cl. 285—18 **25 Claims**

1. A connector for joining a conduit from a source to a cassette which is insertable in a frame, the connector comprising:



a first connector member secured to an end of said conduit, said conduit having another end in communication with said cassette;

a second connector member being in communication with said source;

a first plate which is fixed relative to said cassette and which holds said first connector member; and

a second plate which is fixed relative to said source and which holds said second connector member;

wherein said first connector member and said second connector member are configured to engage each other upon an insertion of said cassette into said frame so that said first conduit is in fluid communication with said source, and wherein said first and second plates are positioned to contact each other when said cassette reaches a point of full insertion.

5,553,895

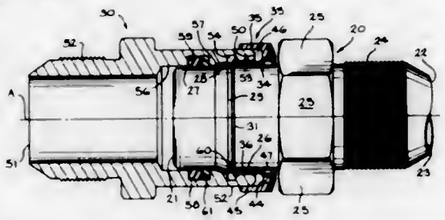
COUPLING ASSEMBLY

Terry L. Karl, Blissfield, Mich.; Gregory J. Gloden; Philip C. Van Riper, both of Holland; John P. Zainea, Middle Point, and John T. Myers, Haviland, all of Ohio, assignors to Aeroquip Corporation, Maumee, Ohio

Filed May 3, 1995, Ser. No. 433,581

Int. Cl.[6] F16L *35/00*

U.S. Cl. 285—39 **45 Claims**



1. A coupling assembly for connecting two members comprising in combination:

(a) a split locking ring having a first end and a second end, said first and second ends being aligned to permit abutting engagement, said ring being expandable to define a gap between said first and second ends;

(b) a first member extending along an axis from a forward end toward a rearward position and having an exterior surface, a rib extending outwardly from said exterior surface, said rib including

(i) a ramp tapering outwardly in a direction away from said forward end and away from said axis at an angle in the range of 10° to 25° relative to said axis,

(ii) a cylindrical surface parallel to said axis extending rearwardly from said ramp a distance of at least 0.010 inch; and

(iii) a shoulder tapering away from said forward end and inwardly toward said axis, said cylindrical surface connecting said ramp and said shoulder; and

(c) a second member extending from a receiving end to a remote end including

(i) an inwardly facing cylindrical wall sized to received said first member including said rib and extending axially from a position closely adjacent said receiving end toward said remote end, and

(ii) an inwardly facing annular groove extending outwardly from said inwardly facing cylindrical wall, said split locking ring being receivable in said annular groove, said annular groove having surfaces extending outwardly from said inwardly facing cylindrical wall including a first surface defining one portion of said groove and a second surface positioned between said first surface and said receiving end, said second surface including a chamfer tapering inwardly toward said axis in a direction toward said receiving end and being disposed at an angle relative to said axis which is smaller than the angle between said shoulder and said axis;

said first member and said second member being sized such that upon insertion of said first member into said second member, said split locking ring travels up said ramp to increase the size of said gap, over said rib cylindrical surface and contracts to reduce the size of said gap and to engage said shoulder becoming trapped between said shoulder and said chamfer.

5,553,896

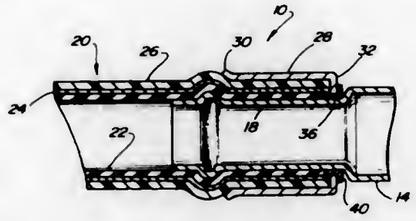
ELECTRICALLY INSULATED FLUID COUPLING ASSEMBLY

Frederick W. Woodward, Dexter, Mich., assignor to Pilot Industries, Inc., Dexter, Mich.

Filed Feb. 15, 1995, Ser. No. 389,120

Int. Cl.[6] F16L *11/12*

U.S. Cl. 285—47 **10 Claims**



1. An electrically insulated fluid coupling assembly comprising:

a fluid coupling having a female portion constructed of an electrically conductive material, said female portion having an elongated tubular stem,

a fluid conduit having an inner liner and an outer layer constructed of an electrically conductive material,

said coupling stem being insertable into said inner layer of said conduit,

a tubular ferrule constructed of an electrically conductive material, said ferrule being open at each end and disposed around said stem so that said ferrule sandwiches an end of said conduit between said ferrule and said stem to thereby secure said female portion of said coupling to said conduit,

means for electrically insulating said ferrule from said stem of said female portion wherein said insulating means comprises an electrical insulator ring having an axial portion coaxially disposed in one end of said ferrule and a radially outwardly extending portion which covers at least a portion of one axial end of said ferrule.

5,553,897

FASTENING SYSTEM FOR FASTENING A THROUGH PIPE TO A HEARTH WALL, THE PIPE OPENING INTO A BOX

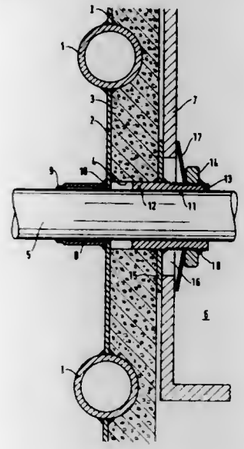
Frédéric Maillot, Clamart, France, assignor to GEC Alsthom Stein Industrie, Velizy-Villacoublay, France

Filed Jun. 16, 1995, Ser. No. 491,574

Claims priority, application France, Jun. 20, 1994, 94 07524

Int. Cl.[6] F16L *5/06*

U.S. Cl. 285—192 **5 Claims**



1. A fastening system for fastening a through pipe and a box to a hearth wall of a hearth, the hearth wall including an outside metal screen, an inside layer of refractory material which defines an inside face, an orifice, the box including a wall provided with a further orifice and being disposed proximate to the inside face, the through pipe passing through the hearth wall via the orifice and through the further orifice and opening into the box which is subjected to a pressure and to a temperature that are different from those of the hearth, said fastening system comprising:

external pipe-securing means for securing the through pipe to the outside metal screen;

an internal metal guide tube fitted over the through pipe and having one end interposed between the orifice and the through pipe, and another end being externally threaded;

a rigid washer fixedly secured externally to said internal metal guide tube and disposed so as to abut against the inside face of the inside layer of refractory material, the wall of the box being mounted against said rigid washer, and the further orifice in the wall of the box being larger than a cross-section of said internal metal guide tube;

a sealing device fitted over said internal metal guide tube and disposed against the wall of the box; and

a threaded nut screwed onto the threaded end of said internal metal guide tube so as to clamp said sealing device against the wall of the box, thereby sandwiching the wall of the box between said rigid washer and said sealing device.

5,553,898

HOT-TAPPING SLEEVE

Elmer V. Rogers, Jr., North Olmsted, Ohio, assignor to The Pipe Line Development Company, Westlake, Ohio

Filed Jun. 30, 1995, Ser. No. 491,361

Int. Cl.[6] F16L *5/00*

U.S. Cl. 285—197 **1 Claim**

1. A tapping sleeve for attaching a branch pipe to a main pipe, said tapping sleeve comprising:

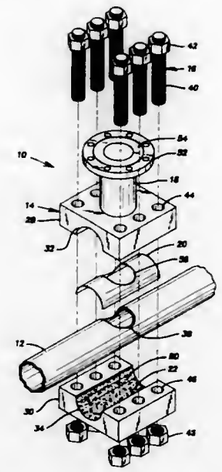
a split sleeve having first and second sleeve members which together form a circular bore for receiving a portion of the main pipe, said first sleeve member and said second sleeve member each forming approximately one half of said circular bore;

a plurality of clamping members passing through associated holes in said first and second sleeve members to clamp said first and second sleeve members together with the main pipe therebetween;

a side branch attached to said first sleeve member having an opening in fluid communication with said circular bore;

a sheet type packing member located around said opening and throughout a major portion of the area between said first sleeve member and the main pipe; and

a metal particulate coating spray welded throughout a major portion of the surface area of the interior of said second sleeve member and engageable with the main pipe for resisting axial displacement of the main pipe to permit tapping of the main pipe while the main pipe is pressurized, said particulate coating having a hardness greater than that of the pipe to ensure that elements of the particulate coating are embedded into the pipe for adequate axial gripping of the pipe.



5,553,899

MOLDED QUICK CONNECT COUPLING

Phillip Norkey, Jackson, and Stephen Anderson, Livonia, both of Mich., assignors to Pilot Industries, Inc., Dexter, Mich.

Filed May 19, 1995, Ser. No. 445,278

Int. Cl.[6] F16L *37/22*

U.S. Cl. 285—316 **10 Claims**

1. A quick connect coupling adapted for connection to a nipple having a radially inwardly extending recess formed at a position spaced from a free end of the nipple, said coupling comprising:

a tubular and cylindrical body open at each end, one end of said body being dimensioned to slidably extend over the free end of the nipple to a connected position, said body having a plurality of circumferentially spaced openings formed at a position spaced from said one end of said body, said openings being in alignment with the nipple recess when the coupling is in said connected position, wherein at least one of said openings is not aligned with a center line bisecting a predetermined diameter of said body,

a spherical retainer disposed in each opening of said body, said retainers being movable between a radially inner locked position and a radially outer unlocked position, each retainer having a cross-sectional area greater than its associated body opening on an inside surface of said body,

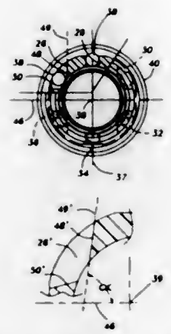
a tubular and cylindrical locking ring positioned coaxially around said body and movable between a retracted and an

a primary sealing portion formed at an inner part of said receiving port and a secondary sealing portion formed at the inlet of

a first axial section of the sleeve has second attachment means for releasably cooperating with said external first attachment

5,553,903

WINDOW VENT STOP



extended position, said locking ring having an inner cam surface which radially moves said retainers to said locked position as said locking ring moves from said retracted to said extended position,

means for resiliently urging said ring towards said extended position,

wherein each body opening which is not aligned with said center line bisecting said predetermined diameter of said body has at least one sidewall which extends in a direction which intersects said predetermined diameter at an angle less than or equal to 90° relative to said center line of said body.

5,553,900

PIPE JOINT STRUCTURE FOR FLUID DEVICE

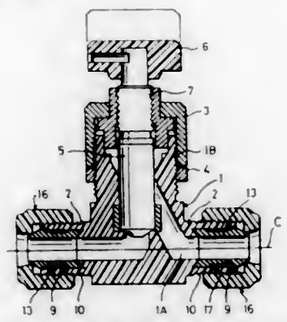
Toshiyuki Fukumoto, Toyonaka, and Kiyoshi Nishio, Takarazuka, both of Japan, assignors to Nippon Pillar Packing Co., Ltd., Osaka, Japan

Continuation of Ser. No. 180,468, Jan. 12, 1994, abandoned, which is a continuation of Ser. No. 803,984, Dec. 9, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 466,184

Claims priority, application Japan, Jan. 24, 1991, 3-006944

Int. Cl.[6] **F16L** *25/00*

U.S. Cl. 285—331 **4 Claims**



1. A pipe joint structure which is used for connection of a pipe in a semiconductor manufacturing process or for a fluid handling device for handling a strong acid or strong alkali fluid, comprising:

a fluid handling device body defining a fluid passage;

means, not in said fluid passage, for controlling fluid flow through said fluid passage;

at least one cylindrical joint body defining an elongated axis and provided at the inner peripheral surface thereof with a receiving port into which one-end pushing portion of a fluid carrying pipe is inserted, and at the outer peripheral surface thereof with a male screw threaded portion, said at least one cylindrical joint body being formed integrally with said fluid handling device body;

a primary sealing portion formed at an inner part of said receiving port and a secondary sealing portion formed at the inlet of said receiving port, said primary sealing portion and said secondary sealing portion being inclined with respect to the axis defined by said at least one cylindrical joint body;

an inner ring having an inner-end sealing portion which comes in contact with said primary sealing portion; and

a pushing ring threadedly connected to said male screw threaded portion on the outer periphery of said joint body, said pushing ring including means adapted to provide a sealing force to both said sealing portions when said pushing ring is threadedly moved, wherein:

said inner ring has an inner diameter which is the same as that of the fluid carrying pipe and that of the fluid passage in the fluid handling device so that the fluid flows smoothly, and which is pressingly inserted into one end of the fluid carrying pipe, to thereby increase the diameter of the one-end pushing portion of the fluid carrying pipe,

said inner ring is provided with an outer-end sealing portion which produces contact with said secondary sealing portion,

said pushing ring comprises (i) a cylindrical portion having a female screw portion threadedly connectable to the male screw portion at the outer periphery of the joint body, and (ii) an annular pushing portion defining said sealing force means and having an inner peripheral surface inclined with respect to said axis for defining an inner end and which is provided at the inner end of the inner peripheral surface with a pushing edge portion having a diameter substantially equal to the outer diameter of the fluid carrying pipe;

said primary sealing portion and said inner-end sealing portion when in contact being mutually inclined with respect to the axis defined by said at least one cylindrical joint body, and

said fluid handling device body, said at least one cylindrical joint body, said inner ring and said pushing ring are made of fluoroplastic.

5,553,901

DEVICE FOR CONNECTING A LENGTH OF DUCT TO A COUPLING ENDPIECE

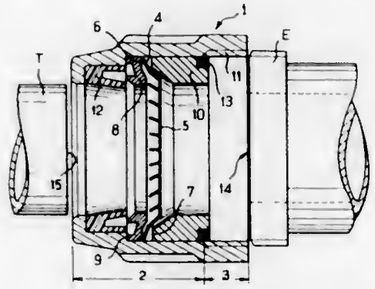
Pierre Serot, Fontenay-aux-Roses, France, assignor to Legris S.A., Rennes, France

Continuation of Ser. No. 998,789, Dec. 23, 1992, abandoned. This application Oct. 19, 1994, Ser. No. 325,634

Claims priority, application France, Dec. 26, 1991, 91 16173; Dec. 26, 1991, 91 16174

Int. Cl.[6] **F16L** *19/06*

U.S. Cl. 285—340 **9 Claims**



1. A connection device for releasably connecting an end section of a length of duct to a tube fitting body, said body having a tubular end coupling portion limited by a front distal face and provided with external first attachment means adjacent to said front distal face, said device including:

a generally tubular sleeve in which,

a first axial section of the sleeve has second attachment means for releasably cooperating with said external first attachment means of said end coupling portion,

a second axial section of the sleeve integral with said first axial portion has radial grip means for instant connection of the end section of said length of duct to said sleeve, said grip means including a deformable element which is deformable between an operative shape and an inoperative shape, said second axial section having an internal surface facing said front distal face so that when said external first attachment means of the end coupling portion is fully engaged with the second attachment means of the sleeve, said internal surface of said second axial section and said front distal face are in an axial relative position such that said deformable element is in operative shape, said front distal face and said internal surface being the operating means for deforming said deformable element,

wherein said front distal face is planar, perpendicular to the axis of said tubular sleeve and constitutes an abutment for the end section of the length of duct when inserted axially in the sleeve.

5,553,902

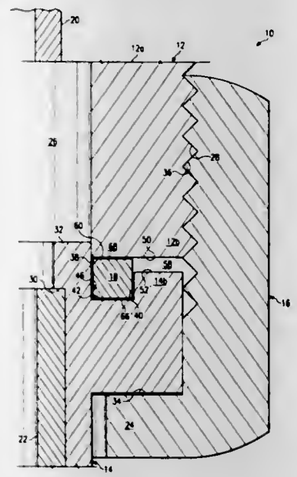
LEAK-PROOF COUPLING

Patrick J. Powers, c/o Byron Value P.O. Box 458, Siloan Springs, Ark. 72761

Filed Jul. 12, 1994, Ser. No. 274,294

Int. Cl.[6] **F16L** *17/06*

U.S. Cl. 285—350 **1 Claim**



1. A coupling comprising:

a first portion having first and second ends, the first end having a longitudinal channel defined between an outer and an inner wall, the outer wall of the longitudinal channel being lower than the inner wall of the longitudinal channel;

a gasket positioned within the longitudinal channel;

a second portion having first and second ends, the first end engaging the gasket within the longitudinal channel of the first portion, said engagement forming a first sealing area between the bottom of the longitudinal channel and the first end of the second portion and a second sealing area between the outer wall of the longitudinal channel and the first end of the second portion;

a collar for connecting the first and the second portions; and

wherein the gasket positioned within the first sealing area deforms into the second sealing area when compressed between the bottom of the longitudinal channel and the first end of the second portion.

5,553,903

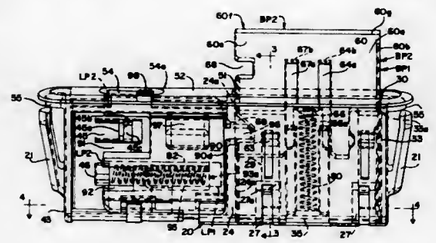
WINDOW VENT STOP

James G. Prete, Hinsdale, Ill.; Steven E. Schultz, Demontte, Ind., and Allen D. Polowinczak, Plainfield, Ill., assignors to Ashland Products, Inc., Lowell, Ind.

Filed Aug. 22, 1994, Ser. No. 293,483

Int. Cl.[6] **E05C** *1/08*

U.S. Cl. 292—163 **20 Claims**



1. A stop means for limiting movement of a sliding window along a predetermined path of window movement, the stop means comprising:

a housing adopted to be positioned adjacent and out of said path of window movement, said housing having a first cavity and a second cavity adjacent to each other;

a bolt operatively associated with said first cavity being moveable along a predetermined first path between a first position wherein said bolt is locked within said first cavity against an outward bias and a second position wherein a first portion of said bolt extends out of said first cavity and a second portion of said bolt remains within said first cavity;

said first portion of said bolt in said second position adopted to extend into said path of window movement so as to contact said sliding window to define said limit of movement of said window along said path of window movement at which point of contact said second portion transfers forces resulting from said contact to said housing;

a latch within said second cavity moveable along a predetermined second path in a direction transverse to said first path between a first position biased toward and engaging said bolt, and a second position removed from engagement with said bolt;

an actuator on said latch for facilitating movement of said latch between said first position and said second position to unlock said bolt;

a spring positioned between said housing and said bolt biasing said bolt toward said second position; and,

a guide comprising a tongue and groove arrangement between said bolt and said housing to maintain said bolt within close tolerance of said first path, and to guide said bolt along said first path, and to transfer lateral loads from said bolt to said housing, said bolt receiving said lateral loads from said contact of said sliding window with said first portion of said bolt.

5,553,904

PROTECTING SEAL FOR SHIPPING CONTAINERS AND TRAILERS

Lorenzo Lorenzo, 1820 SW. 98th Ave., Miami, Fla. 33165

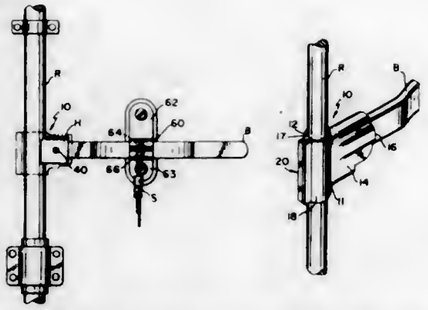
Filed Apr. 28, 1995, Ser. No. 430,563

Int. Cl.[6] **B65D** *27/30*

U.S. Cl. 292—307 R **6 Claims**

1. A protecting seal for doors of containers and trailers that include a rotating rod to which a locking bar pivoting housing is rigidly mounted and including a locking bar that is pivotally mounted within said pivoting housing further including a pin mounted therein for pivotally connecting said locking bar, and said protecting seal comprising:

A) sleeve means for receiving said locking bar and including an inner surface; and



B) jacket means perpendicularly mounted to said sleeve means, said jacket means including an inner wall that comes in contact with said rod, and said jacket means further including longitudinally extending edges and flap members that extend outwardly from said edges to cooperatively and partially embrace said rod thereby protecting said pin against tampering.

5,553,905

ORNAMENT HANDLING APPARATUS

Peter I. Bentivegna, 541 S. Schuylkill, Jeffersonville, Pa. 19403

Filed Mar. 9, 1995, Ser. No. 401,361

Int. Cl.[6] B25J *1/04*

U.S. Cl. 294—24 **20 Claims**

1. An apparatus for handling objects, said apparatus comprising:
an elongated handle having opposed ends; and
a hook-shaped applicator attachable at a first end thereof to an end of said elongated handle and extending outwardly therefrom, with said applicator including a hook receiving hole located near a second end of said applicator and extending at least partially into said applicator and configured to receive a free end of an object hook, with the second end of said applicator located away from a longitudinal line extending through said elongated handle such that an object attached thereto by an object hook will not contact said elongated handle during normal use,
wherein said apparatus is useable to hang objects by positioning a user's hand about said elongated handle, inserting a free end of an object hook into said hook receiving hole, orientating said apparatus to position the object hook above an object support, lowering said apparatus to place the object hook onto the object support, and removing said applicator from the object hook.

5,553,906

FLOOR AND SIDE WALL CONNECTORS

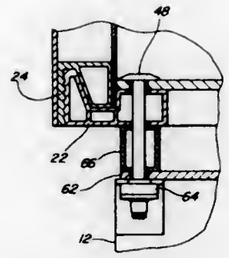
James R. Kunz, Riverside, Calif., assignor to Fleetwood Enterprises, Inc., Riverside, Calif.

Filed Jul. 26, 1994, Ser. No. 280,600

Int. Cl.[6] B62D *27/00*

U.S. Cl. 296—29 **17 Claims**

1. In a mobile body construction having a floor and a side wall, the improvement of a joint system comprising:



a first rigid elongated hollow joint member comprising a first recessed coupling interface section and a first protruding interface section having a first undulating surface at one end of the first joint member;
a second rigid elongated hollow joint member comprising a second protruding interface section fitting into the first recessed coupling interface section and a second recessed coupling interface section having a second undulating surface complementary to and overlapping the first undulating surface; and
means for connecting the second elongated hollow joint member to the side wall and securely fastening the second elongated hollow joint member to the first elongated hollow joint member, wherein the first recessed coupling interface section is larger in width than the second protruding interface section in order to receive a portion of the side wall which locks the respective joint members together.

5,553,907

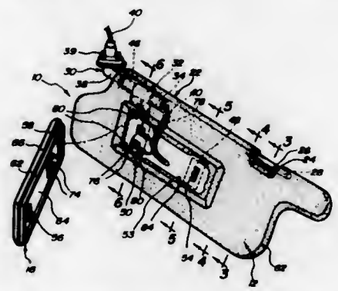
RIGID FOAM VISOR

Joseph R. Finn, Waterford; James R. Jones, Dryden, and Kirk Jensen, Novi, all of Mich., assignors to Takata Inc., Auburn Hills, Mich.

Continuation of Ser. No. 191,267, Feb. 3, 1994, abandoned. This application Nov. 22, 1995, Ser. No. 562,034

Int. Cl.[6] B60J *3/02*

U.S. Cl. 296—97.1 **24 Claims**



1. A sun visor or other accessory for a motor vehicle, said sun visor or other accessory being movable between a stored position and a deployed position and comprising:
a body made of rigid foam, said foam having a rigidity sufficient to self-support said body and said sun visor or other assembly without requiring additional reinforcing structures to be located within said foam and said body;
a cover which covers said body;
a pivot arm having first and second ends, said first end having mounting means for mounting said pivot arm and said sun visor or other accessory to the headliner of the vehicle, said second end being at least partially contained within said body; and

detent means for maintaining said sun visor or other accessory in said stored position, said deployed position, and intermediate positions between said stored and deployed positions, said detent means being at least partially contained within said body and engaging said pivot arm.

5,553,908

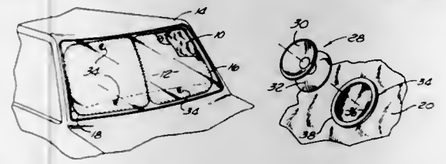
SUN SHIELD ASSEMBLY

Joseph M. Shink, Valencia, Calif., assignor to Auto-Shade, Inc., Moorpark, Calif.

Continuation of Ser. No. 244,954, Jun. 14, 1994, abandoned. This application Dec. 15, 1995, Ser. No. 573,596

Int. Cl.[6] B60J *3/00*; **F16B** *47/00*

U.S. Cl. 296—978 **6 Claims**



1. An automobile sun shield assembly that can cover an automobile window, comprising:
a shade that includes a sheet of flexible opaque material attached to a frame, said frame being constructed as a single closed loop that can be twisted into a plurality of concentric loops;
a first flexible conical cup coupled to said flexible opaque material, said first flexible conical cup being adapted to be depressed onto the window to create a vacuum between said first flexible conical cup and the window such that said shade is attached to the window; and,
a second flexible conical cup attached to said first flexible conical cup, said second flexible conical cup being adapted to be depressed onto a grommet attached to said flexible opaque material to couple said first flexible conical cup to said shade, the grommet forming a solid platform within the flexible material for adhesion of the second flexible conical cup.

5,553,909

SMALL TWO-SEATER CAR

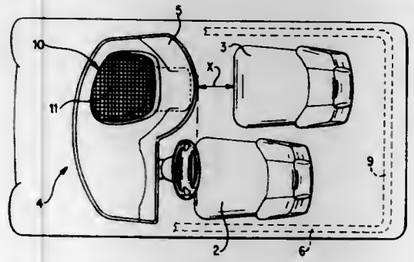
Bruno Sacco; Johann Tomforde, both of Sindelfingen, Germany; Anton Reichel, Ditzinger, Germany; Gerhard Steinle, New Port Beach, Calif.; Berthold Klein, Rutesheim, Germany; David Slaughter, San Diego, and Mike Ma, Rosemead, both of Calif., assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Feb. 28, 1995, Ser. No. 399,359

Claims priority, application Germany, Feb. 28, 1994, 440648.9

Int. Cl.[6] B60N *2/00*

U.S. Cl. 296—185 **11 Claims**



1. Small two-seater car, comprising:
a) at least one front wheel and a pair of rear wheels, each wheel including a tire, and an axle extending between said rear wheels;
b) a driver seat on a driver side of said car and a passenger seat on a passenger side of said car, each seat having a seat cushion thereon, and the passenger seat being longitudinally offset to the rear with respect to the driver seat located beside it, by up to half the depth of said seat cushion;
c) a dashboard arranged in front of said driver seat and said passenger seat, wherein the dashboard extends a first distance rearwardly on the driver side and a second distance rearwardly on the passenger side, and wherein the second distance is greater than the first distance by an amount approximately equal to the amount of longitudinal offset of the passenger seat, such that the distance between the dashboard and a front edge of said driver seat is approximately the same as the distance between the dashboard and a front edge of said passenger seat;
d) outer frame side members in the region of a said rear wheels which extend in a bent-off section up to at least the level of a rear wheel upper edge, such that at least the passenger seat is protected with respect to side impact forces by the outer frame side members; and
e) vehicle bodywork having virtually no overhang beyond said rear wheels, whereby, in the event of a rear impact, said rear axle is used to absorb impact forces before more pronounced intrusion to the rear takes place.

5,553,910

DEVICE FOR REINFORCING A DOOR OF A PASSENGER CAR

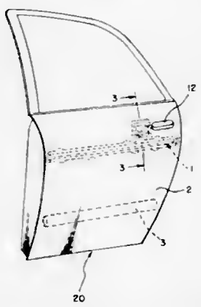
Young H. Park, Kyungnam-Do, Rep. of Korea, assignor to Hyundai Motor Co., Ulsan, Rep. of Korea

Filed Mar. 2, 1995, Ser. No. 398,169

Claims priority, application Rep. of Korea, Mar. 5, 1994, 94-4172

Int. Cl.[6] B60R *27/00*

U.S. Cl. 296—188 **19 Claims**



1. A device for reinforcing a door of a passenger car, comprising:
an upper reinforcing member including a body member and a reinforcing plate,
said body member having a plurality of horizontal slits disposed therein and flanged adhesive-backed projections extending from a peripheral flange thereof,
said reinforcing plate having a plurality of vertical slits and a C-shaped adhesive channel, the upper reinforcing member being attached to an inside of an outer door panel through the adhesive-backed projections and the adhesive channel; and
a lower impact beam disposed in parallel with said upper reinforcing member, said upper reinforcing member and lower impact beam being disposed within the door, whereby attachment of said upper reinforcing member and said lower impact beam reinforces a door and absorbs any impact to the door.

5,553,911

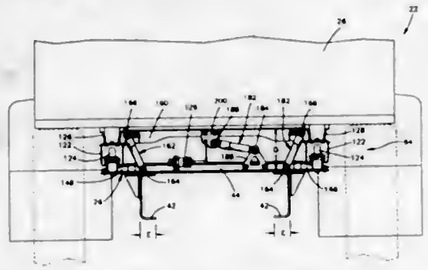
HEAVY DUTY MOTOR VEHICLE CAB SUSPENSION

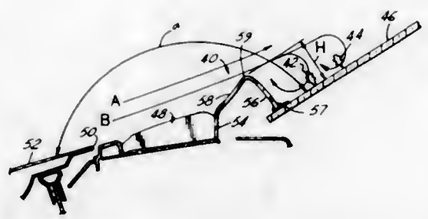
Jan-Olof Bodin, Alingsas, Sweden; Steve L. Barnhardt, High Point, N.C.; Nils B. Nilsson, Gothenburg, and Mats H. Andersson, Molndal, both of Sweden, assignors to Volvo GM Heavy Truck Corporation, Greensboro, N.C.

Filed Dec. 15, 1994, Ser. No. 356,475

Int. Cl.[6] B62D *33/06*

U.S. Cl. 296—190 **6 Claims**





1. In a conventional over-the-highway truck or tractor having a frame including at least two fore and aft extending rails and a transverse member interconnecting the rails and a cab mounted on the frame behind an engine, an improved cab suspension for enhancing ride quality comprising:

a spaced pair of mounting assemblies connecting a forward portion of the cab to the frame rail for limited pivotal movement about an axis transverse of the rails;

a pair of spaced apart springs interposed between and connected to a rearward portion of the cab and to the transverse member outboard of the rails for modulating pivotal motion of the cab relative to the frame and about the axis;

a pair of spaced apart motion dampers interposed between and directly connected to the cab and to the transverse member at locations between the pair of springs;

the motion dampers being oppositely canted at acute angles relative to the frame;

the motion dampers interconnecting the cab and frame to damp and limit relative cab and frame movement both toward and away from one another; and,

a centering damper interposed between and connected to the cab and directly to the frame transverse member, the centering damper being between the motion dampers and adapted to bias the cab toward a transversely centered position relative to the frame rails.

5,553,912

FLUID CONTAINMENT DEVICE

Joseph E. Kubina, Oxford; Mark E. Gleason, Farmington Hills; Jerry F. Loughlin, Jr., Lake Orion; Todd H. Wludyka, Walled Lake; Thomas C. Odette, Bloomfield Hills; Craig S. Montie, Wixom; Richard F. Biermacher, West Bloomfield; Patrick M. Harney, Rochester Hills, and Alfredo N. DiMichele, Warren, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Continuation-in-part of Ser. No. 130,481, Oct. 1, 1993, abandoned. This application Oct. 28, 1994, Ser. No. 330,942

Int. Cl.[6] B62D *25/08*

U.S. Cl. 296—192 **13 Claims**

1. A fluid containment device operable between a vehicle's louvered panel trailing edge portion, and an individual wiper blade to divert rain water or washer fluid toward the outboard sides of the vehicle's windshield during a final or intermittent stroke of the wiper blade, said device comprising a rigid body mounted along the trailing edge portion of said louvered panel adjacent the wiper blade in its down position, said rigid body having a ramped leading portion and a substantially vertically oriented trailing portion, said leading portion and said trailing portion joined at their adjacent edges to form an upper edge positioned substantially directly above a leading edge of the windshield, and having a terminal end portion formed on the substantially vertically oriented trailing portion permanently abutted against said windshield.

5,553,913

MOTOR VEHICLE SLIDING ROOF PANEL SEAL

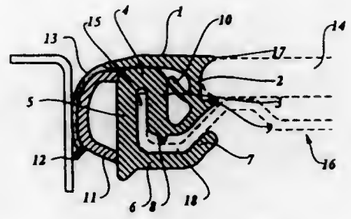
Martinus W. M. Nabuurs, Overloon, Netherlands, assignor to Inalfa B.V., Netherlands

Filed Jan. 9, 1995, Ser. No. 370,280

Claims priority, application Netherlands, Jan. 10, 1994, 9400035

Int. Cl.[6] B60J *10/12*

U.S. Cl. 296—216 **9 Claims**



1. A roof panel for closing an opening provided in a roof of a motor vehicle comprising:

a substantially flat closing plate (**14**);

a resilient sealing section extending along at least part of a circumference of said closing plate;

a supporting flange (**15**), said sealing section being secured to the supporting flange; and

wherein said sealing section comprises a sealing flange (**1**) substantially in a plane with an upper boundary surface of said closing plate, said sealing flange having a first end adjacent to an end of said closing plate;

a substantially U-shaped connecting part (**2**, **3**) including a first leg (**2**) connected to said sealing flange (**1**) and a second leg (**3**), said legs forming an opening facing toward said sealing flange (**1**), said second leg (**3**) being located at a larger distance from said closing plate than the first leg (**2**), the second leg (**3**) having a surface remote from the first leg connected to the supporting flange (**15**); and

a resilient lip (**9**) connected to the first leg (**2**) and engageable with an underside of said closing plate in a closed position of said closing plate and wherein when the first leg is pressed toward the second leg by said closing plate said sealing flange (**1**) abuts against said closing plate (**14**).

5,553,914

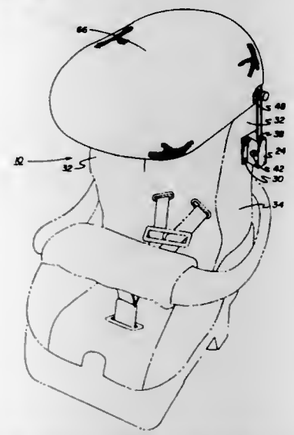
TODDLER CAR SEAT SHADE

Carshena Y. Holladay, 408 Keith Ct., Chesapeake, Va. 23325

Filed Sep. 18, 1995, Ser. No. 529,742

Int. Cl.[6] A47C *7/66*

U.S. Cl. 297—184.17 **1 Claim**



1. A new and improved toddler car seat shade, comprising, in combination:

an inverted U-shaped frame member having downwardly extending vertical legs and an arcuate upper extent, the vertical legs each having a plurality of positioning apertures therethrough and a coupling aperture at the upper extent of each leg;

a pair of similarly configured receptor blocks, each receptor block having a vertical planar flange with apertures for the receipt of screws for coupling with respect to the opposite side portions of a toddler car seat adjacent to an upper extent thereof, the blocks each having a central vertical bore for receiving the vertical legs of the U-shaped frame member, the blocks each having a horizontal aperture therethrough with a bolt extending therethrough and through a preselected positioning aperture of the vertical legs for varying the height of the U-shaped frame member with respect to the car seat;

an elongated inverted C-shaped frame member having apertures at its free internal ends;

pivot pins positionable through the apertures of the elongated inverted C-shaped frame member and the coupling apertures of the inverted U-shaped frame member to effect the pivotal coupling therebetween;

two intermediate C-shaped frame members of varying sizes with apertures at their free ends secured to the pivot pins; and

a cloth positionable over the inverted U-shaped frame member and the elongated C-shaped frame members with a hem in the cloth secured to the U-shaped frame member and the elongated C-shaped frame member.

5,553,915

ATTACHABLE PASSENGER SEAT FOR TWO-WHEELED VEHICLE

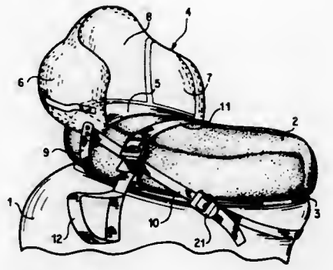
Robert Stamatakis, Am Dicken Turm 3, D-97082, Würzburg, Germany

Filed Sep. 1, 1994, Ser. No. 299,374

Claims priority, application Germany, Sep. 2, 1993, 9313230 U; Dec. 15, 1993, 9319246 U

Int. Cl.[6] B60N *2/38*

U.S. Cl. 297—195.13 **10 Claims**



1. An attachable seat adapted to be secured on a vehicle seat having a seat portion and sides, said attachable seat having a backrest; a seat area; a pair of opposed side members joining said backrest and said seat area, said side members extending downwardly below the seat portion to thereby extend over and touch a sufficient part of the sides of the vehicle seat when the attachable seat is mounted on the vehicle seat to thereby restrain the attachable seat from moving transversely of the vehicle seat when it is attached thereto; and a belt for fastening the attachable seat to the vehicle seat, the belt being attached to the side members and adapted to run underneath the vehicle seat when the attachable seat is mounted on the vehicle seat, in a direction transverse to the vehicle seat.

5,553,916

BICYCLE SADDLE WITH A PLURALITY OF SHOCK-ABSORBING SPRINGS AND MEANS FOR ADJUSTING TENSION OF THE SPRINGS

Tsai-Yun Yu, Taichung Hsien, Taiwan, assignor to Selle Tech Industrial Co., Ltd., Taichung Hsien, Taiwan

Continuation-in-part of Ser. No. 306,996, Sep. 16, 1994. This application Mar. 7, 1995, Ser. No. 399,925

Int. Cl.[6] B62J *1/02;1/10*

U.S. Cl. 297—207 **4 Claims**

1. A bicycle saddle including a rigid saddle body formed as a loop member, an opening formed through said saddle body and a periphery defining said opening which is formed with a plurality of spring-retaining holes, said bicycle saddle further including a rigid spring-retaining assembly which has a plurality of spring-retaining holes, and a plurality of elongated coil springs connected between said saddle body and said spring-retaining assembly under tension, each of which has a first end secured to one of said retaining holes in said saddle body and a second end secured to one of said retaining holes in said spring-retaining assembly, characterized by:

said spring-retaining assembly including:

at least one first connecting member having a threaded hold formed therein and at least one of said retaining holes of said spring-retaining assembly;

at least one second connecting member detachable from and independent of said first connecting member having a counterbore formed therethrough and at least one of said retaining holes of said spring-retaining assembly; and

at least one screw member extending through said counterbore

5,553,918

5,553,919

SCISSOR JACK LUMBAR SUPPORT

forward and rearward placement of the vehicle seat within the vehicle, the device comprising:

at least one screw member extending through said counterbore of said second connecting member and engaging said threaded hole of said first connecting member to engage said first and second connecting members.

5,553,917

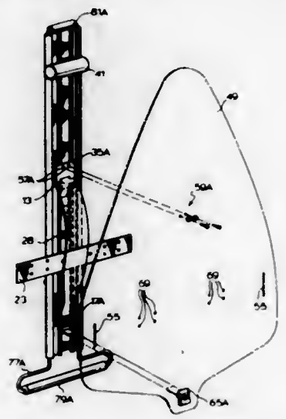
ADJUSTABLE BACKREST

Riyaz Adat, Don Mills; Kevin Mar, Toronto; Craig Pirie, Toronto, and Tim Poupore, Toronto, all of Canada, assignors to Bosaro Biotech Inc., Scarborough, Canada

Continuation-in-part of Ser. No. 102,284, Aug. 5, 1993, Pat. No. 5,344,211. This application Jun. 30, 1994, Ser. No. 268,515

Int. Cl.[6] A47C *7/46*

U.S. Cl. 297—230.14 **33 Claims**



1. An adjustable backrest for supporting a human back comprising:

a) a spine member;

b) a lumbar support member projecting from said spine member;

c) a back pad having upper and lower portions, said upper portion being adapted to support the upper back portion of said human back, and said lower portion resting on said lumbar support member for supporting the lumbar portion of said human back, said back pad being generally triangular with an apex at said upper portion and being flexible for providing free shoulder rotation and upper back twisting;

d) lumbar adjustment means connected to said lumbar support member for adjusting curvature of said lumbar support member relative to said spine member to accommodate different sizes and shapes of said lumbar portion of said human back; and

e) upper back adjustment means connected to said spine portion intermediate said spine portion and said upper portion of said back pad for adjusting curvature of said upper portion to accommodate different sizes and shapes of said upper back portion of said human back.

5,553,918

CONVERTIBLE SEAT STRUCTURE AND THE APPLICATION THEREOF IN PARTICULAR IN A MOTOR VEHICLE

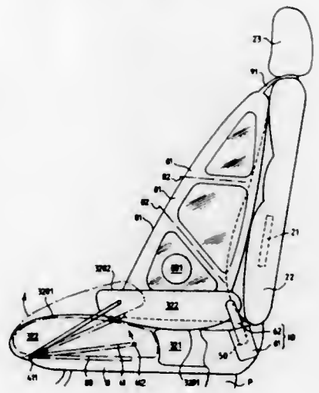
Frédéric L. R. Baret; François Fourrey, both of Montargis, and Nathalie F. Humiliere, Lorris, all of France, assignors to CESA - Compagnie Europeenne de Sieges pour Automobiles, Levallois-Perret Cedex, France

Filed Apr. 5, 1995, Ser. No. 417,063

Claims priority, application France, Apr. 6, 1994, 94 04043

Int. Cl.[6] B60N *2/30*

U.S. Cl. 297—237 **20 Claims**



1. Convertible seat structure comprising in combination: a seat base, a backrest with a frame, a cushion received by said frame, a seat with a frame, a cushion received by said seat frame and having an upper face and a lower face and divided into a fixed rear section close to said backrest and a movable front section, each section having an upper face and a lower face, an articulation means for mounting said front section in such manner that said front section is movable between a normal position in which said front section is into alignement with the rear section and in which said seat structure is capable of receiving an adult passenger and an auxiliary position in which said front section is located above said rear section and in which said seat structure is capable of receiving a child passenger, said articulation means interconnecting said base and movable front section and comprising a linkage having two opposite end portions, at least a first transverse pin connecting one of said end portions to said seat base, at least a second transverse pin connecting the other of said end portions to said movable front section, whereby, said upper face of said front section is facing upwardly when said front section is in said normal position, and said upper face of said front section is facing downwardly when said front section is in said auxiliary position as a result of flipping over said front section by rotation about said two transverse pins and tilting said front section by a rotation about said transverse pin connecting said linkage to said front section, said seat structure further comprising a support means for positioning said front section when it is in said auxiliary position, and a lock comprising two cooperative elements, one of said elements of said lock being interconnected with said movable front section and the other element of said elements of said lock being interconnected with a fixed part of said seat structure, said lock being adapted to immobilize said movable front section when it is in said auxiliary position.

5,553,919

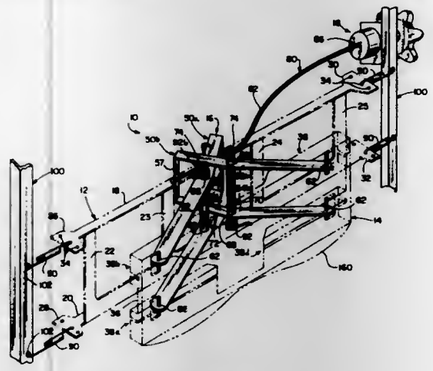
SCISSOR JACK LUMBAR SUPPORT

Michael R. Dennis, Rochester Hill, Mich., assignor to Excellence Lumbar Corporation, Grand Rapids, Mich.

Filed Oct. 11, 1994, Ser. No. 321,961

Int. Cl.[6] A47C *7/46*

U.S. Cl. 297—284.8 **16 Claims**



1. A lumbar support, comprising:

a frame capable of being suspended within a seat back;

a lumbar platform;

a jack extending between said platform and said frame, said jack including a pair of intersecting one piece lever arms each including first and second arm portions meeting at a pivot portion, said pivot portions being pivotally secured to said frame at mutually distinct locations, said first arm portions being pivotally secured to said platform at one end of said lever arm; and

actuator means connected to said second arm portions at another end of said lever arm for actuating said jack to selectively control the relative distance between said frame and said platform, said actuator means being operable from a location remote from said jack.

5,553,920

SEAT CUSHION ADJUSTMENT FOR VEHICLE SEATS

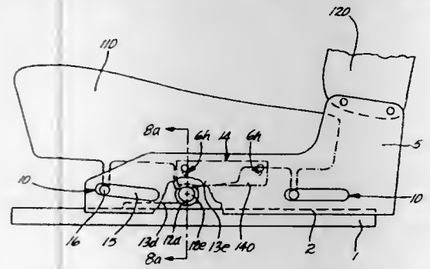
Reinhard Meschkat, Ahorn; Hans Rampel, Ahorn-Schorkendorf, and Thomas Rodde, Coburg, all of Germany, assignors to Brose Fahrzeugteile GmbH & Co. KG, Coburg, Germany

Division of Ser. No. 96,556, Jul. 23, 1993. This application Apr. 6, 1995, Ser. No. 417,979

Claims priority, application Germany, Jul. 24, 1992, 42 24 458.7

Int. Cl.[6] A47C *1/02*

U.S. Cl. 297—344.14 **17 Claims**



10. A seat cushion adjustment device for simultaneously adjusting a seat cushion of a vehicle seat in a vehicle while adjusting forward and rearward placement of the vehicle seat within the vehicle, the device comprising:

a pair of seat frame side parts for attachment to opposite sides of the vehicle seat;

a seat cushion carried by the side parts;

a first adjustment means for adjusting longitudinal placement of the vehicle seat within a vehicle;

a second adjustment means coupled to the first adjustment means by at least one mechanical gear for adjusting at least longitudinal placement of the seat cushion relative to the seat, wherein movement of the second adjustment means is dependent on movement of the first adjustment means, and wherein said first and second adjustment means define a development curve of the seat cushion adjustment; and

separate adjustment means coupled to said second adjustment means for fixing the development curve of the seat cushion adjustment within a restricted area, whereby maximum adjustment positions of the seat cushion are associated with maximum adjustment longitudinal positions of the vehicle seat to avoid exceeding predetermined outer range limits of the seat cushion adjustment, wherein said separate adjustment means includes:

a first slide guide formed in each said side part to facilitate longitudinal only movement of the said seat cushion; and

a second slide guide formed in each said side part to facilitate seat cushion movement selected from the group consisting of longitudinal movement and incline movement.

5,553,921

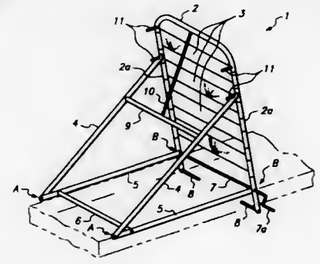
COLLAPSIBLE BACKREST, AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Leonard G. Schenk, 6716 Gulick Rd., Naples, N.Y. 14512

Filed Jun. 19, 1995, Ser. No. 491,728

Int. Cl.[6] A47C *15/00;* **A47D** *1/10*

U.S. Cl. 297—352 **20 Claims**



1. A portable backrest for a bench, comprising:

a panel member;

means, connected to said panel member, for supporting said panel member in a substantially upright position;

means, connected to said panel member and said support means, for selectively clamping said backrest onto a plank of the bench;

means for selectively adjusting an angular position of said panel member relative to the bench;

wherein the bench plank includes an upper surface and two longitudinal sides adjacent either longitudinal edges of the plank upper surface, and wherein said panel member includes a substantially inverted U-shaped frame member having a plurality of longitudinal prongs which are positioned above the bench plank with end portions of said prongs extending substantially adjacent either longitudinal side of the bench plank; and

wherein said clamping means extends between said longitudinal prongs and secures said frame member substantially laterally across the upper surface of the bench plank by squeezing said longitudinal frame prongs towards each other and inwardly against either longitudinal side of the bench plank so that said

frame member is positioned substantially laterally over the upper surface of the bench plank.

a plurality of recognition sensors to detect the footwall rock interface, said sensors being connected via transmission lines to said electronic evaluation and control unit to transmit

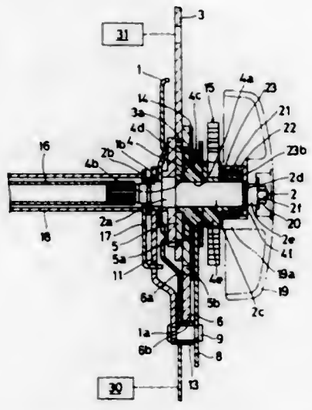
frame member is positioned substantially laterally over the upper surface of the bench plank.

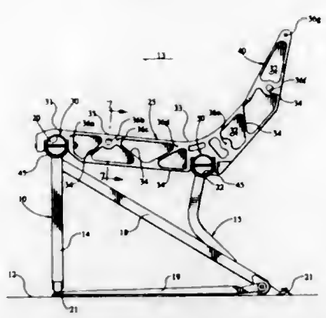
5,553,922

SEAT RECLINING APPARATUS

Yukifumi Yamada, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Jan. 19, 1994, Ser. No. 183,229
Claims priority, application Japan, Jan. 20, 1993, 5-007680
Int. Cl.[6] B60N *2/02*
U.S. Cl. 297—362 **4 Claims**





1. A seat reclining apparatus comprising:
a lower arm for mounting to a seat cushion;
a shaft having a first centric portion rotatably supported at the lower arm, an eccentric portion and a second centric portion;
an upper arm for mounting to a seat-back, said upper arm mounted on the eccentric portion of the shaft, and having a first gear;
a locking arm mounted on the second centric portion of the shaft, engaged with the lower arm, and having a second gear meshed with the first gear, the number of teeth of the second gear differing from the number of teeth of the first gear;
release means for releasing the engagement between the locking arm and the lower arm;
a bushing connected with the lower arm and rotatably supporting the second centric portion of the shaft;
a spiral spring mounted on the bushing and having an inner end connected thereto and an outer end connected to the locking arm for urging the locking arm in one direction;
a handle connected to the shaft for rotating the shaft; and
braking means disposed between the bushing and the handle for restricting rotation of the shaft when the handle is not being manipulated, said braking means being released to permit rotation of the shaft when the handle is manipulated.

5,553,923

BASE FRAME FOR AN AIRCRAFT SEAT

Vahe Bilezikjian, Denton, Tex., assignor to Weber Aircraft, Inc., Gainesville, Tex.

Filed Dec. 8, 1993, Ser. No. 164,064
Int. Cl.[6] A47C *7/02*
U.S. Cl. 297—452.2 **17 Claims**

10. An apparatus for supporting a passenger seat having at least one individual seat for a passenger with a seat bottom portion and a seat back portion, the apparatus comprising: at least one front leg supporting a front horizontal stretcher tube; at least one rear leg supporting a rear horizontal stretcher tube that is spaced apart from the front horizontal stretcher tube, said front and rear horizontal stretcher tubes each having a plurality of aligned apertures therethrough that are spaced-apart along the stretcher tubes; at least two spreaders for maintaining the front and rear horizontal stretcher tubes in spaced-apart, parallel relationship, each of the spreaders having a first portion extending generally horizontally between the front horizontal stretcher tube and the rear horizontal stretcher tube for supporting the seat bottom portion of said at least one individual seat and having a second portion extending generally vertically for at least partially supporting the seat back portion of said at least one individual seat, wherein the first portion of the spreader has a front end with an open curved surface formed thereon and spaced-apart downwardly extending wall sections that generally conform to a segment of the upper surface of the front horizontal stretcher tube and the first portion of the spreader has a rear end with an open curved surface formed thereon and spaced-apart downwardly extending wall sections that generally conform to a segment of the upper surface of the rear horizontal stretcher tube, each of the downwardly extending wall sections having an aperture formed therein, whereby the spreader can be removably positioned over the front and rear horizontal stretcher tubes and such that the apertures in the downwardly extending wall sections align with selected apertures in the front and rear horizontal stretcher tubes; generally U-shaped stirrups having an open curved surface and generally upwardly extending wall sections for engaging a segment of the lower surfaces of the front and rear horizontal stretcher tubes, each of the upwardly extending wall sections having an aperture formed therein, whereby the stirrups can be removably positioned over the front and rear horizontal stretcher tubes, such that the apertures in the upwardly extending wall sections align with selected apertures in the front and rear horizontal stretcher tubes and with the aperture of said downwardly extending wall sections of said spreaders; connector means for connecting the downwardly extending wall sections of the spreaders to the upwardly extending wall sections of the stirrups through selected apertures in the front and rear horizontal stretcher tubes whereby the front and rear horizontal stretcher tubes are releasably clamped between the spreaders and the stirrups and such that the spreaders can be positioned as desired along the front and rear horizontal stretcher tubes.

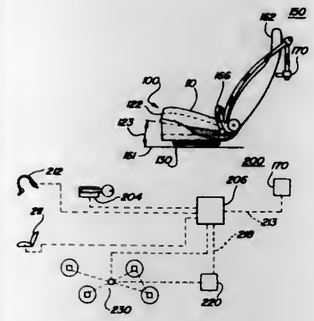
5,553,924

VEHICLE SAFETY SEAT SYSTEM

Alan E. Cantor, Ivyland, Pa.; William H. Muzzy, III, Slidell, La.; Donald K. Eisentraut, Kintnersville, Pa.; Louis A. D'Aulerio, Horsham, Pa., and Gary R. Whitman, Jamison, Pa., assignors to The Board of Trustees of the University of Alabama for its division, The University of Alabama at Birmingham, Birmingham, Ala.

Filed Nov. 15, 1994, Ser. No. 339,859
Int. Cl.[6] A47C *7/18*
U.S. Cl. 297—452.27 **28 Claims**

1. A vehicle safety seat system for protecting an occupant of a vehicle from injury, said vehicle safety seat comprising:



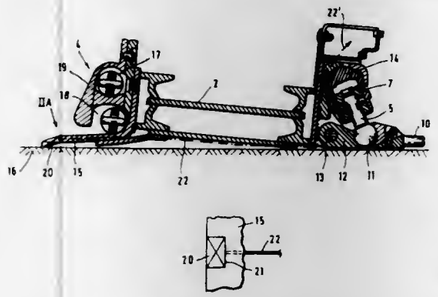
a supporting vehicle seat bottom;
a first foam layer disposed over said supporting vehicle seat bottom and supported by said supporting vehicle seat bottom, said first foam layer configured to support the occupant's buttocks;
a second foam layer disposed over said first foam layer, said second foam layer having a rate sensitive compression characteristic, said rate sensitive compression characteristic comprising a compressive response to a slow application of force and a rigid response to a rapid application of force;
a vehicle off-ground sensor adapted to detect at least one wheel leaving the ground in a crash situation; and
an occupant restraint having a pretensioner device, said pretensioner device adapted to activate in response to said vehicle off-ground sensor, said occupant restraint positioned for retaining the buttocks on said first foam layer upon activation of said pretensioner.

5,553,925

APPARATUS FOR AUTOMATICALLY ADJUSTING THE CUTTING HORIZON OF A MINING EXTRACTION APPARATUS

Gerhard Merten, Lünen, and Thomas Hoelken, Bergkamen, both of Germany, assignors to Westfalia Becorit Industrietechnik GmbH, Germany

Filed Mar. 31, 1995, Ser. No. 414,216
Claims priority, application Germany, Apr. 27, 1994, 44 14 578.0
Int. Cl.[6] E21C *27/34;35/10*
U.S. Cl. 299—1.1 **80 Claims**



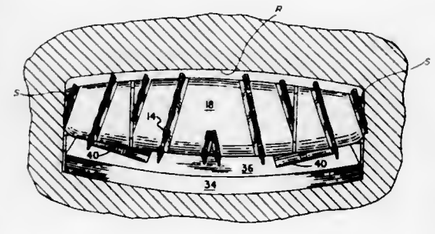
1. An apparatus for adjusting a cutting horizon of a mining machine of the type which is guided along a machine guide positioned at a mining face having a footwall rock interface, the apparatus comprising;
a machine guide;
an electronic evaluation and control unit;
a plurality of recognition sensors to detect the footwall rock interface, said sensors being connected via transmission lines to said electronic evaluation and control unit to transmit measuring signals thereto;
a plurality of hydraulic adjusting cylinders having moveable pistons, said cylinders being connected to said electronic evaluation and control unit to receive an output therefrom and associated with said machine guide to adjust said machine guide relative to said mining face;
wherein said plurality of recognition sensors are disposed distributed along said machine guide, said electronic evaluation and control unit processes said measuring signals to produce said output, and said plurality of hydraulic adjusting cylinders use said output to adjust said machine guide and, thereby, the cutting horizon of the mining machine.

5,553,926

SELF-PROPELLED MINING APPARATUS AND METHOD FOR CUTTING ARCHED OPENING

Jon C. Blackstock, Ironton, Ohio; John A. Baird, Jr., Flatwoods, and Ian T. Carr, Ashland, both of Ky., assignors to Mining Technologies, Inc., Ashland, Ky.

Filed Nov. 22, 1994, Ser. No. 343,694
Int. Cl.[6] E21C *27/24;29/22*
U.S. Cl. 299—10 **18 Claims**



10. An apparatus for mining mineral from a seam comprising:
a frame: and
a rotary drum mounted to said frame for cutting mineral from the seam, said rotary drum having an arched profile and including a midline of greatest diameter gradually tapering toward lateral ends of said drum so as to provide a radius of curvature of between substantially 150–500 inches.

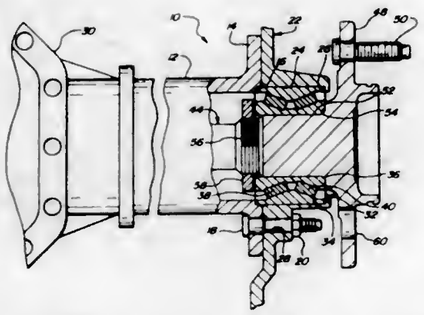
5,553,927

REAR AXLE ASSEMBLY WITH WHEEL END AXIAL RETENTION

Vince Mastrangelo, Ann Arbor, Mich., assignor to The Budd Company, Troy, Mich.

Filed Mar. 2, 1995, Ser. No. 396,481
Int. Cl.[6] B60B *35/12;37/00*
U.S. Cl. 301—124.1 **10 Claims**

7. An axle assembly for a motor vehicle of the type having a rigid drive shaft extending outboard from a differential to a wheel end and incorporating a cartridge bearing assembly having inner and outer races, said axle assembly comprising:
a hollow axle tube extending outboard from said differential and defining a radially extending axle tube flange and an outboard facing bearing assembly retention surface,
a bearing carrier having an inside diameter cylindrical bearing retention surface and an inward projecting flange adapted to engage said bearing outer race, said bearing carrier adapted to be fastened to said axle tube flange, said axle tube bearing retention surface and said bearing carrier flange cooperating to restrain said bearing outer race,



said axle shaft having a wheel mounting flange and a cylindrical bearing journal adjacent said wheel mounting flange and forming a radially extending shoulder at the outboard end of said cylindrical bearing journal surface, said axle shaft further having a threaded portion adjacent the inboard end of said bearing journal surface, and

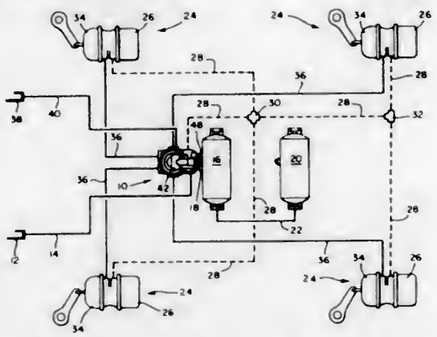
a retention nut adapted to be threaded onto said axle shaft threaded portion for cooperating with said axle shaft shoulder to clamp and restrain said bearing inner race.

5,553,928

SIMPLIFIED FULL-FUNCTION VALVE FOR HEAVY DUTY BRAKE SYSTEMS

James D. Hart, Ortinville, Mich., and Michael J. Moody, Smithville, Mo., assignors to Midland Brake, Inc., Kansas City, Mo.

Filed Mar. 28, 1995, Ser. No. 411,936
Int. Cl.[6] B60T *13/00*
U.S. Cl. 303—7 **16 Claims**



1. A simplified integrated full-function valve for heavy duty brake systems comprising a full-function valve body having individual ports for fluid communication with spring brake chambers, service brake chambers, pressurized-air reservoir and exhaust and for receiving pressurized control and supply air from respective sources thereof;

internal passageways within said valve body in fluid communication with said ports and disposed so as to communicate pressurized control air for service brake control, and supply air to and from the reservoir, the spring brake chambers and the service brake chambers of the air brake system, and to exhaust;

a plurality of valve modules within said full-function valve body and disposed to selectively determine the fluid communications within said internal passageways and ports responsive to the respective positions of the valve modules;

the port and related internal passageways for said spring brake chambers being fluid-communicatively-isolated from said reservoir, said service brake chambers and said control air, whereby the number of said internal passageways within said valve body is minimized;

said plurality of valve modules comprising:

(a) a spring brake valve module within said full-function valve body providing (i) fluid communication from the spring brake port of said valve body to the exhaust port when air pressure at the supply port is less than a first predetermined pressure, and (ii) fluid communication from the supply port of said valve body to the spring brake ports when the air pressure at the supply port is at or higher than said first predetermined pressure;

(b) a relay valve module within said full-function valve body for selectively employing supply air to actuate the service brakes responsive to control-air signals received at the control port of said valve body; and

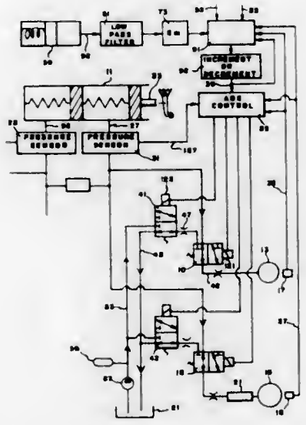
(c) a biased one-way pressure protection valve module within said full-function body providing fluid communication from the supply port to the reservoir port and to the relay valve module at or above a second predetermined air pressure at the supply port.

5,553,929

VARIABLE DUTY CYCLE ANTILOCK BRAKING SYSTEM WITH ACCELEROMETER AND FAIL-SAFE

Robert M. Rivard, West Bloomfield; Michael J. Schneider, Bloomfield Township, both of Mich.; Tamas I. Pattantyus, Elyria, Ohio; Kenneth S. Towers, Granger, Ind., and Jack R. Phipps, Bristol, Tenn., assignors to AlliedSignal Inc., Morristown, N.J.

Division of Ser. No. 353,861, Dec. 12, 1994, Pat. No. 5,487,598. This application Sep. 6, 1995, Ser. No. 524,272
Int. Cl.[6] B60T *8/32*
U.S. Cl. 303—113.1 **11 Claims**



1. A wheeled vehicle braking system selectively operable in one of three braking modes, a normal braking mode (**119**) where braking force is proportional to an operator brake pedal pressure, an enhanced anti-skid braking mode (**69**) where braking force may be maintained at a maximum nonskid level, and a conventional anti-skid braking mode (**71**) where braking force follows a cyclic pattern of fluid pressure bleed and build, the system comprising:

an operator controlled source of pressurized hydraulic fluid (**11**);

a hydraulically actuated wheel rotation braking device (**13, 15**) which responds to applied hydraulic pressure to apply a braking force to a wheel of the vehicle to arrest wheel motion;

means (**17, 19**) for determining the speed of said wheel;

means (**59**) operable independently of any vehicle wheels for determining vehicle deceleration;

means (**61, 73, 87, 91, 92**) responsive to the means for determining vehicle deceleration for computing a wheel speed reference;

means (**33, 67**) for identifying a wheel skid condition, and for invoking an anti-skid braking mode when a wheel skid condition is identified;

means (**63**) for confirming the accuracy of the determined vehicle deceleration; and

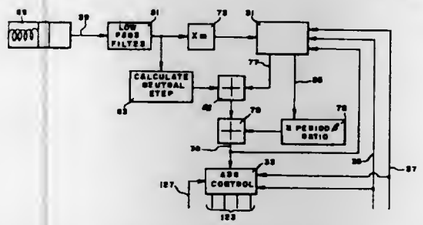
means responsive to the means for confirming for substituting the conventional anti-skid braking mode (**71**) for the enhanced anti-skid braking mode (**69**) in the event the determined vehicle deceleration is determined to be inaccurate.

5,553,930

VARIABLE DUTY CYCLE ANTILOCK BRAKING SYSTEM WITH ACCELEROMETER AND FAIL-SAFE

Robert M. Rivard, West Bloomfield; Michael J. Schneider, Bloomfield Township, both of Mich.; Tamas I. Pattantyus, Elyria, Ohio; Kenneth S. Towers, Granger, Ind., and Jack R. Phipps, Bristol, Tenn., assignors to AlliedSignal Inc., Morristown, N.J.

Division of Ser. No. 353,861, Dec. 12, 1994, Pat. No. 5,487,598. This application Sep. 6, 1995, Ser. No. 524,271
Int. Cl.[6] B60T *8/32*
U.S. Cl. 303—174 **3 Claims**



1. In the control of a vehicle anti-lock braking system, the method of searching for an optimum wheel speed reference (**39**) comprising the steps of:

determining (**119**) on which side of the peak of a mu-slip curve the vehicle is operating by repeatedly computing a wheel speed reference to determining the sign of the ratio of the most recent change in measured acceleration to the most recent change in computed wheel slip, and updating a previously computed wheel speed reference by incrementing (**103**) that previous reference by the sum of a first amount and a second amount in the event the sign of the determined ratio is positive;

incrementing (**101**) said previously computed wheel speed reference by the difference between the first amount and the second amount in the event the sign of the determined ratio is negative;

incrementing (**88**) said wheel speed reference by a value (**79**) which changes said wheel speed reference toward a peak (**75**) of the m-slip curve thereby calculating an updated wheel speed reference, and

utilizing (**33**) said updated wheel speed reference to control appropriately the braking system.

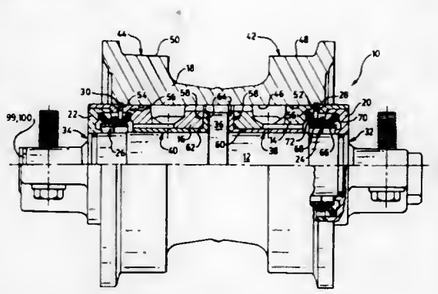
5,553,931

TRACK ROLLER ASSEMBLY

Mark S. Diekevers, East Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Dec. 15, 1994, Ser. No. 356,943
Int. Cl.[6] B62D *55/15*
U.S. Cl. 305—100 **15 Claims**

1. A track roller assembly for guiding the track of a track-type machine, said roller assembly comprising:



a central supporting shaft having first and second end portions, a central flange portion, and first and second bushing supporting portions positioned respectively between said central flange portion and said first and second end portions;

first and second bushings positioned on respective first and second bushing supporting portions of said supporting shaft;

a roller shell having first and second tread portions and an internal bore, said shaft and said bushings being adapted to fit within said bore,

first and second end caps positioned on respective first and second shaft end portions, said end caps substantially closing said internal bore;

first and second seal assemblies positioned between respective first and second bushings and said end caps; and

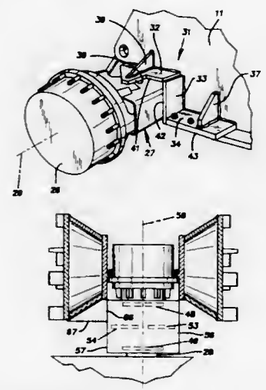
first and second split retaining rings adapted to secure said roller shell in a fixed position with respect to said bushings and said shaft.

5,553,932

WHEEL CLEANING SYSTEM

Ernie Freeman, 1460 W. 130th St., Brunswick, Ohio 44212

Continuation-in-part of Ser. No. 274,837, Jul. 14, 1994, Pat. No. 5,451,100, which is a continuation of Ser. No. 942,433, Sep. 9, 1992, Pat. No. 5,330,260. This application Aug. 2, 1995, Ser. No. 510,461
Int. Cl.[6] B62D *55/088*
U.S. Cl. 305—107 **2 Claims**



1. A self-propelled multi-wheeled compactor for refuse comprising a chassis, a pair of spaced axles on the chassis, a set of wheels rotatably mounted on the axles, an engine and a drive train on the chassis for driving at least one of said wheels for rotation on an axle, one axle having a pair of spaced wheels, said spaced wheels each having an inboard side facing towards the chassis, each of said spaced wheels having a cutter blade mounted on its inboard side at a location that revolves in a path around its associated axle,

a stationary cutter blade associated with each of said spaced wheels rigidly mounted with respect to the associated axle at a location generally tangent to the path of the revolving cutter blade, the rotational and stationary cutter blades having cooperating cutting edges that operate to shear refuse that tends to be entrained by the associated wheel and wrapped around the associated axle, at least a portion of the cutting edge of the revolving cutter blade being spaced from the respective wheel a distance that is substantially greater than ten times the operating clearance between the cutting edges, each stationary blade having a cross-cut portion generally parallel to the associated axle and a radial cut portion lying in a plane generally perpendicular to the axle, said rotational cutter blade having cutting edge portions complimentary to both of said stationary cutting blade edge portions.

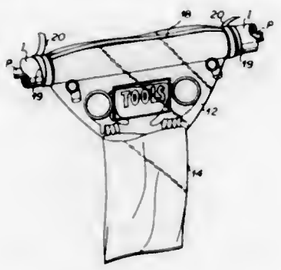
2. A self-propelled multi-wheeled compactor for refuse comprising a chassis, a pair of spaced axles on the chassis, a set of wheels rotatably mounted on the axles, an engine and a drive train on the chassis for driving at least one of said wheels for rotation on an axle, one axle having a pair of spaced wheels, said spaced wheels each having an inboard side facing towards the chassis, each of said spaced wheels having a cutter blade mounted on its inboard side at a location that revolves in a path around its associated axle, a stationary cutter blade associated with each of said spaced wheels rigidly mounted with respect to the associated axle at a location generally tangent to the path of the revolving cutter blade, the rotational and stationary cutter blades having cooperating cutting edges that operate to shear refuse that tends to be entrained by the associated wheel and wrapped around the associated axle, at least a portion of the cutting edge of the revolving cutter blade being spaced from the respective wheel a distance that is substantially greater than ten times the operating clearance between the cutting edges, each stationary blade having a pair of parallel cutting edges, each of said parallel cutting edges being arranged to cooperate with the rotating cutter blade at an angular position of the wheel remote from the angular position of the wheel at which the other parallel cutting edge cooperates with the rotating cutter blade.

5,553,933

SAFETY GLOVE BAG AND METHOD OF MAKING SAME

Kurt D. Ross, Atlanta, Ga., assignor to Grayling Industries, Inc., Alpharetta, Ga.

Filed Aug. 19, 1994, Ser. No. 293,187
Int. Cl.[6] B08B *15/00*
U.S. Cl. 312—1 **7 Claims**



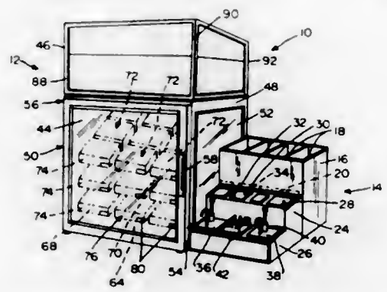
1. Apparatus for use in removing hazardous material from an elongated pipe, said apparatus having an upper work section comprised of a sheet of flexible material of generally rectangular shape and having a generally centrally located opening, a lower debris collection and disposal bag that depends from said upper work section about said opening, and gloves mounted to said upper work section, whereby upon wrapping and securing the upper work section about a pipe with opposite ends thereof drawn upwardly thereto aside the opening the work section is configured into the shape of a funnel for funneling debris worked from the pipe down into the debris collection and disposal bag.

5,553,934

HOT COUNTERTOP SELF-SERVICE FOOD STATION

Cindie M. Wells, McFarland; Scott A. Halverson, Poynette, and John A. Jonoyic, Madison, all of Wis., assignors to Kraft Foods, Inc., Northfield, Ill.

Continuation of Ser. No. 50,689, Apr. 20, 1993, Pat. No. 5,464,279, which is a division of Ser. No. 691,255, Apr. 25, 1991, Pat. No. 5,203,255. This application Jun. 6, 1995, Ser. No. 466,848
Int. Cl.[6] A21B *1/00;* **A23L** *1/00;* **A47B** *77/08;* **A47F** *3/14*
U.S. Cl. 312—128 **13 Claims**



1. A combination countertop self-service condiment server and adjacent hot food countertop self-service display station, comprising:

a countertop self-service condiment server having a tiered body, said tiered body being of a stepped configuration defining an upper tier area and a lower tier area for receiving condiments;

a self-service countertop display oven including an oven body defining a generally rectangular heated oven compartment having a reclosable hinged front door panel for covering a generally rectangular front opening, means for supplying a flow of heated forced air into said oven compartment, thermostatic temperature control means connected to said hot air supply for maintaining the temperature of said oven compartment at a generally constant range of temperatures, a rack assembly adapted to be placed in said oven compartment and effective to sub-divide said compartment into a gravity feed, self-facing array of columns and rows of product packages disposed at said front opening, and a stop member which prevents packages placed in said rack from sliding forwardly out of said array of columns and rows at said front opening; and

said countertop self-service condiment server is immediately adjacent said self-service countertop display oven.

5,553,935

CABINET AND SUPPORTING FRAME FOR LIQUID DISPENSING SYSTEM

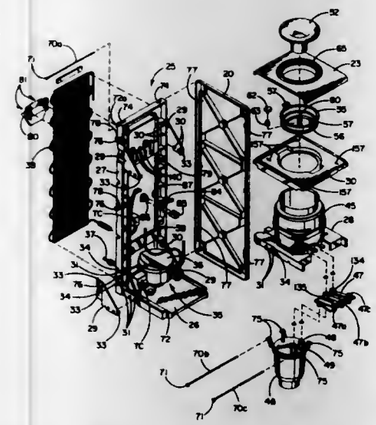
Lowell C. Burnham, Freeport; Robin R. Saar, Shannon, both of Ill.; Knute Alstad, Sun Prairie, and David W. Wendt, Monona, both of Wis., assignors to Elkay Manufacturing Company, Oak Brook, Ill.

Filed Oct. 20, 1993, Ser. No. 139,469
Int. Cl.[6] A47B *47/00*
U.S. Cl. 312—265.3 **9 Claims**

1. A cabinet including a liquid reservoir for a dispensing device comprising, in combination,

a base, a top support, a back member having lower and upper ends, and a front panel having lower and upper ends,

means for securing the base and top support to the lower and upper ends, respectively, of the back member and front panel to form a substantially rigid, open sided, rectangular structure, wherein the means for securing the base to the lower end of the front panel and the means for securing the top support to the upper ends of the back member and the front panel each



includes a slidably removable cross pin dimensioned for insertion in openings formed at the respective ends of said rectangular structure,

said back member and said front panel each having side edges and first connecting means disposed on said side edges,

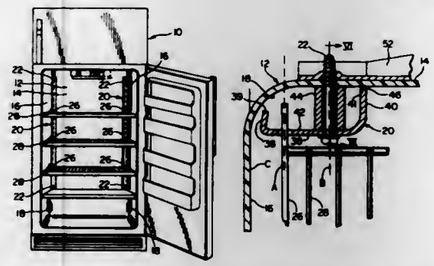
and at least one side panel having second connecting means disposed and dimensioned for cooperation with said first connecting means for detachably connecting said side panel to said structure to close at least one of said open sides.

5,553,936

SHELF LADDER FOR REFRIGERATOR OR FREEZER

James F. Dasher, Evansville, and Brian P. Kelley, Newburgh, both of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jul. 26, 1993, Ser. No. 96,285
Int. Cl.[6] A47B *96/04*
U.S. Cl. 312—408 **4 Claims**



1. An appliance comprising: a liner including a back wall, side walls, and rounded corners connecting said back wall to said side walls, said rounded corners defining 90° arc angle areas; and

a ladder bracket including:

a linear portion having a first longitudinal edge, a second longitudinal edge and a vertical centerline, said linear portion positioned substantially parallel to said back wall,

a leg portion extending from said first longitudinal edge of said linear portion toward said back wall, said leg portion being substantially perpendicular to said linear portion, said leg portion having a longitudinal terminal edge wherein said leg portion has a width measured from said first longitudinal edge to said longitudinal terminal edge,

a hook portion extending from said second longitudinal edge of said linear portion toward said back wall a distance less than said width of said leg portion, said hook portion having a longitudinal terminal edge portion being received in said 90° arc angle areas of one of said rounded corners,

a plurality of slots arranged in said linear portion laterally offset from said vertical centerline toward said hook portion,

a plurality of apertures arranged in said linear portion laterally offset from said vertical centerline toward said leg portion,

a plurality of spacer portion extending from said linear portion toward said back wall a distance greater than said width of said leg portion, said spacer portions being positioned adjacent said plurality of apertures; and

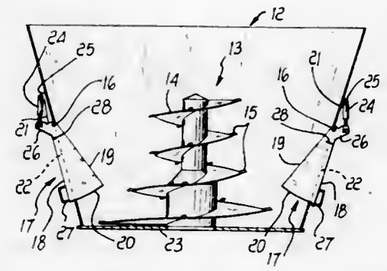
a plurality of fasteners extending through said apertures and spacers for securing said ladder bracket to said back wall.

5,553,937

TRUCK FOR SHREDDING AND MIXING PRODUCTS FOR ZOOTECHNICAL USE INCLUDING IMPROVED CUTTERS

Tiziano Faccia, Viale dell'Industria 3, 35023 Bagnoli Di Sopra, Italy

Filed Sep. 20, 1995, Ser. No. 530,850
Claims priority, application Italy, Sep. 28, 1994, PD94U0097
Int. Cl.[6] B01F *7/24;15/00*
U.S. Cl. 366—302 **9 Claims**



1. A truck for shredding and mixing products for zootechnical use, comprising:

a self-propelled or towed wheeled chassis;

a container being supported on said chassis and being substantially shaped as an inverted frustum defining a peripherical wall and a bottom, said container being open at a top of the container;

a rotating scroll located in said container, said scroll having a vertical axis and an external profile that lies on an ideal substantially conical surface;

shredding cutters being fitted at said profile;

vertically arranged countercutters each of which are shaped substantially as a disk sector, said countercutters each having a respective pivoted vertex which is pivoted to the wall of said container in substantially radial positions; and

slots provided in said wall, said countercutters being insertable and extractable through said slots in said container;

said countercutters being arranged so that each said pivoted vertex is in a substantially median region of the wall and so that each one of said countercutters extend downwards from said pivoted vertex at a lower part of said wall.

5,553,938

IMPROVED TRUCK SHREDDING AND MIXING PRODUCTS FOR ZOO TECHNICAL USE INCLUDING AUTOMATICALLY ACTIVATED COUNTER CUTTERS

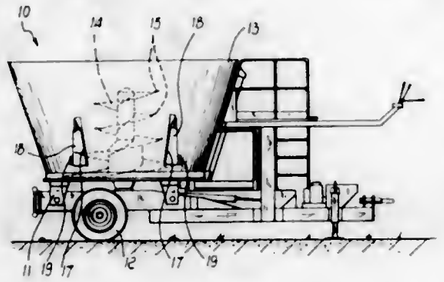
Tiziano Faccia, Viale dell'Industria 3, 35023 Bagnoli di Sopra (Prov. of Padova), Italy

Filed Sep. 20, 1995, Ser. No. 530,852

Claims priority, application Italy, Sep. 28, 1994, PD94A0164

Int. Cl.[6] B01F *7/4;15/00*

U.S. Cl. 366—302 **12 Claims**



1. A truck for shredding and mixing products for zootechnical use, comprising:

a self-propelled or towed wheeled chassis;

a frustum-shaped container that tapers downwardly, said container being open at the top and being supported on said chassis;

a scroll rotatable about a vertical axis and housed in said container, said scroll having an external profile lying on a substantially conical ideal surface;

shredding cutters fitted at said profile;

countercutters, shaped substantially as a disk sector, pivoted in substantially radial positions to the wall of said container with vertices thereof in a vertical arrangement, said countercutters being insertable and extractable through specifically provided slots in the wall of said container; and

an automatic actuation and control device for positioning said countercutters according to work variables;

said automatic actuation and control device comprising:

movement means for moving said countercutters; and

an electronic control unit that controls said movement means in response to said work variables.

5,553,939

METHOD AND DEVICE FOR CALIBRATING AN OPTICAL PYROMETER AND ASSOCIATED REFERENCE WAFERS

Jean-Marie Dilhac, Toulouse; Christian Ganibal, Saint-Orens, and Bernard Rousset, Toulouse, all of France, assignors to Commonaute Economique Europeenne (CEE), Luxemborg, Luxembourg

PCT No. PCT/FR92/00406, § 371 Date Oct. 28, 1993, § 102(e) Date Oct. 28, 1993, PCT Pub. No. WO92/19943, PCT Pub. Date Nov. 12, 1992

PCT Filed May 4, 1992, Ser. No. 140,157

Claims priority, application Luxembourg, May 2, 1991, 87933

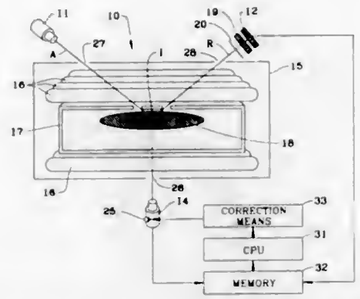
Int. Cl.[6] G01K *15/00*

U.S. Cl. 374—1 **15 Claims**

1. A method of calibrating an optical pyrometer comprising:

a) placing in an oven a wafer having a reference region on at least part of one of its faces, referred to as the active face, the reference region having an electromagnetic wave reflection discontinuity at a known temperature value,

b) transmitting an electromagnetic wave in the direction of the reference region,



c) measuring and recording the intensity of the wave reflected by the reference region,

d) measuring and recording the temperature of the reference region by means of the optical pyrometer to be calibrated,

e) increasing the temperature of the oven,

f) determining the moment when a discontinuity in the reflection of the electromagnetic wave is observed,

g) registering the temperature value measured by the pyrometer at this moment as a measured temperature value,

h) comparing the measured temperature value with the known temperature value,

i) causing the measured temperature value and the known temperature value coincide.

7. A device for calibrating an optical pyrometer including an oven for giving an electrical temperature signal, comprising:

a wafer (**18**) having a reference region having an electromagnetic wave reflection discontinuity at a known temperature value (t_r) and suitable for placement in said oven so that its reference region is on the axis of sight of the pyrometer to be calibrated,

an electromagnetic wave transmitter (**11**) for transmitting an electromagnetic wave in the direction of the reference region of the wafer,

an electromagnetic wave sensor (**12**) arranged for receiving the radiation reflected by the reference region and suitable for giving an electrical signal proportional to the intensity of this reflected radiation,

signal processing means, for receiving electrical signals from said electromagnetic wave sensor and from said pyrometer to be calibrated for detecting the moment of appearance of a discontinuity in the signal from said electromagnetic wave sensor and for generating a calibration temperature signal, representing the calibration temperature value measured by said pyrometer at this moment,

means for comparing the calibration temperature signal and a reference signal representing the known temperature value (t_r) corresponding to said reflection discontinuity for generating a correction signal representing the difference between said signals, and

means for correcting the pyrometer and for receiving the correction signal and for applying said correction signal to said pyrometer and thereby causing the calibration temperature value and known temperature value (t_r) to coincide.

5,553,940

APPARATUS FOR AND METHOD OF DETECTING WATER TEMPERATURE FOR FISHING

Susumu Nishihara, 1862, Aza Iwataki, Iwataki-cho, Yosa-gun, Kyoto, Japan

Filed Mar. 8, 1994, Ser. No. 207,463

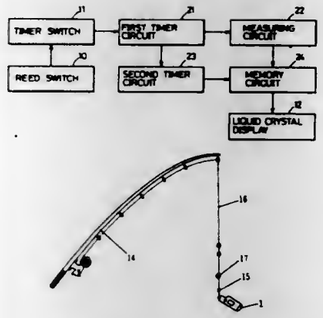
Int. Cl.[6] G01K *1/02;13/00;1/00;* **A01K** *91/06*

U.S. Cl. 374—136 **11 Claims**

1. An apparatus for detecting a water temperature comprising:

a water temperature gauge including,

water temperature detecting means for detecting a water temperature,



a control means for controlling said water temperature detecting means to operate for a prescribed temperature measuring time after a lapse of a desired time, and

a means for displaying said water temperature being detected by operation of said water temperature detecting means; said apparatus further comprising,

a means for vertically moving said water temperature gauge between a position on a water surface and an underwater position of a desired depth.

9. A method of detecting a water temperature, comprising:

a step of submerging a water temperature gauge for detecting a water temperature to an underwater position of a desired depth;

a step of measuring a water temperature in said submerged position including a step of controlling said water temperature gauge to measure said water temperature for a prescribed temperature measuring time after a lapse of a desired time;

a step of displaying said water temperature on said water temperature gauge as it is being measured; and

a step of lifting up said submerged water temperature gauge to a position on a water surface.

5,553,941

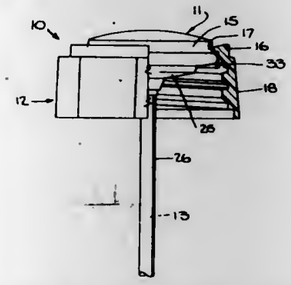
THERMOMETER AND BOTTLE CAP ASSEMBLY

Gil Cope, New York, N.Y., assignor to Safety-Temp Ltd., Santa Monica, Calif.

Filed Feb. 18, 1994, Ser. No. 198,824

Int. Cl.[6] A61J *9/02;9/04;* **G01K** *1/08*

U.S. Cl. 374—150 **22 Claims**



1. A thermometer and bottle cap assembly wherein said thermometer is of the type comprising a metallic sheathed temperature responsive probe joined to a dial indicator, the latter being disposed within a disc-like housing, said disc-like housing having a first wall to which is joined a stem for housing said probe, a window spaced from said first wall, and a circumferential wall joining said window to said first wall, said circumferential wall having a perimetrical protuberance, said disc-like housing being retained within the crown of said bottle cap viewable through a central opening in the top of said crown, said cap being provided with an internally threaded skirt extending away from said disc-like housing for threaded engagement with external threads about the neck of a bottle, said probe extending from substantially the center of said disc-like housing for disposition substantially along the longitudinal axis of said bottle, said cap further having commencing at the cap crown, said central opening bounded by a radially inwardly directed flange, an internal radially outwardly directed circumferential channel accommodating and embracing said circumferential wall protuberance with a substantially snug fit, and a circular top wall joined at its perimeter to said skirt and extending across the diameter of said skirt below said disc-like housing with said probe passing through the center of said top wall, said assembly being constructed for safe use in a microwave oven.

5,553,942

LAMINATE FOR PRODUCING PACKAGING CONTAINERS

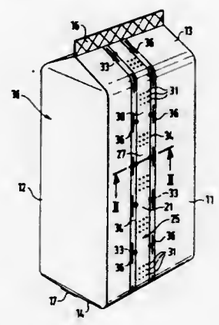
Klaus Domke, Ditzingen; Herbert Stotkiewitz, Bietigheim-Bissingen; Guenther Voegele, Schoenaich; Bernd Neugart, Leutenbach; Mathias Duelfer, Remshalden; Jelco Klimaschewski, Fellbach; Daniel Schulz, Baden-Baden, and Michael Eidher, Rudersberg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 13, 1995, Ser. No. 403,524

Claims priority, application Germany, Mar. 11, 1994, 44 08 244.4

Int. Cl.[6] B65D *33/01*

U.S. Cl. 383—101 **20 Claims**



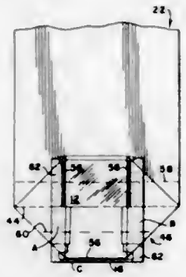
1. A laminate (**20**) for producing packaging containers (**10**), comprising a multilayer packaging material having at least one flexible outer layer (**22**), and having an inner layer (**21**) in contact with a product in the package, wherein the inner and at least one outer layer (**21**, **22**), are firmly joined together along one surface of each layer, except in a linear channel (**27**) in which a portion of the inner layer (**21**) loosely covers a portion of said at least one outer layer and openings (**31**, **36**) are disposed in the channel (**27**) in each of the two layers (**21**, **22**), and a flexible valve strip (**30**) is disposed in the channel (**27**), covers the openings (**31**) of the inner layer (**21**) and operates as a one-way valve, said flexible valve strip (**30**) includes openings (**38**) which are offset from the opening (**31**) in the inner layer and the openings (**36**) in the at least one outer layer.

5,553,943

MULTIPLE PLY PLASTIC LINED BAG WITH SATCHEL BOTTOM

Leland B. Cook, and Ronald G. Thrall, both of Vancouver, Wash., assignors to Bemis Company, Inc., Minneapolis, Minn.

Filed Dec. 23, 1994, Ser. No. 363,515
Int. Cl.° B65D *30/26;30/14*
U.S. Cl. 383—113 **22 Claims**



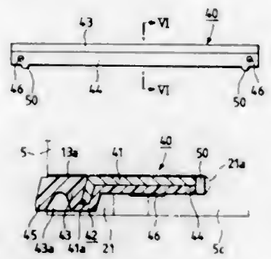
1. A tubular non-gussetted multiple ply paper bag with seamless plastic inner pouch, the bag having a non-satchel open end and a closed satchel bottom end, said closed satchel bottom end comprising a non-slitted folded paper ply and at least one slitted folded paper ply folded to non-adhesively, and foldably, retain a free bottom end of said plastic inner pouch, said plastic inner pouch being permanently heat sealed to itself and sealingly close said free bottom end, said plastic inner pouch further being laterally offset from said paper plies along marginal edges thereof, said paper plies being stepped only in a direction lengthwise of the bag, each ply having an adhesively bonded seam, the seams being laterally offset from each other, whereby said bag is capable of receiving a product therein and forming a rectangular bag bottom at said closed satchel bottom end, and said plastic pouch being heat sealable at said open end for fully enclosing a product therein.

5,553,944

UNDER SEAL FOR LINEAR GUIDE APPARATUS

Nobuyuki Osawa, and Shizuo Kashiwagi, both of Gunma, Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Apr. 20, 1995, Ser. No. 425,485
Claims priority, application Japan, Apr. 27, 1994, 6-090219
Int. Cl.° F16C *29/06*
U.S. Cl. 384—15 **8 Claims**



1. A linear guide apparatus comprising:

a guide rail extending axially and including a first rolling element groove formed on a side surface thereof;

a slider fitted with the guide rail and including a sleeve portion and a second rolling element groove formed on an inner side surface of the sleeve portion, the second rolling element groove of the slider confronting the first rolling element groove of the guide rail, wherein the sleeve portion includes a stepped portion in a lower portion thereof; and

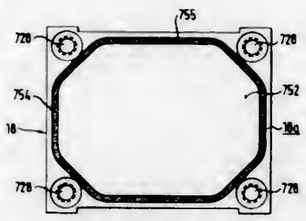
an under seal attached to the lower portion of the sleeve portion of the slider and projected from the inner side surface of the sleeve portion to slidingly contact with a surface of the guide rail, wherein the under seal is received by the stepped portion and comprises a core bar abutted against the stepped portion and a resilient body fixed integrally to the core bar, and wherein the under seal includes a first projection arranged at an outer edge portion of a width of the under seal, the width being orthogonal to an axial direction of the under seal, wherein the first projection is molded integrally with the resilient body by projecting an outer edge of the resilient body in substantially semicircular form, the first projection having resiliency for pressing an inner edge portion of the under seal onto the guide rail.

5,553,945

LINEAR GUIDING APPARATUS FOR GUIDING AN OBJECT

Werner Blaurock, Niederwerrn; Rudolf Schlereth, Frauenroth; Ulrich Wehrhahn, Würzburg; Ernst Albert, Sand/Main, and Günter Blaurock, Niederwerrn, all of Germany, assignors to Deutsche Star GmbH, Schweinfurt, Germany

PCT No. PCT/EP93/01443, § 371 Date Nov. 30, 1994, § 102(e) Date Nov. 30, 1994, PCT Pub. No. WO93/25823, PCT Pub. Date Dec. 23, 1993
PCT Filed Jun. 8, 1993, Ser. No. 351,261
Claims priority, application Germany, Jun. 12, 1992, 42 19 340.0
Int. Cl.° F16C *29/06*
U.S. Cl. 384—45 **58 Claims**



1. A linear guiding apparatus for guiding an object, comprising a rail system and a first partial group of object-guiding rail runner elements—hereinafter referred to as guiding rail runner elements—primarily responsible for the guiding precision of the object, which first partial group comprises at least one group member, said guiding rail runner elements being guided in a moving direction along associated roller paths of said rail system by rolling member loops mounted on said guiding rail runner elements,

a second partial group of damping elements guided along said rail system, connected with said object and being primarily responsible for the damping of vibrations directed transversely to the moving direction being additionally provided between said object and said rail system, which second partial group comprises at least one group member, said damping elements differing from said guiding rail runner elements with respect to the internal structure and/or with respect to the mounting relationship between said object and said rail system, and with the further features

a. at least one damping element—hereinafter referred to as damping rail runner element—is also guided on roller paths of said rail system by rolling member loops mounted on said rail runner element, which roller paths are also associated with said first partial group of guiding rail runner elements, and

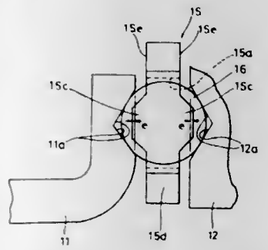
b. the damping characteristics of said damping rail runner element are determined by transverse load transmitting connection means provided in a transverse load transmission path between said rolling members of the respective damping rail runner element and said object.

5,553,946

CAGE AND ROLLING GUIDE UNIT ON WHICH IT IS EQUIPPED

Norimasa Agari, Gifu-ken, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 90,263, Jul. 13, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 483,860
Claims priority, application Japan, Jul. 31, 1992, 4-059164 U
Int. Cl.° F16C *29/02*
U.S. Cl. 384—49 **5 Claims**



1. A rolling guide unit for finite linear motion, said rolling guide unit comprising:

a bed having a first track groove extending in the lengthwise direction of its side surface;

a table having an inverted U-shaped cross-section, said table being positioned on said bed and performing finite linear motion with respect to said bed, said table having a second track groove formed therein at a location in opposition to said first track groove;

a substantially plate-shaped cage in which a plurality of openings are arranged in a row, said cage having a linear shape and being positioned between said first and second track grooves;

rolling elements inserted into each of said openings that roll over said first and second track grooves;

wherein said cage is formed from plastic into a single structure and has projections facing said openings and located between first and second track grooves, said projections protruding from the primary surface of said cage continuously between adjacent openings and extending in the lengthwise direction, said projections being formed on said primary surface on the front and back of said cage;

wherein the width between adjacent ones of said projections facing said openings is smaller than the diameter of said rolling elements to prevent said rolling elements from falling out of said openings, and the width between said adjacent ones of said projections alternates between large and small widths; and,

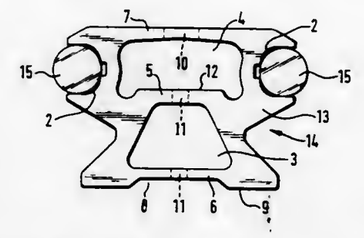
wherein said primary surface is positioned to not make contact with said bed and said table over the entire surface thereof.

5,553,947

GUIDE RAIL FOR RAILBORNE LOAD CARRIERS

Frank Scheib, Neunkirchen; Michael Brunk, Schwalbach, and Rainer Kleber, Sulzbach, all of Germany, assignors to INA Walzlager Schaeffler KG, Germany

PCT No. PCT/EP94/00962, § 371 Date Nov. 6, 1995, § 102(e) Date Nov. 6, 1995, PCT Pub. No. WO94/24444, PCT Pub. Date Oct. 27, 1994
PCT Filed Mar. 26, 1994, Ser. No. 549,696
Claims priority, application Germany, Apr. 21, 1993, 43 13 074.7
Int. Cl.° F16C *29/00;* **B61B** *3/00*
U.S. Cl. 384—55 **8 Claims**



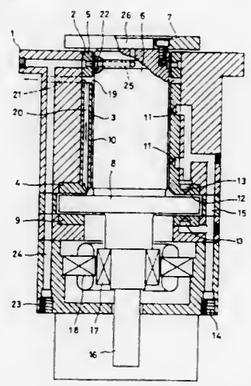
1. A guide rail for railborne load carriers comprising a support (1, 13) made as an extruded hollow profile and at least one running rail (15) arranged in a groove (2) of the support (1, 13), a cavity of the support (1, 13) being divided into a lower chamber (3) and an upper chamber (4) by a cross-web (5), while an outer wall (6) of the lower chamber (3) extends parallel to the cross-web (5), characterized in that the upper chamber (4) adjacent to the groove (2) of the support (1, 13) is closed by a further outer wall (7) of the support (1, 13), which wall (7) extends parallel to the cross-web (5).

5,553,948

STATIC PRESSURE GAS SPINDLE ASSEMBLY

Norio Ito, Kuwana, Japan, assignor to NTN Corporation, Osaka, Japan

Filed Feb. 1, 1995, Ser. No. 382,409
Claims priority, application Japan, Feb. 3, 1994, 6-011500
Int. Cl.° F16C *32/06*
U.S. Cl. 384—107 **1 Claim**



1. A static pressure gas bearing spindle assembly comprising a housing having a top-open sleeve mounting hole, a bearing sleeve and a chucking sleeve mounted in said sleeve mounting hole, a spindle inserted through said bearing sleeve and said chucking sleeve, a table secured to a top end of said spindle, a thrust plate

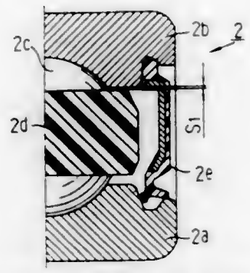
secured to a bottom end of said spindle, a bearing plate provided under and opposite to said thrust plate, said bearing sleeve having a flange at bottom end thereof, said flange and said bearing plate having nozzles through which compressed gas is jetted into thrust bearing gaps formed between said thrust plate and said flange and between said thrust plate and said bearing plate, said bearing sleeve being formed with a nozzle through which compressed gas is jetted into a radial bearing gap formed between said spindle and said bearing sleeve, said chucking sleeve being formed with a suction passage which communicates with a workpiece suction recess formed in said table, characterized in that said chucking sleeve is disposed in said sleeve mounting hole at top thereof, that said bearing sleeve is provided under said chucking sleeve with an annular gas exhaust space defined between said chucking sleeve and said bearing sleeve, and that said housing is formed with a gas exhaust passage that communicates with said gas exhaust space.

5,553,949

ROLLING CONTACT BEARING

Masao Fukuwaka; Tadaaki Maeda, and Takahiro Koremoto, all of Iwata, Japan, assignors to NTN Corporation, Osaka, Japan

Filed May 10, 1995, Ser. No. 438,336
Claims priority, application Japan, May 11, 1994, 6-097076
Int. Cl.[6] F16C *33/38;33/66*
U.S. Cl. 384—523 **9 Claims**



1. A rolling contact bearing comprising an outer ring, an inner ring, a plurality of rolling elements held between said outer ring and said inner ring, and a cage for retaining said rolling elements,

wherein a slight clearance is formed between an inner surface of said outer ring and an outer surface of said cage or between an outer surface of said inner ring and an inner surface of said cage,

wherein a size of said slight clearance is such that a film of lubricant is formed therein and such that the cage receives an advancing force or a braking force from one of said outer ring and said inner ring opposed to said cage with said slight clearance when the rolling contact bearing is rotated, thereby said cage contacts said rolling elements.

5,553,950

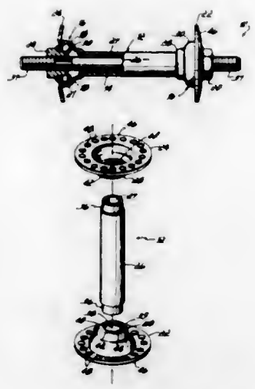
BICYCLE HUB BODY CONSTRUCTION

Carlton P. Pawsat, and William F. Lowe, both of Maysville, Ky., assignors to Wald Manufacturing Co., Inc., Maysville, Ky.

Filed Sep. 23, 1994, Ser. No. 311,608
Int. Cl.[6] F16C *13/00;* **B60B** *27/00*
U.S. Cl. 384—545 **7 Claims**

1. A bicycle hub body for the front hub assembly of a bicycle wheel comprising:

two hub flanges each having an opening therethrough, each flange opening having a spline structure formed around its circumference including alternating teeth and grooves extending radially inwardly with respect to the opening;



a tubular center section extending between the flanges to support and maintain the flanges spaced apart, the center section including ductile ends extending into the flange openings, each ductile end being outwardly pressed into intimate surface-to-surface contact with the spline structure of a respective hub flange and deformed against the flange spline structure and so as to have a cooperating spline structure including radially outwardly extending grooves and teeth aligned with the teeth and grooves, respectively, of the corresponding bore spline structure;

whereby to provide a joint which secures the flanges to the center section and prevents rotation of the flanges with respect to the center section.

5,553,951

HEATED PLATEN AND ROLLERS TO ELEVATE TEMPERATURE OF RECEIVER IN A THERMAL

William H. Simpson, Pittsford; Jacob J. Hastreiter, Jr., Spencerport; Mark S. Janosky, and Mark A. Bobb, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 17, 1995, Ser. No. 373,824
Int. Cl.[6] B41J *2/315*
U.S. Cl. 400—120.18 **5 Claims**

1. An interactive dye thermal transfer printing process using a dye donor layer and a dye receiver layer; said process comprising:

passing an interactive dye donor layer and an opposed receiver layer between a thermal print head and a platen; and

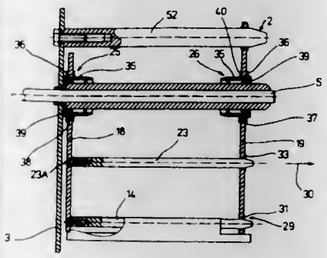
simultaneously (1) imagewise activating the thermal print head to diffuse dye from the dye donor layer to the dye receiver layer and (2) transferring sufficient thermal energy to the dye receiver layer to provide energy to react the dye with the receiver layer, wherein the thermal energy is transferred to the dye receiver layer both before and after dye diffusion.

5,553,952

REUSABLE INK RIBBON CASSETTE FOR A LABEL PRINTER, THE CASSETTE BEING CAPABLE OF ACCOMMODATING INK RIBBONS HAVING DIFFERENT WIDTHS

Dirk Umbach, Hattingen, Germany, assignor to Esselte Meto International GMBH, Heppenheim, Germany

Filed Sep. 22, 1994, Ser. No. 311,259
Claims priority, application Germany, Sep. 24, 1993, 43 32 608.0
Int. Cl.[6] B41J *32/00*
U.S. Cl. 400—208 **24 Claims**



1. A reusable ribbon cassette for a printer for printing labels on a label material, the cassette being capable of accommodating ribbons having different widths, the printer being configured for transferring a printing substance from a printing ribbon to the label material, the printer comprising: means for storing label material to be printed upon; means for storing printing ribbon, the printing ribbon comprising a printing substance thereon; at least one printing element for printing on the label material, the at least one printing element comprising means for transferring the printing substance from the printing ribbon to the label material; means for actuating the at least one printing element to transfer printing substance from said printing ribbon to the label material to print on the label material; and said means for storing printing ribbon comprising said reusable cassette;

said reusable cassette comprising:

a first housing portion;

a second housing portion;

said first and second housing portions comprising means for holding a supply of printing ribbon therebetween;

at least first and second support shaft means, said first and second support shaft means being spaced apart from one another and extending at least between said first and second housing portions for variably positioning said first and second housing portions with respect to one another to accommodate printing ribbons of different widths therebetween;

said first support shaft means having a first end adjacent said first housing portion and a second end, said second end comprising a portion adjacent said second housing portion;

said second support shaft means having a first end adjacent said first housing portion and a second end, said second end comprising a portion adjacent said second housing portion;

at least one of said first housing portion and said second housing portion comprising corresponding openings therein for receiving said first and second support shaft means therethrough for relatively positioning said first and second housing portions with respect to one another;

said first and second support shaft means disposed through said corresponding openings comprise a frictional engagement between said first and second support shaft means and said openings;

said frictional engagement between said first and second support shaft means and said corresponding openings being sufficient for substantially minimizing movement of said first and second housing portions with respect to one another;

said first and second support shaft means each defining a longitudinal axis, and each of said first and second support shaft means comprising a surface facing radially outwardly away from the longitudinal axis, said surface comprising an external surface;

said external surface of each of said first and second support shaft means comprising a substantially smooth, uninterrupted surface extending between said first and second ends thereof;

said at least one of said first housing portion and said second housing portion comprising a radially inwardly disposed surface defining each said opening therein, said radially inwardly disposed surfaces of said openings for being disposed towards said external surface of one of said first and second support shaft means, said radially inwardly disposed surface of each of said openings comprising an internal surface; and

at least one of:

said external surfaces of said first and second support shaft means; and

said internal surfaces of said openings, comprising means for frictionally engaging the other of:

said internal surfaces of said openings; and

said external surfaces of said first and second support shaft means,

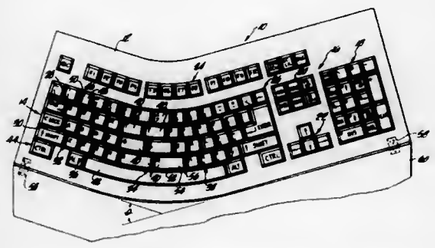
to provide frictional engagement between said external surfaces of said first and second support shaft means and said internal surfaces of said openings, and said frictional engagement between said external surfaces of said first and second support shaft means and said internal surfaces of said openings solely being sufficient for detachably securing said first housing portion and said second housing portion in a fixed position with respect to one another.

5,553,953

ERGONOMIC KEYBOARD

Camacho Herman, 10706 Victory Blvd. #209, North Hollywood, Calif. 91606, and Robert Gramadino, 543 S. Marengo Ave. #3, Pasadena, Calif. 91101

Continuation of Ser. No. 17,106, Feb. 12, 1993, Pat. No. 5,360,280, which is a continuation-in-part of Ser. No. 886,061, May 19, 1992, abandoned, and a continuation-in-part of Ser. No. 900,080, Jun. 17, 1992, abandoned. This application Oct. 31, 1994, Ser. No. 331,688
Int. Cl.[6] B41J *5/10*
U.S. Cl. 400—489 **23 Claims**



1. An ergonomic keyboard having a front edge corresponding to the vertical edge of the keyboard closest to the user, said keyboard comprising:

a. a mount;

b. a plurality of keys on said mount, wherein the keys on said mount are arranged in at least one unbroken row comprised of an arcuate portion, a left portion and a right portion, said left and right portions extending tangentially from the left and right sides of the arcuate portion, respectively, and said arcuate portion of said at least one unbroken row being convex to the front edge of the keyboard.

5,553,954

PRINTER

Mitsuru Nakano, Tokyo, Japan, assignor to Citizen Watch Co.

holding a stick-shaped material, said holder being provided at a front portion of the spiral shaft; a second tubular body turnably

5,553,958

COMBINATION BOOK AND HOLEPUNCH ASSEMBLY

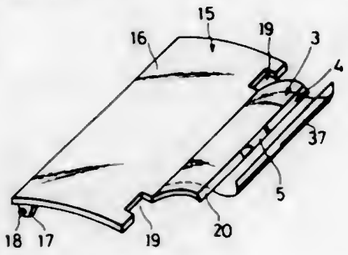
Mark A. Bedol, P.O. Box 2847, Rancho Cucamonga, Calif.

5,553,954

PRINTER

Mitsuru Nakano, Tokyo, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1994, Ser. No. 338,131
Claims priority, application Japan, Nov. 10, 1993, 5-303251
Int. Cl.[6] B41J *11/26*
U.S. Cl. 400—621 **20 Claims**



1. A printer, comprising;
a carrying means for carrying a continuous sheet along a carrying path;
a platen;
a printing head cooperating with the platen;
a first cutter having a first surface facing the continuous sheet and disposed in said carrying path of the continuous sheet and having a first blade surface intersecting the first surface to define a blade edge extending in a direction transverse to a carrying direction of the continuous sheet; and
a first conducting protrusion formed on said first blade surface of said first cutter along said extending direction of said first blade edge, an outer periphery of said first conducting protrusion being disposed to make contact with the continuous sheet and having a cross-section of a substantially circular arc shape,
wherein said platen and printing head are disposed to print on said continuous sheet before the continuous sheet reaches said first cutter when the continuous sheet is moved in said carrying direction.

5,553,955

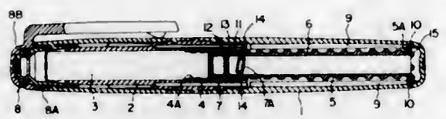
Patent Not Issued For This Number

5,553,956

STICK-SHAPED MATERIAL PROPELLING DEVICE

Yoshihide Mitsuya, and Shoji Anzai, both of Kawagoe, Japan, assignors to Kotobuki & Co., Ltd., Kyoto-hu, Japan

Filed May 26, 1994, Ser. No. 249,938
Claims priority, application Japan, Feb. 23, 1994, 6-025571
Int. Cl.[6] A45D *40/06*
U.S. Cl. 401—68 **14 Claims**



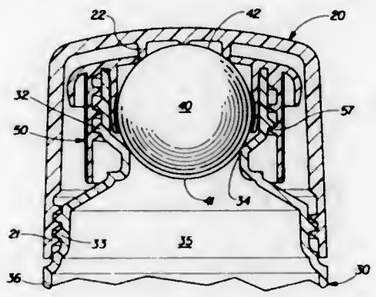
1. A stick-shaped material propelling device comprising a first tubular body; a spiral shaft inserted in the first tubular body, said spiral shaft having an integral guide portion at a rear portion of the spiral shaft, said integral guide potion engaging an inside portion of the first tubular body so that the spiral shaft is unturnable, but is movable in an axial direction relative to the first tubular body; a spiral groove on the circumference of the spiral shaft; a holder for holding a stick-shaped material, said holder being provided at a front portion of the spiral shaft; a second tubular body turnably mounted on the first tubular body having a projection on the inside of a rear portion thereof, said spiral shaft and said holder being inserted in the second tubular body so as to be able to slide in the second tubular body with said projection engaging the spiral groove; a rear end of the second tubular body having two divergent concentric tubular portions including an inner tubular portion, the inner tubular portion of the second tubular body having said projection on the inside of a rear portion thereof and at least one slit formed around the projection on the inner tubular portion of the second tubular body.

5,553,957

PRODUCT DISPENSER WITH ENLARGED NON-DISPENSING APPLICATION/DISTRIBUTION SURFACE

Arthur H. Dornbusch, Cincinnati; Dianna C. Kenneally, Maineville, and JoAnn L. Taylor, Trenton, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 209,032, Mar. 9, 1994, abandoned. This application Nov. 7, 1995, Ser. No. 550,547
Int. Cl.[6] A45D *34/04*
U.S. Cl. 401—209 **17 Claims**



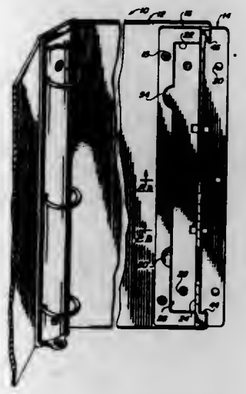
1. An applicator adapted to contain and dispense a product, said applicator including a container comprising a body portion adapted to receive said product and having an upper portion which defines a dispensing opening, said applicator further comprising, in combination:
(a) an applicator dome having an outer skirt extending downwardly therefrom, said outer skirt adapted to engage said upper portion of said container, said applicator dome including an aperture disposed over said dispensing opening, said applicator dome further including an applicator socket in communication with said aperture and said dispensing opening, said applicator dome further including a non-dispensing distribution surface, said distribution surface surrounding and extending generally radially outwardly from said aperture to an outer rim, said outer rim terminates at a location spread radially outwardly of said outer skirt; and
(b) an applicator element rotatably disposed within said applicator socket such that at least a portion of said applicator element is exposed through said aperture, said applicator element dispensing said product when said applicator element is rotated within said applicator, socket;
such that said distribution surface distributes said product dispensed by said applicator element.

5,553,958

COMBINATION BOOK AND HOLEPUNCH ASSEMBLY

Mark A. Bedol, P.O. Box 2847, Rancho Cucamonga, Calif. 91729

Continuation-in-part of Ser. No. 241,012, May 11, 1994, Pat. No. 5,409,319. This application Dec. 16, 1994, Ser. No. 357,729
Int. Cl.[6] B42F *3/00*
U.S. Cl. 402—1 **16 Claims**



1. A combination book and holepunch assembly, comprising:
a book having a flat portion thereon; and
a holepunch assembly securely attached to said flat portion, said holepunch assembly comprising:
(a) a housing comprising a first rigid substantially flat plate securely connected to said flat portion, said housing having a set of a plurality of spaced holes formed therethrough a side thereof;
said housing further including an opening in a central portion thereof; and
a plurality of spaced hinges, said hinges being located on a side edge of said central portion defined by said opening; and
(b) a second rigid plate having a first side hingedly connected via said spaced hinges to said first rigid plate, said second plate having a shape complementary to the shape of said central opening so when said second rigid plate is in a stowed position it may be supported within said central opening, said second plate including spaced projections formed on an upper surface thereof, said projections being so sized and spaced to align with said second set of spaced holes in said first plate when said second plate is rotated away from said stowed position so as to provide a holepunching capability when paper is inserted between said first plate and said second plate.

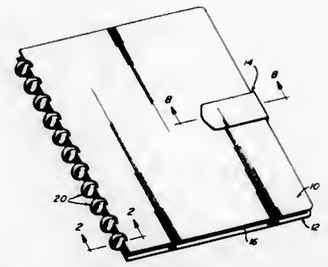
5,553,959

NOTEBOOK SYSTEM

Jacobo Feldman, and Shirley Czukerberg, both of 2101 NW. 53rd St., Boca Raton, Fla. 33496

Filed Jun. 7, 1995, Ser. No. 488,242
Int. Cl.[6] B42F *13/00*
U.S. Cl. 402—79 **14 Claims**

1. A notebook system comprising:
a plurality of sheets arranged in a stack, each sheet having a plurality of openings therein which are spaced apart along an edge of the sheets, the respective openings of each sheet in the stack being aligned with each other, each opening having a generally mushroom-shape configuration with a bulbous opening portion and a stem opening portion which connects said bulbous opening portion to an open edge of said sheet, said bulbous opening portion defined by an arcuate surface having opposite ends and a substantially flat bearing surface having opposite ends which are substantially coincident with the opposite ends of said arcuate surface, and said small opening portion being defined by a narrow channel opening having a width smaller than a with of said flat bearing surface and connecting the open edge of said sheet to said flat bearing surface;



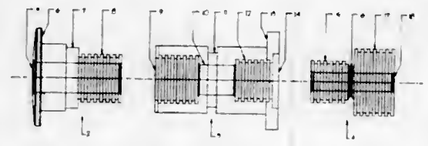
a plurality of disk-like fastening members insertable in respective openings of said stack of sheets to retain said sheets in said stack;
said disk members each having a substantially flat disk-like central surface portion having a central axis, and an enlarged continuous rim portion which extends around the periphery of the central surface portion of said central surface portion, said rim portion projecting outwardly in a direction substantially perpendicular to the central axis of said substantially flat central surface portion;
said central surface portion of each disk member having a radius (R1) which is larger than a thickness of said stack of sheets to be bound thereby, and said central surface portion extending within said stem opening portion; and
said projecting rim portion of each of said disks including an arcuate outer peripheral surface having opposite ends and a substantially flat inner facing bearing surface having opposite ends which are substantially coincident with the opposite ends of said arcuate outer peripheral surface, with said projecting rim portion extending within said bulbous opening portion such that said substantially flat inner facing bearing surface bears upon said substantially flat bearing surface of said bulbous opening portion of said openings of said sheets of said stack which are bound by said disks members.

5,553,960

FIELD SERVICEABLE DERAILLEUR DEVICE

Eric S. Turer, 157 River St., Rochdale, Mass. 01542-1117, and Thomas Malay, 18 Hampton Rd., Exeter, N.H. 03833

Filed Apr. 13, 1995, Ser. No. 421,540
Int. Cl.[6] F16H *59/02*; F16D *9/04*
U.S. Cl. 403—2 **7 Claims**



1. A device for reducing damage to a bicycle derailleur and derailleur hanger, the device comprising:
a head having a head-barrel external connector at a first end, a cap at a second end, and a head tool opening extending through said head;
a barrel having a barrel-head internal connector at a first end whereby said head-barrel external connector of said head is connected to said barrel, said barrel further having a barrel-pin internal connector and a barrel flange at a second end;

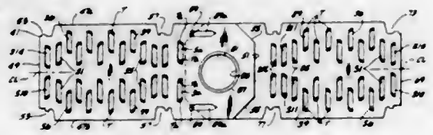
a pin having a pin-barrel external connector at a first end whereby said pin is connected to said barrel-pin internal connector of said barrel, a pin mounting connector at a second end and a pin fracture notch between said first and second ends of said pin so that when said pin is fully connected to said barrel, said barrel flange is flush against said pin mounting connector enabling said notch to fracture when excessive force is placed upon said device.

5,553,961

HINGE AND HINGE JOINT FOR HINGEDLY CONNECTING STRUCTURAL FRAME MEMBERS

Michael M. Olden, Pacific, Mo., assignor to MiTek Holdings, Inc., Wilmington, Del.

Filed Nov. 2, 1994, Ser. No. 333,526
Int. Cl.[6] F16B 15/06
U.S. Cl. 403—119 **17 Claims**



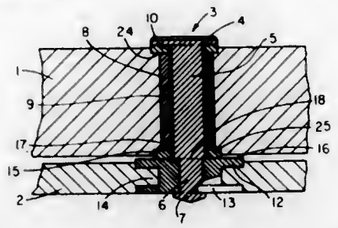
1. A hinge for use in pairs for hingedly connecting two generally coplanar structural members for pivotal movement of one of said members relative to the other in the plane of said members about an axis transverse to the plane of said members, said hinge comprising first and second elongate sheet metal plates, each plate having one face constituting its outside face and the other face constituting its inside face, each said plate having a generally flat body portion and a generally flat extension from said body portion, the plates having their extensions overlapped with the outside face of the extension of the first plate in generally flatwise interengagement with the inside face of the extension of the second plate, and means pivotally interconnecting said overlapped extensions for pivotal movement of one of the plates relative to the other about an axis perpendicular to the plates, characterized in that one of the plates has plate locating means comprising fingers struck therefrom extending from the inside face thereof and having portions lying in a plane which is perpendicular to said one plate and which extends transversely with respect to said one plate, said portions being spaced apart in said plane and being adapted for engagement with a surface of one of said members transverse to the plane of said members for locating said one plate in a predetermined position relative to said one member, said body portion of each said plate being formed with nailing teeth extending from the inside face thereof constituting the plates as nailing plates for nailing of said first plate to one of said wooden members and the second plate to the other of said wooden members, said fingers being struck from said extension of said first plate and being longer than the teeth of said first plate with the tips of said fingers constituting said portions of the fingers located beyond the tips of the teeth of said first plate for sidewise engagement of said tips of the fingers with the surface of one of said members and with the tips of the teeth of said first plate adapted for engagement with a face of said one wooden member and with the tips of the teeth of the second plate adapted for engagement with a corresponding face of the other wooden member to locate the plates in said predetermined position relative to said wooden members whereby the nailing teeth of the plates may be driven into the wooden members.

5,553,962

SCREEN WIPING APPARATUS

Jean-Pierre Eustache, Antony, France, assignor to Valeo Systems D'Essuyage, Montigny-le Bretonneux, France

Filed Jun. 1, 1994, Ser. No. 252,405
Claims priority, application France, Jun. 4, 1993, 93 06724
Int. Cl.[6] F16C 11/04
U.S. Cl. 403—154 **10 Claims**



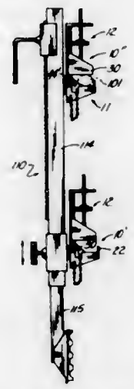
1. Screen wiper apparatus comprising a crank, a crank arm, and a pivot member coupling the crank to the crank arm so as to articulate the crank and crank arm for relative rotation, the pivot member having a head, a first cylindrical portion, and a second cylindrical portion joined to the head by the first cylindrical portion, the diameter of the second cylindrical portion being smaller than that of the first cylindrical portion, the two cylindrical portions and the head of the pivot member all being coaxial with respect to each other, the apparatus further including: a sleeve arranged transversely in the crank with the first cylindrical portion of the pivot member extending through the sleeve; a reinforcing element carried by the crank arm, with the second cylindrical portion of the pivot member extending through the reinforcing element; and at least one ring carried by the crank, with the ring and the crank together defining means for preventing rotation of the ring with respect to the crank.

5,553,963

CLAMP DEVICE FOR A LADDER ADJUSTMENT APPARATUS

Thomas A. Hoy, and Mark D. Scherer, both of 2906 Stuart St., Denver, Colo. 80212

Filed Dec. 8, 1994, Ser. No. 354,164
Int. Cl.[6] F16B 2/12
U.S. Cl. 403—164 **13 Claims**



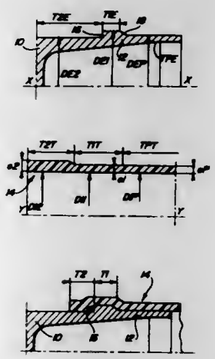
1. A clamp device for operatively and rotatably connecting a ladder adjustment apparatus to at least one rung of a plurality of rungs of a conventional ladder wherein, the device comprises:
a lower generally C-shaped jaw member having an enlarged lower jaw element, an intermediate portion, and an upper portion wherein, the lower jaw element is provided with a raised lip disposed on an outboard end;
an upper jaw member operatively associated with the upper portion of the C-shaped jaw member; and
means for rotatably connecting the C-shaped jaw member to a portion of the ladder adjustment apparatus wherein the lower jaw element is further provided with an enlarged recess and wherein the device further comprises a contoured adapter member having a lower portion dimensioned to be received in said enlarged recess.

5,553,964

MECHANICAL TUBULAR ELEMENT SUCH AS TRANSMISSION SHAFT OF A MOTOR VEHICLE

Michel Rouillot, St Germain En Laye, France, assignor to GKN Automotive AG, Lohmar, Germany

Continuation of Ser. No. 131,994, Oct. 4, 1993, abandoned. This application May 1, 1995, Ser. No. 432,506
Claims priority, application France, Oct. 6, 1992, 92 11838
Int. Cl.[6] F16B 11/00; F16D 1/06
U.S. Cl. 403—279 **24 Claims**



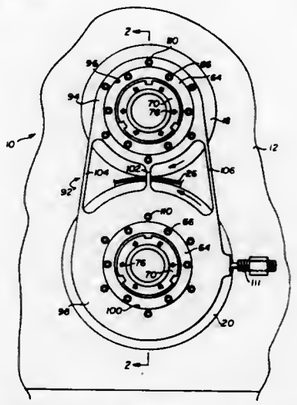
1. Torque transmitting tubular element, comprising in combination:
a tube which is composed of synthetic material and fibers reinforcing said material and has an end portion, and a metal terminal member having an inner portion received inside said end portion of said tube, said end portion of said tube comprising a tube first section and a tube second section, said tube second section being located between said tube first section and an end face of the tube, said inner portion of said terminal member having a generally cylindrical stepped outer surface comprising a member first section having an outside diameter greater than the inside diameter of said tube first section and being received inside said tube first section with an interference fit in an assembled state of said tube and said terminal member for transmission of torque between said tube and said terminal member, said stepped outer surface of said terminal member further comprising a member second section having an outside diameter which is less than said outside diameter of said member first section and is at most equal to the inside diameter of said tube second section, said tube second section, in said assembled state of said tube and said terminal member, axially extending in facing relation to said member second section, whereby, in said assembled state, said tube first section exerts radially gripping action of said member first section while said tube second section exerts no gripping action on said member second section.

5,553,965

CONSTRAINT SYSTEM FOR PARALLEL CANTILEVER SHAFTS

Fred M. Fuss, Hamlin, and John A. Mesolella, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 14, 1995, Ser. No. 388,015
Int. Cl.[6] F16C 27/04
U.S. Cl. 403—291 **21 Claims**



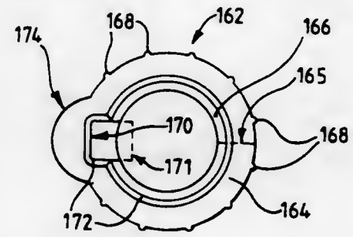
16. A tuned compliance member for use in an apparatus including a pair of parallel shafts having cantilever portions and a pair of cooperating tools each associated with a respective cantilever portion, the shafts being mounted for rotation in the apparatus during use of the tools, the tuned compliance member comprising:
a first body portion with a first bore within which a first bearing may be located on one of the shafts, a second body portion with a second bore within which a second bearing may be located on the other of the shafts, and at least one flexure extended between the first and second body portions, the flexure being effective for limiting deflection of the cantilever portions.

5,553,966

CONNECTING A SHAFT TO A BORE

Peter A. Morelli, Dalton; Kim F. Taylor, Netherton, and David Makin, Longwood, all of Great Britain, assignors to David Brown Engineering Limited, Huddersfield, England

Division of Ser. No. 358,659, Dec. 13, 1994, abandoned, which is a continuation of Ser. No. 59,674, May 12, 1993, abandoned. This application Oct. 27, 1995, Ser. No. 549,225
Claims priority, application United Kingdom, Sep. 9, 1992, 9219091
Int. Cl.[6] F16D 1/00
U.S. Cl. 403—355 **11 Claims**



1. A unitary component for driveably connecting a shaft to a bore of a member, including means enabling the component to be

driveably connected to a conventional keyway of a rectangular cross-section formed in the shaft, and an integral key of curved cross-section adapted to engage in a keyway of correspondingly curved cross-section formed in the bore,

said unitary component for driveably connecting the shaft to a bore of a larger diameter than the shaft, including an integral sleeve adapted to fit between the shaft and the bore,

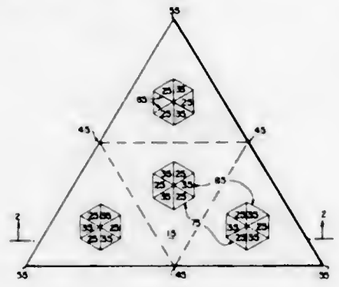
wherein the integral key of curved cross-section is formed on an outer periphery of the sleeve, and wherein the means comprises a keyway formed in an inner periphery of the sleeve and having a rectangular cross-section which is the same as a rectangular cross-section as the keyway in the shaft, wherein the keyways are adapted to be driveably interconnected by a separate, conventional key having a rectangular cross-section.

5,553,967

FASTENING SYSTEM FOR TRIANGULARLY SHAPED SURFACES

Sachiko Uozumi, New York, N.Y., assignor to Geo Snap, Inc., New York, N.Y.

Filed Oct. 5, 1994, Ser. No. 318,078
Int. Cl.[6] A63H *33/00*
U.S. Cl. 403—393 **10 Claims**



1. A fastening system for triangularly shaped surfaces comprising:

a triangularly shaped surface;

three apex fasteners on the triangularly shaped surface, one each located in each of the three sub-triangles formed by lines bisecting the three sides of the triangularly shaped surface and having an apex corresponding to an apex of the triangularly shaped surface and each one located equidistant from the apexes of the sub-triangle formed from the lines bisecting adjacent sides of the triangularly shaped surface and having an apex corresponding to the apex of the triangularly shaped surface formed from the adjacent sides;

said apex fasteners each having three bumps, said bumps having side walls perpendicular to the surface of the triangularly shaped surface;

said apex fasteners each having three dents, said dents having side walls perpendicular to the surface of the triangularly shaped surface, said dents being adapted to receive the bumps in a close manner;

said bumps and dents of said apex fasteners disposed in a generally circular pattern such that each bump is adjacent to two dents, and each dent is adjacent to two bumps;

a center fastener located at a point equidistant from the apexes of the triangularly shaped surface;

said center fastener having three bumps; said bumps having side walls perpendicular to the surface of the triangularly shaped surface;

said center fastener having three dents, said dents being adapted to receive the bumps in a close manner;

said bumps and dents of said center fastener disposed in a generally circular pattern such that each bump is adjacent to two dents, and each dent is adjacent to two bumps;

said center fastener being similar to the apex fasteners only when said center fastener is rotated 60° relative to the orientation of the apex fasteners such that where the bumps in the apex fasteners are, there are dents in the center fastener, and where the dents in the apex fasteners are, there are bumps in the center fastener;

so that two triangularly shaped surfaces may be fastened together by aligning them such that the bumps from either an apex fastener or a center fastener on one triangularly shaped surface are received in the dents of either an apex fastener or a center fastener on the other triangularly shaped surface and held closely by friction along the side walls,

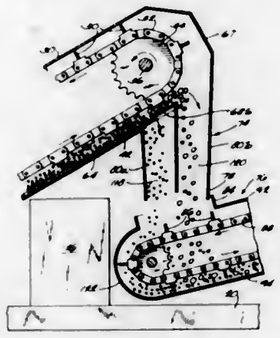
whereby the two triangularly shaped surfaces may be joined with the three apex fasteners and the center fastener of one triangularly shaped surface fastened to the three apex fasteners and the center fastener, respectively, of the other triangularly shaped surface, or with only one apex fastener of one triangularly shaped surface fastened to one apex fastener of the other triangularly shaped surface, or with only one apex fastener and the center fastener of one triangularly shaped surface fastened to the center fastener and one apex fastener, respectively, of the other triangularly shaped surface.

5,553,968

METHOD AND APPARATUS FOR CONVEYING AND DESEGREGATING AGGREGATE

Thomas R. Campbell, Chattanooga, Tenn., assignor to Astec Industries, Inc., Chattanooga, Tenn.

Filed Sep. 29, 1994, Ser. No. 314,349
Int. Cl.[6] E01C *19/00*
U.S. Cl. 404—108 **10 Claims**



1. An apparatus for remixing and conveying aggregate that has been segregated into smaller and larger aggregate, said apparatus comprising:

a. a first conveyor having a receiving end, a discharge end, and edges;

b. a second conveyor having a receiving end and a discharge end, said receiving end of said second conveyor being positioned adjacent said discharge end of said first conveyor;

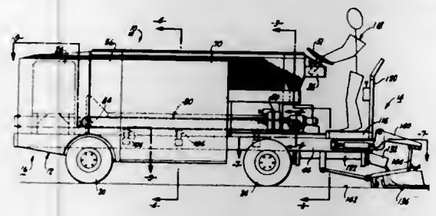
c. said discharge end of said first conveyor having a floor, said floor extending from said receiving end to said discharge end, said floor including a notch at said discharge end and located laterally between said edges, said floor having lateral side portions on either side of said notch, said first conveyor carrying said larger aggregate predominantly along said lateral side portions of said floor and said smaller aggregate therebetween in laterally-oriented segregation, and wherein, in use, said notch causes said smaller aggregate to travel a shorter distance along a longitudinal axis of said first conveyor before being discharged than said larger aggregate and thereby reorients said larger and smaller aggregate from a laterally-oriented segregation to a longitudinally-oriented segregation.

5,553,969

PAVING APPARATUS

Jeffrey Reed, P.O. Box 1620, West Sacramento, Calif. 95691

Filed Feb. 13, 1995, Ser. No. 388,211
Int. Cl.[6] E01C *19/48*
U.S. Cl. 404—110 **10 Claims**



1. A paving apparatus workable by a single operator utilizing a plurality of surface paving components, comprising:

a. a movable platform, said movable platform including a first end portion and a second end portion;

b. a plurality of containers supported on said platform, said plurality of containers permitting storage of the plurality of surface paving components;

c. a conveyor supported by said platform, said conveyor being capable of moving paving components from said first end portion to said second end portion;

d. a holding tank capable of communicating with said plurality of containers for combining said plurality of surface paving components, said conveyor located at said holding tank to transport said combined plurality of surface paving components;

e. an operator stand located at said first end portion of said movable platform;

f. mixing means for blending said plurality of surface paving components, said mixing means including an inlet communicating with said conveyor at said first end portion of said movable platform and an outlet for directing said mixed surface paving components to a surface, said mixing means located at said first end portion of said movable platform adjacent said operator stand;

g. control means for determining the rate of speed at said movable platform for steering said movable platform, said control means located at said first end portion of said movable platform adjacent said operator stand; and

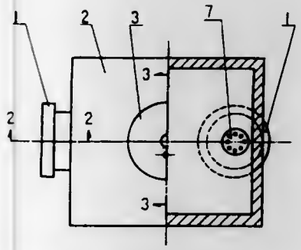
h. motor means for urging movement of said movable platform.

5,553,970

WATER-SAVING IRRIGATION DEVICE

Yuan-Liang Chang, No. 34, Lan-Jou St., Chung-Li City, Tao Yuan, Taiwan

Filed Jun. 12, 1995, Ser. No. 489,425
Int. Cl.[6] A01G *29/00;* **E02B** *13/00*
U.S. Cl. 47—48.5 **6 Claims**



1. A water-saving irrigation device comprising:

a water inlet port and a water outlet port coupled in fluid communication to a water storage container,

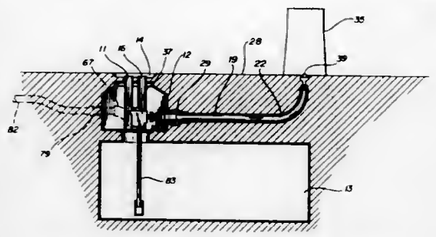
said water outlet port being positioned on a lower or lateral portion of said water storage container, said water outlet port including a water output nozzle, a sediment trap layer disposed within said water outlet nozzle, and a perforated cover plate for securing said sediment trap layer within said water output nozzle.

5,553,971

DOUBLE-CONTAINMENT UNDERGROUND PIPING SYSTEM

Keith J. Osborne, Glen Ellyn, Ill., assignor to Intelpro Corporation, Chicago, Ill.

Filed Dec. 20, 1988, Ser. No. 286,893
Int. Cl.[6] E02D *3/00;* **E02B** *3/16*
U.S. Cl. 405—52 **48 Claims**



1. A piping system for conveying fluid from the outlet port of an underground pump to the inlet port of an above-ground fluid dispenser which comprises:

(a) a containment chamber installed below grade level containing the pump, said chamber comprising a body capable of containing leaked fluid, a removable cover at about grade level, and a sleeve in communication with the body extending outwardly therefrom,

(b) a primary pipe of flexible material for conveying the fluid from the pump, the primary pipe having an inlet end and an outlet end,

(c) means for removably securing the inlet end of the primary pipe in sealed communication with the outlet port of the pump,

(d) means for removably securing the outlet end of the primary pipe in sealed communication with the inlet port of the fluid dispenser,

(e) a secondary pipe of flexible material generally surrounding the primary pipe, said secondary pipe having a lower end and an upper end, the lower end of the secondary pipe being in sealed communication with the containment chamber sleeve, said inner surface of the secondary pipe and said outer surface of the primary pipe defining an annular space,

(f) a dispenser pan installed below the fluid dispenser and the fluid dispenser inlet port so as to contain leakage therefrom, said dispenser pan comprising a body and a pan sleeve in communication with the pan in a gravity draining relationship therefrom, the upper end of the secondary pipe being in sealed communication with the pan sleeve, and

(g) a repeater chamber installed below grade level and comprising a body capable of containing leaked fluid, a removable cover at about grade level and a pair of sleeves in communication with the body extending outwardly therefrom, the primary pipe passing through said repeater chamber sleeves and the secondary pipe comprising a plurality of secondary pipe segments, wherein respective ends of secondary pipe segments are in sealed communication with each of said repeater chamber sleeves, the dispenser pan sleeve, and the containment chamber sleeve,

wherein the primary pipe comprises a plurality of primary pipe segments, and a coupling joining in sealed communication

each contiguous pair of said primary pipe segments, each of said couplings being generally surrounded by a repeater chamber as recited above in paragraph (g),

perforations in said air influx well, the tapering of said air influx well accelerating said circulation of atmospheric air to a maximum velocity through said influx well perforations, (ii) further across through said contaminated soil zone, thereby

an upper portion securable to said lower portion, said upper portion also defining an interior surface in which is received a portion of a pipe to be laid, and having second, cooperating

each contiguous pair of said primary pipe segments, each of said couplings being generally surrounded by a repeater chamber as recited above in paragraph (g),

whereby fluid leaked into the dispenser pan or the annular space between the primary pipe and the secondary pipe may travel within the annular space and is contained within the system, and whereby the primary pipe may be replaced by removing the cover from the containment chamber and uncovering the dispenser pan, unsecuring each end of said primary pipe, and pulling said primary pipe out through said sleeves.

5,553,972

APPARATUS FOR CONTAIMENT OF CONTAMINANTS DURING AN UNDERWATER DREDGING OPERATION

Raymond E. Bergeron, 3452 W. Jefferson, Trenton, Mich. 48183, and William Priore, 1177 E. Center St., Marion, Ohio 43302

Filed Apr. 21, 1995, Ser. No. 426,902
Int. Cl.[6] E02B *3/00*
U.S. Cl. 405—60 **8 Claims**

1. Apparatus for containment of contaminants during an underwater dredging operation comprising:

an elongated anchor adapted to lie on a waterbed,

a flexible sheet having a bottom edge and a top edge, said bottom edge being secured to said anchor,

a first elongated float secured to said top edge of said sheet,

a second elongated float secured to said sheet between said bottom edge and said top edge so that said second float is substantially parallel to and spaced upwardly from said anchor, and

wherein said second float maintains a portion of said flexible sheet between said second float and said anchor in a taut condition so that second float together with said anchor prevents said sheet from causing turbidity of the water bed.

5,553,973

FLUMES FOR MANHOLE INVERTS

Lee Duran, 53 Mount Archer Rd., Lyme, Conn. 06371

Filed May 12, 1995, Ser. No. 440,074
Int. Cl.[6] E02B *9/04*; **F16L** *5/00*; *41/00*
U.S. Cl. 405—120 **19 Claims**

15. A flume for an invert for a manhole having a base along which a flume path connects an inlet at the manhole base to an outlet at the manhole base, comprising:

a first pipe segment and a first open channel segment sized for fluid communication with said first pipe segment; said first pipe segment and said first open channel segment having an overall combined length that is substantially smaller than the distance between said inlet and outlet as measured along said flume path;

a second pipe segment sized for fluid flow communication with said first open channel segment, and with the overall combined length of said first open channel segment and said second pipe segment being substantially less than said distance between said inlet and outlet ports along said flume path;

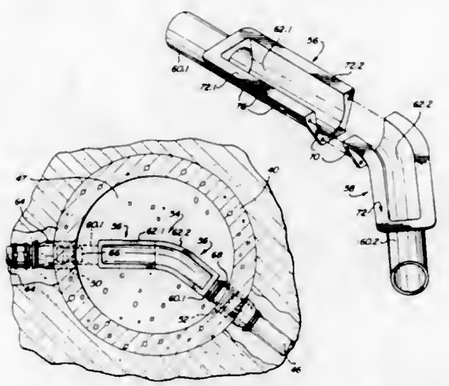
the first open channel and pipe segments having like cross-sections so as to form a continuous invert between said inlet and outlet at the base of said manhole when the first open channel and pipe segments are in abutment with each other.

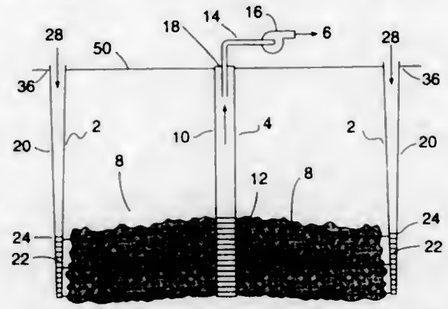
5,553,974

ENHANCED VAPOR EXTRACTION SYSTEM AND METHOD OF IN-SITU REMEDIATION OF A CONTAMINATED SOIL ZONE

Djahangir Nazarian, 1427 S. Saltair Ave.#101, Los Angeles, Calif. 90025

Filed Dec. 2, 1994, Ser. No. 348,608
Int. Cl.[6] B09B *3/00*
U.S. Cl. 405—128 **16 Claims**





1. A system for the in-situ remediation of a contaminated soil zone comprising:

a. an air influx well open to the atmosphere located outside said contaminated zone but traversing an entire depth of said contaminated soil zone, said air influx well tapering from a maximum cross-sectional area at an upper end open to the atmosphere to a minimum cross-sectional area at an opposite lower end;

b. perforations in said air influx well paralleling only a vertical extent of said contaminated soil zone;

c. an air extraction well located within said contaminated zone traversing the entire depth of said contaminated soil zone;

d. perforations in said air extraction well placed only within the vertical extent of said contaminated soil zone;

e. an air displacement unit connected in an airtight manner to said air extraction well, capable of producing a vacuum in said air extraction well and thus creating a circulation of atmospheric air (i) down said air influx well and through said perforations in said air influx well, the tapering of said air influx well accelerating said circulation of atmospheric air to a maximum velocity through said influx well perforations, (ii) further across through said contaminated soil zone, thereby stripping and entraining contaminants from said contaminated zone, the maximum velocity maximizing a rate of stripping and entraining contaminants from said contaminated zone, (iii) further through said perforations in said air extraction well into said air extraction well and (iv) upward through said air extraction Well into said air displacement unit; and

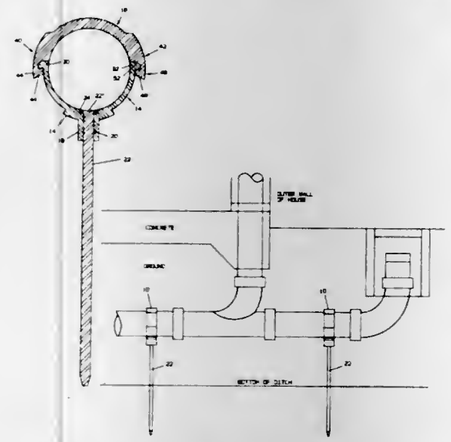
f. a contaminant disposal means connected to said air displacement unit.

5,553,975

METHOD OF INSTALLING UNDERGROUND PIPES FOR SEWER LINES

Michael L. Elkins, 12803 Julian Ave., Lakeside, Calif. 92040

Filed May 15, 1995, Ser. No. 441,232
Int. Cl.[6] F16L *3/13*; *1/028*
U.S. Cl. 405—154 **18 Claims**



1. A method of laying a pipe in the ground, in which there is used a mounting device having a lower portion and an upper portion separately connectable to the said lower portion, the pipe having a length defined along its longitudinal axis, comprising:

(a) inserting a spike first through the lower portion of the mounting device and then driving the spike into the ground where a pipe is to be laid;

(b) snapping a portion of a pipe to be laid into the lower portion;

(c) thereafter, clamping the upper portion of the mounting device to the lower portion, to thereby circumferentially clamp the portion of the pipe by the mounting device;

said step (c) comprising sliding said upper section downwardly against said lower section in a direction transverse to said longitudinal axis of the pipe being laid in order for cooperating clamping means on the lower and upper sections to be clamped together;

wherein said method is for laying sewer pipes having proper gradient, and wherein prior to step said (a) said method comprises digging a ditch, in the bottom ground of which sewer pipes are to be laid; said step (a) comprising driving the spike into the ground an amount that achieves the proper gradient.

9. A mounting clamping device for use in laying pipes, such as sewer pipes, in the bottom-ground of a ditch, comprising:

a lower portion defining an interior surface against which a portion of a pipe to be laid rests, and first, cooperating retaining means for mounting an upper portion to said lower portion;

an upper portion securable to said lower portion, said upper portion also defining an interior surface in which is received a portion of a pipe to be laid, and having second, cooperating retaining means for mutual engagement with said first, cooperating retaining means, whereby said cooperating means removably yet firmly mount said upper portion to said lower portion after a portion of a pipe to be laid has been supported on said interior surface of said lower portion;

said lower portion having a through-opening in a bottom section thereof; and

stake means for passing through said through-opening, said stake means being capable of being driven into the bottom-ground of the ditch for securing said lower portion in said ditch and elevated a desired height above the bottom-ground of the ditch;

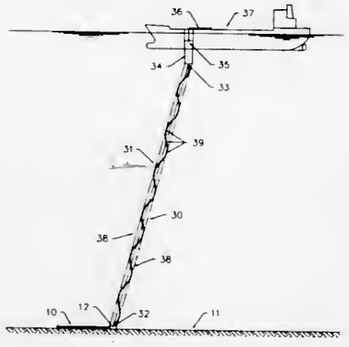
said first, cooperating means comprising latch means, and said second, cooperating means comprises latching means, said latching means comprising at least one prong and cutout, and said latch means comprises camming surface means and a latch-surface, said at least one prong having a canted surface against which said camming surface means acts to force said at least one prong means laterally outwardly as said upper section is slid downwardly on said lower section, said cutout receiving said latch means therein after said at least one prong has cleared said latch-surface, whereupon said latch-surface and said at least one prong means prevent said upper and lower sections from separating.

5,553,976

FLUID RISER BETWEEN SEABED AND FLOATING VESSEL

Jens Korsgaard, 318 N. Post Rd., Princeton Junction, N.J. 08550

Filed Feb. 18, 1994, Ser. No. 198,922
Int. Cl.[6] E02B *17/00*; **E21B** *17/01*
U.S. Cl. 405—195.1 **15 Claims**



1. A riser assembly for conveying fluid contents between the seabed and a floating vessel, wherein the riser assembly comprises:

at least one elongated fluid conveying pipe having a first end adapted to be located proximate to the seabed and a second end adapted to be located proximate to the surface of the sea, said pipe being formed in an undulating configuration about a longitudinal axis extending from the first end to the second end, and

at least one flexible tension member secured to the fluid conveying pipe at at least two spaced apart points along a line extending generally parallel to the longitudinal axis.

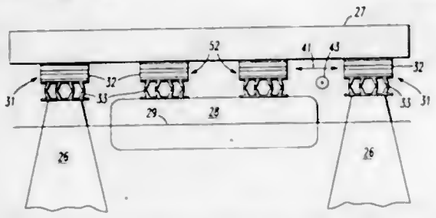
5,553,977

OFF-SHORE PLATFORM CONSTRUCTION, AND METHOD FOR TRANSFERRING LOADS

piling being driven and pivotable downwardly, so as to extend laterally outward of said piling in a locking mode, as the piling is set.

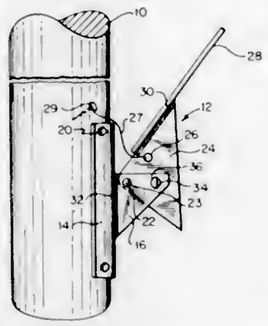
said sliding flexible tube so as to firmly clamp said cargo holder to an edge of said truck's wall;

5,553,977
OFF-SHORE PLATFORM CONSTRUCTION, AND METHOD FOR TRANSFERRING LOADS
William F. Andersen, San Jose, Calif.; Andrew B. Boyd; Russell L. Baldwin, both of Houston, Tex., and Bisuddha N. Datta, Katy, Tex., assignors to Northrop Grumman Corporation, Los Angeles, Calif.
Filed Dec. 16, 1994, Ser. No. 357,954
Int. Cl.[6] E02B *17/08*
U.S. Cl. 405—204 **25 Claims**



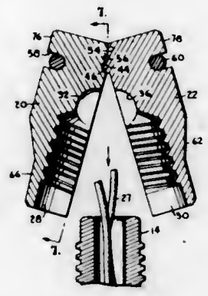
1. In a method of transferring a load from a carrying article to an object when it is believed there may be relative movement between the article and said object during the transfer, the steps of:
selecting a spring element capable of resisting shear loading and having a relatively constant capability of accepting compressive loading over a significant range of the deflection expected during said transfer, said spring element being made up of a plurality of struts of elastomeric material which are individually configured to respond to compressive loading by buckling in a predetermined direction;
positioning said selected spring element at a location at which said load is to contact said object during said transfer; and
using said spring element during said transfer to engage said object.

5,553,978
PILING ANCHOR
Stanley Bates, P.O. Box 43, Point Washington, Fla. 32454
Filed Apr. 25, 1995, Ser. No. 429,216
Int. Cl.[6] E02D *5/74*
U.S. Cl. 405—244 **10 Claims**



1. A piling anchor comprising:
a. a backing plate having an exterior face presented outwardly of a piling being driven and an interior face securable to the piling exterior;
b. a pivot bracket supported upon the exterior face of said backing plate, so as to extend laterally outwardly thereof;
c. a pivoting arm complementally engaging said pivot bracket and pivotably secured thereto by means of a pivot pin extending through said pivoting arm and said pivot bracket;
d. a thrust plate supported upon said pivoting arm, so as to be pivotable upwardly to a mode of substantial alignment with a piling being driven and pivotable downwardly, so as to extend laterally outward of said piling in a locking mode, as the piling is set.

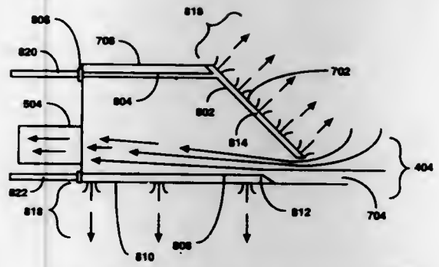
5,553,979
PULL CAP FOR ATTACHMENT TO A PROBE ROD
Volker Wittig, Salina, and Melvin P. Kejr, Brookville, both of Kans., assignors to Keir Engineering, Inc., Salina, Kans.
Filed Jan. 25, 1995, Ser. No. 377,979
Int. Cl.[6] F02D *9/00*; **F21B** *19/00*
U.S. Cl. 405—232 **12 Claims**



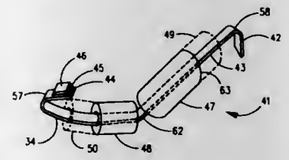
1. A pull cap for positioning about the exposed end of a probe rod and for engaging a pulling device to remove the probe rod from the ground, the pull cap comprising:
a first body section having a first concave surface disposed adjacent one end of said first section and for engaging the exposed end of the rod, said first section also having a first channel on its outer surface adjacent the other end of said first section;
a second body section having a second concave surface disposed adjacent one end of said second section and for engaging the exposed end of the rod, said second section also having a second channel on its outer surface adjacent the other end of said second section;
a hinge means disposed on both said first and second sections adjacent said other ends of said first and second sections and for hinging said first and second sections together so that the pull cap can be pivoted between an open position and a closed position, said first and second concave surfaces engaging the exposed end of the probe rod when the pull cap is in its closed position so that the pull cap can be used to remove the probe rod from the ground; and
an elastic member positioned in said first and second channels and for biasing the pull cap toward its closed position.

5,553,980
SELF PROPELLED DISCHARGE MECHANISM FOR CONTAINER LINER
Victor I. Podd, 2582 NW. 59th St., Boca Raton, Fla. 33496
Filed Aug. 26, 1994, Ser. No. 297,253
Int. Cl.[6] B65G *53/26*
U.S. Cl. 406—38 **3 Claims**

1. A mobile cargo discharge system for use with a container, comprising:
a housing assembly, the housing assembly further comprising:
a forward wall:
an input aperture in the forward wall for inputting cargo;
a fluidizer to enhance cargo fluidic motion during discharge, the fluidizer further comprising:
pump means to generate a flow of air:
an air conduit connected at a first end to the output of the pump means and connected at a second end to a fluidizer panel, the air conduit means directing a flow of air from the pump means to the fluidizer panel; and
the fluidizer panel located in or on the forward wall of the housing assembly, the fluidizer panel having a plurality of apertures of a size such that the air delivered to the fluidizer panel by the pump means is ejected through the apertures a velocity sufficient to disturb the cargo on the external wall of the fluidizer panel;
a discharge port for outputting cargo;
a conduit to provide a path for cargo discharged from the discharge port;
means for pneumatically levitating the housing assembly; and
suction means to pull cargo into the input aperture, through the housing assembly, and then through the discharge port.

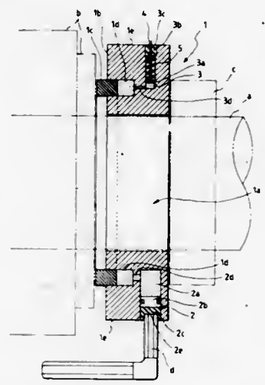


5,553,981
CARGO HOLDER
Leon T. Braden, 18685 N. Roddy Rd., Centralia, Mo. 65240
Filed Oct. 26, 1993, Ser. No. 141,287
Int. Cl.[6] B60P *7/08*
U.S. Cl. 410—116 **11 Claims**



1. A cargo holder which may be firmly but detachedly clamped to an edge of a wall of a pickup truck's cargo bed comprising:
a metal bar having a top end, a bottom end, and a body between its top and bottom ends;
means attached to the bottom end of said bar for engaging an edge of said truck's wall, said wall engaging means comprising a first hook formed from a first continuation of said metal bar;
means attached to the top end of said bar for engaging a tie-down rope, said rope engaging means comprising a second hook formed from a second continuation of said metal bar, said second hook having a maximum dimension extending at an acute angle relative to a longitudinal axis of the bar body;
a flexible cylindrical tube having a top surface facing said second hook, a bottom end facing said first hook, an inside diameter, an outside diameter, and a length at least half as long as the body of said metal bar, disposed around said metal bar so as to slide along the body of the bar between the first and second hooks, wherein said first hook may cooperate with said sliding flexible tube so as to firmly clamp said cargo holder to an edge of said truck's wall;
said second hook further comprising a contour running longitudinally in the direction of said maximum dimension and facing the top surface of said tube, and wherein said top surface of said flexible tube is cut at an acute angle so as to substantially parallel the contour of said second hook.

5,553,982
FLUID TYPE PUSHER WITH THRUST INDICATOR
Yoshito Hashikawa, Nagasaki, Japan, assignor to Japan Development Consultants, Inc., Nagasaki, Japan
Filed Aug. 9, 1994, Ser. No. 288,243
Claims priority, application Japan, May 6, 1994, 6-117537
Int. Cl.[6] F16B *31/02*
U.S. Cl. 411—14 **7 Claims**



1. An annular fluid type pusher for tightening a part on a shaft, said annular fluid type usher comprising:
a body mounted on the shaft on which the part to be tightened is set;
a pushing piece for pushing the part set on the shaft with a fluid pressure;
a sealed fluid path formed annularly in said body for containing a fluid, said pushing piece being slidably disposed in said fluid path;
a fluid pressure adjusting means for adjusting said fluid pressure of said fluid in said sealed fluid path;
an indicator cylinder chamber within said body in communication with said sealed fluid path;
a indicator piston slidably provided in said cylinder chamber;
a spring having a predetermined spring constant to urge said piston against the fluid pressure; and
a thrust indicator for constantly measuring a current value of said pressure, said thrust indicator being in the form of bar on which thrust graduation lines have been marked with one end portion of said thrust indicator being connected to said piston, the other end portion being provided in such a manner as to be protruded in association with the movement of said piston which is slidably moved in proportion to the fluid pressure.

5,553,983
RECESSED SCREW
Katsumi Shinjo, Osaka, Japan, assignor to Yugenkaisha Shinjo

a threaded nut having an interior surface and an exterior surface;
an encapsulation covering all of said exterior surface of said nut, said encapsulation having a base portion covering said exte-

5,553,986
INDIRECT LOCK AND LOCK RELEASE MECHANISM
Susan M. Napierkowski; Arthur T. Nagare, both of Erie, and

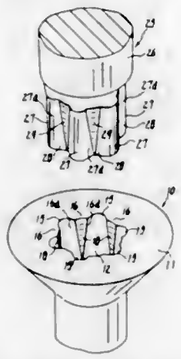
initially engaging a tire of a vehicle as said tire rolls toward a dock position, a chock mechanism for chocking the tire that may be activated once the tire is engaged by the engaging mechanism, and

5,553,983

RECESSED SCREW

Katsumi Shinjo, Osaka, Japan, assignor to Yugenkaisha Shinjo Seisakusho, Osaka, Japan

Filed Nov. 9, 1993, Ser. No. 149,624
Claims priority, application Japan, Nov. 17, 1992, 4-332544
Int. Cl.[6] F16B *23/00;35/06*
U.S. Cl. 411—404 **4 Claims**



1. A recessed screw comprising a screw body having a head with a recess formed therein, the recess being defined as a coaxial superimposition of two equilaterally-triangular recesses which each have arcuate vertices and which are arranged with a phase shift of 60° about a longitudinal axis of the recessed screw to thereby provide six engagable grooves and six driven vanes alternating with one another at regular angular intervals, inner ridges of each of said driven vanes being chamfered to form a conically curved sticking wall which is inwardly slanted towards a bottom of the recess, with sidewalls of each driven vane converging to form a point at the inner end of the sticking wall as the sticking wall intersects the bottom of the recess, the sidewalls of each driven vane extending in parallel with the longitudinal axis of said screw to provide flat planes continuing to a partially cylindrical surface of the corresponding arcuate vertex, the cross-sectional area of each engagable groove being larger than the cross-sectional area of each of the adjacent driven vanes over at least the inner half of the recess, each cross-sectional area being defined by a first circle inscribing innermost points of said six driven vanes and a second circle circumscribing the arcuate vertices of said six engagable grooves.

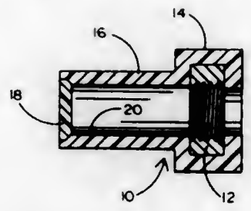
5,553,984

ENCAPSULATED NUT

Donald E. Smith, 16991 Lowell Clr., Huntington Beach, Calif. 92649

Filed Jan. 10, 1995, Ser. No. 370,645
Int. Cl.[6] F16B *19/00;33/00;37/14*
U.S. Cl. 411—429 **9 Claims**

1. An encapsulated nut for use with a bolt in securing a mechanical connection in a caustic environment; the encapsulatd nut comprising:



a threaded nut having an interior surface and an exterior surface;

an encapsulation covering all of said exterior surface of said nut, said encapsulation having a base portion covering said exterior surface and having a cylindrical shaft portion for receiving said bolt extending through said nut, said shaft portion having a hollow smooth interior for receiving said bolt;

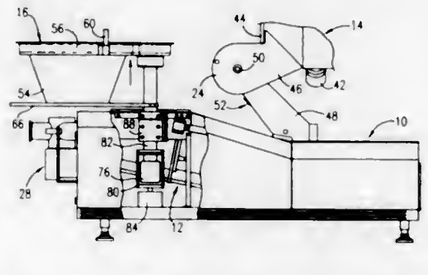
wherein said shaft is open at an end thereof opposite said nut.

5,553,985

QUICK CLEAN-UP DUAL PISTON PUMP

Warren R. Schack, Austin, Tex., and Wendell Dennis, Overland Park, Kans., assignors to Marlen Research Corporation, Overland Park, Kans.

Filed Aug. 19, 1994, Ser. No. 293,501
Int. Cl.[6] B65G *65/46*
U.S. Cl. 414—287 **11 Claims**



1. In a material handling apparatus including a frame, a chamber defined by walls presenting an inlet and an outlet and supported on the frame for receiving material to be handled, and a means for moving the material through the chamber, the improvement comprising:

a hopper assembly for storing material that is to be delivered to the chamber inlet, the hopper assembly presenting walls defining a top, sidewalls and a lower outlet and being supported on the frame for pivotal movement between a use position and a cleaning position;

an actuating means for pivoting the hopper assembly between the use and cleaning positions; and

a transfer assembly between the hopper assembly and the frame for directing material from the hopper assembly into the chamber through said chamber inlet, the transfer assembly including walls defining an inlet for receiving material from said hopper outlet and an outlet for delivering material to said chamber inlet, said transfer assembly being supported for pivotal movement relative to the frame between the use position and the cleaning position, wherein movement of the hopper and transfer assemblies to the cleaning positions exposes the chamber for cleaning.

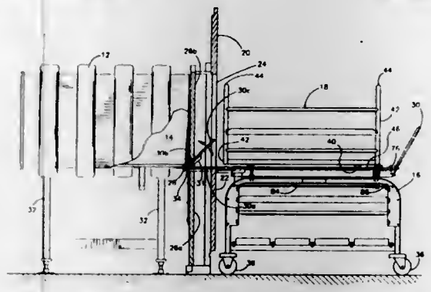
said transfer assembly being supported for axial movement relative to the frame along a vertical axis and for pivotal movement relative to the frame about the vertical axis the improvement further comprising a shifting means for shifting the transfer assembly upward along the vertical axis from the use position so that the transfer assembly may be pivoted to the cleaning position exposing the transfer assembly and the chamber for cleaning.

5,553,986

INDIRECT LOCK AND LOCK RELEASE MECHANISM

Susan M. Naplerkowski; Arthur T. Nagare, both of Erie, and Richard J. Verga, Cranesville, all of Pa., assignors to American Sterilizer Company, Erie, Pa.

Division of Ser. No. 964,451, Oct. 21, 1992, Pat. No. 5,387,063, which is a continuation-in-part of Ser. No. 868,911, Apr. 15, 1992, Pat. No. 5,431,521. This application Oct. 20, 1994, Ser. No. 326,378
Int. Cl.[6] B60P *1/64*
U.S. Cl. 414—401 **16 Claims**



1. Apparatus for use with a movable transfer carriage and a stationary surface of a chamber for remotely permitting or prohibiting the travel of a movable loading car from the stationary surface to the movable transfer carriage comprising:

a blocking member mounted on the stationary surface for rotational movement between a first position in which the travel of the loading car is blocked and a second position in which the loading car is permitted to travel;

an actuating member secured to said transfer carriage for linear reciprocating movement, thereby contacting said blocking member, in order to move it from said first position to said second position;

a securing member for releasably securing the movable transfer carriage to the stationary surface;

first stop member mounted on the actuating member and cooperating with the securing member for preventing said actuating member from moving said blocking member from said first position to said second position unless said securing member secures the movable transfer carriage to the stationary surface; and

second stop member mounted on the actuating member and cooperating with the securing member for maintaining said actuating member in operative contact with said blocking member to maintain said blocking member in said second position.

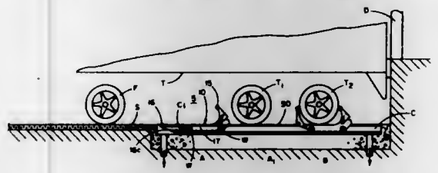
5,553,987

TRUCK ACTIVATED CHOCKING DEVICE

Elwood Ellis, Indian River, Canada, assignor to Rite-Hite Corporation, Milwaukee, Wis.

Continuation of Ser. No. 206,842, Mar. 7, 1994, abandoned. This application Jun. 29, 1995, Ser. No. 496,567
Int. Cl.[6] B65G *67/00*
U.S. Cl. 414—401 **44 Claims**

1. An automatic vehicle activated wheel chocking device for at least one tire of a vehicle comprising an engaging mechanism for initially engaging a tire of a vehicle as said tire rolls toward a dock position, a chock mechanism for chocking the tire that may be activated once the tire is engaged by the engaging mechanism, and a connector connecting said engaging mechanism and said chock mechanism to move them together toward said dock position in response to the rolling motion of the tire.

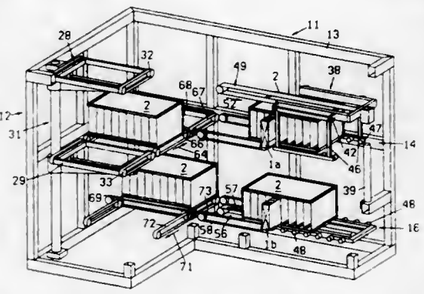


5,553,988

METHOD OF AND APPARATUS FOR MANIPULATING CONTAINERS FOR CIGARETTE TRAYS

Matthias Horn, Ahrensburg, and Peter Kägeler, Geesthacht, both of Germany, assignors to Hauni Maschinenbau AG, Hamburg, Germany

Filed Feb. 2, 1995, Ser. No. 383,084
Claims priority, application Germany, Feb. 16, 1994, 44 04 902.1
Int. Cl.[6] A24L *5/352*
U.S. Cl. 414—416 **18 Claims**



10. Apparatus for manipulating successive empty and filled containers for temporary confinement of sets of trays which are utilized for temporary storage of rod-shaped articles of the tobacco processing industry, comprising means for transporting filled containers at a first level to an emptying station; means for conveying filled containers at a lower second level from a filling station; and means for lowering successive emptied containers from said emptying station to said filling station, said transporting means including means for moving successive filled containers at said emptying station and onto said lowering means in a first direction and said conveying means including means for moving successive emptied containers in stepwise fashion at said filling station in a second direction at least substantially counter to said first direction.

5,553,989

TRAILER FOR HAULING VEHICLES

James Ullman, Highway 77, Wymore, Nebr. 68466

Filed Jan. 9, 1995, Ser. No. 370,030
Int. Cl.[6] B60P *1/43;* **B65G** *67/02;* **E01D** *1/00*
U.S. Cl. 414—537 **8 Claims**

1. A trailer for hauling vehicles, comprising:

a central frame having forward and rearward ends, including first and second elongated parallel longitudinal support members extending from the forward to the rearward end of the frame, and a plurality of transverse cross-members interconnecting the longitudinal members to form an open frame;

a first transverse frame affixed along an outward face of said first longitudinal member and projecting transversely outwardly therefrom;

a second transverse frame affixed along an outward face of the second longitudinal member and projecting transversely outwardly therefrom in a direction opposite the first transverse frame and generally coplanar with said first transverse frame;

a first tread plate supported on said first transverse frame and extending from a forward to a rearward end thereof;

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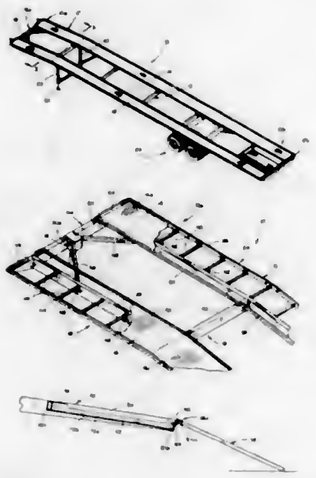
HYDRAULIC WHEELCHAIR LIFT

David Kytola, Sr., 8300 Phillips Rd. SW., Apt. 44, Tacoma,

movable section directing pressurized fluid to said first actuator to lower said platform;

(l) wherein said first control valve is interposed between the



a second tread plate supported on said second transverse frame and extending from a forward to a rearward end thereof;

said tread plates spaced transversely apart a pre-determined distance to support wheels of one of said vehicles thereon;

a wheel assembly mounted on said central frame having wheels in operable engagement with the ground to movably support the rearward end of the central frame above the ground; and

a hitch on the forward end of the central frame for removably attaching the frame to a prime mover;

said first transverse frame including an outer rail extending parallel to the first longitudinal member and between the forward and rearward ends of the central frame, and a plurality of rungs connecting the outer rail to the first longitudinal member;

said first transverse frame rung having coplanar upper surfaces, with said first thread plate supported thereon;

said second transverse frame including an outer rail extending parallel to the second longitudinal member and between the forward and rearward ends of the central frame, and a second plurality of rungs connecting the second transverse frame outer rail to the second longitudinal member;

said second transverse frame rungs having coplanar upper surfaces, with said second tread plate supported thereon;

a first inner rail extending parallel to the first transverse frame outer rail and mounted on said central frame cross-members transversely and inwardly of the first longitudinal member;

said first longitudinal member having an upper surface generally coplanar with said first transverse frame rung upper surfaces;

said first transverse frame outer rail and first inner rail projecting upwardly beyond the plane of the upper surfaces of the first transverse frame rungs;

said first tread plate positioned between the first transverse frame outer rail and first inner rail, atop said first transverse frame rungs and first longitudinal member;

a second inner rail extending parallel to the second transverse frame outer rail and mounted on said central frame cross-members transversely inwardly of the second longitudinal member;

said second longitudinal member having an upper surface generally coplanar with said second transverse frame rung upper surfaces;

said second transverse frame outer rail and second inner rail projecting upwardly beyond the plane of the upper surfaces of the second transverse frame rungs;

said second tread plate positioned between the second transverse frame outer rail and second inner rail, atop the second transverse frame rungs and second longitudinal member.

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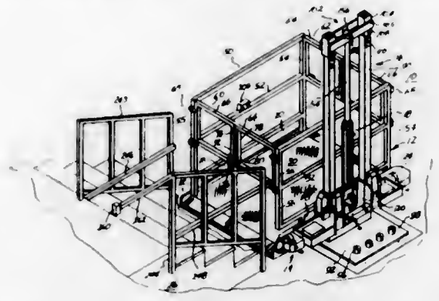
HYDRAULIC WHEELCHAIR LIFT

David Kytola, Sr., 8300 Phillips Rd. SW., Apt. 44, Tacoma, Wash. 98498

Filed Apr. 27, 1990, Ser. No. 515,467
Int. Cl.[6] B66F *7/16*
U.S. Cl. 414—659 **1 Claim**



1. A wheelchair apparatus for transferring wheelchair passengers between different elevations comprising:

(a) a vertically displaceable lift platform having a horizontally movable section extendible therefrom;

(b) a first upright mast assembly;

(c) first carriage means mounting said platform on said first mast assembly for guiding said platform along said first mast assembly;

(d) a first actuator for raising and lowering said platform relative to said first mast assembly;

(e) a second actuator attached to said platform and to said movable section, for extending and retracting said movable section relative to said platform, whereby upon extension of said second actuator, said movable action is extended from said platform to form a substantially coplanar surface with said platform for entrance onto or exit from said platform, and upon retraction of said second actuator said movable section is retracted;

(f) actuator control means operatively connected to said first and second actuators for selectively controlling the movement of said platform and said movable section between a raise and extension sequence wherein said platform is raised and said movable section of the platform is extended, and a retract and lower sequence wherein said platform is lowered and said movable section of the platform is retracted, said sequences resulting from the activation of said first and second actuators;

(g) wherein the actuator control means operatively controls said first and second actuators to raise said platform before extending said movable section of said platform during the raise and extension sequence, and to retract said movable section of the platform before lowering said platform during the retract and lower sequence;

(h) a source of pressurized fluid;

(i) wherein said actuator control means comprise first and second control valves connected in fluid flow communication between said source of pressurized fluid and said first and second actuators;

(j) wherein said first and second control valves during the raise and extension sequence direct pressurized fluid initially to said first actuator to activate said first actuator to raise said platform and then, after said platform has been raised to a desired height, directing pressurized fluid to said second actuator to activate said second actuator to extend said movable section of the platform;

(k) wherein said first and second control valves during the retract and lower sequence direct pressurized fluid initially to said second actuator to activate said second actuator to retract said movable section of the platform while simultaneously preventing fluid from discharging from the first actuator thereby maintaining said platform in raised position, said movable section directing pressurized fluid to said first actuator to lower said platform;

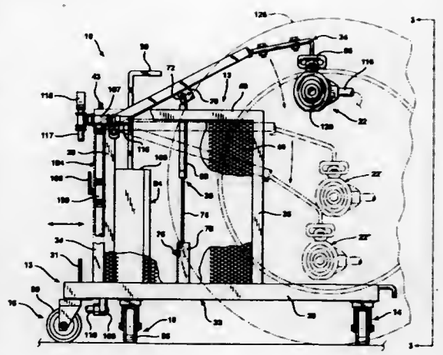
(l) wherein said first control valve is interposed between the source of pressurized fluid and said first actuator and the second control valve is interposed between the source of pressurized fluid d said actuator;

(m) wherein during the raise and extension sequence, said first and second control valves cooperatively direct the pressurized fluid to flow initially through said first control valve in a first direction to first actuator to activate the first actuator to raise said lift platform while simultaneously preventing the pressurized fluid from flowing through said second control valve until said lift platform has been raised to a desired height whereupon the pressurized fluid is directed to flow through said second control valve in a first direction to extend said movable section of the lift platform;

(n) wherein during the retract and lower sequence, said first and second control valves cooperatively direct the pressurized fluid to flow initially to said aid second actuator and from said second actuator and through the second control valve in a second direction thereby to activate said second actuator to react said movable section while simultaneously preventing pressurized fluid from flowing from said first actuator and through said first control valve in a second direction until the movable section has been retracted whereupon pressurized fluid is permitted to flow from the said actuator through said first control valve in a second direction thereby to activate the id actuator to lower said platform;

(o) wherein said first control valve comprises means for directing the pressurized fluid to flow through said first control valve in the first direction and to the first actuator during the raise and extension sequence at a pressure that is lower than the pressure at which fluid is directed to flow through said first control valve in the second direction during the retract and lower sequence; and,

(p) wherein said second control valve having means for directing pressurized fluid from flowing from said second actuator and through said second control valve in the second direction during the retract and lower sequence at a pressure that is lower than the pressure at which the fluid is directed to flow in the first direction through said second control valve and to said second control valve and to said second actuator and also at a pressure which is lower than the pressure at which the fluid is directed to flow from said first actuator and through said first control valve in the second direction during the retract and lower sequence.

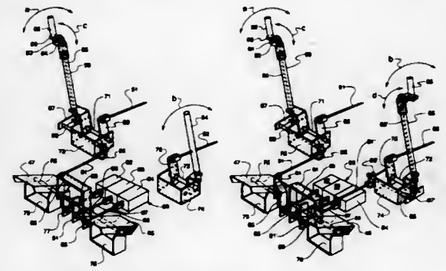


5,553,992

CONTROLS FOR A SKID STEER LOADER

Dale A. Ashcroft, New Holland, Pa., assignor to New Holland North America, Inc., New Holland, Pa.

Filed Oct. 24, 1994, Ser. No. 328,311
Int. Cl.[6] E02F *3/34;9/20*
U.S. Cl. 414—685 **3 Claims**



1. A control system for a skid steer loader having

a main frame supported on four wheels,

an operator cab mounted on said main frame, said cab including side walls extending upwardly from said main frame to define an operator control area therebetween,

a boom structure comprising a pair of arms and a mounting assembly, said arms supported on said frame by said mounting assembly,

power means comprising an engine,

first hydraulic means operatively coupling said engine to said wheels for propelling said loader at varying speeds in forward and reverse,

second hydraulic means operatively coupling said engine to said boom structure for raising and lowering said pair of arms, said system comprising

a multi-spool directional control valve comprising a plurality of operative spool valves associated with a like plurality of forwardly extending control rods, each of which controls a particular spool valve,

first and second hand actuated levers in said operator control area coupled to said first hydraulic means for controlling the direction and speed of said wheels,

a pair of pivotable foot pedals in said operator control area forward of said hand actuated levers, said pedals pivotable about an axis extending transversely and forward of said multi-spool directional control valve,

a hand actuated element operative on one of said hand actuated levers, said element pivotable relative to said one of said levers,

first mechanical linkage means for coupling said hand actuated element to the control rod associated with one of said plurality

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HEAVY DUTY IMPACT WRENCH CADDY

Armando Ferreira, 16343 Summershade Dr., La Mirada, Calif. 90638

Filed Sep. 19, 1994, Ser. No. 308,413
Int. Cl.[6] B25B *17/00*
U.S. Cl. 414—680 **20 Claims**

1. An impact wrench caddy comprising:

a mobile cart, an impact wrench coupling for carrying an impact wrench in a horizontal disposition and which permits rotation of said impact wrench about a vertical axis, a hoist for lifting said impact wrench coupling anchored to said cart, and a biasing mechanism interposed between said cart and said impact wrench coupling so as to exert an upward force thereon.

of spool valves, whereby manipulation of said element reciprocates said control rod.

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THERMAL PROCESS MODULE FOR SUBSTRATE COAT/

5,553,997

of spool valves, whereby manipulation of said element reciprocates said control rod,

second mechanical linkage means for coupling one of said foot pedals to a second control rod associated with a second of said plurality of spool valves, whereby manipulation of said one of said foot pedals reciprocates said second control rod,

said first mechanical linkage means includes an arm pivotally attached to said control rod, said arm mounted to pivot about said axis to reciprocate said rod under conditions where said element is manipulated, and

said second mechanical linkage means includes a second arm pivotally attached to said second control rod, said second arm also mounted to pivot about said axis to reciprocate said second rod under conditions where said one of said foot pedals is manipulated.

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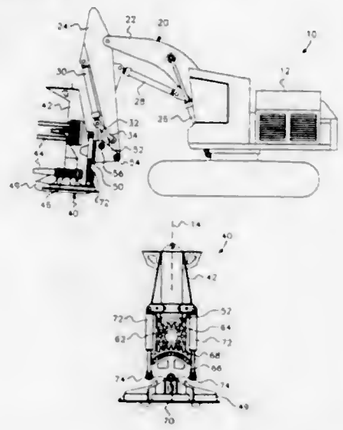
MECHANISM FOR ROTATING A TREE-FELLING IMPLEMENT AND TREE-FELLING IMPLEMENT THEREWITH

Sylvain Gilbert, 1641 boul. St-Dominique, Roberval, Canada, and Michel Taillon, St-Félicien, Canada, assignors to Sylvain Gilbert, Robervat, Canada

Filed Apr. 10, 1995, Ser. No. 419,713

Int. Cl.[6] A01G *23/08*

U.S. Cl. 414—739 **7 Claims**



1. A mechanism for rotating a tree-felling implement, the tree-felling implement comprising a frame rotatably connectable to a distal end of a boom of a logging vehicle by an implement pivot, the mechanism comprising:

a pinion coaxial with the implement pivot and fixed in rotation with reference to the distal end of the boom;

an arc-shaped rack rotatably mounted on the frame of the implement by a rack pivot in spaced relationship with the pinion, the rack being in mesh with the pinion; and

actuating means provided on the frame of the implement for swaying the rack and thereby rotating the implement with reference to the boom.

5,553,994

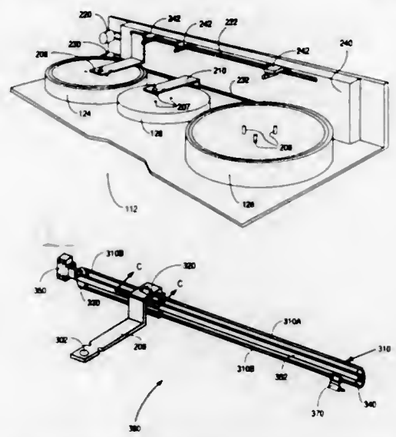
THERMAL PROCESS MODULE FOR SUBSTRATE COAT/DEVELOP SYSTEM

Michael R. Biche, Union City, and H. Alexander Anderson, Santa Cruz, both of Calif., assignors to Semiconductor Systems, Inc., Fremont, Calif.

Division of Ser. No. 93,250, Jul. 16, 1993. This application Oct. 11, 1994, Ser. No. 321,333

Int. Cl.[6] B65G *25/00*

U.S. Cl. 414—752 **8 Claims**



1. In a substrate photolithography system, a mechanism for transferring a substrate comprising:

(i) a transfer arm capable of moving said substrate, said transfer arm having a first end and a second end opposite said first end, said transfer arm further comprising a vacuum clamp at said first end for holding said substrate and a vacuum line between said first end and said second end; and

(ii) a vacuum tube mechanism comprising a vacuum tube and a pair of pulleys, said vacuum tube being wrapped around at least one pulley of said pair of pulleys, said vacuum tube having a movable portion and a stationary portion, said movable portion of said vacuum tube being connected to said second end of said transfer arm, wherein said movable portion of said vacuum tube and said first and second ends of said transfer arm are reciprocable between said pair of pulleys.

5,553,995

METHOD OF DRIVING A TURBINE IN ROTATION BY MEANS OF A JET DEVICE

Michèle Martinez, 82210 St. Nicolas de la Grave, France

PCT No. PCT/FR92/00957, § 371 Date Apr. 7, 1992, § 102(e) Date Apr. 7, 1992, PCT Pub. No. WO93/07361, PCT Pub. Date Apr. 15, 1993

PCT Filed Oct. 9, 1992, Ser. No. 211,490

Claims priority, application France, Oct. 11, 1991, 91 12711

Int. Cl.[6] F01D *1/02;15/06;17/00*

U.S. Cl. 415—1 **26 Claims**

1. A method of driving a turbine that is disposed between an admission channel and an ejection channel, said method comprising:

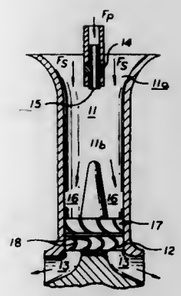
generating a flow of a secondary fluid having a secondary mass flow into said admission channel at a secondary velocity;

injecting a primary fluid having a primary mass flow into said admission channel at a primary velocity, said primary velocity being greater than said secondary velocity, said injecting step occurring substantially simultaneously with said generating step so as to create within said admission channel a mixture of said primary fluid and said secondary fluid, said mixture having a mass flow substantially equal to a sum of said primary mass flow and said secondary mass flow and a velocity toward said turbine that is less than said primary velocity;

passing said mixture over blades of said turbine;

substantially adapting a pressure of said mixture to an ambient pressure outside of said ejection channel; and

ejecting said mixture via said ejection channel.



5,553,996

WIND POWERED TURBINE

Austin P. Farrar, Orchard House, Stutton, Ipswich, Suffolk, IP9 2RY, United Kingdom

Filed Jan. 31, 1994, Ser. No. 189,438

Claims priority, application United Kingdom, Feb. 10, 1993, 9302648

Int. Cl.[6] F03D *7/00*

U.S. Cl. 415—2.1 **17 Claims**

1. A wind powered turbine for driving an engine, comprising a plurality of aerofoil section vanes tangentially angled about a longitudinal axis of a drum-like frame arranged to rotate in a path about its longitudinal axis and having a cylindrical member mounted co-axially with the longitudinal axis and within the path swept by the vanes as they rotate, wherein the vanes are adjustable between a first position at which leading and trailing edges of each vane are at substantially the same distance from the shaft so as to form a substantially closed cylinder, and a second position in which vanes moving into wind add to the rotational forces on the turbine by means of an aerofoil effect, and in which the leading edge of a vane moving into the wind is closer the cylindrical member than the trailing edge so that the vanes cooperate with the cylindrical member to constrain the wind to follow an arcuate path between entry and exit points where it reacts with the vanes of the turbine, each vane having an intermediate region between its leading and trailing edges, and each vane being tapered from its intermediate region to its trailing edge such that the vane has a greater cross-section at its intermediate region than at its trailing edge.

5,553,997

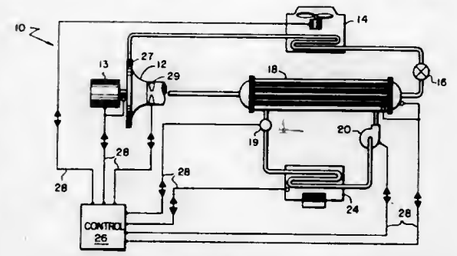
CONTROL METHOD AND APPARATUS FOR A CENTRIFUGAL CHILLER USING A VARIABLE SPEED IMPELLER MOTOR DRIVE

Craig M. Goshaw; Brian T. Sullivan, and Paul C. Rentmeester, all of La Crosse, Wis., assignors to American Standard Inc., Piscataway, N.J.

Division of Ser. No. 345,149, Nov. 28, 1994. This application Jan. 16, 1996, Ser. No. 586,417

Int. Cl.[6] F04D *27/02*

U.S. Cl. 415—17 **17 Claims**



1. A controller for adjusting the capacity of a variable capacity centrifugal compressor driven by a motor, the controller adapted for adjusting the capacity of the compressor in response to demand while minimizing electric power consumption and avoiding surge conditions, comprising:

a pressure coefficient;

a measure of compressor capacity;

a dimensionless plot of possible points of compressor operation relating the pressure coefficient and the measured capacity of the centrifugal compressor;

the current operating point of the centrifugal compressor on the plot;

a region of actual surge on the plot;

a dynamic surge boundary control curve on the plot proximate the region of actual surge; and

hardware, software or firmware, responsive to variations of the region of actual surge and the surge boundary control curve, controlling compressor capacity by varying the opening of the inlet guide vanes and varying the speed of the compressor to move the operating point of the compressor proximate the surge boundary control curve.

5,553,998

GAS FRICTION VACUUM PUMP HAVING AT LEAST THREE DIFFERENTLY CONFIGURED PUMP STAGES RELEASABLY CONNECTED TOGETHER

Martin Mühlhoff, Los Gatos, Calif.; Hans Kriechel, Bornheim, Germany; Frank Fleischmann, Bergheim-Glessen, Germany, and Hans-Peter Kabelitz, Köln, Germany, assignors to Leybold AG, Hanau, Germany

PCT No. PCT/EP93/00984, § 371 Date Nov. 16, 1994, § 102(e) Date Nov. 16, 1994, PCT Pub. No. WO93/23672, PCT Pub. Date Nov. 25, 1993

PCT Filed Apr. 23, 1993, Ser. No. 338,452

Claims priority, application Germany, May 16, 1992, 42 16 237.8

Int. Cl.[6] F01D *01/36*

U.S. Cl. 415—90 **5 Claims**

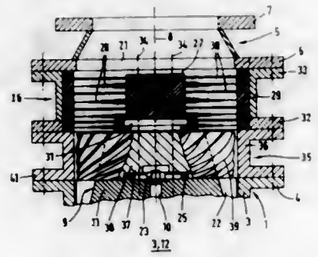
1. A gas friction pump having a vacuum side and a pressure side together defining a respective direction of flow of a gas through the pump, and comprising:

at least three differently configured pump stages sequentially and releasably connected to each other, each comprising a housing section, and a rotor located within the respective housing section;

a first of said pump stages being a molecular pump stage located on the pressure side of said pump, the rotor of said

said forward outer hook having a radially inner land and a radially outer land, said radially outer land being defined by a

1. An electric fan having a wind shifter for shifting the direction of the wind of the fan in a unidirectional wind shifting mode or in



molecular pump stage having a frustoconical hub tapering away from the pressure side;

a second of said pump stages being a filling stage preceding said molecular pump stage in a direction toward the vacuum side, the housing section of said filling stage constituting a stator surrounding the rotor of said filling stage, said rotor of said filling stage comprising a frustoconical, central hub tapering away from the pressure side and adjoining the frustoconical hub of said molecular pump stage so that the two adjoining hubs form a continuous, frustoconical shape, said rotor of said filling stage further including a plurality of radial, helical webs attached to the central hub, each helical web having a pitch and a width decreasing in a direction toward the pressure side for the pumping of the gas; and

a third of said pump stages being a turbomolecular pump stage preceding said filling pump stage and being on the vacuum side of said pump.

5,553,999

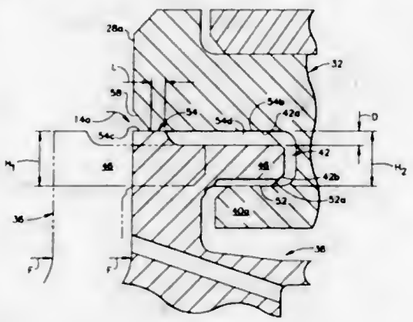
SEALABLE TURBINE SHROUD HANGER

Robert Proctor, West Chester; David R. Linger, Cincinnati; David A. Di Salle, West Chester; Steven R. Brassfield, Cincinnati, and Larry W. Plemmons, Fairfield, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jun. 6, 1995, Ser. No. 467,437

Int. Cl.[6] F01D *11/18*

U.S. Cl. 415—173.1 **8 Claims**



1. A turbine shroud hanger for supporting a turbine shroud panel radially above a plurality of turbine rotor blades for controlling tip clearance therebetween comprising:

forward and aft radially outer hooks extending axially aft and configured for axially slidingly engaging respective forward and aft slots of an annular shroud support joined to an annular outer casing;

forward and aft radially inner hooks configured for engaging respective hooks of said panel for supporting said panel above said blades;

said forward outer hook having a radially inner land and a radially outer land, said radially outer land being defined by a pair of outer pads extending circumferentially inwardly from opposite distal ends of said forward outer hook and a ridge extending circumferentially between said pads at a forward edge of said forward outer hook, with said outer land being interrupted by a central recess extending circumferentially between said pads, and fully aft from said ridge to a distal edge of said forward outer hook; and

said forward outer hook has a predetermined radial height measured between said inner and outer lands thereof which is predeterminedly greater than a predetermined radial height of said shroud support forward slot so that said forward outer hook may be axially inserted into said forward slot in an interference fit therein at least in part at said pair of pads to provide a seal thereat against leakage of bleed air.

5,554,000

BLADE PROFILE FOR AXIAL FLOW COMPRESSOR

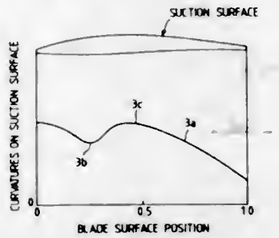
Yasuhiro Katoh, Hitachi; Yoshihiro Tsuda, Katsuta; Mitsuaki Yanagida, Hitachi; Hajime Toriya, Hitachi, and Tetsuo Sasada, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 8, 1994, Ser. No. 302,261

Claims priority, application Japan, Sep. 20, 1993, 5-232776

Int. Cl.[6] F01D *9/04*

U.S. Cl. 415—208.200 **12 Claims**



3. An axial flow compressor comprising a plurality of stator blade rows mounted on an inner surface of a casing which constitutes an annular passage and a plurality of rotor blade rows mounted on a rotor, wherein

a distribution of curvature on a suction surface has a minimum value and a maximum value for each of said plurality of stator blades, a Mach number on each stator blade suction surface increasing thereacross from a value at a leading edge thereof to exceed Mach number 1 to a maximum Mach number therefor, and then decreasing approaching the trailing edge thereof, said minimum value occurring between a position where the Mach number on the stator blade suction surface becomes 1 and a position where said Mach number is at said maximum.

5,554,001

TURBINE NOZZLE/NOZZLE SUPPORT STRUCTURE

Gary L. Boyd, Alpine, Calif., and James E. Shaffer, Maitland, Fla., assignors to Solar Turbines Incorporated, San Diego, Calif.

Division of Ser. No. 166,188, Dec. 13, 1993, Pat. No. 5,441,385. This application Jun. 14, 1995, Ser. No. 427,511

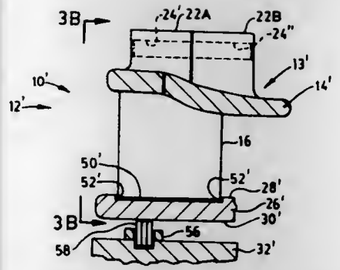
Int. Cl.[6] F04D *29/44*

U.S. Cl. 415—209.2 **4 Claims**

1. A turbine nozzle comprising:

an outer, annular support ring structure having a plurality of accurately spaced, axial connector openings therein;

a nozzle outer structure comprising a plurality of nozzle segments each of which includes a first and a second accurately



and axially separated connecting protrusion, said first and second connecting protrusions on respective, accurately adjacent nozzle segments being axially adjacent and having aligned axial connector openings in said outer support ring with said pin being disposed in said aligned axial connector openings disposed in closely spaced relationship with said outer support ring and including, an outer shroud having a radially inward surface, a radially outward surface, at least one connecting protrusion extending radially outwardly from said outward surface and having an axial connector opening therethrough being generally aligned with one of the axial connector openings in the outer, annular support ring and a plurality of airfoil vanes extending radially inwardly from said inward surface for a predetermined distance and each having an unsupported inner end, said plurality of airfoil vanes being joined to the inward surface;

an inner, annular support ring structure disposed in free and unsupported spaced relation with said airfoil vanes;

an annular inner shroud disposed between said inner support ring structure and said airfoil vanes' inner ends, said annular inner shroud having an inner and an outer surface;

at least one of said inner support ring structure, inner shroud's outer surface, and inner shroud's inner surface having a groove therein which is bounded by end walls;

a locating projection extending into axial relationship with said end walls, said projection comprising at least one of (i) said vanes' inner ends, (ii) an appendage extending from said inner shrouds' inner surface, and (iii) an appendage extending from said inner support ring; and

a pin disposed in a connector opening of said outer support ring structure and an aligned connector opening of the nozzle outer structure.

5,554,002

ELECTRIC FAN HAVING TWO WIND SHIFTING MODES

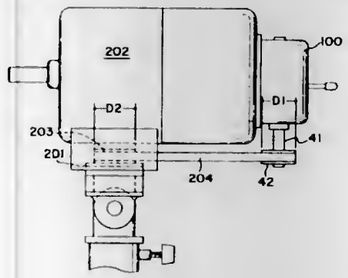
In Man Yoo, 120-1305 Mokdongshinshigazi Apartment, Mok-Kong, Yangchon-ku, Seoul, Rep. of Korea

Filed May 12, 1995, Ser. No. 440,252

Claims priority, application Rep. of Korea, May 19, 1994, 1994/11053

Int. Cl.[6] F04D *25/10*

U.S. Cl. 416—100 **3 Claims**



1. An electric fan having a wind shifter for shifting the direction of the wind of the fan in a unidirectional wind shifting mode or in an opposed-directional wind shifting mode, wherein said wind shifter comprises:

a drive shaft and an output shaft set in a wind shifter housing and parallel to each other, said drive shaft being applied with rotating force of a motor, and said output shaft having a revolving pulley cooperating with a sun pulley of a neck of the fan and unidirectionally or opposed-directionally rotating a head of the fan;

clutch means provided on said output shaft;

a unidirectional rotating unit including:

a first pinion tightly fitted over said drive shaft ;and

a pinion gear gearing into said first pinion and rotatably fitted over the output shaft and selectively coupled to the output shaft by means of said clutch means; and

an opposed-directional rotating unit including:

a second pinion tightly fitted over said drive shaft;

a crank gear gearing into the second pinion and mounted to the wind shifter housing by means of a shaft pin;

a reciprocating rotation disc rotatably fitted over the output shaft and selectively coupled to the output shaft by means of the clutch means; and

a crank rod connecting the crank gear to the disc and converting rotation of the crank gear into reciprocating rotation of the disc.

5,554,003

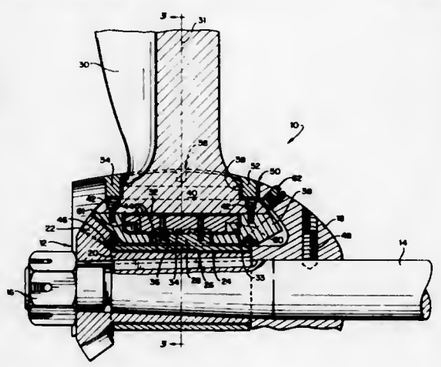
CONTROLLABLE PITCH PROPELLER FOR PROPULSOR AND HYDROTURBINE

Arnold M. Hall, 68 Avondale Rd., Westerly, R.I. 02891

Filed May 31, 1995, Ser. No. 446,960

Int. Cl.[6] B63H *1/06*

U.S. Cl. 416—140 **18 Claims**



18. A fluid dynamic propeller, comprising:

an axially oriented shaft sleeve having a drive pinion at one end thereof;

a floating sleeve rotatable about said shaft sleeve, said floating sleeve having at least one radially extending pivot post;

a blade gear rotatably positioned about said at least one pivot post in communication with said drive pinion of said shaft sleeve;

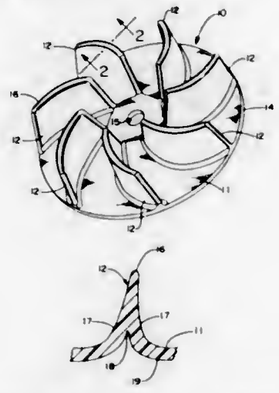
a post capping disc attached to said at least one post of said floating sleeve so as to retain said blade gear between said capping disc and said floating sleeve;

a blade mounted on said blade gear so as to rotate with said blade gear about a blade axis substantially perpendicular to the length of said shaft sleeve; and

stop means on said pivot post or on said capping disc for restricting rotation of said blade gear in a first direction about said blade axis at a first stop position and restricting rotation of said blade gear in the opposite direction about said blade

axis at a second stop position, said first and second stop positions being at least 120 degrees apart about said blade axis.

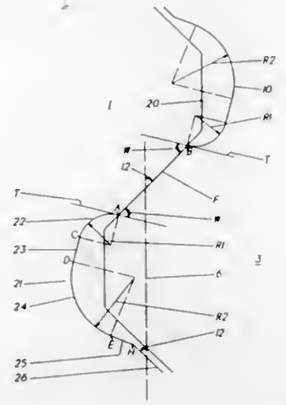
5,554,004
FAN IMPELLER ASSEMBLY
Timothy J. Stewart, Akron, Ohio, assignor to Ametek, Inc., Kent, Ohio
Filed Jul. 27, 1995, Ser. No. 508,226
Int. Cl.[6] F04D *29/28*
U.S. Cl. 416—185 **4 Claims**



1. In a molded impeller fan assembly having an annular disk-shaped backing plate portion, and a plurality of blade portions extending generally orthogonally upwardly from a first side of the backing plate portion, the improvement comprising:
a transitional portion between the backing plate portion and each of the blade portions;
a V-shaped buttress at said transitional portion, said V-shaped buttress supporting the blade portions relative to the backing plate portion; and
wherein said V-shaped buttress comprises a pair of opposed walls extending obliquely between the backing plate portion and the blade portion and a V-shaped indentation disposed between said opposed walls, said walls serving to support the blade portion and to transfer centrifugal and impact forces from the blade portions to the backing plate portion, said walls being formed as the backing plate portion curves gradually toward an apex of each blade portion and axially away from the backing plate portion.

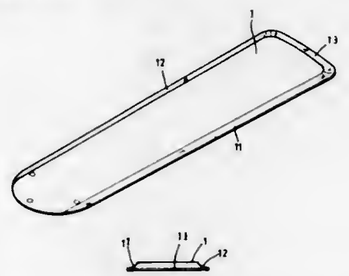
5,554,005
BLADED ROTOR OF A TURBO-MACHINE
Uy-Liem Nguyen, Dättwil, Switzerland, assignor to ABB Management AG, Baden, Switzerland
Filed Aug. 3, 1995, Ser. No. 510,776
Claims priority, application Germany, Oct. 1, 1994, 44 35 268
Int. Cl.[6] F01D *5/30*
U.S. Cl. 416—219 R **2 Claims**

1. A bladed rotor of a turbo-machine, the rotor comprising pinetree-shaped blade roots and the pinetree-shaped blade grooves the blade roots and the blade grooves having a plurality of indentations and teeth defining a plurality of supporting surfaces extending obliquely, the indentations, adjoining the supporting surfaces, in the blade root and in the blade groove being described essentially by a first curve radius and a second curve radius, wherein the first curve radius adjacent to the supporting surface is smaller than the second curve radius, and wherein the opening angle between a



tangent to the circle arc, described by the first curve radius, at the end point of the supporting surface, and the supporting surface amounts to at least forty degrees.

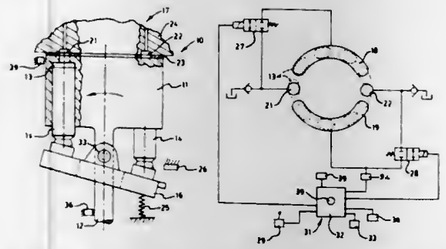
5,554,006
CEILING FAN BLADE CONFIGURATION HAVING A CONCAVE BLADE PERIPHERY
Hsien-Chin Liao, No.27, Lane 228, Wen Chang Street, Nan Twen District, Taichung, Taiwan
Filed Aug. 3, 1995, Ser. No. 511,059
Int. Cl.[6] F04D *29/38*
U.S. Cl. 416—235 **1 Claim**



1. A ceiling fan blade comprising:
a fan blade body including a peripheral portion having two side portions and an end portion, said side portions and said end portion each including a concave surface formed therein for decreasing a resistance to a relative wind to said fan blade body and for facilitating an air circulating effect of said fan blade body.

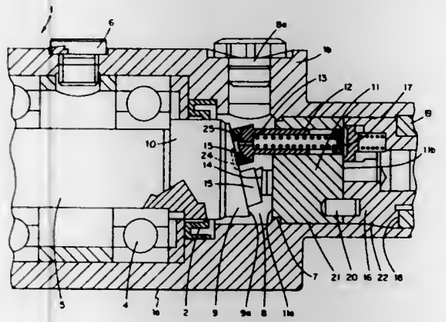
5,554,007
VARIABLE DISPLACEMENT AXIAL PISTON HYDRAULIC UNIT
Thomas A. Watts, Ottawa, Ill., assignor to Caterpillar Inc., Peoria, Ill.
Filed Oct. 17, 1994, Ser. No. 324,199
Int. Cl.[6] F04B *1/30*
U.S. Cl. 417—222.1 **16 Claims**

1. A variable displacement axial piston hydraulic unit comprising:
a rotatable cylinder barrel having a plurality of equally spaced, circumferentially arranged piston bores therein;



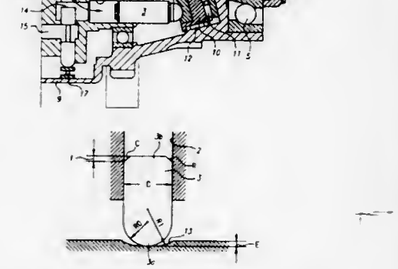
a plurality of pistons each reciprocating in the respective piston bores;
a swashplate tiltably mounted adjacent one end of the cylinder barrel for adjusting the stroke of the pistons;
a head assembly having first and second arcuate shaped passages and at least one control pocket defined therein disposed between adjacent ends of the first and second passages, the other end of the cylinder barrel being in sliding contact with the head assembly so that each piston bore sequentially communicates with the first passage, the control pocket, and the second passage as the cylinder barrel rotates;
an electrohydraulic valve disposed between the control pocket and one of the first and second passages to control fluid flow therebetween as each piston bore communicates with the control pocket; and
control means for outputting a control signal to the electrohydraulic valve in response to receiving a command signal so that the tilt angle of the swashplate is controlled to obtain a desired operating parameter.

5,554,008
HIGH-PRESSURE PUMP TO FEED INTERNAL-COMBUSTION ENGINE FUEL-INJECTIONS
Louis-Claude Porel, Jeanmenil, France, assignor to Hydro Rene Leduc, Azerailles, France
Filed Jun. 28, 1994, Ser. No. 266,604
Claims priority, application France, Jun. 17, 1994, 94 07493
Int. Cl.[6] F04B *1/14*
U.S. Cl. 417—269 **12 Claims**



1. A high-pressure pump to feed fuel injectors comprising a pump casing, an inclined plate (**9**) and hollow axial pistons (**13**) each piston having a spherical head (**14**) which rests against a stud (**15**) sliding on the inclined plate (**9**) which moves inside an intake chamber (**8**), the ~~inclined plate~~ **9** including a crescent-shaped aperture allowing to suck unleaded gasoline through the studs (**15**) and the spherical heads (**14**) into the pistons (**13**), characterized in that the pump casing (**1**) comprises:
a) two integral segments, a first segment (**1***a*) comprising a cylindrical inner borehole receiving a pump shaft (**5**) and pump shaft ball bearings (**4**) and a second segment (**1***b*) comprising another inner borehole receiving the inclined plate (**9**) rigidly affixed to the pump shaft (**5**),
b) a first cylindrical core (**11**) with parallel sides (**11***a*, **11***b*) and which is crossed by a plurality of open-end boreholes (**12**) receiving the pistons (**13**),
c) a second cylindrical core (**16**) of which a planar front side is forced against a rear side (**11***b*) of the first cylindrical core and bearing check-valves (**17**) opposite each borehole (**12**) and of which a rear part of said second cylindrical core (**1***b*) comprises a circular shoulder (**18**), and a plug (**19**) screwed to the end of the inner borehole of the second segment (**1***b*) of the pump casing (**1**), said plug (**19**) resting against the shoulder (**18**) of the second cylindrical core (**16**) in such a way as to compress the first and second cylindrical cores (**11**, **16**) against each other with the first cylindrical core (**11**) resting against a circular stop (**7**) in the second segment (**1***b*) of the pump casing (**1**), the inner boreholes of the two segments (**1***a*, **1***b*) being separated from each other by a seal (**2**) in such manner that only parts located in the second segment (**1***b*) shall be in contact with the unleaded gasoline.

5,554,009
SWASH-PLATE HYDRAULIC PRESSURE DEVICE
Naoki Obta; Naoki Kamide; Jun Iwamoto; Yasunobu Kawakami, and Tsutomu Hayashi, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 11, 1994, Ser. No. 322,865
Claims priority, application Japan, Oct. 13, 1993, 5-255431; Oct. 15, 1993, 5-257978
Int. Cl.[6] F04B *1/14*
U.S. Cl. 417—269 **26 Claims**



1. A swash-plate hydraulic pressure device comprising:
a cylinder block having an annular array of cylinder holes around an axis of said cylinder block, said cylinder block having suction and discharge oil passages;
valve means for selectively bringing said suction and discharge oil passages into communication with said cylinder holes;
a plurality of plungers reciprocally movably disposed in said cylinder holes, respectively, each said plunger having a tip end; and
a swash plate disposed around said cylinder block for rotation with respect to said cylinder block, said tip end of each said plunger engaging said swash plate;
said swash plate being made of metal, at least said tip end of each of said plungers being made of a ceramic material

having a pore area percentage of at most 7.8% and a maximum surface roughness of at most 1.6 s.

means for connecting said arm to a diaphragm air pump for reciprocally driving the air pump and pumping air under control of said electromagnetic drive mechanism;

sponding to retraction of said inlet fluid actuator away from said disposable cassette and for decreasing said volume of

having a pore area percentage of at most 7.8% and a maximum surface roughness of at most 1.6 s.

5,554,010

APPARATUS FOR FEEDING FUEL FROM A SUPPLY TANK TO AN INTERNAL COMBUSTION ENGINE

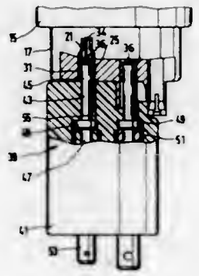
Roland Schoedl, Hemmingen; Kurt Frank, Schorndorf, and Armando Urcuyo, Vaihingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 12, 1994, Ser. No. 290,086

Claims priority, application Germany, Aug. 16, 1993, 43 27 454.4

Int. Cl.[6] F04B *35/04*

U.S. Cl. 417—313 **10 Claims**



1. An assembly for feeding fuel from a supply tank (1) to an internal combustion engine (3) of a motor vehicle, comprising an electrical drive motor, a feed pump (13) driven to rotate by said electrical drive motor (11), said feed pump and said electrical drive motor are disposed in a common housing (15), said housing being enclosed on one end by means of a connection cap (17) provided with a hydraulic connection piece (7), said connection cap including two electrical connection bores (19) that extend into an outer face end of the connection cap, each said electrical connection bore receives one end of a flat end plug electrical connection element (21) arranged to protrude into one of the bores of the connection cap and which is connected electrically to the electric drive motor, each said flat end plug electrical connection element having a female round plug receptacle region to which one additional electrical component (39) can be connected by means of further male round plug connection elements.

5,554,011

MEDICAL FLUID PUMP POWERED BY A CONSTANT SOURCE OF VACUUM

Thomas O. Bales, Miami; Matthew S. Solar, Copper City; Robert Sixto, Jr., Miami, and Kevin W. Smith, Coral Gables, all of Fla., assignors to Symbiosis Corporation, Miami, Fla.

Filed Oct. 27, 1994, Ser. No. 330,370

Int. Cl.[6] F04B *17/00*

U.S. Cl. 417—399 **16 Claims**

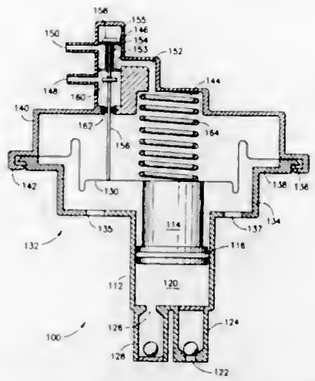
1. A vacuum powered pump comprising:

a) a fluid chamber having an inlet and an outlet;

b) a first displacement means movable in said fluid chamber from a first position to a second position for creating negative pressure in said fluid chamber and movable from said second position to said first position for creating positive pressure in said fluid chamber;

c) biasing means for biasing said first displacement means toward said first position;

d) a vacuum chamber having a vacuum port for coupling with a source of vacuum to provide negative pressure in said vacuum chamber, said first displacement means being responsive to negative pressure in said vacuum chamber such that negative



pressure in said vacuum chamber causes said displacement means to move from said first position to said second position; and

c) a delayed action valve fluidly coupled to said vacuum chamber and mechanically coupled to said first displacement means for allowing ambient air to enter said vacuum chamber when said first displacement means is in said second position and to remain open until said displacement means returns to said first position, wherein

said delayed action valve comprises a cylinder having an air inlet port and a displaceable member within said cylinder, said displaceable member having at least one sealing ring separating said air inlet port from said vacuum chamber when said displacement means is in said first position.

5,554,012

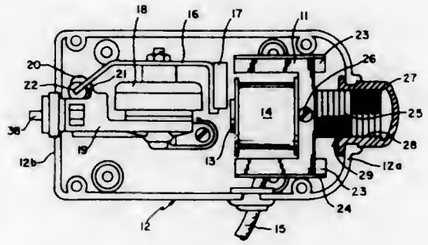
AIR CONTROLLER FOR AIR PUMP

Tsuyoshi Itakura, Tokyo, Japan, assignor to Nihon Doubutsu Yakuhin Kabushikigaisya, Tokyo, Japan

Filed Jul. 6, 1995, Ser. No. 498,896

Int. Cl.[6] F04B *35/04*

U.S. Cl. 417—410.1 **7 Claims**



1. A selectively variable air pumping rate controller for an air pump comprising:

an electromagnetic drive mechanism having an electromagnetic circuit and an electromagnetic coil thereof having a core coaxial therein;

a deflectable mounted arm biased to a rest position and extending toward said coil;

a magnet mounted on said arm for cyclically deflecting said arm to a position confronting said coil core under control of electromagnetic action of the electromagnetic coil when energized thereby cyclically deflecting and reciprocally driving said arm between said rest position and said position confronting said core;

means for connecting said arm to a diaphragm air pump for reciprocally driving the air pump and pumping air under control of said electromagnetic drive mechanism;

a screw feed device for selectively varying the air delivery rate of the air pump by varying the electromagnetic action of the electromagnetic coil on said magnet mounted on said arm comprising a threaded screw for variably alternatively advancing the electromagnetic coil and core therein in an axial direction of the core toward said arm for increasing the air delivery rate of the air pump and retracting the electromagnetic coil and core therein in an opposite direction away from the arm to decrease the air delivery rate of the pump.

5,554,013

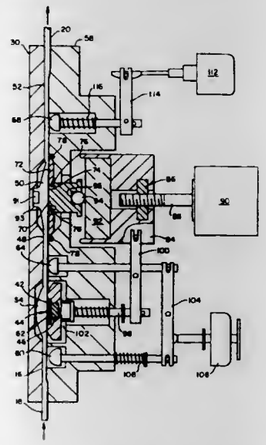
DISPOSABLE CASSETTE WITH NEGATIVE HEAD HEIGHT FLUID SUPPLY

Dana J. Owens, Irving; Aaron Raines, Dallas; Ed G. Rasmussen, Carrollton; David G. Ozinga, Flower Mound; David J. Harrison, Carrollton, and Carl R. Anderson, Dallas, all of Tex., assignors to McGaw, Inc., Carrollton, Tex.

Continuation of Ser. No. 226,174, Apr. 12, 1994, abandoned, which is a continuation of Ser. No. 877,618, May 1, 1992, Pat. No. 5,302,093. This application Jul. 27, 1994, Ser. No. 282,275

Int. Cl.[6] F04B *43/04*

U.S. Cl. 417—413.1 **11 Claims**



1. A disposable cassette for use in an infusion pumping instrument of the type having an inlet valve, an inlet fluid actuator, a transfer valve, an outlet fluid actuator, an outlet valve and means for replaceably holding a disposable cassette, said disposable cassette comprising:

(a) a relatively rigid carrier having an inlet channel, an inlet concave indentation, a transfer channel, an outlet concave indention with a pressure sensor orifice therein and an outlet channel;

(b) a first flexible sheet sealingly affixed overlaying said pressure sensor orifice in said outlet channel;

(c) a second flexible sheet overlaying said relatively rigid carrier and sealed along interior surfaces between said relatively rigid carrier and said second flexible sheet, thereby deflating an inlet passage, an inlet fluid chamber, a transfer passage, an outlet fluid chamber and an outlet passage;

(d) means formed on said disposable cassette for locating said defined passages and fluid chambers adjacent to corresponding valves and fluid actuators in said pumping instrument; and

(e) means operatively associated with said inlet fluid chamber for expanding the volume of said inlet fluid chamber corresponding to retraction of said inlet fluid actuator away from said disposable cassette and for decreasing said volume of said inlet fluid chamber corresponding to advancement of said inlet fluid actuator against said cassette.

5,554,014

DIAPHRAGM PUMP WITH AT LEAST TWO DIAPHRAGMS

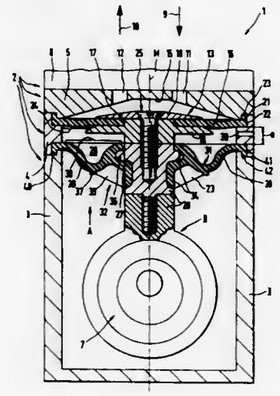
Erich Becker, Bad Krozingen, Germany, assignor to KNF Neuberger GmbH, Freiburg Munzingen, Germany

Filed Aug. 18, 1994, Ser. No. 292,600

Claims priority, application Germany, Aug. 25, 1993, 43 28 559.7

Int. Cl.[6] F04B *43/02*

U.S. Cl. 417—413.1 **12 Claims**



1. A diaphragm pump (1) comprising a pump case (2) having a pump chamber (13) at one end thereof including an inlet port (11) and an outlet port (12) adapted for connection to respective inlet and outlet valves, a connecting rod (8) with at least two diaphragms thereon, and an eccentric drive (7) for driving the connecting rod, wherein a working diaphragm (16) closes the pump chamber (13) and has a deformable annular zone (24), said working diaphragm (16) being essentially generally flat and level in an undeformed condition, and at least one additional diaphragm (26) being arranged between the working diaphragm (16) and the eccentric drive (7) and having a deformable annular zone (30), whereby an at least essentially closed diaphragm interspace (29) is formed between the two diaphragms (16, 26) and is laterally defined by the pump case (2), and wherein the deformable annular zone (30) of the additional diaphragm (26) has a radial expanse wider than the deformable annular zone (24) of the working diaphragm (16), and the deformable annular zone (30) of the additional diaphragm (26) has a channel-like convexity (31) which in an undeformed condition of the diaphragm points toward the eccentric drive (7), wherein the additional diaphragm (26) has on a side thereof facing the eccentric drive 17) holding-down ribs (33), said holding-down ribs being connected to a connecting-rod arm (28) of the eccentric drive (7) by way of a hollow shank (34) incorporated in said diaphragm (26) and adapted to the connecting-rod arm (28), and said holding-down ribs being oriented toward a longitudinal axis of the connecting-rod arm (28).

5,554,015

REFRIGERATION COMPRESSOR THRUST BEARING

1. A hermetic compressor, comprising:

an enclosed compressor casing; and

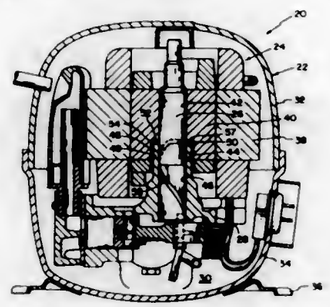
5,554,018

TRANSMISSION WITH REVOLVING BEARING AND

5,554,015
REFRIGERATION COMPRESSOR THRUST BEARING ASSEMBLY

Nelik I. Dreiman, Tipton, and Tara C. Kandpal, Tecumseh, both of Mich., assignors to Tecumseh Products Company, Tecumseh, Mich.

Filed May 23, 1995, Ser. No. 448,198
Int. Cl.[6] F04B *35/04*
U.S. Cl. 417—415 **18 Claims**

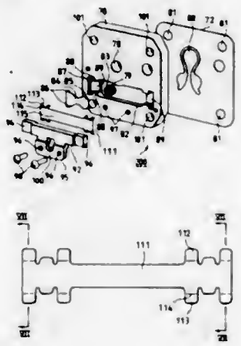


1. A refrigeration compressor comprising:
a housing;
a frame comprising a bearing hub, said bearing hub defining a first vertical bore and having an upper end face, said frame mounted within said housing;
a motor comprising a stator and a rotor, said rotor defining a second bore and a countersunk recess;
a crankshaft received in said recess and secured to said rotor, said crankshaft disposed in said first vertical bore;
a pump unit driven by said crankshaft; and
an annular thrust bearing press-fit in said recess and fixed relative said rotor, said thrust bearing comprising a lower annular bearing surface engaging said hub upper end face so as to form a single frictional pair between said rotor, said thrust bearing, and said bearing hub.

5,554,016
SPRING CONFIGURATION FOR A HERMETIC COMPRESSOR DISCHARGE VALVE

Hiroshi Sasano; Masao Mangyo; Koshi Hamada, and Akihiko Kubota, all of Fujisawa, Japan, assignors to Matsushita Refrigeration Company, Osaka, Japan

Filed Oct. 24, 1994, Ser. No. 330,819
Claims priority, application Japan, Nov. 25, 1993, 5-295157
Int. Cl.[6] F04B *53/10*
U.S. Cl. 417—569 **8 Claims**

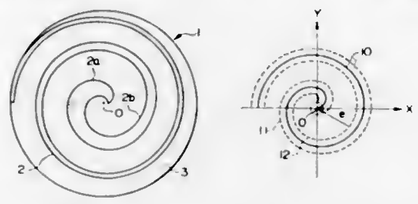


1. A hermetic compressor, comprising:
an enclosed compressor casing; and
a compressor unit disposed within said compressor casing, said compression unit including a compression chamber and a valve assembly having an inlet port arranged to introduce medium to be compressed into the compression chamber and an outlet port arranged to discharge the medium compressed in the compression chamber,
the valve assembly including a valve plate, a single outlet reed valve and a spring member, the valve plate having formed wherein a recessed portion in which the outlet port is formed, the outlet reed valve having a supporting portion and a valve portion for selectively opening and closing the outlet port according to a pressure level of the medium compressed in the compression chamber, the released portion having protrusions protruding inward in the recessed portion to define an outlet reed valve housing in which the supporting portion of the outlet reed valve is secured, the spring member having a plate portion and a plurality of legs extending from the plate portion designed to engaged the protrusions of the recessed portion to retain the outlet reed valve in the outlet reed valve housing and tho provide a spring force service to restrict an opening motion of the valve portion of the outlet reed valve, the legs of the spring member being bent relative to the plate portion to have a given height from the plate portion so as to create a preselected interval between the outlet reed valve and the plate portion of the spring member.

5,554,017
SCROLL FLUID MACHINE, SCROLL MEMBER AND PROCESSING METHOD THEREOF

Hirokatsu Kohsokabe, Ibaraki-ken; Hiroshi Iwata, Odawara; Kazuhiro Endoh, Ibaraki-ken, and Yasuhiro Oshima, Ohira-machi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 992,051, Dec. 17, 1992, Pat. No. 5,427,512. This application Jan. 3, 1995, Ser. No. 368,712
Claims priority, application Japan, Dec. 20, 1991, 3-338970
Int. Cl.[6] F01C *1/04*
U.S. Cl. 418—55.2 **9 Claims**

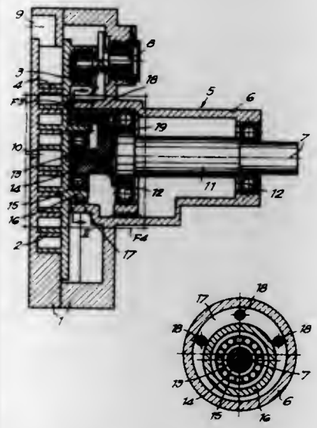


1. A scroll fluid machine in which a pair of scroll members having end plates and volute bodies perpendicular to said end plates, respectively, are in mesh with each other with said volute bodies facing inwardly, and one of said pair of scroll members is moved in revolution with an orbiting radius so as not to be apparently revolved with respect to the other scroll member, wherein the volute bodies of respective scrolls are such that one of an inward curve and an outward curve of one scroll is formed by an algebraic spiral, while another of said inward curve and said outward curve of said one scroll is formed by one of two envelopes drawn when an algebraic spiral of the volute body of the other scroll is moved in a circle with said orbiting radius.

5,554,018
TRANSMISSION WITH REVOLVING BEARING AND SEAL USED HEREBY

Jozef Segers, Lier, Belgium, assignor to Atlas Copco AirPower naamloze vennootschap, Belgium

Filed Jul. 14, 1994, Ser. No. 274,169
Claims priority, application Belgium, Jul. 14, 1993, 09300729
Int. Cl.[6] F01C *1/04;19/12;* **F16C** *3/06*
U.S. Cl. 418—55.4 **13 Claims**



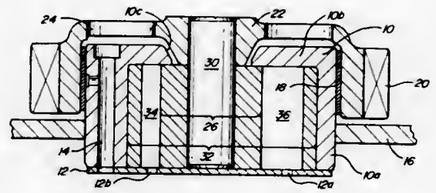
1. A transmission assembly comprising:
a main bearing housing;
a main drive shaft extending into said main bearing housing;
first bearing means rotatably supporting said main drive shaft within said main bearing housing for rotation about a first rotational axis;
a secondary shaft rotatably connected to said main drive shaft, said secondary shaft being rotatable about a second rotational axis that is parallel to and eccentrically positioned with respect to said first rotational axis;
a revolving bearing housing extending within said main bearing housing and about a predetermined portion of said secondary shaft;
a revolving bearing positioned between the predetermined portion of said secondary shaft and said revolving bearing housing; and
a seal situated in an opening between an inner surface portion of said main bearing housing and an outer surface portion of said revolving bearing housing, said seal preventing the passage of fluid thereacross.

5,554,019
COMPACT GEROTOR PUMP

Steve Hodge, Tamworth, United Kingdom, assignor to Concentric Pumps Limited, Birmingham, United Kingdom

PCT No. PCT/GB93/01680, § 371 Date Jan. 24, 1995, § 102(e) Date Jan. 24, 1995, PCT Pub. No. WO94/04824, PCT Pub. Date Mar. 3, 1994
PCT Filed Aug. 9, 1993, Ser. No. 374,585
Claims priority, application United Kingdom, Aug. 18, 1992, 9217540
Int. Cl.[6] F04C *2/10*
U.S. Cl. 418—171 **11 Claims**

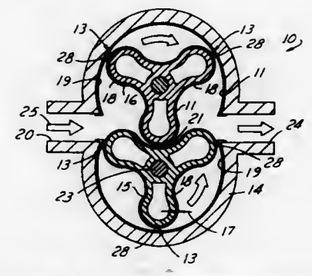
1. A gerotor pump assembly comprising: an external body, a rotatable drive shaft, a rotor housed within said body and coupled to said shaft for rotation therewith, and a drive gear coupled to said drive shaft at one end, the other end of said drive shaft being unsupported, said drive gear being journaled by said body for drivingly rotating said shaft and said rotor relative to said body.



5,554,020
SOLID LUBRICANT COATING FOR FLUID PUMP OR COMPRESSOR

V. Durga N. Rao, Bloomfield Township, and Carlo A. Fucinari, Farmington Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 7, 1994, Ser. No. 319,909
Int. Cl.[6] F01C *21/00*
U.S. Cl. 418—178 **9 Claims**



1. A high efficiency fluid pump for compressing gases or pumping liquids, comprising:
a. means for effecting a pumping action by use of relatively movable parts which cyclically move together and move apart at a zone to transfer fluid, the said parts being constituted of a light weight material; and
b. a coating on at least one of the parts to provide essentially zero clearance when said parts have moved together at said zone, said coating comprising solid lubricants in a polymer resin matrix having a temperature stability up to 700° F.

5,554,021
ULTRA LOW NOX BURNER

Thomas Robertson, Cleveland; Todd Miller, Garfield Heights, and Dennis Quinn, Hinckley, all of Ohio, assignors to North American Manufacturing Co., Cleveland, Ohio

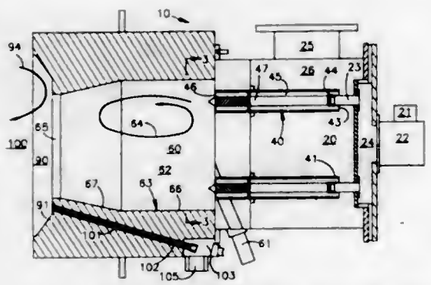
Continuation of Ser. No. 44,719, Apr. 12, 1993, Pat. No. 5,407,345. This application Sep. 20, 1994, Ser. No. 309,205
Int. Cl.[6] F23M *3/00*
U.S. Cl. 431—9 **20 Claims**

1. A burner system for combusting fuel with an oxidant, said burner system comprising:
a reaction chamber having a burner axis and also an inlet and outlet;
a mixing assembly to mix the fuel with the oxidant in a predetermined proportion including:
a plurality of mixer elements located about the burner axis and spaced therefrom at the inlet thereof, wherein the mixed fuel and oxidant is provided to the inlet;
wherein each mixer element further comprises:
a fuel inlet for admitting fuel into the mixer element and an oxidant inlet for admitting oxidant into the mixer element, wherein one of said fuel and oxidant inlets defines a mixer intake at the respective other of said fuel and oxidant inlets

selecting a burner having a burner block having a fuel line for feeding fuel to a fuel port opening into a combustion chamber and a plurality of primary oxidizer lines positioned around

5,554,026
DENTAL HAND PIECE

Gregory L. Van Hale, 247 W. Glenoaks, Glendale, Calif. 91202



defines an input located within the mixer element and spaced a distance from the mixer intake:

a mixer discharge for dischargainq the mixed fuel and oxidant wherein combustion occurs substantially proximate to the mixer discharge:

wherein each mixer discharqe is located off center a significant distance from the burner axis so as to provide a flow imbalance in the reaction chamber in order to recirculate part of said combusted mixed fuel and oxidant within said reaction chamber and thus draw heat back toward each mixer discharge and the remainder of said combusted mixed fuel is discharged out of said outlet of said reaction chamber.

18. A method of combusting fuel with an oxidant in order to reduce NOx emissions comprising the following steps:

a) providing a reaction chamber having a burner axis and also a chamber inlet and chamber outlet;

b) providing a mixing assembly including a plurality of mixer elements located about the burner axis and spaced therefrom at the chamber inlet, for mixing fuel with oxidant in a predetermined proportion;

c) admitting the fuel and oxidant mixture into the reaction chamber through the mixer elements at the chamber inlet;

d) igniting the fuel and oxidant mixture in order to produce combustion near the chamber inlet;

e) recirculating part of the combusted fuel and oxidant mixture within the reaction chamber in order to draw heat back toward the combustion site whereby the mixer elements are located off center a significant distance from the burner axis so as to provide a flow imbalance in the reaction chamber which produces recirculation;

f) discharging the remainder of the combusted fuel and oxidant at the outlet of the reaction chamber.

5,554,022

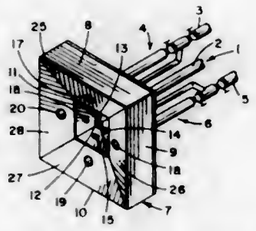
BURNER APPARATUS AND METHOD

James K. Nabors, Jr., Apopka, and William C. Andrews, Longwood, both of Fla., assignors to Xothermic, Inc., Apopka, Fla.

Filed Oct. 14, 1994, Ser. No. 323,006

Int. Cl.[6] F23C *7/00*

U.S. Cl. 431—10 **16 Claims**



1. A process for controlling a flame in a burner for the combustion of a fuel and an oxidizer comprising the steps of:

selecting a burner having a burner block having a fuel line for feeding fuel to a fuel port opening into a combustion chamber and a plurality of primary oxidizer lines positioned around said fuel line for feeding an oxidizer to a plurality of primary oxidizer ports for feeding an oxidizer to a combustion chamber and a plurality of secondary oxidizer lines positioned around said fuel line for feeding an oxidizer to a plurality of secondary oxidizer ports for feeding an oxidizer to a combustion chamber, at least one said secondary oxidizer line and port being positioned adjacent each primary oxidizer line and port, and a first oxidizer control valve located in each oxidizer feed line and positioned to vary the oxidizer being fed in each oxidizer line between the primary oxidizer line and one adjacent secondary oxidizer line and a second oxidizer control valve located in each said secondary oxidizer feed line for varying the amount of oxidizer fed through said oxidizer line;

varying the position and shape of the burner flame in said burner by proportioning the flow of oxidizer between each said primary oxidizer line and one adjacent secondary oxidizer line by varying each said first oxidizer control valve, whereby the flow in each said first and second oxidizer lines is controlled to control the position and shape of a burner flame.

5,554,023

CANDLESTICK AND HOLDER

Laslo Pustay, West Winfield, N.Y., assignor to Pustay Co., West Winfield, N.Y.

Filed Sep. 29, 1994, Ser. No. 314,882

Int. Cl.[6] F23D *3/16*

U.S. Cl. 431—297 **10 Claims**

1. A candle holder adapted to receive therein the bottom end of candles both straight and tapered which comprises:

a cylindraform candle well having a first top diameter, a second bottom diameter, and a third intermediate diameter;

said first top diameter being smaller than said third intermediate diameter but larger than said second bottom diameter.

5,554,024

DENTAL IMPRESSION PAPER TRAY

Masahiko Ueda, Kaizuka, Japan, assignor to Taihei Chemical Industrial Co., Ltd., Osaka, Japan

Filed Jul. 29, 1994, Ser. No. 282,742

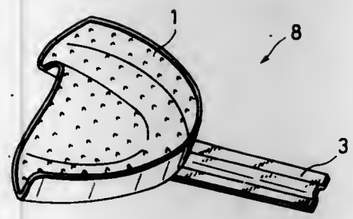
Claims priority, application Japan, Jul. 30, 1993, 5-190145

Int. Cl.[6] A61C *9/00*

U.S. Cl. 433—37 **6 Claims**

1. A dental impression paper tray comprising:

a dish portion and a handle portion, wherein both said dish portion and said handle portion are substantially composed of pulp, which is compressed molded into a dental impression tray shape having a thickness of 0.5 mm–10 mm; wherein:



said dish portion comprises a plate portion and a tooth shaped recessed portion, said dish portion further comprising first and second insertion holes positioned at said tooth shaped recessed portion;

one end of said handle portion comprises a hook; and

said handle portion is removably attached to said dish portion by slidably inserting said handle portion through said first and second insertion holes such that said hook on said handle portion hooks an edge of said plate portion which is adjacent to one of said first and second insertion holes.

5,554,025

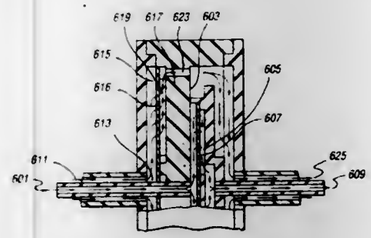
DISPOSABLE POINT OF USE AIR AND WATER FILTER FOR DENTAL SYRINGES

David I. Kinsel, Sylvania, Ohio, assignor to Gelman Sciences, Ann Arbor, Mich.

Filed Mar. 2, 1995, Ser. No. 397,397

Int. Cl.[6] A61C *17/02*

U.S. Cl. 433—80 **13 Claims**



1. A combined air and water microfiltration device suitable for connection to a dental syringe, comprising:

a polymeric housing comprising an inlet housing, a support grid, and an outlet housing;

an air inlet passage, said air inlet passage in communication with an air chamber located within said polymeric housing between said inlet housing and said support grid, said air chamber containing a microporous air filtration membrane positioned such that all air passing through said device must pass through said microporous air filtration membrane;

said support grid located on the outlet side of said microporous air filtration membrane, said support grid supporting said microporous air filtration membrane, said support grid having through holes allowing filtered air to pass through said support grid to an air outlet passage in said outlet housing;

a water inlet tube passing through said inlet housing and said support grid into a water chamber formed between said support grid and a microporous water filtration membrane positioned such that all water passing through said device must pass through said microporous water filtration membrane;

said outlet housing supporting said microporous water filtration membrane against impinging water pressure, said outlet housing having a water outlet passage communicating with said microporous water filtration membrane.

5,554,026

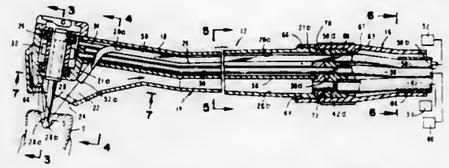
DENTAL HAND PIECE

Gregory L. Van Hale, 247 W. Glenoaks, Glendale, Calif. 91202

Continuation-in-part of Ser. No. 24,375, Mar. 1, 1993, Pat. No. 5,342,196. This application Aug. 25, 1994, Ser. No. 296,249

Int. Cl.[6] A61C *17/02;17/06*

U.S. Cl. 433—82 **18 Claims**



1. A hand piece for use in performing surgical and dental procedures including a rotatable work tool, said work tool being cooled by water from an external source of water, said hand piece comprising:

(a) an elongated handle assembly, including a hollow handle having a distal end, a proximal end and an outer wall defining an interior space, said handle assembly further comprising:

(i) a cooling water conduit disposed within said interior space of said hollow handle; and

(ii) connector means disposed intermediate said distal end and said proximal end of said hollow handle for interconnecting said cooling water conduit with the external source of water;

(b) intake means disposed proximate the work tool and in communication with said interior space of said hollow housing of said handle assembly for capturing the cooling water and channeling it into said interior space said intake means comprising a downwardly depending scoop partially surrounding the work tool, said scoop having side walls defining an open mouth for capturing debris generated by the action of the work tool and for channeling the debris along with the cooling water into said interior space:

(c) vacuum means connected to said proximal end of said hollow handle for creating a vacuum at said intake means.

5,554,027

PROSTHESIS SYSTEM FOR REPLACING TEETH

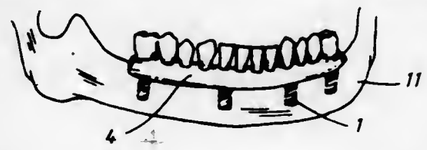
Per-Ingvar Brånemark, Molndal, Sweden, assignor to Medevelop AB, Sweden

Filed Apr. 28, 1994, Ser. No. 234,052

Claims priority, application Sweden, Apr. 28, 1993, 9301424

Int. Cl.[6] A61C *13/22*

U.S. Cl. 433—172 **20 Claims**



1. A prosthesis system for replacement of missing teeth, the system comprising: an arcuate bridge base, two or more substantially rotationally symmetric fixtures implantable in the bone of the lower or upper jaw of a patient, respective rotationally symmetric spacer elements for said fixtures, an arcuate dental bridge, said bridge including teeth and an arcuate profile element supporting the teeth, said profile element being adapted for abutting engagement with the bridge base, said bridge base being a prefabricated element requiring no individual adaptation to accommodate the jaw of the patient, the system including means fixing the bridge base to the spacer elements, and means arranged on or in the profile element for fixing the dental bridge to the bridge base.

170–919 O.G.–96–10: QL3

5,554,028

DENTAL IMPRESSION TAKING

Robert V. Hare, Georgetown, Del., and Paul D. Hammesfahr, Stuart, Fla., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed Mar. 24, 1994, Ser. No. 217,527
Int. Cl.[6] A61C *9/00*
U.S. Cl. 433—214 **9 Claims**

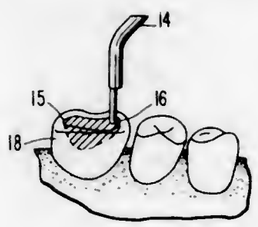
1. A method of preparing an impression of dentition in the oral cavity comprising the steps of sequentially applying a composition comprising a surfactant to an area that is to have its impression taken substantially immediately before applying the impression taking material to said area, rinsing said composition from said area that is to have its impression taken, applying an impression taking material to said area and forming said impression material into intimate contact with said area that is to have its impression taken, and setting said impression material in the impression of said area.

5,554,029

DENTAL LASER APPARATUS AND METHOD FOR ABLATING NON-METALLIC DENTAL MATERIAL FROM A TOOTH

Kenneth Kowalyk, and Michael J. Myers, both of Hilton Head Island, S.C., assignors to Medical Laser Technology, Inc., Hilton Head Island, S.C.

Filed May 31, 1994, Ser. No. 251,135
Int. Cl.[6] A61C *5/00;5/04;1/00;3/00*
U.S. Cl. 433—215 **9 Claims**



1. A method of ablating a non-metallic dental material from a tooth comprising the steps of:

generating radiation pulses having a predetermined wavelength, energy level, pulse repetition rate and duration; and

applying the radiation pulses to the non-metallic dental material in a tooth;

whereby the non-metallic dental material is ablated from the tooth;

wherein the non-metallic dental material comprises a composite material having a resin component and whereby the radiation pulses ablate substantially only the resin component.

5,554,030

METHOD FOR BONDING NON-AMALGAM RESTORATIVE MATERIALS TO DENTAL SURFACES

Paula D. Arlo, Minneapolis, and Steven M. Aasen, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 30, 1994, Ser. No. 268,773
Int. Cl.[6] A61C *5/04;5/00*
U.S. Cl. 433—226 **16 Claims**

1. A method for adhering a non-amalgam dental restorative to a dental surface comprising, in order, the steps of

a) etching said dental surface with acid,

b) applying a treatment composition comprising an electron donor compound to said etched dental surface, thereby providing a treated dental surface,

c) applying a priming solution containing a film-former to said treated dental surface, thereby providing a primed dental surface,

d) applying a chemically curable dental adhesive to said primed dental surface thereby providing an adhesive-coated dental surface, and

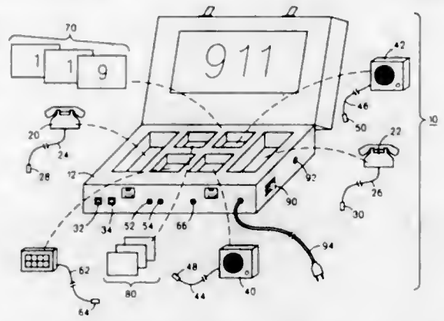
e) applying a non-amalgam dental restorative to said adhesive-coated dental surface; wherein said electron donor compound is selected such that the dental restorative has a higher Adhesive Shear Bond Strength than a like method without said electron donor compound.

5,554,031

TRAINING SYSTEM FOR REPORTING 911 EMERGENCIES

Graydon E. Moir, Hagerstown, Md.; Floyd W. Moir, Seymour, and Karl Cressotti, Cheshire, both of Conn., assignors to Retina Systems, Inc., Seymour, Conn.

Filed Apr. 20, 1995, Ser. No. 425,459
Int. Cl.[6] G09B *25/00*
U.S. Cl. 434—111 **8 Claims**



1. A method of training a child for reporting an emergency on a telephone system of the type having an emergency access code, said method comprising:

(a) providing controllable memory means in which at least one training scenario is recorded;

(b) providing a first telephone coupled to said controllable memory means;

(c) providing a controller coupled to said controllable memory means to cue selected portions of said recorded training scenario to transmit the same to the earpiece of said first telephone;

(d) having a child dial said emergency access code on said first telephone;

(e) having instructor cue successive said selected portion of said recorded training scenario to elicit an answer from said child, over said first telephone, to a question asked in said selected portion, such answer being of the type required by an emergency dispatcher; and

(f) having said instructor repeat step (e) at least one more time to elicit another answer from said child to a different question.

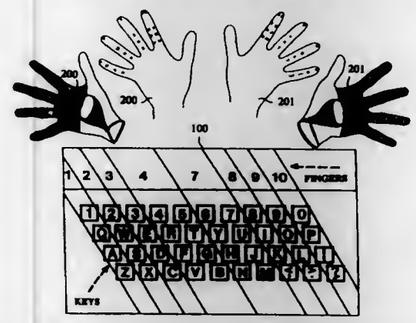
5,554,032

ADAPTIVE SYSTEM BASED ON INDICIA APPLIED TO THE FINGERS FOR TOUCH-TYPING/TRAINING

Farideh Troudet, 18612 Buccaneer Creek, P.O. Box 360664, Strongsville, Ohio 44136

Continuation of Ser. No. 912,874, Jul. 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 770,610, Oct. 3, 1991, abandoned. This application Oct. 24, 1994, Ser. No. 328,393
Int. Cl.[6] G09B *13/04*
U.S. Cl. 434—233 **32 Claims**

1. An adaptive educational device for learning a standardized



typing keyboard having keys, said educational device comprising a left hand glove adapted to surround and cover the left hand of a learner and a right hand glove adapted to surround and cover the right hand of a learner, each of said gloves comprising a body portion and fingers extending from said body portion, said fingers corresponding to the fingers of a human hand and being adapted to surround and cover the corresponding fingers of a learner, each of said fingers having thereon indicia corresponding to the keys on said keyboard which are to be struck by the fingers of a keyboard user, said gloves being adapted to be worn by a learner when said learner is not using said keyboard.

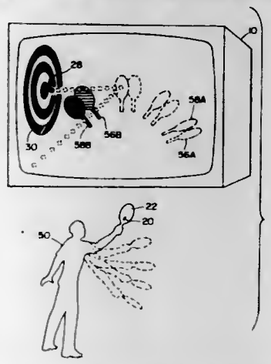
5,554,033

SYSTEM FOR HUMAN TRAJECTORY LEARNING IN VIRTUAL ENVIRONMENTS

Emilio Bizzi, Belmont, Mass.; Ferinando A. Mussa-Ivaldi, Evanston, Ill., and Reza Shadmehr, Waltham, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 1, 1994, Ser. No. 270,028
Int. Cl.[6] A63B *69/00;* **G09B** *9/00;19/00*
U.S. Cl. 434—247 **33 Claims**

1. A teaching system for human trajectory learning comprising:



a motion sensing device for sensing a student's movement;

a display;

memory; and

electronic means responsive to the motion sensing device to generate, during the student's movement, a student's implement virtual image sequence on the display corresponding to the student's movement of an implement set in motion by the student and to simultaneously generate a teacher's implement virtual image sequence on the display of a corresponding teacher's movement of a corresponding implement set in motion by the teacher from said memory, and to generate a virtual object image on the display to be struck by the teacher's implement virtual image sequences, such that the student may cause the student's implement virtual image sequence to imitate the teacher's implement virtual image sequence for attempting to strike the virtual object image, thereby providing an efficient motion learning sequence for the student.

15. A method for teaching human trajectory learning motion, comprising:

sensing a student's movement with a motion sensing device;

generating by the electronic means, during the student's movement of an implement set in motion by the student, a student's implement virtual image sequence in response to the student's movement and a teacher's implement virtual image sequence of a teacher's movement of a corresponding implement set in motion by the teacher from a memory; and

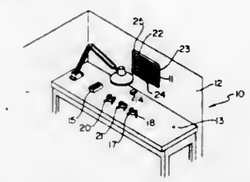
displaying said teacher's implement virtual image sequence of a teacher's movement simultaneously with the student's implement virtual image sequence on a display, and virtual object image, generated by the electronic means, on said display to be struck by the teacher's implement virtual image sequences, such that the student may cause the student's implement virtual image sequence to imitate the teacher's implement virtual image sequence for attempting to strike said virtual object image, thereby providing an efficient motion learning sequence for the student.

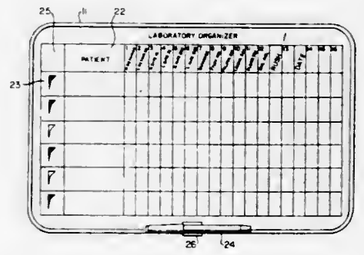
5,554,034

WORKPIECE ORGANIZER

Farnaz Zand, 212 E. Providencia, Burbank, Calif. 91502

Filed Apr. 19, 1995, Ser. No. 424,052
Int. Cl.[6] G09B *23/28;* **G09F** *3/02*
U.S. Cl. 434—263 **5 Claims**





1. In an organizer system for identifying a work product with a particular patient or project, the combination comprising:

a work product;

a chart having a plurality of vertical columns and horizontal rows overlapping each other to define a plurality of squares;

said chart having a markable surface for removably accepting indicia in respective ones of said squares representing said patient or project and work performed therefor or thereon;

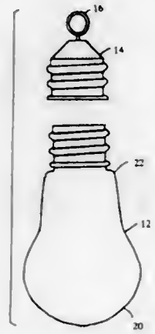
indicator means carried on said chart adjacent to said patient or project indicia identifying said patient or project; and

said indicator means further including a plurality of individual indicators separate from said indicator means carried on said chart and selected ones of said individual indicators embedded in said work product matching said indicator means carried on said chart associated with said patient or project identifying indicia.

5,554,035
BIOLUMINESCENT ALGAE IN LIGHT BULB SHAPED VIEWING DEVICE

Van D. Gooch, 208 W. Fifth St., Morris, Minn. 56267

Filed Jul. 1, 1994, Ser. No. 269,696
Int. Cl.[6] G09B *23/00*
U.S. Cl. 434—297 **8 Claims**



1. An apparatus for viewing luminesence of algae, the apparatus comprising: bioluminescent, dinoflagellate algae;

an aqueous solution in which the bioluminescent algae can live; and

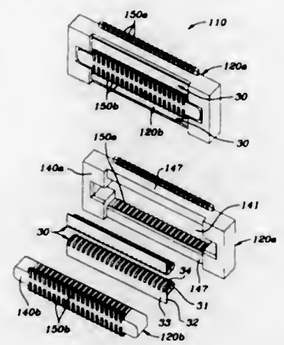
a light bulb shaped container having a bulbous portion and a neck portion extending from the bulbous portion, the light bulb shaped container holding the bioluminescent algae and the aqueous solution, at least a portion of the light bulb shaped container being translucent, where in the aqueous solution has the following composition:

419.0 mM NaCl;
54.6 mM $MgCl_2.6H_2O$;
28.8 mM Na_2SO_4;
10.5 mM $CaCl_2.2H_2O$;
9.39 mM KCl;
2.38 mM $NaHCO_3$;
0.941 mM $NaNO_3$;
0.840 mM KBr;
0.485 mM H_3BO_3;
71.4 μM NaF;
63.8 μM $SrCl_2.6H_2O$;
50.7 μM $NaH_2PO_4.H_2O$;
18.4 μM Na_2EDTA;
12.5 μM $Na_2SiO_3.9H_2O$;
12.1 μM $FeCl_3.6H_2O$;
12.8 nM $ZnSO_4.7H_2O$;
73.8 nM $MnCl_2.4H_2O$;
48.8 nM $COCl_2.6H_2O$;
40.0 nM $CuSO_4.5H_2O$;
26.0 nM $NaMoO_4.2H_2O$;
0.214 nM $(NH_4)_6Mo_7O_{24}.4H_2O$;
0.593 μM thiamine;
4.09 nM biotin;
0.81 nM Vitamin B_{12}; and
2% by weight soil extract.

5,554,036
CIRCUIT BOARD ELECTRICAL CONNECTOR

Hiroshi Shirai, Saitama; Okitsugu Furuya, and Takaki Naitoh, both of Tokyo, all of Japan, assignors to The Whitaker Corporation, Wilmington, Del.

Filed Jun. 1, 1995, Ser. No. 458,068
Claims priority, application Japan, Jul. 4, 1994, 6-174742
Int. Cl.[6] H01R *9/09;23/68*
U.S. Cl. 439—74 **6 Claims**



1. A circuit board connector for electrically connecting conductive pads of circuit boards, comprising:

a first dielectric housing having a recess extending along the length thereof, first electrical contacts on said first dielectric housing having first contact sections for electrical connections to the conductive pads of a first circuit board and second contact sections extending along opposing walls of said recess;

a second dielectric housing profiled to fit within said recess, second electrical contacts on said second dielectric housing having third contact sections for electrical connection to the conductive pads of a second circuit board and fourth contact sections extending along side surfaces of said second dielectric housing opposite the walls of said recess; and

elastomer connecting members disposed in said recess between the side surfaces of said second dielectric housing and the walls of said recess electrically connecting the second contact sections and the fourth contact sections.

5,554,037
TERMINAL SUPPORT FOR USE WITH AN ELECTRONIC COMPONENT

Michael A. Uleski, Roseville, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Mar. 1, 1994, Ser. No. 204,471
Int. Cl.[6] H01R *9/09*
U.S. Cl. 439—76.1 **25 Claims**

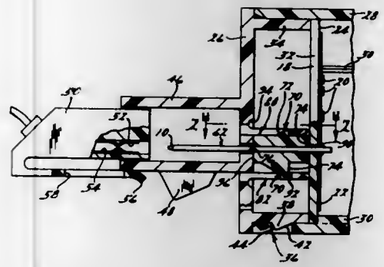
1. A support structure for resisting deformation of an electronic component comprising:

a longitudinally extending terminal affixed to said electronic component, said extending terminal being an electrically conductive terminal;

a carrier member including a pressing surface, said carrier member being a separate member from the extending terminal and being formed of an electrically nonconductive material, said terminal extending through said carrier member;

a base member positioned adjacent to the carrier member, said base member including a flexible tab extending therefrom, said flexible tab including a first stop surface engaging the pressing surface of said carrier member so as to secure said base member to said carrier member; and

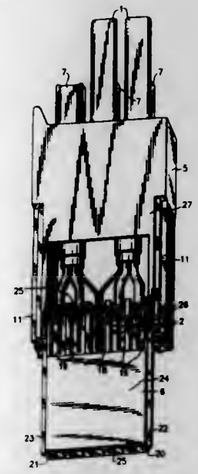
said carrier acting to resist a longitudinal force imposed on said terminal, thereby resisting deformation during connecting to said terminal.



5,554,038
CONNECTOR FOR SHIELDED CABLES

Danny Morlion, St. Amandsberg; Luc Jonckheere, Dilbeek; Jan P. K. van Koetsem, Zwijndrecht, and Eddy K. Creëlle, Dendermonde, all of Belgium, assignors to Framatome Connectors International, Paris, France

Filed Nov. 16, 1994, Ser. No. 340,226
Claims priority, application Netherlands, Nov. 19, 1993, 9302007
Int. Cl.[6] H01R *13/652*
U.S. Cl. 439—108 **12 Claims**

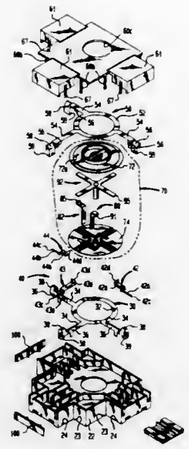


1. Connector for shielded cables, comprising a housing of insulating material with signal and ground contacts accommodated in said housing to which corresponding conductors of the shielded cables are connectable, said contacts being arranged in rows and columns, wherein the housing comprises at least one module and at least one module cap, wherein each module can be detachably mounted in a predetermined position in the module cap, and wherein each module is provided with at least one column of the contacts, each module comprising two outer walls extending in column direction with the signal and ground contacts being located between the outer walls, wherein one of the outer walls is shorter than the other outer wall to expose connection parts of the signal and ground contacts, wherein a cover wall is provided at one end of the module cap for covering the connection parts of the module.

5,554,039
QUICK PLUG CONNECTOR FOR ELECTRIC DISTRIBUTION SYSTEM(S)

Robert Doudon, St. Nicephore, Canada, assignor to Siemens Electric Limited, Brampton, Canada

Filed Sep. 29, 1995, Ser. No. 536,291
Int. Cl.[6] H01R *25/00*
U.S. Cl. 439—115 **7 Claims**



1. A removable electrical connector adapted to be operatively connected to a wall outlet having blade guides and a ground prong receiving aperture and further adapted to be operatively connected to a plurality of continuous outlet cables having a neutral wire, a ground wire and a line wire, said connector including:

(a) an insulated housing comprising a case and a cover;

(b) a neutral contact means and a ground contact means and a line contact means for making contact with the neutral wires, ground wires and line wires of the plurality of continuous outlet cables respectively;

(c) a rotatable plug to be operatively connected to the wall outlet and for making contact to the ground contact means, the line contact means, and the neutral contact means;

the rotatable plug comprising:

a neutral blade contact having at a first end thereof a blade portion for connection to the wall outlet and at a second end a neutral contact edge for making contact with the neutral contact means;

a line blade contact having at a first end thereof a blade portion for connection to the wall outlet and at a second end a line contact edge for making contact with the line contact means;

a ground star contact having a flat cruciform and a ground prong extending from an underside of the cruciform for connection to the wall outlet, the flat cruciform having a plurality of extensions each one of said extensions having a ground contact edge for making contact with the ground contact means;

the rotatable plug being adapted to align the neutral blade portion and the line blade portion and the ground prong, the rotatable plug being rotatable to orient the neutral blade portion and line blade portion and the ground prong to mate with the blade guides and ground prong receiving apertures of the wall outlet;

the neutral contact means comprising a neutral contact flat ring for being contacted by the neutral contact edge of the rotatable plug and further having a plurality of arms extending outwardly from said flat ring, each of said arms having a neutral camming portion connected to a neutral cable engaging portion engageable with the neutral wire of a corresponding one of the continuous outlet cables, each of said neutral camming portions being biased in a retracted

position wherein the electrical connector is mountable to and demountable from a corresponding one of the continu-

being connected to the uniting strip by a substantially flat intermediate portion, and each having a resilient contact strip

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5,554,042
RESILIENT BODY ELECTRICAL CONNECTOR SYSTEM

Valentine L. Denninger, Sunnyvale, Calif., assignor to Trimble

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5,554,043
CONNECTOR FOR TRANSMISSION

position wherein the electrical connector is mountable to and demountable from a corresponding one of the continuous outlet cables;

the line contact means comprising a line contact flat ring for being contacted by the line contact edge of the rotatable plug and further having a plurality of arms extending outwardly from said flat ring, each of said arms having a line camming portion connected to a line cable engaging portion engageable with the line wire of a corresponding one of the continuous outlet cables, each of said line camming portions being biased in a retracted position wherein the electrical connector is mountable to and demountable from a corresponding one of the continuous outlet cables;

the ground contact means comprising a plurality of ground contacts, each of said ground contacts having a rib which connects at one end to a shoulder for receiving contact with any one of the edges of the ground star contact, the rib connecting at a second end to a ground cable engaging portion engageable with the ground wire of a corresponding one of the continuous outlet cables, each of said ribs being biased in a retracted position wherein the electrical connector is mountable to and demountable from a corresponding one of the continuous outlet cables;

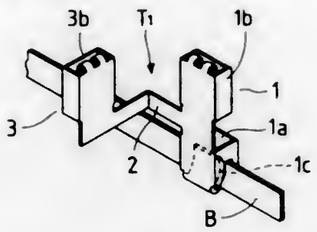
the cover of said housing having a plurality of cover pushers each being moveable between a first and a second position relative to said case, a corresponding one of the neutral camming portions and a corresponding one of the line camming portions and a corresponding one of the ribs being in a retracted position when a corresponding one of said cover pushers is in said first position, each of the cover pushers having pushing means which when said corresponding cover pusher is moved from said first to said second position pushes said corresponding one of the line camming portions and said corresponding one of the neutral camming portions and said corresponding one of the ribs to extended positions wherein said corresponding one of the line cable engaging portion and said corresponding one of the neutral cable engaging portion and said corresponding one of the ground cable engaging portion are engageable with the line wire and the neutral wire and the ground wire of the corresponding one of the continuous outlet cables.

5,554,040

JOINT TERMINAL FOR BUS BAR

Tomohiro Sugiura, and Kunihiko Takeuchi, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Division of Ser. No. 163,701, Dec. 9, 1993, Pat. No. 5,416,972.
This application Feb. 24, 1995, Ser. No. 393,894
Claims priority, application Japan, Dec. 10, 1992, 4-330506
Int. Cl.[6] H01R 25/16
U.S. Cl. 439—212 **9 Claims**



1. A concatenated terminal comprising:

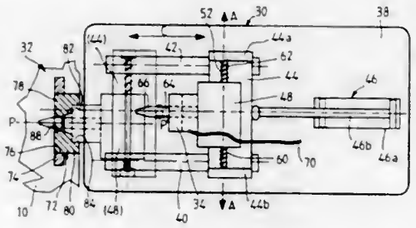
a plurality of terminals integrally connected on a uniting strip, each of said terminals comprising upper and lower terminal portions having respective longitudinal axes and separated by the uniting strip, the upper and lower terminal portions each being connected to the uniting strip by a substantially flat intermediate portion, and each having a resilient contact strip and a wall portion surrounding the contract strip, at least one of said upper and lower terminal portions having opposing slits in the respective portion for engagement with a substantially flat bus bar, said slits on one of said terminal portions being able to receive therein the bus bar at the same time in a direction substantially parallel to the longitudinal axis of said one terminal portion.

5,554,041

ELECTRICAL CONNECTION DEVICE WITH AUTOMATIC POSITIONING

Régis Lallement, Cestas, France, assignor to Lectra Systemes, S.A., Cestas Cedex, France

PCT No. PCT/FR93/00790, § 371 Date Feb. 28, 1995, § 102(e) Date Feb. 28, 1995, PCT Pub. No. WO94/06176, PCT Pub. Date Mar. 17, 1994
PCT Filed Aug. 4, 1993, Ser. No. 392,825
Claims priority, application France, Sep. 1, 1992, 92 10452
Int. Cl.[6] H01R 13/64
U.S. Cl. 439—248 **9 Claims**



1. An electrical connection device with automatic positioning, for connecting a first and a second electrical connection elements, said connection being obtained by engaging one of the elements in other by relative displacement along a connection direction said device comprising:

a base which is fixed during the electrical connection operation;

a first moving support displaceable relative to said base relative to said base along said connection direction (C);

means for displacing said first support relative to said base along said connection direction;

a second support mounted on said first support and movable relative thereto along an adjustment direction which is orthogonal to the connection direction (C);

an indexer element secured to said second support, extending along the connection direction, and having an indexing end, said first connection element being secured to said second support; and

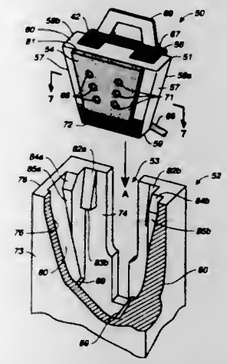
a cam-forming assembly suitable for co-operating with the indexing end of said indexer element, said second connection element being secured to said cam-forming assembly, whereby during displacement of the first moving support, co-operation between the indexer element and the cam-forming assembly causes said second support to be displaced relative to the first support until said first connection element is properly positioned relative to the second connection element.

5,554,042

RESILIENT BODY ELECTRICAL CONNECTOR SYSTEM

Valentine L. Denninger, Sunnyvale, Calif., assignor to Trimble Navigation, Limited, Sunnyvale, Calif.

Filed Feb. 28, 1995, Ser. No. 395,689
Int. Cl.[6] H01R 13/52
U.S. Cl. 439—272 **33 Claims**



1. An electrical connector assembly for making separable electrical connections, the assembly having resistance to external moisture and contamination, comprising:

a resilient insulating connector body defining a longitudinal axis, the connector body including a resilient gasket layer and a contiguous resilient second body member, the resilient gasket layer having one side defining a slidably smooth outward facing connector mating interface, the gasket layer having the other side bonded to the second body member disposed between the connector mating interface and the second body member;

a receptacle having a complementary mating interface for slidably receiving the connector mating interface as the connector is moved along the longitudinal axis;

a plurality of spaced apart first electrical conductors, each conductor having one end with a corresponding contact point, and a corresponding opposed connection end, a portion of each of the conductors and each connection end being embedded within the second body member, each of the respective conductor contact points protruding outside the second body member and disposed in the interior of a corresponding recess opening provided in the resilient gasket layer and connector mating interface, the contact points aligned in a plane parallel to the connector mating interface;

guide means for urging the connector body toward the connector mating interface such that the connector mating interface and the respective conductor contact points will simultaneously make intimate sliding contact with the receptacle complementary mating interface by compressing the gasket layer against the receptacle complementary mating interface as the connector body is slidably moved longitudinally with respect to the receptacle complementary mating surface;

a plurality of corresponding spaced apart second electrical conductors embedded in the receptacle, each second electrical conductor defining a corresponding planar contact surface, the respective contact surfaces disposed along the receptacle complementary mating interface to slidably receive the corresponding connector contact points thereon, as the connector body is slidably moved into a contact position;

latching means for removably latching the connector body in registration with the receptacle such that the respective conductor contact points are aligned in contacting opposition with the corresponding receptacle second contact surfaces at the contact position;

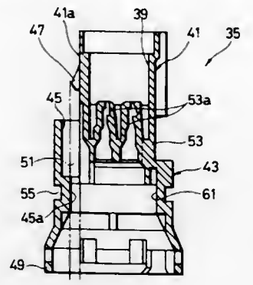
whereby good electrical contact is provided between each respective connector contact point and each corresponding receiving contact surface, and each electrical contact is sealed from external moisture and contamination.

5,554,043

CONNECTOR FOR TRANSMISSION

Makoto Yamanashi, Shizuoka-ken, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Jul. 27, 1994, Ser. No. 281,272
Claims priority, application Japan, Jul. 28, 1993, 5-186116
Int. Cl.[6] H01R 13/627
U.S. Cl. 439—350 **6 Claims**



1. A connector for a transmission, comprising:

a cylindrical part which is provided on a first axial end thereof with a hood part for engaging with a mating connector, said cylindrical part having chambers for accommodating electrical terminals;

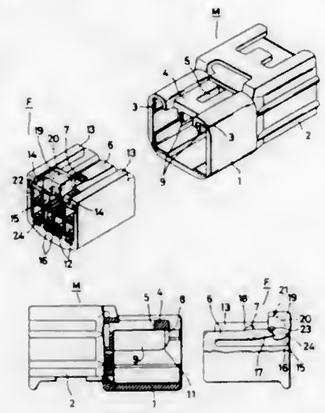
a transmission-case engaging part to be mounted in a mount hole formed in a transmission case, said transmission-case engaging part being formed integral with a second axial end opposite the first axial end of said cylindrical part and being formed to be substantially cylindrical so that an outer diameter of said transmission-case engaging part is larger than an outer diameter of said cylindrical part, said transmission-case engaging part having an opening formed at a first axial end thereof and an inlet for pouring fluid sealant formed at a second axial end thereof, said inlet being arranged at a connecting part of said cylindrical part with said transmission-case engaging part;

at least one projection provided on a periphery of said cylindrical part for engaging with the mating connector; and

a penetration space defining a flowpath for the fluid sealant between the cylindrical part and the transmission-engaging part, the flowpath extending from said opening of said transmission-case engaging part at said first axial end thereof along the periphery of said cylindrical part;

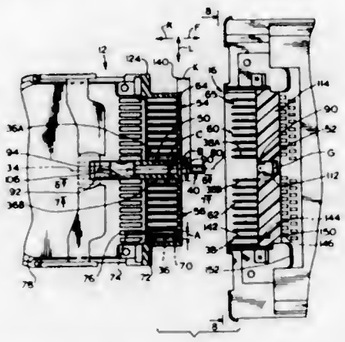
wherein said at least one projection is arranged along an axial extent of the cylindrical part substantially in-line with said penetration space, and said at least one projection comprises a first edge portion extending between a first point and a second point, said first point being nearer to said first axial end of said cylindrical part than said second point is, said at least one projection further comprising a second edge portion which is inversely slanted and extends between said second point and a third point, said third point being nearer to said first axial end of said cylindrical part than said second point is, whereby said second edge portion of said at least one projection and said penetration space can be formed by a single molding die simultaneously, said molding die being drawn in an axial direction of said transmission-case engaging part after molding.

5,554,044
CONNECTOR
Satoru Nishide, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Mie, Japan
Filed Jul. 5, 1995, Ser. No. 498,337
Claims priority, application Japan, Jul. 13, 1994, 6-185476
Int. Cl.[6] H01R *13/627*
U.S. Cl. 439—352 **7 Claims**



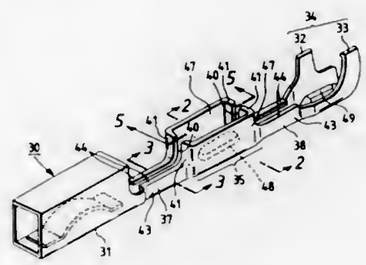
1. A connector comprising:
a first connector housing having a flexibly deformable lock arm;
a second connector housing having a lock portion elastically engageable with said lock arm when the two connector housings are completely engaged with each other; and
a lock holding member rotatably mounted on said first connector housing, said lock holding member being movable between an unlock position to allow said lock arm to be flexed in an unlocking direction thereof and a lock position to inhibit said lock arm to be flexed in the unlocking direction; wherein the lock holding member is positioned below the lock arm when the lock holding member is in the lock position.

5,554,045
LATCH FOR IC CARD CONNECTOR
Gary C. Bethurum, Laguna Niguel, Calif., assignor to ITT Cannon, Inc., Santa Ana, Calif.
Filed Jun. 19, 1995, Ser. No. 492,223
Int. Cl.[6] H01R *13/64*
U.S. Cl. 439—372 **10 Claims**



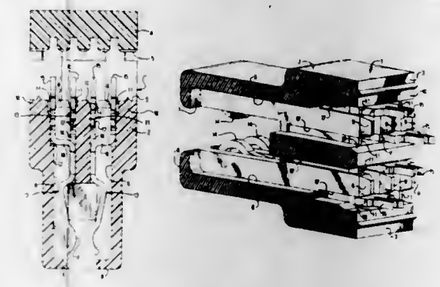
1. An electrical plug connector having a plurality of plug contacts and having a plug connector axis extending in forward and rearward directions, for mating with receptacle contacts of a receptacle connector and for latching to the receptacle connector, wherein the plug connector includes a plug connector housing and a latch which is rotatably mounted in said housing about a latch axis which is substantially parallel to said connector axis, wherein said latch has a forward end with at least one radial projection that has a largely rearwardly-facing first shoulder for moving behind a largely forwardly-facing second shoulder on the receptacle connector, and wherein said plug housing has top and bottom portions and has laterally opposite side edges which are spaced apart by more than said top and bottom portions, and has front and rear portions, characterized by:
an actuator which includes a pair of handles lying outside of said housing and adjacent to said opposite side edges of said housing, said actuator being slidable longitudinally on said housing in forward and rearward directions, said handles being coupled through a crossbar means that extends across said housing between said handles to said latch to rotate said latch about said latch axis as said handles slide forwardly and rearwardly along said longitudinal directions.

5,554,046
SOLDERLESS TERMINAL
Osamu Sugiyama, and Sakai Yagi, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Dec. 23, 1994, Ser. No. 362,898
Claims priority, application Japan, Dec. 24, 1993, 5-345909
Int. Cl.[6] H01R *4/24*
U.S. Cl. 439—397 **16 Claims**



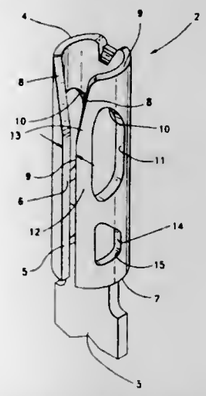
1. A solderless terminal, comprising:
an electrical contact portion located at a front end portion of said terminal, said electrical contact portion being engageable with a mating connecting terminal;
a conductor connecting portion having a core-wire contact slot provided therein, said core-wire contact slot being defined by a pair of opposing conductor clamping blades adapted to cut an insulating cover of a lead wire and retain the conductor of said lead wire to thereby electrically connect said terminal to the conductor of said lead wire; and
a constricted portion merging with said conductor connecting portion,
wherein said constricted portion has a cubic shape defined by a bottom plate and opposing side walls, said side walls being bent inwardly to form right and left reinforcing walls,
wherein said conductor connecting portion has right and left side walls which are confronted with each other to accommodate a part of said lead wire which is to be pushed in said conductor connecting portion, and
wherein an end portion of each of said right and left side walls is bent inwardly substantially in the same direction as said reinforcing walls of said constricted portions to form said conductor clamping blades.

5,554,047
ELECTRICAL CONNECTOR WITH TERMINAL SUPPORTING WALLS
Michael W. Englert, Jr., Charlotte, N.C., assignor to The Whitaker Corporation, Wilmington, Del.
Filed Feb. 28, 1995, Ser. No. 413,731
Int. Cl.[6] H01R *13/38*
U.S. Cl. 439—405 **17 Claims**



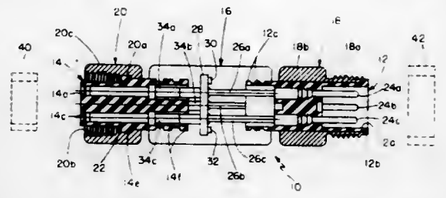
1. An electrical connector comprising:
a first face on an insulating housing,
cavities in the housing, each of the cavities communicating with two slotted openings, and wherein:
an electrical contact in each of the cavities extends along one or the other of the slotted openings,
projecting walls on the housing extend rearward of the slotted openings,
a rearward contact section is received in slotted spaces between the projecting walls, and
opposite sides of the rearward contact section are confined between respective projecting walls to resist bending of the terminal.

5,554,048
INSULATION DISPLACING BARREL CONTACT
Crisostomo Martins, Carignano, Italy, assignor to The Whitaker Corporation, Wilmington, Del.
Filed Nov. 28, 1994, Ser. No. 345,673
Claims priority, application United Kingdom, Dec. 22, 1993, 9326230
Int. Cl.[6] H01R *4/24*
U.S. Cl. 439—406 **17 Claims**



1. A barrel-shaped insulation displacing contact (IDC) stamped and formed from sheet metal comprising a barrel-shaped body section extending longitudinally between a wire receiving end and a terminal end, the body section comprising a longitudinally disposed IDC slot formed by a pair of spaced-apart opposed IDC edges of a seam of the body-section arising from folding together thereof from the sheet metal, the contact characterized in that at least one elongated closed perimeter cutout having closed ends having a generally arcuate surface is provided in the body-section along side and spaced from one of the opposed IDC edges to form a resilient beam therebetween.

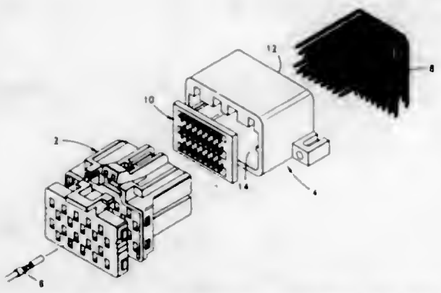
5,554,049
INLINE INDICATING INTERCONNECT
Jeffrey Reynolds, Brynmawr, Wales, assignor to Woodhead Industries, Inc., Northbrook, Ill.
Filed Aug. 19, 1993, Ser. No. 109,379
Int. Cl.[6] H01R *13/66*
U.S. Cl. 439—490 **9 Claims**



1. An inline indicating interconnect for electrically coupling a first male and a second female connector in completing an electrical circuit to connect a functional device to a load, and for indicating a continuity condition for the electrical circuit, said interconnect comprising:
a first connector body including a first end portion having a rotatable threaded portion for coupling to said first male connector and further including a second cylindrical end portion;
a second connector body including a first end portion having a rotatable threaded portion for coupling to said second female connector and further including a second cylindrical end portion;
indicator circuit means electrically coupled to said first and second connector bodies, said indicator circuit means including a disc-shaped circuit board having circuitry disposed on a generally flat surface thereof and coupled to a light source, said indicator circuit means further including said light source mounted to said circuit board and energizable for emitting light when said continuity condition is satisfied; and
an interconnect body coupled to said first and second connector bodies and comprised of a molded light-transmissive material, wherein said interconnect body is molded about said indicator circuit means so as to encapsulate and support said indicator circuit means and to permit viewing of light emitted by said light source, wherein said interconnect body is generally cylindrical and includes first and second opposed open ends respectively adapted to receive in tight-fitting engagement the cylindrical end portions of said first and second connector bodies, and wherein each of said cylindrical end portions of said first and second connector bodies includes a respective plurality of spaced, annular ribs disposed thereabout for securely attaching said connector bodies to said interconnect body.

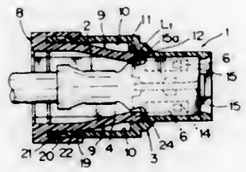
5,554,050
FILTERING INSERT FOR ELECTRICAL CONNECTORS
Gary R. Marpoe, Jr., Kernersville, N.C., assignor to The Whitaker Corporation, Wilmington, Del.
Filed Mar. 9, 1995, Ser. No. 401,594
Int. Cl.[6] H01R *13/66*
U.S. Cl. 439—620 **24 Claims**

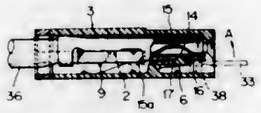
1. A filtering insert for use with an electrical connector including terminals, the filtering insert comprising:



a plurality of stamped and formed connecting tabs, each including a terminal socket and a solder tab section;
at least one stamped and formed ground member having solder contact sections;
an insulative substrate with the connecting tabs secured to the insulative substrate with the solder tab sections being positioned adjacent to separation projections of said substrate in alignment with and spaced from the solder contact sections on the ground member; and
filter components soldered to aligned ones of the solder tab sections and solder contact sections.

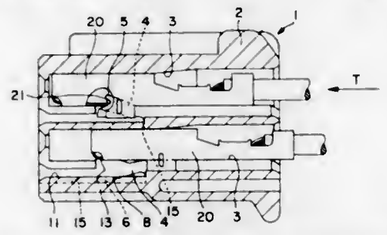
5,554,051
DOUBLE-LOCK TYPE CONNECTOR
Yasuhisa Shinji, and Kazuhiro Morishita, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Mar. 2, 1995, Ser. No. 397,497
Claims priority, application Japan, Mar. 7, 1994, 6-35743
Int. Cl.[6] H01R *13/436*
U.S. Cl. 439—595 **8 Claims**





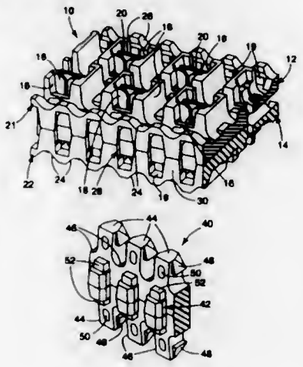
1. A double-lock type connector comprising:
a housing and a holder inserted into said housing, said housing including at least one looking lance which resiliently deflects to lock a terminal when said terminal is inserted into said housing;
a pair of locking arms provided on said holder which resiliently deflect to lock said terminal when said holder is inserted into said housing;
a pair of first paths provided in said housing and a pair of second paths each of which is continuous with a forward end of a respective one of said pair of first paths;
each of said locking arms resiliently deflecting in a direction perpendicular to the direction in which said locking lance deflects; and
first and second locking positions provided in said housing; wherein
said pair of locking arms is guided into said pair of first paths when said holder is inserted to said first locking position, said locking arms being guided into said second paths when said holder is further inserted to said second locking position, thereby permanently locking the terminal.

5,554,052
LOCKING CONNECTOR
Eiji Saijo; Keigo Atsumi, and Masahiko Aoyama, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan
Filed Dec. 7, 1994, Ser. No. 351,503
Claims priority, application Japan, Dec. 7, 1993, 5-071579 U
Int. Cl.[6] H01R *13/40*
U.S. Cl. 439—595 **10 Claims**



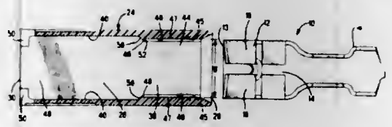
1. A connector comprising a housing containing at least one cavity adapted to receive a terminal fitting, an engaging member having a first position, wherein said engaging member projects into said cavity, and a second position, wherein said engaging member is deflected in a deflection direction into a deflection space, by said terminal fitting as said fitting is inserted in an insertion direction into said cavity, said deflection space being adjacent to, and in communication with, said cavity,
a reinforcing projection on a face of said engaging member and extending in said deflection direction, said reinforcing projection being defined by at least one cut-out portion on said engaging member and having a cut-out surface,
a recess in an inner wall of said housing adjacent said reinforcing projection, said recess being adapted to receive said projection when said engaging member is in said second position.

5,554,053
MODULAR CONNECTOR WITH SEPARABLE WIRE RETENTION
Gary B. Matthews, Austin, Tex., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Aug. 24, 1994, Ser. No. 294,959
Int. Cl.[6] H01R *13/58*
U.S. Cl. 439—719 **7 Claims**



1. A modular, multiple-pair wire connector comprising:
an elongate connector body having a top portion attached to a bottom portion, an upper surface, and a sidewall adjacent to and generally perpendicular with said upper surface, said upper surface further having a plurality of generally parallel wire channels;
a cover having a structured surface for removable attachment to said top portion of said connector body;
a plurality of metallic elements disposed in said connector body, each element having two ends, at least one of said ends having an insulation displacement contact disposed in said top portion of said connector body and pointing generally toward said cover; and
a plurality of dovetail cavities formed in said sidewall of said connector body, each of said cavities being generally identical and interposed between said wire channels.

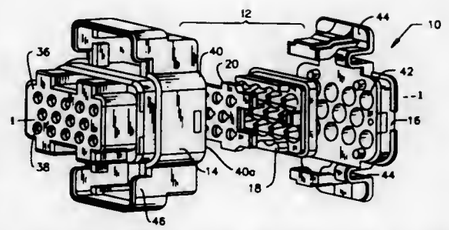
5,554,054
TEMPORARY TERMINAL RETENTION FEATURE
David J. Bratina, Oberlin, and Scott D. Glatfelter, York, both of Pa., assignors to The Whitaker Corporation, Wilmington, Del.
Filed Apr. 17, 1995, Ser. No. 422,980
Int. Cl.[6] H01R *4/22*
U.S. Cl. 439—730 **20 Claims**



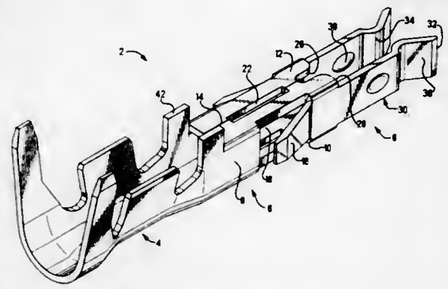
1. An electrical connector, comprising:
a housing having a cavity with a rear section and a forward section towards a mating end of the housing, the rear section having sidewalls with a width therebetween;
a temporary stop disposed along the side wall in the rear section; and
a terminal having a mating portion and a crimping portion, the mating portion having a width slightly larger than the width of the rear portion;
whereby when the mating portion is temporarily secured within the rear portion of the cavity in an interference fit, the temporary stop prevents the terminal from being inserted in the mating end until the crimping portion is crimped to a wire by an assembling machine and the assembling machine inserts the terminal fully into the cavity by forcing the terminal past the temporary stop thereby destroying the temporary stop.

5,554,055
ELECTRICAL CONNECTOR EMPLOYING DUAL LOCKING CONTACT RETENTION
Steven D. Miller, Conway, Ark., assignor to Thomas & Betts Corporation, Memphis, Tenn.
Filed Aug. 31, 1994, Ser. No. 298,815
Int. Cl.[6] H01R *13/436*
U.S. Cl. 439—752 **14 Claims**

1. An electrical connector assembly comprising:
a plurality of elongate electrical contacts, each said contact having a connection end, an opposed conductor terminating end and a central portion therebetween; said central portion including a first locking element adjacent said conductor terminating end and a second longitudinally spaced locking element adjacent said connection end; and
an elongate insulative connector housing having an interconnection end and a contact insertion end for insertably supporting said contacts therein, said connector housing including:
a discrete initial contact support member positioned adjacent said contact insertion end; said initial contact support member including a plurality of initial apertures permitting insertable passage of said contacts through said initial contact support member in an insertion direction from said contact insertion end toward said interconnection end; said initial contact support member including engagement elements adjacent each initial aperture for locking engagement with said first locking elements of said contacts preventing inadvertent movement of said contact in a withdrawal direction opposite said first direction; and
a discrete final contact support member movably positioned adjacent said interconnection end of said housing, said final contact support member including a plurality of first apertures; said first apertures being shaped to provide first aperture portions permitting passage of said second locking elements of said contacts therethrough in said first direction and second aperture portions in communication with first aperture portions, preventing passage of said second locking elements therethrough in said withdrawal direction; said final contact support member being movable within said housing to move from a first position permitting contact passage through said first apertures to a second position preventing contact passage through said first apertures.



5,554,056
LOW INSERTION FORCE RECEPTACLE TERMINAL
Roy Henricus op ten Berg, Oss, Netherlands, assignor to The Whitaker Corporation, Wilmington, Del.
Filed Nov. 25, 1994, Ser. No. 344,907
Claims priority, application United Kingdom, Dec. 2, 1993, 9324762
Int. Cl.[6] H01R *4/48*
U.S. Cl. 439—857 **10 Claims**



1. An electrical receptacle terminal stamped and formed from sheet metal comprising a rectangular shaped body section having top, bottom and sidewalls, and a pair of single resilient cantilever beams extending axially from opposed sidewalls thereof, each

cantilever beam having a first protrusion proximate a complementary male contact receiving end thereof, the first protrusions spaced

engine being prevented from moving relative to the hull by a rod-shaped member that has one end thereof fixed to one of

layer and an upper glass layer have been serially formed, and forming a rear electrode on a bottom of the substrate;

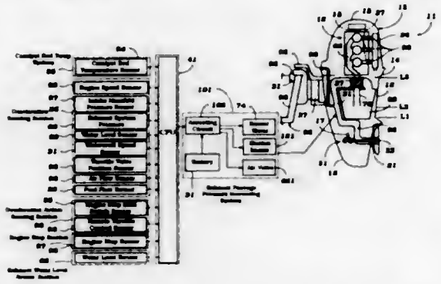
cantilever beam having a first protrusion proximate a complementary male contact receiving end thereof, the first protrusions spaced apart at a distance less than the thickness of a complementary mating male contact axially receivable therebetween such that the cantilever beams are resiliently biased apart during preliminary insertion of the male contact therebetween, characterized in that each cantilever beam has a second protrusion in the form of a contact dimple, the contact dimple being axially offset from the first protrusion towards the body section, whereby the contact dimples are spaced apart during preliminary insertion at a distance less than the thickness of the male contact such that during complete axial insertion of the male contact therebetween, the cantilever beams are resiliently biased further apart and electrical contact between the cantilever beams and the male contact is effectuated substantially by the contact dimples and characterized in that the top and bottom walls of the body section comprise, centrally disposed between the sidewalls, oblong cutouts extending axially therealong for adjustment of the spring force of the cantilever beams by modification of the width or length of the cutouts.

5,554,057

EXHAUST TREATMENT FOR OUTBOARD MOTOR

Kohji Abe; Akihiro Onoue, and Atsushi Isogawa, all of Shizuoka-ken, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 14, 1993, Ser. No. 168,066
Claims priority, application Japan, Dec. 14, 1992, 4-353655
Int. Cl.[6] B63H *21/32*
U.S. Cl. 440—89 **55 Claims**



1. A marine outboard drive comprising an internal combustion engine having at least one exhaust port, a drive shaft housing and lower unit adapted to be supported upon the transom of an associated watercraft and having a propulsion device driven by said engine for propelling said watercraft through a body of water, an underwater exhaust gas discharge formed in said drive shaft housing and lower unit for discharging exhaust gases to the atmosphere through the body of water in which said watercraft is operating, exhaust conduit means for delivering exhaust gases from said exhaust port to said underwater exhaust gas discharge, and purging means responsive to a condition for precluding water from flowing above a predetermined position in said exhaust conduit means by purging water from said exhaust conduit means.

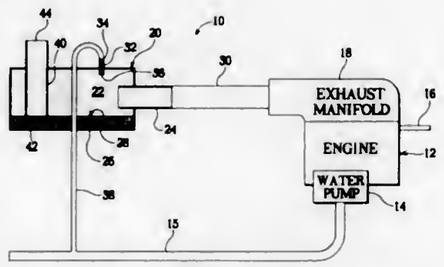
5,554,058

MARINE ENGINE EXHAUST SYSTEM AND ASSOCIATED METHOD

Wayne A. LeQuire, Blount County, Tenn., assignor to Ultra Marine Products, Inc., Louisville, Tenn.

Filed Jul. 7, 1995, Ser. No. 499,679
Int. Cl.[6] B63H *21/10*
U.S. Cl. 440—89 **4 Claims**

1. A marine engine exhaust system for use with a marine engine of a marine vehicle, the marine vehicle having a cooling system,



including a water pump, for injecting water into the marine engine for cooling the marine engine, said exhaust system comprising:

a muffler body defining an internal cavity for receiving exhaust gases, said cavity defining a reservoir portion disposed in a bottom portion of said muffler body for holding water;

at least one first passageway communicating with said cavity of said muffler body for receiving said exhaust gases from said marine engine whereby said exhaust gases are communicated to said cavity of said muffler body;

at least one second passageway communicating with said cavity of said muffler body for being placed in fluid communication with the cooling system of the marine vehicle at a point upstream from the point at which the cooling system injects water into the marine engine, whereby water taken from the cooling system at a point upstream from the point at which the cooling system injects water into the marine engine is communicated to said reservoir portion of said cavity by the water pump of the cooling system; and

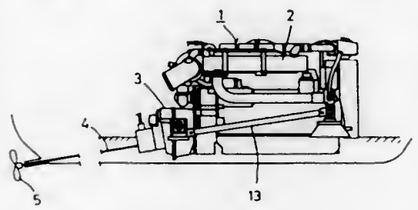
at least one third passageway through which said exhaust gases and water are ejected from said cavity of said muffler body, said third passageway having an inlet port disposed in said reservoir portion of said cavity of said muffler body and having an outlet port exterior to said muffler body.

5,554,059

METHOD OF DAMPING VIBRATIONS OF HULL OF SMALL WATERCRAFT

Ichiro Yamasaki, 3, Ebisujima-cho 5-cho, Sakai-shi, Osaka, Japan

Filed Jan. 31, 1995, Ser. No. 381,320
Claims priority, application Japan, Feb. 1, 1994, 6-010465
Int. Cl.[6] B63H *1/15*
U.S. Cl. 440—52 **8 Claims**



1. A method of damping vibrations of the hull of a watercraft, comprising the steps of:

securing an engine to a bed of the hull by elastically mounting the engine to the bed with fixing members fixed relative to the bed, the fixing members comprising elastic members elastically supporting vertical and horizontal forces and mounting members coupling the fixing members to legs of the engine; and

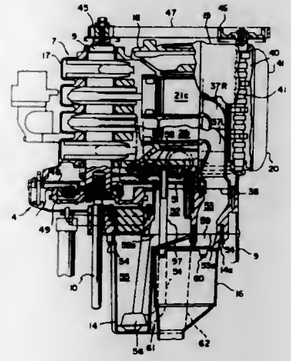
restricting horizontal movement of the engine under a force that is in reaction to a ship propelling force that is transmitted from a propeller to the engine while the engine is being driven by preventing the engine from moving relative to the hull, the engine being prevented from moving relative to the hull by a rod-shaped member that has one end thereof fixed to one of the legs of the engine and another end fixed to the bed.

5,554,060

OUTBOARD ENGINE STRUCTURE

Kouji Koishikawa; Masaki Tsunoda, and Hitoshi Suzuki, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1994, Ser. No. 357,515
Claims priority, application Japan, Dec. 18, 1993, 5-343910
Int. Cl.[6] B63H *21/32*
U.S. Cl. 440—89 **15 Claims**



1. An outboard engine structure comprising:

(a) an engine body case;

(b) an engine body mounted on an upper portion of said engine body case;

(c) an exhaust passage means vertically oriented in said engine body case, for carrying exhaust gas from said engine and discharging the exhaust gas into water;

(d) an oil pan mounted within an upper portion of said engine body case; and

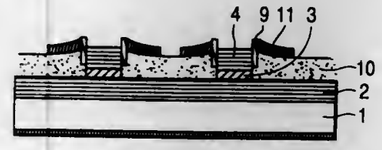
(e) a catalytic converter mounted in said exhaust passage means within said engine body case positioned adjacent said oil pan.

5,554,061

METHOD FOR MAKING A VERTICAL RESONANT SURFACE-EMITTING MICRO-LASER

Hyo-Hoon Park; Min-Soo Park, and Byeoung-Su Yoo, all of Daejeon, Rep. of Korea, assignors to Electronics & Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Dec. 19, 1994, Ser. No. 359,200
Claims priority, application Rep. of Korea, Sep. 30, 1994, 94-25171
Int. Cl.[6] H01J *9/12;9/18*
U.S. Cl. 445—28 **3 Claims**



1. A method for making an upper surface-emitting micro-laser comprising the steps of:

depositing a protective layer on a substrate having a surface-emitting laser structure on which a lower glass layer, an active layer and an upper glass layer have been serially formed, and forming a rear electrode on a bottom of the substrate;

forming a resist pattern on said protective layer and forming resonance structures by performing a first ion etching on said protective layer and said upper glass layer using the resist pattern as a mask;

applying a metal all over surfaces of said resonance structures Ion which the first and forming side electrodes on a side surface of said resonance structures by performing a second etching on said metal and on said active layer except on said resonance structures;

applying a polyimide layer thick enough to cover all said resonance structures for planarazation and removing partially said polyimide layer until a part of said side electrodes is exposed, and then wiring the exposed electrodes on said side surface; and

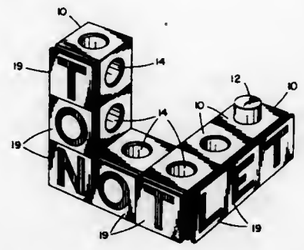
removing said polyimide layer and said protective layer remaining on said resonance structures by an upper emission of the laser to open a top surface of said upper glass layer.

5,554,062

BUILDING WORD BLOCKS

Esther Goldsen, 27 Spruce Hill Rd., Weston, Conn. 06883

Filed May 24, 1995, Ser. No. 449,801
Int. Cl.[6] A63H *33/08*
U.S. Cl. 446—124 **2 Claims**



1. An educational alphabet and word toy comprising: a combination of interlocking blocks and removable letter units with means for gripping;

each block having the general configuration of a cube having six faces;

each cube having a circular recess on five faces thereof and a cylindrical peg on one face of a diameter substantially equal to the recesses;

each letter unit including a substantially flat face with a letter indicia thereon;

a cylindrical peg projecting from each letter unit opposite the flat face thereof and of a diameter substantially equal to the diameter of the circular recesses in said cubes;

said letter units being no larger than the faces of said blocks;

a beveled outer edge around the periphery of each letter unit, defining said means for gripping by providing a separation between said beveled edge and a face of a cube when said letter unit is secured to said face.

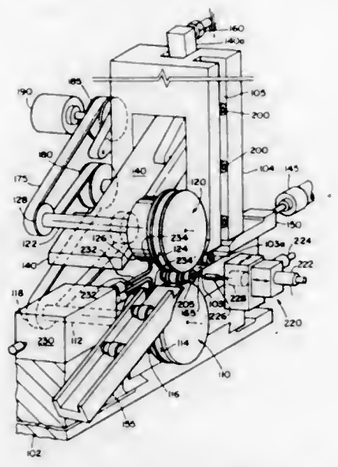
5,554,063

CENTERLESS GRINDER HAVING INSIDE DIAMETER SIZE CONTROL AND METHOD THEREFOR

Lawrence I. Millay, Springfield, Vt., and Richard E. Crossman, Leicester, Mass., assignors to Bryant Grinder Corporation, Springfield, Vt.

Filed Aug. 3, 1994, Ser. No. 285,348
Int. Cl.[6] B24B *49/00;51/00*
U.S. Cl. 451—9 **20 Claims**

1. A method for controlling a grinding machine including a disk for rotating a workpiece, a shoe for cooperating with the disk and



a workpiece support element to hold the workpiece, and a grinder for grinding an inner surface of the workpiece during the rotation, the method comprising:

determining an outside diameter of the workpiece by detecting displacement of the disk;

calculating a necessary wall thickness that will yield the desired inner diameter; and

operating the grinder to remove material along the inner surfaces of the workpiece to achieve the calculated wall thickness.

5,554,064

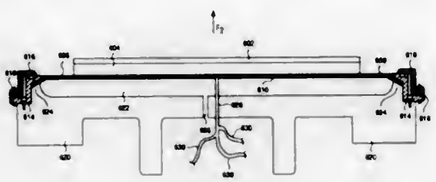
ORBITAL MOTION CHEMICAL-MECHANICAL POLISHING APPARATUS AND METHOD OF FABRICATION

Joseph R. Breivogel, Aloha; Samuel F. Louke, Beaverton; Michael R. Oliver, Tigard; Leopoldo D. Yau, and Christopher E. Barns, both of Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Aug. 6, 1993, Ser. No. 103,412

Int. Cl.[6] B24B *29/00;7/22*

U.S. Cl. 451—41 **46 Claims**



1. A method of polishing a thin film formed on a first surface of a substrate comprising the steps of:

forcibly pressing a polishing pad that is coupled to a flexible diaphragm together with said first surface for a period of time such that said polishing pad substantially conforms to said first surface wherein said polishing pad has an orbital motion with respect to said substrate;

depositing slurry onto said flexible polishing pad during polishing wherein said slurry is deposited onto said polishing pad by feeding said slurry through a plurality of holes formed through said polishing pad; and

removing said substrate from said polishing pad after polishing.

5,554,065

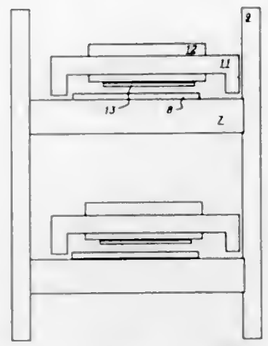
VERTICALLY STACKED PLANARIZATION MACHINE

Richmond B. Clover, 1199 W. Vanderbilt Ct., Sunnyvale, Calif. 94087

Filed Jun. 7, 1995, Ser. No. 473,424

Int. Cl.[6] B24B *5/00*

U.S. Cl. 451—283 **30 Claims**



1. A vertically stacked planarization machine for polishing wafers including:

a. a plurality of vertically stacked platens coupled together, thereby forming a platen stack, each vertically stacked platen including a polishing surface;

b. means for orbiting the platen stack coupled to each of the vertically stacked platens within the platen stack; and

c. means for holding a wafer in contact with the polishing surface of one of the vertically stacked platens.

5,554,066

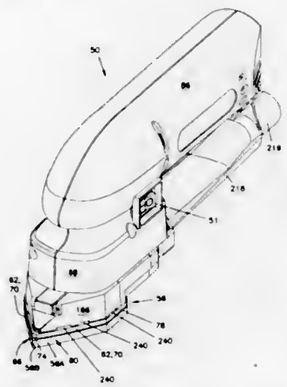
IN-LINE PROFILE SANDER

Donald R. Bosten; John R. Kriaski, both of Jackson; Randy G. Cooper, Milan, and John C. Smith, Jackson, all of Tenn., assignors to Proter-Cable Corporation, Jackson, Tenn.

Filed Feb. 9, 1995, Ser. No. 385,910

Int. Cl.[6] B24B *23/00*

U.S. Cl. 451—356 **16 Claims**



1. An in-line sander, comprising:

(a) a sander body which houses a motor coupled to an in-line oscillating mechanism, the in-line oscillating mechanism being adapted and configured to move a sanding pad in a linear oscillating motion; and

(b) a profiled sanding pad coupled to the in-line oscillating mechanism, the profiled sanding pad having, in a plane substantially perpendicular to the linear oscillating motion, a particular non-linear cross sectional profile which defines, substantially consistently along the length of the pad, a non-linear sanding surface corresponding to a profile to be formed onto or to be sanded on a workpiece, whereby sandpaper secured to the sanding surface of the profiled sanding pad will power sand the profile to be formed onto or to be sanded on a workpiece.

5,554,067

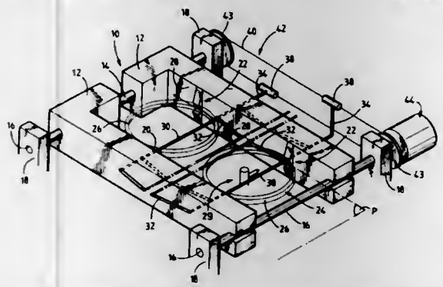
FRAME HOLDER FOR PRESCRIPTION GLASSES

Michel J. M. Lecerf, and Raynald G. M. Longuet, both of Amfreville la Campagne, France, assignors to Buchmann Optical Engineering, Ieper, Belgium

Filed May 23, 1995, Ser. No. 447,878

Int. Cl.[6] B24B *41/06*

U.S. Cl. 457—384 **6 Claims**



1. Frame holder (**10**) for prescription glasses (**24**) of the type featuring two jaws (**12**) mounted in such manner that they slide in relation to each other so that they can move toward or away from each other, and also featuring a device (**22**) to center the frame (**24**) between the jaws (**12**) so as to hold said frame (**24**) in a reference plane (P); said frame holder (**10**) for prescription glasses featuring also a device (**30**) to support frame (**24**) inside jaws (**12**), said device (**30**) supporting frame (**24**) features at least two rods (**30**) parallel to the sliding direction of the jaws (**12**), each one (**30**) extending opposite a rim (**26**) of the frame (**24**) to serve as support to the frame (**24**) before its being clamped by the jaws, said rods (**30**) being mounted in a moving manner in relation to the jaws (**12**) so that, after the jaws (**12**) are closed, it can be retracted so as to permit to pick up the contours of the frame (**24**) rims (**26**).

5,554,068

ABRASIVE FLAP BRUSH AND METHOD AND APPARATUS FOR MAKING SAME

Jeanne M. Carr, Menomonie, Wis.; Jeffrey R. Clampitt, Lino Lakes, and Dean R. Zimmerman, Falcon Heights, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Dec. 13, 1994, Ser. No. 354,952

Int. Cl.[6] B24B *9/02*

U.S. Cl. 451—468 **39 Claims**

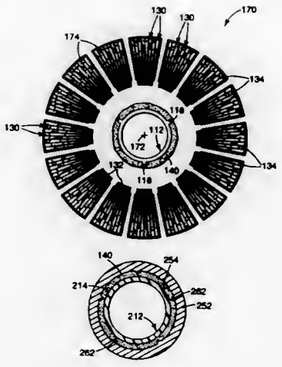
1. A method of making an abrasive flap brush, comprising the steps of:

a) providing a central core including an outer surface, a first end, and a second end;

b) placing said first end of said core in a coater including a bore, said bore including an inner wall configured to extend around said outer surface;

c) introducing adhesive into said bore;

d) moving said core from said first end to said second end through said bore thereby coating said outer surface with said adhesive; and



e) adhering a plurality of abrasive flaps to said core with said adhesive; wherein at least one of said outer surface and said inner wall includes a

spacing means for maintaining a predetermined minimum distance between said outer surface and said inner wall.

5,554,069

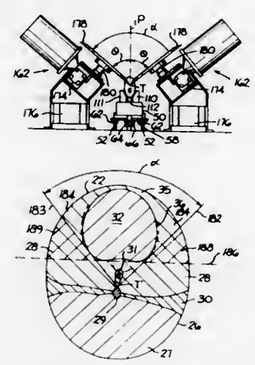
APPARATUS AND METHOD FOR SUBDIVIDING A FISH INTO A LOIN-CONTAINING PORTION AND A VISCERA-CONTAINING PORTION

Ronald H. Burch; Andrew A. Corley, both of Harahan; Eric W. Morales, New Orleans, and Kirk T. Selenberg, Metairie, all of La., assignors to The Laitram Corporation, Harahan, La.

Filed Jun. 1, 1995, Ser. No. 456,493

Int. Cl.[6] A22C *25/18*

U.S. Cl. 452—149 **33 Claims**



1. A method of subdividing a fish into two sections, comprising cutting the fish with a pair of cuts flanking and forming acute angles with a central vertical plane through the fish, the acute angles being selected to position the cuts to avoid the visceral cavity and the belly bones beside the visceral cavity, the cuts meeting along a path disposed largely between the backbone of the fish and the visceral cavity and extending substantially from the vent to a point on the outside surface of the fish proximate the eyes and opening toward the ventral side of the fish to cut a wedge-shaped belly-bone- and viscera-containing belly section from the fish.

5,554,070

COIN GAME MACHINE ISLAND AND COIN TREATING APPARATUS

Takemoto Takatoshi, and Kawashima Kazunari, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ace Denken, Tokyo, Japan

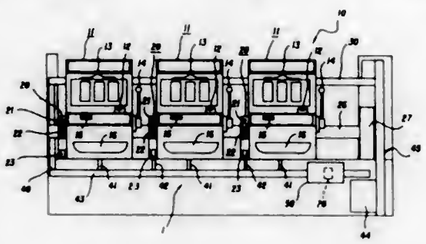
PCT No. PCT/JP93/01208, § 371 Date Apr. 28, 1995, § 102(e) Date Apr. 28, 1995, PCT Pub. No. WO94/05385, PCT Pub. Date Mar. 17, 1994

PCT Filed Aug. 26, 1993, Ser. No. 397,164

Claims priority, application Japan, Sep. 7, 1992, 4-238656; Sep. 7, 1992, 4-238657

Int. Cl.[6] B08B *3/02*; **G07D** *9/00*

U.S. Cl. 453—31 **14 Claims**



1. In a coin game machine island having a plurality of coin game machines which use a coin as a game medium and having a plurality of coin dispensers for dispensing coins corresponding to an amount of inserted money, a coin game machine of said plurality of coin game machines is placed alternatingly beside a coin dispenser of said plurality of coin dispensers, said coin game machine island comprising:

a coin circulating path having a distribution conveyer extending at each upper portion of said plural coin game machines and coin dispensers, plural overflow passages extending downwardly from the end of said distribution conveyer and respective coin game machines, a collecting conveyer extending at the lower portion of said island and connected to the ends of said respective overflow passages, a coin tank placed at the outlet end side of said collecting conveyer and a lift means for lifting coins stored in said coin tank to the inlet end of said distribution conveyer;

a coin washing machine provided in said coin circulating path;

a coin supply means for receiving coins on said coin circulating path and sending said coins, once received, to said coin washing machine at a given interval;

a conveying means for sending said coins in said coin supply machine downstream for further processing;

a dehydration means for absorbing water on said coins, once polished and washed; and

a dryer means for removing dampness from said coins; and

wherein said coin game machines, said coin dispensers, said coin circulating path, said distribution conveyer, said plural overflow passages, said collecting conveyer, said coin tank, said lift means, said coin washing machine, said coin supply means, said conveying means, said dehydration means and said dryer means are all mounted inside said coin game island.

5,554,071

AIR-CHANGE SYSTEM FOR A MULTI-STOREY BUILDING

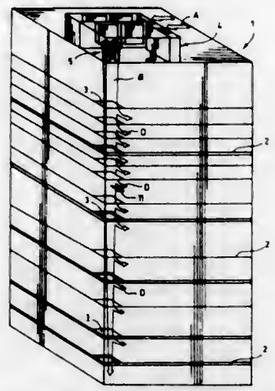
Heikki Peltola, Hollola, and Markku Saloranta, Lahti, both of Finland, assignors to Abb Flakt Oy, Helsinki, Finland

PCT No. PCT/FI92/00095, § 371 Date Oct. 31, 1994, § 102(e) Date Oct. 31, 1994, PCT Pub. No. WO93/20388, PCT Pub. Date Oct. 14, 1993

PCT Filed Apr. 1, 1992, Ser. No. 307,824

Int. Cl.[6] F24F *3/044*; *7/007*

U.S. Cl. 454—338 **11 Claims**



1. A ventilation system for a multi-storey building having intermediate levels and a roof, said system comprising:

a ventilation apparatus mounted on the roof of the building with fans for generating a directed inlet air flow; and

a ductless service shaft extending vertically through the building which is formed by vertically spaced opening in each level of the building, said service shaft forming a flow path directed downwards from the fans wherein said service shaft permits surrounding air to be brought along from upper ones of said intermediate levels to lower ones of said intermediate levels, and wherein said service shaft serving as an inlet air flow channel having deflecting means for passing a part of the air flow to each of said intermediate levels of said building.

5,554,072

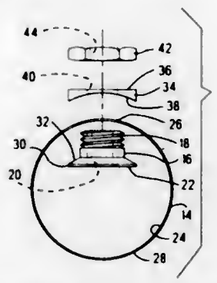
AXIAL CONNECTOR FOR CONCENTRIC CYLINDRICAL TUBES

Eric T. Green, Harrisburg, Pa., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Mar. 24, 1995, Ser. No. 410,160

Int. Cl.[6] H01R *9/07*

U.S. Cl. 439—582 **15 Claims**



1. A connector to connect electrical leads to an inner cylindrical tube and a spaced apart outer cylindrical tube, the tubes being approximately concentric with one another, each tube having respectively, an inner wall and an outer wall, the outer cylindrical tube having an opening between the inner wall and the outer wall, the connector comprising:

a body having a center bore therethrough, the body being disposed in the opening in the outer cylindrical tube and extending outwardly from the outer wall of the outer cylindrical tube, the body being secured to the outer cylindrical tube,

an adapter disposed in the bore in the body, a coaxially mounted conductor retractably disposed in the adapter and electrically insulated from the adapter, the conductor having a first end and an opposite second end, the first end engaging the outer wall of the inner cylindrical tube and forming an electrical contact therewith, and

a first electrical lead connected to the end of the coaxially mounted conductor and a second electrical lead connected to the body of the connector.

5,554,074

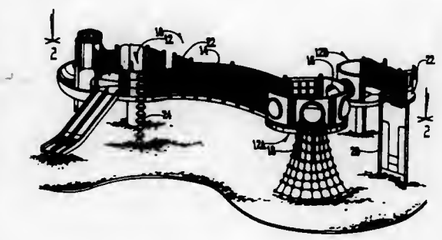
PLAYGROUND DECK ASSEMBLY

Terry Von Parrish, Monett, Mo., assignor to Miracle Recreation Equipment Company, Monett, Mo.

Filed Oct. 14, 1993, Ser. No. 136,590

Int. Cl.[6] A63G *21/00*

U.S. Cl. 472—116 **31 Claims**



1. A playground deck comprising,

a support frame,

said support frame including a pedestal centrally positioned under said deck,

said frame including a connecting means extending between the outer ends of adjacent arms to provide a unitary support frame,

a plurality of pie shaped deck sections on said frame in side by side relationship forming said deck,

said frame including a plurality of support arms radiating outwardly from said pedestal for supporting said deck sections above the ground,

at least one of said pie sections including an outer end portion connected to said pie section through said connecting means, and

said one pie section having a straight outer end surface and said end portion having an outer rounded surface such that a round in shape platform is provided when all pie sections have end portions.

5,554,073

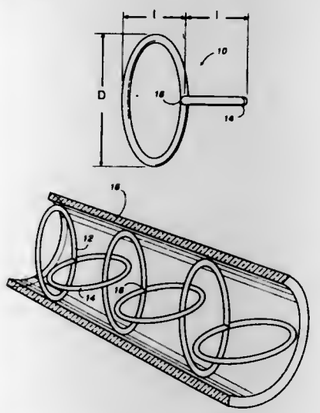
FLEXIBLE SHAFT

Rathnakar Yadama, 1685 Beechwood Ave., San Leandro, Calif. 94579

Continuation of Ser. No. 55,749, May 3, 1993, abandoned. This application Jan. 6, 1995, Ser. No. 369,335

Int. Cl.[6] F16C *1/00*

U.S. Cl. 464—52 **2 Claims**



1. A flexible shaft comprising:

a non-rotatable tubular outer shell of flexible material;

a rotatable flexible shaft within said shell, said flexible shaft including a plurality of links, each link having a first solid loop and a second solid loop, each of said loops formed of first and second arcuate sections spanning the inside diameter of said shell, the center of said first section of said second loop being connected at a right angle to the center of the second section of said first loop, a pair of said connected loops forming said link having a length not greater than said inside diameter, the second arcuate section of said second loop coupled to the first arcuate section of the first loop in a next following link, the maximum diameter of said loops being less that the inside diameter of said tubular shell.

5,554,075

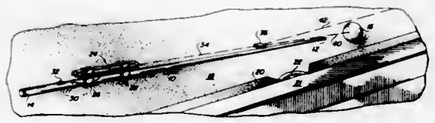
POOL CUE ALIGNMENT DEVICE

Gabriel I. Glazer, 7118 N. 6th Ave., Phoenix, Ariz. 85016

Filed Jan. 22, 1996, Ser. No. 589,408

Int. Cl.[6] A63D *15/08*

U.S. Cl. 473—2 **4 Claims**



1. A pool cue alignment device for assisting a user in lining up a pool shot on a pocket billiards table, said device comprising in combination:

a. a cue stick having a longitudinal axis, and having a handle end and an opposing tip end;

b. a laser for directing a source beam of laser light;

c. fastening means for fastening the laser to the cue stick for directing the source beam along a path extending generally parallel to the longitudinal axis of the cue stick, and generally toward the tip end of the cue stick;

d. a beam deflector for receiving at least a portion of the source beam and generating a deflected beam, the deflected beam being directed at an acute angle from the path of the source beam, said beam deflector being fastened to the cue stick between the fastening means and the tip end of the cue stick, the beam deflector being sufficiently spaced from the tip end

of the cue stick to direct the deflected beam over the top of a cue ball when the tip end of the cue stick is pointed toward the cue ball.

a putter head connected to the tip of said shaft, said putter head bearing a weight ratio to said weight means ranging between 0.42:1 and 1.54:1 and a weight ratio to an overall weight of

5,554,080

SPEED REDUCING MECHANISM AND TRANSMISSION DEVICE HAVING TWO RANGES OF SPEED RATIOS

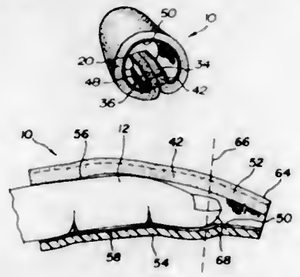
of the cue stick to direct the deflected beam over the top of a cue ball when the tip end of the cue stick is pointed toward the cue ball.

5,554,076

METHOD OF USING A BOWLER'S FINGER SLEEVE

E. Nelson Clark, 533 Devonshire Dr., Hollidaysburg, Pa. 16648

Filed May 26, 1995, Ser. No. 451,809
Int. Cl.[6] A63D *5/00*; A63B *71/14*
U.S. Cl. 473—61 **8 Claims**



1. A method of bowling comprising the steps of:

placing a snug rubber sleeve on a finger of a bowling hand; and

gripping a bowling ball with said bowling hand so that said rubber sleeve is in firm contact with said ball; and

bowling said ball with said bowling hand;

wherein said rubber sleeve placed on the finger is constructed primarily of high-density neoprene rubber;

wherein the neoprene rubber sleeve which is placed on the finger is first constructed by the method steps of:

folding a substantially flat sheet of neoprene rubber in half with free edge portions being flat against one another to form a transition tube having a transition internal passage to approximately snugly fit the finger on which said rubber sleeve is to be placed;

attaching said free edge portions together to form a seam having seam allowance;

turning said transition tube inside out so as to form the rubber sleeve having a sleeve internal passage with said seam allowance forming a radially directed ridge therealong;

wherein said step of placing said rubber sleeve on said finger of said bowling hand includes the substep of mounting said radially directed internal ridge toward the dorsal surface of the finger.

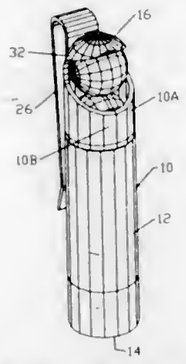
5,554,077

BALL DISPENSER

Roy Coles, Box 13, Mallard Drive, Nanoose Bay, British Columbua, Canada

Filed Feb. 29, 1996, Ser. No. 608,876
Int. Cl.[6] A63R *57/00*; B65D *85/00*
U.S. Cl. 473—131 **4 Claims**

1. A ball dispenser for storing and dispensing balls each having a spherical radius comprising a tube having a longitudinal axis and a substantially cylindrical inner wall surface centered on said axis, a cap at one axial end of said tube, said cap having a concave substantially spherical surface positioned directly over said longitudinal axis and facing said tube, said spherical surface having a spherical radius substantially equal to said spherical radius of said balls to be dispensed, a bridge connecting said cap with said tube, a mouth opening formed in said dispenser adjacent to said cap on a side of said dispenser opposite to and remote from said bridge, said mouth opening, said cap and said bridge being substantially symmetrical relative to a center plane extending along the longitudinal axis and dividing said dispenser into two substantially equal



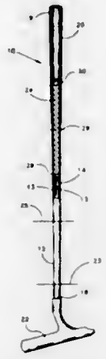
halves, said mouth opening having its periphery on each side of said plane shaped to define a V-shape, each said V shape tapering from a maximum opening of said mouth opening opposite said bridge to a mouth ending adjacent to said bridge, each said V shape being formed by a pair of side edges, one adjacent to said cap sloping toward said bridge and an end of the cylindrical housing remote from said cap and another remote from said cap sloping toward said bridge and said cap, ends of said one and said another side edge of each said pair remote from said maximum mouth opening being interconnected by a curved edge, said mouth opening having a dimension measured parallel to said longitudinal axis at least equal to twice said spherical radius of said balls and sufficient to permit one of said balls to pass therethrough and said cap having a lip formed at its end remote from said bridging section defining a portion of said peripbery of said mouth opening at said plane and spaced from said cylindrical axis a distance less than spherical radius of said balls.

5,554,078

GOLF PUTTER

Richard H. Hannon, Oceanside, and Carl T. Wagner, Encinitas, both of Calif., assignors to Golfology, Incorporated, Carlsbad, Calif.

Filed Mar. 31, 1995, Ser. No. 415,137
Int. Cl.[6] A63B *53/14*
U.S. Cl. 473—292 **17 Claims**



1. An improved golf putter comprising:

a shaft having an inner chamber, a butt-end, and a tip;

a grip attached to the butt-end of said shaft;

a weight means along said shaft, said weight means having a predetermined center point, said center point positioned along said shaft between 20 and 71.4 length % from said butt-end relative to an overall length of said improved golf putter; and

a putter head connected to the tip of said shaft, said putter head bearing a weight ratio to said weight means ranging between 0.42:1 and 1.54:1 and a weight ratio to an overall weight of said improved golf putter ranging between 0.25:1 and 0.47:1, which after all elements are connected and attached presents a specific balance point for said improved golf putter ranging between 44.3 and 65.7 length % from said butt-end relative to the overall length of said golf putter and a swingweight between C-9 and negative G-0,

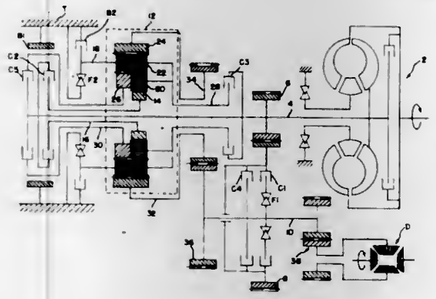
whereby, said putter head and said weight means so ratioed in weight and said weight means so positioned provides a counterweight to the weight of said putter head of said improved golf putter when stroking a putt.

5,554,079

GEAR TRAIN OF AN AUTOMATIC FIVE-SPEED TRANSMISSION FOR A VEHICLE

Taeseok Seo, and Donghoon Park, both of Kyungki-do, Rep. of Korea, assignors to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Apr. 6, 1995, Ser. No. 418,026
Claims priority, application Rep. of Korea, Apr. 6, 1994, 94-7191; Apr. 6, 1994, 94-7195
Int. Cl.[6] F16H *3/62*
U.S. Cl. 475—207 **8 Claims**



1. A gear train of an automatic five-speed transmission comprising:

input means for transferring the power of an engine via a torque converter;

a first-speed drive gear mounted on said input means;

a first-speed driven gear meshed with said first-drive gear to produce a reduced speed ratio;

output means for transferring the power received from said first-speed driven gear to a differential gear;

a planetary gear unit connected with said input means;

a first friction element selectively connected with said input means and output means for producing a first reduced speed ratio;

a second friction element selectively connected with said input means for transferring the input power through a first power transfer member to a first sun gear of said planetary gear unit to produce a second reduced speed ratio;

a third friction element selectively connected with said input means for transferring the input power through a second power transfer member to a planetary carrier of said planetary gear unit serving as an input element; and

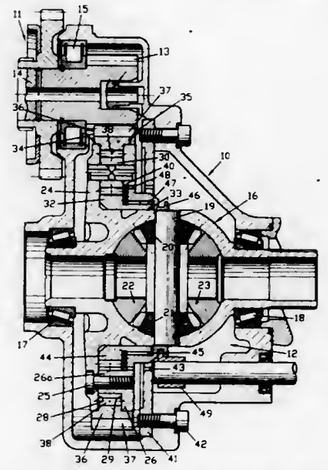
a fourth friction element for gripping a third power transfer member to employ as a reacting element a second sun gear receiving the rotational force of said first sun gear of said planetary gear unit serving as an input element.

5,554,080

SPEED REDUCING MECHANISM AND TRANSMISSION DEVICE HAVING TWO RANGES OF SPEED RATIOS FOR A MOTOR VEHICLE

Henry Dangel, 54 Avenue de la 1ère D.B., 68100 Mulhouse, France

Filed Dec. 15, 1994, Ser. No. 356,893
Claims priority, application France, Dec. 15, 1993, 93 15117
Int. Cl.[6] F16H *37/08*
U.S. Cl. 475—204 **8 Claims**



1. A speed reducing mechanism of the planetary gear train type comprising in combination: a case, a planet carrier rotatively mounted within said case, a ring having external gear teeth and internal gear teeth, a sun gear, and planet gears carried by said planet carrier and engaged with said sun gear and with said internal gear teeth of said ring, said planet carrier comprising a first radial flange defining at least one cylindrical journal rotatively supporting said ring, wherein said ring is solely supported by said planet carrier which is rotatably mounted on said case.

5,554,081

DIFFERENTIAL WITH DISTRIBUTED PLANET GEARS

Ward E. Bowerman, Rochester, N.Y., assignor to Zexel Torsen Inc., Rochester, N.Y.

Filed Mar. 8, 1995, Ser. No. 400,809
Int. Cl.[6] F16H *48/10*
U.S. Cl. 475—252 **19 Claims**

1. In a parallel-axis gear differential for interconnecting a pair of drive axles which share a common axis of rotation, said differential having:

a housing rotatable about said pair of drive axles;

a pair of cylindrical side gears positioned in said housing for receiving ends of the respective drive axles for rotation therewith about the common axis, each said side gear having an outer diameter and an effective face width;

a plurality of cylindrical planet gears organized in meshing pairs and positioned circumferentially in said housing about said common axis for rotation about respective axes extending parallel to the common axis; and

each of said planet gears including a first meshing portion in engagement with the effective face width of one of said side gears and a second meshing portion in engagement with a respective meshing portion of its paired planet gear, the meshing portions of each said planet gear having an outer diameter and the meshing engagement of said side and planet gears interconnecting said respective axle ends in a mutual driving and load-transmitting relationship;

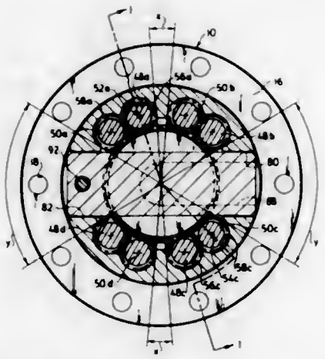
composite planetary gears are arranged around an axis of said carrier, each of said composite planetary gears consisting of a large pinion meshing with a common first gear, and a small pinion which

a support member comprising a support rod and a leg support, said support rod provided at a front end thereof with a through hole which is coaxial with said locating hole of

5,554,085

WEIGHT-TRAINING MACHINE

William T. Dalebout, Logan, Utah, assignor to ICON Health &



the improvement wherein:

four separate and distinct pairs of said planet gears are symmetrically arranged about the common axis in two separated sets, with two planet gear pairs being positioned in each set, and with the axes of all of said planet gears located at the same radial distance from the common axis;

said two pairs of planet gears in each said set are circumferentially separated from each other by respective first angular spacings;

said two sets of planet gears are separated from each other by respective second angular spacings;

said housing has at least one window for providing access to space interior of said differential, said window being positioned in circumferential alignment with at least one of said second angular spacings; and

said second angular spacings are substantially larger than said first angular spacings so that said four pairs of planet gears are distributed symmetrically-but-not-equiangularly about the common axis and said two sets of planet gears are separated by a distance larger than said outer diameter of one of said planet gears to permit access through said window to said space interior of said differential.

5,554,082

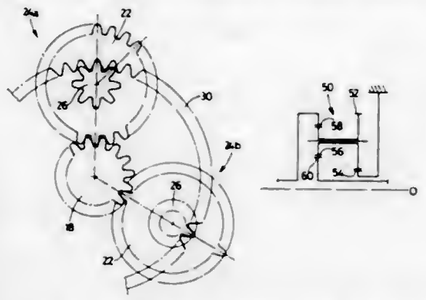
TRANSMISSION WITH INTEGRAL LARGE AND SMALL PLANETARY GEARS, AND METHOD OF ASSEMBLING THE TRANSMISSION

Mitsuhiro Umeyama; Takashi Shimizu; Eiji Ichioka; Kinya Yoshii; Takeharu Koide, all of Toyota, and Makoto Funahashi, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 17, 1994, Ser. No. 323,805
Claims priority, application Japan, Oct. 26, 1993, 5-267157
Int. Cl.[6] F16H *1/28*

U.S. Cl. 475—338 **12 Claims**

1. A planetary gear type transmission including a plurality of



composite planetary gears supported by a carrier such that said composite planetary gears are arranged around an axis of said carrier, each of said composite planetary gears consisting of a large pinion meshing with a common first gear, and a small pinion which has a smaller diameter than said large pinion and which meshes with a common second gear, wherein the improvement comprises:

said large and small pinions having a ratio Zp_1/Zp_2 which is equal to an integer not smaller than 2, wherein Zp_1 and ZP_2 represent numbers of teeth of said large and small pinions, respectively.

5,554,083

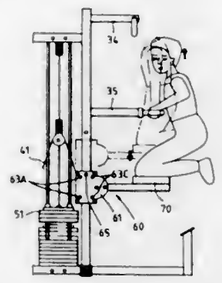
MULTIPURPOSE EXERCISE MACHINE HAVING AN ARM DRILLING DEVICE

James Chen, No. 35, Tun Hl Rd., Chin Chan Ll, Sa Lu, Taichung, Taiwan

Filed Mar. 22, 1995, Ser. No. 408,721
Int. Cl.[6] A63B *23/12*

U.S. Cl. 482—95 **1 Claim**

1. A multipurpose exercise machine comprising:



a support frame unit having a bottom bar, an upright bar extending upwardly from said bottom bar, an upper bar fastened to a top end of said upright bar,

a slant bar fastened between said upper bar and said bottom bar;

a pushing and swiveling mechanism fastened with said upper bar;

a seat fastened to said slant bar;

a lifting mechanism located in front of said seat;

a pulling mechanism fastened with a front end of said upper bar;

a treading support mounted on said bottom bar;

a horizontal bar support fastened to an upper end of said upright bar;

a parallel bar support fastened to an upper portion of a midsegment of said upright bar;

a pulley set disposed in a space formed by said bottom bar, said upright bar and said upper bar, said pulley set comprising a plurality of pulleys and ropes;

a weight loading device provided with a plurality of weights and fastened with a first rope of said ropes; and

an arm drilling device fastened to a midsegment of said upright bar such that said arm drilling device is located under said horizontal bar support and said parallel bar support, and that said arm drilling device is fastened with a second rode of said ropes of said pulley set;

wherein the weight loading device resists movement of the pushing and swiveling mechanism, the lifting mechanism, the pulling mechanism and biases the arm drilling mechanism upward;

wherein said arm drilling device comprises:

a sliding seat having a frame formed by two plates which are provided respectively with a plurality of roller sets capable of sliding on the surface of said upright bar so as to enable said sliding seat to slide up and down along said upright bar, said frame of said sliding seat provided centrally with a locating hole and further provided peripherally with at least one through hole; and

a support member comprising a support rod and a leg support, said support rod provided at a front end thereof with a through hole which is coaxial with said locating hole of said frame of said sliding seat and is engageable with an insertion via which another insertion pin is inserted into said through hole pin, said support rod further provided with another through hole of said frame so as to enable said support rod to swivel, said leg support mounted on said support rod for supporting thereon both legs of an exerciser;

wherein said upright bar is provided in a midsegment thereof with a horizontal hole Which is coaxial with a through hole located at a top of said frame of said sliding seat and is engageable with an insertion pin for locating said sliding seat on said upright bar.

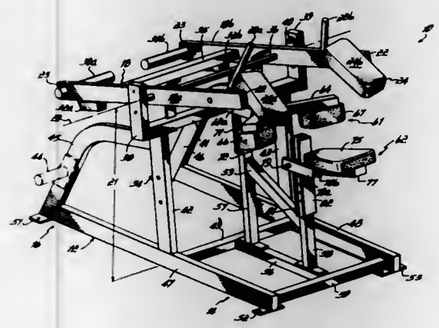
5,554,084

ABDOMINAL/HIP FLEX EXERCISE MACHINE

Gary A. Jones, Falmouth, Ky., assignor to Hammer Strength Corporation, Cincinnati, Ohio

Filed Aug. 18, 1994, Ser. No. 292,466
Int. Cl.[6] A63B *23/02;21/06*

U.S. Cl. 482—97 **14 Claims**



1. An abdominal/hip flex exercise machine comprising:

a frame supported on a floor, the frame having a first end adapted to support an exerciser in an upright exercise position facing a second end of the frame;

a lever pivotally connected to the frame intermediate the first and second ends of the frame and pivotable about a horizontal axis located above the floor, the lever having first and second ends corresponding to the first and second ends of the frame, the horizontal axis spaced away from the upright exercise position;

a weight bolder located proximate the second end of the lever and adapted to provide a weight resistance to movement of the lever about the axis; and

a pair of forearm pads mounted in a spaced relation proximate the first end of the lever adjacent the upright exercise position and angled downwardly from a horizontal toward the upright exercise position, the pads adapted to be engaged by forearms of the exerciser when in the upright exercise position, and the pads being acted upon by the exerciser in a downwardly directed abdominal/hip flex motion initiated from the upright exercise position, thereby to pivot the lever about the axis against the weight resistance at the second end thereof and to exercise an abdominal muscle group of the exerciser.

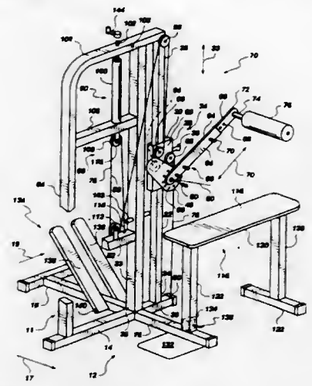
5,554,085

WEIGHT-TRAINING MACHINE

William T. Dalebout, Logan, Utah, assignor to ICON Health & Fitness, Inc., Logan, Utah

Filed Feb. 3, 1994, Ser. No. 191,088
Int. Cl.[6] A63B *21/22*

U.S. Cl. 482—137 **19 Claims**



1. An exercise machine comprising:

a frame for positioning on a support surface, said frame including an upright member having a lower end and an upper end;

trolley means adapted to said upright member for movement therealong between said lower end and said upper end;

locking means operably associated with said upright member and said trolley means for locking said trolley means to said upright member at selected locations along said upright:

a cable having a first end, a second end and a bight thereinbetween, said first end being connected to structure associated with said frame;

resistance means mechanically associated with said frame and operably linked with said second end of said cable to resist movement of said cable; and

an exercise assembly for operation by a user to perform exercises, said exercise assembly including

a plate rotatably mounted to said trolley means for movement relative to said trolley means,

an arm rotatably attached proximate a first end to said trolley means to rotate relative to said trolley means, said arm extending outwardly from said trolley means proximate said plate to a second end, said second end being configured for contact with and movement by a user performing exercises,

indexing means operably associated with said plate and said arm for detachably interconnecting said arm with said plate in a selected one of a plurality of positions,

first guide means secured to said plate for operably contacting the bight of said cable and for displacing said bight upon movement of said arm, and

second guide means secured to said trolley means for guiding said bight to and from said first guide means and for guiding said cable toward said resistance means and toward said first end of said cable.

5,554,086

LEG PRESS EXERCISE APPARATUS

Theodore G. Habing, Long Beach, and Douglas J. Habing, Manhattan Beach, both of Calif., assignors to Pacific Fitness Corporation, Cypress, Calif.

Filed Sep. 23, 1994, Ser. No. 309,879
Int. Cl.[6] A63B *21/062;21/068;23/04*

U.S. Cl. 482—137 **31 Claims**

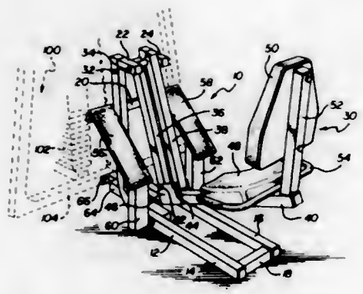
1. An apparatus for performing a seated leg press exercise comprising:

5,554,088

SPORT TRAINING BAG AND SUPPORT

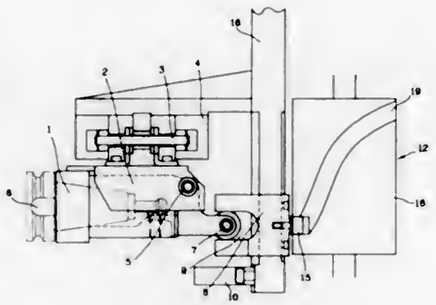
Milan Zlojutro, 1940 E. Diamond Ave., Mesa, Ariz. 85204

means being adapted to be engaged and acted upon by ball and toe portions of soles of feet of an exerciser when in the exercise position, wherein the exerciser arcuately pivots the



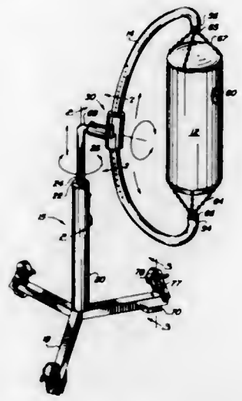
a frame;
means fixed to the frame for supporting a user's feet;
a seat movable with respect to the frame for supporting the user in a seated position;
linkage means pivotally coupled to the frame at a first location and the seat at a second location below the first location, said linkage means for locating the seat along a path of motion relative to the frame such that the torso supporting means remains in an approximately constant attitude relative to horizontal at every position along the path of motion; and
means, coupled directly to the seat, for providing a user selectable exercise resistance.

5,554,087
TOOL PIVOTING MECHANISM OF A TOOL MAGAZINE
Yaw-Der Hwang, Taipei, and Jyh-Jone Lee, Tainan City, both of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu Hsien, Taiwan
Filed Nov. 15, 1994, Ser. No. 340,601
Int. Cl.[6] B230 *3/155*
U.S. Cl. 483—62 **12 Claims**



1. A tool pivoting mechanism of a tool magazine for a machining center comprising an actuating means, a transmitting mechanism, and a tool pivoting mechanism, said actuating means being provided to connect said transmitting mechanism and said tool pivoting mechanism; wherein said transmitting mechanism comprises a cam set means which drives said pivoting mechanism, further wherein said actuating means is a rotary driving means, and said cam set means is a barrel cam set which drives said tool pivoting mechanism.

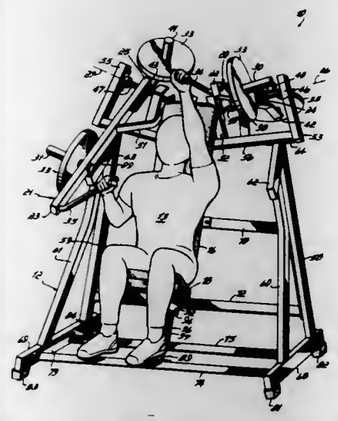
5,554,088
SPORT TRAINING BAG AND SUPPORT
Milan Zlojutro, 1940 E. Diamond Ave., Mesa, Ariz. 85204
Filed Sep. 12, 1995, Ser. No. 527,021
Int. Cl.[6] A63B *67/00*
U.S. Cl. 482—83 **9 Claims**



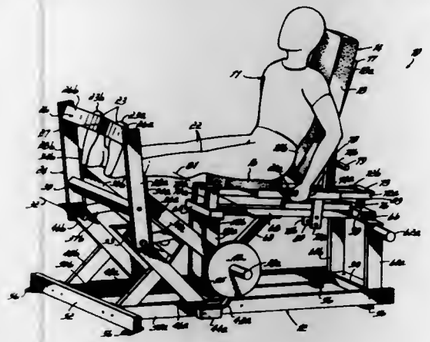
1. A sport training device comprising:
(a) base member;
(b) a support attached to and upwardly extending from the base member;
(c) a height adjustment member engaging the support and being vertically adjustable with respect to the support;
(d) an arm extending from said height adjustment member and terminating at a connector, one of said connector and said arm being rotatably adjustable about a generally horizontal axis;
(e) a substantially C-shaped suspension frame member having opposite ends and defining a bag suspension area therebetween, said frame member being attached to said connector to thereby allow said frame member to be vertically and angularly adjusted with respect to said connector; and
(f) a punching bag having attachment means for suspending said punching bag from said suspension frame, at one end and anchoring said bag at the other end, in said bag-suspension area whereby the height and angular position of said punching bag may be selectively adjusted, along with said frame.

5,554,089
MILITARY PRESS EXERCISE MACHINE
Gary A. Jones, Falmouth, Ky., assignor to Hammer Strength Corporation, Cincinnati, Ohio
Filed Sep. 16, 1994, Ser. No. 307,510
Int. Cl.[6] A63B *21/06*
U.S. Cl. 482—97 **14 Claims**

1. A military press exercise machine comprising:
a frame defining an exercise position for an exerciser whereby the exerciser in the exercise position faces a forward direction along a vertical midplane bisecting the frame;
a lever having forward and rearward ends, each rearward end being pivotally connected to the frame so as to pivot about a pivot axis located above and behind the exercise position, the pivot axis angling downward and forward toward the midplane, and the lever extending from the pivot axis in the forward direction and laterally away from the midplane, the lever pivoting in a tilted plane converging with the midplane in the upward direction and diverging from the midplane in the forward direction;
a weight holder connected to the lever adjacent the forward end thereof, the weight holder adapted to hold a selected weight to provide a selected weight resistance, the weight holder providing the forward end of the lever a resistance to pivotal motion in the tilted plane in a generally upward direction; and
a handle connected to the forward end of the lever, the handle located forward of the exercise position and spaced laterally from the midplane, the handle adapted to be grasped by an exerciser located in the exercise position and raised upwardly in a military press exercise motion against the selected weight resistance to pivotally raise the forward end of the lever above the pivot axis, the handle moving upward and toward the midplane during the motion to exercise a muscle group associated with the military press exercise motion.

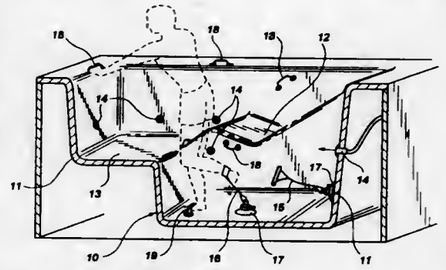


5,554,090
CALF EXERCISE MACHINE
Gary A. Jones, Falmouth, Ky., assignor to Hammer Strength Corporation, Cincinnati, Ohio
Filed Dec. 30, 1994, Ser. No. 367,467
Int. Cl.[6] A63B *21/06;23/08*
U.S. Cl. 482—97 **18 Claims**



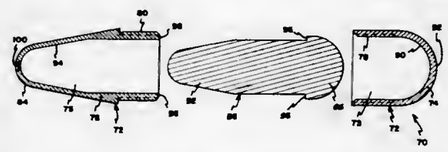
1. A calf exercise machine comprising:
a frame;
support means connected to the frame for supporting an exerciser in a seated exercise position with the legs of the exerciser extending in a direction along a length of the machine;
lever means pivotally connected to the frame forward of the support means for rotating with respect to the frame about a substantially horizontal pivot axis oriented perpendicular to the length of the machine;
engagement means secured to one end of the lever means and having a bend extending toward the support means, and providing two distinct engagement portions the engagement means being adapted to be engaged and acted upon by ball and toe portions of soles of feet of an exerciser when in the exercise position, wherein the exerciser arcuately pivots the lever means about the pivot axis by extending and retracting the ball and retracting the ball and toe portions of the feet, resulting in a corresponding flexion/extension of the calf muscle of the exerciser; and
weight holding means connected to the lever means for providing a selected weight resistance to pivotal motion of the lever means during flexion of the calf muscle by the exerciser.

5,554,091
METHOD AND APPARATUS FOR MINIMIZING LACTICEMIA DURING EXERCISE
Kenneth Patey, 2851 ½ County Rd. 4, Meeker, Colo. 81641
Filed Jun. 1, 1995, Ser. No. 459,186
Int. Cl.[6] A63B *21/02*
U.S. Cl. 482—111 **20 Claims**



1. A method for exercise while submerged in a tub of water which minimizes formation of lactic acid within a joint or muscle; said method comprising the steps of:
a) submerging the muscle or joint in a hot tub;
b) positioning an elastic band between the muscle or joint and an anchor mounted to the hot tub;
c) applying a submerged jet of heated water against the muscle or joint; and
d) exercising the muscle or joint by extending the elastic band while maintaining the application of the jet of heated water on the muscle or joint being exercised.

5,554,092
APPARATUS AND METHOD FOR TESTING AND EXERCISING PELVIC MUSCLES
Stanley D. Harpstead, Arden Hills, and Hugh Hestad, Eden Prairie, both of Minn., assignors to Dacomed Corporation, Minneapolis, Minn.
Filed Jun. 3, 1994, Ser. No. 253,710
Int. Cl.[6] A63B *21/065*
U.S. Cl. 482—148 **17 Claims**



1. An apparatus for testing and/or strengthening pelvic muscles, comprising:
a hollow casing defining a cavity, the casing including a top piece that is removably attached to a bottom piece, the bottom piece including an end that fits within the top piece when the top and bottom pieces of the casing are attached together; and

a plurality of inserts of differing weight positionable in the cavity defined by the casing, at least one of the inserts including a head portion, a body portion and a shoulder portion, the shoulder portion being positioned between the head and body portions, wherein when the one insert is placed in the cavity of the casing, the shoulder of the insert cooperates with the end of the bottom piece of the casing to securely retain the head portion of the insert within the top piece of the casing and the base portion of the insert within the bottom piece of the casing.

5,554,093

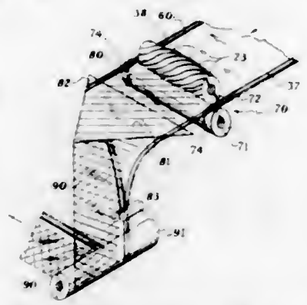
FLEXIBLE THERMOPLASTIC CONTAINERS HAVING A VISUAL PATTERN THEREON

Jose Porchia, Midland; Brian C. Dais, Sanford, both of Mich.; Karen E. McBride, Indianapolis, Ind.; D. Lyn Farrelly, Indianapolis, Ind., and Robert R. Steele, Indianapolis, Ind., assignors to Dowbrands L.P., Indianapolis, Ind.

Division of Ser. No. 355,744, Dec. 14, 1994, which is a continuation of Ser. No. 84,654, Jun. 28, 1993, abandoned. This application May 30, 1995, Ser. No. 454,449

Int. Cl.[6] B31B *1/25*

U.S. Cl. 493—240 **4 Claims**



1. A process for making a container having two sidewalls, side seams, a bottom edge, a top and an opening adjacent the top, the process comprising the steps of:

contacting the web with an impressing roller;

impressing a web stock with a first initial impressed pattern; and

forming the container from said web stock to form first and second sidewalls, each sidewall having the first impressed pattern thereon, such that upon forming said container from said web stock, said first and second sidewalls having said initial patterns thereon are adjacent to each other and at least a second pattern on the container different from the first initial pattern on the web stock is perceived by an observer of the container.

5,554,094

FOLDING APPARATUS

Wilfred S. Viens, Lisbon, Conn., assignor to Gunther International, Ltd., Norwich, Conn.

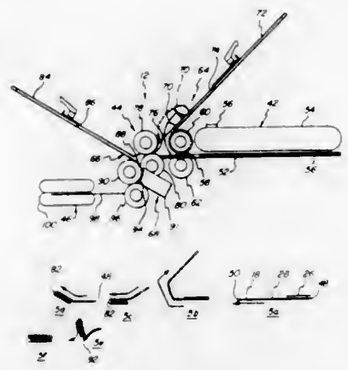
Filed May 5, 1994, Ser. No. 238,325

Int. Cl.[6] B65H *45/14*

U.S. Cl. 493—421 **19 Claims**

1. A folding apparatus for providing a product with at least one fold, the product including a document with at least one insert thereon, the document having leading and trailing edges, each insert having a leading edge spaced from the leading edge of the document and having a trailing edge aligned with the trailing edge of the document, the folding apparatus comprising:

(a) a first conveying device for delivering the product in a first path to a folding device, said first conveying device having means for maintaining the trailing edges of each insert in



alignment with the trailing edge of the document until the leading edge of each insert is engaged by the folding device; and

(b) a folding device for receiving the product from said conveying device, said folding device comprising:

(i) a diverting device for diverting the leading edge of the document as the product moves in the first path and changing a direction of movement of the leading edge of the document to a second path, said diverting device being moveable between an operative position in the first path of the product as the leading edge of the document exits from said first conveying device and an inoperative position spaced from the first path of the product,

(ii) means located in the second path for stopping movement of the leading edge of the document along the second path, and

(iii) first driven roller means creating a first nip for engaging an intermediate portion of the document between the leading and trailing edges thereof after movement of the leading edge thereof has been stopped in the second path, said first driven roller means drawing the product through said first nip in a third path to create a first folded edge at the intermediate portion of the document without folding the at least one insert, each insert being located between the first folded edge and the trailing edge of the document.

5,554,095

BIAS TAPE MAKER

Yoshimi Matsuo, Osaka, Japan, assignor to Clover Manufacturing Co. Ltd., Osaka, Japan

Filed Oct. 28, 1994, Ser. No. 330,742

Claims priority, application Japan, Jul. 15, 1994, 6-164013

Int. Cl.[6] B65H *45/22*

U.S. Cl. 493—440 **11 Claims**

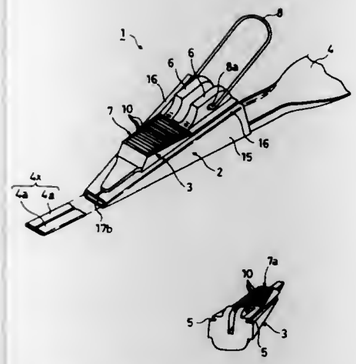
1. A bias tape maker comprising:

a thin walled outer member including a bottom wall, a pair of side walls extending upright from the bottom wall, and a pair of roof margins bent toward each other, the outer member having a tape entry opening and a tape exit slit, the outer member being tapered from the tape entry opening to the tape exit slit; and

an inner core member fitted in the outer member and having a pair of longitudinal grooves for receiving the pair of roof margins;

wherein a tape guide passage is formed between the outer member and the inner member to extend from the tape entry opening of the outer member to the tape exit slit, the tape guide passage including a tape folding portion adjoining the tape exit opening;

wherein the bottom wall of the outer member is formed with a tape advancing slot extending longitudinally between the tape entry opening and the tape exit slit;



wherein the inner core member has a larger width portion immediately below the pair of longitudinal grooves, and a smaller width portion immediately below the larger width portion; and

wherein the larger width portion provides a pair of downwardly facing steps each of which extends generally in parallel to a bottom surface of the inner member.

5,554,096

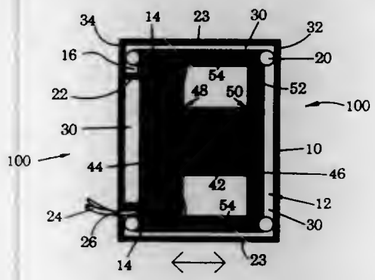
IMPLANTABLE ELECTROMAGNETIC HEARING TRANSDUCER

Geoffrey R. Ball, Sunnyvale, Calif., assignor to Symphonix, San Jose, Calif.

Continuation-in-part of Ser. No. 87,618, Jul. 1, 1993, Pat. No. 5,456,654. This application Apr. 8, 1994, Ser. No. 225,153

Int. Cl.[6] H04R *25/00*

U.S. Cl. 600—25 **12 Claims**



1. A method of improving hearing in a subject, comprising the steps of:

a) providing a device comprising:

i) a transducer comprising a magnet and a first coil disposed within and attached to a housing, said magnet producing a first magnetic field and said first coil producing a second magnetic field, said first and second magnetic fields interacting to cause vibrations of said housing,

ii) a receiving coil, and

iii) leads connecting, and allowing for current between, said transducer and said receiving coil;

b) providing a hearing impaired subject;

c) surgically implanting said transducer in the middle ear of said subject and said receiving coil external to said middle ear, said surgical implanting comprising creating a channel in the temporal bone of said subject and inserting said transducer through said channel into the middle ear; and

d) conducting current from said receiving coil to said implanted transducer so as to cause said housing to vibrate.

5,554,097

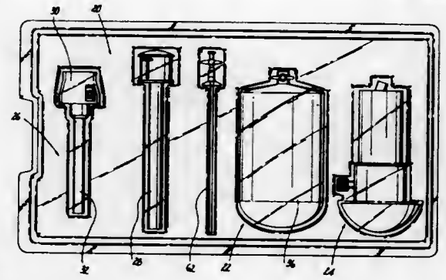
SURGICAL INSTRUMENTATION KIT

Thomas D. Guy, Fairfield, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 5, 1994, Ser. No. 317,685

Int. Cl.[6] A61B *1/00*

U.S. Cl. 600—102 **16 Claims**



1. A surgical kit for diagnostic endoscopic examination using an endoscope including an illuminating port for connection to a light source, the surgical kit comprising:

at least one trocar assembly including a cannula;

at least one self-contained illumination unit configured for engagement with the illuminating port of the endoscope, the illuminating unit including a frame having a connection port configured to engage the illuminating port of the endoscope, a power source generator disposed within the frame for supplying an electrical current, and a light source connected to and energizable by said power source generator; and

at least one self-contained insufflator unit having a supply of insufflation media and being connectable to the cannula of the one trocar;

the trocar, the self-contained illuminating unit and the one insufflation unit positioned in a package having a top cover and a bottom cover.

5,554,098

ENDOSCOPE SYSTEM INCLUDING ENDOSCOPE AND DISPOSABLE PROTECTION COVER

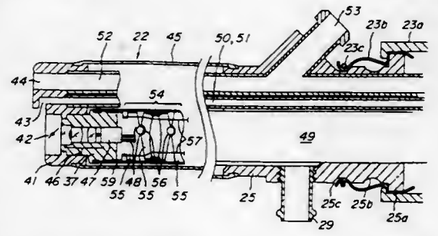
Hisao Yabe, Hachioji; Yoshihiro Iida, Tama; Akira Suzuki; Hideo Ito, both of Hachioji; Yoshio Tashiro, Hino; Minoru Yamazaki, Hachioji; Osamu Tamada, Hachioji, and Keiichi Arai, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1993, Ser. No. 38,720

Claims priority, application Japan, Feb. 26, 1993, 5-007454 U; Feb. 26, 1993, 5-038144; Mar. 1, 1993, 5-040013; Mar. 3, 1993, 5-008551 U

Int. Cl.[6] A61B *1/00*

U.S. Cl. 600—121 **12 Claims**



1. A protection cover for use in an endoscope system including an endoscope having an insertion section insertable into a cavity under inspection and an operation section to which a proximal end of the insertion section is connected and a protection cover having

an insertion section cover for covering said insertion section of the endoscope and an operation section cover for covering said operation section of the endoscope, the improvement being character-

altering the field of view of said optical means with respect to said optical axis of said optical means;

an illumination system including a plurality of optical fibers

5,554,102

PORTABLE MASSAGING DEVICE

Shih-Kuan Chien, No. 584, Sec. 2, Chung San Rd., Hsin Lien

5,554,103

HIGH EFFICIENCY EXTERNAL COUNTERPULSATION APPARATUS AND METHOD FOR CONTROLLING SAME

an insertion section cover for covering said insertion section of the endoscope and an operation section cover for covering said operation section of the endoscope, the improvement being characterized in that said operation section cover comprises a first cover portion for covering a grip portion of said operation section and made of rigid or semi-rigid material and a second cover portion for covering the remaining portion of the operation section of the endoscope and made of soft material.

5,554,099

ENDOSCOPIC INSTRUMENT

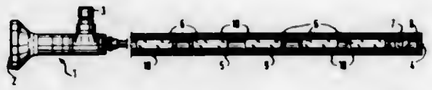
Rudolf Heimberger, Oberderdlingen, and Uwe Schaumann, Knittlingen, both of Germany, assignors to Richard Wolf GmbH, Knittlingen, Germany

Filed Nov. 29, 1994, Ser. No. 346,443

Claims priority, application Germany, Dec. 2, 1993, 43 41 062.6

Int. Cl.[6] A61B *1/06*

U.S. Cl. 600—160 **5 Claims**



1. Endoscopic instrument with a long, stretched out shaft (**5**), and with at least one rod-shaped lens (**6**) arranged therein, characterized in that the lens (**6**) is provided on its peripheral surfaces (**10**) with a coating that increases its breaking strength.

5,554,100

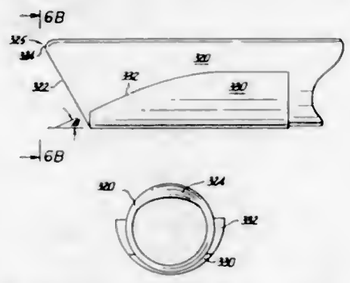
ARTHROSCOPE WITH SHIM FOR ANGULARLY ORIENTING ILLUMINATION FIBERS

Dennis C. Leiner, Dublin, N.H.; William G. Peck, Rochester, N.Y.; Theodorus W. A. van den Berg, Beek en Donk, Netherlands; Jörg Brambring, Eindhoven, Netherlands, and Willem J. Voormolen, Mierlo, Netherlands, assignors to United States Surgical Corporation, Norwalk, Conn., and U.S. Philips Corporation, New York, N.Y.

Filed Mar. 24, 1994, Ser. No. 217,502

Int. Cl.[6] A61B *1/07*; G02B *6/00*

U.S. Cl. 600—182 **32 Claims**



1. A disposable rigid arthroscope which comprises:

a frame member;

an outer tube member extending distally from said frame member and defining a longitudinal axis;

an inner lens tube member disposed within said outer tube member;

optical means disposed within said inner lens tube member for conveying an image of an object, said optical means defining an optical axis and including an objective lens arrangement disposed adjacent a distal end portion of said inner lens tube member, said objective lens arrangement including means for altering the field of view of said optical means with respect to said optical axis of said optical means;

an illumination system including a plurality of optical fibers disposed within a space defined between said outer tube member and said inner lens tube member; and

a generally arcuate shim member disposed about at least a peripheral portion of said distal end portion of said inner lens tube member, said shim member including first and second opposed side edges angularly oriented relative to said optical axis, said first and second side edges configured and dimensioned to orient end portions of at least a group of said optical fibers at a general angular orientation relative to said optical axis in the general direction of the field of view, said shim member having a proximal end portion extending on both sides thereof along an inner periphery of said outer tube member so as to define a major cross-sectional dimension, said major cross-sectional dimension approximating a maximum inner dimension of said outer tube member such that said shim member engages said outer tube member and stabilizes said inner lens tube member within said outer tube member thereby facilitating assembly of said inner lens tube member therewithin.

5,554,101

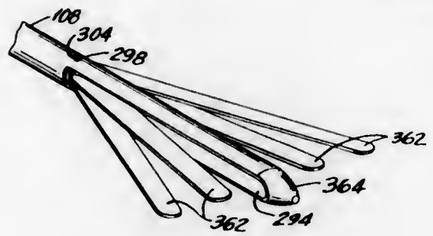
SURGICAL RETRACTOR

Paul A. Matula, Brookfield, Conn., and Stanley H. Remiszewski, Bolton, Mass., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 874,743, Apr. 27, 1992, Pat. No. 5,381,788, which is a continuation-in-part of Ser. No. 740,443, Aug. 5, 1991, Pat. No. 5,199,419. This application Dec. 22, 1994, Ser. No. 361,933

Int. Cl.[6] A61B *17/02*

U.S. Cl. 600—214 **11 Claims**



1. A surgical retractor comprising:

a) a handle assembly;

b) an elongated body extending distally from the handle assembly and defining opposed proximal and distal end portions, a longitudinal axis which extends therethrough, an interior bore, and an exterior wall;

c) a blade cavity formed within said elongated body and terminating at a location proximal of the distal end portion thereof and opening through the exterior wall of the elongated body;

d) a retractor assembly including a plurality of interleaved blade members disposed within the blade cavity and mounted fear cooperative movement between a first position enclosed within the interior bore of the elongate body and a second position extending radially outwardly from the blade cavity through the exterior wall of the elongated body; and

e) an actuator within the handle assembly which is movably attached to the interleaved blade members for controlled movement of said blade members out of the blade cavity.

5,554,102

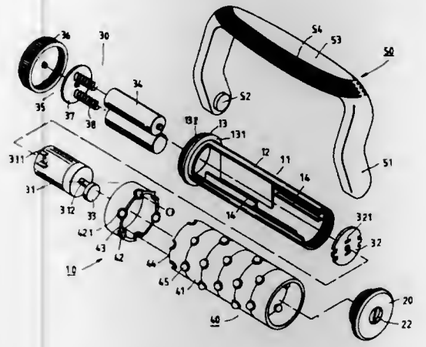
PORTABLE MASSAGING DEVICE

Shih-Kuen Chiou, No. 584, Sec. 2, Chung-San Rd., Hwu-Lian Village, Yeongjing Shiang, Changhua Shiann, Taiwan

Filed Apr. 20, 1995, Ser. No. 425,505

Int. Cl.[6] A61H *1/00*; *15/00*

U.S. Cl. 601—72 **4 Claims**



3. A portable massaging device comprising:

a cylindrical body having first and second ends, said cylindrical body first end provided with a connection portion including an annular flange and an outer threaded portion, said cylindrical body further provided on an inner wall surface of said second end with an inner threaded portion;

a massaging set fitted over said cylindrical body such that one end of said massaging set is stopped by said annular flange of said cylindrical body, said massaging set comprising a plurality of fitting members and massaging nipples, said fitting members provided with a plurality of receiving recesses in which said massaging nipples are securely held said fitting members further provided respectively with a plurality of mortises and tenons for holding said fitting members together;

a power unit housed in said cylindrical body and comprising a motor having at one end a shaft on which a cam is mounted, said motor having at an opposite end two conducting pieces engageable respectively with the positive terminal of a battery and the negative terminal of another battery, said power unit further including a conducting member having a cover engageable with said outer threaded portion of said connection portion of said cylindrical body, said conducting member further including a rotatable piece pivoted to said cover and two conducting springs which are fastened to said rotatable piece, one of said conducting springs engaging the positive terminal of said another battery and the other of said conducting springs engaging the negative terminal of said battery;

an end cap engaging said inner threaded portion of said cylindrical body for locating said massaging set and for shielding said power unit; and

a handle comprising first and second arms each having a retaining projection, wherein said end cap and said cover of said power unit have inner and outer sides and said end cap and cover outer sides are each provided with a retaining slot; said first arm retaining projection securely engaging one of said retaining slots and said second arm retaining projection securely engaging the other of said retaining slots;

wherein said massaging nipples and said recesses are substantially spherical and said recesses are formed between adjacent ones of said fitting members.

5,554,103

HIGH EFFICIENCY EXTERNAL COUNTERPULSATION APPARATUS AND METHOD FOR CONTROLLING SAME

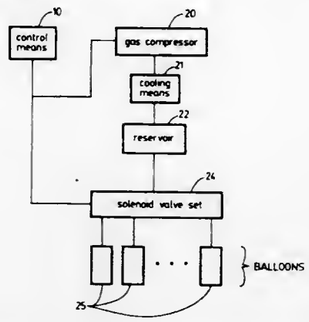
Zhensheng Zheng; Zhili Huang, both of Guangzhou; Ziqiang Huang, Xiantan, and Shifang Yang, Guangzhou, all of China, assignors to Vasomedical, Inc., Hauppauge, N.Y.

Continuation of Ser. No. 58,394, May 6, 1993, abandoned. This application Feb. 27, 1995, Ser. No. 396,261

Claims priority, application China, May 7, 1992, 92103545.4; May 8, 1992, 92209589.2; May 8, 1992, 92209813.1

Int. Cl.[6] A61B *5/00*

U.S. Cl. 601—152 **42 Claims**



1. An external counterpulsation apparatus for use with a patient, comprising:

balloon means adapted to be received about the lower extremities of the patient, said balloon means including a plurality of inflatable devices;

a source of compressed fluid;

fluid reservoir means connected to the source of compressed fluid for inflating said balloon means; and

fluid distribution means connected to the fluid reservoir means for distributing said source of compressed fluid to said balloon means;

the fluid distribution means including a cylinder and a piston, the cylinder connected to the balloon means such that each of said inflatable devices is sequentially inflated and deflated by said fluid distribution means upon movement of said piston in said cylinder.

5,554,104

CUSTOM FORMABLE KNEE BRACE

Tracy E. Grim, Broken Arrow, Okla., assignor to Royce Medical Company, Camarillo, Calif.

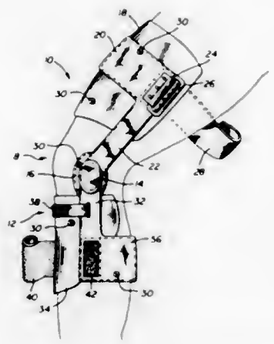
Continuation-in-part of Ser. No. 993,121, Dec. 18, 1992, abandoned. This application Dec. 2, 1994, Ser. No. 349,021

Int. Cl.[6] A61F *5/00*

U.S. Cl. 602—8 **20 Claims**

7. A custom formable knee brace comprising:

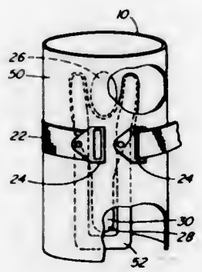
a femoral brace component sized for circumferential fitting over an anterior femoral portion of a leg, said femoral brace component including a first liquid or gas permeable matrix impregnated with a first hardenable material, said first matrix forming a substantially rigid structural member of said femoral brace component when said first hardenable material is hardened, the portions of said substantially rigid structural member of said femoral brace component extending in a circumferential direction around the femoral portion of the leg being free of any preformed rigid material which could inhibit full conformation of said substantially rigid structural member of said femoral brace component to a configuration of the femoral portion of the leg, said substantially rigid structural member of said femoral brace component being resistive to local deformities thereof from pressures applied to said femoral brace component;



a tibial brace component sized for circumferential fitting over an anterior tibial portion of the leg, said tibial brace component including a second liquid or gas permeable matrix impregnated with a second hardenable material, said second matrix forming a substantially rigid structural member of said tibial brace component when said second hardenable material is hardened, portions of said substantially rigid structural member of said tibial brace component extending in a circumferential direction around the tibial portion of the leg being free of any preformed rigid material which could inhibit full conformation of said substantially rigid structural member of said tibial brace component to a configuration of the tibial portion of the leg, said substantially rigid structural member of said tibial brace component being resistive to local deformities thereof from pressures applied to said tibial brace component; and

a hinge assembly pivotally connecting said femoral brace component to said tibial brace component.

5,554,105
PATELLA STABILIZER
Dean A. Taylor, Vancouver, Canada, assignor to Generation II Orthotics, Inc, Richmond, Canada
Filed Jul. 1, 1994, Ser. No. 269,976
Int. Cl.[6] A61F *5/00*
U.S. Cl. 602—26 **8 Claims**



1. A patella stabilizer comprising:

a sleeve adapted to be received around a knee of a wearer;

a generally Y-shaped first support in the sleeve comprising a first member and a pair of second members, said first member being adapted to extend beneath the wearer's patella to a point over the wearer's tibia;

said second members being bifurcated members structured and arranged to extend from the first member along each side of the wearer's patella when the patella stabilizer is in position on the wearer;

a relatively rigid second support having a generally U-shaped opening with sides, the rigid second support being located inside the sleeve with the sides of the opening extending upwardly, beneath and alongside the wearer's patella and said first member when the stabilizer is in use whereby the first support and the rigid second support together cradle the patella in order to prevent lateral shifting; and

a strap configured to extend around the wearer's leg over the first and second members.

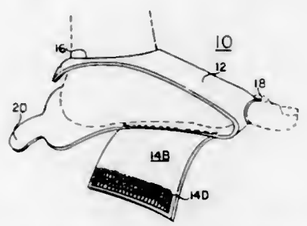
5,554,106
HYDROCOLLOID EXIT SITE DRESSING
Lynn M. Layman-Spillar, Seattle; Margo L. Gisselberg, Lynnwood, and Bradford C. Fowler, Woodinville, all of Wash., assignors to Quinton Instrument Company, Bothell, Wash.
Filed Oct. 13, 1994, Ser. No. 322,894
Int. Cl.[6] A61F *13/00*
U.S. Cl. 602—42 **33 Claims**

1. A protective member for use with a percutaneous device which extends from the skin of the patient, the protective member comprising;

a flexible dressing having a first portion formed as generally planar member having at least a top surface and a bottom surface wherein said bottom surface is formed to generally conform to the top skin surface of the patient; and

a second portion formed of a moisture reactive material and said second portion is associated with said dressing and includes a tapered downwardly extending member which is sized to extend from said bottom surface of said first portion to a location below the top skin surface of the patient in use.

5,554,107
ELASTIC FOOTWRAP
Donald R. Shannahan, 112 W. Logan, Caldwell, Id. 83605
Division of Ser. No. 27,187, Mar. 5, 1993, Pat. No. 5,460,601. This application Jun. 6, 1995, Ser. No. 481,763
Int. Cl.[6] A61F *13/00*
U.S. Cl. 602—66 **3 Claims**



1. An elastic footwrap for treating plantar fasciitis, which comprises:

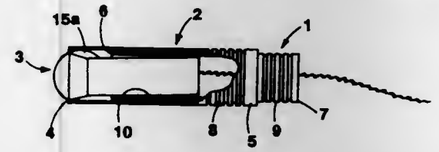
a. a tubular body of elastic material, the body having an ankle opening and a plurality of toe openings;

b. the ankle opening being positioned to extend from above the heel forward along both sides of the foot just below the ankle to the top of the foot;

c. the toe openings being positioned forward of the ankle opening so that the body envelops the foot between the ankle opening and the toe openings and exerts a predetermined compressive force to support the arch of the foot; and

d. the body being adapted to envelope the heel below the ankle opening to form a heel cup, the heel cup being positioned so that a predetermined compressive force is exerted along the bottom of the foot between the heel and the toes.

5,554,108
SANITARY TAMPON
John H. D. Browning, Alresford; Robert I. Wynne, Hayling Island, both of England, and Harry Hayes, Hampden, Mass., assignors to Tambrands Inc., White Plains, N.Y.
PCT No. PCT/GB92/01980, § 371 Date Jun. 29, 1994, § 102(e) Date Jun. 29, 1994, PCT Pub. No. WO93/08779, PCT Pub. Date May 13, 1993
PCT Filed Oct. 29, 1992, Ser. No. 240,669
Claims priority, application United Kingdom, Nov. 6, 1991, 9123524
Int. Cl.[6] A61F *13/20*
U.S. Cl. 604—15 **14 Claims**



1. A sanitary tampon assembly comprising

a compact applicator comprising an inner tube and an outer tube slidably disposed over the inner tube so that a major portion of the inner tube is telescopically retained inside the outer tube, the outer tube having a distal discharge end shaped for insertion into the body of a user, the inner tube having distal and proximal ends; and

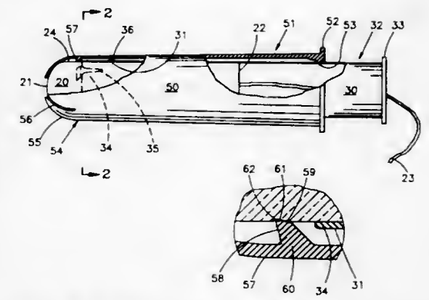
a tampon, having a distal expulsion end and a proximal withdrawal end and comprising a solid body formed of compressed absorbent material, a major portion of said tampon being disposed inside the inner tube, said tampon having a tampon longitudinal axis extending from the distal expulsion end to the proximal withdrawal end,

said tampon being shaped and dimensioned so that when the tampon is positioned in the inner tube, said tampon longitudinal axis extends at an angle with respect to a longitudinal axis of the applicator, taken lengthwise through an approximate center of the inner tube, and, when the inner tube is withdrawn past the proximal end of the tampon to remove the tampon from the inner tube and thereby prime the applicator for use, the proximal end of the tampon will asymmetrically urge itself against one side of an inner surface of the outer tube so that, when the inner tube is pushed back into the outer tube to expel the tampon, the proximal end of the tampon will be hindered from re-entering the distal end of the inner tube.

5,554,109
COMPACTLY ASSEMBLED TAMPON APPLICATOR
Max Frayman, 25 Quinnehtuk Clr., Longmeadow, Mass. 01106
Filed Jan. 9, 1995, Ser. No. 370,192
Int. Cl.[6] A01F *13/32*
U.S. Cl. 604—15 **12 Claims**

1. A compactly assembled tampon applicator comprising:

a tampon shaped for intra-vaginal insertion having any configuration, acceptable for the projected function, including straight cylindrical configuration;



an inner tube including a proximal end adapted to store said tampon fitted therein with a relatively small portion of said tampon protruding therefrom;

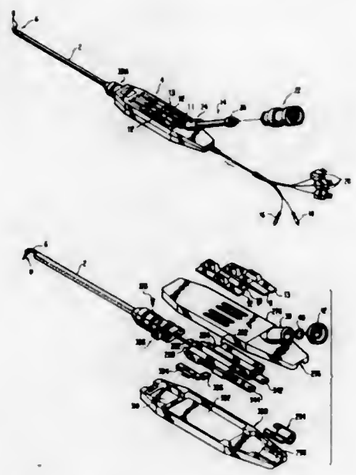
an outer tube telescopically fitted over said inner tube and having a proximal discharge end;

a stopping means to prevent complete withdrawal of said inner tube from said outer tube during preparation of the applicator for use;

a holding means to prevent distal movement of said tampon relative to said outer tube during partial distal withdrawal of said inner tube over said tampon; wherein said holding means comprises at least one set of circumferentially extended stiff cogs, each of which comprises a base, by which said stiff cog is rigidly fixed to an acting portion of said outer tube at a location of said protruding portion of said tampon, and, on the opposite side from said base, at least one biting edge defined by the crossing of a proximally faced surface and a truncating surface, said acting portion of said outer tube in vicinity of said base comprises flexible sections having a predetermined flexibility, so that in the assembled applicator said stiff cogs are radially outwardly displaced by said protruding portion of said tampon and said flexible sections are deformed and stressed, whereby said flexible sections being in the deformed and stressed condition create radially inwardly directed forces allowing to keep said biting edges constantly contacted with sufficient forces to the side surface of said protruding portion of said tampon.

5,554,110
MEDICAL ABLATION APPARATUS
Stuart D. Edwards, Los Altos; Ronald G. Lax, Grassvalley; Ingemar H. Lundquist, Pebble Beach; Hugh R. Sharkey, Redwood City, and James A. Baker, Palo Alto, all of Calif., assignors to Vidamed, Inc., Menlo Park, Calif.
Continuation-in-part of Ser. No. 929,638, Aug. 12, 1992, abandoned, Ser. No. 12,370, Feb. 2, 1993, Pat. No. 5,370,675, Ser. No. 62,364, May 13, 1993, Pat. No. 5,435,805, and Ser. No. 61,647, May 13, 1993, Pat. No. 5,421,819. This application Jan. 12, 1994, Ser. No. 180,578
Int. Cl.[6] A61B *17/39*
U.S. Cl. 604—22 **14 Claims**

1. A method for the treatment of benign prostatic hypertrophy of a prostate of a human male having a bladder with a base and a penis with a urethra therein formed by a urethral wall extending into the base of the bladder along a longitudinal axis with the prostate having tissue surrounding the urethra near the base of the bladder by the use of a radio frequency electrode formed of an electrically conductive material and being relatively rigid so that it can serve as a stylet and having a sharpened distal extremity serving as a tissue puncturing tip comprising the steps of introducing the radio frequency electrode into the urethra and advancing it longitudinally of the urethra along the longitudinal axis until the tip is in the vicinity of the prostate, thereafter advancing the radio frequency electrode in a direction at an angle to the longitudinal axis of the urethra to cause the radio frequency electrode to penetrate the urethral wall and to extend into the tissue of the



prostate so that a preselected length of the radio frequency electrode including the tip is exposed to tissue in the prostate to thereby select a target volume of the tissue in the prostate surrounding the exposed length of the radio frequency electrode to be exposed to radio frequency energy, supplying radio frequency energy to the radio frequency electrode so that radio frequency energy is supplied to the selected target volume of the prostate surrounding the exposed length of the radio frequency electrode at a sufficient power level and for a sufficient period of time to raise the temperature of the tissue of the prostate in the selected target volume to cause ablation of the tissue in the selected target volume, separating ablated tissue from the radio frequency electrode while the radio frequency electrode is within the prostate, continuing the ablation of the tissue in the selected target volume and thereafter withdrawing the radio frequency electrode from the tissue of the prostate and out of the urethra whereby the separation of the ablated tissue from the radio frequency electrode improves the efficiency of the treatment.

5,554,111

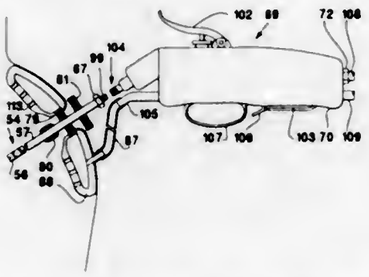
BONE CLEANING AND DRYING SYSTEM

Bernard F. Morrey, Rochester, Minn.; John J. McLeod, Jr., Grand Forks, N. Dak., and Frederick M. Schultz, Rochester, Minn., assignors to Mayo Foundation For Medical Education & Research, Rochester, Minn.

Filed Mar. 16, 1995, Ser. No. 405,500

Int. Cl.[6] A61N *1/30*

U.S. Cl. 604—26 **7 Claims**



1. A bone cleaning and drying system for use during joint replacement surgery and other types of surgery to remove and collect the air, blood, fluids, fat, marrow, tissue and bone debris from the cavities of the bone, comprising in combination:

a) a handpiece having a gas control valve, a suction control valve, a gas supply hose to a gas supply source of a compressed gas, and means to attach the suction control valve to a vacuum source;

b) said gas control valve connected to an applicator for carrying the compressed gas to the cavity of the bone;

c) said applicator having a applicator shaft whose proximal end is connected to the handpiece and whose distal end terminates in a applicator nozzle;

d) said applicator nozzle having a slit on the side of the applicator shaft, said slit angled to the axis of the applicator shaft, to direct the compressed gas exiting the applicator nozzle in a reversed flow direction;

e) surrounding the proximal end of the applicator shaft, a hollow deflector shield onto which the entrained material from the cavities of the bone are directed when the applicator nozzle is inserted into said cavities, and compressed gas is discharged through the slit;

f) the distal surface of said hollow deflector shield having a plurality of apertures;

g) the interior of the hollow deflector shield connected through a flexible suction hose to said suction control valve and to a vacuum source;

WHEREBY the cavity of the bone and the openings in the surrounding cancellous bone are cleaned emptied and dried during the surgery, and air, blood, fluids, fat, marrow, tissue and bone debris from the cavities of the bone are entrained within the suction system for removal, prior to the insertion of the bone cement and the prosthetic implant.

5,554,112

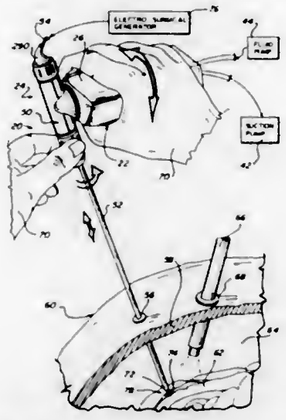
MINIMALLY INVASIVE IRRIGATOR/ASPIRATOR SURGICAL PROBE AND METHOD OF USING SAME

Harold J. Walbrink, Laguna Niguel; Roger F. Etherington, Newport Beach; Charles E. Beuchat, Irvine; Vincent J. Burgess, Hermosa Beach, and Kent D. Richards, Lake Forest, all of Calif., assignors to Birtcher Medical Systems, Inc., Irvine, Calif.

Continuation of Ser. No. 958,931, Oct. 9, 1992. This application Jul. 8, 1994, Ser. No. 272,294

Int. Cl.[6] A61M *1/00*

U.S. Cl. 604—27 **25 Claims**



1. An irrigator/aspirator surgical probe to be manipulated by hand during a surgical procedure, comprising:

an elongated hollow probe tube extending generally along a longitudinal probe axis and having an interior space through which irrigation and aspiration fluid flows to and from a surgical site at a distal end of the probe tube; and

a handle adapted to be gripped by hand, the handle including an exterior gripping structure defining a rotational axis separate from the longitudinal probe axis, said rotational axis of the gripping structure extending at a predetermined converging angle with respect to the longitudinal probe axis, the handle rotatably connected relative to the probe tube to allow the gripping structure to rotate about the rotational axis independently of the position of the probe tube during the surgical procedure.

5,554,113

FLOW PRESSURE TRANSDUCER

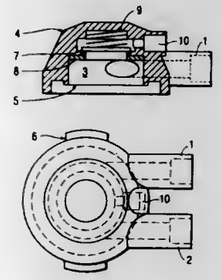
Pavel Novak, Schaffhausen; Clemens Rebholz, Uhldingen/Müllheim, and Joachim Willner, Neunkirch, all of Germany, assignors to Storz Endoskop GmbH, Schaffhausen, Germany

Continuation of Ser. No. 77,721, Jun. 17, 1993, abandoned. This application Jun. 7, 1994, Ser. No. 255,881

Claims priority, application Germany, Jun. 17, 1992, 42 19 888.7

Int. Cl.[6] A61M *1/00*

U.S. Cl. 604—30 **6 Claims**



1. A medical pressure transducer comprising a sterilizable pressure dome having two connection means for attaching fluid inflow and outflow tubes to said pressure dome, an inner housing within said pressure dome in fluid communication with said two connection means having a sterilizable pressure dome diaphragm for sensing the pressure within said housing and transmitting said pressure to an unsterilized pressure sensor connected to said pressure dome, and a relief valve within said housing connected to a drain for allowing excess fluid to escape said housing when said relief valve experiences pressures above normal.

5,554,114

INFUSION DEVICE WITH PREFORMED SHAPE

George B. Wallace, Rancho Santa Margarita; Scott M. Evans, Santa Ana, both of Calif., and Andrew H. Cragg, Edina, Minn., assignors to Micro Therapeutics, Inc., San Clemente, Calif.

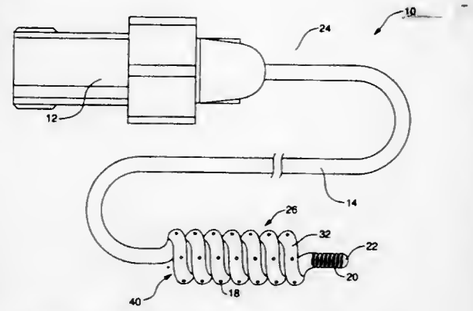
Filed Oct. 20, 1994, Ser. No. 326,609

Int. Cl.[6] A61M *25/00*

U.S. Cl. 604—53 **25 Claims**

1. A method for introducing a drug or agent into a desired infusion site in a blood vessel and for infusing a drug or agent into the blood vessel in the peripheral low blood flow rate region thereof comprising the steps of:

providing an infusion device having an elongated tubular body comprising a distal infusion segment and a proximal segment and a proximal and distal end and having an infusion lumen formed therein extending along the axis of the elongated tubular body from the proximal end to the distal infusion segment and a plurality of infusion ports comprising a first portion, a second portion add a third portion formed in, and distributed along the length and around the circumference of said distal infusion segment of the tubular body distal to a proximal segment of the tubular body;



forming said distal infusion segment of said elongated tubular body to assume an expanded helical coil infusion configuration of at least two turns extending axially and outwardly from the proximal segment when positioned at a desired infusion site in a blood vessel, the expanded helical coil infusion configuration providing a generally centrally disposed higher flow rate perfusion lumen for perfusing blood centrally therethrough and locating the plurality of infusion ports in the peripheral low blood flow rate region of the blood vessel, such that at least said first portion of the plurality of infusion ports face outward toward the vessel wall, said second portion of the plurality of infusion ports face axially toward adjacent turns of the expanded helical coil, and said third portion of the plurality of infusion ports face inward toward the perfusion lumen;

straightening the expanded helical coil infusion configuration of said distal infusion segment for facilitating advancement of said distal infusion segment to a selected location in a blood vessel;

advancing said infusion device with said straightened distal infusion segment through the patient's vascular system to located said distal infusion segment at a desired site in a blood vessel

allowing said distal infusion segment to assume said expanded helical coil infusion configuration; and

introducing an infusion fluid into the lumen for infusion through said plurality of infusion ports in the low blood flow rate region adjacent to said blood vessel wall.

5,554,115

SENSOR FOR MEASURING PRESSURES IN A CASSETTE PUMP PROXIMAL AND DISTAL TO A PUMPING CHAMBER

V. Stanton Thomas, Palo Alto, and Peter A. Holst, Castro Valley, both of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Apr. 7, 1995, Ser. No. 418,752

Int. Cl.[6] A61M *31/00*

U.S. Cl. 604—65 **21 Claims**

1. Apparatus for monitoring a fluid pressure in a cavity, said apparatus comprising:

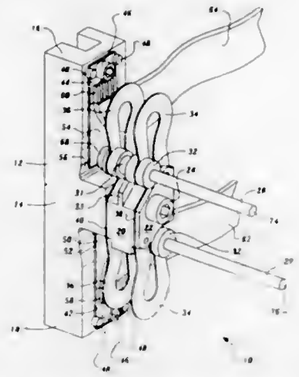
(a) an elastomeric membrane that encloses said cavity on at least one side, said elastomeric membrane varying in stiffness; and

(b) a pressure sensor disposed adjacent the elastomeric membrane and including:

(i) a pin having opposed first and second ends, the first end of the pin contacting the elastomeric membrane, subjecting the pin to an applied force caused by pressure in the cavity;

(i) a base used to mount the pressure sensor and including an upright portion;

(iii) a cantilevered arm having one end mounted to the base and an opposite end extending free and disposed adjacent the second end of the pin;



(iv) a pair of flat springs arranged in stacked array, each flat spring having planar surfaces that are arranged generally in parallel with the planar surfaces of the other flat spring, each flat spring being supported by the upright portion of the base, extending outwardly therefrom, and then curving back toward the upright portion of the base, ends of the flat springs being coupled to the pin at spaced-apart points along a longitudinal axis of the pin, said pair of flat springs elastically supporting the pin so that its second end is in contact with the cantilevered arm; and

(v) a strain gauge mounted on the cantilevered arm, said strain gauge producing a signal indicative of strain in the cantilevered arm caused by stress, the stress being due to a force exerted on said cantilevered arm by the pin in response to the fluid pressure in the cavity, said pin experiencing a displacement sufficiently small when responding to the pressure in the cavity so that said signal produced by the strain gauge is substantially independent of the varying stiffness of the elastomeric membrane, thereby substantially eliminating a non-linear error in the signal that would otherwise be caused by the varying stiffness of the elastomeric membrane.

5,554,116

DEVICE FOR ORAL DISPENSING OF MEDICINE

Chen Fu-Hsiang, 47-14, Fan-po Street, Fan-po Village, Fu-Hsin Hsiang, Chang Hwa Hsien, Taiwan

Filed Nov. 13, 1995, Ser. No. 555,858

Int. Cl.[6] A61J *17/00*

U.S. Cl. 604—77 **2 Claims**

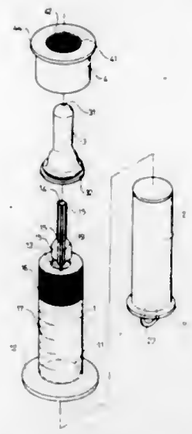
1. An oral dispensing device comprising:

a bottle for receiving medicine therein, said bottle including a first end having an opening formed therein and including an annular flange extended radially outward from said first end thereof and including a second end having an orifice formed therein for allowing the medicine to be forced out of said bottle, said bottle including a post extended from said second end thereof and having a plurality of fins extended radially outward therefrom so as to define a plurality of liquid passages therebetween,

a nipple engaged on said post and engaged on said second end of said bottle and including a hole for allowing the medicine to flow out of said nipple, said nipple including an annular rib extended radially outward therefrom,

a cover including an aperture for engaging with said nipple, said cover being engaged with said annular rib so as to secure said nipple to said bottle, and

a plunger slidably engaged in said bottle via said opening of said bottle and including an annular flange for engaging with said first end of said bottle so as to limit an inward movement of said plunger to said bottle,



the medicine accommodated in said bottle being forced outward through said orifice and said liquid passages and through said hole of said nipple when said plunger is moved inward of said bottle, and the medicine being forced through said liquid passages when said nipple is bitten by babies.

5,554,117

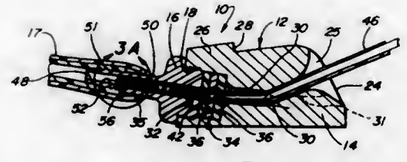
IMPLANTABLE ACCESS DEVICES

William D. Ensminger, and Robert F. Gavin, both of Ann Arobr, Mich., assignors to Michigan TransTech Corporation, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 259,053, Jun. 13, 1994, Pat. No. 5,417,656, which is a continuation of Ser. No. 148,394, Oct. 8, 1993, Pat. No. 5,350,360, which is a division of Ser. No. 940,619, Sep. 4, 1992, Pat. No. 5,281,199, which is a continuation-in-part of Ser. No. 818,626, Jan. 10, 1992, Pat. No. 5,226,879, which is a continuation-in-part of Ser. No. 654,661, Feb. 15, 1991, Pat. No. 5,180,365, which is a continuation-in-part of Ser. No. 539,793, Jun. 18, 1990, Pat. No. 5,053,013, which is a continuation-in-part of Ser. No. 487,541, Mar. 1, 1990, Pat. No. 5,057,084. This application May 15, 1995, Ser. No. 442,722

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—93 **16 Claims**

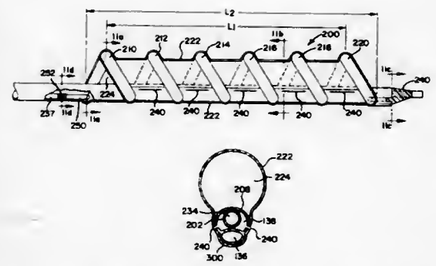


1. An implantable access device which permits the introduction of a flexible external filament such as a catheter, guide wire or optical fiber into a patient for communication with an internal catheter located within the body of the patient, said device comprising:

a housing having portions defining an inlet opening, an outlet opening and a passageway communicating therebetween, said inlet opening being generally funnel shaped and guiding a percutaneously inserted flexible external filament into said passageway, said outlet opening being defined in a discharge nipple which is adapted to have the internal catheter attached thereto, said housing also including support means for supporting said device within the body of the patient;

sealing means for sealing around said external filament when present within said device and for inhibiting the flow of fluids through said passageway when said filament is not present within said device; and

limiting means within said housing for engaging the flexible filament and limiting the extent to which the flexible filament can be inserted through said device, said limiting means in the form of a reducing diameter passageway section providing a positive stop for the flexible filament during insertion of the flexible filament into said device and preventing the flexible filament from entering into the internal catheter.



5,554,118

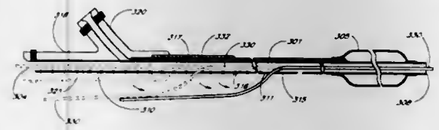
UNIVERSAL MODE VASCULAR CATHETER SYSTEM

G. David Jang, 636 Golden West Dr., Redlands, Calif.

Continuation-in-part of Ser. No. 756,295, Sep. 6, 1991, abandoned, Ser. No. 705,295, May 24, 1991, and Ser. No. 714,642, Jun. 13, 1991. This application Dec. 22, 1993, Ser. No. 172,640

Int. Cl.[6] A61M *29/00*

U.S. Cl. 604—96 **44 Claims**



19. An angioplasty balloon catheter, comprising:

a catheter shaft with a proximal end and a distal end and having a first lumen extending therethrough, said first lumen having an outside wall and being of sufficient dimension to receive a guidewire extending through said first lumen, and an inflatable balloon positioned on the distal end;

a balloon inflation lumen extending through said shaft and in communication with said balloon;

a guidewire connector attached to the proximal end of said catheter communicating with said first lumen in such a manner as to direct said guidewire into said first lumen, said connector further having a wall; and

means for permitting said guidewire, when extending through said first laterally removed through the wall of the connector and separate means for permitting said guidewire, when extending through said first lumen, to be removed through the outside wall of said first lumen while maintaining the longitudinal positioning of a guidewire in a patient, said means initially providing an enclosed first lumen in said connector prior to the removal of a guidewire therethrough.

5,554,119

DRUG DELIVERY CATHETER WITH MANIFOLD

Kent D. Harrison, Brooklyn Park; Gary L. Hendrickson, Big Lake; Thomas J. Holman, Minneapolis; Daniel M. Lafontaine, Plymouth; Matthew J. Miller, White Bear Lake, and David B. Robinson, Chanhassen, all of Minn., assignors to SciMed, Maple Grove, Minn.

Continuation-in-part of Ser. No. 740,047, Aug. 2, 1991, abandoned. This application Jan. 27, 1994, Ser. No. 187,614

Int. Cl.[6] A61M *5/32*

U.S. Cl. 604—96 **16 Claims**

1. A drug delivery catheter for insertion into a vessel which contains a first flowing fluid, the drug delivery catheter comprising:

an elongated tubular member having a proximal end and a distal end;

a drug lumen in fluid communication with the distal end of the tubular member for delivering a second fluid;

an inflatable balloon assembly disposed at the distal end of the tubular member, the balloon assembly including an inflatable balloon member having an uninflated state and an inflated state;

aperture means for delivering the second fluid from said drug lumen to said vessel;

the balloon assembly, comprising a tubular balloon helically wound through the elongated tubular member creating balloon members and a sheath attached between the balloon members such that (1) when the balloon members are in an uninflated state, the first fluid in the vessel may flow around the balloon assembly, and (2) when the balloon members are in an inflated state, sections of the balloon members contact the vessel wall defining at least one containment pocket for containing the second fluid between the vessel wall, the contacting sections of the balloon assembly and the sheath, the aperture means being disposed in the containment pocket and an inflatable lumen being defined through the interior of the balloon members and sheath to allow the first fluid to flow through the balloon members; and

an inflation lumen in fluid communication with the balloon members for inflating the balloon members.

5,554,120

POLYMER BLENDS FOR USE IN MAKING MEDICAL DEVICES INCLUDING CATHETERS AND BALLOONS FOR DILATATION CATHETERS

Ziyun Chen, Santa Clara; Tai Cheng, Mountain View; Ketan Muni; Udayan Patel, both of San Jose, and Robert Saltman, Redwood City, all of Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Filed Jul. 25, 1994, Ser. No. 280,764

Int. Cl.[6] A61M *25/00;25/10;29/02*

U.S. Cl. 604—96 **36 Claims**

1. A catheter material formed from polymeric components, comprising:

about 60–77% by weight of the total blend composition of a first polymeric component selected from the group consisting of polyesters and polyamides, said polyesters being prepared from the group of dicarboxylic acids selected from aromatic dicarboxylic acids having from 8 to 14 carbon atoms and aliphatic dicarboxylic acids having from 2 to 12 carbon atoms, and at least one glycol selected from the group consisting of glycols having the formula $HO(CH_2)_nOH$, where n is an integer from 2 to 10, neopentyl glycol and cyclohexane dimethanol, and said polyamides being branched or straight chain polyamides having a molecular weight of at least 5000;

about 23–40% by weight of the total blend composition of a second polymer component having a Shore hardness less than 75 D, wherein said second polymeric component is a softening ethylene copolymer, the ethylene copolymer having the formula E'X' or E'X'Y', where E' is ethylene, and is about 60–85% by weight of the ethylene copolymer, where X' is about 15–40% by weight of the ethylene copolymer, and is selected from the group consisting of methylacrylate, ethylacrylate, propylacrylate, butylacrylate and mixtures thereof, and Y' is selected from the group consisting of α,

170-919 O.G.-96-11: QL3

β-ethylenically unsaturated monocarboxylic acids, α, β-ethylenically unsaturated dicarboxylic acids, and anhy-

a) a syringe body which includes a first cylindrical portion, a plunger axially movably reciprocally mounted in said cylin-

pump means being operable for pressurizing the fluid within the pressure chamber of the bladder to a pressure which is sufficient to expand the outer wall through said differential volume V_2.

said passageway is limited to substantially the axial depth of said second annular brace, to form a thin diaphragm gasket to permit minimally restricted movement of laparoscopic instru-

β-ethylenically unsaturated monocarboxylic acids, α, β-ethylenically unsaturated dicarboxylic acids, and anhydrides comprising about 0.5–15% by weight of the ethylene copolymer; and

less than about 2.5% by weight of the total blend composition of a compatibilizing ethylene copolymer having the formula E/X/Y where

E is ethylene,

X is an α, β-ethylenically unsaturated monomer derived from at least one of alkylacrylate, alkylmethacrylate, alkyl vinyl ether, carbon monoxide, sulfur dioxide, or mixtures thereof, where the alkyl groups contain 1–12 carbon atoms, and

Y is an α, β-ethylenically unsaturated monomer containing a reactive group that forms a covalent bond with said first polymeric component.

5,554,121

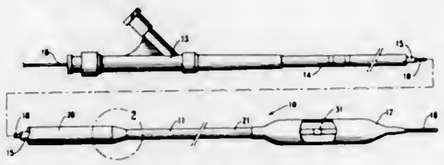
INTRALUMINAL CATHETER WITH HIGH STRENGTH PROXIMAL SHAFT

Robert D. Ainsworth, Scotts Valley; Tai C. Cheng, Mountain View, and Lawrence D. Wasicek, Sunnyvale, all of Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Filed Jul. 25, 1994, Ser. No. 280,210

Int. Cl.[6] A61M *29/00*

U.S. Cl. 604—96 **6 Claims**



1. A balloon dilatation catheter comprising:

a) a proximal catheter shaft portion formed at least in part of an extruded engineering thermoplastic polymeric material with a tensile strength greater than 10,000 psi, an elongation greater than 50% and a tensile modulus greater than 300,000 psi, having proximal and distal ends and having a first inner lumen extending therein to the distal end;

b) a distal catheter shaft portion being more flexible than the proximal catheter shaft portion, having proximal and distal ends and a second inner lumen extending from the proximal end of the distal shaft portion to a location proximal to the distal end of the distal catheter shaft portion and being in fluid communication with the first inner lumen extending within the proximal catheter shaft portion; and

c) an expandable dilatation balloon on the distal catheter shaft portion having an interior in fluid communication with the second inner lumen extending within the distal shaft portion.

5,554,122

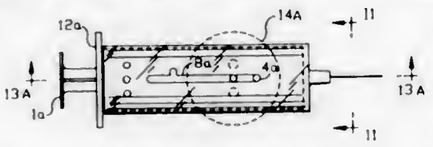
DISPOSABLE SYRINGE

Carolina Emanuel, 165 Staples Rd., Easton, Conn. 06612

Filed Mar. 23, 1995, Ser. No. 411,141

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—110 **5 Claims**



1. A disposable syringe, comprising in combination,

a) a syringe body which includes a first cylindrical portion, a plunger axially movably reciprocally mounted in said cylindrical portion, a neck portion integral with said first cylindrical portion which extends outwardly from said first cylindrical portion at one end thereof, and a hypodermic needle which extends parallel to the longitudinal axis of said first cylindrical portion outwardly from said first cylindrical portion from the other end thereof; and

b) a second cylindrical portion coaxially mounted on said first cylindrical portion; and second cylindrical portion having a bottom with an opening, said bottom being integral with said second cylindrical portion, said second cylindrical portion being first manually angularly movable and then manually slidably axially movable relative to said first cylindrical portion from a first partially extended position to a second fully retracted position; when said second cylindrical portion is disposed in said second fully retracted position said hypodermic needle projects through said opening in said integral bottom of said second cylindrical portion so that it is ready for use, and then said second cylindrical portion manually axially movable to a fully extended third position in which said bottom axially extends beyond the free end of said hypodermic to fully envelop said hypodermic needle; and

c) first, second and third locking means on said first and second cylindrical portions to respectively operatively lock said second cylindrical portion in said first, second and third positions relative to said first cylindrical portion.

5,554,123

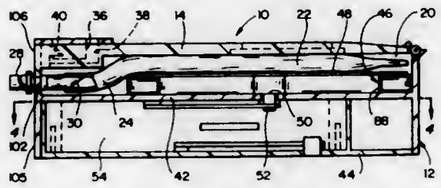
PORTABLE INFUSION PUMP

Glenn Herskowitz, 220 Hawthorne Ave., Larkspur, Calif. 94939

Filed Oct. 31, 1994, Ser. No. 331,883

Int. Cl.[6] A61M *5/155;5/145*

U.S. Cl. 604—141 **7 Claims**



1. A portable infusion pump for infusing intravenous solution from a bag through tubing into a patient, the bag having a flexible sidewall which at least partially encloses a volume to contain the solution, the bag further having a dispensing port for releasable connection with an end of the tubing, the pump comprising the combination of a housing having a compartment for removably receiving and supporting the bag in a solution-dispensing position, a push plate positioned within the housing, said push plate having a planar area A_1 which is in juxtaposed relationship with said flexible sidewall when the bag is in said solution-dispensing position, actuating means for moving the push plate against said flexible sidewall for compressing the bag and discharging solution therefrom during an infusion phase of an operating cycle, said push plate being moved by the actuating means from a home position toward the bag through a predetermined stroke length L_5 which is sufficient to substantially empty the solution from the bag with the volume V_1 which is swept by movement of the push plate through its stroke length having the relationship $V_1=L_5\times A_1$, said actuating means comprising 1) a reservoir having a supply chamber for holding a supply of fluid, 2) a flexible bladder having an outer wall which encloses a pressure chamber for receiving a charge of said fluid, said outer wall being expandable from a non-operating position through a differential volume V_2 which is sufficient to act against and move said push plate through said length L_5, said bladder being shaped with a configuration by which said volume V_2 is less than about 75% of the volume V_1, and 3) pump means for pumping fluid between the reservoir and pressure chamber, said pump means being operable for pressurizing the fluid within the pressure chamber of the bladder to a pressure which is sufficient to expand the outer wall through said differential volume V_2.

5,554,124

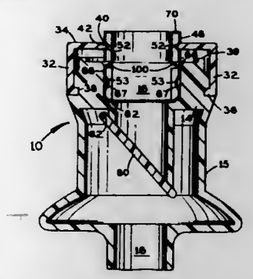
UNIVERSAL GASKET FOR LAPAROSCOPIC CANNULA

Alfredo Alvarado, 4310 Bayview Dr., Ft. Lauderdale, Fla. 33308

Continuation-in-part of Ser. No. 27,718, Mar. 8, 1993, abandoned. This application May 2, 1994, Ser. No. 235,873

Int. Cl.[6] A61M *39/06*

U.S. Cl. 604—167 **9 Claims**



1. A laparoscopic cannula gasket apparatus for sealing around an instrument within a cannula, comprising:

a first member having an internal passageway,

an elastic sleeve member within said passageway, said elastic sleeve member being formed of a sleeve member material having an average thickness,

means for securing a first segment of said sleeve member to said passageway,

a second member rotatably connected to said first member,

means for securing a second segment of said sleeve member to said second member,

said first and second segments of said sleeve member being spaced apart so that a gasket-forming portion of said sleeve member extends between said first and second segments,

such that rotating said second member relative to said first member stretches said portion of said sleeve member between said first and second segments to progressively form an annular diaphragm of stretched sleeve member material extending radially inwardly from said passageway to progressively close around and make sealing contact with said instrument,

wherein said means for securing said second segment of said sleeve member comprises a port in said second member having a port edge and a second annular brace having an axial depth and having two member edges and fit within said port and against said port edge, said sleeve member second segment being anchored between said port edge and said second annular brace, and extending over a member edge of said second annular brace opposite said first member, and then doubling back inside and through said second annular brace,

wherein said passageway in said first member has an inner wall, and said means for securing said first segment of said sleeve member comprises a first annular brace having an axial depth and which is positioned within and across said passageway to follow said passageway inner wall, and said first annular brace is spaced apart from said second annular brace a distance greater than said average thickness of said sleeve member material for permitting said sleeve member to pass between said first and second annular braces without binding between said first and second annular braces when one said annular brace is rotated relative to the other said annular brace, and said sleeve member extends between said first annular brace and said passageway inner wall such that said first segment is anchored between said first annular brace and said passageway inner wall, such that the length of said gasket-forming portion of said sleeve member exposed within said passageway is limited to substantially the axial depth of said second annular brace, to form a thin diaphragm gasket to permit minimally restricted movement of laparoscopic instruments within said internal passageway while said instruments are engaged by said gasket.

5,554,125

PREFILLED VIAL SYRINGE

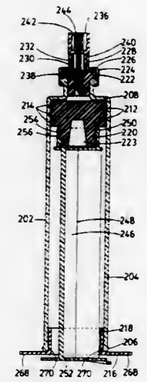
David L. Reynolds, 305 Knowlton Road, P.O. Box 600, (Knowlton) Lac Brome, Quebec, Canada

Continuation-in-part of Ser. No. 791,399, Nov. 16, 1991, Pat. No. 5,364,369, which is a continuation-in-part of Ser. No. 437,203, Nov. 16, 1989, Pat. No. 5,137,527, which is a continuation-in-part of Ser. No. 72,015, Jul. 8, 1987, Pat. No. 4,886,495. This application May 17, 1994, Ser. No. 245,132

Claims priority, application United Kingdom, Nov. 14, 1990, 9024710; May 17, 1993, 9310084

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—187 **14 Claims**



1. A pharmaceutical vial used for forming a barrel and a piston of a syringe after being filled and capped, comprising a cylindrical glass vial body having at one end an integral open neck and a peripheral external flange around an outer end of the neck, a peripheral rounded edge defining an inner periphery of an open opposite end, and a piston of resilient material having a cylindrical head within and concentric with the cylindrical glass body, the piston maintaining a slidable hermetically sealing relationship with a main inner cylindrical surface of the body, and being located to define a chamber of volume equal to the nominal capacity of the vial between the piston head and the neck of the vial, the piston having integral coupling structure wholly within the body for subsequent connection to a syringe plunger, and the vial being stable when standing on the open end of the body such that it can be conveyed while so standing through vial filling and capping machinery without tipping over, the body being formed adjacent said open end with peripheral radially extending positive retention means for engagement with complementary configurations of a tubular piston retaining member subsequently inserted within said open end of the body to resist overpressure within the body, wherein the retention means is formed by shaping a lower end portion of the body to have a reduced internal diameter such that the retention means is formed by an upwardly facing shoulder at the top of the lower end portion which projects inwardly of the projected circumference of said main interior cylindrical surface, and the lower end portion is located essentially within the projected circumference of a main cylindrical external surface of the body such as to leave the external surface of the body free of projections having an adverse effect on the stability of the vial;

said vial further including a pharmaceutical project within the chamber, a needle penetrable stopper inserted in the neck, and an annular cap crimped over said stopper and the flange of the

neck to retain the stopper in hermetic engagement with the neck, the cap being provided with a concentric tubular outward extension for receiving one of a double ended hollow

end of a bent pointed sharp end needle portion, radially expands, in a one way latching motion, into the receiving flared cavity structure and into a captured one way latching

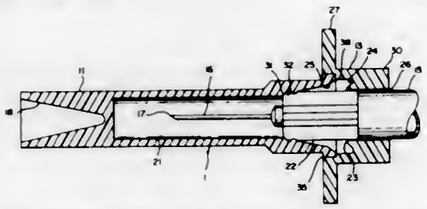
neck to retain the stopper in hermetic engagement with the neck, the cap being provided with a concentric tubular outward extension for receiving one of a double ended hollow needle and an adaptor for receiving a single ended hollow needle such that one end of the double ended needle, or a hollow needle provided on the adaptor, can penetrate the stopper, and including a finger grip and piston retainer member, wherein the piston retainer member includes a tubular member which is a press fit within the open end of the body of the vial, and a flange at an outer end of the tubular member providing outwardly extending finger tabs, the tubular member being recessed in its external surface adjacent the flange in the vicinity of the finger tabs so as to receive the retention means inward of the interior wall of the body.

5,554,126

MULTIPLE PURPOSE PROTECTIVE HYPODERMIC NEEDLE CAP

Daniel E. Filley, NE. 381 Bear Creek Dewatto Rd., Bremerton, Wash. 98312

Filed Aug. 9, 1994, Ser. No. 288,676
Int. Cl.[6] A61M *5/00*
U.S. Cl. 604—192 **17 Claims**



1. A multiple purpose protective hypodermic needle cap, comprising a first part and a second part arranged longitudinally adjacent to one another

a. the first part, called a cap, having the integral portions of:

i. an interior hollow structure to receive a hypodermic needle and portions of a syringe;

ii. an inner flared cavity structure to receive a bent hypodermic needle end and portions of a syringe and to contact the second part, and

iii. a conical shaped cavity structure to serve as a hypodermic needle bend gauge; and

b. the second part, called a cover, having the integral portions of:

i. a syringe surrounding receiving chamber structure;

ii. a receiving flared cavity structure, called a locking ring groove, to receive a bent hypodermic needle end, and a pointed sharp end thereof, and portions of a syringe and to contact the first part; and

iii. an engagement circular lip structure, called a locking ring-lip, to receive and to capture in a one way latching motion, a pointed sharp end of a bent hypodermic needle end;

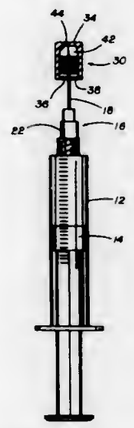
whereby this multiple purpose protective hypodermic needle cap is adapted to be used with a disposable hypodermic needle syringe: first, to protect a hypodermic needle during shipping and storing, until a syringe is ready for its medical use; second, after a syringe is utilized, the conical shaped cavity structure, which serves as a hypodermic needle bend gauge, is positioned over an end portion of a hypodermic needle, and then this multiple purpose protective hypodermic needle cap is used as a tool to bend back a pointed sharp end portion of a hypodermic needle beyond ninety degrees; third, the multiple purpose protective hypodermic needle cap is moved clear of a bent pointed sharp end portion of a hypodermic needle, then rotated and placed back over a bent pointed sharp end needle portion, and beyond; and fourth, the multiple purpose protective hypodermic needle cap is moved over a bent pointed sharp end needle portion, until a pointed sharp end of a bent pointed sharp end needle portion, radially expands, in a one way latching motion, into the receiving flared cavity structure and into a captured one way latching position with respect to the engagement circular lip structure, serving as a locking ring-lip, and thereafter a disposable hypodermic needle syringe, so covered by this multiple purpose protective hypodermic needle cap, is safely disposed of, for this protective hypodermic needle cap is locked on, and cannot be removed without completely destroying a hypodermic needle and/or a syringe.

5,554,127

SYRINGE NEEDLE THIMBLE CAP AND METHOD OF USE THEREOF

Ronald Crouther, Chesterfield; Douglas L. Stenslokken, Ballwin, and Eugene E. Weilbacher, Ellisville, all of Mo., assignors to Sherwood Medical Company, St. Louis, Mo.

Filed Oct. 11, 1994, Ser. No. 321,000
Int. Cl.[6] A61M *5/32*
U.S. Cl. 604—192 **19 Claims**



1. A syringe needle thimble cap for purging air from a hypodermic needle and syringe comprising:

a cylindrical member having a closed end and an open end;

an absorbent core material affixed within said cylindrical member, the core filling only a portion of said tubular member such that an open space exists between the core and the closed end, the core being pierceable by the hypodermic needle to allow for the purging of air from the needle and syringe, the core material being hydrophilic such that it absorbs any liquid ejected from the hypodermic needle and syringe while allowing air to escape from the open space within the tubular member to the outside atmosphere.

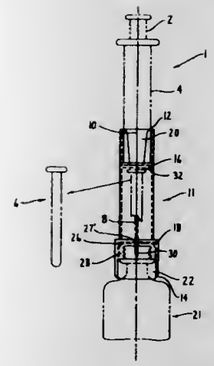
5,554,128

SYRINGE AND VIAL CONNECTOR

Harry S. Hedges, Kalamazoo, Mich., assignor to Joseph K. Andonian, Portage, Mich.

Continuation-in-part of Ser. No. 208,142, Mar. 9, 1994, Pat. No. 5,520,659. This application Jan. 9, 1995, Ser. No. 370,020
Int. Cl.[6] A61M *5/32*
U.S. Cl. 604—192 **5 Claims**

1. A combination comprising a disposable syringe having a tubular barrel and a capped needle on one end of said barrel and a tubular sleeve mounted over the capped needle end of said syringe wherein



said tubular sleeve has a first end, a second end and internal bore means adapted to receive in coaxial alignment said capped needle end of said syringe and a medicinal vial,

said first end of said tubular sleeve is fitted firmly but removably over the capped needle end of said syringe,

said bore means at said second end of said tubular sleeve is adapted to fit firmly but removably over a medicinal vial having needle penetrable top means suitable for receiving said needle for the purpose of extracting medicament from said vial into the barrel of said syringe without exposing the tip of said needle to the user until said syringe is ready for injecting the medicament from said syringe,

said bore means is sufficiently large throughout its entire length to accommodate said cap of said needle and extend beyond the tip of said needle,

said sleeve possesses first stop means within said bore means for limiting the penetration of the said syringe barrel into said first end of said sleeve and second stop means within said bore means for limiting the penetration of the top of said vial into said second end of said sleeve,

means at the second end of said sleeve adapted to permit the manual removal of said needle cap before attaching said vial without exposing the tip of the needle to the user and

the length of said sleeve and the distance between said stops in said bore means is adapted to permit the needle on the end of said syringe to penetrate the top of said vial and extract the contents of said vial when said sleeve is connected to said syringe and said vial.

5,554,129

SAFETY CAP AND HUB FOR MEDICAL INSTRUMENTS

John A. Stevenson, 14835 Telegraph Rd., Santa Paula, Calif. 93060

Filed Nov. 28, 1994, Ser. No. 345,611
Int. Cl.[6] A61M *5/32*
U.S. Cl. 604—192 **18 Claims**

1. A safety cap comprising,

a cap body with upper and lower ends and having first and second juxtaposed compartments for temporarily securing a medical instrument, which has a sharp end and a hub, before use and permanently securing it after use, respectively, said cap body having a first opening spaced from its upper end for removing said instrument from said first compartment and a second opening in the cap body's upper end for receiving said used instrument into said second compartment; and

a stand at the cap body's lower end for supporting said cap in a position in which the second opening is exposed to receive the sharp end of said used instrument so that a used instrument can be inserted into the second compartment for permanent storage without grasping the cap during said insertion,

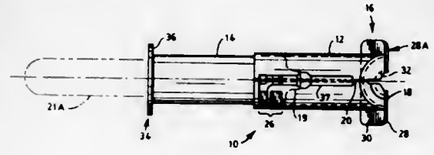
said second compartment comprising a locking mechanism for engaging said hub to permanently secure the sharp end of said instrument inside said second compartment, said locking mechanism comprising a flexible annular member that is connected to said second compartment and provides said second opening so that said hub can be pushed through said second opening to secure said used instrument.

5,554,130

STICK-FREE SYRINGE AND ASSOICATED METHODS

James McDonald, Monson; Charles N. Sturtevant, III, Braintree, both of Mass.; John Monteith, Hollidaysburg, Pa., and Mark Monteith, Lake Mary, Fla., assignors to Creative Bio Tech, Inc., Hollidaysburg, Pa.

Filed May 17, 1995, Ser. No. 443,597
Int. Cl.[6] A61M *5/32*
U.S. Cl. 604—198 **22 Claims**



1. A sheath for controlling a hypodermic syringe, the syringe of the type which includes (i) a blood collection tube and (ii) a hypodermic needle for drawing blood from a patient and into the tube, comprising:

an elongated tubular safety holder forming an axial cavity between a distal end and a proximal end, the distal end forming an aperture with a diameter that is greater than the diameter of the needle and less than the diameter of the tube, the holder having means for slideably engaging the syringe within

the cavity and between a first position, wherein the needle protrudes through the aperture, and a second position, wherein the holder substantially encloses the needle, the holder further having a substantially flat portion at the distal end for mounting the holder onto the patient, the flat portion stabilizing contact between the sheath and the patient and forming an angle relative to the elongated axis of the sheath, thereby controlling the angle at which the needle draws blood from the patient, and

means for securing the syringe at the second position such that the syringe is substantially restricted from movement along the elongated axis of the holder.

5,554,131

HYPODERMIC NEEDLE WITH PROTECTION DEVICE

Antonio Lacivita, Turin, Italy, assignor to Pia Carpinelli, Cumiana, Italy

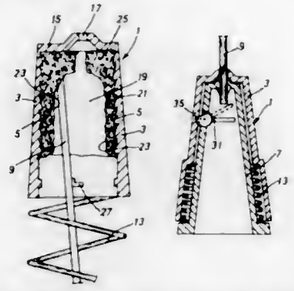
PCT No. PCT/EP93/01619, § 371 Date May 24, 1994, § 102(e) Date May 24, 1994, PCT Pub. No. WO94/01152, PCT Pub. Date Jan. 20, 1994

PCT Filed Jun. 22, 1993, Ser. No. 199,162

Claims priority, application Italy, Jul. 13, 1992, TO92A0579

Int. Cl.[6] A61M *5/32*

U.S. Cl. 604—198 **2 Claims**



1. A hypodermic needle with an after-use protection device against infection risks, comprising a cap (1) or a hollow member having a cylindrical or truncated cone shape, with piercing-resistant walls (3) having an inner irregular profile (5), a base (7) and said cap being snap-secured to the base (7) supporting the needle (9), and provided at its base (7) with a resilient element (13) with a marked propulsive capability, and at the other end (15) with a preferably eccentric hole (17), wherein inside the cavity (19) of the cap (1) there is provided a pocket (21), outwardly defined by the cap walls (3) and inwardly by a pierceable metal foil (23), said pocket containing an adhesive and air-hardening material (25), in case supported by a resilient spongy material, and

wherein the cap (1) is locked to the base (7) of the needle, by a series of cooperating snap retainers (27) located on the inner wall of the cap (1) and on the outer wall of the needle base (7) mating the cap (1) whereby a short manually imparted displacement of the cap (1) causes the cap to be released from the base (7), and allows it to spring upward to wholly shelter the needle (9), with said displacement that can be imparted even with the needle (9) still inserted in the skin, so that the cap (1) is released and springs forward to shelter the exposed portion of the needle (9), and remains ready to wholly cover it, as soon as it will be extracted from the skin.

5,554,132

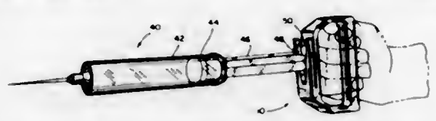
HAND GRIP FOR USE WITH SYRINGE

Thomas D. Straits, Grayslake; Andrew D. Obecny, Antioch, and Kenneth R. Greene, Vernon Hills, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Mar. 30, 1995, Ser. No. 413,562

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—227 **8 Claims**



1. A hand grip device for use with an associated syringe having a plunger stem with a push and pull flange at a terminal end of the plunger stem, comprising:

a grip portion having opposite ends and extending generally the width of a hand;

a bracket portion including two arms and a push bar, each arm connected to opposite ends of the grip portion and the push bar connecting the two arms so as to be generally parallel to the grip portion; and

a pull bar spaced from and parallel to the push bar and cantilevered from one of the bracket arms, the pull bar having a V-shaped slot extending away from the cantilevered end to an open end for slidably engaging the push and pull flange of the associated syringe.

5,554,133

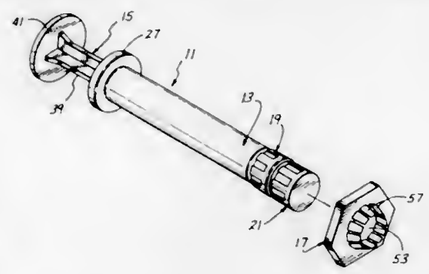
SYRINGE FLANGE ADAPTER AND METHOD

David S. Haffner, Mission Viejo, and Kenneth E. Kadziauskas, Laguna Niguel, both of Calif., assignors to Allergan, Inc., Irvine, Calif.

Division of Ser. No. 182,930, Jan. 18, 1994, Pat. No. 5,419,775. This application Apr. 13, 1995, Ser. No. 421,646

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—227 **10 Claims**



1. A syringe comprising:

a barrel having a longitudinal passage extending through the barrel and a flange;

a connector adjacent one end of the barrel for attaching a cannula to the barrel and said flange being adjacent another end of the barrel and having a forward face facing said one end of the barrel;

a plunger slidable in the passage of the barrel to expel flowable material from the barrel and having a pressure pad outside the passage adjacent one end of the plunger;

an adapter having a passage extending through the adapter and a counterbore, said adapter being shorter than said barrel, said passage of the adapter being sized and adapted to allow the adapter to be slid over said connector and said one end of the barrel but not over the flange to the forward face of the flange, said counterbore being sized and adapted to receive the flange, said adapter including a collar extending circumferentially of the barrel and radially beyond the flange to form finger pads when the adapter is on the barrel and engaging the flange; and

said adapter including a section which is constructed and adapted to yield radially outwardly as the adapter is moved onto the barrel and toward said flange from said one end of the barrel, said section gripping the barrel.

5,554,134

CAP FOR AN AMPOULE OF AN INJECTION UNIT

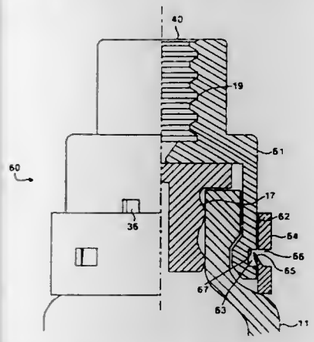
Frits F. Bonnichsen, Lynge, Denmark, assignor to Novo Nordisk A/S, Bagsvaerd, Denmark

Continuation of Ser. No. 53,501, Apr. 27, 1993, abandoned, which is a continuation of Ser. No. 768,683, Oct. 9, 1991, abandoned. This application Mar. 31, 1994, Ser. No. 221,277

Claims priority, application Denmark, Sep. 21, 1990, 2282/90

Int. Cl.[6] A61M *5/00;5/31*

U.S. Cl. 604—240 **4 Claims**



1. A closure for an ampoule for an injection unit, said ampoule having a hollow, cylindrical barrel (11) with a distal end and a proximal end, said distal end terminating in a neck (12), an outwardly directed annular projection (30) on the neck, and a piston closing the proximal end of the barrel, said closure comprising:

a disc shaped part (31);

a holding cap comprising a proximal section in the form of a skirt (35;62) having one or more interior projections (38) at its proximal end for engagement behind the annular projection (30) of the barrel neck, and a distal section having means for attaching a needle thereto, the holding cap engaging the disc-shaped part (31) pressing it sealingly against the annular projection; and a locking ring (20;64) provided on the outside of the skirt (35;62) locking the projections (38) in their engagement position behind the annular projection (30), wherein the locking ring (20;64) and the skirt (35;62) are a pair of elements provided with mutually engaging means in the form of resilient fingers (37;65) on one of the elements, recesses (36;66) are provided behind the fingers in the element carrying the fingers to accommodate said fingers when the locking ring (20;64) is passed over the skirt (35;62), and an edge is provided on the other element not carrying the fingers (37;65) over which edge the fingers (37;65) grip irreversibly when the locking ring is mounted in a locking position on the skirt.

5,554,135

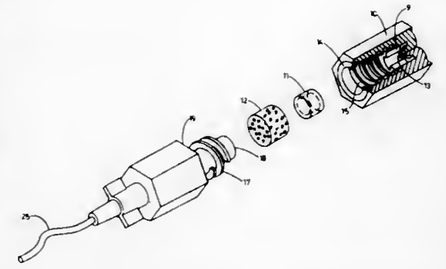
STERILE MEDICAL INJECTION PORT AND COVER METHOD AND APPARATUS

Steve Z. Menyhay, 9850 N. Willow Creek La., Fresno, Calif. 93720

Filed Feb. 17, 1995, Ser. No. 390,651

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—256 **22 Claims**



1. A method for covering and aseptically cleansing an external injection port with membrane comprising the steps of:

a. attaching a closed-ended hollow cylindrical cover over said port, said cover having an internal bore with helical screw threads therein, a projection on the inside at the end thereof, a capsule containing antiseptic material and a pad of absorbent porous material disposed therein, and an annular rubberized seal for airtight attachment to said port;

b. screwing said cover over said port so that said capsule is pressed against said projection such that said capsule ruptures thereby releasing said antiseptic material onto said pad; and

c. tightening said cover over said port so that said pad of antiseptic material comes into contact with the membrane of said port creating a closed aseptic environment.

5,554,136

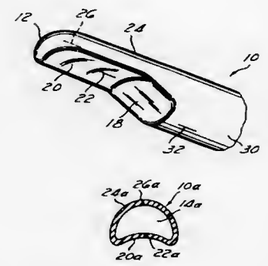
DUAL LUMEN INFUSION/ASPIRATION CATHETER

Ronald B. Luther, Newport Beach, Calif., assignor to Luther Medical Products, Inc., Tustin, Calif.

Continuation-in-part of Ser. No. 302,522, Sep. 7, 1994, Pat. No. 5,522,807. This application Feb. 27, 1995, Ser. No. 395,493

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—264 **16 Claims**



1. A catheter comprising:

a) an elongate body having proximal and distal ends;

b) a first lumen extending through a substantial portion of said body;

c) a concave wall formed said body proximate the distal end thereof; said concave wall being a wall of said first lumen;

d) a first slit formed in said concave wall;

e) a first convex wall formed in said body proximate the distal end thereof, said first convex wall also being a wall of said first lumen, said first convex wall being comprised of a more rigid material than said concave wall; and

f) wherein said first slit opens in response to decreased fluid pressure within said first lumen so as to facilitate aspiration via said first lumen and wherein said more rigid first convex wall mitigates the occurrence of catheter collapse during aspiration and said less rigid concave wall contributes to the overall flexibility of the body.

5,554,137

TISSUE PIERCING MEMBERS

a tubular section having a lumen extending along its length and being in fluid communication with the lumen of said body for

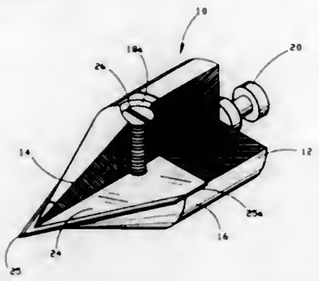
5,554,140

FEEDING TUBE RETAINING STRAP

Lester D. Michels, Eden Prairie; Douglas J. Duchon, Chanhassen, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

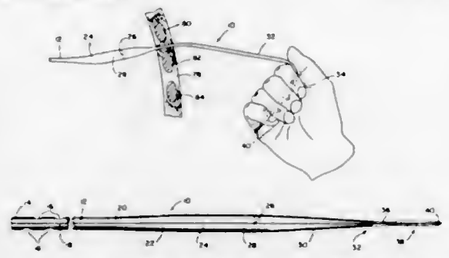
blow molded body portion, said end portion extending from a first end of said uridom and having a controlled wall thickness, said

5,554,137
TISSUE PIERCING MEMBERS
Wayne P. Young, Brewster, N.Y., and Salvatore Castro, Seymour, Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Oct. 8, 1993, Ser. No. 134,354
Int. Cl.[6] A61M 5/18; A61B 17/32; B26B 5/00
U.S. Cl. 604—264 12 Claims



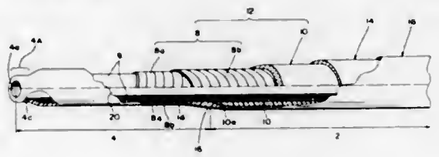
1. A piercing tip for use in piercing body tissue comprising:
(a) a body member defining an outer face and a base portion, the body member including a first body portion defining a distal face, a proximal face, a planar side wall and a frustoconically curved side wall and a second body portion defining a distal conical portion; and
(b) a substantially planar cutting blade having a triangular cutting region, the cutting blade being positioned within a slot formed in the body such that the triangular cutting region extends at least in part beyond the outer face of the body.

5,554,138
THORACIC CATHETER WITH ELONGATED PULLING LEAD
Charles G. Stanford, West Bend, and Michael J. Brown, Brookfield, both of Wis., assignors to Medovations, Germantown, Wis.
Filed Dec. 12, 1994, Ser. No. 353,678
Int. Cl.[6] A61M 25/00
U.S. Cl. 604—280 11 Claims



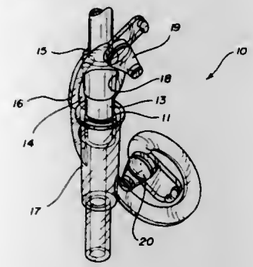
1. A thoracic catheter suitable for being placed in the open thoracic cavity of a patient following surgery to receive fluids found in the cavity, said catheter being capable of being drawn by a user in a facile manner through an opening in the thoracic wall from inside the thorax to outside the thorax to permit removal of the fluids from the cavity through the catheter, said catheter comprising:
an elongated body suitable for being placed in the thoracic cavity of the patient, said body having a lumen extending along its length, at least one opening extending through said body and to said lumen so that fluids found in the thoracic cavity may be received in said lumen, said body having a distal end portion with a first diameter, and said body having a proximal end;
a tubular section having a lumen extending along its length and being in fluid communication with the lumen of said body for receiving fluids, said tubular section having a second diameter greater than said first diameter, said tubular section having a distal end portion connected to, and merging smoothly with, said proximal end of said body, said tubular section having a proximal end, said tubular section being severable intermediate its distal end portion and proximal end to create a discharge port for the thoracic catheter;
a hollow elongated pulling lead having a third diameter less than said first diameter, said elongated pulling lead having a distal end portion connected to, and merging smoothly with, said proximal end of said tubular section, said elongated pulling lead having a proximal end;
said body, tubular section, and elongated pulling lead being integrally formed of a single piece of flexible plastic material; and
a tip member connected to the proximal end of said pulling lead so that a portion of said elongated pulling lead exists between said tubular section and said tip member having a flexibility and length sufficient to enable the elongated pulling lead to be bent and grasped under the fingers of the user across the width of the palm;
said tip member and elongated pulling lead being insertable through the opening in the thoracic wall from inside to outside the thorax, said elongated pulling lead being bent and grasped under the fingers of the user across the width of the palm to facilitate drawing the tubular section of the thoracic catheter through the opening and beyond the point at which said tubular section is severable to form the discharge port.

5,554,139
CATHETER
Naofumi Okajima, Tokyo, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 27, 1994, Ser. No. 364,297
Claims priority, application Japan, Dec. 24, 1993, 5-325610
Int. Cl.[6] A61M 25/00
U.S. Cl. 604—282 27 Claims



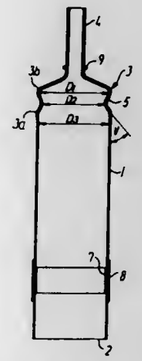
1. A catheter, comprising:
an inner layer;
an outer layer; and
an intermediate layer arranged between said inner and outer layers, said intermediate layer including a coil layer having a double layer coil portion composed of an inner coil wound in a first direction and an outer coil wound around the outside of said inner coil in a second direction that is opposite to said first direction, wherein said inner coil and said outer coil are formed from flat members whose ratios of thickness to width of cross section are less than 1.

5,554,140
FEEDING TUBE RETAINING STRAP
Lester D. Michels, Eden Prairie; Douglas J. Duchon, Chanhassen, and Norman C. Reid, Minneapolis, all of Minn., assignors to Sandoz Nutrition Ltd., Berne, Switzerland
Continuation-in-part of Ser. No. 828,398, Jan. 30, 1992, Pat. No. 5,322,073. This application Mar. 11, 1994, Ser. No. 212,631
Int. Cl.[6] A61M 25/00
U.S. Cl. 604—283 6 Claims



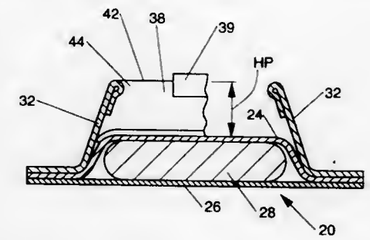
1. A retaining device on a single-port connector of a feeding tube for preventing unintentional disconnect of a feeding solution supply tube from the single-port connector, wherein said retaining device comprises a flexible locking strap secured at one end thereof to a single-port connector and having an opening in said strap; said strap being adapted for having said supply tube passed through said opening and removeably secured by engagement of said supply tube and said opening to prevent unintentional disengagement of said supply tube from said single-port connector.

5,554,141
THERMOPLASTIC URIDOM AND METHOD AND APPARATUS FOR THE MANUFACTURING THEREOF
Henrik G. Wendler, Frederiksberg, Denmark, assignor to Coloplast A/S, Denmark
Continuation of Ser. No. 719,779, Jun. 24, 1991, abandoned. This application Feb. 4, 1994, Ser. No. 191,757
Claims priority, application Denmark, May 15, 1990, 1201/90
Int. Cl.[6] A61F 5/44
U.S. Cl. 604—352 13 Claims



1. A unitary uridom for use as an external catheter and a male unitary incontinence device consisting essentially of a single layer, unitary, tubular length of thermoplastically processed non-preprocessed thermoplastic elastomeric base material comprising an injection molded end portion, a combined pull extrusion and blow molded tubular portion and a combined pull extrusion and blow molded body portion, said end portion extending from a first end of said uridom and having a controlled wall thickness, said tubular portion connecting said end portion to said body portion, and said body portion being thin-walled and having a wall thickness which is less that a wall thickness of said end portion.

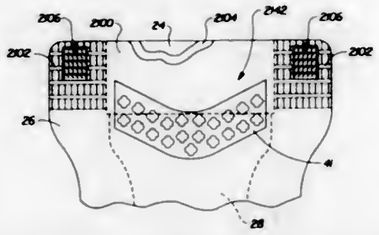
5,554,142
ABSORBENT ARTICLE HAVING MULTIPLE EFFECTIVE HEIGHT TRANSVERSE PARTITION
Kimberly A. Dreier, Cincinnati, and Donald C. Roe, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Nov. 30, 1994, Ser. No. 347,026
Int. Cl.[6] A61F 13/15
U.S. Cl. 604—385.1 12 Claims



1. A diaper for a female wearer, said diaper having a mutually orthogonal longitudinal centerline, a transverse centerline and Z-direction, said diaper comprising:
a liquid pervious topsheet having an outwardly oriented surface and a core facing surface opposed thereto, said outwardly oriented surface of said topsheet lying in the plane of said longitudinal and said transverse centerlines, whereby said Z-direction extends outwardly therefrom;
a liquid impervious backsheet at least partially peripherally joined to said topsheet;
an absorbent core between said topsheet and said backsheet;
a transverse partition disposed on said outwardly oriented surface of said topsheet and extending outwardly therefrom to a distal edge having an effective height spaced from said plane, said transverse partition dividing said diaper into a front portion and a rear portion, whereby fecal material deposited in the rear portion of said diaper is obstructed from migrating to the front portion of said diaper; and
at least one blocking member juxtaposed with said distal edge of said transverse partition, whereby said at least one blocking member has a greater effective height from said plane than non-reinforced regions of said partition without said at least one blocking member.

5,554,143
ABSORBENT ARTICLE WITH MULTIPLE ZONE STRUCTURAL ELASTIC-LIKE FILM WEB EXTENSIBLE WAIST FEATURE
Donald C. Roe, West Chester; David J. K. Goulait; Sheila S. Rodriguez, both of Cincinnati; Edward P. Carlin, Maineville; Kimberly A. Dreier, Cincinnati; Carolyn M. Jasper, Cincinnati, and Dean J. Daniels, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Division of Ser. No. 203,456, Feb. 28, 1994. This application May 24, 1995, Ser. No. 448,943
Int. Cl.[6] A61F 13/15
U.S. Cl. 604—385.2 8 Claims

1. A disposable absorbent article having a front waist region and a back waist region, the absorbent article comprising:



a chassis assembly comprising a liquid pervious topsheet, a liquid impervious backsheet joined with said top sheet, and an absorbent core positioned between said topsheet and said backsheet; and

an extensible back waist feature positioned in said back waist region, said extensible back waist feature joined to and extending longitudinally outwardly from said chassis assembly, said extensible back waist feature comprising:

(a) a hip panel extending longitudinally outwardly from said absorbent core, said hip panel being extensible in a direction having a vector component in the lateral direction;

(b) a central waistband panel joined to and extending longitudinally outwardly from said hip panel, said central waistband panel being extensible in a direction having a vector component in the lateral direction, the extension force of said central waistband panel being greater than the extension force of said hip panel; and

(c) a pair of side panels joined to and extending laterally outwardly from said central waistband panel and at least a portion of said hip panel, each said side panel having a waist zone and a leg zone, said waist zone having a first direction of extensibility and said leg zone having a second direction of extensibility different from said first direction of extensibility.

5,554,144

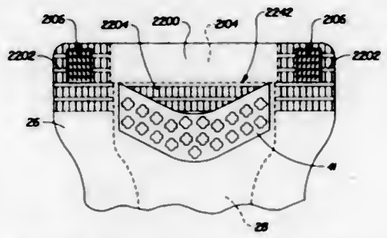
ABSORBENT ARTICLE WITH MULTIPLE ZONE STRUCTURAL ELASTIC-LIKE FILM WEB EXTENSIBLE WAIST FEATURE

Donald C. Roe, West Chester; David J. K. Goulait; Sheila S. Rodriquez, both of Cincinnati; Edward P. Carlin, Maineville; Kimberly A. Dreier, Cincinnati; Carolyn M. Jasper, Cincinnati, and Dean J. Daniels, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 203,456, Feb. 28, 1994. This application May 24, 1995, Ser. No. 449,042

Int. Cl.[6] A61F *13/15*

U.S. Cl. 604—385 **7 Claims**



1. A disposable absorbent article having a front waist region and a back waist region, the absorbent article comprising:

a chassis assembly comprising a liquid pervious topsheet, a liquid impervious backsheet joined with said topsheet, and an absorbent core positioned between said topsheet and said backsheet; and

an extensible back waist feature positioned in said back waist region, said extensible back waist feature joined to and extending longitudinally outwardly from said chassis assembly, said extensible back waist feature comprising:

(a) a hip panel extending longitudinally outwardly from said absorbent core, said hip panel being extensible in a direction having a vector component in the lateral direction;

(b) a central waistband panel joined to and extending longitudinally outwardly from said hip panel, said central waistband panel being extensible in a direction having a vector component in the lateral direction, the extension force of said central waistband panel being greater than the extension force of said hip panel; and

(c) a pair of side panels joined to and extending laterally outwardly from said central waistband panel and at least a portion of said hip panel.

5,554,145

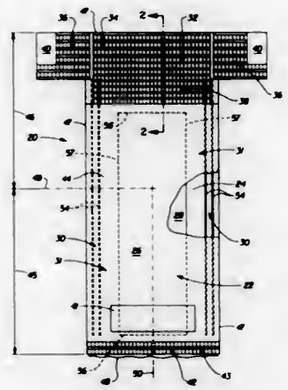
ABSORBENT ARTICLE WITH MULTIPLE ZONE STRUCTURAL ELASTIC-LIKE FILM WEB EXTENSIBLE WAIST FEATURE

Donald C. Roe, West Chester; David J. K. Goulait; Sheila S. Rodriguez, both of Cincinnati; Edward P. Carlin, Maineville; Kimberly A. Dreier, Cincinnati; Carolyn M. Jasper, Cincinnati, and Dean J. Daniels, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 28, 1994, Ser. No. 203,456

Int. Cl.[6] A01F *13/15*

U.S. Cl. 604—385.2 **7 Claims**



1. A disposable absorbent article having a front waist region and a back waist region, the absorbent article comprising:

a chassis assembly comprising a liquid pervious topsheet, a liquid impervious backsheet joined with said topsheet, and an absorbent core positioned between said topsheet and said backsheet; and

an extensible back waist feature positioned in said back waist region, said extensible back waist feature joined to and extending longitudinally outwardly from said chassis assembly, said extensible back waist feature comprising:

(a) a hip panel extending longitudinally outwardly from said absorbent core, said hip panel being extensible in a direction having a vector component in the lateral direction;

(b) a central waistband panel joined to and extending longitudinally outwardly from said hip panel, said central waistband panel being extensible in a direction having a vector component in the lateral direction, the extension force of

said central waistband panel being greater than the extension force of said hip panel; and

(c) a pair of side panels joined to and extending laterally outwardly from said central waistband panel and at least a portion of said hip panel, each said side panel being extensible in a direction having a vector component in the lateral direction.

5,554,146

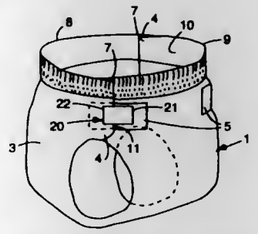
MECHANICAL FASTENER FOR DISPOSABLE ARTICLE

Laura S. Niederhofer, St. Paul; Leigh E. Wood, Woodbury, and Stephen P. Polski, Shoreview, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 6, 1994, Ser. No. 239,042

Int. Cl.[6] A61F *13/15*

U.S. Cl. 604—391 **46 Claims**



1. A closure system on a disposable absorbent article comprising a disposable absorbent article with at least two corner portions each of said corner portions having a liquid-permeable inner layer formed from a nonwoven fibrous web and a liquid-impermeable outer layer, and a mechanical fastening tab adjacent a first edge of a first of said two corner portions, the liquid-impermeable outer layer at a second opposing corner of said two corner portions having a first fibrous web on an outer surface of said liquid-impermeable outer layer engageable with said mechanical fastening tab, said mechanical fastening tab having a first face and a second face, at least said first face having male mechanical fastening structures engageable with said first fibrous web, a first inward end portion of said mechanical fastening tab located adjacent said liquid-impermeable inner layer and engaged therewith, and an outward end portion of said mechanical fastening tab extending outward of said first corner portion at said first edge wherein both said inward end potion and outward end portion have said male mechanical fastening structures such that both end portions are engageable with said first fibrous web wherein said inward end portion mechanically engages said nonwoven fibrous web inner layer by said male mechanical fastening structures such that the male mechanical fastening structures project through said nonwoven fibrous web and are engageable with said first fibrous web.

5,554,147

COMPOSITIONS AND DEVICES FOR CONTROLLED RELEASE OF ACTIVE INGREDIENTS

Christopher D. Batich; Marc S. Cohen, both of Gainesville, Fla., and Kirk Foster, Baltimore, Md., assignors to CApHCO, Inc., Gainesville, Fla.

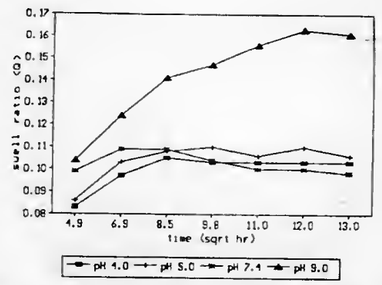
Filed Feb. 1, 1994, Ser. No. 189,854

Int. Cl.[6] A61K *9/22*

U.S. Cl. 604—890.1 **8 Claims**

1. A method for controlling a bacterial infection associated with the use of an indwelling medical device in an environment which is desired to be kept free of bacterial infection, wherein said infection would cause an increase in the pH of the environment of said indwelling medical device, wherein said method comprises:

implanting into a patient in need of such a medical device an indwelling medical device which is coated with a biologically active agent integally incorporated throughout and trapped within a pH-sensitive polymer matrix, wherein said polymer matrix swells to release said agent at an increased rate or only upon said change of pH, thereby controlling said infection.



5,554,148

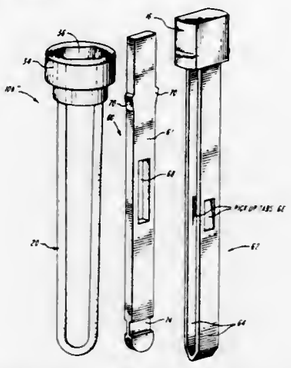
RENEWABLE NEURAL IMPLANT DEVICE AND METHOD

Patrick Aebischer, Barrington, R.I.; Paul C. DiCesare, Norwalk, Conn.; Moses Goddard, Tiverton, R.I., and Paul J. Mulhauser, New York, N.Y., assignors to Brown University Research Foundation, Providence, R.I.

Continuation of Ser. No. 226,389, Apr. 12, 1994, abandoned, which is a continuation of Ser. No. 722,950, Jun. 28, 1991, abandoned, which is a continuation-in-part of Ser. No. 369,296, Jun. 21, 1989, abandoned, and Ser. No. 613,109, Nov. 14, 1990, Pat. No. 5,106,627, which is a division of Ser. No. 369,296, which is a continuation-in-part of Ser. No. 121,626, Nov. 17, 1987, Pat. No. 4,892,538. This application May 26, 1995, Ser. No. 453,571

Int. Cl.[6] A61K *9/22*

U.S. Cl. 604—890.1 **29 Claims**



14. A refillable immunoisolatory therapeutic device for implantation through a human skull and into a human brain, comprising:

a flexible cell chamber adapted for containing viable cells which secrete at least one biologically active factor, the cell chamber comprising a first end, a second end for positioning within the brain, a cell chamber exterior wall surface, and at least one semipermeable surface in the second end, across which the active factor secreted by the viable cells can be delivered to the brain, the cell chamber being adapted for infusion with the viable cells and for protecting the viable cells from immunogens;

the cell chamber constructed as a U-tube with the open free ends of the U-tube connected at the first end of the cell chamber to a cap, the cap adapted to engage a skull anchoring means, for anchoring the cell chamber to a human skull,

the cap having accessing means comprising at least one port in fluid communication with at least one free end of the U-tube

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5,554,150

GRANULOCYTE COLONY-STIMULATING FACTOR SOLUTION DELIVERY METHOD

5,554,152

METHOD FOR INTRA-OPERATIVE MYOCARDIAL REVASCULARIZATION

a laser light source for producing an output laser beam, and

a mode distribution means for intercepting the output laser beam to control distribution of laser energy of the output laser beam

the cap having accessing means comprising at least one port in fluid communication with at least one free end of the U-tube to introduce, flush and renew the viable cells,

a substantially rigid mandrel adapted to engage at least a portion of the cell chamber exterior wall surface during implantation in the brain, wherein the mandrel engages at least a portion of the cell chamber exterior wall surface during implantation and the mandrel being removable through a insertion port in the cap after implantation.

5,554,149

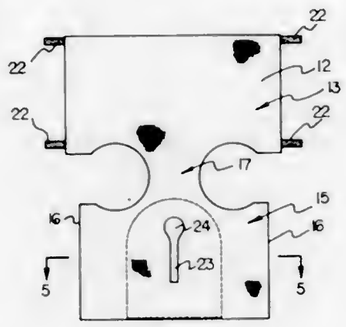
MALE INCONTINENCE PANTS

Doris O'Donnell, P.O. Box 363, Lincoln Park, N.J. 07035

Filed Jun. 14, 1995, Ser. No. 490,234

Int. Cl.[6] A61F *13/15*

U.S. Cl. 604—385.1 **3 Claims**



1. Male incontinence pants, comprising,

a flexible web, the flexible web having an outer surface spaced from an inner surface, the flexible web further comprising a first web spaced from a second web, the first web having a first web rear edge spaced from a first web forward edge, the second web having a second web rear edge spaced from a second web forward edge, and a connecting web, the connecting web interconnecting the first web forward edge and the second web rear edge,

and

a pocket member having a pocket cavity, and the pocket cavity extending from the second web, and extending from the second web forward end to the connecting web, and the pocket member oriented medially between the second web sides of the second web;

an entrance slot directed into the pocket cavity extending from the inner surface of the second web, and the slot having a first end adjacent to the second web forward end, and the pocket entrance slot having a semi-circular second end to accommodate a male scrotum, with the pocket entrance slot extending medially between the second web sides and oriented substantially orthogonally relative to the second web forward end.

5,554,150

GRANULOCYTE COLONY-STIMULATING FACTOR SOLUTION DELIVERY METHOD

Anne Bousseau, Paris; Armand Frydman, Verrières-le-Buisson; Jean-Paul Plard, Vitry; Gilles Spenlehauer, Cachan, and Michel Veillard, Sceaux, all of France, assignors to Rhone-Poulenc Rorer S.A., Antony Cedex, France

PCT No. PCT/FR93/00731, § 371 Date Jan. 20, 1995, § 102(e) Date Jan. 20, 1995, PCT Pub. No. WO94/02164, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 19, 1993, Ser. No. 373,287

Claims priority, application France, Jul. 23, 1992, 92 09079

Int. Cl.[6] A61K *9/22*

U.S. Cl. 604—891.1 **19 Claims**

1. A method for administering granulocyte-colony stimulating factor to a patient comprising continuous subcutaneous delivery of a solution comprising granulocyte-colony stimulating factor to said patient.

5,554,151

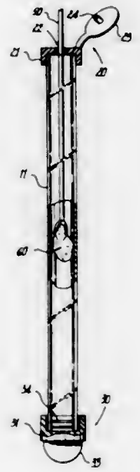
SPECIMEN RETRIEVAL CONTAINER

Peter W. J. Hinchliffe, New Haven, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Sep. 27, 1994, Ser. No. 313,701

Int. Cl.[6] A61B *17/00*

U.S. Cl. 606—1 **13 Claims**



1. A specimen retrieval container for retrieving a specimen from a body cavity, which comprises:

a) an elongated tube having a proximal end, a distal end, and an axial bore extending therethrough, said tube being substantially impervious to fluid;

b) a first end cap positioned at the proximal end of the tube and having a main body portion with an aperture therethrough, and a capping tab flexibly attached to said main body portion, said capping tab having a plug projecting therefrom for engaging said aperture and forming a fluid tight seal when inserted therethrough; and

c) a second end cap releasably engaged with the distal end of said tube to form a fluid tight seal therewith, wherein said first end cap possesses at least two L-shaped notches for a bayonet type mounting engagement with a cannula assembly housing.

5,554,152

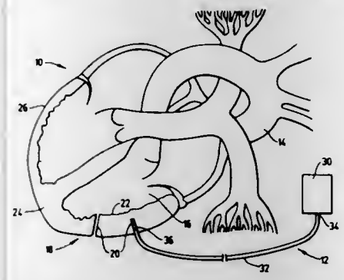
METHOD FOR INTRA-OPERATIVE MYOCARDIAL REVASCULARIZATION

Michael Aita, Sunnyvale, Calif.; Mahmood Mirhoseini; Mary Cayton, both of Glendale, Wis.; Carl J. Simpson, and Brian Guscott, both of Los Altos Hills, Calif., assignors to Cardio-Genesis Corporation, Santa Clara, Calif.

Continuation of Ser. No. 79,699, Jun. 16, 1993, Pat. No. 5,380,316, which is a continuation of Ser. No. 630,259, Dec. 18, 1990, abandoned. This application Dec. 20, 1994, Ser. No. 361,787

Int. Cl.[6] A61B *17/36*

U.S. Cl. 606—7 **19 Claims**



1. A method of forming a channel in a desired portion of a wall of a patient's heart from an exterior portion thereof, comprising the steps of:

providing an elongated flexible laser wave guide system having proximal and distal ends;

guiding a distal portion of the elongated flexible laser wave guide within the patient's chest cavity to the exterior portion of the wall of the patient's heart through which a channel is to be formed; and

maintaining the distal end of the flexible laser wave guide system against tissue of the heart wall through which the channel is to be formed while transmitting laser energy from a remote laser source through the laser wave guide system and out the distal end thereof in a beam onto the tissue of the heart wall with sufficient energy and for a sufficient length of time to form a channel through the wall of the patient's heart.

5,554,153

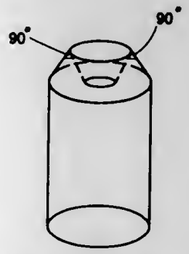
LASER SKIN PERFORATOR

David J. Costello, Albuquerque, N.M.; Aleksei Y. Dergatchev, Hoover, Ala.; Warren E. Parkhurst, Houston, Tex.; Valeri G. Polushkin, and Sergey A. Kokhanovsky, both of Troitsk, U.S.S.R., assignors to Cell Robotics, Inc., Albuquerque, N.M.

Filed Aug. 29, 1994, Ser. No. 297,295

Int. Cl.[6] A61B *17/36*

U.S. Cl. 606—9 **9 Claims**



1. A laser perforator for perforating skin with a perforation to permit blood under a surface of the skin to flow out, the perforator comprising

a laser light source for producing an output laser beam, and

a mode distribution means for intercepting the output laser beam to control distribution of laser energy of the output laser beam across the perforation of the skin the mode distribution means is a cylindrical rod having a 90 degree annular corner reflector having a conical surface with an apex diametrically opposed to the cone so that the conical surface forms a circular reflective surface at the end of said means.

5,554,154

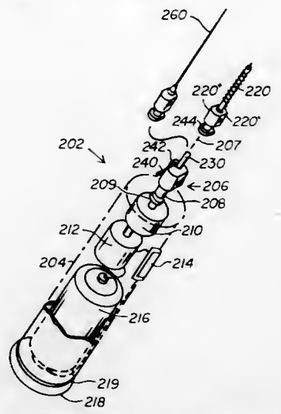
INTRA-OSSEOUS NEEDLE DRILL

Norman Rosenberg, 11122 Alford, Brighton, Mich. 48116

Filed Mar. 3, 1995, Ser. No. 397,779

Int. Cl.[6] A61B *17/00*

U.S. Cl. 606—80 **11 Claims**



1. A drill and medical needle assembly, comprising:

a needle having a fitting end and a tip suitable for intra-osseous use, the fitting end of the needle featuring a primarily circular but non-symmetrical cross-section including two opposing flat outer surfaces, the drill comprising:

a hand-held housing having proximal and distal ends;

a chuck to removably receive the needle at its fitting end, the chuck being rotatable and extending outwardly from the distal end of the housing, the physical mounting of the chuck being sufficiently close to the distal end of the housing to minimize lateral movement of the chuck and needle attached thereto during the rotation thereof, the chuck including means for releasably receiving and mating with the fitting end of the needle;

energy storage means disposed within the housing and coupled in an energy path to the chuck, the energy released from the energy storage means being sufficient to permit the rotating needle to penetrate into the intra-osseous cavity of a patient; and

a user-accessible switch supported on the housing, the activation of which causes at least a portion of the stored energy to be converted into the rotation of the chuck and medical needle.

5,554,155

FIBER OPTIC PICK MANIPULATOR

Carl C. Awh, Lutherville; R. Scott Rader, Baltimore; Alexander C. Walsh, Hunt Valley, and Eugene de Juan, Jr., Phoenix, all of Md., assignors to Johns Hopkins University, Baltimore, Md.

Filed Jun. 3, 1994, Ser. No. 253,917

Int. Cl.[6] A61B *17/36;* **A61F** *9/007*

U.S. Cl. 606—16 **18 Claims**

1. A manipulator comprising:

5,554,157

ROD SECURING POLYAXIAL LOCKING SCREW AND

(c) a wire electrode extending diagonally from adjacent an outer end of said stop arm to said endocervical portion, said offset

an elongated support member having a proximal end and a distal end;

at least one optical fiber extending through at least a portion of said support member; and

an aspiration passage extending through at least a portion of said support member and including an aspiration tube which extends distally beyond said distal end of said support member, said aspiration tube having a generally straight portion extending from said distal end of said support member and a curved portion extending distally from a distal end of said straight portion, said curved portion terminating distally in a pointed pick tip;

an aspiration lumen being defined through at least a portion of said straight portion and terminating distally in an aspiration opening, said pointed pick tip being substantially closed and said aspiration opening being defined at said curved portion, spaced from said pointed pick tip.

5,554,156

LASER MEDICAL TREATMENT APPARATUS

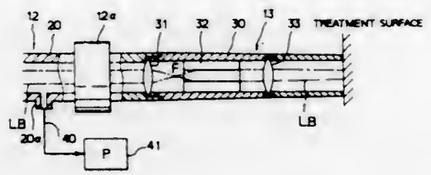
Susumu Shimizu, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 25, 1994, Ser. No. 217,568

Claims priority, application Japan, Mar. 26, 1993, 5-068701

Int. Cl.[6] A61B *17/36*

U.S. Cl. 606—17 **11 Claims**



1. A laser apparatus for medical treatment use in which a laser beam is irradiated on a portion of a human body to be treated, comprising:

means for generating a laser beam of giant pulse;

a light guide means having one end through which the laser beam outputted from the laser beam generation means is guided and propagated;

a hand piece attached to another end of the light guide means for propagating the laser beam from the light guide means so as to irradiate the laser beam propagated in the hand piece to the portion to be treated;

means for forming a beam converging point within at least a laser beam propagating path located in the hand piece; and

means for keeping a vacuum state in at least a predetermined region in the laser beam propagating path, the predetermined region including the beam converging point.

5,554,157

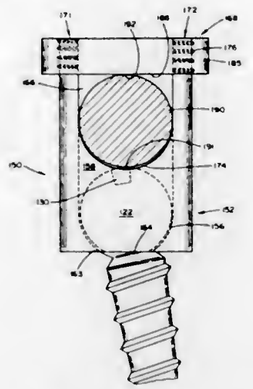
ROD SECURING POLYAXIAL LOCKING SCREW AND COUPLING ELEMENT ASSEMBLY

Joseph P. Errico, Hempstead, N.Y.; Thomas J. Errico, Summit, and James D. Ralph, Oakland, both of N.J., assignors to Fastenetix, L.L.C., Summit, N.J.

Continuation-in-part of Ser. No. 502,285, Jul. 13, 1995. This application Jul. 14, 1995, Ser. No. 502,048

Int. Cl.[6] A61B *17/70*

U.S. Cl. 606—61 **2 Claims**



1. A orthopedic rod implantation apparatus having polyaxial screw and coupling elements, comprising:

at least one elongate rod;

at least one polyaxial screw having a curvate head;

at least one coupling element, including

an axially extending interior passage having an inwardly curvate surface at a lower end thereof, said inwardly curvate surface defining a socket wherein said semispherical head may be polyaxially mounted for selected angular adjustment of the screw relative to the coupling element,

a pair of opposing channels formed in the top of said coupling element, said channels defining a rod receiving locus,

a pair of upwardly extending members having an exterior threading disposed on uppermost portions thereof; and

at least one top locking nut, mateable with said threading, for locking a rod in said rod receiving locus, and for locking said the semispherical head of said screw in the socket of said coupling element by direct contact between said rod and said semispherical head, thereby locking said screw at said selected angle.

5,554,158

INTERCONDYLAR NOTCH CUTTER FOR POSTERIOR STABILIZED FEMORAL KNEE PROSTHESIS

John D. Vinciguerra, Austin; Charles H. Perrone, Jr., Georgetown; Charles W. Mumme, and Jeffery C. Higgins, both of Austin, all of Tex., assignors to Intermedics Orthopedics, Inc., Austin, Tex.

Continuation of Ser. No. 252,689, Jun. 2, 1994, abandoned. This application May 26, 1995, Ser. No. 451,530

Int. Cl.[6] A61B *17/56*

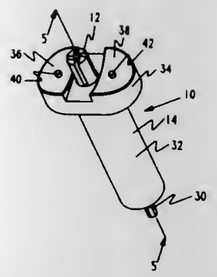
U.S. Cl. 606—80 **8 Claims**

3. A surgical apparatus for cutting an intercondylar notch in a distal end of a patient's femur for receiving a posterior stabilized knee prosthesis, said apparatus comprising:

a distal femoral trial prosthesis having an anterior side and a posterior side,

a notch cutter, and

means for guiding said notch cutter with respect to said trial prosthesis,



said distal femoral trial prosthesis providing access to an area of the distal end of the patient's femur between the medial and lateral condyles and having at least one trial condylar articulating surface replicating a condylar articulating surface of a corresponding permanent femoral prosthesis,

said notch cutter having means for slidingly stabilizing said notch cutter on said trial condylar articulating surface for relative sliding articulation, and means connected to said stabilizing means for milling a notch in said area between said medial and lateral condyles,

said at least one trial condylar articulating surface comprising a medial articulating surface and a lateral articulating surface, said medial and lateral articulating surfaces being spaced apart from one another to provide said access to said area of the patient's femur between the medial and lateral condyles,

said means for guiding comprising at least one slot and means for tracking said slot, and

means for limiting the motion of said notch cutter comprising end stops on said at least one slot.

5,554,159

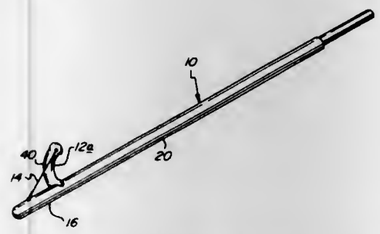
INSTRUMENT FOR ELECTRO-SURGICAL EXCISOR FOR THE TRANSFORMATION ZONE OF THE UTERINE CERVIX AND METHOD OF USING SAME

Nathan R. Fischer, 17 Lovelace Dr., West Hartford, Conn. 06117

Continuation-in-part of Ser. No. 192,132, Feb. 4, 1994, Pat. No. 5,403,310. This application Dec. 22, 1994, Ser. No. 361,747

Int. Cl.[6] A61B *17/39*

U.S. Cl. 606—45 **8 Claims**



1. An electro-surgical instrument for excision of a tissue specimen from a transformation zone of a uterine cervix by insertion through a vaginal canal comprising:

(a) an elongated body member having two ends with an endocervical portion adjacent one end, a contact portion adjacent a second end, and a vaginal portion therebetween, said endocervical portion being insertable into and rotatable in uterine cervix;

(b) a stop arm extending substantially at a right angle to said body member at a juncture of said endocervical portion and said vaginal portion, said stop arm having a laterally offset portion intermediate its length; and

(c) a wire electrode extending diagonally from adjacent an outer end of said stop arm to said endocervical portion, said offset portion of said stop arm enabling visual observation of a cervical area to be cut by the wire electrode.

5,554,160

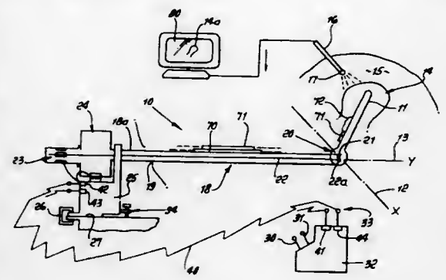
UTERUS MANEUVERING METHOD

James C. Caillouette, 685 Oak Knoll Circle, Pasadena, Calif. 91106

Filed May 23, 1995, Ser. No. 447,347

Int. Cl.[6] A61B *17/42*

U.S. Cl. 606—119 **25 Claims**



1. In a uterus maneuvering method, the steps that include:

a) providing a lengthwise elongated boom, and a strut carried at one end of the boom to be pivoted relative to the boom, and inserting the strut and boom via the vaginal cavity to locate the strut to project in the uterine cavity,

b) providing actuator means associated with the boom and strut for effecting controlled pivoting of the strut, and providing a linkage to extend within the boom and to operatively connect between the actuator means and said strut,

c) providing control means for controlling said actuator means, and including a servo system having an extra-corporeal manual control means, for coupling between said manual control means and actuator means,

d) and operating said servo system to maneuver the uterus,

e) providing support structure for said boom, and orienting the boom in selected position in the birth canal with said strut inserted into the uterus for pivoting therein,

f) and wherein said support structure is provided to carry the boom for pivoting about an axis extending lengthwise at the boom.

5,554,161

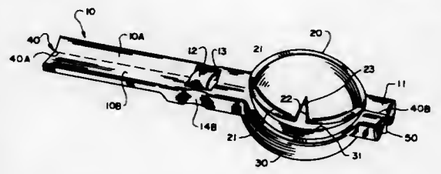
TICK REMOVAL TOOL

Larry K. Thibeault, 5 Heritage Cir., Brookline, N.H. 03033

Filed Apr. 12, 1995, Ser. No. 420,872

Int. Cl.[6] A61B *17/50*

U.S. Cl. 606—131 **11 Claims**



1. A tool for removing ticks and similar parasites, comprising a handle,

two spoon-shaped sections,

means by which said sections are hingedly attached on an axis parallel to said handle so as to be rotatable between an open

a rotational atherectomy apparatus having a flexible, elongated drive shaft with a proximal segment, an intermediate segment,

said exchangeable skin-contact part having a contact surface for pressing against the skin when using the blood lancet device and an outlet opening for the lancet,

means by which said sections are hingedly attached on an axis parallel to said handle so as to be rotatable between an open position and a closely-fitting overlapping closed position, and

a mechanical stop determining said closed position,

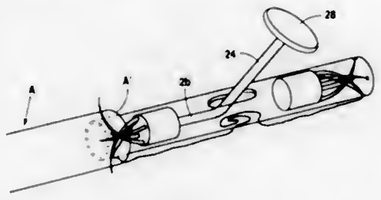
the first of said sections having an open slit in one edge, said slit being first closed and then reduced in size by the second of said sections as said sections are rotated from said open position to said overlapping closed position.

5,554,162

METHOD AND DEVICE FOR SURGICALLY JOINING LUMINAL STRUCTURES

Gregory S. DeLange, 7934 Pleasant Creek, San Antonio, Tex. 78240

Filed Dec. 2, 1994, Ser. No. 349,494
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—153 **17 Claims**



1. A system for surgically joining at least two luminal structures, the system comprising:

a bridge having walls defining an interior space, a first end and a second end, and a body, said body being between said first end and said second end, said bridge capable of being inserted, at least partially, into the luminal structures;

a first needle having a pointed first end and a second end, said needle dimensioned to be fitted into the interior of said bridge;

suture material for engaging the second end of said first needle;

channel for guiding said first needle through said bridge into the luminal structures to be joined;

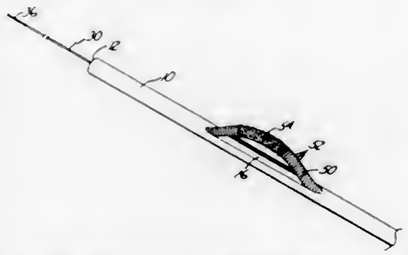
wherein one end of said bridge is at least partially inserted into an end of one of the luminal structures to be joined for receipt of said first needle through said guiding means and through the walls of one of the luminal structures.

5,554,163

ATHERECTOMY DEVICE

Leonid Shturman, Minnetonka, Minn., assignor to Shturman Cardiology Systems, Inc., Minneapolis, Minn.

Filed Apr. 27, 1995, Ser. No. 429,626
Int. Cl.[6] A61B *17/32*
U.S. Cl. 606—159 **77 Claims**



1. An atherectomy device for removing tissue from a bodily passageway or cavity, comprising:

a rotational atherectomy apparatus having a flexible, elongated drive shaft with a proximal segment, an intermediate segment, and a distal segment, a portion of the intermediate segment being coated with an abrasive material to define an abrasive segment of the drive shaft, the drive shaft further including a central lumen for receipt of a guide wire therein, around which the drive shaft may be rotated;

a guide wire having proximal, intermediate and distal portions, the proximal portion being generally straight, the intermediate portion having a predetermined curved positioning portion such that when the abrasive segment of the drive shaft is located along the curved positioning portion, such curved portion urges the abrasive segment laterally; and

a catheter having side walls defining a lumen sized to receive the drive shaft therein, the catheter having proximal, intermediate and distal sections, the intermediate section having an elongated aperture in the side wall, the aperture having a width permitting the abrasive segment of the drive shaft to extend therethrough so that when the abrasive segment of the drive shaft and the curved positioning portion of the guide wire are both aligned with the aperture in the side wall of the catheter, such curved positioning portion urges the abrasive segment laterally out through the catheter aperture to engage tissue to be removed from a bodily passageway or cavity.

5,554,164

CURVED KNIFE FOR LINEAR STAPLERS

Donald F. Wilson, Shelton; Randolph F. Lehn, Stratford; Frank Dworak, Rocky Hill; Roy D. Gravener, Fairfield; Joseph E. Kus, Norwalk, and Ralph A. Stearns, Bozrah, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 133,490, Oct. 7, 1993, abandoned. This application Mar. 30, 1995, Ser. No. 415,026
Int. Cl.[6] A61B *17/62;17/08;* **B31B** *1/00*
U.S. Cl. 606—167 **18 Claims**

1. In a surgical fastening instrument having a plurality of fasteners and a knife for severing tissue, the improvement comprising:

a nonlinear cutting edge formed on a tissue engaging portion of said knife, the cutting edge having a first convex curved portion, a second convex curved portion, and an intermediate concave curved portion disposed between said first and second portions, wherein the cutting edge forms a substantially sinusoidal shape having a plurality of radii of curvature.

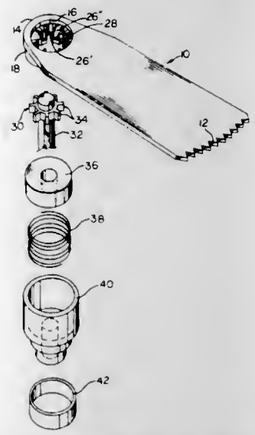
5,554,165

SURGICAL BLADE AND HUB

Scott Raitt, Thousand Oaks, Calif., and Donald E. Culvey-house, Union, Mich., assignors to Hall Surgical, Div. of Zimmer, Inc., Largo, Fla.

Filed Feb. 9, 1995, Ser. No. 386,044
Int. Cl.[6] A61B *17/14*
U.S. Cl. 606—176 **9 Claims**

1. A locking mechanism for connecting a saw blade to a powered instrument, said mechanism comprising a hub carried by the powered instrument, said saw blade comprising a base end defining an aperture for accommodating a portion of said hub said hub and said blade having a plurality of interacting fins and slots, respectively, for locking the blade to the hub, said fins extending radially from the hub, the blade comprising a washer adjacent to the base end having an opening extending therethrough, the washer comprising an interior surface adjacent the blade and an exterior surface spaced from the blade, the plurality of complete slots extending radially from the opening into the washer, the complete slots extending from the interior surface to the exterior surface, a like plurality of truncated slots extending radially from the opening into the washer with a truncated slot being positioned between adjacent complete slots, the truncated slot extending from the interior surface toward the exterior surface and terminating spaced from the exterior surface thereby forming a shoulder.



said exchangeable skin-contact part having a contact surface for pressing against the skin when using the blood lancet device and an outlet opening for the lancet,

wherein said disposable item is configured such that the lancet can be inserted only together with the skin-contact part, and

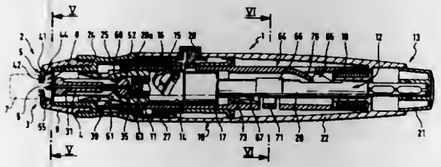
wherein the skin-contact part and lancet body are connected to one another and at the point of connection between the skin-contact part and the lancet body, a first predetermined breaking section is provided by means of which the skin-contact part and the lance body are separable from one another following insertion of the disposable item.

5,554,166

BLOOD LANCET DEVICE FOR WITHDRAWING BLOOD FOR DIAGNOSTIC PURPOSES

Hans Lange, Lampertheim, and Herbert Argauer, Pirk, both of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed Jun. 16, 1994, Ser. No. 260,811
Claims priority, application Germany, Jun. 21, 1993, 43 20 463.5
Int. Cl.[6] A61B *17/32*
U.S. Cl. 606—182 **26 Claims**



1. Blood lancet device for withdrawing blood for diagnostic purposes, comprising:

a housing,

a lancet holder, movable within the housing, for holding a lancet, said lancet being a component of a disposable item which comprises the lancet with a lancet body made of a plastic material, an exchangeable skin contact part and a lancet needle fixed in the lancet body, and which disposable item is intended for once only use and is inserted at an anterior end of the housing in a single operation,

a lancet drive to drive the puncturing and retraction movement of the lancet holder with a lancet held therein,

wherein the housing has an anterior end in the puncturing direction, receiving the exchangeable skin-contact part and the lancet.

5,554,167

TISSUE PIERCING MEMBERS

Wayne P. Young, Brewster, N.Y.; Dominick L. Mastri, Bridgeport, Conn.; Henry Bolanos, East Norwalk, Conn., and George M. Chelednik, Bethel, Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation-in-part of Ser. No. 134,354, Oct. 8, 1993, Pat. No. 5,554,137. This application Jul. 26, 1994, Ser. No. 280,686
Int. Cl.[6] A61B *17/32;* **A61M** *5/18*
U.S. Cl. 606—184 **20 Claims**

1. A piercing tip for an obturator comprising:

(a) a body member having a conical distal portion defining a longitudinal axis including a cylindrical portion which extends from a circular base of the body member having first and second elongated cutouts substantially parallel to one another and transverse to the longitudinal axis of the body member; and

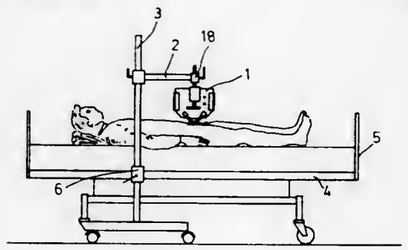
(b) a cutting blade associated with the body member including a distal edge portion extending beyond the periphery of the conical distal portion of the body member and a proximal mounting flange configured to mount the piercing tip to the obturator.

5,554,168

DEVICE FOR CLOSING THE OPERATION WOUND AFTER PUNCTURE OF ARTERIA FEMORALIS OR VENA FEMORALIS

Anne L. Petersen, Greve, Denmark, assignor to LL Medico APS, Denmark

PCT No. PCT/DK92/00171, § 371 Date Jan. 13, 1994, § 102(e) Date Jan. 13, 1994, PCT Pub. No. WO92/21297, PCT Pub. Date Dec. 10, 1992
PCT Filed May 29, 1992, Ser. No. 157,040
Claims priority, application Denmark, Jun. 3, 1991, 1055/91
Int. Cl.[6] A61B *17/12*
U.S. Cl. 606—201 **7 Claims**



1. A device adapted for closing an operation wound after insertion of a catheter in an artery, the device comprising:

an upright member with a horizontal arm,

a frame which includes first and second actuating handles, each actuating handle pivotally mounted with respect to a pivot pin and movable between a first and second position;

surgical fasteners from said cartridge assembly to drive said surgical fasteners into said body tissue.

attachment means disposed on said body for attaching said first object to said apparatus; and

retaining means for resisting forces tending to withdraw said

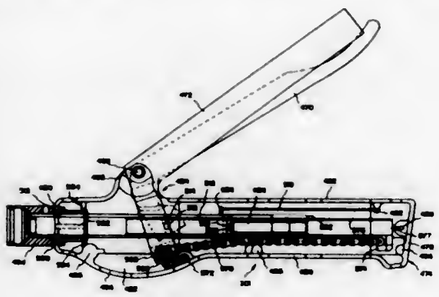
1. A device adapted for closing an operation wound after insertion of a catheter in an artery, the device comprising:
an upright member with a horizontal arm,
a connector rod connected to the horizontal arm,
a head adjustably and swingably mounted on a vertical axis on the connector rod, the head being vertically movable from an initial position to a working position,
a first and a second pressure rod, each carried by the head distal from the horizontal arm, the first and the second pressure rods each having a lower end,
two pressure shoes, a respective shoe mounted with a limited amount of swing on the respective lower ends of the first and the second pressure rods,
each pressure shoe having an underside, each underside having a skidproof coating thereon,
wherein when the head is moved to the working position, each pressure shoe contacts a respective compress, the pressure shoes being able to exert a uniform yielding and constant vertical pressure on the wound and further being able to exert a horizontal pressure against the wound from one pressure shoe to the other,
and wherein the head is so oriented that the horizontal pressure is in a longitudinal direction with respect to the artery.

5,554,169

METHOD FOR PLACING STAPLES IN LAPAROSCOPIC OR ENDOSCOPIC PROCEDURES

David T. Green, Westport; Henry Bolanos, East Norwalk; Daniel E. Alesi, New Fairfield; Keith Ratcliff, Sandy Hook, and Charles R. Sherts, Southport, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 145,727, Oct. 29, 1993, Pat. No. 5,425,745, which is a continuation of Ser. No. 943,383, Sep. 10, 1992, abandoned, which is a continuation of Ser. No. 709,641, Jun. 3, 1991, abandoned, which is a division of Ser. No. 358,646, May 26, 1989, Pat. No. 5,040,715. This application Jun. 6, 1995, Ser. No. 469,938
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—219 **2 Claims**



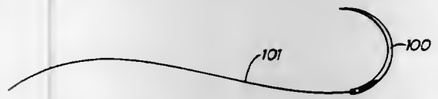
1. A method of endoscopically driving fasteners into body tissue comprising the steps of:
providing an endoscopic opening into a body for accessing tissue to be fastened;
providing a surgical apparatus for driving surgical fasteners into body tissue including:
a frame which includes first and second actuating handles, each actuating handle pivotally mounted with respect to a pivot pin and movable between a first and second position;
an endoscopic portion defining a longitudinal axis and extending distally from said frame, said endoscopic portion including:
i) an elongated support for receiving a cartridge assembly, the cartridge assembly having a distal end and a proximal end and including a plurality of surgical fasteners slidably mounted therein, and having a tissue engaging surface;
ii) a jaw member having a distal end and a proximal end, said proximal end of said jaw member being pivotally retained in said elongated support such that the jaw member is movable between an open position and a closed position in close cooperative alignment with the tissue engaging surface of the cartridge assembly and said distal end of said jaw member is in juxtaposed alignment with said distal end of said cartridge assembly;
iii) a closure member for moving the jaw member between the open position and the closed position comprising a collar operatively associated with at least a portion of said support and said jaw member, said collar having a camming edge and being movable between a first position in which said camming edge is located proximally to the proximal end of said jaw member, and a second position in which said camming edge is located distally to the proximal end of said jaw member, said collar cooperating with said jaw member such that when said collar is moved from said first position to said second position, said jaw member is urged to said closed position;
iv) pusher elements for ejecting the surgical fasteners from the cartridge assembly through tissue; and
v) an elongated member operatively associated with said second actuating member which translates with respect to said endoscopic portion independent of said closure member for actuating said pusher elements; and
vi) linkage operatively associated with said first actuating handle for moving said collar between said first position and said second position;
pivoting said first actuating handle from said first to said second position, thereby translating the closure member to the second position to approximate said jaw member towards said cartridge assembly prior to inserting said jaw member and cartridge assembly into said endoscopic opening;
inserting said approximated jaw member and cartridge assembly of said surgical apparatus into said endoscopic opening;
pivoting said first actuating handle from said second position to said first position, thereby translating the closure member from the second position to the first position to open said approximated jaw member and said cartridge assembly to define a tissue receiving space therebetween;
positioning body tissue into which said fasteners are to be driven such that said body tissue enters said tissue receiving space between said jaw member and said cartridge assembly in a direction extending from a distal to a proximal end of said jaw member and said cartridge assembly;
pivoting said first actuating handle from said first position to said second position, thereby translating the closure member back to the second position to cause said jaw member to move said jaw member from said open position to said closed position; and
pivoting said second actuating handle from said first position to said second position, thereby translating said elongated member independent of the closure member and actuating said pusher elements for ejecting said surgical fasteners from said cartridge assembly to drive said surgical fasteners into said body tissue.

5,554,170

ABSORBABLE BLOCK COPOLYMERS AND SURGICAL ARTICLES FABRICATED THEREFROM

Mark S. Roby, Killingworth; Steven L. Bennett, New Haven, and Cheng-Kung Liu, Norwalk, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Division of Ser. No. 204,721, Mar. 2, 1994, Pat. No. 5,403,347, which is a continuation-in-part of Ser. No. 68,811, May 27, 1993, abandoned. This application Jan. 26, 1995, Ser. No. 378,754
Int. Cl.[6] A61B *17/04*; **C08G** *64/18;64/02;63/08*
U.S. Cl. 606—230 **5 Claims**



1. A suture fabricated from a copolymer, said copolymer comprising a proportion of glycolic acid ester units as one of said blocks, and another of said blocks comprising a random copolymer of 1,4 dioxane-2-one and 1,3 dioxane-2-one,exhibiting a maximum energy for a given size suture as follows:

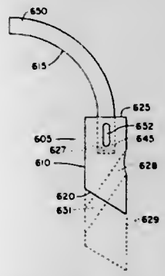
Suture Size	Maximum 0-5% Strain Energy, kg-mm
3/0	about 2.62

5,554,171

SUTURE ANCHOR

Roland F. Gatturna, Walpole; James E. Nicholson, Lincoln, and James O'Leary, Medford, all of Mass., assignors to Mitek Surgical Products, Inc., Westwood, Mass.

Continuation of Ser. No. 981,011, Nov. 24, 1992, Pat. No. 5,358,511, which is a continuation of Ser. No. 853,261, Mar. 18, 1992, Pat. No. 5,192,303, which is a continuation of Ser. No. 711,145, Jun. 6, 1991, abandoned, which is a continuation of Ser. No. 439,452, Nov. 20, 1989, Pat. No. 5,046,513, which is a continuation of Ser. No. 51,367, May 18, 1987, Pat. No. 4,898,156. This application Oct. 24, 1994, Ser. No. 327,584
Int. Cl.[6] A61B *17/04*
U.S. Cl. 606—232 **4 Claims**



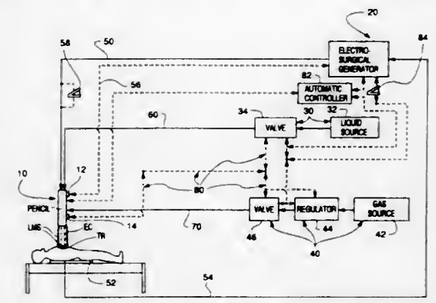
1. Apparatus for attaching a first object to a second object, said apparatus comprising:
a body having a longitudinal axis and a maximum cross-section perpendicular to said longitudinal axis, said body being adapted for longitudinal insertion into said second object;
attachment means disposed on said body for attaching said first object to said apparatus; and
retaining means for resisting forces tending to withdraw said apparatus from said second object after its insertion therein, said retaining means comprising at least one flexible element having first and second portions, said first portion being supported by said body and said second portion normally extending outboard from said body so that said second portion is located outwardly of a longitudinal axial projection of said maximum cross-section of said body, said flexible element being substantially elastically deformable such that said second portion of said flexible element is capable of being located substantially within a longitudinal axial projection of said maximum cross-section of said body.

5,554,172

DIRECTED ENERGY SURGICAL METHOD AND ASSEMBLY

Glenn A. Horner; Scott A. Miller; Warren P. Heim; Larry K. Blankenship, and James L. Brassell, all of Boulder, Colo., assignors to The Larren Corporation, Boulder, Colo.

Filed May 9, 1995, Ser. No. 437,321
Int. Cl.[6] A61N *1/08*
U.S. Cl. 607—88 **51 Claims**



1. A surgical method for achieving a predetermined surgical effect on tissue while reducing the generation of smoke by quenching tissue pyrolysis comprising:
applying a directed energy stream to a predetermined tissue region to achieve a predetermined surgical effect; and
contacting said predetermined tissue region with a liquid mist stream comprising liquid droplets having a diameter of between about 0.1 to 1000 micrometers and a mass flow rate of about 1511 milligrams per square centimeter or less per a 1 second time period to quench tissue pyrolysis.

5,554,173

DEFIBRILLATOR CHARGE TESTER

Gerald M. Lemole, 404 Tomlinson Rd., Huntingdon Valley, Pa. 19006

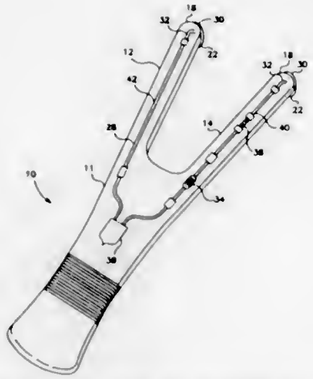
Filed Oct. 13, 1994, Ser. No. 323,470
Int. Cl.[6] A61N *1/00;1/08*; **G01R** *1/06;31/12*
U.S. Cl. 607—1 **15 Claims**

11. A defibrillator charge tester for detecting the presence of an electrical charge on the electrode surfaces of a defibrillator, said charge tester comprising:
a generally Y-shaped nonconductive shell having a handle portion and a plurality of elongated portions extending from one end of the handle portion;
a charge testing circuit disposed in the shell, the circuit comprising
(i) a plurality of conductive terminal ends, each terminal end extending through the shell at a respective distal end of one

detecting the onset of a cardiac arrhythmia;
monitoring the device operational parameter to forecast the

5,554,176

IMPLANTABLE ELECTRODE AND SENSOR LEAD APPARATUS



of the elongated portions and terminating in a conductive contact member for contacting a respective defibrillator electrode surface,

(ii) an indicator electrically connected to the terminal ends for indicating that current is flowing through the circuit, said indicator being activated when the current flowing through the circuit exceeds a first predetermined value, and

(iii) a slow-burning fuse electrically connected to the terminal ends for breaking the continuity of the circuit when current passing through the fuse exceeds the first predetermined value and for permitting the activation of the indicator for a short period of time before the circuit continuity is broken.

5,554,174

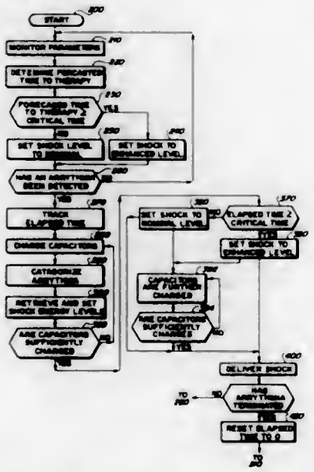
SYSTEM AND METHOD FOR AUTOMATICALLY ADJUSTING CARDIOVERTER AND DEFIBRILLATOR SHOCK ENERGY AS A FUNCTION OF TIME-TO-THERAPY

James D. Causey, III, Simi Valley, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.

Filed Oct. 18, 1995, Ser. No. 544,524

Int. Cl.[6] A61N *1/39*

U.S. Cl. 607—5 **15 Claims**



7. A method of administering therapeutic shocks from an implantable cardiac stimulating device to a patient's heart to interrupt cardiac arrhythmias, the method comprising the steps of:

detecting the onset of a cardiac arrhythmia;

monitoring the device operational parameter to forecast the amount of time required from the onset of a cardiac arrhythmia to generate and deliver the therapeutic shock;

selecting the nominal energy level for the therapeutic shock when the forecasted time is less than a prescribed critical time;

selecting the increased energy level for the therapeutic shock when the forecasted time equals or exceeds the prescribed critical time; and

generating a therapeutic shock at one of (a) a nominal energy level, and (b) an increased energy level, and delivering the therapeutic shock to the patient's heart, wherein an amount of time from the onset o a cardiac arrhythmia is required to generate and deliver the therapeutic shock, the amount of time varying as a function of a device operational parameter.

5,554,175

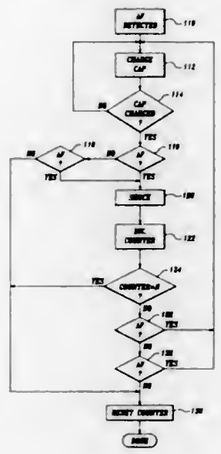
THERAPY TERMINATION IN AN ATRIAL DEFIBRILLATOR AND METHOD

Clifton A. Alferness, Redmond, Wash., assignor to InControl, Inc., Redmond, Wash.

Filed Nov. 29, 1994, Ser. No. 346,500

Int. Cl.[6] A61N *1/39*

U.S. Cl. 607—5 **12 Claims**



2. An atrial defibrillator comprising:

an atrial fibrillation detector for determining if the atria of a heart are in need of cardioversion;

therapy means for performing a therapy sequence to apply cardioverting electrical energy to the atria when the atria are in need of cardioversion; and,

means for terminating the therapy sequence when the atrial fibrillation detector fails at least twice in succession to determine that the atria are in need of cardioversion.

5,554,176

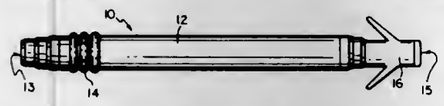
IMPLANTABLE ELECTRODE AND SENSOR LEAD APPARATUS

David S. Maddison, Wollstonecraft; Michael Skalsky, Waverley; Gerhard Gotthardt, Castle Hill, and Neil Anderson, Artarmon, all of Australia, assignors to Telectronics Pacing Systems, Inc., Englewood, Colo.

Continuation of Ser. No. 3,113, Jan. 12, 1993, abandoned, which is a division of Ser. No. 772,975, Oct. 8, 1991, Pat. No. 5,330,520, which is a continuation-in-part of Ser. No. 644,426, Jan. 22, 1991, abandoned, and Ser. No. 617,949, Nov. 27, 1990, abandoned, which is a continuation of Ser. No. 453,125, Dec. 5, 1989, abandoned, which is a continuation of Ser. No. 223,738, Jul. 25, 1988, abandoned, which is a continuation of Ser. No. 863,357, May 15, 1986, abandoned, said Ser. No. 644,426is a continuation of Ser. No. 188,487, Apr. 29, 1988, abandoned. This application Jul. 19, 1994, Ser. No. 279,814

Int. Cl.[6] A61N *1/04*

U.S. Cl. 607—9 **14 Claims**



1. A body implantable electrode lead apparatus for delivering electrical pulses from a cardiac pacemaker device to body tissues, said electrode lead apparatus comprising:

a first non-coiled electrical conductor having a proximal end and a distal end, said first non-coiled electrical conductor being comprised of a non-intrinsically conductive polymeric material coated with a conductive material;

first means for insulating said first non-coiled electrical conductor;

a second non-coiled electrical conductor having a proximal end and a distal end, said second non-coiled electrical conductor being disposed coaxially about said first non-coiled electrical conductor and said first insulating means, said second non-coiled electrical conductor comprised of a non-intrinsically conductive polymeric material coated with a conductive material;

second means for insulating said second non-coiled electrical conductor;

means for coupling the proximal ends of said first and said second non-coiled electrical conductors to the cardiac pacemaker device; and

electrode means for delivering the electrical pulses from the distal ends of said first and second non-coiled conductors to the body tissues, said electrode means including exposed lengths of said first and said second non-coiled electrical conductors from which said first and said second insulating means have been selectively removed to provide a stepped transition between said first and second non-coiled electrical conductors.

5,554,177

METHOD AND APPARATUS TO OPTIMIZE PACING BASED ON INTENSITY OF ACOUSTIC SIGNAL

Robert S. Kieval, Golden Valley, and Orhan Soykan, New Brighton, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

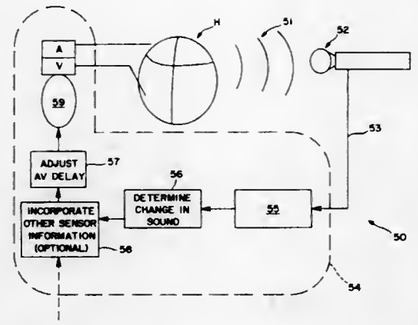
Filed Mar. 27, 1995, Ser. No. 411,241

Int. Cl.[6] A61N *1/39*

U.S. Cl. 607—17 **17 Claims**

1. A method for adjusting a cardiac pacemaker by automatically responding to abnormal sounds caused by a suboptimal heart condition comprising;

isolating a particular heart sound believed to be indicative of the suboptimal heart condition at least in part by relating it temporally to the time of first (S_1) and second (S_2) heart sounds from the signal produced by an acoustic sensor adaptively situated in association with the body of a patient to receive such sounds and from them for producing high signal levels of such sounds,



determining a measure of at least one characteristic of the particular heart sound,

adjusting the time period before the next delivered pacing pulse until the lowest desirable measure of said at least one characteristic of said particular heart sound is detected.

5,554,178

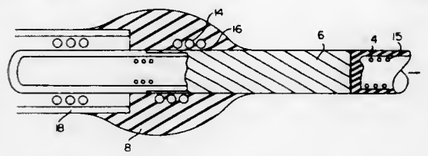
METALIZED IMPLANTABLE CARDIAC ELECTRODE

Roger W. Dahl, Andover, Minn., and David Lipson, Indianapolis, Ind., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Continuation of Ser. No. 24,176, Feb. 22, 1993, abandoned. This application Apr. 26, 1995, Ser. No. 427,942

Int. Cl.[6] A61N *1/05*

U.S. Cl. 607—122 **5 Claims**



1. An electrode adapted for implantation on or about a heart and for connection to a system for monitoring or stimulating cardiac activity, the electrode comprising:

a flexible polymeric substrate formed as a silicone rubber tube having an exposed surface layer;

a region of the exposed surface layer impregnated with a metal to form an electrically conductive surface;

an electrical conductor for electrical connection to the system; and

a conductive adhesive joining the conducting surface to the electrical conductor.

5,554,179

IMPLANTABLE DIFIBRILLATOR ELECTRODE

Brigitte Stroetmann, Uttenreuth, and Gerhard Starbeck, Nuremberg, both of Germany, assignors to Pacesetter AB, Sweden

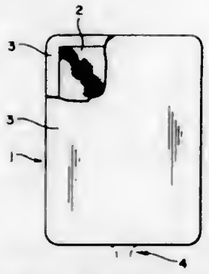
Filed Jun. 30, 1994, Ser. No. 268,893

Claims priority, application Germany, Jul. 2, 1993, 43 22 130.0

Int. Cl.[6] A61N *1/05*

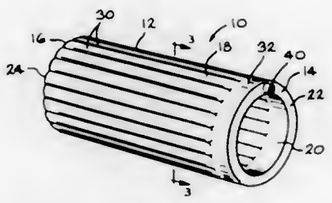
U.S. Cl. 607—129 **17 Claims**

1. An implantable defibrillator electrode comprising a large surfaced electrode in the form of a netting, a spiral, or a fabric of



electronically conductive material, the electrode being embedded completely in a biocompatible, hydrophilic, electrolytically conductive polymer.

5,554,180
INTRALUMINAL STENTING GRAFT
Rodney E. Turk, West Bloomfield, Mich., assignor to Aeroquip Corporation, Maumee, Ohio
Filed Jul. 7, 1995, Ser. No. 499,740
Int. Cl.[6] A61F 2/04
U.S. Cl. 623—1 **13 Claims**



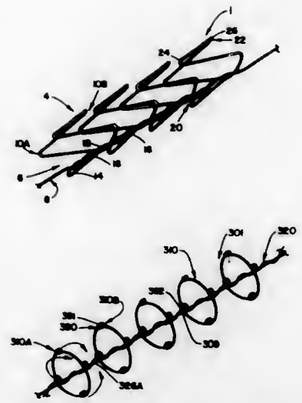
1. An intraluminal stenting graft for implantation in a blood vessel, comprising:

a collapsible tube member having a first end and a second end, an outer layer and an inner layer extending between said ends, said outer layer being joined along a plurality of longitudinally extending lines to said inner layer to form a plurality of cylinders between said inner layer and said outer layer extending longitudinally between said first end and said second end, said cylinders, when expanded, providing structural support to said tube member, said tube member including means for introducing an absorbate therein; and

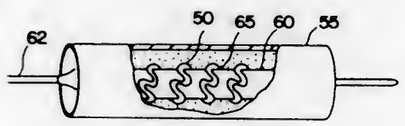
an absorbent positioned in at least one of said cylinders, whereby when said absorbate is introduced to said plurality of cylinders and said absorbent, said absorbent absorbs said absorbate and increases in volume to support said tube member in said blood vessel.

5,554,181
STENT
Gladwin S. Das, St. Paul, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.
Filed May 4, 1994, Ser. No. 237,626
Int. Cl.[6] A61F 2/06
U.S. Cl. 623—1 **10 Claims**

1. A stent comprising, a self-expandable cylindrical body made from a single piece of material, the stent having a longitudinal dimension, said cylindrical body including a plurality of closed windings and strips intermediate the closed windings such that said stent is prevented from expanding generally in the direction of said longitudinal dimension, said self-expandable cylindrical body exhibiting at least a spring-like behavioral component in a radial direction upon self-expanding from a first radially-constrained unexpanded geometry, to a second radially-unconstrained expanded geometry.



5,554,182
METHOD FOR PREVENTING RESTENOSIS
Thomas Q. Dinh, Minnetonka; Michael Dror, Edina, and Robert S. Schwartz, Rochester, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.
Division of Ser. No. 306,781, Sep. 15, 1994, and a continuation-in-part of Ser. No. 79,222, Jun. 17, 1993, which is a continuation of Ser. No. 854,118, Mar. 19, 1992, abandoned. This application Apr. 27, 1995, Ser. No. 429,444
Int. Cl.[6] A61F 2/06;2/04; A61M 29/02
U.S. Cl. 623—1 **6 Claims**



1. A method for preventing restenosis in a body lumen treated to open a luminal restriction, the method comprising the steps of:

(a) providing a stent body;

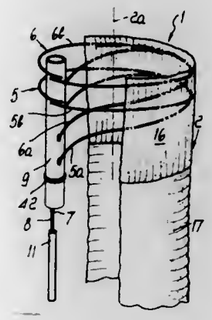
(b) applying to the stent body a composition of fibrinogen and thrombin to effect polymerization of the fibrinogen to fibrin;

(c) applying heparin to the fibrinogen and thrombin as the fibrinogen is being polymerized to fibrin;

(d) delivering the stent having fibrin and heparin thereon percutaneously and transluminally into a body lumen and through the body lumen to the portion of the body lumen having the luminal restriction; and

(b) expanding the stent and fibrin thereon into contact with the body lumen.

5,554,183
VASCULAR PROSTHESIS FOR THE SUBSTITUTION OR INTERNAL LINING OF BLOOD VESSELS OF MEDIUM OR LARGE DIAMETER AND DEVICE FOR ITS APPLICATION
Stefano Nazari, Via Bignanico 12/C, 22100 Como, Italy
Filed Jan. 13, 1995, Ser. No. 372,746
Claims priority, application Italy, Jan. 19, 1994, MI94A0066
Int. Cl.[6] A61F 2/06
U.S. Cl. 623—1 **23 Claims**



1. Vascular prosthesis for substitution or internal lining of a segment of a blood vessel of medium or large diameter, comprising

a tubular body made of biocompatible material, said tubular body defining a lateral wall, a first and a second longitudinal end thereof and a longitudinal axis thereof;

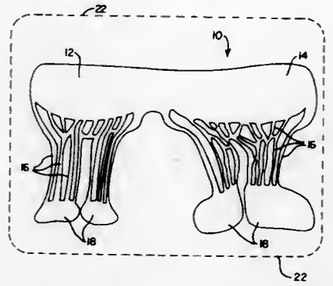
at least one radially expandable body disposed substantially coaxial to said tubular body and perimetrically connected to said tubular body, said expandable body comprising

a support extending longitudinally along an axis between a first and a second longitudinal end thereof, said axis being substantially parallel to the axis of the tubular body, said support having a plurality of lateral holes, said plurality of lateral holes including at least a first lateral hole and a second lateral hole proximal to said first lateral hole, and at least a third lateral hole and a forth lateral hole proximal to said third hole, said third and fourth holes being longitudinally spaced with respect to said first and second holes; and

at least one elastically flexible wire slidingly mounted on said support for radial expansion and contraction of said expandable body, said wire entering the support through said first longitudinal end thereof, said wire then coming out from the support through said first lateral hole and reentering the support through said third lateral hole so as to define a first tract of said wire inclined with respect to a plane perpendicular to said axis of said tubular body and a second tract of said wire in a plane perpendicular to said axis of said tubular body, said wire further coming out again from the support through said forth lateral hole and reentering the support through said second lateral hole so as to define a third tract of said wire substantially in the same plan as the second tract, and a forth tract of said wire inclined with respect to a plan perpendicular to the axis of said tubular body, said second tract and said third tract forming substantially an annular loop, said wire coming out then from the support through said first longitudinal end thereof, thereby expansion and contraction of said tubular body is obtained when said wire slides with respect to said support, said wire being frictionally engaged to said support in said first, second, third and fourth lateral hole,

said expandable body being connected to said tubular body by repeated passages of said wire along said first, second, third and forth tract through the wall of said tubular body, thereby a radial expansion of said tubular body is obtained when said expandable body is expanded, said expandable body being disposed at said first end of said tubular body.

5,554,184
HEART VALVE
Venkat R. Machiraju, 534 Squaw Run E., Pittsburgh, Pa. 15238
Filed Jul. 27, 1994, Ser. No. 281,305
Int. Cl.[6] A61F 2/24
U.S. Cl. 623—2 **16 Claims**



1. A method for repairing a human heart valve, comprising the steps of cutting a single sheet of a natural or artificial sheet material into the shape of an excised human heart valve including at least one trabeculated tier of chordae tendineae, said tier terminating in a papillary muscle graft tab, and surgically implanting the cut sheet material into the heart of a patient in whom heart valve repair is indicated.

5,554,185
INFLATABLE PROSTHETIC CARDIOVASCULAR VALVE FOR PERCUTANEOUS TRANSLUMINAL IMPLANTATION OF SAME
Peter C. Block, 3510 SW. Sherwood Place, Portland, Oreg. 97201; W. Earl Anderson, 230 E. 38th Ave., Eugene, Oreg. 97405-4714, and David G. Atteridge, 18235 SW. Barcelona Way, Beaverton, Oreg. 97007
Filed Jul. 18, 1994, Ser. No. 276,663
Int. Cl.[6] A61F 2/24
U.S. Cl. 623—2 **17 Claims**

1. An inflatable cardiovascular valve initially deployable in a collapsed deflated configuration and subsequently inflatable to a non-collapsed operative configuration, said valve comprising:

a) an inflatable valve support body which, when fully inflated, comprises a generally annular ring defining a central passageway through which blood may flow;

b) at least one leaflet occluder attached to said inflatable valve support body and configured to move back and forth between:

i. an open position wherein blood may flow in a first direction through said central passageway; and

ii. a closed position whereby blood is prevented from backflowinq through said central passageway in a second direction, said second direction being opposite said first direction;

c) an inflation port formed on said inflatable valve support body to facilitate inflation thereof; and

d) at least one pin protruding outwardly from said valve and configured to engage said adjacent anatomical structure when said inflatable valve body is inflated.

5,554,187
MEDICATION DISPENSING INTRA-OCULAR LENS SYSTEM

5,554,189
URETERAL PROSTHESIS
Fernando I. De La Torre, Rocafort 252 3º 2ª, Barcelona, Spain

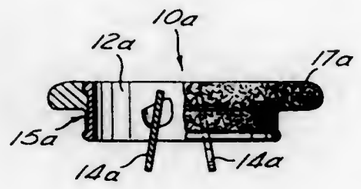
portion of a bone, the bone having outer and inner contours, the prosthesis component produced thereby providing a surface for transmission of forces between the bone and the prosthesis com-

d) at least one pin protruding outwardly from said valve and configured to engage said adjacent anatomical structure when said inflatable valve body is inflated.

5,554,186
BILEAFLET MECHANICAL HEART VALVE HAVING CROPPED SLOT PIVOT CONFIGURATION AND METHOD FOR PREVENTING BLOOD STAGNATION THEREIN

George X. Guo, Dove Canyon, and Robert Stoble, Mission Viejo, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Filed Dec. 22, 1994, Ser. No. 362,633
Int. Cl.[6] A61F 2/24
U.S. Cl. 623—2 **26 Claims**

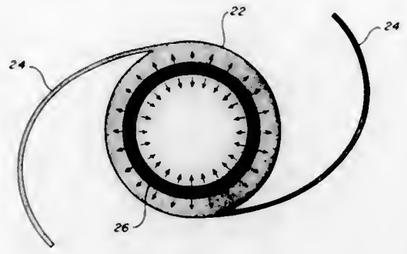


1. A bileaflet mechanical cardiovascular valve comprising:
a) an annular valve body having an inner surface and a central blood flow passageway extending therethrough, said valve body having an blood inflow side and a blood outflow side;
b) first and second pairs of pivot slots formed on opposite sides of the inner surface of the annular valve body, a central axis defined between each pair of pivot slots, each pivot slot comprising:
i) an indentation formed in said valve body and having a curved configuration;
ii) a first flat end wall at one end of said indentation adjacent said blood inflow side, said first flat end wall having first and second ends;
iii) a second flat end wall at an end of said indentation opposite said first flat end wall and adjacent said blood outflow side, said second flat end wall having first and second ends, said second flat end wall being substantially parallel to said first flat end wall, and said first and second flat end walls disposed at an angle transecting the central axis of said valve body;
iv) an inner curved edge adjacent the central axis extending from the first end of the first flat end wall to the first end of the second flat end wall, said inner cursed edge comprising a curved upper portion, a substantially straight central portion, and a curved lower portion; and,
v) an outer curved lateral edge extending from the second end of the first flat end wall to the second end of the second flat end wall, said outer curved lateral edge comprising a substantially straight upper portion and a curved lower portion;
c) right and left occluder leaflets having first and second ends, and ear members extending from the first and second ends thereof, said ear members being disposed within said pivot slots to pivotally mount said occluder leaflets within said annular valve body;
d) said occluder leaflets being thereby pivotally movable between:
i) an open position wherein said occluder leaflets are positioned to allow blood to flow in a first direction through said blood flow passageway; and
ii) a closed position wherein said occluder leaflets prevent blood from backflowing through said blood flow passageway in a second direction, opposite said first direction.

5,554,187
MEDICATION DISPENSING INTRA-OCULAR LENS SYSTEM

Joseph Rizzo, III, 220 Commonwealth Ave., Boston, Mass. 02116

Filed Aug. 18, 1995, Ser. No. 517,157
Int. Cl.[6] A61F 2/16
U.S. Cl. 623—6 **17 Claims**

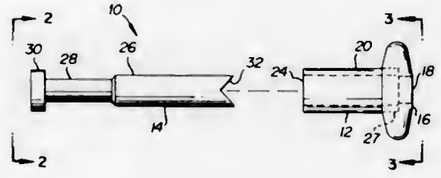


1. Medication dispensing intra-ocular lens system for implantation into an eye comprising:
an implantable intra-ocular lens;
a carrier medium disposed on a surface of the lens; and
a biologically active material or materials embedded in the carrier medium for controlled release into the eye.

5,554,188
UNIVERSAL MIDDLE EAR PROSTHESIS

Anthony Prescott, Arlington, Tenn., assignor to XOMED, Inc., Jacksonville, Fla.

Continuation of Ser. No. 55,181, Apr. 29, 1993, abandoned.
This application Apr. 11, 1995, Ser. No. 419,833
Int. Cl.[6] A61F 2/18
U.S. Cl. 623—10 **13 Claims**

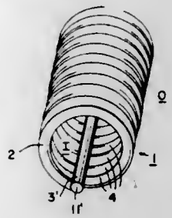


1. A modular middle ear ossicles prosthesis for providing mechanical linkage between a tympanic membrane and an inner ear portion, such as a stapes or footprint of a stapes, the prosthesis comprising:
a first portion including an enlarged head having a substantially circular outer circumference and a rounded outer surface for engaging the tympanic membrane and a cannulated shaft extending from said head, said shaft having a predetermined length and defining a bore with an inside diameter sized to slide over a natural head of the stapes such that said first portion is operable alone as a partial ossicular prosthesis; and
a second portion including an elongated shaft having a distal section sized to be inserted within said bore of the cannulated shaft of said first portion and a second section with a diameter smaller than a diameter of said distal section, resulting in a combination that is operable to provide a total ossicular prosthesis when replacement of all the ossicles is required.

5,554,189
URETERAL PROSTHESIS

Fernando I. De La Torre, Rocafort 252 3º 2ª, Barcelona, Spain

Filed Feb. 27, 1995, Ser. No. 394,848
Claims priority, application Spain, Feb. 25, 1994, 9400384
Int. Cl.[6] A61F 2/02
U.S. Cl. 623—11 **5 Claims**

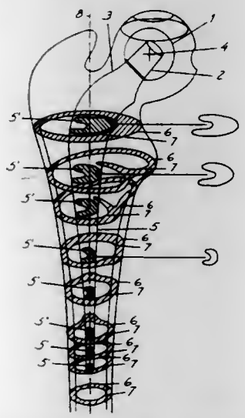


1. Lasting withdrawable ureteral prosthesis comprising a hollow tubular frame having an outside region and an inside region, said hollow tubular frame consisting of a coiled biotolerable metallic wire formed into a plurality of contiguous contacting spires, and an internal metallic wire extending through the inside region of the hollow tubular frame from one end of the frame to another end thereof, said internal metallic wire being attached to at least three, but not more than four, of said spires at each of said ends to prevent elastic elongation of the coiled biotolerable metallic wire, wherein at least a portion of said spires permit a flow of urine between said spires from said inside region to said outside region and from said outside region to said inside region.

5,554,190
PROSTHESIS COMPONENT AND A METHOD OF PRODUCING IT

Klaus Draenert, Gabriel-Max-Str. 3, D-8000 München 80, Germany

PCT No. PCT/EP93/01002, § 371 Date Oct. 21, 1994, § 102(e) Date Oct. 21, 1994, PCT Pub. No. WO93/21863, PCT Pub. Date Nov. 11, 1993
PCT Filed Apr. 26, 1993, Ser. No. 325,350
Claims priority, application Germany, Apr. 24, 1992, 42 13 599.0
Int. Cl.[6] A61F 2/28
U.S. Cl. 623—16 **18 Claims**

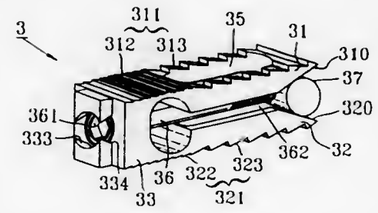


1. A method of producing a prosthesis component for anchoring with using bone cement and also for anchoring without using bone cement, in a bony bed in the epiphyseal, metaphyseal or diaphyseal portion of a bone, the bone having outer and inner contours, the prosthesis component produced thereby providing a surface for transmission of forces between the bone and the prosthesis component, the prosthesis component having a mass and a rigidity, the method comprising the following steps:
three-dimensionally reconstructing the bony bed from a series of sections of the bone;
producing a contour model of the bone including the outer and inner contours;
determining mean density of the bone in individual bone sections; and
adapting the prosthesis component to the bony bed by determining a material property of the prosthesis component to correlate with the mean density in the individual bone sections.

5,554,191
INTERSOMATIC VERTEBRAL CAGE

Michel Lahille, Vauhallan, and Phillippe Cottin, Saint Remy Les Chevreuse, both of France, assignors to Biomat, Igny, France

Filed Jan. 23, 1995, Ser. No. 376,413
Claims priority, application France, Jan. 26, 1994, 94 00860
Int. Cl.[6] A61F 2/44
U.S. Cl. 623—17 **10 Claims**



1. An intersomatic cage adapted to be inserted between a pair of vertebral bodies, comprising:
(a) two spaced branches having first and second ends, said second branch ends having facing bearing surfaces, said branches defining a longitudinal slot therebetween extending from said second ends of said branches, said slot being enlarged near said first end, thereby to increase the flexibility of said branches, said branches having outside surfaces which are substantially plane and parallel when said intersomatic cage is being inserted between the two vertebral bodies;
(b) a linking portion linking said first ends of said branches and integral with said first branch ends;
(c) a screw having a screw-threaded shank passing through said linking portion and between said branches; and
(d) a spreader member disposed between said facing bearing surfaces of said second branch ends and screwed to said screw-threaded shank of said screw, said spreader member being applied onto said facing bearing surfaces by screwing said screw, thereby spreading said second ends of said branches after having inserted said cage between said vertebral bodies.

5,554,192
INTRAMEDULLARY IMPLANT STEM AND

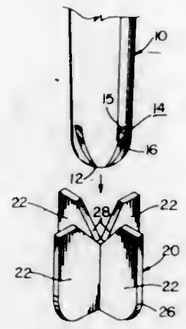
5,554,194
MODULAR SURGICAL IMPLANT

CHEMICAL

5,554,195
PROCESS FOR THE PRODUCTION OF RESIST PRINTS

Georg Robert, Inzlingen, Germany, assignor to Sandoz Ltd., Basle, Switzerland

5,554,192
INTRAMEDULLARY IMPLANT STEM AND CENTRALIZER
Roy D. Crowninshield, Warsaw, Ind., assignor to Zimmer, Inc., Warsaw, Ind.
Filed Oct. 5, 1994, Ser. No. 317,697
Int. Cl.[6] A61F *2/28*
U.S. Cl. 623—16 **10 Claims**



1. In combination, an implant prosthesis for insertion into a cavity prepared in a bone comprising a stem component having a distal end; and a centralizer for attachment to said stem component distal end,

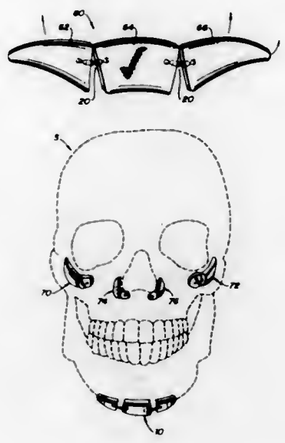
said stem component having a plurality of longitudinal channels formed around its periphery adjacent its said distal end,

said centralizer including a plurality of blade parts for engaging said stem component within said channels when said centralizer is attached to said stem component, wherein said channels each have an inner wall, which converges radially toward the apex of said stem component distal end.

5,554,193

Patent Not Issued For This Number

5,554,194
MODULAR SURGICAL IMPLANT
Deborah L. Sanders, West Chester, Pa., assignor to United States Surgical Corporation, Norwalk, Conn.
Filed Jun. 7, 1995, Ser. No. 480,086
Int. Cl.[6] A61F *2/28;* **F16B** *12/44*
U.S. Cl. 623—16 **18 Claims**



6. A modular surgical implant comprising at least a first segment and a second segment, the first segment being connected to the second segment by a connector having a first portion and a second portion, the first portion being secured into the first segment and the second portion being secured into the second segment, the first portion and the second portion dimensioned and configured to mate and form a swivel such that the first segment and second segment are movable in multiplanar orientation relative to each other.

5,554,195
PROCESS FOR THE PRODUCTION OF RESIST PRINTS
Georg Robert, Inzlingen, Germany, assignor to Sandoz Ltd., Basle, Switzerland
Filed Jun. 1, 1995, Ser. No. 457,637
Claims priority, application Germany, Jun. 3, 1994, 44 19 450.1
Int. Cl.[6] D06D *5/12*
U.S. Cl. 8—446 **2 Claims**

1. Process for the production of resist prints on two-dimensional textile pieces having an upper side and an opposed reverse side comprising the sequential steps of:

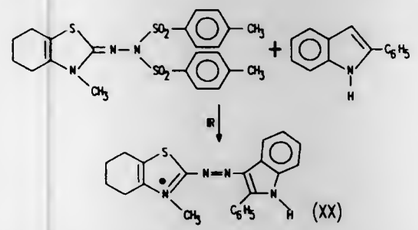
(a) impregnating those parts of the upper side of a textile piece which are to be given a resist effect with a water-repellent comprising a fluorocarbon polymerizate or copolymerizate, in admixture with an aqueous isocyanate cross-linking agent; and, optionally, a dyestuff-containing printing paste;

(b) drying said textile piece;

(c) fixing the water-repellent; and

(d) dyeing the textile piece by applying an aqueous dyeing liquor to the reverse side only of said textile piece.

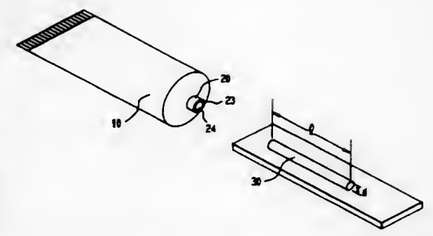
5,554,196
METHOD OF MARKING A SURFACE OF AN OBJECT BY MEANS OF A LASER LIGHT
Ytsen Wielstra, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 248,947, May 25, 1994, abandoned. This application Aug. 1, 1995, Ser. No. 509,808
Claims priority, application European Pat. Off., May 26, 1993, 93201505
Int. Cl.[6] D06P *1/02;3/00;5/20*
U.S. Cl. 8—444 **17 Claims**



1. A method of marking a surface of an object comprising coating said surface with a layer of a mixture comprising at least a binder, a dye precursor and a coupler, said dye precursor being a heterocyclic bis-sulphonylhydrazone of the formula A>C=N—NR_1R_2 wherein A is a heterocyclic ring system, and R_1 and R_2 are selected from the group consisting of alkylsulphonyl and arylsulphonyl and said coupler being a compound having an active hydrogen atom and selected from the group consisting of indoles, phenols, anilines and methylene compounds, irradiating said mixture with a laser light beam according with the desired marking to thereby convert the dye precursor to an azo-dye at areas of said layer irradiated by said laser light beam.

5,554,197
HAIR DYING SYSTEM AND METHODS FOR ACCURATELY BLENDING AND DEVELOPING HAIR DYE
Anthony Assini, Martinsville, and Bernard Foss, Rockaway, both of N.J., assignors to Anthony Bernard Incorporated, Martinsville, N.J.
Filed Jul. 19, 1994, Ser. No. 277,332
Int. Cl.[6] A61K *7/13;* **A45D** *19/00;40/24*
U.S. Cl. 8—406 **17 Claims**

1. A hair dying system, comprising:



an oxidative dye component having a preselected concentration of a developable oxidative hair dye;

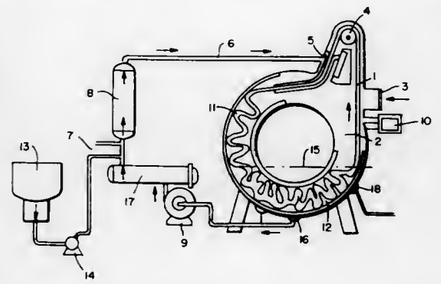
a first dye reservoir containing said oxidative dye component;

a developer component having a preselected concentration of a developer capable of developing said oxidative hair dye;

a first developer reservoir containing said developer component;

dispensing means for dispensing said oxidative dye component from said first dye reservoir and for dispensing said developer component from said first developer reservoir, said dispensing means including a first orifice defining an outlet from said first dye reservoir, said first orifice having a cross-sectional area sized active to said concentration of oxidafire hair dye, and a second orifice defining an outlet from said first developer reservoir, said second orifice having a cross-sectional area sized relative to said concentration of said developer; and a blending means for blending together is dispensed quantity of said oxidative dye and developer components, wherein said blending means comprises a substantially fat-surface, inert material having a measuring means for measuring a dispensed quantity of at least one of said developer and said oxidative dye component disposed thereon, and wherein said blending means is detached from said first dye reservoir and said first developer reservoir.

5,554,198
METHOD FOR DYEING FABRIC
Mark K. Poplin, Miami, Fla., assignor to Tinter Inc., Opa-Locka, Fla.
Filed Jan. 17, 1995, Ser. No. 372,974
Int. Cl.[6] D06P *5/12;5/22*
U.S. Cl. 8—482 **23 Claims**



1. A method for applying color to a fabric to create random dye patterns thereon comprising the steps of gathering the fabric and simultaneously or shortly thereafter applying at least one dye accelerant onto the gathered fabric in a random and nonuniform manner so that the resulting fabric has random areas containing dye accelerant and random areas not containing dye accelerant; applying dye to the fabric at a temperature effective to permit rapid absorption of the dye into the dye accelerant containing areas, and less or no absorption of the dye into the areas not containing dye accelerant; and removing unabsorbed dye while inhibiting migration of absorbed dye within the fabric.

5,554,199
DYEING PROCESS AND AUXILIARY

OOCR[4], wherein R^3 and R^4 independently represent a hydrocarbyl group, provided that R^1 and R^2 do not both represent the acetate

thermally treating the heated and dewatered slurry, said step including at least a step of decarboxylating the oil-impregnated coal through heating to remove oxygen there-

on the refractory wall and the refractory floor of said combustion chamber beyond a predetermined reduced or no slag condition,

5,554,199

DYEING PROCESS AND AUXILIARY

Hans-Peter Baumann, Ettingen, Switzerland, assignor to Sandoz Ltd., Basle, Switzerland

Filed Nov. 17, 1994, Ser. No. 340,924

Claims priority, application Germany, Nov. 19, 1993, 43 39 473.6

Int. Cl.[6] C07C *309/42;* **D06P** *1/56;3/66*

U.S. Cl. 8—543 **10 Claims**

1. In a process for the exhaust dyeing of cellulose-containing substrates with reactive dyes (R) in aqueous liquor containing 20–200 g/L sodium chloride; and the optional presence of a sequestering agent (Q), a hydrotrope (H), or a mixture of (Q) and (H); the improvement comprising the dyeing being carried out in the presence of 0.05–5 g per liter aqueous liquor of an auxiliary (E), (E) being a methylene-bridge-containing and sulpho-group-containing aromatic product or mixture of products, optionally in salt form, that is obtainable by sulphonation of

(a) a compound of formula

to introduce on average at least 1.1 sulpho groups per molecule of (a),

and of

(b) at least one optionally alkylsubstituted diphenyl(thio)ether, to introduce on average at least 1.1 sulpho groups per molecule of (b), and condensation of the sulphonation products of (a) and of (b) with

(c) formaldehyde or a formaldehyde-yielding compound in acidic medium and optionally, followed by reaction with a base to form a salt, wherein R_1 and R_2 are independently hydrogen or alkyl of 1 to 4 carbon atoms.

5,554,200

OIL ADDITIVES AND COMPOSITIONS

Ramah J. Brod, Abingdon; Brian W. Davies, Blewbury, and Tuncel Ibrahim, Abingdon, all of United Kingdom, assignors to Exxon Chemical Patents Inc, Linden, N.J.

PCT No. PCT/EP93/01666, § 371 Date Dec. 21, 1994, § 102(e) Date Dec. 21, 1994, PCT Pub. No. WO94/00386, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 29, 1993, Ser. No. 360,666

Claims priority, application United Kingdom, Jun. 30, 1992, 9213904

Int. Cl.[6] C10L *1/18;* **C10M** *145/08*

U.S. Cl. 44—393 **26 Claims**

1. A crude oil, lubricating oil or fuel oil composition comprising an additive effective to improve low temperature flow of the oil, the additive comprising:

(i) an oil-soluble ethylene copolymer having, in addition to units derived from ethylene, from 7.5 to 35 molar per cent of units of the formula

I

and

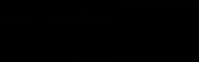
(ii) an oil-soluble ethylene copolymer having, in addition to units derived from ethylene, up to 10 molar per cent of units of the formula

II

wherein each R independently represents H or CH_3, and each R^1 and R^2 independently represents a group of the formula $COOR^3$ or $OOCR^4$, wherein R^3 and R^4 independently represent a hydrocarbyl group, provided that R^1 and R^2 do not both represent the acetate group, the proportion of units I in polymer (i) being at least 2 molar per cent greater than the proportion of units II in polymer (ii),

wherein (A) the composition also contains an ethylene-vinyl ester copolymer further to any that may be present; or

(B) at least one of polymer (i) and polymer (ii) additionally contains units of the formula



III

where R^5 represents —OH, or of the formula

IV

where R^6 and R^7 each independently represent hydrogen or an alkyl group with up to 4 carbon atoms; or

(C) at least one of R^3 and R^4 represents an alkyl or alkenyl group having at least 4 carbon atoms, and at least one of (i) or (ii) is a copolymer made by (a) saponification and re-esterification or (b) transesterification of an ethylene-vinyl acetate or propionate copolymer or an ethylene-methyl or ethyl(meth)acrylate copolymer.

5,554,201

THERMAL TREATED COAL, AND PROCESS AND APPARATUS FOR PREPARING THE SAME

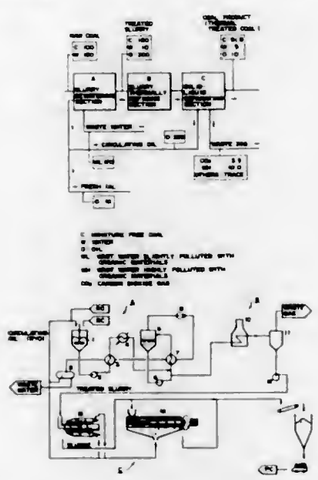
Kazuhito Yagaki; Osamu Okuma; Takuo Shigehisa, and Tetsuya Deguchi, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Dec. 27, 1994, Ser. No. 364,754

Claims priority, application Japan, Dec. 27, 1993, 5-331731

Int. Cl.[6] C10L *1/32;9/00*

U.S. Cl. 44—626 **13 Claims**



1. A thermally treated coal having a water content of not more than 10%, said coal being formed from the process comprising the steps of:

providing a porous coal;

providing an oil for impregnating pores of the porous coal;

mixing the coal and the oil to obtain a slurry;

heating the slurry, said step of heating including steps of evaporating water from the porous coal and inducing impregnation of the oil into the pores of the coal; and

thermally treating the heated and dewatered slurry, said step including at least a step of decarboxylating the oil-impregnated coal through heating to remove oxygen therefrom.

5,554,202

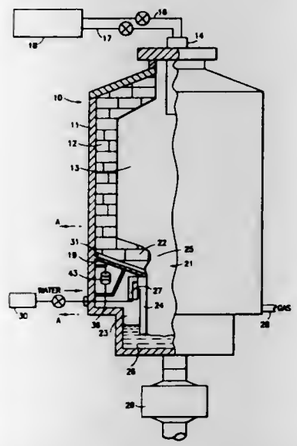
GASIFIER MONITORING APPARATUS

Donald D. Brooker, Hopewell Junction, N.Y.; James S. Falsetti, New Fairfield, Conn.; James K. Wolfenbarger, Torrance, Calif.; Dinh-Cuong Vuong, Nederland, and Allen J. Pertuit, Sugar Land, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 114,856, Sep. 2, 1993, abandoned. This application Mar. 21, 1995, Ser. No. 407,220

Int. Cl.[6] C10J *3/48;3/52*

U.S. Cl. 48—62 R **10 Claims**



1. A gasifier for the partial oxidation of a carbonaceous fuel mixture in a high temperature atmosphere to provide a hot effluent, including a synthesis gas, said gasifier comprising,

a) a housing shell having an upright sidewall portion and a floor portion integrally joined to the upright sidewall portion to form a continuation of the upright sidewall portion,

b) a combustion chamber in the housing shell in which the carbonaceous fuel mixture is directed and partially oxidized, said combustion chamber having a refractory wall lining the upright sidewall portion of the housing shell and a refractory floor lining the floor portion of said housing shell,

c) a bath section below the floor portion of said housing shell for holding liquid coolant,

d) a throat section at the refractory floor of said combustion chamber, said throat section having a throat opening in the refractory floor and the floor portion of said housing shell through which said combustion chamber communicates with said bath section to conduct hot products of said partial oxidation from said combustion chamber into said bath section,

e) a deslagging heater at said combustion chamber for melting solidified slag on the refractory wall and the refractory floor of said combustion chamber, said refractory floor being downwardly inclined toward said throat opening to enable the melted slag to flow out of said combustion chamber through said throat opening,

f) movement-sensing means provided below the floor portion of said housing shell in said bath section to contact the floor portion of said housing shell in said bath section and deflect with the floor portion of said housing shell to sense deflection of said floor portion of said housing shell due to slag buildup on the refractory wall and the refractory floor of said combustion chamber beyond a predetermined reduced or no slag condition,

g) signal-producing means connected to said movement-sensing means for generating a signal corresponding to the deflection of said movement-sensing means to control operation of said deslagging burner to melt the slag buildup on the refractory wall and the refractory floor when said movement-sensing means detects a predetermined deflection of said floor of said housing shell beyond the predetermined reduced or no slag condition.

5,554,203

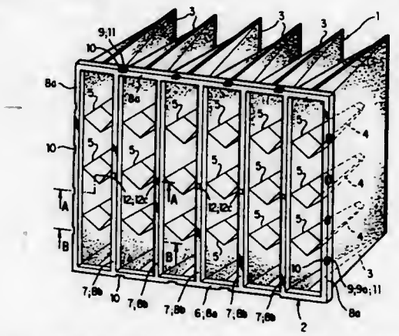
FILTER ELEMENT

Albert Borkent, 2 Prins Bernhardweg, NL 8453, XB Oranjewoud; Erik Kuiper, 30 Wiidswal, NL 8465 PV, Oudehaske, and Sander G. Van Vreeland, 133 Bögelskamphoek, NL 7546, DJ Enschede, all of Netherlands

Filed Jan. 13, 1995, Ser. No. 372,471

Int. Cl.[6] B01D *46/00*

U.S. Cl. 55—378 **15 Claims**



1. A filter element for the separation of dust particles from a gas or air flow, comprising:

a number of filter pockets; and

a main support frame;

the open mouth edges of said filter pockets being interconnected to said main support frame and its interconnecting traversing ribs wherein said main support frame comprises interfitting interior and exterior subframes which are detachably connected one to another and to each and all of said filter pockets, characterized in that the periphery of the interior subframe to which said filter pockets are connected, comprises a number of protrusions and the exterior subframe is provided with a corresponding number of receiving openings for interfitting said subframes into said main support frame, the protrusions being interlockingly engaged by each of said receiving openings by means of a snapping action, such that simultaneously the open edges of said filter pockets are leak free and tightly wedged between opposed surfaces of said subframes.

5,554,204

SURFACE TREATMENT METHOD FOR QUARTZ MATERIAL

Hiroaki Kotaka, Nagoya; Nobuhisa Kurono, Chita-gun; Hidenori Yamaoka, Nagoya; Yoshirou Aiba, Zama, and Shuuitsu Matsuo, Atsugi, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1994, Ser. No. 281,107

Claims priority, application Japan, Aug. 9, 1993, 5-217086

Int. Cl.[6] C03C *3/06*

U.S. Cl. 65—60.8 **7 Claims**

1. A surface treatment method for quartz material, comprising a step of conducting a heat contact treatment on quartz material

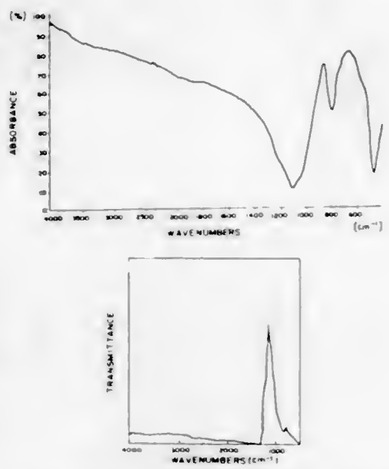
5,554,206

METHOD OF CHARGING ORE

Karl Czermak, Enns; Konstantin Millonig, Georgen a/d Stief-

5,554,208

ENHANCED GAS SEPARATIONS AND ZEOLITE COMPOSITIONS THEREFOR



serving as a target to be treated with ammonia gas at a temperature of 1200° C. or less under the presence of a carbon generating source.

5,554,205

AIR FILTER FOR THE INTERIOR OF A MOTOR VEHICLE

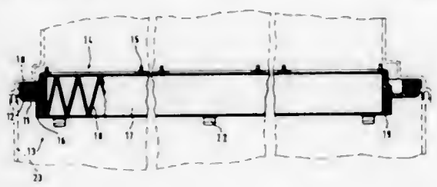
Volker Ernst, Sachsenheim; Arthur Klotz, Remseck, and Rudolf Leipelt, Marbach, all of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Germany

Filed Aug. 17, 1994, Ser. No. 291,857

Claims priority, application Germany, Aug. 19, 1993, 43 27 834.5

Int. Cl.[6] B01D *46/52*

U.S. Cl. 55—385.3 **8 Claims**



1. An air filter for use in ventilating an interior of a motor vehicle, comprising:

a housing having an unfiltered-air inlet and a clean-air outlet;

a filter insert having a pleated filter medium; and

an adapter inserted into said housing and arranged therein, said adapter having a surrounding seal element for providing a seal between said unfiltered-air inlet and said clean-air outlet, said filter insert being removably arranged in said adapter, and said filter insert having a sealing element surrounding said filter insert for providing a seal with respect to said adapter.

5,554,206

METHOD OF CHARGING ORE

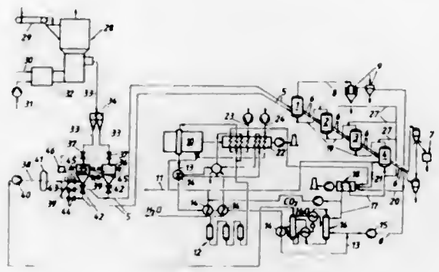
Karl Czermak, Enns; Konstantin Milionis, Georgen a/d Stiefling; Gero Tessmer, Linz, all of Austria, and Roy H. Whipp, Jr., Miami, Fla., assignors to Voest-Alpine Industrieanlagenbau GmbH, Austria, and Brifer International Ltd., Barbados

Filed Mar. 3, 1995, Ser. No. 398,562

Claims priority, application Austria, Mar. 4, 1994, 465/94

Int. Cl.[6] C21B *13/00*

U.S. Cl. 75—446 **16 Claims**



1. A method of charging fine-grained ore into a reactor pressure vessel through which process gas flows, comprising the steps of:

providing a first conveying pressure vessel means;

introducing a first portion of the ore into said first conveying pressure vessel means;

providing compressed gas, said compressed gas being taken from said process gas and fed back to said process gas;

pressurizing said first portion of the ore with said compressed gas;

providing at least one further conveying pressure vessel means;

introducing a second portion of the ore into said at least one further conveying pressure vessel means;

pressurizing said second portion of the ore with said compressed gas; and

charging said reactor pressure vessel continuously by alternately feeding said pressurized first portion of the ore from said first conveying pressure vessel means and said pressurized second portion of the ore from said at least one further conveying pressure vessel means into said reactor pressure vessel, said compressed gas taken from said process gas being fed along with said ore.

5,554,207

PROCESS OF RECYCLING IRON OXIDES AND PLASTICS IN STEELMAKING

Eugene A. Bogdan, North Huntingdon, and Alvin A. Terchick, Monroeville, both of Pa., assignors to USX Corporation, Pittsburgh, Pa.

Filed Nov. 25, 1994, Ser. No. 344,868

Int. Cl.[6] C21B *3/04*

U.S. Cl. 75—500 **17 Claims**

1. A method of recovering metallic iron values in waste iron oxide dust, comprising recovering waste iron oxide dust at a temperature sufficient to soften and melt a water-insoluble thermoplastic material, mixing the hot iron oxide dust and the plastic in proportions sufficient to soften and melt the plastic to form a binder for the iron oxide dust, agglomerating the mixture into a particulate form suitable for introduction into a steelmaking furnace, adding the particulate mixture to a steelmaking furnace, and combusting the plastic binder.

5,554,208

ENHANCED GAS SEPARATIONS AND ZEOLITE COMPOSITIONS THEREFOR

Joseph T. Mullhaupt, Williamsville, and Paula C. Stephenson, East Amherst, both of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Division of Ser. No. 165,876, Dec. 14, 1993, Pat. No. 5,441,557. This application Aug. 7, 1995, Ser. No. 511,847

Int. Cl.[6] B01D *53/047*

U.S. Cl. 95—96 **15 Claims**

1. An enhanced process for the selective adsorption of a more readily adsorbable component of a gas mixture containing said component and a less readily adsorbable component in an adsorption system containing at least one bed of adsorbent material capable of selectively adsorbing the more readily adsorbable component from the gas mixture, each bed in said adsorption system undergoing, on a cyclic basis, a processing sequence comprising:

(a) introducing the gas mixture at an upper adsorption pressure to said bed containing adsorbent material comprising an X or A type zeolitic adsorbent composition having true unit cells of 8 β-cages, each true unit cell having a symmetrical framework composition and a symmetrical cation composition, said symmetrical cation composition being monovalent, divalent, or mixtures thereof, said symmetrical framework composition having an equal average number of Al atoms per β-cage in all 8 β-cages of each true unit cell and said symmetrical cation composition having the same average number of either monovalent or divalent cations, or of mixtures of each type, distributed in each β-cage of the true unit cell, said symmetrical framework composition having a SiO_2/Al_2O_3 ratio from about 2.741 to about 2.861;

(b) depressurizing the bed by the release of gas therefrom so as to decrease the pressure in the bed from said upper adsorption pressure to a lower desorption pressure so as to desorb said more readily adsorbable component and pass it from the bed;

(c) repressurizing the bed from the lower desorption pressure to said upper adsorption pressure; and

(d) introducing additional quantities of the feed gas mixture to the bed as the cyclic processing sequence is carried out in each bed in the adsorption system,

whereby enhanced equilibrium selectivity for the adsorption of the more readily adsorbable component of the gas mixture is achieved.

5,554,209

DEVICE FOR REMOVING CONTAMINANTS FROM A GAS STREAM

Alan W. Dingfelder, 3582 Williams Rd., North East, Pa. 16428

Filed Feb. 27, 1995, Ser. No. 394,708

Int. Cl.[6] B03C *1/00*

U.S. Cl. 96—1 **17 Claims**

1. A gas contaminant separator for removing contaminants from a gas stream, comprising:

a pressure tube formed with a first separator section and an second section;

a plate formed with a plurality of holes mounted within the pressure tube and extending intermediate the first separator section, and the second section;

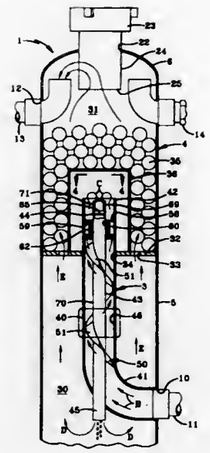
inlet means included in the pressure tube for admitting a contaminated gas stream into the first separator section;

outlet means for releasing a gas stream from the pressure tube;

a down pipe;

a gas transfer means for transferring the gas stream from the pressure tube to the down pipe whereby said down pipe communicates with the gas transfer means and the outlet means; and

magnetic field inducing means positioned adjacent one of the pressure tube and down-pipe for creating a magnetic field within at least one of the pressure tube and down pipe whereby the gas stream must pass through said magnetic field.



5,554,210

SUSPENSION DEVICE AND A RAPPING MECHANISM FOR ELECTRODES IN AN ELECTROSTATIC PRECIPITATOR

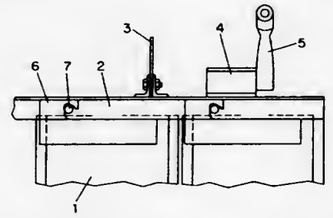
Torben P. Anderson, Valby, Denmark, assignor to FLS MILJØ A/S, Denmark, and Compania Sevillana de Electricidad, Spain

Filed Jan. 11, 1995, Ser. No. 371,223

Claims priority, application Denmark, Jan. 11, 1994, 0045/94

Int. Cl.[6] B03C *3/76*

U.S. Cl. 96—33 **10 Claims**



1. A suspension device and a rapping mechanism for electrodes in an electrostatic precipitator for cleaning smoke gases, wherein the suspension device comprises at least one substantially horizontally arranged elongated supporting element from which a plurality of electrodes are suspended, said supporting element being connected to the inside of a precipitator housing, said rapping mechanism having means for transmitting an impact or vibrating influence to the individual electrode at least at its uppermost end, the rapping mechanism having means for supplying the impact or vibrating influence to the supporting element in the longitudinal direction of the element, and wherein the individual electrode is provided with suspension means for cooperating with the supporting element in such a way that the electrode is suspended pivotably about a horizontal axis on the supporting element and is free of play relative to the supporting element in the longitudinal direction of the element.

5,554,211

AQUEOUS ELECTROLESS PLATING SOLUTIONS

5,554,213

INK COMPOSITIONS FOR INK JET PRINTING

particulate materials carry a surface charge, the surface charge on the first particulate material being of opposite sign to the surface

5,554,218

CEMENT COMPOSITIONS AND METHODS OF

5,554,211

AQUEOUS ELECTROLESS PLATING SOLUTIONS

George S. Bokisa, North Olmsted, and William J. Willis, North Royalton, both of Ohio, assignors to McGean-Rohco, Inc., Cleveland, Ohio

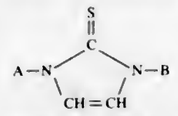
Filed Nov. 15, 1995, Ser. No. 559,712
Int. Cl.[6] C23C *18/31*
U.S. Cl. 106—1.22 24 Claims

1. An aqueous electroless plating solution for depositing one or more metals selected from the group consisting of tin, lead, bismuth, indium, gallium and germanium onto a metal surface comprising:

(A) at least one solution-soluble metal salt selected from the group consisting of a stannous salt, a lead salt, a bismuth salt, an indium salt, a gallium salt and a germanium salt;

(B) at least one acid selected from the group consisting of fluoboric acid, alkane sulfonic acids, alkanol sulfonic acids, and mixtures thereof;

(C) a complexing agent which is an imidazole-2-thione compound of the Formula III



(III)

wherein A and B are the same or different —RY groups wherein R is a linear, branched or cyclic hydrocarbylene group containing up to 12 carbon atoms, and Y is a hydrogen, halogen, cyano, vinyl, phenyl, or ether moiety; and

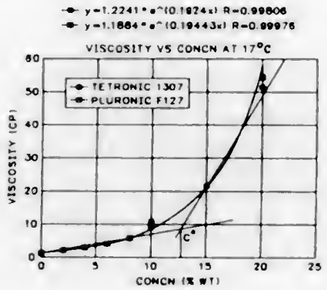
(D) water.

5,554,212

WATERFAST HIGH GLOSS HYPERTHERMOGELLING AQUEOUS PHASE CHANGE INK AND METHOD FOR USE

Loc V. Bui, Beaverton; Clifford R. King, Salem; Donald R. Titterington, Tualatin, and Bhalchandra M. Karandikar, Lake Oswego, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Continuation-in-part of Ser. No. 239,105, May 6, 1994, Pat. No. 5,462,591. This application Oct. 30, 1995, Ser. No. 550,062
Int. Cl.[6] C09D *11/02*
U.S. Cl. 106—20 R 36 Claims



1. An aqueous phase change ink composition, comprising:

a coloring agent;

a water dispersible polyester gloss agent; and

an amount of hyperthermogelling component in a concentration such that the ink composition is in a liquid state at a first temperature and is in a solid state at a second temperature where the second temperature is greater than the first temperature.

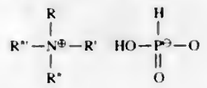
5,554,213

INK COMPOSITIONS FOR INK JET PRINTING

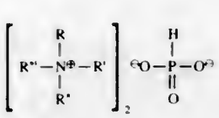
Edward J. Radigan, Jr., Hamlin; Richard L. Colt, Rochester; Kurt B. Gundlach, Pittsford, and Miguel A. Fontanez, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 227,828, Apr. 14, 1994, Pat. No. 5,389,133, said Ser. No. 136,146is a continuation-in-part of Ser. No. 992,240, Dec. 17, 1992, Pat. No. 5,258,064. This application Dec. 1, 1994, Ser. No. 347,937
Int. Cl.[6] C09D *11/02*
U.S. Cl. 106—22 H 36 Claims

1. An ink composition which comprises water, a colorant, and a phosphite salt of the general formula



or



wherein R, R', R" and R"' can each, independently of each other, be hydrogen, an alkyl group, a substituted alkyl group, an aryl group, or a substituted aryl group.

5,554,214

WATER ABLATIVE COATING FOR VEHICLE DRAG REDUCTION

Robert F. Supcoe, Annapolis, Md., and Francis J. Moran, Concord, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 3, 1976, Ser. No. 722,299
Int. Cl.[6] B63B *1/34*
U.S. Cl. 106—264 9 Claims

1. A water ablative paint having drag reducing characteristics consisting essentially of:

a water-soluble high molecular weight polymer in particulate form;

a vehicle suspending and carrying said particulate polymer;

a solvation modifier that is hydrophobic and powdery in form coated on said particulate polymer; and

film modifiers including a swelling deferent, that increase elasticity, reduce brittleness, and aid in even ablation of said polymer, and defers swelling of the film coating.

5,554,215

COMPOSITE PIGMENTARY MATERIAL

Leslie A. Simpson; John Robb; Jonathan Banford; Paul F. Dietz, all of Cleveland, and John Temperley, Stocktonon Tees, all of England, assignors to Tioxide Specialties Limited, United Kingdom

Division of Ser. No. 59,754, May 12, 1993, Pat. No. 5,509,960. This application Jun. 7, 1995, Ser. No. 481,837
Claims priority, application United Kingdom, Jun. 4, 1992, 9211822
Int. Cl.[6] C04B *14/20*
U.S. Cl. 106—436 48 Claims

1. A process for producing a composite particulate pigmentary material comprising forming an aqueous dispersion of particles of a first particulate material and an aqueous dispersion of particles of a second, chemically distinct, particulate material, the pH values of the dispersions so formed being such that the particles of both

particulate materials carry a surface charge, the surface charge on the first particulate material being of opposite sign to the surface charge on the second particulate material and at least one of said dispersions being formed in the substantial absence of a dispersing agent and mixing said dispersions under conditions such that the mixing does not produce a reversal of the sign of the surface charge on one of the materials to produce an aqueous dispersion of composite particles, said composite particles comprising an association of particles of said first material and said second material, the particles of said first material being held in association with the particles of said second material as a result of said surface charges and wherein said aqueous dispersion of composite particles contains at least 35 per cent by weight of said composite particles, said first material being an inorganic pigment or extender.

5,554,216

HIGH GLOSS DURABLE TiO_2 PIGMENT

Andrejs Baidins, and Michael P. Diebold, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 261,084, Jun. 16, 1994, abandoned, which is a continuation of Ser. No. 65,043, May 24, 1993, abandoned, which is a continuation of Ser. No. 841,809, Feb. 26, 1992, abandoned. This application Dec. 15, 1994, Ser. No. 356,760
Int. Cl.[6] C09C *1/36*
U.S. Cl. 106—442 9 Claims

1. A coated pigment consisting essentially of:

(a) a TiO_2 particle core;

(b) a porous coating of about 0.2 to 5% by weight of alumina, calculated as Al_2O_3 and based on the weight of the TiO_2; and

(c) a dense coating of:

(i) about 0.001–3% by weight of molybdena, calculated as MoO_3 and based on the weight of the TiO_2; and

(ii) about 0.05% to 5% of alumina, calculated as Al_2O_3 and based on the weight of the TiO_2, said dense alumina coating being formed in aqueous media in the presence of an effective amount of soluble molybdate.

5,554,217

STIR-IN ORGANIC PIGMENTS

Fridolin Bäbler, Hockessin, Del., assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

Continuation-in-part of Ser. No. 305,549, Sep. 14, 1994. This application Jun. 7, 1995, Ser. No. 475,165
Int. Cl.[6] C08K *5/00*
U.S. Cl. 106—494 25 Claims

1. A process for coloring a high-molecular-weight organic material, which comprises stirring an effective pigmenting amount of a stir-in pigment into a suspension or solution of the high-molecular-weight organic material to produce a uniform dispersion of the pigment in the high molecular weight organic material without any additional milling step; wherein the stir-in pigment is a non-surface treated organic pigment crude consisting essentially of non-platelet shaped pigment particles having an average particle size in the range from 0.5 μm to 25 μm, which pigment crude is not carbazole dioxazine crude; or wherein the stir-in pigment is a pigment composition which comprises from 0.1 to 50 parts by weight of an inorganic filler pigment and from 50 to 99.9 parts by weight of a non-surface treated organic pigment, wherein the organic pigment has an average particle size in the range from 0.5 μm to 25 μm, and wherein the sum of the parts by weight of the inorganic filler pigment and the organic pigment is 100.

170–919 O.G.–96–12: QL3

5,554,218

CEMENT COMPOSITIONS AND METHODS OF UNDERWATER APPLICATION

Shawn Evans, 1610 Monmouth Dr., San Diego, Calif. 92109, and Kevin Wallace, 394 Laveta Ave., Encinitas, Calif. 92024

Filed Apr. 3, 1995, Ser. No. 415,489
Int. Cl.[6] C04B *22/12;111/74*
U.S. Cl. 106—639 23 Claims

1. A composition for preparing cement that solidifies underwater comprising exothermic micro particles and base cement, wherein the exothermic micro particles are less than about 2,250 micrometers in diameter and are present in an amount sufficient to solidify the cement underwater.

5,554,219

PROCESS FOR PRODUCING SINGLE-CRYSTAL BULK ZINC SELENIDE

Tsuguo Fukuda, Sendai, Japan; Peter Rudolph, Berlin, Germany, and Kazuyuki Umezu, Sendai, Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Filed Jan. 23, 1995, Ser. No. 376,896
Int. Cl.[6] C30B *11/14*
U.S. Cl. 117—83 10 Claims

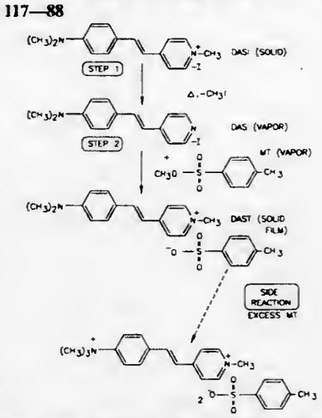
1. A process for producing a single-crystal bulk ZnSe from a melt by a high-pressure melt technique in a vertical Bridgman furnace (VB) or a vertical gradient freezing (VGF) furnace, wherein polycrystalline ZnSe is used as a seed and wherein a single crystal is grown on said seed.

5,554,220

METHOD AND APPARATUS USING ORGANIC VAPOR PHASE DEPOSITION FOR THE GROWTH OF ORGANIC THIN FILMS WITH LARGE OPTICAL NON-LINEARITIES

Stephen R. Forrest; Vladimir S. Ban; Paul E. Burrows, and Jeffrey Schwartz, all of Princeton, N.J., assignors to The Trustees of Princeton University, Princeton, N.J.

Filed May 19, 1995, Ser. No. 444,252
Int. Cl.[6] C30B *29/54*
U.S. Cl. 117—88 34 Claims



1. A method for growing optically nonlinear thin films of a desired organic salt on a substrate positioned in a reaction zone of a reactor, comprising the steps of:

volatizing at least one donor molecular precursor of the desired organic salt in an individual chamber, said donor molecular precursor being selected from the group consisting of a reducing agent, a nucleophile, and a base, respectively;

volatizing at least one acceptor molecular precursor of said desired organic salt in an individual chamber, said acceptor

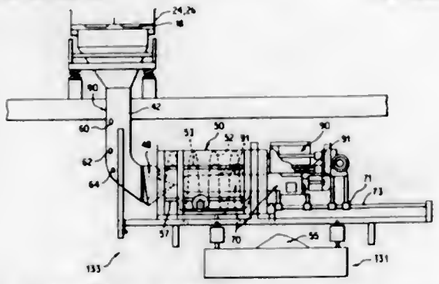
precursor being selected from the group consisting of an oxidizing agent, an electrophile, or an acid, respectively;

transporting the volatized donor and acceptor molecular precur-

second return means connected to the flow conducting means and to the source means to provide a constant second path independent from the first path to return excess thixotropic

precursor being selected from the group consisting of an oxidizing agent, an electrophile, or an acid, respectively;
transporting the volatized donor and acceptor molecular precursors into said reaction zone of said reactor; and
reacting said volatized donor and acceptor molecular precursors in a manner causing the growth of the desired thin film on said substrate.

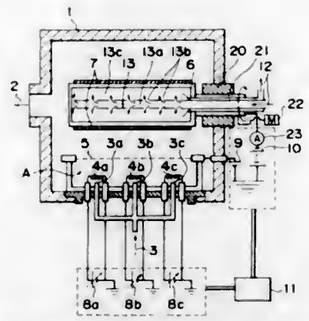
5,554,221
APPARATUS FOR DISPENSING PORTIONS OF MATERIAL
John L. Center, and Patrick J. Bierschenk, both of Dallas, Tex., assignors to Recot, Inc., Plano, Tex.
Division of Ser. No. 989,362, Dec. 11, 1992, Pat. No. 5,353,959.
This application Jun. 21, 1994, Ser. No. 262,905
Int. Cl.[6] A23G *3/00*
U.S. Cl. 118—19 **14 Claims**



1. An apparatus for dispensing material, comprising:
a feed chute for conveying material, said feed chute having an upper end and a lower end;
a feed head in communication with the lower end of said feed chute and being rotatable with respect to the feed chute, said feed head having a first opening into which material passes from the feed chute and a second opening out of which the material passes from the feed head;
a rotatable tumbler connected to the feed head; and
a device for rotating the tumbler;
whereby rotation of the tumbler causes rotation of the feed head and rotation of the feed head to a first extent causes material to pass into the feed head and rotation of the feed head past the first extent dispenses the material from the feed head into the tumbler.

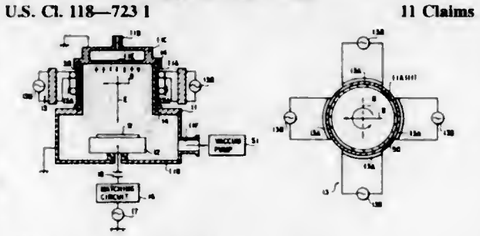
5,554,222
IONIZATION DEPOSITION APPARATUS
Munekazu Nishihara, Neyagawa; Masahide Yokoyama, Hirakata; Hatsuhiko Shibasaki, Ibaraki, and Youichi Ohnishi, Higashiosaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan
Continuation of Ser. No. 69,684, May 28, 1993, abandoned.
This application Jul. 12, 1995, Ser. No. 501,698
Claims priority, application Japan, Jun. 1, 1992, 4-140653
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—723 HC **6 Claims**

1. An ionization deposition apparatus which comprises:
an ion source which is located in a vacuum chamber, said ion source including (1) gas introduction ports for supplying a gaseous film material into the vacuum chamber, (2) a filament unit, which includes a plurality of independent filaments for which respective current amounts of filament currents flowing in said filaments are independently controlled, for generating thermoelectrons when the filaments are heated by the filament currents, and an (3) anode electrode for accelerating and colliding the thermoelectrons against molecules of the gaseous film material to turn the molecules to plasma;



a holder for holding a to-be-deposited object, the holder being placed confronting to the anode electrode of the ion source in the vacuum chamber, and connected to a bias source to attract ions in the plasma to a surface of the holder;
a bias current detector for detecting a bias current of said bias source; and
a control unit for changing a ratio of all the filament currents so as to maintain the detected bias current constant.

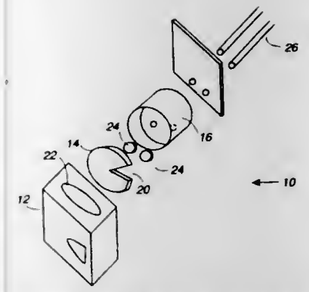
5,554,223
PLASMA PROCESSING APPARATUS WITH A ROTATING ELECTROMAGNETIC FIELD
Issei Imahashi, Yamanashi-ken, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan
Filed Mar. 4, 1994, Ser. No. 205,798
Claims priority, application Japan, Mar. 6, 1993, 5-071225
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—723 I **11 Claims**



9. A plasma process apparatus comprising:
a process container containing at least one object to be processed having a processed surface;
induction means adapted to form in the process container an electromagnetic field rotating along a plane substantially parallel to the processed surface and to supply electromagnetic waves, therein generating plasma of the process gas, when a high-frequency voltage is applied thereto; and
means for reducing the pressure in the process container to 0.005 Tort during processing.

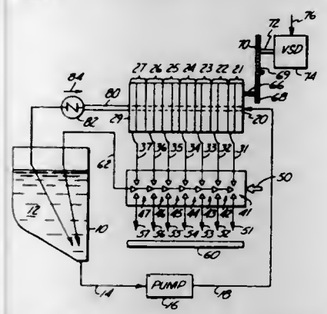
5,554,224
SUBSTRATE HEATER FOR THIN FILM DEPOSITION
Steve R. Foltyn, 111 Beryl St., Los Alamos, N.M. 87544
Filed Mar. 31, 1994, Ser. No. 222,195
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—725 **7 Claims**

1. A substrate heater for thin film deposition of metallic oxides upon a target substrate configured as a disk comprising
means for supporting in a location a target substrate configured as a disk;
means for rotating the target substrate upon the support means; and,



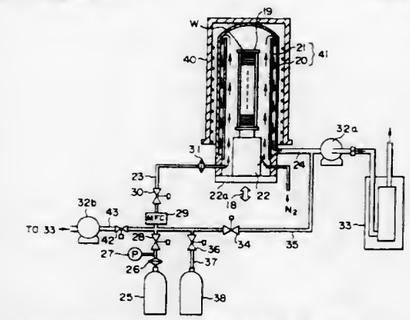
means for heating the target substrate, the heating means including a pair of heating elements defining a heating cavity around the support means with one heater element situated on each side of the location for the target substrate, one heater element defining an opening through which a desired coating material can enter for thin film deposition and the heating means includes an opening slot through which the target substrate can be entered into the heating cavity onto the support means.

5,554,225
DEVICE FOR DISPENSING THIXOTROPIC MATERIALS
Jimmy A. DeMars, Hugo, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.
Continuation of Ser. No. 260,555, Jun. 16, 1994, Pat. No. 5,445,674, which is a continuation of Ser. No. 847,944, Mar. 6, 1992, abandoned. This application Mar. 20, 1995, Ser. No. 406,444
Int. Cl.[6] B05C *5/00*
U.S. Cl. 118—669 **14 Claims**



1. Apparatus for dispensing a thixotropic food onto a food surface comprising:
source means for providing a continuous supply of the thixotropic food;
conveyor means for transporting the food surface past a dispensing position;
a dispensing port mounted above the dispensing position;
valve means having "on" and "off" conditions and an input port and first and second output ports;
flow conducting means connecting the input port to the source means to receive a supply of the thixotropic food therefrom, the first output port connected to the dispensing port to deposit the thixotropic food on the food surface as it passes through the dispensing position, said flow conducting means including a positive displacement pump means connected to the source means to move the thixotropic food therefrom to the input port;
first return means connected to the second output port and to the source means to provide a first path to return excess thixotropic food to the source means and to provide continuous motion of the thixotropic food through the valve means;
second return means connected to the flow conducting means and to the source means to provide a constant second path independent from the first path to return excess thixotropic food to the source means and to provide continuous motion of the thixotropic food in the flow conducting means, the provision of continuous motion operating to overcome the thixotropic tendency to resist motion;
flow restriction means connected to the second return means to provide a back pressure to assure continuous flow to the valve means;
position sensing means operable to produce a signal indicative of the position of the food surface with respect to the dispensing position;
computer means capable of receiving the signal indicative of position and operable to control the "on" condition of the valve means in accordance therewith;
connecting means to connect the conveyor means to the computer means so that the speed of the conveyor means is controlled by the computer means;
speed sensing means in communication with the computer means to produce an output signal indicative of the speed of the conveyor means and to supply the output signal to the computer means; and
food surface and thixotropic food sensing means for supplying an output indicative of the number of food surfaces and a quantity of thixotropic food and connecting it to the computer means.

5,554,226
HEAT TREATMENT PROCESSING APPARATUS AND CLEANING METHOD THEREOF
Wataru Okase, and Masaaki Hasei, both of Sagamihara, Japan, assignors to Tokyo Electron Kabushiki Kaisha, Tokyo-to, and Tokyo Electron Tohoku Kabushiki Kaisha, Iwate-ken, both of Japan
Division of Ser. No. 163,799, Dec. 9, 1993, Pat. No. 5,427,625.
This application Mar. 28, 1995, Ser. No. 411,899
Claims priority, application Japan, Dec. 18, 1992, 4-354909
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—724 **4 Claims**



1. A heat treatment processing apparatus, comprising:
a reaction vessel;
a reaction gas supply pipe connected to said reaction gas vessel;
a waste gas exhaust pipe connected to said reaction gas vessel;
a flow rate control unit disposed at said reaction gas supply pipe;
reaction gas supply means connected to said reaction gas supply pipe on an upstream side of said flow rate control unit through a reaction gas supply valve;
inert gas supply means connected to said reaction gas supply pipe on an upstream side of said flow rate control unit through an inert gas supply valve;
a vacuum pump disposed at said waste gas exhaust pipe;
a bypass pipe connected to said reaction gas supply pipe at said upstream side of said flow rate control unit and connected to said waste gas exhaust pipe at an upstream side of said vacuum pump for connecting said vacuum pump so that said

pump can deaerate the interior of said flow rate control unit and the interior of a portion of said reaction gas supply pipe that is at said upstream side of said flow rate control unit;

a reaction gas pipe valve disposed at a portion of said reaction gas supply pipe that is at a downstream side of said flow rate control unit; and

a bypass pipe valve disposed at said bypass pipe.

5,554,227

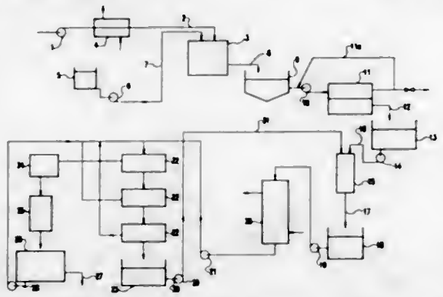
PROCESS OF MANUFACTURING CRYSTAL SUGAR FROM AN AQUEOUS SUGAR JUICE SUCH AS CANE JUICE OR SUGAR BEET JUICE

Robert J. Kwok, Paunene, Hi.; Xavier Lancrenon, Chicago, Ill., and Marc-Andre Theoleyre, Paris, France, assignors to Societe Nouvelle De Recherches Et D'Applications Industrielles D'Echangeurs D'Ions Applexion, Epone, France

Filed Nov. 12, 1993, Ser. No. 151,383

Int. Cl.[6] C13F *1/02;1/28;* **C13J** *1/06;* **B01D** *15/08*

U.S. Cl. 127—58 **8 Claims**



1. A process for the manufacture of crystallized sugar from an aqueous sugar juice containing sugars, and organic impurities including colloids, and mineral impurities comprising a first step of processing said aqueous sugar juice using a filtration method selected from a group consisting of tangential microfiltration, tangential ultrafiltration, or tangential nanofiltration, thereby providing a filtrate, a second step of softening said filtrate to selectively remove calcium and magnesium ions, a third step of concentrating said filtrate to provide a syrup and a fourth step of crystallizing said syrup to provide a crystal sugar and molasses, said first step removing a substantial part of said colloids to prevent said colloids from impairing said second, third or fourth steps.

5,554,228

METHOD AND DEVICE FOR CLEANING MEDICAL INSTRUMENTS

Nicola Giordano, Villingen-Schwenningen, and Dieter Weisshaupt, Immendingen, both of Germany, assignors to Aesculap AG, Tuttlingen, Germany

Filed Dec. 15, 1994, Ser. No. 356,398

Claims priority, application Germany, Jun. 26, 1992, 42 21 102.6

Int. Cl.[6] B08B *3/04;5/04*

U.S. Cl. 134—21 **20 Claims**

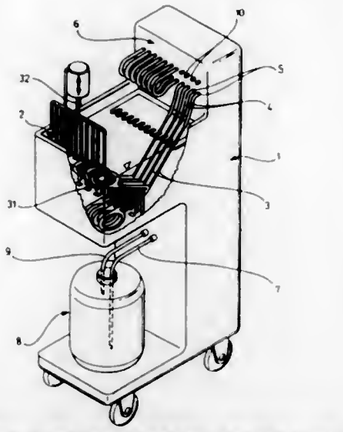
1. A device for cleaning medical tubular shaft instruments having a handle and a free end, said device comprising:

a container for holding a cleaning bath of a cleaning liquid;

a holder for holding the tubular shaft instruments such that said handle portion and at least a portion of a shaft attached thereto dip into the cleaning bath in said container;

a suction chamber arranged at an upper portion of the holder, said suction chamber bearing a number of closure means next to one another; and

hoses connected individually to each closure means;



wherein each of said hoses is sealingly attachable to said free end of a corresponding one of the tubular shaft instruments to provide a suction force at said free end;

thereby allowing cleaning liquid to be drawn from said cleaning bath through the shaft of the instrument, and then through said free end.

5,554,229

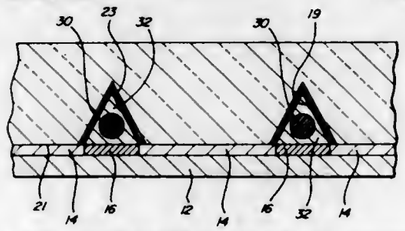
LIGHT DIRECTING ELEMENT FOR PHOTOVOLTAIC DEVICE AND METHOD OF MANUFACTURE

Craig N. Vogeli, New Baltimore, Mich., assignor to United Solar Systems Corporation, Troy, Mich.

Filed Feb. 21, 1995, Ser. No. 391,773

Int. Cl.[6] H01L *31/04;31/18*

U.S. Cl. 136—259 **8 Claims**



1. A photovoltaic cell having decreased shading, comprising:

a layer of bottom electrode material;

a photovoltaic body disposed on said layer of bottom electrode material;

a transparent layer of top electrode material disposed upon said photovoltaic body in a spaced apart relationship with said layer of bottom electrode material so that the photovoltaic body is sandwiched therebetween;

at least one electrically conductive current-collecting grid line formed by at least one current conducting wire in electrical communication with said top electrode;

an encapsulant cover of transparent, electrically insulating synthetic organic polymeric material disposed directly upon said top electrode material and said at least one wire so as to cover the top electrode and the at least one wire; and

a V-shaped groove formed in said encapsulant cover at an interface with said top electrode and extending for a distance through said encapsulant cover, said wire being disposed in said groove such that said groove is generally coextensive with the length of said current collecting wire and in registry therewith, said groove including two angularly disposed, silvered side walls which are operative to reflect incident light away from the grid line so that said light illuminates adjacent

portions of said photovoltaic cell, and further comprising a mass of electrically conductive filler material disposed in said groove and supporting said wire to place said wire in electrical communication with said top electrode.

5,554,230

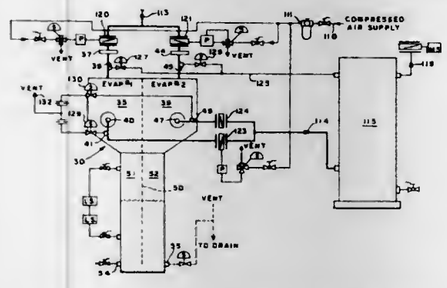
LOW DEW POINT GAS GENERATOR COOLING SYSTEM

Michael J. Huber, Toledo; Jerry P. Jason, Maumee, and Garry W. Barbee, Waterville, all of Ohio, assignors to Surface Combustion, Inc., Maumee, Ohio

Filed Jun. 1, 1995, Ser. No. 456,490

Int. Cl.[6] C23C *8/20*

U.S. Cl. 148—208 **26 Claims**



1. A method for producing from a wet gas stream a continuous stream of dried gas having a dew point less than about 20° F. comprising the steps of:

a) providing i) a single compressor for compressing a refrigerant gas to produce a compressed, heated refrigerant gas stream, ii) a condenser for liquefying said compressed heated refrigerant gas stream to produce a cooled refrigerant stream, iii) first and second evaporator coils with associated expansion valves, and iv) valves for porting said refrigerant streams between said evaporators and said wet gas stream over said evaporators;

b) repeatedly performing a periodic, refrigeration cycle in which i) during a first phase of said cycle, said wet gas is passed over said first evaporator which functions as an active evaporator through which said cooled refrigerant stream passes for drying said wet gas passing over said first evaporator while a portion of said heated compressed refrigerant stream is passed through said second evaporator which is in an inactive state for defrosting same and ii) during a second phase of said cycle, said wet gas is ported over said second evaporator acting as an active evaporator through which said cooled, refrigerant stream passes for drying said wet gas while a portion of said heated compressed refrigerant in passed through said first evaporator functioning as an inactive evaporator for defrosting same;

c) during each cycle phase metering a portion of said heated compressed refrigerant stream into said cooled refrigerant stream ported into said active evaporator, the metering rate of said heated refrigerant stream being periodically reduced from the beginning to the end of each cycle phase as ice accumulates on said active evaporator whereby said wet gas is continuously dried to a generally constant dew point throughout each portion of the cycle.

5,554,231

CORROSION RESISTANT ALUMINUM AND ALUMINUM COATING

John W. Bibber, Batavia, Ill., assignor to Sanchem, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 50,841, Apr. 21, 1993, Pat. No. 5,358,623, and Ser. No. 322,238, Oct. 13, 1994, Pat. No. 5,437,740. This application Jul. 7, 1995, Ser. No. 499,311

Int. Cl.[6] C23F *11/18;* **C23C** *22/66*

U.S. Cl. 148—272 **4 Claims**

1. A non-chromium aluminum coating composition to provide a protective conversion coating for aluminum or aluminum alloys which have not been treated with chromium comprising as the essential ingredients thereof an alkali metal permanganate and an aluminum nitrate wherein the composition is an aqueous composition having a pH of about 2.5 to about 4.0, and there is at least 760 ppm permanganate and there is about 0.10 to about 10.0% aluminum nitrate.

5,554,232

AMORPHOUS METAL WIRE

Katsuyuki Fujimoto; Kohati Nomura, and Shuji Ueno, all of Kyoto, Japan, assignors to Unitika Ltd., Hyogo, Japan

Filed Nov. 2, 1994, Ser. No. 333,989

Claims priority, application Japan, Nov. 2, 1993, 5-297293

Int. Cl.[6] H01F *1/153*

U.S. Cl. 148—304 **11 Claims**

1. An amorphous metal wire consisting essentially of Fe, Co, Si and B, and having the following composition by atomic %:

$$(Fe_aCo_b)_{100-(x+z)}Si_xB_z$$

where:

$0.4 \leqq a \leqq 0.6$;

$a+b=1$;

$6 \leqq y \leqq 8$; and

$13 \leqq z \leqq 16$.

5,554,233

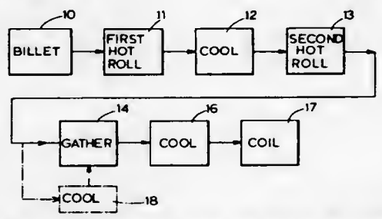
COLD DEFORMABLE, HIGH STRENGTH, HOT ROLLED BAR AND METHOD FOR PRODUCING SAME

William E. Heitmann, Crown Point, Ind., and Birchel S. Brown, Apollo Beach, Fla., assignors to Inland Steel Company, Chicago, Ill.

Continuation of Ser. No. 249,456, May 26, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 469,448

Int. Cl.[6] C21D *8/02;* **C22C** *38/14;38/12*

U.S. Cl. 148—330 **50 Claims**



1. A method for producing a hot rolled steel bar capable of subsequent cold deformation, said method comprising the steps of:

providing a billet having a steel composition consisting essentially of, in wt. %,

carbon	0.10–0.14
manganese	1.35–1.60
silicon	0.20–0.35

-continued

niobium	0.05–0.10
boron	0.001–0.004
molybdenum	0.01–0.1
titanium	0.008–0.020
nitrogen	less than 0.008
aluminum	0.020–0.030

and a balance consisting essentially of iron;

subjecting said billet to a first hot rolling step to produce an intermediate hotrolled product;

providing said billet with a temperature in the range 1175° to 1230° C. (2147° to 2246° F.) at the beginning of the first hot rolling step;

cooling said intermediate product to a temperature in the range 780° to 900° C. (1420° to 1650° F.) following said first hot rolling step;

subjecting the cooled intermediate product to a second hot rolling step to produce a continuous hot rolled bar;

gathering said continuous hot rolled bar into a succession of overlapping loops;

providing said continuous, hot rolled bar with a gathering temperature in the range 780° to 855° C. (1420° to 1570° F.) at the beginning of said gathering step;

conveying said succession of overlapping loops through a cooling stage in which air at ambient temperature is blown through said loops to cool the loops to a temperature below 427° C. (800° F.);

and then coiling said loops.

5,554,234

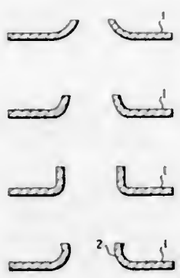
HIGH STRENGTH ALUMINUM ALLOY FOR FORMING FIN AND METHOD OF MANUFACTURING THE SAME

Hiroaki Takeuchi, Nikko, and Hiroshi Kano, Imaichi, both of Japan, assignors to Furukawa Aluminum Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 83,918, Jun. 28, 1993, abandoned. This application Dec. 22, 1994, Ser. No. 362,746

Int. Cl.[6] C22F *1/04*

U.S. Cl. 148—551 **2 Claims**



1. A method of manufacturing a high strength aluminum alloy suitable for a fin having a collar portion and having a thickness of not larger than 0.105 mm and comprising the steps of:

continuously supplying an aluminum alloy melt containing at most 0.1% by weight of Si, 0.10 to 1.0% by weight of Fe, 0.1 to 0.50% by weight of Mn, 0.01 to 0.15% by weight of Ti, and the balance of Al and unavoidable impurities, to the outer circumferential surfaces of a pair of cooling molds disposed to face each other and rotated in a sliding contact with each other, to obtain a cast plate having a thickness of 2 to 15 mm;

applying a cold rolling treatment to the resultant cast plate such that the final rate of reduction in the thickness of the cast plate is at least 80%; and

applying a homogenizing annealing treatment to the cold rolled thin plate at 250° to 320° C. to cause intermetallic compounds having a diameter not larger than 0.1 μm to be distributed within the metal texture of the alloy in a number density of at least $10/\mu m^3$.

5,554,235

METHOD OF AND PROCESS FOR COLD-ROLLING OF STAINLESS-STEEL AND TITANIUM-ALLOY STRIP

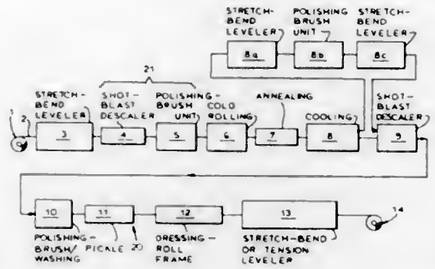
Rolf Noe; Andreas Noe, both of Mülheim, and Dieter Baukloh, Duisburg, all of Germany, assignors to BWG Bergwerk-Und Walzwerk-Machinenbau GMBH, Duisburg, Germany

Filed Nov. 2, 1994, Ser. No. 333,556

Claims priority, application Germany, Jul. 7, 1994, 44 23 664.6

Int. Cl.[6] C21D *8/02*

U.S. Cl. 148—610 **15 Claims**



1. A method of producing cold-rolled stainless-steel or titanium-alloy strip from hot-rolled stainless-steel or titanium-alloy strip, said method comprising the steps of, in a single continuous line and in succession in said line:

(a) descaling a hot-rolled stainless-steel or titanium-alloy strip while displacing said strip along said single continuous line by at least one of the steps of:

(a1) shot blasting the hot-rolled stainless-steel or titanium-alloy strip, and

(a2) brush polishing the hot-rolled stainless- steel or titanium-alloy strip, to produce a descaled hot-rolled stainless-steel or titanium-alloy strip;

(b) thereafter cold rolling the descaled hot-rolled stainless-steel or titanium-alloy strip to a final strip thickness while displacing said strip along said single continuous line to produce a cold-rolled descaled stainless-steel or titanium-alloy product;

(c) subsequently annealing said cold-rolled descaled stainless-steel or titanium-alloy product while displacing said strip along said single continuous line to produce an annealed strip; and

(d) thereafter pickling the annealed strip while displacing same along said single continuous line, thereby forming the cold-rolled stainless-steel or titanium-alloy strip.

5,554,236

METHOD FOR MAKING LOW NOISE SIGNAL TRANSMISSION CABLE

David T. Sioples, and Grant Walter, both of Newark, Del., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Division of Ser. No. 206,319, Mar. 3, 1994, Pat. No. 5,477,011. This application Jun. 1, 1995, Ser. No. 456,603

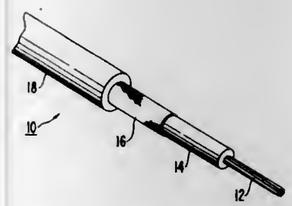
Int. Cl.[6] H01B *13/22*

U.S. Cl. 156—52 **8 Claims**

1. A method of producing a low noise electrical signal transmission cable which comprises:

providing a conductor;

providing a porous insulative layer comprising at least in part polytetrafluoroethylene;



laminating said insulative layer to a thermoplastic film layer at a temperature above a melt temperature of the thermoplastic film layer;

stretching said laminate at a temperature above the melt temperature of the thermoplastic;

providing a shield layer surrounding the insulative layer; and

bonding the laminate in fixed relative position to the shield to avoid separation and movement between the laminate and the shield during use thereby reducing the formation of triboelectric currents resulting from said movement.

5,554,237

FIBER REINFORCED PLASTIC PRODUCT AND AN INDICATION METHOD THEREOF

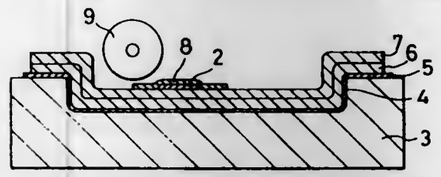
Kuniyuki Harada, Ohta; Kazutaka Sawada, Isesaki; Yoshiteru Hosoya, Sawa County, and Tetsuo Shibusawa, Ohta, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 193,547, Feb. 8, 1994, Pat. No. 5,464,671. This application May 25, 1995, Ser. No. 449,886

Claims priority, application Japan, Feb. 26, 1993, 5-62934

Int. Cl.[6] B32B *31/00;31/04;31/06;31/10*

U.S. Cl. 156—60 **12 Claims**



1. An indication method for a fiber reinforced plastic product made by alternatively overlaying a first uncured fiber reinforced thermoset resin mat on a second fiber reinforced thermoset resin mat in a mold, comprising the steps of:

laying on one of said fiber reinforced thermoset resin mats a label having information about a material for at least one of said first and second fiber reinforced thermoset resin mats;

covering said label by laying a transparent, uncured thermoset resin mat with transparent fiber reinforcement over said label; and

consolidating said product by applying pressure to said product in said mold.

5,554,238

METHOD OF MAKING RESILIENT BATT

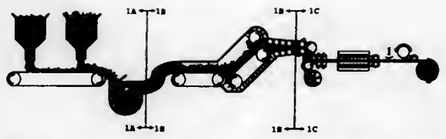
Brent W. English, Barneveld, Wis., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 155,253, Nov. 22, 1993, Pat. No. 5,418,031. This application Dec. 27, 1994, Ser. No. 364,358

Int. Cl.[6] B32B *31/12*; D04H *1/54*

U.S. Cl. 156—62.2 **11 Claims**

1. A method of making a resilient batt suitable for use as a thermal insulation, the method comprising the steps of:



mixing cellulosic particulates and thermoplastic fibers to form a mixture in which the cellulosic particulates are entangled by the thermoplastic fibers, wherein the cellulosic particulates include cellulosic particles and cellulosic fibers, the cellulosic particles being substantially 1–10 mm in diameter and the cellulosic fibers being substantially 0.5–3.0 mm in length and wherein the thermoplastic fibers are 3–15% of the mixture by weight, are 1–6 denier and are 2–15 cm in length; and

forming an insulating batt from the mixture; and

heat treating at least one surface of the batt to melt the thermoplastic fibers at the at least one surface of the batt without melting the thermoplastic fibers in the interior of the batt to form a heat treated batt having at least one skin wherein the thermoplastic fibers in the interior of the heat treated batt are unmelted and are joined to one another only by entanglement and wherein the batt is capable of being compressed, rolled-up and confined in rolled-up form and returning to its original shape upon removal of the confinement.

5,554,239

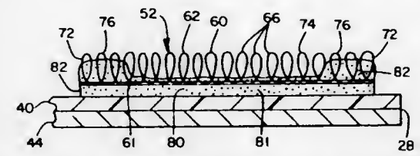
METHOD OF MANUFACTURING A FASTENING SYSTEM FOR AN ABSORBENT ARTICLE

Paul J. Datta, Appleton, and Michael A. Machurick, Little Chute, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 366,077, Dec. 28, 1994, Pat. No. 5,476,702. This application May 5, 1995, Ser. No. 435,124

Int. Cl.[6] A44B *18/00*; A61F *13/62*; B32B *31/04;31/12*

U.S. Cl. 156—66 **15 Claims**



1. A method of forming a fastening component, comprising the steps of:

providing a first fastener comprising a flexible fabric;

providing substrate; and applying an adhesive substance between the first fastener and the substrate and bonding the adhesive substance to both the first fastener and the substrate, the adhesive substance comprising:

a first zone having a first basis weight greater than zero; and

a second zone having a second basis weight at least about 1.5 times greater than the first basis weight.

5,554,240

THERMALLY CONDUCTIVE JOINING METHOD AND JOINT

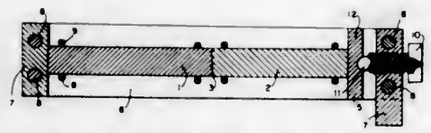
William W. Toy, 511 Andros La., Indian Harbour Beach, Fla. 32937

Filed May 1, 1995, Ser. No. 431,426

Int. Cl.[6] B32B *31/02*

U.S. Cl. 156—83 **8 Claims**

1. A method of joining metal surfaces of parts together to provide a high strength thermally conductive joint comprising the steps of:



(A) applying an adhesive filled with particles having a particle size of less than about 0.050 millimeters, a hardness greater than that of the metals to be joined and having a thermal conductivity greater than that of said adhesive to at least one of said metal surfaces;
(B) forcing said surfaces together with a surface pressure of at least about 35 Kg/sq cm by application of an external unidirectional force; and
(C) curing the adhesive while the surfaces are held together with said force of at least about 35 Kg/sq cm, in which said adhesive is a thermoset adhesive and said force is applied during curing by an apparatus at least partially enclosing said parts, which apparatus expands less than said parts when heated to a temperature at which said adhesive cures, said force being applied by differential thermal expansion of said parts relative to said apparatus.

5,554,241

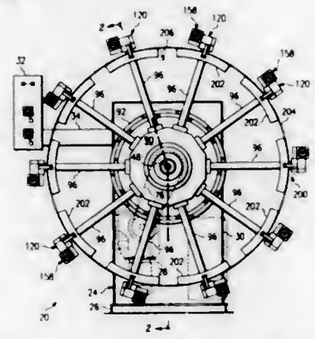
APPARATUS AND METHOD FOR RETREADING A TIRE

Michael J. King, Concord; Robert A. Flynn, San Francisco, and Henry Torrez, San Leandro, all of Calif., assignors to Oliver Rubber Company, Oakland, Calif.

Division of Ser. No. 45,914, Apr. 12, 1993, Pat. No. 5,354,406, which is a continuation-in-part of Ser. No. 908,228, Jul. 2, 1992, abandoned. This application Sep. 22, 1994, Ser. No. 311,581

Int. Cl.[6] B29C *73/00*

U.S. Cl. 156—96 **8 Claims**



1. A method for installing an adjustable tread mold having a plurality of mold segments on a prepared tire carcass having a strip of retread material disposed on the exterior of the tire carcass, including the steps of:
placing resilient retaining means on the mold segments to urge the mold segments toward the tire carcass;
releasably securing the plurality of mold segments to a tread mold loading machine;
positioning the plurality of mold segments on the tread mold loading machine to define in part an expanded opening to receive the tire carcass therein;
mounting the tire carcass on the tread mold loading machine;
positioning the tire carcass within the expanded opening defined in part by the mold segments;
moving the mold segments to contact the retreading material on the exterior of the tire carcass;
releasing the mold segments from the tread loading machine after engagement with the retreading material;
maintaining the mold segments on the retreading material with the resilient retaining means; and
removing the tire carcass from the tread mold loading machine with the tread mold engaged with the retreading material.

5,554,242

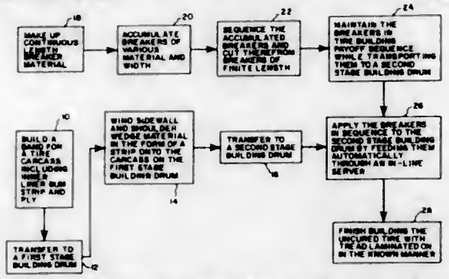
METHOD FOR MAKING A MULTI-COMPONENT TIRE

Thomas E. Brown, Uniontown; Jon D. Carlson, Medina; Michael W. Cook, Uniontown; Michael Mihalik, St. Marys, all of Ohio, and Jack A. Davisson, Luxembourg, Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 869,517, May 30, 1986, abandoned. This application Jun. 9, 1988, Ser. No. 205,053

Int. Cl.[6] B29D *30/06*

U.S. Cl. 156—111 **5 Claims**



1. In a method of making a tire where a band to make up the tire carcass is formed by adding gum strip to an inner liner which is covered with a ply to form the band which is then transferred to a first tire building position for the addition of sidewall, shoulder wedge and beads from which position there is transfer to a second tire building position for final shaping of the uncured tire and the addition of breakers and tread rubber, the improvement comprising: forming the sidewall and shoulder wedge by applying a plurality of turns of elastomer strip to obtain their shape on the carcass at the first tire building position.

5,554,243

METHOD FOR MANUFACTURING ABSORBENT MEMBER FOR ABSORBENT ARTICLE

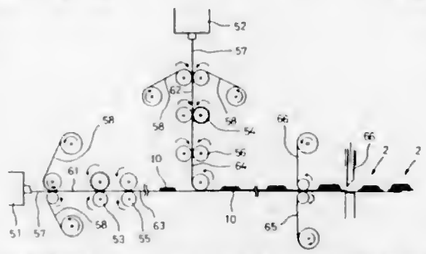
Takamitsu Igaue, and Tsutomu Kido, both of Kawanoe, Japan, assignors to Uni-Charm Corporation, Ehime-ken, Japan

Division of Ser. No. 272,316, Jul. 8, 1994. This application Jun. 20, 1995, Ser. No. 493,054

Claims priority, application Japan, Jul. 15, 1993, 5-175258

Int. Cl.[6] B32B *31/08*

U.S. Cl. 156—164 **3 Claims**



1. A method for manufacturing an absorbent member which has a liquid permeable covering sheet and a reticulated sheet for covering an absorbent core and is adapted to be interposed between a liquid permeable topsheet and a liquid impermeable backsheet of an absorbent article, said method comprising the steps of:

(a) applying to a continuously delivered, thermoplastic synthetic resin sheet a number of slits arranged in a moving direction of said resin sheet in a predetermined pattern;
(b) stretching said resin sheet to form said reticulated sheet having a transverse central region having large size openings created by said slits to define a relatively high open ratio and transverse opposite side regions having smaller size openings relative to the large size openings and also created by said slits to define a relatively low open ratio;
(c) locating said central region of the reticulated sheet over a central region of said absorbent core to cover said absorbent core; and
(d) covering said absorbent core and said reticulated sheet with said covering sheet.

5,554,244

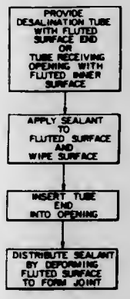
METHOD OF JOINING FLUTED TUBE JOINT

Peter C. Ruggles, and Jack S. Snodgress, both of Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Division of Ser. No. 245,193, May 17, 1994, Pat. No. 5,472,243. This application Jun. 7, 1995, Ser. No. 481,577

Int. Cl.[6] F16L *13/10;13/14*

U.S. Cl. 156—196 **5 Claims**



1. A method of joining a tube to an opening in a tube receiving member comprising the steps of:
a) providing a tube with a grooved surface on an end portion thereof;
b) applying a sealant to the end portion of said tube;
c) inserting said end portion into an opening in a tube receiving member; and
d) uniformly distributing said sealant by deforming said end portion to form a joint between said end portion and said tube receiving member, wherein said distributing step further comprises deforming said grooved surface by working the inner surface of the tube to enlarge the diameter of the tube.

5,554,245

BIAXIALLY ORIENTED SEALABLE POLYPROPYLENE FILM HAVING IMPROVED BARRIER PROPERTIES

Detlef E. Schuhmann, Kiedrich; Herbert Peiffer, Mainz-Finthen; Ursula Murschall, Nierstein, and Gunter Schloegl, Kelkheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 154,029, Nov. 18, 1993, Pat. No. 5,433,983, which is a continuation-in-part of Ser. No. 734,157, Jul. 22, 1991, abandoned. This application Jul. 17, 1995, Ser. No. 503,028

Claims priority, application Germany, Jul. 21, 1990, 40 23 272.7

Int. Cl.[6] B29C *47/00*

U.S. Cl. 156—244.24 **20 Claims**

1. A process for producing a sealable film comprising
(A) producing by coextrusion through a slot die a cast film comprising
(i) a base layer comprising polypropylene and a hydrocarbon resin having a softening point of at least 140°C., and
(ii) at least one top layer comprising
(a) an ethylene/propylene copolymer having an ethylene content of not more than about 10% by weight,
(b) a propylene/1-butene copolymer,
(c) a propylene/ethylene/alpha-olefin terpolymer, or
(d) a blend of two or more of (a), (b) and (c), wherein said top layer comprises an antiblocking agent with an average particle size of 1 to 6 μm,
(B) chilling the cast film on a chill roll; and then
(C) orienting the film by biaxial stretching in the longitudinal and transverse directions.

5,554,246

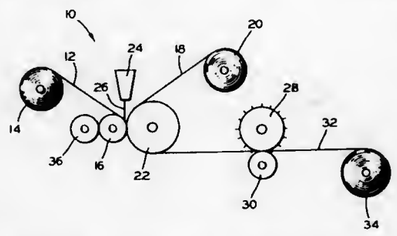
AIR INFILTRATION BARRIER LAMINATE AND PROCESS FOR PREPARING SAME

James Anwyll, Jr., Ponte Veda Beach, Fla., assignor to Anthony Industries, Inc., Adrian, Mich.

Filed Jan. 12, 1995, Ser. No. 371,835

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—253 **9 Claims**



1. A process for preparing an air infiltration barrier laminate, comprising:
providing a woven polyolefin fabric;
providing a polyolefin film;
extrusion coating a layer of molten resin onto the woven polyolefin fabric;
contacting the polyolefin film to the layer of resin, and laminating together the woven polyolefin fabric, the resin, and the polyolefin film; and
perforating the laminated structure.

5,554,247

METHOD OF MANUFACTURING A HIGH DENSITY INK JET PRINTHEAD ARRAY

John R. Pies; David B. Wallace, both of Dallas, and Donald J. Hayes, Plano, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Continuation of Ser. No. 149,717, Nov. 9, 1993, Pat. No. 5,433,809, which is a continuation of Ser. No. 746,036, Aug. 16, 1991, abandoned. This application Apr. 11, 1995, Ser. No. 420,152

Int. Cl.[6] B32B *31/18*

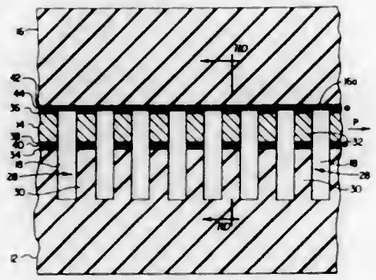
U.S. Cl. 156—268 **27 Claims**

1. A method of manufacturing a channel array for an ink jet printhead, comprising the steps of:
providing a main body portion having a first surface;
providing an intermediate body portion having first and second surfaces, said intermediate body portion formed of a piezoelectric material polarized in a first direction;
conductively bonding said first surface of said intermediate body portion to said first surface of said main body portion such that said direction of polarization is generally parallel to said first surface of said main body portion;

5,554,249

MAGNETRON PLASMA PROCESSING SYSTEM

lens array, and optically detecting a positional displacement of the of the microlens array with respect to the matrix liquid crystal display; and



forming a plurality of parallel grooves in said intermediate body portion and said main body portion, said grooves being formed in a second direction generally perpendicular to said first direction;

providing a top body portion having a first surface; and

conductively bonding said first surface of said top body portion to said second surface of said intermediate body portion.

5,554,248

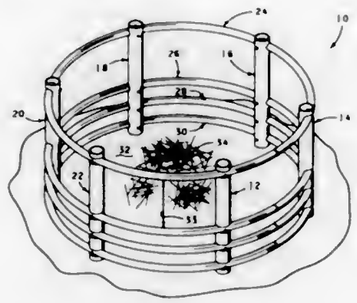
METHOD FOR MANUFACTURING A LIVESTOCK FEEDER

Joe L. Payne, Rte. 2, Box 162, Kaw, Okla. 74641

Continuation-in-part of Ser. No. 170,489, Dec. 20, 1993. This application Sep. 19, 1994, Ser. No. 308,183

Int. Cl.[6] B32B *31/00;* **B29C** *65/00*

U.S. Cl. 156—304.2 **43 Claims**



1. A method for manufacturing a livestock feeder for retaining hay so that livestock can consume the hay without trampling on the hay, the method comprising the steps of:

forming a plurality of polymeric retainer members having angular deflection characteristics and memory;

forming a plurality of leg members; and

connecting the leg members and the retainer members together such that the leg members and the retainer members cooperate to define a hay retaining space with the retainer members horizontally, spatially disposed to permit access to hay in the hay retaining space by livestock while preventing livestock from trampling hay in the hay retaining space and the leg members spatially disposed to permit the polymeric retainer members to be angularly deflected by pressure exerted thereon and restored to a substantially non-deflected position upon removal of such pressure.

5,554,249

MAGNETRON PLASMA PROCESSING SYSTEM

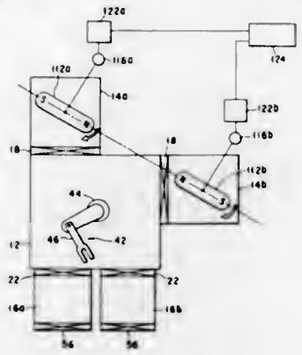
Makoto Hasegawa, Kawasaki; Tsuyoshi Saito; Fumihiko Higuchi, both of Tokyo; Hideaki Amano, Zama; Katsunori Naitoh, Yamanashi-ken; Takashi Tozawa, Yamanashi-ken; Tatsuya Nakagome, Yamanashi-ken; Keiki Ito, Nirasaki, and Kouji Suzuki, Yamanashi-ken, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Filed Feb. 28, 1995, Ser. No. 395,303

Claims priority, application Japan, Feb. 28, 1994, 6-054671; Oct. 28, 1994, 6-289266

Int. Cl.[6] H01L *21/00;* **C23C** *14/34;16/00*

U.S. Cl. 156—345 **20 Claims**



1. A system for processing a target surface of a substrate using a plasma, said system comprising:

a container defining a vacuum processing space for storing and processing said substrate;

a supply system for introducing a gas into said container, said gas to be made into a plasma;

an exhaust system for exhausting said container;

a pair of counter electrodes facing each other within said container;

a support member, disposed within said container, for supporting said substrate such that said target surface is exposed to said processing space;

a power supply for applying a voltage between said counter electrodes, thereby generating an electric field;

a first magnet mechanism driven by a first motor for generating a first magnetic field between said counter electrodes, said first magnetic field having a N-S axis crossing said electric field and rotating;

a second magnet mechanism driven by a second motor for generating a second magnetic field in a separate second chamber having a rotating N-S axis, said first and second magnetic fields having parallel rotational planes; and

a controller for controlling said first and second motors with respect to rotation of said first and second magnetic fields, such that when one of the first and second magnetic fields is rotated, the other is rotated at equal speed.

5,554,250

APPARATUS FOR MICROPERFORATING ZIPPERED FILM USEFUL FOR MANUFACTURING A RECLOSABLE ZIPPERED BAG

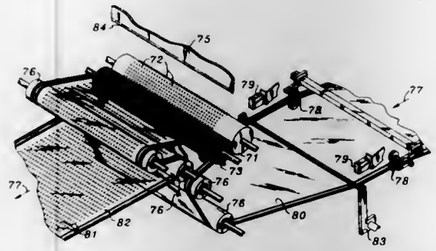
Brain C. Dais, Sanford, and Jose Porchia, Midland, both of Mich., assignors to DowBrands L.P., Indianapolis, Ind.

Division of Ser. No. 114,801, Aug. 31, 1993, Pat. No. 5,405,561. This application Nov. 30, 1994, Ser. No. 346,714

Int. Cl.[6] B32B *35/00*

U.S. Cl. 156—353 **2 Claims**

1. An apparatus for preparing a microperforated zippered thermoplastic film web stock useful for producing a zippered produce bag comprising:



(a) means for providing a web of thermoplastic film with zipper profile members on at least one side of the web, the zipper profile members spaced apart on the web forming a central web area between the profiles;

(b) means for feeding the web between the nip of a cylinder having a plurality of heated pins and a pressure roller such that a plurality of microholes are formed in the central web area between the zipper profile members;

(c) means for maintaining the web in feeding alignment between the pin cylinder and the pressure roller such that the web area between the profile members is microperforated in a uniform microhole size; and

(d) a means for detecting the film web wrapping around the pin cylinder.

5,554,251

OPTICAL DEVICE ASSEMBLE APPARATUS

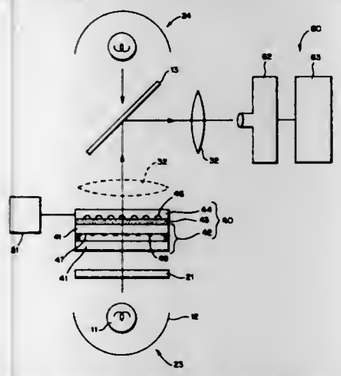
Noriko Watanabe, Nara; Hiroshi Nakanishi, Tenri; Kazuhiro Shibata, Kashihara; Hiroshi Hamada, Nara, and Fumiaki Funada, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 862,626, Apr. 1, 1992, abandoned. This application Jul. 29, 1994, Ser. No. 282,419

Claims priority, application Japan, Apr. 3, 1991, 3-071208; Apr. 4, 1991, 3-071929; Oct. 30, 1991, 3-285132

Int. Cl.[6] B32B *35/00*

U.S. Cl. 156—379.8 **21 Claims**



1. An optical apparatus for adhering an optical device including a microlens array and a matrix liquid crystal display, wherein the microlens array has a focal length and the array is separated by the focal length from the matrix liquid crystal display, and; the optical apparatus comprising:

light source means for emitting light for positional alignment and light for adhesion toward the optical device;

position detecting means for receiving the light for positional alignment from the optical device, said position detecting means monitoring moiré fringes formed by the light for positional alignment transmitted through or reflected by the matrix liquid crystal display and passing through the microlens array, and optically detecting a positional displacement of the of the microlens array with respect to the matrix liquid crystal display; and

a positional alignment mechanism means for supporting the optical device and moving the micro lens array and matrix liquid crystal display to be movable with respect to each other and positionally aligning the micro lens array and the matrix liquid crystal display in accordance with a detecting result of the position detecting means;

wherein the light for adhesion is radiated to a photo-curing adhesive resin interposed between the the positionally aligned microlens array and matrix liquid crystal display.

5,554,252

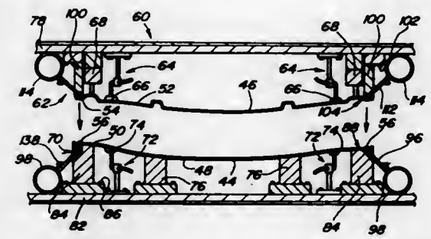
HOT AND COOL AIR BONDING APPARATUS

Hugh C. Foran, Utica, Mich., assignor to The Budd Company, Troy, Mich.

Filed Jan. 27, 1995, Ser. No. 379,873

Int. Cl.[6] B32B *31/04;31/20*

U.S. Cl. 156—497 **26 Claims**



1. An apparatus for bonding a first member to a second member, said first member having a mating surface with an uncured adhesive located thereon, said apparatus comprising:

first and second nest means for receiving and supporting the first member and the second member in a spaced relationship;

moving means for controlling relative movement of the nest means such that a mating surface of the second member contacts the adhesive located on the mating surface of the first member;

switchable heating and cooling means for first blowing pressurized heated air about outer surfaces of the first member and the second member for heating the adhesive, and thereafter, blowing pressurized cooler air thereto while the members are supported in the first and second nest means;

metallic tubular members carried by and thermally insulated from at least one of the nest means and including a plurality of apertures through which the pressurized heated and cooler air is blown; and

air conduit means, located on an outer periphery of at least one of the nest means, for delivering the pressurized heated and cooler air from the switchable heating and cooling means to the metallic tubular members.

5,554,253

TUBE RESTORING APPARATUS AND TUBE RESTORING METHOD

Takahiko Watanabe, Shizuoka-ken, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 22, 1994, Ser. No. 215,821

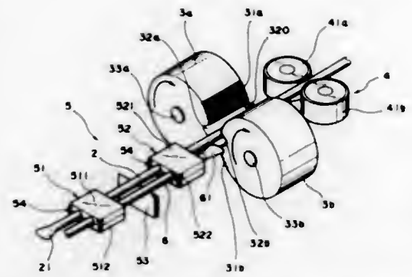
Claims priority, application Japan, Apr. 2, 1993, 5-100542

Int. Cl.[6] B29C *73/00*

U.S. Cl. 156—503 **4 Claims**

1. A system for connecting two flexible tubes, comprising:

a tube connecting device for connecting by fusion a first flexible tube having an inner passage to a second flexible tube having an inner passage, the tube connecting device including a



heated cutting element for cutting ends of the first and second tubes, the fusion of the first and second tubes producing a resulting tube having a deformed portion in which the inner passage is at least partially narrowed due to an at least partially fused inner surface of the resulting tube;

a tube restoring device for separating the fused inner surface of the resulting tube, said tube restoring device including a pair of press members which each have a press surface, said press members being spaced apart to define a space between the press surfaces through which the resulting tube passes, the tube restoring device including a moving device connected to at least one of the press members to move the at least one press member with the resulting tube positioned between the press surfaces to impart a compression force to the deformed portion of the resulting tube and thereby effect separation of the at least partially fused inner surface of the resulting tube; and

a tube feed mechanism for advancing the first tube to a point at which a portion of the first tube is located at the tube connecting device and for advancing the resulting tube to position the deformed portion of the resulting tube between the press members.

5,554,254

POST CONTACT LAYER ETCH BACK PROCESS WHICH PREVENTS PRECIPITATE FORMATION

Yuan-Chang Huang, and Kuang-Hui Chang, both of Hsin-Chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsin-Chu, Taiwan

Filed Mar. 16, 1995, Ser. No. 405,077

Int. Cl.[6] H01L *21/306*

U.S. Cl. 156—625.1 **29 Claims**

1. The method of preventing a formation of precipitates after etching back a contact layer on a surface of a substrate, the substrate surface including a barrier layer that contains titanium, the method comprising the steps of:

depositing a barrier layer containing titanium on the substrate surface,

depositing a contact layer over said barrier layer,

etching back said contact layer with a fluorine containing gas to expose said barrier layer, and

rinsing the substrate with de-ionized water within 4 hours of the completion of the etching of the contact layer.

5,554,255

METHOD OF AND APPARATUS FOR A DIRECT VOLTAGE ARC DISCHARGE ENHANCED REACTIVE TREATMENT OF OBJECTS

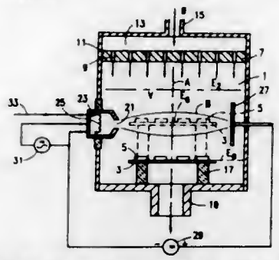
Johann Karner, Feldkirch, Austria, and Erich Bergmann, Mels, Switzerland, assignors to Balzers Aktiengesellschaft, Furstentum, Liechtenstein

Division of Ser. No. 757,712, Sep. 11, 1991, Pat. No. 5,336,326. This application Apr. 4, 1994, Ser. No. 222,378

Claims priority, application Germany, Sep. 14, 1990, 40 29 268.1

Int. Cl.[6] B44C *1/22*; C23C *16/00*

U.S. Cl. 156—643.1 **19 Claims**



1. A method for vacuum process treatment of at least a surface portion of a workpiece, comprising the steps of:

(a) generating a DC plasma discharge by applying a DC voltage between an anode arrangement and a cathode arrangement in a vacuum chamber to produce an electric field in a discharge space between said anode arrangement and said cathode arrangement;

(b) feeding electrically charged particles into said discharge space;

(c) continuously introducing fresh reactive gas into said discharge space;

(d) continuously removing gases and gaseous reaction products from said discharge space;

(e) controlling flow direction of said fresh reactive gas introduced during step (c) so that said flow direction is substantially parallel to an imaginary line representing a DC arc discharge space and extending between said anode arrangement and said cathode arrangement and where the reactive gas is introduced in a region adjacent to one of the cathode and anode arrangements and is removed in a region adjacent to another one of the anode and cathode arrangements to thereby control the flow direction; and

(f) positioning said workpiece to expose a workpiece surface portion to said plasma discharge and said fresh reactive gas.

5,554,256

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A SEMICONDUCTOR BODY WITH FIELD INSULATION REGIONS FORMED BY GROOVES FILLED WITH INSULATING MATERIAL

Armand Pruijmboom; Ronald Koster; Cornelis E. Timmering, and Ronald Dekker, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

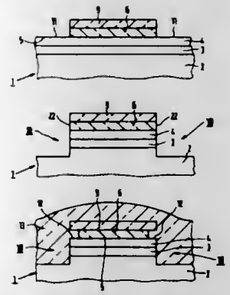
Filed Sep. 22, 1994, Ser. No. 310,824

Claims priority, application Belgium, Sep. 23, 1993, 09300997

Int. Cl.[6] H01L *21/00*

U.S. Cl. 156—643.1 **10 Claims**

1. A method of manufacturing a semiconductor device having a semiconductor body with field insulation regions formed by grooves filled with insulating material, comprising the steps of etching the grooves into the semiconductor body with the use of an etching mask formed on an auxiliary layer provided on a surface of the semiconductor body, removing the auxiliary layer from the portion of the surface situated next to the etching mask and from an edge of the surface situated below the etching mask, and



depositing a layer of the insulating material on the semiconductor body, whereby the grooves are filled and the edge of the surface situated below the etching mask is covered, and then treating the semiconductor body to remove material parallel to the surface down to said auxiliary layer and then removing the remaining portion of the auxiliary layer, the auxiliary layer being removed from the portion of the surface situated next to the etching mask before the grooves are etched into the semiconductor body, and the auxiliary layer being removed from the edge of the surface situated below the etching mask after the grooves have been etched into the semiconductor body.

5,554,257

METHOD OF TREATING SURFACES WITH ATOMIC OR MOLECULAR BEAM

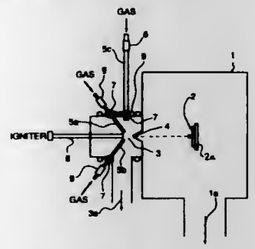
Kenetsu Yokogawa, Hachioji; Yoshimi Kawanami, Kokubunji, and Tatsumi Mizutani, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 5, 1994, Ser. No. 270,839

Claims priority, application Japan, Jul. 21, 1993, 5-179593

Int. Cl.[6] H01L *21/00*

U.S. Cl. 156—643.1 **19 Claims**



1. A method of generating one of a molecular or atomic beam for treating a sample surface, comprising the steps of:

preparing an apparatus comprising a vacuum reaction chamber, a vacuum sample chamber and an aperture through which reaction products produced in said vacuum reaction chamber pass to form a beam that is projected onto the sample in said vacuum sample chamber for treating the surface of the sample to be processed;

setting a sample within said vacuum sample chamber;

introducing at least two types of gases that react with one another into said vacuum reaction chamber;

initiating an explosion reaction or a combustion reaction of said two gases within said vacuum reaction chamber that generates said reaction products and translation energy for accelerating said reaction products; and

projecting said reaction products having said translation energy generated by said explosion reaction or said combustion reaction into said beam by passing said reaction products through said aperture onto the sample in said vacuum sample chamber for containing the sample to be processed.

5,554,258

FLOTATION PROCESS FOR MECHANICAL PULP USING A SURFACE ACTIVE AGENT

Hans U. Suess, Hasselroth; Norbert Nimmerfroh, Linsengericht, and Ralf Grimmer, Rodenbach, all of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 5, 1994, Ser. No. 238,746

Claims priority, application Germany, May 26, 1993, 43 17 466.3

Int. Cl.[6] D21C *1/00;9/16*

U.S. Cl. 162—24 **6 Claims**

1. A process for pretreating unbleached mechanical pulp, having a degree of beating of 70 to 80 Schopper-Reigler, obtained from the defiberization of wood prior to paper production and which pulp is subsequently bleached and made into paper, comprising subjecting said unbleached mechanical pulp obtained from wood to flotation in a flotation zone at a pH between 4 and < 7 using 0.01% to 1% by weight, based on the absolutely dry pulp, of a cationic surface active agent, removing the resulting froth containing organic acids, sugars, short-chain hemicelluloses, lignins and rosins in dissolved or colloidal form resulting from the defiberization of wood from the flotation zone and obtaining the pre-treated wood pulp.

5,554,259

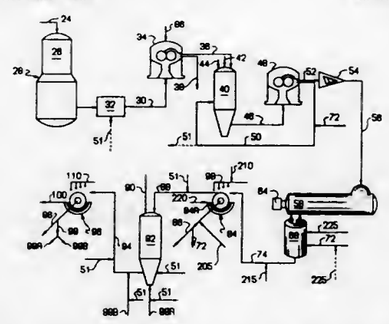
REDUCTION OF SALT SCALE PRECIPITATION BY CONTROL OF PROCESS STREAM PH AND SALT CONCENTRATION

Thomas P. Gandek, Trenton, N.J.; James C. Joseph, Yardley, Pa.; Michael A. Pikulin, Bound Brook; George Pangalos, Plainsboro, both of N.J., and Philip E. Bowden, Franklin, Va., assignors to Union Camp Patent Holdings, Inc., Wayne, N.J.

Filed Oct. 1, 1993, Ser. No. 130,619

Int. Cl.[6] D21C *9/08;9/153*

U.S. Cl. 162—48 **43 Claims**



1. A method for reducing or eliminating the formation of salt scale upon process equipment caused by precipitation of salts during the bleaching of pulp which comprises:

subjecting the pulp to a bleaching sequence which includes a plurality of pulp treatment steps, wherein at least one pulp treatment step is conducted under alkaline conditions and at least one pulp treatment step is conducted with ozone under acidic conditions;

generating an acidic filtrate stream which contains salts therein by washing or pressing the pulp after the acidic ozone treatment step;

combining at least a portion of the filtrate stream with a caustic material and pulp to cause the salts to associate with the pulp, thus removing the salts from the filtrate stream to reduce or eliminate the formation of salt scale upon process equipment during the bleaching of the pulp; and

directing the pulp and associated salts to at least one subsequent bleaching or brightening step.

5,554,260

METHOD AND USE INVOLVING NAPHTHALENE SULPHONATE SALT(S) AND POLYETHYLENE OXIDE, TO IMPROVE RETENTION AND DRAINAGE

Georges Radu, Brossard, and Pierre Langevin, Jonquiere, both of Canada, assignors to E.QU.I.P. International Inc., Quebec, Canada

PCT No. PCT/CA92/00497, § 371 Date Oct. 12, 1994, § 102(e) Date Oct. 12, 1994, PCT Pub. No. WO94/11575, PCT Pub. Date May 26, 1994

PCT Filed Nov. 9, 1992, Ser. No. 256,455

Int. Cl.[6] D21H *21/10*

U.S. Cl. 162—158 **34 Claims**

1. In a method for the production of paper, the improvement wherein one or several naphthalene sulphonate salt(s) selected from the group consisting of sodium, potassium, ammonium, calcium and aluminum salt(s) of naphthalene sulphonate, in a granulated form or as a condensed or diluted solution, and a solution of one or several polyethylene oxide having a molecular weight varying from 1×10^6 to 13×10^6 are admixed with a mixture comprising lignocellulosic fibers and fines and an aqueous medium, providing that:

said polyethylene oxide is admixed in said mixture when said mixture already contains at least a part of said naphthalene sulphonate salt(s);

the polyethylene oxide being admixed in such an amount as to represent from 10 to 700 grams per ton of dry matter of said mixture; and

the naphthalene sulphonate salt(s) being admixed in such an amount as to represent from 50 to 1500 grams per ton of dry matter of said mixture.

5,554,261

DYEING OF PAPER

Claudia Nilz, Roedersheim; Norbert Sendhoff, Gruenstadt; Walter Breitschaft, Ludwigshafen; Manfred Zillig, Mannheim, and Primoz Lorencak, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP93/02580, § 371 Date Mar. 15, 1995, § 102(e) Date Mar. 15, 1995, PCT Pub. No. WO94/08092, PCT Pub. Date Apr. 14, 1994

PCT Filed Sep. 23, 1993, Ser. No. 397,060

Claims priority, application Germany, Oct. 1, 1992, 42 22 040.8

Int. Cl.[6] D21H *21/28*

U.S. Cl. 162—162 **9 Claims**

1. A process for dyeing paper during paper manufacture by adding water-soluble anionic dyes and cationic polymers to a paper pulp as fixing agents in an amount sufficient to fix said dyes and removing water from said paper pulp with the formation of dyed paper, said cationic polymers comprising hydrolyzed copolymers of N-vinylcarboxamides which comprise:

a) 40–80 mol % of vinylamine units; and

b) 60–20 mol % of units of vinyl alcohol, acrylonitrile, vinylurea and a mixture thereof, in copolymerized form.

5,554,262

LASER CURTAIN EDGE TRACKING SYSTEMS FOR PAPERMAKING MACHINES

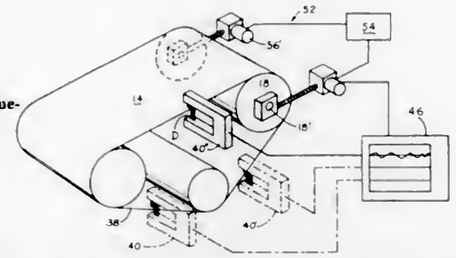
John S. Turner, Rochester, N.H., assignor to Wangner Systems Corp., Greenville, S.C.

Filed Jul. 11, 1994, Ser. No. 272,808

Int. Cl.[6] D21F *1/100*; G01V *9/04*

U.S. Cl. 162—198 **14 Claims**

12. An edge tracking apparatus in combination with a papermaking machine, said papermaking machine including a plurality rotating support, idler and drive rolls acting to support and circulate a continuous papermaking fabric through said papermaking



machine, said support, idler and drive rolls each having an axis of rotation transverse the direction of movement of said continuous paper forming fabric; wherein said tracking apparatus comprises:

an edge sensor comprising a laser scanner having a transmitting arm which delivers a laser screen of pre-selected volume and a receiving arm which receives said laser screen and produces electrical signals in response to the volume of screen received, said laser scanner being arranged adjacent a longitudinal edge of said papermaking fabric, said laser scanner being operative to continuously monitor said moving edge of said papermaking fabric to detect lateral position changes of said longitudinal edge relative to a desired lateral position during movement of said continuous papermaking fabric through said papermaking machine, said transmitting arm generating laser screens of varying volume depending upon the position of said longitudinal edge relative to said desired lateral position;

a guide roll over which said papermaking fabric passes;

a guide roll mounting structure mounting said guide roll for angular displacement and a drive selectively operable to displace said guide roll relative to said mounting structure;

a recording unit operative to record the linear position of said longitudinal edge during movement of said continuous paper forming fabric through said papermaking machine;

a controller, said controller being operative to receive said electrical signals generated by said receiving arm and to produce control signals operative to activate said drive to displace said guide roll to steer said longitudinal edge through minute longitudinal positions and into alignment with said desired lateral position, said controller further producing second control signals in response to said electrical signals to activate said recording unit to graphically plot the positions of said longitudinal edge relative to said desired lateral position during movement of said paper forming fabric through said papermaking machine; wherein,

said edge tracking apparatus acts to simultaneously maintain said edge aligned with said desired lateral position and plot the position of said edge during operation of said papermaking machine.

5,554,263

METHOD FOR REMOVING OR INSTALLING ROLLS IN A PAPER MACHINE OR THE LIKE

Ossi Laakko, Kokkola, Finland, assignor to EWM Technology Ltd. OY, Kokkola, Finland

PCT No. PCT/FI92/00154, § 371 Date Nov. 23, 1993, § 102(e) Date Nov. 23, 1993, PCT Pub. No. WO92/20598, PCT Pub. Date Nov. 26, 1992

PCT Filed May 20, 1992, Ser. No. 142,337

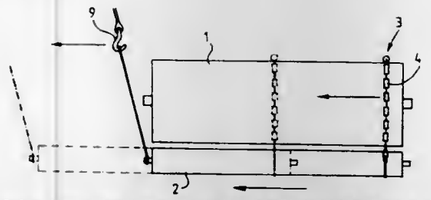
Claims priority, application Finland, May 24, 1991, 912531

Int. Cl.[6] D21F *1/24*

U.S. Cl. 162—199 **13 Claims**

1. A method for removing and installing rolls in a paper machine substantially in a direction of a longitudinal axis of the rolls, comprising the steps of:

supporting an auxiliary displacing means to a substantially horizontal support structure of the paper machine above the roll to be displaced, the auxiliary displacing means being mounted to move longitudinally along the support structure;



fixing immovably one end of the roll to be displaced to the auxiliary displacing means so as to be suspended from it, and supporting the other end of the roll to be displaced by a displacing device; and

moving the roll to be displaced by the displacing device substantially in the direction of the longitudinal axis of the roll to be displaced so that the auxiliary displacing means fixed to one end of the roll to be displaced moves longitudinally along the support structure while roll to be displaced moves with it;

wherein another roll positioned above the roll to be displaced is used as the support structure.

5,554,264

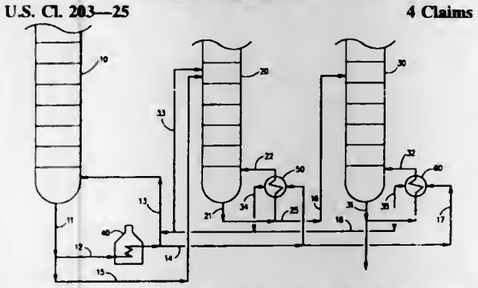
MULTIPLE REBOILER SYSTEM

Angel Sy, Pasadena, Tex., assignor to Chemical Research & Licensing Company, Pasadena, Tex.

Division of Ser. No. 258,934, Jun. 13, 1994, Pat. No. 5,457,277. This application Apr. 24, 1995, Ser. No. 426,986

Int. Cl.[6] B01D *3/00*

U.S. Cl. 203—25 **4 Claims**



1. In a process for the production of cumene wherein benzene is reacted with propylene in a distillation column reactor, which has a first circulating reboiler stream, unreacted benzene and propylene are stripped from the heavier cumene which is taken as bottoms product, and the bottoms product from the distillation column reactor is further processed in a second and a third distillation column, each of said second and third distillation columns having second and third circulating reboiler streams, respectively, the improvement comprising providing heat to the circulating reboiler stream of said distillation column reactor in a fired heater to form a heated circulating reboiler stream, taking a portion of said heated circulating reboiler stream to heat the second and third circulating reboiler streams of said second and third distillation columns and recombining said portion of said heated circulating reboiler stream with said first circulating reboiler stream after heating said second and third circulating reboiler streams.

3. In a process for the production of cumene wherein benzene is reacted with propylene in a distillation column reactor, which has a first circulating reboiler stream, unreacted benzene and propylene are stripped from the heavier cumene which is taken as bottoms product, and the bottoms product from the distillation column reactor is further processed in a second and a third distillation column, each of said second and third distillation columns having second and third circulating reboiler streams, respectively, the improvement comprising providing heat to the circulating reboiler stream of said distillation column reactor in a fired heater to form a heated circulating reboiler stream, taking a portion of said heated circulating reboiler stream to heat the second and third circulating reboiler streams of said second and third distillation columns and returning said portion of said heated circulated reboiler stream to said fired heater after heating said second and third circulating reboiler streams.

5,554,265

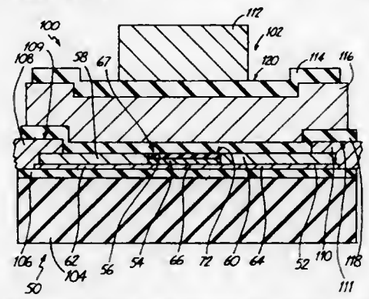
METHOD OF MAKING A MAGNETORESISTIVE SENSOR

Peter L. Bonyhard, Scotts Valley, Calif.; James F. Dolejsi, Chanhassen, Minn.; Charles H. Tolman, Bloomington, Minn., and William P. Wood, Edina, Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Division of Ser. No. 380,820, Jan. 30, 1995, Pat. No. 5,495,378. This application Apr. 13, 1995, Ser. No. 421,543

Int. Cl.[6] C23C *14/34*; G11B *5/42*; B05D *5/12*

U.S. Cl. 204—192.35 **2 Claims**



1. A method of forming a magnetoresistive sensor comprising:

depositing a magnetoresistive layer upon a substrate;

depositing a spacer layer upon the magnetoresistive layer;

depositing a soft adjacent layer upon the spacer layer;

depositing a photoresist layer upon a central region of the soft adjacent layer, the photoresist layer defining a central region in each of the soft adjacent layer, the spacer layer, and the magnetoresistive layer, the photoresist layer also at least partially defining first and second outer regions in each of the soft adjacent layer, the spacer layer, and the magnetoresistive layer;

removing the first and second outer regions in each of the soft adjacent layer and the spacer layer;

depositing permanent magnet material upon the first and second outer regions of the magnetoresistive layer and upon the photoresist layer, the permanent magnet material deposited upon the first and second outer regions of the magnetoresistive layer forming first and second permanent magnets; and

removing the photoresist layer and thereby removing the permanent magnet material deposited upon the photoresist layer, the permanent magnets remaining on the first and second outer regions of the magnetoresistive layer each having a surface which is essentially coplanar with a surface of the soft adjacent layer.

5,554,266

SEMICONDUCTOR DEVICE MANUFACTURING APPARATUS

Rintarou Okamoto, Kitakyushu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 231,709, Apr. 22, 1994, abandoned. This application Jun. 2, 1995, Ser. No. 460,068

Claims priority, application Japan, Apr. 23, 1993, 5-096396

Int. Cl.[6] C23C *14/34*

U.S. Cl. 204—298.15 **2 Claims**

1. A semiconductor device manufacturing apparatus for processing a semiconductor wafer housed in a reaction vessel, the apparatus comprising:

a support base with a substantially flat surface;

an insulative holding member disposed on top of and extending an entire length of the substantially flat surface of the support base, for holding the semiconductor wafer, the support base and the insulative holding member being housed in the reaction vessel,

wherein an area of the insulative holding member facing the semiconductor wafer is larger than an area of the semiconductor wafer and the insulative holding member is provided with a stepped portion for preventing ends of the semiconductor wafer from being brought into contact with the insulative holding member, and

wherein the portion of the support base facing the semiconductor wafer is substantially level.

5,554,267

WIRE SECTION OF A MACHINE FOR MAKING FIBROUS MATERIAL WEBS

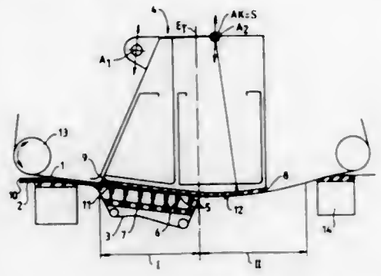
Udo Grossmann, Heidenheim, and Werner Eckl, Bachhagel, both of Germany, assignors to J. M. Voith GmbH, Heidenheim, Germany

Filed Aug. 8, 1994, Ser. No. 287,212

Claims priority, application Germany, Aug. 11, 1993, 43 26 867.6

Int. Cl.[6] **D21F** *1/00;1/48*

U.S. Cl. 162—301 **4 Claims**



1. A wire section of a machine for making a web from a fiber suspension travelling through said machine, comprising:

two continuous wires defining together a twin-wire zone;

a dewatering element having at least one surface which is pressable on the inside of one of said wires, said dewatering element including, in the direction of travel of the fiber suspension, two dewatering zones, said dewatering zones oriented to interact with said at least one of said wires;

a first dewatering zone defining a generally flat surface, and a second dewatering zone defining a surface configured to curve about an axis of curvature in the direction of travel of the suspension;

at least two support axes coordinated with said dewatering element, one of said support axes being tiltable; and

a pivot axis coordinated with the dewatering element, wherein another one of said support axes comprises said pivot axis, said pivot axis arranged to be stationary during tilting of said one support axis, said pivot axis extending parallel to a separation plane between the first and second dewatering zones and parallel to at least one of said wires, said pivot axis being arranged in closely spaced relationship to said axis of curvature such that said pivot axis substantially coincides with said axis of curvature.

5,554,268

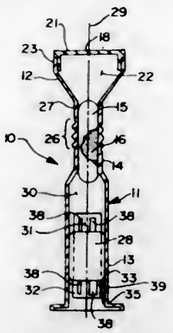
DISPOSABLE SENSOR FOR METAL ANALYSIS

Richard V. Priddy, 6507 Darnall Rd., Baltimore, Md. 21204; John C. Schmidt, 2702 Superior Ave., Baltimore, Md. 21234, and John E. Studer, Jr., 106 Burnham Rd., Morris, N.J. 07950

Filed Feb. 22, 1995, Ser. No. 392,364

Int. Cl.[6] **G01N** *27/26*

U.S. Cl. 204—400 **22 Claims**



1. In combination with a monitoring device for determining the concentration of at least one metal in a water sample, a disposable sensor comprising a housing including a first section, a second section, and a flexible intermediate section therebetween, an ampoule disposed in the intermediate section and containing a reagent, means for forming a liquid seal between the first and second sections, means for disposing the water sample in the first section, and at least one electrode assembly disposed in the second section, wherein the intermediate section of the housing of the disposable sensor may be flexed to break the ampoule, wherein the seal may be broken between the first and second sections, such that the water sample mixes with the reagent and flows into the second section containing the electrode assembly, and wherein said at least one electrode assembly may be disposed in engagement with the monitoring device to determine the concentration of said at least one metal in the water sample.

5,554,269

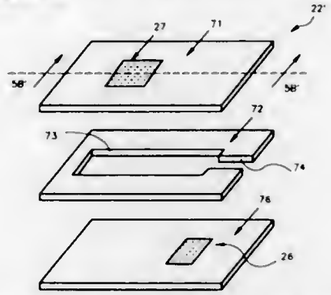
NO_x SENSOR USING ELECTROCHEMICAL REACTIONS AND DIFFERENTIAL PULSE VOLTAMMETRY (DPV)

Jose P. Joseph, and Seajin Oh, both of Palo Alto, Calif., assignors to Gas Research Institute, Chicago, Ill.

Filed Apr. 11, 1995, Ser. No. 420,121

Int. Cl.[6] **G01N** *27/407*

U.S. Cl. 204—424 **16 Claims**



1. A sensor for accurately measuring a nitrogen oxide concentration in a gas mixture, comprising:

an electrochemical sensing cell for consuming nitrogen oxide within said gas mixture and for producing an electrical signal indicative of an amount of said nitrogen oxide within said gas mixture, said sensing cell comprising an anode electrocatalyst, a cathode electrocatalyst, and a solid metal oxide electrolyte disposed therebetween; and differential pulse voltammetry means connected to said sensing cell having:

(1) pulse superimposition means for combining a pulse with a sensing cell bias imposed upon said sensing cell;

(2) measurement means for measuring said electrical signal before and during superimposition of said pulse to derive first and second sample signals; and

(3) concentration derivation means for mathematically combining said first and second sample signals to derive a differential pulse voltammetry signal which is indicative of said nitrogen oxide concentration within said gas mixture;

wherein said sensing cell bias is imposed between said anode and cathode electrocatalysts and across said electrolyte, said cathode electrocatalyst for decomposing said nitrogen oxide said electrolyte capable of conducting oxide ions at high temperatures above 2000° C.

5,554,270

ELECTROLYTIC DESILVERING METHOD

Patrick E. Y. Bernard, Bellecroix; Claude R. Bertorelli, Dracy le Fort, and Alain C. S. Marchand, Jaux, all of France, assignors to Eastman Kodak Company, Rochester, N.Y.

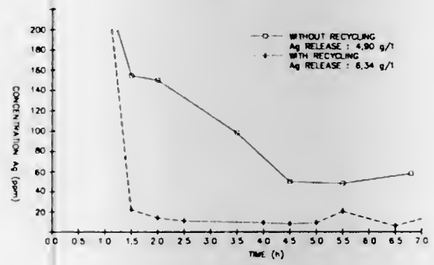
PCT No. PCT/FR92/00418, § 371 Date Nov. 12, 1993, § 102(e) Date Nov. 12, 1993, PCT Pub. No. WO92/20838, PCT Pub. Date Nov. 26, 1992

PCT Filed May 11, 1992, Ser. No. 157,352

Claims priority, application France, May 14, 1991, 91 05984

Int. Cl.[6] **C25C** *1/20*

U.S. Cl. 205—494 **9 Claims**



1. A process for electrolytically desilvering a photographic effluent circulating through an electrolytic cell wherein said cell has an electric field that is perpendicular to the circulating effluent and comprises at least one anodic compartment and at least one cathodic compartment; said method comprising the steps of:

circulating the effluent through the cathodic compartment to desilver the effluent by electrochemical reaction;

circulating at least a portion of the desilvered effluent through the anodic compartment to form a mixture of the desilvered effluent with effluent in the anodic chamber, thereby forming silver sulfide;

and

discharging the mixture formed in the anode chamber to a sewer.

5,554,271

METHOD OF MANUFACTURING A COMPOSITE MATERIAL

Trevor J. Illston; Paul A. Doleman, both of Derby; Edwin G. Butler, Warwick; Peter M. Marquis, Solihull; Clive B. Ponton, Birmingham; Reza Piramoon, Coventry, and Mark J. Gilbert, Birmingham, all of England, assignors to Rolls-Royce plc, London, England

PCT No. PCT/GB92/01928, § 371 Date Mar. 8, 1995, § 102(e) Date Mar. 8, 1995, PCT Pub. No. WO93/10056, PCT Pub. Date May 27, 1993

PCT Filed Oct. 29, 1992, Ser. No. 244,075

Claims priority, application United Kingdom, Nov. 22, 1991, 9124822

Int. Cl.[6] **C25D** *13/02*

U.S. Cl. 204—479 **19 Claims**

1. A method of manufacturing a composite material comprising the steps of:

immersing an electrically conductive porous reinforcing medium in a ceramic sol, said ceramic sol comprising a plurality of sol particles, each carrying a surface charge and not having a polymer coating thereon;

applying a potential difference between said porous reinforcing medium and an electrode immersed in said sol, said potential difference being sufficient to cause said surface-charged sol particles to migrate through said sol and be deposited upon said porous reinforcing medium, said step of applying said potential difference being continued until said porous reinforcing medium is substantially completely permeated by said sol particles;

discontinuing said application of said potential difference;

fixing said sol particles in position within said porous reinforcing medium after said step of discontinuing said potential difference;

removing said permeated porous reinforcing medium from said sol and subsequently sintering said sol particles permeated within said porous reinforcing medium.

5,554,272

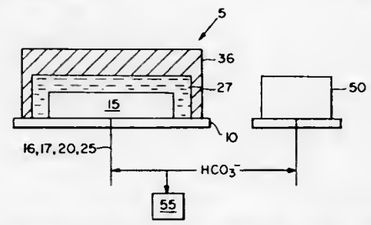
PLANAR BICARBONATE SENSOR

John S. Benco, Holliston, and Joseph S. Foos, Needham, both of Mass., assignors to Ciba Corning Diagnostics Corp., Medfield, Mass.

Filed Aug. 10, 1995, Ser. No. 513,266

Int. Cl.[6] **G01N** *27/26*

U.S. Cl. 205—782.5 **7 Claims**



1. A planar bicarbonate sensor comprising an electrically nonconductive substrate having applied thereto in a planar format an electrically conductive material in at least one region adjacent to said substrate; a dielectric coating covering at least a lead portion of said electrically conductive material but leaving exposed at least an electrode area of said electrically conductive material and leaving exposed at least a contact area on said region of said electrically conductive material; a silver/silver halide transducer present adjacent to said electrically conductive material in said exposed electrode area; an internal electrolyte residue layer present on top of and adjacent to said transducer; a cover membrane present on top of and adjacent to said internal electrolyte residue layer, wherein said internal electrolyte residue layer is an aqueous solution comprised of from about 0.0002 M to about 0.0003 M of

a bicarbonate source, and a halide salt of potassium, lithium, or sodium, wherein said internal electrolyte residue layer has been

-continued

M/YO_3	0.2 to 0.6

5,554,276

APPARATUS FOR MAINTAINING A STABLE BATH FOR AN AUTODEPOSITION COMPOSITION BY

a second state for feeding said chemical bath through said IEX column, for removing metal ions from said chemical bath, said second state programming including:

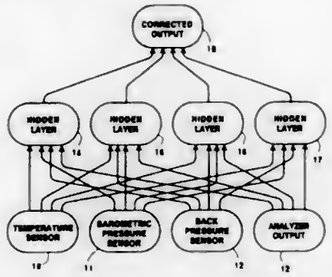
a bicarbonate source, and a halide salt of potassium, lithium, or sodium, wherein said internal electrolyte residue layer has been dried.

5,554,273

NEURAL NETWORK COMPENSATION FOR SENSORS

Hollis C. Demmin, Tonawanda; Richard B. Mazzarella, Grand Island, and James D. Bortman, Clarence, all of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Jul. 26, 1995, Ser. No. 506,752
Int. Cl.[6] G01N 27/26
U.S. Cl. 205—785 **20 Claims**



1. A method for correcting an output from an electrochemical cell sensor, having an output responsive to a concentration of sensed species in a stream, a pressure and a temperature in an interactive non-linear relationship, comprising the steps of:

(a) providing an pressure sensor for producing an output responsive to a pressure in proximity to the electrochemical sensor;

(b) providing a temperature sensor for producing an output responsive to a temperature of said electrochemical sensor; and

(c) processing the outputs of the electrochemical sensor, pressure sensor and temperature sensor in a neural network having an output function which compensates said electrochemical sensor for changes in pressure and temperature to indicate a concentration of the sensed species.

5,554,274

MANUFACTURE OF IMPROVED CATALYST

Thomas F. Degnan, Moorestown; Donald J. Klocke, Somerdale, both of N.J., and Mae K. Rubin, Bala Cynwyd, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 988,992, Dec. 11, 1992, Pat. No. 5,369,071. This application Oct. 19, 1994, Ser. No. 325,838
Int. Cl.[6] C10G 47/02
U.S. Cl. 208—111 **16 Claims**

1. A process for converting a feedstock comprising organic compounds to conversion product which comprises contacting said feedstock at organic compound conversion conditions with a catalyst comprising an active form of a synthetic porous crystalline material, said synthetic porous crystalline material having been manufactured by the method comprising:

(i) forming a reaction mixture hydrogel having a pH of from about 10 to about 14, containing sources of alkali or alkaline earth metal (M) cations; an oxide of trivalent element (X); an oxide of tetravalent element (Y); n-propylamine directing agent (R); and water, said reaction mixture having a composition in terms of mole ratios, within the following ranges:

YO_2/X_2O_3	<40
H_2O/YO_2	10 to 35
OH^-/YO_2	0.1 to 0.3
M/YO_2	0.2 to 0.6
R/YO_2	0.01 to 0.6

(ii) maintaining the reaction mixture until crystals of ZSM-5 structure are formed,

(iii) recovering the ZSM-5 crystals from the reaction mixture,

(iv) ammonium exchanging the recovered ZSM-5 crystals,

(v) deagglomerating the ion-exchanged crystals,

(vi) slurrying a matrix material with the deagglomerated ZSM-5 crystals at a pH of from about 2 to about 12, to yield a ZSM-5/matrix material comprising from about 5 to about 80 wt. % ZSM-5 and from about 20 to about 95 wt. % matrix,

(vii) drying the ZSM-5/matrix material, and

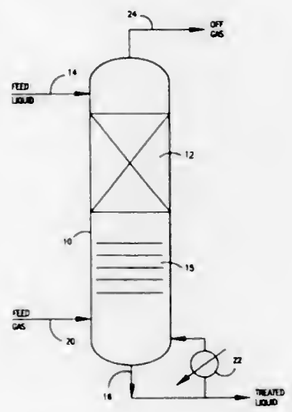
(viii) converting the dried ZSM-5/matrix material to the protonic form having an Alpha Value of greater than about 30.

5,554,275

CATALYTIC HYDRODESULFURIZATION AND STRIPPING OF HYDROCARBON LIQUID

Mohsen N. Harandi, Langhorne, Pa., assignor to Mobil Oil Corporation, Fairfax, Va.

Filed Nov. 28, 1994, Ser. No. 345,666
Int. Cl.[6] C10G 45/06;45/36
U.S. Cl. 208—213 **9 Claims**



1. A process for hydrogenating and stripping a volatile light hydrocarbon liquid stream containing C_3+ aliphatics including organosulfur impurity to remove lower boiling components and convert said organosulfur to monoalkene, comprising the steps of:

introducing said light hydrocarbon stream at a top portion of a vertical stripping tower having an upper contact zone containing a bed of solid hydrodesulfurization catalyst particles and a lower contact zone;

introducing a light gas stream containing hydrogen at a lower portion of said stripping tower;

flowing said light hydrocarbon stream and said light gas stream countercurrently in contact with said solid hydrodesulfurization catalyst particles under hydrodesulfurization and stripping conditions, thereby converting said organosulfur impurity in the upper contact zone;

recovering a stripped liquid hydrocarbon stream from the bottom of said stripping tower; and

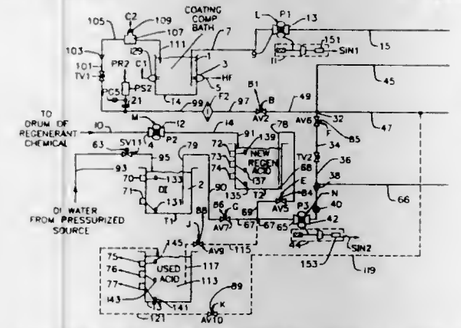
recovering a light stripping gas stream from the top of said tower.

5,554,276

APPARATUS FOR MAINTAINING A STABLE BATH FOR AN AUTODEPOSITION COMPOSITION BY PERIODICALLY SEPARATING PARTICULAR METAL IONS FROM THE COMPOSITION

William G. Kozak, Hatfield, and Joseph C. Topping, North Wales, both of Pa., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Division of Ser. No. 231,075, Nov. 7, 1994, which is a division of Ser. No. 8,956, Jan. 26, 1993, Pat. No. 5,393,416. This application May 30, 1995, Ser. No. 452,926
Int. Cl.[6] B01D 17/12;24/45
U.S. Cl. 210—87 **16 Claims**



1. A system automated for providing stabilization of a chemical bath, including at least periodic removal of metal ions and contaminants from the chemical bath, said system comprising:

a first tank containing deionized water (DI water);

a second tank containing chemical regenerant;

a third tank containing a chemical bath comprising a fluid mixture;

an ion exchange (IEX) column containing ion exchange resin for removing metal ion contaminants from said chemical bath passed therethrough;

a waste port for discharging waste products from said system for treatment;

first pump means energizable by a first pump control signal;

second pump means energizable by a second pump control signal;

first valve means connected in series with said first pump means, and said IEX column, between said third tank and said waste port;

second valve means connected in a series loop with said first pump means, said IEX column, and said third tank, for providing a fluid path for passing said chemical bath from said third tank, through said IEX column, and returning from said IEX column back to said third tank;

third valve means connected in series with said second pump means and said IEX column, between said first tank and said third tank;

fourth valve means connected in series with said second pump means and said IEX column, between said first tank and said waste port, for providing a fluid path for DI water to flow through said IEX column in one direction;

fifth valve means connected in series with said second pump means and said IEX column, between said second tank and said waste port; and

controller means programmed to provide an automatic process control sequence for successive states of operation including:

a first state for removing residual DI water from said IEX column, and discharging from said waste port the DI water removed, said first state programming including:

means for producing and applying operating signals to said first valve means for opening the same; and

means for producing and applying said first pump control signal to said first pump means for pumping a predetermined quantity of said chemical bath into said IEX column, for displacing excess DI water therefrom, and discharging the excess DI water from said waste port; and

a second state for feeding said chemical bath through said IEX column, for removing metal ions from said chemical bath, said second state programming including:

means for producing and applying operating signals to said second valve means for opening the same; and

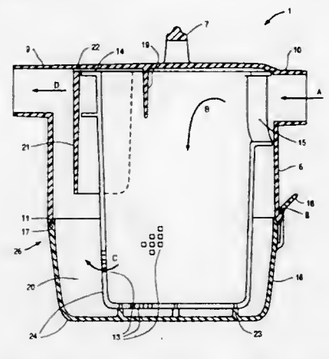
means for producing and applying said first pump control signal to said first pump means for pumping a predetermined quantity of said chemical bath through said IEX column for treatment, and therefrom back to said third tank.

5,554,277

IN-LINE LEAF TRAP

Dieter J. Rief, 2780 Bardy Rd., Santa Rosa, Calif. 95405, and Herman E. Frentzel, Frentzel Engineering, 424 Bee St., Sausalito, Calif. 94965

Filed Jun. 5, 1995, Ser. No. 462,205
Int. Cl.[6] B01D 35/05; E04H 4/16
U.S. Cl. 210—94 **16 Claims**



10. In combination with a swimming pool filter system joined in fluid communication with a suction-type automatic pool cleaner by a swimming pool cleaner hose in a pool having a water line, in-line leaf trap apparatus including:

a first portion of the hose;

a second portion of the hose;

an upper rigid molded-plastic body;

a lower rigid molded-plastic body;

means for mating the upper and lower bodies together to form a face seal, the apparatus having no O-ring or other seal;

a body assembly formed by the upper and lower bodies, the body assembly having an exterior and a hollow interior, a substantial portion of the body assembly being transparent or translucent;

an open male end on the body assembly, the male end insertable into the first portion of the hose;

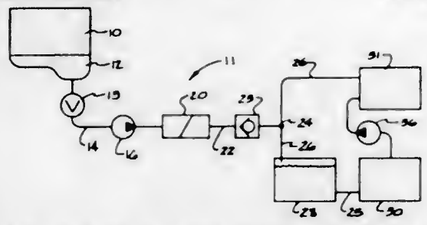
an open female end on the body assembly which is larger than the male end, the second portion of the hose insertable into the female end;

an open mesh basket in the hollow interior, the basket having an enlarged opening disposed in fluid communication with one of the open ends; and

at least one downwardly depending water-flow diversion baffle passing perpendicularly through a plane that passes axially though the open ends,

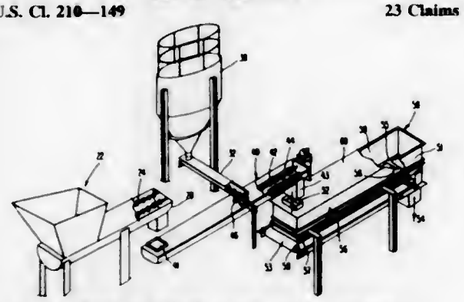
wherein all pans of the in-line leaf trap apparatus are made of rigid plastic.

5,554,278
QUICK CHANGE OIL RECYCLER
Bruce L. Henderson, 425 W. 9th, Concordia, Kans. 66901
Filed Jun. 3, 1994, Ser. No. 253,332
Int. Cl.[6] B01D *35/02*
U.S. Cl. 210—136 **4 Claims**



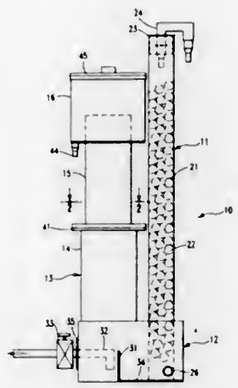
1. A used-oil disposing system permanently attached to a fuel tank and an oil pan sump of an engine in a vehicle for disposing of the engine crankcase oil, said engine including a conventional fuel system having fuel injection means, a main fuel line for fluidly connecting said fuel injection means to said fuel tank, a constant flow pump disposed in said main fuel line for pumping fuel from said fuel tank to said fuel injection means, and a return line for returning excess fuel from said fuel injection means to said fuel tank, the improvement comprising:
a hydraulic line connecting the oil pan sump to the said return line;
a normally closed shut off valve positioned in said hydraulic line retaining the motor oil within the oil pan during normal engine operation, and for permitting oil to flow therethrough when opened during engine shutdown;
an auxiliary pump means positioned in said hydraulic line selectively activated to pump the used motor oil through said shutoff valve from the oil pan sump into the the return line during engine shutdown;
filter means in said hydraulic line upstream of said return line, for filtering particulate matter from the oil prior to entry into said return fuel line;
whereby opening of said shutoff valve and activation of said auxiliary pump means causes oil to flow from said oil pan sump, through said shutoff valve, through said auxiliary pump means, through said filter, into said return line, and into said fuel tank to be mixed with fuel contained therein.

5,554,279
APPARATUS FOR TREATMENT OF SEWAGE SLUDGE
Paul G. Christy, Wayne, Pa., assignor to RDP Company, Plymouth Meeting, Pa.
Filed Sep. 26, 1994, Ser. No. 311,933
Int. Cl.[6] C02F *11/14*
U.S. Cl. 210—149 **23 Claims**



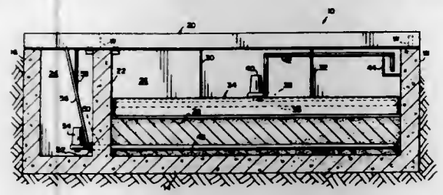
1. An apparatus for treating sewage sludge comprising:
(a) means for providing sludge;
(b) means for mixing the sludge with at least one alkaline additive proportionate to the sludge, such that a reaction caused by the mixing increases the temperature of the mixture to a minimum desired temperature and increases the pH of the mixture to a minimum desired level;
(c) a pasteurization chamber having at least one inlet opening and at least one discharge opening;
(d) means for delivering the sludge and alkaline additive mixture to the inlet opening of the pasteurization chamber;
(e) the pasteurization chamber comprising means for continuously conveying substantially every particle of the mixture through the chamber for a desired dwell time, without any substantial agitation of the mixture such that the mixture does not become substantially more watery, wherein said mixture is substantially enclosed in the pasteurization chamber for the desired dwell time and harmful pathogens in said mixture are substantially destroyed during said conveying; and
(f) means for discharging the mixture from the discharge opening of the pasteurization chamber.

5,554,280
FILTER SYSTEM
Gary Loehr, RR1, Box 127 Lime Ridge Rd., Poughquaq, N.Y. 12570
Filed May 15, 1995, Ser. No. 441,271
Int. Cl.[6] C02F *1/24*
U.S. Cl. 210—169 **11 Claims**



1. A system for removing organic waste from water and to facilitate gas exchange between the water and air, the system comprising:
a source of water containing organic waste;
means for mixing air with organic waste containing water in such manner that the air is broken down into fine air bubbles to which the organic waste becomes attached and gas exchange is carried on thereby, the mixing means including,
a tube having an upper and lower end,
an inlet pipe at the upper end for delivering said water containing organic waste at pressure into the tube,
an inlet means at the upper end of the tube through which air may be drawn,
air-water mixing media within the tube for breaking up the air/water into fine bubbles to which the organic waste becomes attached and gas exchange occurs, and
an outlet in the lower end of the tube for discharge into the separating means;
means connected to the mixing means for separating the water from the organic waste carrying air bubbles; and,
means connected to separating means for removing the organic waste material from the air and for delivering the water to a separate source.

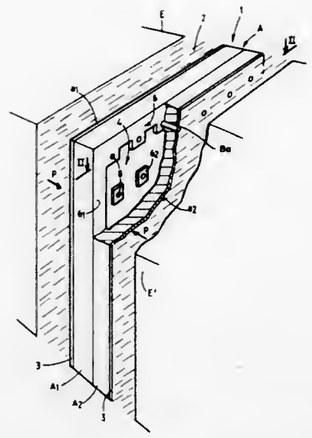
5,554,281
TRAVELING BRIDGE FILTER SYSTEM AND ASSOCIATED UNDERDRAIN
Mack D. McDougald, Ochlocknee, Ga., assignor to Davis Water & Waste Industries, Inc., Thomasville, Ga.
Continuation of Ser. No. 68,165, May 28, 1993, abandoned.
This application Jan. 27, 1995, Ser. No. 379,112
Int. Cl.[6] B01D *24/46*
U.S. Cl. 210—273 **21 Claims**



11. Travelling bridge filtration apparatus comprising an open top tank having a floor, side walls and an interior partition dividing the tank into a filtration basin and a filtrate channel, said filtration basin having a filter media bed therein supported directly on said floor and adapted to receive influent from above the bed; a plurality of tubular, underdrain pipe headers extending across and through the bed between the side walls of the tank, in vertically spaced relationship with the floor of said tank, each pipe header supported at opposite ends thereof by said side walls, and provided with a plurality of apertures enabling filtrate flowing in a downward direction through said bed to enter said pipe headers, each pipe header communicating with said filtrate channel thereby enabling filtrate to pass into said filtrate channel; travelling bridge means mounted on the open top of the tank for movement along the tank, the bridge having a backwash hood suspended therefrom and adapted to pass along the bed in the filtration basin in close proximity thereto, said backwash hood having a waste manifold therein connected to a wash water pump adapted to remove backwash waste from said hood, said bridge also having a backwash pump suspended therefrom within said filtrate channel, said backwash pump including discharge means engageable sequentially with each said pipe header, thereby enabling pumping of filtrate through said plurality of pipe headers and into said bed in an upward direction to backwash successive portions of said bed.

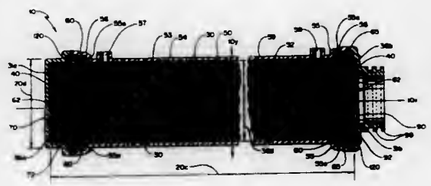
5,554,282
INORGANIC MEMBRANE FILTRATION UNIT
Philippe Lescoche, Nyons, France, assignor to T.A.M.I. Industries (Societe Anonyme), Nyons, France
PCT No. PCT/FR93/00994, § 371 Date Jun. 6, 1994, § 102(e) Date Jun. 6, 1994, PCT Pub. No. WO94/08705, PCT Pub. Date Apr. 28, 1994
PCT Filed Oct. 7, 1993, Ser. No. 244,616
Claims priority, application France, Oct. 9, 1992, 92 12379
Int. Cl.[6] B01D *25/02*
U.S. Cl. 210—321.75 **10 Claims**

1. A filtration unit for filtering a liquid medium comprising:
a first inorganic rigid, porous structure having first and second opposing principal faces, said structure having a first internal cavity formed by bearing means providing a seal about said first internal cavity;
at least one separating layer provided on at least one of said first and second principal faces, each of said at least one separating layer having an associated porosity which is less than a porosity associated with said structure;
means for supplying a liquid medium to be filtered to at least one of said first and second principal faces of said structure;
a first channel extending through said structure and said at least one separating layer and opening at each of said first and second principal faces, said channel extending through said structure at said bearing means; and,



means for fluidly sealing said first channel, within said structure, relative to said first internal cavity such that said first channel forms a first circulation network.

5,554,283
HOLLOW FIBER FILTER HAVING A POROUS COLLAR/RING SEAL
Paul D. Brinda, Robbinsdale, and Louis C. Cosentino, Plymouth, both of Minn., assignors to Minntech Corporation, Minneapolis, Minn.
Continuation of Ser. No. 885,149, May 18, 1992, abandoned.
This application Mar. 31, 1995, Ser. No. 418,881
Int. Cl.[6] B01D *63/02*
U.S. Cl. 210—321.8 **26 Claims**



1. An apparatus comprising:
(a) a casing defining an interior chamber for encasing a bundle of hollow fibers, said casing having at least one end with an inner, lateral, annular lip proximal to said end;
(b) an annular porous collar having first and second peripheral edges, said annular porous collar including pores having a pore size distribution from about 5 μm to about 500 μm,
wherein at least one of said peripheral edges is coupled to said casing along said inner, lateral, annular lip; and
(c) a bundle of hollow fibers disposed within said interior chamber, said bundle of hollow fibers having a first bundle end and a second bundle end, wherein at least one of said bundle ends is rigidly disposed within a potting plug of fluid impermeable material;
wherein said fluid impermeable material of said potting plug, said casing and said annular porous collar are sealingly joined by penetration of said fluid impermeable material through said pores of said annular porous collar.

5,554,284

BACKWASHABLE FILTER FOR FLUIDS

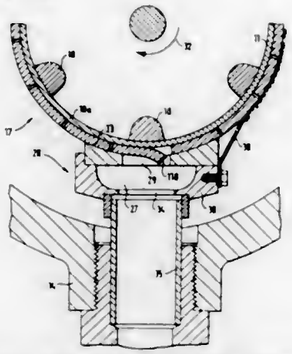
Bertram Bartelt, Steinheim; Peter Gohle, Ludwigsburg, and Wolfgang Schaal, Backnang, all of Germany, assignors to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Germany

Filed Jan. 11, 1995, Ser. No. 371,538

Claims priority, application Germany, Jan. 11, 1994, 44 00 485.0

Int. Cl.[6] B01D *33/073;33/46;33/50*

U.S. Cl. 210—356 **16 Claims**



1. A backwashable fluid filter comprising a hollow-cylindrical filter element rotatable about its axis, through which a radial flow passes and which separates a filtrate chamber from a dirty-fluid chamber inside a filter housing, said filter being provided with a drive mechanism to rotate the cylindrical filter element about its axis and a stationary backwashing device arranged parallel to the axis of the filter element and comprising a dirt removal channel, said dirt removal channel being connected via a shut-off valve to a dirt discharge conduit, wherein said filter element comprises a plate provided with slit-shaped openings, each of said slit-shaped openings defining a resilient tongue, a resiliently mounted stripping device abutting said filter element and being arranged in front of the backwashing device for removing dirt situated on the surface of the filter element, and said dirt removal channel being provided with at least one opening which opens toward the surface of the filter element through which backwashing fluid can enter the dirt removal channel.

5,554,285

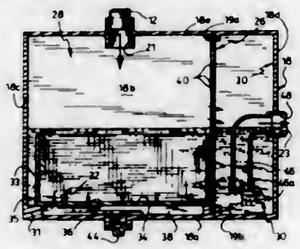
FILTERING APPARATUS FOR SINK DRAIN PIPE

René Bellefeuille, 1949, rue St-Philippe, Trois-Rivières (Québec), Canada, assignor to René Bellefeuille, and Gilles Marin, both of Trois-Rivières, Canada

Filed Sep. 21, 1995, Ser. No. 531,756

Int. Cl.[6] B01D *29/03;35/027*

U.S. Cl. 210—449 **5 Claims**



1. A combined siphon and water filtration system for use with a sink, comprising:

(a) a main housing member, circumscribing an enclosure being subdivided into first and second compartments by an intermediate upright partition wall, and defining a flooring;

(b) a fluid intake means, mounted into an upper portion of said first compartment and adapted to be fluidingly connected to the drain pipe of the sink for fluid flow into said first compartment;

(c) a water outlet means, mounted into an intermediate section of said second compartment and adapted to be fluidingly connected to a sewer line;

wherein said partition wall defines a lower water-tight portion and an upper portion having a plurality of bores, said bores sized for macroparticulate contaminant screening of said fluid, wherein upon fluid level exceeding the lower edge of said partition wall upper portion, purified water only is allowed to flow through said partition wall upper portion and into said second compartment;

(d) a tray, sized for freely fitting inside said first compartment and releasably engaged thereinto and supported by said flooring for collecting and accumulating the macroparticulate contaminant screened by said partition wall upper portion during fluid flow therethrough; and

(e) siphon means, mounted into said second compartment and operatively coupled to said water outlet means, for escape of said purified water from said enclosure outwardly of said housing member to the sewers.

5,554,286

MEMBRANE FOR LIQUID MIXTURE SEPARATION

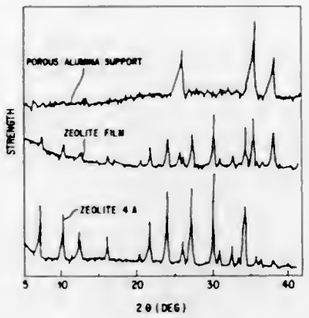
Kenichi Okamoto; Hidetoshi Kita, both of Yamaguchi; Masakazu Kondo, Chiba; Norikazu Miyake, and Yasuo Matsuo, both of Tokyo, all of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 352,768, Dec. 2, 1994, abandoned. This application Jun. 22, 1995, Ser. No. 493,538

Claims priority, application Japan, Dec. 27, 1993, 5-331141

Int. Cl.[6] B01D *71/02*

U.S. Cl. 210—500.25 **12 Claims**



1. A membrane for liquid mixture separation comprising,

a porous support,

seed crystals held on a surface of said support, said seed crystals having an average particle size of 1–5 μm and being held on the surface of the support in an amount of 0.5–5.0 mg/cm^2, and

an A-type zeolite film deposited on said porous support after the seed crystals are held thereon.

5,554,287

CELLULOSE MATRIX FILTER MATERIAL

Dieter Beck, Bad Kreuznach; Peter P. Breitbach, deceased, late of Bretzenheim; Thomas Breitbach, heir, Ingelheim; Rudiger Leibnitz, Bad Kreuznach, and Gerd Ritter, Guldental, all of Germany, assignors to Seitz-Filter-Werke GmbH und Co., Bad Kreuznach, Germany

Filed Mar. 25, 1994, Ser. No. 218,323

Claims priority, application Germany, Mar. 26, 1993, 43 09 845.2

Int. Cl.[6] B01D *39/18;* **B27N** *3/04*

U.S. Cl. 210—500.29 **37 Claims**

1. A filter comprising a filter layer in the form of a cellulose matrix in which are embedded cellulose acetate fibers and additives, wherein microcrystalline cellulose (3) is incorporated in said filter layer as an additive in an amount of from 10 per cent to 70 per cent by weight of the entire layer and in that microfine cellulose (4) is incorporated in said filter layer as an additive in an amount of from zero per cent to 50 per cent by weight of the entire layer.

5,554,288

DISPOSABLE FILTERS AND MANUFACTURING PROCESS

Theodore B. Rydell, Schawano; Joseph D. Wahlquist, Green Bay, and Gerald W. Tumanic, Shawano, all of Wis., assignors to Little Rapids Corporation, Green Bay, Wis.

Continuation-in-part of Ser. No. 173,986, Dec. 28, 1993, abandoned. This application Apr. 11, 1994, Ser. No. 226,257

Int. Cl.[6] B01D *39/04;39/18*

U.S. Cl. 210—504 **91 Claims**

1. A composite paper filter ply comprising:

a. between about 1% and about 20% by weight of halogen and organic contaminant removal additive distributed throughout said paper filter ply;

b. between about 1% and about 20% by weight of metal cation removal additive distributed throughout said paper filter ply; and

c. between about 98% and about 60% by weight of pulp.

5,554,289

APPARATUS AND METHOD FOR INCREASING THE CAPACITY OF A WASTEWATER POND TREATMENT FACILITY

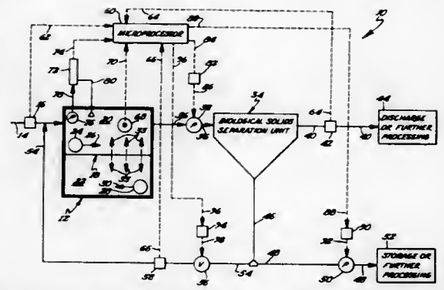
Harry C. Grounds, 477 S. Cretin Ave., St. Paul, Minn. 55105-1313

Filed Dec. 13, 1993, Ser. No. 166,220

Int. Cl.[6] C02F *3/12*

U.S. Cl. 210—607 **16 Claims**

1. In combination with a wastewater pond treatment facility including at least one pond for treatment of wastewater and means



for bringing influent wastewater to said pond, an apparatus for increasing the wastewater treatment capacity of said pond, said apparatus comprising:

a porous baffle disposed in said pond and separating said pond into a first portion and a second portion, said first portion to be used for concentrated treatment of biological solids said means for bringing influent wastewater to said pond bringing the influent wastewater to said pond first portion;

means for separating biological solids from the wastewater to produce a process material and biological solids;

means for fluidically connecting said pond first portion to said means for separating biological solids;

means for transporting the process material from said means for separating biological solids; and

return means for transporting the biological solids from said means for separating biological solids to said pond first portion.

5,554,290

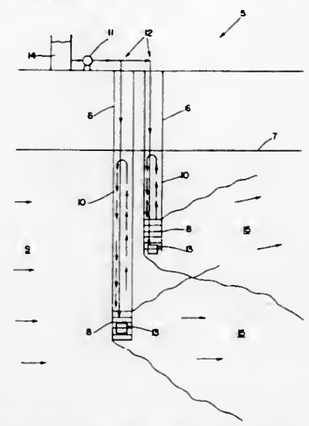
INSITU ANAEROBIC REACTIVE ZONE FOR INSITU METALS PRECIPITATION AND TO ACHIEVE MICROBIAL DE-NITRIFICATION

Suthan S. Suthersan, Yardley, Pa., assignor to Geraghty & Miller, Inc., Denver, Colo.

Filed Apr. 11, 1995, Ser. No. 420,234

Int. Cl.[6] C02F *3/28*

U.S. Cl. 210—610 **8 Claims**



1. A method for removing contaminants dissolved in ground water, comprising the steps of:

establishing an injection well from the ground surface to a saturated zone contaminated with heavy metal compounds;

placing a conduit within said injection well, wherein said conduit has a fluid-permeable section below the water table of said contaminated saturated zone; and

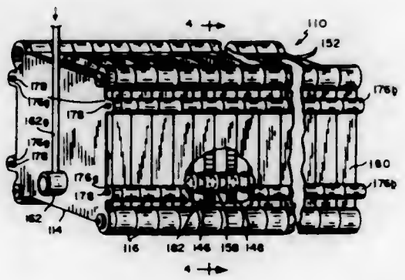
supplying carbohydrates and sulfates capable of being utilized by an indigenous population of microorganisms to said conduit such that said carbohydrates and said sulfates are forced out of said fluid-permeable section into said contaminated saturated zone whereby the indigenous population of microorganism will metabolize said carbohydrates leading to the formation of anaerobic conditions and will metabolize said sulfates to produce sulfide ions which will cause the in-situ precipitation of the heavy metal compounds.

5,554,291

METHODS AND APPARATUS FOR BIODEGRADATION OF POLLUTED FLUIDS

Joseph G. Scanzillo, 15 Metacomett Rd., Scituate, Mass. 02066, and Russell J. Anderson, III, 485 Mt. Blue St., Norwell, Mass. 02061

Continuation-in-part of Ser. No. 965,734, Oct. 23, 1992, Pat. No. 5,344,557. This application Sep. 2, 1994, Ser. No. 300,719
Int. Cl.[6] C02F *3/02*
U.S. Cl. 210—615 **23 Claims**



21. A method of treating polluted fluids to biologically remove pollutants comprising the step of:

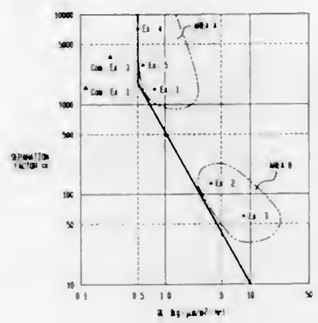
creating a horizontal flow of oxygen and polluted fluid into an inlet opening of a vessel, said vessel having a top and a bottom, an inlet opening and an outlet opening, and at least one wall defining said vessel exterior and an inner chamber, said inner chamber having an oxygen injection means in communication with said inlet opening to receive said flow of oxygen and polluted fluid and said outlet opening in communication with said inner chamber to receive said fluid and air from said inner chamber to create a horizontal flow of oxygen and polluted fluid within said inner chamber, said inner chamber having a matrix for immobilizing microorganisms capable of degrading pollutants, said wall having at least one air impervious surface at the top of the vessel above the matrix, said vessel having orientation means for maintaining the vessel in a position where said flow of fluid is horizontal and said air impervious surface above the matrix; and said containment vessel, oxygen injection means and orientation means are comprised of a plurality of modular units, each unit comprising a section of said interior chamber and matrix, a section of said oxygen injection means, and a section of said orientation means, said modular unit having a first surface and a second surface, said first surface of one modular unit interfitting with a second surface of a second modular unit; said microorganisms absorbing pollutants from said fluids flowing through said inner chamber and metabolizing said pollutants to remove pollutants from the fluid.

5,554,292

PERMSELECTIVE MEMBRANE OF POLYACRYLONITRILE COPOLYMER AND PROCESS FOR PRODUCING THE SAME

Yasushi Maeda, Shizuoka; Kengo Magara, Hyogo, and Hitoshi Tsugaya, Osaka, all of Japan, assignors to Daicel Chemical Industries, Ltd., Japan

PCT No. PCT/JP92/01127, § 371 Date Apr. 5, 1993, § 102(e) Date Apr. 5, 1993, PCT Pub. No. WO93/04769, PCT Pub. Date Mar. 18, 1993
PCT Filed Sep. 3, 1992, Ser. No. 39,051
Claims priority, application Japan, Sep. 3, 1991, 3-222747; Aug. 10, 1992, 4-212634
Int. Cl.[6] B01D *61/36*
U.S. Cl. 210—640 **9 Claims**



3. A process for separation of an organic substance from a mixture with water comprising:

(a) providing a polyacrylonitrile copolymer permselective membrane of at least one polyacrylonitrile copolymer having about 90 to 97 mol % of acrylonitrile monomer units and at least one comonomer unit of N-vinyl-2-pyrrolidone, wherein the membrane has a primary side and a secondary side and has:

(i) a rate $Q(N_2)$ of nitrogen gas permeation through the resulting membrane in the range of 5×10^{-6} to 1×10^{-3} $cm^3(STP)/cm^2.sec.cmHg$; and

(ii) a rate, $Q(kg/m^2.hr)$, of selective permeation of water times the membrane thickness, L (μm), of at least 0.5 kg.μm/m^2.hr, a separation factor of $\alpha \geqq 10$, and $\log\alpha \geqq -1.77\times\log(QL)+2.77$ when the pervaporation performance of a 5–30 μm-thick dense uniform membrane is evaluated using, as a liquid feed, an 80 wt. % aqueous solution of acetic acid at a temperature of 70° C.; and

wherein the polyacrylonitrile copolymer permselective membrane is produced by:

(1) dissolving the polyacrylonitrile copolymer and the N-vinyl-2-pyrrolidone comonomer unit, in an aprotic polar solvent to prepare a solution having a copolymer concentration of 10 to 30 wt. %;

(2) casting or extruding the solution into a coagulating bath to form an asymmetric membrane; and

(3) post-treating the asymmetric membrane in:

(i) water or steam at a temperature of at least 90° C.; or

(ii) a dry atmosphere at a temperature of the glass transition point (Tg) of the copolymer to 180° C.;

(b) vaporizing the mixture;

(c) passing the vaporized mixture over the primary side of the membrane whereby the water to be separated permeates through the membrane; and

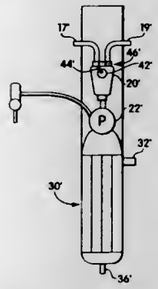
(d) condensing the permeated water vapor on the secondary side of the membrane to thereby separate the water from the mixture.

5,554,293

DISPOSABLE BLOOD WASHING AND APHERESIS DEVICE AND METHOD OF USING THEREOF

John Uboch, Warwick, R.I., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Jun. 28, 1993, Ser. No. 83,618
Int. Cl.[6] B01D *61/00;65/00;36/00;37/00*
U.S. Cl. 210—650 **26 Claims**



16. A method of separating blood into cellular blood components and blood fluids, comprising the steps of:

providing a blood processor including a disposable housing supporting therein a circuit for conducting blood to be processed, an open loop pneumatically driven pulsating pump for pumping blood to be processed and a separator for separating blood into cellular blood components and blood fluids;

connecting a source of blood whose components are to be separated to the circuit for conducting blood;

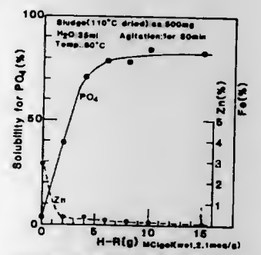
continuously pumping blood with the open loop pneumatically driven pulsating pump along the circuit for conducting blood and into the separator without reversible flow at a frequency sufficient to agitate the blood therein so that the cellular components in the blood are inhibited from blocking passage of the blood fluids through the separator.

5,554,294

METHOD FOR DISSOLVING SLUDGE AND RECOVERING CONSTITUENTS THEREFROM

Tadashi Nishino, Tokyo, Japan, assignor to Yukiyoshi Iwamoto, Tokyo, Japan

Continuation of Ser. No. 187,616, Jan. 27, 1994, abandoned. This application Jul. 18, 1995, Ser. No. 503,675
Claims priority, application Japan, Jan. 29, 1993, 5-013060
Int. Cl.[6] C02F *1/42*
U.S. Cl. 210—663 **10 Claims**



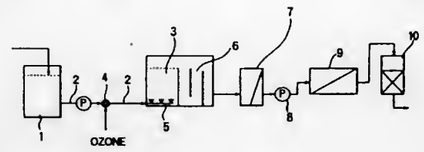
1. A method for dissolving slightly soluble sludge which is produced during chemical conversion coating of metal, consisting of agitating the sludge in an aqueous suspension containing hydrogen type strongly acidic cation exchange resin; ion-exchanging metallic components in the sludge with the resin and adsorbing the metallic components on the resin; dissolving oxyacid components in the sludge into liquid phase, and recovering the oxyacid components from the solution and the metallic components from the resin.

5,554,295

METHOD FOR PRODUCING PURE WATER

Cozy Ban; Motonori Yanagi; Takaaki Fukumoto, all of Itami; Toshiki Manabe, Toda; Hiroshi Yanome, Toda, and Kazuhiko Kawada, Toda, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 955,143, Oct. 1, 1992, Pat. No. 5,470,461. This application May 11, 1995, Ser. No. 439,124
Claims priority, application Japan, Oct. 4, 1991, 3-257291
Int. Cl.[6] C02F *9/00*
U.S. Cl. 210—668 **4 Claims**



1. A method of producing pure water comprising:

providing a silica containing water;

ionizing non-ionic silica which is contained in the water by exposing the water to at least 1 ppm of ozone for at least 20 minutes and to ultraviolet radiation; and

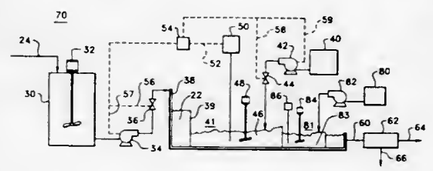
removing ionized silica from the water by absorbing it onto a solid electrolyte by ion exchange.

5,554,296

SYSTEM AND METHOD FOR PURIFYING WASTE STREAMS CONTAINING WATER REDUCIBLE PAINTS

Nashat Zakhary, Hasbrouch Heights, N.J., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed May 15, 1995, Ser. No. 441,022
Int. Cl.[6] C02F *1/52*
U.S. Cl. 210—702 **20 Claims**



1. A method for purifying a wash coat waste water stream that is produced from the wash coating of metal cans, consisting essentially of the steps of:

(a) contacting a plurality of metal cans with a wash coat composition comprising a water reducible paint composition containing paint compounds;

(b) contacting a portion of the wash coated metal cans with an aqueous wash solution, whereby a portion of the wash coat is removed from the metal can in the wash solution, the wash solution having a water content of at least 95 percent by weight;

(c) adding sulfuric acid with the wash solution to reduce the pH of the wash solution to below about 5.5 and to form a suspension comprising water and precipitated paint compounds; and

(d) separating a portion of the precipitated paint compounds from the water in the suspension.

5,554,297

PROCESS OF REMOVING SURFACTANT FROM

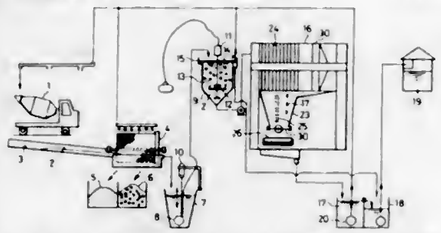
adding to mill flume water containing steel mill scale particles

(b) exciting said photocatalyst with ultraviolet light to form photocatalyst conduction band electrons and positive holes

5,554,302

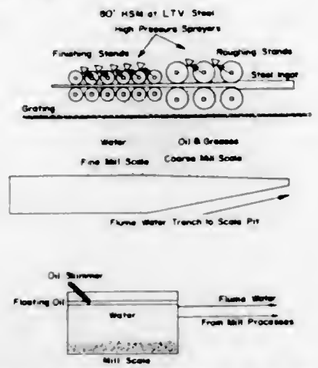
CORE BLOW NOZZLE

5,554,297
PROCESS OF REMOVING SURFACTANT FROM UNCURED CONCRETE BY FLOTATION
Kiyoshi Tanii, Kumamoto-ken, Japan, assignor to Tanii Industries Co., Ltd., Arao, Japan
Filed Dec. 22, 1994, Ser. No. 361,771
Claims priority, application Japan, Dec. 29, 1993, 5-355200; Dec. 29, 1993, 5-355228; Apr. 5, 1994, 6-101671; Jun. 17, 1994, 6-169920
Int. Cl.[6] B03D *1/02*
U.S. Cl. 210—703 **3 Claims**



1. A process for removing and destroying surfactant from uncured concrete sludge, comprising the steps of:
supplying uncured concrete sludge to a pretreatment vessel so as to store said sludge therein;
supplying air into said sludge so as to form a plurality of bubbles;
allowing most of any surfactant contained in said sludge to adhere to said plurality of bubbles;
removing said plurality of bubbles from said sludge, said bubbles having said surfactant adhering thereto; and
destroying surfactant coatings in said sludge by said bubbles, said surfactant coatings covering cement particles in said sludge, wherein the concrete sludge remaining after the surfactant coatings have been destroyed has a composition that allows newly-generated surfaces of said cement particles to hydrate and form coarse particles so as to prevent a filter cloth from clogging.

5,554,298
STEEL MILL FLUME WATER TREATMENT
Ronald D. Kochik, Batavia; David A. Picco, Shorewood, both of Ill.; Michael L. Braden, Sugar Land, Tex., and Kristine S. Saimen, Naperville, Ill., assignors to Nalco Chemical Company, Naperville, Ill.
Filed Jan. 20, 1995, Ser. No. 376,729
Int. Cl.[6] B01D *17/05*
U.S. Cl. 210—708 **7 Claims**

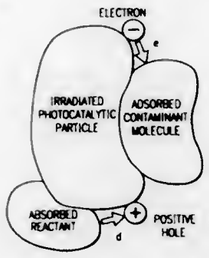


1. A method of preventing deposition of oil on steel mill scale particles comprising:
adding to mill flume water containing steel mill scale particles and oil an amphoteric copolymer of an amine acrylate and an acrylic acid having a molar ratio of from about 90:10 to about 40:60 of amine acrylate to acrylic acids, wherein said amine acrylate is selected from the group consisting of dimethylaminoethyl acrylate methyl chloride quaternary, dimethylaminoethyl acrylate benzyl chloride quaternary, dimethylaminoethyl methacrylate methyl chloride quaternary, and 3-methacryloylaminopropyl trimethyl ammonium chloride, wherein the amphoteric copolymer has an intrinsic viscosity of from about 0.8 to about 3.0 dL\g and wherein the amphoteric copolymer is added in an amount of from about 1 part per million to about 500 parts per million;
pumping the water to a scale pit,
separating the scale particles from the flume water;
whereby the separated scale particles have an oil content less than 2.0% by weight of the particles.

5,554,299
TREATMENT/REMOVAL OF BYPRODUCT AQUEOUS EFFLUENTS COMPRISING HYDROXYNITROAROMATIC COMPOUNDS
Faouzi Joulak, Chesnay; Louis Le Bris, Lyons, and Philippe Marion, Villeurbanne, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France
Filed Jan. 3, 1995, Ser. No. 367,873
Claims priority, application France, Dec. 31, 1993, 93 15988
Int. Cl.[6] C02F *1/52;1/66*
U.S. Cl. 210—712 **13 Claims**

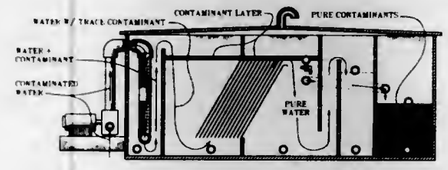
1. A process for the treatment/removal of byproduct aqueous effluent containing contaminating amounts of hydroxynitroaromatic compounds, comprising (a) intimately contacting a mixture of at least one nitroaromatic compound and at least one hydroxynitroaromatic compound with an aqueous wash medium which comprises a neutralizing agent,
(b) separating the resulting admixture into an organic phase and an aqueous phase, (c) recycling a fraction of said separated aqueous phase to said aqueous wash medium,
(d) periodically draining from 3% to 10% of the total amount of said aqueous wash medium, and
(e) adding a replenishing amount of aqueous wash medium corresponding to the drained fraction thereof.

5,554,300
PURIFICATION SYSTEM
Brian E. Butters, St. Thomas, and Anthony L. Powell, London, both of Canada, assignors to Purifics Environmental Technologies, Inc., Hyde Park, Canada
Filed Feb. 22, 1995, Ser. No. 394,548
Int. Cl.[6] C02F *1/48*
U.S. Cl. 210—748 **14 Claims**



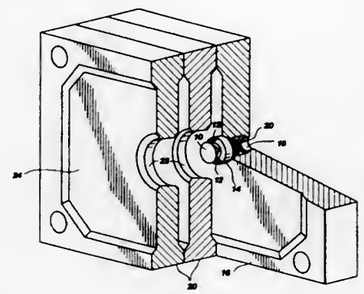
1. A method for purifying a contaminated fluid by photocatalytic treatment, comprising:
(a) providing a contaminated fluid including contaminant molecules in the presence of a photocatalyst;
(b) exciting said photocatalyst with ultraviolet light to form photocatalyst conduction band electrons and positive holes thereby inducing an oxidation state whereby some contaminant molecules are oxidized;
(c) inducing a reduction state, in the substantial absence of oxidizing agents that compete for said photocatalyst conduction band electrons, by adding a reactant comprising a carboxylic acid in sufficient quantity to provide surrogate electrons that react with said positive holes formed on the photocatalyst while the semiconductor catalyst is irradiated whereby other contaminant molecules are reduced by said photocatalyst conduction band electrons.

5,554,301
WATER CLARIFICATION SYSTEM
William W. Rippetoe, Bixby, and David N. Shroff, Broken Arrow, both of Okla., assignors to Universal Environmental Technologies, Inc., Naples, Fla.
Filed May 8, 1995, Ser. No. 436,623
Int. Cl.[6] C02F *1/40*
U.S. Cl. 210—748 **11 Claims**



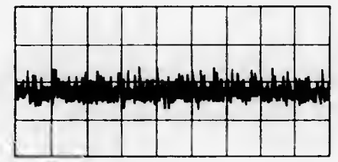
1. A clarification system for water having entrained in solution or as an emulsion, broad spectrum contaminants comprising:
a collision chamber having an entry aperture and an ion collider disposed in a central region therein, the ion collider for treating the water and the entrained broad spectrum contaminants with a plurality of free electrons and the water and the broad spectrum contaminants then passing out of the collision chamber, the collision chamber further having a first overflow weir disposed in a rearward region for directing the flow of treated water and treated broad spectrum contaminants out of the collision chamber after passage through the ion collider;
a separation chamber disposed rearwardly of the collision chamber and being in flow communication with the first overflow weir for receiving the treated water and treated contaminants, the separation chamber further including an elongated upstanding member disposed in a rearward section of the separation chamber and having a plurality of apertures sized to urge passage of the bulk of the treated contaminants through the apertures;
a clarifying chamber disposed rearwardly of the separation chamber and having a plurality of baffle plates obliquely oriented for urging upward flow of the treated water therethrough across the baffle plates and clarifying the remaining treated contaminants from the treated water, the clarifying chamber further including a contaminant withdrawal aperture oriented in a rearward portion for skimming the treated contaminants off the surface of the treated water;
a water collection reservoir disposed rearwardly of the clarifying chamber and being in flow communication with the clarifying chamber for accumulating the treated water flowing therein, the water collection reservoir further including a second overflow weir disposed in a forward area for urging the treated water to flow into a rear area of the water collection reservoir; and
a contaminant collection tank disposed rearwardly of the water collection reservoir and being adapted with a contaminant receiving aperture in flow communication with the contaminant withdrawal aperture for receiving the treated contaminants withdrawn from the separation chamber.

5,554,302
CORE BLOW NOZZLE
Alan M. Carabine, Kaysville, Utah, assignor to Baker Hughes Incorporated, Houston, Tex.
Filed Mar. 30, 1995, Ser. No. 413,637
Int. Cl.[6] B01D *25/32*
U.S. Cl. 210—791 **11 Claims**



1. A method for removing remnant slurry from the center feed core of a filter press, said method comprising the steps of:
forcing pressurized air through said center feed core of a filter press, and
diverting said pressurized air away from an axial center of said center feed core of said filter press.

5,554,303
MAGNETIC RECORDING MEDIUM PREPARATION
Hideo Kaneko; Katsushi Tokunaga; Yoshio Tawara, all of Kanagawa-ken; Noboru Tamai, and Yasuaki Nakazato, both of Nagano-ken, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan
Filed Mar. 2, 1995, Ser. No. 397,564
Claims priority, application Japan, Mar. 4, 1994, 6-034595; Mar. 28, 1994, 6-057076
Int. Cl.[6] B44C *1/22;* **H01L** *21/00*
U.S. Cl. 216—2 **9 Claims**



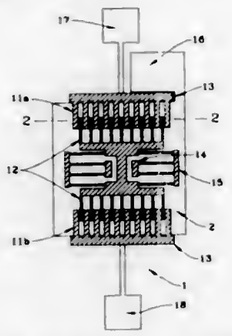
1. In a method for the preparation of a magnetic recording medium, which comprises a substrate plate of silicon as a non-magnetic material and a magnetic recording layer of a magnetic metal or alloy formed on at least one surface of the substrate plate, in a process comprising the step of forming the magnetic recording layer by a dry process on the surface of the substrate plate, the improvement which comprises, prior to the formation of the magnetic recording layer on the surface of the substrate plate, subjecting the surface of the substrate plate to a surface roughening treatment so that the surface has a surface roughness Rmax in the range from 5 nm to 100 nm.

5,554,304
PROCESS FOR PRODUCING A MICROMOTION MECHANICAL STRUCTURE

attaching a low dielectric constant porous polymer layer to a surface of the substrate;

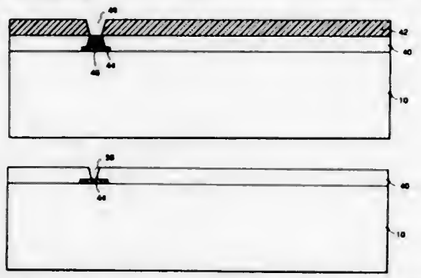
5,554,311
LUBRICANT FOR REFRIGERATING MACHINE EMPLOYING REFRIGERANT COMPRISING

5,554,304
PROCESS FOR PRODUCING A MICROMOTION MECHANICAL STRUCTURE
Kenichiro Suzuki, Tokyo, Japan, assignor to Nec Corporation, Minato-ku, Japan
Division of Ser. No. 52,272, Apr. 20, 1993, Pat. No. 5,428,259, which is a continuation of Ser. No. 650,017, Feb. 4, 1991, abandoned. This application Mar. 24, 1995, Ser. No. 409,990
Claims priority, application Japan, Feb. 2, 1990, 2-23684; Feb. 2, 1990, 2-23685
Int. Cl.[6] H01L *21/306;* **B44C** *1/22*
U.S. Cl. 216—2 **7 Claims**



1. A process for the production of a micromotion mechanical structure comprising at least one fixed electrode and at least one movable electrode which is moved by electrostatic power applied to the fixed electrode; said process comprising the steps of:
(a) forming an electrode pattern of at least one of said fixed electrode and said movable electrode on a surface of a semiconductor substrate,
(b) attaching the surface of the semiconductor substrate, on which said electrode pattern is formed, to a surface of a different substrate, and
(c) separating said electrode pattern from the semiconductor substrate so that the electrode pattern remains on the surface of the different substrate.

5,554,305
PROCESSING LOW DIELECTRIC CONSTANT MATERIALS FOR HIGH SPEED ELECTRONICS
Robert J. Wojnarowski, Ballston Lake; Herbert S. Cole, Burnt Hills; Theresa A. Sitnik-Nieters, Scotia, and Wolfgang Daum, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Division of Ser. No. 247,820, May 23, 1994, Pat. No. 5,449,427. This application Mar. 27, 1995, Ser. No. 411,178
Int. Cl.[6] H01L *21/3105*
U.S. Cl. 216—62 **5 Claims**



1. A method for applying and ablating a low dielectric constant material over a substrate, comprising the steps of:
attaching a low dielectric constant porous polymer layer to a surface of the substrate;
applying mask material over the polymer layer;
forming a via in the mask material extending through to the polymer layer;
diffusing an additive material in a region of the polymer layer through the via in the mask material;
removing the mask material; and
ablating at least some of the polymer layer in the region where the additive material was diffused.

5,554,306
SULFITED FATTY COMPOUNDS WITH A REDUCED CONTENT OF FREE HYDROGEN SULFITE
Ramon Segura, Barcelona, Spain, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany
PCT No. PCT/EP93/03274, § 371 Date May 30, 1995, § 102(e) Date May 30, 1995, PCT Pub. No. WO94/12471, PCT Pub. Date Jun. 9, 1994
PCT Filed Nov. 22, 1993, Ser. No. 446,771
Claims priority, application Germany, Nov. 30, 1992, 42 40 159.3
Int. Cl.[6] C14C *9/00;11/00*
U.S. Cl. 252—8.57 **21 Claims**

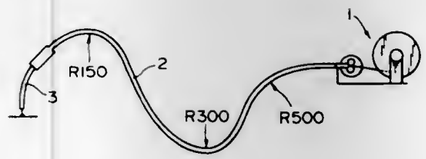
12. A leather treating composition containing sulfited fatty compounds having a reduced content of free hydrogen sulfite prepared by blowing unsaturated fatty compounds in an oxygen atmosphere at 100° C. to 150° C., sulfiting the blown fatty compounds with sodium metabisulfite, and subsequently fixing unreacted hydrogen sulfite as sulfosuccinic acid ester by aftertreatment with maleic acid esters, and optionally, a basic material.

5,554,307
PROCESS FOR IMPROVING LUBRICATING BASE OIL QUALITY
Daniel N. N. Dagorn; Thous G. Mahtout; Pierre Grandvallet, and Bob Scheffer, all of Grand Couronne, France, assignors to Shell Oil Company, Houston, Tex.
Filed Nov. 15, 1995, Ser. No. 559,521
Claims priority, application European Pat. Off., Nov. 16, 1994, 94402602
Int. Cl.[6] C10M *125/02*
U.S. Cl. 508—111 **8 Claims**

1. A process for improving the quality of hydroprocessed lubricating base oils, which process comprises contacting a hydroprocessed lubricating base oil with dry activated carbon.

5,554,308
LUBRICANT FOR WIRE FEEDING AND WIRE DRAWING AND A WELDING WIRE MANUFACTURED BY USING THE SAME
Norio Masaie; Tomoyuki Tachibana; Koji Seita, and Yasuo Araike, all of Fujisawa, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan
Continuation of Ser. No. 985,151, Dec. 3, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 463,257
Claims priority, application Japan, Dec. 3, 1991, 3-348242
Int. Cl.[6] C10M *125/00;125/18;131/00*
U.S. Cl. 508—181 **6 Claims**

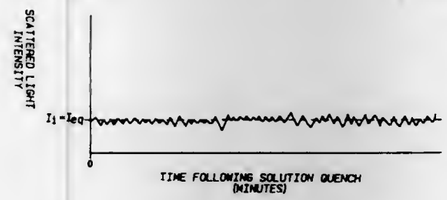
1. A lubricant for wire feeding and wire drawing consisting essentially of an aqueous dispersion, wherein water is the dispersing medium, of larger polytetrafluoroethylene powder of 0.5–40 μm in particle diameter and polytetrafluoroethylene powder of 0.1–0.4 μm in particle diameter, and wherein the amount of larger polytetrafluoroethylene powder is present in an amount of 5 g to 40 g per liter of the lubricant.



5,554,309
LUBRICANTS FOR CERAMICS AT ELEVATED TEMPERATURES
Robert W. Bruce, Monroeville, and E. Erwin Klaus, State College, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Filed Aug. 28, 1989, Ser. No. 398,966
Int. Cl.[6] C10M *129/10;137/04;137/02*
U.S. Cl. 508—312 **18 Claims**

1. A method for lubricating the interface of two ceramic surfaces in frictional contact in mechanical systems that operate at temperatures above approximately 600° F., said method comprising the steps of:
providing a first and second ceramic surface;
providing a lubricant selected from the group consisting of p-dodecylphenol, oxidized mineral oil and organophosphorus compounds having an average chain of carbon atoms less than or equal to twenty-one;
applying said lubricant to the interface of said first and second ceramic surfaces at temperatures above approximately 600° F.

5,554,310
TRISUBSTITUTED UNSATURATED POLYMERS
Albert Rossi, Warren, N.J., and Salvatore Rea, Franklin Square, N.Y., assignors to Exxon Chemical Patents Inc., Linden, N.J.
Continuation-in-part of Ser. No. 992,192, Dec. 17, 1992, abandoned. This application Jun. 9, 1994, Ser. No. 257,615
Int. Cl.[6] C10M *107/08;143/00*
U.S. Cl. 508—591 **21 Claims**



1. An unsaturated polymer composition of a C_4 to C_8 α -olefin, wherein at least about 10 percent of the polymer unsaturation has three hydrocarbyl substituents on the two carbons of olefinic unsaturation.

5,554,311
LUBRICANT FOR REFRIGERATING MACHINE EMPLOYING REFRIGERANT COMPRISING HYDROFLUOROETHANE
Tadashi Katafuchi, and Akira Nakamura, both of Ichihara, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 177,074, Jan. 3, 1994, abandoned, which is a continuation-in-part of Ser. No. 18,157, Jan. 16, 1993, abandoned. This application May 18, 1995, Ser. No. 443,457
Claims priority, application Japan, Feb. 18, 1992, 4-030529; Feb. 17, 1993, 5-027907
Int. Cl.[6] C09K *5/04;* **C10M** *107/02;105/32*
U.S. Cl. 252—68 **15 Claims**

1. A lubricant composition for a compression-type refrigerating machine, said composition comprising a refrigerant selected from the group consisting of 1,1,1,2-tetrafluoroethane (R-134a), 1,1,2,2-tetrafluoroethane (R-134), pentafluoroethane (R-125), difluoromethane (R-32), and 1,1,1-trifluoroethane (R-143a) and a lubricant comprising (A) 60 to 90% by weight of a synthetic oil composed of (A-1) at least one member selected from the group consisting of a poly-α-olefin and ethylene/α-olefin copolymer or (A-2) a mixture of an alkylbenzene and at least one member selected from the group consisting of a poly-α-olefin and an ethylene/α-olefin copolymer, said poly-α-olefin being a polymer of an α-olefin having 8 to 14 carbon atoms and a kinematic viscosity of 10 to 350 cSt at 40° C., and (B) 10 to 40% by weight of a fluidity improver composed of at least one member selected from the group consisting of an ester compound and a triglyceride; said ester compound being selected from the group consisting of:
(I) a reaction product of a polybasic carboxylic acid or a derivative thereof, a polyhydric alcohol or a derivative thereof and a monobasic fatty acid or a derivative thereof,
(II) a reaction product of a polybasic carboxylic acid or a derivative thereof, a polyhydric alcohol or a derivative thereof and a monohydric aliphatic alcohol or a derivative thereof,
(III) a reaction product of a polyhydric alcohol or a derivative thereof and a monobasic fatty acid or a derivative thereof,
(IV) a reaction product of a monohydric aliphatic alcohol or a derivative thereof and a polybasic carboxylic acid or a derivative thereof, or
(v) a reaction product of a polybasic carboxylic acid or a derivative thereof and a polyhydric alcohol or a derivative thereof.

5,554,312
PHOTORESIST STRIPPING COMPOSITION
Irl E. Ward, Bethlehem, Pa., assignor to Ashland, Dublin, Ohio
Filed Jan. 13, 1995, Ser. No. 374,205
Int. Cl.[6] C11D *3/28;3/32;3/30;3/37*
U.S. Cl. 510—175 **11 Claims**

1. A stripping composition comprising a mixture of
a) from about 30 to 96 weight percent of an organic polar solvent selected from the group consisting of N,N-dialkylalkanoylamide, N-alkyl lactams, lactones, acetate esters of ethylene glycol ethers, acetate esters of propylene glycol ethers, aliphatic amides, cyclic, aliphatic sulfones, esters of dibasic acids, cyclic ketones, sulfoxides, ether alcohols and mixtures thereof;
b) from about 4 to 70 weight percent of an organic aliphatic or aromatic amine of the general formula of R_1—NH—R_2, or an organic amino alcohol of the general formula of OH—R_1—NH—R_2 or mixtures thereof, wherein R_1 is selected from the group consisting of phenyl, lower alkyl and lower alkoxy and R_2 is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy and lower alkanol;
c) a glycol selected from the group consisting of polyethylene glycol, polypropylene glycol and mixtures thereof in an amount of less than 1.0 weight percent and more than 0.01 weight percent to provide a conformal caging effect, said glycol having an average molecular weight of 400 to 1,000.

5,554,313
CONDITIONING SHAMPOO CONTAINING INSOLUBLE, NONVOLATILE SILICONE

wherein R represents an alkanoyl or alkenoyl group having from 10 to 18 carbon atoms;
R^1 represents an alkylene having from 2 to 4 carbon atoms;

1. A polysiloxane liquid crystalline polymer having a number average molecular weight of 1000 to 30,000 and comprising repeating units of the formulas:

wherein molar ratios w, x y and z of the repeating units (I), (II), (III) and (IV), respectively, satisfy the equations: $0 \leqq w \leqq 0.95$, $0 \leqq x \leqq 0.4$, $0 \leqq y \leqq 1$ and $0 \leqq z \leqq 1$ provided that at least one of y and

5,554,313

CONDITIONING SHAMPOO CONTAINING INSOLUBLE, NONVOLATILE SILICONE

John M. Chandler, Bear, Del., assignor to ICI Americas Inc., Wilmington, Del.

Filed Jun. 28, 1994, Ser. No. 267,692
Int. Cl.[6] A61K *7/075*
U.S. Cl. 510—121 **20 Claims**

1. An aqueous composition comprising:

(a) from 45 to 95%, by weight of the composition, water;

(b) from 1 to 5%, by weight of the composition, sorbitan monostearate, sorbitan distearate or mixtures thereof;

(c) from 0.01 to 1%, by weight of the composition, stearyl alcohol ethylene oxide condensate having at least 50 and does not exceed 13 ethylene oxide units;

(d) from 0.1 to 10%, by weight of the composition, insoluble, non-volatile silicone; and

(e) from 1 to 40% by weight of the composition, surfactant or combinations of surfactants selected from the group consisting of:

i. anionic surfactants or combinations thereof selected from the group consisting of sodium, magnesium, ammonium and mono-, di- and triethanolamine salts of alkyl ether sulfates, N-alkoyl sarcosinates, alkyl phosphates, and alkyl ether phosphates;

ii. nonionic surfactants or combinations thereof selected from aliphatic (C_8–C_{18}) primary or secondary, linear or branched chain alcohols and phenols condensed with 60 to 30 alkylene oxide units and mono or dialkyl alkanolamides or alkyl polyglucosides;

iii. amphoteric surfactants or combinations thereof; and

iv. mixtures thereof.

5,554,314

Patent Not Issued For This Number

5,554,315

FOAMING SURFACTANT COMPOSITION COMPRISING FATTY ACID POLYOXYALKYLENE LOWER ALKYL ETHER AND FATTY ACID MONOGLYCERIDE

Manabu Tonomura, Tochigi; Masaaki Iwahashi, and Toyomi Koike, both of Wakayama, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Dec. 28, 1994, Ser. No. 364,687
Claims priority, application Japan, Dec. 28, 1993, 5-354071
Int. Cl.[6] C11D *1/825;10/04;11/00*
U.S. Cl. 510—535 **11 Claims**

1. A surfactant composition comprising a fatty acid polyoxyalkylene lower alkyl ether represented by formula (1):

$$R(OR^1)_nOR^2 \quad (1)$$

wherein R represents an alkanoyl or alkenoyl group having from 10 to 18 carbon atoms;

R^1 represents an alkylene having from 2 to 4 carbon atoms;

R^2 represents a lower alkyl group; and

n is from 5 to 100 on the weight-average; and a fatty acid monoglyceride represented by formula (2):

$$R^3OCH_2CH(OH)CH_2OH \quad (2)$$

wherein R^3 represents an alkanoyl group having from 8 to 16 carbon atoms or an alkenoyl group having from 12 to 22 carbon atoms.

7. A method for improving the foaming properties of a fatty acid polyoxyalkylene lower alkyl ether represented by formula (1):

$$R(OR^1)_nOR^2 \quad (1)$$

wherein R represents an alkanoyl or alkenoyl group having from 10 to 18 carbon atoms;

R^1 represents an alkylene having from 2 to 4 carbon atoms;

R^2 represents a lower alkyl group; and

n is from 5 to 100 on the average, which comprises adding a fatty acid monoglyceride represented by formula (2):

$$R^3OCH_2CH(OH)CH_2OH \quad (2)$$

wherein R^3 represents an alkanoyl group having from 8 to 16 carbon atoms or an alkenoyl group having from 12 to 22 carbon atoms;

to the fatty acid polyoxyalkylene lower alkyl ether.

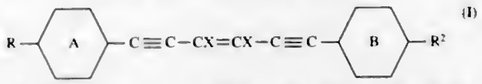
5,554,316

HEXENEDIYNE DERIVATIVE AND A LIQUID CRYSTAL COMPOSITION

Atsuko Fujita; Shuichi Matsui; Kazutoshi Miyazawa; Yasuyuki Goto; Etsuo Nakagawa, and Shinichi Sawada, all of Chibaken, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Mar. 14, 1995, Ser. No. 403,615
Claims priority, application Japan, Mar. 16, 1994, 6-072613
Int. Cl.[6] C09K *19/52;19/34;* **C07C** *22/08;43/215;43/225*
U.S. Cl. 252—299.01 **20 Claims**

1. A hexenediyne having the following formula (I):



(I)

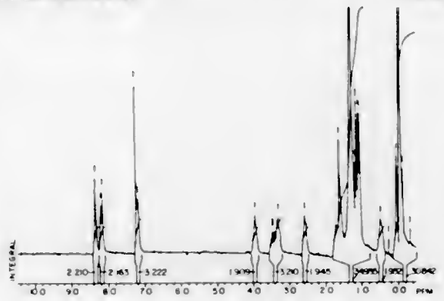
wherein R^1 and R^2 each represents an alkyl group of 1 to 10 carbon atoms or an alkoxy group of 1 to 10 carbon atoms independently of each other; ring A and ring B each represents 1,4-cyclohexylene or 1,4-phenylene independently of each other; and X represents hydrogen atom or fluorine atom.

5,554,317

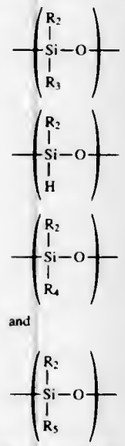
COMPOUND HAVING UNSATURATED SIDE CHAIN, PROCESS FOR PREPARING THE SAME, LIQUID CRYSTALLINE POLYMER PREPARED FROM THE SAME, LIQUID CRYSTAL MIXTURE AND DISPLAY ELEMENT

Yoshiaki Tsubata; Kayoko Ueda; Koichi Fujisawa, all of Tsukuba; Takayuki Higashi, Yokohama; Masayoshi Minai, Moriyama; Naoyuki Takano, and Yukari Fujimoto, both of Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 13, 1994, Ser. No. 274,315
Claims priority, application Japan, Jul. 13, 1993, 5-173337; Aug. 3, 1993, 5-192380; Oct. 7, 1993, 5-251638; Feb. 3, 1994, 6-011895
Int. Cl.[6] C09K *19/52;19/34;19/12;* **G02F** *1/13*
U.S. Cl. 252—299.01 **7 Claims**



1. A polysiloxane liquid crystalline polymer having a number average molecular weight of 1000 to 30,000 and comprising repeating units of the formulas:



(I)

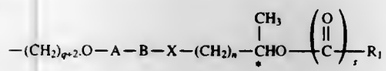
(II)

(III)

and

(IV)

wherein R_2 and R_3 are the same or different and represent an alkyl group having 1 to 5 carbon atoms; R_4 represents a group of the formula:



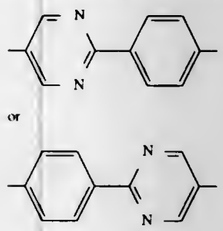
(6)

in which A and B are the same or different and represent a group selected from the group consisting of 1,4-phenylene, 2,5-pyridine, 2,5-pyrimidine, 2,5-pyrazine, 3,6-pyridazine, 4,4'-biphenyl, 5-(2-phenylpyrimidine), 2-(5-phenylpyrimidine), 2-(5-phenylpyridine), 2,6-naphthalene, 2,6-quinoline, 2,6-quinoxaline and 2,6-quinazoline, or either one of A and B represents a single bond, provided that the phenyl ring may be optionally substituted with at least one fluorine atom; R_1 represents a saturated or unsaturated alkyl group having 1 to 20 carbon atoms which may be optionally substituted with at least one halogen atom or an alkoxyalkyl group having 2 to 20 carbon atoms which may be optionally substituted with at least one halogen atom; X represents $—CH_2CH_2—$, —CH=CH—, — C≡C— or a single bond; n is an integer of 0 to 6; q is an integer of 1 to 15; p and s are each 0 or 1; and the asterisk * indicates an asymmetric carbon atom; and

R_5 represents a group of the formula

(7)

in which, R_6 is an alkyl group having 3 to 30 carbon atoms, at alkoxy group having 3 to 20 carbon atom, an alkoxyalkyl group having 3 to 20 carbon atoms or an alkoxy-alkyloxy group having 3 to 20 carbon atoms; j is an integer of 3 to 17; and t is 0 or 1, and —A–B— represents a group of the formula:



or

wherein molar ratios w, x y and z of the repeating units (I), (II), (III) and (IV), respectively, satisfy the equations: $0 \leqq w \leqq 0.95$, $0 \leqq x \leqq 0.4$, $0 \leqq y \leqq 1$ and $0 \leqq z \leqq 1$ provided that at least one of y and z is not zero.

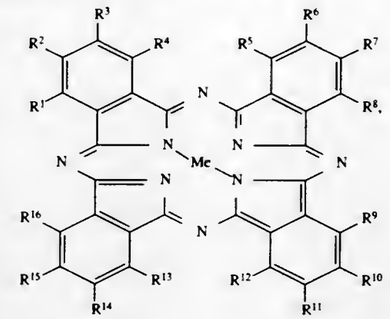
5,554,318

USE OF COMPOUNDS WHICH ABSORBS AND FLUORESCE IN THE IR RANGE AS CRACK-DETECTING AGENTS

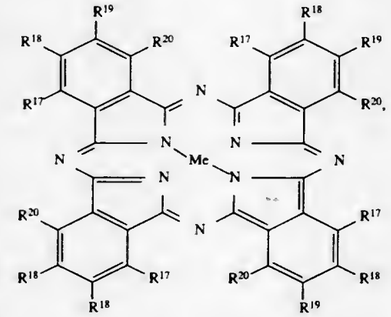
Peter Neumann, Mannheim; Jürgen Kipper, Karlsruhe; Bernhard Albert, Maxdorf, and Gerhard Wagenblast, Wachenheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jan. 27, 1995, Ser. No. 379,283
Claims priority, application Germany, Feb. 7, 1994, 44 03 664.7
Int. Cl.[6] G01N *21/91*
U.S. Cl. 252—301.19 **5 Claims**

1. A method for detecting cracks in a material, comprising applying to said material a solution of a crack-detecting agent having an absorption maximum in the range from 600 to 1,200 nm and a fluorescence maximum in the range from 620 to 1,200 nm, and exciting said applied solution of the crack-detecting agent to render it fluorescent to thereby detect any cracks present in said material, wherein said crack-detecting agent is of the following formulas Ia, Ib, II, III, IV or V:



(Ia)



(Ib)

where

Me^1 is two lithium atoms, magnesium, zinc, manganese, VO, tiO, AlCl or a radical of the formula

where

Y^{17} and Y^{18} independently of one another are each hydroxyl, C_1–C_{20}-alkoxy, C_1–C_{20}-alkyl, C_2–C_{20}-alkenyl, C_3–C_{20}-

alkenyloxy or a radical of the formula

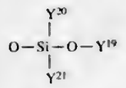
the formula

NT^6T^7 or O —CO—NT^6T^7, where T^6 and T^7 independently of one another are each hydrogen,

5,554,320

LIQUID CLEANING COMPOSITIONS

alkenyloxy or a radical of the formula



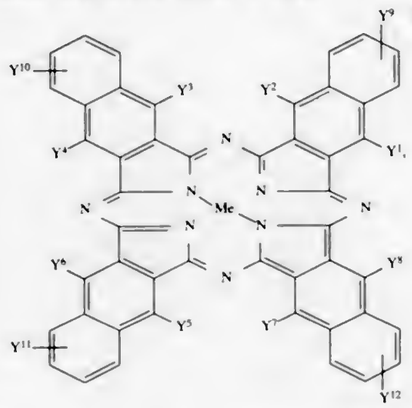
where Y^{19} is C_1–C_{20}-alkyl, C_2–C_{20}-alkenyl or C_4–C_{20}-alkadienyl and Y^{20} and Y^{11} independently of one another are each C_1–C_{12}-alkyl, C_2–C_{12}-alkenyl or the above-defined radical OY^{19},

at least 4 of the radicals R^1 to R^{16} independently of one another are each a radical of the formula $W—X^1$, where W is a chemical bond, oxygen, sulfur, imino, C_1–C_4-alkylimino or phenylimino and X^1 is C_1–C_{20}-alkyl which may be interrupted by 1 to 4 oxygen atoms as ether functions and may be substituted by phenyl, or X^1 is adamantyl, C_5-C_7-cycloalkyl or unsubstituted or substituted phenyl,

any remaining radicals R^1 to R^{16} are each hydrogen, halogen, hydroxysulfonyl or C_1–C_4-dialkylsulfamoyl,

R^{17} and R^{18} or R^{18} and R^{19} or R^{19} and R^{20} together in each case form a radical of the formula $X^2—C_2H_4—X^3$, where one of the two radicals X^2 and X^3 is oxygen and the other is imino or C_1–C_4-alkylimino, and

R^{19} and R^{20} or R^{17} and R^{20} or R^{17} and R^{18} independently of one another are in each case hydrogen or halogen.



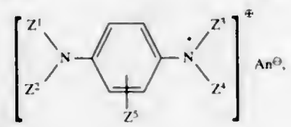
(II)

where

Y^1, Y^2, Y^3, Y^4, Y^5, Y^6, Y^7 and Y^8 independently of one another are each hydrogen, hydroxyl or a radical of the formula $W—X^4$, where W is a chemical bond, oxygen sulfur, imino, C_1–C_4-alkylimino or phenylimino and X^4 is C_1–C_{20}-alkyl, which may be interrupted by 1 to 4 oxygen atoms as ether functions and may be substituted by phenyl, or X^4 is C_5–C_7-cycloalkyl, C_2–C_{20}-alkenyl or C_4–C_{20}-alkadienyl, and

Y^9, Y^{10}, Y^{11} and Y^{12} independently of one another are each hydrogen, C_1–C_{20}-alkyl or C_1–C_{20}-alkoxy, where the alkyl groups may each be interrupted by 1 to 4 oxygen atoms as ether functions, or are each halogen, hydroxysulfonyl or C_1–C_4-dialkylsulfamoyl, and

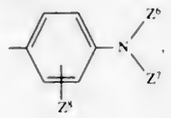
Me^2 is two hydrogen atoms or has the above-defined meaning of Me^1,



(III)

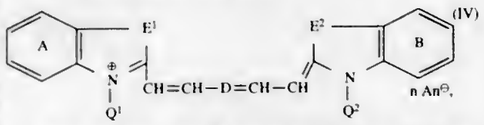
where

Z^1, Z^2, Z^3 and Z^4 independently of one another are each C_1–C_{20}-alkyl which may be interrupted by 1 to 4 oxygen atoms as ether functions, or are each C_1–C_{20}-alkanoyl or a radical of the formula



where Z^6 is hydrogen, C_1–C_{20}-alkyl which may be interrupted by 1 to 4 oxygen atoms as ether functions, or is C_1–C_{20}-alkanoyl, Z^7 is hydrogen or C_1–C_{20}-alkyl which may be interrupted by 1 to 4 oxygen atoms as ether functions, and Z^8 is hydrogen, C_1–C_{20}-alkyl which may be interrupted by 1 to 4 oxygen atoms as ether functions, or is halogen, and

$An\ominus$ is one equivalent of an anion,



(IV)

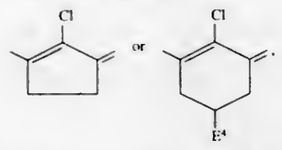
where the rings A and B independently of one another may each be benzofused and may be substituted,

E^1 and E^2 independently of one another are each oxygen, sulfur, imino or a radical of the formula

$—C(CH_3)_2—$ or $—CH=CH—$,

D is a radical of the formula

$—CE^3=$ or $—CH=CE^3—CH=$,

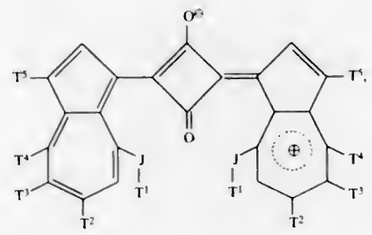


where E^3 is hydrogen, C_1–C_6-alkyl, chlorine or bromine and E^4 is hydrogen or C_1–C_6-alkyl,

Q^1 and Q^2 independently of one another are each phenyl, C_5–C_7-cycloalkyl, C_1–C_{20}-alkyl which may be interrupted by 1 to 4 oxygen atoms as ether functions and are unsubstituted or substituted by hydroxyl, chlorine, bromine, carboxyl, C_1–C_4-alkoxy-carbonyl, acryloyloxy, methacryloyloxy, hydroxysulfonyl, C_1–C_7-alkanoylamino, C_1–C_6-alkylcarbamoyl, C_1–C_6-alkylcarbamoyloxy or a radical of the formula $G\ominus(K)_3$, where G is nitrogen or phosphorus and K is phenyul, C_5–C_7-cycloalkyl or C_1–C_{20}-alkyl,

$An\ominus$ is one equivalent of an anion and

n is 1, 2 or 3,



(V)

where

J is C_1–C_{12}-alkylene,

T^1 is hydrogen, halogen, amino, hydroxyl, C_1C_{12}-alkoxy, phenyl, substituted phenyl, carboxyl, C_{11}–C_{12}-alkoxycarbonyl, cyano or a radical of the formula $—NT^7—CO—T^6$, $—CO—NT^6T^7$ or $O—CO—NT^6T^7$, where T^6 and T^7 independently of one another are each hydrogen,

C_1–C_{12}-alkyl, C_5–C_7-cycloalkyl, phenyl, 2,2,6,6-tetramethylpiperidin-4-yl or cyclohexylaminocarbonyl, and

T^2, T^3, T^4 and T^5 independently of one another are each hydrogen or C_1–C_{12}-alkyl which is unsubstituted or substituted by halogen, amino, C_1–C_{12}-alkoxy, phenyl, substituted phenyl, carboxyl, C_1–C_{12}-alkoxycarbonyl or cyano,

with the proviso that, when T^5 is hydrogen, the ring positions of the substituents J-T^1 and T^4 may furthermore be interchanged within an azulene ring, on one azulene ring or both azulene rings.

5,554,319

PHOSPHOR

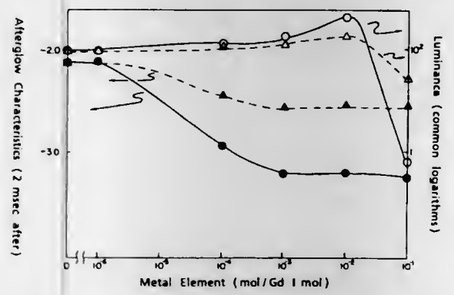
Takashi Nakamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 263,220, Jun. 17, 1994, abandoned, which is a continuation of Ser. No. 134,370, Oct. 12, 1993, abandoned, which is a continuation of Ser. No. 1,242, Jan. 6, 1993, abandoned, which is a continuation of Ser. No. 885,058, May 14, 1992, abandoned, which is a continuation of Ser. No. 774,171, Oct. 15, 1991, abandoned, which is a continuation of Ser. No. 666,449, Mar. 11, 1991, abandoned, which is a continuation of Ser. No. 541,392, Jun. 21, 1990, abandoned. This application Feb. 16, 1995, Ser. No. 389,688

Claims priority, application Japan, Jun. 22, 1989, 1-160213

Int. Cl.[6] C09K *11/86*

U.S. Cl. 252—301.4 H **9 Claims**



1. A cerium activated rare earth oxyhalide phosphor having a crystal structure that is the same as PbFCl, wherein Ln, O and X are crystal matrix elements in which Ln is at least one rare earth element selected from the group consisting of Y, La, Gd and Lu; X is at least one halogen selected from the group consisting of Cl, Br and I; and the quantity of Ce per mole of rare earth oxyhalide is represented by x, where x is a number satisfying the condition of $0<x\leqq0.2$, and a ratio between said Ln and said X satisfy the condition of $0.500<X/Ln\leqq0.998$ by atomic ratio; said phosphor exhibiting a stimulation spectrum having a maximum peak located at λ, which is a wavelength satisfying the condition of 550 nm$<\lambda<$700mm, said λ, being at a longer wavelength than the λ, of the phosphor as defined above except where $X/Ln>0.998$, which further contains at least one metal element selected from the group consisting of Li, K, In, Al, Ca, Bi, Sm, Cu, Mg, Cs, Tl, Zn, Pb and Hf, wherein said metal element is present in an amount of not more than 0.1 mol/mol Ln, but not less than 10^{-6} mol/mol Ln.

5,554,320

LIQUID CLEANING COMPOSITIONS

Georges Ylanakopoulos, Rue Gros Gland, 30, 4000, Liege, Belgium

Continuation-in-part of Ser. No. 155,315, Nov. 22, 1993, Pat. No. 5,462,697. This application Sep. 23, 1994, Ser. No. 311,753

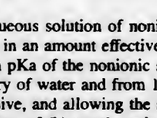
Int. Cl.[6] C23F *11/14;11/167*

U.S. Cl. 252—389.23 **3 Claims**

1. An acidic anticorrosion solution which comprises approximately by weight:

(a) 0.1 to 0.5% of phosphoric acid;

(b) 0.5% to 4.0% of a nitrogen containing organic compound having the formula:



wherein R_1 is a methyl group and R_2, R_3, and R_4 are independently selected from the group consisting of CH_3, C_2H_5, CH_2CH_2Y and $CH_2CH_2CH_2Y$, wherein Y is selected from the group consisting of Cl, Br, CO_2H, $(CH_2O)_nOH$, wherein n is 1 to 10 and OH, and X^- is selected from the group consisting of Cl, Br, and methosulfate; and

(c) the balance being water, wherein the anticorrosion solution does not contain any sodium chloride and said anticorrosion solution, when coated on an acid sensitive enamel surface, protects said acid sensitive enamel surface from corrosion.

5,554,321

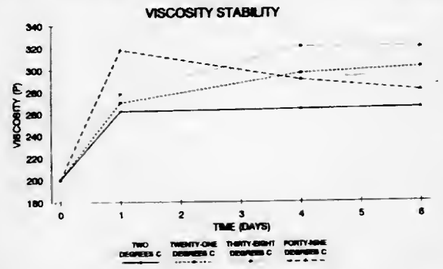
THICKENED AQUEOUS ABRASIVE CLEANSER WITH IMPROVED RINSABILITY

Clement K. Choy, Alamo; Brian P. Argo, Tracy; Kevin J. Brodbeck, Pleasanton, and Lynn M. Hearn, Livermore, all of Calif., assignors to The Clorox Company, Del.

Division of Ser. No. 125,949, Sep. 23, 1993, Pat. No. 5,470,499. This application Aug. 31, 1995, Ser. No. 522,046

Int. Cl.[6] C11D *1/75;3/02;3/37*

U.S. Cl. 510—398 **6 Claims**



1. A method for making a thickened aqueous abrasive cleanser with enhanced phase and viscosity stability, the method comprising the steps of:

(a) making an aqueous solution of nonionic surfactant and pH adjusting agent in an amount effective for maintaining the ph at least above a pKa of the nonionic surfactant;

(b) making a slurry of water and from 1% to 70% of a calcium carbonate abrasive, and allowing the slurry to degas;

(c) adding the slurry of (b) to take solution of (a), slowly with gentle mixing and allowing the resultant mixture to degas; and

(d) adding a quantity of cross-linked polyacrylate having a molecular weight of 80,000–7,000,000 g/mole and a pH of a 2% solution at 21° C. of between 1.8 and 5 and any adjunct ingredients wherein said nonionic surfactant and said cross-linked polyacrylate are present in amounts effective to result

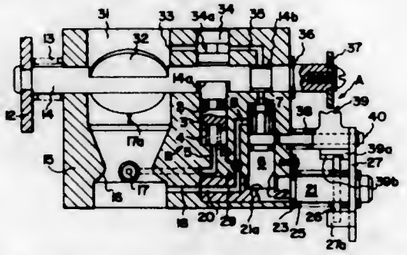
in a composition that is shear-thinning and wherein said composition has an ionic strength of less than about 5M.

5,554,322

APPARATUS FOR SUPPLYING STARTING-FUEL FOR A CARBURETOR

Takeshi Kobayashi, Yokohama, Japan, assignor to Walbro Japan, Inc., Tokyo, Japan

Filed Jun. 13, 1995, Ser. No. 490,071
Claims priority, application Japan, Jun. 20, 1994, 6-160543
Int. Cl.[6] F02M *1/04*
U.S. Cl. 261—35 **11 Claims**



1. A carburetor comprising, a body, a mixing passage through said body having an air inlet and a fuel and air mixture outlet, a throttle valve in said mixing passage between said inlet and said outlet and mounted on a throttle shaft carried by said body, a fuel chamber carried by said body, a main metering jet communicating with said mixing passage upstream of said throttle valve and with said fuel chamber, a mixing chamber carried by said body, a fuel intake passage communicating with said mixing chamber and said fuel chamber, an air intake passage communicating with said mixing chamber and said mixing passage upstream of said throttle valve for supplying air to mix with fuel in said mixing chamber, an outlet passage communicating with said mixing chamber and said mixing passage downstream of said throttle valve for supplying a mixture of fuel and air from said mixing chamber to said mixing passage downstream of said throttle valve, a control valve carried by said body, communicating with said outlet passage, and having a plunger movable to a closed position and an open position of said control valve to control the flow of an air and fuel mixture from the mixing chamber to the mixing passage, an actuator shaft carried by said body and operably connected with said plunger to move said plunger to open and closed positions of said control valve in response to rotary movement of said actuator shaft, and a mechanical mechanism operably associated with said actuator shaft and said throttle shaft for releasably retaining said actuator shaft in the open position of said control valve and releasing and rotating the actuator shaft to the closed position of said control valve in response to rotary movement of the throttle shaft to move the throttle valve from an idle position toward a full open position of said throttle valve.

5,554,323

PROCESS FOR PRODUCING MICROCAPSULES

Yoshihiro Tsukimi; Takayuki Matsumoto, and Hideo Nagano, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 4, 1993, Ser. No. 145,626
Claims priority, application Japan, Nov. 5, 1992, 4-319305
Int. Cl.[6] B01J *13/16*
U.S. Cl. 264—4.7 **5 Claims**

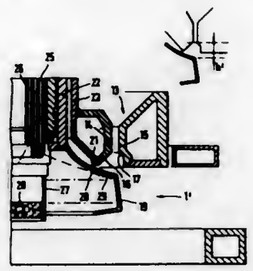
1. A process for producing microcapsules using continuous emulsification equipment, comprising the steps of: pouring a disperse phase into a disperse medium in a preliminary emulsification tank medium while stirring said disperse medium to thereby form a primary emulsion; transferring said primary emulsion into cylindrical continuous emulsification equipment having a rotatable inner cylinder; rotating said inner cylinder and subsequently stepwise lowering the rotational speed of said inner cylinder in accordance with a predetermined schedule to produce a broad particle size distribution; subsequently adding water and an aqueous solution of sodium hydroxide to said emulsion in an encapsulation tank; and revolving a stirrer in said encapsulation tank while performing an encapsulation reaction in said encapsulation tank to thereby produce a capsule solution, wherein synthetic high polymer based wall membranes serving as shells in said emulsion are formed in said encapsulation tank.

5,554,324

METHOD FOR PRODUCING MINERAL WOOL

Jean L. Bernard, Clermont; Serge Vignesoult, Paris; Jean Battigelli, Rantigny; Guy Berthier, Clermont, and Hans Furtak, Speyer am Rhein, all of France, assignors to Isover Saint-Gobain, France

Filed Mar. 18, 1994, Ser. No. 215,650
Int. Cl.[6] B29B *9/00*
U.S. Cl. 264—8 **22 Claims**



1. A method for producing mineral wool, comprising:

providing a material having a liquidus temperature above 1200° C. and a viscosity of less than 5000 poises at said liquidus temperature;

melting said material;

heat treating said molten material for a treatment period sufficient to destroy all nuclei of crystallization;

introducing the molten material into a spinner having a peripheral wall that comprises a plurality of orifices;

centrifuging the molten material through said plurality of orifices thereby forming a plurality of filaments;

attenuating said plurality of filaments by subjecting said plurality of filaments to a heated gas flow flowing along said peripheral wall, said heated gas flow being heated by an annular external burner concentrically disposed with respect to said spinner; and

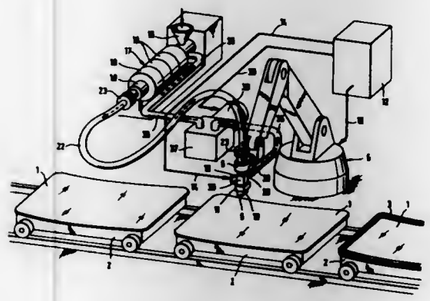
maintaining a spinner temperature during ongoing operation of said spinner so that said spinner temperature is lower than or equal to a temperature at which the viscosity of the molten material is 100 poises, and higher than a crystallization temperature in an undercooled state of the molten material.

5,554,325

PROCESS AND DEVICE FOR EXTRUDING A CALIBRATED PROFILE OF A THERMOPLASTIC POLYMER ONTO ARTICLES

Rolf Kotte, Alsdorf-Begau; Gerd Cornils, and Thomas Stumpe, both of Merzenich, all of Germany, assignors to Saint Gobain Vitrage International, Courbevoie, France

Filed May 9, 1994, Ser. No. 239,572
Claims priority, application Germany, May 10, 1993, 43 15 469.7
Int. Cl.[6] B29C *47/02;47/30*
U.S. Cl. 264—37 **13 Claims**



1. A process for extruding a calibrated profile of a thermoplastic polymer onto an article positioned in a processing region of an automatic handling unit, comprising the steps of:

feeding a melted polymer to a heated extruder head having an extrusion die;

extruding the melted polymer from the extruder head while guiding the extruder head along a surface of the article;

lifting the extruder head from the article after completion of said extruding step; and

maintaining, without interruption, the feeding of the melted polymer to the extruder head during said lifting step and unit commencement of a subsequent second feeding step by discharging the melted polymer out of the extruder head via an outlet orifice other than said extrusion die, the pressure loss during discharge through said outlet orifice of said extruder head being substantially equal to the pressure loss during discharge through said extrusion die so that the melted polymer fed to the extruder head is substantially directed to said outlet orifice, said outlet orifice being provided in the extruder head and in the vicinity of the extrusion die.

6. A device for extruding a calibrated profile of a thermoplastic polymer onto an article positioned in a processing region of an automatic handling unit, comprising:

an extruder for extruding a melted polymer, said extruder including an extruder head having a heated extrusion die with an orifice and a heated pressure hose connecting said extruder to said extruder head for supplying the melted polymer to said extrusion die; and

an automatic handling unit including a controller for guiding said extruder head along a surface of the article during extrusion of the melted polymer from the extrusion die,

wherein said extruder head comprises:

a) an outlet orifice other than said orifice of said extrusion die, and

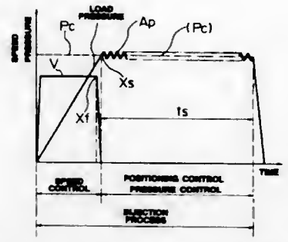
b) a change-over valve being movable in response to said controller and positionable for selectively directing the melted polymer to one of said extrusion die and said outlet orifice, the pressure loss during discharge through said outlet orifice of said extruder head being substantially equal to the pressure loss during discharge through said extrusion die so that the melted polymer fed to the extruder head is substantially directed to said outlet orifice.

5,554,326

CONTROL METHOD OF INJECTION MOLDING MACHINE

Makoto Nakazawa; Toshiyasu Koda, and Tyuyoshi Arai, all of Nagano, Japan, assignors to Nissei Plastic Industrial Co., Ltd., Nagano-ken, Japan

Filed Apr. 14, 1995, Ser. No. 421,886
Claims priority, application Japan, Apr. 15, 1994, 6-102335
Int. Cl.[6] B29C *45/77*
U.S. Cl. 264—40.1 **7 Claims**



1. A control method of an injection molding machine including the steps of molding by advancing a screw, injecting and filling the resin in a barrel cylinder into a mold to fill the mold, and then applying a predetermined holding pressure to the resin in the mold, characterized in that the control method comprises the steps of:

performing an injecting and filling by using an injection cylinder having a double-rod piston which can advance and retreat the screw; and

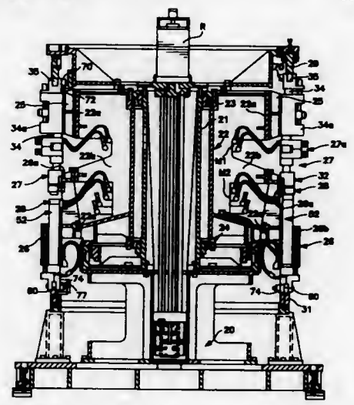
then controlling to drive the injection cylinder by a controlling signal including a predetermined alternating current signal in such a manner that the screw vibrates in a fore and rear direction as a center with a advance finish and stop position and a position at which the screw is moved so as to retreat by a predetermined distance from the advance finish and stop position.

5,554,327

METHOD AND APPARATUS FOR COMPRESSION MOLDING PLASTIC ARTICLES

Keith W. Ingram, Holland, Ohio; David C. Thompson, Ft. Wayne, Ind., and David C. Thompson, Ft. Wayne, Ind., assignors to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Oct. 14, 1993, Ser. No. 135,829
Int. Cl.[6] B29C *43/08;43/18;43/58*
U.S. Cl. 264—40.5 **55 Claims**



1. A method for compression molding a plastic article comprising

providing a first tool assembly having a male mold associated therewith,

providing a second tool assembly having a cavity mold associated therewith,

providing a first fixed cam for moving the first tool assembly relative to said second assembly and a second fixed cam for moving said second tool assembly relative to said first assembly,

interposing a fluid cylinder comprising a fluid filled chamber and a piston on one of said tool assemblies interposed between one of said fixed cams and the associated tool assembly for urging said one tool assembly toward said other tool assembly to provide a constant limiting molding force during the full movement of the associated tooling under the actuation of said cams,

providing said fluid in said fluid cylinder at a predetermined pressure to provide a constant limiting molding force during the forming of the plastic article of the associated tooling under the actuation of said cams,

providing a charge of extrudate to the cavity of the cavity mold,

moving the first and second assemblies under the action of said fixed cams to move the first assembly and second mold assembly toward one another to close the mold and provide a constant limiting molding force on the charge to compress the charge to form an article,

providing an array of sets of said first tool assemblies, said associated second tool assemblies and said associated fluid cylinders having the pressure therein maintained at said predetermined pressure to provide a constant limiting molding force for each set of tooling assemblies unaffected by the other sets of tool assemblies during the full movement of the associated set under the actuation of said cams,

moving said sets of tool assemblies successively in an endless path past a station wherein a charge of extrudate is delivered successively to a cavity mold, and

thereafter moving said sets of tooling successively past the fixed cams such that the cams cause each set for first tool assembly and second tool assembly to close the mold and provide a constant molding force on the charge to compress the charge to form an article, and

connecting the fluid cylinder to a common source of fluid under said predetermined pressure.

28. An apparatus for compression molding a plastic article comprising

a first mold assembly having a male mold associated therewith,

a second mold assembly having a cavity mold associated therewith,

a first fixed cam for moving said first mold assembly relative to said second mold assembly,

a second fixed cam for moving said second mold assembly relative to said first mold assembly,

a fluid cylinder having a fluid filled chamber at a predetermined pressure and a piston on one of said tool assemblies interposed between one of said first fixed cam and said first mold assembly and said second fixed cam and said second mold assembly and urging said one tool assembly toward said other tool assembly interposed between to provide a constant limiting molding force during the full movement of the associated tooling under the actuation of said cams,

an array of sets of first tool assemblies, associated second tool assemblies, and associated fluid cylinders having the pressure therein maintained at said predetermined pressure to provide a constant limiting molding force for each set of tooling assemblies unaffected by the other sets of tooling assemblies,

means for moving said sets of tooling assemblies successively in an endless path past a station wherein a charge of extrudate is delivered successively to a cavity mold, and thereafter successively past said fixed cams to cause each set of first tool assembly to close the mold and provide a constant limiting molding force on the charge to compress the charge to form into an article, and

means connecting the fluid chambers of said fluid cylinders to a source of fluid pressure.

5,554,328

METHOD OF MAKING HEAT AND IMPACT RESISTANT COMPOSITE CERAMIC MATERIAL

Stanislav F. Kondakov, Chernogolovka, Russian Federation, assignor to Composite Materials, Inc., Fairfax, Va.

Filed Dec. 21, 1994, Ser. No. 360,903
Int. Cl.[6] B29C *59/00*
U.S. Cl. 264—60 **18 Claims**

1. A method of manufacturing a ceramic composite material comprising the steps of:

blending a plurality of constituent powders consisting essentially of, by mass ratio, 50–90% powdered boron carbide, 5– 30% powdered silicon carbide, and 3–22% powdered titanium carbide, each powdered constituent having a particle size between 1 and 40 microns; and

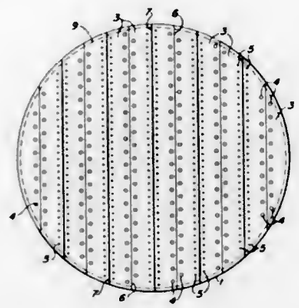
consolidating the blended constituent powders with the application of heat to form a ceramic composite body which includes 50–90% boron carbide, 5–30% silicon carbide, and 3–22% titanium carbide, and has fracture toughness of between 9–15 $MPa \times m^{1/2}$.

5,554,329

FRACTIONATION TRAY FORMED BY TRIANGULAR DOWNCOMER MODULES

Daniel R. Monkelbaan, Amherst; Michael R. Resetarits, Depew, and Robert J. Miller, Niagara Falls, all of N.Y., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 167,297, Dec. 16, 1993, Pat. No. 5,407,605. This application Mar. 13, 1995, Ser. No. 403,154
Int. Cl.[6] B01F *3/04*
U.S. Cl. 261—98 **4 Claims**



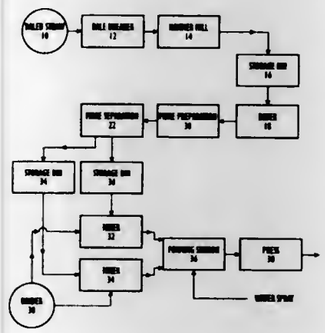
1. A fractionation tray adapted for being mounted in a horizontal plane in a vertical fractionation column, said tray having upper and lower surfaces and comprising a perforated tray deck formed entirely from a plurality of adjacent triangular downcomer modules and substantially free of horizontal planar imperforate or perforate areas; with each downcomer module comprising a pair of planar sidewalls which are inclined at substantially equal angles from the plane of the tray and joined together to form sealed top and bottom regions of the downcomer module separated by an imperforate central region; with two rows of perforations being located in each of the downcomer module sidewalls, with one row of said perforations being located respectively in each of the top and bottom regions of the downcomer modules with the perforations in the bottom region being larger than the perforations in the upper region of the sidewalls, and with the perforations in the upper region of each downcomer module sidewall having a greater total area than the larger perforations in the lower region of the corresponding downcomer module sidewall.

5,554,330

PROCESS FOR THE MANUFACTURING OF SHAPED ARTICLES

Steven J. Flannery, Outario, Canada, and Hans G. Bücking, Springe, Germany, assignors to Isoboard Enterprises Inc., Toronto, Canada, and Bison-werke Bahre & greten GmbH & Co KG, Spring, Germany

Filed Jan. 31, 1995, Ser. No. 380,760
Int. Cl.[6] B27N *3/08;* **B32B** *31/20;31/22*
U.S. Cl. 264—113 **30 Claims**



1. A process for preparing shaped articles comprising the steps of:

(a) mixing a water curable binder with vegetable particulate material to form a first mixture, the moisture content of said first mixture being insufficient to cure said binder prior to said mixture being placed in a mold;

(b) feeding said first mixture to a mold having molding plates, said molding plates and said first mixture defining an interface;

(c) providing liquid water from an external source to at least a portion of said interface, the amount of water added at said interface, in conjunction with the moisture content of said first mixture, being sufficient to cure said binder; and,

(d) subjecting said first mixture to elevated temperatures and and pressures.

5,554,331

METHOD OF MAKING A LARGE DECORATIVE PANEL

Joseph S. Kildune, Salem, N.H., assignor to GenCorp Inc., Fairlawn, Ohio

Filed Apr. 25, 1995, Ser. No. 428,614
Int. Cl.[6] B29C *33/40;33/42;59/02*
U.S. Cl. 264—161 **19 Claims**

1. A method of forming a decorative thermoplastic panel having an embossed decorative indicia comprising the steps of:

a) forming a decorative design within an impressionable material to provide a positive mold;

b) casting an elastomeric material within the positive mold to provide a negative blanket casting;

c) removing the blanket casting from the positive mold;

d) pouring a casting material over the blanket casting to form an embossing plate having a decorative design substantially identical to the decorative design within the positive mold;

e) embossing the thermoplastic panel with the embossing plate under high temperature and pressure to form the decorative thermoplastic panel.

5,554,332

PROCESS OF MANUFACTURING SHAPED ELEMENTS FROM SYNTHETIC THERMOPOLASTICS

Helfried Schnallinger, Sarmingstein, A-4382 Sarmingstein 46, Austria

PCT No. PCT/AT93/00159, § 371 Date Apr. 12, 1995, § 102(e) Date Apr. 12, 1995, PCT Pub. No. WO94/08772, PCT Pub. Date Apr. 28, 1994
PCT Filed Oct. 20, 1993, Ser. No. 424,316
Claims priority, application Austria, Oct. 21, 1992, 2081/92
Int. Cl.[6] B29C *57/02*
U.S. Cl. 264—230 **3 Claims**

1. A process of manufacturing a socket at an end of a tubular element of a thermoplastic synthetic material having a softening temperature, which comprises the steps of

(a) heating the tubular element end to at least the softening temperature of the thermoplastic synthetic material to obtain a softened tubular element end,

(b) shaping the softened tubular element end until the diameter of the tubular element end has been expanded to exceed a desired final diameter of the socket by 0.5% to 5%, depending on the thermoplastic synthetic material,

(c) cooling the softened tubular element end after shaping to below the softening temperature,

(d) subjecting the cooled tubular element end to compression to compact the thermoplastic synthetic material and until the diameter until is slightly smaller than the desired final diameter, and finally

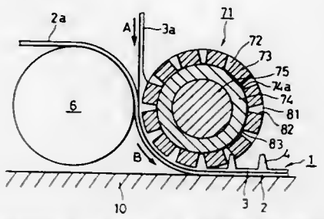
(e) releasing the compression to permit the tubular element end to expand to assume the desired final diameter of the socket.

5,554,333

APPARATUS AND METHOD FOR PRODUCING FLOOR MAT CARRYING FLAT-TIPPED PROJECTIONS

Nobuo Fujiki, Shiga, Japan, assignor to Japan Vilene Company Ltd., Tokyo, Japan

Filed Dec. 29, 1994, Ser. No. 366,237
Claims priority, application Japan, Dec. 29, 1993, 5-350118
Int. Cl.[6] B29C *59/04*
U.S. Cl. 264—284 **8 Claims**



1. An apparatus for producing a floor mat carrying a group of projections with a predetermined shape on a reverse surface to be contacted with a floor, by passing a molding resin material supplied from a resin supply means through a nip between a press roll and a mold roll contacting each other in parallel, wherein the mold roll contains

a hollow drum having through holes for a mold and contacting the press roll;

an air venting means provided inside the hollow drum; and a sealing means for the molding resin material;

each of the through holes provided in the hollow drum has an insertion opening of the molding resin material, having a shape corresponding to a sectional shape of a predetermined base shape of the projections, a wall portion having a shape corresponding to a predetermined side shape of the projections, and an air venting opening having a shape corresponding to a predetermined flat tip area shape of the projections; and

at least until the through hole is completely filled with the molding resin material, the air venting opening of the through

hole communicates with the air venting means, and when at least the through hole is completely filled with the molding resin material, the air venting opening of the through hole is sealed with the sealing means.

8. A method for producing a floor mat carrying a group of projections of a predetermined shape on a reverse surface to be contacted with a floor, by passing a molding resin material supplied from a resin supply means through a nip between a press roll and a mold roll contacting each other in parallel, comprising the steps of:

supplying a heated molding resin material to a nip between the press roll and the mold roll containing a hollow drum having through holes for a mold and contacting the press roll, an air venting means provided inside the hollow drum and a sealing means for the molding resin material;

filling the through holes provided in the hollow drum, with the molding resin material supplied by rotation of the press roll and the mold roll from an insertion opening of the through hole for the molding resin material, each through hole having the insertion opening having a shape corresponding to the sectional shape of a predetermined base shape of the projections, a wall portion having a shape corresponding to a predetermined side shape of the projections, and an air venting opening having a shape corresponding to a predetermined flat tip area shape of the projections;

pushing an air out of the through holes from the air venting opening to the air venting means, along with insertion of the molding resin material,

sealing the air venting opening with a sealing means when the through hole is completely filled with the molding resin material;

cooling the molding resin material in the through holes; and

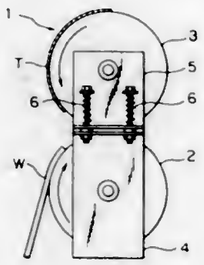
withdrawing the cooled resin material from the through holes by rotation of the press roll and the mold roll.

5,554,334

METHOD FOR PRODUCING SIMPLE PRINTING PLATE HAVING OPEN CELLS

Shigetora Kashio; Tsutomu Mizumi, both of Okazaki, and Kuniyuki Takahashi, Urayasu, all of Japan, assignors to Toray Industries, Inc., Japan

Filed Aug. 15, 1994, Ser. No. 290,182
Claims priority, application Japan, Aug. 25, 1993, 5-232527
Int. Cl.[6] B29C *59/04;67/20*
U.S. Cl. 264—293 **3 Claims**



1. In a method of embossing a relief pattern into an open-cell printing plate, wherein said relief pattern is embossed in an impression surface of said printing plate by contact with a heated embossing die, the steps which comprise:

(a) attaching said heated embossing die to a rotatable arcuate embossing support,

(b) providing a rotatable arcuate impression support for said printing plate;

(c) providing a movable and yieldable connection continuously urging said embossing support and said impression support toward each other,

(d) synchronously rotating, in unison and in a common direction, said embossing support and said printing plate support in a manner continuously to advance and press both said heated embossing surface and said impression surface toward each other, with said printing plate advancing while compressed between them,

(e) controlling the pressing to a pressure of 0.05 to 50 kgf/cm^2, and

(f) controlling the heating of said heated embossing die to a surface temperanre of 80°–150° C.,

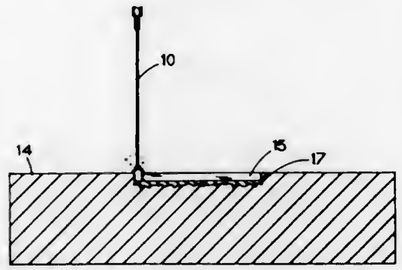
whereby said embossing support and said impression support are yieldably movable toward and away from each other to follow changes of thickness of said priming plate.

5,554,335

PROCESS FOR ENGRAVING CERAMIC SURFACES USING LOCAL LASER VITRIFICATION

William C. Fields, Hermann; Dan Fredrick, Ballwin; Steve Grannemann; Phyllis Hannan, both of Hermann, and Igor Lukashevsky, St. Louis, all of Mo., assignors to Laser Light Technologies, Inc., Hermann, Mo.

Filed Feb. 22, 1995, Ser. No. 392,046
Int. Cl.[6] B23K *26/16*
U.S. Cl. 264—400 **8 Claims**



1. A process for engraving ceramic surfaces using a laser, said process comprising applying said laser to said ceramic surface along an area to be engraved such that a portion of said ceramic material in said engraving area is removed and melted by said laser to a sufficient degree such that said melted material is fused into a surrounding unmelted portion of said ceramic material whereby an adherent, contrasting marking is created along said engraving area to a depth within and below said ceramic surface, said engraving taking place in three stages:

a first stage in which said laser removes a portion of said ceramic material to form said depth for said marking within and below said ceramic surface;

a second stage in which said laser continues to deliver energy to melt and vitrify said ceramic material whereby it is fused into surrounding unmelted ceramic material within said depth; and

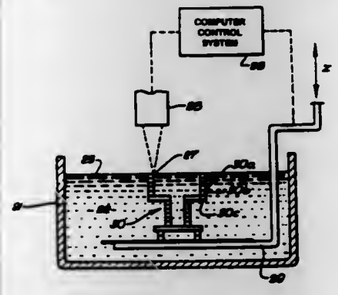
a third stage in which said laser removes residue from said ceramic surface to effect said adherent, contrasting marking.

5,554,336

METHOD AND APPARATUS FOR PRODUCTION OF THREE-DIMENSIONAL OBJECTS BY STEREOLITHOGRAPHY

Charles W. Hull, Arcadia, Calif., assignor to 3D Systems, Inc., Valencia, Calif.

Continuation of Ser. No. 299,878, Sep. 1, 1994, abandoned, which is a division of Ser. No. 967,303, Oct. 20, 1992, Pat. No. 5,344,298, which is a continuation of Ser. No. 749,125, Aug. 23, 1991, Pat. No. 5,474,943, which is a continuation of Ser. No. 637,999, Jan. 4, 1991, abandoned, which is a continuation of Ser. No. 493,498, Mar. 14, 1990, abandoned, which is a division of Ser. No. 340,894, Apr. 19, 1989, Pat. No. 4,929,402, which is a continuation of Ser. No. 161,346, Feb. 19, 1988, abandoned, which is a continuation of Ser. No. 792,979, Dec. 9, 1985, abandoned, which is a division of Ser. No. 638,905, Aug. 8, 1984, Pat. No. 4,575,030. This application Jun. 5, 1995, Ser. No. 462,865
Int. Cl.[6] B29C *35/08;41/02*
U.S. Cl. 264—401 **20 Claims**



2. A method of producing a three-dimensional object from a medium capable of solidification when subjected to synergistic stimulation, said method comprising the steps of:

providing said medium;

forming successive cross-sectional layers of structure of said object at a surface of said medium and adhering each successive cross-sectional layer of structure to a preceding cross-sectional layer of structure, said forming step including the steps of:

exposing at least a first portion of said surface of said medium to said synergistic stimulation according to a first pattern of exposure when forming at least a first cross-sectional layer of structure, and

exposing a second portion of said surface of said medium to said synergistic stimulation in accordance with a second pattern of exposure when forming said at least first cross-sectional layer of structure, wherein the first and second patterns at least partially overlap and result in a solidification depth which is greater than a solidification achieved by either pattern alone whereby said object is produced from a plurality of formed and adhered cross-sectional layers of structure.

14. A method of producing a three-dimensional object from a medium capable of solidification when subjected to solidifying radiation, said method comprising the steps of:

providing data representing cross-sections of the three-dimensional object to be formed;

forming a first cross-sectional layer of structure by exposing said medium to said solidifying radiation including exposing at least a first portion of said medium at least twice in accordance with a first repeated pattern of exposure;

forming successive layers of medium adjacent to any previously formed cross-sectional layers of structure;

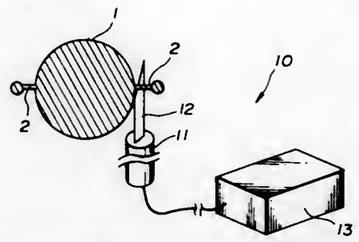
forming and adhering successive cross-sectional layers of structure to any previously formed layers of structure by exposing said layers of medium to said solidifying radiation, whereby a plurality of successively adhered cross-sectional layers of structure form the three-dimensional object.

5,554,337

PREPARATION OF SPHERICAL BODY

Keisuke Ihara, Yokohama, Japan, assignor to Bridgestone Sports Co., Ltd., Tokyo, Japan

Filed Mar. 7, 1995, Ser. No. 399,463
Claims priority, application Japan, Mar. 7, 1994, 6-062028
Int. Cl.[6] B29C *37/02;* **A63B** *37/12*
U.S. Cl. 264—442 **6 Claims**



1. A method for preparing a spherical body, comprising the steps of:

molding a spherical body having at least a surface portion made of a thermoplastic resin in a split mold consisting of a pair of mold halves mated along a parting line, the spherical body as molded having a fin on its surface along the parting line, and

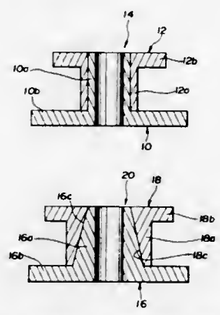
removing the fin from the spherical body surface by heat by means of an ultrasonic cutter while melting and flowing a raised portion of a step at said parting line into a depressed portion thereby flattening said step.

5,554,338

METHOD OF PREPARING COMPOSITE SINTERED BODY

Hiroshi Sugihara; Hiroyuki Ishikawa; Tsutomu Uemura, all of Chiba; Akira Fujiki, Kanagawa; Hiromasa Imazato, Chiba, and Shinichi Umino, Kanagawa, all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, and Hitachi Powdered Metals Co., Ltd., Chiba, both of Japan

Filed Apr. 18, 1995, Ser. No. 423,577
Claims priority, application Japan, Apr. 19, 1994, 6-080658
Int. Cl.[6] B22F *7/02*
U.S. Cl. 419—5 **27 Claims**



1. A method of preparing a composite sintered body having inner and outer portions fitted with each other, the method comprising the steps of:

(a) preparing an inner powder compact;

(b) preparing an outer powder compact;

(c) fitting the inner and outer powder compacts with each other so as to prepare a composite powder compact; and

(d) sintering the composite powder compact so as to prepare the composite sintered body,

wherein the inner and outer powder compacts are respectively selected such that, during the step (d), the amount of growth

of the inner powder compact becomes greater than that of the

(e) retracting said assembly away from said surface such that

5,554,343

PARTICLE AND LIGHT AND HEAVY FLUID

of the inner powder compact becomes greater than that of the outer powder compact,

wherein each of the inner and outer composite powder compacts is made of one member selected from the group consisting of a wax-type segregation prevention powder mixture and a metal-soap-type segregation prevention powder mixture, and

wherein at least one of the inner and outer composite powder compacts is made of the wax-type segregation prevention powder.

5,554,339

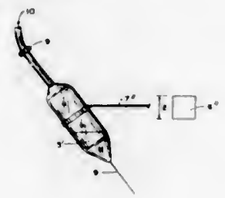
PROCESS FOR THE MANUFACTURE OF WHOLLY MICROFABRICATED BIOSENSORS

Stephen N. Cozzette, Nepean, Canada; Graham Davis, Plainsboro, N.J.; Imants R. Lauks, Yardley; Randall M. Mier, Morrisvile, both of Pa.; Sylvia Pizsnik, Jackson, N.J.; Nicolaas Smit, Hightstown, N.J.; Paul Van Der Werf, Princeton Junction, N.J., and Henry J. Wieck, Plainsboro, N.J., assignors to I-Stat Corporation, Princeton, N.J.

Division of Ser. No. 943,345, Sep. 10, 1992, Pat. No. 5,466,575, which is a division of Ser. No. 432,714, Nov. 7, 1989, Pat. No. 5,200,051, which is a continuation-in-part of Ser. No. 381,223, Jul. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 270,171, Nov. 14, 1988, abandoned. This application Aug. 19, 1993, Ser. No. 109,507

Int. Cl.[6] **G01N** *21/00;21/01;30/00;* **C12M** *1/00*

U.S. Cl. 422—50 **63 Claims**



1. A method of establishing a dispensed layer onto a substantially planar surface comprising:

(a) preparing a fluid composition suitable for loading into a microsyringe assembly;

(b) loading said fluid composition into said microsyringe assembly, which assembly comprises (i) a reservoir for holding said fluid composition, (ii) a microsyringe needle, including an elongated member and a needle tip, (iii) means for delivering said fluid composition from said reservoir to said microsyringe needle, (iv) means for forcing controlled amounts of said fluid composition through said elongated member to form an emerging droplet of a predetermined volume on said needle tip, and (v) means for controlling the multidirectional movement of said assembly such that said droplet may be brought into contact with a preselected area of a substantially planar surface;

(c) treating said surface under conditions sufficient to bring its surface free energy, in terms of its hydrophilicity or hydrophobicity, within a desired range such that the contact angle and thickness of the dispensed fluid composition are controlled;

(d) contacting said droplet on said needle tip with a preselected area of said surface; and

(e) retracting said assembly away from said surface such that said droplet disengages from said needle tip in a manner that provides a dispensed layer of said fluid composition having predictable and reproducible dimensions on said surface.

5,554,340

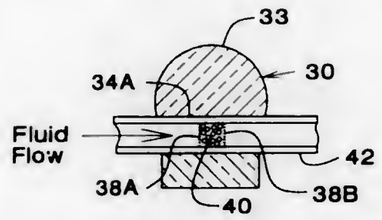
ASSAY SYSTEM

Steve J. Lackie, Lexington, Mass., assignor to Sapidyne, Inc., Boise, Id.

Continuation of Ser. No. 265,648, Jun. 24, 1994, which is a continuation of Ser. No. 924,720, Aug. 3, 1992, Pat. No. 5,372,783. This application Oct. 23, 1995, Ser. No. 546,657

Int. Cl.[6] **G01N** *21/00*

U.S. Cl. 422—68.1 **14 Claims**



1. An apparatus comprising, in combination:

focussing optical lens means;

a conduit means of substantially uniform cross-sectional dimension disposed within said lens means for fluid flow of a fluid sample therethrough, and extending transversely to an optical axis of said lens means through a focal region of said lens means; and

a porous mass of light-transparent material disposed in said conduit means, the porosity of said mass being selected to permit fluid flow of said fluid sample therethrough, said apparatus being arranged and constructed such that said lens means focuses light rays that emanate from said porous mass within said conduit means, said lens means focussing said light rays by refraction.

5,554,341

FEED ZONE PERFORMANCE FOR A CAT CRACKER

Jan W. Wells, Bartlesville, Okla.; William H. Long, Jr., Sweeny, and William J. Vedder, Sugarland, both of Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 12, 1994, Ser. No. 354,386

Int. Cl.[6] **F27B** *15/08*

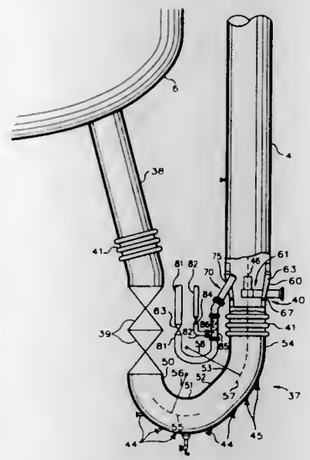
U.S. Cl. 422—145 **54 Claims**

1. A feed injection cone assembly for use in a fluid catalytic cracking unit comprising

(a) a frustoconically-shaped containing means with an centerline axis wherein the frustom end is situated below the base end and the frustom and base ends of said containing means are apertures open to flow,

(b) a gas nozzle assembly with an inlet aperture and an outlet aperture wherein said inlet aperture is connected solely to a gas source, said outlet aperture is situated inside the frustoconically-shaped containing means and generally centered about said centerline axis and oriented for flow in the direction of the base end, and

(c) at least two bifluid nozzle assemblies arranged radially about the centerline axis, each nozzle assembly with an inlet aperture and an outlet aperture and wherein said outlet aperture is oriented for flow toward the centerline axis in an upward manner.



5,554,342

ELECTRICAL HEATING TYPE CATALYTIC DEVICE

Hiroshi Hirayama; Kouji Yoshizaki; Kouhei Igarashi, all of Susono; Keiji Ito, Nagoya; Tohru Yoshinaga; Kiyohiko Watanabe, both of Okazaki; Yukihiro Shinohara, Anjyo, and Osamu Fujishiro, Nagoya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota; Nippon Soken, Inc., Nishio, and Nippondenso Co., Ltd., Kariya-City, all of Japan

Continuation of Ser. No. 228,174, Apr. 15, 1994, abandoned, which is a continuation of Ser. No. 995,648, Dec. 18, 1992, abandoned. This application Jun. 1, 1995, Ser. No. 457,754

Claims priority, application Japan, Dec. 20, 1991, 3-338556; Dec. 21, 1991, 3-339138; Dec. 26, 1991, 3-344865

Int. Cl.[6] **F01N** *3/10;* **B01D** *50/00*

U.S. Cl. 422—174 **25 Claims**

1. An electrically heated catalytic device having a honeycomb shaped metallic catalyst carrier, said electrically heated catalytic device comprising:

a layer of adjoining metallic foils including a corrugated foil and a metallic flat foil, said layer extending along a path from a first electrode to a second electrode and having a width extending in a direction substantially perpendicular to the path, said layer including,

i) first sections; and

ii) second sections each extending for predetermined distances along the path and extending across the entire width of said layer;

b) conductive joints existing between adjoining metallic foils in said first sections; and

c) non-conductive points existing between adjoining metallic foils in said second sections; wherein the surfaces of said layers are coated with an insulation film except in the areas of contact of the first sections where the adjoining metallic foils contact one another.

5,554,343

PARTICLE AND LIGHT AND HEAVY FLUID SEPARATOR

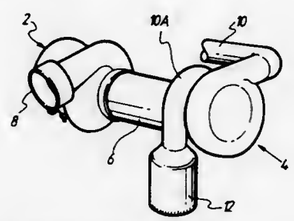
Brian Wade, 23 Hookstone Avenue, Harrogate, North Yorkshire HG2 8ER, England

Continuation of Ser. No. 78,221, Jun. 21, 1993, abandoned. This application Feb. 9, 1995, Ser. No. 386,211

Claims priority, application United Kingdom, Jan. 29, 1991, 9101836; Feb. 12, 1991, 9102886; Oct. 19, 1991, 9122230; WIPO, Jan. 27, 1992, PCT/GB92/00150

Int. Cl.[6] **B01D** *50/00;53/24;19/00*

U.S. Cl. 422—177 **59 Claims**



1. A fluid centrifuge device comprising:

a stationary containment vessel, said containment vessel having a first end and a second end;

a rotatable shroud, said shroud being disposed within said containment vessel, said shroud being rotatable about an axis of rotation within said containment vessel;

a rotatable matrix, said matrix being disposed within said containment vessel, said matrix being rotatable about said axis of rotation within said containment vessel, said matrix being coated with a catalyst so as to promote the formation of particles;

an inlet assembly, said inlet assembly being connected to said first end of said containment vessel;

an outlet assembly, said outlet assembly being connected to said second end of said containment vessel; and

means for rotatably driving said shroud and said matrix.

5,554,344

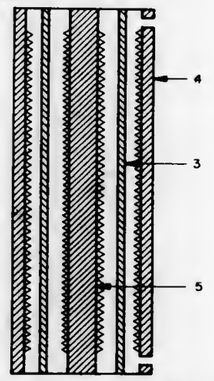
GAS IONIZATION DEVICE

Fernando C. Duarte, 275 Orange Ave., #127A, Chula Vista, Calif. 91911

Filed May 11, 1994, Ser. No. 240,876

Int. Cl.[6] **C01B** *13/11*

U.S. Cl. 422—186.07 **1 Claim**



1. Gas-ozonator device comprising tubular inner and outer electrodes with a dielectric tube concentrically disposed between them; said electrodes, when separated by the dielectric, create a channel

where oxygen is directed through the ozonation chamber; said electrodes are powered by an outside electric source, wherein the embodiment comprises a means of enhancing the electro static field created by the electrodes by etching the exterior of the inner electrode and the interior surface of the outer electrode creating, by calculated design a shaped, sized pattern of the etched spikes.

5,554,345

OZONE GENERATION APPARATUS AND METHOD

Oswald R. G. Kitchenman, Orewa, New Zealand, assignor to Novozone (N.V.) Limited, Glenfield, New Zealand

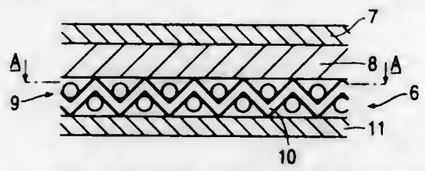
PCT No. PCT/NZ93/00097, § 371 Date Apr. 13, 1995, § 102(e) Date Apr. 13, 1995, PCT Pub. No. WO94/08891, PCT Pub. Date Apr. 28, 1994

PCT Filed Oct. 13, 1993, Ser. No. 416,705

Claims priority, application New Zealand, Oct. 14, 1993, 244729

Int. Cl.[6] B01J *19/08*

U.S. Cl. 422—186.15 **20 Claims**



1. A method of generating ozone using an electrical supply having a frequency of at least 20 KHz comprising:

i) providing a first electrode, a solid dielectric material and a discharge gap region with said dielectric material provided between said first electrode and said discharge gap region;

ii) providing, in use, a flow of oxygen gas or oxygen bearing gas through said discharge gap region;

iii) providing a structure of electrically conductive material having a plurality of spaced apart contact points from each of which is inclined away a portion of said conductive material;

iv) positioning said structure to act as a second electrode within said gas flow so that said plurality of contact points of said structure contact a surface of said dielectric material to divide it up into a plurality of areas defined by zero potential nodes at said second contact points and each said inclined portion provides a variable discharge gap with said dielectric material in between said points of contact; and

v) connecting an electrical supply at a frequency of at least 20 KHz across said first and second electrodes.

2. A method of generating ozone as claimed in claim 1 including connecting said electrically conductive material directly across said high frequency supply.

5,554,346

FLUIDS MIXING AND DISTRIBUTING APPARATUS

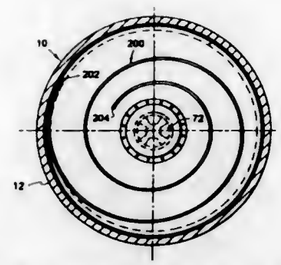
George K. Perry, and John C. Strickland, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 61,605, May 13, 1993, Pat. No. 5,403,560. This application Nov. 4, 1994, Ser. No. 334,667

Int. Cl.[6] B01J *8/04*

U.S. Cl. 422—195 **10 Claims**

10. In a vertical downflow reactor for reacting a vapor and liquid mixed phase reaction mixture including a vertical vessel defined by a cylindrical wall having inlet means, a first catalyst zone below said inlet means, a quench zone below said first catalyst zone, a second catalyst zone below said quench zone and an outlet means below said second catalyst zone, an inwardly sloping collector tray peripherally attached to the wall of said reactor vessel immediately below said quench zone having an opening concentric with the vertical centerline of said reactor vessel for collecting liquid passing downwardly from said quench zone, a mixing means upon the



upper surface of said collector tray for mixing and intimately contacting liquid and vapor from above said collector tray and conveying said mixed vapor and liquid through said collector tray, and a horizontally disposed perforated tray beneath said collector tray and above said second catalyst zone adapted to pass said vapor and liquid therethrough, the improvement in combination therewith comprising a single continuous spiral weir on the upper surface of said collector tray starting at a point on the periphery of said collector tray and spiraling inwardly in a smooth, regular shape toward said concentric opening through a full 720° path.

5,554,347

APPARATUS FOR CARRYING OUT CHEMICAL REACTIONS REQUIRING ADDITION OF HEAT AT LEAST DURING START UP

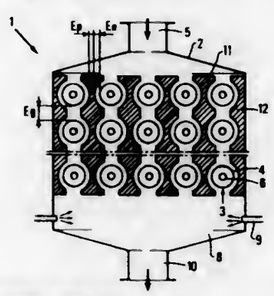
Christian Busson, Charbonnieres; Henri Delhomme, Saint Foy Les Lyon; Laure Gollion, Paris, and Jean Pierre Canague, Fontenay Sous Bois, all of France, assignors to Institut Francais Du Petrole, Rueil Malmaison, and Gaz De France, Paris, both of France

Filed Feb. 2, 1995, Ser. No. 382,599

Claims priority, application France, Feb. 2, 1994, 94 01243

Int. Cl.[6] F28D *21/00;* **B01J** *19/24*

U.S. Cl. 422—204 **26 Claims**



1. An apparatus comprising:

a reactor elongated along one axis, having a reactor wall with an inner surface, a first end and a second end;

at least one supply means at said first end of said reactor for introducing at least one reactant,

at least one discharge means at said second end of said reactor for removing effluents produced,

a first zone within said reactor toward said first end of said reactor, said first zone having a plurality of heat exchange means arranged in substantially parallell layers perpendicular to said reactor axis to define open passages between said heat exchange means for circulation reactants, effluents or mixtures thereof,

said heat exchange means are arranged in successive transverse sections that are independent and substantially perpendicular to said reactor axis,

wherein at least some of said heat exchange means are tubular heat exchange elements each comprising at least one shell

connected to a gas burner for supplying a combustion gas or combustion gas mixture as a heat exchange gas or gas mixture, and at least one outlet means for removing heat exchange gas or gas mixture,

said gas burners are each connected to means for supplying fuel gas and oxidizer gas, and

means for controlling said gas burners and adjusting the quantity of gas supplied to said gas burners, said means for controlling said gas burners are interposed between said means for supplying and said gas burners.

5,554,348

DIFFUSER ELEMENTS FACILITATING THE MASS TRANSFER IN SOLID/GAS REACTIONS

Jean-Michel Bauer, Pagny-sur-Moselle, France, assignor to Le Carbone-Lorraine, Courbevoie, France

Filed Dec. 1, 1994, Ser. No. 352,280

Claims priority, application France, Dec. 14, 1993, 93 15327

Int. Cl.[6] B01J *8/02;20/20*

U.S. Cl. 422—211 **6 Claims**

1. In combination:

a) a reactive composite material comprising a reactive solid phase and a heat-conducting substrate phase comprising expanded graphite; and

b) a diffuser element for facilitating mass transfer in endothermic or exothermic reactions between a reactive gas and the reactive solid phase of said reactive composite material, said diffuser element comprising a carbonaceous material of open porosity formed generally in a shape selected from the group consisting of a plate, a bar and a tube, implanted within said reactive composite material, having a head loss of less than about 0.1 MPa per meter in a direction corresponding to flow of reactive gas through said diffuser element, and having a measured crushing resistance of at least about 10^{-5} $m^3/m^2.s.Pa$ in a diffusion direction generally perpendicular to said direction corresponding to flow,

said diffuser element facilitating diffusion of the reactive gas throughout said reactive composite material, and allowing exchange of heat between a surface portion and a core portion of said reactive composite material in which said diffuser element is implanted.

5,554,349

PROCESS FOR SCAVENGING H_2S BY MIXTURES OF HEXAHYDROTRIAZINES

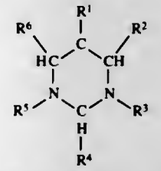
Gordon T. Rivers, Houston, and Richard L. Rybacki, Katy, both of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Division of Ser. No. 959,223, Oct. 9, 1992, Pat. No. 5,347,004. This application Sep. 8, 1994, Ser. No. 302,548

Int. Cl.[6] B01D *53/48;53/52*

U.S. Cl. 423—228 **15 Claims**

1. A method for reducing the levels of hydrogen sulfide (H_2S) in a gaseous or liquid stream containing H_2S comprising adding to said stream an amount of a composition effective to reduce the H_2S level, where the composition comprises at least one hexahydrotriazine of the formula:



(i)

where R^1, R^3 and R^5 are independently selected from the group consisting of hydrogen and an alkyl radical, including substituted alkyl radicals, where when R^1, R^3 and R^5 are not hydrogen, they each have a total of 1 to 5 carbon atoms and

where R^2, R^4 and R^6 are independently selected from the group consisting of hydrogen and an alkyl radical, including substituted alkyl radicals, where when R^2, R^4 and R^6 are not hydrogen, they each have a total of 1 to 5 carbon atoms; and

where at least one of the R^1, R^2, R^3, R^4, R^5, and R^6 groups of the hexahydrotriazine (i) is an alkoxyalkylene group.

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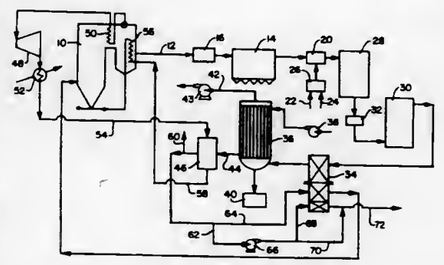
AIR POLLUTION CONTROL AND HEAT RECOVERY SYSTEM AND PROCESS FOR COAL FIRED POWER PLANT

Boris Gurvich, West Hartford; Mark Palkes, Glastonbury, both of Conn., and James D. Wesnor, Birmingham, Ala., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 15, 1994, Ser. No. 356,666

Int. Cl.[6] C01B *17/90;21/46*

U.S. Cl. 423—239.1 **3 Claims**



1. In a process of operating a coal fired steam generator system in which a flue gas stream is produced containing NO_x and SO_2 and in which steam is produced and in which steam is condensed to form condensed steam, the process of removing said NO_x and SO_2 from said flue gas stream and of heating said condensed steam comprising the steps of:

a. catalytically reducing said NO_x in said flue gas stream with a reductant to produce N_2, H_2O, and a flue gas stream removed of NO_x;

b. oxidizing SO_2 in said flue gas stream removed of NO_x to SO_3;

c. hydrating said SO_3 in said flue gas stream containing said SO_3 to H_2SO_4 vapor;

d. passing said flue gas stream containing said H_2SO_4 vapor into heat exchange contact with a combustion air stream whereby said H_2SO_4 vapor is condensed and said combustion air stream is heated;

e. passing said heated combustion air stream into heat exchange contact with said condensed steam whereby said condensed steam is heated and said combustion air stream is cooled;

f. passing said cooled combustion air stream into heat exchange contact with any of said flue gas streams whereby said combustion air stream is further heated and said flue gas stream is cooled;

g. passing said heated condensed steam back to said steam generator; and

h. passing said further heated combustion air stream to said steam generator as combustion air.

5,554,351

HIGH TEMPERATURE STREAM REFORMING

Ivar L. Primdahl, Copenhagen, Denmark, assignor to Haldor Topsoe A/S, Denmark

Filed May 17, 1994, Ser. No. 243,689
Claims priority, application Denmark, May 17, 1993, 0576/93
Int. Cl.[6] C01B *3/34;3/40;* **B01J** *8/04*
U.S. Cl. 423—245.3 **8 Claims**

1. A process for the steam reformation of hydrocarbons, comprising the steps:

i) partially combusting a hydrocarbon feedstock, steam and an oxygen containing gas stream in a burner reactor in which the inside wall of the burner reactor is lined with an alumina containing insulating refractory material which forms volatile degradation products during the combustion process;

ii) passing the resulting partially combusted effluent containing the alumina based volatile degradation products to a steam reforming catalyst for the steam reformation of the residual hydrocarbon molecules within said partially combusted effluent, the improvement comprising:

arranging said steam reforming catalyst into first and second layers wherein the first layer has a lower catalytic activity than the second layer so as to minimize intensity of deposition of the aluminum based degradation products on the first layer of the catalyst bed which is the portion of the catalyst bed that is first contacted by the partially combusted effluent, thereby reducing plugging of the catalyst bed with the aluminum containing degradation products.

5,554,352

PROCESSED SILICA AS A NATURAL POZZOLAN FOR USE AS A CEMENTITIOUS COMPONENT IN CONCRETE AND CONCRETE PRODUCTS

Stephen B. Jaques, West Des Moines, Iowa; Richard D. Stehly, Minneapolis, and Peter B. Dunning, St. Paul, both of Minn., assignors to Construction Material Resources, West Des Moines, Iowa

Filed May 9, 1995, Ser. No. 438,181
Int. Cl.[6] C01B *33/18;* **C04B** *22/06;14/04*
U.S. Cl. 423—339 **14 Claims**

1. A method of making a natural pozzolan comprising:

digesting bauxite ore with sulfuric acid to obtain a silica slurry;

allowing the silica slurry to settle to produce a silica product and liquid;

decanting the liquid from the silica product;

washing the silica product at least one time;

drying and thereafter grinding the silica product wherein said silica product comprises from about 75% to 95% by weight of amorphous silica and acts as a natural pozzolan.

5,554,353

PREPARATION OF HYDROXYLAMMONIUM SALTS

Heinz-Walter Schneider, Ludwigshafen; Axel Wilms, Weisenheim; Rüdiger Schmitz, Lambsheim; Robert Schulz, Lampertheim, and Klaus Michelsen, Hamburg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Feb. 1, 1995, Ser. No. 384,321
Claims priority, application Germany, Feb. 4, 1994, 44 03 479.2
Int. Cl.[6] C01B *21/20*
U.S. Cl. 423—387 **4 Claims**

1. In the process for the preparation of hydroxylammonium salts by catalytic reduction of nitrogen monoxide using hydrogen in the presence of a hydrogenation catalyst, the improvement therein which comprises:

(a) in a first step, filtering the reaction mixture obtained after the catalytic reaction of nitrogen monoxide using hydrogen in the presence of a hydrogenation catalyst reaction giving a solution of essentially hydroxylammonium salt and a filter residue of essentially a mixture of hydrogenation catalyst and a solution of essentially hydroxylammonium salt, and

(b) in a second step, subjecting the filter residue to sedimentation in order to concentrate the hydrogenation catalyst, giving a mixture having a higher concentration of hydrogenation catalyst than the filter residue and a mixture having a lower concentration of hydrogenation catalyst than the filter residue, followed by

(c) combining the mixture from step (b) which has a lower concentration of hydrogenation catalyst than the filter residue with the reaction mixture obtained after the catalytic reduction reaction but before the filtration thereof in step (a), and

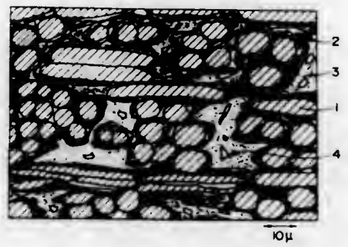
(d) employing the mixture from step (b) which has a higher content of hydrogenation catalyst than the filter residue in the preparation of hydroxylammonium salts by the catalytic reduction of nitrogen monoxide using hydrogen in the presence of a hydrogenation catalyst.

5,554,354

CARBON FIBER-REINFORCED CARBON COMPOSITE MATERIAL AND PROCESS FOR PRODUCING THE SAME

Morihiko Sugino, and Yoshio Inoue, both of Hyogo-ken, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Continuation of Ser. No. 148,417, Nov. 8, 1993, abandoned, which is a continuation of Ser. No. 841,215, Feb. 27, 1992, abandoned, which is a continuation of Ser. No. 177,089, Apr. 4, 1988, abandoned. This application Mar. 21, 1995, Ser. No. 407,674
Claims priority, application Japan, Jan. 22, 1988, 63-12262
Int. Cl.[6] C01B *31/02*
U.S. Cl. 428—307.3 **5 Claims**



1. A carbon fiber-reinforced carbon composite material having a dynamic coefficient of friction of 0.2 to 0.6 prepared by a process comprising:

impregnating a non-woven fabric of carbon fiber or blend of carbon fiber and an organic fiber, said non-woven fabric having undergone needle punching so that the carbon fibers are distributed in the thickness direction of the fabric, with a thermosetting resin and pitch or a pitch-containing thermosetting resin, thereby forming a prepreg; and

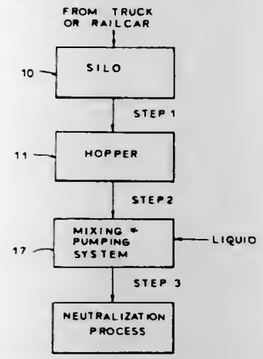
heating the prepreg to calcine the same at a temperature above 400° C. in an inert gas atmosphere under a pressure greater than 70 kgf/cm^2 to form said carbon composite material of said non-woven fabric in a matrix composed of an adhesion-promoting vitreous carbon phase and a soft carbon or fine mosaic carbon filling phase.

5,554,355

OXIDE SLURRY FOR INDUSTRIAL PROCESS APPLICATIONS

Thomas Miller, Walnut, Calif., assignor to PSC Technologies, Inc., King of Prussia, Pa.

Continuation of Ser. No. 83,421, Jun. 28, 1993, abandoned. This application May 18, 1995, Ser. No. 443,566
Int. Cl.[6] C01B *9/02;9/08;17/96*
U.S. Cl. 423—489 **22 Claims**



1. An acid neutralization process comprising the steps of:

contacting a reactive, unhydrated metal oxide with water or an aqueous solution to create an aqueous metal oxide mixture having from about 10% to 70% by weight of the metal oxide, relative to the total weight of the mixture; and

transferring said aqueous metal oxide mixture to a reaction vessel containing an acidic solution such that said aqueous metal oxide mixture is contacted with said acidic solution to cause acid neutralization before substantial hydration of the metal oxide has occurred.

5,554,356

METHOD OF MAKING ESSENTIALLY SILICIC ZEOLITE BETA

Robert J. Saxton, West Chester, and John G. Zajacek, Devon, both of Pa., assignors to ARCO Chemical Technology, L. P., Greenville, Del.

Filed Jun. 7, 1995, Ser. No. 473,394
Int. Cl.[6] C01B *37/02*
U.S. Cl. 423—706 **20 Claims**

1. A method of preparing an essentially silicic zeolite beta comprising:

(a) preparing a reaction mixture comprising a source of silicon oxide, water, and a diquaternary ammonium compound wherein each nitrogen atom bears at least one benzyl group and the nitrogen atoms are linked by an organic moiety such that the nitrogen atoms are separated by at least 7 but no more than 11 atoms;

(b) maintaining the reaction mixture at a temperature of at least 100° C. until crystals of an as-synthesized zeolite comprised of the essentially silicic zeolite beta and the diquaternary ammonium compound are formed; and

(c) recovering said crystals.

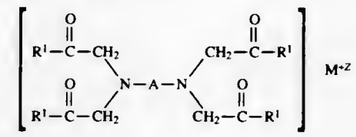
5,554,357

MAGNETIC RESONANCE IMAGING AGENTS CONTAINING HYDRAZIDE MOIETIES

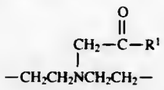
Raghaven Rajagopalan, Maryland Heights, Mo., assignor to Mallinckrodt Medical, Inc., St. Louis, Mo.

Division of Ser. No. 341,978, Apr. 24, 1989, Pat. No. 5,384,108. This application Sep. 30, 1994, Ser. No. 316,355
Int. Cl.[6] A61B *5/055*
U.S. Cl. 424—9.365 **24 Claims**

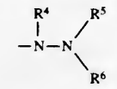
1. A diagnostic composition suitable for enteral or parenteral administration to a warm-blooded animal, which comprises an NMR imaging-effective amount of a complex of a paramagnetic ion having the following formula:



wherein A is —CHR^2—CHR^3— or



M^{+Z} is a paramagnetic ion of an element with an atomic number of 21–29, 42–44 or 58–70, and a valence, Z, of +2 or +3; R^1 groups may be the same or different and are selected from the group consisting of –0$^-$ and



wherein R^4, R^5, and R^6 may be the same or different and are hydrogen, alkyl, hydroxyalkyl, alkoxyalkyl, aminoalkyl or acylaminoalkyl wherein the carbon-containing portions contain from 1 to about 6 carbon atoms, or R^5 and R^6 can together with the adjacent nitrogen form a heterocyclic ring of five, six or seven members, wherein 0 to 1 members other than the nitrogen are —O—, —S—,

or

and which members are unsubstituted or substituted by hydroxy, alkyl, aryl, hydroxyalkyl, aminoalkyl, aminoaryl, alkylamino, or carbamoyl wherein the substituents contain from 1 to about 6 carbon atoms, or R^4 and R^5 can together with the nitrogens to which each is attached form a heterocyclic ring of five, six or seven members, wherein 0 or 1 members other than the nitrogens are —O—, —S—,

or

5,554,360

LOW-IRRITANT SHAMPOO COMPOSITION

contact with one another, for stabilization of pH range, further production of polyiodides more suitable for dissolving and

5,554,364

COMPOSITIONS AND METHODS TO REDUCE POST-

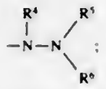
or

and which members are unsubstituted or substituted by hydroxy, alkyl, aryl, hydroxyalkyl, aminoalkyl, aminoaryl, alkylamino, or carbamoyl wherein the substituents contain from 1 to about 6 carbon atoms;

R^2 and R^3 may be the same or different and are hydrogen, alkyl having from 1 to about 6 carbon atoms, phenyl or benzyl;

R^7 is hydrogen, alkyl, hydroxyalkyl, alkoxyalkyl, aminoalkyl or acylaminoalkyl wherein the carbon-containing portions contain from 1 to about 6 carbon atoms;

and wherein 2 or 3 of the R^1 groups are $-O^-$ and the remainder of the R^1 groups are



and a pharmaceutically acceptable carrier, as sterile solution or suspension.

5,554,358

DENTAL COMPOSITIONS WITH ZINC AND BICARBONATE SALTS

David R. Williams, Monroe; Christine W. Ryles, Milford, and Stephen R. Barrow, Trumbull, all of Conn., assignors to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Division of Ser. No. 300,838, Sep. 2, 1994, Pat. No. 5,456,902, which is a division of Ser. No. 116,094, Sep. 2, 1993, Pat. No. 5,372,803. This application Apr. 11, 1995, Ser. No. 419,788

Int. Cl.[6] A61K *7/18*

U.S. Cl. 424—49 **9 Claims**

1. A dental product in a dual compartment dispenser comprising:

(i) a first compartment containing a first composition that comprises from about 0.1 to about 10% by weight of a zinc salt in a pharmaceutically acceptable carrier and a fluoride source present in an effective amount to inhibit formation of caries on teeth; and

(ii) a second compartment containing a second composition that comprises from about 0.5 to about 80% by weight of a bicarbonate salt in a pharmaceutically acceptable carrier.

5,554,359

PIGMENTATION ENHANCER AND METHOD

Bryan B. Fuller, Edmond, Okla., assignor to The Board of Regents of the University of Oklahoma, Norman, Okla.

Continuation-in-part of Ser. No. 943,998, Sep. 11, 1992, abandoned, which is a continuation of Ser. No. 451,420, Dec. 15, 1989, abandoned. This application May 31, 1994, Ser. No. 251,072

Int. Cl.[6] A61K *7/42;7/40*

U.S. Cl. 424—59 **27 Claims**

1. A composition for use in stimulating melanogenesis in human skin cells, comprising:

an effective amount of a lysosomotropic agent capable of increasing levels of melanin in a human melanocyte; and

an effective amount of a pharmaceutically acceptable topical carrier capable of delivering the lysosomotropic agent to the melanocyte under in vivo conditions.

5,554,360

LOW-IRRITANT SHAMPOO COMPOSITION

Tohru Nakamura, Settsu, and Yoshinori Shono, Ibaraki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka-fu, Japan

Filed Apr. 7, 1994, Ser. No. 224,565

Claims priority, application Japan, Apr. 16, 1993, 5-113735

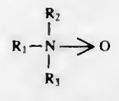
Int. Cl.[6] A61K *7/075*

U.S. Cl. 424—70.11 **12 Claims**

1. A shampoo composition comprising:

(a) a combination of nonionic surfactants consisting of:

(1) an amine oxide of the general formula:



wherein R_1 is C_8–C_{16} alkyl, and R_2 and R_3 are the same or different and are C_1–C_2 alkyl or hydroxyethyl;

(2) a polyoxyethylene polyoxypropylene block polymer; and

(3) at least one selected from polyoxyethylene sorbitan carboxylates and polyoxyethylene alkyl phenyl ethers; and

(b) at least one pyrethroid compound as an active ingredient, which is selected from the group consisting of:

3-phenoxybenzyl (1RS)-cis-trans-chrysanthemate(phenothrin);

3-phenoxybenzyl (1RS)-cis-trans-3-(2,2-dichlorovinyl)- 2,2-dimethylcyclopropanecarboxylate(permethrin);

(RS)-3-allyl-2-methyl-4-oxocyclopent-2-enyl (1RS)-cis-trans-chrysanthemate(allethrin);

cyano(4-fluoro-3-phenoxyphenyl)methyl 3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate(cyfluthrin);

(RS)-2-methyl-4-oxo-3-(2-propynyl)cyclopent-2-enyl (1RS)-cis-trans-chrysanthemate(prallethrin); and

natural pyrethrins.

5,554,361

PROCESSED PRODUCT FOR SKIN AND HAIR TREATMENT

Gary W. Dixon, P.O. Box 5835, Kingsport, Tenn. 37663-0835

Continuation-in-part of Ser. No. 184,839, Jan. 12, 1994, abandoned. This application Jan. 24, 1995, Ser. No. 377,501

Int. Cl.[6] A61K *7/42;7/48;33/18;35/60*

U.S. Cl. 424—70.15 **16 Claims**

1. A photochemically processed product for hair and skin treatment, comprising:

Iodine means for providing diatomic iodine and iodide ions;

Fluid means for diluting said iodine means, such that iodide ions are more easily made available for nucleophilic substitution of alkyl functional groups;

a cod liver oil component, said component having a plurality of potentially available alkyl functional groups;

a photon light energy source component photochemically reacting with diatomic iodine in said iodine means to break it down to iodide ions, and making said ions available more rapidly for nucleophilic reaction and substitution on the alkyl functional groups of said cod liver oil component to produce an iodinated cod liver oil product;

said Iodine means and said fluid means being admixed with said cod liver oil component, and, then, exposed to a photon light component such that a first fluid level containing a substantially white/clear iodinated cod liver oil product is irreversibly produced having a pH of from about 6.5 to about 6.8, and a second fluid level is produced containing remaining fluid means, diatomic iodine and iodides,

each of said levels being remixed prior to therapeutic application for the treatment of hair and skin, such that the remaining iodinated cod liver oil, fluid means and diatomic iodine and remaining iodides of the photochemically processed product are mixed with each other again and interfaced in secondary contact with one another, for stabilization of pH range, further production of polyiodides more suitable for dissolving and delivery in a therapeutically targeted area and further production of free or diatomic iodine or I_2, increasing the bactericidal effects of the entire remixed fluid levels just prior to application.

5,554,362

COMPOSITION AND PROCESS FOR THE PERMANENT SHAPING OF HAIR

Gerhard Maresch, Darmstadt, Germany, and Hans-Jürgen Braun, Ueberstorf, Switzerland, assignors to Wella Aktiengesellschaft, Darmstadt, Germany

Filed May 19, 1994, Ser. No. 246,112

Claims priority, application Germany, May 19, 1993, 43 16 750.0

Int. Cl.[6] H61K *7/09;7/06*

U.S. Cl. 424—70.51 **8 Claims**

1. Hair shaping composition for permanent shaping of hair having a pH of from 6 to 9 and containing water; from 5 to 25 percent by weight of at least one keratin-reducing agent selected from the group consisting of 2-hydroxy-3-mercaptopropionic acid and ammonium, alkali metal and monoethanol amine salts of said 2-hydroxy-3-mercaptopropionic acid; and at least one cosmetic additive selected from the group consisting of kaolin, bentonite, fatty acids, fatty alcohols, starch, polyacrylic acid, cellulose, alginate, vaseline, paraffin oil; anionic, cationic, amphoteric and nonionic surface active compounds; turbidity-inducing agents; dissolving intermediaries; alcohols; stabilizers; buffers; perfume oil; dyes; cationic polymers, lanolin, cholesterin and pantothenic acid.

5,554,363

METHOD OF REDUCING MALODORS IN PERMANENT WAVING

Arun Nandagiri, Libertyville; Bruce H. Solka, Chicago, and John A. Kocis, Palatine, all of Ill., assignors to Helene Curtis, Inc., Chicago, Ill.

Continuation of Ser. No. 17,239, Feb. 12, 1993, abandoned. This application Jan. 11, 1995, Ser. No. 371,353

Int. Cl.[6] A61K *7/09*

U.S. Cl. 424—70.51 **9 Claims**

1. A method of reducing malodor resulting from a reaction of a cysteamine reducing agent with hair while permanently waving hair comprising:

contacting the hair with 0.01% to 20%, based on the total weight of hair contacted, of an aldehyde selected from the group consisting of benzaldehyde; methyl hydrocinnamic aldehyde; and mixtures thereof, said aldehyde being more reactive with the cysteamine reducing agent than with natural hair aldehydes,

contacting the hair, containing said aldehyde, with the cysteamine reducing agent to break cysteine hair bonds while reacting a portion of the reducing agent with said aldehyde thereby forming a reaction product from the reaction of the cysteamine reducing agent with said aldehyde; and

said reaction product having a different odor than a reaction product formed from the reaction of the cysteamine reducing agent with said hair.

5,554,364

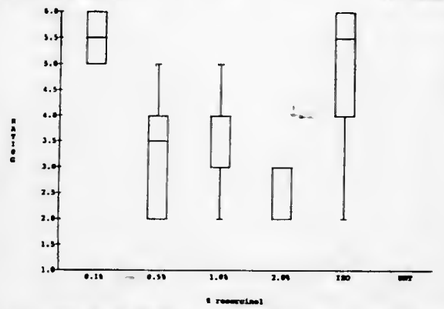
COMPOSITIONS AND METHODS TO REDUCE POST-PERM ODOR

Paul H. Neill, Hinsdale, and Loralei Brandt, Cary, both of Ill., assignors to Helene Curtis, Inc., Chicago, Ill.

Filed Jun. 7, 1995, Ser. No. 484,111

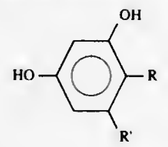
Int. Cl.[6] A61L *9/01*

U.S. Cl. 424—76.1 **26 Claims**



1. A composition effective in reducing malodor resulting from contacting hair with a disulfide bond-breaking reducing agent in a waving lotion used in permanent waving comprising:

an aqueous solution of a polyhydric phenol, reactive with hair aldehydes, having the formula I:



(I)

wherein

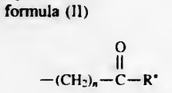
R'=H or OH,

R=H or C_1–C_{12} alkyl,

C_1–C_{12} alcohol,

C_1–C_{12} aldehyde, or

a ketone having formula (II)



(II)

wherein

n=0–12, R"=C_1–C_{12} alkyl, and wherein n+number of carbons in R"=1–12,

said polyhydric phenol having a concentration in the range of about 0.05% to about 10% by weight, and said composition having a pH in the range of about 1.5 to about 10.

5,554,365

USE OF CYANOACRYLATE ADHESIVE COMPOSITIONS TO INHIBIT ACUTE RADIATION-INDUCED SKIN DAMAGE

Michael M. Byram, Colorado Springs, Colo.; Robert Goebel, Huntington Beach; Richard J. Greff, Yorba Linda, both of Calif., and Leonard V. Barley, Jr., Littleton, Colo., assignors to MedLogic Global Corporation, Colorado Springs, Colo.

Filed May 5, 1995, Ser. No. 435,590

Int. Cl.[6] A61K *31/74;31/78*

U.S. Cl. 424—78.02 **22 Claims**

1. A method for inhibiting acute radiation-induced skin damage to a patient arising from treatment of that patient with ionizing radiation wherein application of the radiation is through a portion of the skin thereby exposing the epidermal layer of that skin portion to said ionizing radiation which method comprises:

(a) applying a layer of cyanoacrylate polymer to the surface of the skin area which is to be exposed to ionizing radiation; and

(b) exposing the patient to ionizing radiation through the layer of cyanoacrylate polymer.

5,554,366

SKIN CARE METHOD AND COMPOSITION

Anthony V. Rawlings, Wyckoff, N.J., and Allan Watkinson, Bedford, Great Britain, assignors to Elizabeth Arden Co., Division of Conopco, Inc., New York, N.Y.

Continuation of Ser. No. 40,812, Mar. 31, 1993, abandoned. This application Jan. 17, 1995, Ser. No. 375,076

Claims priority, application United Kingdom, Apr. 2, 1992, 9207288

Int. Cl.[6] A61K *38/48;38/46*

U.S. Cl. 424—78.03 **12 Claims**

1. A composition for topical application to the skin which alleviates or prevents dry flaky skin conditions comprising stratum corneum chymotrypsin-like enzyme.

5,554,367

COMPOSITIONS FOR TREATMENT OF GLAUCOMA

Yusuf Ali; Rajni Jani, and George R. McCarty, all of Forth Worth, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 188,284, Jan. 28, 1994, abandoned, which is a continuation-in-part of Ser. No. 89,358, Jul. 9, 1993, abandoned, which is a continuation of Ser. No. 480,406, Feb. 15, 1990, abandoned, which is a continuation of Ser. No. 154,514, Feb. 5, 1988, Pat. No. 4,911,920, which is a continuation of Ser. No. 890,519, Jul. 30, 1986, abandoned, which is a continuation of Ser. No. 667,003, Oct. 31, 1984, abandoned. This application Nov. 4, 1994, Ser. No. 334,512

Int. Cl.[6] A61K *31/78*

U.S. Cl. 424—78.04 **10 Claims**

1. A topical ophthalmic composition for controlling glaucoma and/or ocular hypertension comprising 0.1 to 1.0 wt./vol. % betaxolol, 0.25 to 10.0 wt./vol. % pilocarpine, 0.05 to 10.0 wt./vol. % poly(styrene-divinyl benzene) sulfonic acid, and 0.01 to 5.0 wt./vol. % polyanionic polymer selected from the group consisting of Carbomer 934P and Carbomer 974P.

5,554,368

PSEUDOMONAS SYRINGAE ATCC 55389 AND USE THEREOF FOR INHIBITING MICROBIAL DECAY ON FRUIT

James P. Stack, Amherst; Steven N. Jeffers, Rutland, both of Mass.; Baruch Sneh, Rehovot, Israel, and Teresa S. Wright, Worcester, Mass., assignors to EcoScience Corporation, Northboro, Mass.

Filed Dec. 3, 1993, Ser. No. 162,533

Int. Cl.[6] A01N *63/00;* **C12N** *1/20*

U.S. Cl. 424—93.47 **44 Claims**

1. A biologically pure culture of a strain of *Pseudomonas syringae* having all the identifying characteristics of the deposited strain *P. syringae* ATCC 55389.

5,554,369

METHOD OF CONTROLLING INSECTS

David R. Corbin, Chesterfield; John T. Greenplate, Manchester; Michael G. Jennings, Chesterfield; John P. Purcell, Ballwin, and Robert D. Sammons, Defiance, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 83,948, Jun. 19, 1993, Pat. No. 5,518,908, which is a continuation-in-part of Ser. No. 937,195, Sep. 4, 1992, abandoned, which is a continuation-in-part of Ser. No. 762,682, Sep. 23, 1991, abandoned. This application Feb. 24, 1995, Ser. No. 393,785

Int. Cl.[6] A61K *38/43;38/00;* **C12N** *9/02;* **A01H** *1/04*

U.S. Cl. 424—94.4 **11 Claims**

1. A method of controlling insect infestation of plants comprising providing a 3-hydroxysteroid oxidase for ingestion by the insect wherein the insect is a lepidopteran or boll weevil.

5,554,370

METHOD FOR THE TREATMENT OF INFLAMMATORY BOWEL DISEASES

Yasuo Uehara, Iruma, and Michihito Ise, Kawagoe, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

Filed May 25, 1995, Ser. No. 450,469

Claims priority, application Japan, May 27, 1994, 6-138071

Int. Cl.[6] A01N *59/00*

U.S. Cl. 424—125 **12 Claims**

1. A method of treating a patient suffering from ulcerative colitis or Crohn's disease, comprising orally administering to said patient symptom-alleviating amount of a pharmaceutical composition in dosage unit form comprising a spherical activated carbon having a particle size of 0.05 to 2 mm.

5,554,371

RECOMBINANT VACCINE AGAINST LYME DISEASE

Anthony C. Caputa, Nanuet, N.Y.; Russell F. Bey, Arden Hills, and Michael P. Murtaugh, Roseville, both of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 790,332, Nov. 12, 1991, abandoned. This application Apr. 14, 1994, Ser. No. 227,478

Int. Cl.[6] A61K *39/00;39/02;* **C12P** *21/00;* **C07K** *16/00*

U.S. Cl. 424—234.1 **8 Claims**

1. A vaccine comprising an immunogenic amount of an antigenic recombinant polypeptide of about 110-kD molecular weight, as determined under reducing conditions by SDS-PAGE, wherein said polypeptide is combined with a physiologically acceptable, non-toxic liquid vehicle, which amount is effective to immunize a susceptible mammal against Lyme borreliosis, wherein the amino acid sequence of said polypeptide corresponds to the amino acid sequence of the recombinant 110-kD polypeptide produced by *E. coli* transformant ATCC 68825.

5,554,372

METHODS AND VACCINES COMPRISING SURFACE-ACTIVE COPOLYMERS

Robert L. Hunter, Tucker, Ga., assignor to Emory University, Atlanta, Ga.

Continuation of Ser. No. 133,760, Oct. 7, 1993, abandoned, which is a continuation of Ser. No. 716,807, Jun. 21, 1991, abandoned, which is a continuation-in-part of Ser. No. 544,831, Jun. 27, 1990, abandoned, which is a continuation-in-part of Ser. No. 449,086, Dec. 8, 1989, abandoned, which is a continuation of Ser. No. 341,315, Apr. 21, 1989, abandoned, which is a continuation of Ser. No. 208,335, Jun. 17, 1988, abandoned, which is a continuation-in-part of Ser. No. 75,187, Jul. 16, 1987, abandoned, which is a continuation-in-part of Ser. No. 909,964, Sep. 22, 1986, abandoned. This application Apr. 11, 1995, Ser. No. 420,333

Int. Cl.[6] A61K *45/00;47/30*

U.S. Cl. 424—280.1 **8 Claims**

1. A method of increasing the immune response in a human or animal to an antigen comprising the step of:

administering an admixture of antigen and adjuvant to an human or animal, wherein the adjuvant comprises:

a surface-active copolymer with the following formula:

$$HO(C_2H_4O)_b(C_3H_6O)_a(C_2H_4O)_bH$$

wherein the molecular weight of the hydrophobe (C_3H_6O) is between approximately 2000 to 5100 and the percentage of hydrophile (C_2H_4O) is between approximately 3% and 15% by weight, excluding a copolymer having the molecular weight of the hydrophobe (C_3H_6O) of 4000 and the percentage of hydrophile (C_2H_4O) of 10% by weight.

5,554,373

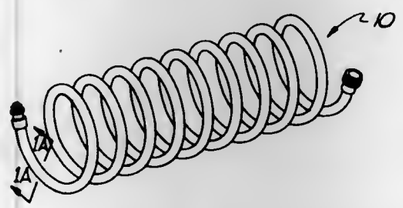
COMPOSITIONS CONTAINING ANTI-MICROBIAL AGENTS AND METHODS FOR MAKING AND USING SAME

Samuel G. Seabrook, and Richard C. Heymann, both of 1051 Planters Pl., Mount Pleasant, S.C. 29464

Filed Nov. 5, 1993, Ser. No. 149,211

Int. Cl.[6] A01N *25/34*

U.S. Cl. 424—400 **35 Claims**



1. An anti-microbial additive for adding to polymeric materials consisting essentially of:

a biocide comprising an organically bound arsenic; and

vitamin E in an amount effective to slow the rate of release of said biocide from a polymeric material when said anti-microbial additive has been added to said polymeric material.

5,554,374

SKIN PREPARATION USING NANOSPHERES

Josette Olivier-Terras, Peronnas, France, assignor to Cosmetics Development Company Limited, United Kingdom

Filed Oct. 17, 1994, Ser. No. 256,634

Claims priority, application France, Jan. 16, 1992, 92 00619

Int. Cl.[6] A61K *7/48*

U.S. Cl. 424—401 **6 Claims**

1. In a skin preparation comprising excipients, a drug carrier encapsulating beta-carotene and a mixture of UV-A and UV-B sunscreen agents, the improvement consisting:

in that the drug carrier consists of nanospheres, and represents from 3 to 6% of the weight of the preparation;

the proportion of UV-B screening agents is higher than those of the UV-A screening agents;

and the UV-B screening agents, are selected from the group consisting of octyl methoxycinnamate, potassium cinnamate, propyl 4-methoxycinnamate, 2-ethylcetyl 4-methoxycinnamate, amyl 4-methoxycinnamate, alpha-cyano 4-methoxycinnamic acid, cyclohexyl 4-methoxycinnamate and potassium, sodium, or diethanolamine salts of 4-methoxycinnamic acid.

6. In a skin preparation comprising excipient, drug carriers encapsulating beta-carotene and a mixture of UV-A and UV-B screening agents, the improvement consisting of, per one hundred parts:

3 to 6%, of nanospheres encapsulating beta-carotene;

4% of octyl methoxycinnamate (UV-B screening agent),

3% of butylmethoxydibenzoylmethane (UV-A screening agent),

1% of preservative,

0.1% of an ion-chelating agent,

0.3% of a gelling agent based on modified cellulose,

0.6% of an agent for adjusting the pH, the remainder to 100% consisting of demineralised water.

5,554,375

TISSUE PROTECTIVE AND REGENERATIVE COMPOSITIONS

Loren R. Pickart, Bellevue, Wash., assignor to Skin Biology, Inc., Bellevue, Wash.

Division of Ser. No. 954,620, Sep. 29, 1992, Pat. No. 5,382,431. This application Jan. 6, 1995, Ser. No. 369,609

Int. Cl.[6] A61K *7/06;38/01;35/12;35/78*

U.S. Cl. 424—401 **9 Claims**

1. A method for increasing the rate of hair growth in a warm-blooded animal, comprising:

administering to the skin of said animal a composition which comprises a peptone digest complexed with an ionic metal in an amount sufficient to increase the rate of hair growth in said animal.

5,554,376

BIOCIDAL SELF ADHESIVE AND PROCESS FOR PRODUCING THE SAME, AS WELL AS SELF-ADHESIVE ARTICLE AND APPLICATION THEREOF

Yasushi Sekiyama, Nishinomiya; Yuichi Mizukami, Kobe; Shuzo Nakagawa, Soka; Hideaki Okabe; Kazuya Katoh, both of Urawa, and Hiroshi Nagaki, Hiki, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

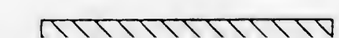
Division of Ser. No. 934,453, Sep. 14, 1992, Pat. No. 5,417,974. This application Mar. 13, 1995, Ser. No. 402,364

Claims priority, application Japan, Nov. 8, 1991, 3-100116 U; Nov. 8, 1991, 3-321003; Nov. 8, 1991, 3-321005

Int. Cl.[6] A01N *25/34*

U.S. Cl. 424—404 **9 Claims**

1. A biocidal self-adhesive comprising an adhesive impregnated with an iso-thiocyanate to hold the latter therein, said adhesive consisting essentially of a polymer which is soluble in or swellable by the iso-thiocyanate.



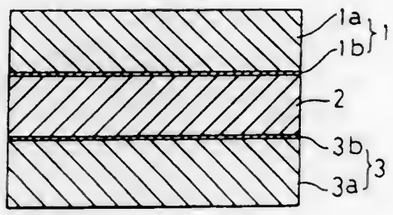
about 97% by weight of said hydrophobic phase of a hydrophobic oil selected from the group consisting of mineral oil, natural or synthetic vegetable oil, long chain fatty acids and alcohols of

group consisting of vinyl acetate, acrylic acid, methyl acrylate, and mixtures thereof,

wherein the drug is completely dissolved in the matrix and the

5,554,384

HIGH DOSE FORMULATIONS OF MYCOPHENOLATE MOFETIL AND MYCOPHENOLIC ACID



5,554,377
NON-TOXIC ANIMAL REPELLENT
Carl J. Abraham, 3 Baker Hill Rd., Great Neck, N.Y. 11023
Filed Dec. 22, 1994, Ser. No. 362,250
Int. Cl.[6] A01N *63/00*
U.S. Cl. 424—405 **15 Claims**

1. A method of repelling animals from an area comprising removing petals from African Marigold and spreading the petals of African Marigold about the area.

5,554,378
PHARMACEUTICAL COMPOSITION AND ITS MUCOSAL USE
Yoshiaki Uda, Hyogo; Shigeyuki Takada, Osaka, and Yukio Fujisawa, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
Continuation of Ser. No. 47,064, Apr. 16, 1993, abandoned, which is a continuation of Ser. No. 753,075, Aug. 30, 1991, abandoned. This application Jan. 27, 1995, Ser. No. 379,114
Claims priority, application Japan, Sep. 3, 1990, 2-234303
Int. Cl.[6] A61F *13/00*
U.S. Cl. 424—434 **22 Claims**

1. A pharmaceutical composition, comprising a physical mixture of:
(a) a therapeutically effective amount of a physiologically active peptide or protein;
(b) heat-labile enterotoxin B subunit present in an amount effective to promote translocation of said physiologically active peptide or protein through nasal mucosa; and
(c) a pharmaceutically acceptable carrier for mucosal administration,
wherein said composition is a liquid or semi-solid preparation and the weight ratio of component (a) to component (b) is in the range of from 0.004 to 4.0.

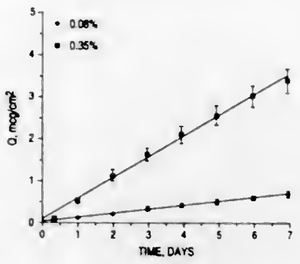
5,554,379
LONG ACTING GI AND ESOPHAGEAL PROTECTANT
Robert Cuca, Edwardsville, Ill.; Keith Lienhop, St. Charles, Mo.; Thomas Riley, Manchester, Mo.; Mitchell I. Kirschner, University City, Mo., and R. Saul Levinson, Chesterfield, Mo., assignors to KV Pharmaceutical Company, St. Louis, Mo.
Filed Jun. 20, 1994, Ser. No. 262,254
Int. Cl.[6] A61K *47/00*
U.S. Cl. 424—439 **15 Claims**

1. A long acting, bioadherent, orally ingestible delivery system which consists essentially of: a water-in-oil system having at least two phases, one phase comprises from about 75% to about 99% by volume of an internal hydrophilic polymer phase selected from the group consisting of water, glycerin, sorbitol solutions, sugar syrups, polymer solutions and mixtures thereof, and the other phase comprises from about 25% to about 1% by volume of an external hydrophobic phase, wherein the external hydrophobic phase is comprised of two components, one component being about 3% to about 97% by weight of said hydrophobic phase of a hydrophobic oil selected from the group consisting of mineral oil, natural or synthetic vegetable oil, long chain fatty acids and alcohols of straight chain alkyls having from 12 to 32 carbon atoms, waxes and mixtures thereof, the other being about 97% to about 3% by weight of said hydrophobic phase of an emulsifier having a HLB value less than 10 selected from the group consisting of sorbitan esters, polyglycerol esters of fatty acids, glycerol esters of fatty acids, 1 to 5 mole ethoxylates of fatty acids or esters, saccharides, derivatives and mixtures thereof.

5,554,380
BIOADHESIVE PHARMACEUTICAL DELIVERY SYSTEM
Robert C. Cuca, Edwardsville, Ill.; Keith S. Lienhop, St. Charles, Mo.; Thomas C. Riley, Jr., Ballwin, Mo.; R. Saul Levinson, Chesterfield, Mo., and Mitchell I. Kirschner, St. Louis, Mo., assignors to KV Pharmaceutical Company, St. Louis, Mo.
Continuation-in-part of Ser. No. 283,904, Aug. 4, 1994, abandoned. This application May 15, 1995, Ser. No. 441,297
Int. Cl.[6] A61K *9/28;9/68;9/20*
U.S. Cl. 424—441 **43 Claims**

1. A solid or semi-solid bioadherent, orally ingestible system, which comprises: a water-in-oil system having at least two phases, one phase comprises from about 25% to about 75% by volume of an internal hydrophilic phase wherein the hydrophilic phase is selected from the group consisting of water, glycerine, sorbitol solutions, sugar syrups, polymer solutions and mixtures thereof, and the other phase comprises from about 25% to about 75% by volume of an external hydrophobic phase, wherein the external hydrophobic phase is comprised of three components, a) one component being about 5% to about 50% of an emulsifier, b) a second component being about 10% to about 75% of a mixture of glyceride esters of long chain fatty acids and c) a third component being about 10% to about 50% of a wax material.

5,554,381
LOW FLUX MATRIX SYSTEM FOR DELIVERING POTENT DRUGS TRANSDERMALLY
Eric J. Roos, Marlborough, Mass.; Chia-Ming Chiang, Foster City, Calif., and Tsung-Min Hsu, Taipei, Taiwan, assignors to Cygnus, Inc., Redwood City, Calif.
Filed Aug. 9, 1993, Ser. No. 104,414
The portion of the term of this patent subsequent to Oct. 12, 2010, has been disclaimed.
Int. Cl.[6] A61L *15/24*
U.S. Cl. 424—449 **7 Claims**

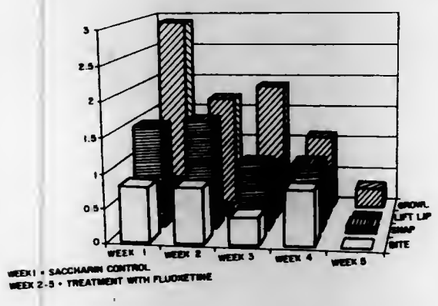


1. A transdermal drug delivery device for administering therapeutically effective amounts of a potent drug at a steady-state delivery rate over a multi-day period comprising a laminate of:
(a) a backing layer that is occlusive to the drug; and
(b) a basal matrix layer of an adhesive copolymer comprising 2-ethylhexyl acrylate and a comonomer selected from the group consisting of vinyl acetate, acrylic acid, methyl acrylate, and mixtures thereof,
wherein the drug is completely dissolved in the matrix and the loading of the drug in the matrix is below 0.5% by weight.

5,554,382
METHODS AND APPARATUS FOR MAKING LIPOSOMES
Trevor P. Castor, Arlington, Mass., assignor to Aphios Corporation, Woburn, Mass.
Filed May 28, 1993, Ser. No. 69,134
Int. Cl.[6] A61K *9/127;9/133;* **B01J** *13/12;* **B28B** *1/54*
U.S. Cl. 424—450 **31 Claims**

1. A method of making liposomes comprising:
a) forming a solution or mixture of a phospholipid and an aqueous phase in a critical, supercritical or near critical fluid said solutiono or mixture being at a pressure of at least 1,000 psig;
b) reducing the pressure of the solution or mixture to separate the critical, supercritical or near critical fluid from the phospholipid and aqueous phase, said phospholipid and aqueous phase forming one or more liposomes.
2. The method of claim 1 wherein said liposome has a therapeutic agent.

5,554,383
VETERINARY METHOD FOR CLINICALLY MODIFYING THE BEHAVIOR OF DOGS EXHIBITING CANINE AFFECTIVE AGGRESSION
Nicholas H. Dodman, Grafton, Mass., assignor to Trustees of Tufts College, Medford, Mass.
Filed Apr. 6, 1995, Ser. No. 417,747
Int. Cl.[6] A61F *2/02;* **A61K** *9/127;9/20;31/44*
U.S. Cl. 424—451 **7 Claims**



1. A veterinary method for clinically modifying the behavior of a household dog exhibiting a recognized type of canine affective aggression behavior, said veterinary behavioral modification method comprising the steps of:
clinically determining that the household dog exhibits a recognized type of canine affective aggression behavior;
administering to the household dog exhibiting a recognized type of canine affective aggression behavior an effective amount of at least one selective serotonin reuptake inhibitor compound sufficient to cause a clinical modification of the canine affective aggression behavior in the household dog; and
allowing sufficient time for said administered effective amount of selective serotonin reuptake inhibitor compound to modify clinically the canine affective aggression behavior of the household dog.

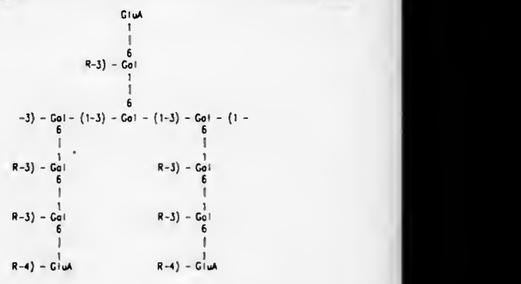
5,554,384
HIGH DOSE FORMULATIONS OF MYCOPHENOLATE MOFETIL AND MYCOPHENOLIC ACID
Glenn J. Samuels, Sunnyvale; Jung-Chung Lee, San Jose; Charles Lee, Union City; Stephen Berry, Saratoga, and Paul J. Jarosz, Los Altos, all of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
Continuation of Ser. No. 61,656, May 13, 1993, Pat. No. 5,455,045. This application Jun. 2, 1995, Ser. No. 459,227
Int. Cl.[6] A61K *9/48*
U.S. Cl. 424—451 **13 Claims**

1. A pharmaceutical formulation comprising a therapeutically effective amount of an active agent selected from the group consisting of mycophenolate mofetil and mycophenolic acid, said active agent having been heated to a first temperature above its melting point, cooled to a second temperature below its melting point at which second temperature said active agent remained liquefied, and filled into a pharmaceutical dosage form while in said cooled liquefied state.

5,554,385
HIGH AMYLOSE STARCH SUBSTITUTED GELATIN CAPSULES
Norman Stroud, Corsham, England, assignor to R. P. Scherer Corporation, Troy, Mich.
Continuation of Ser. No. 619,133, Nov. 28, 1990, abandoned. This application Nov. 22, 1994, Ser. No. 343,185
Int. Cl.[6] A61K *9/48*
U.S. Cl. 424—456 **4 Claims**

1. A soft gelatin capsule made by the rotary-die encapsulation process in which the dry capsule sheath comprises 3–60% of high amylose starch wherein the high amylose starch has from 50% to about 90% amylose content.

5,554,386
DELIVERY OF THERAPEUTIC AGENTS TO RECEPTORS USING POLYSACCHARIDES
Ernest V. Groman, Brookline; Edward T. Menz, Quincy; Philip M. Enriquez, Sheldonville; Chu Jung, Arlington; Jerome M. Lewis, Newton, and Lee Josephson, Arlington, all of Mass., assignors to Advanced Magnetics, Inc., Cambridge, Mass.
Continuation-in-part of Ser. No. 900,686, Jun. 17, 1992, Pat. No. 5,478,576, which is a continuation-in-part of Ser. No. 936,873, Aug. 27, 1992, Pat. No. 5,336,506, which is a continuation of Ser. No. 630,017, Dec. 19, 1990, abandoned, which is a continuation-in-part of Ser. No. 679,526, Apr. 2, 1991, Pat. No. 5,141,739, which is a continuation of Ser. No. 384,991, Jul. 2, 1989, abandoned, which is a continuation-in-part of Ser. No. 228,640, Aug. 4, 1988, abandoned, which is a continuation-in-part of Ser. No. 67,586, Jun. 26, 1987, Pat. No. 4,827,945, which is a continuation-in-part of Ser. No. 882,044, Jul. 3, 1986, Pat. No. 4,770,183. This application Jun. 16, 1994, Ser. No. 260,551
Int. Cl.[6] A61K *47/26;31/56;31/495;31/70;39/395;33/26;38/21*
U.S. Cl. 424—488 **17 Claims**



1. A method for targeting a therapeutic agent to a selected population of cells, the cells being characterized by a receptor mediated endocytosis (RME) receptor, comprising

(i) forming a complex of the therapeutic agent linked to a polysaccharide molecule selected from the group consisting of gum arabic, mannan, fucoidan, and a hydrolysis product of any of the foregoing; and

(ii) allowing the complex to be internalized into the selected population of cells by RME.

5,554,387

SUSTAINED RELEASE HETERODISPERSE HYDROGEL SYSTEMS FOR INSOLUBLE DRUGS

Anand R. Baichwal, Wappingers Falls, N.Y., assignor to Edward Mendell Co., Ltd., Patterson, N.Y.

Division of Ser. No. 118,924, Sep. 9, 1993, Pat. No. 5,455,046. This application May 22, 1995, Ser. No. 447,236

Int. Cl.[6] A61K *9/14*

U.S. Cl. 424—488 **18 Claims**

1. A sustained release excipient, comprising:

a gelling agent comprising a heteropolysaccharide gum and a homopolysaccharide gum which crosslinks with said heteropolysaccharide gum when exposed to a fluid in an environment of use, the ratio of said heteropolysaccharide gum to said homopolysaccharide gum being from about 1:3 to about 3:1;

an inert pharmaceutical diluent selected from the group consisting of a monosaccharide, a disaccharide, a polyhydric alcohol, and mixtures thereof, the ratio of said inert diluent to said gelling agent being from about 1:8 to about 8:1; and

a pharmaceutically acceptable cationic cross-linking agent capable of crosslinking with said gelling agent when exposed to an environmental fluid.

5,554,388

SYSTEMIC DRUG DELIVERY COMPOSITIONS COMPRISING A POLYCATIONI SUBSTANCE

Lisbeth Illum, Nottingham, United Kingdom, assignor to Danbiosyst UK Limited, Nottingham, United Kingdom

Continuation of Ser. No. 743,328, Aug. 20, 1991, abandoned. This application Dec. 14, 1993, Ser. No. 167,611

Claims priority, application United Kingdom, Feb. 25, 1989, 8904370; WIPO, Feb. 23, 1990, PCT/GB90/00291

Int. Cl.[6] A61K *9/50;9/14;9/20;47/36*

U.S. Cl. 424—501 **20 Claims**

1. A method of systemically delivering a pharmaceutically effective amount of a pharmacologically active compound to a mammal comprising:

administering to a mucosal surface a composition including a pharmacologically active compound in a pharmaceutically effective amount when administered systemically and a polymeric substance having a plurality of cationic groups having a molecular weight of 10,000 or more providing for absorption of the active compound across the mucosal surface of the mammal for systemic distribution of the active compound, wherein the polymeric substance is selected from the group consisting of polycationic carbohydrates, polyaminoacids, polyquaternary compounds, protamine, polyimines, polymers having a cationic DEAE group, polyvinylpyridine, polymethacrylates, polyacrylates, polyoxethanes, polyamidoamines, polythiodiethylamino methylethylene, and poly-p-aminostyrene, and (i) the substance is not a polyamino acid which chelates calcium or magnesium ions, (ii) the composition does not consist of microcapsules coated with DEAE-dextran, (iii) if for administration to gut mucosa, the composition does not consist of the active compound and a solution of DEAE-dextran, and (iv) if in the form of a tablet for retention in the mouth, the composition does not comprise chitosan, and

allowing the composition to remain in contact with mucosa for a time sufficient for a pharmaceutically effective amount of the pharmacologically active compound to pass through the mucosa.

5,554,389

URINARY BLADDER SUBMUCOSA DERIVED TISSUE GRAFT

Stephen F. Badylak, W. Lafayette; Sherry L. Voytik, Lafayette; Andrew Brightman, W. Lafayette, and Matt Waninger, Frankfort, all of Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Apr. 7, 1995, Ser. No. 418,763

Int. Cl.[6] A61K *35/22*

U.S. Cl. 424—558 **10 Claims**

1. A composition comprising urinary bladder submucosa delaminated from both the abluminal muscle layers and at least the luminal portion of the tunica mucosa of a segment of a urinary bladder of a warm blooded vertebrate.

5,554,390

COATINGS WITH SECOND PHASE PARTICULATE TO IMPROVE ENVIRONMENTAL PROTECTION

Joshi Anne, and Jen S. Lee, both of Cupertino, Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 188,401, Jan. 28, 1994, abandoned. This application Jan. 31, 1994, Ser. No. 189,425

Int. Cl.[6] C03C *27/02*

U.S. Cl. 428—631 **36 Claims**

1. A method of providing a surface of a carbon containing substrate with a crack-limiting coating which prevents developing cracks from extending through the coating both under isothermal conditions and when the temperature of the coating is changed and which prevents oxygen ambient to the coating from contacting the carbon containing substrate, said method comprising,

applying a slurry coating composition to the surface of the carbon containing substrate,

said slurry coating composition containing silicon,

said slurry coating composition containing at least one refractory metal and an element which lowers the melting point of the slurry coating composition by eutectic melting,

said slurry containing an additional particulate,

fusing the slurry coating composition onto the carbon containing substrate to produce a multilayer coating on the surface of the carbon containing substrate,

said fusing the slurry coating composition onto the carbon containing substrate including a reaction between said substrate and said coating composition,

said multilayer coating having a first layer contiguous to and adhered to the substrate and comprising silicon carbide and having a second multiphase layer,

producing a polycrystalline microstructure in the multiphase layer and in which microstructure,

A. all of the grains of all of the phases in the multiphase layer are smaller than the thickness of the layer,

B. at least a first one of the phases comprises a refractory material

(1) which provides resistance to oxidation at high temperatures, but

(2) which has a mismatch in coefficient of thermal expansion with the substrate material so as to be subject to cracking of grains under thermal stresses which may be incurred during the usage of the coated substrate,

C. at least a second one of the phases in the multiphase layer comprises grains

(1) which surround grains of said first one of the phases and

(2) which have a sufficiently low mismatch in coefficient of thermal expansion with the substrate materials so as to cause a crack extending through a grain in said first one of the phases to be stopped in an adjacent grain or grains of said second one of the phases,

said producing said polycrystalline microstructure including,

heating said slurry coating composition on said carbon containing substrate to a temperature high enough and for a period of time long enough to produce the multiple phases,

limiting said heating of the said slurry coating composition to a temperature low enough and for a period of time short enough to prevent the grains in the multiphase layer from growing as large as the thickness of the multiphase layer, and

allowing cooling of said produced polycrystalline microstructure,

wherein said particulate remains as a particulate after said heating and cooling and are distributed in at least one of the layers, and

wherein the combination of the polycrystalline microstructure and the distributed particulate distribute cracks to individual grains in said first phase and limit the cracks to the individual grains to make all cracks discontinuous and prevent any crack from extending through all of the layers of the entire coating.

5,554,391

COMPOSITION CONTAINING THE DIHYDRATE OF THE CALCIUM SALT OF 3-HYDROXY-5-METHYLISOXAZOLE AND CURPRIC HYDROXIDE

Takeo Ohkouchi; Hitoshi Hosoda; Kenji Yasui; Shigehiro Kato; Yasuhiko Kondo, and Yukiyoshi Takahi, all of Shiga-ken, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Division of Ser. No. 271,264, Jul. 6, 1994, Pat. No. 5,472,972, which is a continuation of Ser. No. 55,516, Apr. 28, 1993, abandoned. This application May 4, 1995, Ser. No. 433,834

Claims priority, application Japan, May 7, 1992, 4-114808; Mar. 3, 1993, 5-042523

Int. Cl.[6] A01N *43/80;59/20*

U.S. Cl. 424—633 **6 Claims**

1. An agrochemical composition comprising a fungicidal effective amount of the dihydrate of the calcium salt of 3-hydroxy-5-methyl-isoxazole in admixture with an effective antimicrobial amount of cupric hydroxide and a carrier.

5,554,392

APPARATUS FOR FORMING WALLS

Leroy D. Gray, 1760 Ferry Ave., SW., Seattle, Wash. 98116

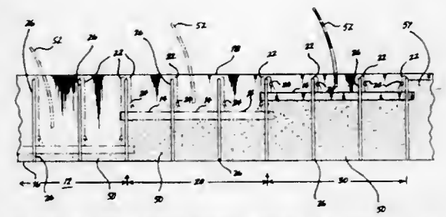
Continuation of Ser. No. 45,418, Apr. 9, 1993, abandoned. This application Apr. 17, 1995, Ser. No. 424,551

Int. Cl.[6] B28B *1/08;* **E04G** *21/06;11/22*

U.S. Cl. 425—64 **11 Claims**

1. An apparatus for forming by extrusion a concrete wall of predetermined thickness, height, and length, said apparatus comprising:

two or more substantially vertical support means positioned at a distance from a preexisting member which distance represents said predetermined thickness of said concrete wall,



at least one slip forming means disposed horizontally between said support means and said preexisting member, said slip forming means having a vertical dimension substantially less than its horizontal dimension and substantially less than said predetermined height of said concrete wall, and said slip forming means serving to extrude concrete up against said preexisting member by pressing said concrete against said preexisting member,

connector means attaching said slip forming means and said support means such that said forming means is vertically movable along a height of said support means at least up to said predetermined height of said concrete wall,

transit means coupled to said connector means for causing said slip forming means to move upwardly along said substantially vertically support means to cause said slip forming means to extrude said concrete up against said preexisting member until said predetermined height of said concrete wall is reached,

concrete delivery means positioned between said slip forming means and said preexisting member for sequentially pouring layers of wet concrete between said slip forming means and said preexisting member and along said predetermined length of said concrete wall from a first end of said concrete wall to a second end of said concrete wall, and

movable vibrating means for sequentially consolidating each of said poured layers of concrete layers and for causing bonding of each last poured layer of concrete with a previously last poured layer of concrete positioned immediately thereunder.

5,554,393

APPARATUS FOR SUPPLYING PARTICLES AND/OR GRANULES TO FORM A LAYER OF PRESCRIBED THICKNESS

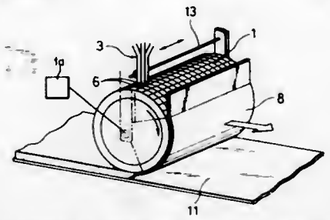
Hiroshi Uchida, Ashikaga; Mituhiro Onuki, Kiryu, and Hideo Watanabe, Ashikaga, all of Japan, assignors to CCA Inc., Tokyo, Japan

Continuation of Ser. No. 22,295, Feb. 25, 1993, abandoned. This application Dec. 6, 1994, Ser. No. 353,997

Claims priority, application Japan, Feb. 26, 1992, 4-073025

Int. Cl.[6] A01J *21/00*

U.S. Cl. 425—92 **30 Claims**



1. An apparatus for supplying particles to form on a given surface a layer of particles having a prescribed thickness, the apparatus comprising:

a cell form provided above the given surface, having a plurality of spaces formed into a polygon in cross section and arranged in a contiguous manner so as to open to one direction, and releasing onto the given surface the particles being supplied into the spaces, said polygon having sides each measuring 1 to 50 mm in length;

particle supplying means movable above the cell form in a direction of a width of the cell form for supplying particles in a prescribed amount into a prescribed number of spaces to form a prescribed pattern in the cell form; and

drive means for moving either the given surface or the cell form.

5,554,394

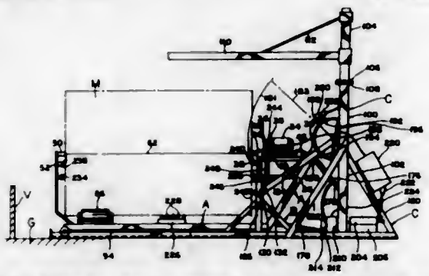
ROTATIONAL THERMAL MOLDING MACHINE

Joseph Feal, Bayshore, and Stephen Bacskay, Central Islip, both of N.Y., assignors to Rototron Corporation, North Babylon, N.Y.

Filed Dec. 6, 1994, Ser. No. 331,475

Int. Cl.[6] B29C *5/04*

U.S. Cl. 425—434 **20 Claims**



1. Molding apparatus comprising mold supporting means for supporting a mold for rotation about an axis of rotation, cradle means for accommodating said mold supporting means with said axis in generally horizontal attitude, and control means for displacing said mold supporting means relative to said cradle means to tilt said axis to a first inclination angle and then to return said mold supporting means to said cradle means, said control means further displacing said cradle means and the mold supporting means accommodated therein to a second inclination angle generally opposite to the said first inclination angle, said control means including piston and cylinder means coupled to said mold supporting means for displacing said mold to said first and second inclination angles.

5,554,395

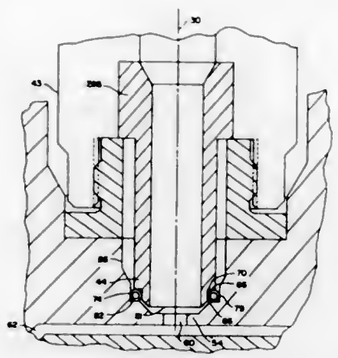
OPEN BORE INJECTION MOLDING APPARATUS

William J. Hume, Amesbury, and Paul M. Swenson, Hamilton, both of Mass., assignors to Kona Corporation, Gloucester, Mass.

Continuation of Ser. No. 105,799, Aug. 12, 1993, abandoned. This application Dec. 30, 1994, Ser. No. 367,779

Int. Cl.[6] B29C *45/20*

U.S. Cl. 425—549 **28 Claims**



1. An open bore, thermally gated injection molding apparatus comprising:

a source of melt material;

a heated manifold having an upper surface, a lower surface, and defining a runner channel extending therethrough from said upper surface to said lower surface;

a heated bushing having a first longitudinal axis, an upper end defining a first opening, a lower end defining a second opening, a lower portion adjacent to said lower end and a first outer surface located between said upper end and said lower portion, said bushing defining an unobstructed axial lumen connecting said first opening to said second opening;

a cooled mold having a top surface, a first bore extending into said top surface, an internal article formation cavity and a gate, said first bore having a second longitudinal axis and being defined by a first side wall and a base, and said gate connecting said base to said article formation cavity;

thin walled sealing means for sealingly connecting said bushing to the periphery of said first bore, said sealing means being formed of a material having low thermal conductivity, and having an inner portion and an outer portion, said inner portion being affixed to said bushing so as to surround said lower portion of said bushing in close proximity to said second opening such that said outer portion of said sealing means extends outwardly from said bushing; and,

pressure means for alternately applying a first predetermined pressure to said melt material for a first preselected interval and a second, reduced predetermined pressure to said melt material for a second preselected interval;

wherein:

(a) said source of molten material communicates with said runner channel adjacent said upper surface of said manifold;

(b) said bushing extends outwardly from said lower surface of said manifold into said first bore such that said first longitudinal axis is substantially aligned with said second longitudinal axis;

(c) said bushing lumen communicates with said runner channel adjacent said lower surface of said manifold;

(d) said bushing resides at least partially in said first bore with said first outer surface located in spaced relation to said first side wall, with said lower portion located in closely spaced relation to said base and with said bushing lumen located in substantial alignment with said gate;

(e) said mold and said bushing together define a gate area comprising said gate, a first volume located between said gate and said second opening in said lower end of said bushing and a substantially annular volume surrounding said first volume, said gate area containing the thermal gradients between said heated bushing and said cooled mold which materially effect the thermal control of the flow of said melt material through said gate during said second preselected intervals; and

(f) said outer portion of said sealing means is urged against the periphery of said first bore within said substantially annular volume so as to form a contact area with said periphery located in closely spaced relation to said gate, said contact area being substantially no larger than that necessary to close off the gap between said periphery of said first bore and said bushing against the passage of melt material.

5,554,396

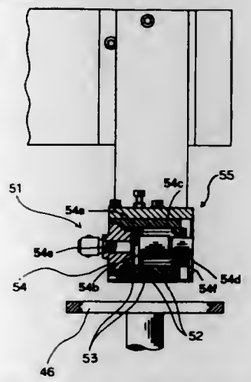
MOLDING MACHINE

Takefumi Kato; Shigeru Morita, and Kiminori Sato, all of Saga-ken, Japan, assignors to NOK Corporation, Tokyo, Japan

Continuation of Ser. No. 297,959, Sep. 26, 1994, abandoned, which is a division of Ser. No. 111,784, Aug. 26, 1993, Pat. No. 5,401,157, which is a division of Ser. No. 875,469, Apr. 29, 1992, Pat. No. 5,273,418. This application Jan. 5, 1996, Ser. No. 583,530

Int. Cl.[6] B29C *45/00*

U.S. Cl. 425—556 **6 Claims**



1. In a molding machine for producing products of a resilient material, a separating apparatus comprising:

a mold assembly including, in sequence, a distribution plate, a first mold die, a second mold die and a third mold die, said second mold die having a plurality of cavities for forming products having tip portions protruding outwardly from said second mold die and into said first mold die;

nipping means having a plurality of fixed claws and movable claws in combination for nipping a plurality of said tip portions of said molded products between the fixed and movable claws when the fixed and movable claws are closed and releasing said tip portions of said molded products when the fixed and movable claws are opened; and

means for pulling the molded products out of the cavities of the second mold die when the mold assembly is separated, by closing said nipping means on said tip portions extending from said second mold die while the remaining portions of the molded products are held by the second mold die in the cavities thereof.

5,554,397

METHODS FOR PRODUCING CHEESE TYPE FOOD AND AGED TYPE CHEESE FROM POWDERED MILK AS A STARTING MATERIAL

Hozumi Tanaka, and Ryoichi Sueyasu, both of Yamanashi, Japan, assignors to Snow Brand Milk Products Co., Ltd., Hokkaido, Japan

Continuation of Ser. No. 912,037, Jul. 9, 1992, abandoned, which is a continuation of Ser. No. 602,739, Oct. 24, 1990, abandoned. This application Jun. 21, 1994, Ser. No. 263,241

Claims priority, application Japan, Oct. 25, 1989, 1-278056; Apr. 20, 1990, 2-104974

Int. Cl.[6] A23C *9/12*

U.S. Cl. 426—36 **9 Claims**

1. A method of producing processed cheese consisting essentially of: forming a concentrated milk by ultrafiltration adjusting the pH of the concentrated milk to pH 5.0–5.8; spray drying the concentrated milk by contact with hot air in a spray dryer to obtain a powdered milk having a moisture content of 5 percent or less, said hot air having a temperature at the spray dryer inlet of 80° to 100° C., and at the spray dryer outlet of 60° to 80° C., forming a liquid mixture by heating said powdered milk, emulsifying salt and water; and thereafter cooling the liquid mixture and obtaining the processed cheese.

5,554,398

PROCESS FOR MANUFACTURING REDUCED-FAT CHEDDAR CHEESE

Carol M. Chen, and Mark E. Johnson, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jul. 10, 1995, Ser. No. 500,434

Int. Cl.[6] A23C *9/12*

U.S. Cl. 426—36 **22 Claims**

1. A process for the production of reduced-fat cheese comprising:

a) ripening milk with a starter culture to yield cheese milk;

b) coagulating the cheese milk by adding a coagulant to yield a coagulum;

c) cutting the coagulum at a firmness level not less than about firmness adjustment 2.2, wherein firmness adjustment is a unitless number equal to cutting time divided by maximum coagulation rate of the cheese milk;

d) cooking the cut coagulum to form curds and whey;

e) separating the curds from the whey, and proceeding directly to mill and salt the curds in the absence of any washing or rinsing of the curds in water;

f) milling the curds;

g) salting the curds at a pH not less than about 5.80; and

h) pressing the curds.

5,554,399

A PROCESS FOR HYDROLYZING PHYTATE WITH A SYNERGETIC ENZYME COMPOSITION

E. M. M. Vanderbeke, Prosper Poulletlaan 37, B-3010 Kessel-Lo, Belgium; M. De Schrijver, Gentsesteenweg 78, B-9200 Dendermonde, Belgium, and A. M. M. Vermeire, Akkersloot-laan 30, B-9940 Evergem, Belgium

Division of Ser. No. 221,695, Apr. 1, 1994, Pat. No. 5,,443,979. This application Aug. 18, 1995, Ser. No. 516,569

Claims priority, application European Pat. Off., Apr. 5, 1993, 93200989

Int. Cl.[6] A23K *1/18*; A23L *1/00*; A23B *7/10*; C12N *9/00*

U.S. Cl. 426—49 **7 Claims**

1. A process for hydrolyzing phytate comprising the step of treating a raw material which contains phytate with an enzyme composition, which includes a mixture of a phytase having a phytate hydrolyzing activity at a pH range from 2.5 to 5.0 and of an acid phosphatase having phytate hydrolyzing activity at a pH of 2.5, in a ratio that provides said mixture with phytate hydrolyzing activity units in a ratio, a/p, wherein a is the activity at pH 2.5 and p is the activity at pH 5.0, of 0.8/1 to 3/1, wherein said activity unit is the amount of enzyme that liberates one micromole of phosphorus/min. at 40° C., respectively, at pH 2.5 and 5.0, and wherein said treatment is carried out under hydrolyzing conditions at a pH whereby said phytase and said acid phosphatase of said enzyme composition have hydrolyzing activity to hydrolyze the phytate in said raw material.

5,554,400

INFUSION BEVERAGE PRODUCT COMPRISING

no-fat baked product having taste and textural properties which are substantially similar to the taste and textural prop-

5,554,405

CORN-BASED SNACK FOODS AND PROCESS OF PREPARATION

5,554,408

BLOOM-INHIBITING FAT BLENDS

Frederick W. Cain; Neil G. Hargreaves, both of Voorburg, and

5,554,400

INFUSION BEVERAGE PRODUCT COMPRISING CO-AGGLOMERATED CREAMER AND SWEETENER SUITABLE FOR BAG AND FILTER PACK BREWING

Gordon K. Stipp, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 295,587, Aug. 25, 1994, abandoned. This application May 8, 1995, Ser. No. 435,054

Int. Cl.[6] B65B *29/02;* **A23F** *5/24;3/18*

U.S. Cl. 426—78 **17 Claims**

1. An infusion package for making a beverage comprising an infusible dry beverage making substance containing water soluble extractable solids and a water soluble additive material, both packaged in a water permeable infusion bag, wherein the soluble additive material comprises a dry steam agglomerated co-agglomerate of a particulate, dairy or non-dairy creamer and a particulate, natural or artificial sweetener wherein the co-agglomerate has a bulk density in the range from about 0.3 g/cc to about 0.7 g/cc.

5,554,401

HIGH MOISTURE COLLAGEN CASINGS

Graeme Y. Alexander, Killearn; Trevor F. Morgan, Airdrie, and Gerald P. Fitzpatrick, North Kelvinside Glasgow, all of United Kingdom, assignors to Devro Limited, Glasgow, United Kingdom

PCT No. PCT/GB93/02045, § 371 Date May 9, 1995, § 102(e) Date May 9, 1995, PCT Pub. No. WO94/07372, PCT Pub. Date Apr. 14, 1994

PCT Filed Oct. 1, 1993, Ser. No. 403,872

Int. Cl.[6] A22C *13/00*

U.S. Cl. 426—140 **10 Claims**

1. A wet edible collagen casing, having a moisture content of 50 to 90% by weight, which has been continuously formed and cross-linked such that the casing has mechanical properties allowing the casing to be filled in its wet state, the casing being packed in its wet state ready for use.

5,554,402

PROCESS FOR PREPARING BAKED FOOD PRODUCTS HAVING LITTLE OR NO FAT USING AN OAT COMPONENT AS A FAT REPLACEMENT

John J. Smith, Hoffman Estates, and Carol A. Steinwebe, Marengo, both of Ill., assignors to The Quaker Oats Company, Chicago, Ohio

Filed Dec. 28, 1993, Ser. No. 174,564

Int. Cl.[6] A21D *13/00*

U.S. Cl. 426—549 **9 Claims**

1. A process for preparing a baked food product containing little or no fat, which process comprises:

(a) preparing an initial mixture comprising from about 10% to about 35% by weight, as a percentage of the initial mixture, of an oat component selected from the group consisting of oat flour, oat bran, oat bran concentrate, defatted oat flour, derailed oat bran, defatted oat bran concentrate, and mixtures thereof, and wherein the balance of the initial mixture comprises water;

(b) hydrating the oat component in the initial mixture to form a hydrated mixture having a gel strength in the range of from about 288 mm to about 400 mm, as measured by a Universal penetrometer using a dish size of 5 cm diameter and a depth of 1.3 cm;

(c) combining the hydrated mixture with flour and other ingredients necessary for preparing a baked product, thereby forming a baking mixture, wherein the amount of hydrated mixture combined is that amount sufficient to provide a low-fat or no-fat baked product having taste and textural properties which are substantially similar to the taste and textural properties of a full-fat version of the baked product; and

(d) heating the baking mixture for a sufficient time and temperature to prepare a fully baked product.

5,554,403

FROZEN DOUGH CONDITIONERS

Shingo Nakamura; Hiroyuki Nakata, and Katsuko Nakamura, all of Kyoto, Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Oct. 28, 1994, Ser. No. 330,958

Claims priority, application Japan, Oct. 29, 1993, 5-293940

Int. Cl.[6] A21D *2/24;2/18;2/16;10/00*

U.S. Cl. 426—549 **20 Claims**

1. A conditioner composition for admixture with a bread dough to reduce freeze damage upon freezing said dough, said composition prepared by drying an aqueous solution or dispersion having pH in the range of about 4 to about 9, said aqueous solution or dispersion comprising:

(A) a sucrose fatty acid ester having an HLB of not less than about 5;

(B) diacetyl tartaric acid monoglyceride;

(C) a fatty acid monoglyceride; and

(D) sugar.

5,554,404

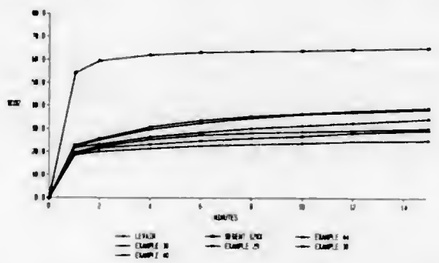
LEAVENING ACID COMPOSITION

Frank H. Y. Chung, Langhorne, Pa., assignor to Rhone-Poulenc Inc., Monmouth Junction, N.J.

Filed Nov. 22, 1994, Ser. No. 344,322

Int. Cl.[6] A21D *2/02*

U.S. Cl. 426—551 **3 Claims**



1. A baking mix for preparing an edible baked good including a composition of matter comprising a monocalcium phosphate leavening acid having a neutralizing value of between about 44 and about 63 wherein the neutralizing value is the amount by weight of sodium bicarbonate needed to neutralize 100 parts by weight of said monocalcium phosphate leavening acid.

5,554,405

CORN-BASED SNACK FOODS AND PROCESS OF PREPARATION

Richard D. Fazzolare, Randolph; Joseph A. Szwerc, Mahwah; Bernhard van Lengerich, Ringwood, and Rudolph J. Leschke, Andover, all of N.J., assignors to Nabisco, Inc., Parsippany, N.J.

Continuation of Ser. No. 848,889, Mar. 10, 1992, Pat. No. 5,320,858, which is a continuation of Ser. No. 310,096, Feb. 14, 1989, Pat. No. 5,104,673, which is a continuation of Ser. No. 62,673, Jun. 16, 1987, Pat. No. 4,834,996, which is a continuation-in-part of Ser. No. 772,918, Sep. 5, 1985, Pat. No. 4,873,093, which is a continuation-in-part of Ser. No. 681,647, Dec. 14, 1984, abandoned. This application Jun. 8, 1994, Ser. No. 257,814

Int. Cl.[6] A23L *1/164*

U.S. Cl. 426—560 **13 Claims**

1. A starch-based baked snack consisting essentially of a blend of masa corn flour and corn flour, said snack being dockered to reduce checking and being produced by baking a laminated dough having a plurality of laminae, to obtain a crisp, chip-like texture and a thin, partially delaminated, blistered chip-like appearance, said blistering being distributed over the surface of said snack.

5,554,406

CONGEALED FRUIT CONFECTION ESPECIALLY FOR MAKING FRUIT CLUSTERS

David J. Muenz, Akron, and Harold J. Hochstetler, Orrville, both of Ohio, assignors to The J. M. Smucker Company, Orrville, Ohio

Filed Mar. 28, 1994, Ser. No. 218,439

Int. Cl.[6] A23L *1/072;1/064*

U.S. Cl. 426—573 **10 Claims**

1. A congealed fruit confection with a high fruit intensity in the form of a bit, said confection comprising a mixture of a fruit concentrate containing at least about 2% fruit solids, at least about 50.0% sweeteners selected from the group consisting essentially of sugar, corn syrup and mixtures thereof, a softening agent and a humectant comprising essentially of glycerin wherein said glycerin making up at least about 10% of said confection, water and pectin of over 1.0% by weight of the mixture, which mixture has been congealed in molding material, said molding material reducing the water of said mixture to provide a water activity of substantially less than about 0.40.

5,554,407

PROCESS FOR MAKING SPREADS AND SPREADS MADE BY THE PROCESS

Janos Bodor, Rijswijk, Netherlands; Matthew Patrick, Naperville, Ill.; Thomas Wajda, Jr., Columbia, and Leendert H. Wesdorp, Elliott City, both of Md., assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Continuation of Ser. No. 335,568, Nov. 7, 1994, abandoned, which is a continuation of Ser. No. 84,752, Jun. 29, 1993, abandoned, which is a continuation of Ser. No. 822,503, Jan. 17, 1992, abandoned. This application May 22, 1995, Ser. No. 445,485

Int. Cl.[6] A23D *7/04*

U.S. Cl. 426—603 **10 Claims**

1. A process for making a fat-continuous emulsion having less than 30 wt. % fat, comprising

a) mixing an at least partially pre-gelled, gell-forming aqueous composition having less than 50% fat with an at least partially pre-solidified fat-continuous water-in-oil starting emulsion in such a way that at no time during or after the mixing step does the temperature exceed the melting point of the fat-continuous emulsion, the resulting emulsion being fat continuous and having less than 30 wt. % fat, the aqueous composition and the fat-continuous starting emulsion being mixed together by back-mixing.

5,554,408

BLOOM-INHIBITING FAT BLENDS

Frederick W. Cain; Neil G. Hargreaves, both of Voorburg, and Adrian D. Hughes, Den Haag, all of Netherlands, assignors to Loders Croklaan B.V., Wormerveer, Netherlands

Continuation of Ser. No. 65,718, May 21, 1993, Pat. No. 5,431,948. This application Apr. 17, 1995, Ser. No. 423,047

Claims priority, application European Pat. Off., May 22, 1992, 92201472; Sep. 30, 1992, 92203001; Dec. 3, 1992, 92203754; Dec. 23, 1992, 92204077

Int. Cl.[6] A23D *9/00*

U.S. Cl. 426—607 **3 Claims**

1. Fat composition suitable for the preparation of non-blooming chocolate-coated, baked bakery dough products comprising fats A, B and C, wherein:

fat A=an (H_2M+M_2H)—olein with C_{24}:C_{36}<2.0, H= saturated fatty acid having $\geq C_{16}$, M=saturated fatty acid having C_8–C_{14},

fat B=fat containing at least 35 wt. % (U_3+U_2S), U= mono- or polyunsaturated fatty acid having $\geq C_{18}$, S=saturated fatty acid having $\geq C_{16}$,

fat C=vegetable fat or a fraction thereof, displaying an N_{20} (non-stab.) of more than 15,

fat A being present in amounts of 5.5–96 wt. %,

fat B being present in amounts of 0–94.5 wt. %,

fat C being present in amounts of 0–94.5 wt. %,

the amount of (B+C) being always more than 0%.

5,554,409

METHOD OF PRODUCING CHOCOLATE CONTINUOUSLY ON AN INDUSTRIAL SCALE

Corrado Vezzani, Milan, Italy, assignor to Vomm Impianti E Processi S.r.L., Milan, Italy

Filed Nov. 22, 1994, Ser. No. 343,244

Int. Cl.[6] A23G *1/10;1/16;1/04;* **B01F** *7/16*

U.S. Cl. 426—631 **5 Claims**

1. A method of producing chocolate continuously on an industrial scale from a previously refined chocolate paste, characterized in that it comprises the steps of:

producing a continuous flow of the chocolate paste, and arranging it in a thin, dynamic layer, and

subjecting the chocolate paste of the thin, dynamic layer to intense mechanical mixing whilst it flows in a heat-exchange relationship with a wall which is kept at a predetermined temperature.

5,554,410

DELIVERY OF FRUIT JUICE, ACIDULANTS, AND LABILE COMPONENTS INTO COOKED CANDY BASE

Anthony J. Bell, Frelinghuysen Township, N.J., and Daniel J. Streit, Rockford, Ill., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 10, 1994, Ser. No. 241,219

Int. Cl.[6] A23G *3/00*

U.S. Cl. 426—660 **6 Claims**

1. A method for preparing a hard candy containing from about 1% to about 35% fruit juice, by weight, which comprises the steps of:

(a) providing a vacuum cooker having a cooker coil, an atmospheric chamber, and a vacuum chamber;

(b) forming a sugar syrup having a moisture content from about 0.1% to about 5%, by weight;

(c) heating the sugar syrup in the cooker coil to cook the syrup;

(d) passing the cooked sugar syrup from the cooker coil to the atmospheric chamber;

(e) admixing fruit juice with the cooked sugar syrup in the atmospheric chamber to form a fruit juice-sugar syrup mixture;

(f) passing the fruit juice-sugar syrup mixture from the atmospheric chamber to the vacuum chamber to remove excess water; and

(g) removing the fruit juice-sugar syrup mixture from the vacuum chamber and forming the fruit juice-sugar mixture into desired shapes of hard candy.

5,554,411

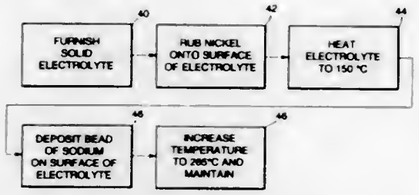
TREATMENT OF SOLID ELECTROLYTES TO PROMOTE WETTABILITY

Lin R. Higley, and Janet L. Dalke, both of Troy, Mich., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 6, 1994, Ser. No. 350,304

Int. Cl.[6] B05D *5/12*

U.S. Cl. 427—11 **14 Claims**



1. A method preparing a solid electrolyte of an electrolytic cell for wetting by a liquid electrode material, comprising the steps of:

furnishing a solid electrolyte of a ceramic material that permits diffusion of sodium ions therethrough;

depositing an asperity-filling metal on a surface of the solid electrolyte in an amount sufficient to fill surface asperities in the solid electrolyte, the asperity-filling metal being selected from the group consisting of nickel and its alloys, copper and its alloys, and 300-series stainless steel, but not lead and its alloys;

heating the electrolyte and deposited asperity-filling metal to a temperature sufficient to melt a cell electrode material; and

depositing a quantity of sodium as the cell electrode material onto the electrolyte surface upon which the asperity-filling metal has been deposited, and permitting the sodium cell electrode material to wick along the surface of the electrolyte.

5,554,412

SOLDER SPRAY LEVELLER

Peter P. A. Lynn, Limeworks Cottage, Kilm La., Buriton, Petersfield, Hampshire GU32 1ON, United Kingdom

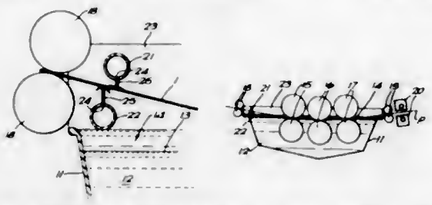
PCT No. PCT/GB92/00821, § 371 Date May 3, 1994, § 102(e) Date May 3, 1994, PCT Pub. No. WO92/19416, PCT Pub. Date Dec. 11, 1992

PCT Filed May 6, 1992, Ser. No. 146,094

Claims priority, application United Kingdom, May 8, 1991, 9109899

Int. Cl.[6] H05K *3/24*

U.S. Cl. 427—96 **18 Claims**



17. A method of tinning a board in a horizontal solder leveller, comprising the steps of:

1) preliminarily tinning the board with an upwardly directed, distributed flow of molten solder, as a spray or curtain, through which the board can pass, so as to remove any residual flux oil remaining on the board;

2) applying molten solder to the board at a main solder application area;

3) feeding the board away from the main solder application area by means of outfeed rollers; and

4) levelling the molten solder applied to the board.

5,554,413

METHOD OF MANUFACTURING ELECTRONIC DEVICE AND APPARATUS FOR MANUFACTURING THE SAME

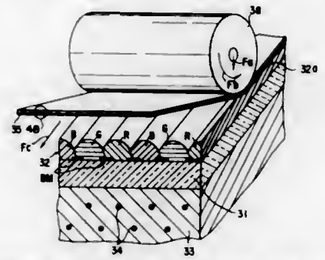
Masaru Nikaido, Miura; Hidemi Kanetaka, and Hideki Yamaguchi, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 945,646, Oct. 27, 1992, abandoned. This application Jun. 6, 1994, Ser. No. 254,669

Claims priority, application Japan, Feb. 28, 1991, 3-059562; Nov. 1, 1991, 3-287822

Int. Cl.[6] B05D *5/12*

U.S. Cl. 427—108 **12 Claims**



1. A method of manufacturing an electronic device comprising the steps of:

(a) forming a color ink layer on a first surface of a substrate, the color ink layer containing a solvent and having a viscosity and an upper surface;

(b) mounting the substrate on a surface of a heating plate so that a second surface of the substrate faces the surface of the heating plate; and

(c) smoothing the upper surface of the color ink layer, which includes the steps of:

(c1) drying the color ink layer so as to remove the solvent;

(c2) placing a resin film directly on the upper surface of the dried color ink layer; and

(c3) using a heating roller to press and heat the color ink layer through the resin film so as to flatten the upper surface of the dried color ink layer.

5,554,414

PROCESS FOR FORMING MEMBRANE HAVING A HYDROPHOBIC FLUOROPOLYMER SURFACE

Wilson Moya, Derry, and Philip M. Goddard, New Ipswich, both of N.H., assignors to Millipore Investment Holdings Limited, Wilmington, Del.

Filed Apr. 12, 1995, Ser. No. 421,126

Int. Cl.[6] B05D *5/00*

U.S. Cl. 427—244 **23 Claims**

1. The process for forming a composite porous polymeric membrane formed from a porous polymeric membrane substrate having an average pore size between about 0.001 and 10 microns formed of a first polymer, said substrate having a surface which is modified on its entire surface with a cross-linked second polymer such that is does not wet with a solvent having a surface tension greater than about 21 mN/m, said composite porous polymeric membrane having essentially the same porous configuration as said porous polymeric membrane substrate which comprises; contacting said porous polymeric membrane substrate with a solution of a polymerizable fluorine containing monomer and a cross-linking agent for said monomer in a polar solvent system having a dielectric constant above 25 at room temperature under conditions to polymerize said monomer and to crosslink said second polymer in situ over the entire surface of said first polymer and to avoid plugging of pores of said polymeric membrane substrate.

5,554,415

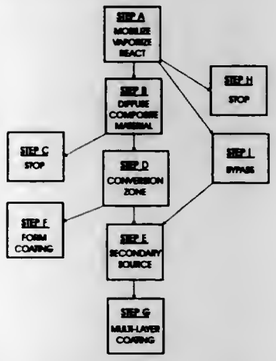
SUBSTRATE COATING TECHNIQUES, INCLUDING FABRICATING MATERIALS ON A SURFACE OF A SUBSTRATE

Manuel C. Turchan, Northville, and Pravin Mistry, Shelby Township, both of Mich., assignors to QQC, Inc., Dearborn, Mich.

Filed Jan. 18, 1994, Ser. No. 182,978

Int. Cl.[6] C23C *16/44;* **C08J** *7/18*

U.S. Cl. 427—248.1 **32 Claims**



1. Method of forming a coating on a substrate, comprising:

directing energy at a surface of a substrate, and with the energy:

mobilizing one or more constituent elements in a sub-surface zone of the substrate;

moving the one or more constituent elements towards the surface of the substrate;

vaporizing selected amounts of the one or more constituent elements in a controlled manner;

reacting the vaporized one or more constituent elements; and

forming, from the vaporized and reacted one or more constituent elements, a material in the sub-surface zone of the substrate; and

further comprising:

while directing a secondary element from a secondary source at the surface of the substrate, and while continuing to direct energy at the surface of the substrate, fabricating a coating on the surface of the substrate.

5,554,416

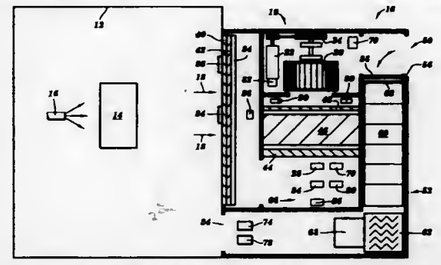
AUTOMATED AIR FILTRATION AND DRYING SYSTEM FOR WATERBORNE PAINT AND INDUSTRIAL COATINGS

Fred G. Scheufler, Rensselaer; Richard D. Scheufler, East Greenbush, and William H. Bayard, South Glens Falls, all of N.Y., assignors to Optimum Air Corporation, Malta, N.Y.

Continuation-in-part of Ser. No. 126,547, Sep. 24, 1993, abandoned. This application Apr. 18, 1995, Ser. No. 423,683

Int. Cl.[6] B05D *1/02*

U.S. Cl. 427—378 **3 Claims**



1. A method for coating a product with a waterborne coating and thereafter utilizing recycled air to dry said product comprising the steps of:

enclosing said product within a spraying/drying booth;

spraying said product with a waterborne coating;

continually exhausting contaminated air from said spraying/drying booth while said product is being sprayed;

directing said contaminated air through a multi-stage series of dry type filters wherein a first filtered air is created;

discharging said first filtered air through a painting cycle discharge port;

terminating the spraying of said product with a waterborne coating;

commencing drying of said product coated with an uncured waterborne coating using only recycled air by continually exhausting said contaminated air from said spraying/drying booth;

directing said contaminated air through said multi-stage series of dry-type filters wherein a second filtered air is created;

directing said second filtered air through a drying system wherein moisture is removed from said second filtered air to create a filtered and dried air;

directing said filtered and dried air into said spraying/drying booth; and

repeating the steps of drying said product until said product is dry.

5,554,417

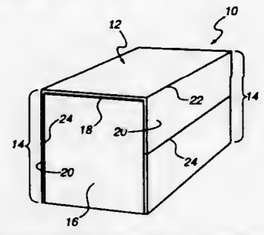
CONVERTIBLE PACKAGING AND HANDLE UNIT

Dwight A. Heming, Warrensburg, Mo., assignor to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Filed Apr. 21, 1995, Ser. No. 426,024

Int. Cl.[6] B05D *3/00*

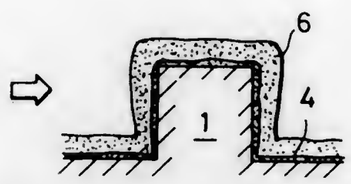
U.S. Cl. 427—445 **21 Claims**



18. A method for applying a substance, comprising the steps of:

(a) attaching a first portion of a convertible packaging and handle member to an applicator adapted to apply a substance;
(b) positioning a second portion of the convertible packaging and handle member from a first position, wherein the first portion encloses at least a portion of the object, to a second position, wherein the second portion is operable to manipulate the applicator, the second portion including a first flap and a second flap, each of the first and second flaps including at least a first fold line and a second fold line; and
(c) manipulating the applicator to apply the substance.

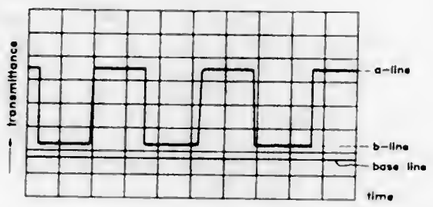
5,554,418
METHOD OF FORMING PASSIVATION FILM
Kazuyuki Ito; Kyuzo Nakamura; Michio Ishikawa; Jun Tegawa; Noriaki Tani; Masanori Hashimoto, all of Chiba-ken, and Yumiko Ohashi, Nagoya, all of Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Chigasaki, and Brother Kogyo Kabushiki Kaisha, Nagoya, both of Japan
Filed Sep. 27, 1994, Ser. No. 310,760
Claims priority, application Japan, Dec. 28, 1993, 5-335714
Int. Cl.[6] B05D *3/06*; **C23C** *16/00*
U.S. Cl. 427—579 **6 Claims**



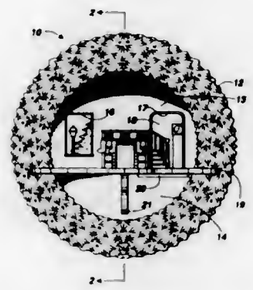
1. A method of forming an SiO_2 passivation film comprising:
forming on a surface of a substrate an initial SiO_2 passivation film by plasma chemical vapor deposition process in which organic oxysilane is used as a raw gas by using instead of a reactive gas having an ashing effect, a gas selected from the group consisting of Ar, He, and NH_3 as a reactive gas which serves as an auxiliary for decomposing the raw gas, whereby ashing of the substrate by oxygen or hydrogen radicals is prevented; and
thereafter forming an SiO_2 passivation film on top of the initial passivation film by using a reactive gas having an ashing effect.

5,554,419
LIQUID CRYSTAL DISPLAY DEVICE
Seong-eun Chung, Seoul, and Jong-cheon Lee, Suwon, both of Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Kyungki-Do, Rep. of Korea
Continuation of Ser. No. 366,091, Dec. 29, 1994, abandoned.
This application Dec. 14, 1995, Ser. No. 574,581
Claims priority, application Rep. of Korea, May 31, 1994, 94-12219
Int. Cl.[6] G02F *1/1337*
U.S. Cl. 428—1 **12 Claims**

1. A liquid crystal display device comprising a pair of substrates, a transparent electrode disposed on each of the substrates, an orientation coating disposed on each of the transparent electrodes, and a liquid crystal material disposed between the orientation coatings, wherein the orientation coating disposed on at least one of the electrodes is a multi-layer orientation coating comprising an orientation-treated under-coating layer and an over-coating layer that is not orientation-treated disposed between the under-coating layer and the liquid crystal material.

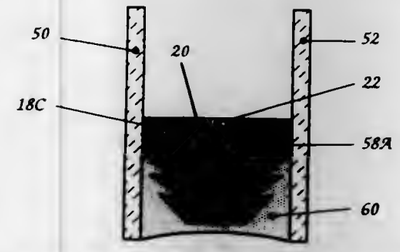


5,554,420
DECORATIVE DISPLAY DEVICE
John T. Noble, Jr., 710 River Knoll Dr., Marietta, Ga. 30067
Filed Jan. 11, 1994, Ser. No. 180,143
Int. Cl.[6] B44C *5/04*
U.S. Cl. 428—10 **12 Claims**



1. A kit for assembly into a display device, comprising:
a first plate member having a first transverse dimension and front and rear surfaces;
a second plate member having a second transverse dimension and front and rear surfaces;
means for attaching said first and second plate members in fixed, spaced relationship to a pre-existing form;
said first plate member having at least one aperture therein for viewing at least some portions of said second plate member when said plate members are in their fixed spaced relationship;
said first plate member having a first transverse slot therein and extending therethrough;
said second plate member having a second transverse slot therein and extending therethrough and so located as to align with said first slot when said plate members are in their fixed, spaced relationship;
a floor member having a front portion and a rear portion and top and bottom surfaces, said rear portion being adapted to fit within and pass through said first and second slots;
means for holding said floor member in position relative to said first and second plate members when said rear portion is positioned within said slots; and
means adapted to bear against said bottom surface of said floor member and said front surface of said first plate member for supporting said floor member when said floor member is held in position relative to said first and second plate members.

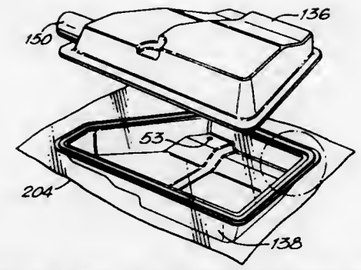
5,554,421
INSULATING MULTIPLE LAYER SEALED UNITS AND INSULATING SPACER AND ASSEMBLY
France Delisle, 228, de la Colline, Alma, Quebec, Canada, and James Boudreault, 485, Mgr de Laval, Baie St-Paul, Quebec, Canada
Division of Ser. No. 160,152, Dec. 2, 1993. This application Jun. 7, 1995, Ser. No. 480,319
Claims priority, application Canada, Sep. 2, 1993, 2105460
Int. Cl.[6] B29D *5/02*
U.S. Cl. 428—34.1 **2 Claims**



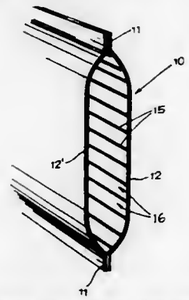
1. A multi-pane sealed unit comprising: glass panes or panel walls and an insulating spacer having an elongated configuration comprising:
a pair of side surface areas which are mirror images and having angled surfaces which are spaced apart so as to provide a greater contact surface with a sealing material;
a first surface and a second surface connected to said angled surfaces and enclosing an empty space running along a length portion of the spacer, said empty space having a cross-sectional shape with a necked-down portion in a groove that is intermediate a bottom portion of the necked-down groove and a widened portion of the groove opposite the first surface wherein the angled surfaces include one of a recess, a depression and an indentation;
a tongue with a protrusion made from said first surface by one of punching, cutting, melting, shaping and drilling and a mechanism locking said tongue to the necked-down portion at a groove depth intermediate the bottom of the groove and an open mouth of the groove in an area opposite the first surface, said tongue and said groove having matching cross-sectional shapes which upon mating provide a substantially self-relieved interlocking fit therewith wherein said spacer is interposed between one of said glass panes and panel walls and is positioned in layers of a multi-pane sealed unit.

5,554,422
MANUFACTURING OF CONTAINERS
David C. Gill, Keynsham, and Garry K. Pressey, Mangotsfield, both of United Kingdom, assignors to Nomix Manufacturing Company, Ltd., United Kingdom
Continuation of Ser. No. 525,492, May 18, 1990, abandoned. This application Mar. 5, 1992, Ser. No. 847,418
Claims priority, application United Kingdom, May 26, 1989, 8912224
Int. Cl.[6] B65B *3/00*
U.S. Cl. 428—34.3 **6 Claims**

1. A method of manufacturing a filled container comprising a rigid housing, formed from rigid first and second housing parts, the interior of the housing being divided into two compartments by a partition of flexible material, the first housing part having an outlet aperture which communicates with one of the compartments, the method comprising the steps recited below, in the order listed:
(a) permanently deforming a region of the flexible material, at a first station, into a predetermined configuration corresponding to the internal configuration of the second housing part;
(b) displacing the deformed region of the flexible material to a second station, at which the housing parts are situated, and placing the deformed region into registering contact with the internal surface of the second housing part;
(c) bringing the first and second housing parts into engagement with each other to form the housing with the partition of flexible material disposed between them;
(d) sealing the first and second housing parts and the partition of flexible material together along a periphery of the same, whereby the partition can be displaced within the container to alter the volume of the two compartments formed therein; and
(e) filling the container by introducing liquid through the outlet aperture into the compartment defined between the partition and the first housing part, that compartment being vented through the outlet aperture.



5,554,423
TUBULAR ELEMENT FOR THE FORMATION OF BAGS FOR THE VACUUM-PACKING
Luigi F. Abate, Via Colli Storici 67, S. Martino d/Battaglia (Brescia), Italy
Filed Mar. 3, 1994, Ser. No. 205,833
Claims priority, application Italy, Oct. 13, 1993, BS93U0074
The portion of the term of this patent subsequent to Jul. 10, 2015, has been disclaimed.
Int. Cl.[6] B65D *33/02*; *81/20*
U.S. Cl. 428—35.2 **8 Claims**



1. A tubular element for forming bags used for the vacuum-packing of products, comprising: a first starting sheet formed of an outer layer of film made of a plastic material that is impermeable to gas and formed of an inner layer of film made of a thermoplastic, heat-sealable material; a second starting sheet formed of an outer layer of film made of a plastic material which is impermeable to gas and an inner layer of film made of a thermoplastic, heat-sealable material, said inner layer of said first starting sheet being bonded to said inner layer of said second starting sheet along an upper edge of said first starting sheet and said second starting sheet and being bonded along a lower edge of said first starting sheet and said second starting sheet to provide upper and lower bonded edges, said bonded edges extending in a length direction and said first starting sheet and said second starting sheet and said bonded edges cooperating to define a tube with an interior region for receiving the product to be vacuum packaged; thermoplastic, heat-sealable strand elements heat bonded to an inner surface of said

inner layer of one of said first starting sheet and said second starting sheet, said strands extending along a length of said tubular

gaseous atmosphere formed by electrically ionizing a gas which contacts the substrate; and

5,554,427
SHEET MATERIAL EDGE LABELING

5,554,429
WOOD BOARD AND FLOORING MATERIAL

inner layer of one of said first starting sheet and said second starting sheet, said strands extending along a length of said tubular element substantially in parallel to said upper and lower bonded edges, said strands being spaced apart to define vacuum packing evacuation channels, each evacuation channel being formed between two adjacent strands.

5,554,424

AIRBAG AND FABRIC FOR MANUFACTURING SAME

Wolf R. Krummheuer, Wuppertal; Volker Siejak, Duisburg, and Hans Graefe, Schwelm, all of Germany, assignors to Akzo Nobel, N.V., Netherlands

Continuation of Ser. No. 210,197, Mar. 18, 1994, abandoned. This application Apr. 25, 1995, Ser. No. 428,505

Claims priority, application Germany, Mar. 19, 1993, 43 08 871.6; Feb. 12, 1994, 44 04 487.9

Int. Cl.[6] B60R *21/16*

U.S. Cl. 428—35.2 **5 Claims**

1. An airbag having increased heat resistance comprising an uncoated contact fabric, an uncoated filter fabric or a combination thereof, the contact fabric having an air permeability <10 l/dm^{2}min at a test differential pressure of 500 Pa and the filter fabric having an air permeability of 20–100 l/dm^{2}min at a test differential pressure of 500 Pa, the uncoated contact fabric and uncoated filter fabric comprising closely woven synthetic filament yarns which comprise filaments which are hollow on the inside, with a hollow area fraction, based on the total cross-sectional area of the filaments, of 10–40%, said yarns having a linear density of 200–1,100 dtex and a filament linear density of <8 dtex, the uncoated contact fabric having a closeness value >72%, and the uncoated filter fabric having a closeness value of 45–68%, the closeness values calculated according to the following:

$$\text{closesness value } \% = (d_w + d_f)^2 \times f_w \times f_f$$

where d_w, f_f=diameter of warp or filling yarn in mm, and f_w, f_f=warp or filling threads per cm, for a plain weave and the closeness value as calculated above multiplied by a correction factor for a weave other than a plain weave, wherein said airbag comprising both contact and filter fabrics comprises a filter part, comprising said uncoated filter fabric which filters hot particles from the incoming gas and provides a partial escape of the gas from the airbag, in communication with a contact part, comprising said uncoated contact fabric against which the incoming gas flows and upon which a vehicle occupant impacts as a result of an accident, and wherein said airbag when composed of only said uncoated contact fabric permits a partial escape of the gas upon impact by the occupant.

5,554,425

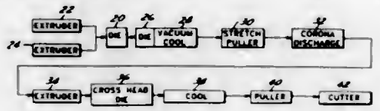
FLUOROPOLYMER COMPOSITE TUBE AND METHOD OF PREPARATION

Edward K. Krause, Ann Arbor, and Kenneth J. Kuenzel, Grass Lake, both of Mich., assignors to Pilot Industries, Inc., Dexter, Mich.

Division of Ser. No. 200,941, Feb. 23, 1994, abandoned, which is a continuation of Ser. No. 817,304, Jan. 6, 1992, abandoned. This application Mar. 14, 1995, Ser. No. 403,499

Int. Cl.[6] B29D *22/00;23/00;* **B32B** *1/08*

U.S. Cl. 428—36.91 **10 Claims**



1. A composite prepared by a process comprising the steps of:
(1) chemically activating a formed fluoropolymer substrate by subjecting the substrate to a charged, substantially non-inert gaseous atmosphere formed by electrically ionizing a gas which contacts the substrate; and
(2) thereafter chemically bonding a layer of a thermoplastic polymer to a smooth, void-free outer surface of said fluoropolymer substrate by applying said layer of thermoplastic polymer to the chemically activated fluoropolymer substrate.

5,554,426

MULTILAYER PLASTIC PIPE

Stefan Röber, Hamburg; Hans Jadamus, and Hans Ries, both of Marl, all of Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

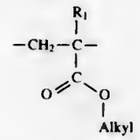
Filed Mar. 24, 1995, Ser. No. 409,723

Claims priority, application Germany, Mar. 24, 1994, 44 10 148.1

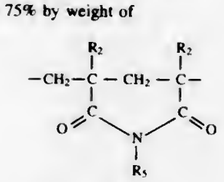
Int. Cl.[6] B32B *1/08;* **F16L** *9/14*

U.S. Cl. 428—36.91 **22 Claims**

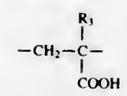
1. A multilayer plastic pipe, comprising:
(1) a first layer comprising polyamide; and
(2) a second layer adjacent to the first layer, comprising,
(a) from 97.5 to 50% by weight of polyvinylidene fluoride or vinylidene fluoride copolymer; and
(b) from 2.5 to 50% by weight of an acrylate copolymer,
wherein the first and second layers adhere to one another, and the acrylate copolymer comprises:
(i) from 14 to 85% by weight of



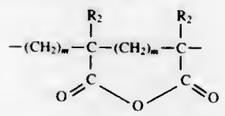
(ii) from 0 to 75% by weight of



(iii) from 0 to 15% by weight of



(iiii) from 7 to 20% by weight of



wherein
m is 0 or 1,
Alkyl is methyl, ethyl, propyl, butyl, pentyl, hexyl, and
R_1 to R_5 is H or (C_nH_{2n+1}),
n is 1 to 6, and
R_1 to R_5 can be identical or different.

5,554,427

SHEET MATERIAL EDGE LABELING

Steven A. Sera, Fresno, Calif., assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Oct. 15, 1991, Ser. No. 785,418

Int. Cl.[6] B65C *7/00*

U.S. Cl. 428—43 **17 Claims**

1. A label and sheet system comprising:
a plurality of lumber sheets, each said lumber sheet having two generally planar opposite sides and a peripheral edge, said generally planar opposite sides being generally parallel and having a length and width substantially greater than the depth of the edge of said lumber sheet, said plurality of lumber sheets being arranged face-to-face adjacent one another, and
a label strip comprising a plurality of labels arranged end-to-end, each said label having upper and lower ends, said labels being connected by fragile tearing lines which delimit said upper and lower ends, said label strip being adhered to said edges of said lumber sheets, said upper and lower ends of said labels extending generally parallel said planar sides of said lumber sheets, each said lumber sheet having a plurality of said labels adhered thereto such that removal of an individual sheet will remove a plurality of labels therewith.

5,554,428

MEMORY DISK SHEET STOCK AND METHOD

Charles W. Bartges, Delmont; Robert W. Hayland, Jr., Oakmont; Craig J. Jensen, Pittsburgh, and Steven F. Baumann, Penn Hills, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Sep. 1, 1994, Ser. No. 299,836

Int. Cl.[6] B32B *3/00*

U.S. Cl. 428—64.1 **22 Claims**

1. A memory disk sheet stock having improved strength levels, said memory disk stock comprising an alloy composition which consists essentially of about 1–11 wt. % magnesium, up to about 5 wt. % zinc, up to about 1 wt. % copper, up to about 0.3 wt. % zirconium, up to about 0.2 wt. % iron, up to about 0.2 wt. % silicon, and about 0.05–1 wt. % of a dispersoid-forming element selected from the group consisting of: scandium, erbium, thulium, lutetium, ytterbium, hafnium and yttrium, the balance aluminum and incidental elements and impurities.

5,554,429

WOOD BOARD AND FLOORING MATERIAL

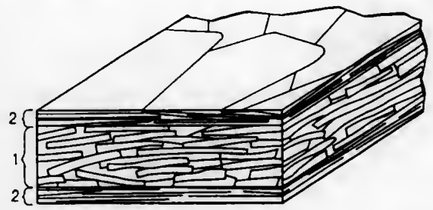
Ritsuo Iwata; Hirotosi Takahashi; Satoshi Suzuki, and Takayuki Endo, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

Filed Jul. 14, 1994, Ser. No. 274,969

Claims priority, application Japan, Jul. 14, 1993, 5-174564; Jul. 29, 1993, 5-188526; Jul. 29, 1993, 5-188527; Nov. 9, 1993, 5-279910; Nov. 24, 1993, 5-293716; Nov. 24, 1993, 5-293717; Dec. 8, 1993, 5-308406

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—105 **29 Claims**



1. A wood board, comprising:
(a) a core layer comprising at least one wood strand board in which wooden strips are adhered and integrally molded with a foaming binder, and
(b) at least one surface layer comprising wood oriented strand board in which wooden strips are adhered and integrally molded using a binder, and which is laminated to at least one surface of said core layer,
wherein said foaming binder comprises a mixture of foaming resin and non-foaming resin at a ratio within a range of 4:1–1:4, and
wherein an amount of resin contained in said foaming binder is within a range of 5–15 weight percent with respect to a total weight of said foaming binder and said wooden strips constituting said core layer.

5,554,430

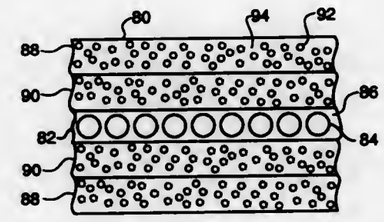
LOW CTE BORON/CARBON FIBER LAMINATE

David J. Pollatta, Webster, and Thomas N. Quinzi, East Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 23, 1994, Ser. No. 363,676

Int. Cl.[6] B32B *5/12;5/06;* **D04H** *3/02*

U.S. Cl. 428—113 **9 Claims**



1. A boron/carbon fiber 1D laminate comprising a boron fiber layer, a carbon fiber layer having a balanced pair of carbon fiber plies oriented at ±Theta greater than zero with respect to a reference direction, said laminate having a Coefficient of Thermal Expansion between ±0.54 μm/m/°C., a specific modulus greater than 8.9×10^6 meter, said fiber layers embedded in a plastic resin matrix.

5,554,431

SHEET OF PLASTIC MATERIAL FOR PANE AND PANE MADE USING SUCH A SHEET

a. a frame which fits into and is secured in the opening;
b. a door hingedly mounted to the frame for motion between an open and closed position;

a selection electrode formed on said substrate and connected with each of selection lines;
a common electrode formed on said substrate between the

$Tc_3<Tc_1<Tc_2<Tc_4$, where i=1, 2, 3, or 4

indicating an ordinal number of said magnetic layers; and
said second magnetic layer is formed of a material which exhib-

5,554,431

SHEET OF PLASTIC MATERIAL FOR PANE AND PANE MADE USING SUCH A SHEET

Jean-Louis Bravet, Thourotte; Noel Crux, Compiegne, and Anne L'Her, Paris, all of France, assignors to Saint-Gobain Vitrage, Courbevoie, France, and Asahi Glass Company, Ltd., Tokyo, Japan

Filed Mar. 22, 1995, Ser. No. 407,949
Claims priority, application France, Mar. 22, 1994, 94 03331
Int. Cl.[6] B32B *9/00*
U.S. Cl. 428—137 **15 Claims**

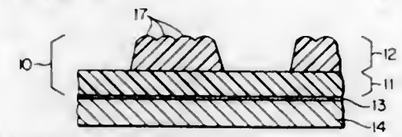
1. A sheet of plastic material, comprising two films, a polyurethane adhesive film for contacting a glass substrate, and a reservoir film in contact with and adjacent to said adhesive film, said reservoir film or both said adhesive film and said reservoir film contain an organosilane coupling agent, wherein said organosilane coupling agent can migrate from said reservoir film to said adhesive film.

5,554,432

PRESS POLYMERIZATION OF LENTICULAR IMAGES

Ellen R. Sandor, Chicago; William T. Cunnally, Island Lake, and Stephan B. Meyers, Chicago, all of Ill., assignors to The Phocogram Venture, Inc., Chicago, Ill.

Division of Ser. No. 945,139, Sep. 15, 1992, Pat. No. 5,330,799. This application Mar. 2, 1994, Ser. No. 204,786
Int. Cl.[5] B32B *3/02*
U.S. Cl. 428—157 **20 Claims**



1. A lenticular sheet comprising:
(a) a thermosetting polymer layer having a top surface and a bottom surface;
(b) a base substrate having a top surface, wherein said top surface is attached to the bottom surface of the polymer layer;
(c) an array of lenticles formed in a first portion of the top surface of the thermosetting polymer layer; and
(d) a lenticulated image printed on the top surface of the base substrate,
wherein the lenticulated image only covers a first portion of the base substrate, said first portion underlying the array of lenticles formed in the first portion of the top surface of the thermosetting polymer layer, and wherein text is printed on a second portion of the base substrate, said second portion not underlying the array of lenticles,
wherein the thickness of the thermosetting polymer layer is such that the lenticulated image is positioned at the focal point of the lenticles,
wherein the lenticles have a viewing angle of at least 30 degrees,
wherein the thermosetting polymer layer is cured, and wherein, during fabrication of the lenticular sheet, the registration of the array of lenticles to the lenticulated image was maintained by forming the lenticles in the thermosetting polymer in-line with printing the lenticulated image.

5,554,433

FIRE RATED FLOOR DOOR AND CONTROL SYSTEM

Jerome F. Perrone, Jr., Wallingford, and Duane W. Hipp, Orange, both of Conn., assignors to The Bilco Company, West Haven, Conn.

Filed Feb. 10, 1995, Ser. No. 386,925
Int. Cl.[6] B22B *9/00*
U.S. Cl. 428—192 **12 Claims**

1. A hinged door assembly for enclosing an opening which door will automatically close, in a fire comprising:
a. a frame which fits into and is secured in the opening;
b. a door hingedly mounted to the frame for motion between an open and closed position;
c. a hydraulic/pneumatic housing having an axially movable rod and connected piston therein which forms a hydraulic chamber and a pneumatic chamber in the housing with the end of the rod not connected to the piston extending from an end of the housing with the end of the extended rod pivotally attached to the door and the housing pivotally attached to the frame to allow movement of the housing and rod during opening and closing of the door;
d. a hydraulic fluid source such as oil connected to the hydraulic chamber of the housing, the connection having a check valve to prevent flow through the connection from the housing to the fluid source;
e. a pneumatic valve connected to the pneumatic chamber of the housing and connected to a pressurized source activating means and having a vent position which allows a gas flowing into or out of the pneumatic chamber to vent to the atmosphere, the pneumatic valve having a first actuating means for setting the pneumatic valve position;
f. a hydraulic valve connected to the hydraulic chamber of the housing and to the hydraulic fluid source, the hydraulic valve having a second actuating means for setting the hydraulic valve position;
g. a second hydraulic valve connected to the hydraulic chamber of the housing and to the hydraulic fluid source;
h. a heat sensing or heat actuating means connected to the pressurized source activating means and to the second hydraulic valve; and
i. a pressurized pneumatic source connected to the pressurized source activating means, wherein when a fire starts and the door is open the heat sensing or heat actuating means opens the second hydraulic valve and actuates the pressurized source actuating means supplying a pressurized gas from the pressurized pneumatic source to the pneumatic valve actuating the first actuating means to position the valve so that the vent is closed and the gas is directed into the pneumatic chamber of the housing forcing the hydraulic fluid in the hydraulic chamber of the housing through the second hydraulic valve into the hydraulic fluid source and thereby closing the door, wherein when the door is closed, the first actuating means is actuated to position the pneumatic valve so that the vent is opened.

5,554,434

MICRO LIGHT VALVE AND METHOD FOR MANUFACTURING THE SAME

Gyeong-Lyong Park; Sin-Chong Park, and Hyung-Moo Park, all of Daejeon, Rep. of Korea, assignors to Electronics & Telecommunications Research Inst., Daejeon-Shi, Rep. of Korea

Division of Ser. No. 149,653, Nov. 9, 1993, Pat. No. 5,393,710. This application Apr. 7, 1994, Ser. No. 224,295
Claims priority, application Rep. of Korea, Nov. 10, 1992, 92-20984
Int. Cl.[6] B32B *9/00*
U.S. Cl. 428—209 **10 Claims**

1. A micro light valve which is used for a pixel of a display device and which passes or shuts off a light beam by utilizing an electrostatic force, said light valve comprising:
a substrate through which light can pass;
a plurality of data lines and selection lines;
a data electrode formed on said substrate and connected with at least one of said data lines;
a selection electrode formed on said substrate and connected with each of selection lines;
a common electrode formed on said substrate between the selection and data electrodes;
a flat-shaped micro shifting element capable of moving in a linear direction and which serves as a light shutter;
an insulating layer formed respectively between the shifting element and each of the electrodes;
a frame which has a guiding means for guiding the shifting element and
said data, selection and common electrodes for receiving externally applied driving signals to drive the shifting element.

5,554,435

TEXTILE STRUCTURES, AND THEIR PREPARATION

Rakesh K. Gupta, Rockdale County, and Richard J. Legare, Newton County, both of Ga., assignors to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 189,233, Jan. 31, 1994, abandoned. This application Mar. 18, 1994, Ser. No. 210,989
Int. Cl.[6] B32B *5/08;5/26;* **D04H** *3/14;3/16*
U.S. Cl. 428—224 **37 Claims**

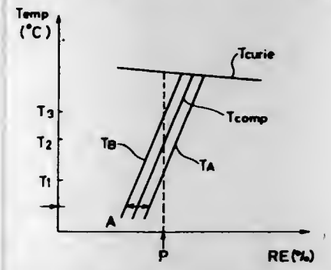
1. A nonwoven structure comprising first fibers and second fibers:
the first fibers comprising meltblown microfibers; and
the second fibers consisting essentially of a single polymer or polymer alloy, and having nonuniform melt viscosity and a substantially constant melting point across their cross-sections.

5,554,436

MAGNETO-OPTICAL RECORDING MEDIUM

Hiroyuki Katayama, Nara; Junichiro Nakayama, Shiki-gun; Naoyasu Iketani, Tenri, and Kenji Ohta, Kitakatsuragi-gun, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 36,135, Mar. 24, 1993, abandoned. This application Nov. 16, 1994, Ser. No. 341,310
Claims priority, application Japan, Apr. 22, 1992, 4-101527
Int. Cl.[6] G11B *11/10;13/04*
U.S. Cl. 428—212 **10 Claims**



1. A magneto-optical recording medium, for recording by light intensity modulation, comprising
first, second, third, and fourth magnetic layers which are laminated in this order so that an exchange coupling exists between any adjacent layers of said first through said fourth magnetic layers, and
a substrate supporting said first through said fourth magnetic layers, wherein:
said first layer is a memory layer for recording information based on magnetization direction and
said second layer is a writing layer for copying a magnetization direction to said first magnetic layer;
respective Curie temperatures Tc_i of said first through said fourth magnetic layers satisfy an inequality

$Tc_3<Tc_1<Tc_2<Tc_4$, where i=1, 2, 3, or 4

indicating an ordinal number of said magnetic layers; and
said second magnetic layer is formed of a material which exhibits an in-plane magnetization at room temperature, and in which a transition occurs from the in-plane magnetization to a perpendicular magnetization above a transition temperature between the room temperature and the temperature Tc_3, thereby permitting overwriting by light intensity modulation and thereby improving the stability of recording of information on said first layer.

5,554,437

GAMMA-STERILIZABLE BARRIER FABRICS

Rakesh K. Gupta, Conyers; Randall E. Kozulla, Walton County, and Richard J. Legare, Conyers, all of Ga., assignors to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 226,619, Apr. 12, 1994, abandoned, which is a continuation-in-part of Ser. No. 145,360, Oct. 29, 1993, and a continuation-in-part of Ser. No. 47,407, Apr. 19, 1993, abandoned. This application May 26, 1995, Ser. No. 451,603
Int. Cl.[6] B32B *27/00;5/06;5/22*
U.S. Cl. 428—286 **48 Claims**

1. A fabric comprising (1) at least one layer of a gamma-sterilizable nonwoven material comprising cardable multiconstituent staple fibers, at least 50% by weight of the nonwoven material comprising a gamma-sterilizable polymer and more than 50% by weight of the multiconstituent staple fiber comprising the gamma-sterilizable polymer, and (2) at least one layer of gamma-sterilizable barrier material selected from the group consisting of film, wet-laid fabrics, and meltblown webs, at least 50% by weight of the barrier material comprising a gamma-sterilizable polymer.

5,554,438

SELF-RELEASE BINDER SYSTEM

Joseph J. Marcinko, Mullica Hill, N.J., and John R. Robertson, Glen Mills, Pa., assignors to Imperial Chemical Industries, PLC, London, United Kingdom

Filed Jul. 22, 1994, Ser. No. 278,781
Int. Cl.[6] C08K *5/01;5/09;* **C08L** *91/08*
U.S. Cl. 428—306.6 **11 Claims**

1. A multi-component self-release binder system for use in the manufacture of molded articles comprising (a) an organic polyisocyanate binder as a first component; and (b) a composition comprising (i) a wax and (ii) a fatty acid as a second component, wherein component (a) and component (b) are applied separately to the material to be molded.

5,554,439

COATING COMPOSITION AND COATING FILM COMPOSITION

Ken Ohkura, Denenchofu 2-23-11, Ohta-ku, Tokyo; Satoru Matsuzaki, Nakano 1-128, Iwata-shi, Shizuoka-ken, both of Japan, and Pekka J. Eskelinen, Kaunismäentie 107, 28800 Pori, Finland

Filed Feb. 3, 1995, Ser. No. 383,586
Int. Cl.[6] B32B *5/16*
U.S. Cl. 428—323 **7 Claims**

1. A coating composition comprising a liquid medium containing a titanium dioxide pigment and a coating film formation resin, said titanium dioxide pigment being in the form of flaky or fin-shaped small pieces of silicon dioxide covered by titanium dioxide and having a diameter of 1 to 300 microns and a thickness of 0.001 to 1 micron, 20 to 90% by weight of said silicon dioxide being dissolved out from said titanium dioxide-coated silicon dioxide small pieces.

5,554,440

MAGNETIC RECORDING MEDIUM AND METHOD FOR PRODUCING THE SAME

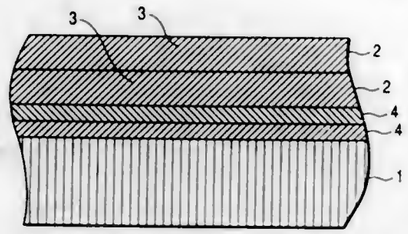
Tatsuaki Ishida; Ryuji Sugita; Kiyokazu Tohma, and Yasuaki Ban, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-Fu, Japan

Filed Sep. 9, 1993, Ser. No. 118,326

Claims priority, application Japan, Apr. 13, 1992, 85916; Sep. 9, 1992, 240540; Dec. 25, 1992, 357981

Int. Cl.[6] G11B *5/66; 5/70*

U.S. Cl. 428—336 **6 Claims**



1. A magnetic tape comprising a polymer substrate and a magnetic layer which is formed directly on a surface of said substrate or which is formed on a nonmagnetic under layer formed on said substrate, wherein said magnetic layer is in-plane anisotropic having an axis of easy magnetization which slants from a normal line to a plane of said magnetic layer towards a longitudinal direction of the tape, wherein said magnetic layer comprises cobalt, oxygen and optionally nickel, and wherein said magnetic tape is characterized by having (i) a coercive force of at least 120 kA/m, (ii) a squareness ratio of at least 0.9 in a hysteresis loop which is obtained when a magnetic field is applied in a plane of said magnetic layer in a longitudinal direction of the magnetic tape, and (iii) on the hysteresis loop, an intensity of the applied magnetic field, at which a magnetization when the applied magnetic field is increased is 99% of the magnetization when the applied magnetic field is decreased, of net larger than 400 kA/m.

5,554,441

RANDOM MACRODOMAIN MULTICONSTITUENT FIBERS, THEIR PREPARATION, AND NONWOVEN STRUCTURES FROM SUCH FIBERS

Rakesh K. Gupta, Conyers, and Jon R. Williams, Social Cirle, both of Ga., assignors to Hercules Incorporated, Wilmington, Del.

Filed Apr. 16, 1993, Ser. No. 46,861

Int. Cl.[6] D02G *3/00*

U.S. Cl. 428—373 **39 Claims**

1. A multiconstituent fiber, comprising;

a) a first polymer, as a continuous phase; and

(b) at least one second polymer, as at least one discontinuous phase, randomly dispersed through the continuous phase, in the form of domains;

wherein at least 40 percent by weight of the domains have a first dimension of at least 5 percent of the equivalent diameter of the fiber, and have a second dimension of at least 20 microns.

5,554,442

BINDER FIBER AND NONWOVEN FABRICS USING THE FIBER

Nobuhiro Matsunaga, and Katsuyoshi Nikura, both of Amagasaki, Japan, assignors to Unitika Ltd., Hyogo, Japan

Continuation of Ser. No. 295,753, Sep. 1, 1994, abandoned. This application Feb. 26, 1996, Ser. No. 605,456

Claims priority, application Japan, Jan. 7, 1993, 5-018173

Int. Cl.[6] D02G *3/00*

U.S. Cl. 428—373 **6 Claims**

1. A conjugate fiber comprising a polyester copolymer and polyethylene terephthalate, said polyester copolymer including ε-caprolactonee as a polyester component and said polyester copolymer having a melting point of not less than 100° C., wherein at least a portion of the surface of said fiber is composed of said polyester copolymer.

5,554,443

BONDING WIRE WITH HEAT AND ABRASION RESISTANT COATING LAYERS

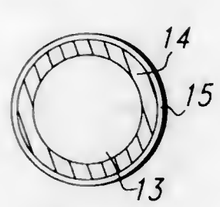
Hiroyuki Kondo, Kawasaki; Kohei Tatsumi, Yokohama; Masao Kimura, Kawasaki, and Kiyoshi Onodera, Kawaguchi, all of Japan, assignors to Texas Instruments Incorporated, Dallas, Tex., and Nippon Steel Corporation, Japan

Continuation of Ser. No. 672,275, Mar. 20, 1991, abandoned. This application May 12, 1995, Ser. No. 440,177

Claims priority, application Japan, Mar. 20, 1990, 2-68423

Int. Cl.[6] D02G *3/00*

U.S. Cl. 428—375 **16 Claims**



1. A bonding wire for use in forming bonded electrical connections on a semiconductor device, said bonding wire comprising:

an elongated fine wire of electrically conductive material;

first and second non-conductive coating layers of different resins with respect to each other;

said first non-conductive resin coating layer covering said elongated fine wire of electrically conductive material and including at least one aromatic polyester resin having good insulating property and heat resistance; and

said second non-conductive resin coating layer covering said first non-conductive resin coating layer and including at least one resin selected from the group consisting of polyurethanes, polyester imides, and polyimides and having good abrasion resistance.

5,554,444

Patent Not Issued For This Number

5,554,445

METHOD FOR SEED ENCRUSTING

Henryk Struszczyk, Zgierz, Poland, and Olli Kivekäs, Tampere, Finland, assignors to Novasso Oy, Finland

PCT No. PCT/FI93/00308, § 371 Date Mar. 17, 1995, § 102(e) Date Mar. 17, 1995, PCT Pub. No. WO94/03062, PCT Pub. Date Feb. 17, 1994

PCT Filed Jul. 29, 1993, Ser. No. 374,766

Claims priority, application Finland, Jul. 29, 1992, 923421

Int. Cl.[6] B05D *7/00*

U.S. Cl. 428—403 **20 Claims**

1. Method for seed encrusting which comprises spraying or mixing a liquid dispersion of microcrystalline chitosan containing 0.0001–10 wt. % of polymer having an average molecular weight not lower than 1000, a water retention value from 200 to 5000%, deacetylation degree not lower than 35%, particle size in the range of 0.1–100 μm and energy of hydrogen bonds in a form of film of 10–25 kJ/mol, on seed in an amount to provide a content of polymer not lower than 0.01 wt. % based on the seed weight; and then removing excess solvent to thereby form a polymer film covering said seed.

5,554,446

COATED MATERIAL, THE PREPARATION OF USE THEREOF

Ernst Minder, Sissach, Switzerland, and Walther Hofherr, Kirchzarten-Zarten, Germany, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Division of Ser. No. 89,137, Jul. 9, 1993, Pat. No. 5,413,860. This application Feb. 16, 1995, Ser. No. 389,365

Claims priority, application Switzerland, Jul. 15, 1992, 2227/92

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—411.1 **15 Claims**

1. A coated material comprising (a) a solid dielectric or semiconductive substrate which is (b) partially or completely coated on at least one surface with a silicate in which a crystalline charge transfer complex is incorporated.

5,554,447

ANTISTATIC COATING COMPOSITION IN A CONDUCTIVE SUBSTRATE AND PROCESS OF MANUFACTURE

John H. Bayless, Jr., and Donald K. Johnes, both of Hendersonville, N.C., assignors to Sterling Diagnostic Imaging, Inc., Glasgow, Del.

Continuation of Ser. No. 79,578, Jun. 22, 1993. This application Jun. 5, 1995, Ser. No. 463,611

Int. Cl.[6] B32B *27/08;* **G03C** *1/795*

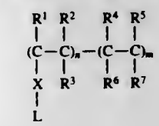
U.S. Cl. 428—483 **2 Claims**

1. A conductive substrate for use in a photographic element, comprising:

(a) a polyethylene terephthalate support;

(b) 0.01 to 10 g/m^2 of a conductive layer coated on said support, said conductive layer having a low surface energy during coating and a high surface energy after coating, wherein said conductive layer is formed without surfactants or soaps from the reaction product of

(i) a conductive crosslinkable polymer of formula



wherein:

X is a divalent linking group;

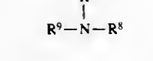
L is a charge carrying group;

R^1, R^2 and R^3 independently represent hydrogen, alkyl of 1–20 carbons, carboxyl, or alkylamine of 1–20 carbons;

R^4, R^5, R^6 and R^7 independently represent hydrogen, alkyl of 1–20 carbons, or a group capable of being crosslinked to form a film with the proviso that at least one of R^4, R^5, R^6 and R^7 comprises the group capable of being crosslinked to form a film; and

n and m are chosen such that a ratio n/m is no less than 0.01 and no more than 100;

(ii) a volatile amine defined by



wherein;

R^8, R^9 and R^{10} independently represent hydrogen, or an alkyl of 1–5 carbons; and

(iii) a crosslinking agent wherein said crosslinking agent comprises at least one polyfunctional aziridine, said volatile amine being present in an amount sufficient to maintain the pH of said product at a level of at least 7.0, at ambient temperature during formation of said product.

5,554,448

WIRE FOR NB_3X SUPERCONDUCTING WIRE

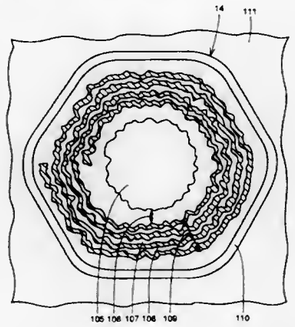
Yuichi Yamada, and Naoki Ayai, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

Filed Feb. 17, 1994, Ser. No. 201,281

Claims priority, application Japan, Feb. 22, 1993, 5-032114

Int. Cl.[6] H01B *12/10*

U.S. Cl. 428—612 **16 Claims**



1. A wire for an Nb_3X superconducting wire, comprising:

a wire being prepared by superposing and winding up a first sheet consisting of pure Nb or an Nb alloy and a second sheet consisting of metal atoms X, reacting with said Nb for forming a compound exhibiting superconductivity, or an X alloy;

a stabilizing material layer being so provided as to enclose said wire; and

a diffusion barrier layer being provided between an outer surface of said wire and an inner surface of said stabilizing material layer for preventing said metal atoms X from being diffused in said stabilizing material layer,

said diffusion barrier layer being made of a metal material having larger tensile strength than that of said first sheet wherein said metal material includes an Nb alloy.

5,554,449

HIGH LUMINANCE THIN-FILM ELECTROLUMINESCENT DEVICE

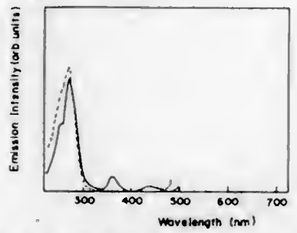
Shoichiro Tanomura; Masahiro Matsui, and Takashi Morishita, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 913,988, Jul. 17, 1992, abandoned, which is a continuation of Ser. No. 760,855, Sep. 18, 1991, abandoned, which is a continuation of Ser. No. 492,748, Mar. 13, 1990, abandoned. This application Nov. 18, 1994, Ser. No. 343,999

Claims priority, application Japan, Mar. 15, 1989, 1-60699; Dec. 26, 1989, 1-334743

Int. Cl.[6] H05B *33/02*

U.S. Cl. 428—690 **19 Claims**



14. A thin-film electroluminescent device having a phosphor layer that exhibits both an x-ray diffraction pattern including a (220) line with a half-width less than or equal to 0.5 degrees and a (200) line with a half width less than or equal to 0.4 degrees and an excitation spectrum with a peak at a wavelength of about from 350 nm to 370 nm, the thin film electroluminescent device manufactured by a method comprising the steps of:

forming a first electrode on a substrate;

forming a first insulating layer on the first electrode;

forming phosphor layer, including a luminous center and charge compensator, on the first insulating layer;

annealing the phosphor layer for at least one hour at a temperature of at least 650° C. in an atmosphere including a sulfur-containing gas;

forming a second insulating layer on the annealed phosphor layer; and

forming a second electrode on the second insulating layer, wherein one of the first or second electrodes is transparent.

5,554,450

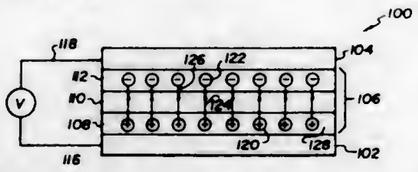
ORGANIC ELECTROLUMINESCENT DEVICES WITH HIGH THERMAL STABILITY

Jianmin Shi, Webster; Chin H. Chen, Mendon; Steven A. Van Slyke, and Ching W. Tang, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 8, 1995, Ser. No. 401,102

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—690 **5 Claims**



1. An organic electroluminescent device, comprising an anode and a cathode, and an organic electroluminescent element disposed between the anode and cathode,

characterized in that the organic electroluminescent element has at least one hole transporting layer;

the hole transport layer includes a polyaromatic amine of the formula:

where

n is equal to 4, 5, or 6;

R^1 is selected from the group consisting of alkyl, aryl and substituted aryl;

R^2 is selected from the group consisting of alkyl, aryl and substituted aryl; and

R is selected from the group consisting of hydrogen and alkyl.

5,554,451

OPTICAL DATA RECORDING MEDIUM

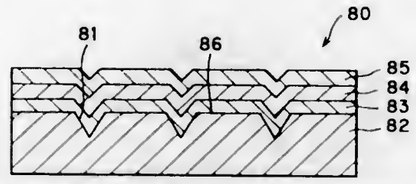
Kazunari Taki, Nagoya; Yumiko Ohashi, Hashima; Takuya Hamaguchi, Nagoya; Hideo Maruyama, Kuwana, and Riki Matsuda, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 28, 1992, Ser. No. 952,647

Claims priority, application Japan, Sep. 27, 1991, 3-249455; Sep. 27, 1991, 3-249456; Nov. 14, 1991, 3-299032

Int. Cl.[6] G11B *5/66*

U.S. Cl. 428—694 ML **33 Claims**



1. An optical data recording medium for optically recording data therein and for optically reproducing the data therefrom, both done using a laser beam, said optical data recording medium comprising:

a substrate;

a patterned reflective material layer provided over said substrate, and patterned to include reflective portions formed of a light-reflective material and transmissive portions, the transmissive portions formed by complete removal of the light-reflective material, said transmissive portions defining data recording and reproducing areas, the light-reflective material reflecting at least a part of the laser beam that falls thereon;

an interference layer provided over both the reflective portions and the transmissive portions of said patterned reflective material layer, a surface of the interference layer remote from said patterned reflective material layer having raised portions corresponding to said reflective portions, said interference layer being formed of a dielectric material having an index of refraction larger than that of said substrate; and

an optical data recording layer provided over said interference layer for optically recording data therein and for optically reproducing the data thus recorded therein,

wherein said data recording and reproducing areas of said patterned reflective material layer are continuously extended to define a plurality of side-by-side data recording tracks, the transmissive portions of said data recording tracks allowing the laser beam irradiated on said substrate to pass therethrough to reach said optical data recording layer, thereby recording data in said optical data recording layer and reproducing the data recorded in said optical data recording layer, said reflective portions of said patterned reflective material layer defining tracking guide areas between adjacent data recording tracks, the data recording and reproducing areas and the tracking guide areas having their widths extending perpendicular to a data recording track extending direction, a total value of the width of one of said data recording and reproducing areas and the widths of the tracking guide areas located on each longitudinal side of said one data recording and reproducing area being equal to or greater than a spot diameter of the laser beam to be irradiated on said optical data recording layer.

5,554,452

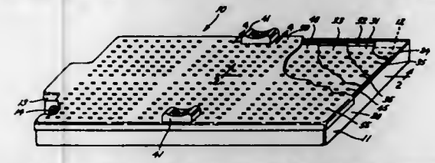
METAL-AIR BATTERIES HAVING IMPROVED AIR ACCESS VALVES

William P. Delmolino, Cumming, and Ronald A. Putt, Marrieta, both of Ga., assignors to Matsi, Inc., Atlanta, Ga.

Filed Sep. 22, 1994, Ser. No. 310,438

Int. Cl.[6] H01M *2/00*

U.S. Cl. 429—10 **25 Claims**



1. A prismatic metal-air battery having at least one prismatic metal-air cell received in a cell cavity of a prismatic casing, wherein the casing comprises:

a wall portion having at least one opening in communication with the cell cavity and a surface proximate to said wall portion opening;

a valve member having at least one opening therein and a surface proximate of said valve member opening which bears on said wall portion surface, said valve being moveable between a closed position in which the valve member opening does not overlap with the wall portion opening, in which said closed position air is blocked from entering said cell cavity through said wall portion opening by said valve member, and an open position in which the valve member opening and wall portion opening at least partially overlap, in which said open position air may enter said cell cavity through said wall portion opening and said valve member opening; and

means for providing an attractive force between the wall portion and the valve member.

5,554,453

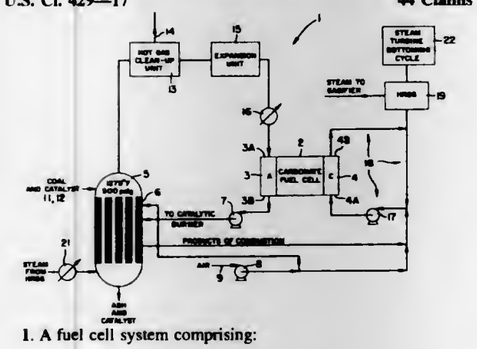
CARBONATE FUEL CELL SYSTEM WITH THERMALLY INTEGRATED GASIFICATION

George Steinfeld, Southbury, Conn.; Steven J. Meyers, Huntington Beach, Calif., and Arthur Lee, Fishkill, N.Y., assignors to Energy Research Corporation, Danbury, Conn.

Filed Jan. 4, 1995, Ser. No. 368,430

Int. Cl.[6] H01M *8/04;8/06*

U.S. Cl. 429—17 **44 Claims**



1. A fuel cell system comprising:

a fuel cell having an anode compartment and a cathode compartment for receiving fuel gas and oxidant gas, respectively;

a gasifier for generating fuel gas for said fuel cell;

and a catalytic burner means which receives the exhaust gas from said anode compartment of said fuel cell and which burns said anode exhaust gas and an oxidant gas to generate and directly transfer heat to gases generated by said gasifier without said exhaust gases admiring with the gases generated by said gasifier.

5,554,454

SOLID OXIDE FUEL CELL STACK

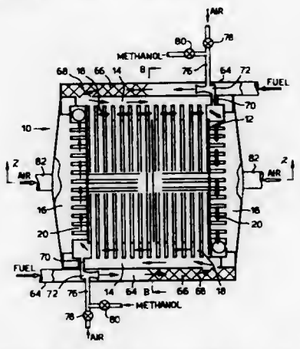
Frederick J. Gardner; Michael J. Day, both of Derby; Nigel P. Brandon, Leicestershire, and John B. Brownell, Derbyshire, all of England, assignors to Rolls-Royce plc, London, England

Filed Feb. 16, 1995, Ser. No. 392,545

Claims priority, application United Kingdom, Feb. 19, 1994, 9403234

Int. Cl.[6] H01M *8/10*

U.S. Cl. 429—19 **43 Claims**



1. A solid oxide fuel cell stack comprising at least one first module and at least one second module,

each first module comprising a first hollow distribution member defining a plurality of first passages internally thereof for the supply of a first reactant longitudinally relative to the first distribution member, the first distribution member having sides facing in opposite directions,

at least one electrolyte/electrode assembly arranged to be carried on one side of the first distribution member, the at least one electrolyte/electrode assembly and the first distribution member defining a plurality of second passages therebetween, the second passages extending longitudinally relative to the first distribution member for the distribution of first reactant and the removal of spent first reactant,

each electrolyte/electrode assembly comprising a plurality of first electrodes, a plurality of solid oxide electrolyte members and a plurality of second electrodes,

each solid oxide electrolyte member being positioned between and contacting a respective one of the first electrodes and a respective one of the second electrodes to form a fuel cell,

at least one interconnector to connect the first electrode of one fuel cell with the second electrode of an adjacent fuel cell,

the first electrodes on each electrolyte/electrode assembly facing the first distribution member,

each second module comprising a second hollow distribution member defining a plurality of third passages internally thereof for the supply of a second reactant longitudinally relative to the second distribution member,

the at least one first module being arranged in proximity to the at least one second module such that the at least one electrolyte/electrode assembly and the second distribution member define a plurality of fourth passages therebetween, the fourth passages extending longitudinally relative to the second distribu-

tion member for the distribution of second reactant and the removal of spend second reactant,

the second electrodes on each electrolyte/electrode assembly facing the second distribution member,

means to supply first reactant to the first passages,

and means to supply second reactant to the third passages;

said first and second modules each being removably disposed in said stack.

5,554,455

RESEALABLE SAFETY VENT AND A SEALED ALKALINE RECHARGEABLE BATTERY PROVIDED WITH THE SAFETY VENT

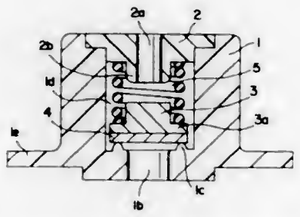
Hiroshi Inoue, Neyagawa; Shinji Hamada, Hirakata; Hiromu Matsuda, Hyogo; Munehisa Ikoma, Tawarahonmachi, and Hiroshi Yamasaki, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 13, 1995, Ser. No. 502,280

Claims priority, application Japan, Jul. 13, 1994, 6-161188

Int. Cl.[6] H01M *2/12*

U.S. Cl. 429—53 **14 Claims**



1. A sealed alkaline rechargeable battery equipped with a resealable safety vent comprising:

a safety vent body having a passage at the center of a bottom portion of said body, an end of said passage terminating in said body surrounded by a circular protrusion, and

a safety vent cover having a vent hole fastened to said safety valve body by means of bonding to form a unitary structure with a central internal passage, and

an elastic valve component comprising a valve seat and a rubber pad fabricated into a one-piece unit, said valve component having a top part and a flange part, said top part inserted inside a coil spring disposed in said central internal passage so that the top surface of said flange part of said valve component compresses said coil spring inside said central internal passage; wherein

a bottom surface of said elastic valve component is held against said protrusion inside of said safety vent body and closes said passage in said safety vent body; and

wherein a container cover in which said safety vent, is incorporated as a monobloc, or a container cover in which said safety vent is bonded or fusion bonded to become a part of the container cover, is fastened around a top edge of a container by means of bonding or fusion bonding, said safety vent incorporated into said access cover to communicate with and vent gas from inside said container, said container housing an electrode group consisting of at least one positive plate, negative plate and separator and an appropriate quantity of alkaline electrolyte for impregnation of the electrode, said safety vent is hermetically sealed with the container along the latter's top edge by means of bonding or fusion bonding.

5,554,456

ELECTROCHEMICAL HYDROGEN STORAGE ALLOYS AND BATTERIES CONTAINING HETEROGENEOUS POWDER PARTICLES

Stanford R. Ovshinsky, Bloomfield Hills; Michael A. Fetcenko, Rochester Hills; Jun Im, Sterling Heights; Benjamin Chao, Troy; Benjamin Reichman, West Bloomfield, and Kwo Young, Troy, all of Mich., assignors to Ovonic Battery Company, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 259,793, Jun. 14, 1994, Pat. No. 5,506,069, Ser. No. 436,673, Apr. 27, 1995, and Ser. No. 423,072, Apr. 17, 1995. This application May 8, 1995, Ser. No. 436,674

Int. Cl.[6] H01M *4/38*

U.S. Cl. 429—59 **34 Claims**

33. An electrochemical hydrogen storage cell comprising: non-uniform heterogeneous composite powder particles for electrochemical hydrogen storage comprising:

a first component comprising materials having the following composition:

$$(Mg_xNi_{1-x})_aM_b$$

where,

M represents at least one modifier element chosen from the group consisting of Ni, Co, Mn, Al, Fe, Cu, Mo, W, Cr, V, Ti, Zr, Sn,

Th, Si, Zn, Li, Cd, Na, Pb, La, Ce, Pr, Nd, Mm, and Ca;

b ranges from 0 to less than 30 atomic percent; and

a+b=100 atomic percent of said first component material; $25 \leqq x \leqq 75$; blended with

a second component comprising at least one element chosen from the group consisting of:

Ti in the amount of 0 to 60 atomic percent;

Zr in the amount of 0 to 40 atomic percent;

V in the amount of 0 to 60 atomic percent;

Ni in the amount at 0 to 57 atomic percent;

Cr in the amount of 0 to 5 atomic percent;

Cu in the amount of 0 to 56 atomic percent;

Co in the amount of 0 to 15 atomic percent;

Mn in the amount of 0 to 20 atomic percent;

Al in the amount of 0 to 20 atomic percent;

Fe in the amount of 0 to 10 atomic percent;

Mo in the amount of 0 to 8 atomic percent;

La in the amount of 0 to 30 atomic percent; and

Mm in the amount of 0 to 30 atomic percent;

where the total amount of said elements is equal to 100 atomic percent of said second component.

5,554,457

FOIL POSITIVE ELECTRODES IN SODIUM-NICKEL CHLORIDE BATTERIES

Ratnakumar V. Bugga, 160 W. Floral Ave., Arcadia, Calif. 91006; Alan I. Attia, 41 Perry Dr., Needham, Mass. 02192, and Gerald Halpert, 1000 E. California Blvd., Pasadena, Calif. 91106

Filed Mar. 1, 1995, Ser. No. 401,516

Int. Cl.[6] H01M *4/58*

U.S. Cl. 429—102 **10 Claims**

1. A rechargeable sodium/transition metal halide cell comprising in combination:

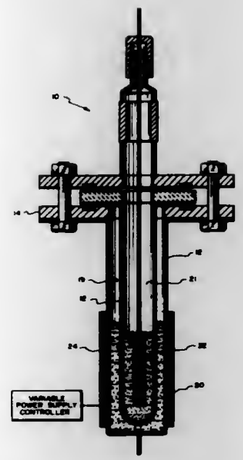
a first body of molten sodium;

a second body of molten catholyte salt;

a ceramic separator capable of transporting sodium ions between said bodies disposed between and separating said bodies;

an anode connected to said first body; and

a spirally wound or corrugated foil cathode immersed in the second body, said cathode comprising transition metal halide.



5,554,458

ALUMINUM NON-AQUEOUS ELECTROLYTE SECONDARY CELL

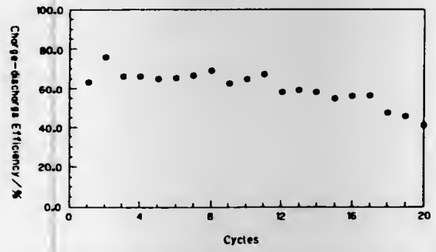
Kazuhiro Noda; Eishi Endo, and Kenichi Takahashi, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 23, 1995, Ser. No. 409,033

Claims priority, application Japan, Mar. 28, 1994, 6-082382

Int. Cl.[6] H01M *10/40*

U.S. Cl. 429—194 **2 Claims**

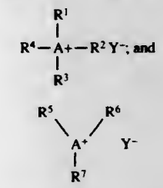


1. An aluminum non-aqueous electrolyte secondary cell comprising:

a negative electrode comprising aluminum or an aluminum alloy;

a positive electrode comprising FeS_2; and

a non-aqueous electrolyte comprising an aluminum halide of the formula AlX_3, wherein X is selected from Cl, Br and I, said aluminum halide being present in said non-aqueous electrolyte in a concentration of from 0.1 to 10.0M, an organic halide selected from compounds having the formulas:



wherein A represents a nitrogen atom or phosphorus atom, R^1, R^2, R^3, R^4, R^5, R^6 and R^7 independently represent a hydrocarbon group, R^1 may be combined with R^2 to form a ring, R^5 may be combined with R^7 to form a ring, and Y^- represents a counteranion selected from the group consisting of Cl^-, Br^- and I^-, wherein X and Y are different, and a non-aqueous solvent selected from the group consisting of 1,2-dichloroethane, 1,2-dichlorobenzene, 1,3-dichlorobenzene and mixtures of at least two of the foregoing, the molar ratio of said organic halide to said aluminum halide in the non-aqueous electrolyte being from 0.2 to 1.0.

5,554,459

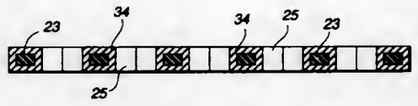
MATERIAL AND METHOD FOR LOW INTERNAL RESISTANCE LI-ION BATTERY

Antoni S. Gozdz, Tinton Falls, and Paul C. Warren, Far Hills, both of N.J., assignors to Bell Communications Research, Inc., Morristown, N.J.

Filed Jan. 23, 1996, Ser. No. 589,944

Int. Cl.[6] H01M *4/64*

U.S. Cl. 429—194 **18 Claims**



12. A low internal resistance rechargeable battery comprising positive and negative electrode body members with a separator member disposed therebetween, each of said electrode and separator members comprising a flexible, polymeric film composition, and respective flexible electrically-conductive current collector members in contact with said electrode members, each said member being bonded to contiguous members to form a unitary flexible laminate battery structure

characterized in that

a) said collector members comprise metallic current collector elements the surfaces of which have been cleaned of insulative materials; and

b) said cleaned collector elements are coated with an adherent electrically-conductive polymeric composition.

5,554,460

MULTI-LAYERED COATED MEMBRANE ELECTRODES FOR ELECTROCHEMICAL CELLS AND CELLS USING SAME

Han Wu, Barrington, and John E. Nerz, Hawthorn Woods, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1994, Ser. No. 276,679

Int. Cl.[6] H01M *6/48*

U.S. Cl. 429—210 **10 Claims**

1. An electrode for an electrochemical cell, said electrode comprising:

an electrochemically inert substrate having a first and a second surface, and fabricated of a porous membrane material selected from the group consisting of polypropylene, polyethylene, polyvinyl alcohol, nylon, and combinations thereof, and having pores formed therein, said pores having a bulk pore size of between 10 nm and 500 nm said substrate further functioning as the separator material for the electrochemical cell into which said electrode is incorporated;

a first layer of electrochemically active material deposited on said first surface of said substrate, and into the pores formed

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PAPERMAKING BELT AND METHOD OF MAKING THE SAME USING DIFFERENTIAL LIGHT TRANSMISSION

a first layer of electrochemically active material deposited on said first surface of said substrate, and into the pores formed therein said layer deposited to a thickness of between 3 and 200 nm;

a current collecting layer deposited atop said first layer of said first electrochemically active material, said current collecting layer deposited to a thickness of between 0.01 and 1.0 μm; and

a second layer of electrochemically active material, said second layer deposited to a thickness of between 3 and 200 nm.

5,554,461

Patent Not Issued For This Number

5,554,462

CARBON ANODE FOR A LITHIUM RECHARGEABLE ELECTROCHEMICAL CELL AND A PROCESS FOR ITS PRODUCTION

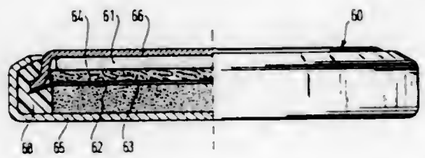
Serge Flandrois, Pessac; Annie Fevrier, St. Medard en Jalles; Philippe Biensan, Epinay S/Orge, and Bernard Simon, Issy Les Moulineaux, all of France, assignors to Saft, Romainville, France

Filed Dec. 21, 1994, Ser. No. 360,953

Claims priority, application France, Dec. 22, 1993, 93 15474; Jul. 5, 1994, 94 08291

Int. Cl.[6] H01M *4/02*

U.S. Cl. 429—218 **9 Claims**



1. A carbon anode for a lithium rechargeable electrochemical cell that also includes a cathode and an electrolyte, the anode comprising a graphite-containing carbon-containing material, wherein said material includes, prior to electrical cycling, at least a first rhombohedral phase constituted by graphite having a rhombohedral crystal structure, wherein the rhombohedral phase comprises a fraction of more than 10% of the graphite-containing carbon-containing material.

5,554,463

CURRENT COLLECTOR HAVING COINED SIDE EDGES FOR USE IN AN ELECTROCHEMICAL CELL, AND METHOD OF ITS PRODUCTION

Nikola Marincic, Winchester, and Luka Rabadjija, Newton, both of Mass., assignors to Pacesetter, Inc., Sylmar, Calif.

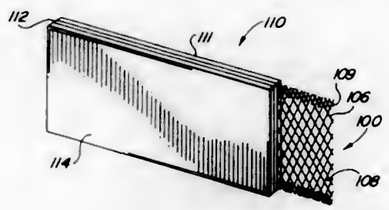
Filed Jun. 2, 1995, Ser. No. 459,683

Int. Cl.[6] H01M *2/20*

U.S. Cl. 429—233 **10 Claims**

1. In an electrochemical cell for use within an implantable device, wherein the cell includes an electrode structure having an expanded screen current collector, and wherein said improvement comprises:

coining at least a portion of opposing side edges of the current collector inwardly by an amount sufficient to prevent any sharp portions occurring along the side edges from extending outwardly.



5,554,464

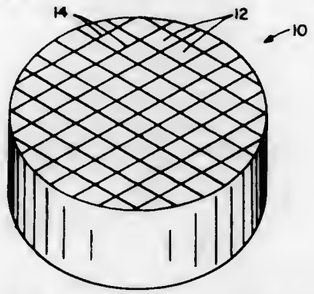
HONEYCOMB BATTERY SEPARATOR

John L. Stempin, Beaver Dams; Ronald L. Stewart, Big Flats, and Dale R. Wexell, Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jul. 26, 1995, Ser. No. 506,713

Int. Cl.[6] H01M *2/14*

U.S. Cl. 429—247 **17 Claims**



1. A rechargeable battery assembly comprising an electrolyte, spaced, external electrodes and a separator between the electrodes, the separator being an elongated, thin honeycomb structure composed of open cells separated from adjacent cells by thin, porous, ceramic walls, the open cells and separating walls running lengthwise of the honeycomb structure, the honeycomb structure having opposed outside faces to which the electrodes are attached, the outside faces on the honeycomb and the electrodes attached thereto being parallel with the open cells and porous walls of the honeycomb structure, the open cells and wall pores of the separator containing the electrolyte whereby ion flow occurs between the electrodes, the ion flow being transverse to the length of the honeycomb.

5,554,465

PROCESS FOR FORMING A PATTERN USING A RESIST COMPOSITION HAVING A SILOXANE-BOND STRUCTURE

Hisashi Watanabe, Kyoto, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Division of Ser. No. 304,086, Sep. 9, 1994, which is a continuation of Ser. No. 135,952, Oct. 13, 1993, Pat. No. 5,378,585, which is a continuation of Ser. No. 719,188, Jun. 21, 1991, abandoned. This application May 23, 1995, Ser. No. 448,100

Claims priority, application Japan, Jun. 25, 1990, 2-167173

Int. Cl.[6] G03C *1/00;1/72;* **G03F** *7/075*

U.S. Cl. 430—5 **16 Claims**

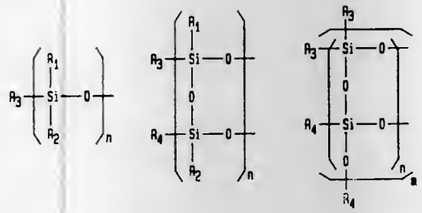
1. A process for forming a pattern, comprising the steps of:

forming a smoothing layer on a substrate;

applying a composition having sensitivity to light or radiation to said smoothing layer to form a resist film, wherein said composition consists essentially of a polymer having a siloxane-bond structure and having at least one end group or a side chain group, and a sensitizing agent, each of said end group and said side chain group is a functional group which causes condensation polymerization upon exposure to acid; and

exposing a portion of said resist film to light or radiation, thereby causing said sensitizing agent to provide an acid which causes condensation polymerization at said end group or said side chain group of said polymer; and

developing said resist film by the use of an alkali developer.



5,554,466

COLOR FILTER AND METHOD OF PREPARATION

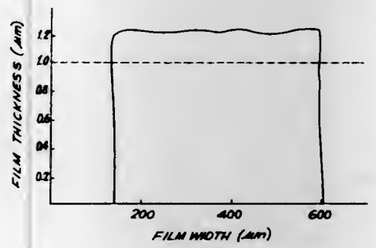
Fumiaki Matsushima; Yoshihiro Ohno; Shigeyuki Ogino, and Kuniyasu Matsui, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Division of Ser. No. 183,204, Jan. 18, 1994, Pat. No. 5,399,450, which is a continuation of Ser. No. 552,274, Jul. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 344,636, Apr. 28, 1989, abandoned. This application Mar. 17, 1995, Ser. No. 406,263

Claims priority, application Japan, Jul. 12, 1989, 179504; Jul. 27, 1989, 194497; Nov. 8, 1989, 290519; Mar. 20, 1990, 70308; Apr. 12, 1990, 96913; Apr. 16, 1990, 99528; Apr. 16, 1990, 99529; Apr. 19, 1990, 101110

Int. Cl.[6] G03F *9/00*

U.S. Cl. 430—7 **20 Claims**



1. A colored article suitable for use as a color filter for a liquid crystal display device, comprising:

a transparent substrate;

a transparent electrode on the transparent substrate; and

a thin film including an organic pigment on the transparent electrode, the pigment deposited by electrolysis from a solution containing a surfactant for solubilizing the pigment in an aqueous micelle solution, and conductive polymer material deposited over the pigment.

5,554,467

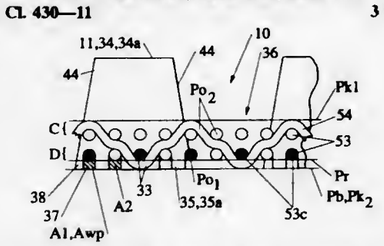
PAPERMAKING BELT AND METHOD OF MAKING THE SAME USING DIFFERENTIAL LIGHT TRANSMISSION TECHNIQUES

Paul D. Trokhan, Hamilton, and Glenn D. Boutilier, Blue Ash, both of Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 152,639, Dec. 20, 1993, Pat. No. 5,514,523, which is a continuation of Ser. No. 872,470, Apr. 20, 1992, Pat. No. 5,334,289, which is a division of Ser. No. 546,633, Jun. 29, 1990, abandoned. This application May 25, 1995, Ser. No. 449,969

Int. Cl.[6] G03C *3/00;* **D03D** *3/00;* **D21F** *1/10*

U.S. Cl. 430—11 **3 Claims**



1. A backside textured papermaking belt comprising: a reinforcing structure and a framework comprised of photosensitive resinous material, said framework having a first surface, a second surface opposed to said first surface and conduits extending between said first surface and said second surface, said first surface having a paperside network formed therein defining said conduits, said second surface having a backside network with passageways distinct from said conduits and which provide surface texture irregularities in said backside network, wherein the belt is made by the method comprising the steps of:

(a) providing a foraging unit having a working surface;

(b) providing a reinforcing structure having a paper-facing side, a machine-facing side opposite said paper-facing side, interstices and a reinforcing component comprised of a plurality of structural components, a first portion of said reinforcing component having a first opacity and a second portion of said reinforcing component having a second opacity less than said first opacity, said first opacity being sufficient to substantially prevent curing of said photosensitive resinous material when said photosensitive resinous material is in its uncured state and said first portion is positioned between said photosensitive resinous material and an actinic light source, and said second opacity being sufficient to permit curing of said photosensitive resinous material, said first portion defining a first projected area;

(c) bringing at least a portion of said machine-facing side of said reinforcing structure into contact with said working surface of said forming unit;

(d) applying a coating of liquid photosensitive resin to at least one side of said reinforcing structure so that said coating forms a first surface and a second surface, said coating being distributed so that at least a portion of said second surface of said coating is positioned adjacent said working surface of said forming unit, portions of said second surface of said coating are positioned between said first portion of said reinforcing component and said working surface of said forming unit, and said paper-facing side of said reinforcing structure is positioned between said first and second surfaces of said coating, wherein the portion of said coating positioned between said first surface of said coating and said paper-facing side of said reinforcing structure comprises a resinous overburden;

(e) controlling the thickness of said overburden to a preselected value;

(f) providing a mask having opaque and transparent regions, said opaque regions together with said transparent regions defining a preselected pattern in said mask;

(g) positioning said mask between said coating of liquid photosensitive resin and an actinic light source so that said mask is

in contacting relation with said first surface of said coating,

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5,554,469

in contacting relation with said first surface of said coating, said opaque regions of said mask shielding a portion of said coating from the light rays of said light source and said transparent regions leaving other portions of said coating unshielded;

(h) curing said unshielded portions of liquid photosensitive resin coating and those portions of said coating that said second portion of said reinforcing structure permits the curing of, and leaving said shielded portions and those portions of said coating positioned between said first portion of said reinforcing structure and the working surface of said forming unit uncured by exposing said coating of liquid photosensitive resin to light having an activating wavelength from said light source through said mask and through said reinforcing structure to form a partially-formed composite belt; and

(i) removing substantially all uncured liquid photosensitive resin from said partially-formed composite belt to leave a hardened resin framework which has a plurality of conduits in those regions which were shielded from said light rays by the opaque regions of the mask and passageways that provide surface texture irregularities in the backside network of said framework which correspond to those portions of the second surface of the coating which were prevented from curing by the first portion of the reinforcing structure.

5,554,468

CRT ELECTROPHOTOGRAPHIC SCREENING METHOD USING AN ORGANIC PHOTOCONDUCTIVE LAYER

Pabitra Datta, Cranbury; Eugene S. Poliniak, Willingboro, both of N.J.; Brian T. Collins, Lancaster, Pa.; Harry R. Stork, Adamstown, Pa.; Peter M. Ritt, East Petersburg, Pa.; Edward R. Garrity, Jr., Lancaster, Pa.; Richard LaPeruta, Jr., Lititz, Pa., and George M. Ehemann, Jr., Lancaster, Pa., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Apr. 27, 1995, Ser. No. 430,004
Int. Cl.[6] G03G *5/00;5/06*
U.S. Cl. 430—28 **18 Claims**

1. In a method of manufacturing a luminescent screen assembly for a CRT on an interior surface of a viewing faceplate of a panel comprising the steps of:

a) coating said interior surface of said viewing faceplate to form a volatilizable organic conductive (OC) layer;

b) overcoating said OC layer to form a volatilizable organic photoconductive (OPC) layer;

c) electrostatically charging said OPC layer;

d) exposing selected areas of said OPC layer light to form a charge image; and

e) developing said charge image with at least one phosphor material; the improvement wherein step b) includes the substeps of:

i) grounding said OC layer;

ii) providing an organic photoconductive solution comprising a resin, an electron donor material, an electron acceptor material and a mixture of two solvents having different boiling points; and

iii) spraying electrostatically-charged droplets of said organic photoconductive solution onto said OC layer, with at least one electrostatic spray gun, to provide said OPC layer, having uniform thickness, overlying said OC layer.

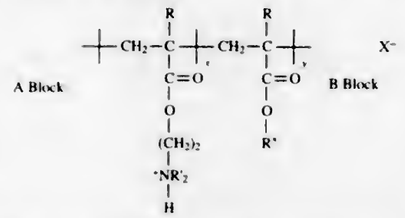
5,554,469

CHARGING PROCESSES WITH LIQUID COMPOSITIONS

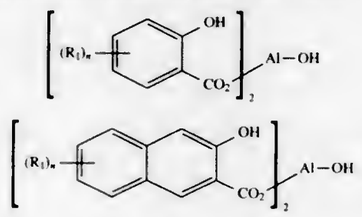
James R. Larson, Fairport; John S. Facci, Webster; Joseph Mammino, Penfield; Milan Stolka, Fairport, and John W. Spiewak, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 1, 1995, Ser. No. 566,265
Int. Cl.[6] G03G *13/02*
U.S. Cl. 430—31 **31 Claims**

1. A process for charging layered imaging members by the transfer of ions thereto which comprises contacting the imaging member with a liquid composition comprised of a nonpolar liquid, and a mixture of surfactants of an ammonium block copolymer first surfactant of the formula



wherein X^- is a conjugate base or anion of a strong acid; R is hydrogen or alkyl; R' is alkyl; R" is an alkyl group containing from about 6 to about 20 carbon atoms; and y and x represent the number average degree of polymerization (DP) wherein the ratio of y to x is in the range of from about 10 to 2 to about 1,000 to 200; and a second surfactant component of the formula



wherein R_1 is selected from the group consisting of hydrogen and alkyl, and n is 0 (zero), 1,2, 3, or 4 and applying a voltage to said liquid composition.

5,554,470

PROCESS AND APPARATUS FOR MANUFACTURING MIGRATION IMAGING MEMBERS

Hardy Sonnenberg, Freelton; Arnold L. Pundsack, Georgetown, and Man C. Tam, Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

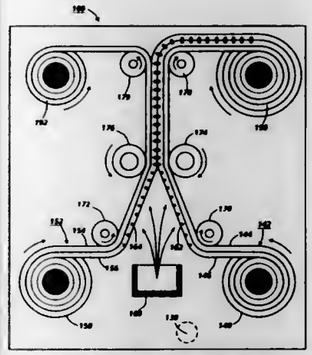
Continuation-in-part of Ser. No. 353,461, Dec. 9, 1994. This application May 2, 1995, Ser. No. 432,747
Int. Cl.[6] G03G *17/10*
U.S. Cl. 430—41 **17 Claims**

1. A process for preparing a migration imaging member, comprising:

applying a first softenable layer to a first substrate and a second softenable layer to a second substrate;

softening the first and second softenable layers;

contacting the first softenable layer and the second softenable layer in a deposition zone in a vacuum chamber with vapors comprising a migration marking material so that the migration marking material is simultaneously deposited on the first softenable layer and the second softenable layer; and laminating the first softenable layer and the second softenable layer to one another after said contacting step.



5,554,471

COMBINATION OF TONERS

Jacques C. Bertrand, Ontario; Roger N. Ciccarelli, Rochester; Thomas R. Pickering, Webster, and Denise R. Bayley, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 12, 1995, Ser. No. 542,151
Int. Cl.[6] G03G *13/01;9/09;15/01*
U.S. Cl. 430—45 **33 Claims**

26. An imaging process which comprises the generation of an electrostatic image on a photoconductive imaging member followed by the development thereof with a combination, set, or gamut of toners, and wherein four toners are selected, and which toners are comprised of a cyan toner, a magenta toner, a yellow toner, and a black toner, each of said toners being comprised of resin and pigment, and wherein the pigment for the cyan toner is a β type copper phthalocyanine, the pigment for the magenta toner is a quinacridone, the pigment for the yellow toner is an isoindoline, and the pigment for the black toner is carbon black, and wherein each of said cyan, magenta and yellow pigment is dispersed in said toners by a flushing process, which process comprises mixing a wet cake of said magenta pigment, a wet cake of said yellow pigment, and a wet cake of said cyan pigment with said toner resin, thereafter heating to remove water enabling a pigment amount of about 50 weight percent, and wherein each of the resulting pigmented resin concentrate product is mixed and diluted with additional toner resin to generate cyan, magenta and yellow toners, each of said cyan, magenta or yellow pigments respectively being present in an amount of from about 20 to about 40 weight percent.

5,554,472

ELECTROPHOTOGRAPHIC PHOTOCONDUCTORS

Koichi Aizawa, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

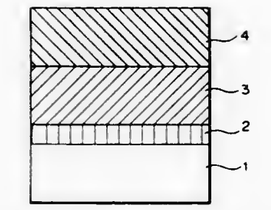
Filed Feb. 22, 1995, Ser. No. 393,308
Claims priority, application Japan, Feb. 23, 1994, 6-024633
Int. Cl.[6] G03G *5/047;5/10;5/14*
U.S. Cl. 430—58 **8 Claims**

1. An electrophotographic photoconductor, comprising:

an electroconductive substrate consisting of an aluminum alloy having an iron content of 0.1 percent by weight or less;

an intermediate layer formed on said electroconductive substrate, which intermediate layer is comprised of a resin and has a thickness of at least 0.5 μm;

a charge-generation layer formed on said intermediate layer; and



a charge-transport layer formed on said charge generation layer.

5,554,473

PHOTORECEPTOR HAVING CHARGE TRANSPORT LAYERS CONTAINING A COPOLYCARBONATE AND LAYER CONTAINING SAME

Rudolf E. Cais, and Frederick W. Gerriets, both of Virginia Beach, Va., assignors to Mitsubishi Chemical America, Inc., White Plains, N.Y.

Filed Nov. 23, 1994, Ser. No. 348,061
Int. Cl.[6] G03G *5/047;* **H01B** *1/20*
U.S. Cl. 430—59 **10 Claims**

1. An organic photoconductive imaging receptor, comprising:

(A) a conductive metal substrate;

(B) a charge generation layer coated on said conductive metal substrate; and

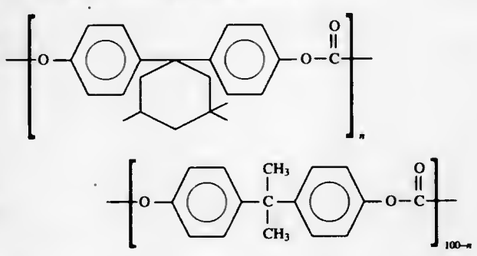
(C) a charge transport layer coated on said charge generation layer;

wherein said charge transport layer comprises:

(a) a copolycarbonate comprising a statistical distribution of monomer units derived from 1,1-bis-(4 -hydroxyphenyl)-3,3,5-trimethylcyclohexane and 2,2-bis-(4-hydroxyphenyl)propane; and

(b) a charge transport material;

wherein said copolycarbonate has the formula (I):



wherein *n* is the mole percent of monomer units derived from 1,1-bis-(4-hydroxyphenyl)-3,3,5-trimethylcyclohexane and 100-n is the mole percent of monomer units derived from 2,2-bis-(4-hydroxyphenyl)propane, and n is 10 to 90 mole % and 100-n is 90 to 10 mole %.

3. The organic photoconductive imaging receptor of claim 1, wherein said charge transport material is selected from the group consisting of PY-DPH and CZ-DPH.

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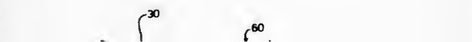
A CONDUCTIVE SUBSTRATE BEARING A

5,554,475

(i) a photoconductor comprising a light transmitting support and at least a light-transmitting electroconductive layer and a



5,554,474

A CONDUCTIVE SUBSTRATE BEARING A ELASTOMERIC POLYURETHANE COATING CONTAINING A CONDUCTIVITY CONTROL AGENT

William B. Vreeland, Webster; John C. Wilson, and Mark C. Zaretsky, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 30, 1994, Ser. No. 268,601
Int. Cl.[6] G03G *15/04*
U.S. Cl. 430—66 **16 Claims**

1. A member for electrically cooperating with a conductive support surface to attract charged toner particles from the conductive support surface towards the member comprising a conductive substrate capable of supporting a uniform bias potential thereon and at least one coating comprising a resilient elastomeric polyurethane formed by reacting:

(a) a polyisocyanate prepolymer comprising the reaction product of:

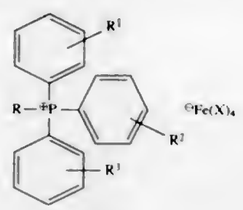
(i) a saturated aliphatic polyisocyanate, a saturated cycloaliphatic polyisocyanate or an aromatic polyisocyanate; and

(ii) a polyol free of aliphatic unsaturation; and

(b) a hardening mixture comprising:

(i) a polyol of (a) (ii) or a diamine free of aliphatic unsaturation or a mixture thereof; and,

(ii) as a conductivity control agent for controlling the resistivity of the elastomeric polyurethane, from 0.001 to 5.0 weight percent, based on the total weight of the polyurethane, of a phosphonium tetrahaloferrate salt represented by the formula:



wherein

R represents an alkyl group having from 1 to 24 carbon atoms; a substituted alkyl group having from 1 to 24 carbon atoms substituted with one or more hydroxy-, alkoxy-, carboalkoxy-, nitro-, cyano-, keto- halo-groups; a cycloalkyl group having from 3 to 7 carbon atoms; an alkaryl group having from 1 to 20 carbon atoms in the alkyl group and 6 to 14 carbon atoms in the aryl group; an aralkyl group having from 1 to 4 carbon atoms in the alkyl group and 6 to 14 carbon atoms in the aryl group wherein the aryl group is substituted with one or more alkyl groups containing from 1 to 18 carbon atoms, one or more alkoxy groups containing from 1 to 12 carbon atoms, one or more hydroxy-, halo-, cyano-, amino-, or nitro- groups; or phenyl;

R^1, R^2 and R^3, which can be the same or different, represents hydrogen; an unsubstituted alkyl group having from 1 to 24 carbon atoms; a substituted alkyl group having from 1 to 24 carbon atoms substituted with one more hydroxy groups, alkoxy groups containing from 1 to 12 carbon atoms, carboalkoxy groups containing from 1 to 12 carbon atoms, acyloxy groups containing from 1 to 12 carbon atoms, nitro-, cyano-, keto- or halo-groups; carbomethoxy, acetoxy, methoxy or chloro and

X, which can be the same or different, is independently selected from fluorine, chlorine, bromine or iodine, the coating, being in electrical contact with the conductive substrate, and having an electrical resistivity of 1.0×10^6 to 5.0×10^{11} ohm cm; a hardness between 20 Shore A to 80 Shore D and a thickness of 0.127 cm to 1.58 cm.

5,554,475

Patent Not Issued For This Number

5,554,476

TONER PARTICLES FOR USE IN COMPOSITIONS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES AND LIQUID COMPOSITION USING SAME

Benzion Landa, Edmonton, Canada; Peretz Ben-Auraham; Joseph Hall, both of Rehovot, Israel, and George A. Gibson, Endwell, N.Y., assignors to Indigo, N.V., Veldhoven, Netherlands

Continuation of Ser. No. 5,703, Jan. 19, 1993, Pat. No. 5,407,771, which is a continuation of Ser. No. 756,641, Sep. 9, 1991, Pat. No. 5,192,638, which is a division of Ser. No. 394,141, Aug. 16, 1989, Pat. No. 5,047,307, which is a continuation of Ser. No. 287,840, Dec. 21, 1988, abandoned, which is a division of Ser. No. 157,122, Feb. 10, 1988, Pat. No. 4,794,651, which is a continuation of Ser. No. 45,168, Apr. 24, 1987, abandoned, which is a continuation of Ser. No. 679,906, Dec. 10, 1984, abandoned, and a continuation-in-part of Ser. No. 242,242, Sep. 9, 1988, abandoned. This application Mar. 6, 1995, Ser. No. 399,249
Int. Cl.[6] G03G *9/09;9/083;9/08;* D02G *3/00*
U.S. Cl. 430—106 **71 Claims**

24. A toner particle useful for developing a latent electrostatic image, the particle comprising a core and a plurality of fibrous extensions therefrom, the core and extensions consisting essentially of the same material wherein the material comprises a thermoplastic polymer and at least one other component.

26. A toner particle according to claim 24 wherein said at least one other component comprises a colored material.

28. A toner particle according to claim 26 wherein the colored material comprises carbon black.

5,554,477

DEVELOPER FOR DEVELOPING LATENT ELECTROSTATIC IMAGES

Yoshio Ozawa, Mie; Hisashi Mukataka; Ryushi Imoo, both of Tokyo, and Satoshi Nishida, Saitama, all of Japan, assignors to Kyocera Corporation, Kyoto, Japan

Filed Jun. 14, 1993, Ser. No. 76,919
Claims priority, application Japan, Jun. 15, 1992, 4-180313; Dec. 28, 1992, 4-361689
Int. Cl.[6] G03G *9/107;9/113*
U.S. Cl. 430—106.6 **13 Claims**

1. A developer for developing visible toner images from latent electrostatic images for use in an image formation system for forming a toner image by developing a latent electrostatic image formed corresponding to a light image on a photoconductor, the system comprising:

(i) a photoconductor comprising a light transmitting support and at least a light-transmitting electroconductive layer and a photoconductive layer successively overlaid on the light-transmitting support,

(ii) development means disposed substantially adjacent the photoconductive layer for supplying the developer onto the surface of the photoconductor to thereby develop a visible toner image from a latent electrostatic image,

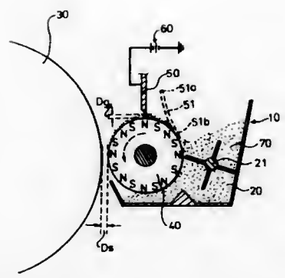
(iii) voltage application means for applying a voltage across the light-transmitting electroconductive layer and the development means, and

(iv) exposure means disposed substantially adjacent the light-transmitting support and directed toward the development means, whereby the developer is brought into contact with the surface of the photoconductor, the developer comprising:

(a) an electroconductive magnetic carrier comprising a plurality of electroconductive magnetic carrier particles, each of the plurality of carrier particles comprising a magnetic base particle and an electroconductive layer formed on the surface of the magnetic base particle, the plurality of electroconductive magnetic carrier particles forming a magnetic brush for imparting an electric charge to the photoconductive layer when the developer is brought into contact with the photoconductor to thereby uniformly charge the surface of the photoconductor and erase any residual electric charge on the surface of photoconductor,

(b) a magnetic high-resistivity carrier, and

(c) an electrically insulating toner.



supplying said magnetic developer onto said surface of the cylindrical magnet, said developer containing a magnetic carrier and a toner;

rotating said developer conveying member to thereby convey the magnetic developer on the surface of the cylindrical magnet to the developing region; and

attaching toner in the magnetic developer conveyed to the developing region to an electrostatic latent image formed on said image bearing member.

5,554,478

ELECTROPHOTOGRAPHIC DRY TONER

Shinichi Kuramoto, Numazu; Yoshihisa Okamoto, Fuji; Yasuo Asahina, Numazu; Michio Izumi, Numazu; Hidefumi Gohhara, Numazu; Chiharu Mochizuki, Numazu; Tomomi Suzuki, Gotenba; Hideo Nakamura, and Masaru Wakisaka, both of Ichihara, all of Japan, assignors to Ricoh Company, Ltd., and Mitsui Petrochemical Industries, Ltd., both of Tokyo, Japan

Filed Jul. 11, 1994, Ser. No. 273,185
Claims priority, application Japan, Jul. 12, 1993, 5-171505; Jul. 4, 1994, 6-152054
Int. Cl.[6] G03G *9/087*
U.S. Cl. 430—109 **7 Claims**

1. A dry toner for use in electrophotography comprising:

a coloring agent; and

a polyol resin serving as a binder resin, which comprises (a) a main chain portion having a repeat unit, said main chain portion comprising an epoxy resin moiety and, in said repeat unit, at least two alkylene oxide moieties, and (b) protected terminal portions bonded to said main chain portion.

5,554,479

IMAGE FORMATION METHOD

Masahisa Ochiai, Fukaya, and Masumi Asanae, Kumagaya, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Dec. 14, 1994, Ser. No. 356,064
Claims priority, application Japan, Dec. 17, 1993, 5-343968; Dec. 24, 1993, 5-347845; Dec. 27, 1993, 5-348829; Jan. 25, 1994, 6-006124
Int. Cl.[6] G03G *13/09;15/09*
U.S. Cl. 430—122 **17 Claims**

1. An image forming method for conveying a magnetic developer held directly on the surface of a developer conveying member opposed to an image-bearing member to a developing region to visualize an electrostatic latent image, comprising:

implementing as said developer conveying member a semiconductive or insulating cylindrical magnet having a plurality of heteropolar magnet poles arranged alternatively on its surface, the overall magnet being integrally formed;

5,554,480

FLUORESCENT TONER PROCESSES

Raj D. Patel, Oakville; H. Bruce Goodbrand, Hamilton; Grazyna E. Kmiecik-Lawrynowicz, Burlington; Michael A. Hopper, Toronto; Melvin D. Croucher, St. Catharines, and James M. Duff, Mississauga, all of Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 1, 1994, Ser. No. 299,392
Int. Cl.[6] G03G *9/087;9/09*
U.S. Cl. 430—137 **29 Claims**

1. A process for the preparation of fluorescent toner compositions consisting essentially of

(i) preparing a pigment dispersion mixture in a solvent, which dispersion is comprised of a first fluorescent pigment and a second colored nonfluorescent pigment, an ionic surfactant and optionally a charge control agent;

(ii) shearing the pigment dispersion with a latex mixture comprised of a counterionic surfactant with a charge polarity of opposite sign to that of said ionic surfactant, a nonionic surfactant and resin particles, thereby causing a flocculation or heterocoagulation of first fluorescent pigment and second colored nonfluorescent pigment, resin particles and optionally a charge control agent to form electrostatically bound toner size aggregates; and

(iii) heating the electrostatically bound toner sized aggregates to form said toner compositions comprised of resin particles, said first pigment and said second pigment and optionally a charge control agent, and wherein the first fluorescent pigment is excitable by ultraviolet light in the frequency range of from about 254 to about 366 nanometers and fluoresces in the visible spectrum of from about 400 to about 700 nanometers, and wherein the first fluorescent pigment is selected from the group consisting of 4,4'-bis(styryl)biphenyl, 2-(4-phenylstilben-4-yl)6-butylbenzoxazole, β-methylumbelliferone, 4-methyl-7-dimethylaminocoumarin, 4-methyl-7-aminocoumarin, N-methyl-4-methoxy-1,8-naphthalimide, 9,10-bis(phenethynyl)anthracene, and 5,12-bis(phenethynyl)naphthacene, and the second colored nonfluorescent pigment is selected from the group consisting of magnetite, cyan, magenta, and yellow pigments.

5,554,481

POSITIVE WORKING PHOTORESIST COMPOSITION

Yasumasa Kawabe; Kenichiro Sato, and Toshiaki Aoai, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

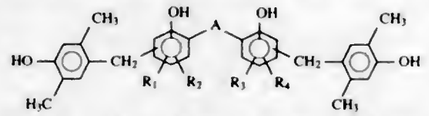
Continuation-in-part of Ser. No. 306,329, Sep. 15, 1994, abandoned. This application Dec. 22, 1994, Ser. No. 361,697

Claims priority, application Japan, Sep. 20, 1993, 5-233537; Sep. 20, 1993, 5-233538; Oct. 7, 1993, 5-251780; Oct. 7, 1993, 5-251781

Int. Cl.[6] G03F *7/023*

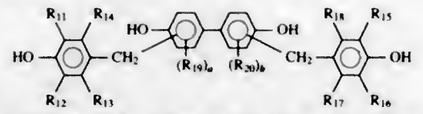
U.S. Cl. 430—192 **10 Claims**

1. A positive working photoresist composition comprising, in admixture, at least one alkali-soluble resin and one or both of a 1,2-naphthoquinonediazido-5 sulfonic acid ester and a 1,2-naphthoquinonediazido-4-sulfonic acid ester of a polyhydroxy compound selected from the group consisting of compounds represented by the following formulae (I), (II), and (III):



(I)

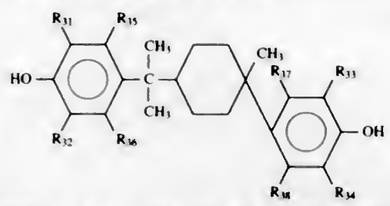
wherein R_1 to R_4, which may be the same or different, each represents a hydrogen atom, an alkyl group having 1–8 carbon atoms; and A represents —S— or —SO_2—;



(II)

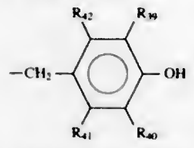
wherein R_{11} to R_{20}, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group, an aryl group, an alkoxy group, an acyl group, an alkenyl group,

an aralkyl group, an alkoxycarbonyl group, an arylcarbonyl group, an acyloxy group, a nitro group, or a cyano group, provided that when one or both of R_{11} and R_{12} are groups other than a hydrogen atom, at least one of R_{13} and R_{14} is a group other than a hydrogen atom, and when one or both of R_{15} and R_{16} are groups other than a hydrogen atom, at least one of R_{17} and R_{18} is a group other than hydrogen atom; and a and b each represents 1 or 2; and



(III)

wherein R_{31} to R_{34}, which may be the same or different, each represents a hydrogen atom, a hydroxy group, a halogen atom, an alkyl group, an aryl group, an alkoxy group, an acyl group, an alkenyl group, an aralkyl group, an alkoxycarbonyl group, an arylcarbonyl group, an acyloxy group, a nitro group, or a group represented by the following formula:



wherein R_{39} to R_{42}, which may be the same or different, each represents a hydrogen atom, an alkyl group, or an alkoxy group; and R_{35} to R_{38}, which may be the same or different, each represents a hydrogen atom, a hydroxy group, a halogen atom, an alkyl group, an aryl group, an alkoxy group, an acyl group, an alkenyl group, an aralkyl group, an alkoxycarbonyl group, an arylcarbonyl group, a nitro group, or a cyano group.

5,554,482

SILVER HALIDE LIGHT-SENSITIVE MATERIAL CONTAINING BASE PRECURSOR AND POLYVINYL ALCOHOL

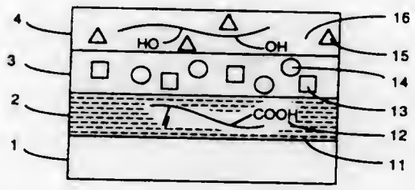
Hiroaki Yokoya, and Akihiro Endo, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 25, 1995, Ser. No. 428,892

Claims priority, application Japan, Apr. 25, 1994, 6-109031; May 18, 1994, 6-128194; Jun. 10, 1994, 6-152813

Int. Cl.[6] G03C *8/08;8/40;1/498;* **G03F** *7/06*

U.S. Cl. 430—203 **21 Claims**



1. A silver halide light-sensitive material which comprises a support and two or more layers, and silver halide, a reducing agent, an ethylenically unsaturated polymerizable compound or a cross-linkable polymer and a base precursor being independently contained in at least one of the layers, wherein a layer containing the base precursor further contains a modified polyvinyl alcohol (I) having such a chemical structure that a terminal alkyl group having 4 or more carbon atoms is attached to a polyvinyl alcohol.

5,554,483

PHOTOGRAPHIC IMAGE INCLUDING AN INK-ACCEPTABLE SURFACE

Thomas G. DeNoto, Lexington; Paul E. Nangeroni, Avon, and David F. Oberhauser, Stoneham, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 425,572, Apr. 20, 1995, abandoned. This application Dec. 13, 1995, Ser. No. 572,177

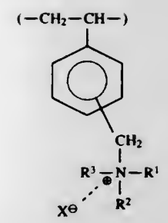
Int. Cl.[6] G03C *8/32;11/08*

U.S. Cl. 430—237 **15 Claims**

8. A method for providing an ink-acceptable surface on a diffusion transfer photographic image comprising the steps of

forming a photographic image by exposing to an imagewise pattern of radiation a diffusion transfer photographic film unit which includes a photosensitive element arranged in superposed or superposable relation with an image-receiving element, said photosensitive element comprising a support carrying at least one silver halide emulsion layer, and developing said exposed photosensitive element with an aqueous alkaline processing composition whereby there is formed an image in said image-receiving element; and

applying to the surface of said photographic image an aqueous mixture comprising a polymeric mordant material including monomer units represented by the formula



wherein each of R^1, R^2 and R^3 is independently alkyl, substituted alkyl, cycloalkyl, aryl, aralkyl or at least two of R^1, R^2 and R^3, together with the nitrogen atom to which they are bonded complete a saturated or unsaturated nitrogen-containing heterocyclic ring and X is an anion.

5,554,484

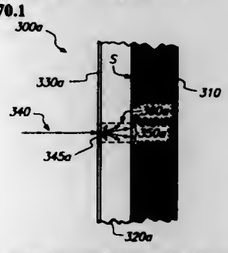
GAMMA RADIATION SENSITIVE RESIST MATERIALS FOR SEMICONDUCTOR LITHOGRAPHY

Michael D. Rostoker, San Jose; Nicholas F. Pasch, Pacifica, and Joe Zelayeta, Saratoga, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation of Ser. No. 56,239, Apr. 30, 1993, Pat. No. 5,374,974. This application Dec. 19, 1994, Ser. No. 359,046

Int. Cl.[6] G03F *7/004*

U.S. Cl. 430—270.1 **14 Claims**



1. A radiation sensitive resist material for application on a surface of a semiconductor wafer, comprising:

a base resist material having a high cross-section and absorptivity to, and being chemically sensitive to, photons; and

a doping material having a high cross-section to gamma rays, being responsive to incident gamma rays to emit photons, and being provided in a concentration selected so that the doping material, in response to imaging gamma rays, emits a sufficient quantity of photons to chemically convert the base resist material.

5,554,485

MID AND DEEP-UV ANTIREFLECTION COATINGS AND METHODS FOR USE THEREOF

Robert R. Dichiara, Middletown; James T. Fahey, Poughkeepsie; Pamela E. Jones, Bronx; Christopher F. Lyons, LaGrangeville; Wayne M. Moreau, Wappingers Falls; Ratnam Sooriyakumaran, Fishkill; Gary T. Spinillo, Wappingers Falls; Kevin M. Welsh, Fishkill, and Robert L. Wood, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 17,938, Feb. 16, 1993, Pat. No. 5,401,614, which is a continuation-in-part of Ser. No. 845,404, Mar. 3, 1992, abandoned. This application Sep. 29, 1994, Ser. No. 315,271

Int. Cl.[6] G03C *5/00*

U.S. Cl. 430—271.1 **20 Claims**

1. An antireflective coating composition for use with chemically amplified photoresist compositions comprising a poly(arylether) polymer, which is highly absorbent to mid and/or deep UV radiation, which is substantially inert to contact reactions with a chemically amplified photoresist composition, and which is insoluble in the developer for the chemically amplified photoresist composition.

2. A photoresist structure having at least two layers and overlaying a semiconductor substrate comprising

an antireflective first layer coated upon said substrate wherein the antireflective layer comprises a poly(arylether) polymer, and wherein the antireflective layer is substantially inert to contact reactions with the photoresist layer, and wherein the antireflective layer is insoluble in the developer for the photoresist layer, and

a second layer coated upon said antireflective first layer comprising a chemically amplified photoresist which is sensitive to ultraviolet radiation having a wavelength in the range from about 180 nm to about 350 nm.

5,554,486

TECHNIQUES FOR UNIFORMIZING PHOTORESIST THICKNESS AND CRITICAL DIMENSION OF UNDERLYING FEATURES THROUGH AEROSOL APPLICATION OF PHOTORESIST

Mario Garza, Sunnyvale, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Division of Ser. No. 907,757, Jun. 29, 1992, Pat. No. 5,330,883. This application Jan. 31, 1994, Ser. No. 189,574

Int. Cl.[6] G03J *7/16*

U.S. Cl. 430—273.1 **6 Claims**

6. A method of forming, over an underlying semiconductor substrate, a photoresist film which will exhibit uniform reflectivity, and an antireflective layer over said film of photoresist, comprising:

a) forming a photoresist solution comprising:

i) from about 3% to about 12% by weight solvent; and

ii) from about 88% to about 97% by weight solids; by total weight of said solution;

b) applying said solution as an aerosol to said semiconductor substrate to form a film of photoresist of uniform thickness over said semiconductor substrate; and

c) applying over said film of photoresist on said semiconductor substrate a coating of a partially fluorinated compound:

i) having a refractive index of from about 1.30 to about 1.34;

ii) capable of adhering to said film of photoresist; and

iii) having a thickness of L/4 where "L" is the wavelength of incident photolithographic light in said film of photoresist;

to thereby form an antireflective film over said film of photoresist.

5,554,487

RESIST FORMATION MADE BY APPLYING, DRYING AND REFLOWING A SUSPENSION OF PHOTOCURABLE MATERIAL

Nicholas E. Ivory, Somerset; Michael Jeffries, Bristol; Robert J. Palmer, and Wrenford J. Thatcher, both of Somerset, all of Great Britain, assignors to Coates Brothers PLC, Kent, United Kingdom

PCT No. PCT/GB92/00451, § 371 Date Oct. 14, 1993, § 102(e) Date Oct. 14, 1993, PCT Pub. No. WO92/16877, PCT Pub. Date Oct. 1, 1992

PCT Filed Mar. 13, 1992, Ser. No. 117,063

Claims priority, application United Kingdom, Mar. 15, 1991, 9105561

Int. Cl.[6] G03C *5/00*

U.S. Cl. 430—311 **2 Claims**

1. A process for the formation of a patterned resist upon a substrate which comprises the steps of:

(i) mechanically applying a layer of a suspension of a powdered solid photocurable material in an aqueous carrier to the sub-

strate, wherein said powdered solid photocurable material comprises the reaction product of an epoxy resin with an ethylenically unsaturated carboxylic acid, together with a photoinitiator;

(ii) drying the layer applied in step (i) by evaporation of the aqueous carrier and reflowing the powder, under the action of heat, to give a coherent film;

(iii) imagewise exposing the dried film to radiation through a patterned mask whereby portions of the film exposed to radiation are cured; and

(iv) subsequently developing the exposed film by removing unexposed portions thereof with an appropriate solvent.

5,554,488

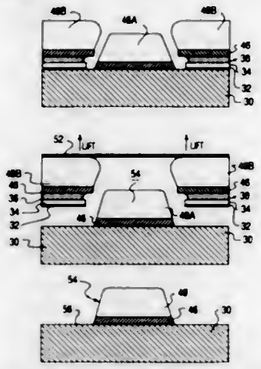
SEMICONDUCTOR DEVICE STRUCTURE AND METHOD OF FORMATION THEREOF

Brian A. Rioux, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 281,726, Jul. 28, 1994, abandoned. This application Dec. 21, 1995, Ser. No. 575,446

Int. Cl.[6] G03F *7/00*

U.S. Cl. 430—315 **22 Claims**



1. A method of forming semiconductor device comprising:

providing a semiconductor substrate having a planar surface; p1 preparing the surface by providing a surface layer of a material which is weakly bonded to the surface for controlling adhesion to the surface of overlying layers;

providing thereon a multilayer masking stack comprising a first masking layer of a material which may be etched selectively relatively to the substrate, and a second layer which has differential etch selectivity relative to the first masking layer;

patterning and etching the multilayer masking stack to define an opening for formation of a device structure on the substrate surface, the differential etch selectivity of the first and second masking layers providing for controlled undercutting of first masking layer relative to the second masking layer, to provide a device opening with undercut sidewalls, and exposing the underlying substrate within the opening;

depositing overall at least one layer of conductive material to form a contact with the substrate within the device opening, said at least one layer of conductive material thereby being deposited on the substrate surface within the device opening and over the surface of the multilayer masking stack, and the undercut sidewalls of the device opening causing a discontinuity in the at least one layer of conductive material, near the sidewall;

etching the at least one layer of conductive material, whereby etching occurs preferentially at the discontinuity near the sidewall and separates part of the at least one layer of conductive material to form a device structure on the substrate surface, thereby separating said part from surrounding parts of the at least one layer of conductive material and the underlying masking layers;

and then, removing the masking layer stack with the overlying conductive material by a lift-off process in which said layers are separated from the substrate at the weakly bonded surface layer, said weakly bonded surface layer facilitating separation of the masking stack from the substrate, leaving said device structure on the substrate surface.

5,554,489

METHOD OF FORMING A FINE RESIST PATTERN USING AN ALKALINE FILM COVERED PHOTORESIST

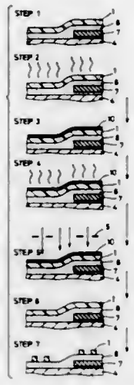
Takeo Ishibashi; Eiichi Ishikawa, and Itaru Kanai, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 103,639, Aug. 11, 1993, abandoned. This application Dec. 2, 1994, Ser. No. 353,256

Claims priority, application Japan, Aug. 20, 1992, 4-221444

Int. Cl.[6] G03K *5/00*

U.S. Cl. 430—326 **13 Claims**



1. A forming method of a fine resist pattern, comprising the steps of:

applying on a substrate a positive photoresist including naphthoquinone diazide and novolak resin;

applying an alkaline application film to a surface of said positive photoresist, thereby rendering said surface of said positive photoresist insoluble without immersing the photoresist in an alkali liquid;

selectively irradiating said positive photoresist having said alkaline application film applied thereon with light;

removing the application film by either development or wet etching with an organic solvent; and

developing said positive photoresist after removing the application film.

5,554,490

RELIEF PATTERN PRODUCING METHOD AND APPARATUS AND RELIEF PATTERN SHEET

Mikio Imaeda, Bisai, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed May 1, 1995, Ser. No. 432,929

Claims priority, application Japan, May 13, 1994, 6-099918

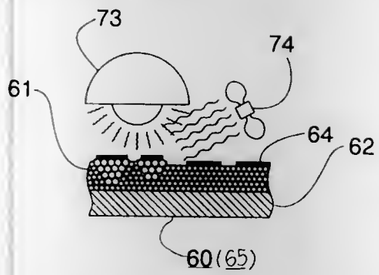
Int. Cl.[6] G03C *5/16*

U.S. Cl. 430—327 **13 Claims**

1. A relief pattern producing method comprising the steps of:

forming a plurality of image patterns on a thermal expansile sheet having a thermal expansile layer laid on a base material layer, said thermal expansile layer including a foaming agent that is foamed upon heating;

exposing said thermal expansile sheet to light including infrared rays; and



causing a part of said thermal expansile layer covered with said image patterns formed on said thermal expansile sheet to be heated and foamed, by virtue of said exposure, so that relief patterns corresponding to said image patterns are formed on said thermal expansile sheet,

wherein said step of forming said plurality of image patterns on said thermal expansile sheet includes setting an interval between two arbitrary adjoining image patterns of more than two image patterns formed on said thermal expansile sheet to more than about 0.3 times as large as a diameter of a circle whose area is the same as an area of said image patterns.

5,554,491

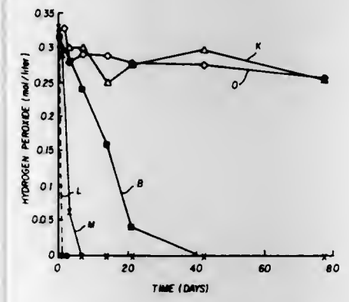
USE OF AN ALKALINE PREBATH TO ACTIVATE AN ACIDIC PEROXIDE BLEACH SOLUTION FOR PROCESSING COLOR PHOTOGRAPHIC ELEMENTS

Terrence R. O'Toole, Webster, N.Y., and Mark F. Sistare, Carrboro, N.C., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 21, 1995, Ser. No. 407,937

Int. Cl.[6] G03C *7/00;5/18;5/26;5/49*

U.S. Cl. 430—393 **22 Claims**



1. A method for processing a color silver halide photographic element, comprising:

A) subsequently to or simultaneously with color development, treating an imagewise exposed color silver halide photographic element with an alkaline prebath solution, and

B) bleaching said treated element with an acidic, rehalogenating peroxide bleaching solution that has a buffer capacity, C_A, of less than about 0.05 mol/l, and comprises chloride ion in an amount of from about 0.01 to about 1 mol/l.

5,554,492

PHOTOGRAPHIC SILVER HALIDE COLOR MATERIAL

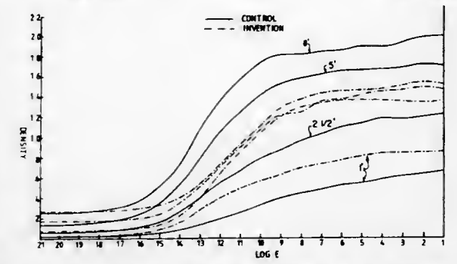
Siu C. Tsoi, Watford, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 7, 1995, Ser. No. 418,706

Claims priority, application United Kingdom, Apr. 29, 1994, 9408530

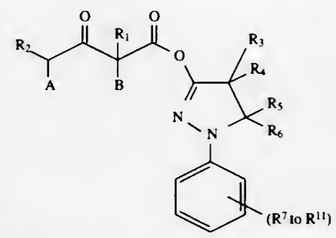
Int. Cl.[6] G03C *1/42;7/407*

U.S. Cl. 430—443 **8 Claims**



1. A color photographic material comprising at least one silver halide emulsion layer having associated therewith a dye image-forming coupler and which contains in a layer thereof an ETA (electron transfer agent) releasing compound of the general formula:

(I)



wherein

R^1 is an alkyl group,

R^2 to R^6 are individually H or an alkyl group with the proviso that when one or both of R^5 or R^6 are H, R^3 and R^4 must not be H,

R^7 to R^{11} are individually H, or an alkyl or alkoxy group,

A is H or an alkyl group and B is an alkyl group or, together with the atoms to which they are attached, A and B complete a carbocyclic or heterocyclic ring group,

or,

when A and B are not linked together, A and R^2 may together complete an aromatic or nonaromatic carbocyclic group or an aromatic or nonaromatic heterocyclic group,

with the proviso that if R^7 to R^{11} are all hydrogen then neither R_3 nor R_4 are methyl or hydroxymethyl.

5,554,493

USE OF 2,1-BENZISOXAZOL-3(1H)-ONES AS ANTIOXIDANTS IN COLOR PHOTOGRAPHIC PROCESSING METHODS

Robert J. Perry, Pittsford; Carl A. Marrese, Penfield, and Sucheta Tandon, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 404,789, Mar. 15, 1995, abandoned. This application Nov. 6, 1995, Ser. No. 553,934

Int. Cl.[6] G03C *5/305;5/30*

U.S. Cl. 430—446 **16 Claims**

1. A method for processing a color photographic element comprising:

developing an imagewise exposed color photographic element containing at least one image dye forming coupler with a

photographic color developer composition having a pH of wt. %:

from about 9 to about 13 and comprising:

(a) a nucleic add polymerase,

(b) a template, and

5,554,501

BIOPOLYMER SYNTHESIS USING SURFACE

photographic color developer composition having a pH of from about 9 to about 13 and comprising:

a) a primary aromatic amine color developing agent, and

b) a 2,1-benzisoxazol-3(1H)-one as an antioxidant,

said color developer composition being free of image dye forming couplers.

5,554,494

SILVER HALIDE PHOTOGRAPHIC MATERIAL COMPRISING EMULSION LAYER AND HYDROPHOBIC BACKING LAYER PROVIDED ON SUPPORT

Kentaro Shiratsuchi; Tsukasa Yamada, and Satoru Toda, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 23, 1995, Ser. No. 494,070

Claims priority, application Japan, Jun. 23, 1994, 6-141479

Int. Cl.[6] G03C *1/76*

U.S. Cl. 430—523 **16 Claims**

1. A silver halide photographic material comprising a silver halide emulsion layer and a hydrophobic backing layer provided on a support, said hydrophobic backing layer being formed by coating core/shell polymer particles, wherein the core comprises a cross-linked polymer, having a glass transition temperature in the range of 10° C. to 65° C. and the shell comprises an essentially not cross-linked polymer.

5,554,495

SILVER HALIDE PHOTOGRAPHIC LIGHT SENSITIVE MATERIAL CONTAINING ANTISTATIC LAYER

Nobuaki Tsuji, Hino, Japan, assignor to Konica Corporation, Japan

Filed Nov. 1, 1994, Ser. No. 333,141

Claims priority, application Japan, Nov. 9, 1993, 5-279923

Int. Cl.[6] G03C *1/85*

U.S. Cl. 430—530 **6 Claims**

1. A silver halide photographic light-sensitive material comprising a support having thereon a silver halide emulsion layer containing a silver halide emulsion, wherein said support has, on at least one side thereof, an antistatic layer comprising a water-soluble conductive polymer and a hydrophobic polymer that has been hardened with a hardener, or an antistatic layer comprising conductive metal oxide particles containing at least one metal selected from Zn, Ti, Sn, Al, In, Si, Mg, Ba, Mo, W and V; said antistatic layer having thereon said silver halide emulsion layer; and said silver halide emulsion being spectrally sensitized by adding thereto a substantially water-insoluble spectral-sensitizing dye in the form of a dispersion of solid particles dispersed in an aqueous medium substantially free from an organic solvent and a surfactant.

5,554,496

SILVER HALIDE PHOTOGRAPHIC MATERIAL COMPRISING EMULSION LAYER AND BACKING LAYER PROVIDED ON SUPPORT

Kentaro Shiratsuchi; Satoru Toda, and Tsukasa Yamada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

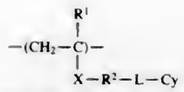
Filed Mar. 2, 1995, Ser. No. 397,494

Claims priority, application Japan, Mar. 2, 1994, 6-032111

Int. Cl.[6] G03C *1/81;1/76*

U.S. Cl. 430—536 **20 Claims**

11. A silver halide photographic material comprising a silver halide emulsion layer and an anticurl backing layer provided on a support, wherein a surface backing layer is further provided on the anticurl backing layer, said surface backing layer comprising a hydrophobic polymer which is a copolymer comprising a repeating unit represented by the formula (I) in an amount not less than 50 wt. %:



(I)

wherein R^1 is a hydrogen atom or an alkyl group having one to four carbon atoms; X is —COO—, —CONR[3]— or a phenylene group; R^3 is a hydrogen atom or an alkyl group having one to four carbon atoms; R^2 is a single bond or an alkylene group having one to three carbon atoms, which may be substituted with a hydroxyl group or a halogen atom; L is a single bond or a divalent linking group selected from the group consisting of —OCO—, —NHCOO—, —OCOCH$_2$—, —NHCONH—, —NHCO—, —NH—, and —O—, and Cy is an alicyclic group consisting of a monocyclic ring and having three to sixteen carbon atoms, wherein the alicyclic group is unsubstituted or is substituted with an alkyl group, an alkenyl group or a halogen atom.

5,554,497

CARDIOPLEGIC SOLUTION FOR ARRESTING AN ORGAN

Richard M. Raymond, Charlotte, N.C., assignor to Charlotte-Mecklenburg Hospital Authority, Charlotte, N.C.

Filed Dec. 12, 1994, Ser. No. 354,503

Int. Cl.[6] A01N *1/02*

U.S. Cl. 435—1.2 **28 Claims**

1. A cardioplegic solution for arresting a heart intended for transplantation comprising, per liter of solution:

(a) a balanced isotonic solution comprising sodium, potassium, calcium, magnesium and bicarbonate ions in a physiologically acceptable amount;

(b) from about 0.5 μM to about 2.0 μM of an amiloride-containing compound; and

(c) water.

5,554,498

NUCLEIC ACID AMPLIFICATION USING SCANDIUM AND LANTHANUM IONS

Aaron G. Filler, Seattle, Wash., and Andrew M. L. Lever, Cambridge, England, assignors to Syngenix Limited, Cambridge, United Kingdom

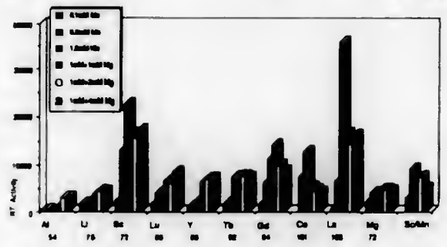
PCT No. PCT/GB92/01599, § 371 Date Feb. 28, 1994, § 102(e) Date Feb. 28, 1994, PCT Pub. No. WO93/05174, PCT Pub. Date Mar. 18, 1993

PCT Filed Sep. 1, 1992, Ser. No. 204,144

Claims priority, application United Kingdom, Aug. 30, 1991, 9118676; Nov. 7, 1991, 9123677; Mar. 13, 1992, 9205470; Mar. 24, 1992, 9206402

Int. Cl.[6] C12P *19/34;* **C12Q** *1/00;1/68;1/70*

U.S. Cl. 435—5 **9 Claims**



1. A kit of two or more containers packaged together, the contents comprising an IUPAC Group 3 ion, or a salt thereof, wherein said Group 3 ion is selected from the group consisting of scandium ion and lanthanum ion, and at least one reagent selected from the group consisting of:

(a) a nucleic add polymerase,

(b) a template, and

(c) a buffer solution having a pH that is substantially the optimum for the polymerase activity of said nucleic acid polymerase.

5,554,499

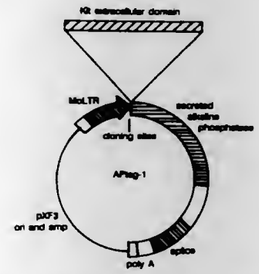
DETECTION AND ISOLATION OF LIGANDS

Philip Leder, Chestnut Hill, and John G. Flanagan, Brookline, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Continuation of Ser. No. 945,514, Sep. 16, 1992, abandoned, which is a division of Ser. No. 593,764, Oct. 5, 1990, abandoned. This application Sep. 14, 1994, Ser. No. 306,255

Int. Cl.[6] G01N *33/535;33/566;33/569;33/574*

U.S. Cl. 435—5 **46 Claims**



16. A method of detecting a ligand of a known polypeptide receptor in a sample, said method comprising

providing a hybrid molecule comprising said polypeptide receptor covalently bonded to SEAP,

contacting said sample with said hybrid molecule to form an affinity complex between said ligand and said hybrid molecule, and

treating said sample such that any hybrid molecule not forming an affinity complex is removed, and

detecting said affinity complex using a molecule which binds SEAP to detect the presence of said ligand.

5,554,500

CLONED GENES FOR HUMAN DOPAMINE D2 RECEPTORS AND CELL LINES EXPRESSING SAME

Mark R. Brann, and Thomas M. Stormann, both of Bethesda, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Sep. 27, 1989, Ser. No. 413,026

Int. Cl.[6] C12Q *1/68;1/00;* **C12N** *15/63;* **G01N** *33/48*

U.S. Cl. 435—6 **3 Claims**

1. In a method for pharmacological, physiological, or functional analysis of a dopamine agonist or antagonist, the improvement comprising using an effective amount of a mammalian cell line comprising a transfected mammalian cell stably transfected with an expression vector capable of transforming a procaryotic or eucaryotic cell, wherein the expression vector expresses an isolated or essentially pure DNA sequence coding for a human dopamine D2 receptor and said transfected mammalian cell comprises said human dopamine D2 receptor expressed by said DNA sequence.

5,554,501

BIOPOLYMER SYNTHESIS USING SURFACE ACTIVATED BIAXIALLY ORIENTED POLYPROPYLENE

Peter J. Coassin, San Juan Capistrano; Robert S. Matson, Orange, and Jang B. Rampal, Yorba Linda, all of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 971,100, Oct. 29, 1992, abandoned. This application Oct. 29, 1993, Ser. No. 145,939

Int. Cl.[6] C12Q *1/68;* **G01N** *35/48*

U.S. Cl. 435—6 **12 Claims**

1. In a method for synthesizing biopolymer attached to a solid support material, said method comprising sequentially coupling biomonomers to form said biopolymer, wherein the improvement comprises sequentially coupling biomonomers to a solid support material formed of biaxially oriented polypropylene having nucleophiles linked to its surface.

5,554,502

PROCESS FOR DETERMINING NUCLEASE ACTIVITY

Masato Mitsuhashi, and Mieko Ogura, both of Irvine, Calif., assignors to Hitachi Chemical Co. Ltd., Japan, and Hitachi Chemical Research Center Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 125,361, Sep. 22, 1993, abandoned. This application Nov. 5, 1993, Ser. No. 147,936

Int. Cl.[6] C12Q *1/00;1/68;* **G01N** *21/76;* **C12N** *15/00*

U.S. Cl. 435—6 **24 Claims**

1. A kit for detection and quantification of nuclease activity in a sample having an unknown nuclease activity, comprising the following components:

a plate having a plurality of wells therein, at least one of said wells being a control well and at least one of said wells being a test well, each of said test and control wells containing a known quantity of a polynucleotide and a thiazolium or azolium dye having a partition coefficient greater than 10^7 with said polynucleotide, wherein each of said test wells is for simultaneously containing a sample containing a nuclease to be quantified and polynucleotide-dye complexes formed from said polynucleotide and said dye; and

a nuclease in a container apart from said polynucleotide, wherein each of said control wells is for simultaneously containing a known quantity of said nuclease and polynucleotide-dye complexes formed from said polynucleotide and said dye.

5,554,503

SAMPLE PROCESSING METHOD FOR *MYCOBACTERIUM TUBERCULOSIS*

James A. Down, Cary; Adriann H. Walters, Durham; Margaret S. Dey, Apex; Deborah R. Howard, Durham; Michael C. Little, Raleigh, and William E. Keating, Durham, all of N.C., assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 60,844, May 11, 1993, abandoned. This application Aug. 4, 1994, Ser. No. 286,100

Int. Cl.[6] C12Q *1/68;* **C12P** *19/34*

U.S. Cl. 435—6 **15 Claims**

1. A method for processing *Mycobacterium tuberculosis* consisting essentially of:

a) liquifying a sputum sample;

b) centrifuging the liquified sample to form a liquified pellet;

c) washing the liquified pellet two or three times with a wash solution consisting of saline, water or a buffer which does not contain detergents, enzymes or chelating agents, and centrifuging between washes at a speed sufficient to form a washed pellet which is resistant to loss of material during washing, and;

d) resuspending the washed pellet in a solution consisting of saline, water or a buffer which does not contain detergents,

enzymes or chelating agents and lysing the *Mycobacterium tuberculosis*, if present, by heating at 95°–120° C. for about 5–30 minutes.

5,554,504

DIAGNOSTIC METHOD FOR DETECTING THE RUPTURE OF FETAL MEMBRANES

Eeva-Marja Rutanen, Espoo, Finland, assignor to OY Medix Biochemica AB, Kauniainen, Finland

PCT No. PCT/FI91/00413, § 371 Date Jun. 30, 1993, § 102(e) Date Jun. 30, 1993, PCT Pub. No. WO92/12426, PCT Pub. Date Jul. 23, 1992

PCT Filed Dec. 30, 1991, Ser. No. 81,286

Claims priority, application Finland, Dec. 31, 1990, 906469

Int. Cl.[6] G01N *33/53;33/543;33/577*

U.S. Cl. 435—7.8 **11 Claims**

1. A diagnostic method for detecting rupture of fetal membranes in a pregnant woman comprising:

obtaining a sample of vaginal secretions from the pregnant woman,

reacting the sample with at least one binding substance that specifically binds to insulin-like growth factor binding protein 1, IGFBP-1, in order to detect a level of IGFBP-1 in the sample, and

detecting a level of IGFBP-1 in the sample above a predetermined threshold level, the predetermined threshold level being selected as indicative of amniotic fluid in the vaginal secretion sample,

wherein a level of IGFBP-1 in the sample above the predetermined threshold level is indicative of rupture of fetal membranes in the pregnant woman.

5,554,505

METHOD AND APPARATUS FOR OPTICALLY SCREENING MICROSCOPIC CELLS

Constance M. Hajek, Miami Lakes, and Thomas Russell, Miami, Fla., assignors to Coulter Corporation, Miami, Fla.

Continuation of Ser. No. 782,155, Oct. 24, 1991, abandoned, which is a continuation-in-part of Ser. No. 617,096, Nov. 23, 1990, Pat. No. 5,340,719. This application Dec. 1, 1993, Ser. No. 160,986

Int. Cl.[6] G01N *33/50;33/80;1/28;21/00*

U.S. Cl. 435—721 **38 Claims**

1. A method of optically screening microscopic cells for cancer, comprising:

providing one of a whole blood or a bone marrow sample including all originally present constituents or a portion thereof including at least a plurality of cells of interest unaltered in number and type with at least some cells appearing to be cancer cells;

combining at least a first sample portion of said cells with at least a first set of microspheres having at least a first reactant bound thereto specific to at least a first specific molecule which can exist on at least one type of cancer cell, said first set of microspheres being smaller than said cells to which said microspheres are bound;

preparing a smear of said cells on a slide including said microspheres;

staining said smear with a histological type stain; and

optically viewing at least some of said cells with a microscope to at least identify the presence or absence of cells to which said first set of microspheres are bound to provide cancer screening information.

5,554,506

ISOLATED, MAGE-3 DERIVED PEPTIDES WHICH COMPLEX WITH HLA-A2 MOLECULES AND USES THEREOF

Pierre van der Bruggen; Thierry Boon-Falleur, both of Brussels, Belgium; Catia Traversari, and Katharina Fleischauer, both of Milan, Italy, assignors to Ludwig Institute For Cancer Research, New York, N.Y.

Filed Mar. 24, 1994, Ser. No. 217,187

Int. Cl.[6] G01N *33/567;33/574;* **C07K** *7/00*

U.S. Cl. 435—7.24 **3 Claims**

3. A method for identifying a sample containing a complex of HLA-A2 and the peptide of SEQ ID No. 4 comprising:

(a) contacting a cytolytic T cell generated to an HLA-A2/SEQ ID NO. 4 peptide complex with a sample suspected of containing a complex of HLA-A2/SEQ ID No. 4 peptide under conditions sufficient for interaction of the HLA-A2-SEQ ID NO. 4 peptide complex with said cytolytic T cell, and

(c) detecting interaction of the HLA-A2/SEQ ID NO. 4 complex with said cytolytic T cell.

5,554,507

BACILLUS SUBTILIS SIDEROPHORE GENES

Trudy H. Grossman, Mount Kisco, N.Y., and Marcia S. Osburne, Lexington, Mass., assignors to American Cyanamid Company, Wayne, N.J.

Continuation-in-part of Ser. No. 922,602, Jul. 30, 1992, abandoned. This application Apr. 22, 1993, Ser. No. 51,142

Int. Cl.[6] C12N *1/21;5/10;15/63;* **C12Q** *1/18*

U.S. Cl. 435—32 **12 Claims**

1. A method for identifying compounds having potential antibiotic activity against microorganisms with an enterobactin-type siderophore comprising contacting a host cell transformed with an isolated nucleic acid sequence comprising nucleotides 198 to 715 of SEQ ID NO:1, or an isolated nucleic acid sequence contained in plasmid pENTA1, pENT4, or pENTB2 with the compound to be tested, and observing the presence or absence of an effect of the compound on the host cell's ability to grow in low iron medium, wherein compounds that inhibit the host cell's ability to grow in low iron medium are identified as compounds with potential antibiotic activity.

5,554,508

PROCESS FOR THE ENZYMATIC SYNTHESIS OF ALKYL ESTERS OF PEPTIDES AND PEPTIDES, AND MICROPARTICLES THEREFROM

Daniel H. Auriol; Francois B. Paul, both of Toulouse, and Pierre F. Monsan, Mondonville, all of France, assignors to Ulice, Riom, France

PCT No. PCT/FR93/00213, § 371 Date Oct. 31, 1994, § 102(e) Date Oct. 31, 1994, PCT Pub. No. WO93/18180, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 2, 1993, Ser. No. 295,845

Claims priority, application France, Mar. 9, 1992, 92 02789

Int. Cl.[6] C12P *21/06;7/62;* **A61K** *9/16;38/01*

U.S. Cl. 435—68.1 **51 Claims**

1. A process for the simultaneous enzymatic synthesis of a mixture of alkyl esters of peptides and peptides comprising:

simultaneously contacting a protein substrate of animal or plant origin with at least one serine protease having both a proteolytic activity and an esterolytic activity on proteins or peptides, and at least one aliphatic alkanol having from 1 to 5 carbon atoms, at a concentration of more than about 30% v/v, wherein the simultaneous contacting is performed at a pH of less than 7, and

recovering a mixture of water soluble and/or alcohol soluble alkyl esters of peptides and peptides having an average molecular mass from about 3,000 to about 10,000 daltons, said mixture having an esterification value of at least 25%.

5,554,509

NUCLEOTIDE PROBES AND METHODS FOR DETERMINING TAQI POLYMORPHISMS IN THE HUMAN APO(A) GENE

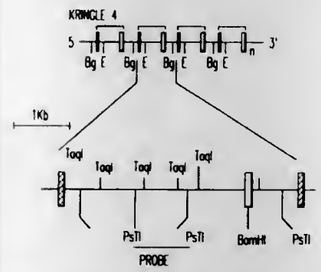
Giuseppe Colucci, and Roberto Taramelli, both of Milan, Italy, assignors to Clonit SpA, Milan, Italy

Filed Jan. 26, 1994, Ser. No. 185,301

Claims priority, application United Kingdom, Jan. 26, 1993, 9301453

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 **14 Claims**



1. A method of determining a TaqI polymorphism within the human Apo(a) gene in a sample of human DNA, which comprises

(a) digesting the sample of human DNA with restriction enzyme TaqI,

(b) contacting the sample human DNA with a probe which hybridizes to human genomic DNA between the TaqI sites immediately 5' and 3' of the polymorphic leader TaqI site of the human Apo(a) gene, said human genomic DNA being detectable by PCR amplification of the Apo(a) gene using the 5' and 3' primers:

5': 5' CCT ATT TGG ATT TTG GAC GC 3'(SEQ ID NO: 1)

3': 5' GAT AAC AGA CCA ATA GCT GT 3'(SEQ ID NO: 2), and

(c) determining the TaqI polymorphism present in the sample by observing the size(s) of the fragment(s) in the sample to which the probe binds.

5,554,510

REGULATION OF GENE EXPRESSION

Melvyn Hollis; David Pioli, both of Alderley Edge, United Kingdom, and Dario Valenzuela, Somerville, Mass., assignors to Imperial Chemical Industries, PLC, London, England, and President and Fellows of Harvard College, Cambridge, Mass.

Continuation of Ser. No. 20,231, Feb. 19, 1993, abandoned, which is a continuation of Ser. No. 573,159, Nov. 27, 1990, abandoned. This application Dec. 1, 1993, Ser. No. 161,170

Claims priority, application United Kingdom, Mar. 31, 1988, 8807683

Int. Cl.[6] C12N *15/09;15/67*

U.S. Cl. 435—69.1 **10 Claims**

1. A regulated expression construct comprising a gene, said gene comprising:

A) a first DNA sequence coding for a protein;

B) a DNA regulatory region operatively associated with said first DNA sequence, said DNA regulatory region having a protein-binding site consisting of adjacent different second and third DNA sequences on complementary strands; wherein said protein binding site binds a heterodimer regulatory protein; wherein said heterodimer regulatory protein consists of different first and second protein monomers which do not naturally form a heterodimer; and wherein

i) said first protein monomer has a DNA-binding domain cognate to said second DNA sequence;

ii) said second protein monomer has a DNA-binding domain cognate to said third DNA sequence; and

iii) wherein said first and second protein monomers associate to form said heterodimer regulatory protein;

C) a fourth DNA sequence coding for said first protein monomer;

D) a fifth DNA sequence coding for said second protein monomer;

wherein upon expression of said fourth and fifth DNA sequences, said first and second protein monomers are made and associate to form said heterodimer, and wherein said heterodimer binds said regulatory region, thereby regulating expression of said first DNA sequence.

10. A method of regulating gene expression in a host cell, said host cell comprising a regulated expression construct comprising a gene, said gene comprising:

A) a first DNA sequence coding for a protein;

B) a DNA regulatory region operatively associated with said first DNA sequence, said DNA regulatory region having a protein-binding site consisting of adjacent different second and third DNA sequences on complementary strands; wherein the protein-binding site binds a heterodimer regulator protein; wherein said heterodimer protein consists of different first and second protein monomers which do not naturally form a heterodimer; and wherein

i) said first protein monomer has a DNA-binding domain cognate to said second DNA sequence;

ii) said second protein monomer has a DNA-binding domain cognate to said third DNA sequence; and

iii) wherein said first and second protein monomers associate to form said heterodimer regulatory protein;

the method comprising supplying in said host cell a heterodimer comprising said first and second different protein monomers whereby when said heterodimer is bound to said protein-binding site, expression of said protein is regulated.

5,554,511
CALCIUM INDEPENDENT CYTOSOLIC PHOSPHOLIPASE A_2/B ENZYMES
Simon Jones, Somerville, and Jin Tang, Canton, both of Mass., assignors to Genetics Institute, Inc., Cambridge, Mass.
Division of Ser. No. 281,193, Jul. 27, 1994. This application Apr. 14, 1995, Ser. No. 422,420
Int. Cl.[6] C12P *21/06;* **A61K** *38/46;* **C12N** *9/20*
U.S. Cl. 435—69.1 **2 Claims**

1. A process for producing a protein having phospholipase activity, said process comprising:
(a) establishing a culture of a host cell in a suitable culture medium, said host cell being transformed with a vector comprising an expression control sequence and a polynucleotide, said polynucleotide comprising a nucleotide sequence selected from the group consisting of:
(1) the nucleotide sequence of SEQ ID NO: 1;
(2) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:2;
(3) allelic variants of the sequence of (1); and
(b) isolating said protein from said culture.

5,554,512
LIGANDS FOR FLT3 RECEPTORS
Stewart D. Lyman, Seattle, and M. Patricia Beckmann, Poulsbo, both of Wash., assignors to Immunex Corporation
Continuation-in-part of Ser. No. 209,502, Mar. 7, 1994, abandoned, which is a continuation-in-part of Ser. No. 162,407, Dec. 3, 1993, abandoned, which is a continuation-in-part of Ser. No. 111,758, Aug. 25, 1993, abandoned, which is a continuation-in-part of Ser. No. 106,463, Aug. 12, 1993, abandoned, which is a continuation-in-part of Ser. No. 68,394, May 24, 1993, abandoned. This application May 11, 1994, Ser. No. 243,545
Int. Cl.[6] C12N *15/19;* **C07H** *21/04*
U.S. Cl. 435—69.5 **21 Claims**

1. An isolated DNA sequence encoding a flt3 ligand (flt-3-L) polypeptide, said DNA selected from the group consisting of:
(a) the coding region of the flt3-L gene;
(b) cDNA sequences that encode a polypeptide having the amino acid sequence selected from the group consisting of amino acids 28 to Xaa of SEQ ID NO:2 and amino acids 28 to Yaa of SEQ ID NO:6, wherein Xaa is an amino acid from 163 to 231, and Yaa is an amino acid from 160 to 235;
(c) DNA sequences that hybridize under moderately stringent conditions to the DNA of (a) or (b), and which DNA sequences encode a polypeptide that binds to flt3 and which is at least 80% identical to a polypeptide encoded by the DNA of (a) or (b); and
(d) DNA sequences that, due to the degeneracy of the genetic code, encode flt3-L polypeptides having the amino acid sequence of the polypeptides encoded by the DNA sequences of (a), (b) or (c).

5,554,513
PRODUCTION OF RECOMBINANT HUMAN INTERFERON-BETA2
Michel Revel, and Asher Zilberstein, both of Rehovot, Israel, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel
Continuation of Ser. No. 860,883, May 8, 1986, abandoned, which is a continuation-in-part of Ser. No. 208,925, Nov. 20, 1980, Pat. No. 5,468,607. This application Dec. 12, 1989, Ser. No. 449,447
Claims priority, application Israel, Nov. 21, 1979, 58765; Oct. 14, 1985, 76714
Int. Cl.[6] C12P *21/04;* **C12N** *15/00;15/22*
U.S. Cl. 435—69.51 **24 Claims**

1. A recombinant vector comprising a DNA sequence which codes for human interferon-beta$_{2_A}$ and further comprising a regulatory region positioned in a way that expression of the human interferon beta$_{2_A}$ is possible.

5,554,514
PRODUCTION OF RECOMBINANT HUMAN INTERFERON BETA 2B
Michel Revel, and Asher Zilberstein, both of Rehovot, Israel, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel
Continuation of Ser. No. 65,404, Jun. 23, 1987, abandoned, which is a division of Ser. No. 860,883, May 5, 1986, abandoned, which is a continuation-in-part of Ser. No. 208,925, Nov. 20, 1980, Pat. No. 5,468,607. This application Feb. 19, 1991, Ser. No. 657,258
Claims priority, application Israel, Nov. 21, 1979, 58765; Oct. 14, 1985, 76714
Int. Cl.[6] C12P *21/04;* **C12N** *15/00;15/22*
U.S. Cl. 435—69.51 **14 Claims**

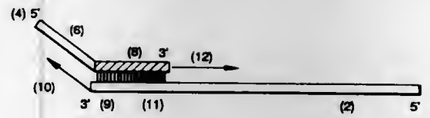
1. DNA consisting essentially of the IFA-11 gene DNA.

5,554,515
PREPARATION OF A MONOCLONAL ANTIBODY SPECIFIC TO HUMAN MYELOMONOCYTE INTERFERON-GAMMA
Masashi Kurimoto, and Masakazu Mitsuhashi, both of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan
Division of Ser. No. 336,224, Nov. 7, 1994, which is a division of Ser. No. 62,323, May 17, 1993, Pat. No. 5,362,490, which is a continuation of Ser. No. 658,740, Feb. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 78,005, Jul. 21, 1987, abandoned, and a continuation-in-part of Ser. No. 379,318, Jul. 13, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 476,040
Claims priority, application Japan, Jul. 25, 1986, 61-176266; May 25, 1987, 62-125777; Jul. 23, 1988, 63-184069
Int. Cl.[6] C12P *21/04;* **A61K** *37/66;* **G01N** *33/53;* **C07K** *7/00*
U.S. Cl. 435—70.21 **5 Claims**

1. A process for preparing a monoclonal antibody specific to human myelomonocyte interferon-gamma, comprising:
propagating an established human myelomonocyte which produces myelomonocyte interferon-gamma;
recovering and purifying the interferon-gamma produced by said human myelomonocyte;
immunizing a non-human warm-blooded animal using the recovered and purified human myelomonocyte interferon-gamma as an antigen;
recovering an antibody producing cell from the animal;
fusing said antibody producing cell with a myeloma cell to produce hybrid cells;
selecting from said hybrid cells a hybrid cell capable of producing antibody specific to human myelomonocyte interferon-gamma; and
culturing the hybrid cell to produce said monoclonal antibody specific to human myelomonocyte interferon-gamma.

5,554,516
NUCLEIC ACID SEQUENCE AMPLIFICATION METHOD, COMPOSITION AND KIT
Daniel L. Kacian; Diane L. McAllister; Sherrol H. McDonough, and Nanibhushan Dattagupta, all of San Diego, Calif., assignors to Gen-Probe Incorporated, San Diego, Calif.
Continuation of Ser. No. 879,686, May 6, 1992, abandoned. This application Dec. 2, 1993, Ser. No. 162,836
Int. Cl.[6] C12P *19/34;* **C12Q** *1/68;* **C07H** *21/04*
U.S. Cl. 435—91.21 **41 Claims**

1. A method of amplifying a target ribonucleic acid sequence comprising the following steps:



a) incubating a mixture comprising:
a target nucleic acid comprising said target ribonucleic acid sequence,
one or more promoter-primers comprising a single nucleic acid sequence comprising a promoter recognizable by an RNA polymerase and a primer located 3' relative to said promoter, said primer being sufficiently complementary to said target nucleic acid to form a promoter-primer:target nucleic acid complex at or near the 3'-end of said target ribonucleic acid sequence, and able to be extended to form a complement of said target ribonucleic acid sequence by a DNA polymerase,
said DNA polymerase, and said RNA polymerase,
at a temperature and in a solution effective to allow amplification of said target ribonucleic acid sequence, said mixture lacking a primer which forms a hybrid with said complement of said target ribonucleic acid sequence; and
b) producing multiple copies of an RNA sequence complementary to said target ribonucleic acid sequence using said target ribonucleic acid sequence as a template.

5,554,517
NUCLEIC ACID AMPLIFICATION PROCESS
Cheryl Davey, Toronto, and Lawrence T. Malek, Brampton, both of Canada, assignors to AKZO Nobel N.V., Netherlands
Continuation of Ser. No. 211,384, Jun. 24, 1988, Pat. No. 5,409,818. This application Feb. 10, 1995, Ser. No. 386,774
Claims priority, application Canada, Feb. 24, 1988, 559709
Int. Cl.[6] C12P *19/34;* **C12Q** *1/68*
U.S. Cl. 435—91.21 **15 Claims**

1. A process for the amplification of an RNA first template or a DNA second template as defined herein, at a relatively constant temperature and without serial addition of reagents, comprising
(A) providing a single reaction medium including a first primer, a second primer having an anti-sense sequence of a promoter, an RNA polymerase that recognizes said promoter, and a DNA polymerase;
(B) providing in said single reaction medium said RNA first template, such that the following steps take place:
(1) hybridizing said first primer to said RNA first template,
(2) synthesizing from said DNA polymerase and said RNA first template a DNA second template by extending said first primer and thereby forming an RNA-DNA hybrid intermediate,
(3) hydrolyzing the RNA of said RNA-DNA hybrid intermediate,
(4) hybridizing said second primer to said DNA second templates
(5) synthesizing from said DNA polymerase, said second primer, and said DNA second template a functional promoter recognized by an RNA polymerase,
(6) having said RNA polymerase recognizing said functional promoter and transcribing said DNA second template, thereby providing copies of said RNA first template,
and thereafter
(C) maintaining said conditions for a time sufficient to achieve a desired amplification of said RNA first template or said DNA second template.

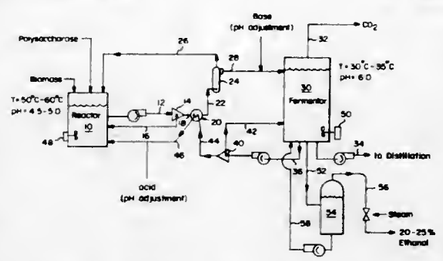
5,554,518
STABILIZED METAL-ION-ACTIVATED L-ARGINASE (L-ARGININE AMIDINO HYDROLASE E.C.3.5.3.1)
Andreas Bommarius, Frankfurt (Main); Karlheinz Drauz, and Kyriakos Makryaleas, both of Freigericht, all of Germany, assignors to Degussa Aktiengesellchaft, Frankfurt am Main, Germany
Continuation of Ser. No. 894,769, Jun. 10, 1992, abandoned. This application Oct. 17, 1994, Ser. No. 323,609
Claims priority, application Germany, Jun. 10, 1991, 41 19 029.7
Int. Cl.[6] C12P *13/10;* **C12N** *9/80*
U.S. Cl. 435—114 **9 Claims**

1. In a method for the enzymatic production of L-ornithine from L-arginine in which L-arginine is converted to L-ornithine in an aqueous solution by means of mammalian liver L-arginase and L-arginase is recovered, the improvement in which ascorbic acid is present in dissolved form in the solution in at least 10-fold molar amount relative to the L-arginase, and conversion to L-ornithine takes place in quiescent solution.

5,554,519
PROCESS FOR PREPARING GENISTEIN
J. Mark Weber, Chicago; Andreas Constantinou, Naperville, and Paul E. Hessler, Berwyn, all of Ill., assignors to Ferma-Logic, Inc., Chicago, Ill.
Filed Aug. 7, 1995, Ser. No. 512,192
Int. Cl.[6] C12P *17/06*
U.S. Cl. 435—125 **11 Claims**

1. A process of preparing genistein comprising fermenting *Saccharopolyspora erythraea* on a soy-based substrate and recovering the genistein.

5,554,520
ETHANOL PRODUCTION BY RECOMBINANT HOSTS
David E. Fowler; Philip G. Horton, and Arie Ben-Bassat, all of Gainesville, Fla., assignors to BioEnergy International, L.C., Gainesville, Fla.
Continuation-in-part of Ser. No. 946,290, Sep. 17, 1992, Pat. No. 5,487,989, which is a continuation-in-part of Ser. No. 846,344, Mar. 6, 1992, Pat. No. 5,424,202, which is a continuation-in-part of Ser. No. 670,821, Mar. 18, 1991, abandoned, and Ser. No. 624,277, Dec. 7, 1990, abandoned, each which is a continuation-in-part of Ser. No. 352,067, May 15, 1989, Pat. No. 5,000,000, which is a continuation-in-part of Ser. No. 239,099, Aug. 31, 1988, abandoned. This application Mar. 5, 1993, Ser. No. 26,051
Int. Cl.[6] C12P *7/10;7/14*
U.S. Cl. 435—165 **45 Claims**



1. A method for producing ethanol from cellulose-containing biomass, comprising the steps of:
A. contacting, in a first reaction vessel, said biomass with a polysaccharase enzyme such that the cellulose in said biomass is broken down into simpler oligosaccharides and/or monosaccharides;

wherein said contacting is carried out at a temperature of from about 40° C. to about 60° C. and a pH of from about 4.5 to about 5.0;

B. producing from said first reaction vessel a sugar solution comprising at least glucose, other cellulose-derived sugars and hemicellulose-derived sugars;

C. reacting said sugar solution of Step B to biologically consume a portion of the sugar solution thereby producing (i) a reaction product stream and (ii) a depleted sugar solution;

D. introducing said depleted sugar solution into a fermentor which comprises gram-negative enteric recombinant bacteria capable of fermenting the sugars present in said depleted sugar solution; and

E. fermenting said sugars in the depleted sugar solution into ethanol at a temperature of from about 30° C. to about 35° C. and a pH of about

wherein said bacteria are capable of fermenting said sugars in the depleted sugar solution into ethanol, and comprises a recombinant host, other than *Escherichia coli*, comprising a first heterologous DNA coding for alcohol dehydrogenase and pyruvate decarboxylase, wherein said heterologous DNA is from *Zymomonas mobilis* and wherein said host expresses said heterologous DNA at a sufficient functional level so as to facilitate the production of ethanol as the primary fermentation product by said host,

wherein said host also produces a polysaccharase, and said host further comprises a second heterologous DNA segment, the expression product of which is said polysaccharase.

5,554,521

CHITINASE-PRODUCING PLANTS

Trevor V. Suslow, El Cerrito, Calif., and Jonathan D. G. Jones, Norwich, United Kingdom, assignors to DNA Plant Technology Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 930,970, Aug. 14, 1992, Pat. No. 5,290,687, which is a continuation of Ser. No. 550,253, Jul. 9, 1990, Pat. No. 5,374,540, which is a continuation-in-part of Ser. No. 888,033, Jul. 8, 1986, Pat. No. 4,940,840, which is a continuation-in-part of Ser. No. 593,691, Mar. 26, 1984, Pat. No. 4,751,081. This application Dec. 19, 1994, Ser. No. 358,901

Int. Cl.[6] C12N *15/56;15/62;15/82;15/29*

U.S. Cl. 435—172.3 **25 Claims**

9. A method of preparing a fruit having an enhanced level of reducing sugar, said method comprising transforming a plant which produces said fruit with DNA which encodes chitinase;

growing said plant under chilling or freezing temperatures;

selecting fruit from said plant which display reduced chilling or freezing damage.

5,554,522

DIHYDRODIPICOLINATE REDUCTASE CRYSTALS AND THREE DIMENSIONAL STRUCTURE

James Sacchettini, New Rochelle, and John Blanchard, Pelham Manor, both of N.Y., assignors to Albert Einstein College of Medicine of Yeshiva University, a Division of Yeshiva University, Bronx, N.Y.

Filed Apr. 28, 1994, Ser. No. 234,135

Int. Cl.[6] C12N *9/02*

U.S. Cl. 435—189 **6 Claims**

1. An isolated dihydrodipicolinate reductase-NADPH crystallized complex in the form of a parallelepiped with a space group of I222, and having unit cell constants of a=75.3 Å, b=81.5 Å, c=94.2 Å, and $\alpha=\beta=\gamma=90°$.

5,554,523

NUCLEIC ACID SEQUENCES ENCODING HUMAN LEUCINE-ZIPPER PROTEIN-KINASE

Usharani Reddy, North Wales, and David Pleasure, Wynnewood, both of Pa., assignors to Children's Hospital of Philadelphia, Philadelphia, Pa.

Filed Mar. 1, 1994, Ser. No. 205,018

Int. Cl.[6] C12N *1/20;15/00;9/12*

U.S. Cl. 435—194 **6 Claims**

6. A method of producing leucine-zipper protein kinass which comprises culturing recombinant host cells wherein said host cells are transformed with cDNA encoding a protein which is at least 85% homologous to a protein encoded by SEQ ID NO:1 operably linked to regulatory control sequences which effect the expression of said coding sequence in said transformed host cells and isolating said leucine-zipper protein kinase produced by said host cells.

5,554,524

MORE COMPLEX TYPE RETROVIRUSES HAVING MIXED TYPE LTR, AND USES THEREOF

Howard M. Temin, Madison, and Kathleen A. Boris-Lawrie, Middleton, both of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation of Ser. No. 21,622, Feb. 17, 1993, abandoned. This application Jun. 22, 1994, Ser. No. 264,115

Int. Cl.[6] C12N *7/00;7/01;15/00;15/09*

U.S. Cl. 435—235.1 **12 Claims**

4. A plurality of recombinant retroviral expression vectors capable of expressing replication competent retroviral virus particles, each expression vector comprising:

an S Type retroviral long terminal repeat and DNA encoding MC Type retroviral protein, wherein each expression vector encodes a MC Type att, pbs, E, and ppt, and wherein the encoded MC Type retroviral protein is human immunodeficiency viral Env, Gag, or Pol protein;

wherein all three of said human immunodeficiency viral Env, Gag and Pol cannot be expressed from any single such expression vector, but all can be expressed collectively by said plurality of expression vectors.

5,554,525

CHICKEN ANEMIA VIRUS VACCINE AND DIAGNOSTIC

Paulus J. A. Sondermeijer, and Johannes A. J. Claessens, both of Boxmeer, Netherlands, assignors to Akzo Nobel N.V., Arnhem, Netherlands

Continuation of Ser. No. 605,881, Oct. 31, 1990, abandoned. This application Jul. 20, 1992, Ser. No. 917,722

Int. Cl.[6] C12N *15/34;7/01;1/21;5/10*

U.S. Cl. 435—240.1 **9 Claims**

1. An isolated and purified DNA molecule comprising a chicken anemia virus DNA fragment encoding a polypeptide having an amino acid sequence shown in SEQ ID NO:2, wherein said DNA fragment is substantially free of other chicken anemia virus DNA that codes for other chicken anemia virus polypeptides.

5,554,526

HUMAN PARAINFLUENZA VIRUS TYPE 4A FUSION PROTEIN AND GENE CODING FOR THE SAME

Kunio Komdo, Ushiku; Mitsuo Kawano, and Yasuhiko Ito, both of Tsu, all of Japan, assignors to Fujikura Kasei Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 915,826, Jul. 28, 1992, abandoned. This application Oct. 11, 1994, Ser. No. 321,587

Claims priority, application Japan, Nov. 29, 1990, 2-325171

Int. Cl.[6] C12N *5/00;15/00;* **C12Q** *1/68;* **C07H** *17/00*

U.S. Cl. 435—240.1 **10 Claims**

1. An isolated DNA sequence consisting of the base sequence shown in SEQ ID NO. 1 or a base segment of at least 20 bases shown in SEQ ID NO. 1 that is specific for the identification of PIV-4A.

5,554,527

AGENT FOR THE STORAGE AND SUSPENSION OF CELLS, ESPECIALLY ERYTHROCYTES

Karl Fickenscher, Marburg, Germany, assignor to Behringwerke Aktiengesellschaft, Marburg, Germany

Continuation of Ser. No. 606,922, Oct. 31, 1990, abandoned. This application Apr. 20, 1992, Ser. No. 871,575

Claims priority, application Germany, Nov. 24, 1989, 39 38 907.3

Int. Cl.[6] C12N *5/00;* **A01N** *1/02;* **G01N** *33/53;31/00*

U.S. Cl. 435—240.1 **6 Claims**

1. A method for the preservation and storage of erythrocytes in a suspendable form comprising the steps of: a) separating erythrocytes from blood containing said erythrocytes; and b) suspending the separated erythrocytes in an aqueous solution buffered at a pH of 5 to 9, and containing 2 to 50 mmol/l of a chelating agent for the chelation of multiply charged ions, wherein the aqueous solution in step (b) further comprises per liter 3–100 mmol of glucose or fructose, 20–200 mmol of sodium chloride, 10–50 mmol of potassium chloride, 0.5–10 mmol of magnesium chloride, 2–100 mmol of HEPES, 0–100 mmol of sodium phosphate, 10,000–20,000 units of heparin, 1–5 grams of gelatin or polygeline, 2–50 mmol of ATP and 0–1 g of 5-chloro-2-methyl-3[2H]isothiazolone and 2-methyl-3 isothiazolone or chloramphenicol, and wherein the erythrocytes are preserved for at least six months.

5,554,528

COMPOSITIONS AND METHODS FOR INHIBITION OF HIV PRODUCTION

Gail M. Harrison; Ian H. Maxwell; Tyler J. Curiel, and Francoise Maxwell, all of Denver, Colo., assignors to Board of Revents of University of Colorado, Boulder, Colo.

Continuation-in-part of Ser. No. 685,601, Apr. 15, 1991, Pat. No. 5,306,631, which is a continuation-in-part of Ser. No. 88,086, Aug. 21, 1987, abandoned. This application Nov. 4, 1993, Ser. No. 147,829

Int. Cl.[6] C12N *5/00;15/00*

U.S. Cl. 435—240.2 **20 Claims**

1. A stably transformed cell line of mammalian origin, wherein the genome of said cell line has been genetically engineered to contain an HIV-regulated chimeric diphtheria toxin gene, wherein said diphtheria toxin gene is expressed under the regulatory control of HIV cis-acting sequences and HIV trans-acting factors, wherein the expression of said HIV-regulated chimeric diphtheria toxin gene is activated by HIV trans-acting factors present when and if said cell line becomes HIV-infected, whereby said HIV-infected cell is selectively killed.

5,554,529

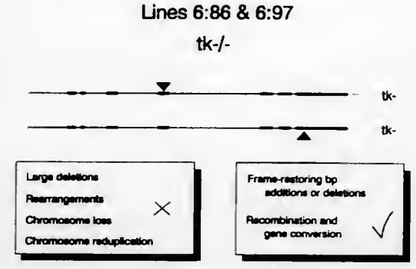
CELL LINES AND METHODS FOR ASSAYING HUMAN INTERCHROMOSOMAL RECOMBINATION

Mark B. Benjamin, Boston, and John B. Little, Brookline, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Continuation of Ser. No. 738,316, Jul. 31, 1991, abandoned. This application May 9, 1994, Ser. No. 239,924

Int. Cl.[6] C12N *5/08;15/01;15/54;15/11*

U.S. Cl. 435—240.2 **7 Claims**



1. A human cell line which has a different mutation in each allele of the endogenous thymidine kinase gene resulting in the loss of a selectable phenotype and which can revert to the phenotype by homologous interallelic recombination but not by large deletions of nucleotides or by chromosome loss.

5,554,530

ASEPTIC IN VITRO ENDOMYCORRHIZAL SPORE MASS PRODUCTION

J. AndréFortin, Neufchatel; Marc St-Arnaud, Laval; Chantal Hamel, St-Roch-de-l'Achigan; Claude Chavarie, and Mario Jolicoeur, both of Montréal, all of Canada, assignors to Université de Montréal, Montreal, Canada

Continuation-in-part of Ser. No. 102,950, Aug. 6, 1993, abandoned. This application Aug. 4, 1994, Ser. No. 286,116

Int. Cl.[6] C12N *1/14;1/04;* **A01H** *15/00;17/00*

U.S. Cl. 435—256.8 **18 Claims**

1. A method of producing endomycorrhizal fungal spores in vitro in a two-compartment container having a gellified medium, which comprises:

a) cultivating aseptically transformed dicotyledon root organs, capable of autonomous growth in vitro, in a first compartment containing a mineral minimal medium with sugar, wherein said medium is suitable for root growth;

b) inoculating said transformed root organs with endomycorrhizal fungal spores selected from the group consisting of *Glomus intraradices, Glomus aggregatum, Glomus versiforme, Scutellospora heterogama, Glomus etunicatum, Glomus mosseae, Glomus lamellosum, Glomus macrocarpum, Gigaspora margarita*, and *Sclerocystis sp. :*

c) cultivating said inoculated transformed root organs for a time sufficient for the endomycorrhizal fungi to grow into a second root-free and root exudate-free compartment containing a mineral minimal medium without sugar and for production of endomycorrhizal fungal spores to occur in said second compartment; and

d) recovering said produced endomycorrhizal fungal spores of step c) from said second root-free compartment gellified medium.

5,554,531

DEVICE FOR PERFORMING TIMED ASSAY BY

5,554,533

APPARATUS AND METHOD FOR REARING

5,554,535

WHITE-ROT FUNGUS AND USES THEREOF

Robert A. Blanchette, Shoreview, Minn.; Theresa S. Rush

5,554,537

NON-DESTRUCTIVE SURFACE SAMPLER

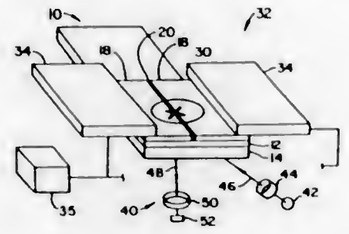
Anthony N. Sharpe, Almonte, Canada, assignor to Her Majesty

5,554,531

DEVICE FOR PERFORMING TIMED ASSAY BY ELECTRICAL RESISTANCE CHANGE

Stephen E. Zweig, Los Gatos, Calif., assignor to Avocet Medical, Inc., Los Gatos, Calif.

Continuation of Ser. No. 267,051, Jun. 17, 1994, abandoned. This application Aug. 7, 1995, Ser. No. 512,134
Int. Cl.[6] G01N *21/01*
U.S. Cl. 435—286.1 12 Claims



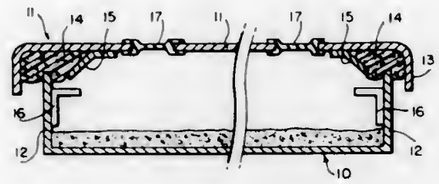
1. A detection unit comprising:
a support stage for receiving a test article, the test article having spaced-apart electrodes in electrical contact with a reaction zone, wherein the reaction zone on the test article is disposed at a viewing location;
a heater attached to the support stage for heating the test article in the region of the reaction zone;
means attached to the support stage for detecting electrical resistance across the test article;
means attached to the support stage for optically viewing the reaction zone when disposed at the viewing location;
means in communication with the electrical resistance detecting means for initiating a timing cycle when the electrical resistance detecting means detects a lowering of electrical resistance across the test article upon application of a fluid sample having an amount of analyte therein to the test article;
means for actuating the optical viewing means and the electrical resistance detecting means at one or more times during the timing cycle to measure one or more optically detectable signals and electrical resistance values at known times during the timing cycle; and
means for correlating the measured signals and values from the optical viewing means and the electrical resistance detecting means with the known times at which the signals and values are measured so that the amount of analyte initially present in the sample may be determined.

5,554,533

APPARATUS AND METHOD FOR REARING NEMATODES, FUNGI, TISSUE CULTURES AND THE LIKE, AND FOR HARVESTING NEMATODES

Robin A. Bedding, Flynn; Michael A. Stanfield, Tasmania, and Graham W. Crompton, Grenfell, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organisation, Campbell, Australia

Continuation of Ser. No. 955,899, Dec. 11, 1992, abandoned. This application Mar. 27, 1995, Ser. No. 411,078
Claims priority, application Australia, Apr. 11, 1990, PJ9571
Int. Cl.[6] C12N *1/12*
U.S. Cl. 435—252.1 9 Claims



1. A culture vessel for the large scale rearing of infective juvenile entomopathogenic nematodes, fungi, and tissue cultures, said culture vessel comprising:
(a) a substantially flat tray having a continuous wall extending substantially orthogonally from the periphery of said tray;
(b) a substantially flat lid having essentially the same shape as said tray but dimensions greater than said tray, so that when said lid is positioned to cover said tray, a periphery of said lid is outside said wall; said lid having a continuous side wall which extends substantially orthogonally from the periphery of said lid;
said lid including at least one flange, said at least one flange extending from the same face of the lid as the side wall of the lid, said at least one flange being substantially parallel to the side wall of the lid and being inclined towards the side wall of the lid so as to form a gutter between said at least one flange and said side wall; said lid further provided with at least one aperture which is closed by a seal of a flexible, resilient, autoclavable material; and
(c) an air permeable gasket of medium density polyether polyurethane foam positioned around the edge of said lid within said gutter and adjacent to said lid side wall, whereby when said lid is placed on said tray, said gasket is contacted by the upper edges of the tray wall.

5,554,532

BACTERIA USEFUL FOR PRODUCTION OF OPTICALLY ACTIVE 3-PHENYL-1,3-PROPANEDIOL

Akinobu Matsuyama; Michio Ito, both of Arai; Yoshinori Kobayashi, Joetsu, and Naoki Kawada, Tsukuba, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 844,609, Apr. 7, 1992, Pat. No. 5,356,812. This application Apr. 7, 1994, Ser. No. 224,303
Claims priority, application Japan, Aug. 10, 1990, 2-211861; Oct. 15, 1990, 2-276101; Jul. 4, 1991, 3-164354
Int. Cl.[6] C12N *1/12;1/20*
U.S. Cl. 435—252.1 4 Claims

1. A biologically pure culture of *Serratia sp.* No. 2664 (FERM BP-4319) which is capable of increasing the optical purity of (S)-3-phenyl-1,3-propanediol from a mixture of (R) and (S) enantiomers of 3-phenyl-1,3-propanediol.

5,554,534

BACILLUS THURINGIENSIS TOXINS ACTIVE AGAINST SCARAB PESTS

Tracy E. Michaels, Ames, Iowa; Kenneth E. Narva, San Diego, and Luis Foncerrada, Vista, both of Calif., assignors to Mycogen Corporation, San Diego, Calif.

Division of Ser. No. 14,941, Feb. 1, 1993, abandoned, which is a continuation-in-part of Ser. No. 828,430, Jan. 30, 1992, Pat. No. 5,185,148, which is a continuation-in-part of Ser. No. 808,316, Dec. 16, 1991, abandoned. This application Sep. 30, 1994, Ser. No. 315,468
Int. Cl.[6] C12N *1/21;15/32;* C07K *14/325*
U.S. Cl. 435—252.3 4 Claims

1. An isolated polynucleotid encoding a toxin which is active against scarab pests, said polynucleotide encoding the amino acid sequence of SEQ ID NO. 4 or a fragment thereof sufficient to retain anti-scarab activity.

5,554,535

WHITE-ROT FUNGUS AND USES THEREOF

Robert A. Blanchette, Shoreview, Minn.; Theresa S. Brush, Lexington, Mass.; Roberta L. Farrell, Danvers, Mass.; Keith A. Krisa, Somerville, Mass., and Chittra Mishra, Lexington, Mass., assignors to Clariant Finance (BVI) Limited, Tortola, Virgin Islands (Br.)

Continuation of Ser. No. 198,459, Feb. 18, 1994, Pat. No. 5,427,945, which is a continuation of Ser. No. 276,081, Nov. 23, 1988, abandoned. This application Oct. 28, 1994, Ser. No. 330,874
Int. Cl.[6] C12N *1/14;* C12P *1/02;* C02F *3/00*
U.S. Cl. 435—254.1 5 Claims

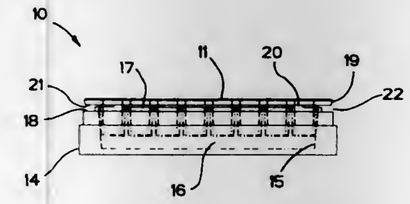
1. A culture composition comprising a biologically pure culture of *Scytinostroma galactinum* strain F361 fungus which is capable of producing manganese oxide in stationary liquid culture when veratryl alcohol is present and when wood, is absent and a lignolytic enzyme inducer selected from the group consisting of an isolated and purified lignin, a cellulosic substrate containing a bound lignin component and an aromatic ring-containing lignin component degradation product which is unbound to a cellulosic substrate.

5,554,536

BIOLOGICAL ANALYSIS DEVICE HAVING IMPROVED CONTAMINATION PREVENTION

Donald B. Rising, Stow, Mass., assignor to Millipore Investment Holdings Limited, Wilmington, Del.

Filed Jan. 5, 1995, Ser. No. 369,212
Int. Cl.[6] C12M *3/06*
U.S. Cl. 435—305.1 9 Claims



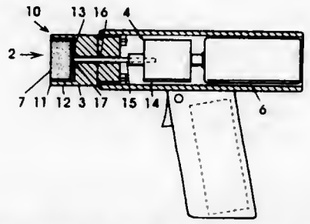
1. A device for conducting biological analyses comprising:
a tray with a bottom surface and contiguous side surfaces defining at least one reservoir for holding a liquid solution;
a ledge extending around the periphery of said reservoir;
means defining a ridge on said ledge between the interior of said reservoir and the exterior of said tray;
sample receptacle support means adapted to cover the opening of said reservoir at least in the vicinity of said ridge and said ledge;
means for spacing said support means from said ridge to create a first capillary space therebetween extending about the periphery of said reservoir to permit the exchange of gas from the exterior of said device to the interior of said reservoir and vice-versa;
said ledge and said support means creating a second space adjacent to said first capillary space, the height of said first capillary space being less than that of said second space, whereby said liquid solution in said reservoir will preferentially remain in said first capillary space in the event said liquid solution spills out of said reservoir.

5,554,537

NON-DESTRUCTIVE SURFACE SAMPLER

Anthony N. Sharpe, Almonte, Canada, assignor to Her Majesty the Queen in right of Canada as represented by the Minister of Health and Welfare Canada, Ottawa, Canada

Filed Nov. 29, 1995, Ser. No. 563,976
Int. Cl.[6] C12M *1/26*
U.S. Cl. 435—309.1 6 Claims



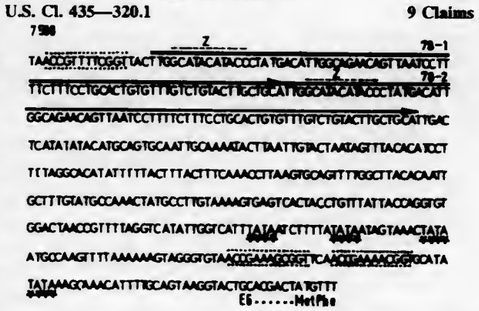
1. A surface sampler for microbiological analysis comprising:
a scrubber-retainer comprising a compressible liquid absorbing elastic material for scrubbing a test surface and releasably retaining a liquid;
a chamber disposed around the scrubber-retainer, said chamber having an open front end to allow the material to contact a test surface, side walls defining a sealing edge for sealing engagement against the test surface, and a rear portion for confining a region around the scrubber-retainer against the test surface to be sampled; and
drive means for moving the scrubber-retainer to scrub the test surface and release analytes from the test surface, and alternately compressing and decompressing the compressible material to allow liquid to be alternately released and absorbed, respectively, to produce a suspension of the released analytes.

5,554,538

DNA SEQUENCES DERIVED FROM PAPILLOMAVIRUS HPV-33 GENOME

Stewart Cole, Chatillon Sous Bagneux, and Rolf E. Streeck, La Celle St-Cloud, both of France, assignors to Institut Pasteur, Paris, France

Continuation of Ser. No. 161,239, Nov. 10, 1993, abandoned, which is a continuation of Ser. No. 32,694, Mar. 17, 1993, abandoned, which is a continuation of Ser. No. 908,895, Jul. 8, 1992, abandoned, which is a continuation of Ser. No. 664,503, Mar. 5, 1991, abandoned, which is a continuation of Ser. No. 518,302, May 2, 1990, abandoned, which is a continuation of Ser. No. 128,341, Nov. 20, 1987, abandoned. This application Mar. 25, 1994, Ser. No. 222,569
Claims priority, application European Pat. Off., Mar. 21, 1986, 86400609
Int. Cl.[6] C12N *15/37*
U.S. Cl. 435—320.1 9 Claims



1. An isolated DNA consisting of the 78 base sequence identified as 78-1 in FIG. 3.

5,554,539

DETERMINATION OF AN ANALYTE

5,554,540

METHOD AND APPARATUS FOR PRESERVING THE

5,554,542

IMMUNOASSAY FOR ISOTHIAZOLONES

Gary L. Willingham, Glenside, Pa.; Richard F. Schumer,

5,554,544

FIELD EDGE MANUFACTURE OF A T-GATE LDD POCKET DEVICE

5,554,539
DETERMINATION OF AN ANALYTE

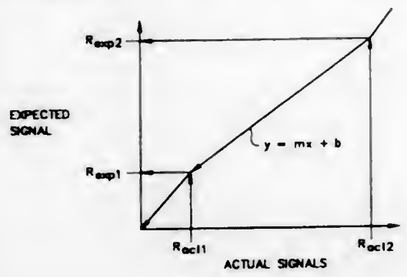
Donovan C. Chadney, Chinnor, and Kevin P. J. Doyle, Tring, Herts, both of England, assignors to Johnson & Johnson Clinical Diagnostics, Inc., Rochester, N.Y.

Filed Dec. 21, 1994, Ser. No. 360,481

Claims priority, application United Kingdom, Dec. 22, 1993, 93026197; Jan. 17, 1994, 94012141

Int. Cl.[6] G01N *31/00*

U.S. Cl. 436—8 **4 Claims**



1. A method of recalibrating in an analyzer, a calibration relationship between concentrations of analyte and analyzer-generated signals corresponding to those concentrations, using a factory-prepared relationship for N number of concentrations, wherein each concentration has an expected signal value R_{exp}, the method comprising the steps of:

a) selecting at least two calibrators of differing concentrations one being higher in analyte value than the other, so that one (C_1) is at a high concentration and one (C_2) at a low concentration, respectively, that are optionally independent of the value of the concentrations of said N number;

b) ascertaining actual signals $R_{act1}+R_{act2}$ produced by each of said at least two calibrators in said analyzer;

c) ascertaining which of said N number of concentrations $(C_i)_{low}$ have an expected signal value below the actual signal of said low concentration-selected calibrator of step a) and which concentrations $(C_i)_{high}$ have an expected signal value greater than the actual signal of said high concentration-selected calibrator of step a);

d) forming the ratio of R_{act1}/R_{exp1} and R_{act2}/R_{exp2}, where R_{exp1} and R_{exp2} are predicted signals expected for concentration C_1 and C_2 using said factory-prepared relationship;

e) producing a corrected signal for each of said concentrations $(C_i)_{low}$ by multiplying each signal $(R_{exp})_{low}$ for each of said below concentration values by the ratio R_{act1}/R_{exp1} and a corrected signal for each of said concentrations $(C_i)_{high}$ by multiplying each signal $(R_{exp})_{high}$ for each of said greater concentration values by the ratio R_{act2}/R_{exp2};

f) for each of said N number of concentrations having values between C_1 and C_2, producing a corrected signal $PS_{remainder}$ in accord with the following formula:

$$PS_{remainder}=(R_{act2}-R_{act1})/(R_{exp2}-R_{exp1})\cdot(R_{expremainder}-R_{exp1})+R_{act1};$$

g) ascertaining the relationship for the corrected signals so obtained in steps e)–f) versus the N number of concentrations; and

h) providing a best curve fit for data points between the N number of concentrations to obtain the recalibrated relationship.

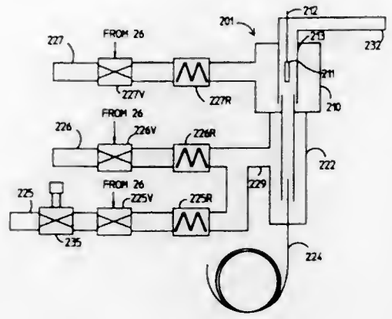
5,554,540
METHOD AND APPARATUS FOR PRESERVING THE SENSITIVITY OF A THERMIONIC IONIZATION DETECTOR

Chinkai Meng, Hockessin, Del., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 19, 1995, Ser. No. 375,019

Int. Cl.[6] G01N *30/02*

U.S. Cl. 436—153 **8 Claims**



8. An analytical method, comprising the steps of:

providing a selectable flow of a detector support fluid;

providing a fluid mixture including the selectable flow of the detector support fluid, an analyte, and a solvent,

providing a thermionic ionization detector for receiving the fluid mixture wherein the presence of the solvent at the thermionic ionization detector occurs in a solvent elution period;

effecting a reduction in the selectable flow of the detector support fluid to a reduced flow for a flow reduction period, and

coordinating the flow reduction period with the solvent elution period.

5,554,541
CHARACTERIZING MACROMOLECULES INTERACTING WITH AT LEAST THREE LIGANDS ON A SENSOR

Magnus Malmqvist; Robert Karlsson; Anita Larsson, all of Uppsala, and Jörgen Sjödal, Knivsta, all of Sweden, assignors to Pharmacia Biosensor AB, Uppsala, Sweden

Continuation of Ser. No. 681,530, May 10, 1991, abandoned. This application Dec. 30, 1994, Ser. No. 366,443

Claims priority, application Sweden, Nov. 10, 1988, 8804074; Jun. 5, 1989, 8902043

Int. Cl.[6] G01N *33/543*

U.S. Cl. 436—518 **14 Claims**

1. A method of discriminating between and mapping epitopes of a macromolecule by studying its interactions with ligands, comprising the steps of:

determining blocking or non-blocking of the epitopes by the ligands by, after the macromolecule has interacted with at least one ligand, sequentially contacting the macromolecule with at least two additional ligands, either the macromolecule or one of the at least two additional ligands having been bound to a sensor surface;

determining ligand binding interaction by detecting a change in the physico-chemical properties of the sensor surface; and

discriminating between epitopes of the macromolecule and mapping their relative positions on the basis of the determined blocking or non-blocking of the epitopes by the ligands.

5,554,542
IMMUNOASSAY FOR ISOTHIAZOLONES

Gary L. Willingham, Glenside, Pa.; Richard F. Schuman, North Potomac; Chun-Hsien Huang, Rockville, both of Md., and John S. Chapman, Ambler, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 927,765, Sep. 28, 1992, abandoned. This application Sep. 28, 1993, Ser. No. 128,451

Int. Cl.[6] G01N *33/531*; **C12N** *5/20*; **C07K** *16/44*

U.S. Cl. 436—548 **5 Claims**

1. Hybridoma having all of the identifying characteristics of ATCC Patent Deposit B9-14715H9-1[1]H6.

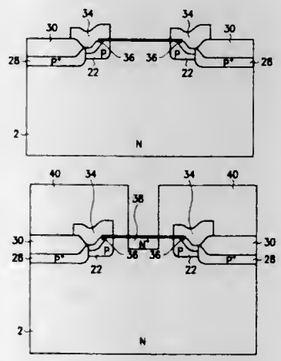
5,554,543
PROCESS FOR FABRICATING BIPOLAR JUNCTION TRANSISTOR HAVING REDUCED PARASITIC CAPACITANCE

Sheng-Hsing Yang, Hsinchu, Taiwan, assignor to United Microelectronics Corporation, Hsinchu, Taiwan

Filed May 24, 1995, Ser. No. 449,625

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—31 **7 Claims**



1. A process for fabricating a bipolar junction transistor device on a semiconductor substrate of a first conductivity type, wherein said substrate serves as a collector for said bipolar junction transistor device, comprising:

forming a shielding layer with designated pattern on said substrate;

implanting impurities of a second conductivity type into said substrate to form doped regions by utilizing said shielding layer as masking;

forming a first oxide layer over said doped regions through a first thermal oxidation;

removing said first oxide layer;

forming spacers on the sidewalls of said shielding layer;

implanting impurities of the second conductivity type into said substrate to form heavily-doped regions by utilizing said shielding layer and spacers as masking;

forming a second oxide layer over said heavily-doped regions through a second oxidation;

removing said spacers to form trenches in places of said spacers;

forming emitter electrodes on said doped regions via said trenches, and forming emitter regions of the first conductivity type beneath said emitter electrodes; and

forming a contact region of the first conductivity type in said collector.

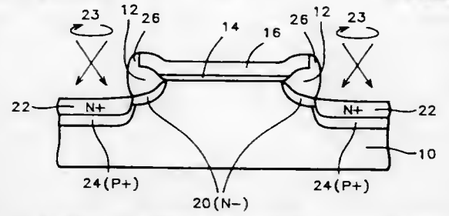
5,554,544
FIELD EDGE MANUFACTURE OF A T-GATE LDD POCKET DEVICE

Chen-Chung Hsu, Taichung, Taiwan, assignor to United Microelectronics Corporation, Hsin-Chu, Taiwan

Filed Aug. 9, 1995, Ser. No. 512,834

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—35 **15 Claims**



1. The method of manufacturing a T-gate LDD pocket device integrated circuit comprising:

providing field oxide regions in and on the surface of a semiconductor substrate wherein said T-gate device will be formed between said field oxide regions;

providing a gate oxide layer on the surface of said semiconductor substrate between said field oxide regions;

depositing a layer of polysilicon over the surface of said gate oxide layer;

etching away portions of said polysilicon layer leaving said polysilicon layer only between and over the inner edges of said field oxide regions;

covering said remaining polysilicon layer with a photoresist mask wherein the inner edges of said field oxide regions underlying said polysilicon layer are protected by said photoresist mask;

etching away said field oxide regions not covered by said photoresist mask to form said T-gate device;

implanting first ions having a first conductivity type at a tilt angle to form lightly doped regions at the surface of said semiconductor substrate from which said field oxide regions have been removed and underlying the inner edges of said remaining field oxide regions;

implanting second ions of said first conductivity type to form first heavily doped regions at the surface of said semiconductor substrate from which said field oxide regions have been removed;

forming spacers on the sidewalls of said T-gate device wherein said spacers protect said lightly doped regions from degradation; and

implanting third ions of a second conductivity type wherein said second conductivity type is opposite to said first conductivity type to form pocket heavily doped regions underlying said first heavily doped regions to complete the fabrication of said T-gate LDD pocket device in the manufacture of said integrated circuit.

5,554,545
METHOD OF FORMING NEURON MOSFET WITH DIFFERENT INTERPOLYSILICON OXIDE THICKNESS

Chung-Cheng Wu, Toucheng, and Ming-Tzong Yang, Hsin Chu, both of Taiwan, assignors to United Microelectronics Corporation

Filed Sep. 1, 1994, Ser. No. 299,266

Int. Cl.[6] H01L *21/265*

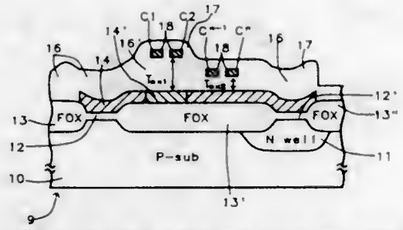
U.S. Cl. 437—40 **16 Claims**

1. In a process for fabricating a semiconductor device with a plurality of conductors capacitively coupled to a first electrode, comprising the steps as follows:

forming a mask on the surface of said first electrode, said mask having an opening through said mask exposing a zone of said first electrode, doping said zone of said first electrode through said opening in said mask.

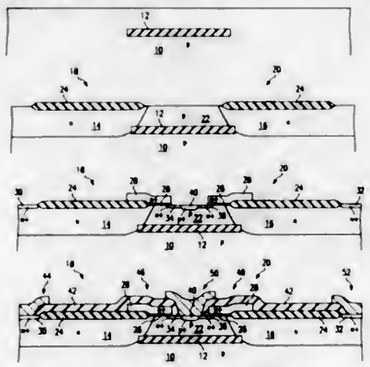
forming a gate insulating layer on said face over the portion of said channel region between said first and second doped regions; and

(d) then subjecting the structure to a first ion implantation of N type dopant material, to a dosage level such that the implanted silicon becomes lightly N type;



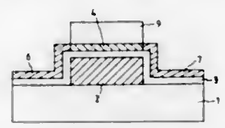
removing said mask from the surface of said first electrode,
oxidizing said first electrode to form a layer of oxide over said first electrode, said layer of oxide having a variable thickness with said layer of oxide being thicker over said zone than and a thinner layer of oxide formed elsewhere,
forming at least one electrode over said first electrode on said thinner layer of oxide aside from said zone, and
forming at least one other electrode over said first electrode on said thicker layer of oxide above said zone,
whereby said one electrode and said other electrode have substantially different capacitive coupling to said electrode.

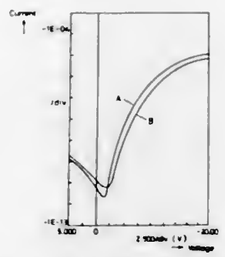
5,554,546
METHOD OF FABRICATING A HIGH VOLTAGE TRANSISTOR
Satwinder Malhi, Garland, Tex., assignor to Texas Instruments Inc., Dallas, Tex.
Division of Ser. No. 342,398, Nov. 18, 1994, which is a continuation of Ser. No. 317, Jan. 4, 1993, abandoned. This application Oct. 17, 1995, Ser. No. 513,056
Int. Cl.[6] H01L *21/8234*
U.S. Cl. 437—40 **9 Claims**



1. A method for fabricating a semiconductor device comprising the steps of:
providing a substrate having a first conductivity type;
forming a body insulating layer in said substrate beneath a face of said substrate and spaced from said face;
forming a first doped region of a second conductivity type, said first doped region extending from said face into said substrate to a depth equal to or greater than said insulating layer and surrounding said body insulating layer, thereby isolating a channel region of said substrate between said face, said body insulating layer and said first doped region;
forming a first contact providing conductive contact to said first doped region;
forming a second doped region in said channel region, said second doped region having said second conductivity type and said second doped region being spaced from said first doped region;
forming a second contact providing conductive contact to said second doped region;
forming a gate insulating layer on said face over the portion of said channel region between said first and second doped regions; and
forming a gate on said gate insulating layer.

5,554,547
PROCESS FOR THE PRODUCTION OF THIN FILM TRANSISTOR USING OXYGEN PLASMA
Hyoung C. Ha, Seoul, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Rep. of Korea
Continuation of Ser. No. 127,969, Sep. 28, 1993, abandoned. This application Jan. 31, 1995, Ser. No. 380,993
Claims priority, application Rep. of Korea, Sep. 29, 1992, 92-17794
Int. Cl.[6] H01L *21/84;21/336*
U.S. Cl. 437—40 **2 Claims**

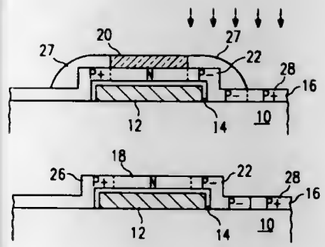




1. A process for producing a thin film transistor, which comprises the steps of:
(a) forming a gate electrode on an insulating substrate;
(b) following said step (a), depositing an insulating film over said insulating substrate and said gate electrode;
(c) following said step (b), forming a channel silicon layer on the insulating film;
(d) following said step (c), applying oxygen plasma treatment to the channel silicon layer to form an oxidized layer between said channel silicon layer and said insulating film, said oxidized layer reducing both defects in said channel silicon layer and defects in an interface between said channel silicon layer and said insulating film; and
(e) following said step (d), implanting impurities into the resulting channel silicon layer to form a source region and a drain region.

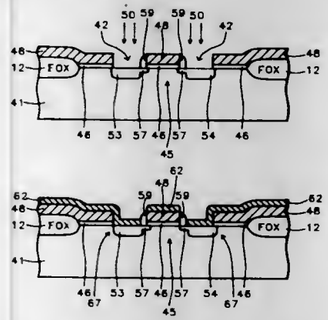
5,554,548
METHOD OF FABRICATING A ONE-SIDED POLYSILICON THIN FILM TRANSISTOR
Ravishankar Sundaresan, Garland, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.
Division of Ser. No. 193,725, Feb. 9, 1994, abandoned, which is a continuation of Ser. No. 860,983, Mar. 31, 1992, abandoned. This application Apr. 24, 1995, Ser. No. 426,851
Int. Cl.[6] H01L *21/336*
U.S. Cl. 437—41 **15 Claims**

1. A method of forming a thin film transistor of a semiconductor integrated circuit, comprising:
forming a first conductive structure over a portion of the integrated circuit;



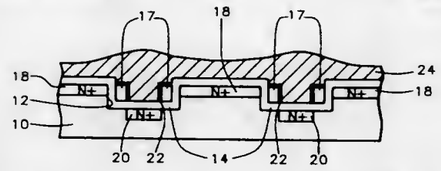
forming a first dielectric layer over the first conductive structure;
forming a polysilicon layer, having a first dopant therein, over the first dielectric layer;
forming a second dielectric layer over a portion of the polysilicon layer substantially over the first conductive structure;
implanting a second dopant into the polysilicon layer not covered by the second dielectric layer;
forming a photoresist layer over a portion of the second dielectric layer and a portion of the polysilicon layer;
implanting a third dopant into the polysilicon layer not covered by the second dielectric layer and the photoresist layer;
removing the photoresist layer;
forming oxide sidewall spacers adjacent to the second dielectric layer and covering a portion of the polysilicon layer adjacent to the second dielectric layer; and
implanting the third dopant into the polysilicon layer not covered by the second dielectric layer and the sidewall spacers.

5,554,549
SALICIDE PROCESS FOR FETS
Jenn-Ming Huang, Hsih-Chu, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company Ltd., Hsih-Chu, Taiwan
Filed Jul. 3, 1995, Ser. No. 497,765
Int. Cl.[6] H01L *21/265*
U.S. Cl. 437—41 **12 Claims**



1. A process for manufacturing a field effect transistor and connections thereto, comprising:
(a) providing a structure that comprises a body of P type silicon, including field isolating regions comprised of thick layers of silicon oxide, the surface of said silicon body being covered by a thin layer of silicon oxide in the regions between said field isolating regions;
(b) depositing a layer of polycrystalline silicon over said structure;
(c) patterning and then etching said thin layer of silicon oxide and said layer of polycrystalline silicon down to the level of the silicon body so as to form trenches on either side of a gate region that comprises the areas of the thin layer of silicon oxide and polycrystalline silicon that have not been removed;
(d) then subjecting the structure to a first ion implantation of N type dopant material, to a dosage level such that the implanted silicon becomes lightly N type;
(e) depositing silicon oxide on the side walls of said trenches and etching to form oxide spacers;
(f) selectively removing the oxide spacers that are located on the side walls away from said gate region;
(g) after step (f) subjecting the structure to a second ion implantation of N type dopant material to a dosage level such that the implanted silicon becomes strongly N type;
(h) coating the structure with a layer of a refractory metal;
(i) heating the structure until said refractory metal has been converted to a refractory metal silicide wherever it is in contact with silicon; and
(j) etching the structure with an etchant that removes said refractory metal and does not remove said refractory metal silicide.

5,554,550
METHOD OF FABRICATING ELECTRICALLY ERASEABLE READ ONLY MEMORY CELL HAVING A TRENCH
Ming-Tzung Yang, Hsin Chu, Taiwan, assignor to United Microelectronics Corporation, Hsin-Chu, Taiwan
Filed Sep. 14, 1994, Ser. No. 305,558
Int. Cl.[6] H01L *21/8247*
U.S. Cl. 437—43 **15 Claims**



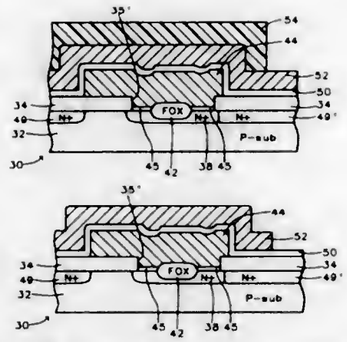
1. A methods of fabricating an electrically programmable read only memory cell on a semiconductor substrate comprising:
forming an elongated trench in said substrate,
forming a first insulating layer over the surface of said substrate, including the sidewalls and bottom of said trench,
forming individual multiple pairs of spaced polycrystalline silicon layers on the opposed sidewalls of the trench, which form floating gates,
implanting a first type dopant into said substrate thereby forming a continuous doped region in the bottom of said trench, which form a continuous source region, and also individual doped regions on opposite sides of the trench, adjacent to the top surface of the substrate, which form the drain regions,
forming a second insulating layer over the said individual pairs of spaced polycrystalline silicon layers,
forming a conductive control gate word line stripe over, and transverse to the trench adjacent to the individual polycrystalline silicon layers, and
forming an electrical contact to the continuous doped region in the bottom of the trench.

5,554,551
METHOD OF MANUFACTURE OF AN EEPROM CELL WITH SELF-ALIGNED THIN DIELECTRIC AREA
Gary Hong, Hsin-Chu, Taiwan, assignor to United Microelectronics Corporation, Hsin-Chu, Taiwan
Filed Nov. 23, 1994, Ser. No. 344,005
Int. Cl.[6] H01L *21/8247*
U.S. Cl. 437—43 **21 Claims**

1. A method of fabricating an EPROM on a lightly doped semiconductor substrate comprising,
forming a first dielectric layer on said substrate,
forming a tunnel mask with a tunnel opening therein,

forming a doped source region and a doped drain region in the substrate

removing a portion of said first strips through mask openings formed in spaces between said second strips with reference to

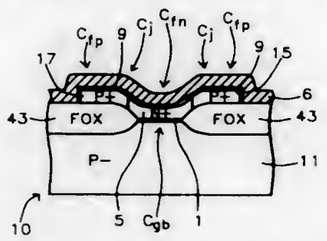


etching through said mask to form a tunnel window in said first dielectric layer,
doping to form a first doped region of said substrate through said tunnel window,
stripping said tunnel mask,
forming a spacer frame about the periphery of said window over said first doped region of said substrate,
forming a second dielectric layer over said first doped region within said spacer frame,
removing said spacer frame,
forming a tunnel oxide layer over the exposed surface of said first doped region of said substrate,
forming a blanket deposit of a doped floating gate layer over said tunnel oxide layer,
forming a floating gate mask over said floating gate layer and etching to shape said floating gate layer into a floating gate and then stripping said floating gate mask,
ion implanting dopant to form buried N+ source/drain regions in said substrate through exposed surfaces of said gate oxide adjacent to said floating gate,
forming a blanket interconductor layer over said floating gate,
forming a blanket control gate layer of a doped material over said interconductor dielectric layer,
forming a control gate mask on said control gate layer,
patterning said control gate layer by etching away portions of said control gate layer unprotected by said control gate mask, and
removing said control gate mask.

5,554,552
PN JUNCTION FLOATING GATE EEPROM, FLASH EPROM DEVICE AND METHOD OF MANUFACTURE THEREOF

Kao M. Chi, Hsin-Chu, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company, Hsin-Chu, Taiwan

Filed Apr. 3, 1995, Ser. No. 415,420
Int. Cl.[6] H01L *21/8247*
U.S. Cl. 437—43 **20 Claims**

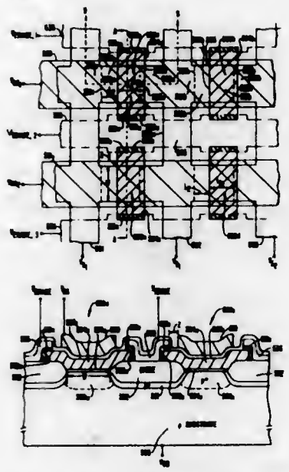


1. A method of forming a floating gate ROM device comprising providing a lightly doped P- semiconductor substrate,
forming a doped source region and a doped drain region in the substrate,
forming a tunnel oxide layer and field oxide regions formed over the surface of the substrate,
forming a PN junction floating gate electrode from a first polysilicon layer comprising doped polysilicon with an N doped region above the tunnel oxide layer and at least one P doped region above the field oxide region juxtaposed with the N doped region,
forming an intergate electrode dielectric layer covering the PN floating gate electrode,
forming a polysilicon control gate electrode from a second polysilicon layer over the intergate electrode dielectric layer, and
forming an additional dielectric layer over the control gate electrode.

5,554,553
HIGHLY COMPACT EPROM AND FLASH EEPROM DEVICES

Eliyahou Harari, 2320 Friars La., Los Altos, Calif. 94022

Continuation of Ser. No. 154,162, Nov. 17, 1993, which is a division of Ser. No. 777,673, Oct. 15, 1991, Pat. No. 5,268,319, which is a division of Ser. No. 381,139, Jul. 17, 1989, Pat. No. 5,198,380, which is a division of Ser. No. 204,175, Jun. 19, 1988, Pat. No. 5,095,344. This application Jun. 6, 1995, Ser. No. 467,762
Int. Cl.[6] H01L *29/60*
U.S. Cl. 437—43 **22 Claims**



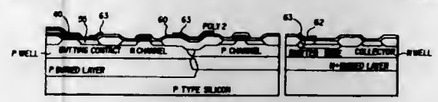
1. A method of forming an array of flash EEPROM cells on a semiconductor substrate surface, comprising:
forming a plurality of parallel elongated source and drain regions beneath the substrate surface which have continuous lengths extending in a first direction across said surface and are spaced apart in a second direction thereacross to form channel regions therebetween, said first and second directions being substantially orthogonal to each other,
forming a first plurality of parallel elongated conductive strips insulated from the substrate and individually positioned over at least a portion of a channel region with continuous lengths extending in said first direction and being spaced apart in the second direction,
forming a second plurality of parallel elongated conductive strips as control gates insulated from the substrate and the first plurality of conductive strips, said second plurality of strips having continuous lengths extending in said second direction and being spaced apart in said first direction,

removing a portion of said first strips through mask openings formed in spaces between said second strips with reference to edges of the second strips, thereby to convert the first strips into a two dimensional array of electrically isolated floating gates underlaying said second strips and exposing surface areas of the floating gates to the spaces between the second strips,
forming tunnel dielectric layers on said exposed floating gate surface areas, and
forming, in the spaces between said second strips in contact with said tunnel dielectric layers, a third plurality of parallel elongated conductive strips as erase gates with continuous lengths extending in said second direction and being spaced apart in the first direction, said third strips being insulated from the second strips and the substrate.

5,554,554
PROCESS FOR FABRICATING TWO LOADS HAVING DIFFERENT RESISTANCE LEVELS IN A COMMON LAYER OF POLYSILICON

Bamdad Bastani, Danville, Calif.; Larry Wong, Hillsboro, Oreg., and Craig Lage, Puyallup, Wash., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 104,389, Aug. 9, 1993, abandoned, which is a division of Ser. No. 852,357, Mar. 17, 1992, abandoned, which is a continuation of Ser. No. 270,928, Nov. 14, 1988, abandoned. This application Feb. 18, 1994, Ser. No. 198,698
Int. Cl.[6] H01L *21/8244*
U.S. Cl. 437—47 **2 Claims**



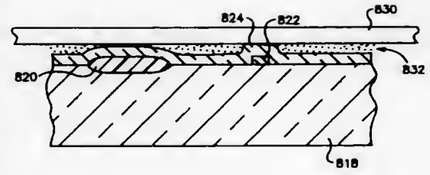
1. A method of forming a first load having a first resistance level and a second load having a second resistance level in a common layer of polysilicon formed in a semiconductor device structure, the method comprising the steps of:
(a) forming a layer of polysilicon having said first resistance level on said semiconductor device structure;
(b) forming a mask on said layer of polysilicon to define selected areas of said polysilicon layer to be implanted with a dopant;
(c) implanting said selected areas of said polysilicon layer with said dopant to modify the resistance of said selected areas so that said selected areas have said second resistance level; and
(d) etching away selected regions of said polysilicon layer to form first load regions having said first resistance level and second load regions having said second resistance level.

5,554,555
PLANARIZING BY POLISHING TECHNIQUES FOR FABRICATING SEMICONDUCTOR DEVICES BASED ON CMOS STRUCTURES

Michael D. Rostoker, San Jose, and Nicholas F. Pasch, Pacifica, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation of Ser. No. 278,573, Jul. 21, 1994, which is a continuation of Ser. No. 33,213, Mar. 18, 1993, abandoned, which is a continuation-in-part of Ser. No. 750,196, Aug. 26, 1991, Pat. No. 5,217,566. This application Dec. 12, 1994, Ser. No. 353,897
The portion of the term of this patent subsequent to Aug. 26, 2011, has been disclaimed.
Int. Cl.[6] H01L *21/00*
U.S. Cl. 437—52 **2 Claims**

1. A method of fabricating a CMOS microelectronic circuit on a surface of a semiconductor substrate having first and second well regions, comprising:



forming a silicon nitride layer over the surface;
patterning the silicon nitride layer to have an opening over the first well region and a nitride segment over the second well region;
implanting a first dopant of a first conductivity type into the substrate through the opening into the first well region, the nitride segment substantially shielding implantation of the first dopant into the second well region;
growing a first silicon dioxide layer over the surface in the opening over the first well region, the nitride segment substantially inhibiting growth of silicon dioxide in the second well region;
removing the silicon nitride layer;
implanting second dopant of a second conductivity type into the substrate, the first silicon dioxide layer substantially shielding implantation of the second dopant into the first well region;
removing the first silicon dioxide layer;
forming gate oxide layers over channel regions in the first and second well regions respectively;
forming gates over the gate oxide layers respectively;
forming source and drain regions in each of the first and second well regions on opposite sides of the channel regions respectively;
forming a second silicon dioxide layer over the surface and the gates which is relatively thick between the first and second well regions and is relatively thin in remaining areas over the surface, a surface of the second layer of silicon dioxide having irregular topology;
forming a third silicon dioxide layer over the second silicon dioxide layer, a surface of the third silicon dioxide layer having irregular topology;
planarizing, by chemical-mechanical polishing, the surface of the third silicon dioxide layer using a motor-driven polishing pad;
monitoring a motor load on said polishing pad;
terminating said polishing when said motor load evens out indicating that the surface of the third silicon dioxide layer is substantially devoid of topological features;
forming a fourth silicon dioxide layer over the third silicon dioxide layer;
forming first vias through the fourth, third and second silicon dioxide layers;
forming metal plugs in the first vias to contact the source and drain regions respectively;
forming a fifth silicon dioxide layer over the fourth silicon dioxide layer and over the metal plugs, a surface of the fifth silicon dioxide layer having troughs and irregularities;
forming a filler glass layer over the fifth silicon dioxide layer to smooth the troughs and irregularities;
forming a sixth silicon dioxide layer over the filler glass layer silicon dioxide layer and portions of the fifth silicon dioxide layer that are exposed through the filler glass layer;
forming second vias through the sixth and fifth silicon dioxide layers;
applying a barrier metal layer that fills the second vias over the sixth silicon dioxide layer;
applying a metal filler over the barrier metal layer;
applying a metal cap over the metal filler; and
applying a passivation layer over the metal cap and the sixth silicon dioxide layer.

170–919 O.G.–96–15: QL3

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METHOD OF MAKING A SEMICONDUCTOR MEMORY DEVICE HAVING AN INCREASED CAPACITANCE OF

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METHOD FOR FABRICATING A STACKED CAPACITOR WITH A SELF ALIGNED NODE CONTACT IN A

first heating said oxide layer to a temperature of about 800° C. for about 30 minutes in 100% N2 (nitrogen) at a flow rate of about 10,000 sccm, then densifying said oxide layer at a

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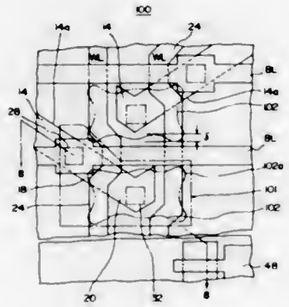
METHOD OF MAKING A SEMICONDUCTOR MEMORY DEVICE HAVING AN INCREASED CAPACITANCE OF MEMORY CELL

Taiji Ema, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 210,735, Mar. 21, 1994, which is a continuation of Ser. No. 725,783, Jul. 9, 1991, abandoned. This application Apr. 18, 1995, Ser. No. 423,092
Claims priority, application Japan, Jul. 9, 1990, 2-181896
Int. Cl.[6] H01L *21/8242*
U.S. Cl. 437—52 **4 Claims**



1. A method for fabricating a semiconductor memory device having a memory cell transistor and a memory cell capacitor, said method comprising the steps of:

forming the memory cell transistor on a substrate;

covering the memory cell transistor by an insulator layer;

providing a contact hole through the insulator layer to expose a part of the memory cell transistor;

depositing a first conductor material layer on the insulator layer such that the first conductor material layer establishes a contact to the exposed part of the memory cell transistor;

depositing a photoresist layer on the first conductor material layer;

exposing the photoresist layer to an optical beam via a mask that carries a plurality of primary patterns each corresponding generally to the pattern of the memory cell capacitor to be formed, said mask further having a plurality of secondary patterns to surround each of the primary patterns, each of said secondary patterns comprising a plurality of projections separated from each other and projecting outward from each of the primary patterns;

patterning the photoresist layer exposed by the optical beam;

patterning the first conductor material layer using the patterned photoresist layer as a mask to form a first electrode of the memory cell capacitor, the first electrode having an upper major surface, of a nominally rectangular configuration and corresponding, nominally rectangular periphery, and a lateral wall substantially perpendicular to the upper major surface of the substrate, the lateral wall defining the actual periphery of the first electrode and, when viewed in a direction perpendicular to the upper major surface of the substrate, the lateral wall having an undulating form defined by a smooth curve extending outwardly and inwardly of the nominally rectangular periphery along the full extent thereof;

depositing a dielectric film on said first conductor material layer to cover a top surface and a side wall of the first electrode; and

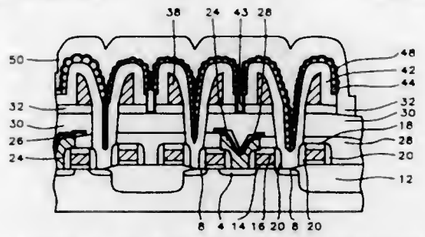
depositing a second conductive material layer on said dielectric film to cover a top surface and a side wall of the dielectric film respectively corresponding to the top surface and the side wall of the first electrode.

5,554,557

METHOD FOR FABRICATING A STACKED CAPACITOR WITH A SELF ALIGNED NODE CONTACT IN A MEMORY CELL

Chao-Ming Koh, Hsinchu, Taiwan, assignor to Vanguard International Semiconductor Corp., Hsin-Chu, Taiwan

Filed Feb. 2, 1996, Ser. No. 597,529
Int. Cl.[6] H01L *21/70;27/00*
U.S. Cl. 437—52 **25 Claims**



1. A method of fabricating a capacitor on a substrate having an active area, comprising the sequential processes of:

a) forming a first planar insulation layer over said substrate;

b) sequentially forming a first conductive layer and a second insulation layer over said first insulation layer;

c) forming a first opening in said second insulation layer centered over said active area and exposing said first conductive layer, said first opening defined by vertical sidewalls of said second insulation layer;

d) forming first sidewall spacers on the sidewalls of said second insulation layer, said first sidewall spacers forming a second opening;

e) anisotropically etching portions of said first conductive layer and said first insulation layer through said second opening and thereby exposing said active area, said anisotropic etch forming a node contact hole;

f) removing said second insulation layer exposing remaining portions of said first conductive layer;

g) forming a bottom storage electrode over the exposed portions of said first conductive layer and said first sidewall spacers, and filling said node contact hole;

h) depositing a capacitor dielectric layer over said bottom storage electrode; and

forming a top plate electrode over said capacitor dielectric layer.

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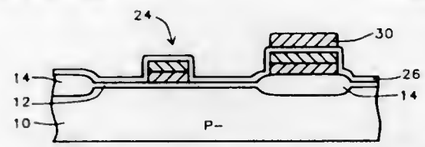
METHOD OF MAKING HIGH PRECISION W-POLYCIDE-TO-POLY CAPACITORS IN DIGITAL/ANALOG PROCESS

Shun-Liang Hsu; Jyh-Kang Ting, and Chun-Yi Shih, all of Hsin-Chu, Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsin-Chu, Taiwan

Filed Feb. 13, 1995, Ser. No. 387,081
Int. Cl.[6] H01L *21/70;27/00*
U.S. Cl. 437—60 **12 Claims**



1. A method for forming a capacitor on a silicon substrate, comprising the steps of:

forming a first layer of doped polysilicon over said silicon substrate;

forming a silicide layer over said first layer of doped polysilicon;

patterning said first layer of doped polysilicon and said silicide layer to form a polycide bottom plate of said capacitor;

forming an oxide layer over said bottom plate;

first heating said oxide layer to a temperature of about 800° C. for about 30 minutes in 100% N2 (nitrogen) at a flow rate of about 10,000 sccm, then densifying said oxide layer at a temperature of between about 800° and 900° C. in an atmosphere of between about 5 and 10 percent oxygen (O2), said oxygen having a flow rate of between about 500 and 1000 sccm;

forming a second layer of doped polysilicon over said oxide layer;

patterning said second layer of polysilicon to form a top plate of said capacitor;

removing said oxide layer except under said top plate of said capacitor, where it acts as a capacitor dielectric; and

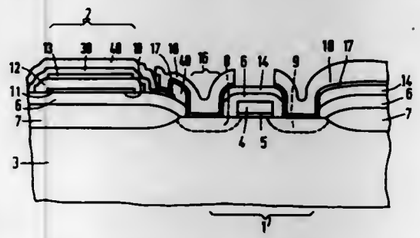
annealing said bottom plate.

5,554,559

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A CAPACITOR WITH A FERROELECTRIC, DIELECTRIC

Robertus A. M. Wolters; Poul K. Larsen, and Mathieu J. E. Ulenaers, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 206,916, Mar. 4, 1994, Pat. No. 5,396,095, which is a continuation of Ser. No. 879,636, May 7, 1992, abandoned. This application Nov. 29, 1994, Ser. No. 346,975
Claims priority, application European Pat. Off., May 8, 1991, 91201104
Int. Cl.[6] H01L *21/302*
U.S. Cl. 437—62 **8 Claims**



1. A method of manufacturing a semiconductor device in which a capacitor is provided on a surface of a semiconductor body comprising a semiconductor element whereby consecutively a lower electrode, an oxidic ferroelectric dielectric, and an upper electrode are provided in such a way that the upper electrode does not cover an edge of the dielectric, after which an insulating layer with superimposed metal conductor tracks is provided, characterized in that the edge of the dielectric not covered by the upper electrode is covered with a coating layer which is substantially imperviable to hydrogen, and in that then the device is heated in an atmosphere which contains hydrogen.

5,554,560

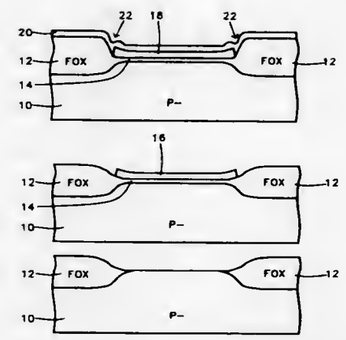
METHOD FOR FORMING A PLANAR FIELD OXIDE (FOX) ON SUBSTRATES FOR INTEGRATED CIRCUIT

Chen-Chiu Hsue; Sun-Chieh Chien, and Ming-Hua Liu, all of Hsin-chu, Taiwan, assignors to United Microelectronics Corporation, Hsin-chu, Taiwan

Filed Sep. 30, 1994, Ser. No. 315,772
Int. Cl.[6] H01L *21/76*
U.S. Cl. 437—69 **18 Claims**

1. A method for fabricating planar field oxide (FOX) isolation areas on a silicon substrate having device areas thereon, comprising the steps of:

providing a silicon substrate having a principal surface that is planar;



thermally oxidizing said silicon substrate principal surface and thereby forming a silicon oxide pad layer;

depositing a first insulating layer on said silicon oxide pad layer and thereby forming a barrier layer to oxidation;

patterning said first insulating layer and said silicon oxide pad layer by photoresist masking and anisotropic etching, thereby leaving portions of said first insulating layer and silicon oxide pad layer over said device areas and exposing elsewhere said substrate surface;

removing said photoresist masking;

thermally oxidizing said silicon substrate forming a Field OXide (FOX) structure composed of silicon oxide on and in said exposed surface areas, a portion of which extends upward above the surface of said substrate and surrounds said device areas;

forming on said silicon substrate a leveling layer and thereby filling the gaps between said patterned first insulating layer and raised portion of said field oxide structures, wherein said leveling layer is a spin-on-glass layer having a thickness of between about 300 to 1000 Angstroms;

blanket etching back said leveling layer, said field oxide structure and said first insulating layer non-selectively by a timed etch thereby planarizing said field oxide structure;

removing said remaining first insulating layer and said silicon oxide pad layer and thereby completing said planar field oxide structure surrounding and isolating said device areas.

5,554,561

EPITAXIAL OVERGROWTH METHOD

Donald L. Plumton, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

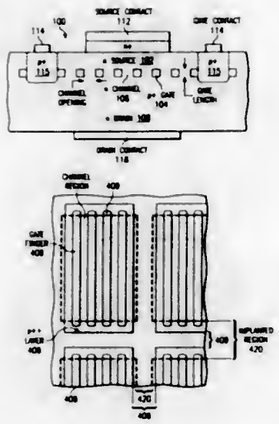
Continuation-in-part of Ser. No. 56,004, Apr. 30, 1993. This application Nov. 29, 1993, Ser. No. 159,353
Int. Cl.[6] H01L *21/20*
U.S. Cl. 437—89 **11 Claims**

1. A method of fabrication of a buried doped region, comprising the steps of:

(a) forming first and second semiconductor structures on a semiconductor layer, said layer having a first conductivity type and said first and second structures separated from each other and each having a second conductivity type opposite said first conductivity type;

(b) forming a semiconductor epilayer on said first and second structures plus on said layer, said epilayer of said first conductivity type; and

(c) after said forming said epilayer, introducing dopants of said second conductivity type into a region in said epilayer to convert said region to said second conductivity type, said region connnecting said first and second structures.

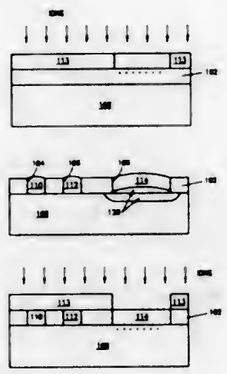


5,554,562

ADVANCED ISOLATION SCHEME FOR DEEP SUBMICRON TECHNOLOGY

Kuang-Yeh Chang, Los Gatos; Yowjuang W. Liu, San Jose, both of Calif.; Mark I. Gardner, Ceder Creek, and Frederick N. Hause, Austin, both of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 6, 1995, Ser. No. 417,572
Int. Cl.[6] H01L 21/20
U.S. Cl. 437—89 7 Claims



1. A method of forming a semiconductor device, having at least one retrograde well, comprising:
providing a semiconductor body;
providing an oxide layer over the semiconductor body;
implanting ions of a chosen conductivity in a selected location through the oxide layer into the semiconductor body;
providing an opening through the oxide layer over the selected location to the semiconductor body; and
providing semiconductor material in the opening of the oxide layer, whereby the retrograde well is formed.

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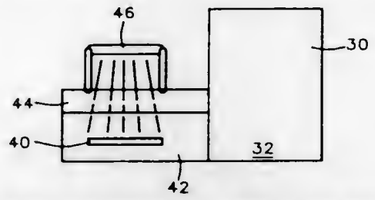
IN SITU HOT BAKE TREATMENT THAT PREVENTS PRECIPITATE FORMATION AFTER A CONTACT LAYER ETCH BACK STEP

Po-Tao Chu, Taoyuan; Kuang-Hui Chang, and Yuan-Chang Huang, both of Hsin-Chu, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsin-Chu, Taiwan

Filed Apr. 4, 1995, Ser. No. 416,163
Int. Cl.[6] H01L 21/28
U.S. Cl. 437—190 23 Claims



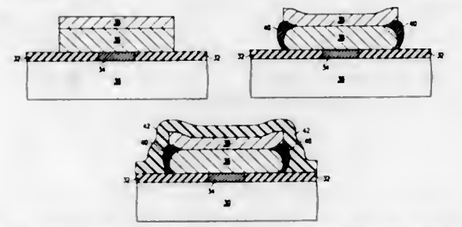
1. A method of preventing the formation of precipitates on a substrate surface after a contact layer etch back step, the method comprising the steps of:
depositing a barrier layer containing titanium on the surface of the substrate,
depositing a contact layer over said barrier layer and over the surface of the substrate,
etching back said contact layer and exposing portions of the barrier layer; and
thereafter heating said substrate and exposed portions of said barrier layer with radiant heat until the surface temperature of said substrate is between 100° C. and 200° C. and maintaining the temperature for between about 60 to 180 seconds.

5,554,564

PRE-OXIDIZING HIGH-DIELECTRIC-CONSTANT MATERIAL ELECTRODES

Yasushiro Nishioka, Tsukuba, Japan; Scott R. Summerfelt, Dallas, Tex.; Kyung-ho Park, and Pijush Bhattacharya, both of Tsukuba, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 1, 1994, Ser. No. 283,467
Int. Cl.[6] H01L 21/28
U.S. Cl. 437—192 21 Claims



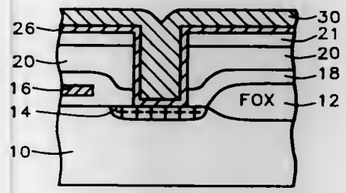
1. A method of forming a microelectronic structure, said method comprising steps:
(a) forming a supporting layer having a principal surface;
(b) forming an adhesion layer on said principal surface of said supporting layer, said adhesion layer comprising a substantially unoxidized sidewall;
(c) forming a noble metal layer on a top surface of said adhesion layer;
(d) oxidizing said unoxidized sidewall of said adhesion layer to form a pre-oxidized sidewall; and
(e) subsequent to oxidizing said sidewall depositing a high-dielectric-constant material layer on said noble metal layer, wherein said pre-oxidized sidewall inhibits further oxidation and expansion of said adhesion layer adjacent said pre-oxidized sidewall during the deposition of the high-dielectric-constant material as compared to oxidation and expansion that would occur in the adhesion layer when the adhesion layer is not oxidized prior to depositing the high-dielectric-constant material.

5,554,565

MODIFIED BP-TEOS TUNGSTEN-PLUG CONTACT PROCESS

Jhon-Jhy Liaw, Taipei; Jin-Yuan Lee, and Ming-Chang Teng, both of Hsin-Chu, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company Ltd., Hin-Chu, Taiwan

Filed Feb. 26, 1996, Ser. No. 606,832
Int. Cl.[6] H01L 21/441
U.S. Cl. 437—192 49 Claims



1. A method of forming a contact to a silicon semiconductor device and providing connection to a metallic interconnection network comprising:
providing a semiconductor wafer;
forming semiconductor devices within the surface of said semiconductor wafer;
forming a first layer of silicon oxide over said semiconductor devices;
forming a layer of glass over said first layer of silicon oxide;
flowing said layer of glass by heating;
etching said layer of glass utilizing an anisotropic etching procedure;
forming a second layer of silicon oxide over said layer of glass to form a composite dielectric sandwich comprising said first layer of silicon oxide, said layer of glass and said second layer of silicon oxide;
depositing a layer of photoresist on said second layer of silicon oxide;
patterning said photoresist to define contact hole openings;
etching said composite dielectric sandwich with a unidirectional dry etching technique to provide vertical walled openings in said composite dielectric sandwich, exposing the subjacent contact regions of the semiconductor devices;
implanting dopant atoms into the contact openings;
removing said photoresist layer;
subjecting said semiconductor wafer to a first rapid thermal annealing(RTA) to activate said implanted dopant atoms;
forming a titanium layer over said semiconductor wafer;
forming a metal barrier layer over said titanium layer;
subjecting said semiconductor wafer to a second rapid thermal annealing(RTA);
depositing a tungsten layer; and
etching said tungsten layer to form tungsten plugs.

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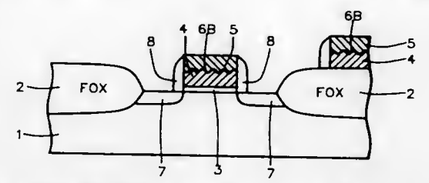
METHOD TO ELIMINATE POLYCIDE PEELING

Water Lur, Taipei, and Cheng H. Huang, Hsin-Chu, both of Taiwan, assignors to United Microelectronics Corporation, Hsin-Chu, Taiwan

Filed Sep. 6, 1994, Ser. No. 301,537
Int. Cl.[6] H01L 21/28
U.S. Cl. 437—193 13 Claims



1. A method for forming an improved polycide structure including a polysilicon layer and a metal silicide layer comprising:
forming said polysilicon layer by chemical vapor deposition at a temperature between about 580° to 600° C., at a pressure below about 300 mTorr, to a thickness between about 500 to 4000 Angstroms and resulting in a hemispherical grained polysilicon surface as deposited:
depositing said metal silicide layer on said hemispherical grained polysilicon surface; and
patterning to form said polycide structure.

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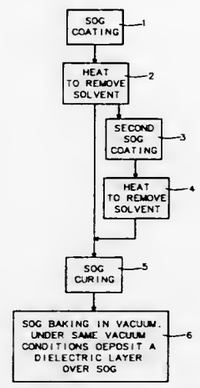
METHOD FOR IMPROVING ADHESION TO A SPIN-ON-GLASS

Shih-Ming Wang, Kaohsiung, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company Ltd., Hsin-Chu, Japan

Filed Sep. 1, 1994, Ser. No. 299,268
Int. Cl.[6] H01L 21/469
U.S. Cl. 437—195 12 Claims



1. A method for planarizing the surface of an integrated circuit comprising:
providing a layer of silicon dioxide on the surface of a silicon body;
depositing a layer of a first conductive material onto said silicon dioxide surface;
etching said layer of a first conductive material into a pattern;
depositing a layer of a first insulating material onto said etched layer of conductive material;
applying a siloxane solution to the surface of said integrated circuit such that all points on said surface lie below the surface of said siloxane solution;

heating said integrated circuit so as to drive out all solvent from said siloxane solution;

optionally applying a second layer of siloxane solution and then heating it to drive out the solvent;

heating said integrated circuit in an oxygen atmosphere so as to cure said layer or layers of siloxane thereby converting them to a layer of cured spin-on-glass;

providing a vacuum chamber and then baking said integrated circuit inside said vacuum chamber at a pressure less than about 3 torr for between 0.5 and 3 minutes;

without allowing any increase in the pressure within said vacuum chamber, depositing a layer of a second insulating material onto the surface of said layer of cured spin-on-glass;

etching via holes from the surface of said layer of a second insulating material down to the level of said first layer of conductive material;

depositing a second layer of a conductive material onto the surface of said layer of a second insulating material so as to make contact with said first layer of conductive material wherever said via holes have been etched and;

etching said second layer of conductive material into a pattern.

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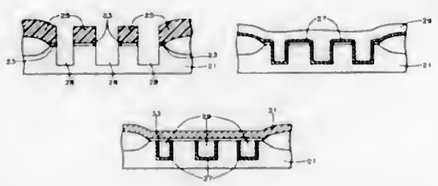
POLYSILICON TRENCH AND BURIED POLYSILCON WALL DEVICE STRUCTURES

Jemmy Wen, Hsinchu, Taiwan, assignor to United Micro Electronics Corporation, Hsin-Chu, Taiwan

Filed Dec. 27, 1994, Ser. No. 365,047

Int. Cl.[6] H01L *21/44;21/48*

U.S. Cl. 437—203 **13 Claims**



1. A method of forming a trench device, comprising the steps of:

providing a semiconductor substrate;

forming a barrier dielectric layer on the surface of said semiconductor substrate;

forming a layer of photoresist with openings for source and drain regions in said layer of photoresist on said barrier dielectric layer;

forming vertical trenches in said semiconductor substrate through said openings in said layer of photoresist wherein each of said vertical trenches has a top, a bottom, and sidewalls;

removing remaining said layer of photoresist;

filling said vertical trenches with doped polysilicon wherein said doped polysilicon contacts said sidewalls of said vertical trenches;

annealing said doped polysilicon and said sidewalls of said vertical trenches;

removing said barrier dielectric layer on said surface of said semiconductor substrate;

forming a gate dielectric layer on said surface of said semiconductor substrate wherein said gate dielectric layer covers said tops of said vertical trenches;

forming a gate electrode layer on said gate dielectric layer; and

forming a gate electrode pattern in said gate dielectric layer.

5,554,569

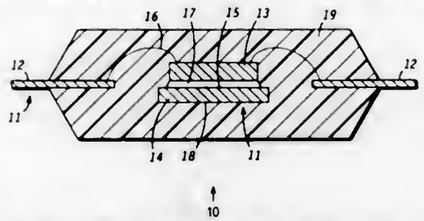
METHOD AND APPARATUS FOR IMPROVING INTERFACIAL ADHESION BETWEEN A POLYMER AND A METAL

Sankaranarayanan Ganesan, Chandler, and Howard M. Berg, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 6, 1994, Ser. No. 254,842

Int. Cl.[6] H01L *21/60*

U.S. Cl. 437—207 **16 Claims**



1. A method for improving an interfacial adhesion between a polymer and one of a metal surface or a metal alloy surface, comprising the steps of:

providing the one of a metal surface or a metal alloy surface;

bombarding the one of a metal surface or a metal alloy surface with a grit material, the grit material suspended in a gaseous carrier medium; and

encapsulating a portion of the one of a metal surface or a metal alloy surface with a molding compound.

5,554,570

METHOD OF FORMING INSULATING FILM

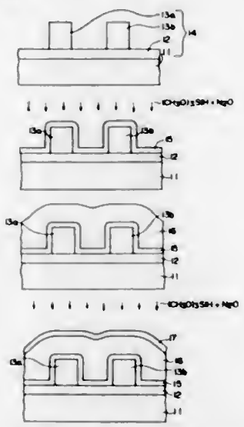
Kazuo Maeda; Noboru Tokumasu, and Yoshiaki Yuyama, all of Tokyo, Japan, assignors to Canon Sales Co., Inc., Japan; Alcantech Co., Inc., Japan, and Semiconductor Process Laboratory Co., Ltd., Japan

Filed Jan. 9, 1995, Ser. No. 370,247

Claims priority, application Japan, Jan. 25, 1994, 6-006381

Int. Cl.[6] H01L *21/31;21/316*

U.S. Cl. 437—235 **19 Claims**



1. A method of forming a silicon device comprising:

(a) forming a plasma from a gas containing at least one organic compound having Si-H bonds and an oxidizing gas;

(b) contacting a deposition substrate with said plasma to form a silicon-containing insulating film as a backing layer on the substrate; and

(c) coating said backing layer with a layer of silicon oxide by thermal CVD.

5,554,571

PRODUCTION OF DIELECTRIC CERAMIC MATERIAL POWDER

Shinsei Okabe, Takatsuki; Sakiko Iwamoto, Nagaokakyo, and Haruaobu Sano, Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Oct. 3, 1995, Ser. No. 538,335

Claims priority, application Japan, Oct. 3, 1994, 6-239058

Int. Cl.[6] C04B *35/49*

U.S. Cl. 501—138 **12 Claims**

1. A method for producing dielectric ceramic material powders having a composition composed of a main component of $Ba(Ti_{1-x-y}Zr_xHf_y)O_3$, where $0.05 \leqq x \leqq 0.25$ and $0 \leqq y \leqq 0.05$, and containing, as additives, at least one element of calcium and magnesium, at least one rare earth element, and manganese, said method comprising:

a first step of allowing barium hydroxide, at least one titanium compound, at least one zirconium compound and at least one hafnium to react with one another in an aqueous solution at 65° to 95° C. by catalytic actions of a base selected from the group consisting of alkali and amines to form a main component $Ba(Ti_{1-x-y}Zr_xHf_y)O_3$, said at least one titanium compound being selected from the group consisting of hydrolyzable titanium-containing organic compounds, titanium hydroxide and titania sol, said at least one zirconium compound being selected from the group consisting of hydrolyzable zirconium-containing organic compounds, zirconium hydroxide and zirconia sol, said at least one hafnium compound being selected from the group consisting of hydrolyzable hafnium-containing organic compounds, hafnium hydroxide and hafnia sol;

a second step of allowing at least one rare earth element compound and a manganese compound to react with one another in an aqueous solution by catalytic actions of a base selected from the group consisting of alkali and amines to form a complex hydroxide of at least one rare earth element and manganese;

a third step of allowing at least one compound of calcium compounds and magnesium compounds to react with carbonate ions in an aqueous solution to form at least one carbonate of calcium and magnesium;

a fourth step of mixing respective precipitates prepared in said first to third steps by the wet process, drying and then thermally treating the resultant mixture.

5,554,572

Patent Not Issued For This Number

5,554,573

RANEY-TYPE CATALYSTS FOR THE HYDROGENATION OF HALONITROAROMATIC COMPOUNDS

Georges Cordier, Francheville; Jean-Pierre Damon, Le Touvet; Pierre Fouilloux, Caluire et Cuire, and Philippe Marion, Villeurbanne, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Filed Oct. 7, 1994, Ser. No. 319,643

Claims priority, application France, Oct. 7, 1993, 93 12149

Int. Cl.[6] B01J *25/02*

U.S. Cl. 502—301 **15 Claims**

1. A Raney catalyst composition consisting essentially of an alloy of nickel, aluminum and molybdenum, Ni/Al/Mo, the alloy having an Al/Mo ratio by weight thereof being equal to or greater than 1, and a Mo/(Ni+Al) ratio by mass thereof being at least 5%, and the nickel content being not greater than 78% by weight.

5,554,574

METHOD FOR PREPARING COPPER-CONTAINING HYDROGENATION REACTION CATALYST AND METHOD FOR PRODUCING ALCOHOL

Kiyoshi Tsukada; Yasuyuki Hattori, and Taku Mimura, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Division of Ser. No. 357,173, Dec. 12, 1994, Pat. No. 5,481,048. This application May 25, 1995, Ser. No. 451,056

Claims priority, application Japan, Dec. 13, 1993, 5-342536

Int. Cl.[6] B01J *23/72*

U.S. Cl. 502—345 **9 Claims**

1. A method for preparing a copper-containing catalyst usable in hydrogenation reaction, comprising reducing a precursor of a copper-containing catalyst usable in hydrogenation reaction with hydrogen gas or a mixture of hydrogen and an inert gas by liquid phase reduction in a stream of a solvent which does not react with copper oxide or metallic copper, wherein the liquid phase reduction is carried out in the temperature range of from 50° to 140° C.

5,554,575

BIODEGRADABLE AND BIOREMEDIAL ABSORBENT COMPOUND FOR LIQUIDS

Thomas D. Cutler, Green Bay; Lane F. Dohl; Raymond F. Dohl, both of DePere, and James E. Hauer, Green Bay, all of Wis., assignors to Precision Remediation & Supply, Inc., DePere, Wis.

Filed Nov. 15, 1994, Ser. No. 339,949

Int. Cl.[6] C08L *1/02*

U.S. Cl. 502—404 **11 Claims**

1. A biodegradable absorbent compound for liquids comprising a mixture of fibers of bagasse and cottonseed hull lint, said mixture containing a greater amount, by weight, of bagasse fibers than cottonseed hull lint, said bagasse fibers being coarser than said cottonseed hull lint which is finer, said finer cottonseed hull lint in said mixture intermingling between said coarser bagasse fibers, said compound containing a binder for maintaining a uniform mixture of said coarser bagasse fibers and intermingled finer cottonseed hull lint in said biodegradable absorbent compound.

5,554,576

METHOD AND COMPOSITION FOR ENHANCING UPTAKE AND TRANSPORT OF BIOACTIVE AGENTS IN PLANTS

Pradip K. Mookerjee, Flemington, N.J., and Ahmad Omid, Walnut Creek, Calif., assignors to Tomen Corporation, Tokyo, Japan

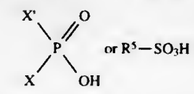
Continuation of Ser. No. 39,171, Jun. 17, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 490,093

Int. Cl.[6] A01N *25/30;* **C11D** *1/14;1/34;1/04*

U.S. Cl. 504—116 **58 Claims**

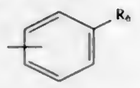
1. A method of enhancing uptake and transport of a plant-active agent into a living plant, said agent being capable of effecting a physiological response within said plant and said agent having a molecular structure capable of equilibrating to acidic and basic species in the presence of water; comprising the step of contacting said plant with an amount of said agent effective to obtain said physiological response in said plant in the presence of a non-phytotoxic uptake-enhancing amount of an uptake-enhancing adjuvant, said adjuvant comprising

(a) 20–60% (w/w) of an anionic surfactant of the formula:



wherein X is HO— or $-(O-(CH_2)_m)_nOR'$; X' is $-(O-(CH_2-)_m)_nOR'$;

R^1 is an alkyl or alkaryl group containing 5–50 carbon atoms;
m is 2 to 3; and
n is an integer from 1 to about 50;
R^5 is linear or branched alkyl or alkenyl containing 6 to about 50 carbon atoms, or R^5 is



wherein R^6 is alkyl or alkenyl containing 1 to about 30 carbon atoms;

(b) 40–60% (w/w) of fatty acids, fatty acid esters or mixtures thereof; and

(c) 10–40% (w/w) of polyalkylene glycol esters of fatty acids.

5,554,577

AGENTS FOR THE STIMULATION AND CULTIVATION OF PLANT GROWTH AND PROCESS FOR PRODUCING SAID AGENTS

Wolfgang Kempf, Dormagen; Peter Schroeder, Viersen; Wolfgang Ritter, and Bernd Ebbe, both of Haan, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP93/00646, § 371 Date Oct. 13, 1994, § 102(e) Date Oct. 13, 1994, PCT Pub. No. WO93/19023, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 18, 1993, Ser. No. 307,595

Claims priority, application Germany, Mar. 20, 1992, 42 09 014.8

Int. Cl.[6] A01N *25/10*

U.S. Cl. 504—116 **28 Claims**

1. An article of manufacture comprising a shaped mixture comprised of a plant-active material for the stimulation or cultivation of plant growth, said plant-active material containing a member selected from the group of plant nutrients, plant-protective agents, and mixtures thereof, in admixture with a thermoplastic binder consisting essentially of a starch which is the product of thermo-mechanical digestion at elevated pressures and temperatures of a mixture comprising starch and water, said starch being present in an amount of from about 10 to 30% by weight of said shaped mixture and at least 60% by weight of said shaped mixture of the plant-active material.

5,554,578

OXIME ETHER DERIVATIVES, THEIR PREPARATION AND FUNGICIDES CONTAINING THESE DERIVATIVES

Bernd Wenderoth, Lampertheim; Siegbert Brand, Weinheim; Franz Schuetz, Ludwigshafen; Thomas Kuekenhoehner, Frankenthal; Franz Roehl; Eberhard Ammermann, both of Ludwigshafen, and Gisela Lorenz, Neustadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

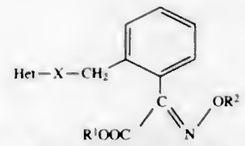
Division of Ser. No. 237,841, May 4, 1994, Pat. No. 5,468,717, which is a division of Ser. No. 620,456, Dec. 4, 1990, Pat. No. 5,334,577, which is a continuation of Ser. No. 411,638, Sep. 25, 1989, abandoned. This application Aug. 8, 1995, Ser. No. 512,487

Claims priority, application Germany, Oct. 14, 1988, 38 35 028.9

Int. Cl.[6] C07D *211/78*

U.S. Cl. 504—130 **8 Claims**

2. A process for combating fungi, wherein the fungi, or the materials, plants, seed or the soil threatened by fungus attack are treated with a fungicidally effective amount of a compound of the formula I



(I)

where R^1 and R^2 are each hydrogen or C_1–C_5-alkyl, Het is 2-pyrimidinyl, 4-pyrimidinyl, pyrazinyl, 2-benzothiazolyl or 2-benzoxazolyl, the heterocyclic ring system being unsubstituted or substituted by halogen, C_1–C_6-alkyl, C_3–C_6-cycloalkyl, C_1–C_2-haloalkyl, C_1–C_4-alkoxy, C_1–C_4-alkoxy-C_1–C_4-alkyl, aryl, aryl-C_1–C_4-alkyl, C_1–C_4-alkylcarbonyl, C_1–C_4-alkoxycarbonyl or cyano, and X is oxygen, or a plant-tolerated acid addition salts, metal complex or N-oxide thereof.

5,554,579

(2-IMIDAZOLIN-2-YL) FUSED HETEROPYRIDINE COMPOUNDS, INTERMEDIATES FOR THE PREPARATION OF AND USE OF SAID COMPOUNDS AS HERBICIDAL AGENTS

Barrington Cross, Rocky Hill; Marinus Los, Pennington; Robert F. Doehner, Jr., East Windsor; David W. Ladner, Hamilton Square, and Jerry L. Johnson, Lawrenceville, all of N.J., assignors to American Cyanamid Co., Madison, N.J.

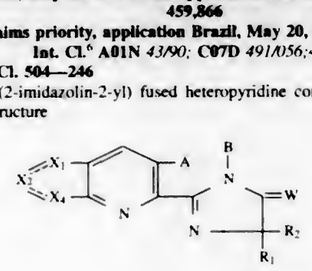
Division of Ser. No. 123,827, Sep. 20, 1993, Pat. No. 5,510,319, which is a division of Ser. No. 465,569, Jan. 16, 1990, Pat. No. 5,252,538, which is a continuation of Ser. No. 178,408, Apr. 6, 1988, abandoned, which is a continuation of Ser. No. 876,599, Jun. 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 808,578, Dec. 13, 1985, abandoned, and Ser. No. 612,531, May 21, 1984. This application Jun. 2, 1995, Ser. No. 459,866

Claims priority, application Brazil, May 20, 1985, 8502364

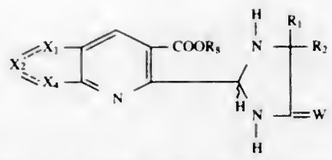
Int. Cl.[6] A01N *43/90*; **C07D** *491/056;495/04*

U.S. Cl. 504—246 **10 Claims**

1. (2-imidazolin-2-yl) fused heteropyridine compounds having the structure

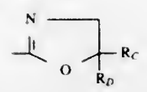


(II)



(XVIII)

wherein A is $COOR_8$, CHO, CH_2OH, $COCH_2OH$, $CONH_2$, CH_2CH_2OH, CONHOH or



R_C and R_D are each hydrogen or C_1–C_4 alkyl;

R_8 is hydrogen, C_1–C_4 alkyl which may be interrupted by O or S, or is optionally substituted with C_1–C_4 alkoxy, halogen, hydroxy, C_3–C_6 cycloalkyl, benzyloxy, furyl, phenyl, furfuryl, halophenyl, C_1–C_4alkylphenyl, C_1–C_4 alkoxyphenyl, nitrophenyl, carboxyl, C_1–C_4 alkoxy carbonyl, cyano or C_1–C_4 trialkylammonium; C_3–C_6 alkenyl, optionally substituted with one or two C_1–C_3alkoxy, phenyl or halogen groups; C_3–C_6 cycloalkyl, optionally substituted with one or two C_1–C_3 alkyl groups; C_3–C_{10} alkynyl, optionally substituted with phenyl, halogen, C_1–C_4 alkoxy; or a cation selected from the group consisting of alkali metals, alkaline earth metals, manganese, copper, iron, ammonium and organic ammonium;

B is H, COR_9 or SO_2R_{10}. R_9 is C_1–C_{11} alkyl, chloromethyl, C_1–C_4 alkoxyl or phenyl optionally substituted with one chloro, one nitro, one methyl, or one methoxy group;

R_{10} is C_1–C_5 alkyl, phenyl, or phenyl substituted with one methyl, halogen, nitro or C_1–C_4 alkoxy;

R_1 is C_1–C_4 alkyl;

R_2 is C_1–C_4 alkyl or C_3–C_6 cycloalkyl;

and when taken together with the carbon to which they are attached, R_1 and R_2 may represent C_3–C_6 cycloalkyl, optionally substituted with methyl;

— — — represents a single or double bond;

W is O or S;

X_1, X_2, and X_4 are any combination of CR_4, CR_5R_6, O or S, with the proviso that one of X_1, X_2, and X_4 must be CR_4 or CR_5R_6 and two of X_1, X_2, and X_4 must be O or S;

R_4 is hydrogen, halogen, C_1–C_6 alkyl; C_1–C_4 alkoxy; C_2–C_6 alkanoyloxy; C_1–C_4 alkylthio; phenoxy; C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy; nitro, C_1–C_4 alkoxycarbonyl; C_1–C_4 dialkylamino; C_1–C_4 alkylsulfonyl or phenyl, optionally substituted with one or two C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen or C_1–C_4 haloalkyl;

R_5 and R_6 are each hydrogen, C_1–C_4 alkyl; C_1–C_4 alkoxy, C_1–C_4 haloalkoxy; nitro, C_1–C_4 alkylsulfonyl or phenyl optionally substituted with one or two C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen or C_1–C_4 haloalkyl; or any combination of these groups except when R_5 and R_6 are the same group, they are either both hydrogen or both C_1–C_4 alkyl; and when taken together, R_5 and R_6 may form a ring in which R_5R_6 are represented by the structure $—(CH_2)_n—$ where n is an integer of 4 or 5, or when taken together, R_5 and R_6 may form a group =O or $=NR_7$ wherein R_7 is phenyl, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylamino;

R_4, R_5 and R_6, when present on adjacent positions may, along with the atoms to which they are attached, form a ring and such R_4–R_6 pairs can be represented by the structure $—(CH_2)_m—$ or $—(CH)_m—$ where m is an integer of 3 or 4;

with the provisos that

— — — represents a single bond between:

X_1 and X_2 when either X_1 or X_2 is S, O or CR_5R_6;

X_2 and X_4 when either X_2 or X_4 is S, O or CR_5R_6; and

when B is COR_9 or SO_2R_{10} and R_8 is hydrogen, then ——— represents an aromatic bond, and R_4, may not be halogen.

5,554,580

N-ARYL-SUBSTITUTED NITROGEN-CONTAINING HETEROCYCLES INTERMEDIATES AND THEIR USE AS HERBICIDES AND PLANT GROWTH REGULATORS

Reiner Fischer, Monheim; Uta Jessen-Korte, Duesseldorf; Franz Kunisch, Odenthal-Gloebusch; Albrecht Marhold, Leverkusen; Pieter Ooms, Krefeld; Otto Schallner, Monheim; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Bergisch-Gladbach; Birgit Krauskopf, Bergisch-Gladbach, and Harry Strang, Duesseldorf, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

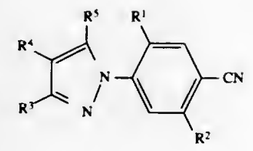
Continuation of Ser. No. 618,355, Nov. 26, 1990, abandoned, which is a division of Ser. No. 435,898, Nov. 13, 1989, Pat. No. 5,006,148. This application Jul. 20, 1992, Ser. No. 918,895

Claims priority, application Germany, Nov. 23, 1988, 38 39 480.4

Int. Cl.[6] A01N *43/56*; **C07D** *231/54;231/56*

U.S. Cl. 504—281 **14 Claims**

1. An N-aryl-substituted nitrogen-containing heterocycle of the formula



in which

R^1 represents hydrogen, fluorine, chlorine and bromine and

R^2 represents fluorine, chlorine or bromine, or represents a radical $—X—R^9$,

where

R^3 and R^4 together represent a double-linked alkanediyl radical having 2 to 6 carbon atoms,

R^5 represents hydrogen, fluorine, chlorine, bromine, iodine, represents straight-chain or branched alkyl having 1 to 6 carbon atoms or represents straight-chain or branched halogenoalkyl having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms,

R^9 represents in each case straight-chain or branched alkyl having 1 to 8 carbon atoms, alkenyl having 2 to 8 carbon atoms, alkinyl having 3 to 8 carbon atoms, halogenoalkyl having 1 to 8 carbon atoms and 1 to 17 identical or different halogen atoms, halogenoalkenyl having 2 to 8 carbon atoms and-1 to 15 identical or different halogen atoms, halogenoalkinyl having 3 to 8 carbon atoms and 1 to 13 identical or different halogen atoms, represents cyanoalkyl, alkoxyalkyl, alkylthioalkyl, halogenoalkoxyalkyl, alkoxy-alkoxyalkyl, (bis-alkoxy)alkyl, (bis-alkylthio)alkyl, alkyl-carbonylalkyl, alkoxycarbonylalkyl or alkoxyalkoxycarbo-nylalkyl, each having 1 to 8 carbon atoms in the individual alkyl moieties and if appropriate 1 to 9 identical or different halogen atoms, represents cycloalkyl, cycloalkyloxycarbo-nylalkyl or cycloalkylalkyl, having in each case 3 to 7 carbon atoms in the cycloalkyl moiety and if appropriate 1 to 4 carbon atoms in the straight-chain or branched alkyl moiety and each of which is optionally monosubstituted or polysubstituted by identical or different substituents, suit-able substituents in each case being: halogen and in each case straight-chain or branched alkyl or alkoxy, each hav-ing 1 to 4 carbon atoms, R^9 furthermore represents oxeta-nylalkyl, tetrahydrofuranylalkyl, tetrahydrofuranylalkyl oxycarbonylalkyl or tetrahydropyranylalkyl, each of which has 1 to 3 carbon atoms in the respective alkyl moieties and eacb of which is optionally substituted by alkyl having 1 to 4 carbon atoms or R^9 represents aralkyl which has 6 to 10 carbon atoms in the aryl moiety and 1 to 4 carbon atoms in the straight-chain or branched alkyl moiety and which is optionally monosubstituted or polysubstituted by identical or different substituents, suitable aryl substituents being: halogen, cyano, nitro, in each case straight-chain or branched alkyl, alkoxy, alkylthio or alkoxycarbonyl, each having 1 to 4 carbon atoms, or in each case straight-chain or branched halogenoalkyl, halogenoalkoxy or halo-genoalkylthio, each having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, and

X represents oxygen or sulphur.

5,554,581

TETRAHYDROPHTHALAMIDE DERIVATIVE,

metal, alkaline earth metal and ammonium ions and esters thereof with C_1–C_{10}-carboxylic acids or inorganic acids, and wherein the

perature while applying an electric field E across the photoconductive substance and exposing said photoconductive substance to photoexciting irradiation in the range between 530 and 740 nm

sulfate complexes, tripolyphosphates, tetrasodium pyrophosphate, citrates, aluminosilicates, cellulose-based materials and

5,554,581

TETRAHYDROPHTHALAMIDE DERIVATIVE, INTERMEDIATE FOR PRODUCING THE SAME, PRODUCTION OF BOTH, AND HERBICIDE CONTAINING THE SAME AS ACTIVE INGREDIENT

Kenji Hirai; Tomoko Matsukawa; Tomoyuki Yano; Emiko Ejiri; Kiyomi Aizawa; Koichi Shikakura, all of Kanagawa; Tomoko Yoshii, Shizuoka; Sadayuki Ugai, Shizuoka; Osamu Yamada, Shizuoka, and Shigeki Kishi, Shizuoka, all of Japan, assignors to Sagami Chemical Research Center, and Kaken Pharmaceutical Co., Ltd., both of Japan

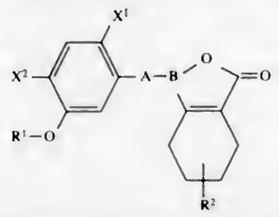
Division of Ser. No. 302,881, Sep. 19, 1994, Pat. No. 5,506,190. This application May 25, 1995, Ser. No. 450,344

Claims priority, application Japan, Mar. 25, 1992, 4-97462; Jan. 28, 1993, 5-31132

Int. Cl.[6] A01N *43/12*; C07D *307/87*

U.S. Cl. 504—298 4 Claims

1. A compound represented hy the general formula (V):



(V)

wherein X^1 represents a halogen atom, X^2 represents a hydrogen atom or a halogen atom, R^1 represents a substituted or unsubstituted cycloakyl group having from 3 to 8 carbon atoms, A—B represents NH—C(OH) or N=C, and R^2 represents a hydrogen atom, a chlorine atom or a methyl group.

5,554,582

CYCLOHEXENONE COMPOUNDS, THEIR PREPARATION AND THEIR USE FOR CONTROLLING UNDESIRABLE PLANT GROWTH

Michael Keil, Freinsheim; Ulrich Schirmer, Heidelberg; Dieter Kolassa, Ludwigshafen; Juergen Kast, Boehl-Iggelheim; Bruno Wuerzer, Otterstadt, and Norbert Meyer, Ladenburg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

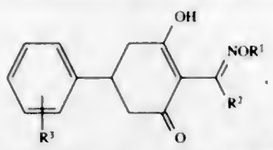
Continuation of Ser. No. 545,764, Jun. 29, 1990, abandoned, which is a continuation of Ser. No. 281,999, Dec. 9, 1988, abandoned. This application Nov. 30, 1992, Ser. No. 983,604

Claims priority, application Germany, Dec. 10, 1987, 37 41 823.8

Int. Cl.[6] A01N *33/24*; *43/32*; *43/18*; C07C *251/44*

U.S. Cl. 504—344 5 Claims

1. A cyclohexenone compound of the formula I



(I)

where R^1 is alkyl of 1 to 4 carbon atoms, alkenyl or alkynyl of 3 or 4 carbon atoms, haloalkenyl of 3 or 4 carbon atoms and 1 to 3 halogen substituents, or is thenyl which is unsubstituted or mono-, di- or trisubstituted by halo and/or C_1–C_4-alkyl, R^2 is alkyl of 1 to 4 carbon atoms, and R^3 is formyl, a radical of the general formula R^4XCHXR^5, where X is oxygen or sulfur, and R^4 and R^5 are identical or different alkyl, or together denote alkylene of 1 to 4 carbon atoms and which is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, hydroxy, halogen, cyano or C_1–C_4-dialkylamino, and their biologically active salts with alkali metal, alkaline earth metal and ammonium ions and esters thereof with C_1–C_{10}-carboxylic acids or inorganic acids, and wherein the R_3 is in the 4-position.

5,554,583

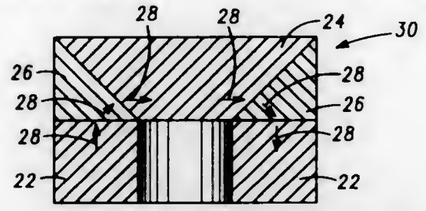
PERMANENT MAGNET DESIGN FOR HIGH-SPEED SUPERCONDUCTING BEARINGS

John R. Hull, 5519 S. Bruner, Hinsdale, Ill. 60521; Kenneth L. Uherka, 830 Ironwood, Frankfort, Ill. 60423, and Robert G. Abdoud, 13 Country Oaks La., Barrington Hills, Ill. 60010

Filed Sep. 8, 1994, Ser. No. 303,017

Int. Cl.[6] F16C *39/00*

U.S. Cl. 505—166 14 Claims



1. A high temperature superconducting bearing, comprising:

a permanent magnet rotor levitated by a high temperature superconducting structure, said permanent magnet rotor comprising a plurality of concentric permanent magnet rings coupled to a plurality of first permanent magnet ring structures having substantially triangular cross-sections which are coupled to a second permanent magnet ring structure having a substantially quadrangular cross-section, said first and second ring structures having mating boundary faces enabling magnetic flux lines to pass substantially perpendicularly through said boundary faces.

5,554,584

SUPERCONDUCTIVE PHOTOCONDUCTIVE SUBSTANCE OF THE CA-SR-BI-CU-O GROUP SYSTEM AND A METHOD OF PRODUCING THE SAME

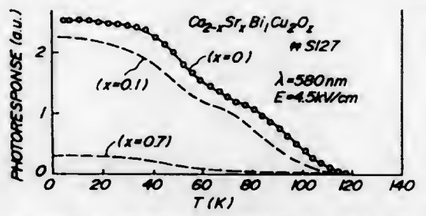
Taizo Masumi, Yokohama, Japan, assignor to University of Tokyo, Tokyo, Japan

Continuation of Ser. No. 945,434, Sep. 14, 1992, abandoned, which is a continuation of Ser. No. 392,802, Aug. 11, 1989, abandoned. This application Jan. 24, 1995, Ser. No. 377,483

Claims priority, application Japan, Aug. 12, 1988, 63-201654

Int. Cl.[6] H01J *29/45*

U.S. Cl. 505—181 4 Claims



1. A method for eliciting the photoconductivity of a photoconductive substance of the Ca-Sr-Bi-Cu-O system having a general chemical formula $Ca_{(x-x)}$-Sr_x-$Bi_{(Y-y)}$-Cu_Y-O_Z, X being 2 to 3, $0 \leqq x \leqq 0.7$, Y being 3 to 4, $0 < y \leqq 2$, and z being 4 to 9, wherein said substance is an insulator or semiconductor in the dark at a temperature below 105 to 115 K and has a photoconductivity Q(λ, T) at said temperature upon photoexcitation with irradiation in a wavelength range between 530 to 740 nm, which method comprises maintaining said photoconductive substance below said temperature while applying an electric field E across the photoconductive substance and exposing said photoconductive substance to photoexciting irradiation in the range between 530 and 740 nm, said irradiation having an intensity per unit length which is sufficiently high to elicit said photoexcitation.

5,554,585

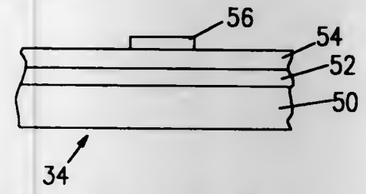
METHOD OF FORMING A SUPERCONDUCTOR MICROSTRIP TRANSMISSION LINE

Randy W. Simon, Long Beach; Christine E. Platt, El Segundo; Alfred E. Lee, Torrance, and Gregory S. Lee, West Los Angeles, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Division of Ser. No. 803,935, Dec. 9, 1991, which is a continuation of Ser. No. 233,637, Aug. 18, 1988. This application Nov. 4, 1994, Ser. No. 334,774

Int. Cl.[6] H01L *39/24*

U.S. Cl. 505—430 40 Claims



1. A method of fabricating a superconductor microstrip transmission line comprising this step of:

forming a copper oxide superconductor film on a lanthanum aluminate substrate.

5,554,586

POLYUREA THICKENER AND GREASE COMPOSITION

Samuel Pratt, Port Arthur, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Feb. 27, 1995, Ser. No. 395,215

Int. Cl.[6] C10M *149/20*

U.S. Cl. 508—552 10 Claims

1. A grease composition comprising a lubricating oil and a thickener, characterized in that the thickener is a polyurea compound prepared by reacting a diisocyanate compound with a monoamine and a polyoxypropylene diamine having a molecular weight of about 150 to about 300.

5,554,587

PROCESS FOR MAKING HIGH DENSITY DETERGENT COMPOSITION USING CONDITIONED AIR

Scott W. Capeci, North Bend, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Aug. 15, 1995, Ser. No. 515,406

Int. Cl.[6] C11D *11/00*

U.S. Cl. 510—444 11 Claims

1. A process for preparing a high density detergent composition comprising the steps of:

(a) agglomerating an aqueous surfactant paste and dry detergent material initially in a high speed mixer/densifier and subsequently in a moderate speed mixer/densifier so as to form detergent agglomerates having a density of at least about 650 g/l, wherein said aqueous surfactant paste has a viscosity of from about 5,000 cps to about 100,000 cps and contains from about 70% to 95%, by weight of said aqueous surfactant paste, of a detersive surfactant and the balance water and adjunct ingredients and said dry detergent material is selected from the group consisting of carbonates, sulfates, carbonate/sulfate complexes, tripolyphosphates, tetrasodium pyrophosphate, citrates, aluminosilicates, cellulose-based materials and organic synthetic polymeric absorbent gelling materials; and

(b) inputting air into said high speed mixer/densifier and said moderate speed mixer/densifier while agglomerating said aqueous surfactant paste and said dry detergent material, wherein said air has a relative humidity below the equilibrium relative humidity of said detergent agglomerates such that at least a minor amount of water from said surfactant paste is absorbed by said air.

5,554,588

PERFUME COMPOSITIONS

John M. Behan, Ashford; Christopher F. Clements, Folkestone; David C. Hooper, Ashford; John R. Martin, Birkenhead; James B. Melville, Eastham, and Keith D. Perring, Ashford, all of United Kingdom, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation of Ser. No. 285,593, Aug. 3, 1994, abandoned, which is a continuation of Ser. No. 973,364, Nov. 9, 1992, abandoned. This application Apr. 25, 1995, Ser. No. 428,399

Claims priority, application European Pat. Off., Nov. 8, 1991, 91310360

Int. Cl.[6] A61K *7/46*

U.S. Cl. 512—1 26 Claims

1. A perfume composition in which at least 50% by weight of the composition is constituted by at least four of the following five categories:

a) from 0.2 to 20% of one or more ethers of formula

R^1OR^2

in which the group R^1 and R^2 are connected only through the ether oxygen atom, and are aliphatic or aromatic groups such that the ether has a molecular weight of 150 to 200;

b) from 5 to 50% of one or more aromatic methyl ketones of general formula

in which R^3 is an aromatic group which is unsubstituted or substituted with a benzene, a naphthalene or an indene ring such that the molecular weight of the ketone is from 170 to 300;

c) from 5 to 50% of one or more alcohols of formula

R^4OH

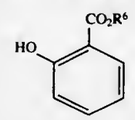
in which R^4 is an aliphatic group, optionally containing not more than one olefinic double bond, and optionally bearing an aromatic substituent group, such that the molecular weight of the alcohol is in the range 130 to 180;

d) from 2 to 40% of one or more esters which are acetates or propionates of formula

$CH_3CO_2R^5$ and $C_2H_5CO_2R^5$

in which the group R^5 is an aliphatic group optionally containing not more than one olefinic double bond, and optionally bearing an aromatic substituent group such that the molecular weight of the ester is in the range 180 to 210;

e) from 2 to 60% of one or more salicylates of general formula



in which R is an aliphatic group, optionally containing not more than one olefinic double bond, and optionally bearing an

aromatic substituent group, such that the molecular weighty of the salicylate is in the range 190 to 230;

provided that the categories which are present include:

(i) both category (a) which is the said ethers and category (b) which is the said aromatic methyl ketones with category (a) then containing from 0.2 to 6% by weight of one or more ethers in which the group R^1 is phenyl or naphthyl, unsubstituted or substituted with alkyl;

(ii) both category (a) which is the said ethers and category (e) which is the said salicylates; or

(iii) categories (a) which is the said ethers, (b) which is the said aromatic methyl ketones and (e) which is the said salicylates;

all the above percentages being by weight of the whole perfume compositions.

5,554,589

METHOD OF ADDING FISH OIL TO AN ENTERAL NUTRITIONAL PRODUCT

Normanella T. Dewille, Upper Arlington; Terrence B. Mazer, Reynoldsburg, both of Ohio; Edward H. Parke, Portage, Mich.; Francis J. Cipriano, Three Rivers, Mich., and Dennis L. Raabe, Sturgis, Mich., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 69,054, May 8, 1993, abandoned. This application Oct. 12, 1994, Ser. No. 321,664

Int. Cl.[6] A61K *47/44;* **A23J** *1/04*

U.S. Cl. 514—2 **3 Claims**

1. A method of making an enteral nutritional product containing fish oil comprising the sequential steps of:

(a) preparing a slurry which is free of fish oil and containing protein and carbohydrates;

(b) passing the slurry through a conduit immediately prior to the slurry entering a homogenizer and using a mass flow meter to meter fish oil into the slurry in the conduit at a uniform rate such that the fish oil is evenly disbursed throughout the slurry, said fish oil up to the time of addition to the slurry being maintained at a temperature of not greater than about 4° C. under a nitrogen blanket; and

(c) immediately thereafter homogenizing and heat treating the product of step (b).

5,554,590

METHOD OF TREATING ASTHMA

Robert H. Fisher; W. James Metzger, and Ruth A. Henriksen, all of Greenville, N.C., assignors to East Carolina University, Greenville, N.C.

Filed Aug. 19, 1992, Ser. No. 932,374

Int. Cl.[6] A61K *38/16*

U.S. Cl. 514—8 **12 Claims**

1. A method of treating asthma in a subject in need of such treatment, comprising contacting an effective asthma-combating amount of Asthma Reversal Factor (ARF) to the respiratory epithelium of said subject.

5,554,591

Patent Not Issued For This Number

5,554,592

INSECTICIDAL TOXINS FROM THE PARASTIC WASP, BRACON HEBETOR

Gary B. Quistad, Mountain View, Calif., and Douglas J. Leisy, Corvallis, Oreg., assignors to Sandoz Ltd.

Continuation of Ser. No. 13,890, Feb. 5, 1993, abandoned, which is a continuation-in-part of Ser. No. 897,192, Jun. 10, 1992, abandoned, which is a continuation-in-part of Ser. No. 847,570, Mar. 4, 1992, abandoned. This application Aug. 10, 1994, Ser. No. 288,408

Int. Cl.[6] A61K *38/16;* **C07K** *14/435;* **A01N** *27/00;63/00*

U.S. Cl. 514—12 **6 Claims**

1. A polypeptide designated Brh-1 isolated from the wasp *Bracon hebetor* which exhibits insect toxicity and has a molecular weight greater than 70 kDa and has the sequence of SEQ ID No. 5.

5,554,593

THERAPEUTIC AGENT FOR THREATENED ABORTION

Takayoshi Nakaya, Nagoya, and Yayoi Kajiwara, Kawasaki, both of Japan, assignors to Hoechst Japan Limited, Tokyo, Japan

Continuation of Ser. No. 26,010, Mar. 4, 1993, abandoned. This application Dec. 23, 1994, Ser. No. 364,077

Claims priority, application Japan, Jun. 6, 1992, 4-449353

Int. Cl.[6] A61K *35/16;35/50;38/43;26/00*

U.S. Cl. 514—12 **9 Claims**

1. A method of treating threatened abortion which comprises administering to a patient in need thereof an effective amount of purified human blood coagulation factor XIII.

5,554,594

IMIDAZOLIDINE DERIVATIVES

Gerhard Zoller, Schöneck; Bernd Jablonka, Bad Soden; Melitta Just, Langen; Otmar Klingler, Rodgau; Gerhard Breipohl; Jochen Knolle, both of Frankfurt am Main, and Wolfgang König, Stallwang, all of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Germany

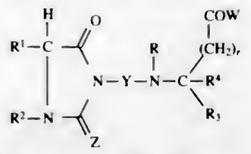
Continuation of Ser. No. 98,123, Jul. 27, 1993, abandoned. This application May 31, 1995, Ser. No. 456,066

Claims priority, application Germany, Aug. 28, 1992, 42 28 717.0

Int. Cl.[6] C07D *233/76;* **A61K** *37/02*

U.S. Cl. 514—18 **18 Claims**

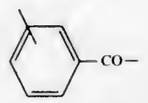
1. Compounds of the formula I



(I)

in which

Y denotes $-(CH_2)_m-CO-$, where m represents an integer from 1 to 4, or



r denotes a number from 0 to 3;

Z denotes oxygen or sulphur;

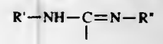
W denotes (C_1-C_{28})-alkoxy, (C_6-C_{14})-aryl-(C_1-C_6)-alkoxy, (C_6-C_{14})-aryloxy, amino or mono- or di-(C_1-C_{18})-alkylamino;

R denotes hydrogen or (C_1-C_6)-alkyl;

R^1 denotes $-(CH_2)_n-NH-X$, where n represents an integer from 1 to 6, $-(CH_2)_p-C_6H_4-NH-X$ or $-(CH_2)_p-C_6H_4-(CH_2)_q-C(=NX^2)-NH_2$, where p represents an integer from 1 to 3 and q represents a number from 0 to 2, but also where instead of

can be present;

X denotes hydrogen, (C_1-C_6)-alkyl, (C_1-C_6)-alkoxycarbonyl, (C_1-C_6)-alkylcarbonyl, (C_1-C_{18})-alkylcarbonyloxy-(C_1-C_6)-alkoxycarbonyl, (C_6-C_{14}) -aryloxycarbonyl, (C_6-C_{14})-aryl-(C_1-C_6)-alkoxycarbonyl, cyano, hydroxyl, (C_1-C_6)-alkoxy, amino or a radical of the formula II



(II)

in which R' and R" independently of one another represent hydrogen, (C_1-C_6)-alkyl, (C_1-C_6)-alkoxycarbonyl, (C_1-C_6)-alkylcarbonyl, (C_1-C_{18})-alkylcarbonyloxy-(C_1-C_6)-alkoxycarbonyl, (C_6-C_{14})-aryloxycarbonyl, (C_6-C_{14})-aryl-(C_1-C_6)-alkoxycarbonyl, cyano, hydroxyl, (C_1-C_6)-alkoxy or amino;

X^1 denotes $-(CH_2)_q-NH-X$ or $-(CH_2)_q-C(=NX^2)-NH_2$;

X^2 denotes hydrogen, (C_1-C_6)-alkyl, (C_1-C_6)-alkoxycarbonyl, (C_1-C_6)-alkylcarbonyl, (C_1-C_{18})-alkylcarbonyloxy-(C_1-C_6)-alkoxycarbonyl, (C_6-C_{14})-aryloxycarbonyl, (C_6-C_{14})-aryl-(C_1-C_6)-alkoxycarbonyl, cyano, hydroxyl, (C_1-C_6)-alkoxy or amino;

R^2 denotes hydrogen or (C_1-C_6)-alkyl;

R^3 denotes hydrogen or phenyl;

R^4 denotes hydrogen, $-COOR^5$, $-CO-N(CH_3)-R^5$ or $-CO-NH-R^5$;

R^5 denotes hydrogen, or (C_1-C_{28})-alkyl, which is optionally monosubstituted or polysubstituted by identical or different radicals from the series consisting of hydroxyl, hydroxycarbonyl, aminocarbonyl, mono- or di-(C_1-C_{18})-alkylaminocarbonyl, amino-(C_2-C_{14})-alkylaminocarbonyl, amino-(C_1-C_3)-alkylphenyl-(C_1-C_3)-alkylaminocarbonyl, (C_1-C_{18})-alkylcarbonylamino-(C_1-C_3)-alkylphenyl-(C_1-C_3)-alkylaminocarbonyl, C_1-C_{18})-alkylcarbonylamino-(C_2-C_{14})-alkylaminocarbonyl, phenyl-(C_1-C_8)-alkoxycarbonyl, amino, mercapto, (C_1-C_{18})-alkoxy, (C_1-C_{18})-alkoxycarbonyl, (C_3-C_8)-cycloalkyl, halogen, nitro, trifluoromethyl or a radical R^6;

R^6 denotes (C_6-C_{14})-aryl, (C_6-C_{14})-aryl-(C_1-C_8)-alkyl, a monocyclic or bicyclic 5- to 12-membered heterocyclic ring which can be aromatic, partially hydrogenated or completely hydrogenated and which, as the heteroelement, can contain one, two or three identical or different nitrogen, oxygen or sulphur atoms, or denotes a radical R^7, where the aryl radical and, independently thereof, the heterocyclic radical can be optionally mono-substituted or polysubstituted by identical or different radicals from the series consisting of (C_1-C_{18})-alkyl, (C_1-C_{18})-alkoxy, halogen, nitro and trifluoromethyl;

R^7 denotes $-NR^8R^9$, $-OR^8$, $-SR^8$, an amino acid side chain, a natural or unnatural amino acid residue, imino acid residue, optionally N-(C_1-C_6)-alkylated or (C_6-C_{14})-aryl-(C_1-C_6)-alkylated azaamino acid residue or dipeptide residue, in which the peptide bond can be reduced to $NH-CH_2$, and also their esters and amides, where free functional groups can optionally be substituted by hydrogen or hydroxymethyl or protected by protective groups customary in peptide chemistry, or denotes a radical $-COR^7$; in which R^7 is defined as R^7;

R^8 denotes hydrogen, (C_2-C_{18})-alkyl, (C_8-C_{14})-aryl-(C_1-C_8)-alkyl, (C_1-C_{18})-alkylcarbonyl, (C_1-C_{18})-alkoxycarbonyl, (C_8-C_{14})-arylcarbonyl, (C_8-C_{14})-aryl-(C_1-C_8)-alkylcarbonyl, or (C_6-C_{14})aryl-$(C_1-C_{18}$)-alkoxycarbonyl, where the alkyl groups can optionally be substituted by an amino group, a natural or unnatural amino acid residue, imino acid residue, optionally N-(C_1-C_8)alkylated or (C_8-C_{14})-aryl-(C_1-C_8)-alkylated azaamino acid residue or a dipeptide residue, in which the peptide bond can be reduced to $NH-CH_2$; and

R^9 denotes hydrogen, (C_1-C_{18})-alkyl, (C_8-C_{14})-aryl or (C_8-C_{14})-aryl-(C_1-C_8)-alkyl;

and there physiologically tolerable salts, extending compounds of the formula I, wherein, simultaneously,

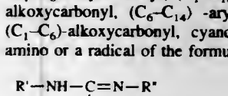
r denotes 1;

Z denotes oxygen;

W denotes tert-butoxy;

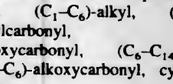
R denotes hydrogen;

R^1 denotes $-(CH_2)_k-NH-X^a$ where k represents an integer from 3 to 5, $-CH_2-C_6H_4-NH-X^a$ or $-CH_2-C_6H_4-C(=NH)-NH_2$ or where instead of



is present;

X^a denotes hydrogen, (C_1-C_6)-alkyl or a radical of the formula



in which $R^{a'}$ and $R^{a''}$ independently of one another denote hydrogen or (C_1-C_6)-alkyl;

X^{1a} has one of the meanings of X^a or denotes $-C(=NH)-NH_2$.

5,554,595

SELECTIVE REGULATION OF B LYMPHOCYTE PRECURSORS BY HORMONES

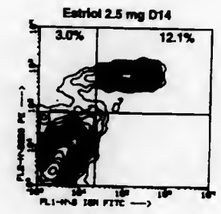
Paul W. Kincade, Oklahoma City, and Kay L. Medina, Moore, both of Okla., assignors to Oklahoma Medical Research Foundation, Oklahoma City, Okla.

Continuation of Ser. No. 44,280, Apr. 19, 1993, abandoned. This application Oct. 11, 1994, Ser. No. 321,156

The portion of the term of this patent subsequent to Apr. 7, 2014, has been disclaimed.

Int. Cl.[6] C07K *14/575;14/59;* **A61K** *31/56;38/24*

U.S. Cl. 514—21 **4 Claims**



1. A method for modulating production of committed mammalian B lymphocyte precursor cells in a culture of cells containing B lymphocyte precursor cells and mature B lymphocytes comprising exposing the mix of cells to a hormone selected from the group consisting of hormones elevated during pregnancy, synthetic analogues of the hormones elevated during pregnancy, eliciting agents of the hormones elevated during pregnancy, and antagonists of the hormones elevated during pregnancy, in an amount effective to alter selectively the production of mammalian B lymphocyte precursor cells by proliferation or differentiation as compared with proliferation of mature B lymphocytes.

5,554,596

VIRUS INHIBITING COMPOSITION

Walter Mach, deceased, late of Kirchseon, and by Chantal Mach, executor, both of Wasserburgerstr. 17, D-8011 Kirchseon, Germany

Filed Jan. 27, 1993, Ser. No. 969,208

Claims priority, application Germany, May 27, 1990, 40 17 091

Int. Cl.[6] A61K *31/70*; **C07G** *100*; **C08L** *97/00*

U.S. Cl. 514—22 **29 Claims**

1. A virus-inhibiting composition, which is produced by a process comprising:

(a) isolating a lignin unit containing fraction from a natural lignin containing material by extraction in an aqueous media under weakly acidic or alkaline conditions and separating the resultant insoluble solids;

(b) isolating a lignoid unit containing fraction from a lignin containing product selected from the group consisting of wood-incarbonization products, bioconverted lignin containing material and mixtures thereof, by carrying out an aqueous alkaline extraction at a pH of 8 to 14 and separating the resultant alkali-insoluble solids; and

(c) preparing a water-soluble polymer by reacting the lignin unit containing fraction from step (a) with the lignoid unit containing fraction from step (b), under aqueous alkaline conditions at a pH of about 9 to 12, removing by ultrafiltration a low molecular weight fraction having a molecular weight of, no more than 3000 daltons, isolating a fraction containing at least one polymer comprising lignin and having a molecular weight of 15 to 40 kilodaltons, discarding the resultant residue, and treating the 15 to 40 kildalton fraction with an hydrogen ion cation exchanger at a pH of 3 to 7.

5,554,597

COMPOSITIONS COMPRISING 2-HYDROXYCARBOXYLIC ACIDS AND RELATED COMPOUNDS, AND METHODS FOR ALLEVIATING SIGNS OF DERMATOLOGICAL AGING

Ruey J. Yu, 4 Lindenwold Ave., Ambler, Pa. 19002, and Eugene J. Van Scott, 3 Hidden Ln., Abington, Pa. 19001

Continuation of Ser. No. 359,939, Dec. 20, 1994, which is a continuation of Ser. No. 117,559, Sep. 7, 1993, abandoned, which is a continuation of Ser. No. 936,863, Aug. 27, 1992, abandoned, which is a continuation of Ser. No. 683,437, Apr. 10, 1991, abandoned, which is a continuation-in-part of Ser. No. 469,738, Jan. 19, 1990, abandoned, which is a continuation of Ser. No. 945,680, Dec. 23, 1986, abandoned, and a continuation-in-part of Ser. No. 393,749, Aug. 15, 1989, Pat. No. 5,091,171. This application Jun. 7, 1995, Ser. No. 478,522

Int. Cl.[6] A01N *37/00*

U.S. Cl. 514—557 **23 Claims**

1. A method for preventing and/or reducing the appearance of skin changes associated with intrinsic and/or extrinsic aging, said skin changes associated with aging resulting from natural or innate aging or exposure to actinic radiation,

wherein said skin changes associated with aging are selected from the group consisting of wrinkles, thinning of the skin, deepening of skin lines, yellowish skin, loss of elasticity, loss of recoilability, and loss of collagen,

said method comprising topically applying to the skin a composition comprising (i) at least one compound selected from the group consisting of 2-hydroxycarboxylic acids, 2ketoacids and related compounds, or topically effective salts thereof in an amount and for a period of time sufficient to prevent and/or reduce the appearance of said skin change, and (ii) a sunscreen agent,

wherein said 2-hydroxycarboxylic acid is represented by a generic structure of:

$$(R_a)(R_b)C(OH)COOH$$

wherein R_a and R_b may be the same or different and are independently selected from H, F, Cl, Br, alkyl, aralkyl or aryl group of saturated or unsaturated, isomeric or non-isomeric, straight or branched chain or cyclic form, having 1 to 29 carbon atoms, and in addition R_a and R_b can be substituted by OH, CHO, COOH and alkoxy group having 1 to 9 carbon atoms, said 2-hydroxycarboxylic acid may be present as a free acid or lactone form, or in a salt form with an organic base or an inorganic alkali, and as stereoisomers as D, L, and DL forms when R_a and R_b are not identical,

said 2-ketoacid is represented by a generic structure of:

$$(R_c)COCOO(R_d)$$

wherein R_c and R_d may be the same or different and are independently selected from H, alkyl, aralkyl or aryl group of saturated or unsaturated, isomeric or non-isomeric, straight or branched chain or cyclic form, having 1 to 29 carbon atoms, and in addition R_c may carry F, Cl, Br, I, OH, CHO, COOH and alkoxy group having 1 to 9 carbon atoms, said alpha ketoacid existing as a free acid or an ester form, or in a salt form with an organic base or an inorganic alkali, and

said related compound is selected from the group consisting of quinic acid, isocitric acid, tropic acid, trethocanic acid, 3-chlorolactic acid, cerebronic acid, citramalic acid, agaricic acid, aleuritic acid, pantoic acid, lactobionic acid and hexulosonic acid.

5,554,598

METHOD OF TREATING CRURAL OR DECUBITUS ULCER WITH ZINC HYALURORIC ACID COMPLEX

Kálmán Burger; Iván Réthey; Béla D. Stefkó; István D. Gebhardt; Gyöngyvér Király née; dr. Géza Takácsi Nagy; János Illés; Erzsébet Neszmélyi; István Rácz, and Viktoria Várkonyi, all of Budapest, Hungary, assignors to Chemical Works of Richter Gedeon Ltd., Budapest, Hungary

Continuation of Ser. No. 602,326, Nov. 21, 1990, abandoned. This application Aug. 10, 1992, Ser. No. 928,154

Claims priority, application Hungary, Feb. 24, 1989, 891/89

Int. Cl.[6] A61K *31/70*

U.S. Cl. 514—54 **1 Claim**

1. A method of treating a crural ulcer or decubitus ulcer in an afflicted patient which comprises the step of locally administering to said ulcer, a therapeutically effective amount of a zinc hyaluronic acid complex with a stoichiometric composition, prepared through the interaction of equivalent amounts of sodium hyaluronate and zinc ions in aqueous solution, where the zinc is surrounded by four oxygen atoms in the first coordination sphere, the length of the ZnO bond distance is 199 pm whereas two carbon atoms are present in a longer distance of 241 pm from the zinc atom.

5,554,599

22-THIO VITAMIN D DERIVATIVES

Gunnar Grue-Sørensen, Ølstykke, and Erik R. Uttosen, Copenhagen, both of Denmark, assignors to Leo Pharmaceutical Products Ltd., Ballerup, Denmark

PCT No. PCT/DK93/00425, § 371 Date Apr. 11, 1995, § 102(e) Date Apr. 11, 1995, PCT Pub. No. WO94/14766, PCT Pub. Date Jul. 7, 1994

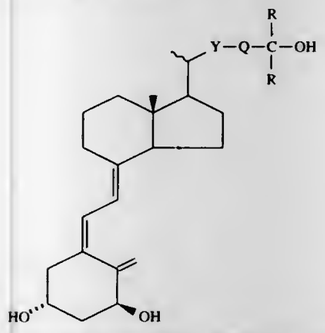
PCT Filed Dec. 17, 1993, Ser. No. 411,634

Claims priority, application United Kingdom, Dec. 23, 1992, 9226877

Int. Cl.[6] A61K *31/59*; **C07C** *401/00*

U.S. Cl. 514—167 **13 Claims**

1. A compound of the formula I



I

in which formula Y is sulfur, S(O), or $S(O)_2$; R stands for C_1–C_3 alkyl; or

can form a C_3–C_8 carbocyclic ring; Q is a C_1–C_8 hydrocarbylene diradical; and prodrugs of I in which one or more of the hydroxy groups are masked as groups which can be reconverted to hydroxy groups in vivo.

5,554,600

METHODS FOR INHIBITING ENDOMETRIOSIS

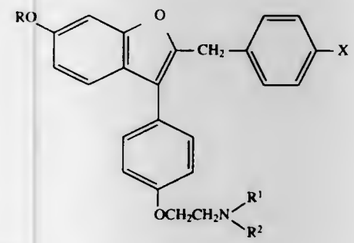
Steven A. Fontana, Martinsville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 20, 1995, Ser. No. 376,950

Int. Cl.[6] A61K *31/56*

U.S. Cl. 514—182 **11 Claims**

1. A method for inhibiting endometriosis comprising administering to a woman in need of treatment an effective amount of a compound of formula I



I

wherein

R is hydrogen or methyl;

R^1 R^2 each are methyl or ethy, or R^1 and R^2 together with the nitrogen atom to which they are attached represent a saturated heterocyclic group; and

X is bromo, chloro, fluoro, or hydrogen; or a pharmaceutically acceptable salt thereof.

5,554,601

METHODS FOR NEUROPROTECTION

James W. Simpkins; Meharvan Singh, both of Gainesville, and Jean Bishop, Jacksonville, all of Fla., assignors to University of Florida, Gainesville, Fla.

Continuation-in-part of Ser. No. 149,175, Nov. 5, 1993, abandoned. This application Oct. 4, 1994, Ser. No. 318,042

Int. Cl.[6] A61K *31/56*

U.S. Cl. 514—182 **29 Claims**

1. A method of conferring neuroprotection on a population of cells in a subject, comprising:

(i) providing an estrogen compound; and

(ii) administering the compound in the absence of testosterone, in an effective dose, to the population of cells so as to confer neuroprotection.

5,554,602

LABELLING OF HORMONES WITH RHENIUM AND TECNETIUM

Siden Top, Lisses; Anne Vessieres; G'erard Jaquen, L'Hay–Les–Roses, all of France, and Jacques Quivy, Louvain–Laneuve, Belgium, assignors to LaRegion Wallone, Namur, Belgium

Filed Apr. 12, 1993, Ser. No. 45,124

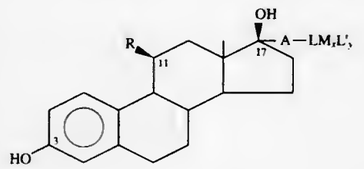
Claims priority, application France, Apr. 10, 1992, 92 04411

Int. Cl.[6] C07J *1/00*; **A61K** *31/565*

U.S. Cl. 424—1.45 **13 Claims**

1. An organometallic oestrogen complex of the formula (I):

(I)



wherein

A represents a C_1 to C_7 alkylene radical or a C_2 to C_7 alkenylene or alkynylene radical,

M_2 represents one or more identical or different transition metals,

L'_y represents one or more identical or different ligands complexing the metal(s) M_x and

L represents a ligand for M_x coupled covalently to A selected from the group consisting of phenol and cyclopentadienyl,

R represents H or a substituted or unsubstituted C_1 to C_7 alkyl or alkoxy.

5,554,603

ORALLY ACTIVE DERIVATIVES OF 1,3,5(10)-ESTRATRIENE

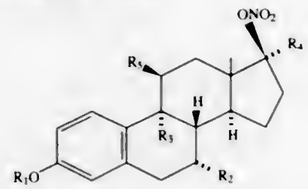
Hyun K. Kim, Bethesda; Richard P. Blye, Highland, and Gabriel Bialy, Bethesda, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Sep. 17, 1993, Ser. No. 122,853

Int. Cl.[6] A61K *31/56;* **C07J** *1/00*

U.S. Cl. 514—182 **9 Claims**

1. A compound of the formula



wherein

R_1 is selected from the group consisting of hydrogen, lower alkyl, cycloalkyl and lower acyl;

R_2 is selected from the group consisting of hydrogen and lower alkyl;

R_3 is selected from the group consisting of hydrogen, hydroxy and lower alkoxy;

R_4 is selected from the group consisting of hydrogen and lower alkyl; and

R_5 is nitrate.

5,554,604

METHOD OF CONTROLLING MALE FERTILITY

Armelle Bonfils, Paris, and Daniel Philibert, La Varenne Saint Hilaire, both of France, assignors to Roussel Uclaf, France

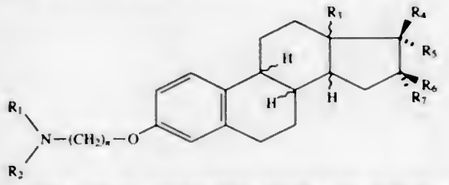
Filed Mar. 8, 1995, Ser. No. 401,078

Claims priority, application France, Mar. 24, 1994, 94 03460

Int. Cl.[6] A61K *31/565;31/57;31/575*

U.S. Cl. 514—182 **8 Claims**

1. A method of controlling male fertility in warm-blooded animals comprising administering to male warm-blooded animals an amount of a compound selected from the group consisting of a compound of the formula



wherein R_1 and R_2 are individually selected from the group consisting of alkyl of 1 to 8 carbon atoms and benzyl, R_3 is α- or β-methyl, n is an integer from 2 to 10, R_4 is selected from the group consisting of hydrogen, —OH and acyloxy of an organic carboxylic acid of up to 12 carbon atoms and R_5 is selected from the group consisting of hydrogen, —OH, acyloxy of an organic carboxylic acid of up to 12 carbon atoms and alkyl, alkenyl and alkynyl of up to 8 carbon atoms, R_6 and R_7 are individually selected from the group consisting of hydrogen, —OH and acyloxy of an organic carboxylic acid of up to 12 carbon atoms and R_4 and R_7 are hydrogen and their non-toxic, pharmaceutically acceptable acid addition salts in an amount sufficient to control male fertility.

5,554,605

MACROCYCLIC LACTAM PROKINETIC AGENTS

Leslie A. Freiberg, Waukegan; Carla Edwards, Evanston; Richard J. Pariza, Winthrop Harbor, and Hugh N. Nellans, Mundelein, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

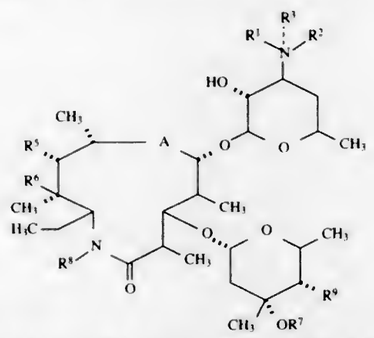
Division of Ser. No. 108,659, Mar. 30, 1992, which is a continuation-in-part of Ser. No. 682,836, Apr. 9, 1991, abandoned. This application May 4, 1995, Ser. No. 435,017

Int. Cl.[6] C07D *521/00;* **A61K** *31/71*

U.S. Cl. 514—183 **2 Claims**

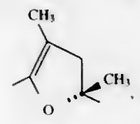
1. A method for enhancing gastrointestinal motility in humans and other mammals in need of such treatment comprising administering a therapeuticallly effective amount of a compound of the formula:

(I)

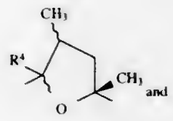


and pharmaceutically acceptable salts thereof wherein the dotted line is an optional bond, In formula (I), A is selected from

(II)

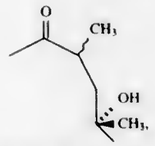


(III)



and

(IV)



where a wavy line represents a bond having either steric orientation,

R^1 and R^2 in formula (I) may independently be selected from hydrogen, loweralkyl, halo-substituted loweralkyl, cyano-substituted loweralkyl, hydroxy-substituted loweralkyl, loweralkenyl, loweralkynyl, lower cycloalkyl, lower cycloalkylmethyl and benzyl,

R^3 in formula (I) may be absent or, if present, selected from loweralkyl, loweralkenyl, loweralkynyl and benzyl and accompanied by a pharmaceutically acceptable counterion so as to form a quaternary ammonium salt,

R^4 in formulae (I) and (III) may be hydrogen or, taken together with R^6, may form an ether bridge,

R^5 in formula (I) may be —OH, or —OR^{10}, wherein R^{10} is selected from loweralkyl, loweralkanoyl and —$S(O)_2CH_3$, or, taken together with R^6 and the carbons to which they are attached, may form a cyclic carbonate,

R^6 in formula (I) may be hydrogen, —OH, or —OR^{11} wherein R^{11} is selected from loweralkyl, loweralkanoyl and —$S(O)_2CH_3$; or, taken together with R^4, may form an ether bridge; or, taken together with R^5 and the carbons to which they are attached, may form a cyclic carbonate,

R^7 in formula (I) may be either hydrogen or methyl,

R^8 in formula (I) may be hydrogen or loweralkyl,

R^9 in formula (I) may be hydrogen or hydroxy.

5,554,606

ANTIBIOTIC COMPOUNDS

Michael J. Betts, Wilmslow, and Gloria A. Breault, Congleton, both of England, assignors to Zeneca Limited, London, United Kingdom

PCT No. PCT/GN92/00526, § 371 Date Oct. 6, 1993, § 102(e) Date Oct. 6, 1993, PCT Pub. No. WO92/18582, PCT Pub. Date Oct. 29, 1992

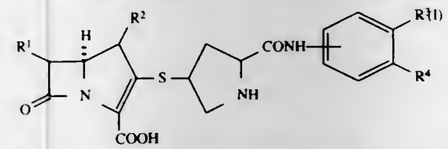
PCT Filed Apr. 2, 1992, Ser. No. 329,614

Claims priority, application United Kingdom, Mar. 12, 1990, 9005469; Apr. 8, 1991, 9107363

Int. Cl.[6] C07D *487/04;* **A61K** *31/40*

U.S. Cl. 514—210 **15 Claims**

1. A carbapenem compound of the formula (I)



R^1 is 1-hydroxyethyl, 1-fluoroethyl or hydroxymethyl;

R^2 is hydrogen or C_{1-4}alkyl;

R^3 and R^4 are ortho with respect to one another wherein R^3 and R^4 are independently hydroxy or in vivo hydrolysable esters thereof;

the benzene ring being optionally further substituted by C_{1-4}alkyl, halo, hydroxy, hydroxyC_{1-4}alkyl, amino, nitro, C_{1-4}alkoxy, carboxyC_{1-4}alkyl, C_{1-4}alkanoylamino, N-alkyl-N-C_{1-4}alkanoylamino, trifluomethyl, carboxy, carbamoyl, C_{1-4}alkylcarbamoyl, di-C_{1-4}alkylcarbamoyl, cyano, C_{1-4}alkanesulphonamido, C_{1-4}alkanoyl, C_{1-4}alkanoyloxy, C_{1-4}alkoxycarbonyl, C_{1-4}alkylthio, C_{1-4}alkanesulphinyl, C_{1-4}alkanesulphonyl, C_{2-4}alkenyl, hydroxyiminomethyl, C_{1-4}alkoxyiminomethyl, aminosulphonyl, C_{1-4}alkylaminosulphonyl or di-[N-C_{1-4}alkyl]aminosulphonyl;

or a pharmaceutically acceptable salt or in vivo hydrolysable ester thereof.

5,554,607

USE OF 2-THIOXO-IMIDAZOLIN-4-ONE DERIVATIVES IN THE TREATMENT OF ATHEROSCLEROSIS

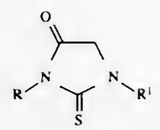
Hassan M. Elokdah, Fairless Hills, Pa.; Sie-Yearl Chai, Lawrenceville, N.J.; Theodore S. Sulkowski, Wayne, and Donald P. Strike, St. Davids, both of Pa., assignors to American Home Products Corporation, Madison, N.J.

Filed Nov. 28, 1995, Ser. No. 563,325

Int. Cl.[6] A61K *31/395;31/55;31/445;31/44*

U.S. Cl. 514—210 **36 Claims**

1. A method for increasing the HDL cholesterol concentration in the blood of a mammal in need of increased HDL cholesterol blood concentration, which comprises administering to said mammal, orally or parenterally, a compound of formula I:



I

wherein

R is alkyl of 1 to 6 carbon atoms; unsubstituted aromatic N, O or S heterocycle having 4 to 6 carbon and one hetero ring member; substituted or unsubstituted aryl of 6 to 10 carbon atoms, arylalkyl of 7 to 12 carbon atoms, benzhydryl or indanyl, in which the substituents are one to three members independently selected from the group consisting of alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, alkylthio of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkynyl of 2 to 6 carbon atoms, halo, perfluoroalkyl of 1 to 6 carbon atoms, perfluoroalkoxy of 1 to 6 carbon atoms or hydroxy; and

R^1 is aryl of 6 to 10 carbon atoms, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkynyl of 2 to 6 carbon atoms or substituted aryl of 6 to 10 carbon atoms where the substituents are one to three members independently selected from the group consisting of alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, alkylthio of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkynyl of 2 to 6 carbon atoms, halo, perfluoroalkyl of 1 to 6 carbon atoms, perfluoroalkoxy of 1 to 6 carbon atoms or hydroxy.

5,554,608

INHIBITION OF HAIR GROWTH

Gurpreet S. Ahluwalia, 8632 Stable View Ct., Gaithersburg, Md. 20879; Douglas Shander, 16112 Howard Landing Dr., Gaithersburg, Md. 20878, and Peter Styczynski, 3709 Roop Rd., New Windsor, Md. 21776

Filed Sep. 28, 1994, Ser. No. 314,327

Int. Cl.[6] A61K *31/55;31/54;31/505;31/47*

U.S. Cl. 514—212 **33 Claims**

1. A process for inhibiting mammalian hair growth, comprising selecting an area of skin from which reduced hair growth is desired; and

applying to said area of skin a composition of an inhibitor of protein kinase C in an amount effective to reduce hair growth.

5,554,609

Patent Not Issued For This Number

5,554,610

INHALATIONAL TREATMENT OF PULMONARY HYPERTENSION AND RELATED CONDITIONS

Andrew J. Williams, and Derek R. Buckle, both of Epsom, England, assignors to Beecham Group p.l.c., Brentford, England

Continuation of Ser. No. 54,711, Apr. 28, 1993, abandoned, which is a continuation of Ser. No. 396,547, Aug. 21, 1989, abandoned, which is a division of Ser. No. 214,776, Jul. 5, 1988, Pat. No. 4,891,380. This application Aug. 24, 1994, Ser. No. 295,220

Claims priority, application United Kingdom, Jul. 7, 1987, 8715944; Aug. 6, 1987, 8718587

Int. Cl.[6] A61K *31/54;31/495;31/505;31/44*

U.S. Cl. 514—223.2 **6 Claims**

1. A method for the treatment of disorders associated with pulmonary hypertension or right heart failure in mammals, which method comprises administering to the mammal in need thereof a

therapeutically effective amount of a vasodilator selected from the group consisting of ganglion blockers, sympathetic nerve blockers, and direct vasodilators, wherein said vasodilator is administered to said mammal by inhaling.

5,554,611

USE OF COUMARIN DERIVATIVES

Karl Schönafinger, Alzenau; Peter Klemm, Bretzenheim, and Jörg Ostrowski, deceased, late of Rodenbach, all of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 8, 1994, Ser. No. 336,374

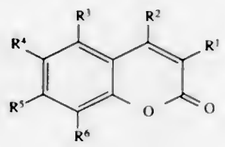
Claims priority, application Germany, Nov. 8, 1993, 43 37 906.0

Int. Cl.[6] A61K *31/54;31/535;31/495;31/445*

U.S. Cl. 514—228.2 **10 Claims**

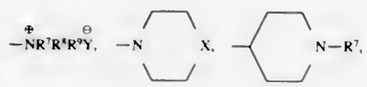
1. Method for treating a host afflicted with an excessively high NO level, against disorders which arise as the result of an elevated NO level in the body which comprises administering to such a host in need thereof an effective dose of a coumarin compound of the formula I

(I)

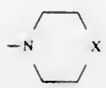


in which

R^1 denotes hydrogen; halogen; $(C_2–C_6)$-alkenyl; $(C_7–C_{10})$-aralkyl; phenyl which is optionally substituted by $(C_1–C_4)$-alkyl, $(C_1–C_4)$-alkoxy, halogen, nitro or amino; $(C_1–C_6)$-alkyl, hydroxy-$(C_1–C_6)$-alkyl or dihydroxy-$(C_1–C_6)$-alkyl, which are optionally substituted by $(C_1–C_4)$-alkoxy, $(C_1–C_4)$-alkoxycarbonyl, $(C_1–C_4)$-alkyl-carbonyl, amino or aminocarbonyl which can also be N-substituted or di-N-substituted.

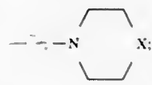


pyridyl or di-$(C_1–C_4)$-alkylamino-$(C_1–C_4)$-alkylthio; $—CH(CH_2—NR^7R^8)_2$; or di-$(C_1–C_4)$-alkylamino-$(C_1–C_4)$-alkylthio; R^2 denotes $(C_1–C_6)$-alkyl which is optionally substituted by

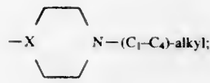


or amino or aminocarbonyl which can also be N-substituted or di-N-substituted; $(C_2–C_6)$-alkenyl; $(C_6–C_{10})$-aryl; or pyridyl;

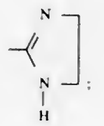
R^3 and R^4, independently of each other, denote hydrogen; hydroxyl; $(C_1–C_4)$-alkoxy, hydroxy-$(C_1–C_4)$-alkoxy or dihydroxy-$(C_1–C_4)$-alkoxy which are optionally substituted by $(C_1–C_4)$-alkoxycarbonyl, amino or aminocarbonyl which can also be N-substituted or di-N-substituted, or



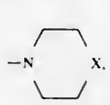
$(C_2–C_6)$-alkenyloxy; amino-$(C_1–C_4)$-alkyl which can also be N-substituted or di-N-substituted;



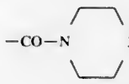
R^5 is defined as R^3 and additionally also denotes CF_3; OR^7; $(C_7–C_{10})$-aralkoxy; $(C_1–C_4)$-alkoxy which can be substituted by one or two hydroxyl groups or by



$(C_1–C_6)$-alkoxy which is substituted by $—COOR^7$ or $—NR^7R^8$; $(C_1–C_4)$-alkylcarbonyl; $(C_2–C_6)$-alkynyl; $(C_1–C_4$-alkoxycarbonyloxy; NH_2; or NHR^{10}; R^6 is defined as R^3 but cannot represent chlorine; R^7 denotes hydrogen; $(C_1–C_6)$-alkyl, hydroxy-$(C_1–C_6)$-alkyl or dihydroxy-$(C_1–C_6)$-alkyl which are optionally substituted by amino, di-$(C_1–C_4)$-alkylamino, $(C_1–C_4)$-alkoxy, cyano,



or a radical R^{10}, $(C_2–C_6)$-alkenyl; or $(C_7–C_{10})$-aralkyl; R^8 denotes hydrogen; $(C_1–C_6)$-alkyl; $(C_1–C_4)$-alkoxy-$(C_1–C_6)$-alkyl; or $(C_7–C_{10})$-aralkyl; R^9 denotes $(C_1–C_4)$-alkyl; R^{10} denotes aminocarbonyl; N-$(C_1–C_4)$-alkylaminocarbonyl); di-N-$(C_1–C_4)$-alkylaminocarbonyl; N-$(C_6–C_{10})$-arylaminocarbonyl;



$(C_1–C_4)$-alkylcarbonyl; $(C_6–C_{10})$-arylcarbonyl; di-N-$(C_1–C_4)$-alkylaminomethylcarbonyl; $—SO_2(C_1–C_4)$-alkyl or $—SO_2(C_6–C_{10})$-aryl; X denotes a single bond; O; CH_2; S; NH; N$(C_1–C_4)$-alkyl; N$(C_6–C_{10})$-aryl; or N(hydroxy-$(C_1–C_6)$-alkyl; and Y denotes Cl; BR; I; TosO; HSO_4 or CH_3COO, and their pharmacologically acceptable acid addition compounds.

5,554,612

4-AMINO 6-SUBSTITUTES MYCOPHENOLIC ACID AND DERIVATIVES

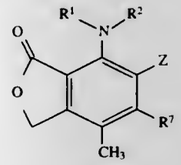
John W. Patterson; David Morgans, Jr.; Eric B. Sjogren; David B Smith; Francisco X. Talamás; Dean R. Artis; Alicia Cervantes; Todd R. Elworthy; Mario Fernández; Fidencio Franco; Ronald C. Hawley; Teresa Lara; David G. Loughhead; Peter H. Nelson; Alejandra Trejo; Ann M. Waltos, and Robert J. Weikert, all of 3401 Hillview Ave., P.O. Box 10850, Palo Alto, Calif. 94303

Division of Ser. No. 198,741, Feb. 18, 1994. This application May 26, 1995, Ser. No. 452,243

Int. Cl.[6] A61K *31/365;31/535;* **C07D** *307/88;413/12*

U.S. Cl. 514—233.5 **25 Claims**

1. A compound represented by the formula:



wherein:

R^1 is hydrogen or lower alkyl;

R^2 is hydrogen, lower alkyl, $—C(O)R^3$, $—C(O)NR^4R^5$, $—CO_2R^6$, or $—SO_2R^3$; in which:

R^3 is hydrogen, lower alkyl, halo lower alkyl or optionally substituted phenyl;

R^4 is hydrogen, lower alkyl or optionally substituted phenyl;

R^5 is hydrogen, lower alkyl or optionally substituted phenyl;

R^6 is lower alkyl or optionally substituted phenyl; and

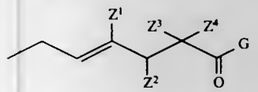
R^7 is lower alkyl, cycloalkyl, fluorovinyl, difluorovinyl, trifluorovinyl, lower alkenyl, $—C≡C—R^8$, allyl, CHO, or CH_2OR^9; in which:

R^8 is hydrogen or lower alkyl, and

R^9 is hydrogen or 4-methoxybenzyl; and

Z is a side chain selected from Formulae ZA, ZB, ZC, ZD, ZE, ZF, ZG, and ZH:

Formula ZA



wherein:

Z^1 is hydrogen, lower alkyl, halo or CF_3;

$Z^2$is hydrogen, lower alkyl, lower alkoxy, aryl, or $—CH_2Z^{13}$, where Z^{13} is aryl or heteroaryl;

Z^3 is hydrogen, lower alkyl, lower alkenyl, lower alkoxy, phenyl, or $—S(O)_mZ^{12}$, where

Z^{12} is lower alkyl, and

m is 0, 1 or 2;

Z^4 is hydrogen, lower alkyl, or phenyl, or Z^3 and Z^4 taken together with the carbon to which they are attached form cycloalkyl of three to five carbon atoms; and

G is OH, lower alkoxy, lower thioalkyl, $—NG^1G^2$, $—O(CH_2)_nG^1G^2$, or $—O(CH_2)_n—G^3$, where

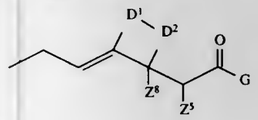
n is an integer from 1 to 6,

G^1 is hydrogen or lower alkyl,

G^2 is hydrogen or lower alkyl, and

$=G^3$ is lower alkylene of four to six carbon atoms, or lower alkylene of three to five carbon atoms plus one member that is —O—, —S—, or $—N(G^4)—$ where G^4 is hydrogen or lower alkyl;

Formula ZB



wherein:

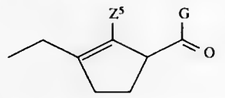
Z^5 is hydrogen or lower alkyl;

Z^6 is hydrogen or lower alkyl;

D^1 and D^2 together with their adjacent carbon atoms form an optionally substituted, saturated or unsaturated carbocyclic or heterocyclic ring of 3 to 7 atoms; and

G is as defined above; or

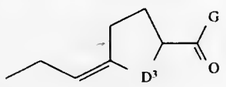
Formula ZC



wherein:

Z^5, Z^6, and G are as defined above; or

Formula ZD

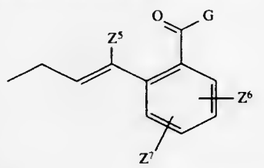


wherein:

D^3 is $—CH_2—$ or $—CH_2CH_2—$; and

G is as defined above; or

Formula ZE



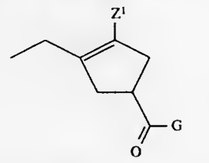
wherein:

Z^6 is hydrogen, lower alkyl, lower alkoxy, —COOH, $—NH_2$ or halo;

Z^7 is hydrogen, lower alkyl, lower alkoxy or halo; and

Z^5 and G are as defined above; or

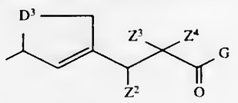
Formula ZF



wherein:

Z^1 and G are as defined above; or

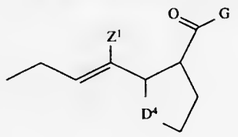
Formula ZG



wherein:

D^3, Z^2, Z^3, Z^4 and G are as defined above; or

Formula ZH



wherein:

D^4 is $—CH_2—$, $—CH_2CH_2—$, $—CH_2CH_2CH_2—$, —O—, or $—OCH_2—$; and

Z^1 and G are as defined above;

or a pharmaceutically acceptable salt thereof.

5,554,613

HETEROCYCLIC DERIVATIVES

Keith B. Mallion, Knutsford, England, assignor to Zeneca Limited, London, England

PCT No. PCT/GB93/01165, § 371 Date Jun. 9, 1994, § 102(e) Date Jun. 9, 1994, PCT Pub. No. WO93/24486, PCT Pub. Date Dec. 9, 1993

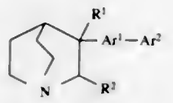
PCT Filed Jun. 2, 1993, Ser. No. 190,073

Claims priority, application United Kingdom, Jun. 4, 1992, 9211796

Int. Cl.[6] C07D *401/10;413/10;* **A61K** *31/495;31/44*

U.S. Cl. 514—253 **13 Claims**

1. A compound of formula I, or a pharmaceutically acceptable salt thereof,



wherein:

R^1 is hydrogen or hydroxy;

R^2 is hydrogen; or

R^1 and R^2 are such that $>CR^1CR^2<$ is of the structure $>C=C<$;

Ar^1 is a phenylene moiety;

Ar^2 is a 6-membered heteroaryl moiety containing one or two nitrogen atoms;

and wherein Ar^1 and Ar^2 are independently substituted or unsubstituted with one or more substituted independently selected from halogeno, hydroxy, amino, nitro, cyano, carboxy, carbamoyl, (1–6C)alkyl, (2–6C)alkenyl, (2–6C)alkynyl, (1–6C)alkoxy, (1–6C)alkylamino, di-[(1–6C)alkyl]amino, N-(1–6C)alkylcarbamoyl, di-N,N-[(1–6C)alkyl]carbamoyl, (1–6C)alkoxycarbonyl, di-N,N-[(1–6C)alkylcarbamoyl, (1–6C)alkoxylcarbonyl, (1–6C)alkylthio, (1–6C) alkylsulphinyl, (1–6C)alkylsulphonyl, halogeno(1–6C)alkyl, (1–6C)alkanoylamino, (1–4C)alkylenedioxy, (1–6C)alkanoyl and oxime derivatives thereof and 0-(1–6C)alkyl ether of said oxime derivatives.

5,554,614

2-[(4-HETEROARYL-1-PIPERAZINYL)ALKYL]-1,3-DIOXANES AND RELATED COMPOUNDS AND THEIR THERAPEUTIC UTILITY

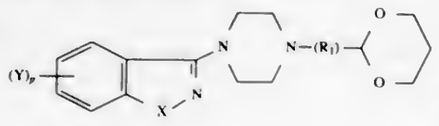
Joseph T. Strupczewski, Flemington; Grover C. Helsley, Stockton; Edward J. Glamkowski, Warren; Yulin Chiang, Covent Station, all of N.J.; Kenneth J. Bordeau, Kintnersville, Pa.; Peter A. Nemoto, Raritan, and John J. Tegeler, Bridgewater, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 329,000, Oct. 25, 1994, abandoned, which is a continuation-in-part of Ser. No. 144,265, Oct. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 969,383, Oct. 30, 1992, Pat. No. 5,364,866, which is a continuation-in-part of Ser. No. 788,269, Nov. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 944,705, Sep. 5, 1991, abandoned, which is a continuation of Ser. No. 619,825, Nov. 29, 1990, abandoned, which is a continuation of Ser. No. 456,790, Dec. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 354,411, May 19, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 467,173

Int. Cl.[6] A61K *31/495;* **C07D** *413/14;417/14;405/14*

U.S. Cl. 514—254 **16 Claims**

1. A compound of the formula:



wherein

X is —O—, —S—, —NH—, or —$N(R_2)$;

R_2 is selected from the group consisting of lower alkyl, aryl lower alkyl, aryl, cycloalkyl, aroyl, alkanoyl, and phenylsulfonyl groups;

aryl is as defined hereinafter;

p is 1 or 2;

Y is hydrogen, lower alkyl, hydroxy, chlorine, fluorine, bromine, iodine, lower alkoxy, trifluoromethyl, nitro, or amino;

R_1 is $—CR_{24}R_{27}—(CR_{23}R_{27})_n—$ where n is 0, 1, 2 or 4; or

$—CHR_{24}CH=CH—CHR_{24}—$,

$CHR_{24}—C\equiv C—CHR_{24}—$,

$—CHR_{24}—CH=CH—CR_{23}R_{24}—CHR_{24}—$,

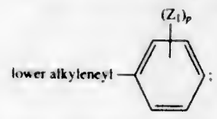
$—CHR_{24}—CR_{23}R_{24}—CH=CH—CHR_{24}—$,

$—CHR_{24}—C\equiv C—CR_{23}R_{24}—CHR_{24}—$, or

$—CH_{24}—CR_{23}R_{24}—C\equiv C—CHR_{24}$,

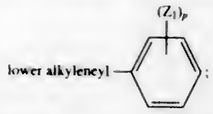
the —CH=CH— bond being cis or trans;

R_{23} is hydrogen, (C_1–C_{18}) linear alkyl, phenyl, hydroxy, (C_1–C_{18})alkoxy, aryloxy, aryl(C_1–C_{18})alkyloxy, (C_1–C_{18})alkanoyloxy, hydroxy(C_1–C_6)alkyl, (C_1–C_{18})alkoxy(C_1–C_6)alkyl, phenyl (C_1–C_6)alkyloxy, aryl(C_1–C_{18})alkyloxy(C_1–C_6)alkyl, (C_1–C_{18})alkanoyloxy(C_1–C_6)alkyl or



where Z_1 is lower alkyl, —OH, lower alkoxy, —CF_3, —NO_2, —NH_2, or halogen, and p is as previously defined;

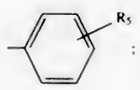
R_{24} is hydrogen, (C_1–C_{18}) linear alkyl, phenyl, hydroxy(C_1–C_6)alkyl, (C_1–C_{18})alkoxy(C_1–C_6)alkyl, phenyl(C_1–C_6)alkyloxy, aryl(C_1–C_{18})alkyoxy(C_1–C_6)alkyl (C_1–C_{18})alkanoyloxy(C_1–C_6)alkyl or



where Z_1 and p are as previously defined;

R_{27} is hydrogen or R_{24} and R_{27} taken together with the carbon to which they are attached form C=O or C=S;

and aryl is phenyl or



where R_5 is hydrogen, lower alkyl, lower alkoxy, hydroxy, chlorine, fluorine, bromine, iodine, lower monoalkylamino, lower dialkylamino, nitro, cyano, trifluoromethyl, or trifluoromethyl; and, any hydroxyl group attached to an aliphatic or aromatic carbon atom, or any primary or secondary nitrogen atom may be acylated with a (C_4– C_{18})carboxylic group, in addition, any nitrogen atom may alternatively be acylated with a (C_4–C_{18})alkoxycarbonyl group;

all geometric, optical, and stereoisomers thereof, or a pharmaceutically acceptable acid addition salt thereof.

5,554,615

CONDENSED PYRIMIDINE DERIVATIVE

Hiroaki Nomura; Toru Haneda; Yoshihiko Kotake; Norihiro Ueda, and Kyosuke Kitoh, all of Ibaraki, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

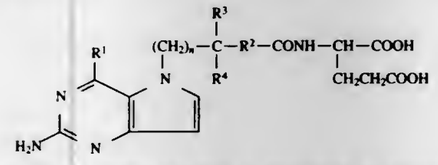
Continuation of Ser. No. 928,102, Aug. 11, 1992, abandoned. This application Sep. 6, 1994, Ser. No. 300,564

Claims priority, application Japan, Aug. 21, 1991, 3-209252; Sep. 30, 1991, 3-251548

Int. Cl.[6] C07D *487/04;239/70;* **A61K** *31/505*

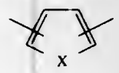
U.S. Cl. 514—258 **26 Claims**

1. (Amended) A pyrrolo[3,2-d]pyrimidine derivative represented by the following formula (1) or a pharmacologically acceptable salt thereof:



(1)

wherein R^1 represents a hydroxyl or amino group; R^2 represents a phenylene group or a group represented by the formula:



wherein X represents a sulfur or oxygen atom; R^3 and R^4 may be the same or different from each other and each represents a hydrogen atom or a straight-chain or branched hydrocarbon group having 1 to 6 carbon atoms, or alternatively R^3 and R^4 may be united to form an alkylidene group, and n is an integer of 1 to 3.

5,554,616

FUNGICIDAL MIXTURES

Horst Wingert, Mannheim; Bernd Müller, Frankenthal; Hubert Sauter, Mannheim; Eberhard Ammermann, Heppenheim; Gisela Lorenz, Neustadt; Reinhold Saur, Böhl-Iggelheim; Klaus Scheiberger, Gönnheim, and Manfred Hampel, Neustadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

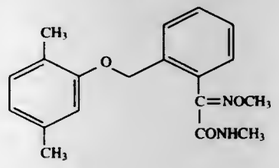
Division of Ser. No. 364,930, Dec. 28, 1994, Pat. No. 5,504,110. This application Nov. 16, 1995, Ser. No. 559,338

Int. Cl.[6] A01N *37/18;43/54*

U.S. Cl. 514—269 **5 Claims**

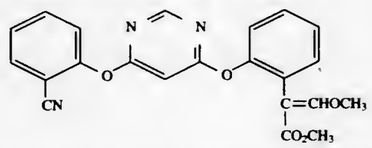
1. A fungicidal mixture containing synergistic fungicidally effective amounts of

(a) an oxime ether carboxamide of the formula I



and

(b) an methoxyacrylic acid ester of the formula III



wherein the weight ratio of the compound I to the compound III is from 10:1 to 0.1:1.

5,554,617

METHOD FOR TREATING CANCER WITH 6-ARYL PYRIMIDINE COMPOUNDS

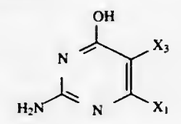
Dale A. Stringfellow, and Patricia E. Fast, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 306,212, Sep. 14, 1994, abandoned, which is a continuation of Ser. No. 180,006, Jan. 11, 1994, abandoned, which is a continuation of Ser. No. 77,813, Jun. 16, 1993, abandoned, which is a continuation of Ser. No. 963,236, Oct. 19, 1992, abandoned, which is a continuation of Ser. No. 842,726, Feb. 26, 1992, abandoned, which is a continuation of Ser. No. 742,580, Aug. 7, 1991, abandoned, which is a continuation of Ser. No. 640,532, Jan. 14, 1991, abandoned, which is a continuation of Ser. No. 544,814, Jun. 27, 1990, abandoned, which is a continuation of Ser. No. 440,452, Nov. 21, 1989, abandoned, which is a continuation of Ser. No. 341,238, Apr. 18, 1989, abandoned, which is a continuation of Ser. No. 220,877, Jul. 18, 1988, abandoned, which is a continuation of Ser. No. 102,311, Sep. 25, 1987, abandoned, which is a continuation of Ser. No. 930,027, Nov. 10, 1986, abandoned, which is a continuation of Ser. No. 820,871, Jan. 15, 1986, abandoned, which is a continuation of Ser. No. 731,326, May 3, 1985, abandoned, which is a continuation of Ser. No. 553,738, Nov. 21, 1983, abandoned, which is a continuation of Ser. No. 319,358, Nov. 9, 1981, abandoned, which is a continuation of Ser. No. 174,947, Aug. 4, 1980, abandoned, which is a division of Ser. No. 79,850, Sep. 28, 1979, abandoned. This application Apr. 7, 1995, Ser. No. 419,963

Int. Cl.[6] A61K *31/505*

U.S. Cl. 514—272 **4 Claims**

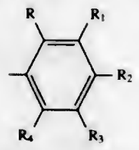
1. A process for treating susceptible forms of cancer comprising the systemic administration of an effective anti-cancer amount of a compound of the formula:



wherein X_3 is equal to X, X_4, or X_5 wherein X_4 is fluoro, chloro, bromo or iodo, and X_5 is mono-, di- or trihalo methyl, mono-, di- or trifluoroethyl, perfluoropropyl and X is alkyl of from 1 to 3 carbon atoms, inclusive, 2-propynyl , 2-propenyl , and alkyloxyacyl where alkyl is as defined above, and X_1 is a member selected from the group consisting of:

(a) phenyl,

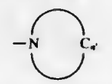
(b) a monosubstituted phenyl of the formula:



wherein provided that only one of groups R, R_1, R_2, R_3, R_4 is other than hydrogen and R or R_4 is alkyl of from 1 to 8 carbon atoms, inclusive, including isomeric forms, alkoxy of from 1 to 8 carbon atoms, inclusive, including isomeric forms, fluoro, chloro, bromo, iodo, or nitro; R_1 or R_3 is fluoro, chloro, bromo, iodo, nitro, trifluoromethyl or alkoxy of from one to eight carbon atoms, alkoxyethyloxy wherein alkoxy is from 1 to 5 carbon atoms, inclusive, or

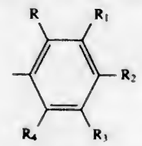
wherein R_5 and R_6 are the same or different and are alkyl of from 1 to 8 carbon atoms, inclusive, benzyl or taken together with

are a saturated cycloalkylamino group



wherein n' is 3, 4, 5 or 6 or dialkyl substituted cycloalkylamino wherein each alkyl is from 1 to 3 carbon atoms, inclusive; and R_2 is chloro, fluoro, bromo, iodo, or alkyl of from 1 to 3 carbon atoms, inclusive,

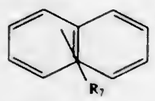
(c) a disubstituted phenyl of the formula:



wherein any two of R, R_1, R_2, R_3 and R_4 are not hydrogen and are the same or different and are fluoro, chloro, bromo, iodo, alkyl of from 1 to 8 carbon atoms, including isomeric forms, alkoxy of from 1 to 8 carbon atoms, inclusive isomeric forms, nitro and trifluoromethyl;

(d) a trihalo substituted phenyl wherein halo is chloro, bromo, iodo or fluoro,

(e) α-naphthyl of the formula:



wherein R is substituted in either ring and is hydrogen, alkyl of from 1 to 8 carbon atoms, inclusive, including isomeric forms, alkoxy of from 1 to 8 carbon atoms, inclusive, including isomeric forms, fluoro, chloro, iodo, bromo or nitro,

(f) 2-furyl,

(g) 3-pyridyl,

(h) 2-pyridyl and

(i) 2-pyrazyl,

or a salt thereof in association with a pharmaceutical carrier to a human or animal having a cancer disease.

5,554,618

INTRAVENOUSLY ADMINISTRABLE AQUEOUS SOLUTION

Karl Groke, Eggersdorf, Austria, assignor to Hafslund Nycomed Pharma Aktiengesellschaft, Linz, Austria

Filed Sep. 19, 1994, Ser. No. 305,605

Claims priority, application Germany, Sep. 14, 1993, 43 31 147.4

Int. Cl.[6] A61K *31/19;31/195;31/425;31/505*

U.S. Cl. 514—275 **1 Claim**

1. An intravenously administrable, aqueous solution, comprising, per liter, 11.17 mmol of an Na salt of 3-methoxy-4-(4'-aminobenzenesulfonamido)-1,2,5-thiadiazole, 2.20 mmol of 2,4-diamino-5-(3',4',5'-trimethoxybenzyl)pyrimidine, 140–180 milliequivalents of L-malic acid or salt thereof, L-serine or L-threonine or the same equivalent amount of mixtures thereof, an amount of NaOH necessary for setting a pH of 6.5 to 7.0, and optionally inert additives for adjusting the osmolarity to physiologically tolerable values.

5,554,619

MICROBICIDES

Ronald Zeun, Neuenburg, Germany, and René Zurflüh, Bülach, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

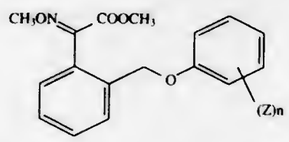
Division of Ser. No. 268,090, Jun. 28, 1994, Pat. No. 5,436,248. This application Apr. 18, 1995, Ser. No. 424,683

Claims priority, application Switzerland, Jul. 2, 1993, 2007/93; Jul. 16, 1993, 2155/93

Int. Cl.[6] A01N *37/12;37/44;43/54*

U.S. Cl. 514—275 **7 Claims**

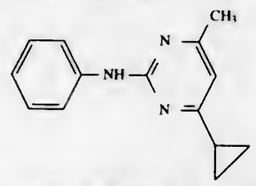
1. A microbicidal composition for use in plants, comprising synergistic fungicidally effective amounts of at least two active ingredient components, wherein component I is a compound of formula IB



IB

in which:

Z is methyl and n is 0, 1 or 2; and component II is the 2-anilinopyrimidine of formula II



II

4-cyclopropyl-6-methyl-N-phenyl-2-pyrimidineamine, or a salt or a metal complex thereof; together with an inert carrier;

wherein the weight ratio of the active ingredients I and II is in the range of 1:10 to 10:1.

5,554,620

SUBSTITUTED 6,11-ETHANO-6,11-DIHYDROBENZO[B] QUINOLIZINIUM SALTS AND COMPOSITIONS AND METHODS OF USE THEREOF

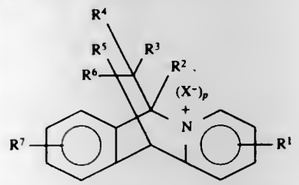
Diane L. DeHaven-Hudkins, West Pikeland Township, Chester County; John A. Dority, Jr., Upper Providence Township, Montgomery County; William G. Earley, East Vincent Township, Chester County; Virendra Kumar, Tredyffrin Township, Chester County; John P. Mallamo, Uwchlan Township, Chester County; Matthew S. Miller, Lower Makefield Township, Bucks County, and Chakrapani Subramanyam, Towamencin Township, Montgomery County, all of Pa., assignors to Sterling Winthrop Inc., New York, N.Y.

Continuation-in-part of Ser. No. 121,127, Sep. 14, 1993, abandoned. This application Jul. 29, 1994, Ser. No. 283,317

Int. Cl.[6] A61K *31/44;* **C07D** *471/00*

U.S. Cl. 514—278 **53 Claims**

1. A compound of the formula:



wherein:

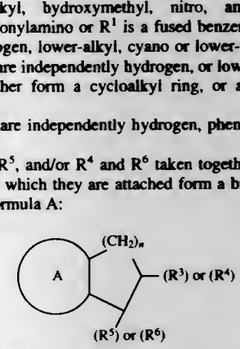
R^1 is hydrogen, or from one to four, the same or different, substituents in any of the 1-, 2-, 3- or 4- positions selected from the group consisting of lower-alkoxy, lower-alkyl, halogen, hydroxy, OC(O)alkyl-CH=CH-alkyl, OC(O) alkyl, OC(O)-lower-alkenyl-C(O)Oalkyl, alkoxy, OC(O)alkyl-C(O)Oalkyl, hydroxymethyl, nitro, amino and lower-alkylsulfonylamino or R^1 is a fused benzene ring;

R^2 is hydrogen, lower-alkyl, cyano or lower-alkoxycarbonyl;

R^3 and R^4 are independently hydrogen, or lower-alkyl; or R^3 and R^4 together form a cycloalkyl ring, or a lower alkylidene group;

R^5 and R^6 are independently hydrogen, phenyl, furyl or benzofuryl;

or R^3 and R^5, and/or R^4 and R^6 taken together with the carbon atoms to which they are attached form a bicyclic ring system of the formula A:



A

wherein A is phenyl, or a 5-membered heterocyclic ring system and n is an integer from one to three;

R^7 is hydrogen, or from one to four, the same or different, substituents in any of the 7-, 8-, 9-, or 10- positions selected from the group consisting of lower-alkyl, lower-alkanoyloxy, halogen, nitro, hydroxy, lower-alkoxy, methylenedioxy, polyfluorolower-alkyl, $OCO(CH_2)_mC(O)Oalkyl$, OC(O)alkyl, C(O)Oalkyl, CO_2^-, carboxy, sulfo, SO_3^-, PO_3H; PO_3^- cyano and polychlorolower-alkyl OC(O)alkyl-CH=CH-alkyl, OC(O)-lower-alkenyl-C(O)alkyl, alkoxy, OC(O)alkyl-C(O))alkyl, halomethyl, hydroxymethyl, amino and lower-alkylsulfonylamino wherein m is an integer from one to four and/or R^7 is a fused pyrazole ring;

X^- is an anion; and, p is zero when R^7 is a negatively charged radical and p is one when R^7 is other than a negatively charged radical;

or a pharmaceutically acceptable acid-addition salt of basic members thereof; or a solvate thereof; or a stereoisomer thereof; with the following provisos a) at least one of R^3 and R^5 when taken individually must be a phenyl, furyl or benzofuryl group; b) when R^3 and R^5 or R^4 and R^6 together form a bicyclic ring system of formula A wherein A is phenyl and n is 1; R^1, R^2, R^4, and R^6 or R^1, R^2, R^3 and R^5, respectively are hydrogen and X^- is BF_4^-, R^7 is other than hydrogen or 9-methyl; c) when R^1, R^2, R^3, and R^4 are hydrogen; R^5 and. R^6 are phenyl, and X^- is ClO_4^- or Br^-; R^7 is other than hydrogen.

5,554,621

DIHYDROPYRIDINE NPY ANTAGONISTS: NITROGEN HETEROCYCLIC DERIVATIVES

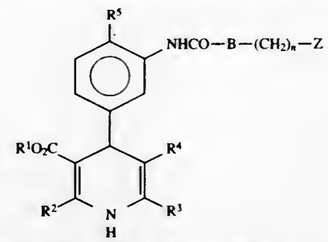
Graham S. Poindexter, Old Saybrook; Marc Bruce, Wallingford; Graham Johnson, Madison; Karen LeBoulluec, Wallingford, and Jeffrey W. Noonan, Branford, all of Conn., assignors to Bristol-Myers Squibb Company, New York, N.Y.

Filed Jun. 7, 1995, Ser. No. 482,354

Int. Cl.[6] A61K *31/16;31/17;* **C07D** *401/10*

U.S. Cl. 514—278 **9 Claims**

1. A compound of Formula (I) and its pharmaceutically acceptable



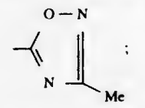
(I)

acid addition salts or hydrates thereof, wherein

R^1 is lower alkyl;

R^2 and R^3 are independently selected from cyano and lower alkyl;

R^4 is selected from $—CO_2R^1$, cyano and



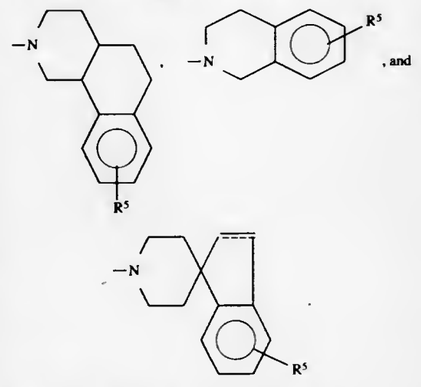
;

R^5 is selected from hydrogen, halogen, hydroxy, lower alkyl, lower alkenyloxy, and lower alkoxy;

B is —NH— or a covalent bond;

n is an integer selected from 2 to 5; and

Z is selected from the group consisting of



, and

with the solid and dotted lines representing either a single or double covalent bond.

5,554,622
ASYMMETRICALLY SUBSTITUTED BISNAPHTHALIMIDES

Miguel F. Brana; José M. C. Berlanga; Marina M. Moset; María J. Pérez de Vega, all of Madrid, Spain; Gerhard Keilhauer, Marlboro, Mass.; Xiao-Dong Qian, Wellesley, Mass., and Cynthia Romerdahl, Wayland, Mass., assignors to Knoll Aktiengesellschaft, Ludwigshafen, Germany

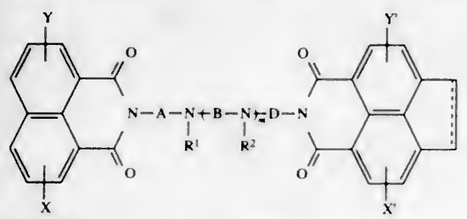
Filed Mar. 15, 1995, Ser. No. 397,259

Claims priority, application Germany, Sep. 30, 1992, 42 32 739.3

Int. Cl.[6] A61K *31/435;* **C07D** *221/18*

U.S. Cl. 514—284 **2 Claims**

1. An asymmetrically substituted bisnaphthalimide of the formula I



I

in which

A, B and D are identical ,or different and are straight-chain or branched alkylidene groups, cycloalkylidene or phenylene radicals,

R^1 and R^2 are identical or different and are hydrogen atoms or C_1–C_6-alkyl or aryl or benzyl groups which can be substituted by C_1–C_6-alkyl groups, halogen atoms, CF_3—, nitro, hydroxyl, NR_2^3, OR^4, $COOR^5$, $CONR_2^6$, $CONHR^7$, $NHCOR^8$, SO_2NHR^9 or SO_mR^{10} groups, or together are a —CH_2—, —C_2H_4— or C_3H_6— group,

X,X',Y and Y' are identical or different and are hydrogen or halogen atoms, amino, C_1–C_6-alkyl, CF_3, hydroxyl, NR_2^3, OR^4, $COOR^5$, CHO, $CONR_2^6$, $CONHR^7$, $NHCOR^8$, SO_2NHR^9, SO_mR^{10}, COR^{11}, ureido, C_1–C_6alkylureido, N=C=S or N=C=O groups,

R^3–R^{11} are identical or different and are C_1–C_6-alkyl, cycloalkyl or aryl groups, m is the number 0, 1 or 2, and ⟨ is a single or double bond,

and the salts thereof with physiologically tolerated acids.

5,554,623
METHOD FOR THE LONG TERM REDUCTION OF BODY FAT STORES, INSULIN RESISTANCE, HYPERSINSULINEMIA AND HYPERGLYCEMIA IN VERTEBRATES

Anthony H. Cincotta, Andover, Mass., and Albert H. Meier, Baton Rouge, La., assignors to Ergo Science Incorporated, Charlestown, Mass., and The Board of Supervisors of Louisiana University and Agricultural and Mechanical College, Baton Rouge, La.

Continuation of Ser. No. 719,745, Jun. 24, 1991, Pat. No. 5,344,832, which is a continuation-in-part of Ser. No. 463,327, Jan. 10, 1990, abandoned, which is a continuation-in-part of Ser. No. 192,332, May 10, 1988, abandoned. This application May 26, 1994, Ser. No. 249,808

Int. Cl.[6] A61K *31/44*

U.S. Cl. 514—288 **17 Claims**

1. A method for modifying and regulating at least one of lipid and glucose metabolism in a vertebrate animal or human subject in need of such treatment comprising:

administering a prolactin stimulator to said subject on a timed daily basis at a predetermined time of day in a dosage amount sufficient to increase hormonal prolactin level in the blood of said subject; and

continuing said administration for a period of time sufficient to modify and reset on a long-term basis the subject's daily prolactin cycle to cause it to mimic the peak of the daily prolactin cycle of a lean healthy member of the same species, thereby achieving in said subject at least one of the following modifications in lipid and glucose metabolism: decrease in insulin resistance, reduction in fat stores, suppression of hyperinsulinemia and reduction of hyperglycemia.

5,554,624
IMIDAZOPYRIDINE DERIVATIVES AS ANGIOTENSIN II ANTAGONISTS

Carmen Almansa; Elena Carceller; Concepcion Gonzalez, all of Barcelona; Carmen Torres, Badalona, and Javier Bartroli, Barcelona, all of Spain, assignors to J. Uriach & Cia., Spain

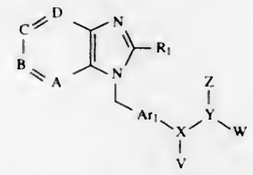
Filed Feb. 24, 1995, Ser. No. 393,981

Claims priority, application Spain, Feb. 24, 1994, 94-00364

Int. Cl.[6] A61K *31/435;* **C07D** *471/04*

U.S. Cl. 514—303 **21 Claims**

1. A compound of formula I:



I

wherein:

one of A, B, C and D is N and the other are CR, wherein each R independently represents hydrogen, C_{1-4} alkyl, COOH or halogen;

R_1 represents C_{1-4} alkyl or C_{3-7} cycloalkyl;

Ar_1 represents phenyl or pyridyl which can be optionally substituted with a group C_{1-4} alkyl, C_{1-4} alkoxy, halogen, nitro, amino, C_{1-4} alkylamino or C_{1-4} dialkylamino;

V represents C_{1-4} alkyl, C_{3-7} cycloalkyl, aryl, aryl-(C_{1-4})alkyl or a 5- or 6-membered aromatic heterocycle, in which from 1 to 3 of the ring atoms are nitrogen and/or oxygen and/or sulphur, said heterocycle being unsubstituted or having one or more substituents R_2;

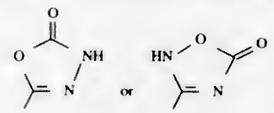
aryl represents phenyl or phenyl substituted with one or more groups R_2;

R_2 represents C_{1-4} alkyl, C_{1-4} haloalkyl, C_{1-4} alkoxy, C_{1-4} haloalkoxy, halogen, nitro, cyano, hydroxy, amino, C_{1-4} alkylamino, C_{1-4} dialkylamino;

the group X—Y represents C=C or CH—CR_3;

R_3 represents hydrogen, C_{1-4} alkyl or aryl-(C_{1-4})alkyl;

Z represents —CO_2R_4; -tetrazol-5-yl; tetrazol-5-ylmethyl; —CONH(tetrazol-5-yl); —$CONHSO_2R_4$; —$CONHSO_2$-Het; —$CONHOR_4$; —$CONR_4R_5$; —$COCH_2COR_4$; —$COCH_2CO_2R_4$; —$CONHNHSO_2R_4$; —$CONHNHCONH_2$; —$CH_2NHSO_2R_4$; —$CH_2CO_2R_4$; —$CH_2SO_2NHCOR_4$; —$CH_2SO_2NHCONHR_4$; —$CH_2CONHSO_2R_4$; —CH_2SO_2NH-Het; —CH_2NHCOR_4; —$NHSO_2R_4$; —$NHCOR_4$; —$NHCONHSO_2R_4$; —$NHSO_2NHCOR_4$; —$NHCONR_4SO_2CH_2R_4$; —SO_3H; —SO_2NHR_4; —$SO_2NHCONR_4R_5$; —$SO_2NHCO_2R_4$; —$SO_2N(CO_2R_4)_2$; —SO_2NHCOR_4; —SO_2NH—Het; —SO_2NHCO-Het; —$PO(OH)_2$; —$PO(OR_4)_2$; —$PO(OH)(OR_4)$; 3-(trifluoromethyl)-1,2,4-triazol-5-yl; or a group of formula



wherein Het represents a 5- or 6-membered aromatic heterocycle in which from 1 to 3 of the ring atoms are nitrogen and/or oxygen

and/or sulphur and which can be optionally substituted with one or two groups chosen from hydroxy, mercapto, C_{1-4} alkyl, C_{1-4} alkoxy, halogen, nitro, CO_2H, CO_2C_{1-4} alkyl, amino, C_{1-4} alkylamino and C_{1-4} dialkylamino; and R_4 and R_5 independently represent hydrogen, C_{1-4} alkyl, aryl, aryl-(C_{1-4})alkyl or perfluoro-(C_{1-4})alkyl;

W represents hydrogen, cyano, C_{1-4} alkyl, C_{1-4} haloalkyl, C_{3-7} cycloalkyl, aryl, aryl-(C_{1-4})alkyl, C_{1-4} alkylsulfonyl, C_{1-4} alkylsulfinyl, C_{1-4} alkylthio, C_{1-4} alkoxy, C_{1-4} alkylcarbonyl, halogen, hydroxymethyl or C_{1-4} alkoxymethyl, or W can have any of the meanings disclosed for Z;

or a salt or solvate thereof.

5,554,625
SUBSTITUTED BIPHENYLMETHYLIMIDAZOPYRIDINES

Ralph A. Rivero, Tinton Falls; Prasun K. Chakravarty, Edison; William J. Greenlee, Teaneck; Nancy J. Kevin, Clifton, and Nathan B. Mantlo, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

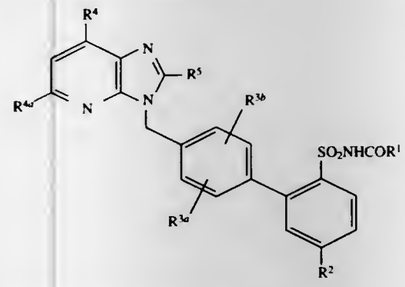
PCT No. PCT/US93/06407, § 371 Date Jan. 6, 1995, § 102(e) Date Jan. 6, 1995, PCT Pub. No. WO94/02142, PCT Pub. Date Feb. 3, 1994

Continuation of Ser. No. 916,303, Jul. 17, 1992, abandoned. This PCT application Jul. 7, 1993, Ser. No. 416,790

Int. Cl.[6] A61K *31/435;* **C07D** *471/04*

U.S. Cl. 514—303 **9 Claims**

1. A compound of structural formula:



or a pharmaceutically acceptable salt thereof, wherein

R^1 is

a) C_{1-6} alkyl,

b) C_{1-6} alkylamino,

c) C_{1-6} alkoxy-$(CH_2)_n$—, wherein n is 1 or 2,

d) aryl $S(O)_q$—, wherein q is 0 to 3,

e) C_{1-6} alkylthio-$(CH_2)_n$—,

f) aryl, either unsubstituted or substituted with

1) C_{1-6} alkyl,

2) aryloxy,

3) C_{1-6} alkoxy,

4) —Cl,

5) —Br, or

6) C_{1-6} alkylamino;

R^2 is

a) —Cl,

b) C_{1-6} alkyl,

c) C_{1-5} alkoxy,

d) C_{1-5} alkoxy-CH_2—,

e) di(C_{1-5} alkyl) amino-CH_2—,

f) pyrrolidin-1-yl-CH_2—,

g) morpholin-1-yl-CH_2—,

h) polyfluoro-C_{1-5} alkoxy,

i) aryl,

j) C_{1-5} alkyl $S(O)_q$-$(CH_2)_q$,

k) aryl-$(CH_2)_n$—;

R^{3a} and R^{3b} are independently

a) H,

b) F, Cl, Br or I,

c) C_{1-4} alkyl,

d) C_{1-4} alkyoxy, or

e) aryl;

R^{3a} and R^{3b} on adjacent carbons can be joined together to form a benzo group;

R^4 and R^{4a} are independently

a) C_{1-3} alkyl,

b) polyfluoro-C_{1-3} alkyl,

c) —$COHNR^1$,

d) —CO_2R^1 or

e) —CONH $(CH_2)_n$-aryl; and

R^5 is hydrogen or C_{1-5} alkyl.

5,554,626
SUBSTITUTED HETEROCYCLIC COMPOUNDS AS DOPAMINE-REUPTAKE INHIBITORS

Peter Moldt, Humlebæk; Jørgen Scheel-Krüger, Glostrup, and Leif H. Jensen, Copenhagen, all of Denmark, assignors to NeuroSearch A/S, Glostrup, Denmark

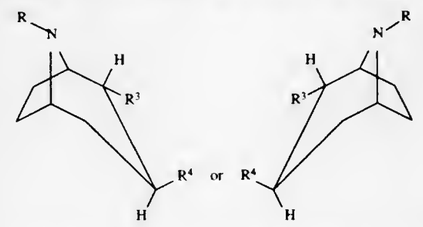
Filed Jul. 16, 1993, Ser. No. 93,184

Claims priority, application Denmark, Dec. 23, 1992, 1541/92; Jun. 18, 1993, 0718/93

Int. Cl.[6] C07D *413/04;* **A61K** *31/46*

U.S. Cl. 514—304 **9 Claims**

1. A method of treating a disorder or disease of a living animal body, including a human, selected from Parkinsonism, drug addiction and/or abuse, and depression, comprising the step of administering to such a living animal body, including a human, in need thereof an effective amount of a compound having the formula



or

any mixture thereof, or a pharmaceutically-acceptable salt thereof; wherein

R is hydrogen, alkyl, alkenyl, alkynyl, cycloalkylalkyl, or 2-hydroxyethyl;

R^3 is a 5- or 6-membered monocyclic heterocyclic group (HET), optionally substituted with

alkyl;

cycloalkyl;

cycloalkylalkyl;

phenyl optionally substituted with a substituent selected from the group consisting of halogen, CF_3, CN, alkoxy, alkyl, alkenyl, alkynyl, amino, nitro, or HET;

phenylphenyl;

pyridyl optionally substituted with a substituent selected from the group consisting of halogen, CF_3, CN, alkoxy, alkyl, alkenyl, alkynyl, amino, nitro, or HET;

thienyl optionally substituted with a substituent selected from the group consisting of halogen, CF_3, CN, alkoxy, alkyl, alkenyl, alkynyl, amino, nitro, or HET;

or benzyl optionally substituted with a substituent selected from the group consisting of halogen, CF_3, CN, alkoxy, alkyl, alkenyl, alkynyl, amino, nitro, or HET;

provided however, that

R^3 is not 1,2,4-oxadiazol-3-yl which is substituted in the 5-position with alkyl, cycloalkyl, or cycloalkylalkyl;

R^3 is not 1,2,4-oxadiazol-5-yl which is substituted in the 3-position with alkyl, cycloalkyl, or cycloalkylalkyl;

R^3 is not 1,2,4-oxadiazol-3-yl which is substituted in the 5-position with phenyl optionally substituted with a substituent selected from the group consisting of halogen, CF_3, CN,

W represents a bond or a saturated or unsaturated hydrocarbon chain of 1, 2, 3, 4, 5 or 6 carbon atoms;

R^3 is 1-piperidinyl, 1-pyrrolidinyl, methyl-1-pyrrolidinyl, dimethyl-1-pyrrolidinyl, 4-morpholino, dimethylamino, diethylamino, or 1-hexamethyleneimino; or a pharmaceuti-

R^3 is

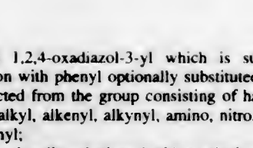
R^3 is not 1,2,4-oxadiazol-3-yl which is substituted in the 5-position with phenyl optionally substituted with a substituent selected from the group consisting of halogen, CF_3, CN, alkoxy, alkyl, alkenyl, alkynyl, amino, nitro, or HET;
phenylphenyl;
or benzyl optionally substituted with a substituent selected from the group consisting of halogen, CF_3, CN, alkoxy, alkyl, alkenyl, alkynyl, amino, nitro, or HET; and
R^3 is not 1,2,4-oxadiazol-5-yl optionally substituted in the 3-position with phenyl optionally substituted with a substituent selected from the group consisting of halogen, CF_3, CN, alkoxy, alkyl, alkenyl, alkynyl, amino, nitro, or HET;
phenylphenyl; or
benzyl optionally substituted with a substituent selected from the group consisting of halogen, CF_3, CN, alkoxy, alkyl, alkenyl, alkynyl, amino, nitro, or HET;
R^4 is phenyl optionally substituted with a substituent selected from the group consisting of halogen, CF_3, CN, alkoxy, alkyl, alkenyl, alkynyl, amino, nitro, or HET;
3,4-methylenedioxyphenyl;
benzyl optionally substituted with a substituent selected from the group consisting of halogen, CF_3, CN, alkoxy, alkyl, alkenyl, alkynyl, amino, nitro, or HET;
a 5- or 6-membered monocyclic heterocyclic group (HET) optionally substituted with a substituent selected from the group consisting of halogen, CF_3, CN, alkoxy, alkyl, alkenyl, alkynyl, amino, nitro, or HET; or
naphthyl optionally substituted with a substituent selected from the group consisting of halogen, CF_3, CN, alkoxy, alkyl, alkenyl, alkynyl, amino, nitro, or HET.

5,554,627
TACHYKININ ANTAGONISTS

Richard T. Lewis, Harlow; Angus M. MacLeod, and Kevin J. Merchant, both of Bishops Stortford, all of United Kingdom, assignors to Merck, Sharp & Dohme Ltd., Hoddesdon, England

PCT No. PCT/GB93/02213, § 371 Date Apr. 27, 1995, § 102(e) Date Apr. 27, 1995, PCT Pub. No. WO94/10167, PCT Pub. Date May 11, 1994
PCT Filed Oct. 27, 1993, Ser. No. 428,065
Claims priority, application United Kingdom, Oct. 30, 1992, 9222820; Nov. 17, 1992, 9224098; Dec. 14, 1992, 9226057; Mar. 23, 1993, 9306031
Int. Cl.[6] A61K *31/445;* **C07D** *453/00*
U.S. Cl. 514—305 **11 Claims**

1. A compound of formula (I), or a salt or prodrug thereof:



(I)

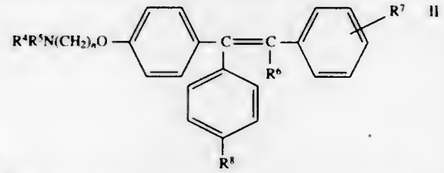
wherein
Q^1 represents unsubstimted indolyl or indolyl substituted by one or more substituents selected from carbon atom substituents of the group consisting of C_{1-6}alkyl, C_{2-6}alkenyl, halo, cyano, nitro, trifluoromethyl, trimethylsilyl, SR^a, SOR^a, SO_2R^a, OR^a, NR^aR^b, NR^aCOR^b, NR^aCOOR^b, $COOR^a$ or $CONR^aR^b$ and nitrogen atom substituents of the group consisting of C_{1-6}alkyl, phenyl(C_{1-4}alkyl), substituted phenyl(C_{1-4}alkyl) wherein the substituents are one or more carbon atom substitues, as previously defined, $COOR^a$ or $CONR^aR^b$, where R^a and R^b independently represent H, C_{1-6}alkyl, phenyl or trifluoromethyl;
the dotted line represents an optional covalent bond;
one of X and Y represents H and the other represents hydroxy or C_{1-6}alkoxy, or X and Y together form a group =O or $=NOR^5$ where R^5 is H or C_{1-6}alkyl;
Z represents O, S or NR^2, where R^2 is H or C_{1-6}alkyl;
W represents a bond or a saturated or unsaturated hydrocarbon chain of 1, 2, 3, 4, 5 or 6 carbon atoms;
R^1 represents H or C_{1-6}alkyl;
R^3 represents H, C_{1-6}alkyl or C_{2-6}alkenyl;
R^4 represents phenyl optionally substituted by 1, 2, or 3 groups selected from C_{1-6}alkyl, C_{2-6}alkenyl, C_{2-6}alkynyl, halo, cyano, nitro, trifluoromethyl, trimethylsilyl, OR^a, SR^a, SOR^a, NR^aR^b, NR^aCOR^b, $NR^aCO_2R^b$, CO_2R^a, or $CONR^aR^b$, where R^a and R^b independently represent H, C_{1-6}alkyl, phenyl or trifluoromethyl; and
R^6 represents NR^7R^8 (where R^7 and R^8 each independently represent H, C_{1-6}alkyl, phenyl optionally substituted by one or more of C_{1-6}alkyl, C_{1-6}alkoxy, halo or trifluoromethyl or phenylC_{1-4}alkyl optionally substituted in the phenyl ring by one or more of C_{1-6}alkyl, C_{1-6}alkoxy, halo or trifluoromethyl) or an optionally substituted aromatic or non-aromatic azacyclic or azabicyclic group.

5,554,628
METHOD FOR MINIMIZING THE UTEROTHROPHIC EFFECT OF TAMOXIFEN AND TAMOXIFEN ANALOGS

Henry U. Bryant, Indianapolis, and Steven A. Fontana, Martinsville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

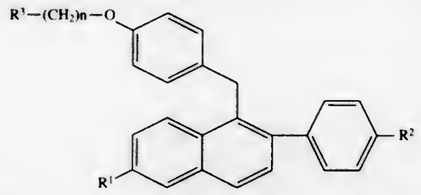
Filed Sep. 20, 1994, Ser. No. 308,904
Int. Cl.[6] A61K *31/445;31/55;31/535;31/40*
U.S. Cl. 514—319 **11 Claims**

1. A method of minimizing the uterotrophic effect of non-steroidal antiestrogen compounds of formula II



II

wherein
either R^4 is H or a lower alkyl radical and R^5 is a lower alkyl radical, or R^4 and R^5 are joined together with the adjacent nitrogen atom to form a heterocyclic radical;
R^6 is H or a lower alkyl radical;
R^7 is H, halo, OH, a lower alkyl radical, or is a buta-1,3-dienyl radical which together with the adjacent benzene ring forms a naphthyl radical;
R^8 is H or OH; and
n is 2;
or a pharmaceutically acceptable salt thereof,
wherein said formula II compound is administered to a woman for the treatment of breast carcinoma, comprising concurrently or sequentially administering to said woman an effective amount of compound of formula I



I

wherein
R^1 is —H, —OH, —O(C_1–C_4 alkyl), —$OCOC_6H_5$, —OCO(C_1–C_6 alkyl) , or —OSO_2(C_4–C_6 alkyl);
R^2 is —H, —OH, —O(C_1–C_4 alkyl), —$OCOC_6H_5$, —OCO(C_1–C_6 alkyl), or —OSO_2(C_4–C_6 alkyl);
n is 2 or 3; and

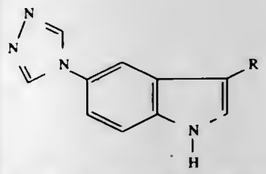
R^3 is 1-piperidinyl, 1-pyrrolidinyl, methyl-1-pyrrolidinyl, dimethyl-1-pyrrolidinyl, 4-morpholino, dimethylamino, diethylamino, or 1-hexamethyleneimino; or a pharmaceutically acceptable salt thereof.

5,554,629
4-SUBSTITUTED 1,2,4-TRIAZOLE DERIVATIVES

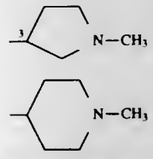
Raymond Baker; Victor G. Matassa, both of Herts; Austin J. Reeve, Essex; Francine Sternfeld, London, and Leslie J. Street, Essex, all of England, assignors to Merck, Sharp & Dohme Ltd., Hoddesdon, England

Continuation of Ser. No. 97,244, Jul. 23, 1993, abandoned. This application Jun. 29, 1995, Ser. No. 496,839
Claims priority, application United Kingdom, Jul. 30, 1992, 9216192; Jul. 30, 1992, 9216264; Oct. 23, 1992, 9222261
Int. Cl.[6] A61K *31/435;* **C07D** *401/14;403/14*
U.S. Cl. 514—323 **7 Claims**

1. A compound of formula I:



wherein R represents a 2-(dimethylamino)ethyl group or a group of formula (i) or (ii):



(i)

(ii)

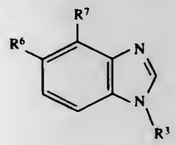
or pharmaceutically acceptable salt thereof.

5,554,630
BENZIMIDAZOLE COMPOUNDS

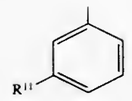
Lene Teuber, Anemonevej, Denmark; Oskar Axelsson, Stora Kvarngatan, Sweden, and Frank Wätjen, Åfaldet, Denmark, assignors to NeuroSearch A/S, Glostrup, Denmark, and Meiji Seika Kaisha, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 207,774, Mar. 8, 1994, abandoned. This application Mar. 24, 1995, Ser. No. 410,572
Claims priority, application Denmark, Mar. 24, 1993, 0337/93; Sep. 21, 1993, 1055/93
Int. Cl.[6] A61K *31/44*
U.S. Cl. 514—338 **7 Claims**

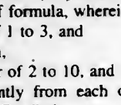
1. A method of treating a living animal body suffering from a condition of anxiety, convulsions, or sleep disorders, by modulation of the benzodiazepine receptor of the central nervous system of the living animal, which comprises administering to such a living animal body in need thereof an amount of a compound selected from those having the formula:



or a pharmaceutically-acceptable salt thereof wherein R^1 is



wherein
R^{11} is selected from pyridyl, imidazolyl, benzimidazolyl, oxadiazolyl, furanyl, and morpholinyl, and said groups having an alkyl ring substituent;
one of R^6 and R^7 is halogen, amino, nitro, C_1–C_9 acylamino; trifluoromethyl, alkyl, alkoxy, COO-alkyl, alkoxy-alkyl, C_1–C_9 acyl, CH=NOH, CH=NO-alkyl; CH=N-NH-(C=O)-NH_2;



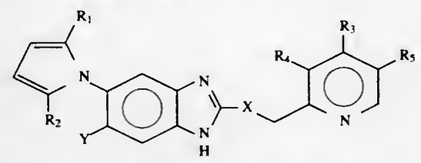
(I) wherein
Z is O, S, N, C=C , or C=N; or imidazolyl; and the other of R^6 and R^7 is hydrogen; and wherein alkyl and alkoxy are C_1–C_8 alkyl and alkoxy; which is effective for amelioration of the said condition.

5,554,631
NOVEL 5-PYRROLYL-6-HALOGENO-2-PYRIDYLMETHYLSULFINYL BENZIMIDAZOLE DERIVATIVES

Su U. Kim; Dong Y. Kim, both of Seoul; Gi J. Chung; Sung K. Hong, both of Kyungki-do; Sung J. Park; Sang H. Nam, both of Seoul, and Seung M. Lee, Kyungki-do, all of Rep. of Korea, assignors to Il-Yang Pharm. Co., Ltd., Seoul, Rep. of Korea

Filed Mar. 21, 1995, Ser. No. 408,167
Claims priority, application Rep. of Korea, Feb. 12, 1994, 94-32612
Int. Cl.[6] C07D *401/12;* **A61K** *31/44*
U.S. Cl. 514—338 **4 Claims**

1. A compound having the following formula (I):



(I)

or a pharmaceutically acceptable salt thereof, in which
X represents S, SO or SO_2,
Y represents halogen,
R_1 and R_2 independently from each other represent hydrogen or methyl,
R_3 represents hydrogen, C_1–C_8 alkyl, —SR_6, —$N(R_7)_2$, [1-piperidinyl, 4-morpholinyl, 4 -methylpiperazin-1-yl, 1-pyrrolidinyl] or a group of formula —OR_6 or —$O(CH_2)_m$—Z, wherein
R_6 represents C_1–C_4 alkyl, C_2–C_4 alkenyl, [optionally substituted] C_3–C_{10} cycloalkyl optionally substituted with C_1–C_4 alkyl, C_2–C_5 fluoroalkyl, phenyl optionally substituted with C_1–C_4 alkyl or benzyl optionally substituted with C_1–C_4 alkyl,
R_7 represents hydrogen or C_1–C_5 alkyl,
Z represents a group of formula, wherein
q denotes an integer of 1 to 3, and
R_9 represents hydrogen,
m represents an integer of 2 to 10, and
R_4 and R_5 independently from each other represent hydrogen, lower alkoxy or C_1–C_5 alkyl.

5,554,632
BENZIMIDAZOLE COMPOUNDS

nyl, pyrimidinyl, pyridazinyl, triazinyl, oxazolyl, oxadiazolyl,

olinone compounds, between about 25 and about 92 wt % of a plasticizer in which said isothiazolinone compound or mixture of

solid tumor an amount of a nitric oxide synthase inhibitor sufficient to reduce tumor blood flow and a therapeutically effective amount

5,554,632

BENZIMIDAZOLE COMPOUNDS

Lene Teuber, Varlose, Denmark; Oskar Axelsson, Malmo, Sweden, and Frank Watjen, Herlev, Denmark, assignors to NeuroSearch A/S, Glostrup, Denmark, and Meiji Seika Kaisha, Ltd., Tokyo, Japan

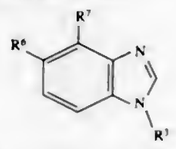
Division of Ser. No. 207,774, Mar. 8, 1994, abandoned. This application Dec. 9, 1994, Ser. No. 352,585

Claims priority, application Denmark, Mar. 24, 1993, 0337/93; Sep. 21, 1993, 1055/93

Int. Cl.[6] C07D *401/14;* **A61K** *31/44*

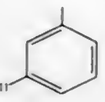
U.S. Cl. 514—338 **6 Claims**

1. A compound having the formula:



or a pharmaceutically-acceptable salt thereof wherein

R^3 is



wherein

one of R^6 and R^7 is C_1–C_9 acylamino; CH=NOH; CH=NO-alkyl; CH=N—NH—(C=O)—NH_2;

wherein Z is O, S, N, C=C, or C=N; or imidazolyl; and the other of R^6 and R^7 is hydrogen;

R^{11} is selected from pyridyl, imidazolyl, and said groups having an alkyl ring substituent; and wherein alkyl is C_1–C_8 alkyl.

5,554,633

SUBSTITUTED AMINES AS TACHYKININ RECEPTOR ANTAGONISTS

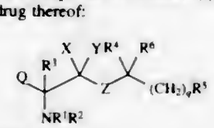
Martin R. Teall, Stansted, Great Britain, assignor to Merck, Sharp & Dohme, Ltd., Hoddesdon, England

Filed Jan. 27, 1995, Ser. No. 374,746

Int. Cl.[6] C07D *213/40;307/52;* **A61K** *31/44;31/34*

U.S. Cl. 514—357 **15 Claims**

1. A compound of formula (I), or a pharmaceutically salt or prodrug thereof:



(I)

wherein

Q represents optionally substituted phenyl or optionally substituted benzhydryl;

X and Y each represent H or X and Y together form a group =O;

Z represents O, S or NR^9, where R^9 represents H or C_{1-6}alkyl;

R^1 represents H or C_{1-6}alkyl;

R^2 represents C_{1-6}alkyl substituted by $CONR^7(CH_2)_pR^8$, where R^7 is H or C_{1-6}alkyl, R8 is heteroaryl selected from group consisting of substituted or unsubstituted thienyl, furyl, pyrrolyl, pyridyl, pyrazolyl, triazolyl, tetrazolyl, thiazolyl, pyrazinyl, pyrimidinyl, pyridazinyl, triazinyl, oxazolyl, oxadiazolyl, thiadiazolyl, isoxazolyl, quinolyl, isothiazolyl, imidazolyl, benzimidazolyl, benzoxazolyl, benzothiophenyl, benzofuranyl and indolyl, wherein the substituents are selected from the group consisting of C_{1-6}alkyl, C_{1-6}alkoxy, phenyl, oxo, thioxo, halo, trifluoromethyl, NR^aR^b, NR^aCOR^b, $CONR^aR^b$, CO_2R^a, SR^a, SO_2R^a, where R^a and R^b each independently represent H, C_{1-6}alkyl, phenyl or trifluoromethyl; and p is 0, 1, 2, 3, 4, 5 or 6;

R^3 represents H, C_{1-6}alkyl or C_{2-6}alkyenyl;

R^4 represents H, C_{1-6}alkyl or phenyl (optionally substituted by one or more of C_{1-6}alkyl, C_{2-6}alkenyl, C_{2-6}alkynyl, halo, cyano, nitro, trifluoromethyl, trimethylsilyl, SR^a, SOR^a, SO_2R^a, OR^a, NR^aR^b, NR^aCOR^b, NR^aCOOR^b, $COOR^a$ or $CONR^aR^b$, where R^a and R^b each independently represent H, C_{1-6}alkyl, phenyl or trifluoromethyl);

R^5 represents phenyl optionally substituted by one or more of C_{1-6}alkyl, C_{2-6}alkenyl, C_{2-6}alkynyl, halo, cyano, nitro, trifluoromethyl, trimethylsilyl, SR^a, SOR^a, SO_2R^a, OR^a, NR^aR^b, NR^aCOR^b, NR^aCOOR^b, $COOR^a$ or $CONR^aR^b$, where R^a and R^b are as above defined;

R^6 represents H or C_{1-6}alkyl;

q is 0, 1, 2 or 3.

5,554,634

N-(HYDROXYETHYL)BUTANEDIAMIDE DERIVATIVES

Paul C. Anderson, Pierrefonds; Teddy Haimos, St. Laurent; Grace L. Jung, Montréal; Marc-André Poupart, and Bruno Simoneau, both of Laval, all of Canada, assignors to Bio-Mega Boehringer Ingelheim Research Inc., Quebec, Canada

Division of Ser. No. 123,954, Sep. 20, 1993, which is a continuation-in-part of Ser. No. 951,250, Sep. 25, 1992, abandoned. This application May 1, 1995, Ser. No. 432,503

Int. Cl.[6] C07D *277/28;277/38;* **A61K** *31/425*

U.S. Cl. 514—370 **8 Claims**

1. A compound of formula 1A

A'—N($R^{1'}$)C(O)CH_2CH(R^2)C(O)—B 1A

wherein A' is HO—$CR^5(R^6)CH_2$ wherein R^5 and R^6 together with the carbon atom to which they are attached form a 1,1-(lower cycloalkanediyl); $R^{1'}$ is $R^7R^8NC(O)CH_2$ wherein R^7 is hydrogen or lower alkyl and R^8 is lower alkyl; R^2 is Het-CH_2 wherein Het is an unsubstituted or monosubstituted thiazole ring wherein the substituent is selected from the group consisting of lower alkyl, lower alkoxy, halo, hydroxy, amino and lower alkylamino; B is a transition state analog of the formula NHCH(R^{11})CH(OH)—Z wherein R^{11} is lower alkyl or (lower cycloalkyl)methyl, and Z is lower alkyl or CH(OH)R^{16} wherein R^{16} is lower alkyl or lower cycloalkyl; with the provisos (1) that the asymmetric carbon atom bearing R^{11} has the (S) configuration, (2) that when Z is lower alkyl, then the asymmetric carbon atom bearing the hydroxyl in the NHCH(R^{11})CH(OH) radical has the (S) configuration, (3) that when Z is CH(OH)R^{16} wherein R^{16} is lower alkyl or lower cycloalkyl the asymmetric carbon atoms bearing the hydroxyls in the NHCH(R^{11})CH(OH) and Z radicals have respectively the (R) and (S) configuration, and (4) that the carbon atom bearing R^2 has the (R) configuration; or a therapeutically acceptable acid addition salt thereof.

5,554,635

LIQUID ISOTHIAZOLINONE CONCENTRATES HAVING IMPROVED LOW TEMPERATURE-STABILITY AND IMPROVED ANTI-BACTERIAL PROPERTIES

Nuno M. Rei, Boxford, and Roger G. Hamel, Methuen both of Mass., assignors to Morton International, Inc., Chicago, Ill.

Filed Feb. 7, 1995, Ser. No. 384,883

Int. Cl.[6] C07D *275/03;* **A61K** *31/425*

U.S. Cl. 514—372 **5 Claims**

1. A liquid concentrate comprising between about 4 and about 25 wt % of an isothiazolinone compound or mixture of isothiazolinone compounds, between about 25 and about 92 wt % of a plasticizer in which said isothiazolinone compound or mixture of isothiazolinone compounds is soluble and between about 4 and about 50 wt % of 2,4,4'-trichloro-2'-hydroxydiphenyl ether.

5,554,636

N-ACYLATED 4-HYDROXPHENYLAMINE DERIVATIVES WITH ANALGESIC PROPERTIES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Nicolas G. Bazan, New Orleans, La., and Julio A. Gomez, Alcala de Henares, Spain, assignors to LSU Medical Center Foundation, New Orleans, La.

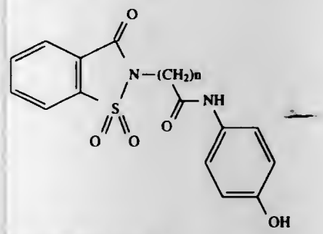
Filed Apr. 21, 1995, Ser. No. 426,234

Int. Cl.[6] A61K *31/425;* **C07D** *275/06*

U.S. Cl. 514—373 **8 Claims**

1. A compound of formula I,

I



wherein n is a number from 1 to 5.

5,554,637

LEFLUNOMIDE FOR INHIBITING INTERLEUKIN 1 ALPHA

Klaus U. Weithmann, Hofheim, and Robert R. Bartlett, Darmstadt, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 177,983, Jan. 6, 1994, abandoned. This application Jun. 5, 1995, Ser. No. 462,916

Claims priority, application Germany, Jan. 8, 1993, 43 00 276.5

Int. Cl.[6] A61K *31/42*

U.S. Cl. 514—378 **1 Claim**

1. A method for the treatment of a condition characterized by an elevated interleukin 1 alpha level in a human or animal suffering from at least one of increased cartilage resorption, type-1diabetes, and febrile disorders caused by pyrogen, wherein the method comprises administering to said human or animal N-(4-trifluoromethylphenyl)- 5-methylisoxazole-4-carboxamide in an amount sufficient to inhibit the synthesis and liberation of said interleukin.

5,554,638

METHODS FOR IMPROVING THERAPEUTIC EFFECTIVENESS OF AGENTS FOR THE TREATMENT OF SOLID TUMORS AND OTHER DISORDERS

Mark W. Dewhirst, Chapel Hill; Robert E. Meyer, Cary; Joseph Bonaventura, Beaufort, all of N.C., and Joseph DeAngelo, Hamtramck, Mich., assignors to Duke University; Apex Bioscience, Inc., both of Durham, and North Carolina State University, Raleigh, all of N.C.

Continuation-in-part of Ser. No. 66,756, May 24, 1993. This application May 20, 1994, Ser. No. 246,882

Int. Cl.[6] A61K *31/22;31/415*

U.S. Cl. 514—398 **24 Claims**

1. A method for treating an animal having a vascularized solid tumor comprising administering to an animal having a vascularized solid tumor an amount of a nitric oxide synthase inhibitor sufficient to reduce tumor blood flow and a therapeutically effective amount of a hypoxic cytotoxin or acidotic cytotoxin, wherein the animal is a mammal, the solid tumor is a sarcoma or carcinoma, the nitric oxide synthase inhibitor inhibits or suppresses nitric oxide synthesis by a nitric oxide synthase in mammalian tissue, the hypoxic cytotoxin is more toxic to a mammalian cell under hypoxic conditions than to the mammalian cell not under hypoxic conditions, and the acidotic cytotoxin is more toxic to the mammalian cell under acidotic conditions than to the mammalian cell not under acidotic conditions.

5,554,639

MEDICAMENTS

Joanne Craig; Derek L. Crookes, and Stephen J. Skittrall, all of Ware, Great Britain, assignors to Glaxo Group Limited, London, England

Continuation of Ser. No. 377,485, Jan. 24, 1995, abandoned, which is a continuation of Ser. No. 66,038, Jun. 14, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 460,791

Claims priority, application United Kingdom, Dec. 12, 1990, 9026998

Int. Cl.[6] A61K *31/41*

U.S. Cl. 514—415 **9 Claims**

1. An intranasal pharmaceutical composition for intranasal administration which comprises an aqueous solution containing an intranasally effective amount of 3-[2-(dimethylamino)ethyl]-N-methyl-1H-indole-5-methanesulphonamide sulphate salt (2:1) or a physiologically acceptable solvate thereof as active ingredient together with a pharmaceutically acceptable carrier, wherein the aqueous solution has a pH range of 5 to 7.

5,554,640

USE OF PROPANOLAMINE DERIVATIVES AS SELECTIVE 5-HT_1 ANTAGONISTS

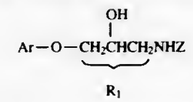
Edward E. Beedle, Indianapolis; David W. Robertson, Greenwood, and David T. Wong, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 171,943, Dec. 22, 1993, Pat. No. 5,420,294, which is a continuation of Ser. No. 996,484, Dec. 21, 1992, abandoned, which is a continuation of Ser. No. 638,298, Jan. 4, 1991, abandoned, which is a division of Ser. No. 434,137, Nov. 8, 1989, Pat. No. 5,013,761, which is a continuation of Ser. No. 202,767, Jun. 3, 1988, abandoned. This application Feb. 8, 1995, Ser. No. 385,508

Int. Cl.[6] A61K *31/405;31/135*

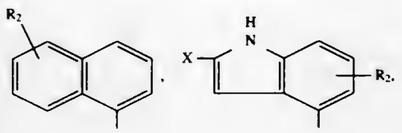
U.S. Cl. 514—415 **7 Claims**

1. A method of selectively antagonizing the 5-HT_1 receptor in a mammal comprising administering to a mammal an effective 5-HT_1 antagonizing amount of a compound of the formula



t

where Ar is



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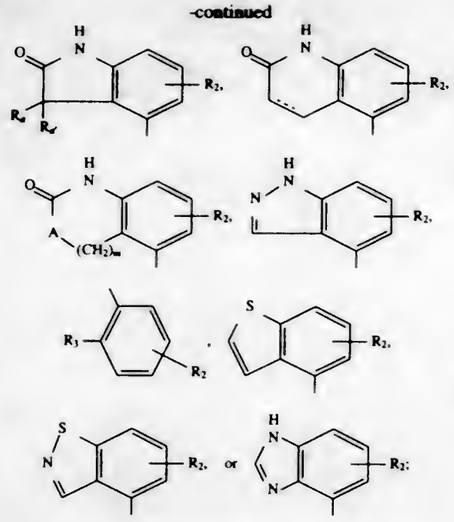
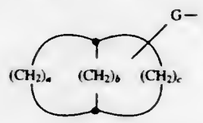
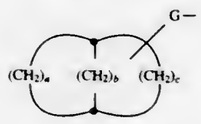


R_1 is hydrogen or methyl substituted on one of the three connecting carbon atoms;
R_2 is hydrogen, C_1–C_4 alkyl, trifluoromethyl, hydroxy, (C_1–C_4 alkyl)-O-, (C_1–C_4 alkyl)-S(O)p-, or halo;
R_3 is a bicycloalkyl group of the formula



where a and c are independently 1–5, b is 0–5, and (a+c) is greater than 2;
z is a straight or branched C_4–C_{10} alkane, alkene, or alkyne group, (C_4–C_8 cycloalkyl)-G- unsubstituted or substituted with C_1–C_4 alkyl or phenyl, a bicycloalkyl group of the formula



wherein a and c are independently 1–5, b is 0–5, and (a+c) is greater than 2,
C_2–C_{10} alkyl unsubstituted or substituted by phenyl which is unsubstituted or substituted by R_2 as previously defined, or -(C_1–C_4 alkylidene)-T-(C_1–C_4 alkyl), where T is —O—, —S—, —SO—, or —SO_2—;
where
each G is independently a bond or C_1–C_4 alkylidene;
X is —H, —COY, —CN, or C_1–C_4 alkyl;
Y is —OH, —O—(C_1–C_4 alkyl), or —NH_2;
———— represents a single or double bond;
R_a and R_a' are independently hydrogen or C_1–C_3 alkyl, or when taken together with the carbon atom to which they are attached form a C_3–C_8 cycloalkyl ring;
p is 0, 1, or 2;
A is —O—, —S—, —NH—, or —NCH_3—; and
m is 0, 1, 2, or 3;
or a pharmaceutically-acceptable salt thereof.

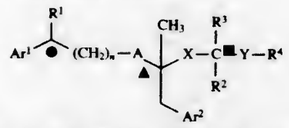
5,554,641

NONPEPTIDES AS TACHYKININ ANTAGONISTS

David C. Horwell, 8 West Hill, Foxton, Cambridge, England; Martyn C. Pritchard, 9 Bury Close, St. Ives, Cambridgeshire, and Jennifer Raphy, 15 Greenhill Park, Thorley Park, Bishops Stortford, Herts CM23 4EW both of United Kingdom

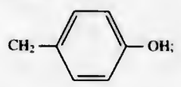
Filed Mar. 20, 1995, Ser. No. 406,607
Int. Cl.[6] A61K *31/40;* **C07D** *209/10*
U.S. Cl. 514—415 **14 Claims**

1. A compound of formula



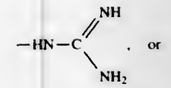
I

or a pharmaceutically acceptable salt thereof
wherein:
the ●, ▲, and ■ indicate all stereoisomers at these carbon atoms;
Ar^1 is phenyl unsubstituted or substituted by from 1 to 3 substituents selected from:
alkyl,
halogen,
nitro,
trifluoromethyl,
cyano,
hydroxy, and
alkoxy;
Ar^1 can also be pyridine;
R^1 is hydrogen or a straight, branched, or cycloalkyl of from 1 to 7 atoms; or
Ar^1 and R^1 form a ring of 5 to 8 atoms when joined by a bond;
n is an integer of from 0 to 2;
A is OCONH, CONH, CO_2, NHCONH, CH_2NH, and $COCH_2$;
Ar^2 is phenyl as defined in Ar^1 above,
pyridine,
thiophene,
naphthyl,
indole,
benzofuran,
benzothiophene, or
imidazole;
X is
—OCONH—,
—CONH—,
—CO_2—,
—NHCONH—,
—CH_2NH—,
—$COCH_2$—,
—$CONCH_3$—,
—CH_2O—,
—CH_2CH_2—, or
—CH=CH—;
R^2 is
hydrogen,
methyl,
phenyl,
benzyl,
$CH_2C_6H_{11}$, or

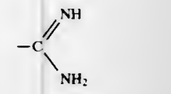


R^3 is hydrogen or methyl;
Y is
—(CH_2)$_m$—,
—(CH_2)$_m$O—, wherein m is an integer of from 1 to 5,
—CONH—,
—CH_2NH—,
—SO_2NH—(CH_2)$_n$—.

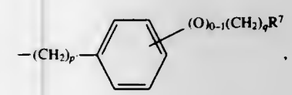
—$COCH_2$—, or
—CH=CH—; and
R^4 is hydrogen, alkyl straight or branched of from 1 to 8 atoms unsubstituted or substituted by a substituent selected from:
hydrogen,
OR^5,
$NHCOCH_3$,
NR^5R^6,
SO_2CH_3,
SO_2NH_2,
$NHSO_2NH_2$,
$NHCONH_2$,
$CONR^5R^6$,
COR^5,

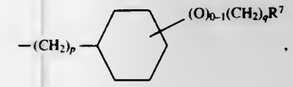


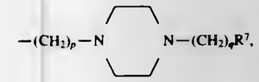
or

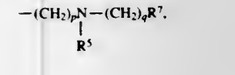


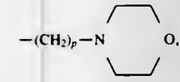
wherein R^5 and R^6 are each independently hydrogen or alkyl, and
R^4 is

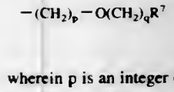












wherein p is an integer of from 0 to 5, q is an integer of from 0 to 4, and R^7 is hydrogen, hydroxy, alkoxy, $CONR^5R^6$, or $NHCONR^5R^6$ wherein R^5 and R^6 are as described above.

5,554,642

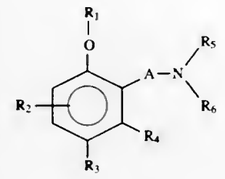
ARYLALKYL(THIO) AMIDES

Michel Langlois, Sceaux; Pierre Renard, Versailles, and Gérard Adam, Le Mesnil Le Roi, all of France, assignors to Adir et Compagnie, Courbevoie, France

Division of Ser. No. 375,503, Jan. 18, 1995, Pat. No. 5,464,872, which is a continuation of Ser. No. 131,207, Oct. 1, 1993, abandoned. This application May 22, 1995, Ser. No. 446,409
Claims priority, application France, Oct. 2, 1992, 92 11671
Int. Cl.[6] A61K *31/405;* **C07D** *209/04*
U.S. Cl. 514—415 **11 Claims**

1. A compound which is selected from those of formula (I):

(I)



in which:
A represents a —CH_2—CH_2— chain, unsubstituted or substituted with lower alkyl,
R_1 represents hydrogen or lower alkyl,
R_2 represents hydrogen, halogen or lower alkyl,
R_3 and R_4, together with the benzene ring which carries them, form an indole ring-system E_3 on the understanding that the portion of the ring-system E_3 formed by R_3 and R_4 and the two carbon atoms of the benzene ring which carry them is:
unhydrogenated or partially hydrogenated,
and unsubstituted or substituted with one or more radicals chosen from: halogen, hydroxyl, lower alkyl, lower alkoxy, lower alkoxycarbonyl, and trifluoromethyl,
R_5 represents hydrogen or lower alkyl,
R_6 represents a group

in which
X represents oxygen and R_7 represents a radical chosen from:
lower alkyl, unsubstituted or substituted with one or more radicals chosen from halogen, hydroxyl, and lower alkoxy,
linear or branched alkenyl having 2 to 7 carbon atoms, inclusive, unsubstituted or substituted with one or more radicals chosen from halogen, hydroxyl, and lower alkoxy,
and —(CH_2)$_m$—E_4 in which m represents 0 or 1 to 4, inclusive, and E_4 represents a mono- or bicyclic cycloalkyl having 3 to 12 carbon atoms, inclusive, unsubstituted or substituted with one or more radicals chosen from halogen, and lower alkyl,
its optical isomers, and addition salts thereof with a pharmaceutically-acceptable acid or base when R_3 or R_4 represents a satisfiable group,
on the understanding that the terms "lower alkyl" and "lower alkoxy" denote linear or branched groups having 1 to 6 carbon atoms, inclusive, and that the terms "cycloalkenyl" and "alkenyl" denote hydrocarbon groups containing one or more double bonds.

5,554,643

PRO-DRUGS FOR CCK ANTAGONISTS

David C. Horwell; Martyn C. Pritchard, both of Cambridge,

5,554,644

TACHYKININ (NK2) ANTAGONISTS

David C. Horwell, Foxton; William Howson, Weston Colville,

5,554,647

METHOD AND COMPOSITIONS FOR TREATMENT AND/OR PREVENTION OF SKIN DAMAGE AND AGING

5,554,643

PRO-DRUGS FOR CCK ANTAGONISTS

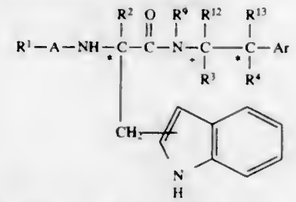
David C. Horwell; Martyn C. Pritchard, both of Cambridge, and Reginald S. Richardson, Suffolk, all of England, assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 726,653, Jul. 12, 1991, Pat. No. 5,340,825, which is a continuation-in-part of Ser. No. 576,315, Aug. 31, 1990, abandoned. This application Apr. 13, 1994, Ser. No. 227,211

Int. Cl.[6] A61K *31/405;* **C07D** *209/18*

U.S. Cl. 514—419 **17 Claims**

1. A compound of the formula



I

or a pharmaceutically acceptable salt thereof wherein:

R^1 is a cycloalkyl or polycycloalkyl hydrocarbon of from three to twelve carbon atoms with from zero to four substituents each independently selected from the group consisting of a straight or branched alkyl of from one to about six carbon atoms, halogen, CN, OR*, SR*, CO_2R^*, CF_3, NR^5R^6, and $-(CH_2)_nOR^5$ wherein R* is hydrogen, straight or branched alkyl of from one to six carbon atoms, $-(CH_2)_nAr$, —COAr, $-(CH_2)_nOCOAr$, or $-(CH_2)_nNR^5COAr$ and R* may also independently be R** as defined below,

and R** must be present once in formula I, and R** is attached to formula I through a metabolically labile bond, R^5 and R^6 are each independently hydrogen or alkyl of from one to six carbon atoms and n is an integer from zero to six; and R** is $-(CH_2)_nNR^5R^6$, $-(CH_2)_n-B-D^*$ wherein D* is O—COR*, CO_2Ar^2, $(CH_2)_nAr^2$, $OCOAr^2$, NR^5COAr^2, $COAr^2$, $CO_2CH(R)-CO_2R^*$, $CO_2-(CH_2)_nOCOR^*$ where $Ar^2$is independently taken from Ar, where m is as defined below, $CONHCH(R)CO_2R^*$ where R is a side chain of aspartic or glutamic acid, R is hydrogen only when B is not a bond, $-CO_2CH_2CH_2N^+(R^*)_3X^{1-}$ when X^{1-} is a pharmaceutically acceptable counter anion,

A is $-(CH_2)_nCO-$, $-SO_2-$, $-S(=O)-$, —NHCO—, $-(CH_2)_n-C(=O)-$,

$-SC-$,

$-O-(CH_2)_nCO-$ or $-HC=CHCO-$ wherein n is an integer from zero to six;

R^2 is CH_3;

R^3 and R^4 are each independently selected from hydrogen, R^2 and $-(CH_2)_n-B-D$ wherein:

n' is an integer of from zero to three;

B is a bond,

$-OCO(CH_2)_n-$,

$-O(CH_2)_n-$,

$-NHCO(CH_2)_n-$,

$-CONH(CH_2)_n-$,

$-NHCOCH=CH-$,

$-COO(CH_2)_n-$,

$-CO(CH_2)_n-$,

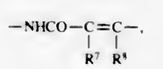
$-S-(CH_2)_n-$,

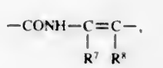
$-S(=)-(CH_2)_n-$,

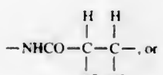
$-SO_2-(CH_2)_n-$,

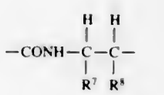
$-NHSO_2-(CH_2)_n-$,

$-SO_2NH-(CH_2)_n-$,









wherein R^7 and R^8 are each independently selected from hydrogen and R^2 or together form a ring $(CH_2)_m$ wherein m is an integer of from 1 to 5 and n is as defined above;

D is hydrogen,

—COOR*,

$-CH_2NR^5R^*$,

$-CHR^2NR^5R^*$,

$-CH_2OR^*$,

$-CHR^2OR^*$,

$-CH_2SR^*$,

$-CHR^2SR^*$,

$-CONR^5R^6$,

$-CONR^5R^*$,

an acid replacement selected from

$HO_3S-\}$,

$\}-PO_3H_2-$,

$PhSO_2NHCO-\}$,

$CF_3CONHCO-\}$,

$CF_3SO_2NHCO-\}$,

$H_2NSO_2-\}$,

wherein R*, R^2, R^5, and R^6 are as defined above;

R^9 is hydrogen or a straight or branched alkyl of from one to six carbon atoms, $-(CH_2)_nCO_2R^*$, $-(CH_2)_nNR^5R^*$, wherein n, R*, and R^5 are as defined above or taken from R^3;

R^{12} and R^{13} are each independently hydrogen or are each independently taken with R^3 and R^4, respectively, to form a moiety doubly bonded to the carbon atom; and

Ar is a mono- or polycyclic unsubstituted or substituted carboaromatic or carbo- hydroaromatic moiety.

5,554,644

TACHYKININ (NK2) ANTAGONISTS

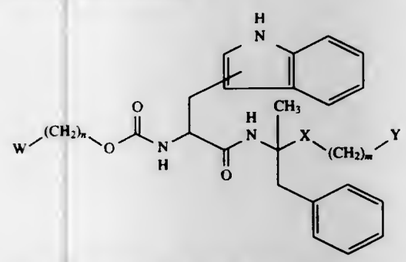
David C. Horwell, Foxton; William Howson, Weston Colville, both of England, and Simon Osborne, Newmarket, United Kingdom, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 8, 1994, Ser. No. 255,491

Int. Cl.[6] C07D *209/14;* **A61K** *31/405*

U.S. Cl. 514—419 **9 Claims**

1. A compound of formula



I

or a pharmaceutically acceptable salt thereof wherein

w is 1-naphthalene or 2,3 -dimenthoxyphenyl;

n is an integer of from 0 to 2;

X is $COCH_2$, $CH(OH)CH_2$, CH_2NH, or CH_2CH_2;

m is an integer of from 1 to 2; and

Y is OH, $CONH_2$, or $NHSO_2R$ wherein R is CH_3.

5,554,645

ANTINEOPLASTIC COCOA EXTRACTS AND METHODS FOR MAKING AND USING THE SAME

Leo J. Romanczyk, Jr., Hackettstown, N.J.; John F. Hammerstone, Jr., Nazareth, Pa., and Margaret M. Buck, Morristown, N.J., assignors to Mars, Incorporated, McLean, Va.

Filed Oct. 3, 1994, Ser. No. 317,226

Int. Cl.[6] A01N *43/16;* **A61K** *31/35;* **C07D** *313/00*

U.S. Cl. 514—453 **14 Claims**

1. A substantially pure cocoa extract or synthetic polyphenol(s) consisting essentially of polyphenol(s) of oligomers 3 through 12.

5,554,646

METHOD FOR REDUCING BODY FAT IN ANIMALS

Mark E. Cook; Michael W. Pariza, and Yeonhwa Park, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 875,896, Apr. 29, 1992, Pat. No. 5,430,066, which is a continuation-in-part of Ser. No. 7,413, Jan. 22, 1993, Pat. No. 5,428,072. This application Aug. 29, 1994, Ser. No. 297,472

Int. Cl.[6] A61K *31/20;31/23*

U.S. Cl. 514—560 **9 Claims**

1. A method of reducing body fat in an animal in which it is desired to reduce the body fat which comprises administering to the animal a safe amount of a member selected from the class consisting of a conjugated linoleic acid, a non-toxic salt thereof, an active ester thereof, and mixtures thereof, which is effective to reduce the body fat of the animal.

5,554,647

METHOD AND COMPOSITIONS FOR TREATMENT AND/OR PREVENTION OF SKIN DAMAGE AND AGING

Nicholas V. Perricone, 35 Pleasant St. 0 Suite 2A, Meriden, Conn. 06450

Continuation-in-part of Ser. No. 407,413, Mar. 17, 1995, which is a continuation-in-part of Ser. No. 24,890, Mar. 1, 1993, Pat. No. 5,409,693, which is a continuation of Ser. No. 732,444, Jul. 18, 1991, abandoned, which is a continuation of Ser. No. 420,287, Oct. 12, 1989, abandoned. This application Apr. 27, 1995, Ser. No. 435,944

Int. Cl.[6] A61K *31/34*

U.S. Cl. 514—474 **20 Claims**

1. A method for the treatment of aging skin and subcutaneous muscles comprising topically applying to affected skin areas a composition comprising an acetylcholine precursor active ingredient selected from the group consisting of dimethylaminoethanol, monoaminoethanol, choline, serine, acetic acid esters of dimethylaminoethanol, acetic acid esters of monoaminoethanol, parachlorophenylacetic acid esters of dimethylaminoethanol, parachlorophenylacetic acid esters of monoaminoethanol, and mixtures thereof in a dermatologically acceptable carrier that percutaneously delivers the active ingredient in amounts effective to produce increased muscle tone.

5,554,648

COBALT COMPLEXES AS ANTICANCER AGENTS

William A. Denny; Brian D. Palmer; David C. Ware, and William R. Wilson, all of Auckland, New Zealand, assignors to Warner Lambert Company, Morris Plains, N.J.

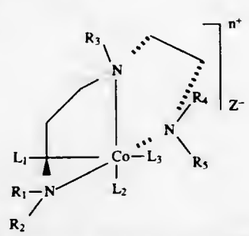
Division of Ser. No. 184,413, Jan. 21, 1994, Pat. No. 5,348,977, which is a continuation-in-part of Ser. No. 83,862, Jun. 28, 1993, abandoned, which is a continuation of Ser. No. 825,228, Jan. 24, 1992, abandoned. This application Jun. 22, 1994, Ser. No. 263,640

Claims priority, application New Zealand, Jan. 25, 1991, 236906

Int. Cl.[6] A61K *31/295;* **C07F** *15/06*

U.S. Cl. 514—501 **8 Claims**

1. A substantially purified compound represented by the general formula (III):



(III)

where R_1–R_5 separately represent H, lower alkyl (optionally substituted with hydroxy and/or amine functions) containing from 1 to 6 carbon atoms, or CH_2CH_2Cl, except that two but not more than two of R_1–R_5 shall represent CH_2CH_2Cl groups in any one molecule; L_1–L_3 separately represent all possible combinations of Cl^-, NO_2^- and NH_3 monodentate ligands, or represent a combination of one of these monodentate ligands together with an acetylacetonate bidentate ligand, or collectively represent a tridentate ligand selected from iminodiacetato, N-(Q)iminodiacetato where Q is lower alkyl (optionally substituted with hydroxy and/or amine functions) containing from 1 to 6 carbon atoms, glycylglycinato and 2,6-pyridinedicarboxylato; n is 0 or 1, and, when n=1, Z^- represents Cl^-, Br^-, I^-, ClO_4^-, NO_3^-, HCO_3^- or any other pharmaceutically-acceptable organic or inorganic counterion.

170-919 O.G.-96-16: QL3

2. A compound represented by the general formula (III):

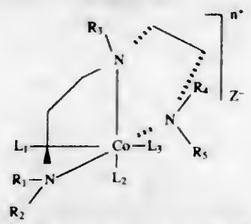
5,554,651

METHOD OF TREATING WRINKLES USING

said related compound is selected from the group consisting of quinic acid, isocitric acid, tropic acid, trethocanic acid,

-continued

2. A compound represented by the general formula (III):



(III)

where R_1–R_5 separately represent H, lower alkyl (optionally substituted with hydroxy and/or amino functions) containing from 1 to 6 carbon atoms, or CH_2CH_2Cl, except that not more than two of R_1–R_5 shall represent CH_2CH_2Cl groups in any one molecule; L_1–L_3 separately represent all possible combinations of Cl^-, NO_2^- and NH_3 monodentate ligands, or a combination of one of these monodentate ligands together with an acetylacetonate bidentate ligand or may collectively represent a tridentate ligand; n is 0 or 1, and, when n=1, Z^- represents Cl^-, Br^-, I^-, ClO_4^-, NO_3^-, HCO_3^- or any other pharmaceutically-acceptable organic or inorganic counterion; and with the proviso that compound is not selected from the group consisting of $[Co(NO_2)_3(Cl\text{-etoldien})]$, $[Co(NO_2)_2—Cl(Cl\text{-etoldien})]$ and $[Co(NO_2)_3(dietoldien)]$.

5,554,649

CONTROLLING AGENT FOR FABRIC PEST INSECTS

Takao Ishiwatari, Minoo, and Kazunori Tsushima, Sanda, both of Japan, assignors to Sumitomo Chemical Company, Limited., Osaka, Japan

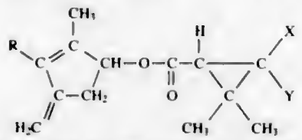
Continuation of Ser. No. 98,733, Jul. 29, 1993, abandoned. This application Dec. 19, 1994, Ser. No. 359,013

Claims priority, application Japan, Aug. 25, 1992, 4-225663; Mar. 30, 1993, 5-071699

Int. Cl.[6] A01N *37/08*

U.S. Cl. 514—530 **16 Claims**

1. A method for controlling fabric pest insects comprising applying a controlling agent which comprises an insecticidally effective amount of a carboxylic acid ester represented by the formula (I):



(I)

wherein R represents an allyl or propargyl group, Y is a hydrogen atom when X represents an isobutenyl, 2,2-difluorovinyl or 2-chloro-2-fluorovinyl group, and Y is a methyl group when X represents a methyl group, and an inert carrier to a locus where the insects inhabit.

5,554,650

ANTIPHLOGISTIC, ANALGESIC, ANTIPYRETIC INJECTION PREPARATION

Richard J. Holl; Thomas R. Tice, and Laura L. Williams, all of Birmingham, Ala., assignors to Southern Research Institute, Birmingham, Ala.

Filed Jul. 28, 1994, Ser. No. 281,579

Int. Cl.[6] A61K *31/135*

U.S. Cl. 514—567 **38 Claims**

1. An antiphlogistic, analgesic and antipyretic parenteral preparation comprising a therapeutically effective amount of diclofenac, its pharmaceutically acceptable salt, or both, a surfactant, a cosurfactant, and water, and having a pH of 3–10.

5,554,651

METHOD OF TREATING WRINKLES USING CITRAMALIC ACID

Ruey J. Yu, Ambler, and Eugene J. Van Scott, Abington, both of Pa., assignors to Tristrata, Inc., Princeton, N.J.

Continuation of Ser. No. 179,190, Jan. 10, 1994, Pat. No. 5,470,880, which is a continuation of Ser. No. 89,101, Jul. 12, 1993, Pat. No. 5,389,677, which is a division of Ser. No. 8,223, Jan. 22, 1993, abandoned, which is a continuation of Ser. No. 812,858, Dec. 23, 1991, abandoned, which is a continuation of Ser. No. 469,738, Jan. 19, 1990, abandoned, which is a continuation of Ser. No. 945,680, Dec. 23, 1986, abandoned. This application Jun. 6, 1995, Ser. No. 467,894

Int. Cl.[6] A61K *7/48;31/19*

U.S. Cl. 514—574 **10 Claims**

1. Method of visibly reducing a human skin wrinkle comprising topically applying to said wrinkle a composition comprising citramalic acid or a topically effective salt thereof in an amount and for a period of time sufficient to visibly reduce said wrinkle, wherein said wrinkle is a facial wrinkle.

5,554,652

METHOD OF TREATING WRINKLES USING ALPHA HYDROXYACIDS, ALPHA KETOACIDS AND A SUNCREEN AGENT

Ruey J. Yu, 4 Lindenwold Ave., Ambler, Pa. 19002, and Eugene J. Van Scott, 3 Hidden La., Abington, Pa. 19001

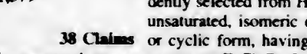
Continuation of Ser. No. 179,190, Jan. 10, 1994, Pat. No. 5,470,880, which is a continuation of Ser. No. 89,101, Jul. 12, 1993, Pat. No. 5,389,677, which is a division of Ser. No. 8,223, Jan. 22, 1993, which is a continuation of Ser. No. 812,858, Dec. 23, 1991, abandoned, which is a continuation of Ser. No. 469,738, Jan. 19, 1990, abandoned, which is a continuation of Ser. No. 945,680, Dec. 23, 1986, abandoned. This application Jun. 7, 1995, Ser. No. 487,685

Int. Cl.[6] A01N *37/00*

U.S. Cl. 514—557 **17 Claims**

1. A method for visibly reducing and/or preventing a human skin wrinkle comprising topically applying to said wrinkle a composition comprising (i) at least one compound selected from the group consisting of 2-hydroxycarboxylic acids, 2-ketoacids and related compounds, or topically effective salts thereof, and (ii) a sunscreen agent, in an amount and for a period of time sufficient to visibly reduce and/or prevent said wrinkle,

wherein said 2-hydroxycarboxylic acid is represented by a generic structure of:



wherein R_a and R_b may be the same or different and are independently selected from H, F, Cl, Br, alkyl, aralkyl or aryl group of saturated or unsaturated, isomeric or non-isomeric, straight or branched chain or cyclic form, having 1 to 29 carbon atoms, and in addition R_a and R_b can be substituted by OH, CHO, COOH and alkoxy group having 1 to 9 carbon atoms, said 2-hydroxycarboxylic acid may be present as a tree acid or lactone form, or in a salt form with an organic base or an inorganic alkali, and as stereoisomers as D, L, and DL forms when R_a and R_b are not identical,

said 2-ketoacid is represented by a generic structure of:

wherein R_c and R_d may be the same or different and are independently selected from H, alkyl, aralkyl or aryl group of saturated or unsaturated, isomeric or non-isomeric, straight or branched chain or cyclic form, having 1 to 29 carbon atoms, and in addition R_c may carry F, Cl, Br, I, OH, CHO, COOH and alkoxy group having 1 to 9 carbon atoms, said alpha ketoacid existing as a free acid or an ester form, or in a salt form with an organic base or an inorganic alkali, and

said related compound is selected from the group consisting of quinic acid, isocitric acid, tropic acid, trethocanic acid, 3-chlorolactic acid, cerebronic acid, citramalic acid, agaricic acid, aleuritic acid, pantoic acid, lactobionic acid and hexulosonic acid.

5,554,653

INHIBITORS OF HIV PROTEASE USEFUL FOR THE TREATMENT OF AIDS

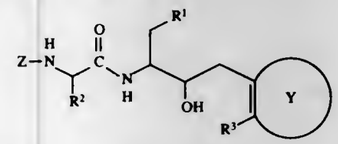
Kwan Hui, Carmel; Charles D. Jones, Indianapolis; Louis N. Jungheim, Indianapolis, and Timothy A. Shepherd, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 22, 1992, Ser. No. 995,620

Int. Cl.[6] C07D *215/48;217/26;* **C07C** *321/28;323/20*

U.S. Cl. 514—605 **28 Claims**

1. A compound of formula I



1

wherein:

Z is hydrogen, formyl, carbamoyl, C_2–C_6 alkanoyl, C_1–C_4 alkoxycarbonyl, —C(O)CF_3 or —S(O)$_2$—R, where

R is C_1–C_6 alkyl, amino, trifluoromethyl, C_1–C_4 alkylamino, di(C_1–C_4) alkylamino, aryl, aryl (C_1–C_4) alkyl, heterocycle, unsaturated heterocycle or C_5–C_7 cycloalkyl;

R^1 is aryl, C_5–C_7 cycloalkyl or —S—R^{1x}, where R^{1x} is aryl or C_5–C_7 cycloalkyl;

R^2 is an amino acid side chain, —$(CH_2)_y$—X—R^{2a}, cyano (C_1–C_4)alkyl or —$(CH_2)_y$—S(O)$_w$— [1-N(R^{2c})-tetrazol-5-yl], where

y is 0, 1, 2 or 3;

X is a bond, divalent (C_2–C_4) alkenyl, divalent (C_2–C_4)alkynyl, —C(O)—O—, —O—C(O)—, —C(O)—NR^{2b}—, —NR^{2b}—C(O)—, —NR^{2b}—, —C(O)—, —O—, or —S(O)$_w$—,

w is 0, 1 or 2;

R^{2a} is C_1–C_6 alkyl, aryl, unsaturated heterocycle, heterocycle, aryl (C_1–C_4)alkyl, unsaturated heterocycle (C_1–C_4)alkyl or heterocycle (C_1–C_4) alkyl;

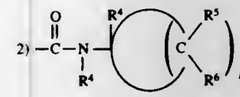
R^{2b} is hydrogen or C_1–C_4 alkyl;

R^{2c} is hydrogen, C_1–C_6 alkyl, aryl, unsaturated heterocycle, aryl (C_1–C_4) alkyl or unsaturated heterocycle (C_1–C_4) alkyl;

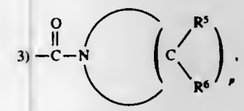
Y is aryl or unsaturated heterocycle;

R^3 is a group having the structure:

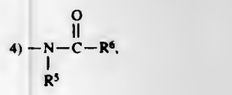
1) —C(O)—NR^4R^4,



2)



3)



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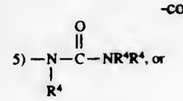
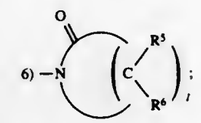


6)



;

l

where:

p is 4 or 5;

l is 3, 4 or 5;

R^4 at each occurrence is independently hydrogen, C_1–C_6 alkyl or hydroxy (C_1–C_4) alkyl;

R^5 and R^6 are independently selected from hydrogen, hydroxy, C_1–C_6 alkyl, C_1–C_6 alkoxy, amino, C_1–C_4 alkylamino, hydroxy (C_1–C_4) alkyl, carboxy, C_1–C_4 alkoxycarbonyl, carbamoyl, N— (C_1—C_4) alkylcarbamoyl, aryl, heterocycle or unsaturated heterocycle;

with the proviso that when Z is hydrogen, formyl, carbamoyl, C_2–C_6 alkanoyl or C_1–C_4 alkoxycarbonyl; R^2 is an amino acid side chain or —$(CH_2)_y$—X—R^{2a}, where y is 0, 1, 2 or 3; X is a bond, —C (O)—O— or —C(O)—NR ^{2b}—; R^{2b} is hydrogen; and R^{2a} is aryl, heterocycle or unsaturated heterocycle, then R^1 must be aryl or C_5–C_7 cycloalkyl; or a pharmaceutically acceptable salt thereof.

5,554,654

METHOD FOR ENHANCING THE THERAPEUTIC EFFECT OF AN ANTI-ACNE AGENT

Ruey J. Yu, 4 Lindenwold Ave., Ambler, Pa. 19002, and Eugene J. Van Scott, 3 Hidden La., Abington, Pa. 19001

Continuation of Ser. No. 179,190, Jan. 10, 1994, Pat. No. 5,470,880, which is a continuation of Ser. No. 89,101, Jul. 12, 1993, Pat. No. 5,389,677, which is a division of Ser. No. 8,223, Jan. 22, 1993, which is a continuation of Ser. No. 812,858, Dec. 23, 1991, abandoned, which is a continuation of Ser. No. 469,738, Jan. 19, 1990, abandoned, which is a continuation of Ser. No. 945,680, Dec. 23, 1986, abandoned. This application Jun. 7, 1995, Ser. No. 487,692

Int. Cl.[6] A01N *37/00*

U.S. Cl. 514—557 **26 Claims**

1. A method of enhancing the effect of a composition comprising an anti-acne agent selected from the group consisting of salicylic acid, retinoic acid, erythromycin, metronidazole, tetracycline, clindamycin, minocycline and meclocycline as a first ingredient, in a topically acceptable vehicle for the topical administration to a person in need thereof, comprising combining with said composition a second composition consisting essentially of an enhancing amount of at least one second ingredient selected from the group consisting of 2-hydroxycarboxylic acids, lactones and salts thereof and 2-ketoacids, esters, lactones and salts thereof and related compounds selected from the group consisting of quinic acid, isocitric acid, tropic acid, trethocanic acid, 3-chlorolactic acid, cerebronic acid, citramalic acid, agaricic acid, aleuritic acid, pantoic acid, lactobionic acid and hexulosonic acid.

5,554,655

METHOD OF TREATING HIV INFECTION

Jess G. Thoene, 1308 Brooks, Ann Arbor, Mich. 48103, assignor to Jess G. Thoene, Ann Arbor, Mich.

Continuation of Ser. No. 017,994, Feb. 16, 1993, abandoned, which is a continuation of Ser. No. 767,802, Sep. 30, 1991, abandoned. This application Apr. 15, 1994, Ser. No. 229,142

Int. Cl.[6] A61K *31/13*

U.S. Cl. 514—665 **18 Claims**

1. A method for treating HIV infection, comprising administering an effective amount of cysteamine, cystamine, phosphocysteamine, or a pharmaceutically acceptable salt thereof to a patient in need thereof.

5,554,656

DISINFECTANT CONCENTRATES AND DISINFECTANTS ON AMINE AND ALCOHOL BASE AND THEIR USE

Bernd Löwer; Heinz Eggensperger, both of Hamburg; Peter Gorancy-Bermes, Ahrensburg, and Andreas Dettmann, Hamburg, all of Germany, assignors to Reckitt & Colman Inc., Montvale, N.J.

Filed Feb. 25, 1994, Ser. No. 201,610

Claims priority, application Germany, Feb. 25, 1993, 43 06 344.6

Int. Cl.[6] A01N *33/04;33/06;33/08*

U.S. Cl. 514—674 **16 Claims**

1. A disinfectant composition concentrate comprising: at least one aliphatic glycol ether according to the general formula:

$$R_4—(O—R_5)_n—OH$$

in which:

R_4 is a straight- or branch-chained alkyl group having 5 to 18 C atoms;

R_5 is a straight- or branch-chained alkyl group having 2 to 4 C atoms; and,

n is a whole number between 2 and 4, of limited miscibility with water and;

at least one alkyl amine according to the general formula:

in which

R_1 is a C_4–C_{20} alkyl group, a C_5–C_{10} cycloalkyl group, a C_7–C_{10} aryl alkyl group, or a C_6–C_{14} aryl group;

R_2 is an amino alkyl group of the formula $—(CH_2)_n—NH_2$, wherein n is a number from 2 to 10; and,

R_3 is hydrogen or the same as R_2.

5,554,657

PROCESS FOR RECYCLING MIXED POLYMER CONTAINING POLYETHYLENE TEREPHTHALATE

Thomas F. Brownscombe, Houston; Howard L. Fong, Sugar Land; Zaida Diaz; Hoe H. Chuah; Raymond L. June, all of Houston, Tex.; Kevin L. Rollick, Munroe Falls, Ohio; Thomas C. Semple, Friendswood, Tex., and Mark R. Tompkin, Massillon, Ohio, assignors to Shell Oil Company, Houston, Tex.

Filed May 8, 1995, Ser. No. 436,878

Int. Cl.[6] C08J *11/04;* **B03D** *1/08*

U.S. Cl. 521—48 **47 Claims**

1. A process for recovering a polyester polymer from a mixed polymer recycle stream, while maintaining the polyester polymer in polymer form, comprising:

contacting a mixed polymer recycle stream comprising at least 50 weight percent polyester polymer, lesser portions of other polymers, including one or more polyolefins, and impurities, with a chemical wash solvent that dissolves at least a portion of the impurities present in the mixed polymer recycle stream and substantially rejects dissolution of the polyester polymer present in the mixed polymer recycle stream, to form a chemical wash solution containing impurities dissolved in the chemical wash solvent, and a residual mixed polymer recycle stream;

separating the chemical wash solution from the residual mixed polymer recycle stream;

contacting, at an elevated temperature, the residual mixed polymer recycle stream with a selective solvent that selectively dissolves the polyester polymer and substantially rejects dissolution of any other polymer present in the mixed polymer recycle stream, to form a residual waste stream, a separate polyolefin phase, and a selective solvent solution comprising the polyester polymer dissolved in the selective solvent;

separating the selective solvent solution from the separate polyolefin phase, and from the residual waste stream; and

precipitating the polyester polymer from the selective solvent solution, to form a precipitated polyester polymer and a spent selective solvent solution; and

separating the spent selective solvent from the precipitated polyester polymer, to obtain a recovered polyester polymer product having an intrinsic viscosity of from about 0.2 dl/g to about 0.8 dl/g.

5,554,658

INJECTION MOLDED PVA SPONGE

Solomon Rosenblatt, 127 W. 79th St., Apt. 11-C, New York, N.Y. 10024

Continuation-in-part of Ser. No. 979,260, Nov. 20, 1992, Pat. No. 5,276,993, which is a continuation of Ser. No. 740,942, Aug. 6, 1991, Pat. No. 5,170,580. This application Dec. 14, 1993, Ser. No. 167,591

Int. Cl.[6] C08J *9/30*

U.S. Cl. 521—51 **14 Claims**

1. A process for making a sponge product having a polyvinyl alcohol matrix that is at least partially acetalized, said process comprising the steps of:

frothing a mixture of an aldehyde, aqueous polyvinyl alcohol and a mineral acid, with the proviso that if said frothing occurs approximately at or below ambient temperature then said polyvinyl alcohol includes a high molecular weight polyvinyl alcohol or a compound selected from the group consisting of a wetting agent, a thickening agent and a mixture thereof is included and wherein said frothing step is performed until a foam having sufficient viscosity to resist escape of entrained air is formed;

inserting said foam into a vented mold;

heating said mold containing said foam thereby forcing said foam against an inner surface of said mold and thereby forming an open celled outer skin on said sponge product and wherein said outer skin has a smaller average pore size relative to an interior portion of said sponge product; and

releasing said product from said mold.

5,554,659

INJECTION MOLDED PVA SPONGE

Solomon Rosenblatt, 127 W. 79th St., Apt. 11-C, New York, N.Y. 10024

Division of Ser. No. 167,591, Dec. 14, 1993, which is a continuation-in-part of Ser. No. 979,260, Nov. 20, 1992, Pat. No. 5,276,993, which is a continuation of Ser. No. 740,942, Aug. 6, 1991, Pat. No. 5,170,580. This application Jun. 2, 1995, Ser. No. 460,661

Int. Cl.[6] C08J *9/30;9/34*

U.S. Cl. 521—51 **16 Claims**

1. An individually molded porous sponge product comprising a polyvinyl alcohol matrix that is at least partially acetalized, said

product having an open celled outer skin capable of absorbing and passing water through to an interior portion of said product, said outer skin having smaller average pore size than said interior portion and wherein said outer skin substantially uniformly covers said inner portion and wherein said outer skin is formed by forcing a foam material to contact a surface of a mold.

5,554,660

WATER HUMIDITY RESISTANT STARCH FOAMS

Paul A. Altieri, Belle Mead, and Martin M. Tessler, Edison, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed Mar. 31, 1995, Ser. No. 414,862

Int. Cl.[6] C08L *3/06;3/08;* **C08J** *9/00*

U.S. Cl. 521—81 **23 Claims**

1. A biodegradable, water and humidity resistant expanded starch product comprising:

a) from about 25 to 90% by weight of starch or flour modified with up to 15% by weight of alkylene oxide containing 2 to 6 carbon atoms; and

b) from about 10 to 75% by weight of starch ester having a degree of substitution of from about 1.0 to 1.8, or flour ester having a degree of substitution of 0.3 to 1.1.

5,554,661

CLOSED CELL, LOW DENSITY ETHYLENIC POLYMER FOAM PRODUCED WITH INORGANIC HALOGEN-FREE BLOWING AGENTS

Bharat I. Chaudhary, Kehl, Germany; Georges Eschenlauer, Souffelweyersheim, France, and Bruce S. Marks, Westerville, Ohio, assignors to Dow Deutschland Inc., Rheinmuenster, Germany

Division of Ser. No. 241,115, May 10, 1994, Pat. No. 5,416,129. This application Feb. 24, 1995, Ser. No. 394,117

Int. Cl.[6] C08J *9/12*

U.S. Cl. 521—97 **10 Claims**

1. An uncrosslinked, closed cell, low density ethylenic polymer foam prepared from a foaming composition comprising an uncrosslinked low density ethylenic polymer having a melt index of less than about 25 grams per 10 minutes and a melt tension between about 2.0 grams and about 9.0 g and an inorganic halogen-free blowing agent.

5,554,662

LOW VISCOSITY POLYMER POLYOLS A PROCESS FOR THEIR PRODUCTION AS WELL AS THE MANUFACTURE OF POLYURETHANE FROM MATERIALS

Josef Sanders, Leverkusen; Mark Kratz, Krefeld; Manfred Dietrich, Leverkusen; Torsten Heinemann, Köln; Helmut Woynar, Dormagen; Gundolf Jacobs, Rösrath, and Uwe Scholz, Köln, all of Germany, assignors to Bayer Adtiengesellschaft, Leverkusen, Germany

Filed Jun. 6, 1995, Ser. No. 470,695

Claims priority, application Germany, Mar. 10, 1995, 195 08 578.7

Int. Cl.[6] C08K *5/09;* **C08L** *75/00*

U.S. Cl. 521—137 **15 Claims**

1. A process for the production of stable, agglomerate-free, low viscosity graft copolymer dispersion comprising polymerizing at least one ethylenically unsaturated monomer in the presence of a base polyol, a macromer, and an enol ether of the formula:

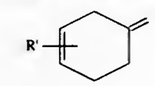
$$A=CH—O—R,$$

wherein:

R represents: an aliphatic hydrocarbon radical having 1 to 18 carbon atoms; a cycloaliphatic hydrocarbon radical having 5 to 10 carbon atoms; or a substituted or unsubstituted benzyl radical;

and

A represents: a divalent radical of the formula:



wherein:

R' represents: hydrogen or an aliphatic hydrocarbon radical having 1 to 8 carbon atoms.

5,554,663

α-AMINOACETOPHENONES AS PHOTOINITIATORS

Vincent Desobry, Marly; Kurt Dietliker, Fribourg; Rinaldo Hüsler, Marly; Werner Rutsch, Fribourg; Manfred Rembold, Aesch, and Franciszek Sitek, Therwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

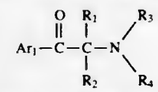
Division of Ser. No. 432,035, May 1, 1995, which is a continuation of Ser. No. 222,764, Apr. 4, 1994, abandoned, which is a continuation of Ser. No. 14,055, Feb. 5, 1993, abandoned, which is a continuation of Ser. No. 758,928, Sep. 11, 1991, abandoned, which is a division of Ser. No. 501,409, Mar. 28, 1990, Pat. No. 5,077,402, which is a continuation of Ser. No. 403,004, Sep. 5, 1989, abandoned, which is a continuation of Ser. No. 172,618, Mar. 24, 1988, abandoned. This application Jun. 6, 1995, Ser. No. 466,847

Claims priority, application Switzerland, Mar. 26, 1987, 1152/87

Int. Cl.[6] C08F *2/46*

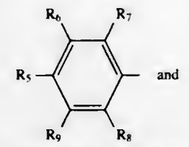
U.S. Cl. 522—8 **6 Claims**

1. A compound of the formula I



(I)

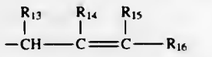
in which Ar_1 is an aromatic radical of the formula IV



(IV)

and

R_1 is either (a) a radical of the formula:



or (b) a radical of the formula $—CH(R_{13})—Ar_2$, in which Ar_2 is a phenyl radical which is unsubstituted or substituted by halogen, C_1–C_{12}alkyl, C_1–C_4alkoxy, C_1–C_8alkylthio or $—(OCH_2CH_2)_nOCH_3$, or benzoyl, n being 1–10,

R_2 is C_1–C_8alkyl or phenyl,

R_3 and R_4 independently of one another are C_1–C_{12}alkyl, C_2–C_4alkyl which is substituted by C_1–C_4alkoxy, —CN or $—COO(C_1$–C_4alkyl), or are allyl, cyclohexyl or benzyl, or R_3 and R_4 together are C_4–C_6alkylene, which can be interrupted by —O— or $—N(R_{17})—$,

R_5 is $—SR_{19}$,

R_6 is hydrogen, halogen, C_1–C_4alkyl or one of the meanings of R_5,

R_7 and R_8 are hydrogen or halogen,

R_9 is hydrogen or C_1–C_4alkyl,

R_{13}, R_{14}, R_{15} and R_{16} independently of one another are hydrogen or methyl,

R_{17} is hydrogen C_1–C_4alkyl, benzyl, 2-hydroxyethyl or acetyl,

R_{19} is hydrogen, C_1–C_4alkyl, benzyl, 2-hydroxyethyl, 2-methoxyethyl, phenyl or p-tolyl, and in the case where R_1 is benzyl and R_2 is methyl or benzyl, R_5 is not $—SCH_3$.

5,554,664

ENERGY-ACTIVATABLE SALTS WITH FLUOROCARBON ANIONS

William M. Lamanna, Stillwater; Michael C. Palazzotto, Woodbury; Wayne S. Mahoney, St. Paul, and Michael A. Kropp, Cottage Grove, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 398,606, Mar. 6, 1995, abandoned. This application Nov. 17, 1995, Ser. No. 558,245

Int. Cl.[6] C08F *2/46*

U.S. Cl. 522—25 **27 Claims**

1. An energy activatable salt wherein the energy activatable salt has

(1) a cation comprising at least one of (a) an organometallic cation, wherein the organometallic cation comprises (i) substituted or unsubstituted aromatic compounds based on arene or cyclopentadienyl ligands and, (ii) a transition metal atom, (b) an I-, P-, C- and S-centered organic onium cation, or (c) a mixture thereof, and

(2) a sufficient number of an anion to neutralize the charge of the cation, wherein the anion comprises a tris-(highly fluorinated alkylsulfonyl)methide, tris-(fluorinated arylsulfonyl)methide, bis-(highly fluorinated alkylsulfonyl)imide, bis-(fluorinated arylsulfonyl)imide, mixed aryl- and alkylsulfonyl imides and methides and any combinations thereof and

with the proviso that the salt is not a diazonium salt, an ammonium salt, or a simple metal salt.

5,554,665

METHOD AND DISPENSER FOR MAKING DENTAL PRODUCTS

Louis H. Tateosian, York; Scott E. Shaffer, Jacobus, and Mark A. Latta, York, all of Pa., assignors to Dentsply Research & Development Corp., Milford, Del.

Continuation of Ser. No. 81,940, Jun. 23, 1993, abandoned. This application Apr. 28, 1995, Ser. No. 430,705

Int. Cl.[6] C08F *2/46*

U.S. Cl. 522—30 **21 Claims**

1. A method of forming a denture reline to improve the fit of a denture to the soft tissue contours of the mouth of a patient, comprising:

providing a first polymerizable paste composition comprising a free radical generating peroxide oxidizing agent of a catalyst system, a stabilizer effective to prevent polymerization for at least 180 days at 23° C. prior to mixing and at least one polymerizable acrylic compound, and

a second polymerizable paste composition comprising a reducing agent for said peroxide and at least one polymerizable acrylic compound,

mixing said polymerizable paste compositions in a static mixer to form a polymerizing paste composition,

applying said polymerizing paste composition to a denture, and shaping the polymerizing paste composition to areas of soft tissue of the mouth of the patient said polymerizing paste composition substantially self curing in the patient's mouth within less than about 5 minutes.

5,554,666

PHOTOCURABLE COMPOSITIONS

Mark Livesay, El Cajon, Calif., assignor to Sunrez Corporation, El Cajon, Calif.

Filed Feb. 24, 1995, Ser. No. 394,237

Int. Cl.[6] C08F *2/46*

U.S. Cl. 522—81 **9 Claims**

1. In a photocurable putty or molding composition containing a photocurable resin, a photoinitiator, an ethylenically unsaturated monomer and a thickening agent, and glass filler the improvement which comprises said thickening agent comprising about 12 to 70% by weight of aluminum trihydrate.

5,554,667

METHOD OF FORMING A PRIMARY, WET-TO-WET RESIN BOND BETWEEN AT LEAST TWO LAMINATES, AND A PRODUCT BY THE PROCESS THEREOF

W. Novis Smith, Philadelphia, Pa., and Mark Livesay, El Cajon, Calif., assignors to Sunrez Corporation, El Cajon, Calif.

Filed Jun. 1, 1995, Ser. No. 457,843

Int. Cl.[6] C08F *2/46*

U.S. Cl. 522—81 **13 Claims**

1. A method of forming a structure which includes at least two curable laminates or panels each having a photocurable minor area to be joined together and a cured or uncured major area, comprising the steps of:

A. forming a primary, wet-to-wet photocurable resin bond between said minor areas;

B. photo-shielding said minor area of each of said at least two laminates which are to be joined;

C. curing each said major area of said at least two laminates, and then;

D. photocuring the minor areas of overlap of uncured resin.

5,554,668

HIGH MELT STRENGTH, PROPYLENE POLYMER, PROCESS FOR MAKING IT, AND USE THEREOF

B. Joseph Scheve; John W. Mayfield, and Anthony J. DeNicola, Jr., all of New Castle County, Del., assignors to Montell North America Inc., Wilmington, Del.

Continuation of Ser. No. 166,285, Dec. 13, 1993, abandoned, which is a continuation of Ser. No. 471,692, Jan. 29, 1990, abandoned, which is a division of Ser. No. 152,619, Feb. 5, 1988, Pat. No. 4,916,198, which is a continuation-in-part of Ser. No. 819,395, Jan. 16, 1986, abandoned, which is a continuation-in-part of Ser. No. 696,799, Jan. 31, 1985, abandoned. This application Aug. 31, 1994, Ser. No. 299,311

Int. Cl.[6] C08J *3/28*; **C08F** *110/06*

U.S. Cl. 522—157 **13 Claims**

1. A process for making normally solid, high molecular weight, gel-free, propylene polymer material characterized by a branching index of less than 1 and which exhibits strain hardening elongational viscosity from normally solid, high molecular weight, amorphous to predominantly crystalline propylene polymer material without strain hardening elongational viscosity, which comprises:

(1) irradiating said amorphous to predominantly crystalline propylene polymer material

(a) while said material is in contact with an environment in which the active oxygen concentration is established and maintained at less than about 15% by volume of said environment

(b) with high energy ionizing radiation at a dose rate in the range from about 1 to about 1×10^4 megarads per minute for a period of time sufficient for a substantial amount of chain scission of the amorphous content of said material to occur, but insufficient to cause gelation of the material

(2) maintaining the thus irradiated material in such an environment for a period of time from about one minute to about one hour, sufficient for a significant amount of long chain branches to form such that the material becomes characterized by a branching index of less than 1; and

(3) then treating the irradiated material while in such environment to deactivate substantially all of the free radicals present in the irradiated material;

wherein said molecular weight is weight average molecular weight of at least about 100,000; and

wherein said propylene polymer material is selected from the group consisting of (a) homopolymers of propylene, (b) random copolymers of propylene and an olefin selected from the group consisting of ethylene, C_4–C_{10} 1-olefins, and C_4–C_{10} dienes, provided that, when said olefin is ethylene, the maximum polymerized ethylene content is about 5% by weight, when said olefin is a C_4–C_{10} 1-olefin, the maximum polymerized content thereof is about 20% by weight, and when said olefin is a C_4–C_{10} diene, the maximum polymerized content thereof is about 5% by weight, and (c) random terpolymers of propylene and 1-olefins selected from the group consisting of ethylene and C_4–C_8 1-olefins, provided that the maximum polymerized C_4–C_8 1-olefin content is about 20% by weight, and when ethylene is one of said 1-olefins, the maximum polymerized ethylene content is about 5% by weight.

5,554,669

EMULSION OF POLYMER HAVING (METH)ACRYLATE UNIT AND ADHESIVE COMPOSITIONS CONTAINING THE EMULSION

Nobuo Nakabayashi, 5-6-20 Koganehara, Matsudo-shi, Chiba-ken; Kazuhiko Ishihara, Kodaira, and Yasukazu Saitai, Moriyama, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, and Nobuo Nakabayashi, Matsudo, both of Japan

Continuation-in-part of Ser. No. 066,211, May 25, 1993, abandoned. This application Oct. 21, 1994, Ser. No. 327,414

Claims priority, application Japan, May 27, 1992, 4-158945

Int. Cl.[6] C08L *33/08*;*33/10*

U.S. Cl. 523—118 **17 Claims**

1. An emulsion of a water insoluble polymer, in which the polymer consists essentially of

(a) a recurring unit derived from a (meth)acrylate,

(b) a recurring unit derived from a vinyl compound having a group of $—SO_3R$ in which R is a hydrogen atom, an alkali metal atom or ammonium ion and

(c) a recurring unit derived from a vinyl compound containing a group of $—COOR_4$ in which R_4 is a hydrogen atom, an alkali metal atom or ammonium ion, or a group of $—OPO(OR_5)_2$ in which R_5 is a hydrogen atom, an alkali metal atom or ammonium ion, and

is derived from a mixture of the (a) (meth)acrylate, (b) the vinyl compound having the group of $—SO_3R$ and (c) the vinyl compound containing the group of $—COOR_4$ or the group of $—OPO(OR_5)_2$ in the molar ratio of (meth)acrylate:total of the two vinyl compounds of 99:1 to 50:50 and in the molar ratio of the vinyl compound having the group of $—SO_3R$ to the vinyl compound containing the group of $—COOR_4$ or the group of $—OPO(OR_5)_2$ of 99:1 to 1:99 by a soap-free emulsion polymerization, and wherein at least 50 mol % of the vinyl compound having the group of $—SO_3R$ is a vinyl compound having the group $—SO_3H$.

5,554,670

METHOD OF PREPARING LAYERED SILICATE-EPOXY NANOCOMPOSITES

Emmanuel P. Giannelis, Ithaca, N.Y., and Phillip B. Messersmith, Clarendon Hills, Ill., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Sep. 12, 1994, Ser. No. 304,574

Int. Cl.[6] C08K *3/34;9/12*; **C08C** *63/02*

U.S. Cl. 523—209 **10 Claims**

1. A method for preparing an epoxy-smectite clay nanocomposite, comprising dispersing a smectite clay in a dry state into a liquid diglycidyl ether of bispbenol A (DGEBA) said smectite-type clay having been modified to an organoclay by ion exchange with an alkyl ammonium salt; the positive ion of the salt being of the form $^+NH_3R_1$, $^+NH_2R_2R_3$, $^+NHR_4R_5R_6$, or $^+NR_7R_8R_9R_{10}$, wherein R_1 through R_{10} are organic radicals; and wherein R_1, at least one of R_2 and R_3, at least one of R_4, R_5, and R_6, and at least one of R_7, R_8, R_9 and R_{10}, contain a functional group capable of reacting and bonding with the epoxy upon crosslinking of same; wherein said dispersing step is sufficient to transform the initial mixture from opaque to semi-transparent; and curing in the presence of a curing agent which both produces delamination of the organoclay and either cross-links the DGEBA in the presence of said organoclay, reacts directly with the organoclay, or catalyzes the crosslinking reaction between the organoclay and DGEBA, wherein said curing agent is selected from one or more members of the group consisting of nadic methyl anhydride (NDA), benzyldimethylamine (BDMA) and boron trifluoride monoethylamine (BTFA).

5,554,671

LOW VOC, AQUEOUS DISPERSED ACRYLIC EPOXY MICROGELS

Gary P. Craun, Berea, Ohio, and Victor V. Kaminski, Cary, N.C., assignors to The Glidden Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 249,251, May 25, 1994, abandoned. This application Mar. 21, 1995, Ser. No. 407,664

Int. Cl.[6] C08K *3/20*; **C08L** *63/02*

U.S. Cl. 523—408 **22 Claims**

1. An aqueous dispersed, protective surface coating composition containing minimal amounts of volatile organic compounds at a VOC below about one pound organic solvent per gallon resin solids and containing an aqueous dispersed microgel polymeric binder, the microgel polymeric binder comprising on a weight basis:

between 60% and 99% of a preformed carboxyl addition copolymer dispersing agent of copolymerized ethylenically unsaturated monomers comprising at least 5% of a carboxyl functional monomer by weight of said copolymerized monomers, said ethylenically unsaturated monomers copolymerized in minimal amounts of organic solvent to produce a preformed copolymer having a number average molecular weight between 1,000 and 50,000 and an Acid No. above 30, where the preformed copolymer is dispersed into water;

Between 1% and 40% of an epoxy crosslinking resin having an epoxide equivalent weight between about 100 and 500 and a number average molecular weight between 200 and 1,000, the epoxy being dispersed into the water dispersed preformed copolymer dispersing agent; and

wbere the microgel polymer is produced by the process of (a) preforming the carboxyl functional copolymer dispersing agent in organic solvent and dispersing the preformed copolymer in water to produce an aqueous dispersion of copolymer, (b) dispersing the epoxy resin into the aqueous dispersion of copolymer, and (c) crosslinking the carboxyl functional addition copolymer with the epoxy resin to produce an aqueous disperse polymer of epoxy crosslinked microgel particles of epoxy crosslinked with the addition copolymer, the crosslinked microgel particles having a particle size below 1 micron and an Acid No. above 30, where the crosslinked microgel particles are stably dispersed in water free of surfactant.

5,554,672

EPOXY RESIN PRIMER FOR LINING OF WET CONCRETE SURFACES

Makoto Saito; Yoshimasa Chiba, and Hiroyuki Misaki, all of Saitama-ken, Japan, assignors to Tonen Corporation, Tokyo, Japan

Filed Mar. 17, 1994, Ser. No. 214,917
Claims priority, application Japan, Mar. 18, 1993, 5-082446
Int. Cl.[6] C08L *63/00;63/02;* **C08G** *59/64*
U.S. Cl. 523—466 **1 Claim**

1. A primer for a lining of a wet concrete surface comprising
at least one liquid epoxy resin selected from the group consisting of a diglycidyl ether of bisphenol A, a diglycidyl ether of bisphenol F and tetraglycidyldiaminodiphenylmethane,
a hydrophobic ethylene oxide-modified diaminodiphenylmethane,
a thixotropic agent and
a silane coupling agent,
wherein
the amount of hydrophobic ethylene oxide-modified diaminodiphenylmethane is an amount effective for curing the liquid epoxy resin,
the amount of the thixotropic agent is 0.1–50 weight parts per total 100 weight parts of the liquid epoxy resin and the hydrophobic ethylene oxide-modified diaminodiphenylmethane,
the amount of the silane coupling agent is 0.1–20 weight parts per total 100 weight parts of the liquid epoxy resin and the hydrophobic ethylene oxide-modified diaminodiphenylmethane, and
the hydrophobicity of the ethylene oxide-modified diaminodiphenylmethane is defined by a test in which
(1) 100 g of the ethylene oxide-modified diaminodiphenylmethane and 100 g of water are poured into a glass cup.
(2) the content of said cup consisting of the ethylene oxide-modified diaminodiphenylmethane and the water are stirred at room temperature to the extent that a mixture is formed, and
(3) the mixture is allowed to stand for one day at room temperature
whereby the ethylene oxide-modified diaminodiphenylmethane is considered hydrophobic if the standing mixture is clearly separated into an ethylene oxide-modified diaminodiphenylmethane layer and a water layer, as observed by the eye.

5,554,673

DIP MOLDED POLYURETHANE FILM COMPOSITIONS

Tilak M. Shah, Cary, N.C., assignor to Polygenex International, Inc., Cary, N.C.

Filed Nov. 29, 1993, Ser. No. 158,604
Int. Cl.[6] C08K *5/3415;5/54;5/05;5/02*
U.S. Cl. 524—104 **10 Claims**

1. A dip molding polyurethane elastomer composition comprising:
A. a thermoplastic polyurethane elastomer;
B. a first solvent component which is at least one strong solvent for said polyurethane elastomer;
C. a second solvent component which is at least one non-solvent or non-polar or low polarity weak solvent for said polyurethane elastomer, wherein said second solvent component is freely miscible with said first solvent component;
D. a third solvent component which is at least one blush resistor which limits the rate of evaporation of said first solvent component and said second solvent component and which limits the absorption of water vapor into said composition;
wherein said polyurethane is homogeneously dissolved in said solvent to form a solution having a viscosity in the range of from about 400 to about 800 cP.

5,554,674

FLAME RETARDANT MOLDING THERMOPLASTICS

Douglas G. Hamilton, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Apr. 7, 1995, Ser. No. 418,987
Int. Cl.[6] C08K *5/04;3/32*
U.S. Cl. 524—288 **22 Claims**

1. A thermoplastic composition containing a halogenated flame retardant absent an antimony containing synergist which comprises:
(a) from 20–90 weight percent of a single thermoplastic resin or a heteropolymer thermoplastic resin blend;
(b) from 5–65 weight percent of a halogenated flame retardant; and
(c) a flame retardant enhancing additive absent an antimony containing synergist consisting essentially from about 5–70 weight percent of a metal acid pyrophosphate of the formula:

$$M^{\prime}_{x}H_yP_nO_{3n+1}$$

wherein M is a metal selected from the group consisting of alkali metals and alkaline earth metals, x is a number from 1 to 12, y is a number from 1 to 12, n is a number from 2 to 10, z is a number from 1 to 5, and the sum of xz+y is equal to n+2, all percentages being based on the weight of the total composition wherein said metal acid pyrophosphate is present in an amount sufficient to enhance the flame retardancy to a VO flame rating under Underwriters Laboratories Test No. 94.

5,554,675

INK COMPOSITIONS AND PREPARATION

Gary T. Clark, Rt. 13, 513 Montezuma Rd., Kingsport, Tenn. 37664; John N. Rasar, 705 Midfield Dr., Kingsport, Tenn. 37665, and Rebecca R. Stockl, 1138 Catawba St., Kingsport, Tenn. 37660

Continuation of Ser. No. 964,812, Oct. 22, 1992, abandoned, which is a division of Ser. No. 465,695, Jan. 16, 1990, abandoned, which is a division of Ser. No. 187,712, Apr. 29, 1988, Pat. No. 4,912,157, which is a continuation of Ser. No. 50,665, May 18, 1987, abandoned. This application May 9, 1994, Ser. No. 240,288
Int. Cl.[6] C08K *5/06*
U.S. Cl. 524—376 **9 Claims**

1. A ink composition comprising a substantially homogeneous system of the components:
(1) from about 4 to about 80% weight % of polymeric material of at least one linear, water-dissipatable polymer having carbonyloxy linking groups in the linear molecular structure wherein up to 80% of the linking groups may be carbonylamido linking groups, the polymer having an inherent viscosity of from about 0.1 to about 1.0 measured in a 60/40 parts by weight solution of phenol/tetrachloroethane at 25° C. and at a concentration of 0.25 gram of polymer in 100 ml of the solvent, the polymer containing substantially equimolar proportions of acid equivalents (100 mole percent) to hydroxy and amino equivalents (100 mole percent), the polymer comprising the reaction products of (a), (b), (c) and (d) from the following reactants or ester forming or esteramide forming derivatives thereof;
(a) at least one difunctional dicarboxylic acid;
(b) from about 4 to about 25 mole percent, based on a total of all acid, hydroxyl and amino equivalents being equal to 200 mole percent, of at least one difunctional sulfomonomer containing at least one cationic sulfonate group attached to an aromatic or cycloaliphatic nucleus wherein the functional groups are hydroxy, carboxyl or amino;
(c) at least one difunctional reactant selected from a glycol or a mixture of a glycol and diamine having two —NRH groups, the glycol containing two —CH_2—OH groups of which
(1) at least 15 mole percent based on the total mole percent of hydroxy or hydroxy and amino equivalents, is a poly(ethylene glycol) having the structural formula

$$H\text{-}(OCH_2\text{—}CH_2)_n\text{-}OH,$$

n being an integer of from 2 to about 20, or
(2) of which from about 0.1 to less than about 15 mole percent based on the total mole percent of hydroxy or hydroxy and amino equivalents, is a poly(ethylene glycol) having the structural formula

$$H\text{-}(OCH_2\text{—}CH_2)_n\text{-}OH,$$

n being an integer of between 2 and about 500, and with the proviso that the mole percent of said poly(ethylene glycol) within said range is inversely proportional to the quantity of n within said range; and
(d) from none to at least one difunctional reactant selected from a hydroxycarboxylic acid having one —$C(R)_2$—OH group, an aminocarboxylic acid having one —NRH group, and an amino-alcohol having one —$C(R)_2$—OH group and one —NRH group, or mixtures of said difunctional reactants;
wherein each R in the (c) or (d) reactants is a H atom or an alkyl group of 1 to 4 carbon atoms;
(2) from about 1.0 to about 60.0 weight % of pigment material;
(3) from about 0.01 to about 30 weight % total of one or a mixture of compounds of the formula R—C≡C—R^1 wherein R and R^1 are each selected from straight and branched alkyl of 1–15 carbons wherein at least one of R and R^1 carries from 1–3 hydroxyl groups wherein the H of each said hydroxyl group is independently unsubstituted or substituted with a substituent of the formula

$$\text{-}(CH_2\text{—}CH_2\text{—}O)_m\text{-}H \text{ or } \text{-}(CH_2\text{—}CH(CH_3)\text{—}O)_m\text{-}H$$

wherein n and m are each from 1 to about 50 and the total of these substituents present is such that the total of n and m is less than about 60; and
(4) from substantially none to about 90 weight % of water.

5,554,676

Patent Not Issued For This Number

5,554,677

BLOW-MOLDED ARTICLE MADE FROM THERMOPLASTIC RESIN COMPOSITION

Kenji Nagaoka; Hiroshi Hagimori, and Kaoru Kitadono, all of Ichihara, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 200,105, Feb. 22, 1994, abandoned, which is a continuation-in-part of Ser. No. 72,959, Jun. 8, 1993, abandoned. This application Mar. 7, 1995, Ser. No. 400,391
Claims priority, application Japan, Jun. 9, 1992, 4-149215
Int. Cl.[6] C08J *5/10;* **C08K** *3/40;* **C08L** *71/12*
U.S. Cl. 524—494 **5 Claims**

1. A blow-molded article made from a thermoplastic resin composition which comprises a mixture consisting of (A) 10–65 parts by weight of a polyphenylene ether and (B) 90–35 parts by weight of a polyamide, (C) 10–100 parts by weight of a glass fiber, (D) 3–20 parts by weight of a polyolefin and (E) 0.01–10 parts by weight of an unsaturated polar monomer compound having in its molecule simultaneously (a) carbon-carbon double bond or carbon-carbon triple bond and (b) carboxyl group, acid anhydride group, amino group, acid amide group, imide group, epoxy group, carboxylic acid ester group, isocyanate group, methylol group or hydroxyl group as a compatibilizing agent, said amounts of (C), (D) and (E) are respectively on the basis of 100 parts by weight of a mixture of (A) and (B), wherein said thermoplastic resin composition has a critical parison length of 450 to 550 mm when it is blow-molded using a 50 mm ϕ blow-molding machine at an extrusion rate of 170 g/minute and at a temperature of 270° C.

5,554,678

ELECTROMAGNETIC SHIELDING COMPOSITE

Makoto Katsumata; Hidenori Yamanashi, and Hitoshi Ushijima, all of Gotenba, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Apr. 27, 1995, Ser. No. 429,473
Claims priority, application Japan, May 19, 1994, 6-105248
Int. Cl.[6] C08K *3/00*
U.S. Cl. 524—495 **13 Claims**

1. An electromagnetic shielding composite comprising:
a thermoplastic synthetic resin mixed with a first metal conductive fiber, a second metal, having a melting point between a temperature at which said resin can be molded and a temperature at which said composite is used for electromagnetic shielding, and a vapor-phase grown carbon fiber.

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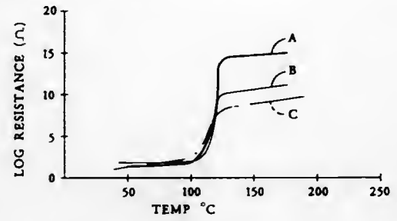
PTC CONDUCTIVE POLYMER COMPOSITIONS CONTAINING HIGH MOLECULAR WEIGHT POLYMER MATERIALS

Tai C. Cheng, 3375 Kenzo Ct., Mountain View, Calif. 94040

Continuation-in-part of Ser. No. 242,614, May 13, 1994, abandoned. This application May 23, 1995, Ser. No. 447,749
Int. Cl.[6] C08K *3/00*
U.S. Cl. 524—495 **32 Claims**



1. A PTC conductive polymer composition comprising:
a melt-extrudable polyolefin matrix,
a melt-resistant, volume-expansion-regulating polymer characterized by a linear thermal expansion coefficient of at least 200×10^{-6}/° C., the volume-expansion-regulating polymer exhibiting volume expansion with minimal migration upon heating of the composition, the volume-expansion-regulating polymer being dispersed within the polyolefin matrix but being present in an amount of at most 50% by weight of the total polymeric portion such that interference with the extrudability of the polyolefin matrix does not occur, and
a particulate conductive filler, containing only PTC conductive particles, dispersed within the polyolefin matrix along with but distinct from the volume-expansion-regulating polymer.

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HEAT-RESISTANT PERFLUOROELASTOMER COMPOSITION

Leo Ojakaar, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 197,516, Feb. 16, 1994, abandoned. This application Nov. 28, 1994, Ser. No. 348,231
Int. Cl.[6] C08K *3/04*
U.S. Cl. 524—496 **12 Claims**

1. A composition comprising
a) a perfluoroelastomer having copolymerized units of
i) a perfluoroolefin,
ii) a perfluoro(alkyl vinyl)ether of the formula

$$CF_2\text{=}CFO(R_f^{\prime}O)_n(R_f^{\prime\prime}O)_mR_f$$

where $R_f^{\prime}$ and $R_f^{\prime\prime}$ are different linear or branched perfluoroalkylene

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(G) forcing said paste through said template onto said surface;

R^4 is a divalent radical comprising about 2 to about 20 carbon

where R_f' and R_f'' are different linear or branched perfluoroalkylene groups of 2–6 carbon atoms, m and n are independently 0–10, and R_f is a perfluoroalkyl group of 1–6 carbon atoms, and

iii) a cure site monomer which is either free of hydrogen atoms or which has hydrogen atoms that are removed during crosslinking of the perfluoroelastomer; and

b) 35–70 parts per hundred parts perfluoroelastomer of a carbon black having an average particle size of at least about 100 nm as

determined by ASTM D-3849; with the proviso that the cure site monomer of the perfluoroelastomer of component a) is present in an amount no greater than 3 mol % of the perfluoroelastomer.

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HEAT RESISTANT MULTI-COLOR TEXTURED POWDER COATINGS

Rajendra Patel, Schaumburg, Ill., assignor to Coatings America Inc., Chicago, Ill.

Filed Aug. 4, 1995, Ser. No. 511,516

Int. Cl.[6] C08L *83/00;* **C08K** *3/34*

U.S. Cl. 524—506 **10 Claims**

1. A multi-colored textured powder coating characterized by high heat resistance of at least 150° F. for the application to the exterior surface of a metal substrate, the multi-colored textured powder coating comprising a solid silicone resin and a mixture of polyacrylate and silica, wherein the solid silicone resin first undergoes extrusion and grinding that results in a powder of solid silicone resin, and the mixture of polyacrylate and silica is then added to the powder of solid silicone resin.

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DISPERSANT POLYMERS

Rodney M. Harris, Chicago; Maqsood S. Ahmed, Homewood, and Thomas A. Renner, Lansing, all of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Division of Ser. No. 329,743, Oct. 26, 1994, Pat. No. 5,430,089, which is a division of Ser. No. 198,249, Feb. 18, 1994, Pat. No. 5,360,856, which is a division of Ser. No. 28,039, Mar. 8, 1993, Pat. No. 5,288,828. This application May 31, 1995, Ser. No. 455,447

Int. Cl.[6] C08L *33/00;* **C08K** *5/10*

U.S. Cl. 524—523 **1 Claim**

1. A method for adjusting the color of a coating comprising an active hydrogen containing film-forming polymer and a crosslinker, which method comprises admixing a pigment dispersion with the film-forming polymer and crosslinker, wherein the pigment dispersion comprises:

(i) 1 to about 80% by weight pigment;

(ii) 10 to about 60% of a hydroxy-functional polymeric dispersant which is substantially free of acid groups, amine groups and ethylenic unsaturation; and

(iii) the remainder being a liquid carrier;

wherein the dispersant is the free radical addition polymerization reaction product of a mixture of monomers consisting essentially of:

(a) 15–30% by weight styrene; and

(b) 15–30% by weight of at least one alkyl methacrylate monomer having 1 to 16 carbon atoms in the alkyl group; and

(c) 20–60% by weight of at least one alkyl acrylate monomer having 1 to 16 carbon atoms in the alkyl group; and

(d) 7–25% by weight of at least one hydroxy-functional ethylenically unsaturated monomer copolymerizable with monomers (a) (b) and (c);

wherein said polymeric dispersant has a weight average molecular weight of 18,000 to 24,000, a number average molecular weight of 4,500 to 7,400, and a polydispersity of 2.9 to 4.2.

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VINYL CHLORIDE RESIN ELASTOMER COMPOSITION

Masabumi Oshima, Nagoya, Japan, assignor to Mitsubishi Chemical MKV Company, Tokyo, Japan

Filed Mar. 31, 1995, Ser. No. 414,203

Claims priority, application Japan, Apr. 1, 1994, 6-064843; Oct. 24, 1994, 6-258265

Int. Cl.[6] C08L *27/06;67/02;* **C08K** *5/11;5/12*

U.S. Cl. 524—569 **12 Claims**

1. A vinyl chloride resin elastomer composition consisting essentially of, as main components, 100 parts by weight of a vinyl chloride resin, from 10 to 200 parts by weight of an acrylic rubber, from 1 to 50 parts by weight of an acrylic resin and from 30 to 300 parts by weight of a plasticizer, wherein said acrylic rubber is a copolymer of (1) an acrylic acid ester alone or combined with another functional monomer, which is at least partially cross-linked with (2) a difunctional cross-linking monomer to form a tetrahydrofuran-insoluble rubber component, and wherein said acrylic resin is a polymer or copolymer of at least one of acrylic acid, an acrylic acid ester, acrylamide, acrylonitrile, methacrylic acid and a methacrylic acid ester.

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FORMING POLYIMIDE COATING BY SCREEN PRINTING

Jin O. Choi, Getzville; John A. Tyrell, Williamsville, and Paul D. Dubell, Cheektowaga, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 134,707, Oct. 12, 1993. This application Dec. 16, 1994, Ser. No. 357,894

Int. Cl.[6] C08L *83/08;83/04;* **D04H** *1/16*

U.S. Cl. 524—588 **18 Claims**

1. A meted of forming a polyimide coating on the surface of substrate comprising

(A) forming a first solution which comprises

(1) organic solvent; and

(2) monomers of

(a) diamine; and

(b) dianhydride, tetracarboxylic acid, or ester of tetracarboxylic acid;

(B) polymerizing said monomers to form a polyamic acid soluble in said organic solvent;

(C) imidizing 10 to 90% of the amic acid groups in said polyamic acid to form a partially imidized polyamic acid;

(D) forming a more concentrated solution of said partially imidized polyamic acid, wherein said more concentrated solution is formed by either 1) heating said first solution of partially imidized polyamic acid under vacuum at about 80 to about 130° C. to evaporate said organic solvent or by 2) precipitating said partially imidized polyamic acid from said first solution and forming a second solution having a solids content of 20 to 60 wt % by dissolving said partially imidized polyamic acid in an organic solvent;

(E) forming a paste which comprises said more concentrated solution of said partially imidized polyamic acid mixed with about 0.1 to about 10 wt % a based on the weight of said paste, of a thixotrope;

(F) placing a template over said surface;

(G) forcing said paste through said template onto said surface;

(H) evaporating the solvent from said paste on said surface; and

(I) fully imidizing said partially imidized polyamic acid on said surface to form said polyimide coating.

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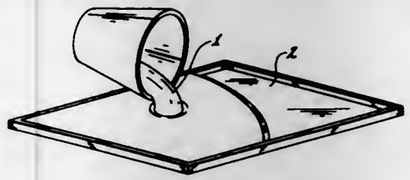
METHOD OF MAKING A SIGN HAVING RAISED CHARACTERS

Wayne L. Dorpfeld, Oakfield; Robert W. Williams, Akron, and Arnold R. Wolfe, Medina, all of N.Y., assignors to American Tactile Corporation, Medina, N.Y.

Division of Ser. No. 993,870, Dec. 23, 1992, Pat. No. 5,504,144. This application Oct. 11, 1995, Ser. No. 540,838

Int. Cl.[6] C08L *83/07;* **B44C** *1/165*

U.S. Cl. 524—588 **5 Claims**



1. A method of making a sign having raised characters, comprising:

machining said characters from a partially cured polymerizable composition;

removing unwanted material from said composition, leaving said characters intact;

curing said machined characters; and,

transferring said machined characters to said sign.

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ROOM TEMPERATURE CURABLE SILANE-TERMINATED POLYURETHANE DISPERSIONS

Kurt C. Frisch, Jr., Fridley; Bruce H. Edwards, White Bear Lake, both of Minn.; Ashok Sengupta, London, Canada; Lowell W. Holland, St.Paul Park; Richard G. Hansen, St. Paul, both of Minn., and Ian R. Owen, River Falls, Wis., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation of Ser. No. 109,640, Aug. 20, 1993, abandoned. This application Nov. 13, 1995, Ser. No. 557,385

Int. Cl.[6] C08L *83/08;75/12*

U.S. Cl. 524—588 **17 Claims**

1. An anionically stabilized polymer composition comprising polymer of formula (I)

$$[SIL—X]—ISO—Y—[POL—X—ISO—Y]_n—[CE—X—ISO—Y]_m—[WSC—X—ISO—Y]_q—[SIL] \quad (I)$$

wherein [POL—X—ISO—Y], [CE—X—ISO—Y], and [WSC—X—ISO—Y] can be randomly distributed or form blocks;

wherein

SIL represents

$$(R^3O)_p—Si(R^5)_{(3-p)}—R^4—;$$

R^3 is selected from the group consisting of hydrogen; alkyl radicals comprising about 1 to about 4 carbon atoms; acyl groups comprising about 2 to about 5 carbon atoms; and oxime groups of the formula —N=CR^5R^6, wherein R^5 is a monovalent alkyl group comprising about 1 to about 12 carbon atoms and wherein R^6 is a monovalent alkyl group comprising about 1 to about 12 carbon atoms;

R^4 is a divalent radical comprising about 2 to about 20 carbon atoms, wherein said radical contains no isocyanate reactive functional groups;

p represents an integer of 1 to 3;

X is a divalent radical selected from the group consisting of

$$—NH—C(=O)—NH—, \quad —N(R)—C(=O)—NH—,$$

$$—S—C(=O)—NH—, \text{ and } —O—C(=O)—NH—;$$

wherein R is independently selected from the group consisting of phenyl, linear aliphatic groups comprising about 1 to about 12 carbon atoms, branched aliphatic groups comprising about 1 to about 12 carbon atoms, and cycloaliphatic groups;

ISO represents a moiety derived from a polyisocyanate component comprising a compound having 2 isocyanate groups and optionally further comprising a compound having greater than 2 isocyanate groups;

Y is a divalent radical selected from the group consisting of

$$—NH—C(=O)—NH—, \quad —N(R)—C(=O)—NH—,$$

$$—NH—C(=O)—S—, \text{ and } —NH—C(=O)—O;—$$

wherein R is as defined above;

POL represents a moiety derived from a polyol component comprising a compound having 2 isocyanate reactive functional groups and optionally a compound having greater than 2 isocyanate reactive functional groups, each isocyanate reactive functional group having at least one active hydrogen;

n represents an integer of about 2 to about 85;

CE represents a moiety derived from a chain extender component comprising a difunctional chain extender having 2 isocyanate reactive functional groups and optionally a polyfunctional chain extender having at least 3 isocyanate reactive functional groups each isocyanate reactive functional group having at least one active hydrogen, wherein the chain extender component specifically excludes difunctional sterically hindered amines having the general formula

$$HO—R^7—N(R^9)—R^8—OH$$

wherein: R^7, R^8 R^9 are independently selected from the group consisting of cyclic and aliphatic organic radicals free of isocyanate reactive functional groups, and with the proviso that at least 75% of the R^9 groups have at least 4 carbon atoms;

m represents an integer of about 1 to about 84;

WSC represents a moiety derived from a water-solubilizing compound, wherein the water solubilizing compound possesses at least one water solubilizing group and at least two isocyanate reactive functional groups, each isocyanate reactive functional group containing at least one active hydrogen wherein the water solubilizing group is reacted with a basic salt forming compound to anionically stabilize the polymer;

q represents an integer of about 2 to about 85;

wherein the urethane branching coefficient of the polymer is about 1.7 to about 2.25; and wherein sufficient polyisocyanate component is included to provide an excess on an isocyanate equivalent basis of about 1.4 to about 4 times the combined active hydrogen equivalent of the isocyanate reactive functional groups of the polyol component, the water solubilizing compound, and the chain extender component.

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RESINS AND COMPOSITIONS FOR THE MANUFACTURE OF HEAT-RESISTANT HIGH MODULUS MATERIALS, AND MOLDED ARTICLES OBTAINED FROM SUCH MATERIALS

Yeong-Show Yang, Lamorlaye, France, assignor to Cray Valley S.A., Puteaux, France

PCT No. PCT/FR93/00630, § 371 Date Dec. 27, 1994, § 102(e) Date Dec. 27, 1994, PCT Pub. No. WO94/00503, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 24, 1993, Ser. No. 362,416

Claims priority, application France, Jun. 26, 1992, 92 07879

Int. Cl.[6] C08G *18/62*

U.S. Cl. 525—63 **12 Claims**

1. A composite material obtained from a first mixture based on polyisocyanate, a second mixture comprising at a least one ethylenically unsaturated monomer, at least one polyoxyalkylene polyamine and an ethylenically unsaturated polymer, and a cross-linking catalyst, wherein;

the first mixture comprises at least one polyisocyanate and at least one catalyst for the reaction between the polyisocyanate and the ethylenically unsaturated polymer of the second mixture, and in that

the second mixture comprises, per 100 parts by weight:

from 25 to 50 parts by weight of at least one ethylenically unsaturated monomer,

from 50 to 75 parts by weight of an aminated unsaturated polyester resin which is the product of the reaction between (a) an unsaturated polyol polyester prepolymer and (b) a polyoxyalkylene amine, the weight ratio of (a)/(b) being at least 0.8 and not exceeding about 50, and

up to 4 parts by weight of at least one cross-linking catalyst.

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THERMOPLASTIC RESIN COMPOSITION AND ITS SYNTHETIC RESIN COMPOSITE

Hiroyuki Yashima, and Katsuji Horio, both of Ichihara, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 305,556, Sep. 14, 1994, abandoned. This application Aug. 3, 1995, Ser. No. 610,754

Claims priority, application Japan, Sep. 28, 1993, 5-241668; May 16, 1994, 6-124698

Int. Cl.[6] C08L *25/08;25/12;9/02;9/06*

U.S. Cl. 525—71 **16 Claims**

1. A theromplastic resin composition, comprising:

A) 100 parts by weight of a grafted diene rubber-containing styrene resin wherein said styrene resin contains aromatic vinyl monomer units and vinyl cyanide monomer units,

B) from 1.5 to 35 by parts by weight of a vinyl resin-containing acrylic rubber polymer having a glass transition temperature of not higher than 20° C. and a gel content of not higher than 70%, obtained by polymerizing from 1 to 200 parts by weight of at least one vinyl monomer in the presence of 100 parts by weight of an acrylic rubber polymer, and

C) from 1.8 to 37.5 parts by weight of a polymer of a vinyl monomer having a weight average molecular weight of at least 200,000 and a glass transition temperature exceeding 20° C.,

provided that the sum of components (B) and (C) is from 6 to 50 by weight.

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COMBINATIONS OF POLYORGANOSILOXANES AND FLUORORUBBERS CONTAINING DOUBLE BONDS BY SI-H ADDITION

Gerhard Langstein, Kuerten-Biesfeld; Ralf Krüger, Bergisch Gladbach; Heinrich Alberts, Odenthal; Hans-Heinrich Moretto, and John Huggins, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 93,121, Jul. 16, 1993, abandoned. This application Nov. 23, 1994, Ser. No. 344,780

Claims priority, application Germany, Jul. 24, 1992, 42 24 559.1

Int. Cl.[6] C08F *8/00*

U.S. Cl. 525—102 **14 Claims**

1. A chemically linkable mixture which comprises

(a) about 98 to 80% by weight of a fluororubber containing lateral olefinic double bonds and produced by copolymerization of vinylidene fluoride, hexafluoropropene and a member of the group consisting of alkenyl isocyanurates, alkenyl cyanurates and combinations thereof,

(b) about 2 to 20% by weight of at least one member selected from a group consisting of a slicone oligomer, silicone elastomer and a fluorosilicone elastomer, each of which contains Si—H groups, and

(c) a catalyst which contains at least one noble metal or an organic peroxide.

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LOW VISCOSITY ADHESIVE COMPOSITIONS CONTAINING ASYMMETRIC RADIAL

Bridget A. Spence; Jeffrey G. Southwick; Steven S. Chin, and Ronald J. Hoxmeier, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 336,458, Nov. 9, 1994. This application Jun. 12, 1995, Ser. No. 489,529

Int. Cl.[6] C08F *297/04*

U.S. Cl. 525—105 **3 Claims**

1. A low viscosity adhesive composition which comprises:

(a) an asymmetric radial block copolymer of a vinyl aromatic hydrocarbon and at least one conjugated diene having from 3 to 6 polymer arms, which:

(i) contains from 40 to 80% by weight of polyvinyl aromatic hydrocarbon block/polydiene block copolymer arms and the balance polydiene homopolymer arms,

(ii) has vinyl aromatic hydrocarbon blocks with block molecular weights of from 8000 to 30,000,

(iii) has conjugated diene blocks in the copolymer arms with a molecular weight of at least 6000, and

(iv) has a polyvinyl aromatic hydrocarbon content of from 10 to 40% by weight; and

(b) from 20 to 400 parts per hundred parts of polymer of a tackifying resin.

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ADHESIVES, SEALANTS, COATINGS AND POLYMER COMPOSITIONS CONTAINING MONOHYDROXYLATED POLYDIENES IN HYDROXYL FUNCTIONAL RESINS

David J. St. Clair, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 90,857, Jul. 12, 1993, abandoned. This application Aug. 31, 1994, Ser. No. 298,701

Int. Cl.[6] C08L *33/14*

U.S. Cl. 525—111 **10 Claims**

1. A coating, adhesive or sealant composition comprising a compound made by:

reacting a monohydroxylated conjugated diene polymer having a peak molecular weight from 500 to 20,000 with a diisocyanate or multifunctional isocyanate to form a modified curing agent;

reacting the modified curing agent with an epoxy resin or an acrylic resin having hydroxyl groups.

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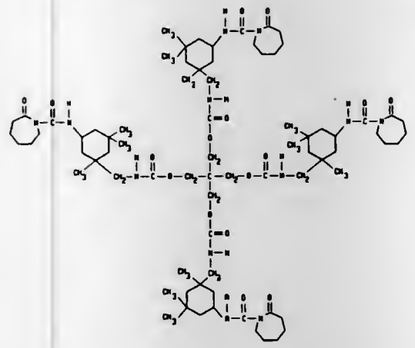
BLOCKED ISOCYANATE CROSSLINKERS BASED ON PENTAERYTHRITOL FOR USE IN THERMOSETTING COATINGS

Alistair J. Ross, Strongsville, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Jan. 6, 1994, Ser. No. 177,890

Int. Cl.[6] C08F *8/30*

U.S. Cl. 525—124 **13 Claims**



1. A thermosetting coating comprising the reaction product of (A) at least one hydroxyl containing polymer and (B) a blocked isocyanate crosslinking agent comprising the reaction product of (1) (a) pentaerythritol or (b) a mixture of pentaerythritol and a diol or a triol, (2) at least one blocking agent and (3) at least one diisocyanate.

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COMPOSITIONS OF POLYPHENYLENE ETHER AND POLYAMIDE RESINS CONTAINING TERPENE PHENOL RESINS

Takashi Ohtomo, Utsunomiya; Koji Myojo, Mishima, and Hiroshi Kubo, Moka, all of Japan, assignors to General Electric Company, Pittsfiled, Mass.

Filed Sep. 11, 1995, Ser. No. 526,346

Claims priority, application Japan, Oct. 11, 1994, 6-270202

Int. Cl.[6] C08L *71/12;77/00*

U.S. Cl. 525—133 **12 Claims**

1. A thermoplastic resin composition comprising:

(A) 10–80 parts by weight of polyphenylene ether resin with respect to a total of 100 parts by weight of (A) and (B);

(B) 90–20 parts by weight of polyamide resin with respect to a total of 100 parts by weight of (A) and (B); and

(C) 0.3–10 parts by weight with respect to a total of 100 parts by weight of (A) and (B) of a terpene phenol resin having a hydroxyl value of 45 or above.

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PERFORMANCE ENHANCING ATHLETIC SHOE COMPONENTS AND METHODS

William R. Crow, 21300 Rim Rd., Perris, Calif. 92570

Continuation-in-part of Ser. No. 45,831, Apr. 8, 1993, abandoned, which is a continuation-in-part of Ser. No. 10,727, Jan. 29, 1993, abandoned, which is a continuation of Ser. No. 744,196, Aug. 12, 1991, abandoned, which is a continuation-in-part of Ser. No. 718,082, Jun. 19, 1991, abandoned, which is a continuation-in-part of Ser. No. 632,762, Dec. 21, 1990, abandoned. This application Mar. 23, 1995, Ser. No. 409,023

Int. Cl.[6] C08L *7/00;9/00;* **A43B** *13/38;1/10*

U.S. Cl. 525—236 **13 Claims**

1. A performance-enhancing shoe component for placement beneath the ball of a human foot, comprising:

(a) 1,4-polybutadiene, said 1,4-polybutadiene having a cis content of at least about 90%, and

(b) natural rubber;

wherein the amount of said 1,4-polybutadiene is within the range of about 50 weight percent to about 75 percent weight, and the amount of said rubber is within the range of about 50 weight percent to about 25 weight percent, said weight percentages being based on the total weight of said 1,4-polybutadiene and said rubber;

wherein said 1,4-polybutadiene and said rubber are cross-linked to form a cured mix;

wherein said cure mix is shaped to form a layer for placement within a shoe and beneath the ball of the foot;

wherein said layer provides at least 47% energy return as a result of the properties of said 1,4-polybutadiene and said rubber in said cured mix; and

wherein said cured mix is substantially free of fillers and non-energy-returning rubbers which reduce energy return.

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STYRENIC COPOLYMER AND PROCESS FOR PRODUCING SAME

Shuji Machida, and Toshinori Tazaki, both of Chiba-ken, Japan, assignors to Idemitsu Kosan Co. Ltd., Tokyo, Japan

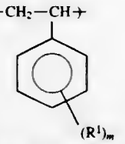
Division of Ser. No. 259,166, Jun. 13, 1994, which is a continuation of Ser. No. 890,581, Jul. 10, 1992, abandoned. This application May 4, 1995, Ser. No. 433,966

Claims priority, application Japan, Nov. 21, 1990, 2-314327; Mar. 27, 1991, 3-89509

Int. Cl.[6] C08F *297/06*

U.S. Cl. 525—268 **2 Claims**

1. A styrenic copolymer which comprises structural units (I) represented by the formula (I)



(I)

wherein R^1 is a hydrogen atom, halogen atom or substituent having at least one member selected from a carbon atom, tin atom and silicon atom; m is an integer from 1 to 5; and when m is a plural, R^1 may be the same or different and structural units (IX) represented by the formula (IX)

(IX)

wherein at least two of R^{21} to R^{24} are each a substituent represented by $—(CH_2)_n—COOR$ wherein R is a hydrogen atom; a metal belonging to the group I, II, III, IVA or VIII in the Periodic Table; an alkyl group having 1 to 20 carbon atoms which may be non-substituted or substituted by a substituent selected from a

halogen atom, an alkylthio group, acylthio group, arylthio group and a halogenoalkoxy group; an alkenyl group having 2 to 5

block copolymers of the structure A-B-C-D derived from a vinyl aromatic monomer and a conjugated diene, having a total

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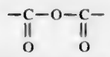
COATED POLYCARBONATE AND METHOD FOR

halogen atom, an alkylthio group, acylthio group, arylthio group and a halogenoalkoxy group; an alkenyl group having 2 to 5 carbon atoms; an alkynyl group having 2 to 5 carbon atoms; an arylalkyl group having 7 to 20 carbon atoms; or an aryl group having 6 to 20 carbon atoms which may be non-substituted or substituted by a substituent selected from a halogen atom, hydroxyl group and an alkyl group having 1 to 20 carbon atoms, and n is an integer from 0 to 10 or two of R^{21} to R^{24} together form a formula (X)



(X)

and the others of R^{21} to R^{24} are each a hydrogen atom; halogen atom; an alkyl group having 1 to 4 carbon atoms which may be non-substituted or substituted by a carboxyl group; an alkylthio group having 2 to 4 carbon atoms; alkoxy group having 1 to 4 carbon atoms; aryl group having 6 to 10 carbon atoms; aryloxy group having 6 to 10 carbon atoms; a nitro group or a trialkylsilyl group having 1 to 4 carbon atoms, said styrenic copolymer being characterized in that said structural unit (IX) is contained in an amount of 0.01 to 99.9 mol %, the intrinsic viscosity of said copolymer as measured in 1,2,4-trichlorobenzene at 135° C. ranges from 0.01 to 20 dl/g and the stereoregularity of the main chain of said structural unit (I) has a high degree of syndiotactic configuration.

5,554,696

PROCESS FOR THE PREPARATION OF INDUSTRIALLY APPLICABLE DIFUNCTIONAL ANIONIC POLYMERIZATION INITIATORS AND THEIR USE

Roger M. A. Fayt, Liege, Belgium; Frederik H. van der Steen, Amsterdam, Netherlands; Phillippe J. Teyssie, Liege, Belgium; Judith J. B. Walhof, Amsterdam, Netherlands, and Yi-Song Yu, Liege, Belgium, assignors to Shell Oil Company, Houston, Tex.

Filed May 9, 1995, Ser. No. 437,738

Claims priority, application European Pat. Off., Sep. 5, 1994, 94201287

Int. Cl.[6] C08F *297/04*; C07F *1/02*

U.S. Cl. 525—314 **15 Claims**

1. A process for the preparation of an efficient industrial organolithium diinitiator, comprising the steps of:

reacting two mole equivalents of a mono-organolithium initiator with one mole equivalent 1,3-diisopropenyl benzene at a temperature in the range of from −20° C. to 60° C. in an apolar hydrocarbon solvent, optionally in the presence of a tertiary amine, to form a diinitiator; and

reacting the diinitiator with a small amount of conjugated diene monomer and at least 15 vol % of an aromatic ether activator relative to the total solvent volume, at a temperature in the range of from 0° to 30° C., to form a solution of an α, ω-dilithio poly(conjugated diene) initiator having a peak molecular weight in the range of from 1000 to 3000.

5,554,697

LINEAR BLOCK COPOLYMERS PROCESS FOR THEIR PREPARATION AND ADHESIVE COMPOSITION CONTAINING THEM

Menno A. Van Dijk; Jacqueline M. Veurink; Birgitte M. L. C. Van De Vliet, and Jeroen Van Westrenen, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 414,842, Mar. 31, 1995, Pat. No. 5,510,423. This application Jan. 5, 1996, Ser. No. 583,241

Claims priority, application European Pat. Off., Apr. 11, 1994, 94200965

Int. Cl.[6] C08F *297/04*

U.S. Cl. 525—314 **7 Claims**

1. Adhesive compositions comprising:

block copolymers of the structure A-B-C-D derived from a vinyl aromatic monomer and a conjugated diene, having a total bound vinyl aromatic content in the range of from 10 to 40 wt %, wherein the conjugated diene has been polymerized in a 1,2 or 3,4 addition in an amount of from 1 to 20% of the total bound conjugated diene, and wherein A represents a predominantly poly(vinyl aromatic) block, B represents a predominantly poly(conjugated diene), D represents a predominantly poly(vinyl aromatic) block, and C represents a tapered block of the conjugated diene occurring in the block B and the vinyl aromatic constituting the block D, wherein the tapering in block C shows an increasing content of vinyl aromatic monomer in the direction to block D, wherein the weight ratio of the conjugated diene occurring in block B and the conjugated diene occurring in block C is in the range of from 5:5 to 9:1, and wherein the total apparent molecular weight is from 130,000 to 300,000; and

one or more components selected from tackifying resins, stabilizers, and plasticizers.

5,554,698

LOW-HAZE IONOMERS OF COPOLYMERS OF ALPHA-OLEFINS, CARBOXYLIC ACID ESTERS, AND OPTIONAL COMONOMERS, AND PROCESSES FOR MAKING AND ACIDIFYING THESE IONOMERS

James H. Wang, Appleton, Wis.; David Rosendale, Mauriceville, Tex.; Victor P. Kurkov, San Rafael, Calif.; Leslie P. Theard, Houston, Tex.; Ta Yen Ching, Novato, Calif.; Lewis R. Compton, Orange, Tex.; Tor H. G. Palmgren, Orange, Tex., and Mitchell P. Eichelberger, The Woodlands, Tex., assignors to Chevron Chemical Company, San Ramon, Calif.

Continuation of Ser. No. 379,411, Jan. 27, 1995, which is a continuation-in-part of Ser. No. 330,290, Oct. 27, 1994, which is a continuation-in-part of Ser. No. 144,173, Oct. 27, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 463,375

Int. Cl.[6] C01F *8/42*

U.S. Cl. 525—330.2 **6 Claims**

1. A blow-molded article comprising a copolymer of alpha-olefins having from two to eight carbon atoms, esters of alpha, beta-ethylenically-unsaturated carboxylic acids having from four to twenty-two carbon atoms, and metal salts of acrylic or methacrylic acid, wherein the copolymer has a haze of no more than ten percent as measured by ASTM method D 1003.

5,554,699

METHOD OF CURING RUBBERS WITHOUT FORMING NITROSAMINES

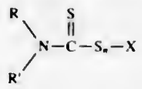
Robert W. Layer, Stow, and Dwight W. Chasar, Northfield, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 958,395, Oct. 8, 1992, abandoned. This application Jun. 28, 1994, Ser. No. 268,143

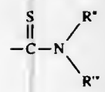
Int. Cl.[6] C08C *19/00*

U.S. Cl. 525—332.7 **36 Claims**

1. A composition comprising an unsaturated sulfur vulcanizable rubber, and an accelerator which abates N-nitrosamine formation during curing, the accelerator being represented by the formula:



where R is a branched alkyl group having from 4 up to 6 carbon atoms, R' is an alkyl group which may or may not be branched or an alkaryl or aryl group or a cyclic alkyl group; X is another thiocarbamyl group of the structure



or an alkylthio group; n is an integer from 1 to 6; and

R" is a branched alkyl group having from 4 to 6 carbon atoms, and R'" is a linear or branched alkyl group having up to 8 carbon atoms, a cyclic alkyl group having from 5 to about 12 carbon atoms or an alkaryl or aryl group having from 6 to about 12 carbon atoms.

5,554,700

CATALYZED CATIONIC LACQUER BINDER, PROCESS FOR PRODUCING THE SAME AND ITS USE

Rudolf Schipfer; Gerhard Schmoelzer, and Edmund Urbano, all of Graz, Austria, assignors to Vianova Resins AG, Graz, Austria

PCT No. PCT/AT93/00091, § 371 Date Nov. 28, 1994, § 102(e) Date Nov. 28, 1994, PCT Pub. No. WO93/24578, PCT Pub. Date Dec. 9, 1993

PCT Filed May 27, 1993, Ser. No. 343,448

Claims priority, application Austria, May 29, 1992, 1122/92; Dec. 24, 1992, 2571/92

Int. Cl.[6] C08F *8/30*

U.S. Cl. 525—360 **18 Claims**

1. A catalysed cationic coating composition which is water-thinnable after protonation, wherein said composition comprises one or more cationic paint binders that is crosslinkable by transesterification and/or transamidation and/or transurethanisation and/or by reaction of terminal double bonds, and one or more bismuth salt of an aliphatic hydroxycarboxylic acid.

5,554,701

CROSSLINKED POLYESTERS MADE FROM DECAHYDRONAPHTHALENE DIMETHANOL

Yeong-Ho Chang; Robert B. Barbee, and Brian S. Phillips, all of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Mar. 24, 1995, Ser. No. 409,399

Int. Cl.[6] C08F *20/00*; C08G *63/44*

U.S. Cl. 525—437 **18 Claims**

1. A thermosetting powder coating composition comprising

A) an aliphatic polyester comprised of 80 to 100 weight percent of diacid residues selected from the group consisting of residues of 1,2-cyclohexanedicarboxylic acid, 1,3-cyclohexanedicarboxylic acid, and 1,4-cyclohexanedicarboxylic acid and from about 80 to 100 weight percent of residues of 2,6-decahydronaphthalene dimethanol, said polyester having a number average molecular weight (Mn) of from about 1,500 to about 10,000, a glass transition temperature (Tg) of about 45° C. to 100° C., and hydroxyl or acid number of from about 20 to about 100;

B) a crosslinking effective amount of a crosslinker reactive with said polyester.

5,554,702

COATED POLYCARBONATE AND METHOD FOR MAKING THE SAME

James P. Bell, Storrs, Conn.; Ying Huang, and Yunchao Yu, both of Beijing, China, assignors to The University of Connecticut, Storrs, Conn.

Filed Dec. 8, 1994, Ser. No. 351,765

Int. Cl.[6] C08G *64/14*

U.S. Cl. 525—463 **16 Claims**

1. A method of making a polymeric coupling agent by reacting, in the presence of a catalyst an epoxidized silane and a polycarbonate backbone to chemically bond said epoxidized silane to said polycarbonate to produce a polymeric coupling agent, said catalyst being catalytically effective to promote chemical bonding between said epoxidized silane and said polycarbonate to produce said polymeric coupling agent.

5,554,703

NITROGENOUS MULTIACRYLIC MONOMERS, THEIR PREPARATION AND THEIR APPLICATION TO THE OBTENTION OF NEW POLYMERS

Jean-Pierre Pascault, Villeurbanne; Florence Rolly, Saint-Priest; Mohamed Taha, Clapiers, and Christelle Titier, Saint-Beauzire, all of France, assignors to Cray Valley S.A., Puteaux, France

PCT No. PCT/FR92/01229, § 371 Date Jan. 18, 1994, § 102(e) Date Jan. 18, 1994, PCT Pub. No. WO93/13050, PCT Pub. Date Jul. 8, 1993

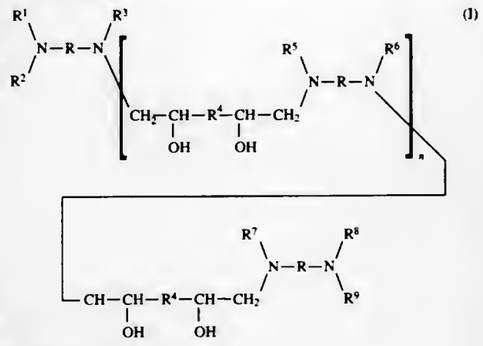
PCT Filed Dec. 23, 1992, Ser. No. 108,566

Claims priority, application France, Dec. 24, 1991, 91 16125

Int. Cl.[6] C08F *283/00*; *283/10*

U.S. Cl. 525—530 **10 Claims**

1. A process for preparing a nitrogenous multiacrylic compound of the formula



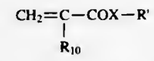
(I)

wherein

n is an integer at least equal to 0,

R_1, R_2, R_3, R_5, R_6, R_7,

R_8 and R_9 are selected, independently from each other, from a hydrogen atom and acrylic or methacrylic groups having the formula



R_{10} being selected from a hydrogen atom and a methyl group, X is selected from sulfur and oxygen atoms and R' being a hydrocarbon group of 2 to 20 carbons atoms comprising a hydroxyl group within the backbone or at the end of the chain, selected from linear or branched alkyl groups, monocyclic or polycyclic cycloalkyl or heterocycloalkyl groups and alkylaryl groups,

R_4 is a group having the formula $—CH_2—O—R_{11}—O—CH_2—$ wherein R_{11} is a bivalent group selected form alkylene groups

having from 2 to 12 carbon atoms and those comprising at least a substituted or non-substituted aliphatic or aromatic

having the formula $CH_2=C(C(O)OR^3)(R^4)$ wherein R^3 is a

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GRANULAR VINYL CHLORIDE RESIN AND PROCESS

NCO functionality of at least 2 and subsequent partial reac-

having from 2 to 12 carbon atoms and those comprising at least a substituted or non-substituted aliphatic or aromatic ring, and

R is a bivalent group comprising at least one substituted or non-substituted aliphatic or aromatic ring,

with the proviso that when n is 0, at least 2 of the groups R_1, R_2, R_3, R_7, R_8

and R_9 are acrylic or methacrylic groups, and when n is greater than 0, at least 2 of the groups R_1, R_2,

R_3, R_5, R_6, R_7, R_8 and R_9 are acrylic or methacrylic groups,

said process comprising reacting (a) at least one diamine of the formula $H_2N—R—NH_2$ with (C_1) at least one polyepoxidic resin and with (C) at least one (meth)acrylic epoxide, the respective proportions of the polyepoxidic resin and the (meth)acrylic epoxide being selected in order to remain under the gel point until the end of the reaction, the molar concentration of the polyepoxidic resin, defined as C_1, and the molar concentration of the (meth)acrylic epoxide, defined as C, being linked by the equation:

$$C_1\left(i^2-\frac{4i}{3}\right)<\frac{C}{3}$$

i being the functionality of the polyepoxidic resin, said reaction being conducted such that all the reactants are reacted simultaneously or (a) is reacted first with (C_1) and the resultant reaction product is reacted with (C).

5,554,704

CONTROLLED PARTICLE SIZE POLYOLEFINS FROM SILICA SUPPORTED PREPOLYMERIZED MATALLOCENE CATALYST

Terry J. Burkhardt, Kingwood; Masahide Murata, Seabrook, and William B. Brandley, Deer Park, all of Tex., assignors to Exxon Chemical Patents, Inc., Wilmington, Del.

Continuation of Ser. No. 96,630, Jul. 22, 1993, abandoned, which is a division of Ser. No. 885,170, May 18, 1992, Pat. No. 5,240,894. This application Jul. 1, 1994, Ser. No. 270,096

Int. Cl.[6] C08F *4/42*

U.S. Cl. 526—153 **9 Claims**

1. A process for producing a polyolefin from one or more alpha-olefins containing from two to about twenty carbon atoms comprising contacting said one or more alpha-olefins under polymerization conditions with a supported catalyst prepared by the method comprising the steps of:

(a) forming a metallocene/alumoxane reaction solution;

(b) contacting said solution with a porous carrier thereby forming a mixture;

(c) drying the mixture until the mixture is visually dry; then

(d) drying the mixture further using heat at a temperature of from 30° C. to about 80° C. for a time period of from about one hour to about eight hours, thereby removing residual solvent from the pores of the carrier.

5,554,705

POLYMERS USEFUL AS PRINTING VEHICLES

Brenda A. Cleary, Sellersville, and Steven P. Boucher, Hatfield, both of Pa., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Filed Mar. 17, 1995, Ser. No. 407,428

Int. Cl.[6] C08F *20/10*

U.S. Cl. 526—318.44 **23 Claims**

1. A polymer produced by the process of polymerizing monomers comprised of:

(i) from about 35% to about 50% by weight of an aromatic monomer having the formula $CH_2=C(R^1)(R^2)$ wherein R^1 is an aromatic group having from 6 to 10 carbon atoms, and R^2 is hydrogen or methyl,

(ii) an alcohol resistance improving amount of from about 5% to about 20% by weight of a long-chain aliphatic monomer having the formula $CH_2=C(C(O)OR^3)(R^4)$ wherein R^3 is a fatty alkyl group having from 12 to 22 carbon atoms and R^4 is hydrogen or methyl,

(iii) from about 25% to about 40% by weight of a hardening monomer having the formula $CH_2=C(C(O)OR^5)(R^6)$ wherein R^5 is a hardening alkyl group having from 1 to 4 carbon atoms and R^6 is hydrogen or methyl, and

(iv) from about 5% to 20% by weight of a plasticizing monomer having the formula $CH_2=C(C(O)OR^7)(R^8)$ wherein R^7 is a plasticizing alkyl group selected from the group consisting of straight chain alkyl groups having from 3 to 11 carbon atoms and branched chain alkyl groups having 5 to 11 carbon atoms and R^8 is hydrogen, wherein the alcohol resistance is improved over a polymer which does not contain (ii).

5,554,706

MESOGENIC ACRYLATE COPOLYMERS HAVING BOTH SILOXY AND ALKYLENE SPACER GROUPS

Yu Nagase, Sagamihara; Eiichi Akiyama, Fujisawa, and Yuriko Takamura, Sagamihara, all of Japan, assignors to Sagami Chemical Research Center, Sagamihara, Japan

PCT No. PCT/JP94/00539, § 371 Date Oct. 19, 1995, § 102(e) Date Oct. 19, 1995, PCT Pub. No. WO94/24180, PCT Pub. Date Oct. 27, 1994

PCT Filed Mar. 31, 1994, Ser. No. 532,572

Claims priority, application Japan, Apr. 20, 1993, 5-115182

Int. Cl.[6] C08F *230/08;* **C09K** *19/00*

U.S. Cl. 526—279 **2 Claims**

1. A copolymer having a mesogenic group in the side chain comprising a repeating unit represented by the following formula (I):

(I)

wherein, R is a hydrogen atom, a halogen atom, an alkyl group or a phenyl group, X is a single bond, an oxygen atom or a group of the formula —COO— or —OCO—, Q^1 is a mesogenic group, and k is an integer of from 2 to 20, and a repeating unit represented by the following formula (II):

(II)

wherein, R', which may be the same or different to the above R, is a hydrogen atom, a halogen atom, an alkyl group or a phenyl group, each of R^1 to R^6, which may be the same or different, is an alkyl group or a phenyl group, X is a single bond, an oxygen atom or a group of the formula —COO— or —OCO—, Q^2, which may be the same or different to the above Q^1, is a mesogenic group, each of m and p is an integer of from 2 to 10, and n is an integer of from 0 to 10; and the molar ratio of the repeating unit of the formula (I) to the repeating unit of the formula (II) ranges from 95/5 to 20/80 and the number average molecular weight is at least 1,000.

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GRANULAR VINYL CHLORIDE RESIN AND PROCESS FOR ITS PREPARATION

Tokio Nikuni, and Yukio Noro, both of Yokkaichi, Japan, assignors to Mitsubishi Chemical MKV Company, Tokyo, Japan

Continuation of Ser. No. 5,399, Jan. 15, 1993, abandoned. This application Apr. 1, 1994, Ser. No. 221,456

Claims priority, application Japan, Jan. 17, 1992, 4-006840; Jan. 17, 1992, 4-006841; Jan. 17, 1992, 4-006842

Int. Cl.[6] C08F *114/06*

U.S. Cl. 526—344.2 **5 Claims**

1. A paste-making, spherical, low dusting and powder flowable granular vinyl chloride resin having a crushing strength of 10 to 60 g/mm^2 with a diameter of from 50 to 300 μm prepared by spray-drying a latex or a slurry obtained by mixing:

(A) from 90 to 10% by weight on a solid particle basis of a polyvinyl chloride latex produced by emulsion polymerization or fine suspension polymerization containing fine particles with diameters within a range of not larger than 3 μm,

(B) from 10 to 90% by weight of large particles with diameters within a range of from 5 to 65 μm prepared by spray-drying a polyvinyl chloride latex obtained by emulsion polymerization or fine suspension polymerization by using a double fluid nozzle, and

(C) from 0 to 10% by weight of particles with diameters other than those of particles (A) and (B),

said fine particles and large particles being granulated and bonded on their surfaces.

5,554,708

METHODS OF MAKING POLYSILOXANES

Timothy N. Biggs, and Gary E. Le Grow, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 433,181, May 3, 1993, Pat. No. 5,516,870. This application Sep. 18, 1995, Ser. No. 529,789

Int. Cl.[6] C08G *77/08*

U.S. Cl. 528—23 **6 Claims**

1. A method of making linear triorganosiloxy endcapped methylhydrogen polysiloxanes comprising (i) forming a reaction mixture containing a silanol-free hexaorganodisiloxane, one or more silanol-free methylhydrogen cyclic siloxanes, and less than about 100 parts per million water, (ii) contacting the reaction mixture with anhydrous trifluoromethane sulfonic acid catalyst, and (iii) agitating the mixture and the catalyst at below 100° C. to form a linear triorganosiloxy endcapped methylhydrogen polysiloxane.

5,554,709

MOISTURE-CURING ALKOXYSILANE-TERMINATED POLYURETHANES

Winfried Emmerling, Neuss; Tore Podola, Monheim; Lothar Unger, Erkrath, and Martin Majolo, Erkelenz, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

Continuation of Ser. No. 315,307, Sep. 29, 1994, abandoned, which is a continuation of Ser. No. 179,897, Jan. 10, 1994, abandoned, which is a continuation of Ser. No. 30,140, Mar. 18, 1993, abandoned. This application May 8, 1995, Ser. No. 436,504

Claims priority, application Germany, Sep. 18, 1990, 40 29 505.2

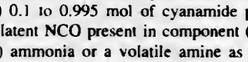
Int. Cl.[6] C08G *18/10;18/28;18/83*

U.S. Cl. 528—27 **20 Claims**

1. Moisture-curing alkoxysilane-terminated polyurethanes obtained by preparing polyurethane prepolymers having an average NCO functionality of at least 1 and less than 2 in a first step by

a) reaction of OH-terminated polyols with diisocyanates to form NCO-terminated polyurethane prepolymers having an average NCO functionality of at least 2 and subsequent partial reaction of the remaining NCO groups with monoalkyl polyether alcohols, with linear or branched aliphatic monofunctional alcohols containing 1 to 18 carbon atoms, or with both monoalkyl polyether alcohols and linear or branched aliphatic monofunctional alcohols or by

a') reaction of OH-terminated polyols with a mixture of mono- and diisocyanates and, in a second step, reaction of substantially all the free NCO groups in the polyurethane prepolymers obtained in a), a'), or both with alkoxysilanes corresponding to the following general formula:



in which

X=NHR^2, or $(NH—CH_2—CH_2)_m—NHR^2$

R=$—CH_3$, $—CH_2CH_3$ or OR^1

R^1=an aliphatic, cycloaliphatic and/or aromatic hydrocarbon radical containing 1 to 10 carbon atoms

R^2=H and/or an aliphatic, cycloaliphatic and/or aromatic hydrocarbon radical containing 1 to 10 carbon atoms

n=2 to 6

m=1 or 2.

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CONDUCTIVE POLYMERS AND PROCESS FOR PREPARING THE SAME

Shigeru Mori; Motoo Fukushima; Eiichi Tabei, all of Kawasaki; Yoshitaka Hamada, and Seizi Katayama, both of Annaka, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1994, Ser. No. 197,986

Claims priority, application Japan, Feb. 18, 1993, 5-053043

Int. Cl.[6] C08G *77/20;* **B05D** *5/12;* **H01M** *4/70*

U.S. Cl. 528—32 **7 Claims**

1. A method for preparing a silicon-containing conductive polymer which comprises providing a film or coating of a silicon-containing polymer which has Si—Si bonds or both Si—Si bonds and multiple C—C bonds in the main chain, and subjecting the film or coating to vapor phase doping with ferric chloride.

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POLYISOCYANATE ADDITION COMPOUNDS CONTAINING CYANAMIDE GROUPS AND THEIR USE

Harro Träubel, Leverkusen; Thomas Münzmay, Dormagen; Tillmann Hassel, Köln; Wilhelm Krümmel; Hans-Albert Ehlert, both of Leverkusen, and Joachim Kochta, Bonn, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sep. 6, 1994, Ser. No. 301,742

Claims priority, application Germany, Sep. 8, 1993, 43 30 378.1

Int. Cl.[6] C08G *18/30*

U.S. Cl. 528—49 **5 Claims**

1. A reaction product of

(a) an organic polyisocyanate,

(b) 0.005 to 0.9 equivalents of a C_{6-24} alcohol per equivalent of NCO or latent NCO present in component (a),

(c) 0.1 to 0.995 mol of cyanamide per equivalent of NCO or latent NCO present in component (a), and

(d) ammonia or a volatile amine as neutralizing agent for the cyanamide groups of component (c),

with the proviso that the reaction product is free from polyester and polyether groups and from halogen atoms.

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B) at least one polyether diol or polyol having a molecular

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AQUEOUS DEVELOPABLE PHOTOSENSITIVE POLYURETHANE-(METH)ACRYLATE

Truc-Chi T. Huynh-Tran, Burtonsville, Md.; Ronald J. Kumpfmiller, Marietta, Ga., and Cynthia L. Ebner, Mt. Airy, Md., assignors to W.R. Grace & Co.-Conn., New York, N.Y.

Division of Ser. No. 3,167, Jan. 12, 1993, Pat. No. 5,364,741, which is a continuation-in-part of Ser. No. 924,264, Aug. 28, 1992, Pat. No. 5,328,805. This application May 19, 1994, Ser. No. 246,197

Int. Cl.[6] C08G *18/48;18/12;18/48;18/67*

U.S. Cl. 528—58 **15 Claims**

1. Photosensitive polyurethane comprising a polymer of the formula

J-R-R[1]-J, where the J's are identical and are either OCN- or G,

R comprises B and F; B, E, and F; or E and F;

A-O- is $-CH_2CH_2-O-$, $-CH_2CH(CH_3)-O-$, $-CH_2CH_2CH_2CH_2-O-$, $-CH_2CH_2CH(CH_3)-O-$, or $-CH_2CH(CH_3)CH_2-O-$, or mixtures thereof;

B is [-R[1]-NH-C(:O)O(A-O)$_b$-C(:O)NH], where b is a number such that (A-O-)$_b$ has a molecular weight of about 650–7000;

D is [-R[2]-O-C(:O)[$(R^3)_{0\ or\ 1}$]-C(:O)-O-]$_m$, or -R[7]-O -[C(:O)-$(CH_2)_5$-O-]$_m$, where m and n are such that D has a molecular weight of about 600– 6000;

E is [-R[1]-NHC(:O)-O-D-R[2]-O-C(:O)-NH-];

F is [-R[1]-NHC(:O)-O-R[4] R[5] R[6]-O-C(:O) -NH-];

G is $CH_2{=}C(R^9)$-C(:O)-O-R[8]-O-C(:O)-NH-;

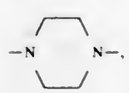
R[1] is a substituted or unsubstituted divalent aromatic, aliphatic, or cycloaliphatic group containing 2–20 carbons, methylene diphenylene or a modified methylene diphenylene which is the residue of the reaction product of methylene diphenylene diisocyanate with a polyether polyol;

R[2] is a divalent, aliphatic, cycloaliphatic, or alpharyl group of 2–20 carbons;

R[3] is a divalent, aliphatic, cycloaliphatic, aryl, or alpharyl group of 1–20 carbons;

R[4] and R[6] are the same or different alkylene groups with 1–6 carbons; or R[4] can be -$(CH_2CH_2O)_dCH_2CH_2$-, provided R[6] is -$(CH_2CH_2O)_eCH_2CH_2$-, where d and e are each 0 to 9 and the sum of d+e=3 to 15;

R[5] is -N(R[7])-,



or -N(Ph)-;

R[7] is an alkyl group with 1–6 carbons;

R[8] is a 1–7 carbon alkylene; and

R[9] is H or methyl;

wherein 60–80 weight percent of the polymer is of moieties of polyether and polyester polyols.

5,554,713

THERMOSETTING CASTABLE AND CURABLE POLYURETHANE-UREA POLYMERS HAVING IMPROVED FLOW AND END-WASTE CHARACTERISTICS FOR INSULATING THERMAL BARRIERS

Gerard S. Freeland, Lawton, Mich., assignor to Azon USA Inc., Kalamazoo, Mich.

Filed Jan. 6, 1995, Ser. No. 369,701

Int. Cl.[6] C08G *18/48;18/42;* **E04B** *1/78;* **E06B** *1/12*

U.S. Cl. 528—76 **24 Claims**

1. A thermosetting castable and curable polyurethane-urea polymer having improved flow and end-waste characteristics, suitable for pouring into a channel in an aluminum extrusion to provide a thermal barrier upon curing of the polymer and debridgement of the channel, consisting essentially of the following inter-reacted components:

A) a polyisocyanate having a functionality of at least about 2;

B) at least one polyether diol or polyol having a molecular weight between about 2000 and about 6000 and an OH-functionality between about 2 and about 4;

C) a polyether diol or polyol having a molecular weight of 300 to less than 2000 and an OH-functionality between about 2 and about 4;

D) one or more glycols having a molecular weight between about 50 and 250 and an OH-functionality between about 1.8 and about 2.2;

E) a polyester diol or polyol having a molecular weight between about 250 and 1000 and an OH-functionality of about 1.5 to about 4;

F) a polyamine having a molecular weight between about 50 and about 4000 and an amine functionality of about 2 to about 4; and

said constituent diols and polyols being in the proportion of 0 to about 85 percent by weight of B), about 5 to about 90 percent by weight of C), 0 to about 25 percent by weight of D), 0 to about 30 percent by weight of E), and about 2 to about 15 percent by weight of F), per 100 percent by weight of all diol and polyol and amine components; the combined percentage of B) and C) being about 40 to about 90 percent by weight;

G) an effective polyurethane-catalyzing amount of a urethane catalyst; and

the isocyanate component A) and combined diol and polyol and amine components B), C), D), E), and F) being in proportions so as to provide an NCO ratio to the active hydrogen in all diol, polyol, and amine components of at least about 1:1,

with the proviso that, when all three of B), D), and E) are each present at less than 5% by weight, then the molecular weight of C) is about 1500 or less,

the polymer having the following characteristics:

a flow time not greater than about six (6) seconds when poured into an aluminum channel 8 feet long, ¼ inch wide, and ½ inch deep at a temperature of approximately 77° F.,

a gel time not greater than about five minutes,

and, when cured, a notched IZOD impact strength (PLI) greater than 0.5,

a tensile strength (PSI) greater than 500,

an elongation greater than 10%,

and an at least 65 shore A hardness using a Rex durometer.

5,554,714

SPHERICAL CURING AGENT FOR EPOXY RESIN, CURING AGENT MASTERBATCH FOR EPOXY RESIN AND THEIR PREPARATION.

Souichi Murol, Shizuoka-ken, and Hsi-Chuan Tsai, Kanagawa-ken, both of Japan, assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Division of Ser. No. 22,607, Feb. 18, 1993, Pat. No. 5,480,957. This application Jun. 7, 1995, Ser. No. 472,617

Int. Cl.[6] C08F *283/00;* **C08G** *59/68*

U.S. Cl. 528—94 **1 Claim**

1. A heat curable composition comprising, as the major components, an epoxy resin and an amine/epoxy adduct in the form of fine, substantially spherical particles, said particles having a melting point of at least 50° C. and a particle diameter of 0.1 μm to 30 μm, said particles being obtained by reacting an amine compound having only one active amino-hydrogen and a polyfunctional epoxy compound at a ratio of the epoxy group in said epoxy compound to the active amino-hydrogen in said amine compound of substantially 1:1 in the presence of a dispersion stabilizer in an organic solvent capable of dissolving both said amine compound and said epoxy compound but incapable of dissolving the adduct formed therefrom at elevated temperatures with agitation, said dispersion stabilizer being a polymeric compound having high affinity to both said organic solvent and said adduct formed.

5,554,715

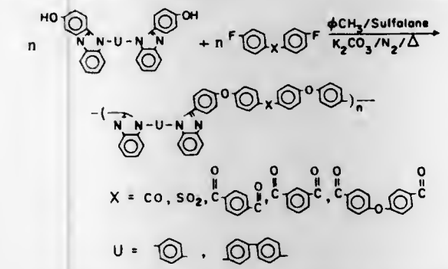
POLY(N-ARYLENEBENZIMIDAZOLE)S VIA AROMATIC NUCLEOPHILIC DISPLACEMENT

John W. Connell; Paul M. Hergenrother, and Joseph G. Smith, all of Yorktown, Va., assignors to The United States of America as represented by the Administrator of National Aeronautics and Space Administration, Washington, D.C.

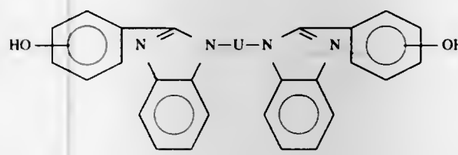
Division of Ser. No. 45,339, Mar. 5, 1993, Pat. No. 5,410,012. This application Jan. 17, 1995, Ser. No. 375,334

Int. Cl.[6] C08G *73/18*

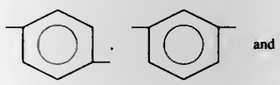
U.S. Cl. 528—125 **3 Claims**



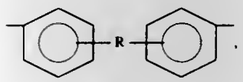
1. A di(hydroxyphenyl-N-arylenebenzimidazole) having the general structure



wherein the catenation of the hydroxy radicals is selected from the group consisting of meta-meta, para-para, and para meta; wherein U is selected from the group consisting of

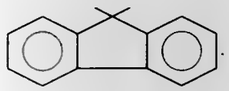


and



and R is a bond or is a radical selected from the group of

CH, CO, S, O, SO_2 or



5,554,716

USE OF HYDROGENATED ABIETIC ACID AS A CHAIN TERMINATOR FOR THE PRODUCTION OF POLYCARBONATES AND POLYESTER CARBONATES

Burkhard Köhler; Wolfgang Ebert, both of Krefeld; Klaus Horn, Dormagen, and Rolf Dhein, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 6, 1995, Ser. No. 417,821

Claims priority, application Germany, Apr. 18, 1994, 44 13 397.9

Int. Cl.[6] C08G *64/00*

U.S. Cl. 528—196 **12 Claims**

1. Thermoplastic aromatic polycarbonates prepared from diphenols, carbonate donors, chain terminators and optionally branching agents by an interfacial, homogenous solution or melt transesterification process, which are chain terminated with hydrogenated abietic acid in quantities of 0.6 to 12 mole-%, based on diphenols.

5,554,717

SYNTHESIS OF POLYANILINES AND ITS CO-POLYMERS BY MELT CONDENSATION

Ali Afzali-Ardakani, Yorktown Heights, N.Y., and Jeffrey D. Gelorme, Plainville, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

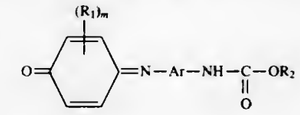
Filed Oct. 18, 1995, Ser. No. 544,902

Int. Cl.[6] C08G *12/00*

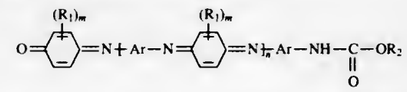
U.S. Cl. 528—229 **16 Claims**

1. A method comprising the steps of:

providing a first compound having the structural formula:



providing energy to polymerize said first compound to a second compound having the structural formula:



wherein quinone can also be naphthoquinone and anthraquinone and their substituted derivatives, where said substituents are alkyl, alkylaryl, vinyl, alkynyl, alkoxy, alkylthio, alkylsilyl, aryloxy, dialkysubstituted amines, chlorine, bromine, fluorine or iodine;

Ar is selected from the group consisting of a substituted phenylene wherein the substituents are selected from the group consisting of alkyl, aryl, vinyl, alkynyl, alkoxy, alkylthio, alkylsilyl, aryloxy, dialkysubstituted amines, chlorine, bromine, fluorine, iodine and dialkylamino;

R_1 is an alkyl, alkylaryl, vinyl, alkynyl, alkoxy, alkylthio, alkylsilyl, aryloxy, dialkysubstituted amines, chlorine, bromine, fluorine and iodine;

m is 0 to 4;

n is 1 or greater;

"alkyl" where referred to above is 1–18 carbon atoms;

R_2 is a heat induced leaving group which generates a proton and catalyzes the condensation reaction.

5,554,718

CATONIC UREA/FORMALDEHYDE RESINS, THEIR PREPARATION AND THEIR USE IN THE PAPER INDUSTRY

Klaus Flory, Leimen; Andreas Stange; Michael Kroener, both of Mannheim, and Norbert Sendhoff, Gruenstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP90/01399, § 371 Date Nov. 6, 1991, § 102(e) Date Nov. 6, 1991, PCT Pub. No. WO91/02762, PCT Pub. Date Mar. 7, 1991

PCT Filed Aug. 22, 1990, Ser. No. 775,928

Claims priority, application Germany, Aug. 23, 1989, 39 27 812.3

Int. Cl.[6] C08G *2/26;14/02*

U.S. Cl. 528—246 **12 Claims**

1. A cationic urea/formaldehyde resin, produced by condensing urea and formaldehyde in a molar ratio of from 1:1.5 to 1:3 in the presence of polymers which contain not less than 1 mol % of polymerized vinylamine units and have K values of from 5 to 300 (determined according to H. Fikentscher in 5% strength aqueous sodium chloride solution at 25 ° C. and at a polymer concentration of 1% by weight), in an amount of from 5 to 50 g, based on one mole of urea in the end product, where the mixture is first

a) precondensed at a pH of from 8 to 14, then acidified and

b) condensed at a pH of from 1 to 5 until gel formation begins,

c) then from 0.3 to 1.5 moles of formaldehyde are added per mole of urea used,

d) post-condensation is carried out and

e) the resin solution is subsequently neutralized.

5,554,719

POLYHYDROXYSTYRENE WITH A NOVOLAK TYPE STRUCTURE

James R. Sounik, Corpus Christi, Tex., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Jun. 16, 1995, Ser. No. 491,464

Int. Cl.[6] C08G *65/38;63/00*

U.S. Cl. 528—212 **21 Claims**

1. A polyhydroxystyrene having a novolak type structure which is prepared by a process which comprises the steps of (a) reacting at least one substituted phenyl carbinol with a carboxylic acid for a sufficient period of time and under suitable conditions of temperature and pressure to form a reaction mixture, and (b) polymerizing said reaction mixture in the presence of a suitable catalyst for a sufficient period of time and under suitable conditions of temperature and pressure to form a said plyhydroxystyrene, with the proviso that at least molar equivalents of carboxylic acid are used in step (a) of the process.

5,554,720

NAPHTHALENEDICARBOXYLIC ACID POLYMERS CONTAINING ARYL THIOETHERS AND HAVING REDUCED FLUORESCENE

Max A. Weaver, Kingsport, Tenn.; David E. Mills, Wake Forest, N.C.; James Tanner, III, Kingsport, Tenn.; Jean C. Fleischer, Kingsport, Tenn.; Wayne P. Pruett, Kingsport, Tenn., and L. Shane Moody, Johnson City, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Dec. 21, 1994, Ser. No. 360,549

Int. Cl.[6] C08G *63/688;75/00*

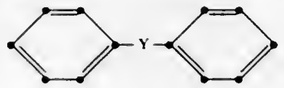
U.S. Cl. 528—295 **14 Claims**

1. A naphthalenedicarboxylic acid containing polymer composition with reduced fluorescence comprising condensation residues of:

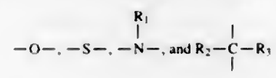
(a) a dicarboxylic acid component which comprises at least 0.1 mole percent of 2,6-naphthalenedicarboxylic acid or 2,6-naphthalenedicarboxylate ester;

(b) a diol or diamine component; and

(c) 0.1 to 5 mole percent, based on 100 mole percent dicarboxylic acid and 100 mole percent diol or diamine, of an aromatic thioether having the formula $Ar(SR)_n$ wherein n is 1 or more; R is selected from the group consisting of C_1 to C_{12}-alkyl, C_5 to C_7-cycloalkyl, C_3 to C_8-alkenyl, C_3 to C_8-alkynyl, aryl, and —L—X, wherein L is an organic divalent linking group, and X is a polyester reactive group; Ar is an aromatic radical selected from the group consisting of benzene, naphthalene, biphenyl, and



wherein Y is selected from the group consisting of



wherein R_1 is selected from the group consisting of C_1 to C_{12}-alkyl, C_5 to C_7-cycloalkyl, aryl, and —L—X, and R_2 and R_3 are independently selected from the group consisting of C_1 to C_6-alkyl and aryl, provided that at least one polyester reactive group X is present on the aromatic thioether.

5,554,721

ACID CATALYZED PROCESS FOR PREPARING AMINO ACID POLYMERS

David E. Adler, Dresher; Michael B. Freeman, Harleysville; James M. Lipovsky, Langhorne, all of Pa.; Yi H. Paik, Princeton, N.J.; Jan E. Shulman, Newtown, and Graham Swift, Blue Bell, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 213,648, Mar. 16, 1994, Pat. No. 5,457,176, which is a continuation-in-part of Ser. No. 125,052, Sep. 21, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 471,946

Int. Cl.[6] C02F *5/02;5/08;* **B01F** *3/00;* **C08G** *69/00*

U.S. Cl. 528—328 **3 Claims**

1. A method of dispersing inorganic particulates in aqueous systems by adding at least one amino acid polymer to aqueous systems containing inorganic particulates; wherein the amino acid polymer is prepared by a process comprising:

a) forming a reaction mixture of from about 15 to about 95 percent by weight amino acid, from about 3 to about 85 percent by weight of acid catalyst, and 0 to about 50 percent by weight of a polyfunctional monomer, wherein the weight percentages are based on the total weight of the reaction mixture;

b) heating said reaction mixture from about 110° C. to about 300° C., while maintaining said reaction mixture as an intimate admixture by; i) adding one or more processing aid to the reaction mixture; ii) using mechanical means; or iii) a combination thereof;

c) removing water from said reaction mixture; and

d) recovering amino acid polymer.

5,554,722

AROMATIC POLYAMIDE COMPOSITIONS WITH IMPROVED ELECTROSTATIC PROPERTIES, FORMED STRUCTURES PRODUCED THEREFROM, AND USE AND PRODUCTION THEREOF

Dieter Eichenauer, Kriftel; Werner Groh, Lich; Hans-Tobias Macholdt, Darmstadt; Jörg Dahringer, Bobingen; Holger Jung, Niedernhausen, and Richard Neuert, Winkelhaid, all of Germany, assignors to Hoechst AG, Germany

Filed Aug. 15, 1994, Ser. No. 290,378

Claims priority, application Germany, Aug. 17, 1993, 42 27 595.8

Int. Cl.[6] C08G *69/26*

U.S. Cl. 528—340 **38 Claims**

1. A composition comprising an aromatic polyamide which is a polymer with the repeating structural units selected from the group consisting of formulae I, II and III

$$-OC\text{-}Ar^1\text{-}CO\text{-}NH\text{-}Ar^2\text{-}NH- \quad (I),$$

$$-OC\text{-}Ar^1\text{-}CO\text{-}NH\text{-}Ar^3\text{-}NH- \quad (II),$$

$$-OC\text{-}Ar^1\text{-}CO\text{-}NH\text{-}Ar^4\text{-}NH- \quad (III),$$

where Ar^1, Ar^2, Ar^3 and Ar^4 are each independently of the others a bivalent monocylic or polycyclic aromatic radical whose free valences are disposed para or meta or comparably parallel, coaxial or kinked to each other,

Ar^3 and Ar^4 or Ar^2, Ar^3 and Ar^4, is present in a polymer molecule, each have different individual case meanings within the scope of the given definitions, and the respective monomer building blocks underlying the polymer are selected so as to produce an aromatic polyamide which is soluble in organic solvents and from 0.01 to 30% by weight based on the weight of the composition, of an organic or organometallic charge control agent.

5,554,723

PROCESS FOR PRODUCTION OF POLY(ARYLENE THIOETHER) CONTAINING PHTHALIC ANHYDRIDE GROUPS

Naomitsu Nishihata; Shunzo Endo; Yukio Ichikawa, and Takayuki Katto, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo K.K., Tokyo, Japan

Filed Mar. 19, 1993, Ser. No. 35,342

Claims priority, application Japan, Mar. 27, 1992, 4-101639

Int. Cl.[6] C08G *75/14*

U.S. Cl. 528—388 **2 Claims**

1. A process for the production of a granular poly(arylene thioether) containing phthalic anhydride groups wherein a dihalogen-substituted aromatic compound and an alkali metal sulfide are polymerized in a polar organic solvent containing water to produce the poly(arylene thioether), which comprises conducting the polymerization reaction under the following conditions:

(i) a monohalogen-substituted phthalic compound is provided in a polymerization reaction system, and a ratio, a/b of the number of moles, a of the charged dihalogen-substituted aromatic compound to the number of moles, b of the charged alkali metal sulfide is controlled within a range of $0.8<a/b<1$;

(ii) the amount of the monohalogen-substituted phthalic compound is controlled within a range of 0.05–30 mole % based on the total amount of the dihalogen-substituted aromatic compound and the monohalogen-substituted phthalic compound; and

(iii) the polymerization reaction is conducted in the following at least two steps:

First step:

A reaction is conducted in the presence of water in a proportion of 0.5–2.4 moles per mole of the charged alkali metal sulfide at a temperature of 150°–235° C. until a conversion of the dihalogen-substituted aromatic compound becomes 50–98 mole %,

Second step:

Water is added in such a manner that the water content becomes 2.5–7.0 moles per mole of the charged alkali metal sulfide, and the reaction mixture is heated up to a temperature of 245°–280° C. to continue the polymerization reaction, temperature of 245°–280° C. to continue the polymerization reaction.

5,554,724

ISOLATED TUMOR REJECTION ANTIGEN PRECURSOR MAGE-2 DERIVED PEPTIDES, AND USES THEREOF

Cornelis J. M. Melief; M. W. Visseren; W. M. Kast, all of Leiden, Netherlands; Pierre van der Bruggen, and Thierry Boon-Falleur, both of Brussels, Belgium, assignors to University of Leiden, Leiden, Netherlands

Filed Mar. 24, 1994, Ser. No. 217,188

Int. Cl.[6] C07K *7/00;* **A61K** *38/08*

U.S. Cl. 530—328 **4 Claims**

1. Isolated peptide selected from the group consisting of SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 4, SEQ ID NO: 8, SEQ ID NO: 9, and SEQ ID NO: 11.

5,554,725

SYNTHESIS OF DOLASTATIN 15

George R. Pettit, Paradise Valley, Ariz., assignor to Arizona Board of Regents acting on behalf of Arizona State University, Tempe, Ariz.

Filed Sep. 14, 1994, Ser. No. 306,146

Int. Cl.[6] C07K *5/00;7/00;17/00*

U.S. Cl. 530—330 **19 Claims**

1. A method of synthesizing dolastatin 15 comprising the steps of:

coupling tripeptide (8) and tripeptide (5b) to form peptide (9a);

hydrogenating said peptide (9a) to form peptide (9b);

coupling said peptide (9b) with Dov to form dolastatin 15; and

isolating said dolastatin 15.

5,554,726

METHOD FOR PRODUCING HYDROGENATED NBR LATEX

Eiichi Araki; Norihiro Sugihara; Mari Kamada, and Taiji Matsukawa, all of Himeji, Japan, assignors to Sumitomo Seika Chemicals Co., Ltd., Japan

PCT No. PCT/JP94/01960, § 371 Date Jul. 18, 1995, § 102(e) Date Jul. 18, 1995, PCT Pub. No. WO95/14729, PCT Pub. Date Jun. 1, 1995

PCT Filed Nov. 21, 1994, Ser. No. 492,085

Claims priority, application Japan, Nov. 22, 1993, 5-315998

Int. Cl.[6] C08J *3/02;* **C08L** *9/04*

U.S. Cl. 528—495 **11 Claims**

1. A method for producing a hydrogenated nitrile-butadiene rubber latex comprising mixing an organic layer in which a hydrogenated nitrile-butadiene rubber is dissolved in an organic solvent with an aqueous layer in which an emulsifier is dissolved in water, then agitating the mixture, and removing the organic solvent by distillation, characterized in that said emulsification is performed in the presence of an alcohol having the general formula of ROH (wherein R is an unsubstituted, saturated or unsaturated, aliphatic or aralkyl hydrocarbon having 1 to 9 carbon atoms).

5,554,727

ANTI-OBESITY PROTEINS

Z is HO—$(CH_2)_n$—COOH; and n=1 to 12;

C represents H, OH, OMe, NH_2, NH—R where R represents

5,554,731

PROCESS FOR THE PREPARATION OF AMINOAZO

Z is

5,554,727

ANTI-OBESITY PROTEINS

Margret B. Basinski, Indianapolis; Richard D. DiMarchi, Carmel; William F. Heath, Jr., Fishers, and Brigitte E. Schoner, Monrovia, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 381,833, Jan. 31, 1995, abandoned. This application Feb. 6, 1995, Ser. No. 383,631

Int. Cl.[6] A61K *38/00;* **C07K** *7/10;7/00*

U.S. Cl. 530—324 **15 Claims**

1. A protein comprising the amino acids of positions 95 through 100 of SEQ ID NO: 1 properly crosslinked to SEQ ID NO: 2, or a pharmaceutically acceptable salt thereof.

5,554,728

LIPID CONJUGATES OF THERAPEUTIC PEPTIDES AND PROTEASE INHIBITORS

Channa Basava, San Diego, and Karl Y. Hostetler, Del Mar, both of Calif., assignors to NeXstar Pharmaceuticals, Inc., Boulder, Colo.

Filed Jul. 23, 1991, Ser. No. 734,434

Int. Cl.[6] C07K *5/00;7/00;17/00;* **A61K** *38/00*

U.S. Cl. 530—327 **8 Claims**

1. A peptide-lipid conjugate selected from the group consisting of:

i-Boc—Tyr—Pro—Ile—Gly—C;

X—Ser—Gln—Asn—Tyr—Pro—Ile—Val—C;

X—Ser—Gln—Asn—Tyr-Acpnt-Ile—Val—C;

X-Succinyl-Ala—Ala—(D-b-Nal)—Pip—C;

X-Succinyl-Val—Ser—Gln—Asn—Tyr—Pip—Ile—Val—Gln—C;

X-Succinyl-Val—Ser—Gln—Asn—Tyr—Pip—Ile—Val—Gln—C;

X-Succinyl-Val—Ser—Gln—Asn—Tyr—Diq—Ile—Val—Gln—C;

X-Succinyl-(D—Phe)—(D-a-Nal)—Pip—(L-a-(OH)—Leu)—Val—C;

X-Succinyl-Phe(CHOH—CH_2N)Phe—Ile—Phe—C;

X-Succinyl-Phe—O—CH_2—CHOH
|
C—Phe—O—CH_2—CHOH;

Boc—Ser(X)—Phe—O—CH_2—CHOH;
|
Boc—Ser—Phe—O—CH_2—CHOH;

X—Phe(CHOH—CH_2N)Phe—Ile—Phe—C;

and

X—Phe(CHOH—CH_2N)Pro—Ile—Val—C;

wherein

X represents phosphatidyl-tyrosine; phosphatidyl-serine; phosphatidyl-threonine; phosphatidyl-hydroxyproline; 1-O-alkyl-sn-glycero-3-phospho-O-tyrosine; 1-O-acyl-sn-glycero-3-phospho-O-tyrosine; 1-O-alkyl-sn-glycero-3-phospho-O-serine; 1-O-acyl-sn-glycero-3-phospho-O-serine; 1-O-alkyl-sn-glycero-3 -phospho-O-hydroxyproline; 1-O-acyl-sn-glycero-3-phospho-O-hydroxyproline; 1-O-alkyl-sn-glycero-3-phospho-O-threonine; 1-O-acyl-sn-glycero-3-phospho-O-threonine; 1-O-alkyl-sn-glycero-3-diphospho-O-tyrosine; 1-O-acyl-sn-glycero-3 -diphospho-O-tyrosine; 1-O-alkyl-sn-glycero-3-diphospho-O-serine; 1-O-acyl-sn-glycero-3-diphospho-O-serine; 1-O-alkyl-sn-glycero-3-diphospho-O-hydroxyproline; 1-O-acyl-sn-glycero-3 -diphospho-O-hydroxyproline; 1-O-alkyl-sn-glycero-3-diphospho-O-threonine; 1-O-acyl-sn-glycero-3-diphospho-O-threonine; phosphatidyl ethanolamine-Y; phosphatidic acid, or phosphatidic acid-Z,

wherein Y is HOOC—$(CH_2)_n$—COOH;

Z is HO—$(CH_2)_n$—COOH; and n=1 to 12;

C represents H, OH, OMe, NH_2, NH—R where R represents $C_{1\text{-}12}$ alkyl, benzyl, substituted benzyl, $(CH_2)_n$-phenyl where n=1 to 12, 2-methyl pyridyl, phosphatidyl-tyrosine, phosphatidyl-serine, phosphatidyl-threonine, phosphatidyl-hydroxyproline, 1-O-alkyl-sn-glycero-3-phospho-O-tyrosine, 1-O-acyl-sn-glycero-3-phospho-O-tyrosine, 1-O-alkyl-sn-glycero-3-phospho-O-serine, 1-O-acyl-sn-glycero-3-phospho-O-serine, 1-O-alkyl-sn-glycero-3 -phospho-O-hydroxyproline; 1-O-acyl-sn-glycero-3-phospho-O-hydroxyproline; 1-O-alkyl-sn-glycero-3-phospho-O-threonine, 1-O-acyl-sn-glycero-3-phospho-O-threonine, 1-O-alkyl-sn-glycero-3-diphospho-O-tyrosine, 1-O-acyl-sn-glycero-3 -diphospho-O-tyrosine, 1-O-alkyl-sn-glycero-3-diphospho-O-serine, 1-O-acyl-sn-glycero-3-diphospho-O-serine, 1-O-alkyl-sn-glycero-3-diphospho-O-hydroxyproline, 1-O-acyl-sn-glycero-3 -diphospho-O-hydroxyproline, 1-O-alkyl-sn-glycero-3-diphospho-O-threonine, 1-O-acyl-sn-glycero-3-diphospho-O-threonine, phosphatidyl ethanolamine, or phosphatidyl ethanolamine-W, wherein W is H_2N—$(CH_2)_n$—COOH, and n=1 to 12.

5,554,729

MAMMALIAN ADRENOCORTICOTROPIC HORMONE RECEPTORS AND USES

Roger D. Cone, Oregon City, and Kathleen G. Mountjoy, Portland, both of Oreg., assignors to State of Oregon, Acting by and Through the Oregon State Board of Higher Education on Behalf of the Oregon Health Sciences University, Portland, Oreg.

Division of Ser. No. 866,560, Apr. 10, 1992, Pat. No. 5,280,112. This application Jun. 15, 1993, Ser. No. 77,673

Int. Cl.[6] C07K *14/705;14/71*

U.S. Cl. 530—350 **2 Claims**

1. An isolated 33.9 kilodalton adrenocorticotropic hormone receptor having an amino acid sequence identified as SEQ ID No:4.

5,554,730

METHOD AND KIT FOR MAKING A POLYSACCHARIDE-PROTEIN CONJUGATE

James E. Woiszwillo, Milford, and Jie Di, Norwood, both of Mass., assignors to Middlesex Sciences, Inc., Norwood, Mass.

Continuation-in-part of Ser. No. 206,456, Mar. 4, 1994, which is a continuation-in-part of Ser. No. 28,237, Mar. 9, 1993, abandoned. This application Dec. 23, 1994, Ser. No. 372,820

Int. Cl.[6] C07K *17/02;* **A61K** *39/02;39/05;39/095*

U.S. Cl. 530—410 **30 Claims**

1. A method for making a polysaccharide-protein conjugate comprising:

a) oxidizing a polysaccharide with an oxidizing agent to form an oxidized polysaccharide, and

b) combining the oxidized polysaccharide with a protein in the presence of a macromolecular crowding agent

wherein the polysaccharide and protein form a Schiff base conjugate in the absence of a reducing agent.

5,554,731

PROCESS FOR THE PREPARATION OF AMINOAZO DYES

Karl-Josef Herd, Odenthal-Holz, and Peter Roschger, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 41,741, Apr. 1, 1993, Pat. No. 5,432,266, which is a continuation-in-part of Ser. No. 898,859, Jun. 15, 1992, abandoned. This application Sep. 22, 1994, Ser. No. 310,462

Claims priority, application Germany, Jun. 22, 1991, 41 20 696.7; Aug. 10, 1992, 42 26 374.3

Int. Cl.[6] C09B *62/503;62/505;62/51;62/513*

U.S. Cl. 534—593 **2 Claims**

1. A process for the preparation of a water-soluble reactive dye of structure (1):

$$A\text{—}(SO_2X)_{1\text{ or }2} \qquad (1)$$

wherein

A is a chromophoric azo, polyazo, anthraquinone or formazane radical, and

X is a $CH{=}CH_2$ or $CH_2CH_2OSO_3H$,

which comprises oxidizing a mercapto compound of the formula

$$A\text{—}(S\text{—}CH_2\text{—}CH_2\text{—}OH)_{1\text{ or }2}$$

to form a sulphonyl compound of the formula

$$A\text{—}(SO_2\text{—}CH_2\text{—}CH_2\text{—}OH)_{1\text{ or }2}$$

sulphating said compound to produce a sulphate of the formula

$$A\text{—}(SO_2\text{—}CH_2\text{—}CH_2\text{—}OSO_3H)_{1\text{ or }2}$$

or further reacting said compound with a base to produce a vinylsulphonyl compound of the formula

$$A\text{—}(SO_2\text{—}CH{=}CH_2)_{1\text{ or }2}.$$

5,554,732

FIBRE-REACTIVE DISAZO DYESTUFFS

Rainer Nusser, Müllheim, Germany, and Roland Wald, Huningue, France, assignors to Sandoz Ltd, Basel, Switzerland

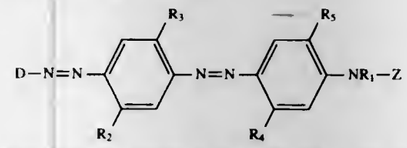
Continuation of Ser. No. 106,003, Aug. 13, 1993, abandoned. This application May 2, 1995, Ser. No. 431,651

Claims priority, application Germany, Aug. 14, 1992, 42 26 918.0

Int. Cl.[6] C09B *62/03;62/25;62/09;31/043;* **D06P** *3/66;3/10*

U.S. Cl. 534—637 **15 Claims**

1. A compound of formula I



I

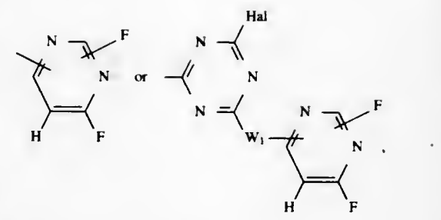
or a salt thereof, or a mixture of such compounds or salts, in which

each R_1 is independently hydrogen, $C_{1\text{-}4}$alkyl or $C_{1\text{-}4}$alkyl, monosubstituted by hydroxy, cyano or chloro

each of R_2 and R_4 is independently hydrogen, $C_{1\text{-}4}$alkyl, $C_{1\text{-}4}$alkoxy, —NHCO$C_{1\text{-}4}$alkyl or —$NHCONH_2$,

each of R_3 and R_5 is independently hydrogen, $C_{1\text{-}4}$alkyl or $C_{1\text{-}4}$alkoxy, and

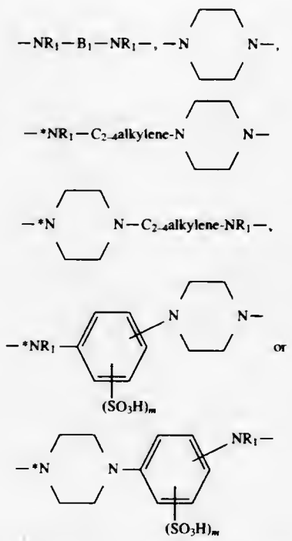
Z is



in which

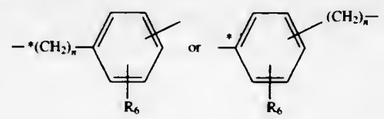
Hal is fluorine or chlorine and

W_1 is



each m is independently 0 or 1 and the marked nitrogen atom is bound to a carbon atom of the triazine ring,

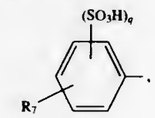
B_1 is $C_{2\text{-}4}$alkylene; —$C_{2\text{-}3}$alkylene—Q—$C_{2\text{-}3}$alkylene- in which Q is —O— or —NR_1—; $C_{3\text{-}4}$alkylene monosubstituted by hydroxy,



n is 0 or an integer 1 to 4,

R_6 is hydrogen, $C_{1\text{-}4}$alkyl, $C_{1\text{-}4}$alkoxy, carboxy or sulpho, and the marked carbon atom is attached to the —NR_1 group which is bound to a carbon atom of the triazine ring;

D is one of the radicals (a) to (d),



(a)

-continued

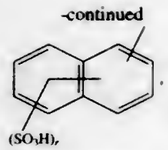
wherein R_1 is C_1–C_4alkyl which is unsubstituted or substituted by

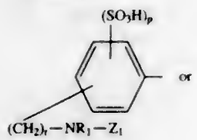
(b) hydroxyl, R_2 and R_3 are each independently of the other hydrogen,

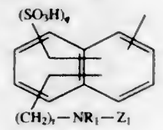
R_1 is hydrogen, C_1–C_3alkyl, trifluoromethyl or cyclopropyl, R_2 is aryl or heteroaryl, each of which is unsubstituted or substi-

Z_1 signifies hydroxy, $C_{1\text{-}4}$-alkoxy, a mono- or di-($C_{1\text{-}4}$-alkyl)-

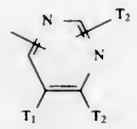
-continued







in which
R_7 is hydrogen, C_{1-4}alkyl, C_{1-4}alkoxy, carboxy or 'NHCOCH$_3$,
p is 0, 1 or 2,
q is 1 or 2,
r is 1, 2 or 3,
t is 0 or 1, and
Z_1 is



wherein
T_1 is hydrogen, chloro or cyano, and the two T_2's are the same and each is fluoro or chloro.

5,554,733

REACTIVE AZO DYES CONTAINING PHENYLAMINO-CHLOROTRIAZINYLAMINO AND α,β-DIBROMOPROPROYLAMINO OR α-BROMOACRYLOYLAMINO FIBER REACTIVE GROUPS

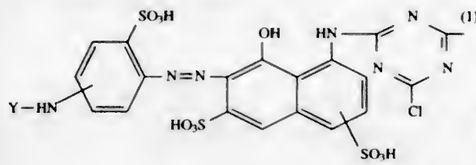
Athanassios Tzikas, Prattein, and Rolf Deitz, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Mar. 27, 1995, Ser. No. 411,258

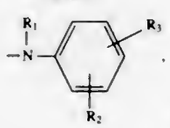
Int. Cl.[6] C09B *62/085;62/473;* **D06P** *3/24*

U.S. Cl. 534—638 **9 Claims**

1. A reactive dye of the formula



(1)



wherein R_1 is C_1–C_4alkyl which is unsubstituted or substituted by hydroxyl, R_2 and R_3 are each independently of the other hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_2–C_4alkanoylamino or halogen and Y is α,β-dibromopropionylamino or α-bromacryloyl.

5,554,734

AZO DYES CONTAINING A BRIDGE MEMBER BASED ON STIBENE AND MORPHOLINO-SUBSTITUTED TRIAZINE

Urs Lauk, Zürich, Switzerland, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

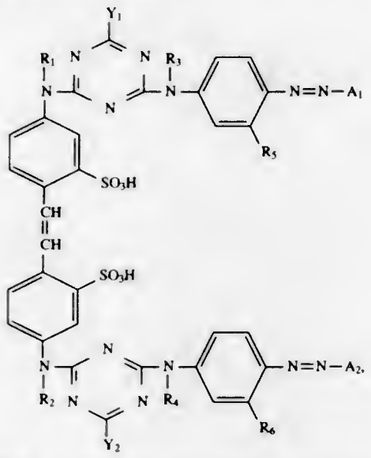
Filed Jun. 2, 1995, Ser. No. 460,176

Claims priority, application Switzerland, Jun. 20, 1994, 1950/94

Int. Cl.[6] C09B *56/04*

U.S. Cl. 534—691 **5 Claims**

1. An azo dye of formula



(1)

wherein
R_1, R_2, R_3 and R_4 are each independently of one another hydrogen or unsubstituted or substituted C_1–C_4alkyl,
R_5 and R_6 are C_2–C_4alkanoylamino,
Y_1 and Y_2 are morpholino, and
A_1 and A_2 are sulfo-substituted phenyl.

5,554,735

AZO OXIME ETHERS AND THEIR USE AS FUNGICIDES

Hugo Ziegler, Witterswil, Switzerland, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

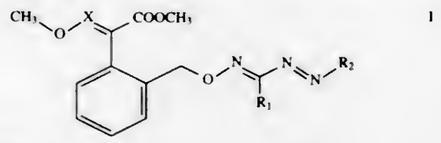
Filed Aug. 26, 1994, Ser. No. 295,775

Claims priority, application Switzerland, Feb. 28, 1992, 624/92-4

Int. Cl.[6] C07C *245/02;245/04;251/12;* **A01N** *33/26*

U.S. Cl. 534—738 **22 Claims**

1. A compound of the formula I in form of a racemic mixture or isomer thereof



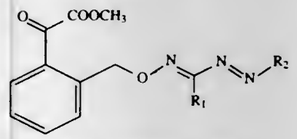
I

in which
X is CH or N,

R_1 is hydrogen, C_1–C_3alkyl, trifluoromethyl or cyclopropyl, R_2 is aryl or heteroaryl, each of which is unsubstituted or substituted by one or more substituents R,
R is halogen; C_1–C_6alkyl; C_3–C_6cycloalkyl; C_1–C_4haloalkyl; C_1–C_4alkoxy; hydroxyl; phenyl, benzyloxy or aryloxy, each of which is unsubstituted or substituted by halogen, C_1–C_4alkyl, C_1–C_6alkoxy, trifluoromethyl or trifluoromethoxy; C_1–C_4haloalkoxy; cyano; nitro; mercapto; C_1–C_4alkylthio; NR_3R_4; $CONR_3$ R_4; cyanomethyl; $SO_2NR_3R_4$; COR_5 or $COOR_5$,
R_3 and R_4 independently of one another are C_1–C_4alkyl or R_3 and R_4 together with the N atom form a 5–7-membered ring which can additionally contains 0–2 hetero atoms, and
R_5 is hydroxyl, C_1–C_4alkyl or aryl.

18. A method for controlling or preventing fungus infestation on plants, parts of plants or the locus where they are growing which comprises the application of a compound of the formula I according to claim 1.

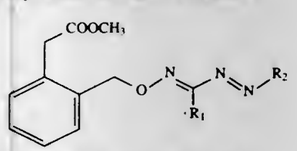
21. A keto ester of formula VI



VI

in which R_1 and R_2 are as defined in claim 1.

22. A phenyl acetate derivative of formula X



X

in which R_1 and R_2 are as defined in claim 1.

5,554,736

AZO DYES CONTAINING A 2-(ARYLSULPHONYLAMINO)PYRIMIDINE RADICAL

Jordi B. Barra, c/Narcis Monturiol 64, 1.3., El Prat de Llobregat/Barcelona, and Jose R. Sorolla, Avenida Carrilet 121, 4.1., L'Hospitalet de Llobregat/Barcelona, both of Spain

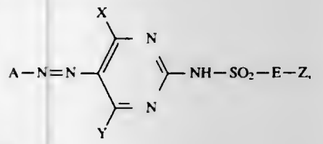
Division of Ser. No. 430,794, Apr. 28, 1995, which is a continuation of Ser. No. 212,087, Mar. 14, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 471,432

Claims priority, application United Kingdom, Mar. 16, 1993, 9305374

Int. Cl.[6] C09B *31/16;31/02;* **D06P** *1/39;3/32*

U.S. Cl. 534—755 **10 Claims**

1. A compound of formula



(II)

wherein
A signifies the radical of a diazo component,
X signifies X_1 or X',
Y signifies Y_1 or Y',
X' signifies C_{1-4}-alkoxy, a mono- or di-(C_{1-4}-alkyl)-amino group, an acylamino group or a carboxymethylamino group,
Y' signifies C_{1-4}-alkoxy, a mono- or di-(C_{1-4}-alkyl)-amino group, an acylamino group or a carboxymethylamino group,
Z signifies a primary amino group or Z_1,
Z_1 signifies hydroxy, C_{1-4}-alkoxy, a mono- or di-(C_{1-4}-alkyl)-amino group, an acylamino group, a carboxymethylamino group or a group —N=N—B,
B signifies the radical of a coupling component
E signifies an aromatic bivalent radical,
X_1 signifies hydroxy or a primary amino group and
Y_1 signifies hydroxy or a primary amino group,
or a mixture of compounds of formula (II).

5,554,737

DOUBLED ACID AZO DYES WITH A HYDROXYPYRIDONE COUPLING COMPONENT

Gunther Lamm, Haßloch; Helmut Reichelt, Neustadt, and Matthias Wiesenfeldt, Mutterstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

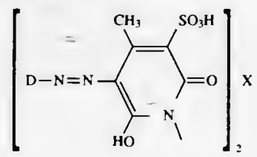
Filed May 2, 1995, Ser. No. 432,815

Claims priority, application Germany, May 7, 1994, 44 16 266.9

Int. Cl.[6] C09B *31/153;33/12;* **D06P** *1/39;1/06*

U.S. Cl. 534—758 **7 Claims**

1. An azo dye of the formula I



(I)

where
D is the radical of a diazo component, and
X is C_2–C_8-alkylene with or without interruption by an ether oxygen atom,
in the form of the free acid or its salts.

5,554,738

ACYL-ARYL DISAZO HAVING A 6-UREIDO-L-HYDROXY-NAPHTHALENE-3-SULFONIC ACID COUPLING OCMPONENT

Jean-Marie Adam, Rosenau, France, and Adolf Käser, Bottmingen, Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

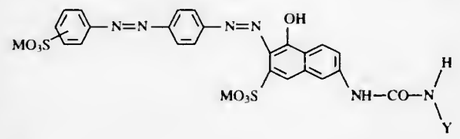
Continuation of Ser. No. 492,247, Mar. 9, 1990, abandoned, which is a continuation of Ser. No. 182,612, Apr. 18, 1988, abandoned. This application Oct. 18, 1991, Ser. No. 781,634

Claims priority, application Switzerland, Apr. 27, 1987, 1594/87

Int. Cl.[6] C09B *31/08*

U.S. Cl. 534—829 **5 Claims**

1. A disazo dye of the formula



wherein
Y is unsubstituted phenyl and M is a colourless cation.

5,554,739

PROCESS FOR PREPARING CARBON MATERIALS WITH DIAZONIUM SALTS AND RESULTANT CARBON PRODUCTS

James A. Belmont, Acton, Mass., assignor to Cabot Corporation, Boston, Mass.

Filed Dec. 15, 1994, Ser. No. 356,653

Int. Cl.[6] C07C *245/02;245/04*

U.S. Cl. 534—885 **19 Claims**

1. A process for preparing a carbon product having an organic group attached to a carbon material comprising the step of:

reacting at least one diazonium salt with a carbon material selected from a graphite powder, a graphite fiber, a carbon fiber, a carbon cloth, a vitreous carbon product, and an activated carbon product in the absence of an externally applied electric current sufficient to reduce the diazonium salt.

18. A carbon product prepared according to the process of claim 1.

5,554,740

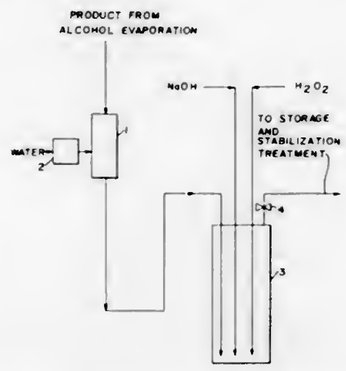
CONTINUOUS BLEACHING OF ALKYLPOLYGLYCOSIDES

Patrick M. McCurry, Jr., Lansdale, Pa.; Robert L. Klein, Jr., Libertyville, Ill.; Michael W. Gibson, Fairfield, Ohio; James D. Beaulieu, and Janet R. Varvil, both of West Chester, Ohio, assignors to Henkel Corporation, Plymouth Meeting, Pa.

Continuation-in-part of Ser. No. 914,363, Jul. 15, 1992, Pat. No. 5,362,861. This application Aug. 23, 1994, Ser. No. 294,689

Int. Cl.[6] C07H *15/04;1/06*

U.S. Cl. 536—4.1 **22 Claims**



1. A method of reducing the color of an alkylpolyglycoside comprising the steps of

(a) providing an aqueous solution of the alkylpolyglycoside;

(b) continuously introducing the aqueous solution from step (a) to a bleaching zone maintained at a bleaching-effective temperature below about 120° C.;

(c) adjusting and continuously maintaining the pH of the aqueous solution in said bleaching zone at a pH of about 10 to about 11.5;

(d) contacting the aqueous solution with a peroxy bleaching agent in an amount effective to bleach and reduce the color of the alkylpolyglycoside; and in the presence of more than about 250 ppm and less than about 1000 ppm Magnesium (Mg); and

(e) continuously removing alkylpolyglycoside from said bleaching zones, wherein the alkylpolyglycoside has a Klett color below about 50, an extinction coefficient color from about 0.025 to about 0.25 at a pH of 7, and a residual bleaching agent level below about 1000 ppm.

5,554,741

PROCESS FOR THE PRODUCTION OF ALKYL AND/OR ALKENYL OLIGOGLUCOSIDES

Franz-Josef Carduck, Haan; Paul Schulz, Wuppertal, and Rainer Eskuchen, Langenfeld, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP93/00444, § 371 Date Sep. 1, 1994, § 102(e) Date Sep. 4, 1904, PCT Pub. No. WO93/18046, PCT Pub. Date Sep. 16, 1993

PCT Filed Feb. 26, 1993, Ser. No. 295,757

Claims priority, application Germany, Mar. 6, 1992, 42 07 101.1

Int. Cl.[6] C07H *1/00;3/04;3/06*

U.S. Cl. 536—18.6 **16 Claims**

1. A process for producing an alkyl or alkenyl oligoglucoside or mixture thereof comprising the steps of: (1) providing a mixture comprised of an aqueous syrup of glucose and at least one fatty alcohol containing from 6 to 22 carbon atoms; (2) forming a water-free suspension by drying said mixture to a residual water content of from about 0.05 to about 0.3% in a turbo dryer having rotating fittings therein; (3) forming an alkyl or alkenyl oligoglucoside or mixture thereof by reacting said water-free suspension in the presence of an acid catalyst.

5,554,742

PREPARATION OF ALKYL GLYCOSIDES

Gerhard Wolf, Mannheim; Alfred Oftring, Bad Durkheim; Georg Schuh, Ludwigshafen; Helmut Wolf, Hassloch; Rudolf Alt, Ludwigshafen; Hans-Heinrich Bechtolsheimer, Dittelsheim-Hessloch, and Dieter Hertel, Leimen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP93/00791, § 371 Date Sep. 15, 1994, § 102(e) Date Sep. 15, 1994, PCT Pub. No. WO93/21196, PCT Pub. Date Oct. 28, 1993

PCT Filed Apr. 1, 1993, Ser. No. 295,795

Claims priority, application Germany, Apr. 10, 1992, 42 12 080.2

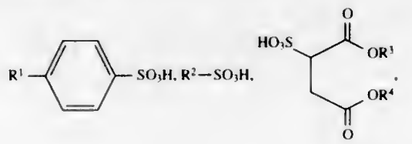
Int. Cl.[6] C07H *1/00;15/04*

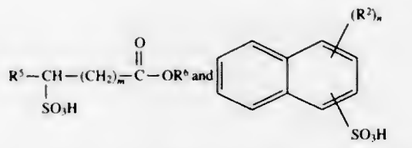
U.S. Cl. 536—18.6 **3 Claims**

1. An emulsion process for preparing alkyl glycosides by reaction of aqueous glycoses having a water content of 10–80% by weight with aliphatic primary alcohols having from 8 to 30 C atoms, which comprises

(a) employing the alcohols and the glycoses in a molar ratio of 2:1–10:1,

(b) using 0.1–5% by weight, based on the amount of the glycoses employed, of an acidic catalyst selected from the group consisting of





wherein R^2 is C_8-C_{22} alkyl, R^2 is C_8-C_{30} alkyl, R^3 is H or C_8-C_{22}-alkyl, R^4 is C_6-C_{22}, alkyl, R^5 is C_4-C_{22}-alkyl, R^6 is C_1-C_{30} alkyl or H, m is an integer from 0 to 10 and n is 1 or 2,

(c) using 1–30% by weight, based on the amount of the glycoses employed, of alkyl glycosides as an emulsifier,

(d) preparing the aqueous glycose to 50°–90° C. and metering the preheated aqueous solution of the glycose with effective mixing into the reaction mixture of alcohol, acidic catalyst and emulsifier in such a manner that an emulsion is formed,

(e) carrying out the reaction in emulsion at from 100° to 150° C. and from 10 to 100 mbar, the water introduced into the reaction mixture and the water formed by the reaction being continuously removed by distillation,

(f) after the reaction has ended, neutralizing the acidic catalyst by addition of a base such that the resulting mixture has a pH of 8–10, then

(g) removing the excess alcohol by distillation at from 0.01 to 10 mbar down to a residual content of less than 5% by weight, based on the amount of alkyl glycoside present, and

(h) bleaching the reaction mixture at pH 8–10 after conversion into an aqueous paste having a content of 30–70% by weight of alkyl glycoside using a compound eliminating active oxygen.

5,554,743

ENDO-1,4-BETA-GLUCANASE GENES AND THEIR USE IN PLANTS

Alan B. Bennett, Davis; Robert L. Fischer, El Cerrito; Coralie Lashbrook, Dixon, all of Calif., and James Giovannoni, Ithaca, N.Y., assignors to The Regents of the University of California, Oakland, Calif.

Division of Ser. No. 271,883, Apr. 7, 1994, which is a continuation-in-part of Ser. No. 687,446, Apr. 18, 1991, Pat. No. 5,328,999, and a continuation-in-part of Ser. No. 511,417, Apr. 20, 1990, Pat. No. 5,168,064. This application May 4, 1995, Ser. No. 434,702

Int. Cl.[6] C12N *15/29;15/55;15/82;9/42*

U.S. Cl. 536—23.6 **5 Claims**

1. An isolated nucleic acid sequence encoding a tomato endoglucanase.

5,554,744

METHOD FOR LOADING SOLID SUPPORTS FOR NUCLEIC ACID SYNTHESIS

Nandkumar Bhongle, and Jin-Yan Tang, both of Shrewsbury, Mass., assignors to Hybridon, Inc., Worcester, Mass.

Filed Sep. 23, 1994, Ser. No. 311,156

Int. Cl.[6] C07H *21/00*

U.S. Cl. 536—25.3 **27 Claims**

1. A method of loading a functionalized solid support for oligonucleotide synthesis comprising simultaneously contacting in a solvent the functionalized solid support with diisopropylcarbodiimide, a nucleoside having a 3' linker group attached, and an acid catalyst.

5,554,745

ALDEHYDE CATIONIC DERIVATIVES OF GALACTOSE CONTAINING POLYSACCHARIDES USED AS PAPER STRENGTH ADDITIVES

Chung-Wai Chiu, Westfield; Roger Jeffcoat, Bridgewater; Matthew Henley, Somerset, and Leroy Peek, Milford, all of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Continuation of Ser. No. 883,319, May 14, 1992. This application Apr. 21, 1995, Ser. No. 426,808

Int. Cl.[6] D21H *21/00*

U.S. Cl. 536—52 **8 Claims**

1. In the method of making paper having dry strength, wet strength, temporary wet strength or combinations thereof, the step which consists essentially of adding, as a strength aid, to the pulp containing stock at any stage prior to forming a web, an effective amount of an aldehyde cationic polysaccharide derivative, that is obtained from a naturally occurring galactose containing polysaccharide which is cationized and subsequently oxidized by reacting with galactose oxidase to provide an aldehyde group in the C_6 position of the galactose unit and wherein the aldehyde cationic polysaccharide derivative has a cationic content represented by a D.S. of from about 0.005 to 1.5 and an aldehyde content represented by a D.E. of from about 5 to 40.

5,554,746

LACTAM NUCLEIC ACIDS

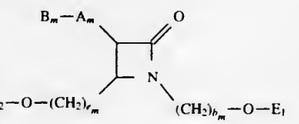
Vasulinga Ravikumar, and Venkatraman Mohan, both of Carlsbad, Calif., assignors to ISIS Pharmaceuticals, Inc., Carlsbad, Calif.

Filed May 16, 1994, Ser. No. 243,368

Int. Cl.[6] C07D *205/08;403/04;473/34;* **C07F** *9/24*

U.S. Cl. 540—200 **6 Claims**

1. A compound having the structure:



wherein

B_m is adenine, guanine, thymine, cytosine, or uracil;

A_m is $(CR_6R_7)_x$ where R_6 and R_7 are independently selected from the group consisting of hydrogen, $(C_2$–$C_6)$alkyl, aryl, aralkyl, hydroxy, $(C_1$–$C_6)$alkoxy, $(C_1$–$C_6)$alkylthio, NR_3R_4 and SR_5, where each of R_3 and R_4 is independently selected from the group consisting of hydrogen, $(C_1$–$C_4)$alkyl, $(C_1$–$C_4)$alkoxy, alkylthio-substituted $(C_1$–$C_4)$alkyl, alkythoio and amino; and R_5 is hydrogen, (C_1C_6)alkyl, hydroxy-, alkoxy-, or alkythio-subsituted $(C_1$–$C_6)$alkyl;

x is an integer from 0 to 10;

E1and E2 , independently, are H or hydroxyl protecting group;

e_m is 0 or an integer from 1 to 6;

b_m is 0 or an integer from 1 to 6.

5,554,747

OPTICAL AMPLIFIER

5,554,749

FUNCTIONALIZED MACROCYCLIC LIGANDS FOR

c. R^5 is hydrogen or loweralkyl; or the optical isomers thereof, or pharmaceutically acceptable salts thereof.

alkoxy, NO_2, CN, OCF_3, $ClSO_2$, SO_3H, $(C_1$–$C_4)$-alkanoyloxy, $(C_1$–$C_4)$-alkoxycarbonyl and/or $(C_1$–$C_2)$-alkylenedioxy,

R^3 is, if n=1, hydrogen, CH_3, which is unsubstituted or substi-

5,554,747

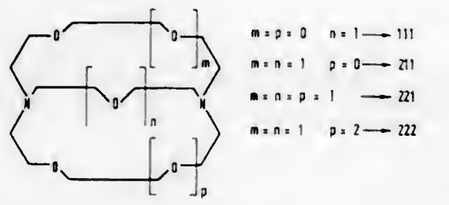
OPTICAL AMPLIFIER

Prem K. Sharma; Arie R. Van Doorn, and Aemilianus G. J. Staring, all of Einhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 226,184, Apr. 11, 1994, Pat. No. 5,490,010. This application Jun. 7, 1995, Ser. No. 488,307

Int. Cl.[6] C07D *207/22*

U.S. Cl. 540—456 **2 Claims**



1. A compound having the general formula

$$\{RE(dpa)_3\}^{3-}Cat_3^{+} \quad (5)$$

where RE is a rare earth ion, dpa stands for 2,6-pyridine dicarboxylic acid, and Cat is a cation.

5,554,748

ADDUCTS OF MACROCYCLIC CHELANTS

Paul F. Sieving, San Jose, and Alan D. Watson, Campbell, both of Calif., assignors to Nycomed Salutar, Inc., Wayne, Pa.

Division of Ser. No. 494,865, Jan. 16, 1990, Pat. No. 5,364,613, which is a continuation-in-part of Ser. No. 335,162, Apr. 7, 1989, abandoned. This application Dec. 30, 1993, Ser. No. 175,989

Int. Cl.[6] C07D *255/02;257/02;273/00*

U.S. Cl. 540—465 **5 Claims**

1. A mixed carboxycarbonic anhydride adduct of a macrocyclic chelant selected from the group consisting of the residues of 1,4,7,10-tetraazacyclododecanetetraacetic acid (DOTA), 1,4,7,10-tetraazacyclododecane-1,4,7-triacetic acid (DO3A), 1-oxa-4,7,10-triazacyclododecane-triacetic acid (OTTA), 1,4,7-triazacyclononanetriacetic acid (NOTA), 1,4,8,11-tetraazacyclotetradecanetetraacetic acid (TETA), DOTA-N(2-aminoethyl)amide and DOTA-N(2-aminophenethyl)amide formed by a process comprising the following steps:

(a) dispersing a carboxylic macrocyclic chelant in a polar, anhydrous solvent;

(b) adding a base with a pKa sufficient to remove all carboxyl protons to create an amine salt of said chelant soluble in said solvent;

(c) chilling the reaction mixture to between about 5° C. and 55° C. above the freezing point of the solvent; and

(d) adding a substantially equimolar amount of chilled alkylhaloformate under anhydrous conditions while approximately maintaining the temperature of step (c) for a period of time sufficient for substantially complete reaction to form a slurry containing the mixed carboxycarbonic anhydride of the chelant.

5,554,749

FUNCTIONALIZED MACROCYCLIC LIGANDS FOR IMAGING APPLICATIONS

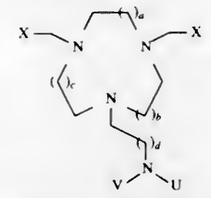
Rebacca A. Wallace, Manchester, and Dennis A. Moore, Ferguson, both of Mo., assignors to Mallinckrodt Medical, Inc.

Filed Jan. 14, 1994, Ser. No. 182,251

Int. Cl.[6] C07D *255/02;* **C07F** *5/00*

U.S. Cl. 540—474 **21 Claims**

1. A compound of the formula:



wherein U is $-(CH_2)_nX$ or $-(CH_2)_nNR_1(CH_2)X$; R_1 is hydrogen, C_1–C_8 alkyl, C_1–C_8 hydroxyalkyl or C_1–C_8 alkoxyalkyl; V is $-(CH_2)_nX-$, $-(CH_2)_nNR_1(CH_2)X$, hydrogen, C_1–C_8 alkyl, C_1–C_8 hydroxyalkyl or C_1– C_8 alkoxyalkyl; V and R_1 may jointly be $-(CH_2)_m-$ to form a heterocyclic ring; X is $-CO_2H$, $-PO_3H_2$, $-SO_3H$ or $-CONHOH$; a, b, c, d, n and m may be the same or different and are from one to about ten, preferably from one to about three.

5,554,750

(PYRROLIDINYL)PHENYL CARBAMATES AND RELATED COMPOUNDS

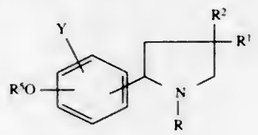
David G. Wettlaufer, Phillipsburg, and Peter A. Nemoto, Raritan, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 370,944, Jan. 10, 1995, which is a division of Ser. No. 248,785, May 25, 1994, Pat. No. 5,405,845, which is a division of Ser. No. 208,554, Mar. 10, 1994, Pat. No. 5,338,739. This application May 8, 1995, Ser. No. 438,124

Int. Cl.[6] C07D *413/06;417/06;401/06;209/48*

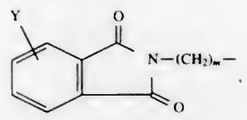
U.S. Cl. 544—141 **16 Claims**

1. A compound of the formula

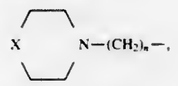


wherein:

a. R is a group of the formula



or a group of the formula



wherein X is $-CH_2-$, $-O-$, or $-S-$, Y is hydrogen, loweralkyl, loweralkoxy, hydroxy, halogen, or trifluoromethyl, and m is 1 to 5, n is 1 to 5;

b. R^1 and R^2 are independently hydrogen or loweralkyl;

c. R^5 is hydrogen or loweralkyl; or the optical isomers thereof, or pharmaceutically acceptable salts thereof.

5,554,751

AMINOUREIDOFULLERENE AND AMINOTHIOUREIDOFULLERENE DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Klaus-Dieter Kampe, Bad Soden, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Nov. 10, 1994, Ser. No. 337,937

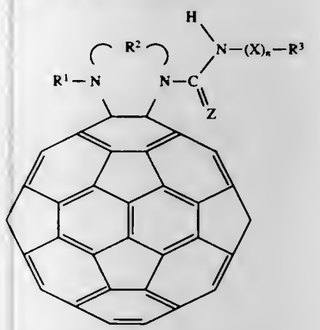
Claims priority, application Germany, Nov. 12, 1993, 43 38 672.5

Int. Cl.[6] C07D *225/08;223/14;221/18*

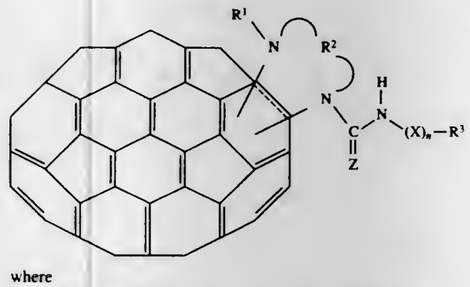
U.S. Cl. 544—338 **5 Claims**

1. A compound of the formula I or II

I



II



where

R^1 is $(C_1$–$C_4)$-alkyl,

R^2 is $(C_2$–$C_4)$-alkylene or 1,2-cyclo-$(C_3$–$C_7)$-alkylene,

n is an integer zero or 1,

Z is O or S,

X is $(C_1$–$C_{12})$-alkylene, $(C_3$–$C_{12})$-alkenylene or $(C_6$–$C_{10})$arylene, where alkylene and alkenylene is unsubstituted or substituted by $(C_1$–$C_4)$-alkoxy, $(C_1$–$C_4)$-alkylthio, Cl, Br, I, $(C_1$–$C_4)$-alkoxycarbonyl, $(C_6$–$C_{10})$-aryl and/or $(C_6$–$C_{10})$-aryl$(C_1$–$C_4)$-alkyl, where aryl is unsubstituted or is monosubstituted or polysubstituted independently of one another by halogen, $(C_1$–$C_4)$-alkyl, $(C_1$–$C_4)$-alkoxy, CF_3, CN or NO_2,

and where arylene is unsubstituted or monosubstituted or polysubstituted independently of one another by halogen, $(C_1$–$C_4)$-alkyl, $(C_1$–$C_4)$-alkoxy, $(C_1$–$C_4)$-alkylthio, CF_3, OCF_3, CN, NO_2 and/or $(C_1$–$C_4)$-alkoxycarbonyl,

R^3 is, if n is zero, $(C_1$–$C_{12})$-alkyl, $(C_3$–$C_{11})$-alkenyl, $(C_3$–$C_8)$-alkynyl, $(C_1$–$C_8)$-perfluoroalkyl, $(C_6$–$C_{14})$-aryl or trimethylsilyl, where alkyl, alkenyl and alkynyl are unsubstituted or monosubstituted or polysubstituted independently of one another by $(C_1$–$C_4)$-alkoxy, $(C_1$–$C_4)$-alkylthio, phenyloxy, phenylthio, halogen, $ClSO_2$ and/or $(C_1$–$C_4)$-alkoxycarbonyl, and aryl is unsubstituted or monosubstituted or polysubstituted independently of one another by halogen, $(C_1$–$C_4)$-alkyl which is unsubstituted or substituted by halogen, $(C_1$–$C_4)$-alkoxy, NO_2, CN, OCF_3, $ClSO_2$, SO_3H, $(C_1$–$C_4)$-alkanoyloxy, $(C_1$–$C_4)$-alkoxycarbonyl and/or $(C_1$–$C_2)$-alkylenedioxy,

R^3 is, if n=1, hydrogen, CH_3 which is unsubstituted or substituted by halogen,

$CH{=}CH_2$, $(C_1$–$C_4)$-alkoxy, $(C_1$–$C_4)$-alkylthio, halogen, $(C_6$–$C_{14})$-aryl, aryloxy, $(C_6$–$C_4)$-aryl-$(C_1$–$C_4)$-alkyloxy, trimethylsilyloxy, C(O)—NHR', C(O)NR'$_2$, COOR', where R' is $(C_1$–$C_4)$-alkyl,

$(C_1$–$C_6)$-alkanoyloxy, SO_2R^5, OSO_2R^5 where R^5 is $(C_1$–$C_4)$-alkyl, $(C_6$–$C_{10})$-aryl or $(C_1$–$C_4)$-alkyl-$(C_6$–$C_{10})$-aryl, or —N=C=Z where Z is as defined above,

and aryl is unsubstituted or monosubstituted or polysubstituted independently of one another by halogen, $(C_1$–$C_4)$-alkoxy, $(C_1$–$C_4)$-alkylthio, $(C_1$–$C_4)$-alkyl which is unsubstituted or substituted by halogen, NO_2, CN, $ClSO_2$, SO_3H, $(C_1$–$C_4)$-alkanoyloxy, $(C_1$–$C_4)$-alkoxycarbonyl or $(C_6$–$C_{10})$aryloxy.

5,554,752

SPIROVESAMICOLS

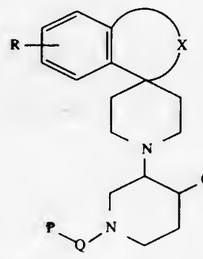
Simon M. N. Efange, Plymouth, Minn., and Stanley M. Parsons, Santa Barbara, Calif., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Division of Ser. No. 131,887, Oct. 5, 1993, Pat. No. 5,457,207. This application Mar. 14, 1995, Ser. No. 405,491

Int. Cl.[6] C07D *401/04*

U.S. Cl. 546—17 **1 Claim**

1. A compound capable of binding to a vesamicol receptor selected from:



wherein

X is —CH=CH—, $-CH_2CH_2-$, $(CH_2)_3$, —CY=CZ—, —CHY—CHZ—;

Y is H, halogen;

Z is H, halogen;

R is H or halogen;

P is phenyl, substituted phenyl; and

Q is an alkylene chain having between 0 and 4 carbons.

5,554,753

CATALYTIC ENANTIOSELECTIVE SYNTHESIS OF α-AMINO ACID DERIVATIVES BY PHASE-TRANSFER CATALYSIS

Martin J. O'Donnell, Indianapolis, Ind.; Shengde Wu, Urbana, Ill.; Irena Esikova, El Cerrito, Calif., and Aiqiao Mi, Chengdu, China, assignors to Indiana University Foundation, Bloomington, Ind.

Filed Aug. 25, 1993, Ser. No. 111,661

Int. Cl.[6] C07D *487/08;471/08*

U.S. Cl. 546—134 **7 Claims**

1. A compound useful as an enantioselective catalyst, comprising an N-substituted O-substituted cinchoninium or cinchonidinium halide or a 3a,3b-dihydro N-substituted O-substituted cinchoninium or cinchonidinium halide, wherein the N-substituent is alkyl-aryl wherein the alkyl is C_1 to C_5 and the aryl is up to C_{30}, and the O-substituted is C_1 to about C_{10} alkyl or alkenyl.

5,554,754

AZODICARBOXYLIC ACID DERIVATIVES CONTAINING

to prepare a compound of the formula

wherein R^{10} and R^{11} are alkyl or pharmaceutically acceptable acid addition salts thereof, and one or more therapeutically inert exipi-

5,554,758

METHOD FOR PRODUCING ETHERS

5,554,754

AZODICARBOXYLIC ACID DERIVATIVES CONTAINING HINDERED AMINE MOIETIES AS POLYMER STABILIZERS

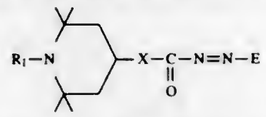
Ramanathan Ravichandran, Nanuet, and Ambelal R. Patel, Scarsdale, both of N.Y., assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Division of Ser. No. 316,272, Sep. 30, 1994, Pat. No. 5,470,900, which is a continuation-in-part of Ser. No. 224,616, Apr. 7, 1994, Pat. No. 5,300,828, which is a continuation-in-part of Ser. No. 132,881, Oct. 5, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 463,453

Int. Cl.[6] C07D *211/00;* **C08K** *5/34*

U.S. Cl. 546—184 **15 Claims**

1. A compound which is an azo derivative of formula IV

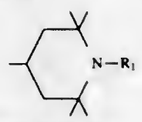


IV

where

R_1 is hydrogen, oxyl, hydroxyl, alkyl of 1 to 8 carbon atoms, alkyl of 2 to 4 carbon atoms substituted by one hydroxyl group, allyl, benzyl, benzyl substituted by one of two alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 18 carbon atoms, cycloalkoxy of 5 to 12 carbon atoms or alkanoyl of 1 to 8 carbon atoms;

X is —O— or $—NR_2—$ where R_2 is hydrogen, alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, phenylalkyl of 7 to 15 carbon atoms, alkyl of 2 to 4 carbon atoms substituted by one alkoxy group of 1 to 12 carbon atoms or a group of formula II



II

in which R_1 is as defined above; and

E is alkyl of 1 to 20 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, aryl of 6 to 14 carbon atoms or phenylalkyl of 7 to 22 carbon atoms, or

E is $—CONHR_4$, $—CSNHR_5$, $—COR_6COR_7$, $—COR_8CONHR_9$, $—COR_{10}$, $—COOR_{11}$ or $—SO_2R_{12}$,

in which R_4, R_5, R_7, R_9, R_{10}, R_{11} and R_{12} are each independently of the other hydrogen, alkyl of 1 to 20 carbon atoms, cycloalkyl of 5 to 12 carbon atoms, aryl of 6 to 14 carbon atoms or phenylalkyl of 7 to 22 carbon atoms; and

R_6 and R_8 are each independently of the other an alkylene of 1 to 12 carbons.

5,554,755

2-AMINO-3-AROYL-BENZO{β}THIOPHENES AND METHODS FOR PREPARING AND USING SAME TO PRODUCE 6-HYDROXY-2-(4-HYDROXYPHENYL)-3-[4-(2-AMINOETHOXY)-BENZOYL]BENZO{β}THIOPHENES

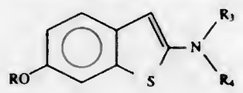
Alexander G. Godfrey, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 257,859, Jun. 10, 1994, Pat. No. 5,466,810. This application Mar. 15, 1995, Ser. No. 404,659

Int. Cl.[6] C07D *333/66*

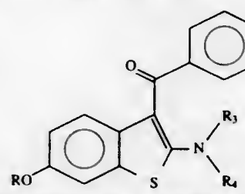
U.S. Cl. 546—202 **4 Claims**

1. A method of using a compound of formula (A)



(A)

to prepare a compound of the formula



(B)

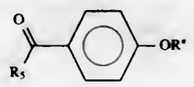
or the pharmaceutically acceptable salts thereof;

wherein R is C_1–C_6 alkyl;

R^* is C_1–C_6 alkyl, amino C_1–C_6 alkyl, or a group of the formula $—(CH_2)_nNR_1R_2$, wherein n is 1 to 4, and R_1 and R_2 are independently C_1–C_6 alkyl, or combine to form C_4–C_6 polymethylene or $—(CH_2)_2O(CH_2)_2—$; and

R_3 and R_4 are independently C_1–C_6 alkyl or combine to form C_4–C_6 polymethylene;

comprising acylating a compound of the formula (A) with an acylating agent of the formula



wherein R_5 is bromo, iodo, chloro, or a group forming an active ester.

5,554,756

AMINO ACID DERIVATIVES

Bairaj K. Handa, Welwyn Garden City; Peter J. Machin, London; Joseph A. Martin, West Common; Sally Redshaw, Stevenage, and Gareth J. Thomas, Welwyn, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

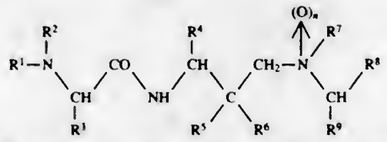
Division of Ser. No. 916,812, Jul. 20, 1992, Pat. No. 5,446,161, which is a division of Ser. No. 362,621, Jun. 5, 1989, Pat. No. 5,157,041. This application Feb. 17, 1995, Ser. No. 391,380

Claims priority, application United Kingdom, Jun. 13, 1988, 8813940; Apr. 10, 1989, 8908035

Int. Cl.[6] C07D *211/32;* **A61K** *31/445*

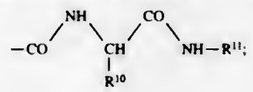
U.S. Cl. 546—225 **1 Claim**

1. A pharmaceutical composition comprising a compound of the formula



I

wherein n is zero or 1; R^1 is alkoxycarbonyl, aralkoxycarbonyl, alkanoyl, cycloalkylcarbonyl, aralkanoyl, or aroyl; R^3 is alkyl, cycloalkyl, aryl, aralkyl, cyanoalkyl, alkylsulphinylalkyl, carbamoylalkyl or alkoxycarbonylalkyl or, when n is zero, R^3 is additionally alkylthioalkyl or, when n is 1, R^3 can also be alkylsulphonylalkyl; R^4 is alkyl, cycloalkyl, cycloalkylalkyl, aryl or aralkyl; R^5 is hydrogen and R^6 is hydroxy or R^5 and R^6 together are oxo; R^7 and R^8 together are tetramethylene group which is optionally substituted by hydroxy, alkoxycarbonylamino or acylamino; and R^9 is alkoxycarbonyl, monoalkylcarbamoyl, monoaralkylcarbamoyl, monoarylcarbamoyl or a group of the formula



(b)

wherein R^{10} and R^{11} are alkyl or pharmaceutically acceptable acid addition salts thereof, and one or more therapeutically inert excipients.

5,554,757

PROCESS FOR THE PREPARATION OF IMIDAZOPYRIDINE DERIVATIVES, AND INTERMEDIATES THEREFORE

Yoshio Urawa; Ken Furukawa; Toshikazu Shimizu; Yoji Yamagishi, all of Ibaraki; Tomio Tsurugi, Chiba, and Tomio Ichino, Ibaraki, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

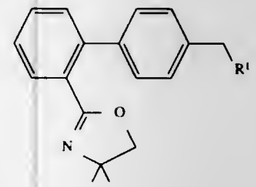
Division of Ser. No. 256,869, Aug. 5, 1994. This application Jun. 6, 1995, Ser. No. 468,078

Claims priority, application Japan, Dec. 7, 1992, 4-351139; Dec. 16, 1992, 4-353865; Jun. 17, 1993, 5-169805; Jun. 17, 1993, 5-169823; Jun. 17, 1993, 5-169824; Jun. 17, 1993, 5-169825

Int. Cl.[6] C07D *263/14*

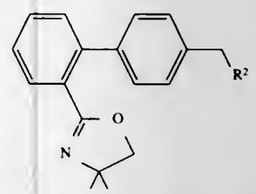
U.S. Cl. 548—237 **8 Claims**

1. A biphenyloxazoline derivative (I) having the following formula:



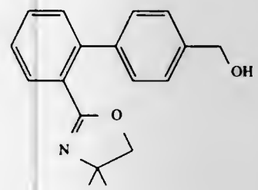
wherein R^1 represents a hydroxyl group, a lower alkylsulfonyloxy group, or an arylsulfonyloxy group.

2. A process for the preparation of an active biphenyloxazoline derivative (III) represented by the following formula:



(III)

wherein R^2 represents a lower alkylsulfonyloxy group, an arylsulfonyloxy group or a halogen atom, which comprises subjecting a hydroxymethyl-biphenyloxazoline derivative (II) having the following formula to sulfonylation or halogenation:



(II)

5,554,758

METHOD FOR PRODUCING ETHERS

Yukio Mizuno, Toyono-gun, and Michiro Arita, Nara, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 352,184, Dec. 1, 1994, abandoned, which is a continuation of Ser. No. 121,291, Sep. 15, 1993, abandoned, which is a continuation of Ser. No. 855,798, Mar. 23, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 474,133

Claims priority, application Japan, Mar. 25, 1991, 3-060208

Int. Cl.[6] C07D *213/28;213/30*

U.S. Cl. 546—250 **6 Claims**

1. A method of preparing an ether compound of the formula:

$A—CH_2CH_2—O—B$

wherein A represents 5-ethyl-2-pyridyl and B represents 4-formylphenyl, which comprises reacting a compound of the formula:

$A—CH_2CH_2—X$

wherein A is as defined above and X represnts methylsulfonyloxy or p-toluene sulfonyloxy with a compound of the formula:

$MO—B$

wherein M represents potassium and B is as defined above in a non-aqueous solvent.

5,554,759

BENZOTRIAZOLE BASED UV ABSORBING MONOMERS AND PHOTOGRAPHIC ELEMENTS CONTAING POLYMERS FORMED THEM

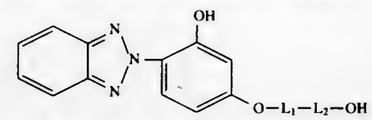
Lal C. Vishwakarma, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 313,492, Sep. 27, 1994, Pat. No. 5,455,152. This application Mar. 9, 1995, Ser. No. 401,739

Int. Cl.[6] C07D *249/20*

U.S. Cl. 548—260 **5 Claims**

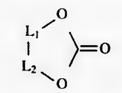
1. A method of making a compound of formula (D):



(D)

wherein: the benzo ring and the hydroxy substituted phenyl ring may each be further substituted with 1 to 4 substituents which are, independently, 1 to 18 carbon alkyl, aryl, heteroaryl, aryloxy or alkoxy, or halogen, or the benzo may have a benzo, pyrrolo, furyl or thienyl ring fused thereto, and the alkyl and alkoxy substituents may have from 1 to 5 intervening oxygen, sulfur or nitrogen atoms; L_1 and L_2 are, independently, methylene or methylene substituted with 1–6 carbon alkyl, alkoxy, or halogen;

the method comprising reacting the dihydroxy compound corresponding to formula (D) with ethylene carbonate of the formula:



wherein L_1 and L_2 are the same as previously defined.

5,554,760

2-(2-HYDROXY-3-α-CUMYL-5-NONYLOR 5-DODECYLPHENYL)-2H-BENZOTRIAZOLE

selected from the group consisting of fluorine, chlorine, and bromine, or represents C_3–C_6-cycloalkyl, or C_3–C_6-cycloalkyl

R is hydrogen or a C_1–C_4-alkyl, or a ω-(C_1–C_4)alkoxy(C_2–C_4)alkyl, or a ω-(C_2–C_4)alkanoyloxy

5,554,765

BISIMIDE COMPOUNDS, POLYIMIDE RESIN

5,554,760
2-(2-HYDROXY-3-α-CUMYL-5-NONYLOR 5-DODECYLPHENYL)-2H-BENZOTRIAZOLE

Roland A. E. Winter, Armonk; Ramanathan Ravichandran, Nanuet; Mark S. Holt, West Nyack; Volker H. von Ahn, Mahopac; Joseph E. Babiarz, Amawalk, all of N.Y., and David G. Leppard, Marly, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 424,843, Apr. 19, 1995. This application Jun. 6, 1995, Ser. No. 466,851
Int. Cl.[6] C07D *249/20*
U.S. Cl. 548—260 **2 Claims**

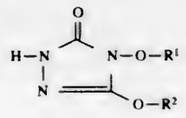
1. The compound which is 2-(2-hydroxy-3-α-cumyl-5-nonylphenyl)-2H-benzotriazole.

5,554,761
HERBICIDAL SULPHONYLAMINOCARBONYLTRIAZOLINONES HAVING TWO SUBSTITUENTS BONDED VIA OXYGEN

Wilhelm Haas, Pulheim; Klaus-Helmut Müller, Düsseldorf; Klaus König, Odenthal; Hans-Joachim Santel, Leverkusen; Klaus Lürssen, and Robert R. Schmidt, both of Bergisch Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 174,495, Dec. 28, 1993, Pat. No. 5,488,028, which is a division of Ser. No. 945,194, Sep. 15, 1992, Pat. No. 5,300,480, which is a continuation-in-part of Ser. No. 31,426, Mar. 15, 1993, Pat. No. 5,405,970, which is a continuation-in-part of Ser. No. 816,365, Dec. 30, 1991, Pat. No. 5,241,074, which is a division of Ser. No. 692,439, Apr. 29, 1991, Pat. No. 5,094,683, which is a division of Ser. No. 556,052, Jul. 20, 1990, Pat. No. 5,057,144, which is a continuation-in-part of Ser. No. 337,775, Apr. 13, 1989, abandoned. This application Oct. 19, 1995, Ser. No. 547,698
Claims priority, application Germany, May 9, 1988, 38 15 769.9; Oct. 12, 1989, 39 34 081.3; Sep. 25, 1991, 41 31 842.0
Int. Cl.[6] C07D *249/12*
U.S. Cl. 548—263.6 **6 Claims**

1. A triazolinone of the formula



in which

R^1 represents C_1–C_6-alkyl, C_1–C_6-alkyl substituted by one or more members selected from the group consisting of fluorine, chlorine, bromine, cyano, C_1–C_4-alkoxy, C_1–C_4-alkylcarbonyl and C_1–C_4-alkoxycarbonyl, or represents C_3–C_6-alkenyl or C_3–C_6-alkinyl, or represents C_3–C_6-alkenyl or C_3–C_6-alkinyl each of which is substituted by one or more members selected from the group consisting of fluorine, chlorine and bromine, or represents C_3–C_7-cycloalkyl or C_4–C_7-cycloalkenyl, or represents C_3–C_7-cycloalkyl or C_4–C_7-cycloalkenyl each of which is substituted by one or more members selected from the group consisting of fluorine, chlorine, bromine and C_1–C_4-alkyl, or represents phenyl-C_1–C_3-alkyl, or phenyl C_1–C_3-alkyl which is substituted by one or more members selected from the group consisting of fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy and C_1–C_4-alkoxy-carbonyl, and

R^2 represents C_1–C_6-alkyl or C_1–C_6-alkyl which is substituted by one or more members selected from the group consisting of fluorine, chlorine, bromine, cyano, C_3–C_6-cycloalkyl, C_1–C_4alkoxy and C_1–C_4-alkoxycarbonyl, or represents C_3–C_6-alkenyl or C_3–C_6-alkinyl, or represents C_3–C_6-alkenyl or C_3–C_6-alkinyl each of which is substituted by one or more members selected from the group consisting of fluorine, chlorine, and bromine, or represents C_3–C_6-cycloalkyl, or C_3–C_6-cycloalkyl which is substituted by one or more members selected from the group consisting of fluorine, chlorine, bromine and C_1–C_4-alkyl, or represents cyclohexenyl, or represents phenyl-C_1–C_3-alkyl, or phenyl-C_1–C_3-alkyl which is substituted by one or more members selected from the group consisting of fluorine, chlorine, bromine, cyano, nitro, C_1–C_4-alkyl, trifluoromethyl, C_1–C_4-alkoxy and C_1–C_4-alkoxy-carbonyl.

5,554,762
PROCESS FOR THE PREPARATION OF 1,1-METHANE-BIS (HYDANTOIN)

Jeffrey D. Robbins, Berkeley, Calif., assignor to Zeneca Limited, London, England

Filed May 15, 1995, Ser. No. 442,231
Int. Cl.[6] C07D *233/40;233/72*
U.S. Cl. 548—314.1 **7 Claims**

1. A method for the synthesis of 1,1'-methane-bis(hydantoin) comprising: reacting hydantoin with a formaldehyde source selected from the group consisting of paraformaldehyde, a 37% formaldehyde solution, formaldehyde gas and a formaldehyde alcohol complex, wherein about two moles of hydantoin are used per mole of said formaldehyde source, in an aqueous medium containing about 35–90 % by weight initial water content and a strong protic acid, wherein the concentration of the strong protic acid is between 3 to 6 mole equivalent of acid per mole equivalent of formaldehyde source.

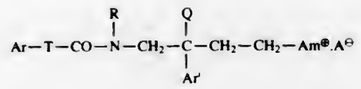
5,554,763
1-AZONIABICYCLO[2.2.1] HEPTANES AND PHARMACEUTICAL COMPOSITIONS IN WHICH THEY ARE PRESENT

Xavier Emonds-Alt, Combeilhaux; Patrick Gueule, Teyran; Vincenzo Proietto, Saint George d'Orques, and Didier Van Broeck, Marviel les Montpellier, all of France, assignors to Sanofi, Paris, France

Division of Ser. No. 239,417, May 6, 1994, Pat. No. 5,494,616, which is a continuation-in-part of Ser. No. 129,311, Sep. 30, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 470,249
Claims priority, application France, Sep. 30, 1992, 92 12083
Int. Cl.[6] C07D *487/02*
U.S. Cl. 548—453 **8 Claims**

1. A quaternary basic amide of the formula

(I)



in which

Ar is an optionally substituted mono-, di- or tri-cyclic aromatic or heteroaromatic group;

T is a direct bond, a hydroxymethylene group, an alkoxymethylene group in which the alkoxy group is C_1–C_4, or a C_1–C_5-alkylene group;

Ar' is a phenyl which is unsubstituted or mono- or polysubstituted by a substituent selected from: a halogen atom, preferably a chlorine or fluorine atom, a trifluoromethyl, a C_1–C_4-alkoxy or a C_1–C_4-alkyl, said substituents being identical or different, a thienyl, a benzothienyl, a naphthyl or an indolyl;

R is hydrogen or a C_1–C_4-alkyl, or a ω-(C_1–C_4)alkoxy(C_2–C_4)alkyl, or a ω-(C_2–C_4)alkanoyloxy (C_1–C_4)alkyl;

Q is hydrogen;

or else Q and R together form a 1,2-ethylene, 1,3-propylene or 1,4-butylene group;

$Am^{\oplus}$ is the radical

in which X_1, X2 and X3, together with the nitrogen atom to which they are bonded, form an 1-azoniabicyclo[2.2.1]heptane system optionally substituted by a phenyl or benzyl group; and

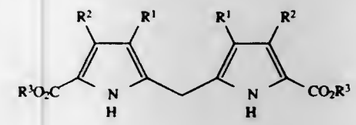
A^- is a pharmaceutically acceptable anion.

5,554,764
PREPARATION OF PYRROL AND OXAZOLE COMPOUNDS: FORMATION OF PORPHYRINS AND C-ACYL-ALPHA-AMINO ACID ESTERS THEREFROM

John Verkade, Ames, Iowa, and Jiansheng Tang, Naperville, Ill., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation of Ser. No. 291,409, Aug. 16, 1994, Pat. No. 5,446,166, which is a division of Ser. No. 142,775, Oct. 26, 1993, Pat. No. 5,367,084. This application May 16, 1995, Ser. No. 441,958
Int. Cl.[6] C07D *403/06*
U.S. Cl. 548—455 **2 Claims**

1. A dipyrromethane compound of the general structure:



selected from the group consisting essential of:

(a) a compound wherein R^1 and R^2 are each Et, and R^3 is Me;

(b) a compound wherein R^1 and R^3 are each Et and R^2 is CF_3;

(c) a compound wherein R^1 is Et, R^2 is CF_3, and R^3 is Me;

(d) a compound wherein R^1 and R^3 are each Me and R^2 is CF_3;

(e) a compound wherein R^1 and R^2 are linked to form a bridge —R^1R^2— wherein —R^1R^2— is —$CH_2(CH_2)_2CH_2$— and R^3 is Me; and

(f) a compound wherein R^1 and R^2 are linked to form a bridge —R^1R^2— wherein —R^1R^2— is —$CH_2(CH_2)_2CH_2$— and R^3 =unsubstituted C1–C4 alkyl and benzyl.

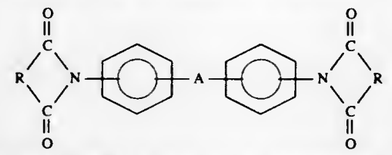
5,554,765
BISIMIDE COMPOUNDS, POLYIMIDE RESIN COMPOSITION PREPARED THEREFROM, AND CARBON FIBER-REINFORCED POLYIMIDE RESIN COMPOSITION

Masahiro Ohta; Akio Matsuyama; Eiji Senoue; Fumiaki Kuwano; Osamu Yasui; Yasunori Yoshida; Akinori Ryu, all of Fukuoka-Ken, and Tadashi Kobayashi, Kanagawa-ken, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

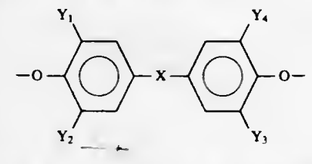
Division of Ser. No. 934,681, Nov. 9, 1992, Pat. No. 5,457,154. This application Jun. 7, 1995, Ser. No. 478,867
Claims priority, application Japan, Jan. 21, 1991, 3-04963; Feb. 19, 1991, 3-24303; Feb. 20, 1991, 3-25932; Mar. 26, 1991, 3-61685; Apr. 18, 1991, 3-86558; Jun. 27, 1991, 3-156792; Jul. 1, 1991, 3-160211; Aug. 29, 1991, 3-218286; Sep. 11, 1991, 3-231295; Sep. 11, 1991, 3-231296; Oct. 29, 1991, 3-282849; Nov. 1, 1991, 3-287660; Nov. 1, 1991, 3-287661; WIPO, Jan. 20, 1992, PCT/JP92/00039
Int. Cl.[6] C07D *209/48;* C08G *73/10*
U.S. Cl. 548—462 **7 Claims**

1. A bisimide compound represented by the formula(1):

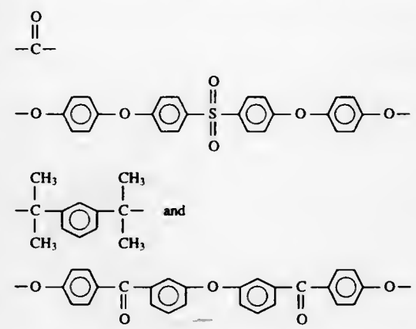
(1)



wherein A is a divalent radical selected from the group consisting of radicals having the formulas:



wherein X is a direct bond, a divalent hydrocarbon radical having from 1 to 10 carbon atoms, hexafluorinated isopropylidene, carbonyl, thio or sulfonyl, and Y_1–Y_4 are individually hydrogen atom, lower alkyl radical, lower alkoxy radical, chlorine or bromine atom,



and R is a divalent radical selected from the group consisting of a monoaromatic radical, condensed polyaromatic radical and non-condensed aromatic radical connected to each other with a direct bond or a bridge member.

170–919 O.G.–96–17: QL3

5,554,766
PROCESS FOR PREPARING WATER-SOLUBLE

5,554,768
SUBSTITUTED SUCCINIMIDES

R_3=a divalent organic radical;

5,554,771
2-DEOXY DERIVATIVES OF N-ACETYL NEURAMINIC

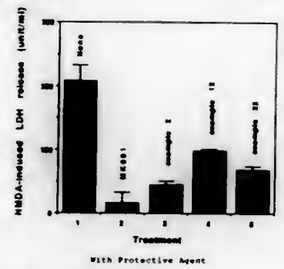
5,554,766
PROCESS FOR PREPARING WATER-SOLUBLE ORGANIC OXIDE
Haruhiko Takeya, Satte, Japan, assignor to Cosmo Research Institute, and Cosmo Oil Co., Ltd., both of Tokyo, Japan
Filed Feb. 15, 1995, Ser. No. 389,201
Claims priority, application Japan, Feb. 22, 1994, 6-023887
Int. Cl.[6] C07C *227/02*
U.S. Cl. 548—473 **9 Claims**

1. A process for preparing a water-soluble organic oxide which comprises,

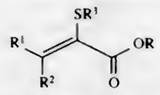
reacting an oil-soluble organic compound with molecular oxygen in the presence of a water-insoluble sensitizer in one or a mixture of organic solvents under irradiation of light to produce a water-soluble organic oxide, wherein water is added before or after the reaction is completed to produce an organic solvent-containing layer and a water-containing layer and

transferring the water-soluble organic oxide to the water layer.

5,554,767
ALPHA-MERCAPTOACRYLIC ACID DERIVATIVES HAVING CALPAIN INHIBITORY ACTIVITY
Kevin K. Wang, Ypsilanti, and Po-Wai Yuen, Ann Arbor, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed May 21, 1993, Ser. No. 132,624
Int. Cl.[6] C07D *403/06;209/30;209/18;* **A61K** *31/41*
U.S. Cl. 548—496 **12 Claims**



1. A compound of Formula



I

or a pharmaceutically acceptable salt thereof wherein

R is hydrogen, alkyl cycloalkyl, alkenyl, cycloalkenyl, alkynyl, aminoalkyl, aryl, or together with R^3 forms a ring;

R^1 is unsubstituted 2- or 3-indolyl or 2- or 3-indolyl substituted at position 4–7 with 1 or more fluoro or chloro moieties,

R^2 is hydrogen, alkyl, of one, three, four, five, or six carbon atoms, cycloalkyl, alkenyl, cycloalkenyl, alkynyl, aryl, with the proviso that aryl is not phenyl, arylalkyl, arylalkenyl, arylalkynyl, p2 unsubstituted 2- or 3-indolyl or 2- or 3-indolyl substituted at position 4–7 with 1 or more fluoro or chloro moieties,

unsubstituted 2- or 3-indolylalkyl or 2- or 3-indolylalkyl substituted at position 4–7 of the indolyl with 1 or more fluoro or chloro moieties,

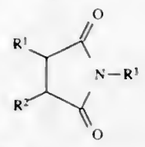
unsubstituted 2- or 3-indolylalkynyl or 2- or 3-indolylalkenyl substituted at position 4–7 of the indolyl with 1 or more fluoro or chloro moleties;

unsubstituted 2- or 3-indolylalkynyl or 2- or 3-indolylalkynyl substituted at position 4–7 of the indolyl with 1 or more fluoro or chloro moieties; and

R^3 is hydrogen, alkyl, cycloalkyl, alkenyl, cycloalkenyl, alkynyl, aminoalkyl, aryl, or —COR^4 wherein R^4 is alkyl, alkenyl, alkynyl, alkoxy, amino, or aryl.

5,554,768
SUBSTITUTED SUCCINIMIDES
Reinhard Dönges, Bad Soden; Rudolf Ehrler, Flörshelm, and Rainer Helwerth, Eschborn, all of Germany, assignors to Holchst Aktiengesellschaft, Germany
Filed May 25, 1994, Ser. No. 248,764
Claims priority, application Germany, May 27, 1993, 43 17 651.8
Int. Cl.[6] C07D *207/408;207/325;207/404;207/412*
U.S. Cl. 548—545 **11 Claims**

1. A succinimide of the formula I



(I)

in which

R^1 and R^2, independently of one another, are hydrogen, C_1-C_{24}-alkyl, C_2-C_{24}-alkenyl, C_6-C_{12}-cycloalkyl, C_6-C_{12}-cycloalkenyl, C_6-C_{12}-aryl, C_1-C_{24}-alkoxy, C_1-C_{24}-acyl, C_1-C_{24}-acyloxy, a hydroxyl, amino or sulfo group or a C_1-C_{24}-dialkylamino, C_1-C_{24}-acylamino, C_1-C_{24}-alkylsulfato, C_1-C_{24}-alkylsulfonato, C_1-C_{24}-alkylsulfito, C_1-C_{24}-alkylsulfinyl or C_1-C_{24}-alkoxycarbonyl radical, and

R^3 is a polyhydroxyalkyl radical of the formula

(II)

in which

R^4 is —$(CHOR^7)_n$—H,

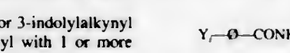
R^5 is —$(CHOR^7)_m$—H,

R^6 is —$(CHOR^7)_o$—H where n+m+o is 2–6, and

R^7 is H.

5,554,769
EXTENDED END CAP MONOMER FOR MAKING ADVANCED COMPOSITES
Clyde H. Sheppard, Bellevue, Wash., and Hyman R. Lubowitz, Rolling Hills Estates, Calif., assignors to The Boeing Company, Seattle, Wash.
Division of Ser. No. 280,866, Jul. 26, 1994, which is a division of Ser. No. 43,824, Apr. 6, 1993, Pat. No. 5,367,083, which is a division of Ser. No. 831,145, Jan. 13, 1992, Pat. No. 5,216,117, which is a division of Ser. No. 181,013, Apr. 13, 1988, Pat. No. 5,104,967, which is a continuation-in-part of Ser. No. 92,740, Sep. 3, 1987, abandoned. This application Jun. 5, 1995, Ser. No. 464,989
Int. Cl.[6] C07D *207/456;209/48;209/72*
U.S. Cl. 548—549 **11 Claims**

1. An amine intermediate useful in synthesizing crosslinking polyamideimide oligomers, of the formula:

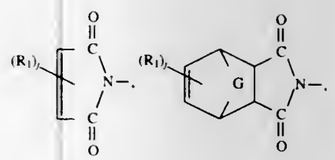


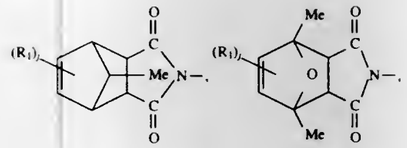
wherein

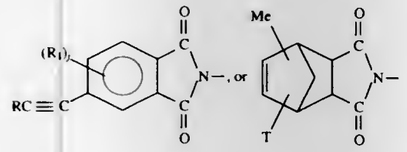
Ø=phenyl;

i=1 or 2;

R_3=a divalent organic radical;







R_1=any of lower alkyl, lower alkoxy, aryl, aryloxy, substituted alkyl, substituted aryl, or halogen,

j=0, 1, or 2;

G=—CH_2—, —O—, —S—, —SO_2—, —SO—, —CO—, —CHR—, or —$C(R)_2$—;

R=hydrogen, lower alkyl, or phenyl;

T=methallyl or allyl; and

Me=methyl.

5,554,770
METHOD FOR MAKING POLYALKYLATED XANTHENES
Andrew J. Caruso; Julia L. Lee, both of Schenectady, and Joseph A. King, Jr., Niskayuna, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Apr. 17, 1995, Ser. No. 423,662
Int. Cl.[6] C07D *311/82*
U.S. Cl. 549—388 **8 Claims**

1. A method for making polyalkylated xanthenes comprising effecting reaction in the presence of an operative amount of an organic sulfonic acid as catalyst and at a temperature in the range of about 100°–200° C. and a pressure in the range of about 1–75 atmospheres, between (A) an oxygenated organic material selected from the class consisting of ketones, spirobichromans and chromans, and (B) an alkylated phenol, the molar ratio of reagent B to reagent A being in the range of about 2–100:1.

5,554,771
2-DEOXY DERIVATIVES OF N-ACETYL NEURAMINIC ACID AND THEIR PREPARATION
Chi-Huey Wong, College Station, and William J. Hennen, Bryan, both of Tex., assignors to G. D. Searle & Co., Chicago, Ill.
Continuation of Ser. No. 60,895, May 12, 1993, abandoned, which is a division of Ser. No. 789,227, Nov. 7, 1991, Pat. No. 5,239,091, which is a division of Ser. No. 711,559, May 30, 1991, abandoned, which is a continuation of Ser. No. 238,357, Aug. 30, 1988, abandoned. This application Aug. 16, 1995, Ser. No. 515,634
Int. Cl.[6] C07D *309/10*
U.S. Cl. 549—419 **2 Claims**

1. A method for preparing the beta-anomer of a 2 -deoxy-N-acetyl-neuraminic acid ester derivative comprising:

esterifying the acid group of N-acetyl neuraminic acid to result in an N-acetyl neuraminic acid ester;

protecting the hydroxyl groups of the N-acetyl neuraminic acid ester and

activating the protected N-acetyl neuraminic acid ester at the 2-position without having separated the protected N-acetyl-neuraminic acid ester wherein the protection and activation is achieved by incubation with an agent consisting of acetyl chloride;

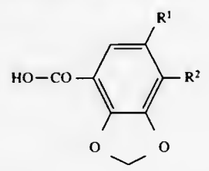
eliminating the activating group and a hydrogen atom located at the 3-position of the protected, activated N-acetyl-neuraminic acid ester;

hydrogenating the protected N-acetyl-neuraminic acid ester; and

recovering the beta-anomer of a 2-deoxy-N-acetyl-neuraminic acid ester derivative.

5,554,772
N-(3-HYDROXY-4-PIPERIDINYL) DIHYDROBENZOFURAN, (DIHYDRO-2H-BENZOPYRAN OR DIHYDROBENZODIOXIN)CARBOXAMIDE DERIVATIVES
Georges H. P. Van Daele, Turnhout, and Frans M. A. Van den Keybus, Essen, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium
Division of Ser. No. 301,825, Sep. 7, 1994, which is a division of Ser. No. 489,419, Mar. 6, 1990, Pat. No. 5,374,637, which is a continuation-in-part of Ser. No. 326,941, Mar. 22, 1989, abandoned. This application Apr. 3, 1995, Ser. No. 415,888
Int. Cl.[6] C07D *307/00*
U.S. Cl. 549—434 **1 Claim**

1. A chemical intermediate of the formula:



a salt or a stereochemically isomeric form thereof, wherein:

one or two hydrogen atoms in the 1,3-dioxole moiety may be replaced by a C_{1-6}alkyl group;

R^1 represents hydrogen, halo, C_{1-6}alkylsulfonyl, or aminosulfonyl; and

R^2 represents amino, mono- or di(C_{1-6}alkyl)amino, arylC_{1-6}alkylamino, or C_{1-6}alkylcarbonylamino.

5,554,773
NEW N-TRITYL PROTECTED ASPARTIC ACID

where Q is a ligand containing the ring

5,554,776
RACEMIC METALLOCENE COMPLEXES AND THEIR

wherein:

Pd(II) is palladium having a valence of +2;

5,554,773

NEW N-TRITYL PROTECTED ASPARTIC ACID DERIVATIVES FOR THE PREPARATION OF PHOSPHONATE NMDA ANTAGONISTS

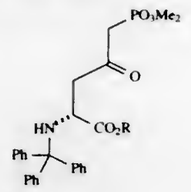
Jeffrey P. Whitten, Cincinnati, and Duane E. Rudisill, West Chester, both of Ohio, assignors to Merrell Pharmaceuticals Inc., Cincinnati, Ohio

Division of Ser. No. 341,325, Nov. 16, 1994, abandoned, which is a continuation of Ser. No. 45,832, Apr. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 792,834, Nov. 15, 1991, abandoned. This application May 12, 1995, Ser. No. 439,672

Int. Cl.[6] C07F *9/40*

U.S. Cl. 552—104 **7 Claims**

1. R-enantiomers of the formula:



wherein R is methyl or ethyl.

5,554,774

PREPARATION OF CHLORINATED VIOLANTHRONES OR ISOVIOLANTHRONES

Udo Bergmann, Bensheim; Gerhard Schäfer, Heidelberg, and Heinrich Kowarsch, Oberderdingen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Feb. 10, 1995, Ser. No. 386,665

Claims priority, application Germany, Feb. 12, 1994, 44 04 587.5

Int. Cl.[6] C07C *50/36*

U.S. Cl. 552—281 **7 Claims**

1. A process for preparing chlorinated violanthrones or isoviolanthrones, comprising:

preparing a liquid reaction medium of a violanthrone or a isoviolanthrone in a diluent of a C_2–C_5 aliphatic monocarboxylic acid, a C_2–C_5 aliphatic halomonocarboxylic acid, or combination thereof;

heating the reaction medium to the required temperature for chlorination which is within the range of 40°–160° C.; and

introducing chlorine into the heated reaction medium thereby selectively chlorinating the violanthrone or isoviolanthrone starting material.

5,554,775

BORABENZENE BASED OLEFIN POLYMERIZATION CATALYSTS

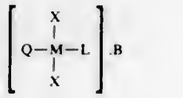
Ramesh Krishnamurti, Amherst; Sandor Nagy, Grand Island, both of N.Y., and Bradley P. Etherton, Houston, Tex., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jan. 17, 1995, Ser. No. 373,814

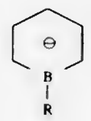
Int. Cl.[6] C07F *17/00;5/02*

U.S. Cl. 556—7 **20 Claims**

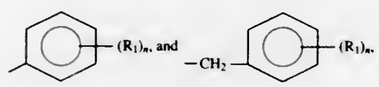
1. A catalyst having the general formula



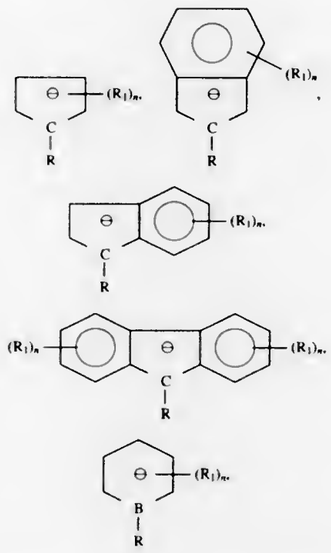
where Q is a ligand containing the ring



R is selected from the group consisting of hydrogen, $N(R')_2$, OR', and R', each R' is independently selected from the group consisting of alkyl from C_1 to C_{10}, aryl from C_6 to C_{15}, alkaryl from C_7 to C_{15}, and aralkyl from C_7 to C_{15}, each X is independently selected from hydrogen, halogen, alkoxy from C_1 to C_{10}, dialkylamino from C_1 to C_{10}, methyl,



each R_1 is independently selected from the group consisting of halogen, alkoxy from C_1 to C_{10}, and R', L is selected from the group consisting of



Q, and X, where L can be bridged to Q, B is an optional Lewis base, "n" is 0 to 5, and M is selected from the group consisting of titanium, zirconium, and hafnium.

5,554,776

RACEMIC METALLOCENE COMPLEXES AND THEIR PREPARATION

Franz Langhauser, Salinenstr; Jürgen Kerth, Carlsberg; Günther Schweier, Friedlsheim, all of Germany; Hans-Herbert Brintzinger, Taegerswilen, Switzerland, and Stefan Mansel, Konstanz, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

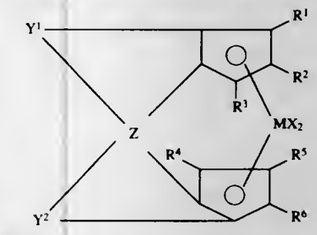
Filed Oct. 28, 1994, Ser. No. 328,777

Claims priority, application Germany, Oct. 30, 1993, 43 37 232.5

Int. Cl.[6] C07F *17/00;7/00;9/00*

U.S. Cl. 556—11 **3 Claims**

1. A metallocene complex of the formula I



where

M is titanium, zirconium, hafnium, vanadium, niobium or tantalum,

X is fluorine, chlorine, bromine, iodine, hydrogen, C_1–C_{10}-alkyl, C_6–C_{15}-aryl or —OR^7,

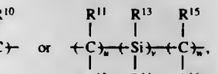
R^7 is C_1–C_{10}-alkyl, C_6–C_{15}-aryl, alkylaryl, aryl-alkyl, fluoroalkyl or fluoroaryl where each alkyl radical is of 1 to 10 carbon atoms and each aryl radical is from 6 to 20 carbon atoms,

R^1 to R^6 are each hydrogen, C_1–C_{10}-alkyl, 5-membered to 7-membered cycloalkyl which in turn may carry C_1–C_{10}-alkyl radicals as substituents, C_6–C_{15}-aryl or arylalkyl, where two adjacent radicals together may furthermore be a cyclic group of 4 to 15 carbon atoms, or $Si(R^8)_3$

R^8 is C_1–C_{10}-alkyl, C_6–C_{15}-aryl or C_3–C_{10}-cycloalkyl,

Z is silicon, germanium, tin or carbon,

Y^1 and Y^2 are each



or

R^9 to R^{16} are each hydrogen, C_1–C_{10}-alkyl, 5-membered to 7-membered cycloalkyl which in turn may carry C_1–C_{10}-alkyl radicals as substituents, C_6–C_{15}-aryl or arylalkyl, where two adjacent radicals together may furthermore be a cyclic group of 4 to 15 carbon atoms, or $Si(R^{17})_3$

R^{17} is C_1–C_{10}-alkyl, C_6–C_{15}-aryl or C_3–C_{10}-cycloalkyl and

u, v and w are each an integer from 0 to 7, with the proviso that the sum u+v+w is≧2.

5,554,777

CATALYST FOR THE PREPARATION OF LINEAR CARBON MONOXIDE/ALPHA-OLEFIN COPOLYMERS

John G. Hefner, and Brian W. S. Kolthammer, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 9,198, Jan. 22, 1993, abandoned. This application Jul. 8, 1994, Ser. No. 272,727

Int. Cl.[6] C07F *9/02;15/00;* **B01J** *31/00*

U.S. Cl. 556—21 **9 Claims**

1. A homogeneous catalyst composition consisting essentially of a cationic transition metal complex of the formula

$$(Pd(II)S_{4-ax}L_x)^{+2}(A)^{-n},$$

wherein:

Pd(II) is palladium having a valence of +2;

S is tetrahydrofuran, 1,2-dimethoxyethane, pyridine, acetonitrile, propionitrile, benzonitrile, dimethylformamide, hexamethylphosphoramide, dimethylsulfoxide, 1 -piperidinecarbonitrile or a mixture thereof;

L is a monodendate, bidendate or tridendate ligand or ligands having one or more bonding sites;

x is an integer from 1 to 3 and is equal to the total number of ligands;

A is a weakly or non-coordinating anion capable of stabilizing the complex in its cationic form, wherein A is selected from tetrafluoroborate, perchlorate, tetraphenylborate, hexafluorophosphate, trifluoromethanesulfonate, or a mixture thereof;

a represents the number of bonding sites of the ligand L; and n is 1 or 2 and y is 2 or 1;

provided that

(i) when n is 1, y is 2 and when n is 2, y is 1; and

(ii) when the anion A is tetrafluoroborate, the organometallic complex is not (tris(acetonitrile)palladium(I-I)triphenylphosphine), (bis(acetonitrile)palladium(II)bis(triphenyl-phosphine)), ((acetonitrile)palladium(II)tris (triphenylphosphine)) (bis(acetonitrile)palladium(II) 1,3-bis(diphenylphosphino)propane) or bis(pyridine)palladium(II)bis(diphenylphosphino)ethane.

5. A homogeneous catalyst composition consisting essentially of a cationic transition metal complex of the formula

$$(Pd(II)S_{4-ax}L_x)^{+2}(A)^{-n},$$

wherein:

Pd(II) is palladium having a valence of +2;

S is acetonitrile, benzonitrile, propionitrile, 1,4-dioxane, dimethylformamide, hexamethylphosphoramide, pyridine, 1 -piperidinecarbonitrile, dimethoxyether, aniline, dimethylsulfoxide, 1,2-dimethoxyethane, diethylether, tetrahydrofuran, or a mixture of at least two thereof;

L is a substantially water insoluble monodendate, bidendate or tridendate ligand or ligands having one or more bonding sites;

x is an integer from 1 to 3 and is equal to the total number of ligands;

A is a weakly or non-coordinating anion capable stabilizing the complex in its cationic form, wherein A is selected from tetrafluoroborate, perchlorate, tetraphenylborate, hexafluorophosphate, trifluoromethanesulfonate, or a mixture thereof;

a represents the number of bonding sites of the ligand L; and n is 1 or 2 and y is 2 or 1;

provided that

(i) when n is 1, y is 2 and when n is 2, y is 1; and

(ii) when the anion A is tetrafluoroborate, the organometallic complex is not (tris(acetonitrile)palladium(I-I)triphenylphosphine), (bis(acetonitrile)palladium(II)bis(triphenyl-phosphine)), ((acetonitrile)palladium(II)tris(triphenylphosphine)) (bis(acetonitrile)palladium(II) 1,3-bis(diphenylphosphino)propane) or bis(pyridine)palladium(II)bis(diphenylphosphino)ethane.

9. A homogeneous catalyst composition consisting essentially of a cationic transition metal complex of the formula

$$(Pd(II)S_{4-ax}L_x)^{+2}(A)^{-n},$$

wherein:

Pd(II) is palladium having a valence of +2;

S is tetrahydrofuran, 1,2-dimethoxyethane, pyridine, acetonitrile, propionitrile, benzonitrile, dimethylformamide, hexamethylphosphoramide, dimethylsulfoxide, 1 -piperidinecarbonitrile or a mixture thereof;

L is a monodendate, bidendate or tridendate ligand or ligands having one or more bonding sites;

x is an integer from 1 to 3 and is equal to the total number of ligands;

A is a weakly or non-coordinating anion capable of stabilizing the complex in its cationic form, wherein A is selected from tetrafluoroborate, perchlorate, tetraphenylborate, hexafluorophosphate, triflouromethanesulfonate, or a mixture thereof;

a represents the number of bonding sites of the ligand L; and n is 1 or 2 and y is 2 or 1;

di-, or tri-substituted phenyl, a phenyl C_1–C_6 alkyl and a mono-, di- or tri-substituted phenyl C_1–C_6 alkyl, wherein the

5,554,783

RETROVIRAL PROTEASE INHIBITING COMPOUNDS

a represents the number of bonding sites of the ligand L; and
n is 1 or 2 and y is 2 or 1;
provided that
(i) when n is 1, y is 2 and when n is 2, y is 1; and
(ii) when the anion A is tetrafluoroborate, the organometallic complex is not (tris(acetonitrile)palladium(1-I)triphenylphosphine), (bis(acetonitrile)palladium(II)bis(triphenyl-phosphine)), ((acetonitrile)palladium(II)tris(triphenylphosphine)) (bis(acetonitrile)palladium(II) 1,3-bis(diphenylphosphino)propane) or bis(pyridine)palladium(II)bis(diphenylphosphino)ethane; and
(iii) when the anion A is perchlorate, the ligand L is not 1,3-bi(di-n-butylphosphine) propane.

5,554,778

RUTHENIUM HYDROGENATION CATALYSTS

Richard P. Beatty, Newark, Del., and Rocco A. Paciello, Durkheim, Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 31, 1995, Ser. No. 381,697
Int. Cl.[6] C07F *15/00;9/02*
U.S. Cl. 556—21 **14 Claims**

1. A ruthenium complex having the formula $Ru(\eta^3\text{-}C_8H_8\text{-}PCy_2)(PCy_3)Cl$, wherein Cy is a cyclohexyl group.

2. A process for the preparation of a ruthenium complex having the formula $Ru(\eta^3\text{-}C_8H_8\text{-}PCy_2)(PCy_3)Cl$, wherein Cy is a cyclohexyl group, comprising: (a) contacting a ruthenium compound of the formula $R^1{}_2RuX_2$, wherein R^1 is a mono- or poly-, cyclic- or acyclic alkene ligand, present as either two separate ligands or as a single polyalkene ligand and X is a halide or a pseudohalogen; with tricyclohexylphosphine in the presence of a solvent; (b) adding a base to the solution; and (c) isolating the ruthenium complex from the solution.

6. A process for the preparation of a ruthenium complex having the formula $RuHCl(H_2)(PCy_3)_2$, wherein Cy is a cyclohexyl group, comprising the steps of:

(a) contacting a ruthenium complex having the formula $Ru(\eta^3C_8H_8\text{-}PCy_2)(PCy_3)Cl$ wherein Cy is a cyclohexyl group with gaseous hydrogen in the presence of a solvent to form a solution or suspension; and

(b) agitating the solution or suspension to form the ruthenium complex having the formula $RuHCl(H_2)(PCy_3)_2$.

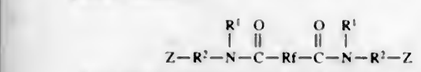
5,554,779

ORGANOSILICON COMPOUND AND A METHOD FOR PREPARING THE SAME

Shinichi Sato, Annaka, and Noriyuki Koike, Gunma-ken, both of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

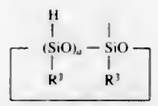
Filed Nov. 13, 1995, Ser. No. 558,001
Claims priority, application Japan, Nov. 11, 1994, 6-302998
Int. Cl.[6] C07F *7/10*
U.S. Cl. 556—419 **16 Claims**

1. An organosilicon compound represented by the following general formula (1):



(1)

wherein R^1 are independently a hydrogen atom or an unsubstituted or substituted monovalent hydrocarbon group, R^2 are independently an alkylene group, Rf is a perfluoroalkylene group or a divalent perfluoropolyether group, and Z is a group having the general formula:



wherein R^3 are independently an unsubstituted or substituted monovalent hydrocarbon group, and a is an integer of 2 to 4.

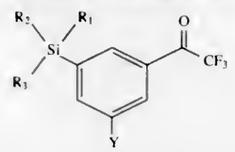
5,554,780

PROCESS FOR THE PREPARATION OF 1-(3-TRIALKYLSILYLPHENYL)-2,2,2-TRIFLUOROMETHYL ETHANONE DERIVATIVES

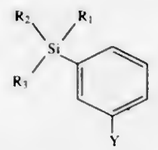
Richard A. Wolf, Midland, Mich., assignor to Merrell Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 238,768, May 5, 1994, abandoned. This application Feb. 1, 1995, Ser. No. 382,949
Int. Cl.[6] C07F *7/08;7/18*
U.S. Cl. 556—436 **5 Claims**

1. A process for preparing a compound of the formula:



wherein
R_1, R_2 and R_3 are each independently C_1–C_4 alkyl; and
Y is hydrogen or $—SiR_1R_2R_3$, comprising reacting a compound of the formula:



wherein R_1, R_2, R_3 and Y are defined as above, with a trifluoroacylating agent in the presence of a Friedel-Crafts acylating catalyst.

5,554,781

MONOALKYL PHOSPHONIC ACID ESTER PRODUCTION PROCESS

Robert L. Reierson, 1 Ruthies Run, Cranbury, N.J. 08512

Continuation-in-part of Ser. No. 220,069, Mar. 30, 1994, abandoned. This application Mar. 6, 1995, Ser. No. 399,253
Int. Cl.[6] C07F *9/09*
U.S. Cl. 558—110 **7 Claims**

1. A process for the production of monoalkyl phosphoric acid ester compositions comprising the steps of:

a) preparing a slurry or paste reagent composition by intimately blending and exclusively reacting, at from about room temperature to about 80° C. or the ultimate phosphation reaction temperature, an effective amount of phosphoric anhydride with from about 75 weight percent to about 117 weight percent phosphoric acid, said reagent composition having an effective equivalent polyphosphoric acid weight percent of from about 118 to about 125; and

b) reacting said reagent composition with at least one alcohol of the formula $RO\{C_nH_{2n}O\}_xH$ wherein R is selected from the group consisting of a saturated or unsaturated aliphatic C_1–C_{30} straight or branched carbon chain, a phenyl, a mono-, di-, or tri-substituted phenyl, a phenyl C_1–C_6 alkyl and a mono-, di-, or tri-substituted phenyl C_1–C_6 alkyl, wherein the phenyl substituent group(s) each have a total of 1 to 30 carbon atoms, and wherein each substitution may be a saturated or unsaturated straight or branched carbon chain, a phenyl, an alkyl phenyl, a phenyl alkyl, or an alkyl phenyl alkyl group; wherein n is from 2 to 4 and may be the same or different for each alkylene oxide unit; and wherein x is from 0 to 100, for a reaction time of from about 4 to about 12 hours;

wherein in the ester compositions, the monoalkyl to dialkyl phosphate weight ratio is greater than 80:20 and the weight percent of the residual alcohol and phosphoric acid are individually each less than 6%.

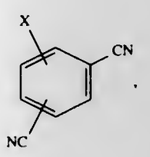
5,554,782

PREPARATION OF DICYANOBENZENES BY AMMONOXIDATION

Clemens Grund, Mannheim; Guenther Glas, Meckenheim; Paul Guenthert, Schifferstadt; Helmut Reichelt, Neustadt; Rainer Becker; Arno Lange, both of Bad Duerkheim, and Klaus Friedrich, Schifferstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

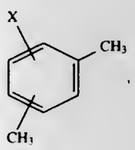
Filed Feb. 8, 1994, Ser. No. 194,461
Claims priority, application Germany, Feb. 23, 1993, 43 05 497.8
Int. Cl.[6] C07C *255/51*
U.S. Cl. 558—327 **12 Claims**

1. A process for the preparation of dicyanobenzenes of formula I:



(I)

in which X denotes nitro or amino
wherein a xylene of formula II



in which X has the meaning stated above, is oxidized at a temperature of from 400° to 500° C. with oxygen in the presence of ammonia and a catalyst, said catalyst comprising a support and an active catalyst component, said support comprising aluminum oxide, said active catalyst component consisting essentially of 2–10 wt % vanadium (V) oxide, 1–10 wt % antimony (III) oxide, 0.002–2 wt % of an alkali metal oxide and 0.01–1 wt % of an alkaline earth metal or an alkaline earth metal compound.

5,554,783

RETROVIRAL PROTEASE INHIBITING COMPOUNDS

Dale J. Kempf, Libertyville; Daniel W. Norbeck, Lindenhurst, and Lynn M. Codacovi, Antioch, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 270,210, Aug. 23, 1994, which is a division of Ser. No. 121,673, Nov. 17, 1987, Pat. No. 5,354,866, which is a continuation of Ser. No. 777,626, Oct. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 746,020, Aug. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 616,170, Nov. 20, 1990, abandoned, which is a continuation-in-part of Ser. No. 518,730, May 9, 1990, Pat. No. 5,142,056, which is a continuation-in-part of Ser. No. 456,124, Dec. 22, 1989, abandoned, which is a continuation-in-part of Ser. No. 405,604, Sep. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 355,945, May 23, 1989, abandoned. This application Apr. 7, 1995, Ser. No. 418,978
Int. Cl.[6] C07C *271/10*
U.S. Cl. 560—25 **1 Claim**

1. The compound (2R,3R,4S,5S)-3-acetoxy-2,5-bis(benzyloxycarbonylamino)-4-bromo-1,5-diphenylhexane.

5,554,784

PROCESS FOR PREPARING IODOALKYNYLCARBAMATES HAVING A LOW TENDENCY OF YELLOWING WHEN EXPOSED TO LIGHT

Rainer Gruening, 24 Voorhees Dr., Basking Ridge, N.J. 07920

Filed Jul. 8, 1994, Ser. No. 271,956
Int. Cl.[6] C07C *261/00*
U.S. Cl. 560—167 **3 Claims**

1. An improved method for preparing 3-iodo-2-propynylbutylcarbamate of the type where 2-propyn-1-ol is reacted with butylisocyanate to form 2-propynbutylcarbamate and the 2-propynylbutylcarbamate is iodinated to form 3-iodo-2-propynylbutylcarbamate; wherein the improvement comprises preparing the butylisocyanate by distillation within about 24 hours prior to reaction with the 2-propyn-1-ol and carrying out the reaction in the absence of a trialkylamine catalyst.

5,554,785

ORGANOTIN CATALYZED TRANSESTERIFICATION PRODUCTS

(II) **Louise E. Trapasso, West Long Branch, N.J., and Stanley J. Padegimas, Memphis, Tenn., assignors to CPS Chemical Company, Inc., Old Bridge, N.J.**

Continuation-in-part of Ser. No. 116,448, Sep. 19, 1993, Pat. No. 5,498,751. This application Jun. 7, 1995, Ser. No. 473,188
Int. Cl.[6] C07C *69/34*
U.S. Cl. 560—201 **16 Claims**

1. An ester of an acrylic or methacrylic acid with an alcohol or polyol, which ester is selected from the group consisting of trimethylolpropane triacrylate, tripropylene glycol diacrylate, tetraethylene glycol diacrylate, 1,6-hexanediol diacrylate, 1,3-butylene glycol diacrylate, 2-phenoxyethyl acrylate, trimethylolpropane trimethacrylate, polyethylene glycol dimethacrylate, tetraethylene glycol dimethacrylate and 1,3-butylene glycol dimethacrylate, wherein said ester has a level of purity greater than about 95% as measured by gas chromatography using an 11 meter RTx200 trifluoropropyl methyl polysiloxane column, a flame ionization detector, an injection temperature of 200° C., an initial column temperature of 90° C. for two minutes, followed by heating to 270° C. at a rate of 8° C. per minute and a detector temperature of 300° C.

5,554,786

PROCESS FOR THE PREPARATION OF CARBOXYLIC ESTERS DEFINED FROM ALLYLIC ALCOHOLS

Hubert Mimoun, Challex, France, and Chengguo Jia, Ames, Iowa, assignors to Firmenich S.A., Geneva, Switzerland

Filed May 5, 1995, Ser. No. 436,069

Claims priority, application Switzerland, Jun. 1, 1994, 1704/94

Int. Cl.[6] **C07C** *67/05*

U.S. Cl. 560—243 **7 Claims**

1. A process for the preparation of carboxylic esters derived from allylic alcohols via allylic acyloxylation of olefins, wherein an aliphatic or cycloaliphatic olefin, having 4 to 16 carbon atoms in its main chain and possessing a non-terminal double bond, is treated with a carboxylic acid in the presence of hydrogen peroxide and of a catalyst consisting of a palladium salt or complex.

5,554,787

2,2-DIALKYLPENTANE 1,5-DIISOCYANATES, 2,2-DIALKYLPENTANE 1,5-DIURETHANES AND 2,2-DIALKYLPENTANE 1,5-DICARBAMOYL CHLORIDES, AND THEIR PREPARATION AND USE

Franz Merger; Andreas Otterbach, both of Frankenthal; Tom Witzel, Ludwigshafen, and Hans Renz, Meckenheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

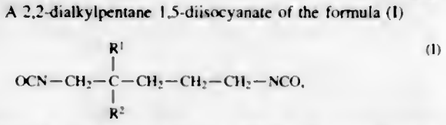
Continuation of Ser. No. 655,471, Feb. 14, 1991, abandoned. This application Feb. 3, 1995, Ser. No. 383,771

Claims priority, application Germany, Mar. 30, 1990, 40 10 226.2

Int. Cl.[6] **C07C** *265/04*

U.S. Cl. 560—355 **1 Claim**

1. A 2,2-dialkylpentane 1,5-diisocyanate of the formula (I)



(I)

wherein R^1 and R^2 are identical or different and are linear alkyl having from 2 to 12 carbon atoms, branched alkyl having from 3 to 12 carbon atoms, linear alkenyl having from 2 to 12 carbon atoms or branched alkenyl having from 4 to 12 carbon atoms.

5,554,788

PROCESS FOR THE STEREOSELECTIVE SYNTHESIS OF 3-SUBSTITUTED 2-THIOMETHYLPROPIONIC ACIDS

Wolfgang Holla, Kriftel; Bernhard Kammermeier, Germany, and Gerhard Beck, both of Frankfurt, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

PCT No. PCT/EP93/02673, § 371 Date May 15, 1995, § 102(e) Date May 15, 1995, PCT Pub. No. WO94/00789, PCT Pub. Date Apr. 14, 1994

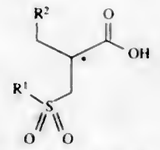
PCT Filed Sep. 30, 1993, Ser. No. 411,831

Claims priority, application Germany, Oct. 1, 1992, 42 33 099.8

Int. Cl.[6] **C07C** *315/02*

U.S. Cl. 562—429 **7 Claims**

1. A process for the stereoselective preparation of a compound of the formula I



I

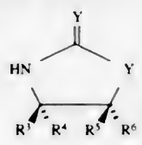
in which R^1 is C_1–C_6-alkyl, C_3–C_6-cycloalkyl, (C_6–C_{12})-aryl-(C_1–C_4)-alkyl or C_6–C_{12}-aryl or -heteroaryl or -heterocycloalkyl which is unsubstituted or substituted by 1, 2 or 3 identical or different hydroxyl, methoxy or trialkylsilyloxy groups; and

R^2 is C_6–C_{12}-aryl which is unsubstituted or substituted by 1, 2 or 3 identical or different methoxy, halogen, cyano, methyl, trifluoromethyl, isopropyl or nitro groups;

is C_3–C_9-heteroaryl which is unsubstituted or substituted by 1, 2 or 3 identical or different methoxy, halogen, cyano, methyl, trifluoromethyl, isopropyl or nitro groups; or

is C_1–C_{10}-alkyl, alkenyl or alkynyl which is unsubstituted or substituted by 1, 2 or 3 identical or different methoxy, halogen, cyano, methyl, trifluoromethyl, isopropyl or nitro groups

and the compounds of the formula I may be present in the R or S form, which process comprises reacting a compound of the formula IIa or IIb or IIIa or IIIb, respectively, (chiral auxiliary), in which Y is =O or S,



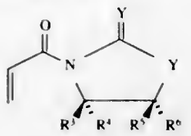
R^3=C_1–C_4-alkyl, R^5=C_6–C_{10}-aryl, R^4=R^6=H, IIa

R^4=C_1–C_4-alkyl, R^6=C_6–C_{10}-aryl, R^3=R^5=H, IIb

R^3=C_1–C_4-alkyl, C_1–C_2-alkyl-C_6–C_{12}-aryl, R^4=R^5=R^6=H, IIIa

R^4=C_1–C_4-alkyl, C_1–C_2-alkyl-C_6–C_{12}-aryl, R^3=R^5=R^6=H,

a_1) with acrylic acid or with a derivative of acrylic acid, to form a compound of the formula IVa or IVb or Va or Vb, respectively, in which Y is =O or S,



R^3=C_1–C_4-alkyl, R^5=C_6–C_{10}-aryl, R^4=R^6=H, IVa

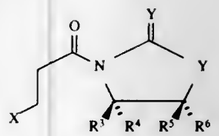
R^4=C_1–C_4-alkyl, R^6=C_6–C_{10}-aryl, R^3=R^5=H, IVb

R^3=C_1–C_4-alkyl, C_1–C_2-alkyl-C_6–C_{12}-aryl, R^4=R^5=R^6=H, Va

R^4=C_1–C_4-alkyl, C_1–C_2-alkyl-C_6–C_{12}-aryl, R^3=R^5=R^6=H, Vb

or

a_2) with propionic acid or a propionic acid derivative which are in turn substituted in position C_3 by a radical X=Cl, Br, OTs, OMs, to form a compound of the formula VIa or VIb or VIIa or VIIb, respectively, in which X and Y are as defined above,



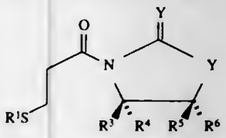
R^3=C_1–C_4-alkyl, R^5=C_6–C_{10}-aryl, R^4=R^6=H, VIa

R^4=C_1–C_4-alkyl, R^6=C_6–C_{10}-aryl, R^3=R^5=H, VIb

R^3=C_1–C_4-alkyl, C_1–C_2-alkyl-C_6–C_{12}-aryl, R^4=R^5=R^6=H, VIIa

R^4=C_1–C_4-alkyl, C_1–C_2-alkyl-C_6–C_{12}-aryl, R^3=R^5=R^6=H, VIIb

b) reacting the compound of the formula IVa, IVb, Va, Vb, VIa, VIb, VIIa or VIIb obtained according to a_1) or a_2), directly or after isolation in a nonaqueous medium or in the presence of a phase-transfer catalyst in an aqueous two-phase system, with a mercaptan of the formula R^1SH, in which R^1 is as defined above, into the corresponding compound of the formula VIIIa or VIIIb or IXa or IXb, respectively, in which R^1 and Y are as defined above,



R^3=C_1–C_4-alkyl, R^5=C_6–C_{10}-aryl, R^4=R^6=H, VIIIa

R^4=C_1–C_4-alkyl, R^6=C_6–C_{10}-aryl, R^3=R^5=H, VIIIb

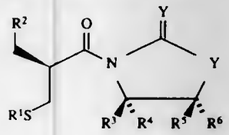
R^3=C_1–C_4-alkyl, C_1–C_2-alkyl-C_6–C_{12}-aryl, R^4=R^5=R^6=H, IXa

R^4=C_1–C_4-alkyl, C_1–C_2-alkyl-C_6–C_{12}-aryl, R^3=R^5=R^6=H, IXb

or

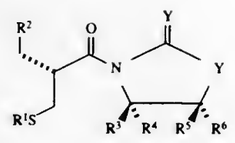
a_3) converting a compound of the formula IIa or IIb or IIIa or IIIb, respectively, in the presence of a quantity of a base which is sufficient for the deprotonation of the oxazolidinone and of the mercaptan R^1SH, in which R^1 is as defined above, into a compound of the formula VIIIa or VIIIb or IXa or IXb, respectively, by reaction with acryloyl or propionyl halides or their respective mixed anhydrides and further reaction of the reaction product with the mercaptan in one step,

c) then converting the compound obtained according to b) or a_3) into the corresponding compound of the formula Xa, Xb, XIa or XIb by stereoselective alkylation,



R^3=C_1–C_4-alkyl, R^4=R^6=H, R^5=C_6–C_{12}-aryl, Xa

R^3=C_1–C_4-alkyl, C_1–C_2-alkyl-C_6–C_{12}-aryl, R^4=R^5=R^6=H, XIa

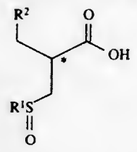


R^4=C_1–C_4-alkyl, R^6=C_6–C_{12}-aryl, R^3=R^5=H, Xb

R^4=C_1–C_4-alkyl, C_1–C_2-alkyl-C_6–C_{12}-aryl, R^3=R^5=R^6=H, XIb

in which Y, R^1 and R^2 are as defined above,

d) then converting the compound obtained in this way by reaction with H_2O_2 in alkaline solution, into compounds of the formula XII which may be present in the R or S form,



XII

and

e) then converting the compound obtained in this way, by further oxidation, into the corresponding compound of the formula I.

5,554,789

ARYLPROPIONIC DERIVATIVE, A PROCESS FOR THE PREPARATION AND THE USE THEREOF AS AN ANALGESIC AGENT

Germano Carganico, El Masnou; David M. Casellas, Rubi, and M. Luisa G. Perez, El Masnou, all of Spain, assignors to Laboratorios Menarini S.A., Barcelona, Spain

PCT No. PCT/EP93/03127, § 371 Date May 23, 1995, § 102(e) Date May 23, 1995, PCT Pub. No. WO94/11332, PCT Pub. Date May 26, 1994

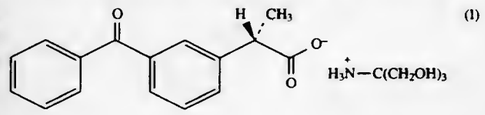
PCT Filed Nov. 9, 1993, Ser. No. 428,231

Claims priority, application Spain, Nov. 10, 1992, 9202260

Int. Cl.[6] **C07C** *59/76*

U.S. Cl. 562—460 **7 Claims**

1. (+)-(S)-2-(3-Benzoylphenyl)propionic acid tromethamine salt substantially free from the (−)-(R) enantiomers of the 2-(3-benzoylphenyl)propionic acid tromethamine salts, of formula (I)



(I)

5,554,790

PROCESS FOR PRODUCING ACETIC ANHYDRIDE AND ACETIC ACID

Yoshiyuki Harano, and Yoshiaki Morimoto, both of Hyogo, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 22, 1995, Ser. No. 408,703

Claims priority, application Japan, Apr. 4, 1994, 6-066319

Int. Cl.[6] **C07C** *51/12;45/49*

U.S. Cl. 562—519 **14 Claims**

1. A process for producing acetic anhydride and acetic acid by reacting methanol and methyl acetate with carbon monoxide, which comprises the steps of:

(a) reacting methanol and methyl acetate with carbon monoxide or a mixture of carbon monoxide and hydrogen in the presence of a catalyst in a reaction zone at a temperature of from 150° to 250° C. and a pressure of from 5 to 120 bar;

(b) withdrawing a carbonylated mixture from the reaction zone and flash-evaporating the carbonylated mixture in a vapor-liquid separation zone at a pressure of from above atmospheric pressure up to 5 bar to evaporate a major portion of volatile fractions contained therein, feeding the evaporated volatile fractions to a first distillation zone and recycling a catalyst solution not evaporated in the vapor-liquid separation zone to the reaction zone;

(c) conducting distillation in a column in said first distillation zone of said evaporated volatile fractions at a pressure of from above atmospheric pressure up to 5 bar to obtain a low-boiling point fraction from an upper portion of the column, a mid-boiling point fraction containing acetic anhydride and acetic acid as a sidestream from said column and a high-boiling point fraction having catalyst contained therein from a lower portion of said column, recycling the low-boiling point fraction to the reaction zone and the high-boiling point fraction to at least one of the reaction zone and the vapor-liquid separation zone;

(d) feeding the sidestream of the mid-boiling point fraction containing acetic anhydride and acetic acid to a second distillation zone;

(e) conducting distillation in a column in said second distillation zone of said sidestream of the mid-boiling point fraction containing acetic anhydride and acetic acid at a pressure of from above atmospheric pressure up to 5 bar to obtain a low-boiling point fraction from an upper portion of the column and recycling the low-boiling point fraction to the reaction zone;

(f) obtaining a sidestream of a fraction containing acetic anhydride and acetic acid and feeding it to a third distillation zone; and

(g) conducting distillation in a column in said third distillation zone of the sidestream of the fraction containing acetic anhydride and acetic acid from the second distillation zone to obtain acetic acid from an upper portion of the column and acetic anhydride from a lower portion of the column.

5,554,791

PROCESS FOR PRODUCING [S,S]-ETHYLENEDIAMINE-N,N'-DISUCCINIC ACID

Ronny W. Lin, Baton Rouge; Eldon E. Atkinson, Jr., Greenwell Springs, and Donald E. Balhoff, Baton Rouge, all of La., assignors to Albemarle Corporation, Richmond, Va.

Filed Jul. 11, 1994, Ser. No. 272,456

Int. Cl.[6] C07C *229/00*

U.S. Cl. 562—565 **31 Claims**

1. A process for the production of [S,S]-ethylenediamine-N,N'-disuccinic acid, which process comprises:

a. reacting L-aspartic acid with a stoichiometric deficient amount of 1,2-dihaloethane in a basic aqueous medium to produce an aqueous solution containing from about 3 to about 50 wt % L-aspartic acid salt and from about 2 to about 40 wt % [S,S]-ethylenediamine-N,N'-disuccinic acid salt; and

b. precipitating, from the aqueous solution, [S,S]-ethylenediamine-N,N'-disuccinic acid by co-feeding, to a volume of water, (1) the aqueous solution and (2) an aqueous mineral acid having a dissociation constant within the range of from about 1.0×10^{-5} to about 1.0×10^{10}, wherein the feed rates of the aqueous solution and the aqueous mineral acid are controlled so that the volume of water has a pH within the range of from about 2 to about 6.5 at least substantially throughout the co-feed period.

5,554,792

N-VINYLFORMAMIDE COMPOSITIONS

Shigeru Sawayama, Yokohama, and Kohichi Satoh, Zama, both of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

Continuation of Ser. No. 115,168, Aug. 31, 1993, abandoned. This application Apr. 13, 1995, Ser. No. 421,018

Claims priority, application Japan, Sep. 1, 1992, 4-233853

Int. Cl.[6] C07C *209/90;233/01*

U.S. Cl. 564—4 **16 Claims**

1. An N-vinylformamide composition comprising 1 to 250 ppm by weight of formic acid based on N-vinylformamide.

5,554,793

CATALYTIC REFORMING OF ALKYLENEAMINES

George E. Hartwell; Robert G. Bowman, and David C. Molzahn, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 154,195, Nov. 17, 1993, Pat. No. 5,410,087, which is a division of Ser. No. 932,410, Aug. 19, 1992, Pat. No. 5,288,909, which is a division of Ser. No. 730,415, Jul. 16, 1991, Pat. No. 5,166,442, which is a continuation-in-part of Ser. No. 611,244, Nov. 9, 1990, Pat. No. 5,118,850, which is a division of Ser. No. 287,189, Dec. 20, 1988, Pat. No. 4,996,363. This application Dec. 19, 1994, Ser. No. 359,135

The portion of the term of this patent subsequent to Oct. 26, 2010, has been disclaimed.

Int. Cl.[6] C07C *209/00;209/64;* **C07D** *295/023;295/13*

U.S. Cl. 564—470 **21 Claims**

1. A process of reforming alkyleneamines comprising contacting an alkyleneamine feedstock or a mixture of two or more of such feedstocks, which is in the liquid phase and which is essentially free of any alcohol capable of eminating the feedstock or feedstock mixture, with a catalyst under reaction conditions such that an alkyleneamine or mixture of alkyleneamines is formed which is different from the feedstock, the catalyst being selected from the group consisting of:

Group VB metal phosphates,

with the proviso that the catalyst is essentially free of hydrogenation metals.

5,554,794

PROCESS FOR PREPARING A GASOLINE ADDITIVE COMPOUND

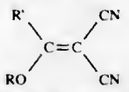
Thomas H. Johnson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 156,525, Nov. 19, 1993, Pat. No. 5,354,343, which is a continuation-in-part of Ser. No. 938,914, Aug. 31, 1992, abandoned. This application Aug. 18, 1994, Ser. No. 292,546

Int. Cl.[6] C07C *209/48*

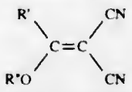
U.S. Cl. 564—491 **13 Claims**

1. A process for preparing a gasoline additive compound comprising reacting a dinitrile compound of formula II



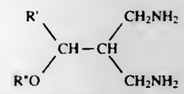
(II)

with a polyether mono-ol or hydrocarbyl mono-ol of formula R"OH to produce a intermediate compound of formula III



(III)

hydrogenating said intermediate compound to produce a diamine of formula IV



(IV)

where R' is hydrogen, an alkyl, alkylaryl, or aryl group, and R is an alkyl group; and R"O is derived from R"OH, a polyether mono-ol or hydrocarbyl mon-ol.

5,554,795

PROCESS FOR PREPARING CYCLOPENTADIENYL-TYPE LIGANDS

Krisztina Frey; Gabriele von Massow; Helmut G. Alt, all of Bayreuth, Germany, and M. Bruce Welch, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

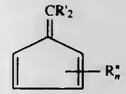
Division of Ser. No. 303,982, Sep. 9, 1994. This application May 19, 1995, Ser. No. 445,270

Int. Cl.[6] C07F *9/02;9/00;17/00;* **C07C** *211/00*

U.S. Cl. 568—8 **8 Claims**

1. A process for preparing a cyclopentadienyl ligand comprising reacting a fulvene compound and a nucleophile;

wherein said fulvene compound is represented by the formula



wherein each R' and R" is individually selected from the group consisting of alkyl, aryl, alkenyl, and alkoxy groups, each containing 1 to 20 carbon atoms, halogen, and hydrogen; and

wherein said nucleophile is represented by the formula JA, wherein J is an alkali metal, wherein A is —YPR_2, or —YNR_2, wherein Y is an alkylene group containing 1 to 24 carbon atoms, wherein each R is individually selected from alkyl groups containing 1 to 20 carbon atoms.

5,554,796

REMOVAL OF PRIMARY AND SECONDARY HYDROPEROXIDE IMPURITES FROM TERTIARY HYDROPEROXIDES

Ahmad Soltani-Ahmadi, Radnor, and Robert N. Cochran, West Chester, both of Pa., assignors to ARCO Chemical Technology, L.P., Greenville, Del.

Filed Apr. 29, 1994, Ser. No. 235,823

Int. Cl.[6] C07C *409/00;* **B01D** *3/34*

U.S. Cl. 568—576 **5 Claims**

1. A process for purification of tertiary alkyl hydroperoxide which contains contaminating amounts of primary and secondary alkyl hydroperoxides to reduce the content of said primary and secondary alkyl hydroperoxides which consists essentially of admixing the tertiary alkyl hydroperoxide with a carboxylic acid derivative under substantially anhydrous conditions at 10°–150° C. for 1 second to 1 hour, subsequently reacting the resulting admixture with a base at 10°–150° C. for 1 second to 3 hours, and recovering tertiary alkyl hydroperoxide reduced by at least 90% in the content of primary and secondary alkyl hydroperoxides.

5,554,797

TETRA (HYDROXPHENYL) ALKANES

Reinhard Schulz, Staufen-Wettelbrunn; Norbert Münzel, Heitersheim, both of Germany; Martin Roth, Giffers, Switzerland, and Wilhelm Knobloch, Schwörstadt, Germany, assignors to OCG Microelectronic Materials, Inc., Norwalk, Conn.

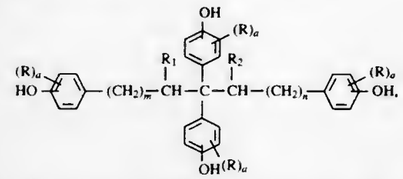
Division of Ser. No. 180,180, Jan. 11, 1994, Pat. No. 5,436,098, which is a division of Ser. No. 932,128, Aug. 15, 1992, Pat. No. 5,296,330. This application Mar. 7, 1995, Ser. No. 399,686

Claims priority, application Switzerland, Aug. 30, 1991, 2550/91; Feb. 12, 1992, 413/92

Int. Cl.[6] C07C *43/30;43/32*

U.S. Cl. 568—592 **1 Claim**

1. A tetra(hydroxyphenyl)alkane of formula I



(I)

wherein each R is independently selected from the group consisting of C_1–C_4alkyl, C_1–C_4alkoxy, —$OCH_2C_6H_5$, —OC_6H_5 or —$COOC_1$—C_4alkyl; R_1 and R_2 are each independently selected from the group consisting of H, C_1–C_4alkyl, —C_6H_5 or a cycloaliphatic 5- or 6-membered ring; each a is, independently of each other, selected from the group of integers from 0 to 4; and each m and n are, independently of each other, selected from the group consisting of an integer 0 to 2; with the proviso that, if both R_1 and R_2 are —H and each a is 0 or 1, then neither m nor n may not be 0.

5,554,798

FERTILE GLYPHOSATE-RESISTANT TRANSGENIC CORN PLANTS

Ronald C. Lundquist, Minnetonka, and David A. Walters, Bloomington, both of Minn., assignors to DeKalb Genetics Corporation, St. Paul, Minn.

Continuation of Ser. No. 508,045, Apr. 11, 1990, Pat. No. 5,484,956, which is a continuation-in-part of Ser. No. 467,983, Jan. 22, 1990, abandoned. This application May 15, 1995, Ser. No. 441,073

Int. Cl.[6] A01H *4/00;* **C12N** *15/05*

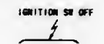
U.S. Cl. 800—205 **6 Claims**

1. A fertile transgenic *Zea mays* plant containing an isolated heterologous DNA construct encoding EPSP synthase wherein said DNA construct is expressed so that the plant exhibits resistance to normally toxic levels of glyphosate, wherein said resistance is not present in a *Zea mays* plant not containing said DNA construct, and wherein said DNA construct is transmitted through a complete normal sexual cycle of the transgenic plant to the progeny generation.

ELECTRICAL

5,554,799

Patent Not Issued For This Number



5,554,799

Patent Not Issued For This Number

5,554,800

INSPECTION DEVICE FOR DETECTING SURFACE FAULTS, AND AN INSTRUMENT INCORPORATING SUCH A DEVICE

Ivar Jonsson, Onsala, Sweden, assignor to Vattenfall AB, Vallingby, Sweden

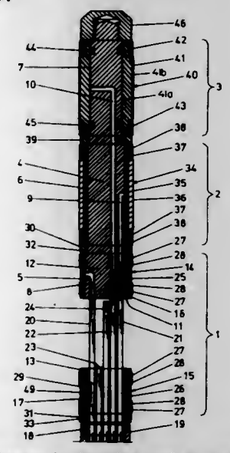
PCT No. PCT/SE92/00716, § 371 Date Jul. 27, 1994, § 102(e) Date Jul. 27, 1994, PCT Pub. No. WO93/07475, PCT Pub. Date Apr. 15, 1993

PCT Filed Oct. 12, 1992, Ser. No. 211,616

Claims priority, application Sweden, Oct. 10, 1991, 9102939

Int. Cl.[6] G01N *21/91;21/90*

U.S. Cl. 73—104 **20 Claims**



1. A device for use in detecting surface penetrant containing faults or flaws in the inner surface of a tubular member, the device comprising:

a handling device and a tubular shaped body of an elastic material having penetrant absorbent surfaces;

said tubular shaped body being movable by said handling device to an area of the inner surface of said tubular member chosen for inspection, expanded to a state in which the penetrant absorbent surfaces abut the entire inner surface of said tubular member surrounding said penetrant absorbent surfaces, and contracted so as to distance the penetrant absorbent surfaces from the inner surface of said tubular member and removal of said tubular shaped body by said handling device.

5,554,801

DIAGNOSIS APPARATUS AND METHOD FOR A CYLINDER PRESSURE SENSOR

Satoru Watanabe, Atsugi, Japan, assignor to Unisia Jecs Corporation, Atsugi, Japan

Filed Jun. 13, 1995, Ser. No. 489,716

Claims priority, application Japan, Jun. 14, 1994, 6-131660

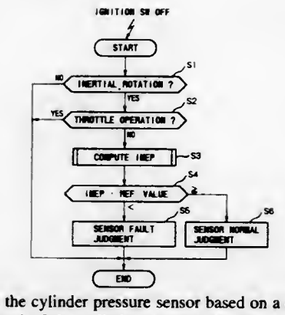
Int. Cl.[6] G01M *15/00*

U.S. Cl. 73—115 **8 Claims**

1. A diagnosis apparatus for a cylinder pressure sensor comprising:

diagnosis condition detection means for detecting as a diagnosis condition whether a crankshaft of an engine is rotating after switching off an ignition switch, and

diagnosis means for determining, when said diagnosis condition detection means detects rotation of the engine crankshaft after switching off the ignition switch, the presence or absence of a fault in the cylinder pressure sensor based on a current detection signal of the cylinder pressure sensor, and outputting a fault diagnosis signal.



5,554,802

CYLINDER IDENTIFYING DEVICE FOR AN INTERNAL COMBUSTION ENGINE

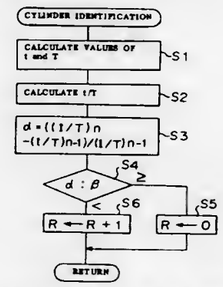
Wataru Fukui, and Atsuko Hashimoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 21, 1995, Ser. No. 393,926

Claims priority, application Japan, Sep. 13, 1994, 6-218830

Int. Cl.[6] G01M *15/00*

U.S. Cl. 73—117.3 **4 Claims**



1. A cylinder identifying device for an internal combustion engine comprising:

a rotary signal generator for generating, in synchronism with a rotation of the engine, a signal having first positional pulses, each designating a first plurality of first and second reference positions each corresponding to one of a plurality of cylinders, and, in addition to said first positional pulses, a second positional pulse designating a set of first and second reference positions disposed in front of a specific one of the first reference positions designated by one of the first positional pulses corresponding to a specific one of the cylinders;

measuring means for measuring first time periods between contiguous ones of the first reference positions and second time periods between the first and second reference positions both of the first and second positional pulses output from the rotary signal generator;

calculating means for calculating ratios, each defined as the second time period as compared with the first time period, based on a result of the measuring means and for normalizing changes of the ratios in two successive ones of the first time periods based on a specific one of the ratios at a predetermined one of the first time periods, said calculating means normalizing the changes of the ratios by taking a difference between the ratios corresponding to the two successive ones of the first time periods and dividing that difference by the ratio of the preceding one of the two successive ones of the first time periods; and

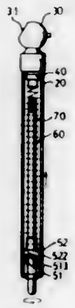
identifying means for identifying the cylinders each corresponding to each of the first positional pulses based on a result of the calculating means.

5,554,803

TUNABLE TIRE PRESSURE INDICATOR

Tien-Tsai Huang, No. 4-2, Lane 30, Wu-Chang St., Pan-Chiao, Taipei Hsien, Taiwan

Filed Jun. 29, 1995, Ser. No. 496,322
Int. Cl.[6] B60C *23/02*
U.S. Cl. 73—146.8 **3 Claims**



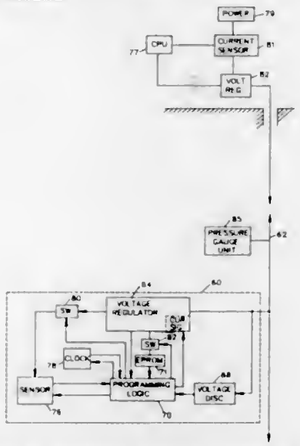
1. A tunable tire pressure indicator, comprising:
an elongated hollow casing having upper and lower end portions;
a valve-actuating member mounted to said upper end portion of said casing and adapted to be connected to an inflating valve member of a tire;
a piston provided movably in said casing adjacent said valve-actuating member;
a plug unit mounted in said lower end portion of said casing;
a biasing member provided in said casing between said piston and said plug unit; and
a pressure indicating rod disposed in said casing, said piston pushing said pressure indicating rod to extend out of said casing through said plug unit against action of said biasing member so as to provide a tire pressure reading in response to pressure entering said casing via said valve-actuating member;
said plug unit including: a movable member formed with an axial passage to permit said pressure indicating rod to extend slidably therethrough and to permit rotation of said movable member with said pressure indicating rod, said biasing member abutting against said movable member; a stationary member mounted securely in said lower end portion of said casing, said stationary member being formed with an axial throughhole larger than the cross-section of said pressure indicating rod to permit passage of said pressure indicating rod therethrough; and coupling means for coupling adjustably and rotatably said movable member to said stationary member to permit adjustment in distance between said movable member and said piston to adjust correspondingly initial spring force of said biasing member;
whereby, tuning of the tire pressure indicator to obtain a precise tire pressure reading can be achieved by adjusting the initial spring force of said biasing member.

5,554,804

HIGH TEMPERATURE PRESSURE MONITORING SYSTEM

Leroy C. Delatorre, Sugar Land, Tex., and Renée Pingenot, Springfield, Mo., assignors to Panex Corporation, Sugar Land, Tex.

Filed Mar. 20, 1995, Ser. No. 406,516
Int. Cl.[6] G01V *1/00*; F21B *47/06*; G06F *15/20*
U.S. Cl. 73—152.52 **11 Claims**



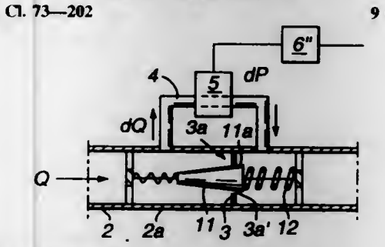
1. A system for monitoring downhole pressure in a high temperature well bore over an extended period of time where there are multiple pressure sensing tools in the well bore which are connected to a common single wire conductor cable disposed within said well bore and leading to the earth's surface and for selectively reading out pressure measurements from the respective pressure sensing tools, which system is comprised of:
a production string of pipe disposed in a high temperature well bore;
more than one pressure sensing tool disposed downhole on the string of pipe where each pressure sensing tool is connected to the single wire conductor cable which extends along the string of pipe to the earth's surface;
each of said pressure sensing tools having
sensor means for obtaining pressure measurements in digital format,
downhole communication means for receiving and sending digital signals on said single wire conductor cable, programmable means for storing a specified operational configuration for processing digital signals of the pressure sensor means in digital format,
programmable logic means connected to said pressure sensor means and said downhole communication means,
said logic means in each of said pressure sensing tools respectively being configured and arranged to respond to a selected characterized digital polling signal from the earth's surface to output pressure measurements from a selected sensor tool to said conductor cable for transmission of digital signals up to the earth's surface;
surface communication means at the earth's surface connected to said conductor cable for selectively generating different characterized digital polling signals on the conductor cable so that a characterized digital polling signal can be used by said logic means for selectively actuating one of said pressure sensing tools to obtain pressure measurements from the one pressure sensing tool independently of any or all of the other sensing tools.

5,554,805

FLOWMETER WITH A VARIABLE CONSTRICTION

Göran Bahrton, Högomsvägen 40, S-183 50 Täby, Sweden

PCT No. PCT/SE92/00856, § 371 Date Jun. 16, 1994, § 102(e) Date Jun. 16, 1994, PCT Pub. No. WO93/12406, PCT Pub. Date Jun. 24, 1993
PCT Filed Dec. 11, 1992, Ser. No. 256,006
Claims priority, application Sweden, Dec. 17, 1991, 9103735
Int. Cl.[6] G01F *1/00;5/00*
U.S. Cl. 73—202 **9 Claims**



9. A flowmeter comprising:
a main conduit operable to transmit a main fluid flow therethrough
a movable constriction device housed in the main conduit, the constriction device defining a variable fluid throughflow area in the main conduit, the variable fluid throughflow area variable based on a variable fluid pressure drop across the constriction device, the variable fluid throughflow area variable from a first throughflow area corresponding to a first main flow rate through the main conduit and a first fluid pressure drop, to a greater second throughflow area corresponding to a greater second main flow rate through the main conduit and a greater second fluid pressure drop, the second main flow rate being greater than would be expected if the first throughflow area remained constant as the first pressure drop increased to the second pressure drop;
a by-pass conduit in fluid connection with the main conduit upstream and downstream of the constriction device, the by-pass conduit operable to transmit a variable by-pass flow therethrough, the by-pass flow variable from a first by-pass flow rate corresponding to the first main flow rate, to a second by-pass flow rate corresponding to the second main flow rate, the second by-pass flow rate being less than would be expected if the first throughflow area remained constant as the first pressure drop increased to the second pressure drop; and
a calibrated flowmeter provided in the bypass conduit, the calibrated flowmeter in communication with the by-pass flow and determining the main flow rate based on the by-pass flow rate, the calibrated flowmeter calibrated to accurately determine the main flow rate when the second main flow rate ranges up to at least 1000 times greater than the first main flow rate.

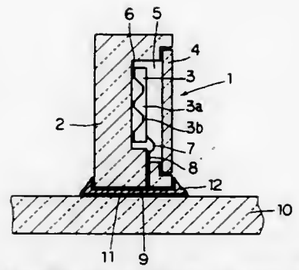
5,554,806

PHYSICAL-QUANTITY DETECTING DEVICE

Naohito Mizuno, Kariya; Shinichi Hirose, Nukata-gun; Hiromi Ariyoshi, Kariya, and Yasuki Shimoyama, Nukata-gun, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 7, 1995, Ser. No. 477,614
Claims priority, application Japan, Jun. 15, 1994, 6-132996; Mar. 23, 1995, 7-063730
Int. Cl.[6] G01P *1/02*
U.S. Cl. 73—493 **20 Claims**

1. A physical-quantity detecting device comprising:
a housing which is to be fixed on a circuit board, having a hollow portion;
a sensor chip installed within said hollow portion, said sensor chip being to be subjected to force in a direction perpendicular or parallel to said circuit board to output an electrical signal in correspondence with magnitude of said force;
said housing has a flat end face on an outer side thereof; and
a wiring electrode for outputting said electrical signal provided so as to be drawn from a wall of said hollow portion to said flat end face penetrating the housing, said wiring electrode having a face-bonding pad region on said flat end face, wherein
said face-bonding pad region of said wiring electrode is electrically and mechanically connected to wiring on said circuit board when said housing is fixed to the circuit board.

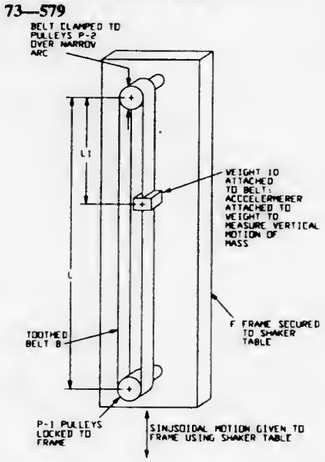


5,554,807

BELT DAMPING

Michael N. Tranquilla, 16823 Fitzgerald, Livonia, Mich. 48154

Filed Apr. 6, 1995, Ser. No. 418,221
Int. Cl.[6] G01M *19/00*
U.S. Cl. 73—579 **21 Claims**



1. A method of determining damping coefficients for a resilient web, comprising:
stretching a prescribed length of said web between a pair of pulley means mounted on frame means; attaching a prescribed test mass M_o on said length at a prescribed distance L_1 from one said pulley means; shaking said frame means at resonance frequency f_R, while deriving resonance-amplitude; and using the foregoing to determine damping coefficients.

5,554,808

SYSTEM AND METHOD FOR DETECTING PLY

5,554,811

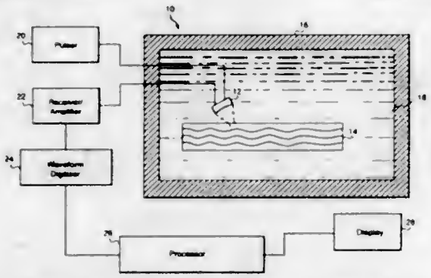
AUTOMATIC CHEMICAL ANALYZERS WITH SAMPLING SYSTEMS

5,554,808

SYSTEM AND METHOD FOR DETECTING PLY WRINKLING IN A LAMINATED COMPOSITE

Richard Y. Chiao, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 3, 1995, Ser. No. 415,916
Int. Cl.[6] G01N *29/04;29/06*
U.S. Cl. 73—598 **28 Claims**



1. A method of ultrasonically detecting and measuring subsurface ply wrinkling in a laminated composite, comprising the steps of:

ultrasonically scanning the laminated composite with sound wave energy generated from a first transducer operating in a perpendicular incidence pulse echo mode to determine a direction of a ply wrinkle trough;

ultrasonically scanning the composite with sound wave energy generated from a second transducer operating in an oblique incidence pulse echo mode after the direction of the ply wrinkle trough has been determined;

detecting echo signals reflected from the composite with the second transducer, a set of reflected echo signals representing a three-dimensional waveform data set u(x,y,t) having spatial dimensions (x,y) and a temporal dimension (t) mapping directly to a third spatial dimension (z) orthogonal to the surface of the composite, the three dimensional waveform data set u (x,y,t) corresponding to a three-dimensional volumetric region in the composite;

processing the three-dimensional waveform data set u(x,y,t) into a data set w(x,y,t);

filtering ply noise from the three-dimensional data set w(x,y,t);

converting the filtered three-dimensional data set into two two-dimensional C-scans of the composite, wherein a first C-scan corresponds to wrinkle severity and a second C-scan corresponds to wrinkle depth; and

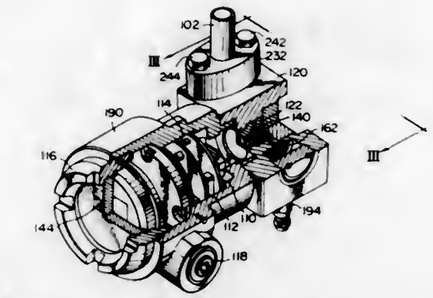
measuring subsurface wrinkling in the composite from the wrinkle severity C-scan and the wrinkle depth C-scan.

5,554,809

PROCESS DETECTION APPARATUS

Tomoyuki Tobita, Katsuta; Yoshimi Yamamoto, Ibaraki; Masao Fukunaga, Tokyo; Teruo Kobayahsi, Katsuta, and Akira Nagasu, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 5, 1994, Ser. No. 318,315
Claims priority, application Japan, Oct. 8, 1993, 5-253387; Jul. 22, 1994, 6-170670
Int. Cl.[6] G01L *7/00*
U.S. Cl. 73—700 **14 Claims**



1. A process detection apparatus for providing data regarding process fluid as an output to an external element, the apparatus comprising:

a pressure sensing body having a sensor sensing a pressure of the process fluid;

a signal processing portion having a signal processor circuit processing a signal from the pressure sensing body; and

an indicator provided on the signal processing portion and indicating data regarding the process fluid;

wherein,

said sensor, said signal processor circuit and said indicator are arranged substantially along a common axis;

said signal processing portion and said indicator being formed in substantially cylindrical shapes respectively; and

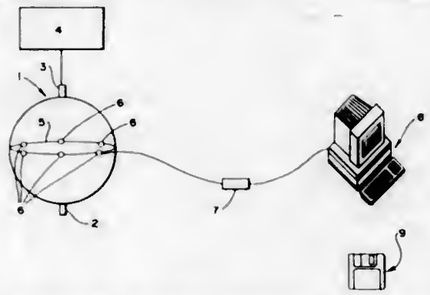
said signal processing portion being movably mounted to said pressure sensing body for change of relative positions of said signal processing portion and said pressure sensing body.

5,554,810

METHOD FOR THE PREDICTIVE DETERMINATION OF LOAD OF A STRUCTURE AT RUPTURE

Jean-Charles Anifrani, Saint Medard en Jalles; Christian M. Le Floc'H, Blanquefort; Didier Sornette, Nice, and Bernard Souillard, Le Chesnay, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris Cedex, France

Filed Jan. 30, 1995, Ser. No. 380,617
Claims priority, application France, Jan. 31, 1994, 94 01237
Int. Cl.[6] G01N *29/04*
U.S. Cl. 73—801 **13 Claims**



1. Method for predictive determination of load, simple or combined, at rupture, of a structure, comprising:

(a) subjecting the structure to a stress which is equivalent to the load;

(b) while performing step (a), recording acoustic activity generated by damages suffered in the structure, up until a predetermined stress threshold; and

(c) determining the predictive value of the load at rupture using the recorded acoustic emission based on a relationship linking time to the load:

$dE/dt=Eo/(t_r-t)^{\alpha}$ in which:

dE/dt is the variation of acoustic energy generated by the damages;

Eo is a standardizing factor;

t is time, and

t_r is the moment of rupture,

the exponent α, Eo and t_r being determined from the relationship

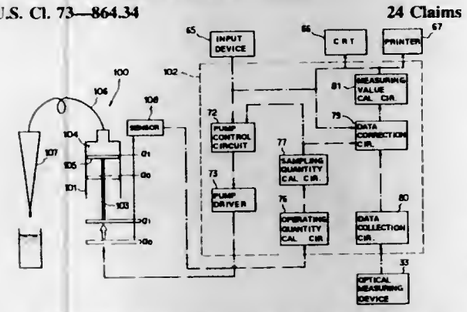
$$\text{Log } (dE/dt)=-\alpha\text{Log } (t_r-t)+\text{Log } (Eo).$$

5,554,811

AUTOMATIC CHEMICAL ANALYZERS WITH SAMPLING SYSTEMS

Kyuji Rokugawa, Nishinasuno-Machi; Kouji Matsumoto, Otawara, and Morito Inoue, Nishinasuno-Machi, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 70,995, Jun. 4, 1993, Pat. No. 5,415,051.
This application Jan. 31, 1995, Ser. No. 380,998
Claims priority, application Japan, Mar. 2, 1993, 5-041314
Int. Cl.[6] G01N *21/75;35/10*
U.S. Cl. 73—864.34 **24 Claims**



1. An automatic chemical analyzer having a sampling system by which a liquid selectively including a specimen and a reagent is sampled by sucking the liquid at one position on the automatic chemical analyzer and discharging the sucked liquid at another position on the automatic chemical analyzer, resultant chemical reaction between the specimen and the reagent being detected as light absorbance data and collected for chemical analysis of the specimen, said sampling system comprising:

a pump having a pumping chamber for sucking and discharging the liquid;

a tube having one end connected to the pumping chamber;

a nozzle connected to another end of the tube;

means for driving the pump to sample a certain quantity of the liquid by sucking and discharging the liquid;

a sensor for sensing an operating quantity of the pump and generating a signal corresponding to the operating quantity;

means for determining the sampling quantity sampled by the pump in response to the signal from the sensor; and

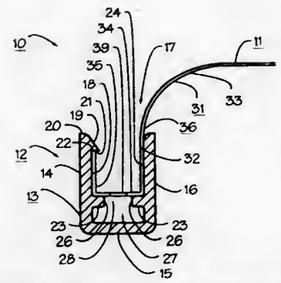
means for correcting the collected light absorbance fluctuations in data in accordance with the determined sample quantity even with fluctuations in the certain quantity sampled.

5,554,812

DRUM HEAD AND TENSIONING HOOP WITH POSITIONING AND T-LOCK RIDGES

David G. Donohoe, Springville, Calif., assignor to Aquarian Accessories Corporation, Anaheim, Calif.

Filed Feb. 28, 1995, Ser. No. 395,625
Int. Cl.[6] G10D *13/02*
U.S. Cl. 84—413 **20 Claims**



1. A drum head for musical percussion instruments comprising:

a. a thin, flexible membrane having a flat, circular disk-shaped upper battering section, and a downwardly depending peripheral section, said peripheral section including a generally vertically disposed annular flange wall, and a generally horizontally disposed annular flange wall joined to said vertically disposed annular flange wall,

b. a circular ring-shaped tensioning hoop having in the upper side thereof an elongated annular groove adapted to insertingly receive said horizontally disposed annular flange wall,

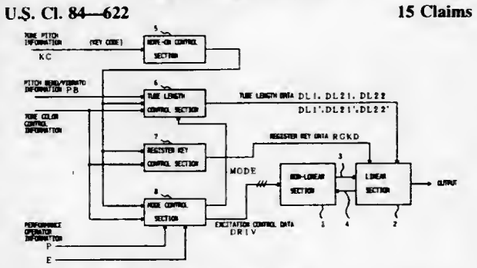
c. fastening means for securing said horizontally disposed annular flange wall within said hoop said fastening means comprising an annular ring-shaped body composed of a solid polymer overlying said horizontally disposed annular flange wall.

5,554,813

ONE SIGNAL SYNTHESIZER EMPLOYING A CLOSED WAVE GUIDE NETWORK

Masahiro Kakishita, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Continuation of Ser. No. 76,908, Jun. 15, 1993, abandoned.
This application May 8, 1995, Ser. No. 436,924
Claims priority, application Japan, Jun. 16, 1992, 4-181681
Int. Cl.[6] G10H *7/00;1/06*
U.S. Cl. 84—622 **15 Claims**



1. A tone signal synthesizer comprising:

signal circulation means including a bidirectional signal transmitting channel section which has a channel for transmitting a wave signal in an advancing direction and a channel for transimitting the wave signal in a reflecting direction, and a signal junction section for controlling advancement and reflection of the wave signal at a boundary of said signal transmitting channel section, a delay time in said signal transmitting channel section being variably controlled by a first parameter group so as to control a resonance characteristic of said signal circulation means;

excitation means for exciting the wave signal to be supplied to said signal circulation means, an excitation frequency of said excitation means being controlled in accordance with a second parameter group, the wave signal circulating in said signal circulation means being taken out as a tone signal, a pitch of said tone signal being determined by a combination of the resonance frequency of said signal circulation means and the excitation frequency of said excitation means;

combination determination means for determining a combination of the first parameter group to be used in said signal circulation means and the second parameter group to be used in said excitation means, in correspondence to a pitch of a tone to be generated; and

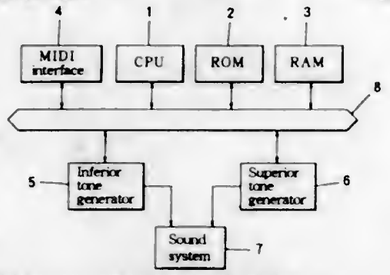
parameter generation means for, in accordance with the combination determined by said determination means, generating individual parameters of said first and second parameter groups and supplying thus-generated parameters to said signal circulation means and excitation means.

5,554,814

ELECTRONIC MUSICAL INSTRUMENT CREATING TIMBRE BY OPTIMUM SYNTHESIS MODE

Takuya Nakata, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Filed Oct. 27, 1995, Ser. No. 549,272
Claims priority, application Japan, Oct. 31, 1994, 6-288571
Int. Cl.[6] G10H *1/06*
U.S. Cl. 84—659 **7 Claims**



1. An electronic musical instrument comprising:

a composite sound source for generating a musical tone, and including a first synthesizing circuit for creating a variety of timbres of the musical tone having a superior quality and a second synthesizing circuit for creating another variety of timbres of the musical tone having an inferior quality;

admission means for admitting designation information effective to designate one of the first and second synthesizing circuits to be activated and effective to designate a timbre to be created by the designated one of the first and second synthesizing circuits;

detection means operative when the second synthesizing circuit is designated for providing a detection signal if the designated timbre can be also created by the first synthesizing circuit; and

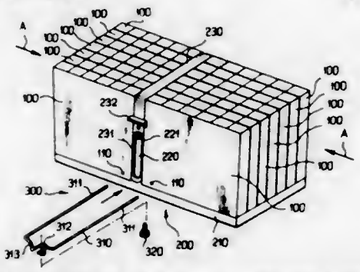
control means responsive to the detection signal for altering the admitted designation information so that the first synthesizing circuit is activated in place of the second synthesizing circuit so as to create the designated timbre by the superior quality.

5,554,815

MUNITION CONSTITUTING A CARTRIDGE-LAUNCHER LOADER, IN PARTICULAR FOR COUNTERMEASURE CARTRIDGE-LAUNCHER ON AIRCRAFT

Christian Authie, Muret, and Philippe Cassagne, Fonsorbes, both of France, assignors to Etienne Lacroix Toux Artifices S.A., Muret, France

Filed Sep. 6, 1994, Ser. No. 301,276
Claims priority, application France, Sep. 6, 1993, 93 10555
Int. Cl.[6] F41F *3/00*
U.S. Cl. 89—1.59 **6 Claims**



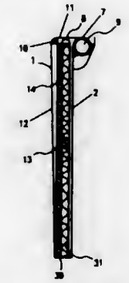
3. A cartridge-launcher loader munition comprising a plurality of consumable modules each in the form of a flat strip of juxtaposed cartridges each comprising a payload of chaff, said strips having flat surfaces, an ejector pyrotechnic charge and electrical initiator means and a reusable support receiving the strips having means for immobilizing the strips and a handle for transporting and installing it, in which munition said flat surfaces of said strips are juxtaposed to form a homogeneous block essentially constituting at least a part of the body of the munition and the support includes a fixed plate carrying said strips and receiving the latter, when they are inserted by sliding in a direction substantially parallel to a plane of said plate, wherein said support further includes a wall perpendicular to the plane of said plate against which said strips abut at the end of insertion, and wherein the side of said strip abutted against said wall carries a centering and locking pin which is inserted at the end of insertion into a cooperating hole in said wall.

5,554,816

REACTIVE BALLISTIC PROTECTION DEVICES

Samuel R. Skaggs, Rte. 11, Box 81E, Santa Fe, N.M. 87501, and Mark F. Folsom, 25747 Carmel Knolls Dr., Carmel, Calif. 92923

Filed May 13, 1994, Ser. No. 242,613
Int. Cl.[6] F41H *5/007;5/08;5/04*
U.S. Cl. 89—36.17 **14 Claims**



1. A ballistic protection device, interposable between a user and an assailant, said device comprising in operative combination:

an armor panel for deflecting a bullet fired by said assailant;

a reactive initiator disposed on said armor panel, for detecting at least one of the impact of said bullet and the discharge of said assailant's firearm; and

an incapacitating flash device further disposed upon said armor panel and in operative combination with said reactive initiator, said flash device including at least one flash lamp, an electrical energy storage device, and a flash lamp control circuit.

5,554,817

PYROTECHNIC IGNITION APPARATUS

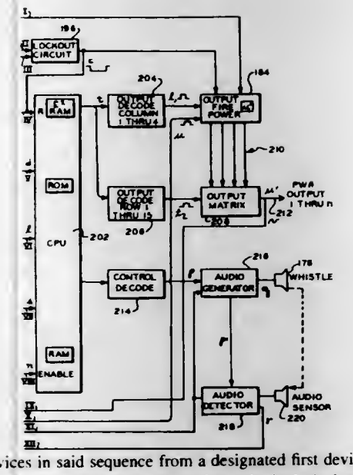
Joseph L. La Mura, West Caldwell, and Ronald C. Wallenburg, Pennsauken, both of N.J., assignors to Joanell Laboratories, Inc., Livingston, N.J.

Division of Ser. No. 145,499, Nov. 1, 1993, Pat. No. 5,450,686, which is a division of Ser. No. 877,809, May 4, 1992, Pat. No. 5,284,094, which is a division of Ser. No. 419,549, Oct. 10, 1989, Pat. No. 5,157,222. This application May 22, 1995, Ser. No. 447,070
Int. Cl.[6] F42D *1/055*
U.S. Cl. 102—217 **17 Claims**

1. A control circuit for igniting an array of pyrotechnic devices each at a different array position, said circuit comprising:

control means employing digital computer means responsive to an applied ignite command signal for selectively igniting said devices in a given ignition sequence; and

means for causing the control means to interrupt the ignition of said devices prior to the completion of the ignition of all said devices in said sequence from a designated first device in the sequence leaving a portion of non-ignited devices in the sequence, and then selectively restart the ignition sequence from the first designated device of said sequence or from the next to be ignited device in the remainder of the non-ignited devices in the stopped sequence.

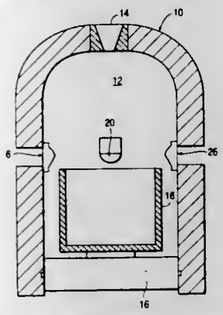


5,554,818

LITHIUM WATER REACTOR

Barry D. Edgar, and Timothy Jone, both of Fareham, United Kingdom, assignors to The Marconi Company Limited, Middlesex, United Kingdom

Filed Feb. 14, 1991, Ser. No. 664,050
Claims priority, application United Kingdom, Mar. 26, 1990, 9006705
Int. Cl.[6] F42B *12/00*
U.S. Cl. 102—364 **11 Claims**



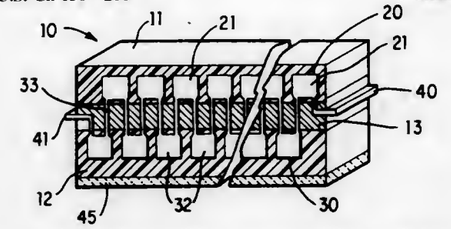
1. A reactor comprising: a combustion chamber; a charge comprising a discrete body of one of lithium and an easily oxidisable metal disposed inside the chamber; first means for introducing water from outside the chamber onto said charge so as to cause combustion of said charge; and second means for introducing water into the chamber to mix with the combustion products of the reaction of said charge and the water from said first means and to produce steam.

5,554,819

METHOD AND APPARATUS FOR THE THERMOELECTRIC GENERATION OF ELECTRICITY

A. Baghal-Kermani, 515 E. 88th St. Apt. 5-L, New York, N.Y. 10128

Filed Jan. 22, 1992, Ser. No. 832,925
Int. Cl.[6] H01L *35/30*
U.S. Cl. 136—206 **8 Claims**



1. A thermoelectric generator system comprising a thermoelectric generator having a plurality of thermocouples thermally coupled to separate spaced apart first and second members, said first and second members contacting said thermocouples with electrically non-conductive portions abutting said thermocouples, said thermocouples being interconnected to form a thermopile, said first member being exposed to radiation from the sun, and an absorbent layer affixed to said second member, said absorbent layer being exposed to environment external of said system, said system further comprising means for applying water to said absorbent layer, to effect cooling of said second member by evaporation of water from said absorbent layer to an environment external of said system,

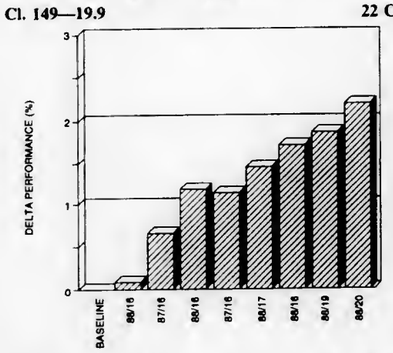
said system further comprising means spaced from said absorbent layer to form a channel therebetween, and means for directing air through said channel.

5,554,820

HIGH SOLIDS ROCKET MOTOR PROPELLANTS USING DIEPOXY CURING AGENTS

Robert B. Wardle, Logan, and R. Scott Hamilton, Bear River City, both of Utah, assignors to Thiokol Corporation, Ogden, Utah

Filed Mar. 20, 1995, Ser. No. 406,573
Int. Cl.[6] C06B *45/10*
U.S. Cl. 149—19.9 **22 Claims**



1. A solid rocket motor propellant comprising the products of combining:

a butadiene-acrylonitrile-acrylic acid terpolymer binder (PBAN);

a curative selected from the group consisting of diepoxides having 4 to 10 carbon atoms;

a solid oxidizer salt; and

5,554,824

IC PACKAGE AND PACKAGING METHOD FOR THE

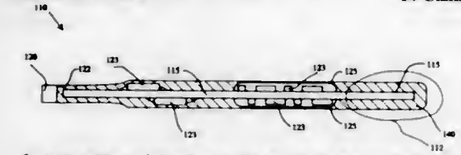
5,554,826

OVERHEAD TRANSMISSION CONDUCTOR

covering thereon that is adapted to engage the housing and form a seal around the opening in the housing when in a closed position;

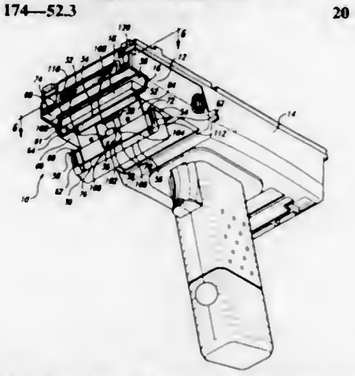
a curative selected from the group consisting of diepoxides having 4 to 10 carbon atoms;
a solid oxidizer salt; and
a solid fuel;
wherein the solid oxidizer salt and solid fuel together comprise not less than about 86% by weight of the propellant composition.

5,554,821
REMOVABLE COMPUTER PERIPHERAL CARDS HAVING A SOLID ONE-PIECE HOUSING
Michael W. Patterson, Pleasanton, and Hem P. Takiar, Fremont, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.
Filed Jul. 15, 1994, Ser. No. 275,985
Int. Cl.[6] H01L *23/28*
U.S. Cl. 174—52.2 **14 Claims**



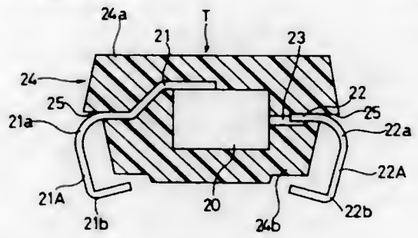
1. A portable peripheral card for use with an electrical device comprising:
a printed circuit board having electrical components mounted thereon;
an electrical connector attached to the printed circuit board for permitting communications between the electrical components on the printed circuit board and the electrical device; and
a solid one-piece package that completely encapsulates the printed circuit board and the electrical components thereon yet exposes a portion of the electrical connector to facilitate electrical connections between the printed circuit board and the electrical device.

5,554,822
SEALABLE, LATCHABLE DOOR FOR SECURING AND PROTECTING A PC MEMORY CARD
David Glipin, Everett, and John M. Bishay, Mukilteo, both of Wash., assignors to Intermec Corporation, Everett, Wash.
Filed Nov. 10, 1993, Ser. No. 151,066
Int. Cl.[6] H05K *5/06*
U.S. Cl. 174—52.3 **20 Claims**



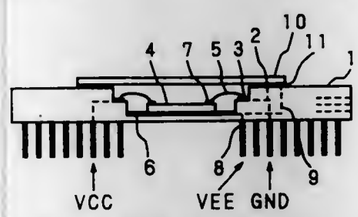
1. A sealable door assembly used with an electronic device that has a housing adapted to removably receive a memory device through an opening in the housing, the housing further including a latch receiver, the assembly comprising:
a door shaped and sized to removably cover the opening in the housing, said door having at least one engaging face with a covering thereon that is adapted to engage the housing and form a seal around the opening in the housing when in a closed position;
a connecting member retained by the housing for movement between a retracted position and an extended position, said connecting member being attached to said door, said door being carried by said connecting member, said door being movable relative to said connecting member for movement between said closed position when said connecting member is moved into said retracted position, and an open position whereat said door is sufficiently clear of the opening in the housing to permit insertion and removal of the memory device when said connecting member is moved into said extended position; and
a latching member attached to said door and adapted to releasably engage the housing to secure said connecting member in said retracted position and said door in said closed position and to selectively release said connecting member for movement to said extended position whereat said door is moveable to said open position.

5,554,823
PACKAGING DEVICE AND ITS MANUFACTURING METHOD
Miki Hasegawa, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan
Filed Dec. 23, 1992, Ser. No. 996,336
Claims priority, application Japan, Dec. 27, 1991, 3-360057
Int. Cl.[6] H01L *23/02*
U.S. Cl. 174—52.4 **3 Claims**



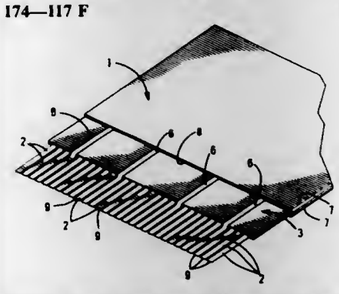
1. A packaging device comprising:
an electric circuit device;
a plurality of lead terminals, each of said lead terminals having two ends with a first of said two ends of each of said lead terminals being connected to the electric circuit device; and
a resin for encapsulating the electric circuit device and said one of said ends of each of the plurality of lead terminals,
wherein a remainder of each of said leads not encapsulated in the resin protrudes out of an end surface of the resin and is curved downward, each of said leads curving downward from a lower side of an upper half of the resin in an arcuate manner with a predetermined radius of curvature, wherein the predetermined radius of curvature of each lead terminal is 0.06 mm to 1.0 mm, and an inwardly bent portion is formed on a second end of each of said plurality of lead terminals, said inwardly bent portions having a smaller radius of curvature than said predetermined radius of curvature, and wherein an outermost end of the inwardly bent portion is located inward from an outermost point of the predetermined radius of curvature.

5,554,824
IC PACKAGE AND PACKAGING METHOD FOR THE SAME
Masahiro Ueda, and Shuichi Matsue, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 30, 1992, Ser. No. 997,756
Claims priority, application Japan, Jan. 7, 1992, 4-000902
Int. Cl.[6] H01L *23/02*
U.S. Cl. 174—52.4 **9 Claims**



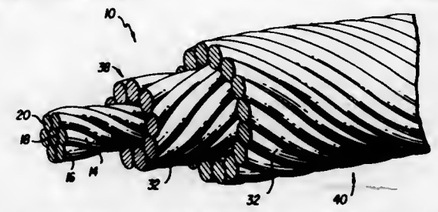
1. An IC package for packaging an IC chip to which a voltage is to be applied, comprising:
a package body which has plural kinds of wiring patterns on a surface;
means for respectively applying voltages which are different in level from each other, to said wiring patterns;
means for applying said different voltages to said IC chip; and
said IC package further includes one of plurality of lids which are to be put on said package body, said lids being different from each other in size.

5,554,825
FLEXIBLE CABLE WITH A SHIELD AND A GROUND CONDUCTOR
Stephen M. Parker, High Point, N.C., and Thomas J. Lynch, Mechanicsburg, Pa., assignors to The Whitaker Corporation, Wilmington, Del.
Filed Nov. 14, 1994, Ser. No. 338,920
Int. Cl.[6] H01B *7/08*
U.S. Cl. 174—117 F **9 Claims**



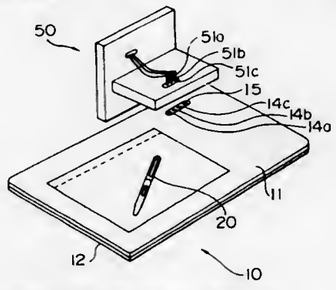
8. An electrical cable comprising: a flexible and flat conductive shield, a flexible ribbon of insulation separating the shield from multiple flexible signal conductors extending along the insulation, and at least one flexible ground conductor between the insulation and the shields the signal conductors are spaced apart on pitch spacings, with a corresponding one of said signal conductors absent from at least one of the pitch spacings, and each said ground conductor extending above said one of the pitch spacings and at least one opening through the shield exposing the insulation and each said ground conductor.

5,554,826
OVERHEAD TRANSMISSION CONDUCTOR
Bobby C. Gentry, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.
Continuation of Ser. No. 115,606, Sep. 3, 1993, Pat. No. 5,374,783, which is a continuation of Ser. No. 904,116, Jun. 25, 1992, Pat. No. 5,243,137. This application Dec. 1, 1994, Ser. No. 352,122
Int. Cl.[6] H01B *5/08*
U.S. Cl. 174—128.1 **8 Claims**



5. An improved overhead transmission conductor produced by the process which comprises the steps of:
providing a stranded steel core;
annealing high-conductivity aluminum rod to the fully annealed state;
drawing the fully annealed rod to produce conductor wires;
stranding at least one layer of said conductor wires about the stranded steel core to form a cable, said stranding being performed without increased lubrication and in the absence of:
i) substantially reduced back-tension,
ii) substantially reduced operating speeds, and
iii) substantially enlarged closing dies, all as necessitated by fully annealed conductor wires; and
thereafter stress-relieving/annealing the conductor wires by heat treatment at limited temperatures until the conductor wires are substantially dead soft wherein said overhead transmission conductor exhibits at least 64% IACS conductivity, without significant deleterious effect on the stranded steel core.

5,554,827
METHOD OF AND APPARATUS FOR DETERMINING WHETHER A DIGITIZER COORDINATE DETECTING TABLET IS PROPERLY OPERATING AND/OR WRITING ADJUSTMENT DATA INTO A MEMORY ASSOCIATED WITH THE TABLET
Yasuo Oda, Saitama-ken, Japan, assignor to WACOM Co., Ltd., Saitama-ken, Japan
Filed Feb. 22, 1993, Ser. No. 24,171
Int. Cl.[6] G08C *21/00;* **G09G** *3/02*
U.S. Cl. 178—18 **21 Claims**



1. A coordinate detecting device, comprising:
a circuit board;
a housing in which the circuit board is housed; and

a cable extending from the circuit board to outside of the housing for electrically connecting the circuit board to appa-

5,554,830
NOISE-REDUCING COVERING FOR VEHICLE

to not less than 30% by weight of the fiber assembly are recycled polyester fibers produced from a recycled polyester material hav-

a cable extending from the circuit board to outside of the housing for electrically connecting the circuit board to apparatus external to the housing,

check pin guide holes located on a wall portion of the housing, and

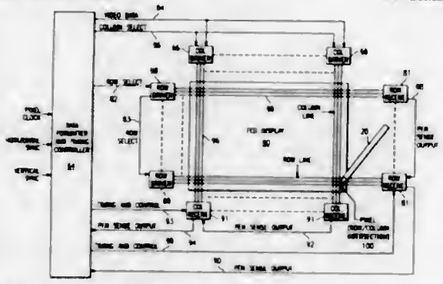
check terminals located on a portion of the circuit board, said circuit board portion corresponding to that of the check pin guide holes, said check terminals being connected for coupling signals between an apparatus outside of the housing and the circuit board.

5,554,828

INTEGRATION OF PEN-BASED CAPABILITY INTO A FIELD EMISSION DEVICE SYSTEM

Charles E. Primm, Plano, Tex., assignor to Texas Instruments Inc.

Filed Jan. 3, 1995, Ser. No. 367,558
Int. Cl.[6] G08C *21/00*
U.S. Cl. 178—18 **26 Claims**



4. An electrographic system comprising:

a field emission device having a cathode coupled to an anode, row and column drivers coupled to said cathode and to a controller, and row and column lines respectively coupled to said row and column drivers;

receive circuitry coupled to said controller and said row and column lines; and

a stylus coupled to said field emission device; said stylus outputing a pulsed light;

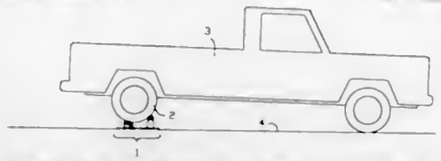
wherein said receive circuitry receives said pulse from said stylus on said row and column lines.

5,554,829

LAND SEISMIC ACOUSTIC SOURCE

Bill L. Jaworski, P.O. Box 290, Burley, Wash. 98322

Filed Feb. 14, 1995, Ser. No. 388,563
Int. Cl.[6] G01J *1/143*
U.S. Cl. 181—114 **20 Claims**



1. An apparatus for generating a seismic signal in the earth in cooperation with a vehicle having a drive wheel, the apparatus comprising:

(a) a base having a bottom for placement on the ground; and

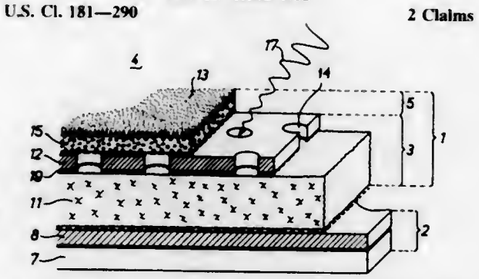
(b) a drive roller rotatably secured to said base, said drive roller having an axis of rotation and a surface arranged and configured for engagement with the drive wheel of the vehicle, at least a portion of said surface of said drive roller being farther from the axis of rotation than other portions of said surface.

5,554,830

NOISE-REDUCING COVERING FOR VEHICLE INTERIOR

Peter Müller, Rheinheim, Germany, and Günther Wedermann, Wallisellen, Switzerland, assignors to Matec Holding AG, Küsnacht, Switzerland

Continuation of Ser. No. 842,199, Jul. 31, 1992, abandoned. This application Jun. 30, 1994, Ser. No. 269,961
Claims priority, application Switzerland, Jul. 19, 1990, 2402/90
Int. Cl.[6] E04B *1/82*
U.S. Cl. 181—290 **2 Claims**



1. A noise-transmission-reducing covering for the inside of the passenger compartments of vehicles, the inside having a sound field, said covering comprising:

a carpet covering top layer made of an air-permeable material for facing the passenger compartment,

an acoustic insulation composite including:

an air-permeable dense layer underlying the carpet covering top layer and adjacent to said carpet covering top layer, said dense layer including openings therein and functioning as a solid mass,

a spongy mass layer underlying said dense layer, said spongy mass layer functioning as a spring, said spongy mass having a sound-damping quality of the acoustic insulation composite;

a steam permeable, water impermeable and sound wave transmissible insulating barrier layer interposed between said dense layer and said spongy mass layer;

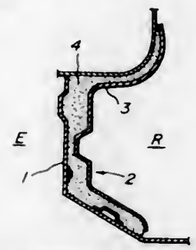
wherein said air-permeable carpet top covering layer and said air-permeable dense layer couple the sound field acoustically with said spongy mass layer, thereby increasing sound-absorbing effectiveness of said covering.

5,554,831

SOUND ABSORBING MEMBER

Hiroshi Matsukawa, Tokyo; Kyoichi Watanabe, and Hiroshi Sugawara, both of Yokosuka, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, and Nissan Motor Co., Ltd., Kanagawa Pref., both of Japan

Filed Sep. 26, 1994, Ser. No. 312,063
Claims priority, application Japan, Sep. 27, 1993, 5-239822
Int. Cl.[6] E04B *1/84*
U.S. Cl. 181—294 **6 Claims**



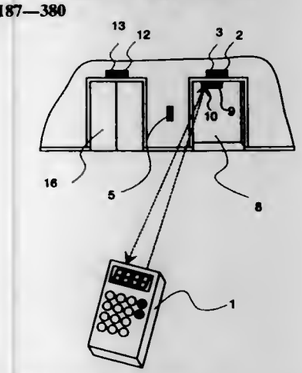
1. A sound absorbing member for an automobile comprised of a fiber assembly consisting essentially of short fibers and having a thickness of not less than 5 mm, in which the fibers corresponding to not less than 30% by weight of the fiber assembly are recycled polyester fibers produced from a recycled polyester material having an intrinsic viscosity of not less than 0.4, and not less than 30% by weight of the fiber assembly have a fiber size of not more than 4 denier.

5,554,832

REMOTE CONTROLLER LINKAGE TO AN ELEVATOR SYSTEM

Jorma Lumme, Rixenart, Belgium; Asko Juntunen, and Matti Kujala, both of Hyvinkää , Finland, assignors to Kone Oy, Helsinki, Finland

Continuation of Ser. No. 171,440, Dec. 22, 1993, abandoned. This application Mar. 29, 1995, Ser. No. 412,850
Claims priority, application Finland, Dec. 22, 1992, FI925843
Int. Cl.[6] B66B *1/46;1/18*
U.S. Cl. 187—380 **4 Claims**



1. An elevator system comprising:

an elevator car located within an elevator shaft;

an elevator controller, controlling the movement of said elevator car;

a communications bus, connected to said elevator controller, communicating messages to and from said elevator controller;

a remote controller;

a plurality of transceivers, each connected to said communications bus, receiving request signals from said remote controller and transmitting request signals to said elevator controller through said bus, at least one of said transceivers is located outside the elevator car and adjacent to a door of the elevator car and one of said transceiver is located in the elevator car,

wherein only one of said plurality of transceivers transmits a first message, if said first message is received by more than one transceiver.

5,554,833

MAGNETIC SWITCH TRIPPING SYSTEM

Wayne Johnson, 2303 Winchester St., Oceanside, Calif. 92054

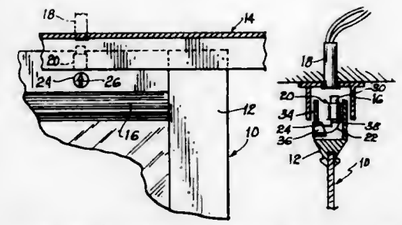
Filed Sep. 26, 1994, Ser. No. 312,526
Int. Cl.[6] H01H *3/16;9/00*
U.S. Cl. 200—61.72 **13 Claims**

1. A switch trip for use primarily in a sliding glass door having a frame with sidewalls to trip a magnetic alarm switch mounted in the door casing above the door, comprising:

(a) a magnetic element;

(b) an elongated stem mounting said magnet such that it extends longitudinally from one end thereof, and,

(c) said stem and said magnet substantially defining an L-shape with the width between the apex of the "L" and a line between the two ends thereof being no greater than on the order of the spacing between said sidewalls such that said trigger can be inserted into a hole bored in one of said sidewalls of said sliding glass door near the top thereof and hooked into place with said magnetic element extending upright with its top adjacent the surface of said door casing which mounts said alarm switch.

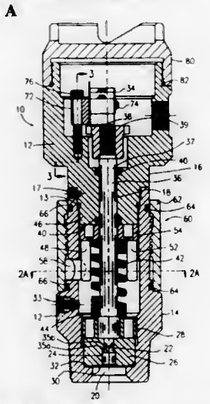


5,554,834

PRESSURE SWITCH

James R. Eliett, Edmonton, Canada, assignor to Argus Machine Co. Ltd., Edmonton, Canada

Filed Aug. 4, 1994, Ser. No. 284,994
Int. Cl.[6] H01H *35/38*
U.S. Cl. 200—82 A **18 Claims**



1. A pressure switch comprising:

a housing with an interior bore and exterior threads;

a rod slidable over a limited range within the bore under external fluid pressure;

a mechanically operated electrical switch operatively connected to the rod;

adjustment means encapsulated within the housing to adjust resistance of the rod to movement under external fluid pressure;

a port in the housing for access to the adjustment means; and

a removable cover for the port, the cover including a ring threaded onto and around the housing, and longitudinally movable on the exterior threads from a position away from the port to a position over the port.

5,554,835

TRAVERSING CONDUCTOR PRESSURE SENSITIVE SWITCH

Paul F. Newham, San Antonio, Tex., assignor to Bed-Check Corporation, Tulsa, Okla.

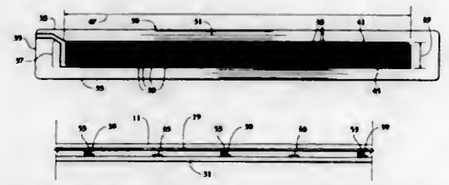
Filed Jul. 27, 1994, Ser. No. 281,431
Int. Cl.[6] H01H *3/14*
U.S. Cl. 200—85 R **18 Claims**

1. A pressure sensitive switch comprising:

5,554,837

INTERACTIVE LASER WELDING AT ELEVATED

wherein d_1/d_2 is 0.2 or more, d_1 being a depth of said gap between said metallic heating body and said ceramic sintering body and d_2 being a thickness of said metallic heating body,



upper, middle and lower laminar elongated nonconductive members, said middle member having an opening therethrough defining a cavity between said upper and lower members;

an array of substantially parallel, spaced-apart electrically conductive bands fixed to a lower surface of said upper member and traversing said cavity;

an array of substantially parallel, spaced-apart electrically conductive bands fixed to an upper surface of said lower member and traversing said cavity and said upper member bands, selected lower member bands being discretely connected to an electrical input lead and other lower member bands being discretely connected to an electrical output lead; and

an array of substantially parallel, spaced-apart dielectric bands fixed to said lower member upper surface and traversing said cavity between said arrays of conductive bands at alternate overlapping points thereof and partially separating said arrays of conductive bands from electrical contact therebetween at said alternate overlapping points;

said upper and lower members being resiliently flexible to permit said overlapping points of said arrays of conductive bands to close into and open out of electrical contact therebetween upon exertion and removal, respectively, of a threshold external compressive force to and from said cavity.

5,554,836

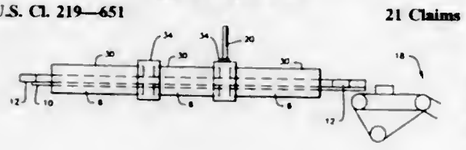
INDUCTION HEATING IN LOW OXYGEN-CONTAINING ATMOSPHERE

Mircea S. Stanescu, Durham, N.C., and Paul F. Stratton, West Yorkshire, England, assignors to The BOC Group, Inc., Murrah Hill, N.J.

Filed May 23, 1994, Ser. No. 247,447

Int. Cl.[6] H05B *6/16*

U.S. Cl. 219—651 **21 Claims**



1. An induction heating apparatus comprising:

(a) at least two induction heating coils, each induction heating coil being contained within a separate housing, each housing being aligned in a linear spaced apart relationship to define a pathway for the passage of a part to be heated;

(b) a cover means enclosing the space between each housing; and

(c) a tube assembly having entry through at least one of the cover means and into the pathway for transporting an inert gas alone or in combination with an oxygen-reacting gas from a source to the pathway to establish a low oxygen-containing atmosphere therein.

5,554,837

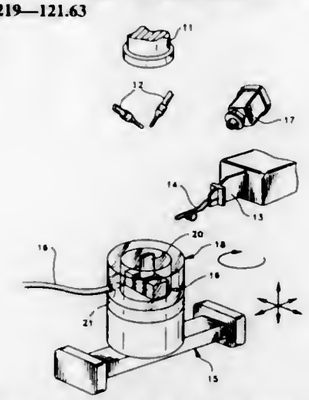
INTERACTIVE LASER WELDING AT ELEVATED TEMPERATURES OF SUPERALLOY ARTICLES

Frank Goodwater, Reno; Lang D. Huynh, Carson City; David S. Kang, Carson City; Hon Li, Carson City; James M. Lizotte, Reno, and Brian G. Doyle, Gardnerville, all of Nev., assignors to Chromalloy Gas Turbine Corporation, San Antonio, Tex.

Filed Sep. 3, 1993, Ser. No. 116,670

Int. Cl.[6] B23K *26/08*

U.S. Cl. 219—121.63 **25 Claims**



1. A process for laser welding a nickel and/or cobalt based superalloy article chosen from the group consisting of a gama-prime precipitation strengthened superalloy containing titanium and aluminum in a combined amount of at least 5% and an MCrAlY alloy wherein M is nickel and/or cobalt comprising:

preheating an entire weld area and region adjacent to the weld area of the article to a ductile temperature which is above an aging temperature and below an incipient melting temperature for said superalloy and within the range of 1400° F. to 2100° F. with an induction heat coil and maintaining such temperature during welding and solidification of a weld; and welding the preheated article utilizing a laser with a powder alloy feed, with a control means preprogrammed with values for control of the laser, the powder feed and a general path for a motion system on which the article is fixtured, said values based on the configuration and composition of the article wherein the control means further includes a vision system which digitizes the weld area of the article providing a precise path for the laser welding to follow individualized for the weld area of the specific article being welded.

5,554,838

HAND-HELD HEATING TOOL WITH IMPROVED HEAT CONTROL

Edward C. Berdich, Downingtown, Pa., assignor to Wind Lock Corporation, Birdsboro, Pa.

Filed Aug. 23, 1995, Ser. No. 518,232

Int. Cl.[6] H05B *1/02;3/00*

U.S. Cl. 219—240 **8 Claims**

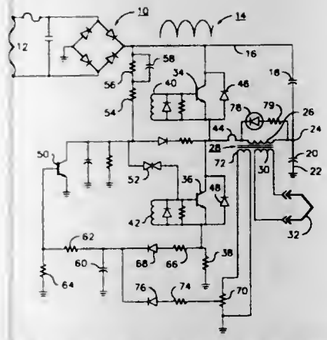
1. A hand-held heating tool comprising:

a resistive heating element;

means for receiving alternating line current at a first frequency;

means, comprising an oscillator connected to the line current receiving means and to the resistive heating element, for producing an alternating current in the resistive heating element at a second frequency higher than the first frequency; and

delivery and control means for causing the oscillator to deliver to the heating element a sequence of electrical pulses, each pulse consisting of plural oscillations at the second frequency, and for adjusting the time intervals between the pulses to



control the electrical energy dissipated by the resistive heating element and thereby control the temperature of the heating element;

in which the means for receiving the line current comprises rectification means connected to receive said line current and producing a series of sinusoidal pulses at a repetition rate which is at least equal to the frequency of the line current, in which the oscillator is a non-self triggering oscillator connected to receive the series of sinusoidal pulses, the oscillator being responsive to a trigger pulse and beginning oscillation to produce alternating current at said second frequency only upon receipt of a trigger pulse during the duration of a sinusoidal pulse of the series and continuing to produce said alternating current only until the termination of the sinusoidal pulse during which the trigger pulse was received, and in which the delivery and control means comprises means for producing trigger pulses for triggering the oscillator, the delivery and control means being capable of producing trigger pulses during selected sinusoidal pulses, thereby the oscillator is capable of oscillating during some of the sinusoidal pulses of the series and capable of remaining idle during other sinusoidal pulses of the series.

5,554,839

CERAMIC HEATER

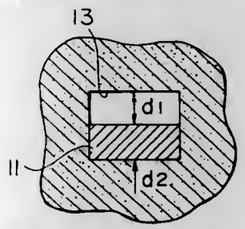
Tadashi Tsuruta, Chita; Masatoshi Suzuki; Hiromi Sano, both of Nagoya; Namitsugu Fujii, Yokkaichi, and Hiroshi Sugino, Chita-gun, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 11, 1994, Ser. No. 208,786

Claims priority, application Japan, Mar. 12, 1993, 5-052502; Feb. 28, 1994, 6-030173

Int. Cl.[6] H05B *3/44*

U.S. Cl. 219—544 **9 Claims**



1. A ceramic heater comprising:

a ceramic sintered body to which a flux for accelerating the sintering of the ceramic has been added; and

a metallic heating body, embedded in and contacting said ceramic sintered body, for heating said ceramic sintered body when electric current is supplied thereto;

and the ceramic heater including a gap for collecting said flux of said ceramic sintered body when electric current is supplied to said metallic heating body, the gap being between said ceramic sintered body and said metallic heating body,

wherein d_1/d_2 is 0.2 or more, d_1 being a depth of said gap between said metallic heating body and said ceramic sintering body and d_2 being a thickness of said metallic heating body.

5,554,840

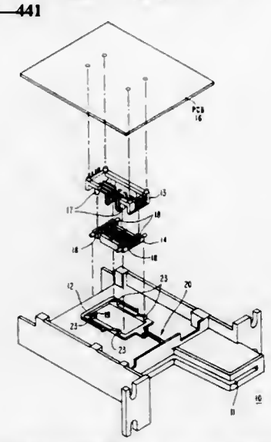
HYBRID CARD READER

Jagtar S. Saroya, San Pedro, Calif., assignor to American Magnetics Corporation, Carson, Calif.

Filed Mar. 7, 1994, Ser. No. 207,298

Int. Cl.[6] G06K *7/06*

U.S. Cl. 235—441 **4 Claims**



1. A card reader comprising a housing including a slot for accepting a smart card along a path in a first plane, said reader also including a printed circuit board bearing circuitry for interacting with data stored in a card inserted in said slot, said printed circuit board including a first set of electrical contacts corresponding to a second set of contacts on a smart card, said reader also including a subassembly for connecting said first set of contacts to said second set responsive to the movement of a smart card along said path, said subassembly including a collar member, a carraige and a spring contact array, said collar, carraige and array mating with one another, said collar member being spring loaded for movement only in the plane of said path, said spring contact array being fixed to said printed circuit board in alignment with said collar member, said collar member engaging a card advancing along said path and having ramps thereon for moving said carraige in a direction orthogonal to said plane, said array and said carraige being positioned and dimensioned so that the movement of said carraige distorts the spring contacts of said array into contact with contacts on a smart card fully seated in said reader.

5,554,841

ARTICLE MARKER AND DECODING METHOD

Karen L. Kost; William J. Fry; Timothy Lock, all of Ann Arbor, and Michael S. Davis, South Lyon, all of Mich., assignors to Lynn Ltd., Ann Arbor, Mich.

Filed Mar. 1, 1994, Ser. No. 203,546

Int. Cl.[6] G06K *7/10;19/6*

U.S. Cl. 235—464 **22 Claims**

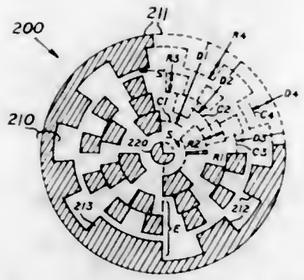
1. A marker digitally encoding a numerical value, comprising:

a perimeter having a predetermined shape;

a center;

a plurality of references, spaced apart around the perimeter to determine angular displacement about the center;

at least one concentric data track disposed within the perimeter, the shape of the track being substantially similar to that of the perimeter;



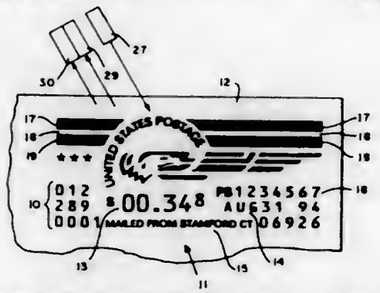
a digitally encoded bit pattern associated with the data track, the location of a particular bit within the pattern being determinable as a function of angular displacement and distance as measured radially inwardly from the closest point associated with the perimeter.

5,554,842

LUMINESCENT FACING MARKS FOR ENHANCED POSTAL INDICIA DISCRIMINATION

Richard A. Counell, South Salem, N.Y.; Thyagaraj Sarada, and Richard A. Bernard, both of Norwalk, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 22, 1994, Ser. No. 362,059
Int. Cl.[6] G06K *19/06*
U.S. Cl. 235—491 **14 Claims**



1. A method of supplying a mail piece with a postal indicia that is used to sort the mail piece comprising the steps of:

printing a portion of a postal indicia or the entire postal indicia on a mail piece with a ink that is fluorescent and phosphorescent; and

reading the portion of the postal indicia to distinguish between conventional indicia and new indicia that contains more information.

5,554,843

OPTICAL ELEMENT DRIVING MECHANISM

John R. Leonard, Glendale, Ariz., assignor to Honeywell Inc., Minneapolis, Minn.

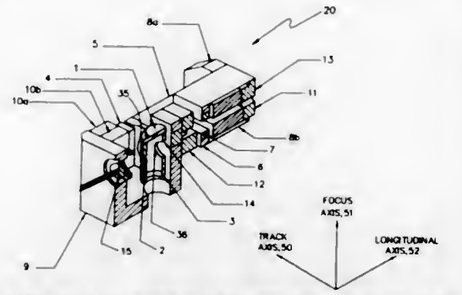
Filed Sep. 6, 1994, Ser. No. 301,507
Int. Cl.[6] G01J *1/20*
U.S. Cl. 250—201.5 **16 Claims**

1. An apparatus for detecting position of an optical element and repositioning the optical element when necessary comprising:

a suspended support structure supporting the optical element;

a light emitting means;

a photodetector, aligned in a straight line with the light emitting means, which detects when the optical element is out of position by an image created onto elements within the photodetector by the light emitting means;



a first end of the apparatus with connections coming out of the apparatus to connect the apparatus with external connections and a second end of the apparatus opposite the first end;

a control system connected to the photodetector;

magnetic means; and

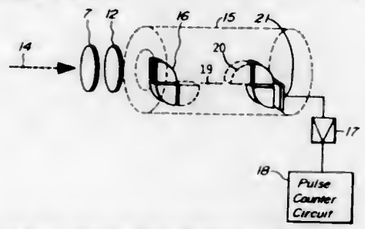
a plurality of driving coils which are used with the magnetic means to move the optical element along two axes, a first axis and a second axis, so that the optical element is moved back into position.

5,554,844

PASSBAND-ADJUSTABLE PHOTO-DETECTOR FOR INVERSE PHOTOEMISSION SPECTROSCOPY

Hirofumi Namatame, Higashihiroshima, and Masaki Taniguchi, Hiroshima, both of Japan, assignors to Hiroshima University, Hiroshima, Japan

Filed Mar. 15, 1995, Ser. No. 404,554
Claims priority, application Japan, Mar. 24, 1994, 6-053821
Int. Cl.[6] G01N *21/00*; **G02F** *1/01*; **H01L** *31/10*
U.S. Cl. 250—287 **8 Claims**



1. For use in inverse photo-emission spectroscopy wherein an electron gun directs an electron beam on to a sample, a pass-band adjustable photo-detector receiving light emitted by said sample when said electron beam impinges thereon, said photo-detector comprising:

a photo-electron multiplier including a dynode having a first KCl film deposited thereon, and a collector for collecting electrons emitted by said dynode;

a LiF monocrystal window and a CaF_2 monocrystal window interposed between the sample and said dynode, said LiF window having a second KCl film deposited thereon, light emitted by the sample being transmitted through said LiF and CaF_2 windows to impinge on said dynode;

temperature adjusting means for setting the temperature of said monocrystal windows between the temperature of liquid nitrogen and 150° C.; and

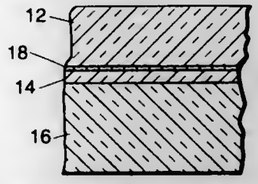
output means coupled to an output of said photo-electron multiplier for measuring the intensity of the electrons collected by said collector.

5,554,845

METHOD AND APPARATUS TO EFFECTIVELY ELIMINATE OPTICAL INTERFERENCE STRUCTURE IN DETECTOR RESPONSE

Edgar E. Russell, Goleta, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Filed Nov. 14, 1994, Ser. No. 337,720
Int. Cl.[6] H01J *5/16*
U.S. Cl. 250—226 **14 Claims**



1. A method of fabricating a device in which spectral variation in optical signals transmitted to an optical detector or array of optical detectors is reduced, said spectral variation resulting from a layer over the active area of the optical detector or array of optical detectors, said method comprising:

(a) providing an optical detector having an active area, at least a portion of said active area being covered by a layer, said layer and said optical detector having different indices of refraction such that said layer introduces spectral variation into optical signals incident to said active area, said spectral variation having a period of interference defined by the formula

$$1/(2nt \cos \theta'),$$

where n represents the index of refraction of said layer, t represents the thickness of said layer, and θ' represents the angle of incidence of said optical signals within said layer;

(b) providing a plate having an index of refraction substantially equal to the index of refraction exhibited by said layer, said plate having an areal extent at least equivalent to that of said at least a portion of said active area covered by said layer; and

(c) bonding said plate and said layer with an adhesive such that said plate is parallel to said layer across said at least a portion of said active area covered by said layer, said adhesive having an index of refraction substantially equal to the index of refraction exhibited by said layer and said plate,

whereby said bonding forms a structure having a composite thickness comprising the thicknesses of said plate, said adhesive, and said layer, said structure having an index of refraction substantially equal to said index of refraction n of said layer, such that the variable t of said formula is effectively increased and said period of interference is reduced according to the inverse relationship between t and period defined in said formula.

5,554,846

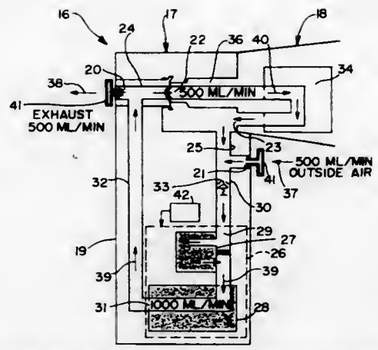
APPARATUS AND A METHOD FOR DETECTING ALARM MOLECULES IN AN AIR SAMPLE

Charles H. Ward II, Edgewood, Md., assignor to Environmental Technologies Group, Inc., Baltimore, Md.

Filed Jul. 31, 1995, Ser. No. 509,387
Int. Cl.[6] H01J *49/04*
U.S. Cl. 250—288 **14 Claims**

1. An apparatus for detecting alarm molecules in an air sample during an alarm mode, wherein residual alarm molecules are removed during a clear-down mode before a subsequent air sample is introduced, the apparatus comprising:

a first unit and a second unit, each of said first and second units having an inlet port and an output port, respectively, the inlet port of the first unit being connected to the inlet port of the second unit, the output port of the first unit being connected to the output port of the second unit,



wherein the first unit includes a sub-unit comprising a pump and a filter, the sub-unit having an inlet port and an output port,

wherein the inlet ports of the first unit and the second unit are connected to the output port of the sub-unit,

wherein the output ports of the first unit and the second unit are connected to the inlet port of the sub-unit,

wherein, during the alarm mode, the pump in the sub-unit is turned off, and the air sample passes from the inlet port of the first unit through the second unit to the output port of the first unit, thereby depositing alarm molecules in the first unit and the second unit, and

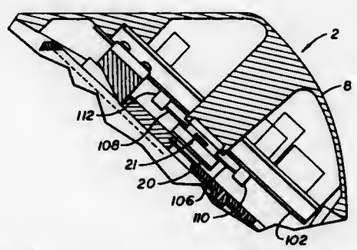
wherein, during the clear-down mode, the pump in the sub-unit is turned on, outside air passes from the output port of the first unit and, being mixed with an air flow from the output port of the second unit, passes through the sub-unit, and exhausts the first unit through the inlet port of the first unit, and enters the inlet port of the second unit, thereby cleaning the first unit and the second unit from the alarm molecules deposited therein during the alarm mode.

5,554,847

FLEXIBLY CONNECTABLE HIGH PRECISION THERMAL AND STRUCTURAL FOCAL PLANE ARRAY MOUNT

Paul R. Salvio, Palos Verdes Estates, and Kevin A. Walsh, Inglewood, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Oct. 11, 1994, Ser. No. 320,365
Int. Cl.[6] G01J *5/02*
U.S. Cl. 250—332 **13 Claims**



1. A flexibly connectable high precision thermal and structural detector array mount for mounting an uncooled detector array to a frame within a night vision camera comprising:

a fixture of thermally conductive material having a first substantially planar surface and a second surface;

first means for attaching the uncooled detector array to the first surface of the fixture;

second means for attaching the fixture to the frame within a night vision camera at the second surface of the fixture;

third means disposed for aligning the fixture to the frame within the night vision camera; and

fourth means to flexibly connect the uncooled detector array to a circuit board proximate the detector array.

5,554,848

GANTRY FOR NUCLEAR MEDICINE IMAGING SYSTEMS

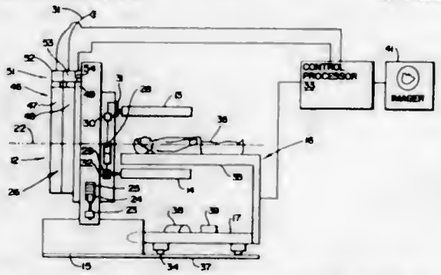
Nathan Hermony; Dan Inbar; Moshe B. Porath, and David Freundlich, all of Haifa, Israel, assignors to Elscint Ltd., Haifa, Israel

Continuation of Ser. No. 785,056, Oct. 30, 1991, abandoned. This application Dec. 15, 1993, Ser. No. 166,897

Claims priority, application Israel, Nov. 2, 1990, 096230

Int. Cl.[6] G01T *1/166*

U.S. Cl. 250—363.05 **18 Claims**



1. A nuclear medicine diagnostic imaging system comprising:

a gantry assembly including a stationary gantry member having a central axis,

a rotatable gantry member including a rotatable nuclear camera detector mounted on said rotatable gantry member for rotation about said central axis,

patient support means aligned with said central axis,

means for enabling said nuclear camera detector to continuously rotate about a patient on said patient support means during data acquisition,

means for moving said patient support means during said data acquisition relative to said gantry assembly for causing the relative motion between said nuclear camera detector and said patient to describe a helix for providing a helical whole body scan,

control processing means for supplying control signals for said system and for receiving data acquired by said nuclear camera detector responsive to said control signals and for processing said received data during said data acquisition to provide images of said patient, and

said means for enabling said nuclear camera detector to continuously rotate about the patient including cableless coupling means for coupling electric power, control signals and radioactive emission data between said stationary gantry member and said nuclear camera detector.

5,554,849

MICRO-BOLOMETRIC INFRARED STARING ARRAY

James L. Gates, Lake Oswego, Oreg., assignor to Flir Systems, Inc., Portland, Oreg.

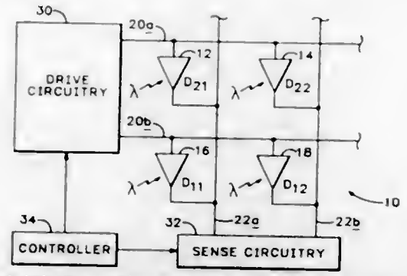
Filed Jan. 17, 1995, Ser. No. 372,982

Int. Cl.[6] G01J *5/20*

U.S. Cl. 250—370.08 **12 Claims**

1. A two-dimensional bolometric array comprising:

plural bolometer devices arranged in a generally planar two-dimensional array across a semiconductor substrate,



each bolometer device in said array being characterized as a semiconductor junction that is, by external drive means, normally reverse biased and that is selectively forward biasable at a substantially fixed forward bias voltage produced by external means, said device being exposable to infrared energy incident on said device and said device exhibiting a determinedly variable response to a varying amount of absorbed infrared energy incident upon said device, said device being thermally isolated from said substrate that forms a part of said device, said device having on one side of the junction a drive line for applying a bias thereto and having on another side of the junction a sense line for measuring said device's response to the amount of infrared energy incident on said device,

wherein plural ones of said plural devices share one or more common drive or one or more common sense lines controllable by associated bolometric array drive and sense circuitry.

5,554,850

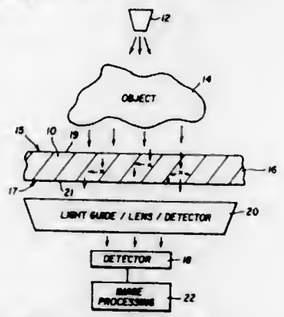
X-RAY SCINTILLATING PLATE UTILIZING ANGLED FIBER OPTIC RODS

Shahram Hejazi, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 4, 1994, Ser. No. 334,286

Int. Cl.[6] G01T *1/20*

U.S. Cl. 250—367 **3 Claims**



1. X-ray imaging apparatus comprising:

an x-ray scintillating plate having

a first face upon which is projected an x-ray image;

a bundle of fiber optic rods having first and second ends, wherein said first ends are coupled with said first face of said plate, each of said fiber optic rods including a core of optical material which emits light when exposed to x-rays and cladding surrounding said core; and

a second face coupled to said second ends of said rods for emitting a light x-ray image produced by said bundle of fiber optic rods in response to a projected x-ray image;

wherein said bundle of fiber optic rods are oriented at such an angle other than 90° relative to an x-ray image projected thereon, that substantially all x-rays of said x-ray image are absorbed by said rod cores before they are transmitted to said second face.

5,554,851

PARALLEL PLANE HOLDING MECHANISM AND APPARATUS USING SUCH A MECHANISM

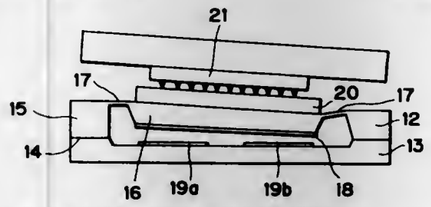
Yutaka Hirai, Tokyo; Osamu Takamatsu, Atsugi; Katsunori Hatanaka, Yokohama; Masaru Nakayama, Atsugi; Hiroyasu Nose, Zama; Takayuki Yagi, Tokyo, and Yasuhiro Shimida, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 946,899, Sep. 18, 1992, abandoned. This application Mar. 20, 1995, Ser. No. 407,245

Claims priority, application Japan, Sep. 24, 1991, 3-273289; Sep. 7, 1992, 4-238366

Int. Cl.[6] H01J *37/28*

U.S. Cl. 250—442.11 **13 Claims**



1. A parallel plane holding mechanism comprising:

a flat plate-shaped member having a plurality of apertured portions and a plurality of beams extending from a peripheral portion thereof;

a base plate disposed to face said member;

a first electrode provided on a surface of said member which faces said base plate;

a second electrode provided on a surface of said base plate which faces said member; and

applying means for applying voltages to said first and second electrodes,

wherein said member is moved by applying said voltages to said first and second electrodes by said applying means, said member maintaining a planar configuration during movement.

5,554,852

ION IMPLANTATION HAVING INCREASED SOURCE LIFETIME

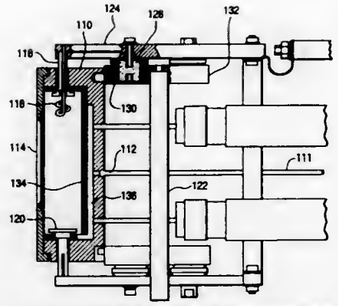
Nicholas Bright, Saratoga, Calif.; Paul A. Burfield, Crawley, England; John Pontefract, Uckfield, England; Bernard F. Harrison, Cothorne, England; Peter Meares, Holt, England; David R. Burgin, Grenoble, France; Andrew S. Devaney, Wivelsfield Green, England, and Peter T. Kindersley, Horsham, England, assignors to Applied Materials, Inc., Santa Clara, Calif.

Division of Ser. No. 105,522, Aug. 11, 1993, Pat. No. 5,517,077, which is a division of Ser. No. 898,854, Jun. 15, 1992, Pat. No. 5,262,652, which is a continuation-in-part of Ser. No. 699,874, May 14, 1991, abandoned. This application Apr. 3, 1995, Ser. No. 415,978

Int. Cl.[6] H01J *27/00*

U.S. Cl. 250—492.21 **15 Claims**

1. In an ion implantation system comprising an ion source including an arc chamber for producing an ion beam of a preselected chemical species at a predetermined beam current level, beam analyzing means for receiving said beam and selectively separating various ion species on the basis of mass to produce an analyzed beam, and beam resolving means for permitting said separated species to pass to a target to be implanted, the improvement which comprises using tungsten as the material of the source or a portion thereof.



5,554,853

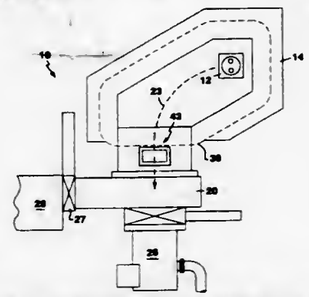
PRODUCING ION BEAMS SUITABLE FOR ION IMPLANTATION AND IMPROVED ION IMPLANTATION APPARATUS AND TECHNIQUES

Peter H. Rose, Conway, N.H., assignor to Krytek Corporation, Danvers, Mass.

Filed Mar. 10, 1995, Ser. No. 402,353

Int. Cl.[6] H01J *37/317*

U.S. Cl. 250—492.21 **16 Claims**



1. An apparatus for implanting ions of a selected ion species and a selected ion energy into a workpiece comprising:

an ion plasma source for generating an ion source plasma from a selected source gas and having an ion exit aperture;

an extraction electrode for extracting and for accelerating ions from the exit aperture of the plasma source, the extraction electrode being positioned in the vicinity of the ion exit aperture of the ion plasma source, the ion source being biased at a potential relative to the extraction electrode to achieve a selected ion beam energy;

a magnetic structure having pole faces that define a magnetic deflection gap therebetween and having an ion exit region where ions exit the magnetic deflection gap, the ion plasma source and the extraction electrode being positioned in the magnetic deflection gap so that when the magnetic structure is energized ions extracted from the plasma source corresponding to the selected species are deflected about an angular beam path trajectory of at least ninety degrees before extracted ions reach the ion exit region and exit the magnetic deflection gap; and

a stage for supporting a workpiece and for positioning the workpiece to intercept ions that exit the magnetic deflection gap for achieving implantation of intercepted ions into the workpiece.

5,554,854

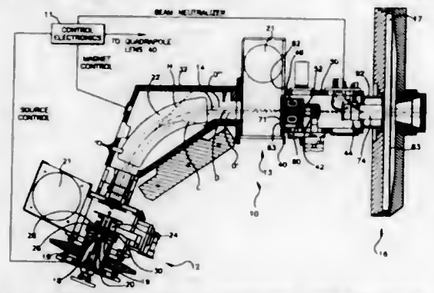
IN SITU REMOVAL OF CONTAMINANTS FROM THE INTERIOR SURFACES OF AN ION BEAM IMPLANTER

Julian G. Blake, Beverly Farms, Mass., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 17, 1995, Ser. No. 503,299

Int. Cl.[6] H01J *37/36*

U.S. Cl. 250—492.21 **36 Claims**



1. A method for removing contaminant material adhering to interior surfaces of an ion beam implanter, the method comprising the steps of:

a) extracting ions from source materials and forming the ions into an ion beam that traverses a beam path through an evacuated region along a trajectory to an ion implantation chamber;

b) adjusting the trajectory of the ion beam to cause the ion beam to strike interior surfaces of the implanter in contact with the evacuated region to dislodge the contaminant material from the interior surfaces; and

c) removing the dislodged contaminant material from the evacuated region of the implanter.

5,554,855

PHOTOPOLYMERIZATION REACTOR AND SMALL-SIZED LIGHT IRRADIATOR FOR DENTAL USE

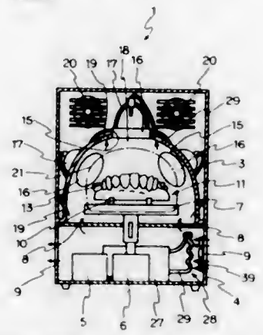
Masato Ueno, Hiroshima, Japan, assignor to Molten Corporation, and Chugoku Shiken Kabushiki Kaisha, both of Hiroshima, Japan

Filed Jul. 26, 1993, Ser. No. 96,305

Claims priority, application Japan, Jul. 31, 1992, 4-059422 U; Aug. 7, 1992, 4-061473 U; Mar. 12, 1993, 5-017019 U; May 31, 1993, 5-154429

Int. Cl.[6] A61C *19/00;13/14*

U.S. Cl. 250—455.11 **8 Claims**



1. A photopolymerization reactor for dental use comprising:

a light source emitting at least visible light and infrared light;

at least one transparent cell charged with a coolant disposed to the emission side of said light source, to absorb infrared light, said transparent cell composed of a disc shaped main body having a hollow space therein which is formed integrally with heat resistant glass;

pipes in communication with a pump, a heat exchanger and said at least one transparent cell for circulation of the coolant, said heat exchanger cooling the coolant which has been heated in the at least one transparent cell; and

a board for mounting a formed article which is composed of materials for a pattern made of photopolymerizable resin, impinging the light thereon from said light source after transmitting through said transparent cells.

5,554,856

CONVEYER-TYPE UNIT FOR RADIATION STERILIZATION

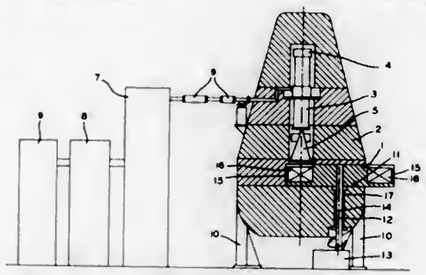
Sergei V. Bidnyy, Moscow; Alexander A. Zavadtsev, Reutov; Emmanuel A. Mirochnik, Moscow; Alexander V. Mishchenko, Moscow; Vitaly M. Pirozhenko, Moscow, and Igor V. Radchenko, Moscow, all of Russian Federation, assignors to Biosterile Technology, Inc., Fort Wayne, Ind.

Filed Oct. 24, 1994, Ser. No. 327,619

Claims priority, application Russian Federation, Nov. 1, 1993, 93049760

Int. Cl.[6] H01J *37/20*

U.S. Cl. 250—455.11 **21 Claims**



1. A radiation sterilization apparatus comprising:

an electron injector;

an electron accelerator coupled to said injector;

an electron beam scanning system coupled to said accelerator for directionally scanning accelerated electrons;

shielding surrounding said injector, accelerator and scanning system for blocking radiation;

a cavity in said shielding; and,

a selectively rotatable transporter received in part in said cavity and communicating in part outside of said shielding whereby products to be irradiated are placed in the field of accelerated electrons by rotation of said transporter.

5,554,857

METHOD AND APPARATUS FOR ION BEAM FORMATION IN AN ION IMPLANTER

Victor M. Benveniste, Gloucester, Mass., assignor to Eaton Corporation, Cleveland, Ohio

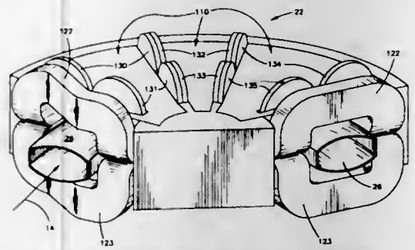
Filed Oct. 19, 1995, Ser. No. 545,135

Int. Cl.[6] H01J *37/317;49/30*

U.S. Cl. 250—492.21 **12 Claims**

1. An ion implanter having an ion source for emitting ions and an implantation chamber mounted in spaced relation to the ion source; apparatus that defines an ion beam path through which ions move from the ion source to the implantation chamber comprising:

a) a magnet positioned along the ion beam path between the ion source and the implantation chamber for deflecting ions through arcuate paths to filter unwanted particles from the ion beam, said magnet comprising:



i) first and second magnetic pole pieces constructed from a ferromagnetic material; said pole pieces having inwardly facing pole surfaces spaced apart by a magnetic field region through which the ion beam moves;

ii) one or more primary current carrying coils positioned near the magnetic pole pieces for creating a primary dipole magnetic field in the magnetic field region between the inwardly facing pole surfaces of the first and second magnetic pole pieces and bend charged particles that make up the ion beam along arcuate paths through the magnetic field region; and

iii) one or more additional current carrying coils for providing electric currents which extend along the arcuate path followed by the ion beam for superimposing a quadrapole field on the dipole field in the magnetic field region between the pole pieces; and

b) a controller electrically coupled to the primary and additional current carrying coils of said magnet for energizing said coils to create a magnetic field having both dipole and quadrapole components in the magnetic field region between the pole surfaces.

5,554,858

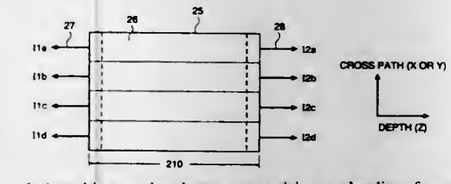
SEGMENTED POSITION SENSING DETECTOR FOR REDUCING NON-UNIFORMLY DISTRIBUTED STRAY LIGHT FROM A SPOT IMAGE

Pat V. Costa, Nissequogue; William E. Yonescu, Smithtown, and Donald Fritz, Coram, all of N.Y., assignors to Robotic Vision Systems, Inc, Hauppauge, N.Y.

Filed Sep. 22, 1994, Ser. No. 310,841

Int. Cl.[6] G01V *8/00*

U.S. Cl. 250—559.29 **5 Claims**



1. A position sensing detector comprising: a plurality of sensing channels; each channel having ends and a length between said ends; means for imaging a light spot having a width; each channel having a width equal to or less than the width of the light spot being imaged so that a single reflected spot falls within a single channel; an output current lead at each end of each channel; means for imaging the light spot along the length of said channel; said channels being electrically isolated from each other; a channel being activated dependent on an object location from which light is reflected, stray light appearing in unactivated channels being extracted from a desired signal in the activated channel, said channels having a geometry for interacting with a single light spot to produce an output electrical signal representing position of the spot unaffected by non-uniformly distributed stray light; electrical signals being generated in all channels simultaneously.

5,554,859

ELECTRON EMISSION ELEMENT WITH SCHOTTKY JUNCTION

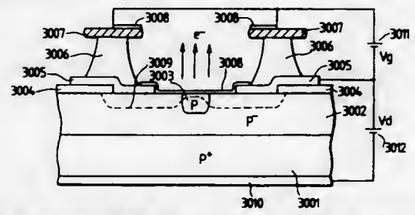
Takeo Tsukamoto; Nobuo Watanabe, both of Atsugi; Toshihiko Takeda, and Masahiko Okunuki, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 320,552, Oct. 11, 1994, abandoned, which is a continuation of Ser. No. 140,965, Oct. 25, 1993, abandoned, which is a continuation of Ser. No. 745,975, Aug. 12, 1991, abandoned, which is a continuation of Ser. No. 575,868, Aug. 31, 1990, abandoned. This application Nov. 13, 1995, Ser. No. 557,678

Claims priority, application Japan, Sep. 4, 1989, 1-229084; Sep. 7, 1989, 1-233931; Sep. 7, 1989, 1-233932; Oct. 13, 1989, 1-267576; Oct. 13, 1989, 1-267577; Oct. 13, 1989, 1-267578; Oct. 13, 1989, 1-267579

Int. Cl.[6] H01L *29/06;29/12*

U.S. Cl. 257—10 **32 Claims**



1. An electron emission device comprising a plurality of electron emission elements, each element of said plurality of electron emission elements comprising: a p-type semiconductor layer; a Schottky electrode for forming a Schottky junction with said p-type semiconductor layer; means for applying a reverse bias voltage to said Schottky electrode and said p-type semiconductor layer to cause said Schottky electrode to emit electrons; and a lead electrode for externally guiding the emitted electrons;

wherein a tapered oxide film is formed around the Schottky junction portion and

a stripe of P+ type region arranged in a first direction (X-axis direction), and a stripe of the Schottky electrode arranged in a second direction (Y-axis direction) perpendicular to said first direction are provided two-dimensionally so that the intersections between the stripes constitute electron emission elements arranged in a matrix.

5,554,860

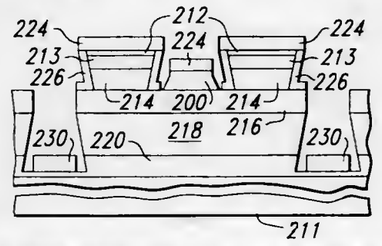
RESONANT TUNNELING TRANSISTOR NOISE GENERATOR

Alan C. Seabaugh, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 156,152, Nov. 22, 1993, abandoned. This application Apr. 17, 1995, Ser. No. 425,664

Int. Cl.[6] H01L *29/06;31/0328;29/00*

U.S. Cl. 257—25 **13 Claims**



1. A method for generating a signal with at least two noise spikes thereon comprising:

forming a multi-emitter transistor having at least two emitter fingers, a base and a collector;

5,554,862

POWER SEMICONDUCTOR DEVICE

forming a multi-emitter transistor having at least two emitter fingers, a base and a collector;

forming a resonant tunneling diode in each said emitter finger, each said resonant tunneling diode having a unique switching voltage different from the switching voltage of each other said resonant tunneling diode; and

applying a time varying signal to said base to produce a time varying signal at said collector having noise spikes thereon caused by switching of said resonant tunneling diodes.

5,554,861

THIN FILM TRANSISTORS AND ACTIVE MATRICES INCLUDING THE SAME

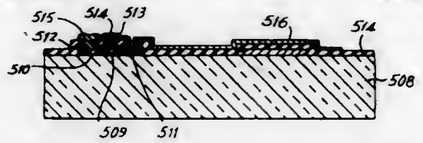
Toshihiko Mano; Toshimoto Kodaira, and Hiroyuki Oshima, all of Nagano-ken, Japan, assignors to Seiko Epson Corporation, Shinju-ku, Japan

Continuation of Ser. No. 901,432, Jun. 19, 1992, abandoned, which is a continuation-in-part of Ser. No. 203,548, May 31, 1988, Pat. No. 5,124,768, and a continuation of Ser. No. 862,151, May 12, 1986, abandoned, and Ser. No. 484,046, Apr. 11, 1983, abandoned. This application Feb. 14, 1995, Ser. No. 388,900

Claims priority, application Japan, Apr. 13, 1982, 57-61440; Apr. 19, 1982, 57-64892; Aug. 19, 1982, 57-143786

Int. Cl.[6] H01L *29/76*

U.S. Cl. 257—71 **6 Claims**



1. A liquid crystal device wherein data signals are supplied to liquid crystal cells through a plurality of field effect transistors arranged in a plurality of picture elements, each of said field effect transistors comprising:

a channel region comprising a thin film of polycrystalline silicon, the thin film of the channel region being less than 2500 Å in thickness;

a source region and a drain region formed in said thin film and spaced apart by said channel region, the source region and the drain region each having a top surface and a side surface, the side surface extending between the substrate and the top surface;

an insulating film disposed on said channel region and said top and side surfaces of said source region and said drain region, the insulating film comprising the thermal oxidation product of the material forming the channel region and being substantially free of dopant;

a first capacitor electrode of a display capacitor and a gate electrode formed from a same material and by a same process, the gate electrode being disposed on the insulating film and opposing the channel region;

a second capacitor electrode of the display capacitor opposing the first capacitor electrode, the second capacitor electrode being a pixel electrode; and

an insulating layer disposed on the insulating film and the gate electrode.

5,554,862

POWER SEMICONDUCTOR DEVICE

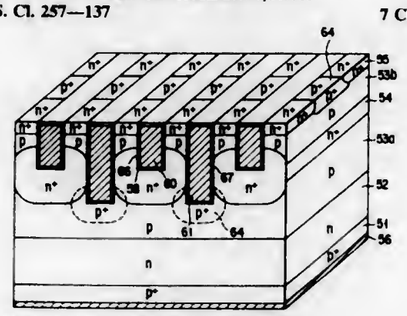
Ichiro Omura, Yokohama; Mitsuhiko Kitagawa, Tokyo; Kazuya Nakayama, Sagamihara, and Masakazu Yamaguchi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 40,595, Mar. 31, 1993, Pat. No. 5,298,769. This application Jan. 19, 1994, Ser. No. 183,364

Claims priority, application Japan, Mar. 31, 1992, 4-105674; Jan. 20, 1993, 5-007415

Int. Cl.[6] H01L *29/74;31/111*

U.S. Cl. 257—137 **7 Claims**



1. A power semiconductor device comprising:

an emitter layer of a first conductivity type;

a base layer of a second conductivity type formed so as to be in contact with said emitter layer of said first conductivity type;

a low-resistance layer of said second conductivity type formed above said base layer of said second conductivity type and not in contact with said emitter layer of said first conductivity type, said low-resistance layer having a higher carrier concentration than that of said base layer of said second conductivity type;

an intermediate layer of said first conductivity type formed in a surface of said low-resistance layer of said second conductivity type;

a source layer of said second conductivity type formed in a surface of said intermediate layer of said first conductivity type;

a plurality of trenches formed in said low-resistance layer of said second conductivity type such that a side of each of said trenches is in contact with said intermediate layer of said first conductivity type and said source layer of said second conductivity type;

a gate electrode arranged within each of said trenches via a gate insulating film;

a first main electrode connected to said emitter layer of said first conductivity type; and

a second main electrode connected to said source layer of said second conductivity type,

wherein said low-resistance layer surrounds bottom portions of said trenches so as to completely separate said intermediate layer of said first conductivity type from said base layer of said second conductivity type.

5,554,863

GATE TURN-OFF THYRISTOR

Sigeyasu Kouzuchi, Hitachi; Shuroku Sakurada, Katsuta; Takashi Saitoh, Hitachiota, and Hitoshi Komuro, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Haramachi Electronics Co., Ltd., Hitachi, both of Japan

Filed Jun. 15, 1994, Ser. No. 260,331

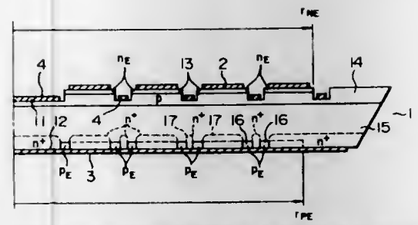
Claims priority, application Japan, Jun. 22, 1993, 5-150099

Int. Cl.[6] H01L *29/74;31/111*

U.S. Cl. 257—138 **17 Claims**

6. A gate turn-off thyristor comprising:

a plurality of n-type emitter semiconductor layer groups disposed in multi-concentric manner, each of said n-type emitter semiconductor layer groups being divided into a plurality of n-type areas so that the divided n-type areas are disposed radially;



a p-type base semiconductor layer which cooperates with said n-type emitter semiconductor layer groups to form a first main circular surface;

an n-type base semiconductor layer;

a plurality of p-type emitter semiconductor layer groups disposed in multi-concentric manner, said plurality of p-type emitter semiconductor layer groups including areas which individually overlap with respective ones of said plurality of n-type areas of said n-type emitter semiconductor layer groups when projected on said first main circular surface, one of said p-type emitter semiconductor layer groups positioned on an outermost periphery of the plurality of p-type emitter semiconductor layer groups having an outer diameter smaller than that of a corresponding one of said n-type emitter semiconductor layer groups, said one of said p-type emitter semiconductor layer groups forming said individual overlapped areas with corresponding n-type areas of said corresponding one of said n-type emitter semiconductor layer groups, plural ones of said p-type emitter semiconductor layer groups positioned on inner peripheries respectively having outer diameters not smaller than that of corresponding ones of said n-type emitter semiconductor layer groups, said plural ones of said p-type emitter semiconductor layer groups forming said individually overlapping areas respectively with corresponding n-type areas of said corresponding ones of said n-type semiconductor layer groups, said plurality of p-type emitter semiconductor layer groups cooperating with said n-type base semiconductor layer to form a second main circular surface;

a first main electrode formed in low resistance contact with said plurality of n-type areas on the first main surface;

a second main electrode formed in low resistance contact with said plurality of p-type emitter semiconductor layer groups and said n-type base semiconductor layer on the second main surface;

a control electrode formed in said p-type base semiconductor layer on the first main surface;

a first electrode plate connected electrically with said first main electrode; and

a second electrode plate connected electrically with said second main electrode.

5,554,864

SEMICONDUCTOR DEVICE HAVING IMPROVED COVERAGE WITH INCREASED WIRING LAYERS

Kuniaki Koyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Sep. 29, 1994, Ser. No. 314,968

Claims priority, application Japan, Oct. 18, 1993, 5-258786

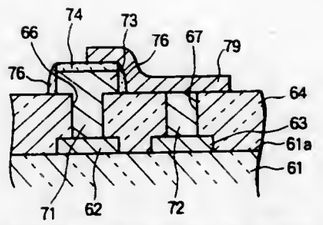
Int. Cl.[6] H01L *23/48*

U.S. Cl. 257—211 **24 Claims**

1. A semiconductor device comprising:

a base film having a principal surface;

an interlayer insulating region, formed on the principal surface of said base film, in which first and second conductive sections are formed, said interlayer insulating region having first and second contact holes which reach the first and the second conductive sections, respectively, said interlayer insulating region having an upper surface;



a first conductor, embedded in the first contact hole, for connecting with said first conductive section;

a first conductive region, connected with said first conductor, covering the upper surface of said interlayer insulating region, said first conductive region having an upper surface and a side surface;

an insulating film covering only the upper surface and the side-wall surface of said first conductive region, but not extending beyond the side-wall surface of said first conductive region onto the upper surface of said interlayer insulating region;

a second conductor, embedded in the second contact hole, for connecting with said second conductive section; and

a second conductive region covering said second conductor, the upper surface of said interlayer insulating region, and said insulating film, said second conductive region in direct contact with the upper surface of said interlayer insulating region, whereby said second conductive region overlies said first conductive region with said second conductive region isolated from said first conductive region by said insulating film.

5,554,865

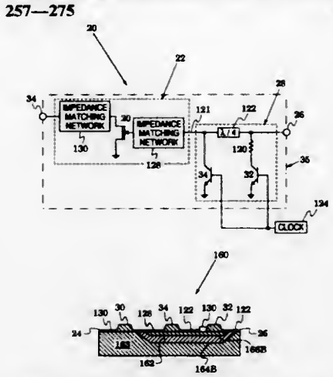
INTEGRATED TRANSMIT/RECEIVE SWITCH/LOW NOISE AMPLIFIER WITH DISSIMILAR SEMICONDUCTOR DEVICES

Lawrence E. Larson, Bethesda, Md., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jun. 7, 1995, Ser. No. 483,673

Int. Cl.[6] H01L *29/80;31/112;31/072;31/109*

U.S. Cl. 257—275 **20 Claims**



1. A monolithic T/R switch/LNA having an input port for reception of a radar signal and an output port for delivery of an amplified radar signal, comprising:

a semiconductor substrate having a depression;

a first semiconductor heterostructure having lateral and depressed portions that are carried on said substrate with said

lateral portion positioned laterally from said depression and said depressed portion positioned in said depression; and

a second semiconductor heterostructure carried over said first heterostructure's depressed portion;

wherein said first and second heterostructures are formed in a predetermined semiconductor system that includes at least one semiconductor layer having a first bandgap and at least one semiconductor layer having a second bandgap that is wider than said first bandgap,

an amplifier element with an input and an output is formed from one of said first heterostructure's lateral portion and said second heterostructure and at least one switching element is formed from the other of said first heterostructure's lateral portion and said second heterostructure,

said at least one switching element is arranged to selectively couple said amplifier element's input and said input port during said radar signal reception and isolate said amplifier's input from said input port at other times, and

said amplifier element's output is coupled to said output port.

5,554,866

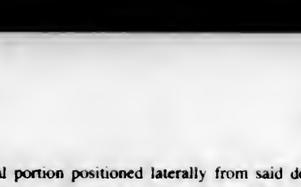
PRE-OXIDIZING HIGH-DIELECTRIC-CONSTANT MATERIAL ELECTRODES

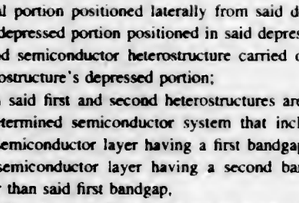
Yasushiro Nishioka, Tsukuba, Japan; Scott R. Summerfelt, Dallas, Tex.; Kyung-ho Park, and Pijush Bhattacharya, both of Tsukuba, Japan, assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 283,467, Aug. 1, 1994. This application Jun. 7, 1995, Ser. No. 486,120

Int. Cl.[6] H01L *27/108;29/43;* **G11C** *11/22*

U.S. Cl. 257—295 **18 Claims**





1. A microelectronic structure comprising:

(a) a supporting layer having a principal surface;

(b) an adhesion layer overlying said principal surface of said supporting layer, said adhesion layer comprising a top surface and an expanded, oxidized sidewall;

(c) a noble metal layer overlying said top surface of said adhesion layer, said noble metal layer comprising a deformed area overlying said oxidized sidewall; and

(d) a high-dielectric-constant material layer overlying said noble metal layer, whereby said high-dielectric-constant material layer is substantially free of expansion stress cracks in proximity to said deformed area of said noble metal layer.

5,554,867

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE HAVING A MEMORY CELL TRANSISTOR AND A SELECT TRANSISTOR

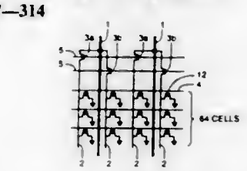
Natsuo Ajika, and Atsushi Ohba, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

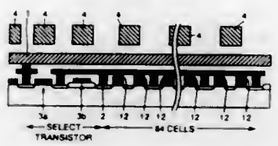
Filed Dec. 9, 1994, Ser. No. 352,656

Claims priority, application Japan, Dec. 27, 1993, 5-330067; Nov. 8, 1994, 6-273732

Int. Cl.[6] H07L *29/68*

U.S. Cl. 257—314 **14 Claims**





1. A nonvolatile semiconductor memory device including a memory cell transistor and a select transistor for storing information by drawing electrons from a floating gate of a memory cell transistor by means of a tunnel phenomenon in a region where a drain region and said floating gate of said memory cell transistor overlap, said nonvolatile semiconductor memory device comprising:

a main bit line electrically connected to said select transistor, and

a sub-bit line electrically connected to said memory cell transistor, and having a length corresponding to at least 16 and not more than 1024 memory cell transistors; wherein said sub-bit line comprises two sub-bit lines of a first sub-bit line and a second sub-bit line having a predetermined distance therebetween in a direction perpendicular to the extending direction of said main bit line, said first and second sub-bit lines comprising a plurality of segments spaced apart and extending parallel to the extending direction of said main bit line for a predetermined length of said main bit line L said sub-bit line having one select transistor connected thereto.

5,554,868

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE

Masanori Hayashikoshi; Yasushi Terada; Takeshi Nakayama; Yoshikazu Miyawaki, and Shinichi Kobayashi, all of Hyogo-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 810,409, Dec. 20, 1991, abandoned. This application Sep. 6, 1994, Ser. No. 300,877

Claims priority, application Japan, Dec. 26, 1990, 2-406902

Int. Cl.[6] H01L *29/788*

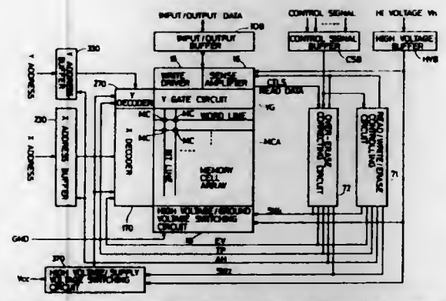
U.S. Cl. 257—315 **7 Claims**

1. Electrically erasable non-volatile semiconductor memory device, comprising:

a memory cell array including a plurality of memory cells arranged in a matrix manner, each memory cell having a source region, a drain region, a control gate and a floating gate; erasing means for erasing data stored in said plurality of memory cells by tunneling electrons from said floating gate to said source region;

writing means for writing data into a selected memory cell by injecting electrons to said floating gate via avalanche break down in the vicinity of the drain region;

reading means for reading data written in said memory cells;



over-erase detecting means responsive to said reading means for detecting whether at least one memory cell in said memory cell array is in the over erase state or not; and

tunnel writing means responsive to detection of said at least one memory cell in the over-erase state by said over-erase detecting means for injecting electrons simultaneously into each floating gate of each of the memory cells commonly connected to a word line to which said at least one memory cell is connected by a tunnel phenomenon from a corresponding source region, said over-erase detecting means preventing tunnel writing from being performed if no memory cell is in the over-erase state.

5,554,869

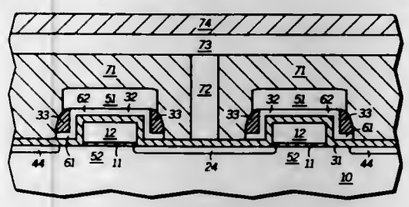
ELECTRICALLY PROGRAMMABLE READ-ONLY MEMORY ARRAY

Kuo-Tung Chang, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 251,162, May 31, 1994, Pat. No. 5,429,969. This application Apr. 17, 1995, Ser. No. 423,068

Int. Cl.[6] H01L *29/788*

U.S. Cl. 257—316 **19 Claims**



1. An electrically programmable read-only memory cell comprising:

a semiconductor substrate having a first conductivity type;

a first doped region having a second conductivity type that is opposite the first conductivity type, wherein the first doped region lies within the substrate;

a second doped region having the second conductivity type, wherein the second doped region lies within the substrate and is spaced apart from the first doped region;

a channel region having the first conductivity type and lying within the substrate and between the first and second doped regions;

a floating gate overlying the substrate and the first doped and channel regions but does not overlie the second doped region;

a first conductive member lying adjacent to the floating gate and overlying the first and second doped regions and the channel region;

a spacer overlying the first conductive member and lying adjacent to a side of the floating gate; and

a second conductive member overlying the first conductive member and the spacer, wherein:

the first and second conductive members are electrically connected to each other; and

a combination of the first and second conductive members is a control gate for the memory cell.

5,554,870

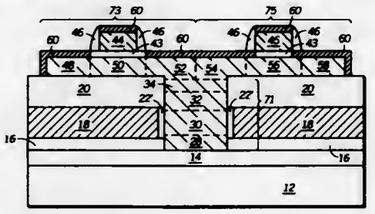
INTEGRATED CIRCUIT HAVING BOTH VERTICAL AND HORIZONTAL DEVICES AND PROCESS FOR MAKING THE SAME

Jon T. Fitch; Suresh Venkatesan, and Keith E. Witek, all of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 191,693, Feb. 4, 1994, abandoned. This application Aug. 2, 1995, Ser. No. 510,329

Int. Cl.[6] H01L *21/265;21/70*

U.S. Cl. 257—334 **22 Claims**



1. An integrated circuit comprising:

a semiconductor substrate having a first active area formed of a single crystal semiconductor material;

a vertical device formed above the substrate and having a second active area vertically connected to the first active area, the vertical device having a first electrode and a second electrode within the second active area;

a dielectric layer formed above the substrate and adjacent at least a portion of the vertical device; and

a horizontal device formed above the substrate, on the dielectric layer, and connected to the substrate by the vertical device, the horizontal device having a third active area and a third electrode and a fourth electrode within the third active area;

wherein the first, second, third, and fourth electrodes are formed of a continuous single crystal semiconductor layer of the semiconductor material and are connected to each other, and wherein the first, second, third, and fourth electrodes have a same conductivity type.

5,554,871

SEMICONDUCTOR DEVICE HAVING MOS TRANSISTOR WITH NITROGEN DOPING

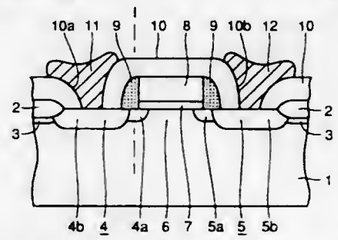
Tomohiro Yamashita, and Satoshi Shimizu, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 483,036

Claims priority, application Japan, Nov. 9, 1994, 6-275095

Int. Cl.[6] H01L *27/088*

U.S. Cl. 257—336 **14 Claims**



1. An MOS transistor, comprising:

a pair of source/drain regions formed on a main surface of a semiconductor substrate so as to sandwich a channel region;

a gate electrode formed on the main surface of said semiconductor substrate positioned between said pair of source/drain regions with a gate insulating film interposed therebetween; and

a sidewall oxide film formed in contact with a side surface of said gate electrode, a side surface of said gate insulating film, and the main surface of said semiconductor substrate and having nitrogen introduced therein, so that a concentration distribution of said nitrogen in a section in the direction perpendicular to the main surface of said semiconductor substrate has a first concentration peak at an interface between said sidewall oxide film and the main surface of said semiconductor substrate, and

a second concentration peak positioned closer to said sidewall oxide film than said first concentration peak positioned at the interface between said sidewall oxide film and the main surface of said semiconductor substrate.

5,554,872

SEMICONDUCTOR DEVICE AND METHOD OF INCREASING DEVICE BREAKDOWN VOLTAGE OF SEMICONDUCTOR DEVICE

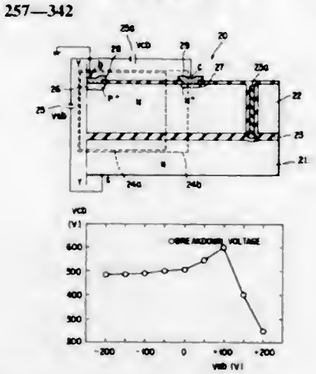
Yoshiro Baba, Yokohama; Shunichi Hiraki, Nagareyama, and Akihiko Osawa, Machida, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 881,853, May 12, 1992, abandoned. This application Mar. 27, 1995, Ser. No. 412,215

Claims priority, application Japan, May 13, 1991, 3-137285

Int. Cl.[6] H01L *29/76*

U.S. Cl. 257—342 **19 Claims**



1. A semiconductor device comprising:

a composite semiconductor substrate comprising a first semiconductor substrate, a second semiconductor substrate, and an oxide interlayer bonded therebetween, said first semiconductor substrate including an element forming region having a thickness and an impurity concentration such that full depletion of a depletion layer occurs in said first substrate before a junction breakdown in said element forming region, and

potential setting means for setting a potential of said second semiconductor substrate at a potential higher than a minimum potential in said element forming region of said first semiconductor substrate, said potential setting means having potential fixing means for fixing said potential of said second semiconductor substrate to an optimal potential value at which a maximum device breakdown voltage is obtained.

5,554,873

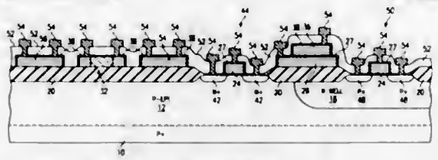
SEMICONDUCTOR DEVICE HAVING POLYSILICON RESISTOR WITH LOW TEMPERATURE COEFFICIENT

John P. Erdeljac, Plano, and Louis N. Hutter, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 247,443, May 23, 1994, Pat. No. 5,489,547. This application Jun. 7, 1995, Ser. No. 475,116

Int. Cl.[6] H01L *27/02*

U.S. Cl. 257—380 **4 Claims**



1. A semiconductor device, comprising:

a semiconductor layer;

a first polysilicon resistor of a first conductivity type formed over said semiconductor layer;

a second polysilicon resistor of a second conductivity type opposite said first conductivity type formed over said semiconductor layer;

said first and second polysilicon resistors doped with a first dose of a dopant of said second conductivity type, said first dose giving said second polysilicon resistor a sheet resistance in the range from about 500 to 2000 ohms/square, said first polysilicon resistor additionally doped with a second dose of a dopant of said first conductivity type so as to have a sheet resistance in the range of about 150–350 ohms/square.

5,554,874

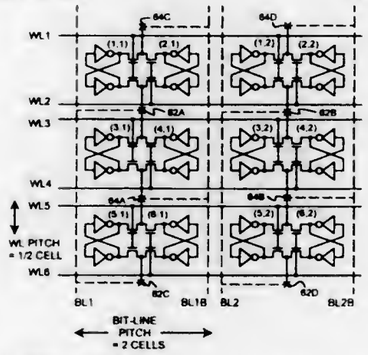
SIX-TRANSISTOR SRAM CELL WITH WIDE BIT-LINE PITCH, DOUBLE WORDS LINES, AND BIT-LINE CONTACT SHARED AMONG FOUR CELLS

Sinan Doluca, Cupertino, Calif., assignor to Quantum Effect Design, Inc., Santa Clara, Calif.

Filed Jun. 5, 1995, Ser. No. 461,019

Int. Cl.[6] H01L *27/11;29/76*

U.S. Cl. 257—390 **20 Claims**



10. A memory comprising:

a plurality of memory cells arranged in an array of rows and columns, a row and a column intersecting at a single cell, the columns being further arranged into non-overlapping column-pairs each consisting of two adjacent columns;

a first and a second word line for each row of memory cells, the first word line selecting a first plurality of memory cells in the row and the second word line selecting a second plurality of memory cells in the row, each memory cell in the first plurality of cells being adjacent on both sides to memory cells in the second plurality of cells in an alternating sequence memory cells in the row of memory cells;

a pair of bit lines for every column-pair of memory cells, the pair of bit lines including a true bit line and a complement bit line together communicating one bit of data;

each cell in the plurality of memory cells comprising: storage means for storing one bit of data; first access transistor means for coupling the storage means to the true bit line; and

second access transistor means for coupling the storage means to the complement bit line;

the first and the second access transistor means having control gates coupled to a local word line for the cell, the local word line being coupled to the first word line when the cell is in the first plurality of cells but coupled to the second word line when the cell is in the second plurality of cells;

whereby each memory cell connects to one of the two word lines crossing the cell and one pair of bit lines connects to two columns of cells.

5,554,875

SEMICONDUCTOR DEVICE WITH FORCE AND/OR ACCELERATION SENSOR

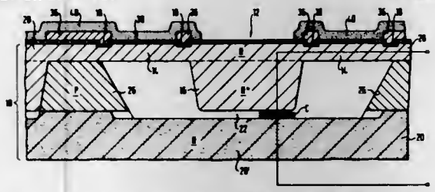
Siegbert Hartauer, Landshut, Germany, assignor to Texas Instruments Deutschland, Germany

Continuation of Ser. No. 215,987, Mar. 22, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 486,156

Claims priority, application Germany, Mar. 22, 1993, 43 09 206.3

Int. Cl.[6] H01L *29/82*

U.S. Cl. 257—418 **8 Claims**



1. A semiconductor sensor device for sensing force and/or acceleration, said semiconductor sensor device comprising:

a substrate of semiconductor material of a first conductivity type;

a first epitaxial layer of a second conductivity type disposed on said semiconductor substrate of said first conductivity type;

a second epitaxial layer of said first conductivity type disposed on said first epitaxial layer of said second conductivity type;

the second epitaxial layer having an integral rib disposed thereon of the first conductivity type and extending downwardly therefrom toward said semiconductor substrate and defining a mass;

said first epitaxial layer having an opening extending through the thickness thereof and receiving the mass extending downwardly from the second epitaxial layer;

said mass being spaced from an opposing surface of said semiconductor substrate to define a gap therebetween;

said second epitaxial layer having a resilient support element integral therewith and integrally connected to the mass;

at least one transducer provided on said second epitaxial layer in a region of said resilient support element and being responsive to flexure of said resilient support element induced by movement of the mass relative to said semiconductor substrate to provide an output data signal indicative of the measurement of motion of the mass imparting flexure to said resilient support element; and

each of the mass, said second epitaxial layer including the resilient support element, said first epitaxial layer, and said semiconductor substrate being part of an integral body of monocrystalline semiconductor material.

5,554,876

FIELD EFFECT TRANSISTOR INCLUDING SILICON OXIDE FILM AND NITRIDED OXIDE FILM AS GATE INSULATOR FILM AND MANUFACTURING METHOD THEREOF

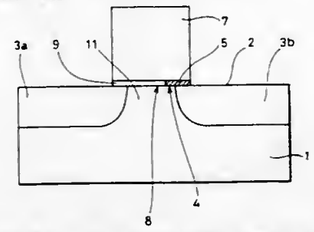
Shigeru Kusunoki, and Masahide Inuishi, both of Hyogo-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 930,932, Aug. 18, 1992, Pat. No. 5,369,297. This application Aug. 16, 1994, Ser. No. 292,591

Claims priority, application Japan, Sep. 5, 1991, 3-225686; Dec. 6, 1991, 3-323239; Jul. 3, 1992, 4-176873

Int. Cl.[6] H01L *29/78*

U.S. Cl. 257—411 **7 Claims**



1. A field effect transistor for controlling a flow of carriers by a voltage applied to a gate electrode, said field effect transistor comprising:

a semiconductor substrate having a main surface;

a source region and a drain region formed with a spacing from each other in said semiconductor substrate;

an insulating film formed on said main surface located between said source region and said drain region;

a gate electrode formed on said insulating film; and

sidewall films including a nitrided oxide film to interpose said gate electrode therebetween.

5,554,877

COMPOUND SEMICONDUCTOR ELECTROLUMINESCENT DEVICE

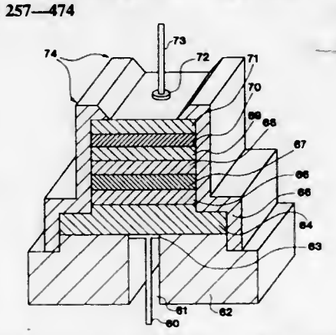
Masahiko Kitagawa, Nara-Ken, and Yoshitaka Tomomura, Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 635,424, Jan. 3, 1991, abandoned, which is a continuation of Ser. No. 347,274, May 4, 1989, abandoned. This application Sep. 2, 1992, Ser. No. 938,536

Claims priority, application Japan, May 6, 1988, 63-110910

Int. Cl.[6] H01C *29/78;* **H01L** *33/00*

U.S. Cl. 257—474 **3 Claims**



1. An electroluminescent device of compound semiconductor having a plurality of electroluminescent portions comprising:

a semiconductor substrate having a plurality of through-holes bored therein;

an electroluminescent device layer formed of a plurality of epitaxially grown layers on said substrate;

a plurality of first electrodes being directly connected to said electroluminescent device layer through each of said through-holes;

a second electrode being formed opposite to said first electrodes with said electroluminescent device layer sandwiched between said first and second electrodes; and

a plurality of grooves formed on the surface opposite to the substrate, said grooves dividing said electroluminescent device layer into the plurality of electroluminescent portions, and said grooves having a thickness which is thinner than a thickness of said electroluminescent device layer, said grooves extending to a lighting layer in said electroluminescent device layer.

5,554,878

INTERGRATED HIGH-VOLTAGE RESISTOR INCLUDING FIELD-PLATE LAYERS

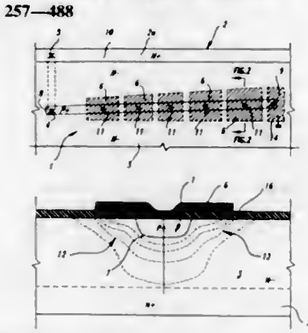
Sergio Palara, Acitrezza, Italy, assignor to CO. RI. M. ME., Catania, Italy

Continuation of Ser. No. 67,664, May 26, 1993, abandoned. This application Dec. 8, 1994, Ser. No. 352,425

Claims priority, application European Pat. Off., May 28, 1992, 92830270

Int. Cl.[6] H01L *23/60;23/64*

U.S. Cl. 257—488 **23 Claims**



1. A high-voltage resistor structure comprising:

a substantially linear high-voltage resistor of a first conductivity type integrated in an epitaxial layer on a semiconductor substrate having a second conductivity type, the semiconductor substrate including a contact member of the second conductivity type at a first electric potential, the resistor having a first end electrically connected to the substrate by the contact member through a conductive contact extending between the first end and the contact member such that the first end and the substrate are maintained at the first electric potential and a second end electrically connected to a lower electric potential than the first end; and

a plurality of field-plate layers, each field-plate layer covering at least a section of the resistor, in aligned fashion, the field-plate layers discontinuously covering the resistor providing gaps between the field-plate layers.

5,554,879

HIGH VOLTAGE COMPONENT HAVING A LOW STRAY CURRENT

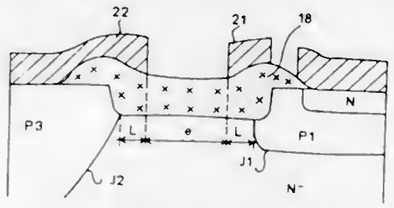
François Poulin, Tours, France, assignor to SGS-Thomson Microelectronics, S.A., Gentilly, France

Continuation of Ser. No. 52,271, Apr. 20, 1993, abandoned, which is a continuation of Ser. No. 747,369, Aug. 20, 1991, abandoned. This application Oct. 28, 1994, Ser. No. 330,421

Claims priority, application France, Aug. 21, 1990, 90 10738

Int. Cl.[6] H01L *29/00*

U.S. Cl. 257—506 **20 Claims**



1. A high voltage semiconductor component having a low stray current comprising

a central region of a first conductivity type with a low doping level, surrounded by layers of the second conductivity type with a higher doping level, which form, with said central region, first and second junctions liable to hold said high voltage,

wherein the first and second junctions have respective apparent perimeters, on a main surface of the component, which lie on both sides of an apparent surface of said central region,

and wherein a groove is formed over both said apparent perimeters and is filled with a glassivation layer,

the surface of said glassivation layer being covered, above the perimeter of each junction, with a metallization contacting the respective layer of the second conductivity type corresponding to the junction.

5,554,880

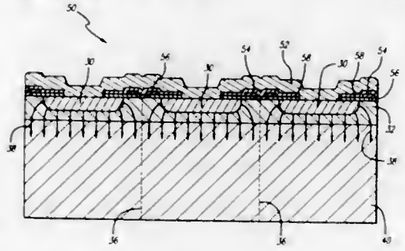
UNIFORM CURRENT DENSITY AND HIGH CURRENT GAIN BIPOLAR TRANSISTOR

Richard A. Metzler, Mission Viejo, and Vladimir Rodov, Redondo Beach, both of Calif., assignors to Semicoa Semiconductors, Costa Mesa, Calif.

Filed Aug. 8, 1994, Ser. No. 287,161

Int. Cl.[6] H01L *29/00*

U.S. Cl. 257—560 **4 Claims**



1. A transistor comprising:

a collector region;

a base region having a base thickness and formed on one side of said collector region;

a plurality of emitter islands formed within said base region;

a plurality of emitter contacts;

an upper metal layer interconnecting a plurality of emitter contacts, each of said plurality of emitter contacts being formed on a top side of a respective one of said plurality of emitter islands; and

each of said plurality of emitter islands being spaced apart from a neighboring emitter island by an emitter separation distance, said emitter separation distance being substantially equal to said base thickness.

5,554,881

CONSTITUTION OF AN ELECTRODE ARRANGEMENT IN A SEMICONDUCTOR ELEMENT

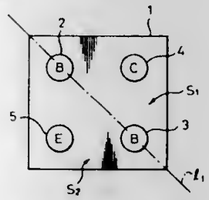
Takahisa Koyasu, Chita; Kouji Numazaki; Hirokazu Kasuya, both of Nukata-gun; Mitsuhiro Saitou, Obu, and Kazuhisa Ikeda, Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 15, 1994, Ser. No. 357,492

Claims priority, application Japan, Dec. 17, 1993, 5-317887

Int. Cl.[6] H01L *29/70*

U.S. Cl. 257—584 **17 Claims**



1. A semiconductor device, comprising:

a semiconductor element having a plurality of electrodes formed on one surface; and

a plurality of wiring members connected to the electrodes;

said electrodes including at least two first electrodes, and a second electrode and a third electrode of different kinds which are separated from said first electrodes, a first of said plurality of wiring members being selectively connected to at least one and less than all of said two first electrodes, and a second and a third of said plurality of wiring members being connected to said second and third electrodes, respectively; and

said two first electrodes, said second electrode and said third electrode being arranged on the surface of said semiconductor element such that a straight line passing through said two first electrodes separates said semiconductor element into two regions, said second electrode being contained in a first of said two regions and said third electrode being contained in a second of said two regions.

5,554,882

INTEGRATED TRIGGER INJECTOR FOR AVALANCHE SEMICONDUCTOR SWITCH DEVICES

R. Aaron Falk, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 147,300, Nov. 5, 1993, abandoned. This application Mar. 14, 1995, Ser. No. 404,128

Int. Cl.[6] H01L *29/868;29/87*

U.S. Cl. 257—605 **11 Claims**

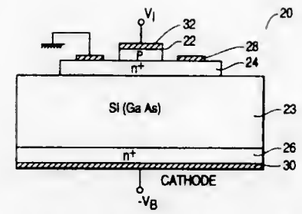
1. An avalanche semiconductor switch device, comprising:

a semi-insulating layer;

a first layer heavily doped with an n type dopant coupled to said semi-insulating layer, said first layer being integrated above and in contact with said semi-insulating layer, said first layer being integrated below and in contact with an anode contact;

an injector layer doped with a p type dopant integrated above and in contact with said first layer, said injector layer having a level of the p type dopant less than the level of the n type dopant in the first layer and capable of injecting charges into said semi-insulating layer in response to a voltage across said first layer and said injector layer; and

a second layer heavily doped with the n type dopants being below and in contact with the semi-insulating layer, the second layer being above and in contact with a cathode contact.



5,554,883

SEMICONDUCTOR DEVICE AND MANUFACTURING METHOD THEREFOR

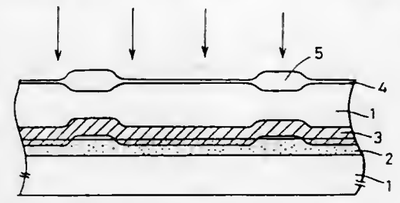
Takashi Kuroi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 902,424, Jun. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 660,824, Feb. 26, 1991, abandoned. This application Jul. 25, 1994, Ser. No. 279,876

Claims priority, application Japan, Apr. 28, 1990, 2-113057

Int. Cl.[6] H01L *31/117*

U.S. Cl. 257—617 **10 Claims**



1. A semiconductor device, comprising;

a localized buried impurity layer comprising an ion-injected conductivity type determining element located at a predetermined depth from a main surface of a semiconductor substrate; and

a localized gettering layer comprising an ion-injected element selected from the group consisting of oxygen, carbon, fluorine, chlorine and nitrogen with a dose in the range of 1×10^{14} to 1×10^{15} ions/cm^2, located at a predetermined depth from a main surface of a semiconductor substrate;

wherein the localized buried impurity layer is formed entirely within the semiconductor substrate at a shallower depth from the main surface of the semiconductor substrate than the localized gettering layer and the localized buried impurity layer overlaps to a predetermined amount the localized gettering layer.

5,554,884

MULTILEVEL METALLIZATION PROCESS FOR USE IN FABRICATING MICROELECTRONIC DEVICES

Warren F. McArthur, Solana Beach, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 134,120, Oct. 7, 1993, abandoned. This application Jan. 27, 1995, Ser. No. 378,995

Int. Cl.[6] H01L *23/58*

U.S. Cl. 257—634 **12 Claims**

1. A process for depositing a multilevel metallization interconnect structure in a microelectronic device, comprising the steps of:

an integrated circuit chip arranged within said device hole of said film and having electrodes connected to ends of said leads; and

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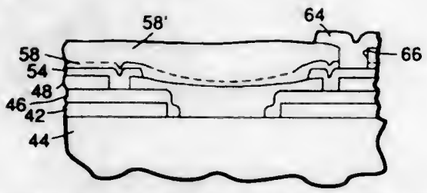
5,554,887

PLASTIC MOLDED SEMICONDUCTOR PACKAGE

Akiyoshi Sawai; Haruo Shimamoto; Toru Tachikawa, and Jun

5,554,889

STRUCTURE AND METHOD FOR METALLIZATION OF SEMICONDUCTOR DEVICES



providing a microelectronic device base structure having a predetermined topography thickness;

depositing a flowable dielectric layer having a thickness of from about two to about three times said topography thickness, whereby an uneven layer is formed;

flowing the uneven flowable dielectric layer to smooth said uneven layer;

thinning the smoothed flowable dielectric layer by etching to decrease the thickness thereof to a predetermined thickness; opening a via through the thinned, smooth flowable dielectric layer to the microelectronic device base structure;

depositing a first patterned metallization layer to overlie the via through the smoothed flowable dielectric layer;

depositing an interlevel dielectric layer;

thinning the interlevel dielectric layer by etching to smooth the surface thereof;

opening a via through the smoothed interlevel dielectric layer to the first patterned metallization layer; and

depositing a second patterned metallization layer to overlie the via through the smoothed interlevel dielectric layer.

5,554,885

SEMICONDUCTOR DEVICE INCLUDING MEANS FOR DISPERSING AND ABSORBING TENSILE FORCES ACTING ON FILM TAPE

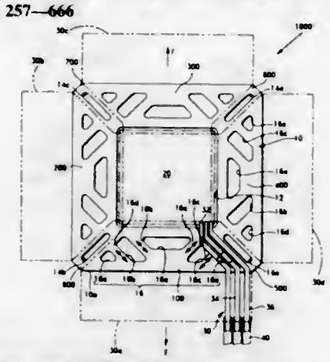
Yasuo Yamasaki; Norikata Hama; Munenori Kurasawa, and Nobuaki Hashimoto, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Jun. 3, 1994, Ser. No. 253,878

Claims priority, application Japan, Jun. 4, 1993, 5-134738; Jun. 4, 1993, 5-134739; Jun. 4, 1993, 5-134740; May 17, 1994, 6-126912

Int. Cl.[6] H01L *23/495;23/498*

U.S. Cl. 257—666 **15 Claims**



1. A semiconductor device comprising:

an electrically insulating film having a device hole and a plurality of lead formation regions around said device hole;

a plurality of lead groups, each group including a large number of leads, arranged in a predetermined pattern that is formed in said plurality of lead formation regions on the surface of said film;

an integrated circuit chip arranged within said device hole of said film and having electrodes connected to ends of said leads; and

a resin sealing portion that seals in at least said integrated circuit chip, said film, and said lead groups;

wherein said m comprises:

means, formed in said film, for securing bonding between said film and said resin sealing portion and for dispersing and absorbing external tensile forces acting on said film to suppress deformation of said film;

wherein said securing, dispersing and absorbing means includes a plurality of slit-shaped apertures, each slit-shaped aperture being provided in a region between two adjacent lead formation regions;

a plurality of groups of aperture portions, each group being provided in each of said lead formation region; and

a plurality of linking portions formed on said film between adjacent aperture portions in each group of aperture portions, such that stresses generated by the external tensile forces are dispersed along said linking portions.

5,554,886

LEAD FRAME AND SEMICONDUCTOR PACKAGE WITH SUCH LEAD FRAME

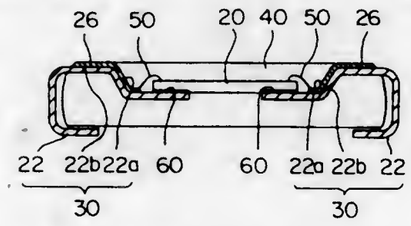
Chi J. Song, Daejon, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Choongchungbook-D, Rep. of Korea

Filed Feb. 7, 1995, Ser. No. 384,988

Claims priority, application Rep. of Korea, Mar. 30, 1994, 6579/1994

Int. Cl.[6] H01L *23/495*

U.S. Cl. 257—666 **12 Claims**



1. A lead frame for a semiconductor package comprising:

a plurality of multi-layered inner leads, each of said multi-layered inner leads including at least two different metal layers joined directly to each other; and

an outer lead formed by an extension part of at least one of the different metal layers of each of said multi-layered inner leads, wherein each of said multi-layered inner leads comprises:

a first metal layer having a chip connection part at a first end thereof for electrically connecting each said inner lead to a semiconductor chip, and having an exposure part at a second end thereof for use as an electric connection terminal when vertically layering a plurality of packages; and

a second metal layer joined to the bottom surface of said first metal layer and having a first end extending beyond the first end of the first metal layer to form a step between the first end of the first metal layer and the first end of the second metal layer, said second metal layer having a chip mount part for mounting the semiconductor chip thereon at the first end thereof.

5,554,887

PLASTIC MOLDED SEMICONDUCTOR PACKAGE

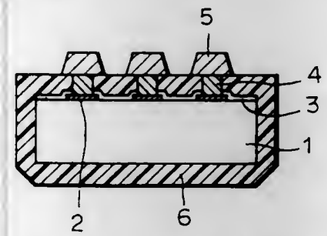
Akiyoshi Sawai; Haruo Shimamoto; Toru Tachikawa, and Jun Shibata, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1994, Ser. No. 234,808

Claims priority, application Japan, Jun. 1, 1993, 5-130802

Int. Cl.[6] H01L *23/28*

U.S. Cl. 257—737 **15 Claims**



1. A plastic molded semiconductor package comprising:

a semiconductor chip having a main surface;

a pad electrode formed on said main surface of said semiconductor chip and functioning as a part of an electrode for external connection;

an internal connection conductor formed on said pad electrode, having a substantially flat top surface and functioning as a part of said electrode for external connection;

a molding resin encapsulating said semiconductor chip and exposing only said top surface of said internal connection conductor; and

an external connection conductor formed on said top surface of said internal connection conductor, having a substantially flat top surface and functioning as a part of said electrode for external connection.

5,554,888

SEMICONDUCTOR DEVICE WIRING STRUCTURE

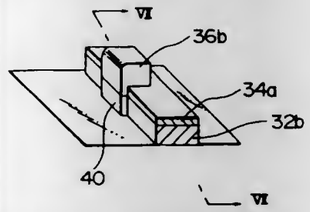
Katsuyuki Kato, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 28, 1994, Ser. No. 233,997

Claims priority, application Japan, Apr. 30, 1993, 5-104766

Int. Cl.[6] H01L *23/48;23/52;29/40*

U.S. Cl. 257—750 **7 Claims**



1. A semiconductor device multilayer wiring structure, comprising:

a bottom conductive layer on a substrate;

a top conductive layer;

an auxiliary conductive layer on the bottom conductive layer, and a pillar connection portion connected between the top conductive layer and the bottom conductive layer having at least a portion of the pillar connection portion formed over the auxiliary conductive layer,

wherein the bottom conductive layer has a pattern determined by a sum of a pattern of the auxiliary conductive layer formed on the bottom conductive layer and a pattern of the pillar connection portion.

5,554,889

STRUCTURE AND METHOD FOR METALLIZATION OF SEMICONDUCTOR DEVICES

Hank H. Shin, Gilbert; Clarence J. Tracy, Tempe; Robert L. Duffin, Mesa; John L. Freeman, Jr., Mesa; Gordon Grivna, Mesa, and Syd R. Wilson, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 862,710, Apr. 3, 1992, abandoned. This application Apr. 27, 1995, Ser. No. 430,105

Int. Cl.[6] A01L *23/48;23/52;29/40*

U.S. Cl. 257—765 **5 Claims**

1. A semiconductor device metallization scheme for reducing stress voids, wherein the metallization consists of a homogeneous alloy of aluminum, copper and tungsten.

5,554,890

IGNITION CIRCUIT FOR A SQUIB IN AN AIR BAG IN A VEHICLE

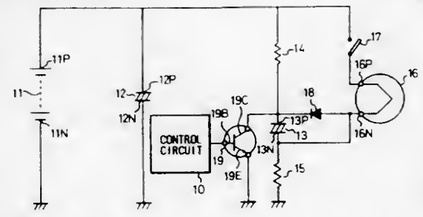
Kenichi Kinoshita, Kako-gun, Japan, assignor to Fujitsu Ten Limited, Kobe, and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Mar. 9, 1994, Ser. No. 207,748

Claims priority, application Japan, Mar. 16, 1993, 5-055797

Int. Cl.[6] H02J *1/06*

U.S. Cl. 307—10.1 **7 Claims**



1. An ignition circuit for a squib in an air bag in a vehicle, comprising

a battery;

a first capacitor which is charged by said battery;

a second capacitor which is connected in parallel with said first capacitor, and charged by said battery;

a sensor that detects a collision of the vehicle; and

an igniting means which connects said first capacitor and said second capacitor in series, and supplies electric energy charged in said first capacitor and said second capacitor to said squib when the collision of said vehicle is detected by the sensor.

5,554,891

ANTITHEFT DEVICE FOR A VEHICLE

Hidekazu Shimizu, and Akihiro Hashimoto, both of Hamakita, Japan, assignors to Asahi Denso Kabushiki Kaisha, Japan

Filed Mar. 28, 1994, Ser. No. 218,569

Claims priority, application Japan, Mar. 30, 1993, 5-097206; Sep. 30, 1993, 5-269683

Int. Cl.[6] B60R *25/04*

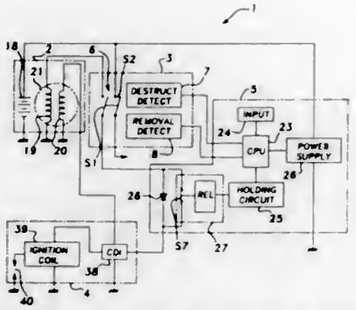
U.S. Cl. 307—10.2 **26 Claims**

1. An antitheft device for a vehicle having an engine ignition device and a power supply for said engine ignition device, comprising:

an ignition switch including switching means for opening and closing a circuit connection between said engine ignition device and said power supply, said ignition switch also including locking means for mechanically inhibiting normal use of said vehicle, and sensor means for detecting an abnormality of at least one of said switching means and said locking means; and

5,554,896

PORTABLE POWER SUPPLY FOR HANDPIECES



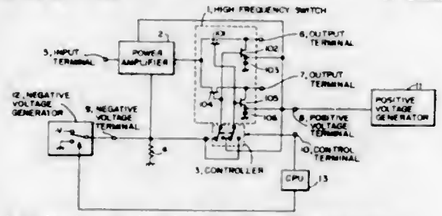
an antitheft unit having means for receiving an input signal, means for causing a first disablement condition in response to said input signal wherein at least a part of said engine ignition device is disabled, and means for causing a second disablement condition in response to the detection of said abnormality by said sensor means wherein at least a part of said engine ignition device is disabled, said second disablement condition being different than said first disablement condition, at least one part of said engine ignition device being incorporated into said antitheft unit and said antitheft unit being adapted to make the operation of said engine ignition device substantially impossible by controlling the function of said at least one part of the engine ignition device.

5,554,892

SIGNAL PROCESSING CIRCUIT FOR SWITCH CAPABLE OF REDUCING INSERTION LOSS

Hidehiko Norimatsu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 28, 1994, Ser. No. 233,942
Claims priority, application Japan, Apr. 28, 1993, 5-125513
Int. Cl.[6] H01H *33/59*
U.S. Cl. 307—115 **17 Claims**



1. A signal processing circuit for a switch comprising:
a switch having a plurality of routes to pass a signal; and
a first controller, to select one of the routes, for supplying a positive voltage and a negative voltage as switch control signals to said switch in response to a control signal.

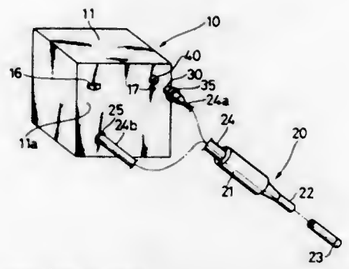
5,554,893

SYSTEM FOR CONTROLLING SEMICONDUCTOR

Toshio Oku, Tokyo, Japan, assignor to Machida Endoscope Co., Ltd., Tokyo, Japan

Filed Feb. 8, 1995, Ser. No. 385,640
Claims priority, application Japan, Feb. 17, 1994, 6-041743
Int. Cl.[6] H01H *7/16*
U.S. Cl. 307—119 **3 Claims**

1. A semiconductor control system comprising:
(a) an instrument including a semiconductor;
(b) a cable extending from said instrument;
(c) a first connector mounted on one end of said cable and electrically connected to said semiconductor; and



(d) a control unit including:
(i) a housing;
(ii) a second connector disposed on a front wall of said housing, said first connector being removably connected to said second connector;
(iii) a power source circuit received in said housing;
(iv) a control circuit received in said housing and connected to said second connector; said control circuit being further connected to said power source circuit through a power source switch, said control circuit being capable of supplying a constant voltage to a power source terminal of said semiconductor when electrically connected to said power source circuit by turning on said power source switch, and thereafter supplying a control signal to a control terminal of said semiconductor, said control circuit being capable of stopping the output of control signal to said control terminal and then stopping the supply of voltage to said power source terminal when disconnected from said power source circuit by turning off said power source;
(v) characterized in that said housing is provided on a front wall thereof in the vicinity of said second connector with an operating portion for said power source switch, said operating portion being movable between a first position and a second position situated backwardly of said first position and in a direction generally perpendicular to said front wall of said housing, said power source switch being in an Off-state when said operating portion is in said first position, said power source switch being turned on in a midway of the movement of said operating portion from said first position to said second position, said first connector being provided with a pressing member, said pressing member, when said first connector is connected to said second connector, being moved toward said front wall of said housing, at that time, said pressing member pushing said operating portion so that said operating portion is moved from said first position to said second position; and
(e) said control unit including a second power source switch disposed between said power source circuit and said control unit and in a serial relation with the first-mentioned power source switch, a second operating portion for turning on/off said second power source switch being provided on said front wall of said housing but away from said second connector.

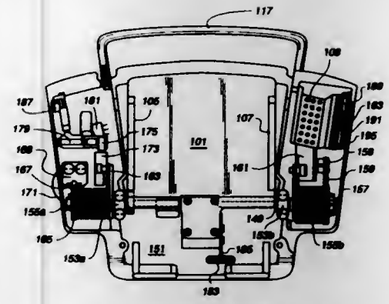
5,554,894

ELECTRONIC FOOTSWITCH FOR OPHTHALMIC SURGERY

Perry Sepielli, Richboro, Pa., assignor to Iolab Corporation, Claremont, Calif.

Filed Oct. 28, 1994, Ser. No. 330,925
Int. Cl.[6] H01H *35/02*
U.S. Cl. 307—119 **30 Claims**

1. An electronic footswitch for use in controlling a plurality of surgical devices used by a surgeon in ophthalmic surgery, said footswitch comprising:
(a) a fixed frame and housing;
(b) a shaft and a foot pedal mounted on the shaft for pivotable rotation with respect to said frame, said shaft being journaled for rotation within said housing;



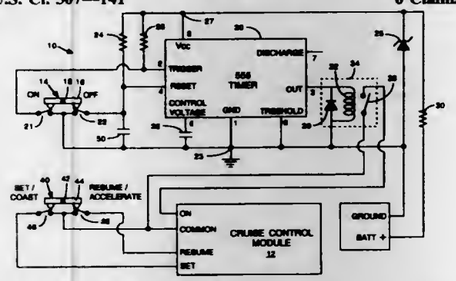
(c) a spring member mounted about said shaft and coupled to said foot pedal and to said housing to bias said foot pedal to resist rotation of the foot pedal;
(d) continuously adjustable means coupled to the spring member for adjusting the bias of said spring member to a surgeon selected value;
(e) electronic encoding means for generating an electronic signal representative of the rotation of said shaft;
(f) control means responsive to said electronic encoding means and said plurality of surgical devices, to vary a plurality of operational characteristics of said devices in accordance with preset patterns set by said surgeon.

5,554,895

ELECTRONIC LATCHING CIRCUIT FOR MOMENTARY CONTACT SWITCHES

Michael E. Ross, Clayton, N.C., and Mark G. C. Robinson, Cedar Rapids, Iowa, assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 2, 1995, Ser. No. 382,543
Int. Cl.[6] H01H *7/08*
U.S. Cl. 307—141 **6 Claims**



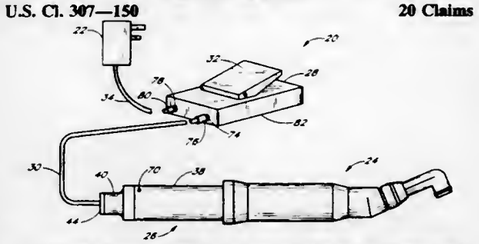
1. A switch circuit comprising:
a first node and a second node for receiving a DC voltage applied thereacross;
a timer comprising an integrated circuit having a trigger terminal, a reset terminal, a threshold terminal, a Vcc voltage supply terminal connected to the second node, a ground terminal connected to the first node and an output terminal at which a signal is produced which enables said switch circuit to energize a device;
a first normally-open switch connected between the first node and the trigger terminal wherein operation of the first normally-open switch activates said timer;
a second normally-open switch connected between the first node and the reset terminal wherein operation of the second normally-open switch deactivates said timer; and
a circuit element connected to the threshold terminal and applying a substantially constant voltage level to the threshold terminal.

5,554,896

PORTABLE POWER SUPPLY FOR HANDPIECES

Donald J. Hogan, Carlsbad, Calif., assignor to Miyad, Del Mar, Calif.

Filed Oct. 28, 1994, Ser. No. 331,985
Int. Cl.[6] H02J *7/00*
U.S. Cl. 307—150 **20 Claims**



1. A portable power supply system for handpieces comprising:
a variable voltage foot controller having a disconnectable electrical power source comprised of a rechargeable battery unit;
a sealed and sterilizable electric motor assembly including a distal end having a male coupling for type ISO-3954-1982E handpieces and a proximal end having a connector; and
a coaxial cable connected at one end to the variable voltage foot controller and at the other end to said connector on said proximal end of the sealed electric motor assembly.

5,554,897

DOWNHOLD MOTOR COOLING AND PROTECTION SYSTEM

Fred S. Martin, and John L. Bearden, both of Claremore, Okla., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Apr. 22, 1994, Ser. No. 231,542
Int. Cl.[6] H02K *9/19;9/00;5/12;* **F04B** *17/03*
U.S. Cl. 310—54 **19 Claims**

1. A cooling apparatus for cooling and protecting a submersible electric motor used in a well, the cooling apparatus comprising:
a shroud concentrically disposed around a motor housing of the motor, the shroud being sealed from well fluids in the well and defining an annular chamber between the motor housing and the shroud;
a longitudinal annular baffle that partitions the chamber into two concentric annular sub-chambers;
the sub-chambers having axially spaced apart communication openings such that the two sub-chambers are in fluid communication with each other;

a chamber fluid located in the chamber for circulating between the two sub-chambers through the communication openings to

peripheral surface, and provided at one end with an attach-

greater than the width of said opening as measured normal to such radial plane; and

5,554,902

LIGHTWEIGHT HIGH POWER ELECTROMOTIVE DEVICE AND METHOD FOR MAKING SAME

a chamber fluid located in the chamber for circulating between the two sub-chambers through the communication openings to facilitate the transfer of heat between the motor and the well fluids outside the shroud; and

the chamber fluid being isolated from communication with an exterior of the shroud.

5,554,898

ROTARY GENERATOR

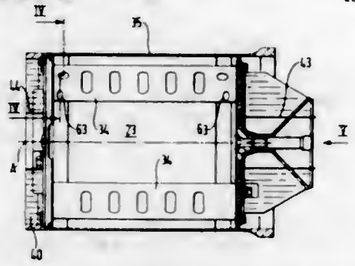
Rodney S. Howard, Hemel Hempstead; Mark D. Stephenson, Jersey Farm, and Eric J. Topping, Watford, all of Great Britain, assignors to Lucas Industries PLC, Great Britain

Filed Nov. 3, 1994, Ser. No. 333,713

Claims priority, application United Kingdom, Nov. 5, 1993, 9322866

Int. Cl.[6] H02K *1/32;9/02*

U.S. Cl. 310—61 **13 Claims**



1. A rotary generator comprising a stator having end windings, a rotor within the stator, the rotor defining a flow path for cooling fluid which, during rotation of the rotor, forms an annular layer in the rotor around a core of air, the rotor including a cooling fluid feed means extending into the annular layer of cooling fluid and having an inlet and an outlet Orifice of fixed size, the inlet, in use, being positioned within the annular layer of cooling fluid whereby a head of cooling fluid is formed at the inlet between the inlet and the core of air, the feed means defining a duct through which the cooling fluid passes by action of centrifugal force towards the outlet from which cooling fluid is directed onto the end windings, the rotation of the rotor causing the head of fluid at the inlet to reduce with increasing rotational speed thereby affecting control of cooling fluid flow through the feed means as the rotational speed increases.

5,554,899

ELECTRIC ACTUATOR

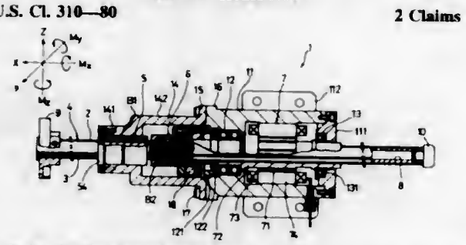
Hiroshi Teramachi, Tokyo, Japan, assignor to THK Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1994, Ser. No. 224,576

Claims priority, application Japan, Apr. 10, 1993, 5-107763

Int. Cl.[6] H02K *7/06*

U.S. Cl. 310—80 **2 Claims**



1. An electric actuator comprising:

a composite shaft having a spiral ball screw groove and an axially extending ball spline groove formed in its outer peripheral surface, and provided at one end with an attachment for a moving body;

a hollow motor including a hollow motor shaft through which said composite shaft extends, a motor housing in which said motor shaft is rotatably supported by a plurality of bearings, a rotor carried on the outer peripheral surface of said motor shaft, and a stator contained in said motor housing and surrounding said rotor;

a ball screw nut connected to one end of said motor shaft for rotation therewith, and fitted threadedly about said composite shaft and on a multiplicity of balls capable of rolling along said ball screw groove; and

a ball spline nut fixedly secured to said motor housing, and fitted about said composite shaft and on a multiplicity of balls capable of rolling along said ball spline groove;

said ball spline nut, ball screw nut, and motor being arranged in the order mentioned as viewed from said attachment;

said motor shaft-supporting bearings including a fixed standard bearing and an axially movable bearing disposed on opposite sides of said motor, said fixed standard bearing being disposed intermediate said ball screw nut and said motor and being situated closer to said ball screw nut than said motor to provide a standard for the axial position of said motor shaft, and said movable bearing being spring-biased axially toward said motor.

5,554,900

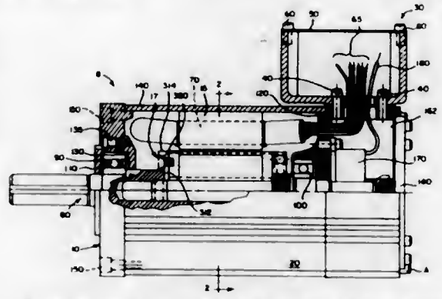
MOTOR INCLUDING EMBEDDED PERMANENT-MAGNET ROTOR

Stephen L. Pop, Sr., Warren, Ohio, assignor to Schlenker Enterprises Ltd., Hillside, Ill.

Filed Feb. 4, 1994, Ser. No. 191,957

Int. Cl.[6] H02K *21/12*

U.S. Cl. 310—156 **61 Claims**



1. A rotor of cylindrical configuration for use in a motor having a high torque to size ratio, said rotor having an outer cylindrical peripheral surface and comprising:

a central rotor shaft with a center axis;

at least first and second retainers securely mounted on said shaft in spaced opposed relation to one another;

a plurality of magnetically conductive segments arrayed around said shaft between said first and second retainers with each of said segments spanning a circumferential sector of said cylindrical configuration;

magnets disposed between each adjacent pair of said segments for providing magnetic flux through said adjacent segments for linking through a stator disposed around said peripheral surface;

each of said segments having an opening extending therethrough in generally spaced parallel relation to said shaft, each of said openings being of a cross-section which is elongated radially, namely having a length as measured parallel to a radial plane through the center axis of said shaft which is significantly greater than the width of said opening as measured normal to such radial plane; and

a non-magnetic securing bar extending through each of said openings and engaging the respective segment at the radially inward side of said opening to support said segment at least in a radial direction, each of said securing bars being a separate element spaced from said shaft and being in radial support engagement with said retainers whereby said bars and said retainers support said segments in predetermined positions in said rotor.

5,554,901

SERVO-DRIVE FOR ROTARY ANGLE ADJUSTMENT OF AN ACTUATOR FOR CONTROLLING AN OPEN CROSS-SECTION OF A MEDIUM FLOW LINE

Friedrich Wendel, Weissach; Manfred Franz, Ditzingen; Johannes Meiwes, Markgroeningen; Uwe Hammer, Schwieberdingen; Michael Altmann, Loechgau, and Dieter Dick, Muehlacker, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

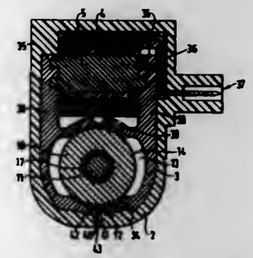
PCT No. PCT/DE93/00630, § 371 Date Apr. 11, 1994, § 102(e) Date Apr. 11, 1994, PCT Pub. No. WO94/04807, PCT Pub. Date Mar. 3, 1994

PCT Filed Jul. 17, 1993, Ser. No. 211,612

Claims priority, application Germany, Aug. 11, 1992, 42 26 548.7

Int. Cl.[6] H02K *21/14;1/12;* **F16K** *31/02*

U.S. Cl. 310—162 **6 Claims**



1. A servo-drive of a rotary actuator for controlling an opening cross-section of a medium conducting flow line for internal combustion engines, comprising a diametrically magnetized rotor (14) having a longitudinal axis, said magnetized rotor is for rotation about a longitudinal axis, a stator (3) with two poles (33, 34) and at least one winding for inducing a magnetic field, said stator (3) has a yoke (35) with two legs (38, 39) and a through-opening (13) and is formed by stacking first and second individual sheet-metal laminas (6) alternately, and the rotor (14) is arranged in the through-opening (13), the two poles (33, 34) are constructed on a wall of the through-opening (13) in such a way that one pole (33) is located on a side of the through-opening (13) facing the at least one winding (5) which is located between the legs (38, 39) and one pole (34) which is located on a side of the through-opening (13) facing away from the at least one winding (5), and at least one weak point (40) in the form of a recess (41) is formed in the two poles (33, 34) of said first sheet-metal lamina, and a gap (42) that completely penetrates the two poles (33,34) in a radial direction is formed in a wall of said second sheet metal lamina in each pole (33, 34) in the radial direction, wherein the second group of sheet-metal laminas (6) having gaps (42) as weak points (40) is disposed between said first group of sheet-metal laminas (6) having recesses (41) as weak points (40), and wherein in a multiple repeating way, the second group of sheet-metal laminas (6) with gaps (42) is disposed between the first group of sheet-metal laminas (6) with recesses (41) and are stacked in alternation to form the stator (3).

5,554,902

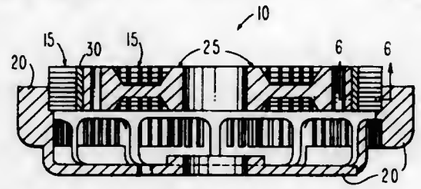
LIGHTWEIGHT HIGH POWER ELECTROMOTIVE DEVICE AND METHOD FOR MAKING SAME

Norman J. Kessens, Blue Springs, Mo.; Douglas M. Bowen, Overland Park; James P. Ceule, Shawnee, both of Kans., and Milton W. Rice, Seattle, Wash., assignors to Libby Corporation, Kansas City, Mo.

Filed Oct. 15, 1993, Ser. No. 138,242

Int. Cl.[6] H02K *1/12*

U.S. Cl. 310—254 **9 Claims**



1. An electromotive device comprising:

a stator assembly having a plurality of magnetic flux conducting integrated stator bars formed from a plurality of separate but interleaved laminated sheets and each having electrical conductor windings disposed adjacent said integrated stator bars for creating an electromagnetic field, wherein each laminated sheet includes a plurality of T-shaped regions for forming the integrated stator bars, said plurality of T-shaped regions being of two types, a first type having an aligned longitudinal grain orientation and a second type having a misalignment longitudinal grain orientation wherein the misalignment in said second type is still small enough to reduce heat generation in comparison to a randomly oriented grain orientation; and

means adjacent the stator assembly for generating a magnetic field within said electromotive device;

whereby the integrated stator bars are self-aligning because each individual T-shaped region does not need to be individually stacked and aligned relative to each other during manufacturing of the device.

5,554,903

ROTARY ELECTRIC MACHINE

Muneaki Takara, 19-20, Oruku 1-chome, Naha, Okinawa, 901-01, Japan

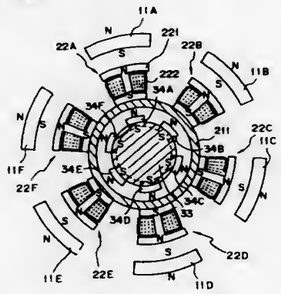
PCT No. PCT/JP92/01334, § 371 Date Jun. 9, 1994, § 102(e) Date Jun. 9, 1994, PCT Pub. No. WO93/08634, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 14, 1992, Ser. No. 211,661

Claims priority, application Japan, Oct. 14, 1991, 3-296519; Aug. 21, 1992, 4-245709

Int. Cl.[6] H02K *1/22;1/27*

U.S. Cl. 310—266 **3 Claims**



1. A rotary electric machine comprising:

a hollow outer stator having a plurality of field magnets;

a cylindrical hollow rotor arranged concentrically inside the outer stator with a gap therebetween; and

an inner stator arranged concentrically inside said rotor with a gap therebetween, said inner stator having a plurality of field magnets;

wherein the plurality of field magnets of said outer stator are disposed in a spaced relationship along a circumferential direction on its surface directed to said rotor in such a manner that all magnetic poles of said field magnets on the side directed to said rotor have the same polarity;

said rotor is mounted with a plurality of magnetic pole generating means, each including a rotor winding wound on its core, disposed along a circumferential direction on its surface directed to said outer stator, in a spaced relationship in accordance with the position in which said field magnets are disposed;

a commutation mechanism, disposed for exciting a rotor winding of said rotor by a commutator and a brush; and

wherein said commutation mechanism is structured such that (A) a rotor winding of said rotor is excited in a direction in which the magnetic pole of said rotor on the side directed to said field magnets generates the same polarity as that of the magnetic pole of said field magnets facing said rotor and that said rotor winding is excited at a timing when a combination of (i) a magnetic repulsive force to be received from a field magnet disposed on the rear side in the rotational direction of said rotor, and (ii) a magnetic repulsive force to be received from the field magnet disposed on the front side in the normal direction thereof turns into a force for urging the rotation of said rotor in its rotational direction, when said rotor winding is excited, because the magnetic repulsive force received from a field magnet disposed on the rear side in the rotational direction of said rotor is greater than the magnetic repulsive force received from the field magnet disposed on the front side in the rotational direction thereof, and (B) the excitation of said rotor winding is suspended at a timing when the rotation of said rotor in the normal direction is decreased because the relationship of the magnetic repulsive forces between the magnetic poles of said rotor and said field magnets is reversed, and wherein the magnetic poles of said rotor on the opposite side of the magnetic poles generated by said magnetic pole generating means are arranged to appear in the circumferential direction on the inside surface of said rotor; and said inner stator is structured such that a plurality of its field magnets are arranged in the circumferential direction on a surface facing said rotor in a spaced relationship in accordance with the position in which the inner magnetic poles of said rotor are disposed and such that the magnetic poles of said field magnets of said inner stator on the side directed to said rotor all have the same polarity which is opposite to the polarity of the magnetic poles of the field magnets of the outer stator on the side directed to said rotor.

5,554,904

VIBRATION CONTROL APPARATUS HAVING AUTOMATIC GAIN CONTROL

Kokichi Terajima, Tokyo, Japan, assignor to Akai Electric Co., Ltd., Tokyo, Japan

Filed Jan. 10, 1995, Ser. No. 371,031

Claims priority, application Japan, Jul. 5, 1994, 6-153953; Jul. 20, 1994, 6-168142

Int. Cl.[6] H01L *41/107*

U.S. Cl. 310—316 **18 Claims**

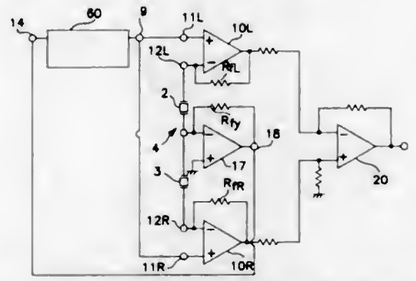
1. Vibration control apparatus comprising,

(a) a vibrator having a vibration member having at least one side surface with a resonance point,

(b) first and second piezoelectric elements on said at least one side surface, each piezoelectric element having at least first and second electrodes,

(c) a drive apparatus having a signal output terminal that outputs a drive signal of the vibrator, and a signal input terminal;

(d) first and second feedback amplifiers, each having a feedback input terminal, and a signal input terminal;



wherein each respective signal input terminal of said first and second feedback amplifiers is connected to said signal output terminal of said drive apparatus, the feedback input terminal of said first feedback amplifier is connected to said first electrode of said first piezoelectric element, the feedback input terminal of said second feedback amplifier is connected to said first electrode of said second piezoelectric element, said second electrodes of said first and second piezoelectric elements are connected to said signal input terminal of said drive apparatus, and

wherein said drive apparatus further comprises an automatic gain control circuit which holds fixed a combined current value of respective currents flowing through said second electrodes.

5,554,905

PIEZOELECTRIC ROTATING MOTOR

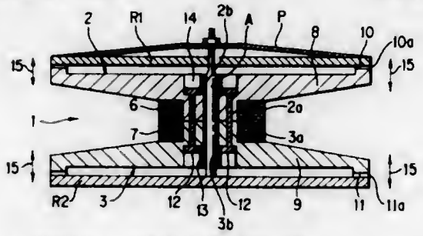
Michel Gschwind, Grasse; Tatsumi Mitsuta, Cagnes sur Mer; Daniel Guyomar, Nice; Jean-Denis Sauzade, Grasse, and Thierry Mazoyer, Vence, all of France, assignors to IMRA Europe SA, and Techsonic, both of Valbonne, France

Filed Feb. 1, 1995, Ser. No. 384,335

Claims priority, application France, Feb. 1, 1994, 94 01069

Int. Cl.[6] H01L *41/08*

U.S. Cl. 310—323 **12 Claims**



1. A piezoelectric rotating motor comprising:

a plurality of piezoelectric elements;

a disk-shaped stator having a center portion in which the piezoelectric elements are accommodated, a circular friction zone which is formed on an outer peripheral portion of its one surface and a connecting portion which connects the center portion with the friction zone so as to form a lever transmitting and amplifying the axial strain of the piezoelectric elements to the portion of the friction zone located in the same angular sector as the piezoelectric elements and which has a cone shape at a rear side of the friction zone so as to thin its thickness from the center portion to the outer peripheral portion and producing a progressive wave forming an elliptical vibration on the friction zone by the composition of its three dimensional strain due to the piezoelective effect of the piezoelectric elements; and

a rotor being contacted with the friction zone under pressure.

5,554,906

ULTRASONIC MOTOR

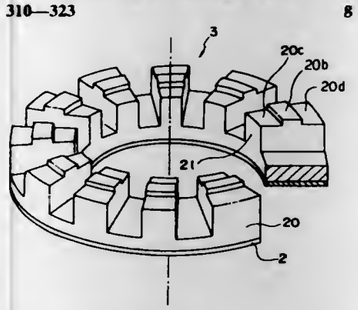
Tadao Takagi, Yokohama, Japan, assignor to Nikon Corporation, Chiyoda-ku, Japan

Continuation of Ser. No. 136,808, Oct. 15, 1993, abandoned. This application Sep. 27, 1994, Ser. No. 312,654

Claims priority, application Japan, Oct. 19, 1992, 4-279948; Oct. 12, 1993, 5-254552

Int. Cl.[6] H02N *2/00*; **H01L** *41/08*

U.S. Cl. 310—323 **8 Claims**



1. An ultrasonic motor comprising:

a piezoelectric member which is excited in response to a driving signal;

an elastic member in which a travelling wave is produced upon excitation of said piezoelectric member; and

a movable member which is driven by the travelling wave produced in said elastic member, said movable member having a contact surface; wherein

a surface of said elastic member confronts said movable member and includes a first surface portion and a second surface portion which extend along a travelling direction of the travelling wave;

said first surface portion contacts said contact surface of said movable member, and said first surface portion has a width greater than a width of said contact surface of said movable member;

said second surface portion is formed at a lower position than said first surface portion by a predetermined step difference such that no surface-polishing treatment is conducted on said second surface portion when a surface-polishing treatment is conducted on said first surface portion; and

the predetermined step difference is set so that an amplitude of a travelling wave produced at said first surface portion is equal to an amplitude of a travelling wave produced at said second surface portion, wherein the step difference is set to a value below 10% of the height of the elastic member.

5,554,907

VEHICLE SPEED MEASUREMENT APPARATUS

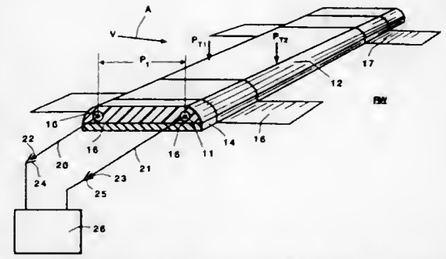
Donald A. Dixon, Columbia, Md., assignor to Mitron Systems Corporation, Columbia, Md.

Continuation-in-part of Ser. No. 880,638, May 8, 1992, abandoned. This application Jun. 26, 1992, Ser. No. 904,623

Int. Cl.[6] H01L *41/08*; **G08G** *1/02*

U.S. Cl. 310—339 **2 Claims**

1. In a vehicle speed sensor system for sensing wheeled vehicular traffic thereover, the improvement comprising, a flexible carrier member having an elongated flat elastomeric member, a pair of elongated piezoelectric pressure sensors embedded in closely spaced parallel relation in said flat, elastomeric member, said elastomeric member maintaining the distance between said piezoelectric pressure sensors constant, and means for measuring the time interval between peak voltages induced in said piezoelectric pressure sensors by wheeled vehicular traffic thereon, and wherein said sensors include a common strip of piezoelectric plastic and a pair of spaced electrodes are formed on said common strip to constitute said pair of piezoelectric pressure sensors.



5,554,908

PRECOMBUSTION CHAMBER DEVICE

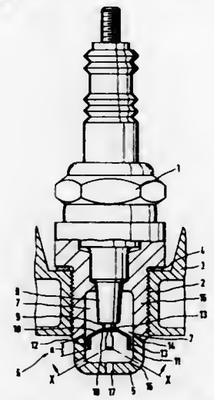
Dieter Kuhnert, Friedrich-Metz-Strasse 18, and Reinhard Latsch, Sunnisheimring 43, both of 74889 Sinsheim, Germany

Filed Mar. 28, 1995, Ser. No. 411,896

Claims priority, application Germany, Mar. 29, 1994, 44 10 858.3

Int. Cl.[6] H01T *13/20*; **F02B** *19/00*

U.S. Cl. 313—140 **17 Claims**



1. A precombustion chamber device for the ignition of preferably lean fuel-air mixtures comprising a precombustion chamber, which contains an electrode carrier extending into the precombustion chamber and having at least one ignition electrode attached to it, said electrode having at least one ignition portion, which with an inner wall surface of the precombustion chamber defines a spark gap directed substantially athwart the longitudinal axis of the precombustion chamber, such inner wall surface functioning as a ground electrode, wherein the ignition portion of the at least one ignition electrode is offset in relation to the longitudinal axis of the precombustion chamber and extending substantially parallel to the wall surface, which is in the spark gap portion is substantially cylindrical, of the precombustion chamber is arranged adjacent to the wall surface;

wherein in a fitted condition thereof the precombustion chamber has at least one portion extending into the main combustion space of an internal combustion engine.

5,554,909

ONE DIMENSIONAL TENSION MASK-FRAME

a fluorescent screen formed on an inner surface of said front housing;

signal processing circuit means responsive to the electric pulse signal for producing a saw-tooth wave signal, said signal

5,554,909

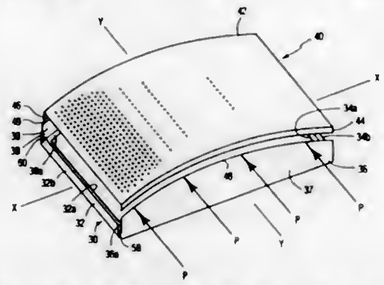
ONE DIMENSIONAL TENSION MASK-FRAME ASSEMBLY FOR CRT

Matthew S. Brennesholtz, Pleasantville, N.Y., assignor to Philips Electronics North America Corporation, New York, N.Y.

Filed May 6, 1994, Ser. No. 239,172

Int. Cl.[6] H01J *29/80*

U.S. Cl. 313—402 **13 Claims**



1. An aperture mask-frame assembly for a cathode ray tube comprising:

a mask consisting of a relatively thin sheet defining a large number of apertures;

a frame comprising two side members, a top member and a bottom member; the members jointed at four corners; at least the top and bottom members each comprising an upstanding portion having a spring constant, the upstanding portions each having a free edge, the upstanding portions of the top and bottom members separated at the corners from the side members, so that the upstanding portions can flex independently without influence from the side members, and at least one of the upstanding portions being flexed inwardly so as to have an outward spring bias;

the mask secured along the free edges of the upstanding portions of the top and bottom members of the frame;

whereby the mask is in a state of mechanical tension, and during thermal expansion of the mask, the at least one upstanding portion moves outwardly to maintain the mask in a state of mechanical tension.

5,554,910

ELASTIC RESTRAINT FOR FLAT PANEL DISPLAYS

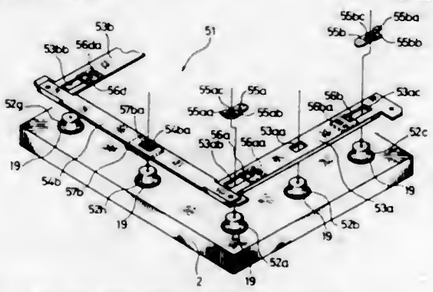
Hiroshi Aono; Mitsunori Yokomakura, both of Takatsuki; Mitsunori Katano, Sanda, and Michiaki Watanabe, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Kadoma, Japan

Filed Sep. 27, 1994, Ser. No. 312,865

Claims priority, application Japan, Sep. 30, 1993, 5-244565

Int. Cl.[6] H01J *29/46*

U.S. Cl. 313—497 **17 Claims**



1. A flat type image display apparatus comprising:

a vacuum case having a front housing and a rear panel;

a fluorescent screen formed on an inner surface of said front housing;

a back electrode formed on an inner surface of said rear panel;

a plurality of linear cathodes disposed in said vacuum case for emitting electron beams;

a flat-shaped electrode unit for deflecting, focussing and controlling said electron beams; and

a supporting unit for holding said flat-shaped electrode unit, said supporting unit comprising a substantially rectangular shaped frame and resilient retaining means, said substantially rectangular shaped frame holding said flat-shaped electrode unit, intermediate parts at sides of said substantially rectangular shaped frame being rigidly fixed to said rear panel, each corner of said substantially rectangular shaped frame being elastically attached to said rear panel by said resilient retaining means such that an engagement between said rear panel and said flat-shaped electrode unit via said supporting unit is stabilized regardless of differences in degrees of deformation thereamong.

5,554,911

LIGHT-EMITTING ELEMENTS

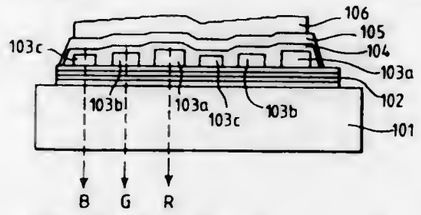
Takahiro Nakayama, Hitachi; Atsushi Kakuta, Hitachioota, and Takao Iwayanagi, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1994, Ser. No. 214,767

Claims priority, application Japan, Mar. 18, 1993, 5-058767

Int. Cl.[6] H01J *1/70*

U.S. Cl. 313—504 **27 Claims**



1. A multi-color light-emitting element comprising a first optical micro-cavity structure having a first film of organic material providing a light-emitting region thereof and an optical length determining its emission wavelength, and a second optical micro-cavity structure having a second film of organic material providing a light-emitting region thereof and an optical length, different from said optical length of said first micro-cavity structure, determining its emission wavelength, whereby said emission wavelengths of said first and second optical micro-cavity structures are different from one another to provide multi-color light emission.

5,554,912

ADAPTIVE INSTRUMENT DISPLAY BRIGHTNESS CONTROL SYSTEM

Peter A. Thayer, Indianapolis, and Morgan D. Murphy, Kokomo, both of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed May 15, 1995, Ser. No. 441,505

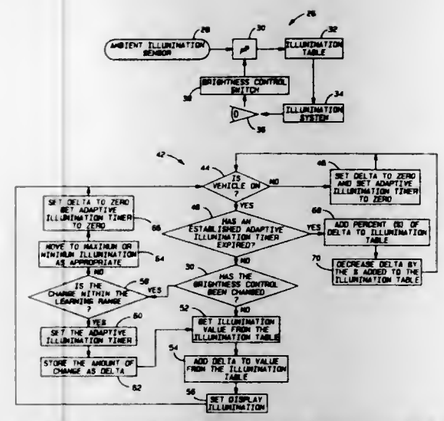
Int. Cl.[6] H05B *37/00*

U.S. Cl. 315—157 **21 Claims**

10. A system for automatically adjusting a display brightness of an instrument display of a vehicle based on ambient light intensity, said system comprising:

a light sensor, said light sensor determining the ambient light intensity and providing a signal indicative of the ambient light intensity;

an illumination source, said illumination source illuminating the display;



a variable intensity switch, said variable intensity operable to vary the intensity of the illumination source; and

a control device being responsive to the signal from the light sensor and providing a signal to the illumination source that will set an intensity level of the illumination source dependent on the signal from the light sensor, wherein the intensity level is based on illumination values stored in the control device, said illumination values being changed to adjusted illumination values in response to an adjustment of the intensity of the illumination source by the variable intensity switch.

5,554,913

BLOWER SYSTEM FOR VEHICLE AIR-CONDITIONERS

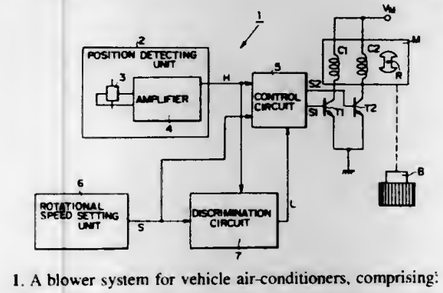
Hiroshi Ohsawa, Ohsato-gun, Japan, assignor to Zexel Corporation, Tokyo, Japan

Filed Dec. 6, 1994, Ser. No. 354,045

Claims priority, application Japan, Dec. 7, 1993, 5-339823

Int. Cl.[6] H02K *17/32*

U.S. Cl. 318—434 **3 Claims**



1. A blower system for vehicle air-conditioners, comprising:

a blower;

a direct current brushless motor for rotationally driving said blower;

a magnetic detecting means for producing an electric pulse signal related to the position of a magnetic rotor of said motor, a frequency of said electric pulse signal varying with the rotational speed of said motor, and the cycle period and peak value of said electric pulse signal increasing with decreasing rotational speed of said motor;

a setting device for producing a set signal representing a set rotational speed of the motor;

control circuit means responsive to the electric pulse signal and the set signal for controlling an exciting current supplied to said motor for producing a rotational torque in the magnetic rotor;

signal processing circuit means responsive to the electric pulse signal for producing a saw-tooth wave signal, said signal processing circuit means comprising means for changing the cycle period and peak value of aid saw-tooth wave signal in relation to the rotational speed of the magnetic rotor;

reference signal generating means for generating a reference signal, the level of said reference signal increasing as the set rotational speed of the motor decreases; and

a discrimination circuit for generating a discrimination signal based on a comparison of said saw-tooth wave signal with the reference signal and indicating whether or not said motor is in a locked state;

said reference signal generating means comprising means responsive to said set signal for setting the level of the reference signal such that the time period between motor locking and output of the discrimination signal becomes shorter as the set rotational speed of the motor becomes higher.

5,554,914

MICRO ROBOT

Osamu Miyazawa, C/O Seiko Epson Corporation 3-5 Owa 3-chome, Suwa-shi, Nagano-ken, Japan

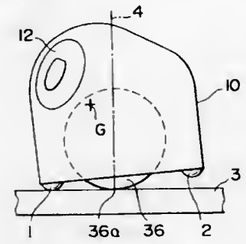
PCT No. PCT/JP92/01415, § 371 Date Jun. 7, 1993, § 102(e) Date Jun. 7, 1993, PCT Pub. No. WO93/09018, PCT Pub. Date May 13, 1993

PCT Filed Nov. 2, 1992, Ser. No. 70,399

Claims priority, application Japan, Nov. 5, 1991, 3-288764; Mar. 27, 1992, 4-071696; Mar. 27, 1992, 4-071697; Mar. 27, 1992, 4-071698

Int. Cl.[6] B25J *7/00*

U.S. Cl. 318—568.11 **11 Claims**



1. A micro robot comprising:

at least two sensors having respective detection regions partly overlapping each other;

at least one pair of driving means, being driven independently of each other and having driven points separated from each other, each driven point defining a vertical axis extending therefrom in a direction perpendicular to a direction of movement;

a control portion which is composed in a form of a thin plate, for controlling said driving means on the basis of outputs of said sensors;

a chargeable power source portion for supplying a power source voltage to said sensors, said driving means and said control portion; and wherein said control portion and said power source portion being arranged in parallel between said pair of driving means, said driving means including an electromagnetic stepping motor, said electromagnetic stepping motor comprising; a magnetic rotor, an exciting coil winding wound on a magnetic core, a tabular stator having a circular hole to house said magnetic rotor, a pair of recesses, each being smaller than said magnetic rotor opening into the inside wall of said circular hole at diametrically opposed sites about the center of said circular hole and at a biased angle from a direction of a magnetic flux excited in said circular hole, and a pair of concave portions disposed outside said circular hole; said exciting coil winding being arranged between both ends of said tabular stator, said micro robot further having a center

of gravity positioned in approximate alignment with a plane including the vertical axis of said driven points of said pair of driving means and below the highest height among the height of said driving means, said control portion and said power source portion.

5,554,915

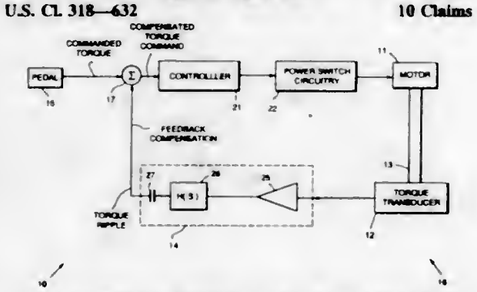
HIGH IMPEDANCE AC COUPLING METHOD FOR QUICK COMMAND RESPONSE IN TORQUE COMPENSATION SYSTEMS

Robert S. Wedeen, Manhattan Beach, and Gholam D. Goodarzi, Torrance, both of Calif., assignors to Delco Electronics Corporation, Kokomo, Ind.

Continuation of Ser. No. 61,795, May 13, 1991, abandoned. This application Dec. 14, 1995, Ser. No. 574,093

Int. Cl.[6] G05B *5/00*

U.S. Cl. 318—632 **10 Claims**



1. In an oscillation compensation system for use with an electric motor having an output shaft, a transducer coupled to the output shaft for sensing pulsations present therein, an input source for providing a command input signal, a summing device having an output and having one input coupled to the input source, a controller coupled to the output of the summing device, and power switching circuitry coupled between the controller and the electric motor, wherein the improvement comprises:

an AC coupling arrangement coupled between the transducer and a second input of the summing device that generates a feedback compensation signal that is combined with the commanded input signal that compensates for oscillations present in the output shaft of the electric motor, and wherein the AC coupling arrangement comprises:

a loop amplifier coupled to the transducer;

AC coupling means coupled between the loop amplifier and the summing device; and

a high impedance signal source having an impedance that is relatively high compared to the impedance of the loop amplifier coupled between the loop amplifier and the AC coupling means.

5,554,916

METHOD OF STARTING A SENSORLESS MOTOR

Isao Kaneda, Moriyama, and Kobei Yonemura, Yokaichi, both of Japan, assignors to Nidec Corporation, Kyoto, Japan

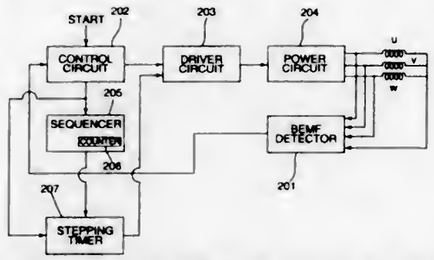
Filed Nov. 30, 1993, Ser. No. 160,026

Claims priority, application Japan, Nov. 30, 1992, 4-319929; Dec. 1, 1992, 4-321861; Dec. 7, 1992, 4-326382; Dec. 17, 1992, 4-337064

Int. Cl.[6] G05B *11/14*

U.S. Cl. 318—672 **16 Claims**

1. A method of starting a sensorless motor, wherein the motor comprises a stator provided with three-phase stator coils to which an exciting current is supplied, a rotor provided with a rotor magnet for obtaining a rotating torque by the electromagnetic interaction of the stator, a sequencer including an exciting counter which causes an inner stepping pattern signal to proceed, a driver means for supplying an exciting current to the stator coils based on



the inner stepping pattern signal from the sequencer, and a control means for controlling the inner stepping pattern signal supplied to the driver means from the sequencer;

the method comprising a first and second stepping steps in which the inner stepping pattern is fed to the driver means at the time of starting the motor, the exciting counter causing the inner stepping pattern signal to proceed by 1, the control means controlling the sequencer so as to feed the inner stepping pattern signal skipped by 1 forwardly or rearwardly from an exciting pattern signal supplied to the driver means just before the inner stepping pattern signal in the second stepping step is fed to the driver means, and a third step comprising a reverse exciting operation in which the exciting current is switched off from one of positive to negative and negative to positive without including a cessation time in the coil of one phase out of three-phase coils in the early period of the second stepping step.

5,554,917

APPARATUS FOR REGULATING THE POWER CONSUMPTION OF A VACUUM CLEANER

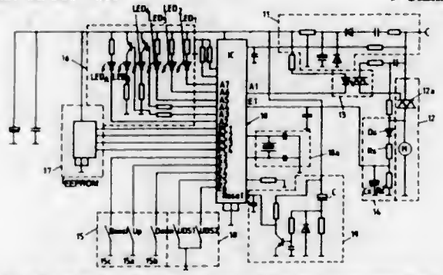
Gerhard Kurz, Industriestrasse W-75382, Althengstett, Germany, and Manfred Kraft, Neubulach, Germany, assignors to Gerhard Kurz, Althengstett, Germany

Filed Aug. 11, 1994, Ser. No. 297,390

Claims priority, application Germany, Aug. 12, 1993, 43 27 070.0

Int. Cl.[6] H02P *5/00*

U.S. Cl. 318—805 **9 Claims**



1. An apparatus for regulating the power consumption of a vacuum cleaner of the type having a fan which is driven by an electric motor, comprising:

means for sensing a voltage across the electric motor;

means for digitizing the sensed voltage to define a digitized and sensed voltage; and

a microprocessor, the microprocessor including:

means for processing the digitized and sensed voltage by relating the digitized and sensed voltage to an actual effective voltage that has been delivered to the electric motor using stored or table values to thereby determine the actual effective voltage;

comparing means for comparing the determined actual effective voltage to a predetermined one of a plurality of operating modes;

a phase-angle determining circuit for determining the phase angle of a current supplied to the electric motor at the moment the voltage across the electric motor is sensed; and

regulating means for regulating the power consumption of the vacuum cleaner in response to the output value of the comparing means by activating the phase-angle circuit, whereby power consumption in the vacuum cleaner is maintained generally constant regardless of supply line voltage or frequency variations.

5,554,918

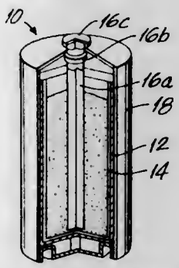
MECHANICALLY-REHARGEABLE BATTERY

Yehuda Harats, and Jonathan R. Goldstein, both of Jerusalem, Israel, assignors to Electric Fuel (E.F.L.) Ltd., Jerusalem, Israel

Filed Mar. 8, 1994, Ser. No. 208,016

Int. Cl.[6] H01M *10/28*

U.S. Cl. 320—2 **16 Claims**



1. A mechanically-rechargeable secondary single-cell consumer electric battery for generating up to two volts, said battery being capable of electrical recharge and comprising:

a replaceable zinc anode;

a housing containing said anode and provided with an aperture sealed by a removable closure, said aperture permitting removal and replacement therethrough of at least said anode;

a cathode selected from the group consisting of a manganese dioxide electrode, a nickel hydroxide electrode, a silver oxide electrode, and an air electrode also contained in said housing;

a non-spillable electrolyte in contact with both said cathode and said anode;

a separator system physically separating the anode from the cathode; and

a sealing element positioned between a face of said housing and a face of said closure for ensuring that electrolyte moisture required for correct operation remains within said housing.

5,554,919

CHARGE/DISCHARGE CIRCUIT HAVING A SIMPLE CIRCUIT FOR PROTECTING A SECONDARY CELL FROM OVERCHARGING AND OVERDISCHARGING

Takahito Uchida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 17, 1994, Ser. No. 197,688

Claims priority, application Japan, Feb. 17, 1993, 5-027064

Int. Cl.[6] H01M *10/44;* **H02J** *7/00*

U.S. Cl. 320—14 **10 Claims**

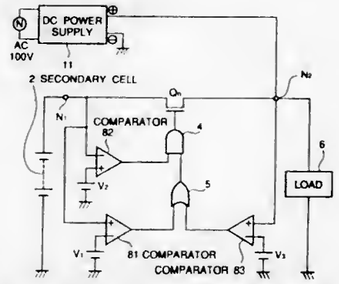
1. A charge/discharge circuit for preventing overcharging and overdischarging of a secondary cell, the circuit comprising:

a first terminal connected to the secondary cell;

a second terminal connected to an external DC voltage supply and a load;

a bidirectional analog switch connected between said first terminal and said second terminal;

a first detection means connected to said first terminal for generating a first detection signal when a voltage on said first terminal is lower than a first reference voltage;



a second detection means connected to said first terminal for generating a second detection signal when the voltage on said first terminal is higher than a second reference voltage which is higher than said first reference voltage;

a third detection means connected to said second terminal for generating a third detection signal when a voltage on said second terminal is lower than a third reference voltage which is higher than said second reference voltage; and

a control means receiving said first, second and third detection signals for controlling an ON/OFF condition of said analog switch so as to bring said analog switch into an OFF condition when the voltage on said second terminal is lower than said third reference voltage and the voltage on said first terminal is lower than said first reference voltage, or when the voltage on said first terminal is higher than said second reference voltage.

5,554,920

RECHARGEABLE BATTERY CHARGING METHOD

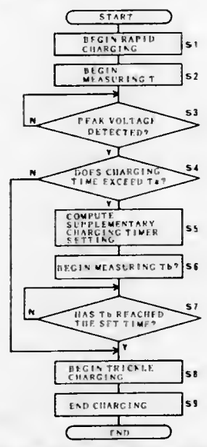
Toshiharu Kokuga, Sumoto, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Sep. 22, 1994, Ser. No. 310,055

Claims priority, application Japan, Sep. 30, 1993, 5-244758

Int. Cl.[6] H01M *10/44*

U.S. Cl. 320—22 **26 Claims**



1. A rechargeable battery charging method wherein:

(a) charging the rechargeable battery until a peak battery voltage of the rechargeable battery is detected;

(b) measuring a charging time from the start of charging until detection of the peak battery voltage;

(c) computing a supplementary charging time interval according to the charging time; and

(d) performing supplementary charging of the rechargeable battery for the supplementary charging time interval after detection of the peak battery voltage.

15. A rechargeable battery charging method wherein:

(a) charging the rechargeable battery until a peak battery voltage of the rechargeable battery is detected;

5,554,922

APPARATUS FOR THE CONVERSION OF PRESSURE FLUCTUATIONS PREVAILING IN FLUID SYSTEMS

third means coupled to said first means and said second means for selecting the lower of said first voltage sense signal and

signal when the electric potential of the capacitor exceeds a predetermined threshold voltage; and a logic gate for receiv-

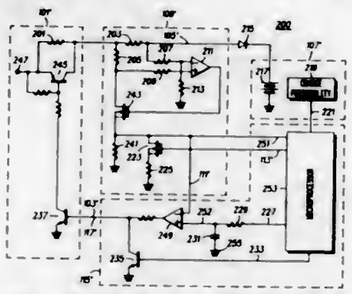
15. A rechargeable battery charging method wherein:
(a) charging the rechargeable battery until a peak battery voltage of the rechargeable battery is detected;
(b) measuring a charging current from the start of charging until detection of the peak battery voltage;
(c) computing a supplementary charging time interval according to the charging current; and
(d) performing supplementary charging of the rechargeable battery for the supplementary charging time interval after detection of the peak battery voltage.

5,554,921

BATTERY CHARGER APPARATUS AND METHOD WITH MULTIPLE RANGE CURRENT CONTROL

Edward Li, Roselle; Ralph M. Mitchell, Elgin, and John H. Aseltine, Buffalo Grove, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 23, 1993, Ser. No. 172,307
Int. Cl.[6] H01M *10/46;10/44;* **H02J** *7/04*
U.S. Cl. 320—22 **16 Claims**



1. A battery charger apparatus with multiple range current control comprising:
programmable current source means coupled to and for providing a charge current to charge a battery, wherein the charge current is dependent on a charge demand signal provided to said programmable current source means;
scaler means coupled to said programmable current source means for providing a scaled charge current signal dependent on the charge current and a current range signal; and
charge current control means for regulating the charge current by providing the charge demand signal to said programmable current source means, wherein the charge demand signal is dependent on the scaled charge current signal, and wherein more than one amplitude of the charge current is provided to said battery, dependent on more than one current range signal provided by said charge current control means to said scaler means.

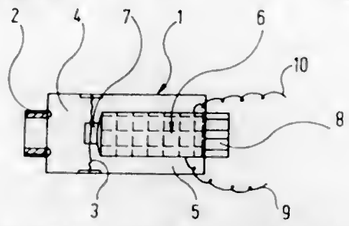
12. A method of charging a battery with multiple range current control, said method comprising the steps of:
providing a charge current to charge a battery dependent on a charge demand signal provided to a programmable current source;
providing a scaled charge current signal dependent on the charge current and a current range signal; and
regulating the charge current by providing the charge demand signal to the programmable current source, wherein the charge demand signal is dependent on the scaled charge current signal, and wherein more than one amplitude of the charge current is provided to the battery, dependent on more than one current range signal provided by the charge current control unit to the scaler.

5,554,922

APPARATUS FOR THE CONVERSION OF PRESSURE FLUCTUATIONS PREVAILING IN FLUID SYSTEMS INTO ELECTRICAL ENERGY

Horst Kunkel, Stuttgart, Germany, assignor to Hansa Metallwerke AG, Stuttgart, Germany

Filed Jan. 31, 1995, Ser. No. 380,756
Claims priority, application Germany, Feb. 2, 1994, 44 03 180.7
Int. Cl.[6] H02K *35/00*
U.S. Cl. 322—3 **16 Claims**



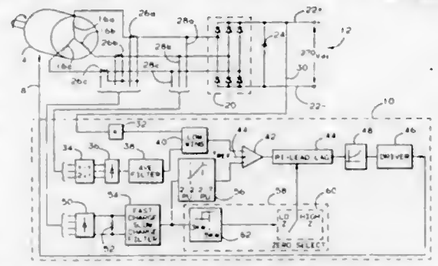
1. A system for the conversion of pressure fluctuations prevailing in fluid distribution piping systems into electrical energy, characterized in that it includes:
a) a casing (1; 101; 201; 301);
b) at least one chamber (4; 104; 204; 304) formed in the casing (1; 101; 201; 301) which may be linked to a fluid system and which is limited on the one side by a wall (3; 103; 203; 303, 303') which may be moved back and forth under the influence of the pressure prevailing in the fluid system;
c) at least one apparatus (6; 106*a*, 106*b*; 206*a*, 206*b*, 206*a'*, 206*b'*; 306*a*, 306*b*) which is connected to the movable wall (3; 103; 203; 303, 303') and which converts the mechanical energy transmitted by this into electrical energy.

5,554,923

VOLTAGE REGULATOR AND METHOD FOR DC POWER GENERATING SYSTEM

Vijay Maddali; John F. Defenbaugh, and Hassan Mansir, all of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jun. 1, 1995, Ser. No. 457,549
Int. Cl.[6] H02P *9/00*
U.S. Cl. 322—25 **11 Claims**



1. A voltage regulator for a DC power generation system having a prime mover driven generator for producing an AC voltage output, the AC voltage output being rectified to a DC voltage output for use by the system, comprising:
first means for sensing the AC voltage output, said first means producing a first voltage sense signal proportional to the AC voltage output;
second means for sensing the DC voltage output, said second means producing a second voltage sense signal proportional to the DC voltage output;

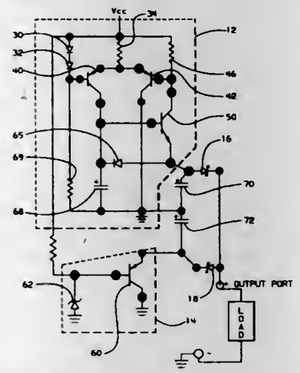
third means coupled to said first means and said second means for selecting the lower of said first voltage sense signal and said second voltage sense signal for use in controlling the DC voltage output.

5,554,924

HIGH SPEED SHUNT REGULATOR

Jerry K. McMahon, Apalachin, N.Y.; Floyd W. Olsen, Athens, Pa., and Matthew F. Seward, Windsor, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 27, 1995, Ser. No. 508,852
Int. Cl.[6] G05F *1/613;1/618;3/16*
U.S. Cl. 323—229 **15 Claims**



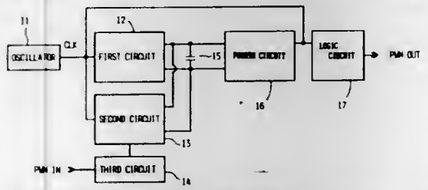
1. A shunt regulator comprising:
a source of DC current;
a DC voltage reference/current shunt circuit;
first and second Schottky diodes connected in series with each other between said source and said DC voltage reference/current shunt circuit and oriented to pass DC current of said source to a load and said DC voltage reference/current shunt circuit, an output port for said load being coupled between said first and second Schottky diodes.

5,554,925

PULSE DURATION MODULATOR AND PULSE DURATION MODULATION TYPE SWITCHING POWER SOURCE

Kimio Shibata, Chiba, Japan, assignor to Seiko Instruments Inc., Japan

Filed Dec. 1, 1994, Ser. No. 347,863
Int. Cl.[6] H02M *3/335*
U.S. Cl. 323—282 **7 Claims**



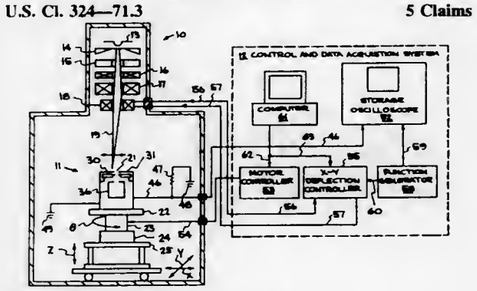
1. A pulse duration modulator comprising:
a first circuit for discharging a capacitor according to a first electric potential of a clock signal from an oscillator; a second circuit for charging the capacitor according to a second electric potential of the clock signal; a third circuit for controlling the level of a charge current applied to the capacitor according to the level of an input voltage signal applied thereto; a fourth circuit, coupled to the capacitor, for producing an output signal when the electric potential of the capacitor exceeds a predetermined threshold voltage; and a logic gate for receiving the output signal from the fourth circuit and the clock signal and producing a pulse output signal having a pulse width dependent upon the level of the input signal.

5,554,926

MODIFIED FARADAY CUP

John W. Elmer, Pleasanton; Alan T. Teruya, and Dennis W. O'Brien, both of Livermore, all of Calif., assignors to Regents of the University of California, Oakland, Calif.

Division of Ser. No. 283,438, Aug. 1, 1994, Pat. No. 5,468,966.
This application Jul. 31, 1995, Ser. No. 509,552
Int. Cl.[6] G01R *13/00*
U.S. Cl. 324—71.3 **5 Claims**



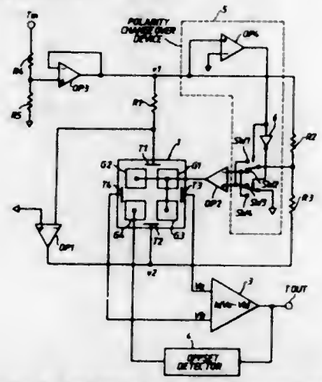
1. A modified Faraday cup comprising:
a housing having a plurality of interconnected aligned openings of different cross-sections therein;
a plurality of blocks secured together to form a slit there between being located in one of said plurality of openings;
an insulator having a plurality of interconnected openings therein;
a Faraday cup located in one of said plurality of openings in said insulator;
a cap forming member having a slot therein;
an insulator member having a slot therein;
said cap member and said insulator member being located in said one of said plurality of openings in said insulator;
an electrical lead connected to said Faraday cup and extending through a second of said plurality of openings in said insulator;
said insulator being positioned in a second of said plurality of openings in said housing and such that said slot in each of said cap forming member and said insulator member are aligned with said slit and a third of said openings in said housing;
plug means having an opening therein and mounted in an enlarged end of said second of said plurality of openings in said housing for retaining said insulator in said second opening in said housing, said electrical lead extending through said opening in said plug means; and a plate means having a slit therein mounted on said housing such that the slit therein is in alignment with said third of said plurality of openings in said housing and in alignment with said slit formed between said blocks;
whereby passage of a beam of energy across said slit in said plate caused beam current to be captured by said Faraday cup producing an output signal through said electrical lead.

5,554,927

ELECTRICAL QUANTITY MEASUREMENT DEVICE

Ryoji Maruyama, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 3, 1995, Ser. No. 398,663
Claims priority, application Japan, Mar. 3, 1994, 06-033542
Int. Cl.[6] G01R *33/06;33/00*
U.S. Cl. 324—117 H **7 Claims**



1. A device for measuring an electrical quantity of a system under measurement, comprising:

a Hall element equipped with a pair of current input terminals and a pair of voltage output terminals, four equivalent resistances being formed between two adjacent terminals of said current input terminals and said voltage output terminals;

magnetic field applying means for applying a magnetic field proportional to a value of a first current on said Hall element;

current supply means for flowing a second current between said pair of said current input terminals of said Hall element;

output means for detecting a first voltage appearing between said pair of said output voltage terminals and outputting said first voltage as a measured value corresponding to said electrical quantity;

offset compensation means for detecting an offset appearing between said pair of said voltage output terminals for varying one of said four equivalent resistances in said Hall element based on said offset thus detected so as to compensate said offset; and

input resistance control means for varying remaining three of said equivalent resistances other than said one equivalent resistance such that a second voltage generated between said pair of said current input terminals caused by a flow of said second current is maintained at a predetermined value;

whereby an input resistance value of said Hall element being held constant.

5,554,928

MANUFACTURING DEFECT ANALYZER

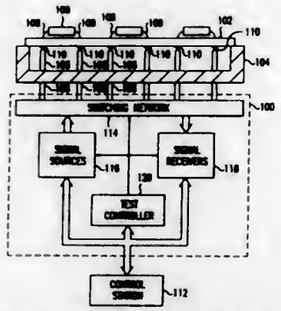
Philip J. Stringer, Chertsey, England, assignor to Teradyne, Inc., Boston, Mass.

Division of Ser. No. 329,031, Oct. 25, 1994, Pat. No. 5,521,513.
This application Nov. 20, 1995, Ser. No. 560,854
Int. Cl.[6] G01R *31/02;* **H01H** *31/02*
U.S. Cl. 324—158.1 **8 Claims**

1. A method of testing a printed circuit board with a plurality of semiconductor electronic components, each having a plurality of signal leads and at least one ground lead, mounted thereon, said method comprising the steps of:

a) applying a first voltage between a first signal lead and a ground lead of one semiconductor electronic component;

b) applying a second voltage between at least a second signal lead and a ground lead of the semiconductor electronic component;



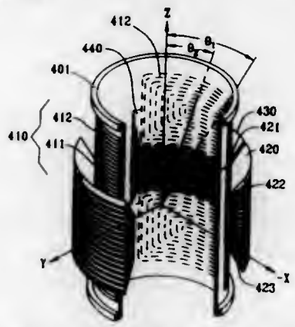
c) measuring the change in current flow in the first lead between a time when the first voltage is connected to the first lead and a time when the first voltge is connected to the first lead while the second voltage is connected to the second lead.

5,554,929

CRESCENT GRADIENT COILS

F. David Doty, and James K. Wilcher, both of Columbia, S.C., assignors to Doty Scientific, Inc., Columbia, S.C.

Filed Mar. 12, 1993, Ser. No. 30,853
Int. Cl.[6] G01R *33/20*
U.S. Cl. 324—318 **37 Claims**



1. An MRI transverse gradient coil system, referenced in a spherical coordinate system, substantially symmetric with respect to the equatorial plane $\Theta=90°$ and substantially symmetric with respect to the longitudinal planes $\phi=0°$ and $\phi=90°$, said system comprising:

a nonmetallic, nonmagnetic cylindrical coilform of outer radius r_4 and inner radius r_3;

a plurality of electrically conductive surface loops bonded to the outer surface of said coilform, said loops centered at polar angle less than 60°;

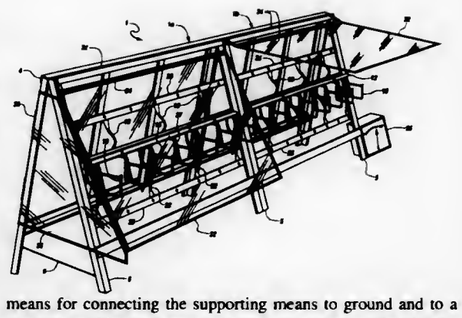
a plurality of axially aligned crescent coils bonded to the outer surface of said coilform at polar angle greater than 70°;

each said crescent coil comprising:

a nonmetallic, nonmagnetic, crescent coilform having an external concave surface composed of a section of a cylinder of a radius approximately equaling r_4 and axial length h_1 parallel to the crescent coilform axis, said crescent coilform defining an opposite external surface; said crescent coilform substantially symmetric with respect to a plane containing said coilform axis;

external conductive loops wound around said crescent coilform axis and bonded to said external surfaces to form azimuthally oriented parallel conductor elements on said concave surface and said opposite surface the conductor elements on each face defining a turns density, such that the mean turns density on said concave surface is higher than the mean turns density on said opposite surface;

further characterized by having a diagonal crescent coil with coilform axis positioned at 45°, an x-center crescent coil with coilform axis positioned at 0°, and a y-center crescent coil with coilform axis positioned at 90°.



means for connecting the supporting means to ground and to a source of high voltage in alternating sequence, whereby the supporting means causes the flow of electric current through discrete segments of a live-line tool; and

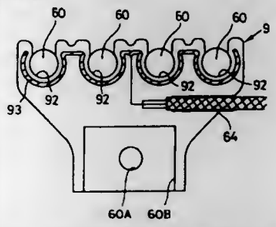
means for detecting the flow of electric current through the supporting means.

5,554,930

SPARK PLUG VOLTAGE PROBE DEVICE IN AN INTERNAL COMBUSTION ENGINE

Shigeru Miyata; Hideji Yoshida; Yoshihiro Matsubara; Yasuo Ito, and Takashi Suzuki, all of Nagoya, Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Division of Ser. No. 866,812, Apr. 9, 1992, Pat. No. 5,317,267.
This application Apr. 28, 1994, Ser. No. 234,421
Claims priority, application Japan, Apr. 12, 1991, 3-80107; Jun. 14, 1991, 3-143531; Jul. 8, 1991, 3-167127
Int. Cl.[6] F02P *17/12;* **G01R** *1/06;19/165*
U.S. Cl. 324—402 **3 Claims**



1. A spark plug voltage probe device which detects a voltage applied to a spark plug installed in an internal combustion engine so as to analyze a burning condition in the internal combustion engine on the basis of the voltage applied to the spark plug, the spark plug voltage probe device comprising:

a rubber clamper (**9**) secured to the internal combustion engine, and having a groove (**92**) in which a spark cable (**60**) is located so as to form a static capacity between an electrical conductor (**93**) embedded in the rubber clamper (**9**) and the spark plug cable (**60**);

the electrical conductor (**93**) being in the rubber clamper (**9**) along the groove (**92**), and the electrical conductor (**93**) being connected to a microcomputer by way of an output cable (**64**) so as to analyze a spark plug voltage waveform on the basis of the static capacity provided between the electrical conductor (**93**) of the rubber clamper (**9**) and the spark plug cable (**60**); and

a condenser (**42**) connected to a common point (A) between the electrical conductor (**93**) and the microcomputer so as to reduce the spark plug voltage according to a capacity of the condenser (**42**).

5,554,931

PORTABLE LIVE LINE TOOL TESTER

Samuel E. Allison, and Dale V. Bright, both of Waco, Tex., assignors to Texas Meter & Device Company, Dallas, Tex.

Filed Mar. 6, 1995, Ser. No. 398,549
Int. Cl.[6] B32B *31/22;* **H01M** *10/46*
U.S. Cl. 324—557 **23 Claims**

1. A live-line tool tester comprising:

a frame;

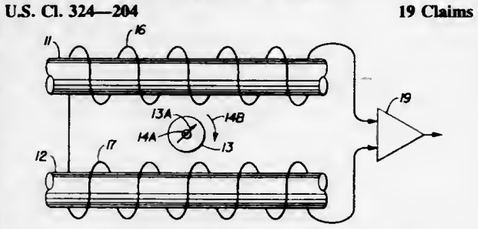
means for supporting a live-line tool to be tested, positioned at a plurality of locations along the frame and adapted to conduct electric current to the live-line tool;

5,554,932

MEASUREMENT OF A SATURATION MAGNETIC FLUX DENSITY THROUGH USE OF A ROTATING PERMANENT MAGNET

Frederick J. Jeffers, Escondido, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 17, 1993, Ser. No. 169,082
Int. Cl.[6] G01N *27/74;* **G01R** *33/12*
U.S. Cl. 324—204 **19 Claims**



1. A device for measuring the magnetic properties of a material, said device comprising:

a radially magnetized dipole permanent cylindrical magnet having a cylindrical axis and having an axis of magnetization perpendicular to and passing through said cylindrical axis;

rotational apparatus for rotating said magnet about a cylindrical axis;

first and second sample holders;

a first inductive pick-up coil wrapped around said first sample holder and positioned on a first side of said magnet, said first coil and first sample holder having an axis in a plane perpendicular to said cylindrical axis; and

a second inductive pickup coil wrapped around said second sample holder and having a symmetric position with respect to said first coil on the opposite side of said cylindrical axis, said first and second coils being electrically coupled; wherein rotation of said dipole permanent magnet produces changing magnetic field which induces opposite voltages in said coils which cancel leach other when no sample material is disposed in said first sample holders, but which produces unbalanced voltages in said coils which result in a net voltage which is a measure of a magnetic property of said sample material disposed in said first sample holder.

5,554,933

POLAR COORDINATES SENSOR PROBE FOR TESTING

5,554,937

APPARATUS AND METHOD FOR SENSING MATERIAL LEVEL BY CAPACITANCE MEASUREMENT

5,554,933

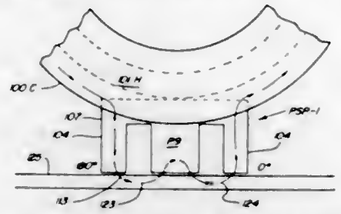
POLAR COORDINATES SENSOR PROBE FOR TESTING MATERIAL SURROUNDING FASTENER HOLES

Delmar L. Logue, R.R. #1, Box 60, Herrick, Ill. 62431

Continuation-in-part of Ser. No. 842,244, Feb. 27, 1992, Pat. No. 5,404,101, Ser. No. 108,880, Aug. 13, 1993, abandoned, Ser. No. 170,058, Dec. 20, 1993, Ser. No. 187,072, Jan. 27, 1994, and Ser. No. 142,933, Oct. 29, 1993. This application Mar. 25, 1994, Ser. No. 217,738

Int. Cl.[6] G01N *27/90*

U.S. Cl. 324—233 **9 Claims**



6. An isolated pick-up core polar sensor probe generating a plurality of phase-amplitude modulated signals, in combination with a rotating magnetic field within a hollow toroid driving core, for inspecting metal specimens with fastener holes in multi-layer metal material, said combination comprising:

a) a hollow toroid driving core formed of a high permeability ferromagnetic material, having a bore disposed in the greater circumference wall for mounting a polar sensor probe, the axis of said bore being perpendicular to the central axis of the hollow toroid core, the hollow toroid core being separable into two parts on a plane perpendicular to the central axis for assembly;

b) an isolated pick-up core polar sensor probe being mounted partially within the the bore for 360 degree flux coupling, the portion of the pick-up core outside the driving core forming an extending portion having a sensing face for coupling a rotating magnetic field to the workpiece;

c) a first excitation winding wound within the hollow toroid core, for inducing a first magnetic field throughout the hollow toroid core;

d) a second excitation winding wound around the outside of the hollow toroid core, being wound in symmetry to the mounted polar sensor probe for flux symmetry, said second excitation winding for inducing a second magnetic field throughout the hollow toroid core;

e) sine-cosine excitation being applied to the first and second excitation windings for inducing a rotating magnetic field throughout the hollow toroid core, said field having distributive axes perpendicular to the surface of the hollow toroid core everywhere;

f) the sine-cosine excitation frequency being selective for eddy current depth adjustment.

5,554,934

METHOD AND APPARATUS FOR LOCATING A BURIED ELEMENT OF INDUCTIVE MATERIAL USING PROBE WITH DETECTOR COILS

Peter Ward, Cramlington; Peter Dowson, Gosforth, and John Wilkinson, Sunderland, all of Great Britain, assignors to British Gas plc, London, England

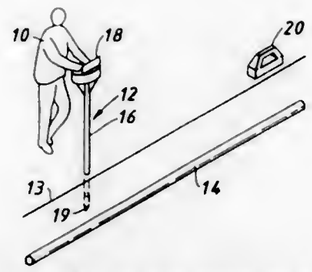
Filed May 10, 1995, Ser. No. 438,927

Claims priority, application United Kingdom, May 11, 1994, 9409431

Int. Cl.[6] G01V *3/11;3/165*

U.S. Cl. 324—326 **7 Claims**

4. An arrangement for locating a buried element of inductive material, said arrangement comprising a transmitter of an alternating magnetic field for causing, by induction, an alternating current to flow in the buried element so as to cause an alternating magnetic



field to be radiated from the buried element, and an insertable probe containing a first linear coil for detecting said radiated field, said probe having a longitudinal axis and including a probe rod having a tip and a probe head connected to said probe rod and including indicator means comprising a visual display or sound emitter means for producing an audio indication, and an electrical circuit, including said indicator means, said first linear coil, signal processing components, and a battery, for producing indications relevant to the position of said first linear coil in relation to said alternating magnetic field, said tip of said probe rod being pointed so as to be insertable into the ground so that said tip can be brought into contact with said buried element by manipulation of the probe rod including pivoting of said probe rod about said tip in response to said indications, said first linear coil carrying a detected current which is induced in said first linear coil by said alternating magnetic field radiated from said buried element and which alternates at the same frequency as said alternating magnetic field, the amplitude of said detected current varying according to the position of said first linear coil with respect to said alternating magnetic field and increasing as said first linear coil approaches said buried element, said amplitude being at a minimum when said first linear coil is at right angles to said magnetic field, said first linear coil having a longitudinal axis parallel to the longitudinal axis of the probe and said probe head containing a second linear coil disposed at right angles to said first linear coil for, in cooperation with said first linear coil, producing orientation and phase information to said indicator means so as to enable an operator of said probe to direct said probe rod towards said buried element by steering said probe based on said information.

5,554,935

MASS OR WEIGHT DETERMINATION OF ARBITRARILY-SHAPED DIELECTRIC OBJECTS BY MICROWAVE RESONATOR MEASUREMENTS

Andrzej W. Kraszewski, Athens, Ga., assignor to The United States of America, as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 3, 1995, Ser. No. 416,405

Int. Cl.[6] G01R *27/04*

U.S. Cl. 324—637 **6 Claims**

1. A process for shape- and size-independent measurement of mass or weight of a dielectric object comprising:

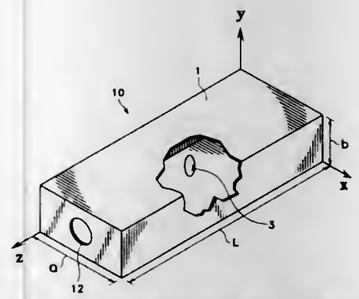
a) measuring the resonant frequency of an empty microwave resonator cavity, said cavity being coupled to a microwave radiation source and a measuring circuit allowing measurement of transmission of microwave radiation through said cavity,

b) measuring the transmission coefficient of said empty cavity,

c) inserting a single object into said cavity,

d) measuring the resonant frequency and transmission coefficient of said cavity with said object,

e) calculating the shift in remnant frequency, ΔF, and the change in said transmission coefficient, ΔT, caused by inserting said object,



f) determing mass of said article using ΔF and ΔT obtained in step e) above and the equation:

$$m=(R-B/G)^2$$

wherein m=mass, $R=\Delta F/\sqrt{\Delta T}$, and B and G are constants specific to the material said object is comprised of and to the microwave cavity used to determine B and G for said material.

5,554,936

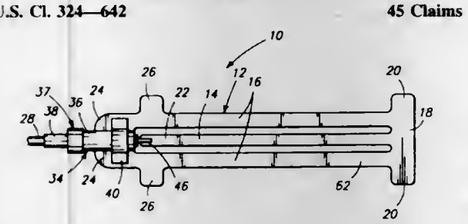
MIXED FLUID TIME DOMAIN REFLECTOMETRY SENSORS

Charles L. Mohr, 1440 Agnes St., Richland, Wash. 99352

Filed Dec. 1, 1994, Ser. No. 349,152

Int. Cl.[6] G01R *27/04*

U.S. Cl. 324—642 **45 Claims**



1. A sensor for use with time domain reflectometry systems to allow measurement of a fluid mixture having intermixed constituents with differing electrical permittivities, comprising:

at least one primary electrode made from electrically conductive material; said at least one primary electrode having sensing surfaces adjacent to which the fluid mixture is located during sensing; said primary electrode being for conducting a pulsed time domain reflectometry signal along the length thereof;

at least one secondary electrode having a spaced relationship with said at least one primary electrode to allow the fluid mixture to be present between the at least one primary electrode and the at least one secondary electrode; said at least one secondary electrode being made from electrically conductive material;

a dielectric layer covering at least said sensing surfaces of said at least one primary electrode, to electrically isolate the primary electrode from the fluid mixture and prevent dissipation of a time domain reflectometry signal propagated through said sensor, said dielectric layer having a thickness of from about 1 thousandths of an inch to about 10 thousandths of an inch.

5,554,937

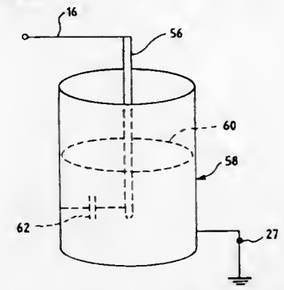
APPARATUS AND METHOD FOR SENSING MATERIAL LEVEL BY CAPACITANCE MEASUREMENT

Gary G. Sanders, and Brian J. Goodwin, both of Rock Falls, Ill., assignors to Penberthy, Inc., Prophetstown, Ill.

Division of Ser. No. 123,316, Sep. 17, 1993, Pat. No. 5,461,321. This application May 15, 1995, Ser. No. 441,140

Int. Cl.[6] G01R *27/26;* **G01F** *23/26*

U.S. Cl. 324—664 **17 Claims**



1. A device for monitoring the level of a material in a container, comprising:

probe means for developing a capacitance that varies with the level of material in the container;

charging means for subjecting the capacitance to a charge-discharge-charge cycle, wherein the capacitance is linearly charged to a first predetermined voltage, then linearly charged to a second predetermined voltage that is opposite in polarity from the first predetermined voltage, and then linearly charged to a reference voltage that is intermediate the first and second predetermined voltages; and

output means for generating an output signal that varies in accordance with the duration of the charge-discharge-charge cycle, said duration being directly proportional to said capacitance.

5,554,938

METHOD OF EVALUATING CURRENT-DRIVEN CONDUCTIVE MATERIAL

Tadahiro Ohmi, 1-17-301, Komegabukuro 2-chome, Aoba-ku, Sendai-shi, Miyagi-ken 980, Japan

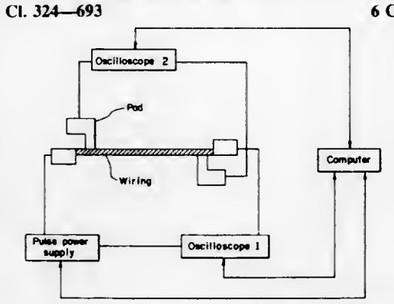
PCT No. PCT/JP94/00991, § 371 Date Feb. 21, 1995, § 102(e) Date Feb. 21, 1995, PCT Pub. No. WO95/00971, PCT Pub. Date Jan. 5, 1995

PCT Filed Jun. 21, 1994, Ser. No. 387,920

Claims priority, application Japan, Jun. 21, 1993, 5-148831

Int. Cl.[6] G01R *27/14*

U.S. Cl. 324—693 **6 Claims**



1. A method of evaluating current-driven conductive material for evaluating a capability of wiring material to withstand electromigration within a shorter period of time by repeating several

times an operating cycle comprising the steps of: flowing a first current in a wiring pattern made of conductive material to measure

5,554,940

BUMPED SEMICONDUCTOR DEVICE AND METHOD

second transistor being coupled between the first operating voltage connection and a second node; and

times an operating cycle comprising the steps of: flowing a first current in a wiring pattern made of conductive material to measure a resistance value of the wiring pattern, then flowing a second current having a current value larger than said first current for a specified period of time to generate electro-migration in said wiring pattern, then turning off said second current, again flowing said first current to measure a resistance value in said wiring pattern, wherein the capability of said wiring to withstand electro-migration is evaluated by adjusting a time for flowing said second current to a fully smaller value than a period of time for flowing said first current and controlling temperature rise when said second current is flown to 50° C. or more lower than that when said first current is flown.

5,554,939

NON-DESRUCTIVE MEASURING SENSOR FOR SEMICONDUCTOR WAFER AND METHOD OF MANUFACTURING THE SAME

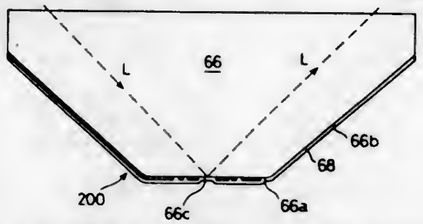
Sadao Hirae; Hideaki Matsubara; Motohiro Kouno, and Takamasa Sakai, all of Kyoto, Japan, assignors to Dainippon Screen Manufacturing Co., Ltd., Japan

Filed Dec. 21, 1993, Ser. No. 171,026

Claims priority, application Japan, Dec. 22, 1992, 4-357145

Int. Cl.[6] G01R *31/308*

U.S. Cl. 324—753 **12 Claims**



1. A sensor for use in non-destructive measurement of electrical characteristics of a semiconductor wafer, comprising:

a transparent member having a first flat surface and a second flat surface substantially parallel with each other, said first flat surface adapted to be spaced substantially parallel from a surface of the semiconductor wafer, said first flat surface having a reflecting plane to reflect a light beam introduced into said transparent member under geometric optical total reflection conditions, said geometric optical total reflection conditions being defined by a non-perpendicular incident angle of said light beam on said reflecting plane and a refractive index of said transparent member, said geometric optical total reflection conditions allowing a part of said light beam incident on said reflecting plane to pass through said reflecting plane by a tunnel effect when said reflecting plane and a surface of said semiconductor wafer are sufficiently close to each other to cause said tunnel effect, said reflected light beam reflected by said reflecting plane being measured to determine a gap between said reflecting plane and said surface of said semiconductor wafer spaced from said reflecting plane;

a test electrode formed on said first flat surface; and

an insulating film of a predetermined thickness formed at least on said test electrode so that said insulating film enhances electrical breakdown characteristics of said test electrode, said predetermined thickness allowing said part of said light beam incident on said reflecting plane under said geometric optical reflection conditions to pass through said insulating film.

5,554,940

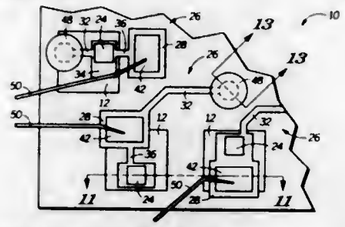
BUMPED SEMICONDUCTOR DEVICE AND METHOD FOR PROBING THE SAME

Eric M. Hubacher, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1994, Ser. No. 270,880

Int. Cl.[6] G01R *31/26*

U.S. Cl. 324—765 **19 Claims**



1. A semiconductor device comprising:

a semiconductor die having a semiconductor substrate with integrated circuitry formed thereon;

the semiconductor die further comprising:

a first metal layer overlying the semiconductor substrate and patterned to form a plurality of bond pads, the plurality of bond pads being electrically connected to the integrated circuitry;

an insulating layer overlying the first metal layer, the insulating layer having a plurality of openings formed therein such that each opening exposes a portion of an underlying bond pad;

a second metal layer overlying the insulating layer and filling the plurality of openings to form a plurality of contacts to the plurality of bond pads, the second metal layer being patterned to also form a plurality of test pads electrically connected to the plurality of contacts, a plurality of bump pads, and a plurality of interconnects, wherein each test pad is electrically connected to a corresponding one of the plurality of bump pads by one of the plurality of interconnects; and

a plurality of conductive bumps formed on the plurality of bump pads.

5,554,941

SELF-TESTING METHOD FOR IRREGULAR CMOS SWITCHING STRUCTURES WITH HIGH DEFECT DETECTION

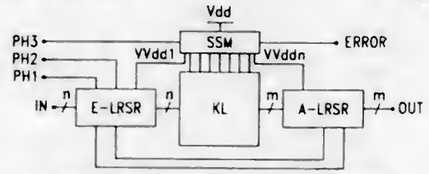
Frank Kesel, Zürich, Switzerland, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 16, 1995, Ser. No. 505,296

Claims priority, application Germany, Feb. 20, 1993, 43 05 288.6

Int. Cl.[6] G01R *31/26*

U.S. Cl. 324—765 **5 Claims**



1. A system for self-testing a CMOS circuit, comprising:

a first transistor coupled between a first operating voltage connection and the CMOS circuit, a first node being arranged between the first transistor and the CMOS circuit, the first transistor being turned on in a static state of the CMOS circuit;

a second transistor with a gate coupled to the first node and having a switching point selected so that the second transistor switches with a predetermined potential at the first node, the second transistor being coupled between the first operating voltage connection and a second node; and

a third transistor coupled between the second node and a second operating voltage connection,

wherein the second and third transistors are off during normal operation of the CMOS circuit, and the second transistor is on when there is a fault in the CMOS circuit,

whereby the second node is substantially isolated from the first and second operating voltage connections during normal operation of the CMOS circuit and is coupled with a low impedance to the first operating voltage connection when there is a fault in the CMOS circuit.

5,554,942

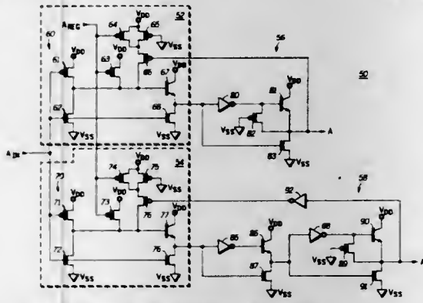
INTEGRATED CIRCUIT MEMORY HAVING A POWER SUPPLY INDEPENDENT INPUT BUFFER

Lawrence N. Herr, Coupland, and Glenn E. Starnes, Austin, both of Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Mar. 13, 1995, Ser. No. 402,787

Int. Cl.[6] H03K *19/003*

U.S. Cl. 326—33 **16 Claims**



1. An integrated circuit memory, comprising:

an input buffer having an inverter, the inverter having an input terminal for receiving an input signal and an output terminal for providing an output signal in response to the input signal, the inverter comprising a first transistor of a first conductivity type and a second transistor of a second conductivity type;

a third transistor, coupled between the output terminal of the inverter and a first power supply voltage terminal, for coupling the output terminal of the inverter to the first power supply voltage terminal in response to a reference voltage, the reference voltage varying in response to variations in a power supply voltage; and

a hysteresis circuit, coupled to the input buffer, for providing hysteresis to the input buffer.

5,554,943

ANALOG TO DIGITAL CONVERTER HAVING A MAGNITUDE AMPLIFIER WITH AN IMPROVED DIFFERENTIAL INPUT AMPLIFIER

Carl W. Moreland, Greensboro, N.C., assignor to Analog Devices, Inc.

Filed Dec. 1, 1994, Ser. No. 347,704

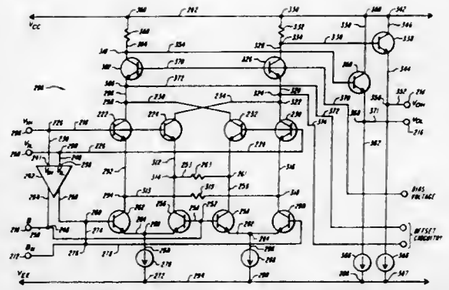
Int. Cl.[6] H03K *5/24*; **H03M** *1/72*

U.S. Cl. 327—65 **20 Claims**

19. An amplifier comprising:

a differential input circuit for receiving and amplifying a differential analog input signal;

a comparator for receiving the differential analog input signal and for generating first and second control signals based on the comparison;



a current switching control circuit, connected to a first side of the input circuit, for controlling folding of the differential analog input signal in response to the first and second control signals; and

an output circuit, connected to the input circuit on a second side, for providing first and second output signals generated at least in part under control of the current switching control circuit.

5,554,944

SAMPLING CIRCUIT

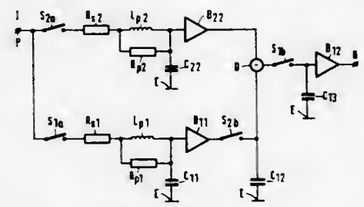
Marinus C. W. Van Buul, and Petrus G. M. Centen, both of Breda, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 28, 1995, Ser. No. 496,279

Claims priority, application European Pat. Off., Jul. 4, 1994, 94201914

Int. Cl.[6] G11C *27/02*

U.S. Cl. 327—91 **5 Claims**



5. A sampling circuit comprising:

a first branch including a series coupling of a first sampling switch, a first coil-resistor parallel circuit, a first hold capacitor having one terminal coupled to a reference potential and another terminal coupled to a first buffer, a further sampling switch having one terminal coupled to an output of the first buffer and an other terminal coupled to a reference potential thru a further hold capacitor;

a second branch coupled in parallel to said first branch and including a series coupling of a second sampling switch, a second coil-resistor parallel circuit, and a second hold capacitor having one terminal coupled to a reference potential and an other terminal coupled to a second buffer;

a subtracter having inputs connected to said other terminal of said further sampling switch and an output of said second buffer; and

a third sampling switch having one terminal coupled to an output of the subtracter and an other terminal coupled to a reference potential thru a third hold capacitor, said other terminal being coupled to a circuit output.

5,554,945

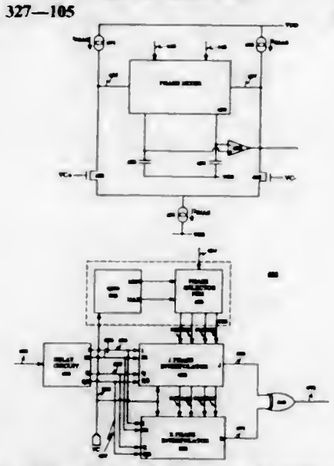
VOLTAGE CONTROLLED PHASE SHIFTER WITH UNLIMITED RANGE

Thomas H. Lee, Cupertino; Kevin S. Donnelly, San Francisco, and Tyyr-Chyang Ho, San Jose, all of Calif., assignors to Rambus, Inc., Mountain View, Calif.

Filed Feb. 15, 1994, Ser. No. 196,582

Int. Cl.[6] H03K *5/13*

U.S. Cl. 327—105 **10 Claims**



1. A phase shift apparatus for producing an output signal that varies in phase from an input signal by a predetermined phase difference in response to a control voltage, the phase shift apparatus comprising:

a first delay circuit coupled to receive the input signal, the first delay circuit for outputting a first intermediate signal that is α degrees out of phase with the input signal and a second intermediate signal that is β degrees out of phase with the first intermediate signal; and

a phase interpolator circuit coupled to receive the control voltage signal, the first intermediate signal, and the second intermediate signal, the phase interpolator for phase mixing the first and second intermediate signals in response to the control voltage signal to produce the output signal such that an output vector representative of the output signal is a sum of a first fraction of a first vector representative of the first intermediate signal and a second fraction of a second vector representative of the second intermediate signal, wherein the control voltage is a differential voltage VC+ and VC−, the phase interpolator comprising:

a first transistor including a first terminal for receiving a supply current, a second terminal for dispensing the supply current, and a third terminal for controlling the amount of supply current flowing from the first terminal to the second terminal in response to VC+;

a second transistor including a first terminal for receiving a supply current, a second terminal for dispensing the supply current, and a third terminal for controlling the amount of supply current flowing from the first terminal of the second transistor to the second terminal of the second transistor in response to VC−;

a first capacitor having a first terminal and a second terminal, wherein the first terminal of the first capacitor is coupled to system ground;

a second capacitor having a first terminal and a second terminal, wherein the first terminal of the second capacitor is coupled to system ground;

a comparator having a negative input coupled to the second terminal of the first capacitor and a positive input coupled to the second terminal of the second capacitor, the comparator for outputting the output voltage;

a phase mixer circuit including a first input coupled to the second terminal of the first transistor, a second input coupled to the second terminal of the second transistor, a first output coupled to the second terminal of the first capacitor, and a second output coupled to the second terminal of the second capacitor, the phase mixer circuit for coupling and decoupling the first input to the first output in response to the first intermediate signal, and for coupling and decoupling the second input to the second output in response to the second intermediate signal.

5,554,946

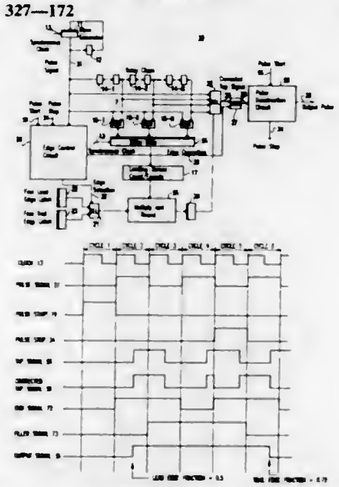
TIMING SIGNAL GENERATOR

Brian W. Curran, Saugerties, N.Y., and Rafael Blanco, Burlington, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 8, 1994, Ser. No. 224,927

Int. Cl.[6] H03K *5/13*

U.S. Cl. 327—172 **2 Claims**



1. A method for generating a timing signal with leading and trailing edges located independently with respect to one another and to an external synchronizing clock signal, the method comprising the steps of:

propagating a digital wave signal synchronized with said external synchronizing clock signal along a multi-stage digital delay chain whose propagation speed is a function of temperature and manufacturing tolerance build up;

determining a stage to which an edge of said digital wave signal propagates in one clock cycle;

multiplying a value assigned to said stage to which an edge of said digital wave signal propagates in one clock cycle with a fine edge value that specifies a desired location of an edge of said timing signal with respect to said external synchronizing clock signal;

selecting a stage of multi-stage digital delay chain, based on said multiplication step, where an edge of said digital wave signal is delayed with respect to an edge of said external synchronizing clock signal by an amount equal to said fine edge value; and

constructing said timing signal with an input from a stage selected in said selecting step.

5,554,947

WAVE-SHAPING CIRCUIT WITH FEEDBACK CIRCUIT FOR ADJUSTING CENTRAL VOLTAGE LEVEL OF INPUT ALTERNATING SIGNAL

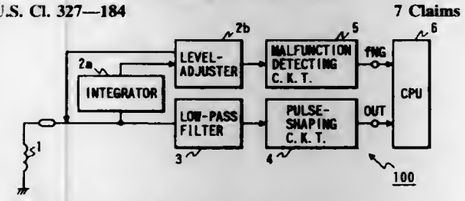
Mitsuhiro Saitou, Oobu, and Hideki Kabune, Chiryu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 7, 1994, Ser. No. 319,549

Claims priority, application Japan, Oct. 8, 1993, 5-253040

Int. Cl.[6] H03K *12/00;5/01;5/153*

U.S. Cl. 327—184 **7 Claims**



1. A wave-shaping apparatus comprising:

a level adjusting circuit arranged to integrate an input alternating signal to determine a central level of amplitude of the input alternating signal for adjusting the central level to a given reference level; and

a rectangular signal generating circuit arranged to compare the input alternating signal adjusted in central level by said level adjusting circuit with first and second threshold values to produce a rectangular signal.

5,554,948

ADAPTIVE THRESHOLD CIRCUIT WITH DECELERATION COMPENSATION

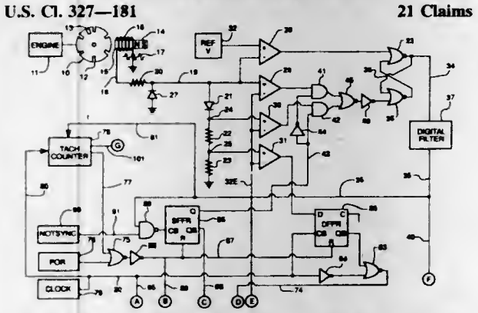
Mark C. Hansen, Ann Arbor, Mich., and Walter K. Kosiak, Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed May 31, 1994, Ser. No. 251,499

The portion of the term of this patent subsequent to Oct. 17, 2012, has been disclaimed.

Int. Cl.[6] G01P *3/489;* **H03K** *5/01;9/06*

U.S. Cl. 327—181 **21 Claims**



1. Apparatus for developing a series of square wave voltage pulses that are developed during rotation of a rotatable wheel comprising:

a magnetic sensor associated with said wheel and having a pick-up coil and means on said wheel for causing an alternating voltage to be generated in said pick-up coil when said wheel rotates relative to said sensor;

an input circuit connected to said pick-up coil;

a digital-to-analog converter having an input and an output for providing a threshold voltage;

a voltage comparator having a first input connected to said input circuit and a second input connected to the output of said converter;

a pulse counter for developing a digital count signal to be input to said converter and having a selectable count register that may be decremented to reduce the digital count signal;

means responsive to the rotation of said wheel for detecting deceleration of said wheel and providing a detected deceleration output signal indicative thereof;

means responsive to said detected deceleration output signal for decrementing said counter to reduce said threshold voltage;

an output circuit for providing a series of said square wave voltage pulses; and

means coupled to the output of said comparator for causing a leading rising edge of said square wave voltage pulse to be developed at said output circuit when the voltage generated in said coil increases to a value that has a predetermined relationship to the output voltage of said converter.

5,554,949

CIRCUIT ARRANGEMENT FOR DELAYING A FUNCTIONAL SIGNAL

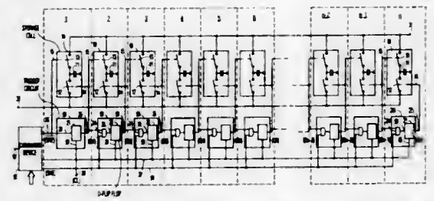
Thomas Suwald, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 14, 1993, Ser. No. 167,265

Claims priority, application Germany, Dec. 15, 1992, 42 42 201.9

Int. Cl.[6] H03H *11/26;* **H03K** *1/04;17/28*

U.S. Cl. 327—276 **9 Claims**



1. A device for delaying a functional signal by a selectable number of discrete clock pulse periods, said device comprising:

input means for receiving said functional signal:

a series of storage devices each having a storage element switchably coupled to said input means each storage element for storing a sample of said functional signal received from said input means;

output means for outputting a delayed said functional signal, said output means being switchably coupled to said storage elements, and said delayed functional signal being received by said output means parallelly from said storage elements;

a shift register having a series of stages each stage being coupled to a single one of said storage devices;

clock means coupled to the shift register for recurrently providing shift pulses to said shift register; and

load means coupled to the shift register for providing at selectable recurrence intervals a control signal to said shift register which control signal is serially shifted through said series of stages and wherein said control signal, when shifted into a particular stage, controls loading of the storage elements, which storage element is within the storage device coupled to the particular stage; with the sample of the functional signal and controls unloading of a delayed sample of the functional signal which was stored in a storage element of a next storage device in said series of storage devices.

5,554,950

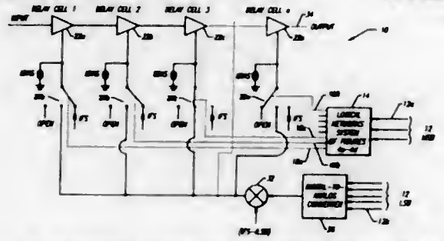
DELAY LINE PROVIDING AN ADJUSTABLE DELAY IN RESPONSE TO BINARY INPUT SIGNALS

Stuart B. Molin, Oceanside, Calif., assignor to Brooktree Corporation, San Diego, Calif.

Continuation of Ser. No. 11,205, Jan. 29, 1993, abandoned, which is a continuation-in-part of Ser. No. 830,595, Feb. 4, 1992, abandoned. This application Feb. 2, 1995, Ser. No. 382,677

Int. Cl.[6] H03H *11/26*

U.S. Cl. 327—277 **30 Claims**



1. In combination for providing an adjustable delay in an input signal,

delay means including a plurality of delay elements connected to one another in a relationship to provide a cumulative delay in the input signal dependent upon the accumulation of the delays provided by the individual ones of the delay elements in the plurality, each of the delay elements being constructed to provide a variable delay between minimum and maximum values,

means for providing a plurality of binary signals each having first and second logic levels respectively indicating a binary "1" and a binary "0" and each having an individual binary significance, the binary signals cumulatively representing the adjustable delay,

means responsive to the binary signals of greatest binary significance in the plurality for producing a plurality of signals in a thermometer code and for introducing the signals in the thermometer code to the delay means to obtain the maximum delay in first ones of the delay elements and the minimum delay in second ones of the delay elements and to select an individual one of the delay elements in accordance with the pattern of such signals in the thermometer code,

means for converting the binary signals in the plurality of least binary significance to produce an analog signal having a magnitude representative of the analog value of such binary signals, and

the individual ones of the delay elements providing a delay between the minimum and maximum delay dependent upon the magnitude of the analog signal from the converting means.

5,554,951

SIGNAL CONDITIONING APPARATUS AND METHOD EXHIBITING ACCURATE INPUT IMPEDANCE AND GAIN CHARACTERISTICS OVER COMMON MODE RANGE AND OPERATIONAL ENVIRONMENTS

John J. Gough, Beith Ayrshire, United Kingdom, assignor to National Semiconductor Corporation, Santa Clara, Calif.

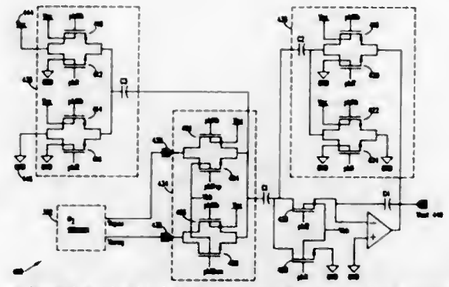
Continuation of Ser. No. 286,051, Aug. 4, 1994, abandoned. This application Nov. 7, 1995, Ser. No. 553,157

Int. Cl.[6] G11C *27/02*

U.S. Cl. 327—337 **41 Claims**

1. A signal conditioning circuit having terminals to receive clock generated control signals, comprising:

an amplifier having an input terminal and an output terminal;



an input impedor having a non-zero reactance, a first terminal coupled to the amplifier input terminal, and a second terminal;

an input circuit coupled to the input impedor second terminal and having first means responsive to a first clock generated control signal for switching the input impedor second terminal between first and second signal source input terminals;

a high impedance detection circuit including a detection impedor having a first terminal coupled to the input impedor second terminal and a second terminal; and

a feedback circuit including a feedback impedor having a first terminal and a second terminal coupled across the amplifier input and output terminals, respectively.

5,554,952

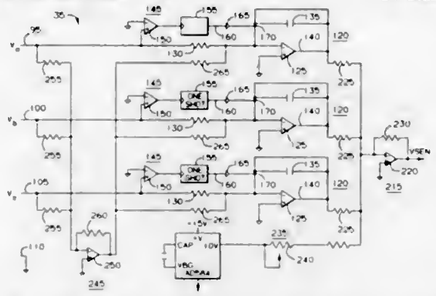
FAST RESPONDING METHOD AND APPARATUS FOR THREE PHASE A/C VOLTAGE SENSING

Eric J. Stacey, Pittsburgh, Pa., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 15, 1994, Ser. No. 196,353

Int. Cl.[6] G06G *7/64*

U.S. Cl. 327—339 **24 Claims**



20. A method for generating a sensing signal from a generally periodic multi-phase AC signal, each phase of said AC signal having sloping transitions, said method comprising the steps of:

integrating each phase of said AC signal using a single integrator respectively associated with each phase thereby to generate an integrated signal for each phase;

resetting each integrator at predetermined sloping transitions of its associated phase; and

summing said integrated signals generated in said step of integrating to generate said sensing signal.

5,554,953

INTERNAL REDUCED-VOLTAGE GENERATOR FOR SEMICONDUCTOR INTEGRATED CIRCUIT

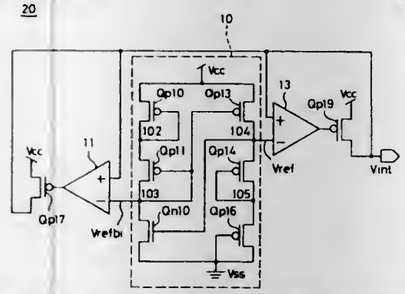
Akinori Shibayama, and Toshio Yamada, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 6, 1993, Ser. No. 132,322

Claims priority, application Japan, Oct. 7, 1992, 4-268490

Int. Cl.[6] G05F *3/02*

U.S. Cl. 327—541 **11 Claims**



1. An internal reduced-voltage generator mounted in a semiconductor integrated circuit so as to generate an internal reduced voltage in the semiconductor integrated circuit, comprising:

a reference voltage generator for generating first and second reference voltages; and

an output circuit coupled to said reference voltage generator, said output circuit operative for outputting said internal reduced voltage based exclusively on the higher one of the first and second reference voltages generated by said reference voltage generator,

said reference voltage generator further comprising;

a first constant-voltage generator for generating said first reference voltage based on a ground voltage; and

a second constant-voltage generator for generating said second reference voltage based on an external power-supply voltage,

each of said first and second constant-voltage generators having a constant current source and a constant voltage source and being controlled by the output of the other constant-voltage generator so that said first and second reference voltages are related to each other.

5,554,954

CIRCUIT FOR BIASING FET AMPLIFIER WITH SINGLE POWER SUPPLY

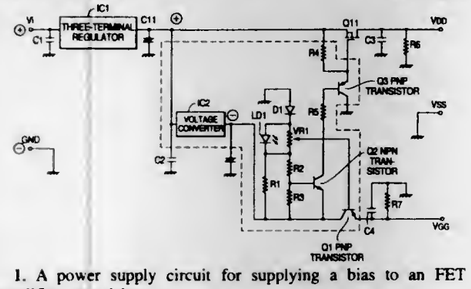
Hideaki Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 14, 1994, Ser. No. 358,593

Claims priority, application Japan, Dec. 16, 1993, 5-317025

Int. Cl.[6] G05F *3/02*

U.S. Cl. 327—546 **9 Claims**



1. A power supply circuit for supplying a bias to an FET amplifier comprising:

an input terminal for receiving a power supply voltage;

a drain-voltage output terminal for biasing a drain of the FET amplifier;

a gate-voltage output terminal for biasing a gate of the FET amplifier;

a source-voltage output terminal being connected to a ground potential for supplying the ground potential to a source of the FET amplifier;

switching means provided between the input terminal and the drain-voltage output terminal;

a voltage converter receiving a voltage from the input terminal and outputting a voltage, having an inverted polarity with respect to the voltage received, to the gate-voltage output terminal; and

circuit means sensing the voltage outputted from the voltage converter and rendering the switching means to a conductive state in response to the presence of the voltage having the inverted polarity being of a predetermined potential.

5,554,955

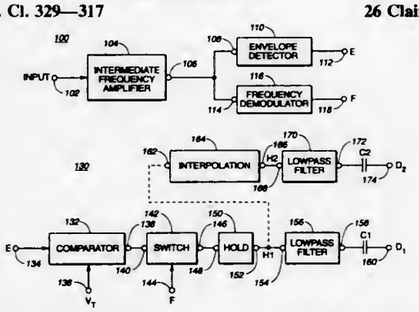
METHOD AND APPARATUS FOR REMOVING THE EFFECTS OF CO-CHANNEL INTERFERENCE FROM THE MESSAGE ON A DOMINANT FREQUENCY MODULATED CARRIER AND FOR RECOVERING THE MESSAGE FROM EACH OF TWO CO-CHANNEL CARRIERS

Glen A. Myers, 279 Laureles Grade Rd., Salinas, Calif. 93908

Filed Aug. 28, 1995, Ser. No. 519,696

Int. Cl.[6] H03D *3/00*

U.S. Cl. 329—317 **26 Claims**



1. A system for providing an estimate of a message being carried by a frequency modulated dominant carrier in the presence of co-channel interference from a subdominant carrier, said system comprising:

an intermediate frequency (IF) amplifier (**104**) which has an input terminal (**102**) for receiving an IF input terminal signal, said IF amplifier having an output terminal (**106**);

an envelope detector (**110**) which has an input terminal (**108**) connected to the output terminal (**106**) of the IF amplifier (**104**), said envelope detector (**110**) having an output terminal (**112**) at which is provided an envelope signal E(t);

a frequency demodulator (**116**) having an input terminal (**114**) to which is connected the output terminal (**106**) of the IF amplifier (**104**), said frequency demodulator (**116**) having an output terminal (**118**) at which is provided a frequency demodulated signal F(t);

a comparator (**132**) having an input terminal (**134**) for receiving an envelope signal E from the output terminal (**112**) of the envelope detector (**110**), said comparator having another input terminal (**136**) for receiving a threshold voltage V_T, said comparator having an output terminal (**138**);

a switch (**142**) having a control terminal (**140**) connected to the output terminal (**138**) of the comparator (**132**), the switch (**142**) having an input terminal (**144**) to which is connected the output terminal (**118**) of the frequency demodulator (**116**), said switch having an output terminal (**146**) at which is provided the frequency demodulated signal F(t) when said switch is closed; and

a hold circuit (**150**) having an input terminal (**148**) to which the output terminal (**146**) of the switch (**142**) is connected, said hold circuit (**150**) having an output terminal (**152**) at which is provided a signal H1.

5,554,956

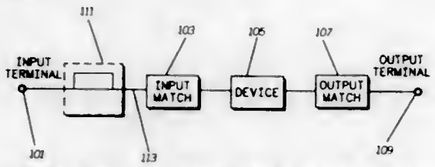
OTHOGONAL INSERTION PHASE TUNING METHOD

Thomas B. Bohn, Island Lake, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 301,083, Sep. 6, 1994, abandoned. This application Feb. 28, 1996, Ser. No. 608,031

Int. Cl.[6] H03F *3/60;* **H03H** *7/20*

U.S. Cl. 330—53 **7 Claims**



1. A method of tuning insertion phase in an amplifier network including an amplifier module having an input line comprising the steps of:

connecting at least one runner, which is different in length, electrically in parallel with said input line to said amplifier network;

measuring the insertion phase of said amplifier module; and

removing either said at least one runner or said input line based on a predetermined measured phase relationship in order to properly tune the insertion phase of said amplifier network.

5,554,957

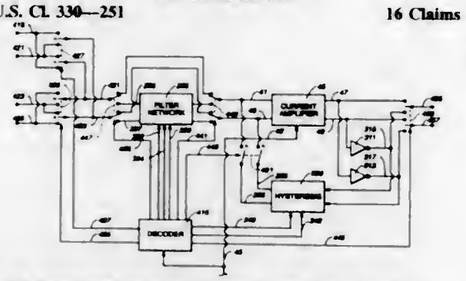
PROGRAMMABLE FUNCTION CURRENT MODE SIGNAL MODULE

Hans W. Klein, Danville, Calif., assignor to IMP, Inc., San Jose, Calif.

Division of Ser. No. 355,082, Dec. 13, 1994, abandoned, which is a division of Ser. No. 248,383, May 24, 1994, which is a continuation-in-part of Ser. No. 198,135, Feb. 16, 1994, abandoned, which is a continuation-in-part of Ser. No. 168,435, Dec. 17, 1993, Pat. No. 5,444,579. This application Jun. 7, 1995, Ser. No. 484,430

Int. Cl.[6] H03F *3/04*

U.S. Cl. 330—251 **16 Claims**



16. A multi-function current signal module, comprising:

a module signal input and a module signal output, means responsive to control signals for transforming a current signal at said module input to a signal at said module output according to a selectable one of two or more functional units selected from a group consisting of an amplifier, a rectifier, a filter and a comparator, and

means responsive to said control signals for setting at least one signal transfer characteristic of the functional units selected by said transforming means.

5,554,958

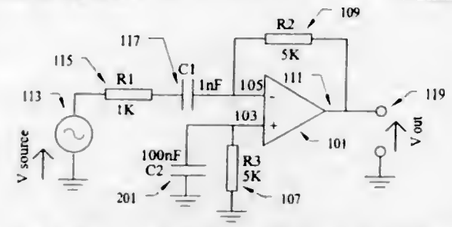
INVERTING AMPLIFIER HAVING A LOW NOISE BIASING NETWORK

Bryan J. Donoghue, Filton, England, assignor to Hewlett Packard Company, Palo Alto, Calif.

Filed Apr. 28, 1995, Ser. No. 431,252

Int. Cl.[6] M03F *1/26*

U.S. Cl. 330—149 **7 Claims**



1. An operational amplifier apparatus, having an output and having an inverting input and a non-inverting input, comprising:

a feedback network from the output to the inverting input;

an input network in series between an input signal source and the inverting input;

a non-inverting input bias circuit, having an inherent impedance at a particular frequency, connected in series between the non-inverting input and a reference voltage level;

a high frequency bypass device connected in parallel across the non-inverting input bias circuit; and

the high frequency bypass device has a lower inherent impedance at the particular frequency than the non-inverting input bias circuit such that the combined impedance of the non-inverting bias circuit and the high frequency bypass device is less than the inherent impedance of the non-inverting bias circuit at the particular frequency, reducing the bandwidth of said non-inverting input bias circuit, and thereby limiting the amount of noise voltage developed across the non-inverting input bias circuit for a particular noise current flowing into the non-inverting input of the operational amplifier and thereby reducing the Johnson noise generated by the non-inverting input bias circuit.

5,554,959

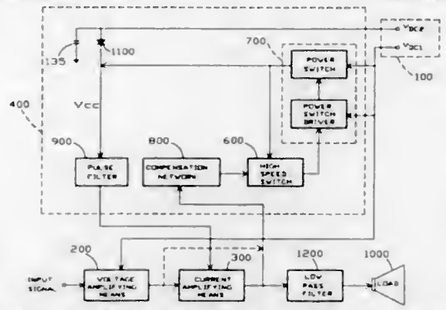
LINEAR POWER AMPLIFIER WITH A PULSE DENSITY MODULATED SWITCHING POWER SUPPLY

Engne Tang, Lexington, Mass., assignor to VAC-com, Inc., Lexington, Mass.

Filed Oct. 25, 1994, Ser. No. 329,078

Int. Cl.[6] H03F *3/04*

U.S. Cl. 330—297 **15 Claims**



14. A method for operating a linear power amplifier of the sort comprising (i) power supply means for connection to a source of electrical power and adapted to provide a first, relatively high DC voltage and a second, relatively low DC voltage; (ii) voltage amplifying means for connection to a signal source and adapted to amplify a first, relatively low voltage signal received from said signal source into a second, relatively high voltage signal; and (iii) current amplifying means connected to said voltage amplifying means and adapted to increase the current flow of said second, relatively high voltage signal, as needed, in order to properly drive a load, wherein said current amplifying means are normally powered by said second, relatively low DC voltage supplied by said power supply means;

wherein said method comprises the steps of:

(1) comparing the instantaneous voltage amplitude of said second, relatively high voltage signal with the level of the voltage powering said current amplifying means;

(2) providing a fixed duration pulse, at said first, relatively high DC voltage, to power said current amplifying means if the voltage amplitude of said second, relatively high voltage signal is high enough relative to the level of the voltage powering said current amplifying means to cause said current amplifying means for approach saturation; and

(3) returning to Step 1.

5,554,960

BRANCHING FILTER, BRANCHING FILTER MODULE AND RADIO COMMNICATION

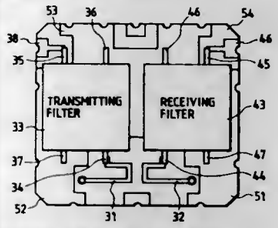
Hideo Ohnuki; Norio Hosaka; Hitoshi Watanabe, all of Yokohama; Isao Akitake, Chigasaki, and Mokoto Katagishi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1995, Ser. No. 385,649

Claims priority, application Japan, Feb. 10, 1994, 6-016598

Int. Cl.[6] H03H *7/46*

U.S. Cl. 333—132 **23 Claims**



1. A high-frequency apparatus comprising:

a conductor substrate;

a first dielectric layer provided on said conductor substrate;

a strip conductor provided on said first dielectric layer;

a second dielectric layer provided on said strip conductor and having through holes provided therein; and

at least one elastic surface-wave element provided over said second dielectric layer in a position above said strip conductor and connected to said strip conductor by said through holes.

5,554,961

ENERGY EFFICIENT ELECTROMAGNETIC CIRCUIT

Doyle W. McCulloch, 803 Ave. C. No. 203, Garland, Tex. 75040

Filed Feb. 13, 1995, Ser. No. 387,448

Int. Cl.[6] H01H *51/22*

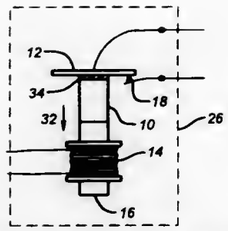
U.S. Cl. 335—78 **13 Claims**

1. An electromagnetic latching relay circuit comprising:

a) a permanent magnet having north and south poles and movable between a first position and a second position;

b) a first electrical contact attached to and movable with said permanent magnet;

c) a current-conducting coil capable of generating a magnetic field aligned with said north and south poles of said permanent magnet and moving said permanent magnet between said first and second positions;



d) a magnetizable core disposed within and magnetized by said coil, said core being capable of maintaining a magnetic field when no current is conducted through said coil;

e) a second contact engaging said first contact when said permanent magnet is in said first position;

f) a current source electrically coupled to said coil;

g) a switching device capable of selecting the direction of and initiating said current flow through said coil, said current flow generating a magnetic field which magnetizes said core and moves said permanent magnet from one of said first or second positions to the other of said first or second positions, thereby engaging or disengaging said first and second contacts; and

h) a current storage device limiting said current flow.

5,554,962

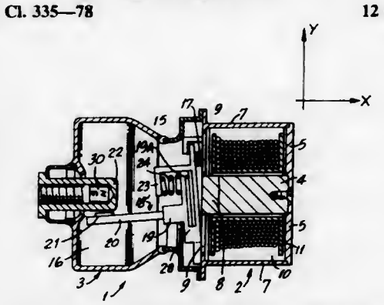
DC VACUUM RELAY DEVICE WITH ANGULAR IMPACT BREAK MECHANISM

G. Stephen Perreira; Bernard V. Bush, both of Santa Barbara; Richard L. Kutin, Camarillo, and Patrick A. Mack, Carpenteria, all of Calif., assignors to Kilovac Corporation, Carpinteria, Calif.

Continuation of Ser. No. 400,281, Mar. 13, 1995, abandoned, which is a continuation of Ser. No. 275,075, Jul. 13, 1994, abandoned, which is a continuation of Ser. No. 139,604, Oct. 20, 1993, abandoned, which is a continuation of Ser. No. 14,042, Feb. 5, 1993, abandoned, which is a continuation of Ser. No. 897,572, Jun. 11, 1992, abandoned, which is a continuation of Ser. No. 676,968, Mar. 28, 1991, abandoned. This application Oct. 13, 1995, Ser. No. 542,687

Int. Cl.[6] H01H *51/22*

U.S. Cl. 335—78 **12 Claims**



1. A relay, comprising a chamber, stationary contacts mounted in the chamber to be bridged by a movable contact, an electromagnetically driven armature assembly including a rotatable armature pivotable about one end and located in the chamber, a rotatable actuator pivotable about one end and located in the chamber, said rotatable actuator having the moveable contact attached thereto, means for rotating the actuator upon rotation of the armature in a direction to make the stationary contacts, means allowing the armature to continue to rotate after the actuator has ceased to rotate upon the movable contact making the stationary contacts, and impact break means for accelerating the armature from rest prior to breaking the stationary contacts and to thereafter impact against the actuator to rotate the actuator end drive the movable contacts

away from the stationary contacts, the rotatable armature having spring receptacle means attached thereto, and a spring positioned

1. A microswitch, comprising:

two mutually coaxial columnar permanent magnets having poles

installation detection means for detecting an attached/detached state of said operating-part main unit on the apparatus main unit; and

away from the stationary contacts, the rotatable armature having spring receptacle means attached thereto, and a spring positioned between said spring receptacle means and said actuator, said actuator further having stop means contactable against and separatable from said armature.

5,554,963

A GAS-FILLED PLASTIC ENCLOSED RELAY

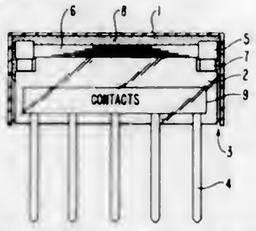
Werner Johler, Au, and Werner Kälin, Rickenbach, both of Switzerland, assignors to Alcatel STR AG, Zurich, Switzerland

Continuation of Ser. No. 73,431, Jun. 9, 1993, abandoned. This application Feb. 6, 1995, Ser. No. 384,692

Claims priority, application Switzerland, Jun. 11, 1992, 01851/92

Int. Cl.[6] H01H *51/00;9/30*

U.S. Cl. 335—151 **4 Claims**



1. A gas-filled plastic enclosed relay for mounting on printed-circuit boards, comprising:

a relay in an irreversibly sealed plastic enclosure, having a gas filling under a pressure of less than 1.5 bar,

wherein the gas filling comprises at least one electronegative gas; and

wherein the sealed plastic enclosure encapsulates the relay and gas filling, and acts as a micro-filter matched to the at least one electronegative gas, preventing the electronegative gas which is under a pressure of less than 1.5 bar, from diffusing away over a predetermined lifetime of the relay, so that the partial pressure of the at least one electronegative gas, and thus an increased dielectric strength, are maintained to a sufficient extent.

5,554,964

MICROSWITCH WITH A MAGNETIC FIELD SENSOR

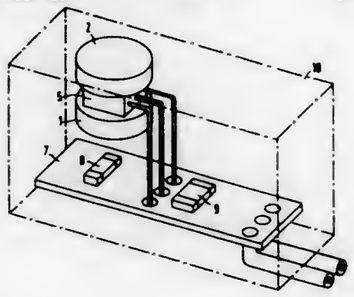
Luc Jansseune, München, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 89,664, Jul. 9, 1993, abandoned. This application Mar. 2, 1995, Ser. No. 398,055

Claims priority, application Germany, Jul. 9, 1992, 42 22 617.1; Nov. 10, 1992, 42 37 928.8

Int. Cl.[6] H01H *9/00*

U.S. Cl. 335—207 **17 Claims**



1. A microswitch, comprising:

two mutually coaxial columnar permanent magnets having poles of the same polarity facing one another and other poles facing away from one another and defining an air gap therebetween, said permanent magnets generating magnetic fields defining a boundary region;

a magnetic field sensor being disposed in the boundary region and fixedly disposed in the air gap; and

a switch device being connected to said magnetic field sensor and having a switching status varying in accordance with magnetic induction at said magnetic field sensor.

5,554,965

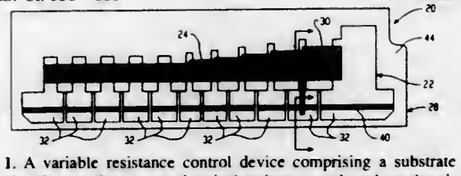
LUBRICATED VARIABLE RESISTANCE CONTROL HAVING RESISTIVE PADS ON CONDUCTIVE PATH

Craig C. Sundberg, Erie, Pa., assignor to The Erie Ceramic Arts Company, Erie, Pa.

Filed Nov. 2, 1994, Ser. No. 333,418

Int. Cl.[6] H01C *10/00*

U.S. Cl. 338—160 **20 Claims**



1. A variable resistance control device comprising a substrate having formed thereon an electrical resistance path and an electrical conductive path, and a movable contact electrically bridging said electrical resistance path and said electrical conductive path, and a lubricant material disposed along said electrical conductive path, said electrical conductive path including one or more protruding ridges spaced along one surface of said electrical conductive path, said one or more protruding ridges being formed of an electrically resistive material, said resistance path forming a series of discrete resistance.

5,554,966

CAR-STEREO WITH REMOVABLE CONTROL PANEL, ALARM, AND POWER CONSERVATION

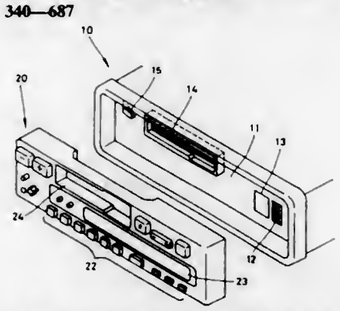
Takayuki Iijima; Yoshio Aoyagi; Shigetoshi Kato; Osamu Yoshizawa; Hiroshi Wakimoto; Akira Kawahara, and Akio Namiki, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 19, 1993, Ser. No. 6,245

Claims priority, application Japan, Jan. 20, 1992, 4-006311 U; Jan. 20, 1992, 4-006312 U; Jan. 24, 1992, 4-007432 U

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—687 **3 Claims**



1. In a car stereo equipment having an apparatus main unit which is installed in a vehicle and a operating-part main unit which is detachably provided with respect to said apparatus main unit, the improvement comprising:

installation detection means for detecting an attached/detached state of said operating-part main unit on the apparatus main unit; and

mode shifting means for shifting the operation of a microcomputer of the apparatus main unit from an ordinary operation processing mode to a low consumption operation processing mode, in which a voltage of a power supply to elements of said microcomputer other than an internal memory is reduced intermittently, when the removal of the operating-part main unit is detected by said installation detection means.

5,554,967

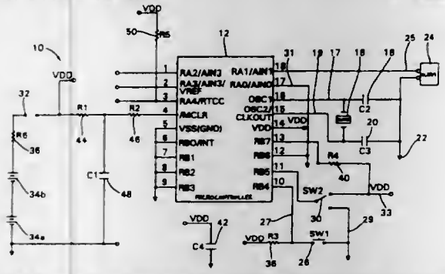
REMINDER DEVICE

David C. Cook, Wexford, Pa.; Douglas E. Weitzel, Hamilton, and Edward T. Hawley, Keyport, both of N.J., assignors to Smithkline Beecham Corp., Philadelphia, Pa.

Filed Jul. 8, 1994, Ser. No. 272,504

Int. Cl.[6] G08B *1/00;* **G04B** *47/00*

U.S. Cl. 340—309.15 **18 Claims**



14. A method of reminding a user when to chew a piece of gum as part of a smoking cessation program, the program being of a fixed length having a predetermined program end point and including a plurality of predetermined intervals, the user chewing a piece of gum upon the expiration of an interval, the method comprising the steps of:

(a) providing a timing device having an elapsed time counter for continuously maintaining the length of time that the user has been taking part in the smoking cessation program, an interval time counter for maintaining a current interval time, a comparator for determining the expiration of an interval and the expiration of the program, an alarm for notifying the user of the expiration of an interval, and a first switch for resetting the interval time counter and determining a new interval time;

(b) initiating device operation by starting the elapsed time counter and the interval time counter;

(c) actuating the first switch in response to the alarm notifying the user that an interval has ended, thereby disabling the alarm, resetting the interval time counter and determining a new interval time, the user chewing a piece of gum in response to the alarm; and

(d) repeating step (c) until the comparator determines the expiration of the program, thereby signifying that the program has ended.

5,554,968

DATA COMMUNICATION USING POWER LINES

Raymond Lee, 51 Old Ox Rd., Manhasset, N.Y. 11030

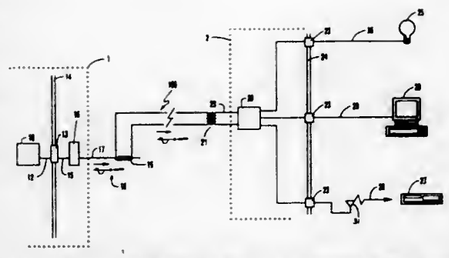
Filed Aug. 22, 1994, Ser. No. 293,845

Int. Cl.[6] H04M *11/04*

U.S. Cl. 340—310.01 **5 Claims**

1. A data communication system using existing power transmission lines comprising:

transmitting means at a first site for superimposing on the power transmission lines connected to and providing power to said first site a superimposed ripple signal including a unique identifying portion containing a site destination code;



a second site connected by said power transmission lines, said second site containing a plurality of diverse electrical devices with local wiring connected to and operated by the electrical power delivered by said transmission lines;

receiver means at said second site interposed between said transmission lines and said local wiring for passing said electrical power from said transmitting lines to said local wiring, said receiver means being responsive to said site destination code for passing said superimposed ripple signal containing said site destination code through to said local wiring and all of said electrical devices in said second site when said unique identifying portion is present and for blocking any ripple signal when said unique site destination code is absent to avoid any interference by said ripple signal with the operation of any electrical device in said second site; and

control means operatively coupled to said local wiring in said second site so as to control electrical devices that are plugged into said wiring, in accordance with said superimposed signal passed through by said receiver means.

5,554,969

DIAGNOSING APPARATUS AND METHOD FOR DETECTING FAILURE IN SENSOR APPLICABLE TO MOTOR-DRIVEN VEHICULAR REAR ROAD WHEEL STEERING SYSTEM

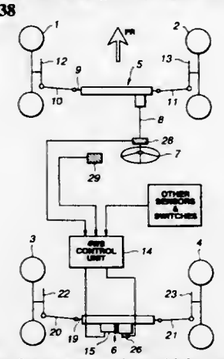
Takaaki Eguchi, Isehara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 23, 1995, Ser. No. 376,916

Claims priority, application Japan, Feb. 2, 1994, 6-010772

Int. Cl.[6] B60Q *1/00;* **G06F** *7/70*

U.S. Cl. 340—438 **12 Claims**



1. An apparatus for an automotive vehicle, comprising:

a) an electric motor;

b) a rear road wheel steering mechanism which is interposed between said motor and rear left and right road wheels of the vehicle and which is so constructed as to steer left and right road wheels of the vehicle through a rear road wheel steering angle in response to a rotation of said motor;

c) detecting means for detecting an information related to a vehicular behavior condition;

d) a rear road wheel steering angle sensor which is so constructed as to produce a sensor signal indicating a direction

and magnitude of the rear road wheel steering angle said sensor signal being used as a positioning information of the

a second circular disk having an aperture formed through a central portion thereof, the second circular disk having a

and magnitude of the rear road wheel steering angle said sensor signal being used as a positioning information of the rear road wheel steering angle to be controlled;

c) rear road wheel steering angle target value calculating means for calculating a rear road wheel steering angle target value according to the detected information related to the vehicular behavior condition;

f) rear road wheel steering angle target value deviation calculating means for calculating a target deviation value between the sensor signal value and the calculated rear road wheel angle target value;

g) controlling means for outputting a servo current to said motor to rotate said motor so that the calculated target deviation gives zero;

h) sensor failure determination area setting means for setting a sensor failure determination area represented by such a relationship between a magnitude of the target deviation and a generation time duration during which the target deviation continues that as the magnitude of the target deviation becomes larger, the generation time duration becomes shorter;

i) first sensor monitoring means for monitoring the sensor signal value and measuring the generation time duration of the target deviation and for determining that a failure in said rear road wheel steering angle sensor has occurred when the relationship between the magnitude of the target deviation and the measured time duration belong to said set sensor failure determination area; and

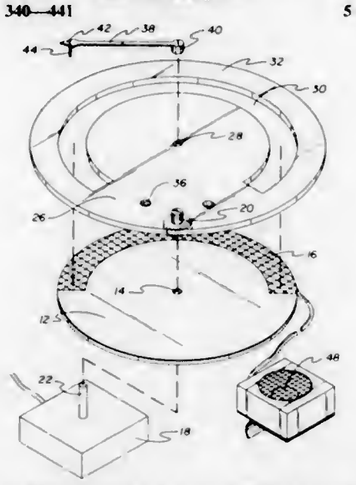
j) warning means for warning the occurrence of failure in the rear road wheel steering angle sensor when said first sensor monitoring means determines that the failure occurs in the rear road wheel steering angle sensor.

5,554,970

SPEED ALARM SYSTEM FOR AN AUTOMOBILE

Haghnazar Mottahedeh, 19400 Collier St., Tarzana, Calif. 91356

Filed Jul. 24, 1995, Ser. No. 506,017
Int. Cl.[6] B60Q *1/00*
U.S. Cl. 340—441 **5 Claims**



1. A speed alarm system for an automobile for alerting a driver that they are exceeding a set speed in an automobile comprising, in combination:

a first circular disk having an aperture formed through a central portion thereof, the first circular disk having a semi-circular electronic indicator grid formed around an outer periphery thereof, the first circular disk rotatably positioned on an existing speedometer relay of an automobile through the aperture thereof and coupled thereto by a knob portion;

a second circular disk having an aperture formed through a central portion thereof, the second circular disk having a circular recess formed therein inwardly of an outer periphery thereof, the second circular disk positionable with the aperture thereof receiving an upper portion of the knob portion therethrough whereby the semi-circular electronic grid of the first circular disk in selective alignment with the circular recess of the second circular disk, an outer edge of the second circular disk having indicia thereon for the indication of speed attained by the vehicle, the first circular disk being rotatable in relationship to the second circular disk whereby the electronic grid can be positioned strategically within the circular recess;

an indicating needle having a first end and a second end, the first end being rotatably coupled with the upper portion of the knob portion, the second end having a magnetic portion extending downwardly therefrom, the magnetic portion extending through the circular recess of the second circular disk; and

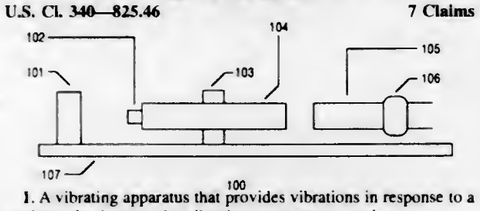
a speaker secured within a housing, the housing having a back portion with adhesive thereon, the adhesive having a peel-off layer disposed thereon, the speaker having wiring extending outwardly of the housing to couple with the existing speedometer relay of the automobile and with the semi-circular electronic grid of the first circular disk, the speaker adapted for securement within the automobile.

5,554,971

VIBRATING APPARATUS FOR LOW PROFILE PAGERS

Jewett E. Foster, Elgin, and Glen O. Reeser, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 983,207, Nov. 30, 1992, abandoned.
This application Apr. 6, 1995, Ser. No. 417,722
Int. Cl.[6] G08B *5/22*
U.S. Cl. 340—825.46 **7 Claims**



1. A vibrating apparatus that provides vibrations in response to a predetermined event, the vibrating apparatus comprises:

a substrate having a substantially planar surface;

a pivotal post mechanically attached to the substrate in a substantially perpendicular manner;

a first bumper mechanically attached to the substrate in a substantially perpendicular manner and located a predetermined distance from the pivotal post;

a polarizable material having a substantially planar geometry, pivotally attached to the pivotal post and being substantially parallel to the substrate such that when the polarizable material is in motion, the direction of motion is substantially parallel to the substrate; and

excitation means, operably coupled to the polarizable material, for providing a varying field such that the polarizable material is set in motion and repeatedly collides with the first bumper.

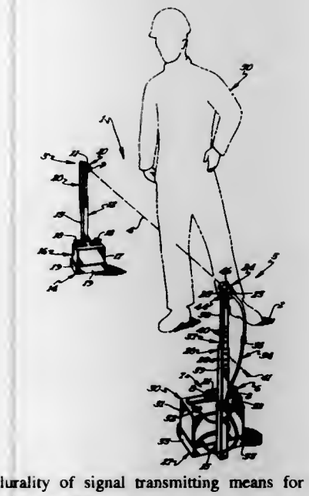
5,554,972

ELECTRONIC PERIMTER WARNING SYSTEM

Brian T. Byrne, Chanhassen, Minn., assignor to Garlock Equipment Company, Minneapolis, Minn.

Filed Oct. 21, 1994, Ser. No. 327,544
Int. Cl.[6] G08B *13/18*
U.S. Cl. 340—556 **11 Claims**

1. An electronic perimeter warning system comprising, in combination:



(a) a plurality of signal transmitting means for transmitting detectable signal beams;

(b) a plurality of signal receiving means for receiving said detectible signal beams transmitted by said plurality of signal transmitting means;

(c) said plurality of signal transmitting means and said plurality of signal receiving means being movably positionable in spaced apart relationship wherein the plurality of receivers and transmitters define an enclosed perimeter such that said detectable signal beams are transmitted continuously therebetween;

(d) sensing means electrically connected to each signal receiving means for detecting when the transmission of said detectable signal beam between one of said signal transmitting means and one of said signal receiving means has been interrupted;

(e) a plurality of alarm means to provide audible signals to persons in the area in which the warning system is located;

(f) a plurality of alignment adjustment means each electrically connected to one of said signal receiving means for detecting when the transmission of said detectible signal beam between one of said signal transmitting means and one of said signal receiving means has been established and providing a visual signal to persons in the area in which the warning system is located; and

(g) a plurality of electrical circuit means each functionally interconnecting one of said sensing means, said alignment adjustment means and said alarm means to activate said respective alarm means when continuity of said detectible signal has been interrupted and to activate said visual signal of said alignment adjustment means when said detectible signal has been established between said signal transmitting means and said signal receiving means.

5,554,973

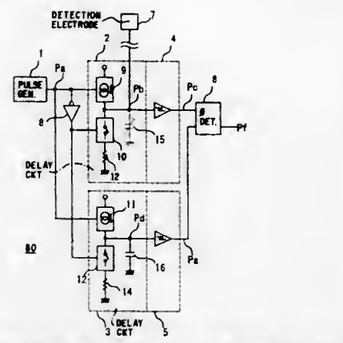
ELECTROSTATIC CAPACITANCE-TYPE SENSOR

Kazunori Kawashima, and Hajime Oda, both of Chiba-ken, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 481,669
Claims priority, application Japan, Jun. 8, 1994, 6-126189
Int. Cl.[6] G08B *13/26*
U.S. Cl. 340—562 **9 Claims**

1. A proximity detector comprising:

a pulse generator;



first and second delay circuits receiving an output of said pulse generator and having first and second capacitances respectively;

an electrostatic capacitance varying converter connected to at least one of said first and second delay circuits to vary a delay of said at least one delay circuit by varying a respective one of said first and second capacitances;

said first and second delay circuit each having a constant current circuit, controlled by said pulse generator, for changing a set state of charge on said first and second capacitances, respectively, in a substantially linear manner; and

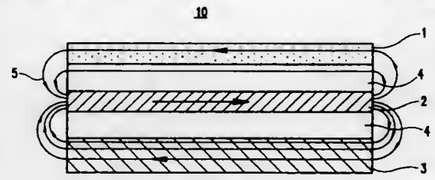
a phase discrimination circuit for detecting a phase difference between outputs of said first and second delay circuits.

5,554,974

ENCODABLE TAG WITH RADIO FREQUENCY READOUT

Michael J. Brady, Brewster; Praveen Chaudhari, Briarcliff Manor; Richard J. Gambino, Stony Brook; Harley K. Heinrich, Brewster; Paul A. Moskowitz, Yorktown, and Robert J. von Gutfeld, New York, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1994, Ser. No. 344,808
Int. Cl.[6] G08B *13/14*
U.S. Cl. 340—572 **23 Claims**



1. A programmable tag, comprising:

a first layer of magnetic material,

a second layer of magnetic material, and

a layer of resonant material, said resonant material having an electron spin resonance absorption characteristic, wherein one of said first layer and said second layer comprises a hard magnetic material and the other of said first layer and said second layer comprises a soft magnetic material,

said first layer and said second layer being in close proximity to said layer of resonant material, and said first layer and said second layer imposing a magnetic bias field on said layer of resonant material, said magnetic bias field being selectively altered to thereby program said tag,

wherein said soft magnetic layer provides an alterable magnetic shunt for personalizing said bias field applied thereto at individual portions of said layer of resonant material.

5,554,975

SAFETY DEVICE FOR THE PROPRIOCEPTION

a flow rate detector, said flow rate detector detecting a flow rate of gas flowing through the gas supply equipment;

second comparing means for comparing said rolling code portion with said second rolling code; and

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SYSTEM FOR SETTING AMBIENT PARAMETERS

5,554,975

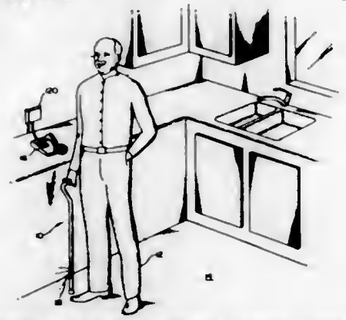
SAFETY DEVICE FOR THE PROPRIOCEPTION IMPAIRED

H. Eugene Hall, 10029 NE. 27th St., Bellevue, Wash. 98004, and Ray Beddo, 23303 64th Ave. West, Mountlake Terrace, Wash. 98043

Division of Ser. No. 957,245, Oct. 6, 1992, Pat. No. 5,331,990. This application Mar. 22, 1994, Ser. No. 216,146

Int. Cl.[6] G08B *23/00*

U.S. Cl. 340—573 **3 Claims**



1. A method for detecting a disabling condition, comprising the following steps:

providing a portable walking aid device which is carried by a user in an upright position;

monitoring the position of the device;

detecting deviation of the device from the upright position for a predetermined first time period;

triggering a first alarm mechanism if the device is not returned to the upright position before the first predetermined time period expires

detecting continued deviation of the device for the upright position for a predetermined second time period measured from the first time period; and,

triggering a second alarm mechanism if the device is not returned to the upright position before the second predetermined time period expires.

5,554,976

METHOD AND APPARATUS FOR DETECTING ABNORMALITY IN GAS SUPPLY EQUIPMENT

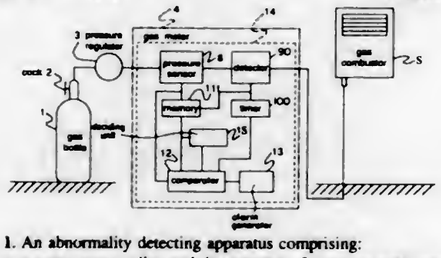
Shinji Miyauchi, Nara-ken; Shinichi Nakane, Yamatokoriyama; Kazutaka Asano, Nara-ken; Yoshio Horiike, Katano, and Makoto Tsuboi, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Oct. 5, 1993, Ser. No. 131,613

Claims priority, application Japan, Oct. 5, 1992, 4-265843; Oct. 5, 1992, 4-265844; Dec. 10, 1992, 4-330235; Dec. 14, 1992, 4-332624; Dec. 14, 1992, 4-332625; Dec. 18, 1992, 4-338413

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—626 **8 Claims**



1. An abnormality detecting apparatus comprising:

a pressure sensor, disposed downstream of a gas pressure regulator, for detecting a gas pressure of a gas supply equipment;

a flow rate detector, said flow rate detector detecting a flow rate of gas flowing through the gas supply equipment;

a first timer which operates on receipt of a signal outputted from the flow rate detector when the gas is turned off;

a cutoff pressure memory, said cutoff pressure memory storing a signal outputted from the pressure sensor;

a cutoff pressure normality/abnormality deciding unit, said deciding unit comparing a pressure stored in the cutoff pressure memory with a predetermined first pressure based on a signal outputted from the first timer;

a gas pressure comparator, said gas pressure comparator comparing the value of a signal outputted from the pressure sensor with a cutoff pressure reference value stored on said cutoff pressure memory based on a signal outputted from the first timer if the cutoff pressure normality/abnormality deciding unit decides that a cutoff pressure is abnormal; and

an alarm generator, said alarm generator outputting a signal indicating abnormality alarm, abnormality information, abnormality indication, and/or cutoff of a gas passage on receipt of a signal outputted from the gas pressure comparator.

5,554,977

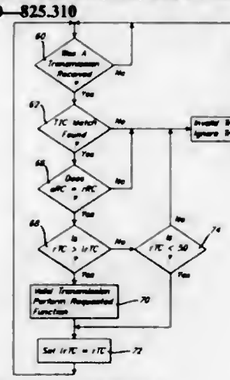
REMOTE CONTROLLED SECURITY SYSTEM

Gary F. Jablonski, Ypsilanti, and Henry J. Ewald, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 1,696, Jan. 7, 1993, abandoned. This application Apr. 27, 1995, Ser. No. 430,104

Int. Cl.[6] G06F *7/04;7/58;* **G08C** *19/00;* **B60R** *25/00*

U.S. Cl. 340—825.310 **5 Claims**



1. A security system comprising;

a transmitter including;

a removable power source;

counting means for providing a count of the number of transmissions made by said transmitter and wherein said counting means has a volatile memory;

first storing means for storing an identification code assigned to said transmitter;

first calculating means for calculating a first rolling code using a predetermined formula; and

transmitting means for transmitting a security code having an identification code portion, a transmission count portion, and a rolling code portion; and

a receiver including;

receiving means for receiving said security code and reproducing said identification portion, said transmission count portion and said rolling code portion;

second storing means for storing said identification code;

third storing means for storing a last transmission count previously received from said transmitter;

second calculating means for calculating a second rolling code using the same predetermined formula;

first comparing means for comparing said identification code portion with the value in said second storing means;

second comparing means for comparing said rolling code portion with said second rolling code; and

third comparing means for comparing said transmission count portion with said last transmission count;

wherein upon removal of said removable power source said volatile memory is cleared and said third storing means is set to the transmission count portion received if said transmission count portion is less than said last transmission count in said third storing means and said transmission count portion is less than a predetermined value.

5,554,978

AUTOMOBILE MULTIPLE COMMUNICATION SYSTEM OPERABLE UNDER LOW POWER CONSUMPTION

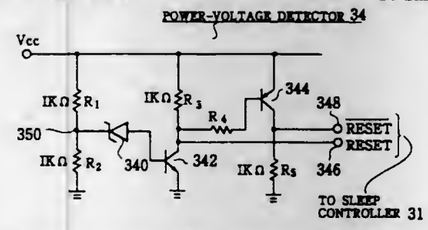
Atsushi Sakagami, Yokohama; Tatsuya Sekido, Zama; Isao Yamamoto, and Yuko Echigo, both of Sagamihara, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama-shi, Japan

Filed Feb. 19, 1993, Ser. No. 20,115

Claims priority, application Japan, Feb. 21, 1992, 4-035314

Int. Cl.[6] G05B *23/02;* **H04S** *3/14;* **H04L** *11/00*

U.S. Cl. 340—825.07 **14 Claims**



1. A multiplex communication system used in an automobile, comprising:

a parent station having at least judging means for judging whether or not a present communication mode of said multiplex communication system corresponds to one of a normal communication mode and a low-power-consumption mode;

at least one child station including:

detection means for detecting that a supply of power to said child station is instantaneously interrupted, thereby producing a detection signal, and

compulsorily condition changing means for compulsorily changing a present operation condition of said child station into a low-power-consumption operation condition in response to said detection signal;

a communication line for mutually connecting said parent station and said child station;

means for changing the present operation condition of said child station into the normal communication mode;

whereby when said judging means judges that the present communication mode of the multiplex communication system corresponds to said normal communication mode, said judging means sets operation conditions of said child station and said parent station to normal operation conditions so as to perform a communication between said child station and said parent station, and

when said judging means judges that the present communication mode of the multiplex communication system corresponds to said low-power-consumption communication mode, said judging means transmits to said child station, an instruction for changing the present operation condition of said child station into the low-power-consumption operation condition, thereby bringing both of said child station and said parent station into the low-power-consumption operations in addition to said compulsorily condition changing operation by said compulsorily condition changing means.

5,554,979

SYSTEM FOR SETTING AMBIENT PARAMETERS

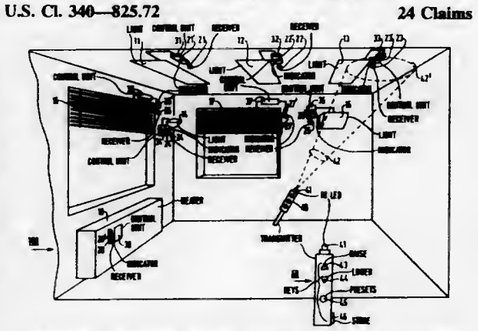
Handoko Kohar; Philippe Wegner, and Léon Smit, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 179,890, Jan. 10, 1994, abandoned, which is a continuation of Ser. No. 840,365, Feb. 24, 1992, abandoned. This application Feb. 2, 1995, Ser. No. 382,934

Claims priority, application Netherlands, Feb. 27, 1991, 9100354

Int. Cl.[6] H04B *10/02;* **G08C** *19/12;* **H04L** *17/02*

U.S. Cl. 340—825.72 **24 Claims**



1. A system for setting ambient parameters of an area, comprising:

(a) a plurality of objects in said area, each object being for influencing a respective different ambient parameter,

(b) a portable control unit including:

i) a transmitter for directional transmission of a control signal in a beam having limited cross section, which control signal does not contain object addressing and identification information for any of the objects, and

ii) at least one control element for specifying an influence on the respective ambient parameters,

(c) a plurality of receivers, each having a respective location associated with an associated one of said objects, for receiving and responding to the control signal from said transmitter, said respective location being such as to be unambiguously distinguishable from locations of other receivers in the system by intersection with the beam, each receiver selecting and setting the associated one of the objects in response to said control signal from the transmitter, so that the associated one of the at least one object is selectable without specific object addressing identification information in said control signal.

5,554,980

REMOTE CONTROL SYSTEM

Koosuke Hashimoto; Eiji Matsuo, both of Nagaokakyo; Hisashi Kawagoe, and Hiroaki Iwaasa, both of Kawanishi, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1994, Ser. No. 207,714

Claims priority, application Japan, Mar. 12, 1993, 5-052141; Jul. 2, 1993, 5-164616; Feb. 2, 1994, 6-011070; Feb. 17, 1994, 6-045153; Mar. 8, 1994, 6-037110

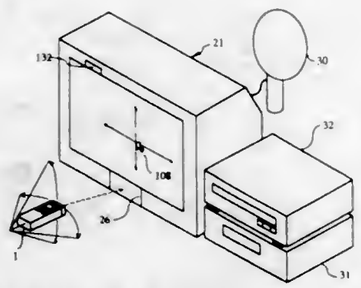
Int. Cl.[6] G08C *19/00;* **G09G** *5/08*

U.S. Cl. 340—825.72 **53 Claims**

1. A remote control system, comprising:

a remote control unit, the remote control unit being moved in three-dimensional space, and including,

movement detecting means for detecting movement of the remote control unit, the movement detecting means capable of detecting movement of the remote control unit in any direction,



a selection switch, and

transmitting means for transmitting output of the movement detecting means and the selection switch; and

a controlled unit, the controlled unit including,

a display device with a display screen, and which displays a cursor and icons on the display screen;

receiving means for receiving the output of the movement detecting means and the selection switch transmitted by the transmitting means, and

control means for moving the cursor across the display screen in accordance with the output of the movement detecting means and the selection switch.

5,554,981

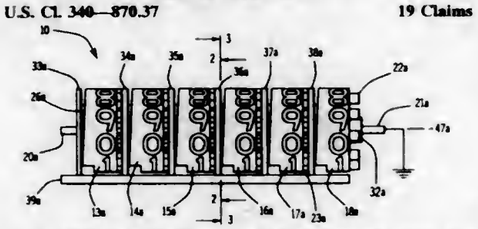
CAPACITIVE NUMBER WHEEL ENCODER FOR UTILITY METERS

Ronald N. Koch, Sewickley; Richard H. Koch, Zelienople, both of Pa., and Ray J. Thornborough, Menomonee, Wis., assignors to Badger Meter, Inc., Milwaukee, Wis.

Filed Aug. 31, 1994, Ser. No. 298,641

Int. Cl.[6] G08C *19/10*

U.S. Cl. 340—870.37 **19 Claims**



1. A capacitive device for providing an electrical signal to a detector circuit to indicate one of a plurality of positions of a movable element to represent a count, wherein

at least one movable element comprises a rotatable element having a circumference with a plurality of positions representing successive increments in a count that is greater than a binary count, and the device further comprising:

a substrate opposite one surface of the rotatable element, the substrate carrying a stationary electrode that is spaced from the rotatable element to form a gap for a variable capacitor; and

means supporting the rotatable element for rotation of the rotatable element around an axis of rotation; and

further comprising dielectric material extending around the circumference of the rotatable element, said dielectric material having variable thickness to produce variable spacing across the gap from the stationary electrode to form a plurality of capacitance values at the plurality of positions around the circumference of the rotatable element, wherein said plurality of capacitance values correspond to a count greater than a binary count.

5,554,982

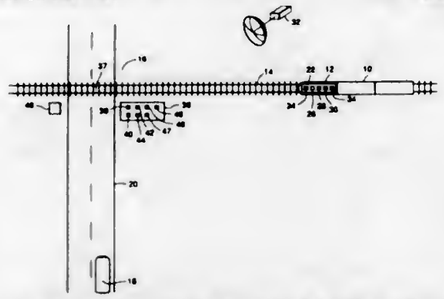
WIRELESS TRAIN PROXIMITY ALERT SYSTEM

Keith L. Shirkey, Tucson, Ariz., and Bruce A. Casella, Rancho Cucamonga, Calif., assignors to Hughes Aircraft Co., Los Angeles, Calif.

Filed Aug. 1, 1994, Ser. No. 283,460

Int. Cl.[6] G08G *1/16*

U.S. Cl. 340—903 **12 Claims**



1. A wireless train proximity alert system for alerting a vehicle's operator-to a train's approach into a grade crossing, comprising:

a transmitter for transmitting a train proximity signal;

a crossing-based transceiver for receiving the train's proximity signal and transmitting a set of boundary coordinates that define a warning zone around the grade crossing, said warning zone having a size and shape based upon the grade crossing's surrounding topography; and

a vehicle-based receiver for receiving the boundary coordinates and, after the vehicle enters the warning zone, activating an alarm to warn the vehicle's operator.

5,554,983

OBJECT RECOGNITION SYSTEM AND ABNORMALITY DETECTION SYSTEM USING IMAGE PROCESSING

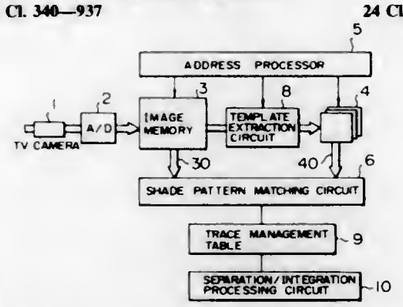
Tadaaki Kitamura, Ibaraki-ken; Yoshiki Kobayashi, Hitachi; Kunio Nakanishi, Hitachi; Masakazu Yahiro, Hitachi; Yoshiyuki Satoh, Hitachi; Toshiro Shibata, Urawa; Takeshi Horie, Kashiwa; Katsuyuki Yamamoto, Matsudo; Masao Takatoo; Haruki Inoue, both of Katsuta, and Kazuyoshi Asada, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 23, 1993, Ser. No. 51,692

Claims priority, application Japan, Apr. 24, 1992, 4-106415; Jul. 13, 1992, 4-185235; Aug. 27, 1992, 4-228751

Int. Cl.[6] G08G *1/017*

U.S. Cl. 340—937 **24 Claims**



10. An object recognition system for photographing an object by a TV camera and recognizing movement of the object by processing input images from the TV camera, comprising:

a template extracting circuit extracting a plurality of images in a template area of predetermined size from an input image f(t) at a time point t;

a template memory circuit storing a plurality of images obtained by the template extracting circuit;

a pattern matching circuit determining a movement point of each template by shade pattern matching between each template stored in the template memory circuit and the input images at incrementing time points obtained from the TV camera;

a trace management table storing a relationship between a time point and a movement point for each gray scale template obtained at the gray scale pattern matching circuit; and

a separation/integration circuit deciding which templates represent an image of a same object by use of the trace management table.

5,554,984

ELECTRONIC TRAFFIC TARIFF RECEPTION SYSTEM AND VEHICLE IDENTIFICATION APPARATUS

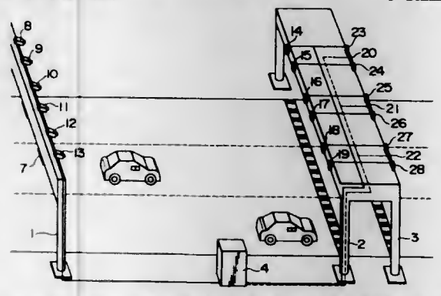
Hisao Shigenaga; Ichiro Fujita; Masayuki Yamamoto, all of Kobe; Michio Hamana; Keiichi Morishita, both of Takasago; Fumitoshi Tachikawa, Nagoya; Hideo Uehara, Kobe, and Yasuhisa Iida, Takasago, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 15, 1994, Ser. No. 196,754

Claims priority, application Japan, Feb. 19, 1993, 5-030250; Feb. 19, 1993, 5-030251

Int. Cl.[6] G08G *1/00*

U.S. Cl. 340—937 **9 Claims**



1. An electronic traffic tariff reception system comprising an in-vehicle unit mounted in a vehicle travelling freely across lanes of a road having one or two or more lanes and which stores vehicle information which identifies individual vehicles and includes radio communication means; a smart card mounted in said in-vehicle unit and in which personal information of a driver is stored; at least one or more antennas for executing a debiting process, one of said at least one or more antennas being disposed above each lane of the road; an antenna controller for controlling said at least one or more antennas to receive the vehicle information and the personal information and transmit debiting information including a debit value for executing said debiting process by means of radio communication with said in-vehicle unit; a local controller for judging whether the vehicle is to be debited on the basis of the vehicle information and the personal information received by said at least one or more antennas for executing said debiting process and whether the vehicle information and the personal information are associated with a vehicle and an individual person authorized to pass through the tariff reception system and supplying a debit value in accordance with a vehicle type to said antenna controller when the vehicle is to be debited; at least one or more monitoring cameras disposed above each lane of the road; a vehicle separator for detecting a front end, back end, and lateral sides of a vehicle passing through a photographing position of said at least one or more monitoring cameras, said photographing position spanning an entire width of the road, without interruption, so that vehicles need not slow down and need not remain in one of the lanes when passing through the tariff reception system; and means for photographing illegally passing vehicles, including means for specifying via said vehicle separator a position of an illegally passing vehicle having the vehicle information or the personal information which is judged to be unauthorized by said local controller and causing one of said at least one or more monitoring cameras corresponding to the specified position to photograph the illegally passing vehicle.

5,554,985

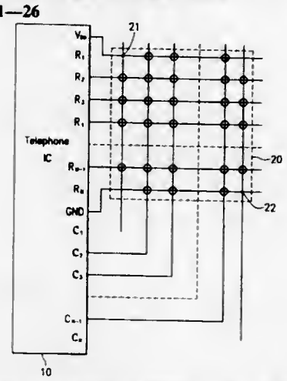
METHOD FOR SCANNING KEYPAD ARCHITECUTRE EMPLOYING POWER SOURCE AND GROUND OF DIGITAL ELECTRONIC DEVICES

Chun-Yen Chang, Hsinchu, Taiwan, assignor to United Microelectronics Corporation, Hsinchu, Taiwan

Filed Jun. 14, 1995, Ser. No. 490,310

Int. Cl.[6] H03K *17/94*

U.S. Cl. 341—26 **3 Claims**



1. A method for key-press scanning of keys in the keypad of digital electronic devices, said digital electronic devices having a digital electronic circuitry contained in an integrated circuit device having a plurality of row pins and column pins, a power pin and a ground pin, wherein a first row connection of a keyswitch matrix is connected to said power pin, a second row connection of said keyswitch matrix is connected to said ground pin, and each of all other row connections of said keyswitch matrix are connected to corresponding one of said row pins, and a first column connection of said keyswitch matrix is connected to said power pin, a second column connection of said keyswitch matrix is connected to said ground pin, and each of all other column connections are connected to corresponding one of said column pins, said method comprising the steps of:

(1) said row pins are set to function as output ports, while said column pins are set as the input ports, and said row pins are set to output low status signals;

(2) said digital integrated circuitry senses the electrical status of said column pins, when all of said column pins are in the floating state, it is determined that no keys in the keypad is pressed, when an electrical high status is detected, it is determined that the key pressed is on the first row, and when an electrical low status is detected, it is determined that the key pressed is on one of the rows of in the second to the last of said row;

(3) when the pressed key is in the second to the last row, the row pins are again set to function as output ports and outputs electrical high status signals subsequently from the second to the last row, while said column pins are set as input ports and monitored; when any of said column pins are sensed to be in its electrical high status, it is decided that the key pressed is in the row pin that is outputting the electrical high signal; otherwise it is decided that the pressed key is on the last row;

(4) said column pins are set to function as output ports, while said row pins are set as the input ports, and said column pins are set to output low status signals;

(5) said digital integrated circuitry senses the electrical status of said row pins, when an electrical high status is detected, it is determined that the key pressed is on the first column, and when an electrical low status is detected, it is determined that

the key pressed is on one of the columns in the second to the last of said column; and

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AIRSPACE MANAGEMENT SYSTEM AND METHOD

Terry L. McKinney, Severn, Md., assignor to Northrop Grum

the key pressed is on one of the columns in the second to the last of said column; and

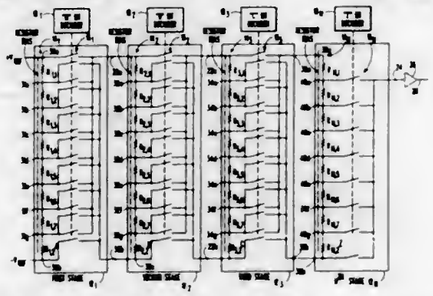
(6) when the pressed key is in the second to the last column, the column pins are again set to function as output ports and outputs electrical high status signals subsequently from the second to the last column, while said row pins are set as input ports and monitored locate the column in which the key is depressed.

5,554,986

DIGITAL TO ANALOG COVERTER HAVING MULTIPLE RESISTOR LADDER STAGES

Robert A. Neidorff, Bedford, N.H., assignor to Unitrode Corporation, Billerica, Mass.

Filed May 3, 1994, Ser. No. 237,388
Int. Cl.[6] H03M *1/68*
U.S. Cl. 341—145 **17 Claims**



5. A digital to analog converter comprising:

a first resistor ladder having a top node and a bottom node and comprising a first plurality of resistors coupled in series, said top and bottom nodes being coupled across a supply voltage;

a second resistor ladder having a top node and a bottom node and comprising a second plurality of resistors coupled in series, wherein each of said second plurality of resistors has a higher resistance value than each of said first plurality of resistors;

a plurality of switches coupled between said first resistor ladder and said second resistor ladder, wherein a first portion of said plurality of switches has first terminals coupled to said first resistor ladder and second terminals coupled to said top node of said second resistor ladder and wherein a second portion of said plurality of switches has first terminals coupled to said first resistor ladder and second terminals coupled to said bottom node of said second resistor ladder such that each junction between two adjacent ones of said first plurality of resistors of said first resistor ladder is coupled to one of said first terminals of said first portion of said plurality of switches and to one of said first terminals of said second portion of said plurality of switches; and

a decoder responsive to a digital input signal for controlling said plurality of switches so as to provide an analog output signal across a portion of said second resistor ladder having a value corresponding to said digital input signal.

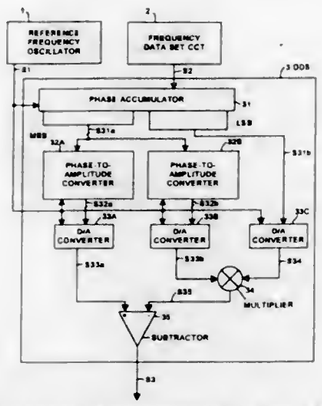
5,554,987

DIRECT DIGITAL SYNTHESIZER CAPABLE OF REDUCING SPURIOUS NOISE COMPONENTS

Toshiyuki Ooga, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Feb. 23, 1994, Ser. No. 200,750
Claims priority, application Japan, Feb. 24, 1993, 5-033864
Int. Cl.[6] H03M *1/66*
U.S. Cl. 341—147 **6 Claims**

4. A direct digital synthesizer comprising:



phase accumulator means accumulating frequency data to produce phase data;

phase-to-sine signal converting means generating a sine signal in response to significant bits of said phase data, said phase-to-sine signal converting means including a first phase-to-amplitude converter for generating sine amplitude data corresponding to the value of said significant bits, and a second converter for converting said sine amplitude data into said sine signal;

phase-to-cosine signal converting means generating a cosine signal, which is advanced in phase by 90 degrees relative to said sine signal, in response to said significant bits, said phase-to-cosine signal converting means including a second phase-to-amplitude converter for generating cosine amplitude data corresponding to the value of said significant bits, and a third converter for converting said cosine amplitude data into said cosine signal;

a first converter for converting less significant bits of said phase data into a phase error signal;

a multiplier for multiplying said cosine signal and said phase error signal to produce a spurious cancel signal;

a subtracter for subtracting said spurious cancel signal from said sine signal to produce a resultant synthesized signal;

a first timing adjusting circuit for causing said cosine signal and said phase error signal to arrive at input terminals of said multiplier substantially at the same timing;

a first level adjusting circuit for confining signal levels of said cosine signal and said phase error signal on said input terminals of multiplier in a predetermined range necessary for said multiplier;

a second timing adjusting signal for causing a spurious component of said sine signal and said spurious cancel signal to arrive at input terminals of said subtracter at substantially the same time; and

a second level adjusting circuit for setting said sine signal and said spurious cancel signal on said input terminals of said subtracter at respective signal levels which minimize said spurious component of said resultant synthesized signal.

5,554,988

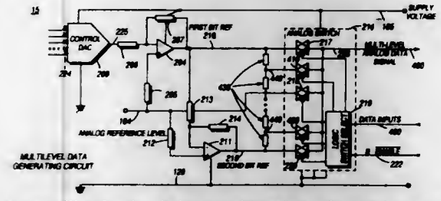
APPARATUS AND METHOD FOR GENERATING A DATA SIGNAL

Michael H. Retzer, Palatine, and Alan D. Muehlfeld, Mount Prospect, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 23, 1994, Ser. No. 295,967
Int. Cl.[6] H03M *1/46;1/66;1/78*
U.S. Cl. 341—154 **10 Claims**

1. An apparatus for generating an analog data signal from digital data inputs, comprising:

an analog reference level;



a controlling level, relative to said analog reference level, providing a first bit reference level relative to said analog reference level;

an inverting amplifier, coupled to said first bit reference level, for providing a second bit reference level relative to said first bit reference level; and

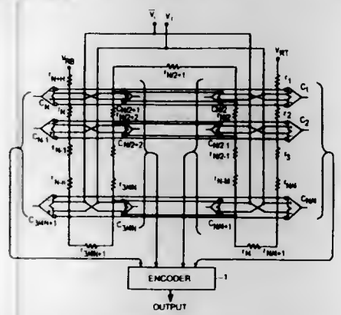
a switching configuration having an output, coupled to said digital data inputs and coupled to said reference levels for providing one of said reference levels at said output.

5,554,989

A/D CONVERTER HAVING FOLDED ARRANGEMENT OF VOLTAGE COMPARATOR

Toshio Kumamoto, and Takahiro Miki, both of Hyogo-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1994, Ser. No. 241,422
Claims priority, application Japan, Aug. 6, 1993, 5-196001
Int. Cl.[6] H03M *1/36*
U.S. Cl. 341—159 **3 Claims**



1. An A/D converter comprising:

a ladder of (N+1) resistors connected in series provided with first, second to N-th intermediate taps at respective connection points and having one end provided with a first reference voltage (V_{RT}) and the other end provided with a second reference voltage (V_{RB}); and

first, second to N voltage comparators for comparing a first differential reference voltage obtained by dividing said first and second reference voltages by said ladder resistors and a second differential reference voltage formed of third and fourth voltages (V_i, $\overline{V}_i$), wherein

said first, second to N-th voltage comparators each include first to fourth input terminals,

the respective first input terminals are connected to said first, second to N-th intermediate taps,

the respective second input terminals are connected to said N-th, (N−1)-th to first intermediate taps,

the respective third input terminals are connected together and supplied with said third voltage,

the respective fourth input terminals are connected together and supplied with said fourth voltage wherein

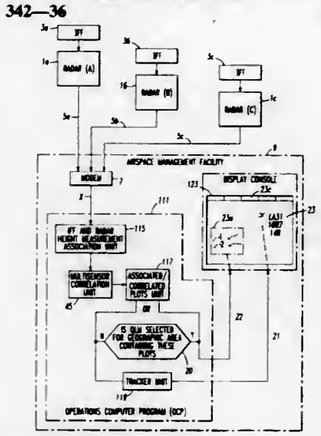
said first, second to N-th voltage comparators are arranged in 2n rows (n is a positive integer greater than one) in a folded manner.

5,554,990

AIRSPACE MANAGEMENT SYSTEM AND METHOD

Terry L. McKinney, Severn, Md., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Aug. 22, 1995, Ser. No. 518,133
Int. Cl.[6] G01S *13/87*
U.S. Cl. 342—36 **42 Claims**



1. A method, comprising the steps of:

(a) receiving input radar information for at least one aircraft;

(b) selecting an alternate display mode other than a normal display mode;

(c) designating at least a portion of a display screen as an area for display of at least a portion of the received radar information in the selected alternate display mode; and

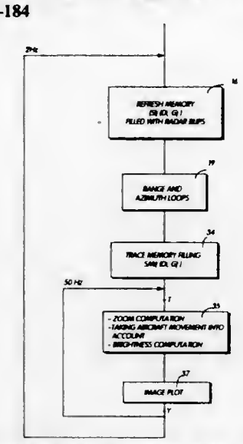
(d) displaying a radar plot of at least one aircraft for which input radar information is received, in the designated area of the display screen.

5,554,991

DEVICE FOR RECREATING A DYNAMIC IMAGE FROM A RADAR FIELD OF THE INVENTION

Bernard Maitre; Xavier Chaella, and Thibault De la Fresnaye, all of Saint Cloud, France, assignors to Electronique Serge Dassault, Saint-Cloud, France

Filed Apr. 6, 1988, Ser. No. 179,043
Int. Cl.[6] G01S *7/24*
U.S. Cl. 342—184 **12 Claims**



1. In a device for recreating a dynamic image, the improvement comprising:

(a) an air-to-ground observation radar, having an output memory and means for choosing a repetition frame, and effective to

that traverse one or more of said zones, and the number of radials that traverse said zones match the average azimuthal

location and the second location, and transmitter means for transmitting the GPS error; and

5,554,996

ANTENNA FOR COMMUNICATION DEVICE

(a) an air-to-ground observation radar, having an output memory and means for choosing a repetition frame, and effective to supply a series of data or basic radar blips which are expressed in elevation, range and azimuth, said blips being stored in said output memory of the radar after having been acquired on the basis of a repetition frame chosen by said choosing means;

(b) means addressing said output memory in range and in azimuth in order to deliver the corresponding elevation information;

(c) range and azimuth processing means operative to carry out at least one range loop paired with at least one azimuth loop, while scanning said output memory of the air-to-ground observation radar in order (i) to replace the current blip by a possibly more distant blip of the same azimuth having a lower elevation; and (ii) to define at each range a substantially continuous sequence of image points obtained by at least one of interpolation and extrapolation between said blips, while taking into account at each azimuth closer image points having a higher elevation;

(d) a basic image memory for storing the image points thus obtained by said range and azimuth processing means;

(e) pre-display processing means and, at least one buffer memory associated therewith, both operative to determine the brightness of these points as a function of their range; and

(f) means for displaying on board said vehicle an image composed of said points whose brightness has thus been determined.

5,554,992

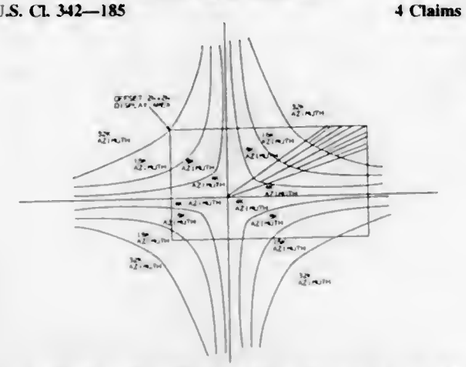
RADAR SCAN CONVERTER FOR PRODUCING AN AGGREGATE RADIAL SCAN PATTERN THAT IS A FUNCTION OF HYPERBOLICALLY-BASED RESOLUTION BOUNDARIES

Joe M. Toth, and Kenneth E. Nuedorf, both of Winnipeg, Canada, assignors to Lockheed Martin Corporation, Bethesda, Md.

Filed Jun. 5, 1995, Ser. No. 462,526

Int. Cl.[6] G01S *7/293;7/04*

U.S. Cl. 342—185 **4 Claims**



1. A process for providing radar scan conversion from radar data in polar coordinates to radar data in rectangular coordinates by a digital computer which receives (r,θ) coordinate data from a radar receiver and which supplies (x,y) coordinate data to a display, wherein said display has a variable azimuthal pixel resolution that increases from the center of the display to the periphery of the display comprising:

defining a plurality of zones of said display which have increasing azimuthal resolution values as said zones extend outwardly from the center of said display towards the periphery of said display and are bound by boundaries that approximate mathematically correct hyperbolic curves, and

generating an aggregate radial scan pattern on said display that consists of a plurality of radials each of which have lengths that traverse one or more of said zones, and the number of radials that traverse said zones match the average azimuthal resolution of each of said zones.

5,554,993

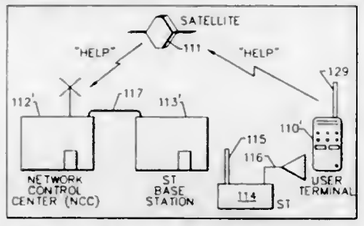
GLOBAL POSITION DETERMINING SYSTEM AND METHOD

John W. Brickell, Raleigh, N.C., assignor to Panasonic Technologies, Inc., Secaucus, N.J.

Filed Jan. 4, 1994, Ser. No. 177,252

Int. Cl.[6] G04S *5/10;* **H04D** *7/185*

U.S. Cl. 342—357 **45 Claims**



31. A mobile homing terminal comprising:

means for receiving an indication of an approximate position signal from a battery powered user terminal;

means for transmitting an activate homing beacon command to the user terminal to thereby activate a homing beacon thereof when the mobile homing terminal approaches the user terminal; and

means, responsive to receipt of a homing beacon, for homing on said homing beacon to locate the user terminal.

5,554,994

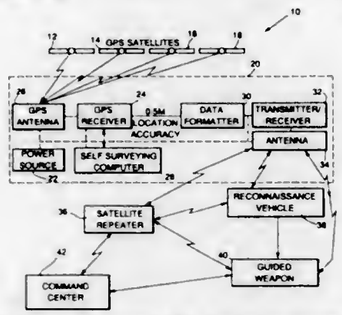
SELF-SURVEYING RELATIVE GPS (GLOBAL POSITIONING SYSTEM) WEAPON GUIDANCE SYSTEM

Arthur J. Schneider, Tucson, Ariz., assignor to Hughes Missile Systems Company, Los Angeles, Calif.

Filed Jun. 5, 1995, Ser. No. 461,080

Int. Cl.[6] H04B *7/185;* **G01S** *5/02*

U.S. Cl. 342—357 **20 Claims**



1. A self-surveying relative GPS (Global Positioning System) weapon guidance system, said system comprising:

a plurality of GPS satellites, said GPS satellites each operable to transmit GPS data;

a transportable unattended ground sensor, said transportable unattended ground sensor including GPS receiver means for receiving said GPS data and determining a second location of the transportable unattended ground sensor, self-surveying means for determining a first benchmark location of the transportable unattended ground sensor, said first benchmark location being more accurate than the second location, error means for determining GPS error between the first benchmark location and the second location, and transmitter means for transmitting the GPS error; and

a guided weapon, said guided weapon operable to utilize the GPS error to substantially increase the delivery accuracy of the guided weapon.

5,554,995

FLAT ANTENNA OF A DUAL FEEDING TYPE

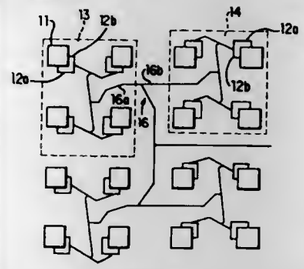
Joo S. Jun, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Continuation of Ser. No. 945,063, Sep. 15, 1992, abandoned. This application May 9, 1994, Ser. No. 240,203

Claims priority, application Rep. of Korea, Sep. 16, 1991, 1991-16144

Int. Cl.[6] H01Q *1/38;21/22*

U.S. Cl. 343—700 MS **5 Claims**



1. A flat antenna of a dual feeding type comprising first and second antenna units, each of said first and second antenna units comprising:

(1) a ground substrate;

(2) first insulating means formed on said ground substrate for electrical isolation of said ground substrate;

(3) receiving means formed on said first insulating means for receiving a transmission;

(4) a second insulator formed on said receiving means; and

(5) coupling removing means formed on said second insulator and having a slot positioned in vertical upward direction of said radiation elements for removal of a mutual coupling between components on said receiving means;

wherein said ground substrate and said receiving means are electrically isolated from each other by said first insulating means and said receiving means and said coupling means are electrically isolated from each other by said second insulator; and

wherein said receiving means includes:

(a) a plurality of radiation elements;

(b) a plurality of first pairs of feeding lines, each of said first pairs of feeding lines being connected to a respective one of said radiation elements with the lines of each of said first pairs of feeding lines having different electrical lengths to have a phase difference of 90°; each one of the radiation elements and a respective one of said first pairs of feeding lines defining a patch unit; and

(c) a substrate on which said radiation elements and said first pairs of feeding lines are formed; and

another pair of feeding lines connected to said first and second antenna units, said another pair of feeding lines having different electrical lengths to provide a phase difference of 180°; the plurality of patch units in said second antenna unit being arranged in a direction opposite to the direction of the plurality of patch units in said first antenna unit; whereby reception characteristics of said first and second antenna units are in phase.

5,554,996

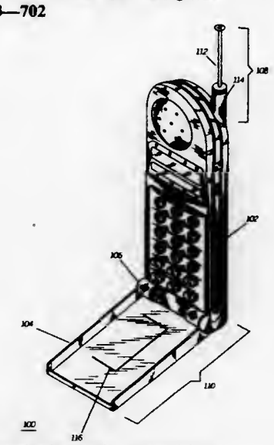
ANTENNA FOR COMMUNICATION DEVICE

Argyrios Chatzipetros, Plantation, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 275,565, Jul. 15, 1994, abandoned. This application Sep. 8, 1995, Ser. No. 525,896

Int. Cl.[6] H01Q *1/24*

U.S. Cl. 343—702 **6 Claims**



1. A communication device, comprising:

a housing;

a substrate located within the housing;

an extendible antenna coupled to the housing;

a direct feed radiator disposed upon the substrate, the direct feed radiator and extendible antenna providing antenna diversity to said communication device; and

a flap;

the housing including a means for receiving the flap and coupling the flap to the housing, the flap including a parasitic radiator positioned to inductively couple to the direct feed radiator when the flap is coupled to the housing.

5,554,997

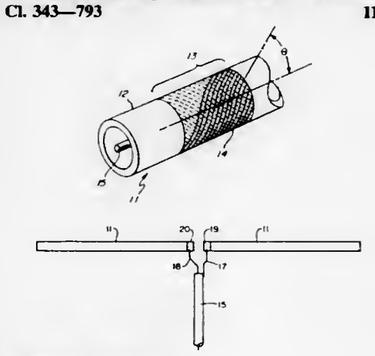
GRAPHITE COMPOSITE STRUCTURES EXHIBITING ELECTRICAL CONDUCTIVITY

Jack M. Cobb, San Juan Capistrano, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 9,137, Jan. 17, 1992, abandoned, which is a continuation of Ser. No. 400,187, Aug. 29, 1989, abandoned. This application Jun. 10, 1994, Ser. No. 258,122

Int. Cl.[6] H01Q *9/16;9/22;* **H01B** *7/34;1/00*

U.S. Cl. 343—793 **11 Claims**



6. An antenna comprising:

a first element comprising

a first hollow tube made of a composite material comprising elongated metal-plated graphite fibers bound in a resin material, said first element having a first exposed region in which the resin has been removed from a first selected area at the surface of the element exposing a first portion of the metal-plated graphite fibers, and

a layer of conductive metal deposited on the first portion of the metal-plated graphite fibers, the conductive metal deposited upon the first portion being different from the metal plated upon the graphite fibers of the first element;

a second element comprising

a second hollow tube made of a composite material comprising elongated metal-plated graphite fibers bound in a resin material, said second element having a second exposed region in which the resin material has been removed from a second selected area at the surface of the element exposing a second portion of the metal-plated graphite fibers, and

a layer of conductive metal deposited on the second portion of the metal-plated graphite fibers, the conductive metal deposited upon the second portion being different from the metal plated upon the graphite fibers of the second element; and

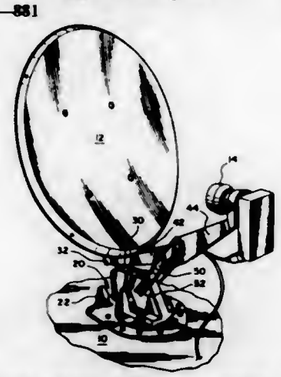
first and second leads soldered to the conductive metal on the first and second exposed portions, respectively.

5,554,998

DEPLOYABLE SATELLITE ANTENNA FOR USE ON VEHICLES

William J. Sherwood, West Burlington, and David W. Wagner, Burlington, both of Iowa, assignors to Winegard Company, Burlington, Iowa

Filed Mar. 31, 1995, Ser. No. 415,478
Int. Cl.[6] H01Q *1/08*
U.S. Cl. 343—881 **15 Claims**



1. A deployable antenna system to be mounted on a support surface, said antenna system comprising:

a base mounted to said support surface;

a reflector having a face;

a feed horn for receiving electrical signals reflected by said reflector;

a reflector support having a lower portion pivotably attached to said base and an upper portion attached to said reflector;

elevation control means for adjustably controlling the elevational position of said reflector support and said reflector between a stowed position in which said reflector is stored face-up adjacent to said support surface with said feed horn above said reflector, and a deployed position;

a feed arm having:

(a) a first segment attached to said reflector support extending between said base and said reflector without passing through said reflector, said first segment also having a distal end; and

(b) a second segment supporting said feed horn, pivotably attached to said distal end of said first segment without passing through said reflector; and

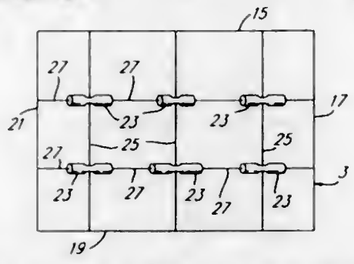
a linkage extending between said base and said second segment of said feed arm without passing through said reflector, said linkage causing said second segment of said feed arm to pivot to a folded position relative to said first segment when said reflector is moved to said stowed position, and allowing said second segment to pivot to an extended position relative to said first segment when said reflector is moved to said deployed position.

5,554,999

COLLAPSIBLE FLAT ANTENNA REFLECTOR

Shyam Gupta, Pointe Claire, and Ralph Pokuls, Beaconsfield, both of Canada, assignors to Spar Aerospace Limited, Mississauga, Canada

Filed Feb. 1, 1994, Ser. No. 189,799
Int. Cl.[6] H01Q *15/02*
U.S. Cl. 343—909 **3 Claims**



1. A flat, collapsible, antenna reflector for use in a predetermined bandwidth, said antenna reflector being configured to reflect a received E-M wave, said antenna reflector comprising:

a ground plane having a plurality of metallic cylinders attached to a ground plane frame by horizontal and vertical strands, said cylinders being of equal size and being equally spaced from each other;

a phasing plane having a plurality of metallic cylinders attached to a phasing plane frame by horizontal and vertical strands, said cylinders being of different sizes and with different spacing from each other; and

spacer means for maintaining said planes in connected, spaced relationship;

wherein the vertical and horizontal strands in both of said ground plane and phasing plane comprise dielectric strands, said metallic cylinders of said phasing plane being sensitive to different frequencies in said band width to cause a received E-M wave to be reflected from said flat antenna reflector in a radiation pattern which simulates the response of a three-dimensional reflector.

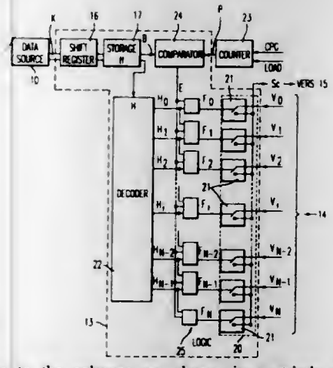
5,555,000

PROCESS AND DEVICE FOR THE CONTROL OF A MICROTIP FLUORESCENT DISPLAY

Denis Sarrasin, Sassenage, and Michel Garcia, Les Milles, both of France, assignors to Commissariat a l'Energie Atomique, Paris, and Pixel International S.A., Rousset, both of France

Filed Jul. 21, 1994, Ser. No. 278,329
Claims priority, application France, Jul. 22, 1993, 93 09022
Int. Cl.[6] G09G *3/12*
U.S. Cl. 345—75 **10 Claims**

1. Process for the control of a microtip fluorescent display formed from pixels arranged in accordance with L rows and M columns which can have a discrete number of Q grey tones, said process comprising, at each selection of a row of the display during a row selection time T_L, the simultaneous application to the display columns of voltages corresponding to the grey levels to be displayed at the pixels corresponding to the intersection of said row and said columns, wherein the different column voltage values



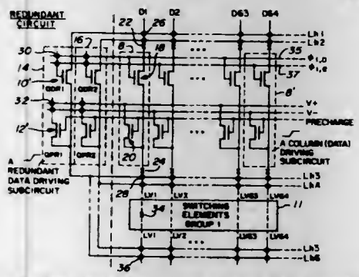
applicable to the columns are chosen in a strictly increasing sequence of N+1 values such that the row selection time is subdivided into S equal time intervals Δt, each voltage value being applied an integral number of time Δt, (N×S)+1 representing the number Q of grey levels, with $N \geq 2$ and $S \geq 2$, and in that during the row selection T_L and as a function of the grey level to be displayed at a pixel, the corresponding column voltage assumes a first value Va for a certain number of time intervals Δt, during the remaining time intervals at the most one second value Vb, said second value following on to the first in the sequence of N voltages.

5,555,001

REDUNDANT SCHEME FOR LCD DISPLAY WITH INTEGRATED DATA DRIVING CIRCUIT

Sywe N. Lee, Taipei; Huann-Min Tang, and Dyi-Chung Hu, both of Sinchu, all of Taiwan, assignors to Prime View HK Limited, Hong Kong, Hong Kong

Filed Mar. 8, 1994, Ser. No. 207,759
Int. Cl.[6] G09G *3/36*
U.S. Cl. 345—93 **10 Claims**



1. A redundant data driver circuit system for a display having first and second opposed substrates separated by a layer of electro-optic material, the system including:

a plurality of picture elements arranged on said at least one substrate in a matrix array of M rows and N columns where both M and N are integers greater than 1;

a common column line for driving each of the M picture elements in each column, the common column line extending from a first input through said active matrix array to a first output;

a data source including a plurality of data lines;

a data driver circuit on said substrate coupled between a respective data source data line and the first input of each common column line to provide the data input to each column of picture elements;

at least one redundant data driver circuit on said at least one substrate having an input conductor and an output conductor; and

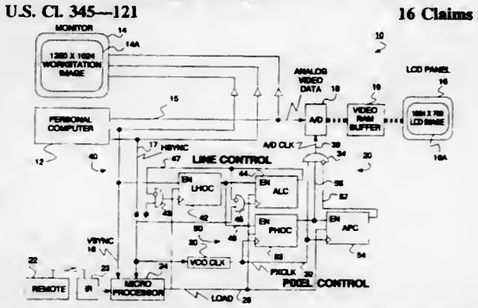
the input conductor of the redundant data driver circuit crossing over and being connectable to the data source data line for all of the data driver circuits and the output conductor of the redundant data driver circuit crossing over and not being electrically connected to the first input of all of the common column lines such that a defective one of any of said data driver circuits is electrically disconnectable from both its respective data source data line and said first input of its associated common column line and replaceable by said at least one redundant data driver circuit by selectively electrically connecting the input conductor of said at least one redundant data driver circuit to said respective data source data line and connecting the output conductor to said first input of said associated common column line to which the disconnected defective data driver circuit had previously been connected.

5,555,002

METHOD AND DISPLAY CONTROL SYSTEM FOR PANNING

Hung Nguyen, Poway, Calif., assignor to Proxima Corporation, Del.

Continuation of Ser. No. 235,292, Apr. 29, 1994, abandoned.
This application Jun. 7, 1995, Ser. No. 475,065
Int. Cl.[6] G09G *5/34*
U.S. Cl. 345—121 **16 Claims**



1. A panning control system including a video source for generating video information signals including a horizontal timing signal and a vertical timing signal indicative of a large video image and a display device for displaying a small display image, comprising:

analog to digital conversion means coupled between the video source and the display device for converting the video information signals into digital information signals to enable a selected portion of the large video image to be displayed on the display device;

the large video image having a video pixel element array of M columns by N rows and the display image having a display pixel element array of m columns by n rows, wherein M, N m and n are positive integers and wherein M and N are larger than m and n, respectively;

gate control means coupled to said conversion means for generating a conversion clock signal to activate selectively said conversion means for converting a selected portion of the video information signals corresponding to said selected video image portion to be displayed as the display image, said selected video image portion having a video image portion pixel element array of m columns by n rows;

line control means responsive to the vertical timing signal and coupled to said gate control means for generating a row control signal to enable said conversion means to be activated;

said line control means including a line hold off means synchronized with the vertical timing signal for inhibiting the display of the video information signals until the first row of said selected video image portion is generated by the video source, wherein said line hold off means generates said row control signal when the first row is generated by the video source;

said line control means further including an active line means coupled to said line hold off means and responsive to said row

a fixed first insulation surface and a second insulation surface disposed in opposed position to the first insulation surface so

a pressure sensor operably connected to said accumulating chamber and measuring a fluid pressure in said accumulating

said line control means further including an active line means coupled to said line hold off means and responsive to said row control signal for enabling the display of the video information signals for all n rows of said selected video image portion when said row control single is generated by said line hold off means;

pixel control means responsive to the horizontal timing signal and coupled to said line control means and said gate control means for generating a column control signal to enable said conversion means to be activated;

said pixel control means including a pixel hold off means synchronized with the video information signal for inhibiting the display of the video information signal until the first column of said selected video image portion is generated by the video source, wherein said pixel hold off means generates said column control signal when the fist column is generated by the video source;

said pixel control means further including an active pixel means coupled to said pixel control means and responsive to said column control signal for enabling the display of the video information signal for all m columns of said selected video image portion when said column control signal is generated by said pixel hold off means;

wherein said conversion means enables the displaying of said selected video image portion as the display image only when said column control signal and said row control signal are generated substantially concurrently;

control means for generating horizontal pan direction command signals and vertical pan direction command signals to adjust said selected video image portion to be displayed, whereby another portion of the video information signal indicative of another portion of the video image is converted for displaying as the display image;

processor means coupled to said pixel control means and said line control means for determining the video information singles to be inhibited until the occurrence of the first column and the first row of said selected video image portion; and

said processor means being responsive to said horizontal pan direction command signals and said vertical pan direction command signals to adjust the selection of the video information signals which are to be inhibited, wherein the selected video image portion to be displayed is adjusted continually by at least one column from a previously selected video image portion in response to said horizontal pan direction command signals and which selected video image portion is adjusted continually by at least one row from said previously selected video image portion in response to a vertical pan direction command signals for changing the portion of the video image converted into the display information signal, whereby each one of the converted video image portions is displayed sequentially continually as the small display image which appears to pan across the large video image.

5,555,003

METHOD FOR SELECTING AN ITEM ON A GRAPHICS SCREEN

Kent M. Montgomery, and Bruce E. Blaho, both of Fort Collins, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 45,925, Apr. 12, 1993, abandoned. This application Apr. 5, 1995, Ser. No. 417,183

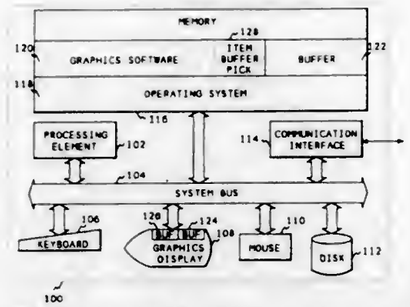
Int. Cl.[6] G09G *5/08*

U.S. Cl. 345—146 **13 Claims**

1. A computer implemented method for selecting one of a plurality of graphic objects displayed on a graphics display screen within a computer system, said computer implemented method comprising the steps of:

(a) creating an item buffer having a storage location corresponding to each display location on the graphics display screen;

(b) assigning one of a plurality of unique item identifiers to each of said plurality of graphic objects displayed on the graphics display screen;



(c) determining a one of the plurality of graphic objects displayed at each display location on the graphics display screen and determining which of said plurality of unique item identifiers is assigned to each one of said graphic objects, and therefore assigned to each display location;

(d) storing said unique item identifiers in said item buffer storage locations comprising the steps of

(d1) dividing each of said unique item identifiers into a plurality of parts,

(d2) storing one of said plurality of parts of each of said unique item identifiers in said item buffer storage locations,

(d3) copying contents of said item buffer storage locations to one of a plurality of areas of a second storage location, and

(d4) repeating steps (d2) through (d3) for each of said remaining plurality of parts of said unique item identifiers;

(e) receiving a graphics display screen location from a pointer device attached to the computer system;

(f) retrieving an item identifier from a location in said item buffer corresponding to said location received in step (e) comprising the steps of

(f1) retrieving a partial item identifier from a corresponding location of each of said plurality of areas of said second storage location, and

(f2) combining said partial item identifiers to create said item identifier;

(g) unhighlighting any previously highlighted graphics objects;

(h) highlighting a graphics object identified by said item identifier retrieved in step (f);

(i) repeating steps (e) through (h) until a selection indicator is activated on said pointer device; and

(j) selecting one or more graphic objects assigned to said item identifier retrieved in step (f).

5,555,004

INPUT CONTROL DEVICE

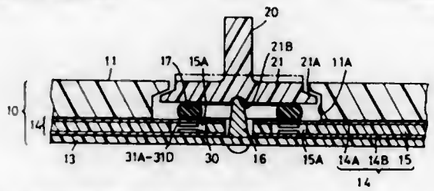
Satomi Ono, and Tadashi Hanajima, both of Isesaki, Japan, assignors to Hosiden Corporation, Osaka, Japan

Filed Aug. 26, 1994, Ser. No. 296,455

Claims priority, application Japan, Aug. 30, 1993, 5-214317; Jun. 15, 1994, 6-133138; Jun. 15, 1994, 6-133139; Jun. 15, 1994, 6-133140; Jun. 15, 1994, 6-133141; Jun. 17, 1994, 6-135534; Jun. 21, 1994, 6-138878

Int. Cl.[6] G09G *5/08*

U.S. Cl. 345—161 **22 Claims**



1. An input control device comprising:

a fixed first insulation surface and a second insulation surface disposed in opposed position to the first insulation surface so as to be movable toward selective portions of the first insulation surface;

M arcuate grouping contacts arranged selectively on said first and second insulation surfaces in an annular array, M being an integer equal to or greater than 2;

M groups of strip contacts disposed in opposed relation to said corresponding M arcuate grouping contacts, respectively, and arranged selectively on said first and second insulation surfaces, each group containing a plurality of said strip contacts extending radially and electrically separated from one another when said strip contacts are out of contact with corresponding ones of said M arcuate grouping contacts;

a control key means disposed in opposed relation to said annular array on the side of said second insulation surface opposite from said first insulation surface;

retaining means for retaining said control key means for tilting movements generally on the center of said annular array with respect to said first insulation surface; and

elastic means disposed between said control key means and said second insulation surface in opposing relation to said annular array for providing an elastic force in opposition to an operating force applied to the control key means, said elastic force acting to press a portion of said second insulation surface in said annular array against said first insulation surface, an area of said portion being dependent on deformation of said elastic means caused by said operating force, whereby one of said M arcuate grouping contacts corresponding to the direction of the operating force applied to said control key means is brought into contact with one or more of said strip contacts depending on the magnitude of the operating force.

5,555,005

ELECTRONICALLY CONTROLLED PNEUMATIC PRESSURE REGULATOR AND METHOD FOR THE REGULATION OF THE PRESSURE OF A FLUID USING SUCH A REGULATOR

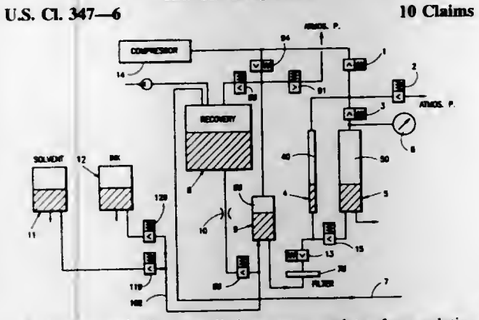
Alain Pagnon, Bourg les Valence, France, assignor to Imaje, Bourg les Valence, France

Filed Sep. 15, 1993, Ser. No. 120,964

Claims priority, application France, Sep. 15, 1992, 92 10993

Int. Cl.[6] B41J *29/38*

U.S. Cl. 347—6 **10 Claims**



1. An electronically controlled pressure regulator for regulating a pressure of a diphasic fluid contained in an accumulating chamber between a higher pressure delivered by a pressure source and a lower discharge pressure delivered by a pressure well, the regulator comprising:

a first solenoid valve;

a transfer volume filled with gas connected to an upper volume of gas of the diphasic fluid of the accumulating chamber by the first solenoid valve;

a second solenoid valve connecting the transfer volume to the pressure source;

a third solenoid valve connecting said transfer volume to the pressure well;

a pressure sensor operably connected to said accumulating chamber and measuring a fluid pressure in said accumulating chamber; and

an electronic control system connected to said pressure sensor and controlling said first, second and third solenoid valve dependent on the fluid pressure sensed by said pressure sensor.

5,555,006

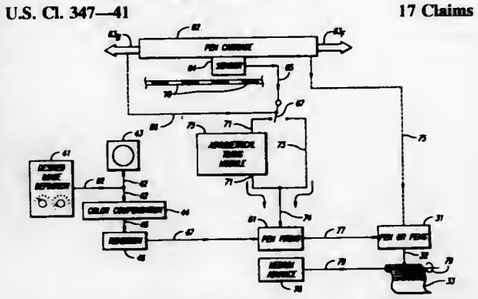
INKJET PRINTING: MASK-ROTATION-ONLY AT PAGE EXTREMES; MULTIPASS MODES FOR QUALITY AND THROUGHPUT ON PLASTIC MEDIA

Lance Cleveland, San Diego; Corrina A. Hall, Escondido, and William C. Hilliard, San Diego, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 30, 1993, Ser. No. 57,366

Int. Cl.[6] B41J *2/145*

U.S. Cl. 347—41 **17 Claims**



1. A method of printing desired images on a low-liquid-absorption printing medium, by construction from individual marks formed in pixel column-and-row arrays by a scanning multiple-nozzle pen that operates in conjunction with a printing-medium advance mechanism; said method comprising the steps of:

scanning the pen repeatedly along a pen-scanning axis across the medium, to place marks on the medium within a swath of pixel rows that is exposed to the multiple nozzles of the pen, each nozzle corresponding to one pixel row;

periodically advancing the printing medium relative to the pen, along a printing-medium-advance axis that is substantially orthogonal to the pen-scanning axis, to bring a fresh portion of the medium within the swath that is exposed to the pen; and

in each scanning of the head across the medium, firing at most one-third of the nozzles in each pixel-position column and thereby depositing, over the total number of scans at each pixel row, at least two drops of ink in each pixel position that is inked.

5,555,007

REFILLABLE INK JET PRINTING MODULE

Danilo Ceschin, Candia Canavese; Rinaldo Ferrarotti, Trino Vercellese; Roberto Morandotti, Mercenasco, and Alessandro Scardovi, Ivrea, all of Italy, assignors to Olivetti-Canon Industriale, S.p.A., Turin, Italy

Filed Sep. 6, 1994, Ser. No. 301,015

Claims priority, application Italy, Sep. 23, 1993, TO93A0694

Int. Cl.[6] B41J *2/175*

U.S. Cl. 347—87 **11 Claims**

1. A refillable ink jet printing module, comprising:

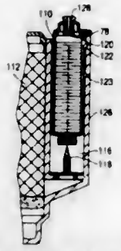
a reservoir containing ink;

a thermal ink jet printing head fixed to and communicating with said reservoir;

housing means integral with said reservoir for receiving and housing an ink cartridge containing a fresh ink supply; and

second temperature range when said pixel to be recorded is said off-mode signal; and

identifying an individual portion of the transfer area of the thermal donor media with each of the receiving media; and



connecting means included in said housing means for supplying said reservoir with said fresh ink supply from said ink cartridge in said housing means;

said housing means comprising a first stop for holding said cartridge in a first position separated from said connecting means, and a second stop for holding said cartridge in a second position in engagement with said connecting means, and said cartridge comprising a stop element cooperating selectively with said first and second stops.

5,555,008

PROCESS FOR ALLEVIATING BLEED IN PRINTED ELEMENTS

John L. Stoffel, San Diego, Calif.; Arthur C. Shor, Concordville, Pa.; Harry J. Spinelli, Wilmington, Del.; Sheau-Hwa Ma, Chadds Ford, Pa.; Howard Matrick, Highlands, N.J.; Mark L. Choy, Escondido, Calif., and Loren E. Johnson, Corvallis, Oreg., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 85,782, Jul. 6, 1993, abandoned. This application Apr. 6, 1994, Ser. No. 223,787

Int. Cl.[6] B41J *2/21; C09D 11/02*

U.S. Cl. 347—100 **25 Claims**

1. A process for creating a multicolor printed element having reduced color bleed, comprising the steps, in any order, of:

(a) applying an anionic ink to an element, said anionic ink comprising an aqueous medium, a colorant and about 0.1 to 30% by weight of an anionic polymer;

(b) applying a cationic ink to said element and in contact with said anionic ink, said cationic ink comprising an aqueous medium, a colorant and 0 to 30% by weight of a cationic polymer.

5,555,009

PRINTING APPARATUS WITH PRESSURE REGULATION

Charles M. Hevenor, Glastonbury; Ronald B. Webster, Vernon; David J. Logan, Bloomfield; Jay T. Niland, Wethersfield; Lisa M. Brant, Middletown; William Loos, Broad Brook; Martin C. Voelker, East Hampton, and Joseph Stempien, Newington, all of Conn., assignors to Gerber Scientific Products, Inc., Manchester, Conn.

Division of Ser. No. 7,662, Jan. 22, 1993. This application May 24, 1995, Ser. No. 447,548

Int. Cl.[6] B41J *25/312*

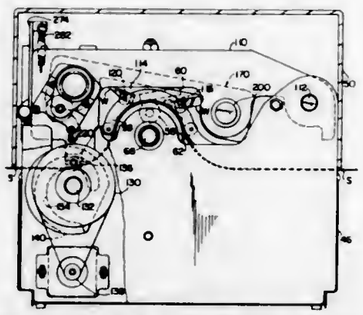
U.S. Cl. 347—198 **5 Claims**

1. A printing apparatus for printing designs, halftones, alphanumeric and other printed matter on sheet material comprising:

a printing head controlled by input signals to generate printed matter on a sheet material during a printing operation;

a printing platen positioned to support the sheet material relative to the printing head during a printing operation;

pressure generating means connected to the printing head and the printing platen for producing pressure at different levels between the printing head and the sheet material during a printing operation, the pressure generating means including a rotary cam on an axis of rotation with a cam slot extending



along a curved path from an exit point in the slot at the periphery of the cam toward the axis of rotation of the cam, and a cam follower engageable with and disengageable from the cam slot at the exit point, the rotary cam and the cam follower being connected with the printing head and the printing platen to move the head and platen into and out of engagement and to adjust the printing pressure between the head and sheet material at different measure levels upon rotation of the cam, the head and platen also being movable further away from one another when the cam follower disengages from the cam slot at the exit point.

5,555,010

REWRITABLE RECORDING APPARATUS

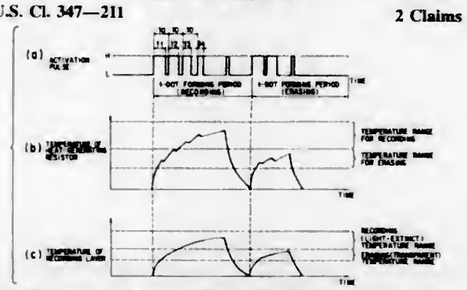
Tadayoshi Ohno; Takashi Yamaguchi, and Shinichi Itoh, all of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 27, 1992, Ser. No. 858,638

Claims priority, application Japan, Mar. 29, 1991, 3-089008

Int. Cl.[6] B41J *2/325*

U.S. Cl. 347—211 **2 Claims**



1. A recording apparatus for recording pixels on a storage medium by displaying pixels thereon when heated to a first temperature range and permitting erasing of said pixels when heated to a second temperature range, said apparatus comprising:

thermal head means for applying thermal energy to said storage medium, said thermal head means including a plurality of heat-generating resisters and means for performing pixel recording and pixel erasing at the same time by applying thermal recording energy and thermal erasing energy, respectively to said storage medium;

determining means for determining electrical pulses, in a one-pixel recording period, having multiple active-level signals for causing said plurality of heat-generating resistors to supply thermal energy to said storage medium in accordance with a pixel which is an on-mode signal or an off-mode signal; and

drive means for driving said plurality of heat-generating resistors based on said electrical pulses so as to change the temperature of said storage medium to said first temperature range when a pixel to be recorded is said on-mode signal and to change the temperature of said storage medium to said

second temperature range when said pixel to be recorded is said off-mode signal; and

wherein said determining means includes means for producing said electrical pulses whose active level signals have pulse widths that become sequentially shorter.

5,555,011

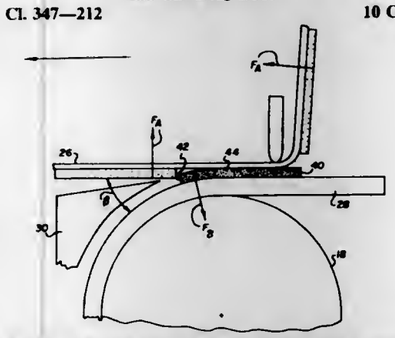
LAMINATION OF A PROTECTIVE LAYER OVER AN IMAGE PRODUCED BY A THERMAL PRINTER

Manh Tang, Penfield; Kin K. Lum, Webster, and James E. Pickering, Holcomb, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 26, 1994, Ser. No. 187,240

Int. Cl.[6] B41J *2/325*

U.S. Cl. 347—212 **10 Claims**



7. A process for producing thermal prints having a protective layer of laminate material, said process comprising the steps of:

(a) printing a color image onto a receiver medium;

(b) applying a laminate material over the color image by advancing the receiver medium and a donor web past a heat source such that a portion of a patch of laminate material carded by a donor web is applied to the receiver medium over the color image; and

(c) rewinding the receiver medium and the donor web along diverging paths after applying a last line of laminate material such that a trailing edge of said portion of the laminate material tends to break cleanly away from a portion of the laminate material not applied to the receiver medium, leaving a straight, even trailing edge.

5,555,012

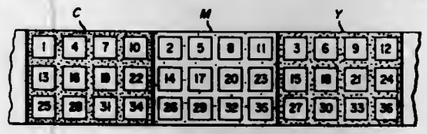
METHOD AND APPARATUS FOR IMPROVED USE OF THERMAL DONOR MEDIA

Richard N. Ellson, and Lawrence A. Ray, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 1, 1994, Ser. No. 251,871

Int. Cl.[6] B41J *35/32;35/00;17/00*

U.S. Cl. 347—217 **16 Claims**



1. A method for positioning a thermal donor media having a plurality of transfer panels each having a transfer area that is greater than the total area of a number of receiving media such that a single transfer panel can provide an area of donor exclusively to each of the number of receiving media, comprising the steps of:

determining the transfer area of a transfer panel of the thermal donor media;

determining the area of each of the number of receiving media; identifying an individual portion of the transfer area of the thermal donor media with each of the receiving media; and

positioning each transfer area with its identified receiving media and performing a donor transfer.

5,555,013

DRIVING DEVICE FOR DRIVING AND END-LUMINESCENT LINE HEAD

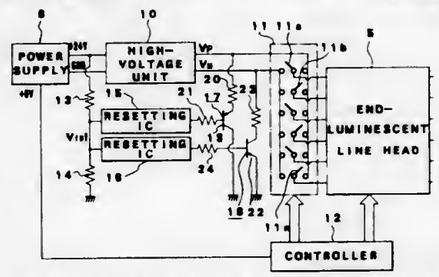
Hidekazu Mori, and Juntaro Oku, both of Shizuoka, Japan, assignors to Kabushiki Kaisha TEC, Shizuoka, Japan

Filed Aug. 19, 1993, Ser. No. 108,304

Claims priority, application Japan, Aug. 20, 1992, 4-221040

Int. Cl.[6] B41J *2/47;2/435;* **H02H** *7/10*

U.S. Cl. 347—237 **6 Claims**



1. A driving device for driving an end-luminescent line head provided with an array of a plurality of end-luminescent EL elements, said driving device comprising:

a power supply having an output side;

a high-voltage unit having an input side connected to the output side of the power supply to receive power from the power supply, and output terminals at which a positive voltage and a negative voltage appear, respectively;

a driver having an input side connected to the output terminals of the high-voltage unit and an output side connected to the end-luminescent line head;

voltage detecting means connected to said output of said power supply for detecting a drop of an output voltage of the power supply; and

means for grounding having one side connected to the output side of the high-voltage unit and the other side connected to ground, and being closed when the voltage detecting means detects the drop of the output voltage of the power supply so as to connect the output side of the high voltage unit to ground.

5,555,014

PRINTING APPARATUS

Koji Matsukawa, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

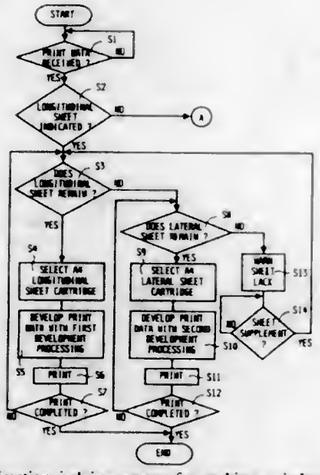
Filed Feb. 4, 1994, Ser. No. 191,080

Claims priority, application Japan, Apr. 14, 1993, 5-112128

Int. Cl.[6] H04N *1/21*

U.S. Cl. 347—262 **18 Claims**

1. A printing apparatus including a longitudinal sheet storing device for storing sheets to be supplied in a longitudinal direction, a lateral sheet storing device for storing the same size sheets as the sheets stored in the longitudinal sheet storing device, to supply the same size sheets in a lateral direction, and a sheet feeding mechanism for feeding to a printing unit a sheet which is stored in either one of the longitudinal sheet storing device and the lateral sheet storing device, the sheet fed from the sheet feeding mechanism being subjected to the printing operation in the printing unit, the printing apparatus further comprising:



sheet direction judging means for making a judgment as to whether a print-direction indicated sheet is stored in one of said longitudinal sheet storing device and said lateral sheet storing device;

sheet presence judging means for judging the presence of a sheet in said one of said longitudinal and lateral sheet storing devices which is identified as storing the print-direction indicated sheet by said sheet-direction judging means;

sheet storing device selecting means for selecting said one of said longitudinal sheet storing device and said lateral sheet storing device which stores the print-direction indicated sheet when the presence of any sheet is judged by said sheet presence judging means and making said sheet feeding mechanism carry out a feeding operation;

sheet storing device switching means for switching the selected sheet storing device to the other storing device which stores sheets whose print direction is different from that of the print-direction indicated sheet when the absence of any sheet is judged by said sheet presence judging means and making said sheet feeding mechanism carry out the feeding operation; and

print data developing means for developing print data to meet the switched print direction when said one of said longitudinal sheet storing device and said lateral sheet storing device is switched to the other storing device by said sheet storing device switching means.

5,555,015

WIRELESS TWO WAY TRANSMISSION BETWEEN CENTER AND USER STATIONS VIA A RELAY

Erwin Aguayo, Jr., Columbia, Md., and Steven J. Crowley, Washington, D.C., assignors to Intrinzix Technologies, Inc., Gaithersburg, Md.

Filed Mar. 20, 1995, Ser. No. 406,529

Int. Cl.[6] H04N *7/173*

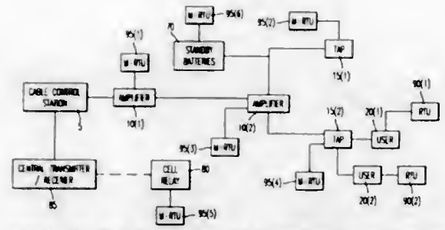
U.S. Cl. 348—6 **13 Claims**

1. A communication system for a cable television system in which a central location transmits signals along a coaxial cable to a user unit through a tap, comprising:

a central transmitting/receiving unit for wirelessly transmitting a first signal generated at the central location and for receiving a second signal;

a first response unit for receiving the first signal wirelessly transmitted from the central transmitting/receiving unit and for generating and wirelessly transmitting the second signal to be received by the central transmitting/receiving unit;

a second response unit connected to the tap, and wherein the second response unit generates a third signal;



wherein the first response unit is connected to the tap and received the third signal, and wherein the third signal comprises command signals to control an operation of the tap connected to the first response unit, and the second signal includes an indication of the command signals of the third signal.

5,555,016

VIDEO SIGNAL DISTRIBUTION SYSTEM

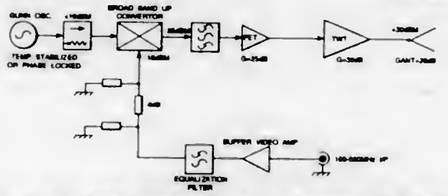
John G. L. Rhodes, deceased, late of Cornwall; Ronald Turner, executor, Malmesbury; Mervyn K. Hobden, Lincoln; Alan T. Wilson, Lincoln, and Graham M. Hilder, Lincoln, all of United Kingdom, assignors to Plessey Semiconductors Limited, and MCEL P.L.C., both of United Kingdom

Filed Jun. 17, 1994, Ser. No. 261,455

Claims priority, application United Kingdom, Jul. 6, 1993, 9313969; Mar. 29, 1994, 9406185

Int. Cl.[6] H04N *7/16*

U.S. Cl. 348—6 **5 Claims**



1. A video signal distribution system for transmitting a wide-band composite signal having a plurality of video signals modulated on respective sub-carriers of respective different frequencies spaced over a band of frequencies, said distribution system comprising: a microwave point-to-point radio link including a transmitter arrangement having balanced modulator means for amplitude modulating said composite signal onto a microwave carrier frequency signal to provide a double side-band suppressed carrier amplitude modulated signal, means for combining said amplitude modulated signal with a carrier frequency reference signal, means for adjusting the relative phase and amplitude of said microwave carrier frequency signal and said carrier frequency reference signal to provide a substantially pure double side-band amplitude modulated combined signal, and means for amplifying said combined signal for transmission over said microwave point-to-point radio link.

5,555,017

SEAMLESS MULTIMEDIA CONFERENCING SYSTEM USING AN ENHANCED MULTIPOINT CONTROL UNIT

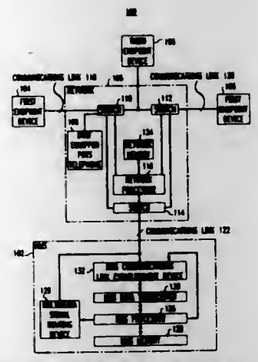
Diane G. Landante, East Brunswick; Dale L. Skran, Marlboro, and Arthur R. Snowdon, Tinton Falls, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jul. 8, 1994, Ser. No. 272,349

Int. Cl.[6] H04M *11/00*; **H04N** *7/15*

U.S. Cl. 348—15 **7 Claims**

1. A method for implementing a multimedia conference in a system comprising



i) a network including a plurality of network communications links, each network communications link being associated with a network address;

ii) a multimedia server (MMS) coupled to the network and comprising

a) multimedia bridge means for mixing and switching multimedia electronic signals representing audio, video, data, and control among a plurality of endpoint devices through the network;

b) MMS communications link establishment means for establishing multimedia communications links on the network;

c) MMS network address transceiver for transmitting and receiving network addresses over the network;

d) processing means comprising a microprocessor; and

e) memory means;

iii) a plurality of endpoint devices, including a first and a second endpoint device, each endpoint device comprising

a) user interface means for accepting input from a user and for providing multimedia output to a user, the multimedia output including at least one of audio, video, and data;

b) endpoint communications link establishment means for establishing communications links on the network;

c) an endpoint network address transceiver for transmitting and receiving network addresses over the network;

d) processing means including a microprocessor; and

e) memory means;

THE METHOD INCLUDING THE STEPS OF:

a) the network assigning the MMS a network address uniquely specifying a particular MMS; and

b) the MMS responding to BAS DTMF commands issued by endpoint devices.

5,555,018

LARGE-SCALE MAPPING OF PARAMETERS OF MULTI-DIMENSIONAL STRUCTURES IN NATURAL ENVIRONMENTS

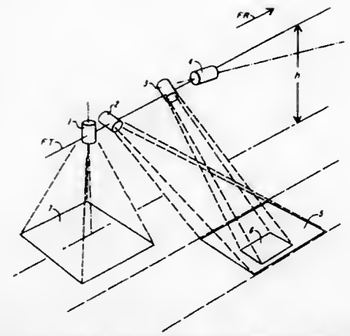
Heiko S. von Braun, Tankenrain Salzgruben 2, Weilheim D-8120, Germany

Continuation-in-part of Ser. No. 573,022, Apr. 25, 1991, abandoned. This application Jul. 5, 1994, Ser. No. 270,421

Int. Cl.[6] H04N *7/18*

U.S. Cl. 348—144 **22 Claims**

1. A method for the large-scale mapping of parameters of multidimensional structures in natural environments, characterized in that the natural environment or range to be mapped or sections thereof are detected during first picture-taking flights at a flight altitude between about 150 and 500 m above ground by means of series aerial surveying pictures taken by reconnaissance cameras (2) in combination with tele-cameras (3) for making detailed images from the range section covered by said reconnaissance cameras (2), the series aerial surveying pictures are set with respect to their position in said range by means of orientation aids and



evaluated using photogrammetric techniques, and the range data obtained of a structure are assigned to the coordinates of the structure in the range for selective retrieval.

5,555,019

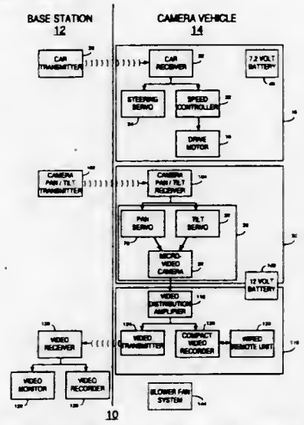
MINIATURE VEHICLE VIDEO PRODUCTION SYSTEM

Kevin Dole, 23427 Park Hacienda, Calabasas, Calif. 91302-1718

Filed Mar. 9, 1995, Ser. No. 401,932

Int. Cl.[6] H04N *7/18*

U.S. Cl. 348—148 **19 Claims**



1. A vehicle video production system for creating full-motion real time video images of a target vehicle, the system comprising:

a miniature vehicle;

a first wireless transmitter;

a first wireless receiver operatively coupled to the miniature vehicle and configured to control movement of the miniature vehicle in response to signals received from the first wireless transmitter;

a video camera attached to the miniature vehicle for generating real-time video images of the target vehicle;

a camera controller connected to the video camera to control movement of the video camera relative to the miniature vehicle;

a second wireless transmitter;

a second wireless receiver operatively coupled to the camera controller and configured to control movement of video camera in response to signals received from the second wireless transmitter;

a video recorder operatively coupled to the video camera configured to record the real time video images generated by the video camera, the video recorder operatively mounted in the miniature vehicle; and

a video display device operatively coupled to the video camera for displaying the real time video images where movement of

a control means which controls the output of said aperture signal producing circuit on the basis of said at least one of the

a video display device operatively coupled to the video camera for displaying the real time video images where movement of the miniature vehicle and movement of the video camera are controlled in real time in response to the video images displayed on the display device to obtain optimal video images of the target vehicle.

5,555,020

SOLID-STATE IMAGING APPARATUS

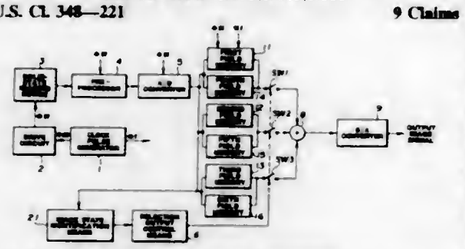
Hideaki Ishihara; Kiyoshi Tsuji, and Akihiko Mochida, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 52,909, Apr. 27, 1993, abandoned. This application Mar. 27, 1995, Ser. No. 412,202

Claims priority, application Japan, Apr. 30, 1992, 4-111812; Apr. 12, 1993, 5-084923

Int. Cl.[6] H04N *5/235;5/225;5/335*

U.S. Cl. 348—221 **9 Claims**



1. A solid-state imaging apparatus, comprising:

a fast driving means that drives a solid-state imaging device at a high speed for a charge accumulation time for one screen in the solid-state imaging device obtaining a signal which can be displayed as an independent screen; that is, for one of time intervals corresponding to a plurality of divisions of a one-field period in a television signal mode, so as to obtain a pixel output which can be displayed as an independent screen in every time interval;

a fast transfer means for transferring pixel outputs of said solid-state imaging device at a high speed;

a memory means in which image signals sent from said fast transfer means are stored screen by screen;

a selection output control means that reads the image signals stored screen by screen in said memory means by converting the time bases into the one for a one-field period in said television signal mode, and automatically selects for output one or more of the plurality of read image signals depending on a state of a subject; and

an adding means for adding the image signals selected by said selection output control means and providing an output image signal.

5,555,021

COMPACT TELEVISION CAMERA WITH SWITCHING NOISE PREVENTION

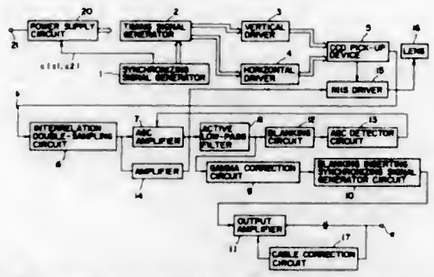
Shigemi Igarashi, Kawasaki, Japan, assignor to Watec America Corporation, Westlake Vlg, Calif.

Continuation of Ser. No. 167,409, Dec. 14, 1993, abandoned. This application Mar. 14, 1995, Ser. No. 403,577

Int. Cl.[6] H04N *5/225*

U.S. Cl. 348—222 **1 Claim**

1. A circuit for improving the compactness of a compact television camera comprising; synchronizing signal generating means; a voltage doubling charging power supply connected to receive a synchronizing pulse from said synchronizing signal generating means, said voltage doubling charging power supply having an input switching transistor receiving said synchronizing pulse from said synchronizing signal generating means for turning said voltage doubling charging power supply on and off at preselected periods; timing signal generating means connected to receive a timing pulse from said synchronizing signal generating means; a vertical driver and a horizontal driver receiving the output from said timing signal generating means for generating vertical and horizontal scanning signals respectively; CCD pick-up means receiving said vertical and horizontal scanning signals from said timing signal generating means and outputting a video signal; a fourth harmonic active low pass filter means receiving a video signal from said CCD pick-up means, said fourth harmonic active low pass filter means comprised of a pair of second harmonic active filters in tandem having emitter follower amplifiers with a gain of one for eliminating high frequency components of said video signal; blanking circuit means for blanking said circuit video signal received from said fourth harmonic active low pass filter means; output amplifying means receiving the output of said fourth harmonic active low pass filter for amplifying and producing a video output signal; said synchronizing signal generating means producing said pulse to turn said voltage doubling charging power supply on or off during a blanking period produced by said blanking circuit means; said on and off pulses from said signal generating means having a falling and rising edge during a blanking period or a falling edge during a first blanking period and a rising edge during the next blanking period; said rising and falling edges being synchronized with the beginning and end of said blanking period; and an image enhancing circuit comprised of a parallel RC circuit, a series RC circuit in series with said parallel RC circuit receiving the output of said fourth harmonic active low pass filter means for heightening the contour of an image; whereby the size of said compact television camera can be reduced.



5,555,022

WHITE BALANCE ADJUSTING APPARATUS FOR AUTOMATICALLY ADJUSTING WHITE BALANCE IN RESPONSE TO COLOR INFORMATION SIGNAL OBTAINED FROM IMAGE SENSING DEVICE

Toshinobu Haruki, Shijonawate, and Kenichi Kikuchi, Daito, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Division of Ser. No. 612,831, Nov. 13, 1990, Pat. No. 5,442,408. This application May 31, 1995, Ser. No. 454,835

Claims priority, application Japan, Nov. 17, 1989, 1-300239; Dec. 26, 1989, 1-337352; Feb. 28, 1990, 2-47915; Mar. 9, 1990, 2-58652; Mar. 28, 1990, 2-80102; Apr. 5, 1990, 2-90902

Int. Cl.[6] H04N *9/23*

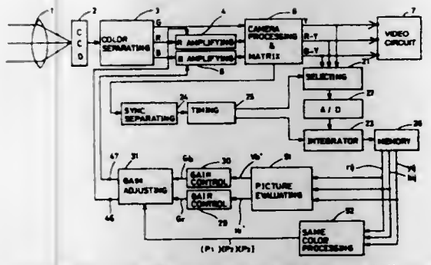
U.S. Cl. 348—223 **4 Claims**

1. A white balance adjusting apparatus for automatically adjusting white balance in response to a plurality of color difference signals obtained from an image sensor having a lens and an image sensing device, comprising:

means for amplifying each of red and blue signals, contained within color information signals, with a corresponding variable gain so as to yield amplified signals and, in response thereto, forming the plurality of said color difference signals;

means for dividing a picture, produced by the image sensor, into a plurality of regions;

means for integrating respective ones of said plurality of color difference signals so as to convert said respective ones of the



plurality of color difference signals into a corresponding color evaluating value for each of said plurality of regions;

means for controlling the corresponding variable gain in response to the corresponding color evaluating value of each of the plurality of regions, wherein said variable gain controlling means comprises means for weighting the corresponding color evaluating value of each of said plurality of regions with a corresponding weight for each of said regions; and

means for restricting a degree towards which the corresponding color evaluating value controls the corresponding variable gain whenever the corresponding color evaluating value of each of said plurality of regions lies outside a predetermined range, wherein said restricting means comprises means for reducing the weight for the corresponding color evaluating value whenever the corresponding color evaluating value of each of said plurality of regions lies outside of a predetermined range.

5,555,023

PROCESSING CIRCUIT FOR VIDEO CAMERA WHICH PREVENTS A FALSE APERTURE SIGNAL FROM BEING GENERATED

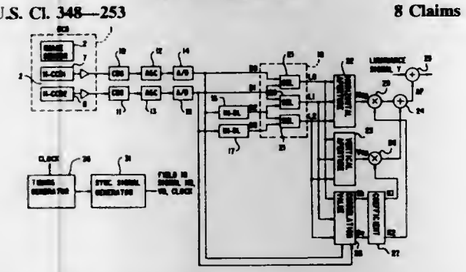
Akihiro Maenaka, Moriguchi; Yukio Mori, Yawata; Haruhiko Murata, Takatsuki; Hirokazu Ide, Osaka, and Hidefumi Okada, Daito, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Apr. 25, 1995, Ser. No. 429,295

Claims priority, application Japan, Apr. 26, 1994, 6-088502

Int. Cl.[6] H04N *9/68*

U.S. Cl. 348—253 **8 Claims**



1. A signal processing circuit for a video camera which comprises a solid-state image sensing device including a large number of pixels arranged in a matrix fashion, and a plurality of kinds of color filters having spectral sensitivity characteristics different from each other arranged in a mosaic fashion, said circuit comprising:

an aperture signal producing circuit which outputs an aperture signal for performing an image enhancement in at least one of a horizontal direction and a vertical direction;

a correlation value detecting means which detects at least one of a horizontal correlation value and a vertical correlation value; and

a control means which controls the output of said aperture signal producing circuit on the basis of said at least one of the horizontal correlation value and the vertical correlation value.

5,555,024

TRANSMITTERS FOR BURYING DIGITAL SIGNALS WITHIN THE TRACE AND RETRACE INTERVALS OF NTSC TELEVISION SIGNALS

Allen L. Limberg, Vienna, Va., assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Continuation of Ser. No. 363,115, Dec. 23, 1994, abandoned. This application Sep. 7, 1995, Ser. No. 524,488

Int. Cl.[6] H04N *7/08*

U.S. Cl. 348—473 **41 Claims**

1. A data signal transmitted simultaneously with a television signal through the same television transmission channel; said television signal comprising a video carrier the amplitude of which is modulated in accordance with a video signal descriptive of the scanning of a succession of image frames as scanned one scan line after another at a prescribed video line rate, or scan line frequency; said image frames occurring at a prescribed video frame rate; said data signal modulating a data carrier having a frequency differing from that of said video carrier by a prescribed frequency offset, and having no image on the other side of said video carrier; said data signal having a symbol rate that is a multiple of said prescribed video line rate, having data frames occurring at a data frame rate that is the same as said video frame rate, and customarily having each of the symbols in said data signal that are transmitted in each of alternate data frames being transmitted again but in opposite phase during the next data frame.

5,555,025

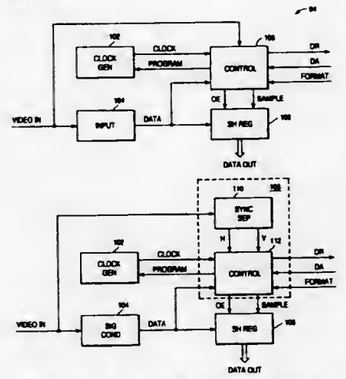
APPARATUS AND METHOD FOR PERFORMING ASYNCHRONOUS MULTI-STANDARD VBI DATA EXTRACTION

Kelly M. McArthur, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 7, 1995, Ser. No. 484,919

Int. Cl.[6] H04N *7/087*

U.S. Cl. 348—478 **27 Claims**



1. A circuit for decoding Vertical Blanking Interval (VBI) television data having any one of a plurality of VBI formats, comprising:

an input circuit coupled to receive a television signal and to output in response thereto digital VBI data at a data frequency;

a register coupled to receive and store the VBI data;

a programmable clock generator receiving a program signal and generating a clock signal having a frequency determined by the program signal, wherein the clock signal is asynchronous with the VBI data; and

a control circuit coupled to receive the VBI data, the clock signal, and a format signal indicating which VBI format is to be decoded, wherein the control circuit provides the program signal based on the format signal, and wherein the control circuit provides a sample signal at the data frequency in response to the clock signal and the VBI data to cause the register to load VBI data at approximately the midpoint in time of each bit of VBI data.

5,555,026

METHOD AND APPARATUS FOR STABILIZING A VIDEO STATE OF A VIDEO DISPLAY HAVING A PICTURE-IN-PICTURE FUNCTION

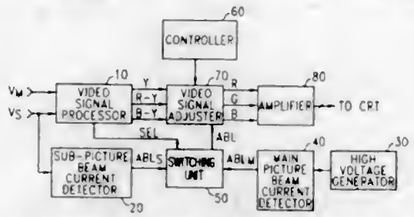
Kab-keun Lee, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Dec. 7, 1994, Ser. No. 351,534

Claims priority, application Rep. of Korea, Dec. 7, 1993, 93-26719

Int. Cl.[6] H04N *5/45;5/59*

U.S. Cl. 348—565 **13 Claims**



1. An apparatus for stabilizing a video state of picture-in-picture images having a main picture and a sub-picture which exists within the main picture, said apparatus comprising:

a cathode ray tube (CRT) for displaying a picture in response to an input video signal;

a video signal processor which receives a main video signal corresponding to the main picture and a sub-video signal corresponding to the sub-picture, for multiplexing the main video signal and the sub-video signal so that the sub-picture is displayed within the main picture, and generating a selection control signal based on the multiplexed main video signal and the multiplexed sub-video signal;

means for generating a main picture automatic beam limiting (ABL) control signal based on a main-picture beam current derived from said CRT, wherein said main-picture beam current corresponds to said main video signal;

means for generating a sub-picture automatic beam limiting (ABL) control signal based on a sub-picture beam current which would be produced in said CRT by said sub-video signal;

a switching unit for receiving said main picture ABL control signal and said sub-picture ABL control signal, selecting and outputting one of the received control signals according to said selection control signal; and

a video signal adjuster for receiving the video signals supplied from the video signal processor, adjusting characteristics of the received video signals according to the ABL control signal output from said switching unit and supplying the adjusted video signals to said CRT, to adjust characteristics of the main picture and the sub-picture.

5,555,027

VIDEO PROCESSOR FOR ENLARGING AND CONTRACTING AN IMAGE IN A VERTICAL DIRECTION

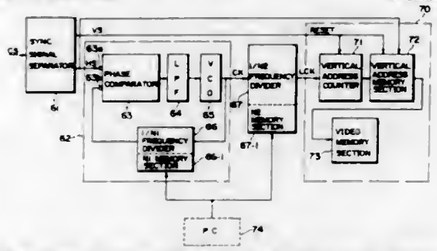
Kesatoshi Takeuchi, Suwa, Japan, assignor to Seiko Epson Corp., Nagano-ken, Japan

Continuation of Ser. No. 212,643, Mar. 11, 1994, Pat. No. 5,422,678, which is a continuation of Ser. No. 930,549, Sep. 29, 1992, abandoned. This application Feb. 16, 1995, Ser. No. 390,679

Claims priority, application Japan, Jan. 29, 1991, 8967

Int. Cl.[6] H04N *5/262*

U.S. Cl. 348—581 **4 Claims**



1. A video processor having a video memory for storing a luminance signal of a video signal, and performing enlargement or contraction in a vertical direction of an image, said video processor comprising:

a synchronous circuit including a first frequency divider for deriving a first clock signal from a horizontal synchronizing signal of the video signal, the first clock signal being synchronous in phase with, and having a higher frequency than, the horizontal synchronizing signal; and

an output circuit for frequency dividing the first clock signal to form a second clock signal and for applying the second clock signal to the video memory as a line clock signal for incrementing a vertical address of the video memory.

5,555,028

POST-PROCESSING METHOD AND APPARATUS FOR USE IN AN IMAGE SIGNAL DECODING SYSTEM

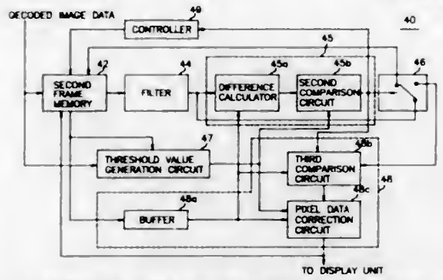
Sang-Ho Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Jun. 29, 1995, Ser. No. 496,588

Claims priority, application Rep. of Korea, Jun. 30, 1994, 94-15373

Int. Cl.[6] H04N *5/21*

U.S. Cl. 348—607 **10 Claims**



1. A method, for use in an image signal decoding system, for post-processing, on a pixel-by-pixel basis, decoded image data of a predetermined number of pixels in a current frame from an image signal decoder included in the image signal decoding system, comprising the steps of:

(a) storing the decoded image data of the current frame to sequentially generate target pixel data from the stored decoded image data, said target pixel data representing the value of a pixel to be filtered;

(b) filtering the target pixel data to thereby produce filtered target pixel data;

(c) calculating an absolute difference value between an original target pixel data and the filtered target pixel data;

(d) selectively generating a first or a second predetermined threshold value based on the decoded image data and the target pixel data;

(e) updating the target pixel data with the filtered target pixel data if the absolute difference value is smaller than the generated threshold value;

(f) repeating said steps (b) to (e) T times if the absolute difference value is smaller than the generated threshold value and updating the target pixel data with corrected target pixel data if the absolute difference value is equal to or larger than the generated threshold value, wherein T is a positive integer and the corrected target pixel data is derived by adding to the original target pixel data the generated threshold value if the original target pixel data is smaller than the filtered target pixel data, and by subtracting the generated threshold value from the original target pixel data if the original target pixel data is greater than the filtered target pixel data; and

(g) repeating said steps (b) to (f) for a next target pixel until all of the pixels included in the decoded image data of the current frame are post-processed.

5,555,029

METHOD AND APPARATUS FOR POST-PROCESSING DECODED IMAGE DATA

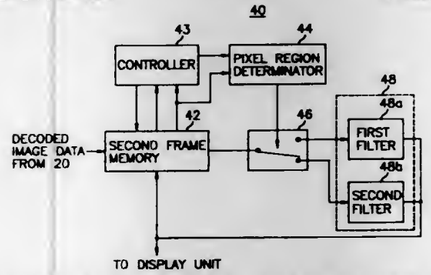
Sang-Ho Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 28, 1995, Ser. No. 508,643

Claims priority, application Rep. of Korea, Jul. 29, 1994, 94-18660

Int. Cl.[6] H04N *5/21*

U.S. Cl. 348—607 **4 Claims**



1. A method, for use in an image signal decoding system, for post-processing, on a pixel-by-pixel basis, decoded image data of a predetermined number of pixels in a current frame from an image signal decoder included in the image signal decoding system, comprising the steps of:

(a) storing the decoded image data of the current frame;

(b) assigning each pixel value included in the stored decoded image data as a target pixel value in sequence, said target pixel value representing the value of a target pixel to be filtered, and producing information representing the position of the target pixel;

(c) generating a selection signal indicating whether or not the target pixel belongs to a boundary region of a block in the stored decoded image data by using the position information of the target pixel, wherein the boundary region denotes a region which includes pixels placed along the boundary of the block;

(d) selectively filtering the target pixel value in response to the selection signal to thereby produce a filtered target pixel value;

(e) updating the target pixel value with the filtered target pixel value; and

(f) repeating said steps (b) to (e) for a next target pixel until all of the pixels included in the decoded image data of the current frame are post-processed.

5,555,030

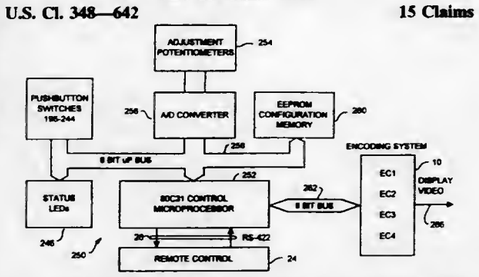
COMPONENT VIDEO SIGNAL TO COMPOSITE VIDEO SIGNAL ENCODING SYSTEM, CONTROL SYSTEM AND METHOD

Sohei Takamoto, Fremont; Douglas J. George, Sunnyvale, and Luigi C. Gallo, Woodside, all of Calif., assignors to Accom, Inc., Menlo Park, Calif.

Continuation of Ser. No. 424,792, Oct. 20, 1989, abandoned. This application Jan. 5, 1993, Ser. No. 808

Int. Cl.[6] H04N *11/00*

U.S. Cl. 348—642 **15 Claims**



1. A control system for an encoding system, said encoding system receiving data associated with input signal processing encoding parameters and in response to said parameter data encoding input color signals of a component video signal into an output composite video signal, the control system comprising:

a control processor;

external means, coupled to said control processor, for providing user selectable input signal processing parameter data to said control processor;

said external means including selector means for selecting between a first and a second data mode for at least one of said input signal processing parameters and adjustment means for adjusting an input data value over a predetermined fixed range of values for at least a second one of said input signal processing parameters;

interface means coupled between said control processor and said encoding system for providing an input signal processing parameter configuration to said encoding system, said parameter configuration including said user selectable input signal processing parameter data;

wherein said input signal processing parameters include a parameter selected from the group consisting of (a) a prefiltering characteristic, including prefiltering bypassing, affecting prefiltering of input chrominance and input luminance signals resulting from said color signals used by said encoding system to produce said composite video signal, (b) a gain adjustment characteristic affecting compensation for deviations from a standard value of amplitude of said color signals, (c) a compensation adjustment affecting compensation for saturation of said color signals, (d) a clipping adjustment affecting a maximum clipping amplitude level of said color signals, (e) a clipping mode parameter affecting selection of clipping mode, (f) a chrominance bandwidth filtering characteristics affecting chrominance filtering for said composite video signal, (g) an input signal blanking disabling parameter that enables an input blanking signal to pass through said encoding system, (h) an in-phase/quadrature I/Q filter parameter affecting chroma-bandwidth of said encoding system, (i) a monochrome/color mode parameter affecting color encoding of said encoding system, (j) a sync parameter affecting compensation of an input time delay associated with said encoding system, (k) an output time parameter affecting compensa-

tion of an output time delay associated with said encoding system including chrominance phase adjustment for said com-

creating a region by merging said current block and said selected potential block, and estimating for said region a set of error

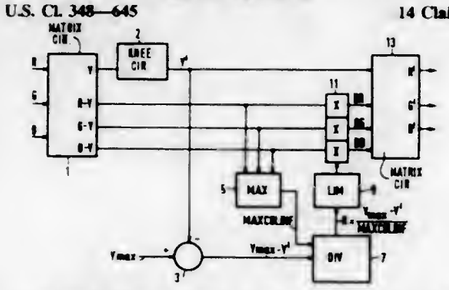
tion of an output time delay associated with said encoding system including chrominance phase adjustment for said composite video signal, (l) a setup parameter affecting a luminance offset associated with said composite video signal, and (m) a standard parameter resulting in PAL-standard or NTSC-standard encoding of said output composite video signal.

5,555,031

ADAPTIVE VIDEO SIGNAL COMPRESSION

Johannes H. J. M. Van Rooij, 's-Hertogenbosch, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 3, 1994, Ser. No. 317,145
Claims priority, application Belgium, Oct. 1, 1993, 09301030
Int. Cl.[6] H04N *5/68*
U.S. Cl. 348—645 **14 Claims**



1. A video signal processing circuit for realizing an adaptive signal compression, comprising:

first means for supplying color difference signals and a luminance signals from applied color signals; and

color saturation control means, coupled to said first means, for limiting at least one color signal exceeding a corresponding maximum value by multiplying the color difference signals by a same correction factor, wherein the color saturation control means comprises:

means for obtaining a maximum value of three color difference signals;

means for determining a difference between a maximally allowed luminance signal value and a value of said luminance signal; and

means for obtaining the correction factor in dependence on the difference between the maximally allowed luminance signal value and the luminance signal value, and the maximum value of the three color difference signals.

5,555,032

INTEGRATED CIRCUIT FOR ECONOMIZING POWER CONSUMPTION OF A MONITOR BY USING TWO REFERENCE VALUES FOR DISCRMINATING THE INPUT SIGNAL

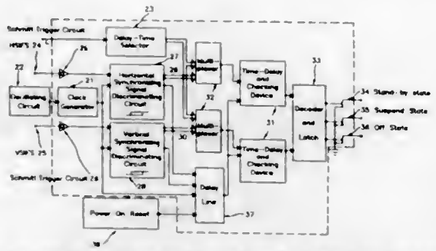
Yung-Keng Kung, Hsin, Taiwan, assignor to Weltrend Semiconductor, Inc., Hsin, Taiwan

Filed May 9, 1994, Ser. No. 239,737
Int. Cl.[6] H04N *5/63*
U.S. Cl. 348—730 **24 Claims**

1. An integrated circuit adapted to be used with a monitor for power management and responsive to at least one synchronizing signal on an input signal, comprising:

a signal discriminator for storing two reference values for each of said at least one synchronizing signal and generating an output signal according to a comparison between said two reference values and said input signal;

a clock generator adapted to be electrically connected to an external oscillating circuit generating an oscillating signal, and receiving and processing said oscillating signal to provide a clock for said integrated circuit for power management; and



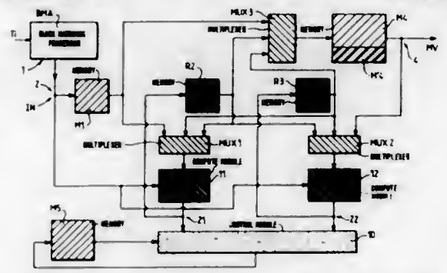
a decoder for decoding said output signal to enable said monitor in a desired state.

5,555,033

METHOD AND DEVICE FOR ESTIMATING MOTION OF OBJECTS IN SUCCESSIVE ANIMATED IMAGES SUBDIVIDED INTO TOW-DIMENSIONAL BLOCKS OF PIXELS

Paul Bazzaz, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 223,623, Apr. 6, 1994, abandoned. This application Jan. 3, 1996, Ser. No. 582,234
Claims priority, application France, Apr. 7, 1993, 93 04138
Int. Cl.[6] H04N *7/28*
U.S. Cl. 348—699 **8 Claims**



1. A method of estimating motion of objects in a sequence of animated images, said method comprising the steps for processing a current image in the sequence, including:

subdividing said current image into two-dimensional blocks arranged in rows and columns, and estimating, for each block, a set of error data, and based on said set, a unique motion vector attributed to the corresponding block;

minimizing the number of motion vectors in the current image by creating and growing regions formed by merging adjacent blocks having coherent motion vectors, and by attributing to each created or grown region a unique motion vector which is coherent with the motion vectors of the merged blocks, including the sub-steps:

scanning the blocks of said current image, regularly, row after row and, in each considered row, column after column, in a manner that a current block has at most two previously scanned adjacent blocks referred to as potential blocks, respectively, localized in the same column and in the same row as said current block;

estimating, based on a comparison of the respective sets of error data of potential blocks and current blocks, a first criterion of coherence of motion vectors of potential blocks with respect to the current block, and a second criterion of arbitration between motion vectors of the potential blocks, for selecting, according to said first and second criteria, at most one of said potential blocks having a motion vector coherent with the motion vector of said current block;

creating a region by merging said current block and said selected potential block, and estimating for said region a set of error data and, based on said set, a unique motion vector for said region;

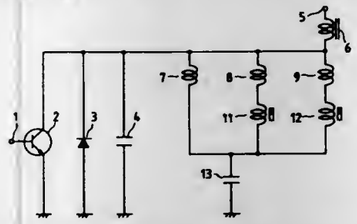
progressively growing said region, referred to as potential region when adjacent to subsequent current blocks, by merging said potential region with one subsequent current block at a time, every time the motion vector of said potential region is coherent with the motion vector of said subsequent current block according to said first and second criteria.

5,555,034

PROJECTION DISPLAY APPARATUS

Toshimitsu Watanabe; Makoto Kitamura, and Takayuki Tanaka, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 17, 1994, Ser. No. 262,336
Claims priority, application Japan, Jun. 30, 1993, 5-161771
Int. Cl.[6] H04N *9/31*
U.S. Cl. 348—746 **32 Claims**



1. A projection display apparatus having three projection tubes for the projection of images of different primary colors, the images from the projection tubes being projected on an enlarged scale onto a screen through projection lenses, comprising:

a first deflection unit having at least a first deflection coil mounted on a neck portion of a first projection tube;

a second deflection unit having at least a second deflection coil mounted on a neck portion of a second projection tube;

a third deflection unit having at least a third deflection coil mounted on a neck portion of a third projection tube; and

a first linearity correction coil coupled in series with a parallel connection of the second deflection unit and only one of the first and third deflection units.

5,555,035

VERY HIGH RESOLUTION LIGHT VALVE WRITING SYSTEM BASED ON TILTING LOWER RESOLUTION FLAT PANELS

Donald C. Mead, Carlsbad; Ronald S. Gold, Fullerton, and Victor J. Fritz, Chino Hills, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

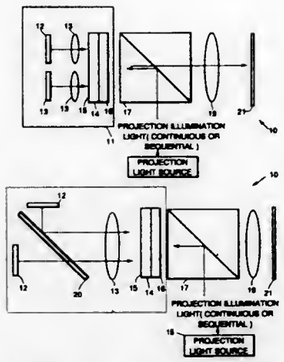
Filed Oct. 3, 1994, Ser. No. 316,782
Int. Cl.[6] H04N *5/74;9/31*
U.S. Cl. 348—757 **29 Claims**

1. Projection apparatus for projecting a relatively large high resolution image on a display screen, said apparatus comprising:

an image source comprising a plurality of tiled image displays, said tiled image displays disposed in an object space of said apparatus;

relay optics disposed along optical paths of images projected by the respective tiled image displays;

a photoactivated reflective liquid crystal light valve disposed along the optical paths of the respective images relayed by the relay optics for receiving the images projected by the tiled image displays imaged onto an input surface thereof;



a polarizing beamsplitter disposed adjacent an output surface of the photoactivated reflective liquid crystal light valve;

an illumination source disposed adjacent the polarizing beamsplitter for providing illumination light that is projected by way of the polarizing beamsplitter onto the output surface of the photoactivated reflective liquid crystal light valve and which is reflected from the output surface back through the polarizing beamsplitter; and

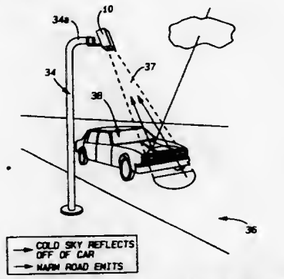
a projection lens disposed adjacent an output surface of the polarizing beamsplitter for projecting the projection illumination light onto the display screen.

5,555,036

PASSIVE MILLIMETER WAVE TRAFFIC SENSOR

Laurence N. Harnett, San Pedro; Mikio L. Yujuri, Torrance, and Merit M. Shoucri, Manhattan Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Continuation-in-part of Ser. No. 992,231, Dec. 17, 1992, abandoned. This application Jan. 26, 1995, Ser. No. 381,361
Int. Cl.[6] G08G *1/00*
U.S. Cl. 340—933 **21 Claims**



1. A sensing device for the passive sensing of millimeter wave ("MMW") signals emanating from a predetermined field of view for determining therefrom information relating to the presence and absence of moving vehicles and a velocity and a length of each said vehicle within said predetermined field of view, said sensing device comprising:

antenna means for receiving said MMW signals;

low noise amplifier means for amplifying a portion of said MMW signal;

detector means for generating a time varying analog signal from said amplified portion of said amplified MMW signal;

analog signal processing means for processing said time varying analog signal;

analog-to-digital converter means for converting said time varying analog signal to a digital signal; and

digital signal processing means for processing said digitized

5,555,040

OPHTHALMIC ILLUMINATION APPARATUS HAVING A

unit converting the beam of light from said concave reflecting mirror into the substantially collimated beam of light;

digital signal processing means for processing said digitized signal along a plurality of processing paths to determine information relating to said presence and absence of said moving vehicles and said velocity and said length of each said vehicle within said predetermined field of view.

5,555,037

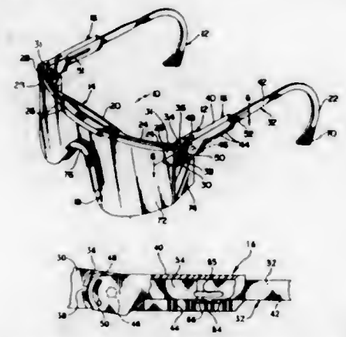
TEMPLE BAR CONSTRUCTION FOR A PAIR OF EYEGLASSES

Richard W. Canavan, East Woodstock, Conn., assignor to Uvex Safety, Inc., Smithfield, R.I.

Continuation-in-part of Ser. No. 984,243, Nov. 30, 1992, Pat. No. 5,381,192, which is a continuation of Ser. No. 741,557, Aug. 7, 1991, abandoned. This application Dec. 28, 1994, Ser. No. 365,575

Int. Cl.[6] G02C *5/20;5/14*

U.S. Cl. 351—118 **13 Claims**



1. A temple bar construction for a pair of eyeglasses comprising telescoping front and rear portions, said rear portion including an elongated body having first and second ends, said front portion being at least partially of generally tubular configuration, said first end of said rear portion being slidably received in said front portion, said front portion having a plurality of longitudinally spaced positioning slots therein, said rear portion including a detent on one edge thereof which is receivable in the positioning slots in the front portion for adjustably securing the relative positions of the front and rear portions, said rear portion having a longitudinally extending opening formed in a central portion of Said body in closely spaced relation to said one edge thereof, said opening forming a resiliently deflectable spring blade having opposing ends which integrally merge with said respective one edge thereof, said detent being disposed at a mid-point on the spring blade of said rear portion between said opposing ends thereof.

5,555,038

UNITARY LENS FOR EYEWEAR

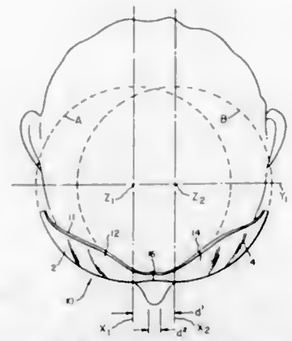
Simon M. Conway, Lima, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 28, 1994, Ser. No. 330,485

Int. Cl.[6] G02C *7/02*

U.S. Cl. 351—159 **15 Claims**

1. A unitary lens for eyewear comprising a top edge, a bottom edge, and first and second lens regions each having an outer surface defined by respective first and second substantially spherical portions, wherein said bottom edge has a central indentation between said lens regions, and a linear distance between the centerpoint of said first substantially spherical portion and the centerpoint of said second substantially spherical portion is from about 0.1 cm to no more than 4.0 cm, and wherein each of the outer surfaces of said first and second lens regions has a radius of curvature of from about 5 to about 7 cm.



5,555,039

EYE MEASURING APPARATUS HAVING AN AUTOMATIC FOGGING PRODUCING MECHANISM AND METHOD THEREOF

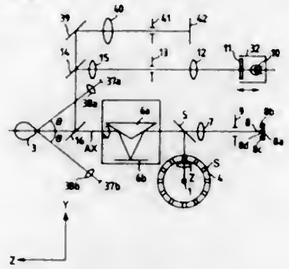
Yoichi Iki, Kawasaki; Nobuyki Miyake, Yokohama, and Yasunori Ueno, Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 192,693, Feb. 7, 1994, abandoned. This application Aug. 22, 1995, Ser. No. 518,021

Claims priority, application Japan, Feb. 10, 1993, 5-021573; Feb. 10, 1993, 5-021574

Int. Cl.[6] A61B *3/10;3/00*

U.S. Cl. 351—205 **33 Claims**



1. An eye measuring apparatus comprising:
- a refracting power detector to measure refracting power values of an eye to be examined in a plurality of meridian directions;
- a fogging producing mechanism to move a position of a target image in a direction of an optical axis of the eye to be examined, thereby performing a fogging operation; and
- a feedback controller to cause said fogging producing mechanism to move the position of said target image in a direction in which accommodation of the eye to be examined is relaxed, in accordance with astigmatic information of the eye to be examined and the refracting power value measured in a predetermined one of the plurality of meridian directions, wherein the astigmatic information is based upon the refracting power values measured in at least two of the plurality of meridian directions and the refracting power value in the predetermined meridian direction takes into account the astigmatic information.

5,555,040

OPHTHALMIC ILLUMINATION APPARATUS HAVING A DEVICE THAT SHADES ILLUMINATING LIGHT

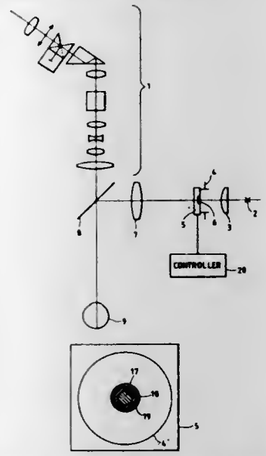
Masanobu Kaneko, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jun. 12, 1995, Ser. No. 489,376

Claims priority, application Japan, Jun. 17, 1994, 6-159575

Int. Cl.[6] A61B *3/10*

U.S. Cl. 351—221 **8 Claims**



1. An ophthalmic illumination apparatus for illuminating an eye to be examined with light, comprising:
- a light source emitting illuminating light;
- a shading device, including an electrical light control element having a transmittance that can be electrically varied, said shading device shading at least part of the illuminating light before the illuminating light illuminates said eye to be examined; and
- a controller that electrically varies the transmittance of said electrical light control element of the shading device.

5,555,041

PROJECTION APPARATUS

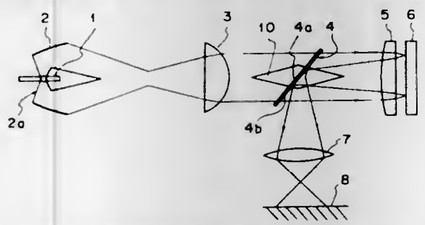
Yuji Manabe, Kamakura, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Apr. 3, 1995, Ser. No. 415,454

Claims priority, application Japan, May 10, 1994, 6-119741

Int. Cl.[6] G03B *21/28*

U.S. Cl. 353—98 **10 Claims**



1. A projection apparatus including:
- a light source having a light emitting portion having a finite size;
- a concave reflecting mirror for and a condenser lens unit that form light from said light source into a substantially collimated beam of light having an inside off-illumination area through which substantially no light from said light source passes, said concave reflecting mirror condensing light from said light source into a beam of light and said condenser lens unit converting the beam of light from said concave reflecting mirror into the substantially collimated beam of light;
- a light valve for reflecting the substantially collimated beam of light from said condenser lens unit and spatially modulating said substantially collimated beam of light on the basis of predetermined image information;
- a projection optical system for imaging the spatially modulated beam of light on a surface;
- a lens group, disposed between said light valve and said projection optical system, for condensing the spatially modulated beam of light from said light valve into said inside off-illumination area of the substantially collimated beam of light formed by said concave reflecting mirror and said condenser lens unit; and
- a light dividing element, disposed between said condenser lens unit and said light valve, for directing the substantially collimated beam of light from said condenser lens unit to said light valve and for directing the beam of light condensed by said lens group to said projection optical system.

5,555,042

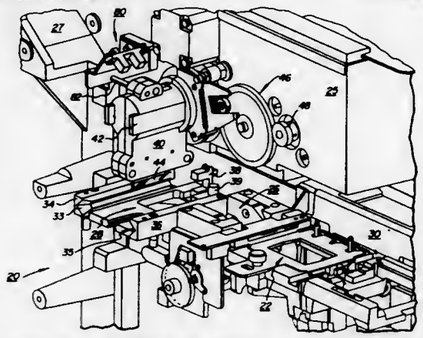
APPARATUS FOR AUTOMATICALLY FEEDING SLIDES INTO A FILM SCANNER

Robert S. Jones, and Thomas W. Mort, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 6, 1994, Ser. No. 319,188

Int. Cl.[6] G03B *23/02;* **H04N** *5/253*

U.S. Cl. 353—103 **17 Claims**



1. Apparatus for automatically feeding a slide from a slide tray slot into a film scanning plane of a slide scanning gate of a film scanner and returning the slide into the tray slot after the scanning process is completed comprising:
- a film scanner frame having an aperture there aligned with said slide scanning gate for allowing the passage of a slide into and out of said slide scanning gate;
- slide tray positioning means formed in said film scanner frame for accepting a slide tray and aligning a slide tray slot with said aperture;
- slide tray moving means for moving a slide tray positioned by said slide tray positioning means to selectively align a tray slot with said aperture and said slide scanning gate of the film scanner;
- a load arm mounted with respect to said film scanner frame at a first end thereof for movement of a second end thereof in a load arm path of travel between a home position and an engaging and moving position with respect to a slide in the aligned tray slot;
- load arm drive motor means for moving said load arm in said load arm path of travel for engaging and moving a slide from said aligned tray slot through said aperture and into the scanning gate to enable the scanning thereof and for returning said load arm to said home position;
- a return arm mounted with respect to said film scanner frame at a first end thereof for movement of a second end thereof in a return arm path of travel between a home position and an

engaging and moving position with respect to a slide in the slide scanning gate; and

said mounting platform having means for allowing pitch and roll motion of said magnetic record/reproduce head to con-

5,555,045

HEAD MOVEMENT FEATURE IN A CAMERA USING A FILM WITH A MAGNETIC MEMORY PORTION

sensing means disposed on said camera body and made from a material having properties which vary depending on the

engaging and moving position with respect to a slide in the slide scanning gate; and

return arm drive motor means for moving said return arm in said return arm path of travel for engaging and moving a slide from said slide scanning gate back through said aperture and into the aligned slot of said slide tray upon completion of the scanning thereof and for returning said return arm to said home position.

5,555,043

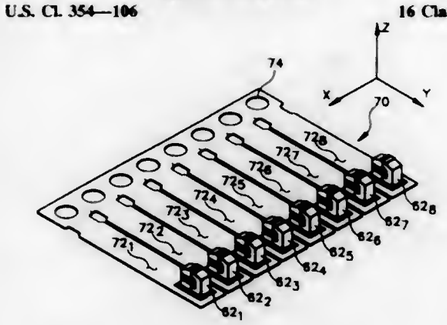
MAGNETICS-ON-FILM IMAGE AREA RECORDING HEAD AND SUSPENSION SYSTEM

George W. Brock, La Jolla; Kent R. Gandola, Carlsbad, and Wlodzimierz S. Czarnecki, Rancho Santa Fe, all of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 30, 1994, Ser. No. 346,997

Int. Cl.[6] G03B *17/24*

U.S. Cl. 354—106 **16 Claims**



1. Magnetic record/reproduce apparatus for recording and/or reproducing information in relation to image frame areas of a photographic filmstrip in a substantially transparent magnetic layer on a surface of the photographic filmstrip, said filmstrip having a cross-film curvature across the width thereof, said apparatus comprising:

means for defining an elongated filmstrip transport path having a backing plate with a record/reproduce aperture therein extending across the width of said filmstrip on one side of the filmstrip transport path;

means for advancing said filmstrip in a film transport direction in said filmstrip transport path from a filmstrip supply to a filmstrip takeup and past said record/reproduce aperture, whereby said filmstrip advanced across said aperture exhibits cross-film curvature;

a plurality of magnetic record/reproduce heads adapted to be suspended with respect to said record/reproduce aperture to extend across said filmstrip in a spaced apart array for recording and/or reproducing information in tracks in said magnetic layer, said tracks extending in said film transport direction and across said image frame areas; and

suspension means having a like plurality of flexure elements corresponding to said plurality of magnetic record/reproduce heads, such that one of said flexure elements suspends a corresponding one of said plurality of magnetic record/reproduce heads in said array within said record/reproduce aperture in loading contact compliance with said cross-film curvature of said filmstrip magnetic layer, each flexure element having a mounting platform for mounting a magnetic record/reproduce head and a movable flexure load beam attached at one end thereto and extending from said backing plate into said record/reproduce aperture and toward said filmstrip magnetic layer to provide loading force through said magnetic record/reproduce head against said magnetic layer, said mounting platform having means for allowing pitch and roll motion of said magnetic record/reproduce head to conform with said cross-film curvature across the contact width of said record/reproduce heads with said magnetic layer.

5,555,044

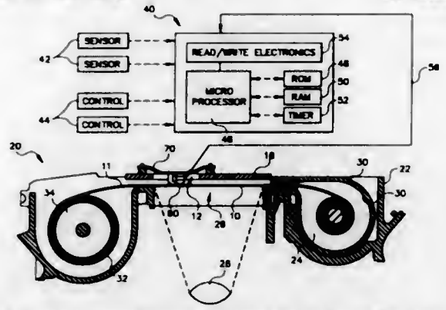
MAGNETICS-ON-FILM IMAGE AREA RECORDING HEAD SUSPENSION SYSTEM

Kent R. Gandola, Carlsbad, and Wlodzimierz S. Czarnecki, Rancho Santa Fe, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 30, 1994, Ser. No. 346,705

Int. Cl.[6] G03B *17/24*

U.S. Cl. 354—106 **20 Claims**



1. Magnetic record/reproduce apparatus for recording and/or reproducing information in relation to image frame areas of a photographic filmstrip in a substantially transparent magnetic layer on a surface of the photographic filmstrip, said filmstrip having a cross-film curvature across the width thereof, said apparatus comprising:

means for defining an elongated filmstrip transport path having a backing plate with a record/reproduce aperture on one side of the filmstrip transport path;

means for advancing said filmstrip in a longitudinal direction in said filmstrip transport path from a filmstrip supply to a filmstrip takeup, whereby said filmstrip advanced alongside said backing plate exhibits said cross-film curvature and the space between said backing plate and said filmstrip magnetic layer varies across the width thereof;

a plurality of magnetic recording heads adapted to be suspended with respect to said backing plate to extend across said filmstrip in a spaced apart array for recording and/or reproducing information in tracks in said magnetic layer, said tracks extending in said longitudinal direction and across said image frame areas; and

suspension means having a like plurality of flexure elements for suspending each of said plurality of magnetic recording heads in said array within said variable space in loading contact compliance with said cross-film curvature of said filmstrip magnetic layer, each flexure element having a mounting platform for mounting a magnetic record/reproduce head and first and second movable flexure legs attached at opposite ends thereof and extending from said backing plate into said record/reproduce aperture and toward said filmstrip magnetic layer to provide loading force through said magnetic record/reproduce head against said magnetic layer, said mounting platform having means for allowing roll motion of said magnetic head mounted to said mounting platform to conform with said cross-film curvature across the contact width of said recording heads with said magnetic layer.

5,555,045

HEAD MOVEMENT FEATURE IN A CAMERA USING A FILM WITH A MAGNETIC MEMORY PORTION

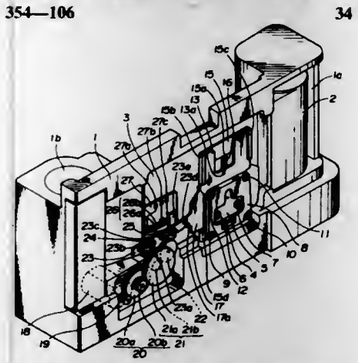
Shinichi Tsujimoto, Machida, and Masaaki Ishihara, Yokohama; both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 191,156, Feb. 3, 1994, abandoned, which is a continuation of Ser. No. 871,545, Apr. 21, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 474,183

Claims priority, application Japan, Apr. 26, 1991, 3-122995

Int. Cl.[6] G03B *17/24;17/00;* **G11B** *5/54*

U.S. Cl. 354—106 **34 Claims**



1. A camera adapted to use a film with a magnetic memory portion, comprising:

a magnetic head for performing at least one of writing information to and reading information from the magnetic memory portion of the film;

moving-away means for moving said magnetic head away from a position where said magnetic head performs at least one of the writing and reading operations; and

a driving source for outputting driving power for driving said moving-away means,

wherein said magnetic head and said moving-away means are arranged on a back side of a film transporting path, and wherein said driving source is arranged on a front side of the film transporting path.

5,555,046

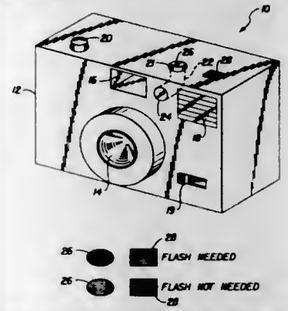
FLASH INDICATION AID FOR CAMERAS WITH MANUAL FLASH

Daniel T. Meyerhoefer, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 23, 1994, Ser. No. 363,667

Int. Cl.[6] G03B *15/03;17/18*

U.S. Cl. 354—149.11 **10 Claims**



1. Apparatus for a camera having a body and a manually operated flash assembly, is characterized by:

sensing means disposed on said camera body and made from a material having properties which vary depending on the amount of incident light striking the sensing means; and

reference means having a specific property value for comparing to said sensing means for visually indicating whether said flash assembly should be powered, wherein said reference means includes a material having a known and fixed optical density, said reference means being disposed adjacent said sensing means to provide a comparative index.

5,555,047

DATA READING AND WRITING APPARATUS

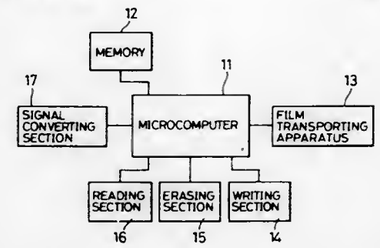
Sadafusa Tsuji, Tondabayashi, and Hiroyuki Okada, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 17, 1994, Ser. No. 245,032

Claims priority, application Japan, May 18, 1993, 5-115611; May 18, 1993, 5-115612

Int. Cl.[6] G03B *17/24*

U.S. Cl. 354—106 **19 Claims**



1. A data reading and writing apparatus for reading and writing a data from and to a magnetic recording portion of a film which optically records plural images, comprising:

a film transport device which transports the film to a predetermined position;

an instructor which instructs a change of data stored on the magnetic recording portion of an arbitrary frame of the film;

a reader which reads out the data stored in the magnetic recording portion; and

a writer which changes the data whose change is instructed, and records the changed data onto the magnetic recording portion.

5,555,048

DUAL FLOATING GEAR SYSTEM FOR A FILM TRANSPORT MECHANISM

Lee D. Oldfield, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 20, 1995, Ser. No. 376,323

Int. Cl.[6] G03B *1//18*

U.S. Cl. 354—173.1 **2 Claims**

1. A film transporting apparatus for moving film between a film cartridge and a take-up spool comprising:

a bi-directional motor rotatable in a first direction and a second direction opposite to the first direction;

a driving gear engaged with said motor and rotatable in a first and a second direction in response to the direction of rotation of said motor; and

a pair of displaceable gears engageable with said driving gear for selectively engaging said film cartridge, wherein said film cartridge is of the thrusting type, which allows the cartridge to initially thrust a leading portion of a contained filmstrip to the take-up spool, is characterized in that:

5,555,050

FILM FEEDING APPARATUS IN A CAMERA

Tsutomu Wakabayashi, Tokyo; Kokichi Dobashi, Sagamihara, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1995, Ser. No. 381,139

Claims priority, application Japan, Feb. 1, 1994, 6-009599

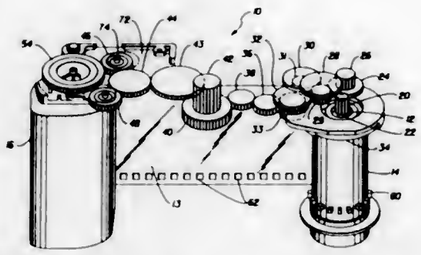
Int. Cl.[6] G03B *1/18*

U.S. Cl. 354—173.1 **4 Claims**

5,555,053

METERING APPARATUS

Stanley W. Stephenson, III, Spencerport, N.Y., assignor to



each of said displaceable gears is independently movable along a slotted path for allowing said gears to move into and out of engagement with said film cartridge depending on the direction of rotation of said motor to allow either winding and rewinding of film out of and into said cartridge, wherein said apparatus includes clutch means for causing one of said displaceable gears to slip out of engagement with said thrusting film cartridge after the thrusted leading portion of the filmstrip has been coupled to said take-up spool during the unwinding of film from said cartridge and for causing the other said displaceable gear to move into engagement with the film cartridge during the rewinding of film into said cartridge.

5,555,049

DRIVING FORCE TRANSMISSION MECHANISM FOR USE IN A CAMERA

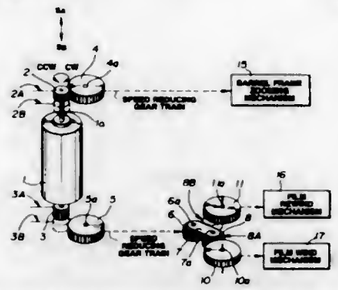
Yukihiko Sugita, Kokubunji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1995, Ser. No. 395,974

Claims priority, application Japan, Mar. 3, 1994, 6-033817

Int. Cl.[6] G03B *1/18*

U.S. Cl. 354—173.1 **29 Claims**



1. A driving force transmission mechanism for a camera comprising: an electric drive source having an output shaft movable in an axial direction, said output shaft being capable of being selectively maintained at one of at least two positions in the axial direction, said output shaft being rotatable about its axis at each of said positions;

axial position control means for determining an axial position of said electric drive source output shaft; and

driven means disposed at said axial positions of said output shaft, said driven means being driven by receiving a torque of rotation of said electric drive source when said output shaft is at a position associated with the driven means to receive a driving force.

5,555,050

FILM FEEDING APPARATUS IN A CAMERA

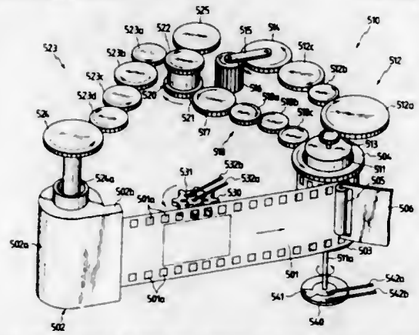
Tsutomu Wakabayashi, Tokyo; Koichi Daitoku, Sagamihara, and Akira Ezawa, Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 337,516, Nov. 8, 1994, abandoned, which is a continuation of Ser. No. 247,467, May 23, 1994, abandoned, which is a continuation of Ser. No. 107,038, Aug. 17, 1993, abandoned, which is a continuation of Ser. No. 978,460, Nov. 19, 1992, abandoned, which is a continuation of Ser. No. 859,966, Mar. 30, 1992, abandoned, which is a division of Ser. No. 758,307, Aug. 28, 1991, Pat. No. 5,136,314, which is a continuation of Ser. No. 617,584, Nov. 26, 1990, abandoned. This application Jun. 2, 1995, Ser. No. 459,297

Claims priority, application Japan, Nov. 28, 1989, 1-306620; Dec. 28, 1989, 1-338350

Int. Cl.[6] G03B *1/18*

U.S. Cl. 354—173.1 **11 Claims**



1. A film feeding apparatus capable of loading a film cartridge having a film entirely enclosed therein and a cartridge spool shaft, the film being able to be fed out from the inside of the film cartridge to the outside thereof or entirely rewound from the outside of the film cartridge to the inside thereof by rotating the cartridge spool shaft, comprising:

a winding spool capable of winding the film;

a film feeding mechanism for rotating the cartridge spool shaft to feed the entirely enclosed film from the inside of the film cartridge to the outside thereof until the film reaches the winding spool;

a detector for detecting that the film is not wound on the winding spool and outputting a detection signal;

a rewinding mechanism electrically connected to said detector, and responsive to said detection signal to rewind the film entirely to the inside of the film cartridge; and

a redriving mechanism electrically connected to said rewinding mechanism and said film feeding mechanism, for driving said film feeding mechanism after completion of the rewinding of the film by said rewinding mechanism, thereby to feed the film again from the cartridge to the winding spool.

5,555,051

BACK-FOCUS ADJUSTING DEVICE FOR A VIDEO CAMERA

Kenichi Maruyama, Okazaki; Haruo Maeda, Tsushima, and Eiji Togawa, Nagoya, all of Japan, assignors to Elmo Co., Ltd., Nagoya, Japan

Filed Apr. 21, 1995, Ser. No. 426,083

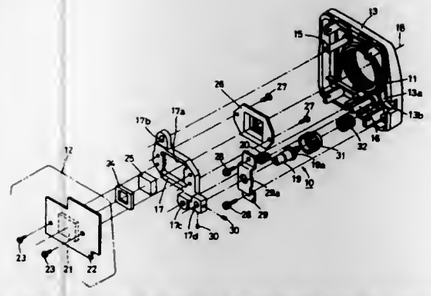
Claims priority, application Japan, Aug. 10, 1994, 6-210597

Int. Cl.[6] G03B *1/18*

U.S. Cl. 354—195.1 **5 Claims**

1. A back-focus adjusting device for a video camera, said device comprising:

two guide pins fixed inside a front panel of a camera body parallel to an optical axis of a lens, said front panel which a lens mount is fixed in,



a carrier supported in the camera body by the two guide pins to move parallel to the optical axis, said carrier to which an image pickup element is fixed,

a spring provided between the carrier and the front panel of the camera body to bias the carrier in such a direction that the carrier separates from the lens mount,

a screw shaft rotatably assembled on the camera body by a holder to move parallel to the optical axis of the lens,

said screw shaft having one end connected with the carrier and the other end on which an adjusting ring is screwed,

said adjusting ring which is rotatable and prevented from slipping out from the screw shaft by the holder, and

an opening formed in the camera body,

said opening through which the adjusting ring can be operated from outside the camera body.

5,555,052

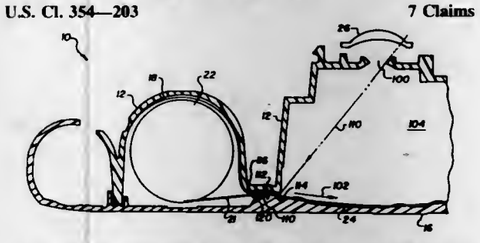
LIGHT SHIELDING APPARATUS

Douglas H. Pearson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 21, 1994, Ser. No. 327,251

Int. Cl.[6] G03B *17/00*

U.S. Cl. 354—203 **7 Claims**



1. A camera comprising a body having a film roll chamber for holding an unexposed roll of film, an exposure chamber into which ambient light enters through a taking lens to impinge on the film, and light blocking means for preventing light entering through said taking lens from entering said film roll chamber, said exposure chamber being bordered by a pair of film rails for supporting the edges of the filmstrip and for guiding the filmstrip from the film roll chamber to the exposure chamber, is characterized in that:

said light blocking means is integral to said body and includes a stepped piece having a first light blocking step sufficiently raised to prevent light from entering said film roll chamber and a second step raised above said first step for supporting edges of the film, said second step being a raised portion of said film rails to allow said first step to be built up.

5,555,053

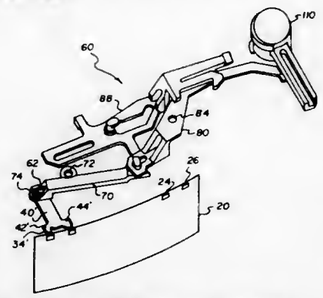
METERING APPARATUS

Stanley W. Stephenson, III, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 4, 1994, Ser. No. 286,025

Int. Cl.[6] G03B *17/42;1/00*

U.S. Cl. 354—206 **7 Claims**



1. In a camera, a metering apparatus comprising:

a metering member having engagement means for engaging a filmstrip; and

a high energy lever movable in opposing directions between a loaded position and a released position having engagement means for tripping a shutter mechanism when the lever is moved toward the released position, is characterized by:

a first linking member having means for contacting said high energy lever, said member being pivotably attached to said metering member for causing said metering member to disengage from said filmstrip when contacted by said high energy lever.

5,555,054

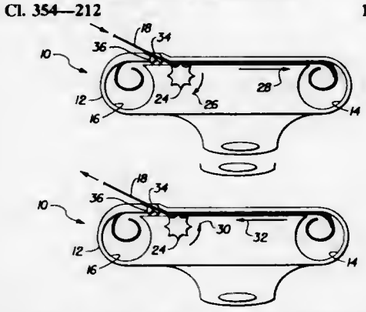
FILM LOADING/UNLOADING DESIGN FOR PHOTOGRAPHIC CAMERA

Dennis R. Zander, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 9, 1995, Ser. No. 370,592

Int. Cl.[6] G03B *1/00;17/02*

U.S. Cl. 354—212 **10 Claims**



1. A method of loading a filmstrip in a photographic camera and unloading the filmstrip from the camera, comprising the successive steps of:

longitudinally inserting a filmstrip through an exterior slot into the camera to load the filmstrip in the camera;

advancing the filmstrip in a forward direction from the exterior slot to an unexposed film chamber;

advancing successive sections of the filmstrip in a reverse direction to an exposed film chamber after each film exposure; and

advancing the filmstrip from the exposed film chamber through the same or a different slot to unload the filmstrip from the camera.

5,555,055

CAMERA WITH MANUAL FILM DRIVE CONTROL AND

5,555,057

DIFFERENTIAL GEAR FOR MOTOR DRIVEN PHOTOGRAPHIC SYSTEM

a first pivot horizontally disposed above said view finder,

a first gear fixedly mounted on said first pivot at one end and

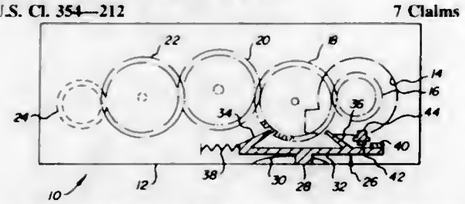
armature formed with a plurality of projecting portions confronted with said poles of said rotor respectively;

5,555,055

CAMERA WITH MANUAL FILM DRIVE CONTROL AND SELF RESETTING REWIND LATCH

Stanley W. Stephenson, III, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 17, 1995, Ser. No. 443,047
Int. Cl.[6] G03B 1/00
U.S. Cl. 354—212 7 Claims



1. A photographic camera having a manual film drive characterized by:

a direction switch movable between a film advance mode and a film rewind mode and biased toward the advance mode; and

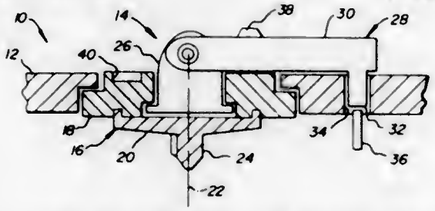
a film presence sensor responsive to loading a film into the camera to effectuate a latch, operative to maintain the direction switch in the rewind mode upon movement thereto while a film is present, said sensor being responsive to removal of the film from the camera to release the latch, allowing return of the direction switch to the advance mode.

5,555,056

CAMERA WITH MANUAL REWIND APPARATUS

Anna C. Schelling, Geneva, and Stanley W. Stephenson, III, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 19, 1995, Ser. No. 445,440
Int. Cl.[6] G03B 1/00
U.S. Cl. 354—212 10 Claims



1. A camera having manual film rewind apparatus including a rotatable driver connectable with a film spool, and a pivotally mounted storable rewind crank rotatable with said driver for turning the driver in a rewind direction, said apparatus characterized by:

a rewind crank support carried for rotation on a common axis with said driver and pivotally mounting said rewind crank; and

an abutment on at least one of the crank and the driver and directly engageable with the other when the crank is in a driving position for transmitting rewind rotation from the crank to the driver;

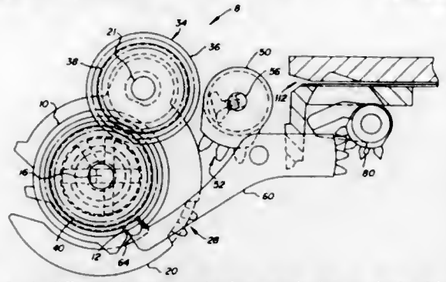
the crank being pivotally movable into a stored position wherein the crank is non-rotatably stored and the driver is disengaged from the crank and freely rotatable with an associated film spool.

5,555,057

DIFFERENTIAL GEAR FOR MOTOR DRIVEN PHOTOGRAPHIC SYSTEM

Anthony DiRisio, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 18, 1995, Ser. No. 443,648
Int. Cl.[6] G03B 1/00
U.S. Cl. 354—212 26 Claims



1. A differential gear mechanism employing a single drive mechanism to advance and rewind photographic film wound about a spool contained within a film cartridge, the film cartridge employing a light lock mechanism movable between an opened and closed position, said differential gear mechanism comprising:

(a) first means for moving the light lock mechanism to either the opened position or the closed position;

(b) spindle means for rotating the spool to advance or rewind the film through the opening in the film cartridge resulting from the moving of the light lock mechanism to the opened position;

(c) second means for rotating said first means about a first axis;

(d) first gear means for rotating one or both of said spindle means or said second means about a second axis;

(e) third means for selectively allowing or preventing one or both of said spindle means or said first means to rotate;

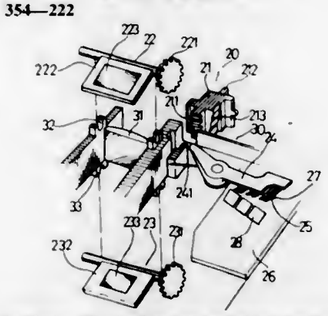
(f) second gear means for transferring the drive force of said single drive mechanism to cause said first gear means to rotate about a third axis.

5,555,058

VIEWFINDER ILLUMINATION SCALE ADJUSTING MECHANISM FOR CAMERAS

Yeou-Fu Huang, Taichung, and Yan-Hone Tsai, Taichung County, both of Taiwan, assignors to Sinpo Optical Co., Ltd., Taichung County, Taiwan

Filed Sep. 14, 1995, Ser. No. 528,225
Int. Cl.[6] G03B 13/10
U.S. Cl. 354—222 1 Claim



1. A viewfinder illumination scale adjusting mechanism comprising:

a sliding block disposed at one side of the viewfinder of a camera, said sliding block comprising a vertical rack at a back side thereof, a knob at a front side thereof, and a stepped transmission portion at one lateral side thereof;

a first pivot horizontally disposed above said view finder,

a first gear fixedly mounted on said first pivot at one end and meshed with the vertical rack of said sliding block;

a first cover board fixedly perpendicularly connected to said first pivot and defining an illumination window;

a second pivot horizontally disposed below said view finder,

a second gear fixedly mounted on said second pivot at one end and meshed with the vertical rack of said sliding block;

a second cover board fixedly perpendicularly connected to said second pivot and defining an illumination window; and

a spring supported switching lever engaged with the stepped transmission portion of said sliding block and moved by it between the On position and the Off position to switch on or off the electric circuit of said camera;

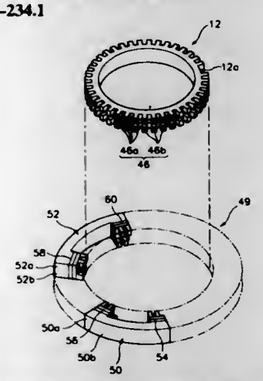
wherein when said sliding block is shifted downwards, said second pivot is driven by said second gear to turn said second cover board upwards through 90°, causing the illumination window of said second cover board to coincide with said viewfinder, and at the same time said switching lever is forced into the On position by said stepped transmission portion; when said sliding block is shifted upwards, said first pivot is driven by said second gear to turn said second cover board downwards through 90°, causing the illumination window of said first cover board to coincide with said viewfinder, and at the same time said switching lever is forced into the On position by said stepped transmission portion.

5,555,059

ELECTROMAGNETIC LENS SHUTTER APPARATUS

Jae-kyeong Seo; Deog-ho Choi, and Seon-ho Lee, all of Changwon, Rep. of Korea, assignors to Samsung Aerospace Industries, Ltd., Kyeongsangnam, Rep. of Korea

Continuation-in-part of Ser. No. 3,494, Jan. 12, 1993, abandoned. This application Feb. 14, 1994, Ser. No. 195,665
Claims priority, application Rep. of Korea, Nov. 10, 1992, 92-21057
Int. Cl.[6] G03B 9/08
U.S. Cl. 354—234.1 4 Claims



1. An electromagnetic lens shutter apparatus comprising

a lens mount including a hollow cylindrical portion defining an opening and a flange fixed on said cylindrical portion;

at least two sheet-like lens shutter blades rotatably mounted on said flange on a side opposite said cylindrical portion;

an exposure adjustment ring rotatably mounted on said cylindrical portion and including an exposure adjustment cam;

a linear pulse motor for driving said exposure adjustment ring, said linear pulse motor including a circular rotor rotatably mounted around said cylindrical portion and a plurality of stators placed around said rotor, said rotor having a plurality of projections projected radially outwardly at regular intervals with each projection divided into an upper part with a north pole and a lower part with a south pole, and each stator having a pair of armatures with an end portion of each armature formed with a plurality of projecting portions confronted with said poles of said rotor respectively;

opening means for opening and closing said shutter blades in accordance with the operation of said exposure adjustment cam; and

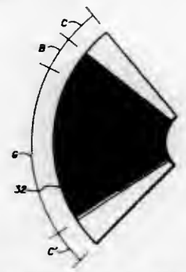
a central processing unit to control the rotation of the linear pulse motor.

5,555,060

SELF CALIBRATING ACTUATOR POSITION CONTROL SYSTEM

Michael J. O'Brien, and Richard A. Littlefield, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 23, 1995, Ser. No. 447,472
Int. Cl.[6] G03B 9/02;17/38;9/08
U.S. Cl. 354—271.1 7 Claims



1. A self calibrating actuator position control system comprising:

an actuator for effecting a range of movement of an element, a portion of the movement range being controlled by a feedback control signal;

a position sensor having a light source, a photo interrupter having a variable optical density pattern formed thereon and a photo detector for generating an output signal proportional to optical density of said photo interrupter, the photo interrupter pattern having an optical density gradient segment used to generate said feedback control signal and having calibration segments preceding said gradient segment, the calibration segments having predetermined maximum and minimum optical density values;

a calibration circuit responsive to said output signal during sensing of said maximum and minimum optical density segments for generating high and low output signal reference values from said maximum and minimum optical density segments; and

signal scaling means for generating a position control output signal from the gradient segment which is scaled between said high and low output signal reference values to have a proportionate correspondence between actuator position and said position control output signal.

5,555,061

CAMERA WITH IMPROVED POSITIONING OF VIBRATION DETECTING SENSORS THEREIN

Isao Soshi, Tokyo; Hidenori Miyamoto, Urayasu, and Seijiro Noda, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Sep. 26, 1994, Ser. No. 311,039
Claims priority, application Japan, Sep. 27, 1993, 5-262947
Int. Cl.[6] G03B 17/02
U.S. Cl. 354—288 10 Claims

1. A camera which photographs an image onto an image storage material by exposing the image storage material through a photographic image plane exposure aperture, the camera comprising:

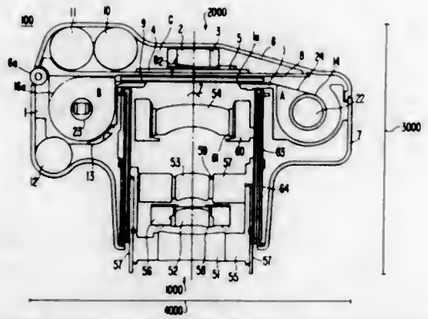
5,555,063

CAMERA WITH BUILT-IN MEANS FOR CLOSING FILM

of said plurality of mode display portions while said window portion reveals remaining ones of said plurality of mode

5,555,066

METHOD OF AND APPARATUS FOR REMOVING



a retaining member which supports the image storage material at the photographic image plane exposure aperture; and

a vibration detecting sensor arranged to the rear of the camera in relation to the retaining member and located approximately at a center position along the width of the camera, the vibration detecting sensor being positioned behind the image storage material when the image storage material is supported by the retaining member.

5,555,062

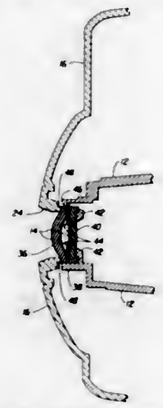
RECYCLABLE SINGLE-USE CAMERA WITH REPLACEABLE FRONT LENS ELEMENT

Douglas H. Pearson, Rochester; Jude A. SanGregory, Spencerport; Kevin P. Lyons, Rochester; Joseph R. Bletry, Rochester, and Alan E. Lewis, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 3, 1995, Ser. No. 368,182

Int. Cl.[6] G03B *17/02*

U.S. Cl. 354—288 **4 Claims**



1. A recyclable single-use camera in which a front casing portion is separable from a main body portion to replace a taking lens during recycling of said camera, is characterized in that:

said taking lens has a replaceable front lens element and a non-replaceable rear lens element;

said main body portion has means for securing said rear lens element to the main body portion independently of said front lens element in order to prevent removal of the rear lens element when the front lens element is replaced; and

said front casing portion has means for holding said front lens element in optical alignment with said rear lens element, and permits removal of the front lens element to allow it to be replaced when the front casing portion is separated from said main body portion during recycling of said camera.

5,555,063

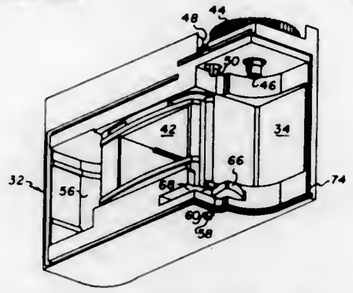
CAMERA WITH BUILT-IN MEANS FOR CLOSING FILM CASSETTE AND EJECTING CLOSED CASSETTE

Edward N. Bailing, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 21, 1995, Ser. No. 407,991

Int. Cl.[6] G03B *17/02*

U.S. Cl. 354—288 **9 Claims**



1. A camera comprising a cassette-receiving chamber for holding a film cassette provided with a light lock which is to be completely closed before removing the cassette from said chamber, is characterized by:

built-in ejection means for ejecting the cassette from said chamber when the light lock is closed;

closure means movable in engagement with the light lock to close the light lock; and

coordination means connects said ejection means and said closure means for allowing the ejection means to eject the cassette from said chamber when the closure means closes the light lock.

5,555,064

MODE CHANGEOVER DEVICE

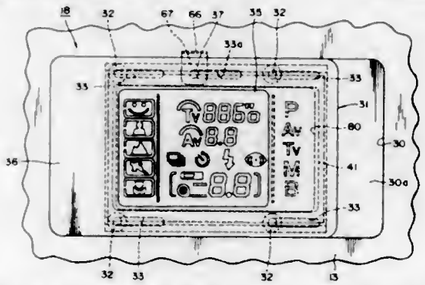
Katsuki Machida, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1995, Ser. No. 426,579

Claims priority, application Japan, Apr. 28, 1994, 6-092185

Int. Cl.[6] G03B *17/18*

U.S. Cl. 354—289.12 **21 Claims**



1. A photographing mode changeover device for a camera having a plurality of photographing modes, said mode changeover device comprising:

means for selecting a photographing mode;

a display device, having a plurality of mode display portions, each of said mode display portions being capable of displaying information corresponding to one of said plurality of photographing modes;

a masking member, having a masking portion and a window portion, said masking portion capable of covering at least one of said plurality of mode display portions while said window portion reveals remaining ones of said plurality of mode display portions;

means for moving said masking member and said display device with respect to each other between a plurality of positions, movement to each of said plurality of positions revealing a previously covered one of said plurality of mode display portions of said display device through said window portion while simultaneously covering another one of said plurality of mode display portions with said masking portion, said means for moving being associated with said selecting means to display information corresponding to a selected one of said photographing modes in said revealed one of a plurality of mode display portions.

5,555,065

CAMERA DISPLAY ILLUMINATION DEVICE WHICH SWITCHABLY ILLUMINATES DISPLAYS

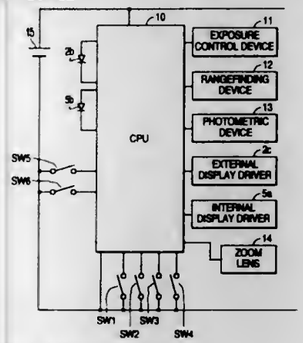
Daiki Tsukahara, Hiratsuka; Hiroshi Wakabayashi, Yokohama; Yuji Katano, and Hidenobu Kaji, both of Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 240,155, May 10, 1994, abandoned. This application Dec. 15, 1995, Ser. No. 568,395

Claims priority, application Japan, May 24, 1993, 5-121151

Int. Cl.[6] G03B *17/20*

U.S. Cl. 354—289.12 **18 Claims**



5. A display apparatus comprising:

a viewfinder;

a first display device;

a first display illumination device which has a first mode and a second mode that cause the first display device to be illuminated and not illuminated, respectively;

a second display device positioned inside the viewfinder, the first display device not being positioned inside the viewfinder;

a second display illumination device which has a first mode and a second mode that cause the second display device to be illuminated and not illuminated, respectively;

a photographic event indicating unit which outputs a signal in response to the occurrence of a photographic event; and

a control mechanism for controlling the first display illumination device and the second display illumination device so that, when the first display illumination device is in the first mode and the photographic event indicating unit outputs a signal in response to the occurrence of the photographic event, the first display illumination device is switched to the second mode and the second display illumination device is switched to the first mode, thereby causing the first display device to be not illuminated and the second display device to be illuminated.

5,555,066

METHOD OF AND APPARATUS FOR REMOVING EXPOSED FILM FROM CARTRIDGES

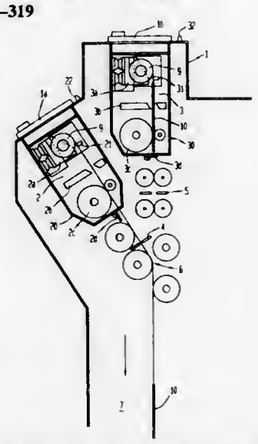
Gerhard Benker, Icking, Germany, assignor to AGFA-Gevaert AG - Fototechnik, München, Germany

Filed Jun. 2, 1995, Ser. No. 461,576

Claims priority, application Germany, Jun. 14, 1994, 44 20 659.3

Int. Cl.[6] G03D *3/08*

U.S. Cl. 354—319 **27 Claims**



1. An apparatus for processing image-recording media confined in substantially lightproof containers, comprising first wall means defining a first substantially lightproof chamber for unloading the containers; second wall means defining a second substantially lightproof chamber for unloading the containers; first conveying means for conveying image-recording media from said first chamber along a first path having an upstream portion in said first chamber; and second conveying means for conveying image-recording media from said second chamber along a second path having an upstream portion in said second chamber, said paths having a junction and merging into a third path downstream of said chambers.

5,555,067

PHOTOGRAPHIC FILM SEPARATING DEVICE AND SEPARATION METHOD

Atsushi Yago; Katsuhiko Tanaka, and Makoto Saotome, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 24, 1994, Ser. No. 265,155

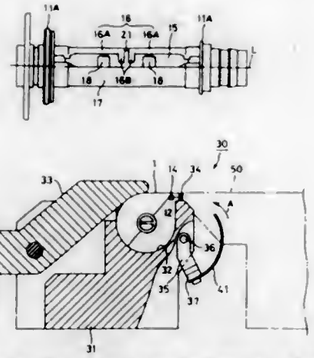
Claims priority, application Japan, Jun. 25, 1993, 5-155606

Int. Cl.[6] G03D *13/10*

U.S. Cl. 354—354 **21 Claims**

1. A photographic film separation method comprising the steps of:

providing a cartridge which is formed by a cartridge main body provided such that an interior portion thereof can be maintained in a light-shielded state, and a spool which is provided at the interior portion of said cartridge main body such that said spool is freely rotatable around an axis of said spool, said spool having a slit which is formed along an axial direction of said spool, a first rod-shaped member provided, with respect to said slit, in a direction orthogonal to the axial direction of said spool, and a second rod-shaped member provided in a direction orthogonal to the axial direction of said spool at an opposite side of said slit with respect to said first rod-shaped member, said second rod-shaped member having a lower rigidity than said first rod-shaped member and being flexibly deformable, said first rod-shaped member having an engagement member which engages a longitudinal direction end



portion of a photographic film at a surface of said first rod-shaped member opposing said slit, said second rod-shaped member having a presser pawl which protrudes from a surface of said second rod-shaped member opposing said slit and which maintains a state of engagement between the photographic film and said engagement member;

providing a container case for accommodating at least one said cartridge for the photographic film;

inserting a separating member between said engagement member and the photographic film positioned within said slit of said cartridge, said separating member having a tip end portion provided to positions at which said engagement member and said presser pawl are provided; and

releasing engagement between the photographic film and said engagement member;

wherein said separating member is curved such that surfaces of said separating member in a direction of thickness thereof which contact the photographic film and said engagement member have a predetermined radius of curvature in a direction of insertion of said separating member, and said insertion is effected by pivoting said separating member around a center of the radius of curvature.

5,555,068

CAMERA WITH IMPROVED LENS DRIVE DURING SWITCHING OF MULTIPLE FOCAL POINT DETECTION AREAS

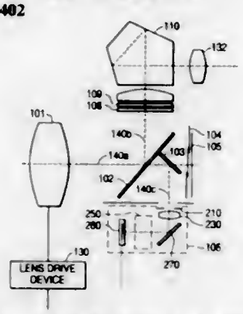
Ken Utagawa, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Dec. 22, 1994, Ser. No. 361,827

Claims priority, application Japan, Dec. 22, 1993, 5-325830

Int. Cl.[6] G03B *13/36*

U.S. Cl. 354—402 **24 Claims**



1. A camera having first and second focal point detection areas which are individually selectable to focus a subject in the selected focal point detection area, the first focal point detection area initially being selected and, thereafter, the second focal point detection area being selected, the camera comprising:

a photographic lens; and

a focus adjustment unit which

calculates a defocus amount corresponding to the first focal point detection area when the first focal point detection area is selected,

drives the photographic lens in accordance with the defocus amount corresponding to the first focal point detection area to focus the subject in the first focal point detection area when the first focal point detection area is selected,

calculates a defocus amount corresponding to the second focal point detection area when the second focal point detection area is selected, and

controls the drive of the photographic lens to focus the subject in the second focal point detection area when the second focal point detection area is selected, based on the defocus amount calculated for the first focal point detection area and the defocus amount calculated for the second focal point detection area.

5,555,069

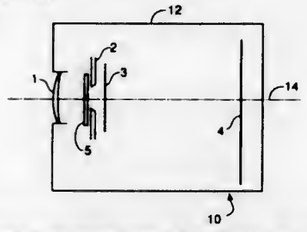
CAMERA WITH ELECTROCHROMIC FILTER

Richard E. Albrecht, Honeoye Falls, and David R. Dowe, Holley, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 28, 1995, Ser. No. 395,746

Int. Cl.[6] G03B *7/08*

U.S. Cl. 354—410 **4 Claims**



1. A camera comprising means for supporting an imaging element for recording a scene, and an electrochromic filter disposed between the scene and the imaging element, is characterized by:

a photoelectric element which emits a electrical energy the value of which depends on an amount of scene light which is incident on the photoelectric element, at least a portion of said electrical energy emitted by the photovoltaic element being used to directly control the optical density of said electrochromic filter, thereby controlling the amount of scene light which reaches the imaging element.

5,555,070

METHOD AND DEVICE FOR CONTROLLING EXPOSURE FOR FLUORESCENCE MICROPHOTOGRAPHY

Frank Hermann, Siegen, Germany, assignor to Leica Mikroskopie und Systeme GmbH, Wetzlar, Germany

Filed Aug. 17, 1993, Ser. No. 107,141

Claims priority, application Germany, Sep. 14, 1992, 42 30 724.4

Int. Cl.[6] G03B *7/00*

U.S. Cl. 354—412 **11 Claims**

1. A method for controlling exposure for microphotography of an object having a luminous intensity which changes over time, said method comprising the steps of:

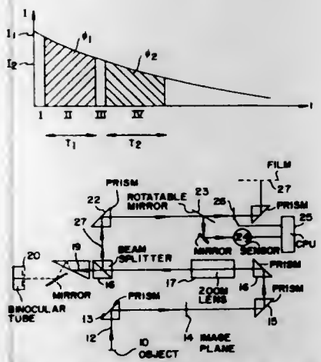
directing a photographic beam of a microscopic luminous image of said object to a sensor;

measuring a first intensity value of said photographic beam;

determining a first exposure time based on said first intensity value;

directing said photographic beam onto a photographic film;

exposing said photographic film for said first exposure time;



directing said photographic beam a second time to said sensor to measure a second intensity value;

determining whether additional exposure is required; and

if said determining step indicates additional exposure time is required

calculating a second exposure time using said first intensity value, said first exposure time and said second intensity value; and

exposing said photographic film for said second exposure time.

5,555,071

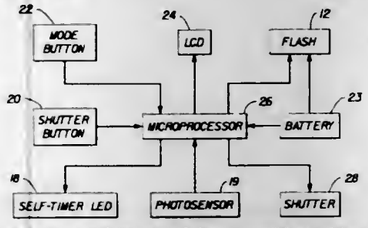
CAMERA WITH SELF-TIMER AND ELECTRONIC FLASH

Norbert Koenig, Rochester, and Glenn Johnson, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 29, 1994, Ser. No. 282,994

Int. Cl.[6] G03B *7/00;9/64;17/38;15/02*

U.S. Cl. 354—418 **9 Claims**



6. A camera comprising a self-timer operable to delay picture taking for a predetermined interval, and an electronic flash having a variable recharge time, is characterized by:

means for preventing commencement of charging of said electronic flash when the predetermined interval is less than the re-charge time of said electronic flash.

5,555,072

CLEANING STRUCTURE FOR OUT-OF-LIQUID CONVEYING PORTION

Kouki Nomura, Aichi-ken, and Hiroyuki Satoh, Kanagawa, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

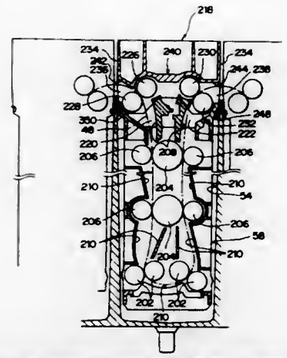
Filed Jun. 7, 1995, Ser. No. 483,270

Claims priority, application Japan, Sep. 5, 1994, 6-211305; Sep. 5, 1994, 6-211306; Sep. 5, 1994, 6-211308

Int. Cl.[6] G03B *27/32;27/52;* **G03D** *3/02;3/08*

U.S. Cl. 355—27 **7 Claims**

1. A cleaning nozzle unit for use in an out-of-liquid conveying portion, said cleaning nozzle unit being mounted to a crossover rack provided at an upper portion of a processing rack provided within a processing bath containing therein a processing solution for processing a photosensitive material which has been subjected to printing, said processing rack conveying the photosensitive material into the processing solution and processing the photosensitive material in the processing solution, said crossover rack accommodating the out-of-liquid conveying portion including out-of-liquid rollers for conveying the photosensitive material in an out-of-liquid area, said cleaning nozzle unit cleaning the out-of-liquid conveying portion, and comprising:



a case opposed to one of side walls between which the out-of-liquid rollers are mounted and which are opposed to end surfaces of the out-of-liquid rollers, said case having a cavity defined therein;

a connecting portion provided at said case and communicating with an interior of said case, said connecting portion being connected to piping for supplying cleaning water to the interior of said case;

a plurality of cleaning nozzles projecting from an outer surface of said case, which outer surface is provided on a side opposite to said one side wall, said plurality of cleaning nozzles communicating with the interior of said case, and extending through corresponding through-holes formed in said one side wall so as to enter the crossover rack, and discharging the cleaning water to the crossover rack; and

an interlocking/non-interlocking portion projecting from the outer surface of said case and elastically and engageably fit in an interlocking portion formed in said one side wall in a state in which said cleaning nozzles penetrate into the corresponding through-holes, thereby mounting said case on said one side wall.

5,555,073

CORRECTING METHOD AND DEVICE FOR A PHOTOGRAPHIC COPYING APPARATUS

Walter Grossman, Russikon, Switzerland; Kuraji Nitta, and Koji Kita, both of Wakayama-ken, Japan, assignors to Noritsu Koki Co., Ltd., Japan

Continuation of Ser. No. 81,676, Jun. 23, 1993, abandoned. This application Nov. 18, 1994, Ser. No. 341,696

Int. Cl.[6] G03B *27/80*

U.S. Cl. 355—41 **12 Claims**

1. A correcting device for a photographic copying apparatus comprising:

a film identifying means for obtaining identification information identifying a type from among a plurality of types of film loaded for copying;

a film density measuring means for measuring density information of said film loaded for copying;

a printing paper exposure means for exposing printing paper;

a control means for controlling said printing paper exposure means based on said identification information and said density information; and

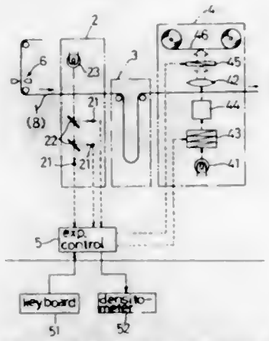
a copy density measuring means for measuring density of a copy exposed;

a toner image supporting member on which a toner image

5,555,076

APPARATUS FOR CONTROLLING AN EXPOSURE

means including means for performing a book coping function, and said means for performing a book copying function



wherein said control means stores plural types of conversion information corresponding to a plurality of combinations of said films for copying and said printing papers, said control means selects one of said plural types of conversion information based on said identification information and on a printing paper employed, said control means derives said exposure information from said selected conversion information and said density information, said control means controls said printing paper exposure means based on said exposure information derived from said density information and said selected conversion information, and said control means test-copies a loaded correcting film on a printing paper by controlling said printing paper exposure means, and correcting said plural types of conversion information based on density information of said test-copied printing paper and on density information of said correcting film measured by said film density measuring means, and wherein said control means corrects reference conversion information of said correcting film based on said density information of said test copy and said density information measured by said film density measuring means, and thereafter corrects said plural types of conversion information of film for copying based on relational information showing relations between said reference conversion information of said correcting film and said conversion information of said plural types of film for copying.

5,555,074

ELECTROPHOTOGRAPHIC APPARATUS AND ELECTROPHOTOGRAPHIC METHOD

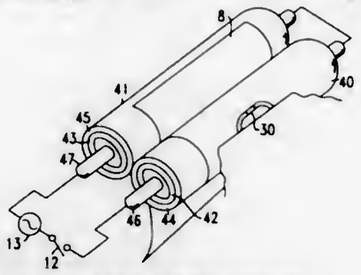
Hideyuki Haragakiuchi; Hiroyuki Tadokoro; Nobuaki Fukazawa; Izamu Terashima; Akira Sasaki; Kazuyoshi Matsuo; Katuyoshi Onose, and Masashi Okuhama, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 10, 1995, Ser. No. 370,707

Claims priority, application Japan, Jan. 13, 1994, 6-001934; Feb. 10, 1994, 6-016083

Int. Cl.[6] G03G *15/20;21/00*

U.S. Cl. 355—208 **9 Claims**



1. An electrophotographic apparatus comprising:

a toner image supporting member on which a toner image developed on an electrostatic latent image is formed;

a recording medium feeder that brings the recording medium into contact with said toner image supporting member;

a fixing apparatus including:

a fixing roller; and

a compression roller in contact with each other to fix the toner image on the recording medium;

a heater disposed inside at least one of said fixing roller and said compression roller;

a temperature detector coupled to the surface temperature of said fixing roller;

a state detector detecting the state of said fixing apparatus before said fixing apparatus is powered on; and

a fixing voltage controller that controls a fixing voltage applied to said heater based on a temperature characteristic measured by said temperature detector, said fixing voltage controller includes a first control characteristic changing means for changing a control point of the fixing voltage by a plurality of fixing voltage control characteristics on the basis of the temperature characteristic measured by said temperature detector.

5,555,075

FIXATION TEMPERATURE CONTROL DEVICE

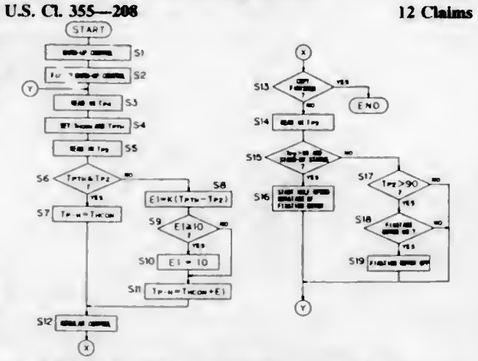
Masahiko Fukano; Toshiyuki Nakade, and Hiroshi Kageyama, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Dec. 8, 1995, Ser. No. 569,979

Claims priority, application Japan, Jan. 11, 1995, 7-002878; Jan. 11, 1995, 7-002879

Int. Cl.[6] G03G *15/20*

U.S. Cl. 355—208 **12 Claims**



1. A fixation temperature control device comprising:

a fixing unit of an image forming apparatus having a press roller and a heat roller heated by a heater for thermally fixing toner on a sheet passing between the press roller and the heat roller;

heat roller temperature detection means for detecting the temperature of the heat roller;

power ON/OFF control means for controlling power ON/OFF of the heater to control the temperature of the heat roller so as to allow the heat roller temperature detected by the heat roller temperature detection means to approach a predetermined control temperature; and

press roller temperature detection means for detecting the temperature of the press roller;

wherein the power ON/OFF control means determines the control temperature by adding to a predetermined heat roller reference temperature a correction value determined based upon the temperature of the press roller detected by the press roller temperature detection means.

5,555,076

APPARATUS FOR CONTROLLING AN EXPOSURE

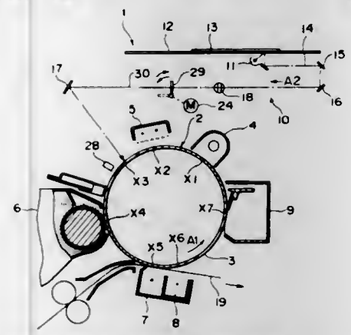
Tsugihito Yoshiyama, Toyohashi, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Filed Dec. 20, 1994, Ser. No. 359,546

Claims priority, application Japan, Dec. 22, 1993, 5-323809

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—208 **8 Claims**



8. An image forming apparatus comprising:

a light source which emits light and exposes a photoreceptor to form an image on said photoreceptor;

a detector which detects the sensitivity of said photoreceptor; and

an adjustment means for adjusting an exposure amount of said light in accordance with said sensitivity detected by said detector, said adjustment means including an optical filter which reduces said exposure amount and a controller which varies electric power to be applied to said light source,

wherein said adjustment means coarsely adjusts said exposure amount by positioning said filter in a light path and out of said light path, and finely adjusts said exposure amount by controlling said electric power.

5,555,077

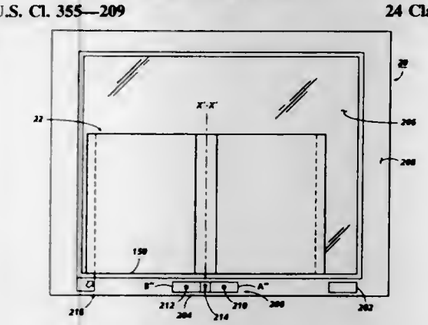
PRINTER HAVING AN ACTIVE USER INTERFACE FEATURE

Richard M. Schooley, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 1, 1994, Ser. No. 347,940

Int. Cl.[6] G03G *15/00*

U.S. Cl. 355—209 **24 Claims**



1. A reproduction machine comprising:

(a) performing means for performing a desired reproduction function according to a preselected mode, said performing means including means for performing a book coping function, and said means for performing a book copying function including a transparent platen;

(b) a controller, including selectable mode means, connected to said performing means for controlling the performance of the desired reproduction function;

(c) mode selecting means connected to said controller for selecting a mode of performing the desired reproduction function; and

(d) a user interface feature, connected to said selectable means and to said controller, for actively directing user input activities to the desired reproduction function to be performed, said user interface feature including a graphic display located on a frame portion surrounding said transparent platen for representing a preselected mode of the desired function to be performed, and means connected to said controller for animating said graphic display in response to selection of said mode selecting means.

5,555,078

SERIAL PRINTER

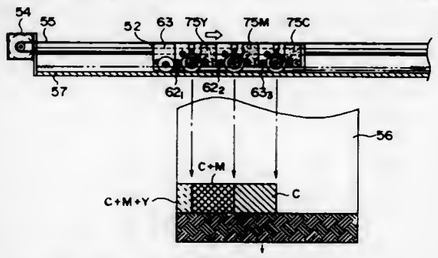
Ryouichi Iwama, and Syuzo Masuda, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 20, 1995, Ser. No. 425,920

Claims priority, application Japan, May 18, 1994, 6-104086

Int. Cl.[6] G03G *15/00;15/01;15/20*

U.S. Cl. 355—210 **11 Claims**



9. A serial printer, comprising:

transport means for transporting a recording sheet in a sheet transport direction;

a plurality of process means;

a printing carriage movable in a carriage moving direction perpendicular to the sheet transport direction and supporting said plurality of process means; and

moving means for moving said printing carriage in the carriage moving direction,

each of said plurality of process means including an image bearing member with a rotary shaft which extends in a direction parallel to the sheet transport direction and a developing means, for forming a latent image on the image bearing member by charging the image bearing member and developing the latent image into a developed image by the developing means,

said developing means of said plurality of process means being provided with developing agents of mutually different colors in the sheet transport direction,

wherein said plurality of process means are arranged in the carriage moving direction on said printing carriage.

5,555,079

IMAGE FORMING APPARATUS FOR PREVENTING

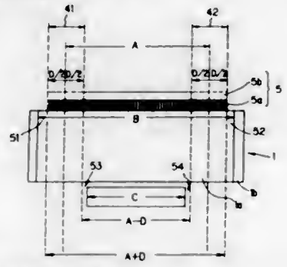
slide cover slidably attached to said container for movement between a first position sealing said opening of said container and

5,555,079

IMAGE FORMING APPARATUS FOR PREVENTING DAMAGE TO CONDUCTIVE FIBERS ON A CHARGING MEMBER

Katsumi Adachi, Nara, and Takashi Hayakawa, Kyoto, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 16, 1994, Ser. No. 341,060
Claims priority, application Japan, Nov. 25, 1993, 5-295353
Int. Cl.[6] G03G *15/02*
U.S. Cl. 355—219 **6 Claims**



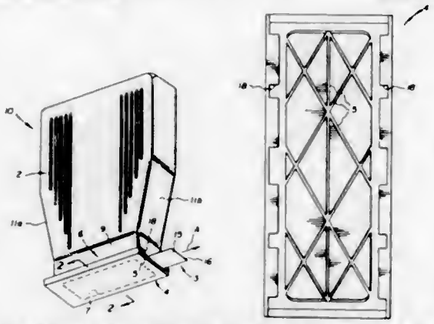
1. An image forming apparatus comprising:
a charged member at least a portion of which is coated with a photoconductive layer rotated in a rotating direction by a rotating means;
a charging member including conductive fibers and placed in contact or nearly in contact with said charged member;
means for vibrating said charging member perpendicularly to said rotating direction of said charged member, wherein a voltage is applied between said charging member and said charged member so as to charge said charged member; and
a developing unit,
wherein said charged member, charging member, and developing unit satisfy the following relation: C+D<A<B−D, where A denotes a longitudinal dimension of said charging member; B denotes a length of the photoconductive layer; C denotes a developing width in the longitudinal direction of the developing unit; D denotes a vibrating width of said charging member.

5,555,080

SLIDE COVER FOR MARKING PARTICLE CARTRIDGE

Terry R. Elich, Pittsford, and Thomas S. Wicks, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 8, 1995, Ser. No. 569,388
Int. Cl.[6] G03G *15/08*
U.S. Cl. 355—260 **12 Claims**



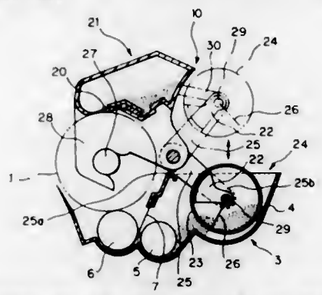
1. A marking particle cartridge including a container defining a marking particle storage chamber and an opening communicating with such chamber through which marking particles may pass, a removable tear strip attached to said container to cover said opening and enable said opening to be selectively uncovered, and a slide cover slidably attached to said container for movement between a first position sealing said opening of said container and a second position remote from said first position where said opening of said container is uncovered, said slide cover comprising:
a substantially planar member; and
a plurality of ribs on said planar member, said ribs being positioned such that said ribs trap and capture residual marking particles.

5,555,081

CLEANER AND TONER MAGAZINE FOR ELECTROPHOTOGRAPHIC APPARATUS

Hirotaka Hatta, Ebina; Hiroshi Saitoh, Ayase; Shigemi Kanda, Atsugi; Yozo Matsuura, Tokyo, and Masahiko Kamijo, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 4, 1994, Ser. No. 177,318
Claims priority, application Japan, Jan. 12, 1993, 5-003435; Mar. 2, 1993, 5-041246; Oct. 27, 1993, 5-269019
Int. Cl.[6] G03G *21/00*
U.S. Cl. 355—298 **17 Claims**



1. A cleaner and toner magazine (CTM) for replenishing a developing device of an electrophotographic apparatus with a toner, comprising:
a waste toner tank for removing a toner left on a photoconductive element of said electrophotographic apparatus after image transfer and collecting said toner;
a fresh toner tank constructed integrally with said waste toner tank for replenishing said developing device with a fresh toner; and
a connector which connects said waste toner tank and said fresh toner tank in such a way as to permit a change in their relative positions with respect to each other so that said fresh toner tank and said waste toner tank may be positioned independently of each other.

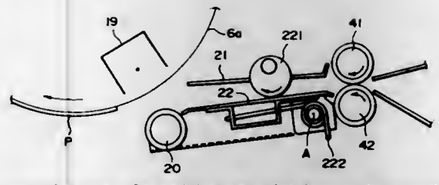
5,555,082

IMAGE FORMING APPARATUS THAT RELEASES SHEET CONVEYING FORCE AFTER THE SHEET REACHES A RECORDING MATERIAL CARRYING MEMBER

Kiyoharu Tanaka; Hajime Suzuki, both of Yokohama, and Koji Kimura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 773,550, Oct. 9, 1991, abandoned.
This application Oct. 12, 1993, Ser. No. 134,879
Claims priority, application Japan, Oct. 12, 1990, 2-275051
Int. Cl.[6] G03G *15/00*
U.S. Cl. 355—309 **18 Claims**

1. An image forming apparatus, comprising:
an image bearing member;
a recording material carrying member for carrying a recording material to an image transfer station where an image is transferred from said image bearing member to the recording material carried on said recording material carrying member;



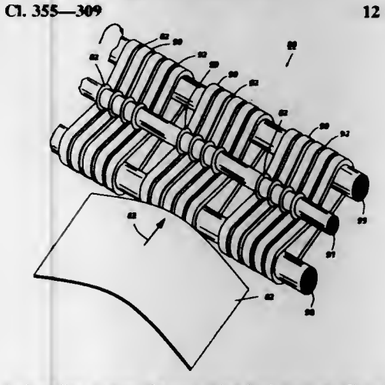
conveying means for applying conveying force to the recording material at a conveying position to convey the recording material to said recording material carrying member; and
releasing means for releasing the conveying force of said conveying means at the conveying position after a leading edge of the recording material is carried on said recording material carrying member and before the leading edge reaches a transfer position.

5,555,083

DECURLER APPARATUS FOR REDUCING CROSS CURL IN SHEETS

Youti Kuo, Penfield, and James F. Smoak, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 3, 1994, Ser. No. 317,254
Int. Cl.[6] G03G *21/00*
U.S. Cl. 355—309 **12 Claims**



1. A decurling system for removing both process direction and cross direction curl from sheets being transported within a printing apparatus or a finisher, comprising: at least one endless belt having a series of grooves in an outer surface thereof, said endless belt being rotatably mounted on support members with an unsupported span between said support members; a decurler shaft, said decurler shaft having a series of ribs adapted for engagement with said grooves in said endless belt to form nips with said grooves of said endless belt to provide localized bendings to sheets passing therethrough in order to minimize cross curl in the sheets.

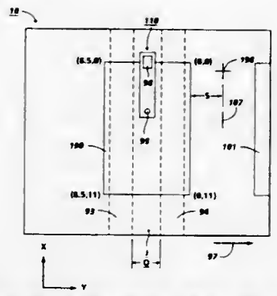
5,555,084

APPARATUS FOR SHEET TO IMAGE REGISTRATION

Joseph S. Vetromile, Brighton, and Lawrence R. Benedict, Rushville, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 28, 1995, Ser. No. 520,345
Int. Cl.[6] G03G *15/00*
U.S. Cl. 355—317 **20 Claims**

1. An apparatus for registering a sheet with a developed image on a moving surface, including:
a transfer station;



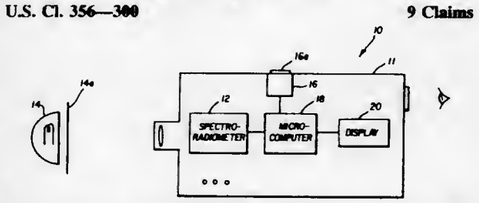
a detector located at said transfer station, said detector being responsive to an edge of the sheet and a registration portion of the developed image for generating a registration signal;
a memory for storing sheet position factors, said memory being responsive to the registration signal from said detector for updating the sheet position factors; and
a registration transport, in communication with said detector and said memory, for moving the sheet to said transfer station in registration with the developed image.

5,555,085

SYSTEM AND METHOD FOR SCENE LIGHT SOURCE ANALYSIS

Mitchell J. Bogdanowicz, Spencerport; Richard C. Sehlin, Rochester, both of N.Y., and Rami Mina, Thousand Oaks, Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 22, 1995, Ser. No. 391,874
Int. Cl.[6] G01J *3/00;3/50*
U.S. Cl. 356—300 **9 Claims**



1. A system for analysis of a scene light source to which a light sensitive medium is to be exposed comprising:
a) spectral measurement means for measuring spectral intensities of said light source at predetermined increments of wavelength in each of a plurality of colors;
b) data storage means for providing reference spectral data at corresponding increments of wavelength for each of said plurality of colors, said reference spectral data being representative of (i) spectral transmittances of a plurality of known filter types, (ii) spectral sensitivities of said light sensitive medium, and (iii) spectral intensities of a reference illuminant on which said light sensitive medium spectral sensitivities are based;
c) a microcomputer; and
d) an output display device;
e) the microcomputer being programmed to respond to said reference spectral data and to said measured light source spectral intensities in each of said colors for determining (i) first log exposures of said light sensitive medium to said light source (ii) second log exposures of said light sensitive medium to said reference illuminant (iii) differences between said first and second log exposures and (iv) an error value

comprised of a summation of the absolute values of said differences, said microcomputer being further programmed to

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METHOD AND APPARATUS FOR EMPLOYING A LIGHT SOURCE AND HETERODYNE INTERFEROMETER FOR

b) one of a second component of said first light beam and a second component of said second light beam constituting said backward scattered light beam and which has passed

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ABSOLUTE DISTANCE MEASURING INTERFEROMETRY USING MULTI-PASS RESONANT

comprised of a summation of the absolute values of said differences, said microcomputer being further programmed to be responsive to said error value (v) to make a selection from said known filter types that provides a desired approximation of spectral response of the light sensitive material to the light source relative to the spectral response of the material to the reference illuminant, and (vi) for providing said selection to said output display device for presentation to a user of said system.

5,555,086

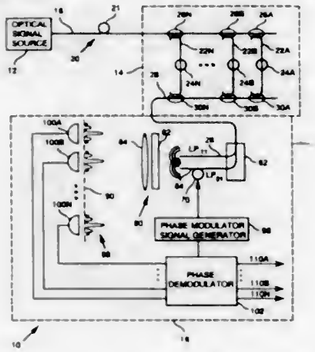
COHERENCE MULTIPLEXED INTERFEROMETRIC SIGNAL PROCESSING SYSTEM AND METHOD

Karlheinz vonBieren, Camarillo, and Donald A. Frederick, Canoga Park, both of Calif., assignors to Litton Systems, Inc., Woodland Hills, Calif.

Continuation-in-part of Ser. No. 707,877, May 31, 1991, abandoned. This application Dec. 24, 1992, Ser. No. 996,974

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—345 **28 Claims**



1. A fiber optic sensing system for monitoring a selected parameter, comprising:

a plurality of fiber optic interferometric sensors connected in an array;

means for introducing two-mode optical signals into each of the plurality of fiber optic interferometric sensors such that each of the plurality of fiber optic interferometric sensors produces an optical signal indicative of changes in the parameter;

a Fourier transform lens arranged to receive the optical signals indicative of changes in the parameter and to provide a lens output signal that includes a plurality of spatially separated interference fringe patterns, each interference fringe pattern corresponding to the optical signal output from a selected one of the plurality of interferometric sensors;

a transmission grating arranged to receive the plurality of spatially separated interference fringe patterns, the transmission grating having a groove spacing corresponding to the spatially separated interference fringe patterns such that the fringe patterns are transmitted through the grating; and

means for monitoring the plurality of spatially separated interference fringe patterns simultaneously and continuously to detect changes in the parameter.

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METHOD AND APPARATUS FOR EMPLOYING A LIGHT SOURCE AND HETERODYNE INTERFEROMETER FOR OBTAINING INFORMATION REPRESENTING THE MICROSTRUCTURE OF A MEDIUM AT VARIOUS DEPTHS THEREIN

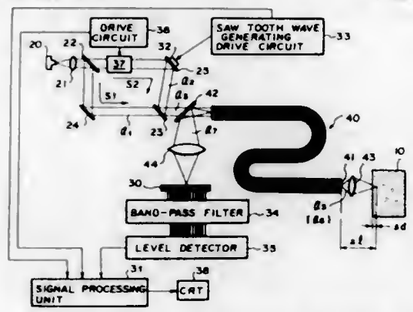
Ichirou Miyagawa, and Masahiro Tolda, both of Kanagawa-ken, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 14, 1994, Ser. No. 260,223

Claims priority, application Japan, Jun. 15, 1993, 5-143362

Int. Cl.[6] G01B *9/02;11/02*

U.S. Cl. 356—345 **7 Claims**



4. An apparatus for obtaining tomographic information, comprising:

i) a light source for producing a low coherence light beam,

ii) an optical system for splitting said low coherence light beam, which has been produced by said light source, into a first light beam and a second light beam, which travel along first and second optical paths, and combining said first light beam and said second light beam with each other at a position at which an optical path difference between said first optical path and said second optical path is larger than a coherence length of said low coherence light beam, to produce a combined light beam, said first and second optical paths being different paths each beginning at a position at which said low coherence light beam is split into said first and second light beams and ending at a position at which said first and second light beams are combined,

iii) a frequency shifter for shifting an original frequency of said first light beam to a second frequency, which is slightly different from the original frequency of said first light beam,

iv) light guide means for guiding the combined light beam to a position in a vicinity of a medium, which has light scattering properties and tomographic information of which is to be obtained,

v) an optical member for splitting said combined light beam, which has been guided to the position in the vicinity of the medium, into a third light beam, which travels reversely to a direction of travel of said combined light beam, and a fourth light beam, which continues to travel along the direction of travel of said combined light beam and is thus irradiated onto the medium, said optical member thereafter combining a backward scattered light beam, which comes from the medium when said fourth light beam is irradiated onto the medium, and said third light beam with each other,

vi) a photodetector for detecting an intensity of an interference light beam obtained from interference of:

a) one of a component of said first light beam and a component of said second light beam constituting said third light beam and which has passed through a longer of said first and second optical paths, and

b) one of a second component of said first light beam and a second component of said second light beam constituting said backward scattered light beam and which has passed through a shorter of said first and second optical paths,

vii) an optical heterodyne detection means for detecting an intensity of said backward scattered light beam in accordance with the intensity of said interference light beam, which has been detected by said photodetector, to obtain information representing a microstructure of the medium at a predetermined depth in the medium, and

viii) an optical path length modulating means disposed in either one of the first and second optical paths for modulating a length of the one of the first and second optical paths in which said optical path length modulating means is disposed to obtain information representing the microstructure at an arbitrary depth in the medium.

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SAGNAC EFFECT OPTICAL GYROMETER HAVING A FULLY INTEGRATED STRUCTURE

Serge Valette, Grenoble, France, assignor to Commissariat A L'Energie Atomique, France

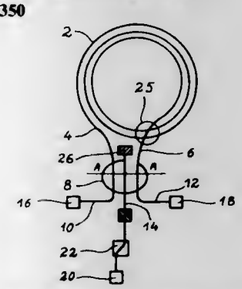
PCT No. PCT/FR93/00038, § 371 Date Jul. 11, 1994, § 102(e) Date Jul. 11, 1994, PCT Pub. No. WO93/14378, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 14, 1993, Ser. No. 256,492

Claims priority, application France, Jan. 17, 1992, 92 00467

Int. Cl.[6] G01C *19/72*

U.S. Cl. 356—350 **21 Claims**



1. A Sagnac effect optical gyrometer comprising a probe including a planar spiral optical loop having light guides for propagating two light waves from a light source, said spiral loop (2) being formed by optical circuits integrated on a substrate, said light guides of the spiral being made optically independent of one another by absorbing structure located between the guides, said two light waves traversing the spiral loop in respective directions opposite to each other, a tricoupler having three parallel rectilinear guides, said three parallel guides including a central guide means and two lateral guides, said lateral guides respectively connecting two ends of said light guides to respective light detecting means, said central guide means having two opposing ends and being connected on one end to said light source, said central guide means being for introducing said light waves into said light guides, said tricoupler being adapted to produce between said two light waves the equivalent of a phase shift in the inoperative position which closely approaches $\pi/2$, said tricoupler being integrated into the same substrate as the spiral loop, and an absorbing structure connected to the other end of said central guide for eliminating residual light exiting said central guide.

5,555,089

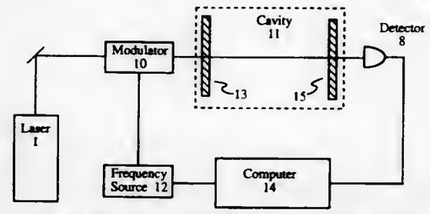
ABSOLUTE DISTANCE MEASURING INTERFEROMETRY USING MULTI-PASS RESONANT CAVITY REFERENCED TO A STABILIZED LASER SOURCE

Thomas J. Dunn, Mohegan Lake, N.Y., and Dharmesh G. Panchal, Greenwich, Conn., assignors to Anvik Corporation, Hawthorne, N.Y.

Filed Nov. 30, 1994, Ser. No. 347,774

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—352 **3 Claims**



1. An absolute distance measuring interferometer using two mirrors in a multi-pass resonant cavity, comprising:

a) an independently stabilized laser system for providing a frequency standard (of frequency w_0) known to very high precision where frequency W_0 is independent of the transmission peaks of said multi-pass resonant cavity;

b) a modulator which modulates at frequency w_m, the output of said stabilized laser system generating optical spectral components w_0+w_m and w_0-w_m whose frequency of modulation w_m is determined by an external frequency source;

c) a multi-pass interferometer having two mirrors forming said resonant cavity and whose optical transmission bandwidth (also known as Free Spectral Range) is inversely proportional to its length;

d) a detection system which monitors the optical intensity from said resonant cavity; and

e) computer means, connected to receive inputs from said detection system and from said frequency source, programmed to calculate the absolute distance between the mirrors of said resonant cavity based on inputs from said detection system and said frequency stabilized laser source.

5,555,090

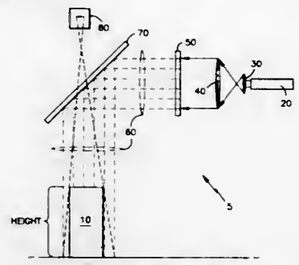
SYSTEM FOR DIMENSIONING OBJECTS

Lawrence E. Schmutz, Watertown, Mass., assignor to Adaptive Optics Associates, Cambridge, Mass.

Filed Oct. 24, 1994, Ser. No. 327,742

Int. Cl.[6] G01B *5/04*

U.S. Cl. 356—381 **20 Claims**



1. A system for measuring the height of an object having an outer surface, comprising:

a source, having two or more light sources, including a first light source providing a first light beam having a structured energy pattern for irradiating the outer surface of the object; said structured energy pattern having a constant dimension, and a

second light source providing a second light beam for uniformly illuminating the outer surface of the object;

5,555,092

METHOD AND APPARATUS FOR CORRECTING

5,555,095

IMAGE SIGNAL PROCESSING APPARATUS

Tatsuki Inuzuka; Toshiaki Nakamura; Shinichi Shinoda, and

second light source providing a second light beam for uniformly illuminating the outer surface of the object;

a sensor, for individually sensing the outer surface of the object as irradiated by said first light beam and said second light beam;

a system for removing interference resulting from unwanted markings on the surface of the object by dividing said first light beam sensed by said sensor with said second light beam sensed by said sensor; and

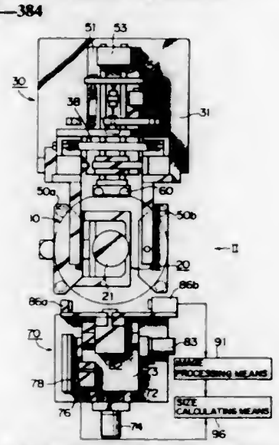
a system for calculating the height of the object in response to said constant dimension of said structured pattern irradiating said outer surface of the object and sensed by said sensor.

5,555,091

WAFER DIAMETER/SECTIONAL SHAPE MEASURING MACHINE

Takeshi Kagamida, Tokyo, Japan, assignor to Tokyo Seimitsu Co., Ltd., Tokyo, Japan

Filed Jan. 17, 1995, Ser. No. 373,036
Claims priority, application Japan, Jan. 27, 1994, 6-023582
Int. Cl.[6] G01N *21/86*
U.S. Cl. 356—384 **9 Claims**



1. A wafer diameter/sectional shape measuring machine for measuring a wafer having a diameter, a sectional shape, and a center, said wafer also having either an orientation flat or a notch, comprising:

a rotatable wafer table for adsorbing and holding a wafer, said wafer table also being movable in a substantially linear direction;

position control means for positioning said center of said wafer and one of said orientation flat or said notch of said wafer at a predetermined position on said wafer table so that said center of said wafer corresponds to a rotational center of said wafer table;

shape detecting means for detecting said sectional shape of said wafer;

measuring means for driving said shape detecting means in a direction of said wafer table, said measuring means being provided with moving value detecting means for detecting a moving value of said shape detecting means;

image processing means for calculating said sectional shape of said wafer based on data detected by said shape detecting means; and

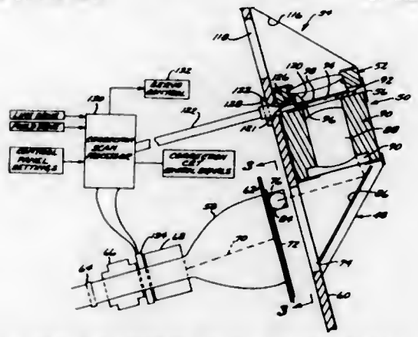
size calculating means for calculating said diameter of said wafer based on a signal from said image processing means and a signal from said moving value detecting means.

5,555,092

METHOD AND APPARATUS FOR CORRECTING HORIZONTAL, VERTICAL AND FRAMING ERRORS IN MOTION PICTURE FILM TRANSFER

Michael C. Kaye, Agoura Hills, and Majid Bemanian, Glendale, both of Calif., assignors to MSCL, Hollywood, Calif.

Continuation of Ser. No. 142,854, Dec. 15, 1987, abandoned.
This application Oct. 18, 1988, Ser. No. 259,125
Int. Cl.[6] H04N *5/86*
U.S. Cl. 348—107 **67 Claims**



1. A method for registering film in a film transfer device, the method comprising the steps of:

(a) passing film across a film plane for scanning of the film by a first scanner;

(b) scanning the film with at least one horizontally directed scan line from the first scanner;

(c) scanning a sprocket hole on the film with a second scanner separate from the first wherein the step of scanning a sprocket hole comprises the step of causing the second scanner to scan horizontally across an edge of the sprocket hole;

(d) sensing the horizontal scan as it passes the edge of the sprocket hole;

(e) producing a signal representative of the location of the edge of the sprocket hole;

(f) comparing the signal to a reference;

(g) generating a correction signal as a result of the step of comparing;

(h) applying the correction signal to a control of the first scanner;

(i) repeating steps (b)–(h) for each of a plurality of scan lines.

5,555,093

IMAGE PROCESSING APPARATUS AND METHOD THEREOF

Nao Nagashima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 26, 1993, Ser. No. 52,452
Claims priority, application Japan, Apr. 30, 1992, 4-111751
Int. Cl.[6] H04N *1/387*
U.S. Cl. 358—296 **19 Claims**

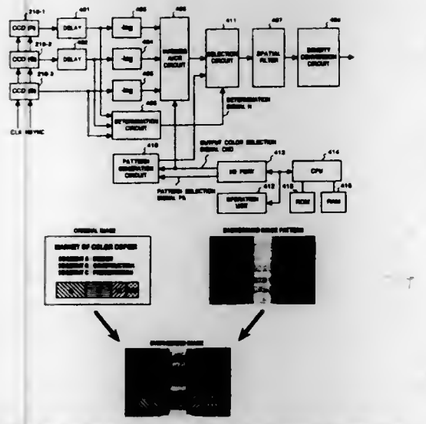
1. An image processing apparatus comprising:

converting means for converting a document image into image data;

background color pattern generation means for generating a background color pattern which includes gradation;

synthesizing means for synthesizing the background color pattern generated by said background color pattern generation means with the image data from the document image converted by said converting means to form synthesized image data, said synthesizing means performing the synthesizing in synchronization with the converting performed by said converting means; and

output means for outputting the synthesized image data.



5,555,094

APPARATUS AND METHOD FOR INTERPRETING IMAGE DATA FOR USE IN A RASTER PLOTTER

J. Brett Lefebvre, Lowell, Mass., and Glenn E. Cabana, Derry, N.H., assignors to Intergraph Corporation, Del.

Continuation of Ser. No. 514,032, Apr. 27, 1990, Pat. No. 5,075,779. This application Sep. 9, 1991, Ser. No. 756,186
Int. Cl.[6] H04N *1/419;1/23*
U.S. Cl. 358—298 **6 Claims**

4. A system for converting information, including tone value information, regarding a page being made up of superior and inferior objects based on an opaque ink model, the system comprising:

means for run length encoding the page information, so that the page is essentially divided into tone runs, and the page information is organized into tone run records, each tone run record containing information relating to (a) tone value of the tone run, (b) starting location of the tone run and (c) length of the tone run; and

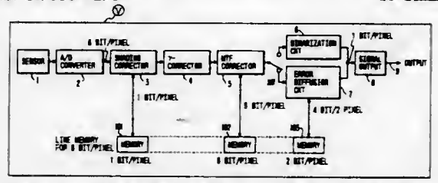
means for deleting information relating to the tone values of those portions of the inferior objects that underlie superior objects, while preserving information relating to the tone values of those portions of objects that do not underlie superior objects.

5,555,095

IMAGE SIGNAL PROCESSING APPARATUS

Tatsuki Inuzuka; Toshiaki Nakamura; Shinichi Shinoda, and Yasuyuki Kojima, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1993, Ser. No. 34,388
Claims priority, application Japan, Mar. 19, 1992, 4-063270
Int. Cl.[6] G02B *26/08;* G03B *21/56*
U.S. Cl. 358—298 **10 Claims**



1. A processing apparatus for processing an image signal inputted using a photoelectric conversion element, comprising:

means for effecting compression and expansion of a white reference signal (b bit/pixel) for shading correction into a compressed signal of d bit per one picture element (data width being b>d);

MTF correction means for correcting a signal of a noticed picture element (e bit/pixel) using a first signal of adjacent plural picture elements (f bit/pixel);

error diffusion means for producing a binary output signal by estimation, using a signal of a noticed picture element and a second signal of error components of a picture element after binarization (j bit/pixel), in order to calculate a pseudo-halftone image;

and

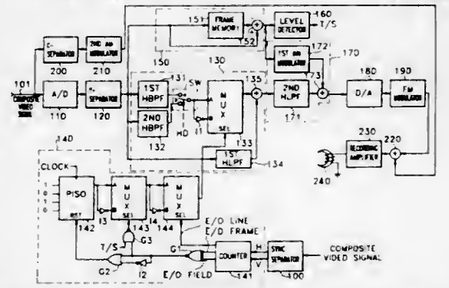
a line memory for storing said compressed signal and said first and second signals, the data width of said stored signals per one picture element being d+f+j=8.

5,555,096

FREQUENCY FOLDING AND UNFOLDING CIRCUITS OF A VIDEO SIGNAL RECORDING/REPRODUCING APPARATUS

Jae-chun Yoo, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

Continuation of Ser. No. 35,181, Mar. 22, 1993, abandoned.
This application Oct. 20, 1994, Ser. No. 326,749
Claims priority, application Rep. of Korea, Mar. 20, 1992, 92-4663
Int. Cl.[6] H04N *9/79*
U.S. Cl. 358—310 **26 Claims**



1. In a video recording apparatus for recording a full-bandwidth video signal including a chroma signal and a luma signal on a recording medium having an effective limited bandwidth, a video signal folding circuit comprising:

an input terminal for receiving said video signal from a signal supply source;

a first frequency folder for separating a predetermined first high-frequency luma signal from said video signal input via

said input terminal to fold the separated signal on a first low-frequency luma band, thereby generating a first folded luma signal having a limited bandwidth;

a second frequency folder for separating a remaining second high-frequency luma signal while excluding said first high-frequency luma band in said video signal from said input terminal to fold the remaining signal on a second low-frequency luma band exclusive of said first low-frequency luma band, thereby generating a second folded luma signal having a limited bandwidth; and

a luma signal recorder that, in recording a given frame of the video signal, alternates, according to a preset period, between recording said first folded luma signal and said second folded luma signal on said recording medium.

5,555,097

TELEVISION-INTEGRATED VIDEO CASSETTE RECORDER APPARATUS

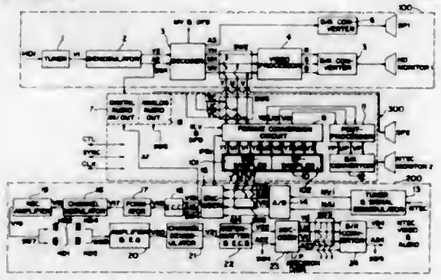
Mun C. Joung; Young J. Choi; Kwan B. Shim; Do H. Cho; Seung I. Kim, and Byoung K. Yoo, all of Seoul, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed May 12, 1994, Ser. No. 241,556

Claims priority, application Rep. of Korea, May 18, 1993, 93-8493

Int. Cl.[6] H04N *5/926*

U.S. Cl. 358—335 **21 Claims**



1. A television-integrated video cassette recorder apparatus comprising:

a high definition television for receiving a high definition television signal from a broadcasting station;

a digital video cassette recorder for recording and playing back the high definition television signal or a standard television signal on/from a magnetic tape, said high definition television displaying the high definition television signal; and

interface means for converting a format of the high definition television signal into a recording format of said digital video cassette recorder in a recording mode, converting a format of a playback signal from said digital video cassette recorder into a high definition television format for said high definition television or a standard television format in a playback mode and performing a plurality of screen processing functions in a standard television manner.

5,555,098

METHOD AND APPARATUS FOR PROVIDING MULTIPLE PROGRAMMED AUDIO/STILL IMAGE PRESENTATIONS FROM A DIGITAL DISC IMAGE PLAYER

Kenneth A. Parulski, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 803,245, Dec. 5, 1991, abandoned. This application Apr. 26, 1994, Ser. No. 233,540

Int. Cl.[6] H04N *5/76*

U.S. Cl. 358—341 **39 Claims**

1. An apparatus for use with a system including a digital data base for storing respectively corresponding digitized still images in

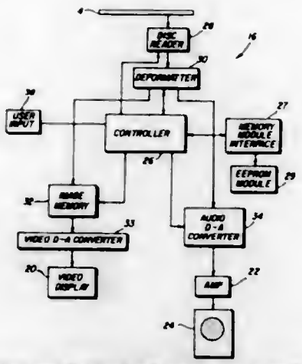


image data files and digitized audio messages in audio data files, for controlling concurrent reproduction of digitized images on an image reproduction device and audio information on a sound reproduction device, said apparatus comprising:

means for providing user input commands;

means, responsive to a single user command from said means for providing user input commands, for selecting and reading a sequence of digitized still images from the image data files in an ordered sequence established in a presentation sequences file and coupling said selected sequence of digitized still images to an image signal output for display on the image reproduction device;

means for identifying a plurality of sequences of digitized audio messages associated with a plurality of sequences of digitized still images, some of said digitized audio messages being associated with different digitized still images in different sequences, said plurality of sequences of digitized audio messages including a selected sequence of digitized audio messages which are to be played back in an ordered sequence also established in the presentation sequences file and concurrently with the display of said selected sequence of digitized still images; and

means for reading said selected sequence of digitized audio messages from the audio data files and coupling the audio information to an audio signal output for playback on the sound reproduction device concurrent with the display of the associated sequence of digitized still images on said image reproduction device.

5,555,099

REPRODUCTION APPARATUS AND METHOD WITH PROOF SET PAGE NUMBERING

Lawrence B. Telle, Greece, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 9, 1994, Ser. No. 353,034

Int. Cl.[6] H04N *1/00*

U.S. Cl. 358—401 **13 Claims**

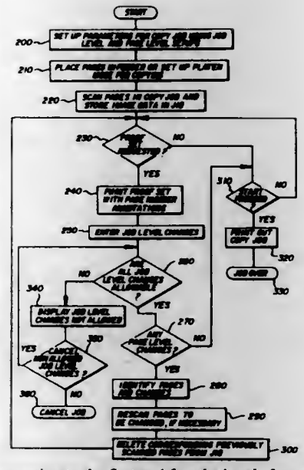
1. A copier apparatus, comprising:

scanning means for electronically scanning a set of original document pages to be reproduced as a production job and producing first electrical signals representing image information on the document pages;

means for inputting operator selectable job level requirements for copying the set of document pages as a copy job and generating second signals representing said job level requirements;

means for inputting operator selectable page level requirements for reproducing pages of the set and generating third signals representing page level requirements;

means for generating fourth signals representing consecutive numbers for use in annotating a hard copy proof set of pages of the set of original document pages;



means responsive to the first and fourth signals for producing the hard copy proof set of pages of said set of original document pages with the hard copy proof set of pages additionally including consecutive numbered annotations, the annotations not being present on the original document pages;

means for inputting a number present as an annotation number on one page of the previously produced hard copy proof set of pages;

means responsive both to an input of said number on said one page and a new operator selectable page level requirement for changing a requirement for reproducing a corresponding original page in said set of original document pages;

means for operating said scanning means to electronically rescan said corresponding original page and generating fifth signals representing image information on said corresponding original page; and

means, responsive to the first, second, third and fifth signals for producing collated copy sets of the set of document pages as a copy job with the said corresponding original page reproduced according to the changed requirement.

5,555,100

FACSIMILE STORE AND FORWARD SYSTEM WITH LOCAL INTERFACE TRANSLATING DTMF SIGNALS INTO STORE AND FORWARD SYSTEM COMMANDS

Mark C. Bloomfield, Marietta; Edward F. Castro, Acworth; Joseph T. Dyer, Marietta; Deborah J. Jackson, Smyrna; Charles E. Lemons, Alpharetta; Bruce A. McCown, Marietta; Johnny P. Mullis, Decatur, and Brian A Troxell, Smyrna, all of Ga., assignors to Audiofax, Inc., Marietta, Ga.

Filed Oct. 7, 1993, Ser. No. 132,997

Int. Cl.[6] H04N *1/32;1/327;1/333*

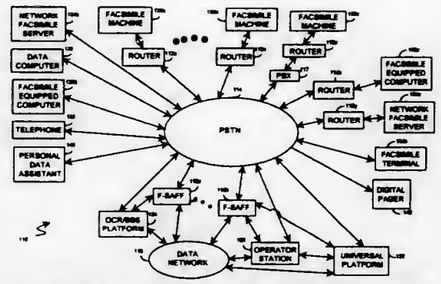
U.S. Cl. 358—402 **41 Claims**

1. A facsimile communication method utilizing an interface device coupled to a local facsimile machine through a first telephone line and selectively coupled to a remotely located facsimile store and forward facility through a second telephone line and a public switched telephone network, the method comprising steps of:

receiving dual tone multi-frequency (DTMF) signals at the interface device generated by the local facsimile machine in response to user input;

translating the DTMF signals received at the interface device from the local facsimile machine into at least one facility command of a plurality of available facility commands for the remotely located facsimile store and forward facility;

calling the remotely located facsimile store and forward facility from the interface device over the second telephone line to



establish a connection between the interface device and the remotely located facsimile store and forward facility;

transmitting the facility command from the interface device over the second telephone line and through the public switched telephone network to the remotely located facsimile store and forward facility;

receiving the facility command at the remotely located facsimile store and forward facility;

analyzing the facility command at the remotely located facsimile store and forward facility to identify the facility command among the plurality of available facility commands;

generating an interface connect/hold command at the remotely located facsimile store and forward facility:

transmitting the interface connect/hold command through the public switched telephone network and the second telephone line to the interface device;

receiving the interface connect/hold command at the interface device;

connecting the first telephone line to the second telephone line at the interface device;

monitoring the local facsimile machine from the remotely located facsimile store and forward facility for facsimile machine tones:

receiving facsimile information from the local facsimile machine at the remotely located facsimile store and forward facility;

monitoring the connected second telephone line at the interface device for concluding handshaking signals;

supplying load from the interface device to the second telephone line in response to detecting the concluding handshaking signals to maintain the connection between the interface device and the remotely located facsimile store and forward facility as the local facsimile machine hangs up the first telephone line; and

hanging up the second telephone line at the interface device.

5,555,101

FORMS CREATION AND INTERPRETATION SYSTEM

Joseph C. Larson, Rancho Santa Fe, and J. Joel Faul, Encinitas, both of Calif., assignors to Cardiff Software, Inc., San Marcos, Calif.

Continuation-in-part of Ser. No. 824,035, Jan. 22, 1992, abandoned, which is a continuation-in-part of Ser. No. 733,942, Jul. 22, 1991, abandoned. This application Jun. 29, 1993, Ser. No. 84,767

Int. Cl.[6] H04N *1/00*

U.S. Cl. 358—403 **31 Claims**

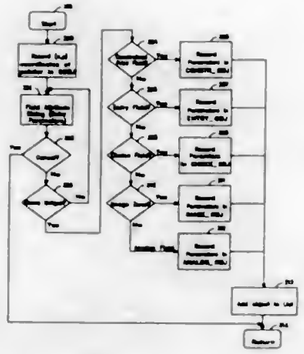
1. In a computer, a method of converting a screen definition file having a plurality of records with data fields for use in a fax form, said form including template information comprising a plurality of template fields, the method comprising the steps of:

reading one or more records in a screen definition file;

processing a selected record so that the fields are converted into a template field;

matrix signal for a gray level in response to the incremental threshold signal and a second dither matrix signal for a

arbitrary position on said display and selecting arbitrary characters as the displaying characteristics; and



computer generating machine readable identification markings on the fax form, wherein the machine readable identification markings identify the fax form and the corresponding template information;

storing the template fields and machine readable identification markings in the computer;

receiving a completed fax form into the computer from a remote location;

automatically identifying the completed fax form, wherein the computer interprets the machine readable identification markings on the completed fax form;

locating in the computer the template information corresponding to the identified completed fax form; and

selectively interpreting information entered on the completed fax form with the template information of the fax form stored in the computer.

5,555,102

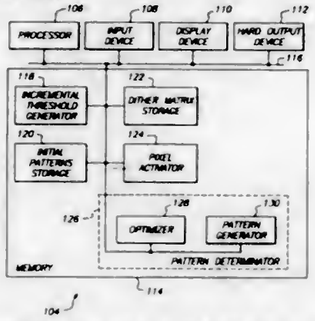
SYSTEM AND METHOD FOR GENERATING IMAGES WITH IMPROVED VISUAL QUALITY USING LOCAL CORRELATION, ORDERED DITHER

John C. Dalton, San Francisco, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Jan. 30, 1995, Ser. No. 379,919

Int. Cl.[6] H04N *1/40; 1/405*

U.S. Cl. 358—456 **24 Claims**



1. A system for generating a set of dither matrices, the system comprising:

an incremental threshold generator, having an input coupled to receive a local correlation criteria signal and having an output, for generating an incremental threshold signal that controls the activation of cells in a dither matrix; and

a pattern generator, having an input coupled to receive the incremental threshold signal from the incremental threshold generator and having an output, for generating a first dither matrix signal for a gray level in response to the incremental threshold signal and a second dither matrix signal for a current gray level.

5,555,103

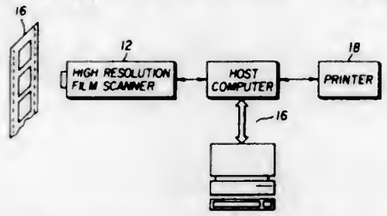
HALF-TONE CONVERSION MASK FOR DIGITAL IMAGES

Peter G. Anderson, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 16, 1992, Ser. No. 852,459

Int. Cl.[6] H04N *1/40; 1/46*

U.S. Cl. 358—456 **22 Claims**



1. A method of generating a half-tone digital image mask for converting respective grey scale values of pixels of a digital image into one of two binary values, comprising the steps of:

(a) defining an N×M array of mask value locations associated with at least a portion of the pixels of said digital image; and

(b) algebraically assigning grey scale to half-tone conversion threshold values to said mask value locations in such a manner that, in the course of sequentially proceeding through said mask value locations in an order defined in accordance with a two-dimensional analog of the Golden Mean, numerically sequential grey scale to half-tone conversion threshold values are encountered such that the grey scale values of the pixels of the digital image are converted into one of two binary values to form a half-done digital image.

5,555,104

OPERATION UNIT OF ELECTRONIC EQUIPMENT UTILIZING VISUALLY DISPLAYED FUNCTIONS ON A TOUCH SCREEN

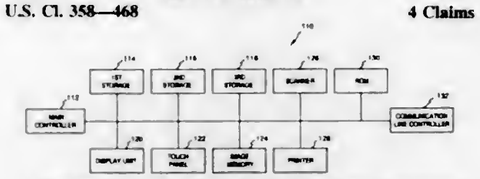
Shinji Todaka, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1994, Ser. No. 207,192

Claims priority, application Japan, Mar. 10, 1993, 5-076276; Jul. 23, 1993, 5-182519

Int. Cl.[6] H04N *1/00*

U.S. Cl. 358—468 **4 Claims**



1. Electronic equipment having an operation unit, comprising:

a touch panel for inputting information to the electronic equipment;

a display for displaying key images input on said touch panel;

display data storage means for storing data which is displayed on said display, said display data storage means having a first storage for storing key frame data as the display data and a second storage for storing character data as the display data;

setting means for setting a displaying position of the key frame data stored in said first storage and for selecting displaying characters from the character data stored in said second storage, said setting means positioning the key frame data at an arbitrary position on said display and selecting arbitrary characters as the displaying characteristics; and

setting data storage means for storing the displaying position of the key frame data set by said setting means and the displaying characters selected by said setting means, said setting data storage means being able to repeatedly display the key frame data and the displaying characteristics at the displaying position.

5,555,105

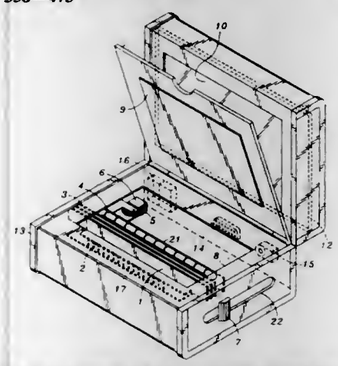
BUSINESS CARD IMAGE COPIER

Fred A. Shahir, 629 Kendale La., Thousand Oaks, Calif. 91360, and Frank K. Sohaei, 7172 Tern Pl., Carlsband, Calif. 92009

Filed Sep. 29, 1992, Ser. No. 954,168

Int. Cl.[6] H04N *1/24*

U.S. Cl. 358—473 **4 Claims**



1. A hand-held business card image copier comprising:

an image scanner module for generating an electronic digitized image of a business card;

a keyboard pad for assigning identification data to the digitized image; a memory controller for storing the digitized image and assigned identification data;

a display screen for depicting the digitized image;

said scanner module, keyboard pad, controller and display screen being contained in a portable housing having a surface area substantially conforming to the surface area of the business card said keyboard pad, said display and said scanner being rotably interconnected and wherein said keyboard pad is rotatable to cover the business card after said card is placed within the housing.

5,555,106

SINGLE PASS LINE SCANNING OF AN IMAGE WITH A COLOR FILTER WHEEL HAVING A PLURALITY OF FILTERS

Steve H. Hsu, 361 Van Ness Way, Suite 301, Torrance, Calif. 90501

Continuation of Ser. No. 790,726, Nov. 8, 1991, abandoned. This application Apr. 4, 1994, Ser. No. 223,094

Int. Cl.[6] H04N *1/46*

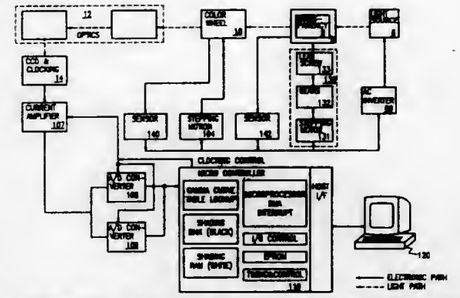
U.S. Cl. 358—512 **14 Claims**

1. A system for line-by-line, single pass color image scanning of an image on an image media, the image having color, the system comprising:

a light source for providing substantial uniform illumination;

means for providing a high frequency current to the light source, the high frequency current sufficient for isolating flicker;

a holding means for affixing the image media thereto, the holding means and image media combination in operative proximity to the light source for providing substantially uniform illuminating to the image to provide a first optical signal;



a light filtering means in operative proximity to the image media for receiving the first optical signal from the image as illuminated and for selectively filtering the first optical signal to provide a second optical signal, the light filtering means including a plurality of sets of color segments for selectively filtering the first optical signal, the plurality of sets of color segments sufficiently translucent to allow the first optical signal to pass in part through the plurality of sets of color segments to provide the second optical signal;

a light focusing subsystem in operative proximity to the light filtering means for receiving the second optical signal and for focusing the second optical signal to provide a third optical signal, the light filtering means disposed between the image media and the light focusing subsystem;

a sensor means in operative proximity to the light focusing subsystem for receiving the third optical signal and for converting the third optical signal to an electrical image signal, the sensor means and the light focusing subsystem optically aligned with the light filtering means such that an aperture of the light focusing subsystem need not completely clear the light filtering means for obtaining valid data, the sensor means not having separate sensor arrays for separate colors and lines;

digitizing means for receiving the electrical image signal and for providing a digitized electric image signal; and

processing means for receiving the digitized electric image signal and for providing an electronic representation of the image spanning a dynamic range of optical density from 0.0 to 3.6.

5,555,107

IMAGE PROCESSING APPARATUS FOR JUDGING A COLOR USING SPATIAL FREQUENCY CORRECTED COLOR COMPONENT SIGNALS

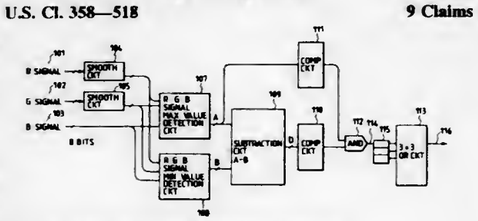
Masahiro Funada; Yoichi Takaragi, both of Yokohama; Shinobu Arimoto, Tokyo, and Michio Kawase, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 556,370, Jul. 24, 1990, abandoned. This application Mar. 29, 1994, Ser. No. 219,744

Claims priority, application Japan, Jul. 25, 1989, 1-193098; Jul. 27, 1989, 1-196049

Int. Cl.[6] H04N *1/60*

U.S. Cl. 358—518 **9 Claims**



1. An image processing apparatus comprising:

a) input means for inputting a first color component signal and a second color component signal both representing an input

5,555,109

ILLUMINATION SYSTEM EMPLOYING AN ARRAY OF

plurality of orientations according to an applied electric field, and having a non-linear electro-optical property; and

a) input means for inputting a first color component signal and a second color component signal both representing an input image;

b) first correcting means for correcting a spatial frequency characteristic of the first color component signal and the second color component signal so as to match spatial frequency characteristics of the first color component signal and the second color component signal;

c) judging means for judging a color of the input image based on the first color component signal and the second color component signal having matched spatial frequency characteristics; and

d) second correcting means for correcting a judgment result of said judging means, said second correcting means correcting a judgment result of an object pixel of the input image by using plural pixels adjacent the object pixel.

5,555,108

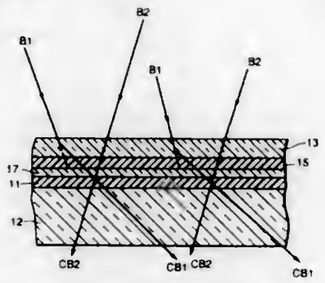
HOLOGRAPHIC EXPOSURE PRISM

Stephen T. Babbitt, Redondo Beach; James E. Scott, Hermosa Beach, and John E. Wreede, Azusa, all of Calif., assignors to Hughes Electronics, Los Angeles, Calif.

Filed Aug. 31, 1994, Ser. No. 298,810

Int. Cl.[6] G03H *1/20;1/26;1/00;* **G02B** *5/32*

U.S. Cl. 359—12 **12 Claims**



1. A hologram exposure system comprising:

a holographic recording medium;

a first monochromatic beam having a predetermined wavelength and a first predetermined direction;

a second monochromatic beam having said predetermined wavelength and a predetermined direction that is different from said first predetermined direction;

a hologram layer from diffracting said first monochromatic beam toward one side of said holographic recording medium to produce a diffracted beam and for transmitting said second monochromatic beam toward said one side of said holographic recording medium without diffraction to produce a non-diffracted beam; and

a holographic zero order filter interposed between said hologram layer and said holographic recording material for diffracting a portion of said first monochromatic beam that is not diffracted by said hologram layer, said holographic zero order filter diffracting said portion of said first monochromatic beam away from said holographic recording medium;

whereby said diffracted beam and said non-diffracted beam interfere in said hologram recording medium to form holographic fringes.

5,555,109

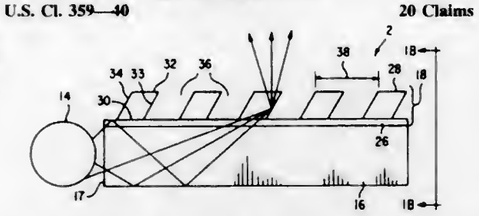
ILLUMINATION SYSTEM EMPLOYING AN ARRAY OF MICROPRISMS

Scott M. Zimmerman, Basking Ridge; Karl W. Beeson, Princeton; Janpu Hou, Bridgewater, and John C. Schweyen, Midland Park, all of N.J., assignors to AlliedSignal Inc., Morris Township, N.J.

Continuation of Ser. No. 242,525, May 13, 1994, which is a continuation-in-part of Ser. No. 149,219, Nov. 5, 1993, Pat. No. 5,396,350. This application Feb. 24, 1995, Ser. No. 394,098

Int. Cl.[6] G02F *1/1335*

U.S. Cl. 359—40 **20 Claims**



1. An illumination assembly for providing a spatially directed light source comprising:

(a) a light transmitting means having a first light accepting surface in close proximity to a first diffuse light source, wherein said light transmitting means transports light emanating from said first diffuse light source;

(b) reflecting means for redirecting said light comprising an array of microprisms wherein each microprism comprises:

(i) a light input surface attached to said light transmitting means;

(ii) a light output surface distal from and parallel to said light input surface and having a surface area at least equal to the surface area of said light input surface;

(iii) a first pair of oppositely disposed sidewalls disposed between and continuous with said light input surface and said light output surface and intersecting said light transmitting means wherein the lines of intersection are substantially parallel to said first light accepting surface and at least one of said sidewalls forms a first tilt angle with respect to the normal of the surface of said light transmitting means;

(iv) a second pair of oppositely disposed tilted sidewalls, disposed between and continuous with said light input surface and said light output surface and intersecting said light transmitting means wherein said lines of intersection are substantially perpendicular to said first light accepting surface and at least one of said sidewalls forms a second tilt angle with respect to the normal of the surface of said light transmitting means;

wherein, said light reflecting through said light transmitting means enters said microprisms through said light input surfaces, is redirected by said sidewalls and emerges through said light output surfaces as a spatially directed light source.

5,555,110

METHOD OF DRIVING A FERROELECTRIC LIQUID CRYSTAL DISPLAY

Toshimitsu Konuma; Takeshi Nishi, and Harumi Mori, all of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Company, Ltd., Kanagawa-ken, Japan

Filed Dec. 15, 1993, Ser. No. 167,357

Claims priority, application Japan, Dec. 21, 1992, 4-357090; Dec. 28, 1992, 4-360195

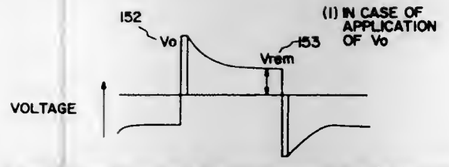
Int. Cl.[6] G02F *1/133;* **G09G** *3/36*

U.S. Cl. 359—56 **5 Claims**

1. A method of driving an electro-optical device comprising:

a pair of substrates;

a pixel electrode provided on one of said substrates;



a liquid crystal material having spontaneous polarization and sandwiched between said substrates;

orienting means provided on a surface of at least one of said substrates which is in contact with said liquid crystal material, said orienting means acting to orient molecules of said liquid crystal material along one axis in at least an initial stage; and

a thin-film transistor connected with said pixel electrode at one of source and drain thereof,

said method comprising:

applying a voltage in different polarities from said thin-film transistor to said liquid crystal material to switch the liquid crystal material between a first state and a second state,

wherein a voltage exceeding a voltage required to maintain said liquid crystal material in one of said first and second states is applied to said pixel electrode during each select period in which the electro-optical device is displaying an image; and

wherein the application of said voltage exceeding the voltage required to maintain said liquid crystal material in one of said first and second states is carried out by applying a voltage pulse to a gate of said thin-film transistor at a pulse width of 0.1 μsec. to 1.5 T_O with a frame period of between 1/6000 sec. and 1/60000 sec., and applying a voltage of 10 V to 25 V to the other one of said source and drain during the application of said voltage pulse, where T_O is a response time of said liquid crystal material.

5,555,111

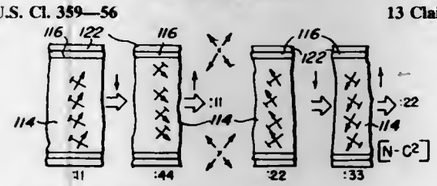
SURFACE STABILIZED FERROELECTRIC LIQUID CRYSTAL DEVICES WITH DIELECTRIC TORQUES GREATER THAN FERROELECTRIC TORQUES

Noel A. Clark, 3106 Kittrell Ct., Boulder, Colo. 80303, and Sven T. Lagerwall, 30 Snackvagen, Goteborg, Sweden

Continuation of Ser. No. 826,473, Jan. 27, 1992, Pat. No. 5,277,905, which is a continuation of Ser. No. 491,464, Mar. 30, 1990, Pat. No. 5,083,855, which is a division of Ser. No. 318,762, Mar. 3, 1989, Pat. No. 4,958,916, which is a division of Ser. No. 225,464, Jul. 28, 1988, Pat. No. 4,840,463, which is a division of Ser. No. 88,482, Aug. 19, 1987, Pat. No. 4,813,767, which is a continuation of Ser. No. 797,021, Nov. 12, 1985, abandoned, which is a division of Ser. No. 511,733, Jul. 7, 1983, Pat. No. 4,563,059, which is a continuation-in-part of Ser. No. 456,844, Jan. 10, 1983, abandoned, which is a continuation of Ser. No. 110,451, Jan. 8, 1980, Pat. No. 4,367,924. This application Oct. 30, 1992, Ser. No. 969,386

Int. Cl.[6] G02F *1/13*

U.S. Cl. 359—56 **13 Claims**



4. Grey scale display device comprising:

a pair of electrodes;

a quantity of chiral smectic liquid crystal having a plurality of layers each comprised of a plurality of molecules whose long axis forming helixes in a bulk of said liquid crystal, said chiral smectic liquid crystal being sandwiched between said pair of electrodes, the distance between which is small enough to suppress the forming of helixes and thereby to assume a plurality of orientations according to an applied electric field, and having a non-linear electro-optical property; and

means for modulating a characteristic of a voltage pulse applied to said pair of electrodes to control a grey level of said display.

5,555,112

LIQUID CRYSTAL DISPLAY DEVICE HAVING MULTILAYER GATE BUSLINE COMPOSED OF METAL OXIDE AND SEMICONDUCTOR

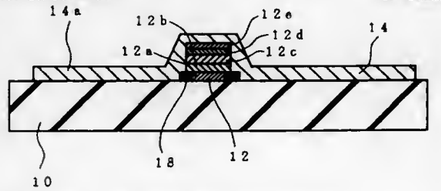
Ryoji Oritsuki; Minoru Hiroshima, both of Chiba-ken; Masahiro Yanai, Mobara; Masaaki Matsuda, Mobara; Toshikazu Horii, Mobara; Yuichi Hashimoto, Mobara; Hayao Kozai, Mobara; Kenkichi Suzuki, Mobara; Masaru Takabatake, Hitachi, and Takashi Isoda, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Device Engineering Co., Ltd., Chiba-ken, both of Japan

Filed Feb. 9, 1994, Ser. No. 193,868

Claims priority, application Japan, Feb. 23, 1993, 5-33370

Int. Cl.[6] G02F *1/1343;* **H01L** *29/04*

U.S. Cl. 359—59 **19 Claims**



1. A liquid crystal display substrate comprising:

pixel electrodes;

thin-film transistors, each having a gate electrode, a drain and a source, the gate electrode being applied with a voltage to impress a voltage on the associated pixel electrode through the drain and source of the thin-film transistor, each thin-film transistor having a gate insulating film overlying the gate electrode, a silicon layer on the gate insulating film, and a highly doped silicon film on the silicon layer, sides of the gate electrode not being covered by the gate insulating film such that the sides are exposed thereby, and an insulating layer, different from the gate insulating film, covering the sides of the gate electrode and not covering a top of the gate electrode; and

interconnect layers or buslines connected to gate electrodes of the thin-film transistors.

5,555,113

LIQUID CRYSTAL DISPLAY DEVICE WITH TWIST ANGLE ØOF 70 TO 90°AND ALIGNMENT TO POLARIZATION DIRECTION ANGLE BETWEEN Ø/2+30°AND Ø/2+60°

Johannes C. H. Mulkens, and Ingrid E. J. R. Heynderickx, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

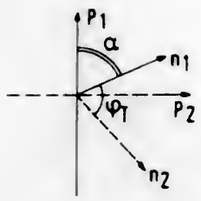
Continuation-in-part of Ser. No. 166,803, Dec. 14, 1993, abandoned, which is a continuation of Ser. No. 13,483, Feb. 1, 1993, abandoned, which is a continuation of Ser. No. 942,123, Sep. 8, 1992, abandoned, which is a continuation of Ser. No. 673,871, Mar. 22, 1991, abandoned. This application Oct. 11, 1994, Ser. No. 321,186

Claims priority, application Netherlands, Mar. 23, 1990, 9000686

Int. Cl.[6] G02F *1/1335;1/13*

U.S. Cl. 359—63 **7 Claims**

1. A liquid crystal display device comprising a layer of liquid crystal material between two substrates, the substrates each being provided with electrodes and orientation means in contact with the liquid crystal material giving the liquid crystal molecules a first



direction of orientation at one of said two substrates and a second direction of orientation at the other of said two substrates such that the liquid crystal material has a twist angle ϕT across the thickness of the layer, said device further comprising polarizers at opposite sides of the layer of liquid crystalline material having directions of polarization which cross each other substantially perpendicularly, characterized in that the twist angle has a value ϕT between 70° and 90° and the angle α between the direction of orientation provided by the orientation means one of the substrates is provided with and the direction of polarization of the polarizer at the same side of the layer of liquid crystal material as said orientation means has a value of α of between $30°+\phi T/2$ and $60°+\phi T/2$.

5,555,114

LIQUID CRYSTAL DISPLAY WITH REFLECTIVE COLOR FILTERS

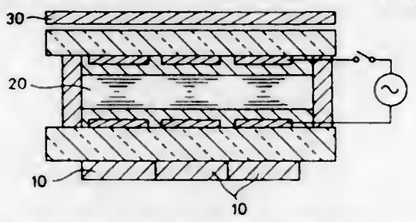
Kenichi Narita, and Takeshi Suzuki, both of Tottori, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, and Tottori Sanyo Electric Co., Ltd., Tottori, both of Japan

Continuation of Ser. No. 156,900, Nov. 24, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 480,731

Claims priority, application Japan, Nov. 30, 1992, 4-320720

Int. Cl.[6] G02F *1/1335*

U.S. Cl. 359—65 **8 Claims**



1. A multi/full color liquid display device comprising:

a plurality of color selection layers consisting essentially of a cholesteric liquid crystal for reflecting respectively circularly polarized light of red, blue and green,

an optical layer formed on said color selection layers at a side where said circularly polarized light is reflected, and

a layer formed on said color selection layers, at a side opposite to said optical layer, for absorbing light transmitted through said color selection layers,

wherein said optical layer comprises a single liquid crystal layer consisting essentially of a ferroelectric liquid crystal of uniaxial orientation and covering entirely arranged said plurality of color selection layers, matrix electrodes holding said liquid crystal layer therebetween, a single phase shifting film covering entirely arranged said plurality of color selection layers, and a polarizer,

wherein said optical layer generates at least one of circularly polarized light and elliptically polarized light approximating circularly polarized light for red, blue and green light when said liquid crystal layer is in one of an ON state and an OFF state,

wherein the voltage between said matrix electrodes is different in amount between colors, whereby said optical layer has different retardation for each selection wavelength, and

wherein said optical layer responds to the driving voltage between said matrix electrodes for effecting multi/full color display by light reflected by said plurality of color selection layers.

5,555,115

OPTICALLY ADDRESSED SPATIAL LIGHT MODULATING SYSTEM BIAS LIGHT SOURCE AND METHOD FOR DRIVING THE SYSTEM

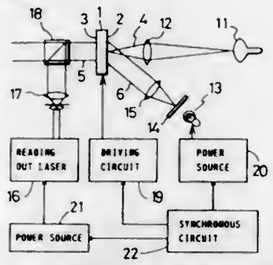
Yasuyuki Mitsuoka; Tadao Iwaki, and Nobuyuki Kasama, all of Tokyo, Japan, assignors to Seiko Instruments Inc., Japan

Filed Sep. 30, 1992, Ser. No. 954,316

Claims priority, application Japan, Mar. 10, 1991, 3-256816

Int. Cl.[6] G02F *1/135*

U.S. Cl. 359—72 **14 Claims**



1. An optically addressed spatial light modulating system comprising: a spatial light modulator having a pair of transparent substrates and a photoconductive layer formed on at least one inner side of the pair of transparent substrates; writing light irradiation means for irradiating a writing light to record an image onto the spatial light modulator; reading out light irradiation means for irradiating a reading out light to read out the recorded image from the spatial light modulator; bias light irradiation means for irradiating the photoconductive layer of the spatial light modulator with a uniform light intensity distribution to adjust a recording sensitivity of the spatial light modulator; and bias light adjusting means for adjusting at least one of the irradiating time and the light intensity of the bias light.

5,555,116

LIQUID CRYSTAL DISPLAY HAVING ADJACENT ELECTRODE TERMINALS SET EQUAL IN LENGTH

Takehiro Ishikawa; Takashi Date, and Fumihiko Sagawa, all of Iwaki, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

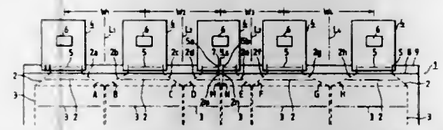
Filed Aug. 11, 1994, Ser. No. 289,357

Claims priority, application Japan, Aug. 23, 1993, 5-207843

Int. Cl.[6] G02F *1/1345;1/1343*

U.S. Cl. 359—88 **6 Claims**

1. In a liquid crystal display including a liquid crystal panel having a plurality of electrode patterns and a plurality of electrode terminals respectively extending from said electrode patterns, said electrode terminals being formed on an edge portion of said liquid



crystal panel, and further including first, second and third tape carriers juxtaposed on said edge portion of said liquid crystal panel such that the second tape carrier is positioned between the first and third tape carriers, each of said tape carriers having an IC mounted thereon for driving said liquid crystal panel, said electrode terminals being connected to a plurality of lead wires formed on one end portion of said each tape carrier; the improvement wherein two adjacent ones of said electrode terminals respectively connected to said first and second tape carriers are substantially equal in length, and two adjacent ones of said electrode terminals respectively connected to said second and third tape carriers are substantially equal in length;

wherein a clearance between the first and second tape carriers is different from a clearance between the second and third tape carriers.

5,555,117

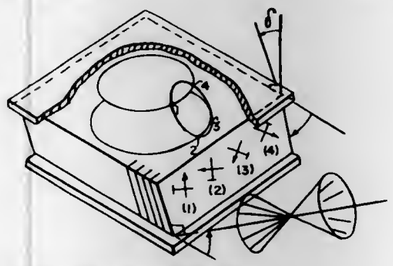
SURFACE STABILIZED FERROELECTRIC LIQUID CRYSTAL DEVICES

Noel A. Clark, 3106 Kittrell Ct., Boulder, Colo. 80303, and Sven T. Lagerwall, 30 Snackvagen, Goteborg, Sweden

Continuation of Ser. No. 969,386, Oct. 30, 1992, which is a continuation of Ser. No. 826,473, Jan. 27, 1992, Pat. No. 5,227,905, which is a continuation of Ser. No. 491,464, Mar. 9, 1990, Pat. No. 5,083,855, which is a division of Ser. No. 318,762, Mar. 3, 1989, Pat. No. 4,958,916, which is a division of Ser. No. 225,464, Jul. 28, 1988, Pat. No. 4,840,463, which is a division of Ser. No. 88,482, Aug. 19, 1987, Pat. No. 4,813,767, which is a continuation of Ser. No. 797,021, Nov. 12, 1985, abandoned, which is a division of Ser. No. 511,733, Jul. 7, 1983, Pat. No. 4,563,059, which is a continuation-in-part of Ser. No. 456,844, Jan. 10, 1983, abandoned, which is a continuation of Ser. No. 110,451, Jan. 8, 1980, Pat. No. 4,367,924. This application May 31, 1995, Ser. No. 455,329

Int. Cl.[6] G02F *1/13*

U.S. Cl. 359—100 **25 Claims**



7. A liquid crystal device comprising:

a pair of substrates;

chiral smectic liquid crystal material having a plurality of layers each comprised of a plurality of molecules, each molecule having a long axis, said long axes forming an angle other than 90° with said layers, said layers aligned parallel to a direction in the plane of said substrates, said long axes of said molecules in a bulk forming helices, said liquid crystal material being disposed between said pair of substrates which are spaced by a distance sufficiently small to suppress the formation of said helices; and

means for applying an electric field to said liquid crystal material, said electric field causing said long axes to change orientation.

5,555,118

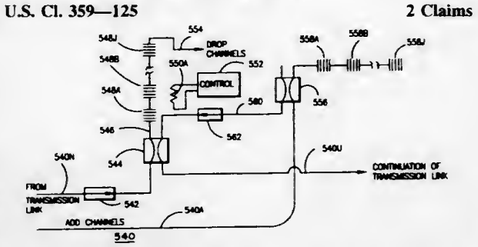
METHOD FOR REMOVING AND INSERTING OPTICAL CARRIERS IN A WDM OPTICAL COMMUNICATION SYSTEM

David R. Huber, Warrington, Pa., assignor to Ciena Corporation, Savage, Md.

Division of Ser. No. 71,263, Jun. 4, 1993. This application Aug. 11, 1995, Ser. No. 514,224

Int. Cl.[6] H04J *14/02*

U.S. Cl. 359—125 **2 Claims**



1. A method for removing and inserting optical carriers in an optical transmission path comprising:

providing an optical transmission path;

transmitting a plurality of optical carriers along the optical transmission path;

providing first and second directional optical transfer devices optically coupled to the optical transmission path, each of the first and second optical transfer devices having at least three optical ports for the input and output of optical signals;

optically coupling at least one Bragg grating to an output port of at least one of the first and second optical transfer devices, the at least one Bragg grating reflecting an optical carrier wavelength;

inputting the plurality of optical carriers to the first optical transfer device;

removing an optical carrier from the plurality of optical carriers input to the first optical transfer device and outputting the removed optical carrier through a first transfer device optical port;

outputting the remaining optical channels through an optical port of the first optical transfer device, the removed optical channel and the remaining optical channels being output through different optical ports of the first optical transfer device;

inputting an insertion optical carrier through an optical port of the second optical transfer device, the insertion optical carrier passing through the second optical transfer device port coupled to the Bragg grating;

reflecting the insertion optical carrier with the Bragg grating back through the second transfer device optical port coupled to the Bragg grating;

outputting the reflected insertion optical carrier from the second optical transfer device such that the insertion optical carrier is added to the optical carriers output by the first optical transfer device.

5,555,119

DIGITAL SAMPLING OF INDIVIDUAL PULSES

wherein a wavelength of a signal output of the single second semiconductor laser is regulated and modulated such that, for

5,555,119

DIGITAL SAMPLING OF INDIVIDUAL PULSES

Meirion F. Lewis, Malvern, United Kingdom, assignor to The Secretary of State of Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, a Britsh Corporation Sole, Whitehall, Great Britain

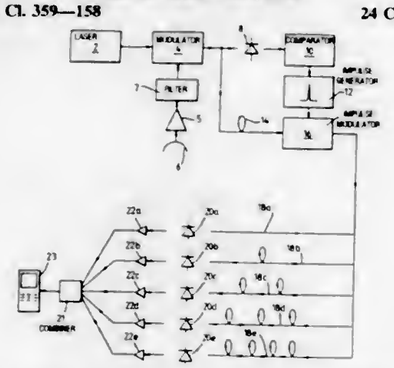
PCT No. PCT/GB92/02318, § 371 Date Jul. 6, 1994, § 102(e) Date Jul. 6, 1994, PCT Pub. No. WO93/13427, PCT Pub. Date Jul. 8, 1993

PCT Filed Dec. 14, 1992, Ser. No. 244,929

Claims priority, application United Kingdom, Dec. 20, 1991, 9127057.9

Int. Cl.[6] H04B *10/04; 10/06*

U.S. Cl. 359—158 **24 Claims**



1. A device for converting wide bandwidth, short duration individual pulses of electro-magnetic radiation into a form more readily digitally sampled, said device comprising,

a source of optical radiation,

a receiving means for receiving a wide bandwidth, short duration pulse of magnetic radiation,

a modulating means, responsive to said optical radiation and said receiving means, for modulating the optical radiation with the pulse to form a modulated optical signal,

an optical time delay means for time delaying at least parts of the modulated optical signal by a plurality of incremental time delays, to produce outputs from the optical time delay means which comprises a plurality of modulated optical signals delayed in time with respect to one another and each substantially identical in profile to at least part of the individual pulse,

a converting means for converting the modulated optical signals output from the optical time delay means into electrical signals, and

a digital sampling means for digitally sampling the electrical signals output from the converting means.

5,555,120

CORDLESS CONTROL SYSTEM FOR AN X-RAY APPARATUS

Timothy D. Telymonde, 75 Manchester Ave., Keyport, N.J. 07735, and Andrew Telymonde, 48 Island Dr., Brick, N.J. 08724

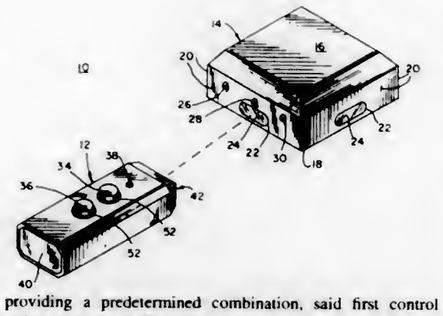
Filed Nov. 10, 1994, Ser. No. 336,989

Int. Cl.[6] H04B *10/10*

U.S. Cl. 359—147 **7 Claims**

1. A cordless control system for actuating selected functions of a mobile X-ray unit comprising:

a) a portable hand held transmitter including a first control switch, a second control switch, and an infrared emitting circuit, said infrared emitting circuit including at least one encoding, encoding switch having a plurality of outputs for



providing a predetermined combination, said first control switch having an Off position, an Intermediate position, and a Lower position; said Intermediate position transmitting only a first binary coded infrared signal for initiating only a Prep function of a mobile X ray apparatus, said Lower position transmitting only a second binary coded infrared signal for initiating an Expose function of the mobile X ray apparatus while simultaneously maintaining said Prep function, said Prep function and said Expose function being terminated upon manual release of said first control switch,

b) a receiver means including at least one infrared sensor and a receiving circuit, the receiving circuit having at least one decoding switch, each decoding switch having a plurality of outputs for providing the predetermined combination, of each of said infrared sensors arrayed for receiving said first binary infrared signal and said second binary coded infrared signal sent by said transmitter, said receiving circuit providing actuation of the selected functions only when said first control switch is manually actuated; and

wherein the predetermined combination provides at least one single channel for the binary coded infrared signals, said first binary coded infrared signal and said second binary coded infrared signal being transmitted on the single channel of said cordless control system.

5,555,121

PROCESS FOR SIMULTANEOUS OPTICAL MODULATION TRANSPOSITION ON SEVERAL WAVELENGTHS

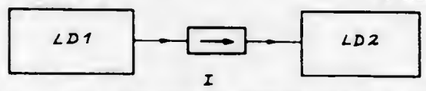
HervéDupont, and Mouhamad Chawki, both of Lannion, France, assignors to France Telecom Establishment autonome de droit public, Paris, France

Continuation of Ser. No. 299,666, Sep. 2, 1994, abandoned. This application Sep. 15, 1995, Ser. No. 528,661

Claims priority, application France, Sep. 9, 1993, 93 10738

Int. Cl.[6] H04B *10/04;* **H01S** *3/98;3/10*

U.S. Cl. 359—180 **6 Claims**



1. A system for the wavelength transposition of a modulated optical signal, comprising:

a first semiconductor laser for generating an incident modulated optical beam to be transposed;

a single second semiconductor laser for receiving the incident optical beam and being able to freely oscillate on several longitudinal modes, said single second semiconductor laser being able to lock on a wavelength of the incident optical beam based on if the incident optical beam has a frequency detuning of one of the longitudinal modes of the single second semiconductor laser and if the incident optical beam has an optical power which exceeds a predetermined threshold;

wherein a wavelength of a signal output of the single second semiconductor laser is regulated and modulated such that, for a first state of the incident optical beam, the single second semiconductor laser is locked on the wavelength of the incident optical beam and only transmits on the longitudinal mode corresponding to the wavelength of the incident optical beam and, for a second state of the incident optical beam, the single second semiconductor laser is not locked on the wavelength of the incident optical beam and simultaneously oscillates on the several longitudinal modes.

5,555,122

LIGHT SCANNING DEVICE

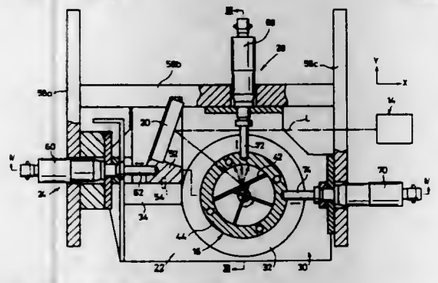
Norihisa Takada, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 13, 1995, Ser. No. 402,694

Claims priority, application Japan, Apr. 11, 1994, 6-071984

Int. Cl.[6] G02B *26/08*

U.S. Cl. 359—196 **2 Claims**



1. A light scanning device comprising:

light beam generating means for generating a light beam; and

a detachable scanning unit for scanning a scanned medium in a main scanning direction with the light beam generated by said light beam generating means;

said scanning unit including:

light beam deflecting means for deflecting the light beam from said light beam generating means to scan the scanned medium with the deflected light beam;

a reflecting mirror for guiding the light beam from said light beam generating means to said light beam deflecting means;

a first adjusting mechanism for angularly adjusting said reflecting mirror about one axis to correct for a bow and an offset of a scanning line on the scanned medium in an auxiliary scanning direction substantially perpendicular to said main scanning direction; and

a second adjusting mechanism for angularly adjusting said light beam deflecting means about two axes to correct for a bow, a lean and an offset, respectively, of the scanning line on the scanned medium.

5,555,123

FLYING SPOT SCANNER

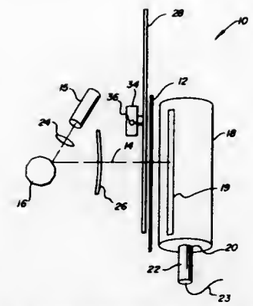
Martin C. Kaplan, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 14, 1995, Ser. No. 388,095

Int. Cl.[6] G02B *26/08*

U.S. Cl. 359—197 **7 Claims**

1. An improved flying spot scanner of the type having means for deflecting and forming a moving spot of light wherein the improvement comprises: mask means for forming a moving aperture that moves in synchronism with the spot of light for reducing flare in the scanner.



5,555,124

ROTATING POLYGON MIRROR DRIVING APPARATUS

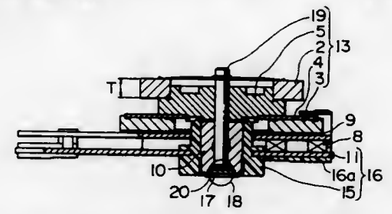
Takao Yoshitsugu, Yonago; Koichiro Ohata, Tottori-ken, and Tsuyoshi Kano, Yasugi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 8, 1993, Ser. No. 162,956

Claims priority, application Japan, Dec. 15, 1992, 4-334155; Dec. 15, 1992, 4-334156; Dec. 15, 1992, 4-334157

Int. Cl.[6] G02B *26/08*

U.S. Cl. 359—200 **6 Claims**



1. A rotating polygon mirror driving apparatus comprising:

a rotor having a rotating polygon mirror fixed thereto, a shaft having a rounded tip and a rotor magnet; and

a pivot bearing comprising a sleeve for radially supporting said shaft, a fluid between said sleeve and said shaft, and a thrust plate in contact with said rounded tip of said shaft to axially support said shaft, wherein said rotating polygon mirror has a dimension measured in an axial direction of said shaft and said dimension is greater than a spot diameter of a laser beam applied to said rotating polygon mirror, and wherein one of said shaft and said sleeve has formed therein a herringbone groove for generating a dynamic pressure to form a dynamic pressure fluid bearing which uses said fluid as a lubricant.

5,555,125

OPTICAL SCANNER

Ke-Ou Peng, Delft, Netherlands, assignor to Opticon Sensors Europe B.V., Hoofddorp, Netherlands

Continuation-in-part of Ser. No. 2,654, Jan. 11, 1993, Pat. No. 5,408,352. This application Aug. 30, 1994, Ser. No. 298,062

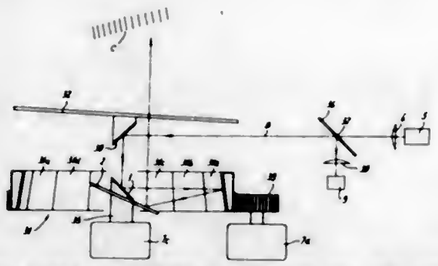
Int. Cl.[6] G02B *26/08*

U.S. Cl. 359—203 **7 Claims**

1. An optical scanner comprising a laser source for generating a laser beam, a first deflector having a front deflecting side and a rear side rotatable about an axis of rotation by a first driving means connected to said rear side of said first deflector and arranged for receiving said laser beam, an array of reflectors made of a polygon having internal reflective faces arranged about said axis of rotation,

thereby providing an amplifier with at least one output, having energy from both said power beam set means and said con-

wherein the reference symbol Φ represents a diameter of said point image, the reference symbols p_x and p_y designate pitches



said polygon being arranged for receiving said laser beam deflected by said first deflector, a second deflector rotatable about said axis of rotation and arranged for receiving said laser beam deflected by said polygon and to deflect said laser beam in a direction substantially parallel with said axis of rotation to an object to be scanned, said optical scanner further comprising at least one detector for detecting light scattered back from said object and a third stationary deflector for directing said laser beam originating from said laser source towards said front deflecting side of said first deflector substantially along said axis of rotation.

5,555,126

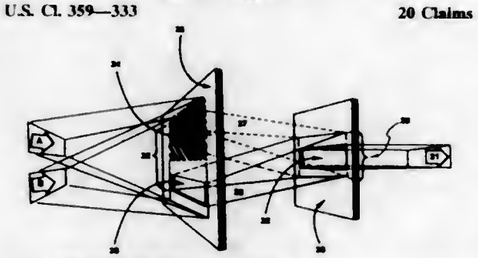
DUAL PHASE AMPLIFICATION WITH PHASE LOGIC

John N. Hait, P.O. Box 4694, Missoula, Mont. 59806-4694

Filed Apr. 10, 1995, Ser. No. 420,195

Int. Cl.[6] G06G *7/00*

U.S. Cl. 359—333 **20 Claims**



1. A dual-phase amplifier comprising:

a power beam set means having at least one beam of energy of at least one wavelength, maintained at a substantially constant level;

a controlling beam set group means having a first beam set which has at least one beam of energy of said at least one wavelength, said controlling beam set group means having an energy sum and being positioned and oriented so as to superimpose said controlling beam set group means onto said power beam set means to produce a first interference image having constructive interference at at least one first location and destructive interference at at least one second location when said energy sum is in phase with said power beam set means, and destructive interference at said at least one first location and constructive interference at said at least one second location when said energy sum is 180 degrees out of phase with said power beam set means;

a first image component separator for separating energy from said at least one first location to provide a first intermediate beam set and separating energy from said at least one second location to provide a second intermediate beam set;

superimposing means for superimposing said intermediate beam sets to produce a second interference image having destructive interference at at least one third location when said intermediate beam sets are on and said power beam set means is greater than said energy sum, and

a second image component separator for separating energy from said at least one third location to provide at least one output, thereby providing an amplifier with at least one output, having energy from both said power beam set means and said controlling beam set group means proportional to said energy sum, at a first phase when said energy sum is in phase with said power beam set means, at a second phase when said energy sum is 180 degrees out of phase with said power beam set means, and at a reduced level at other phase differences.

5,555,127

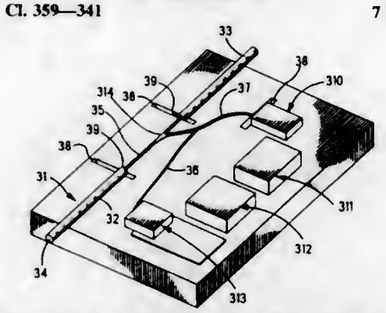
PLANAR HYBRID OPTICAL AMPLIFIER

Hatem Abdelkader, Harrisburg; Robert A. Boudreau, Hummelstown; Terry P. Bowen, Etters; Hongtao Han, Mechanicsburg, all of Pa.; Narinder Kapany, Woodside, Calif., and Paul R. Reitz, Palmyra, Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 269,408, Jun. 30, 1994, abandoned. This application Dec. 18, 1995, Ser. No. 573,910

Int. Cl.[6] H01S *3/00*

U.S. Cl. 359—341 **7 Claims**



1. An apparatus for amplifying an optical signal, comprising:

(a) A substrate having a top surface and a bottom surface, and a selected thickness between said top and bottom surfaces;

(b) A first groove at a first end of said substrate and a second groove at a second end of said substrate, said grooves having optical fibers disposed therein;

(c) A optical waveguide optically connecting said optical fibers;

(d) A laser mounted on said substrate, said laser connected to said optical waveguide by a first coupling waveguide; and

(e) An optical detector mounted on said substrate, said monitor optically coupled to said first coupling waveguide, whereby light from said laser is transmitted to said waveguide and at least one of said fibers and a portion of said light is transmitted to said detector for monitoring said laser.

5,555,128

PHASE CODING TECHNIQUE FOR ONE-WAY IMAGE TRANSMISSION THROUGH AN ABERRATING MEDIUM

Jehad Khoury, Concord, N.H.; Charles L. Woods, Stow, and Jack Fu, Brighton, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 4, 1994, Ser. No. 319,144

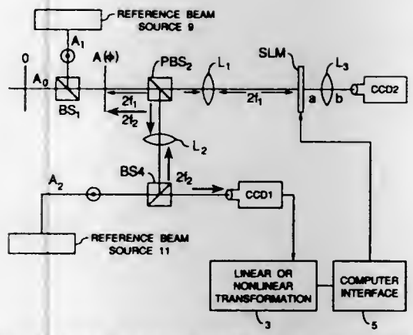
Int. Cl.[6] G03H *1/08;1/16*

U.S. Cl. 359—559 **21 Claims**

1. Apparatus for performing one way image restoration of an image which is projected through a phase aberrating medium comprising:

(a) first beam projection means for projecting an object beam having a first polarization through the phase aberrating medium to produce a diffraction distorted image therein;

(b) second beam projection means for projecting a phase aberration measurement probe beam having a second polarization through the phase aberrating medium to produce a phase aberrated wavefront therein;



(c) beam separation means for separating the object beam from the probe beam;

(d) first imaging means for imaging the diffraction distorted image contained within said object beam upon an image receptor;

(e) second imaging means for imaging the phase aberrated wavefront contained within said probe beam upon an image sensor;

(f) interference pattern generation means for combining the probe beam with a reference beam for in turn producing an interference pattern upon the image sensor; and

(g) phase encoding means, coupled between the image sensor and the image receptor, for producing a phase encoded signal upon the image receptor which compensates for part of the phase distortion of the phase aberrated wavefront in its first order approximation.

5,555,129

OPTICAL LOW PASS FILTER

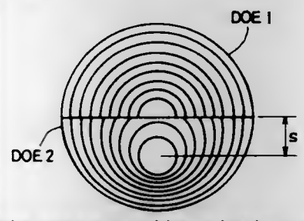
Mitsujiro Konno; Katsuya Ono; Yoshiharu Takasugi; Shinya Matsumoto, and Kimihiko Nishioka, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1994, Ser. No. 233,742

Claims priority, application Japan, Apr. 27, 1993, 5-122163

Int. Cl.[6] G02B *5/18;* **H04N** *5/225*

U.S. Cl. 359—569 **25 Claims**



1. An imaging apparatus comprising: an imaging optical system which includes an optical low pass filter, and a solid-state image pickup device which is disposed so as to locate light receiving surface thereof at a location of an image of an object formed by said imaging optical system; wherein said optical low pass filter is composed of a diffractive optical element having a diffractive surface which is divided into a plurality of regions and disposed at a location of a pupil of said imaging optical system, and wherein said plurality of regions have imaging characteristics which vary in a discontinuous manner bordering on boundary lines of said regions,

wherein said imaging optical system forms a point image which satisfies the following condition:

$$1/\Phi \leqq 1.04(1/(n \cdot p_x)^2 + 1/(m \cdot p_y)^2)$$

wherein the reference symbol Φ represents a diameter of said point image, the reference symbols p_x and p_y designate pitches of picture elements disposed in the horizontal direction and the vertical direction respectively on said solid-state image pickup device, and the reference symbols n and m denote numbers of picture elements disposed in the horizontal direction and the vertical direction respectively on said solid-state image pickup device.

5,555,130

HOLOGRAPHIC SCANNING

Emanuel Marom; Joseph Katz, both of Stony Brook, and Edward Barkan, Miller Place, all of N.Y., assignors to Symbol Technologies, Inc., Holtsville, N.Y.

Division of Ser. No. 225,350, Apr. 8, 1994, Pat. No. 5,504,595, which is a continuation of Ser. No. 894,509, May 26, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 469,228

Int. Cl.[6] G02B *5/18;5/32;27/44*

U.S. Cl. 359—574 **19 Claims**

1. An apparatus for tracing scan lines across a target, said apparatus comprising:

a source of coherent radiation constructed to deliver a beam; and

a diffraction grating element having a diffraction grating pattern positioned along said beam path to receive said beam and to produce a diffracted beam,

said element and said source being constructed and arranged for relative movement so that the portion of the grating pattern that receives said beam changes as a result of said relative movement,

said diffraction grating pattern being configured so that, as said beam traces a continuous path across said pattern in a single direction as a result of said relative movement, said beam diffracts from said pattern and traces successive first and second scan lines across the target, said first and second scan lines being in different scanning directions, said second scan line beginning at approximately the location where the first scan line ends.

5,555,131

OBJECTIVE LENS SYSTEM FOR ENDOSCOPE

Richard F. Horton, Los Lunas, N.M., assignor to Symbiosis Corporation, Miami, Fla.

Filed Oct. 27, 1994, Ser. No. 330,188

Int. Cl.[6] G02B *21/02*

U.S. Cl. 359—661 **19 Claims**

1. An objective lens system for forming an image at the distal end of an endoscope to be transmitted by a relay lens system to an eyepiece at the proximal end of the endoscope, the objective lens system comprising:

a) a distal lens section having

$$1.5<v2-v1<t0 \quad (3)$$

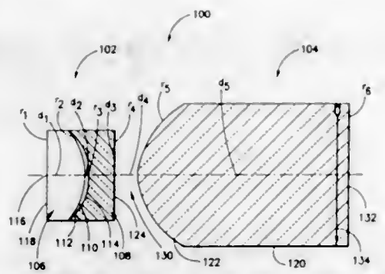
5,555,135

ILLUMINATION SYSTEM

Haruo Uemura, Kyoto, Japan, assignor to Dainippon Screen

said cover comprises a holder to which said at least one sensor is connected;

said cover comprises at least one cover portion angularly posi-



1) a sapphire spheric plano-convex lens element with a planar surface and a convex surface,
2) a first polymeric material aspheric lens element with a concave surface, and
3) an air meniscus lens element formed by said spheric sapphire lens element and said first polymeric material lens element, said planar surface of said sapphire lens element forming a distal end of said objective lens element;

b) a proximal lens section having a polymeric material aspheric rod lens element composed of a material different from that of which said first polymeric material aspheric lens element is composed, said rod lens element having a planar surface, said planar surface of said rod lens element forming a proximal end of said objective lens system,

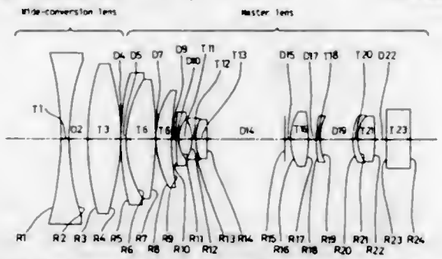
c) an air gap formed by said first polymeric material aspheric lens element and said proximal lens section.

5,555,132

WIDE-CONVERSION LENS AND A ZOOM LENS WITH IT

Katsu Yamada, Matsubara, and Shusuke Ono, Takatsuki, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Sep. 1, 1993, Ser. No. 114,946
Claims priority, application Japan, Oct. 26, 1992, 4-286494
Int. Cl.[6] G02B *15/02*
U.S. Cl. 359—673 **3 Claims**



1. A wide conversion lens consisting essentially of two lens elements for decreasing a focal length of a lens system by attaching said conversion lens in front of a master lens system, the conversion lens consisting essentially of:

a biconcave first lens element located on an object side of the lens system; and

a biconvex second lens element located adjacent to the master lens system, the biconvex second lens having a radius of curvature on an objective side substantially equivalent to an absolute value of a radius of curvature on an image side thereof;

wherein

$$v1>50 \quad (1)$$

$$v2>55 \quad (2)$$

$$1.5<v2-v1<10 \quad (3)$$

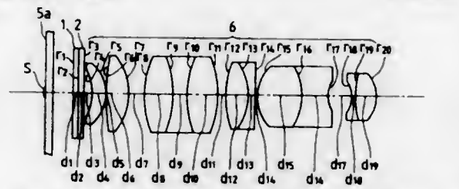
where v1 is an Abbe number of the first lens, and v2 is an Abbe number of the second lens.

5,555,133

OBJECTIVE LENS FOR MICROSCOPE

Takaaki Tanaka, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1994, Ser. No. 359,723
Claims priority, application Japan, Dec. 21, 1993, 5-321920
Int. Cl.[6] G02B *15/02;3/00*
U.S. Cl. 359—673 **8 Claims**



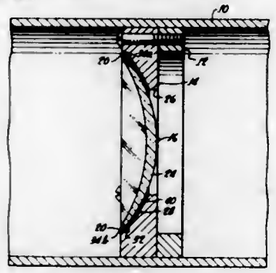
1. An objective lens for microscopes having an optical unit disposed on an optical axis at a front end of the objective lens, said optical unit comprising at least two kinds of optical elements which differ from one another in optical properties and are removable from the optical axis individually, so that a good imaging performance is maintained.

5,555,134

REFRACTIVE LENS CRADLE

Deitmar Hanke, Mission Viejo, and David A. Hull, Manhattan Beach, both of Calif., assignors to Hughes Electronics, Los Angeles, Calif.

Filed Feb. 27, 1995, Ser. No. 395,408
Int. Cl.[6] G02B *7/02*
U.S. Cl. 359—819 **5 Claims**



1. A lens assembly comprising:

a cradle;

a lens mounted to said cradle and having a lens edge;

padding positioned between outer portions of said lens and said cradle for axially positioning said lens relative to said cradle, said lens being free of radial restraint by said padding; and

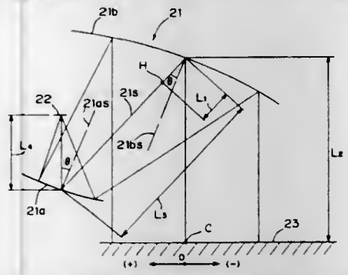
bond material positioned between and bonded to said lens edge and said cradle for radially positioning said lens relative to said cradle.

5,555,135

ILLUMINATION SYSTEM

Haruo Uemura, Kyoto, Japan, assignor to Dainippon Screen Manufacturing Co., Ltd., Japan

Filed Jun. 29, 1990, Ser. No. 546,551
Claims priority, application Japan, Jun. 29, 1989, 1-167429; Jul. 21, 1989, 1-190157
Int. Cl.[6] G02B *5/08;5/10;* **F21V** *7/00*
U.S. Cl. 359—851 **10 Claims**



6. An illumination system for illuminating a surface by collimated light, said illumination system comprising:

reflecting means for reflecting light, said reflecting means having a finite focal length and comprising a plurality of reflecting elements each having a symmetrical configuration and a finite focal length, principal axes of said reflecting elements being shifted from each other; and

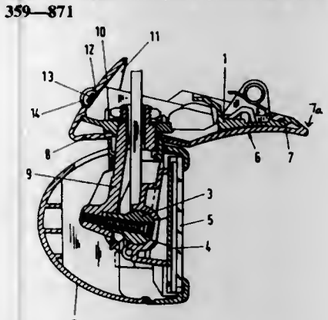
a light source for radiating diverging light located at a point close to a focal point of said reflecting means, said point being deviated from a principal axis of the reflecting element nearest said light source, said principal axes of the reflecting elements being parallel to one another.

5,555,136

INTERIOR REARVIEW MIRROR FOR MOTORIZED VEHICLES

Bernd Waldmann, Esslingen, and Djuanarto Kusuma, Rödental, both of Germany, assignors to Reitter & Schefenacker GmbH & Co. KG, Esslingen, Germany

Filed Jun. 28, 1995, Ser. No. 495,911
Claims priority, application Germany, Jun. 28, 1994, 9410387 U
Int. Cl.[6] G02B *7/182;* **G01J** *1/20;* **B60R** *1/04*
U.S. Cl. 359—871 **8 Claims**



1. An interior rearview mirror for a motorized vehicle, said mirror comprising:

a mirror housing with a mirror member;

a mirror support connected to said mirror housing;

at least one sensor for sensing solar radiation entering the interior of the motorized vehicle through a windshield, said sensor coupled to a control unit of an air conditioning device of the motorized vehicle;

a cover connected to said mirror support, wherein said at least one sensor is positioned at said cover;

said cover comprises a holder to which said at least one sensor is connected;

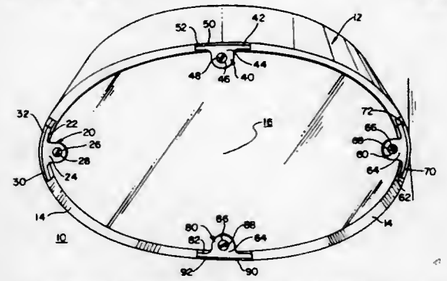
said cover comprises at least one cover portion angularly positioned relative to said holder and covering an underside of said mirror support.

5,555,137

REPAIR KIT FOR AN ADJUSTABLE SIDE VIEW MIRROR FOR VEHICLES

Scott F. Whiting, 90 Briarheath La., Clark, N.J. 07066

Filed Apr. 26, 1995, Ser. No. 429,515
Int. Cl.[6] G02B *7/182;* **B60R** *1/06*
U.S. Cl. 359—872 **3 Claims**



1. A repair kit for repair and retrofit of an adjustable side view mirror for vehicles, comprising:

a) four pliable mounting-bracket assemblies, each having a mirror-engaging adjustment screw for directly engaging and adjusting the position of the side view mirror within a mirror casing;

b) four pieces of double-sided adhesive tape, each for securing and mounting each of said mounting-bracket assemblies to the inside surface of said mirror casing; and

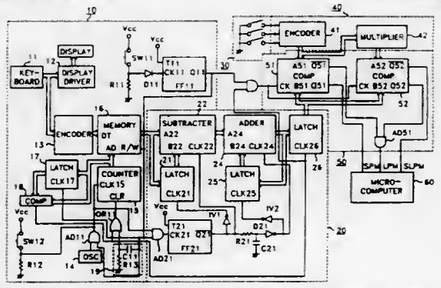
c) each of said mounting bracket assemblies having a base member with a bottom surface for adhering one side of said double-sided adhesive tape thereto.

5,555,138

AUTOMATIC VIDEO TAPE RUNNING MODE SETTING CIRCUIT FOR PROGRAMMED RECORDINGS

Jeong-ho Kim, Taegu, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki, Rep. of Korea

Continuation of Ser. No. 886,811, May 22, 1992, abandoned, which is a continuation of Ser. No. 382,271, Jul. 20, 1989, Pat. No. 5,117,316. This application Oct. 5, 1994, Ser. No. 318,203
Claims priority, application Rep. of Korea, Aug. 26, 1988, 13932/1988
Int. Cl.[6] G11B *15/18*
U.S. Cl. 360—69 **17 Claims**



1. An automatic video tape running mode setting circuit for programmed recordings, comprising:

programmed recording time memory means for memorizing and

two of said plurality of storage discs comprising first and second

first guiding means installed on at least one side adjacent to a

programmed recording time memory means for memorizing and outputting programmed recording start and end times successively for a plurality of programs set by an operator,

a programmed recording time detector for providing output signals by subtracting the start time from the end time outputted from said programmed recording time memory means for each of the programs to calculate each programmed recording time;

a recording capacity detector for detecting recording capacity of the video tape, said video tape being housed in a cassette loaded in a deck;

a recording capacity time base data generator for generating time base data corresponding to the recording capacity detected by said recording capacity detector;

a running mode signal generator for comparing the output signals of the programmed recording time detector and the recording capacity time base data generator, and for generating and transmitting a video tape running mode signal; and

control means for controlling video recording speed to be maintained for each of said plurality of programs in a single recording mode, said recording speed corresponding to said video tape running mode signal.

5,555,139

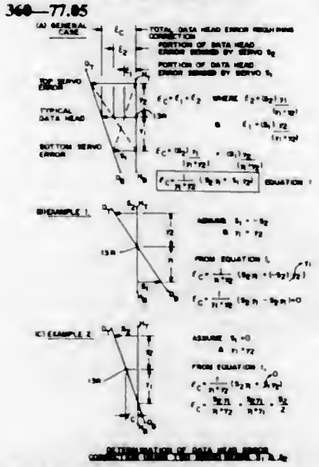
DUAL TRACK SERVO SYSTEM WITH POSITION INTERPOLATION

James O. Jacques, Santa Cruz County, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 388,178, Feb. 10, 1995, abandoned, which is a continuation of Ser. No. 124,372, Sep. 20, 1993, abandoned, which is a continuation of Ser. No. 928,934, Nov. 10, 1986, abandoned. This application Jun. 7, 1995, Ser. No. 479,576

Int. Cl.[6] G11B 5/596

U.S. Cl. 360—77.05 **11 Claims**



1. In a disc drive comprising a frame, a plurality of storage discs journaled to said frame to define a stack and rotatingly driven by motor means at a constant velocity and characterized by a multiplicity of concentric tracks on at least one of a plurality of major surfaces of said discs, and a vertical array of transducer heads in close proximity to said major surfaces, the improvement comprising:

a bi-directional mechanical rotor mounted in said frame adjacent said discs;

a head mounting structure securing said vertical array of transducer heads at one end thereof and secured for movement to said bi-directional mechanical rotor at the other end thereof;

rotor driver means connected to said bi-directional rotor for moving said head mounting structure and said vertical array of transducer heads from a first departure track to a second destination track during track seeking operations;

two of said plurality of storage discs comprising first and second servo discs separated by one or more others of said plurality of storage discs, each of said servo discs having one major surface, or servo surface, dedicated to storing only servo information thereon;

two of said transducer heads comprising first and second servo head position transducers mounted in alignment with said dedicated servo surfaces for providing head position signals, including track error, derived from said first and second servo discs; and

a head position controller coupled to said first and second servo head position transducers, to said rotor driver means and to an external source of transducer head and track selection information, for calculating a track seeking command in response to a known head position and said head position signals, for commanding said vertical array of transducer heads to move from said first departure track to said second destination track during said track seeking operation, and for correcting the position of any given one of said transducer heads relative to said second destination track by proportionally averaging the head position signals fed back from said first and second servo head position transducers, said proportion depending upon the distance of said any given one of said transducer heads from said first and second servo head position transducers;

said head position controller further comprising correction distance calculating means for doing said proportional averaging function by combining proportions of said head position signals from said first and second servo head position transducers to minimize an error distance of said vertical array of transducer heads from said destination track; and

wherein said correction distance calculating means calculates an error correction E_c to be made in positioning said any given one of said transducer heads relative to said second destination track according to the proportion:

$$E_c = \frac{1}{Y_1 + Y_2}\,(S_2Y_1 + S_1Y_2)$$

wherein

Y_1 is the vertical distance from said any given one of said transducer heads to said first servo head position transducer,

Y_2 is the vertical distance from said any given one of said transducer heads to said second servo head position transducer,

S_1 is the track error measured by said first servo head position transducer,

S_2 is the track error measured by said second servo head position transducer, and

each said any given one of said transducer heads that is located at a different vertical distance from said first and second servo head position transducers providing a different error correction E_c, so that fine positioning of any data transducer head in said vertical array of transducer heads is acheived relative to a track on any one of said disc surfaces.

5,555,140

SYNCHRONIZED SPINDLE CONTROL IN DISK DRIVES WITH AT LEAST TWO DATA PER ROTATION OF DISK

Yoshiji Kitamura, and Hirofumi Takise, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

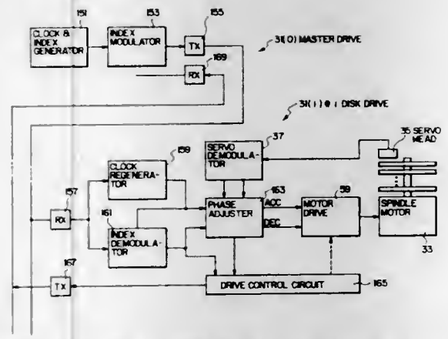
Continuation of Ser. No. 976,408, Nov. 13, 1992, abandoned. This application Dec. 20, 1994, Ser. No. 359,847

Claims priority, application Japan, Nov. 13, 1991, 3-325367; Nov. 18, 1991, 3-302147; Jun. 4, 1992, 4-143892

Int. Cl.[6] G11B 27/22

U.S. Cl. 360—73.02 **14 Claims**

1. A device for rotating a slave spindle in synchronism with a master phase, said device comprising master phase data producing means for producing a master phase datum representative of said master phase, rotating means for controllably rotating said slave spindle, slave phase data producing means coupled to said slave spindle for producing a slave phase datum representative of a slave phase of rotation of said slave spindle, comparing means for comparing said master and said slave phase data to detect a phase



difference between said master and said slave phases and to produce a control signal in accordance with said phase difference, and control means for controlling said rotating means by said control signal, wherein:

said master phase data producing means produces at least N primary phase data in a predetermined time duration collectively as said master phase datum, where N represents a prescribed integer which is not less than three, such that plural primary phase data is produced during a period of rotation of said slave spindle;

said slave phase data producing means produces at least N secondary phase data during one rotation of said slave spindle collectively as said slave phase datum,

said at least N primary phase data are represented by a master composite pulse sequence of master composite pulses produced at N master bit positions except for a predetermined at least one of said master bit positions to avoid synchronization errors caused by noise, said N master bit positions being predetermined in said predetermined time duration; and

said at least N secondary phase data being represented by a combination of a slave reference pulse sequence of slave reference pulses produced at N predetermined slave bit positions during one rotation of said slave spindle and a slave index signal produced once during one rotation of said slave spindle.

5,555,141

APPARATUS FOR ELECTRICALLY DETECTING STARTING/ENDING PORTIONS OF A TAPE

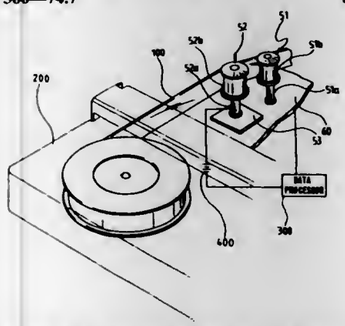
Young-hoon Min, Anyang-city, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Oct. 31, 1994, Ser. No. 331,936

Claims priority, application Rep. of Korea, Oct. 29, 1993, 1993-22743

Int. Cl.[6] G11B 23/32

U.S. Cl. 360—74.7 **8 Claims**



1. An apparatus for detecting at least one of a starting portion and an ending portion of a tape wound on a take-up reel and a supply reel of a cassette, wherein said apparatus comprises:

first guiding means installed on at least one side adjacent to a tape opening of the cassette to be loaded, and being in contact with a recording surface of said tape;

second guiding means which is structurally independent from and laterally spaced apart from said first guiding means and which is fixed so as to be electrically insulated from said first guiding means, said second guiding means being in contact with the recording surface of said tape; and

voltage applying means for applying a predetermined voltage level across said first guiding means and said second guiding means, wherein the at least one of the starting portion and the ending portion of said tape is detected depending on the presence or absence of an electrical current between said first guiding means and said second guiding means.

5,555,142

MAGNETIC DISK SYSTEM

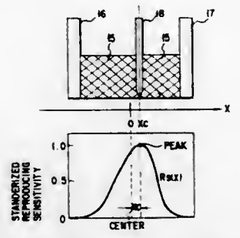
Tomoko Komai, Kawasaki; Makoto Imamura, Kanagawa-ken; Yuji Sakai, and Tetsuo Inoue, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 766,326, Sep. 27, 1991, Pat. No. 5,331,492. This application Mar. 25, 1994, Ser. No. 217,867

Claims priority, application Japan, Sep. 27, 1990, 2-255115; Oct. 29, 1990, 2-288352; Jan. 31, 1991, 3-011108

Int. Cl.[6] G11B 5/596

U.S. Cl. 360—77.06 **14 Claims**



1. A magnetic disk system comprising a magnetic head and a servo control circuit for positioning the magnetic head, in which said magnetic head comprises:

a magnetic film having two ends and a magnetic resistance effect and disposed parallel to a direction of a width of a track of a magnetic recording medium;

a pair of current supplying electrodes in contact with both ends of said magnetic resistance film; and

a signal detecting electrode in contact with said magnetic resistance film and disposed at such an position between said pair of current supplying electrodes that a first reproduced output between said signal detecting electrode and a first one of said pair of current supplying electrodes equals to a second reproduced output between said signal detecting electrode and a second one of said pair of current supplying electrodes when said magnetic film is centered over the track of the magnetic recording medium, and

said servo control circuit comprises:

means for calculating a difference between said first reproduced output and said second reproduced output to produce a position signal of the magnetic head relative to the track: and

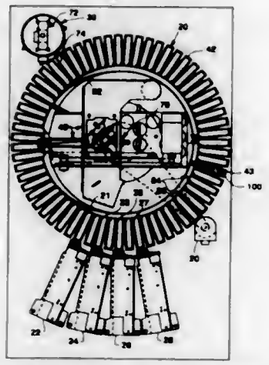
means for controlling a position of the magnetic head based on the position signal.

5,555,143

DATA CARTRIDGE LIBRARY SYSTEM ARCHITECTURE

Bennett C. Hinnen; Hai T. Ho, both of Westminster; Eric A. Rinard; Gregory S. Rinard, both of Boulder; Brian A. Ruff, Denver; Nathan C. Thompson, Boulder, and Hossein Zia-Shakeri, Louisville, all of Colo., assignors to Western Automation Laboratories, Inc., Boulder, Colo.

Filed Jan. 17, 1995, Ser. No. 374,160
Int. Cl.[6] G11B *15/68*
U.S. Cl. 360—92 16 Claims



1. A data cartridge library apparatus, comprising:

storage array means for storing a plurality of data cartridges, wherein said storage array means includes a plurality of slots, each slot capable of storing a data cartridge;

player/recorder means for reading/writing data on a data cartridge;

picker means for moving a data cartridge between said storage array means and said player/recorder means; and

guard means for moving a data cartridge that is at least partially extending out of one of said plurality of slots back into the slot.

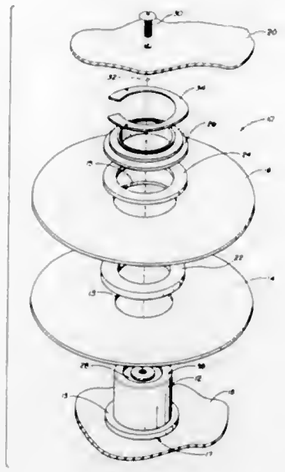
5,555,144

BALANCING SYSTEM FOR A DISC DRIVE DISC ASSEMBLY

Roy L. Wood, Yukon; John D. Stricklin, Oklahoma City, and Loren D. Skarky, Bethany, all of Okla., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jan. 12, 1995, Ser. No. 371,843
Int. Cl.[6] G11B *17/02*; F16F *15/22*
U.S. Cl. 360—98.08 5 Claims

3. In a disc assembly for a disc drive, the disc assembly comprising a plurality of circular discs, each having a central circular aperture formed axially therethrough, a cylindrical hub rotatably mounted on a case of the disc drive, wherein the hub is extended axially through the apertures of the discs for mounting the discs on the hub, and cylindrically symmetric clamping means, including a clamp ring secured to one end of the hub, for clamping the discs on the hub in a substantially coaxial relation with the hub, the improvement wherein the disc assembly further comprises a lamellar, C-shaped balancing clip mounted on one of the hub or the clamp ring to extend in an arc about the axis of the hub, wherein a circular shoulder is formed coaxially with the hub on a face formed perpendicularly to the hub axis on one of the clamp ring or said one end of the hub, wherein the balancing clip is further characterized as having a circularly arcuate inner periphery to mate with at least portions of said shoulder, wherein the balancing clip is mounted on said shoulder, and wherein the shoulder is undercut to conform to a conical surface opening away from the face whereon the shoulder is formed and wherein a portion of the inner periphery of the balancing clip adjacent each side thereof is chamfered to conform to a conical surface opening toward the side of the clip to which the portion of the inner periphery is adjacent at the cone angle of the shoulder.

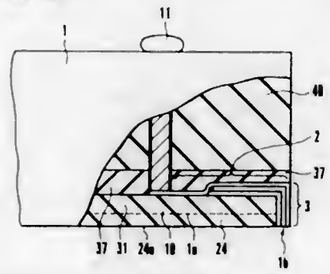


5,555,145

FLOATING HEAD SLIDER WITH A MAGNETIC HEAD INTEGRATED THEREIN

Hiroshi Kajitani, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 18, 1994, Ser. No. 292,035
Claims priority, application Japan, Aug. 20, 1993, 5-205946
Int. Cl.[6] G11B *5/60; 5/23; 17/32; 21/20*
U.S. Cl. 360—103 12 Claims



1. A floating head slider comprising:

a slider main body, having an air bearing surface opposing a magnetic disk and a plurality of rails which are formed on said air bearing surface in an air flow-in direction, said air bearing surface receiving an air flow generated by rotation of said magnetic disk, thereby causing said slider main body to float from a magnetic disk surface, said slider body further having a rear edge surface which meets said air bearing surface at a trailing edge of said air bearing surface; and

a read/write element formed in said slider, said read/write element being substantially parallel to said air bearing surface and being bent at one end to form a front gap portion located at the trailing edge of said air bearing surface, for electromagnetically reading/writing information, wherein a pole portion of said read/write element is exposed on the rear edge surface of said slider main body and continues to said air bearing surface.

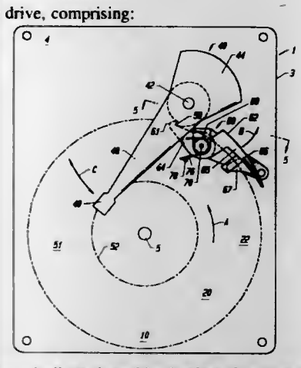
5,555,146

ANTI-ROTATION AIR VANE INERTIA LATCH

Thomas A. Hickox, Scotts Valley; Ramgopal Battu, Los Angeles, and Lawrence W. Gollbach, Felton, both of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 116,919, Sep. 7, 1993, abandoned.
This application Mar. 29, 1995, Ser. No. 413,927
Int. Cl.[6] G11B *5/54*
U.S. Cl. 360—105 14 Claims

1. A disc drive, comprising:



an aerodynamically activated latch adapted to cooperate with an actuator arm, the actuator arm rotating around an axis having a means for engaging the latch supported thereon so that the latch secures the actuator arm against rotation during non-operating conditions of said disc drive, said actuator arm being mounted from a base casting of a housing defining a chamber for at least two discs supported for counter-clockwise rotation by a common central shaft, each actuator arm supporting a data transducer in close proximity to major data surfaces of each of said discs and moving said transducer from track to track over a surface of one of the discs in response to commands to an actuator motor;

said aerodynamically activated latch comprising:

a center shaft located immediately adjacent said one of said discs to allow the latch to be Journaled for counter-clockwise rotation;

a latch engagement arm, wherein said latch engagement arm extends between two of said discs substantially perpendicular to the actuator arm when the actuator arm is at rest with the transducer resting on a landing zone of said one of said discs, said latch engagement arm extending between two of said discs and having a latch finger at one end thereof engaging a notch on a radius of a pivot region of said actuator arm adjacent a center of rotation of the actuator arm, said notch facing said common central shaft mounting of said discs; and

an air vane extending in an opposite direction from said latch engagement arm and from the center shaft, said air vane comprising a flag adjacent a space between two rotating discs, said flag being responsive to an airflow generated by rotation of the discs to rotate in a counter-clockwise direction to cause said latch finger to disengage said notch and release the actuator arm to move said transducer across the surface of said one of said discs so that said latch is effective to hold said actuator arm in the event of shocks in a clockwise or counter-clockwise direction.

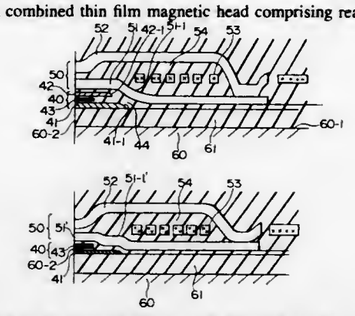
5,555,147

MR/INDUCTIVE COMBINED THIN FILM MAGNETIC HEAD CAPABLE OF REDUCING OCCURRENCE OF A SHORT CIRCUIT

Takao Maruyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 49,414, Apr. 20, 1993, abandoned.
This application Sep. 23, 1994, Ser. No. 311,709
Claims priority, application Japan, Apr. 20, 1992, 4-099468
Int. Cl.[6] G11B *5/33*
U.S. Cl. 360—113 6 Claims

1. A combined thin film magnetic head comprising reading and



recording means formed through a first insulator layer on a non-magnetic substrate for magnetically reading and recording information on a magnetic recording medium, respectively, said non-magnetic substrate having a substrate side end defining an air bearing surface for said magnetic recording medium, said reading means comprising a magneto-resistive element having an element pattern, a first element side end lying in the same plane of said air bearing surface, and a second element side end opposite to said first element side end, said recording means comprising a conductor member with a coil pattern having an outer distal end portion nearest said air bearing surface, said first insulator layer having a forming area for forming said reading means and non-forming area adjoining said forming area, said reading means further comprising:

an under shield pattern being formed under said magneto-resistive element in said forming area through a second insulator layer and having a first under shield side end lying in the same plane of said air bearing surface and a second under shield side end opposite to said first under shield side end; and

an upper shield pattern covering said magneto-resistive element in said forming area through said second insulator layer and having a first upper shield side end lying in the same plane of said air bearing surface and a second upper shield side end opposite to said first upper shield side end;

said recording means further comprising:

an under yoke pattern lying over said reading means and said non-forming area and having a first under yoke side end lying in the same plane of said air bearing surface, a second under yoke side end opposite to said first under yoke side end, and a sloping portion between said first and second under yoke side ends, said sloping portion sloping in a direction toward said first insulator layer and away from said air bearing surface and beginning at a distance from said air bearing surface which is further than a distance at which said second upper shield side end is from said air bearing surface; and

an upper yoke pattern overlying said under yoke pattern and having a first upper yoke side end lying in the same plane of said air bearing surface and a second upper yoke side end opposite to said first upper yoke side end and connected to said second under yoke side end to form a magnetic headcore having a magnetic gap between said first under and said first upper yoke side ends, said conductor member being formed on said non-forming area through a third insulator layer between said under and said upper yoke patterns so that said coil pattern surrounds a connection portion between said second under and said second upper yoke side ends and that said outer distal end portion is spaced farther away from said air bearing surface than said second element side end and said second under and said second upper shield side ends in said forming area.

170-919 O.G.-96-21: QL3

5,555,148

OVERVOLTAGE PROTECTION DEVICE FOR CAPACITOR EXTERNALLY CONNECTED TO POWER

when the output driver is enabled and a pull-up transistor is on, connecting a gate of an isolation transistor which is coupled in series with the pull-up transistor, to a gate of the pull-up

bution system having a present source of electric power supplying three phase AC electric power through a first contactor to utilization equipment and a target source of electric power connectable to

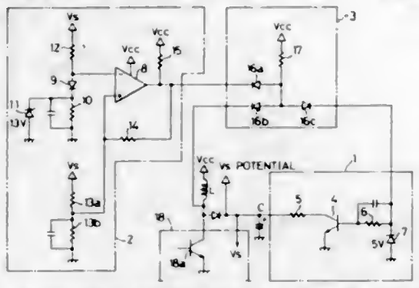
source connection and a cathode of the Zener-diode being coupled with said outer gate connection, and

ii) a semiconductor arrangement, said semiconductor arrange-

5,555,148
OVERVOLTAGE PROTECTION DEVICE FOR CAPACITOR EXTERNALLY CONNECTED TO POWER IC

Hideaki Matsuzaki; Hiroshi Osawa, and Yoshihide Gunji, all of Kohsan-machi, Japan, assignors to Zexel Co., Ltd., Tokyo, Japan

Filed Dec. 13, 1994, Ser. No. 357,178
Int. Cl.[6] H02H 7/16
U.S. Cl. 361—15 **4 Claims**



1. An overvoltage protection device for a capacitor externally connected to a power IC, comprising:

a discharge circuit which is enabled to discharge the capacitor when a control signal is applied thereto and which is disabled in the absence of a control signal applied thereto;

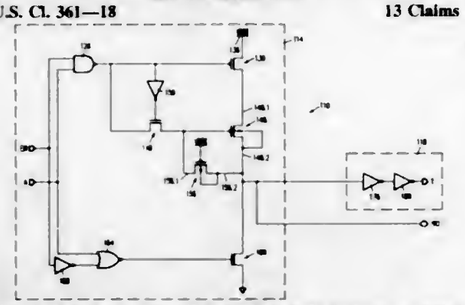
a hysteresis comparator for comparing a voltage across the capacitor with first and second reference voltages, the first reference voltage being greater than the second reference voltage, an output of said hysteresis comparator changing from a first state to a different second state each time the capacitor voltage increases to the first reference voltage from the second reference voltage and changing from the second state to the first state each time the capacitor voltage decreases to the second reference voltage from the first reference voltage; and

a control circuit, operatively coupled to said discharge circuit and to said hysteresis comparator, for outputting the control signal to said discharge circuit when the output of said hysteresis comparator is the second state and for not outputting the control signal to said discharge circuit when the output of said hysteresis comparator is the first state.

5,555,149
OVERVOLTAGE PROTECTION

Joseph D. Wert, Arlington, and Richard L. Duncan, Bedford, both of Tex., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 73,376, Jun. 7, 1993, abandoned. This application Apr. 28, 1995, Ser. No. 430,579
Int. Cl.[6] H02H 7/00
U.S. Cl. 361—18 **13 Claims**



5. A method of preventing a charge leakage between an output terminal and a power supply of an output driver, the method comprising the steps of:

when the output driver is enabled and a pull-up transistor is on, connecting a gate of an isolation transistor which is coupled in series with the pull-up transistor, to a gate of the pull-up transistor so as to turn on the isolation transistor and to drive the output terminal through the pull-up and isolation transistors with a voltage provided by the power supply;

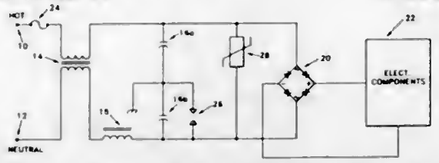
when the output driver is disabled or powered down and a voltage on the output terminal exceeds in magnitude the voltage provided by the power supply by at least a predetermined value, disconnecting the gate of the isolation transistor from the gate of the pull-up transistor and connecting the gate of the isolation transistor to the output terminal thereby turning off the isolation transistor; and

connecting a backgate of the isolation transistor to the output terminal.

5,555,150
SURGE SUPPRESSION SYSTEM

Robert C. Newman, Jr., Emmaus, Pa., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Apr. 19, 1995, Ser. No. 424,111
Int. Cl.[6] H02H 9/04
U.S. Cl. 361—56 **13 Claims**



1. In a system comprising Hot and Neutral power line segments coupled via a filter to protected electronic circuitry, wherein at least one component of said filter is connected to a ground potential, the improvement comprising:

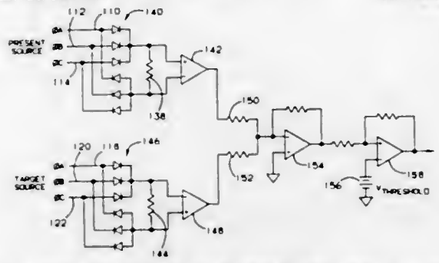
(a) a spark gap comprising a first electrode connected to said Neutral line segment and a second electrode connected to said ground potential; and

(b) one and only one voltage clamping device electrically connected to said Hot and Neutral line segments whereby the system avoids the formation of arcs from Hot to ground or Hot to Neutral, thus minimizing the likelihood of a sustained arc, and whereby the system provides protection from both differential mode (Hot to ground) and common mode (Hot and Neutral to ground) surges with only a single voltage clamping device.

5,555,151
NO-BRAKE POWER TRANSFER PHASE BALANCE SYCHRONIZATION SENSE CIRCUIT AND METHOD

Roy S. Baker, and David W. Lefavour, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 25, 1995, Ser. No. 377,899
Int. Cl.[6] H02H 3/18
U.S. Cl. 361—79 **12 Claims**



1. A three phase no-break power transfer phase balance synchronization sense circuit for an electric power generation and distribution system having a present source of electric power supplying three phase AC electric power through a first contactor to utilization equipment and a target source of electric power connectable to supply three phase AC electric power to the utilization equipment through a second contactor, a transfer of the source of AC electric power from the present source to the target source being accomplished by closing the second contactor prior to opening the first contactor upon synchronization of each phase the two sources, comprising:

first means in sensory communication with the present source of electric power for rectifying the three phase AC electric power generated thereby, said rectifying means generating a first rectified output signal;

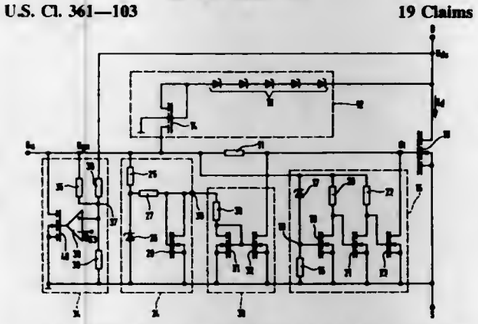
second means in sensory communication with the target source of electric power for rectifying the three phase AC electric power generated thereby, said rectifying means generating a second rectified output signal;

summing means operatively coupled to said first means and said second means for differentially summing said first rectified output signal and said second rectified output signal, said summing means generating a synchronization error signal in response to any phase of the three phase AC electric power generated by the present source differing in magnitude, phase relationship, and frequency from an associated phase of the three phase AC electric power generated by the target source, said synchronization error signal varying in magnitude in response to the amount of said difference in magnitude, phase relationship, and frequency.

5,555,152
MONOLITHICALLY INTEGRATED MOS OUTPUT-STAGE COMPONENT HAVING AN EXCESS-TEMPERATURE PROTECTION DEVICE

Peter Brauchle, Nehren, and Manfred Uebele, Reutlingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 14, 1993, Ser. No. 136,627
Claims priority, application Germany, Oct. 28, 1992, 42 36 333.0
Int. Cl.[6] H02H 3/00
U.S. Cl. 361—103 **19 Claims**



1. A monolithically integrated MOS output-stage device having an output-stage element with a GATE, a SOURCE and a DRAIN, comprising:

a) a source connection coupled to the SOURCE of the output-stage element;

b) a drain connection coupled to the DRAIN of the output-stage element;

c) an integrated gate protection resistor provided between the GATE of the output-stage element and an outer gate connection; and

d) an integrated excess-temperature protection device including:

i) a series connection of a temperature-dependent Zener-diode and a temperature-dependent resistor, the Zener diode having a reverse current which increases with increasing temperature and the temperature-dependent resistor having a resistance which increases with increasing temperature, the temperature-dependent resistor being coupled with said source connection and a cathode of the Zener-diode being coupled with said outer gate connection, and

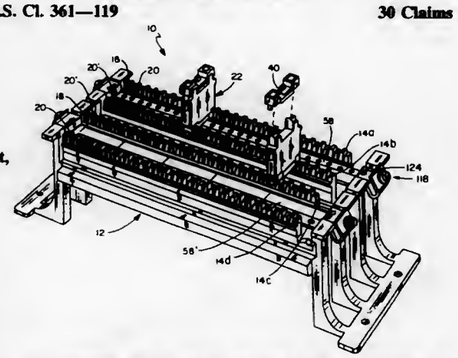
ii) a semiconductor arrangement, said semiconductor arrangement being controlled by a control voltage at a node between said Zener-diode and said temperature-dependent resistor of said series connection,

wherein said semiconductor arrangement includes a switch element, said switch element including an output coupled with said GATE of said output-stage element, whereby a voltage at said GATE is switched via said switch element to a low value when a predetermined temperature-dependent control voltage is exceeded.

5,555,153
VOLTAGE AND/OR CURRENT PROTECTOR AND GROUNDING BAR ARRANGEMENT FOR AT&T STYLE 110 BLOCK

Bjarne Frederiksen, Lombard, and Gregory R. Hayward, Glenview, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Continuation-in-part of Ser. No. 923,249, Jul. 31, 1992, Pat. No. 5,341,269. This application Jul. 11, 1994, Ser. No. 273,201
Int. Cl.[6] H02H 1/04;3/22
U.S. Cl. 361—119 **30 Claims**



1. In combination, a voltage protector and grounding bar arrangement, and a telephone terminal block, comprising:

a telephone terminal block having at least two rows of terminals which are laterally spaced apart with respect to each other so as to form a longitudinally extending channel therebetween;

a grounding bar disposed within said longitudinally extending channel defined between said at least two rows of terminals of said terminal block and having a plurality of holes defined therein;

a housing;

voltage suppressor means disposed within said housing;

a plurality of terminal contacts disposed within laterally spaced portions of said housing for mating with opposed terminals of said at least two rows of laterally spaced terminals of said terminal block, disposed upon opposite sides of said longitudinally extending channel, when said housing is mounted upon said terminal block;

ground contact means disposed within said housing and between said laterally spaced terminal contacts for connection to said voltage suppressor means and to one of said plurality of holes defined within said grounding bar disposed within said longitudinally extending channel of said terminal block defined between said laterally spaced rows of terminals; and

plug-in carrier means, having contacts carried therein, removably disposed upon said housing for connection to said plurality of terminal contacts of said housing.

5,555,154
CVD RAW MATERIAL FOR OXIDE-SYSTEM

5,555,156
PROTECTIVE ENCLOSURE FOR A COMPUTER

5,555,159
ADD-ON MODULE FOR VARIABLE SPEED DRIVES

5,555,154

CVD RAW MATERIAL FOR OXIDE-SYSTEM DIELECTRIC THIN FILM AND CAPACITOR PRODUCED BY CVD METHOD USING THE CVD RAW MATERIAL

Fusaoki Uchikawa; Shigeru Matsuno; Shinichi Kinouchi, and Hisao Watarai, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 121,341, Sep. 14, 1993, abandoned. This application Jan. 3, 1995, Ser. No. 367,745

Claims priority, application Japan, Sep. 22, 1992, 4-252836; Jul. 27, 1993, 5-184904

Int. Cl.[6] H01G *4/10*

U.S. Cl. 361—322 **10 Claims**

1. A metal oxide dielectric thin film [having improved SiO_2 equivalent thickness and reduced leak current density] deposited via chemical vapor deposition (CVD) from a CVD raw material comprising an organometallic compound dissolved in tetrahydrofuran, which dielectric thin film at a thickness of less than or equal to about 50 nm has an SiO_2 equivalent thickness of less than 1 nm, a dielectric constant of at least 230, and a leak current density on the order of 10^{-8} A/cm^2 or less when a potential of 1.65 V is applied to the film.

5,555,155

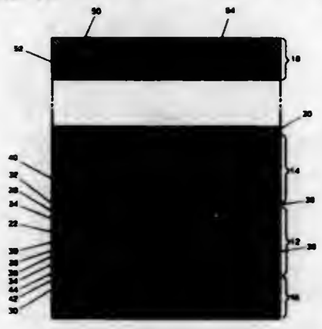
ELECTROCHEMICAL CAPACITOR USING PROTON-CONDUCTING ELECTROLYTE AND METHOD OF MAKE SAME

Hitendra K. Patel, Palatine, and Changming Li, Vernon Hills, both of Ill., assignors to Motorola Energy Systems, Inc., Schaumburg, Ill.

Filed Feb. 21, 1995, Ser. No. 391,742

Int. Cl.[6] H01G *9/00; 9/004*

U.S. Cl. 361—503 **17 Claims**



1. A method of fabricating an electrochemical capacitor comprising the steps of:

providing at least one capacitor subassembly portion having first and second sides, and comprising a graphite current collector having a first and a second side, each side having a central region and a peripheral edge, said current collector having a thickness of between 0.01 and 0.5 mms, a mechanical spacer disposed about the peripheral edge of said first and said second sides of said graphite current collector, a layer of polyaniline electrode material disposed in the central region of said first and second sides of said current collector, and a separator disposed atop each said layer of second electrode material and said spacer; and

providing a capacitor end portion on said first and said second side of said capacitor subassembly position, said capacitor end portion comprising a graphite current collector having first and second sides, each side having a central region and a peripheral edge, a mechanical spacer disposed about said peripheral edge of one side of said current collector, and a layer of electrode material disposed in said central region.

5,555,156

PROTECTIVE ENCLOSURE FOR A COMPUTER SYSTEM

Patrick Decante, 24 bis rue Rémy Laurent, 92260 Fontenay aux Roses, France

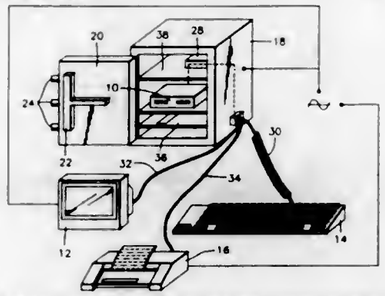
PCT No. PCT/FR92/01035, § 371 Date Jul. 19, 1994, § 102(e) Date Jul. 19, 1994, PCT Pub. No. WO93/09488, PCT Pub. Date May 13, 1993

PCT Filed Nov. 5, 1992, Ser. No. 232,223

Claims priority, application France, Nov. 5, 1991, 91 13117

Int. Cl.[6] E05G *1/100;* **E05C** *3/00;* **G06F** *1/00*

U.S. Cl. 361—683 **7 Claims**



1. A protective enclosure for a computer system, to protect said computer system by confinement, which computer system comprises at least one central processing unit (CPU) and input/output peripherals comprising at least two of

a display element,

means for gaining access to data, and

a printer device for printing data,

wherein said protective enclosure comprises:

enclosure means equipped with a door or the like, which enclosure means house and confine at least one of said at least one CPU of said computer system, and

means for locking and unlocking transmission of a signal, which locking/unlocking means are associated with said enclosure means, to neutralize electronic access to the data contained in the computer system,

wherein said means for gaining access to the data are disposed outside the enclosure;

said door or the like having closing means which, when actuated, actuates said means for locking/unlocking, said means for locking/unlocking having at least one contact controlled by the door or the like of said enclosure, said contact being arranged so as to control a security circuit, said security circuit comprising a switch disposed in at least one of a plurality of links which connect said input/output peripherals to the CPU, such that when said closing means is closed said switch neutralizes only the means for gaining access to data and not operation of the CPU.

5,555,157

ENCLOSURE FOR ELECTRONIC APPARATUS HAVING A COVER CATCH MEMBER ENGAGEABLE WITH TWO DIFFERENT HOUSING CATCH MEMBERS

Ronald J. Moller, Boulder Creek, and Jonathan P. Ive, San Francisco, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Mar. 2, 1994, Ser. No. 205,309

Int. Cl.[6] G06F *1/16;* **H05K** *5/00*

U.S. Cl. 361—683 **27 Claims**

1. An electrical apparatus and enclosure therefor comprising:

a housing including top and bottom surfaces and a plurality of side surfaces, said housing defining an internal volume;

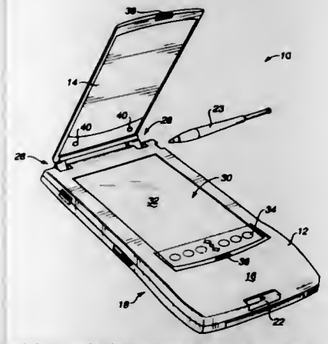
an electrical apparatus disposed within said internal volume of said housing such that said housing and said apparatus provide a user interface region proximate to said top surface;

a cover having a first portion coupled to said housing by a hinge such that said cover can be moved between a closed position substantially overlaying said user interface region and an open position substantially overlaying a portion of said bottom surface of said housing, whereby said cover protects said user interface region when in said closed position and exposes said user interface region for use when in said open position;

a cover catch member coupled to a second portion of said cover;

a first housing catch member coupled to said housing and operative to engage said cover catch member when said cover is in said closed position; and

a second housing catch member coupled to said housing and operative to engage said cover catch member at said open position.



5,555,158

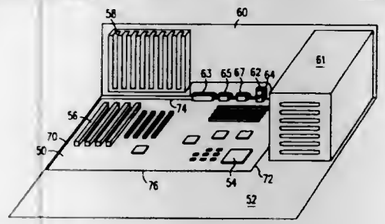
MOTHERBOARD FOR PERSONAL COMPUTER STANDARD DESKTOP CHASSIS

David Dent, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jan. 30, 1995, Ser. No. 380,045

Int. Cl.[6] H05K *5/00;* **G06F** *1/16*

U.S. Cl. 361—684 **22 Claims**



1. A computer motherboard comprising:

a first edge;

said first edge being of a short dimension;

a second edge opposite said first edge;

a third edge;

said third edge being of a long, straight dimension that is greater than said short dimension;

a fourth edge opposite said third edge;

a number of expansion card connector sockets perpendicular to said third edge, said number of expansion card connector sockets being within a first area of said motherboard, said first area being between said third edge and said fourth edge;

said short dimension being of such a length as to accommodate said number of expansion card connector sockets perpendicular to said third edge along said long, straight dimension; and,

a central processing unit located within a second area of said motherboard, said second area being between said first area and said second edge.

5,555,159

ADD-ON MODULE FOR VARIABLE SPEED DRIVES

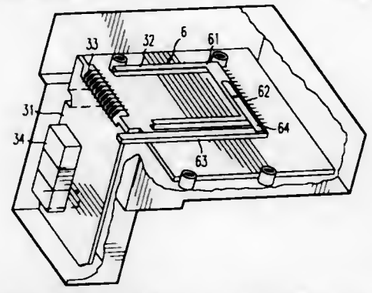
Christophe Dore, Fontenay Le Fleury, France, assignor to Schneider Electric SA, Boulogne-Billancourt, France

Filed Dec. 16, 1994, Ser. No. 357,382

Claims priority, application France, Dec. 17, 1993, 93 15335

Int. Cl.[6] H05K *7/14; 1/14*

U.S. Cl. 361—796 **5 Claims**



1. An add-on module adapted to be mounted on a variable speed drive, said module comprising:

a casing which houses an electronic circuit;

a connector adapted to plug into a corresponding connector provided on said variable speed drive; and

a display formed on a front portion of said casing which displays results of operation of said variable speed drive,

wherein said casing is generally L-shaped with said front portion adapted to be positioned along the front of said variable speed drive and a side portion accommodated on one side of said variable speed drive, and said electronic circuit includes front and side printed circuit boards electrically connected to each other and the angle between which is substantially equal to the angle between said front and side portions of said casing.

5,555,160

LIGHT-GUIDING PANEL FOR SURFACE LIGHTING AND A SURFACE LIGHTING BODY

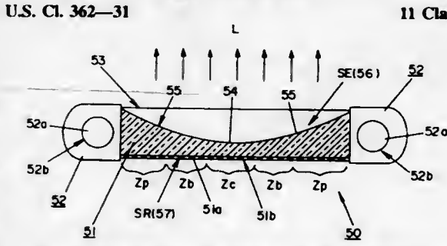
Nobuyoshi Tawara, Niihama, and Takeshi Kojima, Tondabayashi, both of Japan, assignors to Nissen Chemitec Co., Ltd., Niihama, and T. Chatani & Company Ltd., Osaka, both of Japan

Continuation-in-part of Ser. No. 212,243, Mar. 14, 1994, which is a continuation of Ser. No. 64,828, May 19, 1993, abandoned, which is a continuation of Ser. No. 905,014, Jun. 26, 1992, abandoned. This application Oct. 6, 1994, Ser. No. 320,430

Claims priority, application Japan, Jun. 27, 1991, 3-183659; Dec. 6, 1991, 3-108969 U; Feb. 28, 1992, 4-078890

Int. Cl.[6] F21V *8/00*

U.S. Cl. 362—31 **11 Claims**



1. A light-leading panel for surface-lightening, comprising:

an optically transparent plate having a thinnest portion at a center thereof, and white dots printed on a surface of said plate, wherein the surface with the white dots functions as a light-reflecting face, and wherein another surface opposite to the surface having the white dots functions as a light-emitting

face when said panel is disposed in parallel with a light axis and the light is introduced from an end wall of said panel,

5,555,162

COMPACT FLUORESCENT LUMINAIRE

5,555,163

MINIATURE LIGHT DISPLAY

5,555,166

SELF-TIMING POWER-UP CIRCUIT

face when said panel is disposed in parallel with a light axis and the light is introduced from an end wall of said panel,

wherein at least one surface of the plate is a synthesized face which includes a central symmetric concave side and two planes tangentially joined thereto so as to have a symmetric sectional form in cutting the plate along a line which includes the light axis and is vertical to said panel.

wherein an outline of the symmetric sectional form includes two oppositely disposed straight lines each of which extends with an incline approaching the light axis from an edge corresponding to said end wall toward the center and an arcuate portion each end of which is tangentially joined to one end of each of the inclined straight lines, and

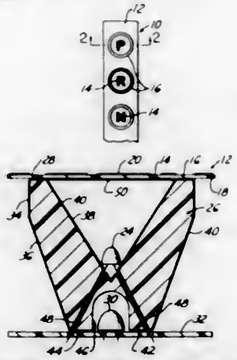
wherein said outline also has a geometrical condition such that an intersection point (C) at which two hypothetical lines extending from each inclined straight line intersect one another, each outer end point (A, E) of each inclined straight line, each intersection point (B, D) at which a straight line passing through the intersection point (C) and also being parallel to the light axis and each straight line extending vertically from each outer end point (A, E) to the light axis intersect each other, two hypothetical rectangular triangles (ΔCAB, ΔCED) formed by connecting the points have the same size and the same shape and are symmetrically disposed by confronting each other at acute apexes thereof, and the length of each hypothetical line is set so as to be no less than 1/10 and no more than 3/5 of the length of the slant of each hypothetical rectangular triangle.

5,555,161

BI-FUNCTIONAL LIGHT PIPE AND DISPLAY ASSEMBLY

Pamela A. Roe, and Dale J. Igram, both of Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Sep. 11, 1995, Ser. No. 526,342
Int. Cl.[6] F21V *7/04*
U.S. Cl. 362—32 **14 Claims**



1. A light apparatus for separately lighting at least two adjacent indicia comprising:

a light pipe having a reflective wall and an emitting surface aligned with a first indicia;

a first light source adjacent the reflective wall of the light pipe for directing light onto other indicia which are not aligned with the emitting surface;

a second light source coupled to the light pipe for illuminating the first indicia via the light pipe; and

wherein the emitting surface surrounds a second indicia, and the light pipe comprises:

a light input end smaller than the emitting surface;

an outer wall expanding outward from the input end to the emitting surface; and

the reflective wall tapers inward from the emitting surface to define an inner conical cavity;

the first light source being in the cavity to illuminate the second indicia;

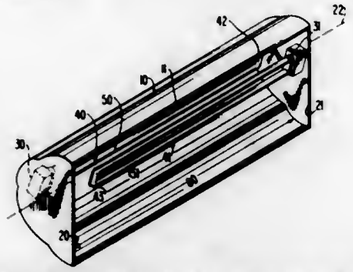
whereby the second light source illuminates the first indicia by internal reflection from the outer wall and the reflective wall.

5,555,162

COMPACT FLUORESCENT LUMINAIRE

Sylvan R. Shemitz, Woodbridge, Coan., assignor to Sylvan R. Shemitz Designs, Inc., West Haven, Conn.

Continuation-in-part of Ser. No. 233,374, Apr. 26, 1994, Pat. No. 5,434,762. This application Dec. 6, 1994, Ser. No. 349,987
The portion of the term of this patent subsequent to Jul. 18, 2012, has been disclaimed.
Int. Cl.[6] F21S *3/00*
U.S. Cl. 362—225 **12 Claims**



1. A lighting fixture for producing enhanced lamp light output density, said fixture comprising:

a reflector having a first end and a second end, a fixture optical centerline extending between said ends, and a fixture length along said fixture optical centerline;

at least a first lampholder and a second lampholder, said first lampholder mounted substantially adjacent said first end of said reflector and said second lampholder mounted substantially adjacent said second end of said reflector, each said lampholder being mounted at that lampholder's respective location such that a projection of said first lampholder along said fixture optical centerline toward said second lampholder partially overlaps said second lampholder, and such that a projection of said second lampholder along said fixture optical centerline toward said first lampholder partially overlaps said first lampholder, each said lampholder having a lampholder length;

at least two elongated lamps, each lamp having:

a plug portion for mating with one of said lampholders, said plug portion having a plug portion length,

a distal portion opposite said plug portion,

a lamp longitudinal axis running from said plug portion to said distal portion, and

a lamp length along said lamp longitudinal axis from said plug portion to said distal portion; wherein:

each of said lamps is mounted in one of said lampholders such that said lamps are tightly gathered to simulate a hairline source, and the lamp longitudinal axes of said lamps are substantially parallel to the optical centerline and are offset from one another;

a portion of said plug portion remains exposed when said lamp is mounted in said lampholder, said exposed portion having an exposed plug portion length;

said fixture length is sufficiently greater than the sum of:

the lamp length of one of said lamps,

the exposed plug portion length of said one of said lamps,

the lampholder length of one of said lampholders associated with said one of said lamps,

the exposed plug portion length of the plug portion of another of said lamps, and

the lampholder length of the lampholder associated with said other of said lamps, that:

for adjacent lamps, being associated with lampholders mounted adjacent different ends of said reflector, the distal portion of any one of said lamps longitudinally clears the lampholder associated with, and the exposed plug portion of, any of said lamps adjacent said one of said lamps;

and

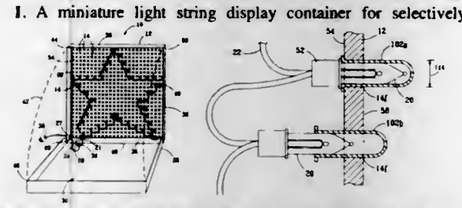
said lamps together form a lamp optical centerline substantially coincident with said fixture optical centerline.

5,555,163

MINIATURE LIGHT DISPLAY

Richard R. Pisani, 2205 Ashley Park, Plano, Tex. 75074

Filed Feb. 9, 1995, Ser. No. 386,160
Int. Cl.[6] G09F *13/00*
U.S. Cl. 362—252 **22 Claims**



1. A miniature light string display container for selectively displaying a plurality of light bulbs of a miniature light string in a desired arrangement, said miniature light string container comprising:

(a) at least one display panel with a face;

(b) a rear surface on said at least one display panel opposite said face;

(c) an array of regularly spaced mounting openings of a predetermined size and shape through said at least one display panel for securely holding bulb portions of a standard miniature light string in selected ones of said mounting openings corresponding to a desired pattern selectable on said array of mounting openings;

(d) a reversibly openable entry panel with a closed position in which said entry panel is closed, adjacent to said rear surface of said display panel, and with an open second position in which said entry panel is opened away from said rear surface of said display panel for access thereto; and

(e) means for allowing an electrical wire of said string of miniature ornamental lights to extend outside of said display container to an electrical power source so that said pattern of inserted light bulbs may be illuminated.

5,555,164

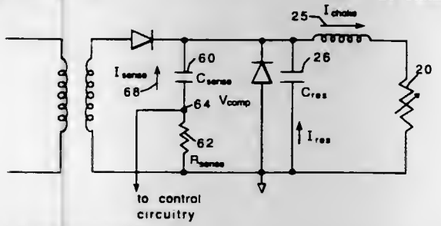
Patent Not Issued For This Number

5,555,165

CURRENT DETECTION IN POWER CONVERSION

Patrizio Vinciarelli, Boston, Mass., assignor to VLT Corporation, San Antonio, Tex.

Continuation of Ser. No. 144,636, Oct. 28, 1993, abandoned. This application May 17, 1995, Ser. No. 444,825
Int. Cl.[6] H02M *3/335*
U.S. Cl. 363—21 **20 Claims**



1. Apparatus comprising

power conversion circuitry which delivers power from an input source to a load via a first capacitor in a series of energy transfer cycles, and

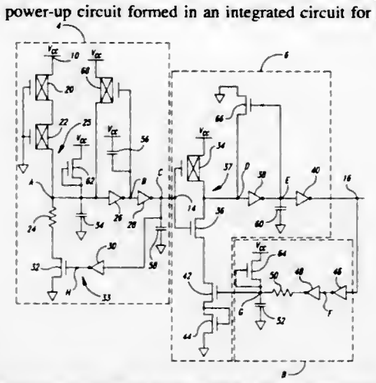
circuitry which measures a value of rate of change of voltage across said capacitor and uses said value to deliver an output which is indicative of a current flowing in the capacitor.

5,555,166

SELF-TIMING POWER-UP CIRCUIT

Joseph C. Sher, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Jun. 6, 1995, Ser. No. 468,105
Int. Cl.[6] H02M *7/10;* **H03K** *3/01*
U.S. Cl. 363—49 **15 Claims**



1. A power-up circuit formed in an integrated circuit for generating a power-up pulse for a semiconductor circuit device based on a supply voltage rising from a reference potential to a steady supply voltage, comprising:

an input stage having an output and an input adapted to receive the supply voltage, the input stage generating at the output a first logic state for a selected time period after receipt of the supply voltage, and a second logic state thereafter;

an output stage having a first input connected to the output of the input stage, a second input, and an output, the output stage generating one logic state when the first input is at the first logic state, and switching to another logic state when the first input is at the second logic state and the second input is at a predetermined logic state, the logic states sequentially generated by the output stage defining the power-up pulse; and

a pulse control circuit connected between the second input and the output of the output stage, the pulse control circuit generating the predetermined logic state after at least a preset delay period after the output of the output stage switches to the one logic state at the start of the power-up pulse whereby the pulse control circuit prevents the output of the output stage from switching to the another logic state from the one logic state for at least the preset delay period to ensure a minimum width for the generated power-up pulse.

5,555,167

POWER SUPPLY APPARATUS WITH A POWER-SAVING FUNCTION

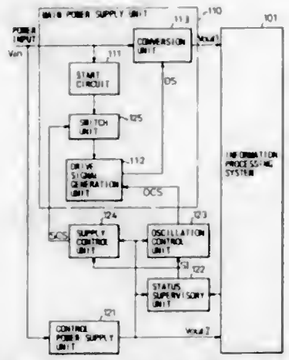
Shigeru Fujihashi, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Apr. 19, 1995, Ser. No. 424,117
Claims priority, application Japan, Apr. 20, 1994, 6-081767
Int. Cl.[6] H02H *7/122*
U.S. Cl. 363—49 **4 Claims**

1. A power supply apparatus with a power-saving function for use in an information processing system, comprising:

main power supply means (**110**) including: start means (**111**), switch means (**125**), drive signal generation means (**112**) and conversion means (**113**); said start means receiving an input voltage (Vin) and starting said drive signal generation means through said switch means; said drive signal generation means generating a drive signal (DS) to said conversion means; and said conversion means converting the input voltage to a first output voltage (Vout1), and outputting the first output voltage to said information processing system (**101**) in response to the drive signal;

control power supply means (**121**) receiving the input voltage (Vin), converting the input voltage to a second output voltage



(Vout2), and outputting the second output voltage to said information processing system;

status supervisory means (122) connected to said information processing system for supervising the status of the system and indicating whether the system is in use or not, and outputting status information (SI);

oscillation control means (123) connected between said status supervisory means and said drive signal generation means for generating an oscillation control signal (OCS) to said drive signal generation means in order to control generation of the drive signal in accordance with the status information; and

supply control means (124) connected between said status supervisory means and said switch means for generating a switch control signal (SCS) to said switch means in order to control turning on/off of said switch means, and said switch means connecting or disconnecting said start means and said drive signal generation means to or from each other.

5,555,168

FREQUENCY MODULATED, SWITCHING POWER SUPPLY

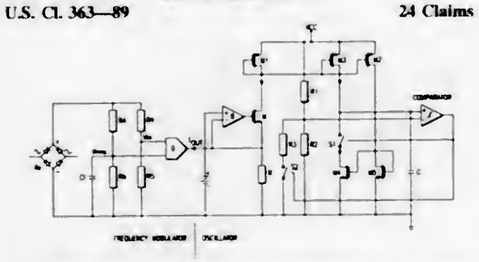
Bruno Ferrario, Fino Mornasco, Italy, assignor to SGS-Thomson Microelectronics, S.r.l., Agrate Brianza, Italy

Filed Jul. 28, 1993, Ser. No. 98,651

Claims priority, application European Pat. Off., Jul. 28, 1992, 92830418.7

Int. Cl.[6] H02M *7/155*

U.S. Cl. 363—89 **24 Claims**



1. A switching power supply, for connection to an AC power line, comprising:

a bridge rectifier connectable to the power line;

an oscillator;

a division circuit configured and connected to provide a ratio output proportional to a ratio between an instantaneous output voltage of said rectifier and a long-term-average of the output voltage of said rectifier; and

a control circuit connected to said division circuit and said oscillator to dynamically shift the frequency of said oscillator in accordance with the value of said ratio;

whereby said control circuit operates independently of the voltage and frequency of the power line voltage.

5,555,169

COMPUTER SYSTEM AND METHOD FOR CONVERTING A CONVERSATIONAL STATEMENT TO COMPUTER COMMAND LANGUAGE

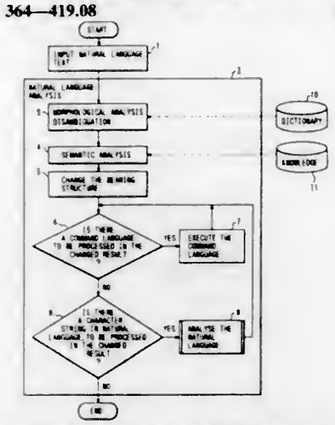
Yasuharu Namba, Yao; Hiroshi Kinukawa, Machida; Hiroshi Tsuji, Itami, and Satoshi Wakayama, Sakai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 14, 1993, Ser. No. 62,951

Claims priority, application Japan, May 20, 1992, 4-152946

Int. Cl.[6] G06F *17/27*

U.S. Cl. 364—419.08 **29 Claims**



1. A method of processing a natural language into a command language in a system comprising a character input means, a processor and a storage device storing a dictionary and a knowledge data base including a plurality of predefined meaning structure changing rules and a plurality of predefined chained functions structures defining expressions representative of the natural language and the command language, the method comprising:

(a) a step of inputting a character string having a natural language form representing a request for a computer operation through said input means, and storing said character string in a stack;

(b) a step performed with said processor of parsing the inputted character string into character sub-strings in accordance with said dictionary by comparing portions of the inputted character string with definitions stored in said dictionary;

(c) a step of with the processor, analyzing syntax of each of said character sub-strings by searching the knowledge data base to select corresponding chained functions structures representative of the character sub-strings;

(d) a step performed with said processor of retrieving knowledge stored in the knowledge data base in accordance with the corresponding chained functions structures selected by the analyzing syntax step (c), the retrieved knowledge defining concepts and structure of knowledge data elements representative of each syntax analyzed sub-string;

(e) a step of with said processor, character string analyzing at least one of said syntax analyzed sub-strings by searching the retrieved knowledge described by the corresponding chained functions structures including the knowledge data elements from the corresponding chained functions structures, by matching at least one of the knowledge data elements with at least one of equivalent knowledge data elements of other chained functions structures in the knowledge data base;

(f) a step of with said processor, generating an intermediate meaning structure representing each of said character string analyzed sub-strings from step (e) by combining the corresponding chained functions structures and the knowledge data elements from other chained functions structures matched in accordance with the character string analyzing step (e); and

(g) a step of with said processor, generating at least one of a new character string in the natural language, an intermediate representation for obtaining a command language, and the command language which is equivalent to said syntax analyzed sub-string on the basis of said generated intermediate meaning structure, said new character string being stored in said stack, and said intermediate representation being stored in said knowledge database, and when the command language is generated, executing the command language, and when the command language is not generated, selecting a different one of said character strings from the stack and recursively repeating the processing until all of the character strings in said stack have each been subject to the generating step (g).

5,555,170

SYSTEM AND METHOD FOR CONTROLLING DOWN SHIFTING OF VEHICLE AUTOMATIC TRANSMISSION

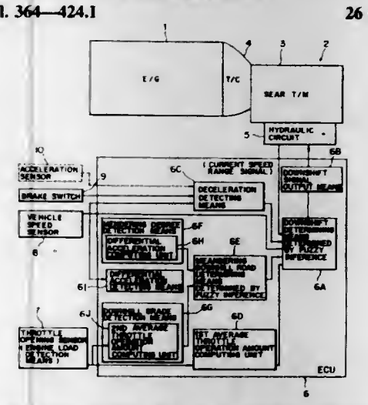
Yasuhiro Nakashima, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 10, 1994, Ser. No. 258,086

Claims priority, application Japan, Jun. 11, 1993, 5-140466

Int. Cl.[6] B60K *41/06*

U.S. Cl. 364—424.1 **26 Claims**



1. A shift control system for a vehicle automatic transmission in which a desired gear ratio is achieved in accordance with a driving state of a vehicle, comprising:

first detecting means for detecting a change in acceleration of said vehicle in a longitudinal direction thereof;

second detecting means for detecting a degree of meandering of a road on which said vehicle is running based on said detected change in acceleration;

third detecting means for detecting a downhill grade of said road;

first determining means for determining whether said road is a meandering downhill road, based on said degree of meandering detected by said second detecting means and said downhill grade detected by said third detecting means;

second determining means for determining whether a downshift is needed, when said road has been determined to be said meandering downhill road by said first determining means; and

means for shifting said gear ratio of said vehicle automatic transmission from a current gear ratio to a gear ratio lower than said current gear ratio based on said determination by said second determining means.

5,555,171

DATA COLLECTION SYSTEM FOR DRIVING MACHINE

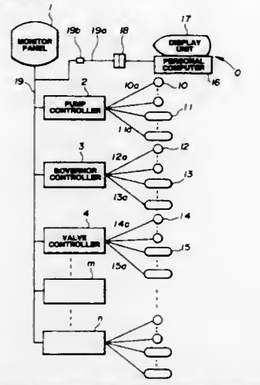
Hiroshi Sonehara; Akira Toba, both of Sagamihara; Shuki Akushichi, and Yoshiyuki Shitaya, both of Hiratsuka, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jul. 7, 1994, Ser. No. 271,490

Claims priority, application Japan, Jul. 8, 1993, 5-169235

Int. Cl.[6] G06F *17/40*

U.S. Cl. 364—424.03 **6 Claims**



1. A data collection system for a driving machine which includes a plurality of controllers for controlling driving of said driving machine disposed within the driving machine to collect data obtained at each controller and to perform predetermined operations, said data collection system comprising:

communication means comprised of said plurality controllers which are interconnected for mutual communication therebetween by means of a communication line,

an external controller connection connector provided on the communication line for mutual communication between an external controller diposed externally of said driving machine and said plurality of controllers,

first control means for controlling the operation of one master controller among the plurality of controllers to perform sequential polling operation over all of the controllers including said master controller and said external controller through said communication line,

second control means for controlling the operation of one of the controllers which has received the polling from said master controller to transmit data obtained at said one of the controllers to the controllers other than said one of the controllers,

third control means operative when said master controller receives a response to the polling from said external controller for judging that the external controller is connected to said connector and stopping the polling operation being performed by the master controller,

fourth control means operative after the external controller responded to the polling from the master controller for controlling the operation of the external controller to perform a sequential polling operation over all of the controllers including the external controller and the master controller throuqh said communication line,

fifth control means for controlling the operation of one of the controllers which has received the polling from the external controller to transmit data obtained at said one of the controllers to the controllers other than said one of the controllers, and

sixth control means operative when data obtained at the controllers other than the external controller are collected at the external controller by the control of the fifth control means for controlling the operation of the external controller to perform the predetermined operations based on the collected data.

5,555,172

USER INTERFACE FOR CONTROLLING ACCESSORIES AND ENTERING DATA IN A VEHICLE

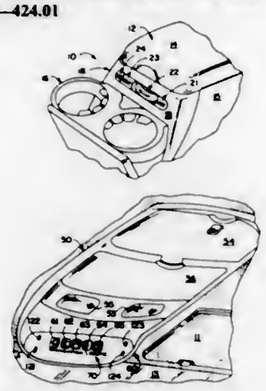
using a vehicle height signal as a vehicle suspension signal representative of the relative positioning of said body and at least one of said wheels;

subtracting means for subtracting a predetermined offset value from said acceleration signal output from said acceleration sensor;

5,555,172
USER INTERFACE FOR CONTROLLING ACCESSORIES AND ENTERING DATA IN A VEHICLE

Suzanne K. Potter, Holland, Mich., assignor to Prince Corporation, Holland, Mich.

Filed Aug. 22, 1994, Ser. No. 293,487
Int. Cl.[6] G06F *15/00;* **B60N** *3/00;* **B60R** *11/00*
U.S. Cl. 364—424.01 **27 Claims**



1. A user interface system for controlling a vehicle accessory comprising:

an overhead housing for mounting to the roof of a vehicle;

a display mounted in said overhead housing;

a plurality of vehicle accessories;

a circuit coupled to said vehicle accessories and said display for selectively providing a set of icons for display on said display, a plurality of said display icons each associated with one of said plurality of vehicle accessories; and

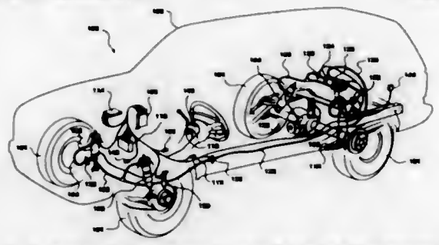
a data selection control remotely located from said overhead housing within reach of the vehicle operator and coupled to said circuit for selecting a desired one of the set of icons displayed on said display,

wherein, upon selection of a desired one of the icons, said circuit provides a set of display symbols to said display for display thereon, said set of display symbols corresponding to control operations for the vehicle accessory associated with the selected one of the set of display icons.

5,555,173
DAMPING FACTOR SWITCHING IN VEHICLE SHOCK ABSORBERS

Douglas C. Campbell, Dearborn; Gary J. Gloceri, West Bloomfield, and Daniel M. McCoy, Shelby Township, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 16, 1994, Ser. No. 356,988
Int. Cl.[6] B60G *17/015*
U.S. Cl. 364—424.05 **7 Claims**



1. A method for operating a controllable vehicle suspension connected between a body and wheels of a vehicle, said method comprising the steps of:

using a vehicle height signal as a vehicle suspension signal representative of the relative positioning of said body and at least one of said wheels;

passing said vehicle suspension signal through a bandpass filter centered on a body frequency of said vehicle to generate a body frequency signal representative of the velocity of the vehicle suspension at a body frequency;

comparing said body frequency signal to a first threshold for suspension jounce and a second threshold for suspension rebound;

generating a first switch request signal to request more firm damping in said vehicle suspension if said body frequency signal exceeds either of said first and second thresholds;

passing said vehicle suspension signal through a bandpass filter centered on a wheel frequency of said vehicle to generate a wheel frequency signal representative of the velocity of the vehicle suspension at a wheel frequency;

comparing said wheel frequency signal to a third threshold for suspension jounce and a fourth threshold for suspension rebound to determine whether the wheel frequency signal is between said third and fourth thresholds and therefor velocity of said controlled vehicle suspension is approximately equal to zero;

generating a switch enable signal while the velocity of said controlled vehicle suspension is approximately equal to zero to enable switching damping of said vehicle suspension;

combining said first switch request signal and said switch enable signal to generate a switch signal for switching to more firm damping in said vehicle suspension;

maintaining said more firm damping for said vehicle suspension for at least a defined time period;

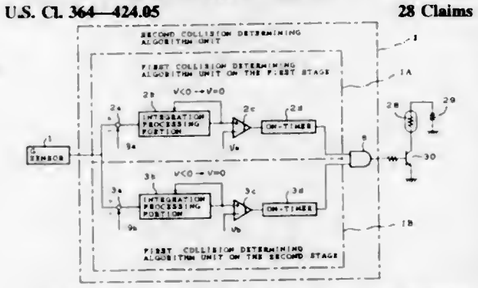
generating a second switch request signal to request a change in said vehicle suspension to less firm damping upon expiration of said at least a defined time period; and

combining said second switch request signal and said switch enable signal to generate a switch signal for switching to less firm damping in said vehicle suspension.

5,555,174
STARTING APPARATUS OF PASSENGER PROTECTING APPARATUS AND METHOD THEREOF

Yukihiro Okimoto; Takashi Furui, and Katsuhiko Ohmae, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, and Mitsubishi Jidosha Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 68,197, May 28, 1993, Pat. No. 5,440,485. This application Apr. 7, 1995, Ser. No. 418,480
Claims priority, application Japan, May 29, 1992, 4-161643
Int. Cl.[6] B60R *21/12;21/32*
U.S. Cl. 364—424.05 **28 Claims**



1. A starting apparatus of a passenger protecting apparatus comprising:

an acceleration sensor converting an acceleration at a time of collision into an acceleration signal;

subtracting means for subtracting a predetermined offset value from said acceleration signal output from said acceleration sensor;

speed calculating means for integrating output from said subtracting means so as to obtain a speed signal;

limiting means for limiting said speed signal to zero when an integrated value of said output from said subtracting means becomes smaller than zero;

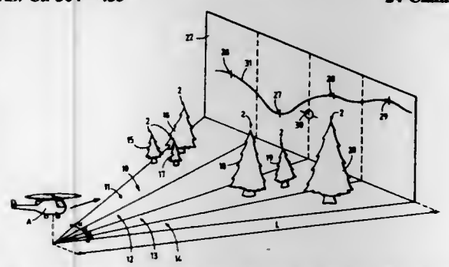
comparing means for comparing an output from said speed calculating means with a threshold value; and

starting means for outputting a starting signal depending upon an output from said comparing means.

5,555,175
METHOD AND DEVICE FOR ASSISTANCE WITH THE PILOTING OF AN AIRCRAFT

Michel D'orso, Luynes, France, assignor to Eurocopter France, Marignane Cedex, France

Filed Nov. 10, 1994, Ser. No. 337,248
Claims priority, application France, Nov. 10, 1993, 93 13428
Int. Cl.[6] G06F *165;* **G01S** *17/93*
U.S. Cl. 364—433 **24 Claims**



1. A method of assisting the piloting of an aircraft at low altitude, making it possible to detect obstacles in relief which are dangerous for said aircraft in the field in front of the aircraft wherein, on the basis of the maneuvering capabilities of the aircraft, a hypothetical curve is calculated, related to said aircraft and associated with an optimal theoretical trajectory for clearing an obstacle in a vertical plane; and wherein, in the field in front of the aircraft, the following steps are performed:

a) all the obstacles situated in a search area are determined;

b) the tops of said obstacles are compared with said hypothetical curve;

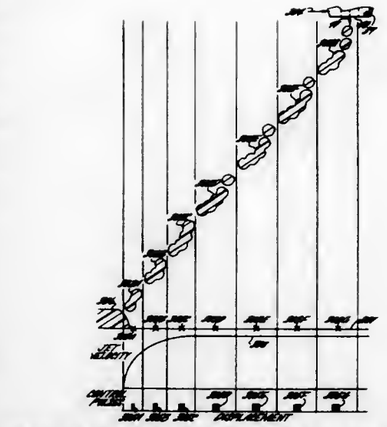
c) one of said obstacles is defined as a dangerous obstacle whose top is situated highest with respect to said hypothetical curve; and

d) the coordinates of said top of said dangerous obstacle are determined.

5,555,176
APPARATUS AND METHOD FOR MAKING THREE-DIMENSIONAL ARTICLES USING BURSTS OF DROPLETS

Herbert E. Menhennett, Easley, and Robert B. Brown, Duncan, both of S.C., assignors to BPM Technology, Inc., Greenville, S.C.

Filed Oct. 19, 1994, Ser. No. 325,889
Int. Cl.[6] G06F *19/00*
U.S. Cl. 364—468.25 **60 Claims**



40. A method for making a three-dimensional article based upon article defining data using an apparatus of a type including a platform, and a build material dispenser positioned adjacent the platform for dispensing build material in a plurality of droplets, said method comprising the steps of:

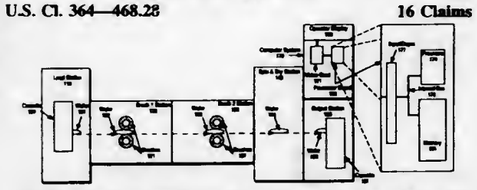
advancing the dispenser along a predetermined path of travel with respect to the platform; and

operating the dispenser to dispense a series of bursts of build material at a series of respective target positions to construct a continuous portion of the article as the dispenser is continuously advanced along the predetermined path of travel to thereby construct the article based upon the article defining data, each burst being defined by a plurality of successive droplets dispensed in relatively rapid succession to each other as compared to a last droplet in one burst and an initial droplet in a next succeeding burst so that the build material of the plurality of successive droplets of a burst combines at a respective target position.

5,555,177
METHOD AND APPARATUS FOR RESETTING INDIVIDUAL PROCESSES IN A CONTROL SYSTEM

Mark A. Simmons, San Jose, Calif., assignor to Ontrak Systems, Inc., Milpitas, Calif.

Filed May 27, 1994, Ser. No. 250,278
Int. Cl.[6] G06F *19/00*
U.S. Cl. 364—468.28 **16 Claims**



12. A method of controlling a portion of a double-sided wafer scrubber, said double-sided wafer scrubber including a processor, a memory, a station and a second station, said processor being coupled in communications with said memory, said station and said second station, said processor for communicating control signals to said station and said second station, said memory for storing a program and data for use by said processor;

said processor executing a process controlling said station;

said processor executing a second process controlling said second station;

said processor receiving a signal to reset said station;

said processor resetting said process causing only said station to be reset.

5,555,178
CONTROL APPARATUS AND METHOD FOR HOLDING

extracting, using a computer, information regarding a working sequence of said plurality of working machines and informa-

present where the slope of the digitized ultrasonic has the value zero, and determining a corresponding polarity sign

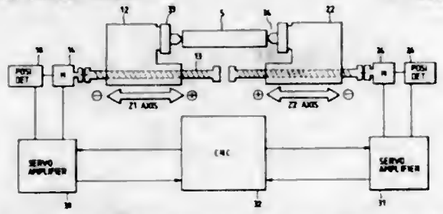
5,555,182
SOURCE QUALITY MONITORING SYSTEM

5,555,178

CONTROL APPARATUS AND METHOD FOR HOLDING A WORKPIECE IN A MACHINE TOOL

Hiroshi Hashimoto, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1993, Ser. No. 153,042
Claims priority, application Japan, Nov. 17, 1992, 4-307041
Int. Cl.[6] B23B *23/00*; **G06F** *19/00*
U.S. Cl. 364—474.17 **19 Claims**



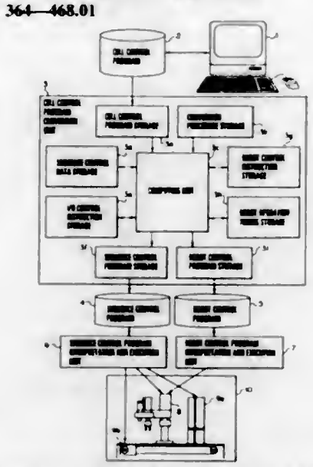
1. A control apparatus for a machine tool including opposed workpiece holding means for machining a workpiece having a longitudinal axis of rotation and opposite end faces held by said workpiece holding means, and a driving means for driving at least one of said workpiece holding means to press said holding means against a workpiece end face, said control apparatus comprising pressing completion judging means for judging, throughout a machining process, whether or not the operation of said driving means is complete.

5,555,179

CONTROL METHOD AND CONTROL APPARATUS OF FACTORY AUTOMATION SYSTEM

Masahiro Koyama, Ibaraki-ken; Norihisa Miyake, Matsudo; Hiroshi Sakairi, Tsukuba; Shizuko Hattori; Yasuyuki Momoi, both of Ibaraki-ken; Tsutomu Fujimoto, and Tsuyoshi Kai, both of Tochigi-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 2, 1994, Ser. No. 299,632
Claims priority, application Japan, Sep. 3, 1993, 5-219511
Int. Cl.[6] G05B *19/418*
U.S. Cl. 364—468.01 **21 Claims**



1. A computer-implemented control method of factory automation system having a cell formed by a plurality of working machines including at least one automated machine to execute a series of works in accordance with a control program, said method comprising the steps of:

extracting, using a computer, information regarding a working sequence of said plurality of working machines and information regarding control of inputs and outputs of said plurality of working machines from a cell control program, which includes specifications of working of said cell as a whole, said cell control program being input to the computer, said cell control program further including information regarding a working sequence of said plurality of working machines, information regarding control of inputs and outputs of said plurality of working machines, information regarding operation control of said automated machine, and information regarding synchronization of operations of said working machines;

generating, on the basis of said extracted information by using the computer, a sequence control program in which control of the working sequence of said plurality of working machines and control of inputs and outputs of said plurality of working machines are described;

extracting, from said cell control program by using the computer, information regarding operation control of said automated machine and information regarding synchronization of operations of said working machines;

generating, on the basis of the information extracted in said extracting step using the computer, an automated machine control program in which processing for control over positioning and operation trajectory of said automated machine are described; and

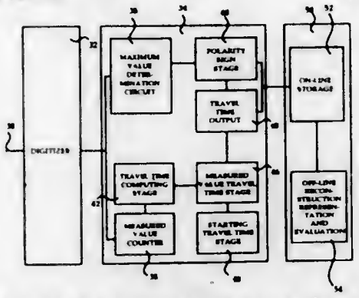
controlling working of said cell in accordance with said sequence control program and said automated machine control program.

5,555,180

METHOD FOR PROCESSING DIGITIZED ULTRASONIC SIGNALS ORIGINATING FROM AN ULTRASONIC PROBE FOR THE STORAGE OF AND LATER RECONSTRUCTION OF THE ULTRASONIC SIGNALS FROM THE STORED DATA

Heinz-Josef Hilger, Am Kreuz; Manfred Rehrmann, Hurth, and Norbert Steinhoff, Erftstadt, all of Germany, assignors to Krautkramer GmbH & Co., Hurth, Germany

Filed Mar. 29, 1994, Ser. No. 219,101
Claims priority, application Germany, Mar. 29, 1993, 43 10 134.8; Oct. 1, 1993, 43 33 531.4
Int. Cl.[6] G06F *7/00*
U.S. Cl. 364—577 **9 Claims**



7. An apparatus for processing an ultrasonic signal comprising:

(a) a probe having a probe frequency, said probe used for measuring the ultrasonic signal;

(b) a digitizer which digitizes the ultrasonic signal from the probe at a sample frequency which is a multiple of the probe frequency;

(c) a maximum value determination circuit connected to the digitizer which determines maximum amplitudes of the digitized ultrasonic signal, whereby maximum amplitudes are

present where the slope of the digitized ultrasonic has the value zero, and determining a corresponding polarity sign thereto;

(d) a measured value counter also connected to the digitizer for determining a time value corresponding to the maximum amplitudes of the digitized ultrasonic signal;

(e) a memory for storage of the maximum amplitude, the polarity sign and the time value corresponding to the maximum amplitude of the digitized ultrasonic signal; and

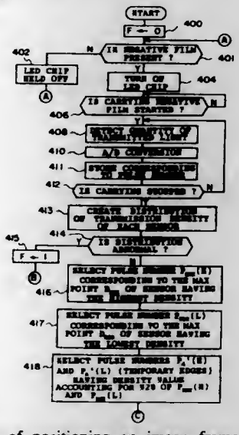
(f) means for reconstructing the ultrasonic signal by plotting the stored maximum amplitude, the stored time value and the stored polarity sign corresponding to the maximum amplitudes of the digitized ultrasonic signal and connecting any two neighboring maximum amplitudes with a 180 degree cosine curve having a slope of zero at each of the two neighboring maximum amplitudes.

5,555,181

METHOD OF POSITIONING IMAGE FRAME AND PHOTOGRAPHIC FILM CARRIER

Yasuhiro Seto, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 27, 1992, Ser. No. 888,984
Claims priority, application Japan, May 28, 1991, 3-123857
Int. Cl.[6] G03B *27/52*
U.S. Cl. 355—41 **21 Claims**



1. A method of positioning an image frame recorded on a photographic film at a predetermined position, said method comprising the steps of:

detecting an image frame edge depending on a quantity of transmitted light passing through the photographic film while the photographic film is being carried;

determining a film carrying amount, wherein for a normal image frame the edge of which has been detected in said detecting step, the film carrying amount is based on the detected image frame edge, and for a faulty image frame the edge of which has been undetected in said detecting step, the film carrying amount is based on a recording tendency, said recording tendency being obtained based on the image frame edges of the normal image frames preceding said

positioning the image frame at the predetermined position by carrying the photographic film by the film carrying amount determined in said determining step,

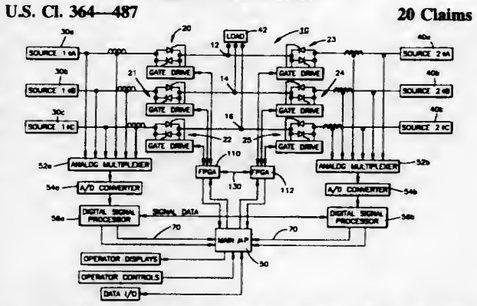
wherein said film carrying amount for the faulty image frame is the sum of an average of carrying directional lengths of the normal image frames preceding said faulty image frame and an average of intervals between said normal image frames.

5,555,182

SOURCE QUALITY MONITORING SYSTEM

James M. Gaim, Shaker Heights, Ohio, assignor to Cyberex, Inc., Mentor, Ohio

Filed May 4, 1995, Ser. No. 433,690
Int. Cl.[6] G01R *25/00*
U.S. Cl. 364—487 **20 Claims**



1. Monitoring apparatus for detecting phase and magnitude disruptions in an alternating voltage input signal comprising:

a) an input circuit for receiving an alternating voltage input signal and providing a first alternating output signal that follows a phase of the alternating voltage input signal and for providing a second alternating output signal phase shifted in relation to the first alternating output signal by a specified amount;

b) a demodulation circuit for combining the first output signal from the input circuit with the alternating voltage input signal to produce a first demodulated signal and for combining the second alternating output signal from the input circuit with the alternating voltage input signal to produce a second demodulated signal, said demodulation circuit including circuitry for removing a ripple signal resulting from the combining of signals applied to the demodulation circuit; and

c) an output circuit coupled to the demodulation circuit for assessing the quality of the alternating voltage input signal by comparing the first and second demodulated signals with predetermined quality thresholds to produce an output indication of the quality of the alternating voltage input signal.

5,555,183

METHOD AND APPARATUS FOR SYNCHRONIZING TO A SYNCHRONOUS SELECTIVE CALL SIGNAL

David F. Willard, Plantation; Robert J. Schwendeman, Pompano Beach; William J. Kuznicki, Coral Springs, and Michael J. DeLuca, Boca Raton, all of Fla., assignors to Motorola, Inc, Schaumburg, Ill.

Continuation-in-part of Ser. No. 801,574, Dec. 2, 1991, Pat. No. 5,325,088. This application Feb. 3, 1994, Ser. No. 191,881
Int. Cl.[6] H04Q *7/18;7/06*
U.S. Cl. 340—825.21 **4 Claims**

1. In a selective call receiver having a power consuming circuit for receiving a synchronous communication signal having a multiplicity of frames, each of the multiplicity of frames having

a frame synchronization signal and

a frame identification signal being a member of a plurality of frame identification signals, each of the plurality of frame identification signals occurring in a predetermined sequence, the selective call receiver having means for storing, the means for storing having an assigned frame identification signal corresponding to one of the plurality of frame identification signals and a first mask, a method of conserving power during an interval of time after acquiring frame synchronization and before a first occurrence of a desired frame of the multiplicity of frames, comprising the steps of:

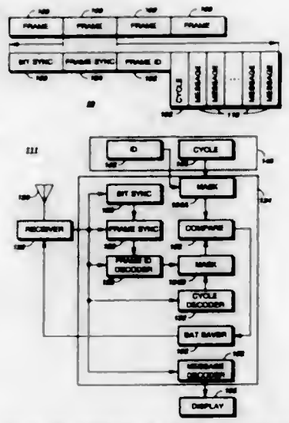
enabling the power consuming circuit;

receiving the frame synchronization signal to acquire frame synchronization;

5,555,185

METHOD AND APPARATUS FOR IMAGING USING AN

(a) performing a path tracing search to determine the minimum path delay from at least one clock input to at least one clock



receiving one of the plurality of frame identification signals to produce a received frame identification signal;

wherein each frame comprises a second mask;

comparing the assigned frame identification signal with the first mask stored in the selective call receiver and the second mask received from the one of the plurality of frames to generate a plurality of assigned frame identification signals;

determining the first occurrence of the desired frame of the multiplicity of frames as a result of the plurality of assigned frame identification signals generated in the step of comparing; and

disabling the power consuming circuit until the first occurrence of the desired frame.

5,555,184

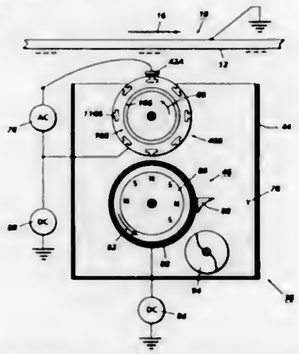
DEVELOPER ROLLER ASSEMBLY AND METHOD FOR MAKING SAME

Timothy R. Jaskowiak, and Steven C. Hart, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 29, 1994, Ser. No. 297,281

Int. Cl.[6] G03G *15/08*

U.S. Cl. 355—259 **14 Claims**



1. A roller assembly for transporting developer material in a development apparatus, the roller assembly comprising a cylindrical sleeve section including:

(a) a first inner layer providing rigidity to said sleeve section; and

(b) a second outer layer having a series of undercuts formed non-radially therein for holding developer material being transported, each undercut of said series of undercuts including a non-radial inverted T-slot and a portion of said second outer layer overhanging said non-radial inverted T-slot.

5,555,185

METHOD AND APPARATUS FOR IMAGING USING AN INTERMEDIATE TRANSFER MEMBER

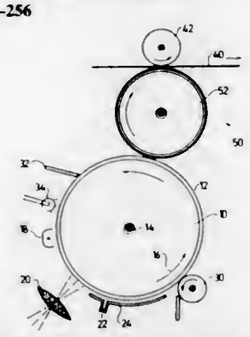
Benzion Landa, Edmonton, Canada, assignor to Indigo N.V., SM Veldhoven, Netherlands

Continuation-in-part of Ser. No. 293,456, Jan. 4, 1989. This application Aug. 30, 1989, Ser. No. 400,717

Claims priority, application United Kingdom, Sep. 8, 1988, 8821180; Oct. 4, 1988, 8823256

Int. Cl.[6] G03G *15/10*

U.S. Cl. 355—256 **20 Claims**



1. Apparatus for transfer of a liquid toner image, containing carrier liquid and toner particles which solvate said carrier liquid at a solvation temperature above room temperature, from an image bearing surface to a substrate, the apparatus comprising:

an intermediate transfer member arranged in operative association with said image bearing surface;

a transfer station operative for transferring said image from said image bearing surface onto said intermediate transfer member; and

heating means operative for heating said image on said intermediate transfer member to a temperature above said solvation temperature, below the melting point of the toner particles and below the boiling point of said carrier liquid prior to transfer of the image to said substrate so as to cause the image to adhere to said substrate.

5,555,186

PROJECTION TYPE LIQUID CRYSTAL DISPLAY APPARATUS USING MULTIPLE POLARIZING BEAM SPLITTERS

Yukinori Shioya, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Feb. 15, 1995, Ser. No. 389,174

Claims priority, application Japan, Feb. 15, 1994, 6-040445

Int. Cl.[6] G02F *1/1335;* **G02B** *27/12*

U.S. Cl. 359—40 **3 Claims**

1. A projection type liquid crystal display apparatus which modulates light beams originating from a light source by a liquid crystal display device and projects the modulated light beams by a projection lens, comprising:

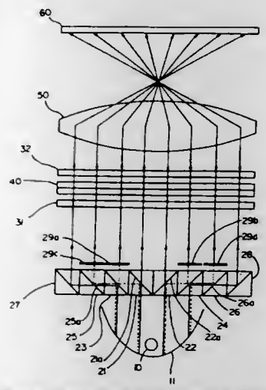
first polarizing beam splitters having respective first polarization separating surfaces arranged perpendicularly to each other, each of the first polarization separating surfaces serving to separate a light beam emitted from the light source into a P-polarization component and an S-polarization component by transmitting and outputting toward the liquid crystal display device one of those components and reflecting the other component;

first light beam reflecting elements disposed outside and adjacent to the respective first polarizing beam splitters, each for reflecting the P- or S-polarization component reflected by the first polarization separating surface and a light beam directly inputted from the light source;

second polarizing beam splitters disposed outside and adjacent to the respective first light beam reflecting elements and having respective second polarization separating surfaces, each of the second polarization separating surfaces serving to separate the light beam inputted from the light source and reflected by the first light beam reflecting element into a P-polarization component and an S-polarization component by transmitting one of those components and reflecting and outputting toward the liquid crystal display device the other component;

second light beam reflecting elements disposed outside and adjacent to the respective second polarizing beam splitters, each for reflecting toward the liquid crystal display device the P- or S-polarization component transmitted from the second polarization separating surface; and

phase plates disposed in optical paths of P- or S-polarization components separated by the first and second polarization separating surfaces, for converting the incident P- or S-polarization components to S- or P-polarization components by rotating their polarization directions by 90°.



5,555,187

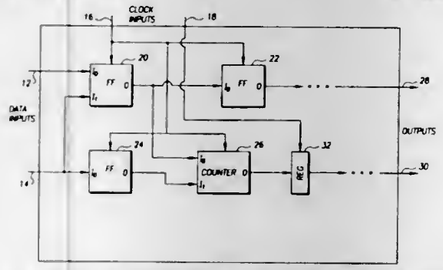
METHOD AND APPARATUS FOR DETERMINING THE TIMING SPECIFICATION OF A DIGITAL CIRCUIT

Athanasius W. Spyrou, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Dec. 30, 1994, Ser. No. 366,701

Int. Cl.[6] G06F *17/50;19/00*

U.S. Cl. 364—490 **20 Claims**



1. A method for determining required setup times for a digital circuit, the digital circuit including data inputs, clock inputs and storage elements, said storage elements having an inherent setup time ($Setup_{pmat}$) said method comprising the steps of:

(a) performing a path tracing search to determine the minimum path delay from at least one clock input to at least one clock pin of a storage element in the integrated circuit ($Clock_{min}$);

(b) performing a path tracing search to determine the maximum path delay from at least one data input to at least one level one storage element ($Data_{max}$); and

(c) determining the required setup time for a data input/level one storage element pair from the expression:

$$Data_{max}-Clock_{min}+Setup_{pmat}.$$

5,555,188

OPTIMAL RETIMING OF SYNCHRONOUS LOGIC CIRCUITS

Srimat T. Chakradhar, No. Brunswick, N.J., assignor to NEC USA, Inc., Princeton, N.J.

Continuation of Ser. No. 73,787, Jun. 8, 1993, abandoned. This application Dec. 27, 1994, Ser. No. 365,971

Int. Cl.[6] G06F *17/50*

U.S. Cl. 364—490 **3 Claims**

Table 1. Optimum retiming results

Circuit	Gates	FFs	Clock Period		CPU secs		
			Initial	Optimal	SIS	COR	
						CPLEX	SIS	Total
bigkey	14511	224	11	8	29046	0	86	86
clma	38667	33	75	53	>3 days	0	285	285
clmb	57689	33	75	53	>3 days	0	268	268
diffe	5282	224	15	13	4437	0	10	10
mm30a	3484	90	158	158	4483	0	0	0
mm9a	566	12	25	25	71	0	0	0
mm9b	1083	27	54	54	308	0	0	0
mm9c	1274	28	74	81	380	0	1	1
mult16a	528	16	46	8	11	0	0	0
mult16b	382	30	5	5	11	0	0	0
mult32a	1088	32	87	8	48	0	2	2
mult32b	783	62	5	5	52	0	0	0
s1196	880	18	20	20	232	0	0	0
s13207	8708	501	25	33	8469	1	11	12
s1423	1919	74	55	55	188	0	1	1
s1488	1480	6	15	14	246	0	1	1
s1494	1504	6	15	14	255	0	1	1
s15850	9039	522	47	38	7763	9	12	18
s208	181	8	10	10	5	0	0	0
s27	17	3	5	5	0	0	0	0
s298	256	14	9	5	3	0	0	0
s344	236	15	14	11	3	0	0	0
s349	241	15	14	11	3	0	0	0
s382	300	21	12	7	3	0	0	0
s38417	19892	1552	21	20	24445	23	45	78
s38584	27710	1424	37	34	115255	11	51	82
s386	379	6	11	11	21	0	0	0
s400	320	21	12	7	3	0	0	0
s420	343	16	12	12	26	0	0	0
s444	342	21	13	7	7	0	0	0
s510	438	6	12	11	13	0	0	0
s526	507	21	9	7	10	0	0	0
s5378	2994	163	18	13	1081	0	4	4
s641	342	19	24	24	34	0	0	0
s713	367	19	24	24	37	0	0	0
s820	928	5	14	13	83	0	1	1
s832	987	5	14	13	87	0	1	1
s838	707	32	19	18	88	0	0	0
s9234	4662	162	34	21	1540	1	7	8
sbc	1370	27	15	15	425	0	0	0

1. A process for designing a synchronous logic circuit that includes an interconnection of logic gates and clocked flip flops so as to have an optimal clock period that includes the steps of

preparing a preliminary design that provides the structural features of said circuit, said design including a plurality of path segments, each bounded at its ends by a combination of clocked flip flops, primary inputs, or primary outputs,

preparing a path graph of said design in which path graph each clocked flip flop appears as a separate vertex, the primary inputs and primary outputs collectively form another vertex, and the path segments appear as arcs with the delays of the path segments as weights of their respective arcs,

determining the minimum clock period for which the circuit has no critical paths or cycles by setting up an integer linear program and then computing the optimal solution to the integer linear program as a solution of its corresponding linear program relaxation with the longest delay arc and path delays as constraints, and

retiming the preliminary design in the light of said optimal solution by repositioning the clock flip-flops to achieve a circuit design with an improved delay.

5,555,189

INTERNAL COMMUNICATIONS SYSTEM FOR

first transmission control means for controlling switching operations of said first switching means;

5,555,191

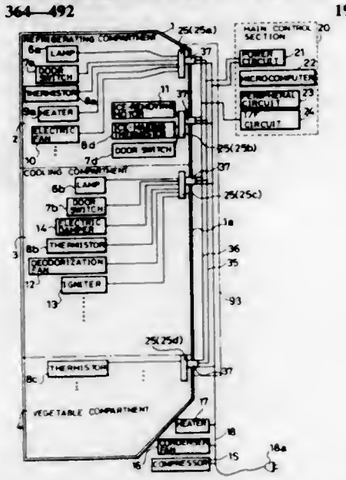
AUTOMATED STATISTICAL TRACKER

5,555,189

INTERNAL COMMUNICATIONS SYSTEM FOR REFRIGERATOR AND WIRING STRUTURE THEREOF

Hisao Yamazato, Hirakata; Naoki Tani, Nara; Naohiko Aoki, Ikoma-gun; Jyunzou Kashara, Kashiba, and Yasunari Uramoto, Kitakyushu, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 95,402, Jul. 23, 1993, Pat. No. 5,485,397.
This application Apr. 28, 1995, Ser. No. 430,357
Claims priority, application Japan, Jul. 30, 1992, 4-203641; Jan. 21, 1993, 5-8839; Mar. 4, 1993, 5-44050; Apr. 9, 1993, 5-83330; May 7, 1993, 5-106681
Int. Cl.[6] H01B *7/00*; **H02J** *5/00*; **F16L** *11/12*
U.S. Cl. 364—492 **19 Claims**



1. A communication system, provided in an electric refrigerator including a plurality of internal devices, comprising:

at least one sub-control means for controlling operations of the internal devices, said sub-control means being placed in a vicinity of a corresponding internal device so as to be connected thereto;

main control means for controlling the electric device by controlling said sub-control means;

a single communication line for connecting said main control means and said sub-control means so as to permit communications between them;

wherein said main control means includes:

first transmission means for transmitting a message to said sub-control means through said communication line; and

first receiving means for receiving a message from said sub-control means through said communication line, and

said sub-control means includes;

second transmission means for transmitting a message to said main control means through said communication line; and

second receiving means for receiving a message from said main control means through said communication line;

wiring members for supplying power, said wiring members connecting said main control means and said sub-control means;

said first transmission means of said main control means and said second transmission means of said sub-control means are provided between one of said wiring members and said communication lines;

said first transmission means and said second transmission means respectively include:

first switching means for switching a state of said communication line between a low level and a high level by connecting and disconnecting it to one of said wiring members, and

first transmission control means for controlling switching operations of said first switching means;

said first transmission means and said second transmission means respectively transmit messages through said communication line by controlling the switching operations of said first switching means using said first transmission control means;

wherein the refrigerator includes a pipe-shaped cold air guide member for guiding cold air into compartments, said cold air guide member being provided on a back surface of the refrigerator, and

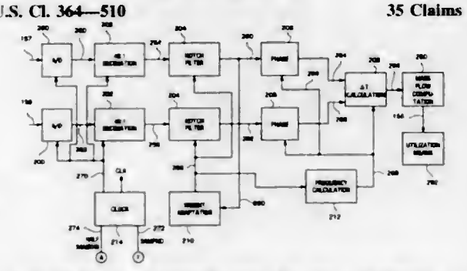
said communication line and said wiring members are inserted within a space of said cold air guide member.

5,555,190

METHOD AND APPARATUS FOR ADAPTIVE LINE ENHANCEMENT IN CORIOLIS MASS FLOW METER MEASUREMENT

Howard V. Derby, Boulder; Tamal Bose, Denver, both of Colo., and Seeraman Rajan, Bombay, Ind., assignors to Micro Motion, Inc., Boulder, Colo.

Filed Jul. 12, 1995, Ser. No. 501,411
Int. Cl.[6] G01F *1/84*
U.S. Cl. 364—510 **35 Claims**



1. An apparatus for measuring mass flow rate of a material in a Coriolis mass flow meter having a flow tube and having first and second sensors associated with said flow tube for generating output signals indicative of the oscillatory movement of said flow tube, said apparatus comprising:

analog to digital converter means for periodically sampling said sensor output signals and for converting sampled sensor output signals to digital form to generate a sequence of discrete sampled values representative of said output signals, including any undesirable components, of each of said first and second sensors;

digital notch filtration means, responsive to the generation of said sequence of discrete sampled values, for generating a sequence of discrete enhanced values, each discrete enhanced value corresponding to a sample of said sequence of discrete sampled values with said undesirable components removed;

phase value determination means, responsive to the generation of said sequence of discrete enhanced values, for generating the phase values of the oscillatory movement of said flow tube indicated by said sequence of discrete enhanced values;

phase difference means, responsive to the generation of said phase values, for determining a phase difference between the output signals of said first and second sensors; and

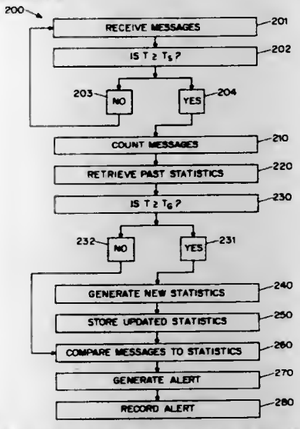
mass flow measurement means, responsive to the determination of phase difference, for determining a mass flow rate value of the material flowing through the flow tube.

5,555,191

AUTOMATED STATISTICAL TRACKER

George Hripcsak, New York, N.Y., assignor to Trustees of Columbia University in the City of New York, New York, N.Y.

Filed Oct. 12, 1994, Ser. No. 321,785
Int. Cl.[6] A61B *5/02*
U.S. Cl. 364—514 R **34 Claims**



1. A method for automatically monitoring a system to detect malfunctions, wherein said system generates messages based upon selected data, comprising the steps of:

(a) receiving messages generated by said system;

(b) counting said messages over statistically significant time periods to form message subgroups including selected numbers of messages;

(c) comparing the number of messages in each of said subgroups with predefined limits for that subgroup to determine whether said number of messages in that subgroup is statistically unusual; and

(d) generating an alert signal whenever a statistically unusual number of messages is detected.

5,555,192

DETECTION OF DUPLICATE IDENTIFICATION CODES IN COMMUNICATION UNITS

Gary W. Grube, Barrington, Ill., and Timothy W. Markison, Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 23,512, Feb. 26, 1993, abandoned. This application Feb. 16, 1995, Ser. No. 389,613
Int. Cl.[6] H04Q *3/02*; **G06K** *15/00*
U.S. Cl. 364—514 R **10 Claims**

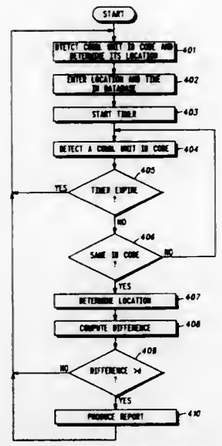
1. In a radio communication system, a method for detecting unauthorized duplication of a first RF communication unit identity, the method comprising the steps of:

a) operably receiving, by a monitoring computer, a first RF transmission, wherein the first RF transmission includes the first RF communication unit identity;

b) when the first RF transmission is received, determining, by the monitoring computer, source location of the first RF transmission;

c) storing, by the monitoring computer in a data base, the source location of the first RF transmission and the first RF communication unit identity;

d) within a predetermined period of time after receiving the first RF transmission, operably receiving, by the monitoring computer, a second RF transmission, wherein the second RF transmission includes a second RF communication unit identity;



e) when the second RF transmission is received, determining by the monitoring computer, source location of the second RF transmission;

f) comparing, by the monitoring computer, the first RF communication unit identity with the second RF communication unit identity;

g) when the first RF communication unit identity substantially matches the second RF communication unit identity, determining, by the monitoring computer, a difference between the source location of the first RF transmission and the source location of the second RF transmission; and

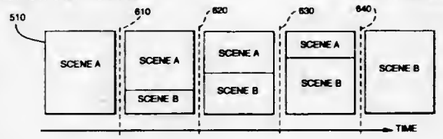
h) when the difference exceeds a predetermined distance, identifying, by the monitoring computer, the unauthorized duplication of the first RF communication unit identity.

5,555,193

VIDEO COMPRESSION SYSTEM WITH EDITING FLAG

Mikhail Tsinberg, Riverdale, N.Y.; Faramarz Azadegan, Plainsboro, N.J.; Antony Hu, Baskin Ridge, N.J., and Shigeo Ogawa, Robbinsville, N.J., assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed May 25, 1993, Ser. No. 66,191
Int. Cl.[6] G02F *1/33*
U.S. Cl. 364—514 A **19 Claims**



1. A video playback system comprising:

means for receiving a digital video signal, said digital video signal having a first video signal part and a second video signal part;

means for detecting a flag portion in the received video signal, said flag portion indicating a beginning of the second video signal part;

a display for displaying a first video scene in accordance with the first video signal part

and

means for holding the displayed first video scene on the display when the detecting means detects the flag portion.

5,555,194

CLONING TECHNIQUE FOR DIGITAL IMAGE

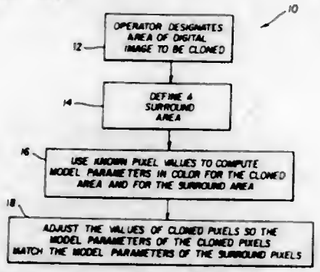
said diagnostic information and receiving said parameter value, and said processor means programmed to receive said

5,555,197

VIDEO SIGNAL PROCESSOR AND METHOD FOR

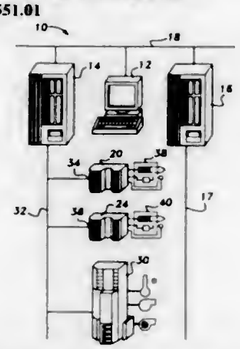
an analyzer for analyzing said signals generated by said particle detector, said analyzer comprising:

5,555,194
CLONING TECHNIQUE FOR DIGITAL IMAGE RETOUCHING
David R. Cok, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jul. 26, 1994, Ser. No. 280,700
Int. Cl.[6] G03C *7/18*
U.S. Cl. 364—526 **20 Claims**



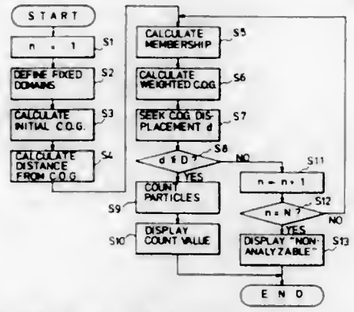
1. A pixel cloning method for digital image retouching of a digital image having known image pixel values, the method comprising the steps of:
selecting an area to be corrected, the area to be corrected being a cloned area;
defining a surround area based on the cloned area;
using the known image pixel values to determine model parameters of a quadratic functional model in each color for the cloned area and for the surround area to create cloned parameters and surround parameters; and
adjusting values of the cloned pixels so that the cloned parameters match the surround parameters.

5,555,195
CONTROLLER FOR USE IN AN ENVIRONMENT CONTROL NETWORK CAPABLE OF STORING DIAGNOSTIC INFORMATION
Howard A. Jensen, Mequon, and John E. Seem, Menomonee Falls, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.
Filed Jul. 22, 1994, Ser. No. 278,915
Int. Cl.[6] G01F *1/06*
U.S. Cl. 364—551.01 **2 Claims**



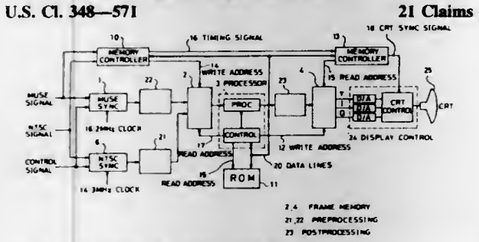
2. A VAV controller operatively associated with a VAV box, said VAV controller coupled to a first communication bus, said VAV controller comprising:
parameter input means for receiving a parameter value from a sensor;
a communication port coupled with said first communication bus;
memory means for storing diagnostic information; and
processor means coupled with said memory means, said parameter input means, and said communication port, for generating said diagnostic information and receiving said parameter value, and said processor means programmed to receive said parameter value at said parameter input said processor means programmed to calculate said diagnostic information and store in said memory said diagnostic information related to an average error associated with said parameter value said processor means programmed to provide said diagnostic information to said communication port, wherein a computer is coupled to said communication port via said first communication bus and said computer receives said diagnostic information, and wherein said controller provides an actuator signal to said VAV box for controlling air flow, and wherein said diagnostic information further is comprised of a plurality of samples of said actuator signal.

5,555,196
METHOD OF COUNTING PARTICLES USING DEGREE OF MEMBERSHIP IN CLUSTERING DATA POINTS INTO SUBGROUPS
Kaoru Asano, Kobe, Japan, assignor to Toa Medical Electronics Co., Ltd., Kobe, Japan
Filed Jun. 18, 1992, Ser. No. 900,449
Claims priority, application Japan, Nov. 27, 1991, 3-339707
Int. Cl.[6] G01N *27/27*
U.S. Cl. 364—555 **7 Claims**



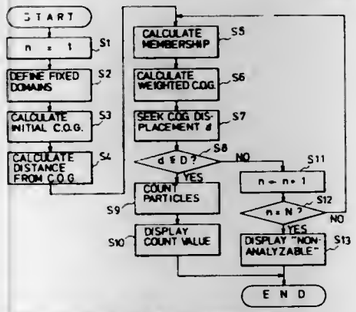
1. A particle counting method comprising:
passing plural kinds of particles substantially one at a time through a narrow path;
measuring values of at least two kinds of characteristics of each particle in said narrow path;
preparing a scattergram of at least two dimensions using said values as parameters thereof;
partitioning said particles in said scattergram into clusters of said plural kinds;
defining a fixed domain for each cluster of said scattergram so that all of the particles within said domain belong to said cluster without exception and assigning a membership value of one to all particles within said domain;
calculating an initial center of gravity of each cluster based upon the spatial distribution of the particles throughout said cluster;
calculating a distance from said particle distributed outside each said fixed domain in said scattergram to the initial center of gravity of said cluster and calculating the membership value of said particle to each cluster based upon said distance;
correcting said initial center of gravity of each cluster in consideration of the value of membership of each particle distributed outside said fixed domains to each cluster;
calculating an estimated number of particles belonging to each cluster based upon the value of membership of each particle in said scattergram to each cluster.

5,555,197
VIDEO SIGNAL PROCESSOR AND METHOD FOR PROCESSING A SCANNING LINE REGARDLESS OF THE SYNCHRONIZING SIGNAL
Kazuki Ninomiya; Tamotsu Nishiyama; Jiro Miyake, and Katsuya Hasegawa, all of Osaka, Japan, assignors to Matsusita Electric Industrial Co., Ltd., Osaka, Japan
Filed Apr. 11, 1994, Ser. No. 226,663
Claims priority, application Japan, Apr. 12, 1993, 5-084712; Jul. 26, 1993, 5-183836; Aug. 3, 1993, 5-192195
Int. Cl.[6] H04N *5/14;9/64*
U.S. Cl. 348—571 **21 Claims**



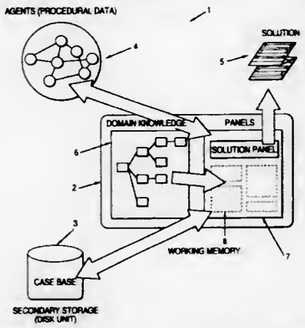
1. A video signal processor comprising:
(a) first and second storage means for storing plural items of pixel data,
(b) an address generator for generating a write address of said first storage means in order that pixel data obtained by sampling a video signal is sequentially written in said first storage means in synchronism with a synchronizing signal, and a read address of said second storage means in order that pixel data is sequentially read out of said second storage means in synchronism with said synchronizing signal, and
(c) processing means for reading the pixel data from said first storage means, processing said read pixel data, and writing said processed pixel data in said second storage means, at an operating frequency higher than a sampling rate of said video signal.

5,555,198
APPARATUS FOR COUNTING PARTICLES
Kaoru Asano, Nishi-ku, Japan, assignor to Toa Medical Electronics Co., Ltd., Kobe, Japan
Division of Ser. No. 900,449, Jun. 18, 1992. This application Jun. 6, 1995, Ser. No. 466,371
Claims priority, application Japan, Nov. 27, 1991, 3-339707
Int. Cl.[6] G01N *27/27*
U.S. Cl. 364—555 **4 Claims**



1. A particle counting apparatus, comprising:
a particle detector comprising a path for receiving a specimen, said specimen containing a plurality of particles and plural kinds of particles, said detector generating signals representing at least two characteristics of each of said plurality of particles when said plurality of particles pass through said path;
an analyzer for analyzing said signals generated by said particle detector, said analyzer comprising:
means for generating a scattergram having at least two dimensions, said scattergram being based on said signals generated by said particle detector;
means for defining a plurality of fixed domains in said scattergram, said fixed domains containing said particles, said particles belonging to respective clusters, said clusters corresponding to respective ones of said plural kinds of particles, and assigning a membership value of one to the particles within said fixed domains;
means for determining a center of gravity of each of said clusters based on a spatial distribution of the particles in each fixed domain;
means for determining distances of particles distributed outside said fixed domains to the center of gravity of each cluster and calculating a membership value for each of said particles distributed outside the fixed domains to each cluster based on said determined distance;
means for correcting the center of gravity of each cluster based on the membership values of the particles distributed outside the fixed domains to each cluster and the membership values of the particles within each fixed domain;
means for causing said means for calculating membership values to repeat operation based on said corrected center of gravity and for causing said means for correcting the center of gravity to repeat operation based on membership values obtained by repeating calculation of membership values until an mount of correction of the center of gravity reaches a predetermined value; and
means for estimating a number of particles that belong to each cluster based on the membership value of each particle to each cluster; and
a display for displaying results obtained by the analyzer.

5,555,199
AUTOMATIC DESIGN PROCESS AND APPARATUS
Padraig Cunningham, and Barry Smyth, both of Dublin, Ireland, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jul. 29, 1993, Ser. No. 98,776
Claims priority, application Ireland, Jul. 31, 1992, 922530
Int. Cl.[6] G06F *17/00*
U.S. Cl. 364—578 **14 Claims**



1. An automatic design process carried out by an apparatus comprising a memory circuit; a plurality of processing agents; a non-volatile memory device storing a case base having paths comprising classification nodes linked according to classification features which they store, the paths terminating in case nodes, each case node storing features and a case; and an interface, the process comprising the steps of:
partitioning the memory circuit into a plurality of panels, each associated with at least one processing agent and having a pre-defined automatic design function, at least some of said panels being for temporary storage of data and being cleared on initialization of the apparatus;

completing initialization of the apparatus by writing a design task detailed specification having a frame-based description in

5,555,201
METHOD AND SYSTEM FOR CREATING AND

means for selecting a level of hierarchical abstraction for any displayed graphical object; and

completing initialization of the apparatus by writing a design task detailed specification having a frame-based description in a pre-defined format to a specification panel of the memory circuit;

performing a processing operation with a retrieval processing agent comprising the steps of:

identifying classification features in the detailed specification and using said classification features to determine paths through the case base to case nodes,

comparing the features of the identified case nodes with those of the detailed specification to determine a closest match case node, and retrieving the case of said closest match case node,

writing the retrieved case to a retrieved case panel of the memory circuit, and

writing mapping links identifying the differences between the retrieved case and the detailed specification to a mappings panel of the memory circuit, said mapping links being associated with adaption modules for performing modifications to adapt for the differences; and

adapting at least part of the retrieved case with an adaption processing agent by retrieving the mapping links and activating the associated adaption modules, and writing an adapted case to an adaption panel of the memory circuit;

wherein the processing agents of the apparatus are activated in an automatic manner by operation of a write function of the apparatus, said write function carrying out write operations to the memory circuit for all processing agents upon receipt of each write instructions therefrom, and upon receipt of each write instruction automatically determining associated processing agents and timing data by reference to a look-up table and transmitting activation signals to the associated processing agents.

5,555,200

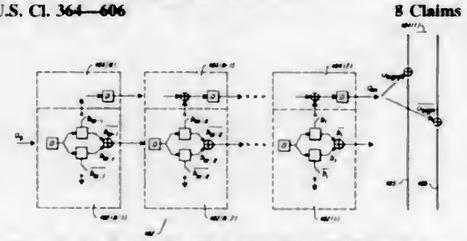
CHARGE DOMAIN BIT-SERIAL MULTIPLYING DIGITAL-ANALOG CONVERTER

Alice M. Chiang, Weston, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 388,170, Feb. 10, 1995, which is a continuation of Ser. No. 49,707, Apr. 20, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 457,827

Int. Cl.[6] G06J *1/00*

U.S. Cl. 364—606 **8 Claims**



1. A charge domain bit-serial multiplying digital-analog converter including a plurality of pipelined processing stages, each of said processing stages comprising:

an analog input for receiving an analog input signal;

a digital input for receiving a digital input signal;

a dividing circuit operable for receiving said analog signal and dividing it into first and second equal portions;

a first output unit which receives a magnitude product of said first equal portion of said analog input signal and said digital input signal in response to said digital signal having a first digital value; and

a second output unit which receives said first equal portion in response to said digital signal having a second digital value or said second equal portion in response to said digital signal having said first digital value.

5,555,201

METHOD AND SYSTEM FOR CREATING AND VALIDATING LOW LEVEL DESCRIPTION OF ELECTRONIC DESIGN FROM HIGHER LEVEL, BEHAVIOR-ORIENTED DESCRIPTION, INCLUDING INTERACTIVE SYSTEM FOR HIERARCHICAL DISPLAY OF CONTROL AND DATAFLOW INFORMATION

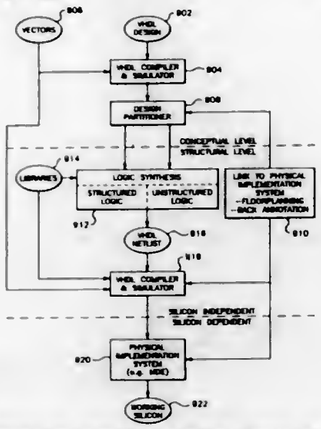
Carlos Dangelo, Los Gatos; Daniel Watkins, both of Los Altos, and Doron Mintz, Sunnyvale, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation-in-part of Ser. No. 77,304, Jun. 14, 1993, Ser. No. 76,729, Jun. 14, 1993, Ser. No. 076,738, Jun. 14, 1993, Ser. No. 76,728, Jun. 14, 1993, Pat. No. 5,541,849, and Ser. No. 77,403, Jun. 14, 1993, said Ser. No. 77,304is a continuation-in-part of Ser. No. 77,294, Jun. 14, 1993, and Ser. No. 917,801, Jul. 20, 1992, Pat. No. 5,220,512, which is a continuation of Ser. No. 512,129, Apr. 19, 1990, abandoned, said Ser. No. 77,294is a continuation-in-part of Ser. No. 917,801, and Ser. No. 54,053, Apr. 26, 1993, which is a continuation of Ser. No. 507,201, Apr. 6, 1990, Pat. No. 5,222,030. This application Feb. 10, 1994, Ser. No. 196,337

The portion of the term of this patent subsequent to Jun. 22, 2010, has been disclaimed.

Int. Cl.[6] G06F *17/50*

U.S. Cl. 364—489 **24 Claims**



1. An interactive system for hierarchical display of control and dataflow information, comprising:

an ECAD system including a computer processor, means for storing design-related information, and graphical display means;

means for a problem-solving user to enter a high-level design description on said ECAD system and to store said design description on said means for storing;

means, on the ECAD system, for analyzing the high-level design description to identify modules of the design and to organize the modules in a hierarchical manner such that:

each module at other than a highest level of abstraction is associated with ancestor modules at higher levels of abstraction;

each module at other than a lowest level of abstraction is associated with progeny modules at lower levels of abstraction;

means, on the ECAD system, for synthesizing one or more detailed electronic designs from the high-level design description;

graphical display means, connected to said computer processor, for displaying graphical objects representing selected modules of the design;

means for graphically indicating control and data flow between said graphical objects on said graphical display means, said graphical control and data flow indications representing control and data flow between the modules represented by the graphical objects;

means for selecting a level of hierarchical abstraction for any displayed graphical object; and

means for indicating that a displayed graphical object represents a module which has progeny modules associated therewith at a lower level of abstraction.

5,555,202

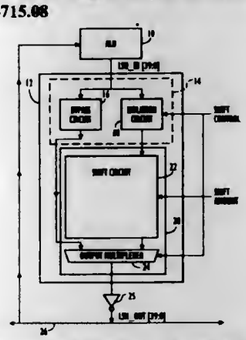
LOW-POWER, HIGH-PERFORMANCE BARREL SHIFTER

Tam-Anh Chu, Milpitas, Calif., assignor to Cirrus Logic, Inc., Fremont, Calif.

Filed Dec. 5, 1994, Ser. No. 353,280

Int. Cl.[6] G06F *7/00*; **G11C** *19/00*

U.S. Cl. 364—715.08 **37 Claims**



1. An arrangement for performing arithmetic operations in a processor, comprising:

an arithmetic logic unit (ALU) that performs arithmetic operations on data provided as input to the ALU, the ALU having an input for receiving the data and an ALU output at which M-bit results of the arithmetic operations on the data are produced; and

a barrel shifter including:

a barrel shifter input coupled to the ALU output;

a shift circuit coupled to the barrel shifter input, the shift circuit selectively shifting the M-bit results and producing shifted M-bit results at a shift circuit output; and

a barrel shifter output coupled to the shift circuit output, with the shifted M-bit results produced at the barrel shifter output when the shift circuit is selected to shift the M-bit results, and unshifted M-bit results produced at the barrel shifter output when the shift circuit is selected not to shift the M-bit results,

wherein the barrel shifter input includes an isolation circuit that isolates the shift circuit from the ALU output when the shift circuit is selected not to shift the M-bit results.

5,555,203

DYNAMIC SEMICONDUCTOR MEMORY DEVICE

Shinichiro Shiratake, Tokyo; Kazunori Ohuchi, Yokohama, and Daisaburo Takashima, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 13, 1994, Ser. No. 358,582

Claims priority, application Japan, Dec. 28, 1993, 5-349074; Dec. 28, 1993, 5-354208; Jun. 22, 1994, 6-140353

Int. Cl.[6] G11C *7/00*

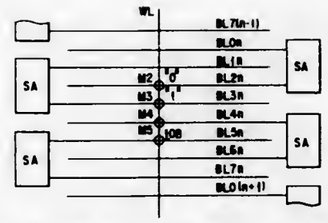
U.S. Cl. 365—51 **17 Claims**

1. A semiconductor memory device comprising:

a plurality of bit lines constituting a plurality of bit-line pairs arranged such that every two pairs form a unit in which one of the bit lines of one pair extends between the bit lines of the other pair;

a plurality of word lines;

a plurality of memory cells connected to said bit lines under control of said word lines; and



a plurality of sense amplifiers for detecting and amplifying a potential difference between the bit lines of any pair,

wherein data from a memory cell is arranged to be transferred to only one of two bit lines which are located near and outside the bit lines of any pair when one word line is selected.

5,555,204

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE

Tetsuo Endoh; Yoshiyuki Tanaka, both of Yokohama; Seiichi Aritome; Riichiro Shirota, both of Kawasaki; Susumu Shuto, Ichikawa; Tomoharu Tanaka, Yokohama; Gertjan Hemink, Kawasaki, and Toru Tanzawa, Ebina, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 28, 1994, Ser. No. 266,633

Claims priority, application Japan, Jun. 29, 1993, 5-158386; Dec. 13, 1993, 5-311740

Int. Cl.[6] G11C *16/02*

U.S. Cl. 365—189.01 **34 Claims**

1. A non-volatile semiconductor memory device comprising:

a memory cell array including a plurality of memory cells, which are arranged in a matrix, capable of electrically rewriting and erasing data, said memory cell having a source and a drain;

a plurality of bit lines coupled to said drain of said memory cells;

a plurality of word lines which are control gates of said memory cells;

write means for, when a page write operation is to be performed, applying a first writing potential to a selected word line, applying a first bit line potential to a bit line which is connected to a memory cell connected to said selected word line in which a first data value is to be written, and applying a second bit line potential to a bit line which is connected to a memory cell connected to said selected word line in which a second data value is to be written; and

rewrite means for reading out data written by said write means, causing said write means to perform a write operation again if there is a memory cell which has undergone an insufficient write operation, and sequentially increase the first writing potential to increase the potential difference between the word

line and the substrate and source/drain in accordance with the number of write operations.

5,555,205

METHOD DEVICE FOR RECORDING INFORMATION, AND METHOD FOR MEASURING THE TRANSMITTANCE OF LIQUID CRYSTALS, WHICH IS APPLIED TO RECORDING INFORMATION

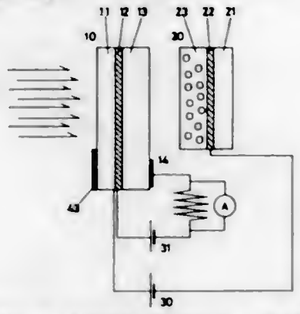
Masato Okabe, Tokyo, Japan, assignor to Dai Nippon Printing Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1994, Ser. No. 233,812

Claims priority, application Japan, Apr. 27, 1993, 5-101277; Apr. 30, 1993, 5-104225; Sep. 3, 1993, 5-220872; Sep. 3, 1993, 5-220874; Nov. 26, 1993, 5-296921

Int. Cl.[6] G03G *15/00*; G11C *13/04*

U.S. Cl. 365—108 **36 Claims**



1. A method for recording information by oppositely facing across an air gap a photoelectric sensor having a transparent electrode and a photoconductive layer formed on a transparent substrate in this order to a liquid crystal recording medium having a transparent electrode and a polymer dispersion type of liquid crystal recording layer formed on a transparent substrate in this order, and applying voltage between both the electrodes for exposure to image-carrying light, so that the liquid crystals are oriented to record the information, characterized in that the current flowing through said liquid crystal recording medium is monitored to calculate the voltage applied on said liquid crystal recording medium, and the duration of the applied voltage is controlled on the basis of the calculated voltage.

5,555,206

SEMICONDUCTOR MEMORY DEVICE

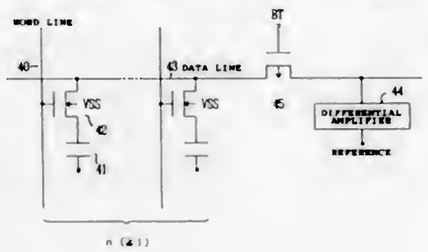
Toshiya Uchida, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 220,914, Mar. 31, 1994, abandoned. This application Oct. 4, 1995, Ser. No. 539,107

Claims priority, application Japan, May 20, 1993, 5-118666

Int. Cl.[6] G11C *11/24*

U.S. Cl. 365—149 **16 Claims**



1. A semiconductor memory device comprising:

memory cells each having a depletion-type field effect transistor and a capacitor connected in series;

a bit line connected to said memory cells;

amplifier means for amplifying the potential of the bit line; and

voltage limiting means, including an enhancement-type field effect transistor, for limiting a voltage applied to the bit line by the amplifier means by a predetermined value.

5,555,207

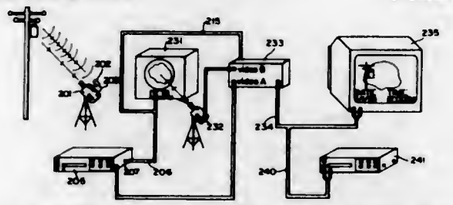
AN ELECTROMAGNETIC FIELD FREQUENCY AND IMAGE MAGNETIC FORMS QUANTUM ANALYZER APPARATUS

Stanley Barker, 1101 McKinley St., Philadelphia, Pa. 19111

Continuation-in-part of Ser. No. 106,647, Aug. 16, 1993, abandoned, which is a continuation-in-part of Ser. No. 935,548, Aug. 26, 1992, abandoned. This application May 3, 1994, Ser. No. 238,010

Int. Cl.[6] G01R *31/00*

U.S. Cl. 324—121 R **3 Claims**



1. An electromagnetic field frequency and image magnetic forms quantum analyzer apparatus which collects and evaluates electromagnetic field waves and visual images of selected locations which comprises:

video camera means to record visual images and non-visible electromagnetic field wave recordings, which includes magnetic tape means therein to receive and record visual images thereon at said selected locations,

electromagnetic field wave sensor means on said camera means aligned with said visual image recording, to receive and record the non-visible electromagnetic field waves on said magnetic tape means simultaneously with said visual images of said selected locations, and

means for converting said recorded electromagnetic field waves to visible wave form images and for mixing the wave form images and visual images of selected locations to provide a permanent record.

5,555,208

STATIC RANDOM ACCESS MEMORY

Toshiyuki Nishihara, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 27, 1995, Ser. No. 429,778

Claims priority, application Japan, May 6, 1994, 6-117634

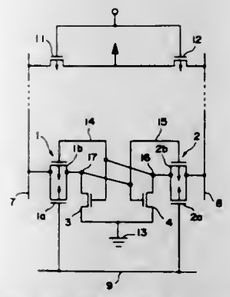
Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—154 **16 Claims**

1. An SRAM memory cell comprising:

a pair of first metallic insulated semiconductor transistors with a first conduction type cross-connected from the drain to the gate of each other; and

a pair of second metallic insulated semiconductor selector transistors with a second conduction type for address selection in cooperation with bit lines in circuit with said selector transistors and a word line in circuit with a gate of each of said selector transistors and having conductive characteristics



opposite to said first conduction type provided correspondingly to each of said first metallic insulated semiconductors;

a source of power;

a pair of third metallic insulated semiconducting path transistors of the second conduction type provided in parallel with transfer gates of said second metallic insulated selector transistors and having gate electrodes connected to each gate electrode of said first metallic insulated semiconductors on a corresponding side thereof respectively, wherein said third metallic insulated semiconducting path transistors operate as pull-up elements.

5,555,209

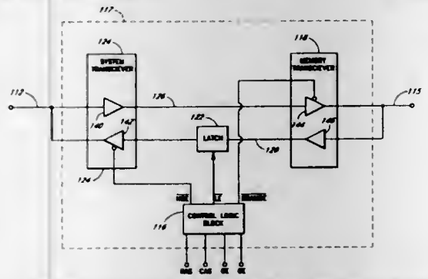
CIRCUIT FOR LATCHING DATA SIGNALS FROM DRAM MEMORY

Mark L. Smith, Laguna Beach, and Randy W. Raasch, Mission Viejo, both of Calif., assignors to Simple Technology, Inc., Santa Ana, Calif.

Filed Aug. 2, 1995, Ser. No. 510,376

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—189.05 **33 Claims**



1. A circuit to be used in conjunction with a memory processor and a memory device for latching data being read from the memory for an extended period of time to allow the memory processor to access the data during the extended period of time, said circuit comprising:

a first transceiver connected to a memory device;

a second transceiver connected to a memory processor;

a data-in bus interconnecting the first transceiver and the second transceiver wherein the data-in bus has a default state wherein the data-in bus is connected to said memory device through said first transceiver;

a data-out bus interconnecting the second transceiver and the first transceiver wherein the data-out bus has a default state wherein the data-out bus is isolated from said memory processor through said second transceiver;

a latch connected to said data-out bus so as to latch data on said data-out bus; and

control logic providing control signals to said first and second transceivers and to said latch, wherein said control logic, in response to receiving signals from said memory processor indicating said memory processor is reading data from said memory device, isolates said data-in bus from said memory device, connects said data-out bus to said memory processor and enables said latch to thereby latch a data bit on said data-out bus for an extended period of time, said data-in bus and said data-out bus returning to said default states upon completion of said memory processor reading said latched data bit.

5,555,210

SEMICONDUCTOR MEMORY DEVICE

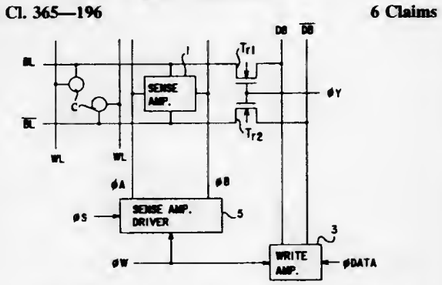
Yoshiharu Kato, Kasugai, Japan, assignor to Fujitsu Limited, Kawasaki, and Fujitsu VLSI Limited, Kasugai, both of Japan

Filed Sep. 15, 1994, Ser. No. 305,880

Claims priority, application Japan, Sep. 17, 1993, 5-231869

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—196 **6 Claims**



1. A semiconductor memory device, responsive to a first enable signal provided thereto, comprising:

a plurality of memory cells;

a word line communicatively coupled to said memory cells;

a first bit line communicatively coupled to said memory cells;

a sense amplifier, connected to said first bit line, for latching cell data read from said memory cells;

a data writing circuit, connected to said first bit line and responsive to said first enable signal, for writing data to said memory cells; and

switching means, connected to said sense amplifier and responsive to said first enable signal, for disabling said sense amplifier,

wherein said switching means includes a sense amplifier driver for supplying a drive signal to said sense amplifier, said sense amplifier driver terminating the supply of said drive signal to said sense amplifier in response to the first enable signal, and

wherein said sense amplifier driver, supplied with power from both a high and a low voltage power supplies, amplifies data in response to said first enable signal and a second enable signal, said sense amplifier driver comprising

a first, second and third transistors connected in series between the high and low voltage power supplies, wherein a node between said first and second transistors and a node between said second and third transistors communicatively couple to said sense amplifier; and

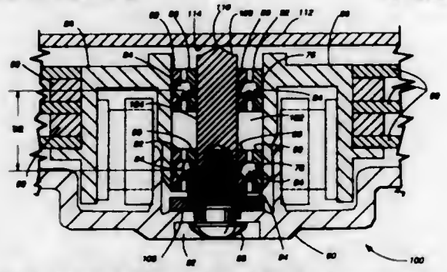
a control circuit, connected to gates of said first to third transistors, responsive to said first and second enable signals to activate said first and third transistors when both the second enable signal is active sand the first enable signal is inactive, and to deactivate said first and third transistors when the first enable signal is active.

5,555,211

IMPROVED SPINDLE SHAFT FOR ATTACHING A COVER IN A DISK DRIVE

Frank W. Bernett, Colorado Springs, Colo., assignor to Quantum Corporation, Milpitas, Calif.

Filed Jan. 23, 1995, Ser. No. 377,122
Int. Cl.[6] G11B *17/02*
U.S. Cl. 360—99.08 **20 Claims**



1. A computer mass storage device disk drive assembly including a data transducer positionable with respect to at least one rotating storage media disk affixed to a central hub rotationally secured to the substantially concentric spindle shaft, said assembly being disposed between a baseplate mounted to a cover, therein defining an enclosure with said spindle shaft being secured to said baseplate at a proximal end thereof and presenting an opposite distal end extending toward said cover, the improvement in the combination comprising:

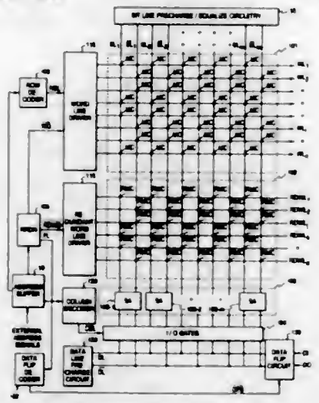
a conical tip disposed at said distal end of said spindle shaft adjoining said cover, said tip interacting with a substantially planar interior surface of said cover such that when said cover is mounted to said baseplate, said spindle shaft is maintained in a substantially fixed relationship therebetween.

5,555,212

METHOD AND APPARATUS FOR REDUNDANCY WORD LINE REPLACEMENT IN A SEMICONDUCTOR MEMORY DEVICE

Kirihata Toshiaki, Wappingers Falls, and Kato Daisuke, Poughkeepsie, both of N.Y., assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan, and International Business Machines Corpation, Armonk, N.Y.

Filed Sep. 19, 1994, Ser. No. 306,438
Int. Cl.[6] G11C *7/00;29/00*
U.S. Cl. 365—200 **32 Claims**



1. A semiconductor memory device, comprising:

memory cells arranged in rows and columns, said memory cells including normal memory cells and redundant memory cells for replacing defective ones of said normal memory cells;

bit line pairs connected to said memory cells, each bit line pair consisting of first and second bit lines which are respectively connected to memory cells for storing true data and memory cells for storing complementary data in corresponding ones of said columns;

word lines, said word lines including normal word lines each respectively connected to normal memory cells in a corresponding one of said rows and redundant word lines each respectively connected to redundant memory cells in a corresponding one of said rows, said normal word lines including a first normal word line for selecting a first normal memory cell for storing true data connected to the first bit line of one of said bit line pairs and a second normal word line for selecting a second normal memory cell for storing complementary data connected to the second bit line of said one of said bit line pairs, and said redundant word lines including a first redundant word line for selecting a first redundant memory cell for storing true data connected to the first bit line of said one of said bit line pairs and a second redundant word line for selecting a second redundant memory cell for storing complementary data connected to the second bit line of said one of said bit line pairs;

a data line pair consisting of first and second data lines for inputting/outputting complementary data signals to/from said bit line pairs;

a data flip circuit for selectively flipping the data signals on said first and second data lines; and

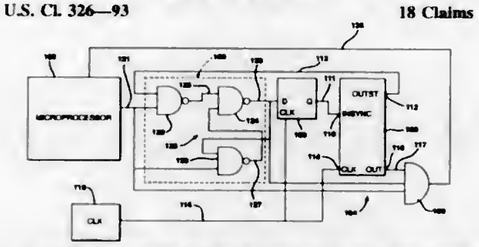
redundancy control means for controlling said data flip circuit to flip the data signals on said first and second data lines when said first normal memory cell connected to said first normal word line is replaced with said second redundant memory cell connected to said second redundant word line or when said second normal memory cell connected to said second normal word line is replaced with said first redundant memory cell connected to said first redundant word line.

5,555,213

INTERFACE CIRCUIT, SYSTEM AND METHOD FOR INTERFACING AN ELECTRONIC DEVICE AND A SYNCHRONOUS STATE MACHINE HAVING DIFFERENT CLOCK SPEEDS

Steven T. DeLong, Woodridge, Ill., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Jun. 29, 1995, Ser. No. 496,700
Int. Cl.[6] H03K *19/00*
U.S. Cl. 326—93 **18 Claims**



1. An interface circuit for interfacing an electronic device being associated with a device clock speed and a finite synchronous state machine being associated with a state clock speed, the device clock speed capable of being faster than the state clock speed, the interface circuit comprising:

an input circuit for receiving an input signal from the electronic device and for generating a first output signal representative of the input signal, transitions in the input signal being based on the device clock speed; and

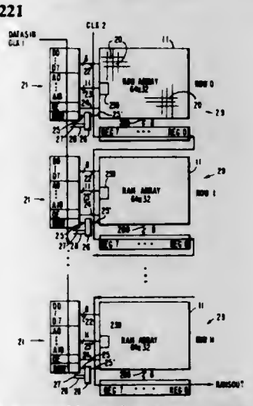
a latch circuit for receiving the first output signal from the input circuit and for providing a latch signal representative of the first output signal to the finite synchronous state machine based on the state clock speed.

5,555,214

APPARATUS FOR SERIAL READING AND WRITING OF RANDOM ACCESS MEMORY ARRAYS

Chiakang Sung, Milpitas; Wanli Chang, Saratoga, and Joseph Huang, San Jose, all of Calif., assignors to Altera Corporation, San Jose, Calif.

Filed Nov. 8, 1995, Ser. No. 555,110
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—221 **20 Claims**



1. Serially programmable random access memory comprising:

at least one random access memory array including:

a plurality of random access memory bits,

a plurality of data input lines for entering data to be stored in said random access memory array,

a plurality of address input lines and an address decoder for entering address information indicating in a write mode in which of said plurality of random access memory bits said data to be stored are to be stored, and for indicating in a read mode which of said plurality of random access memory bits are to be output from said random access memory array, and

a read/write control input, said random access memory array being in a read mode when a read/write control signal applied to said read/write control input is in a first logic state and being in a write mode when said read/write control signal applied to said read/write control input is in a second logic state;

for each said at least one random access memory array, a set of input/programming registers connected to said data input lines, said address input lines and said read/write control input for inputting programming data for said random access memory array, said programming data including said address information and a registered control signal to be applied to said read/write control input, and including said data to be written when said input/programming registers are used for writing, said input/programming registers being chained together such that said programming data can be entered serially into said registers; and

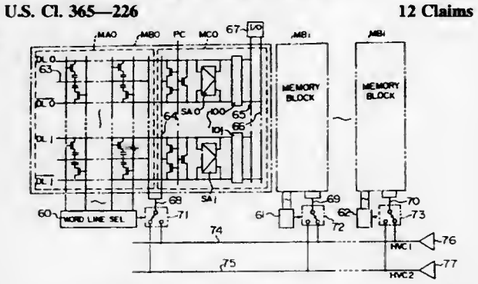
a read/write control circuit for selectively operating said at least one random access memory array in one of (a) a first mode in which said random access memory array is in one of (i) a read mode, and (ii) a write mode, regardless of said registered control signal, and (b) a second mode in which said random access memory array is in one of (i) a read mode, and (ii) a write mode, under control of said registered control signal.

5,555,215

SEMICONDUCTOR MEMORY OPERATING WITH LOW SUPPLY VOLTAGE

Yoshinobu Nakagome, Hachioji; Kiyoo Itoh, Higashikurume; Hitoshi Tanaka, Tachikawa; Yasushi Watanabe, Hanno; Eiji Kume, Matsuyama; Masanori Isoda, Sayama; Eiji Yamasaki, Fussa, and Tatsumi Uchigiri, Kokubunji, all of Japan, assignors to Hitachi, Ltd, and Hitachi ULSI Engineering Corporation, both of Tokyo, Japan

Continuation of Ser. No. 67,736, May 26, 1993, abandoned, which is a division of Ser. No. 621,064, Nov. 29, 1990, Pat. No. 5,264,743. This application Oct. 5, 1995, Ser. No. 539,724
Claims priority, application Japan, Dec. 8, 1989, 1-317518; Jan. 22, 1990, 2-012237; Feb. 23, 1990, 2-041076
Int. Cl.[6] G11C *11/401*
U.S. Cl. 365—226 **12 Claims**



1. A semiconductor device comprising a large scale integrated circuit including:

a plurality of blocks of the same kind, one or more of which are selected by a block selection signal placing said selected one or more blocks in an operative state; and

a driving means including a first drive circuit which outputs a voltage to said blocks and a second drive circuit which outputs a voltage to said blocks, the voltage output by the first drive circuit and the voltage output by the second drive circuit having substantially the same value, and a plurality of switching means,

wherein a first input of each of said plurality of switching means is coupled to an output of said first drive circuit,

wherein a second input of each of said plurality of switching means is coupled to an output of said second drive circuit,

wherein an output of each of said plurality of switching means is coupled to a corresponding one of said blocks, and

wherein the voltage of said output of said first drive circuit is supplied to the one or more selected blocks in an operative state via a first input and an output of a corresponding one of said plurality of switching means, while the voltage of said output of said second drive circuit is supplied to each of non-selected blocks in inoperative states via a second input and an output of each of corresponding ones of said plurality of switching means, the one or more blocks selected being less in number than the number of non-selected blocks.

5,555,216

LINE DECODER CIRCUIT FOR A MEMORY WORKING AT LOW SUPPLY VOLTAGES

Sylvie Drouot, Luynes, France, assignor to SGS-Thomson Microelectronics S.A., Saint-Genis, Pouilly, France

Filed Dec. 21, 1994, Ser. No. 361,313
Claims priority, application France, Dec. 22, 1993, 9315498
Int. Cl.[6] G11C *8/00*
U.S. Cl. 365—230.06 **44 Claims**

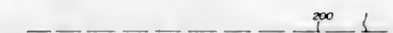
1. An integrated circuit comprising a line decoder circuit, comprising:

an input terminal for receiving a binary selection signal;

an output terminal for delivering a binary line signal;

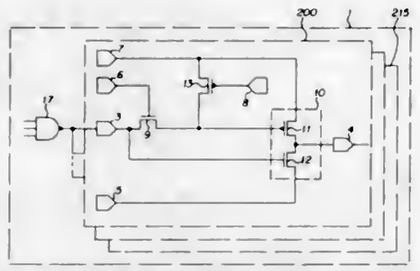
a first reference terminal for receiving a ground voltage;

a second reference terminal for receiving a line supply voltage;



a plurality of groups of comparators, each being connected to

for each said time scale trace, using the estimated value for Q and the ratio between a reference frequency, f_{ref}, and a



a third reference terminal for receiving a selection voltage;

a fourth reference terminal for receiving a control voltage;

a selection transistor having a control gate connected to the third reference terminal, a source and a drain coupled to the input terminal;

an inverter comprising a first P-type transistor having a source connected to the second reference terminal, a drain and a control gate connected to the source of the selection transistor and forming an input of the inverter, and a first N-type transistor having a source connected to the first reference terminal, a drain connected to both the drain of the first P-type transistor and the output terminal and a control gate;

a second P-type transistor having a source connected to the second reference terminal and a control gate connected to the fourth reference terminal and a drain connected to the control gate of the first P-type transistor of the inverter; and

wherein the input terminal is connected to the control gate of the first N-type transistor of the inverter.

5,555,217

SEMICONDUCTOR MEMORY DEVICE HAVING PRESETTING FUNCTION SENSE AMPLIFIER

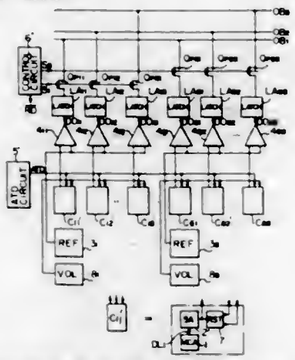
Kiyokazu Hashimoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Division of Ser. No. 320,457, Oct. 11, 1994. This application May 3, 1995, Ser. No. 434,403

Claims priority, application Japan, Oct. 13, 1993, 5-280141

Int. Cl.[6] G11C *8/00*

U.S. Cl. 365—233.5 **18 Claims**



1. A semiconductor memory device comprising:

a plurality of groups of memory blocks;

a plurality of reference circuits each for generating a reference voltage signal and transmitting the reference voltage signal to one of said groups of memory blocks;

a plurality of constant voltage generating circuits each for generating a constant voltage signal and transmitting the constant voltage signal to one of said groups of memory blocks;

a plurality of groups of comparators, each being connected to one of said memory blocks, each group being connected to one of said groups of constant voltage generating circuits; and

an output means, connected to said comparators, for outputting output data of said groups of comparators alternatively to output busses;

each of said memory blocks comprising:

a memory cell array including a plurality of read-only memory cells;

a digit line, connected to said memory cell array, said digit line receiving a read data from a selected one of said read-only memory cells;

a sense amplifier, connected to said digit line, for sensing a voltage at said digit line to generate a sense voltage signal;

a presetting circuit, connected to said sense amplifier and one of said constant voltage generating circuits, for presetting the sense voltage signal in accordance with the constant voltage signal of the one of said constant voltage generating circuits, said presetting circuit being enabled by an address transition detection signal; and

each comparator being connected to a corresponding sense amplifier and to one of said reference circuits for comparing the sense voltage signal from said corresponding sense amplifier with the reference voltage signal from said one of said reference circuits to generate an output signal, with the voltage of the reference voltage signal connected to the comparator being constant regardless of a presetting operation of the corresponding presetting circuit.

5,555,218

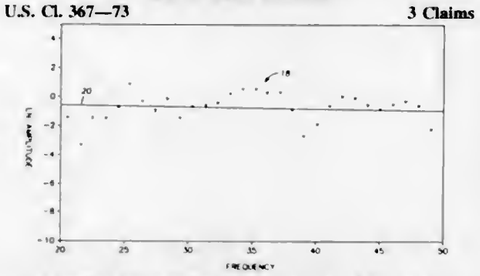
COMPUTATION OF Q-DERIVED STATIC CORRECTIONS FROM SEISMIC DATA

Ronald E. Chambers, Houston, and Subhashis Mallick, Missouri City, both of Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Feb. 27, 1995, Ser. No. 394,471

Int. Cl.[6] G01V *1/30;1/32*

U.S. Cl. 367—73 **3 Claims**



1. A method for modeling a cross section of the earth from seismic data signals in the presence of anelastic regosol characteristics, comprising:

launching a seismic wavefield from an acoustic source from each one of a first plurality of spaced-apart source locations;

receiving said seismic wavefields at each one of a second plurality of spaced-apart seismic receivers after reflection from sub-surface earth layers, said receivers being offset from the respective source locations;

recording on a storage medium the reflected seismic wavefields, received by each of said second plurality of receivers, as a raw discrete time series of periodic electrical signals, each said discrete time series being formatted as one of a corresponding plurality of time-scale traces;

deriving the amplitude spectra for a selected time window of said time scale traces;

for a travel time T within said time window, estimating the rate of change, Q, of the natural logarithm of the amplitude of said periodic electrical signals as a function of frequency within an effective frequency passband included by said electrical signals;

for each said time scale trace, using the estimated value for Q and the ratio between a reference frequency, f_{ref}, and a selected frequency minimum, f_{min}, within the effective frequency passbands corresponding to the selected time windows for each said time scale trace, calculating a Q-derived static time-drift, ΔT_{static};

applying ΔT_{static} to each said time scale trace in a summing register to form new time scale traces corrected for dispersive-induced time drift; and

using a computer-graphics program, displaying the new, corrected time scale traces to form a model of a cross section of the earth.

5,555,219

FERROELECTRIC MATERIAL, AND SEMICONDUCTOR MEMORY, OPTICAL RECORDING MEDIUM AND MICRO-DISPLACEMENT CONTROL DEVICE USING THE FERROELECTRIC MATERIAL

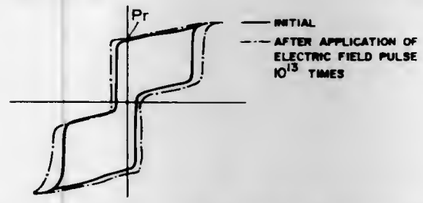
Yoshikazu Akiyama, Yokohama, and Sachiko Kimura, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 16, 1993, Ser. No. 168,770

Claims priority, application Japan, Dec. 16, 1992, 4-354494; Mar. 16, 1993, 5-081365; Mar. 26, 1993, 5-092346; Sep. 6, 1993, 5-245949

Int. Cl.[6] H01L *27/10*

U.S. Cl. 359—103 **6 Claims**



1. A ferroelectric material which has hysteresis characteristics in the polarization—electric field relationship thereof, exhibits an antiferroelectric phase at room temperature, and carries out a structural phase transition from said antiferroelectric phase to a ferroelectric phase with the application of an electric field thereto, with a phase transition electric field with which the antiferroelectric-to-ferroelectric phase transition is carried out being shifted to a lower electric field with the elevation of the temperature thereof, and a phase transition electric field with which a ferroelectric-to-antiferroelectric phase transition is carried out having a negative value.

5,555,220

SLICKLINE CONVEYED WELLBORE SEISMIC RECEIVER

James Minto, Houston, Tex., assignor to Western Atlas International, Inc., Houston, Tex.

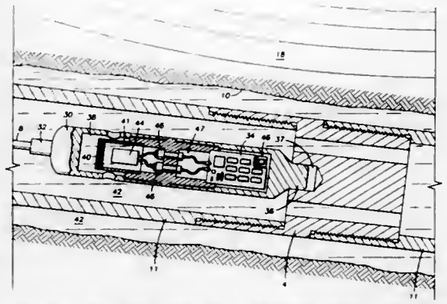
Continuation of Ser. No. 267,566, Jun. 28, 1994, abandoned. This application Sep. 18, 1995, Ser. No. 529,414

Int. Cl.[6] G01V *1/40*

U.S. Cl. 367—86 **11 Claims**

1. An apparatus for recording a geophysical survey in a wellbore penetrating an earth formation, said apparatus comprising:

a seismic receiver, adapted for traversing said wellbore, and comprising at least one transducer, a power source and a signal processing and recording unit, said at least one transducer, said power source and said signal processing and recording unit disposed within said receiver, said signal processing and recording unit programmed to generate a recording of an electrical signal generated by said at least one transducer as a result of detecting seismic energy;



a surface control unit, connected to a seismic energy source, said surface control unit synchronized with said signal processing and recording unit to activate said seismic energy source at predetermined time intervals corresponding to time intervals at which said signal processing and recording unit generates said recording, said surface control unit adapted to record an acoustic signature of said seismic energy source; and wherein said signal processing and recording unit comprises

an analog signal processor connected to said at least one transducer said processor including an amplifier and a filter,

a first analog-to-digital converter connected to said analog signal processor,

a digital signal processor connected to said first analog-to-digital converter,

a first timer-controller connected to said analog to digital converter, said first timer-controller programmed to activate said first analog-to-digital converter at predetermined time intervals corresponding to the predetermined time intervals at which said seismic energy source is activated,

a first clock connected to said first timer-controller, a digital memory connected to said digital signal processor and to said first timer-controller, and

a communications port connected to said first digital signal processor wherein said recording is transferred from said digital memory to said surface control unit and wherein said signal processing and recording unit is synchronized to said surface control unit.

5,555,221

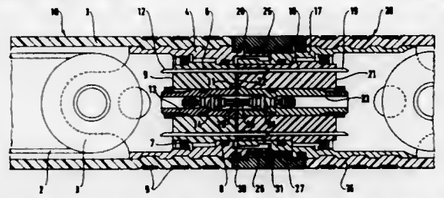
DEVICE FOR PICKING UP SOUND WAVES PROPAGATING IN WATER

Claude Brochard, Viry Chatillon, and Pierre Joanicot, Sceaux, both of France, assignors to Thomson-CSF, Paris, France

Filed Oct. 4, 1979, Ser. No. 84,025

Int. Cl.[6] H04B *1/00*

U.S. Cl. 367—154 **7 Claims**



1. A device for picking up sound waves propagating in water, the device including at least a first component and a second component, each component including at least one acoustic sensor disposed inside a cylindrical sheath, electric conductors disposed in the sheath and connected to the sensor, two cylindrical end pieces connected coaxially to the two respective ends of the sheath in a sealed manner and a dielectric liquid disposed inside the sheath between the two end pieces, a first end piece of the first component including a first cylindrical electric connector fixed coaxially in the

first end piece, the connector having a first plane outer surface and

which they are attached producing a spring with a high frequency spurious response that is less susceptible to damage

means for attaching said strip member to a wheelchair;

a pointer member; and

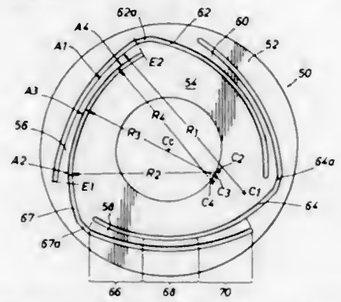
first end piece, the connector having a first plane outer surface and being in contact with the dielectric liquid of the first component which is on the side opposite to the first surface, the first connection including connector pins which protrude with respect to the first surface and which are connected, on the opposite site side, to the conductors disposed in the sheath of the first component, a second end piece of the second component comprising a second cylindrical electric connector fixed coaxially in the second end piece, said connector having a second outer surface and being in contact with the dielectric liquid of the second component on the opposite side to the second surface, the second connector including sockets which lead out onto the second surface and are connected, on the opposite side, to the conductors disposed in the sheath of the second component, the device further including means for connecting the first component to the second component by inserting pins in the sockets and applying the first end piece against the second end piece, the means including at least one seal ring for preventing the water from reaching the space between the first surface and the second surface when the device is submerged, characterized in that it further includes at least a first valve fixed axially in the first connector and means for causing the first valve to open when the first end piece is in contact with the second end piece, so that part of the dielectric liquid inside the sheath of the first component can flow through the first valve into the space between the first surface and the second surface up to the seal ring, said part of the liquid then exerting on the seal ring a pressure which opposes that exerted on the seal ring by the water in which the device is submerged.

5,555,222

LOW DISTORTION GEOPHONE SPRING

Daniel Ming-Kwong Woo, Missouri City, Tex., assignor to Shaw Industries Limited, Nexdale, Canada

Filed Sep. 26, 1994, Ser. No. 312,094
Int. Cl.[6] H04R *9/00;11/00*
U.S. Cl. 367—187 **12 Claims**



1. A disc-shaped spring, for use in a geophone, to suspend a coil form from a permanent magnet assembly for reciprocal movement relative to the magnet assembly, comprising

an outer ring,

an inner ring, and

a plurality of arms extending between and connected to the outer ring and the inner ring, said arms being formed by a plurality of slots, each of which extends along the outside edge of one arm and the inside edge of an adjacent arm, said slots being shaped so that the outside edge of each arm has the same radius of curvature and a center point which is located in the area of the disc-shaped spring on the opposite side of the center of the disc, and

an inside edge having a plurality of curved surfaces including at least one intermediate surface opposite from the outside edge and two end surfaces that diverge from the outside edge,

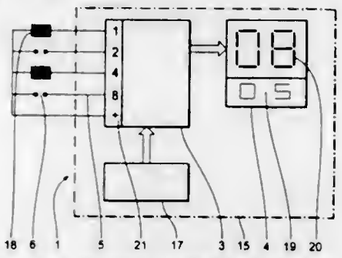
to provide each arm with a thin intermediate section that makes up no more than 30% of the total length of the arm and end sections that increase in width in the direction of the ring to which they are attached producing a spring with a high frequency spurious response that is less susceptible to damage due to lateral shock.

5,555,223

CONSUMER ITEM

Markus Baralnsky, Windsteiner Weg 27, D-14165 Berlin, Germany

PCT No. PCT/DE93/00167, § 371 Date Aug. 18, 1994, § 102(e) Date Aug. 18, 1994, PCT Pub. No. WO93/17401, PCT Pub. Date Sep. 2, 1993
PCT Filed Feb. 22, 1993, Ser. No. 290,824
Claims priority, application Germany, Feb. 20, 1992, 42 05 400.1
Int. Cl.[6] G04R *47/00;* **G04F** *8/00;* **G01D** *21/00*
U.S. Cl. 368—10 **24 Claims**



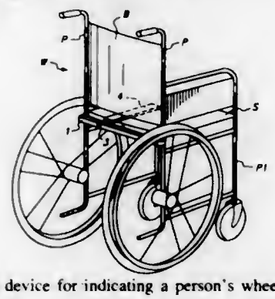
1. A process for producing or packing an item with a limited period of use or interest, more particularly a regularly appearing publication or foodstuffs to be consumed within a short time, in which the item or the packaging thereof is fitted, by adhesive means or other means of attachment, with a timer providing a display with a time range adapted to the period of use or interest of the item, or an adapted energy source, and in which the timer, close to the time of production of the item, especially at the time of combining the timer with the item or its packaging, is set and/or configured wherein the improvement comprises that the timer is set and/or configured so that its display is synchronized with the actual time, and that, at the same time, there is an indication of the time of production.

5,555,224

WHEELCHAIR SEATING INDICATOR AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Ernest T. DePonty; Denise Billups, both of Spokane, and Rocky Greenfield, Airway Heights, all of Wash., assignors to Accucare, L.L.C., Spokane, Wash.

Filed Aug. 18, 1995, Ser. No. 516,792
Int. Cl.[6] G04B *4/00;* **B62M** *1/14*
U.S. Cl. 368—10 **20 Claims**



1. A timing device for indicating a person's wheelchair usage, comprising:

a strip member having a time scale printed thereon;

means for attaching said strip member to a wheelchair;

a pointer member; and

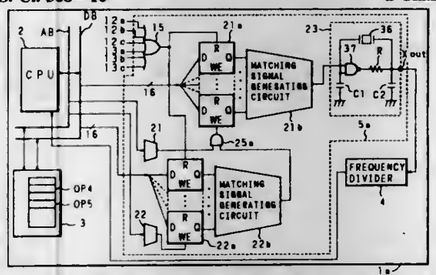
means for selectively positioning said pointer member relative to said time scale so as to indicate a time period of substantially continuous seating of a person in the wheelchair.

5,555,225

CLOCK GENERATING CIRCUIT AND MICROCOMPUTER INCORPORATING SAME

Naoto Hayashi, and Kazuo Nakamura, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1995, Ser. No. 520,188
Claims priority, application Japan, Dec. 14, 1994, 6-310942
Int. Cl.[6] G04B *47/00;* **G04F** *5/00*
U.S. Cl. 368—10 **2 Claims**



1. A clock generator permitting a clock oscillator to suspend its own clock oscillation in response to a signal from CPU, said clock generator comprising:

a first memory for storing a first signal outputted by said CPU;

a first matched signal generating circuit for outputting a second signal permitting the suspension of clock oscillation when the content of the memory stored in said first memory is found in accord with the memory stored therein;

a second memory for storing a third signal from said CPU;

a second matched signal generating circuit for providing a fourth signal suspending the clock oscillation to said clock oscillator when the content of the memory stored in said second memory is found in accord with the memory stored therein; and

a gate circuit for permitting said second memory to store said third signal in response to said second signal outputted by said first matched signal generating circuit.

5,555,226

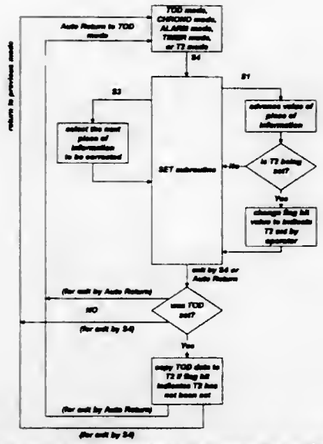
AUTOMATIC SETTING OF ALTERNATE TIME ZONE DATA IN A MULTIMODE ELECTRONIC TIMEPIECE

Ronald S. Lizzi, West Hartford, Conn., assignor to Timex Corporation, Middlebury, Conn.

Filed Jul. 17, 1995, Ser. No. 503,363
Int. Cl.[6] G04B *19/22*
U.S. Cl. 368—21 **1 Claim**

1. An improved multimode electronic timepiece of the type having a display, a plurality of manually actuated switches, and an integrated circuit having memory locations, the integrated circuit being programmed to keep time, to provide a plurality of modes, including time-of-day and at least one alternate time zone, to permit an operator of the timepiece to set the time-of-day and the alternate time zone in response to actuation of selected switches, and to store the time-of-day and the alternate time zone data in the memory locations, wherein the improvement comprises:

flag means for copying the contents of the memory location storing the time-of-day data to the memory location for the alternate time zone data when the time-of-day has been set



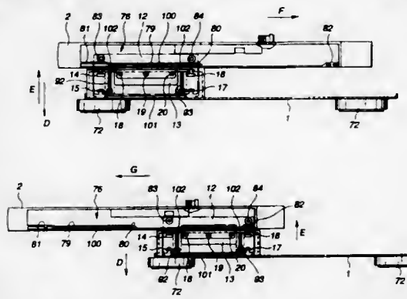
and the alternate time zone has not been set by the operator, the copied contents in the memory location for the alternate time zone data being displayed on the display in response to actuation of a selected switch and being changed in further response to actuation of selected switches, the flag means including a flag bit set in one of the memory locations of the integrated circuit, the value of the flag bit being dependent upon whether or not the operator has set the alternate time zone.

5,555,227

DISC RECORDING AND/OR REPRODUCING APPARATUS

Tadao Kurosu, Saitama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 6, 1994, Ser. No. 223,674
Claims priority, application Japan, Apr. 28, 1993, 5-123080
Int. Cl.[6] G11B *17/26;17/04*
U.S. Cl. 369—37 **8 Claims**



1. A disc recording/reproducing apparatus having a main body and comprising:

recording/reproducing means for recording/reproducing information signals on or from a disc, said recording/reproducing means being mounted in said main body;

a transport tray mounted in said main body for movement between a loading position proximate said recording/reproducing means and an unloading position at least partially outside of said main body;

drive means for moving said transport tray between the loading position and the unloading position;

a rotary table rotatably mounted on said transport tray, said rotary table having plural disc-setting recesses extending radially from the center thereof, means for rotating said rotary table relative to said transport tray for selectively positioning one of said disc setting recesses at a position proximate said recording/reproducing means,

a first lock means on said transport tray for preventing rotation of said rotary table with respect to said transport tray when said transport tray is not at said loading or unloading positions; and

a second lock means operated by said drive means for preventing movement of said transport tray when the transport tray reaches said unloading position,

said apparatus further comprising an oscillation suppression means for inhibiting oscillating movement of said transport tray at said loading position or at said unloading position, wherein said oscillation suppression means comprises a cam associated with said transport tray, a cam follower member mounted in the main body in rolling contact with said cam and means for biasing said cam follower member towards said cam.

5,555,228

AN OPTICAL HEAD HAVING A VERTICAL FLAT PLATE SHAPED MAGNETIC CIRCUIT CONTAINING A TRACKING COIL AND A FOCUSING COIL

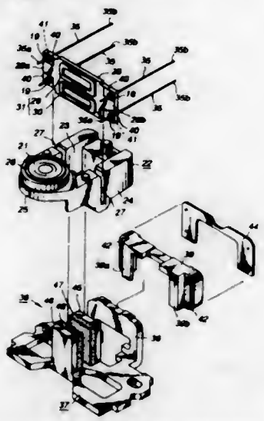
Takashi Izuka, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 15, 1994, Ser. No. 340,066

Claims priority, application Japan, Nov. 16, 1993, 5-309849

Int. Cl.[6] G11B *7/09*

U.S. Cl. 369—44.15 **21 Claims**



12. An objective lens driving device comprising:

a bobbin holding an objective lens at one end thereof and having a vertical opening at a mid portion thereof;

a rectangular flat-plate-shaped member having flat-plate-shaped focusing and tracking coils, said flat-plate-shaped member extending parallel to the optical axis of said objective lens;

a plurality of resilient supporting members each having one end mounted on the bobbin and having the other end supported by a stationary portion, said resilient supporting members supporting said bobbin for movement in a direction parallel to the optical axis of said objective lens and in a planar direction normal to said optical axis; and

a magnet mounted within the opening in said bobbin for facing the focusing and tracking coils mounted on said flat-plate-shaped member.

5,555,229

METHOD AND ARRANGEMENT FOR RECORDING/REPRODUCING COMPRESSED PROGRAM INFORMATION ON A RECORDING MEDIUM CONTAINING A PLURALITY OF PROGRAMS

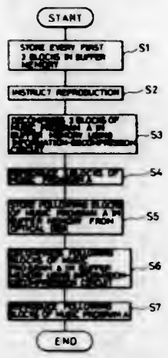
Kunio Kojima, Nabari; Shigemi Maeda, Yamatokoriyama, and Jun Akiyama, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 7, 1994, Ser. No. 271,492

Claims priority, application Japan, Jul. 16, 1993, 5-177092

Int. Cl.[6] G11B *5/09*

U.S. Cl. 369—60 **21 Claims**



13. In an information recording/reproduction arrangement wherein a plurality of programs are stored on a recording medium, each comprising one or more blocks of information, said arrangement including a buffer memory for storing compressed information to be recorded or reproduced wherein the buffer memory is logically divided into a number of areas dedicated to respective programs, the number being at least the same as or greater than that of the programs on the recording medium, an information reproduction method comprising the steps of:

(a) successively reading pieces of leading compressed information, each of which corresponds to a predetermined number of blocks from the leading portion of each of a plurality of programs recorded on a recording medium and successively storing the pieces of leading compressed information in the buffer memory;

(b) fetching a piece of leading compressed information of a first certain program among the programs from the buffer memory and reproducing the piece of leading compressed information after decompressing it; and

(c) reading first compressed information corresponding to a predetermined number of blocks following the leading compressed information of the first certain program from the recording medium and supplying the first compressed information to the storage means while the leading compressed information is being reproduced.

5,555,230

MULTICHANNEL DIGITAL-SIGNAL REPRODUCING APPARATUS FOR SWITCHING ACCESS TIMING RELATIVE TO REPRODUCING TIMING

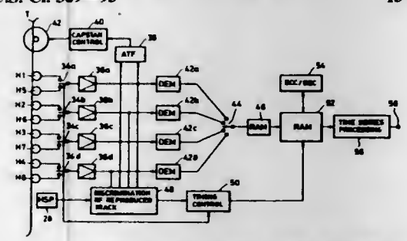
Motokazu Kashida; Hidenori Hoshi; Kenichi Nagasawa, and Shinichi Yamashita, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 307,407, Sep. 16, 1994, Pat. No. 5,481,518, which is a continuation of Ser. No. 027,583, Mar. 5, 1993, abandoned, which is a continuation of Ser. No. 369,690, Jun. 21, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 475,838

Claims priority, application Japan, Jun. 28, 1988, 63-159926; Sep. 14, 1988, 63-230921

Int. Cl.[6] G11B *20/10*

U.S. Cl. 369—93 **13 Claims**



12. An apparatus for reproducing digital information from a recording medium having a plurality of parallel tracks and digital information recorded thereon as n-channel, n being greater than or equal to 2, digital signals, the digital signals including subdigital information, in addition to the digital information, for identifying the n-channel digital signals, said apparatus comprising:

n reproducing heads for reproducing the n-channel digital signals;

storage means for storing digital information within the digital signals which said n reproducing heads reproduce;

first designating means for designating an address into which the respective signals reproduced by said n reproducing heads are stored based on the subdigital information in the digital signals reproduced by said reproducing heads, the address being designated among addresses allocated in said storage means among the digital information corresponding to the i number of tracks; and

access means for accessing said storage means for performing a predetermined processing for a predetermined amount of digital information stored in said storage means, the predetermined amount of digital information being recorded on adjacent i number of tracks, said access means comprising second designating means for designating addresses to which said access means accesses,

wherein said first designating means designates addresses for storing reproduced digital signals based on the subdigital information so that addresses designated by said second designating means correspond to digital signals concurrently recorded for different channels.

5,555,231

INFORMATION RECORDING METHOD, METHOD FOR REPRODUCING RECORDED INFORMATION, AND APPARATUS THEREFOR

Masakuni Yamamoto, Yamato, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

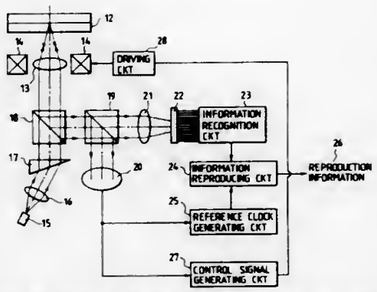
Continuation of Ser. No. 968,302, Oct. 29, 1992, abandoned. This application Aug. 3, 1994, Ser. No. 283,895

Claims priority, application Japan, Oct. 31, 1991, 3-311373

Int. Cl.[6] G11B *7/00*

U.S. Cl. 369—100 **25 Claims**

1. A method of encoding information into at least three kinds of codes, and recording an arrangement of the at least three kinds of codes on a recording medium having tracks, said method comprising steps of:



making the codes of the information to respectively correspond to information pits of at least three kinds; and

forming the information pits corresponding to the codes on the recording medium, in an arrangement along the tracks, wherein the information pits of different kinds can be mutually identified by the length along the longitudinal direction of a track, and the distance along the longitudinal direction of a track between the center of a pit on the recording medium and a reference position determined on the medium according to a reference clock signal.

5,555,232

OPTICAL HEAD WITH BUILT-IN SEMICONDUCTOR LASER, OBJECTIVE LENS AND ¼ WAVELENGTH PLATE

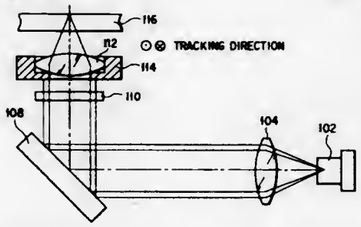
Shohei Kobayashi; Takeshi Yamazaki, both of Hachioji; Tsuneo Yanagida, Hino; Haruhiko Takemura, and Toshihiro Ogata, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1994, Ser. No. 336,782

Claims priority, application Japan, Nov. 19, 1993, 5-290900; Apr. 12, 1994, 6-073107

Int. Cl.[6] G11B *7/00;7/12*

U.S. Cl. 369—112 **15 Claims**



1. An optical head for optically recording and/or reproducing data on/from a recording mediums, comprising:

a semiconductor laser for emitting light;

a semiconductor substrate for reflecting the emitted light from said semiconductor laser to said recording medium;

a light receiving element formed on said semiconductor substrate;

an objective lens for focussing the light from said semiconductor substrate on said recording medium; and

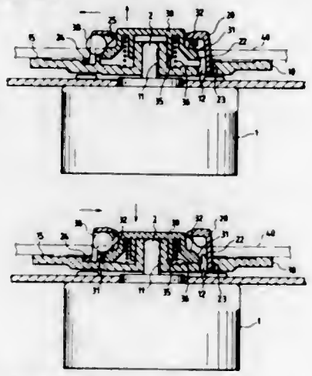
a ¼ wavelength plate situated between said semiconductor substrate and said objective lens.

5,555,233

DISK HOLD DEVICE HAVING AN OPERATION BUTTON

Hideo Yano; Susumu Arai, both of Saitama, and Fumio Kobayashi, Nagano, all of Japan, assignors to Asahi Corporation, Tokyo, and Kabushiki Kaisha Sankyo Seiki Seisakusho, Nagano, both of Japan

Filed Oct. 18, 1993, Ser. No. 136,888
Claims priority, application Japan, Oct. 19, 1992, 4-306111
Int. Cl.[6] G11B *25/04; 17/028*
U.S. Cl. 369—270 7 Claims



1. A disk holding device comprising:
a turn table for holding a disk having a disk center hole in a center thereof on said turn table;
an operation member mounted on the turn table to freely move relative to said turn table between a load position and an unload position;
a cap-shaped disk mount member including an opening end portion engaging the turn table and a bottom portion having a circular shaped hole surrounding the operation member, said center hole of said disk fitted with an outer peripheral surface of the disk mount member;
an engagement member disposed in the disk mount member to freely move in a radial direction of said disk mount member, said engagement member being brought into contact with said disk center hole when said disk is fitted with the outer peripheral surface of said disk mount member;
urging means for urging said engagement member to said disk center hole, whereby said disk is secured to said turn table when said operation member is in said load position; and
urging force releasing and reducing means for releasing and reducing an urging force provided to said engagement member by said urging means to facilitate loading and unloading of said disk to and from said turn table, wherein said urging force releasing and reducing means releases and reduces said urging force when said operation member is in said unload position.

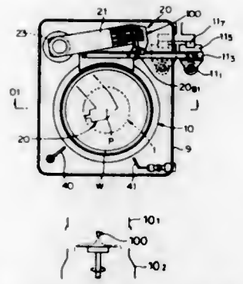
5,555,234

DEVELOPING METHOD AND APPARATUS

Kenji Sugimoto, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Jan. 27, 1995, Ser. No. 379,811
Claims priority, application Japan, Feb. 17, 1994, 6-045075
Int. Cl.[6] G03D *3/02; 5/00*
U.S. Cl. 354—317 15 Claims

1. A developing apparatus for developing a desired pattern exposed to a substrate surface having a photosensitive resin film formed thereon, by successively supplying a prewetting liquid and a developer to the substrate surface, said apparatus comprising:
substrate support means for supporting a substrate having said substrate surface with said photosensitive resin film formed thereon and said desired pattern exposed thereto;



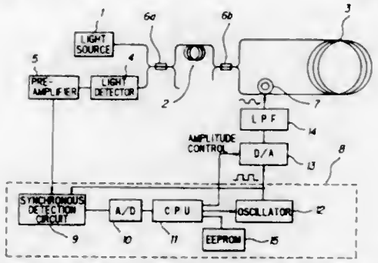
prewetting liquid supply means for supplying said prewetting liquid to said substrate surface and thereby and thereby changing the substrate surface from hydrophobic to hydrophilic;
ultrasonic applying means for applying ultrasonic waves to said prewetting liquid; and
developer supplying means for supplying said developer to said substrate surface; wherein;
said substrate support means includes a spin support mechanism rotatable while supporting said substrate in horizontal posture;
said prewetting liquid supply means includes a prewetting liquid supply nozzle disposed above said spin support mechanism for supplying said prewetting liquid to said substrate surface;
said ultrasonic applying means is mounted in said prewetting liquid supply nozzle;
said developer supply means includes a developer supply nozzle disposed above said spin support mechanism for supplying said developer to said substrate surface; and
said prewetting liquid supply means and said developer supply means are driven horizontally to a position above the spin support mechanism.

5,555,235

OPTICAL FIBER GYRO WITH MEMORY STORING DATA MEASURED UNDER APPLICATION OF ANGULAR VELOCITY

Tatsuya Kumagai; Hiroshi Kajioka; Munehiro Akiyama; Shigeru Oho, and Hisao Sonobe, all of Ibaraki-ken, Japan, assignors to Hitachi Cable, Ltd., and Hitachi, Ltd., both of Tokyo, Japan

Filed Sep. 13, 1994, Ser. No. 305,490
Claims priority, application Japan, Sep. 13, 1993, 5-226999
Int. Cl.[6] G01C *19/72*
U.S. Cl. 356—350 5 Claims



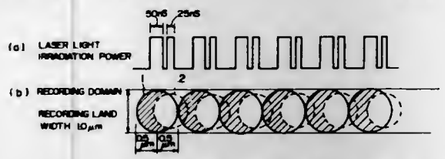
1. An optical fiber gyro using a phase modulating method, comprising:
means for providing two lights;
means for modulating a phase of at least one of said two lights;
an optical fiber sensing loop for propagating said two lights in clockwise and counter clockwise directions, said optical fiber sensing loop being mounted on a rotating member, and said at least one of said two lights being supplied from said modulating means;
an optical coupler for coupling said two lights propagated through said optical fiber sensing loop and supplied therefrom to provide a coupled light;
a light detector for receiving said coupled light to generate an output signal; and
a signal processing circuit for processing said output signal to detect an angular velocity of said rotating member;
wherein said signal processing circuit comprises:
means for generating data including a ratio of a fundamental wave component of said output signal to an even harmonic wave component of said output signal dependent on an angular velocity of said rotating member by processing said output signal;
a memory for storing angular velocities applied at a preparatory state on said rotating member, and data generated in said generating means when said angular velocities are applied at said preparatory state on said rotating member; and
means for reading an angular velocity corresponding to data generated in said generating means at an operation state.

5,555,236

MAGNETO-OPTICAL RECORDING METHOD OF ERASING A PORTION OF A FIRST RECORDING DOMAIN TO FORM A CRESCENT-SHAPED SECOND RECORDING DOMAIN

Koyo Hasegawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 111,271, Aug. 24, 1993, abandoned, which is a continuation of Ser. No. 780,892, Oct. 17, 1991, abandoned. This application Apr. 25, 1995, Ser. No. 428,000
Claims priority, application Japan, Oct. 19, 1990, 2-278938
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—116 4 Claims



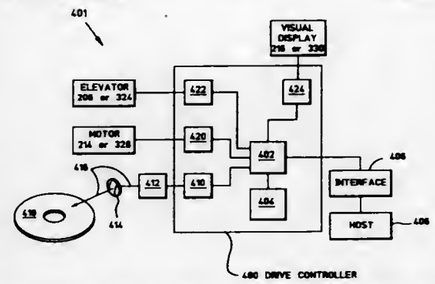
1. A magneto-optical recording method, comprising the steps of:
forming a first recording domain on a magnetooptical recording medium by applying light having a first pulse width to the recording medium; and
thereafter, erasing a portion of the first recording domain to thereby form a second recording domain having a crescent shape, by applying light having a second pulse width, different from the first pulse width, to a portion of the recording medium including the first recording domain, wherein the second pulse width is smaller than the first pulse width and the power of the light having the first pulse width applied to the recording medium is the same as the power of the light having the second pulse width applied to the recording medium.

5,555,237

CONTAMINATION DETECTION APPARATUS AND METHOD USING WRITE POWER CALIBRATION VALUES

Bryan A. Cassels; James J. Dente; Andrew A. Gaudet; Ian E. Henderson, and Daniel J. Winarski, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 30, 1995, Ser. No. 452,916
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—116 23 Claims



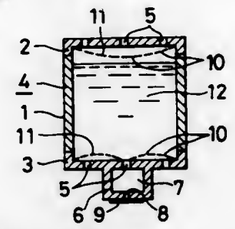
13. An apparatus for managing in an optical drive, comprising:
a laser device to write data to an optical medium by imparting upon the medium a laser beam having a level of output power selected in accordance with a write calibration (W/C) value received by the laser device;
a controller coupled to the laser device and programmed to perform method steps comprising:
generating and repeatedly updating the W/C value;
providing the W/C value to the laser device;
comparing the W/C value to a first predetermined value; and
operating the optical drive to execute a first predetermined operational sequence when the W/C value exceeds the first predetermined value.

5,555,238

INK SUPPLIER

Toshio Miyazawa, Shizuoka, Japan, assignor to Kabushiki Kaisha TEC, Shizuoka, Japan

Filed Jun. 29, 1992, Ser. No. 905,310
Claims priority, application Japan, Jul. 8, 1991, 3-166629
Int. Cl.[6] B41J *2/175*
U.S. Cl. 347—86 9 Claims



7. An ink supplier comprising:
an ink storage tank for storing ink therein, said ink storage tank being connected to an ink reservoir having an ink jet means by ejecting ink from said ink storage tank;
a first mesh positioned in said ink storage tank and provided at a first end of said ink storage tank, said first mesh comprising a plurality of first draft holes provided at a plurality of corners of said ink storage tank for communicating an inside of said ink storage tank without side air; and

a second mesh positioned in said ink storage tank and provided at a second end of said ink storage tank at a position opposite

5,555,240

PROCESS FOR FABRICATING A LIQUID CRYSTAL

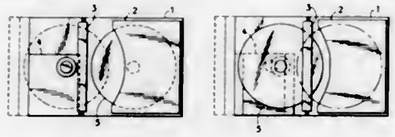
detecting whether said one or more forwarding conditions are stored in said memory;

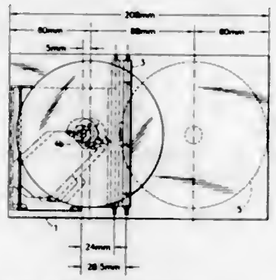
a second mesh positioned in said ink storage tank and provided at a second end of said ink storage tank at a position opposite said first end, said second mesh comprising a plurality of second draft holes provided at a plurality of corners of said ink storage tank for communicating the inside of said ink storage tank with outside air.

5,555,239
DISK SYSTEM

Kazuki Takai, Tokyo, and Yoshihiro Inoue, Nagoya, both of Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 105,285, Aug. 6, 1993, abandoned. This application Feb. 23, 1995, Ser. No. 393,505
Claims priority, application Japan, Aug. 10, 1992, 4-212926
Int. Cl.° G11B *17/10;17/22*
U.S. Cl. 369—192 **9 Claims**



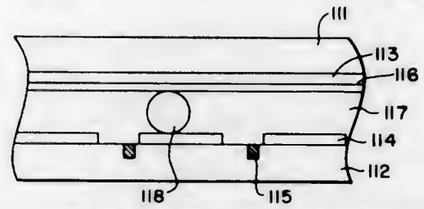


4. A disk system of the type comprising:
a system chassis;
storage means, disposed proximate one end of said system chassis, for storing a plurality of data storage disks in a vertical stack;
player means, disposed on said system chassis, opposite said storage means for receiving a selected disk from said storage means and for processing the data stored therein, said player means including a turntable; and
transfer means, disposed on said system chassis intermediate said storage means and said player means, for transferring a selected disk therebetween, said transfer means including at least one roller member adapted for engagement with the selected disk;
the improvement comprising: first displacement means for horizontally displacing said at least one roller member toward said storage means and away from said turntable after the transfer of the selected disk from said storage means to said turntable and for displacing said at least one roller member toward said turntable and away from said storage device after the return of the selected disk from said turntable to said storage means, said at least one roller member lying directly within the outer periphery of the disks within the vertical stack stored in said storage means when in said first transfer position.

5,555,240
PROCESS FOR FABRICATING A LIQUID CRYSTAL DISPLAY WITH SWITCHING ELEMENTS FORMED IN A SUBSTRATE

Takeshi Nishi; Toshimitsu Konuma, and Michio Shimizu, all of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Japan

Filed May 19, 1994, Ser. No. 246,161
Claims priority, application Japan, May 21, 1993, 5-142883
Int. Cl.° G02F *1/1333;1/136*
U.S. Cl. 359—82 **9 Claims**

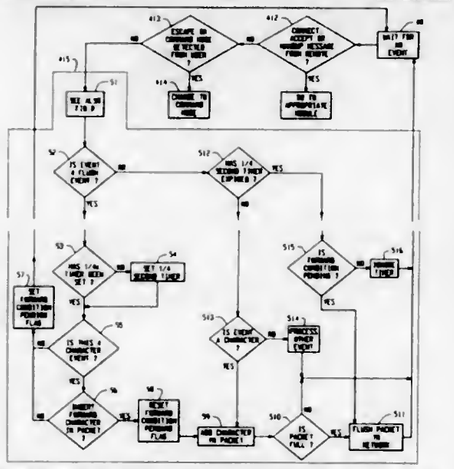


1. A process for fabricating an electro-optical device comprising:
forming a switching element on a surface of a thermoplastic substrate; and subjecting the surface of the substrate having thereon the switching element to pressing by applying pressure to the switching element while heating the substrate to a temperature not lower than a glass transition temperature of the substrate.

5,555,241
METHOD AND APPARATUS FOR MAXIMIZING THE DATA TRANSMISSION IN A WIRELESS DATA COMMUNICATION NETWORK

Mihai Lazaridis; Herb A. Little; Gary P. Mousseau, all of Waterloo, and Anand Sinha, Hamilton, all of Canada, assignors to Research in Motion Limited, Ontario, Canada

Continuation of Ser. No. 214,598, Mar. 18, 1994, abandoned. This application Jun. 2, 1996, Ser. No. 458,556
Int. Cl.° H04J *3/14*
U.S. Cl. 370—17 **22 Claims**



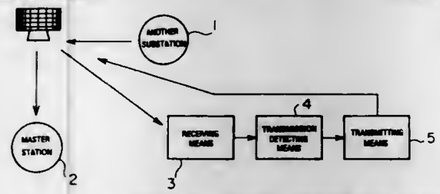
1. A method of packetizing data received from a data source, the method comprising the steps of:
accumulating data from the data source into a packet;
processing the data to determine whether one or more forwarding conditions has occurred, and if so storing said forwarding conditions in a memory;

detecting whether said one or more forwarding conditions are stored in said memory;
setting a timer to a first predetermined time period to indicate that at least one of the one or more forwarding conditions has been detected; and
if upon the first predetermined time period expiring, no additional data had been received during the first predetermined time period, transmitting the packet.

5,555,242
SUBSTATION APPARATUS FOR SATELLITE COMMUNICATIONS

Syuji Saitou, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Jan. 30, 1995, Ser. No. 380,596
Claims priority, application Japan, Aug. 22, 1994, 6-196433
Int. Cl.° H04J *3/14;* **H04B** *7/185*
U.S. Cl. 370—17 **3 Claims**



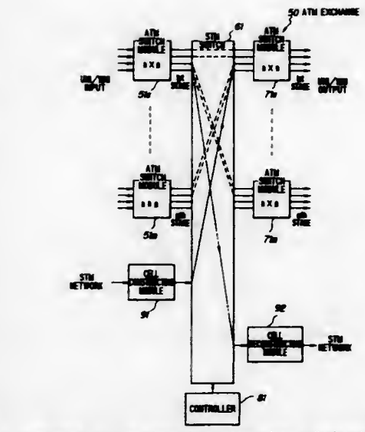
1. A substation apparatus for satellite communication in which communication between a master station and a plurality of substations is achieved via a communication satellite, comprising:
receiving means for receiving a radio wave transmitted from another substation to the master station;
transmission detecting means for determining based on an output of said receiving means whether another substation is transmitting data; and
transmitting means for controlling data transmission therefrom to the master station in accordance with an output of said transmission detecting means,
wherein said transmission detecting means includes identification signal detecting means for detecting an identification signal from the output of said receiving means, and determining means for determining whether or not another substation is transmitting data to the master station, based on the identification signal detected by said identification signal detecting means.

5,555,243
SELF ROUTING EXCHANGE AND EXCHANGE SYSTEM

Satoshi Kakuma; Shiro Uriu; Noriko Samejima; Masami Murayama, all of Kawasaki, and Naoki Fukuda, Fukuoka, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Dec. 9, 1994, Ser. No. 353,499
Claims priority, application Japan, Jun. 2, 1994, 6-121386
Int. Cl.° H04L *12/64*
U.S. Cl. 370—58.2 **7 Claims**

1. A self-routing exchange for switching fixed-length cells, which have control data for self-routing and transmission information, to prescribed outgoing paths, comprising:
switch modules connected in multiple stages which include an intermediate stage, a stage preceding and a stage succeeding said intermediate stage, wherein said intermediate stage is a circuit switching module capable of changing over a connection relationship between incoming highways and outgoing highways, and each of said stages preceding and succeeding said intermediate stage includes self-routing switch modules; and

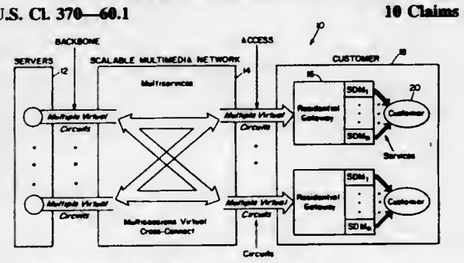


a controller for setting the connection relationship between incoming highways and outgoing highways of said circuit switching module.

5,555,244
SCALABLE MULTIMEDIA NETWORK

Dev V. Gupta, Flemington; Yu-Ren B. Chen, Somerville, both of N.J.; Craig A. Sharper, Los Altos, Calif., and Alan E. Stone, Morristown, N.J., assignors to Integrated Network Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 243,059, May 19, 1994, abandoned. This application Jun. 30, 1994, Ser. No. 269,370
Int. Cl.° H04Q *11/04;* **H04J** *3/16;3/22;3/02*
U.S. Cl. 370—60.1 **10 Claims**



1. A multimedia network system comprising:
a plurality of gateway devices for transmitting and receiving a plurality of digital signals, each digital signal comprising user data, each gateway device having a plurality of service definition modules for transmitting and receiving the user data to and from users; and
a switch comprising a tiered system of buses and a plurality of channel units coupled to the gateway devices for converting the user data into cells having an intra-switch cell format and coupling the cells to the tiered system of buses, and receiving cells addressed to users and converting data in the cells into appropriate physical and frame format and coupling the converted data to the appropriate gateway device wherein the tiered system of buses comprises a plurality of first buses carrying digital bits at a first rate and a plurality of second buses carrying digital bits at a second rate, the first buses being interconnected to the second buses and wherein the first buses consist of N independent X bit parallel buses and the second buses consist of N independent serial buses.

5,555,245
METHOD FOR IMPLEMENTING TIME SWITCHING AND A TIME SWITCH

first- and second-direction lines of one virtual path, detects errors in said connected virtual path within said detection section;

5,555,245
METHOD FOR IMPLEMENTING TIME SWITCHING AND A TIME SWITCH

Hannu Ahstale, and Marko Kokko, both of Oulu, Finland, assignors to Nokia Telecommunications Oy, Espoo, Finland

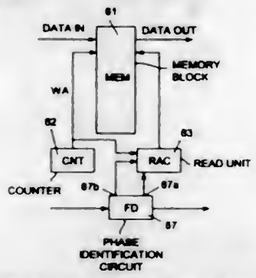
PCT No. PCT/FI93/00290, § 371 Date Mar. 7, 1995, § 102(e) Date Mar. 7, 1995, PCT Pub. No. WO94/03022, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 8, 1993, Ser. No. 374,522

Claims priority, application Finland, Jul. 17, 1992, 923296

Int. Cl.[6] H04Q *11/04*

U.S. Cl. 370—66 **4 Claims**



4. A time switch for implementing time switching in a synchronous digital hierarchy (SDH) network, in which the contents of time slots of an incoming STM-1 signal are written into a memory at memory locations determined by a write address, and read from said memory at memory locations indicated by switching data contained in an address control memory, for switching the contents of any time slot in the frame structure of an incoming STM-1 signal, to any time slot in the outgoing frame structure of an STM-1 signal,

said time switch comprising:

a memory arranged to have written thereinto at respective addresses the contents of a succession of incoming time slots;

first means controlling writing into said memory and providing an indication of respective write addresses;

second means controlling reading from said memory, said second means comprising:

an address control memory, switching data of which, provided as an output thereof, indicates memory addresses of said memory from which data is to be read;

an adder circuit having connected as inputs thereto:

said indication of respective write addresses, from which a fixed delay has been subtracted, and

said output of said address control memory, in the form of an address, which, in frame blocks starting from columns **19**, **82**, **145** and **208** of a respective STM-1 frame give switching data of each time slot of the frame block as a relative address consisting of the location difference, within the respective frame block, between an outgoing time slot and an incoming time slot to be switched thereto, said relative address having a permitted value range of 63 address values within each column of a respective said frame block; and

means for forcing the output of the address control memory to zero during columns 1 to 12 of the respective STM-1 frame.

5,555,246
PROCESS FOR THE PRODUCTION OF A BALANCED WIRE RESISTOR

David Weber, Affoltern, and Willi Wild, Allenwinden, both of Switzerland, assignors to Landis & Gyr Business Support AG, Zug, Switzerland

Filed Feb. 9, 1994, Ser. No. 193,940

Claims priority, application Switzerland, Feb. 16, 1993, 469/93

Int. Cl.[6] H01C *7/22;3/16;3/04;* **G01K** *7/16*

U.S. Cl. 338—17 **10 Claims**

1. A process for the production of a newly to be wound wire resistor having an electrical resistance with a first desired resistance value ($R_{desired,\ T1}$) at a first predetermined temperature T1 and a second desired resistance value ($R_{desired,\ T2}$) at a second predetermined temperature T2, said newly to be wound wire resistor comprising a first winding connected to a second winding, said windings having different temperature coefficients and wherein said electrical resistance is determined by said windings, said process comprising

measuring a wire length ($l_{w2,i}$) of a wire used for a first winding of a previously wound i-th resistor,

measuring a wire length ($l_{w2,i}$) of a wire used for a second winding of said previously wound i-th resistor,

measuring a resistance value ($R_{w1,T2,i}$) at said temperature T1 of said first winding of said i-th resistor,

measuring a resistance value ($R_{w1,T2,i}$) at said temperature T2 of said first winding of said i-th resistor,

measuring a resistance value ($R_{w2,T1,i}$) at said temperature T1 of said second winding of said i-th resistor,

measuring a resistance value ($R_{w2,T2,i}$) at said temperature T2 of said second winding of said i-th resistor,

calculating a wire length ($l_{W1,i+1}$) for said first winding of a newly to be wound (i+1)th wire resistor based on said desired resistance values ($R_{desired,T2}$ and $R_{desired,T1}$), said measured length ($l_{W1,i}$) and said measured resistance values ($R_{W1,T1,i}$ and $R_{W1,T2,i}$) of said first winding of said previously wound i-th wire resistor, and

calculating a wire length ($l_{W2,i+1}$) for said second winding of said newly to be wound (i+1)th wire resistor based on said desired resistance values ($R_{desired,T2}$ and $R_{desired,T1}$), said calculated length ($l_{W1,i+1}$) of said first winding of said (i+1th) resistor, said measured lengths ($l_{W1,i}$ and $l_{W2,i}$) and said measured resistance values ($R_{W1,T1,i}$; $R_{W1,T2,i}$; $R_{W2,T1,i}$; $R_{W2,T2,i}$) of said first and second windings of said previously wound i-th wire resistor.

5,555,247
FRAME SYNCHRONIZING APPARATUS FOR QUADRATURE MODULATION DATA COMMUNICATION RADIO RECEIVER

Akihiko Matsuoka; Hiroshi Ohnishi, both of Tokyo; Yoshinori Kunieda; Kouei Misaizu, both of Kawasaki, and Yuuri Yamamoto, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

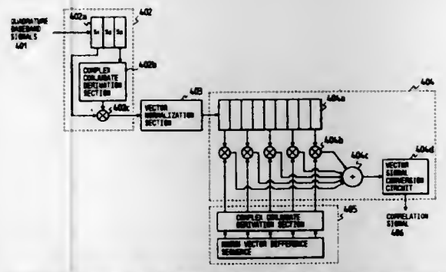
Division of Ser. No. 200,592, Feb. 23, 1994, Pat. No. 5,463,627. This application Aug. 16, 1995, Ser. No. 515,607

Claims priority, application Japan, Feb. 26, 1993, 5-037641; Feb. 23, 1995, 7-033072

Int. Cl.[6] H04J *3/06*

U.S. Cl. 370—105.1 **15 Claims**

1. A frame synchronizing apparatus for a receiving apparatus of a digital data communications radio system in which data are transmitted as symbols by quadrature modulation of a carrier, arranged in time-multiplexed frames each including a fixed symbol sequence, said receiving apparatus including means for demodulating a received radio signal to obtain quadrature baseband signals expressing said symbols, sampling means for sampling said quadrature baseband signals in successive sample periods to obtain respective received vector values, said frame synchronizing apparatus including a data correlation circuit for producing a correlation signal synchronized with occurrences of said fixed symbol sequence, comprising:



vector difference value generating means for deriving respective received vector difference values between successive pairs of said received vector values, said pairs being mutually separated by one symbol period;

vector normalization means for converting said received vector difference values to respective normalized received vector difference values;

known vector difference value generating means for generating a sequence of normalized known vector difference values, expressing respective vector differences between successive pairs of symbols of said fixed symbol sequence;

means for generating successive sequences of said normalized received vector difference values in respective ones of said sampling periods, each sequence comprising an identical number of values to that of said normalized known vector difference value sequence, said normalized received vector difference values of each sequence being successively mutually separated by one symbol period; and

correlation derivation means for deriving successive degrees of correlation between said normalized known vector difference value sequence and said normalized received vector difference value sequences, to thereby derive said correlation signal.

5,555,248
TANDEM CONNECTION MAINTENANCE SYSTEM

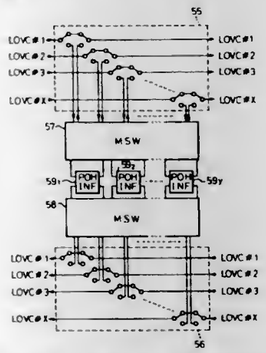
Eiji Sugawara, Kawasaki, Japan, assignor to Fujitu Limited, Kawasaki, Japan

Filed Mar. 16, 1994, Ser. No. 213,957

Claims priority, application Japan, Sep. 20, 1993, 5-233507

Int. Cl.[6] G06F *11/00*

U.S. Cl. 371—5.1 **18 Claims**



18. An apparatus for detecting errors caused along a detection section within a communication network for a plurality of virtual paths established along the entire length of the detection section, comprising:

a plurality of POH path overhead interface circuits each of which, when connected at one end of a detection section to first- and second-direction lines of one virtual path, detects errors in said connected virtual path within said detection section;

a first matrix switch for selecting a number of virtual paths from among said plurality of virtual paths and connecting the first-direction lines of said selected virtual paths respectively to said POH interface circuits; and

a second matrix switch for connecting the second-direction lines of said virtual paths selected by said first matrix switch respectively to said POH interface circuits in interlocking fashion with said first matrix switch.

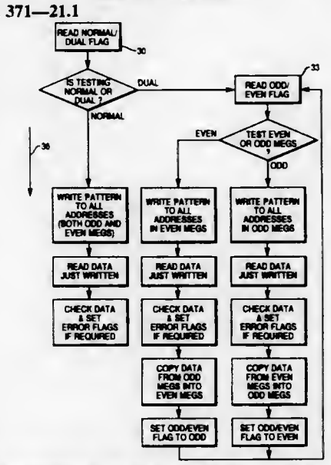
5,555,249
NON-DESTRUCTIVE MEMORY TESTING IN COMPUTERS

Michael R. Hilley, Belton, and William J. Kass, Easley, both of S.C., assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 18, 1991, Ser. No. 761,578

Int. Cl.[6] G01P *29/00*

U.S. Cl. 371—21.1 **4 Claims**



1. In a computer having a processor and a memory device, with the processor being able to run a program which tests the operability of the memory device, a method comprising the steps of:

a) storing the program in a first part of the memory device;

b) running the program, after step (a), so as to test the operability of a second part of the memory device;

c) moving the program, after step (b), from the first part of the memory device to the second part of the memory device; and

d) running the program, after step (c), so as to test the first part of the memory device.

5,555,250
DATA ERROR DETECTION AND CORRECTION SYSTEM

William J. Walker, Houston; Alan L. Goodrum, Tomball, and Dale J. Mayer, Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Oct. 14, 1994, Ser. No. 323,263

Int. Cl.[6] H03M *13/00*

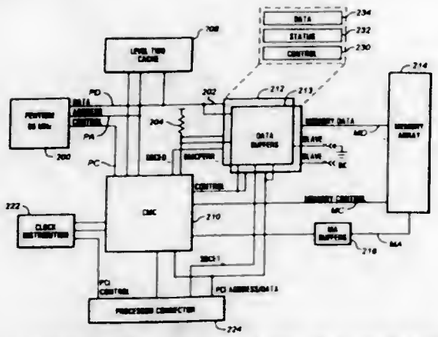
U.S. Cl. 371—40.1 **23 Claims**

1. A data error correction circuit for use in a computer system, the computer system having a memory connected to a first number of memory data bits and a second number of check bits, the error correction circuit comprising:

at least two data buffers, wherein each of said data buffers includes:

5,555,253
TECHNIQUE FOR LOCKING A LASER DIODE TO A PASSIVE CAVITY

an image relaying telescope positioned downstream of the amplifier, as seen by the input beam;



a plurality of memory data pins for receiving a portion of said first number of memory data bits, wherein the number of memory data bits received by all of said data buffers is equal to said first number;

a plurality of check bit pins for receiving a portion of said second number of said check bits, wherein the number of check bits received by all of said data buffers is equal to said second number;

means coupled to said memory data pins and said check bit pins for generating a plurality of partial syndrome bits based on said received memory data bits and said received check bits;

output means connected to said partial syndrome bit generating means for providing said plurality of partial syndrome bits to the other data buffers;

means coupled to said output means of each of the other data buffers for receiving said partial syndrome bits provided by each of the other data buffers;

means coupled to said partial syndrome bit generating means and to said receiving means for generating a plurality of fix bits based on said plurality of partial syndrome bits generated by said partial syndrome bit generating means and said partial syndrome bits received from the other data buffers, wherein said plurality of fix bits indicate which of said received memory data bits are erroneous; and

means coupled to said plurality of memory data pins and coupled to said fix bit generating means for correcting said memory data bits received by said plurality of memory data pins based on said plurality of fix bits.

5,555,251

ARRANGEMENT TO MINIMIZE EDDY CURRENTS IN MR IMAGERS

Ilmari V. Kinanen, Espoo, Finland, assignor to Picker Nordstar Inc., Helsinki, Finland

Filed Jun. 7, 1994, Ser. No. 255,330

Claims priority, application Finland, Jun. 8, 1993, 932615

Int. Cl.[6] G01V *3/00;3/14*

U.S. Cl. 324—319 **17 Claims**

1. A magnetic resonance imaging system comprising:

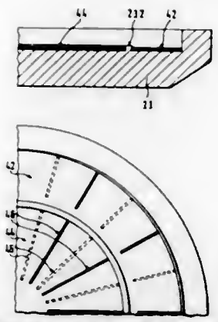
a magnetically permeable core;

two pole pieces, each having a face, said pole pieces disposed on said core such that the pole piece faces are in opposed relationship forming a gap therebetween;

means for producing a main magnetic field in the gap;

a gradient coil disposed between the pole piece faces and adjacent one of the pole piece faces; and

two or more circular sheets of electrically insulated ferromagnetic material disposed between the face of a pole piece and the gradient coil, said sheets laminated on top of each other into two or more layers in a direction substantially parallel to the face of the pole piece, each sheet having one or more slots therein and arranged in relationship to each other such that the



slots of one layer do not align with the slots of the next layer, said sheets being axially symmetric to the face of the pole piece.

5,555,252

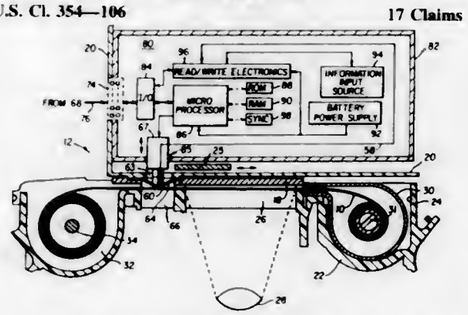
MAGNETIC RECORD/REPRODUCE MODULE FOR CAMERA

George W. Brock, La Jolla, and Robert E. Swanson, Del Mar, both of Calif., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 28, 1994, Ser. No. 345,961

Int. Cl.[6] C03B *17/24*

U.S. Cl. 354—106 **17 Claims**



1. A system for recording or reproducing information in a magnetic layer on a photographic film strip comprising:

a still camera having means for receiving and transporting an elongated film strip having said magnetic layer deposited on the film surface, means for exposing image frames of the film strip, and a magnetic record head aligned with said magnetic layer of the filmstrip transported by the film strip receiving and transporting means; and

a detachable, record module for attachment to said camera including power supply means, means for recording information in the magnetic layer of the film strip in relation to the exposure of image frames of the film strip, said information recording means including means for providing operating power to said magnetic record head from said power supply means, means for supplying control signals to said magnetic record head defining the recording format and content, and means for synchronizing the recording of information to the transport of the film strip by said film strip receiving and transport means of said camera.

5,555,253

TECHNIQUE FOR LOCKING A LASER DIODE TO A PASSIVE CAVITY

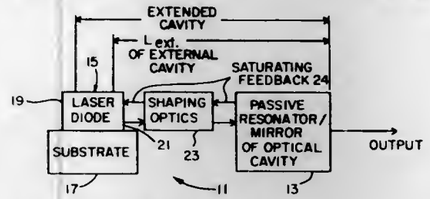
George J. Dixon, Indian Harbor Beach, Fla., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 370,508, Jan. 9, 1995, abandoned.

This application Jun. 7, 1995, Ser. No. 481,192

Int. Cl.[6] H01S *3/13*

U.S. Cl. 372—29 **16 Claims**



1. A laser comprising in combination:

a semiconductor gain element having back and front facets and generating optical radiation at the front facet;

an anti-reflective coating on the front facet of the semiconductor gain element;

an extended cavity comprising first and second opposing mirrors, where the first mirror is the back facet of the semiconductor gain element and the second mirror has a reflectivity R_{ext} and comprises a passive resonator physically separated from the gain element for storing as circulating power the optical radiation emitted through the front facet of the gain element;

an optical coupling for introducing the optical radiation from the gain element into the passive resonator, including a means for preventing the gain element from receiving radiation backreflected by the passive resonator as a result of the impedance mismatch between the gain element and the passive resonator;

a feedback path for returning to the semiconductor gain element a portion of the circulating power of the passive resonator;

means in the feedback path for maintaining fluctuations in the amplitude of the circulating power below five (5) percent of an average value of the circulating power; and

an optical filter for spectrally filtering the portion of passive radiation fed back to the gain element.

5,555,254

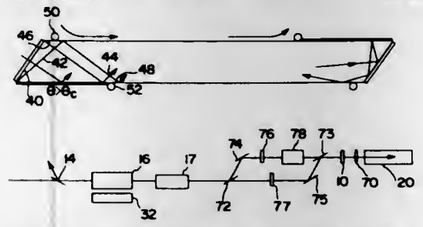
HIGH BRIGHTNESS SOLID-STATE LASER WITH ZIG-ZAG AMPLIFIER

Hagop Injeyan, Glendale; Randall J. St. Pierre, Santa Monica; Rodger C. Hilyard, Canyon Country; George M. Harpole, San Pedro, and Carolyn S. Hoefer, Malibu, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Nov. 5, 1993, Ser. No. 148,758

Int. Cl.[6] H01S *3/04;3/06*

U.S. Cl. 372—33 **16 Claims**



1. A high brightness solid-state laser source, comprising:

a master oscillator, generating a pulsed input beam having a nearly diffraction limited beam quality;

a zig-zag slab amplifier positioned to receive and amplify the beam from the master oscillator, during a first pass through the amplifier;

an image relaying telescope positioned downstream of the amplifier, as seen by the input beam;

a phase conjugation cell positioned to receive the amplified input beam from the zig-zag slab amplifier and to reflect the beam in phase conjugated form back into the zig-zag slab amplifier for a second pass, whereby aberrations introduced in the zig-zag slab amplifier during the first pass are practically canceled during the second pass;

means for extracting an amplified beam after the second pass through the amplifier, whereby the extracted amplified beam has high beam quality and extremely high brightness;

a quarter-wave plate positioned adjacent to the phase conjugation cell, to convert linearly polarized light of the input beam to circularly polarized light for more effective use in the phase conjugation cell, and to convert circularly polarized light reflected from the phase conjugation cell into orthogonally polarized linear light for the return beam; and

means for reducing the effect of birefringence introduced in the zig-zag amplifier;

and wherein the means for extracting the amplified beam includes a polarizer to outcouple the orthogonally polarized return beam.

5,555,255

SURFACE-EMITTING LASER DIODE

Anton Köck, and Erich Gornik, both of München, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

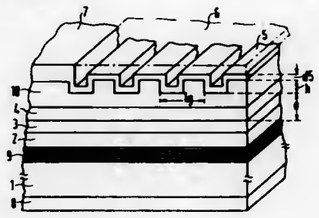
PCT No. PCT/DE93/01113, § 371 Date Jun. 5, 1995, § 102(e) Date Jun. 5, 1995, PCT Pub. No. WO94/13043, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 24, 1993, Ser. No. 448,425

Claims priority, application Germany, Dec. 3, 1992, 42 40 706.0

Int. Cl.[6] H01S *3/19*

U.S. Cl. 372—96 **6 Claims**



1. A surface-emitting laser diode, comprising;

semiconductor material,

an active layer in said semiconductor material,

contacts on said semiconductor material for applying an operating current to said surface-emitting laser diode,

a spatial periodic structure on a surface, facing away from the active layer, of the semiconductor material,

a metal film applied at least to a region of the surface that is provided with said spatial periodic structure,

said spatial periodic structure being of a height and a length of each period and a minimum distance of said metal film from the active layer and a thickness of the metal film being dimensioned such that, during operation of the laser diode, surface modes are excited at the surface, facing away from the active layer, of the metal film by photons produced in the active layer, and

a reflector arrangement for forming a vertical resonator being at least one layer on a side, facing away from said spatial periodic structure, of the active layer.

5,555,256

CHANNEL IDENTIFIER GENERATION

b1) coupling means for connecting to a line type telephony equipment,

5,555,260

DECENTRALIZED BASE STATION FOR REDUCING BANDWIDTH REQUIREMENTS FOR

5,555,256

CHANNEL IDENTIFIER GENERATION

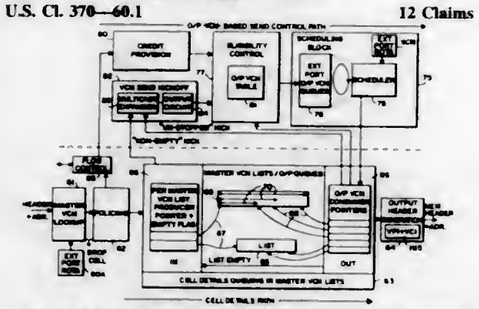
Costas Calamvokis, Bishopston, England, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 14, 1995, Ser. No. 423,125

Claims priority, application European Pat. Off., Apr. 28, 1994, 94303119

Int. Cl.[6] H04L *9/16; 12/56*

U.S. Cl. 370—60.1 **12 Claims**



1. Apparatus for carrying out predetermined functions in respect of packets received thereby through at least one input port of the apparatus, each packet including a channel label that uniquely identifies, for the input port on which the packet is received by the apparatus, a virtual channel with which the packet is associated; said apparatus including VCN-providing means for providing for each packet received by the apparatus, an identifier (master VCN), that uniquely identifies the combination of virtual channel and input port associated with the packet, and processing means for carrying out said predetermined functions in respect of each packet in dependence on the master VCN provided for the packet by said VCN-providing means, said VCN-providing means comprising:

port identification means for generating for each packet a respective port label identifying the input port on which the packet was received,

combining means for combining together the channel label and port label associated with a packet to produce a long channel identifier which is then output,

key-providing means for dividing up the output of the combining means in predetermined manner to provide K keys where K is an integer greater than or equal to 2, and

table lookup means to which said K keys are applied, said table lookup means comprising:

respective conversion means for converting each of said K keys associated with a packet into a corresponding, shorter index, and

a K-dimensional master table having locations holding respective master VCNs, the K indexes derived from the same packet serving to access a corresponding master-table location in order to provide the master VCN of the packet concerned.

5,555,257

CELLULAR/SATELLITE COMMUNICATIONS SYSTEM WITH IMPROVED FREQUENCY RE-USE

Paul W. Dent, Stehags, Sweden, assignor to Ericsson GE Mobile Communications Inc., Research Triangle Park, N.C.

Division of Ser. No. 179,953, Jan. 11, 1994. This application May 16, 1995, Ser. No. 442,166

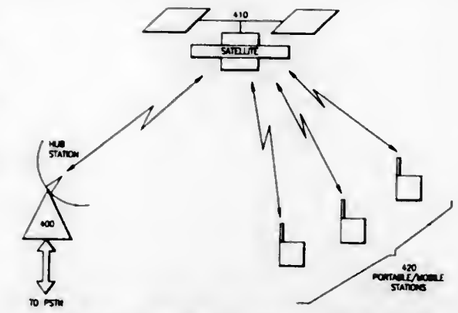
Int. Cl.[6] H04B *07/185*

U.S. Cl. 370—95.1 **9 Claims**

1. A method of wireless communication with mobile stations, comprising the steps of:

transmitting signals representative of communications from said mobile stations to an orbiting satellite having a multi-element antenna;

receiving combinations of said signals from said mobile stations at each of said antenna elements and coherently transponding said signal combinations to a ground station;



receiving said coherently transponded signals at said ground station and analog-to-digital converting said coherently transponded signals to produce corresponding numerical sample streams;

processing said numerical sample streams in a numerical matrix processor to separate said transmitted signals originating respectively from each of said mobile stations to produce separated sample streams; and

numerically processing said separated sample streams to reconstruct said communication representative signals and sending said reconstructed signals to a telephone switching network.

5,555,258

HOME PERSONAL COMMUNICATION SYSTEM

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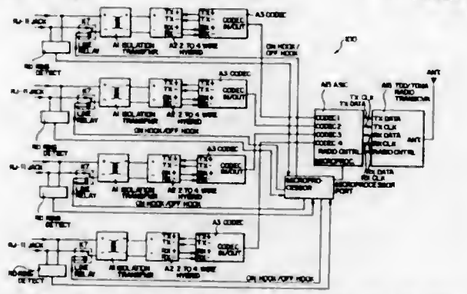
Filed Jun. 17, 1994, Ser. No. 262,214

Int. Cl.[6] H04B *1/56*

U.S. Cl. 370—29 **37 Claims**



1. A wireless telephone subsystem for coupling line type telephony equipment to the Public Switched Telephone Network (PSTN) comprising:

a) a base unit adapted to be coupled to a plurality of lines of the PSTN, said base unit including:

a1) base coder/decoder means for transforming analog signals received from said lines of said PSTN to first digital signals and for transforming other digital signals to analog signals for coupling to said lines of said PSTN,

a2) base multiple channel TDD/TDMA transceiver means coupled to said base coder/decoder means, said base multiple channel TDD/TDMA transceiver means responsive to said first digital signals for transmitting said signals by placing selected portions of said first digital signals into selected portions of a multiplex frame, and for receiving other digital signals and coupling said other digital signals to said base coder/decoder means, and

a3) programmable switching means for associating selected of said PSTN lines and selected portions of said multiplex frame

b) at least one wireless interface unit comprising:

b1) coupling means for connecting to a line type telephony equipment,

b2) remote coder/decoder means for transforming analog signals received from said line type telephony equipment over said coupling means to second digital signals and for transforming other digital signals to analog signals for coupling to said line type telephony equipment through said coupling means, and

b3) remote TDD/TDMA transceiver means coupled to said remote coder/decoder means, said remote TDD/TDMA transceiver means responsive to said second digital signals for transmitting said second digital signals by placing said second digital signals into selected portions of said multiplex frame, and for receiving other digital signals for coupling said other digital signals to said remote coder/decoder means,

whereby said line type telephony equipment is coupled to said PSTN without requiring a conductive path therebetween.

5,555,259

PROCESS AND DEVICE FOR MELTING DOWN OF SCRAP

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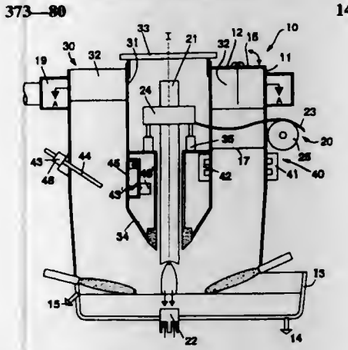
Filed May 31, 1995, Ser. No. 424,413

Claims priority, application Germany, Oct. 26, 1992, 42 36 510.4

Int. Cl.[6] F27D *13/00*

U.S. Cl. 373—80 **14 Claims**



3. An arc furnace, comprising:

a shaft;

a vessel at a bottom end of the shaft, the vessel having tap holes for discharging at least one of slag and metallic melt;

a cathode extending into the vessel and operated with direct current;

an anode provide in a bottom of the vessel;

means connected at a top end of the shaft for drawing-off flue gas; and

an electrode support arranged at the top end of the shaft for holding the cathode, the electrode support including a pipe arranged concentrically to a center line of the shaft, the pipe having a bottom end that is conically tapered, the electrode support further including support arms connected between the shaft and a top end of the pipe, the drawing-off means including a flue-gas duct arranged at the top end of the shaft so as to surround the shaft.

5,555,260

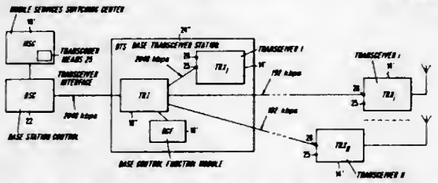
DECENTRALIZED BASE STATION FOR REDUCING BANDWIDTH REQUIREMENTS FOR COMMUNICATIONS TO AND FROM RADIO TRANSMITTER-RECEIVERS IN A TELECOMMUNICATIONS NETWORK

Hans L. Rinnbäck, Järfälla; Håkan M. Halén, Stockholm, and Per V. Israelsson, Täby, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation of Ser. No. 202,179, Feb. 25, 1994, abandoned. This application Aug. 24, 1995, Ser. No. 519,016

Int. Cl.[6] H04B *7/24*

U.S. Cl. 370—84 **16 Claims**



10. A cellular TDMA telecommunications network, comprising:

a decentralized base station;

at least one mobile services switching center;

transcoder means provided remotely from the base station for digitally encoding and compressing speech data to be transmitted to the base station;

at least one transceiver for communicating with mobile stations;

a network control unit adapted to receive the digitally encoded and compressed speech data from said transcoder means;

a transceiver interface for interfacing between the network control unit and the at least one transceiver;

a first communications link connected between the network control unit and the transceiver interface, the first communications link being adapted to transmit the digitally encoded and compressed speech data at a relatively high transmission rate;

at least one second communications link connected between the transceiver interface and each of the at least one transceivers, the at least one second communications link being adapted to transmit the digitally encoded and compressed speech data at a rate relatively lower than the transmission rate of the first communications link;

means provided in the transceiver interface, for adapting the rate of the first communications link to the lower rate of the at least one secood communications link.

5,555,261

INTERFACE DEVICE BETWEEN A NETWORK AND AN EXCHANGE FOR ASSEMBLING FIXED-LENGTH CELL AND TRANSMITTING THE SAME

Mikio Nakayama; Tetsuo Tachibana; Youzou Iketani; Yuzo Okuyama, and Satoshi Kakuma, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Nov. 15, 1994, Ser. No. 339,541

Claims priority, application Japan, Feb. 7, 1994, 6-013776; Nov. 2, 1994, 6-269298

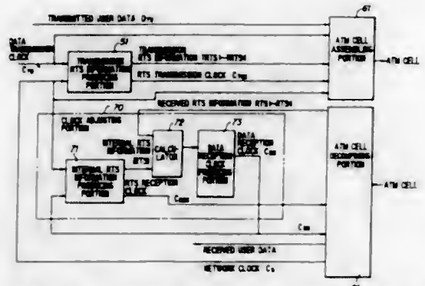
Int. Cl.[6] H04J *3/06;* **H04L** *12/56*

U.S. Cl. 370—103 **15 Claims**

1. An interface device connected to a network, for assembling a transmission fixed-length cell from user data to be transmitted and for disassembling a reception fixed-length cell received from said network to extract said user data therefrom, said interface device comprising:

a transmission timing information generating means for producing a first transmission timing information based on a network clock supplied from said network and a data transmission clock synchronized with the user data;

a cell assembling means for assembling the fixed-length cell from the user data and said first transmission timing information to transmit said fixed length cell to said network;



a clock adjusting means for generating internal timing information based on said network clock and a data reception clock, to adjust the timing of said data reception clock so as to reduce a difference between said internal timing information and a second transmission timing information contained in the reception first-length cell which is received from said network; and

a cell decomposing means for disassembling said reception fixed-length cell received from said network into said user data and said transmission timing information, to output said user data in synchronism with said data reception clock from said clock adjusting means.

5,555,262

TRANSMISSION SYSTEM OF THE SYNCHRONOUS DIGITAL HIERARCHY

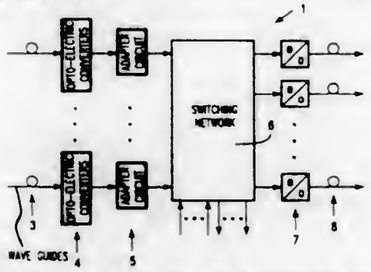
Ralph Urbansky, Nürnberg, Germany, assignor to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 152,565, Nov. 12, 1993, abandoned. This application Sep. 1, 1995, Ser. No. 522,800

Claims priority, application Germany, Nov. 19, 1992, 42 38 899.6

Int. Cl.[6] H04J *3/06*

U.S. Cl. 370—102 **11 Claims**



1. A transmission system including a transmission device for transmitting a plurality of transport modules of data in a synchronous multiplex hierarchy, said transport modules including higher-order transport modules, said data arranged in a plurality of columns and rows in a frame structured signal, said transmission device comprising:

adapting means for delaying one of said higher-order transport modules to a predetermined position to generate an adapted frame structure signal; and

switching means for writing and identifying said adapted frame structure signal on a column-by-column basis and to read out said adapted frame signal on a column-by-column basis in a predetermined order to form an outgoing frame structured signal.

5,555,263

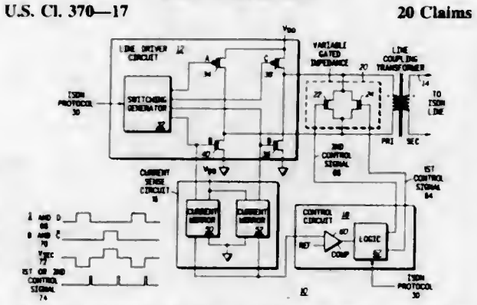
METHOD AND APPARATUS FOR REDUCING SWITCHING OSCILLATIONS IN AN ISDN LINE INTERFACE CIRCUIT

Joseph C. Y. Fong, and Mathew A. Rybicki, both of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Nov. 1, 1994, Ser. No. 332,669

Int. Cl.[6] H04L *25/12*

U.S. Cl. 370—17 **20 Claims**



1. An apparatus for limiting switching oscillations on a line interface circuit, the apparatus comprising:

a line driver circuit operably coupled to a primary winding of a line coupling transformer, wherein the liner driver circuit provides an alternating input to the primary winding, and wherein the alternating input is based on a protocol of Integrated Services Digital Network;

a current sense circuit operably coupled to the line driver circuit, wherein the current sense circuit senses current that the line driver circuit provides to the primary winding to produce sensed current;

a control circuit operably coupled to the current sense circuit, wherein the control circuit provides a first control signal when the sensed current is in a first predetermined range and a second control signal when the sensed current is in a second predetermined range, and wherein the first control signal and the second control signal are based on the protocol; and

a variable gated impedance comprising at least two transistors coupled in parallel across the primary winding, wherein a first transistor of the at least two transistors has a first impedance and is enabled when the first control signal is received, and a second transistor of the at least two transistors has a second impedance and is enabled when the second control signal is received, and the first impedance is less than the second impedance, such that switching oscillations are minimized.

5,555,264

METHODS AND DEVICES FOR PRIORITIZING IN HANDLING BUFFERS IN PACKET NETWORKS

Hans K. M. Sällberg, Lund, Sweden, and Soren Blaabjerg, Allerod, Denmark, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE93/00237, § 371 Date Nov. 14, 1994, § 102(e) Date Nov. 14, 1994, PCT Pub. No. WO93/19551, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 22, 1993, Ser. No. 307,611

Claims priority, application Sweden, Mar. 20, 1992, 9200868

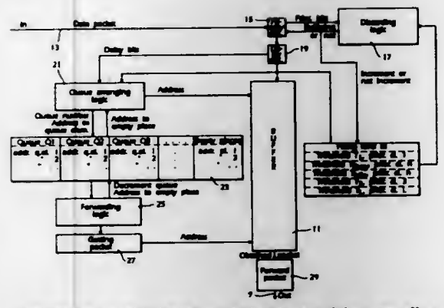
Int. Cl.[6] H04L *12/56*

U.S. Cl. 370—17 **12 Claims**

4. A device for handling in a packet network a buffer memory, in which arrived packets are stored before they are forwarded, in particular in a switch device,

each packet belonging to a certain loss priority class of at least two loss priority classes and a threshold value being associated with each loss priority class,

each packet also belonging to a certain delay priority class of at least two delay priority classes, the delay priority classes being intended to allow different delays for the packets



belonging to said classes, such that longer delays are allowed for packets belonging to delay priority classes having a lower delay priority,

the device comprising

an input on which the packets arrive,

the buffer memory,

an output on which the packets are forwarded,

a logic unit for determining those packets to be stored in the buffer memory comprising

a) means for determining the loss priority class of an arrived packet,

b) means for determining if the present total number of packets stored in the buffer memory is less than the threshold value associated with the loss priority class of the arrived packet and for forwarding, in the case that this condition is satisfied, a signal thereof to

c) means for storing the arrived packet in the buffer memory, and

d) means for determining for each arrived packet also the delay priority class of the packet and

another logic unit for determining which packet is to be sent from the buffer memory comprising means for choosing packets belonging to a higher delay priority class before packets belonging to a lower delay priority class wherein each lower delay priority class is associated with time intervals having predetermined lengths, such that instead of a packet from a higher delay priority class a packet is chosen from a lower delay priority class if no packet from the lower delay priority class has been forwarded during the time interval with the predetermined length associated with the delay priority class thereof and if such a packet is available, and

means for transferring a chosen packet to the output for forwarding.

5,555,265

SWITCHING PATH SETTING SYSTEM USED IN SWITCHING EQUIPMENT FOR EXCHANGING A FIXED LENGTH CELL

Satoshi Kakuma; Shiro Uriu; Noriko Samejima, and Kazuo Hajikano, all of Kanagawa, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Oct. 31, 1994, Ser. No. 332,379

Claims priority, application Japan, Feb. 28, 1994, 6-029334

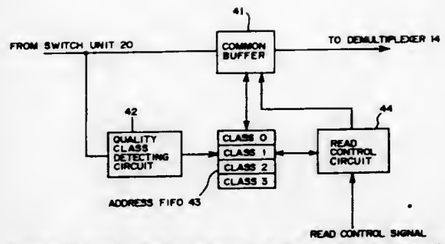
Int. Cl.[6] H04L *12/56*

U.S. Cl. 370—60 **11 Claims**

1. A switching system for switching a fixed length cell including a header field having control information indicating a quality class thereof and route information for a route to be switched and an information field of data, said cell being transmitted from an input link to an output link, the switching system comprising:

an interface circuit for receiving the cell from the input link and for generating and outputting a selection information designating a quality class allocated to the cell being transmitted in accordance with the control information of the cell;

a buffer for storing the cell received from the interface circuit; and



a buffer control circuit for storing, in response to the selection information of the cell received from the interface circuit, the cell in a selective address of the buffer determined by the selection information.

5,555,266

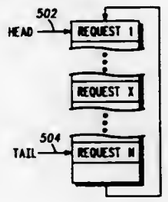
METHOD FOR REDUCING TRANSMISSION DELAYS IN A PACKET TRANSMISSION SYSTEM

Dale R. Buchholz, Palatine; Karen E. Robbins, Lake Zurich; R. Lee Hamilton, Jr., Palatine, and William K. Doss, Lake in the Hills, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 4, 1993, Ser. No. 131,358

Int. Cl.[6] H04J *3/16*

U.S. Cl. 370—95.1 **17 Claims**



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1. In a packet transmission system wherein a plurality of remote units request service from a communications controller by transmitting plural access requests to said communications controller, establishing a time within which a response to a given one of the access requests is anticipated and retransmitting said given access request upon expiration of the established time, a method for reducing transmission delays, said method comprising the steps of:

at the remote units:

storing the plural transmitted access requests sequentially in memory;

awaiting resource grants from the communications controller; and

applying a resource grant next received from the communications controller to the oldest of the plural access requests stored in memory in order to transmit data packets to the communications controller.

5,555,267

FEEDFORWARD CONTROL SYSTEM, METHOD AND CONTROL MODULE

George E. Burke, Jr., 9412 S. Mere Ct., Raleigh, N.C. 27615; George M. Horne, 106 Exeter Ct., Cary, N.C. 27511, and Michael B. Carter, 1921 Strebor St., Durham, N.C. 27705

Filed Jul. 30, 1993, Ser. No. 99,788

Int. Cl.[6] H04J *3/00*

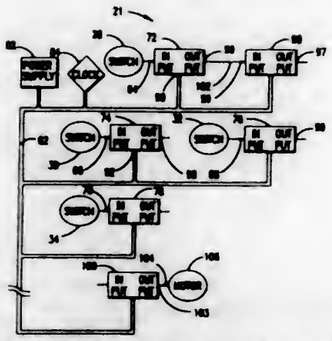
U.S. Cl. 370—85.1 **31 Claims**

1. A control system for controlling at least one output device in response to a plurality of signals from input devices, comprising:

transitions in a Finite State Machine (FSM) model, the I/O Sequence being used in constructing a Verification Test Sequence

5,555,271

SEMICONDUCTOR LASER DEVICE



a plurality of control modules coupled to a bus, each of the control modules functional as a logical unit;

means for transferring input signals to the bus from the plurality of control modules responsive to said input devices at selected times associated with the control modules;

at least one combinational logical unit formed by feedforwarding an output signal from one of the plurality of control modules associated with one of the selected times to an input terminal of at least one other of the plurality of control modules associated with another of the selected times; and

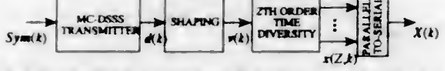
wherein an output of said combinational logic unit is couplable to other of said plurality of control modules to form a multilevel combinational logical control system to control the output device.

5,555,268

MULTICODE DIRECT SEQUENCE SPREAD SPECTRUM

Michel Fattouche, 156 Hawkwood Blvd N.W., Calgary, Alberta, Canada, and Hatim Zaghloul, 402 - 1st Ave. N.E., Calgary, Alberta, Canada

Filed Jan. 24, 1994, Ser. No. 186,784
Int. Cl.[6] H04B *1/707; 1/69*
U.S. Cl. 375—206 **32 Claims**



1. A transceiver for transmitting a first stream of data symbols, the transceiver comprising:

a converter for converting the first stream of data symbols into plural sets of N data symbols each;

first computing means for operating on the plural sets of N data symbols to produce modulated data symbols corresponding to an invertible randomized spreading of the first stream of data symbols; and

means to combine the modulated data symbols for transmission.

5,555,269

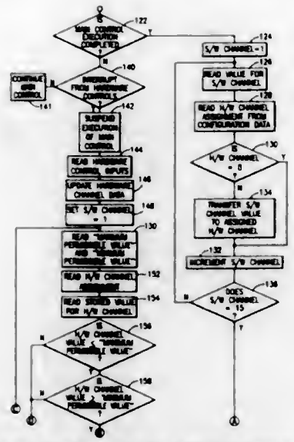
ERROR DETECTION FOR HVAC SYSTEMS

Arthur F. Friday, Jr., and Chi-Ping Chan, both of Liverpool, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 29, 1993, Ser. No. 143,038
Int. Cl.[6] F25B *49/00;* **F28F** *27/00*
U.S. Cl. 371—5.1 **15 Claims**

1. A process executable by a processor within a control unit of a heating or cooling system, the processor being responsive to values of electronic signals received from elements of a heating or cooling system electronically connected to the control unit, said process comprising the steps of:

storing an electronic signal value of an electronic signal received from at least one particular electronically connected element



in a storage location set aside within a memory associated with the processor for storing the value of electronic signal received from the particular element;

comparing the stored value of the electronic signal received from the particular element with a range of electronic signal values permitted for the particular element;

transferring the stored value of the electronic signal received from the particular element to a different storage location when the stored value of the electronic signal received from the particular element is within the range of permitted electronic signal values for the particular element; and

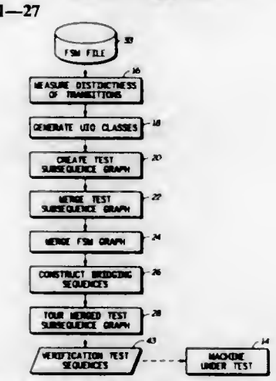
using the value of the electronic signal received from the particular element within a control program executable by the processor so as to control the heating or cooling system only when the value of the electronic signal received from the particular element has been transferred to the different storage location for use within the control program.

5,555,270

METHOD AND APPARATUS FOR CONSTRUCTION UNIQUE INPUT/OUTPUT SEQUENCE (UIO) SETS UTILIZING TRANSITION DISTINCTNESS MEASUREMENTS

Xiao Sun, and Carmie A. Hull, both of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Filed Mar. 13, 1995, Ser. No. 403,332
Int. Cl.[6] G06F *11/00*
U.S. Cl. 371—27 **13 Claims**



1. A method for measuring an I/O Sequence Distinctness Measurement (DM) for an I/O Sequence associated with model state

transitions in a Finite State Machine (FSM) model, the I/O Sequence being used in constructing a Verification Test Sequence (VTS) to test a Machine Under Test (MUT) for conformance against the FSM model, wherein:

said FSM model has a plurality of Model States (ST) and a plurality of State Transitions (TR),

each of the plurality of State Transitions (TR) is located between a First Model State (ST) and a Second Model State (ST) in the FSM model,

each of the plurality of State Transitions (TR) has a corresponding I/O Sequence, and

each I/O Sequence includes an Input Stimulus and an Output Response,

said method comprising the steps of:

(a) identifying all members of an Identified State Transition (TR) Set, wherein:

each member of the Identified State Transition (TR) Set is an Identified State Transition (TR) Set Member, and

all Identified State Transition (TR) Set Members are State Transitions (TR);

(b) identifying all members of an Identified I/O Sequence Set, wherein:

each member of the Identified I/O Sequence Set is an Identified I/O Sequence Set Member,

each member of the Identified I/O Sequence Set is different from each other member of the Identified I/O Sequence Set, and

the I/O Sequence corresponding to each Identified TR Set Member is equal to one member of the Identified I/O Sequence Set;

(c) selecting one member of the Identified I/O Sequence Set as a Selected I/O Sequence;

(d) identifying each member of a First Identified State Transition (TR) Subset, wherein:

each member of the First Identified State Transition (TR) Subset is a First Identified State Transition (TR) Subset Member,

said First identified State Transition (TR) Subset contains at least one First Identified TR Subset Member,

each First Identified State Transition (TR) Subset Member is one of the Identified TR Set Members,

the I/O Sequence corresponding to each First Identified State Transition (TR) Subset Member is equal to the Selected I/O Sequence, and

all Identified State Transition (TR) Set Members with corresponding I/O Sequences equal to the Selected I/O Sequence are First Identified State Transition (TR) Subset Members;

(e) providing control signals to direct a computer processor to calculate an I/O Sequence Distinctness Count by counting the First Identified State Transition (TR) Subset Members;

(f) providing control signals to direct the computer processor to calculate the I/O Sequence Distinctness Measurement (DM) by applying a transformation to the I/O Sequence Distinctness Count;

(g) providing said I/O Sequence Distinctness Measurement (DM) for storage in a memory;

(h) associating the I/O Sequence Distinctness Measurement (DM) with every one of the First Identified State Transition (TR) Subset Members;

(i) repeating steps (c)–(h) until each Identified I/O Sequence Set Member has been selected one time; and

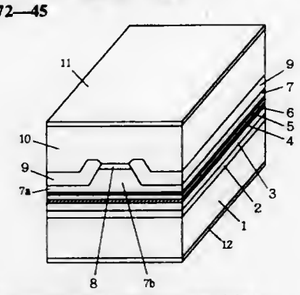
(j) utilizing at least one said I/O Sequence Distinctness Measurement (DM) in the generation of the Verification Test Sequence (VTS).

5,555,271

SEMICONDUCTOR LASER DEVICE

Shoji Honda, Tottori; Masayuki Shono, Moriguchi; Ryoji Hiroyama, Hirakata; Yasuyuki Bessho, Uji; Hiroyuki Kase, Takatsuki; Toyozo Nishida; Takahiro Uetani, both of Hirakata, and Junko Suzuki, Nara, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka-fu, Japan

Filed Dec. 23, 1994, Ser. No. 363,619
Claims priority, application Japan, Dec. 27, 1993, 5-332321; Sep. 14, 1994, 6-220212
Int. Cl.[6] H01S *3/19*
U.S. Cl. 372—45 **21 Claims**



1. A semiconductor laser device, comprising:

a GaAs semiconductor substrate of one of a first conductivity type and a second conductivity type opposite to said first conductivity type;

a first cladding layer on said GaAs semiconductor substrate of an AlGaInP system crystal of the same conductivity type as said substrate and having a lattice substantially matching the lattice of said GaAs semiconductor substrate;

an active layer on said first cladding layer;

a second cladding layer on said active layer of an AlGaInP system crystal, said second cladding layer being of a conductivity type opposite to the conductivity type of said substrate and having a lattice substantially matching the lattice of said GaAs semiconductor substrate; and

a p-type barrier cladding layer in the one of said first and second cladding layers which is p-type and/or between said one cladding layer and said active layer of an AlGaInP system crystal or an AlInP system crystal,

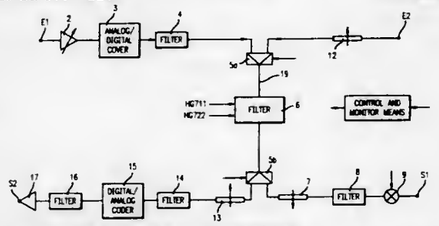
said p-type barrier cladding layer having a thickness to substantially block transmission of electrons therethrough, having tensile strain and also having band gap energy larger than that of said one cladding layer.

5,555,272

SIGNAL PROCESSING DEVICE USING SEVERAL DIFFERENT FILTERINGS, ESPECIALLY FOR AUDIO-FREQUENCY CODING OF VOICE SIGNALS

Freddy Balestro, and Patrice Senn, both of Grenoble, France, assignors to France Telecom, Paris, France

Filed Apr. 15, 1994, Ser. No. 228,479
Claims priority, application France, Apr. 16, 1993, 93 04532
Int. Cl.[6] H04B *1/38*
U.S. Cl. 375—220 **13 Claims**



1. A signal processing device, comprising:

a filter input receiving a signal with a frequency of sampling;

a single digital filter having a cutoff frequency which depends upon the sampling frequency of said signal, said single digital filter also having a single predetermined frequency attenuation template which is compatible with a plurality of substantially homothetic predetermined elementary frequency attenuation templates of different types of signals processed by said signal processing device;

a first input and a first output for respectively receiving and delivering a plurality of analog signals and corresponding digital signals having different predetermined types of receiving and delivering transmission specifications associated with substantially homothetic predetermined elementary frequency attenuation templates;

a second input and a second output for respectively receiving and delivering a plurality of digital signals and corresponding analog signals having different predetermined types of receiving and delivering transmission specifications associated with different, substantially homothetic predetermined elementary frequency attenuation templates;

first signal conversion means arranged between the first input and the first output;

second signal conversion means arranged between the second input and the second output;

wherein the single digital filter is commonly connected to said first and second signal conversion means;

a first transmission channel linking the first input with the first output;

a second transmission channel linking the second input with the second output;

a serial bus connected to said single digital filter and commonly connected to said first and second transmission channels;

means for multiplexing digital samples originating from signals received on said first and second inputs; and

means for demultiplexing digital samples originating from signals received on said first and second inputs; wherein the first channel comprises:

an analog/digital coder with shaping of a noise spectrum;

a blocker-type digital filter coupled to said analog/digital coder;

wherein the single digital filter incorporates a blocking circuit of order chosen to compensate for effects of the blocker-type digital filter;

wherein the second channel comprises:

a digital/analog coder with shaping of a noise spectrum and having a working frequency higher than frequency of digital signal originating from the single digital filter; and

further comprises an interpolating digital filter coupled between an output of the single digital filter and an input of the digital/analog coder.

5,555,273

AUDIO CODER

Toshiyuki Ishino, Toyko, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 21, 1994, Ser. No. 361,218

Claims priority, application Japan, Dec. 24, 1993, 5-326776

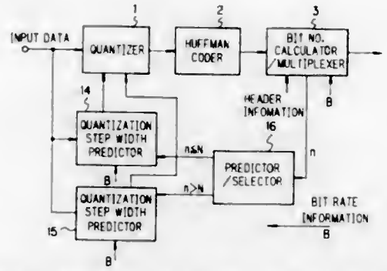
Int. Cl.[6] H04B *14/04;14/06;* **G10L** *3/02;9/00*

U.S. Cl. 375—244 **3 Claims**

1. An audio coder comprising:

quantizing means for quantizing input audio signal data with a quantization step width and outputting quantized data as a result thereof;

first predicting means for predicting the quantization step width to be supplied to said quantizing means on a basis of the input audio signal data and a number of bits of the quantized data;



second predicting means for predicting the quantization step width on the basis of the input audio signal data and the number of bits of the quantized data;

coding means for performing Huffman coding on the quantized data output by said quantizing means;

calculating means for calculating a number of bits per unit time of a coded sequence signal obtained through coding in said coding means; and

selecting means for selecting either one of said first and second predicting means on the basis of the input audio signal data and the number of bits of the quantized data,

wherein said first predicting means further predicts another wider quantizing step width by a predetermined step width when the number of bits calculated by said calculating means exceeds a predetermined value, and

wherein said selecting means selects said first predicting means when the number of bits calculated by said calculating means exceeds the predetermined value but does not exceed a threshold value N and selects said second predicting means when the number of bits calculated by said calculating means exceeds the predetermined value and the threshold value N.

5,555,274

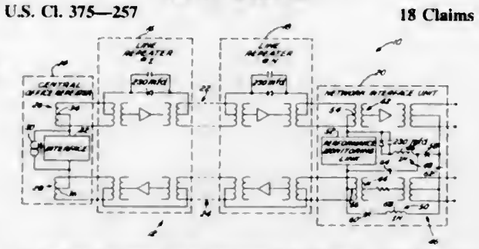
PHANTOM DATA LINK FOR DIGITAL TRANSMISSION LINES

Laurence L. Sheets, Woodridge, Ill., assignor to Teltrend Inc., St. Charles, Ill.

Filed Mar. 2, 1992, Ser. No. 844,129

Int. Cl.[6] H04B *3/00*

U.S. Cl. 375—257 **18 Claims**



1. In telecommunications transmission facilities, said facilities including a central office, a network interface unit, and two pairs of cables therebetween, said central office transmitting to and receiving from said network interface unit payload data and performance monitoring data over said pairs of cables and including a simplex lead for each of said two pairs of cables, said network interface unit also receiving from and transmitting to said central office payload data and performance monitoring data over said pairs of cable and including a simplex lead for each of said two pairs of cables, and a data link, comprising, in combination:

a central office interface, interconnected between said simplex leads in said central office, for sending and receiving payload data and performance monitoring data; and

a performance monitoring link, interconnected between said simplex leads in said network interface unit, for sending, simultaneously, payload data and performance monitoring data to said central office interface.

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MULTI-THRESHOLD AND HIERARCHICAL TELEVISION SIGNAL TRANSMISSION SYSTEM

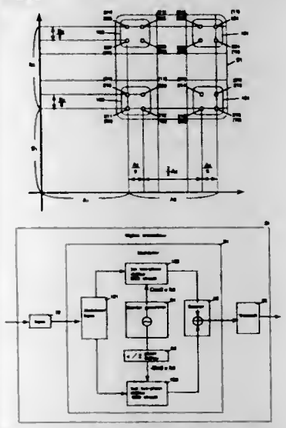
Mitsuaki Oshima, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 857,627, Mar. 25, 1992, abandoned. This application Apr. 5, 1995, Ser. No. 417,269

Claims priority, application Japan, Mar. 27, 1991, 3-062798; Apr. 25, 1991, 3-095813; May 29, 1991, 3-155650; Jul. 23, 1991, 3-182236; Mar. 17, 1992, 4-060739

Int. Cl.[6] H04L *5/12;23/02;27/22;27/20*

U.S. Cl. 375—261 **32 Claims**



1. A signal transmission apparatus comprising:

a modulator for modulating a carrier wave with an input signal to produce a modulated signal having symbols each representing a corresponding one of m signal points in a signal space diagram, where m is an integer, the modulator including means for receiving the input signal containing a first data stream of n values which carries information constituting a first television image and a second data stream which carries information enhancing a quality of the first television image so that the information carried by the first data stream and the information carried by the second data stream constitute in combination a second television image which is higher in definition than the first television image, dividing the m signal points into n signal point groups, assigning n values of the first data stream to the n signal point groups respectively, and assigning data of the second data stream to the signal points of each of the n signal point groups; and

a transmitter for transmitting the modulated signal,

wherein said modulator includes a means for shifting the signal points to other positions in the signal space diagram so that one of them which is located at a nearest position to the origin point of the I-axis and Q-axis coordinates of the diagram, is spaced Sδ from each axis wherein the m signal points are distinguishable from one another in the signal diagram by a first set of thresholds which divides the signal diagram into m regions and the n signal point groups are distinguishable from one another in the signal diagram by a second set of thresholds which divides the signal diagram more coarsely than the first set of thresholds into n regions, where δ is the distance between the nearest signal point and the I-axis or Q-axis and S is the length of shift which is more than 1.

5,555,276

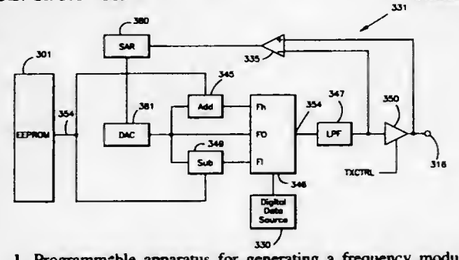
METHOD OF AND APPARATUS FOR CONTROLLING MODULATION OF DIGITAL SIGNALS IN FREQUENCY-MODULATED TRANSMISSIONS

Steven E. Koenck; Ronald L. Mahany, and William W. Frede, all of Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa

Continuation-in-part of Ser. No. 735,128, Jul. 22, 1991, which is a continuation-in-part of Ser. No. 467,096, Jan. 18, 1990, Pat. No. 5,052,020. This application Mar. 4, 1994, Ser. No. 205,639

Int. Cl.[6] H03C *3/00;* **H04L** *27/12*

U.S. Cl. 375—303 **13 Claims**



1. Programmable apparatus for generating a frequency modulated signal at a selected center frequency in accordance with digital data of at least first and second data levels, said apparatus comprising:

a) a modulator having an input and an output and being responsive to an input modulation signal applied to its input for generating at its output the frequency modulated signal at a center frequency dependent on a quiescent voltage appearing at its input;

b) means for sampling and storing a value of the quiescent voltage;

c) addressable means for storing a plurality of offsets;

d) programmable means for adding a downloaded offset voltage to the stored value of the quiescent voltage to output a high modulation voltage;

e) programmable means for subtracting a downloaded offset voltage from the stored value of the quiescent voltage to provide a low modulation voltage;

f) means for addressing in accordance with a data transmission parameter said addressable storing means and for downloading a corresponding offset to said adding means and said subtracting means; and

g) switch means coupled to said subtracting and adding means and to receive the digital data for generating and applying to said input of said modulator the input modulation signal comprising a sequence of the high and low modulation voltages in accordance respectively with the first and second .data levels of the digital data.

5,555,277

TECHNIQUE FOR CANCELLING COMMON MODE SWITCHING NOISE TO ACHIEVE REDUCED ERROR RATES IN A LOCAL AREA NETWORK

Charles E. Lawrence, Lytle; Floyd H. McDougall, and Jay W. Lundschen, both of San Antonio, all of Tex., assignors to Datapoint Corporation, San Antonio, Tex.

Filed Dec. 1, 1993, Ser. No. 160,593

Int. Cl.[6] H03D *1/04*

U.S. Cl. 375—346 **15 Claims**

1. A common mode switching noise cancellation circuit for a local area network (LAN), the LAN having a plurality of nodes connected by a communication medium; each node including a transmitter to transmit outgoing information signals over the medium, a receiver to receive incoming information signals from the medium, and a plurality of switches which connect the transmitter to the medium and disconnect the receiver from the medium to transmit outgoing information signals to the medium and which

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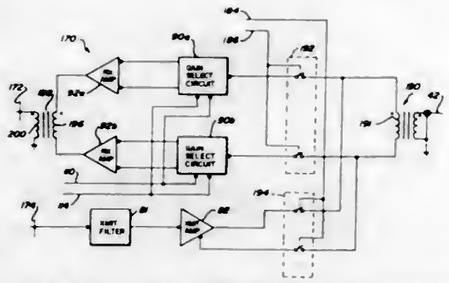
PROCESS AND DEVICE FOR PRODUCING A

positioning and retaining the fuel rods in a predetermined configuration, and the fuel rods being arranged with a predetermined pitch



connect the receiver to the medium and disconnect the transmitter from the medium to receive incoming information signals from the medium, the switch operation of connecting and disconnecting the transmitter and receiver creating common mode switching noise; said common mode switching noise cancellation circuit comprising:

a first circuit device connected to the medium and by the switches to the transmitter and the receiver, the first circuit device supplying a primary copy and an inverted copy of each incoming information signal, the common mode switching noise being essentially equal in polarity and magnitude on both the primary and inverted copies;

a first receiver amplifier connected through the switches to receive the primary copy of the incoming information signal;

a second receiver amplifier connected through the switches to receive the inverted copy of the incoming information signal;

the first and second receiver amplifiers establishing a similar level of gain for the primary and inverted copies of the incoming information signal and for the common node noise associated with each of the primary and inverted copies; and

a second circuit device connected to the first and second receiver amplifiers and operative to combine the primary and inverted copies in an additive manner to produce a reproduced version of the incoming information signal, the combination of the primary and inverted copies also effectively subtracting the common node noise in the primary and inverted copies to eliminate the effect of the common mode switching noise in the reproduced version of the incoming information signal.

5,555,278

SEMICONDUCTOR CIRCUIT HAVING PHASE LOCK FUNCTION

Harufusa Kondoh, Hyogo-ken, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 118,814, Sep. 10, 1993, abandoned. This application Apr. 11, 1995, Ser. No. 420,400

Claims priority, application Japan, Sep. 21, 1992, 4-251426

Int. Cl.[6] H03D *3/24*

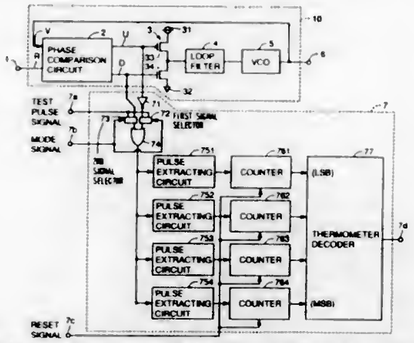
U.S. Cl. 375—376 **8 Claims**

1. A semiconductor circuit having a phase lock function formed on a semiconductor chip, comprising:

phase locked loop means including phase comparison means for comparing the phases between an input signal and a feedback signal to provide a pulse signal having a pulse width according to the phase difference,

a plurality of signal extracting means each receiving said pulse signal for extracting a pulse signal having a pulse width exceeding a corresponding predetermined pulse width,

a plurality of determination means provided corresponding to said plurality of signal extracting means, each counting the pulse signal extracted by the corresponding signal extracting means to determine whether the count result within a first predetermined time period reaches a predetermined number, and



evaluation signal output means for providing an evaluation signal of said phase locked loop means according to the determination results of said plurality of determination means.

5,555,279

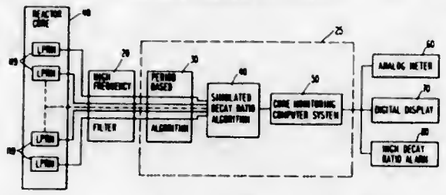
SYSTEM FOR MONITORING AND CONTROLLING NUCLEAR REACTORS

Israel Nir, 1755 Plantation Blvd., Jackson, Mich. 39211, and Christofer M. Mowry, 445 Wexford Overlook Dr., Roswell, Ga. 30075

Filed Nov. 16, 1994, Ser. No. 340,586

Int. Cl.[6] G21C *7/36*

U.S. Cl. 376—216 **36 Claims**



1. A computer-based power oscillation monitoring system for detection and indication of thermal-hydraulic stability margin in a nuclear reactor having a core including a plurality of fuel assemblies, said system comprising:

a) a plurality of neutron flux detectors in the nuclear reactor core contiguous to the fuel assemblies, said plurality of flux detectors being distributed throughout the reactor core, said plurality of flux detectors providing a like plurality of output signals, each output signal being indicative of the neutron flux of the portion of the core adjacent the corresponding flux detector;

b) a computer-based detector processing system utilizing:

i) a means for determining a density-wave related periodicity signal for each flux detector output signal utilizing a period-based algorithm; and

ii) a means for generating a simulated decay ratio signal for the reactor core, based on the periodicity signals utilizing a simulated decay ratio algorithm; and

c) a corrective signal means for improving reactor stability margin when said simulated decay ratio signal reaches a predetermined level.

5,555,280

PROCESS AND DEVICE FOR PRODUCING A LEAKPROOF PROTECTIVE COATING ON A SURFACE OF A NUCLEAR REACTOR COMPONENT

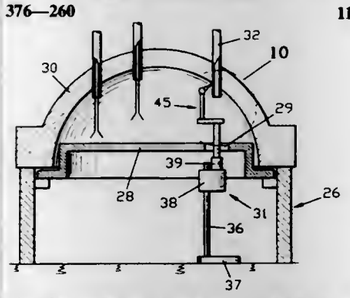
Jean-Pierre Cartry, Lyons, France, assignor to Framatome, Courbevoie, France

Filed Dec. 30, 1994, Ser. No. 366,572

Claims priority, application France, Dec. 30, 1993, 93 15931

Int. Cl.[6] G21C *19/00*

U.S. Cl. 376—260 **11 Claims**



10. Device for producing a protective coating on the inner surface of a tubular adapter passing through the reactor vessel head of a pressurized water nuclear reactor, the reactor vessel head being deposited on a servicing stand and accessible from below through an opening in a protective wall, comprising a vertical column fastened to a support resting on a supporting surface of the stand below an adapter in vertical position, a platform mounted so as to move in the vertical direction on the column, a vertical support mounted so at to rotate about a vertical axis on the platform and a semitransferred arc plasma torch fastened to an upper end of the rotary support.

5,555,281

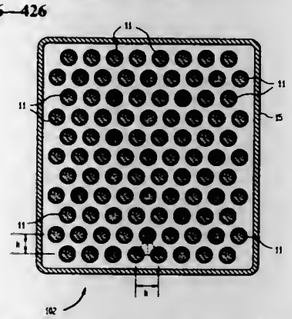
TRIANGULAR LATTICE FOR LWR SQUARE FUEL ASSEMBLIES

Harold E. Williamson, Richland, and Kenneth V. Walters, Kennewick, both of Wash., assignors to Siemens Power Corporation, Richland, Wash.

Filed Sep. 30, 1994, Ser. No. 315,379

Int. Cl.[6] G21C *3/30*

U.S. Cl. 376—426 **8 Claims**



2. A nuclear fuel assembly for boiling water reactors, the assembly having a plurality of elongated parallel fuel rods supported between a lower tie plate positioned toward the bottom of the assembly and an upper tie plate positioned toward the top of the assembly, an outer channel surrounding the plurality of fuel rods and having a substantially square cross-sectional area for conducting coolant/moderator about the fuel rods from the bottom of the assembly toward the toe of assembly, at least one spacer for positioning and retaining the fuel rods in a predetermined configuration, and the fuel rods being arranged with a predetermined pitch in an array of 9×11 where the centers of the fuel rods are located at the vertices of isosceles triangles, wherein each of the isosceles triangles has a base and a height and the ratio of the height to the base is about 0.8.

5,555,282

Patent Not Issued For This Number

5,555,283

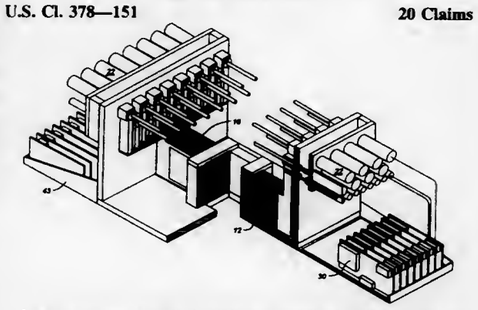
COMPUTER-CONTROLLED MINIATURE MULTILEAF COLLIMATOR

Almon S. Shiu, Bellaire; James R. Ewton, Pearland; Henry E. Rittichier, Missouri City; Jeremy Wong, Houston, and Samuel S. Tung, Missouri City, all of Tex., assignors to Board of Regents of the University of Texas System, Austin, Tex.

Filed Jun. 7, 1995, Ser. No. 488,404

Int. Cl.[6] G21K *1/02*

U.S. Cl. 378—151 **20 Claims**



1. A computer-controlled miniature multileaf collimator for use in small radiation field treatments and capable of dynamically shaping a radiation beam projected at isocenter, from a radiation source, comprising:

a. a first bank of tapered leaves arranged in a substantially stacked configuration, each leaf having a proximal edge nearest to a radiation source, a distal edge furthest from a radiation source, and a leading edge perpendicular to said proximal edge, each of said leaves being sufficiently thin such that when the distal edge of each leaf is spaced approximately 75 centimeters from a radiation source projected at isocenter, the projected width of each leaf at isocenter is less than 5 millimeters;

b. a second bank of tapered leaves arranged in a substantially stacked configuration and said second bank containing at least as many leaves as said first bank, each leaf having a proximal edge nearest to a radiation source, a distal edge furthest from a radiation source, and a leading edge perpendicular to said proximal edge and facing the leading edge of a leaf in said first bank, each of said leaves being sufficiently thin such that when the distal edge of each leaf is spaced approximately 75 centimeters from a radiation source projected at isocenter, the projected width of each leaf at isocenter is less than 5 millimeters;

c. a drive shaft attached to each leaf such that axial movement of the drive shaft results in movement of a leaf in one of said banks toward or away from a leaf in the other of said banks;

d. a reversible motor coupled to each drive shaft and capable of axially displacing each drive shaft, resulting in displacement of each leaf along an axis parallel to the proximal edge of the leaf;

e. a first position-indicating device coupled to each motor and

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MULTIVARIATE SYSTEM HAVING AN INTELLIGENT

nications channel to a corresponding conditioned output signal to the communications channel,

message and for actuating said synthesized verbal message providing means to modulate said transmitter section with

e. a first position-indicating device coupled to each motor and capable of detecting the position of each leaf and transmitting a first signal indicative of each leaf's position, said device further capable of detecting axial movement of each leaf of less than 0.1 millimeters;

f. a motor controller electrically coupled to each motor, said controller comprising a memory capable of receiving, storing, and transmitting a signal indicative of the position of the leaf coupled to the drive shaft that is coupled to the motor to which the controller is coupled, and said controller further capable of receiving a signal from said position indicating device and transmitting a signal to the motor to change the position of the drive shaft a predetermined distance; and

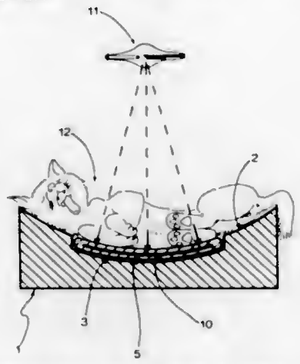
g. a programmable computer comprising a memory capable of storing desired position data for each leaf for a multiplicity of predetermined radiation beam shapes, and a display screen capable of indicating the position of each leaf, said computer further comprising a comparator electrically coupled to receive signals from said first position-indicating device, to compare said signals to desired position data stored in memory for each leaf, and to transmit a message to the display screen if the difference between the position indicated by the position-indicating signal and the desired position for any leaf is not within a predetermined tolerance.

5,555,284

ROENTGENOGRAPHY OF VERTEBRAL COLUMN AND THE DEVICES USED THEREFOR

Yoshihiro Kishigami, 1-6-1, Maruyama Dr., Abeno-ku, Osaka, Japan

Filed Dec. 16, 1994, Ser. No. 357,584
Int. Cl.[6] G03B *12/02*
U.S. Cl. 378—177 **2 Claims**



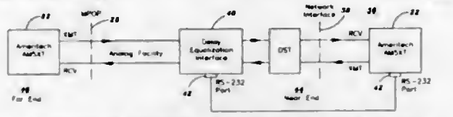
1. A roentgenography of the vertebral column of a patient comprising the steps of laying said patient on a concavely curved X-ray film set on the top of a semi-ring curved photographic stand in such that radius of curvature of said concavely curved X-ray film is equal to a distance between said X-ray film and X-ray tube positioned over said patient laid on the X-ray film to curve the vertebral column of said patient into a circularly arched shape corresponding to the shape of said concavely curved X-ray film, and irradiating X-ray from said X-ray tube positioned at the center of said circular arch upon said vertebral column.

5,555,285

MULTI-VARIATE SYSTEM HAVING AN INTELLIGENT TELECOMMUNICATIONS INTERFACE WITH AUTOMATIC ADAPTIVE DELAY DISTORTION EQUALIZATION (AND RELATED METHOD)

Javier J. Tapia, Wheaton; Richard R. McBeth, Sugar Grove, and Paul E. O'Neil, St. Charles, all of Ill., assignors to Westell Incorporated, Aurora, Ill.

Filed Mar. 30, 1995, Ser. No. 413,421
Int. Cl.[6] H03H *7/40;* **H04M** *3/08;7/04*
U.S. Cl. 379—28 **27 Claims**



3. A method of envelope delay distortion equalization of a transmit and/or receive signal path of an associated analog communications channel, the analog communications channel comprising a telephone line of a telecommunications network, the communications channel selected from a plurality of available communications channels, the communications channel having an associated analog signal having an associated frequency and an associated phase, comprising the steps of:

operatively locating an intelligent envelope delay distortion equalization telecommunications interface means at a predetermined location within the transmit signal path and/or the receive signal path of the communications channel, the predetermined location selected from a plurality of available locations positioned between the end-user location and the telecommunications network;

originating a predetermined test in response to a command from a predetermined location, the predetermined location selected from a plurality of available locations positioned between the end-user location and the telecommunications network;

aligning the interface means in the signal path, thereafter, in response to a predetermined test actuated by the interface, the interface means including associated processor means, said processor means having associated logic operatively coupled thereto, thereafter said processor means acquiring information directed to determine the actual envelope delay distortion present for predetermined frequency ranges of the communications channel, thereafter said processor means determining variables with respect to said predetermined frequency ranges in accordance with a predetermined manner in which (i) the phase of the signal in accordance with a first determination comprising a predetermined first stage directed to the signal conditioning of the phase of the signal, and (ii) the phase of the signal in accordance with a second determination comprising a predetermined second stage directed to the signal conditioning of the phase of the signal, thereafter, the processor storing the acquired information and the variables in associated nonvolatile memory, the alignment means operatively coupled to an associated signal processing means, thereafter the processor means providing an output signal to the signal processing means;

digital signal processing the signal in a predetermined manner, the interface means including digital signal processing means having associated logic operatively coupled thereto, the signal processing means determining the requisite phase shift of the signal for the predetermined frequency ranges to compensate for the envelope delay distortion for the communications channel, the signal processing means operatively coupled to an associated digital adaptive all pass filter means; and

digital adaptive all pass filtering the signal in a predetermined manner, the interface means including digital adaptive all pass filter means, the filter means having associated logic operatively coupled thereto, the filter means having an automatically variable center all-pass filter which facilitates the shifting of the phase of the signal over predetermined frequencies, the filter means acting to modify the signal in a manner which compensates for the envelope delay distortion for the communications channel to a corresponding conditioned output signal to the communications channel,

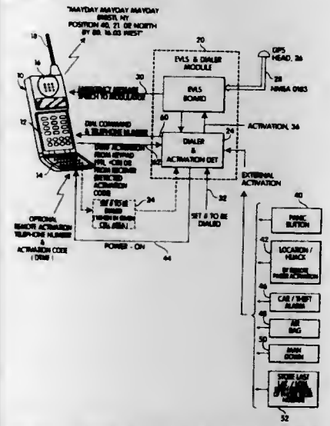
whereby, pre and post delay distortion equalization is achieved for a plurality of predetermined frequency ranges for said telephone line.

5,555,286

CELLULAR PHONE BASED AUTOMATIC EMERGENCY VESSEL/VEHICLE LOCATION SYSTEM

Robert K. Tendler, Chestnut Hill, Mass., assignor to Tendler Technologies, Inc., Chestnut Hill, Mass.

Continuation of Ser. No. 189,135, Jan. 31, 1994, abandoned. This application Aug. 14, 1995, Ser. No. 515,100
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—59 **7 Claims**



1. An emergency location system for transmitting a synthesized voice message including geographic coordinates from one location to another over a cellular phone at the time of an emergency, comprising:

a cellular phone at said one location, said cellular phone including a transmitter having a modulation section means for generating DTMF tones corresponding to a telephone number, keypad generating signals for controlling said means for generating DTMF tones to dial telephone numbers, means for transmitting said tones to place a call and a bus for controlling said phone and for coupling remotely generated analog audio signals corresponding to an emergency message the modulation section of said transmitter;

means coupled to said bus for providing said remotely generated audio signals to said modulation section said said signals including a predetermined synthesized verbal message including the geographic coordinates of said phone for the modulation thereof;

means for providing an emergency message transmission activation signal; and

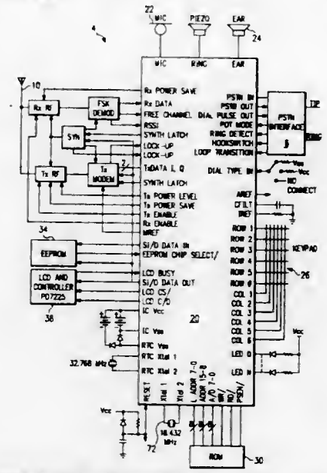
a dialer/activation detector coupled to said bus and electrically interposed between said keypad and said means for generating said DTMF tones and responsive to the provision of said activation signal for locking out said keypad during said emergency message and for generating output signals to capture the operation of said cellular phone so as to control the dialing operation thereof from said dialer/activation detector only during said emergency message transmission, and relinquishing said control after said emergency message has been transmitted, said dialer/activation detector including means for causing said DTMF tone generating means to provide tones for dialing predetermined telephone number by interrupting portion of said keypad during said emergency message, thus effectuate a substitution of said dial at output signals said keypad generated signals during said emergency message and for actuating said synthesized verbal message providing means to modulate said transmitter section with said emergency message.

5,555,287

INTEGRATED CIRCUIT AND CORDLESS TELEPHONE USING THE INTEGRATED CIRCUIT

Dale E. Gulick; Joseph W. Peterson; James E. Bowles; John G. Bartkowiak, all of Austin, Tex.; Munehiro Yoshikawa, Tokyo, Japan; Shin Saito, Tokyo, Japan, and H. Matsubara, Tokyo, Japan, assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 21, 1992, Ser. No. 918,627
Int. Cl.[6] H04Q *7/32*
U.S. Cl. 379—61 **17 Claims**



1. An integrated circuit comprising:

(a) an external interface portion, said external interface portion comprising:

(i) means for operatively connecting an external keypad thereto;

(ii) means for operatively connecting an external memory thereto;

(iii) means for operatively connecting an external oscillator thereto;

(iv) means for operatively connecting an external transceiver thereto;

(v) a serial port;

(vi) a parallel port; and

(vii) an audio interface subportion;

(b) an audio path portion, said audio path portion comprising:

(i) a codec, said codec operatively connected to said audio interface subportion;

(ii) an ADPCM, said ADPCM directly connected to said codec to define a codec/ADPCM element which is further directly connected to said serial port;

(iii) a first and a second FIFO operatively connected to said ADPCM; and

(iv) a tone ringer operatively connected to said audio interface subportion; and

(c) a system control portion, said system control portion comprising:

(i) a microcontroller directly connected to said parallel port;

(ii) a frame formatter operatively connected to said microcontroller;

(iii) a battery level detector;

(iv) a RSSI A/D converter;

(v) a real time clock;

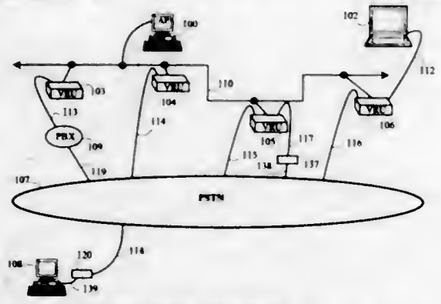
(vii) means for scanning a keypad connected to said means for operatively connecting an external keypad thereto;

5,555,291

METHOD AND SYSTEM FOR AUTOMATICALLY

(vii) means for scanning a keypad connected to said means for operatively connecting an external keypad thereto;
(viii) an interrupt controller, said interrupt controller operatively connected between said microcontroller and said means for scanning a keypad; and
(ix) a clock generator, said clock generator connected between said microcontroller and said means for operatively connecting an external audio path portion thereto.

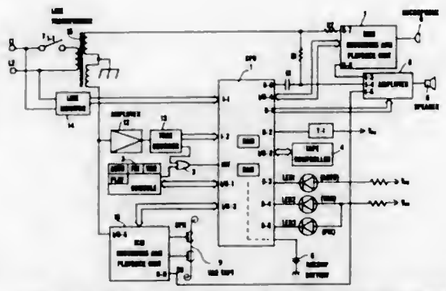
5,555,288
VOICE PROCESSING SYSTEM WITH A CONFIGURABLE TELEPHONE LINE INTERFACE
Keith H. Angelini, North Billerica, Mass., assignor to Voicetek Corporation, Chelmsford, Mass.
Filed Apr. 12, 1994, Ser. No. 227,307
Int. Cl.[6] H04M *1/64*
U.S. Cl. 379—67 **23 Claims**



1. A voice response system comprising:
an interface unit coupled to a plurality of trunk groups each comprising a plurality of channels which each operate in accordance with a set of operating parameters; and
a control unit comprising
a plurality of trunk type configuration files, each file corresponding to each unique set of operating parameters, each file containing values corresponding to certain operating parameters within said set, and
a server process responsive to each unique set of said values contained in a configuration file and to events received over said channels for responding to said events in accordance with said values.

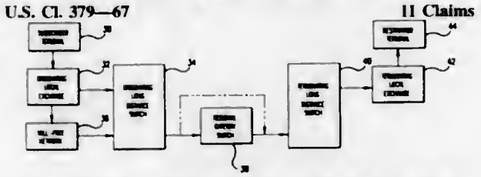
5,555,289
TELEPHONE ANSWERING DEVICE WITH OPERATING STATUS CONFIRMATION MEANS
Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan
Filed Mar. 22, 1995, Ser. No. 408,525
Claims priority, application Japan, Mar. 22, 1994, 6-073750
Int. Cl.[6] H04M *1/64*
U.S. Cl. 379—67 **11 Claims**

1. A telephone answering device with operating status confirmation means, wherein when a ringing signal is detected, a telephone line is engaged, an outgoing message is transmitted, and a message from a caller is recorded, said device comprising:
first control means for limiting recording length of an incoming message from a caller to a predetermined time period;
second control means for enabling recording of an incoming message from a caller until said caller places telephone on-hook;
means for switching between said first control means and said second control means;



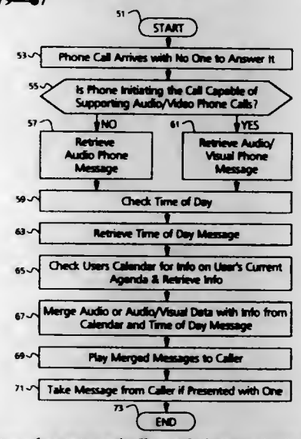
means for indicating, by means of a distinguishable audible signal, which of said two control means is selected when said switching means switches said first and second control means for one to another; and
means for indicating by means of an audible signal which of said two control means is selected when said device is set to answer mode, said audible signal corresponding to one of said two control means which is currently selected by said switching means.

5,555,290
LONG DISTANCE TELEPHONE SWITCHING SYSTEM WITH ENHANCED SUBSCRIBER SERVICES
Clark E. McLeod; Steven J. Hogan, both of Cedar Rapids; Kristi T. Feltz, Iowa City; Douglas R. Murdock, Cedar Rapids, all of Iowa, and Van E. Hanson, Forest, Va., assignors to MCI Communications Corporation, Washington, D.C.
Continuation of Ser. No. 32,594, Mar. 17, 1993, abandoned, which is a division of Ser. No. 513,956, Apr. 23, 1990, Pat. No. 5,222,120. This application Apr. 11, 1995, Ser. No. 420,331
Int. Cl.[6] H04M *3/50;11/08;15/12*
U.S. Cl. 379—67 **11 Claims**



4. A method for providing at least one subscriber at least one authorized enhanced service to a caller through a long distance telephone switching system, comprising the steps of:
receiving a call placed by said caller from any telephone with which communications with said long distance telephone switching system may be established;
generating a call detail record containing information relating to said call;
receiving an enhanced service request code from said caller relating to said one authorized enhanced service of a plurality of enhanced services available through said long distance telephone switching system;
generating a billing detail record containing information relating to said authorized enhanced service requested by said caller; and
generating a subscriber bill based on the information contained in said call detail record and the information contained in said billing detail record.

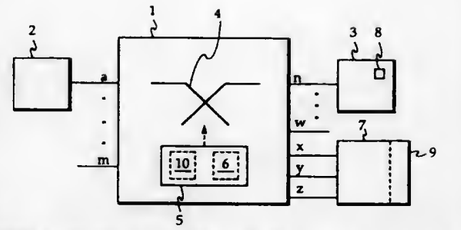
5,555,291
METHOD AND SYSTEM FOR AUTOMATICALLY UPDATING TELEPHONE RESPONSE MECHANISM
Hadyn Inniss, Farmington Hills, Mich.; Sheila Scaggs, Fort Worth, and Robert P. Welch, Colleyville, both of Tex., assignors to International Business Machine Corporation, Armonk, N.Y.
Continuation of Ser. No. 15,938, Feb. 10, 1993, abandoned. This application Jul. 14, 1995, Ser. No. 502,877
Int. Cl.[6] H04M *1/64*
U.S. Cl. 379—67 **4 Claims**



3. A system for automatically updating a telephone response mechanism, said telephone response mechanism providing a response to a caller, comprising:
a) means for retrieving a first message portion;
b) means for providing a plurality of information sets in a preselected database in a data processing system and for providing each of said information sets with an access attribute;
c) means for determining a time of receipt of a call from said caller;
d) means for selecting an information set from said plurality of information sets in said database based upon said determined time of receipt of a call from said caller and for determining from said access attribute of said selected information set, if access to said selected information set on said database by said caller is authorized and if authorized, then for retrieving said selected information set from said database and creating a second message portion from said retrieved information set;
e) means for playing said first message portion and said second message portion to said caller in a sequential manner.

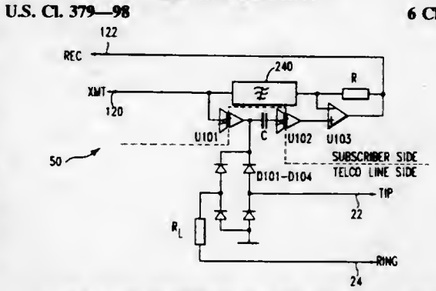
5,555,292
PABX WITH VOICE MAIL DEVICE
Wolfgang Eckhart, Wien, Austria, assignor to Alcatel N.V., Rijswijk, Netherlands
Continuation-in-part of Ser. No. 443,327, May 17, 1995, abandoned. This application Oct. 11, 1995, Ser. No. 541,110
Claims priority, application Austria, Jun. 1, 1995, 1120/94
Int. Cl.[6] H04M *1/64;3/42*
U.S. Cl. 379—67 **3 Claims**

1. A telephone exchange (1) with a voice mail device (7), which stores voice messages arriving from a first telephone (2) used by a first subscriber and intended for a second subscriber using a second telephone (3) in a mailbox (9) assigned to the second subscriber, and to send the voice messages to the second telephone (3) upon the second subscriber's request, where the telephone exchange (1) includes a control device (5) which contains a process control (10) for controlling a selected mailbox (9), where in the event that all connection paths (x, y, z) to the voice mail device (7) are busy



during a call made by the first subscriber, who then orders an automatic call-back when a connection path of the voice mail device becomes available, the process control (10) stores a telephone number of the voice mail device (7) and, after a connection path (x, y, z) becomes available, keeps it open for the first subscriber, then calls the first subscriber and, after the first subscriber lifts the receiver of the first telephone (2), connects the first subscriber with the voice mail device (7), characterized in that the process control (10) after said first subscriber orders the automatic call-back also stores the telephone number of the second telephone (3) and, after performing the automatic call-back sends the telephone number of the second telephone (3) to the voice mail device (7), which then connects the first telephone (2) with the mailbox (9) of the second subscriber.

5,555,293
OPTICALLY-COUPLED DATA ACCESS ARRANGEMENT AND TRANSHYBRID
Robert Krause, Menlo Park, Calif., assignor to Siemens Components, Inc., Cupertino, Calif.
Division of Ser. No. 191,841, Feb. 4, 1994. This application Mar. 23, 1995, Ser. No. 409,562
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—98 **6 Claims**



1. A data access arrangement for interconnecting a telephone network of tip and ring lines and a subscriber digital data bus, comprising:
a modem for bidirectionally converting analog signals to digital signals, having a bidirectional digital bus port for connection to the subscriber digital data bus, an analog transmit port, and an analog receive port; and
means for connecting the modem to the telephone network and isolating the modem from the telephone network, the means for connecting and isolating having
first means for transferring signals received on the tip and ring lines of the telephone network to the analog receive port of the modem and suppressing signals originating at the analog transmit port of the modem, the first means having an output provided to the analog receive port of the modem;
second means for isolating the tip and ring lines of the telephone network from the modem and transferring signals originating at the analog transmit port of the modem to the tip and ring lines of the telephone network, the second means being connected between the analog transmit port of the modem and the tip and ring lines of the telephone network; and

third means for isolating the tip and ring lines of the telephone network from the modem and transferring signals received on the tip and ring lines of the telephone network, the third means being connected between the tip and ring lines of the telephone network and the first means.

5,555,294

COMMUNICATION METHOD AND APPARATUS

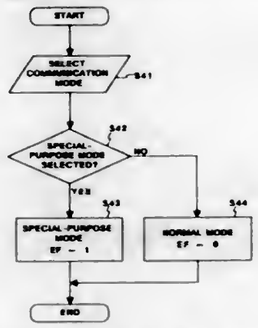
Shintaro Abe, Fujisawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 224,997, Apr. 7, 1994, abandoned, which is a continuation of Ser. No. 708,215, May 31, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 483,890

Claims priority, application Japan, Jun. 5, 1990, 2-145468; Jun. 26, 1990, 2-165654

Int. Cl.[6] H04M *11/00*

U.S. Cl. 379—100 **29 Claims**



1. A communication apparatus capable of communication through a plurality of communication channels, wherein plural independent communications can be performed concurrently over respective communication channels, each independent communication being performed in one of a plurality of different types of communication modes, and each communication channel being capable of performing communication in any of the types of communication modes, said apparatus comprising:

setting means for setting a special purpose mode to limit availability for use of the plurality of communication channels for performing communication in a kind of the types of communication modes;

input means for inputting a communication request including the type of communication mode; and

communication control means, responsive to the communication request, for discriminating whether the type of communication mode corresponding to the communication request is currently being performed through some of the plurality of communication channels, for discriminating whether an available communication channel exists, and for performing a communication corresponding to the communication request in accordance with the type of communication mode which is currently being performed and the available communication channel,

wherein, in a case where the special purpose mode is set, said communication control means performs a communication corresponding to the communication request in accordance with the discrimination of whether the type of the communication mode is currently being performed even if the available communication channel exists, and

in a case where the special purpose mode is not set, said communication control means performs the communication corresponding to the communication request by using the available communication channel.

5,555,295

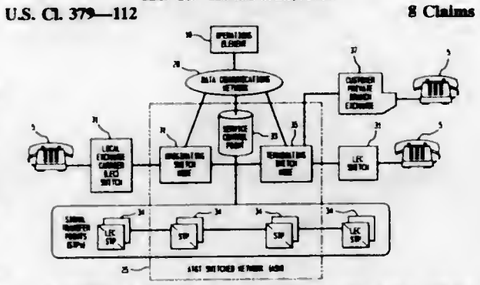
SERVICE AND INFORMATION MANAGEMENT SYSTEM FOR A TELECOMMUNICATIONS NETWORK

Gurcharan S. Bhusri, Holmdel, N.J., assignor to AT&T Corp., Murray Hill, N.J.

Filed May 16, 1995, Ser. No. 442,526

Int. Cl.[6] H04M *3/22;15/00*

U.S. Cl. 379—112 **8 Claims**



1. A method of measuring an amount of time which elapses between a calling party dialing a phone number of a called party and the calling party hearing a ringback tone indicating that the called party has been alerted to a telephone call, comprising:

transmitting from a first telecommunications element in the geographic area of the calling party to an originating network element in the geographic area of the calling party a first message indicating that the phone number of the called party was dialed by the calling party;

copying the first message;

appending transaction information to the copied first message having a time stamp indicating when the first message was received by the originating network element, so that the appended information and the copied first message form a first information packet;

forwarding the first information packet from the originating network element to a communications unit;

transmitting to the originating network element a second message indicating that the called party was alerted to the call;

copying the second message;

appending transaction information to the copied second message having a time stamp indicating when the second message was received by the originating network element, so that the appended information and the copied second message form a second information packet;

forwarding the second information packet from the originating network element to the communications unit; and

subtracting the value of the time stamp in the first information packet from the value of the time stamp in the second information packet to obtain a first component of delay.

5,555,296

PAY TELEPHONE STAND

Charles R. McCloskey, 139 Shoemaker Ave., Ste. D, Norwalk, Calif. 90650-4533

Filed Dec. 5, 1994, Ser. No. 349,564

Int. Cl.[6] H04M *17/00;1/00;9/00*

U.S. Cl. 379—145 **16 Claims**

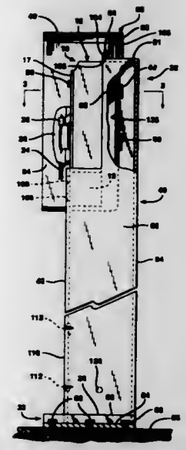
1. A stand for a coin-operated machine having an exterior, an interior protected by said exterior, a coin collection box within said interior, and a coin box access door in said exterior, comprising:

a base firmly attached to an underlying support;

a hollow, upright column permanently secured to said base and having vertical enclosing walls and defining an upper end with a seating opening therein for seating said coin-operated machine therewithin such that said coin-operated machine is laterally confined within said enclosing walls;

a mount located internally within said enclosing walls proximate said seating opening;

a fastener inaccessible from the exterior of said coin operated machine for securing said coin-operated machine to said



mount, and wherein said upright column defines a coin box door access opening in said enclosing walls below said upper end for providing authorized access to said coin box door of said coin-operated machine.

5,555,297

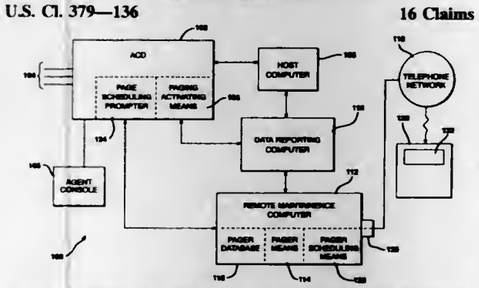
AUTOMATIC CALL DISTRIBUTOR REPORTING SYSTEM AND METHOD THEREFOR

Victor V. Ochy, Woodridge, and Jeffrey D. Hodson, Wheaton, both of Ill., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed May 18, 1995, Ser. No. 443,500

Int. Cl.[6] H04M *3/22*

U.S. Cl. 379—136 **16 Claims**



1. An automatic call distributor reporting system for transmitting data reports through a telephone network for display on at least one of a plurality of remote electronic display devices, each of the data reports and each of the remote electronic display devices being associated with at least one of a plurality of supervisors, the system comprising:

an automatic call distributor for routing a plurality of incoming telephone calls to a plurality of agent units and for generating data representative of operation of the automatic call distributor;

a data reporting system for periodically receiving the data from the automatic call distributor, for formatting the data for proper transmission through the telephone network to at least one of the plurality of remote electronic display devices and for transmitting the formatted data to the telephone network for display on at least one of the plurality of remote electronic display devices; and

paging activating means in the automatic call distributor for activating and deactivating the transmission of the formatted data from the data reporting system to each individual remote electronic display device.

5,555,298

METHOD AND SYSTEM FOR ESTABLISHING A CONNECTION BETWEEN PARTIES IN A NETWORK

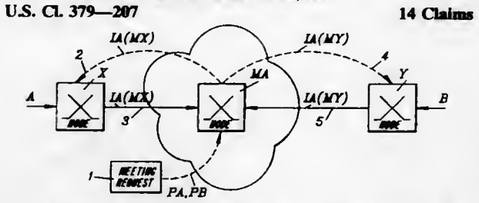
Björn E. R. Jonsson, Järfälla, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Feb. 16, 1993, Ser. No. 18,214

Claims priority, application Sweden, Feb. 17, 1992, 9200469

Int. Cl.[6] H04M *3/42;7/00*

U.S. Cl. 379—207 **14 Claims**



1. A method of establishing in real time a connection between a first party and a second party via at least one telecommunication network, said parties having previously agreed upon to establish communication therebetween and, as a result thereof, a first call from said first party has arrived to a first node of the network and a second call from said second party has arrived to a second node of the network, said method comprising the steps of:

selecting any of the switching nodes of said network as a meeting place;

reserving first and second idle interaction numbers in said selected switching node, said interaction numbers being selected in the number series of said selected switching node;

creating a first assignment process in said first node;

creating a second assignment process in said second node, said first assignment process making an outgoing call using the first interaction number, said second assignment process making an outgoing call using the second interaction number;

routing said outgoing calls through said network to said selected node; and

interconnecting with each other incoming calls to said selected node that as destination use said first and second interaction numbers.

5,555,299

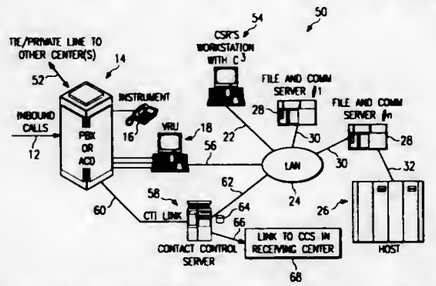
METHOD AND SYSTEM FOR TRANSFERRING CALLS AND CALL-RELATED DATA BETWEEN A PLURALITY OF CALL CENTERS

Michael J. Maloney, Plano, Tex.; Bruce L. Hitson, Mountain View, and David T. McCalmont, San Jose, both of Calif., assignors to Teknekron Infoswitch Corporation, Fort Worth, Tex.

Continuation of Ser. No. 329,677, Oct. 26, 1994, abandoned, which is a continuation of Ser. No. 89,111, Jul. 8, 1993, abandoned. This application Jul. 14, 1995, Ser. No. 502,596

Int. Cl.[6] H04M *3/58*

U.S. Cl. 379—212 **20 Claims**



1. A system for transfemng a voice component and a related data component of a call from a first workstation and associated voice instrument to a second workstation and associated voice instrument, comprising:

a first call distribution circuit for first receiving a call comprising

a microphone signal, produces a sidetone speaker signal corre-

rent to the alerting mechanism and alternately discharging

hollow gear shaft at the center mounted around the bottom

a first call distribution circuit for first receiving a call comprising a voice component, and wherein said first call distribution circuit is further operable to distribute said voice component to said first voice instrument;

a first contact control server coupled to said first call distribution circuit for generating a data component related to said voice component;

a first workstation coupled to said first contact control server for receiving said data component, said first workstation comprising a first set of control instructions for generating a transfer screen from said data component;

a second call distribution circuit for receiving said voice component via a first communication path from said first call distribution circuit and distributing said voice component to said second voice instrument;

a second contact control server for receiving said transfer screen from said first contact control server via a second communication path;

a second workstation coupled to said second contact control server for receiving said transfer screen;

transfer initiating instructions within said first set of control instructions for initiating a transfer instruction to transfer said transfer screen from said first workstation to said second workstation and said voice component from said first voice instrument to said second voice instrument;

transfer instructions within said first contact control server for responding to said transfer initiating instructions, said transfer instructions comprising:

voice component directing instructions for transferring said voice component from said first voice instrument through said first call distribution circuit and said first communication path to said second call distribution circuit and further to said second voice instrument,

unique identifier generating instructions for generating a unique identifier for relating said voice component with said transtar screen and for supplying said unique identifier as dialed number digits and further directing said unique identifier as said dialed number digits along with said voice component via said first communication path to said second call distribution circuit, and

transfer screen directing instructions for directing said transfer screen along with said unique identifier and a voice connect message via said second communication path to said second contact control server; and

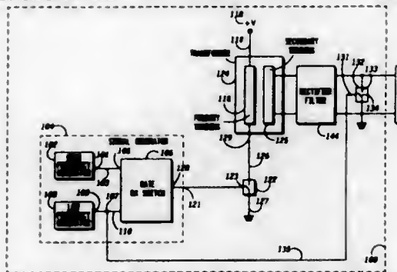
receiving instructions within said second contact control server for receiving said transfer screen and said unique identifier from said first contact control server, relating said voice connect and message said transfer screen using said unique identifier, and transferring said related transfer screen to said second workstation.

5,555,301

POWER SUPPLY APPARATUS AND METHOD FOR ENERGIZING TELEPHONE ALERTING MECHANISMS AND CIRCUITRY

Barry Boike, Cullman, and David H. Nabors, Huntsville, both of Ala., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 21, 1994, Ser. No. 360,916
Int. Cl.[6] H04M *19/00*
U.S. Cl. 379—413 **30 Claims**



1. A power supply apparatus in a data communications device for energizing telephone alerting mechanisms, the data communications device capable of receiving an incoming telephone call for transmitting data, the power supply apparatus being couplable to a low voltage direct current source to provide energy to the power supply apparatus, the power supply apparatus further couplable to a telephone alerting mechanism, the power supply apparatus comprising:

a signal generator, the signal generator when energized producing a control signal and a reversing switch signal in response to the incoming telephone call;

a first switch coupled to the signal generator, the first switch having a control terminal to open and close the first switch in response to the control signal, the first switch having a first terminal and a second terminal, the first terminal coupled to a common ground;

a transformer having a primary winding and a secondary winding, the primary winding having a first end and a second end, the first end of the primary winding couplable to the low voltage direct current source, the second end of the primary winding coupled to the second terminal of the first switch, such that in the presence of the low voltage direct current source, the opening and closing of the first switch generates a time varying current in the primary winding and thereby inducing a high voltage alternating current across the secondary winding;

a rectifier filter coupled in parallel to the secondary winding to produce a high voltage direct current in the presence of the high voltage alternating current across the secondary winding; and

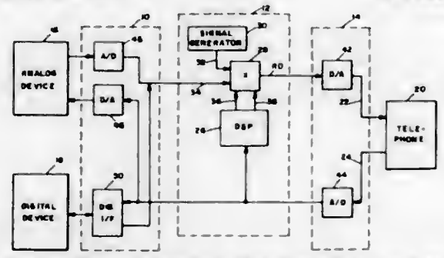
a second switch coupled to the signal generator, further coupled to the rectifier filter and couplable to an alerting mechanism, the second switch further having a control terminal to open and close the second switch in response to the reversing switch signal, thereby providing the high voltage direct current to the alerting mechanism and alternately discharging energy from the alerting mechanism.

5,555,300

TELEPHONE HANDSET MICROPHONE LEVEL ADJUSTMENT

Howard A. Gutzmer, 4335 Grace Rd., Bonita, Calif. 92002

Filed Mar. 7, 1994, Ser. No. 206,944
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—395 **28 Claims**



1. A signal level adjustment apparatus connectable to a telephone instrument, wherein the telephone instrument, in response to a microphone signal, produces a sidetone speaker signal corresponding to the microphone signal, the apparatus comprising:

telephone interface means for receiving a speaker signal from a telephone instrument and for providing a microphone signal to said telephone instrument, said speaker signal having a speaker signal level, said microphone signal having a microphone signal level;

device interface means for receiving a device signal from a telecommunications device; and

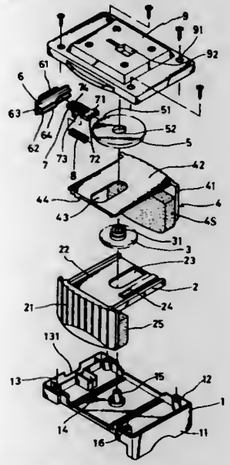
adaptation means for receiving said speaker signal, for producing said microphone signal in response to said device signal, and for adjusting said microphone signal level in response to said speaker signal corresponding to said microphone signal.

5,555,302

MOBILE TELEPHONE HOLDER

Chin-Yang Wang, No. 167, Lane 131, Sec. 2, Ture Hsing Rd., Panchiao City Taipei Hsien, Taiwan

Filed Jul. 18, 1995, Ser. No. 503,591
Int. Cl.[6] H04M *1/00*
U.S. Cl. 379—446 **2 Claims**



1. A mobile telephone holder comprising:

a base plate having a front end, a rear end, an upward top flange raised from said rear end, a downward bottom flange around the border, a transverse bottom chamber adjacent to said front end, a longitudinal bottom chamber perpendicularly extended from said transverse bottom chamber, a sliding notch on said downward flange in communication with said transverse bottom chamber, a bottom female screw rod equally spaced between said front end and said rear end, and a plurality of bottom posts around the border;

a back cover covered on the downward bottom flange over said base plate, having plurality of mounting holes respectively fastened to the bottom posts of said base plate by screws, and a hanging hole for hanging;

a first clamping plate movably coupled to said base plate and said back cover at one side, said first clamping plate comprising a vertical clamping wall extended out of said base plate and said cover plate, a horizontal mounting wall extended from the vertical clamping wall of said first clamping plate at right angles and moved in and out of a hole defined between said base plate and said back cover at one side, a longitudinal sliding slot coupled to the bottom female screw rod on said base plate, a rack on the horizontal mounting wall of said first clamping plate along one side of the longitudinal sliding slot on said first clamping plate;

a second clamping plate movably coupled to said base plate and said back cover at an opposite side, said second clamping plate comprising a vertical clamping wall extended out of said base plate and said cover plate, a horizontal mounting wall extended from the vertical clamping wall of said second clamping plate at right angles and moved in and out of a hole defined between said base plate and said back cover at an opposite side, a longitudinal sliding slot coupled to the bottom female screw rod on said base plate, a rack on the horizontal mounting wall of said second clamping plate along one side of the longitudinal sliding slot on said second clamping plate;

a rotating gear meshed between the rack on said first clamping plate and the rack on said second clamping plate, having a hollow gear shaft at the center mounted around the bottom female screw rod of said base plate;

a locating gear mounted around the hollow gear shaft of said rotating gear;

a sliding switch mounted in the transverse bottom chamber on said base plate, said sliding switch comprising a head extended out of the sliding notch on the downward flange of said base plate, two parallel ribs disposed inside said transverse bottom chamber, a mounting groove defined between said ribs, and a curved projecting portion disposed inside said mounting groove;

a stop rod mounted within said longitudinal bottom chamber on said base plate and moved by said sliding switch to stop said locating gear and said rotating gear from rotation, said stop rod having a toothed head for engagement with said locating gear, a downward stop flange, and a raised actuating portion stopped at the curved projecting portion of said sliding switch; and

a spring mounted inside said longitudinal bottom chamber and stopped between the downward stop flange of said stop rod and the periphery of said longitudinal bottom chamber;

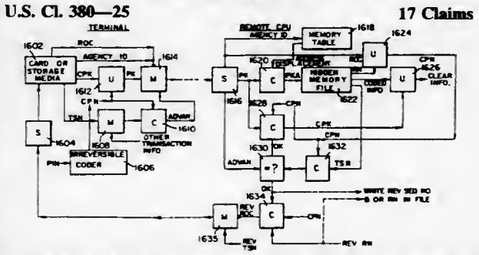
wherein when said sliding switch is moved in one direction, the toothed head of said stop rod is forced into engagement with said locating gear, causing said first clamping plate and said second clamping plate stopped in position; when said sliding switch is moved in the reversed direction, the toothed head of said stop rod is forced away from said locating gear by said spring, permitting said first clamping plate and said second clamping plate to be moved relative to each other.

5,555,303

SECURE TRANSACTION SYSTEM AND METHOD UTILIZED THEREIN

Leon Stambler, 7803 Boulder La., Parkland, Fla. 33067

Division of Ser. No. 122,071, Sep. 14, 1993, which is a division of Ser. No. 977,385, Nov. 17, 1992, Pat. No. 5,267,314. This application May 22, 1995, Ser. No. 445,612
Int. Cl.[6] H04L *9/00*
U.S. Cl. 380—25 **17 Claims**



1. In a transaction system comprising a first storage means in possession of a first party, containing party information, the party information comprising a predetermined first non-secret code (ROC1), a predetermined arbitrary first transaction number (TN1), and predetermined party information used to form a predetermined address (PA), a second storage means, and party information stored in the second storage means, the second storage means party information comprising a predetermined arbitrary first secret number (RN1), and a predetermined second transaction number (TN2) corresponding to the TN1, a method for authenticating the first party, the first storage means, and transaction information comprising the steps of:

receiving a personal identification number (PIN) from the first party, at a first site, and generating first coded authentication information using the received PIN;

retrieving the party information from the first storage means, at the first site;

coding the transaction information and the TN1 with the first coded authentication information to generate a first anti-duplication variable authentication number (ADVAN1), at the first site;

transmitting the ADVAN1, and a portion of the retrieved first storage means party information, said portion comprising the ROC1 and the predetermined party information used to form the PA, from the first site to a second site;

deriving the PA at the second site from the received predetermined party information;

accessing the second storage means using the derived PA to locate and retrieve RN1 and TN2;

generating second coded authentication information using the received ROC1 and the retrieved RN1;

uncoding the ADVAN1 using the second coded authentication information to derive the TN1 and the transaction information;

comparing the derived TN1 to the retrieved TN2;

authenticating the first party, the first storage means, and the transaction information if the derived TN1 corresponds to the retrieved TN2;

forming a revised third transaction number (TN3) and a revised second secret number (RN2);

storing the TN3 and the RN2 in the second storage means at the predetermined address (PA);

generating a revised second non-secret code (ROC2) using the second coded authentication information and the RN2;

coding the TN3 with the second coded authentication information to generate a second anti-duplication variable authentication number ADVAN2);

transmitting the ADVAN2 and the ROC2 from the second site to the first site;

uncoding the received ADVAN2 at the first site using the first coded authentication information to derive the TN3; and

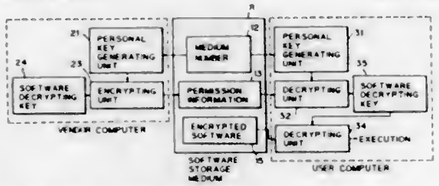
storing the derived TN3 and the received ROC2 in the first storage means for use in a subsequent transaction.

5,555,304

A STORAGE MEDIUM FOR PREVENTING AN ILLEGAL USE BY A THIRD PARTY

Takayuki Hasebe; Ryota Akiyama, and Makoto Yoshioka, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Division of Ser. No. 31,339, Mar. 15, 1993, Pat. No. 5,392,351.
This application Nov. 18, 1994, Ser. No. 341,176
Claims priority, application Japan, Mar. 16, 1992, 4-058048
The portion of the term of this patent subsequent to Mar. 15, 2013, has been disclaimed.
Int. Cl.[6] H04L *9/32*; **G06F** *12/14*
U.S. Cl. 380—4 **28 Claims**



1. A vendor computer comprising:

a personal key generating means for generating a medium key based on a medium personal number;

an electronic data decrypting key; and

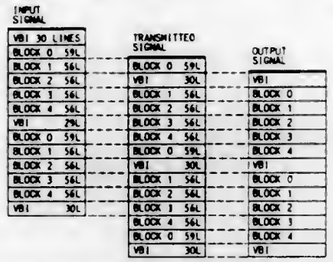
an encrypting means for encrypting the electronic data decrypting key based on the medium key to generate an encrypted permission information.

5,555,305

METHOD AND APPARATUS FOR SECURE TRANSMISSION OF VIDEO SIGNALS

Adrian P. Robinson, London; Christopher K. P. Clarke, Crawley, and Andrew J. Bower, Burgess Hill, all of United Kingdom, assignors to British Broadcasting Corporation, London, England

PCT No. PCT/GB92/01786, § 371 Date Jun. 13, 1994, § 102(e) Date Jun. 13, 1994, PCT Pub. No. WO93/07718, PCT Pub. Date Apr. 15, 1993
PCT Filed Sep. 29, 1992, Ser. No. 211,279
Claims priority, application United Kingdom, Sep. 30, 1991, 9120696; May 20, 1992, 9210750
Int. Cl.[6] H04N *7/167*
U.S. Cl. 380—14 **24 Claims**



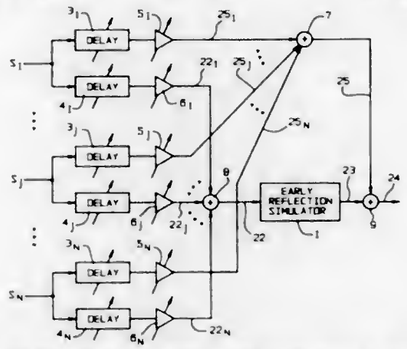
1. A video signal encoder for providing a scrambled video signal output, comprising means for sampling an input video signal, means for digitising the sampled signal, means for subdividing the digitised sampled signal into a plurality of blocks of active picture lines, and means for shuffling the line order within each block according to a predetermined sequence to scramble the signal, characterised in that the colour bursts of shuffled lines remain in position and that the sampling frequency is an integral multiple of four times the frequency of the reference colour subcarrier of the video signal.

5,555,306

AUDIO SIGNAL PROCESSOR PROVIDING SIMULATED SOURCE DISTANCE CONTROL

Michael A. Gerzon, Jericho, Great Britain, assignor to Trifield Productions Limited, London, England

Continuation of Ser. No. 863,669, Apr. 6, 1992, abandoned.
This application Jun. 27, 1995, Ser. No. 495,712
Claims priority, application United Kingdom, Apr. 4, 1991, 9107011
Int. Cl.[6] H03G *3/00*
U.S. Cl. 381—63 **39 Claims**



1. An audio signal processing system for processing a plurality of channels conducting signals encoded for directional reproduction comprising:

input means for receiving input signals;

output mixing means for producing an output signal;

early reflection simulation means;

a first signal path connecting said input means to said output mixing means; and

a second signal path connecting said input means to an input of said early reflection simulation means and connecting an output of said early reflection simulation means to said output mixing means;

said early reflection simulation means producing, for each of the input signals S from said input means, including an input signal S encoded for reproduction from a non-channel direction, a multiplicity of delayed replicas of said input signal each having a time delay T relative to an arrival time via said first signal path of said input signal S to said output mimimg means, and having a gain magnitude g_S relative to gain of a component corresponding to a first arrival of said input signal S at said output mixing means, said early reflection simulation means and said second signal path having in combination a gain/delay characteristic varying with a parameter d_S corresponding to a simulated sound source distance, said gain/delay characteristic characterized by the following equation:

$$g=[1/(1+cT/d_S)]e^{-rT},$$

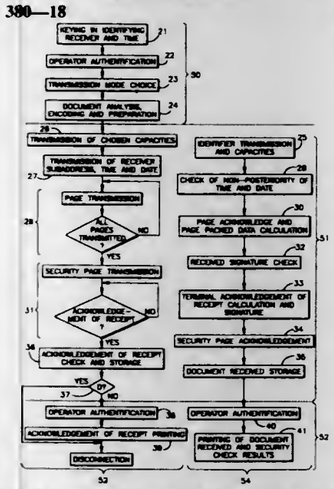
where c is the speed of sound in air, and r is a predetermined constant of absorption per unit time delay which is one of frequency dependent and frequency independent.

5,555,307

DEVICE AND PROCESS FOR RENDERING SECURE THE TRANSMISSION OF FAXES, AS WELL AS FAX UNIT WHICH HAS BEEN MADE SECURE AND INCORPORATING SUCH A DEVICE

Hervé Le Corre, Everville; Marc Girault, Caen, and Marie-Joséphe Revillet, Verson, all of France, assignors to France Telecom Etablissement Autonome De Droit Public, Paris, France

Filed Jan. 26, 1994, Ser. No. 188,052
Claims priority, application France, Jan. 28, 1993, 93 00867
Int. Cl.[6] H04L *9/00*
U.S. Cl. 380—18 **9 Claims**



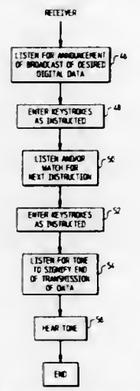
1. Device for rendering secure the transmission of faxes comprising a user interface and a security module, said security module being operable to generate and check a plurality of digital signatures, said digital signatures including an operator digital signature and a transmission date and time digital signature, said security module including means for authenticating the operator, means for verifying transmission and reception, and means for detecting replays, wherein said means for detecting replays is operable to compare the transmission date and time digital signature with a plurality of previously received transmission date and time digital signatures and rejects the fax being transmitted if said transmission date and time digital signature corresponds with any one of said plurality of previously received transmission date and time digital signatures.

5,555,308

ENCRYPTION OF SIGNALS TO INSURE VIEWERSHIP OF COMMERCIALS

Jack R. Levien, McDowell, Va., assignor to Angelika R. Levien, McDowell, Va.

Filed Nov. 10, 1994, Ser. No. 337,672
Int. Cl.[6] H04L *9/00*
U.S. Cl. 380—20 **24 Claims**



1. In a broadcast signal transmission system, including a broadcast message, a method for distributing digital data to a plurality of receivers, said method comprising:

generating a key code;

encrypting said digital data using said key code to form an encrypted digital data packet;

combining said key code with said broadcast message to form a combined broadcast message, said key code being unencrypted;

transmitting said combined broadcast message to form a broadcast message; and

transmitting said encrypted digital data packet; and at each of said plurality of receivers,

receiving said broadcast message;

displaying said broadcast message;

receiving said key code from said displayed broadcast message;

receiving said encrypted digital data packet;

manually entering said key code at said receiver to form a manually entered key code; and

decrypting said encrypted digital data packet using said manually entered key code.

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CRYPTOGRAPHIC KEY MANAGEMENT APPARATUS

5,555,310

STEREO VOICE TRANSMISSION APPARATUS, STEREO

a display for providing a visual indication of the results of an analysis corresponding to analysis data; and

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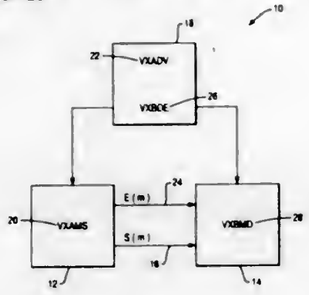
CRYPTOGRAPHIC KEY MANAGEMENT APPAPRATUS AND METHODS

Johannes P. Kruys, Gt Harmelen, Netherlands, assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 77,693, Jun. 15, 1993, abandoned.
This application Oct. 17, 1994, Ser. No. 324,326
Claims priority, application United Kingdom, Jun. 22, 1992, 9213169
Int. Cl.[6] H04L *9/00;9/30*
U.S. Cl. 380—21 **5 Claims**



1. Cryptographic key management apparatus for a communication domain enabling secure communication among a plurality of domain members comprising:

a plurality of Keys for use in said apparatus comprising Master Keys and Working Keys;

said Master Keys comprising a Domain Master Key shared by all domain members and a Member Master Key unique to each said domain member;

said Working Keys comprising Domain Vector Keys and Member Vector Keys;

said Domain Vector Keys being public keys for use by said domain members and having control information therein defining said Domain Vector Keys for encryption and verification;

each said Member Vector Key being a private key for use by an associated domain member and having control information therein defining said Member Vector Key for decryption and message sealing;

each said Member Vector Key having a cryptographic key value encrypted therein using the associated Member Master Key;

said Domain Master Key being a public key shared by all domain members and used for protecting said Domain Vector Keys;

each said Domain Vector Key having a cryptographic key value encrypted therein using the Domain Master Key;

each said Member Master Key being a private key for use by an associated domain member;

each said Member Vector Key having a cryptographic key value encrypted therein using the associated Member Master Key;

a directory accessible by all domain members, with at least one Domain Vector Key and one Member Vector Key being provided for each said domain member to provide a Pair of Vector Keys, with each said Pair of Vector Keys having the same said cryptographic key value therein;

each said domain member including:

a vector key processor and a cryptographic processor;

said vector key processor receiving said Working Keys for controlling said data encryption and data decryption; and

said cryptographic processor performing said encryption and decryption.

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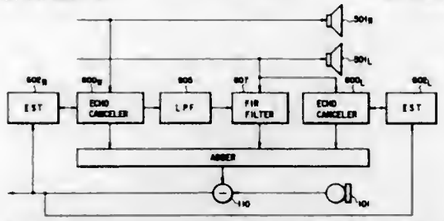
STEREO VOICE TRANSMISSION APPARATUS, STEREO SIGNAL CODING/DECODING APPARATUS, ECHO CANCELER, AND VOICE INPUT/OUTPUT APPARATUS TO WHICH THIS ECHO CANCELER IS APPLIED

Shigenobu Minami, Ayase, and Osamu Okada, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 14, 1994, Ser. No. 195,023
Claims priority, application Japan, Feb. 12, 1993, 5-024051; Feb. 26, 1993, 5-038908; Mar. 12, 1993, 5-051189
Int. Cl.[6] H04H *5/00*
U.S. Cl. 381—17 **43 Claims**



1. A stereo signal coding/decoding apparatus for coding and decoding signals input from a plurality of input units, comprising:

discriminating means for discriminating a single utterance mode from a multiple simultaneous utterance mode;

first coding means for coding the signals when said discriminating means discriminates the single utterance mode;

first decoding means for decoding information coded by said first coding means;

a plurality of second coding means, arranged in correspondence with said plurality of input units, for coding the signals when said discriminating means discriminates the multiple simultaneous utterance mode; and

a plurality of second decoding means, arranged in correspondence with said plurality of second coding means, for decoding pieces of information respectively coded by said plurality of second coding means.

5,555,311

ELECTRO-ACOUSTIC SYSTEM ANALYZER

Robert W. Reams, Lynnwood, Wash., assignor to Electronic Engineering and Manufacturing, Inc., Mountlake Terrace, Wash.

Filed Apr. 1, 1994, Ser. No. 222,629
Int. Cl.[6] H04R *29/00*
U.S. Cl. 381—58 **70 Claims**

1. A system for analyzing an electro-acoustic system of the type having an electronic input and an acoustic transducer generating an acoustic signal corresponding to an electrical signal applied to said electronic input, said system comprising:

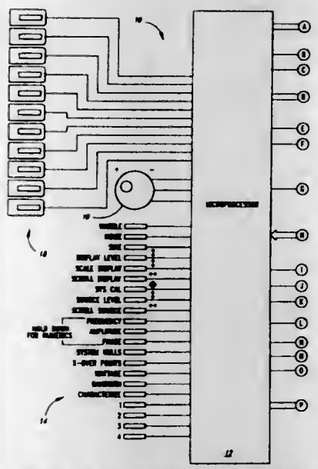
a stimulus subsystem for generating said electrical signal, said stimulus subsystem including:

an oscillator generating an oscillator output signal having a primary frequency component determined by the value of an oscillator frequency control signal;

a noise generator generating a random noise signal at a noise generator output;

a band-reject filter attenuating frequency components of a signal applied to an input that are within a predetermined band of frequencies centered at a specified frequency corresponding to the value of a frequency control signal applied to a frequency control input, said band-reject filter input being coupled to said noise generator output and generating at an output a band-reject filtered signal;

a variable gain circuit having an input selectively coupled to said noise generator output and said band-reject filter output in response to a first coupling control signal, said variable gain circuit generating a signal at an output having a magnitude



that is a product of said magnitude of a signal applied to its input and said value of a gain control signal applied to a gain control input;

coupling means responsive to a second coupling control signal for selectively coupling said oscillator output signal, said variable gain output, and said band-reject filter output to the electronic input of said electro-acoustic system;

an analysis subsystem for analyzing a plurality of performance parameters of said electro-acoustic system, said analysis subsystem including:

a microphone acoustically coupled to the acoustic transducer of said electro-acoustic system and generating an output signal corresponding to said acoustic signal;

a low-pass filter attenuating frequency components of a signal applied to an input that are greater than a specified frequency corresponding to the value of a frequency control signal applied to a frequency control input, said low-pass filter input being coupled to the output of said microphone and generating at an output a low-pass filtered signal;

a high-pass filter attenuating frequency components of a signal applied to an input that are less than a specified frequency corresponding to the value of a frequency control signal applied to a frequency control input, said high-pass filter input being coupled to the output of said microphone and generating at an output a high-pass filtered signal;

a band-pass filter attenuating frequency components of a signal applied to an input that are significantly greater than and less than a specified frequency corresponding to the value of a frequency control signal applied to a frequency control input, said band-pass filter input being coupled to the output of said microphone and generating at an output a band-pass filtered signal;

a first analog-to-digital converter having an input selectively coupled to the outputs of said low-pass filter, said high-pass filter, and said band-pass filter, said analog-to-digital generating at an output a digital word corresponding to the magnitude of a signal applied to its input;

a second analog-to-digital converter having an input coupled to said microphone said analog-to-distal converter generating at an output a digital word corresponding to the magnitude of a signal applied to its input; and

a phase comparator receiving said oscillator output signal and said microphone output signal and providing a phase indication signal corresponding to the difference in phase between said oscillator output signal and said microphone output signal;

a control and display subsystem for controlling the operation of said stimulus and analysis subsystems and displaying the results of said analysis, said control and display subsystem including:

a display for providing a visual indication of the results of an analysis corresponding to analysis data; and

a microprocessor coupled to said oscillator for generating said oscillator frequency control signal, said band-reject filter for generating the frequency control signal for said band-reject filter, said variable gain circuit for generating said gain control signal and said first coupling control signal, said coupling means for generating said second coupling control signal, said high-pass filter, low-pass filter, and band-pass filter for generating the frequency control signals for said high-pass filter, low-pass filter and band-pass filter, said first and second analog-to-digital converters for receiving respective digital words therefrom, and said display for generating said analysis data, said microprocessor: analyzing the bandwidth of said electro-acoustic system by:

generating a stimulus signal having a frequency spectrum that encompasses the bandwidth of said electro-acoustic system;

generating at least one of said coupling control signals for coupling either the output of said oscillator so the variable gain output to the electronic input of said electro-acoustic system;

generating a frequency control signal and applying said frequency control signal to the frequency control inputs of said high-pass, low-pass, and band-pass filters to cause said filters to have the same specified frequency and said specified frequency to sweep through at least a portion of said frequency spectrum while said stimulus signal is being applied to said electro-acoustic system;

recording the digital words from said first analog-to-digital converter corresponding to respective amplitudes of the signals output by said high-pass, low-pass, and band-pass filters to provide three sets of digital words each of which contain a record of the amplitudes of signals at the output of a respective filter at a plurality of specified frequencies;

accumulating the values of the distal words in each of said sets to provide a respective accumulated value for each of said high-pass, low-pass, and band-pass filters;

determining the high frequency response of said electro-acoustic system as the specified frequency at which the accumulated value for said band-pass filter is substantially equal to the accumulated value for said high-pass filter;

determining the low frequency response of said electro-acoustic system as the specified frequency at which the

accumulated value for said band-pass filter is substantially equal to the accumulated value for said low-pass filter; and

causing said display to provide a visual indication of said high frequency bandwidth and said low frequency bandwidth; and

analyzing the thermal power limit of said electro-acoustic system by:

generating said first coupling control signal to cause the output of said noise generator to be applied to said variable gain circuit;

generating said second coupling control signal to couple said variable gain output to the electronic input of said electro-acoustic system;

generating said gain control signal to cause a noise signal at the output of said variable gain circuit to gradually increase in intensity;

receiving the digital words from said second analog-to-digital converter corresponding to respective amplitudes of the microphone output signal as the noise signal at the output of said variable gain circuit gradually increases;

detecting when a change in amplitude of the microphone output signal corresponding to said digital words does not match an increase in the output of said variable gain circuit, and noting the amplitude of said microphone output signal at that time; and

causing said display to provide a visual indication of the amplitude of said microphone output signal at that time, thus providing an indication of the thermal limit of said electro-acoustic system;

analyzing the group delay of said electro-acoustic system by:

generating said oscillator frequency control input to cause said oscillator to generate a signal having a primary fre-

quency component that sweeps from one end of a frequency spectrum to another;

horizontal edges, said base line decision means moving the search line at a predetermined sampling interval from a proxi-

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FINGERPRINT DATA PROCESSING METHOD

(b) an inspection ray source providing said inspection rays to a first side of said product;

quency component that sweeps from one end of a frequency spectrum to another;

receiving said phase indication signal from said phase comparator and determining from said phase indication signal the group delay of said electro-acoustic system as a function of the frequency designated by oscillator frequency control input; and

causing said display to provide a visual indication of the magnitude of said group delay as a function of the frequency designated by oscillator frequency control input; and

analyzing the spurious vibration of said electro-acoustic system by:

generating said frequency control signal for said band-reject filter and applying said frequency control signal to the frequency control input of said band-reject filter to cause the specified frequency of said filter to scan within said frequency spectrum so that a signal at the output of said band-reject filter has a wide band of frequency components substantially excluding said predetermined band of frequencies centered at the specified frequency corresponding to the value of said frequency control signal;

generating said frequency control signal for said band-pass filter and applying said frequency control signal to the frequency control input of said band-pass filter to cause the specified frequency of said band-pass filter to match the specified frequency of said band-reject filter so that the band-pass filtered signal has a primary frequency component at a frequency excluded from the output of said band-reject filter;

receiving the digital word from said second analog-to-digital converter corresponding to the amplitude of the band-pass filtered signal as said band-reject filter and said band-pass filter scan within said frequency spectrum, said microprocessor recording the amplitude of said band-pass filtered signal as a function of said frequency control signals; and

causing said display to provide a visual indication of the amplitude of said band-pass filtered signal as a function of the specified frequency corresponding to said frequency control signals.

5,555,312

AUTOMOBILE APPARATUS FOR ROAD LANE AND VEHICLE AHEAD DETECTION AND RANGING

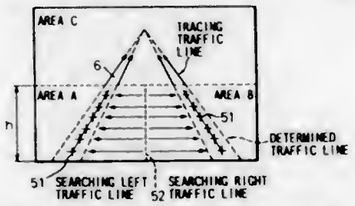
Nobukazu Shima, Kobe, and Hiroshi Kamada, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Apr. 28, 1994, Ser. No. 234,676

Claims priority, application Japan, Jun. 25, 1993, 5-155138

Int. Cl.[6] G06K 9/00

U.S. Cl. 382—104 **28 Claims**



1. An apparatus for recognizing road environment, comprising:

road image recording means mounted on a car to pick up an image of a road;

edge imaging means for preparing an edge image showing contours of objects within said road image;

base line decision means for detecting probable base lines having long horizontal edges in the edge image by moving a search line in a predetermined range and for selecting one of the probable base lines as a baseline of a car running ahead, which baseline is a boundary between said car running ahead and the road, according to an arrangement of the detected horizontal edges, said base line decision means moving the search line at a predetermined sampling interval from a proximal end toward a distal end in the edge image, and determining the search lines containing at least a predetermined number of pixels, each pixel containing a horizontal edge component, as probable base lines by detecting pixel values along the search line;

search area decision means for determining horizontal positions of left and right edges of the base line and setting a search area including the base line and the horizontal positions of left and right edges of the base line; and

ahead car position determining means for determining a position in said search area of the car running ahead, the ahead car position determining means determining the horizontal positions of the car ahead based upon said horizontal edge components in the search area wherein said pixels are counted by count means.

5,555,313

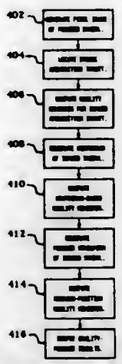
METHOD AND APPARATUS FOR CHARACTERIZING THE PERFORMANCE OF A PRINTER OR AN IMAGING SYSTEM

Joe Zheng, Brookfield, Conn., and Jiansu Lai, Boston, Mass., assignors to United Parcel Service of America, Inc., Atlanta, Ga.

Continuation of Ser. No. 295,142, Aug. 24, 1994, abandoned, which is a continuation of Ser. No. 28,308, Mar. 9, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 487,872

Int. Cl.[6] G06K 9/00

U.S. Cl. 382—112 **10 Claims**



1. A method for characterizing the performance of a device, comprising the following steps:

(a) providing a printed symbol containing a control pattern, said printed symbol having been generated with a printer;

(b) generating a pixel image of said printed symbol with imaging means, wherein said pixel image contains an imaged control pattern;

(c) locating said imaged control pattern in said pixel image using a computer processor;

(d) run-length encoding said imaged control pattern using the computer processor to generate a run-length-encoded imaged control pattern;

(e) calculating a quality measure using the computer processor, said quality measure being a function of said run-length-encoded imaged control pattern and a run-length-encoded representation of a defined control pattern; and

(f) characterizing the performance of said device in accordance with said quality measure using the computer processor, wherein said device is one of said printer and said imaging means.

5,555,314

FINGERPRINT DATA PROCESSING METHOD

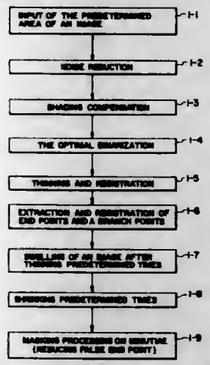
Tatsushi Nakajima, Osaka, Japan, assignor to Ezel Inc., and Sharp Corporation, both of Tokyo, Japan

Continuation of Ser. No. 906,847, Jun. 30, 1992, abandoned. This application Apr. 25, 1994, Ser. No. 232,414

Claims priority, application Japan, Jul. 4, 1991, 3-190590; Jul. 4, 1991, 3-190592

Int. Cl.[6] G06K 9/00

U.S. Cl. 382—124 **4 Claims**



1. A method of processing an unknown physical fingerprint comprising:

i) obtaining an unknown fingerprint image that includes images of ridges in said unknown physical fingerprint;

ii) binarizing said images of ridges in said unknown fingerprint image to produce a binarized image of said ridges;

iii) generating an image with fused ridges by expanding said images of ridges in said binarized image of said unknown fingerprint;

iv) shrinking said image with fused ridges to create a scaled-down image; and

v) masking a first portion of said unknown fingerprint image with said scaled-down image so as to create a modified image of said unknown fingerprint.

5,555,315

PINHOLE INSPECTION DEVICE AND METHOD

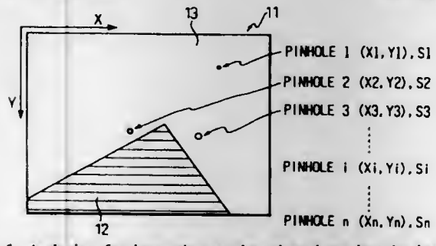
Takahiro Itakura, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 2, 1994, Ser. No. 190,514

Claims priority, application Japan, Feb. 3, 1993, 5-016611

Int. Cl.[6] G06K 9/00; G01N 21/00

U.S. Cl. 382—141 **16 Claims**



1. A device for inspecting a plate-shaped product having a pattern area through which inspection rays can pass and a background area, and for detecting and evaluating flaws in said background area, said flaws corresponding to portions of said background area which allow said inspection rays to pass therethrough, said device comprising:

(a) holding means for holding said product to be inspected;

(b) an inspection ray source providing said inspection rays to a first side of said product;

(c) an imaging camera arranged so as to obtain an image of a second side of said product illuminated by said inspection ray source, said image including a pattern portion corresponding to said pattern area and a background portion corresponding to said background area;

(d) masking means for masking said pattern portion of said image to prevent inspection rays that pass through said pattern area from appearing in a masked image of said product while permitting inspection rays that pass through said background area to appear as spots in said masked image, said spots in said masked image corresponding to said flaws in said background area of said product;

(e) means for detecting a size of each of said spots in said masked image and a distance of each of said spot from said pattern portion;

(f) means for defining thresholds corresponding to an allowable maximum limit of a size of each of said spots, said thresholds being defined such that a value of a threshold associated each spot decreases as said distance of that spot from said pattern portion increases; and

(g) means for comparing said actual size of each of said spots to one of said thresholds to determine whether said size of said spot exceeds a maximum limit so as to cause said product to be rejected.

5,555,316

INSPECTING APPARATUS OF MOUNTING STATE OF COMPONENT OR PRINTING STATE OF CREAM SOLDER IN MOUNTING LINE OF ELECTRONIC COMPONENT

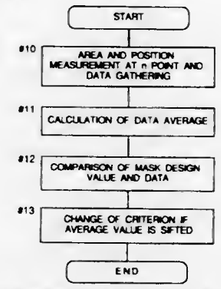
Toshihiko Tsujikawa, Toyonaka; Seiji Mizuoka, Moriguchi, and Masao Nagamato, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Jun. 30, 1993, Ser. No. 83,700

Claims priority, application Japan, Jun. 30, 1992, 4-172984; Jul. 8, 1992, 4-180759; Jul. 10, 1992, 4-183519; Jul. 10, 1992, 4-183520

Int. Cl.[6] G06K 9/00

U.S. Cl. 382—150 **2 Claims**



1. An inspecting method for a mounting line for inspecting an assembly state of an article obtained from a precedent process in the mounting line, which comprises the steps of:

using an image pick-up device to obtain an image of the article;

generating measurement data indicative of the assembly state of the article from the image obtained by the image pick-up device;

comparing the measurement data of the assembly state with an absolute decision criterion defining a predetermined allowable range of the measurement data and comparing the measurement data with an operating state criterion defining a second predetermined allowable range of the measurement data which is within the and narrower than the first predetermined allowable range; and

deciding whether the assembly state of the article is defective based on whether the measurement data is within the first

predetermined allowable image, and deciding an operating state of the proceeding process of the mounting line based on measurement data which is within the first predetermined allowable range and outside the second predetermined allowable range;

wherein the precedent process is cream soldering by a cream soldering apparatus, and wherein the assembly state is a cream solder state of a printed circuit board printed by the cream solder printing apparatus in the precedent process,

wherein the absolute decision criterion and the operating state criteria are in accordance with a design value of a metal mask used in the cream soldering printing apparatus,

wherein the deciding step comprises the steps of:

identifying measurement data which is both within the absolute decision criterion and outside the operating state criterion;

calculating an average value of the measurement data identified in the identifying step;

deciding whether the calculated average value is shifted within a predetermined range; and

changing the operating state criterion in a manner not to decide defective as non-defective if the average value is decided in the change deciding step to be shifted within the predetermined range, and then replacing the operating state criterion with a new operating state criterion.

5,555,317

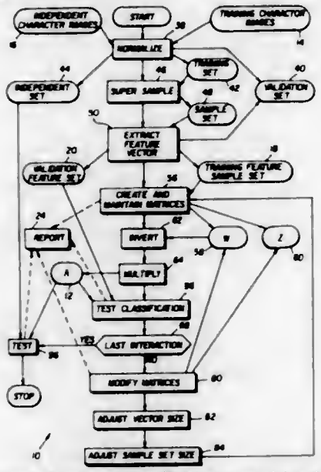
SUPERVISED TRAINING AUGMENTED POLYNOMIAL METHOD AND APPARATUS FOR CHARACTER RECOGNITION

Peter G. Anderson, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 18, 1992, Ser. No. 931,741

Int. Cl.[6] G06K *9/62;9/48*

U.S. Cl. 382—159 **13 Claims**



1. A method of character classification, comprising the steps of:

(a) performing a polynomial discriminant weight matrix creation operation using a training character set of training character images;

(b) testing the weight matrix to determine classification accuracy;

(c) modifying the training character set responsive to the testing by increasing representation of a character that is incorrectly classified or distinguished in classification strength from an incorrect classification by less than a difference;

(d) repeating steps (a)–(c) for a number of iterations; and

(e) classifying an unclassified character in an image using the weight matrix.

5,555,318

THRESHOLDING METHOD FOR SEGMENTING GRAY SCALE IMAGE, METHOD FOR DETERMINIG BACKGROUND CONCENTRATION DISTRIBUTION, AND IMAGE DISPLACEMENT DETECTION METHOD

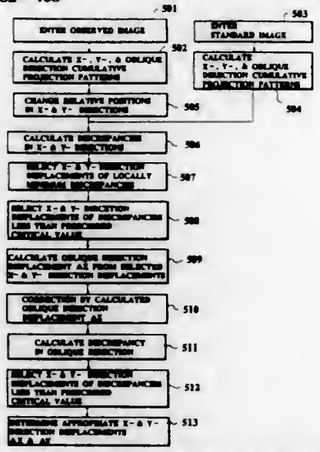
Minoru Ito, Atsugi, and Toshifumi Watanabe, Ischara, both of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Division of Ser. No. 728,587, Jul. 11, 1991, Pat. No. 5,506,917. This application Nov. 7, 1995, Ser. No. 551,811

Claims priority, application Japan, Jul. 13, 1990, 2-186851; Jul. 13, 1990, 2-186852; Jul. 13, 1990, 2-186853

Int. Cl.[6] G06K *9/46*

U.S. Cl. 382—468 **12 Claims**



1. A method of detecting a displacement of an observed image with respect to a reference image in vertical and lateral directions, comprising the steps of:

(a) obtaining a vertical cumulative projection pattern with respect to the vertical direction for each of the observed image and the reference image, and a lateral cumulative projection pattern with respect to the lateral direction for each of the observed image and the reference image;

(b) obtaining candidate vertical displacements Δx of the observed image with respect to the reference image in the vertical direction for which a vertical discrepancy between the vertical cumulative projection patterns for the observed image and the reference image is locally minimum, and candidate lateral displacements Δy of the observed image with respect to the reference image in the lateral direction for which a lateral discrepancy between the lateral cumulative projection patterns for the observed image and the reference image is locally minimum;

(c) obtaining an oblique cumulative projection pattern with respect to an oblique direction for each of the observed image and the reference image;

(d) calculating an estimated oblique displacement Δz from each of the candidate vertical displacements Δx and each of the candidate lateral displacements Δy obtained at the step (b);

(e) adjusting the oblique cumulative projection pattern for the observed image by the estimated oblique displacement Δz calculated at the step (d) to obtain an adjusted oblique cumulative projection pattern;

(f) obtaining an oblique discrepancy between the oblique cumulative projection pattern for the reference image and the adjusted oblique cumulative projection pattern for the observed image; and

(g) determining the displacement in the vertical and lateral directions as one of the candidate vertical displacements Δx and one of the candidate lateral displacements Δy for which the oblique discrepancy obtained at the step (f) satisfies a prescribed condition.

5,555,319

CRITICAL DIMENSION MEASURING METHOD AND EQUIPMENT THEREOF

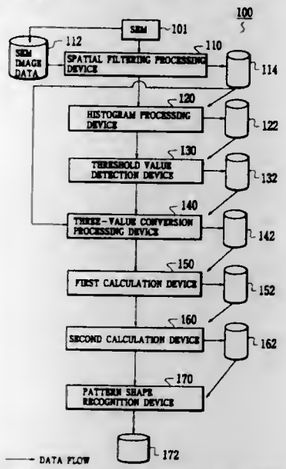
Koji Tsubusaki, Kanagawa-ken, and Fumio Komatsu, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 3, 1994, Ser. No. 237,169

Claims priority, application Japan, May 6, 1993, 5-105492

Int. Cl.[6] G06K *9/00*

U.S. Cl. 382—170 **3 Claims**



1. Critical dimension measuring equipment comprising:

irradiating means for irradiating an electron beam onto a measured pattern to be measured;

detecting means for detecting a secondary and reflected electron reflected from the measured pattern;

filtering means for receiving image data as the secondary and reflected electron detected by the detecting means and implementing a spatial filtering processing of the image data and storing the result of the spatial filtering processing into a first memory;

histogram processing means for receiving the image data which been obtained after the spatial filtering processing stored in the first memory, implementing histogram processing of the image data, and storing the result of the histogram processing into a second memory;

threshold value detection means for receiving the result of the histogram processing stored in the second memory, generating a threshold value by automatically separating classes in a histogram obtained by the histogram processing based on the discriminant criteria method, and storing the result generated by the threshold value detection means into a third memory;

three-value conversion processing means for receiving the threshold value stored in the third memory, implementing three-value conversion of the image data stored in the first memory obtained after spatial filtering processing based on the threshold value, and storing the result obtained by the three-value conversion means into a fourth memory;

first calculation means for receiving image data stored in the fourth memory obtained after three-value conversion processing, obtaining the area and perimeter of the bottom section of the pattern based on this data, and storing the result obtained by the first calculation means into a fifth memory;

second calculation means for receiving the area and the perimeter of the bottom section of the pattern stored in the fifth memory, obtaining the diameters of the patterns based on this data, and storing the result obtained by the second calculation means into a sixth memory; and

pattern shape recognition means for automatically deciding whether the pattern is circular or elliptical based on the pattern diameter stored in the sixth memory, calculating the diameter of the circle based on the area if the pattern is circular, and calculating a major axis and a minor axis of the ellipse based on the area and the perimeter if the pattern is elliptical.

5,555,320

PATTERN RECOGNITION SYSTEM WITH IMPROVED RECOGNITION RATE USING NONLINEAR TRANSFORMATION

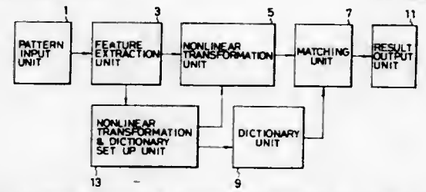
Bunpei Irie, and Yoshiaki Kurosawa, Kanagawa, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 29, 1993, Ser. No. 158,857

Claims priority, application Japan, Nov. 27, 1992, 4-318698

Int. Cl.[6] G06K *9/62*

U.S. Cl. 382—225 **22 Claims**



1. A pattern recognition system for identifying an input pattern with one of a plurality of prescribed recognizable categories for patterns, comprising:

pattern input means for inputting the input pattern to be recognized;

feature extraction means for extracting a feature vector from the input pattern inputted by the pattern input means;

nonlinear transformation means for applying a nonlinear transformation for each of said prescribed recognizable categories to the feature vector extracted by the feature extraction means to obtain a transformed feature data for the input pattern for each of said prescribed recognizable categories, where the nonlinear transformation for each of said prescribed recognizable categories maps linearly inseparable distributions in a vector space containing the feature vector onto separable distributions; and

matching means for comparing the transformed feature data for the input pattern for each of said prescribed recognizable categories with a corresponding reference feature model for each of said prescribed recognizable categories indicating a feature vector distribution for each of said prescribed recognizable categories, for finding a category of the input pattern as that of the reference feature model for one of said prescribed recognizable categories that is closest to the transformed feature data for the input pattern for said one of said prescribed recognizable categories.

5,555,321

IMAGE DATA BINARY CODING METHOD AND APPARATUS

Hirokazu Ogura; Kazuo Kaneko, and Tadayoshi Kono, all of Yokohama, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed May 25, 1994, Ser. No. 248,953

Claims priority, application Japan, Nov. 19, 1993, 5-290450

Int. Cl.[6] G06K *9/36*

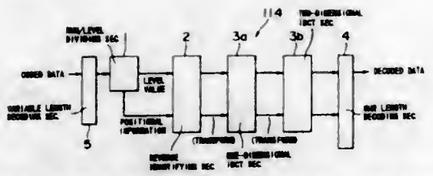
U.S. Cl. 382—235 **7 Claims**

1. A computer-implemented image data decoding method in image data telecommunication, for decoding received coded image data for each image block, wherein said received data for each image block are composed of a set of pairs of run and level values for each nonzero component for the image block, said run and level values being representative of amplitudes of frequencies contained in an image, and for calculating values of pixels

means for designating a directional signal indicative of the speed

a symbol output means sequentially outputting from the system while counting the bi-level symbols in the long

processing including a computation associated with each pixel in one of said first and second processed image signals



arranged in a matrix form within each image block, said method comprising the following steps of:

converting said each run value to an index that indicates the position of the associated nonzero component in said image block and thus forming another set of pairs of position and level values for each nonzero component for the image block;

multiplying said each level value with a given reverse quantifying coefficient, and thus forming another set of pairs of position and quantified level values for each nonzero component;

transforming the positional information into new positional information that simulates a zigzag-raster scan and thus forming another set of pairs of simulated position and quantified level values for each nonzero component; and

multiplying reverse discrete cosine coefficients based upon said new positional information for arranging the level values to obtain a pixel value for each of said pixels.

5,555,322

IMAGE STORING DEVICE FOR ELECTRONIC FILING SYSTEM

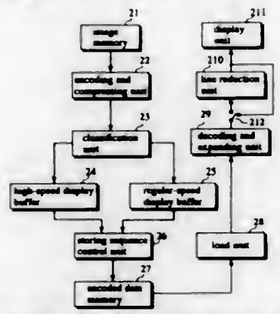
Hideo Terai, Kyoto; Akira Itoh, Nagaokakyo, and Teruyuki Kitaguchi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 16, 1994, Ser. No. 213,714

Claims priority, application Japan, Mar. 17, 1993, 5-057475

Int. Cl.[6] G06K 9/36

U.S. Cl. 382—232 **2 Claims**



1. An image storing device for compressing a scanned original image and storing the compressed image as well as expanding the stored image and outputting the expanded image, comprising:

an encoding and compression unit for encoding and compressing image data for each scanning line;

a classification unit for classifying the encoded and compressed image data into one of a reduction encoded data at a predetermined reduction rate and remaining encoded data;

a first display buffer for receiving the reduction encoded data;

a second display buffer for receiving the remaining encoded data, the first display buffer operates at a higher speed than the second display buffer;

an encoded data memory unit;

a storing sequence control unit for storing a sequence of encoded data into the encoded data memory unit, wherein the encoded data from the higher speed first display buffer is prioritized over the encoded data from the second display buffer;

means for designating a directional signal indicative of the speed of output;

a load unit for reading the encoded data memory unit in accordance with the directional signal to provide either a high speed output or a regular speed output, wherein when high speed output is designated, the load unit will read the prioritized encoded data and when a regular speed output is designated, the load unit will read a scan line of the prioritized encoded data and scan lines of the remaining encoded data in a proportional manner to the predetermined reduction rate;

a decoding and expanding unit for decoding and expanding the compressed data from the load unit; and

a display unit for displaying the image from the decoded and expanded data.

5,555,323

SYSTEM FOR BI-LEVEL SYMBOL CODING/DECODING WITH SAVED STORAGE AND METHOD FOR SAME

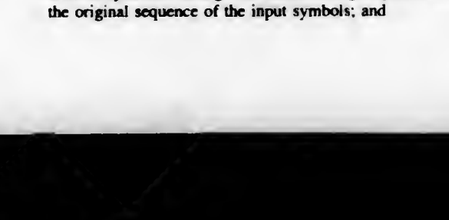
Takahiro Hongu, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 15, 1994, Ser. No. 356,892

Claims priority, application Japan, Dec. 16, 1993, 5-316171

Int. Cl.[6] G06K 9/00

U.S. Cl. 382—247 **2 Claims**



1. An arithmetic coding-decoding system comprising:

a coding subsystem for coding a set of bi-level symbols inputted to the system, in an original sequence with a given total length, into a combination of a compressed arithmetic data code and an information code subsequent thereto, the data code having sequentially transmittable portions cooperative with each other to represent the original sequence of the input symbols, the information code carrying information on the total length of the original sequence, and the coding subsystem for transmitting any portion of the data code and the information code; and

a decoding subsystem including:

a code gate means passing any transmitted portion of the data code except a final one;

an arithmetic decoding means decoding respective portions of the data code, as they are sequentially input thereto through the code gate means; and

a decodable control means decoding the transmitted information code to provide the arithmetic decoding means with the information on the total length of the original sequence of the input symbols and controlling the code gate means to pass the final portion of the data code so that the arithmetic decoding means provided with the information decodes the final portion of the data code to thereby complete generating a set of bi-level symbols to be outputted from the system in the same sequence and with the same length as the input symbols;

the code gate means includes a register means shifting any subsequence of the data bits in a transmitted turn thereof to input to the arithmetic decoding means, and the register means having a final subsequence of the data bits stored therein waiting to be inputted to the arithmetic decoding means;

the arithmetic decoding means includes:

an adaptive arithmetic decoding means decoding the sequence of the data bits inputted thereto into a long sequence of bi-level symbols starting with an according sequence with the original sequence of the input symbols; and

a symbol output means sequentially outputting from the system while counting the bi-level symbols in the long sequence;

the decodable control means informs the symbol output means of the total count of the input symbols and controls to flush the register means so that the symbol output means outputs the according sequence of the bi-level symbols out of the long sequence;

the adaptive arithmetic decoding means includes a reduction type adaptive arithmetic decoder; and

the final subsequence of the data bits represents an intermediate binary fraction between a lower bound and an upper bound of a final augend corresponding to a final symbol in the original sequence of the input symbols.

5,555,324

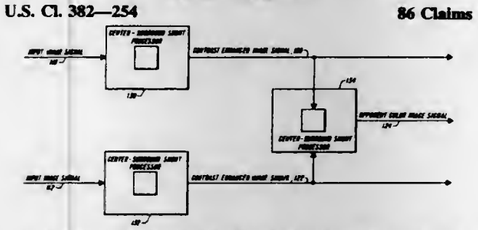
METHOD AND APPARATUS FOR GENERATING A SYNTHETIC IMAGE BY THE FUSION OF SIGNALS REPRESENTATIVE OF DIFFERENT VIEWS OF THE SAME SCENE

Allen M. Waxman, Newton; David A. Fay, Somerville; Alan N. Gove, Brookline; Michael C. Seibert, Bedford, and Joseph P. Racamato, Tewksbury, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Nov. 1, 1994, Ser. No. 332,696

Int. Cl.[6] G06K 9/40

U.S. Cl. 382—254 **86 Claims**



1. A method for processing first and second digital image signals, each of said image signals being representative of a different two dimensional view of the same scene, each of said image signals including a two dimensional array of pixels, each of said pixels having an associated value representative of a detectable characteristic at a corresponding position in said scene, comprising the steps of:

A. center-surround shunt processing said first image signal to generate a first processed image signal including a two dimensional array of pixels, said processing including performing a computation associated with each pixel in said first image signal, wherein for each of said computations, pixels in a neighborhood including at least said associated pixel collectively form a central element for said computation, and pixels in a neighborhood at least surrounding said central element collectively form a surround element for said computation, wherein a result of each of said computations is a pixel of said first processed image signal,

B. center-surround shunt processing said second image signal to generate a second processed image signal including a two dimensional array of pixels, said processing including performing a computation associated with each pixel in said second image signal, wherein for each of said computations, pixels in a neighborhood including at least said associated pixel collectively form a central element for said computation, and pixels in a neighborhood at least surrounding said central element collectively form a surround element for said computation, wherein a result of each of said computations is a pixel of said second processed image signal,

C. center-surround shunt processing portions of said first and second processed image signals to generate a third processed image signal including a two dimensional array of pixels, said processing including a computation associated with each pixel in one of said first and second processed image signals, wherein for each of said computations, pixels in a neighborhood including at least said associated pixel form a central element for said computation, and pixels in a neighborhood at least surrounding a central element corresponding to said central element in the other of said first and second processed image signals form a surround element for said computation, wherein a result of each of said computations is a pixel of said third processed image signal.

5,555,325

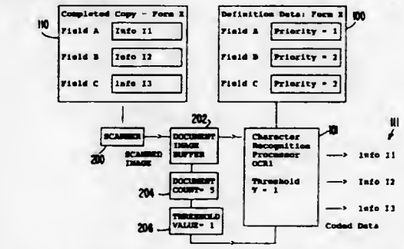
DATA CAPTURE VARIABLE PRIORITY METHOD AND SYSTEM FOR MANAGING VARYING PROCESSING CAPACITIES

Mark E. Burger, Germantown, Md., assignor to Lockheed Martin Federal Systems, Inc., McLean, Va.

Filed Oct. 22, 1993, Ser. No. 142,256

Int. Cl.[6] G06K 9/03; G06F 15/00

U.S. Cl. 382—309 **9 Claims**



1. In a data processing system, including a document image input, a document image buffer, and a character recognition processing means, a method for managing the recognition of text characters in a plurality of document images, comprising the steps of:

storing a first field definition in said system, specifying a first location and a first data capture priority value for a first field in a document type and a second field definition in said system, specifying a second location and a second data capture priority value for a second field, which is less than said first data capture priority value, in said document type;

buffering in said document image buffer, a plurality of document images of said document type, containing text characters in said first and second fields;

counting in said system, said plurality of buffered document images in said document image buffer and sending a data capture priority threshold signal to said character recognition processing means if said plurality is greater than a predetermined value; and

performing character recognition of said first and second fields with said character recognition processing means when said plurality of buffered document images is less than said predetermined value and omitting performing character recognition of said second field with said character recognition processing means in accordance with said second field definition, in response to said data capture priority threshold signal when said plurality of buffered document images is greater than said predetermined value.

5,555,326

OPTICAL WAVEGUIDE INTENSITY MODULATOR USING ELECTRO-OPTIC POLYMER

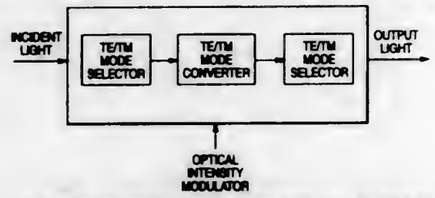
Wei-Yen Hwang; Jang-Joo Kim; Tae-Hyeong Zyung, and Min-Chul Oh, all of Daejeon, Rep. of Korea, assignors to Electronics & Telecommunications Research Inst., Rep. of Korea

Filed Dec. 19, 1994, Ser. No. 358,906

Claims priority, application Rep. of Korea, Dec. 9, 1994, 94-33476

Int. Cl.[6] G02B *6/27*

U.S. Cl. 385—2 **12 Claims**



1. An optical waveguide intensity modulator for modulating an intensity of an input light and generating an output light of desired polarization state, said modulator comprising a series of combination of:

a TE-TM mode converting means for selectively converting TE and TM modes of an input light by controlling a phase difference and an amplitude ratio of said two modes, said TE-TM mode converting means having a core layer being poled to substantially 45° direction with respect to a predetermined direction; and

a TE or TM mode selecting means connected to said TE-TM mode converting means for modulating a phase difference between a TE mode and a TM mode of an input light, said TE or TM mode selecting means having a core layer being poled to said predetermined direction.

5,555,327

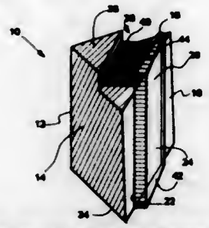
FRUSTRATED TOTAL INTERNAL REFLECTION DEVICE

Richard H. Laughlin, 1906 Campbell Trail, Richardson, Tex. 75082

Filed Jun. 7, 1995, Ser. No. 480,144

Int. Cl.[6] G02B *5/12*

U.S. Cl. 385—16 **32 Claims**



16. A device for processing an optical signal comprising:

a refractor having first and second ends and having a reflecting surface for reflecting the optical signal by total internal reflection;

a switchplate having first and second ends, a contact surface for contacting the refractor, and a reflective surface for reflecting the optical signal, and wherein the second end of the switchplate is secured to the refractor proximal to the refractors second end;

a first actuator for providing a force that moves the switchplate with respect to the refractor;

a second actuator for moving the switchplate in a direction opposite to the first actuator; and

wherein the switchplate's contact surface is operable to frustrate the total internal reflection of the optical signal by the refractor's reflecting surface when the contact surface of the switchplate is in proximal contact with the refractor so that the optical signal enters the switchplate, and wherein the switchplate's reflective surface is operable to reflect the optical signal.

5,555,328

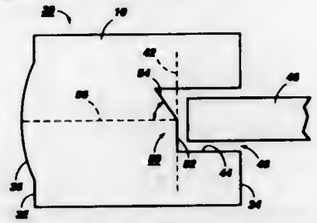
TOTAL INTERNAL REFLECTION KNIFE EDGE

Anthony Ang, Long Beach, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 14, 1995, Ser. No. 514,551

Int. Cl.[6] G02B *6/32*

U.S. Cl. 385—31 **1 Claim**



1. A total internal reflection knife edge comprising:

a transparent means for receiving a scanning light beam;

said transparent means having a beam entrance end and a beam exit end;

said transparent means having an opening at the beam exit end for receiving a fiber optic element;

said opening being open at the beam exit end and terminating at a closed end intermediate the beam entrance end and the beam exit end;

a portion of said closed end having a surface being so constructed and arranged to reflect the scanning light beam striking said surface;

another portion of said closed end having a surface being so constructed and arranged to allow the scanning light beam striking said surface of said another portion to pass through said surface of said another portion and enter the fiber optic element in said opening; and

said beam entrance end including a convex surface so constructed and arranged to individually focus each scanning light beam entering said convex surface on said surface of said another portion.

5,555,329

LIGHT DIRECTING OPTICAL STRUCTURE

Jerry Kuper, Martinsville; Leon Segal, Randolph; Karl W. Beeson, Princeton, and Scott M. Zimmerman, Basking Ridge, both of N.J., assignors to AlliedSignal Inc., Morris Township, N.J.

Continuation-in-part of Ser. No. 149,219, Nov. 5, 1993, Pat. No. 5,424,406, and Ser. No. 242,525, May 3, 1994, Pat. No. 5,428,468, and Ser. No. 321,368, Oct. 11, 1994. This application Jan. 23, 1995, Ser. No. 376,709

Int. Cl.[6] G02B *6/34*

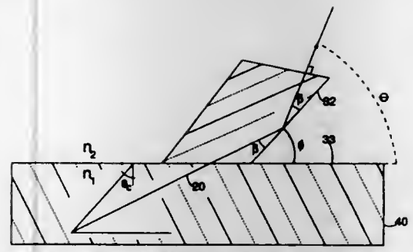
U.S. Cl. 385—36 **26 Claims**

1. An apparatus for directing light in a desired direction, the apparatus comprising:

a) a first waveguide having a first edge and a second edge opposed thereto, said first waveguide having an index of refraction higher than that of its surroundings;

b) a quadrilateral second waveguide, said second waveguide having an index of refraction higher than that of its surroundings and having first, second, third, and fourth edges, the first edge of the second waveguide optically coupled with and sized to fit the first edge of the first waveguide; the fourth edge opposed to the first edge of the second waveguide, said fourth edge defining an input face; said second and third edges connecting said first and fourth edges, said second and third edges each defining respective acute angles with said first edge; and

c) a multiplicity of prisms optically coupled with a face of said planar first waveguide.



5,555,330

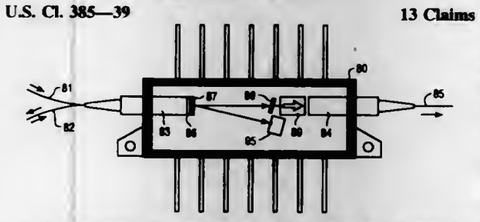
WAVELENGTH DIVISION MULTIPLEXED COUPLER WITH LOW CROSSTALK BETWEEN CHANNELS AND INTEGRATED COUPLER/ISOLATOR DEVICE

Jing-Jong Pan; Ming Shih, both of Milpitas, and Jingyu Xu, San Jose, all of Calif., assignors to E-Tek Dynamics, Inc., San Jose, Calif.

Filed Dec. 21, 1994, Ser. No. 361,610

Int. Cl.[6] G02B *6/26*

U.S. Cl. 385—39 **13 Claims**



1. A wavelength division multiplexed coupler and isolator for transmitting optical signals between a first optical fiber to a second optical fiber and blocking optical signals from said second optical fiber to said first optical fiber, said multiplexer and isolator comprising

a housing;

a first subassembly mounted to said housing for holding an end of said first fiber in coaxial relationship with a first collimator, said first collimator collimating light from said first fiber;

a second subassembly mounted to said housing for holding an end of said second fiber in coaxial relationship with a second collimator, said second collimator refocussing collimated light at said end of said second fiber, said first and second collimators forming an optical path therebetween in said housing;

means for filtering light in said optical path responsive to the wavelength of said light;

means for partially deflecting light away from said optical path;

means in said housing for receiving said partially deflected light for monitoring the intensity of light in said optical path; and

an optical isolator subassembly in said optical path, said isolator subassembly transmitting light in said optical path from said first collimator to said second collimator and blocking light in said optical path from said second collimator to said first collimator;

whereby said wavelength division multiplexed coupler and isolator is integrated into said housing and capable of monitoring optical signals therethrough.

5,555,331

DEVICE FOR CONNECTING OPTICAL FIBRES TO WAVEGUIDE FORMED IN A SUBSTRATE

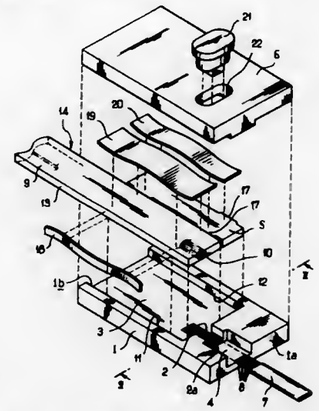
Gilles Billet, Voiron, and Huan B. Yin, Meunecy, both of France, assignors to Radiall, Rosny-Sous-Bois, France

Filed May 9, 1995, Ser. No. 436,923

Claims priority, application France, May 10, 1994, 94 05743

Int. Cl.[6] G02B *6/30*

U.S. Cl. 385—49 **8 Claims**



1. A device for connecting at least one optical fiber to at least one integrated-optics waveguide which is formed within a substrate at a predetermined distance from one of the faces of the substrate constituting a reference plane, including a receptacle (2) capable of receiving the terminal portion of the optical fiber (8) and a planar support (3) capable of receiving the substrate (9) applied against said support (3) through its reference plane (9*a*), the receptacle (2) and the support (3) being arranged in such a manner that the axis of the waveguide (10) and the axis of the optical fiber (8) are situated in one and the same plane parallel to the reference plane (9*a*) of the substrate (9), said device further including a removable lateral abutment (5) capable of being positioned against the support (3) and against which the substrate (9) bears when it is accommodated within the support (3), said lateral abutment (5) being dimensioned in such a manner as to set the substrate (9) in a position in which the axis of the waveguide (10) coincides with that of the optical fiber (8).

5,555,332

APPLICATOR AND ASSOCIATED METHOD FOR INSERTING GUIDE PINS IN A FIBER OPTIC CONNECTOR

David L. Dean, Hickory; Alan J. Malanowski, Newton; James R. Merriken, Hudson, and Otto I. Szentesi, Hickory, all of N.C., assignors to Siecor Corporation, Hickory, N.C.

Filed Jun. 8, 1995, Ser. No. 487,765

Int. Cl.[6] G02B *6/38*

U.S. Cl. 385—53 **25 Claims**

1. An applicator for inserting guide pins in corresponding apertures of a fiber optic connector, the applicator comprising:

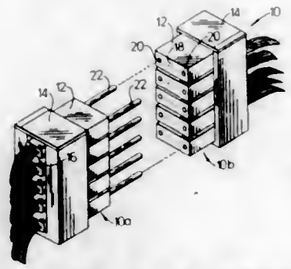
a carrier body defining a plurality of bores opening through a first surface of said carrier body;

a plurality of guide pins disposed at least partially within respective ones of said plurality of bores defined by said carrier body, said guide pins extending outwardly from the first surface of said carrier body and wherein said plurality of bores are located according to a predetermined pattern which corresponds to the relative positions of the apertures defined by the fiber optic connector such that said plurality of guide

5,555,334

OPTICAL TRANSMISSION AND RECEIVING MODULE

characterized in that dielectrics or dielectric fibers having little



pins are aligned with and can be simultaneously inserted within respective ones of the apertures of the fiber optic connector; and

means for releasably retaining said plurality of guide pins within respective ones of said plurality of bores defined by said carrier body prior to inserting said plurality of guide pins within respective ones of the apertures of the fiber optic connector.

5,555,333

OPTICAL MODULE AND A FABRICATION PROCESS THEREOF

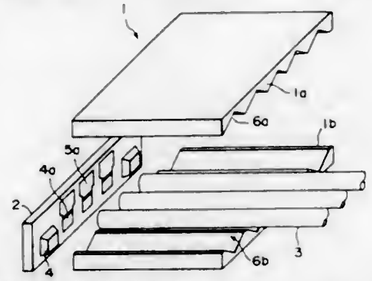
Masayoshi Kato, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 11, 1994, Ser. No. 272,734

Claims priority, application Japan, Jul. 12, 1993, 5-171726; Aug. 23, 1993, 5-207365; Oct. 22, 1993, 5-264763; Dec. 16, 1993, 5-315709; May 6, 1994, 6-094144

Int. Cl.[6] G02B 6/36

U.S. Cl. 385—89 **17 Claims**



1. An optical module, comprising:

an optical connector element carrying one or more optical fibers, said optical connector element having an end surface and a pair of major surfaces, said end surfaces being formed with at least a pair of positioning spaces at respective, predetermined positions, said optical connector element carrying said one or more optical fibers such that said optical fibers extend generally parallel to said pair of major surfaces in a direction toward said end surface; and

a device substrate carrying one or more optical devices on an upper major surface thereof in correspondence to said one or more optical fibers;

said device substrate having at least a pair of polygonal projections on said upper major surface at respective predetermined positions corresponding to said two positioning spaces on said end surface of said optical connector element;

said device substrate being mounted upon said optical connector element such that said end surface of said optical connector element faces said upper major surface of said device substrate and such that said polygonal projections on said upper major surface of said device substrate engage with said positioning spaces on said end surface of optical connector element.

5,555,334

OPTICAL TRANSMISSION AND RECEIVING MODULE AND OPTICAL COMMUNICATION SYSTEM USING THE SAME

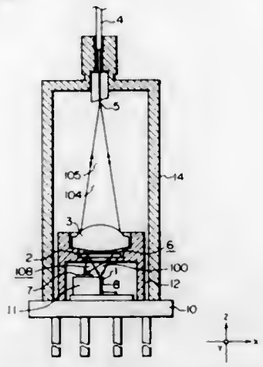
Kunikazu Ohnishi, Yokosuka; Masayuki Ineue; Yoshio Suzuki, both of Yokohama, and Yukio Fukui, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 7, 1994, Ser. No. 319,940

Claims priority, application Japan, Oct. 7, 1993, 5-251700; Mar. 17, 1994, 6-046712

Int. Cl.[6] G02B 6/36

U.S. Cl. 385—93 **22 Claims**



1. An optical transmission and receiving module, comprising:

a light emitting device;

a photodetector;

an optical element for introducing a light beam emitted from said light emitting device to a predetermined optical transmission path;

a housing for accommodating at least said light emitting device and said photodetector;

a window formed in said housing and provided with a transparent member for passing light therethrough in opposite directions, said light emitting device and said photodetector being provided on the same side with respect to said transparent member; and

a diffraction grating having grooves of rectilinear or curvilinear traces and provided on either an upper surface or alternatively a lower surface of said transparent member.

5,555,335

OPTICAL FIBRES FOR BLOWN INSTALLATION

Philip A. Barker; David J. Stockton; Christopher Fisk, and Peter D. Jenkins, all of Suffolk, England, assignors to British Telecommunications public limited company, London, England

PCT No. PCT/GB92/01190, § 371 Date Apr. 1, 1994, § 102(e) Date Apr. 1, 1994, PCT Pub. No. WO93/01512, PCT Pub. Date Jan. 21, 1993

PCT Filed Jul. 1, 1992, Ser. No. 170,287

Claims priority, application United Kingdom, Jul. 1, 1991, 9114196; Jan. 21, 1992, 9201283

Int. Cl.[6] G02B 6/52

U.S. Cl. 385—100 **16 Claims**

8. An optical package suitable for blowing, the package comprising:

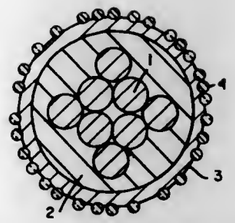
at least one optical fibre,

an inner coating about said fibre, and

an outer resin coating about said inner coating,

said outer resin coating including a significant plurality of particulate inclusions at least 10 μm across,

the concentration of said particulate inclusions being significantly greater at the outer surface of said resin coating than at the inner limit of said resin coating.



the innermost third of the depth of said resin coating being substantially free from inclusions of 10 μm or more across.

5,555,336

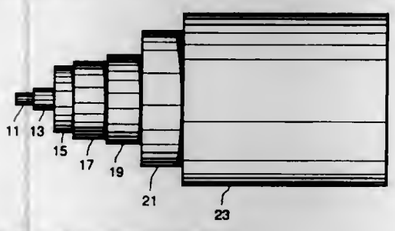
FIBER OPTIC OWER DISTRIBUTION

David T. Winslow, Los Angeles, Calif., assignor to Hughes Aircraft Company (now known as Hughes Electronics), Los Angeles, Calif.

Filed Dec. 27, 1994, Ser. No. 364,868

Int. Cl.[6] G02B 6/44

U.S. Cl. 385—101 **2 Claims**



1. A fiber optic assembly, comprising:

a light guiding optical fiber strand;

a first metal layer with an outside surface coated around said elongated light guiding optical fiber strand;

an elongated glass capillary with an inside surface surrounding said light conveying optical fiber strand and said first metal layer coating disposed therearound;

viscous boding material disposed between the outside surface of said first metal layer and the inside surface of said elongated glass capillary; and

a second metal layer coated around said elongated glass capillary, said first metal layer and said second metal layer for conducting electrical power.

5,555,337

SURFACE WAVE GUIDELINE AND OBJECT DETECTING DEVICE USING SURFACE WAVE GUIDELINE

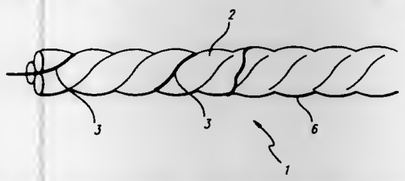
Hiroshi Hata, Nagano, Japan, assignor to MK Seiko Co., Ltd., Japan

Filed Dec. 1, 1994, Ser. No. 347,895

Claims priority, application Japan, Dec. 16, 1993, 5-344207

Int. Cl.[6] G02B 6/44

U.S. Cl. 385—101 **4 Claims**



4. An object detecting device using a surface wave guideline, characterized in that dielectrics or dielectric fibers having little high frequency loss are intertwisted in a periodic structure like a rope, and conductors are arranged inside or outside thereof in a period harmonizing with said periodic structure, and

further characterized in that, in a device for detecting approach or contact by an object, there are provided a transmitting portion for applying a surface wave to said surface wave guideline, a receiving portion for receiving a reflected surface wave by approach or contact by the object to or with the surface wave guideline, and a detecting portion for outputting a detected signal assuming that approach or contact by the object to or with said surface wave guideline when a reflected wave at a predetermined level or higher is received by said receiving portion.

5,555,338

SELF-SUPPORTING ELECTRICAL AND OPTICAL OVERHEAD CABLE

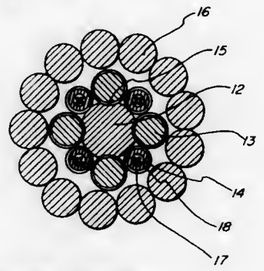
Helmut Haag, Titz, and Georg Hog, Monchen-Gladbach, both of Germany, assignors to Alcatel Kabel AG & Co., Hanover, Germany

Filed Jun. 7, 1995, Ser. No. 483,544

Claims priority, application Germany, Jul. 19, 1994, 44 25 464.4

Int. Cl.[6] G02B 6/44

U.S. Cl. 385—101 **20 Claims**



1. An overhead cable comprising:

a plurality of cable elements including:

(a) at least one electrical conductor;

(b) at least one tensile strength support clement; and

(c) at least one optical fiber-containing tube containing at least one optical fiber; and

a thin, self-enclosed metal coating which is in direct contact with the surface of said at least one optical fiber-containing tube, said metal coating including a layer of aluminum having a thickness between 5–70 μm.

5,555,339

DISPLAY MATRIX COMPRISING LIGHT-EMITTING FIBERS THAT ARE MASKABLE BY DISKS EACH HAVING A PLURALITY OF SECTORS

Philippe Migny, and Pierre Passet, both of Saint Cyr-sur-Loire, France, assignors to Securite Et Signalisation - S.E.S., France

Filed Apr. 7, 1995, Ser. No. 418,822

Claims priority, application France, Apr. 7, 1994, 94 04106

Int. Cl.[6] G02B 6/04

U.S. Cl. 385—115 **3 Claims**

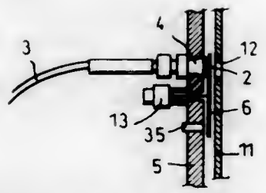
1. A display matrix formed by the downstream ends of a set of optical fibers whose upstream ends are disposed to receive light from a light source, the matrix being of the type in which the downstream ends of the optical fibers are associated individually or in sets with masking disks disposed in front of the downstream ends of the fibers concerned and each of said masking disks possessing a plurality of sectors interposable in the light path in

0.4<(Da/Db)<0.6,

5,555,342

PLANAR WAVEGUIDE AND A PROCESS FOR ITS

designated text sequence, and for replacing, in the text stream, said unspoken character having said first characteristic with



order to modify the color and/or the intensity of the light emitted forwards from the matrix, each of said disks being driven in stepwise rotation by a non-reversible motor having two stable equilibrium positions, with rotation of the motor being controlled by pulses, and in which a display control device is provided connected to said motors in order to control rotation of the disks in selected manner so as to transform the display at will,

wherein each mask disk is associated with at least one detecting device for detecting at least one angular position of said disk, and wherein each motor is associated with an activation device connected to the display control device via a device for monitoring matching, said device for monitoring matching receiving signals from said detection device and acting on said activation device in the event of a mismatch between the signals received from the display control device and the signals emitted by said detection device.

5,555,340

OPTICAL TRANSMISSION SYSTEM WITH DISPERSION COMPENSATING OPTICAL FIBER

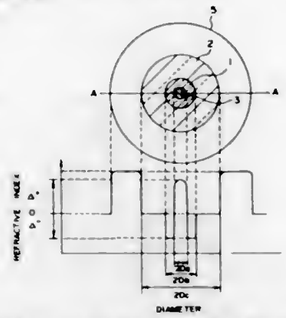
Masashi Onishi, and Hiroo Kanamori, both of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 408,620, Mar. 23, 1995, abandoned. This application Sep. 5, 1995, Ser. No. 523,750

Claims priority, application Japan, Mar. 23, 1994, 6-051680

Int. Cl.[6] G02B *6/22*

U.S. Cl. 385—127 **17 Claims**



1. An optical transmission system having a dispersion compensating optical fiber, wherein said dispersion compensating fiber comprises:

(a) a core;

(b) a first cladding surrounding the core; and

(c) a second cladding surrounding the first cladding;

and wherein said dispersion compensating fiber satisfies the following relations:

$$n1<n2<nc,$$

$$3\ \mu m<2Da<4\ \mu m,$$

$$0.4<(Da/Db)<0.6,$$

$$0.02<(nc-n2)/n2<0.03,$$

$$0.004<(n2-n1)/n2<0.01,$$

where

nc is a refractive index of the core;

n1 is a refractive index of the first cladding;

n2 is a refractive index of the second cladding;

2Da is a diameter of the core; and

2Db is an outer diameter of the first cladding.

5,555,341

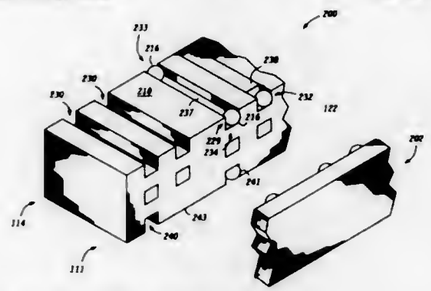
WAVEGUIDE WITH AN ELECTRICALLY CONDUCTIVE CHANNEL

Ravinder K. Sharma, Mesa; Michael S. Lebby, Apache Junction; Davis H. Hartman, Phoenix, and Kent W. Hansen, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 18, 1994, Ser. No. 214,524

Int. Cl.[6] G02B *6/10*

U.S. Cl. 385—129 **12 Claims**



1. An optoelectronic module comprising:

an interconnect board having standard electronic components with an output pad and output leads;

a molded optical waveguide including a core region, a cladding region, a first surface, and portions of the core region and the cladding region forming a first end surface and a second end surface, the first end surface and the second end surface being oppositely opposed with the first surface and the first end surface meeting to form a nexus of the first surface and the first end surface and the first surface and the second end surface meeting to form another nexus of the first surface;

a conductive channel having a first opening at the nexus of the first surface and the first end surface and a second opening at the another nexus of the first surface and the second end surface with the conductive channel extending from first opening to the second opening along the first surface;

an optical component with a working portion, the optical component being mechanically and electrically connected to the molded optical waveguide so that the working portion of the optical component is aligned to the core region of the molded optical waveguide, which is mounted to the interconnect board; and

means for electrically connecting the output pad of the standard electronic components to the optical component, thereby interconnecting the standard electronic components to the optical component.

5,555,342

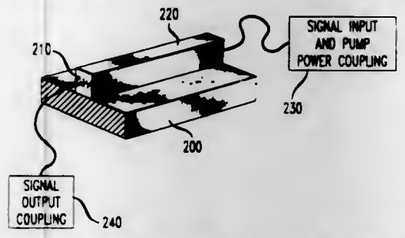
PLANAR WAVEGUIDE AND A PROCESS FOR ITS FABRICATION

Christoph J. Buchal, Julich, Germany, and Theo Siegrist, Neshanic Station, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jan. 17, 1995, Ser. No. 373,346

Int. Cl.[6] G02B *6/10*

U.S. Cl. 385—129 **7 Claims**



1. An optical device suitable for amplifying an optical signal comprising:

a coupling for introducing said signal, a coupling for introducing optical power for amplification, a coupling for signal output, and a region suitable for guiding said signal and said optical power wherein the region comprises a doped, waveguide material that is a single trivalent crystalline or polycrystalline material formed over a substrate wherein the substrate has a refractive index that is lower than the refractive index of the waveguide material, wherein the waveguide material is doped with rare earth ions and wherein the concentration of the dopant in at least some portion of the doped waveguide material is about 0.05 atomic percent to about 12 atomic percent, thereby providing the waveguide material with an emission spectrum that has a bandwidth of at least about 60 nm and that amplifies an optical signal at a wavelength of about 1.51 μm to about 1.57 μm.

5,555,343

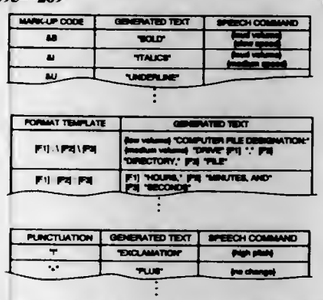
TEXT PARSER FOR USE WITH A TEXT-TO-SPEECH CONVERTER

Willis J. Luther, Irvine, Calif., assignor to Canon Information Systems, Inc., Costa Mesa, Calif.

Continuation of Ser. No. 978,487, Nov. 18, 1992, abandoned. This application Apr. 7, 1995, Ser. No. 418,872

Int. Cl.[6] G10L *9/00*

U.S. Cl. 395—269 **82 Claims**



1. A text processor for a text-to-speech converter comprising:

a parser for accepting a text stream, for parsing the text stream to detect an unspoken character having a first characteristic, an unspoken character having a second characteristic, and spoken characters, and for not altering the spoken characters in the text stream;

a text generator, responsive to detection of an unspoken character having the first characteristic, for generating a pre-designated text sequence, and for replacing, in the text stream, said unspoken character having said first characteristic with said pre-designated text sequence; and

a speech command generator, responsive to detection of an unspoken character having a second characteristic, for generating pre-designated speech commands.

5,555,344

METHOD FOR RECOGNIZING PATTERNS IN TIME-VARIANT MEASUREMENT SIGNALS

Klaus Zünkler, Dachau, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

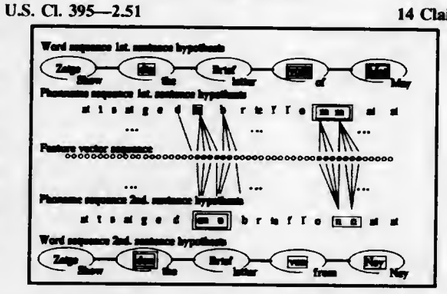
PCT No. PCT/DE92/00744, § 371 Date Mar. 18, 1994, § 102(e) Date Mar. 18, 1994, PCT Pub. No. WO93/06591, PCT Pub. Date Apr. 1, 1993

PCT Filed Sep. 4, 1992, Ser. No. 211,201

Claims priority, application Germany, Sep. 20, 1991, 41 31 387.9

Int. Cl.[6] G10L *5/06;9/00*

U.S. Cl. 395—2.51 **14 Claims**



1. A method for recognizing patterns in time-variant measurement signals by classifying a temporal sequence of feature vectors and reclassification in pairs, comprising the steps of:

segmenting the sequence of feature vectors which is to be classified using a Viterbi decoding algorithm, this sequence to be classified being compared with a set of hidden Markov models;

calculating for each hidden Markov model a total emission probability for the generation of the sequence to be classified by this hidden Markov model;

determining an optimum assignment path from feature vectors to states of the hidden Markov models by backtracking;

calculating, for at least one pair of hidden Markov models, modified total emission probabilities for each hidden Markov model of said at least one pair on a precondition that a respective other hidden Markov model of a same pair competes with the hidden Markov model under review, the total emission probability being calculated, for generating the sequence to be classified by a hidden Markov model, by calculating for all feature vectors of the sequence to be classified and for all states of the hidden Markov model a local logarithmic emission probability for generating the respective feature vector by the respective state, and by calculating an accumulated logarithmic emission probability for each state as a sum of its local logarithmic emission probability and an accumulated logarithmic emission probability of its best possible predecessor state, the best possible predecessor state being logged;

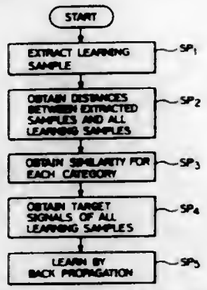
determining a respective more probable hidden Markov model of said at least one pair;

selecting the hidden Markov model having the highest total emission probability from among all pairs under review.

5,555,345
LEARNING METHOD OF NEURAL NETWORK

Yasuhiro Komori, and Shigeki Sagayama, both of Kyoto, Japan, assignors to ATR Interpreting Telephony Research Laboratories, Kyoto, Japan

Filed Mar. 3, 1992, Ser. No. 845,096
Claims priority, application Japan, Mar. 25, 1991, 3-060170
Int. Cl.[6] G06E *1/00;* **G06F** *3/00;15/18;* **G06G** *7/00*
U.S. Cl. 395—23 **4 Claims**



1. A learning method of a neural network having a plurality of learning samples, said learning method identifying to which one of N categories each learning sample belongs using a data set consisting of N categories and comprising the steps of:

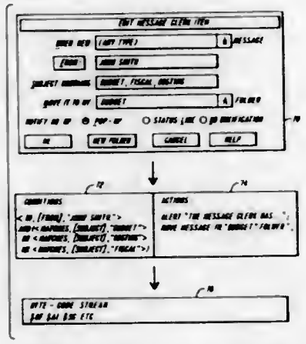
obtaining in advance similarity for a learning sample for each learning sample in said data set; and

performing learning by back propagation using said obtained similarity as a target signal of the neural network.

5,555,346
EVENT-DRIVEN RULE-BASED MESSAGING SYSTEM

Kevin C. Gross, Belmont; Charles J. Digate, Winchester, and Eugene H. Lee, Cambridge, all of Mass., assignors to Beyond Corporated, Cambridge, Mass.

Continuation-in-part of Ser. No. 771,197, Oct. 4, 1991, Pat. No. 5,283,856. This application Jan. 29, 1993, Ser. No. 11,346
Int. Cl.[6] G06F *15/18*
U.S. Cl. 395—51 **22 Claims**



14. A method for manipulating a message in an apparatus including a messaging system, said method comprising the steps of:

inputting selected information via a user input device into at least one data field;

formulating, in response to said inputting step, at least one rule according to a scripting language comprising an event portion, a condition portion, and an action portion;

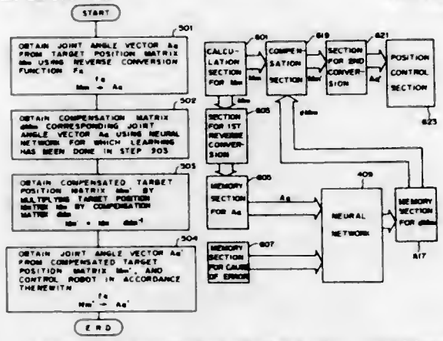
translating said at least one rule into an instruction stream for execution by said apparatus; and

executing said instruction stream in said apparatus to manipulate said message in accordance with said instruction stream.

5,555,347
METHOD AND APPARATUS FOR CONTROLLING A ROBOT USING A NEURAL NETWORK

Takao Yoneda, Nagoya, and Katsuhiro Komura, Takahama, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 21, 1993, Ser. No. 123,997
Claims priority, application Japan, Sep. 21, 1992, 4-276679; Sep. 21, 1992, 4-276680; Sep. 29, 1992, 4-285268; Sep. 29, 1992, 4-285269
Int. Cl.[6] G06F *15/18;15/00*
U.S. Cl. 395—82 **6 Claims**



1. A method of controlling an articulated robot, comprising of the steps of:

calculating a first joint angle vector indicating target joint angles of respective joints of the robot based on a target position matrix indicating a desired target position;

supplying a neural network with said first joint angle vector so as to obtain a compensation amount corresponding to said target position matrix;

multiplying said target position matrix with said compensation amount so as to obtain a compensated target position matrix;

calculating a second joint angle vector indicating target joint angles of the respective joints of the robot based on said compensated target position matrix; and

controlling the robot in accordance with the second joint angle vector.

5,555,348
PRINT DEVICE FOR PRINTING CODE DATA IN ASSOCIATION WITH CODE NUMBERS

Takami Takeuchi, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 10, 1994, Ser. No. 194,312
Claims priority, application Japan, Mar. 12, 1993, 5-078761
Int. Cl.[6] G06G *15/00*
U.S. Cl. 395—110 **13 Claims**

1. A print device, comprising:

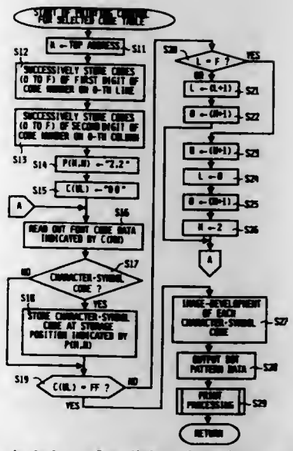
printing means for printing characters and symbols on a print medium;

code table storing means for storing a plurality of code tables in which code numbers and code data for characters and symbols are arranged in association with each other for each code table;

code table selecting means for selecting a code table stored in said code table storing means;

arranging means for arranging code data of characters and symbols in the code table selected using said code table selecting means in association with the corresponding code number; and

control means for controlling said printing means to carry out a printing operation so that the characters and symbols indicated by the code data which are arranged by said arranging means are printed in association with the code numbers, wherein the code number for code data of the characters and

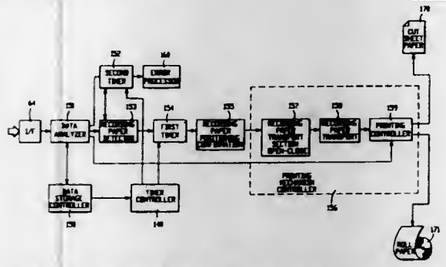


symbols includes a first-digit code and a second-digit code and the characters and symbols are printed in a matrix form in association with the code number including the first-digit code and the second-digit code.

5,555,349
PRINTING DEVICE AND RECORDING PAPER CONTROL

Masayo Miyasaka; Yoshikazu Ito; Masahiro Minowa, and Kazunari Yawata, all of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 139,627, Oct. 20, 1993, Pat. No. 5,437,004, which is a continuation of Ser. No. 902,318, Jun. 22, 1992, abandoned. This application Mar. 1, 1995, Ser. No. 397,009
Int. Cl.[6] G06K *15/00*
U.S. Cl. 395—111 **7 Claims**



1. A method of controlling printing on cut-sheet type paper in a printing device, comprising the steps off

receiving from a host computer a first predetermined time parameter representing a first duration which the printer will not print to allow for paper positioning;

detecting by the printing device the presence or absence of the paper inserted in the printing device;

measuring by the printing device a first time interval beginning with when the presence of the paper is detected;

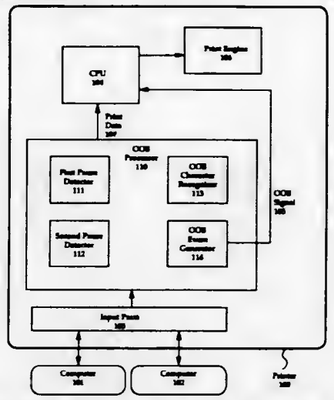
reconfirming by the printing device the presence of the paper after said measuring step; and

initiating paper transport through a printing mechanism that prints a desired output on the paper when the first time interval exceeds the first duration and when the paper is reconfirmed in said reconfirmation step.

5,555,350
MULTI-INTERPRETER PRINTER AND PROCESS INCLUDING RECOGNITION OF OUT-OF-BANK CHARACTERS

David W. Strauss, Needham, Mass., assignor to Xionics Document Technologies, Inc., Burlington, Mass.

Filed Apr. 5, 1995, Ser. No. 417,220
Int. Cl.[6] G06K *15/00*
U.S. Cl. 395—112 **6 Claims**



3. A process for recognizing OOB characters in a data stream, said data stream being provided to a printer by one or more attached computers, the process comprising:

measuring a pause in the data stream relative to a portion of the data stream;

tagging the portion of the data stream as a possible OOB character in response to the pause exceeding a predetermined duration; and

recognizing the portion of the data stream as an actual OOB character in response to correspondence of the possible OOB character with one of a set of known OOB characters.

5,555,351
HOST COMMUNICATION MASSAGE MANAGER FOR A LABEL PRINTING SYSTEM WITH DATA COLLECTION CAPABILITIES

Gina M. Craig, Dayton; James E. Globig, Kettering; Dale E. Lamprecht, Jr., Dayton; James G. Markham, Spring Valley; Donald A. Morrison; Richard E. Schwabe, both of Dayton; Raymond D. Tavener, Kettering, and Rex D. Watkins, Franklin, all of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed May 8, 1992, Ser. No. 880,718
Int. Cl.[6] G06K *15/00*
U.S. Cl. 395—114 **79 Claims**

1. A host communication message manager for use in a local bar code data processing system having a memory for storing data, said local processing system being coupled to at least one bar code printer and being in communication with, via said manager, a labeler having data collection capabilities and a host processing system, comprising:

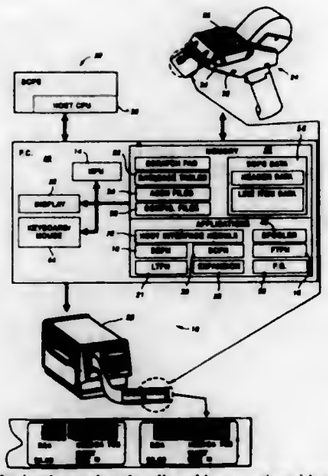
means for receiving data collected by said labeler, said receiving means storing said data in said memory to update said memory;

means for receiving a message from said host processing system, said message including information identifying data; and one or more allowable operations to be performed with respect to said data, said allowable operations including a data print initiation operation to initiate the printing of data by said bar code printer; and

between the vertices of the grid cell that lies behind the face being processed, and through which the viewing ray passes,

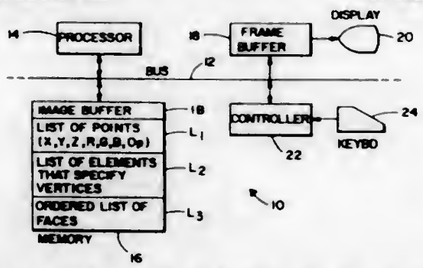
line to thereby make said supplementary area in contact with said target linework image area; and

5,555,355
SYSTEM AND METHOD FOR CLAMPING VARIABLE



means for implementing the allowable operations identified in a received message including said data print initiation operation.

5,555,352
OBJECT-BASED IRREGULAR-GRID VOLUME RENDERING
Bruce D. Lucas, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Continuation-in-part of Ser. No. 156,873, Nov. 23, 1993, which is a continuation of Ser. No. 690,834, Apr. 23, 1991, abandoned. This application Jun. 22, 1994, Ser. No. 263,816
Int. Cl.[6] G06T *15/50*
U.S. Cl. 395—123 **16 Claims**



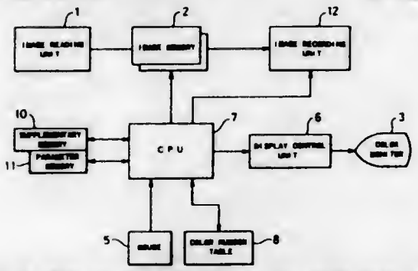
6. Apparatus for rendering data for display, the data representing a model space that includes at least one translucent solid to be volume rendered, comprising:

means for associating individual points in the model space with individual vertices of an irregular grid cell enclosed by faces, each of the vertices of each of a plurality of the grid cells being stored within storage means and having an associated luminosity value and an associated opacity value;

means, coupled to said storage means, for ordering faces of the grid cells in accordance with their depth from a viewing plane; and

means for processing, in turn, individual ones of the ordered faces of the grid cells for determining, for all viewing rays that project onto pixels on the viewing plane and that intersect the face being processed, an amount of light arriving at the pixel, the amount of light being a function of both the associated luminosity value and the associated opacity value of a grid cell that lies behind a processed face through which the viewing ray passes, the associated luminosity value and the associated opacity value being determined by interpolation between the vertices of the grid cell that lies behind the face being processed, and through which the viewing ray passes, wherein the amount of light arriving at a pixel for a given viewing ray is a function of both the luminosity and the opacity within the volume of each grid cell through which the viewing ray passes.

5,555,353
METHOD OF AND APPARATUS FOR PRODUCING SHADOWED IMAGES
Hiroshi Shibazaki, Kyoto, Japan, assignor to Dainippon Screen Manufacturing Co., Ltd., Japan
Filed Jul. 23, 1993, Ser. No. 96,922
Claims priority, application Japan, Aug. 6, 1992, 4-232965
Int. Cl.[6] G06T *15/50*
U.S. Cl. 395—126 **11 Claims**



5. An image processing apparatus for processing image data representing a target linework image area to thereby produce a supplementary area to said linework image area, comprising:

a first memory for storing image data representing a target linework image area with respect to each scanning line in a primary scanning direction, said target linework image area being specified to have a predetermined color, said image data and said supplementary area data being run length data including a start position of a line segment and a length of the line segment;

a second memory for memorizing said set of image data read out from said first memory, said second memory further memorizing an ordinal number of said set of image data, said ordinal number being set at a predetermined initial value when said set of said image data is memorized in said second memory;

parameter input means for specifying shift parameters indicating a gradient of a shift of said target linework area and a range of said shift in a secondary scanning direction;

image data reading means for successively reading out a set of said image data from said first memory in order of a secondary scanning coordinate of each primary scanning line, said set of said image data representing a linework image on a target primary scanning line; and

supplementary area production means for shifting a target line segment represented by said set of said image data according to said shift parameters to thereby produce supplementary area data representing a supplementary area for said target line segment, said target line segment having said predetermined color, said supplementary area including a supplementary line segment on each of primary scanning lines which are within said range of said shift from said target primary scanning line, wherein said supplementary area production means comprises:

means for obtaining a start position of said supplementary line segment on said each of primary scanning lines from a start position of said target line segment as a function of said gradient of said shift, and updating said set of said image data memorized in said second memory with said start position of said supplementary line segment; and

supplementary area correction means for extending said supplementary line segment along said primary scanning line to thereby make said supplementary area in contact with said target linework image area; and

ordinal number updating means for increasing said ordinal number by one every time when another set of said image data of a next primary scanning line is read out from said first memory.

5,555,354
METHOD AND APPARATUS FOR NAVIGATION WITHIN THREE-DIMENSIONAL INFORMATION LANDSCAPE
Steven L. Strasnick, Mountain View, and Joel D. Tesler, Cupertino, both of Calif., assignors to Silicon Graphics Inc., Mountain View, Calif.
Filed Mar. 23, 1993, Ser. No. 36,115
Int. Cl.[6] G06T *15/20*
U.S. Cl. 395—127 **48 Claims**

1. A method for navigating through data within a display by transforming said data into a three-dimensional information landscape representation of the data, said three-dimensional information landscape comprising objects arranged in a three-dimensional landscape, said objects corresponding to data elements in said data, and said objects having object attributes corresponding to data fields characterizing said data elements, said method for navigating comprising the steps of:

(a) defining said data elements and said data fields characterizing said data elements;

(b) defining said object attributes characterizing said objects in said three-dimensional landscape;

(c) creating said three-dimensional information landscape representation of said data by transforming data elements of said data into corresponding objects arranged in said three-dimensional landscape, wherein said transforming of said data elements further includes mapping data fields characterizing said data elements into object attributes characterizing said objects such that said object attributes are indicative of information in said data fields;

(d) displaying said three-dimensional information landscape representation of said data to extend from a foreground at or near said display to a horizon located beyond the display relative to the viewpoint of a user including:

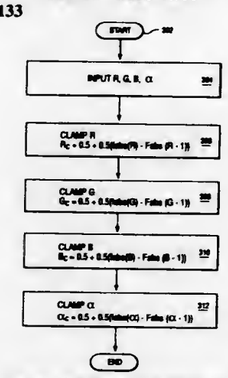
displaying said objects in a hierarchy of levels, each level containing objects having a common data field associated with said respective level during said mapping,

accumulating data information at each level of the hierarchy so that at least one of said object attributes of said objects in each level represents a sum of data information in corresponding objects in lower levels in the hierarchy, and

normalizing sizes of said objects displayed at each level of the hierarchy independent of the size of objects at other levels in the hierarchy; and

(e) navigating through said three-dimensional information landscape representation of said data.

5,555,355
SYSTEM AND METHOD FOR CLAMPING VARIABLE VALUES WITHOUT USING BRANCH INSTRUCTIONS
Chandrasekhar Narayanaswami, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 14, 1993, Ser. No. 121,140
Int. Cl.[6] G06T *11/00*
U.S. Cl. 395—133 **10 Claims**



1. A graphics system for drawing lighted color polygons, said system operating on a computer system having a processor, memory and storage, the graphics system comprising:

means for transforming said polygons from a first coordinate system to a second coordinate system;

means for clipping said polygon to a visible display area;

means for lighting said verticles according to a lighting model to provide lighted color vertex data;

first instruction means for determining an absolute value of one or more components of one said verticles by said processor without execution of a branching instruction;

second instruction means for calculating a clamped color value of one of said verticles to be displayed based on said absolute value determined by said first instruction means;

means for assembling said clamped color vertex data into a primitive for rasterization.

5,555,356
SYSTEM AND METHOD FOR GENERATING A TRIMMED PARAMETRIC SURFACE FOR DISPLAY ON A GRAPHIC DISPLAY DEVICE
Frederick J. Scheibl, Rhinebeck, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 29, 1992, Ser. No. 968,628
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—134 **20 Claims**

1. A computer implemented method for generating for display a trimmed parametric surface as a single quadrilateral mesh in a computer graphics system, said parametric surface comprising a plurality of parametric coordinates and having one or more trimming polylines applied thereto, said method comprising the computer implemented steps of:

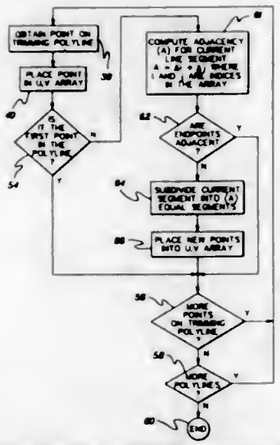
defining a plurality of line segments representative of said one or more trimming polylines; and

generating the single quadrilateral mesh coextensive with said parametric surface, said single quadrilateral mesh having a plurality of edges coinciding with said plurality of line segments of said trimming polylines, said generating comprising the steps of:

defining in a memory means an array of U,V values, said array representing points of said parametric surface before said one or more trimming polylines are applied;

identifying a plurality of points representative of said trimming polylines;

determining whether each of said points is located within said array of U,V values; and



placing in said array each of said points determined not to be in said array, each of said points determined not to be in said array replacing a U,V value neighboring to it and located in said array;

determining whether said neighboring value can be replaced; and

adding one of a row or a column to said array when said neighboring value cannot be replaced;

rendering for display said trimmed parametric surface by traversing said array.

5,555,357

COMPUTER SYSTEM AND METHOD FOR GENERATING AND MANIPULATING CHARTS AND DIAGRAMS

Antonio M. Fernandes, Monte Sereno, Calif.; Charles F. Good, Milford, Ohio, and Craig S. Young, Zephyr Cove, Nev., assignors to Claris Corporation, Santa Clara, Calif.

Filed Jun. 3, 1994, Ser. No. 253,981

Int. Cl.[6] G06F *15/62*

U.S. Cl. 395—141 **26 Claims**

1. A system for automatically generating and positioning a new drawing element, the system comprising:

a display device having an input;

an input device having an output;

a memory, having inputs and outputs, for storing data including a plurality of element records including an element type record, routines for creating and manipulating drawing elements, and

a means for automatically generating and positioning a drawing element using an automatic generation user interface having representations of control buttons; and

a processing unit responsive to the means for automatically generating, the processing unit coupled to the display device, the input device, and the memory.

5,555,358

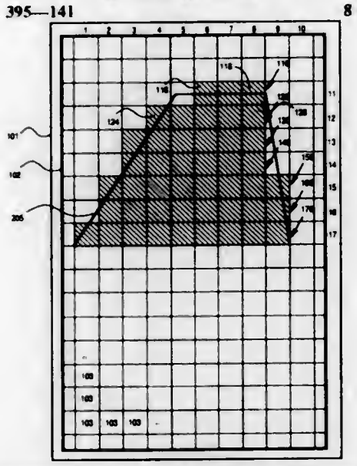
DIGITAL PRINTING SYSTEM AND PROCESS USING COMPACT TRAPEZOIDAL REPRESENTATIONS

Thomas P. Blumer, Cambridge, and Peter W. Barada, Amesbury, both of Mass., assignors to Xionics Document Technologies, Inc., Burlington, Mass.

Continuation of Ser. No. 024,532, Mar. 1, 1993. This application Jul. 12, 1995, Ser. No. 501,518

Int. Cl.[6] G06F *15/62*

U.S. Cl. 395—141 **8 Claims**



1. A process of drawing a convex polygon on a computer output device in response to a command generated by a computer, the process comprising the steps of:

creating a pixel-based intermediate representation of said convex polygon;

determining a change in slope over a portion of said intermediate representation;

selectively drawing said polygon on said output device using a first final representation of said convex polygon in response to the results of said step of determining said change in slope indicating said change in slope exceeding a predetermined threshold; and

selectively drawing said convex polygon on said output device using a second final representation of said polygon in response to the results of said step of determining said change in slope indicating said change in slope not exceeding the predetermined threshold.

5,555,359

COMPUTER GRAPHICS ANTI-ALIASING METHOD USING A PARTITIONED LOOK-UP TABLE

Sang-gil Choi; Jun-hyoung Cho, and Young-cheul Wee, all of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

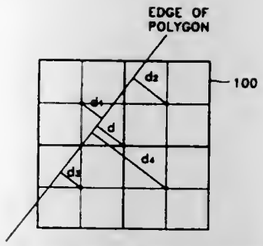
Filed Nov. 28, 1994, Ser. No. 348,130

Claims priority, application Rep. of Korea, Nov. 30, 1993, 93-25929

Int. Cl.[6] G06T *5/00*

U.S. Cl. 395—141 **5 Claims**

1. An anti-aliasing method using a partitioned LUT having sub-LUTs; the method comprising the steps of:



dividing a pixel into four sub-blocks; obtaining a sub-block distance for each sub-block from the center of each of said four sub-blocks to a straight line of the edge of a predetermined polygon, using a pixel distance from the center of said pixel to said straight line and the slope of said straight line; and

respectively generating sub-masks stored in said sub-LUTs for the respective sub-blocks by inputting the respective sub-block distances and said slope, to said sub-LUTs.

5,555,360

GRAPHICS PROCESSING APPARATUS FOR PRODUCING OUTPUT DATA AT EDGES OF AN OUTPUT IMAGE DEFINED BY VECTOR DATA

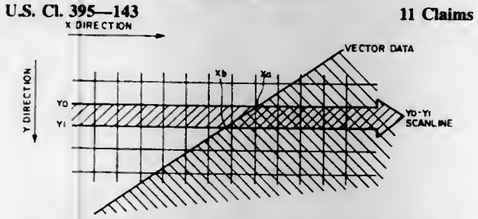
Hitomi Kumazaki, Koshigaya; Yoshiaki Hanyu, Tokyo, and Masaki Sano, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 4, 1991, Ser. No. 680,697

Claims priority, application Japan, Apr. 9, 1990, 2-93568; Apr. 13, 1990, 2-97937; Apr. 13, 1990, 2-97938; Feb. 14, 1991, 3-42744

Int. Cl.[6] G06T *11/00*

U.S. Cl. 395—143 **11 Claims**



1. A graphics processing apparatus for producing output data at edges of an output image which is defined by vector data, the apparatus comprising:

a) approximation means for determining an approximate area factor of each edge pixel at edges of the output image, which output image is defined by the vector data, the determining being based on a decimal fraction extracted from a coordinate value of a predetermined one of two points, which two points are intersections between the vector data and two border lines of a scanline having a thickness equivalent to a width of one pixel; and

b) antialiasing means, including:

1) means for determining shaded area factors of the edge pixels of the output image, based on the approximate area factor of each edge pixel determined by the approximation means; and

2) means for producing output data based on the shaded area factors, so as to reduce aliasing effects at edges of the output image.

5,555,361

MULTIPROCESS INPUT SYSTEM WITH SUPPRESSED AMOUNT OF COMMUNICATION BETWEEN PROCESSES

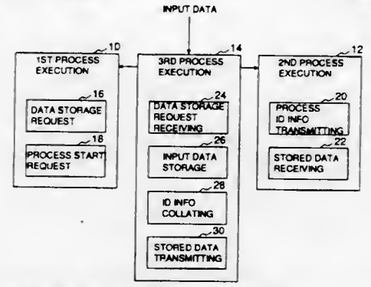
Masahiko Narita; Takashi Fujiwara; Keisuke Fukui; Makiko Shimamura, and Takanori Tateno, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 153,467, Nov. 17, 1993, abandoned. This application Nov. 3, 1995, Ser. No. 553,084

Claims priority, application Japan, Nov. 17, 1992, 4-306998

Int. Cl.[6] G06F *3/00*

U.S. Cl. 395—144 **12 Claims**



1. A multiprocess input system comprising:

first process execution means for processing input data related to key codes received from an input device;

second process execution means for processing the input data into text data related to character string data which are obtained by converting the key codes; and

third process execution means for distributing the input data to said first and second process execution means,

said third process execution means comprising:

data storage request receiving means for receiving from said first process execution means storage start conditions for starting storage of the input data and first identification information of said second process execution means, and for storing the storage stare conditions and the first identification information of said second process execution means permitted to make access to the input data;

input data storage means for starting storage of the input data only when the storage start conditions stored in said data storage request receiving means are satisfied;

identification information collating means for collating the first identification information stored in said input data storage means and second identification information received from said second process execution means; and

stored data transmitting means for transmitting the input data stored in said input data storage means to said second process execution means only when the first identification information and the second identification information match.

5,555,362

METHOD AND APPARATUS FOR A LAYOUT OF A DOCUMENT IMAGE

Akio Yamashita, Urawa, and Kazuharu Toyokawa, Yamato, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

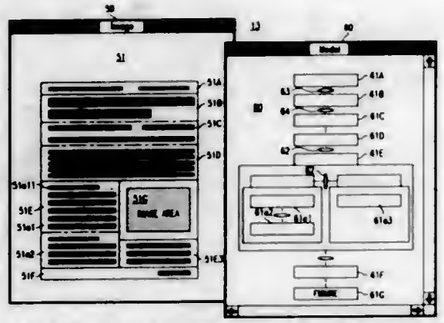
Continuation of Ser. No. 956,702, Oct. 5, 1992, abandoned. This application Jul. 26, 1995, Ser. No. 507,061

Claims priority, application Japan, Dec. 18, 1991, 3-333778

Int. Cl.[6] G06F *17/00*

U.S. Cl. 395—145 **2 Claims**

1. A method for generating a layout model to define objects of a document image by an apparatus having an input unit, an area generation unit, a layout model generation unit, a storage unit and a display unit, comprising the steps of:



analyzing an inputted document image with said area generation unit to extract separators to separate the objects of the document in order to segment said document image into a plurality of areas and create a tree structure in accordance with said areas and said separators;

displaying said document image on said display unit together with a schematic representation of said tree structure;

correcting said tree structure, if required, with said area generation unit by manipulation of said areas;

generating a layout model, having nodes assigned, wherein the nodes have no attribute data associated therewith, wherein each node corresponds to each of respective said areas displayed in said schematic representation, by said layout model generation unit in order to display said layout model on said display unit; and

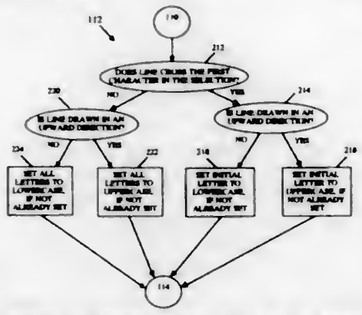
assigning a previously inputted macroparameter to each of said nodes with no attribute data associated therewith, wherein said macroparameter rearranges said nodes when said layout model does not correspond to the document image.

5,555,363

RESETTING THE CASE OF TEXT ON A COMPUTER DISPLAY

Frederich N. Tou, Cupertino; Stephen P. Capps, San Carlos; Gregg S. Foster, Woodside, and Ernest H. Beernink, San Carlos, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 30, 1993, Ser. No. 130,602
Int. Cl.[6] G06F *5/01*
U.S. Cl. 395—146 **12 Claims**



1. A method for setting the case of a selected textual object displayed on a display screen of a pen-based computer system, the method comprising the steps of:

receiving a stroke input on the display screen;

determining whether the stroke is a case setting gesture that is formed from a single substantially vertical line that intersects the selected textual object, and does not include a significant horizontal component; and

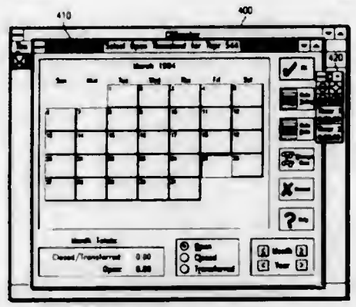
setting the case of at least one character in the intersected selected textual object based upon the direction that the case setting gesture is drawn and the location at which the gesture is drawn relative to the intersected selected textual object when the stroke is determined to be a case setting gesture.

5,555,364

WINDOWED COMPUTER DISPLAY

David S. Goldstein, Plano, Tex., assignor to Prosoft Corporation, Dallas, Tex.

Filed Aug. 23, 1994, Ser. No. 294,502
Int. Cl.[6] G06F *3/14*
U.S. Cl. 395—159 **60 Claims**



1. A computer system, comprising:

a memory device for storing tasks for execution by said computer system;

a central processing unit (CPU) coupled to said memory device for executing selectable ones of said tasks;

a display device coupled to said CPU and providing an area for displaying data associated with said selectable ones of said tasks, said area capable of being divided into a plurality of windows, said plurality of windows providing regions within said area for displaying data associated with corresponding said selectable ones of said tasks, said plurality of windows capable of occluding one another to denote foreground and background tasks; and

a first task storable on said memory device and executable by said CPU, said first task directing said CPU to create an associated first window on said display device, said associated first window capable of occluding a portion of said plurality of windows to allow a user continued temporary access to functions of said first task when one of said plurality of tasks is a foreground task, said first task automatically returning execution to said foreground task when said temporary access is completed.

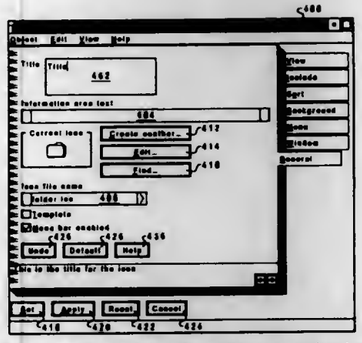
5,555,365

METHOD AND SYSTEM FOR OPTIMIZING STATIC AND DYNAMIC BINDING OF PRESENTATION OBJECTS WITH THE OBJECT DATA THEY REPRESENT

Robert F. Selby, Austin, Tex.; Shimon Yanai, Nesher, Israel; Pnina Vortman, Ofakim, Israel, and Larry Weisberg, Efrat, Israel, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 26, 1994, Ser. No. 296,552
Int. Cl.[6] G06F *3/14*
U.S. Cl. 395—159 **12 Claims**

1. A method in a data processing system having an object oriented environment, wherein said object oriented environment includes a plurality of graphic user interface objects and a plurality of application objects, each graphic user object having a unique identifier and a selected attribute and each application object having a preselected response, said method comprising:



identifying graphic user interface objects associated with an application object;

creating a table specifying relationships between said graphic user interface objects and each graphic user interface object and said application object; and

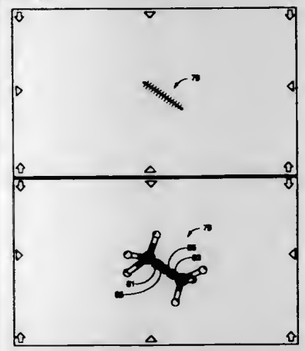
each time said application object is initialized, utilizing said table to specify objects within said application object.

5,555,366

COMPUTER GRAPHICS SYSTEM FOR SELECTIVELY MODELLING MOLECULES AND INVESTIGATING THE CHEMICAL AND PHYSICAL PROPERTIES THEREOF

Steven L. Teig, Palo Alto, and Scott D. Kahn, Los Altos, both of Calif., assignors to MCC - Molecular Simulations, Burlington, Mass.

Division of Ser. No. 732,496, Jul. 18, 1991, Pat. No. 5,386,507.
This application Dec. 29, 1994, Ser. No. 365,677
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—161 **3 Claims**



1. A computer graphics system to display a model of atoms and molecules and to investigate chemical and physical properties of said atoms and molecules comprising:

a processor;

a controller coupled to said processor to direct operations of said graphics system;

a memory coupled to said processor to store dam relative to known atoms and molecules, and intra-molecular forces between atoms in said molecules;

a monitor coupled to said processor to provide a display of information and said model of the user selected atoms and molecules from said data in said memory with a three-dimensional technique used by chemists to illustrate a relationship between atoms and molecules, said model displayed as graphical elements representing atoms located at atomic center positions with graphical coordinates of said atomic centers relative to each other stored in said memory, and connecting graphical elements between said atomic centers representing bonds therebetween; and

a pointer manipulation device coupled to said processor to provide a user a capability to dynamically model said molecular model by selecting data relative to atoms and molecules from said memory for said model, to conformationally alter a molecular model, and to direct operation of said controller;

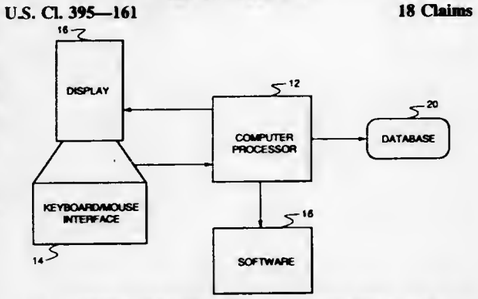
wherein said controller permits limited movement of an atomic center position with respect to the atomic center positions of other atoms within said model to dynamically model said molecular model by conformationally altering said three-dimensional displayed molecular model in keeping with said intra-molecular forces between atoms of said molecular model under the operation of said pointer manipulation device.

5,555,367

METHOD AND SYSTEM FOR GENERATING COMPUTER PROGRAMS FOR QUERIES FORMED BY MANIPULATING OBJECT-ORIENTED DIAGRAMS

William J. Premerlani, Scotia, N.Y.; Michael R. Blaha, Chesterfield, Mo.; James E. Rumbaugh, and Robert M. Salemme, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 30, 1994, Ser. No. 315,514
Int. Cl.[6] G06F *3/14*
U.S. Cl. 395—161 **18 Claims**



1. A computer-implemented method for generating a computer program that specifies a query for extracting data from a database, the method comprising the steps of:

creating an object-oriented diagram describing data structures within the database as object classes and providing a representation of relationships between each of the object classes;

interpreting the object-oriented diagram as specifying a subset of all object instances of the object classes that satisfy constraints implied by the relationships in the object-oriented diagram;

performing a series of transformations on the object classes within the object-oriented diagram to further specify conditions of the query;

producing a revised object-oriented diagram representative of the query; and

automatically generating a code for the query from the revised object-oriented diagram.

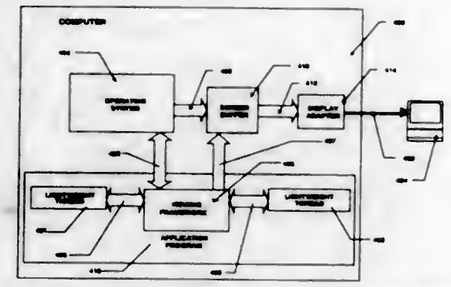
5,555,368

OBJECT-ORIENTED MULTI-TASKING VIEW FRAMEWORK

Debra L. Orton, San Jose, and David B. Goldsmith, Los Gatos, both of Calif., assignors to Taligent, Cupertino, Calif.

Filed Dec. 30, 1993, Ser. No. 176,145
Int. Cl.[6] G06F *3/14*
U.S. Cl. 395—157 **12 Claims**

1. A system for displaying screen information in a first and a second view, in which the first view may partially obscure a



portion of the second view leaving a non-obscured visible area of the second view, the system comprising:

(a) a screen buffer for holding the screen information;

(b) display adapter means for directly obtaining the screen information from the screen buffer and for displaying the screen information on a display controlled by the display adapter means;

(c) a processor and an attached memory, holding a first and a second application program;

(d) an operating system in the memory for multi-task scheduling and controlling the concurrent execution of the first and second application programs on the processor;

(e) view system means cooperating with the operating system for maintaining a first visible area definition, designating a first portion of the screen buffer for holding screen information for the first view, and for maintaining a second visible area definition, designating a second portion of the screen buffer for holding screen information for the second view visible area;

(f) concurrency control means for controlling access by the first and second application programs to the first and second visible area definitions to present the first and second visible area definitions from becoming corrupted by simultaneous access by the first and second application programs;

(g) wherein the first and second application programs each comprise

means controlled by the concurrency control means for obtaining a visible area definition, and

means for directly storing screen information into a portion of the screen buffer designated by the obtained visible area definition.

5,555,369

METHOD OF CREATING PACKAGES FOR A POINTER-BASED COMPUTER SYSTEM

Norberto Menendez, San Jose; Peter J. Potrebic, Mtn. View, and Benjamin W. Sharpe, San Francisco, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

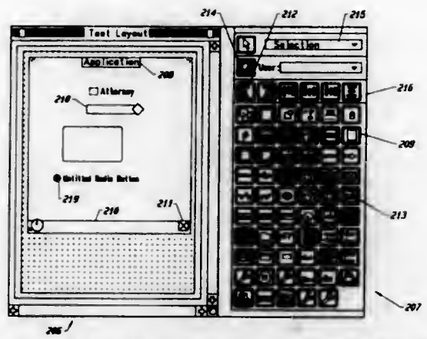
Filed Feb. 14, 1994, Ser. No. 195,939

Int. Cl.[6] G06F *3/14*

U.S. Cl. 395—161 **31 Claims**

1. A method of using a first computer system having a display screen displaying a first graphical user interface to create an application that can be executed and displayed through a second graphical user interface on a second computer system having a display screen sensitive to a pointer, a processor in communication with the display screen, and a memory in communication with the processor such that when the application is executing on the processor it can perform defined actions in response to interaction of the pointer with the display screen, the method comprising the following steps:

displaying a first layout window on the first graphical user interface displayed on the display screen of the first computer system, the first layout window defining a representation of the display screen of the second computer system as it will appear when the application is executing on the second computer system;



displaying a plurality of predefined view as manipulated by a user on the first layout window, each such predefined view defining a graphical interface element appearing on the display screen of the second computer system when the application is executing, the predefined view being located at regions of the first layout window corresponding to the locations of corresponding graphical interface elements appearing on the display screen of the second computer system when the application is executing on the second computer system, the graphical interface elements including one or more of slide bars, buttons, check boxes, icons, menus, and dialog boxes;

linking a second layout window to a predefined view on the first layout window, the second layout window itself having a plurality of predefined views defining graphical interface elements capable of appearing on the display screen of the second computer system when the application is executing; and

building said application from views on said first and second layout windows.

5,555,370

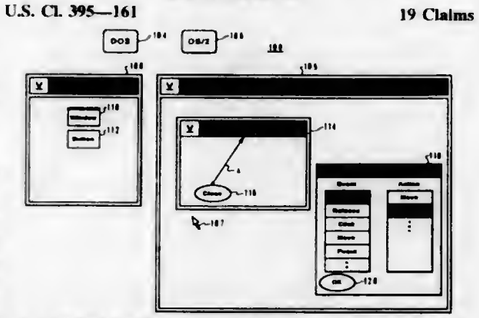
METHOD AND SYSTEM FOR CREATING COMPLEX OBJECTS FOR USE IN APPLICATION DEVELOPMENT

Shih-Gong Li, and John S. Wang, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1993, Ser. No. 174,561

Int. Cl.[6] G06F *3/14*

U.S. Cl. 395—161 **19 Claims**



1. A method in a data processing system for permitting a user to efficiently create an application utilizing a plurality of objects in a graphic user interface, said method comprising:

graphically presenting a plurality of objects to said user in said graphic user interface;

permitting said user to create a compound object utilizing at least two of said plurality of objects; and

automatically associating said compound object with said plurality of objects in response to a user input; and

displaying an icon associated with said compound object, wherein said compound object thereafter may be graphically selected by said user to efficiently create an application.

5,555,371

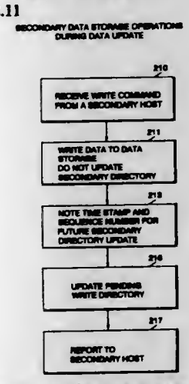
DATA BACKUP COPYING WITH DELAYED DIRECTORY UPDATING AND REDUCED NUMBERS OF DASD ACCESSES AT A BACK UP SITE USING A LOG STRUCTURED ARRAY DATA STORAGE

Linda Marie Duyanovich, Saratoga, Calif.; William Frank Micka, Tucson, Ariz., and Robert Wesley Shomler, Morgan Hill, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 36,017, Mar. 23, 1993, Pat. No. 5,446,871, and Ser. No. 992,219, Dec. 17, 1992. This application Jul. 18, 1994, Ser. No. 276,379

Int. Cl.[6] G06F *11/34*

U.S. Cl. 395—182.11 **28 Claims**



1. A dual mode remote data copy apparatus for transferring updated data from a primary data-storage system to a secondary data-storage system, including in combination:

a primary data processing system connected to said primary data-storage system;

said secondary data-storage system connected to said primary data-storage system and to said primary data processing system;

said primary and secondary data-storage systems having primary and secondary long-term storage comprising first and second peripheral means, respectively;

each said peripheral means in both said data-storage systems having a plurality of first and second device addressable data-storage locations for retentively storing data;

primary and secondary directories respectively in said primary and secondary data-storage systems for respectively providing addressability of data stored in said first and second peripheral means;

an update directory in said secondary data-storage system for providing addressability of update copy data stored in said second peripheral means;

pending write update means in said primary data processing system and being connected to said primary and secondary data-storage systems for establishing a pending write update session wherein during said pending write update session predetermined data contained in predetermined ones of addressable data units stored in said primary data-storage system are updated by one or more successive copies of said update data, each said copy of each said updated addressable data unit is copied to said secondary data-storage system and wherein said primary directory is updated to address each successive copy of said update data but said secondary directory is not updated until said pending write update session is terminated, then updated with a most recent copy of said update data for the respective addressable data units;

primary data update means in said primary data-storage system and connected to said pending write update means and to said primary data processing system for repeatedly receiving copies of said update data from said primary data processing system during said pending write update session and for responding to receiving said update data during said pending write update session for repeatedly storing said update data in said first peripheral means as successive copies of said addressable data units, respectively, that are updates to data of said addressable data units currently stored in said first peripheral means and updating said primary directory to address said update data, as copied data, stored in said primary data-storage system such that said primary directory has only addresses for a last recorded copy of data that are updated a plurality of times;

time means in said primary data update means for indicating a time of updating for each said data update; identifying data updated at each indicated time of updating for indicating which data are most recently updated copy of said update data;

system inter-communication means connected to said primary and secondary data-storage systems; to said pending write update means; said time indicating means and being responsive to said pending write update means establishing said pending write update session; and to said first update means updating data stored in said first peripheral means in a primary temporary data storage, as a part of said pending write update session, said update data stored in said primary data-storage system, to copy each respective said time of updating indication and said identification to said secondary data-storage system and for indicating to said secondary data-storage system that said copied update data, said time of updating indication and said identification of data are a part of said pending write update session;

secondary data update means in said secondary data-storage system connected to said update directory, to said primary temporary data storage and to said system inter-communication means for responding to receiving said update data, said time of storage indication and identification of said update data in said pending write update session for storing said update data in said second peripheral means and to update said update directory including storing said time of updating indication and identification of said update data in said update directory for indicating said received update data are a part of said predetermined data;

consistency means in said primary data processing system for indicating termination of said pending write update session and that said secondary directory is now to be updated for actuating secondary data-storage systems to update said secondary directory; and

secondary directory update means being connected to said consistency means and having data selection means for selecting only that portion of said copied update data stored in said second means and having a time of updating indication that indicates which of said copied update data is a most recent copy of said copied update data and for updating said secondary directory to indicate addresses of only said most recent copy of said copied update data currently stored in said second peripheral means.

5,555,372

FAULT-TOLERANT COMPUTER SYSTEM EMPLOYING AN IMPROVED ERROR-BROADCAST MECHANISM

Mark D. Tetreault, Northborough; Charles J. Horvath, Concord, and William I. Leavitt, Grafton, all of Mass., assignors to Stratus Computer, Inc., Marlborough, Mass.

Filed Dec. 21, 1994, Ser. No. 360,414

Int. Cl.[6] G06F *11/14;11/30*

U.S. Cl. 395—182.13 **23 Claims**

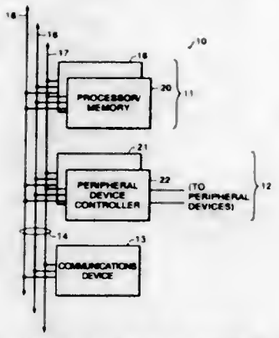
11. For use in a digital data-processing system comprising a communications channel, including a plurality of duplicated information-carrying buses, for carrying error-broadcast signals

5,555,374

SYSTEM AND METHOD FOR COUPLING A PLURALITY OF PERIPHERAL DEVICES TO A HOST COMPUTER

5,555,375

METHOD AND APPARATUS FOR NETWORK COMPUTER SYSTEMS MANAGEMENT GROUP



placed in the channel in response to detection of errors in the information that the duplicated buses carry, a bus device comprising:

A) obey logic for causing the bus device alternatively to assume a plurality of bus-selection states, each of which is associated with a different one of the buses, the bus associated with the bus-selection state assumed by the bus device being denominated the bus selected by the bus device, and

B) means for:

i) in the absence of an error-detection signal, using information present at designated time slots on the selected bus, but

ii) in response to an error-broadcast signal representing an error in information placed on either bus during that time slot, regardless of whether that bus is the bus selected by the bus device, using in place of that information the information carried by a bus in a different time slot.

23. For use in a digital data-processing system comprising a communications channel, including a plurality of duplicated information-carrying buses, for carrying error-broadcast signals placed in the channel in response to detection of errors in the information that the duplicated buses carry, a bus device comprising:

A) obey logic causing the bus device alternatively to assume a plurality of bus-selection states, each of which is associated with a different one of the buses, the bus associated with the bus-selection state assumed by the bus device being denominated the bus selected by the bus device, the obey logic, in the absence of an error-broadcast signal representing an error on a given bus not selected by the bus device, responding to an error-broadcast signal representing an error on the bus selected by the bus device by causing the bus device to assume the bus-selection state associated with the given bus; and

B) bus-driving circuitry for:

i) placing identical information on all of the buses at a designated time slot when operating properly and

ii) performing retransmission of that information in a different time slot in response to an error-broadcast signal indicating an error in information placed on any bus during the designated time slot, regardless of whether that bus is the bus selected by the bus device.

5,555,373

INACTIVITY MONITOR FOR TRUSTED PERSONAL COMPUTER SYSTEM

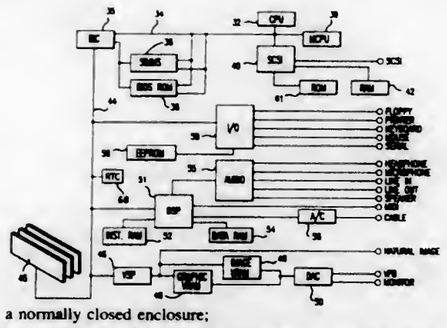
Richard A. Dayan, and Palmer E. Newman, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 6, 1995, Ser. No. 383,884

Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—188.01 **19 Claims**

1. A personal computer system for receiving and retaining data and capable of securing data retained within the system against unauthorized access, the system comprising:



a normally closed enclosure;

an erasable memory element mounted within said enclosure for selective activation to active and inactive states and for receiving and storing a privileged access password when in the active state;

a manually operable option switch mounted within said enclosure, said option switch being operatively connected with said erasable memory element and manually settable by a user of the personal computer system for setting said erasable memory element to the active and inactive states;

an inactivity monitor in the computer system for determining whether or not a measured time period between successive uses of the system exceeds a specified inactivity period;

means for selectively enabling and disabling the inactivity monitor;

means for inhibiting a successful power-up of the computer system in response to a determination by the inactivity monitor, while enabled, that the measured time period exceeds the specified inactivity period; and

a system processor mounted within said enclosure and operatively connected with said erasable memory element for controlling access to at least certain levels of data stored within the system by distinguishing between entry and non-entry of the password and between the enabled and disabled state of the inactivity monitor.

17. A method of operating a personal computer system having an enclosure, a system processor mounted within the enclosure, a selectively activatable erasable memory element mounted within the enclosure, a manually operable option switch mounted within the enclosure manually settable by a user of the personal computer system for setting the memory element to active and inactive states, a tamper detection switch mounted within the enclosure for detecting opening of the enclosure, an inactivity monitor for determining whether or not a measured time between successive uses of the system exceeds a specified inactivity period, and a utility program invocable by the user for rendering the inactivity monitor enabled and specifying the inactivity period, the method comprising the steps of:

manually setting the option switch and selectively setting the memory element into the active state;

storing a privileged access password in the active memory element;

invoking the utility program to enable the inactivity monitor;

controlling access to at least certain levels of data stored within the system by distinguishing between entry and non-entry of the password and between an enabled and disabled state of the inactivity monitor; and

inhibiting a power-up of the system in response to any switching of the tamper switch and in response to a determination by the enabled inactivity monitor that the measured time exceeds the specified inactivity period while the privileged access password is stored in the memory element.

5,555,374

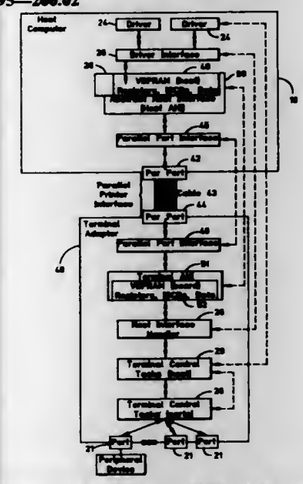
SYSTEM AND METHOD FOR COUPLING A PLURALITY OF PERIPHERAL DEVICES TO A HOST COMPUTER THROUGH A HOST COMPUTER PORT

Donald G. Armerding, San Diego; William B. Beal, Solana Beach; Alan J. Izzo; Billy A. Oestra, both of San Diego, and Terrell L. Rodman, Carlsbad, all of Calif., assignors to Systech Computer Corporation, San Diego, Calif.

Filed Aug. 26, 1994, Ser. No. 296,713

Int. Cl.[6] G06F *13/38;15/16;15/173*

U.S. Cl. 395—200.02 **7 Claims**



1. A communication system for coupling a host computer with a plurality of peripheral devices, comprising:

a host interface in the host computer for receiving peripheral device control information and data from a plurality of peripheral device drivers;

a host interface memory means for buffering peripheral device control information and data between the host interface and the plurality of peripheral device drivers;

a host parallel port in the host computer;

a host port interface in the host computer coupled to the host interface, to the host interface memory means, and to the host parallel port for providing two-way communication of control information and data between the host interface memory means and the host parallel port;

a signal conductor connected to the host parallel port; and

a terminal adapter, remotely located from the host computer, the terminal adapter including:

a terminal adapter parallel port connector connected to the signal conductor;

a terminal adapter interface memory means for buffering the control information and data;

a terminal adapter port interface connected to the terminal adapter parallel port connector for communication of the control information and data between the terminal adapter and the terminal adapter parallel port;

a terminal adapter interface coupled to the terminal adapter port interface and to the terminal adapter interface memory means for entering control information and data in the terminal adapter interface memory means; and

a terminal control means coupled to the terminal adapter interface and to the terminal adapter interface memory means for controlling the operation of a plurality of peripheral devices in response to control and status information in the terminal adapter interface memory means.

5,555,375

METHOD AND APPARATUS FOR NETWORK COMPUTER SYSTEMS MANAGEMENT GROUP ADMINISTRATION

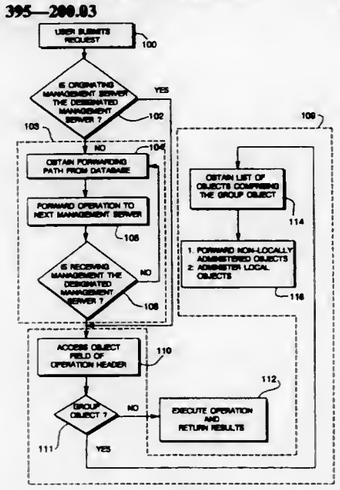
Ram Sudama, Hudson; David M. Griffin, Maynard, both of Mass.; Brad C. Johnson, Westerly, R.I.; Dexter Sealy, Boston, Mass.; James Shelhamer, Maynard, Mass., and Owen H. Tallman, Lunenburg, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 722,867, Jun. 28, 1991, abandoned.

This application Jan. 12, 1995, Ser. No. 373,513

Int. Cl.[6] G06F *9/40*

U.S. Cl. 395—200.03 **8 Claims**



1. A method for administering an operation on a network of computer systems, said network of computer systems having a plurality of management servers for administering objects, a first group object having a first plurality of constituent objects and a second group object having a second plurality of constituent objects, said method comprising the steps of:

creating a name space containing a list of all objects including said first group object, said second group object, each of said first plurality of constituent objects and each of said second plurality of constituent objects, said list identifying said first plurality of constituent objects as belonging to said first group object and identifying said second plurality of group objects as belonging to said second group object;

identifying in said list an associated one of said plurality of management servers for administering each of said first group object, said second group object, each of said first plurality of constituent objects and each of said second plurality of constituent objects;

generating an operation that is directed to a first target object selected from the group consisting of said first group object and said second group object, said operation comprising at least one sub-operation directed to a second target object selected from the group consisting of said first group object, said second group object, each of said first plurality of constituent objects and each of said second plurality of constituent objects, said second target object being different from said first target object;

receiving said operation at the management server identified in said list as administering said first target object;

transferring said operation to said first target object for execution;

transferring said sub-operation to the management server identified in said list as administering said second target object;

5,555,377

SYSTEM FOR SELECTIVELY COMPRESSING DATA

5,555,378

SCHEDULING TRANSMISSION MULTIMEDIA

5,555,379

CACHE CONTROLLER INDEX ADDRESS GENERATOR

transferring said sub-operation to the management server identified in said list as administering said second target object;

transferring said sub-operation to said second target object for execution.

5,555,376

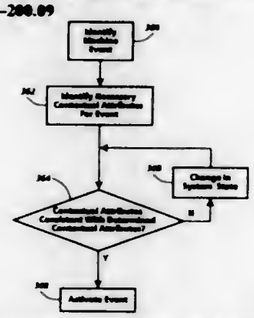
METHOD FOR GRANTING A USER REQUEST HAVING LOCATIONAL AND CONTECTUAL ATTRIBUTES CONSISTENT WITH USER POLICIES FOR DEVICES HAVING LOCATIONAL ATTRIBUTES CONSISTENT WITH THE USER REQUEST

Marvin M. Theimer, Mountain View; Michael J. Spreitzer, Tracy; Mark D. Weiser, Palo Alto; Richard J. Goldstein, San Francisco; Scott A. Elrod, Redwood City; Daniel C. Swinehart; William N. Schilit, both of Palo Alto; Robert T. Krivacic, San Jose, and Roy Want, Mountain View, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1993, Ser. No. 161,968

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—200.09 **6 Claims**



1. A method for superimposing prespecified locational, environmental, and contextual controls on user interactions, including interactions of mobile users, with computational resources of a distributed computer system for performing a multiplicity of operations and with processes running on equipment residing on said system, each device of the distributed computer system having a location and at least one allowable operation, the method comprising the steps of:

registering interaction policies, including user specified interaction policies, on an identifiable address path;

registering user and equipment locations, including dynamically updated indications of the locations of mobile users;

registering interaction requests, each interaction request including a requested operation;

identifying locational and contextual attributes of each of said interaction requests by reference to contextual information, including registered locations;

for each interaction request, identifying a device having locational attributes consistent with the locational attributes of the interaction request and an allowable operation consistent with the requested operation of the interaction request;

granting interaction requests that have locational and contextual attributes that are consistent with said interaction policies and for which a device has been identified whose allowable operation is consistent with the requested operation; and

denying interaction requests that have locational or contextual attributes that are inconsistent with said interaction policies.

5,555,377

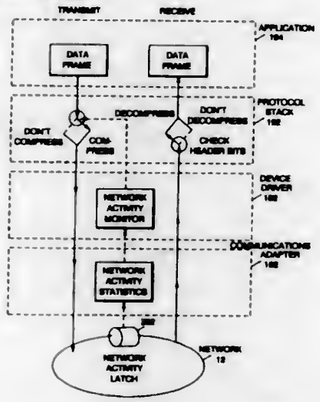
SYSTEM FOR SELECTIVELY COMPRESSING DATA TRANSFERED IN NETWORK IN RESPONSE TO PRODUCED FIRST OUTPUT WHEN NETWORK UTILIZATION EXCEEDS FIRST THRESHOLD AND DATA LENGTH OVER LIMIT

Kenneth J. Christensen; Steven E. Polge, both of Wake, and Anthony D. Walker, Durham, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1993, Ser. No. 168,613

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—200.11 **5 Claims**



1. A data communications system for efficiently transferring data with variable length between two or more terminals in a network by selectively compressing the data, comprising:

two or more terminals connected via a token ring transfer medium in a network;

means in each terminal for monitoring network utilization by detecting the number of frames traveling over the network having a token busy during a predetermined time period, producing a first output when network utilization exceeds a first threshold and producing a second output when said network utilization is below a second threshold;

means associated with each of said terminals for compressing data, to be transmitted from the first terminal to a second terminal on said network, in response to said first output of said monitoring means when said variable data length is over a selected limit;

means for transmitting data from said first terminal to said second terminal on said network without compressing the data in response to said second output or the absence of said first output;

means associated with each of said terminals for detecting compressed data received by said second terminal;

means associated with each of said terminals for decompressing data, received by said second terminal, in response to an output of said detecting means; and

means associated with each of said terminals for controlling said means for compressing and said means for decompressing such that said means for compressing and decompressing are operational only when the number of frames having a busy token, detected by said means for detecting, are above a predetermined number.

5,555,378

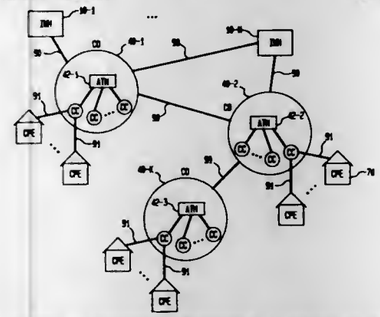
SCHEDULING TRANSMISSION MULTIMEDIA INFORMATION IN BROADBAND NETWORKS USING A TOKEN PASSING SCHEME

Alexander Gelman, Brooklyn, N.Y., and Shlomo Halfin, Chatham, N.J., assignors to Bell Communications Research, Inc., Morristown, N.J.

Filed Mar. 2, 1994, Ser. No. 206,777

Int. Cl.[6] H01J *13/00*

U.S. Cl. 395—200.13 **6 Claims**



1. A system for scheduling transmission of multimedia information from a first set of nodes as requested by subscribers at a second set of nodes, wherein said first and second sets of nodes are interconnected by an ATM switch, such that collisions at said ATM switch are avoided and requests are serviced in a timely manner, said system comprising:

at each node of said first set, a first schedule processor which includes a first request processor connected to a first token processor, said first request processor receiving requests for multimedia information from nodes of said second set and said first token processor selecting a request from among said requests and issuing a token to the node of said second set which sent said selected request together with a first end of transmission time (t_1), and

at each node in said second set, a second schedule processor which includes a second request processor connected to a second token processor, said second request processor receiving requests for multimedia information from subscribers, wherein each of said received requests includes a response time (RT), and sending at least one of said received requests to one of said nodes of said first set together with a second end of transmission time (t_2), and said second token processor receiving tokens issued from said first token processors at nodes of said first set, selecting one of said tokens for acceptance, causing a message of acceptance to be sent to the node of said first set issuing said selected token, rejecting other of said tokens and returning said rejected tokens to nodes of said first set issuing said rejected tokens; and

wherein said first schedule processor further includes a return token store for holding a list of nodes of said second set rejecting tokens issued by said first token processor and means responsive to said list of nodes held at said return token store for performing a request selection using a distance function which minimizes idle time at said first schedule processor and missed response times of requests, said distance function (D_1) being

$$D_1=|t_1-t_2|+RT/R_0$$

wherein

$$R_0=T_0/t_0,$$

T_0 being a time for servicing each request to prevent the requesting subscriber from being without multimedia information and t_0 being a time for transmitting requested multimedia information.

5,555,379

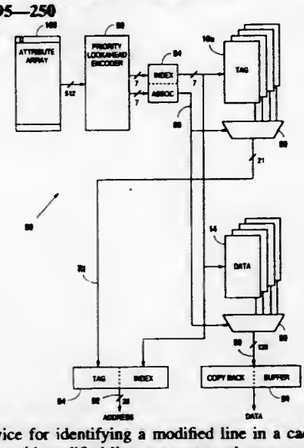
CACHE CONTROLLER INDEX ADDRESS GENERATOR

Mark Silla, Round Rock, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 6, 1994, Ser. No. 271,105

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—250 **12 Claims**



1. A device for identifying a modified line in a cache memory and writing said modified line to an external memory comprising:

detector for simultaneously determining all modifications of said cache memory;

prioritizer for prioritizing said modifications for purposes of sequentially writing said modifications to said external memory; and

identifier for identifying an address in said external memory to which each said modification is to be written;

wherein said cache memory includes an attribute array, a tag array, and a data array;

wherein said prioritizer is a logic circuit that sequentially outputs, according to a desired prioritization, an associativity signal and an index signal each corresponding to each of said modifications;

wherein said identifier includes a determiner utilizing said index signal and said associativity signal to determine from said tag array a tag signal for combination with said index signal to yield said address.

5,555,380

DATA TRANSFER SYSTEM WITH BUFFER REQUEST INCLUDING BLOCK LENGTH TO UPDATE THE BUFFER POINTER PRIOR TO TRANSFERRING OF THE BLOCK

Hideto Suzuki, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 13, 1992, Ser. No. 867,523

Claims priority, application Japan, Apr. 11, 1991, 3-106805

Int. Cl.[6] G06F *15/16;12/02*

U.S. Cl. 395—250 **15 Claims**

1. A data transfer system, comprising:

a plurality of processors each having predetermined data blocks to be transferred;

a buffer having a predetermined number of buffer areas for storing data transferred from said plurality of processors;

an external pointer storing an address designating a position of one of said buffer areas in said buffer,

a system bus connecting said plurality of processors to said buffer;

means for providing arbitration of said system bus to allow only one of said plurality of processors to access said buffer;

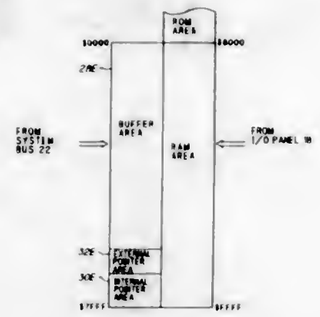
means for retrieving and reading the address stored in the external pointer, the address including a plurality of bits

chronous peripheral bus, said plurality of circuits and said standard synchronous peripheral PC bus on said motherboard operating in synchronism with a first clock having a first

bus for a preselected pattern of transaction activity comprises the step of monitoring the bus to detect a preselected number of back-to-back bus write transactions; and

5,555,384

RESCHEDULING CONFLICTING ISSUED INSTRUCTIONS BY DELAYING ONE CONFLICTING INSTRUCTION INTO THE SAME PIPELINE STAGE AS A



TWO-PORT RAM 26

indicating a size of data transferred to said buffer from said one of said plurality of processors;

means for renewing the address stored in the external pointer and read therefrom in accordance with the plurality of bits indicative of the size of data; and

means for providing a data storing area of a predetermined length in said buffer in accordance with the size of data;

wherein when any of said plurality of processors accesses the external pointer to write data to said buffer, the address stored in the external pointer is read out and incremented by a digital value corresponding to an indication of the plurality of bits which are included with the address by the renewing means.

5,555,381

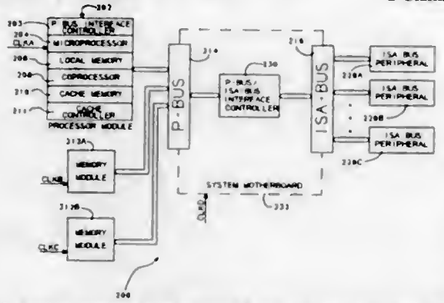
MICROCOMPUTER ARCHITECTURE UTILIZING AN ASYNCHRONOUS BUS BETWEEN MICROPROCESSOR AND INDUSTRY STANDARD SYNCHRONOUS BUS

Thomas E. Ludwig, Irvine, and Thomas W. Craft, Mission Viejo, both of Calif., assignors to AST Research, Inc., Irvine, Calif.

Continuation of Ser. No. 346,352, Nov. 29, 1994, abandoned, which is a continuation of Ser. No. 220,942, Mar. 31, 1994, abandoned, which is a continuation of Ser. No. 972,515, Nov. 6, 1992, abandoned, which is a continuation of Ser. No. 433,982, Nov. 9, 1989, Pat. No. 5,191,657. This application May 26, 1995, Ser. No. 451,517

Int. Cl.[6] G06F *13/00;13/42*

U.S. Cl. 395—281 **2 Claims**



1. A microcomputer system which includes a microprocesor and a standard synchronous peripheral bus, said microprocessor having an interface specification functionally equivalent to the interface specification of one of an Intel 80286, 80386 or 80486 microprocessor, said standard synchronous peripheral bus providing electrical communication to a plurality of peripheral devices, wherein said microprocessor system comprises:

a motherboard onto which said standard synchronous peripheral PC bus is mounted, said motherboard including a plurality of circuits in electrical communication with said standard synchronous peripheral bus, said plurality of circuits and said standard synchronous peripheral PC bus on said motherboard operating in synchronism with a first clock having a first frequency;

a processor circuit board separate from said motherboard onto which said microprocessor is mounted, said processor circuit board including a connector for providing electrical communication to said motherboard, said processor circuit board including a plurality of circuits which provide functional support for said microprocessor, said microprocessor and said plurality of circuits on said processor circuit board operating in synchronism with a second clock having a second frequency, said second clock operating asynchronously with respect to said first clock;

an asynchronous bus;

a first bus interface circuit mounted on said motherboard, said first bus interface circuit providing electrical communication between said standard synchronous peripheral PC bus and said asynchronous bus;

a second bus interface circuit mounted on said processor circuit board, said second bus interface circuit providing electrical communication between said microprocessor and said asynchronous bus; and

a processor memory circuit mounted on said processor circuit board and operating at said second frequency in synchronism with said microprocessor.

5,555,382

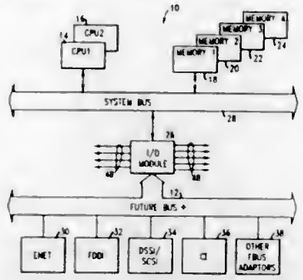
INTELLIGENT SNOOPY BUS ARBITER

Kurt M. Thaller, Acton; Nitin D. Godiwala, Boylston, and Barry A. Maskas, Sterling, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 73,251, Jun. 8, 1993, abandoned, which is a continuation of Ser. No. 874,236, Apr. 24, 1992, abandoned. This application Dec. 19, 1994, Ser. No. 359,321

Int. Cl.[6] G06F *9/26;* **H01J** *13/00*

U.S. Cl. 395—293 **5 Claims**



1. In a multiprocessor system including a plurality of processors coupled via a system bus to a main memory the system bus operating in accordance with a SNOOPY bus protocol, each processor having a cache memory that is accessible by the respective processor and is accessible by the other processors in said multiprocessor system via transactions on the system bus, each transaction including the communication of address and data information over the system bus, a method of ensuring adequate access to said cache by said respective processor to prevent starvation of said respective processor, said method comprising the steps of:

arbitrating between requests for access to said system bus by said plurality of processors, said step of arbitrating further comprising the steps of;

monitoring the system bus for a preselected pattern of transaction activity on the bus, wherein the step of monitoring the bus for a preselected pattern of transaction activity comprises the step of monitoring the bus to detect a preselected number of back-to-back bus write transactions; and

upon detecting the preselected pattern of transaction activity by said monitoring, inserting an idle bus cycle on said system bus to permit said respective processor to access its cache memory.

5,555,383

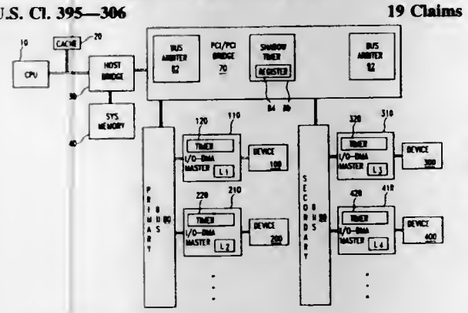
PERIPHERAL COMPONENT INTERCONNECT BUS SYSTEM HAVING LATENCY AND SHADOW TIMERS

Uri Elazar, Alon Hagalil, and Yehuda Peled, Bet Shearim, both of Israel, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 7, 1994, Ser. No. 337,008

Int. Cl.[6] G06F *13/14;13/42*

U.S. Cl. 395—306 **19 Claims**



1. A computer system, comprising:

a central processing unit;

a bridge unit coupled to said central processing unit;

at least one shadow timer for counting a received time value;

first and second buses, each of which is coupled to said bridge unit;

a plurality of first peripheral units coupled to said first bus, each of said plurality of first peripheral units including an associated latency timer for counting an associated latency time value; and

a plurality of second peripheral units coupled to said second bus, each of said plurality of second peripheral units also including an associated latency timer for counting an associated latency time value, the latency time value associated with each of said first and second peripheral units representing a time necessary to perform a transfer operation;

wherein each of said first peripheral units is operable for transferring and receiving information from any one of the other first peripheral units and from any one of said second peripheral units; and

wherein during a transfer operation in which information from one of said first peripheral units is transferred to one of said second peripheral units, the one first peripheral unit receives control of said first bus, the latency timer associated with the one first peripheral unit begins its counting operation with its associated latency time value in response to the one first peripheral unit obtaining control of said first bus, said at least one shadow timer receives the latency time value associated with the one first peripheral unit, and said at least one shadow timer begins its counting operation with said received latency time value in response to the one first peripheral unit obtaining control of said second bus and starting the transfer of information to the one second peripheral unit.

5,555,384

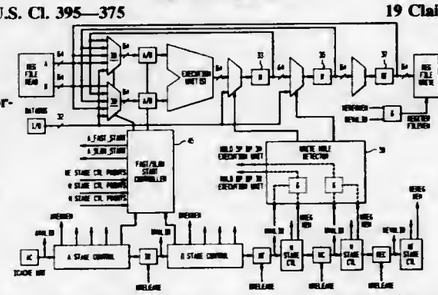
RESCHEDULING CONFLICTING ISSUED INSTRUCTIONS BY DELAYING ONE CONFLICTING INSTRUCTION INTO THE SAME PIPELINE STAGE AS A THIRD NON-CONFLICTING INSTRUCTION

David B. Roberts, Santa Clara; George S. Taylor, Menlo Park, and David M. Parry, Santa Clara, all of Calif., assignors to Silicon Graphics, Inc., Mountain View, Calif.

Continuation of Ser. No. 35,544, Mar. 23, 1993, abandoned, which is a continuation of Ser. No. 444,495, Dec. 1, 1989, abandoned. This application Oct. 18, 1994, Ser. No. 324,861

Int. Cl.[6] G06F *9/38*

U.S. Cl. 395—375 **19 Claims**



1. A pipeline controller for a computer system having an instruction pipeline containing a plurality of types of multiple stage issued instructions, having variable execution latencies, and requiring particular computer resources at different stages of execution, the controller comprising:

pipeline monitoring means coupled to the instruction pipeline for detecting the types and stages of execution of issued instructions in the pipeline;

conflict detector means coupled to the pipeline monitoring means for detecting when two issued instructions in the pipeline will require a given computer resource in a same stage at some future time; and

rescheduler means coupled to both the conflict detector means and to the instruction pipeline for rescheduling one of said two issued instructions which will be in the same stage at some future time, said rescheduler means including means for detecting when a third issued instruction will not require said given computer resource in said same stage at some other future time, and means for enabling the rescheduled one of said two issued instructions and said third issued instruction to continue execution such that the rescheduled one of said two issued instructions has exclusive access to said computer resource at said other future time when both said third issued instruction and the rescheduled one of said two issued instructions are in the same stage of execution in the instruction pipeline.

5,555,385

ALLOCATION OF ADDRESS SPACES WITHIN VIRTUAL MACHINE COMPUTE SYSTEM

Damian L. Osisek, Vestal, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 27, 1993, Ser. No. 143,404

Int. Cl.[6] G06F *9/26*

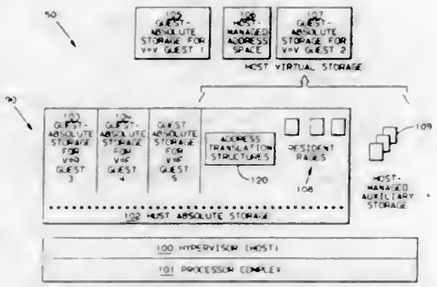
U.S. Cl. 395—401 **28 Claims**

1. A computer system for allocating and granting shared access to an address space in storage said system comprising:

host operating system means for creating first and secood virtual machine guests; and wherein

said first guest includes means, responsive to a request from a first application executing in said first guest to allocate an address space, for determining at least in part a storage region for said address space;

said first guest includes means, responsive to a request from said first application to grant shared access by a second application



executing in said second guest to said address space, for notifying said host means that said second guest is authorized to access said address space and notifying said second guest that said second application is authorized to access said address space;

said second guest includes means, responsive to a request from said second application to access said address space, for determining whether said second application has authority to access said address space; and

said host means also participates in determining a storage region for said address space.

5,555,386

DATA FLOW PROCESSOR WITH VARIABLE LOGIC CONNECTION BETWEEN PROCESSORS IN A SYSTEM

Shingo Nomura, Nabari, Japan, assignor to Sharp Kabushiki Kaisha, Osaka-fu, Japan

Continuation of Ser. No. 157,326, Nov. 26, 1993, abandoned. This application Mar. 2, 1995, Ser. No. 397,720
Claims priority, application Japan, Nov. 26, 1992, 4-316918
Int. Cl.[6] G06F *7/04;13/00*
U.S. Cl. 395—375 **13 Claims**

1. A data flow processor, comprising:

a plurality of input ports for receiving a data packet including branching condition data;

a plurality of output ports for outputting a data packet;

branching control information storage means for storing branching control information designating a comparison position, the comparison position designating a relative positional location for selection of a portion of stored data for subsequent comparison and for storing reference data, including branching condition data, for subsequent comparison to data in a data packet input through one of said plurality of input ports; and

branching means for comparing a portion of the branching condition data of the reference data and a portion of the branching condition data of the input data packet, each portion corresponding to data located at the comparison position designated by the stored branching control information, and for selecting one of said plurality of output ports, based on the comparison, through which the input data packet is to be output, said branching means including,

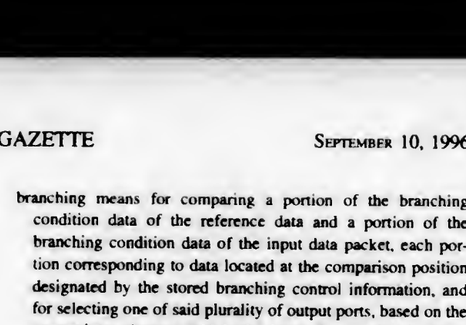
selection means for storing branching control information including comparison designation data (RM) and reference data (RD) in a specific data packet in said branching control information storage means, for conducting a predetermined logic operation utilizing (RM) and (RD) of said branching control information storage means and said branching condition data (PE) of the input data packet, and for selecting one of said plurality of output ports based on a result of the conducted logic operation, wherein the stored branching control information and stored reference data are variable.

5,555,387

METHOD AND APPARATUS FOR IMPLEMENTING VIRTUAL MEMORY HAVING MULTIPLE SELECTED PAGE SIZES

Mark W. Branstad; Jonathan W. Byrn; Gary S. Delp; Philip L. Leichty, all of Rochester; Kevin G. Plotz, Byron; Fadi-Christian E. Safi, Rochester, and Albert A. Slane, Oronoco, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 6, 1995, Ser. No. 467,266
Int. Cl.[6] G06F *9/26;9/34;12/00;12/02*
U.S. Cl. 395—419 **3 Claims**



3. An apparatus for implementing virtual memory having multiple selected page sizes comprising:

a virtual address; the virtual address including a map index and a frame offset;

selector means for receiving the virtual address frame offset and the multiple selected page sizes for generating an offset and index; said selector means including means for generating a plurality of predetermined boundary values; and means for generating a limit; said limit generating means including means for receiving said virtual address frame offset and for subtracting each said predetermined boundary value from said virtual address frame offset;

frame map table means for indexing the virtual address map index and the selector means generated index and generating a base address; and

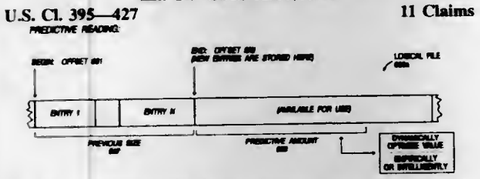
means for adding the frame map table means generated base address and the selector means generated offset and providing a physical address.

5,555,388

MULTI-USER SYSTEM AND METHODS PROVIDING IMPROVED FILE MANAGEMENT BY READING

Steven T. Shaughnessy, Mt. Hermon, Calif., assignor to Borland International, Inc., Scotts Valley, Calif.

Filed Aug. 20, 1992, Ser. No. 933,480
Int. Cl.[6] G06F *12/00;13/00*
U.S. Cl. 395—427 **11 Claims**



1. In a computer system having a memory and a storage device, an improved method for storing and retrieving a plurality of information files, the method comprising:

(a) storing the plurality of information files as a single disk file, the disk file including at least one storage block for each of the information files, said at least one storage block having a uniform size, and each said information file having a variable file size, and storing with the single disk file a directory of said information files, said directory including a plurality of entries each of which stores a location of an information file within the single disk file:

(b) retrieving a desired information file from the storage device by:

(i) locating a storage block having the desired information file by:

searching the directory for an entry storing said location of the desired information file, and

if the entry is found, retrieving from the directory entry said location for the desired information file, and

(ii) reading from the storage block an amount of data equal to the file size of the information file plus an additional amount:

(c) processing said retrieved information file in the memory, said processing including at least one of adding or deleting data entries from the information file:

(d) storing the processed information file on the storage device:

(e) storing in the memory a new size for the processed information file:

(f) if the new size exceeds the at least one storage block size,

(i) invalidating the at least one storage block,

(ii) appending to the single disk file a new block having a size larger than that of the invalidated storage block, and

(iii) storing the information file in the new block: and

(g) subsequently reading the desired information file by:

seeking to said location of the desired information file, and

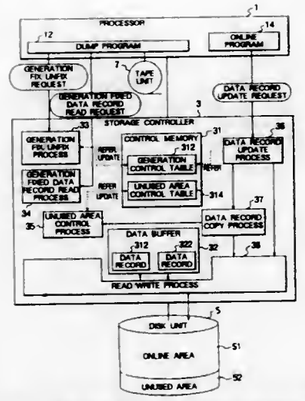
in a single input/output operation, reading an amount of data equal to the file size plus an additional amount.

5,555,389

STORAGE CONTROLLER FOR PERFORMING DUMP PROCESSING

Takao Satoh; Akira Yamamoto, both of Sagamihara, and Shigeo Honma, Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 5, 1994, Ser. No. 270,831
Claims priority, application Japan, Jnl. 7, 1993, 5-168112
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—427 **24 Claims**



data record generation fix request received from said processing unit, said data record generation fix request specifying a range of data records to be set in a generation fixed status;

a deciding means for deciding whether or not a data record to be updated in an update request is in a generation fixed status by referring to said generation fixing means in response to a data record update request received from said processing unit;

an old data record copying means for copying said data record to be updated to an unused area of said storage device by associating said data record to be updated with said generation identifier when said deciding means decides that said data record to be updated is in the generation fixed status; and

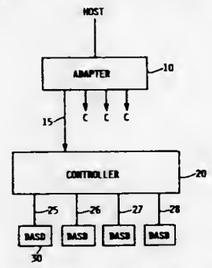
means for storing in said storage device the data record transferred from said processing unit in compliance with said data record update request.

5,555,390

DATA STORAGE METHOD AND SUBSYSTEM INCLUDING A DEVICE CONTROLLER FOR RESPECIFYING AN AMENDED START ADDRESS

Ian D. Judd, Winchester, United Kingdom; Patrick A. Buckland, Austin, Tex.; Roger G. Cath, Eastleigh, United Kingdom; Gordon J. Cockburn, Romsey, United Kingdom, and William A. Short, Eastleigh, United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 938,057, Oct. 19, 1992, abandoned. This application Jan. 19, 1995, Ser. No. 375,064
Int. Cl.[6] G06F *13/12;12/00*
U.S. Cl. 395—439 **8 Claims**



1. A method of transferring data from a data storage subsystem to an attached host data processing system having a host memory, said host memory having a plurality of addresses, the data storage subsystem comprising a device controller connected for communication to a direct access storage device on which the data is stored, the method comprising the steps of:

sending a data transfer command from the host data processing system to the device controller of the data storage subsystem

to initiate data transfer, the data transfer command specifying a sequence of blocks of data to be transferred, said sequence of blocks further comprising a first set of blocks and a second set of blocks, said sequence of blocks in sequential order when a first set of blocks of data is followed by a second set of blocks of data, and said data transfer command specifying a start address in the host memory to which the first block of the first set of blocks of data in the sequence of blocks of data is to be transferred; and

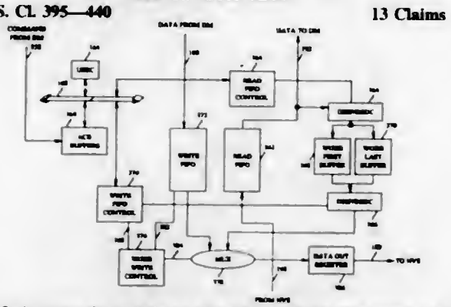
transferring the sequence of blocks of data from the data storage subsystem to the host data processing system in response to the data transfer command as a first set of blocks and a separate second set of blocks, the device controller of the data storage subsystem capable of calculating and specifying an amended start address in host memory to which the second set of blocks is to be transferred, said amended start address being different from the start address specified in the data transfer command.

5,555,391

SYSTEM AND METHOD FOR STORING PARTIAL BLOCKS OF FILE DATA IN A FILE CACHE SYSTEM BY MERGING PARTIAL UPDATED BLOCKS WITH FILE BLOCK TO BE WRITTEN

Joseba M. De Subijana, Minneapolis; Gary R. Robeck, Albertville; Wayne A. Michaelson, Circle Pines, and Steven M. Wierdsma, Andover, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Dec. 23, 1993, Ser. No. 172,663
Int. Cl.[6] G06F *12/06*
U.S. Cl. 395—440 **13 Claims**



12. A system for updating a selected portion of a file stored in a non-volatile storage within a file cache system coupled to a host computer system, comprising:

buffer means for storing a first selected portion and a second selected portion of a file received from the non-volatile storage, wherein said file is composed of a plurality of segments, each segment contains a plurality of blocks, each block contains a plurality of words, the unit of data transfer between the host computer system and the file cache system is one or more blocks specified by a number of blocks count, the size of a portion of said file to be updated is not equal to an integral multiple of the size of a block and said portion of said file to be updated may be stored in multiple contiguous blocks, said first selected portion of said file contains data starting from a first word of a fist selected block of said file up to but not including a word specified by the first word index, said second portion of said file contains data starting from a word immediately succeeding a word specified by a last word index within a last selected block of said file up to and including a last word in said last selected block, and said first selected block is the same as said last selected block for file updates of less than or equal to one block

write FIFO means, coupled to the host computer system, for storing said portion of said file to be updated, wherein said portion of said file to be updated does not include but is contiguously between said first selected portion and said second selected portion of said file and includes data starting from a word in said first selected block specified by said first word index up to and including a word in said last selected block specified by said last word index, said portion of said file to be updated being received from the host computer system,

write control means, coupled to said write FIFO means, for controlling the selective transfer of said first selected portion of said file from said buffer means, said portion of said file to be updated from said write FIFO means, and said second selected portion of said file from said buffer means to the non-volatile storage by generating a plurality of selection control signals according to said first word index, said last word index, and said number of blocks count, said write control means including

first index means for storing said first word index;

second index means for storing said last word index;

blocks count means for storing said number of blocks count;

address decode means, coupled to said first index means and said second index means, for determining the address of the word in selected portion of a file being processed

compare means, coupled to said blocks count means, said address decode means, and said write FIFO means, for controlling the continued transfer of words contained in said first selected portion of said file, said second selected portion of said file, and said portion of said file to be updated, and

selection control decode means, coupled to said first index means, said second index means, and said compare means, for controlling the selection of either said first selected portion of said file, said second selected portion of said file, or said portion of said file to be udpated, for transfer to the non-volatile storage, and

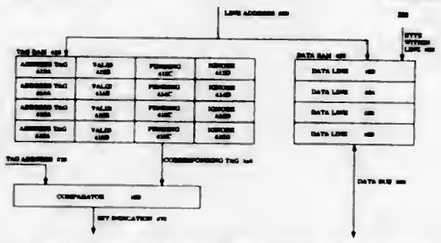
a multiplexor, coupled to said buffer means and the non-volatile storage, and connected to said write FIFO means, and said write control means to select said first selected portion of said file or said second selected portion of said file from said buffer means, or said portion of said file to be updated from said write FIFO means for transfer into the non-volatile storage according to said selection control signals received from said write control means.

5,555,392

METHOD AND APPARATUS FOR A LINE BASED NON-BLOCKING DATA CACHE

Robert B. Chaput, Beaverton, and Randy L. Steck, Hillsboro, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Oct. 1, 1993, Ser. No. 130,284
Int. Cl.[6] G06F *12/02*
U.S. Cl. 395—445 **8 Claims**



1. A non-blocking data cache that contains data for use by a processor, comprising:

a data random access memory (RAM) that contains a plurality of lines of data;

a tag RAM coupled to the data RAM that contains information relating to each line of the plurality of lines of data, information relating to a line of data in the data RAM comprising:

an address tag;

a pending count;

an ignore indicator;

a comparator coupled to the tag RAM that compares a tag address with the address tag, the tag address being part of a physical address from the processor, and generates a hit indication indicating that data identified by the tag address from the processor is contained in the data RAM when the address tag matches the tag address, and generates a miss indication otherwise;

means responsive to the miss indication for causing the tag RAM to increment the pending count, wherein a non-zero pending count indicates that at least one fill to the line of data in the data RAM is pending, and for causing the tag RAM to decrement the pending count each time a fill to the line of data in the data RAM has been completed; and

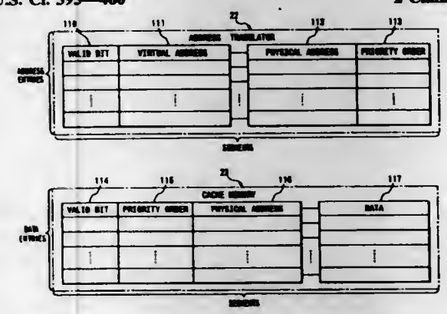
means responsive to the ignore indicator for ignoring a fill operation to the line of data in the data RAM when the pending count is not zero and data having a line address of the line of data in the data RAM has been stored.

5,555,393

METHOD AND APPARATUS FOR A CACHE MEMORY WITH DATA PRIORITY ORDER INFORMATION FOR INDIVIDUAL DATA ENTRIES

Tetsuya Tanaka, Osaka, and Takashi Taniguchi, Moriguchi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 338,818, Nov. 10, 1994, Pat. No. 5,487,162, which is a continuation of Ser. No. 841,106, Feb. 25, 1992, abandoned. This application Oct. 27, 1995, Ser. No. 549,448
Int. Cl.[6] G06F *12/10*
U.S. Cl. 395—460 **2 Claims**



1. An apparatus for cache lock control, comprising:

a cache memory having divided entries each for storing data and priority order information;

an address translator having divided entries each for storing priority order information;

means for selecting one of tile entries of the cache memory and one of the entries of the address translator;

means for comparing priority order information in the selected entry of the cache memory and priority order information in the selected entry of the address translator; and

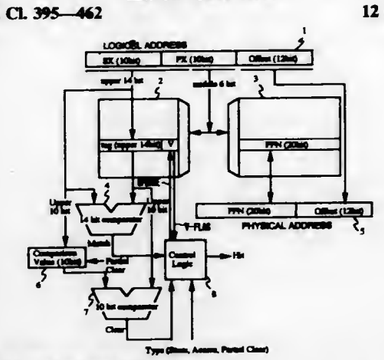
means for controlling updating of data in the selected entry of the cache memory in response to a result of said comparing by the comparing means.

5,555,394

DATA PROCESSOR WITH THE ABILITY OF FAST PARTIAL CLEARING OF BUFFER MEMORY

Fumio Arakawa, Tokyo, and Kunio Uchiyama, Kodaira, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 2, 1993, Ser. No. 115,026
Claims priority, application Japan, Sep. 11, 1992, 4-242958
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—462 **12 Claims**



1. A data processor comprising:

a buffer memory including a tag array of a plurality of entries and a data array of a plurality of entries;

a first comparator which compares address information read out from said tag array in accordance with an address signal with address information of said address signal, said first comparator for performing hit determination;

a latch circuit which holds address information used for partial clearing of said buffer memory; and

a second comparator which compares the address information held in said latch circuit with the address information read out of said tag array, said second comparator for performing determination of partial clearing;

wherein each entry of said tag array has a flag indicating a valid state, an invalid state or a clear waiting state, and

wherein in response to the output of said second comparator indicative of coincidence of both inputs of address information, the flag of a corresponding entry of said tag array is shifted from the clear waiting state to the invalid state.

5,555,395

SYSTEM FOR PERRFORMING MEMORY TABLE CACHE RELOADS IN A REDUCED NUMBER OF CYCLES USING A MEMORY CONTROLLER TO SET STATUS BITS IN THE MAIN MEMORY TABLE

Terry J. Parks, Round Rock, Tex., assignor to Dell U.S.A. L.P., Austin, Tex.

Continuation of Ser. No. 69,864, May 28, 1993, abandoned. This application May 24, 1995, Ser. No. 449,858
Int. Cl.[6] G06F *12/00;13/00*
U.S. Cl. 395—472 **22 Claims**

1. A computer system for performing memory table cache reloads in a reduced number of cycles, comprising:

a bus;

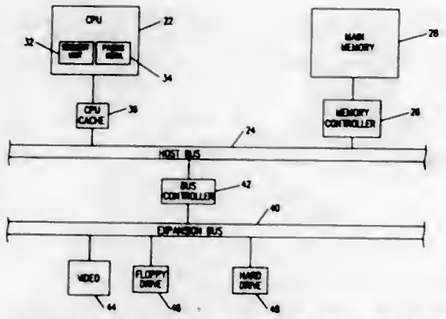
main memory coupled to said bus, wherein said main memory is configured to store memory tables, each of said memory tables comprising a plurality of memory table entries, wherein each of said plurality of memory table entries includes information regarding memory blocks in said main memory;

a processor coupled to said bus, said processor including a memory table cache configured to store a subset of said plurality of memory table entries, wherein said processor is configured to use said information in said plurality of memory table entries in said plurality of memory tables in the main memory to access data in said main memory, wherein said processor is configured to generate a memory table cache

(d) adding said queue bank as a queue entry to said local queue

said OR output of the plurality of the small unit priority circuits

memory, and upon such an event, supplying a signal to said cache memory causing the synchronization thereof with said



reload cycle to said main memory that causes one of said plurality of memory table entires to be read from said main memory into said memory table cache; and

a memory controller coupled between said bus and said main memory, said memory controller being responsive to said memory table cache reload cycle to read one of said plurality of memory table entries from one of said memory tables, provide said one of said plurality of memory table entries to said processor, and set a status bit in said one of said memory table entries in said main memory, wherein said memory controller determines if said status bit in said one of said plurality of memory table entries is already set and, if said bit is set, does not set said status bit in said memory table entry.

5,555,396

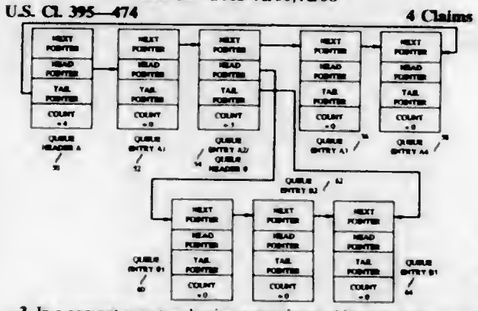
HIERARCHICAL QUEUING IN A SYSTEM ARCHITECTURE FOR IMPROVED MESSAGE PASSING AND PROCESS SYNCHRONIZATION

Merwin H. Alferness, New Brighton; Charles R. Caldarale, Minneapolis; David R. Johnson, Oakdale; Joseph P. Kerzman, New Brighton, and James R. McBreen, Shoreview, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Dec. 22, 1994, Ser. No. 362,034

Int. Cl.[6] G06F *12/00;12/08*

U.S. Cl. 395—474 **4 Claims**



3. In a computer system having a queuing architecture to support interprocess communication between at least first and second processes being executed by at least one processor coupled to a main storage unit and controlled by a computer operating system, units of data storage residing in the main storage unit called queue banks, each queue bank being capable of representing a queue header element or a queue entry element of a queue, each queue including one queue header and zero or more queue entries, a queue being the mechanism by which princesses can communicate with each other and containing attributes describing its use, a queue entry being used for storing a multi-word message segment, a method of interprocess communication without copying message segments comprising the steps of:

(a) creating a primary queue in the main storage unit;

(b) creating a local queue in the main storage unit;

(c) storing a multi-word message segment into a queue bank;

(d) adding said queue bank as a queue entry to said local queue by enqueuing said queue bank to said local queue without performing a data copy of said multi-word message segment and without requiring actions to be taken by the computer operating system;

(e) repeating steps (c) and (d) for all said message segments to be sent from the first process to the second process that must be processed by the second process together as a complete message;

(f) adding said local queue to said primary queue by enqueuing said queue header of said local queue as a queue entry in said primary queue without performing a data copy of said multi-word message segment and without requiring actions to be taken by the computer operating system, and;

(g) removing said local queue from said primary queue by dequeuing said queue header of said local queue without performing a data copy of said multi-word message segment and without requiring actions to be taken by the computer operating system, thereby providing access to said complete message for the second process.

5,555,397

PRIORITY ENCODER APPLICABLE TO LARGE CAPACITY CONTENT ADDRESSABLE MEMORY

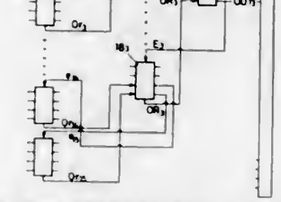
Hiroshi Sasama, and Masato Yoneda, both of Tokyo, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed Jan. 7, 1993, Ser. No. 2,463

Claims priority, application Japan, Jan. 10, 1992, 4-003404; Jan. 10, 1992, 4-003405

Int. Cl.[6] G06F *7/00*

U.S. Cl. 395—485 **15 Claims**



1. A priority encoder having priority means for selecting one active input signal supplied to one input terminal at one address according to a predetermined priority order among active input signals supplied to input terminals at least at two addresses, and for producing output signals including only one active signal to be encoded corresponding to said selected active input signal, and for sequentially producing the output signals in said predetermined priority, order by selecting said active input signals one after another, and encode means for receiving said output signals including only one active signal to be encoded of said priority means as inputs, and for encoding the address of the input terminal which said selected active input signal is supplied to,

said priority means is formed into a hierarchical structure having at least two hierarchies by using a plurality of small unit priority circuits which output an OR output as a logical sum signal of input signals less than said plurality of input signals, and which activate and output only an output signal corresponding to an active highest priority input signal in output signals corresponding to 1 to 1 to said input signals less than said plurality of input signals when an enable signal is active, and

said OR output of the plurality of the small unit priority circuits in a lower hierarchy is the input signal to the small unit priority circuits in a higher hierarchy, and the output signals of the small unit priority circuits in the higher hierarchy are the enable signals to the plurality of small unit priority circuits in the lower hierarchy, and priority is concurrently assigned to the small unit priority circuits in the same hierarchy.

5,555,398

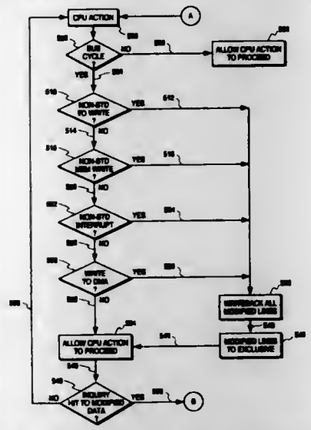
WRITE BACK CACHE COHERENCY MODULE FOR SYSTEMS WITH A WRITE THROUGH CACHE SUPPORTING BUS

Srinivas Raman, Folsom, Calif., assignor to INTEL Corporation, Santa Clara, Calif.

Filed Apr. 15, 1994, Ser. No. 228,145

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—470 **6 Claims**



1. A write back cache coherency system for a computer wherein said computer includes at least one bus that contains snooping signals but not write back support signals, a CPU communicating with said bus, a cache memory communicating with said CPU and having a plurality of addresses for storing data which are organized into lines and a plurality of status bits indicating at least whether a line is in an invalid, modified or exclusive state, a main memory communicating with said bus, a DMA controller connected to said bus, at least one device to said bus, a plurality of additional addressable devices in said computer system each connected to a bus, said cache coherency system comprising:

a cache tag array connected to said cache memory, said cache tag array containing one bit per byte in said cache memory and adapted to indicate if a particular byte in cache has been written to by said CPU;

a cache coherency module added to computer, said cache coherency module including a bus snooping sub-module connected to said bus for monitoring the address and control signals thereon, a system address sub-module which includes a DMA address table containing the addresses of registers of said DMA controller, an I/O address table containing the addresses of all non-standard I/O devices, a memory table containing the addresses of all non-standard memory addresses and a non-standard interrupt table, and a logic sub-module is connected to said bus snooping sub-module and said system address sub-module and providing control signals to said cache memory, said logic sub-module in conjunction with said bus-snooping sub-module and said system address sub-module being adapted to:

indicate when said DMA controller is programmed by said CPU to allow an external I/O device to read or write to main memory, and upon such an event, supplying a signal to said cache memory causing the synchronization thereof with said main memory;

indicate when said CPU performs a write to a non-standard I/O or memory address, and upon such an event, supply a signal to said cache memory causing the synchronization thereof with said main memory;

indicate when a non-standard interrupt has been sent to the CPU by an external device, and upon such an event, supply a signal to said cache memory causing the synchronization thereof with said main memory;

indicate when an inquiry cycle is being run and a hit to a modified line has occurred as a result thereof, and upon such an event, supply a signal to said CPU that stops CPU access to said cache memory;

indicate when said external I/O device has completed its read or write to main memory as programmed by said DMA, and upon such event, supply a signal to said cache memory causing any modified data therein to be written back to said main memory and changing the line containing said modified data to the invalid state.

5,555,399

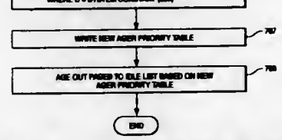
DYNAMIC IDLE LIST SIZE PROCESSING IN A VIRTUAL MEMORY MANAGEMENT OPERATING SYSTEM

Ted C. Waldron, Sunrise, and Glenn E. Brew, Boca Raton, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 7, 1994, Ser. No. 271,684

Int. Cl.[6] G06F *12/12*

U.S. Cl. 395—486 **6 Claims**



1. For use in a data processing system having primary memory and secondary memory and a virtual memory manager that swaps information between said primary and secondary memories, said virtual memory manager employing an ager to determine which information is eligible for swapping from primary memory to secondary memory and providing a listing of said eligible information, a method for dynamically determining execution priorities of said ager relative to non-ager methods on said data processing system, comprising the steps of:

a) determining a minimum size and a maximum size of said listing;

b) setting a first priority of said ager based upon said minimum size of said listing and setting a second priority of said ager based upon said maximum size of said listing;

c) determining if any information is reclaimed from said listing for use in said primary memory;

d) redetermining said minimum and maximum sizes of said listing based upon the amount of said reclaimed information; and

e) resetting said first priority of said ager based upon said redetermined minimum size of said listing and resetting said second priority of said based upon said redetermined maximum size of said listing.

5,555,400

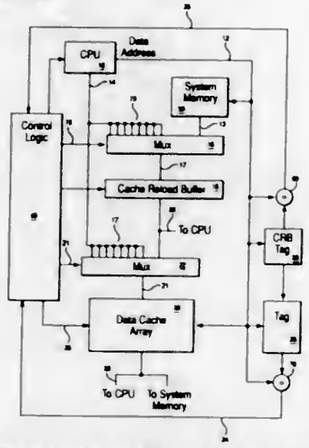
METHOD AND APPARATUS FOR INTERNAL CACHE COPY

Randall D. Groves, and John T. O'Quin, III, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 950,351, Sep. 24, 1992, abandoned. This application Feb. 8, 1995, Ser. No. 385,217

Int. Cl.[6] **G06F** *12/02*

U.S. Cl. 395—492 **12 Claims**



6. A system for moving data in a data processing system having an interconnection of a processor, main memory, a cache, and cache reload buffer having a directory, to reduce cache miss traffic between the main memory and the cache, comprising:

means for loading a line of data with a first address from the main memory or the cache into the cache reload buffer;

means for loading the first address into the buffer directory;

means for changing the first address in the buffer directory to a second address; and

means for invalidating any data in cache having the first address responsive to an address change in the buffer directory by the means for changing, the invalidation improving the effective storage efficiency of the cache.

5,555,401

SELF CONFIGURING DEVICE SYSTEM

Tom Allen, Marlborough; Joseph E. Provino, Cambridge; William E. Pittore, Lexington, all of Mass., and Steven Kleiman, Los Altos, Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 361,893, Dec. 22, 1994, abandoned, which is a continuation of Ser. No. 936,239, Aug. 26, 1992, abandoned. This application Nov. 22, 1995, Ser. No. 561,558

Int. Cl.[6] **G06F** *13/10*

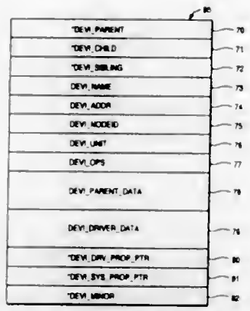
U.S. Cl. 395—500 **24 Claims**

23. An apparatus for generating device names accessible by a user, the device names indicating a physical arrangement of devices in a computer system, comprising:

first circuitry for determining a hierarchy of the devices according to the physical arrangement of the devices in the computer system, and determining a device driver for each device in the hierarchy;

a first mechanism coupled to said first circuitry for generating a device name for each device in the hierarchy;

second circuitry for creating at least one non-leaf node in the hierarchy for each device in the hierarchy that is a non-leaf device, said non-leaf node being accessible by a user, said non-leaf node containing a pointer to a non-leaf node of a parent of the non-leaf device;



a second mechanism, coupled to said second circuitry, for creating at least one device inode for each leaf device in the hierarchy, said device inode being accessible by the user, said device inode containing a pointer to a non-leaf node of the parent of the leaf device;

a third mechanism, coupled to said second circuitry, configured to, each device in the hierarchy, execute the device driver to generate minor node data and leaf device names; and

a fourth mechanism, coupled to said third mechanism configured to create an additional inode accessible by the user for each additional minor node if the minor node

data specifies additional minor nodes, the additional inodes having the leaf device names.

5,555,402

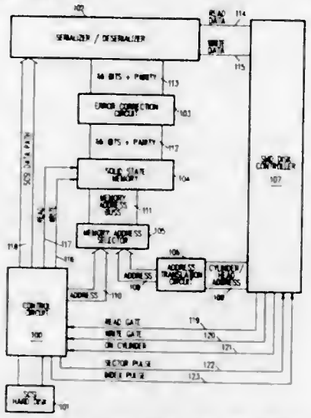
A DISK STORAGE SUBSYSTEM FOR INTERFACING WITH A PARRALLEL PATH, A NONVOLATILE MEDIA AND A VOLATILE STORAGE MEDIUM

George B. Tuma, Scotts Valley, Calif.; Wade B. Tuma, Reno, Nev., and Robert E. Warne, Markleeville, Calif., assignors to Database Excelleration Systems, Inc., Santa Clara, Calif.

Continuation of Ser. No. 985,731, Dec. 1, 1992, which is a division of Ser. No. 753,269, Aug. 30, 1991, Pat. No. 5,218,691, which is a division of Ser. No. 224,530, Jul. 26, 1988, Pat. No. 5,070,474. This application Jun. 6, 1995, Ser. No. 486,177

Int. Cl.[6] **G06F** *12/00*

U.S. Cl. 395—500 **19 Claims**



1. A disk storage subsystem for storing data supplied by a disk controller and retrieving data needed by said disk controller, wherein said disk controller specifies a storage location by geometric address information, said disk storage subsystem comprising:

a volatile storage medium;

a parallel path;

a nonvolatile media;

a control circuit comprising a first port, a second port, a first control line and a second control line, wherein said first port is operatively coupled to said nonvolatile media, said second port is operatively coupled to said parallel path, said first control line is operatively coupled to said volatile storage medium and said second control line is operatively couplable to said disk controller;

wherein in a first mode of operation, in response to a first control signal from said disk controller, said control circuit stores data received from said disk controller at a location in said volatile storage medium corresponding to geometric address information;

in a second mode of operation, in response to a second control signal from said disk controller, said control circuit retrieves data from a location in said volatile storage medium corresponding to said geometric address information and provides said retrieved data to said disk controller; and

further wherein said control circuit can store parallel data received on said parallel path into said nonvolatile media and supply parallel data from said nonvolatile media on said parallel path.

5,555,403

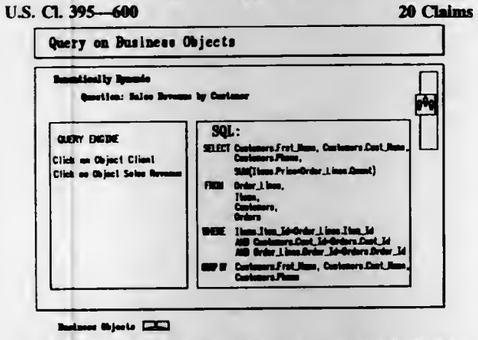
RELATIONAL DATABASE ACCESS SYSTEM USING SEMANTICALLY DYNAMIC OBJECTS

Jean-Michel Cambot, Paris, France, and Bernard Liautaud, New York, N.Y., assignors to Business Objects, S.A., Paris, France

Filed Nov. 27, 1991, Ser. No. 800,506

Int. Cl.[6] **G06F** *17/30*

U.S. Cl. 395—600 **20 Claims**



1. A method for accessing values in a relational database, wherein the relational database operates in a computer system and provides returned values responsive to queries specified in a predefined query language, wherein the relational database supports the use of functions and operators to perform operations on values within the database, wherein the relational database includes a plurality of tables, wherein each table is associated with one or more attributes, wherein each attribute has a set of values, wherein the method includes a user interface executing on a computer system operated by a human user, wherein the computer system executing the user interface includes a processor coupled to a memory, wherein the processor is further coupled to the user interface and the relational database, the method comprising the following steps:

associating a first familiar name with a first returned value, wherein the familiar name is also associated with the following: a SELECT clause describing the values returned using a combination of the functions and operators supported by the predefined query language; a WHERE clause describing a condition which can be used to restrict the scope of the returned value; and a plurality of tables containing the attributes on which the SELECT and WHERE clauses operate;

accepting signals from the user interface to specify a query, wherein the query includes the familiar name;

generating a query in the predefined query language, wherein the query includes the condition; and

using the query to access one or more attributes in the relational database.

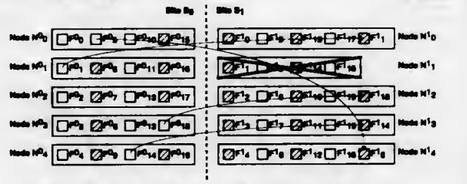
5,555,404

CONTINUOUSLY AVAILABLE DATABASE SERVER HAVING MULTIPLE GROUPS OF NODES WITH MINIMUM INTERSECTING SETS OF DATABASE FRAGMENT REPLICAS

Øystein Torbjørnsen, and Svein-Olaf Hvasshovd, both of Trondheim, Norway, assignors to Telenor AS, Trondheim, Norway

Continuation-in-part of Ser. No. 336,331, Nov. 8, 1994, Pat. No. 5,423,037, which is a continuation of Ser. No. 852,669, Mar. 17, 1992, abandoned. This application May 26, 1995, Ser. No. 451,885

Int. Cl.[6] **G06F** *17/30;11/20;9/28*

U.S. Cl. 395—600 **7 Claims**

1. A multiprocessor computer system, comprising:

N data processors, wherein N is a positive integer greater than three, each data processor having its own, separate, central processing unit, memory for storing database tables and other data structures, and communication channels for communication with other ones of said N data processors; each of said N data processors independently executing a distinct instruction data stream;

at least a plurality of said N data processors including a communications processor for receiving transaction requests and for transmitting responses thereto;

said N data processors being divided into at least two groups, each having at least two data processors;

each data processor including:

fragmenting means for fragmenting each of said database tables into N fragments, and for storing replicas of each fragment in different ones of said N data processors, wherein said different ones of said N data processors are in different ones of said groups of data processors such that a complete copy of each of said database tables is located within each said group of data processors and such that simultaneous failure of all data processors in either of said groups would leave a complete copy of each of said database tables in the other of said groups of data processors;

a data dictionary that stores information indicating where each said replica replica of each fragment of said database tables is stored among said N data processors;

said fragmenting means further adapted for changing the information stored in said data dictionary upon failure of any one of said N data processors to indicate that the replicas stored on the failed data processor are not available, and for regenerating said replicas on the failed data processor in non-failed ones, if any, of the data processors in the same group of data processors as the failed data processor; and

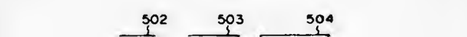
said fragmenting means further adapted for dividing said database tables into F fragments F^S_x, for storing said F fragments in the data processors in each said group, where

for a particular fragment F^S_x, S identifies the group of data

table, said frame forwarding circuit processing forwarding

5,555,407

METHOD OF AND APPARATUS FOR REDUCTION OF



for a particular fragment P^S_x, S identifies the group of data processors in which the fragment is stored and x is an index that identifies the fragment and has a value between 0 and F–1; said fragmenting means adapted to assign each fragment P^S_x to a data processor y in group S in accordance with the following fragment to node assignment equation:

$$y=(x+(x\text{div } N_S)\text{-}Q(S)) \text{ modulo avail}$$

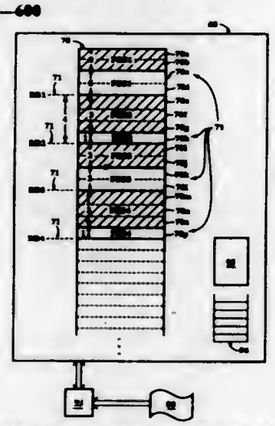
where y identifies which data processor fragment P^S_x is assigned to, N_S is the number of data processors in group S used for storing database fragments, Q(S) is an integer between 0 and N_S–1 where Q(S) is a distinct value for each said group, and avail is the number of said N_S data processors that have not failed.

5,555,405

METHOD AND APPARATUS FOR FREE SPACE MANAGEMENT IN A FORWARDING DATABASE HAVING FORWARDING ENTRY SETS AND MULTIPLE FREE SPACE SEGMENT QUEUES

Martin E. Griesmer, Arlington, and David Benson, Acton, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 6, 1993, Ser. No. 88,013
Int. Cl.[6] G06F *12/02*
U.S. Cl. 395—600 **12 Claims**



1. An apparatus for free space management in a forwarding database, comprising:

a forwarding table having zero or more forwarding entry sets of different sizes, and zero or more free space segments, each said free space segment having a size;

a packing process, having read and write access to said forwarding table and responsive to a trigger condition, for locating a first free space segment of a first size, and for moving one or more forwarding entry sets following said first free space segment in order to create new free space segment of a second size, said second size greater than said first size;

a plurality of free queues, each one of said plurality of free queues having zero or more queue elements indicating free space segments of size equal to a free space segment size associated with said free queue;

a plurality of local area network (LAN) segments;

a transceiver circuit coupled with said local area network segments, for transmitting frames onto and receiving frames from said local area network segments;

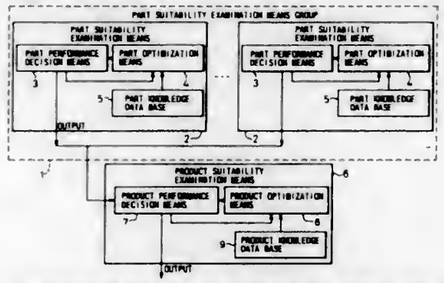
a frame forwarding circuit, coupled with said transceiver circuit, for making frame forwarding decisions based on the contents of said received frames and the contents of said forwarding table, said frame forwarding circuit processing forwarding entry sets that do not cross block boundaries within said forwarding table.

5,555,406

METHOD AND APPARATUS FOR ASSISTING THE DESIGN OF PARTS OF A PRODUCT

Takashi Nozawa, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 30, 1994, Ser. No. 298,012
Claims priority, application Japan, Aug. 30, 1993, 5-214431; Jul. 22, 1994, 6-171157
Int. Cl.[6] G06G *7/64*; G06F *15/00*
U.S. Cl. 395—500 **4 Claims**



1. A design assisting apparatus for assisting in design of parts of a product made of an assembly of the parts, said design assisting apparatus comprising:

a) a plurality of part suitability examination means, each of said part suitability examination means including:

(a1) a part performance decision means for deciding if target performances for said part are satisfied;

(a2) a part knowledge data base for storing part knowledge to enable each of said parts in the assembly of the parts to satisfy the target performances of said part; and

(a3) a part optimization means for optimizing parameters of a part by referring to the part knowledge stored in said part knowledge data base so that said part satisfies said target performances for said part, said part optimization means optimizes the parameters when said part does not satisfy the target performances for said part before the optimizing, wherein initially input parameters are first optimized to satisfy the target performances of said parts and then outputted; and

b) a said product suitability examination means including:

(b1) a product performance decision means for deciding if said product satisfies target performances for the product;

(b2) a product knowledge data base storing product knowledge to enable said product to satisfy said target performances of said product; and

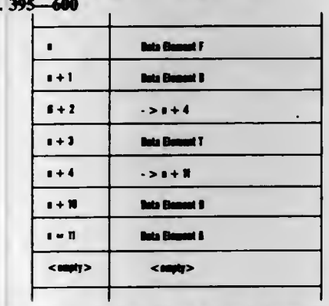
(b3) a product optimization means for optimizing said parameters of said parts of said assembly of the parts constituting said product by referring to said product knowledge stored in said product knowledge data base so that said product satisfies said target performances for said product, said product optimization means optimizes the parameters when said product does not satisfy said target performances of said product under existing parameters, wherein the parameters of said plurality of parts outputted by said part suitability examination means are first optimized to satisfy said target performances for said product and then outputted.

5,555,407

METHOD OF AND APPARATUS FOR REDUCTION OF BANDWIDTH REQUIREMENTS IN THE PROVISION OF ELECTRONIC INFORMATION AND TRANSACTION SERVICES THROUGH COMMUNICATION NETWORKS

Jean-Francois Cloutier, North Tarrytown; Oleg Arsky, Shenorock, both of N.Y.; Nikolas Boyd, Los Angeles, Calif., and Rosemary Rush, New York, N.Y., assignors to Home Information Services, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 19,111, Feb. 17, 1993, abandoned. This application Oct. 29, 1993, Ser. No. 143,018
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—600 **11 Claims**



1. A system for providing access to data through telecommunication network, comprising:

a host data processor and a source of central data elements at central location; and

a local terminal coupled to said host data processor through said telecommunication network and including

a local computer, and

a local database accessible by said local computer for storing local data elements corresponding to said central data elements and automatically updatable by said host data processor in accordance with said corresponding central data elements, wherein

said source of central data elements stores central lifetime tags associated with the central data elements and identifying time between activation and deactivation of said central data elements, and said local database stores local lifetime tags associated with said local data elements and identifying time between activation and deactivation of said local data elements,

said host data processor compares central and local lifetime tags of corresponding central and local data elements to identify any inconsistent local data elements, and

said local computer is responsive to said comparison for storing inconsistent data element pointers for identifying said inconsistent local data elements.

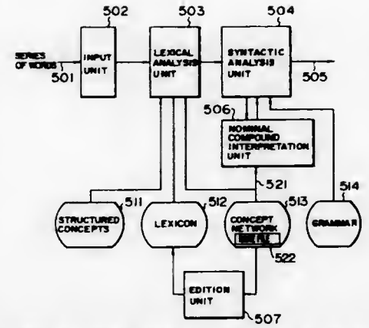
5,555,408

KNOWLEDGE BASED INFORMATION RETRIEVAL SYSTEM

Hiromichi Fujisawa, Tokorozawa, Japan; David Cohn, Seattle, Wash.; Atsushi Hatakeyama, Kokubunji, and Itsuko Kiuchi, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 831,093, Feb. 10, 1992, which is a continuation of Ser. No. 276,384, Nov. 25, 1988, abandoned, which is a continuation-in-part of Ser. No. 844,123, Mar. 26, 1986, Pat. No. 4,868,733. This application Oct. 25, 1993, Ser. No. 141,039
Claims priority, application Japan, Nov. 27, 1987, 62-297568; Jan. 11, 1988, 63-2609
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—600 **38 Claims**

1. A knowledge based system for retrieving information by using a concept relation model which expresses knowledge by a plurality



of interconnected nodes, each node represents a concept corresponding to information included in said node, said node being connected to other nodes by links, each of said links represents a relation between concepts represented by nodes connected by said link, comprising:

a first memory for storing concept names corresponding to said nodes, each concept name corresponds to a concept;

a second memory for storing information representing subsumption relations between different concepts corresponding to links connected between said concepts;

a third memory for storing information representing definitions of different kinds of relations;

a fourth memory for storing information representing relations between different concepts corresponding to links connected between said concepts; and

relation deducting means for inputting a string of words from a user of said system and deducting both concept names and relations between concepts from said inputted string of words by using knowledge stored in said first to fourth memory; and

retrieval means for retrieving information from at least one of said nodes based on said concept names and said relations between concepts deducted by said relation deducting means.

5,555,409

DATA MANAGEMENT SYSTEMS AND METHODS INCLUDING CREATION OF COMPOSITE VIEWS OF DATA

Richard B. Leenstra, Sr., Bremerton; Edwin H. Wurden, Poulsbo; Lance N. Otis, Silverdale, and Frederick L. Wurden, Port Orchard, all of Wash., assignors to Applied Technical Sysytem, Inc., Port Orchard, Wash.

Continuation-in-part of Ser. No. 621,834, Dec. 4, 1990, Pat. No. 5,303,367. This application Apr. 11, 1994, Ser. No. 226,071
Int. Cl.[6] G06F *15/40*
U.S. Cl. 395—600 **30 Claims**

1. A method of employing a computer with input means, memory, and a data processing unit to manage data, said method comprising the steps of:

employing said computer to create an original array of data sets, each said data set having a data type element for differentiating one kind of subject matter from another and a data value element for differentiating data sets with the same data type element and said original array containing a key data set and data sets related to said key data set;

employing said computer to link the related data sets in a hierarchy in which each of the related data sets is in an indentured relationship to the key data set;

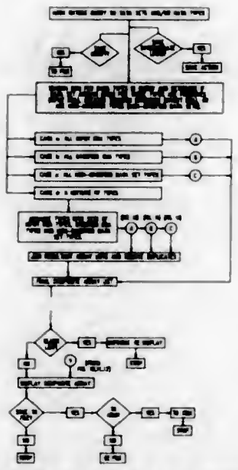
so employing the computer to invert the relationship between at least one indentured data set in the original array and the remaining data sets in said array as to create an inverted data set array having: (a) said indentured data set as its key data set, and (b) all data sets higher in the hierarchy of the original data set linked to that key data set in inverted order;

rality of lines carrying respective descriptions and having respective line numbers, to create post-edit software, such that

(c) instruction means for writing, using the processor, in the DCB object code the data representative of the plurality of

5,555,413

COMPUTER SYSTEM AND METHOD WITH INTEGRATED LEVEL AND EDGE INTERRUPT



employing said computer to create a file containing the original data array and the inverted data array or arrays; and

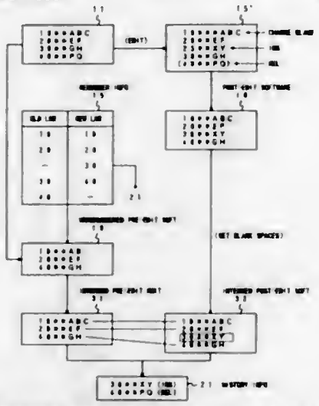
employing said computer to construct and store a list of all the key data sets in said file.

5,555,410

GENERATION MANAGEMENT SYSTEM AND METHOD FOR MANAGING RESOURCE GENERATION USING PRE-EDIT AND POST-EDIT LINE RENUMBERING

Shoji Tsuchiya, Kanagawa, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 12, 1994, Ser. No. 304,406
Claims priority, application Japan, Oct. 5, 1993, 5-248975
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—600 **16 Claims**



1. A generation management system for managing software resources in a computer, comprising:

memory means for holding generation management data set that includes: original-generation software used as a reference of software management, said original-generation software including a plurality of lines having respective line numbers; history information indicative of the history of modification of said original-generation software; and line-number history information indicative of the history of change of the line numbers in said original-generation software;

editor means for editing pre-edit software created from said generation management data set and including therein a plurality of lines carrying respective descriptions and having respective line numbers, to create post-edit software, such that said post-edit software includes therein a plurality of lines carrying respective descriptions and having respective line numbers in a state that said plurality of lines of said post-edit software are renumbered;

renumbering information creation means for creating renumbering information in which line numbers of pre-edit software and the line numbers of said post-edit software are compared with each other line by line such that a line of said post-edit software for a description corresponds to a line of said pre-edit software for an identical description;

history information creation means for creating said history information based upon comparison of said pre-edit software and said post-edit software;

wherein said history information creation means creates renumbered pre-edit software based upon said renumbering information, such that the line number of said pre-edit software for such a line carrying a description corresponding to a line of the post-edit software, is changed to be coincident to the line number of the corresponding line of the post-edit software, and such that the line number of said pre-edit software for such a line carrying a description not corresponding to a line in the post-edit software, is left unchanged, and

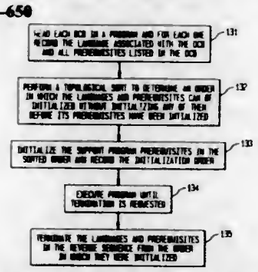
wherein said history information creation means creates said history information by comparing each line of said renumbered pre-edit software and each line of said post-edit software.

5,555,411

INITIALIZING PROGRAMS HAVING DEPENDENCIES

Laurence E. England; Andrew J. Lang, and Alfred W. Shannon, all of Morgan Hill, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 79,480, Jun. 18, 1993, Pat. No. 5,428,780, which is a continuation of Ser. No. 796,898, Nov. 21, 1991, abandoned. This application Mar. 31, 1995, Ser. No. 414,297
Int. Cl.[6] G06F *9/00*
U.S. Cl. 395—650 **9 Claims**



1. A computer program product, stored on a computer-readable media for use in a computer system, for generating object code on the computer system for inclusion in a computer program having an executable object code, the computer system having a processor, said computer program product comprising:

(a) instruction means for compiling or assembling a source code corresponding to the executable object code, wherein the source code contains data representative of a plurality of prerequisite programs which must be initialized prior to execution of the executable object code;

(b) instruction means for forming, using the processor, a dependent control block (DCB) object code for specifying the plurality of prerequisite programs which must be initialized prior to execution of the executable object code, the processor assigning the DCB object code a selected symbolic name for identification purposes;

(c) instruction means for writing, using the processor, in the DCB object code the data representative of the plurality of prerequisite programs which must be initialized prior to the execution of the executable object code; and

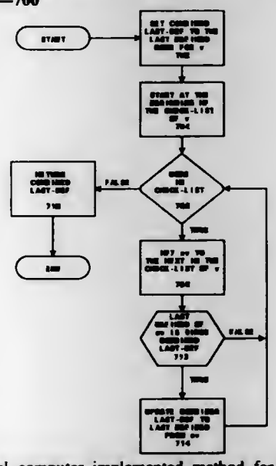
(d) instruction means for storing, using the processor, the DCB object code together with the executable object code; thereby, creating a first object code.

5,555,412

COMPLIER AND METHOD FOR ALIAS CHECKING IN A COMPLIER

Keith V. Besaw; Robert J. Donovan, both of Rochester, Minn., and Shmuel Sagiv, Ramat Hasharon, Israel, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 363,981, Dec. 23, 1994, which is a continuation of Ser. No. 988,898, Dec. 9, 1992. This application Nov. 16, 1995, Ser. No. 558,496
Int. Cl.[6] G06F *9/45*
U.S. Cl. 395—700 **21 Claims**



1. A digital computer implemented method for converting a source program to an object code comprising the steps of:

receiving the source program; the received source program including a plurality of variables, and said plurality of variables including a plurality of aliased variables; said plurality of aliased variables including a plurality of predefined large alias classes and other aliased variables not included in a predefined large alias class;

initializing an aliasing data structure for each said variable in the source program and attaching for each said variable in the source program both a corresponding empty check-list and a corresponding empty set-list;

constructing a respective pseudo variable to represent each said predefined large alias class in the source program and, for each variable included within each said predefined large alias class attaching said respective pseudo variable to said corresponding check-lists;

constructing set lists of each said variable in the source program including the steps of, for each variable included within each said predefined large alias class attaching said respective pseudo variable to each of said corresponding set-lists and, for each said variable in the source program attaching all additional other variables aliased to each said variable to said corresponding set-list for each said variable; said additional other variables being included in said other aliased variables not included in a predefined large alias class;

utilizing said set-lists and said check lists for data flow analysis and optimizing the source program; and

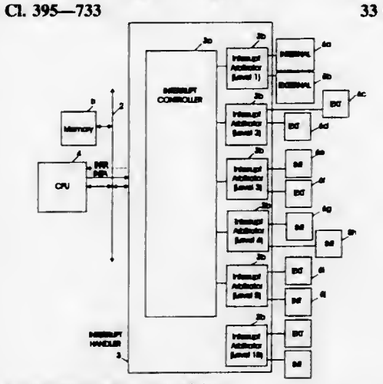
utilizing said optimized source program for generating the object code.

5,555,413

COMPUTER SYSTEM AND METHOD WITH INTEGRATED LEVEL AND EDGE INTERRUPT REQUESTS AT THE SAME INTERRUPT PRIORITY

Terence Lohman, Boca Raton, Fla.; Mark G. Noll, Raleigh, N.C.; Jose A. Olive, Miami, and Roberto V. Perez, Boca Raton, both of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 17, 1995, Ser. No. 390,610
Int. Cl.[6] G06F *9/46*
U.S. Cl. 395—733 **33 Claims**



1. A computer system comprising:

a processor having an interrupt request input, the processor servicing interrupts in response to receipt of a signal at the interrupt request input;

a first device coupled to the processor, the first device capable of transmitting a first interrupt request signal that comprises an edge transition;

a second device coupled to the processor, the second device capable of transmitting a second interrupt request signal that comprises a level assertion; and

an interrupt handler coupled to the processor and the first and second devices, the interrupt handler receiving the first and second interrupt request signals as inputs and providing the first and second interrupt request signals as outputs to the processor in a sequence according to a predetermined criteria, the first and second interrupt request signals having identical priority.

5,555,414

MULTIPROCESSING SYSTEM INCLUDING GATING OF HOST I/O AND EXTERNAL ENABLEMENT TO GUEST ENABLEMENT AT POLLING INTERVALS

Roger E. Hough, Austin, Tex., and Robert E. Murray, Kingston, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 14, 1994, Ser. No. 355,566
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—734 **6 Claims**

1. A method, for enabling a host system program, in a data processing system operating under a multiprocessing hypervisor program, comprising the steps of:

first, determining if a first predetermined bit indicates an interpretive execution mode for a guest system program;

second, determining if a second bit indicates an I/O pass-through state for the guest system program;

third, determining if a third bit, which is an I/O enablement mask, indicates an I/O enablement or disablement state for the guest system program;

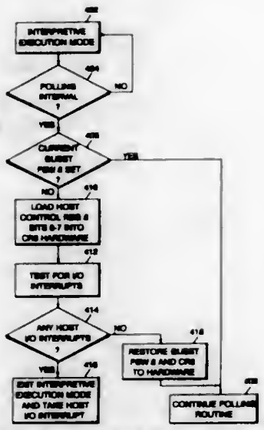
polling at a predetermined time interval while the first bit indicates an interpretive execution mode;

testing for any host system I/O interrupt blocked by an I/O disablement state for the quest system program when the

a disposition matrix comprising an array of cells, each cell storing a disposition indicia corresponding to one said event message type and one possible value of one of said major

e) said second install control module installing said plurality of software products on said computer system, and configuring said computer system's operating environment automatically

said source code files being read one at a time; determining syntactic and semantic correctness of each said source code file;



polling step indicates the end of a predetermined number of one or more time intervals;

exiting said interpretive execution mode, and the host system processing any host system I/O interrupt if any host system interrupt is found by the last testing step.

5,555,415

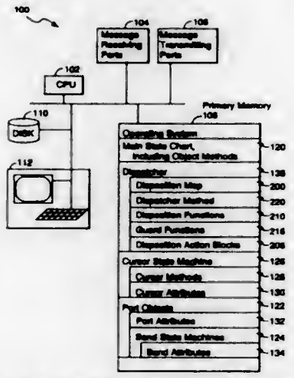
OBJECT ORIENTED EVENT MESSAGE DISPATCHING SUBSYSTEM AND METHOD UTILIZING A DISPOSITION MATRIX

Arthur D. Allen, Mountain View, Calif., assignor to Metasphere, Inc., Los Altos, Calif.

Filed Jan. 10, 1994, Ser. No. 179,251

Int. Cl.[6] G06F 9/40;9/44

U.S. Cl. 395—700 **10 Claims**



1. A memory for storing data for access by programs being executed on a data processing system, said data processing system including a main system having a context consisting of a defined set of major and minor state variables each having a defined range of values, said memory comprising:

a plurality of ports for receiving said event messages, said plurality of ports including a plurality of distinct port types wherein said ports of each said port type receive event messages having event message types corresponding to said each port type;

a plurality of disposition action procedures for disposing of specified event messages; wherein at least one of said disposition action procedures is for sending said specified event messages to said main system for further processing;

a disposition matrix comprising an array of cells, each cell storing a disposition indicia corresponding to one said event message type and one possible value of one of said major state variables, said disposition matrix including cells for all possible combinations of said event message types and all possible values of each of said major state variables; and

a dispatcher procedure for selecting one of said plurality of disposition action procedures to execute for a specified one of said received event messages, including a disposition mapping procedure for (A) evaluating the disposition indicia for all cells in said disposition matrix corresponding to the event message type of said one event message and current values of said major state variables so as to generate a disposition value for each evaluated cell, and (B) selecting one of said disposition values in accordance with predefined selection criteria to generate a selected disposition value;

said dispatcher procedure further for selecting and initiating execution of one of said plurality of disposition action procedures in accordance with said selected disposition value so as to process said one event message.

5,555,416

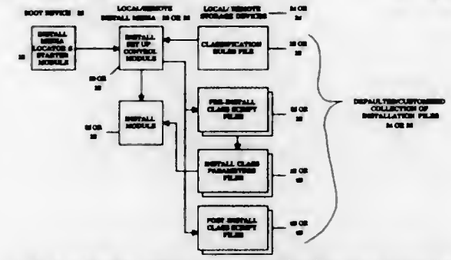
AUTOMATED SOFTWARE INSTALLATION AND OPERATING ENVIRONMENT CONFIGURATION FOR A COMPUTER SYSTEM BASED ON CLASSIFICATION RULES

Gary L. Owens, Mountain View, and David Labuda, Half Moon Bay, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 949,041, Sep. 22, 1992. This application Aug. 17, 1994, Ser. No. 291,330

Int. Cl.[6] G06F 9/44

U.S. Cl. 395—700 **20 Claims**



1. In a computer system, a computer implemented method for automatically installing a plurality of software products on said computer system and configuring said computer system's operating environment, said method comprising the steps of:

a) booting said computer system, loading a first install control module for locating install media and starting installation from a boot device into said computer system's memory, and transferring control to said first install control module loaded into said memory;

b) said first install control module locating an install media comprising a second install control module for setting up and controlling automatic installation, and giving execution control to said second install control module;

c) said second control module locating a collection of installation files comprising a classification rules file and a plurality of install script files, said classification rules file having a plurality of classification rules for classifying a computer system, each of said install script file having a plurality of install commands for performing certain installation and/or configuration tasks;

d) said second install control module determining at least one classification for said computer system using said located classification rules file; and

e) said second install control module installing said plurality of software products on said computer system, and configuring said computer system's operating environment automatically by selectively executing said install script files based on the classification determined for said computer system, wherein said first install control module comprises an operating system with minimal functions, a plurality of initialization and related processes, a command-like language interpreter, a set of system reconfiguration files, and an install media locator and starter routine;

said step a) comprises the steps of:

a.1) booting said computer system, loading said operating system into said memory, and transferring control to said operating system loaded into said memory;

a.2) said operating system loading said initialization and related processes and said command-like language interpreter into memory, and starting execution of said initialization and related processes:

a.3) said operating system further loading said system reconfiguration files into said memory and starting execution of said system reconfiguration files using said command-like language interpreter; end

a.4) said operating system further loading said install media locator and starter routine into said memory and starting execution of said install media locator and starter routine using said command-like language interpreter.

5,555,417

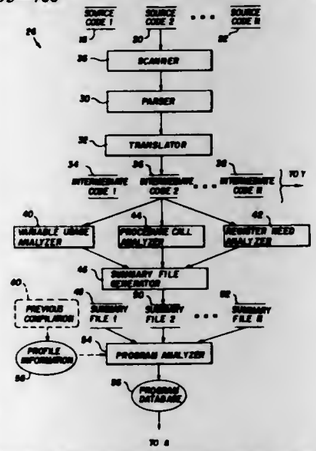
METHOD AND APPARATUS FOR COMPILING COMPUTER PROGRAMS WITH INTERPROCEDURAL REGISTER ALLOCATION

Daryl Odnert, Boulder Creek, and Vatsa Santhanam, Sunnyvale, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 435,914, Nov. 13, 1989, Pat. No. 5,428,793. This application Jan. 23, 1995, Ser. No. 313,432

Int. Cl.[6] G06F 9/44;9/45

U.S. Cl. 395—700 **20 Claims**



1. A method for optimizing register usage in an executable computer program on a computer processor having a limited plurality of machine registers, said computer program being compiled from a plurality of individual source code files, said method comprising the steps of:

reading said individual source code files having high-level program language text reciting a plurality of procedures,

said source code files being read one at a time; determining syntactic and semantic correctness of each said source code file;

translating each said source code file into an intermediate representation and generating therefrom an intermediate representation file;

collecting local information about usage of global variables from each said source code file, wherein a global variable is a named storage location the contents of which can be stored in a single machine register and is accessible from a plurality of procedures;

estimating need of registers for each procedure from each said intermediate representation; and

constructing a record of said register need and said global variable usage and calls to procedures for each procedure in a summary file for each said source code file.

5,555,418

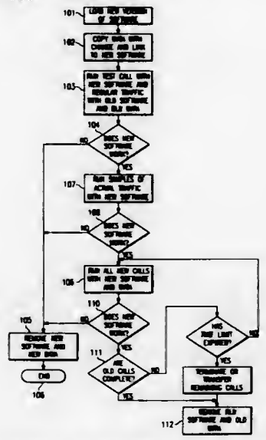
SYSTEM FOR CHANGING SOFTWARE DURING COMPUTER OPERATION

Rickard Nilsson, Katarina Bungate 71, 11642 Stockholm, Sweden; Ulf Markström, Vanadisvägen 32, 11346 Stockholm, Sweden, and Leif Klöfver, Bågsrännari 5, S-12530 Älvsjö, Sweden

Division of Ser. No. 907,294, Jul. 1, 1992, Pat. No. 5,410,703. This application Jan. 30, 1995, Ser. No. 380,798

Int. Cl.[6] G06F 9/06

U.S. Cl. 395—700 **78 Claims**



1. A method of dynamically binding, within a computing system, a first software unit with a second software unit, said method comprising the steps of:

creating a trader portion in said computing system;

loading said first software unit into said computing system, said first software unit having a client interface;

loading said second software unit into said computing system, said second software unit having a server interface compatible with said client interface;

executing a linked procedure call in said first software unit, said linked procedure call specifying said client interface;

accessing said trader portion with said specified client interface to identify said server interface; and

substituting said identified server interface in place of said client interface during execution of said first software unit, thereby dynamically binding said first and second software units.

5,555,419

CORRELATION SYSTEM

5,555,420

MULTIPROCESSOR PROGRAMMABLE INTERRUPT

5,555,421

BIDIRECTIONAL INTERFACE FOR

5,555,419

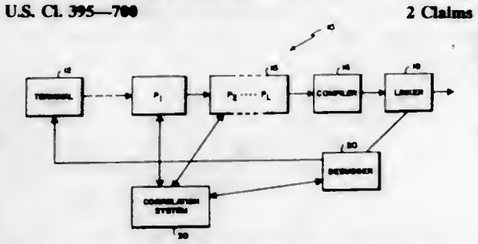
CORRELATION SYSTEM

Mark E. Arsenault, Mason, N.H., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 1,577, Jan. 6, 1993, abandoned. This application Jan. 16, 1995, Ser. No. 491,315

Int. Cl.[6] G06F *11/00;15/16*

U.S. Cl. 395—700 **2 Claims**



1. In a computer system, an apparatus for correlating names of symbols and locations of code segments of computer programs comprising:

a plurality of preprocessors, each preprocessors translating an input file to an output file, the plurality of preprocessors serially connected to each other such that the output file of a previous serially connected one of the plurality of preprocessors is the input file of a next serially connected one the plurality of preprocessors, the input file of a first serially connected one of the plurality of preprocessors being a user program, the output file of a last serially connected one of the plurality of preprocessors being a source program, each input file and each output file including symbols having names and segments having locations, the plurality of preprocessors altering the names of the symbols and moving the locations of the segments while translating;

a compiler coupled to the last preprocessor, the compiler for translating the source program to an executable object code file;

correlation means coupled to the plurality of preprocessors, the correlation means to communicate with the plurality of preprocessors during translation;

a computer accessible memory, the memory storing a correlation database created by the correlation means while communicating with the plurality of preprocessors, the correlation database comprising:

a source correlation table for each input file, the source correlation table including a plurality of input entries, the input entries including

an input symbol name entry for each symbol of the input file having its name altered during translation, and

an input segment location entry for each segment of the input file having its location moved during translation;

a target correlation table for each output file, the target correlation table including a plurality of output entries, the output entries including

an output symbol name entry for each symbol of the output file having its name altered during translation, and

an output segment name entry for each segment of the output file having its location moved during translation;

forward pointers for mapping each input entry to the corresponding output entry;

backward pointers for mapping each output entry to the corresponding input entry; and

means for tracing names of symbols altered and locations of segments moved by the plurality of preprocessors from the user program to the source program, and from the source program to the user program.

5,555,420

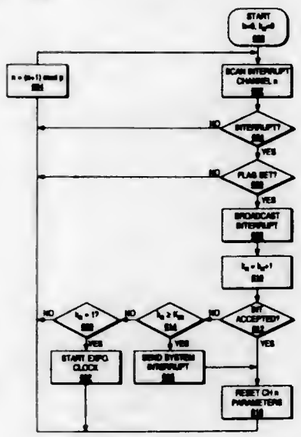
MULTIPROCESSOR PROGRAMMABLE INTERRUPT CONTROLLER SYSTEM WITH SEPARATE INTERRUPT BUS AND BUS RETRY MANAGEMENT

Nitin V. Sarangdhar, Beaverton, Oreg.; P. K. Nizar, El Dorado Hills, Calif., and David G. Carson, Portland, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 8,074, Jan. 22, 1993, Pat. No. 5,283,904, which is a continuation-in-part of Ser. No. 632,149, Dec. 21, 1990, abandoned. This application Dec. 30, 1993, Ser. No. 175,776

Int. Cl.[6] G06F *13/26;9/46*

U.S. Cl. 395—739 **7 Claims**



7. A method for controlling interrupt request traffic in a multiprocessor interrupt controller system having an interrupt bus for broadcasting interrupt request and acceptance messages, two or more interrupt acceptance agents, each coupled to the interrupt bus and to an associated processor for broadcasting interprocessor interrupt request messages initiated by an associated processor and for receiving interprocessor interrupt requests that are broadcast on the interrupt bus and broadcasting an acceptance message for interrupt request messages that are accepted by an interrupt acceptance agent, the method comprising the following step:

a) accepting an interprocesor interrupt request message from its associated processor;

b) boadcasting the interrupt request message on the interrupt bus;

c) monitoring the interrupt bus for an acceptance message indicating that the interrupt request has been accepted by an interrupt acceptance agent;

d) clearing the interrupt request message if an acceptance message is received, otherwise proceed to step e);

e) broadcasting the interrupt at intervals of time until the interrupt request message is accepted, the intervals increasing exponentially by a constant multiplicative factor greater than one after each broadcast;

f) counting the number of times a same interrupt request message has been broadcast;

g) comparing the count number with a prescribed threshold number which, if exceeded, causes a system status flag to be asserted; and

h) returning to step c).

5,555,421

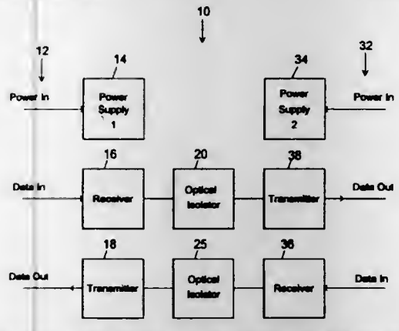
BIDIRECTIONAL INTERFACE FOR INTERCONNECTING TWO DEVICES AND THE INTERFACE HAVING FIRST OPTICAL ISOLATOR AND SECOND OPTICAL ISOLATOR BEING POWERED BY FIRST AND SECOND DEVICE PORTS

Donald J. Enzinna, Lockport, N.Y., assignor to Kistler Instrument Company, Amherst, N.Y.

Filed Nov. 23, 1993, Ser. No. 155,816

Int. Cl.[6] H04B *9/00*

U.S. Cl. 395—750 **9 Claims**



1. A bidirectional interface for interconnecting first and second devices each of which have their own power source, said first device including data input and data output ports and positive, negative and neutral ports and said second device including data input and data output ports and first and second power ports, said interface comprising:

first optical isolator including a) first input means for receiving data signals from said data output port of said first device at a first level and transmitting a first optical signal, and b) first output means for receiving said first optical signal and transmitting a first data signal to said data input port of said second device at a second level;

said first input means being connected to and powered by said first device's data output port and neutral port, and said first output means being connected to and powered by said second device's first and second power ports;

second optical isolator including a) second input means for receiving data signals from said data output port of said second device at said second level and transmitting a second optical signal, and b) second output means for receiving said second optical signal and transmitting a second data signal to said data input port of said first device at said first level; and

said second input means being connected to and powered by said second device's data output port and first power port, and said second output means being connected to and powered by stored signals from said first device's positive and negative ports with respect to said neutral port.

5,555,422

PROBER FOR SEMICONDUCTOR INTEGRATED CIRCUIT ELEMENT WAFER

Shoukichi Nakano, Kawasaki, Japan, assignor to Co-operative Facility for Aging Tester Development, Kanagawa-ken, Japan

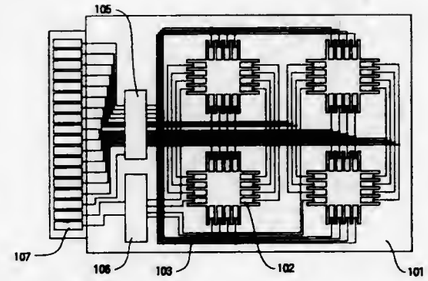
Continuation of Ser. No. 199,392, Feb. 22, 1994, abandoned. This application Oct. 24, 1995, Ser. No. 547,383

Claims priority, application Japan, Mar. 10, 1993, 5-087721; Sep. 2, 1993, 5-218704; Dec. 14, 1993, 5-313538

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—754 **9 Claims**

1. A prober for use in testing an electric performance of a plurality of objects to be tested formed on a substantially flat substrate, comprising:



a prober substrate having top and bottom surfaces and a thermal expansion coefficient which is substantially the same as that of said flat substrate,

a plurality of reeds defined at a probing section in a center portion of said prober substrate by clearances formed through said prober substrate to extend from its top surface to its bottom surface, the bottom surface of said reeds being coplanar with the bottom surface of the prober substrate,

a plurality of contacts for abutting on a corresponding one of a plurality of pads of each object when the prober substrate is positioned on the flat substrate with its bottom surface facing the flat substrate, each contact being provided on one of said reeds in a vicinity of a free end thereof at the side of the bottom surface of said prober substrate, and

a plurality of conductive layers formed on the coplanar bottom surfaces of said reeds and said prober substrate, each of said conductive layers having one end connected to a corresponding one of said contacts and the other end extending beyond the root end of the corresponding reed to a body portion of said prober substrate to allow termination adjacent to an outer circumference of the prober substrate.

5,555,423

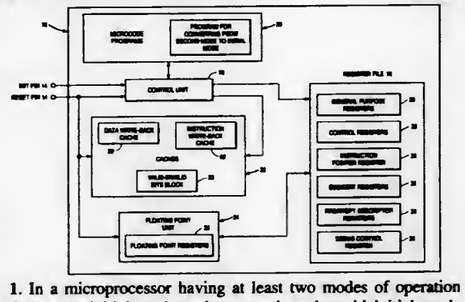
MULTI-MODE MICROPROCESSOR HAVING A PIN FOR RESETTING ITS REGISTER WITHOUT PURGING ITS CACHE

Edward T. Grochowski, San Jose, Calif., and Peter D. MacWilliams, Aloha, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 962,047, Oct. 16, 1992, abandoned, which is a continuation of Ser. No. 794,584, Nov. 19, 1991, abandoned. This application Jul. 26, 1995, Ser. No. 507,715

Int. Cl.[6] G06F *9/46*

U.S. Cl. 395—775 **12 Claims**



1. In a microprocessor having at least two modes of operation including an initial mode and a second mode, said initial mode being the mode to which the microprocessor is initialized upon start-up, an apparatus for transitioning from the second mode to the initial mode, said apparatus comprising:

a microcode memory means for storing microcode;

a control unit coupled to the microcode memory means for receiving and executing microcode that is stored in said

microcode memory means and that controls the microprocessor, said control unit also for receiving interrupt signals;

said first and second storage means each being connected to a data bus associated with said separate second communication

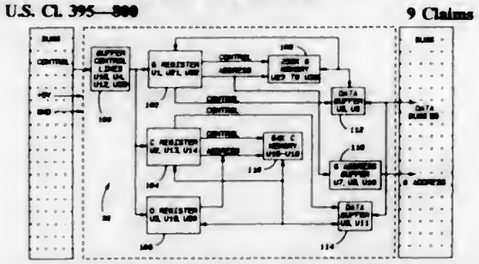
microcode memory means and that controls the microprocessor, said control unit also for receiving interrupt signals;
a plurality of registers, coupled to the control unit, for storing register data;
an internal write-back cache, coupled to the control unit, for storing cache data;
a transition microcode program for unconditionally transitioning from the second mode to the initial mode while maintaining the validity of the contents of the internal write-back cache including means for re-initializing registers selected to place the microprocessor in its initial mode of operation;
an external electrical pin connected to the microprocessor and coupled to the control unit but not to the internal write-back cache and the plurality of registers, that, when asserted, asserts a high priority interrupt to the control unit, and the control unit includes means for halting the microprocessor and unconditionally executing the transition microcode program when said interrupt is recognized; and
a reset pin coupled to the internal write-back cache and the plurality of registers for resetting the microprocessor by directly resetting the contents of said plurality of registers and invalidating the contents of the internal write-back cache.

5,555,424

EXTENDED HARVARD ARCHITECTURE COMPUTER MEMORY SYSTEM WITH PROGRAMMABLE VARIABLE ADDRESS INCREMENT

Edward R. Sederlund, Saginaw; Robert J. Lindesmith, Midland; Larry A. Root, Midland; Wayne P. Dupree, Midland, and Lowell V. Thomas, West Bloomfield, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 6, 1994, Ser. No. 319,453
Int. Cl.[6] G06F *13/00; 12/00*
U.S. Cl. 395—800 **9 Claims**



1. An extended memory system in a computer having a central processing unit, a data memory, a program memory, a first communication path between said central processing unit and said program memory, and a separate second communication path between said central processing unit and said data memory, said extended memory system comprising:

first storage means for containing an ordered sequence of program memory addresses, where each of said program memory addresses is associated with a distinct set of instructions which are, in turn, contained in said program memory; and

second storage means for containing a series of related data value sets, said second storage means including at least one memory unit and logic means, said logic means including a plurality of registers which are capable of separately and alternatively addressing said second storage means, said logic means providing a plurality of programmable address increments for each said memory unit, said programmable address increments including at least an increment by one, an increment by two, an increment by four, and an increment by an integer greater than one, said logic means further including an address register, which in turn includes at least one decoder for detecting an address increment signal retrieved from said program memory by said central processing unit, said address increment signal determining a magnitude of said programmable address increment for said second storage means;

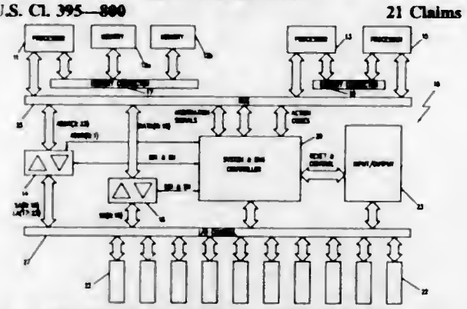
said first and second storage means each being connected to a data bus associated with said separate second communication path for said data memory.

5,555,425

MULTI-MASTER BUS ARBITRATION SYSTEM IN WHICH THE ADDRESS AND DATA LINES OF THE BUS MAY BE SEPARATELY GRANTED TO INDIVIDUAL MASTERS

Charles P. Zeller; Michael D. Durkin, and Thomas H. Holman, Jr., all of Austin, Tex., assignors to Dell USA, L.P., Austin, Tex.

Filed Mar. 7, 1990, Ser. No. 490,003
Int. Cl.[6] G06F *13/362*
U.S. Cl. 395—800 **21 Claims**



1. A multi-master digital computer system, comprising:
(a) a bus having separate address lines and data lines;
(b) at least first and second master device means connected to the bus for originating bus cycles, each having means for requesting the bus and each having means for releasing the bus, each having addressing means activated during a bus cycle and during an address master state, and each having data means for transmitting information during a subsequent data master state;
(c) at least one slave device means connected to the bus, addressable by the first and second master device means during their respective address master states for receiving or transmitting data during their respective data master states; and
(d) an arbiter for arbitrating bus requests by the first and second master device means during the bus cycle, for granting both the address and data lines of the bus to a selected one of the first and second master device means for transmitting to, or receiving data from, the slave device means and for granting only the address lines of the bus to the other master device means to enter the address master state upon its requesting the bus, while the selected master device means is coupled to only the data lines of the bus in the data master state, the arbiter capable of granting the address lines and the data lines separately, thereby accelerating the transfer of the bus from the selected master device means to the other master device means in a pipelining manner.

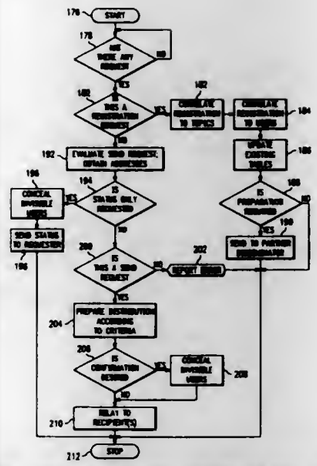
5,555,426

METHOD AND APPARATUS FOR DISSEMINATING MESSAGES TO UNSPECIFIED USERS IN A DATA PROCESSING SYSTEM

William J. Johnson, Flower Mound; Robert S. Keller, Grapevine, and Marvin L. Williams, Lewisville, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 818,189, Jan. 8, 1992, abandoned.
This application Feb. 23, 1995, Ser. No. 393,597
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—200.15 **32 Claims**

1. A method, performed in a data processing system, of disseminating a message sent by a sender, said message including addresses and content, wherein said addresses includes information pertaining to the sender of said message and all desired recipients of said message that were explicitly specified by the sender of said message, and wherein said content includes the remainder of the message other than said addresses, the method comprising the computer implemented steps of:



associating a message content condition with an identity of a user of the data processing system;

comparing the content of the message sent to a message content condition previously associated with the identity of a user to determine whether the condition is met by the content of the message;

determining whether the condition is met by the content of the message;

associating with the message the identity of a nonspecified user whose user identity is associated with a condition that is met by the content of the message, wherein a nonspecified user is a user who was not explicitly specified by the sender of the message as a desired recipient of the message; and

routing the message to the nonspecified user whose nonspecified user identity is associated with the message, as a result of the association of a user identity with the message, wherein a nonspecified user identity is the user identity of a nonspecified user.

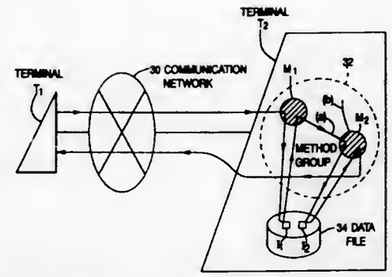
5,555,427

DISTRIBUTED PROCESSING IN A SYSTEM OF COMPUTERS AT TERMINALS CONNECTED BY A COMMUNICATION NETWORK

Shigeru Aoe, Tokyo; Gen Kakehi, and Tadamitsu Ryu, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP90/01680, § 371 Date Dec. 26, 1989, § 102(e) Date Dec. 26, 1989, PCT Pub. No. WO91/10191, PCT Pub. Date Jul. 11, 1991
PCT Filed Dec. 21, 1990, Ser. No. 743,390
Claims priority, application Japan, Dec. 26, 1989, 1-337031; Dec. 26, 1989, 1-337032
Int. Cl.[6] G06F *15/16*
U.S. Cl. 395—800 **18 Claims**

1. A distributed processing system, comprising:
a communication network to transmit messages, including data; and
a plurality of terminals connected together by said communication network, each of said terminals capable of generating the messages, each of the messages having a terminal number for identifying one of said terminals to receive the message, a method code identifying processing of data and a command for identifying data to be processed, each of said terminals including
a memory unit to store objects, including methods, at least one of the objects including a learning method for learning the data and the methods of the objects;
a processor, operatively connected to said communication network, to execute the methods stored in said memory unit; and
a system table to store identifying information on the location and execution sequence of the methods stored in said memory unit, said processor updating said system table and the contents of said memory unit upon receipt of one of the messages from another terminal instructing said processor to execute the learning method stored in said memory unit.

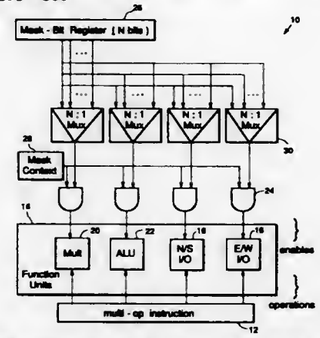


5,555,428

ACTIVITY MASKING WITH MASK CONTEXT OF SIMD PROCESSORS

James J. Radigan, Sunnyvale, and David A. Schwartz, Moorpark, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 989,302, Dec. 11, 1992, abandoned.
This application Mar. 10, 1995, Ser. No. 402,406
Int. Cl.[6] G06F *15/80*
U.S. Cl. 395—800 **21 Claims**



1. A single instruction multiple data (SIMD) architecture including multiple interconnected processing elements, each of said processing elements comprising:
memory means for storing data;
function means for performing computational and/or Input/Output (I/O) operations;
multi-operation instruction register means for storing an instruction for normally causing said function means to simultaneously perform multiple operations;
mask register means for storing a plurality of mask bits, said mask register means including a mask context bit register holding a mask context bit, said mask context bit being logically combined with at least one of the plurality of mask bits for masking one of the operations;

means for setting a condition mask bit, said condition mask bit being one of the plurality of mask bits, wherein the condition mask bit selectively prevents certain operations from being performed; and

stack means for storing the contents of the mask register means during a subroutine call so as to save a context of the processing element during the subroutine call, wherein a state of the mask context bit prior to the subroutine call is stored in the stack means, and wherein a state of the condition mask bit is stored in the mask context bit register during the subroutine call, said stack means stacking multiple contents of the mask register means in sequence for multiple nested subroutine calls.

5,555,429

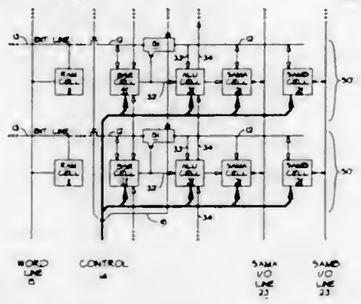
MULTIPORT RAM BASED MULTIPROCESSOR

Ward D. Parkinson; William K. Waller, and Mirmajid Seyyedy, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 842,791, Feb. 27, 1992, Pat. No. 5,475,631, which is a continuation of Ser. No. 321,184, Mar. 9, 1989, abandoned. This application May 8, 1995, Ser. No. 437,447

Int. Cl.[6] G06F *15/16*

U.S. Cl. 395—800 **11 Claims**



9. An integrated circuit, comprising:

a) a dynamic random access memory having at least one portion having a width;

b) a plurality of data stores comprising an arithmetic logic unit, said data stores having widths equal to said width of said at least one portion; and

c) a transfer means for transferring data bidirectionally in parallel between at least two of said data stores of said plurality of data stores and said dynamic random access memory, without accessing data through an external port.

5,555,430

INTERRUPT CONTROL ARCHITECTURE FOR SYMMETRICAL MULTIPROCESSING SYSTEM

Douglas Gephardt, and Rupaka Mahalingaiah, both of Austin, Tex., assignors to Advanced Micro Devices, Sunnyvale, Calif.

Filed May 31, 1994, Ser. No. 251,843

Int. Cl.[6] G06F *13/00*

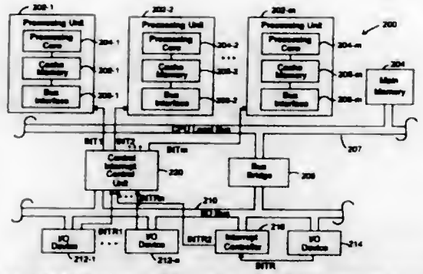
U.S. Cl. 395—800 **17 Claims**

1. A multiprocessing system comprising:

a plurality of processing units;

a plurality of peripheral devices, wherein each of said peripheral devices is configured to generate a respective interrupt signal; and

a central interrupt control unit coupled to said plurality of processing units and to said plurality of peripheral devices, wherein said central interrupt control unit is configured to receive said respective interrupt signals from said plurality of



peripheral devices and is configured to provide corresponding processor interrupt signals to designated processing units, wherein said central interrupt control unit includes:

a plurality of interrupt channels coupled to said plurality of peripheral devices, wherein each interrupt channel is configured to detect an assertion of an interrupt of a corresponding peripheral device, and wherein each interrupt channel further includes a programmable storage unit for storing a vector and a priority value associated with said interrupt of said corresponding peripheral device;

a plurality of CPU channels coupled to said plurality of processing units, wherein each CPU channel is configured to receive interrupt information to control assertions of a corresponding processor interrupt, wherein said interrupt information includes said vector and priority value corresponding to each of several selected interrupts of said peripheral devices that have been asserted; and

a central controller coupled to said plurality of interrupt channels and to said plurality of CPU channels, wherein said central controller is configured to route said interrupt information corresponding to said each of several interrupts that have been asserted from any of said plurality of interrupt channels to a designated CPU channel, and wherein said central controller is configured to prioritize several selected co-pending interrupts provided to said designated CPU channel in accordance with said priority values, whereby said designated processing unit is interrupted by a higher priority interrupt before being interrupted by a lower priority co-pending interrupt.

5,555,431

VARIABLE MAGNIFICATION FINDER

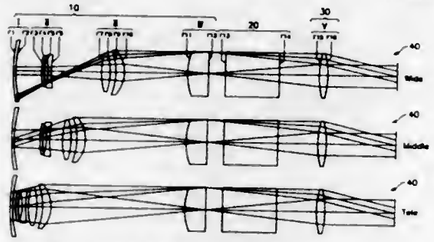
Moon-hyun Kim, Changwon-si, Rep. of Korea, assignor to Samsung Aerospace Industries, Ltd., Kyeongsangnam-do, Rep. of Korea

Filed Jul. 19, 1995, Ser. No. 503,922

Claims priority, application Rep. of Korea, Jul. 21, 1994, 94-17639

Int. Cl.[6] G03B *13/10;* **G02B** *15/14*

U.S. Cl. 354—222 **11 Claims**



1. A variable magnification finder comprising:

an objective lens group having an overall positive power, including, sequentially from an object, a first lens group and a second lens group each having a negative refractive power, a third lens group and a fourth lens group each having a

positive refractive power, and an eyepiece lens group having a positive refractive power,

wherein, the second and third lens groups move to zooming from the wide angle position to the telephoto position, and compensate the change of an aberration resulting from such movement of the second and third lens groups.

5,555,432

CIRCUIT AND METHOD FOR SCHEDULING INSTRUCTIONS BY PREDICTING FUTURE AVAILABILITY OF RESOURCES REQUIRED FOR EXECUTION

Glenn J. Hinton, Portland; Robert W. Martell; Michael A. Fetterman, both of Hillsboro; David B. Papworth, Beaverton, and James L. Schwartz, Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Aug. 19, 1994, Ser. No. 293,388

Int. Cl.[6] G06F *9/38*

U.S. Cl. 395—800 **7 Claims**

1. A processor comprising:

an execution resource, said execution resource executing a first instruction, said execution resource being unavailable to receive an additional instruction for execution until completion of execution of said first instruction, said execution resource indicating a number of clock cycles until availability to receive said additional instruction before completion of execution of said first instruction;

an instruction storage unit, said instruction storage unit having a plurality of entries that contain instructions to be executed, said entries comprising a field indicating a number of clock cycles until an associated instruction is ready to execute;

a scheduler, said scheduler locating a first entry in said instruction storage unit wherein said field indicating a number of clock cycles until said associated instruction is ready to execute that matches said number of clock cycles until availability, said scheduler dispatching said associated instruction from said first entry to said execution resource so as to minimize latency between a time said execution resource completes executing said first instruction and a time said execution resource begins executing said associated instruction from said first entry.

5,555,433

CIRCUIT FOR INTERFACING DATA BUSSES

Uco H. Nguyen, Long Beach; Sam Su, Rowland Heights; Li-Fung Cheung, Alhambra, and George Apostol, Santa Clara, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 13, 1994, Ser. No. 259,403

Int. Cl.[6] G06F *9/00*

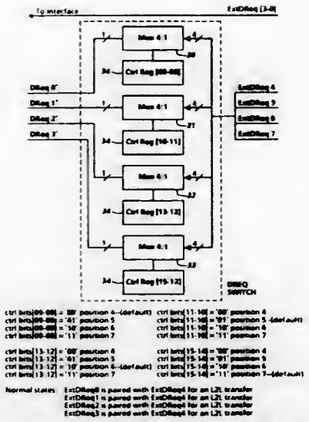
U.S. Cl. 395—800 **1 Claim**

1. A computer system including a plurality of data source devices, a plurality of data destination devices, and a circuit for determining which source device will be coupled to each destination device, the system comprising:

n data source devices, numbered **0** to n-1, each for generating a data request signal indicating that said source device is ready to output data,

n data destination devices, numbered **0** to n-1, each for generating a data request signal indicating that said destination device is ready to receive data,

n means for multiplexing, each having n input lines, each of said input lines being coupled to the data request signal of each of said destination devices, each multiplexing means having one output line, the output lines of said multiplexer means being numbered **0** to n-1 which identify the number of the associated source device,



each means for multiplexing further comprising a register having a number of control bits for controlling which of said input lines to each multiplexer means will be selected for coupling to that multiplexer's output line,

means for loading said registers with said control bits, and means for transmitting data from a numbered source device to the selected destination device when data request signals are produced by both said numbered source device and said selected destination device.

5,555,434

COMPUTING DEVICE EMPLOYING A REDUCTION PROCESSOR AND IMPLEMENTING A DECLARATIVE LANGUAGE

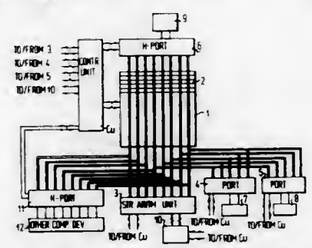
L. Gunnar Carlstedt, Partille, Sweden, assignor to Carlstedt Elektronik AB, Gothenburg, Sweden

Continuation of Ser. No. 739,536, Aug. 2, 1991, abandoned. This application Mar. 14, 1994, Ser. No. 212,566

Claims priority, application Sweden, Aug. 2, 1990, 9002558

Int. Cl.[6] G06F *1/00;3/00*

U.S. Cl. 395—800 **8 Claims**



1. A computing device of reduction type for reducing programs stored therein, comprising:

at least one port means for connecting said computing device with at least one external device connected to said at least one port means;

an active associative storage means for associatively storing and retrieving data elements, said active associative storage means being connected to said at least one port means and comprising a plurality of storage cell means for storing and executing at least part of a computer program stored therein;

a structural arithmetic means comprising a matrix of interconnected registers of storage cell means for storing and reducing at least part of computer programs stored therein; and

a bus means for connecting each of said storage cell means of said active associative storage means to said structural arithmetic means and to said at least one port means, said at least one port means comprising comparison means for comparing,

by a unification operation, data provided by said at least one external device to said at least one port means with data stored in at least one of a plurality of storage cells contained

signal, a set of control signals for executing said command, in accordance with whether said command operates under a

5,555,439

LEARNING SYSTEM AND A LEARNING PATTERN SHOWING METHOD FOR A NEUTRAL NETWORK

by a unification operation, data provided by said at least one external device to said at least one port means with data stored in at least one of a plurality of storage cells contained in said port means, said data provided by said at least one external device and said stored data each having possible undefined data elements or partially defined elements.

5,555,435

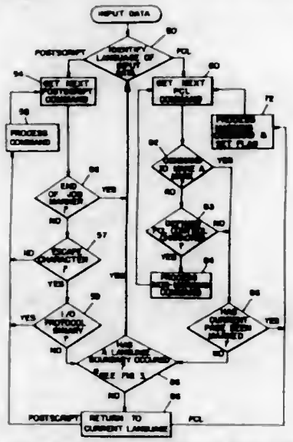
AUTOMATIC LANGUAGE BOUNDARY IDENTIFICATION FOR A PERIPHERAL UNIT THAT SUPPORTS MULTIPLE CONTROL LANGUAGES

Russ Campbell; Daniel L. George; Thomas T. Pearse, and Michael E. Sloane, all of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 939,785, Sep. 3, 1992, abandoned. This application Sep. 20, 1994, Ser. No. 309,515

Int. Cl.[6] G06F *15/00*; G06K *15/00*

U.S. Cl. 395—800 **16 Claims**



1. In a peripheral unit for creating marked pages, said peripheral unit adapted to receive, interpret and respond to a plurality of control languages that may appear in an input data stream, a method for identifying occurrence of a language boundary between a first control language and a second control language, said language boundary indicating a cessation of commands configured in accord with said first control language and a commencement of commands configured in accord with said second control language, comprising the steps of:

(a) determining if a command in said data stream requires a printing of an initial mark on a page and, if yes;

(b) instituting a subroutine to further determine if a language boundary has been encountered; and

(c) if yes, identifying a control language of the input data stream.

5,555,436

APPARATUS FOR ALLOWING MULTIPLE PARALLEL PORT DEVICES TO SHARE A SINGLE PARALLEL PORT

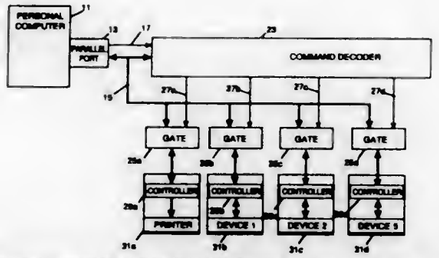
Dan Gavish, Haifa, Israel, assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 165,041, Dec. 10, 1993, abandoned. This application Dec. 11, 1995, Ser. No. 570,347

Int. Cl.[6] H04Q *1/00*; G06F *13/00*

U.S. Cl. 395—821 **20 Claims**

1. An apparatus for coupling a printer parallel port device and a plurality of non-printer parallel port devices to a single parallel port of a personal computer so that each of said parallel port devices can be accessed and controlled by software running in the



personal computer with switching between said plurality of parallel port devices being performed under software control and without user intervention, said apparatus comprising:

command decoder means, coupled to said parallel port, for decoding signals from said parallel port into one of (i) commands for selecting a predetermined one of said parallel port devices or (ii) data or (iii) control for passing to a previously selected one of said parallel port devices, said command decoder means includes a dedicated line, when asserted, selects the printer parallel port device as said predetermined one of said parallel port devices;

b) a plurality of gate means, each of said plurality of gate means is coupled to said command decoder means, for passing signals between said parallel port and said predetermined one of said parallel port devices when said command decoder means has selected said predetermined one of said parallel port devices and for maintaining said predetermined one of said parallel port devices in an idle state when said command decoder means has deselected said predetermined one of said parallel port devices.

5,555,437

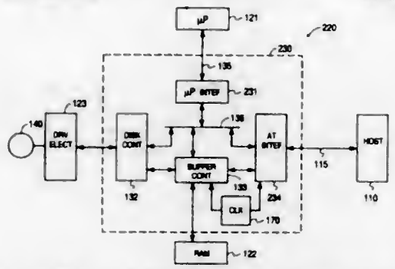
READ-WRITE STATE MACHINE IN A HOST INTERFACE FOR CONTROLLING READ AND WRITE OPERATIONS IN A DISK DRIVE

John S. Packer, Milpitas, Calif., assignor to Adaptec, Inc., Milpitas, Calif.

Continuation of Ser. No. 172,658, Dec. 22, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 479,238

Int. Cl.[6] G06F *3/00*

U.S. Cl. 395—825 **14 Claims**



1. A controller circuit for accessing a hard disk, said controller circuit being coupled by a local bus to receive control information from a microprocessor and by a host bus to receive a read or a write command from a host computer, said read or write command specifying data to be read from or written into one or more addresses of said hard disk, said controller circuit comprising:

a host interface circuit coupled to said host bus, said host interface circuit including:

(i) a command decoding circuit for decoding said command, wherein said command decoding circuit, upon receiving said command, provides a start signal; and

(ii) a logic circuit implementing a state machine and receiving said start signal, for generating, in response to said start signal, a set of control signals for executing said command, in accordance with whether said command operates under a first command mode or a second command mode, wherein when said command operates under said first command mode, said state machine generates said control signals until complete execution of said command, and when said command operates under said second command mode, said state machine transfers control to said microprocessor, after completing transfer of a predetermined unit of transfer for said data, for generating said control signals in completing execution of said command; and

a physical disk controller, coupled to said hard disk and receiving said set of control signals, for reading said data from or writing said data into locations of said hard disk corresponding to said specified addresses in accordance with said set of control signals.

5,555,438

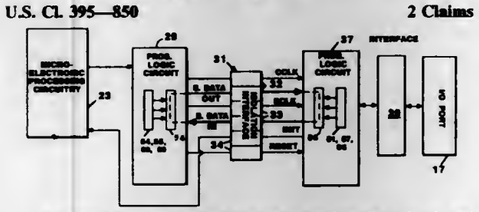
METHOD FOR SYNCHRONOUSLY TRANSFERRING SERIAL DATA TO AND FROM AN INPUT/OUTPUT (I/O) MODULE WITH TRUE AND COMPLEMENT ERROR DETECTION CODING

Steven P. Blech, Twinsburg; Kerry Van de Steeg, Chagrin Falls, and Gerald S. Pepera, Mentor, all of Ohio, assignors to Allen-Bradley Company, Inc., Milwaukee, Wis.

Continuation of Ser. No. 967,948, Oct. 27, 1992, abandoned, which is a continuation of Ser. No. 734,842, Jul. 24, 1991, abandoned. This application May 18, 1995, Ser. No. 443,285

Int. Cl.[6] G06F *13/10*

U.S. Cl. 395—850 **2 Claims**



1. A method for electrically isolating a first interface circuit and a second interface circuit having a first and second shift register respectively, the first and second interface circuits being connected by optical isolators, the method comprising the steps of:

(a) loading the first shift register with 24-bit output data;

(b) loading the second shift register with 24-bit input data;

(c) transmitting a clock signal through a first optical isolator to provide a common clock signal for the first and second interface circuits to be received by the first and second shift registers;

(d) clocking the output data from the first shift register, serially, in synchronism with the common clock signal, through a second optical isolator into the second shift register;

(e) simultaneously with step (d) clocking the input data from the second shift register, serially, in synchronism with the common clock signal, through a third optical isolator into the first shift register;

wherein the input data includes a fourteenth bit and a fifteenth bit that is the complement of the fourteenth bit and including the step of:

(f) if the fourteenth and fifteenth bits of the input data as received by the first shift register after step (e) are not complements to each other generating a fault signal indicating failure of the third optical isolator; and

(g) if the fourteenth and fifteenth bits of the input data as received by the first shift register after step (e) are complements to each other not generating a fault signal indicating failure of the third optical isolator.

5,555,439

LEARNING SYSTEM AND A LEARNING PATTERN SHOWING METHOD FOR A NEUTRAL NETWORK

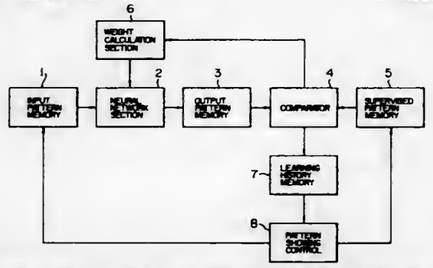
Junichi Higashino, Kodaira; Kazuhiko Kawasaki, and Miyuki Hara, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., and Hitachi Seibu Soft Ware Co., Ltd., both of Tokyo, Japan

Filed Jun. 9, 1992, Ser. No. 895,928

Claims priority, application Japan, Jun. 12, 1991, 3-139982

Int. Cl.[6] G06F *15/18*

U.S. Cl. 395—23 **13 Claims**



1. A multilayer neural network learning system comprising:

an input layer including input means for inputting a plurality of input patterns, a hidden layer including a first plurality of data processing means, and an output layer including a second plurality of data processing means having means for outputting an output pattern;

wherein said hidden layer and said output layer have memory means connected to said input layer and the first plurality of data processing means of the hidden layer belonging to a low layer nearer to the input layer for storing weights corresponding to respective connections, said first plurality of data processing means conducting sum-of-products computation based on the weights;

said system further comprising:

neural network means for conducting steps of learning by use of back propagation;

learning history memory means for storing a difference between a set comprising an output pattern computed from a given one of the input patterns and a supervised pattern constituting a desirable output pattern at each time of weight adjustment and a number of times of weight adjustment for the set; and

pattern showing control means for determining and eliminating the set of said input pattern and said supervised pattern from weight adjustment if said difference between said input pattern and said supervised pattern indicates a failure to satisfy learning convergence conditions after the weight adjustment for said set are performed more than a predetermined number of times.

5,555,440

PARALLEL INTERFACE FOR CONNECTING DATA PROCESSING DEVICES TO ONE ANOTHER OVER BIDIRECTIONAL CONTROL LINES

Jörg Oppat, Berlin, Germany, assignor to Siemens Nixdorf Informationssysteme Aktiengesellschaft, Paderborn, Germany

PCT No. PCT/DE93/00209, § 371 Date Nov. 8, 1993, § 102(e) Date Nov. 8, 1993, PCT Pub. No. WO93/18449, PCT Pub. Date Sep. 16, 1993

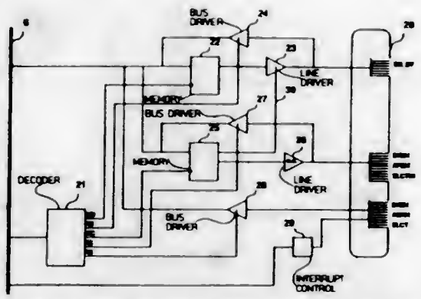
PCT Filed Mar. 8, 1993, Ser. No. 146,150

Claims priority, application Germany, Mar. 10, 1992, 42 07 573.4

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—892 **8 Claims**

1. A parallel interface for connecting data processing devices to one another or to peripheral processing devices, comprising:



at least two status information lines, bidirectional line drivers and control lines, the bidirectional line drivers being open-collector stages, a first data processing device initially being a transmitting device and a second data processing device initially being a receiving device, the transmitting device initially having a connected line driver and the receiving device initially having a disconnected line driver, the transmitting and receiving devices being connected to the at least two status information lines and to the control lines;

a beginning of a first data transmission being signaled by the transmitting device, in the first processing device, on a first control line for a predetermined data transmission direction, and an end of the first data transmission being signaled by the transmitting device, in the second processing device, on a second control line, the two status information lines being used for controlling line drivers of the second processing device, in order to change over the direction of data transmission; and

after the direction of data transmission has been changed over, the line driver in the first data processing device being disconnected and the line driver in the second data processing device being connected, a beginning of a second data transmission being signaled by a transmitting device, in the second processing device, on the first control line in a direction of transmission opposite to the direction of transmission for signaling a beginning of the first data transmission, and an end of the second data transmission being signaled by the transmitting device, in the first processing device, on the first control line.

5,555,441

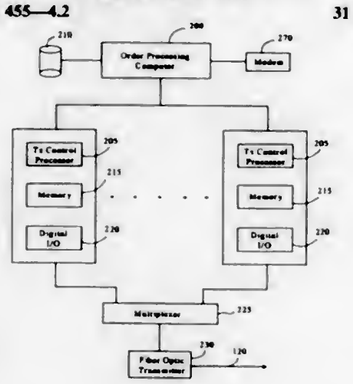
INTERACTIVE AUDIOVISUAL DISTRIBUTION SYSTEM

Joseph C. Haddad, Elizabethtown, Pa., assignor to Interim Design Inc., Elizabethtown, Pa.

Filed Aug. 2, 1994, Ser. No. 284,846

Int. Cl.[6] H04N *7/173*

U.S. Cl. 455—4.2 **31 Claims**



16. A method of interactive distribution of audiovisual programs from a distribution center to a plurality of subscriber stations, comprising the steps of:

storing in a library in said distribution center a selection of audiovisual programs;

receiving requests from said subscriber stations for selected program segments from said selection of audiovisual programs, each of said requests including a time allowance interval within which a respective selected program segment is to be delivered;

processing said requests;

accessing said selected program segments from said library; and

delivering said selected program segments to respective subscriber stations making said requests within respective time allowance intervals.

5,555,442

ERROR DETECTING DEVICE FOR A RADIO BLIND ZONE SYSTEM

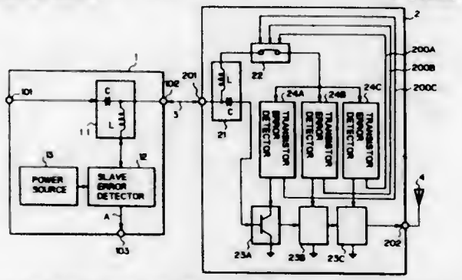
Yuzo Yoneyama, Tokyo, and Atsushi Inahashi, Saitama, both of Japan, assignors to NEC Corporation, Japan

Filed May 20, 1994, Ser. No. 246,740

Claims priority, application Japan, May 21, 1993, 5-118878

Int. Cl.[6] H04B *17/02*

U.S. Cl. 455—9 **7 Claims**



1. In a radio blind zone system including a slave unit located in a radio signal blind zone and including at least one of a relay amplifying device and a tower-top amplifying device which amplify a radio signal, and a master unit situated at an existing station and connected to said slave unit by a coaxial transmission path for feeding a source current and said radio signal to said slave unit;

a device for detecting an error in a load current of said slave unit, comprising:

error detecting means detecting operation voltages of a plurality of transistors, which constitute an amplifying section included in at least one of said relay amplifying device and said tower-top amplifying device, and generating error signals respectively associated with said plurality of transistors;

false fluctuation current generating means located in said slave unit, said false fluctuation current generating means generating a false fluctuation current which changes intentionally the load current of said slave unit, as seen from said master unit, to below a predetermined lower limit or to above a predetermined upper limit; and

determining means locating in said master unit, said determining means causing said master unit to recognize an error occurred in said slave unit via said coaxial transmission path on the basis of said false fluctuation current.

5,555,443

SATELLITE COMMUNICATIONS MULTI-POINT VIDEO TRANSMIT SYSTEM

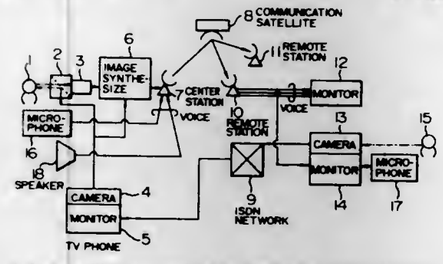
Satoshi Ikehama, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 2, 1993, Ser. No. 41,968

Claims priority, application Japan, Apr. 3, 1992, 4-082152

Int. Cl.[6] H04N *7/14*

U.S. Cl. 455—12.1 **45 Claims**



1. In a satellite communications multi-point video transmit system including a center station and a plurality of remote stations, a method for communicating video data and speech data between said stations, comprising the steps of:

transmitting signals for requesting an interaction from said remote stations to said center station on a terrestrial line in a sequential manner;

in said center station, receiving said signals for requesting an interaction from said plurality of remote stations each received signal including a video signal containing a speech signal, and buffering said received signals;

selecting one of said buffered signals for requesting an interaction sent from said plurality of remote stations;

synthesizing in said center station said selected one of said buffered signals with another video signal which said center station is to transmit to produce a synthesized signal; and

transmitting said synthesized signal from said center station to said plurality of remote stations through a communication satellite.

5,555,444

METHOD AND APPARATUS FOR PREDICTIVE OPERATION OF A COMMUNICATION SYSTEM

Dennis P. Diekelman, Tempe, and Catherine B. Stockwell, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 11, 1994, Ser. No. 208,772

Int. Cl.[6] H04B *7/185*

U.S. Cl. 455—12.1 **30 Claims**

19. In a communication system comprising

a system control segment, and

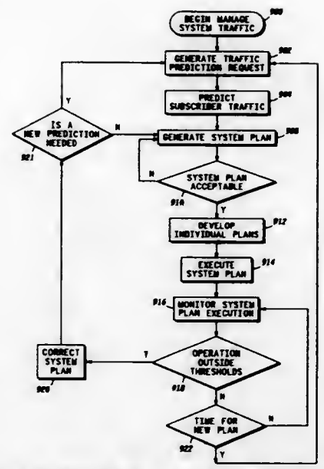
one or more routing devices which provide communication channels,

a method for interfacing subscriber units with the communication system comprising the steps of:

a. determining, by the system control segment, one or more allowable access numbers based on a subscriber traffic prediction;

b. broadcasting, by the one or more routing devices, the one or more allowable access numbers; and

c. utilizing, by the subscriber units, the communication channels when the one or more allowable access numbers broadcast by the one or more routing devices are compatible with particular access numbers contained within resident memory devices of the subscriber units.



5,555,445

METHOD OF INTRA-CELL AND INTER-CELL HANDOVER IN A MOBILE COMMUNICATIONS SYSTEM

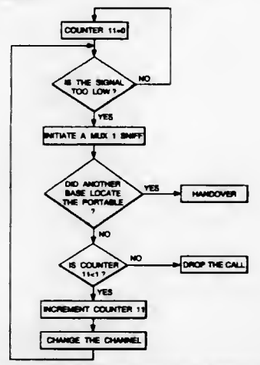
Andrew J. Booth, Bishop's Stortford, United Kingdom, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 15, 1994, Ser. No. 275,494

Claims priority, application United Kingdom, Jul. 22, 1993, 9315218

Int. Cl.[6] H04B *7/26;* **H04Q** *7/22*

U.S. Cl. 455—33.2 **5 Claims**



1. A method for use in a cellular mobile communications system for performing handover, from a first base station to a second base station, of a call associated with a mobile station moving between adjacent cells corresponding to said base stations, said mobile station being in communication with the first base station via a first communications channel associated with that base station, the method comprising the steps of;

monitoring from the first base station the signal level of the mobile station so as to determine when that signal level falls below a predetermined value;

responsive to said determination attempting to detect the mobile station from said second base station;

effecting intercell handover of the mobile station to the second base station when said detection attempt is successful; when said detection attempt is unsuccessful;

effecting intrahandover of the mobile station from said first channel to a further channel of the first base station and repeating said monitoring and detection attempting steps; and

phone circuit for reducing the amplification of the received radio frequency by the second front end amplifier.

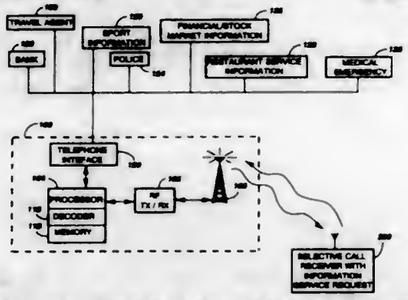
effecting intrahandover of the mobile station from said first channel to a further channel of the first base station and repeating said monitoring and detection attempting steps; and effecting intercell handover to said second base station if said repeated detection attempt is successful.

5,555,446

COMMUNICATION SYSTEM FOR PROVIDING SPORTS INFORMATION, TRAVEL INFORMATION, FINANCIAL/STOCK MARKET INFORMATION TO SELECTIVE CALL RECEIVERS

Leon Jasinski, Ft. Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 955,385, Oct. 1, 1992, abandoned.
This application Feb. 21, 1995, Ser. No. 391,301
Int. Cl.[6] H04B *7/00*
U.S. Cl. 455—54.2 **15 Claims**



8. A selective call receiver capable of generating an information service request, comprising:

means for generating the information service request, said means for generating generates the information service request in a codeword having a 2×N series of bits capable of providing access to N levels of a plurality of information files wherein every 2 bits of the 2×N series of bits provides access to a different level of information in the plurality of information files organized in a hierarchy-tree-structure;

means for transmitting the information service request on a first frequency requesting information to a base station coupled to a plurality of information services;

means for receiving the information transmitted from the base station on a second frequency in response to the information service request;

means for storing the information being received; and

means for displaying the received information.

5,555,447

METHOD AND APPARATUS FOR MITIGATING SPEECH LOSS IN A COMMUNICATION SYSTEM

Michael D. Kotzin, Buffalo Grove, and Gary W. Grube, Palatine, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

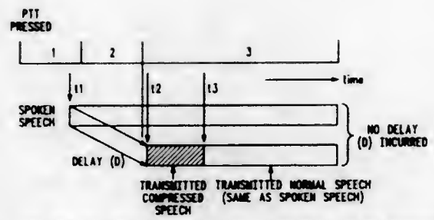
Filed May 14, 1993, Ser. No. 62,643
Int. Cl.[6] H04B *7/00*
U.S. Cl. 455—72 **14 Claims**

1. A method of mitigating speech loss in a communication system, the communication system having a secondary unit incurring a delay to establish communication to a primary unit, the method comprising the steps of:

storing speech during at least the delay to produce stored speech;

transmitting the stored speech at a second speech rate; and

transmitting normal speech at a first speech rate at the end of transmitting the stored speech at the second speech rate, wherein the second speech rate is faster than the first speech



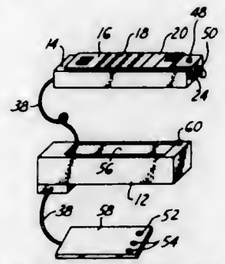
rate and the stored speech is pitch-corrected during transmission.

5,555,448

COMBINED WIRELESS/WIRED PHONE HANDSET SYSTEM

Paul W. Thiede, Sharpsville, and Earl D. Vandivier, Kokomo, both of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Feb. 27, 1995, Ser. No. 395,227
Int. Cl.[6] H04B *1/38*
U.S. Cl. 455—89 **9 Claims**



1. A telephone for portable wireless handset use and alternate use connected to a base station comprising:

a handset having first radio means for low power wireless communication and contacts for wired communication;

a base station having second radio means for high power wireless communication, and a cord for coupling to the handset;

a docking cradle;

a boat for removably seating in the docking cradle for hand-held operation when removed and having a pocket for receiving the handset; and

the boat having terminals connected to the cord for coupling to the handset contacts for wired communication when the handset is seated in the boat;

whereby the handset can be used alone for communication via the first radio means and alternatively the handset can be mated to the boat for coupling through the cord to the base station for either hand-held or hand-free communication via the second radio means.

5,555,449

EXTENDIBLE ANTENNA AND MICROPHONE FOR PORTABLE COMMUNICATION UNIT

Seung K. Kim, Chapel Hill, N.C., assignor to Ericsson Inc., Research Triangle Park, N.C.

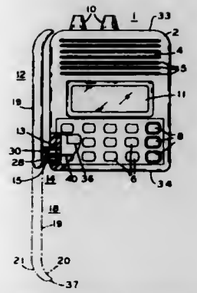
Filed Mar. 7, 1995, Ser. No. 399,663
Int. Cl.[6] H04B *1/38*
U.S. Cl. 455—89 **9 Claims**

1. A portable communication unit comprising:

a housing adapted to be hand held;

a loudspeaker mounted on said housing;

an antenna assembly including an antenna and a support member rotatably mounted on said housing, having a stored posi-



tion with said support member positioned continguous to said housing and an operating position in which said support member extends outward away from said housing with a speaking region on said support member positioned remote from said housing;

said antenna positioned along said support member;

a first acoustic cavity extending along said support member from said speaking region to said housing;

a microphone diaphragm positioned adjacent the housing end of said acoustic cavity;

whereby said speaking region is positioned remote from said speaker when in said operating position;

wherein said antenna assembly is rotatably supported on said housing to enable the rotation thereof between said stored position which is substantially parallel and adjacent to said housing, and said operating position;

said speaking region includes at least one aperture through said support member and positioned on the side of said support member closest to said housing when said assembly is in said stored position;

said antenna comprises a metal strip extending along said support member substantially parallel to said acoustic cavity;

wherein an opening is provided on the surface of said support member opposite said speaking region, and connected to a second acoustic cavity connected to the opposite side of said diaphragm of said microphone to provide background noise cancellation; and

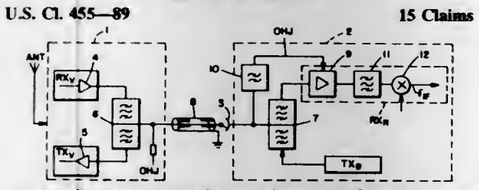
said first and second acoustic cavities are substantially parallel channels extending axially along said support member.

5,555,450

RADIO PHONE AND METHOD OF OPERATING A RADIO PHONE

Erkka Sointula, Märynummi, Finland, assignor to Nokia Mobile Phones Ltd., Finland

Filed Apr. 18, 1994, Ser. No. 228,862
Claims priority, application Finland, Apr. 26, 1993, 931872
Int. Cl.[6] H04B *1/38*
U.S. Cl. 455—89 **15 Claims**



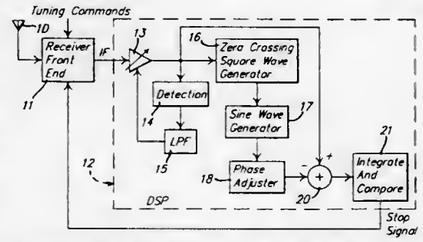
1. A radio phone system for receiving a radio frequency signal comprising a radio phone circuit selectively connected to an external amplifying means, said external amplifying means including a first front end amplifier and said radio phone circuit including a reception branch and a transmission branch, the reception branch of said radio phone circuit being provided with a second front end amplifier for amplifying a received radio frequency signal, wherein a control signal is coupled to the radio phone circuit when the external amplifying means is selectivity connected to the radio phone circuit for reducing the amplification of the received radio frequency by the second front end amplifier.

5,555,451

HIGH-QUALITY RECEPTION INDICATING CIRCUIT FOR SCANNING AM RECIEVERS

John F. Kennedy; Robert D. Plowdrey, both of Dearborn, Mich., and Yao H. Kuo, Shenfield, England, assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 13, 1994, Ser. No. 258,875
Int. Cl.[6] H04B *1/26*
U.S. Cl. 455—161.2 **12 Claims**



1. A method for determining the reception quality of an amplitude modulated (AM) radio signal received by a receiver, comprising the steps of:

mixing said AM radio signal to an intermediate frequency (IF) signal including a carrier;

substantially removing audio information modulated within said IF signal to generate a modified IF signal;

recovering transitions of said carrier from said modified IF signal;

regenerating a substantially pure carrier sine-wave signal from said recovered transitions;

subtracting said modified IF signal and said substantially pure carrier sine-wave signal to generate a noise signal having said carrier substantially eliminated therefrom; and

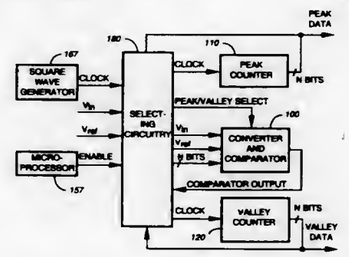
measuring said reception quality in response to said noise signal.

5,555,452

PEAK AND VALLEY SIGNAL MEASURING CIRCUIT USING SINGLE DIGITAL-TO-ANALOG CONVERTER

Edgar H. Callaway, Jr., 11524 Clear Creek Pl., Boca Raton, Fla. 33428; Gary L. Pace, 17640 Lake Park Rd., Boca Raton, Fla. 33487, and James D. Hughes, 5349 Cedar Lake Rd. #12-26, Boynton Beach, Fla. 33437

Filed May 12, 1995, Ser. No. 439,910
Int. Cl.[6] H04B *17/00*
U.S. Cl. 455—226.2 **20 Claims**



19. A peak and valley measuring circuit suitable for detecting peaks and valleys of an analog signal, the peak and valley measuring circuit comprising:

a clock generator for generating a clock signal;

a reference source for providing a reference;

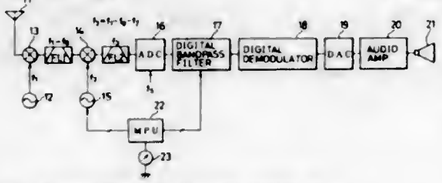
peak counter means having a clock input for receiving the clock

of said mixer to substantially coincide with said center frequency of said passband of said digital bandpass filter.

to both an existing structure and to new structure under construction, said mounting means further comprising first mounting means including a detachable support member attached to said canister

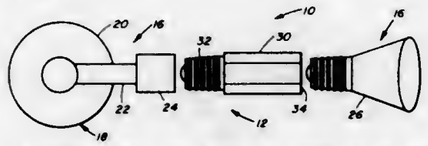
a clock generator for generating a clock signal;
a reference source for providing a reference;
peak counter means having a clock input for receiving the clock signal and counting in response thereto, and providing a digital present count value at a digital output which is representative of a current measurement of a peak of the analog signal;
valley counter means having a clock input for receiving the clock signal and counting in response thereto, and providing a digital present count value at a digital output which is representative of a current measurement of a valley of the analog signal;
converter and comparator means having inputs coupled to the analog signal, to the reference and to the digital outputs of the first and second counters, the converter and comparator means comprising a single digital-to-analog converter (DAC) and generating a converter and comparator output which is an analog signal representative of the digital output of the peak counter means or the valley counter means; and
selecting means having inputs coupled to the reference, to the analog signal, to the clock generator, to the digital outputs of the peak and valley counter means, and to the converter and comparator output, and having outputs coupled to the clock inputs of the peak and valley counter means, the selecting means selecting for operation the peak counter means when a level of the analog signal is greater than the reference, and selecting for operation the valley counter means when the level of the analog signal is less than the reference, the selecting means further controlling the peak counter means to count at a current peak only when the level of the analog signal is greater than a signal representative of the digital present count value of the first counter and controlling the valley counter means to count at a current valley only when the level of the analog signal is less than a signal representative of the digital present count value of the valley counter means.

5,555,453
RADIO COMMUNICATION SYSTEM
Shigeki Kajimoto, Sakai, and Weimin Sun, Ikoma-gun, both of Japan, assignors to Icom Incorporated, Osaka, Japan
Filed Mar. 20, 1995, Ser. No. 406,661
Claims priority, application Japan, Dec. 27, 1994, 6-324661
Int. Cl.[6] H04B *1/06;7/00*
U.S. Cl. 455—266 **4 Claims**



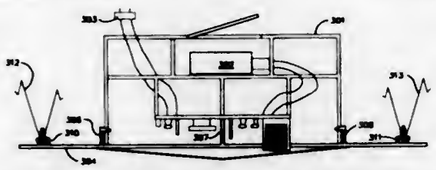
1. A radio communication system comprising:
reception means for receiving a radio frequency signal and outputs a received signal;
a variable frequency local oscillator;
a mixer for mixing said received signal from said reception means with a local oscillator signal from said variable frequency local oscillator;
an analog-digital converter for converting an output signal of said mixer to a digital signal;
a variable center frequency digital bandpass filter for filtering an output signal of said analog-digital converter;
a digital demodulator for demodulating an output signal of said digital bandpass filter; and
control means for changing a frequency of said local oscillator signal by Δf and changing a center frequency of said digital bandpass filter by Δf in accordance with an externally supplied control signal to cause a frequency of said output signal of said mixer to substantially coincide with said center frequency of said passband of said digital bandpass filter.

5,555,454
REMOTE SECURITY LIGHT SIGNAL ALERT SYSTEM
Kent L. Dees, 8385 Lake Ben Ave.,, San Diego, Calif. 92119
Filed Sep. 3, 1994, Ser. No. 315,822
Int. Cl.[6] G08B *5/00*
U.S. Cl. 340—332 **16 Claims**



1. A remote security light signal alert system for use with a security light unit activatable between "on" and "off" conditions, said system comprising:
(a) an electrical signal transmitting unit for electrical connection to the security light unit and having electrical means for producing and broadcasting an electrical signal in response to activation of the security light unit by detecting movement or presence by a detector which causes activation of a light bulb thereof from an "off" to "on" condition, said electrical signal transmitting unit being a module separate from said security light unit and having opposite plug and socket portions for interfitting said module between and interconnecting said module with a light socket and the light bulb of the security light unit, said plug portion of said module being configured to removably interfit with and be received in the light socket of the security light unit, said socket portion of said module being configured to removably interfit with and receive the light bulb of the security light unit; and
(b) an electrical signal receiving unit separate from the electrical signal transmitting unit and security light unit and having electrical means for receiving said electrical signal broadcasted by said electrical means of said signal transmitting unit and for producing an alarm signal in response to the activation of the security light unit thereby indicating movement or presence detected which causes the activation of the light bulb thereof to the "on" condition.

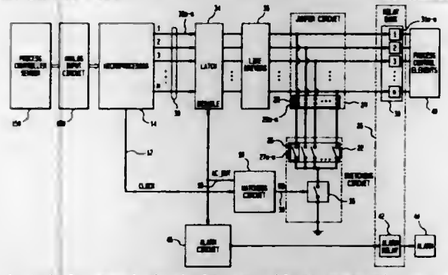
5,555,455
RECESSED FIRE DETECTOR
Dan McGinley, 312 S. Charlotte, Bremerton, Wash. 98312
Filed Oct. 5, 1994, Ser. No. 318,902
Int. Cl.[6] G08B *21/00*
U.S. Cl. 340—627 **11 Claims**



11. An apparatus for detecting fire in a structure having walls and ceiling wherein said ceiling, is a flat surface supported by a plurality of rafters, comprising: a dual power detector adapted for connection to 110 volt power and battery power for sensing the presence of combustion products including hot fluids, a cylindrical metallic canister for housing said detector and includes a flange on one end and a top at the other, and mounting means attached to said canister adapted for mounting said detector into the walls and ceiling of said structure and in such a manner as not to protrude into the interior spaces of said structure and adapted for mounting

to both an existing structure and to new structure under construction, said mounting means further comprising first mounting means including a detachable support member attached to said canister and extendible support members slidably attached to said detachable support member and adapted for attachment to said rafters, and second mounting means including a screw, and a screw retainer attached to said canister and adapted to receive said screw, and a tab stop attached to said screw and said screw retainer in such a manner as to move toward said flange and outward from said canister when said screw is tightened, and a trim ring and grill means attached to said detector by a plurality of attachment clips, said trim ring and grill means including spring mounts for attachment of retainer springs for frictionally fitting against the interior wall of said canister for removably retaining said detector in said canister by spring action.

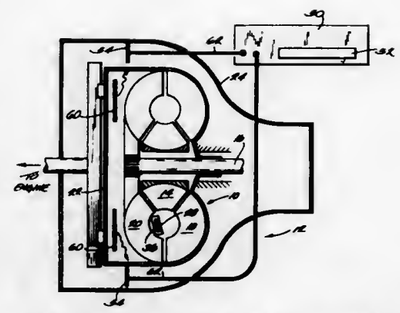
5,555,456
RECONFIGURABLE FAULT CONTROL APPARATUS
Eugene L. Waite, Wilmette, Ill., assignor to ITT Corporation, New York, N.Y.
Filed Aug. 2, 1994, Ser. No. 284,870
Int. Cl.[6] G08B *21/00*
U.S. Cl. 340—635 **20 Claims**



1. A fault control circuit for use with an automatic process controller generating at least one relay signal, comprising:
a fault detection circuit for sensing an interruption of a clock signal and providing a fault indication signal and a relay disabling signal upon interruption of said clock signal;
at least one first electrically-triggered switching means operative to control the automatic process in response to said at least one relay signal, said first switching means being switched to a predetermined fault position in response to said fault indication signal and said relay disabling signal;
a switching circuit; and
selection means which, together with said switching circuit, selectively determine said predetermined fault position of said first switching means, wherein said relay disabling signal disables said at least one relay signal and, said fault indication signal enabling the settings of both said switching circuit and said selection means to establish said predetermined fault position of said first switching means.

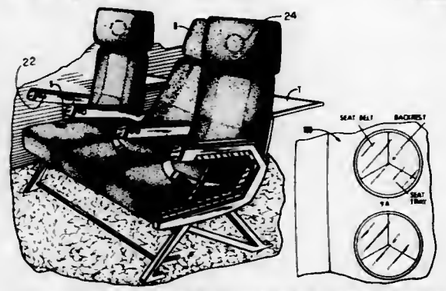
5,555,457
MICROWAVE TELEMETRY FOR SENSING CONDITIONS IN ENCLOSED ROTATING AND/OR RECIPROCATING MACHINERY
Richard L. Campbell, Chassell; Douglas B. Brumm, Calumet; Carl L. Anderson, and Glen L. Barna, both of Houghton, all of Mich., assignors to Board of Control of Michigan Technological University, Houghton, Mich.
Filed Apr. 28, 1995, Ser. No. 431,042
Int. Cl.[6] G08B *21/00*
U.S. Cl. 340—870.17 **12 Claims**

12. A method of measuring a preselected condition within a housing enclosing moving parts comprising the steps of:



sensing the condition and producing a first electrical signal corresponding to the sensed condition;
converting the electrical signal to microwave energy;
radiating said microwave energy into the interior of said housing,
picking up said microwave energy within said housing and producing and transmitting a second signal corresponding to said microwave energy externally of said housing, and
producing a readout external to said housing and corresponding to said first electrical signal and thus said sensed condition.

5,555,458
PASSENGER SAFETY STATUS INDICATOR
Darrell Large, 583 Kumukahi Pl., Honolulu, Hi. 96825
Filed Nov. 14, 1994, Ser. No. 338,389
Int. Cl.[6] G08B *21/00*
U.S. Cl. 340—945 **2 Claims**



1. A safety status system for displaying the status of multiple safety procedures carried out by the passengers in a passenger aircraft having a flight attendant in which each passenger is seated in an assigned seat having a seat belt, a tray movable between stowed and deployed positions, and a seat back rest movable between full upright and reclining positions, comprising:
a master passenger safety status indicator and intercom display console located for viewing at a flight attendant station, said console comprising discrete light means arranged in an array corresponding to the location of passenger seats in said aircraft, so that said array is mapped in one-to-one correspondence with each of said passenger seats and each light means represents a single individual passenger position;
sensing means for sensing the fastened status of each seat belt, the position of each said tray, and position of said seat back rest for each passenger seat for compliance with safety instructions issued by said flight attendant by each passenger and generating corresponding safety status signals;
each said light means comprising a light display divided into segments, each segment indicating continuously the fastened status of the seat belt, the position of said tray, and the position of said seat back rest for each passenger seat on said aircraft; and

means for duplicating the display for each corresponding seat in said light means on the back of the head rest facing each said

5,555,462
SHEET FEEDING APPARATUS

initial value in order to satisfy a subsequent request, said buffer memory having a sufficient capacity to contain several images of

means for duplicating the display for each corresponding seat in said light means on the back of the head rest facing each said passenger seat so that each passenger can be notified of failure to comply with a safety instruction and neighboring passengers can monitor the safety compliance of each passenger.

5,555,459

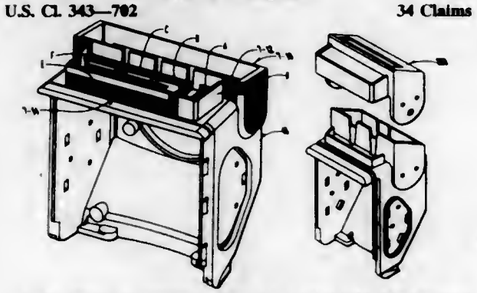
ANTENNA MEANS FOR HAND-HELD DATA TERMINALS

Robert J. Kraus, Vinton; Guy J. West, Cedar Rapids; William T. Gibbs, Cedar Rapids; Patrick H. Davis, Cedar Rapids; James R. Hutton, Cedar Rapids; Bradley E. Eckley, Cedar Rapids; Richard C. Arensdorf, Ely, and Daniel R. Dias, Cedar Rapids, all of Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa

Continuation-in-part of Ser. No. 859,570, Mar. 27, 1992, abandoned. This application Feb. 18, 1993, Ser. No. 19,481

Int. Cl.[6] H01Q *1/24*

U.S. Cl. 343—702 **34 Claims**



1. An improved antenna system for a hand-held data terminal comprising a terminal housing including processing components, data input and output devices, and a radio transceiver circuit comprising:

a radiating element comprising an antenna, and having a connection member for connection to the radio transceiver circuit;

a second housing enclosing the antenna at least partially, the second housing and antenna substantially conforming to the shape of each other; and

the second housing substantially immovably mounted to and closely conforming to the shape of the terminal housing.

5,555,460

METHOD AND APPARATUS FOR PROVIDING A REFORMATTED VIDEO IMAGE TO A DISPLAY

Bo E. Ericson, San Jose, Calif., assignor to Chips and Technologies, Inc., San Jose, Calif.

Continuation of Ser. No. 76,497, Jun. 14, 1993, abandoned, which is a continuation of Ser. No. 443,469, Nov. 29, 1989, abandoned. This application Mar. 9, 1995, Ser. No. 402,159

Int. Cl.[6] G09G *1/00*

U.S. Cl. 345—203 **26 Claims**

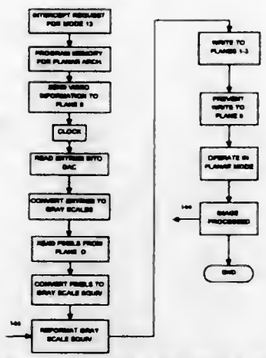
1. In a video graphics array (VGA) system, the VGA system includes a single memory for storing digital information, controller means for controlling the movement of the digital information and converter means for converting the digital information into video information in the form of a color value, a method for providing a grayscale equivalent of the color value to a display, the method comprising the steps of:

(a) configuring the VGA system for planar organization;

(b) drawing an image into a first portion of the single memory with a packed pixel arrangement;

(c) computing a grayscale value of the image in accordance with the color value;

(d) reformatting the grayscale value of the image;



(e) writing the reformatted grayscale value of the image to an unused portion of the single memory with a planar arrangement;

(f) generating the reformatted grayscale value from the unused portion of the single memory; and

(g) preventing the output of the video information of the image from the first portion of the single memory.

5,555,461

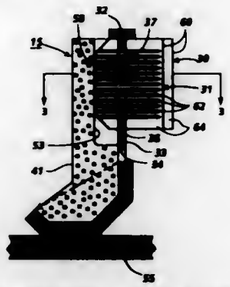
SELF CLEANING WIPER BLADE FOR CLEANING NOZZLE FACES OF INK JET PRINTHEADS

John C. Ackerman, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 3, 1994, Ser. No. 176,925

Int. Cl.[6] B41J *2/165*

U.S. Cl. 347—33 **8 Claims**



1. A fixed wiper blade assembly located in a maintenance station for an ink jet printer having a printhead with nozzles in a nozzle face mounted on a translatable carriage for concurrent reciprocal movement therewith, the wiper blade assembly being positioned for cleaning ink and other debris from the printhead nozzle face when the carriage moves the printhead thereby, the wiper blade assembly comprising: at least one planar wiping blade, having opposed planar surfaces and two opposing ends, one of the two opposing ends being releasably mounted on and perpendicular to a fixed structural member, the mounted one of the ends of the blade being in contact with an ink absorbent material, the other of the opposing ends of the blade having parallel edges for cleaning the printhead nozzle face, each of the blade planar surfaces having a plurality of relatively small, parallel grooves formed therein, the grooves having one end adjacent but spaced from said other end of the blade with the parallel edges for cleaning and another end of the grooves extending to the mounted end and into contact with the absorbent material, each of said grooves providing a capillary force to ink in contact therewith, so that a continuous removal of the ink is provided from a vicinity of the wiping blade which contacts the printhead nozzle face to the absorbent material, thereby obviating a need for a separate cleaning system for the blade.

5,555,462

SHEET FEEDING APPARATUS

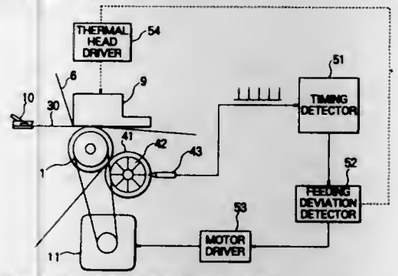
Hiroshi Fukumoto; Naoya Tanaka, both of Amagasaki; Keisuke Oda, Fukuyama; Kazuaki Arimoto, Fukuyama; Takashi Yoshida, Fukuyama; Kazuhiko Higashi, Fukuyama; Yasunori Kasahara, Fukuyama, and Terumi Kuwada, Fukuyama, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1993, Ser. No. 111,155

Claims priority, application Japan, Aug. 28, 1992, 4-229954; Mar. 26, 1993, 5-068913

Int. Cl.[6] B41J *11/44*

U.S. Cl. 347—218 **11 Claims**



1. A sheet feeding apparatus comprising:

sheet feeding means being rotatable for feeding a sheet;

follower roller means being in contact with said sheet fed by said sheet feeding means for detecting a feeding amount of said sheet, said follower roller means being rotated in accordance with movement of said sheet;

sensor means generating a signal each time said follower roller means rotates by a predetermined angle;

timing deviation detecting means for detecting a deviation in the output timing of an output signal of said sensor means relative to a reference value; and

feeding amount deviation calculating means for periodically calculating a deviation in the amount of feeding of said sheet relative to a reference feeding amount based on said deviation in the output timing of the sensor output signal each time said follower roller means rotates a predetermined angle of rotation.

5,555,463

TELEVISION RECEIVER WITH DEFERRED TRANSMISSION OF MOVING IMAGE SEQUENCES

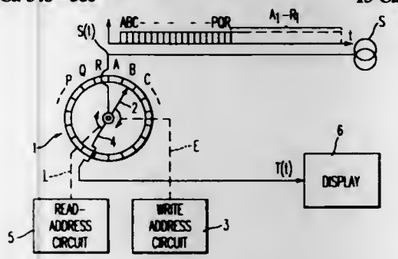
Alain Staron, Paris, France, assignor to Thomson Consumer Electronics, Courbevoie, France

Filed Aug. 30, 1994, Ser. No. 298,781

Claims priority, application France, Jan. 26, 1993, 93 00728

Int. Cl.[6] H04N *5/44;9/79;5/76*

U.S. Cl. 348—560 **13 Claims**



1. Device including means for the deferred transmission of a sequence of moving images via a buffer memory associated with write and read addressing means, said deferment undergoing an abrupt change of value on request and automatically resuming its initial value in order to satisfy a subsequent request, said buffer memory having a sufficient capacity to contain several images of the said sequence, characterized in that the said abrupt change of value is by choice positive or negative, so as to offer the possibility of repeating and that of skipping a portion of the said sequence.

5,555,464

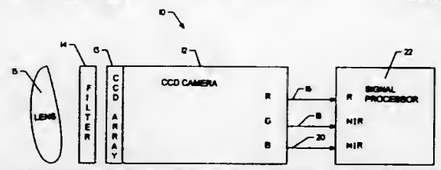
RED/NEAR-INFRARED FILTERING FOR CCD CAMERAS

John D. Hatlestad, Burnsville, Minn., assignor to Lockheed Martin Corporation, Bethesda, Md.

Filed Jul. 28, 1995, Ser. No. 506,987

Int. Cl.[6] H04N *9/07*

U.S. Cl. 348—266 **3 Claims**



1. A CCD camera system for detecting red (R) and near-infrared (NIR) wavelengths, comprising:

a) a color CCD camera comprising a multitude of pixels comprising red and near-infrared responsive pixels, green and near-infrared responsive pixels and blue and near-infrared responsive pixels arranged in a predefined pattern and constructed to provide signals on three output lines, at least a first one of which is representative of said R wavelengths, and at least a second one of which is representative of said NIR wavelengths,

b) filter means overlying said multitude of pixels comprising first defined areas which allow red light to pass and which block near-infrared light and other light, and second defined areas which allow the near-infrared light to pass and which block other light, wherein said first defined areas are configured to cover only said red and near-infrared responsive pixels, and said second defined areas are configured to cover only said green and near-infrared responsive pixels and said blue and near-infrared responsive pixels of said CCD camera, and

c) signal processing means coupled to said at least first and said at least second of said output lines to receive the signals therefrom which is constructed to provide predefined combinations of values which are dependent on the signals said signal processing means receives.

5,555,465

DIGITAL SIGNAL PROCESSING APPARATUS AND METHOD FOR PROCESSING IMPULSE AND FLAT COMPONENTS SEPARATELY

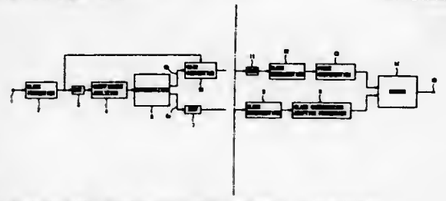
Tetsujiro Kondo, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 25, 1995, Ser. No. 451,057

Claims priority, application Japan, May 28, 1994, 6-138054; May 28, 1994, 6-138055

Int. Cl.[6] H04N *5/14*

U.S. Cl. 348—571 **27 Claims**



1. A digital signal processing apparatus, comprising:

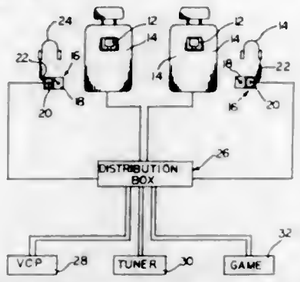
analyzing means for analyzing the frequency of an input digital signal;
separating means for separating an impulse component and a flat component in a frequency region corresponding to an analyzed output of said analyzing means;
first processing means for receiving the impulse component of the output of said separating means and processing the impulse component in the frequency region;
first converting means for converting the flat component of the output of said separating means into a signal in a time region;
second processing means for processing an output of said first converting means in the time region;
second converting means for converting an output of said first processing means into a signal in a time region; and
mixing means for mixing an output of said second converting means and an output of said second processing means.

5,555,466

VEHICULAR AUDIO/VISUAL SYSTEM HAVING DISTRIBUTION BOX FOR CONNECTING INDIVIDUAL PASSENGER MONITORS TO MULTIPLE PROGRAM SOURCES

Paul Scribner, Elkhart, Ind., and Dan Semple, Glen Arbor, Mich., assignors to ASA Electronics Corporation, Elkhart, Ind.

Filed Oct. 12, 1994, Ser. No. 320,970
Int. Cl.[6] H04N 7/16
U.S. Cl. 348—8 **15 Claims**



1. Audio/visual system comprising multiple independent viewing/listening stations, each station including a video monitor and an audio headphone terminal, a distribution box having video and audio output terminals for each of said stations and multiple input terminals for connecting corresponding multiple program sources to said distribution box, and switch means for selectively connecting said program sources to said output terminals, said switch means including a selectively actuatable multiple position switch at each of said stations, each of said multiple position switches being connected to said distribution box and corresponding to a set of output terminals, and electronic switching means within said distribution box responsive to said multiple position switches for connecting corresponding input jacks selected by any of the multiple position switches with the output terminals corresponding thereto.

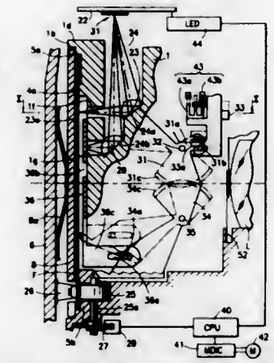
5,555,467

CAMERA EQUIPPED WITH DATA IMPRINTING DEVICE

Hidenori Miyamoto; Isao Soshi, and Hiroshi Wakabayashi, all of Tokyo, Japan, assignors to Nikon Corporation, Tokyo, Japan

Division of Ser. No. 67,676, May 26, 1993, Pat. No. 5,473,397.
This application Jun. 7, 1995, Ser. No. 472,471
Claims priority, application Japan, May 26, 1992, 4-133490
Int. Cl.[6] G03B 17/24
U.S. Cl. 354—106 **1 Claim**

1. A data imprinting device for use in a camera comprising:
a light source for emitting imprinting light;



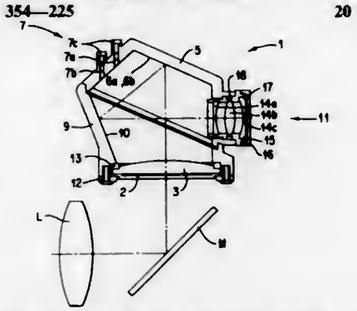
a first part of said device for focusing said imprinting light upon a photosensitive surface at at least two positions;
a second part of said device for selectively occluding said imprinting light from focusing upon at least one position of said at least two positions;
said first part including a first reflecting unit for reflecting incident light of said imprinting light upon a first position of said at least two positions;
said first part including a second reflecting unit for reflecting incident light of said imprinting light upon a second position of said at least two positions;
said first position being further from a center of said photosensitive surface than said second position;
said first reflecting unit being set back further from said photosensitive surface than said second reflecting unit;
said first and second reflecting units including first and second prisms respectively, each having a lens incorporated therein;
a camera body having a first aperture;
said first aperture permitting reflected imprinting light, of said first reflecting unit, to strike said photosensitive surface;
the camera body having a second aperture;
said second aperture permitting reflected imprinting light, of said second reflecting unit, to strike said photosensitive surface; and
said second part including a portion for covering at least one of said first and second apertures.

5,555,468

FINDER DEVICE FOR A CAMERA

Kosho Miura, Kanagawa-ken, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Feb. 24, 1995, Ser. No. 393,835
Claims priority, application Japan, May 16, 1994, 6-100378
Int. Cl.[6] G03B 13/08
U.S. Cl. 354—225 **20 Claims**



1. A finder device for a camera, the camera having an eye piece optical system and at least one of a focus plate and a condenser lens, the finder device comprising:

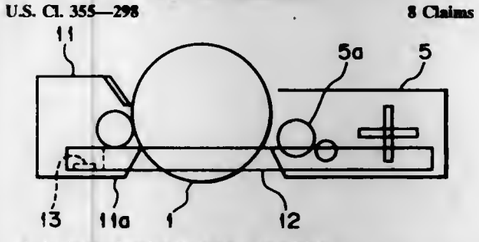
a first reflection component having at least one reflective surface, the at least one reflective surface reflects light rays which pass through at least one of the focus plate and the condenser lens;
a second reflection component that reflects the light rays from the first reflection component to the eye piece optical system; and
wherein a space is defined by the area between the first and second reflection components and the at least one condenser lens and focus plate, the space being filled with a gas other than ambient air and sealed.

5,555,469

IMAGE FORMING APPARATUS HAVING TONER RECYCLING DEVICE WITH ELECTROSTATIC CONVEYOR

Fumihiko Ishikawa; Seiji Oka, both of Yokohama, and Tsukuru Kai, Fujisawa, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 955,432, Oct. 2, 1992, abandoned.
This application Oct. 17, 1994, Ser. No. 323,573
Int. Cl.[6] G03G 21/00
U.S. Cl. 355—298 **8 Claims**



1. An image forming apparatus comprising:
an image carrier for carrying an electrostatic latent image thereon;
a developing unit for developing the latent image by supplying a toner to said image carrier to thereby produce a toner image;
an image transferring unit for transferring the toner image from said image carrier to a recording medium;
a cleaning unit for collecting the toner remaining on a surface of said image carrier after image transfer;
toner transporting means for transporting the toner collected by said cleaning unit to said developing unit;
an electrostatic actuator having a plurality of parallel spaced electrodes located in and along a path which the toner collected by said cleaning unit is transported to said developing unit by said toner transporting means for generating electric fields which transport only particles of the toner carrying a predetermined charge in a predetermined direction;
means to remove, from said path, particles other than said toner; and
means to selectively activate said parallel spaced electrodes by selectively applying thereto at least three respective charging voltages, including a positive voltage, a negative voltage, and a ground voltage, so as to provide an electromotive force to said particles of toner such that said force is the primary force used in moving said particles.

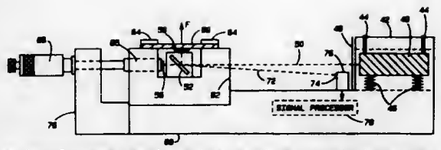
5,555,470

SINGLE WAVE LINEAR INTERFEROMETRIC FORCE TRANSDUCER

Neil M. Cole, and Robert G. Dennis, both of Ann Arbor, Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Continuation of Ser. No. 134,989, Oct. 12, 1993, abandoned.
This application Feb. 9, 1995, Ser. No. 386,120
Int. Cl.[6] G01B 9/02
U.S. Cl. 356—35.5 **26 Claims**

1. A force transducer comprising:



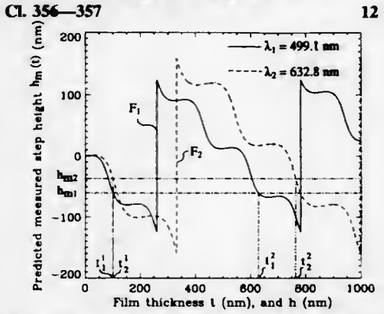
an interferometer having a beam splitter operatively connected to a housing, the housing comprising a material substantially resistive to thermal expansion;
first and second reflective surfaces for receiving light emitted from and reflecting light in the direction of the beam splitter, one of the reflective surfaces reflecting light in the direction of a light source placed opposite the beam splitter;
a load beam operatively connected to the housing, the other of the reflective surfaces being connected to the load beam and reflecting in the direction of the beam splitter, the load beam comprising a material substantially resistive to thermal expansion, the load beam deflecting in response to a force applied thereto;
photo-processing means for detecting a linear portion of an interference fringe pattern from the interferometer and generating a single output signal; and
signal processing means for receiving the single output signal and determining the amount of deflection of the load beam in accordance with a shift of the linear portion of the interference fringe pattern detected by the photo-processing means, said shift measured within the linear portion of the single wave of said interference fringe pattern.

5,555,471

METHOD FOR MEASURING THIN-FILM THICKNESS AND STEP HEIGHT ON THE SURFACE OF THIN-FILM/SUBSTRATE TEST SAMPLES BY PHASE-SHIFTING INTERFEROMETRY

Yiping Xu, and Yuan J. Li, both of Tucson, Ariz., assignors to Wyko Corporation, Tucson, Ariz.

Filed May 24, 1995, Ser. No. 449,353
Int. Cl.[6] G01B 9/02
U.S. Cl. 356—357 **12 Claims**



1. A method for measuring by phase-shifting interferometry the height of a step between an optically-thin film and an opaque substrate in a test sample having known optical parameters at predetermined wavelengths, comprising the following steps:
(a) creating a first curve of a theoretical measured-height versus a physical height of said step between said optically-thin film and opaque substrate in the test sample as a function of said optical parameters at a first predetermined wavelength; and performing phase-shifting interferometry on the test sample to produce a first experimental measured-height of the step between the optically-thin film and the opaque substrate;
(b) repeating step (a) at a second predetermined wavelength, thereby producing a second curve and a second experimental measured-height; and
(c) comparing said first and second curves to determine a single physical height on the curves that corresponds to said first

experimental measured-height on the first curve and to said second experimental measured-height on the second curve.

5,555,475

METHOD AND APPARATUS FOR GENERATING AN OUTPUT DEVICE CONTROL SIGNAL

each other, a plurality of minute unit lenses being formed from said interface and said first and second substance layers by providing

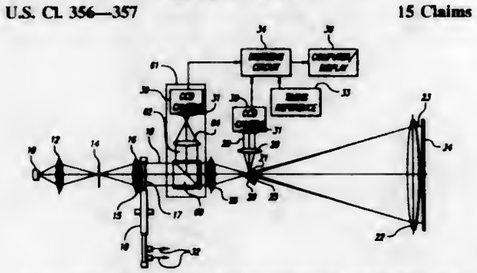
experimental measured-height on the first curve and to said second experimental measured-height on the second curve.

5,555,472

METHOD AND APPARATUS FOR MEASURING FILM THICKNESS IN MULTILAYER THIN FILM STACK BY COMPARISON TO A REFERENCE LIBRARY OF THEORETICAL SIGNATURES

Paul J. Clapis, Sandy Hook, and Keith E. Daniell, Norwalk, both of Conn., assignors to Integrated Process Equipment Corp., Phoenix, Ariz.

Filed Dec. 22, 1993, Ser. No. 179,594
Int. Cl.[6] G01B *9/02*
U.S. Cl. 356—357 **15 Claims**



1. A system for measuring the thicknesses of a first layer and a second layer of materials, one of the layers having a substantially uniform thickness, said system comprising:

first means for providing a first library of theoretical signatures of reflectivity as a function of wavelength for a range of thicknesses of said first layer on the basis of a first assumed thickness of said second layer;

second means for measuring reflectivity as a function of wavelength for said first layer at a plural points on the surface of said first layer to provide a plurality of signatures representing the measured value of reflectivity as a function of wavelength at each point measured;

third means for comparing each of said measured signatures to each of said theoretical signatures in said first library to identify an associated optimal correlation for each measured signature;

fourth means for calculating an error value associated with each optimal correlation of each signature with one of said theoretical signatures in said first library; and

fifth means for analyzing the error value associated with each optimal correlation of each signature with one of said theoretical signatures in said first library to provide a first measure of a quality of a correlation between the actual thickness of said second layer and the first assumed thickness of the second layer.

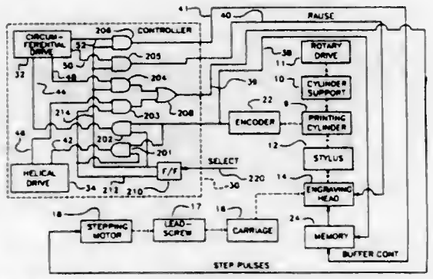
5,555,473

ENGRAVING SYSTEM AND METHOD FOR HELICAL OR CIRCUMFERENTIAL ENGRAVING

David R. Seitz, Vandalia; Curtis Woods, Centerville, and Matthew A. Thomas, Beavercreek, all of Ohio, assignors to Ohio Electronic Engravers, Inc., Dayton, Ohio

Filed Feb. 21, 1995, Ser. No. 391,582
Int. Cl.[6] B41C *1/04*
U.S. Cl. 358—299 **47 Claims**

1. An engraver for helically or cylindrically engraving a cylinder, comprising:



an engraving head;

a driver coupled to said engraving head for driving said engraving head across a surface of said cylinder; and

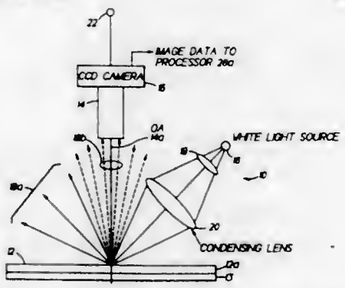
a controller coupled to said engraving head and said driver for energizing said engraving head and said driver to selectively engrave either a helical pattern or a cylindrical pattern on said surface.

5,555,474

AUTOMATIC REJECTION OF DIFFRACTION EFFECTS IN THIN FILM METROLOGY

Anthony M. Ledger, Newfairfield, Conn., assignor to Integrated Process Equipment Corp., Phoenix, Ariz.

Filed Dec. 21, 1994, Ser. No. 360,535
Int. Cl.[6] G01B *11/06*
U.S. Cl. 356—381 **21 Claims**



1. A method for determining a thickness of a layer disposed over a surface of a substrate, comprising the steps of:

illuminating the layer with light having a first incidence angle;

obtaining at least one first image of the layer with light reflecting from the layer and the substrate;

illuminating the layer with light having a second incidence angle;

obtaining at least one second image of the layer with light reflecting from the layer and the substrate, the reflected light being primarily due to a presence of features that at least one of scatter and diffract the light having the second incidence angle;

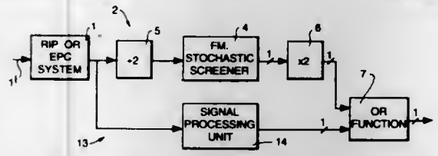
identifying from the at least one second image at least one region not having the features; and determining, in accordance with the at least one first image, a thickness of the layer within the at least one identified region not having the features.

5,555,475

METHOD AND APPARATUS FOR GENERATING AN OUTPUT DEVICE CONTROL SIGNAL

Paul J. Perowne; George C. Manley, and Richard A. Kirk, all of Herts, United Kingdom, assignors to Crosfield Electronics Limited, Herts, United Kingdom

Filed Dec. 9, 1994, Ser. No. 354,854
Claims priority, application United Kingdom, Dec. 10, 1993, 9325263
Int. Cl.[6] H04N *1/52*
U.S. Cl. 358—462 **22 Claims**



1. A method of generating an output device control signal having portions representing the content of pixels of an image including at least two types of image content comprising:

passing data defining the content of each pixel of the image at a lower, first resolution and a higher, second resolution respectively through a pair of processing paths, one corresponding to each of said image content types;

generating a binary control signal from said first resolution data in said first path by applying a stochastic screen;

adapting the binary control signal resulting from said stochastic screen to conform with the data at said second resolution; and

generating said output device control signal by combining data from said two processing paths.

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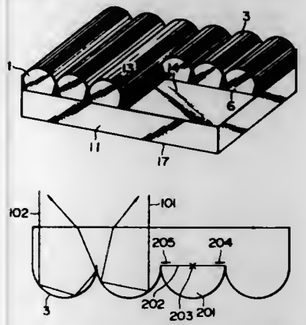
MICROLENS ARRAY SHEET FOR A LIQUID CRYSTAL DISPLAY, METHOD FOR ATTACHING THE SAME AND LIQUID CRYSTAL DISPLAY EQUIPPED WITH THE SAME

Motoyuki Suzuki, Kyoto; Tetsuo Uchida, and Kazuo Matsuura, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Japan

Filed Aug. 24, 1994, Ser. No. 295,249
Claims priority, application Japan, Aug. 30, 1993, 5-235882; Sep. 2, 1993, 5-243793; Sep. 2, 1993, 5-243794
Int. Cl.[6] G02F *1/1335;1/1333;1/13*
U.S. Cl. 359—40 **23 Claims**



6. A microlens array sheet for a liquid crystal display, said microlens array sheet comprising a first substance layer having a first refractive index, a second substance layer having a refractive index less than said first refractive index, and ray cut-off means, said first and second substance layers having an interface between them and being positioned between two planar surfaces parallel to each other, a plurality of minute unit lenses being formed from said interface and said first and second substance layers by providing concave and/or convex surfaces to said interface, said plurality of minute unit lenses being arranged in a plane along said two planar surfaces, and said ray cut-off means being capable of cutting off some rays which have reached said plane before said rays enter said plane, said cut-off means also being capable of cutting off rays which enter said plane from a normal-line direction and repeat a total reflection based on a difference between said refractive indexes of said first and second substance layers at least two times, said ray cut-off means being positioned on at least one of a ray entrance portion and a ray exit portion of said plane.

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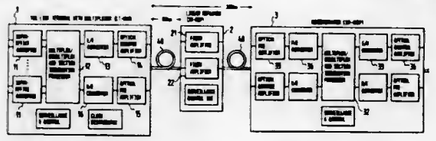
OPTICAL TRANSMISSION SYSTEM CONSTRUCTING METHOD AND SYSTEM

Keiji Tomooka, Yokohama; Naohiro Sakakida, Kawasaki; Shin Nishimura, Yokohama; Yoshihiro Ashi, Yokohama; Hironari Matsuda, Yokohama; Satoshi Aoki, Chigasaki; Yukio Nakano, Zama; Masahiro Takatori, Hachiouji; Toru Kazawa, Kokubunji; Shinya Sasaki, Kodaira; Ryoji Takeyari, Koganei, and Hiroyuki Nakano, Asaka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 23,546, Feb. 26, 1993, Pat. No. 5,500,756. This application Apr. 7, 1993, Ser. No. 44,425
Claims priority, application Japan, Apr. 8, 1992, 4-087247
Int. Cl.[6] H04J *14/00;* **H04B** *10/02*
U.S. Cl. 359—115 **5 Claims**



1. In an optical transmission equipment, including a shelf with a first circuit board slot for accommodating a first device which is an electric-to-optic converter circuit board for converting an electric signal to a transmission light, with a second circuit board slot for accommodating a second device which is an optic-to-electric converter circuit board for converting received light to an electric signal, with at least a third circuit board slot for accommodating at least one of a third device and a fourth device, said third device being a booster optical amplifier circuit board for amplifying transmitting light produced by said first device, and said fourth device being a pre-optical amplifier circuit board for amplifying said received light before providing it to said second device, an optical transmission method comprising the steps

inserting at least one of said first device and said second device to the corresponding circuit board slot;

transmitting said transmission light when said first device is inserted, and the transmission distance is shorter than a predetermined length;

receiving said received light when said second device is inserted and the received light transmitted a shorter distance than a predetermined length;

inserting said third device to said third circuit board slot, when transmitting said transmission light a distance longer than said predetermined length, and

inserting said fourth device to said third circuit board slot when said received light is transmitted a distance longer than said predetermined length.

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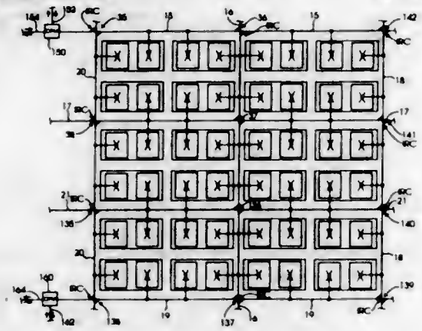
FIBER OPTIC INFORMATION TRANSMISSION SYSTEM

Joseph Zelikovitz, deceased, late of Grove, Okla.; by Bernard Greenblott, executor, 373 Wildwood La., Deerfield Beach, Fla. 33442, and by Jerry L. Owen, executor, 3933 Hartline, Del City, Okla. 73115

Filed Jun. 7, 1995, Ser. No. 471,827
Int. Cl.[6] H04J 14/00; H04B 10/00
U.S. Cl. 359—118 20 Claims



1. A fiber optic transmission system comprising:
a plurality of fiber optic lines, subscriber locations, intelligent communication platforms, and at least one intelligent routing card;
a first source of data at a first subscriber location;
a first data processor line card at said first subscriber location capable of forming a plurality of data transmission packets with data, header and tail information;
a first intelligent communication platform coupled to said first data processor line card by fiber optic lines wherein said first intelligent communication platform is capable of receiving any one of said transmission packets, determining the appropriate route for said one transmission packet and is capable of shunting said one transmission packet onto the appropriate fiber optic line to a first intelligent line module;
a first intelligent routing card at the junction of at least two fiber optic lines and coupled to said first intelligent line module wherein said first intelligent routing card is capable of receiving any one of said transmission packets, determining the appropriate route for said one transmission packet and shunting said one transmission packet onto the appropriate fiber optic line to or away from said first intelligent line module; and
a second data processor line card at a second subscriber location coupled to said first intelligent routing card capable of receiving said transmission packet and decoding the data within said packet.

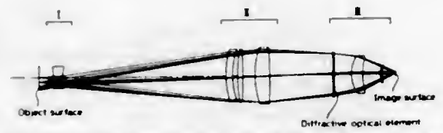
5,555,479

REDUCTION PROJECTION LENS SYSTEM INCLUDING REFRACTIVE AND DIFFRACTIVE OPTICAL ELEMENTS

Kunio Nakagiri, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1994, Ser. No. 332,121
Claims priority, application Japan, Oct. 29, 1993, 5-271675
Int. Cl.[6] G02B 3/08; 3/02; 5/18; 13/18
U.S. Cl. 359—355 8 Claims

1. A reduction projection lens system for forming a reduced image of an object using light from a light source that emits light having a center wavelength of up to 300 nm, wherein said projection lens system includes:



at least one refractive optical element having an aspheric surface;
at least one diffractive optical element; and
a pupil;
wherein said system conforms to the following conditions:

$$0.02<|d|/D<0.17 \quad (3)$$

$$0.01<|h/H|<0.25 \quad (4)$$

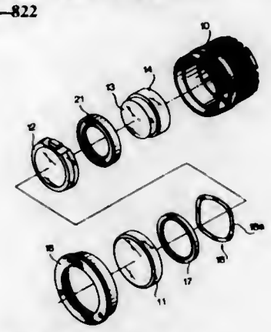
where d is a distance from the pupil of the lens system to the diffractive optical element, D is a conjugate distance, h is height of an off-axis principal ray of maximum image height in the diffractive optical element, and H is an effective radius of the diffractive optical element.

5,555,480

LENS HOLDING STRUCTURE

Hitoshi Tanaka, and Norio Sato, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1994, Ser. No. 274,039
Claims priority, application Japan, Jul. 12, 1993, 5-043163 U
Int. Cl.[6] G02B 7/02
U.S. Cl. 359—822 29 Claims



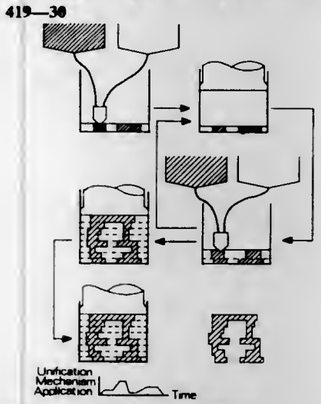
1. A lens holding structure, comprising:
a lens frame that accommodates a first lens and a second lens, said first lens and said second lens having a space therebetween;
a static spacing member having a predetermined thickness along a direction of an optical axis of said first lens and said second lens; and
a resiliently deformable member that biases said first lens and said second lens away from each other along said optical axis,
said spacing member and said resiliently deformable member being positioned adjacent to each other and between said first lens and said second lens along said direction of said optical axis,
said spacing member, located between said resiliently deformable member and one of said first lens and said second lens, reducing a deflection amount of said resiliently deformable member.

5,555,481

METHOD OF PRODUCING SOLID PARTS USING TWO DISTINCT CLASSES OF MATERIALS

Stephen J. Rock, and Charles R. Gilman, both of Troy, N.Y., assignors to Rensselaer Polytechnic Institute, Troy, N.Y.

Continuation of Ser. No. 152,406, Nov. 15, 1993, abandoned.
This application Aug. 1, 1995, Ser. No. 509,730
Int. Cl.[6] B44C 1/22; B22F 7/02
U.S. Cl. 419—30 20 Claims



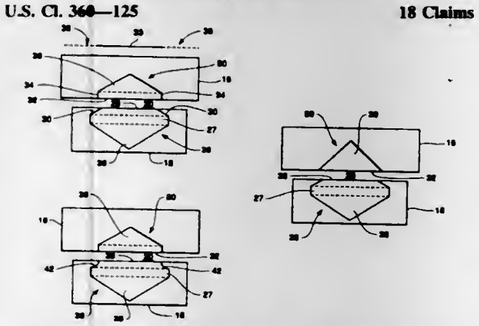
1. A method of producing parts comprising:
depositing a first class material and a second class material in multiple layers, wherein each layer of said multiple layers comprises the first class material and the second class material, and wherein the first class material forms a three dimensional shape defined by the interface of said first class material and said second class material;
compacting the deposited first class and second class material by exerting an external force thereto;
unifying the first class material after the steps of depositing and compacting all layers of said multiple layers; and
removing the second class material from a three dimensional part formed of the first class material.

5,555,482

ETCHED ERASE BAND FEATURE FOR THIN FILM RECORDING HEADS

Michael McNeil, Boulder, Colo., assignor to Maxtor Corporation, Longmont, Colo.

Filed Jul. 7, 1994, Ser. No. 272,113
Int. Cl.[6] G11B 5/187; 5/127; 5/23
U.S. Cl. 360—125 18 Claims



1. A magnetic head for writing data to a track on a surface of a magnetic disk in a hard disk drive, comprising:
(a) a leading edge pole that has a leading edge pole face;
wherein said leading edge pole face has a shape defined by a leading gap edge, a first leading outer edge, a second leading outer edge, a first leading front edge, and a second leading front edge;
wherein said leading gap edge extends from a first leading gap edge end to a second leading gap edge end;
wherein said first leading outer edge extends substantially perpendicular to said leading gap edge and from said first leading gap edge end to a first leading outer edge end;
wherein said second leading outer edge extends substantially perpendicular to said leading gap edge and from said second leading gap edge end to a second leading outer edge end;
wherein said first leading gap edge end, said second leading gap edge end, said first leading outer edge end, and said second leading outer edge end define a leading rectangle;
wherein said first leading front edge extends from said first leading outer edge end to a leading front point;
wherein said second leading front edge extends from said second leading outer edge end to said leading front point;
wherein said leading front point is located between substantially parallel lines that include said first and second leading outer edges;
wherein said first leading outer edge end, said second leading outer edge end, and said leading front point define a leading triangle;
(b) a trailing edge pole that has a trailing edge pole face;
wherein said trailing edge pole face has a shape defined by a trailing gap edge, a first trailing front edge, a second trailing front edge, a first trailing outer edge, a second trailing outer edge, a first trailing back edge, and a second trailing back edge;
wherein said trailing gap edge extends from a first trailing gap edge end to a second trailing gap edge end;
wherein said first trailing front edge extends from said first trailing gap edge end to a first trailing front edge end;
wherein said second trailing front edge extends from said second trailing gap edge end to a second trailing front edge end;
wherein said first trailing gap edge end, said second trailing gap edge end, said first trailing front edge end, and said second trailing front edge end define a trapezoid in which said first and second trailing front edges are non-parallel and of substantially equal length;
wherein said first trailing outer edge extends from said first trailing front edge end to a first trailing outer edge end;
wherein said second trailing outer edge extends from said second trailing front edge end to a second trailing outer edge end;
wherein said first trailing front edge end, said second trailing front edge end, said first trailing outer edge end, and said second trailing outer edge end define a center section with a trailing rectangular shape;
wherein said first trailing back edge extends from said first trailing outer edge end to a trailing back point;
wherein said second trailing back edge extends from said second trailing outer edge end to said trailing back point;
wherein said trailing back point is located between parallel lines that include said first and second trailing outer edges;
wherein said first trailing outer edge end, said second trailing outer edge end, and said trailing back point define a trailing triangle;
wherein said leading gap edge is separated from said trailing gap edge by a gap;
wherein said leading gap edge is substantially parallel to said trailing gap edge;
wherein said leading gap edge is substantially the same length as said trailing gap edge;
wherein said first leading gap edge end, said second leading gap edge end, said first trailing gap edge end, and said second trailing gap edge end define a gap rectangle;

wherein the width of said leading gap edge, defined by said first

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ELECTROMAGNETIC DOOR HOLDER SYSTEM

each protrusion is press fitted into the non-circular bore of said electrical component thereby to provide a frictional connec-

said locking aperture within said main body wherein said device for processing information is prevented from being

wherein the width of said leading gap edge, defined by said first and second leading gap edge ends, is less than the width of said center section, defined by said first and second trailing outer edge ends;

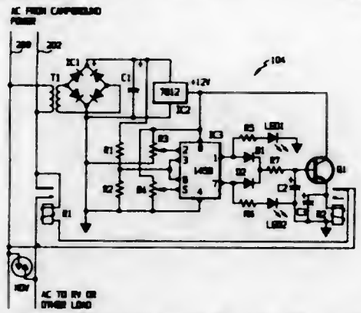
(c) a coil, coupled to said leading and trailing edge poles, for generating a magnetic field that flows across said gap between said leading and trailing edge pole faces such that portions of said leading edge pole face adjacent to said first and second leading outer edges are magnetically saturated for creating erase bands on the outer edges of the track of the magnetic disk.

5,555,483

AUTOMATIC POWER LINE MONITOR SYSTEM

Stanton L. Pressman, 7086 Dassett Ct., #201, Annandale, Va. 22033, and Patrick C. Stuart, 101 Rainbow Dr. #1406, Livingston, Tex. 77351

Filed Feb. 10, 1994, Ser. No. 194,523
Int. Cl.[6] H02H *3/24*
U.S. Cl. 361—90 **18 Claims**



1. A power line monitor system for use with a recreational vehicle for connecting the electrical system of such recreational vehicle to a source of electrical power, comprising:

means for connecting said power line monitor system to said source of electrical power;

means for connecting said electrical system of said recreational vehicle to said power line monitor system;

means for monitoring said source of electrical power to determine whether voltage supplied by said source of electrical power is within a predetermined voltage range;

means for indicating electrical power outside of said predetermined voltage range including a first indicating means connected to indicate a first condition wherein the voltage is higher than said predetermined voltage range and a second indicating means connected to indicate a second condition wherein the voltage is lower than said predetermined voltage range, wherein, during said first or second conditions, at least one of said indicating means are enabled prior to said interruption of said electrical system of said recreational vehicle and said indicating means are disabled prior to restoration of said connection of said recreational vehicle to said source of electrical power; and

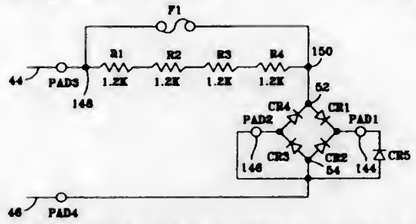
means for interrupting connection of the electrical system of said recreational vehicle to said source of electrical power while said voltage supplied by said source of electrical power is outside of said predetermined voltage range and for automatically restoring connection to said electrical system of said recreational vehicle when said voltage is within said predetermined voltage range, said means for interrupting including at least two relays wherein a first relay controls a second relay for interrupting and automatically restoring connection of said electrical power to said electrical system of said recreational vehicle.

5,555,484

ELECTROMAGNETIC DOOR HOLDER SYSTEM

William P. Dye, and Paul J. Hoggard, both of Indianapolis, Ind., assignors to Von Duprin, Inc., Indianapolis, Ind.

Filed Apr. 4, 1994, Ser. No. 222,042
Int. Cl.[6] H01F *7/18*
U.S. Cl. 361—144 **7 Claims**



1. An electromagnetic door holder system for use with a variety of power sources comprising:

a pair of power input terminals adapted to be coupled to any power source having an output voltage within a selected range;

a resistor circuit having an input coupled to a first of the power input terminals and having a resistor circuit output;

a rectifier circuit having a first rectifier input coupled to the resistor circuit output, having a second input coupled to a second of the power input terminals;

an electromagnetic coil having a first end coupled to the first rectifier circuit output and having a second end coupled to the second rectifier circuit output; and

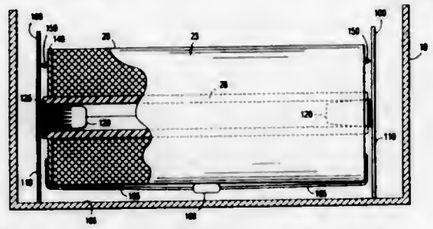
a low resistance circuit having a first end coupled to the resistor circuit input and having a second end coupled to the resistor circuit output, the low resistance circuit including a fusible link, the fusible link being selected to carry current to the rectifier circuit when the power input terminals are coupled to a lower voltage power source and to stop carrying current when the power input terminals are coupled to a higher voltage power source.

5,555,485

DEVICE AND METHOD FOR INSULATING A DRY FILM CAPACITOR

Caryl L. Wallace, Arlington Heights, Ill., assignor to Philips Electronics North America Corporation, New York, N.Y.

Continuation of Ser. No. 94,277, Jul. 19, 1993, abandoned.
This application Nov. 29, 1994, Ser. No. 346,322
Int. Cl.[6] H01G *2/02*
U.S. Cl. 361—272 **18 Claims**



1. An assembly for insulating an electrical component, comprising:

an electrical component having a core with a non-circular bore therein,

a pair of electrically non-conductive discs each having an electrically non-conductive protrusion made of a flexible material and having grooves thereon and being integrally connected to the disc, wherein at least one protrusion has a hollow interior and a distal end with an opening therein and a circular outer periphery, and;

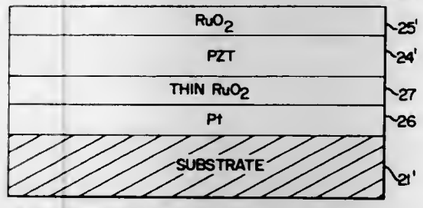
each protrusion is press fitted into the non-circular bore of said electrical component thereby to provide a frictional connection between the circular distal end of the protrusion and the non-circular bore of the electrical component.

5,555,486

HYBRID METAL/METAL OXIDE ELECTRODES FOR FERROELECTRIC CAPACITORS

Angus I. Kingon, Cary, N.C.; Husam N. Al-Shareef, Albuquerque, N.M.; Orlando H. Auciello, Cary, N.C.; Ken D. Gifford, Raleigh, N.C.; Dan J. Lichtenwalner, Raleigh, N.C., and Rovindra Dat, Dallas, Tex., assignors to North Carolina State University, Raleigh, N.C.

Filed Dec. 29, 1994, Ser. No. 365,781
Int. Cl.[6] H01G *4/008;4/10*
U.S. Cl. 361—305 **46 Claims**



1. A ferroelectric capacitor comprising:

a first layer comprising a conducting metal oxide;

a second layer on said first layer, said second layer comprising a metal, wherein said second layer is deposited sufficiently thin to complement said first layer to improve the leakage current behavior of the capacitor and minimize polarization fatigue;

a third layer on said second layer opposite said first layer, said third layer comprising a ferroelectric material; and

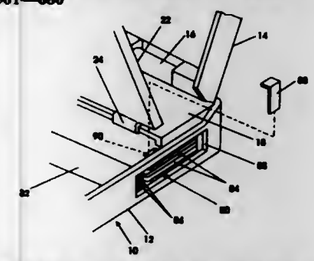
a fourth layer on said third layer opposite said second layer, said fourth layer comprising a conductive material.

5,555,487

INFORMATION PROCESSING APPARATUS HAVING LOCKABLE MODULAR SUBSYSTEMS

Katsutoshi Katoh, Tokyo-to; Michio Suzuki, Yokohama; Yoshiharu Uchiyama, Isehara, and Kenshin Yonemochi, Kamakura, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 22, 1994, Ser. No. 279,124
Claims priority, application Japan, Jul. 23, 1993, 5-182972
Int. Cl.[6] G06F *1/16;* **H05K** *5/03;* **B65D** *55/14*
U.S. Cl. 361—680 **3 Claims**



1. An information processing apparatus comprising:

a main body having an opening therein into which a device for processing information is accommodated so as to be installable and removable therefrom;

a locking aperture within said main body which corresponds to said opening within said main body;

a preventing member freely mountable to and removable from said main body, said preventing member for insertion within said locking aperture within said main body wherein said device for processing information is prevented from being removed from said opening within said main body when said preventing member is mounted within said locking aperture within said main body;

a cover mounted to said main body so as to be freely openable and closeable, said cover preventing removal of said preventing member from said locking aperture within said main body when said cover is closed; and

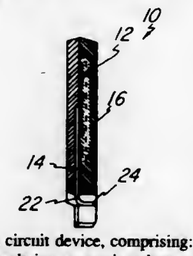
a movable member mounted within said main body, said movable member being movable between a first state in which a portion of said movable member is exposed outside of said main body and a second state in which said portion of said movable member is withdrawn into said main body, wherein in said first state in which said portion of said movable member is exposed outside of said main body, said movable member engages said cover so as to prevent said cover from opening.

5,555,488

INTEGRATED CIRCUIT DEVICE HAVING IMPROVED POST FOR SURFACE-MOUNT PACKAGE

Robert N. McLellan, Garland, and Anthony M. Chiu, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 723,108, Jun. 28, 1991, Pat. No. 5,204,287. This application Jan. 21, 1993, Ser. No. 6,899
Int. Cl.[6] H05K *7/02;* **H01L** *23/28;23/544*
U.S. Cl. 361—820 **15 Claims**



15. An integrated circuit device, comprising:

a package encapsulating a semiconductor die, said package including a plurality of posts integral therewith and extending from at least one edge of said package, said package presenting a lengthwise molding plane; and

a plurality of lead fingers electrically connected to said die, said lead fingers extending from at least one edge of said package;

at least one of said posts being only on one side of said lengthwise molding plane so as to fit into holes in a printed circuit board for mechanically positioning and supporting said package when said lead fingers are affixed to a printed circuit board.

5,555,489

PORTABLE PC COMBINATION

Kari Keskinen, Salpakankaantie 16 A 24, Fin-15870 Hollola, Finland, assignor to Kari Keskinen, Hollola, Finland

Filed Mar. 11, 1994, Ser. No. 209,831
Int. Cl.[6] H05K *7/10*
U.S. Cl. 361—683 **16 Claims**

1. A combination of a printer, a portable PC with cover, and a portable PC combination carrier for transporting said printer and portable PC connected together, comprising:

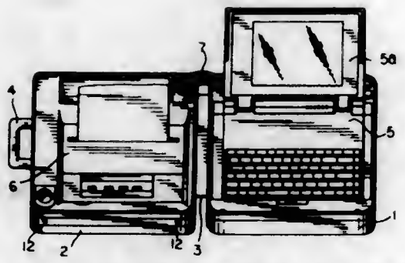
an attache case composed of a bottom section for receiving and holding one of said printer or portable PC, and a cover section for receiving and holding the other of said printer or portable PC;

a hinge connection pivotally connecting said bottom section and said cover section of the case so as to support the printer and

mitting signals between the processor means and the PC card means, the signal transmission means being supported by the wearable support means;

mating connector means by moving said computer away from said port replicating device.

1. A device for focusing all entering light whatever its direction and incidence, said device comprising an optical system having an



said PC in a side-by-side relationship in an open condition of said attache case and with a screen of the portable PC facing a user when a cover for the PC containing the screen is opened along a first axis, and said hinge connection along a second axis which is oriented in an orthogonal direction to the first axis when said cover section is opened;

said cover section in a closed condition of said portable PC combination overlying said bottom section and in an open condition said cover section and said bottom section being adapted to lie on a common planar surface with said portable PC and said printer being in said side-by-side relationship with said printer and said portable PC being juxtaposed to each other with their front edges toward the user.

5,555,490

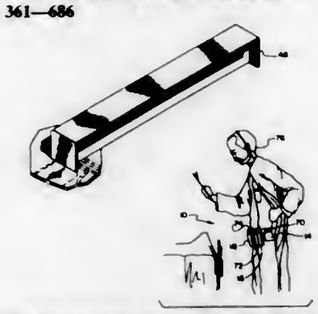
WEARABLE PERSONAL COMPUTER SYSTEM

David W. Carroll, Northfield, Minn., assignor to Key Idea Development, L.L.C., Northfield, Minn.

Filed Dec. 13, 1993, Ser. No. 166,222

Int. Cl.[6] G06F *1/16*; H05K *7/10*

U.S. Cl. 361—686 **20 Claims**



18. A wearable electronic computing device designed for hands-free input operations by a wearer of the computing device, the computing device comprising:

wearable support means for forming a belt, the wearable support means comprising pliant material conformable to and supportable by the body of the wearer of the computing device;

processor means supported by the wearable support means for performing computer processing functions;

PC card connector means supported by the wearable support means for mateably receiving a plurality of PC cards, the wearable support means providing flexibility and relative movement: between the processor means and the PC card connector means to be conformable to the body of the wearer;

PC card means slidably received within and mateably secured to the PC card connector means for forming a computing configuration for performing at least one desired computing function, the PC card means further being readily insertable into and removable from the PC card connector means to perform different computing functions, the PC card means comprising at least one input PC card and at least one output PC card;

signal transmission means coupled with and interconnecting the processor means and the PC card connector means for transmitting signals between the processor means and the PC card means, the signal transmission means being supported by the wearable support means;

input means operably coupled with at least one of the processor means and the PC card means, the input means being supportable by the body of the wearer of the computing device for receiving audible, verbal input from the wearer of the computing device such that tile wearer can perform input operations in a hands-free manner, the input means generating signals corresponding to the audible input for transmission to the processor means via the signal transmission means;

output means operably coupled with at least one of the processor means and the PC card means, the output means being supportable by the body of the wearer for generating output perceivable to the wearer of the computing device, the output means generating the output in response to signals received from the processor means via the signal transmission means; and

a plurality of enclosures supported by the wearable support means, the PC card connector means being disposed within the plurality of enclosures.

5,555,491

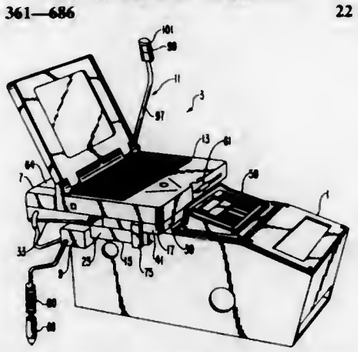
COMPACT DOCKING STATION FOR PORTABLE COMPUTER

Adam M. Tao, Laguna Niguel, Calif., assignor to Toshiba America Information Systems, Inc., Irvine, Calif.

Filed Feb. 14, 1995, Ser. No. 388,579

Int. Cl.[6] H05K *7/10*; G06F *1/16*

U.S. Cl. 361—686 **22 Claims**



1. A docking station for a portable computer, comprising:

a lower mounting bracket including attachment means for attaching said mounting bracket to a base;

an upper mounting bracket providing a generally planar computer support surface for removably supporting a portable computer, said upper mounting bracket being pivotably connected to said lower mounting bracket such that said upper mounting bracket is moveable between a computer use position wherein said support surface extends generally parallel and adjacent to said lower mounting bracket, and a computer attachment/removal position wherein said support surface extends upwardly away from said lower mounting bracket; and

a computer port replicating device attached to said upper mounting bracket adjacent said computer support surface, said port replicating device having:

power input means for receiving power from a power supply;

at least one data input/output port; and

connector means for electrically connecting the portable computer with said power input means and said at least one data input/output port, said connector means being engageable with mating connector means provided on the portable computer, by positioning the portable computer on the computer support surface and moving the computer against said port replicating device, and disengageable from the mating connector means by moving said computer away from said port replicating device.

5,555,492

SIGNAL LAMP

Rolf Feger, Bietigheim-Bissinger, Germany, assignor to ITT Automotive Europe GmbH, Frankfurt, Germany

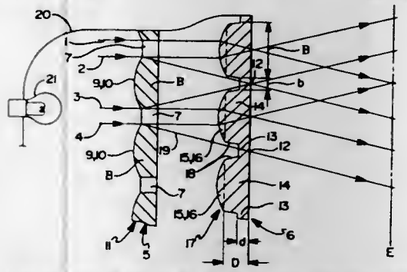
PCT No. PCT/EP93/02220, § 371 Date Feb. 28, 1995, § 102(e) Date Feb. 28, 1995, PCT Pub. No. WO94/05949, PCT Pub. Date Mar. 17, 1994

PCT Filed Aug. 19, 1993, Ser. No. 392,834

Claims priority, application Germany, Aug. 31, 1992, 42 28 928.9

Int. Cl.[6] F21Q *1/00*; B60Q *1/26*

U.S. Cl. 362—293 **14 Claims**



1. A signal lamp, in particular, for automotive vehicles, comprising:

a light source for emitting light rays, a casing including a closure plate of transparent coloring, and comprising one or more light filters provided between the light source and the closure plate, wherein the closure plate is subdivided into segments of varying plate thicknesses including a high plate thickness, and wherein the light filter is provided with recesses within a path of said light rays ahead of the segments having a high plate thickness.

5,555,493

FLUID OPTICS PROJECTOR

Jean-Claude Amblard; Amilcar Vide-Amblard, both of 4, fue du Vert-Bois, F-75003 Paris, France; Roger Le Nagard, 1, rue de la Vielle-Butte, F-78100 S.-Germain-en-Laye, France, and Jean Georget, 20, rue Jean Moulin, F-94300 Vincennes, France

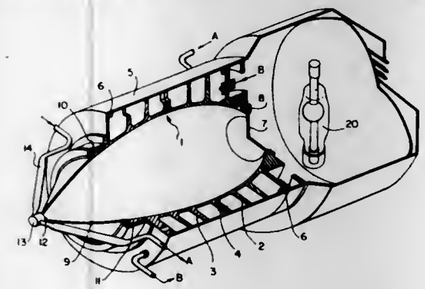
PCT No. PCT/FR93/00314, § 371 Date Dec. 13, 1993, § 102(e) Date Dec. 13, 1993, PCT Pub. No. WO93/21474, PCT Pub. Date Oct. 28, 1993

PCT Filed Mar. 30, 1993, Ser. No. 157,205

Claims priority, application France, Apr. 13, 1992, 92 04509

Int. Cl.[6] F21V *29/00*

U.S. Cl. 362—318 **5 Claims**



1. A device for focusing all entering light whatever its direction and incidence, said device comprising an optical system having an entrance surface through which the light enters and an exit end through which the light exits as an organized and constant luminous flow, said optical system having a volume with an optical shape generated by a logarithmic spiral so that said focusing occurs for light beams entering said entrance surface from any direction and through any point of said entrance surface;

wherein there flows in the optical shape a fluid which is maintained in forced circulation to form a fluid optical system, and which is forced to enter the optical system tangentially to the optical shape and adjacent to the entrance surface which is arranged so that initial circulation of the fluid is tangential and laminar; and wherein, inside the optical system, the fluid has a centripetal rotation movement until it exits through a cone end of the optical shape, thus draining off calories.

5,555,494

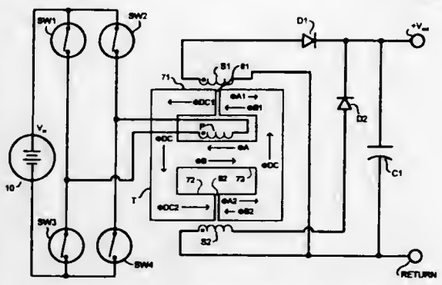
MAGNETICALLY INTEGRATED FULL WAVE DC TO DC CONVERTER

George Q. Morris, 3563 Quarzo Cir., Thousand Oaks, Calif. 91362

Filed Sep. 13, 1993, Ser. No. 121,271

Int. Cl.[6] H02M *3/335*

U.S. Cl. 363—17 **11 Claims**



1. A full wave DC to DC power converter having magnetically integrated transformer and output filter functions for supplying power to a load, comprising:

an input voltage source for supplying DC input voltage;

a transformer primary winding means;

inverter means adapted to periodically connect said input voltage source alternately across said primary winding means for a first half-cycle of one polarity and a second half-cycle of an opposite polarity;

a first transformer secondary winding connected in series with a first rectifier means to form a first output circuit;

a second transformer secondary winding connected in series with a second rectifier means to form a second output circuit;

said first secondary winding being inductively coupled to said primary winding means by a first magnetic flux which has stored energy such that during said first half-cycle said first output circuit simultaneously conducts current that is a sum of current induced by said primary winding means and magnetizing current induced from said first magnetic flux;

said second secondary winding being inductively coupled to said primary winding means by a second magnetic flux which has stored energy such that during said second half-cycle said second output circuit simultaneously conducts current that is a sum of current induced by said primary winding means and magnetizing current induced from said second magnetic flux;

during said first half-cycle said stored energy in said first magnetic flux decreases while simultaneously said stored energy in said second magnetic flux increases, and during said second half-cycle said stored energy in said first magnetic flux increases while simultaneously said stored energy in said second magnetic flux decreases; and,

170-919 O.G.-96-25: QL3

wherein said first magnetic flux and said second magnetic flux

customers wherein each customer communicates from a remote

means for issuing an information carrier serving as a receipt for said charitable contribution made and indicia of a

second translation circuitry to provide communication of said second set of communication signals to the diagnostic test

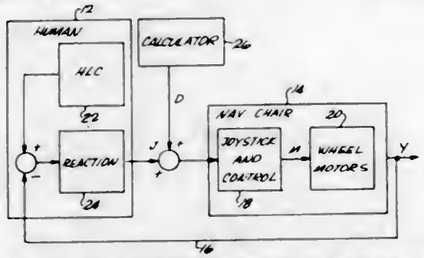
wherein said first magnetic flux and said second magnetic flux exist within a three leg E-core having first, second, and third legs, where said primary winding means is wound on the first leg, said first secondary winding is wound on the second leg, and said second secondary winding is wound on the third leg.

5,555,495

METHOD FOR ADAPTIVE CONTROL OF HUMAN-MACHINE SYSTEMS EMPLOYING DISTURBANCE RESPONSE

David A. Bell, Ann Arbor, Mich.; Lon E. Bell, Pasadena, Calif.; Simon Levine, and Yoram Koren, both of Ann Arbor, Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Oct. 25, 1993, Ser. No. 142,208
Int. Cl.[6] G05B *13/02*
U.S. Cl. 364—148 **14 Claims**



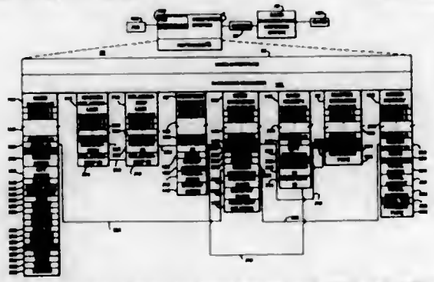
1. An adaptive control method for human in the loop systems comprising the steps of:
(a) sensing human operator reaction to a disturbance in a control system;
(b) characterizing an operator response to the disturbance;
(c) comparing the operator reaction and the characterized response to produce a result;
(d) modifying an initial control law based on the result of the comparison to create a modified control law; and
(e) creating a control signal based on the modified control law.

5,555,496

METHOD AND APPARATUS FOR COMMUNICATING WITH A CARD DISTRIBUTION CENTER FOR MANAGEMENT, SELECTION, AND DELIVERY OF SOCIAL EXPRESSION CARDS

Mary T. Tackbary, 2880 Orange Brace, Riverwoods, Ill. 60015, and Dan G. Friedrich, Chicago, Ill., assignors to Mary T. Tackbary, Riverwoods, Ill.

Filed May 6, 1994, Ser. No. 239,251
Int. Cl.[6] G06F *19/00*
U.S. Cl. 364—401 R **34 Claims**



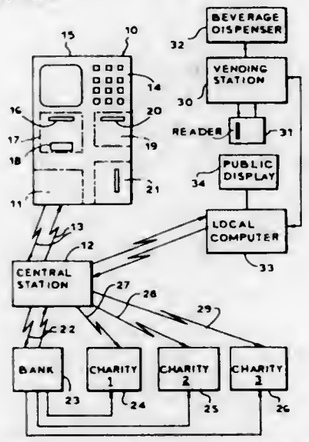
1. An electronic system for management, selection, and delivery of social expression cards directed by a plurality of independent customers wherein each customer communicates from a remote site to a distribution center, the system comprising:
a) a customer access terminal at each remote site having
1) an input device for customer input and selection of card recipient data, recipient occasion data, card design data, and card selection data,
2) memory device for storage of data in the form of data records, including the card recipient data, recipient occasion data, card design data, and card selection data,
3) display means for displaying textual and graphical information representative of the card recipient data, recipient occasion data, card design data, and card selection data,
4) a processor coupled to the display means, memory device, and input device for processing and controlling display of the card recipient data, recipient occasion data, card design data, and card selection data to facilitate card selection and ordering for generating a card order responsive thereto, and for generating and storing in the memory, records of order history and order status, said card recipient data, order history data, order status data, and recipient occasion data operatively linked to facilitate on-going management of card selection and card delivery by the customer with respect to each recipient of the customer; and
b) a communications link coupling the customer access terminal to the distribution center to permit communication of the card order to the distribution center for processing of the card order.

5,555,497

CHARITABLE CONTRIBUTION CENTRALIZATION SYSTEM AND APPARATUS

Edward Helbling, 47 Annandale Rd., Commack, N.Y. 11725

Continuation-in-part of Ser. No. 215,372, Mar. 21, 1994. This application Apr. 28, 1994, Ser. No. 234,409
The portion of the term of this patent subsequent to Mar. 21, 2014, has been disclaimed.
Int. Cl.[6] G06F *17/60;7/04;* **B42D** *15/00;* **G06G** *7/52*
U.S. Cl. 364—401 **3 Claims**



1. A method of coordinating charitable contribution operations, comprising the steps of:
(a) collecting respective charitable contributions at a number of charitable-collection stations provided with
means for receiving a charitable contribution,
means for registering said charitable contribution received, and

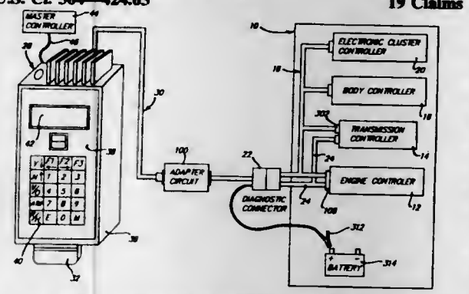
means for issuing an information carrier serving as a receipt for said charitable contribution made and indicia of a specific premium upon receipt of said charitable contribution,
and issuing a respective said information carrier with said indicia thereon from each charitable-collection station for said charitable contribution made;
(b) transmitting from each of said charitable-collection stations to a central accounting and control station information as to charitable contributions made at said stations and charitable institutions to which said charitable contributions are destined;
(c) displaying at each of said charitable-collection stations a premium to which a contributor may be entitled by virtue of said charitable contribution made;
(d) notifying from said central station individual charitable institutions of said charitable contributions due based upon said charitable contributions at said charitable-collection stations; and
(e) issuing to respective contributors, based upon said information carriers and upon presentation thereof selected premiums, said premiums being food service items issued to said donors upon reading of said information carriers at respective vending machines.

5,555,498

CIRCUIT AND METHOD FOR INTERFACING VEHICLE CONTROLLER AND DIAGNOSTIC TEST INSTRUMENT

Charles J. Berra; John R. Boldt, both of Troy; Alan J. Amici, Dearborn, and Joseph J. Krebs, Rochester Hills, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Mar. 18, 1994, Ser. No. 210,673
Int. Cl.[6] G06F *13/00*
U.S. Cl. 364—424.03 **19 Claims**



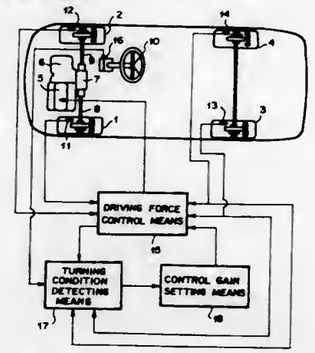
1. An interface circuit for facilitating serial bi-directional communication between a vehicle controller and a diagnostic test instrument under a plurality of different protocol modes, said interface circuit to be connected between the vehicle controller and said diagnostic instrument, said circuit comprising:
enable circuitry means for enabling bi-directional communication in a selected one of said modes, said enable circuitry means having dedicated signal input means for receiving a signal input that determines the selected mode;
first receive circuitry for receiving a first set of communication signals from the diagnostic test instrument in a predetermined protocol mode;
first translation circuitry responsive to said enable circuitry means and to provide communication of said first set of communication signals to the vehicle controller in said selected mode, said first translation circuitry having means for shifting a voltage potential applied to the vehicle controller;
second receive circuitry, for receiving a second set of communication signals from the vehicle controller in said selected mode; and
second translation circuitry to provide communication of said second set of communication signals to the diagnostic test instrument in said predetermined mode.

5,555,499

TRACTION CONTROL SYSTEM FOR VEHICLE

Tetsuhiro Yamashita, and Koji Hirai, both of Hiroshima-ken, Japan, assignors to Mazda Motor Corporation, Hiroshima-ken, Japan

Filed Aug. 8, 1994, Ser. No. 287,221
Claims priority, application Japan, Aug. 20, 1993, 5-228303
Int. Cl.[6] B60T *8/58*
U.S. Cl. 364—426.03 **8 Claims**



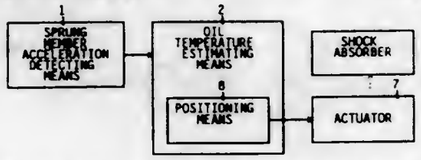
8. A traction control system for a vehicle having an engine, driving wheels and driven wheels comprising a driven wheel speed detecting means which detects the rotational speed of the driven wheels, a driving wheel speed detecting means which detects the rotational speed of the driving wheels, a vehicle speed detects the rotational speed of the driving wheels, a vehicle speed detecting means which calculates the vehicle speed on the basis of the rotational speed of the driven wheels detected by the driven wheel speed detecting means, a slip rate calculating means which calculates the rate of slip of the driving wheels on the basis of the rotational speed of the driving wheels detected by the driving wheel speed detecting means and the vehicle speed calculated by the vehicle speed calculating means, an engine control means which controls the output power of the engine with a control gain so that the rate of slip of the driving wheels converges on a predetermined target value when the rate of slip of the driving wheels exceeds a predetermined thresbold value, a control gain setting means which sets the control gain with which the engine control means controls the output power of the engine, and a turning condition detecting means which detects that the vehicle is making a turn, said control gain setting means setting the control gain of the engine control means for reducing the output power of the engine to be larger when the turning condition detecting means detects that the vehicle is making a turn than when the vehicle is running straight;
wherein said control gain setting means sets the control gain according to the difference between the rate of slip of the driving wheels and the predetermined target value and enlarges the control gain by adding a positive correction value to the difference when the turning condition detecting means detects that the vehicle is making a turn, said correction value being increased with an increase in a value derived from one of the turning angle of a steering wheel detected by a steering angle detecting means and the lateral acceleration of the vehicle detected by a lateral acceleration detecting means until the value reaches a predetermined value and is reduced with increase in the value over the predetermined value.

5,555,500

OIL TEMPERATURE ESTIMATING DEVICE FOR SHOCK ABSORBER, AND SHOCK ABSORBER DAMPING FORCE CONTROL APPARATUS USING SUCH OIL TEMPERATURE ESTIMATING DEVICE

Kazuo Ogawa, Toyota, and Hideo Inoue, Kanagawa-ken, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 26, 1994, Ser. No. 329,741
Claims priority, application Japan, Oct. 28, 1993, 5-270830
Int. Cl.[6] B60G *17/08*
U.S. Cl. 364—424.05 **15 Claims**



9. An apparatus for controlling a damping characteristic of a shock absorber in a suspension system which connects a sprung member and an unsprung member of a motor vehicle, comprising:

acceleration detecting means for detecting an actual value of vertical acceleration of said sprung member;

an actuator for controlling the damping characteristic of said shock absorber according to a drive signal applied thereto; and

a controller for applying said drive signal to said actuator, to thereby operate said actuator for controlling said damping characteristic of said shock absorber,

said controller comprising temperature estimating means for estimating a temperature of a working oil in said shock absorber using said actual value of vertical acceleration of said sprung member detected by said acceleration detecting means, said controller further comprising inhibiting means for inhibiting an operation of said actuator to control said damping characteristic of said shock absorber, when said temperature of said working oil estimated by said temperature estimating means is lower than a predetermined level.

5,555,501

ROAD VEHICLE CAB ATTITUDE CONTROLLING APPARATUS

Kenichi Furihata, and Fumiaki Takei, both of Fujisawa, Japan, assignors to Isuzu Motors, Ltd., Tokyo, Japan

Filed Mar. 31, 1995, Ser. No. 414,343
Int. Cl.[6] B60G *11/06;* **B62D** *33/063;33/10*
U.S. Cl. 364—424.05 **20 Claims**

1. A road vehicle cab attitude controlling apparatus comprising:

frame means supported by wheels of the vehicle;

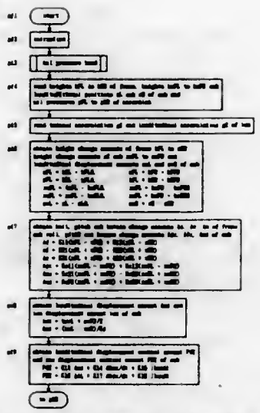
a cab mounted on said frame means;

suspension means mounting said cab on said frame means and allowing relative movement therebetween;

cab actuator means for controlling longitudinally directed motion of said cab with respect to said frame;

sensing means for detecting longitudinal displacements between said frame means and said cab; and

control means for controlling said actuator means in response to said sensing means, and operable to suppress said longitudinal displacements between said frame means and said cab; said control means producing for said actuator means longitudinal displacement control signals represented by the sum of a



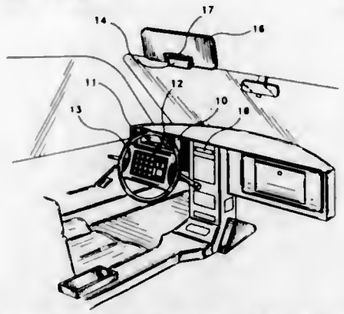
value dependent on a difference between said longitudinal displacements, a differential of said value and an integral of said value.

5,555,502

DISPLAY AND CONTROL APPARATUS FOR THE ELECTRONIC SYSTEMS OF A MOTOR VEHICLE

George E. Opel, Ambler, Pa., assignor to GEO Ventures, Ambler, Pa.

Continuation of Ser. No. 240,638, May 11, 1994, abandoned. This application Jul. 5, 1995, Ser. No. 498,362
Int. Cl.[6] B62D *33/073*
U.S. Cl. 364—424.05 **14 Claims**



1. In a vehicle that has a plurality of electronic subsystems wherein each of the subsystems contains at least one manually adjustable feature, a control apparatus for simplifying the control of the manually adjustable features in the plurality of electronic subsystems, comprising:

a selection panel accessible within the vehicle, said selection panel including a plurality of selection keys for selecting both a target electronic subsystem from said plurality of subsystems and a predetermined adjustable feature from the target electronic subsystem, said plurality of subsystems including predetermined adjustable features that have operational functions that can be selectively increased and decreased within a range, moved up and down, and divided between the left and right of the vehicle;

a tactile control panel accessible within the vehicle, said tactile control panel including at least one dedicated tactile control

that is both separate and distinct from said selection keys, wherein said at least one tactile control includes a LEFT/RIGHT control, a UP/DOWN control and an INCREASE/DECREASE control;

and

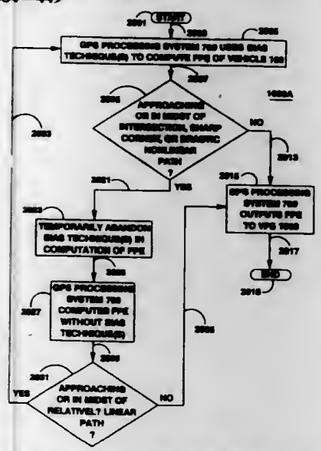
a microprocessor coupled to said selection panel, said tactile control panel and to each of the plurality of electronic subsystems, said microprocessor coupling said at least one dedicated tactile control to said target electronic subsystem wherein said INCREASE/DECREASE control controls said operational functions that can be increased and decreased within a range, said UP/DOWN control controls said operational functions that can be moved up and down, and said LEFT/RIGHT control controls said operational functions that can be divided between the left and right of the vehicle.

5,555,503

SYSTEM AND METHOD FOR PROVIDING ACCURATE VEHICLE POSITIONING USING SPATIAL BIAS TECHNIQUES

Christos T. Kyrtsos, Peoria; Adam J. Gudat, Edelstein; Dana A. Christensen, Peoria; Douglas W. Friedrich, Pekin, and Darrell E. Stafford, Dunlap, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Continuation of Ser. No. 628,560, Dec. 3, 1990, abandoned, and a continuation of Ser. No. 487,980, Feb. 5, 1990. This application Nov. 23, 1993, Ser. No. 155,374
Int. Cl.[6] G06F *165/00*
U.S. Cl. 364—449 **17 Claims**



1. A method for implementing spatial bias techniques in a system that determines the position of a vehicle, comprising the steps of:

(1) receiving navigation signals from a terrestrial positioning system;

(2) computing position estimates of the vehicle using spatial bias techniques and said navigation signals;

(3) if the vehicle approaches a drastic nonlinear path, then ceasing use of said spatial bias techniques; and

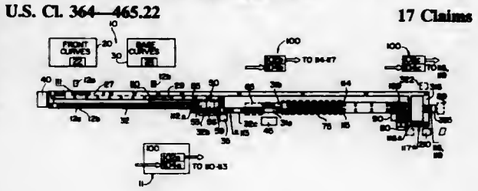
(4) computing said position estimates without said spatial bias techniques until the vehicle approaches a relatively linear path.

5,555,504

PRODUCTION LINE TRACKING AND QUALITY CONTROL SYSTEM

John M. Lepper; Ravi S. Sanka; Craig W. Walker, and Daniel T.-F. Wang, all of Jacksonville, Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Filed Jun. 10, 1994, Ser. No. 257,790
Int. Cl.[6] G06F *19/00*
U.S. Cl. 364—465.22 **17 Claims**



1. A production line tracking and quality control system comprising:

(a) a series of pallets for carrying one or more first contact lens mold halves or one or more complementary second contact lens mold halves throughout a contact lens fabrication facility, each said pallet including a unique identification code;

(b) a conveyor apparatus for transporting said series of pallets throughout said contact lens fabrication facility, said fabrication facility including one or more process stations;

(c) a controller for providing real time monitoring of contact lens fabrication processes at said one or more process stations, said controller including first tracking means for identifying said unique identification code of each said pallets at said one or more process stations of said facility,

said controller receiving process conditions values at each station and generating process status information for each identified pallet in the form of a reject flag when said process conditions are out of predetermined limits,

said controller including memory storage means having unique memory locations for storing said process status information corresponding to each pallet of said series of pallets, said process status information further including a flag indicating that an identified pallet is acceptable for further processing at another station when aid received process conditions are within predetermined limits,

said controller capable of generating time stamp information indicating a specific time each pallet is identified by said tracking means at each said one or more process stations of said facility, each said time stamp information additionally stored in said unique memory location corresponding to each said identified pallet;

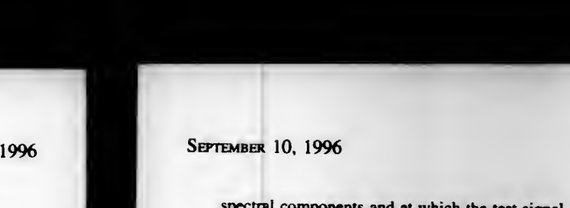
(d) first means for depositing said one or more first contact lens mold halves on pallets of said series;

(e) second means for depositing said one or more complementary second contact lens mold halves on other pallets of said series, said controller generating an initial time stamp value corresponding to the time of each deposit of said first and complementary second mold halves on their respective pallets; and

wherein each said pallets carrying first and complementary second contact lens mold halves are conveyed to a low-oxygen environment for transport therein to another of said process stations of said facility, said low oxygen environment including a nitrogen buffer enclosure containing nitrogen gas, wherein a predetermined number of pallets are present within said enclosure at any one time.

5,555,505

SEWING TREATMENT AND MANAGEMENT SYSTEM



spectral components and at which the test signal (M'), after a self-convolution in the predetermined frequency domain,

5,555,509

SYSTEM FOR RECEIVING HVAC CONTROL

5,555,505
SEWING TREATMENT AND MANAGEMENT SYSTEM USING ELECTRONIC DATA PROCESSING APPARATUS

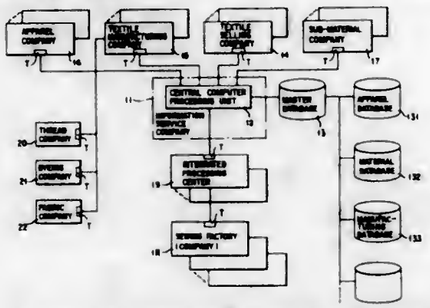
Akira Oosawa, Yokohama; Chiaki Miyasaka, Tokyo; Yasuyuki Ogura, Sagamihara; Toshihito Kouchi, Tokyo, and Shinichi Yoshii, Urawa, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 56,064, Apr. 30, 1993, abandoned. This application Nov. 28, 1994, Ser. No. 345,541

Claims priority, application Japan, Apr. 30, 1992, 4-111224; Mar. 18, 1993, 5-058899

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—470.07 **24 Claims**



1. A method for assisting sewing treatment and management using an electronic data processing system, said method comprising the steps of:

storing data necessary to perform sewing treatment and management of apparel goods in a database provided in an open information service network, the data including data obtained from a plurality of companies in an apparel industry which subscribe to the open information service network;

accessing the database to search for desired data among the data stored in the database according to a request of a sewing company as one of the plurality of companies, through the open information network;

reading out the desired data from the database, and supplying the desired data to the sewing company; and

performing the sewing treatment and management based on the desired data at the sewing company, so that the sewing company performs a desired sewing treatment and management of the apparel goods in accordance with electronic data processing.

5,555,506
METHOD OF FABRICATING IC CHIPS WITH EQUATION ESTIMATED STATISTICAL CROSSTALK VOLTAGES BEING LESS THAN NOISE MARGIN

Richard J. Petschauer, Edina, Minn.; Roland D. Rothenberger, Poway, Calif., and Paul G. Tumms, Fridley, Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Feb. 9, 1995, Ser. No. 385,849

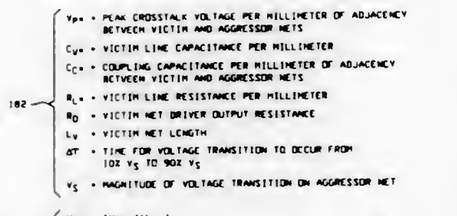
Int. Cl.[6] G06F *17/50;17/10*

U.S. Cl. 364—491 **27 Claims**

1. A method of fabricating an integrated circuit chip, which contains a victim net and a set of aggressor nets with each aggressor net having a line segment that lies next to said victim net, such that crosstalk voltages coupled to said victim and aggressor nets are within an acceptable level; said method including the steps of:

providing a trial layout for said victim net and said aggressor nets;

assigning to said trial layout of said victim net, the parameters of—a line capacitance, a line resistance, and a driver output resistance; and assigning to said trial layout of each aggressor net, the parameters of—a coupling capacitance to said victim net, a voltage transition, and a cycle time for said transition;



estimating, for each aggressor net, a respective mean crosstalk voltage V_M which the aggressor net couples into said victim net as a function

$$V_M = K\left\{\frac{(1-e^{x})}{x} - \frac{(1-e^{y})}{y}\right\}$$

where K, X, and Y are products of said parameters;

modifying said trial layout and repeating said assigning and estimating steps until a summation of the estimated mean crosstalk voltages in the victim net is within said acceptable level; and,

building said chip with the modified layout for which said summation is within said acceptable level.

5,555,507
METHOD FOR DETECTING NON-LINEAR BEHAVIOR IN A DIGITAL DATA TRANSMISSION PATH TO BE EXAMINED

Andreas Wolf, and Hans W. Arweiler, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, München, Germany

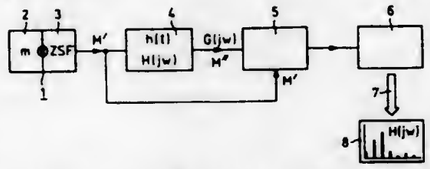
PCT No. PCT/DE93/00109, § 371 Date Aug. 26, 1994, § 102(e) Date Aug. 26, 1994, PCT Pub. No. WO93/17348, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 3, 1993, Ser. No. 295,650

Claims priority, application Germany, Feb. 26, 1992, 42 06 454.6

Int. Cl.[6] H04B *3/46*

U.S. Cl. 364—553 **18 Claims**



1. A method for detecting a non-linear behavior of a digital transmission path comprising the steps of:

a) generating a test signal (M') by combining a sequence (m) of spectral components (S1 . . . S10) distributed equidistantly in a predetermined frequency range with an additional function (ZSF) such that the test signal (M') comprises additional spectral components (ZS1 . . . ZS21), wherein two additional spectral components are distributed equidistantly about each of the spectral components (S1 . . . S10);

b) transmitting the test signal (M') generated in step a) periodically across the digital transmission path;

c) receiving an output signal (M*) at an output of the digital transmission path in response to the test signal (M');

d) selecting predetermined evaluation frequencies (AW1 . . . AW10) as frequencies at which the test signal (M') is free of spectral components and at which the test signal (M'), after a self-convolution in the predetermined frequency domain, exhibits additional spectral components (SA1 . . . SA10); and

e) evaluating the output signal (M*) at the predetermined evaluation frequencies (AW1 . . . AW10).

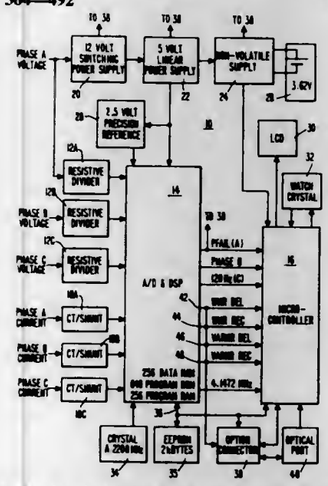
5,555,508
PROGRAMMABLE ELECTRICAL ENERGY METER AND METHODS THEREFOR

Mark L. Munday, and Rodney C. Hemminger, both of Raleigh, N.C., assignors to ABB Power T&D Company Inc., Raleigh, N.C.

Continuation of Ser. No. 259,578, Jun. 14, 1994, abandoned, which is a continuation of Ser. No. 839,182, Feb. 21, 1992, Pat. No. 5,269,821. This application Sep. 27, 1995, Ser. No. 534,693

Int. Cl.[6] G06T *17/00*

U.S. Cl. 364—492 **47 Claims**



1. Apparatus for electronically metering electrical energy, said electrical energy comprising voltage and current characteristics, wherein voltage and current signals representative of said voltage and current characteristics are provided, said apparatus comprising:

a first processor, connected to receive said voltage and current signals, for determining electrical energy from said voltage and current signals and for generating an energy signal representative of the electrical energy determination;

a second processor, connected to said first processor, for receiving said energy signal, for generating an indication signal representative of said energy signal;

an option connector, connected to said first processor and said second processor, whereby said energy signal is provided to said option connector and a communication connection is provided between said option connector and said second processor; and

a power supply, connected to receive said voltage signal, for generating a power signal, said power signal being provided to said option connector, whereby a power connection is provided, said power supply comprising a semi-regulated power source, a regulated power source and a non-volatile power source and wherein an electrical ground is provided, said option connector further providing a semi-regulated power connection, a regulated power connection, a non-volatile power connection and an electrical ground connection.

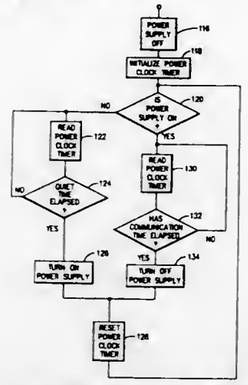
5,555,509
SYSTEM FOR RECEIVING HVAC CONTROL INFORMATION

Robert P. Dolan, Syracuse; Thomas L. DeWolf, Liverpool; Thomas R. Phillips, Cicero, all of N.Y.; Michael J. Zirngibl, Neustadt/Donau, and Josef J. Schon, Landershofen, both of Germany, assignors to Carrier Corporation, Syracuse, N.Y., and Temic Telefunken Microelectronic GmbH, Heilbronn, Germany

Continuation of Ser. No. 31,509, Mar. 15, 1993, abandoned. This application Jan. 16, 1996, Ser. No. 587,169

Int. Cl.[6] G06F *17/50*

U.S. Cl. 364—505 **13 Claims**



1. A system for receiving and processing control information to be used for controlling a heating or air conditioning system, said system comprising:

a programmed processor for reading control information and arranging the control information in a predefined format;

a control processor for receiving the control information in the predefined format;

a power supply associated with said programmed processor for providing power to said programmed processor; said power supply being switched on in response to a signal from said control processor when said programmed processor is to receive control information;

means for transmitting the arranged control information in the predefined format to the control processor for use in controlling the heating or air conditioning system;

means within said control processor for reading the control information in the predefined format; and

means within said control processor for switching said power supply off after reading the control information in the predefined format.

5,555,510
AUTOMATIC COMPUTER CARD INSERTION AND REMOVAL ALGORITHM

Jerry Verseput; Fong-Shek Lam, both of Folsom, and Prasanna Shah, Citrus Heights, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Aug. 2, 1994, Ser. No. 284,185

Int. Cl.[6] H02H *9/00*

U.S. Cl. 364—514 R **14 Claims**

7. In a method of operating a host computer system having at least a system bus which is connected to a CPU, a system memory and a controller having status registers and means for supplying back off signals indicating that new tasks cannot be accepted to the CPU and a plurality of line buffers capable of being in a normal and high impedance state, and a plurality of add in PC card sockets for receiving PC cards connected to said controller, said sockets each having a multi pin connector that includes common address, data and control lines as well as power, ground and card detect

a non-zero detector for detecting a non-zero data when the DCT coefficient data is successively transferred,

means on condition that temperatures of pixels in each of the picture blocks are within the temperature range determined by

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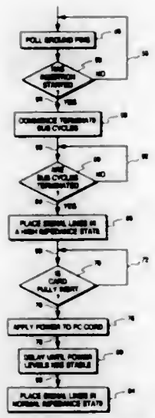
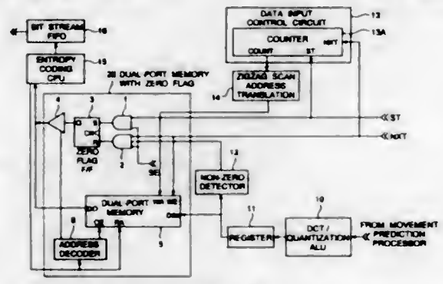
5,555,514
METHOD OF AND APPARATUS FOR GENERATING



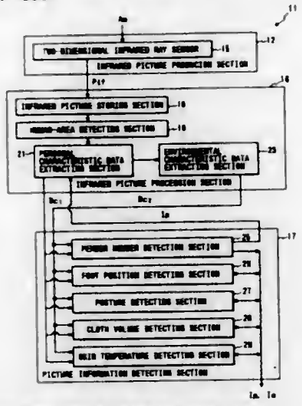
signal pins connected to said line buffers, the steps comprising:
detecting the commencement of the removal of a PC card from a PC card socket;
upon detection of said commencement of said removal of a PC card from a socket, commencing orderly termination of all usage by said CPU of said common address, data and control lines;
determining that all usage by said CPU of said common address, data an control lines is complete;
placing said common address, data and control lines in a high impedance state;
detecting the completion of said removal of said PC card into a PC card socket; and
upon detecting the completion of said removal of said PC card into a PC card socket, returning said common address, data and control lines to their normal operating impedance level.

5,555,511
DATA PROCESSING SYSTEM FOR PICTURE CODING PROCESSING
Yasushi Ooi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Oct. 28, 1994, Ser. No. 330,550
Claims priority, application Japan, Oct. 28, 1993, 5-270717
Int. Cl.[6] H04J *3/22*
U.S. Cl. 364—514 R **20 Claims**



1. A data processing system including:
data memory means for storing discrete cosine transform (DCT) coefficient data successively transferred one after another, said data memory means having a memory capacity which is a multiple of 64 words,
flag means initialized prior to the successive transfer of the DCT coefficient data, said flag means including one bit provided for each 64 words,
a non-zero detector for detecting a non-zero data when the DCT coefficient data is successively transferred,
the non-zero detector operating to invert a logical condition of the flag means when the non-zero data is detected, so that when the successive transfer of the DCT coefficient data has been completed, whether or not all of the data stored in the data memory means is zero, is confirmed on the basis of the logical condition of the flag means, and
entropy coding processing means, coupled to the flag means, for discriminating, on the basis of the logical condition of the flag means, whether or not all of the data stored in the data memory means is zero, when the successive transfer of the DCT coefficient data has been completed,
said entropy coding processing means performing an entropy coding processing on the basis of a result of the discrimination.

5,555,512
PICTURE PROCESSING APPARATUS FOR PROCESSING INFRARED PICTURES OBTAINED WITH AN INFRARED RAY SENSOR AND APPLIED APPARATUS UTILIZING THE PICTURE PROCESSING APPARATUS
Takayuki Imai; Motohiko Naka, both of Kawasaki; Takehiko Shida, Yokohama; Masaaki Sato; Kunio Yoshida, both of Kawasaki; Ikuo Akamine, Kusatsu; Makoto Shimizu, Kyoto, and Yoshiaki Uchida, Ootsu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jul. 25, 1994, Ser. No. 273,168
Claims priority, application Japan, Aug. 19, 1993, 5-204998
Int. Cl.[6] G01J *5/10*
U.S. Cl. 364—550 **27 Claims**

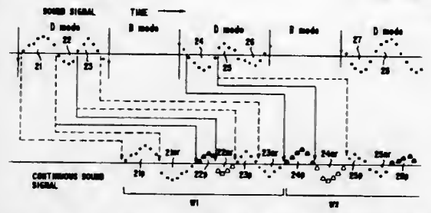


1. A picture processing apparatus, comprising:
infrared picture producing means for producing an infrared picture designating a heat distribution of a measured area in which one or more persons surrounded by environments stay, the infrared picture being composed of a plurality of pixels having temperatures of the measured area as pixel values;
infrared picture storing means for storing the infrared picture produced by the infrared picture producing means;
partitioned block representative temperature calculating means for partitioning the infrared picture stored in the infrared picture storing means into a plurality of picture blocks and calculating average temperatures of the picture blocks as representative temperatures of the picture blocks;
picking-out temperature determining means for determining a temperature range for each of the picture blocks according to each of the representative temperatures calculated by the partitioned block representative temperature calculating means;
human-area picking out means for picking out one or more human-areas from each of the picture blocks partitioned by the partitioned block representative temperature calculating means on condition that temperatures of pixels in each of the picture blocks are within the temperature range determined by the picking-out temperature determining means, and the persons being placed in the human-areas;
representative point calculating means for calculating a representative poiot of each of the human-areas picked out by the human-area picking out means;
personal characteristic data extracting means for extracting pieces of personal characteristic data designating characters of the persons from the infrared picture stored in the infrared picture storing means according to the human-areas picked out by the human-area picking out means, the representative points calculated by the representative point calculating means and the environments;
environmental characteristic data extracting means for extracting pieces of environmental characteristic data designating characters of the environments from the infrared picture stored in the infrared picture storing means; and
picture information detecting means for detecting pieces of personal information pertaining to the persons or pieces of environmental information pertaining to the environments according to the personal characteristic data extracted by the personal characteristic data extracting means and the environmental characteristic data extracted by the environmental characteristic data extracting means.

5,555,513
DATA PROCESSING SYSTEM HAVING A COMPENSATION CIRCUIT FOR COMPENSATING FOR CAPACITIVE COUPLING ON A BUS
Cheri L. Harrington; Michael E. Gladden, both of Austin, Tex., and Blaine M. Prestwich, Salt Lake City, Utah, assignors to Motorola Inc., Schaumburg, Ill.
Filed Jul. 28, 1994, Ser. No. 282,404
Int. Cl.[6] G06J *1/00*
U.S. Cl. 364—602 **20 Claims**

1. A data processing system having a compensation circuit for reducing capacitive coupling between a plurality of conductors arranged substantially parallel to one another, the compensation circuit comprising:
a first transistor having a first current electrode coupled to a power supply voltage terminal, a control electrode, and a second current electrode;
a second transistor having a first current electrode coupled to the second current electrode of the first transistor, a control electrode, and a second current electrode coupled to a first conductor;
a first inverter having an input terminal coupled to the first conductor, and an output terminal coupled to the control electrode of the first transistor;
a second inverter having an input terminal coupled to a second conductor, and an output terminal; and
a logic gate having a first input terminal coupled to the output terminal of the second inverter, a second input terminal for receiving a control signal, and an output terminal coupled to the control electrode of the second transistor;
wherein the second conductor is positioned both adjacent and substantially parallel to the first conductor.

5,555,514
METHOD OF AND APPARATUS FOR GENERATING DOPPLER SOUNDS
Taiho Ri, and Hiroshi Hashimoto, both of Tokyo, Japan, assignors to GE Yokogawa Medical Systems, Limited, Tokyo, Japan
Filed Jan. 3, 1995, Ser. No. 367,243
Claims priority, application Japan, Jul. 20, 1992, 4-191922
Int. Cl.[6] G01S *7/32;7/292*
U.S. Cl. 364—604 **10 Claims**



1. A method of generating Doppler sounds, wherein each of pulse Doppler modes is interrupted for a predetermined time interval to insert a B mode, thereby effecting each of segmented Doppler modes in concurrence with the pulse Doppler mode and the B mode, comprising the following steps:
converting I and Q components of a Doppler signal obtained in the pulse Doppler mode into right and left sound signals respectively;
taking out segmented waveforms interposed between zero cross points of the right and left sound signals produced during a single pulse Doppler mode period so as to create positive-side segmented waveforms obtained by rendering the signs of the segmented waveforms positive and negative-side segmented waveforms obtained by rendering the signs of the segmented waveforms negative, making respective pairs of the positive-side segmented waveforms and the negative-side segmented waveforms of the respective segmented waveforms continuous in order of appearance of the segmented waveforms so as to create double-lengthened right and left sound signals, and making the created respective double-lengthened right and left sound signals produced during the respective pulse Doppler mode periods continuous so as to create continuous right and left sound signals; and
producing the Doppler sounds based on the continuous right and left sound signals.

5,555,515
APPARATUS AND METHOD FOR GENERATING LINEARLY FILTERED COMPOSITE SIGNAL
Hiroyuki Tomita, and Koichi Saito, both of Kanagawa-ken, Japan, assignors to Leader Electronics Corp., Kanagawa-ken, Japan
Filed Jul. 22, 1994, Ser. No. 278,909
Claims priority, application Japan, Jul. 23, 1993, 5-183075
Int. Cl.[6] G06F *7/10*
U.S. Cl. 364—724.01 **20 Claims**

1. A filtered composite signal generating apparatus for generating a linearly filtered composite signal, wherein the original signal of said composite signal is divided into a plurality of sequentially arranged original sub-signals and intervals between adjacent original sub-signals are within a predetermined time period, and wherein at least one of said sub-signals includes a plurality of selectable patterns, said filtered composite signal generating apparatus comprising:
(a) a plurality of memory means storing filtered sub-signals, including said at least one sub-signal including a plurality of

a first bank of registers;
a feedback multiplier connected to selected registers in the first

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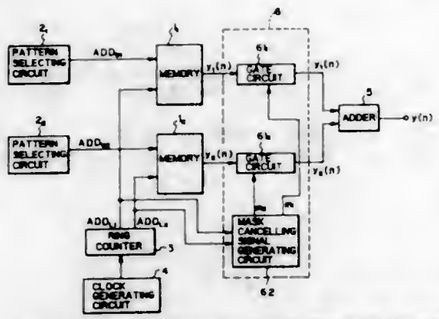
5,555,518
DEPTH SENSING EXPENDABLE OCEANOGRAPHIC



selectable patterns, obtained by linearly filtering said original sub-signals, respectively;

(b) adding means for adding data of said filtered sub-signals read out from said memory means to provide the resultant data to an output terminal of said apparatus; and

(c) control means for controlling timings of providing the data of said filtered sub-signals stored in said memory means to said adding means, said control means including pattern selecting means for selecting one of said plurality of selectable patterns, such that,

when a first filtered sub-signal is to be generated, the data of said first filtered sub-signal sequentially read out from the corresponding first memory means are provided to said adding means, thereby providing the data of said first filtered sub-signal through said adding means to said output terminal,

when a second filtered sub-signal is to be generated in placed of said first filtered sub-signal, during a predetermined time period centered at a switching timing from said first filtered sub-signal, both of data of said first and second filtered sub-signals read out from the corresponding first and second memory means are added at said adding means, thereby providing the added data to said output terminal, and

thereafter, only the data of said second filtered sub-signal read out from said second memory means are provided to said adding means, thereby providing the data of said second filtered sub-signal to said output terminal.

5,555,516

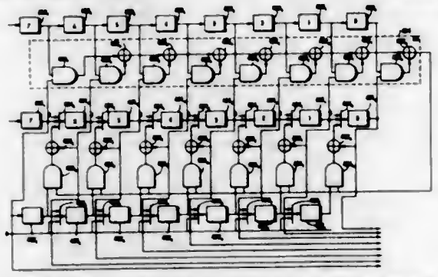
MULTIPURPOSE ERROR CORRECTION CALCULATION CIRCUIT

Christopher P. Zook, Longmont, Colo., assignor to Cirrus Logic, Inc., Fremont, Calif.

Continuation-in-part of Ser. No. 147,758, Nov. 4, 1993. This application Sep. 16, 1994, Ser. No. 306,918

Int. Cl.[6] G06F *7/00;15/00;7/52;* **H03M** *13/00*

U.S. Cl. 364—746.1 **103 Claims**



1. A circuit for performing operations with respect to electrical signals indicative of a value involved in error correction of data, the circuit comprising:

a first bank of registers;

a feedback multiplier connected to selected registers in the first bank for multiplying contents of the first bank of registers by a value of the feedback multiplier;

a second bank of registers;

an inner product circuit for generating an inner product with respect to the contents of the first bank of registers and contents of the second bank of registers;

a third bank of registers;

an adder for updating contents of the second bank of registers using at least the inner product generated by the inner product circuit and contents of the third bank of registers;

wherein at least one of the second bank of registers and the third bank of registers has a serial input terminal whereby a multi-bit value can be serially loaded therein.

5,555,517

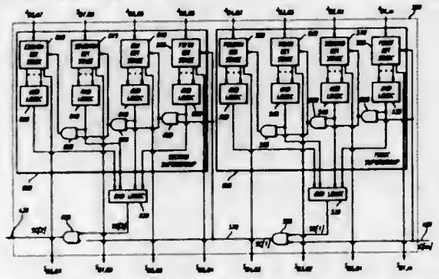
APPARATUS AND METHOD FOR EFFICIENT CARRY SKIP INCREMENTATION

Sumeet Agrawal, Portland, and Narayan Hegde, Beaverton, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jan. 4, 1995, Ser. No. 368,479

Int. Cl.[6] G06F *7/50*

U.S. Cl. 364—770 **31 Claims**



1. An integrated circuit device, receiving an digital operarid having a plurality of data bits and generating a plurality of real bit sums, comprising:

an input line propagating a carry signal;

a first stage coupled to said input line, said first stage includes

a first set of cells that receive said carry signal via said input line and a first set of data bits being less in number than the plurality of data bits and subsequently generate a first plurality of real bit sums corresponding in number to said first set of data bits, and

a logic element that logically ANDs said first set of data bits to produce a product signal;

a logic gate coupled to said logic element of said first stage and said input line, said logic gate receives said product signal and said carry signal and outputs a group carry propagate signal through a signal line, said group carry propagate signal being active if both said product signal and said carry signal are active; and

a second stage coupled to said logic gate via said signal line, said second stage includes a second set of cells lesser in number than said first set of cells that receive a second set of data bits and said group carry propagate signal from said logic gate so that said second stage operates substantially in parallel with said first stage when said group carry propagate signal is active.

5,555,518

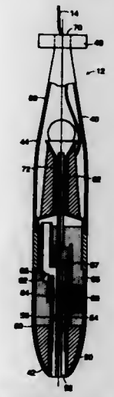
DEPTH SENSING EXPENDABLE OCEANOGRAPHIC PROBES

Mark E. Whalen, Mattapoisett; Randall H. Elgin, and Michael J. Balboni, both of Wareham, all of Mass., assignors to Sippican, Inc., Marion, Mass.

Filed Dec. 5, 1994, Ser. No. 349,607

Int. Cl.[6] H04B *1/59*

U.S. Cl. 367—4 **8 Claims**



1. An expendable oceanographic probe for use in seawater, comprising:

a body having a weighted nose section and an after body having a tail for stabilization, and including a spool of cable paid out through the tail of the after body for coupling to a data acquisition system located above the surface of the seawater;

a seawater property sensor exposed to the seawater for measuring a seawater property, and for providing over the cable to the data acquisition system a property signal representing the measured seawater property;

a pressure sensor exposed to the seawater for generating a pressure signal representing the pressure of the seawater as the probe descends into the seawater; and

a pressure circuit for receiving the pressure signal from the pressure sensor and or using the pressure signal to perturb the property signal at a predetermine seawater pressure by making a change in the property signal that is noticeable by the data acquisition system and that is sufficiently long in duration to indicate to the data acquisition system that the probe has achieved the predetermined seawater pressure during its descent into the seawater, thereby providing over the cable to the data acquisition system information about the measured seawater property and information about the seawater pressure.

5,555,519

DYNAMIC RANDOM ACCESS MEMORY DEVICE WITH THE COMBINED OPEN/FOLDED BIT-LINE PAIR ARRANGEMENT

Daisaburo Takashima, Kawasaki, and Shigeyoshi Watanabe, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 123,466, Sep. 20, 1993, Pat. No. 5,396,450. This application Nov. 23, 1994, Ser. No. 348,068

Claims priority, application Japan, Sep. 22, 1992, 4-253270; Sep. 14, 1993, 5-229215

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—63 **34 Claims**

1. A semiconductor memory device comprising:

a substrate;

a plurality of word lines formed on said substrate;

a plurality of bit lines transverse to said word lines formed on said substrate, said bit lines being divided into a plurality of bit line groups;

an array of memory cells selectively arranged at a plurality of cross points defined between said word lines and said bit lines, every two of said memory cells being arranged respectively at two of every adjacent three of the cross points in each of row and column directions along the bit lines and word lines, and said array of memory cells being divided into a plurality of subarray sections in a direction along the bit lines, said memory cells each being assembled by at least one capacitor formed of a storage-node layer and a plate electrode insulatively disposed over said storage-node layer and at least one MOS transistor, and said bit lines being formed after said plate electrode has been formed;

a plurality of sense amplifiers each connected between two of said bit line groups which are adjacent to each other in the row direction along the bit lines, said sense amplifiers including a first sense amplifier connected to two of said bit lines of one of said bit line groups in a folded bit-line scheme and a second sense amplifier arranged adjacent to said first sense amplifier and connected between said one of said bit line groups and the other which is neighboring thereto, in an open bit-line scheme;

a plurality of switching sections including a first switching circuit connected between said first sense amplifier and one of said bit line groups which is arranged between said first and second sense amplifiers and two second switching circuits, one of the two second switching circuits connected between said second sense amplifier and one of said adjacent two bit line groups and the other of the two second switching circuits connected between said second sense amplifier and the other of said adjacent two bit line groups, said first switching circuit including switching elements connected to the four bit lines of one of said bit line groups and driven to connect said first sense amplifier to the bit lines of said one of said bit line groups in the folded bit-line scheme, and each of said two second switching circuits including switching elements connected to the two bit lines of one of said bit line groups and driven to connect the bit lines of said adjacent two bit line groups to said second sense amplifier in the open bit line scheme.

5,555,520

TRENCH CAPACITOR CELLS FOR A DRAM HAVING SINGLE MONOCRYSTALLINE CAPACITOR ELECTRODE

Akira Sudo, Yokohama; Yusuke Kohyama, Yokosuka, and Haruhiko Koyama, Ichikawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 2, 1994, Ser. No. 353,368

Claims priority, application Japan, Dec. 3, 1993, 5-304182

Int. Cl.[6] H01L *29/68*

U.S. Cl. 365—149 **17 Claims**

1. A semiconductor memory device, comprising:

a semiconductor substrate of a first conductivity type;

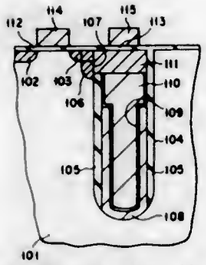
a switching transistor formed on said semiconductor substrate, said switching transistor including a conductor region of a second conductivity type formed in a surface of said semiconductor substrate, and a gate insulatively spaced from a surface of said semiconductor substrate by a gate insulating film;

a trench formed adjacent to said conductor region in said semiconductor substrate;

a capacitor insulating film formed in said trench;

gate from said floating gate, and an amount of charges

a read counter for generating a read address for reading a word



a capacitor electrode formed to bury said trench, at least an upper portion of said capacitor electrode in said trench being monocrystalline; and

an insulating film formed on said capacitor electrode, wherein said insulating film formed on said capacitor electrode has a same thickness as the gate insulating film of said switching transistor.

5,555,521

METHOD OF OPERATING THE SEMICONDUCTOR MEMORY STORING ANALOG DATA AND ANALOG DATA STORING APPARATUS

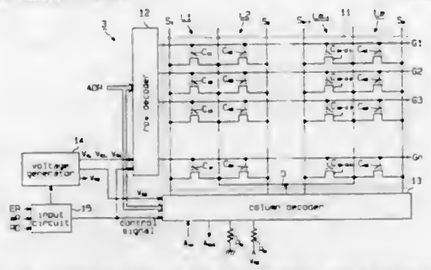
Minoru Hamada, Ogaki, and Hitoshi Ando, Gifu-ken, both of Japan, assignors to Sanyo Electric Co., Ltd, Osaka, Japan

Filed Jun. 9, 1995, Ser. No. 489,037

Claims priority, application Japan, Jun. 14, 1994, 6-132229; Jul. 5, 1994, 6-153942

Int. Cl.[6] **G11C** *27/00*

U.S. Cl. 365—185.03 **14 Claims**



1. An operational method for storing analog data in an electrically programmable and erasable memory cell comprising a transistor having a source, a drain, a control gate and a floating gate, said source, said drain and a channel region therebetween being defined in a semiconductor substrate, said floating gate operating to accumulate charge and being capacitively coupled to said source and said control gate, said method comprising the steps of:

(a) erasing data in said memory cell, said erasing including at least the steps of:

i) applying a predetermined first erase voltage to said control gate,

ii) applying a predetermined second erase voltage to said source, and

iii) applying a ground voltage to said drain to erase said memory cell, wherein charges moved from said channel region are accumulated in said floating gate, thereby erasing data in said memory cell; and

(b) storing analog data in said memory cell, said storing including at least the steps of:

i) applying a predetermined write voltage to said control gate,

ii) applying said ground voltage to said source via a first current limiting element, and

iii) applying a voltage corresponding to said analog data to be stored to said drain to write said analog data in said memory cell, whereby charges are moved to said control gate from said floating gate, and an amount of charges remaining in said floating gate being associated with said analog data to be stored.

5,555,522

SEMICONDUCTOR MEMORY HAVING REDUNDANT CELLS

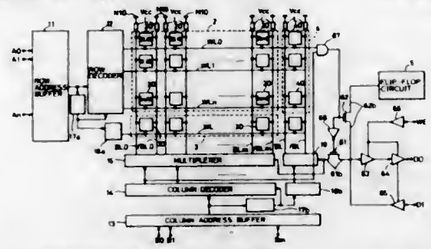
Kenji Anami; Shigeki Ohbayashi, and Osamu Inoue, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1995, Ser. No. 434,442

Claims priority, application Japan, May 20, 1994, 6-107123

Int. Cl.[6] **G11C** *7/00;8/00*

U.S. Cl. 365—200 **24 Claims**



1. A semiconductor memory comprising:

a memory cell array having a plurality of memory cells arranged in matrix fashion;

either a redundant memory cell row or a redundant memory cell column for replacing respectively either any one memory cell row or any one memory cell column in said memory cell array;

specific address detecting means for detecting the selection of a specific address in said memory cell array and for generating a detection signal upon the detection;

power supply nodes for receiving a supply potential;

status storing means for storing beforehand output status representing either the use or the nonuse of either said redundant memory cell row or said redundant memory cell column and for generating the stored output status in response to the receipt of said supply potential; and

switching means for performing a switching operation, in response to said detection signal from said specific address detecting means, to output the output status generated by said status storing means when said specific address is selected, said output status serving as information indicating either the use or the nonuse of either said redundant memory cell row or said redundant memory cell column.

5,555,523

SEMICONDUCTOR MEMORY DEVICE

Ryo Haga, Yokohama; Tomoaki Yabe, Kawasaki; Shinji Miyano, Yokohama, and Kenji Numata, Yamato, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 9, 1995, Ser. No. 556,148

Claims priority, application Japan, Nov. 11, 1994, 6-277509

Int. Cl.[6] **G11C** *7/00*

U.S. Cl. 365—203 **20 Claims**

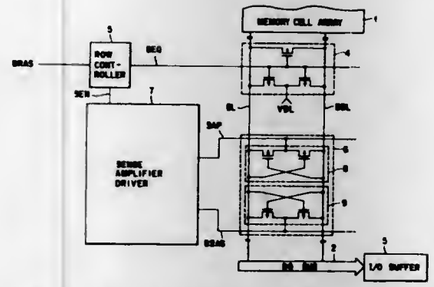
1. A semiconductor memory device comprising:

a plurality of memory cells including at least a first memory cell and a second memory cell;

a first bit line connected to said first memory cell;

a second bit line connected to said second memory cell and paired with said first bit line;

equalize means that is connected between said first bit line and said second bit line and equalizes the potential difference between the potential of said first bit line and that of said second bit line;



amplifying means that is connected between said first bit line and said second bit line and amplifies the potential difference between the potential of said first bit line and that of said second bit line;

a first driving signal line that is connected to said amplifying means and drives said amplifying means;

a second driving signal line that is connected to said amplifying means and paired with said first driving signal line;

driving means that drives said amplifying means, said driving means being connected to said first driving signal line and said second driving signal line and containing precharge means for presetting the potential of said first driving signal line and that of said second driving signal line to a predetermined precharge potential and driving signal supply means for supplying a driving signal to said first driving signal line and said second driving signal line; and

control means for controlling said equalize means and said driving means, wherein

said control means controls said equalize means and said precharge means independently so that said precharge means continues supplying said precharge potential to said first driving signal line and said second driving signal line until essentially immediately before said driving signal supply means supplies said driving signal to said first driving signal line and said second driving signal line.

5,555,524

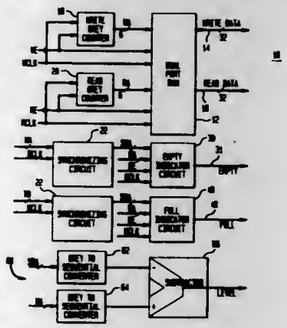
SEMI-SYNCHRONOUS DUAL PORT FIFO

Andrew J. Castellano, Laguna Beach, Calif., assignor to Standard Microsystems Corporation, Hauppauge, N.Y.

Filed Feb. 13, 1995, Ser. No. 388,234

Int. Cl.[6] **G11C** *7/00*

U.S. Cl. 365—221 **8 Claims**



1. A FIFO comprising,

a memory,

a write counter for generating a write address for writing a word into said memory in response to a write clock having a first frequency and a write enable signal,

a read counter for generating a read address for reading a word from said memory in response to a read clock having a second frequency and a read enable signal,

a first synchronizing circuit for synchronizing the write address to the read clock so as to output a synchronized write address,

a second synchronizing circuit for synchronizing the read address to the write clock so as to output a synchronized read address,

a level indicator circuit for outputting a signal indicative of the number of words currently stored in the memory,

an empty indicator circuit responsive to the first synchronizing circuit for outputting an indicator when the memory is empty, and

a full indicator circuit responsive to the second synchronizing circuit for outputting an indicator when the memory is full.

5,555,525

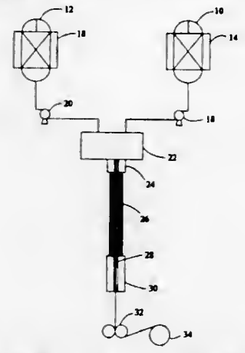
METHOD OF MAKING GRADED REFRACTIVE INDEX POLYMERIC OPTICAL FIBERS AND OPTICAL FIBERS MADE BY THE METHOD

Bang C. Ho; Jian-Hong Chen, both of Hsinchu; Shu-Yin Yang, Chun-Lin, and Yih-Her Chang, Hsinchu, all of Taiwan, assignors to Industrial Technology Research Institute, Chutung, Taiwan

Filed Sep. 7, 1994, Ser. No. 302,062

Int. Cl.[6] **G02B** *6/00;* **C08F** *120/18;* **B05D** *5/06;* **B29D** *11/00*

U.S. Cl. 385—143 **18 Claims**



1. A method of producing a composite optical fiber of polymeric materials having a continuous refractive index distribution from the center of the fiber to the outer layer of the fiber comprising the steps of:

providing a first mixture of a first polymer and at least one first monomer that is a solvent for said first polymer,

providing a second mixture of a second polymer and at least one second monomer that is a solvent for said second polymer, said at least one second monomer being different from said at least a one first monomer,

flowing said first and said second mixtures through a concentric die equipped with an orifice such that a composite optical fiber having an inner layer and an outer layer formed by said first and said second mixtures, respectively, having an interface there in-between is obtained,

passing said composite optical fiber through a diffusion apparatus for a sufficient length of time such that a sufficient amount of said first and said second monomers diffuses across said interface into said outer layer and said inner layer, respectively, and

passing said composite optical fiber through a hardening fixture such that said composite optical fiber is hardened by a radiation energy or an oxidation/reduction process without removing an outermost layer of said fiber,

wherein said composite optical fiber formed has a diameter between about 0.1 mm to about 5 mm.

12. A composite optical fiber of polymeric materials comprising:

a core formed by the polymerization of a first polymer dissolved in at least one first monomer solvent,

a surface layer formed by the polymerization of a second polymer dissolved in at least one second monomer solvent, and

an interface between said core and said surface layer across which a sufficient amount of said at least one first monomer being diffused into said surface layer and a sufficient amount of said at least one second monomer being diffused into said core to cause the formation of a continuous distribution of refractive index from a center of said core to the outermost layer of said surface layer of the fiber,

wherein said fiber has a diameter between about 0.1 mm to about 5 mm.

5,555,526

SYNCHRONOUS SEMICONDUCTOR MEMORY DEVICE HAVING AN AUTO-PRECHARGE FUNCTION

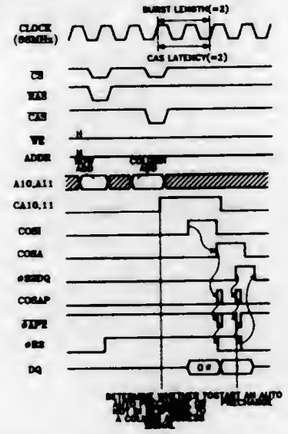
Gyu-Hong Kim, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Mar. 2, 1995, Ser. No. 397,689

Claims priority, application Rep. of Korea, Mar. 3, 1994, 4125/1994

Int. Cl.[6] G11C *8/00*

U.S. Cl. 365—203 **5 Claims**



1. A semiconductor memory device using row and column address strobe signals comprising:

a plurality of memory banks each including a plurality of memory cells; and

means for generating a signal which automatically precharges at least one memory bank of said memory banks in response to receiving a signal which corresponds to said row and column address strobe signals after an address operation for said memory bank is completed, said address operation activating at least one of said plurality of memory cells.

5,555,527

SEMICONDUCTOR MEMORY, MOVING-PICTURE STORING MEMORY, MOVING-PICTURE STORING APPARATUS, MOVING-PICTURE DISPLAYING APPARATUS, STATIC-PICTURE STORING MEMORY, AND ELECTRONIC NOTEBOOK

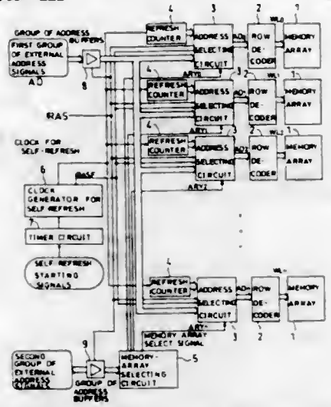
Hisakazu Kotani, Hyogo; Hironori Akamatsu, and Tsutomu Fujita, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 14, 1994, Ser. No. 358,606

Claims priority, application Japan, Dec. 15, 1993, 5-315456; Jan. 12, 1994, 6-001480

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—222 **18 Claims**



1. A semiconductor memory to which data can be sequentially inputted/outputted in synchronization with an external clock, comprising:

a plurality of memory arrays disposed on a chip;

a memory-array selecting circuit for selecting, in accordance with a group of addresses inputted from the outside, at least one memory array out of said plurality of memory arrays;

refresh-signal generating means for generating a refresh address and a word-line basic clock for refresh; and

address-selecting circuits which are equal in number to said memory arrays so as to correspond to said respective memory arrays, wherein

each of said address-selecting circuits is constituted so that it selects, when the corresponding memory array is selected by said memory-array selecting circuit, a word line in said selected memory array in accordance with the group of addresses inputted from the outside and with a word-line basic clock, while it selects, when the corresponding memory array is not selected by said memory-array selecting circuit, word lines in said memory arrays which have not been selected in accordance with the refresh address and the word-line basic clock for refresh generated by said refresh-signal generating means,

said semiconductor memory further comprising:

a pre-switching-time predicting circuit for predicting a time point immediately before a predetermined time at which each of the memory arrays is switched from the unselected state to the selected state by said memory-array selecting circuit; and

a refresh inhibit circuit for inhibiting said refresh-signal generating means from generating the word-line basic clock for refresh at the time point immediately before the predetermined time which was predicted by said pre-switching-time predicting circuit.

5,555,528

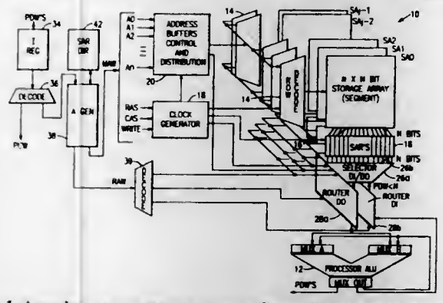
DYNAMIC RANDOM ACCESS MEMORY PERSISTENT PAGE IMPLEMENTED AS PROCESSOR REGISTER SETS

Clive A. Collins, Wappingers Falls; Billy J. Knowles, Kingston; Christine M. Desmoyers, Pine Bush; David B. Rolfe, West Hurley, all of N.Y., and Dale E. Pontius, Colchester, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 289,149, Aug. 12, 1994. This application May 25, 1995, Ser. No. 450,324

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—227 **4 Claims**



1. A random access memory system for storing data in N bit data strings for access by a processor in which the arrays in the memory system are periodically powered down to save power comprising:

a) M memory arrays each storing data in said N bit data strings, said arrays being powered down during periods they are not being accessed;

b) M sense amplifier registers, one such register connected to each of the arrays for storing or reading one said N bit data string for each access of the memory system by the microprocessors, each such register being maintained at full operating power while the array it is connected to is powered down and;

c) access means for accessing said sense amplifier registers separately of each other whereby said registers form a high speed buffer memory where the processor can access data requested during previous memory accesses whether or not any of the M memory arrays of the memory system are powered down.

5,555,529

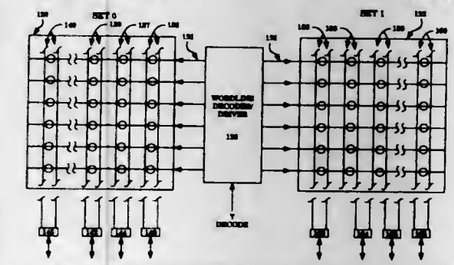
POWER SAVING ARCHITECTURE FOR A CACHE MEMORY

R. Kenneth Hose, Jr., Aloha, and David P. DiMarco, Hillsborough, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 174,382, Dec. 28, 1993, abandoned. This application Oct. 13, 1995, Ser. No. 542,514

Int. Cl.[6] G11C *7/00;8/00*

U.S. Cl. 365—230.06 **10 Claims**



1. A computer system including a central processing unit (CPU) coupled to a memory, said memory comprising:

a first memory array having a plurality of memory cells for storing digital data, each of said memory cells disposed at the intersection of a first plurality of bit line columns and a first plurality of wordlines;

a second memory array having a plurality of memory cells for storing digital data, each of said memory cells disposed at the intersection of a second plurality of bit line columns and a second plurality of wordlines, the first and second plurality of wordlines having a corresponding relationship to each other;

a single wordline address decoder/driver assembly centrally disposed in between said first and second memory arrays and exclusively coupled to each of said first and second plurality of wordlines for receiving an address signal from said CPU, said single wordline address decoder/driver assembly including means for selecting exclusively either said first or said second array, and electrically activating one of said wordlines in said selected array in accordance with said address signal without electrically activating the corresponding wordline of the unselected array, such that each bit line column intersected by said electrically activated wordline in said selected array electrically discharges to provide the value of the memory cell at the point of intersection with the electrically activated wordline as an output to said CPU, while each bit line column intersected by the unactivated corresponding wordline in the unselected array does not electrically discharge to provide the value of the memory cell at the point of intersection with the unactivated wordline to said CPU, thereby reduces power consumption of the memory;

said CPU receiving said provided values of said memory cells disposed along said activated wordline.

5,555,530

METHOD FOR IMPROVING SIGNAL TO NOISE RATIO

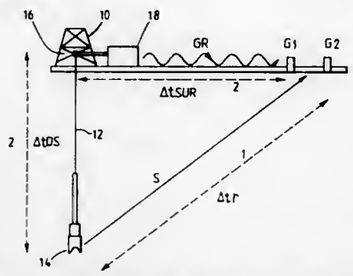
Richard J. Meehan, Cambridge, England, assignor to Schlumberger Technology Corporation, Sugar Land, Tex.

Filed Dec. 6, 1993, Ser. No. 163,444

Claims priority, application United Kingdom, Dec. 12, 1992, 9225985

Int. Cl.[6] G01V *1/36;1/40;* G01J *1/00*

U.S. Cl. 367—45 **26 Claims**

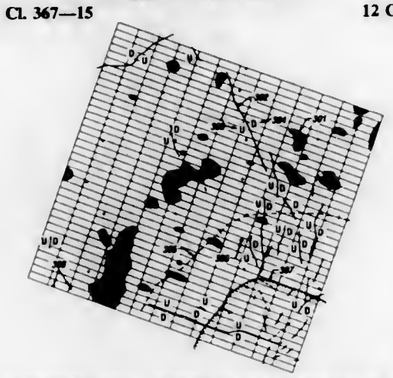


1. A method for improving the signal-to-noise ratio from a pair of seismic detectors which each detect a noisy signal comprising a seismic signal (S) and a noise signal (N), wherein the seismic signal (S) has a different moveout across the pair of seismic detectors from that of the noise signal (N), the noise signal (N) from a given source is detected at the first detector at a time Δt before the corresponding noise signal is detected at the second detector, and the separation of the detectors is such that the noise signal (N) detected at the second detector is substantially the same as that detected at the first detector, the method comprising delaying the noisy signal (S+N) detected at the first detector by an amount τ being greater than the moveout of the seismic signal but not more than Δt and subtracting the delayed signal from that detected at the second detector by means of an adaptive filter so as to minimize the power in the resultant signal, yielding a representation of the seismic signal with attenuated noise level.

5,555,531
METHOD FOR IDENTIFICATION OF NEAR-SURFACE DRILLING HAZARDS

James R. Booth; Michael C. Jacobi, both of New Orleans; Arlette C. Nunez, St. Bernard; Jonathan S. Smith, LaPlace; Peter R. Tauvers, New Orleans, all of La.; Earl H. Doyle, Jr., Sugar Land; Fredric A. Diegel, Jr., Bellaire, both of Tex.; Thomas M. Kratochvil, Metaire, and Brenda G. Gaudin, New Orleans, both of La., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 19, 1994, Ser. No. 358,429
Int. Cl.[6] G01V *1/28*
U.S. Cl. 367—15 **12 Claims**

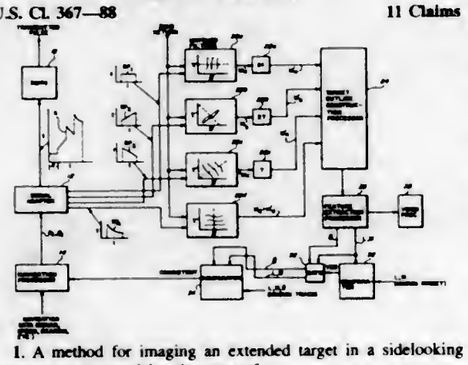


1. A method to identify existence of near-surface drilling hazards in the vicinity of a sea floor location comprising the steps of:
obtaining 3D seismic data for the seafloor in the vicinity of the sea floor location;
preparing at least one high resolution 3D vertical profile from the 3D seismic data;
preparing an artificially-illuminated rendered surface based on the 3D seismic data; and
identifying existence of near-surface hazards in the vicinity of the sea floor location by visual analysis of the rendered surface with reference to the high resolution 3D vertical profile.

5,555,532
METHOD AND APPARATUS FOR TARGET IMAGING WITH SIDELOOKING SONAR

John R. Sacha, State College, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 23, 1984, Ser. No. 623,285
Int. Cl.[6] G03B *42/06*
U.S. Cl. 367—88 **11 Claims**

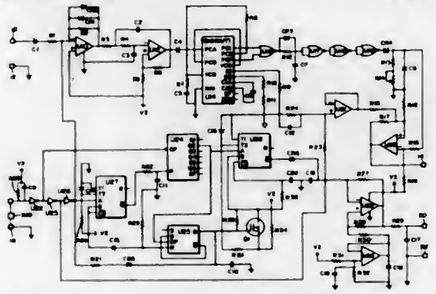


1. A method for imaging an extended target in a sidelooking sonar system comprising the steps of:
detecting a target's range and azimuth;
generating a concatenated sequence of sonar subpulses based on the target's range and azimuth;
transmitting the concatenated sequence of subpulses in a frequency hop code;
receiving the echo of the concatenated sequence of subpulses reflected from the target;
electronically computing range-doppler maps from the echoes for each of the subpulses; and
numerically constructing an image of the target outline from the range-doppler maps.

5,555,533
CONTROL SYSTEM FOR DIVER VOX/PTT COMMUNICATION SYSTEM

Jerome Peck, Mission Viejo, Calif., assignor to Peck/Pelissier a California Partnership, Costa Mesa, Calif.

Filed Dec. 9, 1994, Ser. No. 352,362
Int. Cl.[6] H04B *11/00*
U.S. Cl. 367—132 **26 Claims**



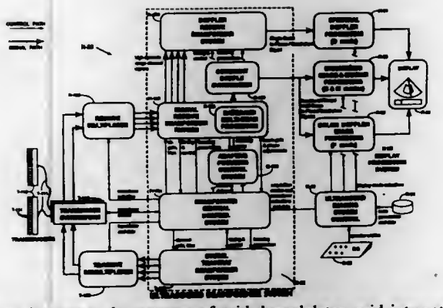
1. In a control system for a diver communication system comprising,
a push-to-talk transmission mode circuit,
a voice operated transmission mode circuit,
a momentary contact switch, and
electronic means for switching between said push-to-talk transmission mode circuit and said voice operated transmission mode circuit on closure of said momentary contact switch at least two times within a first predetermined period of time.

5,555,534
METHOD AND APPARATUS FOR DOPPLER RECEIVE BEAMFORMER SYSTEM

Samuel H. Maslak, Woodside; Christopher R. Cole, Cupertino, and Joseph G. Petrofsky, Sunnyvale, all of Calif., assignors to Acuson Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 286,648, Aug. 5, 1994, abandoned. This application May 2, 1995, Ser. No. 433,916
Int. Cl.[6] G03B *42/06*
U.S. Cl. 367—135 **116 Claims**

1. Apparatus for processing a plurality of input signals each responsive to ultrasonic energy incident on a respective ultrasonic receive element in an array, comprising:
a plurality of range gates each coupled to range gate a respective one of said input signals;
a plurality of focusing phase-rotators each coupled to phase-rotate a respective one of said input signals; and
a summer coupled to sum signals responsive to said gated, phase-rotated signals to produce a summed signal;
a demodulator demodulating a signal responsive to at least one of said input signals;

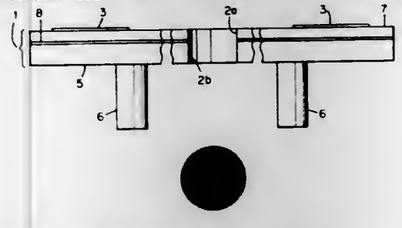


an integrator, downstream of said demodulator, said integrator integrating a signal responsive to said summed signal to produce an output value;
means for operating said apparatus in a first mode (PW), in which each of said range gates is enabled only during selected time periods; and
means for operating said apparatus in a second mode (CW), in which said range gates are enabled continuously.

5,555,535
WATCH DIAL

Gerard D. Davis, 314 E. 18th St., New York, N.Y. 10003

Filed Jul. 19, 1994, Ser. No. 275,713
Int. Cl.[6] G04B *19/06*
U.S. Cl. 368—232 **18 Claims**



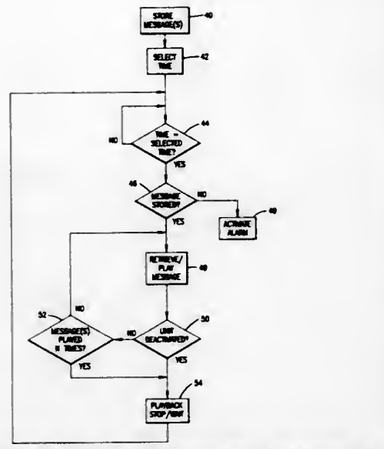
1. A watch dial which comprises:
a base plate, including means to attach the base plate to a watch movement; and
a watch dial face laminated to an upper surface of said base plate, said watch dial face comprising a cross section of a Tagua nut.

5,555,536
DEVICE FOR PLAYING RECORDED AUDIO AT A SELECTED TIME

Rebecca L. Rolf, and Devon A. Rolf, both of 4428 NW. Briarcliff La., Gladstone, Mo. 64116

Filed Jul. 19, 1994, Ser. No. 277,522
Int. Cl.[6] G11B *31/00*
U.S. Cl. 369—19 **12 Claims**

1. A device comprising:
a clock for keeping time;
a means for setting a selected time;
a recorder\player for recording audio and for playing audio recorded therein;
an audible alarm;
a controller, responsive to a condition of said recorder\player, for activating said recorder\player at said selected time when said recorder\player has audio recorded therein;

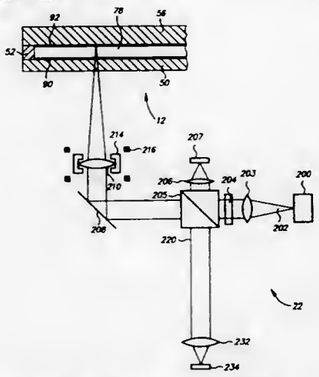


said controller first activates said audible alarm for a period of time, and then activates said recorder\player to thereby play said recorded audio.

5,555,537
OPTICAL DATA STORAGE SYSTEM WITH MULTIPLE WRITE-ONCE PHASE-CHANGE RECORDING LAYERS

Wayne I. Imaino, San Jose; Hal J. Rosen, Los Gatos; Kurt A. Rubin, Santa Clara, and Wade W.-C. Tang, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1995, Ser. No. 497,518
Int. Cl.[6] G11B *7/00;7/24;5/66*
U.S. Cl. 369—109 **40 Claims**



1. An optical data storage system comprising:
a laser light source for generating laser light at a predetermined wavelength and at different read and write power levels;
an optical medium comprising (a) a first member transmissive to the light and having a first surface that forms a medium outer face onto which the light is incident, (b) a first recording layer of phase-change write-once material spaced from the medium outer face by the member, (c) an optical interference film in contact with the first recording layer and transmissive to the light, the optical interference film having an index of refraction significantly different from the index of refraction of the first recording layer and a thickness sufficient to provide constructive interference of the light, the first recording layer and the optical interference film in contact with it being light

transmissive, and (d) a second recording layer of phase-change write-once material spaced from the first recording

5,555,539
MULTI-BEAM SPLIT-TYPE OPTICAL HEAD FOR USE IN

multiplexing/demultiplexing means for multiplexing/demultiplexing the low rate control channel information and

transmissive, and (d) a second recording layer of phase-change write-once material spaced from the first recording layer;

a lens located between the laser light source and said first surface of the member for focusing the laser light to a spot; and

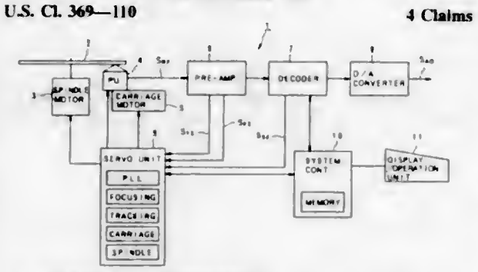
means connected to the lens for moving the lens relative to the medium so the focused spot can be moved from one recording layer to another recording layer, whereby the light at the read power level is reflected back from the first recording layer and the optical interference film when the spot is focused on the first recording layer and the light at the write power level is transmitted through the first recording layer and the optical interference film in contact with it when the spot is focused on the second recording layer to change the phase of the material in the second recording layer.

5,555,538

OPTICAL PICKUP

Naoharu Yanagawa, and Fumihiko Sano, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 3, 1995, Ser. No. 399,099
Claims priority, application Japan, Mar. 11, 1994, 6-41585
Int. Cl.[5] G11B *7/00*
U.S. Cl. 369—110 **4 Claims**



1. An optical pickup comprising:

a laser diode for emitting p-polarized light, the laser diode comprising unit for controlling output power of the p-polarized light by detecting power of the emitted light in front thereof;

a photodetector for receiving a laser light and outputting a signal corresponding to quantity of the laser light received;

a polarization prism for transmitting and guiding the emitted light to an optical disc on which information is recorded by applying heat thereon, and for reflecting and guiding at least a portion of the light reflected by the optical disc to the photodetector, said optical pickup substantially satisfying the following conditions:

$((RP_{MIN}/LDP_{MAX})/OP_{LOSS})\times 100 \leqq Tp$ [%],

$(LP_{MON}/LDP)\times 100 \leqq Rp$ [%],

$(PP_{MIN}/(PP_{MAX}\times R\alpha))\times 100 \leqq Rs$ [%],

Rp=100−Tp [%], and

Ts=100−Rs,

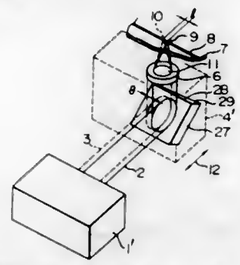
wherein p-polarized light transmittance of the polarization prism is Tp [%], s-polarized light transmittance of the polarization prism is Ts [%], p-polarized light reflectance of the polarization prism is Rp [%], s-polarized light reflectance of the polarization prism is Rs [%], maximum output power of the laser diode is LDP_{MAX} [mW], minimum recording power of the optical disc is RP_{MIN} [mW], estimated loss factor of optical system of the optical pickup is OP_{LOSS}, light quantity detected by the output power control unit is LP_{MON} [mW], normal output power of the laser diode is LDP [mW], maximum power of light irradiated on the optical disc during reproduction is PP_{MAX} [mW], reflectance of the optical disc is $R\alpha$ [%] and minimum power of light irradiated on the optical disc during reproduction is PP_{MIN} [mW].

5,555,539

MULTI-BEAM SPLIT-TYPE OPTICAL HEAD FOR USE IN OPTICAL DISK APPARATUS

Toshimasa Kamisada, Hiratsuka, and Yasuo Kitada, Odawara, both of Japan, assignors to Hitachi, Ltd, Tokyo, Japan

Continuation of Ser. No. 5,272, Jan. 19, 1993, abandoned.
This application Nov. 1, 1994, Ser. No. 332,640
Claims priority, application Japan, Jan. 30, 1992, 4-15133
Int. Cl.[6] G11B *7/135;7/08*
U.S. Cl. 369—219 **10 Claims**



1. A multi-beam split-type optical head for an optical disk apparatus, comprising:

a stationary section including a plurality of light sources; and

a movable section shiftable with respect to the stationary section for receiving parallel light beams generated by the plurality of light sources and for recording/reproducing data using the light beams, said light beams including first and second light beams having different respective wavelengths;

wherein said stationary section includes optical means for emitting the light beams generated by the plurality of light sources, the optical axes of the light beams after being emitted from the stationary section being substantially parallel to the shifting direction of said movable section;

wherein said movable section includes a wedge-shaped dichroic mirror for inclining said light beams with respect to each other to maintain a range of the light beams during movement by the movable section, said dichroic mirror having first and second surfaces angled with respect to each other, and a common lens for converging said inclined light beams to form light spots at a plurality of positions respectively spaced by a predetermined distance; and

wherein the first light beam has a wavelength that is passed by said first surface but reflected by said second surface toward said common lens, and wherein the second light beam has a wavelength that is reflected by said first surface toward said common lens, such that the first and second light beams overlap each other after reflection from the second and first surfaces, respectively.

5,555,540

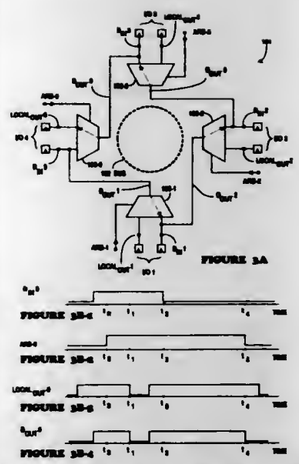
ASIC BUS STRUCTURE

William H. Radke, San Jose, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Feb. 17, 1995, Ser. No. 390,052
Int. Cl.[6] H04J *3/00*
U.S. Cl. 370—16.1 **10 Claims**

1. A system, fabricated on an integrated circuit, for coupling data between M nodes, where M is an integer ≧2, the system comprising:

M modules each module having a first input coupled to a D_{in} input node, having a second input coupled to a local output node, having an arbitration node coupled to an arbitration signal, and having an output node D_{out} that is coupled to said first input node of said same module when said first arbitration signal is in a first state and is coupled to said second input node of said same module when said first arbitration signal is in a second state; and



a conductive bus providing electrical coupling between adjacent said modules such that the D_{in} input node of an M_i module is coupled to the D_{out} output node of an M_{i+1}th module, and the D_{in} input node of the Mth module is coupled to the D_{out} output node of the M_{i-0}th module, where i is an integer $0 \leqq i \leqq M-1$;

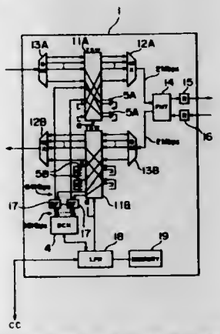
wherein signal states of the arbitration signal coupled to each module define a signal path on said conductive bus between a desired input node on one module and an output node on another module, the modules so coupled providing point-to-point coupling.

5,555,541

EXCHANGE CONNECTED TO A CONTROL CHANNEL JUNCTION LINE

Shigehiko Yazawa; Kazuhiko Ito; Takeshi Uehara; Toru Tachibana, and Keiji Fukuda, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 8, 1993, Ser. No. 118,396
Claims priority, application Japan, Sep. 8, 1992, 4-239611
Int. Cl.[6] H04J *3/22*
U.S. Cl. 370—68.1 **6 Claims**



1. An exchange connected to a control channel junction line, comprising:

a low rate information multiplexing trunk;

a plurality of subscriber circuits connected to said low rate information multiplexing trunk; and

a digital junction line trunk including:

low rate control channel processing means for processing a low rate control channel information, and

multiplexing/demultiplexing means for multiplexing/demultiplexing the low rate control channel information and low rate talking channel information of said low rate information multiplexing trunk; and wherein:

when said low rate information multiplexing trunk is connected to a channel for control channel information one of said subscriber circuits which has a bit rate corresponding to a bit rate used for control information is disabled, and

upon transmission, the low rate control channel information from said low rate control channel processing means and the low rate talking channel information from said low rate information multiplexing trunk are multiplexed with each other by and sent out from said multiplexing/demultiplexing means of said digital junction line trunk, whereas

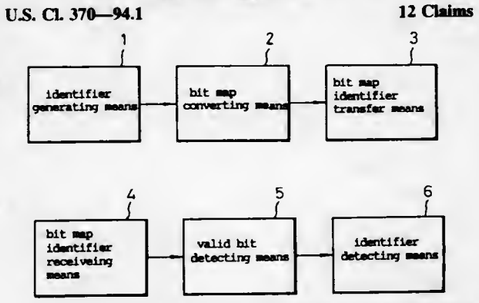
upon reception, the low rate control channel information and the low rate talking channel information to said low rate information multiplexing trunk are demultiplexed by said multiplexing/demultiplexing means, and the low rate control channel information is processed by said low rate control channel processing means while the low rate talking channel information to said low rate information multiplexing trunk is inputted to said low rate information multiplexing trunk.

5,555,542

PACKET DIRECTIONAL PATH IDENTIFIER TRANSFER SYSTEM

Takao Ogura; Shigeo Amemiya; Koji Tezuka, and Takafumi Chujo, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 969,240, Apr. 12, 1993, abandoned.
This application Jan. 11, 1996, Ser. No. 583,962
Claims priority, application Japan, Jun. 19, 1991, 3-147248
Int. Cl.[6] H04L *12/56*
U.S. Cl. 370—94.1 **12 Claims**



2. A communication unit in a high speed packet communication network containing a plurality of nodes connected by links, where a plurality of packet directional paths can be set for each link connecting two adjoining nodes, said communication unit, transferring an identifier of at least one packet directional path to another communication unit, which communicates in the high speed packet communication network, said communication unit comprising:

identifier determining means for determining a respective value of an identifier for each packet directional path

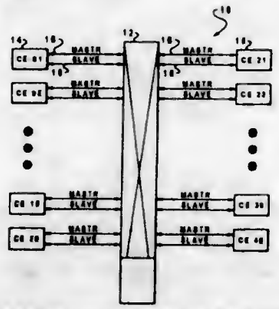
bit map data generating means for generating bit map data including a plurality of bits corresponding to a plurality of values, respectively, where the respective value of the identifier for each packet directional path is represented in the bit map data by making valid a corresponding bit for the respective value; and

identifier transfer means for transferring the bit map data generated by said bit map data generating means, to the other communication unit.

5,555,543
CROSSBAR SWITCH APPARATUS AND PROTOCOL

Gregory F. Grohoski, Cedar Park; Oscar R. Mitchell, Pflugerville, both of Tex.; Tung M. Nguyen, Menlo Park, Calif., and Yongjae Rim, Cedar Park, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 3, 1995, Ser. No. 367,645
Int. Cl.[6] H04J *3/24;* **H04Q** *11/00*
U.S. Cl. 370—58.1 **6 Claims**



1. In a computer networking system having a crossbar switch connecting a plurality of ports, a method for connecting a first port to a second port selected from said plurality of ports, the method comprising the steps of:

requesting an ID from said second port by said first port;

transmitting said ID by said second port to said first port;

requesting a connection with said second port by said first port;

testing to determine if said connection has been granted by second port;

sending a command packet to said second port after granting connection;

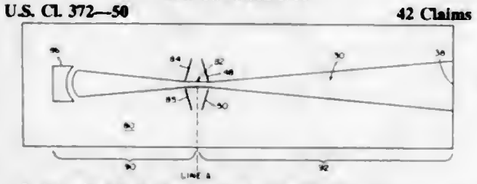
determining if said command packet has been received by said second port; and

upon determining said command packet has been received by said second port, waiting for a response including results of the execution of said command packet by said second port.

5,555,544
TAPERED SEMICONDUCTOR LASER OSCILLATOR

James N. Walpole, Concord; Emily S. Kintzer, Arlington; Stephen R. Chinn, Westford; Christine A. Wang, Bedford, and Lee J. Missaggia, Milford, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 148,386, Nov. 8, 1993, Pat. No. 5,400,353, which is a continuation of Ser. No. 829,778, Jan. 31, 1992, Pat. No. 5,260,822. This application Apr. 4, 1994, Ser. No. 222,413
Int. Cl.[6] H01S *3/18*
U.S. Cl. 372—50 **42 Claims**



1. A semiconductor laser structure comprising:

a) a semiconductor body having a resonant cavity formed of first and second resonant cavity sections formed in said body said body having longitudinally extending outer surfaces, one said outer surface having a width W1, and a wave guiding layer between said outer surfaces in which layer electromagnetic radiation travels longitudinally along said cavity; said first section being formed of a first interface end and an aperture and said second section being formed of a second interface end and said aperture;

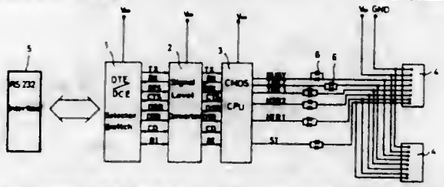
b) said electrically conductive contact joined to one of said ends of said semiconductor body and extending along said one outer surface, said electrically conductive contact being tapered in two directions such that said contact has a width W2 at the ends and a width W3 at the aperture;

c) a portion of said wave guiding layer vertically adjacent and contiguous with said contact comprising a tapered gain region of said layer which is solely defined laterally by the contact and wherein W1 is greater than W2 which is greater than W3.

5,555,545
CONNECTING APPARATUS FOR INTERCONNECTION BETWEEN SERIAL DATA TRANSMISSION DEVICES

Jeng-Rern Yang, Taipei, Taiwan, assignor to Gemtek Technology Co., Ltd., Taipei, Taiwan

Filed Jun. 23, 1994, Ser. No. 264,484
Int. Cl.[6] H04B *1/38;* **H04L** *5/16*
U.S. Cl. 375—220 **2 Claims**



1. A connecting apparatus for interconnection between serial data transmission devices with at least one RS232 interface, said apparatus comprising a DTE/DCE selector switch, a signal level converter, a single chip CPU, and RJ45 telephone bus cables,

said selector switch connecting the at least one RS232 interface to said signal level converter,

said signal level converter converting a signal of a signal level of the RS232 interface to a TTL level for processing by the CPU, and converting a signal of a TTL level of the CPU to the level of the RS232, and

said RJ45 telephone bus cables being connected to said CPU,

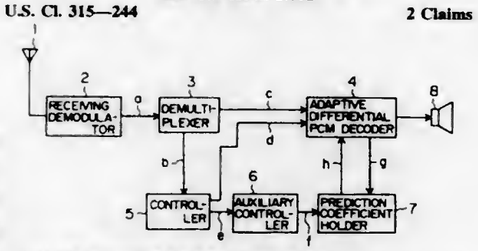
wherein said CPU includes an I/O port, and

wherein said apparatus includes paired, reversed diodes for connecting lines of said RJ45 telephone bus cables, except a line for power supply and a line for connection to earth, to said I/O port of said CPU, each said pair of reversed diodes causing a drop in reflected signals during long distance high speed data transmission.

5,555,546
APPARATUS FOR DECODING A DPCM ENCODED SIGNAL

Ichiro Matsumoto, Sendai, Japan, assignor to Kokusai Electric Co., Ltd., Tokyo, Japan

Filed Jun. 8, 1995, Ser. No. 488,997
Claims priority, application Japan, Jun. 20, 1994, 6-159694
Int. Cl.[6] H04L *27/12*
U.S. Cl. 315—244 **2 Claims**



1. A voice decoding apparatus, comprising:

a receiving demodulator for receiving and demodulating a signal, which is a multiplex-modulated signal of an ADPCM-coded voice signal and a voice activity detection flag indicating either a voice-active duration or a voice-nonactive duration and is transmitted for only the voice-active duration;

a demultiplexer for demultiplexing the demodulated signal from the receiving demodulator into a coded voice signal and the voice activity detection flag;

a controller for outputting the voice activity detection flag from the demultiplexer as it is and outputting a reset signal for each time when the voice activity detection flag changes from the voice-active duration to the voice-nonactive duration and vice versa;

an adaptive differential PCM decoder for decoding, in a voice-active duration, the coded voice signal from the demultiplexer with reference to a prediction coefficient, which raise up from the zero state reset by the reset signal, and for decoding, in a voice-nonactive duration, random code words generated from inside circuitry thereof, with reference to a prediction coefficient of background noise in the voice-active duration just preceding to the current voice-nonactive duration, thereby to generate pseudo-background noise; and

a prediction coefficient holder for receiving the voice activity detection flag from the controller, for receiving, in the voice-active duration, the prediction coefficient from the adaptive differential PCM decoder to calculate an average value thereof for each frame and to store the average value calculated after updating and for applying the average value of the prediction coefficient to the adaptive differential PCM decoder, and for temporarily interrupting, during the voice-nonactive duration, said updating and applying the average value of the prediction coefficient of the voice-active duration just preceding to the current voice-nonactive duration to the adaptive differential PCM decoder as said prediction coefficient of background noise;

characterized by an auxiliary controller, provided between the controller and the prediction coefficient holder, for outputting the voice activity detection flag from the controller intact for respective lasting durations of the voice-active duration and the voice-nonactive duration, and for interrupting the updating of the prediction coefficient by applying the voice activity detection flag to the prediction coefficient holder for a period of time during which the prediction coefficient reset to the zero state in the adaptive differential PCM decoder raises up to a value substantially equal to the prediction coefficient of a voice-nonactive duration just preceding to the current voice-active duration, when the voice-nonactive duration changes to the current voice-active duration, thereby reducing a range of change in the tone quality of the pseudo-background noise, which is caused when the voice activity detection flag received indicates erroneously the voice-active duration for a short time in the voice-nonactive duration.

5,555,547
CONVOLUTIONAL CODING AND VITERBI DECODING SYSTEM TRANSPARENT TO PHASE SKIPS OF PI AND PI/2, WITH APPLICATIONS IN TDMA TRANSMISSION

Didier Lemaitre, Jouy le Moutier, and Jean-Pierre Bonin, Neuilly sur Seine, both of France, assignors to Alcatel Telspace, Nanterre Cedex, France

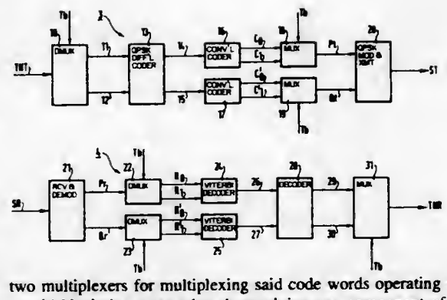
Filed Feb. 15, 1995, Ser. No. 388,820
Claims priority, application France, Feb. 18, 1994, 94 01876
Int. Cl.[6] H04L *5/12*
U.S. Cl. 375—262 **4 Claims**

1. System for coding/decoding digital data transmitted between a transmitter and a receiver, wherein said transmitter includes:

a demultiplexer receiving a digital bit stream to be transmitted and supplying two demultiplexed bit streams at a bit timing rate;

differential coding means receiving said demultiplexed bit streams and supplying two coded bit streams;

two convolutional coders each receiving one of said coded bit streams and each supplying a code word for each coded bit stream bit received;



two multiplexers for multiplexing said code words operating at said bit timing rate and each supplying one component of a symbol to be transmitted; and

means for modulating and transmitting said symbol to be transmitted supplying a transmitted symbol, wherein said receiver includes:

means for receiving and demodulating said transmitted symbol supplying two components of the received symbol;

two demultiplexers each receiving one of said components of said received symbol and each supplying one received code word at said bit timing rate;

two Viterbi decoders each supplying a decoded word from said received code words;

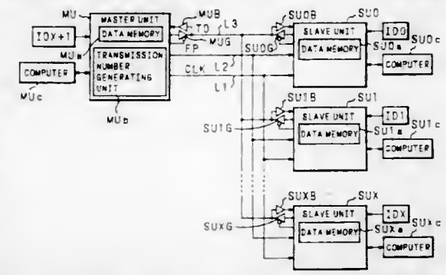
differential decoding means receiving said decoded words and supplying two decoded bit streams; and

a multiplexer for multiplexing said decoded bit streams supplying a received digital bit stream, and wherein said digital data has a frame structure including a frame alignment word, each code word supplied by one of said convolutional coders is applied to a single multiplexer and each bit of said received code word is applied to a single Viterbi decoder, and said differential coding means and said differential decoding means are of the QPSK type.

5,555,548
METHOD AND APPARATUS FOR TRANSFERRING DATA BETWEEN A MASTER UNIT AND A PLURALITY OF SLAVE UNITS

Takumi Iwai, Osaka, and Mikiko Tamori, Kawasaki, both of Japan, assignors to Fjuitsu Limited, Kanagawa, Japan

Filed Jul. 29, 1993, Ser. No. 99,198
Claims priority, application Japan, Oct. 23, 1992, 4-286114; Jul. 15, 1993, 5-175604
Int. Cl.[6] H04L *7/00;* **B42J** *27/12*
U.S. Cl. 375—356 **5 Claims**



1. A data transferring apparatus, comprising a master unit; and a plurality of slave units, for transferring data between the master unit (MU) and said plurality of slave units (SU0, SU1, SU2, SU3) according to a synchronizing signal (CLK) supplied to each unit, each of said master unit (MU) and plurality of slave units (SU0, SU1, SU2, SU3) being connected with each other, said master unit comprising:

a plurality of storing circuits (FF1, FF2, FF3, FF4) which respectively store transmission request signals representing transmission requests from respective slave units (SU0, SU1, SU2, SU3);

a transmission allowance signal generating circuit (13), connected to the plurality of storing circuits, for generating a transmission allowance signal representing the transmission allowance of only one slave unit (SU0, SU1, SU2, or SU3) according to output signals received from the plurality of storing circuits indicating stored contents of said plurality of storing circuits (FF1, FF2, FF3, FF4) and a predetermined priority order;

transmission request rewriting circuits (51, 52, 53, 54) each coupled to a respective storing circuit, for rewriting the stored contents of a respective storing circuit (FF1, FF2, FF3 or FF4) which stores the transmission request signal from the respective slave unit (SU0, SU1, SU2 or SU3), which has been allowed to transmit data based upon a signal from said transmission allowance signal generating circuit (13), into a state where there is no transmission request;

a detecting circuit (50), coupled to said storing circuits, for detecting a predetermined state where there is no transmission request obtained by rewriting all of the stored contents of said plurality of storing circuit (FF1, FF2, FF3, FF4);

selecting circuits (SEL1, SEL2, SEL3, SEL4) each being respectively connected to a respective one of the plurality of storing circuits and also to a respective one of the transmission request rewriting circuits, for selecting either a rewriting operation performed by a respective transmission request rewriting circuit (51, 52, 53, 54), or a signal input operation causing the transmission request signals from the respective slave units (SU0, SU1, SU2, SU3) to be stored in respective storing circuits (FF1, FF2, FF3, FF4); and

a control circuit (NAND 1) having an output connected to each of said selecting circuits (SEL1, SEL2, SEL3, SEL4) and an input connected to receive an input signal from said detecting circuit for transmitting a signal to select either said signal input operation only when said predetermined state is detected by said detecting circuit or said rewriting operation when said predetermined state is not detected by said detecting circuit.

5,555,549

PROCESS FOR MODIFYING A SURFACE OF A FLUORORESIN PRODUCT

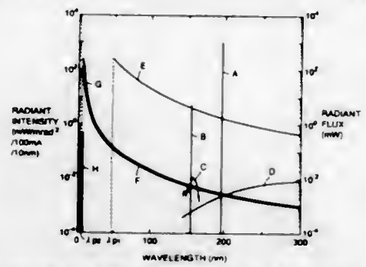
Hiroyuki Nakaishi, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 9, 1995, Ser. No. 402,097

Claims priority, application Japan, Mar. 11, 1994, 6-040693

Int. Cl.[6] C08J *7/00*

U.S. Cl. 378—64 **18 Claims**



1. A process for modifying a surface of a fluororesin product, comprising a step of irradiating said surface of said fluororesin product with synchrotron radiation having a wavelength of not more than 100 nm to chemically modify polymer molecules of said fluororesin product.

5,555,550

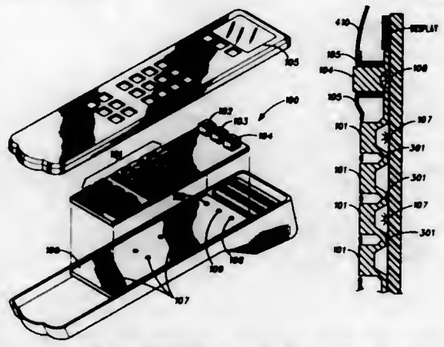
KEYPAD APPARATUS WITH INTEGRAL DISPLAY INDICATORS

Kevin D. Kaschke, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 983,112, Nov. 30, 1992, abandoned, which is a continuation of Ser. No. 591,185, Oct. 1, 1990, abandoned. This application Aug. 29, 1994, Ser. No. 297,436

Int. Cl.[6] H04Q *7/32*

U.S. Cl. 379—59 **27 Claims**



14. A cellular radiotelephone device having internal lighting means comprised of general lighting means and specific lighting means, the cellular radiotelephone device comprising:

transmitting means for transmitting cellular telephone calls;

receiving means for receiving cellular telephone calls;

display means for displaying radiotelephone data; and

a keypad apparatus, comprising:

a plurality of data keys for inputting the radiotelephone data to the device, the plurality of data keys coupled together and arranged in a matrix pattern, each data key having at least one symbol disposed on a top surface thereof for representing each data key, the plurality of data keys being formedof a translucent material allowing light from the general lighting means to be diffused within each key and illuminate the top surface; and

at least one indicator bar integrally molded with the plurality of data keys to form a single-piece unitary member, each indicator bar diffusing light from specific lighting means, each indicator bar adapted to provide a status of the device;

wherein the integrally molded indicator bars are immoveable relative to the yielding movement of the integrally molded plurality of data keys.

5,555,551

METHOD AND APPARATUS FOR FRAUD CONTROL IN CELLULAR TELEPHONE SYSTEMS

Ronald S. Rudokas, Alamo; John A. Storch, Laguna Niguel, and David L. Daniels, Placentia, all of Calif., assignors to AirTouch Communications, Inc., San Francisco, Calif.

Continuation of Ser. No. 84,367, Jun. 29, 1993, Pat. No. 5,420,910. This application Feb. 16, 1995, Ser. No. 389,348

Int. Cl.[6] H04Q *7/22*

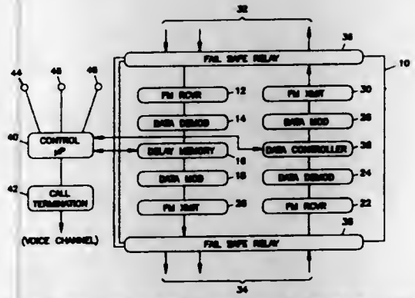
U.S. Cl. 379—59 **14 Claims**

1. A method of preventing fraudulent calls in a cellular telephone system, comprising the steps of:

(a) scanning call records from the cellular telephone system;

(b) analyzing characteristics from the scanned call records to identify a fraudulent cellular telephone;

(c) storing a called number previously received from the fraudulent cellular telephone in an electronic memory;



(d) receiving a call request from a cellular telephone, wherein the call request comprises a called number and a calling number; and

(e) preventing the call request from completing when the called number of the request matches the called number previously received from the fraudulent cellular telephone and stored in the electronic memory.

5,555,552

APPARATUS FOR QUICKLY CAPTURING CORDLESS TELEPHONE CHANNEL TO BE MEASURED

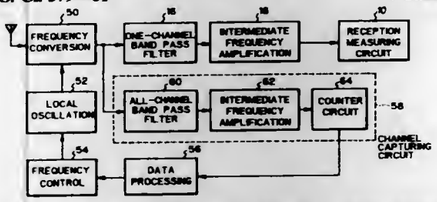
Ei Kawaguchi, Kanagawa-ken, Japan, assignor to Leader Electronics Corporation, Kanagawa-ken, Japan

Filed May 19, 1994, Ser. No. 246,162

Claims priority, application Japan, May 20, 1993, 5-118509

Int. Cl.[6] H04Q *7/38*

U.S. Cl. 379—61 **4 Claims**



1. In a cordless telephone system in which a cordless telephone selects a channel not in use out of a plurality of channels allocated in advance in a predetermined frequency band and then performs communication wirelessly in said selected channel, an apparatus for quickly capturing said selected channel as a channel to be measured in a condition in which said cordless telephone is transmitting an electromagnetic wave in said selected channel, while one or more other cordless telephones are transmitting electromagnetic waves in channels different from said selected channel, the level of the electromagnetic wave in the channels different from said selected channel being lower than the level of the electromagnetic wave in said selected channel at the position where said selected channel is captured as a channel to be measured, said apparatus comprising:

reception means for receiving electromagnetic waves contained in said predetermined frequency band;

counting means for counting the number of zero crossings of a wave having the highest amplitude among said electromagnetic waves which are contained in said predetermined channels and received by said reception means; and

means for determining the channel to be measured in which said cordless telephone is transmitting the electromagnetic wave, in accordance with the value counted by said counting means.

5,555,553

METHOD FOR SUPPORTING COMMUNICATION IN A COMMUNICATION SYSTEM USING INTERMEDIARIES BETWEEN CALLED PARTIES

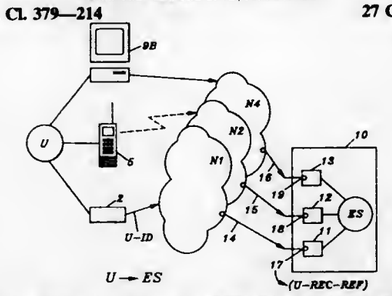
Björn E. R. Jonsson, Järfälla, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Feb. 16, 1993, Ser. No. 18,213

Claims priority, application Sweden, Feb. 17, 1992, 9200465

Int. Cl.[6] H04M *3/42;11/00;7/00*

U.S. Cl. 379—214 **27 Claims**



1. A system for supporting communication for a first user who wishes to be able to communicate with external users, comprising:

a first receptionist which is disposed in a first location for serving the first user;

a second receptionist disposed in a second location for serving external users who desire communication with the first user; and

an intermediary which is in contact with the first and the second receptionists solely via signal connections, for detecting receptionist activities and for alerting the first user that the activity has occurred in one of the receptionists, said intermediary having equipment for serving said external users in accordance with instructions sent by the first user to the intermediary in response to said alert, wherein said first user has two addresses, a first address which is used by external users and a second address which is used by the first user to connect to the first receptionist.

5,555,554

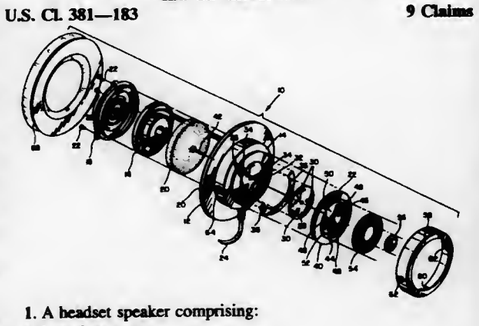
VENTED HEADSET SPEAKER

Alan Hofer, Wantagh, N.Y., and Walter O. Stanton, Palm Beach Gardens, Fla., assignors to Stanton Magnetics, Inc., Plainview, N.Y.

Filed Jun. 8, 1995, Ser. No. 488,796

Int. Cl.[6] H04R *25/00*

U.S. Cl. 381—183 **9 Claims**



1. A headset speaker comprising:

a domed earcup;

a driver positioned within said dome;

at least one aperture extending through said dome;

a rotatable closure for said at least one aperture affixed to said dome and rotatable relative to said dome wherein rotation of said closure varies an exposed portion of said at least one aperture, between a fully open and a fully closed position;

an elongated groove formed in said dome, said groove terminating at one end in an opening extending through said dome; and

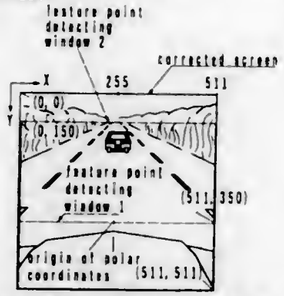
a cover for said groove, said cover having an opening therein at an end of said groove opposite to said groove opening wherein said groove and said cover define a Thuras tube between said openings extending through the dome.

5,555,555

APPARATUS WHICH DETECTS LINES APPROXIMATING AN IMAGE BY REPEATEDLY NARROWING AN AREA OF THE IMAGE TO BE ANALYZED AND INCREASING THE RESOLUTION IN THE ANALYZED AREA

Jun Sato, Cambridge, England, and Mitsuyoshi Saiki, Tsukuba, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 19, 1994, Ser. No. 183,369
Claims priority, application Japan, Jan. 19, 1993, 5-007017
Int. Cl.[6] G06K *9/00*
U.S. Cl. 382—104 **20 Claims**



1. An apparatus for detecting a rectilinear line of an object comprising:

generating means for inputting an analog picture image of said object and generating image data which represents said picture image of said object in an X and Y orthogonal coordinate system;

determining means for determining a plurality of feature points (Xs, Ys), wherein said plurality of feature points (Xs, Ys) are defined by values and distributions of said image data on said picture image and wherein at least some of said plurality of feature points (Xs, Ys) correspond to said rectilinear line;

first converting means for respectively converting each of said plurality of feature points (Xs, Ys) into corresponding first groups of points (r1, t1), wherein said corresponding first groups of points (r1, t1) respectively represent curves in a first r1–t1 polar coordinate system having a first resolution and a first range;

first memory means for storing first frequency data, wherein addresses of said first memory means respectively relate to points of said first r1–t1 polar coordinate system;

first incrementing means for incrementing said first frequency data, wherein said first incrementing means increments said first frequency data stored at a first certain address of said first memory means for each instance that one point in one of said corresponding first groups of points (r1, t1) relates to said first certain address;

first selecting means for selecting a first particular point (rm1, tm1) in said first r1–t1 polar coordinate system, wherein said first particular point (rm1, tm1) corresponds to a first particular address of said first memory means at which said first frequency data represents a maximum value;

second converting means for respectively converting at least some of said plurality of feature points (Xs, Ys) into corresponding second groups of points (r2, t2), wherein said corresponding second groups of points (r2, t2) respectively represent curves in a second r2–t2 polar coordinate system having a second resolution and a second range, wherein said second r2–t2 polar coordinate system is centered about said first particular point (rm1, tm1), and wherein said second resolution is higher than said first resolution and said second range is narrower than said first range;

second memory means for storing second frequency data, wherein addresses of said second memory means respectively relate to points of said second r2–t2 polar coordinate system;

second incrementing means for incrementing said second frequency data, wherein said second incrementing means increments said second frequency data stored at a second certain address of said second memory means for each instance that one point in one of said corresponding second groups of points (r2, t2) relates to said second certain address;

second selecting means for selecting a second particular point (rm2, tm2) in said second r2–t2 polar coordinate system, wherein said second particular point (rm2, tm2) corresponds to a second particular address of said second memory means at which said second frequency data represents a maximum value; and

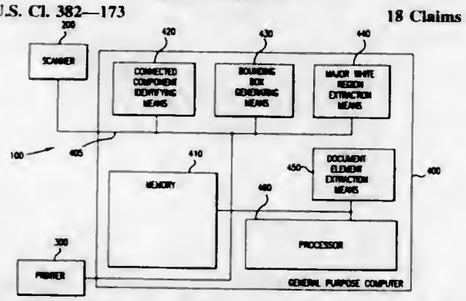
line determining means for determining said rectilinear line in said X and Y orthogonal coordinate system, wherein said rectilinear line is based at least partially on said second particular point (rm2, tm2) and approximates a succession of at least some of said plurality of feature points (Xs, Ys).

5,555,556

METHOD AND APPARATUS FOR DOCUMENT SEGMENTATION BY BACKGROUND ANALYSIS

Masaharu Ozaki, Sunnyvale, Calif., assignor to Xerox Corporation, Stamford, Conn., and Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1994, Ser. No. 315,875
Int. Cl.[6] G06K *9/34*
U.S. Cl. 382—173 **18 Claims**



1. A method for extracting document elements from a document image, comprising the steps of:

identifying at least one connected component in the document image;

generating a minimum bounding box for each at least one connected component in the document image;

identifying primitive background areas surrounding the at least one bounding box for the at least one connected component;

selectively eliminating the primitive background areas such that each remaining primitive background area exceeds a minimum threshold;

selectively combining the remaining primitive background areas in the document image which uniquely share a common edge to form major background regions;

determining at least one set of major background regions based on intersection points between the major background regions;

segmenting the document image into document elements based on the at least one set of determined major background regions; and

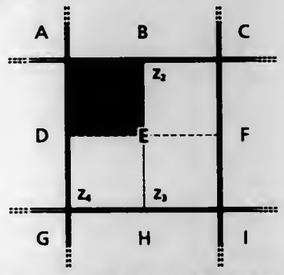
extracting the document elements segmented by the at least one set of determined major background regions.

5,555,557

BIT-MAP IMAGE RESOLUTION CONVERTER WITH CONTROLLED COMPENSATION FOR WRITE-WHITE XEROGRAPHIC LASER PRINTING

Louis D. Mailloux, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 890,064, May 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 588,125, Sep. 25, 1990, Pat. No. 5,410,615, which is a continuation of Ser. No. 513,415, Apr. 23, 1990, Pat. No. 5,282,057. This application Nov. 14, 1994, Ser. No. 338,981
Int. Cl.[6] G06K *9/42*
U.S. Cl. 382—299 **8 Claims**



1. A method of converting the resolution of an image represented by a plurality of pixels and prepared for a first printer at a first resolution to a second magnified resolution for printing at a second printer, comprising the steps of:

storing a portion of pixels of the image prepared for the first printer representing an image portion;

isolating a region of the pixels of said image portion including a pixel formation comprising a central pixel and pixels surrounding said central pixel, isolating the region of the pixels of said image by isolating a 3-pixel by 3-pixel formation of image pixels including a central pixel and pixels surrounding said central pixel;

expanding said central pixel into an array of symmetrically unique pixels repreeoting said central pixel at a second magnified resolution for printing on the second printer; and

for each of said symmetrically unique pixel positions, determining a binary pixel state according to a set of state determination rules based on the states of said pixels in said pixel formation; wherein at portions of the image having a state transition said state determination rules favor a first state over a second state for said symmetrically unique pixel positions adjacent to said state transition when a control field of adjacent pixels including said central pixel in said formation are at a second state, wherein said state determining rules further favor a first state over a second state if said control field comprises at least four adjacent pixels including said central pixel; and

applying said determined binary pixel state to each of said symmetrically unique pixels, producing controlled dilation of image fields at said first state at said second resolution.

5,555,558

METHOD FOR SWITCHING OPTICAL SIGNALS

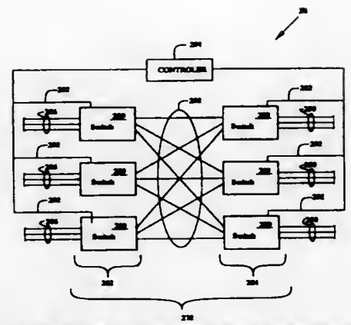
Richard H. Laughlin, 1906 Campbell Trail, Richardson, Tex. 75082

Division of Ser. No. 251,837, May 27, 1994, Pat. No. 5,444,801. This application May 18, 1995, Ser. No. 443,737
Int. Cl.[6] G02B *6/26*
U.S. Cl. 385—16 **10 Claims**

1. A method for switching an input optical signal to one of a plurality of output optical locations, the method comprising the steps of:

collimating the input optical signal into a collimated beam;

directing the collimated beam to one of the output optical locations;



changing the angle of the collimated beam by a selected amount in order to direct the beam to a different one of the output optical locations; and

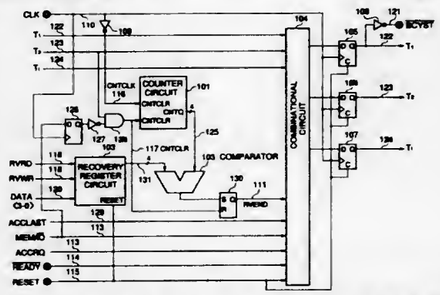
wherein the changing the angle step further comprises changing the angle of the collimated beam by a first amount by reflecting the collimated beam by total internal reflection with a first refractor having a reflective surface, changing the angle of the collimated beam by a second amount by frustrating the total internal reflection of the collimated beam by controlling the spacing between a second refractor having a reflective surface and the first refractor's reflective surface, and reflecting the collimated beam with the second refractor's reflective surface.

5,555,559

MICROPROCESSOR CAPABLE OF ENSURING FLEXIBLE RECOVERY TIME FOR I/O DEVICE BY INSERTING IDLE STATES

Masashi Tsubota, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 717,841, Jun. 21, 1991, abandoned. This application Apr. 4, 1994, Ser. No. 222,320
Claims priority, application Japan, Jan. 21, 1990, 2-164900
Int. Cl.[6] G06F *13/14*
U.S. Cl. 395—879 **2 Claims**



2. A microprocessor which is for use with a clock for generating clock signals and with means for performing an input/output access operation and which has bus cycles including a memory access operation state, an input/output access operation state during which an input/output access operation is performed by the means for performing an input/output access operation, and an idle state, the microprocessor comprising:

detecting means for detecting that said input/output access operation of said input/output access operation state is consecutively executed;

memory means for storing a number of idle states to be inserted and for generating an output;

counting means for counting clock signals generated by said clock and for generating an output;

means for comparing said output of said memory means with said output of said counting means, and for generating a

recovery end signal when said output of said memory means is coincident with said output of said counting means; and

recovery end signal when said output of said memory means is coincident with said output of said counting means; and

control means, coupled to said comparing means for receiving said recovery end signal, for resetting said counting means when said input/output access operation is executed, and for controlling said means for performing an input/output access operation such that a next input/output access operation is not executed until said recovery end signal is received by said control means, when said detecting means has detected that said input/output access operation is consecutively executed,

wherein said memory means includes a recovery register circuit for receiving a recovery register read signal, a recovery register write signal, and a recovery data of n bits, and having a n-bit register for storing the number of idle states representing the recovery time.

5,555,560

REQUEST CANCEL SYSTEM FOR CANCELLING A SECOND ACCESS REQUEST HAVING THE SAME ADDRESS AS A FIRST ACCESS REQUEST

Hiroshi Komatsuda, Yokohama, and Hidehiko Nishida, Inagi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 101,095, Aug. 3, 1993, abandoned, which is a continuation of Ser. No. 466,638, Jan. 17, 1990, abandoned. This application May 25, 1995, Ser. No. 452,576

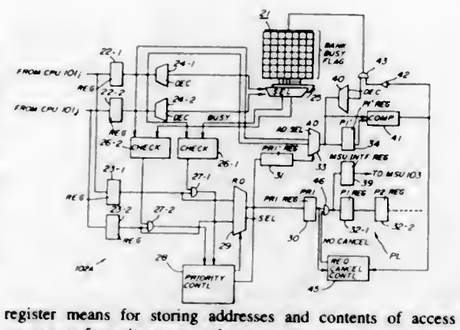
Claims priority, application Japan, Jan. 17, 1989, 1-8064

Int. Cl.[6] **G06F** *12/06;13/14*

U.S. Cl. 395—405 **9 Claims**

1. A request cancel system for a data processing system, the data processing system including a main storage unit having a plurality of banks for controlling access from a plurality of access units, said request cancel system comprising:

bank busy flag group means for storing bank busy flags for each of the banks of the main storage unit, each of said bank busy flags being set when a corresponding one of the banks is in use;



register means for storing addresses and contents of access requests from the access units;

check means for detecting whether a bank designated by an address of an access request is in use based on a corresponding bank busy flag from said bank busy flag group means and for outputting a check signal;

selector means for selectively outputting a first access request to the main storage unit in response to the check signal indicating that the bank designated by the address of the first access request is not in use and for selectively outputting a second access request to the main storage unit, after selectively outputting the first access request, in response to the check signal for the second access request indicating that the bank designated by the address of the second access request is not yet busy;

comparator means, separate from said check means, for comparing the address of the first access request and the address of the second access request and for outputting a coincidence signal if the addresses of the first and second access requests coincide; and

request cancel control means for cancelling the second access request output from said selector means in response to the coincidence signal from said comparator means.

DESIGN PATENTS

GRANTED September 10, 1996

ERRATA

For CLASS	See PATENT NO.
D 06/370	3473
D 02/904	3548
D 23/303	3643

373,451

FROZEN CONFECTION

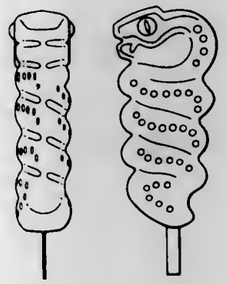
Peter M. Schwarz, Hamburg, Germany, assignor to Good Humor-Breyers Ice Cream, Division of Conopco, Inc., Green Bay, Wis.

Filed Aug. 8, 1995, Ser. No. 42,358

Claims priority, application Hague Agreement, Feb. 8, 1995, DM-032049

Term of patent 14 years

U.S. Cl. D1—104



373,452

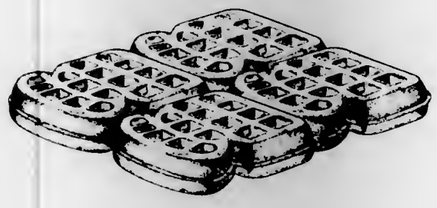
WAFFLE PRODUCT

Harold Gobble, Richland; Michael Bauman; Gerry Johnson, both of Battle Creek, and Douglas R. Zimmermann, Richland, all of Mich., assignors to Kellogg Company, Battle Creek, Mich.

Filed Sep. 20, 1995, Ser. No. 44,184

Term of patent 14 years

U.S. Cl. D1—125



373,453

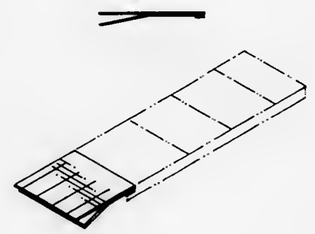
DRAFT PREVENTION FLAP FOR A SLEEPING BAG

Peter Mele, P.O. Box 533, Crown Point, N.Y. 12928

Filed Jan. 12, 1994, Ser. No. 17,398

Term of patent 14 years

U.S. Cl. D2—719



373,454

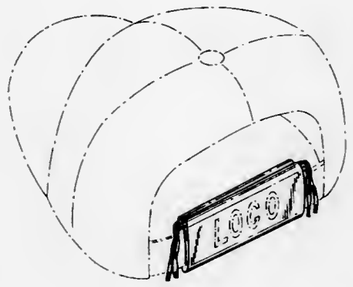
CAP STRAP COVER

Richard D. Ramirez, 7514 Evans Ford Rd., Clifton, Va. 22024

Filed Apr. 11, 1994, Ser. No. 21,217

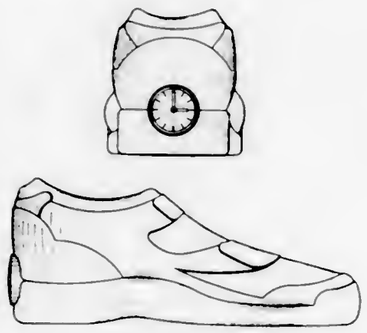
Term of patent 14 years

U.S. Cl. D2—891



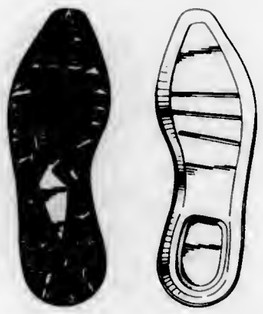
373,455
LEGGING
Nettie H. Graves, 4735 Crossbend Rd., McLeansville, N.C. 27301
Division of Ser. No. 19,407, Mar. 3, 1994, Pat. No. Des. 362,951. This application Sep. 29, 1995, Ser. No. 44,784
Term of patent 14 years
U.S. Cl. D2—901

373,456
AIR TIME SHOE
Calvin L. Gibson, 333 Laurina St., #116, Jacksonville, Fla. 32216
Filed Sep. 5, 1995, Ser. No. 43,469
Term of patent 14 years
U.S. Cl. D2—897

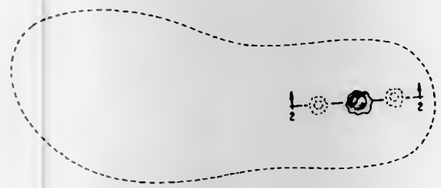


373,457
COMBINED SHOE SOLE AND PERIPHERY
Kimberly Fabio, Cambridge, Mass., assignor to The Keds Corporation, Lexington, Mass.
Filed Mar. 7, 1995, Ser. No. 35,816
Term of patent 14 years
U.S. Cl. D2—952

373,458
SHOE SOLE
Minoru Tanaka, Hyogo-ken, and Tsutomu Otani, Osaku-fu, both of, Japan, assignors to Asics Corporation, Hyogo-ken, Japan
Filed Oct. 18, 1994, Ser. No. 29,820
Claims priority, application Japan, Apr. 20, 1994, 6-11320
Term of patent 14 years
U.S. Cl. D2—957

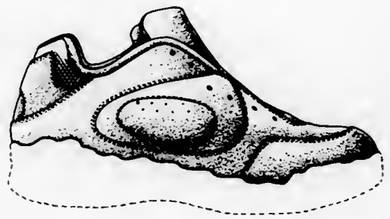


373,459
ELEMENT OF A SHOE SOLE WITH TRANSPARENT PORTION
Catherine M. Bailey, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jun. 15, 1994, Ser. No. 24,507
Term of patent 14 years
U.S. Cl. D2—967



373,460
SHOE UPPER
Kevin J. Crowley, Brentwood, N.H., assignor to Fila U.S.A., Inc., Hunt Valley, Md.
Filed Nov. 22, 1995, Ser. No. 46,955
Term of patent 14 years
U.S. Cl. D2—969

373,461
SHOE UPPER
Wilson W. Smith, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Apr. 21, 1995, Ser. No. 37,874
Term of patent 14 years
U.S. Cl. D2—969



373,462
SHOE UPPER
Joseph D. Boyer, Newington, N.H., assignor to The Timberland Company, Stratham, N.H.
Filed May 12, 1995, Ser. No. 38,803
Term of patent 14 years
U.S. Cl. D2—969

373,463
SHOE UPPER

373,465
UMBRELLA

373,467
UMBRELLA

373,469
COMBINED KEY RING AND FLASHLIGHT

373,463
SHOE UPPER
Pamela S. Greene, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jun. 30, 1995, Ser. No. 40,979
Term of patent 14 years
U.S. Cl. D2—969

373,464
SPORT SHOE LACING
Athena E. Hnarakis, 31 Scottsdale MHP, Laurel, Del. 19956
Filed Jan. 18, 1995, Ser. No. 33,700
Term of patent 14 years
U.S. Cl. D2—978

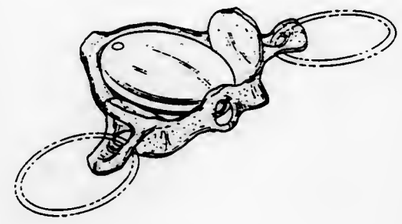
373,465
UMBRELLA
Robert G. Chipman, Austin, Tex., assignor to Landscape Forms, Inc., Kalamazoo, Mich.
Filed Aug. 18, 1995, Ser. No. 42,818
Term of patent 14 years
U.S. Cl. D3—5

373,466
UMBRELLA
Robert G. Chipman, Austin, Tex., assignor to Landscape Forms, Inc., Kalamazoo, Mich.
Filed Aug. 18, 1995, Ser. No. 42,816
Term of patent 14 years
U.S. Cl. D3—5

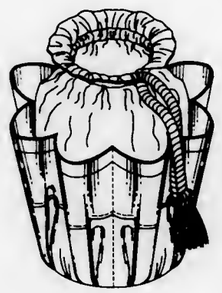
373,467
UMBRELLA
Robert G. Chipman, Austin, Tex., assignor to Landscape Forms, Inc., Kalamazoo, Mich.
Filed Aug. 18, 1995, Ser. No. 42,821
Term of patent 14 years
U.S. Cl. D3—5

373,468
TWO CANOPY FOLD-UP UMBRELLA
Emanuel Dubinsky, 3 Cross Ridge Rd., Chappaqua, N.Y. 10514
Filed Sep. 12, 1995, Ser. No. 43,786
Term of patent 14 years
U.S. Cl. D3—5

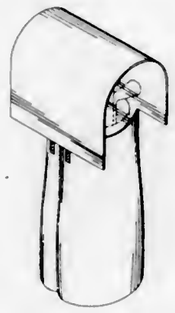
373,469
COMBINED KEY RING AND FLASHLIGHT
Kenneth L. Hamilton, 22546 Ardmore Park, St. Clair Shores, Mich. 48081
Filed Jul. 25, 1995, Ser. No. 41,792
Term of patent 14 years
U.S. Cl. D3—209



373,470
BAG
Marilyn L. Wise, 3715 152nd St. NE., Marysville, Wash. 98271-8918
Filed Jul. 20, 1995, Ser. No. 41,656
Term of patent 14 years
U.S. Cl. D3—244



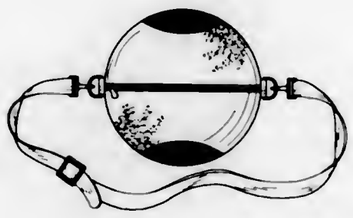
373,471
PROTECTIVE COVER FOR GOLFGEAR
Percival C. Banks, P.O. Box 162, Sunriver, Oreg. 97707
Filed Aug. 16, 1994, Ser. No. 27,214
Term of patent 14 years
U.S. Cl. D3—255



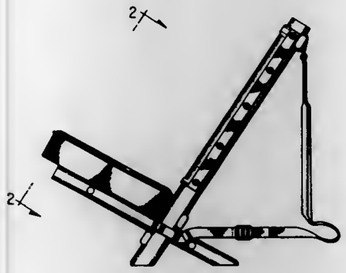
373,473
ARMCHAIR
Raymond Grosfillex, Oyonnax, France, assignor to Sarl Grosfillex, Oyonnas, France
Filed Sep. 12, 1995, Ser. No. 43,788
Claims priority, application Hague Agreement, Mar. 16, 1995, DMA/002818
Term of patent 14 years
U.S. Cl. D6—370

373,474
TOOTHBRUSH WITH HANDLE
Timothy R. Porter, P.O. Box 8007, Tulsa, Okla. 74101-8007
Filed Feb. 21, 1995, Ser. No. 35,092
Term of patent 14 years
U.S. Cl. D4—107

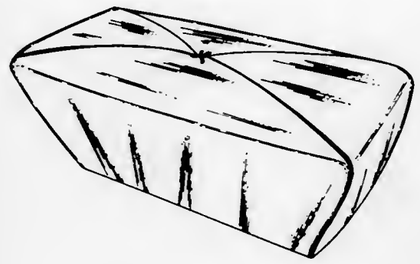
373,472
CARRIER FOR A SPORT BALL
Christopher Eaton, Salem, and James P. Reddy, Lynn, both of Mass., assignors to DAG Products, Hampton, N.H.
Filed Jun. 6, 1995, Ser. No. 40,419
Term of patent 14 years
U.S. Cl. D3—257



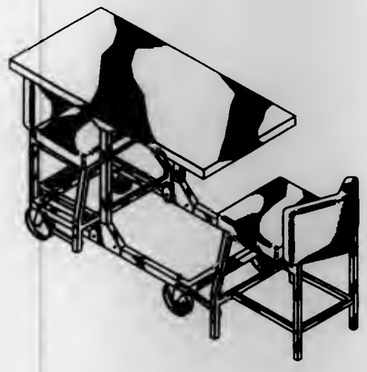
373,475
COMBINED BEACH CHAIR AND BACKRACK
Tom Sullivan, 1347 Gates Ave., Manhattan Beach, Calif. 90266
Filed Nov. 1, 1995, Ser. No. 45,877
Term of patent 14 years
U.S. Cl. D6—335



373,477
UPHOLSTERED OTTOMAN
Sally S. Lewis, 715 N. Canon Dr., Beverly Hills, Calif. 90210
Filed Oct. 25, 1994, Ser. No. 30,262
Term of patent 14 years
U.S. Cl. D6—349



373,476
TABLE WITH ATTACHED CHAIRS
Carl G. Hull, 537 Wilcox St., Waupun, Wis. 53963
Filed May 26, 1995, Ser. No. 39,543
Term of patent 14 years
U.S. Cl. D6—338



373,478
ARMCHAIR
Raymond Grosfillex, Oyonnax, France, assignor to Sarl Grosfillex, Oyonnax, France
Filed Sep. 12, 1995, Ser. No. 43,808
Claims priority, application Hague Agreement, Jul. 24, 1995, DMA/003008
Term of patent 14 years
U.S. Cl. D6—369

373,479
CHAIR

373,481
ARMCHAIR

373,483
FLOATING CHAIR

373,485
SEAT

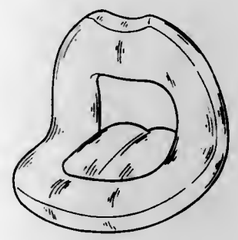
373,479
CHAIR
Chan-chin Lee, No. 303, Tzuli 1st Rd., Sanmin Dist., Kaohsiung, Taiwan
Filed Nov. 20, 1995, Ser. No. 46,551
Term of patent 14 years
U.S. Cl. D6—370

373,481
ARMCHAIR
Raymond Grosfillex, Oyonnax, France, assignor to Sarl Grosfillex, Oyonnax, France
Filed Sep. 12, 1995, Ser. No. 43,807
Claims priority, application Hague Agreement, Jul. 24, 1995, DMA/003008
Term of patent 14 years
U.S. Cl. D6—370

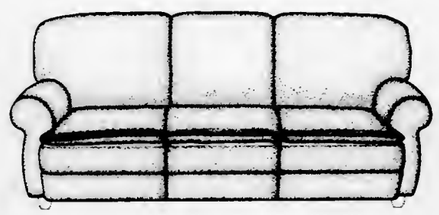
373,480
ARMCHAIR
Raymond Grosfillex, Oyonnax, France, assignor to Sarl Grosfillex, Oyonnax, France
Filed Sep. 12, 1995, Ser. No. 43,750
Claims priority, application Hague Agreement, Jul. 24, 1995, DMA/003008
Term of patent 14 years
U.S. Cl. D6—370

373,482
CHAIR
Chan-chin Lee, No. 303, Tzuli 1st Rd., Sanmin Dist., Kaohsiung, Taiwan, Taiwan
Filed Nov. 2, 1995, Ser. No. 45,940
Term of patent 14 years
U.S. Cl. D6—370

373,483
FLOATING CHAIR
Leroy L. Peterson, Omaha, Nebr., assignor to Sportstuff Inc., Omaha, Nebr.
Filed Oct. 17, 1995, Ser. No. 45,346
Term of patent 14 years
U.S. Cl. D6—380

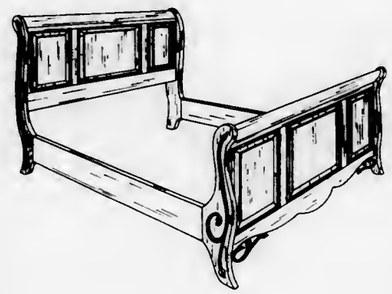


373,485
SEAT
Pasquale Natuzzi, Santeramo In Colle, and Domenico Abbruzzese, Gioia del Colle, both of, Italy, assignors to Industrie Natuzzi, Spa, Bari, Italy
Filed Sep. 11, 1995, Ser. No. 43,715
Term of patent 14 years
U.S. Cl. D6—381



373,484
SEAT
Pasquale Natuzzi, and Raffaella Lucarelli, both of Santeramo In Colle, Italy, assignors to Industrie Natuzzi, Spa, Bari, Italy
Filed Mar. 6, 1995, Ser. No. 35,945
Term of patent 14 years
U.S. Cl. D6—381

373,486
BED
H. Thomas Keller, and Scott Risdon, both of High Point, N.C., assignors to Vaughan Furniture Company, Inc., Galax, Va.
Division of Ser. No. 30,024, Oct. 20, 1994. This application Sep. 29, 1995, Ser. No. 44,820
Term of patent 14 years
U.S. Cl. D6—393



373,487
FOLDING CARD TABLE

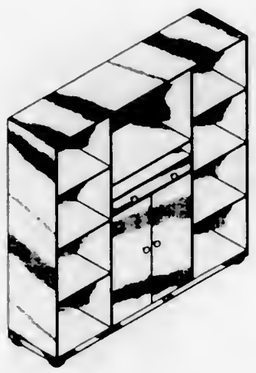
373,489
CHEST

373,491
DRESSER

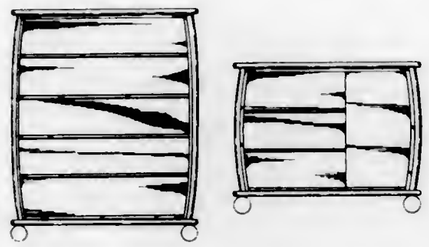
373,493
TOP CLOSURE FOR FREEZER

373,487
FOLDING CARD TABLE
Louis E. Eisner, 1015 Mulberry, Muscatine, Iowa 52761
Filed Aug. 9, 1995, Ser. No. 42,385
Term of patent 14 years
U.S. Cl. D6—429

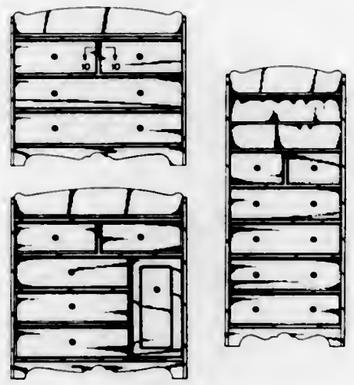
373,488
ENTERTAINMENT CENTER
Theodore A. Johnson, 2723 Kenhill Dr., Bowie, Md. 20715
Filed Jun. 16, 1995, Ser. No. 40,359
Term of patent 14 years
U.S. Cl. D6—436



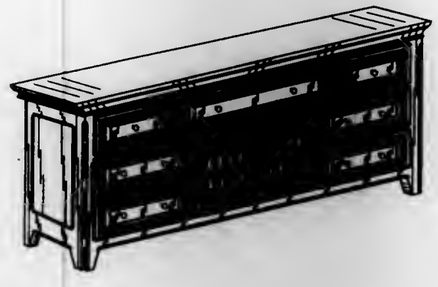
373,489
CHEST
Lawrence E. Tabbia, 102 E. Pleasant Grove Rd., Jackson, N.J. 08527
Filed Sep. 7, 1994, Ser. No. 28,086
Term of patent 14 years
U.S. Cl. D6—441



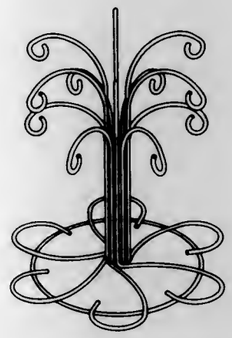
373,490
CHEST
Lawrence E. Tabbia, 102 E. Pleasant Grove Rd., Jackson, N.J. 08527
Filed Oct. 3, 1994, Ser. No. 29,816
Term of patent 14 years
U.S. Cl. D6—445



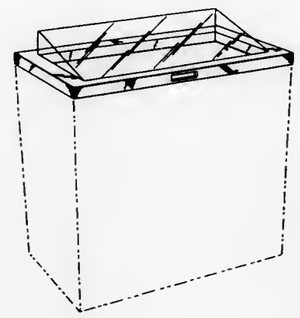
373,491
DRESSER
Guy A. Walters, III, High Point, and Avis E. Tobin, Jr., Thomasville, both of N.C., assignors to Thomasville Furniture Industries, Inc., Thomasville, N.C.
Filed Oct. 28, 1994, Ser. No. 29,980
Term of patent 14 years
U.S. Cl. D6—445



373,492
DISPLAY RACK
Patricia A. Stanley, Mooresboro, N.C., assignor to Glassical Heirlooms, Inc., Forest City, N.C.
Division of Ser. No. 3,551, Jan. 12, 1993, Pat. No. No. Des. 361,224. This application Mar. 7, 1995, Ser. No. 35,795
Term of patent 14 years
U.S. Cl. D6—458



373,493
TOP CLOSURE FOR FREEZER
Sidney Barish, Richmond Hill, Canada, assignor to Creative Carts & Freezers Inc., Richmond Hill, Canada
Filed May 10, 1993, Ser. No. 8,173
Claims priority, application Canada, Apr. 19, 1993, 14-04-93-2
Term of patent 14 years
U.S. Cl. D6—472



373,494
DROP LEAF TABLE
Chan-shin Lee, No. 303, Tzuli 1st Rd., Sanmin Dist., Kaohsiung, Taiwan
Filed Aug. 10, 1995, Ser. No. 42,444
Term of patent 14 years
U.S. Cl. D6—480

373,495
CHAIR
Jeffrey Lee Hall, 1 Hall Rd., Sandy Hook, Conn. 06482
Filed Jun. 16, 1995, Ser. No. 40,360
Term of patent 14 years
U.S. Cl. D6—334

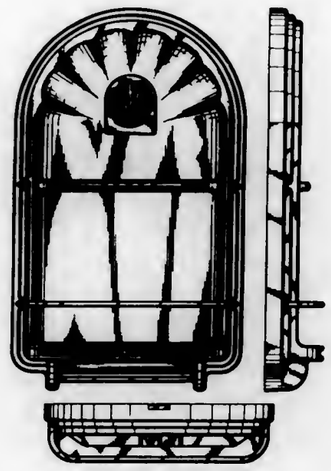
373,497
SURFACE MOUNT SHOWER SHELF
Jeffrey Lee Hall, 1 Hall Rd., Sandy Hook, Conn. 06482
Filed Jun. 16, 1995, Ser. No. 40,361
Term of patent 14 years
U.S. Cl. D6—334

373,499
ELECTRIC KETTLE
Jeffrey Lee Hall, 1 Hall Rd., Sandy Hook, Conn. 06482
Filed Jun. 16, 1995, Ser. No. 40,362
Term of patent 14 years
U.S. Cl. D7—370

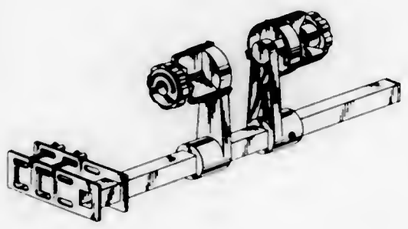
373,501
COFFEE MAKER
Jeffrey Lee Hall, 1 Hall Rd., Sandy Hook, Conn. 06482
Filed Jun. 16, 1995, Ser. No. 40,363
Term of patent 14 years
U.S. Cl. D7—370

373,495
CHAIR
Robert Whalen, 2120 Queen Street East, Suite 300, Toronto, Ontario, Canada
Filed Sep. 8, 1995, Ser. No. 43,485
Term of patent 14 years
U.S. Cl. D6—500

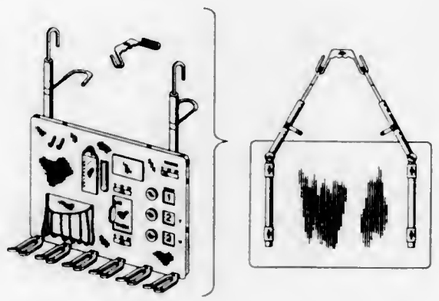
373,497
SURFACE MOUNT SHOWER SHELF
Benjamin E. Gilmore, 638 Sixth St., Hermosa Beach, Calif. 90254
Filed Aug. 16, 1994, Ser. No. 27,227
Term of patent 14 years
U.S. Cl. D6—525



373,496
FILMSTRIP DISPENSER FOR FOOD PACKAGING
Timothy E. Kienzle, Kansas City, Mo., assignor to Robbie Manufacturing, Inc., Lenexa, Kans.
Filed Oct. 6, 1994, Ser. No. 29,449
Term of patent 14 years
U.S. Cl. D6—518

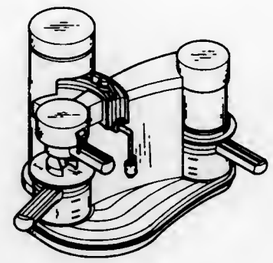


373,498
BASEBALL EQUIPMENT STORAGE AND ORGANIZING DEVICE
Michael B. Young, 9335 Hardy, Overland Park, Kans. 66212
Filed Aug. 2, 1995, Ser. No. 42,167
Term of patent 14 years
U.S. Cl. D6—552

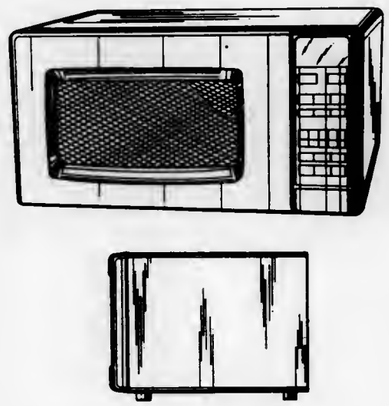


373,499
ELECTRIC KETTLE
Philippe Piret, Ifs, France, assignor to Moulinex S.A., Bagnolet, France
Filed Jan. 17, 1995, Ser. No. 33,575
Claims priority, application France, Jul. 20, 1994, 94 4233
Term of patent 14 years
U.S. Cl. D7—312

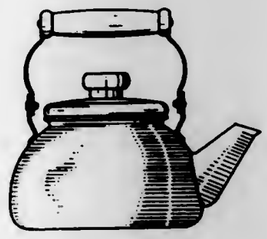
373,501
COFFEE MAKER
Yang P. Han, 56, Min Sheng Street, Fengyuan, Taichung, Taiwan
Filed Aug. 1, 1994, Ser. No. 26,612
Term of patent 14 years
U.S. Cl. D7—309



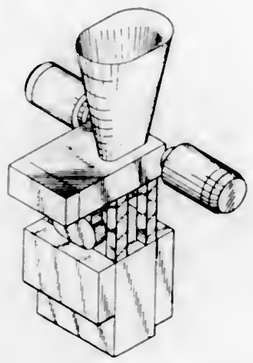
373,502
MICROWAVE OVEN
Nobuhiro Fujii, and Kiyoshi Takeoka, both of Osaka-fu, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Jun. 15, 1995, Ser. No. 41,211
Claims priority, application Japan, Dec. 15, 1994, 6-38508
Term of patent 14 years
U.S. Cl. D7—351



373,500
KETTLE
Chen-Kun Lee, No. 1, Lane 111, Sec. 3, Chung San Rd., Tan Tzu Hsiang, Taichung Hsien, Taiwan
Filed May 2, 1995, Ser. No. 38,293
Term of patent 14 years
U.S. Cl. D7—320

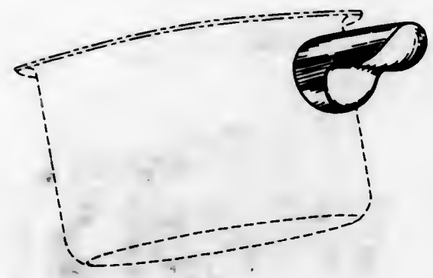


373,503
MACHINE FOR HANDLING BAKERY DOUGH
Donald L. Cummins, deceased, late of Mechanicsville, Va., assignor to Cummins Eagle, Inc., Ashland, Va.
Filed Aug. 17, 1995, Ser. No. 42,864
Term of patent 14 years
U.S. Cl. D7—376

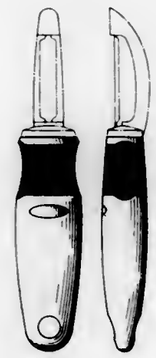


373,504
ELECTRIC FOOD PROCESSOR
Bruno Leverrier, Lassay Les Chateaux, France, assignor to Moulinex S.A., Bagnolet, France
Filed May 25, 1995, Ser. No. 39,801
Claims priority, application France, Nov. 28, 1994, 94 6504
Term of patent 14 years
U.S. Cl. D7—378

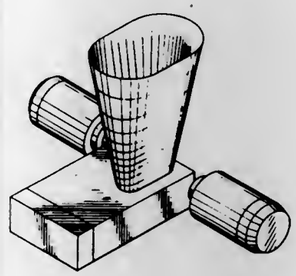
373,505
POT HANDLE
Eric Chan, New York, N.Y., assignor to Corning Incorporated, Corning, N.Y.
Filed Jun. 20, 1994, Ser. No. 20,386
Term of patent 14 years
U.S. Cl. D7—393



373,506
HANDLE
Tucker L. Viemeister, New York, N.Y., assignor to General Housewares Corp., Stamford, Conn.
Filed Apr. 14, 1994, Ser. No. 21,291
Term of patent 14 years
U.S. Cl. D7—395

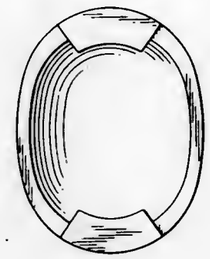


373,507
INFEED HEAD FOR A BAKERY DOUGH HANDLING MACHINE
Donald L. Cummins, deceased, late of Mechanicsville, Va., assignor to Cummins Eagle, Inc., Ashland, Va.
Filed Aug. 17, 1995, Ser. No. 42,802
Term of patent 14 years
U.S. Cl. D7—412



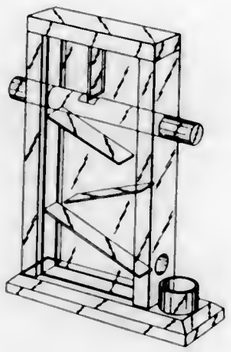
373,508
BEVERAGE CONTAINER
Henry J. Shin, 3386 El Camino Real, Santa Clara, Calif. 95051
Filed Aug. 7, 1995, Ser. No. 42,329
Term of patent 14 years
U.S. Cl. D7—515

373,509
CONTAINER
Rocco Bormioli, Parma, Italy, assignor to Vetreria Parmense Bormioli Rocco S.P.A., Parma, Italy
Filed Apr. 5, 1994, Ser. No. 20,941
Claims priority, application Italy, Oct. 8, 1993, M09300007
Term of patent 14 years
U.S. Cl. D7—550

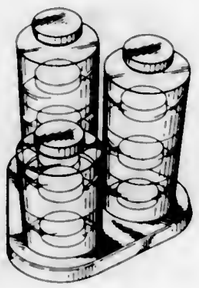


373,510
STACKABLE HOT DOG PLATE WITH CENTER COMPARTMENT
Bette E. Smith, 23681 Posey La., West Hills, Calif. 91304
Filed May 8, 1995, Ser. No. 38,571
Term of patent 14 years
U.S. Cl. D7—555

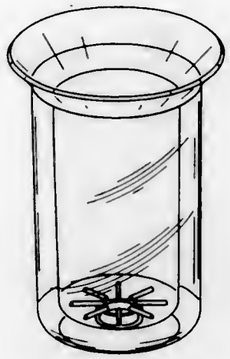
373,511
CANDY DISPENSER
Douglas Militzok, 107 Lawler Rd., West Hartford, Conn. 06117
Filed Sep. 28, 1995, Ser. No. 44,658
Term of patent 14 years
U.S. Cl. D7—589



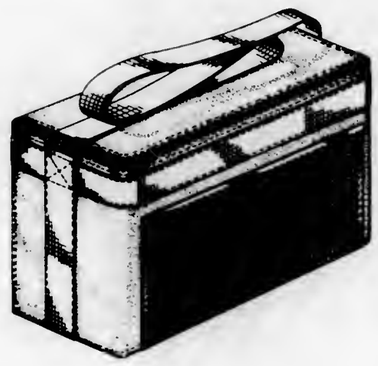
373,512
COMBINED SEASONING CONTAINERS AND ROTATING BASE
Park Hong, Taipei, Taiwan, assignor to Prodyne Enterprises Inc, Ontario, Calif.
Filed Jul. 31, 1995, Ser. No. 42,016
Term of patent 14 years
U.S. Cl. D7—592



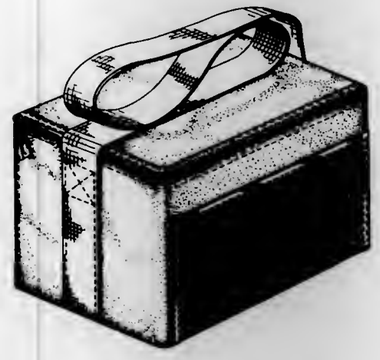
373,513
WINE COOLER
Carsten Joergensen, Kriens, Switzerland, assignor to PI-Design AG, Triengen, Switzerland
Filed Jun. 13, 1995, Ser. No. 40,238
Claims priority, application Denmark, Dec. 14, 1994, 1151/94
Term of patent 14 years
U.S. Cl. D7—603



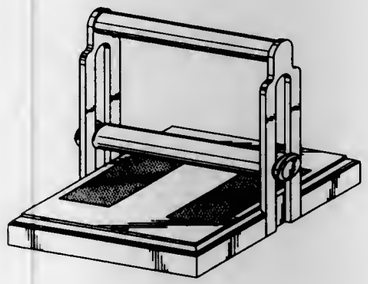
373,514
FLEXIBLE COOLER
Thomas J. Melk, Chicago, Ill., assignor to Outer Circle Products, Ltd., Chicago, Ill.
Filed Jun. 22, 1995, Ser. No. 40,670
Term of patent 14 years
U.S. Cl. D7—607



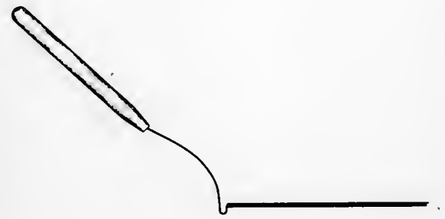
373,515
FLEXIBLE COOLER
Thomas J. Melk, Chicago, Ill., assignor to Outer Circle Products, Ltd., Chicago, Ill.
Filed Jun. 22, 1995, Ser. No. 40,672
Term of patent 14 years
U.S. Cl. D7—607



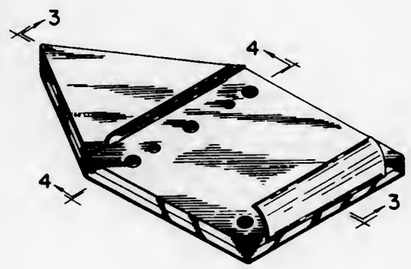
373,516
NAPKIN HOLDER
Michael Curcio, 9404 Nelson La., Manassas, Va. 22110
Filed Oct. 6, 1995, Ser. No. 46,579
Term of patent 14 years
U.S. Cl. D7—631



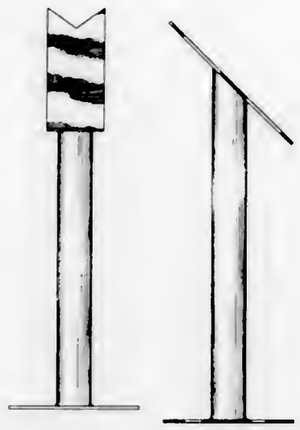
373,517
TORTILLA FRY FORK
Gregory J. Tuchscboundr, N1054 Hwy. H, Fremont, Wis. 54940, and James A. Heiman, 116 Adella Beach Rd., Neenah, Wis. 54956
Filed Jun. 22, 1995, Ser. No. 40,587
Term of patent 14 years
U.S. Cl. D7—683



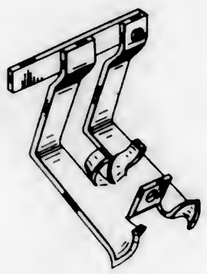
373,518
LOW COST DETAIL S SANDING MACHINE ACCESSORY
Pentti V. Multala, 49 Amsden Dr., Rochester, N.Y. 14623
Filed Dec. 2, 1994, Ser. No. 31,694
Term of patent 14 years
U.S. Cl. D8—70



373,519
TORCH HOLDER
Leon Escalante, 5201 Kaltenbrun Rd., Fort Worth, Tex. 76119, and Elida Escalante, P.O. Box 504, Kennedale, Tex. 76060
Filed Apr. 3, 1995, Ser. No. 37,023
Term of patent 14 years
U.S. Cl. D8—71

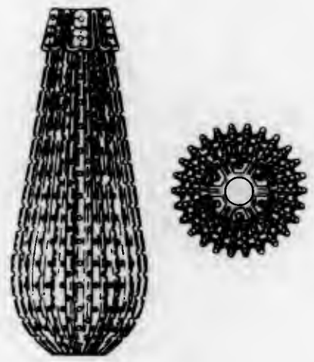


373,520
TORCH FOOT WITH ROUND MOUNT
Fate King, Jr., 329 Diamond St., Mound City, Ill. 62963
Filed Jun. 7, 1995, Ser. No. 39,956
Term of patent 14 years
U.S. Cl. D8—71

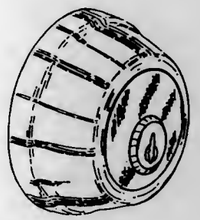


373,521
FOLDING COMBAT KNIFE
Rex Applegate, 32956 State Hwy. 38, Scottsburg, Oreg. 97473; William W. Harsey, Jr., 82710 N. Howe La., Creswell, Oreg. 97426, and Alney K. Vallotton, 621 Fawn Ridge Dr., Oakland, Oreg. 97462
Filed Apr. 24, 1995, Ser. No. 37,991
Term of patent 14 years
U.S. Cl. D8—99

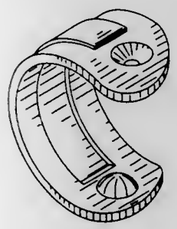
373,522
PULL CHAIN DEVICE
Neall W. Humphrey, El Dorado Hills, Calif., assignor to Trade Source International, El Dorado Hills, Calif.
Filed Jan. 18, 1995, Ser. No. 33,714
Term of patent 14 years
U.S. Cl. D8—307



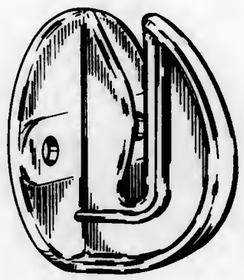
373,523
CYLINDER LOCK HOUSING
Anthony J. Carsello, Chino, Calif., assignor to Emhart Inc., Newark, Del.
Filed Jul. 31, 1992, Ser. No. 922,077
Term of patent 14 years
U.S. Cl. D8—352



373,524
SPRING CLIP
Patrick J. Mainville, 2512 Sunnyside St., Sarasota, Fla. 34239
Filed Nov. 14, 1994, Ser. No. 30,985
Term of patent 14 years
U.S. Cl. D8—395



373,525
CORD TIE-DOWN BASE HOOK
Marty B. Roethler, 4324 Morgan Ridge Rd., Paradise, Calif. 95969
Filed Sep. 5, 1995, Ser. No. 43,422
Term of patent 14 years
U.S. Cl. D8—367



373,526
CORD TIE-DOWN HOOK
Marty B. Roethler, 4324 Morgan Ridge Rd., Paradise, Calif. 95969
Filed Sep. 5, 1995, Ser. No. 43,427
Term of patent 14 years
U.S. Cl. D8—367

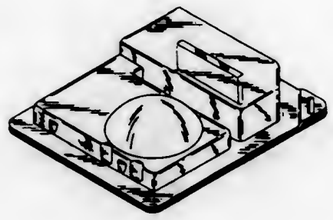
373,527
BONE WAX APPLICATOR PACKAGE
Arnold G. Phillips, 1429 Madison Dr., Buffalo Grove, Ill. 60089

373,529
DISPENSER
Jon R. Zogg, Westfield; Robert Mack, Flemington, and James

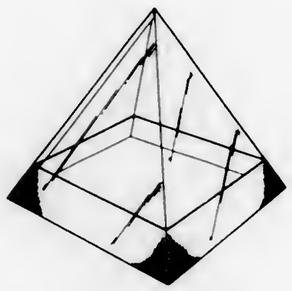
373,531
CARTON FOR DISPLAY AND TRANSPORT OF BEVERAGES

373,533
COMBINED BOTTLE AND CAP
Gregory A. Lathrop, Manchester; Mark D. Gerhart, Westmin-

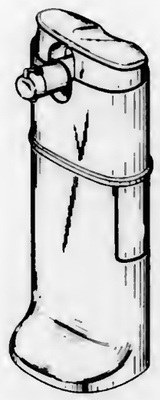
373,527
BONE WAX APPLICATOR PACKAGE
Arnold G. Phillips, 1420 Madison Dr., Buffalo Grove, Ill. 60089
Filed May 16, 1995, Ser. No. 38,912
Term of patent 14 years
U.S. Cl. D9—415



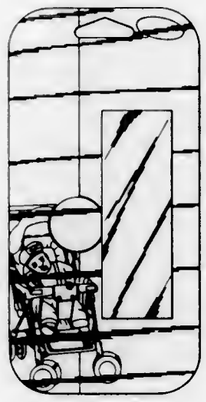
373,528
BOX
Winston Ser Tuen Wei, Singapore, Singapore, assignor to Multiscience System Pte. Ltd., Singapore
Filed Nov. 18, 1994, Ser. No. 31,147
Claims priority, application United Kingdom, May 19, 1994, 2039151
Term of patent 14 years
U.S. Cl. D9—431



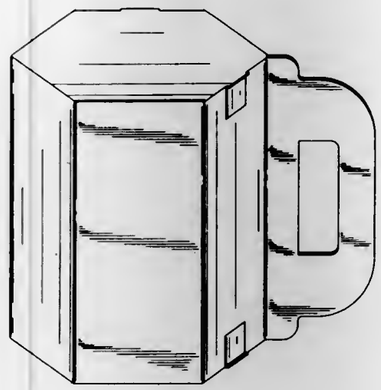
373,529
DISPENSER
Jon R. Zogg, Westfield; Robert Mack, Flemington, and James C. McKinney, Cranbury, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.
Filed Jul. 28, 1995, Ser. No. 42,000
Term of patent 14 years
U.S. Cl. D9—300



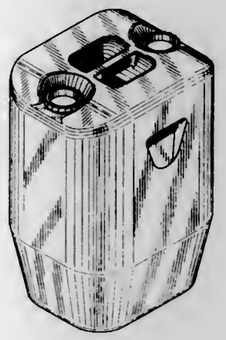
373,530
BLISTER PACKAGE
Richard C. Levy, P.O. Box 34828, Bethesda, Md. 20827, and Richard J. Naddocks, 302 Lexington Dr., Silver Spring, Md. 20901
Filed Aug. 25, 1995, Ser. No. 43,127
Term of patent 14 years
U.S. Cl. D9—415



373,531
CARTON FOR DISPLAY AND TRANSPORT OF BEVERAGES
Edward J. Cooksey, Mitchellville, Md., assignor to Frederick Brewing Company, Frederick, Md.
Filed Nov. 18, 1994, Ser. No. 31,247
Term of patent 14 years
U.S. Cl. D9—430



373,532
CONTAINER
Wallace A. Miller, Cincinnati, Ohio, assignor to SST Industries, Inc., Loveland, Ohio
Filed Jul. 31, 1995, Ser. No. 42,024
Term of patent 14 years
U.S. Cl. D9—520



373,533
COMBINED BOTTLE AND CAP
Gregory A. Lathrop, Manchester; Mark D. Gerhart, Westminster; David F. Gnadt; Arnold Brown, both of Owings Mills, all of Md.; Frank E. Gonda, Fairfield, Conn., and Harry H. Haubert, Freehold, N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.
Filed Mar. 31, 1995, Ser. No. 36,977
Term of patent 14 years
U.S. Cl. D9—528

373,534
COMBINED BOTTLE AND CAP
Gregory A. Lathrop, Manchester; Mark D. Gerhart, Westminster; David F. Gnadt; Arnold Brown, both of Owings Mills, all of Md.; Frank E. Gonda, Fairfield, Conn., and Harry H. Haubert, Freehold, N.J., assignors to Lever Bothers Company, Division of Conopco, Inc., New York, N.Y.
Filed Mar. 31, 1995, Ser. No. 36,978
Term of patent 14 years
U.S. Cl. D9—528

373,535
COMBINED BOTTLE AND CAP

373,537
BOTTLE

373,539
WATCH CASE

373,541
HOUSING FOR ELECTRIC THERMOSTAT

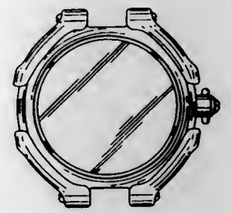
373,535
COMBINED BOTTLE AND CAP
Gregory A. Lathrop, Manchester; Mark D. Gerhart, Westminster; David F. Gandt; Arnold Brown, both of Owings Mills, all of Md.; Frank E. Gonda, Fairfield, Conn., and Harry H. Haubert, Freehold, N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.
Filed Mar. 31, 1995, Ser. No. 36,987
Term of patent 14 years
U.S. Cl. D9—528

373,536
COMBINED BOTTLE AND CAP
Emily M. Kokenge, and Howard H. McIlvain, both of Cincinnati, Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio
Filed Mar. 15, 1994, Ser. No. 19,979
Term of patent 14 years
U.S. Cl. D9—529

373,537
BOTTLE
Lowell C. Schirado, Kentwood, Mich., assignor to Amway Corporation, Ada, Mich.
Filed Feb. 10, 1994, Ser. No. 18,607
Term of patent 14 years
U.S. Cl. D9—572

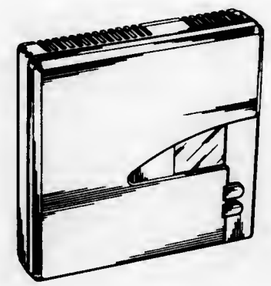
373,538
ANALOG WATCH CASE
Judith R. Riley, Goshen, Conn., assignor to Timex Corporation, Middlebury, Conn.
Filed Nov. 7, 1994, Ser. No. 30,772
The portion of the term of this patent subsequent to Aug. 15, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D10—30

373,539
WATCH CASE
Francoise H. Droz, Case Postale, Switzerland, assignor to Titan International Marketing Ltd., Bangalore, Ind.
Filed Aug. 24, 1995, Ser. No. 43,060
Claims priority, application United Kingdom, Apr. 26, 1995, 2047016
Term of patent 14 years
U.S. Cl. D10—36



373,540
COMBINED WATCH AND BRACELET
Rodolphe Cattin, La Chaux-de-Fonds, Switzerland, assignor to Chagal Horlogerie S.A. (Chagal Horlogerie A.G.) (Chagal Horlogerie Ltd.), La Chaux-de-Fonds, Switzerland
Filed Aug. 16, 1995, Ser. No. 42,753
Claims priority, application Switzerland, Apr. 5, 1995, DMA/002850
Term of patent 14 years
U.S. Cl. D10—32

373,541
HOUSING FOR ELECTRIC THERMOSTAT
Marc Jacques, Québec; Hubert Gagnon; Aldo Balatti, both of St-Augustin; Serge Beaudoin, Rock Forest, and Michel Noël, Sherbrooke, all of, Canada, assignors to Les Systems Electroniques C-MAC Inc., Sherbrooke, Canada
Filed Jul. 12, 1995, Ser. No. 41,379
Claims priority, application Canada, Mar. 24, 1995, 1995-0676
Term of patent 14 years
U.S. Cl. D10—50



373,542
COMBINED WATCH AND BRACELET
Rodolphe Cattin, La Chaux-de-Fnods, Switzerland, assignor to Chagal Horlogerie S.A. (Chagal Horlogerie A.G.) (Chagal Horlogerie Ltd.), La Chaux-de-Fonds, Switzerland
Filed Aug. 16, 1995, Ser. No. 42,754
Claims priority, application WIPO, Apr. 5, 1995, DMA/002 850
Term of patent 14 years
U.S. Cl. D10—32

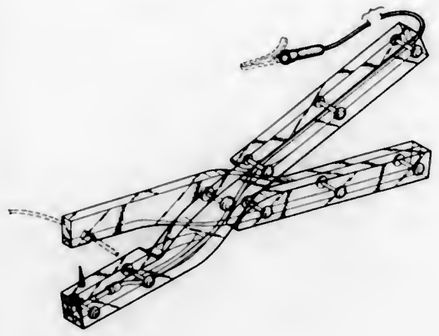
373,543
TRANSPARENT VARIABLE VOLTAGE TESTER

373,545
WINDOW ALARM SURVEILLANCE PANEL

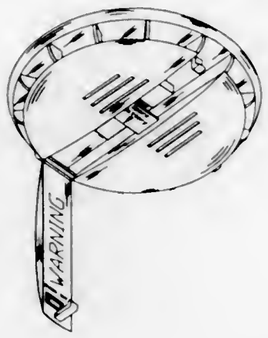
373,547
THEME WIND CHIME

373,549
CHAMOIS NECKLACE

373,543
TRANSPARENT VARIABLE VOLTAGE TESTER
William I. Price, Highway 310 Box 3109A, Madrid, N.Y. 13660
Filed Jul. 31, 1995, Ser. No. 42,057
Term of patent 14 years
U.S. Cl. D10—79



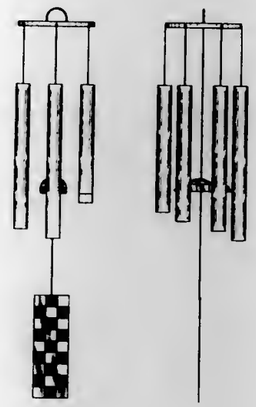
373,544
SMOKE DETECTOR
Aaron M. Nickles, 341 Furnace Dock Rd. Valeria 18, Cortlandt Manor, N.Y. 10566, and Daniel R. Nickles, 839 E. Shore Rd., Hewitt, N.J. 07421
Filed May 3, 1995, Ser. No. 38,333
Term of patent 14 years
U.S. Cl. D10—106



373,545
WINDOW ALARM SURVEILLANCE PANEL
Frank Armanno, Sr., 14399 Picea Ct., Fort Pierce, Fla. 34951
Filed Jun. 8, 1995, Ser. No. 40,037
Term of patent 14 years
U.S. Cl. D10—106

373,546
AN AUDIBLE SIGNAL FOR ALARM UNITS
Yoshio Imahori, Shizouka, Japan, assignor to Star Micronics Co., Ltd., Shizouka-ken, Japan
Filed Mar. 10, 1995, Ser. No. 35,990
Claims priority, application Japan, Sep. 24, 1994, 6-28828
Term of patent 14 years
U.S. Cl. D10—116

373,547
THEME WIND CHIME
Roy B. Stratford, 46 Brookwood La., Shelton, Conn. 06484
Filed Oct. 23, 1995, Ser. No. 45,554
Term of patent 14 years
U.S. Cl. D10—118



373,548
SKATE BOOT
Raymond Losi, II, Thosand Oaks, Calif., assignor to Varifex, Inc., Moorpark, Calif.
Filed Jul. 5, 1994, Ser. No. 25,547
Term of patent 14 years
U.S. Cl. D2—904

373,549
CHAMOIS NECKLACE
Anthony J. Bova, 2039 Cove Clr., Stockton, Calif. 95204
Filed Sep. 5, 1995, Ser. No. 43,421
Term of patent 14 years
U.S. Cl. D11—7

373,550
RING
Israel Itzkowitz, Los Angeles, Calif., assignor to Ambar Diamonds Inc., Los Angeles, Calif.
Filed Aug. 14, 1995, Ser. No. 42,621
Term of patent 14 years
U.S. Cl. D11—34

373,551
FACETED GEMSTONE
Israel Itzkowitz, Los Angeles, Calif., assignor to Ambar Diamonds Inc., Los Angeles, Calif.
Filed Aug. 14, 1995, Ser. No. 42,622
Term of patent 14 years
U.S. Cl. D11—34

373,553
PEARL CLUSTER BUTTON
Jeffrey Rosenthal, Los Angeles, Calif., assignor to Ambar Diamonds Inc., Los Angeles, Calif.
Filed Aug. 14, 1995, Ser. No. 42,623
Term of patent 14 years
U.S. Cl. D11—34

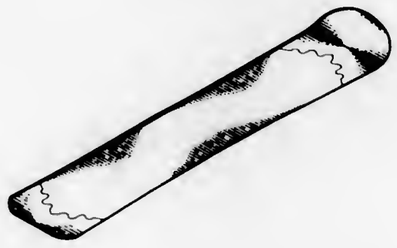
373,555
BRACE FOR A WALKER
Evan T. Ward, Ann Arbor, Mich., and Shivaprasad Dhanapal, David W. Shaw, Saginaw, Gary R. Scott, Midland, and Robert

373,551
FACETED GEMSTONE
Richard W. Udko, Beverly Hills, Calif., assignor to Unigem International, Beverly Hills, Calif.
Filed Nov. 24, 1995, Ser. No. 47,008
Term of patent 14 years
U.S. Cl. D11—90

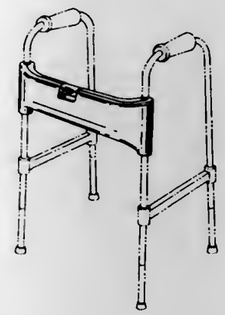
373,552
EGG BASKET
Janet A. Lownsbury, 4544 73rd St. N., St. Petersburg, Fla. 33709
Filed Oct. 3, 1995, Ser. No. 44,905
Term of patent 14 years
U.S. Cl. D11—121

373,553
PEARL CLUSTER BUTTON
Gerhard Fildan, Wohnpark Alte Erlaa, Anton Baumgartner Str. 44, C 4 17 01, A-1232 Vienna, Austria
Filed Jan. 24, 1995, Ser. No. 33,948
Term of patent 14 years
U.S. Cl. D11—222

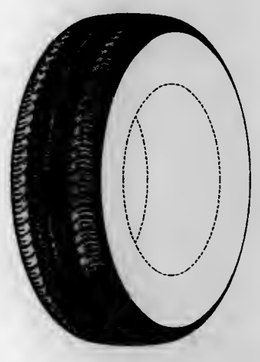
373,554
SNOWBOARD WITH INTERLOCKING TIP AND TAIL
Steven T. Sherrard, 19208 1st SE., Bothell, Wash. 98012
Filed Nov. 21, 1994, Ser. No. 31,287
Term of patent 14 years
U.S. Cl. D12—8



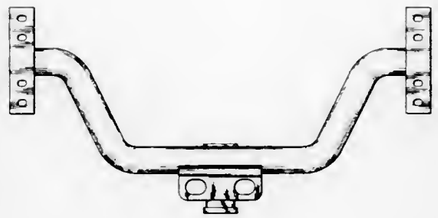
373,555
BRACE FOR A WALKER
Evan T. Ward, Ann Arbor, Mich., and Shivaprasad Dhanapal, Statesville, N.C., assignors to Rubbermaid Health Care Products Inc., Statesville, N.C.
Filed Nov. 15, 1995, Ser. No. 46,465
Term of patent 14 years
U.S. Cl. D12—133



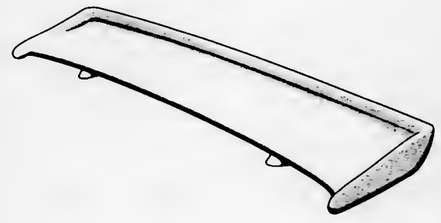
373,556
TIRE TREAD
John S. Attinello, Hartville, Ohio; Maurice Graas, Reichlange, Luxembourg, and Karl E. Sundkvist, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Division of Ser. No. 18,173, Jan. 31, 1994, Pat. No. Des. 366,858. This application Sep. 28, 1995, Ser. No. 44,664
Term of patent 14 years
U.S. Cl. D12—147



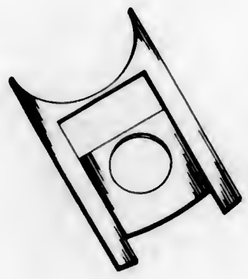
373,557
TRAILER HITCH
David W. Shaw, Saginaw; Gary B. Scott, Midland, and Robert J. Shortland, Bridgeport, all of Mich., assignors to Means Industries, Saginaw, Mich.
Filed Apr. 27, 1995, Ser. No. 38,060
Term of patent 14 years
U.S. Cl. D12—162



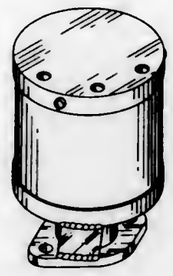
373,558
REAR SPOILER FOR CUSTOMIZED AUTOMOBILE BODY
Stephen M. Saleen, 24307 Nan Ct., Diamond Bar, Calif. 91765
Filed Jun. 16, 1995, Ser. No. 40,379
Term of patent 14 years
U.S. Cl. D12—181



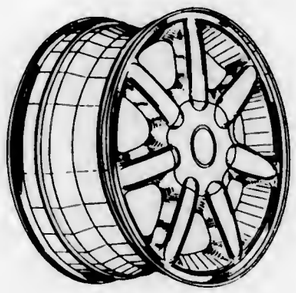
373,559
MOTORCYCLE DASHBOARD PANEL
Douglas Shower, 911 Greentree Dr., Winter Park, Fla. 32789
Filed Sep. 30, 1994, Ser. No. 29,219
Term of patent 14 years
U.S. Cl. D12—192



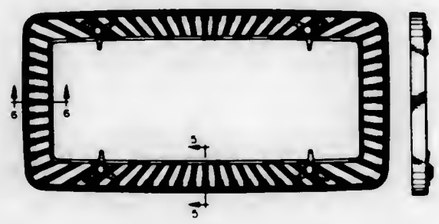
373,561
MUFFLER
Arthur R. Verlengiere, Santa Maria, Calif., assignor to R.L.V. Tuned Exhaust Products, Inc., Santa Maria, Calif.
Filed Mar. 14, 1994, Ser. No. 19,904
Term of patent 14 years
U.S. Cl. D12—194



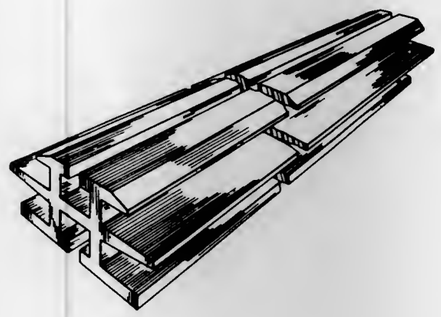
373,562
WHEEL
David Cole, Leiferde, Germany, assignor to Volkswagen AG, Wolfsburg, Germany
Division of Ser. No. 24,282, Jun. 10, 1994, Pat. No. Des. 368,884. This application Aug. 17, 1995, Ser. No. 43,241
Claims priority, application Germany, Feb. 1, 1994, 94 00 882.5
Term of patent 14 years
U.S. Cl. D12—211



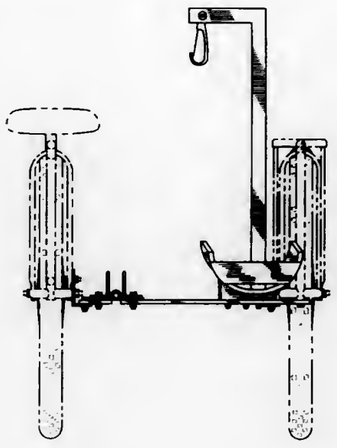
373,560
SPOKED LICENSE PLATE FRAME
Paul E. Spencer, 23302 S. Normandie Ave., Torrance, Calif. 90502
Filed Aug. 28, 1995, Ser. No. 43,178
Term of patent 14 years
U.S. Cl. D12—193



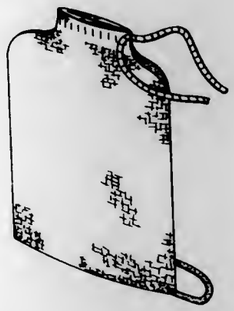
373,563
EXTRUDED WIPER BACKING STRIP
Barry J. Abbott; Valerie M. Abbott, both of Belgrave; Stephen J. Clarke, and Dino Donchi, both of Ringwood, all of, Australia, assignors to Clean Screen Wipers Pty. Ltd., Victoria, Australia
Filed Jan. 12, 1995, Ser. No. 33,406
Term of patent 14 years
U.S. Cl. D12—220



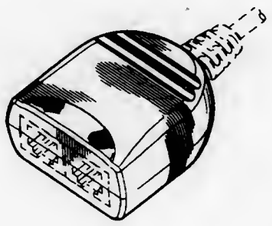
373,565
CARRIER FOR BICYCLE
Samuel R. McDougall, 518 Honeylocust, Bloomfield, N.M. 87413
Filed Aug. 1, 1994, Ser. No. 26,575
Term of patent 14 years
U.S. Cl. D12—408



373,564
HOPPER CAR CATCH BAG
Ted R. Borel, Bay City, Tex., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.
Filed Oct. 11, 1994, Ser. No. 29,612
Term of patent 14 years
U.S. Cl. D12—400



373,566
OVERMOLD FOR AN INTERFACE CABLE
Roman P. Rak, Delta, and William E. Fenton, Surrey, both of, Canada, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jun. 30, 1995, Ser. No. 40,944
Term of patent 14 years
U.S. Cl. D13—133



373,567
OVERMOLDED HOUSING FOR AN INTERFACE CABLE

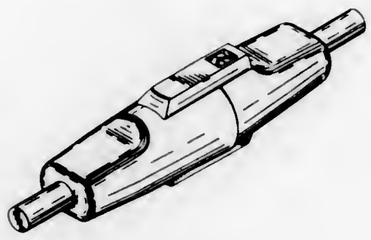
373,569
COMPUTER PORT CONSOLIDATION DEVICE

373,571
CONTROL PANEL FOR A ROOM AIR CONDITIONER

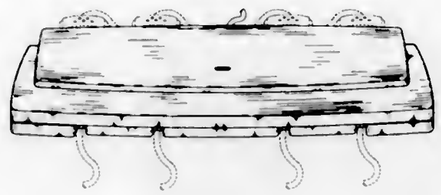
373,573
INDUSTRIAL COMPUTER

373,567
OVERMOLDED HOUSING FOR AN INTERFACE CABLE
Roman P. Rak, 5154 44th Avenue, Delta, British Columbia, Canada, and William E. Fenton, 16476 84A Avenue, Surrey, British Columbia, Canada
Filed Jun. 30, 1995, Ser. No. 40,946
Term of patent 14 years
U.S. Cl. D13—133

373,568
TWO-PIECE INTERLOCKING CONNECTOR
Mitchell H. Bloom, Tulsa County, Okla., and Richard J. Robbins, Sedgwick County, Kans., assignors to Lowrance Electronics, Inc., Tulsa, Okla.
Filed Sep. 28, 1995, Ser. No. 44,809
Term of patent 14 years
U.S. Cl. D13—133

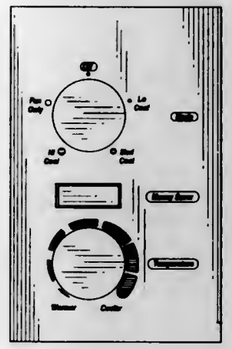


373,569
COMPUTER PORT CONSOLIDATION DEVICE
Ferdinand van Engelen, Bellevue; Steven T. Kaneko, Seattle; Christopher Alviar, Seattle; Russell Sanchez, Seattle, and Mark Mclean, Kirkland, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.
Filed May 19, 1995, Ser. No. 39,059
Term of patent 14 years
U.S. Cl. D13—147

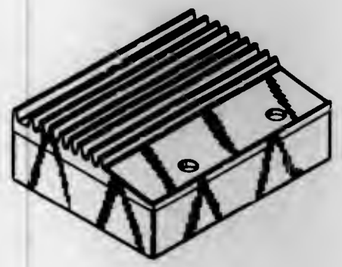


373,570
FUSE
Toshiharu Kudo; Hisashi Hanazaki; Mitsuhiko Totsuka, and Takayoshi Endo, all of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Dec. 1, 1994, Ser. No. 31,605
Claims priority, application Japan, Jun. 1, 1994, 6-15565; Jun. 1, 1994, 6-15566
The portion of the term of this patent subsequent to Mar. 19, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—161

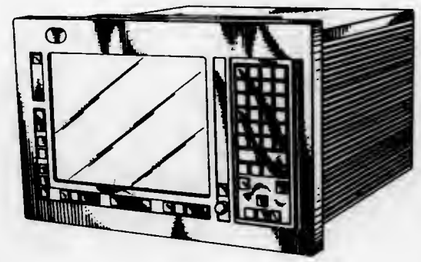
373,571
CONTROL PANEL FOR A ROOM AIR CONDITIONER
Michael Zambelli; Jonathan Marks, both of New York, N.Y.; Rengaswamy Ramakrishnan, and Joel Zillioux, both of Bexar County, Tex., assignors to U.S. Natural Resources, Inc., San Antonio, Tex.
Filed Jan. 20, 1995, Ser. No. 33,826
The portion of the term of this patent subsequent to Aug. 6, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—162



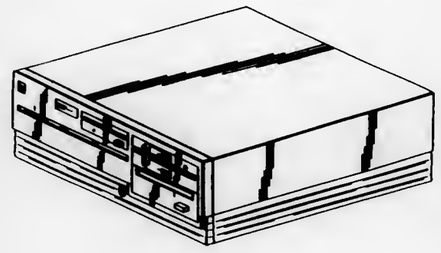
373,572
HEATSINK-OUTFITTED SPEED CONROLLER HOUSING
Kevin R. Orton, Tekin Electronics, Inc., 940 Calle Negocio, San Clemente, Calif. 92673
Filed Dec. 27, 1995, Ser. No. 48,402
Term of patent 14 years
U.S. Cl. D13—179



373,573
INDUSTRIAL COMPUTER
Jose P. Basco, West Palm Beach; William V. Cranston, III, Boca Raton; Hunter T. Foy, Boca Raton; Kendall A. Honeycutt, Boca Raton; Allen R. Hood, Boca Raton, and Frederick C. Yentz, Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 11, 1994, Ser. No. 21,148
Term of patent 14 years
U.S. Cl. D14—100



373,574
DESKTOP COMPUTER
Hartmut H. Esslinger, Los Gatos, Calif., assignor to Packard Bell Electronics, Inc., Westlake Village, Calif.
Continuation-in-part of Ser. No. 23,826, Jun. 1, 1994, abandoned. This application Jun. 13, 1994, Ser. No. 24,326
Term of patent 14 years
U.S. Cl. D14—100



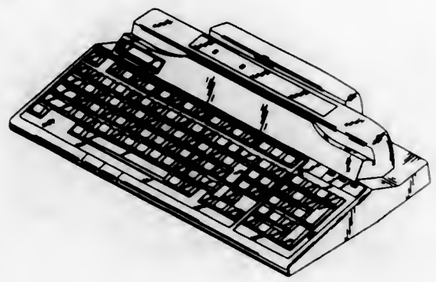
373,575
FINANCIAL INPUT DEVICE

373,577
WRIST REST FOR KEYBOARDS AND MOUSE PADS

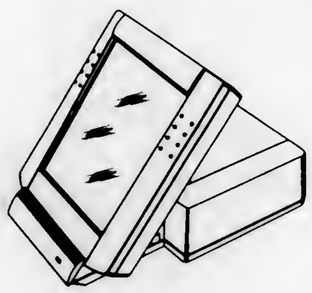
373,579
FLAT PANEL DISPLAY

373,581
DIGITAL ANSWERING MACHINE

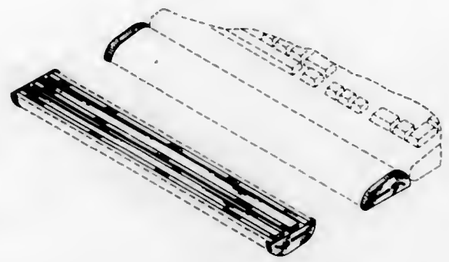
373,575
FINANCIAL INPUT DEVICE
J. E. Alcaniz Fornes, Chiva, and J. Boixadera Ferrer, La Eliana, both of, Spain, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 9, 1994, Ser. No. 30,836
Claims priority, application Spain, May 9, 1994, 132623
Term of patent 14 years
U.S. Cl. D14—100



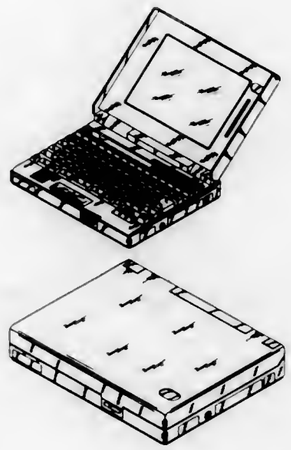
373,576
HANDHELD INFORMATION AND COLLECTION DEVICE WITH CRADLE
Richard Liggett, Laguna Niguel, Calif., assignor to Mastertouch Information Systems, Inc., Larkspur, Calif.
Filed Aug. 30, 1995, Ser. No. 43,280
Term of patent 14 years
U.S. Cl. D14—100



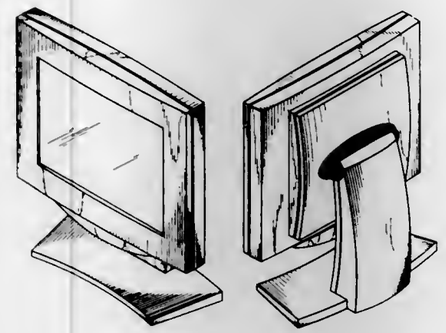
373,577
WRIST REST FOR KEYBOARDS AND MOUSE PADS
Eric L. Tong, Los Angeles, Calif., assignor to Belkin Components, Compton, Calif.
Filed Aug. 29, 1995, Ser. No. 43,220
Term of patent 14 years
U.S. Cl. D14—114



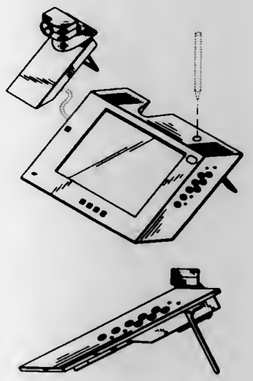
373,578
PORTABLE PERSONAL COMPUTER
Hisashi Shima, Fujisawa, and Kazuhiko Yamazaki, Hiratuka, both of, Japan, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 20, 1995, Ser. No. 46,665
Claims priority, application Japan, Apr. 21, 1995, 7-11480
Term of patent 14 years
U.S. Cl. D14—106



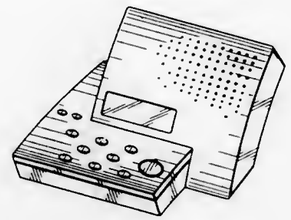
373,579
FLAT PANEL DISPLAY
Tom J. Searby, Fort Collins, Colo.; Henry Y. Chin, and Jan Hippen, both of Portland, Oreg., assignors to Hewlett-Packard Co., Palo Alto, Calif.
Filed Sep. 29, 1994, Ser. No. 29,177
Term of patent 14 years
U.S. Cl. D14—113



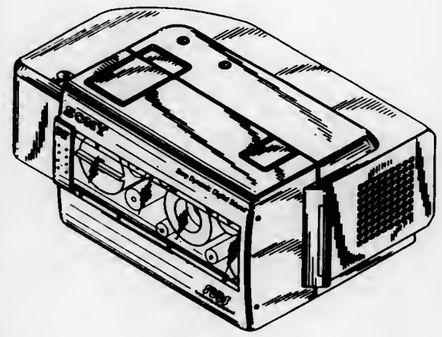
373,580
DISPLAY UNIT WITH AN ATTACHABLE CAMERA UNIT
Kazuo Nakada, Sagamihara; Kazuhiko Yamazaki, Hiratuka, both of, Japan; Tristan A. Merino, Austin, Tex., and Richard F. Sapper, Milan, Italy, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 7, 1995, Ser. No. 35,841
Claims priority, application Japan, Sep. 7, 1994, 6-27154
Term of patent 14 years
U.S. Cl. D14—113



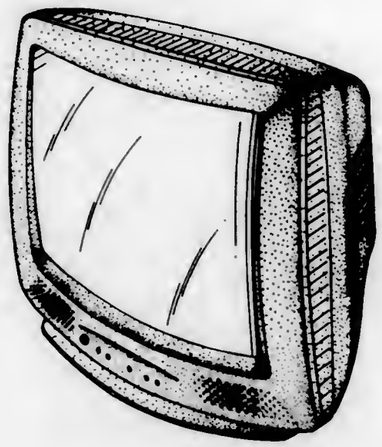
373,581
DIGITAL ANSWERING MACHINE
Anthony Solomita, Norwalk, Conn., and Rita O'Connor, Mamaroneck, N.Y., assignors to Conair Corporation, Stamford, Conn.
Filed Nov. 30, 1995, Ser. No. 47,316
Term of patent 14 years
U.S. Cl. D14—141



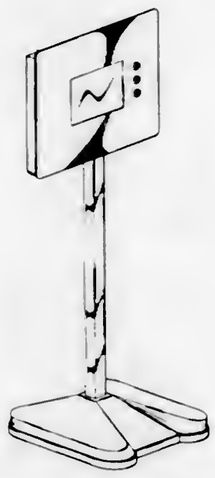
373,582
DIGITAL MOTION PICTURE FILM SOUND DECODER/PLAYER
Yutaka Hasegawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Mar. 2, 1994, Ser. No. 19,451
Term of patent 14 years
U.S. Cl. D14—124



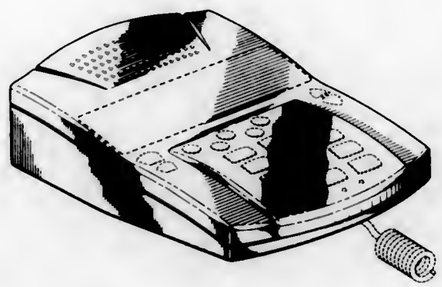
373,583
TELEVISION SET
Osamu Akiyama; Yoshito Fujii; Keiichi Koyama, and Kunihiro Ohki, all of Tochigi-ken, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed May 10, 1995, Ser. No. 38,717
Claims priority, application Japan, Dec. 8, 1994, 6-37702
Term of patent 14 years
U.S. Cl. D14—126



373,584
ENTERTAINMENT SYSTEM DISPLAY STAND
Prem K. Anand, Roswell, Ga., assignor to Health Images, Inc., Atlanta, Ga.
Filed Jun. 28, 1995, Ser. No. 40,934
Term of patent 14 years
U.S. Cl. D14—126

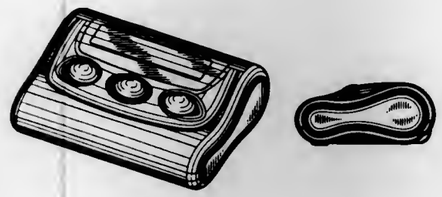


373,585
MODULAR BASE FOR A CORDLESS PORTABLE TELEPHONE
Albert L. Nagele, Wilmette, and Leonid Soren, Lincolnwood, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Oct. 3, 1995, Ser. No. 44,928
Term of patent 14 years
U.S. Cl. D14—149



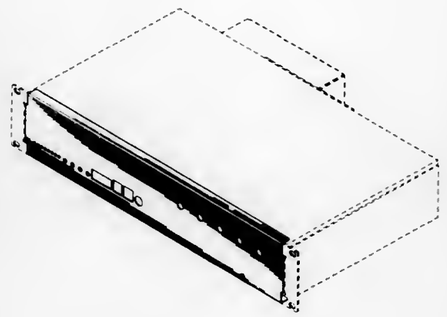
373,586
SELECTIVE CALL RECEIVER
Moo H. Hon, Johor, Malaysia; Kim Y. Lim, and Chee H. Leong, both of Singapore, Singapore, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Feb. 23, 1995, Ser. No. 35,275
Term of patent 14 years
U.S. Cl. D14—191

373,587
RADIO PAGER
Moo H. Hon, Johor, Malaysia; Chee F. Cheng, Singapore, Singapore; Koh S. Chen, Singapore, Singapore, and Lai C. Ho, Singapore, Singapore, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 13, 1995, Ser. No. 37,489
Term of patent 14 years
U.S. Cl. D14—191

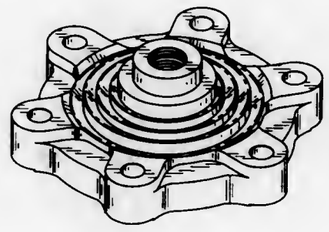


373,588
HAND-HELD REMOTE CONTROL
Donald H. Bowen, Jr., Lilburn; David I. Chang, Duluth, both of Ga.; Bryce G. Rutter; Michael D. Prstojevich, both of St. Louis, Mo.; Robert T. Van Orden, Norcross, and Charles K. Fincher, Marietta, both of Ga., assignors to Scientific-Atlanta, Inc., Norcross, Ga.
Filed Jun. 29, 1995, Ser. No. 40,884
Term of patent 14 years
U.S. Cl. D14—218

373,589
FACE PLATE FOR A RECEIVER
Gary E. Peterson, Schaumburg; David J. Hanson; Raul Olivera, both of Hoffman Estates, and Janice M. Weber, Elgin, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Sep. 14, 1995, Ser. No. 43,889
Term of patent 14 years
U.S. Cl. D14—257



373,590
SNOW MOBILE ENGINE HEAD
Steven R. Benson, 5919 S. 350 West, Murray, Salt Lake City, Utah 84107
Filed Sep. 23, 1994, Ser. No. 28,856
Term of patent 14 years
U.S. Cl. D15—5



373,591
LARGE SELF-PROPELLED BALER

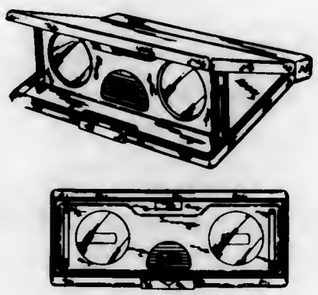
373,593
BODY OF A TELEVISION CAMERA

373,595
PRINTER

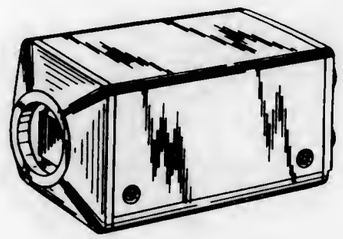
373,597
PHOTO GREETING CARD OVERLAY

373,591
LARGE SELF-PROPELLED BALER
Wilhelm Von Allwörden, Oberstotzingen, and Dietrich Zaps, Rösrath-Forsbach, both of, Germany, assignors to Same S.p.A., Treviglio, Italy
Filed Sep. 19, 1994, Ser. No. 28,546
Term of patent 14 years
U.S. Cl. D15—26

373,592
PAIR OF BINOCULARS
Kwong C. Chan, Flat A, 7th Floor, Manning Industrial Building, 118 How Ming Street, Kwun Tong, Kowloon, Hong Kong
Filed Oct. 27, 1995, Ser. No. 46,722
Claims priority, application United Kingdom, May 1, 1995, 2047150
Term of patent 14 years
U.S. Cl. D16—133



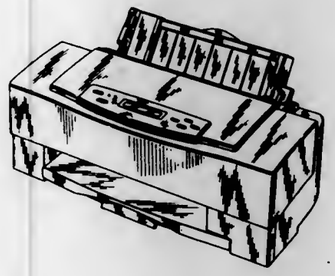
373,593
BODY OF A TELEVISION CAMERA
Ohkuma Hiroko, Tokyo, and Nakamura Takashi, Higashimurayama, both of, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Oct. 30, 1995, Ser. No. 45,770
Claims priority, application Japan, Jul. 6, 1995, 7-19502
Term of patent 14 years
U.S. Cl. D16—203



373,594
CAMERA WITH FIXED FLASH
John K. McBride, and Gary K. Smithborne, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 29, 1995, Ser. No. 40,882
Term of patent 14 years
U.S. Cl. D16—209

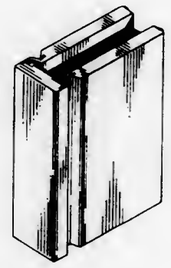
373,595
PRINTER
Benjamin A. Askren, and Thomas E. Pangburn, both of Lexington, Ky., assignors to Lexmark International, Inc., Greenwich, Conn.
Filed Apr. 19, 1995, Ser. No. 37,735
Term of patent 14 years
U.S. Cl. D18—50

373,596
PRINTER FOR ELECTRONIC COMPUTER
Tetsuya Sekine, Kawasaki, and Hiroyuki Tokuda, Yokohama, both of, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 28, 1994, Ser. No. 20,499
Claims priority, application Japan, Sep. 29, 1993, 5-29393
Term of patent 14 years
U.S. Cl. D18—55

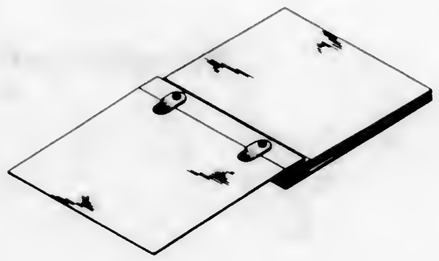


373,597
PHOTO GREETING CARD OVERLAY
Carolyn L. O'Leary, 1018 San Raymundo Rd., Hillsborough, Calif. 94010
Filed Aug. 16, 1994, Ser. No. 27,195
Term of patent 14 years
U.S. Cl. D19—1

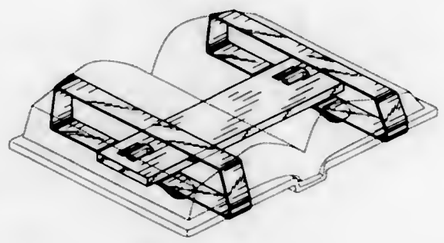
373,598
BOOK
Peter H. Engel, 144 N. Robertson Blvd., Los Angeles, Calif. 90048-3102
Filed Jul. 11, 1995, Ser. No. 41,310
Term of patent 14 years
U.S. Cl. D19—26



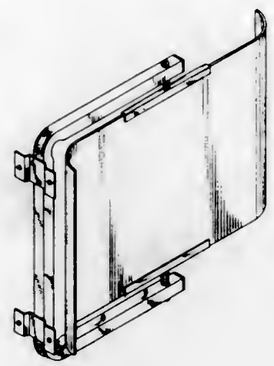
373,599
PHOTO ALBUM
Alain Bernard, Neung sur Beuvron, France, assignor to Press Book Prat, Inc., San Jose, Calif.
Filed Jul. 20, 1995, Ser. No. 41,664
Term of patent 14 years
U.S. Cl. D19—26



373,600
BOOK HOLDER
David W. Oimas, 9227 63rd St. West, Taylor Ridge, Ill. 61284
Filed Mar. 21, 1994, Ser. No. 20,153
Term of patent 14 years
U.S. Cl. D19—91



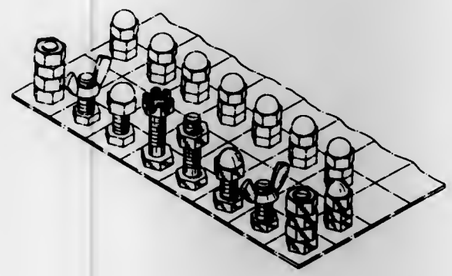
373,601
WIND ACTUATED ROTATING SIGN
William C. Jackle, Oak Park, Ill., assignor to The Niven Marketing Group, Elk Grove Village, Ill.
Filed Oct. 13, 1995, Ser. No. 45,215
Term of patent 14 years
U.S. Cl. D20—21



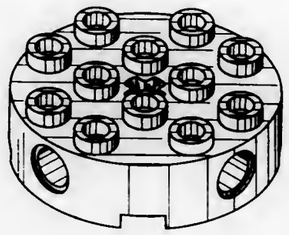
373,602
STORK STAND
Kenneth Prehart, P.O. Box 834, Tannersville, Pa. 18372
Filed May 4, 1995, Ser. No. 38,468
Term of patent 14 years
U.S. Cl. D20—30

373,603
DIE FOR PLAYING A BOARD GAME
Iraj Moradinia, 3998 Briaridge Cir., Atlanta, Ga. 30340
Division of Ser. No. 2,688, Dec. 18, 1992, Pat. No. Des. 354,920. This application Jan. 18, 1995, Ser. No. 33,702
Term of patent 14 years
U.S. Cl. D21—41

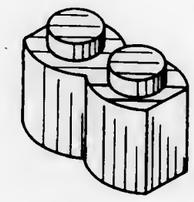
373,604
CHESS SET
Charles A. Salansky, 194 Voorhees Ave., Buffalo, N.Y. 14214
Filed Jun. 25, 1993, Ser. No. 9,952
Term of patent 14 years
U.S. Cl. D21—52



373,605
TOY BUILDING ELEMENT
Ib T. Skov, and Kim Pagel, both of Billund, Denmark, assignors to INTERLEGO AG, Baar, Switzerland
Filed Sep. 29, 1994, Ser. No. 29,104
Term of patent 14 years
U.S. Cl. D21—108



373,606
TOY BUILDING ELEMENT
Jens N. Knudsen, Billund, Denmark, assignor to INTERLEGO AG, Baar, Switzerland
Filed Sep. 14, 1995, Ser. No. 43,915
Term of patent 14 years
U.S. Cl. D21—108



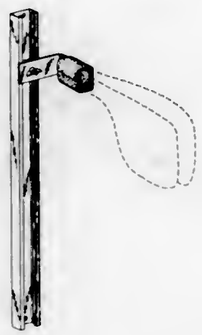
373,607
ADJUSTABLE KICKING PAD HOLDER

373,609
ROLLER SKATE

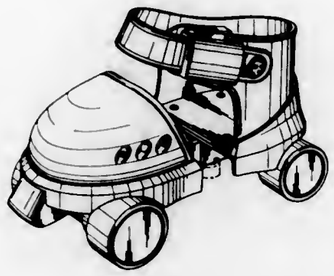
373,611
SPEAR

373,613
FISHING LURE

373,607
ADJUSTABLE KICKING PAD HOLDER
Terry M. Proudfoot, 1565 Nehale Pl., Gresham, Oreg. 97030
Filed Sep. 21, 1995, Ser. No. 44,242
Term of patent 14 years
U.S. Cl. D21—191

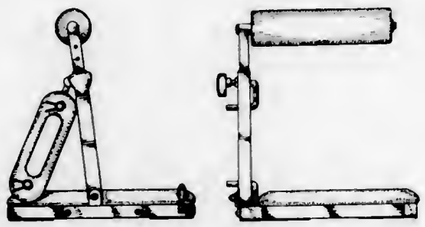


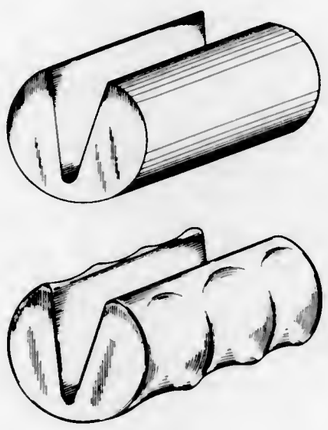
373,609
ROLLER SKATE
Paul Santarsiero, Avon, Conn.; William L. Goldberg, Newton, and Kenneth W. Graham, Stoneham, both of Mass., assignors to Hyde Athletic Industries, Inc., Peabody, Mass.
Filed Jul. 28, 1995, Ser. No. 41,979
Term of patent 14 years
U.S. Cl. D21—226



373,610
ARROW SHAFT GRIPPER
Gary N. Ravencroft, 5011 Ravelle Ct., Paradise, Calif. 95969
Filed Jan. 30, 1995, Ser. No. 34,196
Term of patent 14 years
U.S. Cl. D22—107

373,608
EXERCISE MACHINE
Georgene Summers, Beverly Hills, and Mitchell A. Rothstein, W. Hollywood, both of Calif., assignors to American Fitness Products, Inc., Los Angeles, Calif.
Filed Aug. 18, 1993, Ser. No. 11,953
Term of patent 14 years
U.S. Cl. D21—195

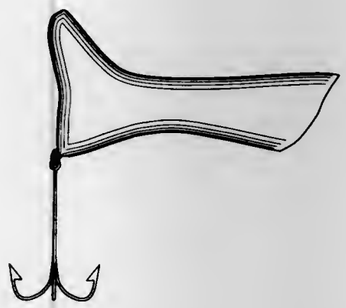




373,611
SPEAR
Lynn C. Thompson, 2747 Seahorse, Ventura, Calif. 93001
Filed Feb. 7, 1995, Ser. No. 34,529
Term of patent 14 years
U.S. Cl. D22—118

373,613
FISHING LURE
Walter B. Lawrence, Louisville, Ky., assignor to S & W Bait Company, Louisville, Ky.
Filed May 16, 1995, Ser. No. 38,843
Term of patent 14 years
U.S. Cl. D22—133

373,612
FISHING LURE
Doyle E. Hodgin, Durham, N.C., assignor to Inspiration Lures, Inc., Apex, N.C.
Filed Oct. 11, 1995, Ser. No. 45,159
Term of patent 14 years
U.S. Cl. D22—126



373,614
FISHING LURE CASE
Stephen L. Bevill, P.O. Box 44, Mabank, Tex. 75147
Continuation-in-part of Ser. No. 8,536, May 20, 1993, abandoned. This application Jun. 13, 1995, Ser. No. 40,204
Term of patent 14 years
U.S. Cl. D22—139

373,615
FOUNTAIN

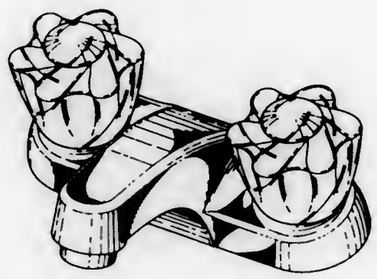
373,617
FAUCET

373,619
FAUCET SET

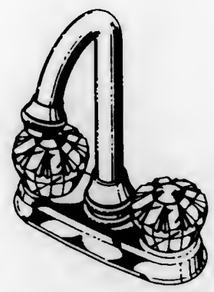
373,621
FAUCET SET

373,615
FOUNTAIN
Kathy L. Crowell, 939 Thomson Rd., Unionville, Tenn. 37180
Filed Jul. 27, 1995, Ser. No. 41,944
Term of patent 14 years
U.S. Cl. D23—201

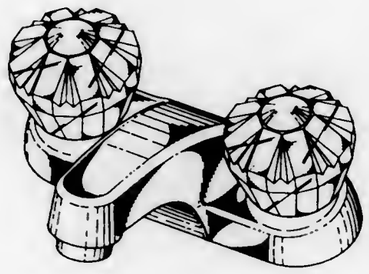
373,616
FAUCET
Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Emhart Inc., Newark, Del.
Filed Sep. 22, 1995, Ser. No. 44,298
Term of patent 14 years
U.S. Cl. D23—241



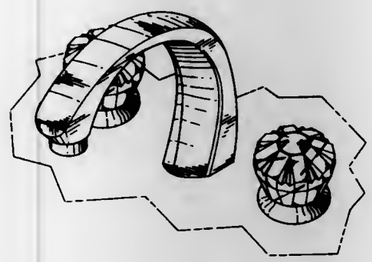
373,617
FAUCET
Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Emhart Inc., Newark, Del.
Filed Sep. 22, 1995, Ser. No. 44,374
Term of patent 14 years
U.S. Cl. D23—241



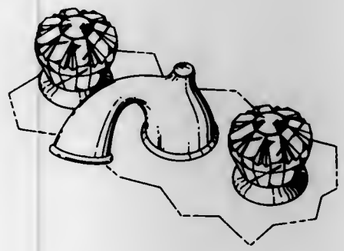
373,618
FAUCET
Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Emhart Inc., Newark, Del.
Filed Sep. 22, 1995, Ser. No. 44,388
Term of patent 14 years
U.S. Cl. D23—241



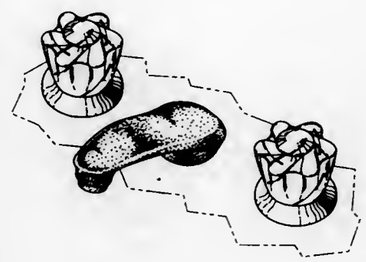
373,619
FAUCET SET
Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Emhart Inc., Newark, Del.
Filed Sep. 22, 1995, Ser. No. 44,339
Term of patent 14 years
U.S. Cl. D23—242



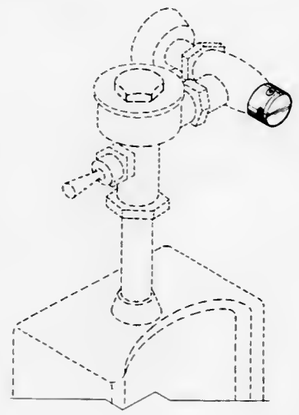
373,620
FAUCET SET
Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Emhart Inc., Newark, Del.
Filed Sep. 22, 1995, Ser. No. 44,343
Term of patent 14 years
U.S. Cl. D23—242



373,621
FAUCET SET
Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Emhart Inc., Newark, Del.
Filed Sep. 22, 1995, Ser. No. 44,371
Term of patent 14 years
U.S. Cl. D23—242



373,622
PLUMBING CAP LOCK
Billy G. Burden, P.O. Box 86, Seneca, Ill. 61360
Filed Jun. 14, 1994, Ser. No. 24,477
Term of patent 14 years
U.S. Cl. D23—260



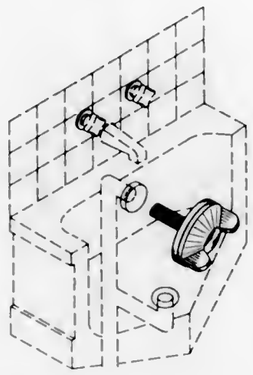
373,623
MECHANICAL TEST PLUG FOR OVERFLOW AND

373,625
AIR PURIFYING BAFFLE

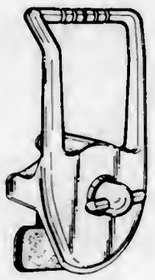
373,627
SPRAY DISPENSER CASE

373,629
COMBINED CEILING FAN MOTOR HOUSING, CANOPY,

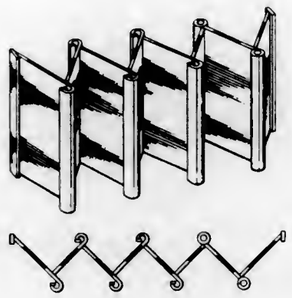
373,623
MECHANICAL TEST PLUG FOR OVERFLOW AND WASTE DRAINS
Allen D. Mathison, Richfield, Minn., assignor to Cherne Industries Incorporated, Minneapolis, Minn.
Filed Jan. 25, 1995, Ser. No. 34,016
Term of patent 14 years
U.S. Cl. D23—260



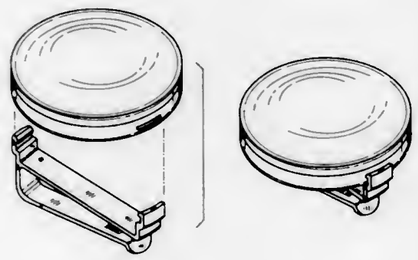
373,624
TUB BAR
Shane Obitts, Elyria, Ohio, assignor to Invacare Corporatioo, Elyria, Ohio
Filed Jun. 8, 1995, Ser. No. 40,025
Term of patent 14 years
U.S. Cl. D23—304



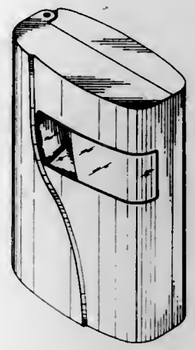
373,625
AIR PURIFYING BAFFLE
Manuel G. Pereira, 900 Dufferin Street, Toronto, Ontario, Canada
Filed May 19, 1995, Ser. No. 39,067
Term of patent 14 years
U.S. Cl. D23—364



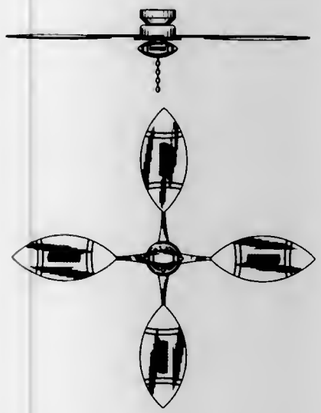
373,626
CLIP-ON DISPENSER ASSEMBLY UNIT FOR AIR TREATING MATERIAL
Stephen V. Dente, Tenafly; John M. Paulovich, Hewitt, and Manhar K. Patel, Saddle Brook, all of N.J., assignors to Reckitt & Colman Inc., Montvale, N.J.
Filed Aug. 9, 1994, Ser. No. 26,921
Term of patent 14 years
U.S. Cl. D23—366



373,627
SPRAY DISPENSER CASE
Paul B. Specht, Wilmette, Ill., assignor to Waterbury Companies, Inc., Waterbury, Conn.
Filed Mar. 31, 1995, Ser. No. 36,943
Term of patent 14 years
U.S. Cl. D23—366

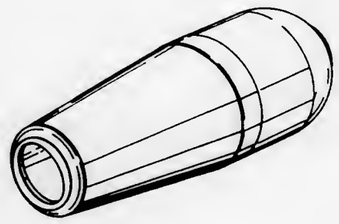


373,628
COMBINED FOOTBALL CEILING FAN AND LIGHT FIXTURE
Francesco DiSandro, 2902 Grisdale Ave., Abington, Pa. 19001
Filed Sep. 5, 1995, Ser. No. 43,492
Term of patent 14 years
U.S. Cl. D23—377



373,629
COMBINED CEILING FAN MOTOR HOUSING, CANOPY, SUPPORT ROD, PULL CORDS AND LIGHT FIXTURES UNIT
Bobby Chan, No. 203 Wu Chiuan Road, Taichung City, Taiwan
Filed Nov. 7, 1995, Ser. No. 46,099
Term of patent 14 years
U.S. Cl. D23—411

373,630
AN INHALATION SPACER FOR AEROSOL MEDICATION
Elna Berg, Dalby, and Jan Karlsson, Hjärup, both of, Sweden, assignors to AB Astra, Sodertalie, Sweden
Filed Jul. 22, 1994, Ser. No. 26,218
Claims priority, application Sweden, Jan. 27, 1994, 94-0206
Term of patent 14 years
U.S. Cl. D24—110

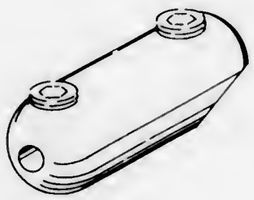


373,631
ORAL CAVITY CLEANER
Yasunari Maeda, and Taro Mochida, both of Kadoma, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan
Filed Feb. 27, 1995, Ser. No. 35,380
Claims priority, application Japan, Aug. 31, 1994, 6-26404
Term of patent 14 years
U.S. Cl. D24—111

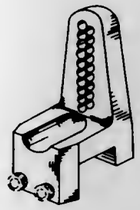
373,633
MANIFOLD DEVICE FOR CHEMICAL SOLID PHASE REACTIONS
Bengt La Motte, Solna, Sweden, assignor to Pharmacia Biotech AB, Upsala, Sweden
Filed Dec. 23, 1994, Ser. No. 32,682
Claims priority, application Sweden, Dec. 23, 1994, 941422
Term of patent 14 years
U.S. Cl. D24—133

373,634
EYE SURGERY FIXATION RING INSTRUMENT
Alan W. Brown, 4220 Forwalt Pl., Wilmington, N.C. 28409
Filed Apr. 11, 1995, Ser. No. 37,342
Term of patent 14 years
U.S. Cl. D24—133

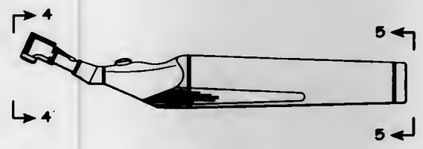
373,632
EXTERNAL FIXATION WIRE RETAINER
Gregory G. Price, Warsaw, and Randall N. Allard, Plymouth, both of Ind., assignors to Zimmer, Inc., Warsaw, Ind.
Division of Ser. No. 25,126, Jun. 27, 1994, Pat. No. Des. 367,529. This application Nov. 14, 1995, Ser. No. 47,815
Term of patent 14 years
U.S. Cl. D24—127



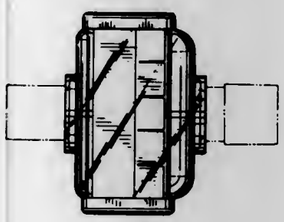
373,635
EXTERNAL FIXATION CLAMP
Gregory G. Price, Warsaw, and Randall N. Allard, Plymouth, both of Ind., assignors to Zimmer, Inc., Warsaw, Ind.
Division of Ser. No. 26,286, Jun. 27, 1994, Pat. No. Des. 367,531. This application Nov. 14, 1995, Ser. No. 46,435
Term of patent 14 years
U.S. Cl. D24—140



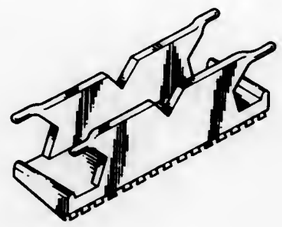
373,636
ROOT CANAL HANDPIECE
Howard Martin, 1006 Spring St., Silver Spring, Md. 20910
Filed Aug. 24, 1995, Ser. No. 43,057
Term of patent 14 years
U.S. Cl. D24—152



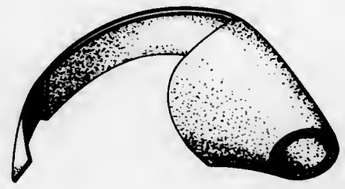
373,637
BOX FILTER
Michael R. Spearman, St. Paul, Minn., assignor to Porous Media Corporation, St. Paul, Minn.
Filed May 8, 1995, Ser. No. 38,534
Term of patent 14 years
U.S. Cl. D24—162



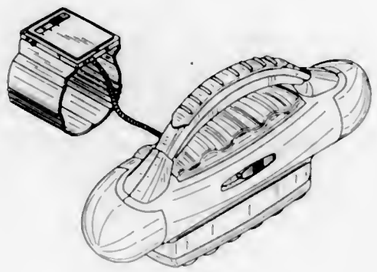
373,638
ORTHODONTIC BRACKET
Earl J. Colbert, 3696 Montego Dr., Huntington Beach, Calif. 92649
Filed Feb. 7, 1995, Ser. No. 34,539
Term of patent 14 years
U.S. Cl. D24—180



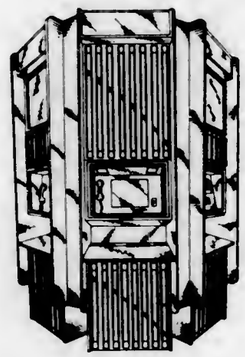
373,639
THUMB SPLINT
Ann W. McKie, 1127 W. 1st St., Duluth, Minn. 55806
Filed Aug. 22, 1995, Ser. No. 42,967
Term of patent 14 years
U.S. Cl. D24—190



373,640
COMBINED HAND HELD MASSAGER AND WRIST MOUNTED CONTROL
James V. Young, University Park, Mo., assignor to General Physiotherapy, Earth City, Mo.
Filed May 22, 1995, Ser. No. 39,303
Term of patent 14 years
U.S. Cl. D24—215



373,641
INFORMATION KIOSKS
James M. Lee, Windermere, Fla., assignor to Lockheed Martin Corporation, Bethesda, Md.
Filed Jun. 9, 1995, Ser. No. 40,094
Term of patent 14 years
U.S. Cl. D25—4

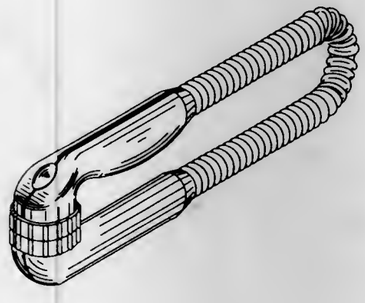


373,642
DOORWAY TRANSOM
Jeffery D. Lint, Columbus; David L. Williams, Orient, and Stephen J. Sparer, Loveland, all of Ohio, assignors to Masco/Tech, Inc., Taylor, Mich.
Filed Sep. 14, 1995, Ser. No. 43,892
Term of patent 14 years
U.S. Cl. D25—138

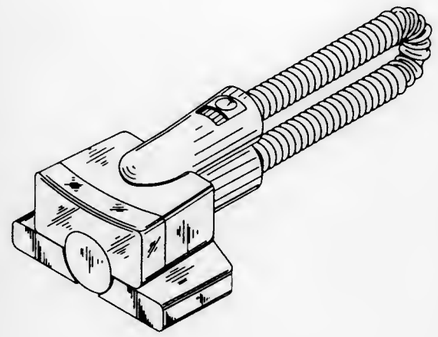
373,643
PEDESTAL HOUSING FOR A SEPTIC TANK PUMP CONTROL PANEL
Virgil A. Einck, 2913 Silver Cedar Rd., Oconomowoc, Wis. 53066
Filed Aug. 2, 1995, Ser. No. 42,157
Term of patent 14 years
U.S. Cl. D23—303

373,644
FLORESCENT LIGHT BULB
Patrick K. Struhs, Cameron Park, Calif., assignor to Trade Source International, El Dorado Hills, Calif.
Filed Nov. 7, 1995, Ser. No. 46,108
Term of patent 14 years
U.S. Cl. D26—2

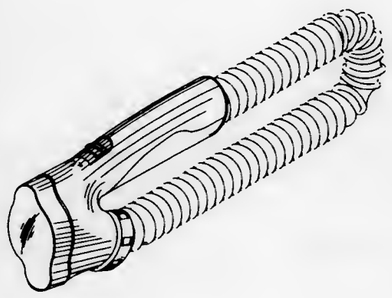
373,645
FLASHLIGHT WITH FLEXIBLE HANDLE
Scott Johnstone, Pleasant Valley, and Aaron Szymanski, Bristol, both of Conn., assignors to Black & Decker Inc., Newark, Del.
Filed Mar. 13, 1995, Ser. No. 36,057
Term of patent 14 years
U.S. Cl. D26—43



373,646
FLEXIBLE LIGHT
Aaron Szymanski, Bristol, and Daniel Haberstich, Rocky Hill, both of Conn., assignors to Black & Decker Inc., Newark, Del.
Filed Mar. 13, 1995, Ser. No. 36,059
Term of patent 14 years
U.S. Cl. D26—43



373,647
HEAD FOR A FLEXIBLE FLASHLIGHT
David W. Kaiser, North Haven, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Apr. 17, 1995, Ser. No. 37,600
Term of patent 14 years
U.S. Cl. D26—43



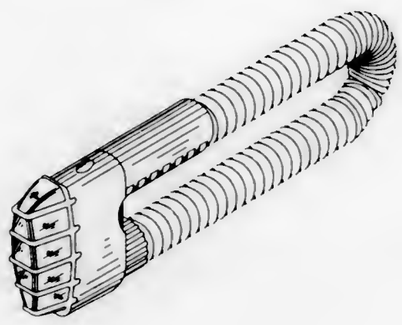
373,648
HEAD FOR A FLEXIBLE FLASHLIGHT

373,650
TABLE LAMP
John Yeh, 660 S. Aberdeen, Anaheim Hills, Calif. 92807

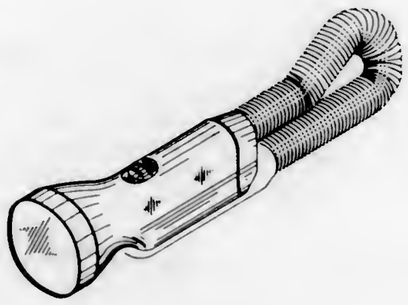
373,652
FLEXIBLE FLASHLIGHT
David W. Kaiser, North Haven, Conn., assignor to Black &

373,654
HAIR BRAIDING DEVICE
Bernadine Schoch, 905 Rainbow Dr., Richardson, Tex. 75081

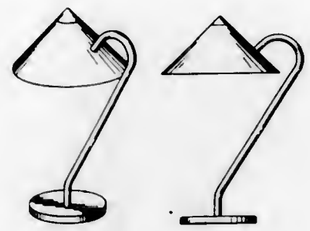
373,648
HEAD FOR A FLEXIBLE FLASHLIGHT
David W. Kaiser, North Haven, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Apr. 17, 1995, Ser. No. 37,611
Term of patent 14 years
U.S. Cl. D26—43



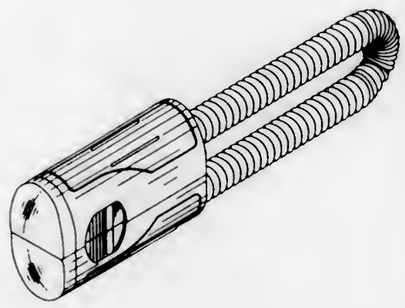
373,649
HEAD FOR A FLASHLIGHT
Richard J. Carbone, Southbury, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed May 22, 1995, Ser. No. 39,118
Term of patent 14 years
U.S. Cl. D26—43



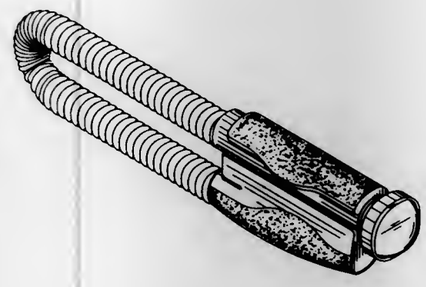
373,650
TABLE LAMP
John Yeh, 660 S. Aberdeen, Anaheim Hills, Calif. 92807
Filed Aug. 11, 1995, Ser. No. 42,487
Term of patent 14 years
U.S. Cl. D26—107



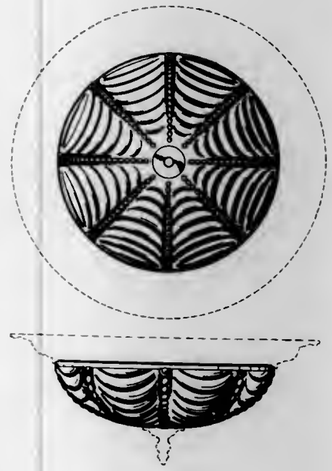
373,651
FLEXIBLE FLASHLIGHT
Aaron Szymanski, Bristol, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Mar. 13, 1995, Ser. No. 36,048
Term of patent 14 years
U.S. Cl. D26—43



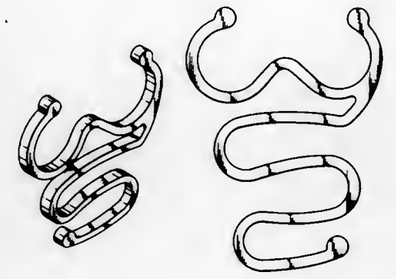
373,652
FLEXIBLE FLASHLIGHT
David W. Kaiser, North Haven, Conn., assignor to Black & Decker Inc., Newark, Del.
Filed Mar. 13, 1995, Ser. No. 36,054
Term of patent 14 years
U.S. Cl. D26—43



373,653
GLASS DOME FOR LIGHTING FIXTURE
Stephen Cohen, Cote St. Luc, Canada, assignor to Artcraft of Montreal Ltd., Montreal, Canada
Filed Dec. 14, 1995, Ser. No. 47,902
Term of patent 14 years
U.S. Cl. D26—134



373,654
HAIR BRAIDING DEVICE
Bernadine Schach, 905 Rainbow Dr., Richardson, Tex. 75081
Filed Aug. 16, 1995, Ser. No. 42,863
Term of patent 14 years
U.S. Cl. D28—10



373,655
KNEE GUARD
Jamie L. Kalvestran, Anoka; William S. Portzline, Minneapolis, both of Minn.; Bryce G. Rutter, University City, Mo., and John H. Loudenslager, Kirkwood, Mo., assignors to Rollerblade, Inc., Minneapolis, Minn.
Filed Jun. 30, 1993, Ser. No. 10,233
Term of patent 14 years
U.S. Cl. D29—121

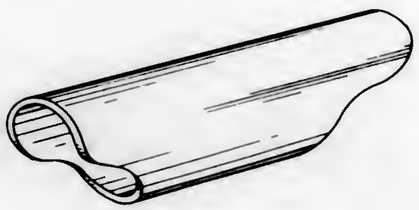
373,656
PROTECTIVE FINGER GUARD

373,658
KITTY HOUSE

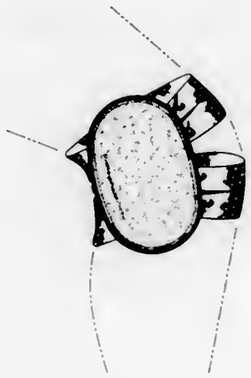
373,660
COVER FOR A BIRD FEEDER
Christopher Gates, Manlius, N.Y., assignor to Pratique, Inc.,

373,662
SPEEDY MOUSE CAT TOY
Daniel A. Box, 445 Rosalie Rd., Bailey, Colo. 80421

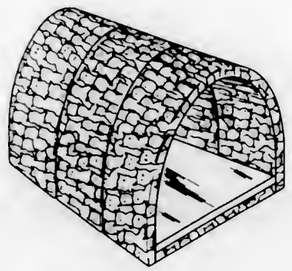
373,656
PROTECTIVE FINGER GUARD
M. Kevin Sorrels, 5300 N. Braeswood Ste. 396, Houston, Tex. 77096
Filed Jan. 23, 1995, Ser. No. 33,912
Term of patent 14 years
U.S. Cl. D29—114



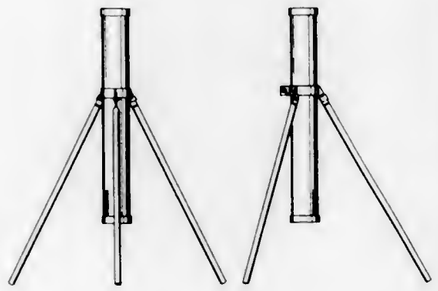
373,657
COMBINED EQUESTRIAN KNEE GRIP PAD AND PROTECTOR
Candi L. Walker, 12401 Summersweet Cove, Austin, Tex. 78729
Filed May 11, 1995, Ser. No. 38,756
Term of patent 14 years
U.S. Cl. D29—121



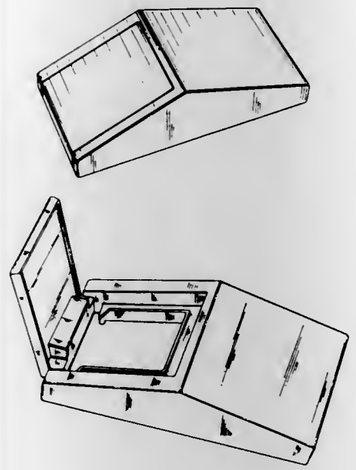
373,658
KITTY HOUSE
Demeter Sierra, P.O. Box 8777, St. Petersburg, Fla. 33708
Filed Dec. 4, 1995, Ser. No. 47,407
Term of patent 14 years
U.S. Cl. D30—108



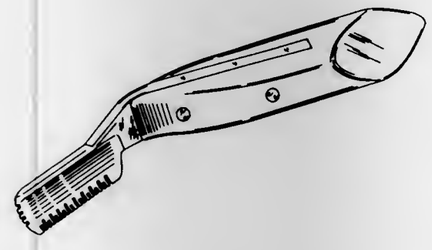
373,659
ANIMAL FEEDER
John S. Miller, P.O. Box 421445, Del Rio, Tex. 78842
Filed Nov. 7, 1994, Ser. No. 30,718
Term of patent 14 years
U.S. Cl. D30—121



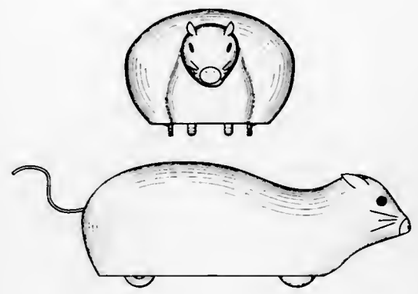
373,660
COVER FOR A BIRD FEEDER
Christopher Gates, Manlius, N.Y., assignor to Pratique, Inc., Chittenango, N.Y.
Filed May 20, 1994, Ser. No. 23,240
Term of patent 14 years
U.S. Cl. D30—124



373,661
ANIMAL GROOMING TOOL
Stephen D. Watson, 622 N. Steel St., Sanford, N.C. 27330
Filed Jun. 16, 1995, Ser. No. 40,417
Term of patent 14 years
U.S. Cl. D30—159



373,662
SPEEDY MOUSE CAT TOY
Daniel A. Box, 445 Rosalie Rd., Bailey, Colo. 80421
Filed Feb. 9, 1995, Ser. No. 34,677
Term of patent 14 years
U.S. Cl. D30—160



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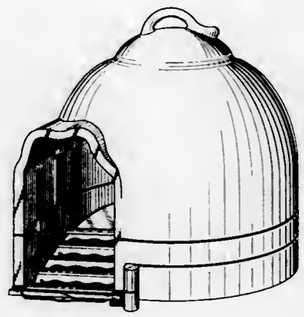
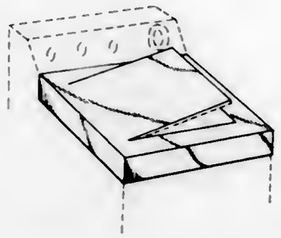
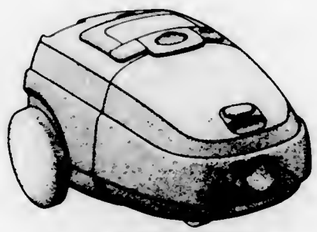
DOMED CAT LITTER BOX
Glen V. Walter, Middleton, Mass., assignor to DesignPoint Industrial Design Studio, Inc., Middleton, Mass.
Filed Feb. 16, 1995, Ser. No. 34,963
Term of patent 14 years
U.S. Cl. D30—161

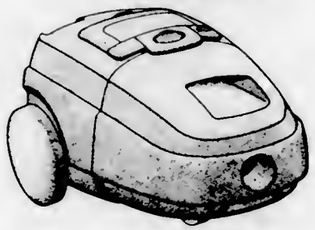


373,664
CLOTHES WASHER COVER
Kenneth A. Jackson, 312 Ripplewood Dr., Mesquite, Tex. 75150
Filed Mar. 16, 1995, Ser. No. 36,268
Term of patent 14 years
U.S. Cl. D32—25



373,665
VACUUM CLEANER
Masahiro Nakamura, and Takeo Koike, both of Osaka-fu, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Mar. 31, 1995, Ser. No. 36,951
Claims priority, application Japan, Oct. 5, 1994, 6-30398; Oct. 5, 1994, 6-30402
Term of patent 14 years
U.S. Cl. D32—21

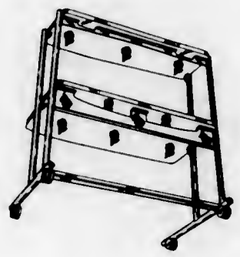




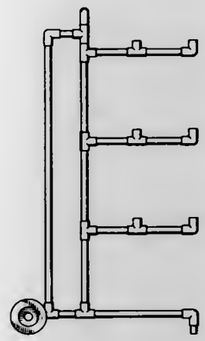
373,666
Patent Not Issued For This Number

373,667
GOLF BAG DOLLY CART
Gary B. Hunsaker, 4475 Dupont Ct. #10, Ventura, Calif. 93003
Filed Aug. 14, 1995, Ser. No. 42,671
Term of patent 14 years
U.S. Cl. D34—15

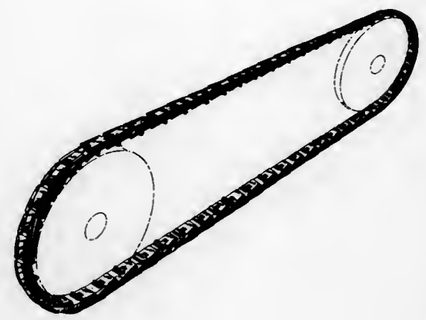
373,668
SHELF CART
Steven E. Linder, Portland, Oreg., assignor to Anthro Corporation, Tualatin, Oreg.
Filed Jun. 16, 1995, Ser. No. 40,572
Term of patent 14 years
U.S. Cl. D34—21



373,669
DOLLY FOR RECEIVING RECYCLING BINS AND CARDBOARD
Robert W. Perkins, Sr., 43487 Columbia Ave., Fremont, Calif. 94538-6022
Filed Oct. 23, 1995, Ser. No. 45,527
Term of patent 14 years
U.S. Cl. D34—24



373,670
LINK BELT FOR MACHINERY
Michael J. Roberts, Hull, England, assignor to Fenner, Inc., Manheim, Pa.
Filed Mar. 24, 1994, Ser. No. 20,344
Term of patent 14 years
U.S. Cl. D34—29



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TO WHOM

PATENTS WERE ISSUED ON THE 10th DAY OF SEPTEMBER, 1996

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Aasen, Steven M.: *See—*
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Abate, Luigi F. Tubular element for the formation of bags for the vacuum-packing. 5,554,423, Cl. 428-35.200.

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ABB Power T&D Company Inc.: *See—*
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Dewille, Normanella T.; Mazer, Terrence B.; Parke, Edward H.; Cipriano, Francis J.; and Raube, Dennis L., 5,554,589, Cl. 514-2.000.
Freiberg, Leslie A.; Edwards, Carla; Pariza, Richard J.; and Nellans, Hugh N., 5,554,605, Cl. 514-183.000.
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Straits, Thomas D.; Obecny, Andrew D.; and Greene, Kenneth R., 5,554,132, Cl. 604-227.000.
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Hull, John R.; Uherka, Kenneth L.; and Abdoud, Robert G., 5,554,583, Cl. 505-166.000.

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Abkowitz, Martin A.: *See—*
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AC & R Components, Inc.: *See—*
Isaacs, Paul E., 5,553,460, Cl. 62-129.000.

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Takamoto, Sohei; George, Douglas J.; and Gallo, Luigi C., 5,555,030, Cl. 348-642.000.

Accucare, L.L.C.: *See—*
DePonty, Ernest T.; Billups, Denise; and Greenfield, Rocky, 5,555,224, Cl. 368-10.000.

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Briechle, George T.; Lubowe, David H.; Dobras, Alfred D.; DeLuca, Raymond F.; and Ackerman, Marvin, 5,553,412, Cl. 40-642.000.

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Maslak, Samuel H.; Cole, Christopher R.; and Petrofsky, Joseph G., 5,555,534, Cl. 367-135.000.
Snider, A. Rebecca; Bennett, Richard M.; McCabe, Laurence J.; Magsig, Peter J.; Ng, Kane L.; Purdy, Lynn M.; and Ruffles, Joseph W., 5,553,620, Cl. 128-660.040.

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Savu, Jeffrey L.; and Tarcha, Timothy, 5,553,850, Cl. 273-317.200.

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Karl, Terry L.; Gloden, Gregory J.; Van Riper, Philip C.; Zainea, John P.; and Myers, John T., 5,553,895, Cl. 285-39.000.
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Anifrani, Jean-Charles; Le Floc'h, Christian M.; Sornette, Didier; and Souillard, Bernard, 5,554,810, Cl. 73-801.000.

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Aita, Michael; Mirhoseini, Mahmood; Cayton, Mary; Simpson, Carl J.; and Prescott, Brian, to CardioGenesis Corporation. Method for intra-operative myocardial revascularization. 5,554,152, Cl. 606-7.000.

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Hirai, Kenji; Matsukawa, Tomoko; Yano, Tomoyuki; Ejiri, Emiko; Aizawa, Kiyomi; Shikatura, Koichi; Yoshii, Tomoko; Ugai, Sadayuki; Yamada, Osamu; and Kishi, Shigeki, 5,554,581, Cl. 504-298.000.

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Akamatsu, Hironori: *See—*
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Kumagai, Tatsuya; Kajioka, Hiroshi; Akiyama, Munehiro; Oho, Shigeru; and Sonobe, Hisao, 5,555,235, Cl. 356-350.000.

Akiyama, Ryota: *See—*
Hasebe, Takayuki; Akiyama, Ryota; and Yoshioka, Makoto, 5,555,304, Cl. 380-4.000.

Akiyama, Yoshikazu; and Kimura, Sachiko, to Ricoh Company, Ltd. Ferroelectric material, and semiconductor memory, optical recording medium and micro-displacement control device using the ferroelectric material. 5,555,219, Cl. 359-103.000.

Aktiebolaget Electrolux: *See—*
Kilström, Lars G.; Lindquist, Nils T.; and Sjöberg, Rolf G., 5,553,349, Cl. 15-360.000.

Akushichi, Shuki: *See—*
Sonehara, Hiroshi; Toba, Akira; Akushichi, Shuki; and Shitaya, Yoshiyuki, 5,555,171, Cl. 364-424.030.

Akzo Nobel N.V.: *See—*
Davey, Cheryl; and Malek, Lawrence T., 5,554,517, Cl. 435-91.210.
Krumbeuer, Wolf R.; Siejak, Volker; and Graefe, Hans, 5,554,424, Cl. 428-35.200.
Sondermeijer, Paulus J. A.; and Claessens, Johannes A. J., 5,554,525, Cl. 435-240.100.

Alatalo, Hannu; and Kokko, Marko, to Nokia Telecommunications Oy. Method for implementing time switching and a time switch. 5,555,245, Cl. 370-66.000.

Alba-Waldensian, Inc.: *See—*
Osborne, Harold G., 5,553,468, Cl. 66-171.000.

Albemarle Corporation: *See—*
Lin, Ronny W.; Atkinson, Eldon E., Jr.; and Balhoff, Donald E., 5,554,791, Cl. 562-565.000.

Albert, Bernhard: *See—*
Neumann, Peter; Kipper, Jürgen; Albert, Bernhard; and Wagenblast, Gerhard, 5,554,318, Cl. 252-301.190.

Albert Einstein College of Medicine of Yeshiva University, a Division of Yeshiva University: *See—*
Sacchettini, James; and Blanchard, John, 5,554,522, Cl. 435-189.000.

Albert, Ernst: *See—*
Blaurock, Werner; Schlereth, Rudolf; Wehrhahn, Ulrich; Albert, Ernst; and Blaurock, Günter, 5,553,945, Cl. 384-45.000.

Alberts, Heinrich: *See—*
Langstein, Gerhard; Krüger, Ralf; Alberts, Heinrich; Moretto, Hans-Heinrich; and Huggins, John, 5,554,689, Cl. 525-102.000.

Albrecht, Richard E.; and Dowe, David R., to Eastman Kodak Company. Camera with electrochromic filter. 5,555,069, Cl. 354-410.000.

Alcantech Co., Inc.: *See—*
Maeda, Kazuo; Tokumasu, Noboru; and Yuyama, Yoshiaki, 5,554,570, Cl. 437-235.000.

Alcatel Kabel AG & Co.: *See—*
Haag, Helmut; and Hog, Georg, 5,555,338, Cl. 385-101.000.

Alcatel N.V.: *See—*
Eckhart, Wolfgang, 5,555,292, Cl. 379-67.000.

Alcatel STR AG: *See—*
Johler, Werner; and Kälin, Werner, 5,554,963, Cl. 335-151.000.

Alcatel Telspace: *See—*
Lemaitre, Didier; and Bonin, Jean-Pierre, 5,555,547, Cl. 375-262.000.

Alcon Laboratories, Inc.: *See—*
Ali, Yusuf; Jani, Rajni; and McCarty, George R., 5,554,367, Cl. 424-78.040.

Alenia Spazio SpA: *See—*
Perrotta, Giorgio, 5,553,816, Cl. 244-158.00R.

Alesi, Daniel E.: *See—*
Green, David T.; Bolanos, Henry; Alesi, Daniel E.; Ratcliff, Keith; and Sherts, Charles R., 5,554,169, Cl. 606-219.000.

Alexander, Dennis R., to University of Nebraska, The Board of Regents of the. Forming fine particles. 5,553,791, Cl. 241-1.000.

Alexander, Graeme Y.; Morgan, Trevor F.; and Fitzpatrick, Gerald P., to Devro Limited. High moisture collagen casings. 5,554,401, Cl. 426-140.000.

Alexander, James C., to United Dominion Industries, Inc. Dock leveler with folding barrier lip. 5,553,343, Cl. 14-71.100.

Alexson, Charles E.: *See—*
Pitzen, James F.; Smith, Jeffrey D.; and Alexson, Charles E., 5,553,675, Cl. 173-217.000.

Alferness, Clifton A., to IsControl, Inc. Therapy termination in an atrial defibrillator and method. 5,554,175, Cl. 607-5.000.

Alferness, Merwin H.; Caldarale, Charles R.; Johnson, David R.; Kerzman, Joseph P.; and McBreen, James R., to Unisys Corporation. Hierarchical queuing in a system architecture for improved message passing and process synchronization. 5,555,396, Cl. 395-474.000.

Ali, Yusuf; Jani, Rajni; and McCarty, George R., to Alcon Laboratories, Inc. Compositions for treatment of glaucoma. 5,554,367, Cl. 424-78.040.

Allen, Arthur D., to Metasphere, Inc. Object oriented event message dispatching subsystem and method utilizing a disposition matrix. 5,555,415, Cl. 395-700.000.

Allen-Bradley Company, Inc.: *See—*
Blech, Steven P.; Van de Steeg, Kerry; and Pepera, Gerald S., 5,555,438, Cl. 395-850.000.

Allen, Michael S.: *See—*
Keipert, Andreas G.; and Allen, Michael S., 5,553,629, Cl. 128-898.000.

Allen, Tom; Provino, Joseph E.; Pittore, William F.; and Kleiman, Steven, to Sun Microsystems, Inc. Self configuring device system. 5,555,401, Cl. 395-500.000.

Allergan, Inc.: *See—*
Haffner, David S.; and Kadziauskas, Kenneth E., 5,554,133, Cl. 604-227.000.

AlliedSignal Aftermarket Europe: *See—*
Rioult, Christian, 5,553,687, Cl. 188-79.540.

AlliedSignal Europe Services Techniques: *See—*
Mery, Jean Claude; and Pressaco, Pierre, 5,553,691, Cl. 188-338.000.

AlliedSignal Inc.: *See—*
Perkey, Russell C., 5,553,827, Cl. 251-30.010.
Rivard, Robert M.; Schneider, Michael J.; Pattantyus, Tamas I.; Towers, Kenneth S.; and Phipps, Jack R., 5,553,929, Cl. 303-113.100.
Rivard, Robert M.; Schneider, Michael J.; Pattantyus, Tamas I.; Towers, Kenneth S.; and Phipps, Jack R., 5,553,930, Cl. 303-174.000.
Turner, Darin J.; Zelenak, Daniel G.; and Musiol, John A., 5,553,888, Cl. 280-731.000.
Zimmerman, Scott M.; Beeson, Karl W.; Hou, Janpu; and Schweyen, John C., 5,555,109, Cl. 359-40.000.

AlliedSignal Inc.: *See—*
Kuper, Jerry; Segal, Leon; Beeson, Karl W.; and Zimmerman, Scott M., 5,555,329, Cl. 385-36.000.

Allison, Samuel E.; and Bright, Dale V., to Texas Meter & Device Company. Portable live line tool tester. 5,554,931, Cl. 324-557.000.

Almansa, Carmen; Carceller, Elena; Gonzalez, Concepcion; Torres, Carmen; and Bartroli, Javier, to J. Uriach & Cia. Imidazopyridine derivatives as angiotensin II antagonists. 5,554,624, Cl. 514-303.000.

Alps Electric Co., Ltd.: *See—*
Ishikawa, Takehiro; Date, Takashi; and Sagawa, Fumihiko, 5,555,116, Cl. 359-88.000.

Al-Shareef, Husam N.: *See—*
Kingon, Angus I.; Al-Shareef, Husam N.; Auciello, Orlando H.; Gifford, Ken D.; Lichtenwalner, Dan J.; and Dat, Rovindra, 5,555,486, Cl. 361-305.000.

Alstad, Knute: *See—*

Burnham, Lowell C.; Saar, Robin R.; Alstad, Knute; and Wendt, David W., 5,553,935, Cl. 312-265.300.

Alt, Helmut G.: *See—*
Frey, Krisztina; von Massow, Gabriele; Alt, Helmut G.; and Welch, M. Bruce, 5,554,795, Cl. 568-8.000.

Alt, Rudolf: *See—*
Wolf, Gerhard; Oftring, Alfred; Schuh, Georg; Wolf, Helmut; Alt, Rudolf; Bechtolsheimer, Hans-Heinrich; and Hertel, Dieter, 5,554,742, Cl. 536-18.600.

Altera Corporation: *See—*
Sung, Chiakang; Chang, Wanli; and Huang, Joseph, 5,555,214, Cl. 365-221.000.

Altieri, Paul A.; and Tessler, Martin M., to National Starch and Chemical Investment Holding Corporation. Water humidity resistant starch foams. 5,554,660, Cl. 521-81.000.

Altmann, Michael: *See—*
Wendel, Friedrich; Franz, Manfred; Meiwes, Johannes; Hammer, Uwe; Altmann, Michael; and Dick, Dieter, 5,554,901, Cl. 310-162.000.

Aluminum Company of America: *See—*
Bartges, Charles W.; Hayland, Robert W., Jr.; Jensen, Craig J.; and Baumann, Steven F., 5,554,428, Cl. 428-64.100.
Bruce, Robert W.; and Klaus, E. Erwin, 5,554,309, Cl. 508-312.000.

Alvarado, Alfredo. Universal gasket for laparoscopic cannula. 5,554,124, Cl. 604-167.000.

Alvarez-Builla Gomez, Julio: *See—*
Bazan, Nicolas G.; and Alvarez-Builla Gomez, Julio, 5,554,636, Cl. 514-373.000.

Amada Metrecs Company, Limited: *See—*
Fujita, Oriya, 5,553,524, Cl. 83-137.000.
Saito, Hiroshi, 5,553,523, Cl. 83-136.000.

Amann, Günther, to Lokosana AG. Prone-position surface with at least three lathwork layers. 5,553,338, Cl. 5-236.100.

Amano, Hideaki: *See—*
Hasegawa, Makoto; Saito, Tsuyoshi; Higuchi, Fumihiko; Amano, Hideaki; Naitoh, Katsunori; Tozawa, Takashi; Nakagome, Tatsuya; Ito, Keiki; and Suzuki, Kouji, 5,554,249, Cl. 156-345.000.

Amblard, Jean-Claude; Vide-Amblard, Amilcar; Le Nagard, Roger; and Georget, Jean. Fluid optics projector. 5,555,493, Cl. 362-318.000.

Amemiya, Shigeo: *See—*
Ogura, Takao; Amemiya, Shigeo; Tezuka, Koji; and Chujo, Takafumi, 5,555,542, Cl. 370-94.100.

American Cyanamid Co.: *See—*
Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,554,579, Cl. 504-246.000.
Grossman, Trudy H.; and Osborne, Marcia S., 5,554,507, Cl. 435-32.000.

American Home Products Corporation: *See—*
Elokdah, Hassan M.; Chai, Sie-Yearl; Sulkowski, Theodore S.; and Strike, Donald P., 5,554,607, Cl. 514-210.000.

American Magnetics Corporation: *See—*
Satoya, Jagtar S., 5,554,840, Cl. 235-441.000.

American Medical Systems, Inc.: *See—*
Westrum, John W., Jr.; Chace, Mark S.; and Kuyava, Charles C., 5,553,379, Cl. 29-450.000.

American Sewing Machine, Inc.: *See—*
Putney, Lawrence B., 5,553,564, Cl. 112-470.130.

American Standard Inc.: *See—*
Goshaw, Craig M.; Sullivan, Brian T.; and Rentmeester, Paul C., 5,553,997, Cl. 415-17.000.

American Sterilizer Company: *See—*
Napierkowski, Susan M.; Nagare, Arthur T.; and Verga, Richard J., 5,553,986, Cl. 414-401.000.

American Tactile Corporation: *See—*
Dorpfeld, Wayne L.; Williams, Robert W.; and Wolfe, Arnold R., 5,554,685, Cl. 524-588.000.

Ametek, Inc.: *See—*
Stewart, Timothy J., 5,554,004, Cl. 416-185.000.

Amici, Alan J.: *See—*
Berra, Charles J.; Boldt, John R.; Amici, Alan J.; and Krebs, Joseph J., 5,555,498, Cl. 364-424.030.

Ammermann, Eberhard: *See—*
Wenderoth, Bernd; Brand, Siegbert; Schuetz, Franz; Kuekenboehner, Thomas; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,554,578, Cl. 504-130.000.
Wingert, Horst; Müller, Bernd; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,554,616, Cl. 514-269.000.

Amoco Corporation: *See—*
Dixon, George J., 5,555,253, Cl. 372-29.000.

Amron, Scott L. Multiple sport practice apparatus. 5,553,848, Cl. 273-26.00E.

Analog Devices, Inc.: *See—*
Moreland, Carl W., 5,554,943, Cl. 327-65.000.

Anami, Kenji; Ohbayashi, Shigeki; and Inoue, Osamu, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor memory having redundant cells. 5,555,522, Cl. 365-200.000.

Andersen, William F.; Boyd, Andrew B.; Baldwin, Russell L.; and Datta, Bisuddha N., to Northrop Grumman Corporation. Off-shore platform construction, and method for transferring loads. 5,553,977, Cl. 405-204.000.

Anderson, Carl L.: *See—*
Campbell, Richard L.; Brumm, Douglas B.; Anderson, Carl L.; and Barna, Glen L., 5,555,457, Cl. 340-870.170.

Anderson, Carl R.: *See—*
Owens, Dana J.; Raines, Aaron; Rasmussen, Ed G.; Ozinga, David G.; Harrison, David J.; and Anderson, Carl R., 5,554,013, Cl. 417-413.100.

Anderson, H. Alexander: *See—*
Biche, Michael R.; and Anderson, H. Alexander, 5,553,994, Cl. 414-752.000.

Anderson, Neil: *See—*
Maddison, David S.; Skalsky, Michael; Gotthardt, Gerhard; and Anderson, Neil, 5,554,176, Cl. 607-9.000.

Anderson, Paul C.; Halmos, Teddy; Jung, Grace L.; Poupart, Marc-André; and Simoneau, Bruno, to Bio-Mega Boehringer Ingelheim Research Inc. N-(hydroxyethyl)butanediamide derivatives. 5,554,634, Cl. 514-370.000.

Anderson, Peter G., to Eastman Kodak Company. Half-tone conversion mask for digital images. 5,555,103, Cl. 358-456.000.

Anderson, Peter G., to Eastman Kodak Company. Supervised training augmented polynomial method and apparatus for character recognition. 5,555,317, Cl. 382-159.000.

Anderson, Russell J., III: *See—*
Scanzillo, Joseph G.; and Anderson, Russell J., III, 5,554,291, Cl. 210-615.000.

Anderson, Stephen: *See—*
Norkey, Phillip; and Anderson, Stephen, 5,553,899, Cl. 285-316.000.

Anderson, Torben P., to FLS Miljø A/S; and Compania Sevillana de Electricidad. Suspension device and a rapping mechanism for electrodes in an electrostatic precipitator. 5,554,210, Cl. 96-33.000.

Anderson, W. Earl: *See—*
Block, Peter C.; Anderson, W. Earl; and Atteridge, David G., 5,554,185, Cl. 623-2.000.

Andersson, Mats H.: *See—*
Bodin, Jan-Olof; Barnhardt, Steve L.; Nilsson, Nils B.; and Andersson, Mats H., 5,553,911, Cl. 296-190.000.

Andersson, Sven E. Pressurized water closet flushing system. 5,553,333, Cl. 4-354.000.

Ando, Hiromi: *See—*
Endo, Mitsuhiro; Shirahata, Kiyoshi; and Ando, Hiromi, 5,553,530, Cl. 91-369.300.

Ando, Hitoshi: *See—*
Hamada, Minoru; and Ando, Hitoshi, 5,555,521, Cl. 365-185.030.

Ando, Shuji; and Honbo, Yoichi, to Bridgestone Corporation. Heavy duty pneumatic radial tires with specified tread profile. 5,553,646, Cl. 152-209.00R.

Andonian, Joseph K.: *See—*
Hedges, Harry S., 5,554,128, Cl. 604-192.000.

Andre, Michel: *See—*
Calmettes, Lionel; Detable, Pascal; and Andre, Michel, 5,553,358, Cl. 24-20.0TT.

Andres, Thomas, to Thermal Industries, Inc. Plastic extrusions for use in floor assemblies. 5,553,427, Cl. 52-177.000.

Andrews, William C.: *See—*
Nabors, James K., Jr.; and Andrews, William C., 5,554,022, Cl. 431-10.000.

Anezaki, Tomoaki: *See—*
Tajima, Ikuo; Kojima, Terutada; Anezaki, Tomoaki; Hirate, Masayoshi; and Suzuki, Shigeo, 5,553,560, Cl. 112-103.000.

Ang, Anthony, to Xerox Corporation. Total internal reflection knife edge. 5,555,328, Cl. 385-31.000.

Angelini, Keith H.: *See—*
Wilson, James A.; Kayserman, Mark; and Angelini, Keith H., 5,555,288, Cl. 379-67.000.

Angles, Manfred: *See—*
Sydekum, Heinz; Angles, Manfred; and Hassmann, Frank, 5,553,713, Cl. 267-221.000.

Anifrani, Jean-Charles; Le Floc'h, Christian M.; Sornette, Didier; and Souillard, Bernard, to Aerospatiale Societe Nationale Industrielle. Method for the predictive determination of load of a structure at rupture. 5,554,810, Cl. 73-801.000.

Anne, Joshi; and Lee, Jen S., to Lockheed Missiles & Space Company, Inc. Coatings with second phase particulate to improve environmental protection. 5,554,390, Cl. 428-631.000.

Anthony Bernard Incorporated: *See—*
Assini, Anthony; and Foss, Bernard, 5,554,197, Cl. 8-406.000.

Anthony Industries, Inc.: *See—*
Anwyll, James, Jr., 5,554,246, Cl. 156-253.000.

Anvik Corporation: *See—*
Dunn, Thomas J.; and Panchal, Dharmesh G., 5,555,089, Cl. 356-352.000.

Anwyll, James, Jr., to Anthony Industries, Inc. Air infiltration barrier laminate and process for preparing same. 5,554,246, Cl. 156-253.000.

Anzai, Shoji: *See—*
Mitsuya, Yoshihide; and Anzai, Shoji, 5,553,956, Cl. 401-68.000.

Aoai, Toshiaki: *See—*
Kawabe, Yasumasa; Satoh, Kenichiro; and Aoai, Toshiaki, 5,554,481, Cl. 430-192.000.

Aoe, Shigeru; Kakehi, Gen; and Ryu, Tadamitsu, to Fujitsu Limited. Distributed processing in a system of computers at terminals connected by a communication network. 5,555,427, Cl. 395-800.000.

Aoki, Naohiko: *See—*

Yamazato, Hisao; Tani, Naoki; Aoki, Naohiko; Kasihara, Jyunzou; and Urumoto, Yasunari, 5,555,189, Cl. 364-492.000.

Aoki, Satoshi: *See—*
Tomooka, Keiji; Sakakida, Naohiro; Nishimura, Shin; Ashi, Yoshihiro; Arimoto, Kazuaki: *See—*
Fukumoto, Hiroshi; Tanaka, Naoya; Oda, Keisuke; Arimoto, Kazuaki; Yoshida, Takashi; Higashi, Kazuhiko; Kasahara, Yasunori; and Kuwada, Terumi, 5,555,462, Cl. 347-218.000.

Ashland Products, Inc.: *See—*
Prete, James G.; Schultz, Steven E.; and Polowinczak, Allen D., 5,553,903, Cl. 292-163.000.

Assini, Anthony; and Foss, Bernard, to Anthony Bernard Incorporated. Hair dying system and methods for accurately blending and developing hair dye

Bäbler, Fridolin, to Ciba-Geigy Corporation. Stir-in organic pigments. 5,554,217, Cl. 106-494.000.

Bacskay, Stephen: *See—*
Feal, Joseph; and Bacskay, Stephen, 5,554,394, Cl. 425-434.000.

Yamazato, Hisao; Tani, Naoki; Aoki, Naohiko; Kasihara, Jyunzou; and Uramoto, Yasunari, 5,555,189, Cl. 364-492.000.

Aoki, Satoshi: *See—*
Tomooka, Keiji; Sakakida, Naohiro; Nishimura, Shin; Ashi, Yoshihiro; Matsuda, Hironari; Aoki, Satoshi; Nakano, Yukio; Takatori, Masahiro; Kazawa, Toru; Sasaki, Shinya; Takeyari, Ryoji; and Nakano, Hiroyuki, 5,555,477, Cl. 359-115.000.

Aono, Hiroshi; Yokomakura, Mitsunori; Katano, Mitsunori; and Watanabe, Michiaki, to Matsushita Electric Industrial Co., Ltd. Elastic restraint for flat panel displays. 5,554,910, Cl. 313-497.000.

Aoyagi, Yoshio: *See—*
Iijima, Takayuki; Aoyagi, Yoshio; Kato, Shigetoshi; Yoshizawa, Osamu; Wakimoto, Hiroshi; Kawahara, Akira; and Namiki, Akio, 5,554,966, Cl. 340-687.000.

Aoyama, Masahiko: *See—*
Saijo, Eiji; Atsumi, Keigo; and Aoyama, Masahiko, 5,554,052, Cl. 439-595.000.

Apex Bioscience, Inc.: *See—*
Dewhirst, Mark W.; Meyer, Robert E.; Bonaventura, Joseph; and DeAngelo, Joseph, 5,554,638, Cl. 514-398.000.

Aphios Corporation: *See—*
Castor, Trevor P., 5,554,382, Cl. 424-450.000.

Apostol, George: *See—*
Nguyen, Uoc H.; Su, Sam; Cheung, Li-Fung; and Apostol, George, 5,555,433, Cl. 395-800.000.

Apple Computer, Inc.: *See—*
Dalton, John C., 5,555,102, Cl. 358-456.000.
Menendez, Norberto; Postebic, Peter J.; and Sharpe, Benjamin W., 5,555,369, Cl. 395-161.000.
Moller, Ronald J.; and Ive, Jonathan P., 5,555,157, Cl. 361-683.000.
Tou, Frederich N.; Capps, Stephen P., Foster, Gregg S.; and Beernink, Ernest H., 5,555,363, Cl. 395-146.000.

Applewhite, John T.: *See—*
Johnson, Lonnie G.; and Applewhite, John T., 5,553,598, Cl. 124-63.000.

Applied Materials, Inc.: *See—*
Bright, Nicholas; Burfield, Paul A.; Pontefract, John; Harrison, Bernard F.; Meares, Peter; Burgin, David R.; Devaney, Andrew S.; and Kindersley, Peter T., 5,554,852, Cl. 250-492.210.

Applied Power Inc.: *See—*
Wenzel, Craig E.; Stobbs, Thomas J., and Ward, James R., 5,553,683, Cl. 180-417.000.

Applied Technical Sysytem, Inc.: *See—*
Leenstra, Richard B., Sr.; Wurden, Edwin H.; Otis, Lance N.; and Wurden, Frederick L., 5,555,409, Cl. 395-600.000.

Aquarian Accessories Corporation: *See—*
Donohoe, David G., 5,554,812, Cl. 84-413.000.

Arai, Keiichi: *See—*
Yabe, Hisao; Iida, Yoshihiro; Suzuki, Akira; Ito, Hideo; Tashiro, Yoshio; Yamazaki, Minoru; Tamada, Osamu; and Arai, Keiichi, 5,554,098, Cl. 600-121.000.

Arai, Masashi: *See—*
Kato, Keno; Noji, Ikutaro; Arai, Masashi; and Fukubayashi, Makoto, 5,553,775, Cl. 236-49.300.

Arai, Susumu: *See—*
Yano, Hideo; Arai, Susumu; and Kobayashi, Fumio, 5,555,233, Cl. 369-270.000.

Arai, Tyuyoshi, to Nissei Plastic Industrial Co., Ltd. Pressure detecting apparatus of injection molding machine. 5,553,481, Cl. 73-4.00R.

Arai, Tyuyoshi: *See—*
Nakazawa, Makoto; Koda, Toshiyasu; and Arai, Tyuyoshi, 5,554,326, Cl. 264-40.100.

Araike, Yasuo: *See—*
Masaie, Norio; Tachibana, Tomoyuki; Seita, Koji; and Araike, Yasuo, 5,554,308, Cl. 508-181.000.

Arakawa, Fumio; and Uchiyama, Kunio, to Hitachi, Ltd. Data processor with the ability of fast partial clearing of buffer memory. 5,555,394, Cl. 395-462.000.

Araki, Eiichi; Sugihara, Norihiro; Kamada, Mari; and Matsukawa, Taiji, to Sumitomo Seika Chemicals Co., Ltd. Method for producing hydrogenated NBR latex. 5,554,726, Cl. 528-495.000.

ARCO Chemical Technology, L.P.: *See—*
Saxton, Robert J.; and Zajacek, John G., 5,554,356, Cl. 423-706.000.
Soltani-Ahmadi, Ahmad; and Cochran, Robert N., 5,554,796, Cl. 568-576.000.

Arensdorf, Richard C.: *See—*
Kraus, Robert I.; West, Guy J.; Gibbs, William T.; Davis, Patrick H.; Hutton, James R.; Eckley, Bradley E.; Arensdorf, Richard C.; and Dias, Daniel R., 5,555,459, Cl. 343-702.000.

Arentson, Roger: *See—*
Thompson, William H.; Arentson, Roger; and Tomkins, Trevor, 5,553,743, Cl. 222-52.000.

Argauer, Herbert: *See—*
Lange, Hans; and Argauer, Herbert, 5,554,166, Cl. 606-182.000.

Argo, Brian P.: *See—*
Choy, Clement K.; Argo, Brian P.; Brodbeck, Kevin J.; and Hearn, Lynn M., 5,554,321, Cl. 510-398.000.

Argus Machine Co. Ltd.: *See—*
Ellett, James R., 5,554,834, Cl. 200-82.00A.

Arikawa, Junichi, to Laurel Bank Machines Co., Ltd. Bill receiving and feeding-out apparatus. 5,553,840, Cl. 271-3.080.

Arimoto, Kazuaki: *See—*
Fukumoto, Hiroshi; Tanaka, Naoya; Oda, Keisuke; Arimoto, Kazuaki; Yoshida, Takashi; Higashi, Kazuhiko; Kasahara, Yasunori; and Kuwada, Terumi, 5,555,462, Cl. 347-218.000.

Arimoto, Shinobu: *See—*
Funada, Masahiro; Takaragi, Yoichi; Arimoto, Shinobu; and Kawase, Michio, 5,555,107, Cl. 358-518.000.

Ario, Paula D.; and Aasen, Steven M., to Minnesota Mining and Manufacturing Company. Method for bonding non-amalgam restorative materials to dental surfaces. 5,554,030, Cl. 433-226.000.

Arita, Miichiro: *See—*
Mizuno, Yukio; and Arita, Miichiro, 5,554,758, Cl. 546-250.000.

Aritome, Seiichi: *See—*
Endoh, Tetsuo; Tanaka, Yoshiyuki; Aritome, Seiichi; Shirota, Riichiro; Shuto, Susumu; Tanaka, Tomoharu; Hemink, Gertjan; and Tanzawa, Toru, 5,555,204, Cl. 365-189.010.

Ariyoshi, Hiromi: *See—*
Mizuno, Naohito; Hirose, Shinichi; Ariyoshi, Hiromi; and Shimoyama, Yasuki, 5,554,806, Cl. 73-493.000.

Arizona Board of Regents acting on behalf of Arizona State University: *See—*
Pettit, George R., 5,554,725, Cl. 530-330.000.

Armentrout, Charles J.; and Strandberg, Carl E., to Pilot Industries, Inc. Leak detection system. 5,553,483, Cl. 73-40.000.

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Artis, Dean R.: *See—*
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Arweiler, Hans W.: *See—*
Wolf, Andreas; and Arweiler, Hans W., 5,555,507, Cl. 364-553.000.

ASA Electronics Corporation: *See—*
Scribner, Paul; and Semple, Dan, 5,555,466, Cl. 348-8.000.

Asada, Kazuyoshi: *See—*
Kitamura, Tadaaki; Kobayashi, Yoshiki; Nakanishi, Kunio; Yahiro, Masakazu; Satoh, Yoshiyuki; Shibata, Toshiro; Horie, Takeshi; Yamamoto, Katsuyuki; Takatoo, Masao; Inoue, Haruki; and Asada, Kazuyoshi, 5,554,983, Cl. 340-937.000.

Asahi Corporation: *See—*
Yano, Hideo; Arai, Susumu; and Kobayashi, Fumio, 5,555,233, Cl. 369-270.000.

Asahi Denso Kabushiki Kaisha: *See—*
Shimizu, Hidekazu; and Hashimoto, Akihiro, 5,554,891, Cl. 307-10.200.

Asahi Glass Company, Ltd.: *See—*
Bravet, Jean-Louis; Crux, Noel; and L'Her, Anne, 5,554,431, Cl. 428-137.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Tonomura, Shoichiro; Matsui, Masahiro; and Morishita, Takashi, 5,554,449, Cl. 428-690.000.

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Machida, Katsuki, 5,555,064, Cl. 354-289.120.
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Ozaki, Yoshito; and Onishi, Katsuhiro, 5,553,831, Cl. 251-292.000.

Asahina, Yasuo: *See—*
Kuramoto, Shinichi; Okamoto, Yoshihisa; Asahina, Yasuo; Izumi, Michio; Gohhara, Hidefumi; Mochizuki, Chiharu; Suzuki, Tomomi; Nakamura, Hideo; and Wakisaka, Masaru, 5,554,478, Cl. 430-109.000.

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Miyauchi, Shinji; Nakane, Shinichi; Asano, Kazutaka; Horiike, Yoshio; and Tsuboi, Makoto, 5,554,976, Cl. 340-626.000.

Aseltine, John H.: *See—*
Li, Edward; Mitchell, Ralph M.; and Aseltine, John H., 5,554,921, Cl. 320-22.000.

Ashcroft, Dale A., to New Holland North America, Inc. Controls for a skid steer loader. 5,553,992, Cl. 414-685.000.

Ashi, Yoshihiro: *See—*
Tomooka, Keiji; Sakakida, Naohiro; Nishimura, Shin; Ashi, Yoshihiro; Matsuda, Hironari; Aoki, Satoshi; Nakano, Yukio; Takatori, Masahiro; Kazawa, Toru; Sasaki, Shinya; Takeyari, Ryoji; and Nakano, Hiroyuki, 5,555,477, Cl. 359-115.000.

Ashland: *See—*
Ward, Irl E., 5,554,312, Cl. 510-175.000.

Ashland Products, Inc.: *See—*
Prete, James G.; Schultz, Steven E.; and Polowinczak, Allen D., 5,553,903, Cl. 292-163.000.

Assini, Anthony; and Foss, Bernard, to Anthony Bernard Incorporated. Hair dying system and methods for accurately blending and developing hair dye. 5,554,197, Cl. 8-406.000.

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Ludwig, Thomas E.; and Craft, Thomas W., 5,555,381, Cl. 395-281.000.

Astec Industries, Inc.: *See—*
Campbell, Thomas R., 5,553,968, Cl. 404-108.000.

AT&T Corp.: *See—*
Bhusri, Gurcharan S., 5,555,295, Cl. 379-112.000.

Atkinson, Eldon E., Jr.: *See—*
Lin, Ronny W.; Atkinson, Eldon E., Jr.; and Balhoff, Donald E., 5,554,791, Cl. 562-565.000.

Atlantic Richfield Company: *See—*
Hartman, Chris J., 5,553,666, Cl. 166-60.000.

Atlas Copco AirPower naamloze vennootschap: *See—*
Segers, Jozef, 5,554,018, Cl. 418-55.400.

Atotech USA, Inc.: *See—*
Ciccarelli, Paul W., Jr.; Seager, Charles, Jr.; and Himes, Ricky, 5,553,633, Cl. 134-72.000.
Smith, Stanley B.; and Blakeslee, G. Allen, 5,553,700, Cl. 198-780.000.

ATR Interpreting Telephony Research Laboratories: *See—*
Komori, Yasuhiro; and Sagayama, Shigeki, 5,555,345, Cl. 395-23.000.

Atsumi, Keigo: *See—*
Saijo, Eiji; Atsumi, Keigo; and Aoyama, Masahiko, 5,554,052, Cl. 439-595.000.

Atteridge, David G.: *See—*
Block, Peter C.; Anderson, W. Earl; and Atteridge, David G., 5,554,185, Cl. 623-2.000.

Attia, Alan I.: *See—*
Bugga, Ratnakumar V.; Attia, Alan I.; and Halpert, Gerald, 5,554,457, Cl. 429-102.000.

Auciello, Orlando H.: *See—*
Kingon, Angus I.; Al-Shareef, Husam N.; Auciello, Orlando H.; Gifford, Ken D.; Lichtenwalner, Dan J.; and Dat, Rovindra, 5,555,486, Cl. 361-305.000.

Audiofax, Inc.: *See—*
Bloomfield, Mark C.; Castro, Edward F.; Dyer, Joseph T.; Jackson, Deborah J.; Lemons, Charles E.; McCown, Bruce A.; Mullis, Johnny P.; and Troxell, Brian A, 5,555,100, Cl. 358-402.000.

Audoire, Philippe; and Memeteau, Michel, to Matra Automobile; and Farnier Penin. Luggage rack for motor vehicle. 5,553,761, Cl. 224-321.000.

Auriol, Daniel H.; Paul, Francois B.; and Monsan, Pierre F., to Ulice. Process for the enzymatic synthesis of alkyl esters of peptides and peptides, and microparticles therefrom. 5,554,508, Cl. 435-68.100.

Authie, Christian; and Cassagne, Philippe, to Etienne Lacroix Toux Artifices S.A. Munition constituting a cartridge-launcher loader, in particular for countermeasure cartridge-launcher on aircraft. 5,554,815, Cl. 89-1.590.

Auto-Shade, Inc.: *See—*
Shink, Joseph M., 5,553,908, Cl. 296-978.000.

Avocet Medical, Inc.: *See—*
Zweig, Stephen E., 5,554,531, Cl. 435-286.100.

Awh, Carl C.; Rader, R. Scott; Walsh, Alexander C.; and de Juan, Eugene, Jr., to Johns Hopkins University. Fiber optic pick manipulator. 5,554,155, Cl. 606-16.000.

Axelsson, Oskar: *See—*
Teuber, Lene; Axelsson, Oskar; and Wätjen, Frank, 5,554,630, Cl. 514-338.000.
Teuber, Lene; Axelsson, Oskar; and Watjen, Frank, 5,554,632, Cl. 514-338.000.

Axelsson, Sven-Inge S.; and Karlsson, Åke I., to Meltic AB. Granulating machine. 5,553,797, Cl. 241-285.300.

Ayai, Naoki: *See—*
Yamada, Yuichi; and Ayai, Naoki, 5,554,448, Cl. 428-612.000.

Azadegan, Faramarz: *See—*
Tsinberg, Mikhail; Azadegan, Faramarz; Hu, Antony; and Ogawa, Shigeo, 5,555,193, Cl. 364-514.00A.

Azon USA Inc.: *See—*
Freeland, Gerard S., 5,554,713, Cl. 528-76.000.

B. F. Goodrich Company, The: *See—*
Adams, Lowell J.; Weisend, Norbert A., Jr.; Pisarski, Nathan; and Simshauser, Steven C., 5,553,815, Cl. 244-134.00R.
Layer, Robert W.; and Chasar, Dwight W., 5,554,699, Cl. 525-332.700.
Rauckhorst, Richard L., III; and Leffel, Kevin L., 5,553,814, Cl. 244-134.00A.

B&G Plastics, Inc.: *See—*
Kolton, Chester; and Spater, Stuart S., 5,553,411, Cl. 40-640.000.

Baba, Yoshiro; Hiraki, Shunichi; and Osawa, Akihiko, to Kabushiki Kaisha Toshiba. Semiconductor device and method of increasing device breakdown voltage of semiconductor device. 5,554,872, Cl. 257-342.000.

Babbitt, Stephen T.; Scott, James E.; and Wreede, John E., to Hughes Electronics. Holographic exposure prism. 5,555,108, Cl. 359-12.000.

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Licht, Morten; Watson, George B.; Myers, Robert B.; and Johnson, Dennis W., 5,553,782, Cl. 239-107.000.

Babiarz, Joseph E.: *See—*
Winter, Roland A. E.; Ravichandran, Ramanathan; Holt, Mark S.; von Ahn, Volker H.; Babiarz, Joseph E.; and Leppard, David G., 5,554,760, Cl. 548-260.000.

Bäbler, Fridolin, to Ciba-Geigy Corporation. Stir-in organic pigments. 5,554,217, Cl. 106-494.000.

Bacskay, Stephen: *See—*
Feal, Joseph; and Bacskay, Stephen, 5,554,394, Cl. 425-434.000.

Badger Meter, Inc.: *See—*
Koch, Ronald N.; Koch, Richard H.; and Thornborough, Ray J., 5,554,981, Cl. 340-870.370.

Badylak, Stephen F.; Voytik, Sherry L.; Brightman, Andrew; and Waninger, Matt, to Purdue Research Foundation. Urinary bladder submucosa derived tissue graft. 5,554,389, Cl. 424-558.000.

Baghai-Kermani, A. Method and apparatus for the thermoelectric generation of electricity. 5,554,819, Cl. 136-206.000.

Bahrton, Göran. Flowmeter with a variable constriction. 5,554,805, Cl. 73-202.000.

Baichwal, Anand R., to Edward Mendell Co., Ltd. Sustained release heterodisperse hydrogel systems for insoluble drugs. 5,554,387, Cl. 424-488.000.

Baidins, Andrejs; and Diebold, Michael P., to Du Pont de Nemours, E. I., and Company. High gloss durable TiO_2 pigment. 5,554,216, Cl. 106-442.000.

Baird, John A., Jr.: *See—*
Blackstock, Jon C.; Baird, John A., Jr.; and Carr, Ian T., 5,553,926, Cl. 299-10.000.

Bakalar, Sharon F. Method and apparatus for heat treating webs. 5,553,391, Cl. 34-110.000.

Baker Hughes Incorporated: *See—*
Carabine, Alan M., 5,554,302, Cl. 210-791.000.
Martin, Fred S.; and Bearden, John L., 5,554,897, Cl. 310-54.000.
Smith, Sidney K., Jr.; and Holder, Danny J., 5,553,672, Cl. 166-382.000.

Baker, James A.: *See—*
Edwards, Stuart D.; Lax, Ronald G.; Lundquist, Ingemar H.; Sharkey, Hugh R.; and Baker, James A., 5,554,110, Cl. 604-22.000.

Baker, Raymond; Matassa, Victor G.; Reeve, Austin J.; Sternfeld, Francine; and Street, Leslie J., to Merck, Sharp & Dohme Ltd. 4-substituted 1,2,4-triazole derivatives. 5,554,629, Cl. 514-323.000.

Baker, Roy S.; and Lefavour, David W., to Sundstrand Corporation. No-brake power transfer phase balance sychronization sense circuit and method. 5,555,151, Cl. 361-79.000.

Bakx, Martinus C. M., to Mead Corporation, The. Clip-type carrier for flanged article. 5,553,705, Cl. 206-158.000.

Balboni, Michael J.: *See—*
Whalen, Mark E.; Elgin, Randall H.; and Balboni, Michael J., 5,555,518, Cl. 367-4.000.

Baldwin, Russell L.: *See—*
Andersen, William F.; Boyd, Andrew B.; Baldwin, Russell L.; and Datta, Bisuddha N., 5,553,977, Cl. 405-204.000.

Bales, Thomas O.; Solar, Matthew S.; Sixto, Robert, Jr.; and Smith, Kevin W., to Symbiosis Corporation. Medical fluid pump powered by a constant source of vacuum. 5,554,011, Cl. 417-399.000.

Balestrieri, Harry, to M. R. Carretta Co., Inc. Football kicking practice device. 5,553,855, Cl. 273-55.00B.

Balestro, Freddy; and Senn, Patrice, to France Telecom. Signal processing device using several different filterings, especially for audio-frequency coding of voice signals. 5,555,272, Cl. 375-220.000.

Balhoff, Donald E.: *See—*
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Balhorn, Alan C. Multi-speed transmission. 5,553,510, Cl. 74-354.000.

Ball, Geoffrey R., to Symphonix. Implantable electromagnetic hearing transducer. 5,554,096, Cl. 600-25.000.

Balling, Edward N., to Eastman Kodak Company. Camera with built-in means for closing film cassette and ejecting closed cassette. 5,555,063, Cl. 354-288.000.

Balzers Aktiengesellschaft: *See—*
Karner, Johann; and Bergmann, Erich, 5,554,255, Cl. 156-643.100.

Ban, Cozy; Yanagi, Motonori; Fukumoto, Takaaki; Manabe, Toshiki; Yanome, Hiroshi; and Kawada, Kazuhiko, to Mitsubishi Denki Kabushiki Kaisha. Method for producing pure water. 5,554,295, Cl. 210-668.000.

Ban, Vladimir S.: *See—*
Forrest, Stephen R.; Ban, Vladimir S.; Burrows, Paul E.; and Schwartz, Jeffrey, 5,554,220, Cl. 117-88.000.

Ban, Yasuaki: *See—*
Ishida, Tatsuaki; Sugita, Ryuji; Tohma, Kiyokazu; and Ban, Yasuaki, 5,554,440, Cl. 428-336.000.

Banford, Jonathan: *See—*
Simpson, Leslie A.; Robb, John; Banford, Jonathan; Dietz, Paul F.; and Temperley, John, 5,554,215, Cl. 106-436.000.

Banker Hughes Incorporated: *See—*
Rivers, Gordon T.; and Rybacki, Richard L., 5,554,349, Cl. 423-228.000.

Bannert, Georg: *See—*
Mitzkus, Jürgen; Wifling, Martin; Kopetzky, Robert; Bannert, Georg; Wengert, Andreas; Diepold, Ulrich; Kempfle, Thomas; Emmert, Erik; and Steffan, Hermann, 5,553,803, Cl. 242-374.000.

Barada, Peter W.: *See—*
Blumer, Thomas P.; and Barada, Peter W., 5,555,358, Cl. 395-141.000.

Barainsky, Markus. Consumer item. 5,555,223, Cl. 368-10.000.

Barbee, Garry W.: *See—*
Huber, Michael J.; Jason, Jerry P.; and Barbee, Garry W., 5,554,230, Cl. 148-208.000.

Barbee, Robert B.: *See—*
Chang, Yeong-Ho; Barbee, Robert B.; and Phillips, Brian S., 5,554,701, Cl. 525-437.000.

Baret, Frédéric L. R.; Fourrey, François; and Humiliere, Nathalie F., to CESA - Compagnie Europeenne de Sieges pour Automobiles. Convertible seat structure and the application thereof in particular in a motor vehicle. 5,553,918, Cl. 297-237.000.

Barkan, Edward: *See*—
Marom, Emanuel; Katz, Joseph; and Barkan, Edward, 5,555,130, Cl. 359-574.000.

Barkenhagen, Michael E., to Hughes Aircraft Company. Noninvasive method and apparatus for determining body chemistry. 5,553,617, Cl. 128-633.000.

Barker, Philip A.; Stockton, David J.; Fisk, Christopher; and Jenkins, Peter D., to British Telecommunications public limited company. Optical fibres for blown installation. 5,555,335, Cl. 385-100.000.

Barker, Stanley. Electromagnetic field frequency and image magnetic forms quantum analyzer apparatus. 5,555,207, Cl. 324-121.00R.

Barkhimer, Robert L.; and Beck, Niels J., to Servojet Products International. Conversion of jerk type injector to accumulator type injector. 5,553,781, Cl. 239-88.000.

Barley, Leonard V., Jr.: *See*—
Byram, Michael M.; Goebel, Robert; Greff, Richard J.; and Barley, Leonard V., Jr., 5,554,365, Cl. 424-78.020.

Barna, Glen L.: *See*—
Campbell, Richard L.; Brumm, Douglas B.; Anderson, Carl L.; and Barna, Glen L., 5,555,457, Cl. 340-870.170.

Barnard, Craig, to Fundustry, Inc. Stackable puzzle and a method for stacking characters of a set to form the puzzle. 5,553,856, Cl. 273-156.000.

Barnard, Michael A.; and Cox, Marvin L., to Wescon Products Company. Support means for conduit. 5,553,822, Cl. 248-302.000.

Barnhardt, Steve L.: *See*—
Bodin, Jan-Olof; Barnhardt, Steve L.; Nilsson, Nils B.; and Andersson, Mats H., 5,553,911, Cl. 296-190.000.

Barns, Christopher E.: *See*—
Breivogel, Joseph R.; Louke, Samuel F.; Oliver, Michael R.; Yau, Leopoldo D.; and Barns, Christopher E., 5,554,064, Cl. 451-41.000.

Barr, John D.; Burrell, Mark W.; Russell, Robert A.; Thorp, Richard; Boast, David; and Clegg, John, to Camco International Inc. Modulated bias units for steerable rotary drilling systems. 5,553,678, Cl. 175-73.000.

Barra, Jordi B.; and Sorolla, Jose R. Azo dyes containing a 2-(arylsulphonylamino)pyrimidine radical. 5,554,736, Cl. 534-755.000.

Barrett, Daniel P.; Davis, Roger J.; Dustman, John E.; Gibas, Dawn R.; Stevens, Bradley G. L.; and Wilson, Barry T., to Summit Envirosolutions, Inc. Measuring system for measuring real time groundwater data. 5,553,492, Cl. 73-152.290.

Barrow, Stephen R.: *See*—
Williams, David R.; Ryles, Christine W.; and Barrow, Stephen R., 5,554,358, Cl. 424-49.000.

Barry, David M., to Boeing Company, The. Piercing grommet having detachable tool for installation. 5,553,368, Cl. 29-423.000.

Bartelt, Bertram; Gohle, Peter; and Schaal, Wolfgang, to Filterwerk Mann & Hummel GmbH. Backwashable filter for fluids. 5,554,284, Cl. 210-356.000.

Bartges, Charles W.; Hayland, Robert W., Jr.; Jensen, Craig J.; and Baumann, Steven F., to Aluminum Company of America. Memory disk sheet stock and method. 5,554,428, Cl. 428-64.100.

Bartkowiak, John G.: *See*—
Gulick, Dale E.; Peterson, Joseph W.; Bowles, James E.; Bartkowiak, John G.; Yoshikawa, Munehiro; Saito, Shin; and Matsubara, Hiroshi, 5,555,287, Cl. 379-61.000.

Bartlett, Robert R.: *See*—
Weithmann, Klaus U.; and Bartlett, Robert R., 5,554,637, Cl. 514-378.000.

Bartroli, Javier: *See*—
Almansa, Carmen; Carceller, Elena; Gonzalez, Concepcion; Torres, Carmen; and Bartroli, Javier, 5,554,624, Cl. 514-303.000.

Barudi, Samir E.; French, John T.; and Gore, Hardial S., to Superior Fireplace Company. Air to fuel ratio adjustment device for sealed-combustion type fireplaces. 5,553,603, Cl. 126-512.000.

Basava, Channa; and Hostetler, Karl Y., to NeXstar Pharmaceuticals, Inc. Lipid conjugates of therapeutic peptides and protease inhibitors. 5,554,728, Cl. 530-327.000.

Basch, Lauren R.; and Patashnick, Harvey, to Rupprecht & Patashnick Company, Inc. Airborne particulate. 5,553,507, Cl. 73-863.010.

BASF Aktiengesellschaft: *See*—
Bergmann, Udo; Schäfer, Gerhard; and Kowarsch, Heinrich, 5,554,774, Cl. 552-281.000.
Flory, Klaus; Stange, Andreas; Kroener, Michael; and Sendhoff, Norbert, 5,554,718, Cl. 528-246.000.
Grund, Clemens; Glas, Guenther; Guenthert, Paul; Reichelt, Helmut; Becker, Rainer; Lange, Arno; and Friedrich, Klaus, 5,554,782, Cl. 558-327.000.
Keil, Michael; Schirmer, Ulrich; Kolassa, Dieter; Kast, Juergen; Wuerzer, Bruno; and Meyer, Norbert, 5,554,582, Cl. 504-344.000.
Lamm, Gunther; Reichelt, Helmut; and Wiesenfeldt, Matthias, 5,554,737, Cl. 534-758.000.
Langhauser, Franz; Kerth, Jürgen; Schweier, Günther; Brintzinger, Hans-Herbert; and Mansel, Stefan, 5,554,776, Cl. 556-11.000.
Merger, Franz; Otterbach, Andreas; Witzel, Tom; and Renz, Hans, 5,554,787, Cl. 560-355.000.
Neumann, Peter; Kipper, Jürgen; Albert, Bernhard; and Wagenblast, Gerhard, 5,554,318, Cl. 252-301.190.
Nilz, Claudia; Sendhoff, Norbert; Breitschaft, Walter; Zillig, Manfred; and Lorencak, Primoz, 5,554,261, Cl. 162-162.000.
Schneider, Heinz-Walter; Wilms, Axel; Schmitz, Rüdiger; Schulz, Robert; and Michelsen, Klaus, 5,554,353, Cl. 423-387.000.
Wenderoth, Bernd; Brand, Siegbert; Schuetz, Franz; Kuekenhoehner, Thomas; Roehl, Franz; Ammermann, Eberhard; and Lorenz, Gisela, 5,554,578, Cl. 504-130.000.
Wingert, Horst; Müller, Bernd; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,554,616, Cl. 514-269.000.
Wolf, Gerhard; Oftring, Alfred; Schuh, Georg; Wolf, Helmut; Alt, Rudolf; Bechtolsheimer, Hans-Heinrich; and Hertel, Dieter, 5,554,742, Cl. 536-18.600.

Basinski, Margret B.; DiMarchi, Richard D.; Heath, William F., Jr.; and Schoner, Brigitte E., to Eli Lilly and Company. Anti-obesity proteins. 5,554,727, Cl. 530-324.000.

Bastani, Bamdad; and Wong, Larry, to National Semiconductor Corporation. Process for fabricating two loads having different resistance levels in a common layer of polysilicon. 5,554,554, Cl. 437-47.000.

Bate, Edward R., Jr.: *See*—
Gosselin, Albert E., Jr.; Bate, Edward R., Jr.; and Johnson, Dale F., 5,553,555, Cl. 110-215.000.

Bates, Stanley. Piling anchor. 5,553,978, Cl. 405-244.000.

Batich, Christopher D.; Cohen, Marc S.; and Foster, Kirk, to CApHCO, Inc. Compositions and devices for controlled release of active ingredients. 5,554,147, Cl. 604-890.100.

Batliner, Rainer; Knoller, Anton; and Neukirchen, Axel, to Hilti Aktiengesellschaft. Rock drill. 5,553,682, Cl. 175-395.000.

Battigelli, Jean: *See*—
Bernard, Jean L.; Vignesoult, Serge; Battigelli, Jean; Berthier, Guy; and Furtak, Hans, 5,554,324, Cl. 264-8.000.

Battistella, Mirco: *See*—
Tacchetto, Maurizio; and Battistella, Mirco, 5,553,361, Cl. 24-68.0SK.

Battle, John R. Refillable liquid dispenser. 5,553,748, Cl. 222-94.000.

Battu, Ramgopal: *See*—
Hickox, Thomas A.; Battu, Ramgopal; and Gollbach, Lawrence W., 5,555,146, Cl. 360-105.000.

Baty, Cheryll A. Handle for the handicap. 5,553,355, Cl. 16-110.00R.

Bauer, Daniel R.; and Kosmider, Kristofer G., to Diversified Bank Installations, Inc. Electronic storage cabinet and lighted sign assembly for an automatic teller machine. 5,553,552, Cl. 109-24.100.

Bauer, Jean-Michel, to Le Carbone-Lorraine. Diffuser elements facilitating the mass transfer in solid/gas reactions. 5,554,348, Cl. 422-211.000.

Bäuerle, Emil; and Korte, Magnus, to Mercedes-Benz AG. Fuel injection arrangement for a multicylinder internal combustion engine. 5,553,592, Cl. 123-456.000.

Baukloh, Dieter: *See*—
Noe, Rolf; Noe, Andreas; and Baukloh, Dieter, 5,554,235, Cl. 148-610.000.

Baumann, Hans-Peter, to Sandoz Ltd. Dyeing process and auxiliary. 5,554,199, Cl. 8-543.000.

Baumann, Steven F.: *See*—
Bartges, Charles W.; Hayland, Robert W., Jr.; Jensen, Craig J.; and Baumann, Steven F., 5,554,428, Cl. 428-64.100.

Bausch & Lomb Incorporated: *See*—
Conway, Simon M., 5,555,038, Cl. 351-159.000.

Baxter International Inc.: *See*—
Guo, George X.; and Stobie, Robert, 5,554,186, Cl. 623-2.000.

Bayard, William H.: *See*—
Scheufler, Fred G.; Scheufler, Richard D.; and Bayard, William H., 5,554,416, Cl. 427-378.000.

Bayer Aktiengesellschaft: *See*—
Sanders, Josef; Kratz, Mark; Dietrich, Manfred; Heinemann, Torsten; Woynar, Helmut; Jacobs, Gundolf; and Scholz, Uwe, 5,554,662, Cl. 521-137.000.

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Fischer, Reiner; Jensen-Korte, Uta; Kunisch, Franz; Marhold, Albrecht; Ooms, Pieter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; Krauskopf, Birgit; and Strang, Harry, 5,554,580, Cl. 504-281.000.
Haas, Wilhelm; Müller, Klaus-Helmut; König, Klaus; Santel, Hans-Joachim; Lürssen, Klaus; and Schmidt, Robert R., 5,554,761, Cl. 548-263.600.
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Martin, Fred S.; and Bearden, John L., 5,554,897, Cl. 310-54.000.

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Coassin, Peter J.; Matson, Robert S.; and Rampal, Jang B., 5,554,501, Cl. 435-6.000.

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Down, James A.; Walters, Adriann H.; Dey, Margaret S.; Howard, Deborah R.; Little, Michael C.; and Keating, William E., 5,554,503, Cl. 435-6.000.

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Williams, Andrew J.; and Buckle, Derek R., 5,554,610, Cl. 514-223.200.

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Kuper, Jerry; Segal, Leon; Beeson, Karl W.; and Zimmerman, Scott M., 5,555,329, Cl. 385-36.000.
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Gelman, Alexander; and Halfin, Shlomo, 5,555,378, Cl. 395-200.130.
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Bell, Steven. Clip-on towel. 5,553,345, Cl. 15-209.100.

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Lucas, Robert G., 5,553,806, Cl. 242-542.400.

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Cook, Leland B.; and Thrall, Ronald G., 5,553,943, Cl. 383-113.000.

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Fowler, David E.; Horton, Philip G.; and Ben-Bassat, Arie, 5,554,520, Cl. 435-165.000.

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Vetromile, Joseph S.; and Benedict, Lawrence R., 5,555,084, Cl. 355-317.000.

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Berdich, Edward C., to Wind Lock Corporation. Hand-held heating tool with improved heat control. 5,554,838, Cl. 219-240.000.

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Ganesan, Sankaranarayanan; and Berg, Howard M., 5,554,569, Cl. 437-207.000.

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Bergeron, Raymond E.; and Priore, William. Apparatus for containment of contaminants during an underwater dredging operation. 5,553,972, Cl. 405-60.000.

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Bergmann, Udo; Schäfer, Gerhard; and Kowarsch, Heinrich, to BASF Aktiengesellschaft. Preparation of chlorinated violanthrones or isoviolanthrones. 5,554,774, Cl. 552-281.000.

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Bernard, Jean L.; Vignesoult, Serge; Battigelli, Jean; Berthier, Guy; and Furtak, Hans, to Isover Saint-Gobain. Method for producing mineral wool. 5,554,324, Cl. 264-8.000.

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Bernett, Frank W., to Quantum Corporation. Improved spindle shaft for attaching a cover in a disk drive. 5,555,211, Cl. 360-99.080.

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Bertrand, Jacques C.; Ciccarelli, Roger N.; Pickering, Thomas R.; and Bayley, Denise R., to Xerox Corporation. Combination of toners. 5,554,471, Cl. 430-45.000.

Berwick Industries, Inc.: *See*—
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Besaw, Keith V.; Donovan, Robert J.; and Sagiv, Shmuel, to International Business Machines Corporation. Compiler and method for alias checking in a compiler. 5,555,412, Cl. 395-700.000.

Bessho, Yasuyuki: *See*—
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Bethlehem Apparatus Co., Inc.: *See*—
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Bethurum, Gary C., to ITT Cannon, Inc. Latch for IC card connector. 5,554,045, Cl. 439-372.000.

Betsold, Matthew: *See*—
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Bey, Russell F.: *See*—
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Beyerlein, David G.; and Rohn, Bruce D., to Delco Electronics Corporation. Solar position correction for climate control system. 5,553,661, Cl. 165-203.000.

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Nishioka, Yasushiro; Summerfelt, Scott R.; Park, Kyung-ho; and Bhattacharya, Pijush, 5,554,564, Cl. 437-192.000.
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Bhongle, Nandkumar; and Tang, Jin-Yan, to Hybridon, Inc. Method for loading solid supports for nucleic acid synthesis. 5,554,744, Cl. 536-25.300.

Bhuari, Gurcharan S., to AT&T Corp. Service and information management system for a telecommunications network. 5,555,295, Cl. 379-112.000.

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Bibber, John W., to Sanchem, Inc. Corrosion resistant aluminum and aluminum coating. 5,554,231, Cl. 148-272.000.

Biche, Michael R.; and Anderson, H. Alexander, to Semiconductor Systems, Inc. Thermal process module for substrate cool/develop system. 5,553,994, Cl. 414-752.000.

Bidnyy, Sergei V.; Zavadtsev, Alexander A.; Mirochnik, Emmanuel A.; Mishchenko, Alexander V.; Pirozhenko, Vitaly M.; and Radchenko, Igor V., to Biosterile Technology, Inc. Conveyer-type unit for radiation sterilization. 5,554,856, Cl. 250-455.110.

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Biggs, Timothy N.; and Le Grow, Gary E., to Dow Corning Corporation. Methods of making polysiloxanes. 5,554,708, Cl. 528-23.000.

Bignell, Noel; Collings, Anthony F.; Hews-Taylor, Kenneth J.; Martin, Barry J.; Braathen, Colin W.; and Welsh, Charles M., to Commonwealth Scientific and Industrial Research Organization. Electronic fluid flow meter. 5,553,505, Cl. 73-861.280.

Bilco Company, The: *See*—
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Bilezikjian, Vahe, to Weber Aircraft, Inc. Base frame for an aircraft seat. 5,553,923, Cl. 297-452.200.

Billet, Gilles; and Yin, Huan B., to Radiall. Device for connecting optical fibres to waveguides formed in a substrate. 5,555,331, Cl. 385-49.000.

Billups, Denise: *See*—
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Anderson, Paul C.; Halmos, Teddy; Jung, Grace L.; Poupart, Marc-André; and Simoneau, Bruno, 5,554,634, Cl. 514-370.000.

BioEnergy International, L.C.: *See*—
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Bishay, John M.: *See*—
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Bison-werke Bahre & greten GmbH & Co KG: *See*—
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Bizzi, Emilio; Mussa-Ivaldi, Ferinando A.; and Shadmehr, Reza, to Massachusetts Institute of Technology. System for human trajectory learning in virtual environments. 5,554,033, Cl. 434-247.000.

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Blaha, Michael R.: *See*—
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Blaho, Bruce E.: *See*—
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Blake, Julian G., to Eaton Corporation. In situ removal of contaminants from the interior surfaces of an ion beam implanter. 5,554,854, Cl. 250-492.210.

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Blanchette, Robert A.; Brush, Theresa S.; Farrell, Roberta L.; Krisa, Keith A.; and Mishra, Chittra, to Clariant Finance (BVI) Limited. White-rot fungus and uses thereof. 5,554,535, Cl. 435-254.100.

Blanco, Rafael: *See*—
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Blech, Steven P.; Van de Steeg, Kerry; and Pepera, Gerald S., to Allen-Bradley Company, Inc. Method for synchronously transferring serial data to and from an input/output (I/O) module with true and complement error detection coding. 5,555,438, Cl. 395-850.000.

Blischke, Frank: *See*—
Schnaibel, Eberhard; Schneider, Erich; and Blischke, Frank, 5,553,450, Cl. 60-274.000.

Block, Peter C.; Anderson, W. Earl; and Atteridge, David G. Inflatable prosthetic cardiovascular valve for percutaneous transluminal implantation of same. 5,554,185, Cl. 623-2.000.

Bloomfield, Mark C.; Castro, Edward F.; Dyer, Joseph T.; Jackson, Deborah J.; Lemons, Charles E.; McCown, Bruce A.; Mullis, Johnny P.; and Troxell, Brian A, to Audiofax, Inc. Facsimile store and forward system with local interface translating DTMF signals into store and forward system commands. 5,555,100, Cl. 358-402.000.

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Bodin, Jan-Olof; Barnhardt, Steve L.; Nilsson, Nils B.; and Andersson, Mats H., to Volvo GM Heavy Truck Corporation. Heavy duty motor vehicle cab suspension. 5,553,911, Cl. 296-190.000.

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Burnham, Lowell C.; Saar, Robin R.; Alstad, Knute; and Wendt, David W., to Elkay Manufacturing Company. Cabinet and supporting frame for liquid dispensing system. 5,553,935, Cl. 312-265.300.
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Burson, Benard, Jr. Security device for bill changers. 5,553,696, Cl. 194-201.000.
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Funada, Masahiro; Takaragi, Yoichi; Arimoto, Shinobu; and Kawase, Michio, 5,555,107, Cl. 358-518.000.
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Alferness, Merwin H.; Caldarale, Charles R.; Johnson, David R.; Kerzman, Joseph P.; and McBreen, James R., 5,555,396, Cl. 395-474.000.

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Campbell, Thomas R., to Astec Industries, Inc. Method and apparatus for conveying and desegregating aggregate. 5,553,968, Cl. 404-108.000.

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Canada, Her Majesty the Queen in right of as represented by the Minister of Health and Welfare Canada: *See—*
Sharpe, Anthony N., 5,554,537, Cl. 435-309.100.

Canavan, Richard W., to Uvex Safety, Inc. Temple bar construction for a pair of eyeglasses. 5,555,037, Cl. 351-118.000.

Canon Information Systems, Inc.: *See—*
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Canon Kabushiki Kaisha: *See—*
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Funada, Masahiro; Takaragi, Yoichi; Arimoto, Shinobu; and Kawase, Michio, 5,555,107, Cl. 358-518.000.
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Kashida, Motokazu; Hoshi, Hidenori; Nagasawa, Kenichi; and Yamashita, Shinichi, 5,555,230, Cl. 369-93.000.
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Yamamoto, Masakuni, 5,555,231, Cl. 369-100.000.

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Maeda, Kazuo; Tokumasu, Noboru; and Yuyama, Yoshiaki, 5,554,570, Cl. 437-235.000.

Cantor, Alan E.; Muzzy, William H., III; Eisentraut, Donald K.; D'Aulerio, Louis A.; and Whitman, Gary R., to University of Alabama for its division, The University of Alabama at Birmingham, The Board of Trustees of the. Vehicle safety seat system. 5,553,924, Cl. 297-452.270.

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CApHCO, Inc.: *See—*
Batich, Christopher D.; Cohen, Marc S.; and Foster, Kirk, 5,554,147, Cl. 604-890.100.

Capps, Stephen P.: *See—*
Tou, Frederich N.; Capps, Stephen P.; Foster, Gregg S.; and Beernink, Ernest H., 5,555,363, Cl. 395-146.000.

Caputa, Anthony C.; Bey, Russell F.; and Murtaugh, Michael P., to University of Minnesota, Regents of the. Recombinant vaccine against Lyme disease. 5,554,371, Cl. 424-234.100.

Carabine, Alan M., to Baker Hughes Incorporated. Core blow nozzle. 5,554,302, Cl. 210-791.000.

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Carceller, Elena: *See—*
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Cardiac Pacemakers, Inc.: *See—*
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Cardiff Software, Inc.: *See—*
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CardioGenesis Corporation: *See—*
Aita, Michael; Mirhoseini, Mahmood; Cayton, Mary; Simpson, Carl J.; and Guscott, Brian, 5,554,152, Cl. 606-7.000.

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Carganico, Germano; Maulcon Casellas, David; and Garcia Perez, M. Luisa, to Laboratorios Menarini S.A. Arylpropionic derivative, a process for the preparation and the use thereof as an analgesic agent. 5,554,789, Cl. 562-460.000.

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Trubiano, Antoine, 5,553,876, Cl. 280-33.991.

Carim, Hatim M.; Knudson, Orlin B.; Ekholm, Bruce P.; Erickson, David P.; Kelliher, William J., Jr.; and Rude, Michael J., to Minnesota Mining and Manufacturing Company. Method and apparatus for noninvasive prediction of hematocrit. 5,553,615, Cl. 128-633.000.

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Roe, Donald C.; Goulait, David J. K.; Rodriquez, Sheila S.; Carlin, Edward P.; Dreier, Kimberly A.; Jasper, Carolyn M.; and Daniels, Dean J., 5,554,144, Cl. 604-385.000.
Roe, Donald C.; Goulait, David J. K.; Rodriguez, Sheila S.; Carlin, Edward P.; Dreier, Kimberly A.; Jasper, Carolyn M.; and Daniels, Dean J., 5,554,145, Cl. 604-385.200.

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Carlson, Jon D.: *See—*
Brown, Thomas E.; Carlson, Jon D.; Cook, Michael W.; Mihalik, Michael; and Davisson, Jack A., 5,554,242, Cl. 156-111.000.

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Carollo, Jerome T.: *See—*
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Carr, Ian T.: *See—*
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Dolan, Robert P.; DeWolf, Thomas L.; Phillips, Thomas R.; Zirngibl, Michael J.; and Schon, Josef J., 5,555,509, Cl. 364-505.000.
Friday, Arthur F., Jr.; and Chan, Chi-Ping, 5,555,269, Cl. 371-5.100.

Carroll, David W., to Key Idea Development, L.L.C. Wearable personal computer system. 5,555,490, Cl. 361-686.000.

Carson, David G.: *See—*
Sarangdhar, Nitin V.; Nizar, P. K.; and Carson, David G., 5,555,420, Cl. 395-739.000.

Carter Holt Harvey Plastic Products Group Limited: *See—*
Wilson, Allan W.; and Pharaoh, James F., 5,553,567, Cl. 119-14.280.

Carter, Michael B.: *See—*
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Cartry, Jean-Pierre, to Framatome. Process and device for producing a leakproof protective coating on a surface of a nuclear reactor component. 5,555,280, Cl. 376-260.000.

Caruso, Andrew J.; Lee, Julia L.; and King, Joseph A., Jr., to General Electric Company. Method for making polyalkylated xanthenes. 5,554,770, Cl. 549-388.000.

Carveth, William H. Protective hockey helmet. 5,553,330, Cl. 2-425.000.

Casartelli, Gabriele, to E.D.C. Sarl. Crash helmet for motorcyclists and the like, provided with a safety device for locking the visor. 5,553,329, Cl. 2-424.000.

Casella, Bruce A.: *See—*
Shirkey, Keith L.; and Casella, Bruce A., 5,554,982, Cl. 340-903.000.

Cassagne, Jean Pierre: *See—*
Busson, Christian; Delhomme, Henri; Gollion, Laure; and Cassagne, Jean Pierre, 5,554,347, Cl. 422-204.000.

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Cassel, Steven B. Eyeglasses visor and case. 5,553,321, Cl. 2-13.000.

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Schönafinger, Karl; Klemm, Peter; Ostrowski, Jörg, deceased, 5,554,611, Cl. 514-228.200.

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Zoller, Gerhard; Jablonka, Bernd; Just, Melitta; Klingler, Otmar; Breipohl, Gerhard; Knolle, Jochen; and König, Wolfgang, 5,554,594, Cl. 514-18.000.

Cassels, Bryan A.; Dente, James J.; Gaudet, Andrew A.; Henderson, Ian E.; and Winarski, Daniel J., to International Business Machines Corporation. Contamination detection apparatus and method using write power calibration values. 5,555,237, Cl. 369-116.000.

Castellano, Andrew J., to Standard Microsystems Corporation. Semi-synchronous dual port FIFO. 5,555,524, Cl. 365-221.000.

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Castro, Edward F.: *See—*
Bloomfield, Mark C.; Castro, Edward F.; Dyer, Joseph T.; Jackson, Deborah J.; Lemons, Charles E.; McCown, Bruce A.; Mullis, Johnny P.; and Troxell, Brian A, 5,555,100, Cl. 358-402.000.

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Catallo, Frank. Means for controlling deflection in a two-roll fabric shrinker. 5,553,365, Cl. 26-18.600.

Caterpillar, Inc.: *See—*
Coutant, Alan R.; and Rajagopalan, Sanjay, 5,553,453, Cl. 60-327.000.
Diekevers, Mark S., 5,553,931, Cl. 305-100.000.
Kyrtsos, Christos T.; Gudat, Adam J.; Christensen, Dana A.; Friedrich, Douglas W.; and Stafford, Darrell E., 5,555,503, Cl. 364-449.000.
Watts, Thomas A., 5,554,007, Cl. 417-222.100.
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Cath, Roger G.: *See—*
Judd, Ian D.; Buckland, Patrick A.; Cath, Roger G.; Cockburn, Gordon J.; and Short, William A., 5,555,390, Cl. 395-439.000.

Causey, James D., III, to Pacesetter, Inc. System and method for automatically adjusting cardioverter and defibrillator shock energy as a function of time-to-therapy. 5,554,174, Cl. 607-5.000.

Cayton, Mary: *See—*
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CCA Inc.: *See—*
Uchida, Hiroshi; Onuki, Mituhiro; and Watanabe, Hideo, 5,554,393, Cl. 425-92.000.

Cebo-Johnson, Mark. Weighted exercising garment. 5,553,322, Cl. 2-69.000.

Cell Robotics, Inc.: *See—*
Costello, David J.; Dergatchev, Aleksei Y.; Parkhurst, Warren E.; Polushkin, Valeri G.; and Kokhanovsky, Sergey A., 5,554,153, Cl. 606-9.000.

Cenedella, Philip W.: *See—*
Wolfson, Lawrence S.; Conlan, Joseph; and Cenedella, Philip W., 5,553,839, Cl. 271-3.110.

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Van Buul, Marinus C. W.; and Centen, Petrus G. M., 5,554,944, Cl. 327-91.000.

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Cerny, Dell L. Small lightweight snow flinger. 5,553,406, Cl. 37-259.000.

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Ceschin, Danilo; Ferrarotti, Rinaldo; Morandotti, Roberto; and Scardovi, Alessandro, to Olivetti-Canon Industriale, S.p.A. Refillable ink jet printing module. 5,555,007, Cl. 347-87.000.

Ceule, James P.: *See—*
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Chace, Mark S.: *See—*
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Chaella, Xavier: *See—*
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Chakradhar, Srimat T., to NEC USA, Inc. Optimal retiming of synchronous logic circuits. 5,555,188, Cl. 364-490.000.

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Chambers, John E. Fluid distribution panel and method. 5,553,417, Cl. 47-60.000.

Chambers, Ronald E.; and Mallick, Subhashis, to Western Atlas International, Inc. Computation of Q-derived static corrections from seismic data. 5,555,218, Cl. 367-73.000.

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Friday, Arthur F., Jr.; and Chan, Chi-Ping, 5,555,269, Cl. 371-5.100.

Chance, Britton, to Non-Invasive Technology, Inc. Examination of biological tissue using frequency domain spectroscopy. 5,553,614, Cl. 128-633.000.

Chandler, John M., to ICI Americas Inc. Conditioning shampoo containing insoluble, nonvolatile silicone. 5,554,313, Cl. 510-121.000.

Chang, Cheng-Tso. Foldable stroller frame. 5,553,885, Cl. 280-642.000.

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Chu, Po-Tao; Chang, Kuang-Hui; and Huang, Yuan-Chang, 5,554,563, Cl. 437-190.000.
Huang, Yuan-Chang; and Chang, Kuang-Hui, 5,554,254, Cl. 156-625.100.

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Chang, Kuo-Tung, to Motorola, Inc. Electrically programmable read-only memory array. 5,554,869, Cl. 257-316.000.

Chang, Wanli: *See—*
Sung, Chiakang; Chang, Wanli; and Huang, Joseph, 5,555,214, Cl. 365-221.000.

Chang, Yeong-Ho; Barbee, Robert B.; and Phillips, Brian S., to Eastman Chemical Company. Crosslinked polyesters made from decahydronaphthalene dimethanol. 5,554,701, Cl. 525-437.000.

Chang, Yih-Her: *See—*
Ho, Bang C.; Chen, Jian-Hong; Yang, Sbu-Yin; and Chang, Yih-Her, 5,555,525, Cl. 385-143.000.

Chang, Yuan-Liang. Water-saving irrigation device. 5,553,970, Cl. 47-48.500.

Chao, Benjamin: *See—*
Ovshinsky, Stanford R.; Fetcenko, Michael A.; Im, Jun; Chao, Benjamin; Reichman, Benjamin; and Young, Kwo, 5,554,456, Cl. 429-59.000.

Chao, Chao-Mu: *See—*
Chou, Chia-Tien; and Chao, Chao-Mu, 5,553,323, Cl. 2-114.000.

Chapman, John S.: *See—*
Willingham, Gary L.; Schuman, Richard F.; Huang, Chun-Hsien; and Chapman, John S., 5,554,542, Cl. 436-548.000.

Chapman, Maurice I.; and Nicholson, David, to UK Sterilisers Ltd. Soil sterilizer and method. 5,553,414, Cl. 47-1.420.

Chaput, Robert B.; and Steck, Randy L., to Intel Corporation. Method and apparatus for a line based non-blocking data cache. 5,555,392, Cl. 395-445.000.

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Raymond, Richard M., 5,554,497, Cl. 435-1.200.

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Chasar, Dwight W.: *See—*
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Chiao, Richard Y., to General Electric Company. System and method for detecting ply wrinkling in a laminated composite. 5,554,808, Cl. 73-598.000.

Chu, Po-Tao; Chang, Kuang-Hui; and Huang, Yuan-Chang, to Taiwan Semiconductor Manufacturing Company. In situ hot bake treatment that prevents precipitate formation after a contact layer etch back step. 5,554,563, Cl. 437-190.000.

Chung, Hoon-Sang; and Kim, Jong-Hyun, to Samsung Electronics Co., Ltd. Method for manufacturing a semiconductor device having a capacitor. 5,554,564, Cl. 437-190.000.

Ciba-Geigy Corporation: *See—*
Dupont, Hervé; Chawki, Mouhamad; and Claveau, Georges, 5,555,121, Cl. 359-180.000.

Cleary, Brenda A.; and Boucher, Steven P., to Henkel Corporation. Polymers useful as printing vehicles. 5,554,705, Cl. 526-318.440.

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Chaudhari, Praveen: *See—*
Brady, Michael J.; Chaudhari, Praveen; Gambino, Richard J.; Heinrich, Harley K.; Moskowitz, Paul A.; and von Gutfeld, Robert J., 5,554,974, Cl. 340-572.000.

Chaudhary, Bharat I.; Eschenlauer, Georges; and Marks, Bruce S., to Dow Deutschland Inc. Closed cell, low density ethylenic polymer foam produced with inorganic halogen-free blowing agents. 5,554,661, Cl. 521-97.000.

Chavarie, Claude: *See—*
Fortin, J. André; St-Arnaud, Marc; Hamel, Chantal; Chavarie, Claude; and Jolicoeur, Mario, 5,554,530, Cl. 435-256.800.

Chawki, Mouhamad: *See—*
Dupont, Hervé; Chawki, Mouhamad; and Claveau, Georges, 5,555,121, Cl. 359-180.000.

Cheil Industries, Inc.: *See—*
Kim, Kun-hye; Son, Soo-ho; Yoon, Young-huy; and Lee, Chang-jig, 5,553,357, Cl. 19-258.000.

Chelednik, George M.: *See—*
Young, Wayne P.; Mastri, Dominick L.; Bolanos, Henry; and Chelednik, George M., 5,554,167, Cl. 606-184.000.

Chemical Research & Licensing Company: *See—*
Sy, Angel, 5,554,264, Cl. 203-25.000.

Chemical Works of Richter Gedeon Ltd.: *See—*
Burger, Kálmán; Réthey, Iván; Stefkó, Béla; Gebhardt, István; Király née, Gyöngyvér Soós; Takácsi Nagy, Géza; Illés, János; Nesztmélyi, Erzsébet; Rácz, István; and Várkonyi, Viktoria, 5,554,598, Cl. 514-54.000.

Chen, Carol M., and Johnson, Mark E., to Wisconsin Alumni Research Foundation. Process for manufacturing reduced-fat Cheddar cheese. 5,554,398, Cl. 426-36.000.

Chen, Chin H.: *See—*
Shi, Jianmin; Chen, Chin H.; Van Slyke, Steven A.; and Tang, Ching W., 5,554,450, Cl. 428-690.000.

Chen, James. Multipurpose exercise machine having an arm drilling device. 5,554,083, Cl. 482-95.000.

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Ho, Bang C.; Chen, Jian-Hong; Yang, Shu-Yin; and Chang, Yih-Her, 5,555,525, Cl. 385-143.000.

Chen, Johson. Snorkel face mask having a light device. 5,553,606, Cl. 128-202.130.

Chen, Kelvin K. Paper clip safety pin. 5,553,363, Cl. 24-353.000.

Chen, Otis Y.: *See—*
Craig, Harold M.; and Chen, Otis Y., 5,553,455, Cl. 60-753.000.

Chen, Yaobin; and Mintun, Thomas G., to Visiting Nurse Service, Inc.; and Indiana University Foundation. Intelligent remote visual monitoring system for home health care service. 5,553,609, Cl. 128-630.000.

Chen, Yu-Ren B.: *See—*
Gupta, Dev V.; Chen, Yu-Ren B.; Sharper, Craig A.; and Stone, Alan E., 5,555,244, Cl. 370-60.100.

Chen, Ziyun; Cheng, Tai; Muni, Ketan; Patel, Udayan; and Saltman, Robert, to Advanced Cardiovascular Systems, Inc. Polymer blends for use in making medical devices including catheters and balloons for dilatation catheters. 5,554,120, Cl. 604-96.000.

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Cheng, Tai C. PTC conductive polymer compositions containing high molecular weight polymer materials. 5,554,679, Cl. 524-495.000.

Cheng, Tai C.: *See—*
Ainsworth, Robert D.; Cheng, Tai C.; and Wasicek, Lawrence D., 5,554,121, Cl. 604-96.000.

Cheng, Yu H.: *See—*
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Chesebrough-Pond's USA Co., Division of Conopco, Inc.: *See—*
Williams, David R.; Ryles, Christine W.; and Barrow, Stephen R., 5,554,358, Cl. 424-49.000.

Cheung, Li-Fung: *See—*
Nguyen, Uoc H.; Su, Sam; Cheung, Li-Fung; and Apostol, George, 5,555,433, Cl. 395-800.000.

Chevron Chemical Company: *See—*
Wang, James H.; Rosendale, David; Kurkov, Victor P.; Theard, Leslie P.; Ching, Ta Yen; Compton, Lewis R.; Palmgren, Tor H. G.; and Eichelberger, Mitchell P., 5,554,698, Cl. 525-330.200.

Chi, Kao M., to Taiwan Semiconductor Manufacturing Company. PN junction floating gate EEPROM, flash EPROM device and method of manufacture thereof. 5,554,552, Cl. 437-43.000.

Chiang, Alice M., to Massachusetts Institute of Technology. Charge domain bit-serial multiplying digital-analog converter. 5,555,200, Cl. 364-606.000.

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Roos, Eric J.; Chiang, Chia-Ming; and Hsu, Tsung-Min, 5,554,381, Cl. 424-449.000.

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Strupczewski, Joseph T.; Helsley, Grover C.; Glamkowski, Edward J.; Chiang, Yulin; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., 5,554,614, Cl. 514-254.000.

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Chiba, Yoshimasa: *See—*
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Chien, Sun-Chieh: *See—*
Hsue, Chen-Chiu; Chien, Sun-Chieh; and Liu, Ming-Hua, 5,554,560, Cl. 437-69.000.

Children's Hospital of Philadelphia: *See—*
Reddy, Usharani; and Pleasure, David, 5,554,523, Cl. 435-194.000.

Chin, Steven S.: *See—*
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Ching, Ta Yen: *See—*
Wang, James H.; Rosendale, David; Kurkov, Victor P.; Theard, Leslie P.; Ching, Ta Yen; Compton, Lewis R.; Palmgren, Tor H. G.; and Eichelberger, Mitchell P., 5,554,698, Cl. 525-330.200.

Chinn, Stephen R.: *See—*
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Chiou, Hering-Der; and Crabtree, Geoffrey J., to Motorola Inc. Method of eliminating dislocations and lowering lattice strain for highly doped N+ substrates. 5,553,566, Cl. 117-2.000.

Chiou, Shih-Kuen. Portable massaging device. 5,554,102, Cl. 601-72.000.

Chips and Technologies, Inc.: *See—*
Ericsson, Bo E., 5,555,460, Cl. 345-203.000.

Chisaka, Yukinori; Daizen, Masaki; Okamura, Yutaka; Tajima, Yukihiro; Kataoka, Mamoru; Sone, Akira; and Nishino, Kimihisa, to Kabushiki Kaisha Nichibei. Blind apparatus. 5,553,649, Cl. 160-168.100.

Chisso Corporation: *See—*
Fujita, Atsuko; Matsui, Shuichi; Miyazawa, Kazutoshi; Goto, Yasuyuki; Nakagawa, Etsuo; and Sawada, Shinichi, 5,554,316, Cl. 252-299.010.

Chiu, Anthony M.: *See—*
McLellan, Robert N.; and Chiu, Anthony M., 5,555,488, Cl. 361-820.000.

Chiu, Bernard; Maxwell, Randolph E.; Gatchell, Stephen M.; Bradley, Jerald; Longan, John; and Jané, Rodney, to Duracraft Corporation. Portable steam inhalator. 5,553,607, Cl. 128-203.260.

Chiu, Chung-Wai; Jeffcoat, Roger; Henley, Matthew; and Peek, Leroy, to National Starch and Chemical Investment Holding Corporation. Aldehyde cationic derivatives of galactose containing polysaccharides used as paper strength additives. 5,554,745, Cl. 536-52.000.

Cho, Do H.: *See—*
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Cho, Jun-hyoung: *See—*
Choi, Sang-gil; Cho, Jun-hyoung; and Wee, Young-cheul, 5,555,359, Cl. 395-141.000.

Choi, Deog-ho: *See—*
Seo, Jae-kyeong; Choi, Deog-ho; and Lee, Seon-ho, 5,555,059, Cl. 354-234.100.

Choi, Jin-O; Tyrell, John A.; and Dubell, Paul D., to Occidental Chemical Corporation. Forming polyimide coating by screen printing. 5,554,684, Cl. 524-588.000.

Choi, Sang-gil; Cho, Jun-hyoung; and Wee, Young-cheul, to Samsung Electronics Co., Ltd. Computer graphics anti-aliasing method using a partitioned look-up table. 5,555,359, Cl. 395-141.000.

Choi, Young J.: *See—*
Joung, Mun C.; Choi, Young J.; Shim, Kwan B.; Cho, Do H.; Kim, Seung I.; and Yoo, Byoung K., 5,555,097, Cl. 358-335.000.

Chou, Chia-Tien; and Chao, Chao-Mu. Full-open type upper garment for patients. 5,553,323, Cl. 2-114.000.

Choy, Clement K.; Argo, Brian P.; Brodbeck, Kevin J.; and Hearn, Lynn M., to Clorox Company, The. Thickened aqueous abrasive cleanser with improved rinsability. 5,554,321, Cl. 510-398.000.

Choy, Mark L.: *See—*
Stoffel, John L.; Shor, Arthur C.; Spinelli, Harry J.; Ma, Sheau-Hwa; Matrick, Howard; Choy, Mark L.; and Johnson, Loren E., 5,555,008, Cl. 347-100.000.

Christensen, Dana A.: *See—*
Kyrtsos, Christos T.; Gudat, Adam J.; Christensen, Dana A.; Friedrich, Douglas W.; and Stafford, Darrell E., 5,555,503, Cl. 364-449.000.

Christensen, Kenneth J.; Polge, Steven E.; and Walker, Anthony D., to International Business Machines Corporation. System for selectively compressing data transferred in network in response to produced first output when network utilization exceeds first threshold and data length over limit. 5,555,377, Cl. 395-200.110.

Christy, Paul G., to RDP Company. Apparatus for treatment of sewage sludge. 5,554,279, Cl. 210-149.000.

Chromalloy Gas Turbine Corporation: *See—*
Goodwater, Frank; Huynh, Lang D.; Kang, David S.; Li, Hon; Lizotte, James M.; and Doyle, Brian G., 5,554,837, Cl. 219-121.630.

Chrysler Corporation: *See—*
Berra, Charles J.; Boldt, John R.; Amici, Alan J.; and Krebs, Joseph J., 5,555,498, Cl. 364-424.030.
Kubina, Joseph E.; Gleason, Mark E.; Loughlin, Jerry F., Jr.; Wludyka, Todd H.; Odette, Thomas C.; Montie, Craig S.; Biermacher, Richard F.; Harney, Patrick M.; and DiMichele, Alfredo N., 5,553,912, Cl. 296-192.000.

Chu, Po-Tao; Chang, Kuang-Hui; and Huang, Yuan-Chang, to Taiwan Semiconductor Manufacturing Company. In situ hot bake treatment that prevents precipitate formation after a contact layer etch back step. 5,554,563, Cl. 437-190.000.

Chu, Tam-Anh, to Cirrus Logic, Inc. Low-power, high-performance barrel shifter. 5,555,202, Cl. 364-715.080.

Chuah, Hoe H.: *See—*
Brownscombe, Thomas F.; Fong, Howard L.; Diaz, Zaida; Chuah, Hoe H.; June, Raymond L.; Rollick, Kevin L.; Semple, Thomas C.; and Tompkin, Mark R., 5,554,657, Cl. 521-48.000.

Chugoku Shiken Kabushiki Kaisha: *See—*
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Chujo, Takafumi: *See—*
Ogura, Takao; Amemiya, Shigeo; Tezuka, Koji; and Chujo, Takafumi, 5,555,542, Cl. 370-94.100.

Chung, Frank H. Y., to Rhone-Poulenc Inc. Leavening acid composition. 5,554,404, Cl. 426-551.000.

Chung, Gi J.: *See—*
Kim, Su U.; Kim, Dong Y.; Chung, Gi J.; Hong, Sung K.; Park, Sung J.; Nam, Sang H.; and Lee, Seung M., 5,554,631, Cl. 514-338.000.

Chung, Seong-eun; and Lee, Jong-cheon, to Samsung Display Devices Co., Ltd. Liquid crystal display device. 5,554,419, Cl. 428-1.000.

Ciba Corning Diagnostics Corp.: *See—*
Benco, John S.; and Foos, Joseph S., 5,554,272, Cl. 205-782.500.

Ciba-Geigy Corporation: *See—*
Adam, Jean-Marie; and Käser, Adolf, 5,554,738, Cl. 534-829.000.
Bäbler, Fridolin, 5,554,217, Cl. 106-494.000.
Desobry, Vincent; Dietliker, Kurt; Hüsler, Rinaldo; Rutsch, Werner; Rembold, Manfred; and Sitek, Franciszek, 5,554,663, Cl. 522-8.000.
Lauk, Urs, 5,554,734, Cl. 534-691.000.
Minder, Ernst; and Hofherr, Walther, 5,554,446, Cl. 428-411.100.
Ravichandran, Ramanathan; and Patel, Ambelal R., 5,554,754, Cl. 546-184.000.
Tzikas, Athanassios; and Deitz, Rolf, 5,554,733, Cl. 534-638.000.
Winter, Roland A. E.; Ravichandran, Ramanathan; Holt, Mark S.; von Ahn, Volker H.; Babiarz, Joseph E.; and Leppard, David G., 5,554,760, Cl. 548-260.000.
Zeun, Ronald; and Zurflüh, René, 5,554,619, Cl. 514-275.000.
Ziegler, Hugo; and Trah, Stephan, 5,554,735, Cl. 534-738.000.

Ciccarelli, Paul W., Jr.; Seager, Charles, Jr.; and Himes, Ricky, to Atotech USA, Inc. Apparatus for treatment of printed circuit boards and the like. 5,553,633, Cl. 134-72.000.

Ciccarelli, Roger N.: *See—*
Bertrand, Jacques C.; Ciccarelli, Roger N.; Pickering, Thomas R.; and Bayley, Denise R., 5,554,471, Cl. 430-45.000.

Ciena Corporation: *See—*
Huber, David R., 5,555,118, Cl. 359-125.000.

Cincotta, Anthony H.; and Meier, Albert H., to Ergo Science Incorporated; and Board of Supervisors of Louisiana University and Agricultural and Mechanical College, The. Method for the long term reduction of body fat stores, insulin resistance, hypersinsulinemia and hyperglycemia in vertebrates. 5,554,623, Cl. 514-288.000.

Cipriano, Francis J.: *See—*
Dewille, Normanella T.; Mazer, Terrence B.; Parke, Edward H.; Cipriano, Francis J.; and Raube, Dennis L., 5,554,589, Cl. 514-2.000.

Cirrus Logic, Inc.: *See—*
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Citizen Watch Co., Ltd.: *See—*
Nakano, Mitsuru, 5,553,954, Cl. 400-621.000.

Claessens, Johannes A. J.: *See—*
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Clampitt, Jeffrey R.: *See—*
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Clapis, Paul J.; and Daniell, Keith E., to Integrated Process Equipment Corp. Method and apparatus for measuring film thickness in multilayer thin film stack by comparison to a reference library of theoretical signatures. 5,555,472, Cl. 356-357.000.

Clariant Finance (BVI) Limited: *See—*
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Clarion Co., Ltd.: *See—*
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Claris Corporation: *See—*
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Clark, E. Nelson. Method of using a Bowler's finger sleeve. 5,554,076, Cl. 473-61.000.

Clark, Gary T.; Rasar, John N.; and Stockl, Rebecca R. Ink compositions and preparation. 5,554,675, Cl. 524-376.000.

Clark, Noel A.; and Lagerwall, Sven T. Surface stabilized ferroelectric liquid crystal devices with dielectric torques greater than ferroelectric torques. 5,555,111, Cl. 359-56.000.

Clark, Noel A.; and Lagerwall, Sven T. Surface stabilized ferroelectric liquid crystal devices. 5,555,117, Cl. 359-100.000.

Clarke, Christopher K. P.: *See—*
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Claveau, Georges: *See—*
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Cleary, Brenda A.; and Boucher, Steven P., to Henkel Corporation. Polymers useful as printing vehicles. 5,554,705, Cl. 526-318.440.

Clegg, John: *See—*
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Clements, Christopher F.: *See—*
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Clemons, Keith P. Glass having inner and outer compartment. 5,553,725, Cl. 215-6.000.

Cleveland, Lance; Hall, Corrina A. E.; and Hilliard, William C., to Hewlett-Packard Company. Inkjet printing: mask-rotation-only at page extremes; multipass modes for quality and throughput on plastic media. 5,555,006, Cl. 347-41.000.

Clonit SpA: *See—*
Colucci, Giuseppe; and Taramelli, Roberto, 5,554,509, Cl. 435-6.000.

Clorox Company, The: *See—*
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Cloutier, Jean-Francois; Arsky, Oleg; Boyd, Nikolas; and Rush, Rosemary, to Home Information Services, Inc. Method of and apparatus for reduction of bandwidth requirements in the provision of electronic information and transaction services through communication networks. 5,555,407, Cl. 395-600.000.

Clover Manufacturing Co. Ltd.: *See—*
Matsuo, Yoshimi, 5,554,095, Cl. 493-440.000.

Clover, Richmond B. Vertically stacked planarization machine. 5,554,065, Cl. 451-283.000.

Co-operative Facility for Aging Tester Development: *See—*
Nakano, Shoukichi, 5,555,422, Cl. 324-754.000.

CO. RI. M. ME.: *See—*
Palara, Sergio, 5,554,878, Cl. 257-488.000.

Coassin, Peter J.; Matson, Robert S.; and Rampal, Jang B., to Beckman Instruments, Inc. Biopolymer synthesis using surface activated biaxially oriented polypropylene. 5,554,501, Cl. 435-6.000.

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Ivory, Nicholas E.; Jeffries, Michael; Palmer, Robert J.; and Thatcher, Wrenford J., 5,554,487, Cl. 430-311.000.

Coates, Clarence A.: *See—*
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Coatings America Inc.: *See—*
Patel, Rajendra, 5,554,681, Cl. 524-506.000.

Cobb, Jack M., to Hughes Aircraft Company. Graphite composite structures exhibiting electrical conductivity. 5,554,997, Cl. 343-793.000.

Cocchi, Lorenzo: *See—*
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Cochran, Robert N.: *See—*
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Cockburn, Gordon J.: *See—*
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Codacovi, Lynn M.: *See—*
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Coerver, Robert A.: *See—*
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Cohen, Glenn M.: *See—*
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Cohen, Marc S.: *See—*
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Cohn, David: *See—*
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Cok, David R., to Eastman Kodak Company. Cloning technique for digital image retouching. 5,555,194, Cl. 364-526.000.

Cole, Christopher R.: *See—*
Maslak, Samuel H.; Cole, Christopher R.; and Petrofsky, Joseph G., 5,555,534, Cl. 367-135.000.

Cole, Herbert S.: *See—*
Wojnarowski, Robert J.; Cole, Herbert S.; Sitnik-Nieters, Theresa A.; and Daum, Wolfgang, 5,554,305, Cl. 216-62.000.

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Colebrand Limited: *See—*
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Coleman Company, Inc., The: *See—*
McMaster, James; and Petersen, Michael, 5,553,759, Cl. 224-631.000.

Coles, Roy. Ball dispenser. 5,554,077, Cl. 473-131.000.

Collings, Anthony F.: *See—*

Bignell, Noel; Collings, Anthony F.; Hews-Taylor, Kenneth J.; Martin, Barry J.; Braathen, Colin W.; and Welsh, Charles M., 5,553,505, Cl. 73-861.280.

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Craig, Harold M.; and Chen, Otis Y., to United Technologies Corporation. Hybrid ceramic article. 5,553,455, Cl. 60-753.000.

Craig, Joanne; Crookes, Derek L.; and Skittrall, Stephen J., to Glaxo Group

Cushman, Michael R.; Krutak, James J.; Parham, William W.; Coates, Clarence A.; Weaver, Max A.; and Patonay, Gabor, to Eastman Chemical Company. Method for detecting and separating thermoplastic containers

Bignell, Noel; Collings, Anthony F.; Hews-Taylor, Kenneth J.; Martin, Barry J.; Braathen, Colin W.; and Welsh, Charles M., 5,553,505, Cl. 73-861.280.

Collins, Brian T.: *See*—
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Wendler, Henrik G., 5,554,141, Cl. 604-352.000.

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Gurvich, Boris; Palkes, Mark; and Wesnor, James D., 5,554,350, Cl. 423-239.100.

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Sarrasin, Denis; and Garcia, Michel, 5,555,000, Cl. 345-75.000.
Valette, Serge, 5,555,088, Cl. 356-350.000.

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Dilhac, Jean-Marie; Ganibal, Christian; and Rousset, Bernard, 5,553,939, Cl. 374-1.000.

Commonwealth Scientific and Industrial Research Organisation: *See*—
Bedding, Robin A.; Stanfield, Michael A.; and Crompton, Graham W., 5,554,533, Cl. 435-252.100.

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Compania Sevillana de Electricidad: *See*—
Anderson, Torben P., 5,554,210, Cl. 96-33.000.

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Pies, John R.; Wallace, David B.; and Hayes, Donald J., 5,554,247, Cl. 156-268.000.
Walker, William J.; Goodrum, Alan L.; and Mayer, Dale J., 5,555,250, Cl. 371-40.100.

Composite Materials, Inc.: *See*—
Kondakov, Stanislav F., 5,554,328, Cl. 264-60.000.

Compton, Lewis R.: *See*—
Wang, James H.; Rosendale, David; Kurkov, Victor P.; Theard, Leslie P.; Ching, Ta Yen; Compton, Lewis R.; Palmgren, Tor H. G.; and Eichelberger, Mitchell P., 5,554,698, Cl. 525-330.200.

Concentric Pumps Limited: *See*—
Hodge, Steve, 5,554,019, Cl. 418-171.000.

Cone, Roger D.; and Mountjoy, Kathleen G., to Oregon Health Sciences University, State of Oregon, Acting by and Through the Oregon State Board of Higher Education on Behalf of the. Mammalian adrenocorticotropic hormone receptors and uses. 5,554,729, Cl. 530-350.000.

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Wolfson, Lawrence S.; Conlan, Joseph; and Cenedella, Philip W., 5,553,839, Cl. 271-3.110.

Connell, John W.; Hergenrother, Paul M.; and Smith, Joseph G., Jr., to United States of America, National Aeronautics and Space Administration. Poly(N-arylenebenzimidazole)s via aromatic nucleophilic displacement. 5,554,715, Cl. 528-125.000.

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Connell, Richard A.; Sarada, Thyagaraj; and Bernard, Richard A., to Pitney Bowes Inc. Luminescent facing marks for enhanced postal indicia discrimination. 5,554,842, Cl. 235-491.000.

Conoscenti, Rosario J. Air cleaner housing. 5,553,587, Cl. 123-198.00E.

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Construction Material Resources: *See*—
Jaques, Stephen B.; Stehly, Richard D.; and Dunning, Peter B., 5,554,352, Cl. 423-339.000.

Consumer Cap Corporation: *See*—
Molinaro, Luca, 5,553,727, Cl. 215-44.000.

Contico International, Inc.: *See*—
Foster, Donald D., 5,553,750, Cl. 222-179.500.
Foster, Donald D.; and Nelson, Philip L., 5,553,752, Cl. 222-340.000.

Conway, Simon M., to Bausch & Lomb Incorporated. Unitary lens for eyewear. 5,555,038, Cl. 351-159.000.

Cook, Alan R. Roof safety anchor. 5,553,685, Cl. 182-45.000.

Cook, Arnold J., to PCC Composites, Inc. Method of directionally cooling using a fluid pressure induced thermal gradient. 5,553,656, Cl. 164-66.100.

Cook, David C.; Weitzel, Douglas E.; and Hawley, Edward T., to SmithKline Beecham Corp. Reminder device. 5,554,967, Cl. 340-309.150.

Cook, Leland B.; and Thrall, Ronald G., to Bemis Company, Inc. Multiple ply plastic lined bag with satchel bottom. 5,553,943, Cl. 383-113.000.

Cook, Mark E.; Pariza, Michael W.; and Park, Yeonhwa, to Wisconsin Alumni Research Foundation. Method for reducing body fat in animals. 5,554,646, Cl. 514-560.000.

Cook, Michael W.: *See*—
Brown, Thomas E.; Carlson, Jon D.; Cook, Michael W.; Mihalik, Michael; and Davisson, Jack A., 5,554,242, Cl. 156-111.000.

Cooper, Randy G.: *See*—
Bosten, Donald R.; Kriaski, John R.; Cooper, Randy G.; and Smith, John C., 5,554,066, Cl. 451-356.000.

Coors Brewing Company: *See*—
Schultz, Robert H., 5,553,826, Cl. 248-678.000.

Cope, Gil, to Safety-Temp Ltd. Thermometer and bottle cap assembly. 5,553,941, Cl. 374-150.000.

Corbin, David R.; Greenplate, John T.; Jennings, Michael G.; Purcell, John P.; and Sammons, Robert D., to Monsanto Company. Method of controlling insects. 5,554,369, Cl. 424-94.400.

Cordier, Georges; Damon, Jean-Pierre; Fouilloux, Pierre; and Marion, Philippe, to Rhone-Poulenc Chimie. Raney-type catalysts for the hydrogenation of halonitroaromatic compounds. 5,554,573, Cl. 502-301.000.

Corley, Andrew A.: *See*—
Burch, Ronald H.; Corley, Andrew A.; Morales, Eric W.; and Selenberg, Kirk T., 5,554,069, Cl. 452-149.000.

Cormack, Donald E.: *See*—
Jameel, Mohomed I.; Cormack, Donald E.; and Tran, Hoc N., 5,553,778, Cl. 239-1.000.

Cornell Research Foundation, Inc.: *See*—
Giannelis, Emmanuel P.; and Messersmith, Phillip B., 5,554,670, Cl. 523-209.000.

Cornie, James A., to Massachusetts Institute of Technology. Method and apparatus for casting. 5,553,658, Cl. 164-97.000.

Cornils, Gerd: *See*—
Kotte, Rolf; Cornils, Gerd; and Stumpe, Thomas, 5,554,325, Cl. 264-37.000.

Corning Incorporated: *See*—
Stempin, John L.; Stewart, Ronald L.; and Wetzell, Dale R., 5,554,464, Cl. 429-247.000.

Correll, John D. Resource saving box. 5,553,771, Cl. 229-110.000.

Cosentino, Louis C.: *See*—
Brinda, Paul D.; and Cosentino, Louis C., 5,554,283, Cl. 210-321.800.

Cosley, Michael, to Reliance/Comm Tech Corporation. Radial jet reattachment nozzle heat sink module for cooling electronics. 5,553,394, Cl. 34-218.000.

Cosmetics Development Company Limited: *See*—
Olivier-Terras, Josette, 5,554,374, Cl. 424-401.000.

Cosmo Oil Co., Ltd.: *See*—
Takeya, Haruhiko, 5,554,766, Cl. 548-473.000.

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Takeya, Haruhiko, 5,554,766, Cl. 548-473.000.

Costa, Pat V.; Yonescu, William E.; and Fritz, Donald, to Robotic Vision Systems, Inc. Segmented position sensing detector for reducing nonuniformly distributed stray light from a spot image. 5,554,858, Cl. 250-559.290.

Costello, David J.; Dergatchev, Aleksei Y.; Parkhurst, Warren E.; Polushkin, Valeri G.; and Kolchanovsky, Sergey A., to Cell Robotics, Inc. Laser skin perforator. 5,554,153, Cl. 606-9.000.

Costello, Richard C.: *See*—
Parekh, Mahendra B.; Kitzmiller, Leon; Costello, Richard C.; Grow, C. Allen; Pinchott, Gordon; O'Leary, Dennis; MacDougall, Louis M.; Okey, David W.; and Fowler, Edward J., 5,553,378, Cl. 29-888.044.

Cottin, Philippe: *See*—
Lahille, Michel; and Cottin, Philippe, 5,554,191, Cl. 623-17.000.

Coulter Corporation: *See*—
Hajek, Constance M.; and Russell, Thomas, 5,554,505, Cl. 435-721.000.

Council, Malcolm N.; and Johnson, Carl H., to Halliburton Company. Twin carriage tubing injector apparatus. 5,553,668, Cl. 166-77.300.

Coutant, Alan R.; and Rajagopalan, Sanjay, to Caterpillar, Inc. Method for providing different speed ranges for a speed pedal. 5,553,453, Cl. 60-327.000.

Covercraft Industries: *See*—
Rushford, Steve, 5,553,652, Cl. 160-354.000.

Cowan, Kenneth M., to Shell Oil Company. Optimizing blast furnace slag cements. 5,553,670, Cl. 166-293.000.

Cox, Marvin L.: *See*—
Barnard, Michael A.; and Cox, Marvin L., 5,553,822, Cl. 248-302.000.

Cozzette, Stephen N.; Davis, Graham; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Van Der Werf, Paul; and Wieck, Henry J., to i-Stat Corporation. Process for the manufacture of wholly microfabricated biosensors. 5,554,339, Cl. 422-50.000.

CPS Chemical Company, Inc.: *See*—
Trapasso, Louise E.; Padegimas, Stanley J.; Epstein, Peter F.; Hung, Paul L. K.; Mukhopadhyay, Purnendu; and Meisel, Philip L., 5,554,785, Cl. 560-201.000.

Crabtree, Geoffrey J.: *See*—
Chiou, Hering-Der; and Crabtree, Geoffrey J., 5,553,566, Cl. 117-2.000.

Craft, Thomas W.: *See*—
Ludwig, Thomas E.; and Craft, Thomas W., 5,555,381, Cl. 395-281.000.

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Wallace, George B.; Evans, Scott M.; and Cragg, Andrew H., 5,554,114, Cl. 604-53.000.

Craig, Gina M.; Globig, James E.; Lamprecht, Dale E., Jr.; Markham, James G.; Morrison, Donald A.; Schwabe, Richard E.; Tavener, Raymond D.; and Watkins, Rex D., to Monarch Marking Systems, Inc. Host communication message manager for a label printing system with data collection capabilities. 5,555,351, Cl. 395-114.000.

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Craig, Joanne; Crookes, Derek L.; and Skittrall, Stephen J., to Glaxo Group Limited. Medicaments. 5,554,639, Cl. 514-415.000.

Cranney, Aaron V.: *See*—
Gunn, Brian D.; and Cranney, Aaron V., 5,553,886, Cl. 280-728.200.

Craun, Gary P.; and Kaminski, Victor V., to Glidden Company, The. Low VOC, aqueous dispersed acrylic epoxy microgels. 5,554,671, Cl. 523-408.000.

Cray Valley S.A.: *See*—
Pascault, Jean-Pierre; Rolly, Florence; Taha, Mohamed; and Titier, Christelle, 5,554,703, Cl. 525-530.000.
Yang, Yeong-Show, 5,554,687, Cl. 525-63.000.

Creative Bio Tech, Inc.: *See*—
McDonald, James; Sturtevant, Charles N., III; Monteith, John; and Monteith, Mark, 5,554,130, Cl. 604-198.000.

Creëlle, Eddy K.: *See*—
Morlion, Danny; Jonckheere, Luc; van Koetsem, Jan P. K.; and Creëlle, Eddy K., 5,554,038, Cl. 439-108.000.

Cressotti, Karl: *See*—
Moir, Graydon E.; Moir, Floyd W.; and Cressotti, Karl, 5,554,031, Cl. 434-111.000.

Crest Lock Co., Inc.: *See*—
Sheiman, Samuel R., 5,553,692, Cl. 190-18.00A.

Crombie, Terry. Interlocking modular bench system. 5,553,551, Cl. 108-181.000.

Crompton, Graham W.: *See*—
Bedding, Robin A.; Stanfield, Michael A.; and Crompton, Graham W., 5,554,533, Cl. 435-252.100.

Crookes, Derek L.: *See*—
Craig, Joanne; Crookes, Derek L.; and Skittrall, Stephen J., 5,554,639, Cl. 514-415.000.

Crosby Group, Inc., The: *See*—
Lucas, Charles E.; and Wilson, Douglas E., 5,553,360, Cl. 24-136.00K.

Crosfield Electronics Limited: *See*—
Perowne, Paul J.; Manley, George C.; and Kirk, Richard A., 5,555,475, Cl. 358-462.000.

Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., to American Cyanamid Co. (2-imidazolin-2-yl) fused heteropyridine compounds, intermediates for the preparation of and use of said compounds as herbicidal agents. 5,554,579, Cl. 504-246.000.

Crossman, Richard E.: *See*—
Millay, Lawrence I.; and Crossman, Richard E., 5,554,063, Cl. 451-9.000.

Croucher, Melvin D.: *See*—
Patel, Raj D.; Goodbrand, H. Bruce; Kmiecik-Lawrynowicz, Grazyna E.; Hopper, Michael A.; Croucher, Melvin D.; and Duff, James M., 5,554,480, Cl. 430-137.000.

Crouther, Ronald; Stenslokken, Douglas L.; and Weilbacher, Eugene E., to Sherwood Medical Company. Syringe needle thimble cap and method of use thereof. 5,554,127, Cl. 604-192.000.

Crow, William R. Performance enhancing athletic shoe components and methods. 5,554,694, Cl. 525-236.000.

Crowley, Steven J.: *See*—
Aguayo, Erwin, Jr.; and Crowley, Steven J., 5,555,015, Cl. 348-6.000.

Crown Cork & Seal Company, Inc.: *See*—
Zakhary, Nashat, 5,554,296, Cl. 210-702.000.

Crowninshield, Roy D., to Zimmer, Inc. Intramedullary implant stem and centralizer. 5,554,192, Cl. 623-16.000.

Crowther, John J.: *See*—
Aghajanian, Michael K.; Langensiepen, Ralph A.; Kennedy, Christopher R.; Rocazella, Michael A.; Wiener, Robert J.; Hanon, Gregory E.; Crowther, John J.; and McCormick, Allyn L., 5,553,657, Cl. 164-97.000.

Crozier, Daniel J. Hacksaw with offset blade. 5,553,385, Cl. 30-508.000.

Crux, Noel: *See*—
Bravet, Jean-Louis; Crux, Noel; and L'Her, Anne, 5,554,431, Cl. 428-137.000.

Cuca, Robert; Lienhop, Keith; Riley, Thomas; Kirschner, Mitchell I.; and Levinson, R. Saul, to KV Pharmaceutical Company. Long acting GI and esophageal protectant. 5,554,379, Cl. 424-439.000.

Cuca, Robert C.; Lienhop, Keith S.; Riley, Thomas C., Jr.; Levinson, R. Saul; and Kirschner, Mitchell I., to KV Pharmaceutical Company. Bioadhesive pharmaceutical delivery system. 5,554,380, Cl. 424-441.000.

Culveyhouse, Donald E.: *See*—
Raitt, Scott; and Culveyhouse, Donald E., 5,554,165, Cl. 606-176.000.

Cummins Electronics Company, Inc.: *See*—
Middleton, Paul L.; and Zeller, John L., 5,553,589, Cl. 123-352.000.

Cunnally, William T.: *See*—
Sandor, Ellen R.; Cunnally, William T.; and Meyers, Stephan B., 5,554,432, Cl. 428-157.000.

Cunningham, Padraig; and Smyth, Barry, to Hitachi, Ltd. Automatic design process and apparatus. 5,555,199, Cl. 364-578.000.

Curiel, Tyler J.: *See*—
Harrison, Gail M.; Maxwell, Ian H.; Curiel, Tyler J.; and Maxwell, Francoise, 5,554,528, Cl. 435-240.200.

Curran, Brian W.; and Blanco, Rafael, to International Business Machines Corporation. Timing signal generator. 5,554,946, Cl. 327-172.000.

Cushman, Michael R.; Krutak, James J.; Parham, William W.; Coates, Clarence A.; Weaver, Max A.; and Patonay, Gabor, to Eastman Chemical Company. Method for detecting and separating thermoplastic containers with near infrared fluorosphores. 5,553,714, Cl. 209-577.000.

Cutler, Thomas D.; Dohl, Lane F.; Dohl, Raymond F.; and Hauer, James E., to Precision Remediation & Supply, Inc. Biodegradable and bioremedial absorbent compound for liquids. 5,554,575, Cl. 502-404.000.

Cyberex, Inc.: *See*—
Galm, James M., 5,555,182, Cl. 364-487.000.

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Roos, Eric J.; Chiang, Chia-Ming; and Hsu, Tsung-Min, 5,554,381, Cl. 424-449.000.

Czarnecki, Wlodzimierz S.: *See*—
Brock, George W.; Gandola, Kent R.; and Czarnecki, Wlodzimierz S., 5,555,043, Cl. 354-106.000.
Gandola, Kent R.; and Czarnecki, Wlodzimierz S., 5,555,044, Cl. 354-106.000.

Czekansky, Edward S.; and Otto, Dennis L., to Timken Company, The. Lip seal separating oil and grease. 5,553,870, Cl. 277-134.000.

Czermak, Karl; Milionis, Konstantin; Tessmer, Gero; and Whipp, Roy H., Jr., to Voest-Alpine Industrieanlagenbau GmbH; and Brifer International Ltd. Method of charging ore. 5,554,206, Cl. 75-446.000.

Czukerberg, Shirley: *See*—
Feldman, Jacobo; and Czukerberg, Shirley, 5,553,959, Cl. 402-79.000.

Dabberdt, Walter F.; Norris, Kenneth D.; Semmer, Steven R.; Delany, Anthony C.; and Fox, Jack R., to University Corporation For Atmospheric Research. Portable intelligent whole air sampling system. 5,553,508, Cl. 73-63.020.

Dacomed Corporation: *See*—
Harpstead, Stanley D.; and Hestad, Hugh, 5,554,092, Cl. 482-148.000.

Daewoo Electronics Co., Ltd.: *See*—
Kim, Sang-Ho, 5,555,028, Cl. 348-607.000.
Kim, Sang-Ho, 5,555,029, Cl. 348-607.000.
Lee, Hyun-Moo, 5,553,801, Cl. 242-357.000.

Dage, Gerhard A.: *See*—
Davis, Leighton I., Jr.; Matteson, Robert W.; and Dage, Gerhard A., 5,553,776, Cl. 236-49.300.

Dagorn, Daniel N. N.; Mahtout, Taous G.; Grandvallet, Pierre; and Scheffer, Bob, to Shell Oil Company. Process for improving lubricating base oil quality. 5,554,307, Cl. 508-111.000.

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Dahringer, Jörg: *See*—
Eichenauer, Dieter; Groh, Werner; Macholdt, Hans-Tobias; Dahringer, Jörg; Jung, Holger; and Neuert, Richard, 5,554,722, Cl. 528-340.000.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
Nakamura, Shingo; Nakata, Hiroyuki; and Nakamura, Katsuko, 5,554,403, Cl. 426-549.000.

Dai Nippon Printing Co., Ltd.: *See*—
Okabe, Masato, 5,555,205, Cl. 365-108.000.

Daicel Chemical Industries, Ltd.: *See*—
Harano, Yoshiyuki; and Morimoto, Yoshiaki, 5,554,790, Cl. 562-519.000.
Maeda, Yasushi; Magara, Kengo; and Tsugaya, Hitoshi, 5,554,292, Cl. 210-640.000.
Matsuyama, Akinobu; Ito, Michio; Kobayashi, Yoshinori; and Kawada, Naoki, 5,554,532, Cl. 435-252.100.

Daido Tokushuko Kabushiki Kaisha: *See*—
Shimizu, Takao; Yamamoto, Noboru; and Suzuki, Hiroaki, 5,553,369, Cl. 29-888.460.

Daigle, Emanuel L.: *See*—
Bender, William J. H.; DeLeo, Gary D.; Westlake, Theodore N., III; Daigle, Emanuel L.; and Ribes, Carolyn W., 5,553,484, Cl. 73-53.010.

Dainichiseika Color & Chemicals Mfg. Co., Ltd.: *See*—
Ohkura, Ken; Matsuzaki, Satoru; and Eskelinen, Pekka J., 5,554,439, Cl. 428-323.000.

Dainippon Screen Manufacturing Co., Ltd.: *See*—
Hirae, Sadao; Matsubara, Hideaki; Kouno, Motohiro; and Sakai, Takamasa, 5,554,939, Cl. 324-753.000.
Shibazaki, Hiroshi, 5,555,353, Cl. 395-126.000.
Uemura, Haruo, 5,555,135, Cl. 359-851.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Sugimoto, Kenji, 5,555,234, Cl. 354-317.000.

Dais, Brain C.; and Porchia, Jose, to DowBrands L.P. Apparatus for microperforating zippered film useful for manufacturing a reclosable zippered bag. 5,554,250, Cl. 156-353.000.

Dais, Brian C.: *See*—
Porchia, Jose; Dais, Brian C.; McBride, Karen E.; Farrelly, D. Lyn; and Steele, Robert R., 5,554,093, Cl. 493-240.000.

Daisuke, Kato: *See*—
Toshiaki, Kirihata; and Daisuke, Kato, 5,555,212, Cl. 365-200.000.

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Wakabayashi, Tsutomu; Daitoku, Koichi; and Ezawa, Akira, 5,555,050, Cl. 354-173.100.

Daizen, Masaki: *See*—
Chisaka, Yukinori; Daizen, Masaki; Okamura, Yutaka; Tajima, Yukihiro; Kataoka, Mamoru; Sone, Akira; and Nishino, Kimihisa, 5,553,649, Cl. 160-168.100.

Dalebout, William T., to ICON Health & Fitness, Inc. Weight-training machine. 5,554,085, Cl. 482-137.000.

Dalke, Janet L.: *See*—

Higley, Lin R.; and Dalke, Janet L., 5,554,411, Cl. 427-11.000.
Dalton, John C., to Apple Computer, Inc. System and method for generating images with improved visual quality using local correlation, ordered dither. 5,555,102, Cl. 358-456.000.
Damian, William P.: *See—*
Hegel, Robert W.; Hawke, Melvin C.; Damian, William P.; and Mullen, Jon R., 5,553,659, Cl. 164-153.000.
Damon, Jean-Pierre: *See—*
Cordier, Georges; Damon, Jean-Pierre; Fouilloux, Pierre, and Marion, Philippe, 5,554,573, Cl. 502-301.000.
Dana Corporation: *See—*
Stambeck, Mark A., 5,553,869, Cl. 277-33.000.
Danbiosyst UK Limited: *See—*
Illum, Lisbeth, 5,554,388, Cl. 424-501.000.
Dangel, Henry. Speed reducing mechanism and transmission device having two ranges of speed ratios for a motor vehicle. 5,554,080, Cl. 475-204.000.
Dangelo, Carlos; Watkins, Daniel; and Mintz, Doron, to LSI Logic Corporation. Method and system for creating and validating low level description of electronic design from higher level, behavior-oriented description, including interactive system for hierarchical display of control and data-flow information. 5,555,201, Cl. 364-489.000.
Daniell, Keith E.: *See—*
Clapis, Paul J.; and Daniell, Keith E., 5,555,472, Cl. 356-357.000.
Daniels, David L.: *See—*
Rudokas, Ronald S.; Storch, John A.; and Daniels, David L., 5,555,551, Cl. 379-59.000.
Daniels, Dean J.: *See—*
Roe, Donald C.; Goulait, David J. K.; Rodriguez, Sheila S.; Carlin, Edward P.; Dreier, Kimberly A.; Jasper, Carolyn M.; and Daniels, Dean J., 5,554,143, Cl. 604-385.200.
Roe, Donald C.; Goulait, David J. K.; Rodriquez, Sheila S.; Carlin, Edward P.; Dreier, Kimberly A.; Jasper, Carolyn M.; and Daniels, Dean J., 5,554,144, Cl. 604-385.000.
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Dany, Walter: *See—*
Del Gaone, Peter V.; Dany, Walter; Rossi, R. Paul, Jr.; Scotchmur, Ronald R.; and Watts, Ernest F., 5,553,788, Cl. 239-527.000.
Dardashti, Shahriar. Storage and display assembly for musical media or the like. 5,553,720, Cl. 211-40.000.
Das, Gladwin S., to University of Minnesota, Regents of the. Stent. 5,554,181, Cl. 623-1.000.
Dasher, James F.; and Kelley, Brian P., to Whirlpool Corporation. Shelf ladder for refrigerator or freezer. 5,553,936, Cl. 312-408.000.
Dasibi Environmental Corporation: *See—*
Gosselin, Albert E., Jr.; Bate, Edward R., Jr.; and Johnson, Dale F., 5,553,555, Cl. 110-215.000.
Dat, Rovindra: *See—*
Kingon, Angus I.; Al-Shareef, Husam N.; Auciello, Orlando H.; Gifford, Ken D.; Lichtenwalner, Dan J.; and Dat, Rovindra, 5,555,486, Cl. 361-305.000.
Database Excelleration Systems, Inc.: *See—*
Tuma, George B.; Tuma, Wade B.; and Warne, Robert E., 5,555,402, Cl. 395-500.000.
Datapoint Corporation: *See—*
Lawrence, Charles E.; McDougall, Floyd H.; and Lundschen, Jay W., 5,555,277, Cl. 375-346.000.
Date, Takashi: *See—*
Ishikawa, Takehiro; Date, Takashi; and Sagawa, Fumihiko, 5,555,116, Cl. 359-88.000.
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Flannery, Steven J.; and Bücking, Hans G., to Isoboard Enterprises Inc.; and Bison-werke Bahre & greten GmbH & Co KG. Process for the manufacturing of shaped articles. 5,554,330, Cl. 264-113.000.
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Kunz, James R., 5,553,906, Cl. 296-29.000.
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van der Bruggen, Pierre; Boon-Falleur, Thierry; Traversari, Catia; and Fleischauer, Katharina, 5,554,506, Cl. 435-7.240.
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Weaver, Max A.; Mills, David E.; Tanner, James, III; Fleischer, Jean C.; Pruett, Wayne P.; and Moody, L. Shane, 5,554,720, Cl. 528-295.000.
Fleischmann, Frank: *See*—
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Flir Systems, Inc.: *See*—
Gates, James L., 5,554,849, Cl. 250-370.080.
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Ham, Fredric M.; and Cohen, Glenn M., 5,553,616, Cl. 128-633.000.
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Rauchwerger, George P., 5,553,479, Cl. 73-1.00R.
FLS Miljø A/S: *See*—
Anderson, Torben P., 5,554,210, Cl. 96-33.000.
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King, Michael J.; Flynn, Robert A.; and Torrez, Henry, 5,554,241, Cl. 156-96.000.
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Hummel, Kenneth W.; and Warwick, David S., 5,553,699, Cl. 198-737.000.
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Focke, Heinz; and Bretthauer, Hans-Jürgen, 5,553,773, Cl. 229-224.000.
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Fong, Howard L.: *See*—
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Fong, Joseph C. Y.; and Rybicki, Mathew A., to Motorola Inc. Method and apparatus for reducing switching oscillations in an ISDN line interface circuit. 5,555,263, Cl. 370-17.000.
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Bryant, Henry U.; and Fontana, Steven A., 5,554,628, Cl. 514-319.000.
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Radigan, Edward J., Jr.; Colt, Richard L.; Gundlach, Kurt B.; and Fontanez, Miguel A., 5,554,213, Cl. 106-22.00H.
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Irving, Harry F., 5,553,409, Cl. 37-446.000.
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Campbell, Douglas C.; Gloceri, Gary J.; and McCoy, Daniel M., 5,555,173, Cl. 364-424.050.
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Jablonski, Gary F.; and Ewald, Henry J., 5,554,977, Cl. 340-825.310.
Kennedy, John F.; Plowdrey, Robert D.; and Kuo, Yao H., 5,555,451, Cl. 455-161.200.
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Hsu, Wu-Hsiung E., 5,553,438, Cl. 52-736.400.
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Jha, Sunil C.; and Forster, James A., 5,553,770, Cl. 228-190.000.
Fortin, J. André; St-Arnaud, Marc; Hamel, Chantal; Chavarie, Claude; and Jolicoeur, Mario, to Université de Montréal. Aseptic in vitro endomycorrhizal spore mass production. 5,554,530, Cl. 435-256.800.
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Tou, Frederich N.; Capps, Stephen P.; Foster, Gregg S.; and Beernink, Ernest H., 5,555,363, Cl. 395-146.000.
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Campbell, Walter R.; Phalen, John W.; and Goidich, Stephen J., 5,553,571, Cl. 122-379.000.
Foti, Sam J., to Hose Master, Inc. Connector for gas appliances. 5,553,893, Cl. 285-168.000.
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Ohnishi, Kunikazu; Inoue, Masayuki; Suzuki, Yoshio; and Fukui, Yukio, 5,555,334, Cl. 385-93.000.
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Frayman, Max. Compactly assembled tampon applicator. 5,554,109, Cl. 604-15.000.
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vonBierren, Karlheinz; and Frederick, Donald A., 5,555,086, Cl. 356-345.000.
Frederiksen, Bjarne; and Hayward, Gregory R., to Illinois Tool Works Inc. Voltage and/or current protector and grounding bar arrangement for AT&T style 110 block. 5,555,153, Cl. 361-119.000.
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Fields, William C.; Fredrick, Dan; Grannemann, Steve; Hannan, Phyllis; and Lukashevsky, Igor, 5,554,335, Cl. 264-400.000.
Freeland, Gerard S., to Azon USA Inc. Thermosetting castable and curable polyurethane-urea polymers having improved flow and end-waste characteristics for insulating thermal barriers. 5,554,713, Cl. 528-76.000.
Freeman, Ernie. Wheel cleaning system. 5,553,932, Cl. 305-107.000.
Freeman, John L., Jr.: *See*—
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Frei, Martin. Space heating system, heater, and combustion chamber. 5,553,604, Cl. 126-523.000.
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Freitag, Brandon R., to Motorola, Inc. Method and apparatus for stencil printing printed circuit boards. 5,553,538, Cl. 101-123.000.
French, John T.: *See*—
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Frey, Krisztina; von Massow, Gabriele; Alt, Helmut G.; and Welch, M. Bruce, to Phillips Petroleum Company. Process for preparing cyclopentadienyl-type ligands. 5,554,795, Cl. 568-8.000.
Friday, Arthur F., Jr.; and Chan, Chi-Ping, to Carrier Corporation. Error detection for HVAC systems. 5,555,269, Cl. 371-5.100.
Friedrich, Dan G.: *See*—
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Frisch, Kurt C., Jr.; Edwards, Bruce H.; Sengupta, Ashok; Holland, Lowell W.; Hansen, Richard G.; and Owen, Ian R., to Minnesota Mining and Manufacturing Company. Room temperature curable silane-terminated polyurethane dispersions. 5,554,686, Cl. 524-588.000.
Fritz, Donald: *See*—
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Fu-Hsiang, Chen. Device for oral dispensing of medicine. 5,554,116, Cl. 604-77.000.
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Nomura, Kouki; and Satoh, Hiroyuki, 5,555,072, Cl. 355-27.000.
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Shiratsuchi, Kentaro; Toda, Satoru; and Yamada, Tsukasa, 5,554,496, Cl. 430-536.000.
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Fujiki, Nobuo, to Japan Vilene Company Ltd. Apparatus and method for producing floor mat carrying flat-tipped projections. 5,554,333, Cl. 264-284.000.
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Fujita, Atsuko; Matsui, Shuichi; Miyazawa, Kazutoshi; Goto, Yasuyuki; Nakagawa, Etsuo; and Sawada, Shinichi, to Chisso Corporation. Hexenediyne derivative and a liquid crystal composition. 5,554,316, Cl. 252-299.010.
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Iwama, Ryouichi; and Masuda, Syuzo, 5,555,078, Cl. 355-210.000.
Kakuma, Satoshi; Uriu, Shiro; Samejima, Noriko; Murayama, Masami; and Fukuda, Noaki, 5,555,243, Cl. 370-58.200.
Kakuma, Satoshi; Uriu, Shiro; Samejima, Noriko; and Hajikano, Kazuo, 5,555,265, Cl. 370-60.000.
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Nakayama, Mikio; Tachibana, Tetsuo; Iketani, Youzou; Okuyama, Yuzo; and Kakuma, Satoshi, 5,555,261, Cl. 370-103.000.
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Yazawa, Shigehiko; Ito, Kazuhiko; Uehara, Takeshi; Tachibana, Toru; and Fukuda, Keiji, 5,555,541, Cl. 370-68.100.
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Fujiwara, Takashi: *See*—
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Hamada, Minoru; and Ando, Hitoshi, to Sanyo Electric Co., Ltd. Method of operating the semiconductor memory storing analog data and analog data storing apparatus. 5,555,521, Cl. 365-185.030.

Hamada, Shinji: *See*—
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Hamada, Yoshitaka: *See*—
Mori, Shigeru; Fukushima, Motoo; Tabei, Eiichi; Hamada, Yoshitaka; and Katayama, Seizi, 5,554,710, Cl. 528-32.000.

Hamaguchi, Takuya: *See*—
Taki, Kazunari; Ohashi, Yumiko; Hamaguchi, Takuya; Maruyama, Hideo; and Matsuda, Riki, 5,554,451, Cl. 428-694.0ML.

Hamana, Michio: *See*—
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Hamann, Russell E., to TRW Vehicle Safety Systems Inc. Seat belt retractor with a cinch mechanism. 5,553,804, Cl. 242-382.400.

Hamel, Chantal: *See*—
Fortin, J. André; St-Arnaud, Marc; Hamel, Chantal; Chavarie, Claude; and Jolicoeur, Mario, 5,554,530, Cl. 435-256.800.

Hamel, Roger G.: *See*—
Rei, Nuno M.; and Hamel, Roger G., 5,554,635, Cl. 514-372.000.

Hamilton, Brian K.; and Parks, Brent A., to OEA, Inc. Hybrid inflator with rapid pressurization-based flow initiation assembly. 5,553,889, Cl. 280-736.000.

Hamilton, Douglas G., to General Electric Company. Flame retardant molding thermoplastics. 5,554,674, Cl. 524-288.000.

Hamilton, John: *See*—
Ulicne, Joseph A.; and Morris, Al, 5,553,875, Cl. 280-20.000.

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Buchholz, Dale R.; Robbins, Karen E.; Hamilton, R. Lee, Jr.; and Doss, William K., 5,555,266, Cl. 370-95.100.

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Wardle, Robert B.; and Hamilton, R. Scott, 5,554,820, Cl. 149-19.900.

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Jones, Gary A., 5,554,084, Cl. 482-97.000.
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Hammer, Uwe: *See*—
Wendel, Friedrich; Franz, Manfred; Meiwes, Johannes; Hammer, Uwe; Altmann, Michael; and Dick, Dieter, 5,554,901, Cl. 310-162.000.

Hammerstone, John F., Jr.: *See*—
Romanczyk, Leo J., Jr.; Hammerstone, John F., Jr.; and Buck, Margaret M., 5,554,645, Cl. 514-453.000.

Hammesfahr, Paul D.: *See*—
Hare, Robert V.; and Hammesfahr, Paul D., 5,554,028, Cl. 433-214.000.

Hampel, Manfred: *See*—
Wingert, Horst; Müller, Bernd; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,554,616, Cl. 514-269.000.

Han, Hongtao: *See*—
Abdelkader, Hasem; Boudreau, Robert A.; Bowen, Terry P.; Han, Hongtao; Kapany, Narinder; and Reitz, Paul R., 5,555,127, Cl. 359-341.000.

Hanajima, Tadashi: *See*—
Ono, Satomi; and Hanajima, Tadashi, 5,555,004, Cl. 345-161.000.

Hanaya, Morimasa, to Tokushu Paper Mfg. Co., Ltd. Process and apparatus for drying sheet materials. 5,553,392, Cl. 34-115.000.

Handa, Balraj K.; Machin, Peter J.; Martin, Joseph A.; Redshaw, Sally; and Thomas, Gareth J., to Hoffmann-La Roche Inc. Amino acid derivatives. 5,554,756, Cl. 546-225.000.

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Hanke, Deitmar; and Hull, David A., to Hughes Electronics. Refractive lens cradle. 5,555,134, Cl. 359-819.000.

Hanks, Lawrence E.; Nielsen, Dennis R.; and Koester, David D., to Seagate Technology, Inc. Tool for a de-swaging head gimbal assembly. 5,553,374, Cl. 29-762.000.

Hannan, Phyllis: *See*—
Fields, William C.; Fredrick, Dan; Grannemann, Steve; Hannan, Phyllis; and Lukashevsky, Igor, 5,554,335, Cl. 264-400.000.

Hanners, William D. Motorcycle center stand with locking device. 5,553,471, Cl. 70-235.000.

Hannon, Richard H.; and Wagner, Carl T., to Golfology, Incorporated. Golf putter. 5,554,078, Cl. 473-292.000.

Hanon, Gregory E.: *See*—
Aghajanian, Michael K.; Langensiepen, Ralph A.; Kennedy, Christopher R.; Rocazella, Michael A.; Wiener, Robert J.; Hanon, Gregory E.; Crowther, John J.; and McCormick, Allyn L., 5,553,657, Cl. 164-97.000.

Hansa Metallwerke AG: *See*—
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Hansen, Kent W.: *See*—
Sharma, Ravinder K.; Lebby, Michael S.; Hartman, Davis H.; and Hansen, Kent W., 5,555,341, Cl. 385-129.000.

Hansen, Mark C.; and Kosiak, Walter K., to Delco Electronics Corporation. Adaptive threshold circuit with deceleration compensation. 5,554,948, Cl. 327-181.000.

Hansen, Richard G.: *See*—
Frisch, Kurt C., Jr.; Edwards, Bruce H.; Sengupta, Ashok; Holland, Lowell W.; Hansen, Richard G.; and Owen, Ian R., 5,554,686, Cl. 524-588.000.

Hanson, Van E.: *See*—
McLeod, Clark E.; Hogan, Steven J.; Feltz, Kristi T.; Murdock, Douglas R.; and Hanson, Van E., 5,555,290, Cl. 379-67.000.

Hanyu, Yoshiaki: *See*—
Kumazaki, Hitomi; Hanyu, Yoshiaki; and Sano, Masaki, 5,555,360, Cl. 395-143.000.

Hara, Miyuki: *See*—
Higashino, Junichi; Kawasaki, Kazuhiko; and Hara, Miyuki, 5,555,439, Cl. 395-23.000.

Hara, Seinosuke; and Tomisawa, Naoki, to Unisia Jecs Corporation. Valve duration control system for four-cycle engine. 5,553,573, Cl. 123-90.150.

Hara, Yoshikazu, to Riso Kagaku Corporation. Method of controlling a linkage drive section in a stencil printing machine. 5,553,537, Cl. 101-116.000.

Harada, Kenichi, to Toyota Jidosha Kabushiki Kaisha. Electrically heated catalytic converter system for an engine. 5,553,451, Cl. 60-277.000.

Harada, Kuniyuki; Sawada, Kazutaka; Hosoya, Yoshiteru; and Shibusawa, Tetsuo, to Fuji Jukogyo Kabushiki Kaisha. Fiber reinforced plastic product and an indication method thereof. 5,554,237, Cl. 156-60.000.

Haragakiuchi, Hideyuki; Tadokoro, Hiroyuki; Fukasawa, Nobuaki; Terashima, Isamu; Sasaki, Akira; Matsuo, Kazuyoshi; Onose, Katuyoshi; and Okuhama, Masashi, to Hitachi, Ltd. Electrophotographic apparatus and electrophotographic method. 5,555,074, Cl. 355-208.000.

Harandi, Mohsen N., to Mobil Oil Corporation. Catalytic hydrodesulfurization and stripping of hydrocarbon liquid. 5,554,275, Cl. 208-213.000.

Harano, Yoshiyuki; and Morimoto, Yoshiaki, to Daicel Chemical Industries, Ltd. Process for producing acetic anhydride and acetic acid. 5,554,790, Cl. 562-519.000.

Harari, Eliyahou. Highly compact EPROM and flash EEPROM devices. 5,554,553, Cl. 437-43.000.

Harats, Yehuda; and Goldstein, Jonathan R., to Electric Fuel (E.F.L.) Ltd. Mechanically-rechargeable battery. 5,554,918, Cl. 320-2.000.

Hare, Robert V.; and Hammesfahr, Paul D., to Dentsply Research & Development Corp. Dental impression taking. 5,554,028, Cl. 433-214.000.

Hargreaves, Neil G.: *See*—
Cain, Frederick W.; Hargreaves, Neil G.; and Hughes, Adrian D., 5,554,408, Cl. 426-607.000.

Harimoto, Kazuyoshi, to NTN Corporation. Roller tappet having yoke member with flat top plate. 5,553,512, Cl. 74-569.000.

Harnett, Laurence N.; Yujuri, Mikio L.; and Shoucri, Merit M., to TRW Inc. Passive millimeter wave traffic sensor. 5,555,036, Cl. 340-933.000.

Harney, Patrick M.: *See*—
Kubina, Joseph E.; Gleason, Mark E.; Loughlin, Jerry F., Jr.; Wludyka, Todd H.; Odette, Thomas C.; Montie, Craig S.; Biermacher, Richard F.; Harney, Patrick M; and DiMichele, Alfredo N., 5,553,912, Cl. 296-192.000.

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Harpole, George M.: *See*—
Injeyan, Hagop; St. Pierre, Randall J.; Hilyard, Rodger C.; Harpole, George M.; and Hoefer, Carolyn S., 5,555,254, Cl. 372-33.000.

Harpstead, Stanley D.; and Hestad, Hugh, to Dacomed Corporation. Apparatus and method for testing and exercising pelvic muscles. 5,554,092, Cl. 482-148.000.

Harrington, Cheri L.; Gladden, Michael E.; and Prestwich, Blaine M., to Motorola Inc. Data processing system having a compensation circuit for compensating for capacitive coupling on a bus. 5,555,513, Cl. 364-602.000.

Harris, Rodney M.; Ahmed, Maqsood S.; and Renner, Thomas A., to Sherwin-Williams Company, The. Dispersant polymers. 5,554,682, Cl. 524-523.000.

Harrison, Bernard F.: *See*—
Bright, Nicholas; Burfield, Paul A.; Pontefract, John; Harrison, Bernard F.; Meares, Peter; Burgin, David R.; Devaney, Andrew S.; and Kindersley, Peter T., 5,554,852, Cl. 250-492.210.

Harrison, David J.: *See*—
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Harrison, Gail M.; Maxwell, Ian H.; Curiel, Tyler J.; and Maxwell, Francoise, to Board of Revents of University of Colorado. Compositions and methods for inhibition of HIV production. 5,554,528, Cl. 435-240.200.

Harrison, Kent D.; Hendrickson, Gary L.; Holman, Thomas J.; Lafontaine, Daniel M.; Miller, Matthew J.; and Robinson, David B., to SciMed. Drug delivery catheter with manifold. 5,554,119, Cl. 604-96.000.

Harrison, Larry G., to Watermarker Corp., The. Water recovery device for reclaiming and refiltering atmospheric water. 5,553,459, Cl. 62-93.000.

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Hart, James D.; and Moody, Michael J., to Midland Brake, Inc. Simplified full-function valve for heavy duty brake systems. 5,553,928, Cl. 303-7.000.

Hart, Steven C.: *See*—
Jaskowiak, Timothy R.; and Hart, Steven C., 5,555,184, Cl. 355-259.000.

Hartauer, Siegbert, to Texas Instruments Deutschland. Semiconductor device with force and/or acceleration sensor. 5,554,875, Cl. 257-418.000.

Hartman, Chris J., to Atlantic Richfield Company. Standoff insulator and method for well pump cable. 5,553,666, Cl. 166-60.000.

Hartman, Davis H.: *See*—
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Haruch, James, to Spraying Systems Co. Enhanced efficiency apparatus for atomizing and spraying liquid. 5,553,785, Cl. 239-432.000.

Haruki, Toshinobu; and Kikuchi, Kenichi, to Sanyo Electric Co., Ltd. White balance adjusting apparatus for automatically adjusting white balance in response to color information signal obtained from image sensing device. 5,555,022, Cl. 348-223.000.

Harvey, Adrian M.; Harvey, Christopher J.; and Bush, Philip K., to Harvey Bush Ltd. Burners. 5,553,415, Cl. 47-1.440.

Harvey Bush Ltd.: *See*—
Harvey, Adrian M.; Harvey, Christopher J.; and Bush, Philip K., 5,553,415, Cl. 47-1.440.

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Hasbro, Inc.: *See*—
Goldfarb, Adolph E.; Jackson, David A.; Goldfarb, Martin I.; Eddins, Fred D.; and Doane Jr., Linwood E., 5,553,643, Cl. 141-34.000.

Hasebe, Takayuki; Akiyama, Ryota; and Yoshioka, Makoto, to Fujitsu Limited. Storage medium for preventing an illegal use by a third party. 5,555,304, Cl. 380-4.000.

Hasegawa, Katsuya: *See*—
Ninomiya, Kazuki; Nishiyama, Tamotsu; Miyake, Jiro; and Hasegawa, Katsuya, 5,555,197, Cl. 348-571.000.

Hasegawa, Koyo, to Canon Kabushiki Kaisha. Magneto-optical recording method of erasing a portion of a first recording domain to form a crescent-shaped second recording domain. 5,555,236, Cl. 369-116.000.

Hasegawa, Makoto; Saito, Tsuyoshi; Higuchi, Fumihiko; Amano, Hideaki; Naitoh, Katsunori; Tozawa, Takashi; Nakagome, Tatsuya; Ito, Keiki; and Suzuki, Kouji, to Tokyo Electron Limited. Magnetron plasma processing system. 5,554,249, Cl. 156-345.000.

Hasegawa, Miki, to Rohm Co., Ltd. Packaging device and its manufacturing method. 5,554,823, Cl. 174-52.400.

Hasegawa, Takanori, to Riso Kagaku Corporation. Master plate making printing device. 5,553,539, Cl. 101-128.210.

Hasei, Masaaki: *See*—
Okase, Wataru; and Hasei, Masaaki, 5,554,226, Cl. 118-724.000.

Hashikawa, Yoshito, to Japan Development Consultants, Inc. Fluid type pusher with thrust indicator. 5,553,982, Cl. 411-14.000.

Hashimoto, Akihiro: *See*—
Shimizu, Hidekazu; and Hashimoto, Akihiro, 5,554,891, Cl. 307-10.200.

Hashimoto, Atsuko: *See*—
Fukui, Wataru; and Hashimoto, Atsuko, 5,554,802, Cl. 73-117.300.

Hashimoto Corporation: *See*—
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Hashimoto, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Control apparatus and method for holding a workpiece in a machine tool. 5,555,178, Cl. 364-474.170.

Hashimoto, Hiroshi: *See*—
Ri, Taiho; and Hashimoto, Hiroshi, 5,555,514, Cl. 364-604.000.

Hashimoto, Kazuo, to Hashimoto Corporation. Telephone answering device with operating status confirmation means. 5,555,289, Cl. 379-67.000.

Hashimoto, Kiyokazu, to NEC Corporation. Semiconductor memory device having presetting function sense amplifier. 5,555,217, Cl. 365-233.500.

Hashimoto, Koosuke; Matsuo, Eiji; Kawagoe, Hisashi; and Iwaasa, Hiroaki, to Mitsubishi Denki Kabushiki Kaisha. Remote control system. 5,554,980, Cl. 340-825.720.

Hashimoto, Masanori: *See*—
Ito, Kazuyuki; Nakamura, Kyuzo; Ishikawa, Michio; Togawa, Jun; Tani, Noriaki; Hashimoto, Masanori; and Ohashi, Yumiko, 5,554,418, Cl. 427-579.000.

Hashimoto, Nobuaki: *See*—
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Hashimoto, Yasuo: *See*—
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Hashimoto, Yuichi: *See*—
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Hassel, Tillmann: *See*—
Träubel, Harro; Münzmay, Thomas; Hassel, Tillmann; Krümmel, Wilhelm; Ehlert, Hans-Albert; and Kochta, Joachim, 5,554,711, Cl. 528-49.000.

Hassmann, Frank: *See*—
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Hastreiter, Jacob J., Jr.: *See*—
Simpson, William H.; Hastreiter, Jacob J., Jr.; Janosky, Mark S.; and Bobb, Mark A., 5,553,951, Cl. 400-120.180.

Hata, Hiroaki: *See*—
Fukuda, Katsumi; Ilzuka, Tadashi; Naka, Reishi; Hata, Hiroaki; Gommori, Masahiko; and Honma, Yoshiharu, 5,553,465, Cl. 62-468.000.

Hata, Hiroshi, to MK Seiko Co., Ltd. Surface wave guideline and object detecting device using surface wave guideline. 5,555,337, Cl. 385-101.000.

Hatakeyama, Atsushi: *See*—
Fujisawa, Hiromichi; Cohn, David; Hatakeyama, Atsushi; and Kiuchi, Itsuko, 5,555,408, Cl. 395-600.000.

Hatanaka, Katsunori: *See*—
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Hathaway, Michael D. Horizontal drilling apparatus. 5,553,680, Cl. 175-78.000.

Hatlestad, John D., to Lockheed Martin Corporation. Red/near-infrared filtering for CCD cameras. 5,555,464, Cl. 348-266.000.

Hatta, Hirotaka; Saitoh, Hiroshi; Kanda, Shigemi; Matsuura, Yozo; and Kamijo, Masahiko, to Ricoh Company, Ltd. Cleaner and toner magazine for electrophotographic apparatus. 5,555,081, Cl. 355-298.000.

Hattori, Shizuko: *See*—
Koyama, Masahiro; Miyake, Norihisa; Sakairi, Hiroshi; Hattori, Shizuko; Momoi, Yasuyuki; Fujimoto, Tsutomu; and Kai, Tsuyoshi, 5,555,179, Cl. 364-468.010.

Hattori, Yasuyuki: *See*—
Tsukada, Kiyoshi; Hattori, Yasuyuki; and Mimura, Taku, 5,554,574, Cl. 502-345.000.

Hauck, John A.: *See*—
Budd, Jeffrey R.; Hauck, John A.; and Beatty, Graydon E., 5,553,611, Cl. 128-642.000.

Hauer, James E.: *See*—
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Hauni Maschinenbau AG: *See*—
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Hause, Frederick N.: *See*—
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Hawley, Edward T.: *See*—
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Hayakawa, Takashi: *See*—
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Hayashi, Hiroshi; and Miyoshi, Tadashi, to Toshihiro Industry Co., Ltd.; and Miyoshi Co., Ltd. Power-assisted shovel truck equipped with a water-feeding device and a water-draining device. 5,553,405, Cl. 37-189.000.

Hayashi, Hiroyuki; Iguchi, Takaaki; and Inamura, Shinji, to Kawasaki Steel Corporation. Method for detecting setting errors of clearance between rollers in universal rolling mill, and method for rolling H-shaped steel having favorable flange dimensions utilizing same detecting method. 5,553,475, Cl. 72-225.000.

Hayashi, Naoto; and Nakamura, Kazuo, to Mitsubishi Denki Kabushiki Kaisha. Clock generating circuit and microcomputer incorporating same. 5,555,225, Cl. 368-10.000.

Hayashi, Tsutomu: *See*—
Ohta, Naoki; Kamide, Naoki; Iwamoto, Jun; Kawakami, Yasunobu; and Hayashi, Tsutomu, 5,554,009, Cl. 417-269.000.

Hayashikoshi, Masanori; Terada, Yasushi; Nakayama, Takeshi; Miyawaki, Yoshikazu; and Kobayashi, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Non-volatile semiconductor memory device. 5,554,868, Cl. 257-315.000.

Hayes, Donald J.: *See*—
Pies, John R.; Wallace, David B.; and Hayes, Donald J., 5,554,247, Cl. 156-268.000.

Hayes, Harry: *See*—
Browning, John H. D.; Wynne, Robert I.; and Hayes, Harry, 5,554,108, Cl. 604-15.000.

Hayes Wheels International, Inc.: *See*—
Jaksic, Miroslav, 5,553,647, Cl. 152-415.000.

Hayland, Robert W., Jr.: *See*—
Bartges, Charles W.; Hayland, Robert W., Jr.; Jensen, Craig J.; and Baumann, Steven F., 5,554,428, Cl. 428-64.100.

Hayward, Gregory R.: *See*—
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Hazard, James T. Toilet seat handle of unitary construction. 5,553,332, Cl. 4-246.100.

Healis, Frank G. Vending apparatus. 5,553,736, Cl. 221-62.000.

Hearn, Lynn M.: *See*—
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Heath Custom Press, Inc.: *See*—
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Heath, William F., Jr.: *See*—
Basinski, Margret B.; DiMarchi, Richard D.; Heath, William F., Jr.; and Schoner, Brigitte E., 5,554,727, Cl. 530-324.000.

Hedges, Harry S., to Andonian, Joseph K. Syringe and vial connector. 5,554,128, Cl. 604-192.000.

Hefner, John G.; and Kolthammer, Brian W. S., to Dow Chemical Company, The. Catalyst for the preparation of linear carbon monoxide/alpha-olefin copolymers. 5,554,777, Cl. 556-21.000.

Hegde, Narayan: *See*—
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Hegel, Robert W.; Hawke, Melvin C.; Damian, William P.; and Mullen, Jon R., to Prince Machine Corporation. Die casting machine with safety bar. 5,553,659, Cl. 164-153.000.
Heid, Armin: *See*—
Lutz, Dieter; Hörth, Franz-Josef; Heide, Hartmut; Göbel, Hilmar; Littell, Alan E. L.; Vonderau, Josef; Heid, Armin; and Scheer, Erich, 5,553,695, Cl. 192-70.140.
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Lutz, Dieter; Hörth, Franz-Josef; Heide, Hartmut; Göbel, Hilmar; Littell, Alan E. L.; Vonderau, Josef; Heid, Armin; and Scheer, Erich, 5,553,695, Cl. 192-70.140.
Heidelberg Harris Inc.: *See*—
Ramsay, Bertrum S., 5,553,544, Cl. 101-415.100.
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Hoff, Howard W., 5,553,546, Cl. 101-483.000.
Heidelberger Druckmaschinen AG: *See*—
Greive, Martin, 5,553,841, Cl. 271-104.000.
Hoff, Howard W., 5,553,546, Cl. 101-483.000.
Ramsay, Bertrum S., 5,553,544, Cl. 101-415.100.
Heidler, Berthold, to BMD Badische Maschinenfabrik Durlach GmbH. Method for conveying moulding boxes and foundry moulding installation operating according to the method. 5,553,655, Cl. 164-29.000.
Heim, Warren P.: *See*—
Horner, Glenn A.; Miller, Scott A.; Heim, Warren P.; Blankenship, Larry K.; and Brassell, James L., 5,554,172, Cl. 607-88.000.
Heimberger, Rudolf; and Schaumann, Uwe, to Richard Wolf GmbH. Endoscopic instrument. 5,554,099, Cl. 600-160.000.
Heinemann, Torsten: *See*—
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Heinrich, Harley K.: *See*—
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Heinzen, Stephen R., to Freudenberg-NOK General Partnership. Cartridge-type lip seal with removable spacer. 5,553,866, Cl. 277-9.500.
Heitmann, William E.; and Brown, Birchel S., to Inland Steel Company. Cold deformable, high strength, hot rolled bar and method for producing same. 5,554,233, Cl. 148-330.000.
Heiwa Seiki Kogyo Co., Ltd.: *See*—
Ishikawa, Masao, 5,553,821, Cl. 248-292.110.
Hejazi, Shahram, to Eastman Kodak Company. X-ray scintillating plate utilizing angled fiber optic rods. 5,554,850, Cl. 250-367.000.
Helbling, Edward. Charitable contribution centralization system and apparatus. 5,555,497, Cl. 364-401.000.
Helene Curtis, Inc.: *See*—
Nandagiri, Arun; Solka, Bruce H.; and Kocis, John A., 5,554,363, Cl. 424-70.510.
Neill, Paul H.; and Brandt, Loralei, 5,554,364, Cl. 424-76.100.
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Hodge, Steve, to Concentric Pumps Limited. Compact gerotor pump. 5,554,019, Cl. 418-171.000.

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Hoechst Japan Limited: *See—*
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Ichikawa, Yukio: *See*—
Nishihata, Naomitsu; Endo, Shunzo; Ichikawa, Yukio; and Katto, Takayuki, 5,554,723, Cl. 528-388.000.
Ichino, Tomio: *See*—
Urawa, Yoshio; Furukawa, Ken; Shimizu, Toshikazu; Yamagishi, Yoji; Tsurugi, Tomio; and Ichino, Tomio, 5,554,757, Cl. 548-237.000.
Ichioka, Eiji: *See*—
Umeyama, Mitsuhiro; Shimizu, Takashi; Ichioka, Eiji; Yoshii, Kinya; Koide, Takeharu; and Funahashi, Makoto, 5,554,082, Cl. 475-338.000.
ICI Americas Inc.: *See*—
Chandler, John M., 5,554,313, Cl. 510-121.000.
Icom Incorporated: *See*—
Kajimoto, Shigeki; and Sun, Weimin, 5,555,453, Cl. 455-266.000.
ICON Health & Fitness, Inc.: *See*—
Dalebout, William T., 5,554,085, Cl. 482-137.000.
Ide, Hirokazu: *See*—
Maenaka, Akihiro; Mori, Yukio; Murata, Haruhiko; Ide, Hirokazu; and Okada, Hidefumi, 5,555,023, Cl. 348-253.000.
Idemitsu Kosan Co., Ltd.: *See*—
Katafuchi, Tadashi; and Nakamura, Akira, 5,554,311, Cl. 252-68.000.
Machida, Shuji; and Tazaki, Toshinori, 5,554,695, Cl. 525-268.000.
Igarashi, Kouhei: *See*—
Hirayama, Hiroshi, Yoshizaki, Kouji; Igarashi, Kouhei; Ito, Keiji; Yoshinaga, Tohru; Watanabe, Kiyohiko; Shinohara, Yukihiro; and Fujishiro, Osamu, 5,554,342, Cl. 422-174.000.
Igarashi, Shigemi, to Watec America Corporation. Compact television camera with switching noise prevention. 5,555,021, Cl. 348-222.000.
Igaue, Takamitsu; and Kido, Tsutomu, to Uni-Charm Corporation. Method for manufacturing absorbent member for absorbent article. 5,554,243, Cl. 156-164.000.
Igram, Dale J.: *See*—
Roe, Pamela A.; and Igram, Dale J., 5,555,161, Cl. 362-32.000.
Iguchi, Takaaki: *See*—
Hayashi, Hiroyuki; Iguchi, Takaaki; and Inamura, Shinji, 5,553,475, Cl. 72-225.000.
Ihara, Keisuke, to Bridgestone Sports Co., Ltd. Preparation of spherical body. 5,554,337, Cl. 264-442.000.
Iida, Yasuhisa: *See*—
Shigenaga, Hisao; Fujita, Ichiro; Yamamoto, Masayuki; Hamana, Michio; Morishita, Keiichi; Tachikawa, Fumitoshi; Uehara, Hideo; and Iida, Yasuhisa, 5,554,984, Cl. 340-937.000.
Iida, Yoshihiro: *See*—
Yabe, Hisao; Iida, Yoshihiro; Suzuki, Akira; Ito, Hideo; Tashiro, Yoshio; Yamazaki, Minoru; Tamada, Osamu; and Arai, Keiichi, 5,554,098, Cl. 600-121.000.
Iijima, Takayuki; Aoyagi, Yoshio; Kato, Shigetoshi; Yoshizawa, Osamu; Wakimoto, Hiroshi; Kawahara, Akira; and Namiki, Akio, to Pioneer Electronic Corporation. Car-stereo with removable control panel, alarm, and power conservation. 5,554,966, Cl. 340-687.000.
Iizuka, Tadashi: *See*—
Fukuda, Katsumi; Iizuka, Tadashi; Naka, Reishi; Hata, Hiroaki; Gommori, Masahiko; and Homma, Yoshiharu, 5,553,465, Cl. 62-468.000.
Ikari, Hideyuki: *See*—
Tatematsu, Susumu; Mori, Kazuhiro; and Ikari, Hideyuki, 5,553,464, Cl. 62-354.000.
Ikeda, Kazuhisa: *See*—
Koyasu, Takahisa; Numazaki, Kouji; Kasuya, Hirokazu; Saitou, Mitsuhiro; and Ikeda, Kazuhisa, 5,554,881, Cl. 257-584.000.
Ikehama, Satoshi, to Hitachi, Ltd. Satellite communications multi-point video transmit system. 5,555,443, Cl. 455-12.100.
Ikemoto, Yoshihiro: *See*—
Maruyama, Teruo; Abe, Yoshikazu; and Ikemoto, Yoshihiro, 5,553,742, Cl. 222-1.000.
Iketani, Naoyasu: *See*—
Katayama, Hiroyuki; Nakayama, Junichiro; Iketani, Naoyasu; and Ohta, Kenji, 5,554,436, Cl. 428-212.000.

Iketani, Youzou: *See*—
Nakayama, Mikio; Tachibana, Tetsuo; Iketani, Youzou; Okuyama, Yuzo; and Kakuma, Satoshi, 5,555,261, Cl. 370-103.000.
Iki, Yoichi; Miyake, Nobuyki; and Ueno, Yasunori, to Nikon Corporation. Eye measuring apparatus having an automatic fogging producing mechanism and method thereof. 5,555,039, Cl. 351-205.000.
Ikoma, Munehisa: *See*—
Inoue, Hiroshi; Hamada, Shinji; Matsuda, Hiromu; Ikoma, Munehisa; and Yamasaki, Hiroshi, 5,554,455, Cl. 429-53.000.
Il-Yang Pharm. Co., Ltd.: *See*—
Kim, Su U.; Kim, Dong Y.; Chung, Gi J.; Hong, Sung K.; Park, Sung J.; Nam, Sang H.; and Lee, Seung M., 5,554,631, Cl. 514-338.000.
Illés, János: *See*—
Burger, Kálmán; Réthey, Iván; Stefkó, Béla; Gebhardt, István; Király née, Gyöngyvér Soós; Takácsi Nagy, Géza; Illés, János; Neszmélyi, Erzsébet; Rácz, István; and Várkonyi, Viktoria, 5,554,598, Cl. 514-54.000.
Illinois Tool Works Inc.: *See*—
Frederiksen, Bjarne; and Hayward, Gregory R., 5,555,153, Cl. 361-119.000.
Kish, Frederick A.; Rancich, Michael A.; Ernst, Richard J.; and Timmerman, Mark S., 5,553,436, Cl. 52-704.000.
Illston, Trevor J.; Doleman, Paul A.; Butler, Edwin G.; Marquis, Peter M.; Ponton, Clive B.; Piramoon, Reza; and Gilbert, Mark J., to Rolls-Royce plc. Method of manufacturing a composite material. 5,554,271, Cl. 204-479.000.
Illum, Lisbeth, to Danbiosyst UK Limited. Systemic drug delivery compositions comprising a polycationi substance. 5,554,388, Cl. 424-501.000.
Im, Jun: *See*—
Ovshinsky, Stanford R.; Fetcenko, Michael A.; Im, Jun; Chao, Benjamin; Reichman, Benjamin; and Young, Kwo, 5,554,456, Cl. 429-59.000.
Imaeda, Mikio, to Brother Kogyo Kabushiki Kaisha. Relief pattern producing method and apparatus and relief pattern sheet. 5,554,490, Cl. 430-327.000.
Imaging and Display Systems Technology, Inc.: *See*—
Rao, N. Vasanth, 5,553,625, Cl. 128-763.000.
Imahashi, Issei, to Tokyo Electron Limited. Plasma processing apparatus with a rotating electromagnetic field. 5,554,223, Cl. 118-723.001.
Imai, Takayuki; Naka, Motohiko; Shida, Takehiko; Sato, Masaaki; Yoshida, Kunio; Akamine, Ikuo; Shimizu, Makoto; and Uchida, Yoshiaki, to Matsushita Electric Industrial Co., Ltd. Picture processing apparatus for processing infrared pictures obtained with an infrared ray sensor and applied apparatus utilizing the picture processing apparatus. 5,555,512, Cl. 364-550.000.
Imaino, Wayne I.; Rosen, Hal J.; Rubin, Kurt A.; and Tang, Wade W.-C., to International Business Machines Corporation. Optical data storage system with multiple write-once phase-change recording layers. 5,555,537, Cl. 369-109.000.
Imaje: *See*—
Pagnon, Alain, 5,555,005, Cl. 347-6.000.
Imamura, Makoto: *See*—
Komai, Tomoko; Imamura, Makoto; Sakai, Yuji; and Inoue, Tetsuo, 5,555,142, Cl. 360-77.060.
Imazato, Hiromasa: *See*—
Sugihara, Hiroshi; Ishikawa, Hiroyuki; Uemura, Tsutomu; Fujiki, Akira; Imazato, Hiromasa; and Umino, Shinichi, 5,554,338, Cl. 419-5.000.
Immunex Corporation: *See*—
Lyman, Stewart D.; and Beckmann, M. Patricia, 5,554,512, Cl. 435-69.500.
Imoo, Ryushi: *See*—
Ozawa, Yoshio; Mukataka, Hisashi; Imoo, Ryushi; and Nishida, Satoshi, 5,554,477, Cl. 430-106.600.
IMP, Inc.: *See*—
Klein, Hans W., 5,554,957, Cl. 330-251.000.
Imperial Chemical Industries, PLC: *See*—
Hollis, Melvyn; Pioli, David; and Valenzuela, Dario, 5,554,510, Cl. 435-69.100.
Marcinko, Joseph J.; and Robertson, John R., 5,554,438, Cl. 428-306.600.
IMRA Europe SA: *See*—
Gschwind, Michel; Mitsuta, Tatsumi; Guyomar, Daniel; Sauzade, Jean-Denis; and Mazoyer, Thierry, 5,554,905, Cl. 310-323.000.
INA Walzlager Schaeffler KG: *See*—
Scheib, Frank; Brunk, Michael; and Kleber, Rainer, 5,553,947, Cl. 384-55.000.
Inahashi, Atsushi: *See*—
Yoneyama, Yuzo; and Inahashi, Atsushi, 5,555,442, Cl. 455-9.000.
Inalfa B.V.: *See*—
Nabuurs, Martinus W. M., 5,553,913, Cl. 296-216.000.
Inamura, Shinji: *See*—
Hayashi, Hiroyuki; Iguchi, Takaaki; and Inamura, Shinji, 5,553,475, Cl. 72-225.000.
Inbar, Dan: *See*—
Hermony, Nathan; Inbar, Dan; Porath, Moshe B.; and Freundlich, David, 5,554,848, Cl. 250-363.050.
InControl, Inc.: *See*—
Alfemess, Clifton A., 5,554,175, Cl. 607-5.000.
Indiana University Foundation: *See*—
Chen, Yaobin; and Mintun, Thomas G., 5,553,609, Cl. 128-630.000.
O'Donnell, Martin J.; Wu, Shengde; Esikova, Irena; and Mi, Aiqiao, 5,554,753, Cl. 546-134.000.
Indigo N.V.: *See*—
Landa, Benzion, 5,555,185, Cl. 355-256.000.
Industrial Technology Research Institute: *See*—
Ho, Bang C.; Chen, Jian-Hong; Yang, Shu-Yin; and Chang, Yih-Her, 5,555,525, Cl. 385-143.000.
Hwang, Yaw-Der; and Lee, Jyh-Jone, 5,554,087, Cl. 483-62.000.
Ingram, Keith W.; and Thompson, David C., to Owens-Illinois Closure Inc. Method and apparatus for compression molding plastic articles. 5,554,327, Cl. 264-40.500.
Injeyan, Hagop; St. Pierre, Randall J.; Hilyard, Rodger C.; Harpole, George M.; and Hoefer, Carolyn S., to TRW Inc. High brightness solid-state laser with zig-zag amplifier. 5,555,254, Cl. 372-33.000.
Inland Steel Company: *See*—
Heitmann, William E.; and Brown, Birchel S., 5,554,233, Cl. 148-330.000.
Inligo, N.V.: *See*—
Landa, Benzion; Ben-Auraham, Peretz; Hall, Joseph; and Gibson, George A., 5,554,476, Cl. 430-106.000.
Inniss, Hadyn; Scaggs, Sheila; and Welch, Robert P., to International Business Machines Corporation. Method and system for automatically updating telephone response mechanism. 5,555,291, Cl. 379-67.000.
Inoue, Haruki: *See*—
Kitamura, Tadaaki; Kobayashi, Yoshiki; Nakanishi, Kunio; Yahiro, Masakazu; Satoh, Yoshiyuki; Shibata, Toshiro; Horie, Takeshi; Yamamoto, Katsuyuki; Takatoo, Masao; Inoue, Haruki; and Asada, Kazuyoshi, 5,554,983, Cl. 340-937.000.
Inoue, Hideo: *See*—
Ogawa, Kazuo; and Inoue, Hideo, 5,555,500, Cl. 364-424.050.
Inoue, Hiroshi; Hamada, Shinji; Matsuda, Hiromu; Ikoma, Munehisa; and Yamasaki, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Resealable safety vent and a sealed alkaline rechargeable battery provided with the safety vent. 5,554,455, Cl. 429-53.000.
Inoue, Masayuki: *See*—
Ohnishi, Kunikazu; Inoue, Masayuki; Suzuki, Yoshio; and Fukui, Yukio, 5,555,334, Cl. 385-93.000.
Inoue, Morito: *See*—
Rokugawa, Kyuji; Matsumoto, Kouji; and Inoue, Morito, 5,554,811, Cl. 73-864.340.
Inoue, Osamu: *See*—
Anami, Kenji; Ohbayashi, Shigeki; and Inoue, Osamu, 5,555,522, Cl. 365-200.000.
Inoue, Takayuki; Fukumoto, Masami; and Yamaura, Izumi, to Matsushita Electric Industrial Co., Ltd. Upright vacuum cleaner. 5,553,347, Cl. 15-327.300.
Inoue, Tetsuo: *See*—
Komai, Tomoko; Imamura, Makoto; Sakai, Yuji; and Inoue, Tetsuo, 5,555,142, Cl. 360-77.060.
Inoue, Tomo; and Hirata, Takashi, to Brother Kogyo Kabushiki Kaisha. Sewing machine and a recording medium for use in combination with the same. 5,553,559, Cl. 112-102.500.
Inoue, Yoshihiro: *See*—
Takai, Kazuki; and Inoue, Yoshihiro, 5,555,239, Cl. 369-192.000.
Inoue, Yoshio: *See*—
Sugino, Morihiko; and Inoue, Yoshio, 5,554,354, Cl. 428-307.300.
Institut Francais Du Petrole: *See*—
Busson, Christian; Delhomme, Henri; Gollion, Laure; and Cassagne, Jean Pierre, 5,554,347, Cl. 422-204.000.
Institut Pasteur: *See*—
Cole, Stewart; and Streeck, Rolf E., 5,554,538, Cl. 435-320.100.
Integrated Network Corporation: *See*—
Gupta, Dev V.; Chen, Yu-Ren B.; Sharper, Craig A.; and Stone, Alan E., 5,555,244, Cl. 370-60.100.
Integrated Process Equipment Corp.: *See*—
Clapis, Paul J.; and Daniell, Keith E., 5,555,472, Cl. 356-357.000.
Ledger, Anthony M., 5,555,474, Cl. 356-381.000.
Intel Corporation: *See*—
Agrawal, Sumeet; and Hegde, Narayan, 5,555,517, Cl. 364-770.000.
Breivogel, Joseph R.; Louke, Samuel F.; Oliver, Michael R.; Yau, Leopoldo D.; and Barns, Christopher E., 5,554,064, Cl. 451-41.000.
Chaput, Robert B.; and Steck, Randy L., 5,555,392, Cl. 395-445.000.
Dent, David, 5,555,158, Cl. 361-684.000.
Gavish, Dan, 5,555,436, Cl. 395-821.000.
Grochowski, Edward T.; and MacWilliams, Peter D., 5,555,423, Cl. 395-775.000.
Hinton, Glenn J.; Martell, Robert W.; Fetterman, Michael A.; Papworth, David B.; and Schwartz, James L., 5,555,432, Cl. 395-800.000.
Hose, R. Kenneth, Jr.; and DiMarco, David P., 5,555,529, Cl. 365-230.060.
McArthur, Kelly M., 5,555,025, Cl. 348-478.000.
Raman, Srinivas, 5,555,398, Cl. 395-470.000.
Sarangdhar, Nitin V.; Nizar, P. K.; and Carson, David G., 5,555,420, Cl. 395-739.000.
Verseput, Jerry; Lam, Fong-Shek; and Shah, Prasanna, 5,555,510, Cl. 364-514.00R.
Intelpro Corporation: *See*—
Osborne, Keith J., 5,553,971, Cl. 405-52.000.
Intergraph Corporation: *See*—
Lefebvre, J. Brett; and Cabana, Glenn E., 5,555,094, Cl. 358-298.000.
Interim Design Inc.: *See*—
Haddad, Joseph C., 5,555,441, Cl. 455-4.200.
Interko, Inc.: *See*—

Loecheenfeldt, Christopher J.; and Muller, Bernardus W., 5,553,533, Cl. 99-494.000.
Intermec Corporation: *See*—
Isaacs, Paul E., to AC & R Components, Inc. Horizontal oil separator/reservoir. 5,553,460, Cl. 62-129.000.
Ise, Michihito: *See*—

Hirayama, Hiroshi; Yoshizaki, Kouji; Igarashi, Kouhei; Ito, Keiji; Yoshinaga, Tohru; Watanabe, Kiyohiko; Shinohara, Yukihiro; and Fujishiro, Osamu, 5,554,342, Cl. 422-174.000.
Ito, Keiki: *See*—
Izuka, Takashi, to Sony Corporation. An optical head having a vertical flat plate shaped magnetic circuit containing a tracking coil and a focusing coil. 5,555,228, Cl. 369-44.150.
Izumi, Mamoru: *See*—

Loecheenfeldt, Christopher J.; and Muller, Bernardus W., 5,553,533, Cl. 99-494.000.
Intermec Corporation: *See*—
Gilpin, David; and Bishay, John M., 5,554,822, Cl. 174-52.300.
Intermedics Orthopedics, Inc.: *See*—
Vinciguerra, John D.; Perrone, Charles H., Jr.; Mumme, Charles W.; and Higgins, Jeffery C., 5,554,158, Cl. 606-80.000.
International Business Machine Corporation: *See*—
Ellerson, James V.; Funari, Joseph; and Varcoe, Jack A., 5,553,769, Cl. 228-123.100.
International Business Machines Corporation: *See*—
Afzali-Ardakani, Ali; and Gelorme, Jeffrey D., 5,554,717, Cl. 528-229.000.
Besaw, Keith V.; Donovan, Robert J.; and Sagiv, Shmuel, 5,555,412, Cl. 395-700.000.
Brady, Michael J.; Chaudhari, Praveen; Gambino, Richard J.; Heinrich, Harley K.; Moskowitz, Paul A.; and von Gutfeld, Robert J., 5,554,974, Cl. 340-572.000.
Branstad, Mark W.; Byrn, Jonathan W.; Delp, Gary S.; Leichty, Philip L.; Plotz, Kevin G.; Safi, Fadi-Christian E.; and Slane, Albert A., 5,555,387, Cl. 395-419.000.
Cassels, Bryan A.; Dente, James J.; Gaudet, Andrew A.; Henderson, Ian E.; and Winarski, Daniel J., 5,555,237, Cl. 369-116.000.
Christensen, Kenneth J.; Polge, Steven E.; and Walker, Anthony D., 5,555,377, Cl. 395-200.110.
Collins, Clive A.; Knowles, Billy J.; Desnoyers, Christine M.; Rolfe, David B.; and Pontius, Dale E., 5,555,528, Cl. 365-227.000.
Curran, Brian W.; and Blanco, Rafael, 5,554,946, Cl. 327-172.000.
Dayan, Richard A.; and Newman, Palmer E., 5,555,373, Cl. 395-188.010.
Dichiara, Robert R.; Fahey, James T.; Jones, Pamela E.; Lyons, Christopher F.; Moreau, Wayne M.; Sooriyakumaran, Ratnam; Spinillo, Gary T.; Welsh, Kevin M.; and Wood, Robert L., 5,554,485, Cl. 430-271.100.
Duyanovich, Linda Marie; Micka, William Frank; and Shomler, Robert Wesley, 5,555,371, Cl. 395-182.110.
Elazar, Uri; and Peled, Yehuda, 5,555,383, Cl. 395-306.000.
England, Laurence E.; Lang, Andrew J.; and Shannon, Alfred W., 5,555,411, Cl. 395-650.000.
Grohoski, Gregory F.; Mitchell, Oscar R.; Nguyen, Tung M.; and Rim, Yongjae, 5,555,543, Cl. 370-58.100.
Groves, Randall D.; and O'Quin, John T., II, 5,555,400, Cl. 395-492.000.
Hough, Roger E.; and Murray, Robert E., 5,555,414, Cl. 395-734.000.
Imaino, Wayne I.; Rosen, Hal J.; Rubin, Kurt A.; and Tang, Wade W.-C., 5,555,537, Cl. 369-109.000.
Inniss, Hadyn; Scaggs, Sheila; and Welch, Robert P., 5,555,291, Cl. 379-67.000.
Jackson, Raymond A.; Lidestri, Kathleen A.; Linnell, David C.; and Master, Raj N., 5,553,766, Cl. 228-13.000.
Johnson, William J.; Keller, Robert S.; and Williams, Marvin L., 5,555,426, Cl. 395-200.150.
Judd, Ian D.; Buckland, Patrick A.; Cath, Roger G.; Cockburn, Gordon J.; and Short, William A., 5,555,390, Cl. 395-439.000.
Katoh, Katsutoshi; Suzuki, Michio; Uchiyama, Yoshiharu; and Yonemochi, Kenshin, 5,555,487, Cl. 361-680.000.
Li, Shih-Gong; and Wang, John S., 5,555,370, Cl. 395-161.000.
Lohman, Terence; Noll, Mark G.; Olive, Jose A.; and Perez, Roberto V., 5,555,413, Cl. 395-733.000.
Lucas, Bruce D., 5,555,352, Cl. 395-123.000.
McMahon, Jerry K.; Olsen, Floyd W.; and Seward, Matthew F., 5,554,924, Cl. 323-229.000.
Narayanaswami, Chandrasekhar, 5,555,355, Cl. 395-133.000.
Osisek, Damian L., 5,555,385, Cl. 395-401.000.
Sawa, Tsutomu; Takenoshita, Hiroyuki; Hada, Toshiki; and Komatsu, Hirohide, 5,553,845, Cl. 271-314.000.
Scheibl, Frederick J., 5,555,356, Cl. 395-134.000.
Selby, Robert F.; Yanai, Shimon; Vortman, Phina; and Weisberg, Larry, 5,555,365, Cl. 395-159.000.
Toshiaki, Kirihata; and Daisuke, Kato, 5,555,212, Cl. 365-200.000.
Waldron, Ted C.; and Brew, Glenn E., 5,555,399, Cl. 395-486.000.
Yamashita, Akio; and Toyokawa, Kazuharu, 5,555,362, Cl. 395-145.000.
International Paper: *See*—
Gordon, Robert L.; and Bernstein, Linda A., 5,553,704, Cl. 206-158.000.
Jensen, Kurt D., 5,553,772, Cl. 229-148.000.
Intrinzix Technologies, Inc.: *See*—
Aguayo, Erwin, Jr.; and Crowley, Steven J., 5,555,015, Cl. 348-6.000.
Inuishi, Masahide: *See*—
Kusunoki, Shigeru; and Inuishi, Masahide, 5,554,876, Cl. 257-411.000.
Inuzuka, Tatsuki; Nakamura, Toshiaki; Shinoda, Shinichi; and Kojima, Yasuyuki, to Hitachi, Ltd. Image signal processing apparatus. 5,555,095, Cl. 358-298.000.
Iolab Corporation: *See*—
Sepielli, Perry, 5,554,894, Cl. 307-119.000.
Iowa State University Research Foundation, Inc.: *See*—
Verkade, John; and Tang, Jiansheng, 5,554,764, Cl. 548-455.000.
Irie, Bunpei; and Kurosawa, Yoshiaki, to Kabushiki Kaisha Toshiba. Pattern recognition system with improved recognition rate using nonlinear transformation. 5,555,320, Cl. 382-225.000.
Irving, Harry F., to Foothills Steel Foundry Ltd. Shroud anchor system. 5,553,409, Cl. 37-446.000.
Isaacs, Paul E., to AC & R Components, Inc. Horizontal oil separator/reservoir. 5,553,460, Cl. 62-129.000.
Ise, Michihito: *See*—
Uehara, Yasuo; and Ise, Michihito, 5,554,370, Cl. 424-125.000.
Ishibashi, Takeo; Ishikawa, Eiichi; and Kanai, Itaru, to Mitsubishi Denki Kabushiki Kaisha. Method of forming a fine resist pattern using an alkaline film covered photoresist. 5,554,489, Cl. 430-326.000.
Ishibashi, Yoshiharu: *See*—
Suzuki, Takuji; Aida, Satoshi; Fujimoto, Katsuhiko; Shibata, Mariko; Ishibashi, Yoshiharu; Izumi, Mamoru; Saitoh, Shiroh; and Okamoto, Kazuya, 5,553,618, Cl. 128-653.100.
Ishida, Tatsuaki; Sugita, Ryuji; Tohma, Kiyokazu; and Ban, Yasuaki, to Matsushita Electric Industrial Co., Ltd. Magnetic recording medium and method for producing the same. 5,554,440, Cl. 428-336.000.
Ishihara, Hideaki; Tsuji, Kiyoshi; and Mochida, Akihiko, to Olympus Optical Co., Ltd. Solid-state imaging apparatus. 5,555,020, Cl. 348-221.000.
Ishihara, Kazuhiko: *See*—
Nakabayashi, Nobuo; Ishihara, Kazuhiko; and Saimi, Yasukazu, 5,554,669, Cl. 523-118.000.
Ishihara, Masaaki: *See*—
Tsujimoto, Shinichi; and Ishihara, Masaaki, 5,555,045, Cl. 354-106.000.
Ishii, Satoshi; and Akatsuka, Takao, to Toyota Jidosha Kabushiki Kaisha. Diagnosis apparatus for vehicle control system. 5,553,488, Cl. 73-116.000.
Ishikawa, Eiichi: *See*—
Ishibashi, Takeo; Ishikawa, Eiichi; and Kanai, Itaru, 5,554,489, Cl. 430-326.000.
Ishikawa, Fumihiko; Oka, Seiji; and Kai, Tsukuru, to Ricoh Company, Ltd. Image forming apparatus having toner recycling device with electrostatic conveyor. 5,555,469, Cl. 355-298.000.
Ishikawa, Hiroyuki: *See*—
Sugihara, Hiroshi; Ishikawa, Hiroyuki; Uemura, Tsutomu; Fujiki, Akira; Imazato, Hiromasa; and Umino, Shinichi, 5,554,338, Cl. 419-5.000.
Ishikawa, Masao, to Heiwa Seiki Kogyo Co., Ltd. Counterbalancing unit. 5,553,821, Cl. 248-292.110.
Ishikawa, Michio: *See*—
Ito, Kazuyuki; Nakamura, Kyuzo; Ishikawa, Michio; Togawa, Jun; Tani, Noriaki; Hashimoto, Masanori; and Ohashi, Yumiko, 5,554,418, Cl. 427-579.000.
Ishikawa, Takehiro; Date, Takashi; and Sagawa, Fumihiko, to Alps Electric Co., Ltd. Liquid crystal display having adjacent electrode terminals set equal in length. 5,555,116, Cl. 359-88.000.
Ishino, Toshiyuki, to NEC Corporation. Audio coder. 5,555,273, Cl. 375-244.000.
Ishiwatari, Takao; and Tsushima, Kazunori, to Sumitomo Chemical Company, Limited. Controlling agent for fabric pest insects. 5,554,649, Cl. 514-530.000.
ISIS Pharmaceuticals, Inc.: *See*—
Ravikumar, Vasulinga; and Mohan, Venkatraman, 5,554,746, Cl. 540-200.000.
Isoboard Enterprises Inc.: *See*—
Flannery, Steven J.; and Bücking, Hans G., 5,554,330, Cl. 264-113.000.
Isoda, Masanori: *See*—
Nakagome, Yoshinobu; Itoh, Kiyoo; Tanaka, Hitoshi; Watanabe, Yasushi; Kume, Eiji; Isoda, Masanori; Yamasaki, Eiji; and Uchigiri, Tatsumi, 5,555,215, Cl. 365-226.000.
Isoda, Takashi: *See*—
Oritsuki, Ryoji; Hiroshima, Minoru; Yanai, Masahiro; Matsuda, Masaaki; Horii, Toshikazu; Hashimoto, Yuichi; Kozai, Hayao; Suzuki, Kenkichi; Takabatake, Masaru; and Isoda, Takashi, 5,555,112, Cl. 359-59.000.
Isogawa, Atsushi: *See*—
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Isover Saint-Gobain: *See*—
Bernard, Jean L.; Vignesoult, Serge; Battigelli, Jean; Berthier, Guy; and Furtak, Hans, 5,554,324, Cl. 264-8.000.
Israel, Chermoni, Low volume irrigation device for horticulture and agriculture crops, 5,553,786, Cl. 239-456.000.
Israelsson, Per V.: *See*—
Rinnbäck, Hans L.; Halén, Håkan M.; and Israelsson, Per V., 5,555,260, Cl. 370-84.000.
Isuzu Motors, Ltd.: *See*—
Furihata, Kenichi; and Takei, Fumiaki, 5,555,501, Cl. 364-424.050.
Itakura, Takahiro, to Nippondenso Co., Ltd. Pinhole inspection device and method. 5,555,315, Cl. 382-141.000.
Itakura, Tsuyoshi, to Nihon Doubutsu Yakuhin Kabushikigaisya. Air controller for air pump. 5,554,012, Cl. 417-410.100.
Ito, Hideo: *See*—
Yabe, Hisao; Iida, Yoshihiro; Suzuki, Akira; Ito, Hideo; Tashiro, Yoshio; Yamazaki, Minoru; Tamada, Osamu; and Arai, Keiichi, 5,554,098, Cl. 600-121.000.
Ito, Kazuhiko: *See*—
Yazawa, Shigehiko; Ito, Kazuhiko; Uehara, Takeshi; Tachibana, Toru; and Fukuda, Keiji, 5,555,541, Cl. 370-68.100.
Ito, Kazuyuki; Nakamura, Kyuzo; Ishikawa, Michio; Togawa, Jun; Tani, Noriaki; Hashimoto, Masanori; and Ohashi, Yumiko, to Nihon Shinku Gijutsu Kabushiki Kaisha; and Brother Kogyo Kabushiki Kaisha. Method of forming passivation film. 5,554,418, Cl. 427-579.000.
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Hirayama, Hiroshi; Yoshizaki, Kouji; Igarashi, Kouhei; Ito, Keiji; Yoshinaga, Tohru; Watanabe, Kiyohiko; Shinohara, Yukihiro; and Fujishiro, Osamu, 5,554,342, Cl. 422-174.000.
Ito, Keiki: *See*—
Hasegawa, Makoto; Saito, Tsuyoshi; Higuchi, Fumihiko; Amano, Hideaki; Naitoh, Katsunori; Tozawa, Takashi; Nakagome, Tatsuya; Ito, Keiki; and Suzuki, Kouji, 5,534,249, Cl. 156-345.000.
Ito, Masahiro: *See*—
Suzuki, Mitso; Ito, Masahiro; and Higaki, Yoshiyuki, 5,553,590, Cl. 123-415.000.
Ito, Michio: *See*—
Matsuyama, Akinobu; Ito, Michio; Kobayashi, Yoshinori; and Kawada, Naoki, 5,554,532, Cl. 435-252.100.
Ito, Minoru; and Watanabe, Toshifumi, to Nippon Telegraph and Telephone Corporation. Thresholding method for segmenting gray scale image, method for determining background concentration distribution, and image displacement detection method. 5,555,318, Cl. 382-468.000.
Ito, Norio, to NTN Corporation. Static pressure gas bearing spindle assembly. 5,553,948, Cl. 384-107.000.
Ito, Shinji: *See*—
Hirano, Hirosaburo; Yamamoto, Yuji; and Ito, Shinji, 5,553,377, Cl. 29-890.053.
Ito, Yasuhiko: *See*—
Kondo, Kunio; Kawano, Mitsuo; and Ito, Yasuhiko, 5,554,526, Cl. 435-240.100.
Ito, Yasuo: *See*—
Miyata, Shigeru; Yoshida, Hideji; Matsubara, Yoshihiro; Ito, Yasuo; and Suzuki, Takashi, 5,554,930, Cl. 324-402.000.
Ito, Yoshikazu: *See*—
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Itoh, Akira: *See*—
Terai, Hideo; Itoh, Akira; and Kitaguchi, Teruyuki, 5,555,322, Cl. 382-232.000.
Itoh, Kiyoo: *See*—
Nakagome, Yoshinobu; Itoh, Kiyoo; Tanaka, Hitoshi; Watanabe, Yasushi; Kume, Eiji; Isoda, Masanori; Yamasaki, Eiji; and Uchigiri, Tatsumi, 5,555,215, Cl. 365-226.000.
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ITT Automotive Europe GmbH: *See*—
Feger, Rolf, 5,555,492, Cl. 362-293.000.
ITT Cannon, Inc.: *See*—
Bethurum, Gary C., 5,554,045, Cl. 439-372.000.
ITT Corporation: *See*—
Kelly, Dale D., 5,553,737, Cl. 221-167.000.
Waite, Eugene L., 5,555,456, Cl. 340-635.000.
Ivansco, Thomas L., Jr.; Kilian, Robert S.; and Elliott, Phillip M., to Paxall Group, Inc., The. Carton conveyor and loading apparatus with adjustable guide members. 5,553,441, Cl. 53-249.000.
Ive, Jonathan P.: *See*—
Moller, Ronald J.; and Ive, Jonathan P., 5,555,157, Cl. 361-683.000.
Ivory, Nicholas E.; Jeffries, Michael; Palmer, Robert J.; and Thatcher, Wrenford J., to Coates Brothers PLC. Resist formation made by applying, drying and reflowing a suspension of photocurable material. 5,554,487, Cl. 430-311.000.
Iwaasa, Hiroaki: *See*—
Hashimoto, Koosuke; Matsuo, Eiji; Kawagoe, Hisashi; and Iwaasa, Hiroaki, 5,554,980, Cl. 340-825.720.
Iwahashi, Masaaki: *See*—
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Iwai, Takumi; and Tamori, Mikiko, to Fjuitsu Limited. Method and apparatus for transferring data between a master unit and a plurality of slave units. 5,555,548, Cl. 375-356.000.
Iwaki, Tadao: *See*—
Mitsuoka, Yasuyuki; Iwaki, Tadao; and Kasama, Nobuyuki, 5,555,115, Cl. 359-72.000.
Iwama, Ryouichi; and Masuda, Syuzo, to Fujitsu Limited. Serial printer. 5,555,078, Cl. 355-210.000.
Iwamoto, Jun: *See*—
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Iwata, Hiroshi: *See*—
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Iwata, Ritsuo; Takahashi, Hirotosi; Suzuki, Satoshi; and Endo, Takayuki, to Yamaha Corporation. Wood board and flooring material. 5,554,429, Cl. 428-105.000.
Iwayanagi, Takao: *See*—
Nakayama, Takahiro; Kakuta, Atsushi; and Iwayanagi, Takao, 5,554,911, Cl. 313-504.000.
Izuka, Takashi, to Sony Corporation. An optical head having a vertical flat plate shaped magnetic circuit containing a tracking coil and a focusing coil. 5,555,228, Cl. 369-44.150.
Izumi, Mamoru: *See*—
Suzuki, Takuji; Aida, Satoshi; Fujimoto, Katsuhiko; Shibata, Mariko; Ishibashi, Yoshiharu; Izumi, Mamoru; Saitoh, Shiroh; and Okamoto, Kazuya, 5,553,618, Cl. 128-653.100.
Izumi, Michio: *See*—
Kuramoto, Shinichi; Okamoto, Yoshihisa; Asahina, Yasuo; Izumi, Michio; Gohhara, Hidefumi; Mochizuki, Chiharu; Suzuki, Tomomi; Nakamura, Hideo; and Wakisaka, Masaru, 5,554,478, Cl. 430-109.000.
Izzo, Alan J.: *See*—
Armerding, Donald G.; Beal, William B.; Izzo, Alan J.; Oostra, Billy A.; and Rodman, Terrell L., 5,555,374, Cl. 395-200.020.
J and J Container Handling Systems: *See*—
Patois, John R.; and Warren, Jack D., 5,553,698, Cl. 198-626.100.
J. M. Smucker Company, The: *See*—
Muenz, David J.; and Hochstetler, Harold J., 5,554,406, Cl. 426-573.000.
J. M. Voith GmbH: *See*—
Grossmann, Udo; and Eckl, Werner, 5,554,267, Cl. 162-301.000.
J. Uriach & Cia.: *See*—
Almansa, Carmen; Carceller, Elena; Gonzalez, Concepcion; Torres, Carmen; and Bartroli, Javier, 5,554,624, Cl. 514-303.000.
Jablonka, Bernd: *See*—
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Jablonski, Gary F.; and Ewald, Henry J., to Ford Motor Company. Remote controlled security system. 5,554,977, Cl. 340-825.310.
Jackson, David A.: *See*—
Goldfarb, Adolph E.; Jackson, David A.; Goldfarb, Martin I.; Eddins, Fred D.; and Doane Jr., Linwood E., 5,553,643, Cl. 141-34.000.
Jackson, Deborah J.: *See*—
Bloomfield, Mark C.; Castro, Edward F.; Dyer, Joseph T.; Jackson, Deborah J.; Lemons, Charles E.; McCown, Bruce A.; Mullis, Johnny P.; and Troxell, Brian A, 5,555,100, Cl. 358-402.000.
Jackson, John C.; Moore, Andrew L.; and Niemiro, Thaddeus A., to Rockwell International Corporation. System for controlling a web in a printing press. 5,553,542, Cl. 101-228.000.
Jackson, Raymond A.; Lidestri, Kathleen A.; Linnell, David C.; and Master, Raj N., to International Business Machines Corporation. In-situ device removal for multi-chip modules. 5,553,766, Cl. 228-13.000.
Jacobi, Michael C.: *See*—
Booth, James R.; Jacobi, Michael C.; Nunez, Arlette C.; Smith, Jonathan S.; Tauvers, Peter R.; Doyle, Earl H., Jr.; Diegel, Fredric A., Jr.; Kratochvil, Thomas M.; and Gaudin, Brenda G., 5,555,531, Cl. 367-15.000.
Jacobs, Gundolf: *See*—
Sanders, Josef; Kratz, Mark; Dietrich, Manfred; Heinemann, Torsten; Woynar, Helmut; Jacobs, Gundolf; and Scholz, Uwe, 5,554,662, Cl. 521-137.000.
Jacobs, John F., Jr. Double mast iceboat. 5,553,562, Cl. 114-43.000.
Jacobs, Leonard P. Open-end self-adjusting ratchet wrench. 5,553,520, Cl. 81-90.100.
Jacques, James O., to Seagate Technology, Inc. Dual track servo system with position interpolation. 5,555,139, Cl. 360-77.050.
Jacques, Jean-Pierre: *See*—
Verschuere, Bruno; and Jacques, Jean-Pierre, 5,553,568, Cl. 119-460.000.
Jadamus, Hans: *See*—
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Jädicke, Horst: *See*—
Schöder, Bernd; Sossnitza, Johannes; Demgensky, Jürgen; Riedmann, Josef; Jädicke, Horst; Glock, Wilfried; and Schramm, Friedrich, 5,553,693, Cl. 192-3.290.
Jaenker, Peter, to Deutsche Aerospace AG. Electro-hydraulic actuator. 5,553,828, Cl. 251-129.010.
Jaksic, Miroslav, to Hayes Wheels International, Inc. Central tire inflation system. 5,553,647, Cl. 152-415.000.
Jameel, Mohomed I.; Cormack, Donald E.; and Tran, Hoc N., to 3003442 Canada Inc. Advanced sootblower nozzle design. 5,553,778, Cl. 239-1.000.
James River Paper Company, Inc.: *See*—
Fadaie, Saadat, 5,553,442, Cl. 53-445.000.
Jané, Rodney: *See*—
Chiu, Bernard; Maxwell, Randolph E.; Gatchell, Stephen M.; Bradley, Jerald; Longan, John; and Jané, Rodney, 5,553,607, Cl. 128-203.260.
Jang, G. David. Universal mode vascular catheter system. 5,554,118, Cl. 604-96.000.
Jani, Rajni: *See*—
Ali, Yusuf; Jani, Rajni; and McCarty, George R., 5,554,367, Cl. 424-78.040.
Janosky, Mark S.: *See*—
Simpson, William H.; Hastreiter, Jacob J., Jr.; Janosky, Mark S.; and Bobb, Mark A., 5,553,951, Cl. 400-120.180.
Janssen Pharmaceutica N.V.: *See*—
Van Daele, Georges H. P.; and Van den Keybus, Frans M. A., 5,554,772, Cl. 549-434.000.

Jansseune, Luc, to Siemens Aktiengesellschaft. Microswitch with a magnetic field sensor. 5,554,964, Cl. 335-207.000.
January, Daniel B.: *See*—
Fischer, Reiner; Jensen-Korte, Uta; Kunisch, Franz; Marbold, Albrecht; Ooms, Pieter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert
Jensen-Korte, Uta: *See*—

Jones, Edward S.: *See*—
Dresie, Carl F.; Jones, Edward S.; Shelley, Stephen R.; Strobl, Kurt H.; Suthar, Shamal L.; and Worden, Harold C., 5,553,835, Cl. 264-
Kaabi, Carine; Lambelet, Pierre; Rossier, Yvan; and Seiler, Alfred, to Nestec S.A. Apparatus for monitoring rehydration kinetics of dehydrated products. 5,553,485, Cl. 73-73.000.

Jansseune, Luc, to Siemens Aktiengesellschaft. Microswitch with a magnetic field sensor. 5,554,964, Cl. 335-207.000.
January, Daniel B.: *See—*
Winslow, Matthew R.; Woolverton, Douglas E.; and January, Daniel B., 5,553,389, Cl. 33-203.180.
Japan Development Consultants, Inc.: *See—*
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Japan Vilene Company Ltd.: *See—*
Fujiki, Nobuo, 5,554,333, Cl. 264-284.000.
Jaquen, G'erard: *See—*
Top, Siden; Vessieres, Anne; Jaquen, G'erard; and Quivy, Jacques, 5,554,602, Cl. 424-1.450.
Jaques, Stephen B.; Stehly, Richard D.; and Dunning, Peter B., to Construction Material Resources. Processed silica as a natural pozzolan for use as a cementitious component in concrete and concrete products. 5,554,352, Cl. 423-339.000.
Jarecki, James J.; and Polzin, Bruce C., to Newell Operating Company. Paint kit including sealable tray assembly. 5,553,701, Cl. 206-15.200.
Jarosz, Paul J.: *See—*
Samuels, Glenn J.; Lee, Jung-Chung; Lee, Charles; Berry, Stephen; and Jarosz, Paul J., 5,554,384, Cl. 424-451.000.
Jasinski, Leon, to Motorola, Inc. Selective call receiver capable of requesting information from a communication system and method therefor. 5,555,446, Cl. 455-54.200.
Jaskowiak, Timothy R.; and Hart, Steven C., to Xerox Corporation. Developer roller assembly and method for making same. 5,555,184, Cl. 355-259.000.
Jason, Jerry P.: *See—*
Huber, Michael J.; Jason, Jerry P.; and Barbee, Garry W., 5,554,230, Cl. 148-208.000.
Jasper, Carolyn M.: *See—*
Roe, Donald C.; Goulait, David J. K.; Rodriguez, Sheila S.; Carlin, Edward P.; Dreier, Kimberly A.; Jasper, Carolyn M.; and Daniels, Dean J., 5,554,143, Cl. 604-385.200.
Roe, Donald C.; Goulait, David J. K.; Rodriquez, Sheila S.; Carlin, Edward P.; Dreier, Kimberly A.; Jasper, Carolyn M.; and Daniels, Dean J., 5,554,144, Cl. 604-385.000.
Roe, Donald C.; Goulait, David J. K.; Rodriguez, Sheila S.; Carlin, Edward P.; Dreier, Kimberly A.; Jasper, Carolyn M.; and Daniels, Dean J., 5,554,145, Cl. 604-385.200.
Jasper, Thomas E., to Locksmasters, Inc. Drive apparatus and portable power source for computerized combination locks. 5,553,472, Cl. 70-278.000.
Jasso, Michael J., Jr. Cover for tree injector capsule and feeder assembly tube. 5,553,416, Cl. 47-57.500.
Jauernig, Udo: *See—*
Findler, Guenther; Buchholz, Juergen; and Jauernig, Udo, 5,553,789, Cl. 239-548.000.
Findler, Guenther; Buchholz, Juergen; and Jauernig, Udo, 5,553,790, Cl. 239-585.100.
Jaworski, Bill L. Land seismic acoustic source. 5,554,829, Cl. 181-114.000.
Je, Yang-Gyu; and Kim, Jong-Su, to Korea Institute of Machinery and Metals. Lateral and axial vibration isolators utilizing leaf springs. 5,553,834, Cl. 267-140.120.
Jeffcoat, Roger: *See—*
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Jeffers, Frederick J., to Eastman Kodak Company. Measurement of a saturation magnetic flux density through use of a rotating permanent magnet. 5,554,932, Cl. 324-204.000.
Jeffers, Steven N.: *See—*
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Jeffries, Michael: *See—*
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Jelic, Ralph, to Verosol USA Inc. Child safety device for looped cords. 5,553,650, Cl. 160-178.100.
Jenkins, Peter D.: *See—*
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Jenkins, Thomas E., II, to Renaissance French Doors & Sash, Inc. Door threshold assembly. 5,553,419, Cl. 49-469.000.
Jennings, Michael G.: *See—*
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Jensen, Andrew M., to Otis Elevator Company. Installation of elevator rails in a hoistway. 5,553,686, Cl. 187-408.000.
Jensen, Craig J.: *See—*
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Jensen, Howard A.; and Seem, John E., to Johnson Service Company. Controller for use in an environment control network capable of storing diagnostic information. 5,555,195, Cl. 364-551.010.
Jensen, Kirk: *See—*
Finn, Joseph R.; Jones, James R.; and Jensen, Kirk, 5,553,907, Cl. 296-97.100.
Jensen, Kurt D., to International Paper. Paperboard clamshell carton. 5,553,772, Cl. 229-148.000.
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Jha, Sunil C.; and Forster, James A., to Texas Instruments Incorporated. Heat exchanger assemblies-material for use therin, and a method of making the material. 5,553,770, Cl. 228-190.000.
Jia, Chengguo: *See—*
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Park, Jang W.; Jin, Sung W.; and Kwag, Tae B., 5,553,802, Cl. 242-372.000.
Joanell Laboratories, Inc.: *See—*
La Mura, Joseph L.; and Wallenburg, Ronald C., 5,554,817, Cl. 102-217.000.
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Johler, Werner; and Kälin, Werner, to Alcatel STR AG. Gas-filled plastic enclosed relay. 5,554,963, Cl. 335-151.000.
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Johns Hopkins University: *See—*
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Johnson & Johnson Vision Products, Inc.: *See—*
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Johnson, Brad: *See—*
Sudama, Ram; Griffin, David M.; Johnson, Brad; Sealy, Dexter; Shelhamer, James; and Tallman, Owen H., 5,555,375, Cl. 395-200.030.
Johnson, Carl H.: *See—*
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Johnson, Dale F.: *See—*
Gosselin, Albert E., Jr.; Bate, Edward R., Jr.; and Johnson, Dale F., 5,553,555, Cl. 110-215.000.
Johnson, David R.: *See—*
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Johnson, Dennis W.: *See—*
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Johnson, Glenn: *See—*
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Johnson, Jerry L.: *See—*
Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,554,579, Cl. 504-246.000.
Johnson, Lonnie G.; and Applewhite, John T., to Johnson Research and Development Co., Inc. Pneumatic launcher for a toy projectile and the like. 5,553,598, Cl. 124-63.000.
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Johnson, Thomas H., to Shell Oil Company. Process for preparing a gasoline additive compound. 5,554,794, Cl. 564-491.000.
Johnson, Wayne. Magnetic switch tripping system. 5,554,833, Cl. 200-61.720.
Johnson, William J.; Keller, Robert S.; and Williams, Marvin L., to International Business Machines Corporation. Method and apparatus for disseminating messages to unspecified users in a data processing system. 5,555,426, Cl. 395-200.150.
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Jones, Brian C., to Wilshire Partners. Plain water pressure boost system for a carbonated beverage dispenser. 5,553,746, Cl. 222-129.100.
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Jones, Derek, to Perkins Limited. Rocker arm lubrication arrangement. 5,553,583, Cl. 123-90.340.

Jones, Edward S.: *See—*
Dresie, Carl F.; Jones, Edward S.; Shelley, Stephen R.; Strobl, Kurt H.; Suthar, Sharnal L.; and Worden, Harold C., 5,553,835, Cl. 264-204.000.
Jones, Gary A., to Hammer Strength Corporation. Abdominal/hip flex exercise machine. 5,554,084, Cl. 482-97.000.
Jones, Gary A., to Hammer Strength Corporation. Military press exercise machine. 5,554,089, Cl. 482-97.000.
Jones, Gary A., to Hammer Strength Corporation. Calf exercise machine. 5,554,090, Cl. 482-97.000.
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Finn, Joseph R.; Jones, James R.; and Jensen, Kirk, 5,553,907, Cl. 296-97.100.
Jones, Jonathan D. G.: *See—*
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Dichiara, Robert R.; Fahey, James T.; Jones, Pamela E.; Lyons, Christopher F.; Moreau, Wayne M.; Sooriyakumaran, Ratnam; Spinillo, Gary T.; Welsh, Kevin M.; and Wood, Robert L., 5,554,485, Cl. 430-271.100.
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Hui, Kwan; Jones, Charles D.; Jungheim, Louis N.; and Shepherd, Timothy A., 5,554,653, Cl. 514-605.000.
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Ferenczy, Nikolaus; and Junkers, Dieter, 5,553,640, Cl. 138-154.000.
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Sawa, Tsutomu; Takenoshita, Hiroyuki; Hada, Toshiki; and Komatsu, Hirohide, 5,553,845, Cl. 271-314.000.
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Takatoshi, Takemoto; and Kazunari, Kawashima, 5,554,070, Cl. 453-31.000.
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Tamura, Tadao, 5,553,434, Cl. 52-545.000.
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Sugino, Morihiko; and Inoue, Yoshio, 5,554,354, Cl. 428-307.300.
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Sonehara, Hiroshi; Toba, Akira; Akushichi, Shuki; and Shitaya, Yoshiyuki, 5,555,171, Cl. 364-424.030.
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Mori, Hidekazu; and Oku, Juntaro, 5,555,013, Cl. 347-237.000.
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Endoh, Tetsuo; Tanaka, Yoshiyuki; Aritome, Seiichi; Shirota, Riichiro; Shuto, Susumu; Tanaka, Tomoharu; Hemink, Gertjan; and Tanzawa, Toru, 5,555,204, Cl. 365-189.010.
Haga, Ryo; Yabe, Tomoaki; Miyano, Shinji; and Numata, Kenji, 5,555,523, Cl. 365-203.000.
Irie, Bunpei; and Kurosawa, Yoshiaki, 5,555,320, Cl. 382-225.000.
Komai, Tomoko; Imamura, Makoto; Sakai, Yuji; and Inoue, Tetsuo, 5,555,142, Cl. 360-77.060.
Maruyama, Ryoji, 5,554,927, Cl. 324-117.00H.
Minami, Shigenobu; and Okada, Osamu, 5,555,310, Cl. 381-17.000.
Nikaido, Masaru; Kanetaka, Hidemi; and Yamaguchi, Hideki, 5,554,413, Cl. 427-108.000.
Ohno, Tadayoshi; Yamaguchi, Takashi; and Itoh, Shinichi, 5,555,010, Cl. 347-211.000.
Okamoto, Rintarou, 5,554,266, Cl. 204-298.150.
Omura, Ichiro; Kitagawa, Mitsuhiko; Nakayama, Kazuya; and Yamaguchi, Masakazu, 5,554,862, Cl. 257-137.000.
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Shimizu, Susumu, 5,554,156, Cl. 606-17.000.
Shiratake, Shinichiro; Ohuchi, Kazunori; and Takashima, Daisaburo, 5,555,203, Cl. 365-51.000.
Sudo, Akira; Kohyama, Yusuke; and Koyama, Haruhiko, 5,555,520, Cl. 365-149.000.
Suzuki, Takuji; Aida, Satoshi; Fujimoto, Katsuhiko; Shibata, Mariko; Ishibashi, Yoshiharu; Izumi, Mamoru; Saitoh, Shiroh; and Okamoto, Kazuya, 5,553,618, Cl. 128-653.100.
Takashima, Daisaburo; and Watanabe, Shigeyoshi, 5,555,519, Cl. 365-63.000.
Toshiaki, Kirihata; and Daisuke, Kato, 5,555,212, Cl. 365-200.000.
Tsinberg, Mikhail; Azadegan, Faramarz; Hu, Antony; and Ogawa, Shigeo, 5,555,193, Cl. 364-514.00A.
Tsubusaki, Koji; and Komatsu, Fumio, 5,555,319, Cl. 382-170.000.
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Kahle, David A. Vacuum workpiece holding device for a work table. 5,553,837, Cl. 269-21.000.
Kahn, Scott D.: *See—*
Teig, Steven L.; and Kahn, Scott D., 5,555,366, Cl. 395-161.000.
Kai, Tsukuru: *See—*

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Kai, Tsuyoshi: *See*—
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Kaji, Hidenobu: *See*—
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Kajimoto, Shigeki; and Sun, Weimin, to Icom Incorporated. Radio communication system. 5,555,453, Cl. 455-266.000.
Kajioka, Hiroshi: *See*—
Kumagai, Tatsuya; Kajioka, Hiroshi; Akiyama, Munehiro; Oho, Shigeru; and Sonobe, Hisao, 5,555,235, Cl. 356-350.000.
Kajitani, Hiroshi, to NEC Corporation. Floating head slider with a magnetic head integrated therein. 5,555,145, Cl. 360-103.000.
Kajiwara, Yayoi: *See*—
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Kakehi, Gen: *See*—
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Hirai, Kenji; Matsukawa, Tomoko; Yano, Tomoyuki; Ejiri, Emiko; Aizawa, Kiyomi; Shikakura, Koichi; Yoshii, Tomoko; Ugai, Sadayuki; Yamada, Osamu; and Kishi, Shigeki, 5,554,581, Cl. 504-298.000.
Kakishita, Masahiro, to Yamaha Corporation. Tone signal synthesizer employing a closed wave guide network. 5,554,813, Cl. 84-622.000.
Kakuma, Satoshi; Uriu, Shiro; Samejima, Noriko; Murayama, Masami; and Fukuda, Noaki, to Fujitsu Limited. Self routing exchange and exchange system. 5,555,243, Cl. 370-58.200.
Kakuma, Satoshi; Uriu, Shiro; Samejima, Noriko; and Hajikano, Kazuo, to Fujitsu Limited. Switching path setting system used in switching equipment for exchanging a fixed length cell. 5,555,265, Cl. 370-60.000.
Kakuma, Satoshi: *See*—
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Kakuta, Atsushi: *See*—
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Kälin, Werner: *See*—
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Kamada, Hiroshi: *See*—
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Kamada, Mari: *See*—
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Kamide, Naoki: *See*—
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Kaminski, Victor V.: *See*—
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Kamisada, Toshimasa; and Kitada, Yasuo, to Hitachi, Ltd. Multi-beam split-type optical head for use in optical disk apparatus. 5,555,539, Cl. 369-219.000.
Kamiya, Masahiko: *See*—
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Kammermeier, Bernhard: *See*—
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Kampe, Klaus-Dieter, to Hoechst Aktiengesellschaft. Aminoureidofullerene and aminothioureidofullerene derivatives and process for the preparation thereof. 5,554,751, Cl. 544-338.000.
Kanai, Itaru: *See*—
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Kanamori, Hiroo: *See*—
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Kanda, Shigemi: *See*—
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Kandpal, Tara C.: *See*—
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Kane, Joseph R.: *See*—
Solanki, Ranvir S.; Gasmann, Eric J.; Kane, Joseph R.; Griffin, Edward P.; and Gantt, Andrew M., 5,553,376, Cl. 29-833.000.
Kaneda, Isao; and Yonemura, Kohei, to Nidec Corporation. Method of starting a sensorless motor. 5,554,916, Cl. 318-672.000.
Kaneko, Hideo; Tokunaga, Katsushi; Tawara, Yoshio; Tamai, Noboru; and Nakazato, Yasuaki, to Shin-Etsu Chemical Co., Ltd. Magnetic recording medium preparation. 5,554,303, Cl. 216-2.000.
Kaneko, Kazuo: *See*—
Ogura, Hirokazu; Kaneko, Kazuo; and Kono, Tadayoshi, 5,555,321, Cl. 382-235.000.
Kaneko, Masanobu, to Nikon Corporation. Ophthalmic illumination apparatus having a device that shades illuminating light. 5,555,040, Cl. 351-221.000.
Kanetaka, Hidemi: *See*—
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Kang, David S.: *See*—
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Kani, Koji, to Nikko Seika Kabushiki Kaisha. Synthetic resin receptacle and method for producing same. 5,553,732, Cl. 220-212.000.
Kano, Hiroshi: *See*—
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Kano, Tsuyoshi: *See*—
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Kao Corporation: *See*—
Tonomura, Manabu; Iwahashi, Masaaki; and Koike, Toyomi, 5,554,315, Cl. 510-535.000.
Tsukada, Kiyoshi; Hattori, Yasuyuki; and Mimura, Taku, 5,554,574, Cl. 502-345.000.
Kapany, Narinder: *See*—
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Kaplan, Martin C., to Eastman Kodak Company. Flying spot scanner. 5,555,123, Cl. 359-197.000.
Karandikar, Bhalchandra M.: *See*—
Bui, Loc V.; King, Clifford R.; Titterington, Donald R.; and Karandikar, Bhalchandra M., 5,554,212, Cl. 106-20.00R.
Karl Mayer Textilmachinenfabrik GmbH: *See*—
Hohne, Hans-Jurgen; and Mista, Kresimir, 5,553,470, Cl. 66-205.000.
Karl, Terry L.; Gloden, Gregory J.; Van Riper, Philip C.; Zainea, John P.; and Myers, John T., to Aeroquip Corporation. Coupling assembly. 5,553,895, Cl. 285-39.000.
Karlow, James P.; Boumarafi, Mohamed; and Hurford, Jonathan, to Takata Inc. Inflatable restraint modular housing with deployment directing feature. 5,553,887, Cl. 280-730.200.
Karlsson, Åke I.: *See*—
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Karlsson, Robert: *See*—
Malmqvist, Magnus; Karlsson, Robert; Larsson, Anita; and Sjödal, Jörgen, 5,554,541, Cl. 436-518.000.
Karner, Johann; and Bergmann, Erich, to Balzers Aktiengesellschaft. Method of and apparatus for a direct voltage arc discharge enhanced reactive treatment of objects. 5,554,255, Cl. 156-643.100.
Karten, Stuart; and Schroeder, Dennis, to Rubbermaid Office Products Inc. Adjustable monitor arm. 5,553,820, Cl. 248-286.100.
Kasahara, Yasunori: *See*—
Fukumoto, Hiroshi; Tanaka, Naoya; Oda, Keisuke; Arimoto, Kazuaki; Yoshida, Takashi; Higashi, Kazuhiko; Kasahara, Yasunori; and Kuwada, Terumi, 5,555,462, Cl. 347-218.000.
Kasama, Nobuyuki: *See*—
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Kaschke, Kevin D., to Motorola, Inc. Keypad apparatus with integral display indicators. 5,555,550, Cl. 379-59.000.
Kase, Hiroyuki: *See*—
Honda, Shoji; Shono, Masayuki; Hiroyama, Ryoji; Bessho, Yasuyuki; Kase, Hiroyuki; Nishida, Toyozo; Uetani, Takahiro; and Suzuki, Junko, 5,555,271, Cl. 372-45.000.
Käser, Adolf: *See*—
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Kashida, Motokazu; Hoshi, Hidenori; Nagasawa, Kenichi; and Yamashita, Shinichi, to Canon Kabushiki Kaisha. Multichannel digital-signal reproducing apparatus for switching access timing relative to reproducing timing. 5,555,230, Cl. 369-93.000.
Kashio, Shigetora; Mizumi, Tsutomu; and Takahashi, Kuniyuki, to Toray Industries, Inc. Method for producing simple printing plate having open cells. 5,554,334, Cl. 264-293.000.
Kashiwagi, Shizuo: *See*—
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Kasihara, Jyunzou: *See*—
Yamazato, Hisao; Tani, Naoki; Aoki, Naohiko; Kasihara, Jyunzou; and Uramoto, Yasunari, 5,555,189, Cl. 364-492.000.
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Kass, William J.: *See*—
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Kast, Juergen: *See*—
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Kast, W. M.: *See*—
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Katafuchi, Tadashi; and Nakamura, Akira, to Idemitsu Kosan Co., Ltd. Lubricant for refrigerating machine employing refrigerant comprising hydrofluoroethane. 5,554,311, Cl. 252-68.000.
Katagishi, Makoto: *See*—
Ohnuki, Hideo; Hosaka, Norio; Watanabe, Hitoshi; Akitake, Isao; and Katagishi, Makoto, 5,554,960, Cl. 333-132.000.
Katano, Mitsunori: *See*—
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Katano, Yuji: *See*—
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Kataoka, Mamoru: *See*—
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Katayama, Hiroyuki; Nakayama, Junichiro; Iketani, Naoyasu; and Ohta, Kenji, to Sharp Kabushiki Kaisha. Magneto-optical recording medium. 5,554,436, Cl. 428-212.000.
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Kato, Katsuhisa, to Tokiwa Chemical Industries Co., Ltd.; and System Technical Co., Ltd. Molding for front glass for vehicles. 5,553,423, Cl. 52-204.597.
Kato, Katsuyuki, to Sony Corporation. Semiconductor device wiring structure. 5,554,888, Cl. 257-750.000.
Kato, Keno; Noji, Ikutaro; Arai, Masashi; and Fukubayashi, Makoto, to Nissan Motor Co., Ltd. Air conditioner system for vehicle. 5,553,775, Cl. 236-49.300.
Kato, Masayoshi, to Ricoh Company, Ltd. Optical module and a fabrication process thereof. 5,555,333, Cl. 385-89.000.
Kato, Shigehiro: *See*—
Ohkouchi, Takeo; Hosoda, Hitoshi; Yasui, Kenji; Kato, Shigehiro; Kondo, Yasuhiko; and Takahi, Yukiyoshi, 5,554,391, Cl. 424-633.000.
Kato, Shigekazu; Nishihata, Kouji; Tsubone, Tsunehiko; and Itou, Atsushi, to Hitachi, Ltd. Vacuum processing apparatus and operating method therefor. 5,553,396, Cl. 34-406.000.
Kato, Shigetoshi: *See*—
Iijima, Takayuki; Aoyagi, Yoshio; Kato, Shigetoshi; Yoshizawa, Osamu; Wakimoto, Hiroshi; Kawahara, Akira; and Namiki, Akio, 5,554,966, Cl. 340-687.000.
Kato, Takefumi; Morita, Shigeru; and Sato, Kiminori, to NOK Corporation. Molding machine. 5,554,396, Cl. 425-556.000.
Kato, Yoshiharu, to Fujitsu Limited; and Fujitsu VLSI Limited. Semiconductor memory device. 5,555,210, Cl. 365-196.000.
Katoh, Katsutoshi; Suzuki, Michio; Uchiyama, Yoshiharu; and Yonemochi, Kenshin, to International Business Machines Corporation. Information processing apparatus having lockable modular subsystems. 5,555,487, Cl. 361-680.000.
Katoh, Kazuya: *See*—
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Katoh, Yasuhiro; Tsuda, Yoshihiro; Yanagida, Mitsuaki; Toriya, Hajime; and Sasada, Tetsuo, to Hitachi, Ltd. Blade profile for axial flow compressor. 5,554,000, Cl. 415-208.200.
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Zoller, Gerhard; Jablonka, Bernd; Just, Melitta; Klingler, Otmar; Breipohl, Gerhard; Knolle, Jochen; and König, Wolfgang, 5,554,594, Cl. 514-18.000.

Klocke, Donald J.: *See*—
Degnan, Thomas F.; Klocke, Donald J.; and Rubin, Mae K., 5,554,274, Cl. 208-111.000.

Klöfver, Leif: *See*—
Nilsson, Rickard; Markström, Ulf; and Klöfver, Leif, 5,555,418, Cl. 395-700.000.

Klotz, Arthur: *See*—
Ernst, Volker; Klotz, Arthur; and Leipelt, Rudolf, 5,554,205, Cl. 55-385.300.

KM-Kabelmetal Aktiengesellschaft: *See*—
Krause, Andreas; and Gravemann, Horst, 5,553,660, Cl. 164-468.000.

Kmiecik-Lawrynowicz, Grazyna E.: *See*—
Patel, Raj D.; Goodbrand, H. Bruce; Kmiecik-Lawrynowicz, Grazyna E.; Hopper, Michael A.; Croucher, Melvin D.; and Duff, James M., 5,554,480, Cl. 430-137.000.

KNF Neuberger GmbH: *See*—
Becker, Erich, 5,554,014, Cl. 417-413.100.

Knight Industries, Inc.: *See*—
Zaguroli, James, Jr., 5,553,832, Cl. 254-267.000.

Knobloch, Wilhelm: *See*—
Schulz, Reinhard; Münzel, Norbert; Roth, Martin; and Knobloch, Wilhelm, 5,554,797, Cl. 568-592.000.

Knodel, Bryan D.; Schulze, Dale R.; and Nuchols, Richard P., to Ethicon Endo-Surgery, Inc. Surgical stapler with improved operating lever mounting arrangement. 5,553,765, Cl. 227-176.100.

Knoll Aktiengesellschaft: *See*—
Braña, Miguel F.; Berlanga, José M. C.; Moset, Marina M.; Pérez de Vega, Maria J.; Keilhauer, Gerhard; Qian, Xiao-Dong; and Romerdahl, Cynthia, 5,554,622, Cl. 514-284.000.

Knolle, Jochen: *See*—
Zoller, Gerhard; Jablonka, Bernd; Just, Melitta; Klingler, Otmar; Breipohl, Gerhard; Knolle, Jochen; and König, Wolfgang, 5,554,594, Cl. 514-18.000.

Knoller, Anton: *See*—
Batliner, Rainer; Knoller, Anton; and Neukirchen, Axel, 5,553,682, Cl. 175-395.000.

Knowles, Billy J.: *See*—
Collins, Clive A.; Knowles, Billy J.; Desnoyers, Christine M.; Rolfe, David B.; and Pontius, Dale E., 5,555,528, Cl. 365-227.000.

Knudson, Orlin B.: *See*—
Carim, Hatim M.; Knudson, Orlin B.; Ekholm, Bruce P.; Erickson, David P.; Kelliher, William J., Jr.; and Rude, Michael J., 5,553,615, Cl. 128-633.000.

Kobayahsi, Teruo: *See*—
Tobita, Tomoyuki; Yamamoto, Yoshimi; Fukunaga, Masao; Kobayahsi, Teruo; and Nagasu, Akira, 5,554,809, Cl. 73-700.000.

Kobayashi, Fumio: *See*—
Yano, Hideo; Arai, Susumu; and Kobayashi, Fumio, 5,555,233, Cl. 369-270.000.

Kobayashi, Noriyuki; and Tamura, Masayuki, to Teijin Limited. Method and apparatus for releasing an end yarn from entangled portions. 5,553,798, Cl. 242-18.00R.

Kobayashi, Shinichi: *See*—
Hayashikoshi, Masanori; Terada, Yasushi; Nakayama, Takeshi; Miyawaki, Yoshikazu; and Kobayashi, Shinichi, 5,554,868, Cl. 257-315.000.

Kobayashi, Shohei; Yamazaki, Takeshi; Yanagida, Tsuneo; Takemura, Haruhiko; and Ogata, Toshihiro, to Olympus Optical Co., Ltd. Optical head with built-in semiconductor laser, objective lens and ¼ wavelength plate. 5,555,232, Cl. 369-112.000.

Kobayashi, Tadashi: *See*—
Ohta, Masahiro; Matsuyama, Akio; Senoue, Eiji; Kuwano, Fumiaki; Yasui, Osamu; Yoshida, Yasunori; Ryu, Akinori; and Kobayashi, Tadashi, 5,554,765, Cl. 548-462.000.

Kobayashi, Takeshi, to Walbro Japan, Inc. Apparatus for supplying starting-fuel for a carburetor. 5,554,322, Cl. 261-35.000.

Kobayashi, Yasutomo: *See*—
Watanabe, Koji; Sugita, Toru; Kobayashi, Yasutomo; Shibao, Masaharu; and Mita, Akimitsu, 5,553,428, Cl. 52-208.000.

Kobayashi, Yoshiki: *See*—

Kokko, Marko: *See*—
Alatalo, Hannu; and Kokko, Marko, 5,555,245, Cl. 370-66.000.

Kokuga, Toshiharu, to Sanyo Electric Co., Ltd. Rechargeable battery charging

Fukuwaka, Masao; Maeda, Tadaaki; and Koremoto, Takahiro, 5,553,949, Cl. 384-523.000.

Koren, Yoram: *See*—

Kratochvil, Thomas M.: *See*—
Booth, James R.; Jacobi, Michael C.; Nunez, Arlette C.; Smith, Jonathan S.; Tauvers, Peter R.; Doyle, Earl H., Jr.; Diegel, Fredric A., Jr.;

Kitamura, Tadaaki; Kobayashi, Yoshiki; Nakanishi, Kunio; Yahiro, Masakazu; Satoh, Yoshiyuki; Shibata, Toshiro; Horie, Takeshi; Yamamoto, Katsuyuki; Takatoo, Masao; Inoue, Haruki; and Asada, Kazuyoshi, 5,554,983, Cl. 340-937.000.

Kobayashi, Yoshinori: *See*—
Matsuyama, Akinobu; Ito, Michio; Kobayashi, Yoshinori; and Kawada, Naoki, 5,554,532, Cl. 435-252.100.

Koch, Richard H.: *See*—
Koch, Ronald N.; Koch, Richard H.; and Thornborough, Ray J., 5,554,981, Cl. 340-870.370.

Koch, Ronald N.; Koch, Richard H.; and Thornborough, Ray J., to Badger Meter, Inc. Capacitive number wheel encoder for utility meters. 5,554,981, Cl. 340-870.370.

Kochik, Ronald D.; Picco, David A.; Braden, Michael L.; and Salmen, Kristine S., to Nalco Chemical Company. Steel mill flume water treatment. 5,554,298, Cl. 210-708.000.

Kochta, Joachim: *See*—
Träubel, Harro; Münzmay, Thomas; Hassel, Tillmann; Krümmel, Wilhelm; Ehlert, Hans-Albert; and Kochta, Joachim, 5,554,711, Cl. 528-49.000.

Kocis, John A.: *See*—
Nandagiri, Arun; Solka, Bruce H.; and Kocis, John A., 5,554,363, Cl. 424-70.510.

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Nakazawa, Makoto; Koda, Toshiyasu; and Arai, Tyuyoshi, 5,554,326, Cl. 264-40.100.

Kodaira, Toshimoto: *See*—
Mano, Toshihiko; Kodaira, Toshimoto; and Oshima, Hiroyuki, 5,554,861, Cl. 257-71.000.

Koecher, Anthony R.; and Schoeller, Kevin M., to Koecher, Anthony R. Hat made from cardboard beverage container and method of making the same. 5,553,327, Cl. 2-200.300.

Koenck, Steven E.; Mahany, Ronald L.; and Frede, William W., to Norand Corporation. Method of and apparatus for controlling modulation of digital signals in frequency-modulated transmissions. 5,555,276, Cl. 375-303.000.

Koenig & Bauer Aktiengesellschaft: *See*—
Schwitzky, Volkmar R.; and Stiel, Jürgen A., 5,553,397, Cl. 34-640.000.

Koenig, Norbert; and Johnson, Glenn, to Eastman Kodak Company. Camera with self-timer and electronic flash. 5,555,071, Cl. 354-418.000.

Koester, David D.: *See*—
Hanks, Lawrence E.; Nielsen, Dennis R.; and Koester, David D., 5,553,374, Cl. 29-762.000.

Koh, Chao-Ming, to Vanguard International Semiconductor Corp. Method for fabricating a stacked capacitor with a self aligned node contact in a memory cell. 5,554,557, Cl. 437-52.000.

Kohar, Handoko; Wegner, Philippe; and Smit, Léon, to U.S. Philips Corporation. System for setting ambient parameters. 5,554,979, Cl. 340-825.720.

Köhler, Burkhard; Ebert, Wolfgang; Horn, Klaus; and Dhein, Rolf, to Bayer Aktiengesellschaft. Use of hydrogenated abietic acid as a chain terminator for the production of polycarbonates and polyester carbonates. 5,554,716, Cl. 528-196.000.

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Kohsokabe, Hirokatsu; Iwata, Hiroshi; Endoh, Kazuhiro; and Oshima, Yasuhiro, to Hitachi, Ltd. Scroll fluid machine, scroll member and processing method thereof. 5,554,017, Cl. 418-55.280.

Kohyama, Yusuke: *See*—
Sudo, Akira; Kohyama, Yusuke; and Koyama, Haruhiko, 5,555,520, Cl. 365-149.000.

Koide, Takeharu: *See*—
Umeyama, Mitsuhiro; Shimizu, Takashi; Ichioka, Eiji; Yoshii, Kinya; Koide, Takeharu; and Funahashi, Makoto, 5,554,082, Cl. 475-338.000.

Koike, Noriyuki: *See*—
Sato, Shinichi; and Koike, Noriyuki, 5,554,779, Cl. 556-419.000.

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Tonomura, Manabu; Iwahashi, Masaaki; and Koike, Toyomi, 5,554,315, Cl. 510-535.000.

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Kojima, Takeshi: *See*—
Tawara, Nobuyoshi; and Kojima, Takeshi, 5,555,160, Cl. 362-31.000.

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Tajima, Ikuo; Kojima, Terutada; Anezaki, Tomoaki; Hirate, Masayoshi; and Suzuki, Shigeo, 5,553,560, Cl. 112-103.000.

Kojima, Yasuyuki: *See*—
Inuzuka, Tatsuki; Nakamura, Toshiaki; Shinoda, Shinichi; and Kojima, Yasuyuki, 5,555,095, Cl. 358-298.000.

Kokhanovsky, Sergey A.: *See*—
Costello, David J.; Dergatchev, Aleksei Y.; Parkhurst, Warren E.; Polushkin, Valeri G.; and Kokhanovsky, Sergey A., 5,554,153, Cl. 606-9.000.

Kokko, Marko: *See*—
Alatalo, Hannu; and Kokko, Marko, 5,555,245, Cl. 370-66.000.

Kokuga, Toshiharu, to Sanyo Electric Co., Ltd. Rechargeable battery charging method. 5,554,920, Cl. 320-22.000.

Kokusai Electric Co., Ltd.: *See*—
Matsumoto, Ichiro, 5,555,546, Cl. 315-244.000.

Kolassa, Dieter: *See*—
Keil, Michael; Schirmer, Ulrich; Kolassa, Dieter; Kast, Juergen; Wuerzer, Bruno; and Meyer, Norbert, 5,554,582, Cl. 504-344.000.

Kolthammer, Brian W. S.: *See*—
Hefner, John G.; and Kolthammer, Brian W. S., 5,554,777, Cl. 556-21.000.

Kolton, Chester; and Spater, Stuart S., to B&G Plastics, Inc. Belt marketing indicator. 5,553,411, Cl. 40-640.000.

Komai, Tomoko; Imamura, Makoto; Sakai, Yuji; and Inoue, Tetsuo, to Kabushiki Kaisha Toshiba. Magnetic disk system. 5,555,142, Cl. 360-77.060.

Komatsu, Fumio: *See*—
Tsubusaki, Koji; and Komatsu, Fumio, 5,555,319, Cl. 382-170.000.

Komatsu, Hirohide: *See*—
Sawa, Tsutomu; Takenoshita, Hiroyuki; Hada, Toshiki; and Komatsu, Hirohide, 5,553,845, Cl. 271-314.000.

Komatsuda, Hiroshi; and Nishida, Hidehiko, to Fujitsu Limited. Request cancel system for cancelling a second access request having the same address as a first access request. 5,555,560, Cl. 395-405.000.

Komori, Yasuhiro; and Sagayama, Shigeki, to ATR Interpreting Telephony Research Laboratories. Learning method of neural network. 5,555,345, Cl. 395-23.000.

Komura, Katsuhiro: *See*—
Yoneda, Takao; and Komura, Katsuhiro, 5,555,347, Cl. 395-82.000.

Komuro, Hitoshi: *See*—
Kouzuchi, Sigeyasu; Sakurada, Shuroku; Saitoh, Takashi; and Komuro, Hitoshi, 5,554,863, Cl. 257-138.000.

Kona Corporation: *See*—
Hume, William J.; and Swenson, Paul M., 5,554,395, Cl. 425-549.000.

Kondakov, Stanislav F., to Composite Materials, Inc. Method of making heat and impact resistant composite ceramic material. 5,554,328, Cl. 264-60.000.

Kondo, Hiroyuki; Tatsumi, Kohei; Kimura, Masao; and Onodera, Kiyoshi, to Texas Instruments Incorporated; and Nippon Steel Corporation. Bonding wire with heat and abrasion resistant coating layers. 5,554,443, Cl. 428-375.000.

Kondo, Kunio; Kawano, Mitsuo; and Ito, Yasuhiko, to Fujikura Kasei Co., Ltd. Human parainfluenza virus type 4A fusion protein and gene coding for the same. 5,554,526, Cl. 435-240.100.

Kondo, Masakazu: *See*—
Okamoto, Kenichi; Kita, Hidetoshi; Kondo, Masakazu; Miyake, Norikazu; and Matsuo, Yasuo, 5,554,286, Cl. 210-500.250.

Kondo, Tetsujiro, to Sony Corporation. Digital signal processing apparatus and method for processing impulse and flat components separately. 5,555,465, Cl. 348-571.000.

Kondo, Yasuhiko: *See*—
Ohkouchi, Takeo; Hosoda, Hitoshi; Yasui, Kenji; Kato, Shigehiro; Kondo, Yasuhiko; and Takahi, Yukiyoshi, 5,554,391, Cl. 424-633.000.

Kondoh, Harufusa, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor circuit having phase lock function. 5,555,278, Cl. 375-376.000.

Kone Oy: *See*—
Lumme, Jorma; Juntunen, Asko; and Kujala, Matti, 5,554,832, Cl. 187-380.000.

Konica Corporation: *See*—
Tsuji, Nobuaki, 5,554,495, Cl. 430-530.000.

König, Klaus: *See*—
Haas, Wilhelm; Müller, Klaus-Helmut; König, Klaus; Santel, Hans-Joachim; Lürssen, Klaus; and Schmidt, Robert R., 5,554,761, Cl. 548-263.600.

König, Wolfgang: *See*—
Zoller, Gerhard; Jablonka, Bernd; Just, Melitta; Klingler, Otmar; Breipohl, Gerhard; Knolle, Jochen; and König, Wolfgang, 5,554,594, Cl. 514-18.000.

Konno, Mitsujiro; Ono, Katsuya; Takasugi, Yoshiharu; Matsumoto, Shinya; and Nishioka, Kimihiko, to Olympus Optical Co., Ltd. Optical low pass filter. 5,555,129, Cl. 359-569.000.

Konno, Tsuneo, to Honda Giken Kogyo Kabushiki Kaisha. Valve operating device for internal combustion engine. 5,553,584, Cl. 123-90.160.

Kono, Tadayoshi: *See*—
Ogura, Hirokazu; Kaneko, Kazuo; and Kono, Tadayoshi, 5,555,321, Cl. 382-235.000.

Konotopsky, William. Toss game apparatus. 5,553,862, Cl. 273-402.000.

Konuma, Toshimitsu; Nishi, Takeshi; and Mori, Harumi, to Semiconductor Energy Laboratory Company, Ltd. Method of driving a ferroelectric liquid crystal display. 5,555,110, Cl. 359-56.000.

Konuma, Toshimitsu: *See*—
Nishi, Takeshi; Konuma, Toshimitsu; and Shimizu, Michio, 5,555,240, Cl. 359-82.000.

Kopetzky, Robert: *See*—
Mitzkus, Jürgen; Wifling, Martin; Kopetzky, Robert; Bannert, Georg; Wengert, Andreas; Diepold, Ulrich; Kempfle, Thomas; Emmert, Erik; and Steffan, Hermann, 5,553,803, Cl. 242-374.000.

Korea Institute of Machinery and Metals: *See*—
Je, Yang-Gyu; and Kim, Jong-Su, 5,553,834, Cl. 267-140.120.

Koremoto, Takahiro: *See*—

Fukuwaka, Masao; Maeda, Tadaaki; and Koremoto, Takahiro, 5,553,949, Cl. 384-523.000.

Koren, Yoram: *See*—
Bell, David A.; Bell, Lon E.; Levine, Simon; and Koren, Yoram, 5,555,495, Cl. 364-148.000.

Korhonen, Ville; Liedes, Allan; and Yli-Kauppila, Jouko, to Valmet Corporation. Dryer section of a paper machine including cylinder groups with single-wire draw. 5,553,393, Cl. 34-117.000.

Korsgaard, Jens. Fluid riser between seabed and floating vessel. 5,553,976, Cl. 405-195.100.

Korte, Magnus: *See*—
Bäuerle, Emil; and Korte, Magnus, 5,553,592, Cl. 123-456.000.

Kosiak, Walter K.: *See*—
Hansen, Mark C.; and Kosiak, Walter K., 5,554,948, Cl. 327-181.000.

Kosmider, Kristofer G.: *See*—
Bauer, Daniel R.; and Kosmider, Kristofer G., 5,553,552, Cl. 109-24.100.

Kost, Karen L.; Fry, William J.; Lock, Timothy; and Davis, Michael S., to Lynn Ltd. Article marker and decoding method. 5,554,841, Cl. 235-464.000.

Koster, Ronald: *See*—
Pruijmboom, Armand; Koster, Ronald; Timmering, Cornelis E.; and Dekker, Ronald, 5,554,256, Cl. 156-643.100.

Kotaka, Hiroaki; Kurono, Nobuhisa; Yamaoka, Hidenori; Aiba, Yoshirou; and Matsuo, Shuuitsu, to Toshiba Ceramics Co., Ltd. Surface treatment method for quartz material. 5,554,204, Cl. 65-60.800.

Kotake, Yoshihiko: *See*—
Nomura, Hiroaki; Haneda, Toru; Kotake, Yoshihiko; Ueda, Norihiro; and Kitoh, Kyosuke, 5,554,615, Cl. 514-258.000.

Kotani, Hisakazu; Akamatsu, Hironori; and Fujita, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Semiconductor memory, moving-picture storing memory, moving-picture storing apparatus, moving-picture displaying apparatus, static-picture storing memory, and electronic notebook. 5,555,527, Cl. 365-222.000.

Kotobuki & Co., Ltd.: *See*—
Mitsuya, Yoshihide; and Anzai, Shoji, 5,553,956, Cl. 401-68.000.

Kotte, Rolf; Cornils, Gerd; and Stumpe, Thomas, to Saint Gobain Vitrage International. Process and device for extruding a calibrated profile of a thermoplastic polymer onto articles. 5,554,325, Cl. 264-37.000.

Kotzin, Michael D.; and Grube, Gary W., to Motorola, Inc. Method and apparatus for mitigating speech loss in a communication system. 5,555,447, Cl. 455-72.000.

Kouchi, Toshihito: *See*—
Oosawa, Akira; Miyasaka, Chiaki; Ogura, Yasuyuki; Kouchi, Toshihito; and Yoshii, Shinichi, 5,555,505, Cl. 364-470.070.

Kouno, Motohiro: *See*—
Hirae, Sadao; Matsubara, Hideaki; Kouno, Motohiro; and Sakai, Takamasa, 5,554,939, Cl. 324-753.000.

Kouzuchi, Sigeyasu; Sakurada, Shuroku; Saitoh, Takashi; and Komuro, Hitoshi, to Hitachi, Ltd.; and Hitachi Haramachi Electronics Co., Ltd. Gate turn-off thyristor. 5,554,863, Cl. 257-138.000.

Kowalyk, Kenneth; and Myers, Michael J., to Medical Laser Technology, Inc. Dental laser apparatus and method for ablating non-metallic dental material from a tooth. 5,554,029, Cl. 433-215.000.

Kowarsch, Heinrich: *See*—
Bergmann, Udo; Schäfer, Gerhard; and Kowarsch, Heinrich, 5,554,774, Cl. 552-281.000.

Koyama, Haruhiko: *See*—
Sudo, Akira; Kohyama, Yusuke; and Koyama, Haruhiko, 5,555,520, Cl. 365-149.000.

Koyama, Kumiaki, to NEC Corporation. Semiconductor device having improved coverage with increased wiring layers. 5,554,864, Cl. 257-211.000.

Koyama, Masahiro; Miyake, Norihisa; Sakairi, Hiroshi; Hattori, Shizuko; Momoi, Yasuyuki; Fujimoto, Tsutomu; and Kai, Tsuyoshi, to Hitachi, Ltd. Control method and control apparatus of factory automation system. 5,555,179, Cl. 364-468.010.

Koyasu, Takahisa; Numazaki, Kouji; Kasuya, Hirokazu; Saitou, Mitsuhiro; and Ikeda, Kazuhisa, to Nippondenso Co., Ltd. Constitution of an electrode arrangement in a semiconductor element. 5,554,881, Cl. 257-584.000.

Kozai, Hayao: *See*—
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Kozak, William G.; and Topping, Joseph C., to Henkel Corporation. Apparatus for maintaining a stable bath for an autodeposition composition by periodically separating particular metal ions from the composition. 5,554,276, Cl. 210-87.000.

Kozulla, Randall E.: *See*—
Gupta, Rakesh K.; Kozulla, Randall E.; and Legare, Richard J., 5,554,437, Cl. 428-286.000.

Kraft Foods, Inc.: *See*—
Wells, Cindie M.; Halverson, Scott A.; and Jonoyic, John A., 5,553,934, Cl. 312-128.000.

Kraft, Manfred: *See*—
Kurz, Gerhard; and Kraft, Manfred, 5,554,917, Cl. 318-805.000.

Kraszewski, Andrzej W.; and Nelson, Stuart O., to United States of America, Agriculture. Mass or weight determination of arbitrarily-shaped dielectric objects by microwave resonator measurements. 5,554,935, Cl. 324-637.000.

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Booth, James R.; Jacobi, Michael C.; Nunez, Arlette C.; Smith, Jonathan S.; Tauvers, Peter R.; Doyle, Earl H., Jr.; Diegel, Fredric A., Jr.; Kratochvil, Thomas M.; and Gaudin, Brenda G., 5,555,531, Cl. 367-15.000.

Kratz, Mark: *See*—
Sanders, Josef; Kratz, Mark; Dietrich, Manfred; Heinemann, Torsten; Woynar, Helmut; Jacobs, Gundolf; and Scholz, Uwe, 5,554,662, Cl. 521-137.000.

Kraus, Robert J.; West, Guy J.; Gibbs, William T.; Davis, Patrick H.; Hutton, James R.; Eckley, Bradley E.; Arensdorf, Richard C.; and Dias, Daniel R., to Norand Corporation. Antenna means for hand-held data terminals. 5,555,459, Cl. 343-702.000.

Krause, Andreas; and Gravemann, Horst, to KM-Kabelmetal Aktiengesellschaft. Method for continuously casting copper alloys. 5,553,660, Cl. 164-468.000.

Krause, Edward K.; and Kuenzel, Kenneth J., to Pilot Industries, Inc. Fluoropolymer composite tube and method of preparation. 5,554,425, Cl. 428-36.910.

Krause, Robert, to Siemens Components, Inc. Optically-coupled data access arrangement and transhybrid. 5,555,293, Cl. 379-98.000.

Krauskopf, Birgit: *See*—
Fischer, Reiner; Jensen-Korte, Uta; Kunisch, Franz; Marhold, Albrecht; Ooms, Pieter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; Krauskopf, Birgit; and Strang, Harry, 5,554,580, Cl. 504-281.000.

Krautkramer GmbH & Co.: *See*—
Hilger, Heinz-Josef; Rehrmann, Manfred; and Steinhoff, Norbert, 5,555,180, Cl. 364-577.000.

Krebs, Joseph J.: *See*—
Berra, Charles J.; Boldt, John R.; Amici, Alan J.; and Krebs, Joseph J., 5,555,498, Cl. 364-424.030.

Kriaski, John R.: *See*—
Bosten, Donald R.; Kriaski, John R.; Cooper, Randy G.; and Smith, John C., 5,554,066, Cl. 451-356.000.

Kriechel, Hans: *See*—
Mühlhoff, Martin; Kriechel, Hans; Fleischmann, Frank; and Kabelitz, Hans-Peter, 5,553,998, Cl. 415-90.000.

Krisa, Keith A.: *See*—
Blanchette, Robert A.; Brush, Theresa S.; Farrell, Roberta L.; Krisa, Keith A.; and Mishra, Chittra, 5,554,535, Cl. 435-254.100.

Krishnamurti, Ramesh; Nagy, Sandor; and Etherton, Bradley P., to Occidental Chemical Corporation. Borabenzene based olefin polymerization catalysts. 5,554,775, Cl. 556-7.000.

Krivacic, Robert T.: *See*—
Theimer, Marvin M.; Spreitzer, Michael J.; Weiser, Mark D.; Goldstein, Richard J.; Elrod, Scott A.; Swinehart, Daniel C.; Schilit, William N.; Krivacic, Robert T.; and Want, Roy, 5,555,376, Cl. 395-200.090.

Kroeckel, John G.: *See*—
Kelly, Bryan M.; Kelly, Matthew F.; Kroeckel, John G.; Haas, Joseph J.; and Lad, Jayash J., 5,553,859, Cl. 273-338.000.

Kroener, Michael: *See*—
Flory, Klaus; Stange, Andreas; Kroener, Michael; and Sendhoff, Norbert, 5,554,718, Cl. 528-246.000.

Kropp, Michael A.: *See*—
Lamanna, William M.; Palazzotto, Michael C.; Mahoney, Wayne S.; and Kropp, Michael A., 5,554,664, Cl. 522-25.000.

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Langstein, Gerhard; Krüger, Ralf; Alberts, Heinrich; Moretto, Hans-Heinrich; and Huggins, John, 5,554,689, Cl. 525-102.000.

Krümmel, Wilhelm: *See*—
Träubel, Harro; Münzmay, Thomas; Hassel, Tillmann; Krümmel, Wilhelm; Ehlert, Hans-Albert; and Kochta, Joachim, 5,554,711, Cl. 528-49.000.

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Krupp Polysius AG: *See*—
Bettenworth, Jörg, 5,553,796, Cl. 241-230.000.

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Cushman, Michael R.; Krutak, James J.; Parham, William W.; Coates, Clarence A.; Weaver, Max A.; and Patonay, Gabor, 5,553,714, Cl. 209-577.000.

Kruys, Johannes P., to NCR Corporation. Cryptographic key management apparatus and methods. 5,555,309, Cl. 380-21.000.

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Rose, Peter H., 5,554,853, Cl. 250-492.210.

Kubicsko, Stephen D.: *See*—
Regiec, Kenneth B.; Stroosnyder, Peter C.; Kubicsko, Stephen D.; and Ward, Charles H., II, 5,554,846, Cl. 250-288.000.

Kubina, Joseph E.; Gleason, Mark E.; Loughlin, Jerry F., Jr.; Wludyka, Todd H.; Odette, Thomas C.; Montie, Craig S.; Biermacher, Richard F.; Harney, Patrick M.; and DiMichele, Alfredo N., to Chrysler Corporation. Fluid containment device. 5,553,912, Cl. 296-192.000.

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Krause, Edward K.; and Kuenzel, Kenneth J., 5,554,425, Cl. 428-36.910.
Kuhnert, Dieter; and Latsch, Reinhard. Precombustion chamber device. 5,554,908, Cl. 313-140.000.
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Lumme, Jorma; Juntunen, Asko; and Kujala, Matti, 5,554,832, Cl. 187-380.000.
Kumagai, Tatsuya; Kajioka, Hiroshi; Akiyama, Munehiro; Ohno, Shigeru; and Sonobe, Hisao, to Hitachi Cable, Ltd.; and Hitachi, Ltd. Optical fiber gyro with memory storing data measured under application of angular velocity. 5,555,235, Cl. 356-350.000.
Kumamoto, Toshio; and Miki, Takahiro, to Mitsubishi Denki Kabushiki Kaisha. A/D converter having folded arrangement of voltage comparator. 5,554,989, Cl. 341-159.000.
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Nakagome, Yoshinobu; Itoh, Kiyoo; Tanaka, Hitoshi; Watanabe, Yasushi; Kume, Eiji; Isoda, Masanori; Yamasaki, Eiji; and Uchigiri, Tatsumi, 5,555,215, Cl. 365-226.000.
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Kung, Yung-Keng, to Weltread Semiconductor, Inc. Integrated circuit for economizing power consumption of a monitor by using two reference values for discriminating the input signal. 5,555,032, Cl. 348-730.000.
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Matsuoka, Akihiko; Ohnishi, Hiroshi; Kunieda, Yoshinori; Misaizu, Kouei; and Yamamoto, Yuuri, 5,555,247, Cl. 370-105.100.
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Fischer, Reiner; Jensen-Korte, Uta; Kunisch, Franz; Marhold, Albrecht; Ooms, Pieter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; Krauskopf, Birgit; and Straag, Harry, 5,554,580, Cl. 504-281.000.
Kunkel, Horst, to Hansa Metallwerke AG. Apparatus for the conversion of pressure fluctuations prevailing in fluid systems into electrical energy. 5,554,922, Cl. 322-3.000.
Kunz, James R., to Fleetwood Enterprises, Inc. Floor and side wall connectors. 5,553,906, Cl. 296-29.000.
Kuo, Yao H.: *See*—
Kennedy, John F.; Plowdrey, Robert D.; and Kuo, Yao H., 5,555,451, Cl. 455-161.200.
Kuo, Youti; and Smoak, James F., to Xerox Corporation. Decurler apparatus for reducing cross curl in sheets. 5,555,083, Cl. 355-309.000.
Kuper, Jerry; Segal, Leon; Beeson, Karl W.; and Zimmerman, Scott M., to AllieSignal Inc. Light directing optical structure. 5,555,329, Cl. 385-36.000.
Kuramoto, Shinichi; Okamoto, Yoshihisa; Asahina, Yasuo; Izumi, Michio; Gohhara, Hidefumi; Mochizuki, Chiharu; Suzuki, Tomomi; Nakamura, Hideo; and Wakisaka, Masaru, to Ricoh Company, Ltd.; and Mitsui Petrochemical Industries, Ltd. Electrophotographic dry toner. 5,554,478, Cl. 430-109.000.
Kurasawa, Munenori: *See*—
Yamasaki, Yasuo; Hama, Norikata; Kurasawa, Munenori; and Hashimoto, Nobuaki, 5,554,885, Cl. 257-666.000.
Kureha Kagaku Kogyo K.K.: *See*—
Nishihata, Naomitsu; Endo, Shunzo; Ichikawa, Yukio; and Katto, Takayuki, 5,554,723, Cl. 528-388.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Uehara, Yasuo; and Ise, Michihito, 5,554,370, Cl. 424-125.000.
Kurimoto, Masashi; and Mitsuhashi, Masakazu, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Preparation of a monoclonal antibody specific to human myelomonocyte interferon-gamma. 5,554,515, Cl. 435-70.210.
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Kuroi, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device and manufacturing method therefor. 5,554,883, Cl. 257-617.000.
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Kotaka, Hiroaki; Kurono, Nobuhisa; Yamaoka, Hidenori; Aiba, Yoshirou; and Matsuo, Shuuitsu, 5,554,204, Cl. 65-60.800.
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Irie, Bunpei; and Kurosawa, Yoshiaki, 5,555,320, Cl. 382-225.000.
Kurosu, Tadao, to Sony Corporation. Disc recording and/or reproducing apparatus. 5,555,227, Cl. 369-37.000.
Kurz, Gerhard; and Kraft, Manfred, to Kurz, Gerhard. Apparatus for regulating the power consumption of a vacuum cleaner. 5,554,917, Cl. 318-805.000.
Kus, Joseph E.: *See*—
Wilson, Donald F.; Lehn, Randolph F.; Dworak, Frank; Gravener, Roy D.; Kus, Joseph E.; and Stearns, Ralph A., 5,554,164, Cl. 606-167.000.
Kusakabe Electric & Machinery Co., Ltd.: *See*—
Kusakabe, Yukio; and Shikata, Yorio, 5,553,526, Cl. 83-319.000.
Kusakabe, Yukio; and Shikata, Yorio, to Kusakabe Electric & Machinery Co., Ltd. Clamp and lower blade mechanism for a steel pipe travelling cutting machine. 5,553,526, Cl. 83-319.000.
Kusuma, Djuanarto: *See*—
Waldmann, Bernd; and Kusuma, Djuanarto, 5,555,136, Cl. 359-871.000.
Kusunoki, Shigeru; and Inuishi, Masahide, to Mitsubishi Denki Kabushiki Kaisha. Field effect transistor including silicon oxide film and nitrided oxide film as gate insulator film and manufacturing method thereof. 5,554,876, Cl. 257-411.000.
Kutin, Richard L.: *See*—
Perreira, G. Stephen; Bush, Bernard V.; Kutin, Richard L.; and Mack, Patrick A., 5,554,962, Cl. 335-78.000.
Kuwada, Terumi: *See*—
Fukumoto, Hiroshi; Tanaka, Naoya; Oda, Keisuke; Arimoto, Kazuaki; Yoshida, Takashi; Higashi, Kazuhiko; Kasahara, Yasunori; and Kuwada, Terumi, 5,555,462, Cl. 347-218.000.
Kuwano, Fumiaki: *See*—
Ohta, Masahiro; Matsuyama, Akio; Senoue, Eiji; Kuwano, Fumiaki; Yasui, Osamu; Yoshida, Yasunori; Ryu, Akinori; and Kobayashi, Tadashi, 5,554,765, Cl. 548-462.000.
Kuyava, Charles C.: *See*—
Westrum, John W., Jr.; Chace, Mark S.; and Kuyava, Charles C., 5,553,379, Cl. 29-450.000.
Kuzniarski, John N. S.; Goodall, Peter F.; and King, Brian, to BOC Group plc, The. Refrigeration apparatus. 5,553,466, Cl. 62-602.000.
Kuznicki, William J.: *See*—
Willard, David F.; Schwendeman, Robert J.; Kuznicki, William J.; and DeLuca, Michael J., 5,555,183, Cl. 340-825.210.
KV Pharmaceutical Company: *See*—
Cuca, Robert; Lienhop, Keith; Riley, Thomas; Kirschner, Mitchell I.; and Levinson, R. Saul, 5,554,379, Cl. 424-439.000.
Cuca, Robert C.; Lienhop, Keith S.; Riley, Thomas C., Jr.; Levinson, R. Saul; and Kirschner, Mitchell I., 5,554,380, Cl. 424-441.000.
Kwag, Tae B.: *See*—
Park, Jang W.; Jin, Sung W.; and Kwag, Tae B., 5,553,802, Cl. 242-372.000.
Kwok, Robert J.; Lancrenon, Xavier; and Theoleyre, Marc-Andre, to Societe Nouvelle de Recherches et d'Applications Industrielles d'Echangeurs d'Ions Applexion. Process of manufacturing crystal sugar from an aqueous sugar juice such as cane juice or sugar beet juice. 5,554,227, Cl. 127-58.000.
Kyocera Corporation: *See*—
Ozawa, Yoshio; Mukataka, Hisashi; Imoo, Ryushi; and Nishida, Satoshi, 5,554,477, Cl. 430-106.600.
Kyrtsos, Christos T.; Gudat, Adam J.; Christensen, Dana A.; Friedrich, Douglas W.; and Stafford, Darrell E., to Caterpillar Inc. System and method for providing accurate vehicle positioning using spatial bias techniques. 5,555,503, Cl. 364-449.000.
Kytola, David, Sr. Hydraulic wheelchair lift. 5,553,990, Cl. 414-659.000.
L.G.L. Electronics S.p.A.: *See*—
Zenoni, Pietro, 5,553,641, Cl. 139-452.000.
Laakko, Ossi, to EWM Technology Ltd. OY. Method for removing or installing rolls in a paper machine or the like. 5,554,263, Cl. 162-199.000.
Laboratorios Menarini S.A.: *See*—
Carganico, Germano; Mauleon Casellas, David; and Garcia Perez, M. Luisa, 5,554,789, Cl. 562-460.000.
Labuda, David: *See*—
Owens, Gary L.; and Labuda, David, 5,555,416, Cl. 395-700.000.
Lacivita, Antonio, to Pia Carpinelli. Hypodermic needle with protection device. 5,554,131, Cl. 604-198.000.
Lackie, Steve J., to Sapidyne, Inc. Assay system. 5,554,340, Cl. 422-68.100.
Lad, Jayash J.: *See*—
Kelly, Bryan M.; Kelly, Matthew F.; Kroeckel, John G.; Haas, Joseph J.; and Lad, Jayash J., 5,553,859, Cl. 273-338.000.
Ladner, David W.: *See*—
Cross, Barrington; Los, Marinus; Doehner, Robert F., Jr.; Ladner, David W.; and Johnson, Jerry L., 5,554,579, Cl. 504-246.000.
Laermer, Franz: *See*—
Benz, Gerhard; Laermer, Franz; Schilp, Andrea; Zabler, Erich; Schirmer, Jürgen; and Uhler, Werner, 5,553,506, Cl. 73-862.590.
Lafontaine, Daniel M.: *See*—
Harrison, Kent D.; Hendrickson, Gary L.; Holman, Thomas J.; Lafontaine, Daniel M.; Miller, Matthew J.; and Robinson, David B., 5,554,119, Cl. 604-96.000.
Lagerwall, Sven T.: *See*—
Clark, Noel A.; and Lagerwall, Sven T., 5,555,111, Cl. 359-56.000.
Clark, Noel A.; and Lagerwall, Sven T., 5,555,117, Cl. 359-100.000.
Lahille, Michel; and Cottin, Philippe, to Biomat. Intersomatic vertebral cage. 5,554,191, Cl. 623-17.000.
Lahtinen, Veli-Tapani. Lifting device for sick or motion-handicapped person. 5,553,335, Cl. 5-81.10C.
Lai, Jiansu: *See*—
Zheng, Joe; and Lai, Jiansu, 5,555,313, Cl. 382-112.000.
Laitram Corporation, The: *See*—
Burch, Ronald H.; Corley, Andrew A.; Morales, Eric W.; and Selenberg, Kirk T., 5,554,069, Cl. 452-149.000.
Lake Medical Products, Inc.: *See*—
Klearman, Jeffrey D.; and Bronson, Robert, 5,553,793, Cl. 241-30.000.
Lallement, Régis, to Lectra Systemes, S.A. Electrical connection device with automatic positioning. 5,554,041, Cl. 439-248.000.
Lam, Ching-Keung. Towel rack. 5,553,722, Cl. 211-99.000.
Lam, Fong-Shek: *See*—
Verseput, Jerry; Lam, Fong-Shek; and Shah, Prasanna, 5,555,510, Cl. 364-514.00R.
Lamanna, William M.; Palazzotto, Michael C.; Mahoney, Wayne S.; and Kropp, Michael A., to Minnesota Mining and Manufacturing Company. Energy-activatable salts with fluorocarbon anions. 5,554,664, Cl. 522-25.000.
Lamb, Mark E.; and Merchant, David E., to Ransomes America Corporation. Riding mower with swingout center mower head. 5,553,445, Cl. 56-7.000.
Lambelet, Pierre: *See*—
Kaabi, Carine; Lambelet, Pierre; Rossier, Yvan; and Seiler, Alfred, 5,553,485, Cl. 73-73.000.
Lamm, Gunther; Reichelt, Helmut; and Wiesenfeldt, Matthias, to BASF Aktiengesellschaft. Doubled acid azo dyes with a hydroxypyridone coupling component. 5,554,737, Cl. 534-758.000.
Lampe, David A. Railroad tie product and method therefor. 5,553,777, Cl. 238-35.000.
Lamprecht, Dale E., Jr.: *See*—
Craig, Gina M.; Globig, James E.; Lamprecht, Dale E., Jr.; Markham, James G.; Morrison, Donald A.; Schwabe, Richard E.; Tavener, Raymond D.; and Watkins, Rex D., 5,555,351, Cl. 395-114.000.
La Mura, Joseph L.; and Wallenburg, Ronald C., to Joanell Laboratories, Inc. Pyrotechnic ignition apparatus. 5,554,817, Cl. 102-217.000.
Lancrenon, Xavier: *See*—
Kwok, Robert J.; Lancrenon, Xavier; and Theoleyre, Marc-Andre, 5,554,227, Cl. 127-58.000.
Landa, Benzion; Ben-Auraham, Peretz; Hall, Joseph; and Gibson, George A., to Inligo, N.V. Toner particles for use in compositions for developing latent electrostatic images and liquid composition using same. 5,554,476, Cl. 430-106.000.
Landa, Benzion, to Indigo N.V. Method and apparatus for imaging using an intermediate transfer member. 5,555,185, Cl. 355-256.000.
Landsate, Diane G.; Skran, Dale L.; and Saowdon, Arthur R., to Lucent Technologies Inc. Seamless multimedia conferencing system using an enhanced multipoint control unit. 5,555,017, Cl. 348-15.000.
Landis & Gyr Business Support AG: *See*—
Weber, David; and Wild, Willi, 5,555,246, Cl. 338-17.000.
Lang, Andrew J.: *See*—
England, Laurence E.; Lang, Andrew J.; and Shannon, Alfred W., 5,555,411, Cl. 395-650.000.
Lang, William M. Furring apparatus and method for applying same to cylindrical columns. 5,553,433, Cl. 52-483.100.
Lange, Arno: *See*—
Grund, Clemens; Glas, Guenther; Gueathert, Paul; Reichelt, Helmut; Becker, Rainer; Lange, Arno; and Friedrich, Klaus, 5,554,782, Cl. 558-327.000.
Lange, Hans; and Argauer, Herbert, to Boehringer Mannheim GmbH. Blood lancet device for withdrawing blood for diagnostic purposes. 5,554,166, Cl. 606-182.000.
Langensiepen, Ralph A.: *See*—
Aghajanian, Michael K.; Langensiepen, Ralph A.; Kennedy, Christopher R.; Rocazella, Michael A.; Wiener, Robert J.; Hanon, Gregory E.; Crowther, John J.; and McCormick, Allyn L., 5,553,657, Cl. 164-97.000.
Langevin, Pierre: *See*—
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Langhauser, Franz; Kerth, Jürgen; Schweier, Günther; Brintzinger, Hans-Herbert; and Mansel, Stefan, to BASF Aktiengesellschaft. Racemic metallocene complexes and their preparation. 5,554,776, Cl. 556-11.000.
Langlois, Michel; Renard, Pierre; and Adam, Gérard, to Adir et Compagnie. Arylalkyl(thio) amides. 5,554,642, Cl. 514-415.000.
Langstein, Gerhard; Krüger, Ralf; Alberts, Heinrich; Moretto, Hans-Heinrich; and Huggins, John, to Bayer Aktiengesellschaft. Combinations of polyorganosiloxanes and fluororubbers containing double bonds by Si-H addition. 5,554,689, Cl. 525-102.000.
Lanxide Technology Company, LP: *See*—
Aghajanian, Michael K.; Langensiepen, Ralph A.; Kennedy, Christopher R.; Rocazella, Michael A.; Wiener, Robert J.; Hanon, Gregory E.; Crowther, John J.; and McCormick, Allyn L., 5,553,657, Cl. 164-97.000.
LaPeruta, Richard, Jr.: *See*—
Datta, Pabitra; Poliniak, Eugene S.; Collins, Brian T.; Stork, Harry R.; Ritt, Peter M.; Garrity, Edward R., Jr.; LaPeruta, Richard, Jr.; and Ehemann, George M., Jr., 5,554,468, Cl. 430-28.000.
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Patterson, John W.; Morgans, David, Jr.; Sjogren, Eric B.; Smith, David B; Talamás, Francisco X.; Artis, Dean R.; Cervantes, Alicia; Elworthy, Todd R.; Fernández, Mario; Franco, Fidencio; Hawley, Ronald C.; Lara, Teresa; Loughhead, David G.; Nelson, Peter H.; Trejo, Alejandra; Waltos, Ann M.; and Weikert, Robert J., 5,554,612, Cl. 514-233.500.
LaRegion Wallone: *See*—
Top, Siden; Vessieres, Anne; Jaquen, G'erard; and Quivy, Jacques, 5,554,602, Cl. 424-1.450.
Large, Darrell. Passenger safety status indicator. 5,555,458, Cl. 340-945.000.
Larren Corporation, The: *See*—
Horner, Glenn A.; Miller, Scott A.; Heim, Warren P.; Blankenship, Larry K.; and Brassell, James L., 5,554,172, Cl. 607-88.000.
Larsen, Poul K.: *See*—
Wolters, Robertus A. M.; Larsen, Poul K.; and Ulenaers, Mathieu J. E., 5,554,559, Cl. 437-62.000.
Larson, James R.; Facci, John S.; Abkowitz, Martin A.; Mammino, Joseph; Stolka, Milan; and Spiewak, John W., to Xerox Corporation. Charging processes with liquid compositions. 5,554,469, Cl. 430-31.000.
Larson, Joseph C.; and Faul, J. Joel, to Cardiff Software, Inc. Forms creation and interpretation system. 5,555,101, Cl. 358-403.000.
Larson, Lawrence E., to Hughes Aircraft Company. Integrated transmit/receive switch/low noise amplifier with dissimilar semiconductor devices. 5,554,865, Cl. 257-275.000.
Larsson, Anita: *See*—
Malmqvist, Magnus; Karlsson, Robert; Larsson, Anita; and Sjödal, Jörgen, 5,554,541, Cl. 436-518.000.
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Fields, William C.; Fredrick, Dan; Grannemann, Steve; Hannan, Phyllis; and Lukashevsky, Igor, 5,554,335, Cl. 264-400.000.
Lashbrook, Coralie: *See*—
Bennett, Alan B.; Fischer, Robert L.; Lashbrook, Coralie; and Giovannoni, James, 5,554,743, Cl. 536-23.600.
Lasto, Clifford S.; and Duhaime, Jeffrey S., to Air-Vac Engineering Company, Inc. Heat-control process and apparatus for attachment/detachment of soldered components. 5,553,768, Cl. 228-102.000.
Latsch, Reinhard: *See*—
Kuhnert, Dieter; and Latsch, Reinhard, 5,554,908, Cl. 313-140.000.
Latta, Mark A.: *See*—
Tateosian, Louis H.; Shaffer, Scott E.; and Latta, Mark A., 5,554,665, Cl. 522-30.000.
Laughlin, Richard H. Frustrated total internal reflection device. 5,555,327, Cl. 385-16.000.
Laughlin, Richard H. Method for switching optical signals. 5,555,558, Cl. 385-16.000.
Lauk, Urs, to Ciba-Geigy Corporation. AZO dyes containing a bridge member based on stibene and morpholino-substituted triazine. 5,554,734, Cl. 534-691.000.
Lauks, Imants R.: *See*—
Cozzette, Stephen N.; Davis, Graham; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Van Der Werf, Paul; and Wieck, Henry J., 5,554,339, Cl. 422-50.000.
Laurel Bank Machines Co., Ltd.: *See*—
Arikawa, Junichi, 5,553,840, Cl. 271-3.080.
Laurent, Jean: *See*—
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Lawrence, Bruce J.; Boyle, John M.; and Schreffler, Scott A., to Bethlehem Apparatus Co., Inc. Packaging for shipping spent fluorescent lamps. 5,553,708, Cl. 206-419.000.
Lawrence, Charles E.; McDougall, Floyd H.; and Lundschen, Jay W., to Datapoint Corporation. Technique for cancelling common mode switching noise to achieve reduced error rates in a local area network. 5,555,277, Cl. 375-346.000.
Lax, Ronald G.: *See*—
Edwards, Stuart D.; Lax, Ronald G.; Lundquist, Ingemar H.; Sharkey, Hugh R.; and Baker, James A., 5,554,110, Cl. 604-22.000.
Layer, Robert W.; and Chasar, Dwight W., to B. F. Goodrich Company, The. Method of curing rubbers without forming nitrosamines. 5,554,699, Cl. 525-332.700.
Layman-Spillar, Lynn M.; Gisselberg, Margo L.; and Fowler, Bradford C., to Quinton Instrument Company. Hydrocolloid exit site dressing. 5,554,106, Cl. 602-42.000.
Lazaridis, Mihal; Little, Herb A.; Mousseau, Gary P.; and Sinha, Anand, to Research in Motion Limited. Method and apparatus for maximizing the data transmission in a wireless data communication network. 5,555,241, Cl. 370-17.000.
Lazer-Tron Corporation: *See*—
Kelly, Bryan M.; Kelly, Matthew F.; Kroeckel, John G.; Haas, Joseph J.; and Lad, Jayash J., 5,553,859, Cl. 273-338.000.
Le Carbone-Lorraine: *See*—
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Leader Electronics Corporation: *See*—
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Tomita, Hiroyuki; and Saito, Koichi, 5,555,515, Cl. 364-724.010.
Leavitt, William J.: *See*—
Tetreault, Mark D.; Horvath, Charles J.; and Leavitt, William J., 5,555,372, Cl. 395-182.130.
Lebby, Michael S.: *See*—
Sharma, Ravinder K.; Lebby, Michael S.; Hartman, Davis H.; and Hansen, Kent W., 5,555,341, Cl. 385-129.000.
LeBoulluec, Karen: *See*—
Poindexter, Graham S.; Bruce, Marc; Johnson, Graham; LeBoulluec, Karen; and Noonan, Jeffrey W., 5,554,621, Cl. 514-278.000.
Le Bris, Louis: *See*—
Joulak, Faouzi; Le Bris, Louis; and Marion, Philippe, 5,554,299, Cl. 210-712.000.

Lecerf, Michel J. M.; and Longuet, Raynald G. M., to Buchmann Optical Engineering. Frame holder for prescription glasses. 5,554,067, Cl. 457-384.000.

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Lallement, Régis, 5,554,041, Cl. 439-248.000.

Leder, Philip; and Flanagan, John G., to President and Fellows of Harvard College. Detection and isolation of ligands. 5,554,499, Cl. 435-5.000.

Ledger, Anthony M., to Integrated Process Equipment Corp. Automatic rejection of diffraction effects in thin film metrology. 5,555,474, Cl. 356-381.000.

Lee, Alfred E.: *See*—
Simon, Randy W.; Platt, Christine E.; Lee, Alfred E.; and Lee, Gregory S., 5,554,585, Cl. 505-430.000.

Lee, Arthur: *See*—
Steinfeld, George; Meyers, Steven J.; and Lee, Arthur, 5,554,453, Cl. 429-17.000.

Lee, Chang-jig: *See*—
Kim, Kun-hye; Son, Soo-ho; Yoon, Young-huy; and Lee, Chang-jig, 5,553,357, Cl. 19-258.000.

Lee, Charles: *See*—
Samuels, Glenn J.; Lee, Jung-Chung; Lee, Charles; Berry, Stephen; and Jarosz, Paul J., 5,554,384, Cl. 424-451.000.

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Wilson, Donald F.; Lehn, Randolph F.; Dworak, Frank; Gravener, Roy D.; Kus, Joseph E.; and Stearns, Ralph A., 5,554,164, Cl. 606-167.000.

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Levin, Michael. Horizontal forming block with curved side wall for architectural structures. 5,553,432, Cl. 52-309.120.

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Levinson, R. Saul: *See*—
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Lin, Ronny W.; Atkinson, Eldon E., Jr.; and Balhoff, Donald E., to Albemarle Corporation. Process for producing [S,S]-ethylenediamine-N,N'-disuccinic acid. 5,554,791, Cl. 562-565.000.

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Landante, Diane G.; Skran, Dale L.; and Snowdon, Arthur R., 5,555,017, Cl. 348-15.000.
Urbansky, Ralph, 5,555,262, Cl. 370-102.000.

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van der Bruggen, Pierre; Boon-Falleur, Thierry; Traversari, Catia; and Fleischauer, Katharina, 5,554,506, Cl. 435-7.240.

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Fields, William C.; Fredrick, Dan; Grannemann, Steve; Hannan, Phyllis; and Lukashevsky, Igor, 5,554,335, Cl. 264-400.000.

Lum, Kin K.: *See*—
Tang, Manh; Lum, Kin K.; and Pickering, James E., 5,555,011, Cl. 347-212.000.

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Lundquist, Ingemar H.: *See*—
Edwards, Stuart D.; Lax, Ronald G.; Lundquist, Ingemar H.; Sharkey, Hugh R.; and Baker, James A., 5,554,110, Cl. 604-22.000.

Lundquist, Ronald C.; and Walters, David A., to DeKalb Genetics Corporation. Fertile glyphosate-resistant transgenic corn plants. 5,554,798, Cl. 800-205.000.

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Lawrence, Charles E.; McDougall, Floyd H.; and Lundschen, Jay W., 5,555,277, Cl. 375-346.000.

Lur, Water; and Huang, Cheng H., to United Microelectronics Corporation. Method to eliminate polycide peeling. 5,554,566, Cl. 437-193.000.

Lürssen, Klaus: *See*—
Haas, Wilhelm; Müller, Klaus-Helmut; König, Klaus; Santel, Hans-Joachim; Lürssen, Klaus; and Schmidt, Robert R., 5,554,761, Cl. 548-263.600.

Luther Medical Products, Inc.: *See*—
Luther, Ronald B., 5,554,136, Cl. 604-264.000.

Luther, Ronald B., to Luther Medical Products, Inc. Dual lumen infusion/aspiration catheter. 5,554,136, Cl. 604-264.000.

Luther, Willis J., to Canon Information Systems, Inc. Text parser for use with a text-to-speech converter. 5,555,343, Cl. 395-269.000.

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Newman, Robert C., Jr., 5,555,150, Cl. 361-56.000.

Lutz, Dieter; Hörth, Franz-Josef; Heide, Hartmut; Göbel, Hilmar; Littell, Alan E. L.; Voadersau, Josef; Heid, Armin; and Scheer, Erich, to Fichtel & Sachs AG. Friction clutch for a transmission of a motor vehicle and a friction lining for a friction clutch. 5,553,695, Cl. 192-70.140.

Lyman, Stewart D.; and Beckmann, M. Patricia, to Immunex Corporation. Ligands for flt3 receptors. 5,554,512, Cl. 435-69.500.

Lymn, Peter P. A. Solder spray leveller. 5,554,412, Cl. 427-96.000.

Lynch, Thomas J.: *See*—
Parker, Stephen M.; and Lynch, Thomas J., 5,554,825, Cl. 174-117.00F.

Lynn Ltd.: *See*—
Kost, Karen L.; Fry, William J.; Lock, Timothy; and Davis, Michael S., 5,554,841, Cl. 235-464.000.

Lyons, Christopher P.: *See*—
Dichiara, Robert R.; Fahey, James T.; Jones, Pamela E.; Lyons, Christopher F.; Moreau, Wayne M.; Sooriyakumaran, Ratnam; Spinillo, Gary T.; Welsh, Kevin M.; and Wood, Robert L., 5,554,485, Cl. 430-271.100.

Lyons, Donald R.; Reich, Stanley M.; and Shyprykevich, Peter, to Grumman Aerospace Corporation. Intrumented patch for repair of fatigue damaged or sensitive structure. 5,553,504, Cl. 73-799.000.

Lyons, Kevin P.: *See*—
Pearson, Douglas H.; SanGregory, Jude A.; Lyons, Kevin P.; Bietry, Joseph R.; and Lewis, Alan E., 5,555,062, Cl. 354-288.000.

M. R. Carretta Co., Inc.: *See*—
Balestrieri, Harry, 5,553,855, Cl. 273-55.00B.

Ma, Mike: *See*—
Sacco, Bruno; Tomforde, Johann; Reichel, Anton; Steinle, Gerhard; Klein, Berthold; Slaughter, David; and Ma, Mike, 5,553,909, Cl. 296-185.000.

Ma, Sheau-Hwa: *See*—
Stoffel, John L.; Shor, Arthur C.; Spinelli, Harry J.; Ma, Sheau-Hwa; Matrick, Howard; Choy, Mark L.; and Johnson, Loren E., 5,555,008, Cl. 347-100.000.

MacDougall, Louis M.: *See*—
Parekh, Mahendra B.; Kitzmiller, Leon; Costello, Richard C.; Grow, C. Allen; Pinchott, Gordon; O'Leary, Dennis; MacDougall, Louis M.; Okey, David W.; and Fowler, Edward J., 5,553,378, Cl. 29-888.044.

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Mach, Walter, deceased; and Mach, by Chantal, executor, 5,554,596, Cl. 514-22.000.

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Machida Endoscope Co., Ltd.: *See*—
Oku, Toshio, 5,554,893, Cl. 307-119.000.

Machida, Katsuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Mode changeover device. 5,555,064, Cl. 354-289.120.

Machida, Shuji; and Tazaki, Toshinori, to Idemitsu Kosan Co. Ltd. Styrenic copolymer and process for producing same. 5,554,695, Cl. 525-268.000.

Machin, Peter J.: *See*—
Handa, Bahraj K.; Machin, Peter J.; Martin, Joseph A.; Redshaw, Sally; and Thomas, Gareth J., 5,554,756, Cl. 546-225.000.

Machiraju, Venkat R. Heart valve. 5,554,184, Cl. 623-2.000.

Macholdt, Hans-Tobias: *See*—
Eichenauer, Dieter; Groh, Werner; Macholdt, Hans-Tobias; Dahringer, Jörg; Jung, Holger; and Neuert, Richard, 5,554,722, Cl. 528-340.000.

Machurick, Michael A.: *See*—
Datta, Paul J.; and Machurick, Michael A., 5,554,239, Cl. 156-66.000.

Mack, Patrick A.: *See*—
Perreira, G. Stephen; Bush, Bernard V.; Kutin, Richard L.; and Mack, Patrick A., 5,554,962, Cl. 335-78.000.

MacLeod, Angus M.: *See*—
Lewis, Richard T.; MacLeod, Angus M.; and Merchant, Kevin J., 5,554,627, Cl. 514-305.000.

MacWilliams, Peter D.: *See*—
Grochowski, Edward T.; and MacWilliams, Peter D., 5,555,423, Cl. 395-775.000.

Maddali, Vijay; Defenbaugh, John F.; and Mansir, Hassan, to Sundstrand Corporation. Voltage regulator and method for DC power generating system. 5,554,923, Cl. 322-25.000.

Maddison, David S.; Skalsky, Michael; Gotthardt, Gerhard; and Anderson, Neil, to Telectronics Pacing Systems, Inc. Implantable electrode and sensor lead apparatus. 5,554,176, Cl. 607-9.000.

Maeda, Haruo: *See*—
Maruyama, Kenichi; Maeda, Haruo; and Togawa, Eiji, 5,555,051, Cl. 354-195.100.

Maeda, Kazuo; Tokumasu, Noboru; and Yuyama, Yoshiaki, to Canon Sales Co., Inc.; Alcantech Co., Inc.; and Semiconductor Process Laboratory Co., Ltd. Method of forming insulating film. 5,554,570, Cl. 437-235.000.

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Kojima, Kunio; Maeda, Shigemi; and Akiyama, Jun, 5,555,229, Cl. 369-60.000.

Maeda, Tadaaki: *See*—
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Maeda, Yasushi; Magara, Kengo; and Tsugaya, Hitoshi, to Daicel Chemical Industries, Ltd. Permaselective membrane of polyacryloniitrile copolymer and process for producing the same. 5,554,292, Cl. 210-640.000.

Maenaka, Akihiro; Mori, Yukio; Murata, Haruhiko; Ide, Hirokazu; and Okada, Hidefumi, to Sanyo Electric Co., Ltd. Signal processing circuit for video camera which prevents a false aperture signal from being generated. 5,555,023, Cl. 348-253.000.

Magara, Kengo: *See*—
Maeda, Yasushi; Magara, Kengo; and Tsugaya, Hitoshi, 5,554,292, Cl. 210-640.000.

Magsig, Peter J.: *See*—
Snider, A. Rebecca; Bennett, Richard M.; McCabe, Laurence J.; Magsig, Peter J.; Ng, Kane L.; Purdy, Lynn M.; and Ruffles, Joseph W., 5,553,620, Cl. 128-660.040.

Mahalingaiah, Rupaka: *See*—
Gephardt, Douglas; and Mahalingaiah, Rupaka, 5,555,430, Cl. 395-800.000.

Mahany, Ronald L.: *See*—
Koenck, Steven E.; Mahany, Ronald L.; and Frede, William W., 5,555,276, Cl. 375-303.000.

Mahoney, John P., to Harnischfeger Corporation. Method for repairing a machine having a support structure and worn components. 5,553,367, Cl. 29-402.080.

Mahoney, Wayne S.: *See*—
Lamanna, William M.; Palazzotto, Michael C.; Mahoney, Wayne S.; and Kropp, Michael A., 5,554,664, Cl. 522-25.000.

Mahtout, Taous G.: *See*—
Dagorn, Daniel N. N.; Mahtout, Taous G.; Grandvallet, Pierre; and Scheffer, Bob, 5,554,307, Cl. 508-111.000.

Mailey, Desmond; Rodriguez, Jose J.; Fregoe, Jerry P.; Stevens, Curtis L.; Dettmers, Frank M., Sr.; Brown, Glenn L.; Kitzer, Gary L.; Miller, James G.; Hillbrands, Martin J.; Strebel, Carl F.; and King, Thomas A., to Solar Turbines Incorporated. Punch press machine. 5,553,525, Cl. 83-184.000.

Maillot, Frédéric, to GEC Alsthom Stein Industrie. Fastening system for fastening a through pipe to a hearth wall, the pipe opening into a box. 5,553,897, Cl. 285-192.000.

Mailloux, Louis D., to Xerox Corporation. Bit-map image resolution converter with controlled compensation for write-white xerographic laser printing. 5,555,557, Cl. 382-299.000.

Maitre, Bernard; Chaella, Xavier; and De la Fresnaye, Thibault, to Electronique Serge Dassault. Device for recreating a dynamic image from a radar field of the invention. 5,554,991, Cl. 342-184.000.

Majnaric, Anton B.; and Bjerke, William M., to Majnaric Technologies, Inc. Method and apparatus for erecting building structures. 5,553,430, Cl. 52-236.800.

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Majnaric, Anton B.; and Bjerke, William M., 5,553,430, Cl. 52-236.800.

Majolo, Martin: *See*—
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Makin, David: *See*—
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Makryaleas, Kyriakos: *See*—
Bommarius, Andreas; Drauz, Karlheinz; and Makryaleas, Kyriakos, 5,554,518, Cl. 435-114.000.

Malanowski, Alan J.: *See*—
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Malavazos, Alex; Malavazos, Gregory; and Malavazos, Constantine, 5,553,851, Cl. 273-142.00E.

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Malay, Thomas: *See*—
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Malek, Lawrence T.: *See*—
Davey, Cheryl; and Malek, Lawrence T., 5,554,517, Cl. 435-91.210.

Malhi, Satwinder, to Texas Instruments Inc. Method of fabricating a high voltage transistor. 5,554,546, Cl. 437-40.000.

Mallamo, John P.: *See*—
DeHaven-Hudkins, Diane L.; Dority, John A., Jr.; Earley, William G.; Kumar, Virendra; Mallamo, John P.; Miller, Matthew S.; and Subramanyam, Chakrapani, 5,554,620, Cl. 514-278.000.

Mallick, Subhashis: *See*—
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Rajagopalan, Raghavan, 5,554,357, Cl. 424-9.365.
Wallace, Rebacca A.; and Moore, Dennis A., 5,554,749, Cl. 540-474.000.

Mallion, Keith B., to Zeneca Limited. Heterocyclic derivatives. 5,554,613, Cl. 514-253.000.

Malmqvist, Magnus; Karlsson, Robert; Larsson, Anita; and Sjödal, Jörgen, to Pharmacia Biosensor AB. Characterizing macromolecules interacting with at least three ligands on a sensor. 5,554,541, Cl. 436-518.000.

Maloney, Michael J.; Hitson, Bruce L.; and McCalmont, David T., to Teknekron Infoswitch Corporation. Method and system for transferring calls and call-related data between a plurality of call centers. 5,555,299, Cl. 379-212.000.

Mammino, Joseph: *See*—
Larson, James R.; Facci, John S.; Abkowitz, Martin A.; Mammino, Joseph; Stolka, Milan; and Spiewak, John W., 5,554,469, Cl. 430-31.000.

Manabe, Toshiki: *See*—
Ban, Cozy; Yanagi, Motonori; Fukumoto, Takaaki; Manabe, Toshiki; Yanome, Hiroshi; and Kawada, Kazuhiko, 5,554,295, Cl. 210-668.000.

Manabe, Yuji, to Nikon Corporation. Projection apparatus. 5,555,041, Cl. 353-98.000.

Mangyo, Masao: *See*—
Sasano, Hiroshi; Mangyo, Masao; Hamada, Koshi; and Kubota, Akihiko, 5,554,016, Cl. 417-569.000.

Manhasset Specialty Co.: *See*—
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Manley, George C.: *See*—
Perowne, Paul J.; Manley, George C.; and Kirk, Richard A., 5,555,475, Cl. 358-462.000.

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Feuerstacke, Ewald, 5,555,259, Cl. 373-80.000.

Mano, Toshihiko; Kodaira, Toshimoto; and Oshima, Hiroyuki, to Seiko Epson Corporation. Thin film transistors and active matrices including the same. 5,554,861, Cl. 257-71.000.

ManometRx Group Ltd: *See*—
Surdut, Raymond J.; Benz, Edwin H., Sr.; and Skoutas, James P., 5,553,503, Cl. 73-778.000.

Mansel, Stefan: *See*—
Langhauser, Franz; Kerth, Jürgen; Schweier, Günther; Brintzinger, Hans-Herbert; and Mansel, Stefan, 5,554,776, Cl. 556-11.000.

Mansir, Hassan: *See*—
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Mantlo, Nathan B.: *See*—
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Mar, Kevin: *See*—
Adat, Riyaz; Mar, Kevin; Pirie, Craig; and Poupore, Tim, 5,553,917, Cl. 297-230.140.

Marchand, Alain C. S.: *See*—
Bernard, Patrick E. Y.; Bertorelli, Claude R.; and Marchand, Alain C. S., 5,554,270, Cl. 205-494.000.

Marcinko, Joseph J.; and Robertson, John R., to Imperial Chemical Industries, PLC. Self-release binder system. 5,554,438, Cl. 428-306.600.

Marconi Company Limited, The: *See*—
Edgar, Barry D.; and Jone, Timothy, 5,554,818, Cl. 102-364.000.

Marega, Antonello; and Sartor, Mario, to TECNICA SpA. Ski-boot with improved padding and slidable tongue. 5,553,402, Cl. 36-117.700.

Maresch, Gerhard; and Braun, Hans-Jürgen, to Wella Aktiengesellschaft. Composition and process for the permanent shaping of hair. 5,554,362, Cl. 424-70.510.

Marhold, Albrecht: *See*—
Fischer, Reiner; Jensen-Korte, Uta; Kunisch, Franz; Marhold, Albrecht; Ooms, Pieter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; Krauskopf, Birgit; and Strang, Harry, 5,554,580, Cl. 504-281.000.

Marin, Gilles: *See*—
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Marincic, Nikola; and Rabadjija, Luka, to Pacesetter, Inc. Current collector having coined side edges for use in an electrochemical cell, and method of its production. 5,554,463, Cl. 429-233.000.

Mariol, John V., to Lisco, Inc. Playyard and bassinet combination. 5,553,336, Cl. 5-93.100.

Marion, Philippe: *See*—
Cordier, Georges; Damon, Jean-Pierre; Fouilloux, Pierre; and Marion, Philippe, 5,554,573, Cl. 502-301.000.
Joulak, Faouzi; Le Bris, Louis; and Marion, Philippe, 5,554,299, Cl. 210-712.000.

Markham, James G.: *See*—
Craig, Gina M.; Globig, James E.; Lamprecht, Dale E., Jr.; Markham, James G.; Morrison, Donald A.; Schwabe, Richard E.; Tavener, Raymond D.; and Watkins, Rex D., 5,555,351, Cl. 395-114.000.

Markison, Timothy W.: *See*—
Grube, Gary W.; and Markison, Timothy W., 5,555,192, Cl. 364-514.00R.

Marks, Bruce S.: *See*—
Chaudhary, Bharat I.; Eschenlauer, Georges; and Marks, Bruce S., 5,554,661, Cl. 521-97.000.

Markström, Ulf: *See*—
Nilsson, Rickard; Markström, Ulf; and Klöfver, Leif, 5,555,418, Cl. 395-700.000.

Marlen Research Corporation: *See*—
Schack, Warren R.; and Dennis, Wendell, 5,553,985, Cl. 414-287.000.

Marom, Emanuel; Katz, Joseph; and Barkan, Edward, to Symbol Technologies, Inc. Holographic scanning. 5,555,130, Cl. 359-574.000.

Marpoe, Gary R., Jr., to Whitaker Corporation, The. Filtering insert for electrical connectors. 5,554,050, Cl. 439-620.000.

Marquis, Peter M.: *See*—
Illston, Trevor J.; Doleman, Paul A.; Butler, Edwin G.; Marquis, Peter M.; Ponton, Clive B.; Piramoon, Reza; and Gilbert, Mark J., 5,554,271, Cl. 204-479.000.

Marrese, Carl A.: *See*—
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Mars, Incorporated: *See*—
Romanczyk, Leo J., Jr.; Hammerstone, John F., Jr.; and Buck, Margaret M., 5,554,645, Cl. 514-453.000.

Martell, Robert W.: *See*—
Hinton, Glenn J.; Martell, Robert W.; Fetterman, Michael A.; Papworth, David B.; and Schwartz, James L., 5,555,432, Cl. 395-800.000.

Martens, Rigobertus W.: *See*—
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Martin, Barry J.: *See*—
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Martin, Fred S.; and Bearden, John L., to Baker Hughes Incorporated. Downhold motor cooling and protection system. 5,554,897, Cl. 310-54.000.

Martin, John R.: *See*—
Behan, John M.; Clements, Christopher F.; Hooper, David C.; Martin, John R.; Melville, James B.; and Perring, Keith D., 5,554,588, Cl. 512-1.000.

Martin, Joseph A.: *See*—
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Martinez, Michèle. Method of driving a turbine in rotation by means of a jet device. 5,553,995, Cl. 415-1.000.

Martinez-Bustos, Fernando: *See*—
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Martins, Crisostomo, to Whitaker Corporation, The. Insulation displacing barrel contact. 5,554,048, Cl. 439-406.000.

Marui Co., Ltd.: *See*—
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Marui, Kohei, to Marui Co., Ltd. Handle stem fixing device in a bicycle. 5,553,511, Cl. 74-551.100.

Maruyama, Hideo: *See*—
Taki, Kazunari; Ohashi, Yumiko; Hamaguchi, Takuya; Maruyama, Hideo; and Matsuda, Riki, 5,554,451, Cl. 428-694.0ML.

Maruyama, Kenichi; Maeda, Haruo; and Togawa, Eiji, to Elmo Co., Ltd. Back-focus adjusting device for a video camera. 5,555,051, Cl. 354-195.100.

Maruyama, Ryoji, to Kabushiki Kaisha Toshiba. Electrical quantity measurement device. 5,554,927, Cl. 324-117.00H.

Maruyama, Takao, to NEC Corporation. MR/inductive combined thin film magnetic head capable of reducing occurrence of a short circuit. 5,555,147, Cl. 360-113.000.

Maruyama, Teruo; Abe, Yoshikazu; and Ikemoto, Yoshihiro, to Matsushita Electric Industrial Co., Ltd. Fluid feed apparatus and method. 5,553,742, Cl. 222-1.000.

Masaie, Norio; Tachibana, Tomoyuki; Seita, Koji; and Araike, Yasuo, to Kabushiki Kaisha Kobe Seiko Sho. Lubricant for wire feeding and wire drawing and a welding wire manufactured by using the same. 5,554,308, Cl. 508-181.000.

Mascheretti, Mario: *See*—
Locatelli, Claudio; and Mascheretti, Mario, 5,553,356, Cl. 19-80.00R.

Maskas, Barry A.: *See*—
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Maslak, Samuel H.; Cole, Christopher R.; and Petrofsky, Joseph G., to Acuson Corporation. Method and apparatus for doppler receive beamformer system. 5,555,534, Cl. 367-135.000.

Mason, John P.: *See*—
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Mason, Linda J.; and Mason, John P. Decreased-tilt flower pot drain. 5,553,418, Cl. 47-79.000.

Massachusetts Institute of Technology: *See*—
Bizzi, Emilio; Mussa-Ivaldi, Ferinando A.; and Shadmehr, Reza, 5,554,033, Cl. 434-247.000.
Chiang, Alice M., 5,555,200, Cl. 364-606.000.
Cornie, James A., 5,553,658, Cl. 164-97.000.
Walpole, James N.; Kintzer, Emily S.; Chinn, Stephen R.; Wang, Christine A.; and Missaggia, Lee J., 5,555,544, Cl. 372-50.000.
Waxman, Allen M.; Fay, David A.; Gove, Alan N.; Seibert, Michael C.; and Racamato, Joseph P., 5,555,324, Cl. 382-254.000.

Master, Raj N.: *See*—
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Mastri, Dominick L.: *See*—
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Masuda, Syuzo: *See*—
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Masumi, Taizo, to University of Tokyo. Superconductive photoconductive substance of the Ca-Sr-Bi-Cu-O group system and a method of producing the same. 5,554,584, Cl. 505-181.000.

Matassa, Victor G.: *See*—
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Matec Holding AG: *See*—
Müller, Peter; and Wedermann, Günther, 5,554,830, Cl. 181-290.000.

Materials Research Corporation: *See*—
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Mato Maschinen-und Metallwarenfabrik Curt Matthaei GmbH & Co. KG: *See*—
Herold, Wolfgang, 5,553,359, Cl. 24-33.00P.

Matra Automobile: *See*—
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Matrick, Howard: *See*—
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Matsi, Inc.: *See*—
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Matson, Robert S.: *See*—
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Matsubara, Hideaki: *See*—
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Gulick, Dale E.; Peterson, Joseph W.; Bowles, James E.; Bartkowiak, John G.; Yoshikawa, Munehiro; Saito, Shin; and Matsubara, Hiroshi, 5,555,287, Cl. 379-61.000.

Matsubara, Yoshihiro: *See*—
Miyata, Shigeru; Yoshida, Hideji; Matsubara, Yoshihiro; Ito, Yasuo; and Suzuki, Takashi, 5,554,930, Cl. 324-402.000.

Matsuda, Hiromu: *See*—
Inoue, Hiroshi; Hamada, Shinji; Matsuda, Hiromu; Ikoma, Munehisa; and Yamasaki, Hiroshi, 5,554,455, Cl. 429-53.000.

Matsuda, Hironari: *See*—
Tomooka, Keiji; Sakakida, Naohiro; Nishimura, Shin; Ashi, Yoshihiro; Matsuda, Hironari; Aoki, Satoshi; Nakano, Yukio; Takatori, Masahiro; Kazawa, Toru; Sasaki, Shinya; Takeyari, Ryoji; and Nakano, Hiroyuki, 5,555,477, Cl. 359-115.000.

Matsuda, Masaaki: *See*—
Oritsuki, Ryoji; Hiroshima, Minoru; Yanai, Masahiro; Matsuda, Masaaki; Horii, Toshikazu; Hashimoto, Yuichi; Kozai, Hayao; Suzuki, Kenkichi; Takabatake, Masaru; and Isoda, Takashi, 5,555,112, Cl. 359-59.000.

Matsuda, Riki: *See*—
Taki, Kazunari; Ohashi, Yumiko; Hamaguchi, Takuya; Maruyama, Hideo; and Matsuda, Riki, 5,554,451, Cl. 428-694.0ML.

Matsue, Shuichi: *See*—
Ueda, Masahiro; and Matsue, Shuichi, 5,554,824, Cl. 174-52.400.

Matsui, Kuniyasu: *See*—
Matsushima, Fumiaki; Ohno, Yoshihiro; Ogino, Shigeyuki; and Matsui, Kuniyasu, 5,554,466, Cl. 430-7.000.

Matsui, Masahiro: *See*—
Tonomura, Shoichiro; Matsui, Masahiro; and Morishita, Takashi, 5,554,449, Cl. 428-690.000.

Matsui, Shuichi: *See*—
Fujita, Atsuko; Matsui, Shuichi; Miyazawa, Kazutoshi; Goto, Yasuyuki; Nakagawa, Etsuo; and Sawada, Shinichi, 5,554,316, Cl. 252-299.010.

Matsukawa, Hiroshi; Watanabe, Kyoichi; and Sugawara, Hiroshi, to Mitsubishi Kasei Corporation; and Nissan Motor Co., Ltd. Sound absorbing member. 5,554,831, Cl. 181-294.000.

Matsukawa, Koji, to Brother Kogyo Kabushiki Kaisha. Printing apparatus. 5,555,014, Cl. 347-262.000.

Matsukawa, Taiji: *See*—
Araki, Eiichi; Sugihara, Norihiro; Kamada, Mari; and Matsukawa, Taiji, 5,554,726, Cl. 528-495.000.

Matsukawa, Tomoko: *See*—
Hirai, Kenji; Matsukawa, Tomoko; Yano, Tomoyuki; Ejiri, Emiko; Aizawa, Kiyomi; Shikakura, Koichi; Yoshii, Tomoko; Ugai, Sadayuki; Yamada, Osamu; and Kishi, Shigeki, 5,554,581, Cl. 504-298.000.

Matsumoto, Ichiro, to Kokusai Electric Co., Ltd. Apparatus for decoding a DPCM encoded signal. 5,555,546, Cl. 315-244.000.

Matsumoto, Kouji: *See*—
Rokugawa, Kyuji; Matsumoto, Kouji; and Inoue, Morito, 5,554,811, Cl. 73-864.340.

Matsumoto, Shinya: *See*—
Konno, Mitsujiro; Ono, Katsuya; Takasugi, Yoshiharu; Matsumoto, Shinya; and Nishioka, Kimihiko, 5,555,129, Cl. 359-569.000.

Matsumoto, Takayuki: *See*—
Tsukimi, Yoshihiro; Matsumoto, Takayuki; and Nagano, Hideo, 5,554,323, Cl. 264-4.700.

Matsunaga, Nobuhiro; and Niikura, Katsuyoshi, to Unitika Ltd. Binder fiber and nonwoven fabrics using the fiber. 5,554,442, Cl. 428-373.000.

Matsuno, Shigeru: *See*—
Uchikawa, Fusaoki; Matsuno, Shigeru; Kinouchi, Shinichi; and Watarai, Hisao, 5,555,154, Cl. 361-322.000.

Matsuo, Eiji: *See*—
Hashimoto, Koosuke; Matsuo, Eiji; Kawagoe, Hisashi; and Iwaasa, Hiroaki, 5,554,980, Cl. 340-825.720.

Matsuo, Kazuyoshi: *See*—
Haragakiuchi, Hideyuki; Tadokoro, Hiroyuki; Fukasawa, Nobuaki; Terashima, Isamu; Sasaki, Akira; Matsuo, Kazuyoshi; Onose, Katuyoshi; and Okuhama, Masashi, 5,555,074, Cl. 355-208.000.

Matsuo, Shuuitsu: *See*—
Kotaka, Hiroaki; Kurono, Nobuhisa; Yamaoka, Hidenori; Aiba, Yoshirou; and Matsuo, Shuuitsu, 5,554,204, Cl. 65-60.800.

Matsuo, Yasuo: *See*—
Okamoto, Kenichi; Kita, Hidetoshi; Kondo, Masakazu; Miyake, Norikazu; and Matsuo, Yasuo, 5,554,286, Cl. 210-500.250.

Matsuo, Yoshimi, to Clover Manufacturing Co. Ltd. Bias tape maker. 5,554,095, Cl. 493-440.000.

Matsuoka, Akihiko; Ohnishi, Hiroshi; Kumieda, Yoshinori; Misaizu, Kouei; and Yamamoto, Yuuri, to Matsushita Electric Industrial Co., Ltd. Frame synchronizing apparatus for quadrature modulation data communication radio receiver. 5,555,247, Cl. 370-105.100.

Matsushima, Fumiaki; Ohno, Yoshihiro; Ogino, Shigeyuki; and Matsui, Kuniyasu, to Seiko Epson Corporation. Color filter and method of preparation. 5,554,466, Cl. 430-7.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Aono, Hiroshi; Yokomakura, Mitsunori; Katano, Mitsunori; and Watanabe, Michiaki, 5,554,910, Cl. 313-497.000.
Imai, Takayuki; Naka, Motohiko; Shida, Takehiko; Sato, Masaaki; Yoshida, Kunio; Akamine, Ikuo; Shimizu, Makoto; and Uchida, Yoshiaki, 5,555,512, Cl. 364-550.000.
Inoue, Hiroshi; Hamada, Shinji; Matsuda, Hiromu; Ikoma, Munehisa; and Yamasaki, Hiroshi, 5,554,455, Cl. 429-53.000.
Inoue, Takayuki; Fukumoto, Masami; and Yamaura, Izumi, 5,553,347, Cl. 15-327.300.
Ishida, Tatsuaki; Sugita, Ryuji; Tohma, Kiyokazu; and Ban, Yasuaki, 5,554,440, Cl. 428-336.000.
Kotani, Hisakazu; Akamatsu, Hironori; and Fujita, Tsutomu, 5,555,527, Cl. 365-222.000.
Maruyama, Teruo; Abe, Yoshikazu; and Ikemoto, Yoshihiro, 5,553,742, Cl. 222-1.000.
Matsuoka, Akihiko; Ohnishi, Hiroshi; Kumieda, Yoshinori; Misaizu, Kouei; and Yamamoto, Yuuri, 5,555,247, Cl. 370-105.100.
Miyauchi, Shinji; Nakane, Shinichi; Asano, Kazutaka; Horiike, Yoshio; and Tsuboi, Makoto, 5,554,976, Cl. 340-626.000.
Nishihara, Munekazu; Yokoyama, Masahide; Shibasaki, Hatsuhiko; and Ohnishi, Youichi, 5,554,222, Cl. 118-723.0HC.
Oshima, Mitsuaki, 5,555,275, Cl. 375-261.000.
Shibayama, Akinori; and Yamada, Toshio, 5,554,953, Cl. 327-541.000.
Tanaka, Tetsuya; and Taniguchi, Takashi, 5,555,393, Cl. 395-460.000.
Terai, Hideo; Itoh, Akira; and Kitaguchi, Teruyuki, 5,555,322, Cl. 382-232.000.
Tsujikawa, Toshihiko; Mizuoka, Seiji; and Nagamoto, Masao, 5,555,316, Cl. 382-150.000.
Yamada, Katsu; and Ono, Shusuke, 5,555,132, Cl. 359-673.000.
Yoshitsugu, Takao; Ohata, Koichiro; and Kano, Tsuyoshi, 5,555,124, Cl. 359-200.000.

Matsushita Electronics Corporation: *See*—
Watanabe, Hisashi, 5,554,465, Cl. 430-5.000.

Matsushita Refrigeration Company: *See*—
Sasano, Hiroshi; Mangyo, Masao; Hamada, Koshi; and Kubota, Akihiko, 5,554,016, Cl. 417-569.000.

Matsushita, Souichi: *See*—
Gono, Takeshi; and Matsushita, Souichi, 5,553,588, Cl. 123-276.000.

Matsusita Electric Industrial Co., Ltd.: *See*—
Ninomiya, Kazuki; Nishiyama, Tamotsu; Miyake, Jiro; and Hasegawa, Katsuya, 5,555,197, Cl. 348-571.000.

Matsuura, Kazuo: *See*—
Suzuki, Motoyuki; Uchida, Tetsuo; and Matsuura, Kazuo, 5,555,476, Cl. 359-40.000.

Matsuura, Yozo: *See*—
Hatta, Hirotaka; Saitoh, Hiroshi; Kanda, Shigemi; Matsuura, Yozo; and Kamijo, Masahiko, 5,555,081, Cl. 355-298.000.

Matsuyama, Akinobu; Ito, Michio; Kobayashi, Yoshinori; and Kawada, Naoki, to Daicel Chemical Industries, Ltd. Bacteria useful for production of optically active 3-phenyl-1,3-propanediol. 5,554,532, Cl. 435-252.100.

Matsuyama, Akio: *See*—
Ohta, Masahiro; Matsuyama, Akio; Senoue, Eiji; Kuwano, Fumiaki; Yasui, Osamu; Yoshida, Yasunori; Ryu, Akinori; and Kobayashi, Tadashi, 5,554,765, Cl. 548-462.000.

Matsuzaki, Hideaki; Osawa, Hiroshi; and Gunji, Yoshihide, to Zexel Co., Ltd. Overvoltage protection device for capacitor externally connected to power IC. 5,555,148, Cl. 361-15.000.

Matsuzaki, Satoru: *See*—
Ohkura, Ken; Matsuzaki, Satoru; and Eskelinen, Pekka J., 5,554,439, Cl. 428-323.000.

Matteson, Robert W.: *See*—
Davis, Leighton I., Jr.; Matteson, Robert W.; and Dage, Gerhard A., 5,553,776, Cl. 236-49.300.

Matthews, Gary B., to Minnesota Mining and Manufacturing Company. Modular connector with separable wire retention. 5,554,053, Cl. 439-719.000.

Matula, Paul A.; and Remiszewski, Stanley H., to United States Surgical Corporation. Surgical retractor. 5,554,101, Cl. 600-214.000.

Mauleon Casellas, David: *See*—
Carganico, Germano; Mauleon Casellas, David; and Garcia Perez, M. Luisa, 5,554,789, Cl. 562-460.000.

Maxtor Corporation: *See*—
McNeil, Michael, 5,555,482, Cl. 360-125.000.

Maxwell, Francoise: *See*—
Harrison, Gail M.; Maxwell, Ian H.; Curiel, Tyler J.; and Maxwell, Francoise, 5,554,528, Cl. 435-240.200.

Maxwell, Ian H.: *See*—
Harrison, Gail M.; Maxwell, Ian H.; Curiel, Tyler J.; and Maxwell, Francoise, 5,554,528, Cl. 435-240.200.

Maxwell, Randolph E.: *See*—
Chiu, Bernard; Maxwell, Randolph E.; Gatchell, Stephen M.; Bradley, Jerald; Longan, John; and Jané, Rodney, 5,553,607, Cl. 128-203.260.

Mayer, Dale J.: *See*—
Walker, William J.; Goodrum, Alan L.; and Mayer, Dale J., 5,555,250, Cl. 371-40.100.

Mayfield, John W.: *See*—
Scheve, B. Joseph; Mayfield, John W.; and DeNicola, Anthony J., Jr., 5,554,668, Cl. 522-157.000.

Mayo Foundation For Medical Education & Research: *See*—
Morrey, Bernard F.; McLeod, John J., Jr.; and Schultz, Frederick M., 5,554,111, Cl. 604-26.000.

Mazda Motor Corporation: *See*—
Nishioka, Futoshi; Hosokai, Tetsushi; and Tanaka, Kazuo, 5,553,595, Cl. 123-698.000.
Yamashita, Tetsuhiro; and Hirai, Koji, 5,555,499, Cl. 364-426.030.

Mazer, Terrence B.: *See*—
Dewille, Normanella T.; Mazer, Terrence B.; Parke, Edward H.; Cipriano, Francis J.; and Raube, Dennis L., 5,554,589, Cl. 514-2.000.

Mazoyer, Thierry: *See*—
Gschwind, Michel; Mitsuta, Tatsumi; Guyomar, Daniel; Sauzade, Jean-Denis; and Mazoyer, Thierry, 5,554,905, Cl. 310-323.000.

Mazzarella, Richard B.: *See*—
Demmin, Hollis C.; Mazzarella, Richard B.; and Borkman, James D., 5,554,273, Cl. 205-785.000.

McAllister, Diane L.: *See*—
Kacian, Daniel L.; McAllister, Diane L.; McDonough, Sherrol H.; and Dattagupta, Nanibhushan, 5,554,516, Cl. 435-91.210.

McArthur, Kelly M., to Intel Corporation. Apparatus and method for performing asynchronous multi-standard VBI data extraction. 5,555,025, Cl. 348-478.000.

McArthur, Warren F., to Hughes Aircraft Company. Multilevel metallization process for use in fabricating microelectronic devices. 5,554,884, Cl. 257-634.000.

McBeth, Richard R.: *See*—
Tapia, Javier J.; McBeth, Richard R.; and O'Neil, Paul E., 5,555,285, Cl. 379-28.000.

McBreen, James R.: *See*—
Alfemess, Merwin H.; Caldarale, Charles R.; Johnson, David R.; Kerzman, Joseph P.; and McBreen, James R., 5,555,396, Cl. 395-474.000.

McBride, Karen E.: *See*—
Porchia, Jose; Dais, Brian C.; McBride, Karen E.; Farrelly, D. Lyn; and Steele, Robert R., 5,554,093, Cl. 493-240.000.

MCC - Molecular Simulations: *See*—
Teig, Steven L.; and Kahn, Scott D., 5,555,366, Cl. 395-161.000.

McCabe, Laurence J.: *See*—
Snider, A. Rebecca; Bennett, Richard M.; McCabe, Laurence J.; Magsig, Peter J.; Ng, Kane L.; Purdy, Lynn M.; and Ruffles, Joseph W., 5,553,620, Cl. 128-660.040.

McCalmont, David T.: *See*—

Maloney, Michael J.; Hitson, Bruce L.; and McCalmont, David T., 5,555,299, Cl. 379-212.000.
McCarty, George R.: *See*—
Ali, Yusuf; Jani, Rajni; and McCarty, George R., 5,554,367, Cl. 424-78.040.
McClement, Arthur, to Otis Elevator Company. Overlay for a passenger conveyor roller track. 5,553,697, Cl. 198-332.000.
McCloskey, Charles R. Pay telephone stand. 5,555,296, Cl. 379-145.000.
McClung, Guy L., III: *See*—
VanNatter, Charlie H., III; and McClung, Guy L., III, 5,553,570, Cl. 119-709.000.
McCormack, Richard A., to Ramco, Inc. Clathrate freeze desalination apparatus and method. 5,553,456, Cl. 62-59.000.
McCormick, Allyn L.: *See*—
Aghajanian, Michael K.; Langensiepen, Ralph A.; Kennedy, Christopher R.; Rocazella, Michael A.; Wiener, Robert J.; Hanon, Gregory E.; Crowther, John J.; and McCormick, Allyn L., 5,553,657, Cl. 164-97.000.
McCown, Bruce A.: *See*—
Bloomfield, Mark C.; Castro, Edward F.; Dyer, Joseph T.; Jackson, Deborah J.; Lemons, Charles E.; McCown, Bruce A.; Mullis, Johnny P.; and Troxell, Brian A, 5,555,100, Cl. 358-402.000.
McCoy, Daniel M.: *See*—
Campbell, Douglas C.; Gloceri, Gary J.; and McCoy, Daniel M., 5,555,173, Cl. 364-424.050.
McCulloch, Doyle W. Energy efficient electromagnetic circuit. 5,554,961, Cl. 335-78.000.
McCurry, Patrick M., Jr.; Klein, Robert L., Jr.; Gibson, Michael W.; Beaulieu, James D.; and Varvil, Janet R., to Henkel Corporation. Continuous bleaching of alkylpolyglycosides. 5,554,740, Cl. 536-4.100.
McDonald, James; Sturtevant, Charles N., III; Monteith, John; and Monteith, Mark, to Creative Bio Tech, Inc. Stick-free syringe and associated methods. 5,554,130, Cl. 604-198.000.
McDonough, Sherrol H.: *See*—
Kacian, Daniel L.; McAllister, Diane L.; McDonough, Sherrol H.; and Dattagupta, Nanibhushan, 5,554,516, Cl. 435-91.210.
McDougald, Mack D., to Davis Water & Waste Industries, Inc. Traveling bridge filter system and associated underdrain. 5,554,281, Cl. 210-273.000.
McDougall, Floyd H.: *See*—
Lawrence, Charles E.; McDougall, Floyd H.; and Lundschen, Jay W., 5,555,277, Cl. 375-346.000.
MCEL P.L.C.: *See*—
Rhodes, John G. L., deceased; Turner, Ronald, executor; Hobden, Mervyn K.; Wilson, Alan T.; and Hilder, Graham M., 5,555,016, Cl. 348-6.000.
McElroy, Lucian G. Tapered bag blower system. 5,553,346, Cl. 15-316.100.
McGaw, Inc.: *See*—
Owens, Dana J.; Raines, Aaron; Rasmussen, Ed G.; Ozinga, David G.; Harrison, David J.; and Anderson, C.:1 R., 5,554,013, Cl. 417-413.100.
McGean-Rohco, Inc.: *See*—
Bokisa, George S.; and Willis, William J., 5,554,211, Cl. 106-1.220.
McGinley, Dan. Recessed fire detector. 5,555,455, Cl. 340-627.000.
MCI Communications Corporation: *See*—
McLeod, Clark E.; Hogan, Steven J.; Feltz, Kristi T.; Murdock, Douglas R.; and Hanson, Van E., 5,555,290, Cl. 379-67.000.
McIntosh, P. Stuckey: *See*—
Snelling, Richard K.; McIntosh, P. Stuckey; and Tucker, Mark, 5,555,258, Cl. 370-29.000.
McJunkin, H. P., Jr.: *See*—
McJunkin, Mark P.; and McJunkin, H. P., Jr., 5,553,880, Cl. 280-283.000.
McJunkin, Mark P.; and McJunkin, H. P., Jr. Energy-absorber for a bicycle frame. 5,553,880, Cl. 280-283.000.
McKinney, Terry L., to Northrop Grumman Corporation. Airspace management system and method. 5,554,990, Cl. 342-36.000.
McKoon, Carl T.; and McKoon, Michael T. Golf putter. 5,553,858, Cl. 473-294.000.
McKoon, Michael T.: *See*—
McKoon, Carl T.; and McKoon, Michael T., 5,553,858, Cl. 473-294.000.
McKown, Russell C.; Quinn, Michael D.; and Yelderman, Mark L. System and method for controlling the temperature of a catheter-mounted heater. 5,553,622, Cl. 128-692.000.
McLellan, Robert N.; and Chiu, Anthony M., to Texas Instruments Incorporated. Integrated circuit device having improved post for surface-mount package. 5,555,488, Cl. 361-820.000.
McLeod, Clark E.; Hogan, Steven J.; Feltz, Kristi T.; Murdock, Douglas R.; and Hanson, Van E., to MCI Communications Corporation. Long distance telephone switching system with enhanced subscriber services. 5,555,290, Cl. 379-67.000.
McLeod, John J., Jr.: *See*—
Morrey, Bernard F.; McLeod, John J., Jr.; and Schultz, Frederick M., 5,554,111, Cl. 604-26.000.
McMahon, Jerry K.; Olsen, Floyd W.; and Seward, Matthew F., to International Business Machines Corporation. High speed shunt regulator. 5,554,924, Cl. 323-229.000.
McManus, John H. Skishoes with brakes and extension and retraction limit stops therefor. 5,553,403, Cl. 36-124.000.
McMaster, James; and Petersen, Michael, to Coleman Company, Inc., The. Backpack assembly. 5,553,759, Cl. 224-631.000.
McMillian, Ray M. Beverage container and dispenser. 5,553,745, Cl. 222-92.000.
McMullin, Francis A.: *See*—
Rowe, Marlin D.; and McMullin, Francis A., 5,553,871, Cl. 277-177.000.
McNeil, Michael, to Maxtor Corporation. Etched erase band feature for thin film recording heads. 5,555,482, Cl. 360-125.000.
Mead Corporation, The: *See*—
Bakx, Martinus C. M., 5,553,705, Cl. 206-158.000.
Mead, Donald C.; Gold, Ronald S.; and Fritz, Victor J., to Hughes Aircraft Company. Very high resolution light valve writing system based on tilting lower resolution flat panels. 5,555,035, Cl. 348-757.000.
Meares, Peter: *See*—
Bright, Nicholas; Burfield, Paul A.; Pontefract, John; Harrison, Bernard F.; Meares, Peter; Burgin, David R.; Devaney, Andrew S.; and Kindersley, Peter T., 5,554,852, Cl. 250-492.210.
Medevelop AB: *See*—
Brånemark, Per-Ingvar, 5,554,027, Cl. 433-172.000.
Medical Laser Technology, Inc.: *See*—
Kowalyk, Kenneth; and Myers, Michael J., 5,554,029, Cl. 433-215.000.
Medina, Kay L.: *See*—
Kincade, Paul W.; and Medina, Kay L., 5,554,595, Cl. 514-21.000.
MedLogic Global Corporation: *See*—
Byram, Michael M.; Goebel, Robert; Greff, Richard J.; and Barley, Leonard V., Jr., 5,554,365, Cl. 424-78.020.
Medovations: *See*—
Stanford, Charles G.; and Brown, Michael J., 5,554,138, Cl. 604-280.000.
Medtronic, Inc.: *See*—
Dinh, Thomas Q.; Dror, Michael; and Schwartz, Robert S., 5,554,182, Cl. 623-1.000.
Kieval, Robert S.; and Soykan, Orhan, 5,554,177, Cl. 607-17.000.
Meehan, Richard J., to Schlumberger Technology Corporation. Method for improving signal to noise ratio. 5,555,530, Cl. 367-45.000.
Meier, Albert H.: *See*—
Cincotta, Anthony H.; and Meier, Albert H., 5,554,623, Cl. 514-288.000.
Meiji Seika Kaisha, Ltd.: *See*—
Teuber, Lene; Axelsson, Oskar; and Wätjen, Frank, 5,554,630, Cl. 514-338.000.
Teuber, Lene; Axelsson, Oskar; and Watjen, Frank, 5,554,632, Cl. 514-338.000.
Meisel, Philip L.: *See*—
Trapasso, Louise E.; Padegimas, Stanley J.; Epstein, Peter F.; Hung, Paul L. K.; Mukhopadhyay, Purnendu; and Meisel, Philip L., 5,554,785, Cl. 560-201.000.
Meiwes, Johannes: *See*—
Wendel, Friedrich; Franz, Manfred; Meiwes, Johannes; Hammer, Uwe; Altmann, Michael; and Dick, Dieter, 5,554,901, Cl. 310-162.000.
Melendy, Peter S.; and Belanger, Richard A. Nozzle adaptor for applying hot melt adhesive. 5,553,758, Cl. 222-533.000.
Melief, Cornelis J. M.; Visseren, M. J. W.; Kast, W. M.; van der Bruggen, Pierre; and Boon-Falleur, Thierry, to University of Leiden. Isolated tumor rejection antigen precursor MAGE-2 derived peptides, and uses thereof. 5,554,724, Cl. 530-328.000.
Meltic AB: *See*—
Axelsson, Sven-Inge S.; and Karlsson, Åke I., 5,553,797, Cl. 241-285.300.
Melville, James B.: *See*—
Behan, John M.; Clements, Christopher F.; Hooper, David C.; Martin, John R.; Melville, James B.; and Perring, Keith D., 5,554,588, Cl. 512-1.000.
Memeteau, Michel: *See*—
Audoire, Philippe; and Memeteau, Michel, 5,553,761, Cl. 224-321.000.
Meneghini, Gianluigi. Device for measuring the distance between the tool tip and the surface of material to be worked with an electronic pantograph. 5,553,388, Cl. 33-23.010.
Menendez, Norberto; Potrebic, Peter J.; and Sharpe, Benjamin W., to Apple Computer, Inc. Method of creating packages for a pointer-based computer system. 5,555,369, Cl. 395-161.000.
Meng, Chinkai, to Hewlett-Packard Company. Method and apparatus for preserving the sensitivity of a thermionic ionization detector. 5,554,540, Cl. 436-153.000.
Menhennett, Herbert E.; and Brown, Robert B., to BPM Technology, Inc. Apparatus and method for making three-dimensional articles using bursts of droplets. 5,555,176, Cl. 364-468.250.
Menyhay, Steve Z. Sterile medical injection port and cover method and apparatus. 5,554,135, Cl. 604-256.000.
Menz, Edward T.: *See*—
Groman, Ernest V.; Menz, Edward T.; Enriquez, Philip M.; Jung, Chu; Lewis, Jerome M.; and Josephson, Lee, 5,554,386, Cl. 424-488.000.
Mercedes-Benz AG: *See*—
Bäuerle, Emil; and Korte, Magnus, 5,553,592, Cl. 123-456.000.
Sacco, Bruno; Tomforde, Johann; Reichel, Anton; Steinle, Gerhard; Klein, Berthold; Slaughter, David; and Ma, Mike, 5,553,909, Cl. 296-185.000.
Merchant, David E.: *See*—
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Merchant, Kevin J.: *See*—
Lewis, Richard T.; MacLeod, Angus M.; and Merchant, Kevin J., 5,554,627, Cl. 514-305.000.
Merck & Co., Inc.: *See*—

Rivero, Ralph A.; Chakravarty, Prasun K.; Greenlee, William J.; Kevin, Nancy J.; and Mantlo, Nathan B., 5,554,625, Cl. 514-303.000.
Merck, Sharp & Dohme Ltd.: *See*—
Baker, Raymond; Matassa, Victor G.; Reeve, Austin J.; Sternfeld, Francine; and Street, Leslie J., 5,554,629, Cl. 514-323.000.
Lewis, Richard T.; MacLeod, Angus M.; and Merchant, Kevin J., 5,554,627, Cl. 514-305.000.
Teall, Martin R., 5,554,633, Cl. 514-357.000.
Merensky, Harald, to Keiper Recaro GmbH & Co. Airplane passenger seat row. 5,553,813, Cl. 244-118.600.
Mergenthaler, Rolf-Hermann: *See*—
Schnaibel, Eberhard; Mergenthaler, Rolf-Hermann; Reuschenbach, Lutz; Veil, Hans; and Weiss, Eduard, 5,553,593, Cl. 123-682.000.
Merger, Franz; Otterbach, Andreas; Witzel, Tom; and Renz, Hans, to BASF Aktiengesellschaft. 2,2-dialkylpentane 1,5-diisocyanates, 2,2-dialkylpentane 1,5-diurethanes and 2,2-dialkylpentane 1,5-dicarbamoyl chlorides, and their preparation and use. 5,554,787, Cl. 560-355.000.
Merrell Pharmaceuticals Inc.: *See*—
Whitten, Jeffrey P.; and Rudisill, Duane E., 5,554,773, Cl. 552-104.000.
Wolf, Richard A., 5,554,780, Cl. 556-436.000.
Merriken, James R.: *See*—
Dean, David L.; Malanowski, Alan J.; Merriken, James R.; and Szentesi, Otto I., 5,555,332, Cl. 385-53.000.
Merten, Gerhard; and Hoelken, Thomas, to Westfalia Becorit Industrietechnik GmbH. Apparatus for automatically adjusting the cutting horizon of a mining extraction apparatus. 5,553,925, Cl. 299-1.100.
Mery, Jean Claude; and Pressaco, Pierre, to AlliedSignal Europe Services Techniques. Mechanically actuated drum brake. 5,553,691, Cl. 188-338.000.
Meschkat, Reinhard; Rampel, Hans; and Rodde, Thomas, to Brose Fahrzeugteile GmbH & Co. KG. Seat cushion adjustment for vehicle seats. 5,553,920, Cl. 297-344.140.
Mesolella, John A.: *See*—
Fuss, Fred M.; and Mesolella, John A., 5,553,965, Cl. 403-291.000.
Messersmith, Phillip B.: *See*—
Giannelis, Emmanuel P.; and Messersmith, Phillip B., 5,554,670, Cl. 523-209.000.
Metasphere, Inc.: *See*—
Allen, Arthur D., 5,555,415, Cl. 395-700.000.
Metzger, W. James: *See*—
Fisher, Robert H.; Metzger, W. James; and Henriksen, Ruth A., 5,554,590, Cl. 514-8.000.
Metzler, Richard A.; and Rodov, Vladimir, to Semicon Semiconductors. Uniform current density and high current gain bipolar transistor. 5,554,880, Cl. 257-560.000.
Meyer, Norbert: *See*—
Keil, Michael; Schirmer, Ulrich; Kolassa, Dieter; Kast, Juergen; Wuerzer, Bruno; and Meyer, Norbert, 5,554,582, Cl. 504-344.000.
Meyer, Robert E.: *See*—
Dewhirst, Mark W.; Meyer, Robert E.; Bonaventura, Joseph; and DeAngelo, Joseph, 5,554,638, Cl. 514-398.000.
Meyerhoefer, Daniel T., to Eastman Kodak Company. Flash indication aid for cameras with manual flash. 5,555,046, Cl. 354-149.110.
Meyers, Stephan B.: *See*—
Sandor, Ellen R.; Cunnally, William T.; and Meyers, Stephan B., 5,554,432, Cl. 428-157.000.
Meyers, Steven J.: *See*—
Steinfeld, George; Meyers, Steven J.; and Lee, Arthur, 5,554,453, Cl. 429-17.000.
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O'Donnell, Martin J.; Wu, Shengde; Esikova, Irena; and Mi, Aiqiao, 5,554,753, Cl. 546-134.000.
Michaels, Tracy E.; Narva, Kenneth E.; and Foncerrada, Luis, to Mycogen Corporation. *Bacillus thuringiensis* toxins active against scarab pests. 5,554,534, Cl. 435-252.300.
Michaelson, Wayne A.: *See*—
De Subijana, Joseba M.; Robeck, Gary R.; Michaelson, Wayne A.; and Wierdsma, Steven M., 5,555,391, Cl. 395-440.000.
Michels, Lester D.; Duchon, Douglas J.; and Reid, Norman C., to Sandoz Nutrition Ltd. Feeding tube retaining strap. 5,554,140, Cl. 604-283.000.
Michelsen, Klaus: *See*—
Schneider, Heinz-Walter; Wilms, Axel; Schmitz, Rüdiger; Schulz, Robert; and Michelsen, Klaus, 5,554,353, Cl. 423-387.000.
Michigan TransTech Corporation: *See*—
Ensminger, William D.; and Gavin, Robert F., 5,554,117, Cl. 604-93.000.
Micka, William Frank: *See*—
Duyanovich, Linda Marie; Micka, William Frank; and Shomler, Robert Wesley, 5,555,371, Cl. 395-182.110.
Micro Motion, Inc.: *See*—
Derby, Howard V.; Bose, Tamal; and Rajan, Seeraman, 5,555,190, Cl. 364-510.000.
Micro Therapeutics, Inc.: *See*—
Wallace, George B.; Evans, Scott M.; and Cragg, Andrew H., 5,554,114, Cl. 604-53.000.
Micron Technology, Inc.: *See*—
Parkinson, Ward D.; Waller, William K.; and Seyyedy, Mirmajid, 5,555,429, Cl. 395-800.000.
Sher, Joseph C., 5,555,166, Cl. 363-49.000.
Middlesex Sciences, Inc.: *See*—
Woiszwillo, James E.; and Di, Jie, 5,554,730, Cl. 530-410.000.
Middleton, Paul L.; and Zeller, John L., to Cummins Electronics Company, Inc. Variable droop engine speed control system. 5,553,589, Cl. 123-352.000.
Midland Brake, Inc.: *See*—
Hart, James D.; and Moody, Michael J., 5,553,928, Cl. 303-7.000.
Mier, Randall M.: *See*—
Cozzette, Stephen N.; Davis, Graham; Lauks, Imants R.; Mier, Randall M.; Piznik, Sylvia; Smit, Nicolaas; Van Der Werf, Paul; and Wieck, Henry J., 5,554,339, Cl. 422-50.000.
Migny, Philippe; and Passet, Pierre, to Securite et Signalisation - S.E.S. Display matrix comprising light-emitting fibers that are maskable by disks each having a plurality of sectors. 5,555,339, Cl. 385-115.000.
Mihalik, Michael: *See*—
Brown, Thomas E.; Carlson, Jon D.; Cook, Michael W.; Mihalik, Michael; and Davisson, Jack A., 5,554,242, Cl. 156-111.000.
Miki, Takahiro: *See*—
Kumamoto, Toshio; and Miki, Takahiro, 5,554,989, Cl. 341-159.000.
Milionis, Konstantin: *See*—
Czermak, Karl; Milionis, Konstantin; Tessmer, Gero; and Whipp, Roy H., Jr., 5,554,206, Cl. 75-446.000.
Milk Specialties Company: *See*—
Thompson, William H.; Arentson, Roger; and Tomkins, Trevor, 5,553,743, Cl. 222-52.000.
Millay, Lawrence I.; and Crossman, Richard E., to Bryant Grinder Corporation. Centerless grinder having inside diameter size control and method therefor. 5,554,063, Cl. 451-9.000.
Miller, Allen W. Cable guard slide. 5,553,600, Cl. 124-86.000.
Miller, James G.: *See*—
Mailey, Desmond; Rodriguez, Jose J.; Fregoe, Jerry P.; Stevens, Curtis L.; Dettmers, Frank M., Sr.; Brown, Glenn L.; Kitzer, Gary L.; Miller, James G.; Hillbrands, Martin J.; Strebel, Carl F.; and King, Thomas A., 5,553,525, Cl. 83-184.000.
Miller, James R., to Manhasset Specialty Co. Method for producing a shaft clutch component. 5,553,382, Cl. 29-896.900.
Miller, Matthew J.: *See*—
Harrison, Kent D.; Hendrickson, Gary L.; Holman, Thomas J.; Lafontaine, Daniel M.; Miller, Matthew J.; and Robinson, David B., 5,554,119, Cl. 604-96.000.
Miller, Matthew S.: *See*—
DeHaven-Hudkins, Diane L.; Dority, John A., Jr.; Earley, William G.; Kumar, Virendra; Mallamo, John P.; Miller, Matthew S.; and Subramanyam, Chakrapani, 5,554,620, Cl. 514-278.000.
Miller Process Coating Co.: *See*—
Miller, William J., 5,553,547, Cl. 101-485.000.
Miller, Robert J.: *See*—
Monkelbaan, Daniel R.; Resetarits, Michael R.; and Miller, Robert J., 5,554,329, Cl. 261-98.000.
Miller, Scott A.: *See*—
Horner, Glenn A.; Miller, Scott A.; Heim, Warren P.; Blankenship, Larry K.; and Brassell, James L., 5,554,172, Cl. 607-88.000.
Miller, Steven D., to Thomas & Betts Corporation. Electrical connector employing dual locking contact retention. 5,554,055, Cl. 439-752.000.
Miller, Thomas, to PSC Technologies, Inc. Oxide slurry for industrial process applications. 5,554,355, Cl. 423-489.000.
Miller, Todd: *See*—
Robertson, Thomas; Miller, Todd; and Quinn, Dennis, 5,554,021, Cl. 431-9.000.
Miller, William J., to Miller Process Coating Co. Laser controlled indexer for printing on ware. 5,553,547, Cl. 101-485.000.
Millipore Investment Holdings Limited: *See*—
Moya, Wilson; and Goddard, Philip M., 5,554,414, Cl. 427-244.000.
Rising, Donald B., 5,554,536, Cl. 435-305.100.
Mills, David E.: *See*—
Weaver, Max A.; Mills, David E.; Tanner, James, III; Fleischer, Jean C.; Pruett, Wayne P.; and Moody, L. Shane, 5,554,720, Cl. 528-295.000.
Mimoun, Hubert; and Jia, Chengguo, to Firmenich S.A. Process for the preparation of carboxylic esters defined from allylic alcohols. 5,554,786, Cl. 560-243.000.
Mimura, Taku: *See*—
Tsukada, Kiyoshi; Hattori, Yasuyuki; and Mimura, Taku, 5,554,574, Cl. 502-345.000.
Min, Young-hoon, to Samsung Electronics Co., Ltd. Apparatus for electrically detecting starting/ending portions of a tape. 5,555,141, Cl. 360-74.700.
Mina, Rami: *See*—
Bogdanowicz, Mitchell J.; Sehlin, Richard C.; and Mina, Rami, 5,555,085, Cl. 356-300.000.
Minai, Masayoshi: *See*—
Tsubata, Yoshiaki; Ueda, Kayoko; Fujisawa, Koichi; Higashii, Takayuki; Minai, Masayoshi; Takano, Naoyuki; and Fujimoto, Yukari, 5,554,317, Cl. 252-299.010.
Minami, Shigenobu; and Okada, Osamu, to Kabushiki Kaisha Toshiba. Stereo voice transmission apparatus, stereo signal coding/decoding apparatus, echo canceler, and voice input/output apparatus to which this echo canceler is applied. 5,555,310, Cl. 381-17.000.
Minder, Ernst; and Hofherr, Walther, to Ciba-Geigy Corporation. Coated material, the preparation of use thereof. 5,554,446, Cl. 428-411.100.
Mining Technologies, Inc.: *See*—
Blackstock, Jon C.; Baird, John A., Jr.; and Carr, Ian T., 5,553,926, Cl. 299-10.000.
Minneman, Allen J.: *See*—

Minneman, Steven W.; and Minneman, Allen J., 5,553,717, Cl. 211-13.000.
Minneman, Steven W.; and Minneman, Allen J., to MTM Molded Products Company. Portable organizer. 5,553,717, Cl. 211-13.000.
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Mitsubishi Denki Kabushiki Kaisha: *See*—
Ajika, Natsuo; and Ohba, Atsushi, 5,554,867, Cl. 257-314.000.
Anami, Kenji; Obbayashi, Shiseki; and Inaye, Osamu, 5,555,522, Cl.

Ninomiya, Kazuki; Nishiyama, Tamotsu; Miyake, Jiro; and Hasegawa, Katsuya, 5,555,197, Cl. 348-571.000.
Miyake, Nobuyki: *See*—
Moir, Graydon E.; Moir, Floyd W.; and Cressotti, Karl, 5,554,031, Cl. 434-111.000.
Moir, Graydon E.; Moir, Floyd W.; and Cressotti, Karl, to Retina Systems,

Minneman, Steven W.; and Minneman, Allen J., 5,553,717, Cl. 211-13.000.

Minneman, Steven W.; and Minneman, Allen J., to MTM Molded Products Company. Portable organizer. 5,553,717, Cl. 211-13.000.

Minnesota Mining and Manufacturing Company: *See*—
Ario, Paula D.; and Azaen, Steven M., 5,554,030, Cl. 433-226.000.
Carim, Hatim M.; Knudson, Orlin B.; Ekholm, Bruce P.; Erickson, David P.; Kelliher, William J., Jr.; and Rude, Michael J., 5,553,615, Cl. 128-633.000.
Carr, Jeanne M.; Clampitt, Jeffrey R.; and Zimmerman, Dean R., 5,554,068, Cl. 451-468.000.
Frisch, Kurt C., Jr.; Edwards, Bruce H.; Sengupta, Ashok; Holland, Lowell W.; Hansen, Richard G.; and Owen, Ian R., 5,554,686, Cl. 524-588.000.
Lamanna, William M.; Palazzotto, Michael C.; Mahoney, Wayne S.; and Kropp, Michael A., 5,554,664, Cl. 522-25.000.
Matthews, Gary B., 5,554,053, Cl. 439-719.000.
Niederhofer, Laura S.; Wood, Leigh E.; and Polski, Stephen P., 5,554,146, Cl. 604-391.000.
Novack, James C.; Neamy, Scott A.; and Scholz, Matthew T., 5,553,366, Cl. 28-170.000.
Pitzen, James F.; Smith, Jeffrey D.; and Alexson, Charles E., 5,553,675, Cl. 173-217.000.

Minntech Corporation: *See*—
Brinda, Paul D.; and Cosentino, Louis C., 5,554,283, Cl. 210-321.800.

Minolta Camera Kabushiki Kaisha: *See*—
Tsuji, Sadafusa; and Okada, Hiroyuki, 5,555,047, Cl. 354-106.000.

Minolta Co., Ltd.: *See*—
Yoshiyama, Tsugihito, 5,555,076, Cl. 355-208.000.

Minowa, Masahiro: *See*—
Miyasaka, Masayo; Ito, Yoshikazu; Minowa, Masahiro; and Yawata, Kazunari, 5,555,349, Cl. 395-111.000.

Minto, James, to Western Atlas International, Inc. Slickline conveyed well-bore seismic receiver. 5,555,220, Cl. 367-86.000.

Mintun, Thomas G.: *See*—
Chea, Yaobin; and Mintun, Thomas G., 5,553,609, Cl. 128-630.000.

Mintz, Doron: *See*—
Dangelo, Carlos; Watkins, Daniel; and Mintz, Doron, 5,555,201, Cl. 364-489.000.

Miracle Recreation Equipment Company: *See*—
Von Parrish, Terry, 5,554,074, Cl. 472-116.000.

Mirhoseini, Mahmood: *See*—
Aita, Michael; Mirhoseini, Mahmood; Cayton, Mary; Simpson, Carl J.; and Guscott, Brian, 5,554,152, Cl. 606-7.000.

Mirochnik, Emmanuel A.: *See*—
Bidnyy, Sergei V.; Zavadtsev, Alexander A.; Mirochnik, Emmanuel A.; Mishchenko, Alexander V.; Pirozhenko, Vitaly M.; and Radchenko, Igor V., 5,554,856, Cl. 250-455.110.

Misaizu, Kouei: *See*—
Matsuoka, Akihiko; Ohnishi, Hiroshi; Kunieda, Yoshinori; Misaizu, Kouei; and Yamamoto, Yuuri, 5,555,247, Cl. 370-105.100.

Misaki, Hiroyuki: *See*—
Saito, Makoto; Chiba, Yoshimasa; and Misaki, Hiroyuki, 5,554,672, Cl. 523-466.000.

Mishchenko, Alexander V.: *See*—
Bidnyy, Sergei V.; Zavadtsev, Alexander A.; Mirochnik, Emmanuel A.; Mishchenko, Alexander V.; Pirozhenko, Vitaly M.; and Radchenko, Igor V., 5,554,856, Cl. 250-455.110.

Mishra, Chittra: *See*—
Blanchette, Robert A.; Brush, Theresa S.; Farrell, Roberta L.; Krisa, Keith A.; and Mishra, Chittra, 5,554,535, Cl. 435-254.100.

Missaggia, Lee J.: *See*—
Walpole, James N.; Kintzer, Emily S.; Chinn, Stephen R.; Wang, Christine A.; and Missaggia, Lee J., 5,555,544, Cl. 372-50.000.

Mista, Kresimir: *See*—
Hohne, Hans-Jurgen; and Mista, Kresimir, 5,553,470, Cl. 66-205.000.

Mistry, Pravin: *See*—
Turchan, Manuel C.; and Mistry, Pravin, 5,554,415, Cl. 427-248.100.

Mita, Akimitsu: *See*—
Watanabe, Koji; Sugita, Toru; Kobayashi, Yasutomo; Shibao, Masaharu; and Mita, Akimitsu, 5,553,428, Cl. 52-208.000.

Mita Industrial Co., Ltd.: *See*—
Fukano, Masahiko; Nakade, Toshiyuki; and Kageyama, Hiroshi, 5,555,075, Cl. 355-208.000.

Mitchell, Oscar R.: *See*—
Grohoski, Gregory F.; Mitchell, Oscar R.; Nguyen, Tung M.; and Rim, Yongjae, 5,555,543, Cl. 370-58.100.

Mitchell, Ralph M.: *See*—
Li, Edward; Mitchell, Ralph M.; and Aseltine, John H., 5,554,921, Cl. 320-22.000.

MiTek Holdings, Inc.: *See*—
Olden, Michael M., 5,553,961, Cl. 403-119.000.

Mitek Surgical Products, Inc.: *See*—
Gatturna, Roland F.; Nicholson, James E.; and O'Leary, James, 5,554,171, Cl. 606-232.000.

Mitron Systems Corporation: *See*—
Dixon, Donald A., 5,554,907, Cl. 310-339.000.

Mitsubishi Chemical America, Inc.: *See*—
Cais, Rudolf E.; and Gerriets, Frederick W., 5,554,473, Cl. 430-59.000.

Mitsubishi Chemical MKV Company: *See*—
Niikuni, Tokio; and Noro, Yukio, 5,554,707, Cl. 526-344.200.

Oshima, Masabumi, 5,554,683, Cl. 524-569.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Ajika, Natsuo; and Ohba, Atsushi, 5,554,867, Cl. 257-314.000.
Anami, Kenji; Ohbayashi, Shigeki; and Inoue, Osamu, 5,555,522, Cl. 365-200.000.
Ban, Cozy; Yanagi, Motonori; Fukumoto, Takaaki; Manabe, Toshiki; Yanome, Hiroshi; and Kawada, Kazuhiko, 5,554,295, Cl. 210-668.000.
Fukui, Wataru; and Hashimoto, Atsuko, 5,554,802, Cl. 73-117.300.
Fukumoto, Hiroshi; Tanaka, Naoya; Oda, Keisuke; Arimoto, Kazuaki; Yoshida, Takashi; Higashi, Kazuhiko; Kasahara, Yasunori; and Kuwada, Terumi, 5,555,462, Cl. 347-218.000.
Hashimoto, Hiroshi, 5,555,178, Cl. 364-474.170.
Hashimoto, Koosuke; Matsuo, Eiji; Kawagoe, Hisashi; and Iwaasa, Hiroaki, 5,554,980, Cl. 340-825.720.
Hayashi, Naoto; and Nakamura, Kazuo, 5,555,225, Cl. 368-10.000.
Hayashikoshi, Masanori; Terada, Yasushi; Nakayama, Takeshi; Miyawaki, Yoshikazu; and Kobayashi, Shinichi, 5,554,868, Cl. 257-315.000.
Ishibashi, Takeo; Ishikawa, Eiichi; and Kanai, Itaru, 5,554,489, Cl. 430-326.000.
Kondoh, Harufusa, 5,555,278, Cl. 375-376.000.
Kumamoto, Toshio; and Miki, Takahiro, 5,554,989, Cl. 341-159.000.
Kuroi, Takashi, 5,554,883, Cl. 257-617.000.
Kusunoki, Shigeru; and Inuishi, Masahide, 5,554,876, Cl. 257-411.000.
Okimoto, Yukihiro; Furui, Takashi; and Ohmae, Katsuhiko, 5,555,174, Cl. 364-424.050.
Sawai, Akiyoshi; Shimamoto, Haruo; Tachikawa, Toru; and Shibata, Jun, 5,554,887, Cl. 257-737.000.
Uchikawa, Fusaoki; Matsuno, Shigeru; Kinouchi, Shinichi; and Watarai, Hisao, 5,555,154, Cl. 361-322.000.
Ueda, Masahiro; and Matsue, Shuichi, 5,554,824, Cl. 174-52.400.
Yamashita, Tomohiro; and Shimizu, Satoshi, 5,554,871, Cl. 257-336.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
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Okimoto, Yukihiro; Furui, Takashi; and Ohmae, Katsuhiko, 5,555,174, Cl. 364-424.050.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Shigenaga, Hisao; Fujita, Ichiro; Yamamoto, Masayuki; Hamana, Michio; Morishita, Keiichi; Tachikawa, Fumitoshi; Uehara, Hideo; and Iida, Yasuhisa, 5,554,984, Cl. 340-937.000.

Mitsubishi Kasei Corporation: *See*—
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Sawayama, Shigeru; and Satoh, Kohichi, 5,554,792, Cl. 564-4.000.

Mitsuhashi, Masakazu: *See*—
Kurimoto, Masashi; and Mitsuhashi, Masakazu, 5,554,515, Cl. 435-70.210.

Mitsuhashi, Masato; and Ogura, Mieko, to Hitachi Chemical Co. Ltd.; and Hitachi Chemical Research Center Inc. Process for determining nuclease activity. 5,554,502, Cl. 435-6.000.

Mitsui Engineering & Shipbuilding Co., Ltd.: *See*—
Okamoto, Kenichi; Kita, Hidetoshi; Kondo, Masakazu; Miyake, Norikazu; and Matsuo, Yasuo, 5,554,286, Cl. 210-500.250.

Mitsui Petrochemical Industries, Ltd.: *See*—
Kuramoto, Shinichi; Okamoto, Yoshihisa; Asahina, Yasuo; Izumi, Michio; Gohhara, Hidefumi; Mochizuki, Chiharu; Suzuki, Tomomi; Nakamura, Hideo; and Wakisaka, Masaru, 5,554,478, Cl. 430-109.000.
Nakabayashi, Nobuo; Ishihara, Kazuhiko; and Saimi, Yasukazu, 5,554,669, Cl. 523-118.000.

Mitsui Toatsu Chemicals, Inc.: *See*—
Ohta, Masshiro; Matsuyama, Akio; Senoue, Eiji; Kuwano, Fumiaki; Yasui, Osamu; Yoshida, Yasunori; Ryu, Akinori; and Kobayashi, Tadashi, 5,554,765, Cl. 548-462.000.

Mitsuoka, Yasuyuki; Iwaki, Tadao; and Kasama, Nobuyuki, to Seiko Instruments Inc. Optically addressed spatial light modulating system bias light source and method for driving the system. 5,555,115, Cl. 359-72.000.

Mitsuta, Tatsumi: *See*—
Gschwind, Michel; Mitsuta, Tatsumi; Guyomar, Daniel; Sauzade, Jean-Denis; and Mazoyer, Thierry, 5,554,905, Cl. 310-323.000.

Mitsuya, Yoshihide; and Anzai, Shoji, to Kotobuki & Co., Ltd. Stick-shaped material propelling device. 5,553,956, Cl. 401-68.000.

Mitzkus, Jürgen; Wifling, Martin; Kopetzky, Robert; Bannert, Georg; Wengert, Andreas; Diepold, Ulrich; Kempfle, Thomas; Emmert, Erik; and Steffan, Hermann, to Takata Vehicle Safety Technology GmbH. Belt tensioner for safety belts for motor vehicles. 5,553,803, Cl. 242-374.000.

Miura, Kosho, to Nikon Corporation. Finder device for a camera. 5,555,468, Cl. 354-225.000.

Miyad: *See*—
Hogan, Donald J., 5,554,896, Cl. 307-150.000.

Miyagawa, Ichirou; and Toida, Masahiro, to Fuji Photo Film Co., Ltd. Method and apparatus for employing a light source and heterodyne interferometer for obtaining information representing the microstructure of a medium at various depths therein. 5,555,087, Cl. 356-345.000.

Miyajima, Takahiro: *See*—
Kawashima, Kazunori; Oda, Hajime; and Miyajima, Takahiro, 5,554,973, Cl. 340-562.000.

Miyake, Jiro: *See*—

Ninomiya, Kazuki; Nishiyama, Tamotsu; Miyake, Jiro; and Hasegawa, Katsuya, 5,555,197, Cl. 348-571.000.

Miyake, Nobuyki: *See*—
Iki, Yoichi; Miyake, Nobuyki; and Ueno, Yasunori, 5,555,039, Cl. 351-205.000.

Miyake, Norihisa: *See*—
Koyama, Masahiro; Miyake, Norihisa; Sakairi, Hiroshi; Hattori, Shizuko; Momoi, Yasuyuki; Fujimoto, Tsutomu; and Kai, Tsuyoshi, 5,555,179, Cl. 364-468.010.

Miyake, Norikazu: *See*—
Okamoto, Kenichi; Kita, Hidetoshi; Kondo, Masakazu; Miyake, Norikazu; and Matsuo, Yasuo, 5,554,286, Cl. 210-500.250.

Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, to Nikon Corporation. Camera equipped with data imprinting device. 5,555,467, Cl. 354-106.000.

Miyamoto, Hidenori: *See*—
Soshi, Isao; Miyamoto, Hidenori; and Noda, Seijiro, 5,555,061, Cl. 354-288.000.

Miyano, Shinji: *See*—
Haga, Ryo; Yabe, Tomoaki; Miyano, Shinji; and Numata, Kenji, 5,555,523, Cl. 365-203.000.

Miyasaka, Chiaki: *See*—
Oosawa, Akira; Miyasaka, Chiaki; Ogura, Yasuyuki; Kouchi, Toshihito; and Yoshii, Shinichi, 5,555,505, Cl. 364-470.070.

Miyasaka, Masayo; Ito, Yoshikazu; Minowa, Masahiro; and Yawata, Kazunari, to Seiko Epson Corporation. Printing device and recording paper control. 5,555,349, Cl. 395-111.000.

Miyata, Shigeru; Yoshida, Hideji; Matsubara, Yoshihiro; Ito, Yasuo; and Suzuki, Takashi, to NGK Spark Plug Co., Ltd. Spark plug voltage probe device in an internal combustion engine. 5,554,930, Cl. 324-402.000.

Miyauchi, Shinji; Nakane, Shinichi; Asano, Kazutaka; Horiike, Yoshio; and Tsuboi, Makoto, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for detecting abnormality in gas supply equipment. 5,554,976, Cl. 340-626.000.

Miyawaki, Yoshikazu: *See*—
Hayashikoshi, Masanori; Terada, Yasushi; Nakayama, Takeshi; Miyawaki, Yoshikazu; and Kobayashi, Shinichi, 5,554,868, Cl. 257-315.000.

Miyazawa, Kazutoshi: *See*—
Fujita, Atsuko; Matsui, Shuichi; Miyazawa, Kazutoshi; Goto, Yasuyuki; Nakagawa, Etsuo; and Sawada, Shinichi, 5,554,316, Cl. 252-299.010.

Miyazawa, Osamu. Micro robot. 5,554,914, Cl. 318-568.110.

Miyazawa, Toshio, to Kabushiki Kaisha TEC. Ink supplier. 5,555,238, Cl. 347-86.000.

Miyoshi Co., Ltd.: *See*—
Hayashi, Hiroshi; and Miyoshi, Tadashi, 5,553,405, Cl. 37-189.000.

Miyoshi, Tadashi: *See*—
Hayashi, Hiroshi; and Miyoshi, Tadashi, 5,553,405, Cl. 37-189.000.

Mizukami, Yuichi: *See*—
Sekiyama, Yasushi; Mizukami, Yuichi; Nakagawa, Shuzo; Otabe, Hideaki; Katoh, Kazuya; and Nagaki, Hiroshi, 5,554,376, Cl. 424-404.000.

Mizumi, Tsutomu: *See*—
Kashio, Shigetora; Mizumi, Tsutomu; and Takahashi, Kuniyuki, 5,554,334, Cl. 264-293.000.

Mizuno, Naohito; Hirose, Shinichi; Ariyoshi, Hiromi; and Shimoyama, Yasuki, to Nippondenso Co., Ltd. Physical-quantity detecting device. 5,554,806, Cl. 73-493.000.

Mizuno, Yukio; and Arita, Miichiro, to Takeda Chemical Industries, Ltd. Method for producing ethers. 5,554,758, Cl. 546-250.000.

Mizuoka, Seiji: *See*—
Tsujikawa, Toshihiko; Mizuoka, Seiji; and Nagamoto, Masao, 5,555,316, Cl. 382-150.000.

Mizutani, Tatsumi: *See*—
Yokogawa, Kenetsu; Kawanami, Yoshimi; and Mizutani, Tatsumi, 5,554,257, Cl. 156-643.100.

MK Seiko Co., Ltd.: *See*—
Hata, Hiroshi, 5,555,337, Cl. 385-101.000.

Mobil Oil Corporation: *See*—
Degnan, Thomas F.; Klocke, Donald J.; and Rubin, Mae K., 5,554,274, Cl. 208-111.000.
Harandi, Mohsen N., 5,554,275, Cl. 208-213.000.

Mochida, Akihiko: *See*—
Ishihara, Hideaki; Tsuji, Kiyoshi; and Mochida, Akihiko, 5,555,020, Cl. 348-221.000.

Mochizuki, Chiharu: *See*—
Kuramoto, Shinichi; Okamoto, Yoshihisa; Asahina, Yasuo; Izumi, Michio; Gohhara, Hidefumi; Mochizuki, Chiharu; Suzuki, Tomomi; Nakamura, Hideo; and Wakisaka, Masaru, 5,554,478, Cl. 430-109.000.

Mohan, Venkatraman: *See*—
Ravikumar, Vasulinga; and Mohan, Venkatraman, 5,554,746, Cl. 540-200.000.

Moher, Robert; and Nook, Thomas J., to Oneida Ltd. Rack for displaying tableware. 5,553,724, Cl. 211-70.700.

Mohr, Charles L. Mixed fluid time domain reflectometry sensors. 5,554,936, Cl. 324-642.000.

Mohr, Michael: *See*—
Löwer, Bernd; Eggensperger, Heinz; Goroncy-Bermes, Peter; Mohr, Michael; and Dettmann, Andreas, 5,554,656, Cl. 514-674.000.

Moir, Floyd W.: *See*—
Moir, Graydon E.; Moir, Floyd W.; and Cressotti, Karl, 5,554,031, Cl. 434-111.000.

Moir, Graydon E.; Moir, Floyd W.; and Cressotti, Karl, to Retina Systems, Inc. Training system for reporting 911 emergencies. 5,554,031, Cl. 434-111.000.

Moldt, Peter; Scheel-Krüger, Jørgen; and Jensen, Leif H., to NeuroSearch A/S. Substituted heterocyclic compounds as dopamine-reuptake inhibitors. 5,554,626, Cl. 514-304.000.

Molin, Stuart B., to Brooktree Corporation. Delay line providing an adjustable delay in response to binary input signals. 5,554,950, Cl. 327-277.000.

Molinaro, Luca, to Consumer Cap Corporation. Tamper-evident cap and neck finish. 5,553,727, Cl. 215-44.000.

Moller, Ronald J.; and Ive, Jonathan P., to Apple Computer, Inc. Enclosure for electronic apparatus having a cover catch member engageable with two different housing catch members. 5,555,157, Cl. 361-683.000.

Møller-Jensen, Jens: *See*—
Plum, Thomas Munk; Steengaard, Kim; and Møller-Jensen, Jens, 5,553,739, Cl. 221-196.000.

Molten Corporation: *See*—
Ueno, Masato, 5,554,855, Cl. 250-455.110.

Molzahn, David C.: *See*—
Hartwell, George E.; Bowman, Robert G.; and Molzahn, David C., 5,554,793, Cl. 564-470.000.

Momoi, Yasuyuki: *See*—
Koyama, Masahiro; Miyake, Norihisa; Sakairi, Hiroshi; Hattori, Shizuko; Momoi, Yasuyuki; Fujimoto, Tsutomu; and Kai, Tsuyoshi, 5,555,179, Cl. 364-468.010.

Monarch Marking Systems, Inc.: *See*—
Craig, Gina M.; Globig, James E.; Lamprecht, Dale E., Jr.; Markham, James G.; Morrison, Donald A.; Schwabe, Richard E.; Tavener, Raymond D.; and Watkins, Rex D., 5,555,351, Cl. 395-114.000.

Monkelbaan, Daniel R.; Resetarits, Michael R.; and Miller, Robert J., to UOP. Fractionation tray formed by triangular downcomer modules. 5,554,329, Cl. 261-98.000.

Monsan, Pierre F.: *See*—
Auriol, Daniel H.; Paul, Francois B.; and Monsan, Pierre F., 5,554,508, Cl. 435-68.100.

Monsanto Company: *See*—
Corbin, David R.; Greenplate, John T.; Jennings, Michael G.; Purcell, John P.; and Sammons, Robert D., 5,554,369, Cl. 424-94.400.

Monteith, John: *See*—
McDonald, James; Sturtevant, Charles N., III; Monteith, John; and Monteith, Mark, 5,554,130, Cl. 604-198.000.

Monteith, Mark: *See*—
McDonald, James; Sturtevant, Charles N., III; Monteith, John; and Monteith, Mark, 5,554,130, Cl. 604-198.000.

Montell North America Inc.: *See*—
Scheve, B. Joseph; Mayfield, John W.; and DeNicola, Anthony J., Jr., 5,554,668, Cl. 522-157.000.

Montgomery, Kent M.; and Blaho, Bruce E., to Hewlett-Packard Company. Method for selecting an item on a graphics screen. 5,555,003, Cl. 345-146.000.

Montie, Craig S.: *See*—
Kubina, Joseph E.; Gleason, Mark E.; Loughlin, Jerry F., Jr.; Wludyka, Todd H.; Odette, Thomas C.; Montie, Craig S.; Biermacher, Richard F.; Harney, Patrick M.; and DiMichele, Alfredo N., 5,553,912, Cl. 296-192.000.

Moody, L. Shane: *See*—
Weaver, Max A.; Mills, David E.; Tanner, James, III; Fleischer, Jean C.; Pruett, Wayne P.; and Moody, L. Shane, 5,554,720, Cl. 528-295.000.

Moody, Michael J.: *See*—
Hart, James D.; and Moody, Michael J., 5,553,928, Cl. 303-7.000.

Mookerjee, Pradip K.; and Omid, Ahmad, to Tomen Corporation. Method and composition for enhancing uptake and transport of bioactive agents in plants. 5,554,576, Cl. 504-116.000.

Moore, Andrew L.: *See*—
Jackson, John C.; Moore, Andrew L.; and Niemiro, Thaddeus A., 5,553,542, Cl. 101-228.000.

Moore Business Forms, Inc.: *See*—
Goodno, Brian, 5,553,774, Cl. 229-303.000.
Ring, Robert S., 5,553,763, Cl. 225-4.000.

Moore, Dennis A.: *See*—
Wallace, Rebacca A.; and Moore, Dennis A., 5,554,749, Cl. 540-474.000.

Moore, Gary L. Removable, washable sweatband for hats. 5,553,326, Cl. 2-181.000.

Morales, Eric W.: *See*—
Burch, Ronald H.; Corley, Andrew A.; Morales, Eric W.; and Selenberg, Kirk T., 5,554,069, Cl. 452-149.000.

Moran, Francis J.: *See*—
Supcoe, Robert F.; and Moran, Francis J., 5,554,214, Cl. 106-264.000.

Morandotti, Roberto: *See*—
Ceschin, Danilo; Ferrarotti, Rinaldo; Morandotti, Roberto; and Scardovi, Alessandro, 5,555,007, Cl. 347-87.000.

Moreau, Wayne M.: *See*—
Dichiara, Robert R.; Fahey, James T.; Jones, Pamela E.; Lyons, Christopher F.; Moreau, Wayne M.; Sooriyakumaran, Ratnam; Spinillo, Gary T.; Welsh, Kevin M.; and Wood, Robert L., 5,554,485, Cl. 430-271.100.

Moreland, Carl W., to Analog Devices, Inc. Analog to digital converter having a magnitude amplifier with an improved differential input amplifier. 5,554,943, Cl. 327-65.000.

Moreland, Marjorie J.: *See*—
Slone, Carolyn S.; Slone, Jeanna K.; and Moreland, Marjorie J., 5,553,849, Cl. 273-239.000.

Morelli, Peter A.; Taylor, Kym F.; and Makin, David, to David Brown Engineering Limited. Connecting a shaft to a bore. 5,553,966, Cl. 403-355.000.

Moretto, Hans-Heinrich: *See*—
Langstein, Gerhard; Krüger, Ralf; Alberts, Heinrich; Moretto, Hans-Heinrich; and Huggins, John, 5,554,689, Cl. 525-102.000.

Morgan, Trevor F.: *See*—
Alexander, Graeme Y.; Morgan, Trevor F.; and Fitzpatrick, Gerald P., 5,554,401, Cl. 426-140.000.

Morgans, David, Jr.: *See*—
Patterson, John W.; Morgans, David, Jr.; Sjogren, Eric B.; Smith, David B; Talamás, Francisco X.; Artis, Dean R.; Cervantes, Alicia; Elworthy, Todd R.; Fernández, Mario; Franco, Fidencio; Hawley, Ronald C.; Lara, Teresa; Loughhead, David G.; Nelson, Peter H.; Trejo, Alejandra; Waltos, Ann M.; and Weikert, Robert J., 5,554,612, Cl. 514-233.500.

Mori, Harumi: *See*—
Konuma, Toshimitsu; Nishi, Takeshi; and Mori, Harumi, 5,555,110, Cl. 359-56.000.

Mori, Hidekazu; and Otu, Juntaro, to Kabushiki Kaisha TEC. Driving device for driving and end-luminescent line head. 5,555,013, Cl. 347-237.000.

Mori, Kazuhiro: *See*—
Tatematsu, Susumu; Mori, Kazuhiro; and Ikari, Hideyuki, 5,553,464, Cl. 62-354.000.

Mori, Shigeru; Fukushima, Motoo; Tabei, Eiichi; Hamada, Yoshitaka; and Katayama, Seizi, to Shin-Etsu Chemical Co., Ltd. Conductive polymers and process for preparing the same. 5,554,710, Cl. 528-32.000.

Mori, Yukio: *See*—
Maenaka, Akihiro; Mori, Yukio; Murata, Haruhiko; Ide, Hirokazu; and Okada, Hidefumi, 5,555,023, Cl. 348-253.000.

Morimoto, Yoshiaki: *See*—
Haraao, Yoshiyuki; and Morimoto, Yoshiaki, 5,554,790, Cl. 562-519.000.

Morin, Donald A.: *See*—
Eisensmith, Terry C.; Morin, Donald A.; and Proto, George R., 5,553,477, Cl. 72-403.000.

Morishita, Kazuhiro: *See*—
Shinji, Yasuhisa; and Morishita, Kazuhiro, 5,554,051, Cl. 439-595.000.

Morishita, Keiichi: *See*—
Shigenaga, Hisao; Fujita, Ichiro; Yamamoto, Masayuki; Hamana, Michio; Morishita, Keiichi; Tachikawa, Fumitoshi; Uehara, Hideo; and Iida, Yasuhisa, 5,554,984, Cl. 340-937.000.

Morishita, Takashi: *See*—
Tonomura, Shoichiro; Matsui, Masahiro; and Morishita, Takashi, 5,554,449, Cl. 428-690.000.

Morita, Shigeru: *See*—
Kato, Takefumi; Morita, Shigeru; and Sato, Kiminori, 5,554,396, Cl. 425-556.000.

Morlion, Danny; Jonckheere, Luc; van Koetsem, Jan P. K.; and Creelle, Eddy K., to Framatome Connectors International. Connector for shielded cables. 5,554,038, Cl. 439-108.000.

Morrey, Bernard F.; McLeod, John J., Jr.; and Schultz, Frederick M., to Mayo Foundation For Medical Education & Research. Bone cleaning and drying system. 5,554,111, Cl. 604-26.000.

Morris, Al: *See*—
Ulicne, Joseph A.; and Morris, Al, 5,553,875, Cl. 280-20.000.

Morris, George Q. Magnetically integrated full wave DC to DC converter. 5,555,494, Cl. 363-17.000.

Morrison, Donald A.: *See*—
Craig, Gina M.; Globig, James E.; Lamprecht, Dale E., Jr.; Markham, James G.; Morrison, Donald A.; Schwabe, Richard E.; Tavener, Raymond D.; and Watkins, Rex D., 5,555,351, Cl. 395-114.000.

Mort, Thomas W.: *See*—
Jones, Robert S.; and Mort, Thomas W., 5,555,042, Cl. 353-103.000.

Mortimer, William P., Jr.: *See*—
Singles, David T.; Walter, Grant; and Mortimer, William P., Jr., 5,554,236, Cl. 156-52.000.

Mortner, Sol E. Compressed air engine system and method for generating electrical energy from the controlled release of compressed air. 5,553,454, Cl. 60-409.000.

Morton International, Inc.: *See*—
Gunn, Brian D.; and Cranney, Aaron V., 5,553,886, Cl. 280-728.200.
Rei, Nuno M.; and Hamel, Roger G., 5,554,635, Cl. 514-372.000.

Moset, Marina M.: *See*—
Braña, Miguel F.; Berlanga, José M. C.; Moset, Marina M.; Pérez de Vega, Maria J.; Keilhauer, Gerhard; Qian, Xiao-Dong; and Romerdahl, Cynthia, 5,554,622, Cl. 514-284.000.

Moskowitz, Paul A.: *See*—
Brady, Michael J.; Chaudhari, Praveen; Gambino, Richard J.; Heinrich, Harley K.; Moskowitz, Paul A.; and von Gutfeld, Robert J., 5,554,974, Cl. 340-572.000.

Motorola Energy Systems, Inc.: *See*—
Patel, Hitendra K.; and Li, Changming, 5,555,155, Cl. 361-503.000.

Motorola, Inc: *See*—
Willard, David F.; Schwendeman, Robert J.; Kuzaicki, William J.; and DeLuca, Michael J., 5,555,183, Cl. 340-825.210.

Motorola, Inc.: *See*—
Bohn, Thomas B., 5,554,956, Cl. 330-53.000.
Boike, Barry; and Nabors, David H., 5,555,301, Cl. 379-413.000.
Buchholz, Dale R.; Robbins, Karen E.; Hamilton, R. Lee, Jr.; and Doss, William K., 5,555,266, Cl. 370-95.100.
Chang, Kuo-Tung, 5,554,869, Cl. 257-316.000.
Chatzipetros, Argyrios, 5,554,996, Cl. 343-702.000.
Chiou, Hering-Der; and Crabtree, Geoffrey J., 5,553,566, Cl. 117-2.000.
Connell, Lawrence E.; and Hollenbeck, Neal W., 5,553,489, Cl. 73-118.100.
Diekelman, Dennis P.; and Stockwell, Catherine B., 5,555,444, Cl. 455-12.100.
Fitch, Jon T.; Venkatesan, Suresh; and Witek, Keith E., 5,554,870, Cl. 257-334.000.
Fong, Joseph C. Y.; and Rybicki, Mathew A., 5,555,263, Cl. 370-17.000.
Foster, Jewett E.; and Reeser, Glen O., 5,554,971, Cl. 340-825.460.
Freitag, Brandon R., 5,553,538, Cl. 101-123.000.
Ganesan, Sankaranarayanan; and Berg, Howard M., 5,554,569, Cl. 437-207.000.
Grube, Gary W.; and Markison, Timothy W., 5,555,192, Cl. 364-514.00R.
Harrington, Cheri L.; Gladden, Michael E.; and Prestwich, Blaine M., 5,555,513, Cl. 364-602.000.
Herr, Lawrence N.; and Starnes, Glenn E., 5,554,942, Cl. 326-33.000.
Hubacher, Eric M., 5,554,940, Cl. 324-765.000.
Jasinski, Leon, 5,555,446, Cl. 455-54.200.
Kaschke, Kevin D., 5,555,550, Cl. 379-59.000.
Kotzin, Michael D.; and Grube, Gary W., 5,555,447, Cl. 455-72.000.
Li, Edward; Mitchell, Ralph M.; and Aseltine, John H., 5,554,921, Cl. 320-22.000.
Retzer, Michael H.; and Muehlfeld, Alan D., 5,554,988, Cl. 341-154.000.
Sharma, Ravinder K.; Lebby, Michael S.; Hartman, Davis H.; and Hansen, Kent W., 5,555,341, Cl. 385-129.000.
Shin, Hank H.; Tracy, Clarence J.; Duffin, Robert L.; Freeman, John L., Jr.; Grivna, Gordon; and Wilson, Syd R., 5,554,889, Cl. 257-765.000.
Solanki, Ranvir S.; Gasmann, Eric J.; Kane, Joseph R.; Griffin, Edward P.; and Gantt, Andrew M., 5,553,376, Cl. 29-833.000.
Sun, Xiao; and Hull, Carmie A., 5,555,270, Cl. 371-27.000.
Wu, Han; and Nerz, John E., 5,554,460, Cl. 429-210.000.

Mottahedeh, Haghnazar. Speed alarm system for an automobile. 5,554,970, Cl. 340-441.000.

Mottram, Toby T. F.: *See*—
Street, Michael J.; and Mottram, Toby T. F., 5,553,569, Cl. 119-525.000.

Mountainside Springs Corporation: *See*—
Mowers, Doug, 5,553,751, Cl. 222-183.000.

Mountjoy, Kathleen G.: *See*—
Cone, Roger D.; and Mountjoy, Kathleen G., 5,554,729, Cl. 530-350.000.

Mousseau, Gary P.: *See*—
Lazaridis, Mihal; Little, Herb A.; Mousseau, Gary P.; and Sinha, Anand, 5,555,241, Cl. 370-17.000.

Mowers, Doug, to Mountainside Springs Corporation. Water dispenser. 5,553,751, Cl. 222-183.000.

Mowry, Christofer M.: *See*—
Nir, Israel; and Mowry, Christofer M., 5,555,279, Cl. 376-216.000.

Moya, Wilson; and Goddard, Philip M., to Millipore Investment Holdings Limited. Process for forming membrane having a hydrophobic fluoropolymer surface. 5,554,414, Cl. 427-244.000.

MSCL: *See*—
Kaye, Michael C.; and Bemanian, Majid, 5,555,092, Cl. 348-107.000.

MTM Molded Products Company: *See*—
Minneman, Steven W.; and Minneman, Allen J., 5,553,717, Cl. 211-13.000.

Muchin, Jerome D. Transparent external nasal dilator. 5,553,605, Cl. 128-200.240.

Muehlfeld, Alan D.: *See*—
Retzer, Michael H.; and Muehlfeld, Alan D., 5,554,988, Cl. 341-154.000.

Muenz, David J.; and Hochstetler, Harold J., to J. M. Smucker Company, The. Congealed fruit confection especially for making fruit clusters. 5,554,406, Cl. 426-573.000.

Mühlhoff, Martin; Kriechel, Hans; Fleischmann, Frank; and Kabelitz, Hans-Peter, to Leybold AG. Gas friction vacuum pump having at least three differently configured pump stages releasably connected together. 5,553,998, Cl. 415-90.000.

Mukataka, Hisashi: *See*—
Ozawa, Yoshio; Mukataka, Hisashi; Imoo, Ryushi; and Nishida, Satoshi, 5,554,477, Cl. 430-106.600.

Mukhopadhyay, Purnendu: *See*—
Trapasso, Louise E.; Padegimas, Stanley J.; Epstein, Peter F.; Hung, Paul L. K.; Mukhopadhyay, Purnendu; and Meisel, Philip L., 5,554,785, Cl. 560-201.000.

Mulhauser, Paul J.: *See*—
Aebischer, Patrick; DiCesare, Paul C.; Goddard, Moses; and Mulhauser, Paul J., 5,554,148, Cl. 604-890.100.

Mulkens, Johannes C. H.; and Heynderickx, Ingrid E. J. R., to U.S. Philips Corporation. Liquid crystal display device with twist angle ϕ of 70° to 90°and alignment to polarization direction angle between $\phi/2+30°$and $\phi/2+60°$. 5,555,113, Cl. 359-63.000.

Mullen, Jon R.: *See*—
Hegel, Robert W.; Hawke, Melvin C.; Damian, William P.; and Mullen, Jon R., 5,553,659, Cl. 164-153.000.

Muller, Bernardus W.: *See*—
Loechtenfeldt, Christopher J.; and Muller, Bernardus W., 5,553,533, Cl. 99-494.000.

Müller, Bernd: *See*—
Wingert, Horst; Müller, Bernd; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,554,616, Cl. 514-269.000.

Müller, Klaus-Helmut: *See*—
Haas, Wilhelm; Müller, Klaus-Helmut; König, Klaus; Santel, Hans-Joachim; Lürssen, Klaus; and Schmidt, Robert R., 5,554,761, Cl. 548-263.600.

Müller, Peter; and Wedermann, Günther, to Matec Holding AG. Noise-reducing covering for vehicle interior. 5,554,830, Cl. 181-290.000.

Mullhaupt, Joseph T.; and Stephenson, Paula C., to Praxair Technology, Inc. Enhanced gas separations and zeolite compositions therefor. 5,554,208, Cl. 95-96.000.

Mullinax, Willie C.: *See*—
Salpaka, Glenn L.; Owens, Valerie D.; and Mullinax, Willie C., 5,553,873, Cl. 279-62.000.

Mullis, Johnny P.: *See*—
Bloomfield, Mark C.; Castro, Edward F.; Dyer, Joseph T.; Jackson, Deborah J.; Lemons, Charles E.; McCown, Bruce A.; Mullis, Johnny P.; and Troxell, Brian A, 5,555,100, Cl. 358-402.000.

Mullkraftwerk Schwandorf Betriebsgesellschaft mbH: *See*—
Krüger, Jörg, 5,553,556, Cl. 110-345.000.

Mumme, Charles W.: *See*—
Vinciguerra, John D.; Perrone, Charles H., Jr.; Mumme, Charles W.; and Higgins, Jeffery C., 5,554,158, Cl. 606-80.000.

Munday, Mark L.; and Hemminger, Rodney C., to ABB Power T&D Company Inc. Programmable electrical energy meter and methods therefor. 5,555,508, Cl. 364-492.000.

Muni, Ketan: *See*—
Chen, Ziyun; Cheng, Tai; Muni, Ketan; Patel, Udayan; and Saltman, Robert, 5,554,120, Cl. 604-96.000.

Münzel, Norbert: *See*—
Schulz, Reinhard; Münzel, Norbert; Roth, Martin; and Knobloch, Wilhelm, 5,554,797, Cl. 568-592.000.

Münzmay, Thomas: *See*—
Träubel, Harro; Münzmay, Thomas; Hassel, Tillmann; Krümmel, Wilhelm; Ehlert, Hans-Albert; and Kochta, Joachim, 5,554,711, Cl. 528-49.000.

Murata, Haruhiko: *See*—
Maenaka, Akihiro; Mori, Yukio; Murata, Haruhiko; Ide, Hirokazu; and Okada, Hidefumi, 5,555,023, Cl. 348-253.000.

Murata Kikai Kabushiki Kaisha: *See*—
Todo, Yuji, 5,553,799, Cl. 242-128.000.

Murata Manufacturing Co., Ltd.: *See*—
Okabe, Shinsei; Iwamoto, Sakiko; and Sano, Harunobu, 5,554,571, Cl. 501-138.000.

Murata, Masahide: *See*—
Burkhardt, Terry J.; Murata, Masahide; and Brandley, William B., 5,554,704, Cl. 526-153.000.

Murayama, Masami: *See*—
Kakuma, Satoshi; Uriu, Shiro; Samejima, Noriko; Murayama, Masami; and Fukuda, Noaki, 5,555,243, Cl. 370-58.200.

Murdock, Douglas R.: *See*—
McLeod, Clark E.; Hogan, Steven J.; Feltz, Kristi T.; Murdock, Douglas R.; and Hanson, Van E., 5,555,290, Cl. 379-67.000.

Muroi, Soniichi; and Tsai, Hsi-Chuan, to W. R. Grace & Co.-Conn. Spherical curing agent for epoxy resin, curing agent masterbatch for epoxy resin and their preparation.. 5,554,714, Cl. 528-94.000.

Murphy, Morgan D.: *See*—
Thayer, Peter A.; and Murphy, Morgan D., 5,554,912, Cl. 315-157.000.

Murray, Robert E.: *See*—
Hough, Roger E.; and Murray, Robert E., 5,555,414, Cl. 395-734.000.

Murschall, Ursula: *See*—
Schuhmann, Detlef E.; Peiffer, Herbert; Murschall, Ursula; and Schloegl, Gunter, 5,554,245, Cl. 156-244.240.

Murtaugh, Michael P.: *See*—
Caputa, Anthony C.; Bey, Russell F.; and Murtaugh, Michael P., 5,554,371, Cl. 424-234.100.

Musiol, John A.: *See*—
Turner, Darin J.; Zelenak, Daniel G.; and Musiol, John A., 5,553,888, Cl. 280-731.000.

Mussa-Ivaldi, Ferinando A.: *See*—
Bizzi, Emilio; Mussa-Ivaldi, Ferinando A.; and Shadmehr, Reza, 5,554,033, Cl. 434-247.000.

Muzzy, William H., III: *See*—
Cantor, Alan E.; Muzzy, William H., III; Eisentraut, Donald K.; D'Aulerio, Louis A.; and Whitman, Gary R., 5,553,924, Cl. 297-452.270.

Mycogen Corporation: *See*—
Michaels, Tracy E.; Narva, Kenneth E.; and Foncerrada, Luis, 5,554,534, Cl. 435-252.300.

Myers, Glen A. Method and apparatus for removing the effects of co-channel interference from the message on a dominant frequency modulated carrier and for recovering the message from each of two co-channel carriers. 5,554,955, Cl. 329-317.000.

Myers, John T.: *See*—
Karl, Terry L.; Gloden, Gregory J.; Van Riper, Philip C.; Zainea, John P.; and Myers, John T., 5,553,895, Cl. 285-39.000.

Myers, Michael J.: *See*—
Kowalyk, Kenneth; and Myers, Michael J., 5,554,029, Cl. 433-215.000.

Myers, Robert B.: *See*—
Licht, Morten; Watson, George B.; Myers, Robert B.; and Johnson, Dennis W., 5,553,782, Cl. 239-107.000.

Myojo, Koji: *See*—
Ohtomo, Takashi; Myojo, Koji; and Kubo, Hiroshi, 5,554,693, Cl. 525-133.000.

Nabisco, Inc.: *See*—
Fazzolare, Richard D.; Szwerc, Joseph A.; van Lengerich, Bernhard; and Leschke, Rudolph J., 5,554,405, Cl. 426-560.000.

Nabors, David H.: *See*—
Boike, Barry; and Nabors, David H., 5,555,301, Cl. 379-413.000.

Nabors, James K., Jr.; and Andrews, William C., to Xothermic, Inc. Burner apparatus and method. 5,554,022, Cl. 431-10.000.

Nabuurs, Martinus W. M., to Inalfa B.V. Motor vehicle sliding roof panel seal. 5,553,913, Cl. 296-216.000.

Nagaki, Hiroshi: *See*—
Sekiyama, Yasushi; Mizukami, Yuichi; Nakagawa, Shuzo; Okabe, Hideaki; Katoh, Kazuya; and Nagaki, Hiroshi, 5,554,376, Cl. 424-404.000.

Nagamoto, Masao: *See*—
Tsujikawa, Toshihiko; Mizuoka, Seiji; and Nagamoto, Masao, 5,555,316, Cl. 382-150.000.

Nagano, Hideo: *See*—
Tsukimi, Yoshihiro; Matsumoto, Takayuki; and Nagano, Hideo, 5,554,323, Cl. 264-4.700.

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Fukuda, Katsumi; Ilzuka, Tadashi; Naka, Reishi; Hata, Hiroaki; Gommori, Masahiko; and Homma, Yoshiharu, 5,553,465, Cl. 62-468.000.

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Nakano, Mitsuru, to Citizen Watch Co., Ltd. Printer. 5,553,954, Cl. 400-621.000.
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Nakata, Takuya, to Yamaha Corporation. Electronic musical instrument creating timbre by optimum synthesis mode. 5,554,814, Cl. 84-659.000.
Nakaya, Takayoshi; and Kajiwara, Yayoi, to Hoechst Japan Limited. Therapeutic agent for threatened abortion. 5,554,593, Cl. 514-12.000.
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Nakayama, Kazuya: *See*—
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Kim, Su U.; Kim, Dong Y.; Chung, Gi J.; Hong, Sung K.; Park, Sung J.; Nam, Sang H.; and Lee, Seung M., 5,554,631, Cl. 514-338.000.
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Nandagiri, Arun; Solka, Bruce H.; and Kocis, John A., to Helene Curtis, Inc. Method of reducing malodors in permanent waving. 5,554,363, Cl. 424-70.510.
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Narita, Kenichi; and Suzaki, Takeshi, to Sanyo Electric Co., Ltd.; and Tottori Sanyo Electric Co., Ltd. Liquid crystal display with reflective color filters. 5,555,114, Cl. 359-65.000.
Narita, Masahiko; Fujiwara, Takashi; Fukui, Keisuke; Shimamura, Makiko; and Tateno, Takanori, to Fujitsu Limited. Multiprocess input system with suppressed amount of communication between processes. 5,555,361, Cl. 395-144.000.
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Bastani, Bamdad; and Wong, Larry, 5,554,554, Cl. 437-47.000.
Gough, John J., 5,554,951, Cl. 327-337.000.
Patterson, Michael W.; and Takiar, Hem P., 5,554,821, Cl. 174-52.200.
Wert, Joseph D.; and Duncan, Richard L., 5,555,149, Cl. 361-18.000.
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Hilley, Michael R.; and Kass, William J., 5,555,249, Cl. 371-21.100.
Kruys, Johannes P., 5,555,309, Cl. 380-21.000.
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Hongu, Takahiro, 5,555,323, Cl. 382-247.000.
Ishino, Toshiyuki, 5,555,273, Cl. 375-244.000.
Kajitani, Hiroshi, 5,555,145, Cl. 360-103.000.
Kitamura, Yoshiji; and Takiue, Hirofumi, 5,555,140, Cl. 360-73.020.
Koyama, Kuniaki, 5,554,864, Cl. 257-211.000.
Maruyama, Takao, 5,555,147, Cl. 360-113.000.
Ooga, Toshiyuki, 5,554,987, Cl. 341-147.000.
Ooi, Yasushi, 5,555,511, Cl. 364-514.00R.
Shioya, Yukinori, 5,555,186, Cl. 359-40.000.
Suzuki, Hideto, 5,555,380, Cl. 395-250.000.
Suzuki, Kenichiro, 5,554,304, Cl. 216-2.000.

Takahashi, Hideaki, 5,554,954, Cl. 327-546.000.
Tsubota, Masashi, 5,555,559, Cl. 395-879.000.
Uchida, Takahito, 5,554,919, Cl. 320-14.000.
Yonezama, Yuzo; and Inahashi, Atsushi, 5,555,442, Cl. 455-9.000.
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Norimatsu, Hidehiko, 5,554,892, Cl. 307-115.000.
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Nelson, Peter H.: *See*—
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Nelson, Philip L.: *See*—
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Nemoto, Peter A.: *See*—
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Teuber, Lene; Axelsson, Oskar; and Wätjen, Frank, 5,554,630, Cl. 514-338.000.
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Ashcroft, Dale A., 5,553,992, Cl. 414-685.000.
Newcomb, John H. Aircraft holding pattern wind compensator. 5,553,387, Cl. 33-1.0SD.
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Jarecki, James J.; and Polzin, Bruce C., 5,553,701, Cl. 206-15.200.
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Newman, Robert C., Jr., to Lutron Electronics Co., Inc. Surge suppression system. 5,555,150, Cl. 361-56.000.
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Nguyen, Hung, to Proxima Corporation. Method and display control system for panning. 5,555,002, Cl. 345-121.000.
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Nicholson, James E.: *See*—
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Niemeyer, Duane J.; Davignon, Barry J.; and Sloss, Christopher W., to Roadmaster Corporation. Adjustable riding toy with an adjustable axle height connection. 5,553,879, Cl. 280-279.000.
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Davignon, Barry J.; Niemeyer, Duane J.; and Sloss, Christopher W., 5,553,878, Cl. 280-229.000.
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Nihon Doubutsu Yakuhin Kabushikigaisya: *See*—
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Utagawa, Ken, 5,555,068, Cl. 354-402.000.
Wakabayashi, Tsutomu; Daitoku, Koichi; and Ezawa, Akira, 5,555,050, Cl. 354-173.100.
Nilsson, Finn, to Spacemaker Limited. Framework for shelving unit. 5,553,549, Cl. 108-110.000.
Nilsson, Nils B.: *See*—
Bodin, Jan-Olof; Barnhardt, Steve L.; Nilsson, Nils B.; and Andersson, Mats H., 5,553,911, Cl. 296-190.000.
Nilsson, Rickard; Markström, Ulf; and Klöfver, Leif. System for changing software during computer operation. 5,555,418, Cl. 395-700.000.
Nilz, Claudia; Sendhoff, Norbert; Breitschaft, Walter; Zillig, Manfred; and Lorencak, Primoz, to BASF Aktiengesellschaft. Dyeing of paper. 5,554,261, Cl. 162-162.000.
Nimmerfroh, Norbert: *See*—
Suess, Hans U.; Nimmerfroh, Norbert; and Grimmer, Ralf, 5,554,258, Cl. 162-24.000.
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Nippon Pillar Packing Co., Ltd.: *See*—
Fukumoto, Toshiyuki; and Nishio, Kiyoshi, 5,553,900, Cl. 285-331.000.
Nippon Soken, Inc.: *See*—
Hirayama, Hiroshi; Yoshizaki, Kouji; Igarashi, Kouhei; Ito, Keiji; Yoshinaga, Tohru; Watanabe, Kiyohiko; Shinohara, Yukihiro; and Fujishiro, Osamu, 5,554,342, Cl. 422-174.000.
Nippon Steel Corporation: *See*—
Kondo, Hiroyuki; Tatsumi, Kohei; Kimura, Masao; and Onodera, Kiyoshi, 5,554,443, Cl. 428-375.000.
Nippon Telegraph and Telephone Corporation: *See*—
Ito, Minoru; and Watanabe, Toshifumi, 5,555,318, Cl. 382-468.000.
Nippon Thompson Co., Ltd.: *See*—
Agari, Norimasa, 5,553,946, Cl. 384-49.000.
Nippondenso Co., Ltd.: *See*—
Hirayama, Hiroshi; Yoshizaki, Kouji; Igarashi, Kouhei; Ito, Keiji; Yoshinaga, Tohru; Watanabe, Kiyohiko; Shinohara, Yukihiro; and Fujishiro, Osamu, 5,554,342, Cl. 422-174.000.
Itakura, Takahiro, 5,555,315, Cl. 382-141.000.
Koyasu, Takahisa; Numazaki, Kouji; Kasuya, Hirokazu; Saitou, Mitsuhiro; and Ikeda, Kazuhisa, 5,554,881, Cl. 257-584.000.
Mizuno, Naohito; Hirose, Shinichi; Ariyoshi, Hiromi; and Shimoyama, Yasuki, 5,554,806, Cl. 73-493.000.
Naito, Toshiharu; Taguchi, Takeyasu; Kamiya, Masahiko; and Fujiwara, Kenji, 5,553,491, Cl. 73-146.500.
Saitou, Mitsuhiro; and Kabune, Hideki, 5,554,947, Cl. 327-184.000.
Tsuruta, Tadashi; Suzuki, Masatoshi; Sano, Hiromi; Fujii, Namitsugu; and Sugino, Hiroshi, 5,554,839, Cl. 219-544.000.
Nir, Israel; and Mowry, Christofer M. System for monitoring and controlling nuclear reactors. 5,555,279, Cl. 376-216.000.
Nishi, Takeshi; Konuma, Toshimitsu; and Shimizu, Michio, to Semiconductor Energy Laboratory Co., Ltd. Process for fabricating a liquid crystal display with switching elements formed in a substrate. 5,555,240, Cl. 359-82.000.
Nishi, Takeshi: *See*—
Konuma, Toshimitsu; Nishi, Takeshi; and Mori, Harumi, 5,555,110, Cl. 359-56.000.
Nishida, Hidehiko: *See*—
Komatsuda, Hiroshi; and Nishida, Hidehiko, 5,555,560, Cl. 395-405.000.
Nishida, Satoshi: *See*—
Ozawa, Yoshio; Mukataka, Hisashi; Imoo, Ryushi; and Nishida, Satoshi, 5,554,477, Cl. 430-106.600.
Nishida, Toyozo: *See*—
Honda, Shoji; Shono, Masayuki; Hiroyama, Ryoji; Bessho, Yasuyuki; Kase, Hiroyuki; Nishida, Toyozo; Uetani, Takahiro; and Suzuki, Junko, 5,555,271, Cl. 372-45.000.
Nishide, Satoru, to Sumitomo Wiring Systems, Ltd. Connector. 5,554,044, Cl. 439-352.000.
Nishihara, Munekazu; Yokoyama, Masahide; Shibasaki, Hatsuhiko; and Ohnishi, Youichi, to Matsushita Electric Industrial Co., Ltd. Ionization deposition apparatus. 5,554,222, Cl. 118-723.0HC.
Nishihara, Susumu. Apparatus for and method of detecting water temperature for fishing. 5,553,940, Cl. 374-136.000.
Nishihara, Toshiyuki, to Sony Corporation. Static random access memory. 5,555,208, Cl. 365-154.000.
Nishihata, Kouji: *See*—
Kato, Shigekazu; Nishihata, Kouji; Tsubone, Tsunehiko; and Itou, Atsushi, 5,553,396, Cl. 34-406.000.
Nishihata, Naomitsu; Endo, Shunzo; Ichikawa, Yukio; and Katto, Takayuki, to Kureha Kagaku Kogyo K.K. Process for production of poly(arylene thioether) containing phthalic anhydride groups. 5,554,723, Cl. 528-388.000.
Nishimura, Shin: *See*—
Tomooka, Keiji; Sakakida, Naohiro; Nishimura, Shin; Ashi, Yoshihiro; Matsuda, Hironari; Aoki, Satoshi; Nakano, Yukio; Takatori, Masahiro; Kazawa, Toru; Sasaki, Shinya; Takeyari, Ryoji; and Nakano, Hiroyuki, 5,555,477, Cl. 359-115.000.
Nishino, Kimihisa: *See*—
Chisaka, Yukinori; Daizen, Masaki; Okamura, Yutaka; Tajima, Yukihiro; Kataoka, Mamoru; Sone, Akira; and Nishino, Kimihisa, 5,553,649, Cl. 160-168.100.
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Fukumoto, Toshiyuki; and Nishio, Kiyoshi, 5,553,900, Cl. 285-331.000.
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Doi, Mizuho; Nishio, Tomoyuki; and Fueki, Nobuhiro, 5,553,497, Cl. 73-504.060.
Nishioka, Futoshi; Hosokai, Tetsushi; and Tanaka, Kazuo, to Mazda Motor Corporation. Fuel system with fuel vapor estimating feature. 5,553,595, Cl. 123-698.000.
Nishioka, Kimihiko: *See*—
Konno, Mitsujiro; Ono, Katsuya; Takasugi, Yoshiharu; Matsumoto, Shinya; and Nishioka, Kimihiko, 5,555,129, Cl. 359-569.000.
Nishioka, Yasushiro; Summerfelt, Scott R.; Park, Kyung-ho; and Bhattacharya, Pijush, to Texas Instruments Incorporated. Pre-oxidizing high-dielectric-constant material electrodes. 5,554,564, Cl. 437-192.000.
Nishioka, Yasushiro; Summerfelt, Scott R.; Park, Kyung-ho; and Bhattacharya, Pijush, to Texas Instruments Incorporated. Pre-oxidizing high-dielectric-constant material electrodes. 5,554,866, Cl. 257-295.000.
Nishishita, Kunihiko; and Kinugawa, Takashi, to Zexel Corporation. Laminated heat exchanger. 5,553,664, Cl. 165-153.000.
Nishiyama, Hiroaki; and Nakano, Katsuyuki, to Fujitsu Limited. Apparatus and a method for detecting the generation of dust particles and a clean room equipped with the apparatus. 5,553,496, Cl. 73-432.100.
Nishiyama, Tamotsu: *See*—
Ninomiya, Kazuki; Nishiyama, Tamotsu; Miyake, Jiro; and Hasegawa, Katsuya, 5,555,197, Cl. 348-571.000.
Nissan Motor Co., Ltd.: *See*—
Eguchi, Takaaki, 5,554,969, Cl. 340-438.000.
Kato, Keno; Noji, Ikutaro; Arai, Masashi; and Fukubayashi, Makoto, 5,553,775, Cl. 236-49.300.
Matsukawa, Hiroshi; Watanabe, Kyoichi; and Sugawara, Hiroshi, 5,554,831, Cl. 181-294.000.
Sakagami, Atsushi; Sekido, Tatsuya; Yamamoto, Isao; and Echigo, Yuko, 5,554,978, Cl. 340-825.070.
Sugihara, Hiroshi; Ishikawa, Hiroyuki; Uemura, Tsutomu; Fujiki, Akira; Imazato, Hiromasa; and Umino, Shinichi, 5,554,338, Cl. 419-5.000.
Nissei Plastic Industrial Co., Ltd.: *See*—
Arai, Tyuyoshi, 5,553,481, Cl. 73-4.00R.
Nakazawa, Makoto; Koda, Toshiyasu; and Arai, Tyuyoshi, 5,554,326, Cl. 264-40.100.
Nissen Chemitec Co., Ltd.: *See*—
Tawara, Nobuyoshi; and Kojima, Takeshi, 5,555,160, Cl. 362-31.000.
Nitta, Kuraji: *See*—
Grossman, Walter; Nitta, Kuraji; and Kita, Koji, 5,555,073, Cl. 355-41.000.
Nizar, P. K.: *See*—
Sarangdhar, Nitin V.; Nizar, P. K.; and Carson, David G., 5,555,420, Cl. 395-739.000.
Noble, John T., Jr. Decorative display device. 5,554,420, Cl. 428-10.000.
Noda, Kazuhiro; Endo, Eishi; and Takahashi, Kenichi, to Sony Corporation. Aluminum non-aqueous electrolyte secondary cell. 5,554,458, Cl. 429-194.000.
Noda, Seijiro: *See*—
Soshi, Isao; Miyamoto, Hidenori; and Noda, Seijiro, 5,555,061, Cl. 354-288.000.
Noe, Andreas: *See*—
Noe, Rolf; Noe, Andreas; and Baukloh, Dieter, 5,554,235, Cl. 148-610.000.
Noe, Rolf; Noe, Andreas; and Baukloh, Dieter, to BWG Bergwerk-Und Walzwerk-Machinenbau GmbH. Method of and process for cold-rolling of stainless-steel and titanium-alloy strip. 5,554,235, Cl. 148-610.000.
Noji, Ikutaro: *See*—
Kato, Keno; Noji, Ikutaro; Arai, Masashi; and Fukubayashi, Makoto, 5,553,775, Cl. 236-49.300.
NOK Corporation: *See*—
Kato, Takefumi; Morita, Shigeru; and Sato, Kiminori, 5,554,396, Cl. 425-556.000.
Nokajima, Kunio; Kimura, Shizuo; Hashimoto, Yasuo; and Urano, Makoto, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for shaping super-plastic metal workpiece. 5,553,474, Cl. 72-60.000.
Nokia Mobile Phones Ltd.: *See*—
Sointula, Erkka, 5,555,450, Cl. 455-89.000.
Nokia Telecommunications Oy: *See*—
Alatalo, Hannu; and Kokko, Marko, 5,555,245, Cl. 370-66.000.
Noll, Mark G.: *See*—
Lohman, Terence; Noll, Mark G.; Olive, Jose A.; and Perez, Roberto V., 5,555,413, Cl. 395-733.000.
Nomix Manufacturing Company, Ltd.: *See*—
Gill, David C.; and Pressey, Garry K., 5,554,422, Cl. 428-34.300.
Nomura, Hiroaki; Haneda, Toru; Kotake, Yoshihiko; Ueda, Norihiro; and Kitoh, Kyosuke, to Eisai Co., Ltd. Condensed pyrimidine derivative. 5,554,615, Cl. 514-258.000.
Nomura, Kohati: *See*—
Fujimoto, Katsuyuki; Nomura, Kohati; and Ueno, Shuji, 5,554,232, Cl. 148-304.000.
Nomura, Kouki; and Satoh, Hiroyuki, to Fuji Photo Film Co., Ltd. Cleaning structure for out-of-liquid conveying portion. 5,555,072, Cl. 355-27.000.
Nomura, Shingo, to Sharp Kabushiki Kaisha. Data flow processor with variable logic connection between processors in a system. 5,555,386, Cl. 395-375.000.
Non-Invasive Technology, Inc.: *See*—
Chance, Britton, 5,553,614, Cl. 128-633.000.
Nook, Thomas J.: *See*—
Moher, Robert; and Nook, Thomas J., 5,553,724, Cl. 211-70.700.
Noonan, Jeffrey W.: *See*—
Poindexter, Graham S.; Bruce, Marc; Johnson, Graham; LeBoulluec, Karen; and Noonan, Jeffrey W., 5,554,621, Cl. 514-278.000.
Norand Corporation: *See*—
Koenck, Steven E.; Mahany, Ronald L.; and Frede, William W., 5,555,276, Cl. 375-303.000.
Kraus, Robert J.; West, Guy J.; Gibbs, William T.; Davis, Patrick H.; Hutton, James R.; Eckley, Bradley E.; Arensdorf, Richard C.; and Dias, Daniel R., 5,555,459, Cl. 343-702.000.
Norbeck, Daniel W.: *See*—
Kempf, Dale J.; Norbeck, Daniel W.; and Codacovi, Lynn M., 5,554,783, Cl. 560-25.000.
Nordica S.p.A.: *See*—
Tacchetto, Maurizio; and Battistella, Mirco, 5,553,361, Cl. 24-68.0SK.
Norimatsu, Hidehiko, to NEC Corproation. Signal processing circuit for switch capable of reducing insertion loss. 5,554,892, Cl. 307-115.000.
Noritsu Koki Co., Ltd.: *See*—

Grossman, Walter; Nitta, Kuraji; and Kita, Koji, 5,555,073, Cl. 355-41.000.
Oku, Hiroshi, 5,553,809, Cl. 242-563.100.
Norkey, Phillip; and Anderson, Stephen, to Pilot Industries, Inc. Molded quick connect coupling. 5,553,899, Cl. 285-316.000.
Noro, Yukio: *See*—
Niikuni, Tokio; and Noro, Yukio, 5,554,707, Cl. 526-344.200.
Norris, Kenneth D.: *See*—
Dabberdt, Walter F.; Norris, Kenneth D.; Semmer, Steven R.; Delany, Anthony C.; and Fox, Jack R., 5,553,508, Cl. 73-63.020.
North American Manufacturing Co.: *See*—
Robertson, Thomas; Miller, Todd; and Quinn, Dennis, 5,554,021, Cl. 431-9.000.
North Carolina State University: *See*—
Dewhirst, Mark W.; Meyer, Robert E.; Bonaventura, Joseph; and DeAngelo, Joseph, 5,554,638, Cl. 514-398.000.
Kingon, Angus I.; Al-Shareef, Husam N.; Auciello, Orlando H.; Gifford, Ken D.; Lichtenwalner, Dan J.; and Dat, Rovindra, 5,555,486, Cl. 361-305.000.
Northern Telecom Limited: *See*—
Booth, Andrew J., 5,555,445, Cl. 455-33.200.
Rioux, Brian A., 5,554,488, Cl. 430-315.000.
Northrop Grumman Corporation: *See*—
Andersen, William F.; Boyd, Andrew B.; Baldwin, Russell L.; and Datta, Bisuddha N., 5,553,977, Cl. 405-204.000.
McKinney, Terry L., 5,554,990, Cl. 342-36.000.
Nose, Hiroyasu: *See*—
Hirai, Yutaka; Takamatsu, Osamu; Hatanaka, Katsunori; Nakayama, Masaru; Nose, Hiroyasu; Yagi, Takayuki; and Shimida, Yasuhiro, 5,554,851, Cl. 250-442.110.
Novack, James C.; Neamy, Scott A.; and Scholz, Matthew T., to Minnesota Mining and Manufacturing Company. Vibration compacted fabrics for orthopedic casting tapes. 5,553,366, Cl. 28-170.000.
Novak, Pavel; Rebholz, Clemens; and Willner, Joachim, to Storz Endoskop GmbH. Flow pressure transducer. 5,554,113, Cl. 604-30.000.
Novasso Oy: *See*—
Struszczyk, Henryk; and Kivekäs, Olli, 5,554,445, Cl. 428-403.000.
Novo Nordisk A/S: *See*—
Bonnichsen, Frits F., 5,554,134, Cl. 604-240.000.
Plum, Thomas Munk; Steengaard, Kim; and Møller-Jensen, Jens, 5,553,739, Cl. 221-196.000.
Novozone (N.V.) Limited: *See*—
Kitchenman, Oswald R. G., 5,554,345, Cl. 422-186.150.
Nozawa, Takashi, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for assisting the design of parts of a product. 5,555,406, Cl. 395-500.000.
NSK Ltd.: *See*—
Osawa, Nobuyuki; and Kashiwagi, Shizuo, 5,553,944, Cl. 384-15.000.
NTN Corporation: *See*—
Fukuwaka, Masao; Maeda, Tadaaki; and Koremoto, Takahiro, 5,553,949, Cl. 384-523.000.
Harimoto, Kazuyoshi, 5,553,512, Cl. 74-569.000.
Ito, Norio, 5,553,948, Cl. 384-107.000.
Nuchols, Richard P.: *See*—
Knodel, Bryan D.; Schulze, Dale R.; and Nuchols, Richard P., 5,553,765, Cl. 227-176.100.
Nuedorf, Kenneth E.: *See*—
Toth, Joe M.; and Nuedorf, Kenneth E., 5,554,992, Cl. 342-185.000.
Numata, Kenji: *See*—
Haga, Ryo; Yabe, Tomoaki; Miyano, Shinji; and Numata, Kenji, 5,555,523, Cl. 365-203.000.
Numazaki, Kouji: *See*—
Koyasu, Takahisa; Numazaki, Kouji; Kasuya, Hirokazu; Saitou, Mitsuhiro; and Ikeda, Kazuhisa, 5,554,881, Cl. 257-584.000.
Nunez, Arlette C.: *See*—
Booth, James R.; Jacobi, Michael C.; Nunez, Arlette C.; Smith, Jonathan S.; Tauvers, Peter R.; Doyle, Earl H., Jr.; Diegel, Fredric A., Jr.; Kratochvil, Thomas M.; and Gaudin, Brenda G., 5,555,531, Cl. 367-15.000.
Nusser, Rainer; and Wald, Roland, to Sandoz Ltd. Fibre-reactive disazo dyestuffs. 5,554,732, Cl. 534-637.000.
Nycomed Salutar, Inc.: *See*—
Sieving, Paul F.; and Watson, Alan D., 5,554,748, Cl. 540-465.000.
Obecny, Andrew D.: *See*—
Straits, Thomas D.; Obecny, Andrew D.; and Greene, Kenneth R., 5,554,132, Cl. 604-227.000.
Oberhauser, David F.: *See*—
DeNoto, Thomas G.; Nangeroni, Paul E.; and Oberhauser, David F., 5,554,483, Cl. 430-237.000.
O'Brien, Dennis W.: *See*—
Elmer, John W.; Teruya, Alan T.; and O'Brien, Dennis W., 5,554,926, Cl. 324-71.300.
O'Brien, Michael J.; and Littlefield, Richard A., to Eastman Kodak Company. Self calibrating actuator position control system. 5,555,060, Cl. 354-271.100.
Occidental Chemical Corporation: *See*—
Choi, Jin-O; Tyrell, John A.; and Dubell, Paul D., 5,554,684, Cl. 524-588.000.
Krishnamurti, Ramesh; Nagy, Sandor; and Etherton, Bradley P., 5,554,775, Cl. 556-7.000.
OCG Microelectronic Materials, Inc.: *See*—
Schulz, Reinhard; Münzel, Norbert; Roth, Martin; and Knobloch, Wilhelm, 5,554,797, Cl. 568-592.000.
Ochiai, Katsumi, to Sony Corporation; and Materials Research Corporation. Multi-valve engine. 5,553,572, Cl. 123-90.140.
Ochiai, Masahisa; and Asanae, Masumi, to Hitachi Metals, Ltd. Image formation method. 5,554,479, Cl. 430-122.000.
Ochs, Dennis E., to Hewlett-Packard Company. Method for calibrating a system for recording and playing back ECG signals. 5,553,623, Cl. 128-711.000.
Ochy P., Victor V.; and Hodson, Jeffrey D., to Rockwell International Corporation. Automatic call distributor reporting system and method therefor. 5,555,297, Cl. 379-136.000.
Oda, Hajime: *See*—
Kawashima, Kazunori; Oda, Hajime; and Miyajima, Takahiro, 5,554,973, Cl. 340-562.000.
Oda, Keisuke: *See*—
Fukumoto, Hiroshi; Tanaka, Naoya; Oda, Keisuke; Arimoto, Kazuaki; Yoshida, Takashi; Higashi, Kazuhiko; Kasahara, Yasunori; and Kuwada, Terumi, 5,555,462, Cl. 347-218.000.
Oda, Yasuo, to WACOM Co., Ltd. Method of and apparatus for determining whether a digitizer coordinate detecting tablet is properly operating and/or writing adjustment data into a memory associated with the tablet. 5,554,827, Cl. 178-18.000.
Odawara Engineering KK: *See*—
Tsugawa, Takayuki; and Tomita, Masahiro, 5,553,372, Cl. 29-734.000.
Odette, Thomas C.: *See*—
Kubina, Joseph E.; Gleason, Mark E.; Loughlin, Jerry F., Jr.; Wludyka, Todd H.; Odette, Thomas C.; Montie, Craig S.; Biermacher, Richard F.; Harney, Patrick M.; and DiMichele, Alfredo N., 5,553,912, Cl. 296-192.000.
Odnert, Daryl; and Santhanam, Vatsa, to Hewlett-Packard Company. Method and apparatus for compiling computer programs with interprocedural register allocation. 5,555,417, Cl. 395-700.000.
O'Donnell, Doris. Male incontinence pants. 5,554,149, Cl. 604-385.100.
O'Donnell, Martin J.; Wu, Shengde; Esikova, Irena; and Mi, Aiqiao, to Indiana University Foundation. Catalytic enantioselective synthesis of α-amino acid derivatives by phase-transfer catalysis. 5,554,753, Cl. 546-134.000.
OEA, Inc.: *See*—
Hamilton, Brian K.; and Parks, Brent A., 5,553,889, Cl. 280-736.000.
Oehy, Jürg; and Yurtsever, Mustafa, to Sulzer Medizinaltechnik AG. Process for the production of outer attachment faces on joint implants. 5,553,476, Cl. 72-325.000.
Oellerer, Friedrich: *See*—
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Officine Meccaniche Roselli S.R.L.: *See*—
Roselli, Pietro, 5,553,738, Cl. 221-195.000.
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Ogata, Toshihiro: *See*—
Kobayashi, Shohei; Yamazaki, Takeshi; Yanagida, Tsuneo; Takemura, Haruhiko; and Ogata, Toshihiro, 5,555,232, Cl. 369-112.000.
Ogawa, Kazuo; and Inoue, Hideo, to Toyota Jidosha Kabushiki Kaisha. Oil temperature estimating device for shock absorber, and shock absorber damping force control apparatus using such oil temperature estimating device. 5,555,500, Cl. 364-424.050.
Ogawa, Shigeo: *See*—
Tsinberg, Mikhail; Azadegan, Faramarz; Hu, Antony; and Ogawa, Shigeo, 5,555,193, Cl. 364-514.00A.
Ogino, Shigeyuki: *See*—
Matsushima, Fumiaki; Ohno, Yoshihiro; Ogino, Shigeyuki; and Matsui, Kuniyasu, 5,554,466, Cl. 430-7.000.
Ogura, Hirokazu; Kaneko, Kazuo; and Kono, Tadayoshi, to Fujitsu Limited. Image data binary coding method and apparatus. 5,555,321, Cl. 382-235.000.
Ogura, Mieko: *See*—
Mitsuhashi, Masato; and Ogura, Mieko, 5,554,502, Cl. 435-6.000.
Ogura, Takao; Amemiya, Shigeo; Tezuka, Koji; and Chujo, Takafumi, to Fujitsu Limited. Packet directional path identifier transfer system. 5,555,542, Cl. 370-94.100.
Ogura, Yasuyuki: *See*—
Oosawa, Akira; Miyasaka, Chiaki; Ogura, Yasuyuki; Kouchi, Toshihito; and Yoshii, Shinichi, 5,555,505, Cl. 364-470.070.
Oh, Min-Chul: *See*—
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Oh, Seajin: *See*—
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Ohashi, Yumiko: *See*—
Ito, Kazuyuki; Nakamura, Kyuzo; Ishikawa, Michio; Togawa, Jun; Tani, Noriaki; Hashimoto, Masanori; and Ohashi, Yumiko, 5,554,418, Cl. 427-579.000.
Taki, Kazunari; Ohashi, Yumiko; Hamaguchi, Takuya; Maruyama, Hideo; and Matsuda, Riki, 5,554,451, Cl. 428-694.0ML.
Ohata, Koichiro: *See*—
Yoshitsugu, Takao; Ohata, Koichiro; and Kano, Tsuyoshi, 5,555,124, Cl. 359-200.000.
Ohba, Atsushi: *See*—

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Ohbayashi, Shigeki: *See*—
Anami, Kenji; Ohbayashi, Shigeki; and Inoue, Osamu, 5,555,522, Cl.
Kitano, Yoshio; and Okamoto, Kozo, 5,553,729, Cl. 219-619.000.
Okamoto, Rintarou, to Kabushiki Kaisha Toshiba. Semiconductor device manufacturing apparatus. 5,554,266, Cl. 204-298.150.

Tanaka, Takaaki, 5,555,133, Cl. 359-673.000.
Yabe, Hisao; Iida, Yoshihiro; Suzuki, Akira; Ito, Hideo; Tashiro, Yoshio;
Osborne, Harold G., to Alba-Waldensian, Inc. Brassiere and method of making same. 5,553,468, Cl. 66-171.000.

Ajika, Natsuo; and Ohba, Atsushi, 5,554,867, Cl. 257-314.000.
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Anami, Kenji; Ohbayashi, Shigeki; and Inoue, Osamu, 5,555,522, Cl. 365-200.000.
Ohio Electronic Engravers, Inc.: *See*—
Seitz, David R.; Woods, Curtis; and Thomas, Matthew A., 5,555,473, Cl. 358-299.000.
Ohkouchi, Takeo; Hosoda, Hitoshi; Yasui, Kenji; Kato, Shigehiro; Kondo, Yasuhiko; and Takahi, Yukiyoshi, to Sankyo Company, Limited. Composition containing the dihydrate of the calcium salt of 3-hydroxy-5-methylisoxazole and cupric hydroxide. 5,554,391, Cl. 424-633.000.
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Perowne, Paul J.; Manley, George C.; and Kirk, Richard A., to Crosfield Electronics Limited. Method and apparatus for generating an output device

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Payne, Joe L. Method for manufacturing a livestock feeder. 5,554,248, Cl. 156-304.200.

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Peck, Randall J.: *See*—
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Herd, Karl-Josef; and Roschger, Peter, 5,554,731, Cl. 534-593.000.

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Rosenberg, Norman. Intra-osseous needle drill. 5,554,154, Cl. 606-80.000.

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Kaabi, Carine; Lambelet, Pierre; Rossier, Yvan; and Seiler, Alfred, 5,553,485, Cl. 73-73.000.

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Agahi, Reza R.; and Ershaghi, Behrooz, 5,553,458, Cl. 62-87.000.

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Feal, Joseph; and Bacskay, Stephen, 5,554,394, Cl. 425-434.000.

Rouillot, Michel, to GKN Automotive AG. Mechanical tubular element such as transmission shaft of a motor vehicle. 5,553,964, Cl. 403-279.000.

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Bonfils, Armelle; and Philibert, Daniel, 5,554,604, Cl. 514-182.000.

Rousset, Bernard: *See*—
Dilhac, Jean-Marie; Ganibal, Christian; and Rousset, Bernard, 5,553,939, Cl. 374-1.000.

Rowe, Marlin D.; and McMullin, Francis A., to United States of America, Navy. Fluidtight door gasket. 5,553,871, Cl. 277-177.000.

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Grim, Tracy E., 5,554,104, Cl. 602-8.000.

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Rubin, Mae K.: *See*—
Degnan, Thomas F.; Klocke, Donald J.; and Rubin, Mae K., 5,554,274, Cl. 208-111.000.

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Carim, Hatim M.; Knudson, Orlin B.; Ekholm, Bruce P.; Erickson, David P.; Kelliher, William J., Jr.; and Rude, Michael J., 5,553,615, Cl. 128-633.000.

Rudisill, Duane E.: *See*—
Whitten, Jeffrey P.; and Rudisill, Duane E., 5,554,773, Cl. 552-104.000.

Rudokas, Ronald S.; Storch, John A.; and Daniels, David L., to AirTouch Communications, Inc. Method and apparatus for fraud control in cellular telephone systems. 5,555,551, Cl. 379-59.000.

Rudolph, Peter: *See*—
Fukuda, Tsuguo; Rudolph, Peter; and Umezu, Kazuyuki, 5,554,219, Cl. 117-83.000.

Rüegg, Anton. Process and apparatus for winding sheet material. 5,553,805, Cl. 242-534.000.

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Hinnen, Bennett C.; Ho, Hai T.; Rinard, Eric A.; Rinard, Gregory S.; Ruff, Brian A.; Thompson, Nathan C.; and Zia-Shakeri, Hossein, 5,555,143, Cl. 360-92.000.

Ruffles, Joseph W.: *See*—
Snider, A. Rebecca; Bennett, Richard M.; McCabe, Laurence J.; Magsig, Peter J.; Ng, Kane L.; Purdy, Lynn M.; and Ruffles, Joseph W., 5,553,620, Cl. 128-660.040.

Ruggles, Peter C.; and Snodgress, Jack S., to Reynolds Metals Company. Method of joining fluted tube joint. 5,554,244, Cl. 156-196.000.

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Rum, Wojciech M. Game board game and method playing the game. 5,553,854, Cl. 273-275.000.

Rumbaugh, James E.: *See*—
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Basch, Lauren R.; and Patashnick, Harvey, 5,553,507, Cl. 73-863.010.

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Cloutier, Jean-Francois; Arsky, Oleg; Boyd, Nikolas; and Rush, Rosemary, 5,555,407, Cl. 395-600.000.

Rushford, Steve, to Covercraft Industries. Tonneau cover system. 5,553,652, Cl. 160-354.000.

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Barr, John D.; Burrell, Mark W.; Russell, Robert A.; Thorp, Richard; Boast, David; and Clegg, John, 5,553,678, Cl. 175-73.000.

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Rybacki, Richard L.: *See*—
Rivers, Gordon T.; and Rybacki, Richard L., 5,554,349, Cl. 423-228.000.

Rybicki, Mathew A.: *See*—
Fong, Joseph C. Y.; and Rybicki, Mathew A., 5,555,263, Cl. 370-17.000.

Rydell, Theodore B.; Wahlquist, Joseph D.; and Tumanic, Gerald W., to Little Rapids Corporation. Disposable filters and manufacturing process. 5,554,288, Cl. 210-504.000.

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Williams, David R.; Ryles, Christine W.; and Barrow, Stephen R., 5,554,358, Cl. 424-49.000.

Ryoichi, Hirai: *See*—
Yoshida, Takao; Takhiro, Suzuki; and Ryoichi, Hirai, 5,553,579, Cl. 123-295.000.

Ryu, Akinori: *See*—
Ohta, Masahiro; Matsuyama, Akio; Senoue, Eiji; Kuwano, Fumiaki; Yasui, Osamu; Yoshida, Yasunori; Ryu, Akinori; and Kobayashi, Tadashi, 5,554,765, Cl. 548-462.000.

Ryu, Tadamitsu: *See*—
Aoe, Shigeru; Kakehi, Gen; and Ryu, Tadamitsu, 5,555,427, Cl. 395-

Sakagami, Atsushi; Sekido, Tatsuya; Yamamoto, Isao; and Echigo, Yuko, to Nissan Motor Co., Ltd. Automobile multiple communication system operable under low power consumption. 5,554,978, Cl. 340-825.070.

Sandor, Ellen R.; Cunnally, William T.; and Meyers, Stephen B., to Phscologram Venture, Inc., The. Press polymerization of lenticular images. 5,554,432, Cl. 428-157.000.

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Sasano, Hiroshi; Mangyo, Masao; Hamada, Koshi; and Kubota, Akihiko, to Matsushita Refrigeration Company. Spring configuration for a hermetic compressor discharge valve. 5,554,016, Cl. 417-569.000.

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S.O.B. Partnership: *See*—
Oyler, Edward N.; and Stover, Harold F., 5,553,749, Cl. 222-129.100.
Saar, Robin R.: *See*—
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Sacchettini, James; and Blanchard, John, to Albert Einstein College of Medicine of Yeshiva University, a Division of Yeshiva University. Dihydrodipicolinate reductase crystals and three dimensional structure. 5,554,522, Cl. 435-189.000.
Sacco, Bruno; Tomforde, Johann; Reichel, Anton; Steinle, Gerhard; Klein, Berthold; Slaughter, David; and Ma, Mike, to Mercedes-Benz AG. Small two-seater car. 5,553,909, Cl. 296-185.000.
Sacha, John R., to United States of America, Navy. Method and apparatus for target imaging with sidelooking sonar. 5,555,532, Cl. 367-88.000.
Sackiney, Solomon K. Game apparatus and method of play for teaching dna related technologies. 5,553,853, Cl. 273-236.000.
Safety-Temp Ltd.: *See*—
Cope, Gil, 5,553,941, Cl. 374-150.000.
Safi, Fadi-Christian E.: *See*—
Brassted, Mark W.; Byrn, Jonathan W.; Delp, Gary S.; Leichty, Philip L.; Plotz, Kevin G.; Safi, Fadi-Christian E.; and Slane, Albert A., 5,555,387, Cl. 395-419.000.
Saft: *See*—
Flaudrois, Serge; Fevrier, Annie; Biensan, Philippe; and Simon, Bernard, 5,554,462, Cl. 429-218.000.
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Hirai, Kenji; Matsukawa, Tomoko; Yano, Tomoyuki; Ejiri, Emiko; Aizawa, Kiyomi; Shikakura, Koichi; Yoshii, Tomoko; Ugai, Sadayuki; Yamada, Osamu; and Kishi, Shigeki, 5,554,581, Cl. 504-298.000.
Nagase, Yu; Akiyama, Eiichi; and Takamura, Yuriko, 5,554,706, Cl. 526-279.000.
Sagawa, Fumihiko: *See*—
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Komori, Yasuhiro; and Sagayama, Shigeki, 5,555,345, Cl. 395-23.000.
Sagiv, Shmuel: *See*—
Besaw, Keith V.; Donovan, Robert J.; and Sagiv, Shmuel, 5,555,412, Cl. 395-700.000.
Saijo, Eiji; Atsumi, Keigo; and Aoyama, Masahiko, to Sumitomo Wiring Systems, Ltd. Locking connector. 5,554,052, Cl. 439-595.000.
Saiki, Mitsuyoshi: *See*—
Sato, Jun; and Saiki, Mitsuyoshi, 5,555,555, Cl. 382-104.000.
Saimi, Yasukazu: *See*—
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Kotte, Rolf; Cornils, Gerd; and Stumpe, Thomas, 5,554,325, Cl. 264-37.000.
Saito, Hiroshi, to Amada Metrecs Company, Limited. Upper tool for a press. 5,553,523, Cl. 83-136.000.
Saito, Koichi: *See*—
Tomita, Hiroyuki; and Saito, Koichi, 5,555,515, Cl. 364-724.010.
Saito, Makoto; Chiba, Yoshimasa; and Misaki, Hiroyuki, to Tonen Corporation. Epoxy resin primer for lining of wet concrete surfaces. 5,554,672, Cl. 523-466.000.
Saito, Shin: *See*—
Gulick, Dale E.; Peterson, Joseph W.; Bowles, James E.; Bartkowiak, John G.; Yoshikawa, Munehiro; Saito, Shin; and Matsubara, Hiroshi, 5,555,287, Cl. 379-61.000.
Saito, Tsuyoshi: *See*—
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Saitoh, Hiroshi: *See*—
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Saitoh, Shiroh: *See*—
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Saitoh, Takashi: *See*—
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Saitou, Mitsuhiro: *See*—
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Saitou, Syuji, to Fujitsu Limited. Substation apparatus for satellite communications. 5,555,242, Cl. 370-17.000.
Sakagami, Atsushi; Sekido, Tatsuya; Yamamoto, Isao; and Echigo, Yuko, to Nissan Motor Co., Ltd. Automobile multiple communication system operable under low power consumption. 5,554,978, Cl. 340-825.070.
Sakai, Takamasa: *See*—
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Sakairi, Hiroshi: *See*—
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Sakase Chemical Industry Co., Ltd: *See*—
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Sakurada, Shuroku: *See*—
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Salemme, Robert M.: *See*—
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Sällberg, Hans K. M.; and Blaabjerg, Soren, to Telefonaktiebolaget LM Ericsson. Methods and devices for prioritizing in handling buffers in packet networks. 5,555,264, Cl. 370-17.000.
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Kochik, Ronald D.; Picco, David A.; Bradea, Michael L.; and Salmen, Kristine S., 5,554,298, Cl. 210-708.000.
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Salpaka, Glenn L.; Owens, Valerie D.; and Mullinax, Willie C., to Power Tool Holders Incorporated. Keyless chuck. 5,553,873, Cl. 279-62.000.
Saltman, Robert: *See*—
Chen, Ziyun; Cheng, Tai; Musi, Ketan; Patel, Udayan; and Saltman, Robert, 5,554,120, Cl. 604-96.000.
Salvio, Paul R.; and Walsh, Kevin A., to Hughes Aircraft Company. Flexibly connectable high precision thermal and structural focal plane array mount. 5,554,847, Cl. 250-332.000.
Samejima, Noriko: *See*—
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Sampson, Robert C.; and Flanigan, Sean T., to Wasco Products, Inc. Flashing and counterflashing. 5,553,425, Cl. 52-58.000.
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Kim, Moon-hyun, 5,555,431, Cl. 354-222.000.
Seo, Jae-kyeong; Choi, Deog-ho; and Lee, Seon-ho, 5,555,059, Cl. 354-234.100.
Samsung Display Devices Co., Ltd.: *See*—
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Choi, Sang-gil; Cho, Jun-hyoung; and Wee, Young-cheul, 5,555,359, Cl. 395-141.000.
Kim, Gyu-Hong, 5,555,526, Cl. 365-203.000.
Kim, Jeong-ho, 5,555,138, Cl. 360-69.000.
Lee, Kab-keun, 5,555,026, Cl. 348-565.000.
Limberg, Allen L., 5,555,024, Cl. 348-473.000.
Min, Young-hoon, 5,555,141, Cl. 360-74.700.
Yoo, Jae-chun, 5,555,096, Cl. 358-310.000.
Yu, Si-Hong, 5,553,663, Cl. 165-151.000.
Samuels, Glenn J.; Lee, Jung-Chung; Lee, Charles; Berry, Stephen; and Jarosz, Paul J., to Syntex (U.S.A.) Inc. High dose formulations of mycophenolate mofetil and mycophenolic acid. 5,554,384, Cl. 424-451.000.
Sanchem, Inc.: *See*—
Bibber, John W., 5,554,231, Cl. 148-272.000.
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de la Luz-Martinez, Jose; Gonzalez-Hernandez, Jesus; Sanchez-Sinencio, Feliciano; de Dios Figueroa C., Juan; Martinez-Bustos, Fernando; and Ruiz-Torres, Maximiano, 5,553,532, Cl. 99-358.000.
Sancoff, Gregory E.; and Doyle, Mark C., to River Medical, Inc. Liquid delivery device. 5,553,741, Cl. 222-1.000.
Sanders, Deborah L., to United States Surgical Corporation. Modular surgical implant. 5,554,194, Cl. 623-16.000.
Sanders, Gary G.; and Goodwin, Brian J., to Penberthy, Inc. Apparatus and method for sensing material level by capacitance measurement. 5,554,937, Cl. 324-664.000.
Sanders, Josef; Krutz, Mark; Dietrich, Manfred; Heinemann, Torsten; Woynar, Helmut; Jacoba, Gundolf; and Scholz, Uwe, to Bayer Aktiengesellschaft. Low viscosity polymer polyols a process for their production as well as the manufacture of polyurethane from materials. 5,554,662, Cl. 521-137.000.

Sandor, Ellen R.; Cunnally, William T.; and Meyers, Stephan B., to Phscelogram Venture, Inc., The. Press polymerization of lenticular images. 5,554,432, Cl. 428-157.000.
Sandoz Ltd.: *See*—
Baumann, Hans-Peter, 5,554,199, Cl. 8-543.000.
Nusser, Rainer; and Wald, Roland, 5,554,732, Cl. 534-637.000.
Quistad, Gary B.; and Leisy, Douglas J., 5,554,592, Cl. 514-12.000.
Robert, Georg, 5,554,195, Cl. 8-446.000.
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Michels, Lester D.; Duchon, Douglas J.; and Reid, Norman C., 5,554,140, Cl. 604-283.000.
SanGregory, Jude A.: *See*—
Pearson, Douglas H.; SanGregory, Jude A.; Lyons, Kevin P.; Bietry, Joseph R.; and Lewis, Alan E., 5,555,062, Cl. 354-288.000.
Sanka, Ravi S.: *See*—
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Sankyo Company, Limited: *See*—
Ohkouchi, Takeo; Hosoda, Hitoshi; Yasui, Kenji; Kato, Shigehiro; Kondo, Yasuhiko; and Takahi, Yukiyoshi, 5,554,391, Cl. 424-633.000.
Sano, Fumihiko: *See*—
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Sano, Harunobu: *See*—
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Emonds-Alt, Xavier; Gueule, Patrick; Proietto, Vincenzo; and Van Broeck, Didier, 5,554,763, Cl. 548-453.000.
Santa Barbara Research Center: *See*—
Russell, Edgar E., 5,554,845, Cl. 250-226.000.
Santa's Best: *See*—
Protz, William F., Jr., 5,553,823, Cl. 248-304.000.
Santel, Hans-Joachim: *See*—
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Haas, Wilhelm; Müller, Klaus-Helmut; König, Klaus; Santel, Hans-Joachim; Lürssen, Klaus; and Schmidt, Robert R., 5,554,761, Cl. 548-263.600.
Santhanam, Vatsa: *See*—
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Sanyo Electric Co., Ltd: *See*—
Hamada, Minoru; and Ando, Hitoshi, 5,555,521, Cl. 365-185.030.
Haruki, Toshinobu; and Kikuchi, Kenichi, 5,555,022, Cl. 348-223.000.
Honda, Shoji; Shono, Masayuki; Hiroyama, Ryoji; Bessho, Yasuyuki; Kase, Hiroyuki; Nishida, Toyozo; Uetani, Takahiro; and Suzuki, Junko, 5,555,271, Cl. 372-45.000.
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Maenaka, Akihiro; Mori, Yukio; Murata, Haruhiko; Ide, Hirokazu; and Okada, Hidefumi, 5,555,023, Cl. 348-253.000.
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Lackie, Steve J., 5,554,340, Cl. 422-68.100.
Sarada, Thyagaraj: *See*—
Connell, Richard A.; Sarada, Thyagaraj; and Bernard, Richard A., 5,554,842, Cl. 235-491.000.
Sarangdhar, Nitin V.; Nizar, P. K.; and Carson, David G., to Intel Corporation. Multiprocessor programmable interrupt controller system with separate interrupt bus and bus retry management. 5,555,420, Cl. 395-739.000.
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Marega, Antonello; and Sartor, Mario, 5,553,402, Cl. 36-117.700.
Sasada, Tetsuo: *See*—
Katoh, Yasuhiro; Tsuda, Yoshihiro; Yanagida, Mitsuaki; Toriya, Hajime; and Sasada, Tetsuo, 5,554,000, Cl. 415-208.200.
Sasaki, Akira: *See*—
Haragakiuchi, Hideyuki; Tadokoro, Hiroyuki; Fukasawa, Nobuaki; Terashima, Isamu; Sasaki, Akira; Matsuo, Kazuyoshi; Onose, Katuyoshi; and Okuhama, Masashi, 5,555,074, Cl. 355-208.000.
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Sasama, Hiroshi; and Yoneda, Masato, to Kawasaki Steel Corporation. Priority encoder applicable to large capacity content addressable memory. 5,555,397, Cl. 395-485.000.
Sasano, Hiroshi; Mangyo, Masao; Hamada, Koshi; and Kubota, Akihiko, to Matsushita Refrigeration Company. Spring configuration for a hermetic compressor discharge valve. 5,554,016, Cl. 417-569.000.
Sato, Jun; and Saiki, Mitsuyoshi, to Aisin Seiki Kabushiki Kaisha. Apparatus which detects lines approximating an image by repeatedly narrowing an area of the image to be analyzed and increasing the resolution in the analyzed area. 5,555,555, Cl. 382-104.000.
Sato, Kiminori: *See*—
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Sato, Masaaki: *See*—
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Sato, Norio: *See*—
Tanaka, Hitoshi; and Sato, Norio, 5,555,480, Cl. 359-822.000.
Sato, Shinichi; and Koike, Noriyuki, to Shin-Etsu Chemical Co., Ltd. Organosilicon compound and a method for preparing the same. 5,554,779, Cl. 556-419.000.
Satoh, Hiroyuki: *See*—
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Satoh, Kenichiro: *See*—
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Satoh, Kohichi: *See*—
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Satoh, Takao; Yamamoto, Akira; and Honma, Shigeo, to Hitachi, Ltd. Storage controller for performing dump processing. 5,555,389, Cl. 395-427.000.
Satoh, Yoshiyuki: *See*—
Kitamura, Tadaaki; Kobayashi, Yoshiki; Nakanishi, Kunio; Yahiro, Masakazu; Satoh, Yoshiyuki; Shibata, Toshiro; Horie, Takeshi; Yamamoto, Katsuyuki; Takatoo, Masao; Inoue, Haruki; and Asada, Kazuyoshi, 5,554,983, Cl. 340-937.000.
Saur, Reinhold: *See*—
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Sauter, Hubert: *See*—
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Sauzade, Jean-Denis: *See*—
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Savu, Jeffrey L.; and Tarcha, Timothy, to Adventure In Mind, Inc. Golfing game dart board, golfing dart game and an associated method. 5,553,850, Cl. 273-317.200.
Sawa, Tsutomu; Takenoshita, Hiroyuki; Hada, Toshiki; and Komatsu, Hirohide, to International Business Machines Corporation; and K R D Corporation. Paper feed roller. 5,553,845, Cl. 271-314.000.
Sawada, Kazutaka: *See*—
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Sawada, Shinichi: *See*—
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Sawai, Akiyoshi; Shimamoto, Haruo; Tachikawa, Toru; and Shibata, Jun, to Mitsubishi Denki Kabushiki Kaisha. Plastic molded semiconductor package. 5,554,887, Cl. 257-737.000.
Sawayama, Shigeru; and Satoh, Kohichi, to Mitsubishi Kasei Corporation. N-vinylformamide compositions. 5,554,792, Cl. 564-4.000.
Sawyer, Miles G., III. Bottled-water dispenser with ice maker and crusher. 5,553,744, Cl. 222-64.000.
Saxton, Robert J.; and Zajacek, John G., to ARCO Chemical Technology, L.P. Method of making essentially silicic zeolite beta. 5,554,356, Cl. 423-706.000.
Scaggs, Sheila: *See*—
Inniss, Hadyn; Scaggs, Sheila; and Welch, Robert P., 5,555,291, Cl. 379-67.000.
Scanzillo, Joseph G.; and Anderson, Russell J., III. Methods and apparatus for biodegradation of polluted fluids. 5,554,291, Cl. 210-615.000.
Scardovi, Alessandro: *See*—
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Schach, Bernadine. Hair styling device. 5,553,631, Cl. 132-210.000.
Schack, Warren R.; and Dennis, Wendell, to Marlen Research Corporation. Quick clean-up dual piston pump. 5,553,985, Cl. 414-287.000.
Schäfer, Gerhard: *See*—
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Scheer, Erich: *See*—
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Morrey, Bernard F.; McLeod, John J., Jr.; and Schultz, Frederick M., 5,554,111, Cl. 604-26.000.
Schultz, Robert H., to Coors Brewing Company. Necking apparatus support. 5,553,826, Cl. 248-678.000.
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Sealy, Dexter: *See*—
Sudama, Ram; Griffin, David M.; Johnson, Brad; Sealy, Dexter; Shelhamer, James; and Tallman, Owen H., 5,555,375, Cl. 395-200.030.
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Scheib, Frank; Brunk, Michael; and Kleber, Rainer, to INA Walzlager Schaeffler KG. Guide rail for railborne load carriers. 5,553,947, Cl. 384-55.000.
Scheibl, Frederick J., to International Business Machines Corporation. System and method for generating a trimmed parametric surface for display on a graphic display device. 5,555,356, Cl. 395-134.000.
Schelberger, Klaus: *See*—
Wingert, Horst; Müller, Bernd; Sauter, Hubert; Ammermann, Eberhard; Lorenz, Gisela; Saur, Reinhold; Schelberger, Klaus; and Hampel, Manfred, 5,554,616, Cl. 514-269.000.
Schelling, Anna C.; and Stephenson, Stanley W., III, to Eastman Kodak Company. Camera with manual rewind apparatus. 5,555,056, Cl. 354-212.000.
Schenk, Leonard G. Collapsible backrest, and methods of constructing and utilizing same. 5,553,921, Cl. 297-352.000.
Schenk, Richard C., to Xerox Corporation. Adapter system to integrate reproduction apparatus to sheet output processing apparatus with lateral registration. 5,553,843, Cl. 271-226.000.
Scherer, Mark D.: *See*—
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Scheufler, Fred G.; Scheufler, Richard D.; and Bayard, William H., to Optimum Air Corporation. Automated air filtration and drying system for waterborne paint and industrial coatings. 5,554,416, Cl. 427-378.000.
Scheufler, Richard D.: *See*—
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Scheve, B. Joseph; Mayfield, John W.; and DeNicola, Anthony J., Jr., to Montell North America Inc. High melt strength, propylene polymer, process for making it, and use thereof. 5,554,668, Cl. 522-157.000.
Schilit, William N.: *See*—
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Schilp, Andrea: *See*—
Benz, Gerhard; Laermer, Franz; Schilp, Andrea; Zabler, Erich; Schirmer, Jürgen; and Uhler, Werner, 5,553,506, Cl. 73-862.590.
Schipfer, Rudolf; Schmoelzer, Gerhard; and Urbano, Edmund, to Vianova Resins AG. Catalyzed cationic lacquer binder, process for producing the same and its use. 5,554,700, Cl. 525-360.000.
Schirmer, Jürgen: *See*—
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Schloegl, Gunter: *See*—
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Haas, Wilhelm; Müller, Klaus-Helmut; König, Klaus; Santel, Hans-Joachim; Lürssen, Klaus; and Schmidt, Robert R., 5,554,761, Cl. 548-263.600.
Schmidter, Thomas C.: *See*—
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Schmitz, Rüdiger: *See*—
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Schmutz, Lawrence E., to Adaptive Optics Associates. System for dimensioning objects. 5,555,090, Cl. 356-381.000.
Schnaibel, Eberhard; Schneider, Erich; and Blischke, Frank, to Robert Bosch GmbH. Method and apparatus for judging the functioning of a catalytic converter. 5,553,450, Cl. 60-274.000.
Schnaibel, Eberhard; Mergenthaler, Rolf-Hermann; Reuschenbach, Lutz; Veil, Hans; and Weiss, Eduard, to Robert Bosch GmbH. Control system and method for metering the fuel in an internal combustion engine. 5,553,593, Cl. 123-682.000.
Schnallinger, Helfried. Process of manufacturing shaped elements from synthetic thermopolastics. 5,554,332, Cl. 264-230.000.
Schneider, Arthur J., to Hughes Missile Systems Company. Self-surveying relative GPS (global positioning system) weapon guidance system. 5,554,994, Cl. 342-357.000.
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Schneider, Heinz-Walter; Wilms, Axel; Schmitz, Rüdiger; Schulz, Robert; and Michelsen, Klaus, to BASF Aktiengesellschaft. Preparation of hydroxylammonium salts. 5,554,353, Cl. 423-387.000.
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Rivard, Robert M.; Schneider, Michael J.; Pattantyus, Tamas I.; Towers, Kenneth S.; and Phipps, Jack R., 5,553,930, Cl. 303-174.000.
Schnewlin-Maier, Margrit. Elastically resilient shoe insole having a nubbed surface. 5,553,398, Cl. 36-43.000.
Schöder, Bernd; Sossnitza, Johannes; Demgensky, Jürgen; Riedmann, Josef; Jädicke, Horst; Glock, Wilfried; and Schramm, Friedrich, to Fichtel & Sachs AG. Hydrokinetic torque converter with lock-up clutch. 5,553,693, Cl. 192-3.290.
Schoedl, Roland; Frank, Kurt; and Urcuyo, Armando, to Robert Bosch GmbH. Apparatus for feeding fuel from a supply tank to an internal combustion engine. 5,554,010, Cl. 417-313.000.
Schoeller, Kevin M.: *See*—
Koecher, Anthony R.; and Schoeller, Kevin M., 5,553,327, Cl. 2-200.300.
Scholz, Matthew T.: *See*—
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Schönafinger, Karl; Klemm, Peter; Ostrowski, Jörg, deceased (by Thomas Ostrowski and Stefanie Ostrowski, legal representatives), to Cassella Aktiengesellschaft. Use of coumarin derivatives. 5,554,611, Cl. 514-228.200.
Schoner, Brigitte E.: *See*—
Basinski, Margret B.; DiMarchi, Richard D.; Heath, William F., Jr.; and Schoner, Brigitte E., 5,554,727, Cl. 530-324.000.
Schooley, Richard M., to Xerox Corporation. Printer having an active user interface feature. 5,555,077, Cl. 355-209.000.
Schopf, Dieter, to Union Special GmbH. Sewing machine with rotary stitch regulator. 5,553,563, Cl. 112-315.000.
Schouten, Pieter; and Siminian, Michael. Truck assembly for roller board apparatus. 5,553,874, Cl. 280-11.280.
Schramayr, Ernst; and Olewicz, Tadeusz A., to Jet Sew Technologies, Inc. Sleeve insertion system with edge guide feature. 5,553,561, Cl. 112-306.000.
Schramm, Friedrich: *See*—
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Schreiber, Melvin: *See*—
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Schricker, Todd: *See*—
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Schroeder, Dennis: *See*—
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Schuhmann, Detlef E.; Peiffer, Herbert; Murschall, Ursula; and Schloegl, Gunter, to Hoechst Aktiengesellschaft. Biaxially oriented sealable polypropylene film having improved barrier properties. 5,554,245, Cl. 156-244.240.
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Schulz, Reinhard; Münzel, Norbert; Roth, Martin; and Knobloch, Wilhelm, to OCG Microelectronic Materials, Inc. Tetra (hydroxphenyl) alkanes. 5,554,797, Cl. 568-592.000.
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Schulz, Winfried F.; Kirchhoffer, Johann; and Wirtz, Hans-Peter, to Ford Motor Company. Multiple ratio automatic transmission and torque converter. 5,553,694, Cl. 192-3.300.
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Schuman, Richard F.: *See*—
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Scribner, Paul; and Semple, Dan, to ASA Electronics Corporation. Vehicular audio/visual system having distribution box for connecting individual passenger monitors to multiple program sources. 5,555,466, Cl. 348-8.000.
Seabaugh, Alan C., to Texas Instruments Incorporated. Resonant tunneling transistor noise generator. 5,554,860, Cl. 257-25.000.
Seabrook, Samuel G.; and Heymann, Richard C. Compositions containing anti-microbial agents and methods for making and using same. 5,554,373, Cl. 424-400.000.
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Hickox, Thomas A.; Battu, Ramgopal; and Gollbach, Lawrence W., 5,555,146, Cl. 360-105.000.
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Jensen, Howard A.; and Seem, John E., 5,555,195, Cl. 364-551.010.
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Segers, Jozef, to Atlas Copco AirPower naamloze vennootschap. Transmission with revolving bearing and seal used hereby. 5,554,018, Cl. 418-55.400.
Segura, Ramon, to Henkel Kommanditgesellschaft auf Aktien. Sulfited fatty compounds with a reduced content of free hydrogen sulfite. 5,554,306, Cl. 252-8.570.
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Seiko Epson Corporation: *See*—
Mano, Toshihiko; Kodaira, Toshimoto; and Oshima, Hiroyuki, 5,554,861, Cl. 257-71.000.
Matsushima, Fumiaki; Ohno, Yoshihiro; Ogino, Shigeyuki; and Matsui, Kuniyasu, 5,554,466, Cl. 430-7.000.
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Yamasaki, Yasuo; Hama, Norikata; Kurasawa, Munenori; and Hashimoto, Nobuaki, 5,554,885, Cl. 257-666.000.
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Mitsuoka, Yasuyuki; Iwaki, Tadao; and Kasama, Nobuyuki, 5,555,115, Cl. 359-72.000.
Shibata, Kimio, 5,554,925, Cl. 323-282.000.
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Kawashima, Kazunori; Oda, Hajime; and Miyajima, Takahiro, 5,554,973, Cl. 340-562.000.
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Kaabi, Carine; Lambelet, Pierre; Rossier, Yvan; and Seiler, Alfred, 5,553,485, Cl. 73-73.000.
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Masaie, Norio; Tachibana, Tomoyuki; Seita, Koji; and Araike, Yasuo, 5,554,308, Cl. 508-181.000.
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Beck, Dieter; Breitbach, Peter P., deceased; Breitbach, Thomas, heir; Leibnitz, Rudiger; and Ritter, Gerd, 5,554,287, Cl. 210-500.290.
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Sakagami, Atsushi; Sekido, Tatsuya; Yamamoto, Isao; and Echigo, Yuko, 5,554,978, Cl. 340-825.070.
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Yu, Tsai-Yun, 5,553,916, Cl. 297-207.000.
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Metzler, Richard A.; and Rodov, Vladimir, 5,554,880, Cl. 257-560.000.
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Konuma, Toshimitsu; Nishi, Takeshi; and Mori, Harumi, 5,555,110, Cl. 359-56.000.
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Maeda, Kazuo; Tokumasu, Noboru; and Yuyama, Yoshiaki, 5,554,570, Cl. 437-235.000.
Semiconductor Systems, Inc.: *See*—
Biche, Michael R.; and Anderson, H. Alexander, 5,553,994, Cl. 414-752.000.

Semmer, Steven R.: *See*—
Dabberdt, Walter F.; Norris, Kenneth D.; Semmer, Steven R.; Delany, Sharp, Bruce R. Double walled storage tank systems with enhanced wall integrity. 5,553,734, Cl. 220-414.000.

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Scribner, Paul; and Semple, Dan, 5,555,466, Cl. 348-8.000.
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Sencorp: *See*—
Remerowski, David L., 5,553,764, Cl. 227-10.000.
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Flory, Klaus; Stange, Andreas; Kroener, Michael; and Sendhoff, Norbert, 5,554,718, Cl. 528-246.000.
Nilz, Claudia; Sendhoff, Norbert; Breitschaft, Walter; Zillig, Manfred; and Lorenzak, Primoz, 5,554,261, Cl. 162-162.000.
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Seo, Jae-kyeong; Choi, Deog-ho; and Lee, Seon-ho, to Samsung Aerospace Industries, Ltd. Electromagnetic lens shutter apparatus. 5,555,059, Cl. 354-234.100.
Seo, Taeseok; and Park, Donghoon, to Hyundai Motor Company. Gear train of an automatic five-speed transmission for a vehicle. 5,554,079, Cl. 475-207.000.
Sepielli, Perry, to Iolab Corporation. Electronic footswitch for ophthalmic surgery. 5,554,894, Cl. 307-119.000.
Sera, Steven A., to Georgia-Pacific Corporation. Sheet material edge labeling. 5,554,427, Cl. 428-43.000.
Serot, Pierre, to Legris S.A. Device for connecting a length of duct to a coupling endpiece. 5,553,901, Cl. 285-340.000.
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Barthimer, Robert L.; and Beck, Niels J., 5,553,781, Cl. 239-88.000.
Beck, Niels J.; Gebert, Kresimir; and Wong, Hoi C., 5,553,575, Cl. 123-198.00F.
Seto, Yasuhiro, to Fuji Photo Film Co., Ltd. Method of positioning image frame and photographic film carrier. 5,555,181, Cl. 355-41.000.
Seward, Matthew F.: *See*—
McMahon, Jerry K.; Olsen, Floyd W.; and Seward, Matthew F., 5,554,924, Cl. 323-229.000.
Seyyedy, Mirmajid: *See*—
Parkinson, Ward D.; Waller, William K.; and Seyyedy, Mirmajid, 5,555,429, Cl. 395-800.000.
SGS-Thomson Microelectronics, Inc.: *See*—
Sundaresan, Ravishankar, 5,554,548, Cl. 437-41.000.
SGS-Thomson Microelectronics S.A.: *See*—
Drouot, Sylvie, 5,555,216, Cl. 365-230.060.
Poulin, François, 5,554,879, Cl. 257-506.000.
SGS-Thomson Microelectronics, S.r.l.: *See*—
Ferrario, Bruno, 5,555,168, Cl. 363-89.000.
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Bizzi, Emilio; Mussa-Ivaldi, Ferinando A.; and Shadmehr, Reza, 5,554,033, Cl. 434-247.000.
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Boyd, Gary L.; and Shaffer, James E., 5,554,001, Cl. 415-209.200.
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Tateosian, Louis H.; Shaffer, Scott E.; and Latta, Mark A., 5,554,665, Cl. 522-30.000.
Shah, Prasanna: *See*—
Verseput, Jerry; Lam, Fong-Shek; and Shah, Prasanna, 5,555,510, Cl. 364-514.00R.
Shah, Tilak M., to Polygenex International, Inc. Dip molded polyurethane film compositions. 5,554,673, Cl. 524-104.000.
Shahir, Fred A.; and Sohaei, Frank K. Business card image copier. 5,555,105, Cl. 358-473.000.
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Shannahan, Donald R. Elastic footwrap. 5,554,107, Cl. 602-66.000.
Shannon, Alfred W.: *See*—
England, Laurence E.; Lang, Andrew J.; and Shannon, Alfred W., 5,555,411, Cl. 395-650.000.
Shape Inc.: *See*—
Lovecky, Craig; Rolfe, Richard; Lowry, Alan B.; and Steller, Robert, 5,553,444, Cl. 53-453.000.
Sharkey, Hugh R.: *See*—
Edwards, Stuart D.; Lax, Ronald G.; Lundquist, Ingemar H.; Sharkey, Hugh R.; and Baker, James A., 5,554,110, Cl. 604-22.000.
Sharma, Prem K.; Van Doorn, Arie R.; and Staring, Aemilianus G. J., to U.S. Philips Corporation. Optical amplifier. 5,554,747, Cl. 540-456.000.
Sharma, Ravinder K.; Lebby, Michael S.; Hartman, Davis H.; and Hansen, Kent W., to Motorola, Inc. Waveguide with an electrically conductive channel. 5,555,341, Cl. 385-129.000.
Sharp, Bruce R. Double walled storage tank systems with enhanced wall integrity. 5,553,734, Cl. 220-414.000.
Sharp Corporation: *See*—
Nakajima, Tatsushi, 5,555,314, Cl. 382-124.000.
Sharp Kabushiki Kaisha: *See*—
Adachi, Katsumi; and Hayakawa, Takashi, 5,555,079, Cl. 355-219.000.
Katayama, Hiroyuki; Nakayama, Junichiro; Iketani, Naoyasu; and Ohta, Kenji, 5,554,436, Cl. 428-212.000.
Kitagawa, Masahiko; and Tomomura, Yoshitaka, 5,554,877, Cl. 257-474.000.
Kojima, Kunio; Maeda, Shigemi; and Akiyama, Jun, 5,555,229, Cl. 369-60.000.
Nomura, Shingo, 5,555,386, Cl. 395-375.000.
Watanabe, Noriko; Nakanishi, Hiroshi; Shibata, Kazuhiro; Hamada, Hiroshi; and Funada, Fumiaki, 5,554,251, Cl. 156-379.800.
Yamazato, Hisao; Tani, Naoki; Aoki, Naohiko; Kasihara, Jyunzou; and Uramoto, Yasunari, 5,555,189, Cl. 364-492.000.
Sharpe, Anthony N., to Canada, Her Majesty the Queen in right of as represented by the Minister of Health and Welfare Canada. Non-destructive surface sampler. 5,554,537, Cl. 435-309.100.
Sharpe, Benjamin W.: *See*—
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Sharper, Craig A.: *See*—
Gupta, Dev V.; Chen, Yu-Ren B.; Sharper, Craig A.; and Stone, Alan E., 5,555,244, Cl. 370-60.100.
Shaughnessy, Steven T., to Borland International, Inc. Multi-user system and methods providing improved file management by reading. 5,555,388, Cl. 395-427.000.
Shaw Industries Limited: *See*—
Woo, Daniel Ming-Kwong, 5,555,222, Cl. 367-187.000.
Sheets, Laurence L., to Teltrend Inc. Phantom data link for digital transmission lines. 5,555,274, Cl. 375-257.000.
Sheiman, Samuel R., to Crest Lock Co., Inc. Mobile carrying case. 5,553,692, Cl. 190-18.00A.
Shelhamer, James: *See*—
Sudama, Ram; Griffin, David M.; Johnson, Brad; Sealy, Dexter; Shelhamer, James; and Tallman, Owen H., 5,555,375, Cl. 395-200.030.
Shell Oil Company: *See*—
Booth, James R.; Jacobi, Michael C.; Nunez, Arlette C.; Smith, Jonathan S.; Tauvers, Peter R.; Doyle, Earl H., Jr.; Diegel, Fredric A., Jr.; Kratochvil, Thomas M.; and Gaudin, Brenda G., 5,555,531, Cl. 367-15.000.
Brownscombe, Thomas F.; Fong, Howard L.; Diaz, Zaida; Chuah, Hoe H.; June, Raymond L.; Rollick, Kevin L.; Semple, Thomas C.; and Tompkin, Mark R., 5,554,657, Cl. 521-48.000.
Cowan, Kenneth M., 5,553,670, Cl. 166-293.000.
Dagorn, Daniel N. N.; Mahtout, Taous G.; Grandvallet, Pierre; and Scheffer, Bob, 5,554,307, Cl. 508-111.000.
Fayt, Roger M. A.; van der Steen, Frederik H.; Teyssie, Phillippe J.; Walhof, Judith J. B.; and Yu, Yi-Song, 5,554,696, Cl. 525-314.000.
Johnson, Thomas H., 5,554,794, Cl. 564-491.000.
Spence, Bridget A.; Southwick, Jeffrey G.; and Chin, Steven S., 5,554,690, Cl. 525-105.000.
St. Clair, David J., 5,554,691, Cl. 525-111.000.
Van Dijk, Menno A.; Veurink, Jacqueline M.; Van De Vliet, Birgitte M. L. C.; and Van Westrenen, Jeroen, 5,554,697, Cl. 525-314.000.
Shelley, Stephen R.: *See*—
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Shemitz, Sylvan R., to Sylvan R. Shemitz Designs, Inc. Compact fluorescent luminaire. 5,555,162, Cl. 362-225.000.
Shepherd, Timothy A.: *See*—
Hui, Kwan; Jones, Charles D.; Jungheim, Louis N.; and Shepherd, Timothy A., 5,554,653, Cl. 514-605.000.
Sheppard, Clyde H.; and Lubowitz, Hyman R., to Boeing Company, The. Extended end cap monomer for making advanced composites. 5,554,769, Cl. 548-549.000.
Sher, Joseph C., to Micron Technology, Inc. Self-timing power-up circuit. 5,555,166, Cl. 363-49.000.
Sherts, Charles R.: *See*—
Green, David T.; Bolanos, Henry; Alesi, Daniel E.; Ratcliff, Keith; and Sherts, Charles R., 5,554,169, Cl. 606-219.000.
Sherwin-Williams Company, The: *See*—
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Sherwood Medical Company: *See*—
Crouther, Ronald; Stenslokken, Douglas L.; and Weilbacher, Eugene E., 5,554,127, Cl. 604-192.000.
Sherwood, William J.; and Wagner, David W., to Winegard Company. Deployable satellite antenna for use on vehicles. 5,554,998, Cl. 343-881.000.
Shi, Jianmin; Chen, Chin H.; Van Slyke, Steven A.; and Tang, Ching W., to Eastman Kodak Company. Organic electroluminescent devices with high thermal stability. 5,554,450, Cl. 428-690.000.
Shibao, Masaharu: *See*—
Watanabe, Koji; Sugita, Toru; Kobayashi, Yasutomo; Shibao, Masaharu; and Mita, Akimitsu, 5,553,428, Cl. 52-208.000.
Shibasaki, Hatsuhiko: *See*—

Nishihara, Munekazu; Yokoyama, Masahide; Shibasaki, Hatsuhiko; and Ohnishi, Youichi, 5,554,222, Cl. 118-723.0HC.
Shibata, Jun: *See*—
Sawai, Akiyoshi; Shimamoto, Haruo; Tachikawa, Toru; and Shibata, Jun, 5,554,887, Cl. 257-737.000.
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Watanabe, Noriko; Nakanishi, Hiroshi; Shibata, Kazuhiro; Hamada, Hiroshi; and Funada, Fumiaki, 5,554,251, Cl. 156-379.800.
Shibata, Kimio, to Seiko Instruments Inc. Pulse duration modulator and pulse duration modulation type switching power source. 5,554,925, Cl. 323-282.000.
Shibata, Mariko: *See*—
Suzuki, Takuji; Aida, Satoshi; Fujimoto, Katsuhiko; Shibata, Mariko; Ishibashi, Yoshiharu; Izumi, Mamoru; Saitoh, Shiroh; and Okamoto, Kazuya, 5,553,618, Cl. 128-653.100.
Shibata, Toshiro: *See*—
Kitamura, Tadaaki; Kobayashi, Yoshiki; Nakanishi, Kunio; Yahiro, Masakazu; Satoh, Yoshiyuki; Shibata, Toshiro; Horie, Takeshi; Yamamoto, Katsuyuki; Takatoo, Masao; Inoue, Haruki; and Asada, Kazuyoshi, 5,554,983, Cl. 340-937.000.
Shibayama, Akinori; and Yamada, Toshio, to Matsushita Electric Industrial Co., Ltd. Internal reduced-voltage generator for semiconductor integrated circuit. 5,554,953, Cl. 327-541.000.
Shibazaki, Hiroshi, to Dainippon Screen Manufacturing Co., Ltd. Method of and apparatus for producing shadowed images. 5,555,353, Cl. 395-126.000.
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Harada, Kuniyuki; Sawada, Kazutaka; Hosoya, Yoshiteru; and Shibusawa, Tetsuo, 5,554,237, Cl. 156-60.000.
Shida, Takehiko: *See*—
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Shigehisa, Takuo: *See*—
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Shigenaga, Hisao; Fujita, Ichiro; Yamamoto, Masayuki; Hamana, Michio; Morishita, Keiichi; Tachikawa, Fumitoshi; Uehara, Hideo; and Iida, Yasuhisa, to Mitsubishi Jukogyo Kabushiki Kaisha. Electronic traffic tariff reception system and vehicle identification apparatus. 5,554,984, Cl. 340-937.000.
Shih, Chun-Yi: *See*—
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Shih, Ming: *See*—
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Shikakura, Koichi: *See*—
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Shikata, Yorio: *See*—
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Shim, Kwan B.: *See*—
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Shima, Nobukazu; and Kamada, Hiroshi, to Fujitsu Limited. Automobile apparatus for road lane and vehicle ahead detection and ranging. 5,555,312, Cl. 382-104.000.
Shimamoto, Haruo: *See*—
Sawai, Akiyoshi; Shimamoto, Haruo; Tachikawa, Toru; and Shibata, Jun, 5,554,887, Cl. 257-737.000.
Shimamura, Makiko: *See*—
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Shimida, Yasuhiro: *See*—
Hirai, Yutaka; Takamatsu, Osamu; Hatanaka, Katsunori; Nakayama, Masaru; Nose, Hiroyasu; Yagi, Takayuki; and Shimida, Yasuhiro, 5,554,851, Cl. 250-442.110.
Shimizu, Hidekazu; and Hashimoto, Akihiro, to Asahi Denso Kabushiki Kaisha. Antitheft device for a vehicle. 5,554,891, Cl. 307-10.200.
Shimizu, Makoto: *See*—
Imai, Takayuki; Naka, Motohiko; Shida, Takehiko; Sato, Masaaki; Yoshida, Kunio; Akamine, Ikuo; Shimizu, Makoto; and Uchida, Yoshiaki, 5,555,512, Cl. 364-550.000.
Shimizu, Michio: *See*—
Nishi, Takeshi; Konuma, Toshimitsu; and Shimizu, Michio, 5,555,240, Cl. 359-82.000.
Shimizu, Satoshi: *See*—
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Shimizu, Susumu, to Kabushiki Kaisha Toshiba. Laser medical treatment apparatus. 5,554,156, Cl. 606-17.000.
Shimizu, Takao; Yamamoto, Noboru; and Suzuki, Hiroaki, to Daido Tokushuko Kabushiki Kaisha. Method for producing an engine valve. 5,553,369, Cl. 29-888.460.
Shimizu, Takashi: *See*—
Umeyama, Mitsuhiro; Shimizu, Takashi; Ichioka, Eiji; Yoshii, Kinya; Koide, Takeharu; and Funahashi, Makoto, 5,554,082, Cl. 475-338.000.
Shimizu, Toshikazu: *See*—
Urawa, Yoshio; Furukawa, Ken; Shimizu, Toshikazu; Yamagishi, Yoji; Tsurugi, Tomio; and Ichino, Tomio, 5,554,757, Cl. 548-237.000.
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Kaneko, Hideo; Tokunaga, Katsushi; Tawara, Yoshio; Tamai, Noboru; and Nakazato, Yasuaki, 5,554,303, Cl. 216-2.000.
Mori, Shigeru; Fukushima, Motoo; Tabei, Eiichi; Hamada, Yoshitaka; and Katayama, Seizi, 5,554,710, Cl. 528-32.000.
Sato, Shinichi; and Koike, Noriyuki, 5,554,779, Cl. 556-419.000.
Shin, Hank H.; Tracy, Clarence J.; Duffin, Robert L.; Freeman, John L., Jr.; Grivna, Gordon; and Wilson, Syd R., to Motorola, Inc. Structure and method for metallization of semiconductor devices. 5,554,889, Cl. 257-765.000.
Shinji, Yasuhisa; and Morishita, Kazuhiro, to Yazaki Corporation. Double-lock type connector. 5,554,051, Cl. 439-595.000.
Shinjo, Katsumi, to Yugenkaisha Shinjo Seisakusho. Recessed screw. 5,553,983, Cl. 411-404.000.
Shink, Joseph M., to Auto-Shade, Inc. Sun shield assembly. 5,553,908, Cl. 296-978.000.
Shinoda, Shinichi: *See*—
Inuzuka, Tatsuki; Nakamura, Toshiaki; Shinoda, Shinichi; and Kojima, Yasuyuki, 5,555,095, Cl. 358-298.000.
Shinohara, Yukihiro: *See*—
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Shioya, Yukinori, to NEC Corporation. Projection type liquid crystal display apparatus using multiple polarizing beam splitters. 5,555,186, Cl. 359-40.000.
Shirahata, Kiyoshi: *See*—
Endo, Mitsuhiro; Shirahata, Kiyoshi; and Ando, Hiromi, 5,553,530, Cl. 91-369.300.
Shirai, Hiroshi; Furuya, Okitsugu; and Naitoh, Takaki, to Whitaker Corporation, The. Circuit board electrical connector. 5,554,036, Cl. 439-74.000.
Shiratake, Shinichiro; Ohuchi, Kazunori; and Takashima, Daisaburo, to Kabushiki Kaisha Toshiba. Dynamic semiconductor memory device. 5,555,203, Cl. 365-51.000.
Shiratsuchi, Kentaro; Yamada, Tsukasa; and Toda, Satoru, to Fuji Photo Film Co., Ltd. Silver halide photographic material comprising emulsion layer and hydrophobic backing layer provided on support. 5,554,494, Cl. 430-523.000.
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Shirkey, Keith L.; and Casella, Bruce A., to Hughes Aircraft Co. Wireless train proximity alert system. 5,554,982, Cl. 340-903.000.
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Shitaya, Yoshiyuki: *See*—
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Shiu, Almon S.; Ewton, James R.; Rittichier, Henry E.; Wong, Jeremy; and Tung, Samuel S., to University of Texas System, Board of Regents of the. Computer-controlled miniature multileaf collimator. 5,555,283, Cl. 378-151.000.
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Shoemaker, Stephen P., Jr.; Tallerico, Joseph L.; Schricker, Todd; Kelly, Matthew F.; and Kelly, Bryan M., 5,553,865, Cl. 273-448.000.
Shoemaker, Stephen P., Jr.; Tallerico, Joseph L.; Schricker, Todd; Kelly, Matthew F.; and Kelly, Bryan M., to Shoemaker, Stephen P. Rotary push arcade game. 5,553,865, Cl. 273-448.000.
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Shono, Masayuki: *See*—
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Shor, Arthur C.: *See*—
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Shroff, David N.: *See*—
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Köck, Anton; and Gornik, Erich, 5,555,255, Cl. 372-96.000.
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Zünkler, Klaus, 5,555,344, Cl. 395-2.510.
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Krause, Robert, 5,555,293, Cl. 379-98.000.
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Doudon, Robert, 5,554,039, Cl. 439-115.000.
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Otterson, Scott D., 5,553,621, Cl. 128-661.090.
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Roberts, David B.; Taylor, George S.; and Parry, David M., 5,555,384, Cl. 395-375.000.
Strasnick, Steven L.; and Tesler, Joel D., 5,555,354, Cl. 395-127.000.
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Simon, Bernard: *See*—
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Simon Ladder Towers, Inc.: *See*—
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Simon, Randy W.; Platt, Christine E.; Lee, Alfred E.; and Lee, Gregory S., to TRW Inc. Method of forming a superconductor microstrip transmission line. 5,554,585, Cl. 505-430.000.
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Anderson, Paul C.; Halmos, Teddy; Jung, Grace L.; Poupart, Marc-André; and Simoneau, Bruno, 5,554,634, Cl. 514-370.000.
Simpkins, James W.; Singh, Meharvan; and Bishop, Jean, to University of Florida. Methods for neuroprotection. 5,554,601, Cl. 514-182.000.
Simple Technology, Inc.: *See*—
Smith, Mark L.; and Raasch, Randy W., 5,555,209, Cl. 365-189.050.
Simpson, Carl J.: *See*—
Aita, Michael; Mirhoseini, Mahmood; Cayton, Mary; Simpson, Carl J.; and Guscott, Brian, 5,554,152, Cl. 606-7.000.
Simpson, Leslie A.; Robb, John; Banford, Jonathan; Dietz, Paul F.; and Temperley, John, to Tioxide Specialties Limited. Composite pigmentary material. 5,554,215, Cl. 106-436.000.
Simpson, William H.; Hastreiter, Jacob J., Jr.; Janosky, Mark S.; and Bobb, Mark A., to Eastman Kodak Company Heated platen and rollers to elevate temperature of receiver in a thermal printer. 5,553,951, Cl. 400-120.180.
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Simpkins, James W.; Singh, Meharvan; and Bishop, Jean, 5,554,601, Cl. 514-182.000.
Singles, David T.; Walter, Grant; and Mortimer, William P., Jr., to W. L. Gore & Associates, Inc. Method for making low noise signal transmission cable. 5,554,236, Cl. 156-52.000.
Sinha, Anand: *See*—
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Sinpo Optical Co., Ltd.: *See*—
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Sippican, Inc.: *See*—
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Sistare, Mark F.: *See*—
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Sitek, Franciszek: *See*—
Desobry, Vincent; Dietliker, Kurt; Hüsler, Rinaldo; Rutsch, Werner; Rembold, Manfred; and Sitek, Franciszek, 5,554,663, Cl. 522-8.000.
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Stein, Andrew M., 5,553,723, Cl. 211-133.000.
Sixto, Robert, Jr.: *See*—
Bales, Thomas O.; Solar, Matthew S.; Sixto, Robert, Jr.; and Smith, Kevin W., 5,554,011, Cl. 417-399.000.
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Sjödal, Jörgen: *See*—
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Sjogren, Eric B.: *See*—
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Skaggs, Samuel R.; and Folsom, Mark F. Reactive ballistic protection devices. 5,554,816, Cl. 89-36.170.
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Skarky, Loren D.: *See*—
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Pickart, Loren R., 5,554,375, Cl. 424-401.000.
Skis Rossignol S.A.: *See*—
Abondance, Roger, 5,553,884, Cl. 280-609.000.
Skittrall, Stephen J.: *See*—
Craig, Joanne; Crookes, Derek L.; and Skittrall, Stephen J., 5,554,639, Cl. 514-415.000.
Skonieczny, Joseph: *See*—
Gold, Phillip J.; Fogler, Donald L., Jr.; Skonieczny, Joseph; and Keller, James F., 5,553,817, Cl. 244-195.000.
Skoutas, James P.: *See*—
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Skran, Dale L.: *See*—
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Slane, Albert A.: *See*—
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Sacco, Bruno; Tomforde, Johann; Reichel, Anton; Steinle, Gerhard; Klein, Berthold; Slaughter, David; and Ma, Mike, 5,553,909, Cl. 296-185.000.
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Sloane, Michael E.: *See*—
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Slone, Carolyn S.; Slone, Jeanna K.; and Moreland, Marjorie J. Combination ferrous metal-edged game pieces and magnetic removal wand. 5,553,849, Cl. 273-239.000.
Slone, Jeanna K.: *See*—
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Sloss, Christopher W.: *See*—
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Smajdek, James A. Device for holding flexible tube dispensers. 5,553,819, Cl. 248-108.000.
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Smit, Léon: *See*—

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Smith, John J.; and Steinwehe, Carol A., to Quaker Oats Company, The. Process for preparing baked food products having little or no fat using an oat component as a fat replacement. 5,554,402, Cl. 426-549.000.
Smith, Jonathan S.: *See*—
Booth, James R.; Jacobi, Michael C.; Nunez, Arlette C.; Smith, Jonathan S.; Tauvers, Peter R.; Doyle, Earl H., Jr.; Diegel, Fredric A., Jr.; Kratochvil, Thomas M.; and Gaudin, Brenda G., 5,555,531, Cl. 367-15.000.
Smith, Joseph G., Jr.: *See*—
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Smith, Kevin W.: *See*—
Bales, Thomas O.; Solar, Matthew S.; Sixto, Robert, Jr.; and Smith, Kevin W., 5,554,011, Cl. 417-399.000.
Smith, Leland B. Thumbrest ring adapter for musical instrument. 5,553,529, Cl. 84-453.000.
Smith, Mark L.; and Raasch, Randy W., to Simple Technology, Inc. Circuit for latching data signals from DRAM memory. 5,555,209, Cl. 365-189.050.
Smith, Sidney K., Jr.; and Holder, Danny J., to Baker Hughes Incorporated. Setting tool for a downhole tool. 5,553,672, Cl. 166-382.000.
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Smith, Steven D.: *See*—
Hall, Gordon C.; Smith, Steven D.; and Carollo, Jerome T., 5,553,328, Cl. 2-422.000.
Smith, W. Novis; and Livesay, Mark, to Sunrez Corporation. Method of forming a primary, wet-to-wet resin bond between at least two laminates, and a product by the process thereof. 5,554,667, Cl. 522-81.000.
SmithKline Beecham Corp.: *See*—
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Raba, Charles E.; and Gabriele, Joseph A., 5,553,747, Cl. 222-94.000.
Smoak, James F.: *See*—
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SMS Schloemann-Siemag Aktiengesellschaft: *See*—
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Smyth, Barry: *See*—
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SNE Enterprises, Inc.: *See*—
Klimek, David J., 5,553,420, Cl. 49-501.000.
Sneh, Baruch: *See*—
Stack, James P.; Jeffers, Steven N.; Sneh, Baruch; and Wright, Teresa S., 5,554,368, Cl. 424-93.470.
Snelling, Richard K.; McIntosh, P. Stuckey; and Tucker, Mark, to McIntosh, P. Stuckey. Home personal communication system. 5,555,258, Cl. 370-29.000.
Snider, A. Rebecca; Bennett, Richard M.; McCabe, Laurence J.; Magsig, Peter J.; Ng, Kane L.; Purdy, Lynn M.; and Ruffles, Joseph W., to Acuson Corporation. Interactive goal-directed ultrasound measurement system. 5,553,620, Cl. 128-660.040.
Snodgress, Jack S.: *See*—
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Snow, Barton H.; Leighton, David M.; and Steckler, Michael J., to General Electric Company. Control system for a jet engine hydraulic system. 5,553,452, Cl. 60-327.000.
Snow Brand Milk Products Co., Ltd.: *See*—
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Soavi, Fabio, to Trasportatori Govoni S.r.l. Method and apparatus for the evacuation, conveyance, compacting and discharge of bulk materials, especially shavings and swarf. 5,553,534, Cl. 100-145.000.
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Sohaei, Frank K.: *See*—
Shahir, Fred A.; and Sohaei, Frank K., 5,555,105, Cl. 358-473.000.
Sointula, Erkka, to Nokia Mobile Phones Ltd. Radio phone and method of operating a radio phone. 5,555,450, Cl. 455-89.000.
Solanki, Ranvir S.; Gasmann, Eric J.; Kane, Joseph R.; Griffin, Edward P.; and Gantt, Andrew M., to Motorola, Inc. Method of and apparatus for changing a production setup. 5,553,376, Cl. 29-833.000.
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Mailey, Desmond; Rodriguez, Jose J.; Fregoe, Jerry P.; Stevens, Curtis L.; Dettmers, Frank M., Sr.; Brown, Glenn L.; Kitzer, Gary L.; Miller, James G.; Hillbrands, Martin J.; Strebel, Carl F.; and King, Thomas A., 5,553,525, Cl. 83-184.000.
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Richards, Paul N., 5,553,494, Cl. 73-304.00R.
Solka, Bruce H.: *See*—
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Soltani-Ahmadi, Ahmad; and Cochran, Robert N., to ARCO Chemical Technology, L.P. Removal of primary and secondary hydroperoxide impurities from tertiary hydroperoxides. 5,554,796, Cl. 568-576.000.
Somes, Steven D. Three degree of freedom robotic manipulator constructed from rotary drives. 5,553,509, Cl. 74-89.200.
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Sone, Akira: *See*—
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Sonehara, Hiroshi; Toba, Akira; Akushichi, Shuki; and Shitaya, Yoshiyuki, to Kabushiki Kaisha Komatsu Seisakusho. Data collection system for driving machine. 5,555,171, Cl. 364-424.030.
Song, Chi J., to Goldstar Electron Co., Ltd. Lead frame and semiconductor package with such lead frame. 5,554,886, Cl. 257-666.000.
Sonnenberg, Hardy; Pundsack, Arnold L.; and Tam, Man C., to Xerox Corporation. Process and apparatus for manufacturing migration imaging members. 5,554,470, Cl. 430-41.000.
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Kurosu, Tadao, 5,555,227, Cl. 369-37.000.
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Soshi, Isao; Miyamoto, Hidenori; and Noda, Seijiro, to Nikon Corporation. Camera with improved positioning of vibration detecting sensors therein. 5,555,061, Cl. 354-288.000.
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Sossnitza, Johannes: *See*—
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Spacemaker Limited: *See*—
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Spar Aerospace Limited: *See*—
Staron, Alain, to Thomson Consumer Electronics. Television receiver with deferred transmission of moving image sequences. 5,555,463, Cl. 348-560.000.

Stevens, Kenneth V., to PRescient Partners L.P. Wrapping device for shaping fabrics to 3-D contours. 5,553,362, Cl. 24-326.000.
Stevenson, John A. Safety cap and hub for medical instruments. 5,554,129, Cl. 604-192.000.
Streeck, Rolf E.: *See*—
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Sparks, Rodney L. Overdraw for a compound bow. 5,553,597, Cl. 124-44.500.
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Speas, Danny E. Nutating disc engine. 5,553,582, Cl. 123-56.400.
Spence, Bridget A.; Southwick, Jeffrey G.; and Chin, Steven S., to Shell Oil Company. Low viscosity adhesive compositions containing asymmetric radial polymers. 5,554,690, Cl. 525-105.000.
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Spinelli, Harry J.: *See—*
Stoffel, John L.; Shor, Arthur C.; Spinelli, Harry J.; Ma, Sheau-Hwa; Matrick, Howard; Choy, Mark L.; and Johnson, Loren E., 5,555,008, Cl. 347-100.000.
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Haruch, James, 5,553,785, Cl. 239-432.000.
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Theimer, Marvin M.; Spreitzer, Michael J.; Weiser, Mark D.; Goldstein, Richard J.; Elrod, Scott A.; Swinehart, Daniel C.; Schilit, William N.; Krivacic, Robert T.; and Want, Roy, 5,555,376, Cl. 395-200.090.
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Spyrou, Athanasius W., to VLSI Technology, Inc. Method and apparatus for determining the timing specification of a digital circuit. 5,555,187, Cl. 364-490.000.
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Stack, James P.; Jeffers, Steven N.; Sneh, Baruch; and Wright, Teresa S., to EcoScience Corporation. *Pseudomonas syringae* ATCC 55389 and use thereof for inhibiting microbial decay on fruit. 5,554,368, Cl. 424-93.470.
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Stamatakis, Robert. Attachable passenger seat for two-wheeled vehicle. 5,553,915, Cl. 297-195.130.
Stamback, Mark A., to Dana Corporation. Bonded valve stem seal with retainer tangs. 5,553,869, Cl. 277-33.000.
Stambler, Leon. Secure transaction system and method utilized therein 5,555,303, Cl. 380-25.000.
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Castellano, Andrew J., 5,555,524, Cl. 365-221.000.
Stanescu, Mircea S.; and Stratton, Paul F., to BOC Group, Inc., The. Induction heating in low oxygen-containing atmosphere. 5,554,836, Cl. 219-651.000.
Stanfield, Michael A.: *See—*
Bedding, Robin A.; Stanfield, Michael A.; and Crompton, Graham W., 5,554,533, Cl. 435-252.100.
Stanford, Charles G.; and Brown, Michael J., to Medovations. Thoracic catheter with elongated pulling lead. 5,554,138, Cl. 604-280.000.
Stange, Andreas: *See—*
Flory, Klaus; Stange, Andreas; Kroener, Michael; and Sendhoff, Norbert, 5,554,718, Cl. 528-246.000.
Stanton Magnetics, Inc.: *See—*
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Stanton, Walter O.: *See—*
Hofer, Alan; and Stanton, Walter O., 5,555,554, Cl. 381-183.000.
Starbeck, Gerhard: *See—*
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Starbucks Corporation: *See—*
Schuyler, Richard D., 5,553,731, Cl. 220-719.000
Staring, Aemilianus G. J.: *See—*
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Starks, William R. Hinge-lock security system. 5,553,351, Cl. 16-223.000.
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Fortin, J. André; St-Arnaud, Marc; Hamel, Chantal; Chavarie, Claude; and Jolicoeur, Mario, 5,554,530, Cl. 435-256.800.
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Staron, Alain, to Thomson Consumer Electronics. Television receiver with deferred transmission of moving image sequences. 5,555,463, Cl. 348-560.000.
Stary, Gary M. Pipeline valve apparatus. 5,553,830, Cl. 251-214.000.
St. Clair, Albert R.; and Brannock, Paul H., to Simmons Company. Method for creating strings of pocketed coil springs. 5,553,443, Cl. 53-450.000.
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Steckler, Michael J.: *See—*
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Steengaard, Kim: *See—*
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Steffan, Hermann: *See—*
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Stefkó, Béla: *See—*
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Stein, Andrew M., to Six Corners Development Company. Rack system for displaying and dispensing candy. 5,553,723, Cl. 211-133.000.
Steinfeld, George; Meyers, Steven J.; and Lee, Arthur, to Energy Research Corporation. Carbonate fuel cell system with thermally integrated gasification. 5,554,453, Cl. 429-17.000.
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Stempin, John L.; Stewart, Ronald L.; and Wexell, Dale R., to Corning Incorporated. Honeycomb battery separator. 5,554,464, Cl. 429-247.000.
Stenslokken, Douglas L.: *See—*
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Stephenson, Mark E.: *See—*
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Stephenson, Paula C.: *See—*
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Stephenson, Stanley W., III, to Eastman Kodak Company. Metering apparatus. 5,555,053, Cl. 354-206.000.
Stephenson, Stanley W., III, to Eastman Kodak Company. Camera with manual film drive control and self resetting rewind latch. 5,555,055, Cl. 354-212.000.
Stephenson, Stanley W., III: *See—*
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Sterling Diagnostic Imaging, Inc.: *See—*
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Sterling Winthrop Inc.: *See—*
DeHaven-Hudkins, Diane L.; Dority, John A., Jr.; Earley, William G.; Kumar, Virendra; Mallamo, John P.; Miller, Matthew S.; and Subramanyam, Chakrapani, 5,554,620, Cl. 514-278.000.
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Stevens, Curtis L.: *See—*
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Stevens, Kenneth V., to PRescient Partners L.P. Wrapping device for shaping fabrics to 3-D contours. 5,553,362, Cl. 24-326.000.
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Stewart, Ronald L.: *See—*
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Stiel, Jürgen A.: *See—*
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Stipp, Gordon K., to Procter & Gamble Company, The. Infusion beverage product comprising co-agglomerated creamer and sweetener suitable for bag and filter pack brewing. 5,554,400, Cl. 426-78.000.
Stobbs, Thomas J.: *See—*
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Stobie, Robert: *See—*
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Stockton, David J.: *See—*
Barker, Philip A.; Stockton, David J.; Fisk, Christopher; and Jenkins, Peter D., 5,555,335, Cl. 385-100.000.
Stockwell, Catherine B.: *See—*
Dickelman, Dennis P.; and Stockwell, Catherine B., 5,555,444, Cl. 455-12.100.
Stoffel, John L.; Shor, Arthur C.; Spinelli, Harry J.; Ma, Sheau-Hwa; Matrick, Howard; Choy, Mark L.; and Johnson, Loren E., to Du Pont de Nemours, E. I., and Company. Process for alleviating bleed in printed elements. 5,555,008, Cl. 347-100.000.
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Storch, John A.: *See—*
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Store Heat & Producte Energy, Inc.: *See—*
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Storz Endoskop GmbH: *See—*
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Strasnick, Steven L.; and Tesler, Joel D., to Silicon Graphics Inc. Method and apparatus for navigation within three-dimensional information landscape. 5,555,354, Cl. 395-127.000.
Stratford, Aloth U. Structural building components. 5,553,421, Cl. 52-182.000.
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Strauss, David W., to Xionics Document Technologies, Inc. Multi-interpreter printer and process including recognition of out-of-bank characters. 5,555,350, Cl. 395-112.000.
Strebel, Carl F.: *See—*
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Street, Michael J.; and Mottram, Toby T. F., to British Technology Group Limited. Animal stall. 5,553,569, Cl. 119-525.000.
Streit, Daniel J.: *See—*
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Strickland, John C.: *See—*
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Stricklin, John D.: *See—*
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Strike, Donald P.: *See—*
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Stringer, Philip J., to Teradyne, Inc. Manufacturing defect analyzer. 5,554,928, Cl. 324-158.100.
Stringfellow, Dale A.; and Fast, Patricia E., to Upjohn Company, The. Method for treating cancer with 6-aryl pyrimidine compounds. 5,554,617, Cl. 514-272.000.
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Stroetmann, Brigitte; and Starbeck, Gerhard, to Pacesetter AB. Implantable difibrillator electrode. 5,554,179, Cl. 607-129.000.
Strong, Molly. Lightweight footwear article providing improved traction. 5,553,399, Cl. 36-9.00R.
Stroosnyder, Peter C.: *See—*
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Stroud, Norman, to R. P. Scherer Corporation. High amylose starch substituted gelatin capsules. 5,554,385, Cl. 424-456.000.
Strupczewski, Joseph T.; Helsley, Grover C.; Glamkowski, Edward J.; Chiang, Yulin; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., to Hoechst-Roussel Pharmaceuticals, Inc. 2-[(4-heteroaryl-1-piperazinyl)alkyl]-1,3-dioxanes and related compounds and their therapeutic utility. 5,554,614, Cl. 514-254.000.
Struszczyk, Henryk; and Kivekäs, Olli, to Novasso Oy. Method for seed encrusting. 5,554,445, Cl. 428-403.000.
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Stump, Greg, to Vermeer Manufacturing Company. Excavator data acquisition and control system and method of use. 5,553,407, Cl. 37-348.000.
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Sudama, Ram; Griffin, David M.; Johnson, Brad; Sealy, Dexter; Shelhamer, James; and Tallman, Owen H., to Digital Equipment Corporation. Method and apparatus for network computer systems management group administration. 5,555,375, Cl. 395-200.030.
Sudo, Akira; Kohyama, Yusuke; and Koyama, Haruhiko, to Kabushiki Kaisha Toshiba. Trench capacitor cells for a dram having single monocrystalline capacitor electrode. 5,555,520, Cl. 365-149.000.
Suess, Hans U.; Nimmerfroh, Norbert; and Grimmer, Ralf, to Degussa Aktiengesellschaft. Flotation process for mechanical pulp using a surface active agent. 5,554,258, Cl. 162-24.000.
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Sugihara, Hiroshi; Ishikawa, Hiroyuki; Uemura, Tsutomu; Fujiki, Akira; Imazato, Hiromasa; and Umino, Shinichi, to Nissan Motor Co., Ltd.; and Hitachi Powdered Metals Co., Ltd. Method of preparing composite sintered body. 5,554,338, Cl. 419-5.000.
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Sugimoto, Kenji, to Dainippon Screen Mfg. Co., Ltd. Developing method and apparatus. 5,555,234, Cl. 354-317.000.

Sugino, Hiroshi: *See—*
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Smith, W. Novis; and Livesay, Mark, 5,554,667, Cl. 522-81.000.
Supcoe, Robert F.; and Moran, Francis J., to United States of America, Navy. Water ablative coating for vehicle drag reduction. 5,554,214, Cl. 106-264.000.

Suzuki, Tomomi: *See—*
Kuranoto, Shinichi; Okamoto, Yoshihisa; Asahina, Yasuo; Izumi, Michio; Gohhara, Hidefumi; Mochizuki, Chiharu; Suzuki, Tomomi; Nakamura, Hideo; and Wakisaka, Masaru, 5,554,478, Cl. 430-
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Sugino, Morihiko; and Inoue, Yoshio, to Kabushiki Kaisha Kobe Seiko Sho. Carbon fiber-reinforced carbon composite material and process for producing the same. 5,554,354, Cl. 428-307.300.

Sugita, Ryuji: *See—*
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Sugita, Toru: *See—*
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Sugita, Yukihiko, to Olympus Optical Co., Ltd. Driving force transmission mechanism for use in a camera. 5,555,049, Cl. 354-173.100.

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Sugiyama, Osamu; and Yagi, Sakai, to Yazaki Corporation. Solderless terminal. 5,554,046, Cl. 439-397.000.

Sulkowski, Theodore S.: *See—*
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Sullivan, Brian T.: *See—*
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Sumitomo Chemical Company, Limited.: *See—*
Ishiwatari, Takao; and Tsushima, Kazunori, 5,554,649, Cl. 514-530.000.
Nagaoka, Kenji; Hagimori, Hiroshi; and Kitadono, Kaoru, 5,554,677, Cl. 524-494.000.
Nakamura, Tohru; and Shono, Yoshinori, 5,554,360, Cl. 424-70.110.
Tsubata, Yoshiaki; Ueda, Kayoko; Fujisawa, Koichi; Higashii, Takayuki; Minai, Masayoshi; Takano, Naoyuki; and Fujimoto, Yukari, 5,554,317, Cl. 252-299.010.

Sumitomo Electric Industries, Ltd.: *See—*
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Onishi, Masashi; and Kanamori, Hiroo, 5,555,340, Cl. 385-127.000.
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Sumitomo Seika Chemicals Co., Ltd.: *See—*
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Summit Packaging Systems, Inc.: *See—*
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Sun Microsystems, Inc.: *See—*
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Owens, Gary L.; and Labuda, David, 5,555,416, Cl. 395-700.000.
Radke, William H., 5,555,540, Cl. 370-16.100.

Sun, Weimin: *See—*
Kajimoto, Shigeki; and Sun, Weimin, 5,555,453, Cl. 455-266.000.

Sun, Xiao; and Hull, Carmie A., to Motorola Inc. Method and apparatus for constructing unique input/output sequence (UIO) sets utilizing transition distinctness measurements. 5,555,270, Cl. 371-27.000.

Suncast Corporation: *See—*
Tisbo, Thomas A.; Whitehead, Stephen P.; and Uffner, Michael G., 5,553,712, Cl. 206-752.000.

Sundaresan, Ravishankar, to SGS-Thomson Microelectronics, Inc. Method of fabricating a one-sided polysilicon thin film transistor. 5,554,548, Cl. 437-41.000.

Sundberg, Craig C., to Erie Ceramic Arts Company, The. Lubricated variable resistance control having resistive pads on conductive path. 5,554,965, Cl. 338-160.000.

Sundstrand Corporation: *See—*
Baker, Roy S.; and Lefavour, David W., 5,555,151, Cl. 361-79.000.
Maddali, Vijay; Defenbaugh, John F.; and Mansir, Hassan, 5,554,923, Cl. 322-25.000.
Parekh, Mahendra B.; Kitzmiller, Leon; Costello, Richard C.; Grow, C. Allen; Pinchott, Gordon; O'Leary, Dennis; MacDougall, Louis M.; Okey, David W.; and Fowler, Edward J., 5,553,378, Cl. 29-888.044.
Stacey, Eric J., 5,554,952, Cl. 327-339.000.

Sung, Chiakang; Chang, Wanli; and Huang, Joseph, to Altera Corporation. Apparatus for serial reading and writing of random access memory arrays. 5,555,214, Cl. 365-221.000.

Sungwoo Allied Signal Corp.: *See—*
Park, Jang W.; Jin, Sung W.; and Kwag, Tae B., 5,553,802, Cl. 242-372.000.

Sunrez Corporation: *See—*
Livesay, Mark, 5,554,666, Cl. 522-81.000.
Smith, W. Novis; and Livesay, Mark, 5,554,667, Cl. 522-81.000.

Supcoe, Robert F.; and Moran, Francis J., to United States of America, Navy. Water ablative coating for vehicle drag reduction. 5,554,214, Cl. 106-264.000.

Superior Fireplace Company: *See—*
Barudi, Samir E.; French, John T.; and Gore, Hardial S., 5,553,603, Cl. 126-512.000.

Surdut, Raymond J.; Benz, Edwin H., Sr.; and Skoutas, James P., to ManometRx Group Ltd. Measurement of fluid pressure such as blood pressure. 5,553,503, Cl. 73-778.000.

Surface Combustion, Inc.: *See—*
Huber, Michael J.; Jason, Jerry P.; and Barbee, Garry W., 5,554,230, Cl. 148-208.000.

Surrency, Tim. Versatile pitcher training and proficiency device. 5,553,847, Cl. 273-26.00R.

Suslow, Trevor V.; and Jones, Jonathan D. G., to DNA Plant Technology Corporation. Chitinase-producing plants. 5,554,521, Cl. 435-172.300.

Suspa Incorporated: *See—*
Doyle, James E., 5,553,550, Cl. 108-144.000.

Suthar, Shamal L.: *See—*
Dresie, Carl F.; Jones, Edward S.; Shelley, Stephen R.; Strobl, Kurt H.; Suthar, Shamal L.; and Worden, Harold C., 5,553,835, Cl. 264-204.000.

Suthersan, Suthan S., to Geraghty & Miller, Inc. Insitu anaerobic reactive zone for insitu metals precipitation and to achieve microbial de-nitrification. 5,554,290, Cl. 210-610.000.

Suwald, Thomas, to U.S. Philips Corporation. Circuit arrangement for delaying a functional signal. 5,554,949, Cl. 327-276.000.

Suzaki, Takeshi: *See—*
Narita, Kenichi; and Suzaki, Takeshi, 5,555,114, Cl. 359-65.000.

Suzuki, Akira: *See—*
Yabe, Hisao; Iida, Yoshihiro; Suzuki, Akira; Ito, Hideo; Tashiro, Yoshio; Yamazaki, Minoru; Tamada, Osamu; and Arai, Keiichi, 5,554,098, Cl. 600-121.000.

Suzuki, Hajime: *See—*
Tanaka, Kiyoharu; Suzuki, Hajime; and Kimura, Koji, 5,555,082, Cl. 355-309.000.

Suzuki, Hideto, to NEC Corporation. Data transfer system with buffer request including block length to update the buffer pointer prior to transferring of the block. 5,555,380, Cl. 395-250.000.

Suzuki, Hiroaki: *See—*
Shimizu, Takao; Yamamoto, Noboru; and Suzuki, Hiroaki, 5,553,369, Cl. 29-888.460.

Suzuki, Hitoshi: *See—*
Koishikawa, Kouji; Tsunoda, Masaki; and Suzuki, Hitoshi, 5,553,586, Cl. 123-195.00P.
Koishikawa, Kouji; Tsunoda, Masaki; and Suzuki, Hitoshi, 5,554,060, Cl. 440-89.000.

Suzuki, Junko: *See—*
Honda, Shoji; Shono, Masayuki; Hiroyama, Ryoji; Bessho, Yasuyuki; Kase, Hiroyuki; Nishida, Toyozo; Uetani, Takahiro; and Suzuki, Junko, 5,555,271, Cl. 372-45.000.

Suzuki, Kenichiro, to Nec Corporation. Process for producing a micromotion mechanical structure. 5,554,304, Cl. 216-2.000.

Suzuki, Kenkichi: *See—*
Oritsuki, Ryoji; Hiroshima, Minoru; Yanai, Masahiro; Matsuda, Masaaki; Horii, Toshikazu; Hashimoto, Yuichi; Kozai, Hayao; Suzuki, Kenkichi; Takabatake, Masaru; and Isoda, Takashi, 5,555,112, Cl. 359-59.000.

Suzuki, Kouji: *See—*
Hasegawa, Makoto; Saito, Tsuyoshi; Higuchi, Fumihiko; Amano, Hideaki; Naitoh, Katsunori; Tozawa, Takashi; Nakagome, Tatsuya; Ito, Keiki; and Suzuki, Kouji, 5,554,249, Cl. 156-345.000.

Suzuki, Masatoshi: *See—*
Tsuruta, Tadashi; Suzuki, Masatoshi; Sano, Hiromi; Fujii, Namitsugu; and Sugino, Hiroshi, 5,554,839, Cl. 219-544.000.

Suzuki, Michio: *See—*
Katoh, Katsutoshi; Suzuki, Michio; Uchiyama, Yoshiharu; and Yonemochi, Kenshin, 5,555,487, Cl. 361-680.000.

Suzuki, Mitso; Ito, Masahiro; and Higaki, Yoshiyuki, to Yamaha Hatsudoki Kabushiki Kaisha. Intake control valve. 5,553,590, Cl. 123-415.000.

Suzuki, Motoyuki; Uchida, Tetsuo; and Matsuura, Kazuo, to Toray Industries, Inc. Microlens array sheet for a liquid crystal display, method for attaching the same and liquid crystal display equipped with the same. 5,555,476, Cl. 359-40.000.

Suzuki, Norio: *See—*
Hirabayashi, Kazuo; Tachibana, Yosuke; and Suzuki, Norio, 5,553,581, Cl. 123-399.000.

Suzuki, Satoshi: *See—*
Iwata, Ritsuo; Takahashi, Hirotosi; Suzuki, Satoshi; and Endo, Takayuki, 5,554,429, Cl. 428-105.000.

Suzuki, Shigeo: *See—*
Tajima, Ikuo; Kojima, Terutada; Anezaki, Tomoaki; Hirate, Masayoshi; and Suzuki, Shigeo, 5,553,560, Cl. 112-103.000.

Suzuki, Takashi: *See—*
Miyata, Shigeru; Yoshida, Hideji; Matsubara, Yoshihiro; Ito, Yasuo; and Suzuki, Takashi, 5,554,930, Cl. 324-402.000.

Suzuki, Takuji; Aida, Satoshi; Fujimoto, Katsuhiko; Shibata, Mariko; Ishihashi, Yoshiharu; Izumi, Mamoru; Saitoh, Shiroh; and Okamoto, Kazuya, to Kabushiki Kaisha Toshiba. Method and apparatus for ultrasound medical treatment. 5,553,618, Cl. 128-653.100.

Suzuki, Tomomi: *See—*
Kuramoto, Shinichi; Okamoto, Yoshihisa; Asahina, Yasuo; Izumi, Michio; Gohhara, Hidefumi; Mochizuki, Chiharu; Suzuki, Tomomi; Nakamura, Hideo; and Wakisaka, Masaru, 5,554,478, Cl. 430-109.000.

Suzuki, Yoshio: *See—*
Ohnishi, Kunikazu; Inoue, Masayuki; Suzuki, Yoshio; and Fukui, Yukio, 5,555,334, Cl. 385-93.000.

Swanson, Robert E.: *See—*
Brock, George W.; and Swanson, Robert E., 5,555,252, Cl. 354-106.000.

Swenson, Paul M.: *See—*
Hume, William J.; and Swenson, Paul M., 5,554,395, Cl. 425-549.000.

Swift, Graham: *See—*
Adler, David E.; Freeman, Michael B.; Lipovsky, James M.; Paik, Yi H.; Shalman, Jan E.; and Swift, Graham, 5,554,721, Cl. 528-328.000.

Swinehart, Daniel C.: *See—*
Theimer, Marvin M.; Spreitzer, Michael J.; Weiser, Mark D.; Goldstein, Richard J.; Elrod, Scott A.; Swinehart, Daniel C.; Schilit, William N.; Krivacic, Robert T.; and Want, Roy, 5,555,376, Cl. 395-200.090.

Sy, Angel, to Chemical Research & Licensing Company. Multiple reboiler system. 5,554,264, Cl. 203-25.000.

Sydekum, Heinz; Angles, Manfred; and Hassmann, Frank, to Fichtel & Sachs AG. Vibration damper assembly having a spring support with adjustable spring plate, and a spring support with adjustable spring plate. 5,553,713, Cl. 267-221.000.

Sylvan R. Shemitz Designs, Inc.: *See—*
Shemitz, Sylvan R., 5,555,162, Cl. 362-225.000.

Symbiosis Corporation: *See—*
Bales, Thomas O.; Solar, Matthew S.; Sixto, Robert, Jr.; and Smith, Kevin W., 5,554,011, Cl. 417-399.000.
Francese, Jose L.; and Whittier, John R., 5,553,624, Cl. 128-751.000.
Horton, Richard F., 5,555,131, Cl. 359-661.000.

Symbol Technologies, Inc.: *See—*
Marom, Emanuel; Katz, Joseph; and Barkan, Edward, 5,555,130, Cl. 359-574.000.

Symphonix: *See—*
Ball, Geoffrey R., 5,554,096, Cl. 600-25.000.

Syngenix Limited: *See—*
Filler, Aaron G.; and Lever, Andrew M. L., 5,554,498, Cl. 435-5.000.

Syntex (U.S.A.) Inc.: *See—*
Samuels, Glenn J.; Lee, Jung-Chung; Lee, Charles; Berry, Stephen; and Jarosz, Paul J., 5,554,384, Cl. 424-451.000.

Systech Computer Corporation: *See—*
Armerding, Donald G.; Beal, William B.; Izzo, Alan J.; Oostra, Billy A.; and Rodman, Terrell L., 5,555,374, Cl. 395-200.020.

System Technical Co., Ltd.: *See—*
Kato, Katsuhisa, 5,553,423, Cl. 52-204.597.

Szentesi, Otto I.: *See—*
Dean, David L.; Malanowski, Alan J.; Merriken, James R.; and Szentesi, Otto I., 5,555,332, Cl. 385-53.000.

Szwerc, Joseph A.: *See—*
Fazzolare, Richard D.; Szwerc, Joseph A.; van Leagerich, Bernhard; and Leschke, Rudolph J., 5,554,405, Cl. 426-560.000.

T.A.M.I. Industries (Societe Anonyme): *See—*
Lescoche, Philippe, 5,554,282, Cl. 210-321.750.

T. Chatani & Company Ltd.: *See—*
Tawara, Nobuyoshi; and Kojima, Takeshi, 5,555,160, Cl. 362-31.000.

Tabei, Eiichi: *See—*
Mori, Shigeru; Fukushima, Motoo; Tabei, Eiichi; Hamada, Yoshitaka; and Katayama, Seizi, 5,554,710, Cl. 528-32.000.

Tacchetto, Maurizio; and Battistella, Mirco, to Nordica S.p.A. Fastening device for sports shoes. 5,553,361, Cl. 24-68.0SK.

Tachibana, Tetsuo: *See—*
Nakayama, Mikio; Tachibana, Tetsuo; Iketani, Youzou; Okuyama, Yuzo; and Kakuma, Satoshi, 5,555,261, Cl. 370-103.000.

Tachibana, Tomoyuki: *See—*
Masaie, Norio; Tachibana, Tomoyuki; Seita, Koji; and Araike, Yasuo, 5,554,308, Cl. 508-181.000.

Tachibana, Toru: *See—*
Yazawa, Shigehiko; Ito, Kazuhiko; Uehara, Takeshi; Tachibana, Toru; and Fukuda, Keiji, 5,555,541, Cl. 370-68.100.

Tachibana, Yosuke: *See—*
Hirabayashi, Kazuo; Tachibana, Yosuke; and Suzuki, Norio, 5,553,581, Cl. 123-399.000.

Tachikawa, Fumitoshi: *See—*
Shigenaga, Hisao; Fujita, Ichiro; Yamamoto, Masayuki; Hamana, Michio; Morishita, Keiichi; Tachikawa, Fumitoshi; Uehara, Hideo; and Iida, Yasuhisa, 5,554,984, Cl. 340-937.000.

Tachikawa, Toru: *See—*
Sawai, Akiyoshi; Shimamoto, Haruo; Tachikawa, Toru; and Shibata, Jun, 5,554,887, Cl. 257-737.000.

Tackbary, Mary T.; and Friedrich, Dan G., to Tackbary, Mary T. Method and apparatus for communicating with a card distribution center for management, selection, and delivery of social expression cards. 5,555,496, Cl. 364-401.00R.

Tadokoro, Hiroyuki: *See—*
Haragakiuchi, Hideyuki; Tadokoro, Hiroyuki; Fukasawa, Nobuaki; Terashima, Isamu; Sasaki, Akira; Matsuo, Kazuyoshi; Onose, Katuyoshi; and Okuhama, Masashi, 5,555,074, Cl. 355-208.000.

Taguchi, Takeyasu: *See—*
Naito, Toshiharu; Taguchi, Takeyasu; Kamiya, Masahiko; and Fujiwara, Kenji, 5,553,491, Cl. 73-146.500.

Taha, Mohamed: *See—*
Pascault, Jean-Pierre; Rolly, Florence; Taha, Mohamed; and Titier, Christelle, 5,554,703, Cl. 525-530.000.

Tai, Jin-Chys: *See—*
Lin, Chih-Ching; and Tai, Jin-Chys, 5,553,711, Cl. 206-710.000.

Taihei Chemical Industrial Co., Ltd.: *See—*
Ueda, Masahiko, 5,554,024, Cl. 433-37.000.

Taillon, Michel: *See—*
Gilbert, Sylvain; and Taillon, Michel, 5,553,993, Cl. 414-739.000.

Taiwan Semiconductor Manufacturing Company: *See—*
Chi, Kao M., 5,554,552, Cl. 437-43.000.
Chu, Po-Tao; Chang, Kuang-Hui; and Huang, Yuan-Chang, 5,554,563, Cl. 437-190.000.
Hsu, Shun-Liang; Ting, Jyh-Kang; and Shih, Chun-Yi, 5,554,558, Cl. 437-60.000.
Huang, Yuan-Chang; and Chang, Kuang-Hui, 5,554,254, Cl. 156-625.100.
Lin, Chih-Ching; and Tai, Jin-Chys, 5,553,711, Cl. 206-710.000.

Taiwan Semiconductor Manufacturing Company Ltd.: *See—*
Huang, Jenn-Ming, 5,554,549, Cl. 437-41.000.
Liaw, Jhon-Jhy; Lee, Jin-Yuan; and Teng, Ming-Chang, 5,554,565, Cl. 437-192.000.
Wang, Shih-Ming, 5,554,567, Cl. 437-195.000.

Tajima, Ikuo; Kojima, Terutada; Anezaki, Tomoaki; Hirate, Masayoshi; and Suzuki, Shigeo, to Tokai Kogyo Mishin Kabushiki Kaisha. Sewing machine and work fabric holder device thereof. 5,553,560, Cl. 112-103.000.

Tajima, Yukihiro: *See—*
Chisaka, Yukinori; Daizen, Masaki; Okamura, Yutaka; Tajima, Yukihiro; Kataoka, Mamoru; Sone, Akira; and Nishino, Kimihisa, 5,553,649, Cl. 160-168.100.

Takabatake, Masaru: *See—*
Oritsuki, Ryoji; Hiroshima, Minoru; Yanai, Masahiro; Matsuda, Masaaki; Horii, Toshikazu; Hashimoto, Yuichi; Kozai, Hayao; Suzuki, Kenkichi; Takabatake, Masaru; and Isoda, Takashi, 5,555,112, Cl. 359-59.000.

Takácsi Nagy, Géza: *See—*
Burger, Kálmán; Réthey, Iván; Stefkó, Béla; Gebhardt, István; Király née, Gyöngyvér Soós; Takácsi Nagy, Géza; Illés, János; Neszmélyi, Erzsébet; Rácz, István; and Várkonyi, Viktoria, 5,554,598, Cl. 514-54.000.

Takada, Norihisa, to Fuji Photo Film Co., Ltd. Light scanning device. 5,555,122, Cl. 359-196.000.

Takada, Shigeyuki: *See—*
Uda, Yoshiaki; Takada, Shigeyuki; and Fujisawa, Yukio, 5,554,378, Cl. 424-434.000.

Takagi, Tadao, to Nikon Corporation. Ultrasonic motor. 5,554,906, Cl. 310-323.000.

Takahashi, Hideaki, to NEC Corporation. Circuit for biasing FET amplifier with single power supply. 5,554,954, Cl. 327-546.000.

Takahashi, Hidehito, to SMC Corporation. Locking device for fluid pressure cylinder. 5,553,690, Cl. 118-300.000.

Takahashi, Hirotosi: *See—*
Iwata, Ritsuo; Takahashi, Hirotosi; Suzuki, Satoshi; and Endo, Takayuki, 5,554,429, Cl. 428-105.000.

Takahashi, Kenichi: *See—*
Noda, Kazuhiro; Endo, Eishi; and Takahashi, Kenichi, 5,554,458, Cl. 429-194.000.

Takahashi, Kuniyuki: *See—*
Kashio, Shigetora; Mizumi, Tsutomu; and Takahashi, Kuniyuki, 5,554,334, Cl. 264-293.000.

Takahashi, Yasuhiro; and Nakayama, Koji, to Riso Kagaku Corporation. Print sheet leading end mounting device having means for lifting released leading end. 5,553,543, Cl. 101-409.000.

Takahi, Yukiyoshi: *See—*
Ohkouchi, Takeo; Hosoda, Hitoshi; Yasui, Kenji; Kato, Shigehiro; Kondo, Yasuhiko; and Takahi, Yukiyoshi, 5,554,391, Cl. 424-633.000.

Takai, Kazuki; and Inoue, Yoshihiro, to Clarion Co., Ltd. Disk system. 5,555,239, Cl. 369-192.000.

Takama, Yukio, to Sakase Chemical Industry Co., Ltd. Article storing tray convenient for various partitioning. 5,553,710, Cl. 206-561.000.

Takamatsu, Osamu: *See—*
Hirai, Yutaka; Takamatsu, Osamu; Hatanaka, Katsunori; Nakayama, Masaru; Nose, Hiroyasu; Yagi, Takayuki; and Shimida, Yasuhiro, 5,554,851, Cl. 250-442.110.

Takamoto, Sohei; George, Douglas J.; and Gallo, Luigi C., to Accom, Inc. Component video signal to composite video signal encoding system, control system and method. 5,555,030, Cl. 348-642.000.

Takamura, Yuriko: *See—*
Nagase, Yu; Akiyama, Eiichi; and Takamura, Yuriko, 5,554,706, Cl. 526-279.000.

Takano, Naoyuki: *See—*
Tsubata, Yoshiaki; Ueda, Kayoko; Fujisawa, Koichi; Higashii, Takayuki; Minai, Masayoshi; Takano, Naoyuki; and Fujimoto, Yukari, 5,554,317, Cl. 252-299.010.

Takara, Muneaki. Rotary electric machine. 5,554,903, Cl. 310-266.000.

Takaragi, Yoichi: *See—*
Funada, Masahiro; Takaragi, Yoichi; Arimoto, Shinobu; and Kawase, Michio, 5,555,107, Cl. 358-518.000.

Takase, Yojiro: *See—*
Ono, Yasushi; Takase, Yojiro; and Wada, Minoru, 5,553,565, Cl. 112-470.180.
Takashima, Daisaburo; and Watanabe, Shigeyoshi, to Kabushiki Kaisha Toshiba. Dynamic random access memory device with the combined open/folded bit-line pair arrangement. 5,555,519, Cl. 365-63.000.
Takashima, Daisaburo: *See—*
Shiratake, Shinichiro; Ohuchi, Kazunori; and Takashima, Daisaburo, 5,555,203, Cl. 365-51.000.
Takasugi, Yoshiharu: *See—*
Konno, Mitsujiro; Ono, Katsuya; Takasugi, Yoshiharu; Matsumoto, Shinya; and Nishioka, Kimihiko, 5,555,129, Cl. 359-569.000.
Takata Inc.: *See—*
Finn, Joseph R.; Jones, James R.; and Jensen, Kirk, 5,553,907, Cl. 296-97.100.
Karlow, James P.; Boumarafi, Mohamed; and Hurford, Jonathan, 5,553,887, Cl. 280-730.200.
Takata Vehicle Safety Technology GmbH: *See—*
Mitzkus, Jürgen; Wifling, Martin; Kopetzky, Robert; Bannert, Georg; Wengert, Andreas; Diepold, Ulrich; Kempfle, Thomas; Emmert, Erik; and Steffan, Hermann, 5,553,803, Cl. 242-374.000.
Takatoo, Masao: *See—*
Kitamura, Tadaaki; Kobayashi, Yoshiki; Nakanishi, Kunio; Yahiro, Masakazu; Satoh, Yoshiyuki; Shibata, Toshiro; Horie, Takeshi; Yamamoto, Katsuyuki; Takatoo, Masao; Inoue, Haruki; and Asada, Kazuyoshi, 5,554,983, Cl. 340-937.000.
Takatori, Masahiro: *See—*
Tomooka, Keiji; Sakakida, Naohiro; Nishimura, Shin; Ashi, Yoshihiro; Matsuda, Hironari; Aoki, Satoshi; Nakano, Yukio; Takatori, Masahiro; Kazawa, Toru; Sasaki, Shinya; Takeyari, Ryoji; and Nakano, Hiroyuki, 5,555,477, Cl. 359-115.000.
Takatoshi, Takemoto; and Kazunari, Kawashima, to Kabushiki Kaisha Ace Denken. Coin game machine island and coin treating apparatus. 5,554,070, Cl. 453-31.000.
Takeda Chemical Industries, Ltd.: *See—*
Mizuno, Yukio; and Arita, Miichiro, 5,554,758, Cl. 546-250.000.
Uda, Yoshiaki; Takada, Shigeyuki; and Fujisawa, Yukio, 5,554,378, Cl. 424-434.000.
Takeda, Toshihiko: *See—*
Tsukamoto, Takeo; Watanabe, Nobuo; Takeda, Toshihiko; and Okunuki, Masahiko, 5,554,859, Cl. 257-10.000.
Takei, Fumiaki: *See—*
Furihata, Kenichi; and Takei, Fumiaki, 5,555,501, Cl. 364-424.050.
Takemura, Haruhiko: *See—*
Kobayashi, Shohei; Yamazaki, Takeshi; Yanagida, Tsuneo; Takemura, Haruhiko; and Ogata, Toshihiro, 5,555,232, Cl. 369-112.000.
Takenoshita, Hiroyuki: *See—*
Sawa, Tsutomu; Takenoshita, Hiroyuki; Hada, Toshiki; and Komatsu, Hirohide, 5,553,845, Cl. 271-314.000.
Takeuchi, Hiroaki; and Kano, Hiroshi, to Furukawa Aluminum Co., Ltd. High strength aluminum alloy for forming fin and method of manufacturing the same. 5,554,234, Cl. 148-551.000.
Takeuchi, Kesatoshi, to Seiko Epson Corp. Video processor for enlarging and contracting an image in a vertical direction. 5,555,027, Cl. 348-581.000.
Takeuchi, Kunihiko: *See—*
Sugiura, Tomohiro; and Takeuchi, Kunihiko, 5,554,040, Cl. 439-212.000.
Takeuchi, Takami, to Brother Kogyo Kabushiki Kaisha. Print device for printing code data in association with code numbers. 5,555,348, Cl. 395-110.000.
Takeya, Haruhiko, to Cosmo Research Institute; and Cosmo Oil Co., Ltd. Process for preparing water-soluble organic oxide. 5,554,766, Cl. 548-473.000.
Takeyari, Ryoji: *See—*
Tomooka, Keiji; Sakakida, Naohiro; Nishimura, Shin; Ashi, Yoshihiro; Matsuda, Hironari; Aoki, Satoshi; Nakano, Yukio; Takatori, Masahiro; Kazawa, Toru; Sasaki, Shinya; Takeyari, Ryoji; and Nakano, Hiroyuki, 5,555,477, Cl. 359-115.000.
Takhiro, Suzuki: *See—*
Yoshida, Takao; Takhiro, Suzuki; and Ryoichi, Hirai, 5,553,579, Cl. 123-295.000.
Taki, Kazunari; Ohashi, Yumiko; Hamaguchi, Takuya; Maruyama, Hideo; and Matsuda, Riki, to Brother Kogyo Kabushiki Kaisha. Optical data recording medium. 5,554,451, Cl. 428-694.0ML.
Takiar, Hem P.: *See—*
Patterson, Michael W.; and Takiar, Hem P., 5,554,821, Cl. 174-52.200.
Takiue, Hirofumi: *See—*
Kitamura, Yoshiji; and Takiue, Hirofumi, 5,555,140, Cl. 360-73.020.
Talamás, Francisco X.: *See—*
Patterson, John W.; Morgans, David, Jr.; Sjogren, Eric B.; Smith, David B; Talamás, Francisco X.; Artis, Dean R.; Cervantes, Alicia; Elworthy, Todd R.; Fernández, Mario; Franco, Fidencio; Hawley, Ronald C.; Lara, Teresa; Loughhead, David G.; Nelson, Peter H.; Trejo, Alejandra; Waltos, Ann M.; and Weikert, Robert J., 5,554,612, Cl. 514-233.500.
Taligent: *See—*
Orton, Debra L.; and Goldsmith, David B., 5,555,368, Cl. 395-157.000.
Tallerico, Joseph L.: *See—*
Shoemaker, Stephen P., Jr.; Tallerico, Joseph L.; Schricker, Todd; Kelly, Matthew F.; and Kelly, Bryan M., 5,553,865, Cl. 273-448.000.
Tallman, Owen H.: *See—*
Sudama, Ram; Griffin, David M.; Johnson, Brad; Sealy, Dexter; Shelhamer, James; and Tallman, Owen H., 5,555,375, Cl. 395-200.030.
Tam, Man C.: *See—*
Sonnenberg, Hardy; Pundsack, Arnold L.; and Tam, Man C., 5,554,470, Cl. 430-41.000.
Tamada, Osamu: *See—*
Yabe, Hisao; Iida, Yoshihiro; Suzuki, Akira; Ito, Hideo; Tashiro, Yoshio; Yamazaki, Minoru; Tamada, Osamu; and Arai, Keiichi, 5,554,098, Cl. 600-121.000.
Tamai, Noboru: *See—*
Kaneko, Hideo; Tokunaga, Katsushi; Tawara, Yoshio; Tamai, Noboru; and Nakazato, Yasuaki, 5,554,303, Cl. 216-2.000.
Tambrands Inc.: *See—*
Browning, John H. D.; Wynne, Robert I.; and Hayes, Harry, 5,554,108, Cl. 604-15.000.
Tamori, Mikiko: *See—*
Iwai, Takumi; and Tamori, Mikiko, 5,555,548, Cl. 375-356.000.
Tamura, Masayuki: *See—*
Kobayashi, Noriyuki; and Tamura, Masayuki, 5,553,798, Cl. 242-18.00R.
Tamura, Tadao, to Kabushiki Kaisha Chugiken. Plate for connecting elongated plates. 5,553,434, Cl. 52-545.000.
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Nakagome, Yoshinobu; Itoh, Kiyoo; Tanaka, Hitoshi; Watanabe, Yasushi; Kume, Eiji; Isoda, Masanori; Yamasaki, Eiji; and Uchigiri, Tatsumi, 5,555,215, Cl. 365-226.000.
Tanaka, Hozumi; and Sueyasu, Ryoichi, to Snow Brand Milk Products Co., Ltd. Methods for producing cheese type food and aged type cheese from powdered milk as a starting material. 5,554,397, Cl. 426-36.000.
Tanaka, Katsuhiko: *See—*
Yago, Atsushi; Tanaka, Katsuhiko; and Saotome, Makoto, 5,555,067, Cl. 354-354.000.
Tanaka, Kazuo: *See—*
Nishioka, Futoshi; Hosokai, Tetsushi; and Tanaka, Kazuo, 5,553,595, Cl. 123-698.000.
Tanaka, Kiyoharu; Suzuki, Hajime; and Kimura, Koji, to Canon Kabushiki Kaisha. Image forming apparatus that releases sheet conveying force after the sheet reaches a recording material carrying member. 5,555,082, Cl. 355-309.000.
Tanaka, Naoya: *See—*
Fukumoto, Hiroshi; Tanaka, Naoya; Oda, Keisuke; Arimoto, Kazuaki; Yoshida, Takashi; Higashi, Kazuhiko; Kasahara, Yasunori; and Kuwada, Terumi, 5,555,462, Cl. 347-218.000.
Tanaka, Takaaki, to Olympus Optical Co., Ltd. Objective lens for microscope. 5,555,133, Cl. 359-673.000.
Tanaka, Takayuki: *See—*
Watanabe, Toshimitsu; Kitamura, Makoto; and Tanaka, Takayuki, 5,555,034, Cl. 348-746.000.
Tanaka, Tetsuya; and Taniguchi, Takashi, to Matsushita Electric Industrial Co., Ltd. Method and apparatus for a cache memory with data priority order information for individual data entries. 5,555,393, Cl. 395-460.000.
Tanaka, Tomoharu: *See—*
Endoh, Tetsuo; Tanaka, Yoshiyuki; Aritome, Seiichi; Shirota, Riichiro; Shuto, Susumu; Tanaka, Tomoharu; Hemink, Gertjan; and Tanzawa, Toru, 5,555,204, Cl. 365-189.010.
Tanaka, Yoshiyuki: *See—*
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Tandon, Sucheta: *See—*
Perry, Robert J.; Marrese, Carl A.; and Tandon, Sucheta, 5,554,493, Cl. 430-446.000.
Tang, Ching W.: *See—*
Shi, Jianmin; Chen, Chin H.; Van Slyke, Steven A.; and Tang, Ching W., 5,554,450, Cl. 428-690.000.
Tang, Engne, to VAC-com, Inc. Linear power amplifier with a pulse density modulated switching power supply. 5,554,959, Cl. 330-297.000.
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Lee, Sywe N.; Tang, Huann-Min; and Hu, Dyi-Chung, 5,555,001, Cl. 345-93.000.
Tang, Jiansheng: *See—*
Verkade, John; and Tang, Jiansheng, 5,554,764, Cl. 548-455.000.
Tang, Jin: *See—*
Jones, Simon; and Tang, Jin, 5,554,511, Cl. 435-69.100.
Tang, Jin-Yan: *See—*
Bhongle, Nandkumar; and Tang, Jin-Yan, 5,554,744, Cl. 536-25.300.
Tang, Manh; Lum, Kin K.; and Pickering, James E., to Eastman Kodak Company. Lamination of a protective layer over an image produced by a thermal printer. 5,555,011, Cl. 347-212.000.
Tang, Wade W.-C.: *See—*
Imaino, Wayne I.; Rosen, Hal J.; Rubin, Kurt A.; and Tang, Wade W.-C., 5,555,537, Cl. 369-109.000.
Tani Denkikogyo Co., Ltd.: *See—*
Tani, Okie, 5,553,540, Cl. 101-129.000.
Tani, Naoki: *See—*
Yamazato, Hisao; Tani, Naoki; Aoki, Naohiko; Kasihara, Jyunzou; and Uramoto, Yasunari, 5,555,189, Cl. 364-492.000.
Tani, Noriaki: *See—*

Ito, Kazuyuki; Nakamura, Kyuzo; Ishikawa, Michio; Togawa, Jun; Tani, Noriaki; Hashimoto, Masanori; and Ohashi, Yumiko, 5,554,418, Cl. 427-579.000.
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Namatame, Hirofumi; and Taniguchi, Masaki, 5,554,844, Cl. 250-207.000.
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Tanii Industries Co., Ltd.: *See—*
Tanii, Kiyoshi, 5,554,297, Cl. 210-703.000.
Tanii, Kiyoshi, to Tanii Industries Co., Ltd. Process of removing surfactant from uncured concrete by flotation. 5,554,297, Cl. 210-703.000.
Tanner, James, III: *See—*
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Tanzawa, Toru: *See—*
Endoh, Tetsuo; Tanaka, Yoshiyuki; Aritome, Seiichi; Shirota, Riichiro; Shuto, Susumu; Tanaka, Tomoharu; Hemink, Gertjan; and Tanzawa, Toru, 5,555,204, Cl. 365-189.010.
Tao, Adam M., to Toshiba America Information Systems, Inc. Compact docking station for portable computer. 5,555,491, Cl. 361-686.000.
Tapia, Javier J.; McBeth, Richard R.; and O'Neil, Paul E., to Westell Incorporated. Multi-variate system having an intelligent telecommunications interface with automatic adaptive delay distortion equalization (and related method). 5,555,285, Cl. 379-28.000.
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Uchino, Ryuichi; Higuchi, Tadashi; Nakano, Takaaki; and Tara, Shigenobu, 5,553,371, Cl. 29-527.200.
Taramelli, Roberto: *See—*
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Tarby Inc: *See—*
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Tarcha, Timothy: *See—*
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Tashiro, Yoshio: *See—*
Yabe, Hisao; Iida, Yoshihiro; Suzuki, Akira; Ito, Hideo; Tashiro, Yoshio; Yamazaki, Minoru; Tamada, Osamu; and Arai, Keiichi, 5,554,098, Cl. 600-121.000.
Tatematsu, Susumu; Mori, Kazuhiro; and Ikari, Hideyuki, to Hoshizaki Denki Kabushiki Kaisha. Auger type ice making machine. 5,553,464, Cl. 62-354.000.
Tateno, Takanori: *See—*
Narita, Masahiko; Fujiwara, Takashi; Fukui, Keisuke; Shimamura, Makiko; and Tateno, Takanori, 5,555,361, Cl. 395-144.000.
Tateosian, Louis H.; Shaffer, Scott E.; and Latta, Mark A., to Dentsply Research & Development Corp. Method and dispenser for making dental products. 5,554,665, Cl. 522-30.000.
Tatsumi, Kohei: *See—*
Kondo, Hiroyuki; Tatsumi, Kohei; Kimura, Masao; and Onodera, Kiyoshi, 5,554,443, Cl. 428-375.000.
Tauvers, Peter R.: *See—*
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Tavener, Raymond D.: *See—*
Craig, Gina M.; Globig, James E.; Lamprecht, Dale E., Jr.; Markham, James G.; Morrison, Donald A.; Schwabe, Richard E.; Tavener, Raymond D.; and Watkins, Rex D., 5,555,351, Cl. 395-114.000.
Tawara, Nobuyoshi; and Kojima, Takeshi, to Nissen Chemitec Co., Ltd.; and T. Chatani & Company Ltd. Light-guiding panel for surface lighting and a surface lighting body. 5,555,160, Cl. 362-31.000.
Tawara, Yoshio: *See—*
Kaneko, Hideo; Tokunaga, Katsushi; Tawara, Yoshio; Tamai, Noboru; and Nakazato, Yasuaki, 5,554,303, Cl. 216-2.000.
Taylor, Dean A., to Generation II Orthotics, Inc. Patella stabilizer. 5,554,105, Cl. 602-26.000.
Taylor, George S.: *See—*
Roberts, David B.; Taylor, George S.; and Parry, David M., 5,555,384, Cl. 395-375.000.
Taylor, JoAnn L.: *See—*
Dornbusch, Arthur H.; Kenneally, Dianna C.; and Taylor, JoAnn L., 5,553,957, Cl. 401-209.000.
Taylor, Kym F.: *See—*
Morelli, Peter A.; Taylor, Kym F.; and Makin, David, 5,553,966, Cl. 403-355.000.
Taylor, Simon A., to Ebac Limited. Dehumidifiers. 5,553,462, Cl. 62-155.000.
Tazaki, Toshinori: *See—*
Machida, Shuji; and Tazaki, Toshinori, 5,554,695, Cl. 525-268.000.
Teall, Martin R., to Merck, Sharp & Dohme, Ltd. Substituted amines as tachykinin receptor antagonists. 5,554,633, Cl. 514-357.000.
Techsonic: *See—*
Gschwind, Michel; Mitsuta, Tatsumi; Guyomar, Daniel; Sauzade, Jean-Denis; and Mazoyer, Thierry, 5,554,905, Cl. 310-323.000.
TECNICA SpA: *See—*
Marega, Antonello; and Sartor, Mario, 5,553,402, Cl. 36-117.700.
Tecnol Medical Products, Inc.: *See—*
Reese, George D.; Rich, Albert R., Jr.; and Brunson, Kevin K., 5,553,608, Cl. 128-206.240.
Tecumseh Products Company: *See—*
Dreiman, Nelik I.; and Kandpal, Tara C., 5,554,015, Cl. 417-415.000.
Tee-Lok Corporation: *See—*
Powers, Frederick P., 5,553,375, Cl. 29-798.000.
Tegeler, John J.: *See—*
Strupczewski, Joseph T.; Helsley, Grover C.; Glamkowski, Edward J.; Chiang, Yulin; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., 5,554,614, Cl. 514-254.000.
Teig, Steven L.; and Kahn, Scott D., to MCC - Molecular Simulations. Computer graphics system for selectively modelling molecules and investigating the chemical and physical properties thereof. 5,555,366, Cl. 395-161.000.
Teijin Limited: *See—*
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Teknekron Infoswitch Corporation: *See—*
Maloney, Michael J.; Hitson, Bruce L.; and McCalmont, David T., 5,555,299, Cl. 379-212.000.
Tektronix, Inc.: *See—*
Bui, Loc V.; King, Clifford R.; Titterington, Donald R.; and Karandikar, Bhalchandra M., 5,554,212, Cl. 106-20.00R.
Telectronics Pacing Systems, Inc.: *See—*
Maddison, David S.; Skalsky, Michael; Gotthardt, Gerhard; and Anderson, Neil, 5,554,176, Cl. 607-9.000.
Telefoanktiebolaget LM Ericsson: *See—*
Sällberg, Hans K. M.; and Blaabjerg, Soren, 5,555,264, Cl. 370-17.000.
Telefonaktiebolaget LM Ericsson: *See—*
Jonsson, Björn E. R., 5,555,553, Cl. 379-214.000.
Jonsson, Björn E. R., 5,555,298, Cl. 379-207.000.
Rinnbäck, Hans L.; Halén, Håkan M.; and Israelsson, Per V., 5,555,260, Cl. 370-84.000.
Telenor AS: *See—*
Torbjørnsen, Øystein; and Hvasshovd, Svein-Olaf, 5,555,404, Cl. 395-600.000.
Telle, Lawrence B., to Eastman Kodak Company. Reproduction apparatus and method with proof set page numbering. 5,555,099, Cl. 358-401.000.
Teltrend Inc.: *See—*
Sheets, Laurence L., 5,555,274, Cl. 375-257.000.
Telymonde, Andrew: *See—*
Telymonde, Timothy D.; and Telymonde, Andrew, 5,555,120, Cl. 359-147.000.
Telymonde, Timothy D.; and Telymonde, Andrew. Cordless control system for an x-ray apparatus. 5,555,120, Cl. 359-147.000.
TEMIC Telefunken Microelectronic GmbH: *See—*
Dolan, Robert P.; DeWolf, Thomas L.; Phillips, Thomas R.; Zirngibl, Michael J.; and Schon, Josef J., 5,555,509, Cl. 364-505.000.
Temin, Howard M.; and Boris-Lawrie, Kathleen A., to Wisconsin Alumni Research Foundation. More complex type retroviruses having mixed type LTR, and uses thereof. 5,554,524, Cl. 435-235.100.
Temperley, John: *See—*
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Tendler, Robert K., to Tendler Technologies, Inc. Cellular phone based automatic emergency vessel/vehicle location system. 5,555,286, Cl. 379-59.000.
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Tendler, Robert K., 5,555,286, Cl. 379-59.000.
Teng, Ming-Chang: *See—*
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Terada, Yasushi: *See—*
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Teradyne, Inc.: *See—*
Stringer, Philip J., 5,554,928, Cl. 324-158.100.
Terai, Hideo; Itoh, Akira; and Kitaguchi, Teruyuki, to Matsushita Electric Industrial Co., Ltd. Image storing device for electronic filing system. 5,555,322, Cl. 382-232.000.
Terajima, Kokichi, to Akai Electric Co., Ltd. Vibration control apparatus having automatic gain control. 5,554,904, Cl. 310-316.000.
Teramachi, Hiroshi, to THK Co., Ltd. Electric Actuator. 5,554,899, Cl. 310-80.000.
Terashima, Isamu: *See—*
Haragakiuchi, Hideyuki; Tadokoro, Hiroyuki; Fukasawa, Nobuaki; Terashima, Isamu; Sasaki, Akira; Matsuo, Kazuyoshi; Onose, Katuyoshi; and Okuhama, Masashi, 5,555,074, Cl. 355-208.000.
Terchick, Alvin A.: *See—*
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Terumo Kabushiki Kaisha: *See—*
Okajima, Naofumi, 5,554,139, Cl. 604-282.000.
Watanabe, Takahiko, 5,554,253, Cl. 156-503.000.
Teruya, Alan T.: *See—*
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Tesler, Joel D.: *See—*
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Tessler, Martin M.: *See—*
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Tessmer, Gero: *See—*

Czermak, Karl; Mihonis, Konstantin; Tessmer, Gero; and Whipp, Roy H., Jr., 5,554,206, Cl. 75-446.000.
Tetreault, Mark D.; Horvath, Charles J.; and Leavitt, William I., to Stratus
Sederlund, Edward R.; Lindesmith, Robert J.; Root, Larry A.; Dupree, Wayne P.; and Thomas, Lowell V., 5,555,424, Cl. 395-800.000.
Thomas, Matthew A.: *See—*

Togawa, Eiji: *See—*
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Czermak, Karl; Mihionis, Konstantin; Tessmer, Gero; and Whipp, Roy H., Jr., 5,554,206, Cl. 75-446.000.
Tetreault, Mark D.; Horvath, Charles J.; and Leavitt, William I., to Stratus Computer, Inc. Fault-tolerant computer system employing an improved error-broadcast mechanism. 5,555,372, Cl. 395-182.130.
Teuber, Lene; Axelsson, Oskar; and Wiitjen, Frank, to NeuroSearch A/S; and Meiji Seika Kaisha, Ltd. Benzimidazole compounds. 5,554,630, Cl. 514-338.000.
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Brooker, Donald D.; Falsetti, James S.; Wolfenbarger, James K.; Vuong, Dinh-Cuong; and Pertuit, Allen J., 5,554,202, Cl. 48-62.00R.
Perry, George K.; and Strickland, John C., 5,554,346, Cl. 422-195.000.
Pratt, Samuel, 5,554,586, Cl. 508-552.000.
Texas Instruments Deutschland: *See*—
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Texas Instruments Incorporated: *See*—
Erdeljac, John P.; and Hutter, Louis N., 5,554,873, Cl. 257-380.000.
Jha, Sunil C.; and Forster, James A., 5,553,770, Cl. 228-190.000.
Kondo, Hiroyuki; Tatsumi, Kohei; Kimura, Masao; and Onodera, Kiyoshi, 5,554,443, Cl. 428-375.000.
Malhi, Satwinder, 5,554,546, Cl. 437-40.000.
McLellan, Robert N.; and Chiu, Anthony M., 5,555,488, Cl. 361-820.000.
Nishioka, Yasushiro; Summerfelt, Scott R.; Park, Kyung-ho; and Bhattacharya, Pijush, 5,554,564, Cl. 437-192.000.
Nishioka, Yasushiro; Summerfelt, Scott R.; Park, Kyung-ho; and Bhattacharya, Pijush, 5,554,866, Cl. 257-295.000.
Plumton, Donald L., 5,554,561, Cl. 437-89.000.
Primm, Charles E., 5,554,828, Cl. 178-18.000.
Seabaugh, Alan C., 5,554,860, Cl. 257-25.000.
Texas Meter & Device Company: *See*—
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Teyssie, Phillippe J.: *See*—
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Thaller, Kurt M.; Godiwala, Nitin D.; and Maskas, Barry A., to Digital Equipment Corporation. Intelligent snoopy bus arbiter. 5,555,382, Cl. 395-293.000.
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Thayer, Peter A.; and Murphy, Morgan D., to Delco Electronics Corporation. Adaptive instrument display brightness control system. 5,554,912, Cl. 315-157.000.
Theard, Leslie P.: *See*—
Wang, James H.; Rosendale, David; Kurkov, Victor P.; Theard, Leslie P.; Ching, Ta Yen; Compton, Lewis R.; Palmgren, Tor H. G.; and Eichelberger, Mitchell P., 5,554,698, Cl. 525-330.200.
Theimer, Marvin M.; Spreitzer, Michael J.; Weiser, Mark D.; Goldstein, Richard J.; Elrod, Scott A.; Swinehart, Daniel C.; Schilit, William N.; Krivacic, Robert T.; and Want, Roy, to Xerox Corporation. Method for granting a user request having locational and contextual attributes consistent with user policies for devices having locational attributes consistent with the user request. 5,555,376, Cl. 395-200.090.
Theoleyre, Marc-Andre: *See*—
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Thermal Industries, Inc.: *See*—
Andres, Thomas, 5,553,427, Cl. 52-177.000.
Theurer, Josef; Wörgötter, Herbert; and Oellerer, Friedrich, to Franz Plasser Bahnbaumaschinen–Industriegesellschaft mbH. Ballast cleaning machine. 5,553,674, Cl. 171-16.000.
Theurer, Werner, to Hago Industrial Corp. Distributed array multipoint nozzle. 5,553,784, Cl. 239-403.000.
Thibeault, Larry K. Tick removal tool. 5,554,161, Cl. 606-131.000.
Thibert, Daniel G.: *See*—
Vassos, Alain A.; and Thibert, Daniel G., 5,553,808, Cl. 242-559.200.
Thiede, Paul W.; and Vandivier, Karl D., to Delco Electronics Corporation. Combined wireless/wired phone handset system. 5,555,448, Cl. 455-89.000.
Thiokol Corporation: *See*—
Wardle, Robert B.; and Hamilton, R. Scott, 5,554,820, Cl. 149-19.900.
THK Co., Ltd.: *See*—
Teramachi, Hiroshi, 5,554,899, Cl. 310-80.000.
Thoene, Jess G., to Thoene, Jess G. Method of treating HIV infection. 5,554,655, Cl. 514-665.000.
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Miller, Steven D., 5,554,055, Cl. 439-752.000.
Thomas, Gareth J.: *See*—
Handa, Balraj K.; Machin, Peter J.; Martin, Joseph A.; Redshaw, Sally; and Thomas, Gareth J., 5,554,756, Cl. 546-225.000.
Thomas, Gary W.: *See*—
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Thomas, Lowell V.: *See*—
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Thomas, Matthew A.: *See*—
Seitz, David R.; Woods, Curtis; and Thomas, Matthew A., 5,555,473, Cl. 358-299.000.
Thomas, Roy C. Adjustable air mattress sleeping bag. 5,553,339, Cl. 5-413.0AM.
Thomas, V. Stanton; and Holst, Peter A., to Abbott Laboratories. Sensor for measuring pressures in a cassette pump proximal and distal to a pumping chamber. 5,554,115, Cl. 604-65.000.
Thompson, Albert E., Jr.: *See*—
Bulger, Mark L.; and Thompson, Albert E., Jr., 5,553,440, Cl. 52-786.130.
Thompson, David C.: *See*—
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Thompson, Nathan C.: *See*—
Hinnen, Bennett C.; Ho, Hai T.; Rinard, Eric A.; Rinard, Gregory S.; Ruff, Brian A.; Thompson, Nathan C.; and Zia-Shakeri, Hossein, 5,555,143, Cl. 360-92.000.
Thompson, William H.; Arentson, Roger; and Tomkins, Trevor, to Milk Specialties Company. Liquid diet delivery system and control valve for use therein. 5,553,743, Cl. 222-52.000.
Thomson Consumer Electronics: *See*—
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Thomson Consumer Electronics, Inc.: *See*—
Datta, Pabitra; Poliniak, Eugene S.; Collins, Brian T.; Stork, Harry R.; Ritt, Peter M.; Garrity, Edward R., Jr.; LaPeruta, Richard, Jr.; and Ehemann, George M., Jr., 5,554,468, Cl. 430-28.000.
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Thorp, Richard: *See*—
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Thorp, Richard E., to Camco Drilling Group Limited. Modulated bias unit for rotary drilling. 5,553,679, Cl. 175-73.000.
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Tice, Thomas R.: *See*—
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Tillon, Georges; and Laurent, Jean. Process and device for making decorated woven-knitted textile backing. 5,553,642, Cl. 139-11.000.
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Timken Company, The: *See*—
Czekansky, Edward S.; and Otto, Dennis L., 5,553,870, Cl. 277-134.000.
Timmering, Cornelis E.: *See*—
Pruijmboom, Armand; Koster, Ronald; Timmering, Cornelis E.; and Dekker, Ronald, 5,554,256, Cl. 156-643.100.
Timmerman, Mark S.: *See*—
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Tinter Inc.: *See*—
Poplin, Mark K., 5,554,198, Cl. 8-482.000.
Tioxide Specialties Limited: *See*—
Simpson, Leslie A.; Robb, John; Banford, Jonathan; Dietz, Paul F.; and Temperley, John, 5,554,215, Cl. 106-436.000.
Tisbo, Thomas A.; Whitehead, Stephen P.; and Uffner, Michael G., to Suncast Corporation. Trading card carrying and display case. 5,553,712, Cl. 206-752.000.
Titier, Christelle: *See*—
Pascault, Jean-Pierre; Rolly, Florence; Taha, Mohamed; and Titier, Christelle, 5,554,703, Cl. 525-530.000.
Titterington, Donald R.: *See*—
Bui, Loc V.; King, Clifford R.; Titterington, Donald R.; and Karandikar, Bhalchandra M., 5,554,212, Cl. 106-20.00R.
Toa Medical Electronics Co., Ltd.: *See*—
Asano, Kaoru, 5,555,196, Cl. 364-555.000.
Asano, Kaoru, 5,555,198, Cl. 364-555.000.
Toba, Akira: *See*—
Sonehara, Hiroshi; Toba, Akira; Akushichi, Shuki; and Shitaya, Yoshiyuki, 5,555,171, Cl. 364-424.030.
Tobita, Tomoyuki; Yamamoto, Yoshimi; Fukunaga, Masao; Kobayahsi, Teruo; and Nagasu, Akira, to Hitachi, Ltd. Process detection apparatus. 5,554,809, Cl. 73-700.000.
Toda, Satoru: *See*—
Shiratsuchi, Kentaro; Yamada, Tsukasa; and Toda, Satoru, 5,554,494, Cl. 430-523.000.
Shiratsuchi, Kentaro; Toda, Satoru; and Yamada, Tsukasa, 5,554,496, Cl. 430-536.000.
Todaka, Shinji, to Canon Kabushiki Kaisha. Operation unit of electronic equipment utilizing visually displayed functions on a touch screen. 5,555,104, Cl. 358-468.000.
Todo, Yuji, to Murata Kikai Kabushiki Kaisha. Auxiliary yarn releasing apparatus. 5,553,799, Cl. 242-128.000.

Togawa, Eiji: *See*—
Maruyama, Kenichi; Maeda, Haruo; and Togawa, Eiji, 5,555,051, Cl. 354-195.100.
Togawa, Jun: *See*—
Ito, Kazuyuki; Nakamura, Kyuzo; Ishikawa, Michio; Togawa, Jun; Tani, Noriaki; Hashimoto, Masanori; and Ohashi, Yumiko, 5,554,418, Cl. 427-579.000.
Tohma, Kiyokazu: *See*—
Ishida, Tatsuaki; Sugita, Ryuji; Tohma, Kiyokazu; and Ban, Yasuaki, 5,554,440, Cl. 428-336.000.
Toida, Masahiro: *See*—
Miyagawa, Ichirou; and Toida, Masahiro, 5,555,087, Cl. 356-345.000.
Tokai Kogyo Mishin Kabushiki Kaisha: *See*—
Tajima, Ikuo; Kojima, Terutada; Anezaki, Tomoaki; Hirate, Masayoshi; and Suzuki, Shigeo, 5,553,560, Cl. 112-103.000.
Tokico Ltd.: *See*—
Endo, Mitsuhiro; Shirahata, Kiyoshi; and Ando, Hiromi, 5,553,530, Cl. 91-369.300.
Tokiwa Chemical Industries Co., Ltd.: *See*—
Kato, Katsuhisa, 5,553,423, Cl. 52-204.597.
Tokuden Co., Ltd.: *See*—
Kitano, Yoshio; and Okamoto, Kozo, 5,553,729, Cl. 219-619.000.
Tokumasu, Noboru: *See*—
Maeda, Kazuo; Tokumasu, Noboru; and Yuyama, Yoshiaki, 5,554,570, Cl. 437-235.000.
Tokunaga, Katsushi: *See*—
Kaneko, Hideo; Tokunaga, Katsushi; Tawara, Yoshio; Tamai, Noboru; and Nakazato, Yasuaki, 5,554,303, Cl. 216-2.000.
Tokushu Paper Mfg. Co., Ltd.: *See*—
Hanaya, Morimasa, 5,553,392, Cl. 34-115.000.
Tokyo Electron Kabushiki Kaisha: *See*—
Okase, Wataru; and Hasei, Masaaki, 5,554,226, Cl. 118-724.000.
Tokyo Electron Limited: *See*—
Hasegawa, Makoto; Saito, Tsuyoshi; Higuchi, Fumihiko; Amano, Hideaki; Naitoh, Katsunori; Tozawa, Takashi; Nakagome, Tatsuya; Ito, Keiki; and Suzuki, Kouji, 5,554,249, Cl. 156-345.000.
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Tokyo Electron Tohoku Kabushiki Kaisha: *See*—
Okase, Wataru; and Hasei, Masaaki, 5,554,226, Cl. 118-724.000.
Tokyo Seimitsu Co., Ltd.: *See*—
Kagamida, Takeshi, 5,555,091, Cl. 356-384.000.
Tolman, Charles H.: *See*—
Bonyhard, Peter I.; Dolejsi, James F.; Tolman, Charles H.; and Wood, William P., 5,554,265, Cl. 204-192.350.
Tomen Corporation: *See*—
Mookerjee, Pradip K.; and Omid, Ahmad, 5,554,576, Cl. 504-116.000.
Tomforde, Johann: *See*—
Sacco, Bruno; Tomforde, Johann; Reichel, Anton; Steinle, Gerhard; Klein, Berthold; Slaughter, David; and Ma, Mike, 5,553,909, Cl. 296-185.000.
Tomisawa, Naoki: *See*—
Hara, Seinosuke; and Tomisawa, Naoki, 5,553,573, Cl. 123-90.150.
Tomita, Hiroyuki; and Saito, Koichi, to Leader Electronics Corp. Apparatus and method for generating linearly filtered composite signal. 5,555,515, Cl. 364-724.010.
Tomita, Masahiro: *See*—
Tsugawa, Takayuki; and Tomita, Masahiro, 5,553,372, Cl. 29-734.000.
Tomkins, Trevor: *See*—
Thompson, William H.; Arentson, Roger; and Tomkins, Trevor, 5,553,743, Cl. 222-52.000.
Tomomura, Yoshitaka: *See*—
Kitagawa, Masahiko; and Tomomura, Yoshitaka, 5,554,877, Cl. 257-474.000.
Tomooka, Keiji; Sakakida, Naohiro; Nishimura, Shin; Ashi, Yoshihiro; Matsuda, Hironari; Aoki, Satoshi; Nakano, Yukio; Takatori, Masahiro; Kazawa, Toru; Sasaki, Shinya; Takeyari, Ryoji; and Nakano, Hiroyuki, to Hitachi, Ltd. Optical transmission system constructing method and system. 5,555,477, Cl. 359-115.000.
Tompkin, Mark R.: *See*—
Brownscombe, Thomas F.; Fong, Howard L.; Diaz, Zaida; Chuah, Hoe H.; June, Raymond L.; Rollick, Kevin L.; Semple, Thomas C.; and Tompkin, Mark R., 5,554,657, Cl. 521-48.000.
Tonen Corporation: *See*—
Saito, Makoto; Chiba, Yoshimasa; and Misaki, Hiroyuki, 5,554,672, Cl. 523-466.000.
Tonomura, Manabu; Iwahashi, Masaaki; and Koike, Toyomi, to Kao Corporation. Foaming surfactant composition comprising fatty acid polyoxyalkylene lower alkyl ether and fatty acid monoglyceride. 5,554,315, Cl. 510-535.000.
Tonomura, Shoichiro; Matsui, Masahiro; and Morishita, Takashi, to Asahi Kasei Kogyo Kabushiki Kaisha. High luminance thin-film electroluminescent device. 5,554,449, Cl. 428-690.000.
Top, Siden; Vessieres, Anne; Jaquen, G'erard; and Quivy, Jacques, to LaRegion Wallone. Labelling of hormones with rhenium and tecnetium. 5,554,602, Cl. 424-1.450.
Topper, Robert T.; Gilliom, John W.; and Tucker, James M., to White Consolidated Industries, Inc. Dispenser with pressure operated, spring biased, reciprocating piston valve. 5,553,756, Cl. 222-496.000.
Topping, Eric J.: *See*—
Howard, Rodney S.; Stephenson, Mark E.; and Topping, Eric J., 5,554,898, Cl. 310-61.000.
Topping, Joseph C.: *See*—
Kozak, William G.; and Topping, Joseph C., 5,554,276, Cl. 210-87.000.
Toray Industries, Inc.: *See*—
Kashio, Shigetora; Mizumi, Tsutomu; and Takahashi, Kuniyuki, 5,554,334, Cl. 264-293.000.
Suzuki, Motoyuki; Uchida, Tetsuo; and Matsuura, Kazuo, 5,555,476, Cl. 359-40.000.
Torbjørnsen, Øystein; and Hvasshovd, Svein-Olaf, to Telenor AS. Continuously available database server having multiple groups of nodes with minimum intersecting sets of database fragment replicas. 5,555,404, Cl. 395-600.000.
Toriya, Hajime: *See*—
Katoh, Yasuhiro; Tsuda, Yoshihiro; Yanagida, Mitsuaki; Toriya, Hajime; and Sasada, Tetsuo, 5,554,000, Cl. 415-208.200.
Toro Company, The: *See*—
Gjerde, Harlan T., 5,553,780, Cl. 239-71.000.
Torres, Carmen: *See*—
Almansa, Carmen; Carceller, Elena; Gonzalez, Concepcion; Torres, Carmen; and Bartroli, Javier, 5,554,624, Cl. 514-303.000.
Torrez, Henry: *See*—
King, Michael J.; Flynn, Robert A.; and Torrez, Henry, 5,554,241, Cl. 156-96.000.
Toshiaki, Kirihata; and Daisuke, Kato, to Kabushiki Kaisha Toshiba; and International Business Machines Corporation. Method and apparatus for redundancy word line replacement in a semiconductor memory device. 5,555,212, Cl. 365-200.000.
Toshiba America Information Systems, Inc.: *See*—
Tao, Adam M., 5,555,491, Cl. 361-686.000.
Toshiba Ceramics Co., Ltd.: *See*—
Kotaka, Hiroaki; Kurono, Nobuhisa; Yamaoka, Hidenori; Aiba, Yoshirou; and Matsuo, Shuuitsu, 5,554,204, Cl. 65-60.800.
Toshihiro Industry Co., Ltd.: *See*—
Hayashi, Hiroshi; and Miyoshi, Tadashi, 5,553,405, Cl. 37-189.000.
Toth, Joe M.; and Nuedorf, Kenneth E., to Lockheed Martin Corporation. Radar scan converter for producing an aggregate radial scan pattern that is a function of hyperbolically-based resolution boundaries. 5,554,992, Cl. 342-185.000.
Tottori Sanyo Electric Co., Ltd.: *See*—
Narita, Kenichi; and Suzaki, Takeshi, 5,555,114, Cl. 359-65.000.
Tou, Frederich N.; Capps, Stephen P.; Foster, Gregg S.; and Beernink, Ernest H., to Apple Computer, Inc. Resetting the case of text on a computer display. 5,555,363, Cl. 395-146.000.
Towers, Kenneth S.: *See*—
Rivard, Robert M.; Schneider, Michael J.; Pattantyus, Tamas I.; Towers, Kenneth S.; and Phipps, Jack R., 5,553,929, Cl. 303-113.100.
Rivard, Robert M.; Schneider, Michael J.; Pattantyus, Tamas I.; Towers, Kenneth S.; and Phipps, Jack R., 5,553,930, Cl. 303-174.000.
Townsend, Edward H. Excavator bucket attachment. 5,553,408, Cl. 37-406.000.
Townsend, Gerald H., to Colebrand Limited. Bridge structure including shock transmission units. 5,553,342, Cl. 14-13.000.
Toy, William W. Thermally conductive joining method and joint. 5,554,240, Cl. 156-83.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Yoneda, Takao; and Komura, Katsuhiro, 5,555,347, Cl. 395-82.000.
Toyokawa, Kazuharu: *See*—
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Toyota Jidosha Kabushiki Kaisha: *See*—
Gono, Takeshi; and Matsushita, Souichi, 5,553,588, Cl. 123-276.000.
Harada, Kenichi, 5,553,451, Cl. 60-277.000.
Hirayama, Hiroshi; Yoshizaki, Kouji; Igarashi, Kouhei; Ito, Keiji; Yoshinaga, Tohru; Watanabe, Kiyohiko; Shinohara, Yukihiro; and Fujishiro, Osamu, 5,554,342, Cl. 422-174.000.
Ishii, Satoshi; and Akatsuka, Takao, 5,553,488, Cl. 73-116.000.
Kinoshita, Kenichi, 5,554,890, Cl. 307-10.100.
Nozawa, Takashi, 5,555,406, Cl. 395-500.000.
Ogawa, Kazuo; and Inoue, Hideo, 5,555,500, Cl. 364-424.050.
Umeyama, Mitsuhiro; Shimizu, Takashi; Ichioka, Eiji; Yoshii, Kinya; Koide, Takeharu; and Funahashi, Makoto, 5,554,082, Cl. 475-338.000.
Tozawa, Takashi: *See*—
Hasegawa, Makoto; Saito, Tsuyoshi; Higuchi, Fumihiko; Amano, Hideaki; Naitoh, Katsunori; Tozawa, Takashi; Nakagome, Tatsuya; Ito, Keiki; and Suzuki, Kouji, 5,554,249, Cl. 156-345.000.
Tracy, Clarence J.: *See*—
Shin, Hank H.; Tracy, Clarence J.; Duffin, Robert L.; Freeman, John L., Jr.; Grivna, Gordon; and Wilson, Syd R., 5,554,889, Cl. 257-765.000.
Trah, Stephan: *See*—
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Trainer, C. W. Particulate separator for fluid production wells. 5,553,669, Cl. 166-105.100.
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Jameel, Mohomed I.; Cormack, Donald E.; and Tran, Hoc N., 5,553,778, Cl. 239-1.000.
Tranquilla, Michael N. Belt damping. 5,554,807, Cl. 73-579.000.
Trapasso, Louise E.; Padegimas, Stanley J.; Epstein, Peter F.; Hung, Paul L. K.; Mukhopadhyay, Purnendu; and Meisel, Philip L., to CPS Chemical Company, Inc. Organotin catalyzed transesterification products. 5,554,785, Cl. 560-201.000.
Trasportatori Govoni S.r.l.: *See*—
Soavi, Fabio, 5,553,534, Cl. 100-145.000.

Träubel, Harro; Münzmay, Thomas; Hassel, Tillmann; Krümmel, Wilhelm; Ehlert, Hans-Albert; and Kochta, Joachim, to Bayer Aktiengesellschaft. Polyisocyanate addition compounds containing cyanamide groups and

Katoh, Yasuhiro; Tsuda, Yoshihiro; Yanagida, Mitsuaki; Toriya, Hajime; and Sasada, Tetsuo, 5,554,000, Cl. 415-208.200.

Choi, Jin-O; Tyrell, John A.; and Dubell, Paul D., 5,554,684, Cl. 524-588.000.
Tzikas, Athanassios; and Deitz, Rolf, to Ciba-Geigy Corporation. Reactive

Hull, John R.; Uherka, Kenneth L.; and Abdoud, Robert G., 5,554,583, Cl. 505-166.000.
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Träubel, Harro; Münzmay, Thomas; Hassel, Tillmann; Krümmel, Wilhelm; Ehlert, Hans-Albert; and Kochta, Joachim, to Bayer Aktiengesellschaft. Polyisocyanate addition compounds containing cyanamide groups and their use. 5,554,711, Cl. 528-49.000.
Traversari, Catia: *See—*
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Trejo, Alejandra: *See—*
Patterson, John W.; Morgans, David, Jr.; Sjogren, Eric B.; Smith, David B; Talamás, Francisco X.; Artis, Dean R.; Cervantes, Alicia; Elworthy, Todd R.; Fernández, Mario; Franco, Fidencio; Hawley, Ronald C.; Lara, Teresa; Loughhead, David G.; Nelson, Peter H.; Trejo, Alejandra; Waltos, Ann M.; and Weikert, Robert J., 5,554,612, Cl. 514-233.500.
Trifield Productions Limited: *See—*
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Trimble Navigation, Limited: *See—*
Denninger, Valentine L., 5,554,042, Cl. 439-272.000.
Tristrata, Inc.: *See—*
Yu, Ruey J.; and Van Scott, Eugene J., 5,554,651, Cl. 514-574.000.
Tritec International Corporation: *See—*
Kim, Jisu, 5,553,384, Cl. 30-85.000.
Trokhan, Paul D.; and Boutilier, Glenn D., to Procter & Gamble Company, The. Papermaking belt and method of making the same using differential light transmission techniques. 5,554,467, Cl. 430-11.000.
Troudet, Farideh. Adaptive system based on indicia applied to the fingers for touch-typing/training. 5,554,032, Cl. 434-233.000.
Troxell, Brian A: *See—*
Bloomfield, Mark C.; Castro, Edward F.; Dyer, Joseph T.; Jackson, Deborah J.; Lemons, Charles E.; McCown, Bruce A.; Mullis, Johnny P.; and Troxell, Brian A, 5,555,100, Cl. 358-402.000.
Trubiano, Antoine, to Cari-All Inc. Nestable shopping cart with improved lower containment means. 5,553,876, Cl. 280-33.991.
True Manufacturing Co., Inc.: *See—*
Trulaske, Robert J., Sr., 5,553,354, Cl. 16-110.00R.
Trulaske, Robert J., Sr., to True Manufacturing Co., Inc. Handle for refrigeration unit door. 5,553,354, Cl. 16-110.00R.
Trustees of Columbia University in the City of New York: *See—*
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Trustees of Princeton University, The: *See—*
Forrest, Stephen R.; Ban, Vladimir S.; Burrows, Paul E.; and Schwartz, Jeffrey, 5,554,220, Cl. 117-88.000.
Trustees of Tufts College: *See—*
Dudman, Nicholas H., 5,554,383, Cl. 424-451.000.
TRW Inc.: *See—*
Harnett, Laurence N.; Yujuri, Mikio L., and Shoucri, Mert M., 5,555,036, Cl. 340-933.000.
Injeyan, Hagop; St. Pierre, Randall J.; Hilyard, Rodger C.; Harpole, George M.; and Hoefer, Carolyn S., 5,555,254, Cl. 372-33.000.
Simon, Randy W.; Platt, Christine E.; Lee, Alfred E.; and Lee, Gregory S., 5,554,585, Cl. 505-430.000.
TRW Repa GmbH: *See—*
Bühr, Erwin; Holzapfel, Volker; Petzi, Jürgen; and Böhmler, Klaus, 5,553,890, Cl. 280-806.000.
TRW Vehicle Safety Systems Inc.: *See—*
Hamann, Russell E., 5,553,804, Cl. 242-382.400.
Tsai, Chuen J.; and Cheng, Yu H., to National Science Council of Republic of China. Inertial impactor with a specially designed impaction plate. 5,553,795, Cl. 241-40.000.
Tsai, Hsi-Chuan: *See—*
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Tsai, Yan-Hone: *See—*
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Tsinberg, Mikhail; Azadegan, Faramarz; Hu, Antony; and Ogawa, Shigeo, to Kabushiki Kaisha Toshiba. Video compression system with editing flag. 5,555,193, Cl. 364-514.00A.
Tsoi, Siu C., to Eastman Kodak Company. Photographic silver halide color material. 5,554,492, Cl. 430-443.000.
Tsubata, Yoshiaki; Ueda, Kayoko; Fujisawa, Koichi; Higashii, Takayuki; Minai, Masayoshi; Takano, Naoyuki; and Fujimoto, Yukari, to Sumitomo Chemical Company, Limited. Compound having unsaturated side chain, process for preparing the same, liquid crystalline polymer prepared from the same, liquid crystal mixture and display element. 5,554,317, Cl. 252-299.010.
Tsuboi, Makoto: *See—*
Miyauchi, Shinji; Nakane, Shinichi; Asano, Kazutaka; Horiike, Yoshio; and Tsuboi, Makoto, 5,554,976, Cl. 340-626.000.
Tsubone, Tsunehiko: *See—*
Kato, Shigekazu; Nishihata, Kouji; Tsubone, Tsunehiko; and Itou, Atsushi, 5,553,396, Cl. 34-406.000.
Tsubota, Masashi, to NEC Corporation. Microprocessor capable of ensuring flexible recovery time for I/O device by inserting idle states. 5,555,559, Cl. 395-879.000.
Tsubusaki, Koji; and Komatsu, Fumio, to Kabushiki Kaisha Toshiba. Critical dimension measuring method and equipment thereof. 5,555,319, Cl. 382-170.000.
Tsuchiya, Shoji, to Fujitsu Limited. Generation management system and method for managing resource generation using pre-edit and post-edit line renumbering. 5,555,410, Cl. 395-600.000.
Tsuda, Yoshihiro: *See—*
Katoh, Yasuhiro; Tsuda, Yoshihiro; Yanagida, Mitsuaki; Toriya, Hajime; and Sasada, Tetsuo, 5,554,000, Cl. 415-208.200.
Tsugawa, Takayuki; and Tomita, Masahiro, to Odawara Engineering KK. Apparatus for inserting insulation sheets into slots of a stator core. 5,553,372, Cl. 29-734.000.
Tsugaya, Hitoshi: *See—*
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Tsuji, Hiroshi: *See—*
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Tsuji, Kiyoshi: *See—*
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Tsuji, Nobuaki, to Konica Corporation. Silver halide photographic light sensitive material containing antistatic layer. 5,554,495, Cl. 430-530.000.
Tsuji, Sadafusa; and Okada, Hiroyuki, to Minolta Camera Kabushiki Kaisha. Data reading and writing apparatus. 5,555,047, Cl. 354-106.000.
Tsujikawa, Toshihiko; Mizuoka, Seiji; and Nagamoto, Masao, to Matsushita Electric Industrial Co., Ltd. Inspecting apparatus of mounting state of component or printing state of cream solder in mounting line of electronic component. 5,555,316, Cl. 382-150.000.
Tsujimoto, Shinichi; and Ishihara, Masaaki, to Canon Kabushiki Kaisha. Head movement feature in a camera using a film with a magnetic memory portion. 5,555,045, Cl. 354-106.000.
Tsukada, Kiyoshi; Hattori, Yasuyuki; and Mimura, Taku, to Kao Corporation. Method for preparing copper-containing hydrogenation reaction catalyst and method for producing alcohol. 5,554,574, Cl. 502-345.000.
Tsukahara, Daiki; Wakabayashi, Hiroshi; Katano, Yuji; and Kaji, Hidenobu, to Nikon Corporation. Camera display illumination device which switchably illuminates displays. 5,555,065, Cl. 354-289.120.
Tsukamoto, Takeo; Watanabe, Nobuo; Takeda, Toshihiko; and Okunuki, Masahiko, to Canon Kabushiki Kaisha. Electron emission element with schottky junction. 5,554,859, Cl. 257-10.000.
Tsukimi, Yoshihiro; Matsumoto, Takayuki; and Nagano, Hideo, to Fuji Photo Film Co., Ltd. Process for producing microcapsules. 5,554,323, Cl. 264-4.700.
Tsunoda, Masaki: *See—*
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Koishikawa, Kouji; Tsunoda, Masaki; and Suzuki, Hitoshi, 5,554,060, Cl. 440-89.000.
Tsurugi, Tomio: *See—*
Urawa, Yoshio; Furukawa, Ken; Shimizu, Toshikazu; Yamagishi, Yoji; Tsurugi, Tomio; and Ichino, Tomio, 5,554,757, Cl. 548-237.000.
Tsuruta, Tadashi; Suzuki, Masatoshi; Sano, Hiromi; Fujii, Namitsugu; and Sugino, Hiroshi, to Nippondenso Co., Ltd. Ceramic heater. 5,554,839, Cl. 219-544.000.
Tsushima, Kazunori: *See—*
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Tucker, James M.: *See—*
Topper, Robert T.; Gilliom, John W.; and Tucker, James M., 5,553,756, Cl. 222-496.000.
Tucker, Mark: *See—*
Snelling, Richard K.; McIntosh, P. Stuckey; and Tucker, Mark, 5,555,258, Cl. 370-29.000.
Tuma, George B.; Tuma, Wade B.; and Warne, Robert E., to Database Excelleration Systems, Inc. A disk storage subsystem for interfacing with a parallel path, a nonvolatile media and a volatile storage medium. 5,555,402, Cl. 395-500.000.
Tuma, Wade B.: *See—*
Tuma, George B.; Tuma, Wade B.; and Warne, Robert E., 5,555,402, Cl. 395-500.000.
Tumanic, Gerald W.: *See—*
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Tumms, Paul G.: *See—*
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Tung, Samuel S.: *See—*
Shiu, Almon S.; Ewton, James R.; Rittichier, Henry E.; Wong, Jeremy; and Tung, Samuel S., 5,555,283, Cl. 378-151.000.
Turchan, Manuel C.; and Mistry, Pravin, to QQC, Inc. Substrate coating techniques, including fabricating materials on a surface of a substrate. 5,554,415, Cl. 427-248.100.
Turer, Eric S.; and Malay, Thomas. Field serviceable derailleur device. 5,553,960, Cl. 403-2.000.
Turk, Rodney E., to Aeroquip Corporation. Intraluminal stenting graft. 5,554,180, Cl. 623-1.000.
Turner, Darin J.; Zelenak, Daniel G.; and Musiol, John A., to AlliedSignal Inc. Snap-on, removable steering wheel with integral airbag housing. 5,553,888, Cl. 280-731.000.
Turner, John S., to Wangner Systems Corp. Laser curtain edge tracking systems for papermaking machines. 5,554,262, Cl. 162-198.000.
Turner, Michael R., to Heath Custom Press, Inc. Plate clamping and tensioning apparatus for rotary printing press. 5,553,545, Cl. 101-415.100.
Turner, Ronald, executor: *See—*
Rhodes, John G. L., deceased; Turner, Ronald, executor; Hobden, Mervyn K.; Wilson, Alan T.; and Hilder, Graham M., 5,555,016, Cl. 348-6.000.
Tyrell, John A.: *See—*

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Tzikas, Athanassios; and Deitz, Rolf, to Ciba-Geigy Corporation. Reactive azo dyes containing phenylamino-chlorotriazinylamino and α,β-dibromoproproylamino or α-bromoacryloylamino fiber reactive groups. 5,554,733, Cl. 534-638.000.
Uchida, Hiroshi; Onuki, Mituhiro; and Watanabe, Hideo, to CCA Inc. Apparatus for supplying particles and/or granules to form a layer of prescribed thickness. 5,554,393, Cl. 425-92.000.
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Nakagome, Yoshinobu; Itoh, Kiyoo; Tanaka, Hitoshi; Watanabe, Yasushi; Kume, Eiji; Isoda, Masanori; Yamasaki, Eiji; and Uchigiri, Tatsumi, 5,555,215, Cl. 365-226.000.
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Arakawa, Fumio; and Uchiyama, Kunio, 5,555,394, Cl. 395-462.000.
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Katoh, Katsutoshi; Suzuki, Michio; Uchiyama, Yoshiharu; and Yonemochi, Kenshin, 5,555,487, Cl. 361-680.000.
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Ueda, Kayoko: *See—*
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Ueda, Masahiko, to Taihei Chemical Industrial Co., Ltd. Dental impression paper tray. 5,554,024, Cl. 433-37.000.
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Uehara, Hideo: *See—*
Shigenaga, Hisao; Fujita, Ichiro; Yamamoto, Masayuki; Hamana, Michio; Morishita, Keiichi; Tachikawa, Fumitoshi; Uehara, Hideo; and Iida, Yasuhisa, 5,554,984, Cl. 340-937.000.
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Yazawa, Shigehiko; Ito, Kazuhiko; Uehara, Takeshi; Tachibana, Toru; and Fukuda, Keiji, 5,555,541, Cl. 370-68.100.
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Sugihara, Hiroshi; Ishikawa, Hiroyuki; Uemura, Tsutomu; Fujiki, Akira; Imazato, Hiromasa; and Umino, Shinichi, 5,554,338, Cl. 419-5.000.
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Ueno, Yasunori: *See—*
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Uetani, Takahiro: *See—*
Honda, Shoji; Shono, Masayuki; Hiroyama, Ryoji; Bessho, Yasuyuki; Kase, Hiroyuki; Nishida, Toyozo; Uetani, Takahiro; and Suzuki, Junko, 5,555,271, Cl. 372-45.000.
Uffner, Michael G.: *See—*
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Ugai, Sadayuki: *See—*
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Uhler, Werner: *See—*
Benz, Gerhard; Laermer, Franz; Schilp, Andrea; Zabler, Erich; Schirmer, Jürgen; and Uhler, Werner, 5,553,506, Cl. 73-862.590.
Uhoch, John, to C. R. Bard, Inc. Disposable blood washing and apheresis device and method of using thereof. 5,554,293, Cl. 210-650.000.
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Chapman, Maurice I.; and Nicholson, David, 5,553,414, Cl. 47-1.420.
Ulenaers, Mathieu J. E.: *See—*
Wolters, Robertus A. M.; Larsen, Poul K.; and Ulenaers, Mathieu J. E., 5,554,559, Cl. 437-62.000.
Uleski, Michael A., to United Technologies Automotive, Inc. Terminal support for use with an electronic component. 5,554,037, Cl. 439-76.100.
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Auriol, Daniel H.; Paul, Francois B.; and Monsan, Pierre F., 5,554,508, Cl. 435-68.100.
Ulicne, Joseph A.; and Morris, Al, to Ulicne, Joseph A.; and Hamilton, John. Collapsible sled with automatic locking means, and methods of constructing and utilizing same. 5,553,875, Cl. 280-20.000.
Ullman, James. Trailer for hauling vehicles. 5,553,989, Cl. 414-537.000.
Ultra Marine Products, Inc.: *See—*
LeQuire, Wayne A., 5,554,058, Cl. 440-89.000.
Umbach, Dirk, to Esselte Meto International GmbH. Reusable ink ribbon cassette for a label printer, the cassette being capable of accommodating ink ribbons having different widths. 5,553,952, Cl. 400-208.000.
Umeyama, Mitsuhiro; Shimizu, Takashi; Ichioka, Eiji; Yoshii, Kinya; Koide, Takeharu; and Funahashi, Makoto, to Toyota Jidosha Kabushiki Kaisha. Transmission with integral large and small planetary gears, and method of assembling the transmission. 5,554,082, Cl. 475-338.000.
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Umino, Shinichi: *See—*
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Gandek, Thomas P.; Joseph, James C.; Pikulin, Michael A.; Pangalos, George; and Bowden, Philip E., 5,554,259, Cl. 162-48.000.
Union Special GmbH: *See—*
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Hara, Seinosuke; and Tomisawa, Naoki, 5,553,573, Cl. 123-90.150.
Watanabe, Satoru, 5,554,801, Cl. 73-115.000.
Unisys Corporation: *See—*
Alferness, Merwin H.; Caldarale, Charles R.; Johnson, David R.; Kerzman, Joseph P.; and McBreen, James R., 5,555,396, Cl. 395-474.000.
De Subijana, Joseba M.; Robeck, Gary R.; Michaelson, Wayne A.; and Wierdsma, Steven M., 5,555,391, Cl. 395-440.000.
Petschauer, Richard J.; Rothenberger, Roland D.; and Tumms, Paul G., 5,555,506, Cl. 364-491.000.
United Dominion Industries, Inc.: *See—*
Alexander, James C., 5,553,343, Cl. 14-71.100.
United Kingdom of Great Britain and Northern Ireland, a British Corporation Sole, The Secretary of State of Defence in Her Britannic Majesty's Government of the: *See—*
Lewis, Meirion F., 5,555,119, Cl. 359-158.000.
United Microelectronics Corporation: *See—*
Chang, Chun-Yen, 5,554,985, Cl. 341-26.000.
Hong, Gary, 5,554,551, Cl. 437-43.000.
Hsu, Chen-Chung, 5,554,544, Cl. 437-35.000.
Hsue, Chen-Chiu; Chien, Sun-Chieh; and Liu, Ming-Hua, 5,554,560, Cl. 437-69.000.
Lur, Water; and Huang, Cheng H., 5,554,566, Cl. 437-193.000.
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Yang, Sheng-Hsing, 5,554,543, Cl. 437-31.000.
United Parcel Service of America, Inc.: *See—*
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United Solar Systems Corporation: *See—*
Vogeli, Craig N., 5,554,229, Cl. 136-259.000.
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Agriculture: *See—*
English, Brent W., 5,554,238, Cl. 156-62.200.
Kraszewski, Andrzej W.; and Nelson, Stuart O., 5,554,935, Cl. 324-637.000.
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Keipert, Andreas G.; and Allen, Michael S., 5,553,629, Cl. 128-898.000.
Khoury, Jehad; Woods, Charles L.; and Fu, Jack, 5,555,128, Cl. 359-559.000.
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Mathews, Wayne; and Hughes, William V., 5,553,482, Cl. 73-40.000.
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Braun, Mark R.; and Stormann, Thomas M., 5,554,500, Cl. 435-6.000.
Kim, Hyun K.; Blye, Richard P.; and Bialy, Gabriel, 5,554,603, Cl. 514-182.000.
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Van den Bergh Foods Co., Division of Conopco, Inc.: *See—*
Bodor, Janos; Patrick, Matthew; Wajda, Thomas, Jr.; and Wesdorp,
Burger, Kálmán; Réthey, Iván; Stefkó, Béla; Gebhardt, István; Király née, Gyöngyvér Soós; Takácsi Nagy, Géza; Illés, János; Neszmélyi, Erzsébet; Rácz, István; and Várkonyi, Viktoria, 5,554,598, Cl. 514-

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Rowe, Marlin D.; and McMullin, Francis A., 5,553,871, Cl. 277-177.000.
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Supcoe, Robert F.; and Moran, Francis J., 5,554,214, Cl. 106-264.000.
U.S. Philips Corporation: *See*—
Bazzaz, Paul, 5,555,033, Cl. 348-699.000.
Falk, Gerhard, 5,553,800, Cl. 242-353.000.
Kohar, Handoko; Wegner, Philippe; and Smit, Léon, 5,554,979, Cl. 340-825.720.
Leiner, Dennis C.; Peck, William G.; van den Berg, Theodorus W. A.; Brambring, Jörg; and Voormolen, Willem J., 5,554,100, Cl. 600-182.000.
Mulkens, Johannes C. H.; and Heynderickx, Ingrid E. J. R., 5,555,113, Cl. 359-63.000.
Pruijmboom, Armand; Koster, Ronald; Timmering, Cornelis E.; and Dekker, Ronald, 5,554,256, Cl. 156-643.100.
Sharma, Prem K.; Van Doorn, Arie R.; and Staring, Aemilianus G. J., 5,554,747, Cl. 540-456.000.
Suwald, Thomas, 5,554,949, Cl. 327-276.000.
Van Buul, Marinus C. W.; and Centen, Petrus G. M., 5,554,944, Cl. 327-91.000.
Van Rooij, Johannes H. J. M., 5,555,031, Cl. 348-645.000.
Wielstra, Ytsen, 5,554,196, Cl. 8-444.000.
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Eisensmith, Terry C.; Morin, Donald A.; and Proto, George R., 5,553,477, Cl. 72-403.000.
Green, David T.; Bolanos, Henry; Alesi, Daniel E.; Ratcliff, Keith; and Sherts, Charles R., 5,554,169, Cl. 606-219.000.
Guy, Thomas D., 5,554,097, Cl. 600-102.000.
Hinchliffe, Peter W. J., 5,554,151, Cl. 606-1.000.
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Matula, Paul A.; and Remiszewski, Stanley H., 5,554,101, Cl. 600-214.000.
Roby, Mark S.; Bennett, Steven L.; and Liu, Cheng-Kung, 5,554,170, Cl. 606-230.000.
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Wilson, Donald F.; Lehn, Randolph F.; Dworak, Frank; Gravener, Roy D.; Kus, Joseph E.; and Stearns, Ralph A., 5,554,164, Cl. 606-167.000.
Young, Wayne P.; and Castro, Salvatore, 5,554,137, Cl. 604-264.000.
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Uleski, Michael A., 5,554,037, Cl. 439-76.100.
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Craig, Harold M.; and Chen, Otis Y., 5,553,455, Cl. 60-753.000.
Gaddis, William T.; Nelson, Kenneth I.; and Thomas, Gary W., 5,553,501, Cl. 73-662.000.
Gold, Phillip J.; Fogler, Donald L., Jr.; and Dryfoos, James B., 5,553,812, Cl. 244-76.00R.
Gold, Phillip J.; Fogler, Donald L., Jr.; Skonieczny, Joseph; and Keller, James F., 5,553,817, Cl. 244-195.000.
Rodgers, Joseph H.; and Kasprow, Robert F., 5,553,449, Cl. 60-204.000.
Unitika Ltd.: *See*—
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Matsunaga, Nobuhiro; and Niikura, Katsuyoshi, 5,554,442, Cl. 428-373.000.
Unitrode Corporation: *See*—
Neidorff, Robert A., 5,554,986, Cl. 341-145.000.
Universal Enterprises, Inc.: *See*—
Ridenour, Ralph G., 5,553,602, Cl. 126-91.00A.
Universal Environmental Technologies, Inc.: *See*—
Rippetoe, William W.; and Shroff, David N., 5,554,301, Cl. 210-748.000.
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Fortin, J. André; St-Arnaud, Marc; Hamel, Chantal; Chavarie, Claude; and Jolicoeur, Mario, 5,554,530, Cl. 435-256.800.
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Dabberdt, Walter F.; Norris, Kenneth D.; Semmer, Steven R.; Delany, Anthony C.; and Fox, Jack R., 5,553,508, Cl. 73-63.020.
University of Alabama for its division, The University of Alabama at Birmingham, The Board of Trustees of the: *See*—
Cantor, Alan E.; Muzzy, William H., III; Eisentraut, Donald K.; D'Auterio, Louis A.; and Whitman, Gary R., 5,553,924, Cl. 297-452.270.
University of California, The Regents of the: *See*—
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University of Connecticut, The: *See*—
Bell, James P.; Huang, Ying; and Yu, Yunchao, 5,554,702, Cl. 525-463.000.
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University of Michigan, The Regents of the: *See*—
Bell, David A.; Bell, Lon E.; Levine, Simon; and Koren, Yoram, 5,555,495, Cl. 364-148.000.
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Caputa, Anthony C.; Bey, Russell F.; and Murtaugh, Michael P., 5,554,371, Cl. 424-234.100.
Das, Gladwin S., 5,554,181, Cl. 623-1.000.
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University of Nebraska, The Board of Regents of the: *See*—
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Shiu, Almon S.; Ewton, James R.; Rittichier, Henry E.; Wong, Jeremy; and Tung, Samuel S., 5,555,283, Cl. 378-151.000.
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Unruh, Stephen N. Snowmobile securement system. 5,553,882, Cl. 280-508.000.
UOP: *See*—
Monkelbaan, Daniel R.; Resetarits, Michael R.; and Miller, Robert J., 5,554,329, Cl. 261-98.000.
Uozumi, Sachiko, to Geo Snap, Inc. Fastening system for triangularly shaped surfaces. 5,553,967, Cl. 403-393.000.
Upjohn Company, The: *See*—
Stringfellow, Dale A.; and Fast, Patricia E., 5,554,617, Cl. 514-272.000.
Uramoto, Yasunari: *See*—
Yamazato, Hisao; Tani, Naoki; Aoki, Naohiko; Kasihara, Jyunzou; and Uramoto, Yasunari, 5,555,189, Cl. 364-492.000.
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Nokajima, Kunio; Kimura, Shizuo; Hashimoto, Yasuo; and Urano, Makoto, 5,553,474, Cl. 72-60.000.
Urawa, Yoshio; Furukawa, Ken; Shimizu, Toshikazu; Yamagishi, Yoji; Tsurugi, Tomio; and Ichino, Tomio, to Eisai Co., Ltd. Process for the preparation of imidazopyridine derivatives, and intermediates therefore. 5,554,757, Cl. 548-237.000.
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Urich, Albert E., Jr. Waste disposal and energy recovery system and method. 5,553,554, Cl. 110-211.000.
Uriu, Shiro: *See*—
Kakuma, Satoshi; Uriu, Shiro; Samejima, Noriko; Murayama, Masami; and Fukuda, Noaki, 5,555,243, Cl. 370-58.200.
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Bogdan, Eugene A.; and Terchick, Alvin A., 5,554,207, Cl. 75-500.000.
Utagawa, Ken, to Nikon Corporation. Camera with improved lens drive during switching of multiple focal point detection areas. 5,555,068, Cl. 354-402.000.
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Uvex Safety, Inc.: *See*—
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Valette, Serge, to Commissariat A L'Energie Atomique. Sagnac effect optical gyrometer having a fully integrated structure. 5,555,088, Cl. 356-350.000.
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Korhonen, Ville; Liedes, Allan; and Yli-Kauppila, Jouko, 5,553,393, Cl. 34-117.000.

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Van den Bergh Foods Co., Division of Conopco, Inc.: *See*—
Bodor, Janos; Patrick, Matthew; Wajda, Thomas, Jr.; and Wesdorp, Leendert H., 5,554,407, Cl. 426-603.000.
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Leiner, Dennis C.; Peck, William G.; van den Berg, Theodorus W. A.; Brambring, Jörg; and Voormolen, Willem J., 5,554,100, Cl. 600-182.000.
Van den Keybus, Frans M. A.: *See*—
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Vanderbeke, E. M. M.; De Schrijver, M.; and Vermeire, A. M. M. Process for hydrolyzing phytase with a synergetic enzyme composition. 5,554,399, Cl. 426-49.000.
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Van De Vliet, Birgitte M. L. C.: *See*—
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van Lengerich, Bernhard: *See*—
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Karl, Terry L.; Gloden, Gregory J.; Van Riper, Philip C.; Zainea, John P.; and Myers, John T., 5,553,895, Cl. 285-39.000.
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Burger, Kálmán; Réthey, Iván; Stefkó, Béla; Gebhardt, István; Király née, Gyöngyvér Soós; Takácsi Nagy, Géza; Illés, János; Neszmélyi, Erzsébet; Rácz, István; and Várkonyi, Viktoria, 5,554,598, Cl. 514-54.000.
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Zheng, Zhensheng; Huang, Zhili; Huang, Ziqiang; and Yang, Shifang, 5,554,103, Cl. 601-152.000.
Vassos, Alain A.; and Thibert, Daniel G., to Eastman Kodak Company. Feeding of a machine with a turret supporting removable magazines distributing strips by means of an external source. 5,553,808, Cl. 242-559.200.
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Vedder, William J.: *See*—
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Verkade, John; and Tang, Jiansheng, to Iowa State University Research Foundation, Inc. Preparation of pyrrol and oxazole compounds: formation of C-acyl-α-amino acid esters therefrom. 5,554,764, Cl. 548-455.000.
Vermeer Manufacturing Company: *See*—
Stump, Greg, 5,553,407, Cl. 37-348.000.
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Verschuere, Bruno; and Jacques, Jean-Pierre, to Elf Aquitaine. Cage for automatically cleaning birds. 5,553,568, Cl. 119-460.000.
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Edwards, Stuart D.; Lax, Ronald G.; Lundquist, Ingemar H.; Sharkey, Hugh R.; and Baker, James A., 5,554,110, Cl. 604-22.000.
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Vinciguerra, John D.; Perrone, Charles H., Jr.; Mumme, Charles W.; and Higgins, Jeffery C., to Intermedics Orthopedics, Inc. Intercondylar notch cutter for posterior stabilized femoral knee prosthesis. 5,554,158, Cl. 606-80.000.
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Chen, Yaobin; and Mintun, Thomas G., 5,553,609, Cl. 128-630.000.
Visseren, M. J. W.: *See*—
Melief, Cornelis J. M.; Visseren, M. J. W.; Kast, W. M.; van der Bruggen, Pierre; and Boon-Falleur, Thierry, 5,554,724, Cl. 530-328.000.
VLSI Technology, Inc.: *See*—
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Voegele, Guenther: *See*—

Domke, Klaus; Stottkiewitz, Herbert; Voegele, Guenther; Neugart, Bernd; Daelfer, Mathias; Klimaschewski, Jelco; Schulz, Daniel; and Eidher, Michael, 5,553,942, Cl. 383-101.000.
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Czermak, Karl; Miliosis, Konstantin; Teasmer, Gero; and Whipp, Roy H., Jr., 5,554,206, Cl. 75-446.000.
Vogeli, Craig N., to United Solar Systems Corporation. Light directing element for photovoltaic device and method of manufacture. 5,554,229, Cl. 136-259.000.
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Volvo GM Heavy Truck Corporation: *See*—
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Vomm Impianti E Processi S.r.L.: *See*—
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vonBieren, Karlheinz; and Frederick, Donald A., to Litton Systems, Inc. Coherence multiplexed interferometric signal processing system and method. 5,555,086, Cl. 356-345.000.
von Braun, Heiko S. Large-scale mapping of parameters of multi-dimensional structures in natural environments. 5,555,018, Cl. 348-144.000.
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von Gutfeld, Robert J.: *See*—
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Vortman, Pnina: *See*—
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Voytik, Sherry L.: *See*—
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Vreeland, William B.; Wilson, John C.; and Zaretsky, Mark C., to Eastman Kodak Company. Conductive substrate bearing a elastomeric polyurethane coating containing a conductivity control agent. 5,554,474, Cl. 430-66.000.
Vrotacoe, James B.; Guaraldi, Glenn A.; Carlson, James R.; and Squires, Gregory T. Gapless tubular printing blanket. 5,553,541, Cl. 101-217.000.
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Wade, Brian. Particle and light and heavy fluid separator. 5,554,343, Cl. 422-177.000.
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Wagner, David W.: *See*—
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Wakabayashi, Hiroshi: *See*—
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Tsukahara, Daiki; Wakabayashi, Hiroshi; Katano, Yuji; and Kaji, Hidenobu, 5,555,065, Cl. 354-289.120.
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Walbrink, Harold J.; Etherington, Roger P.; Beuchat, Charles E.; Burgess, Vincent J.; and Richards, Kent D., to Birtcher Medical Systems, Inc. Minimally invasive irrigator/aspirator surgical probe and method of using same. 5,554,112, Cl. 604-27.000.
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Walker, William J.; Goodrum, Alan L.; and Mayer, Dale J., to Compaq Computer Corporation. Data error detection and correction system. 5,555,250, Cl. 371-40.100.
Walkowe, Janusz, to Stahl International, Inc. Active torsional vibration damper. 5,553,514, Cl. 74-574.000.
Wallace, Caryl L., to Philips Electronics North America Corporation. Device and method for insulating a dry film capacitor. 5,555,485, Cl. 361-272.000.
Wallace, David B.: *See*—
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Wallace, George B.; Evans, Scott M.; and Cragg, Andrew H., to Micro Therapeutics, Inc. Infusion device with preformed shape. 5,554,114, Cl. 604-53.000.
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Walsh, Aaron: *See*—
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Wang, Chin-Yang. Mobile telephone holder. 5,555,302, Cl. 379-446.000.
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Wang, Kevin K.; and Yuen, Po-Wai, to Warner-Lambert Company. Alpha-mercaptoacrylic acid derivatives having calpain inhibitory activity. 5,554,767, Cl. 548-496.000.
Wang, Ming-Teh. Cream dispenser head. 5,553,757, Cl. 222-321.900.
Wang, Shih-Ming, to Taiwan Semiconductor Manufacturing Company Ltd. Method for improving adhesion to a spin-on-glass. 5,554,567, Cl. 437-195.000.
Wangner Systems Corp.: *See*—
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Ward, Peter; Dowson, Peter; and Wilkinson, John, to British Gas plc. Method and apparatus for locating a buried element of inductive material using probe with detector coils. 5,554,934, Cl. 324-326.000.
Wardle, Robert B.; and Hamilton, R. Scott, to Thiokol Corporation. High solids rocket motor propellants using diepoxy curing agents. 5,554,820, Cl. 149-19.900.
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Theurer, Josef; Wörgötter, Herbert; and Oellerer, Friedrich, 5,553,674, Cl. 171-16.000.

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Ang, Anthony, 5,555,328, Cl. 385-31.000.
Bertrand, Jacques C.; Ciccarelli, Roger N.; Pickering, Thomas R.; and Bayley, Denise R., 5,554,471, Cl. 430-45.000.
Jaskowiak, Timothy R.; and Hart, Steven C., 5,555,184, Cl. 355-259.000.
Kuo, Youti; and Smoak, James F., 5,555,083, Cl. 355-309.000.
Larson, James R.; Facci, John S.; Abkowitz, Martin A.; Mammino, Joseph; Stolka, Milan; and Spiewak, John W., 5,554,469, Cl. 430-31.000.
Mailloux, Louis D., 5,555,557, Cl. 382-299.000.
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Ozaki, Masaharu, 5,555,556, Cl. 382-173.000.
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Blumer, Thomas P.; and Barada, Peter W., 5,555,358, Cl. 395-141.000.
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Yamaguchi, Takashi: *See*—
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Yamaha Corporation: *See*—
Iwata, Ritsuo; Takahashi, Hirotosi; Suzuki, Satoshi; and Endo, Takayuki, 5,554,429, Cl. 428-105.000.
Kakishita, Masahiro, 5,554,813, Cl. 84-622.000.
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Abe, Kohji; Onoue, Akihiro; and Isogawa, Atsushi, 5,554,057, Cl. 440-89.000.
Suzuki, Mitso; Ito, Masahiro; and Higaki, Yoshiyuki, 5,553,590, Cl. 123-415.000.
Yoshida, Takao; Takhiro, Suzuki; and Ryoichi, Hirai, 5,553,579, Cl. 123-295.000.

Yamamoto, Akira: *See*—
Satoh, Takao; Yamamoto, Akira; and Honma, Shigeo, 5,555,389, Cl. 395-427.000.

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Yamamoto, Yoshimi: *See*—
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Yamamoto, Yuji: *See*—
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Yamamoto, Yuuri: *See*—
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Yamanashi, Hidenori: *See*—
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Yamanashi, Makoto, to Yazaki Corporation. Connector for transmission. 5,554,043, Cl. 439-350.000.

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Yamasaki, Eiji: *See*—
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Kashida, Motokazu; Hoshi, Hidenori; Nagasawa, Kenichi; and Yamashita, Shinichi, 5,555,230, Cl. 369-93.000.

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Inoue, Takayuki; Fukumoto, Masami; and Yamaura, Izumi, 5,553,347, Cl. 15-327.300.

Yamazaki, Minoru: *See*—
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Yamazaki, Takeshi: *See*—
Kobayashi, Shohei; Yamazaki, Takeshi; Yanagida, Tsuneo; Takemura, Haruhiko; and Ogata, Toshihiro, 5,555,232, Cl. 369-112.000.

Yamazato, Hisao; Tani, Naoki; Aoki, Naohiko; Kasihara, Jyunzou; and Uramoto, Yasunari, to Sharp Kabushiki Kaisha. Internal communications system for refrigerator and wiring structure thereof. 5,555,189, Cl. 364-492.000.

Yanagawa, Naoharu; and Sano, Fumihiko, to Pioneer Electronic Corporation. Optical pickup. 5,555,538, Cl. 369-110.000.

Yanagi, Motonori: *See*—
Ban, Cozy; Yanagi, Motonori; Fukumoto, Takaaki; Manabe, Toshiki; Yanome, Hiroshi; and Kawada, Kazuhiko, 5,554,295, Cl. 210-668.000.

Yanagida, Mitsuaki: *See*—
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Yanagida, Tsuneo: *See*—
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Yanai, Masahiro: *See*—
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Yanai, Shimon: *See*—
Selby, Robert F.; Yanai, Shimon; Vortman, Pnina; and Weisberg, Larry, 5,555,365, Cl. 395-159.000.

Yang, Chi-Kuo. Compactly molded rib means for multiple-fold umbrella. 5,553,634, Cl. 135-25.300.

Yang, Jeng-Rern, to Gemtek Technology Co., Ltd. Connecting apparatus for interconnection between serial data transmission devices. 5,555,545, Cl. 375-220.000.

Yang, Ming-Tzong: *See*—
Wu, Chung-Cheng; and Yang, Ming-Tzong, 5,554,545, Cl. 437-40.000.

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Yang, Sheng-Hsing, to United Microelectronics Corporation. Process for fabricating bipolar junction transistor having reduced parasitic capacitance. 5,554,543, Cl. 437-31.000.

Yang, Shifang: *See*—
Zheng, Zhensheng; Huang, Zhili; Huang, Ziqiang; and Yang, Shifang, 5,554,103, Cl. 601-152.000.

Yang, Sbu-Yin: *See*—
Ho, Bang C.; Chen, Jian-Hong; Yang, Shu-Yin; and Chang, Yih-Her, 5,555,525, Cl. 385-143.000.

Yang, Yeong-Show, to Cray Valley S.A. Resins and compositions for the manufacture of heat-resistant high modulus materials, and molded articles obtained from such materials. 5,554,687, Cl. 525-63.000.

Yang, Young M.; and Kim, Young H. Bicycle pedal. 5,553,515, Cl. 74-594.300.

Yano, Hideo; Arai, Susumu; and Kobayashi, Fumio, to Asahi Corporation; and Kabushiki Kaisha Sankyo Seiki Seisakusho. Disk hold device having an operation button. 5,555,233, Cl. 369-270.000.

Yano, Tomoyuki: *See*—
Hirai, Kenji; Matsukawa, Tomoko; Yano, Tomoyuki; Ejiri, Emiko; Aizawa, Kiyomi; Shikakura, Koichi; Yoshii, Tomoko; Ugai, Sadayuki; Yamada, Osamu; and Kishi, Shigeki, 5,554,581, Cl. 504-298.000.

Yanome, Hiroshi: *See*—
Ban, Cozy; Yanagi, Motonori; Fukumoto, Takaaki; Manabe, Toshiki; Yanome, Hiroshi; and Kawada, Kazuhiko, 5,554,295, Cl. 210-668.000.

Yashima, Hiroyuki; and Horio, Katsuji, to Denki Kagaku Kogyo Kabushiki Kaisha. Thermoplastic resin composition and its synthetic resin composite. 5,554,688, Cl. 525-71.000.

Yasui, Kenji: *See*—

Ohkouchi, Takeo; Hosoda, Hitoshi; Yasui, Kenji; Kato, Shigehiro; Kondo, Yasuhiko; and Takahi, Yukiyoshi, 5,554,391, Cl. 424-633.000.

Yasui, Osamu: *See*—

Imai, Takayuki; Naka, Motohiko; Shida, Takehiko; Sato, Masaaki; Yoshida, Kunio; Akamine, Ikuo; Shimizu, Makoto; and Uchida, Yoshiaki, 5,555,512, Cl. 364-550.000.

Yurtsever, Mustafa: *See*—
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Yuyama, Yoshiaki: *See*—
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Ohsawa, Hiroshi, 5,554,913, Cl. 318-434.000.

Ohkouchi, Takeo; Hosoda, Hitoshi; Yasui, Kenji; Kato, Shigehiro; Kondo, Yasuhiko; and Takahi, Yukiyoshi, 5,554,391, Cl. 424-633.000.

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Ohta, Masahiro; Matsuyama, Akio; Senoue, Eiji; Kuwano, Fumiaki; Yasui, Osamu; Yoshida, Yasunori; Ryu, Akinori; and Kobayashi, Tadashi, 5,554,765, Cl. 548-462.000.

Yau, Leopoldo D.: *See—*
Breivogel, Joseph R.; Louke, Samuel F.; Oliver, Michael R.; Yau, Leopoldo D.; and Barns, Christopher E., 5,554,064, Cl. 451-41.000.

Yawata, Kazunari: *See—*
Miyasaka, Masayo; Ito, Yoshikazu; Minowa, Masahiro; and Yawata, Kazunari, 5,555,349, Cl. 395-111.000.

Yazaki Corporation: *See—*
Katsumata, Makoto; Yamanashi, Hidenori; and Ushijima, Hitoshi, 5,554,678, Cl. 524-495.000.
Shinji, Yasuhisa; and Morishita, Kazuhiro, 5,554,051, Cl. 439-595.000.
Sugiura, Tomohiro; and Takeuchi, Kunihiko, 5,554,040, Cl. 439-212.000.
Sugiyama, Osamu; and Yagi, Sakai, 5,554,046, Cl. 439-397.000.
Yamanashi, Makoto, 5,554,043, Cl. 439-350.000.

Yazawa, Shigehiko; Ito, Kazuhiko; Uehara, Takeshi; Tachibana, Toru; and Fukuda, Keiji, to Fujitsu Limited. Exchange connected to a control channel junction line. 5,555,541, Cl. 370-68.100.

Yeda Research & Development Co. Ltd.: *See—*
Revel, Michel; and Zilberstein, Asher, 5,554,513, Cl. 435-69.510.
Revel, Michel; and Zilberstein, Asher, 5,554,514, Cl. 435-69.510.

Yelderman, Mark L.: *See—*
McKown, Russell C.; Quinn, Michael D.; and Yelderman, Mark L., 5,553,622, Cl. 128-692.000.

Yesel, Leon P.; and Kitzerow, John P., to Caterpillar Inc. All wheel drive torque control lever override. 5,553,517, Cl. 74-731.100

Yhtio, Kemira Osake: *See—*
Ohkura, Ken; Matsuzaki, Satoru; and Eskelinen, Pekka J., 5,554,439, Cl. 428-323.000.

Yi, Alex C., to Rockwell International Corp. Engine power enhancement/pollution control system utilizing vortex air separator. 5,553,591, Cl. 123-585.000.

Yianakopoulos, Georges. Liquid cleaning compositions. 5,554,320, Cl. 252-389.230.

Yin, Huan B.: *See—*
Billet, Gilles; and Yin, Huan B., 5,555,331, Cl. 385-49.000.

Yli-Kauppila, Jouko: *See—*
Korhonen, Ville; Liedes, Allan; and Yli-Kauppila, Jouko, 5,553,393, Cl. 34-117.000.

Yokogawa, Kenetsu; Kawanami, Yoshimi; and Mizutani, Tatsumi, to Hitachi, Ltd. Method of treating surfaces with atomic or molecular beam. 5,554,257, Cl. 156-643.100.

Yokomakura, Mitsunori: *See—*
Aono, Hiroshi; Yokomakura, Mitsunori; Katano, Mitsunori; and Watanabe, Michiaki, 5,554,910, Cl. 313-497.000.

Yokoya, Hiroaki; and Endo, Akihiro, to Fuji Photo Film Co., Ltd. Silver halide light-sensitive material containing base precursor and polyvinyl alcohol. 5,554,482, Cl. 430-203.000.

Yokoyama, Masahide: *See—*
Nishihara, Munekazu; Yokoyama, Masahide; Shibasaki, Hatsuhiko; and Ohnishi, Youichi, 5,554,222, Cl. 118-723.0HC.

Yoneda, Masato: *See—*
Sasama, Hiroshi; and Yoneda, Masato, 5,555,397, Cl. 395-485.000.

Yoneda, Takao; and Komura, Katsuhiro, to Toyoda Koki Kabushiki Kaisha. Method and apparatus for controlling a robot using a neural network. 5,555,347, Cl. 395-82.000.

Yonemochi, Kenshin: *See—*
Katoh, Katsutoshi; Suzuki, Michio; Uchiyama, Yoshiharu; and Yonemochi, Kenshin, 5,555,487, Cl. 361-680.000.

Yonemura, Kohei: *See—*
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Yonescu, William E.: *See—*
Costa, Pat V.; Yonescu, William E.; and Fritz, Donald, 5,554,858, Cl. 250-559.290.

Yoneyama, Yuzo; and Inahashi, Atsushi, to NEC Corporation. Error detecting device for a radio blind zone system. 5,555,442, Cl. 455-9.000.

Yoo, Byeoung-Su: *See—*
Park, Hyo-Hoon; Park, Min-Soo; and Yoo, Byeoung-Su, 5,554,061, Cl. 445-28.000.

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Joung, Mun C.; Choi, Young J.; Shim, Kwan B.; Cho, Do H.; Kim, Seung I.; and Yoo, Byoung K., 5,555,097, Cl. 358-335.000.

Yoo, In Man. Electric fan having two wind shifting modes. 5,554,002, Cl. 416-100.000.

Yoo, Jae-chun, to Samsung Electronics Co., Ltd. Frequency folding and unfolding circuits of a video signal recording/reproducing apparatus. 5,555,096, Cl. 358-310.000.

Yoon, Young-huy: *See—*
Kim, Kun-hye; Son, Soo-ho; Yoon, Young-huy; and Lee, Chang-jig, 5,553,357, Cl. 19-258.000.

Yoshida, Hideji: *See—*
Miyata, Shigeru; Yoshida, Hideji; Matsubara, Yoshihiro; Ito, Yasuo; and Suzuki, Takashi, 5,554,930, Cl. 324-402.000.

Yoshida, Kunio: *See—*
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Yoshida, Takao; Takhiro, Suzuki; and Ryoichi, Hirai, to Yamaha Hatsudoki Kabushiki Kaisha. Fuel injection system for two-cycle engine. 5,553,579, Cl. 123-295.000.

Yoshida, Takashi: *See—*
Fukumoto, Hiroshi; Tanaka, Naoya; Oda, Keisuke; Arimoto, Kazuaki; Yoshida, Takashi; Higashi, Kazuhiko; Kasahara, Yasunori; and Kuwada, Terumi, 5,555,462, Cl. 347-218.000.

Yoshida, Yasunori: *See—*
Ohta, Masahiro; Matsuyama, Akio; Senoue, Eiji; Kuwano, Fumiaki; Yasui, Osamu; Yoshida, Yasunori; Ryu, Akinori; and Kobayashi, Tadashi, 5,554,765, Cl. 548-462.000.

Yoshii, Kinya: *See—*
Umeyama, Mitsuhiro; Shimizu, Takashi; Ichioka, Eiji; Yoshii, Kinya; Koide, Takeharu; and Funahashi, Makoto, 5,554,082, Cl. 475-338.000.

Yoshii, Shinichi: *See—*
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Yoshii, Tomoko: *See—*
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Yoshikawa, Munehiro: *See—*
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Yoshinaga, Tohru: *See—*
Hirayama, Hiroshi; Yoshizaki, Kouji; Igarashi, Kouhei; Ito, Keiji; Yoshinaga, Tohru; Watanabe, Kiyohiko; Shinohara, Yukihiro; and Fujishiro, Osamu, 5,554,342, Cl. 422-174.000.

Yoshioka, Makoto: *See—*
Hasebe, Takayuki; Akiyama, Ryota; and Yoshioka, Makoto, 5,555,304, Cl. 380-4.000.

Yoshitsugu, Takao; Ohata, Koichiro; and Kano, Tsuyoshi, to Matsushita Electric Industrial Co., Ltd. Rotating polygon mirror driving apparatus. 5,555,124, Cl. 359-200.000.

Yoshiyama, Tsugihito, to Minolta Co., Ltd. Apparatus for controlling an exposure. 5,555,076, Cl. 355-208.000.

Yoshizaki, Kouji: *See—*
Hirayama, Hiroshi; Yoshizaki, Kouji; Igarashi, Kouhei; Ito, Keiji; Yoshinaga, Tohru; Watanabe, Kiyohiko; Shinohara, Yukihiro; and Fujishiro, Osamu, 5,554,342, Cl. 422-174.000.

Yoshizawa, Osamu: *See—*
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Young, Kwo: *See—*
Ovshinsky, Stanford R.; Fetcenko, Michael A.; Im, Jun; Chao, Benjamin; Reichman, Benjamin; and Young, Kwo, 5,554,456, Cl. 429-59.000.

Young, Wayne P.; and Castro, Salvatore, to United States Surgical Corporation. Tissue piercing members. 5,554,137, Cl. 604-264.000.

Young, Wayne P.; Mastri, Dominick L.; Bolanos, Henry; and Chelednik, George M., to United States Surgical Corporation. Tissue piercing members. 5,554,167, Cl. 606-184.000.

Yu, Ruey J.; and Van Scott, Eugene J. Compositions comprising 2-hydroxycarboxylic acids and related compounds, and methods for alleviating signs of dermatological aging. 5,554,597, Cl. 514-557.000.

Yu, Ruey J.; and Van Scott, Eugene J., to Tristrata, Inc. Method of treating wrinkles using citramalic acid. 5,554,651, Cl. 514-574.000.

Yu, Ruey J.; and Van Scott, Eugene J. Method of treating wrinkles using alpha hydroxyacids, alpha ketoacids and a sunscreen agent. 5,554,652, Cl. 514-557.000.

Yu, Ruey J.; and Van Scott, Eugene J. Method for enhancing the therapeutic effect of an anti-acne agent. 5,554,654, Cl. 514-557.000.

Yu, Si-Hong, to Samsung Electronics Co., Ltd. Heat exchange for air conditioner. 5,553,663, Cl. 165-151.000.

Yu, Tsai-Yun, to Selle Tech Industrial Co., Ltd. Bicycle saddle with a plurality of shock-absorbing springs and means for adjusting tension of the springs. 5,553,916, Cl. 297-207.000.

Yu, Yi-Song: *See—*
Fayt, Roger M. A.; van der Steen, Frederik H.; Teyssie, Phillippe J.; Walhof, Judith J. B.; and Yu, Yi-Song, 5,554,696, Cl. 525-314.000.

Yu, Yunchao: *See—*
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Yuen, Po-Wai: *See—*
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Yujuri, Mikio L.: *See—*
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Yurtsever, Mustafa: *See—*
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Yuyama, Yoshiaki: *See—*
Maeda, Kazuo; Tokumasu, Noboru; and Yuyama, Yoshiaki, 5,554,570, Cl. 437-235.000.

Z-Pro International, Inc.: *See—*
Dentler, Christopher G., 5,553,754, Cl. 222-391.000.

Zabler, Erich: *See—*
Benz, Gerhard; Laermer, Franz; Schilp, Andrea; Zabler, Erich; Schirmer, Jürgen; and Uhler, Werner, 5,553,506, Cl. 73-862.590.

Zaghloul, Hatim: *See—*
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Zaguroli, James, Jr., to Knight Industries, Inc. Safety device for an air balancing hoist. 5,553,832, Cl. 254-267.000.

Zainea, John P.: *See—*
Karl, Terry L.; Gloden, Gregory J.; Van Riper, Philip C.; Zainea, John P.; and Myers, John T., 5,553,895, Cl. 285-39.000.

Zajacek, John G.: *See—*
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Zakhary, Nashat, to Crown Cork & Seal Company, Inc. System and method for purifying waste streams containing water reducible paints. 5,554,296, Cl. 210-702.000.

Zand, Farnaz. Workpiece organizer. 5,554,034, Cl. 434-263.000.

Zander, Dennis R., to Eastman Kodak Company. Film loading/unloading design for photographic camera. 5,555,054, Cl. 354-212.000.

Zaretsky, Mark C.: *See—*
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Rostoker, Michael D.; Pasch, Nicholas F.; and Zelayeta, Joe, 5,554,484, Cl. 430-270.100.

Zelczer, Alex; and Zelczer, Ruth. Pipe and duct run locator. 5,553,498, Cl. 73-584.000.

Zelczer, Ruth: *See—*
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Zelenak, Daniel G.: *See—*
Turner, Darin J.; Zelenak, Daniel G.; and Musiol, John A., 5,553,888, Cl. 280-731.000.

Zelikovich, Rami. Sports impact sensor apparatus for proximate operation. 5,553,860, Cl. 273-371.000.

Zelikovitz, Joseph, deceased; Greenblott, by Bernard, executor; and Owen, by Jerry L., executor. Fiber optic information transmission system. 5,555,478, Cl. 359-118.000.

Zeller, Charles P.; Durkin, Michael D.; and Holman, Thomas H., Jr., to Dell USA, L.P. Multi-master bus arbitration system in which the address and data lines of the bus may be separately granted to individual masters. 5,555,425, Cl. 395-800.000.

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Zeneca Limited: *See—*
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Zenoni, Pietro, to L.G.L. Electronics S.p.A. Positive modulated braking of the thread for weft feeders. 5,553,641, Cl. 139-452.000.

Zeun, Ronald; and Zurflüh, René, to Ciba-Geigy Corporation. Microbicides. 5,554,619, Cl. 514-275.000.

Zexel Co., Ltd.: *See—*
Matsuzaki, Hideaki; Osawa, Hiroshi; and Gunji, Yoshihide, 5,555,148, Cl. 361-15.000.

Zexel Corporation: *See—*
Nishishita, Kunihiko; and Kinugawa, Takashi, 5,553,664, Cl. 165-153.000.
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Zheng, Joe; and Lai, Jiansu, to United Parcel Service of America, Inc. Method and apparatus for characterizing the performance of a printer or an imaging system. 5,555,313, Cl. 382-112.000.

Zheng, Zhensheng; Huang, Zhili; Huang, Ziqiang; and Yang, Shifang, to Vasomedical, Inc. High efficiency external counterpulsation apparatus and method for controlling same. 5,554,103, Cl. 601-152.000.

Zia-Shakeri, Hossein: *See—*
Hinnen, Bennett C.; Ho, Hai T.; Rinard, Eric A.; Rinard, Gregory S.; Ruff, Brian A.; Thompson, Nathan C.; and Zia-Shakeri, Hossein, 5,555,143, Cl. 360-92.000.

Ziegler, Hugo; and Trah, Stephan, to Ciba-Geigy Corporation. Azo oxime ethers and their use as fungicides. 5,554,735, Cl. 534-738.000.

Zielinski, Timothy T.: *See—*
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Zilberstein, Asher: *See—*
Revel, Michel; and Zilberstein, Asher, 5,554,513, Cl. 435-69.510.
Revel, Michel; and Zilberstein, Asher, 5,554,514, Cl. 435-69.510.

Zillig, Manfred: *See—*
Nilz, Claudia; Sendhoff, Norbert; Breitschaft, Walter; Zillig, Manfred; and Lorencak, Primoz, 5,554,261, Cl. 162-162.000.

Zimmer, Inc.: *See—*
Crowninshield, Roy D., 5,554,192, Cl. 623-16.000.

Zimmerman, Dean R.: *See—*
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Zimmerman, Scott M.; Beeson, Karl W.; Hou, Janpu; and Schweyen, John C., to AlliedSignal Inc. Illumination system employing an array of microprisms. 5,555,109, Cl. 359-40.000.

Zimmerman, Scott M.: *See—*
Kuper, Jerry; Segal, Leon; Beeson, Karl W.; and Zimmerman, Scott M., 5,555,329, Cl. 385-36.000.

Zimgibl, Michael J.: *See—*
Dolan, Robert P.; DeWolf, Thomas L.; Phillips, Thomas R.; Zimgibl, Michael J.; and Schon, Josef J., 5,555,509, Cl. 364-505.000.

Zlojutro, Milan. Sport training bag and support. 5,554,088, Cl. 482-83.000.

Zoller, Gerhard; Jablonka, Bernd; Just, Melitta; Klingler, Otmar; Breipohl, Gerhard; Knolle, Jochen; and König, Wolfgang, to Cassella Aktiengesellschaft. Imidazolidine derivatives. 5,554,594, Cl. 514-18.000.

Zoltner, John D., to Xerox Corporation. Slitter for a desktop page printer. 5,553,528, Cl. 83-443.000.

Zook, Christopher P., to Cirrus Logic, Inc. Multipurpose error correction calculation circuit. 5,555,516, Cl. 364-746.100.

Zünkler, Klaus, to Siemens Aktiengesellschaft. Method for recognizing patterns in time-variant measurement signals. 5,555,344, Cl. 395-2.510.

Zurflüh, René: *See—*
Zeun, Ronald; and Zurflüh, René, 5,554,619, Cl. 514-275.000.

Zweig, Stephen E., to Avocet Medical, Inc. Device for performing timed assay by electrical resistance change. 5,554,531, Cl. 435-286.100.

Zyung, Tae-Hyoung: *See—*
Hwang, Wol-Yon; Kim, Jang-Joo; Zyung, Tae-Hyoung; and Oh, Min-Chul, 5,555,326, Cl. 385-2.000.

2844788 Canada Ltee: *See—*
Rozon, David, 5,553,653, Cl. 160-173.000.

3003442 Canada Inc.: *See—*
Jameel, Mohomed I.; Cormack, Donald E.; and Tran, Hoc N., 5,553,778, Cl. 239-1.000.

3D Systems, Inc.: *See—*
Hull, Charles W., 5,554,336, Cl. 264-401.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10th DAY OF SEPTEMBER, 1996

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Kim, Young-Chan, to SamSung Electronics Co., Ltd. Idling rotation mechanism used in the housing of a video cassette tape recorder. Re. 35,328, Cl. 360-96.500.

SamSung Electronics Co., Ltd.: *See*—

Kim, Young-Chan, Re. 35,328, Cl. 360-96.500.

Sing, Peter. Method of converting logs and resultant product. Re. 35,327, Cl. 52-309.900.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

AMS Medinvent S.A.: *See*—
Wallsten, Hans I., B1 4,655,771, Cl. 623-1.000.

Biogen, Inc.: *See*—
Maraganore, John M.; Fenton, John W., II; and Kline, Toni, B1 5,196,404, Cl. 514-13.000.

Brigham Young University: *See*—
Lee, Milton L.; and Sin, Chung H., B1 5,070,240, Cl. 250-288.000.

Brooks, John A., Jr., to Poly-Vac, Inc. Sterilization and storage container tray. B1 5,098,676, Cl. 422-292.000.

Digital Voice Systems, Inc.: *See*—
Green, David T., B1 5,116,353, Cl. 606-184.000.

Dow Chemical Company, The: *See*—
Park, Chung P., B1 4,640,933, Cl. 521-94.000.

Fenton, John W., II: *See*—
Maraganore, John M.; Fenton, John W., II; and Kline, Toni, B1 5,196,404, Cl. 514-13.000.

Green, David T., to Digital Voice Systems, Inc. Safety trocar. B1 5,116,353, Cl. 606-184.000.

Health Research, Inc.: *See*—
Maraganore, John M.; Fenton, John W., II; and Kline, Toni, B1 5,196,404, Cl. 514-13.000.

Hitachi, Ltd.: *See*—
Yoshida, Kenichi; Watanabe, Takao; and Kiguchi, Takashi, B1 1,033,162, Cl. 364-492.000.

Ideaz International, Inc.: *See*—
Smith, Jerry R., B1 5,349,329, Cl. 340-539.000.

Kiguchi, Takashi: *See*—
Yoshida, Kenichi; Watanabe, Takao, and Kiguchi, Takashi, B1 1,033,162, Cl. 364-492.000.

Klein, Gerald B. Concentric convenience opening beverage can end. B1 4,976,368, Cl. 220-268.000.

Kline, Toni: *See*—
Maraganore, John M.; Fenton, John W., II; and Kline, Toni, B1 5,196,404, Cl. 514-13.000.

Lee, Milton L.; and Sin, Chung H., to Brigham Young University. Apparatus and methods for trace component analysis. B1 5,070,240, Cl. 250-288.000.

Low, John M.; and Milbank, John E. H., to Sortex, Ltd. Method and apparatus for sorting material. B1 5,242,059, Cl. 209-552.000.

Maraganore, John M.; Fenton, John W., II; and Kline, Toni, to Biogen, Inc.; and Health Research, Inc. Inhibitors of thrombin. B1 5,196,404, Cl. 514-13.000.

Milbank, John E. H.: *See*—
Low, John M.; and Milbank, John E. H., B1 5,242,059, Cl. 209-552.000.

Milner, Richard, to Smith & Nephew plc. Gloves, their manufacture and use. B1 5,031,245, Cl. 2-168.000.

Park, Chung P., to Dow Chemical Company, The. Expandable polyolefin compositions and preparation process utilizing isobutane blowing agent. B1 4,640,933, Cl. 521-94.000.

Poly-Vac, Inc.: *See*—
Brooks, John A., Jr., B1 5,098,676, Cl. 422-292.000.

Sin, Chung H.: *See*—
Lee, Milton L.; and Sin, Chung H., B1 5,070,240, Cl. 250-288.000.

Smith & Nephew plc: *See*—
Milner, Richard, B1 5,031,245, Cl. 2-168.000.

Smith, Jerry R., to Ideaz International, Inc. Vehicle security apparatus and method. B1 5,349,329, Cl. 340-539.000.

Sortex, Ltd.: *See*—
Low, John M.; and Milbank, John E. H., B1 5,242,059, Cl. 209-552.000.

Wallsten, Hans I., to AMS Medinvent S.A. Prosthesis comprising an expansible or contractile tubular body. B1 4,655,771, Cl. 623-1.000.

Watanabe, Takao: *See*—
Yoshida, Kenichi; Watanabe, Takao; and Kiguchi, Takashi, B1 1,033,162, Cl. 364-492.000.

Weltmann, Alfred. Prescription eyewear made from non-prescription lens shield material. B1 5,387,950, Cl. 351-178.000.

Yoshida, Kenichi; Watanabe, Takao; and Kiguchi, Takashi, to Hitachi, Ltd. Method and apparatus for guidance of an operation of operating power plants. B1 1,033,162, Cl. 364-492.000.

LIST OF DESIGN PATENTEES

AB Astra: *See*—
Berg, Elna; and Karlsson, Jan, 373,630, Cl. D24-110.000.

Abbott, Barry J.; Abbott, Valerie M.; Clarke, Stephen J.; and Donchi, Dino, to Clean Screen Wipers Pty. Ltd. Extruded wiper backing strip. 373,563, Cl. D12-220.000.

Abbott, Valerie M.: *See*—
Abbott, Barry J.; Abbott, Valerie M.; Clarke, Stephen J.; and Donchi, Dino, 373,563, Cl. D12-220.000.

Abbruzzese, Domenico: *See*—
Natuzzi, Pasquale; and Abbruzzese, Domenico, 373,485, Cl. D6-381.000.

Akiyama, Osamu; Fujii, Yoshito; Koyama, Keiichi; and Ohki, Kunihiro, to Sharp Kabushiki Kaisha. Television set. 373,583, Cl. D14-126.000.

Allard, Randall N.: *See*—
Price, Gregory G.; and Allard, Randall N., 373,632, Cl. D24-127.000.
Price, Gregory G.; and Allard, Randall N., 373,635, Cl. D24-140.000.

Alviar, Christopher: *See*—
van Engelen, Ferdinand; Kaneko, Steven T.; Alviar, Christopher; Sanchez, Russell; and Mclean, Mark, 373,569, Cl. D13-147.000.

Ambar Diamonds Inc.: *See*—
Itzkowitz, Israel, 373,550, Cl. D11-34.000.

American Fitness Products, Inc.: *See*—
Summers, Georgene; and Rothstein, Mitchell A., 373,608, Cl. D21-195.000.

Amway Corporation: *See*—
Schirado, Lowell C., 373,537, Cl. D9-572.000.

Anand, Prem K., to Health Images, Inc. Entertainment system display stand. 373,584, Cl. D14-126.000.

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201 5,553,696

CLASS 198

332 5,553,697
626.1 5,553,698
737 5,553,699
780 5,553,700

CLASS 200

61.72 5,554,833
82 A 5,554,834
85 R 5,554,835

CLASS 203

25 5,554,264

CLASS 204

192.35 5,554,265
298.15 5,554,266
400 5,554,268
424 5,554,269
479 5,554,271

CLASS 205

494 5,554,270
782.5 5,554,272
785 5,554,273

CLASS 206

15.2 5,553,701
38 5,553,702
158 5,553,704
5,553,705
296 5,553,706
315.9 5,553,707
419 5,553,708
446 5,553,709
561 5,553,710
710 5,553,711
752 5,553,712

CLASS 208

111 5,554,274
213 5,554,275

CLASS 209

552 B1 5,242,059
577 5,553,714

CLASS 210

87 5,554,276
94 5,554,277
136 5,554,278
149 5,554,279
169 5,554,280
273 5,554,281
321.75 5,554,282
321.8 5,554,283
356 5,554,284
449 5,554,285
500.25 5,554,286
500.29 5,554,287
504 5,554,288
607 5,554,289
610 5,554,290
615 5,554,291
640 5,554,292
650 5,554,293
663 5,554,294
668 5,554,295
702 5,554,296
703 5,554,297
708 5,554,298
712 5,554,299
748 5,554,300
5,554,301
791 5,554,302

CLASS 211

5 5,553,715
13 5,553,716
5,553,717
18 5,553,718
30 5,553,719
40 5,553,720
59.1 5,553,721
70.7 5,553,724
99 5,553,722
133 5,553,723

CLASS 215

6 5,553,725
11.4 5,553,726
44 5,553,727
233 5,553,728

CLASS 216

2 5,554,303
5,554,304
62 5,554,305

CLASS 219

121.63 5,554,837
240 5,554,838
544 5,554,839
619 5,553,729
651 5,554,836

CLASS 220

3.2 5,553,730
212 5,553,732
268 B1 4,976,368
400 5,553,733
414 5,553,734
469 5,553,735
719 5,553,731

CLASS 221

62 5,553,736
167 5,553,737
195 5,553,738
196 5,553,739

CLASS 222

1 5,553,740
5,553,741
5,553,742
52 5,553,743
64 5,553,744
92 5,553,745
94 5,553,747
5,553,748
129.1 5,553,746
5,553,749
179.5 5,553,750
183 5,553,751
321.9 5,553,757
340 5,553,752
387 5,553,753
391 5,553,754
402.21 5,553,755
496 5,553,756
533 5,553,758

CLASS 224

316 5,553,760
321 5,553,761
403 5,553,762
631 5,553,759

CLASS 225

4 5,553,763

CLASS 227

10 5,553,764
176.1 5,553,765

CLASS 228

13 5,553,766
54 5,553,767
102 5,553,768
123.1 5,553,769
190 5,553,770

CLASS 229

110 5,553,771
148 5,553,772
224 5,553,773
303 5,553,774

CLASS 235

441 5,554,840
464 5,554,841
491 5,554,842

CLASS 236

49.3 5,553,775
5,553,776

CLASS 238

35 5,553,777

CLASS 239

1 5,553,778
17 5,553,779
71 5,553,780
88 5,553,781
107 5,553,782
403 5,553,783
5,553,784
432 5,553,785
456 5,553,786
527 5,553,788
548 5,553,789
585.1 5,553,790

CLASS 241

1 5,553,791
29 5,553,792
30 5,553,793
36 5,553,794
40 5,553,795
230 5,553,796
285.3 5,553,797

CLASS 242

18 R 5,553,798
128 5,553,799
353 5,553,800
357 5,553,801
372 5,553,802
374 5,553,803
382.4 5,553,804
534 5,553,805
542.4 5,553,806
557 5,553,807
559.2 5,553,808
563.1 5,553,809
601 5,553,810
605 5,553,811

CLASS 244

76 R 5,553,812
118.6 5,553,813
134 A 5,553,814
134 R 5,553,815
158 R 5,553,816
195 5,553,817

CLASS 248

56 5,553,818
108 5,553,819
286.1 5,553,820
292.11 5,553,821
302 5,553,822
304 5,553,823
346.07 5,553,824
354.3 5,553,825
678 5,553,826

CLASS 250

201.5 5,554,843
207 5,554,844
226 5,554,845
288 5,554,846
B1 5,070,240
332 5,554,847
363.05 5,554,848
367 5,554,850
370.08 5,554,849
442.11 5,554,851
455.11 5,554,855
492.21 5,554,856
5,554,852
5,554,853
5,554,854
5,554,857
559.29 5,554,858

CLASS 251

30.01 5,553,827
129.01 5,553,828
129.21 5,553,829
214 5,553,830
292 5,553,831

CLASS 252

8.57 5,554,306
68 5,554,311
299.01 5,554,316
5,554,317
301.19 5,554,318
301.4 H 5,554,319
389.23 5,554,320

CLASS 254

267 5,553,832

CLASS 256

65 5,553,833

CLASS 257

10 5,554,859
25 5,554,860
71 5,554,861
137 5,554,862
138 5,554,863
211 5,554,864
275 5,554,865
295 5,554,866
314 5,554,867
315 5,554,868
316 5,554,869
334 5,554,870
336 5,554,871
342 5,554,872
380 5,554,873
390 5,554,874
411 5,554,876
418 5,554,875
474 5,554,877
488 5,554,878
506 5,554,879
560 5,554,880
584 5,554,881
605 5,554,882
617 5,554,883
634 5,554,884
666 5,554,885
5,554,886
737 5,554,887
750 5,554,888
765 5,554,889

CLASS 261

35 5,554,322
98 5,554,329

CLASS 264

4.7 5,554,323
8 5,554,324
37 5,554,325
40.1 5,554,326
40.5 5,554,327
60 5,554,328
113 5,554,330
161 5,554,331
204 5,553,835
230 5,554,332
284 5,554,333
293 5,554,334
400 5,554,335
401 5,554,336
442 5,554,337

CLASS 267

140.12 5,553,834
221 5,553,713
286 5,553,836

CLASS 269

21 5,553,837
93 5,553,838

CLASS 271

3.08 5,553,840
3.11 5,553,839
104 5,553,841
109 5,553,842
226 5,553,843
293 5,553,844
314 5,553,845

CLASS 273

26C 5,553,846
26 E 5,553,848
26 R 5,553,847
55 B 5,553,855
142 E 5,553,851
156 5,553,856
5,553,853
5,553,849
275 5,553,854
317.2 5,553,850
338 5,553,859
371 5,553,860
5,553,861
402 5,553,862
5,553,863
448 5,553,865

CLASS 277

9.5 5,553,866
15 5,553,867
24 5,553,868
33 5,553,869
134 5,553,870
177 5,553,871
205 5,553,872

CLASS 279

62 5,553,873

CLASS 280

11.28 5,553,874
20 5,553,875
33.991 5,553,876
33.997 5,553,877
229 5,553,878
279 5,553,879
283 5,553,880
284 5,553,881
508 5,553,882
607 5,553,883
609 5,553,884
642 5,553,885
728.2 5,553,886
730.2 5,553,887
731 5,553,888
736 5,553,889
806 5,553,890

CLASS 281

43 5,553,891

CLASS 285

12 5,553,892
18 5,553,894
39 5,553,895
47 5,553,896
168 5,553,893
192 5,553,897
197 5,553,898
316 5,553,899
331 5,553,900
340 5,553,901
350 5,553,902

CLASS 292

163 5,553,903
307 R 5,553,904

CLASS 294

24 5,553,905

CLASS 296

29 5,553,906
97.1 5,553,907
185 5,553,909
188 5,553,910
190 5,553,911
192 5,553,912
216 5,553,913
978 5,553,908

CLASS 297

184.17 5,553,914
195.13 5,553,915
207 5,553,916
230.14 5,553,917
237 5,553,918
284.8 5,553,919
344.14 5,553,920
352 5,553,921
362 5,553,922
452.2 5,553,923
452.27 5,553,924

CLASS 299

1.1 5,553,925
10 5,553,926

CLASS 301

124.1 5,553,927

CLASS 303

7 5,553,928
113.1 5,553,929
174 5,553,930

CLASS 305

100 5,553,931
107 5,553,932

CLASS 307

10.1 5,554,890
10.2 5,554,891
115 5,554,892
119 5,554,893
5,554,894
141 5,554,895
150 5,554,896

CLASS 310

54 5,554,897
61 5,554,898
80 5,554,899
156 5,554,900
162 5,554,901
254 5,554,902
266 5,554,903
316 5,554,904
323 5,554,905
5,554,906
339 5,554,907

CLASS 312

1 5,553,933
128 5,553,934
265.3 5,553,935
408 5,553,936

CLASS 313

140 5,554,908
402 5,554,909
497 5,554,910
504 5,554,911

CLASS 315

157 5,554,912

244 5,555,546

CLASS 318

434 5,554,913
568.11 5,554,914
632 5,554,915
672 5,554,916
805 5,554,917
945 5,555,458

CLASS 320

2 5,554,918
14 5,554,919
22 5,554,920
5,554,921

CLASS 322

3 5,554,922
25 5,554,923

CLASS 323

229 5,554,924
282 5,554,925

CLASS 324

71.3 5,554,926
117 H 5,554,927
121 R 5,555,207
158.1 5,554,928
204 5,554,932
233 5,554,933
318 5,554,929
319 5,555,251
326 5,554,934
402 5,554,930
557 5,554,931
637 5,554,935
642 5,554,936
664 5,554,937
693 5,554,938
753 5,554,939
754 5,555,422
765 5,554,940
5,554,941

CLASS 326

33 5,554,942
93 5,555,213

CLASS 327

65 5,554,943
91 5,554,944
105 5,554,945
172 5,554,946
181 5,554,948
184 5,554,947
276 5,554,949
277 5,554,950
337 5,554,951
339 5,554,952
541 5,554,953
546 5,554,954

CLASS 329

317 5,554,955

CLASS 330

53 5,554,956
149 5,554,958
251 5,554,957
297 5,554,959

CLASS 333

132 5,554,960

CLASS 335

78 5,554,961
5,554,962
151 5,554,963
207 5,554,964

CLASS 338

17 5,555,246
160 5,554,965

CLASS 340

309.15 5,554,967
310.01 5,554,968
332 5,555,454
438 5,554,969
441 5,554,970
539 B1 5,349,329
556 5,554,972
562 5,554,973
572 5,554,974
573 5,554,975
626 5,554,976
627 5,555,455
635 5,555,456
687 5,554,966
825.07 5,554,978
825.21 5,555,183
825.310 5,554,977
825.46 5,554,971
825.72 5,554,979
5,554,980
870.17 5,555,457
870.37 5,554,981
903 5,554,982
933 5,555,036
937 5,554,983
5,554,984
945 5,555,458

CLASS 341

26 5,554,985
145 5,554,986
147 5,554,987
154 5,554,988
159 5,554,989

CLASS 342

36 5,554,990
184 5,554,991
185 5,554,992
357 5,554,993
5,554,994

CLASS 343

700 MS 5,554,995
702 5,554,996
5,555,459
793 5,554,997
881 5,554,998
909 5,554,999

CLASS 345

75 5,555,000
93 5,555,001
121 5,555,002
146 5,555,003
161 5,555,004
203 5,555,460

CLASS 347

6 5,555,005
33 5,555,461
41 5,555,006
86 5,555,238
87 5,555,007
100 5,555,008
198 5,555,009
211 5,555,010
212 5,555,011
217 5,555,012
218 5,555,462
237 5,555,013
262 5,555,014

CLASS 348

6 5,555,015
5,555,016
8 5,555,466
15 5,555,017
107 5,555,092
144 5,555,018
148 5,555,019
221 5,555,020
222 5,555,021
223 5,555,022
253 5,555,023
266 5,555,464
473 5,555,024
478 5,555,025
560 5,555,463
565 5,555,026
571 5,555,197
5,555,465
581 5,555,027
607 5,555,028
5,555,029
642 5,555,030
645 5,555,031
699 5,555,033
730 5,555,032
746 5,555,034
757 5,555,035

CLASS 351

118 5,555,037
159 5,555,038
178 B1 5,387,950
205 5,555,039
221 5,555,040

CLASS 353

98 5,555,041
103 5,555,042

CLASS 354

106 5,555,043
5,555,044
5,555,045
5,555,047
5,555,252
5,555,467
149.11 5,555,046
173.1 5,555,048
5,555,049
5,555,050
195.1 5,555,051
203 5,555,052
206 5,555,053
212 5,555,054
5,555,055
5,555,056
5,555,057
222 5,555,058
5,555,431
225 5,555,468
234.1 5,555,059
271.1 5,555,060
288 5,555,061
5,555,062
5,555,063
289.12 5,555,064
5,555,065
317 5,555,234
319 5,555,066
354 5,555,067
402 5,555,068
410 5,555,069
412 5,555,070
418 5,555,071

CLASS 355

27 5,555,072
41 5,555,073
5,555,181
208 5,555,074
5,555,075
5,555,076
209 5,555,077
210 5,555,078
219 5,555,079
256 5,555,185
259 5,555,184
260 5,555,080
298 5,555,081
5,555,469
309 5,555,082
5,555,083
317 5,555,084

CLASS 356

35.5 5,555,470
300 5,555,085
345 5,555,086
5,555,087
350 5,555,088
5,555,235
352 5,555,089
357 5,555,471
5,555,472
381 5,555,090
5,555,474
384 5,555,091

CLASS 358

296 5,555,093
298 5,555,094
5,555,095
299 5,555,473
310 5,555,096
335 5,555,097
341 5,555,098
401 5,555,099
402 5,555,100
403 5,555,101
456 5,555,102
5,555,103
462 5,555,475
468 5,555,104
473 5,555,105
512 5,555,106
518 5,555,107

CLASS 359

12 5,555,108
40 5,555,109
5,555,186
5,555,476

CLASS 360

69 5,555,138
73.02 5,555,140
74.7 5,555,141
77.05 5,555,139
77.06 5,555,142
92 5,555,143
96.5 Re.35,328
98.08 5,555,144
99.08 5,555,211
103 5,555,145
105 5,555,146
113 5,555,147
125 5,555,482

CLASS 361

15 5,555,148
18 5,555,149
56 5,555,150
79 5,555,151
90 5,555,483
103 5,555,152
119 5,555,153
144 5,555,484
272 5,555,485
305 5,555,486
322 5,555,154
503 5,555,155
680 5,555,487
683 5,555,156
5,555,157
5,555,489
684 5,555,158
686 5,555,490
5,555,491
796 5,555,159
820 5,555,488

CLASS 362

31 5,555,160
32 5,555,161
225 5,555,162
252 5,555,163
293 5,555,492
318 5,555,493

CLASS 363

17 5,555,494
21 5,555,165
49 5,555,166
5,555,167
89 5,555,168

CLASS 364

148 5,555,495
401 5,555,497
401 R 5,555,496
419.08 5,555,169
424.01 5,555,172
424.03 5,555,171
5,555,498
424.05 5,555,173
5,555,174
5,555,500
5,555,501
5,555,502
424.1 5,555,170
426.03 5,555,499
433 5,555,175
449 5,555,503
465.22 5,555,504
468.01 5,555,179
468.25 5,555,176
468.28 5,555,177
470.07 5,555,505
474.17 5,555,178
487 5,555,182
489 5,555,201
490 5,555,187
5,555,188
491 5,555,506
492 5,555,189
5,555,508
B1 Re.33,162
505 5,555,509
510 5,555,190
514 A 5,555,193
514 R 5,555,191
5,555,192
5,555,510
5,555,511
526 5,555,194
550 5,555,512
551.01 5,555,195
553 5,555,507
555 5,555,196
5,555,198
577 5,555,180
578 5,555,199
602 5,555,513
604 5,555,514
606 5,555,200
715.08 5,555,202
724.01 5,555,515
746.1 5,555,516
770 5,555,517

CLASS 365

51 5,555,203
63 5,555,519
108 5,555,205
149 5,555,206
5,555,520
154 5,555,208
185.03 5,555,521
189.01 5,555,204
189.05 5,555,209
196 5,555,210
200 5,555,212
5,555,522
203 5,555,523
5,555,526
221 5,555,214
5,555,524
222 5,555,527
226 5,555,215
227 5,555,528
230.06 5,555,216
5,555,529
233.5 5,555,217

CLASS 366

302 5,553,937
5,553,938

CLASS 367

4 5,555,518
15 5,555,531
45 5,555,530
73 5,555,218
86 5,555,220
88 5,555,532
132 5,555,533
135 5,555,534
154 5,555,221
187 5,555,222

CLASS 368

10 5,555,223
5,555,224
5,555,225
21 5,555,226
232 5,555,535

CLASS 369

19 5,555,536
37 5,555,227
44.15 5,555,228
60 5,555,229
93 5,555,230
100 5,555,231
109 5,555,537
110 5,555,538
112 5,555,232
116 5,555,236
5,555,237
192 5,555,239
219 5,555,539
270 5,555,233

CLASS 370

16.1 5,555,540
17 5,555,241
5,555,242
5,555,263
5,555,264
29 5,555,258
58.1 5,555,543
58.2 5,555,243
60 5,555,265
60.1 5,555,244
5,555,256
66 5,555,245
68.1 5,555,541
84 5,555,260
85.1 5,555,267
94.1 5,555,542
95.1 5,555,257
5,555,266
102 5,555,262
103 5,555,261
105.1 5,555,247

CLASS 371

5.1 5,555,248
5,555,269
21.1 5,555,249
27 5,555,270
40.1 5,555,250

CLASS 372

29 5,555,253
33 5,555,254
45 5,555,271
50 5,555,544
96 5,555,255

CLASS 373

80 5,555,259

CLASS 374

1 5,553,939
136 5,553,940
150 5,553,941

CLASS 375

206 5,555,268
220 5,555,272
5,555,545
244 5,555,273
257 5,555,274
261 5,555,275
262 5,555,547
303 5,555,276
346 5,555,277
356 5,555,548
376 5,555,278

CLASS 376

216 5,555,279
260 5,555,280
426 5,555,281

CLASS 378

64 5,555,549
151 5,555,283
177 5,555,284

CLASS 379

28 5,555,285
59 5,555,286
5,555,550
5,555,551
61 5,555,287
5,555,552
67 5,555,288
5,555,289
5,555,290
5,555,291
5,555,292
98 5,555,293
100 5,555,294
112 5,555,295
136 5,555,297
145 5,555,296
207 5,555,298
212 5,555,299
214 5,555,553
395 5,555,300
413 5,555,301
446 5,555,302

CLASS 380

4 5,555,304
14 5,555,305
18 5,555,307
20 5,555,308
21 5,555,309
25 5,555,303

CLASS 381

17 5,555,310
58 5,555,311
63 5,555,306
183 5,555,554

CLASS 382

104 5,555,312
5,555,555
5,555,313
124 5,555,314
141 5,555,315
150 5,555,316
159 5,555,317
170 5,555,319
173 5,555,556
225 5,555,320
232 5,555,322
235 5,555,321
247 5,555,323
254 5,555,324
299 5,555,557

309 5,555,325
468 5,555,318

CLASS 383

5,555,404
5,555,405
5,555,407
5,555,408
209.2 5,554,001

CLASS 416

100 5,554,002
549 5,554,402
5,554,403
551 5,554,404
560 5,554,405

CLASS 431

9 5,554,021
10 5,554,022
297 5,554,023
76.1 5,554,037
108 5,554,038
115 5,554,039
212 5,554,040

62 5,554,087

CLASS 483

240 5,554,093
254 5,554,614
258 5,554,615
269 5,554,616
272 5,554,617
275 5,554,618
288 5,554,674
376 5,554,675
494 5,554,677
495 5,554,678
5,554,679
758 5,554,735
755 5,554,736
758 5,554,737
829 5,554,738
885 5,554,739

CLASS 562

201 5,554,785
243 5,554,786
355 5,554,787

CLASS 568

282 5,554,139
283 5,554,140
352 5,554,141
385 5,554,144
385.1 5,554,142

309 5,555,325
468 5,555,318

CLASS 383

101 5,553,942
113 5,553,943

CLASS 384

15 5,553,944
45 5,553,945
49 5,553,946
55 5,553,947
107 5,553,948
523 5,553,949
545 5,553,950

CLASS 385

2 5,555,326
16 5,555,127
5,555,558
31 5,555,328
36 5,555,329
39 5,555,330
49 5,555,331
53 5,555,332
89 5,555,333
93 5,555,334
100 5,555,335
101 5,555,336
5,555,337
5,555,338
115 5,555,339
127 5,555,340
129 5,555,341
5,555,342
143 5,555,525

CLASS 395

2.51 5,555,344
23 5,555,345
5,555,439
51 5,555,346
82 5,555,347
110 5,555,348
111 5,555,349
112 5,555,350
114 5,555,351
123 5,555,352
126 5,555,353
127 5,555,354
133 5,555,355
134 5,555,356
141 5,555,357
5,555,358
5,555,359
143 5,555,360
144 5,555,361
145 5,555,362
146 5,555,363
157 5,555,368
159 5,555,364
5,555,365
161 5,555,366
5,555,367
5,555,369
5,555,370
182.11 5,555,371
182.13 5,555,372
188.01 5,555,373
200.02 5,555,374
200.03 5,555,375
200.09 5,555,376
200.11 5,555,377
200.13 5,555,378
200.15 5,555,426
250 5,555,379
5,555,380
269 5,555,343
281 5,555,381
293 5,555,382
306 5,555,383
375 5,555,384
5,555,386
401 5,555,385
405 5,555,560
419 5,555,387
427 5,555,388
5,555,389
439 5,555,390
440 5,555,391
445 5,555,392
460 5,555,393
462 5,555,394
470 5,555,398
472 5,555,395
474 5,555,396
485 5,555,397
486 5,555,399
492 5,555,400
500 5,555,401
5,555,402
5,555,406
600 5,555,403
5,555,404
5,555,405
5,555,407
5,555,408
5,555,409
5,555,410
650 5,555,411
700 5,555,412
5,555,415
5,555,416
5,555,417
5,555,418
5,555,419
733 5,555,413
734 5,555,414
739 5,555,420
750 5,555,421
775 5,555,423
800 5,555,424
5,555,425
5,555,427
5,555,428
5,555,429
5,555,430
5,555,432
5,555,433
5,555,434
5,555,435
821 5,555,436
825 5,555,437
850 5,555,438
879 5,555,559
892 5,555,440

CLASS 400

120.18 5,553,951
208 5,553,952
489 5,553,953
621 5,553,954

CLASS 401

68 5,553,956
209 5,553,957

CLASS 402

1 5,553,958
79 5,553,959

CLASS 403

2 5,553,960
119 5,553,961
154 5,553,962
164 5,553,963
279 5,553,964
291 5,553,965
355 5,553,966
393 5,553,967

CLASS 404

108 5,553,968
110 5,553,969

CLASS 405

52 5,553,971
60 5,553,972
120 5,553,973
128 5,553,974
154 5,553,975
195.1 5,553,976
204 5,553,977
232 5,553,979
244 5,553,978

CLASS 406

38 5,553,980

CLASS 410

116 5,553,981

CLASS 411

14 5,553,982
404 5,553,983
429 5,553,984

CLASS 414

287 5,553,985
401 5,553,986
5,553,987
416 5,553,988
537 5,553,989
659 5,553,990
680 5,553,991
685 5,553,992
739 5,553,993
752 5,553,994

CLASS 415

1 5,553,995
2.1 5,553,996
17 5,553,997
90 5,553,998
173.1 5,553,999
208.200 5,554,000
209.2 5,554,001

CLASS 416

100 5,554,002
140 5,554,003
185 5,554,004
219 R 5,554,005
235 5,554,006

CLASS 417

222.1 5,554,007
269 5,554,008
5,554,009
313 5,554,010
399 5,554,011
410.1 5,554,012
413.1 5,554,013
5,554,014
415 5,554,015
569 5,554,016

CLASS 418

55.2 5,554,017
55.4 5,554,018
171 5,554,019
178 5,554,020

CLASS 419

5 5,554,338
30 5,555,481

CLASS 422

50 5,554,339
68.1 5,554,340
145 5,554,341
174 5,554,342
177 5,554,343
186.07 5,554,344
186.15 5,554,345
195 5,554,346
204 5,554,347
211 5,554,348
292 B1 5,098,676

CLASS 423

228 5,554,349
239.1 5,554,350
245.3 5,554,351
339 5,554,352
387 5,554,353
489 5,554,355
706 5,554,356

CLASS 424

1.45 5,554,602
9.365 5,554,357
49 5,554,358
59 5,554,359
70.11 5,554,360
70.15 5,554,361
70.51 5,554,362
5,554,363
76.1 5,554,364
78.02 5,554,365
78.03 5,554,366
78.04 5,554,367
93.47 5,554,368
94.4 5,554,369
125 5,554,370
234.1 5,554,371
280.1 5,554,372
400 5,554,373
401 5,554,374
5,554,375
404 5,554,376
405 5,554,377
434 5,554,378
439 5,554,379
441 5,554,380
449 5,554,381
450 5,554,382
451 5,554,383
5,554,384
456 5,554,385
488 5,554,386
5,554,387
501 5,554,388
558 5,554,389
633 5,554,391

CLASS 425

64 5,554,392
92 5,554,393
434 5,554,394
549 5,554,395
556 5,554,396

CLASS 426

36 5,554,397
5,554,398
49 5,554,399
78 5,554,400
140 5,554,401
549 5,554,402
5,554,403
551 5,554,404
560 5,554,405
573 5,554,406
603 5,554,407
607 5,554,408
631 5,554,409
660 5,554,410

CLASS 427

11 5,554,411
96 5,554,412
108 5,554,413
244 5,554,414
248.1 5,554,415
378 5,554,416
445 5,554,417
579 5,554,418

CLASS 428

1 5,554,419
10 5,554,420
34.1 5,554,421
34.3 5,554,422
35.2 5,554,423
5,554,424
36.91 5,554,425
5,554,426
43 5,554,427
64.1 5,554,428
105 5,554,429
113 5,554,430
137 5,554,431
157 5,554,432
192 5,554,433
209 5,554,434
212 5,554,436
224 5,554,435
286 5,554,437
306.6 5,554,438
307.3 5,554,354
323 5,554,439
336 5,554,440
373 5,554,441
5,554,442
375 5,554,443
403 5,554,445
411.1 5,554,446
483 5,554,447
612 5,554,448
631 5,554,390
690 5,554,449
5,554,450
694 ML 5,554,451

CLASS 429

10 5,554,452
17 5,554,453
19 5,554,454
53 5,554,455
59 5,554,456
102 5,554,457
194 5,554,458
5,554,459
210 5,554,460
218 5,554,462
233 5,554,453
247 5,554,464

CLASS 430

5 5,554,465
7 5,554,466
11 5,554,467
28 5,554,468
31 5,554,469
41 5,554,470
45 5,554,471
58 5,554,472
60 5,554,473
66 5,554,474
106 5,554,476
106.6 5,554,477
109 5,554,478
122 5,554,479
137 5,554,480
192 5,554,481
203 5,554,482
237 5,554,483
270.1 5,554,484
271.1 5,554,485
273.1 5,554,486
311 5,554,487
315 5,554,488
326 5,554,489
327 5,554,490
393 5,554,491
443 5,554,492
446 5,554,493
523 5,554,494
530 5,554,495
536 5,554,496

CLASS 431

9 5,554,021
10 5,554,022
297 5,554,023

CLASS 433

37 5,554,024
80 5,554,025
82 5,554,026
172 5,554,027
214 5,554,028
215 5,554,029
226 5,554,030

CLASS 434

111 5,554,031
233 5,554,032
247 5,554,033
263 5,554,034
297 5,554,035

CLASS 435

1.2 5,554,497
5 5,554,498
5,554,499
6 5,554,500
5,554,501
5,554,502
5,554,503
5,554,509
7.24 5,554,506
7.8 5,554,504
32 5,554,507
68.1 5,554,508
69.1 5,554,510
5,554,511
69.5 5,554,512
69.51 5,554,513
5,554,514
70.21 5,554,515
91.21 5,554,516
5,554,517
114 5,554,518
125 5,554,519
165 5,554,520
172.3 5,554,521
189 5,554,522
194 5,554,523
235.1 5,554,524
240.1 5,554,525
5,554,526
5,554,527
240.2 5,554,528
5,554,529
252.1 5,554,532
5,554,533
252.3 5,554,534
254.1 5,554,535
256.8 5,554,530
286.1 5,554,531
305.1 5,554,536
309.1 5,554,537
320.1 5,554,538
721 5,554,505

CLASS 436

8 5,554,539
153 5,554,540
518 5,554,541
548 5,554,542

CLASS 437

31 5,554,543
35 5,554,544
40 5,554,545
5,554,546
5,554,547
41 5,554,548
5,554,549
43 5,554,550
5,554,551
5,554,552
5,554,553
47 5,554,554
52 5,554,555
5,554,556
5,554,557
60 5,554,558
62 5,554,559
69 5,554,560
89 5,554,561
5,554,562
190 5,554,563
192 5,554,564
5,554,565
95 5,554,566
97 5,554,567
5,554,568
5,554,569
207 5,554,570

CLASS 439

74 5,554,036
76.1 5,554,037
108 5,554,038
115 5,554,039
212 5,554,040
248 5,554,041
272 5,554,042
350 5,554,043
352 5,554,044
372 5,554,045
397 5,554,046
405 5,554,047
406 5,554,048
472 5,553,787
490 5,554,049
582 5,554,072
595 5,554,051
5,554,052
620 5,554,050
719 5,554,053
730 5,554,054
752 5,554,055
857 5,554,056

CLASS 440

52 5,554,059
89 5,554,057
5,554,058
5,554,060

CLASS 445

28 5,554,061

CLASS 446

124 5,554,062

CLASS 451

9 5,554,063
41 5,554,064
283 5,554,065
356 5,554,066
468 5,554,068

CLASS 452

149 5,554,069

CLASS 453

31 5,554,070

CLASS 454

338 5,554,071

CLASS 455

4.2 5,555,441
9 5,555,442
12.1 5,555,443
5,555,444
33.2 5,555,445
54.2 5,555,446
72 5,555,447
89 5,555,448
5,555,449
5,555,450
161.2 5,555,451
226.2 5,555,452
266 5,555,453

CLASS 457

384 5,554,067

CLASS 463

31 5,553,864

CLASS 464

52 5,554,073

CLASS 472

116 5,554,074

CLASS 473

2 5,554,075
61 5,554,076
131 5,554,077
209 5,553,857
292 5,554,078
294 5,553,858
373 5,553,852

CLASS 475

204 5,554,080
207 5,554,079
252 5,554,081
338 5,554,082

CLASS 482

83 5,554,088
95 5,554,083
97 5,554,084
5,554,089
5,554,090
111 5,554,091
137 5,554,085
5,554,086
148 5,554,092

CLASS 483

62 5,554,087

CLASS 493

240 5,554,093
421 5,554,094
440 5,554,095

CLASS 501

138 5,554,571

CLASS 502

301 5,554,573
345 5,554,574
404 5,554,575

CLASS 504

116 5,554,576
5,554,577
130 5,554,578
246 5,554,579
281 5,554,580
298 5,554,581
344 5,554,582

CLASS 505

166 5,554,583
181 5,554,584
430 5,554,585

CLASS 508

111 5,554,307
181 5,554,308
312 5,554,309
552 5,554,586
591 5,554,310
121 5,554,313
175 5,554,312
398 5,554,321
444 5,554,587
535 5,554,315

CLASS 512

1 5,554,588

CLASS 514

2 5,554,589
8 5,554,590
12 5,554,592
5,554,593
13 B1 5,196,404
18 5,554,594
21 5,554,595
22 5,554,596
54 5,554,598
167 5,554,599
182 5,554,600
5,554,601
5,554,603
5,554,604
183 5,554,605
210 5,554,606
5,554,607
212 5,554,608
223.2 5,554,610
228.2 5,554,611
233.5 5,554,612
253 5,554,613
254 5,554,614
258 5,554,615
269 5,554,616
272 5,554,617
275 5,554,618
5,554,619
278 5,554,620
5,554,621
284 5,554,622
288 5,554,623
303 5,554,624
5,554,625
304 5,554,626
305 5,554,627
319 5,554,628
323 5,554,629
338 5,554,630
5,554,631
5,554,632
357 5,554,633
370 5,554,634
372 5,554,635
373 5,554,636
378 5,554,637
398 5,554,638
415 5,554,639
5,554,640
5,554,641
5,554,642
419 5,554,643
5,554,644
453 5,554,645
474 5,554,647
501 5,554,648
530 5,554,649
557 5,554,597
5,554,652
5,554,654
560 5,554,646
567 5,554,650
574 5,554,651
605 5,554,653
665 5,554,655
674 5,554,656

CLASS 521

48 5,554,657
51 5,554,658
5,554,659
81 5,554,660
94 B1 4,640,933
97 5,554,661
137 5,554,662

CLASS 522

8 5,554,663
25 5,554,664
30 5,554,665
81 5,554,666
5,554,667
157 5,554,668

CLASS 523

118 5,554,669
209 5,554,670
408 5,554,671
466 5,554,672

CLASS 524

104 5,554,673
288 5,554,674
376 5,554,675
494 5,554,677
495 5,554,678
5,554,679
496 5,554,680
506 5,554,681
523 5,554,682
569 5,554,683
588 5,554,684
5,554,685
5,554,686

CLASS 525

63 5,554,687
71 5,554,688
102 5,554,689
105 5,554,690
111 5,554,691
124 5,554,692
133 5,554,693
236 5,554,694
268 5,554,695
314 5,554,696
5,554,697
330.2 5,554,698
332.7 5,554,699
360 5,554,700
437 5,554,701
463 5,554,702
530 5,554,703

CLASS 526

153 5,554,704
279 5,554,706
318.44 5,554,705
344.2 5,554,707

CLASS 528

23 5,554,708
27 5,554,709
32 5,554,710
49 5,554,711
58 5,554,712
76 5,554,713
94 5,554,714
125 5,554,715
196 5,554,716
212 5,554,719
229 5,554,717
246 5,554,718
295 5,554,720
328 5,554,721
340 5,554,722
388 5,554,723
495 5,554,726

CLASS 530

324 5,554,727
327 5,554,728
328 5,554,724
330 5,554,725
350 5,554,729
410 5,554,730

CLASS 534

593 5,554,731
637 5,554,732
638 5,554,733
691 5,554,734
738 5,554,735
755 5,554,736
758 5,554,737
829 5,554,738
885 5,554,739

CLASS 536

4.1 5,554,740
18.6 5,554,741
5,554,742
23.6 5,554,743
25.3 5,554,744
52 5,554,745

CLASS 540

200 5,554,746
456 5,554,747
465 5,554,748
474 5,554,749

CLASS 544

141 5,554,750
338 5,554,751

CLASS 546

17 5,554,752
134 5,554,753
184 5,554,754
202 5,554,755
225 5,554,756
250 5,554,758

CLASS 548

237 5,554,757
260 5,554,759
5,554,760
263.6 5,554,761
314.1 5,554,762
453 5,554,763
455 5,554,764
462 5,554,765
473 5,554,766
496 5,554,767
545 5,554,768
549 5,554,769

CLASS 549

388 5,554,770
419 5,554,771
434 5,554,772

CLASS 552

104 5,554,773
281 5,554,774

CLASS 556

7 5,554,775
11 5,554,776
21 5,554,777
5,554,778
5,554,779
436 5,554,780

CLASS 558

110 5,554,781
327 5,554,782

CLASS 560

25 5,554,783
167 5,554,784
201 5,554,785
243 5,554,786
355 5,554,787

CLASS 562

429 5,554,788
460 5,554,789
519 5,554,790
565 5,554,791

CLASS 564

4 5,554,792
470 5,554,793
491 5,554,794

CLASS 568

8 5,554,795
576 5,554,796
592 5,554,797

CLASS 600

25 5,554,096
102 5,554,097
121 5,554,098
160 5,554,099
182 5,554,100
214 5,554,101

CLASS 601

72 5,554,102
152 5,554,103

CLASS 602

8 5,554,104
26 5,554,105
42 5,554,106
66 5,554,107

CLASS 604

15 5,554,108
5,554,109
22 5,554,110
26 5,554,111
27 5,554,112
30 5,554,113
53 5,554,114
65 5,554,115
77 5,554,116
93 5,554,117
96 5,554,118
5,554,119
5,554,120
5,554,121
5,554,122
141 5,554,123
167 5,554,124
187 5,554,125
192 5,554,126
5,554,127
5,554,128
419 5,554,129
436 5,554,130

CLASS 606

198 5,554,130
5,554,131
227 5,554,132
5,554,133
240 5,554,134
256 5,554,135
264 5,554,136
5,554,137
280 5,554,138
282 5,554,139
283 5,554,140
352 5,554,141
385 5,554,144
385.1 5,554,142
5,554,149
385.2 5,554,143
5,554,145
391 5,554,146
890.1 5,554,147
5,554,148
891.1 5,554,150

CLASS 606

1 5,554,151
7 5,554,152
9 5,554,153
16 5,554,155
17 5,554,156
45 5,554,159
61 5,554,157
80 5,554,154
5,554,158
119 5,554,160
131 5,554,161
153 5,554,162
159 5,554,163
167 5,554,164
176 5,554,165
182 5,554,166
184 5,554,167
B1 5,116,353
201 5,554,168
219 5,554,169
230 5,554,170
232 5,554,171

CLASS 607

1 5,554,173
5 5,554,174
5,554,175
9 5,554,176
17 5,554,177
88 5,554,172
122 5,554,178
129 5,554,179

CLASS 623

1 5,554,180
5,554,181
5,554,182
5,554,183
B1 4,655,771
2 5,554,184
5,554,185
5,554,186
6 5,554,187
10 5,554,188
11 5,554,189
16 5,554,190
5,554,192
5,554,194
17 5,554,191

CLASS 800

205 5,554,798

CLASSIFICATION OF DESIGNS

D1— 104 373,451
125 373,452
D2— 719 373,453
891 373,454
897 373,456
901 373,455
904 373,548
952 373,457
957 373,458
967 373,459
969 373,460
373,461
373,462
373,463
978 373,464
D3— 5 373,465
373,466
373,467
373,468
209 373,469
244 373,470
255 373,471
257 373,472
D4— 107 373,474
D6— 335 373,475
338 373,476
349 373,477
369 373,478
370 373,473
373,479
373,480
373,481
373,482
373,483
381 373,484
373,485
393 373,486
429 373,487
436 373,488
441 373,489
445 373,490
373,491
458 373,492
472 373,493
480 373,494
500 373,495
D7— 309 373,501
312 373,499
320 373,500
351 373,502
376 373,503
378 373,504
393 373,505
395 373,506
412 373,507
515 373,508
550 373,509
555 373,510
589 373,511
592 373,512
603 373,513
607 373,514
373,515
D8— 70 373,518
518 373,496
525 373,497
373,520
552 373,498
99 373,521
373,545
307 373,522
352 373,523
367 373,525
373,526
395 373,524
373,530
430 373,531
431 373,528
520 373,532
528 373,533
373,534
373,535
529 373,536
572 373,537
D10— 30 373,538
32 373,540
373,542
36 373,539
71 373,519
50 373,541
79 373,543
90 373,551
116 373,546
118 373,547
7 373,549
D11— 34 373,550
D12— 8 373,554
133 373,555
147 373,556
162 373,557
181 373,558
192 373,559
193 373,560
194 373,561
211 373,562
220 373,563
400 373,564
408 373,565
D13— 133 373,566
373,567
373,568
147 373,569
161 373,570
162 373,571
179 373,572
D14— 100 373,573
373,574
373,575
373,576
106 373,578
113 373,579
373,580
114 373,577
124 373,582
126 373,583
373,584
141 373,581
149 373,585
191 373,586
373,587
218 373,588

	257	373,589		52	373,604		242	373,619		133	373,633			373,649	D32—	21	373,665
D15—	5	373,590		108	373,605			373,620			373,634			373,651		25	373,664
	26	373,591			373,606			373,621		140	373,635			373,652	D34—	15	373,667
D16—	133	373,592		191	373,607		260	373,622		152	373,636		107	373,650		21	373,668
	203	373,593		195	373,608			373,623		162	373,637		134	373,653		24	373,669
	209	373,594		226	373,609		303	373,643		180	373,638	D28—	10	373,654		29	373,670
D18—	50	373,595	D22—	107	373,610		304	373,624		190	373,639	D29—	114	373,656			
	55	373,596		118	373,611		364	373,625		215	373,640		121	373,655			
D19—	1	373,597		126	373,612		366	373,626	D25—	4	373,641			373,657			
	26	373,598		133	373,613			373,627		138	373,642	D30—	108	373,658			
		373,599		139	373,614		377	373,628	D26—	2	373,644		121	373,659			
	91	373,600	D23—	201	373,615		411	373,629		43	373,645		124	373,660			
D20—	21	373,601		241	373,616	D24—	110	373,630			373,646		159	373,661			
	30	373,602			373,617		111	373,631			373,647		160	373,662			
D21—	41	373,603			373,618		127	373,632			373,648		161	373,663			

CLASSIFICATION OF PLANTS

P—	1	9,641		68.1	9,642												

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PATENTS

01	:	5,553,373		5,553,605		5,554,073		5,554,679		5,555,187		5,553,529					
		5,554,650		5,553,617		5,554,078		5,554,694		5,555,201		5,553,648					
		5,555,301		5,553,636		5,554,086		5,554,728		5,555,202		5,553,826					
04	:	5,553,535		5,553,637		5,554,096		5,554,743		5,555,209		5,553,889					
		5,553,566		5,553,643		5,554,110		5,554,746		5,555,214		5,553,963					
		5,553,669		5,553,645		5,554,112		5,554,748		5,555,252		5,554,091					
		5,553,719		5,553,652		5,554,114		5,554,762		5,555,254		5,554,172					
		5,554,075		5,553,666		5,554,115		5,554,812		5,555,293		5,554,365					
		5,554,088		5,553,707		5,554,118		5,554,821		5,555,296		5,554,528					
		5,554,569		5,553,720		5,554,120		5,554,833		5,555,300		5,555,003					
		5,554,725		5,553,726		5,554,121		5,554,840		5,555,328		5,555,111					
		5,554,843		5,553,728		5,554,123		5,554,845		5,555,330		5,555,117					
		5,554,889		5,553,737		5,554,129		5,554,847		5,555,336		5,555,143.					
		5,554,982		5,553,740		5,554,133		5,554,852		5,555,343		5,555,190					
		5,554,994		5,553,741		5,554,135		5,554,874		5,555,354		5,555,211					
		5,555,237		5,553,779		5,554,136		5,554,880		5,555,357		5,555,482					
		5,555,341		5,553,781		5,554,152		5,554,884		5,555,363		5,555,516					
		5,555,444		5,553,807		5,554,160		5,554,896		5,555,366		4,976,368					
		5,555,471		5,553,820		5,554,165		5,554,915		5,555,368		5,349,329					
05	:	5,553,756		5,553,824		5,554,174		5,554,926		5,555,369	09	:	5,553,412				
		5,553,902		5,553,842		5,554,186		5,554,932		5,555,371			5,553,449				
		5,554,055		5,553,844		5,554,218		5,554,945		5,555,374			5,553,455				
06	:	5,553,321		5,553,846		5,554,241		5,554,950		5,555,376			5,553,477				
		5,553,328		5,553,851		5,554,265		5,554,955		5,555,381			5,553,702				
		5,553,344		5,553,857		5,554,269		5,554,957		5,555,384			5,553,746				
		5,553,352		5,553,859		5,554,277		5,554,962		5,555,388			5,553,768				
		5,553,363		5,553,865		5,554,321		5,554,970		5,555,398			5,553,812				
		5,553,370		5,553,874		5,554,336		5,554,997		5,555,402			5,553,817				
		5,553,395		5,553,883		5,554,344		5,555,002		5,555,411			5,553,829				
		5,553,403		5,553,891		5,554,355		5,555,006		5,555,415			5,553,839				
		5,553,419		5,553,906		5,554,384		5,555,008		5,555,416			5,553,973				
		5,553,422		5,553,908		5,554,390		5,555,019		5,555,417			5,554,062				
		5,553,437		5,553,909		5,554,427		5,555,030		5,555,423			5,554,094				
		5,553,442		5,553,953		5,554,457		5,555,035		5,555,428			5,554,097				
		5,553,456		5,553,958		5,554,484		5,555,036		5,555,433			5,554,101				
		5,553,458		5,553,969		5,554,486		5,555,043		5,555,437			5,554,122				
		5,553,471		5,553,974		5,554,501		5,555,044		5,555,454			5,554,151				
		5,553,479		5,553,975		5,554,502		5,555,086		5,555,460			5,554,159				
		5,553,480		5,553,977		5,554,516		5,555,092		5,555,491			5,554,164				
		5,553,487		5,553,984		5,554,521		5,555,101		5,555,494			5,554,169				
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		5,553,516		5,553,994		5,554,553		5,555,105		5,555,524			5,554,350				
		5,553,521		5,553,998		5,554,554		5,555,106		5,555,533			5,554,358				
		5,553,525		5,554,001		5,554,555		5,555,108		5,555,534			5,554,433				
		5,553,555		5,554,026		5,554,562		5,555,134		5,555,537			5,554,453				
		5,553,574		5,554,034		5,554,585		5,555,139		5,555,540			5,554,621				
		5,553,575		5,554,042		5,554,592		5,555,146		5,555,551			5,554,647				
		5,553,591		5,554,045		5,554,612		5,555,157		5,555,556			5,554,702				
		5,553,603		5,554,065		5,554,666		5,555,177	08	:	5,553,508		5,555,009				

	5,555,037		5,553,866		5,554,031		5,553,930			5,553,446		5,553,843					
	5,555,162		5,553,878		5,554,155		5,553,972			5,555,126		5,553,848					
	5,555,226		5,553,879		5,554,214		5,554,015	31	:	5,553,348		5,553,854					
	5,555,313		5,553,903		5,554,268		5,554,020			5,553,406		5,553,921					
	5,555,472		5,553,931		5,554,500		5,554,037			5,553,426		5,553,941					

	5,555,497		5,554,142		5,553,633			5,555,532		5,554,349	50	:	5,554,063				
	5,555,509		5,554,143		5,553,639	44	:	5,553,467		5,554,367	51	:	5,553,333				
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	5,555,535		5,554,145		5,553,656			5,553,625		5,554,548			5,553,685				

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September 17, 1996 Volume 1190 Number 3

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Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1187 O.G. 49, on June 18, 1996.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective July 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1187 O.G. 73, on June 25, 1996.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective July 1, 1996, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	220.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed	660.00
— Corresponding prior U.S. national application filed	430.00
— Supplemental search fee, per additional invention (payable only upon invitation)	190.00
European Patent Office as ISA	1585.00
International fees	
Basic fee	677.00
Basic supplemental fee (for each page over 30)	13.00
Designation fee per country or region	
— For the first 11 national or regional offices designated	164.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	164.00
— Confirmation fee	82.00
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	207.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	470.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	710.00
— Additional examination fee, per additional invention (payable only upon invitation)	250.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	47.00	94.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	340.00	680.00
USPTO was ISA but not IPEA	375.00	750.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	505.00	1010.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	440.00	880.00
Other National fees		
— For each independent claim in excess of 3	39.00	78.00
— For each claim in excess of 20	11.00	22.00
— For each application containing a multiple dependent claim	125.00	250.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

June 4, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on September 14, 1993 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,243,706 through 5,245,705
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on September 12, 1989 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,864,653 through 4,866,788
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on September 10, 1985 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,539,713 through 4,541,124
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $495.00
By other than a small entity $990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $995.00
By other than a small entity $1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,495.00
By other than a small entity $2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $660.00
(2) unintentional $1,550.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED July 10, 1996
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,528	06/877,496	10/27/87
(4,458,434)	(06/285,153)	(07/10/84)
4,458,370	06/414,460	07/10/84
4,458,393	06/316,293	07/10/84
4,458,397	06/429,125	07/10/84
4,458,399	06/521,616	07/10/84
4,458,401	06/290,065	07/10/84
4,458,402	06/455,468	07/10/84
4,458,406	06/310,337	07/10/84
4,458,409	06/459,290	07/10/84
4,458,420	06/515,200	07/10/84
4,458,433	06/381,028	07/10/84
4,458,435	06/482,591	07/10/84
4,458,437	06/381,852	07/10/84
4,458,460	06/266,701	07/10/84
4,458,467	06/249,360	07/10/84
4,458,476	06/380,132	07/10/84
4,458,477	06/469,979	07/10/84
4,458,478	06/333,861	07/10/84
4,458,479	06/310,468	07/10/84
4,458,481	06/357,836	07/10/84
4,458,485	06/355,927	07/10/84
4,458,486	06/294,078	07/10/84
4,458,489	06/402,302	07/10/84
4,458,490	06/424,035	07/10/84
4,458,491	06/413,396	07/10/84
4,458,493	06/389,873	07/10/84
4,458,495	06/349,615	07/10/84
4,458,496	06/418,889	07/10/84
4,458,506	06/306,396	07/10/84
4,458,513	06/353,753	07/10/84
4,458,515	06/374,414	07/10/84
4,458,517	06/334,643	07/10/84
4,458,523	06/363,833	07/10/84
4,458,524	06/335,304	07/10/84
4,458,526	06/317,727	07/10/84
4,458,529	06/305,348	07/10/84
4,458,530	06/354,401	07/10/84
4,458,534	06/437,559	07/10/84
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4,754,558	07/074,140	07/05/88
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4,754,564	06/901,533	07/05/88

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4,755,167	06/599,398	07/05/88
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4,755,718	06/935,359	07/05/88
4,755,723	07/042,304	07/05/88

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5,127,565	07/568,197	07/07/92

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5,128,039	07/710,222	07/07/92
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5,128,066	07/522,651	07/07/92
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5,128,077	07/654,260	07/07/92
5,128,079	07/796,493	07/07/92
5,128,083	07/488,009	07/07/92
5,128,100	07/746,159	07/07/92
5,128,106	07/552,954	07/07/92
5,128,109	07/464,069	07/07/92
5,128,111	07/386,833	07/07/92
5,128,125	07/596,570	07/07/92
5,128,127	07/307,806	07/07/92
5,128,136	07/787,556	07/07/92
5,128,163	07/735,585	07/07/92
5,128,177	07/492,287	07/07/92
5,128,180	07/692,269	07/07/92
5,128,194	07/537,114	07/07/92
5,128,200	07/461,362	07/07/92
5,128,201	07/705,367	07/07/92
5,128,207	07/446,792	07/07/92
5,128,210	07/415,635	07/07/92
5,128,220	07/625,568	07/07/92
5,128,221	07/421,239	07/07/92
5,128,227	07/674,177	07/07/92
5,128,233	07/817,627	07/07/92
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5,128,268	07/368,601	07/07/92
5,128,293	07/653,678	07/07/92
5,128,298	07/726,428	07/07/92
5,128,302	07/527,104	07/07/92
5,128,314	07/469,688	07/07/92
5,128,323	07/355,505	07/07/92
5,128,334	07/631,974	07/07/92
5,128,337	07/763,799	07/07/92
5,128,340	07/700,331	07/07/92
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5,128,346	07/571,945	07/07/92
5,128,348	07/580,473	07/07/92
5,128,349	07/604,802	07/07/92
5,128,357	07/747,510	07/07/92
5,128,361	07/452,799	07/07/92
5,128,364	07/676,632	07/07/92
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5,128,369	07/742,074	07/07/92
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5,128,422	07/477,457	07/07/92
5,128,423	07/716,713	07/07/92
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5,128,461	07/654,621	07/07/92
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5,128,493	07/606,315	07/07/92
5,128,501	07/647,553	07/07/92
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5,128,555	07/800,734	07/07/92
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5,128,684	07/652,825	07/07/92
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5,128,737	07/487,768	07/07/92
5,128,761	07/391,725	07/07/92
5,128,765	07/277,293	07/07/92
5,128,785	07/563,184	07/07/92
5,128,789	07/673,224	07/07/92
5,128,794	07/589,734	07/07/92
5,128,829	07/640,108	07/07/92
5,128,844	07/751,135	07/07/92
5,128,847	07/620,204	07/07/92
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5,128,902	07/604,952	07/07/92
5,128,905	07/634,125	07/07/92
5,128,906	07/712,171	07/07/92
5,128,907	07/682,633	07/07/92
5,128,908	07/608,834	07/07/92
5,128,912	07/219,553	07/07/92
5,128,928	07/609,000	07/07/92
5,128,949	07/359,460	07/07/92
5,128,952	07/584,068	07/07/92
5,128,955	07/466,263	07/07/92
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5,128,998	07/585,911	07/07/92
5,129,004	07/434,503	07/07/92
5,129,006	07/294,446	07/07/92
5,129,025	07/656,366	07/07/92
5,129,031	07/587,960	07/07/92
5,129,033	07/496,256	07/07/92
5,129,045	07/677,315	07/07/92
5,129,074	07/409,672	07/07/92

Patent Number	Serial Number	Issue Date
5,129,081	07/579,249	07/07/92
5,129,096	07/518,457	07/07/92

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

4,745,133, Re. S.N. 08/680,976, July 16, 1996, Cl. 521, FLAME RETARDANT POLYURETHANE FOAMS, Egil Grinberga, et. al., Owner of Record: *Basf Corp., Wyandotte, Mich.*, Attorney or Agent: Bryan H. Davidson, Ex. Gp.: 1207

4,843,839, Re. S.N. 08/543,515, Oct. 16, 1995, Cl. 501/87, SINTERED BODY FOR CHIP FORMING MACHINE, Leif A.E. Akesson, Owner of Record: *Santrade Limited, Lucerne, Switzerland*, Attorney or Agent: Ronald L. Grudziecki, Ex. Gp.: 1108

5,046,746, Re. S.N. 08/588,783, Jan. 19, 1996, FRAME FOR A SKATE, METHOD FOR THE MANUFACTURE THEREOF, SKATING SHOE AND SKATE, Johan Gierveld, Owner of Record: *Gierveld Beheer B.V., Wierden, Netherlands*, Attorney or Agent: Roy W. Butrum, Ex. Gp.: 3106

5,051,397, Re. S.N. 08/684,983, July 22, 1996, Cl. 42.8, JOINED BODY OF HIGH-TEMPERATURE OXIDE SUPERCONDUCTOR, Chie Sata, et. al., Owner of Record: *Hitachi LTD., Tokyo, Japan*, Attorney or Agent: Alan E. Schiavelli, Ex. Gp.: 1317

5,266,510, Re. S.N. 08/568,891, Nov. 30, 1995, Cl. 437/44, HIGH PERFORMANCE SUB-MICRON P-CHANNEL TRANSISTOR WITH GERMANIUM IMPLANT, Owner of Record: *Micron Technology, Inc., Boise, Id.*, Attorney or Agent: Michael Lynch, Ex. Gp.: 2504

5,268,730, Re. S.N. 08/563,094, Nov. 27, 1995, Cl. 354/415, AUTOMATIC LIGHT MODULATING CAMERA, Tadao Takagi, Owner of Record: *Nikon Corp., Tokyo, Japan*, Attorney or Agent: Mitchell W. Shapiro, Ex. Gp.: 2101

5,281,548, Re. S.N. 08/591,702, Jan. 25, 1996, Cl. 437/43, PLUG BASED FLOATING GATE MEMORY, Kirk D. Prall, Owner of Record: *Micron Technology, Inc., Boise, Id.*, Attorney or Agent: Michael G. Fletcher, Ex. Gp.: 1109

5,311,197, Re. S.N. 08/644,423, May 10, 1996, Cl. 342/457, EVENT ACTIVATED REPORTING OF VEHICLE LOCATION, James L. Sorden, Owner of Record: *Trimble Navigation Limited*, Attorney or Agent: William E. Pelton, Ex. Gp.: 2202

5,311,332, Re. S.N. 08/644,827, May 10, 1996, Cl. 358/518, INTERPOLATION METHOD AND COLOR CORRECTION METHOD USING INTERPOLATION, Kaoru Imao, et. al., Owner of Record: *Ricoh Co., LTD., Tokyo, Japan*, Attorney or Agent: Gregory J. Maier, Ex. Gp.: 2612

5,324,086, Re. S.N. 08/670,132, June 25, 1996, Cl. 294/19.1, DEVICE CAPABLE OF POSITIVE EXTENSION AND RETRACTION USING A CASCADING FORCE TRANSFER, Mordechai Hammer, Owner of Record: *Inventor*, Attorney or Agent: Edward Langer, Ex. Gp.: 3102

5,477,716, Re. S.N. 08/671,231, June 27, 1996, Cl. 24/30.5W, APPARATUS FOR MONITORING MOISTURE IN A GAS STREAM, James T. Snow, Owner of Record: *Millipore Corp., Bedford, Mass.*, Attorney or Agent: Andrew T. Karnakis, Ex. Gp.: 3507

5,481,122, Re. S.N. 08/668,601, June 25, 1996, Cl. 257/94, SURFACE LIGHT EMITTING DIODE WITH ELECTRICALLY CONDUCTIVE WINDOW LAYER, Jhy-Feng Lin, et. al., Owner of Record: *Industrial Technology Research Institute, Hsinchu, Taiwan*, Attorney or Agent: Michael D. Bednarek, Ex. Gp.: 2503

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

5,165,418, Reexam. No. 90/004,334, Aug. 15, 1996, Cl. 128/760, BLOOD SAMPLING DEVICE AND METHOD USING A LASER, Nikolai I. Tankovich, Owner of Record: *Inventor*, Attorney or Agent: John R. Ross, c/o Thermotrex Corp., San Diego, Calif., Ex. Gp.: 3301, Requester: Nicolas G. Barzoukas, Arnold White & Durkee, Houston, Tex.

5,170,919, Reexam. No. 90/004,336, Aug. 20, 1996, Cl. 224/587, SIMULATED POUCH WITH INTERIOR, CONCEALED HOLDSTER, Eugene Desantis, et. al., Owner of Record: *Eugene Desantis, DBA Desantis Holster and Leather Goods, New Hyde Park, N.Y.*, Attorney or Agent: Nixon & Vanderhye, Robert A. Vanderhye, Arlington, Va., Ex. Gp.: 3105, Requester: Ross F. Hunt, Larson & Taylor, Arlington, Va.

5,488,276, Reexam. No. 90/004,335, Aug. 19, 1996, Cl. 318/473, APPARATUS FOR DRIVING AND CONTROLLING MOTOR, Yasushi Nishibe, Owner of Record: *Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi-Ken, Japan*, Attorney or Agent: Oliff & Berridge, Alexandria, Va., Ex. Gp.: 2107, Requester: Owner

Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED APRIL 29, 1996
DUE TO FAILURE TO RENEW

Reg. No.	Serial Number	Reg. Date
105,429	71/081,541	07/27/1915
326,279	71/361,833	07/23/1935
326,290	71/361,725	07/23/1935
326,293	71/361,608	07/23/1935
326,302	71/359,344	07/23/1935
326,308	71/358,789	07/23/1935
326,328	71/362,522	07/23/1935
326,353	71/360,322	07/23/1935
326,356	71/358,288	07/23/1935
326,413	71/363,420	07/23/1935
326,421	71/362,545	07/23/1935
326,423	71/362,559	07/23/1935
326,510	71/363,019	07/23/1935
326,532	71/362,205	07/23/1935
326,545	71/362,237	07/23/1935
608,406	71/646,103	07/05/1955

Reg. No.	Serial Number	Reg. Date
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609,347	71/668,784	07/26/1955
609,348	71/670,205	07/26/1955
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609,353	71/655,168	07/26/1955
609,356	71/664,298	07/26/1955
609,357	71/664,299	07/26/1955
609,358	71/664,300	07/26/1955
609,371	71/658,253	07/26/1955
609,373	71/659,143	07/26/1955
609,374	71/659,144	07/26/1955
609,379	71/665,992	07/26/1955
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609,381	71/624,860	07/26/1955
609,382	71/624,862	07/26/1955
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609,460	71/652,819	07/26/1955
609,466	71/670,711	07/26/1955
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609,542	71/661,622	07/26/1955
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609,562	71/672,248	07/26/1955
609,567	71/672,768	07/26/1955
609,571	71/657,877	07/26/1955
609,576	71/671,814	07/26/1955
609,595	71/664,951	07/26/1955
609,603	71/669,621	07/26/1955
609,606	71/672,249	07/26/1955
609,610	71/661,347	07/26/1955
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609,625	71/676,174	07/26/1955
609,627	71/676,253	07/26/1955
609,635	71/654,701	07/26/1955
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609,660	71/670,155	07/26/1955
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609,708	71/671,000	07/26/1955
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609,716	71/627,009	07/26/1955
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609,737	71/662,367	07/26/1955
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1,016,429	73/007,547	07/22/1975
1,016,438	73/016,634	07/22/1975
1,016,441	73/025,896	07/22/1975
1,016,442	73/033,935	07/22/1975
1,016,443	73/005,068	07/22/1975
1,016,444	73/007,621	07/22/1975
1,016,445	73/016,833	07/22/1975
1,016,448	73/027,956	07/22/1975
1,016,449	73/031,155	07/22/1975
1,016,450	73/004,530	07/22/1975
1,016,454	73/006,362	07/22/1975
1,016,456	73/022,280	07/22/1975
1,016,462	73/026,179	07/22/1975
1,016,464	73/004,591	07/22/1975
1,016,466	73/005,881	07/22/1975
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1,016,550	72/444,840	07/22/1975
1,016,551	72/461,400	07/22/1975
1,016,552	72/423,537	07/22/1975
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Errata

"All reference to Patent No. 5,508,755 to Chandrakant B. Patal et al of New Jersey for RADIO RECEIVER FOR RECEIVING BOTH VSB AND QAM DIGITAL HDTV SIGNALS appearing in the *Official Gazette* of April 16, 1996 should be deleted since no patent was granted."

Errata

"All reference to Patent No. 5,546,959 to Elaine Chen et al of Somerville Massachusetts for MULTIMODE FEEDBACK DISPLAY TECHNOLOGY appearing in the *Official Gazette* of August 20, 1996 should be deleted since no patent was granted."

Department of Commerce
Patent and Trademark Office
37 CFR Part 1

[Docket No: 950620162-6014-02]
RIN 0651-AA75

Miscellaneous Changes in Patent Practice

Agency: Patent and Trademark Office, Commerce.
Action: Final Rule.
Summary: The Patent and Trademark Office (Office) is amending the rules of practice in patent cases to implement a number of miscellaneous changes proposed in the rulemaking entitled "Changes to Implement 18-Month Publication of Patent Applications" (Notice of Proposed Rulemaking), published in the *Federal Register* at 60 FR 42352 (August 15, 1995), and in the Patent and Trademark Office *Official Gazette* 1177 *Off. Gaz. Pat. Office* 61 (August 15, 1995), that are not directly related to the 18-month publication of patent applications. While the proposed rule changes in the Notice of Proposed Rulemaking were designed primarily to implement the changes in practice related to the publication of patent applications provided for in H.R. 1733, these miscellaneous proposed changes clarify current rules of practice, without regard to the publication of patent applications.
Effective Date: September 23, 1996.
Sections 1.52(a) and (b), 1.58, 1.72(b), 1.75(g), (h) and (i), 1.77, 1.84(c), (f), (g) and (x), 1.96, 1.154, and 1.163 of 37 CFR apply to applications filed on or after September 23, 1996.

For Further Information Contact: Stephen G. Kunin by telephone at (703) 305-8850, by facsimile at (703) 305-8825, by electronic mail at rbahr@uspto.gov, or Jeffrey V. Nase by telephone at (703) 305-9285, or by mail marked to the attention of Stephen G. Kunin, addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231. For copies of the forms discussed in this final rule package, contact the Customer Service Center of the Office of Initial Patent Examination at (703) 308-1214.

Supplementary Information

This final rule package is designed to implement the miscellaneous changes set forth in the proposed rulemaking entitled "Changes to Implement 18-Month Publication of Patent Applications" (Notice of Proposed Rulemaking) that are not directly related to 18-month publication of patent applications and that are considered desirable even in the absence of an 18-month publication system.

The Notice of Proposed Rulemaking indicated that, in addition to implementing the 18-month publication of patent applications, the Office also proposed to: (1) clarify which applications claiming the benefit of prior applications, or which prior applications for which a benefit is claimed in a later application, will be preserved in confidence; (2) amend the rules pertaining to the format and standards for application papers and drawings to improve the standardization of patent applications; (3) provide for those instances in which inventions of a pending application or patent under reexamination and inventions of a patent held by a single party are not identical, but not patentably distinct; (4) clarify the practice for the delivery or mailing of patents; (5) expedite the entry of international applications into the national stage; and (6) amend a number of rules for consistency and clarity. The Notice of Proposed Rulemaking stated that these proposed rule changes may be adopted as final rules even in the absence of an 18-month publication system, and advised interested persons to comment on any proposed rule change, regardless of whether H.R. 1733 is enacted.

To avoid delays in the implementation of rule changes considered desirable even in the absence of an 18-month publication system, this final rule package provides for changes to 37 CFR §§ 1.12(c), 1.14, 1.52(a) and (b), 1.54, 1.58, 1.62(e) and (f), 1.72(b), 1.75(g), 1.77, 1.78(a) and (c), 1.84(c), (f), (g) and (x), 1.96, 1.97, 1.107, 1.110, 1.131, 1.132, 1.154, 1.163, 1.291, 1.292, 1.315, 1.321 and 1.497, and adds new §§ 1.5(f), 1.75(h) and (i), and 1.130, all of which are based upon the changes proposed in the Notice of Proposed Rulemaking.

Implementation of 18-month publication held in abeyance pending Congressional action on H.R. 1733

The Notice of Proposed Rulemaking also proposed changes to 37 CFR §§ 1.4, 1.5(a), 1.9, 1.11, 1.12(a) and (b), 1.13, 1.16, 1.17, 1.18, 1.19, 1.20, 1.24, 1.51, 1.52(d), 1.53, 1.55, 1.60, 1.78(a), 1.84(j), 1.85, 1.98, 1.108, 1.136, 1.138, 1.492, 1.494, 1.495, 1.701, 1.808, 3.31, 5.1, new §§ 1.5(g), 1.306 through 1.308 and 5.9, and further changes to §§ 1.14, 1.54, 1.62, 1.107, 1.131, 1.132, 1.291 and 1.292 to implement the 18-month publication of patent applications as contained in H.R. 1733 and provide procedures for the treatment of national security classified applications. The adoption of changes to these rules is held in abeyance pending Congressional action on H.R. 1733.

The proposed rule changes in the Notice of Proposed Rulemaking to provide new procedures for the treatment of national security classified applications are also being held in abeyance. These proposed rule changes are separable from the implementation of 18-month publication; however, they are sufficiently related to the implementation of 18-month publication that they are also being held in abeyance pending Congressional action on H.R. 1733.

In the event that H.R. 1733 is enacted, a final rule package to implement this legislation will be published. Final rules to implement 18-month publication of patent applications based upon the Notice of Proposed Rulemaking and the comments received in response to the Notice of Proposed Rulemaking may be adopted without either an additional public hearing or an additional proposal being published for comment.

Implementation of the miscellaneous changes proposed in the Notice of Proposed Rulemaking

The following paragraphs of this section include: (1) a discussion of the rules being added or amended in this final rule package, (2) the reasons for those additions and amendments, and (3) an analysis of the comments received in response to the Notice of Proposed Rulemaking.

Changes to proposed rules: These final rules contain a number of changes to the text of the rules as proposed for comment. The significant changes are discussed below. Familiarity with the Notice of Proposed Rulemaking is assumed.

Sections 1.14(a) and (b) have been re-written for clarity. Section 1.14(a)(1) provides that patent applications are generally preserved in confidence. Section 1.14(a)(2) sets forth the circumstances under which status information concerning an application may be supplied, and § 1.14(a)(3) sets forth the circumstances under which access to, or copies of, an application may be provided. Section 1.14(b) provides that abandoned applications may be destroyed after 20 years from their filing date. The reference to paragraph (b) in § 1.14(e) has been deleted for consistency with the changes to paragraphs (a) and (b) of § 1.14.

Section 1.52(a) is being changed to provide that all papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly "written either by a typewriter or mechanical printer in permanent dark ink or its equivalent," rather than "typed in permanent dark ink." This change will permit the filing of papers printed by any computer operated printer, such as a laser printer which uses toner rather than ink, and will avoid a conflict between § 1.52(a) and Patent Cooperation Treaty (PCT) Rule 11.9. The phrase "when required by the Office" was also added to § 1.52(a).

Section 1.52(b) is being changed to provide that: (1) the application papers must be plainly written with each page printed on only one side of a sheet of paper, with the claim or claims commencing on a separate sheet and the abstract commencing on a separate sheet; (2) the lines of the specification, and any amendments to the specification, must be 1 1/2 or double spaced; and (3) the pages of the specification including claims and abstract must be numbered consecutively, starting with 1, the numbers being centrally located above or preferably, below, the text. This change will clarify: (1) the separate sheet requirement for both the claims and abstract, (2) that the lines of the papers not comprising the specification and amendments thereto need not be 1 1/2 or double spaced, and (3) that the specification, and not the transmittal sheets or other forms, must be numbered.

Section 1.58 is being changed to provide that chemical and mathematical formulae and tables must be presented in compliance with §§ 1.52(a) and (b), except that chemical and mathematical formulae or tables may be placed in a landscape orientation if they cannot be presented satisfactorily in a portrait orientation. This replaces the requirement that "[t]o facilitate camera copying when printing, the width of formulas and tables as presented should be limited normally to 12.7 cm. (5 inches) so that it may appear as a single column in the printed patent." However, chemical and mathematical formulae and tables must still otherwise comply with §§ 1.52(a) and (b). This change will avoid a conflict between § 1.58 and PCT Rule 11.10(d). Section 1.58 is also being changed to require "0.21 cm." rather than "2.1 mm." to ensure consistency.

Section 1.72 is being changed to provide that the abstract must commence on a separate sheet, preferably following the claims. This change will avoid renumbering pages of a specification submitted in the arrangement set forth in § 1.77 when filing the application as an international application.

Section 1.75(h) is being changed to provide that the claim or claims must commence on a separate sheet. This change will clarify that § 1.75 requires that the claim or claims commence or begin on a separate sheet, rather than requiring that all of the claims must be on a single separate sheet or that each claim must be on a separate sheet.

Section 1.77 is being changed to position the abstract as element "(12)" following the claims, rather than element "(3)" prior to the first page of the specification to conform to § 1.72.

Section 1.78(a)(2) is being changed to replace the reference to § 1.14(b) with a reference to § 1.14(a).

Section 1.78(c) is being changed to replace the phrase "[w]here an application or a patent under reexamination and an application or a patent" with the phrase "[w]here an application or a patent under reexamination and at least one other application," since conflicting claims between an application or a patent under reexamination and a patent will be provided for in new § 1.130. Section 1.78(c) is also being changed to delete the sentence "[i]n addition to making said statement, the assignee may also explain why an interference should or should not be declared," since the Office will not, unless good cause is shown, declare or continue an interference when the application(s) and patent are owned by a single party.

Section 1.78(d) is removed. The provisions of § 1.78(d), as proposed, are in new § 1.130(b), since § 1.130 provides for conflicting claims between an application or a patent under reexamination and a patent.

Section 1.84(x) is being changed from "[n]o holes should be provided in the drawings sheets" to "[n]o holes should be made by the applicant in the drawing sheets" to clarify that the application papers, including drawings, should be submitted by the applicant without holes provided therein, but that the Office will drill holes through the application papers during the pre-examination processing of the application.

Section 1.96(b) is being changed to provide that a listing submitted as part of the specification "must be direct printouts (*i.e.*, not copies) from the computer's printer" for clarity.

Section 1.96(c) is being changed to substitute a reference to 36 CFR Part 1230 (Micrographics) for the enumerated American National Standards Institute (ANSI) and National Micrographics Association (NMA) standards. As 36 CFR Part 1230 sets forth the micrographic requirements for government records, it is appropriate to reference this provision, rather than promulgate separate standards for micrographics employed in patent applications.

Section 1.97 is being changed to delete any reference to a reexamination proceeding or a patent owner. The submission of an information disclosure statement during a reexamination proceeding is governed by § 1.555(a).

Section 1.97(a) is being changed from "[i]n order for an applicant for patent or for reissue of a patent to have information considered by the Office during the pendency of a patent application, an information disclosure statement in compliance with § 1.98 should be filed in accordance with this section" to "[i]n order for an applicant for a patent or for a reissue of a patent to have an information disclosure statement in compliance with § 1.98 considered by the Office during the pendency of the application, it must satisfy paragraph (b), (c), or (d) of this section" for clarity. Sections 1.97(c) and (d) are also being changed to clarify the conditions in § 1.97(c) under which a certification as specified in § 1.97(e) or the fee set forth in § 1.17(p) is required, and the conditions in § 1.97(d) under which a certification as specified in § 1.97(e), a petition, and the petition fee set forth in § 1.17(i) are required.

Section 1.110 is amended to change the reference to § 1.78(d) to a reference to § 1.130 for consistency.

The proposed addition of a new § 1.131(a)(3) is being withdrawn in this final rule package. This proposed change, as well as the provisions of former § 1.78(d), has been re-written as a new § 1.130. New § 1.130(a) will provide a procedure for the disqualification of a commonly owned patent claiming a patentably indistinct but not identical invention. New § 1.130(b) will include the provisions of former § 1.78(d).

Section 1.131(a) is being changed to replace the phrase "U.S. patent to another" with "U.S. patent to another or others." Section 1.154(a)(7) is being changed to add "[f]eature" prior to "[d]escription," and § 1.154(a)(8) is being changed to add "a single" prior to "claim."

Section 1.163 is being changed to position the abstract as element "(11)" following the claims, rather than element "(3)" prior to the first page of the specification. This change will parallel the change to § 1.77. In addition, § 1.163(c)(10) is being changed to add "a single" prior to "claim."

Section 1.497(b)(2) is being changed to provide that "[i]f the person making the oath or declaration is not the inventor, the oath or declaration shall state the relationship of the person to the inventor, the facts required by §§ 1.42, 1.43 or 1.47, and, upon information and belief, the facts which the inventor would have been required to state" to better set forth the requirements of an oath or declaration by a person who is not the inventor. Section 1.497(c) is being changed to delete the initial phrase "[t]he oath or declaration must comply with the requirements of § 1.63; however," since it is unnecessary.

Discussion of Specific Rules

Title 37 of the Code of Federal Regulations, Part 1 is amended as follows:

Section 1.5(f) is added to provide that a paper concerning a provisional application must identify the application as such and by the application number.

Section 1.12 is amended to revise paragraph (c) to read "preserved in confidence under § 1.14" for consistency with § 1.14.

Section 1.14 is amended to revise the title and paragraphs (a) and (e) to read "preserved in confidence" for consistency with the language in 35 U.S.C. 122.

Section 1.14(a) is amended to add a paragraph (a)(1) to provide that patent applications are generally preserved in confidence pursuant to 35 U.S.C. 122, and that no information will be given concerning the filing, pendency, or subject matter of any application for patent, and no access will be given to, or copies furnished of, any application or papers relating thereto, except as set forth in § 1.14.

Section 1.14(a) is also amended to add a paragraph (a)(2) to provide that status may be supplied: (1) concerning an application or any application claiming the benefit of the filing date of the application, if the application has been identified by application number or serial number and filing date in a published patent document; (2) concerning the national stage application or any application claiming the benefit of the filing date of a published international application, if the United States of America has been indicated as a Designated State in the international application; or (3) when it has been determined by the Commissioner to be necessary for the proper conduct of business before the Office. Status information includes information such as whether the application is pending, abandoned, or patented, as well as the application number and filing date. The inclusion of applications claiming the benefit of the filing date of applications so identified is to avoid misleading the public in instances in which the application identified as set forth in § 1.14(a)(2) is abandoned, but an application claiming the benefit of the filing date of the identified application (*e.g.*, a continuing application) is pending.

Section 1.14(a) is also amended to add a new paragraph (a)(3) to provide that access to, or copies of, an application may be provided: (1) when the application is open to the public as provided in § 1.11(b); (2) when written authority in that application from the applicant, the assignee of the application, or the attorney or agent of record has been granted; (3) when it has been determined by the Commissioner to be necessary for the proper conduct of business before the Office, or (4) to any person on written request, without notice to the applicant, when the application is abandoned and available and is: (a) referred to in a U.S. patent, (b) referred to in an application open to public inspection, (c) an application which claims the benefit of the filing date of an application open to public inspection, or (d) an application in which the applicant has filed an authorization to lay open the complete application to the public.

Section 1.14(b) is amended to provide that complete applications (§ 1.51(a)) which are abandoned may be destroyed and hence may not be available for access or copies as permitted by paragraph (a)(3)(iv) of this section after 20 years from their filing date, except those to which particular attention has been called and which have been marked for preservation. The sentence in § 1.14(b) concerning the non-return of abandoned applications is deleted as duplicative of the provision in § 1.59, which provides that papers in an application which has received a filing date will not be returned, and is unrelated to the preservation of applications in confidence under § 1.14.

Section 1.52(a) is amended to provide that all papers which are to become a part of the permanent records of the Office must be legibly written by a typewriter or mechanical printer in permanent dark ink or its equivalent in portrait orientation on flexible, strong, smooth, non-shiny, durable and white paper. Section 1.52(a) is further amended to provide that the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing thereon to permit

electronic reproduction by use of digital imaging and optical character recognition, as well as the direct photocopy reproduction currently provided for. Section 1.52(a) is further amended to provide that substitute typewritten or mechanically printed papers "will" be required if the original application papers are not of the required quality. As any substitute typewritten or mechanically printed papers containing the subject matter of the originally filed application papers would constitute a substitute specification, the provisions of § 1.125 governing the entry of a substitute specification would be applicable, and § 1.52(a) is amended to include a specific reference to § 1.125.

Section 1.52(b) is amended to provide that the claim or claims must commence on a separate sheet and the abstract must commence on a separate sheet. Section 1.72(b) provides that the abstract must commence on a separate sheet, and § 1.75(h) provides that the claim or claims must commence on a separate sheet. Section 1.52(b) is amended to provide that the sheets of paper must all be the same size and either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches), with a top margin of at least 2.0 cm. (3/4 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 2.0 cm. (3/4 inch), and a bottom margin of at least 2.0 cm. (3/4 inch), and that no holes should be made in the submitted paper sheets. Section 1.52(b) is further amended to provide that the lines of the specification, and any amendments to the specification, "must" be 1 1/2 or double spaced, and that the pages of the specification "must" be numbered consecutively, starting with page one, with the numbers being centrally located above or below the text. Finally, § 1.52(b) is amended to specifically reference drawings to clarify that drawings are part of the application papers, but that the standards for drawings are set forth in § 1.84.

The proposed changes to §§ 1.52(a) and (b), 1.58, 1.72(b), 1.75(g), (h), and (i), 1.77, 1.84(c), (f), (g), and (x), 1.96, 1.154, and 1.163 pertaining to the format and standards for application papers and drawings in the Notice of Proposed Rulemaking are considered desirable, regardless of whether H.R. 1733 is enacted.

While the vast majority of applications currently comply with §§ 1.52(a) and (b), 1.58, 1.72(b), 1.75(h), 1.84(c), (f), (g), and (x), and 1.96 as adopted in this final rule, those applications which do not comply with §§ 1.52(a) and (b), 1.58, 1.84(c), (f), (g), and (x), and 1.96 as adopted in this final rule (*e.g.*, applications containing hand-written papers) create an inordinate administrative burden on the Office during the initial processing, examination, and publishing of the application as a patent. In addition, the Office plans to replace or augment the current microfilming process with electronic data capture of at least the technical content (*i.e.*, the specification, abstract, claims and drawings) of the application-as-filed for internal Office use, regardless of whether H.R. 1733 is enacted. Therefore, the Office will no longer permit these relatively few applicants to submit application papers and drawings that do not meet the standards set forth in §§ 1.52(a) and (b), 1.58, 1.84(c), (f), (g), and (x), and 1.96 as adopted in this final rule.

The application format set forth in §§ 1.75(g) and (i), 1.77, 1.154, and 1.163 as adopted in this final rule merely expresses the Office's preferences for format of utility, design and plant applications. They do not set forth mandatory requirements for application papers and drawings.

Section 1.54(b) is amended to change "application serial number" to "application number" for consistency with § 1.5(a).

Section 1.58(b) is removed and is reserved as unnecessary in view of the amendments to §§ 1.52(a) and (b).

Section 1.58(c) is amended to provide that chemical and mathematical formulae and tables must be presented in compliance with §§ 1.52(a) and (b), except that chemical and mathematical formulae or tables may be placed in a landscape orientation if they cannot be presented satisfactorily in a portrait orientation. Section 1.58(c) is further amended to delete the following sentences to conform to the writing and paper size and orientation limitations in §§ 1.52(a) and (b): (1) "[t]o facilitate camera copying when printing, the width of formulas and tables as presented should be limited normally to 12.7 cm. (5 inches) so that it may appear as a single column in the printed patent"; (2) "[i]f it is not possible to limit the width of a formula or table to 5 inches (12.7 cm.), it is permissible to present the formula or table with a maximum width of 10 3/4 inches (27.3 cm.) and to place it sideways on the sheet"; and (3) "[h]and lettering must be neat, clean, and have a minimum character height of 0.08 inch (2.1 mm.)." Section 1.58(c) is further amended to insert "chosen" between "must be" and "from a block (nonscript) type font." Section 1.58(c) is further amended to provide metric dimensions with English equivalents in parentheticals, rather than *vice versa*.

Section 1.62(e) is amended to change "application serial number" to "application number" for consistency with § 1.5(a).

Section 1.62(f) is amended to change "secrecy" to "confidence" as is found in 35 U.S.C. 122 and § 1.14, and change "37 CFR 1.14" to "§ 1.14" for consistency.

Section 1.72(b) is amended to provide that the abstract must "commence," rather than "be set forth," on a separate sheet. This change will conform the "separate sheet" requirement for the abstract with that for the claims.

Section 1.75 is amended to include an amendment to paragraph (g), and would add two new paragraphs. Section 1.75(g) is amended to add the phrase "[t]he least restrictive claim should be presented as claim number 1" to the beginning of the paragraph. Section 1.75(h) is added to provide that the claim or claims must commence on a separate sheet. Section 1.75(i) is added to provide that where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation.

Section 1.77 is amended to provide that the elements of the application, if applicable, should appear in the following order: (1) Utility Application Transmittal Form; (2) Fee Transmittal Form; (3) title of the invention; or an introductory portion stating the name, citizenship, and residence of the applicant, and the title of the invention; (4) cross-reference to related applications; (5) statement regarding federally sponsored research or development; (6) reference to a "Microfiche appendix; (7) background of the invention; (8), brief summary of the invention; (9) brief description of the several views of the drawing; (10) detailed description of the invention; (11) claim or claims; (12) abstract of the disclosure; (13) drawings; (14) executed oath or declaration; and (15) sequence listing. The phrase "if applicable" is inserted in the heading, rather than associated with any particular listed element, to clarify that § 1.77 does not *per se* require that an application include all of the listed elements, but merely provides that any listed element included in the application should appear in the order set forth in § 1.77. Section 1.77 is further amended to provide that the (1) title of the invention; (2) cross-reference to related applications; (3) statement regarding federally sponsored research or development; (4) background of the invention; (5) brief summary of the invention; (6) brief description of the several views of the drawing; (7) detailed description of the invention; (8) claim or claims; (9) abstract of the disclosure; and (10) sequence listing, should appear in upper case, without underlining or bold type, as section headings, and if no text follows the section heading, the phrase "Not Applicable" should follow the section heading. Finally, § 1.77 is amended to change the reference to § 1.96(b) in § 1.77(a)(6) to § 1.96(c) for consistency with § 1.96.

Section 1.78(a)(2) is amended to replace the reference to § 1.14(b) with a reference to § 1.14(a) for consistency with §§ 1.14(a) and (b) as amended.

Section 1.78(c) is amended to change "two or more applications, or an application and a patent" to "an application or a patent under reexamination and at least one other application" such that the provisions of § 1.78(c) will also be applicable to a patent under reexamination. Section 1.78(c) is also amended to correct "inventors and owned by the same party contain conflicting claims" to read "inventors are owned by the same party and contain conflicting claims." Section 1.78(c) is also amended to delete the sentence "[i]n addition to making said statement, the assignee may also explain why an interference should or should not be declared."

Section 1.78(d) is removed. The provisions of former § 1.78(d), as proposed, are in new § 1.130(b).

Section 1.84(c) is amended to provide that a reference to the application number, or, if an application number has not been assigned, the inventor's name, may be included in the left-hand corner of the drawing sheet, provided that reference appears within 1.5 cm. (9/16 inch) from the top of the sheet.

Section 1.84(f) is amended to provide that the size of all drawing sheets in an application must be either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11

inches) to conform to the requirement in § 1.52(b) concerning papers in an application.

Section 1.84(g) is amended to delete the margin requirements for the sheet sizes that are no longer acceptable in view of the changes to § 1.84(f). Section 1.84(g) is further amended to provide that the sheets should have scan targets (cross-hairs) on two catercorner margin corners. Finally, § 1.84(g) is amended to increase the bottom and side margins such that each sheet must include a top margin of at least 2.5 cm. (1 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 1.5 cm. (9/16 inch), and a bottom margin of at least 1.0 cm. (3/8 inch), thereby leaving a sight no greater than 17.0 cm. by 26.2 cm. on 21.0 cm. by 29.7 cm. (DIN size A4) drawing sheets, and a sight no greater than 17.6 cm. by 24.4 cm. (6 15/16 by 9 5/8 inches) on 21.6 cm. by 27.9 cm. (8 1/2 by 11 inch) drawing sheets.

Section 1.84(x) is amended to delete the provisions indicating the proper location for holes in a drawing sheet, and provide that no holes should be provided in the drawing sheets.

Section 1.96 is amended to designate the text preceding current paragraph (a) as paragraph (a) "*General*," and would redesignate current paragraphs (a) and (b) as paragraphs (b) and (c), respectively. New § 1.96(a) is further amended to insert a period between "specification" and "[a] computer," to change "these rules" to "this section," and to change "may be submitted in patent applications in the following forms" to "may be submitted in patent applications as set forth in paragraphs (b) and (c) of this section."

New § 1.96(b) is further amended to: (1) change the sentences "[t]he listing may be submitted as part of the specification in the form of computer printout sheets (commonly 14 by 11 inches in size) for use as 'camera ready copy' when a patent is subsequently printed" and "[s]uch computer printout sheets must be original copies from the computer with dark solid black letters not less than 0.21 cm. high, on white, unshaded and unlined paper, the printing on each sheet must be limited to an area 9 inches high by 13 inches wide, and the sheets should be submitted in a protective cover" to "[a]ny listing submitted as part of the specification must be direct printouts (*i.e.*, not copies) from the computer's printer with dark solid black letters not less than 0.21 cm. high, on white, unshaded and unlined paper, and the sheets should be submitted in a protective cover"; (2) delete the sentence "[w]hen printed in patents, such computer printout sheets will appear at the end of the description but before the claims and will usually be reduced about 1/2 in size with two printout sheets being printed as one patent specification page"; and (3) delete the phrase "if the copy is to be used for camera ready copy." New § 1.96(b)(1) provides that the requirements of § 1.84 apply to computer program listings submitted as sheets of drawings, and new § 1.96(b)(2) provides that the requirements of § 1.52 apply to computer program listings submitted as part of the specification.

New § 1.96(c) is amended to: (1) change the references to § 1.77(c)(2) in § 1.96(c) to § 1.77(a)(6) for consistency with § 1.77; (2) change "may" and "should" to "must"; (3) delete the sentence "[a]ll computer program listings submitted on paper will be printed as part of the patent"; (4) relocate the phrase "except as modified or clarified below" in subsection (c)(2); (5) change the phrase "computer-generated information submitted as an appendix to an application for patent shall be in the form of microfiche in accordance with the standards" to "computer-generated information submitted as a 'microfiche appendix' to an application shall be in accordance with the standards" for clarity; (6) change the references to the specific American National Standards Institute (ANSI) or National Micrographics Association (NMA) standards with 36 CFR Part 1230; (7) change "serial number" to "application number"; and (8) provide metric dimensions with English equivalents in parentheticals, rather than *vice versa*.

Section 1.97(a) is amended to include the phrase "for an applicant for patent or for reissue of a patent." Paragraphs (a)–(d) are amended to include the phrase "by the applicant" to clarify that § 1.97 is not available for any third party seeking to have information considered in a pending application. Any third party seeking to have information considered in a pending application must proceed under §§ 1.291 or 1.292. As discussed *supra*, §§ 1.97(a), (c) and (d) are also being amended for clarity. Section 1.97(c) is further amended to correct the phrase "certification as specified in paragraph (3) of this section" to read "certification as specified in paragraph (e) of this section."

Section 1.107 is amended to delete the phrase "and the classes of inventions."

Section 1.110 is amended to change the reference to § 1.78(d) to a reference to § 1.130 for consistency with the removal of § 1.78(d), and the location of the provisions of former § 1.78(d) in § 1.130(b).

A new paragraph (a)(3) in § 1.131 was proposed in the Notice of Proposed Rulemaking to permit a showing of prior invention in a pending application or patent under reexamination to avoid a rejection under 35 U.S.C. 103 based upon a patent which qualifies as prior art only under 35 U.S.C. 102(a) or (e), where the application or patent under reexamination and the patent upon which the rejection is based are both owned by a single party, so long as the invention claimed in the pending application or patent under reexamination and in the other patent are not identical as set forth in 35 U.S.C. 102. Upon further study, it is considered appropriate to disqualify such patents, and provide for the obviation of judicially created double patenting rejections in an application or a patent under reexamination by the filing of a terminal disclaimer in accordance with § 1.321(c), in a separate § 1.130.

New § 1.130(a) provides that when any claim of an application or a patent under reexamination is rejected under 35 U.S.C. 103 on a U.S. patent to another or others which is not prior art under 35 U.S.C. 102(b), and the inventions defined by the claims in the application or patent under reexamination and by the claims in the patent are patentably indistinct but not identical as set forth in 35 U.S.C. 101, and the inventions are owned by the same party, the applicant or owner of the patent under reexamination may disqualify the patent as prior art. Section 1.130(a) specifically provides that the patent can be disqualified as prior art by submission of: (1) a terminal disclaimer in accordance with § 1.321(c), and (2) an oath or declaration stating that the application or patent under reexamination and the patent are currently owned by the same party, and that the inventor named in the application or patent under reexamination is the prior inventor under 35 U.S.C. 104.

Where inventions defined by the rejected claims in the application or a patent under reexamination and by the claims in the patent upon which the rejection is based are patentably distinct, the rejection may be overcome pursuant to § 1.131. Since § 1.130 applies only when inventions defined by the claims in an application or a patent under reexamination and by the claims in the patent are patentably indistinct, § 1.130 expressly provides that an oath or declaration submitted pursuant to § 1.130 to disqualify a patent must be accompanied by a terminal disclaimer in accordance with § 1.321(c).

As the conflict between two pending applications can be avoided by filing a continuation-in-part application merging the conflicting inventions into a single application, § 1.130 is limited to rejections based upon a patent.

New § 1.130(b) includes the provisions of former § 1.78(d), as proposed in the Notice of Proposed Rulemaking. Former § 1.78(d) was proposed to be amended to change "obviousness-type double patenting rejection" to "non-statutory double patenting rejections" as current examining procedures authorize non-obviousness-type double patenting rejections, as well as obviousness-type double patenting rejections (*See* section 804(II) of the Manual of Patent Examining Procedure (MPEP)), and either may be obviated by filing a terminal disclaimer in accordance with § 1.321(c). The phrase "non-statutory double patenting rejection," however, is being replaced with "judicially created double patenting rejection" to better set forth the legal basis for the rejection.

Section 1.78(d) was also proposed to be amended to change each instance of "application" to "application or a patent under reexamination" for consistency with § 1.321 and to clarify that double patenting is a proper consideration in reexamination (*Ex parte Obiaya*, 227 USPQ 58, 60-61 (Bd. Pat. App. & Inter. 1985)), and that a judicially created double patenting rejection in a patent under reexamination may be obviated by filing a terminal disclaimer in accordance with § 1.321(c).

New § 1.130(b) specifically provides that where an application or a patent under reexamination claims an invention which is not patentably distinct from an invention claimed in a commonly owned patent with the same or a different inventive entity, a double patenting rejection will be made in the applica-

tion or a patent under reexamination, and that a judicially created double patenting rejection may be obviated by filing a terminal disclaimer in accordance with § 1.321(c).

unnecessary, and would move the requirement for the fee set forth in § 1.17(j) from paragraph (a) to paragraph (b) where the conditions for entry of a petition for the institution of public

The written comments, and the testimony at the public hearing, have been analyzed. In the event that H.R. 1733 is enacted, the comments directed to the proposed changes to the

gested that line numbering is a beneficial practice which should be permitted, and even encouraged.

Response: Section 1.52 neither requires nor prohibits line numbering.

tion or a patent under reexamination, and that a judicially created double patenting rejection may be obviated by filing a terminal disclaimer in accordance with § 1.321(c).

Section 1.131 is amended to change "U.S. patent to another" to "U.S. patent to another or others" to parallel the language in 35 U.S.C. 102(a), as well as 35 U.S.C. 102(e).

Section 1.132 is amended to change "domestic patent" to "U.S. patent," and "does not claim the invention" to "does not claim the same patentable invention, as defined in § 1.601(n)" for consistency with § 1.131.

Section 1.154 is amended to provide that the elements of a design application, if applicable, should appear in the following order: (1) Design Application Transmittal Form; (2) Fee Transmittal Form; (3) preamble, stating name of the applicant and title of the design; (4) cross-reference to related applications; (5) statement regarding federally sponsored research or development; (6) description of the figure or figures of the drawing; (7) feature description; (8) a single claim; (9) drawings or photographs; and (10) executed oath or declaration. The phrase "[t]he following order of arrangement should be observed in framing design specifications" is changed to "[t]he elements of the design application, if applicable, should appear in the following order" to clarify that § 1.154 does not *per se* require that an application include all of the listed elements, but merely provides that any listed element included in the application should appear in the order set forth in § 1.154. This amendment to § 1.154, however, does not modify the current requirement that an application for a design patent have but a single claim.

A new § 1.163(c) is added to provide that the elements of a plant application, if applicable, should appear in the following order: (1) Plant Application Transmittal Form; (2) Fee Transmittal Form; (3) title of the invention; (4) cross-reference to related applications; (5) statement regarding federally sponsored research or development; (6) background of the invention; (7) brief summary of the invention; (8) brief description of the drawing; (9) detailed botanical description; (10) a single claim; (11) abstract of the disclosure; (12) drawings (in duplicate); (13) executed oath or declaration; and (14) Plant Color Coding Sheet. The phrase "if applicable" is included in the heading, rather than associated with any particular listed element, to clarify that § 1.163 does not *per se* require that an application include all of the listed elements, but merely provides that any listed element included in the application should appear in the order set forth in § 1.163. This amendment to § 1.163, however, does not modify the current requirement that an application for a plant patent have but a single claim.

A new § 1.163(d) is added to define a plant color coding sheet. A plant color coding sheet is a sheet that specifies a color coding system as designated in a color dictionary, and lists every plant structure to which color is a distinguishing feature and the corresponding color code which best represents that plant structure. The plant color coding sheet will provide a means for applicants to uniformly convey detailed color characteristics of the plant. Providing this information in a systematic manner will facilitate the examination of the application.

Section 1.291 is amended to provide that a protest must be filed prior to the mailing of a Notice of Allowance to be considered timely. As a protest cannot be considered subsequent to issuance of the application as a patent, § 1.291(b) is amended to provide that the protest will be considered if the application is still pending when the protest and application file are provided to the examiner (*i.e.*, that the application was pending at the time the protest was filed would be immaterial to its ultimate consideration). Finally, the sentences "[p]rotests raising fraud or other inequitable conduct issues will be entered in the application file, generally without comment on those issues" and "[p]rotests which do not adequately identify a pending patent application will be disposed of and will not be considered by the Office" in § 1.291 are changed to "[p]rotests raising fraud or other inequitable conduct issues will be entered in the application file, generally without comment on those issues" and "[p]rotests which do not adequately identify a pending patent application will be returned to the protestor and will not be further considered by the Office," respectively, and are located in paragraph (b). The Office will acknowledge protests prior to their entry into the application file or return to the protestor, as appropriate.

Section 1.292 is amended to delete the phrase "is filed by one having information of the pendency of an application" as unnecessary, and would move the requirement for the fee set forth in § 1.17(j) from paragraph (a) to paragraph (b) where the conditions for entry of a petition for the institution of public use proceedings are set forth. Section 1.292 is amended to further require that any petition be served on the applicant in accordance with § 1.248, or be filed with the Office in duplicate in the event that service on the applicant is not possible. Finally, § 1.292 is amended to provide that a petition to institute public use proceedings to be considered timely must be filed prior to the mailing of a Notice of Allowance.

Section 1.315 is amended to change "the attorney or agent of record, if there be one; or if the attorney or agent so request, to the patentee or assignee of an interest therein; or, if there be no attorney or agent, to the patentee or to the assignee of the entire interest, if he so request" to "the correspondence address of record. See § 1.33(a)." This change is to simplify § 1.315, and because patents are currently mailed to the patentee at the correspondence address of record.

Section 1.321(c) is amended to change "double patenting rejection" to "judicially created double patenting rejection" for consistency with § 1.78(c) and to clarify that the filing of a terminal disclaimer is ineffective to overcome a statutory double patenting rejection.

Section 1.497(a) is amended to provide that an applicant in an international application must file an oath or declaration that: (1) is executed in accordance with either §§ 1.66 or 1.68, (2) identifies the specification to which it is directed, (3) identifies each inventor and the country of citizenship of each inventor, and (4) states that the person making the oath or declaration believes the named inventor or inventors to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought, rather than an oath or declaration in accordance with § 1.63, to enter the national stage pursuant to §§ 1.494 or 1.495. Currently, the failure to file an oath or declaration in strict compliance with § 1.63 results in non-compliance with § 1.497, and thus 35 U.S.C. 371, which in turn delays the entry of the international application into the national stage. To expedite the entry of international applications into the national stage, § 1.497(a) is amended to require only an oath or declaration that is properly executed, identifies the specification to which it is directed, and, as required by 35 U.S.C. 115, identifies each inventor and the country of citizenship of each inventor and states that the person making the oath or declaration believes the named inventor or inventors to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought.

Section 1.497(b) is subdivided into paragraphs (b)(1) and (b)(2). Section 1.497(b)(1) is amended to provide that the oath or declaration must be made by all of the actual inventors except as provided for in §§ 1.42, 1.43 or 1.47. Section 1.497(b)(2) is amended to change "[i]f the international application was made as provided in §§ 1.422, 1.423 or 1.425, the applicant shall state his or her relationship to the inventor and, upon information and belief, the facts which the inventor is required by § 1.63 to state" to "[i]f the person making the oath or declaration is not the inventor, the oath or declaration shall state the relationship of the person to the inventor, the facts required by §§ 1.42, 1.43 or 1.47, and, upon information and belief, the facts which the inventor would have been required to state."

Section 1.497(c) is added to provide that the oath or declaration must comply with the requirements of § 1.63. Section 1.497(c) further provides that in instances where the oath or declaration does not comply with § 1.63, but meets the requirements of § 1.497(a) and (b), the oath or declaration will be accepted as complying with 35 U.S.C. 371(c)(4) and §§ 1.494(c) or 1.495(c), thus permitting the application to enter the national stage and the assignment of dates under 35 U.S.C. 102(e) and 371(c). A supplemental oath or declaration in compliance with § 1.63, however, will be required in accordance with § 1.67.

Response to Comments

Two hundred and forty-two written comments were received in response to the Notice of Proposed Rulemaking. A public hearing was held on September 19, 1995. Eight persons testified at the public hearing.

The written comments, and the testimony at the public hearing, have been analyzed. In the event that H.R. 1733 is enacted, the comments directed to the proposed changes to the rules of practice to implement the 18-month publication of patent applications will be considered and addressed in the final rule package to implement 18-month publication. Responses to the comments germane to the changes in this final rule package follow.

Comment (1): One comment suggested that, in the absence of an 18-month publication system, the proposed rules relating to application format and standardization of applications be republished to give the public an opportunity to comment on the desirability of these changes in the absence of an 18-month publication system.

Response: The Notice of Proposed Rulemaking specifically stated that the proposed rules relating to application format and standardization of applications may be adopted as final rules even in the absence of an 18-month publication system, and specifically advised interested members of the public to comment on the advisability of the proposed rules relating to application format and standardization of applications, regardless of the legislative action on H.R. 1733. Thus, the public was given an opportunity to comment on the desirability of these changes in the absence of an 18-month publication system. Because the standardization of applications is generally favored and will substantially improve the Office's ability to efficiently and effectively process applications, delaying their adoption as final rules is not justified.

Comment (2): One comment stated that the Office has the authority to require that applications be submitted in computer-readable form, and in fact requires sequence listings to be submitted in such form. The comment suggested that the cost of electronically scanning application papers, as well as errors in scanning the application papers, can be avoided by requiring applicants to provide the specification in computer-readable form. Another comment stated that the Office has the authority to permit electronic filing, and electronic filing should be permitted. Several other comments indicated that scanning an application into a data base, rather than permitting applicants to provide a copy of the application on an electronic medium, is more costly, and is further more likely to introduce errors that could render text searching unreliable. And, several comments suggested that the scanning and typesetting costs associated with the current publication process for issued patents could be reduced by the acceptance of electronic media in place of or in addition to the paper medium currently provided for in the rules of practice. These comments further suggested that the Office should establish fees that reflect the reduced cost to the Office when a copy of an application is provided on an electronic medium (*i.e.*, should establish reduced fees for those who submit a copy of their application on an electronic medium), which fee structure would provide an incentive to supply a copy of an application on an electronic medium.

Response: As discussed in the Notice of Proposed Rulemaking, while the Office is considering the legislative and regulatory changes that would be necessary to permit purely electronic filing of application papers, it does not currently have in place an automated system for the acceptance and processing of application papers in electronic form, other than for sequence listings. Moreover, the Office does not currently have the statutory authority to rebate statutory patent filing fees to reflect any reduced cost to the Office due to the submission of a copy of an application on an electronic medium. The Office will give the comments further consideration as it designs and develops the Patent Application Management (PAM) system.

Comment (3): Several comments noted that §§ 1.52(a) and (b) impose a standard on applicants not currently observed by the Office, and questioned whether papers in the application file prepared by the Office will comply with §§ 1.52(a) and (b).

Response: Sections 1.52(a) and (b) apply to the application papers, and amendments or corrections thereto. As such, §§ 1.52(a) and (b) do not apply to those papers in the application file prepared by the Office, since they do not become part of the printed patent.

Comment (4): One comment noted that proposed § 1.52 appears to be neutral with regard to numbering the lines (*e.g.*, a line number every five lines) of the specification, and suggested that line numbering is a beneficial practice which should be permitted, and even encouraged.

Response: Section 1.52 neither requires nor prohibits line numbering. Applicants are encouraged, but not required, to number the lines of the specification. The Office will give the suggestion further study and consideration in future rulemaking.

Comment (5): One comment noted that when paragraphs are separated by a blank line only (*i.e.*, no indentation) and end between pages, it is not possible to tell that a paragraph break occurred. The comment suggested that the application format requirements should additionally require an indentation at the beginning of each new paragraph.

Response: It is desirable that a specification include an indentation at the beginning of a new paragraph. This requirement, however, was not proposed for comment in the Notice of Proposed Rulemaking. In addition, PCT Rule 11 does not require that the beginning of each new paragraph in the specification be indented.

Comment (6): One comment noted that § 1.52(a) would prohibit handwriting or hand-printing on papers which are to become permanent Office records. The comment questioned whether this requirement would also apply to papers issued in the Office. The comment suggested revising Office practice to prohibit an examiner from handwriting comments on official papers (*e.g.*, advisory actions or interview summary records) because: (1) the handwriting is not always decipherable, and (2) the handwriting as it comes through on the carbon copies furnished to applicants is frequently too light at least in part to be decipherable.

Response: The Office's goal is to create a readable administrative record of the prosecution of every application. The Office is currently designing, testing and implementing electronic forms and Office action writing software to avoid or minimize the need for hand-writing/printing in Office communications. Any applicant receiving an Office communication in which the handwriting is not decipherable, or does not adequately appear on the carbon copies to be decipherable, should request a legible copy of such communication from the Office.

Comment (7): Several comments noted that the limitations in §§ 1.52(a) and (b) regarding "typed" and "ink" appear to exclude computer and laser printers, as well as commercially or mechanically printed papers such as declaration forms. Another comment noted that the limitations in §§ 1.52(a) and (b) regarding "typed" and "ink" are more restrictive than PCT Rule 11.9(a) and (d).

Response: The phrase "printed" was proposed to be deleted since it could be read to mean that hand-printing is acceptable. Section 1.52(a) will require, in part, that "[a]ll papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written either by a typewriter or mechanical printer in permanent dark ink or its equivalent in portrait orientation on flexible, strong, smooth, nonshiny, durable, and white paper." This will clarify that papers printed by a computer-operated laser, or any mechanical printer are acceptable, but that hand-printed papers are not. This change will also avoid inconsistencies with the requirements of PCT Rule 11.9.

Comment (8): One comment noted that the proposed changes to § 1.52(a) did not include any limitations regarding permissible type fonts. The comment questioned, since the purpose of the proposed rule change was to permit optical character recognition (OCR) scanning of the application papers, whether script fonts would be permissible.

Response: Section 1.52(a) does not include any express prohibition against the use of script fonts. Nevertheless, § 1.52(a) requires that "the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing thereon to permit . . . electronic reproduction by use of digital imaging and optical character recognition." Any application papers, including application papers containing a script font, that are not in a form having sufficient clarity and contrast between the paper and the writing thereon to permit electronic reproduction by use of digital imaging and optical character recognition will be objected to as not in compliance with § 1.52(a). Therefore, the Office cautions applicants not to submit application papers having script fonts.

Comment (9): One comment noted that § 1.52(b) would require that all papers (including drawings per proposed § 1.84) be limited to either DIN size A4 or 8 1/2 by 11 inches, which

would eliminate the currently allowed paper sizes of 8 1/2 by 13 or 14 inches. The comment questioned whether this would also apply to the official papers issued by the Office, noting

rules, and as causing tables to be split over multiple pages.

Response: The suggestions are adopted. Section 1.58 will state

cation Transmittal Form, and Fee Transmittal Form set forth in § 1.77 should be numbered pages 1 and 2 pursuant to § 1.52, and further questioned where the drawings and oath or

or patent owner's application *or provisional application from which that application claims priority therefrom* was filed in this country."

would eliminate the currently allowed paper sizes of 8 1/2 by 13 or 14 inches. The comment questioned whether this would also apply to the official papers issued by the Office, noting that the Office currently issues papers having a paper size mix of 8 1/2 by 11, 13, and 14 inches, which presents problems for applicants. The comment suggested that the Office should not issue papers of a size not permitted in § 1.52.

Response: The Office is currently in the process of standardizing to either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches).

Comment (10): One comment suggested that the Office should not issue papers with writing on the back side in accordance with § 1.52(b).

Response: The Office currently includes informational language on the back side of certain forms. The alternatives to issuing such forms with writing on the back side are: (1) not providing this information to applicants, (2) reducing the print size to permit all of the information to be located on the front of the form, or (3) routinely providing multiple page forms. Since none of the alternatives are preferable to simply including informational language on the back side of certain forms, the Office will continue to include information language on the back of papers issued by the Office, until it fully transforms all of its forms to electronically generated forms.

Comment (11): One comment questioned whether the phrase "claims on a separate sheet" in § 1.52(b) means that: (1) all of the claims must appear on a single separate sheet, (2) each claim must appear on a separate sheet, or (3) the claims (claim 1) must begin or commence on a separate sheet. The comment suggested the PCT wording that the claims shall commence on a separate sheet if the rule is intended to require that the claims (claim 1) must begin or commence on a separate sheet.

Response: The phrase has been changed to "the claim or claims commencing on a separate sheet" to clarify that the claims must begin or commence on a separate sheet to parallel PCT requirements. Thus, §§ 1.52(b) and 1.75(h) require that the claims (claim 1) must begin or commence on a separate sheet. Sections 1.52(b) and 1.75(h) do not require that all of the claims be set forth on a single sheet, or that each claim be set forth on a separate sheet.

Comment (12): One comment questioned whether the phrase "abstract and claims on a separate sheet" in § 1.52(b) means that the abstract is to be on one separate sheet, and the claims are to be (or commence) on another separate sheet.

Response: The phrase has been changed to "the claim or claims commencing on a separate sheet and abstract commencing on a separate sheet" to clarify that the claims must commence on one separate sheet and the abstract must commence on another separate sheet.

Comment (13): One comment noted that the requirement in § 1.52(b), as proposed, will require that the lines in the oath or declaration, as well as quotations from the rules, the MPEP, and court decisions in subsequently filed amendments, be 1 1/2 or double spaced, and is inconsistent with the forms included for comment with the Notice of Proposed Rulemaking.

Response: Section 1.52(b) has been changed to require, *inter alia*, that "[t]he lines of the specification, and any amendments to the specification, must be 1 1/2 or double spaced." The requirement for 1 1/2 or double spacing will not apply to oaths or declarations, pre-printed forms, or all of the statements in the "Remarks" section of an amendment. Applicants are nevertheless requested to submit papers with lines 1 1/2 or double spaced, except in standardized forms or where single-spacing may be stylistically necessary (*e.g.*, block quotations).

Comment (14): One comment questioned whether the requirement in § 1.52(b), as proposed, that papers have lines 1 1/2 or double spaced will apply to Office actions. The comment suggested that not placing block quotations from the statutes and regulations in single spacing will decrease the readability of Office actions.

Response: As discussed *supra*, §§ 1.52(a) and (b) are designed to facilitate patent printing and do not apply to Office actions. Section 1.52(b) has been changed to require, *inter alia*, that "[t]he lines of the specification, and any amendments to the specification, must be 1 1/2 or double spaced." Therefore, the requirement for 1 1/2 or double spaced lines will not apply to Office actions.

Comment (15): Several comments objected to the requirement that tables be in portrait orientation as inconsistent with PCT rules, and as causing tables to be split over multiple pages.

Response: The suggestions are adopted. Section 1.58 will state that "[c]hemical and mathematical formulae and tables must be presented in compliance with §§ 1.52(a) and (b), except that chemical and mathematical formulae or tables may be placed in a landscape orientation if they cannot be presented satisfactorily in a portrait orientation," rather than "[t]o facilitate camera copying when printing, the width of formulae and tables as presented should be limited normally to 12.7 cm. (5 inches) so that it may appear as a single column in the printed patent."

Comment (16): One comment stated that § 1.72 is contrary to PCT Rule 11.4(a), and will require renumbering of the application pages for later filing of that application in the European Patent Office (EPO) or under the PCT.

Response: Section 1.72, as proposed in the Notice of Proposed Rulemaking, provided that the abstract be "preferably prior to the first page of the specification," and, as such, merely expressed the Office's preference for the location of the abstract as prior to the first page of the specification. Nevertheless, to avoid the undesirable result of requiring an applicant who submitted an application in the format set forth in § 1.77 to renumber the specification pages for filing that application in the EPO or under the PCT, § 1.72 is changed to state that the preferable location of the abstract is following the claims.

Comment (17): One comment stated that requiring that the rarely used section headings (*e.g.*, statement regarding federally sponsored research and development) be followed by the phrase "not-applicable" is confusing.

Response: Section 1.77 is permissive rather than mandatory. As such, any applicant finding the format suggested therein to be confusing is at liberty to simply include those section headings applicable to the particular application. The use of each section heading, even when the section is "not-applicable," is desirable in that it apprises the Office that the section at issue has been considered and deemed inapplicable. Simply not providing a section heading is ambiguous as to whether the applicant considers the section inapplicable or has not considered whether the section is applicable to the application. In addition, the use of such section headings will be of greater benefit when the Office implements procedures to permit the electronic filing of patent applications.

Comment (18): One comment stated that the requirements set forth in § 1.77 are in addition to those required by the PCT. The comment argued that the Office cannot require international applications entering the national stage under 35 U.S.C. 371 to comply with these requirements.

Response: As discussed *supra*, § 1.77 merely expresses the Office's preference for the arrangement of the application elements. The Office may advise an applicant that the application does not comply with the format set forth in § 1.77, and suggest this format for the applicant's consideration; however, the Office will not require any application to comply with the format set forth in § 1.77. Therefore, there is no conflict between § 1.77 and the PCT.

Comment (19): One comment noted that §§ 1.154 and 1.163 apply to design and plant applications, and, as such, they are not in conflict with PCT Rules. The comment suggested that it would, however, be preferable that all types of U.S. applications maintain the same order of application elements, and that this order be the order set forth by the PCT Rules.

Response: As discussed *supra*, the arrangement of the elements of an application set forth in § 1.77 is not mandatory, and, as such, § 1.77 is not in conflict with the PCT or PCT Rules. Section 1.77 merely expresses the Office's preference for the arrangement of the elements of an application. The Office's preference for the format of design applications (§ 1.154) and plant applications (§ 1.163) is the same as the Office's preference for utility applications (§ 1.77).

Comment (20): One comment stated that in the absence of statutory requirements for the application elements proposed in §§ 1.77, 1.154, and 1.163, the rule should clearly state that these application elements or arrangements are preferred but not mandatory.

Response: Sections 1.77, 1.154, and 1.163 employ the phrase "should" rather than "must," which is the language of a precatory statement. Therefore, §§ 1.77, 1.154, and 1.163 currently state that these application elements or arrangements are preferred, but are not mandatory.

Comment (21): One comment questioned whether the Application Transmittal Form, and Fee Transmittal Form set forth in § 1.77 should be numbered pages 1 and 2 pursuant to § 1.52, and further questioned where the drawings and oath or declaration are to be numbered.

Response: Section 1.52 has been changed to provide that the pages of the specification, not the application, should be consecutively numbered beginning with page 1. The Application Transmittal Form, and Fee Transmittal Form set forth in § 1.77 are not part of the specification. As such, they should not be numbered as pages 1 and 2, respectively. Likewise, the drawings and oath or declaration are not part of the specification, and need not be numbered.

Comment (22): One comment stated that the failure to include the phrase "not applicable" by all of the application elements not required by statute or regulation rendered it unclear as to whether the Office would object to the lack of an application element for which the phrase "not applicable" is not included.

Response: The Office anticipates that an applicant choosing to use the Transmittal forms provided by the Office will arrange his or her application in the format suggested by the Office. The patent statutes and regulations set forth the requirements for a complete application, as well as the requirements for obtaining a filing date in an application. Applications are examined for compliance with the patent statutes and regulations, not for consistency with any particular transmittal form.

Comment (23): One comment noted, in regard to § 1.84(c), that the drawings of an international application, which are often used for processing in the Office, will have the World Organization (WO) publication number and International Bureau (IB) publication date on the top of the drawing.

Response: The WO publication number and IB publication date placed on the top of the drawing of an international application is not objectionable under § 1.84(c).

Comment (24): One comment stated that the scan target points conflict with PCT Rule 11.6(e). As such, the scan target points would have to be removed from applications to be filed as an international application. The comment further stated that these target points are unnecessary in view of the paper size and margin requirements.

Response: Section 1.84(g) states that drawings "should," and not "must," have scan target points printed on two catercorner margin corners. Thus, § 1.84(g) merely expresses the Office's preference for scan target points on the drawings for filming and printing purposes, which are considered desirable due to the different sights on 21.0 cm. by 29.7 cm. (DIN size A4) and 21.6 cm. by 27.9 cm. (8 1/2 by 11 inch) drawing sheets. An applicant wishing to provide scan target points on drawings that will later be filed in the EPO may simply copy the drawings to be filed in the EPO, place the scan target points only on the Office copy of the drawings, and submit the copy of the drawings containing the scan target points to the Office. Likewise, applicants filing drawings that were previously filed in the EPO should simply add scan target points only to the copy of the drawings to be filed in the Office. Nevertheless, as § 1.84(g) merely expresses a preference for scan target points for Office filming and printing purposes, an applicant intending to later file the application in the EPO, or any applicant, is at liberty to not include such scan target points on the drawings. The Office will not object to the absence of scan target points on any drawings filed in the Office. Therefore, § 1.84(g) does not include a requirement in excess of, or inconsistent, with PCT Rules.

Comment (25): One comment stated that the term "catercorner" is slang, and suggested that it be replaced in § 1.84(g) with a phrase such as "diagonally opposite."

Response: The term "catercorner" is not slang. While there are a number of acceptable English phrases to denote diagonally opposite, the term "catercorner" was selected to avoid using a multiple word phrase where a single word will suffice.

Comment (26): One comment stated that the language proposed to be added to § 1.97 regarding a reexamination or patent owner is inconsistent with § 1.533 and suggested that it be deleted.

Response: The suggestion is adopted.

Comment (27): One comment stated that § 1.131 does not specify whether the phrase "application" includes provisional applications. The comment suggested that § 1.131 be amended to state "unless the date of such patent or publication is more than one year prior to the *earliest* date on which the inventor's or patent owner's application *or provisional application from which that application claims priority therefrom* was filed in this country."

Response: The proposed change to § 1.131 is not adopted. It is well established that the filing date of any abandoned application co-pending with and referred to in a patent is the effective date of the patent with respect to the common subject matter disclosed in the patent and abandoned application. *See In re Switzer*, 166 F.2d 827, 77 USPQ 156 (CCPA 1948). Section 1.131 does not make a specific reference to nonprovisional applications for which a benefit is claimed under 35 U.S.C. 120; however, it is understood that the effective date of any patent sought to be antedated pursuant to § 1.131 is the earliest filing date of any application to which the patent is entitled to under 35 U.S.C. 120 with respect to the common subject matter disclosed in the patent and the application. The provisions of title 35, except for 35 U.S.C. 115, 131, 135 and 157, apply to provisional applications. 35 U.S.C. 111(b)(8). It is therefore likewise unnecessary to specifically reference provisional applications in § 1.131.

Comment (28): Several comments objected to §§ 1.291 and 1.292 as pre-grant opposition, especially in view of the pre-grant publication of pending applications that would be provided for in H.R. 1733, if enacted, and the expanded reexamination that would be provided for in H.R. 1732, if enacted. The comments either suggested that the protest and public use proceeding provisions of §§ 1.291 and 1.292 be severely limited or abolished.

Response: The changes to §§ 1.291 and 1.292 place greater obligations on third parties seeking to use these sections. As such, this rule change does not add to any third party's ability to participate in the prosecution of a pending application. Nevertheless, as neither H.R. 1732 nor H.R. 1733 has presently been enacted, analysis of whether modification of §§ 1.291 and 1.292 in addition to that proposed in the Notice of Proposed Rulemaking is desirable in a pre-grant publication or expanded reexamination system is held in abeyance pending enactment of H.R. 1733 or 1732.

Comment (29): One comment noted that any standardization of patent applications should not include pre-printed forms taking eleven hours to complete. The comment further suggested that word-processor versions of any collection of information, rather than pre-printed forms, would be of greater assistance to members of the public.

Response: Initially, the Notice of Proposed Rulemaking indicated that the initial patent application (*e.g.*, the specification, drawings, as well as the standard forms), not merely the proposed standardized forms, is a collection of information estimated to average eleven hours to complete. The Notice of Proposed Rulemaking stated that the public reporting burden for these collections of information is estimated to average: (1) twelve minutes per response for the Fee Transmittal form, (2) twelve minutes per response for the Utility Patent Application Transmittal form, (3) twelve minutes per response for the Design Patent Application Transmittal form, (4) twelve minutes per response for the Plant Patent Application Transmittal form, (5) twelve minutes per response for the Plant Color Coding Sheet, (6) twenty-four minutes per response for the Declaration form, and (7) twenty-four minutes per response for the Plant Patent Application Declaration. Nevertheless, the final rules do not require the use of any standardized form. The Office publishes standardized forms only as an aid to practitioners and applicants.

Comment (30): One comment questioned whether use of the standardized versions of the various forms would be required. Another comment stated that the Office has no authority to require the use of the published forms in the absence of statutory authority.

Response: Use of the forms included for comment with the Notice of Proposed Rulemaking is not mandatory. That is, an applicant need not use the standardized versions of the Fee Transmittal form, Utility Patent Application Transmittal form, Design Patent Application Transmittal form, Plant Patent Application Transmittal form, Plant Color Coding Sheet, Declaration form and Plant Patent Application Declaration form, and need not use any fee transmittal form, application transmittal form, or plant color coding sheet. These forms were created to assist applicants in filing a patent application and to help ensure the filing of a complete application accompanied by the

appropriate fees, thereby avoiding unnecessary delays in the examination of the application.

Comment (31): One comment stated that the Office should

Comment (34): One comment noted that the heading "DECLARATION" does not state the types of applications with which the declaration form could be used. The comment ques-

Response: The phrase "Applicant Authority" indicates the authority that the applicant has in executing the application (*e.g.*, inventor, executor (§ 1.42), assignee (§ 1.47(b)). This field is an optional field for the applicant to complete. The

four minutes per response for the Plant Patent Application Declaration. These estimates include the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing

appropriate fees, thereby avoiding unnecessary delays in the examination of the application.

Comment (31): One comment stated that the Office should not require the use of mandated forms, and if the Office requires the use of mandated forms, the Office should revise the forms to render them readily reproducible by conventional software, and should arrange for versions of these forms in various formats to be distributed by the Internet, bulletin board, or floppy disk. Another comment suggested that the Office should make its form or templates available for electronic copying.

Response: Copies of the standard forms provided by the Office may be obtained by contacting the Customer Service Center of the Office of Initial Patent Examination at (703) 308-1214. Also, many standardized forms have been loaded on the Office's Internet Website and may be electronically copied via the Internet through anonymous file transfer protocol (ftp) (address: ftp.uspto.gov). Nevertheless, use of the forms included for comment with the Notice of Proposed Rulemaking is not mandatory.

Comment (32): One comment questioned why there is a box with an instruction to type a plus sign in the box at the very top of the standardized forms.

Response: As discussed *supra*, the Office plans to replace or augment the current microfilming process with an electronic data base which captures at least the technical content of the application-as-filed for internal Office use. Typing a plus sign (+) into this box will facilitate the image scanner in aligning the remaining typing on the form during the scanning process.

Comment (33): One comment questioned: (1) why the application transmittal forms do not have a place for applicant to indicate the type of new utility application being transmitted (*e.g.*, a provisional, original, continuation, division, continuation-in-part, reissue), and (2) how the Office official will obtain this information for entry in the official use "application type" box.

Response: The Utility Patent Application Transmittal form sets forth instructions for filing utility applications under § 1.53 in the arrangement set forth in § 1.77. All non-reissue, nonprovisional utility applications (*i.e.*, original, continuation, divisional, and continuation-in-part applications) filed under § 1.53 should be submitted using the Utility Patent Application Transmittal form. The Design Patent Application Transmittal form sets forth instructions for filing design applications in the arrangement set forth in § 1.154. All non-reissue design applications should be submitted using the Design Patent Application Transmittal form. The Plant Patent Application Transmittal form sets forth instructions for filing plant applications in the arrangement set forth in § 1.163. All non-reissue, nonprovisional plant applications should be submitted using the Plant Patent Application Transmittal form.

A Reissue Patent Application Transmittal form is also available, and all applications for the reissue of a patent should be submitted using the Reissue Patent Application Transmittal form. The cover sheet provided for in § 1.53(b)(2)(i) for a provisional application functions as a transmittal sheet for a provisional application. As such, the standardized Provisional Application Cover Sheet is the transmittal form for a provisional application. The provisional application cover sheet was published in the rulemaking entitled "Changes to Implement 20-Year Patent Term and Provisional Applications," in the *Federal Register* at 60 FR 20230-31 (April 25, 1995), and in the Patent and Trademark Office *Official Gazette* at 1174 *Off. Gaz. Pat Office* 45-46 (May 2, 1995).

To provide a place on the Application Transmittal form for claims under 35 U.S.C. 119, 120, or 121 would require the use of an unacceptably smaller font on the Application Transmittal form. The Declaration forms provide a place for stating claims under 35 U.S.C. 119, 120 or 121. The inclusion on filing of an executed or unexecuted Declaration form containing this information would assist the Office in ascertaining whether the application is an original, continuation, divisional, or continuation-in-part application. In addition, in the event that H.R. 1733 is enacted, and the proposed changes to §§ 1.55(a) and 1.78(a)(2) are adopted substantially as proposed, the routine inclusion of claims for priority under 35 U.S.C. 119, 120, or 121 in an executed or unexecuted declaration form accompanying the application papers would be an excellent mechanism for avoiding an inadvertent failure to timely submit a claim for priority under 35 U.S.C. 119, 120, or 121.

Comment (34): One comment noted that the heading "DECLARATION" does not state the types of applications with which the declaration form could be used. The comment questioned whether it is intended to be used with any type of nonprovisional application except plant applications for which a separate form is proposed.

Response: The declaration form containing the heading "DECLARATION" is intended to be used with any type of nonprovisional application except plant applications, for which a separate Plant Declaration form is provided.

Comment (35): One comment suggested that in the foreign priority claim section of the Declaration form, the last line, the phrase "having a filing date before that of the application on which priority is claimed" should be changed to "for which priority is not claimed," to cover those foreign applications which have a filing date after that of the application on which priority is claimed and the benefit of which applicant does not want to claim. The comment also indicated that, frequently, an application is filed after the Convention Year.

Response: The suggestion is not adopted. Section 1.63(c) requires that an oath or declaration in any application in which a claim for priority is made pursuant to § 1.55 identify . . . "any foreign application having a filing date before that of the application on which priority is claimed, by specifying the application number, country, day, month, and year of its filing." Thus, the language in the Declaration form aids applicants in submitting a declaration in compliance with § 1.63(c). Any foreign application having a filing date before that of the application on which priority is claimed is, by definition, a foreign application for which priority is not claimed.

Comment (36): One comment suggested that in the foreign priority claim section, the right hand columns, the heading should be corrected to "Certified Copy Attached" since the Office does not routinely want uncertified copies.

Response: The suggestion is adopted. The Declaration form has been modified accordingly.

Comment (37): One comment noted that the Fee Calculation and Application Transmittal are currently on a single sheet/form, where the proposed forms provide a separate sheet/form for each. The comment also noted that the current Declaration form is a single sheet, where the proposed Declaration form contains multiple sheets.

Response: The Office currently receives application transmittals, fee calculations/transmittals and declarations in a variety of forms and in a multitude of formats. The proposed forms were developed as a result of an analysis of the current practices and requirements of applicants, as well as the Office's plans to scan application data from these forms into an electronic data base. The Fee Transmittal form was created to aid applicants in submitting the fees due on filing a new patent application, as well as the fees that may be due throughout the prosecution of the application. The Application Transmittal serves to both aid applicants in filing a complete application, and simplify the pre-examination processing of the application. To permit the inclusion of additional fee calculation and application transmittal information on the standardized forms, and to provide a Fee Transmittal form for use throughout the prosecution of the application, a separate Fee Transmittal form and Application Transmittal form were developed. A multi-page Declaration form is necessary to accommodate the Office's plans to scan application data from this Declaration form into an electronic data base.

Comment (38): One comment indicated that the meaning or purpose of "suffix" in the inventor signature block is unclear, and requested an explanation as to whether it refers to "Jr." or "II," or whether it is a place to put the mother's name for those inventors whose family name is followed by their mother's name.

Response: The field on the Declaration form labeled (inventor) "suffix" is intended to provide the applicant with an option to indicate family position relative to age. Examples of an inventor's suffix are: Jr., Sr., and III. This information is tracked by the Office and is necessary to print patents which accurately reflect bibliographic information about the inventor. The use of this field and the data expected will be clarified and specified in the form instructions.

Comment (39): One comment questioned the meaning or purpose of "Applicant Authority" in the last line of the inventor data block.

Response: The phrase "Applicant Authority" indicates the authority that the applicant has in executing the application (*e.g.*, inventor, executor (§ 1.42), assignee (§ 1.47(b)). This field is an optional field for the applicant to complete. The electronic versions of the proposed standard declaration forms would provide the applicant with directions and a list of valid codes that correspond with a specific identification of the authority the applicant retains (*e.g.*, the Authority Code for an executor will be "04").

Comment (40): One comment stated that due to the spacing and small fonts on the fee transmittal form, this sheet cannot be used with a conventional word processor.

Response: To accommodate all the fee descriptions on a one-page fee transmittal it was necessary to use smaller fonts in the form's design. These fonts are available in Word and WordPerfect. An electronic version of the fee transmittal will be available from the Office soon.

Comment (41): One comment stated that the "one form fits all" mentality of the fee transmittal form should be reconsidered since certain fees are submitted only once during the prosecution of an application.

Response: The proposed standard one-page fee form is primarily to facilitate and simplify the fee payment process. The one-page fee transmittal is intended to aid applicants in providing complete fee information to the Office for each application and paper submission. This will enable the Office to more efficiently process and record fee payments, which will avoid delays in the prosecution of an application.

Other Considerations

This final rule change is in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Order 12612, and the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 *et seq.* It has been determined that this final rule is not significant for the purposes of Executive Order 12866.

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration, that this rule change will not have a significant economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal effect of this rule change is to simplify and clarify the rules governing the form of patent application papers.

The Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

Notwithstanding any other provision of law, no person is required to respond to nor shall any person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB control number.

This final rule package contains a collection of information subject to the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 *et seq.* This collection of information is currently approved by the Office of Management and Budget under Control No. 0651-0032. This collection of information includes the initial patent application filing, the Fee Transmittal form, the Utility Patent Application Transmittal form, the Design Patent Application Transmittal form, the Plant Patent Application Transmittal form, the Plant Color Coding Sheet, the Declaration form, and the Plant Patent Application Declaration form. The above-mentioned forms will reduce the burden and uncertainty associated with the submission of an application and related information, and enhance the Office's ability to use standardized automation techniques (optical character recognition, *etc.*) to record and process information concerning applications. The public reporting burden for these collections of information is estimated to average: (1) ten hours per response for the specification and drawings of an application, (2) twelve minutes per response for the Fee Transmittal form, (3) twelve minutes per response for the Utility Patent Application Transmittal form, (4) twelve minutes per response for the Design Patent Application Transmittal form, (5) twelve minutes per response for the Plant Patent Application Transmittal form, (6) twelve minutes per response for the Plant Color Coding Sheet, (7) twenty-four minutes per response for the Declaration form, and (8) twenty-four minutes per response for the Plant Patent Application Declaration. These estimates include the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collections of information.

Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the Office of System Quality and Enhancement, Data Administration Division, Patent and Trademark Office, Washington, D.C. 20231, and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503 (ATTN: Paperwork Reduction Act Project 0651-0032).

List of Subjects

37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Reporting and record keeping requirements, Small Businesses.

For the reasons set forth in the preamble, 37 CFR Part 1 is amended as follows:

PART 1 - Rules of Practice in Patent Cases

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.5 is amended by adding paragraph (f) to read as follows:

§ 1.5 Identification of application, patent or registration.

* * * * *

(f) When a paper concerns a provisional application, it should identify the application as such and include the application number.

3. Section 1.12 is amended by revising paragraph (c) to read as follows:

§ 1.12 Assignment records open to public inspection.

* * * * *

(c) Any request by a member of the public seeking copies of any assignment records of any pending or abandoned patent application preserved in confidence under § 1.14, or any information with respect thereto, must:

(1) Be in the form of a petition accompanied by the petition fee set forth in § 1.17(i); or

(2) Include written authority granting access to the member of the public to the particular assignment records from the applicant or applicant's assignee or attorney or agent of record.

* * * * *

4. Section 1.14 is amended by revising the section heading and paragraphs (a), (b), and (e) to read as follows:

§ 1.14 Patent applications preserved in confidence.

(a)(1) Patent applications are generally preserved in confidence pursuant to 35 U.S.C. 122. No information will be given concerning the filing, pendency, or subject matter of any application for patent, and no access will be given to, or copies furnished of, any application or papers relating thereto, except as set forth below.

(2) Status information, which includes information such as whether the application is pending, abandoned, or patented, as well as the application number and filing date, may be supplied:

(i) Concerning an application or any application claiming the benefit of the filing date of the application, if the application

has been identified by application number or serial number and filing date in a published patent document,

(ii) Concerning the national stage application or any application claiming the benefit of the filing date of a published international application designating the United States of America, if the application has been identified by international application number and international filing date in a published patent document,

(iii) Concerning a reissue application or any application claiming the benefit of the filing date of a reissue application, if the reissue application has been identified by application number or serial number and filing date in a published patent document,

(iv) Concerning a reexamination proceeding or any application claiming the benefit of the filing date of a reexamination proceeding, if the reexamination proceeding has been identified by control number and filing date in a published patent document,

(v) Concerning a statutory invention registration or any application claiming the benefit of the filing date of a statutory invention registration, if the statutory invention registration has been identified by application number or serial number and filing date in a published patent document,

(vi) Concerning a patent, if the patent has been identified by patent number and issue date in a published patent document,

(vii) Concerning a patent, if the patent has been identified by patent number and issue date in a communication to the public,

(viii) Concerning a patent, if the patent has been identified by patent number and issue date in a paper filed in the application file,

(ix) Concerning a patent, if the patent has been identified by patent number and issue date in a paper served on the applicant or applicant's attorney or agent of record,

(x) Concerning a patent, if the patent has been identified by patent number and issue date in a paper filed in the application file by the applicant or applicant's attorney or agent of record,

(xi) Concerning a patent, if the patent has been identified by patent number and issue date in a paper filed in the application file by a member of the public,

(xii) Concerning a patent, if the patent has been identified by patent number and issue date in a paper filed in the application file by a member of the public, and

(xiii) Concerning a patent, if the patent has been identified by patent number and issue date in a paper filed in the application file by a member of the public, and

(b) A brief abstract of the technical disclosure in the specification must commence on a separate sheet, preferably following the claims, under the heading "Abstract of the Disclosure." The purpose of the abstract is to enable the Patent and Trade-

and there is no statement of record indicating that the claimed inventions were commonly owned or subject to an obligation of assignment to the same person at the time the later invention was made, the assignee may be called upon to state whether

has been identified by application number or serial number and filing date in a published patent document,

(ii) Concerning the national stage application or any application claiming the benefit of the filing date of a published international application, if the United States of America has been indicated as a Designated State in the international application, or

(iii) When it has been determined by the Commissioner to be necessary for the proper conduct of business before the Office.

(3) Access to, or copies of, an application may be provided:

(i) When the application is open to the public as provided in § 1.11(b),

(ii) When written authority in that application from the applicant, the assignee of the application, or the attorney or agent of record has been granted,

(iii) When it has been determined by the Commissioner to be necessary for the proper conduct of business before the Office, or

(iv) To any person on written request, without notice to the applicant, when the application is abandoned and available and is:

(A) Referred to in a U.S. patent,

(B) Referred to in an application open to public inspection,

(C) An application which claims the benefit of the filing date of an application open to public inspection, or

(D) An application in which the applicant has filed an authorization to lay open the complete application to the public.

(b) Complete applications (§ 1.51(a)) which are abandoned may be destroyed and hence may not be available for access or copies as permitted by paragraph (a)(3)(iv) of this section after 20 years from their filing date, except those to which particular attention has been called and which have been marked for preservation.

• • • • •

(e) Any request by a member of the public seeking access to, or copies of, any pending or abandoned application preserved in confidence pursuant to paragraph (a) of this section, or any papers relating thereto, must:

(1) Be in the form of a petition and be accompanied by the petition fee set forth in § 1.17(i); or

(2) Include written authority granting access to the member of the public in that particular application from the applicant or the applicant's assignee or attorney or agent of record.

• • • • •

5. Section 1.52 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1.52 Language, paper, writing, margins.

(a) The application, any amendments or corrections thereto, and the oath or declaration must be in the English language except as provided for in § 1.69 and paragraph (d) of this section, or be accompanied by a verified translation of the application and a translation of any corrections or amendments into the English language. All papers which are to become a part of the permanent records of the Patent and Trademark Office must be legibly written either by a typewriter or mechanical printer in permanent dark ink or its equivalent in portrait orientation on flexible, strong, smooth, non-shiny, durable, and white paper. All of the application papers must be presented in a form having sufficient clarity and contrast between the paper and the writing thereon to permit the direct reproduction of readily legible copies in any number by use of photographic, electrostatic, photo-offset, and microfilming processes and electronic reproduction by use of digital imaging and optical character recognition. If the papers are not of the required quality, substitute typewritten or mechanically printed papers of suitable quality will be required. See § 1.125 for filing substitute typewritten or mechanically printed papers constituting a substitute specification when required by the Office.

(b) Except for drawings, the application papers (specification, including claims, abstract, oath or declaration, and papers as provided for in §§1.42, 1.43, 1.47, *etc.*) and also papers subsequently filed, must have each page plainly written on only one side of a sheet of paper, with the claim or claims commencing on a separate sheet and the abstract commencing on a separate sheet. See §§ 1.72(b) and 1.75(h). The sheets of paper must be the same size and either 21.0 cm. by 29.7 cm. (DIN size A4) or 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches). Each sheet must include a top margin of at least 2.0 cm. (3/4 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 2.0 cm. (3/4 inch), and a bottom margin of at least 2.0 cm. (3/4 inch), and no holes should be made in the sheets as submitted. The lines of the specification, and any amendments to the specification, must be 1 1/2 or double spaced. The pages of the specification including claims and abstract must be numbered consecutively, starting with 1, the numbers being centrally located above or preferably, below, the text. See § 1.84 for drawings.

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6. Section 1.54 is amended by revising paragraph (b) to read as follows:

§ 1.54 Parts of application to be filed together; filing receipt.

• • • • •

(b) Applicant will be informed of the application number and filing date by a filing receipt.

7. Section 1.58 is amended by removing and reserving paragraph (b) and revising the section heading and paragraph (c) to read as follows:

§ 1.58 Chemical and mathematical formulae and tables.

• • • • •

(b) [Reserved]

(c) Chemical and mathematical formulae and tables must be presented in compliance with § 1.52(a) and (b), except that chemical and mathematical formulae or tables may be placed in a landscape orientation if they cannot be presented satisfactorily in a portrait orientation. Typewritten characters used in such formulae and tables must be chosen from a block (non-script) type font or lettering style having capital letters which are at least 0.21 cm. (0.08 inch) high (*e.g.*, elite type). A space at least 0.64 cm. (1/4 inch) high should be provided between complex formulae and tables and the text. Tables should have the lines and columns of data closely spaced to conserve space, consistent with a high degree of legibility.

8. Section 1.62 is amended by revising paragraphs (e) and (f) to read as follows:

§ 1.62 File wrapper continuing procedure.

• • • • •

(e) An application filed under this section will utilize the file wrapper and contents of the prior application to constitute the new continuation, continuation-in-part, or divisional application but will be assigned a new application number. Changes to the prior application must be made in the form of an amendment to the prior application as it exists at the time of filing the application under this section. No copy of the prior application or new specification is required. The filing of such a copy or specification will be considered improper, and a filing date as of the date of deposit of the request for an application under this section will not be granted to the application unless a petition with the fee set forth in § 1.17(i) is filed with instructions to cancel the copy or specification.

(f) The filing of an application under this section will be construed to include a waiver of confidence by the applicant under 35 U.S.C. 122 to the extent that any member of the public who is entitled under the provisions of § 1.14 to access to, or information concerning either the prior application or any continuing application filed under the provisions of this section may be given similar access to, or similar information concerning, the other application(s) in the file wrapper.

• • • • •

9. Section 1.72 is amended by revising paragraph (b) to read as follows: § 1.72 Title and abstract.

• • • • •

(b) A brief abstract of the technical disclosure in the specification must commence on a separate sheet, preferably following the claims, under the heading "Abstract of the Disclosure." The purpose of the abstract is to enable the Patent and Trademark Office and the public generally to determine quickly from a cursory inspection the nature and gist of the technical disclosure. The abstract shall not be used for interpreting the scope of the claims.

10. Section 1.75 is amended by revising paragraph (g) and adding paragraphs (h) and (i) to read as follows:

§ 1.75 Claim(s).

• • • • •

(g) The least restrictive claim should be presented as claim number 1, and all dependent claims should be grouped together with the claim or claims to which they refer to the extent practicable.

(h) The claim or claims must commence on a separate sheet.

(i) Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation.

11. Section 1.77 is revised to read as follows:

§ 1.77 Arrangement of application elements.

(a) The elements of the application, if applicable, should appear in the following order:

(1) Utility Application Transmittal Form.

(2) Fee Transmittal Form.

(3) Title of the invention; or an introductory portion stating the name, citizenship, and residence of the applicant, and the title of the invention.

(4) Cross-reference to related applications.

(5) Statement regarding federally sponsored research or development.

(6) Reference to a "Microfiche appendix." (See § 1.96 (c)). The total number of microfiche and total number of frames should be specified.

(7) Background of the invention.

(8) Brief summary of the invention.

(9) Brief description of the several views of the drawing.

(10) Detailed description of the invention.

(11) Claim or claims.

(12) Abstract of the Disclosure.

(13) Drawings.

(14) Executed oath or declaration.

(15) Sequence Listing (See §§ 1.821 *et. seq.*).

(b) The elements set forth in paragraphs (a)(3) through (a)(5), (a)(7) through (a)(12) and (a)(15) of this section should appear in upper case, without underlining or bold type, as section headings. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading.

12. Section 1.78 is amended by removing paragraph (d) and revising paragraphs (a)(2) and (c) to read as follows:

§ 1.78 Claiming benefit of earlier filing date and cross references to other applications.

(a) • • • • •

(2) Any nonprovisional application claiming the benefit of one or more prior filed copending nonprovisional applications or international applications designating the United States of America must contain or be amended to contain in the first sentence of the specification following the title a reference to each such prior application, identifying it by application number (consisting of the series code and serial number) or international application number and international filing date and indicating the relationship of the applications. Cross-references to other related applications may be made when appropriate. (See § 1.14(a)).

• • • • •

(c) Where an application or a patent under reexamination and at least one other application naming different inventors are owned by the same party and contain conflicting claims, and there is no statement of record indicating that the claimed inventions were commonly owned or subject to an obligation of assignment to the same person at the time the later invention was made, the assignee may be called upon to state whether the claimed inventions were commonly owned or subject to an obligation of assignment to the same person at the time the later invention was made, and if not, indicate which named inventor is the prior inventor.

13. Section 1.84 is amended by revising paragraphs (c), (f)-(g), and (x) to read as follows:

§ 1.84 Standards for drawings.

• • • • •

(c) *Identification of drawings.* Identifying indicia, if provided, should include the application number or the title of the invention, inventor's name, docket number (if any), and the name and telephone number of a person to call if the Office is unable to match the drawings to the proper application. This information should be placed on the back of each sheet of drawings a minimum distance of 1.5 cm. (5/8 inch) down from the top of the page. In addition, a reference to the application number, or, if an application number has not been assigned, the inventor's name, may be included in the left-hand corner, provided that the reference appears within 1.5 cm. (9/16 inch) from the top of the sheet.

• • • • •

(f) *Size of paper.* All drawing sheets in an application must be the same size. One of the shorter sides of the sheet is regarded as its top. The size of the sheets on which drawings are made must be:

(1) 21.0 cm. by 29.7 cm. (DIN size A4), or

(2) 21.6 cm. by 27.9 cm. (8 1/2 by 11 inches).

(g) *Margins.* The sheets must not contain frames around the sight; *i.e.*, the usable surface, but should have scan target points, *i.e.*, cross-hairs, printed on two catercorner margin corners. Each sheet must include a top margin of at least 2.5 cm. (1 inch), a left side margin of at least 2.5 cm. (1 inch), a right side margin of at least 1.5 cm. (9/16 inch), and a bottom margin of at least 1.0 cm. (3/8 inch), thereby leaving a sight no greater than 17.0 cm. by 26.2 cm. on 21.0 cm. by 29.7 cm. (DIN size A4) drawing sheets, and a sight no greater than 17.6 cm. by 24.4 cm. (6 15/16 by 9 5/8 inches) on 21.6 cm. by 27.9 cm. (8 1/2 by 11 inch) drawing sheets.

• • • • •

(x) *Holes.* No holes should be made by applicant in the drawing sheets.

(See § 1.152 for design drawings, § 1.165 for plant drawings, and § 1.174 for reissue drawings.)

14. Section 1.96 is revised to read as follows:

§ 1.96 Submission of computer program listings.

(a) *General.* Descriptions of the operation and general content of computer program listings should appear in the description portion of the specification. A computer program listing for the purpose of this section is defined as a printout that lists in appropriate sequence the instructions, routines, and other contents of a program for a computer. The program listing may be either in machine or machine-independent (object or source) language which will cause a computer to perform a desired procedure or task such as solve a problem, regulate the flow of work in a computer, or control or monitor events. Computer program listings may be submitted in patent applications as set forth in paragraphs (b) and (c) of this section.

(b) *Material which will be printed in the patent.* If the computer program listing is contained on ten printout pages or less, it must be submitted either as drawings or as part of the specification.

(1) *Drawings.* If the listing is submitted as drawings, it must be submitted in the manner and complying with the requirements for drawings as provided in § 1.84. At least one figure numeral is required on each sheet of drawing.

(2) *Specification.*

(i) If the listing is submitted as part of the specification, it must be submitted in accordance with the provisions of § 1.52,

(a) In order for an applicant for a patent or for a reissue of a patent to have an information disclosure statement in

U.S. patent which is not prior art under 35 U.S.C. 102(b), and the inventions defined by the claims in the application or patent

(2) Fee Transmittal Form.

(3) Preamble, stating name of the applicant and title of the

(i) If the listing is submitted as part of the specification, it must be submitted in accordance with the provisions of § 1.52, at the end of the description but before the claims.

(ii) Any listing submitted as part of the specification must be direct printouts (*i.e.*, not copies) from the computer's printer with dark solid black letters not less than 0.21 cm. high, on white, unshaded and unlined paper, and the sheets should be submitted in a protective cover. Any amendments must be made by way of submission of substitute sheets.

(c) *As an appendix which will not be printed.* If a computer program listing printout is eleven or more pages long, applicants must submit such listing in the form of microfiche, referred to in the specification (see § 1.77(a)(6)). Such microfiche filed with a patent application is to be referred to as a "microfiche appendix." The "microfiche appendix" will not be part of the printed patent. Reference in the application to the "microfiche appendix" must be made at the beginning of the specification at the location indicated in § 1.77(a)(6). Any amendments thereto must be made by way of revised microfiche.

(1) *Availability of appendix.* Such computer program listings on microfiche will be available to the public for inspection, and microfiche copies thereof will be available for purchase with the file wrapper and contents, after a patent based on such application is granted or the application is otherwise made publicly available.

(2) *Submission requirements.* Except as modified or clarified in this paragraph (c)(2), computer-generated information submitted as a "microfiche appendix" to an application shall be in accordance with the standards set forth in 36 CFR Part 1230 (Micrographics).

(i) Film submitted shall be a first generation (camera film) negative appearing microfiche (with emulsion on the back side of the film when viewed with the images right-reading).

(ii) Reduction ratio of microfiche submitted should be 24:1 or a similar ratio where variation from said ratio is required in order to fit the documents into the image area of the microfiche format used.

(iii) At least the left-most third (50 mm. x 12 mm.) of the header or title area of each microfiche submitted shall be clear or positive appearing so that the Patent and Trademark Office can apply an application number and filing date thereto in an eye-readable form. The middle portion of the header shall be used by applicant to apply an eye-readable application identification such as the title and/or the first inventor's name. The attorney's docket number may be included. The final right-hand portion of the microfiche shall contain sequence information for the microfiche, such as 1 of 4, 2 of 4, *etc.*

(iv) Additional requirements which apply specifically to microfiche of filmed paper copy:

(A) The first frame of each microfiche submitted shall contain a test target.

(B) The second frame of each microfiche submitted must contain a fully descriptive title and the inventor's name as filed.

(C) The pages or lines appearing on the microfiche frames should be consecutively numbered.

(D) Pagination of the microfiche frames shall be from left to right and from top to bottom.

(E) At a reduction of 24:1, resolution of the original microfilm shall be at least 120 lines per mm. (5.0 target).

(F) An index, when included, should appear in the last frame (lower right-hand corner when data is right-reading) of each microfiche.

(v) Microfiche generated by Computer Output Microfilm.

(A) The first frame of each microfiche submitted should contain a resolution test frame.

(B) The second frame of each microfiche submitted must contain a fully descriptive title and the inventor's name as filed.

(C) The pages or lines appearing on the microfiche frames should be consecutively numbered.

(D) It is preferred that pagination of the microfiche frames be from left to right and top to bottom but the alternative, *i.e.*, from top to bottom and from left to right, is also acceptable.

(E) An index, when included, should appear on the last frame (lower right-hand corner when data is right-reading) of each microfiche.

15. Section 1.97 is amended by revising paragraphs (a) through (d) to read as follows:

§ 1.97 Filing of information disclosure statement.

(a) In order for an applicant for a patent or for a reissue of a patent to have an information disclosure statement in compliance with § 1.98 considered by the Office during the pendency of the application, it must satisfy paragraph (b), (c), or (d) of this section.

(b) An information disclosure statement shall be considered by the Office if filed by the applicant:

(1) Within three months of the filing date of a national application;

(2) Within three months of the date of entry of the national stage as set forth in § 1.491 in an international application; or

(3) Before the mailing date of a first Office action on the merits, whichever event occurs last.

(c) An information disclosure statement shall be considered by the Office if filed by the applicant after the period specified in paragraph (b) of this section, provided that the statement is accompanied by either a certification as specified in paragraph (e) of this section or the fee set forth in § 1.17(p), and is filed before the mailing date of either:

(1) A final action under § 1.113; or

(2) A notice of allowance under § 1.311, whichever occurs first.

(d) An information disclosure statement shall be considered by the Office if filed by the applicant after the period specified in paragraph (c) of this section, provided that the statement is filed on or before payment of the issue fee and is accompanied by:

(1) A certification as specified in paragraph (e) of this section;

(2) A petition requesting consideration of the information disclosure statement; and

(3) The petition fee set forth in § 1.17(i).

• • • • •

16. Section 1.107 is amended by revising paragraph (a) to read as follows:

§ 1.107 Citation of references.

(a) If domestic patents are cited by the examiner, their numbers and dates, and the names of the patentees must be stated. If foreign published applications or patents are cited, their nationality or country, numbers and dates, and the names of the patentees must be stated, and such other data must be furnished as may be necessary to enable the applicant, or in the case of a reexamination proceeding, the patent owner, to identify the published applications or patents cited. In citing foreign published applications or patents, in case only a part of the document is involved, the particular pages and sheets containing the parts relied upon must be identified. If printed publications are cited, the author (if any), title, date, pages or plates, and place of publication, or place where a copy can be found, shall be given.

• • • • •

17. Section 1.110 is revised to read as follows:

§ 1.110 Inventorship and date of invention of the subject matter of individual claims.

When more than one inventor is named in an application or patent, the Patent and Trademark Office, when necessary for purposes of an Office proceeding, may require an applicant, patentee, or owner to identify the inventive entity of the subject matter of each claim in the application or patent. Where appropriate, the invention dates of the subject matter of each claim and the ownership of the subject matter on the date of invention may be required of the applicant, patentee or owner. See also §§ 1.78(c) and 1.130.

18. A new § 1.130 is added after the undesignated center heading "Affidavits Overcoming Rejections" to read as follows:

§ 1.130 Affidavit or declaration to disqualify commonly owned patent as prior art.

(a) When any claim of an application or a patent under reexamination is rejected under 35 U.S.C. 103 in view of a U.S. patent which is not prior art under 35 U.S.C. 102(b), and the inventions defined by the claims in the application or patent under reexamination and by the claims in the patent are not identical but are not patentably distinct, and the inventions are owned by the same party, the applicant or owner of the patent under reexamination may disqualify the patent as prior art. The patent can be disqualified as prior art by submission of:

(1) A terminal disclaimer in accordance with § 1.321(c), and

(2) An oath or declaration stating that the application or patent under reexamination and the patent are currently owned by the same party, and that the inventor named in the application or patent under reexamination is the prior inventor under 35 U.S.C. 104.

(b) When an application or a patent under reexamination claims an invention which is not patentably distinct from an invention claimed in a commonly owned patent with the same or a different inventive entity, a double patenting rejection will be made in the application or a patent under reexamination. A judicially created double patenting rejection may be obviated by filing a terminal disclaimer in accordance with § 1.321(c).

19. Section 1.131 is amended by revising paragraph (a) to read as follows:

§ 1.131 Affidavit or declaration of prior invention to overcome cited patent or publication.

(a)(1) When any claim of an application or a patent under reexamination is rejected under 35 U.S.C. 102(a) or (e), or 35 U.S.C. 103 based on a U.S. patent to another or others which is prior art under 35 U.S.C. 102(a) or (e) and which substantially shows or describes but does not claim the same patentable invention, as defined in § 1.601(n), or on reference to a foreign patent or to a printed publication, the inventor of the subject matter of the rejected claim, the owner of the patent under reexamination, or the party qualified under §§ 1.42, 1.43, or 1.47, may submit an appropriate oath or declaration to overcome the patent or publication. The oath or declaration must include facts showing a completion of the invention in this country or in a NAFTA or WTO member country before the filing date of the application on which the U.S. patent issued, or before the date of the foreign patent, or before the date of the printed publication. When an appropriate oath or declaration is made, the patent or publication cited shall not bar the grant of a patent to the inventor or the confirmation of the patentability of the claims of the patent, unless the date of such patent or printed publication is more than one year prior to the date on which the inventor's or patent owner's application was filed in this country.

(2) A date of completion of the invention may not be established under this section before December 8, 1993, in a NAFTA country, or before January 1, 1996, in a WTO member country other than a NAFTA country.

• • • • •

20. Section 1.132 is revised to read as follows:

§ 1.132 Affidavits or declarations traversing grounds of rejection.

When any claim of an application or a patent under reexamination is rejected on reference to a U.S. patent which substantially shows or describes but does not claim the same patentable invention, as defined in § 1.601(n), on reference to a foreign patent, on reference to a printed publication, or on reference to facts within the personal knowledge of an employee of the Office, or when rejected upon a mode or capability of operation attributed to a reference, or because the alleged invention is held to be inoperative, lacking in utility, frivolous, or injurious to public health or morals, affidavits or declarations traversing these references or objections may be received.

21. Section 1.154 is revised to read as follows:

§ 1.154 Arrangement of specification.

(a) The elements of the design application, if applicable, should appear in the following order:

(1) Design Application Transmittal Form.

(2) Fee Transmittal Form.

(3) Preamble, stating name of the applicant and title of the design.

(4) Cross-reference to related applications.

(5) Statement regarding federally sponsored research or development.

(6) Description of the figure or figures of the drawing.

(7) Feature Description.

(8) A single claim.

(9) Drawings or photographs.

(10) Executed oath or declaration (See § 1.153(b)).

(b) [Reserved]

22. Section 1.163 is amended by adding new paragraphs (c) and (d) to read as follows:

§ 1.163 Specification.

• • • • •

(c) The elements of the plant application, if applicable, should appear in the following order:

(1) Plant Application Transmittal Form.

(2) Fee Transmittal Form.

(3) Title of the invention.

(4) Cross-reference to related applications.

(5) Statement regarding federally sponsored research or development.

(6) Background of the invention.

(7) Brief summary of the invention.

(8) Brief description of the drawing.

(9) Detailed Botanical Description.

(10) A single claim.

(11) Abstract of the Disclosure.

(12) Drawings (in duplicate).

(13) Executed oath or declaration.

(14) Plant color coding sheet.

(d) A plant color coding sheet as used in this section means a sheet that specifies a color coding system as designated in a color dictionary, and lists every plant structure to which color is a distinguishing feature and the corresponding color code which best represents that plant structure.

23. Section 1.291 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1.291 Protests by the public against pending applications.

(a) Protests by a member of the public against pending applications will be referred to the examiner having charge of the subject matter involved. A protest specifically identifying the application to which the protest is directed will be entered in the application file if:

(1) The protest is submitted prior to the mailing of a notice of allowance under § 1.311; and

(2) The protest is either served upon the applicant in accordance with § 1.248, or filed with the Office in duplicate in the event service is not possible.

(b) Protests raising fraud or other inequitable conduct issues will be entered in the application file, generally without comment on those issues. Protests which do not adequately identify a pending patent application will be returned to the protestor and will not be further considered by the Office. A protest submitted in accordance with the second sentence of paragraph (a) of this section will be considered by the Office if the application is still pending when the protest and application file are brought before the examiner and it includes:

(1) A listing of the patents, publications, or other information relied upon;

(2) A concise explanation of the relevance of each listed item;

(3) A copy of each listed patent or publication or other item of information in written form or at least the pertinent portions thereof; and

(4) An English language translation of all the necessary and pertinent parts of any non-English language patent, publication, or other item of information in written form relied upon.

• • • • •

24. Section 1.292 is amended by revising paragraphs (a) and (b) to read as follows:

(2) If the person making the oath or declaration is not the inventor, the oath or declaration shall state the relationship of

Air Filter. The national stage application number is 08/454,216 and has a 35 U.S.C. 371 date of 18 December 1995.

The types of technology for countering terrorism could include, but are not limited to, systems for detecting/identifying

24. Section 1.292 is amended by revising paragraphs (a) and (b) to read as follows:

§ 1.292 Public use proceedings.

(a) When a petition for the institution of public use proceedings, supported by affidavits or declarations is found, on reference to the examiner, to make a *prima facie* showing that the invention claimed in an application believed to be on file had been in public use or on sale more than one year before the filing of the application, a hearing may be had before the Commissioner to determine whether a public use proceeding should be instituted. If instituted, the Commissioner may designate an appropriate official to conduct the public use proceeding, including the setting of times for taking testimony, which shall be taken as provided by §§ 1.671 through 1.685. The petitioner will be heard in the proceedings but after decision therein will not be heard further in the prosecution of the application for patent.

(b) The petition and accompanying papers, or a notice that such a petition has been filed, shall be entered in the application file if:

(1) The petition is accompanied by the fee set forth in § 1.17(j);

(2) The petition is served on the applicant in accordance with § 1.248, or filed with the Office in duplicate in the event service is not possible; and

(3) The petition is submitted prior to the mailing of a notice of allowance under § 1.311.

• • • • •

25. Section 1.315 is revised to read as follows:

§ 1.315 Delivery of patent.

The patent will be delivered or mailed upon issuance to the correspondence address of record. See § 1.33(a).

26. Section 1.321 is amended by revising paragraph (c) to read as follows:

§ 1.321 Statutory disclaimers, including terminal disclaimers.

• • • • •

(c) A terminal disclaimer, when filed to obviate a judicially created double patenting rejection in a patent application or in a reexamination proceeding, must:

(1) Comply with the provisions of paragraphs (b)(2) through (b)(4) of this section;

(2) Be signed in accordance with paragraph (b)(1) of this section if filed in a patent application or in accordance with paragraph (a)(1) of this section if filed in a reexamination proceeding; and

(3) Include a provision that any patent granted on that application or any patent subject to the reexamination proceeding shall be enforceable only for and during such period that said patent is commonly owned with the application or patent which formed the basis for the rejection.

27. Section 1.497 is revised to read as follows:

§ 1.497 Oath or declaration under 35 U.S.C. 371(c)(4).

(a) When an applicant of an international application desires to enter the national stage under 35 U.S.C. 371 pursuant to §§ 1.494 or 1.495, he or she must file an oath or declaration that:

(1) Is executed in accordance with either §§ 1.66 or 1.68;

(2) Identifies the specification to which it is directed;

(3) Identifies each inventor and the country of citizenship of each inventor; and

(4) States that the person making the oath or declaration believes the named inventor or inventors to be the original and first inventor or inventors of the subject matter which is claimed and for which a patent is sought.

(b) (1) The oath or declaration must be made by all of the actual inventors except as provided for in §§ 1.42, 1.43 or 1.47.

(2) If the person making the oath or declaration is not the inventor, the oath or declaration shall state the relationship of the person to the inventor, the facts required by §§ 1.42, 1.43 or 1.47, and, upon information and belief, the facts which the inventor would have been required to state.

(c) If the oath or declaration meets the requirements of paragraphs (a) and (b) of this section, the oath or declaration will be accepted as complying with 35 U.S.C. 371(c)(4) and §§ 1.494(c) or 1.495(c). However, if the oath or declaration does not also meet the requirements of § 1.63, a supplemental oath or declaration in compliance with § 1.63 will be required in accordance with § 1.67.

August 13, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Registration To Practice

The following person successfully passed the registration examination that was held October 14, 1992, and has been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until applicant's registration certificate is mailed to applicant. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before November 1, 1996.

Bui, Hung H., 1330 New Hampshire Ave., Unit 612, Washington, D.C. 20036

August 19, 1996 KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

Registration To Practice

The following person successfully passed the registration examination that was held May 3, 1995, and has been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until applicant's registration certificate is mailed to applicant. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before November 1, 1996.

Needleman, Brad S., 55 E. 80th St., #5A, New York, N.Y. 10021

August 19, 1996 KAREN L. BOVARD, *Director*
Office of Enrollment and Discipline

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37 CFR 1.47 Notice by Publication

Notice is hereby given of the filing of an national stage application with a petition under 37 CFR 1.47 requesting acceptance of the application without the signature of all inventors. The petition has been granted. A notice has been sent to the last known address of the non-signing inventor. The inventor whose signature is missing (Peter Fischer) may join in the application by promptly filing an appropriate oath or Declaration complying with 37 CFR 1.63. The international application number is PCT/EP93/03435 and was filed on 07 December 1993 in the names of Guenter Dungs, Klaus Moessinger, Guenter Thaller and Peter Fischer for the invention entitled Air Filter. The national stage application number is 08/454,216 and has a 35 U.S.C. 371 date of 18 December 1995.

Petitioning to Make Special Patent Applications Relating to Inventions For Countering Terrorism

New patent applications are normally taken up for examination in the order of their effective United States filing date. However, the Commissioner may provide that a patent application will be advanced out of turn for examination if a petition to make the patent application special under 37 CFR 1.102(c) or (d) is granted.

On July 31, 1996, Vice President Gore stated that "[i]t is imperative that those seeking to prevent terrorist activities have all of the tools necessary to accomplish their task." In view of the importance of developing technologies for countering terrorism and the desirability of prompt disclosure of advances made in these fields, the Patent and Trademark Office is establishing a new category for petitions to accord "special" status to patent applications relating to counter-terrorism inventions. International terrorism as defined in 18 U.S.C. 2331 is "activities that (A) involve violent acts or acts dangerous to human life that are a violation of the criminal laws of the United States or of any State, or that would be a criminal violation if committed within the jurisdiction of the United States or of any State; (B) appear to be intended (i) to intimidate or coerce a civilian population; (ii) to influence the policy of a government by intimidation or coercion; or (iii) to affect the conduct of a government by assassination or kidnaping."

The types of technology for countering terrorism could include, but are not limited to, systems for detecting/identifying explosives, aircraft sensors/security systems, and vehicular barricades/disabling systems. Applications which are made special will be advanced out of turn for examination and will be treated as special throughout their pendency by the Patent and Trademark Office.

Applicants who desire that an application relating to inventions for countering terrorism be made special should file a petition, with the fee under 37 CFR 1.17(i) which is presently $130.00, requesting the Patent and Trademark Office to make the application special. The petition for special status should be made in writing, should identify the application by application number and filing date, and should be accompanied by a statement explaining how the invention contributes to countering terrorism. Such statement must be set forth in oath or declaration form unless it is signed by a registered practitioner. The petition will be decided by the Director of the patent examining group to which the application is assigned.

This new category for a petition to make an application special will be added in the next revision of the Manual of Patent Examining Procedure (MPEP) to the other categories discussed in MPEP section 708.02.

Questions concerning this notice should be directed to Magdalen Y. Greenlief, Office of the Deputy Assistant Commissioner for Patent Policy and Projects, (703) 305-8813.

August 19, 1996 BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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37 CFR § 1.47 Notice by Publication

Notice is hereby given of the filing of the following applications with a petition under 37 CFR § 147 requesting the acceptance of the application without the signature of all inventors or, if the inventor is deceased, the legal representative of the deceased inventor. The petition in each application has been granted. A notice has been sent to the last known address of the non-signing inventor or the legal representative. The inventors or legal representatives whose signatures are missing may join in the application by promptly filing an oath or declaration complying with 37 CFR § 1.63.

Application No.	Filing Date	Non-Signing Inventor(s)	Title of Invention
08/077,875	June 18, 1993	Francesco della Valle	New Heparin Derivatives
08/236,562	April 29, 1994	Jonathan S. Nimitz	Clean, Tropodegradable Agents With Low Ozone Depletion And Global Warming Potentials To Protect Against Fires And Explosions
08/356,882	Dec. 15, 1994	Manoj Kole	Control Of PH During Bordetella Growth
08/366,547	Dec. 30, 1994	Shideng Bao	A New Cancer Associated Gene, Protein Expessed Therefrom And Used Therefor
08/372,387	Dec. 21, 1994	Giovanni Maria Testa Elio Bertotti	A Hydraulic Control Circuit For Working Members Of Earthmoving Machines
08/415,171	March 31, 1995	Jerry Twomey	Grandiflora Rose Variety Named 'Twofavor'
08/418,343	April 7, 1995	George Gabor	RF Driven Sulfur Lamp
08/433,293	May 3, 1995	Arian Adrienne Van Der Straten-Ponthoz	Expression Of Heterologous Proteins In Drosophila Cells
08/446,533	May 19, 1995	Chi-Deu Chang	A Kit Containing Glutaraldehyde Coated Collodial Metal Particles Of A Preselected Size
08/454,400	May 30, 1995	Kurt Matthew Hoffmeister	Tire Tread Pitch Bands

Application No.	Filing Date	Non-Signing Inventor(s)	Title of Invention
08/457,054	June 1, 1995	Jonathan S. Nimitz	Clean, Tropodegradable Agents

Application No.	Filing Date	Non-Signing Inventor(s)	Title of Invention
08/556,442	Nov. 9, 1995	Steven G. Christensen	An Apparatus And Method For Assessing Memory In A TDM Network

Application No.	Filing Date	Non-Signing Inventor(s)	Title of Invention
08/457,054	June 1, 1995	Jonathan S. Nimitz	Clean, Tropodegradable Agents With Low Ozone Depletion And Global Warming Potentials To Protect Against Fires And Explosions
08/477,509	June 7, 1995	James Chambers	Novel Peptides Comprising Repetitive Units Of Amino Acids And DNA Sequences Encoding The Same
08/486,523	June 7, 1995	Joseph R. Santosuosso	Display Case With Lens Lighting System
08/486,683	June 7, 1995	Daniel St. Louis	Recombinant Retroviruses
08/500,806	July 11, 1995	Vivien J. Cambridge Thomas L. Koger	Electronic Clinical Thermometer
08/503,955	July 19, 1995	Samuel C. Kingston Steven T. Barham John W. Zscheile, Jr.	Apparatus For Synchronizing Multipoint-To-Point Communications Systems
08/508,918	July 29, 1995	Rajan Bali	Site Security System
08/516,230	Aug. 17, 1995	Michael Shebanow	Method And Appartus For Coordinating The Use Of Physical Registers In A Microprocessor
08/516,840	Aug. 18, 1995	John E. Watkins	An Intelligent Low Power Serial Bus
08/516,850	Aug. 18, 1995	John E. Watkins	A Method For Transmitting Information Over An Intelligent Low Power Serial Bus
08/521,667	Aug. 31, 1995	Brian McGinnis Floyd McWilliams	Modeling Of Object Oriented Database Structures, Translation To Relational Database Structures, And Dynamic Searches Thereon
08/522,567	Sept. 1, 1995	Michael Shebanow	Reclamation Of Processor Resources In A Data Processor
08/522,845	Sept. 1, 1995	Michael Shebanow	Method And Apparatus For Accelerating Control Transfer Returns
08/523,220	Sept. 5, 1995	Donald Olson	Labeling Apparatus And Method
08/523,384	Sept. 5, 1995	Michael Shebanow	Method And Apparatus For Selecting Instructions From Ones Ready To Execute
08/524,195	Sept. 6, 1995	S. Erik Pedersen	Improved Catalysts For The Hydrogenation Of Aqueous Maleic Acid To 1,4-Butanediol
08/536,818	Sept. 29, 1995	Marina E. Janszen	Improved In Situ Amplification Process
08/539,399	Oct. 5, 1995	Robert Ferguson	Parallel Computer
08/540,263	Oct. 6, 1995	Steve S. Lipsky, Jr.	Mobile Or Modular Home Heating And Humidifying System And Method For Installing Humidifier Therein
08/552,434	Nov. 3, 1995	Lester Friedmann	Process For Azeotropic Distillation Of Aqueous Chloral Mixtures
08/555,638	Nov. 8, 1995	Robin Carlson	Boom Suspension Assembly

Application No.	Filing Date	Non-Signing Inventor(s)	Title of Invention
08/556,442	Nov. 9, 1995	Steven G. Christensen	An Apparatus And Method For Assessing Memory In A TDM Network
08/563,784	Nov. 27, 1995	Scott Usher	Miniature Lighting Apparatus
08/600,681	Feb. 13, 1996	Filiberto Rodriguez	Illuminated Tool Caddy

Disclaimers

B1 4,565,351 — Allen C. Conti, Garfield Heights; Armand R. R. Conti, Youngstown, both of Ohio. METHOD FOR INSTALLING CABLE USING AN INNER DUCT. Certificate dated December 1, 1992. Disclaimer filed July 15, 1996, by assignee, ARNCO Corporation.

Hereby enters this disclaimer to claim 17 of said patent

5,039,207 — Bernard J. Green, Harrow, England. LIQUID CRYSTAL DISPLAY DEVICE WITH PRISMATIC LIGHT TRANSMITTING MEMBER. Patent dated August 13, 1991. Disclaimer filed February 28, 1996, by the assignee, THORN EMI PLC.

Hereby enters this disclaimer to claims 1 and 8 of said patent.

5,450,903 — Peter Budde, Chevreuse, France. FILL VALVE. Patent dated September 19, 1995. Disclaimer filed May 13, 1996, by the assignee, Weatherford/Lamb, Inc.

Hereby enters this disclaimer to all claims of said patent.

Disclaimers and Dedications

4,853,866 — Mario Andrada Galan; Antonio Romero Lledo; Vincente Calzado Requena, all of Madrid, Spain. METHOD AND APPARATUS FOR MATCHING PANELS TO BE CUT FROM PATTERNED FABRICS. Patent dated August 1, 1989. Disclaimer and Dedication filed July 22, 1996, by the assignee, Investronica Inc.

Hereby disclaims and dedicates to the Public all claims of said patent.

4,961,171 — Raymond Pinkham, Missouri City; Anthony M. Balistreri, Houston, both of Texas. READ/WRITE MEMORY HAVING AN ON-CHIP INPUT DATA REGISTER. Patent dated October 2, 1990. Disclaimer and Dedication June 17, 1996, by the assignee, Texas Instruments Incorporated.

Hereby disclaims and dedicates to the public the remaining term of said patent.

Removal From Register

Pursuant to 37 CFR § 10.11(b), a survey letter was directed on January 19, 1996, to the last post office address furnished to the Office of Enrollment and Discipline by each of the persons whose name and address appear on the following list. With respect to some of the letters, no reply was received within the period of forty-five (45) days therein set. Other letters were returned by the Post Office with notations to the effect that the addressee was deceased, unknown, or had moved and left no forwarding address or the forwarding had expired.

Accordingly, the names of the folowing persons have been removed from the Register of Patent Attorneys and Agents.

August 2, 1996

KAREN L. BOVARD
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Office of Enrollment & Discipline

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170–920 O.G.–96–2: QL3

Sutter, Andrew J., 1410 Holmby Ave., Los Angeles, Calif.	5,463,671	5,492,953	5,509,067	5,521,591
	5,464,541	5,493,149	5,509,159	5,521,940

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Errata

In the Notice of Certificates of Correction appearing at 1189 O.G. 16, delete all reference to Patent No. 5,511,737, since no Certificate of Correction was granted.

Errata

In the Notice of Certificate of Corrections appearing at 1187 O.G. 39, delete Patent No. 5,451,700, the number was erroneously mentioned and should be deleted.

Certificate of Correction
For Week of September 17, 1996

Re. 35,262	5,291,333	5,395,183	5,439,010
D. 367,250	5,300,334	5,401,372	5,441,804
D. 370,364	5,301,414	5,402,376	5,442,477
D. 371,577	5,302,724	5,402,471	5,442,555
4,646,911	5,310,929	5,402,528	5,442,635
4,714,407	5,312,216	5,403,673	5,443,815
5,021,357	5,314,679	5,403,932	5,446,101
5,063,416	5,316,842	5,404,125	5,446,276
5,081,082	5,322,784	5,411,534	5,449,238
5,086,315	5,324,584	5,412,228	5,449,790
5,166,090	5,327,975	5,416,517	5,451,195
5,171,713	5,344,760	5,417,726	5,451,570
5,184,170	5,345,767	5,419,225	5,452,061
5,185,330	5,349,887	5,421,904	5,452,400
5,187,288	5,356,791	5,424,424	5,453,522
5,240,313	5,361,996	5,424,938	5,453,823
5,241,966	5,363,310	5,427,261	5,455,233
5,242,796	5,366,569	5,427,812	5,455,691
5,245,340	5,370,802	5,428,778	5,456,693
5,265,323	5,375,867	5,430,109	5,458,432
5,269,378	5,376,531	5,434,246	5,458,819
5,271,971	5,382,692	5,436,584	5,458,940
5,286,222	5,384,221	5,437,397	5,459,831
5,288,854	5,387,096	5,438,302	5,463,038
5,463,671	5,492,953	5,509,067	5,521,591
5,464,541	5,493,149	5,509,159	5,521,940
5,465,950	5,493,897	5,509,216	5,521,982
5,467,425	5,494,149	5,509,251	5,522,143
5,468,545	5,494,360	5,509,436	5,522,311
5,468,880	5,494,649	5,509,576	5,522,694
5,470,532	5,494,717	5,510,008	5,523,310
5,473,099	5,494,776	5,510,222	5,523,400
5,474,448	5,495,881	5,510,408	5,523,798
5,475,106	5,496,462	5,510,888	5,523,911
5,476,446	5,496,536	5,510,938	5,524,003
5,477,386	5,497,027	5,511,234	5,524,034
5,477,743	5,497,390	5,511,559	5,524,249
5,477,853	5,497,738	5,511,669	5,524,392
5,477,877	5,497,794	5,511,982	5,524,471
5,478,066	5,498,119	5,512,055	5,525,048
5,478,301	5,498,246	5,512,080	5,525,167
5,478,500	5,498,300	5,512,153	5,525,243
5,478,861	5,498,461	5,512,873	5,525,332
5,479,493	5,498,478	5,513,067	5,525,757
5,479,700	5,498,635	5,513,215	5,525,977
5,479,849	5,498,752	5,513,825	5,526,508
5,480,011	5,499,121	5,514,401	5,526,729
5,480,135	5,500,015	5,514,420	5,526,869
5,480,998	5,500,102	5,514,452	5,526,994
5,481,361	5,500,153	5,514,807	5,527,220
5,481,481	5,500,257	5,514,832	5,527,527
5,482,034	5,500,551	5,515,204	5,527,763
5,482,965	5,500,725	5,515,373	5,527,869
5,483,299	5,501,039	5,516,008	5,528,156
5,483,578	5,501,894	5,516,266	5,528,409
5,484,214	5,502,094	5,516,357	5,528,551
5,485,322	5,502,469	5,516,628	5,528,632
5,485,438	5,502,739	5,516,755	5,528,656
5,485,716	5,502,764	5,517,042	5,528,723
5,486,080	5,503,505	5,517,095	5,529,970
5,486,544	5,503,730	5,517,329	5,530,017
5,486,769	5,503,886	5,517,445	5,530,143
5,487,952	5,504,337	5,517,456	5,530,147
5,488,028	5,504,844	5,517,623	5,530,406
5,488,088	5,504,878	5,518,028	5,530,450
5,488,103	5,505,224	5,518,298	5,531,171
5,488,246	5,505,470	5,518,360	5,531,581
5,488,996	5,505,658	5,519,334	5,531,950
5,489,018	5,505,787	5,519,401	5,532,167
5,489,236	5,505,980	5,519,475	5,532,464
5,489,494	5,506,611	5,519,770	5,532,572
5,489,519	5,506,681	5,520,101	5,532,682
5,489,852	5,506,948	5,520,287	5,532,956
5,490,894	5,507,189	5,520,748	5,533,508
5,491,069	5,507,267	5,520,893	5,533,597
5,491,478	5,507,603	5,521,139	5,534,471
5,491,792	5,507,739	5,521,264	5,535,774
5,492,921	5,508,831	5,521,495	5,536,637
5,492,946	5,508,944		

Summary of Final Decisions
Issued by the
Trademark Trial and Appeal Board
July 1-5, 1996

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
7-1	EX	74/325,262	DowBrands L.P.	2(d)	Refusal Affirmed		"CURL TAMER" [hair styling preparations, namely, conditioners, and holding and styling aids]	"FRIZZ-TAMER" [hair conditioner]	No
7-2	CANC (SJ)	23,559	The Clorox Co. v. Chemical Bank	whether registration based on intent-to-use application is invalid because application was assigned, prior to filing of statement of use, without business to which mark pertained	Petitioner's motion for summary judgment; finding registration invalid granted	"SOFT SCRUB" [household cleanser]	"SUPER SCRUB" [tub, tile and all purpose household cleanser]		Yes
7-3	EX	74/321,027	Tandy Brands Accessories, Inc.	2(e)(4)	Refusal Affirmed		"HICKOK" [sporting goods; namely, basketballs, baseballs, golf clubs, golf balls, etc.]		No

([1])EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (SJ) = SUMMARY JUDGMENT; (R) = RBQ. FOR RECONSIDERATION

SPECIAL BOXES FOR PATENT MAIL

Special box designations should be used to allow forwarding of particular types of mail to the appropriate areas as quickly as possible. Such mail is forwarded to the appropriate area without being opened. Only the following designations should be used:

Summary of Final Decisions
Issued by the
Trademark Trial and Appeal Board
July 8-12, 1996

Issue	Party/Parties	Proceeding or App'n No.	Type of Case[1]	Date Issued
2(d); whether applicant is required, under Sec. 6, to disclaim the word ATHLETICS apart from the mark as a whole	Jeff Anderson dba JC Sports	74/501,423	EX	7-9
2(d)	Biodroga Cosmetic GmbH	74/324,445	EX	7-10
2(d)	Parsons Technology, Inc.	74/370,740	EX	7-10

TTAB Decision	Opposer's/ Petitioner's Mark and Goods/Services	Applicant's/ Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Recommended for Publication
Refusal Affirmed (on both grounds)		"EPIC ATHLETICS" [casual shirts and hats]	"EPIC" and "EPIC SURF AND SKATE" [both for shirts, shorts and pants]; "EPIC DESIGNS" [men's and women's shirts, sweaters, ties, shorts and pants]	No
Refusal Affirmed		"SKIN INITIATIVE" [cosmetics and moisturizers, namely, skin moisturizers, hand, face and body lotions, oils and creams, skin creams and lotions]	"BIO-INITIATIVES" and "BIO-INITIATIVES" (and design) [both for cosmetics, namely, creams, pomade ointment, balm, tonic lotions, make-up, etc.]	No
Refusal Affirmed		"FORM CREATOR" [computer programs for producing custom forms for the user's personal or business use]	"THE CREATOR" [computer programs]	No

(1)EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (SJ) = SUMMARY JUDGMENT; (R) = REQ. FOR RECONSIDERATION

SPECIAL BOXES FOR PATENT MAIL

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Box _____
Assistant Commissioner for Patents
Washington, D.C. 20231

Box Designations	Explanation
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box FWC	Requests for File Wrapper Continuation Applications (under 37 CFR 1.62).
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box Missing Parts	Response to the Notice to File Missing Parts of Application and associated papers and fees.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filing of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for *original* request papers *only*.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications *prior* to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

SPECIAL BOXES FOR TRADEMARK MAIL

Special box designations should be used to allow forwarding of particular types of trademark mail to the appropriate areas as quickly as possible. In addition to these box designations, filers are encouraged to indicate whether the contents of the envelope contain a fee. Envelopes containing a fee should be marked "FEE;" envelopes not containing a fee should be marked "NO FEE." Box designations and "FEE/NO FEE" indicators should appear on the envelope as well as on the cover sheet or first page of any document.

Please address mail as follows:

Box _____
FEE (or NO FEE)
Assistant Commissioner for Trademarks
2900 Crystal Drive
Arlington, Virginia 22202-3513

Box Designations	Explanation
Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOUs) and extension requests.
Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

Reference Collections of U.S. Patents and Trademarks
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SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

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Please address mail as follows:

Box _____
Commissioner of Patents and Trademarks
Washington, D.C. 20231

Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor *except* communications relating to *pending litigation and disciplinary proceedings*; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box M Fee	Correspondence regarding patent maintenance fees and related matter.
Box OED	Mail for the Office of Enrollment and Discipline.

Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries

The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information in various formats from the U.S. Patent and Trademark Office. Many PTDLs have on file all full-text patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs have both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office*. The full-text utility and design patents are distributed numerically on 16 mm microfilm, and plant patents on color microfiche. Patent and trademark search systems on CD-ROM (Compact Disc-Read Only) format are available at all PTDLs to increase utilization of and enhance access to the information found in patents and trademarks. It is through the CD-ROM systems that preliminary patent and trademark searches can be conducted through the numerically arranged collections.

All information is available for use by the public free of charge.

In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4488
	Sunnyvale Center for Innovation, Invention and Ideas	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6249
Connecticut	New Haven: Science Park Library	(203) 786-5447
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(317) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 689-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Media Union Library, University of Michigan	(313) 647-5735
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
Minnesota	Minneapolis Public Library and Information Center	(612) 372-6570
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6579
New Hampshire	Concord: New Hampshire State Library	Not Yet Operational
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
	Buffalo and Erie County Public Library	(716) 858-7101

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PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner

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State	*Name of Library*	*Telephone Contact*
	New York Public Library (The Research Libraries)	(212) 592-7000
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Akron - Summit County Public Library	Not Yet Operational
	Cincinnati and Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	(503) 768-6786
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Patee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaquez General Library, University of Puerto Rico	Not Yet Operational
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(803) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-6822
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University	Not Yet Operational
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN B. KITTLE, Director	308-0661	10/20/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	07/20/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director	308-0651	09/19/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	01/12/95
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	07/29/94
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	09/13/94
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	01/17/95
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—BOBBY R. GRAY, Director	305-9600	10/21/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	08/08/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	01/20/95
TELECOMMUNICATIONS, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	12/13/94
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	01/16/95
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director	308-1113	06/02/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director	308-1148	10/06/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	05/22/95
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	04/20/95
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	10/18/94

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

REEXAMINATIONS

SEPTEMBER 17, 1996

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Bucher, Director, Trademark Examining Office
Condition of Trademark Applications as of August 1, 1996

Law Office	Oldest Date New*	Oldest Date Amendment Filed
Law Office 101—Ron Williams, Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	12/14/95	04/10/96
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/22/96	02/12/96
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/05/96	06/26/96
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/22/96	04/01/96
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/27/96	05/01/96
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/06/96	02/08/96
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/17/96	01/30/96
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services–Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/14/96	03/18/96
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/15/96	05/15/96
**Collective Marks—Class 200		
**Certification Marks—Classes A & B		
Office of Trademark Services—Vacant (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	01/26/96	—0—
Renewals (All Classes)	05/02/96	—0—
Section 12(c) Publications (All Classes)	02/29/96	—0—

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

SEPTEMBER 17, 1996

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,615,806 (2998th)
REMOVAL OF IODIDE COMPOUNDS FROM NON-AQUEOUS ORGANIC MEDIA
Charles B. Hilton, Corpus Christi, Tex., assignor to American Hoechst Corp., New York, N.Y.
Reexamination Request Nos. 90/003,792, Apr. 12, 1995 and 90/004,166, Mar. 4, 1996.
Reexamination Certificate for Patent 4,615,806, issued Oct. 7, 1986, Ser. No. 708,992, Mar. 7, 1985.
Int. Cl.[6] B01D *15/04*
U.S. Cl. 210—690

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–7 is confirmed.

1. A method for removing iodide compounds from a non-aqueous organic medium comprising contacting the medium containing said iodide compounds with an ion exchange resin characterized in that the resin is a macroreticulated strong-acid cation exchanged resin which is stable in the organic medium and has at least one percent of its active sites converted to the silver or mercury form.

REISSUES

SEPTEMBER 17, 1996

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,329

ELECTRONIC BLACKBOARD AND ACCESSORIES SUCH AS WRITING TOOLS

Azuma Murakami, Kanagawa-ken; Kazuo Aoki, Saitama-ken; Tsuguya Yamanami, Saitama-ken; Yoshiaki Tomofuji, Saitama-ken; Takeshi Tanaka, Saitama-ken; Satoshi Inashima, Saitama-ken; Takahiko Funahashi, Saitama-ken; Toshihide Chikami, Saitama-ken, and Toshiaki Senda, Saitama-ken, all of, Japan, assignors to Wacom Co., Ltd., Saitama-ken, Japan

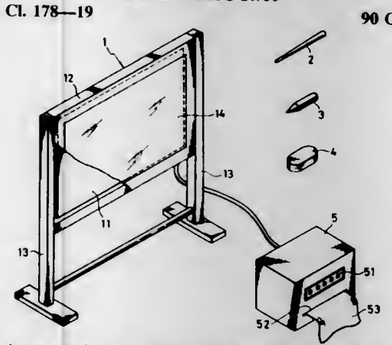
Original No. 5,023,408, dated Jun. 11, 1991, Ser. No. 365,388, Jun. 13, 1989. Application for reissue Jun. 10, 1993, Ser. No. 74,569

Claims priority, application Japan, Jun. 22, 1988, 63-154518

Int. Cl.[6] G08C *21/00*

U.S. Cl. 178—19

90 Claims



29. Apparatus for identifying a characteristic and position of an implement having one of plural characteristics, the implement including a tuned circuit having one of plural different resonant frequencies, comprising a position sensing tablet; a two coordinate direction coil arrangement associated with the tablet; means for supplying AC energy at the plural different resonant frequencies to the coil arrangement; the tuned circuit on the implement when placed in proximity to the tablet and coil arrangement causing changes in current flowing in the coil arrangement at said one frequency; means for sensing changes in the current flowing in the coil arrangement at said different frequencies and responsive to the current changes at said frequencies for deriving a signal indicative of the position and characteristic of the implement on the tablet.

Re. 35,330

HOT TIP CATHETER ASSEMBLY

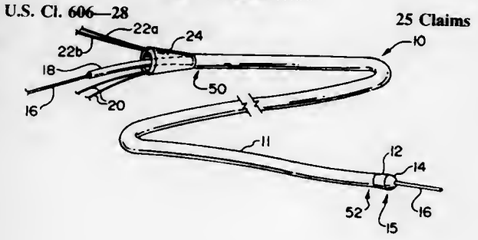
David G. Malone; James L. Vacek, both of Mission, Kans., and G. Scott Smith, Colorado Springs, Colo., assignors to University of Kansas Medical Center, Kansas City, Kans.

Original No. 5,057,105, dated Oct. 15, 1991, Ser. No. 571,212, Aug. 23, 1990. Continuation-in-part of Ser. No. 399,773, Aug. 28, 1989, abandoned. Application for reissue Oct. 13, 1993, Ser. No. 136,414

Int. Cl.[6] A61B *17/38*

U.S. Cl. 606—28

25 Claims



11. A method for applying energy to heat tissue comprising the steps of

locating a catheter with an energy applying element next to tissue,

applying energy to the element while monitoring the temperature of the element,

comparing the monitored temperature of the element with a selected temperature,

determining the deviation between the monitored temperature of the element and the selected temperature,

determining the change of the deviation over time, and

applying energy to the element in response to both the deviation and the change of the deviation over time.

PLANT PATENTS

GRANTED SEPTEMBER 17, 1996

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,643

NECTARINE TREE 'CRYSTAL BELLE'

Jean L. Escande, 47500 Fumel, Sainte-Vite, France

Filed Aug. 2, 1995, Ser. No. 510,262
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—40.1 **1 Claim**

1. A new and distinct variety of nectarine tree substantially as illustrated and described and which is somewhat similar to the Arctic Glo nectarine tree [U.S. Plant Pat. No. 7,884] which matures in approximately the same season, but which is distinguishable therefrom, and characterized principally as to novelty by producing fruit which are mature for harvesting and shipment on approximately June 1 through June 11 under the ecological conditions prevailing in the San Joaquin Valley of Central California, and which further has an attractive, bright red exterior coloration, and is semi-freestone, to freestone by nature.

9,644

AECHMEA FASCINI VARIEGATED FRIEDERIKE'

Wilhelm K. H. Pieper, Dehmke, auf der Horst 2, 3258 Aerzen 9, Germany

Filed Feb. 23, 1995, Ser. No. 393,226
Int. Cl.[6] A01H *5/00*
U.S. Cl. Plt.—88.8 **1 Claim**

1. A new and distinct variety of *Aechmea fascini* Friederike plant, substantially as herein shown and described and characterized particularly as to novelty by spineless, variegated leaf margins.

PATENTS

GRANTED September 17, 1996

ERRATA

For CLASS	See PATENT NO.
405–259	5,555,634
405–303	5,555,635
215–249	5,555,988
220–062	5,555,989
473–309	5,556,097
473–373	5,556,098
463–035	5,556,107
463–045	5,556,108
475–087	5,556,343
475–235	5,556,344
475–085	5,556,350
475–160	5,556,351
475–275	5,556,354
475–332	5,556,355
477–163	5,556,356
493–023	5,556,360
482–124	5,556,368
482–131	5,556,369
600–236	5,556,417
008–549	5,556,435
216–093	5,556,553
210–767	5,556,555
205–784	5,556,556
210–787	5,556,557
508–545	5,556,569
510–188	5,556,572
510–535	5,556,573
510–383	5,556,577
156–172	5,556,601
422–300	5,556,607
429–210	5,556,627
514–362	5,556,909
540–030	5,556,962

ERRATA–CONTINUED

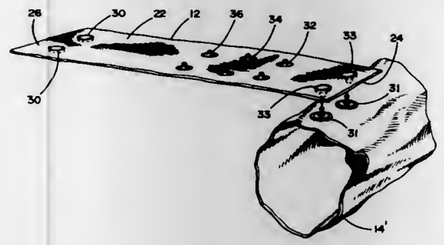
For CLASS	See PATENT NO.
554–190	5,556,970
554–211	5,556,972
558–319	5,556,984
564–492	5,557,011
568–401	5,557,014
356–139	5,557,347
358–296	5,557,412
358–296	5,557,413

PATENTS

GRANTED SEPTEMBER 17, 1996

GENERAL AND MECHANICAL

5,555,561
CUFF SEAL FOR ANTI-CONTAMINATION PROTECTIVE GARMENTS
Christopher Plachta, Kalamazoo, and Gregory L. Bain, Watervliet, both of Mich., assignors to Traak, Inc., Kalamazoo, Mich.
Filed Jun. 28, 1993, Ser. No. 82,396
Int. Cl.[6] A41D *13/00*
U.S. Cl. 2—2 **13 Claims**



1. In a one-piece body-covering garment for protecting the body and limbs of a wearer from external contamination, wherein the garment is fabricated from a non-elastic fabric having a sufficiently small pore size to resist particulate infiltration, the garmet having legs and arms and having cuffs at distal ends of the legs and arms, at least one of the cuffs being substantially non-elastic, the improvement comprising a cuff seal releasably attached to at least one of the non-elastic cuffs, the cuff seal comprising an elongated elastically stretchable band having inner and outer ends, the inner end of the band being attached to the cuff by releasable cuff fasteners, such that the band can be removed from the garment, and the garment and band can be washed and replaced independently of each other, the band being long enough to be wrapped at least once completely around a limb of a wearer that protrudes through the cuff, the cuff seal further including releasable seal fastener means for fastening the outer end of the band to an intermediate portion of the band at a position where the outer end overlaps the band and the band is stretched snugly around the limb, such that the band closes the cuffs snugly and resiliently on the wearer's limb and effectively restricts contaminant infiltration into the garment through the cuffs.

5,555,562
ARTICULAR CONDITIONING SYSTEM
Steven J. Holt, and Alan W. Holt, both of 2383 Wine Ridge Dr., Birmingham, Ala. 35244
Filed Sep. 2, 1994, Ser. No. 300,409
Int. Cl.[6] A41D *1/00*
U.S. Cl. 2—69 **12 Claims**

6. An articular conditioning system including an article of apparel, said article of apparel comprising:

a main torso portion for surrounding the torso of a human body, said torso portion having a neck opening, and first and second flexible arm portions for surrounding and extending to the respective wrists of the body, and first and second leg portions for surrounding and extending along the respective legs of the body, said arm portions and said leg portions being integrally connected to said torso portion, and wherein said torso portion, said arm portions and said leg portions are each formed of a lightweight, stretchable and breathable material;

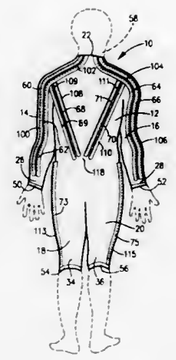
a first solid elastomeric weight member extending along substantially the full length of said first arm portion, said first weight member being arranged to extend over the shoulder for the respective arm, said first weight member including a proximal portion and a distal portion, said proximal portion being located adjacent said neck opening, said distal portion being located at the respective wrist, and wherein said weight member has tensile strength such that the position of said distal portion is maintained at least partially by said proximal portion, said weight member being a solid strip of elastomeric material, and a replacement flexible weight member for replacing said first weight member, with the length of said replacement weight member being substantially the same as the length of said first weight member, and wherein said replacement weight member is heavier than said first weight member;

a second elastomeric weight member extending substantially from said neck opening and along substantially the entire length of said second arm portion, said second weight member including a proximal portion and a distal portion, and wherein said second weight member has tensile strength such that the position of said distal portion of said second weight member is maintained at least partially by said proximal portion of said second weight member;

a third elastomeric weight member extending along substantially the entire length of said first leg portion, and a fourth elastomeric weight member extending along said second leg portion;

fifth and sixth elastomeric weight members located on a back portion of said torso portion, the lengths of said fifth and sixth weight members being essentially the same as the lengths of said third and fourth weight members; and

connecting means including pockets for connecting said first, second, third, fourth, fifth and sixth flexible weight members to said arm portions, said leg portions and said back portion, and for holding said first, second, third, fourth, fifth and sixth weight members tightly against the human body, each said pocket including a zipper for removing the respective weight member from said pocket, said zipper being shorter than said pocket and said weight member and wherein said article of apparel is arranged to prevent the respective weights of said first, second, third, fourth, fifth and sixth weight members from shifting with respect to said arm portions, leg portions and back portion.

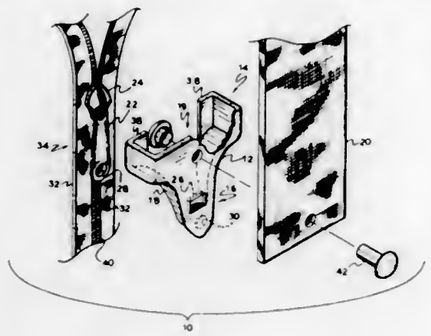


5,555,563
NECKTIE
Richard E. Ear, 13419 Pocono Ct., Herndon, Va. 22070
Filed Jun. 7, 1995, Ser. No. 478,775
Int. Cl.[6] A41D *25/00;25/02;25/16*
U.S. Cl. 2—148 **2 Claims**

1. A frame for supporting a prefabricated knot of a pre-tied necktie, the necktie having a wide front end and an adjustable neck

5,555,566
METHOD OF ENHANCING POSTURE USING GARMENT POCKET STRUCTURE

the guard to the front of the helmet such that the guard is hinged at the top of the helmet and can swing in the fore and aft directions, the improvement comprising:



band including a zippered loop, the loop having opposite sides adjustably zipped together by a zipper camming element, the camming element having a stem with a throughbore, said frame comprising:

a substantially planar wedge-shaped front surface having a narrow lower portion and a wide upper portion, the wide upper portion including an aperture for receiving a rivet to connect the wide front end of the tie to said frame, said wedge shaped front portion including opposing side edges;

two primary flanges disposed substantially perpendicular to said front surface, each of said primary flanges extending rearwardly from one of said side edges of said front surface, each of said primary flanges having a wide end adjacent said wide upper portion of said front surface, said primary flanges tapering from a maximum width at said wide end to a zero width adjacent said narrow lower portion of said front surface;

two secondary flanges connected to said wide ends of said primary flanges, said secondary flanges extending inwardly toward each other substantially parallel to said front surface to define a trough for retaining the neck band;

a horizontal loop extending rearwardly from said lower portion of said front surface for holding the stem of the zipper camming element; and

a boss extending rearwardly from said lower portion of said front surface for engaging the throughbore of the stem of the zipper camming element.

5,555,564

APPARATUS FOR CLEANING A SHOE SOLE AND METHODS FOR MAKING AND USING SAME

Januarius Welch, 11670 Ely, Davisburg, Mich. 48350

Filed Jun. 2, 1995, Ser. No. 459,125

Int. Cl.[6] A41B *11/00;* **A41D** *13/00*

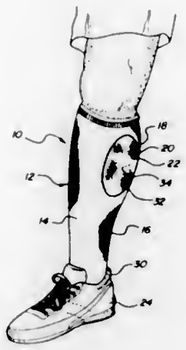
U.S. Cl. 2—239 **19 Claims**

1. A garment of the type worn surrounding the lower portion of one leg, said garment comprising:

an upper tube portion having the shape of a single tube and extending from a lower ankle region to and truncating at an upper band to allow said ankle region to encircle the leg at a point below the calf and adjacent the ankle of a human leg while said upper band encircles the leg at a point below the crotch and adjacent the knee;

a wiping pad supported adjacent an outer surface of said upper tube portion to absorb and retain moisture, said wiping pad including a wiping surface to wipe dust and debris from the sole of an athletic shoe to improve traction;

a moisture barrier supported between said wiping pad and said upper tube portion and shaped to prevent any portion of said wiping pad from contacting or transferring moisture to the leg or said upper tube portion.



5,555,565

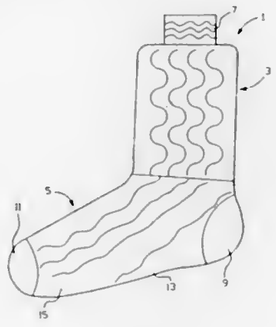
THICK PILE SOCK WITH HETEROGENEOUS BODY AND FOOT PORTIONS, AND SOCK SYSTEM THEREWITH

Joseph E. Gallagher, Jr., Mechanicsville, Pa., assignor to Tanner Lynx Corporation, Flemington, N.J.

Filed Jun. 23, 1995, Ser. No. 493,909

Int. Cl.[6] A41B *11/00;* **A43B** *17/00;* **D04B** *9/46*

U.S. Cl. 2—239 **17 Claims**



1. A thick pile sock, which comprises:

(a) a foot portion having a heel and toe and base, and having a fiber content for dispersion of pressure points over body bone prominences by decreasing pressure, and for prevention of separation of fibers under compression while retaining resiliency, which fiber content consists of an intimate blend of non-elastic synthetic and natural fibers, said non-elastic synthetic fibers being selected from the group consisting of polypropylene, polyester, nylon, polyacrylic materials, and mixtures of these, for enhancing structure and enhancing wicking action, and said natural fibers being selected from the group consisting of wool, cotton, and mixtures of these, for enhancing absorption and resiliency;

(b) a body portion beginning at least one and one-half inches above said heel of said foot portion, and extending upwardly therefrom, and having a fiber content which consists of at least 60% of said synthetic and natural fibers of said foot portion and the balance being heterogenous elastic synthetic fibers; and,

(c) an elastic band located above said body portion and attached to an upper portion of said body portion.

5,555,566

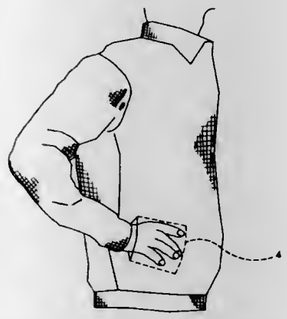
METHOD OF ENHANCING POSTURE USING GARMENT POCKET STRUCTURE

Louis Kuhn, 136 Sutton Pl. South, Lawrence, N.Y. 11559

Filed Mar. 2, 1995, Ser. No. 397,383

Int. Cl.[6] A41D *27/20*

U.S. Cl. 2—247 **3 Claims**



1. A method of enhancing posture, comprising the steps of:

providing a garment including a pair of exterior front panel portions each extending from a side seam to a front edge coinciding with a center line of the garment;

strategically placing a restraining pocket on each front panel portion of the garment;

providing an opening for each of the restraining pockets such that the wearer of the garment can comfortably place their hand into the opening;

providing each restraining pocket with a shallow depth defined by a back seam opposite the pocket opening, the shallow depth of the pocket being less than that of a standard pocket such that the back seam restricts the movement of the wearer's hand;

placing the hands of the wearer inside the restraining pockets such that the hands are restrained to thereby force the wearer's shoulders back resulting in an improved posture and appearance.

5,555,567

ADJUSTABLE SIDE ATTACHMENT STRAP FOR HELMET AND FACE SHIELD

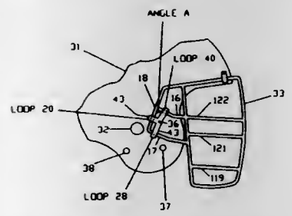
Thomas A. Corpus, 2682 Mulberry La., Arlington Sq., Greenville, N.C. 27858

Continuation-in-part of Ser. No. 786,093, Oct. 31, 1991, Pat. No. 5,293,649. This application Mar. 19, 1993, Ser. No. 34,691

The portion of the term of this patent subsequent to Mar. 15, 2011, has been disclaimed.

Int. Cl.[6] A41D *13/00;* **A42B** *3/00*

U.S. Cl. 2—424 **8 Claims**



1. In a helmet that has a faceguard constructed of a series of bars, including bars in the rear section that extend in an inclined vertical direction, and a first front attachment means for attaching the guard to the front of the helmet such that the guard is hinged at the top of the helmet and can swing in the fore and aft directions, the improvement comprising:

at least two separate straps attached to the helmet at at least a common attachment point, forming a unitary positively restricting side attachment means connected to the helmet, said side attachment means having at least two portions which engage the face guard along two separate areas thereof, to positively restrict face guard movement to a significant degree in the fore and aft directions and in the inclined vertical direction, wherein respective axes of at least some of said at least two portions are non-parallel.

5,555,568

UNDERPANTS FOR MEN HAVING EXTENDABLE SANITARY PORTION

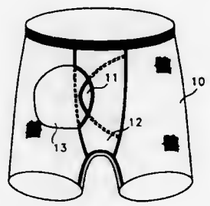
In K. Yon, 617-106, Jukong Apt. #124, Sangil-dong, Kangdong-gu, Seoul, Rep. of Korea

Filed Dec. 5, 1994, Ser. No. 349,671

Claims priority, application Rep. of Korea, Jul. 19, 1994, 1994-17913

Int. Cl.[6] A41B *9/02*

U.S. Cl. 2—403 **10 Claims**



1. Underpants for men comprising:

a divided portion through which a penis can pass; and

a sanitary section having a predetermined area and at least first and second sides, one of which is fixed on an external side of said divided portion such that movement of said sanitary section is allowed for cleaning said penis after urination.

5,555,569

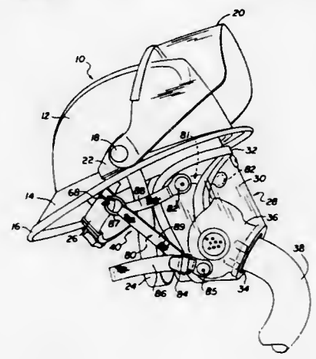
HELMET AND FACE MASK INTERFACE SYSTEM

Abbott A. Lane, Dayton, Ohio, assignor to Firequip Helmets, Inc., Dayton, Ohio

Filed Mar. 18, 1994, Ser. No. 210,707

Int. Cl.[6] A42B *3/18;* **A62B** *18/00*

U.S. Cl. 2—424 **29 Claims**



1. A helmet and face mask system comprising:

5,555,571

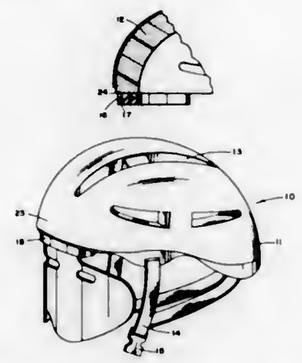
a neck adjustably coupling said filter assembly to said odor collector for permitting reciprocal movement over said range,

5,555,574

SUPPORT FOR END WALL AND SWIMMING POOL

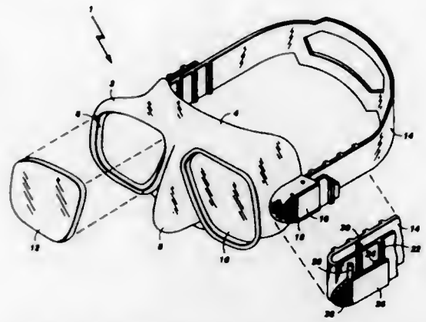
1. A helmet and face mask system comprising:
a helmet including a headband assembly for suspending said helmet on a head of a wearer, said headband assembly including an annular headband adapted to contact a wearer's head, a webbing diametrically attached to said headband, a first connector component attached to said headband at one rear side thereof, and a second connector component attached to said headband at an opposite rear side thereof;
a mask shaped to engage a face of said wearer; and
means for attaching and drawing said mask to said first and second connector components such that an integral connection is formed between said mask and said headband assembly;
said attaching means holding both said helmet on said wearer's head and said mask against said wearer's face securely by drawing said mask and said headband assembly toward each other; and
said attaching means including means for adjustably supporting said mask in a horizontal and vertical direction.

5,555,570
BICYCLE HELMET FACE SHIELD APPARATUS AND METHOD
William P. Bay, Jr., 46 S. St. Andrews, Ormond Beach, Fla. 32174
Filed Mar. 31, 1995, Ser. No. 414,326
Int. Cl.[6] A42B *3/22*
U.S. Cl. 2—424 **13 Claims**



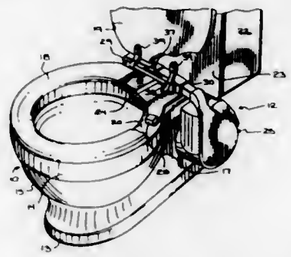
1. A method of removably attaching a bicycle helmet face shield to a bicycle helmet comprising the steps of:
selecting a bicycle helmet having a front edge portion;
selecting a bicycle helmet transparent shield having a predetermined attaching edge thereon;
selecting a resilient shield attaching member having a plurality of parallel elongated slots therein;
bending said selected resilient shield attaching member to the general curvature of a bicycle helmet front portion and attaching said shield attaching member to said bicycle helmet front edge portion in a curved position with said plurality of slots therein facing downward from said helmet; and
attaching said shield in at least one of said parallel elongated slots in said resilient shield, whereby a bicycle shield can be removably attached to a bicycle helmet in one of a plurality of positions on to the helmet.

5,555,571
COLLAPSIBLE DIVING MASK
Scott A. McCaffrey, 59 Oakden Ave., South Weymouth, Mass. 02190
Filed Aug. 8, 1994, Ser. No. 287,146
Int. Cl.[6] A61F *9/02*
U.S. Cl. 2—428 **21 Claims**



1. A collapsible SCUBA diving mask for covering a diver's face, eyes and nose during a compressed air dive, the mask comprising:
a flexible mask body having substantially the width of the diver's face, the body having an interior and a nose pocket communicating with the interior for enclosing the diver's nose, the mask body being sufficiently flexible that it can be folded about the nose pocket when the diving mask is fully assembled;
a flexible skirt integrally molded with the mask body for sealing the mask body to the diver's face;
a pair of rigid lens pieces mounted in the mask body in a water-tight fashion and positioned in front of the diver's eyes;
a mask strap; and
a pair of adjustment mechanisms for attaching the mask strap to the mask body.

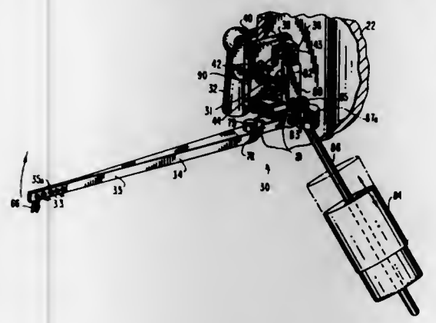
5,555,572
TOILET BOWL VENTILATING AND DEODORIZING APPARATUS
Clyde J. Hunnicutt, Jr., 3026 E. Garfield St., Phoenix, Ariz. 86008
Continuation of Ser. No. 124,815, Sep. 21, 1993, Pat. No. 5,488,741. This application Jun. 7, 1995, Ser. No. 483,149
Int. Cl.[6] E03D *9/052*
U.S. Cl. 4—213 **29 Claims**



1. A toilet ventilating and deodorizing apparatus for extracting and filtering air from a toilet bowl, said apparatus comprising:
an odor collector for extracting air from said toilet bowl;
a filter assembly for deodorizing the air extracted from said toilet bowl, said filter assembly reciprocally moveable over a range toward said odor collector and away from said odor collector;

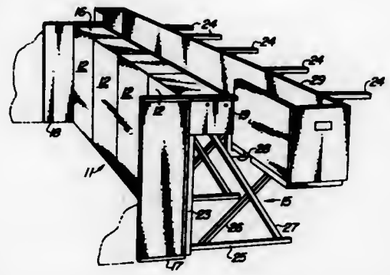
a neck adjustably coupling said filter assembly to said odor collector for permitting reciprocal movement over said range, said odor collector and said neck supporting said filter assembly adjacent said toilet bowl;
switch means carried by said odor collector for activating said filter assembly;
a power source for supplying power to said assembly; and
a power circuit coupling said power source to said filter assembly and said switch means, said power circuit including a first contact carried by said odor collector and a second contact carried by said neck, said first contact and said second contact in engagement over the entire said range.

5,555,573
TOILET FLUSHING DEVICE WITH WATER SAVING FEATURES
Robert M. Jenson, E. Brunswick, N.J., assignor to American Standard Inc., Piscataway, N.J.
Filed Apr. 21, 1995, Ser. No. 426,380
Int. Cl.[6] E03D *1/14*
U.S. Cl. 4—325 **21 Claims**



1. A dual flush device for use in a toilet tank having a flush valve supportable on a valve seat, said valve being actuated by a pivotable actuation arm for effecting both a short flush cycle and a long flush cycle, comprising a cam rotatably supported on said toilet tank adjacent said actuation arm, a handle for selectively rotating said cam in a first direction and in a second direction, opposite said first direction, said cam, when rotated in said first direction, pressing against said actuation arm to pivot said actuation arm to lift said flush valve a distance above said valve seat such that said valve will be fully open, to effect said long flush, said cam, when rotated in said second direction, pressing against said actuation arm to pivot said actuation arm to lift said flush valve a distance above said valve seat insufficient for said valve to become fully open, to effect said short flush, a lever pivotably supported with respect to said actuation arm between a first position where movement of said actuation arm is not blocked and a second position where said lever contacts said actuation arm for a predetermined period of time to partially block movement of said actuation arm when said cam is rotated in said second direction, and a float coupled to said lever for determining said predetermined period of time, said float pivoting said lever into said second position when said cam is rotated in said second direction.

5,555,574
SUPPORT FOR END WALL AND SWIMMING POOL COVER
Robert P. Wason, 1201 Laurelwood Dr., Crestwood, Ky. 40014, and David E. Hall, 1529 46th Ave., Moline, Ill. 61265
Continuation-in-part of Ser. No. 137,928, Nov. 15, 1993, abandoned. This application Nov. 3, 1994, Ser. No. 335,362
Int. Cl.[6] E04H *4/10;4/00*
U.S. Cl. 4—502 **2 Claims**



1. In a end-wall assembly of a swimming pool having a rectangular end wall between adjacent ends of rectangular side walls, the end wall having a smooth horizontal upper surface at a somewhat lower level than the upper surface of each of said adjacent side walls of said walls of said swimming pool, a plurality of spaced reinforcing identical fixture rigidly secured to side end wall, said fixture being parallel and in respective vertical planes extending perpendicularly outwardly from said end wall in a direction mechanism and pool cover, said receptacle having a horizontal bottom and two vertical opposite sides, wherein the improvement comprises,
each of said identical fixtures having a rigid upper supporting member extending generally horizontally outwardly from said end wall, each of said supporting members having an intermediate U-shaped configuration forming a supporting horizontal bottom and two opposite vertical sides, said fixtures being secured precisely at the same level on said end wall such that the bottom of each of U-shaped configurations is on a horizontal plane that is a predetermined distance below said upper surface of said end wall, and said elongated receptacle positioned upright on said supporting horizontal bottoms of a plurality of successive ones of said U-shaped configurations, the respective ones of said vertical sides of said successive configurations being spaced slightly farther apart than the width of said elongated receptacle.

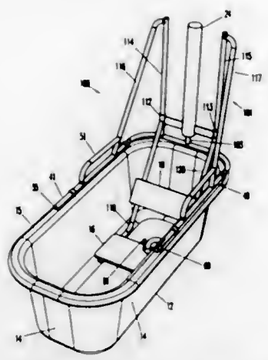
5,555,575
LIFT ASSEMBLY
William A. B. Anscombe-Black, Maroochydore, and Allan J. Farthing, Mooloolaba, both of Australia, assignors to Aqua Medics Pty. Ltd., Maroochydore, Australia
PCT No. PCT/AU92/00603, § 371 Date Aug. 29, 1994, § 102(e) Date Aug. 29, 1994, PCT Pub. No. WO93/08783, PCT Pub. Date May 13, 1993
PCT Filed Nov. 9, 1992, Ser. No. 244,012
Claims priority, application Australia, Nov. 8, 1991, PK9353
Int. Cl.[6] A47K *3/02*
U.S. Cl. 4—563.1 **5 Claims**

1. A lift assembly for use on a bath tub or reservoir having an upper perimeter flange or rim, comprising:
support means for supporting a person to be raised and lowered;
mounting means for mounting said support means for movement between predetermined upper and lower positions and including a tubular frame member adapted for at least partial engagement with an upper perimeter flange or rim of a bath tub or reservoir, said mounting means including guide means

a sheet secured between said first and second longitudinal members, said sheet including a first loop and a second loop;

5,555,578
MATTRESS LINEN SECURING DEVICE

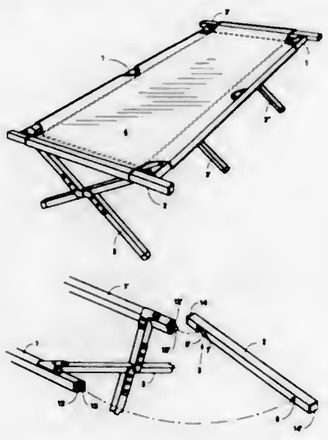
a water piping means arranged within said network of grooves and having two opposite ends extended out of said mattress;



upstanding from said tubular frame member, and carriage means reciprocatably mounted to said guide means; and

a hydraulic ram assembly for raising and lowering said support means between said predetermined upper and lower positions, said hydraulic ram assembly including a cylinder assembly operatively connected to said support means for movement therewith and a piston assembly slidably engaged therein and operatively connected to said tubular frame member such that relative movement between said piston assembly and said tubular frame member is prevented, said tubular frame member being adapted to convey fluid to and from said cylinder assembly through a passage provided in said piston assembly to raise and lower said support means: said cylinder assembly and said support means being secured to said carriage means for reciprocating movement therewith.

5,555,576
SECTIONAL FOLDING BED
Seong R. Kim, 4B-09, Koex, 159-1, Samsung-Dong, Kangnam-Ku, Seoul, Rep. of Korea
Filed Jan. 17, 1995, Ser. No. 386,983
Int. Cl.[6] A47C *17/72;17/64*
U.S. Cl. 5—114 **4 Claims**



1. A sectional folding bed, comprising:

a first longitudinal member including a first protrusion and a second protrusion at its respective ends;

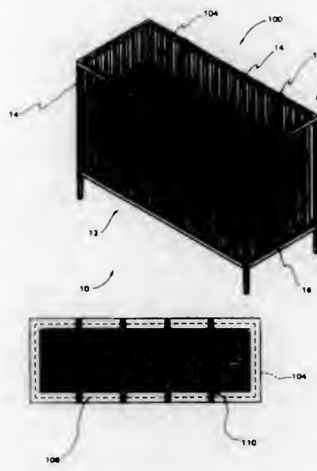
a second longitudinal member including a first protrusion and a second protrusion at its respective ends;

a sheet secured between said first and second longitudinal members, said sheet including a first loop and a second loop;

a first cross member placeable through said first loop, said first cross member including first and second holes that receive a respective one of said first protrusions of said first and second longitudinal members;

a second cross member placeable through said second loop, said second cross member including a hole for receiving said second protrusion of said first longitudinal member and a locking member for receiving said second protrusion of said second longitudinal member, said locking member including a cavity having a ramp and a depression wherein said ramp facilitates the placement of said second protrusion of said second longitudinal member into said depression.

5,555,577
CRIB ADAPTER
Rosemary Volpe, 34 Farmingdale Rd., Parsippany, N.J. 07054
Filed Oct. 4, 1995, Ser. No. 539,333
Int. Cl.[6] A47D *7/00;15/00*
U.S. Cl. 5—93.1 **3 Claims**

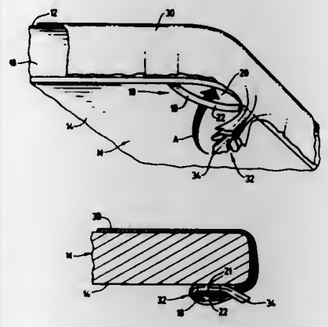


1. A crib adapter for supporting an infant safely above the mattress of a crib having a mattress and lateral walls including top rails, said crib adapter comprising:

a sleeping surface panel providing a sleeping surface for the infant, said sleeping surface panel fabricated from a flexible fabric permeable to air currents; and

suspension means for suspending said sleeping surface panel from the lateral walls of the crib, said suspension means maintaining said sleeping surface panel above and out of contact with the mattress and comprising a plurality of downwardly open hooks for engaging the top rails of the crib, each one of said open hooks attached to said sleeping surgace panel, said sleeping surface panel further comprising a perimetric frame, said flexible fabric removeably attached to said perimetric frame, and said sleeping surface panel having fastening means enabling manual removal of said flexible fabric from said perimetric frame.

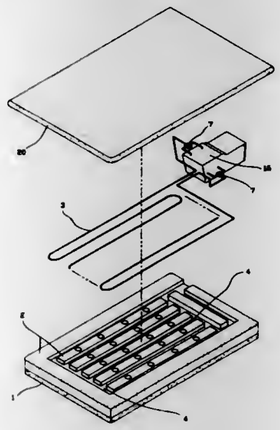
5,555,578
MATTRESS LINEN SECURING DEVICE
Curtis Wyatt, 31192 Casa Grande Dr., San Juan Capistrano, Calif. 92675, and Arnold Balonick, 17301 Ouesan Pl., Encino, Calif. 91316
Filed May 25, 1995, Ser. No. 450,536
Int. Cl.[6] A47C *21/02*
U.S. Cl. 5—460 **16 Claims**



1. A linen securing device for securing bed linen to a mattress, said mattress having an upper surface and lower surface with corners, comprising:

at least one elongated member having first and second ends coupled to said mattress, said member positioned diagonally across a corner of said bottom surface of said mattress forming a space for receiving a portion of said bed linen and securing said bed linen between said member and said bottom surface of said mattress.

5,555,579
MATTRESS ASSEMBLY WITH SEMICONDUCTOR THERMO-CONTROL
Wen-Pin Wu, 4F. No. 6-3, Lane 208, Szu Wei Road, Taipei, Taiwan
Filed Mar. 3, 1994, Ser. No. 250,870
Int. Cl.[6] A47C *21/04*
U.S. Cl. 5—421 **3 Claims**



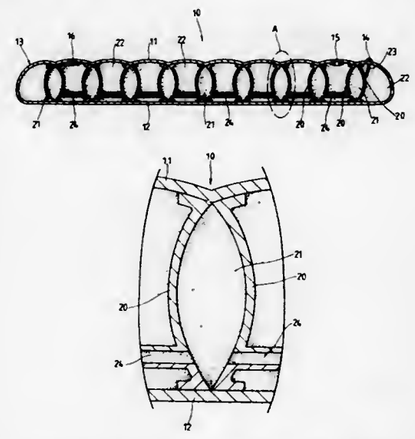
1. A mattress assembly comprising:

a mattress having a network of internal grooves and a soft covering layer therefor;

a water piping means arranged within said network of grooves and having two opposite ends extended out of said mattress; and

a control box connected to the two opposite ends of said water piping, said control box comprising an electronic control circuit, a semiconductor chip having opposed sides coupled to said circuit, a cold water reservoir disposed adjacent one side of said semiconductor chip, a hot water reservoir disposed adjacent the opposite side of said semiconductor chip, heat dissipating means mounted on said hot water reservoir on a side opposite said semiconductor chip, said semiconductor chip being coupled to said electronic control circuit so that the flow of electricity therethrough will cause the temperature at one side adjacent said cold water reservoir to decrease and the temperature at an opposite side adjacent said hot water reservoir increase, said cold and hot water reservoirs having respective inlet and output ports connected each to one end of said water piping means valve means at said ports for controlling the flow therethrough and a hot water pump coupled to said electronic control circuit to pump water from the output port of said hot water reservoir to the input port thereof through said water piping, and a cold water pump coupled to said electronic control circuit to pump water from the output port of said cold water reservoir to the input port thereof through said water piping.

5,555,580
WATER BED WITH INNER COMMUNICABLE AIR CHAMBERS
Yu Chun Hsia, No. 3, Chiao Ai 9th Road, Hsin Tien City, Taipei Hsien, Taiwan
Filed Jul. 28, 1995, Ser. No. 508,682
Int. Cl.[6] A47C *27/10*
U.S. Cl. 5—665 **1 Claim**



1. A water bed having inner communicable air chambers, comprising:

a mattress body formed from an upper sheet and a lower sheet sealed together by means of radioheating, said mattress body having an air inlet, a water inlet, and an air vent formed thereon at predetermined positions, said mattress body having four rounded peripheral edges and corners;

a plurality of long air chambers arranged in parallel inside said mattress body at predetermined intervals and being sealed to and between said upper and said lower sheets of said mattress body by means of radioheating, said air chambers having an oval-shaped cross-sectional contour which allows said air chambers to change their diameter in accordance with an amount of air filled therein and external pressures applied

thereto, said air chambers dividing an inner space of said mattress body into a plurality of alternate air and water passages, said air chambers extending less than the full length

5,555,582
CONVERTIBLE BED
Thomas H. Jerideau, 209 Kennington Dr., Goose Creek, S.C.

providing a member comprised of a body of formable material sealed inside a flexible container, the formable material being a silicone gel comprising uncured silicone rubber, an effective

thereto, said air chambers dividing an inner space of said mattress body into a plurality of alternate air and water passages, said air chambers extending less than the full length of said mattress body such that a communicating water passage is formed inside said mattress body along said rounded periphery inside said mattress body along said rounded periphery thereof to surround said parallel arrangement of air chambers;

a tube having one end connected to said air inlet and another end connected to one of said air chambers, said one end being located at an outer side of said parallel arrangement of air chambers for inflating said air chambers; and

a plurality of transversely extended communicating channels being integrally provided near a bottom portion of said parallel arrangement of air chambers at predetermined intervals for permitting said air chambers to be inflated more quickly;

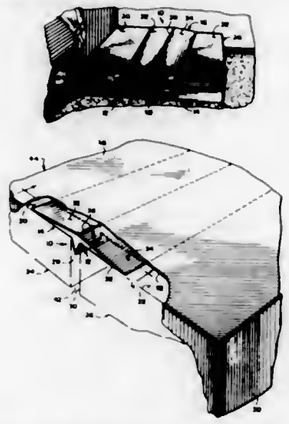
whereby air can be filled into said air chambers via said air inlet and water can be filled into said water passages via said water inlet while said air vent is opened to let out any air displaced from inside said water passages, permitting said mattress body to be maintained in a soft, elastic, stable condition and to have a reduced weight due to said air chambers occupying a large space in said mattress body to reduce an amount of water required to fill the mattress body.

5,555,581

BED BRIDGE AND MATTRESS COVER

Claudia Woods, 1459 St. Louis Dr., Honolulu, HI. 96816

Filed Aug. 24, 1995, Ser. No. 519,084
Int. Cl.[6] A47G *9/00;* **A47C** *21/00*
U.S. Cl. 5—502 **11 Claims**



1. A bed bridge and mattress cover for converting a pair of beds into a larger single bed comprising:

a) a platform member; and

b) an elongated protrusion projecting downwardly from the center of said platform member, whereby when said platform member is placed upon juxtaposed portions of the top surfaces of two adjacent mattresses of the beds, said elongated protrusion will extend down between the sides of the two adjacent mattresses, so that when the two adjacent mattresses are pushed together, said elongated protrusion will then cause said platform member to properly position itself on the top surfaces of the two adjacent mattresses, said mattress cover including:

c) pair of top sheets centrally enclosing said platform member and said elongated protrusion therebetween; and

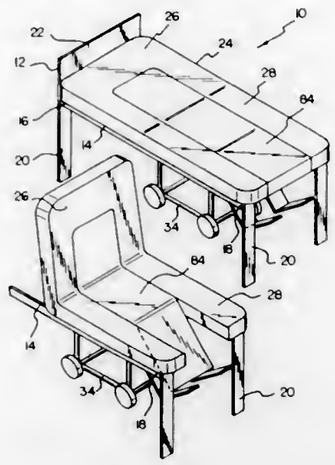
d) a skirt to extend about the perimeter of said pair of top sheets, so as to fit about the exposed sides of the two adjacent mattresses of the pair of beds.

5,555,582

CONVERTIBLE BED

Thomas H. Jerideau, 209 Kennington Dr., Goose Creek, S.C. 29445

Filed Mar. 6, 1995, Ser. No. 400,746
Int. Cl.[6] A61C *7/00;7/10*
U.S. Cl. 5—600 **5 Claims**



2. A new and improved convertible bed for converting a bed to a wheelchair for the convenience of an occupant and caregivers comprising, in combination:

a stationary bed frame having a U-shaped mattress extending along two horizontal support frames thereof, the U-shaped mattress having a locking means secured to an inner portion thereof;

a wheelchair support frame having a pivot portion secured to opposing sides thereof, each pivot portion having a vertical notch and a horizontal notch therein, a lower support of the wheelchair support frame having an axle extending outwardly from end portions thereof, each axle having a wheel coupled thereto;

a foot support frame pivotally secured to lower portions of the wheelchair support frame;

a back support frame having two support legs, each of the support legs having a locking pin theresecured, each locking pin selectively corresponding with the vertical notch or the horizontal notch of the pivot portion of the wheelchair support frame, each of the two support legs having a handle theresecured, each handle having a notch therein, each notch selectively corresponding with the locking means of the stationary bed frame;

an inner mattress extending along an upper surface of the foot support frame and the wheelchair support frame and the back support frame.

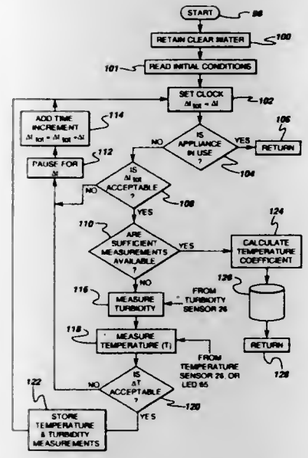
5,555,583

DYNAMIC TEMPERATURE COMPENSATION METHOD FOR A TURBIDITY SENSOR USED IN AN APPLIANCE FOR WASHING ARTICLES

Ertugrul Berkcan, Schnectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 10, 1995, Ser. No. 386,382
Int. Cl.[6] D06F *33/02*
U.S. Cl. 8—158 **7 Claims**

1. A dynamic temperature compensation method for a turbidity sensor used in an appliance for cleansing articles, said method comprising:



retaining substantially particle-free liquid upon completion of cleansing operations in said appliance;

reading initial values of temperature and turbidity of said liquid;

measuring additional values of temperature and turbidity of said liquid at predetermined time intervals; and

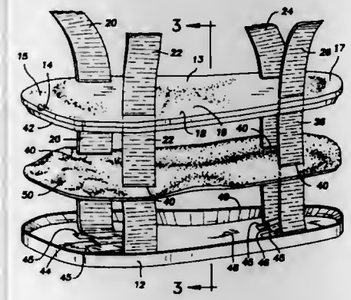
calculating a temperature coefficient, based upon respective ones of said initial and additional values of temperature and turbidity, for characterizing a temperature response of said turbidity sensor over a predetermined temperature range.

5,555,584

METHOD OF PRODUCING CUSTOM-FITTING ARTICLES AND COMPOSITION FOR THE USE THEREWITH

Dan T. Moore, III, Cleveland Heights; Deborah L. James, Cleveland; Maurice E. Wheeler, Ashtabula; William H. Weber, Novelty, and James W. Hoover, Akron, all of Ohio, assignors to Polymer Innovations, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 2,281, Jan. 8, 1993, abandoned, which is a continuation-in-part of Ser. No. 972,237, Nov. 5, 1992, abandoned. This application Jul. 16, 1993, Ser. No. 93,282
The portion of the term of this patent subsequent to Jan. 8, 2013, has been disclaimed.
Int. Cl.[6] A43D *9/00;* **A61F** *5/14;* **A43B** *7/14;* **C08L** *83/00*
U.S. Cl. 12—142 N **27 Claims**



1. A method of producing a custom-fitting article which conforms to the shape of a body part of a mammal, the method comprising the steps of:

providing a member comprised of a body of formable material sealed inside a flexible container, the formable material being a silicone gel comprising uncured silicone rubber, an effective amount of crosslinking agent, and effective amounts of a) fine powder (30 mesh maximum) ethylene copolymer or terpolymer or a mixture thereof and b) liquid plasticizer to form a gel effective to receive and retain an impression, said formable material being capable of remaining at room temperature without curing, the body of formable material having a minimum setting temperature greater than 130° F. and being setable by heating for a period not exceeding thirty minutes and subsequent cooling,

conforming the member by biasing the member against the body part with sufficient pressure to conform the member to the shape of the body part, and

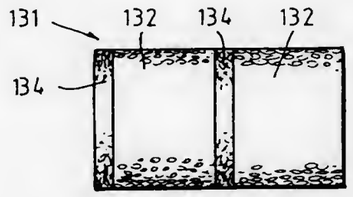
thereafter heating the member for a period not exceeding thirty minutes and thereafter cooling the member so that the formable material is set and the member remains flexible while resiliently retaining an impression of the body part and is utilizable by the mammal as part or all of the custom-fitting article.

5,555,585

PNEUMATIC GUN AND PROJECTILES THEREFOR

Jeffrey B. Fowler, Bedford, Australia, assignor to Compri Technic Pty., Ltd., Bayswater, Australia

Division of Ser. No. 983,849, Mar. 3, 1993, Pat. No. 5,329,660. This application Jul. 18, 1994, Ser. No. 276,615
Claims priority, application Australia, Aug. 10, 1990, PK 1710; Nov. 15, 1990, PK 3364
Int. Cl.[6] B08B *9/04*
U.S. Cl. 15—3.5 **12 Claims**



1. A projectile for a hand held pneumatic gun, the projectile comprising:

a cylindrical portion of high density foamed plastics material having an outside diameter falling within the range 4 mm to 60 mm inclusive, the projectile being adapted to be pushed by compressed air through a tube of slightly less diameter than the cylindrical portion, the foamed plastics material having a density that falls in the range of 80 to 200 kg/m^3 to provide sufficient friction between the projectile and the wall of the tube to remove contaminants and also to substantially prevent air from passing through the projectile whereby, in use, the inner surface of the tube can be substantially cleaned of contaminants,

said projectile being in the form of a pellet wherein one or more layers of abrasive material is bonded to the cylindrical portion to enhance the cleaning properties of the pellet.

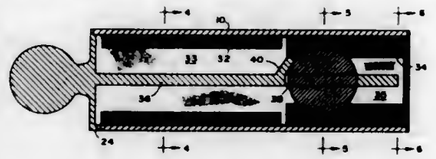
5,555,586

SELF-CONTAINED PORTABLE GOLF BALL WASHING

a plurality of arms having ends rotatable about an axis, wherein

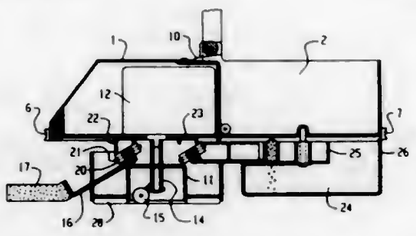
insert front end wall, said side locking strips sized to snap into said respective side locking grooves, and said front locking

5,555,586
SELF-CONTAINED PORTABLE GOLF BALL WASHING UNIT
Allen Dorrich, 9021 Sahler, Brookfield, Ill. 60513, and Willis D. Fillers, 10105 - 107 Cut-Off, Greenville, Tenn. 37743
Filed Sep. 7, 1995, Ser. No. 524,840
Int. Cl.[6] A63B *47/04*
U.S. Cl. 15—21.2 **1 Claim**



1. A portable self-contained golf ball washer including a generally cylindrical washer body closed at one end and open at the other; a closure member positioned to sealingly overlie the open end of the washer body and including an external handle portion and an internal paddle portion, said paddle configured to extend within and substantially to the closed end of the washer body, first and second brush modules shaped to conform to the interior of the washer body and positioned therewithin in longitudinal spaced relation to each other along their respectively longitudinal edges for substantially the full length of the washer body, wherein said first brush module includes bristles configured to extend into said washer body to a first depth and said second brush module includes bristles configured to extend into said washer body to a different depth than the bristles of said first brush module, the bristles of said first and second modules collectively defining a central circular core within said washer body of two different diameters, said brush modules configured to define by their respective longitudinal edges a space also extending substantially the full length of the washer body, such spaced module edges defining therebetween a track configured to accommodate at least one edge of the paddle when the paddle is inserted to a position within the washer body, and ball retention means in said paddle including a ball receiving opening and a ball retention lug extending partially thereover.

5,555,587
FLOOR MOPPING MACHINE
Dwipendra N. Guha, Calcutta, Ind., assignor to The Scott Fetzer Company, Westlake, Ohio
Filed Jul. 20, 1995, Ser. No. 504,432
Int. Cl.[6] A47L *11/292*
U.S. Cl. 15—98 **7 Claims**



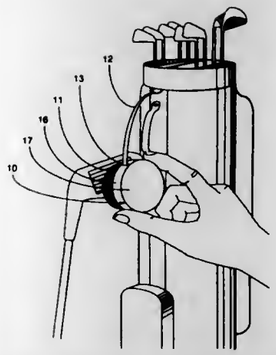
1. A floor mopping machine for automatic mopping of a surface to be cleaned comprising:
a movable housing;
a rotatable mopping member connected to said housing, said rotatable mopping member including a plurality of spongy mop pieces capable of soaking liquid and releasing the same when pressed, wherein during rotation of the mopping member, said spongy mop pieces are pressed on the surfaces to be cleaned, wherein said mopping member further comprises:
a plurality of arms having ends rotatable about an axis, wherein said mop pieces are placeably held to the arms at their ends away from the axis of rotation;
a guiding member provided in said housing for guiding the arms carrying the mop pieces back and forth between mopping and pressing positions; said mopping machine also comprising:
a rotating member connected to said mopping member for rotating the mopping member;
a storing receptacle provided in said housing including an aqueous cleaning medium and dispensing the same to said spongy mop pieces;
a pressing member connected to said housing for pressing the spongy mop pieces to release the liquid held by the said pieces; and
a collector connected to said housing for collecting the liquid released by the spongy mop pieces.

5,555,588
DEVICE FOR CLEANING THE INTERIOR OF A WIND INSTRUMENT
Karl-Heinz Viesehon, 7, 40789, Monheim, Germany
Filed Feb. 17, 1994, Ser. No. 199,571
Claims priority, application Germany, Feb. 19, 1993, 43 05 118.9
Int. Cl.[6] B05C *17/00;* **A47L** *13/46;* **G10G** *7/00*
U.S. Cl. 15—104.16 **10 Claims**

1. A device for cleaning an interior of a wind instrument, said device comprising:
a cleaning body said cleaning body comprising a convexly curved part and a circular disk with a top side said curved part and said disk each made of at least one of the materials selected from the group consisting of foamed rubber, foamed plastic, and foamed latex, and a bottom side, wherein said convexly curved part is selected from the group consisting of a segment of a sphere and a segment of ellipsoid;
wherein said segment has a front convexly curved surface and a planar rear surface and is connected with said planar rear surface to said top side of said circular disk;
said planar surface having a diameter that is smaller than a diameter of said circular disk;
an elongate pulling part having a first end connected to said front convexly curved surface remote from said circular disk for pulling said device through the wind instrument; and
wherein said front convexly curved surface is a cleaning surface adapted to engage and clean the interior of the wind instrument when dulled therethrough.

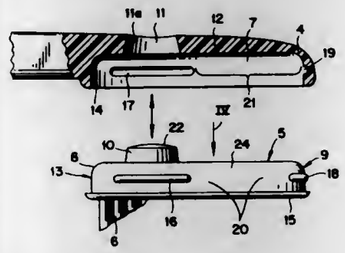
5,555,589
GOLF CLUB AND GOLF SHOE CLEANING DEVICE
Daniel L. Moultrie, 2058 Mills Ave., Claremont, Calif. 91711
Filed Mar. 22, 1995, Ser. No. 408,638
Int. Cl.[6] A46B *5/02;9/02;15/00*
U.S. Cl. 15—105 **4 Claims**

1. A golf club and golf shoe cleaning device comprising:
a container having two opposed ends, with the first end having an exterior surface suitable for printing, and the second end having a plurality of brush bristles extending outwardly from the exterior surface of said second end, the container further includes an aperture between said opposed ends; passing through the aperture is a flexible tether, the flexible tether having two ends with the first end of said flexible tether



residing outside said container and includes means for attachment to a convenient surface; the second end of said flexible tether is attached to and wound around a coiled spring powered revolvable hub that resides within said container, the spring being wound within the revolvable hub in a direction that urges said flexible tether to rewind on said hub after it has been reeled out of said container by a manual withdrawing force.

5,555,590
TOOTH BRUSH
Alwin Blum, Bensheim, and Matthias Georgi, Siegburg, both of Germany, assignors to Fuchs GmbH, St. Augustin, Germany
Filed Aug. 15, 1995, Ser. No. 515,362
Claims priority, application Germany, Sep. 28, 1994, 44 34 617.4
Int. Cl.[6] A46B *9/04*
U.S. Cl. 15—167.1 **4 Claims**



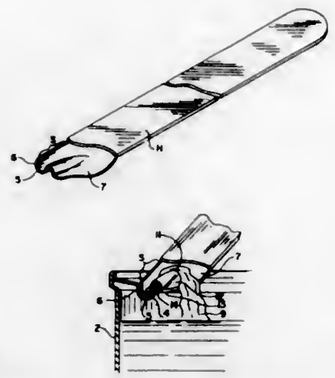
1. A tooth brush comprising:
a handle forming a rear gripping portion and a front head part, said head part including an open, oblong mounting recess having front and rear end walls interconnected by side walls, substantial portions of said recess side walls tapering toward said front end wall, only one side locking groove being formed on each recess side wall, and a front locking groove being formed on said recess front end wall, a section of each recess side wall situated between said front locking groove and said respective side locking groove being substantially smooth and free of said locking grooves; and
a bristle insert having bristles, said insert configured to be snapped into said recess, said bristle insert comprising front and rear end walls interconnected by side walls, substantial portions of said insert side walls tapering toward said insert front end wall, only one side locking strip being formed on each insert side wall, and a front locking strip formed on said insert front end wall, said side locking strips sized to snap into said respective side locking grooves, and said front locking strip sized to snap into said front locking groove, a section of each insert side wall situated between said front locking strip and said respective side locking strip being substantially smooth and free of said locking strips, said section of each insert side wall engaging said respective section of said recess to form a wedging action between said sections of said mounting recess and said bristle insert, said bristle insert including a release button projecting in a direction opposite said bristles and received in an opening formed in a wall of said head part, said button being situated closer to said insert rear end wall than to said insert front end wall.

5,555,591
BATH SCRUBBER
Che-Yuan Chang, No. 1, Lane 147, Sec. 2, Chung San Rd., Yun Lin, Chang Hua Hsien, Taiwan
Filed Oct. 24, 1995, Ser. No. 547,156
Int. Cl.[6] A47K *7/02*
U.S. Cl. 15—210.1 **4 Claims**

1. A bath scrubber, which comprises:
a plurality of scrubbing nets of a cylindrical construction, said scrubbing nets having therein an axial hole and corrugated outer edge portions;
a plurality of fastening members for fastening said scrubbing nets such that said axial hole is separated by said fastening members into a first through hole and a second through hole; and
at least one connection member provided in a midsection thereof with a first line segment and a second line segment, which are received respectively in said first through hole and said second through hole.

5,555,592
PAINT-CAN CHANNEL CLEANER AND RECYCLER
Charles R. Crego, 6928 Essex Dr. SW., Ft. Meyers, Fla. 33919
Filed Dec. 7, 1994, Ser. No. 350,625
Int. Cl.[6] B44D *3/16*
U.S. Cl. 15—236.07 **6 Claims**

1. A device for cleaning a lid channel around the upper perimeter of a paint can by scooping the liquid paint left in the lid channel from previous use of the can, and directing the paint towards an



interior portion of the can, made of one flat and long piece of material, and comprising:

(a) an elongated curved scooping section including an elongated scoop having a lower surface which is shaped to match the shape and size of the lid channel and an upper surface which defines an elongated groove in said scooping section, said scoop further having first and second sides on opposite sides of said elongated groove, a deflecting surface extending along the first side of said scoop to change the flow of the residual paint created by said scooping section, while it is being scooped by pushing the device around the perimeter of the can, said deflecting surface adapted to direct the paint in a direction toward the interior portion of the can along the length of the elongated scoop, the elongated groove in the scooping section having a width which increases from a free end of the scooping section toward an opposite second end of the scooping section and wherein the wider end thereof is curved toward the interior portion of the can when in use;

(b) a discharging surface extending along the second side of the scoop forming a continuation of the scooping section of the device and serving to help direct the flow of paint from the scooping section towards the interior of the can, the discharging surface being separated from the scoop by a member defining a channel for receiving the inner edge of the rim of the can, there being means at the second end of the scooping section adjacent an end of said member for directing the flow of paint from the scoop to the discharging surface; and

(c) a long handle extending from the second end of the scooping section, for holding the device and conveniently pushing around the can in its scooping action.

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VEHICLE DRYING OR POLISHING APPARATUS

Wolfgang Decker, Zusmarshausen-Wollbach, Germany, assignor to Wesumat Fahrzeugwaschanlagen GmbH, Augsburg, Germany

Filed Dec. 20, 1994, Ser. No. 359,576

Claims priority, application Germany, Jan. 27, 1994, 44 02 332.4

Int. Cl.[6] B60S *3/04*

U.S. Cl. 15—302 **7 Claims**

1. In a vehicle drying or polishing apparatus with a device moving the vehicle relative to the apparatus, a flexible, drivable, endless conveyor member guided in a horizontal plane above a path of movement of the vehicle by a plurality of guide wheels arranged on both longitudinal sides of the apparatus and rotating about vertical axes, and a plurality of narrow strips of absorbent material connected to said conveyor member and hanging down vertically therefrom and which are movable by means of said conveyor member transverse to said path of movement of the vehicle, the improvement wherein said conveyor member has two strip-free sections whose respective lengths correspond at least to the greatest vehicle width, and wherein two further sections of said conveyor member lie between said strip-free sections and are each equipped with a plurality of strips, whereby when in an at rest position of said conveyor member, said plurality of strips hang down only on opposite sides of the vehicle, outside said path of movement of the vehicle, and within said path of movement two strip-free gaps are formed, lying one behind the other in said path of movement of the vehicle.

5,555,594

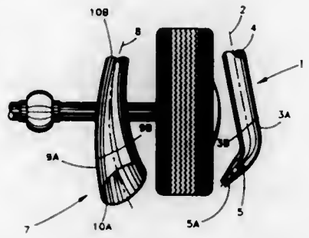
WATER AND DEBRIS DEFLECTOR AND VACUUM

Jack Maddalena, P.O. Box 33128, Portland, Oreg. 97233

Filed Sep. 23, 1994, Ser. No. 311,502

Int. Cl.[6] B60J *9/00*

U.S. Cl. 15—313 **6 Claims**



1. A water and debris deflector and vacuum adapted to automotive and other vehicle use comprising:

A. a first conduit having first conduit inside and outside peripheral surfaces, a first conduit curvilinear line parallel to the first conduit inside and outside peripheral surfaces, a first conduit inlet and a first conduit exhaust;

B. a second conduit having second conduit inside and outside peripheral surfaces, a second conduit curvilinear line parallel to the second conduit inside and outside peripheral surfaces, a second conduit inlet and a second conduit exhaust;

B. means for mounting said first conduit to a vehicle so that said first conduit curvilinear line at the first conduit inlet is substantially parallel with the direction of vehicle travel and at the first conduit exhaust is substantially perpendicular to the direction of travel and at an angle to the road surface such that the exhausted air forces water and debris toward the roadway under the vehicle centerline and toward the second conduit inlet;

C. means for mounting said second conduit to a vehicle so that said second conduit curvilinear line at the second conduit inlet is approximately perpendicular to the direction of vehicle travel and at an angle to the road surface such as to oppose the first conduit exhaust and receive, accept or capture moved or removed water, dirt and debris as accomplished by the first conduit exhaust;

D. means for providing a vacuum or suction source for the second conduit inlet and means to receive and contain, from the second conduit exhaust, water, dirt and other debris received, accepted and captured by the second conduit inlet from the first conduit exhaust, and control means for activating the vacuum or suction source.

5,555,595

CARPET CLEANER UNIT WITH ADJUSTABLE POWER CONTROL

James R. Ligman, Santa Barbara, Calif., assignor to Better Cleaning System, Inc., Madera, Calif.

Filed May 26, 1995, Ser. No. 452,126

Int. Cl.[6] A47L *7/00*

U.S. Cl. 15—319 **12 Claims**

1. A cleaner unit for use in cleaning carpet and upholstery and the like, said cleaner unit comprising:

a plurality of electrical loads including at least one heater for heating a cleaning fluid, a pump for circulating the cleaning fluid to a cleaning tool, and a vacuum motor for vacuuming the cleaning fluid and debris from a surface being cleaned;

power cord means for connecting said loads to a power circuit;

means for monitoring and indicating electrical current usage by said cleaner unit during operation; and

an adjustable power control for variably setting current draw of at least one of said loads so that the electrical current usage of said cleaner unit does not exceed the current capacity of the power circuit.

5,555,596

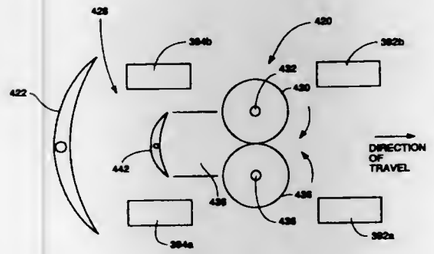
FLOOR CLEANING APPARATUS

Christopher M. Knowlton, Pinehurst, N.C., and Robert J. O'Hara, Castle Rock, Colo., assignors to Windsor Industries, Inc., Englewood, Colo.

Continuation of Ser. No. 233,014, Apr. 25, 1994. This application May 31, 1995, Ser. No. 454,626

Int. Cl.[6] A47L *11/283*

U.S. Cl. 15—320 **20 Claims**



1. An apparatus for cleaning a surface comprising:

a frame;

means, operatively attached to said frame, for cleaning a surface;

at least three wheels for moving said frame and said means for cleaning over a surface; and

means for steering at least one of said at least three wheels;

said means for cleaning includes a first disk brush for scrubbing the surface and that rotates in a clockwise direction about a first vertical axis;

a second disk brush, located adjacent to said first disk brush, for scrubbing the surface and that rotates in a counter-clockwise direction about a second vertical axis;

wherein, during operation of said first and second disk brushes, a stream of wastewater is produced behind said first and second disk brushes, said stream of wastewater is heavier in an area between said first and second vertical axes and lighter elsewhere;

a first squeegee located behind said first and second disk brushes to collect said wastewater; and

a second squeegee located between said first and second disk brushes and said first squeegee, and located to collect at least a portion of the heavier stream of wastewater so that more wastewater is collected.

5,555,597

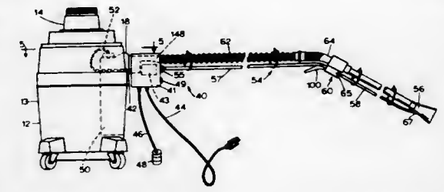
APPARATUS FOR CONVERTING A VACUUM CLEANING DEVICE INTO A LIQUID DISPENSING AND SUCTIONING SYSTEM

Robert C. Berfield, Jersey Shore, Pa., assignor to Shop Vac Corporation, Williamsport, Pa.

Filed Dec. 29, 1994, Ser. No. 366,037

Int. Cl.[6] A47L *7/00*

U.S. Cl. 15—321 **15 Claims**



1. Apparatus for converting a vacuum cleaning apparatus having a first tank, a hose inlet and a suction source coupled to the hose inlet into a liquid dispensing and suctioning system, comprising:

a liquid holding tank for holding liquid;

an attachment head having an outlet for dispensing liquid and an inlet for suctioning liquid;

a housing attachable to the hose inlet and supported by the vacuum cleaning apparatus, further having means extending through the housing for coupling the suction source to the inlet of the attachment head to apply a suction force to a surface to be cleaned; and

means including a pump disposed in the housing and coupled to the holding tank for delivering liquid from the holding tank to the outlet of the head.

5,555,598

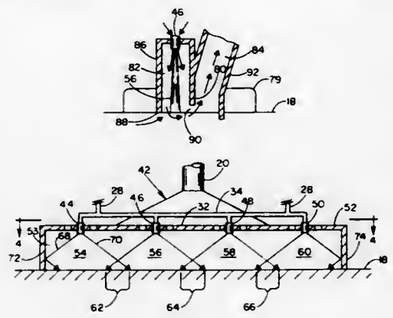
CLEANING TOOL HEAD WITH OVERLAPPING AND OFFSET FLUID SPRAY PATTERNS

Dale L. Grave, Plymouth, and Sung K. Cho, Roseville, both of Minn., assignors to CFR Corporation, New Brighton, Minn.

Filed Apr. 4, 1995, Ser. No. 416,290

Int. Cl.[6] A47L *11/34*

U.S. Cl. 15—322 **24 Claims**



1. A surface cleaning device, including:

a cleaning tool head including a shell having a longitudinal axis extended in a longitudinal direction, and a plurality of fluid spray means mounted to the shell in a row that extends across the shell along said longitudinal axis;

wherein the shell has a substantially planar edge portion adapted for engaging a surface to be cleaned; said edge portion, when contiguous with the surface, orienting the shell and the cleaning tool head in an operating position in which the shell and the surface cooperate to define an enclosed chamber;

wherein each of the fluid spray means sprays fluid in a generally planar and sheet-like spray pattern, and the fluid spray means

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NON-TIPPING WET/DRY VACUUM

Mary B. Carmen, 501 Washington Ave., Jersey Shore, Pa. 17740

for applying a vacuum on demand comprising an elongate generally cylindrical body having a longitudinal axis and a length,

5,555,603

SLIDING CURTAIN CLIP AND GUIDE TRACK

wherein each of the fluid spray means sprays fluid in a generally planar and sheet-like spray pattern, and the fluid spray means are angularly offset from the longitudinal axis by a predetermined offset angle of 1–15 degrees, whereby the spray patterns of the fluid spray means are parallel to one another and define, on said surface, respective elongate spaced apart fluid impingement areas angularly offset from the longitudinal direction by said predetermined offset angle; and

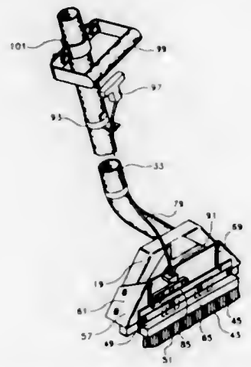
wherein adjacent ones of said fluid impingement areas extend beyond one another to provide regions of overlap, and along said regions of overlap are spaced apart from one another by a distance of at least 0.2 inches (0.5 cm).

5,555,599

CARPET CLEANING BRUSH ASSEMBLY

Jim Markley, 360 N. Andreasen, Escondido, Calif. 92029

Filed Dec. 18, 1995, Ser. No. 574,343
Int. Cl.[6] A47L 9/06
U.S. Cl. 15—322 **13 Claims**



1. A brush assembly for use with a carpet cleaner of the type comprising a cleaning liquid reservoir, cleaning liquid pump, distributing tubing, control valve, and spray nozzle, for applying a thin coating of cleaning liquid to the fibers of a carpet, and a suction nozzle mounted at the lower end of a stiff wand and including suction lines, a suction pump and a catch reservoir to collect the cleaning liquid and solubilized dirt as the nozzle is moved in a back and forth motion over the carpet, said assembly comprising:

a) a brush including a plurality of stiff bristles fixed at their upper end in a wide support and having free lower ends;

b) a bracket for holding said brush in alignment at the suction nozzle, said bracket including means allowing said brush to move from a first upper position out of contact with the carpet to a second lower position wherein said free ends of said bristles come into contact with the carpet;

c) an elongated cable of terminal length extending from a first terminal end connected to said brush upward along the wand to a second terminal end;

d) a first handle attached to said second terminal end of said cable for maneuvering said brush; and,

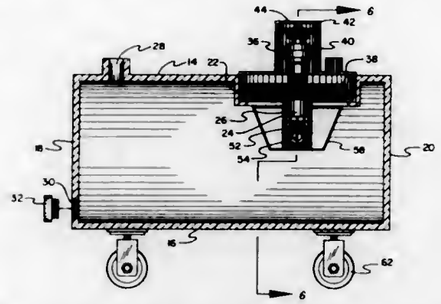
e) a second handle fixed to the wand and positioned above it, intermediate the ends of the wand, and adjacent said first handle for grasping by the user, along with pulling on said first handle, to advance said brush into contact with the carpet, to allow the user to place additional downward pressure on said brush by leaning on the wand against the carpet during the back and forth cleaning motion.

5,555,600

NON-TIPPING WET/DRY VACUUM

Mary R. Corson, 501 Washington Ave., Jersey Shore, Pa. 17740

Filed Mar. 20, 1995, Ser. No. 406,472
Int. Cl.[6] A47L 5/36
U.S. Cl. 15—327.2 **2 Claims**



1. A non-tipping wet/dry vacuum for having a lower center of gravity to prevent tipping over comprising, in combination:

a cylindrical, horizontally disposed tank having an upper portion, a lower portion, a front wall, and a rear wall, the upper portion having a recess formed therein, the recess having an aperture extending downwardly through, the upper portion having a hose inlet inward of the front wall for securement of a hose thereto, the front wall having a threaded aperture formed therethrough adjacent the lower portion, the threaded aperture having a plug removably secured thereto;

a motor secured within a plastic housing above the recess in the upper portion of the cylindrical, horizontally disposed tank, the motor having an impeller disposed above the aperture in the recess, a top of the plastic housing having a plastic grid thereon, the motor having an electric cord extending outwardly of a back portion of the plastic housing, the motor having an on/off switch extending outwardly of a front portion of the plastic housing;

a lid cage extending downwardly from the aperture of the recess of the cylindrical, horizontally disposed tank, the lid cage having a floating ball therein;

a trapezoidal ball float container secured beneath the aperture of the recess of the cylindrical, horizontally disposed tank, the trapezoidal ball float container surrounding the lid cage for protection thereof; and

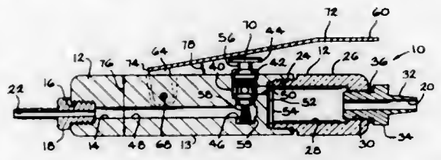
four caster wheels secured to the lower portion of the cylindrical, horizontally disposed tank adjacent to four peripheral points thereon.

5,555,601

ERGONOMIC AND EASILY SERVICEABLE VACUUM PROBE

Perry D. Schultz, North Tonawanda, N.Y., assignor to Wilson Greatbatch Ltd., Clarence, N.Y.

Filed Mar. 22, 1994, Ser. No. 216,491
Int. Cl.[6] A47L 5/24
U.S. Cl. 15—339 **12 Claims**



1. An elongate generally cylindrical vacuum-dependent device sized to be gripped by a person's hand making a fist therearound

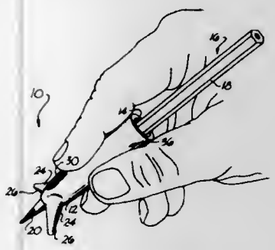
for applying a vacuum on demand comprising an elongate generally cylindrical body having a longitudinal axis and a length, means for connecting said body to a vacuum source, tip means defining an elongate passage having an axially outer opening to said body, said tip means adapted for applying of a vacuum from the vacuum source to the axially outer opening, passage means including means defining a chamber and extending in said body between said vacuum source connecting means and said tip means for directing a vacuum from the vacuum source to said tip means, valve means including a plunger extending radially outwardly of said body and moveable radially outwardly to a first position and radially inwardly to a second position for closing and opening respectively said passage means, means for biasing said valve means to close said passage means, an elongate handle having a length and extending generally longitudinally of said body so that said body and said handle can together be gripped by a person's hand making a fist therearound and having an end portion pivotally connected to said body and spaced from said plunger so that an intermediate portion of said handle overlies said plunger, and said handle being pivotal between a position wherein said plunger is in said first position and a position wherein said handle is depressed toward said body to depress said plunger radially inwardly to said second position whereby, upon release of said handle, said plunger returns to said first position to close said passage means, a particulate filter disposed in said chamber, and means including a portion of said body which is composed of see-through material for allowing viewing into said chamber while a vacuum is being applied whereby a contamination level in the chamber is monitorable, by looking through said see-through material into the chamber, for servicing the filter.

5,555,602

ERASER ASSEMBLY

William T. Leamond, 1727 Wambaw Ave., Charleston, S.C. 29412

Filed Dec. 14, 1994, Ser. No. 355,628
Int. Cl.[6] B43K 29/02
U.S. Cl. 15—428 **14 Claims**



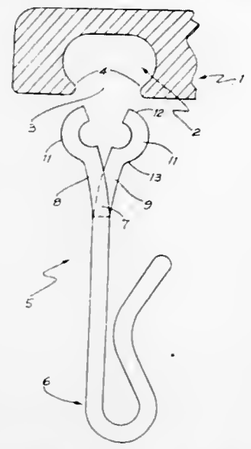
8. An eraser assembly configured for use at the writing end of a writing instrument, said assembly comprising a front end and a body portion with a bore defined therethrough through which the writing end of the writing instrument can protrude; an engaging device for configuring said body portion to the writing end of a writing instrument; at least two eraser arms extending radially opposite each other outward from said body and angled towards said front end of said body, said eraser arms having radially outward ends; and an eraser at said radially outward ends of said eraser arms.

5,555,603

SLIDING CURTAIN CLIP AND GUIDE TRACK

Brian Chester, Potts Point, Australia, assignor to Trychest Proprietary Limited, Potts Point, Australia

Filed Aug. 22, 1994, Ser. No. 293,707
Int. Cl.[6] E05D 15/00
U.S. Cl. 16—87.2 **3 Claims**



1. In combination:

a track member having a horizontal underside, said track member being formed with an elongate slot that is open at the underside of the track member, the slot having a longitudinal entry and the track member including guide means extending longitudinally inside said slot on each side of the entry, and

a plurality of clips each comprising a moulding of resiliently flexible plastic material and having an upper part fitted in the slot above the entry for sliding along the slot, a lower part forming a hook beneath the entry, and a neck that supports the hook from the upper part, and wherein the upper part of each clip comprises at least first and second divergent arms that extend upwardly from the neck through the entry, sliding surfaces on the arms engaging the guide means, and ramp surfaces on the arms for flexing them to facilitate insertion of the clip in the slot, the arms being in-line along the slot so that the first and second arms can be flexed together for insertion of the upper part of the clip in the slot or removal of the upper part of the clip from the slot without mutual interference of the arms.

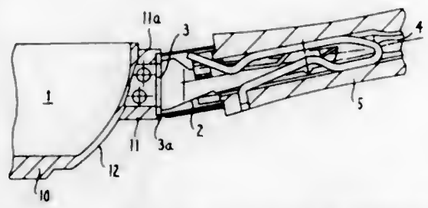
5,555,604

HANDLE FASTENING ON A UTENSIL, FOR EXAMPLE A COOKING UTENSIL

Gerd-Diethard Baumgarten, Wilnsdorf-Wilden, Germany, assignor to Heinrich Baumgarten KG Spezialfabrik fuer Beschlagteile, Neunkirchen, Germany

Filed Jul. 7, 1994, Ser. No. 271,825
Claims priority, application Germany, Jul. 10, 1993, 43 23 106.3
Int. Cl.[6] A47J 45/10
U.S. Cl. 16—114 A **17 Claims**

1. In a handle fastening assembly mounting a handle piece on a utensil comprising a longitudinally extending support arm fastenable to the outer periphery of the utensil, and a handle piece having a hollow interior in which said support arm is slidably received so that said handle piece is movable along said support arm, the improvement comprising a shoulder piece disposed on said outer periphery of said utensil, said shoulder piece and said utensil being a single integral piece of a casting material, said support arm being a single integral piece and having at least one arm part which



defines a holding piece of said support arm, said holding piece being received within said shoulder piece, said shoulder piece is cast and said holding piece is secured by said casting material therein, said at least one arm part defining vertically oriented surfaces on opposite sides thereof.

5,555,605

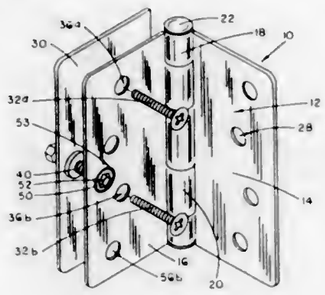
DOOR HINGE ALIGNMENT APPARATUS

Gary M. Mosner, 9301 S. 234th St., Gretna, Nebr. 68028

Filed Oct. 16, 1995, Ser. No. 543,817

Int. Cl.[6] E05D *7/04*

U.S. Cl. 16—247 **10 Claims**



1. A door hinge alignment apparatus for swingably mounting a door on a door frame member and a door jamb spaced from the door frame member and having a door frame member side facing the door frame member and an opposite door side, said apparatus comprising;

a door plate for connection to a door;

a generally flat jamb plate having at least one fastening hole, said jamb plate hingedly connected to said door plate;

a generally flat backing plate spaced from and adjustably connected to said jamb plate and having at least one fastening hole, said backing plate generally parallel with said jamb plate;

adjustable spacing means mounted on said backing plate for adjusting the distance between the door frame member and the door jamb;

said jamb plate and said backing plate adapted to be mounted to the door side and door frame member side, respectively, of the door jamb such that the door jamb is positioned between said jamb plate and said backing plate and said fastening holes of said jamb plate and said backing plate are generally aligned; and

adjustable fastening means extending through said generally aligned fastening holes in said jamb plate and said backing plate for adjustable fastening of said jamb plate and said backing plate to the door frame member.

5,555,606

PAPER FASTNER

Cornel Chu, London, England, assignor to Hi-Tech Industries Limited, London, England

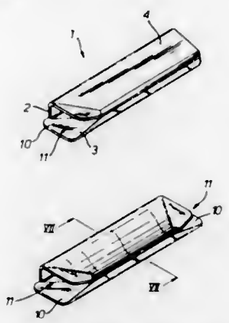
PCT No. PCT/GB93/01168, § 371 Date Dec. 5, 1994, § 102(e) Date Dec. 5, 1994, PCT Pub. No. WO93/25394, PCT Pub. Date Dec. 23, 1993

PCT Filed Jun. 2, 1993, Ser. No. 343,515

Claims priority, application United Kingdom, Jun. 9, 1992, 9212149

Int. Cl.[6] B42F *1/00;21/00*

U.S. Cl. 24—67.9 **14 Claims**



1. A paper fastener comprising a generally channel-sectioned component (1) having a base (2) and first and second opposed arms (3,4) between which an elongate channel is defined, the base (2) of the channel-section having a substantially planar outer surface which provides a region adapted to be written upon, one of the opposed arms (3) forming a supporting surface for the paper and the other arm (4) serving as a gripping member which engages paper received within the channel-section between the arms (3,4) and biases the paper against the opposed arm (3), the arms (3,4) of the channel-sectioned fastener diverging away from each other in a direction towards one end of the channel-section such that the elongate channel is of a different, greater cross-sectional area at said one end, the diverging arms (3,4) extending substantially parallel with each other in cross-section at said one end and forming an open mouth (11) which facilitates the introduction of paper into the fastener, the first arm (3) projecting beyond the second arm (4) at the end of the fastener provided with the open mouth (11), the projecting portion (10) of the first arm (3) forming a platform upon which the edge of one or more sheets of paper is supported when the paper is to be inserted into the fastener.

5,555,607

RETAINING DEVICE

John 1. Parveris, Unit 4, 17 Olive Grove, Mentone, 3194, Victoria, Australia

PCT No. PCT/AU93/00458, § 371 Date Mar. 8, 1995, § 102(e) Date Mar. 8, 1995, PCT Pub. No. WO94/05942, PCT Pub. Date Mar. 17, 1994

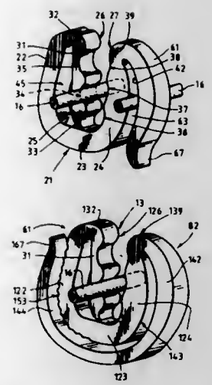
PCT Filed Sep. 7, 1993, Ser. No. 397,217

Claims priority, application Australia, Sep. 9, 1992, PL4616; Oct. 6, 1992, PL5131

Int. Cl.[6] F16G *11/00*

U.S. Cl. 24—129 R **23 Claims**

1. A retaining device for holding at least a portion of an article or two or more articles in a tidy or organized manner by having selected portions of the article or articles attached to the device, said device not being for attachment to a separate substrate, the device comprising a body portion including a substantially u-shaped body member of a first and a second opposed side wall portions facing each other defining a first opening therebetween, said first and second side wall portions interconnected at respective one ends thereof by a web portion and a first arm portion resiliently



connected to one end of the first side wall portion to extend internally into the first opening so as to divide the first opening into an open storage portion and an open retaining portion wherein first portion or portions of the article or articles can be stored in the open storage portion after passing through the open retaining portion of the device and second portion or portions of the article or articles can be retained in the open retaining portion by the action of the first resilient arm being biased towards the second wall portion, and a second arm resiliently connected to the second side wall portion defining a second opening for receiving a third portion or portions of the article or articles, said second arm curving around the outer surface of the second wall portion and web portion such that the article or articles are stored and retained in place in the tidy and organized manner when the device is attached to the respective portions of the article or articles in use.

5,555,608

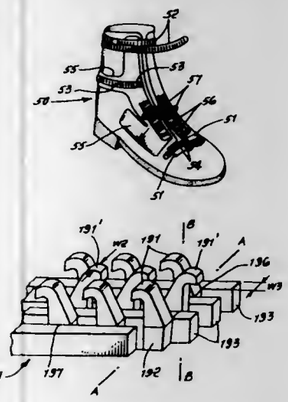
CONNECTOR APPARATUS WITH NESTING RIDGES

Robert M. Allan, 1631 Colgate Cir., La Jolla, Calif. 92037

Continuation-in-part of Ser. No. 5,331, Jan. 15, 1993, Pat. No. 5,345,659, which is a continuation-in-part of Ser. No. 787,424, Nov. 12, 1991, Pat. No. 5,179,767, which is a continuation-in-part of Ser. No. 553,258, Jul. 16, 1990, Pat. No. 5,068,162. This application Apr. 19, 1994, Ser. No. 229,825

Int. Cl.[6] A43B *7/00;* **A44B** *11/00;* **B65D** *63/00*

U.S. Cl. 24—442 **67 Claims**



1. A connector means connectible to strap means, comprising in combination:

a) a plurality of parallel ridges spaced apart and configured to have connection to said strap means,

b) a connector web means supporting said ridges,

c) said parallel ridges and said web means together forming a web,

d) and including means associated with said connector means to confirm complete, adjusted interlock of said strap means with said parallel ridges,

e) said connection having nesting looseness enabling press-together interfit of said ridges and strap means to provide a relatively strong such interfit, while also enabling peel disconnection of said interfit,

f) and said interfit controlling relative lateral movement of said strap means.

5,555,609

SAFEY BELT BUCKLE

Ulf Tolfsen, Gamle Fredrikstad, Norway, and Manus Dahlen, Lefum, Sweden, assignors to Autoliv Development AB, Vargarda, Sweden

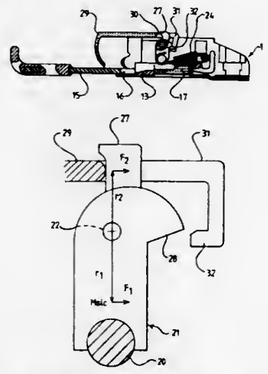
PCT No. PCT/SE93/00812, § 371 Date Sep. 2, 1994, § 102(e) Date Sep. 2, 1994, PCT Pub. No. WO94/08480, PCT Pub. Date Apr. 28, 1994

PCT Filed Oct. 6, 1993, Ser. No. 244,670

Claims priority, application United Kingdom, Oct. 9, 1992, 9221214; Oct. 9, 1992, 9221216

Int. Cl.[6] A44B *11/26*

U.S. Cl. 24—641 **21 Claims**



1. A safety belt buckle for receiving and retaining a tongue mounted on the safety belt, comprising:

a housing defining a path therein to receive the tongue;

a main locking element located in the path, attached to said housing, and being movable between a release position in which said main locking element does not engage the tongue, and a locking position in which said main locking element engages the tongue to retain the tongue in the buckle;

a push button movable essentially parallel to a longitudinal axis of the path and being positioned above said main locking element;

a second locking element mounted to said housing between said push button and said main locking element, and having a first portion engagable by said push button, and a second portion movable along the longitudinal axis of the path to a first position to engage the main locking element when said main locking element is in the locking position to prevent movement of the main locking element to the release position, the second portion and said push button being movable along the longitudinal axis of the path in opposite directions when the main locking element is to be released so that the second portion is moved to a second position in which the main locking element is freed so as to be movable to the release position;

hardware component with respect to said anchor member which is

wherein when said second portion is in the first position, said first portion of said second locking element is engaged by and limits movement of the push button if the buckle is subjected to a g-force acting in a first direction, and said push button engages with and prevents movement of the second locking element if the buckle is subjected to a g-force acting in a second direction opposite to said first direction.

5,555,610

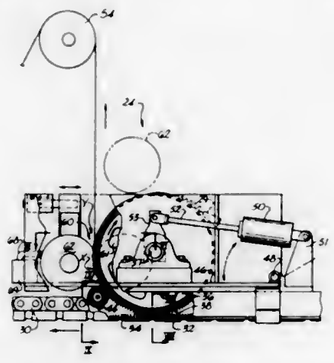
TENTER FRAME, APPARATUS FOR USE WITH TENTER FRAME AND METHODS OF USE

William O. Young, Jr., Spartanburg, and Dennis W. Cothran, Pacolet, both of S.C., assignors to Young Engineering, Inc., Spartanburg, S.C.

Division of Ser. No. 966,137, Oct. 23, 1992, Pat. No. 5,373,613. This application Dec. 2, 1994, Ser. No. 349,077

Int. Cl.[6] D06C *3/02;13/00*

U.S. Cl. 26—96 **19 Claims**



16. Apparatus for removing a web being conveyed along a length of a unit with opposite edges of said web being impaled on pins associated with web conveying means comprising:

a) a housing, said housing defining a slot around at least a portion of the periphery thereof;

b) a rotatable element having pins secured around the periphery of same and extending outwardly therefrom located within said housing and eccentric thereto such that pins on said rotatable element extend through said slot about a portion of the periphery of said housing, said housing being mounted adjacent an end on said web conveying means to bring said pins on said rotatable element into pinning contact with said web inside said pins of said conveying means and while said web remains pinned by said pins of said conveying means and subsequent removal of said web from said pins of said conveying means by rotation of said rotatable element;

c) a pair of discs located about said housing for edge overlap to define a cutting zone thereat for cutting web now carried on pins on said rotatable element inside said line of pins, at least one of said discs being rotated, said discs being oriented with respect to each other such that said discs make contact at the entrance to the cutting zone while defining a gap between the discs at an exit from the cutting zone, whereby web passing through said cutting zone is cut leaving outer web edges pinned to said rotatable element, and surfaces on said housing defining said slot force said remaining web edge off said pins; and

d) means for withdrawing said cut web edge portions.

5,555,611

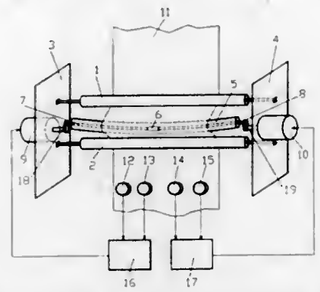
APPARATUS FOR REMOVING BOWED DISTORTIONS IN RUNNING TEXTILE WEB

Edmund K. Lyczek, 428 Qail Ridge Cr., Spartanburg, S.C. 29303

Filed Jun. 6, 1995, Ser. No. 467,867

Int. Cl.[6] D06H *3/12*; D06C *3/06*

U.S. Cl. 26—102 **3 Claims**



1. An apparatus for removing bowed distortions in moving textile web including two stationary plates, at least two idle rolls having ends of their shafts mounted to the stationary plates, first servo drive means mounted to one stationary plate, second servo drive means mounted to the other stationary plate, a plurality of weft sensor means located in front of the textile web, and comprising: a bow roll having its shaft made of two pieces spliced rotatably in the middle of the bow roll defining a splicing spot, wherein one end of the bow roll's shaft is attached to a cranked output shaft of the first servo drive means, while the other end of the bow roll's shaft is attached to a cranked output shaft of the second servo drive means for rotating said shafts independently about the splicing spot.

5,555,612

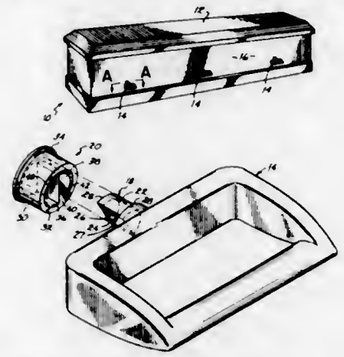
EXTERNALLY REMOVABLE TWIST LOCKING CASKET HARDWARE

John P. Blondo, Batesville, Ind., assignor to Batesville Casket Company, Inc., Batesville, Ind.

Filed Dec. 28, 1994, Ser. No. 365,211

Int. Cl.[6] A61G *17/00*

U.S. Cl. 27—2 **27 Claims**



1. A combination comprising an anchor member for attachment to a casket and an externally removable casket hardware component, said anchor member and said casket hardware component including respective, mating twist locking connectors, said twist locking connectors having stop surfaces engageable and disengageable with each other by a twisting motion of said casket hardware component with respect to said anchor member which is made without accessing an interior of said casket, wherein said stop surfaces define a predetermined angular orientation of said casket hardware component with respect to said anchor member when said anchor member is fixed to said casket, wherein said casket hardware component is a casket handle components, and wherein said anchor member is a generally tubular member sized to receive the twist locking connector of said casket handle component.

5,555,613

DRIVE UNIT WITH MOTOR AND PLUG-IN PINION

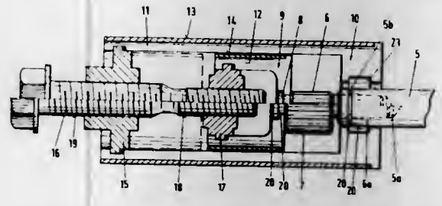
Heinz Schmidt, Dortmund, and Kurt Dumke, Sprockhövel, both of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Jan. 17, 1995, Ser. No. 373,046

Claims priority, application Germany, Jan. 17, 1994, 44 01 491.0

Int. Cl.[6] B23P *19/04*

U.S. Cl. 29—263 **18 Claims**



1. A drive unit and motor combination wherein the drive unit is removably connected to the motor, comprising:

a motor having a drive shaft (5) with a conical seating bore (5*a*), the drive shaft (5) comprising an external groove (5*b*) proximate to the seating bore (5*a*); and

a drive unit having a plug-in pinion (6) with a conical shaft (6*a*) sized and shaped to be removably mounted into the conical seating bore (5*a*) of the drive shaft (5), the plug-in pinion (6) comprising a collar bolt (8) on an end face thereof proximate to toothing (7) formed on the plug-in pinion (6).

5,555,614

FOLDABLE COVER WITH EASEL OPTION

Steven C. Book, Los Angeles, Calif., assignor to Gretson International Ltd., Kowloon, Hong Kong

Division of Ser. No. 156,089, Nov. 22, 1993, Pat. No. 5,377,794. This application Dec. 15, 1994, Ser. No. 356,669

Int. Cl.[6] A45C *9/00*

U.S. Cl. 29—401.1 **1 Claim**

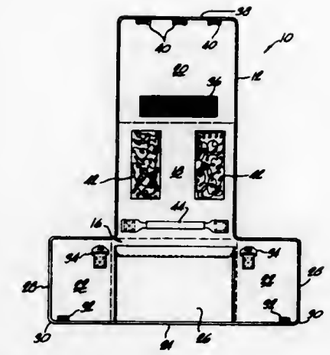
1. A method of forming a carrying case and converting the carrying case into an easel, comprising the steps of:

(1) providing a foldable cover having a generally "T"-shaped configuration, with a first surface and a second surface, the cover having (a) a longitudinal portion comprising a first end section defined by a first lateral edge, a second end section defined by a second lateral edge, and a central section between the first and second end sections, and (b) a lateral cross-bar portion comprising the first end section and a flap portion on either side of the first end section;

(2) folding the longitudinal portion, thereby bringing the first surface of the second end section into contact with the second surface of the first end section;

(3) removably fastening the second end section to the first end section;

(4) folding the flap portions toward each other, thereby bringing the second surface of the flap portions into contact with the first surface of the central section;



(5) removably fastening the flap portions to the central section, thereby forming a carrying case;

(6) unfastening the flap portions from the central section and unfolding the flap portions away from the central section;

(7) unfastening the second end section from the first end section and unfolding the longitudinal portion, thereby exposing the second surface of the first end portion;

(8) folding the flap portions toward each other, thereby bringing the second surface of the flap portions into contact with the second surface of the first end section;

(9) removably fastening the flap portions to the first end section;

(10) folding the longitudinal portion into a three-sided easel configuration, with the first end section forming an easel base, the central section forming an easel back, and the second end section forming an easel front; and

(11) removably securing the second lateral edge to the first lateral edge, thereby stabilizing the easel configuration.

5,555,615

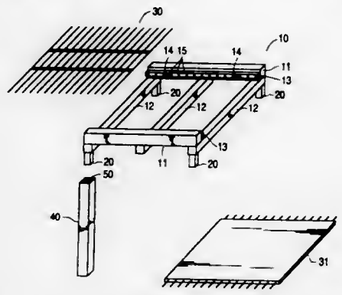
MODULAR WIRE FRAME TABLE AND METHOD OF ASSEMBLY

Carl Salli, Round Rock, Tex., assignor to Advanced Micro Devices Inc., Sunnyvale, Calif.

Filed Mar. 21, 1995, Ser. No. 407,708

Int. Cl.[6] B23P *25/00*

U.S. Cl. 29—458 **19 Claims**



15. A method of assembling a wire frame table comprising a frame having an open top portion, a plurality of holes formed on two opposing support bars attached to the open top portion and a plurality of projections formed underneath said frame, a wire frame having a plurality of wire elements spaced substantially parallel to one another and to correspond to the holes of said support bar, and a plurality of legs having top portions adapted to receive said projections of said frame, said method comprising the steps of:

(a) treating said frame, said wire frame, and said legs separately with one of electro-polishing and electro-plating;

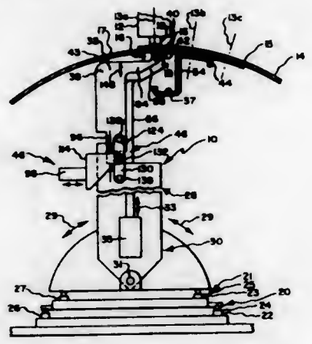
(b) inserting said wire frame into said holes of said support bar;

5,555,619

METHOD OF ELECTRICALLY CONNECTING A

(b) inserting said wire frame into said holes of said support bar; and
(c) engaging said legs with said projections of said frame,
wherein said frame, said wire frame, and said legs are made from stainless steel.

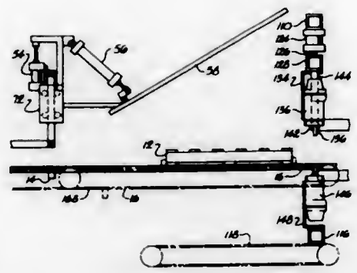
5,555,616
METHOD AND APPARATUS FOR POSITIONING OF TOOLING EFFICIENTLY
David Michalewski, Cheektowaga, and Ernest K. Krell, Lewiston, both of N.Y., assignors to Gemcor Engineering Corporation, Buffalo, N.Y.
Filed Oct. 13, 1993, Ser. No. 135,914
Int. Cl.[6] B23P *11/00*
U.S. Cl. 29—509 **10 Claims**



1. A method for positioning tooling with respect to a workpiece comprising the steps of:
a. supporting the tooling in a head;
b. supporting the head by a frame;
c. moving the frame relative to the workpiece along and about an axis;
d. extending and retracting the frame for movement radially of a workpiece engagement surface on the head toward and away from the workpiece;
e. extending and retracting the head relative to the frame for movement radially of the workpiece engagement surface toward and away from the workpiece;
f. selecting the head to be adapted so that the workpiece engagement surface is offset circumferentially from a body portion of the head which extends radially; and
g. positioning the workpiece engagement surface in a position which is at least partially overhung by a workpiece strengthening member portion.

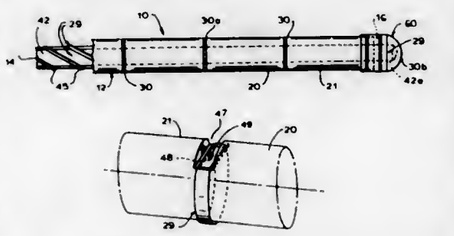
5,555,617
PALLET MANUFACTURING APPARATUS
Harold W. Pope, Rte. 5, Box 94, Piedmont, Ala. 36272
Filed Oct. 7, 1994, Ser. No. 320,843
Int. Cl.[6] B23P *19/04*
U.S. Cl. 29—772 **12 Claims**

1. An apparatus for holding boards as they are being nailed when constructing a wooden pallet formed by an upper tier of spaced boards, an intermediate tier of boards and a bottom tier of spaced boards, comprising:
a receiver for supporting said boards prior to being nailed together, wherein said respective upper and bottom tier of boards include elongated spaced apart boards with the longitudinal axis of said boards through the elongated length thereof being parallel in each respective said tier;



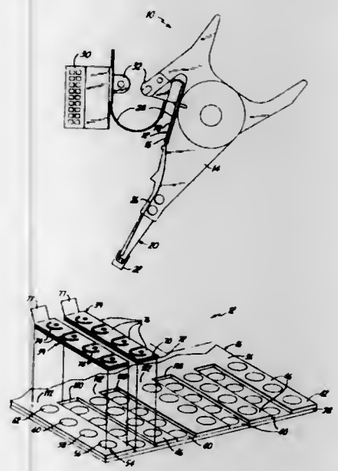
a movable nail driving mechanism for successively driving nails into adjacent boards of said upper and lower tiers of boards for forming said pallet;
a pivotal arm pivotable in a plane substantially perpendicular to said longitudinal axis of said upper tier of boards for simultaneously pressing down on all of said upper tier of boards while said nail driving mechanism drives said nails into successive boards of said upper tier of boards; and
a lifting mechanism for lifting said pivotal arm out of engagement with said upper tier of boards for removing said nailed pallet.

5,555,618
METHOD OF MAKING ELECTRODE-CARRYING CATHETER
Josef Winkler, Reading, Pa., assignor to Arrow International Investment Corp., Wilmington, Del.
Continuation-in-part of Ser. No. 135,152, Oct. 12, 1993. This application Dec. 14, 1994, Ser. No. 355,663
Int. Cl.[6] H01R *43/00*
U.S. Cl. 29—825 **16 Claims**



1. A process for manufacturing an electrode-carrying catheter, comprising the steps of:
(A) over-extruding a core-covering layer of plastic over a flexible, elongate core;
(B) helically winding a spaced apart plurality of flexible, electrically conductive wires about and at least partially into the core-covering layer;
(C) over-extruding a flexible, non-conducting outer layer of plastic over the wound wires and the core-covering layer;
(D) removing portions of the outer layer, the core-covering layer and any insulation about the wound wires at a plurality of spaced locations so as to expose a portion of each of the wound wires;
(E) replacing the removed portions at each location with an electrically conductive flexible ribbon electrode electrically and physically joined at one end to a respective one of the wound wires, wound under tension completely about the outer layer and then joined at the other end to itself; and
(F) crimping each of the ribbon electrodes onto the outer layer thereabout at each spaced location.

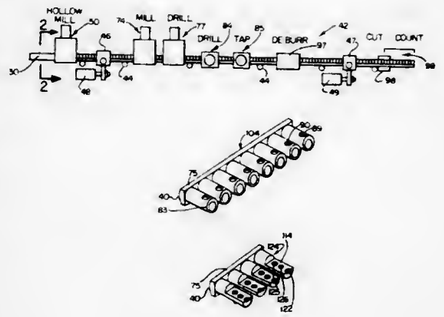
5,555,619
METHOD OF ELECTRICALLY CONNECTING A TRANSDUCER TO A PREAMPLIFIER
Mark Maggio, Bethany; Tom Metzner; Steven Eckerd, both of Oklahoma City; Loren Skarky, Bethany, all of Okla.; Yoshiki Midori, Edina, Minn.; Cal Hardie, Minneapolis, Minn., and Ray Yu, Bloomington, Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.
Division of Ser. No. 230,392, Apr. 20, 1994. This application Jun. 1, 1995, Ser. No. 457,266
Int. Cl.[6] H01R *43/02*
U.S. Cl. 29—860 **15 Claims**



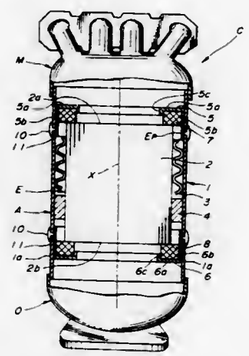
1. A method for electrically connecting a transducer to a preamplifier in a computer disc drive, the method comprising:
electrically connecting a first electrically conductive pad on an intermediate strip to a first distinct terminal of the transducer;
electrically connecting a second electrically conductive pad on the intermediate strip to a second distinct terminal of the transducer, wherein the location of the first and second electrically conductive pads designates the transducer terminal connected thereto; and
positioning the intermediate strip such that the first electrically conductive pad makes electrical contact to a first corresponding terminal of the pre-amplifier and the second electrically conductive pad makes electrical contact to a second corresponding terminal of the pre-amplifier.

5,555,620
METHOD OF MAKING ELECTRICAL CONNECTORS
Antonius M. Kies, Oisterwijk, Netherlands, assignor to Erico International Corporation, Solon, Ohio
Filed Jnn. 6, 1995, Ser. No. 468,539
Int. Cl.[6] H01R *43/16*
U.S. Cl. 29—874 **14 Claims**

1. A method of making an electrical connector comprising the steps of machining an elongated generally rectangular cross-sectioned extruded bar stock of conductive metal by hollow milling the bar stock transversely from one end to a depth spaced from the opposite end to form posts projecting from the unmilled end of the bar stock, removing any excess metal between the posts to the same depth as said posts, and forming and tapping a hole in said posts normal to the longitudinal axis of the post to enable an electrical conductor to be clamped to the post, and then cutting the bar stock to length between posts to form an electrical connector having at least two posts.



5,555,621
METHOD OF PRODUCING A CATALYTIC CONVERTER
Hiroshi Tanabe; Tsutomu Imamura; Katsumi Amada, and Yuji Shimada, all of Tokyo, Japan, assignors to Calsonic Corporation, Tokyo, Japan
Division of Ser. No. 145,177, Nov. 3, 1993, abandoned. This application Jul. 5, 1994, Ser. No. 270,827
Claims priority, application Japan, Mar. 11, 1993, 5-050659; Mar. 22, 1993, 5-012845 U; Mar. 24, 1993, 5-065381
Int. Cl.[6] B23P *15/00*
U.S. Cl. 29—890 **9 Claims**



1. A method of producing a catalytic converter, comprising:
winding a support material made of metal wire mesh and a thermally expandable seal material on a catalyst carrier made of a ceramic and carrying a catalytic material;
disposing first and second cushioning materials respectively at peripheral portions of opposite end faces of said ceramic carrier;
attaching first and second annular metal end caps respectively to the first and second cushioning materials so as to be located axially outside of said first and second cushioning materials, each metal cap having an annular flange section facing the peripheral portion of the end face of said ceramic carrier, and a cylindrical section integral with said flange section;
encasing said ceramic carrier within a container made of a metal;
pressing said first and second annular metal caps toward said ceramic carrier by using a pressing jig in a manner to apply a predetermined pressure to said ceramic carrier in an axial direction so that said predetermined pressure is constant throughout a plurality of ceramic carriers having different axial dimensions;

maintaining said ceramic carrier in a state to be axially sup-

nected to one of said side walls, said members engaging said cutting means in a manner to orient said cutting means within

1. A reciprocating drive mechanism for a power tool comprising:
(a) a housing;

maintaining said ceramic carrier in a state to be axially supported at said predetermined pressure through said first and second cushioning materials between said first and second metal caps; and

plug welding said first and second metal end caps to said container, while maintaining said predetermined pressure.

5,555,622

METHOD OF MANUFACTURING A HEAT TRANSFER SMALL SIZE TUBE

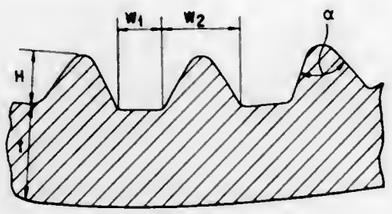
Kouji Yamamoto; Toshiaki Hashizume, and Hiroshi Kawaguchi, all of Tokyo, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 98,619, Jul. 28, 1993, abandoned, which is a division of Ser. No. 64,733, May 19, 1993, abandoned, which is a continuation of Ser. No. 832,222, Feb. 7, 1992. This application Feb. 21, 1995, Ser. No. 391,635

Claims priority, application Japan, Feb. 13, 1991, 3-41068; Feb. 21, 1991, 3-48946

Int. Cl.[6] B23P *15/26*

U.S. Cl. 29—890.053 **6 Claims**



1. A method of manufacturing a heat-transfer small size metal tube, comprising the steps of: inserting a grooved plug in a metal tube having an outer diameter of not less than 4.5 mm; performing a rotary process with respect to an outer surface of said metal tube while pulling said metal tube in a tube-axis direction, thereby continuously forming grooves in an inner surface of said metal tube in a spiral shape wherein the spiral shape extends in the tube-axis direction, each of said spiral shape grooves having a ridge bottom width/bottom wall thickness ratio defined as W_2/t of 0.2 to 1.5, a groove depth H of 0.15 to 0.3 mm, and a groove bottom width W_1 of 0.15 to 0.5 mm; and

subjecting the metal tube to a diameter reduction process with a diameter reduction rate of 20 to 40% by performing at least one draw without a plug with respect to said metal tube to produce a heat-transfer small size tube having a ratio t/D of $0.025<t/D<0.075$, where t is said bottom wall thickness and D is the outer diameter of the metal tube.

5,555,623

METHOD FOR PRODUCING OBJECT LENS HOLDER

Yoshimasa Goda, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 871,661, Apr. 21, 1993, Pat. No. 5,381,273. This application May 3, 1994, Ser. No. 237,472

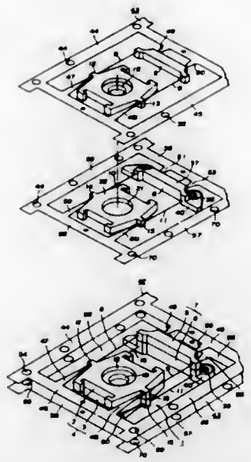
Claims priority, application Japan, Apr. 21, 1991, 3-123030

Int. Cl.[6] B23P *15/00*; **B28B** *5/00*; **G11B** *7/00*

U.S. Cl. 29—896.9 **6 Claims**

1. A method for producing an object lens holder for holding an object lens that converges a laser light radiated from a laser light source on a signal recording surface of an optical recording medium, comprising the steps of:

forming resilient deflecting portions in first and second thin sheet members,



integrally molding first and second bobbin halves of synthetic resin on said first and second thin sheet members respectively, wherein said deflecting portions extend from portions of said bobbin halves,

abutting and connecting said first and second bobbin halves to each other, and

severing said first and second bobbin halves from said first and second thin sheet members together with said resilient deflecting portions.

5,555,624

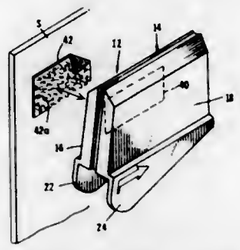
PACKAGE OPENER

Brian McCracken, 21416 Velicata St., Woodland Hills, Calif. 91364

Filed Feb. 13, 1995, Ser. No. 387,115

Int. Cl.[6] B26B *29/06*

U.S. Cl. 30—2 **15 Claims**



1. A package opening device for use in opening packages having spaced apart walls, a connecting wall interconnecting said spaced apart walls, said connecting wall having a width and a thin outer covering extending over said spaced apart walls and said connecting wall, said opening device comprising:

(a) first and second side walls defining an interior space therebetween, each said side wall having an extension, said extension being spaced apart a distance slightly greater than said width of said connecting wall;

(b) cutting means for cutting said outer covering, said cutting means including a cutting edge extending between said extensions for cutting engagement with said outer covering; and

(c) connector means for interconnecting said first and second side walls and for supporting said cutting means, said connector means comprising a pair of spaced apart members connected to one of said side walls, said members engaging said cutting means in a manner to orient said cutting means within said interior space.

5,555,625

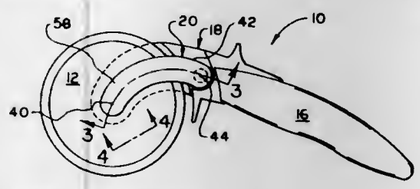
ROTARY CUTTER

William J. Scheminger, Olean, N.Y., assignor to Cutco Cutlery Corporation, Olean, N.Y.

Filed Nov. 6, 1995, Ser. No. 553,925

Int. Cl.[6] B26B *3/00*

U.S. Cl. 30—319 **7 Claims**



1. A rotary cutter comprising:

a disc blade having a central mounting opening;

an elongated handle having adjacent an end thereof a standard including a generally cylindrical bearing portion removably inserted within said central opening for mounting said disc blade for rotation about a first axis, a first annular bearing surface disposed adjacent one end of said cylindrical bearing portion and a first latch portion disposed adjacent an opposite end of said cylindrical bearing portion;

a swing arm having a first end pivotally mounted for swinging movement relative to said handle about a second axis disposed essentially parallel to said first axis and a second end having a second latch portion and second annular bearing surface, said swing arm being movable between a retaining position in which said swing arm is disposed to overlie said disc blade and said second bearing surface is disposed in a facing aligned relationship with said first bearing surface to prevent removal of said cylindrical bearing portion from within said central opening of said disc blade and a release position in which said swing arm is at least substantially removed from overlying relation with said disc blade to permit removal thereof from said cylindrical bearing portion and said second latch portion engages with said first latch portion for releasably retaining said swing arm in said retaining position.

5,555,626

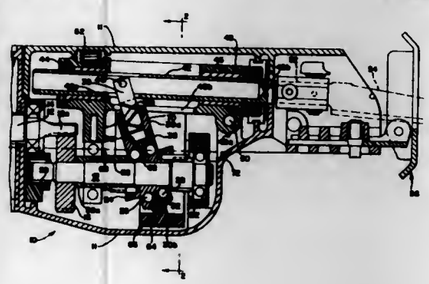
RECIPROCATING DRIVE MECHANISM

Rudolf Fuchs, Neuhausen, Germany, assignor to S-B Power Tool Company, Chicago, Ill.

Filed Nov. 27, 1995, Ser. No. 563,135

Int. Cl.[6] B23D *49/04*

U.S. Cl. 30—393 **5 Claims**



1. A reciprocating drive mechanism for a power tool comprising:

(a) a housing;

(b) a drive shaft rotatably mounted in said housing;

(c) a spindle mounted in said housing for reciprocating motion along a substantially rectilinear first axis;

(d) a counterweight mounted in said housing for reciprocating motion along a second axis parallel to said first axis, said counterweight being shaped such that its center of gravity is located between said spindle and said drive shaft; and

(e) a wobble plate unit mounted on said drive shaft and having a first end connected to said spindle and a second end connected to said counterweight, whereby upon rotation of said drive shaft said spindle and said counterweight are simultaneously reciprocated in opposite directions.

5,555,627

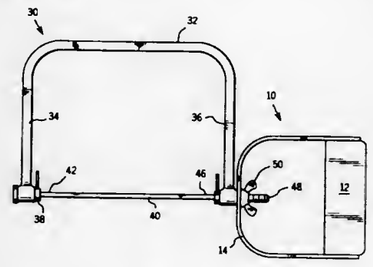
D-SHAPED HANDLE FOR COPING SAWS

Mark Hartzell, 6525 W. County Line Rd., Brown Deer, Wis. 53223

Continuation of Ser. No. 290,350, Aug. 15, 1994, abandoned. This application Sep. 5, 1995, Ser. No. 523,563

Int. Cl.[6] B23D *51/01*

U.S. Cl. 30—509 **12 Claims**



1. A coping saw comprising:

a) a D-shaped handle, further comprising:

I) a C-shaped member having first and second shanks and an aperture; and

ii) a cross-member attached to at least one of said first and second shanks;

b) a U-shaped saw frame having first and second frame shanks;

c) a saw blade;

d) means for securing said saw blade between said first and second frame shanks; and

e) means for attaching said D-shaped handle to said means for securing,

wherein said cross-member is substantially perpendicular to said saw blade such that said D-shaped handle is substantially symmetric about said means for attaching.

5,555,628

U-BOLT TORQUING TOOL

Freddie Madden, Cincinnati, Ohio, assignor to Consolidated Metal Products, Inc., Cincinnati, Ohio

Division of Ser. No. 354,413, Dec. 12, 1994, Pat. No. 5,492,019, which is a division of Ser. No. 192,496, Feb. 7, 1994, Pat. No. 5,412,874. This application Jul. 7, 1995, Ser. No. 499,634

Int. Cl.[6] G01B *3/14*

U.S. Cl. 33—1 SB **9 Claims**

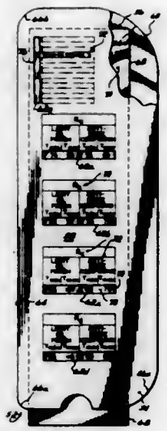
1. A tool used in securing a type of U-bolt assembly, the U-bolt assembly includes a U-bolt having two end-threaded legs and a bend radius for each leg, the tool comprising:

a surface having torquing indicia located thereon, said torquing indicia including designation data for the type of U-bolt

case factor allowance, for each of the groups of stitchlines is

5,555,631

ELLIPSE SCRIBE



assembly and a corresponding optimum torque value for securing the U-bolt assembly;

a radius for testing each U-bolt bend radius; and

means for correlating said testing radius with said torquing indicia so that the U-bolt assembly may be properly secured.

5,555,629

GARMENT PATTERN MAKING

Douglas C. Leighton, Leeds, United Kingdom, assignor to Bracken Enterprises Limited, Leeds, United Kingdom

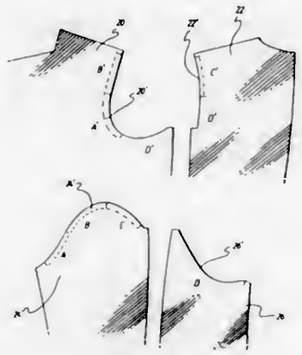
PCT No. PCT/GB92/01221, § 371 Date Jul. 8, 1994, § 102(e) Date Jul. 8, 1994, PCT Pub. No. WO93/00836, PCT Pub. Date Jan. 21, 1993

PCT Filed Jul. 6, 1992, Ser. No. 170,362

Claims priority, application United Kingdom, Jul. 4, 1991, 9114458

Int. Cl.[6] A41H *3/00*

U.S. Cl. 33—17 R **12 Claims**



1. A method for preparing a set of patterns for the cutting of material thereto for forming pieces which, when joined together form a garment, each of the patterns in the set prepared in relation to a specific size of garment to be produced therefrom and the patterns are provided with stitchlines in positions along which the cut material will be sewn such that groups of the stitchlines, when joined together, form a seam of the garment, and at least one of the stitchlines in at least some of the groups is provided with an allowance in the length thereof as an ease factor and wherein the ease factor allowance, for each of the groups of stitchlines is provided and checked during the creation of the set of patterns by following the steps of:

analyzing the fabric from which the garment is to be made and the style of the garment;

allocating an ease factor value for that seam;

selecting one of the stitchlines of the seam as a dominant stitchline, the remainder as subservient stitchlines;

including the ease factor allowance in at least one of the subservient stitchlines;

comparing the total length of the subservient stitchlines, including the ease factor allowance, with the length of the dominant stitchline and checking that the difference between the lengths is equivalent to the allocated ease factor allowance; and

repeating the steps for each of the groups of stitchlines for each seam in the set of patterns.

5,555,630

COMPASS WITH SAFETY PIVOT

Etienne N. De Souza, 5 rue Charles Koenig, 6800 Colmar, France

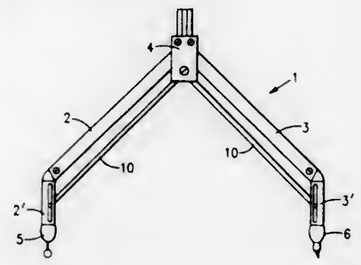
PCT No. PCT/FR93/00860, § 371 Date Mar. 7, 1995, § 102(e) Date Mar. 7, 1995, PCT Pub. No. WO94/05514, PCT Pub. Date Mar. 17, 1994

PCT Filed Sep. 8, 1993, Ser. No. 397,119

Claims priority, application France, Sep. 8, 1992, 92/10720; Dec. 10, 1992, 92/15000

Int. Cl.[6] B43L *9/02*

U.S. Cl. 33—27.02 **1 Claim**



1. A compass with a safety pivot for drawing at least one of arcs and circles on a drawing surface, the compass comprising two branches (2, 3) which are articulated at a common end (4), the first branch (2) being equipped with a safety pivot (5) and the second branch (3) being equipped with one of a pencil and a pencil holder (6), each of the two branches comprising first and second parts (2, 2' and 3, 3'), each respective first part (2, 3) connecting a respective second part (2', 3') to the common end (4), each of the second parts (2', 3') being connected to a return mechanism (10), supported by the common end (4), for positioning the second parts (2', 3') along an axis perpendicular to the drawing surface;

wherein the safety pivot (5) comprises a pin (8) housed in a fixed body (9), the pin (8) has a rounded end (7) at a remote end thereof and the rounded end (7) is rotatable about an axis in relation to the fixed body (9), the rounded end (7) is at least partially spherical, and the rounded end (7) is at least partially covered with a non-slip finish (7') for contacting the drawing surface to define the center of one of a circle and an arc to be drawn.

5,555,631

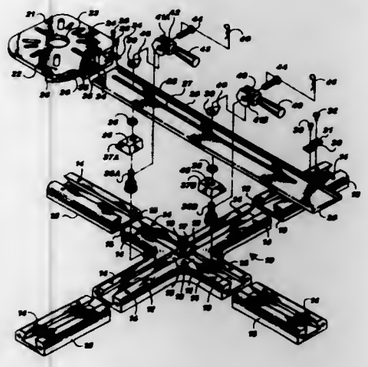
ELLIPSE SCRIBE

Daniel J. Houston, 301 Golfmaster, Hilton Head Island, S.C. 29938

Filed Jan. 17, 1995, Ser. No. 373,101

Int. Cl.[6] B43L *11/055;9/04*

U.S. Cl. 33—31 **20 Claims**



1. A contact beam ellipse scribe apparatus comprising:

a. a first track including a block aperture therein;

b. a second track oriented perpendicularly to the first track and intersecting the first track at a centerpoint;

c. a scribe beam including an elongated beam element with a scribe end and an adjustment track located on and substantially parallel to the elongated beam element;

d. a first slider block slidably engaged within the first track and including an anchor hole therein, wherein the first slider block may be slidably located within the first track so that the anchor hole and block anchor aperture may be collinearly aligned;

e. a first adjustment pin which rotatably engages the first slider block;

f. a second slider block slidably engaged within the second track, wherein the first track and the second track each comprise keyways in which the first slider block and the second slider block are respectively adapted to slidably fit; and

g. a second adjustment pin which rotatably engages the second slider block;

h. an anchor pin sized to be inserted within both the anchor hole and the block anchor aperture when the anchor hole and the block anchor aperture are collinearly aligned.

5,555,632

APPARATUS FOR MEASURING THE CONTOURS OF A WHEEL

Hans J. Naumann, Albany, N.Y.; Reinhard Robotta, Erlau, Germany; Gunter Schröter, and Rolf Oesterreich, both of Chemnitz, Germany, assignors to Niles-Simmons Industrieanlagen GmbH, Chemnitz, Germany

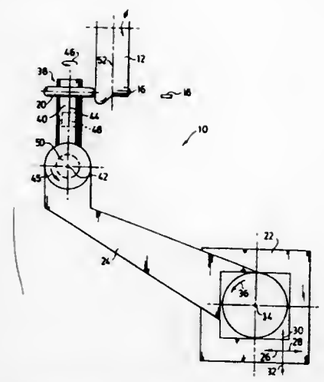
Filed Feb. 7, 1995, Ser. No. 385,034

Claims priority, application Germany, Feb. 8, 1994, P 44 03 951.4

Int. Cl.[6] G01B *5/20*

U.S. Cl. 33—203 **6 Claims**

1. An apparatus for measuring the contours of a railroad wheel comprising a tool slide, a measuring arm pivotally attached to said tool slide, a measuring wheel rotatably attached to said measuring arm, means for moving said measuring arm horizontally, means for moving said measuring arm vertically, means for pivoting said measuring arm, a mark, optical means for sensing the rotation of said railroad wheel, and means for sensing the movement of said measuring arm, wherein:



(a) said apparatus is comprised of a first encoder for determining the degree to which said measuring arm moves during any particular time during the rotation of said railroad wheel in any particular rotation cycle, and

(b) said apparatus is comprised of a second encoder for determining at what point in said particular rotation cycle said measuring arm has moved.

5,555,633

SCALE ASSEMBLY

Christopher Stott, Chellaston, England, assignor to LK Limited, Derby, United Kingdom

PCT No. PCT/GB93/01466, § 371 Date Jan. 20, 1995, § 102(e) Date Jan. 20, 1995, PCT Pub. No. WO94/02800, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 13, 1993, Ser. No. 374,587

Claims priority, application United Kingdom, Jul. 24, 1992, 9215767

Int. Cl.[6] G01B *5/008*

U.S. Cl. 33—704 **12 Claims**

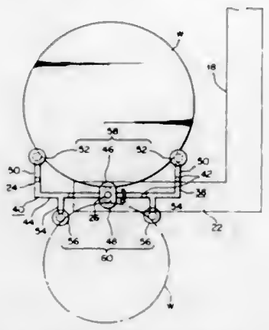
1. A scale assembly for use in monitoring movement of a component on a guideway structure of a coordinate measuring machine, the assembly comprising an elongate scale, a support for the scale, mounting means for fixedly mounting the support relative to the structure at one reference location and flexibly mounting the support on the structure at another location, securing means for fixedly securing the scale to the support to substantially prevent relative movement therebetween, and connecting means for non-movably connecting the structure to the machine, the support being fixedly mounted on the connecting means and being formed of a thermally stable material whereby to be capable of fixing the spatial position of the support relative to the machine, the flexible mounting for the support on the structure accommodating movement of the latter due to thermal expansion of the material thereof, without changing the spatial position of the support and therefore the scale.

5,555,634

air from outside said dryer enclosure to said first zone of said

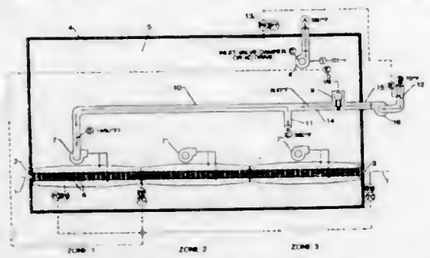
each of said first and second rows, and first and second drying

5,555,634
WAFER HOLDER
Isao Uchiyama, and Hideo Kudo, both of Fukushima-ken, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Japan
Filed Dec. 16, 1994, Ser. No. 358,112
Claims priority, application Japan, Jan. 18, 1994, 6-003354
Int. Cl.[6] F26B *21/06*
U.S. Cl. 34—78 **17 Claims**



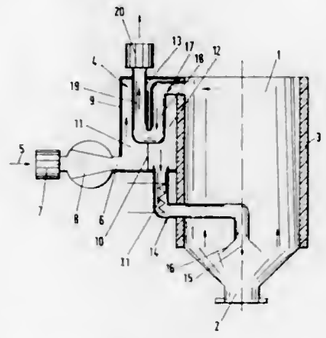
1. A wafer holder having a plurality of wafer holding means united fixedly in one body rotatably secured onto a robot arm for drying, each said wafer holding means being adapted for holding one or more wafers of a selected diameter vertically supported in a stable manner, said selected diameter being chosen from a number and combination of different diameters, and means for allowing rotation of said wafer holder having said plurality of wafer holding means as a whole about an axis.

5,555,635
CONTROL AND ARRANGEMENT OF A CONTINUOUS PROCESS FOR AN INDUSTRIAL DRYER
Paul G. Seidl, De Pere, Wis., assignor to W. R. Grace & Co.-Conn., New York, N.Y.
Filed Jan. 18, 1995, Ser. No. 374,015
Int. Cl.[6] F26B *21/06*
U.S. Cl. 34—79 **17 Claims**



1. Apparatus for drying a web of material having a coating containing volatile substances, comprising:
- a dryer enclosure having a web inlet opening and a web exit opening spaced from said web inlet opening, said dryer enclosure including at least a first drying zone having a first drying zone atmosphere and a leaving drying zone having a leaving drying zone atmosphere;
- a plurality of air jet nozzles in each of said drying zones for blowing air onto said web;
- a burner in said dryer enclosure, said burner being in communication with air from outside said dryer enclosure; and
- recirculation means in communication with said burner for recirculating a mixture of leaving drying zone atmosphere and said air from outside said dryer enclosure to said first zone of said dryer, said recirculation means comprising a duct in communication with said burner and a supply fan operative to move a mixture of leaving drying zone atmosphere and outside air to said first dryer zone.

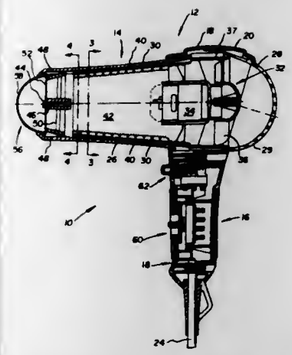
5,555,636
DRYER
Walter Kramer, Kreuzlingen, Switzerland, and Holger Kühnau, Konstanz, Germany, assignors to Motan Holding GmbH, Konstanz, Germany
Filed Feb. 24, 1995, Ser. No. 399,092
Claims priority, application Germany, Feb. 25, 1994, 44 06 322.9; Jul. 14, 1994, 44 24 846.6
Int. Cl.[6] F26B *19/00*
U.S. Cl. 34—86 **16 Claims**



1. A dryer comprising:
- a hopper for material to be dried;
- an inlet line for supplying dry air to said hopper;
- a heating device for heating the dry air to a desired drying temperature before introduction into said hopper;
- a return line connected to said hopper for removing moist air from said hopper that results from the dry air passing through a material in said hopper and absorbing moisture from the material;
- said return line having a part that functions as a heat exchanger, wherein the dry air before entering said hopper is guided through said heat exchanger;
- a housing in which said heat exchanger is positioned, wherein said inlet line is connected to said housing; and
- said housing comprising a partition dividing the interior of said housing into a first and a second flow chamber and wherein the dry air flows in opposite directions through said first and said second flow chambers.

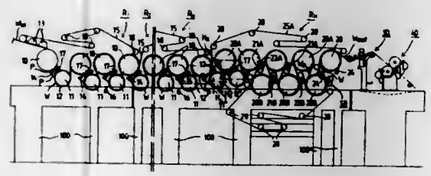
5,555,637
DRYING APPARATUS
James G. Montagnino, El Paso, Tex., assignor to Production Engineered Designs, Inc., El Paso, Tex.
Filed Oct. 14, 1994, Ser. No. 322,459
Int. Cl.[6] A45D *20/00*
U.S. Cl. 34—97 **27 Claims**

1. A drying apparatus comprising a housing including a nozzle having a cross-sectional shape and containing an air outlet, a fan assembly contained within the housing for generating a flow of air from the outlet, and a flow guide of tubular shape contained within the nozzle, the flow guide having a cross-sectional shape similar to the cross-sectional shape of the nozzle and being separated from the nozzle so as to form a space between the nozzle and the flow



guide, the flow guide comprising a continuous member having a plurality of spaced, generally circular holes therein, the holes having a size and location relative to each other to cancel by interference sound waves generated by the fan assembly and thereby attenuate noise generated by the fan assembly.

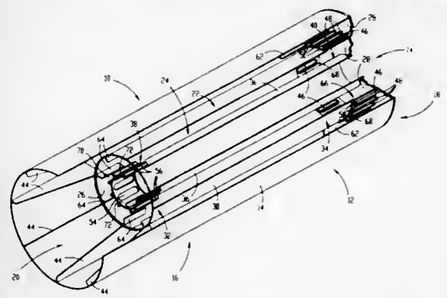
5,555,638
METHOD FOR CONTACT DRYING A PAPER WEB AND A DRYER SECTION OF A PAPER MACHINE
Risto Lehosvuo, Säynätsalo; Allan Liedes, Palokka, and Pekka Matilainen, Vaajakoski, all of Finland, assignors to Valmet Corporation, Helsinki, Finland
Filed Mar. 24, 1995, Ser. No. 410,076
Claims priority, application Finland, Mar. 29, 1994, 941449
Int. Cl.[6] F26B *3/00;13/08*
U.S. Cl. 34—117 **27 Claims**



1. A method for contact drying a paper web in a dryer section including a plurality of successively arranged normal groups with single-wire draw, each of said normal groups including heated smooth-faced drying cylinders situated in a row, reversing suction cylinders or reversing suction rolls situated in another row spaced from said row of drying cylinders, and a drying wire for pressing the paper web into contact with said drying cylinders and for carrying the paper web between said drying cylinders and said reversing suction cylinders or rolls, the method comprising the steps of:
- drying the paper web to substantially a first dry solids content by passing the web through said plurality of successively arranged normal groups with single-wire draw, and thereafter
- drying the paper web to substantially a second dry solids content by passing the web through a hybrid group including a single-wire draw portion and a twin-wire draw portion, said single-wire draw portion including heated smooth-faced drying cylinders situated in a first row, reversing suction cylinders or rolls situated in a second row spaced from said first row, and a drying wire for pressing the paper web into contact with said drying cylinders and for carrying the paper web between said drying cylinders and said reversing suction cylinders or rolls, said twin-wire draw portion including drying cylinders arranged in said first row and a second row, wire guide rolls arranged between adjacent ones of said drying cylinders in each of said first and second rows, and first and second drying wires for pressing the web against the surfaces of said drying cylinders in a respective row,
- said first drying wire of said twin-wire draw portion constituting the drying wire in said single-wire draw portion.

17. A dryer section of a paper machine for drying a paper web, comprising
- a plurality of successively arranged normal groups with single-wire draw, each of said normal groups including drying cylinders arranged in one row, reversing rolls arranged in another row spaced from said row of said drying cylinders, and a drying wire for carrying the web between said drying cylinders and said reversing rolls, and
- a hybrid dryer group arranged after said plurality of normal groups in a running direction of the web, said hybrid dryer group comprising a single-wire draw portion including heated smooth-faced drying cylinders situated in a first row, reversing rolls, and a first drying wire for pressing the web into contact with said drying cylinders and carrying the web between said drying cylinders and said reversing rolls, and a twin-wire draw portion including drying cylinders arranged in said first row and a second row, wire guide rolls arranged between adjacent ones of said drying cylinders in each of said first and second rows, and a second drying wire for pressing the web against said drying cylinders in said second row,
- said first drying wire also forming a part of said twin-wire draw portion and pressing the web against said drying cylinders in said first row of said twin-wire draw portion.

5,555,639
ROTARY DRUM DRYER
Jeffrey T. Livingston, Neodesha, and Andrew D. Livingston, Independence, both of Kans., assignors to Productization Inc., Independence, Kans.
Filed May 18, 1995, Ser. No. 443,682
Int. Cl.[6] F26B *11/02*
U.S. Cl. 34—135 **19 Claims**



1. A rotary drum dryer comprising:
- a housing presenting opposed, first and second ends; and
- means for rotating said housing;
- said housing including
  - means for receiving inlet gas from a source thereof, and for discharging exhaust gas from said housing,
  - means for receiving material including elongated strands from a source thereof, and for discharging said material from said housing,
  - a first tube having sidewalls and presenting opposed, first and second ends,
  - a second tube having sidewalls and presenting opposed, first and second end,
  - means for positioning said second tube within said first tube and coupling said tubes adjacent said respective first and second ends thereof without any intervening connections between said first and second tubes along said tube sidewalls,

said second tube including means defining a plurality of apertures through said second tube sidewall adjacent said second end thereof for passage of material between said tubes,

each of said apertures presenting a length dimension and a width dimension, said length and width dimensions being greater than the length of the strands of material; and

at least one filler flight positioned between adjacent ones of said second tube apertures.

5,555,640

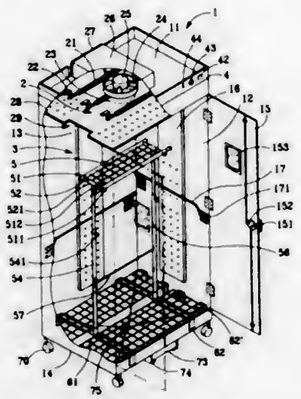
HOUSEHOLD DRYING CENTER

Chau C. Ou, 12 F., 275 Yuan-Hua Rd., Chungli City, Taoyuan Hsien, Taiwan

Filed Jul. 25, 1995, Ser. No. 506,479

Int. Cl.[6] F26B *19/00;25/06*

U.S. Cl. 34—202 **10 Claims**



1. A household drying center for drying laundry, fabric articles and household goods, comprising:

a cabinet defined by a top wall, a bottom wall and a plurality of side walls, the top wall having an opening formed therein, the bottom wall having a plurality of casters disposed thereunder;

a heating chamber located at an upper portion of the cabinet and below the top wall, the heating chamber including heating means and a substantially horizontal heat diffusion plate located below the heating means; the heat diffusion plate including a plurality of lateral edges in contact with the side walls of the cabinet, a plural number of apertures formed therein and a substantially rectangular side slot formed in each of a rear and lateral side edge;

a blower disposed above the opening of the top wall for generating forced air into the heating chamber, the blower being housed in a case which has a rear opening upon which an air filter means is mounted;

a control panel located above a front side wall of the cabinet and including a timer for setting the operation duration of the heating means and the blower, a temperature selection switch for setting the heating means to generate one of various predetermined heating power outputs and a signal light for indicating the operative state of the heating means and the blower;

a drying chamber located in the middle and lower portions of the cabinet below the heat diffusion plate, the drying chamber including a plurality of air ducts, a plurality of side rod means, a door mounted on the front side wall for accessing the interior of the drying chamber, and a thermostat for setting the heating means to an inoperative state when the temperature of the interior of the drying chamber reaches a predetermined level, a plurality of hollow air ducts, and a side rod means;

each air duct being substantially rectangular in cross section and vertically disposed on each of a rear and lateral side wall and having an open top end engaged with the side slot of the heat diffusion plate for forming an air passage to the heating chamber, a closed bottom end and a plural number of apertures facing the interior of the drying chamber;

the side rod means at least one substantially inverted 'U' shape rod having two ends, a substantially horizontal middle portion and two pivot arms at the ends, each pivot arm being tiltably engaged with a pivot bracket disposed on an interior surface of a side wall of the drying chamber;

a support means including a support stand and a base grid disposed in the drying chamber, the support stand including a substantially rectangular frame formed by a pair of transverse bars and a pair of longitudinal bars, and a pair of transversely spaced uprights with the top ends thereof engaging with the rectangular frame and with the bottom ends thereof secured on a pair of spaced and longitudinal base bars which are secured on two opposite side walls of the cabinet;

the rectangular frame being spaced from the heat diffusion plate, the side walls and the bottom wall of the cabinet; and the base grid resting on plural pairs of brackets located on two opposite side walls of the cabinet and disposed horizontally above the base bars;

a draining means located below the base bars and above the bottom wall, the draining means including a drain board which has a surface inclined downwardly from lateral sides thereof to a drain outlet formed in a center thereof, and a drip tray movably disposed below the drain outlet and under the bottom wall of the cabinet; and

an air discharge means including an air outlet formed adjacent the drain outlet, and a hollow air discharge duct located below the drain board, the discharge duct having a front end in fluid communication with the air outlet and a rear end in fluid communication with an air discharge port disposed on an outside surface of the rear side wall of the cabinet.

5,555,641

DEVICE AND METHOD FOR CONTROLLING DRYING PERIOD OF TIME OF A LAUNDRY DRYER

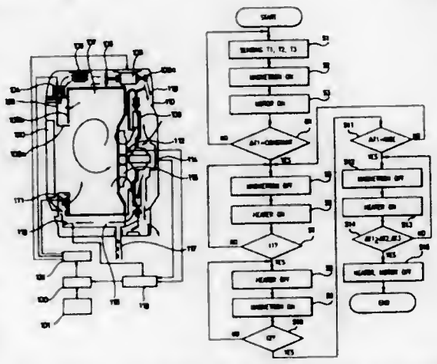
In K. Lee, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Jan. 11, 1994, Ser. No. 179,869

Claims priority, application Rep. of Korea, Jan. 11, 1993, 1993-274

Int. Cl.[6] F26B *3/34*

U.S. Cl. 34—261 **4 Claims**



1. A method for controlling drying period of time of a laundry dryer comprising:

a preheat drying process for carrying out drying operations by driving a magnetron and a motor until a temperature difference between a first air temperature of a high temperature and high humid air in a drum and a second air temperature after a dehumidification and cooling becomes constant in the drying operation;

an equilibrium drying process for carrying out drying operation until the temperature difference between the first air temperature and the second air temperature rises by turning on/off the magnetron and a heater alternatively when the temperature difference between the first air temperature and the second air temperature is constant;

a drying finish process for carrying out the drying operation by turning off the magnetron while driving the heater only when the air temperature difference between the first air temperature and the second air temperature starts to rise and finishing the drying operation when the risen air temperature difference reaches to a preset air temperature differences preset according to a quantity of the laundry;

wherein the alternative turn on/off period of time of the magnetron and the heater in the equilibrium drying process is different; and

wherein the period of a turn-on time of the heater is set longer than the period of the turn-on time of a magnetron.

5,555,642

PROCESS FOR UPGRADING LOW-QUALITY WOOD

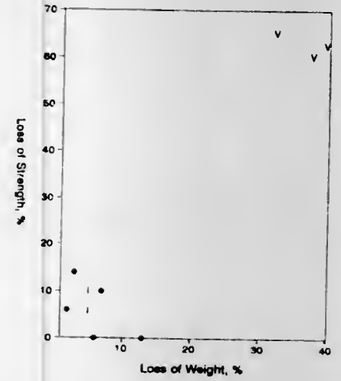
Peter C. Rem; Hans van der Poel, and Herman P. Ruyter, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 7, 1994, Ser. No. 179,012

Claims priority, application European Pat. Off., Jan. 8, 1993, 93200045

Int. Cl.[6] F26B *7/00*

U.S. Cl. 34—423 **15 Claims**



1. A process for upgrading low-quality wood to high-quality wood comprising the following stages:

a. softening the low-quality wood by directly heating it electrically in the presence of an aqueous medium at a pressure of at least the equilibrium vapor pressure of the aqueous medium;

b. drying the softened wood, wherein the drying stage comprises a first part and a second part;

c. curing the dried wood; and

d. cooling the cured wood, wherein the softening stage and at least the first part of the drying stage are carried out by ohmic heating.

5,555,643

METHOD AND APPARATUS FOR CREATING AIR FLOW IN A WALL OR CEILING FOR DRYING PURPOSES THROUGH AN ELECTRICAL BOX

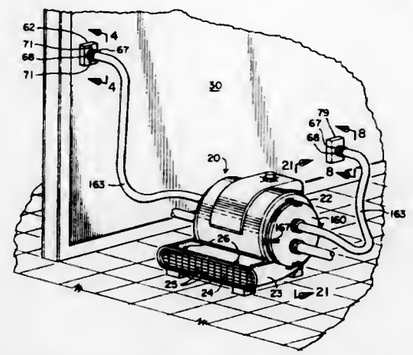
James A. Guasch, 11441 Eastbrook Ave., Los Altos, Calif. 94024

Continuation-in-part of Ser. No. 323,891, Oct. 17, 1994, Pat. No. 5,419,059. This application May 26, 1995, Ser. No. 452,270

The portion of the term of this patent subsequent to May 30, 2012, has been disclaimed.

Int. Cl.[6] F26B *3/00*

U.S. Cl. 34—443 **17 Claims**



1. Apparatus for applying a partial vacuum to a hollow wall or ceiling through an opening in the wall or ceiling with a surface of the wall or ceiling extending around an open face of the opening, comprising:

a conduit body having a first end sized and configured to fit circumferentially around the open face of a given opening and a second end configured to be coupled to a source of a partial vacuum;

an air flow passage extending between and opening to the first and second ends whereby a partial vacuum applied to the air flow passage through the second end is directed to and causes a reduction in air pressure at the first end; and

means for securing the conduit body over the open face of a given opening so that the first end will substantially abut the surface around the opening.

5,555,644

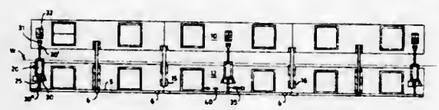
FLUID CYLINDER RETRACTION LOCKING DEVICE

Rodney Voegtline, Greenbay, Wis., assignor to W.R. Grace & Co.-Conn., New York, N.Y.

Filed Oct. 17, 1994, Ser. No. 323,973

Int. Cl.[6] F26B *13/00*

U.S. Cl. 34—444 **12 Claims**



1. A retraction locking system for a dryer having first and second hoods retractable with respect to each other, said retraction locking system comprising:

a base having an aperture operative to receive a rod when said first and second hoods are retracted in a bood closed first position with respect to each other;

a cylinder having said rod, said rod having a first end fixed to said first hood, and a second end moveable with respect to said base between said hood-closed first position wherein said

rod is received in said aperture, and a hood-retracted position wherein said rod is retracted from said aperture; and

means for blocking said rod, when said rod is retracted from said aperture from re-entering said aperture.

6. A method of locking a first load in a retracted position with respect to a second load, comprising:

retracting said first load with respect to said second load;

providing a retraction locking system comprising:

a base mounted on said second load, said base having an aperture;

a cylinder having a rod, said rod having a first end fixed to said first load, and a second end moveable with respect to said base between a load-closed position wherein said rod is received in said aperture, and a load-retracted position wherein said rod is retracted from said aperture; and

blocking said rod, when the first load is in a retracted position with respect to the second load, from re-entering said aperture.

5,555,645

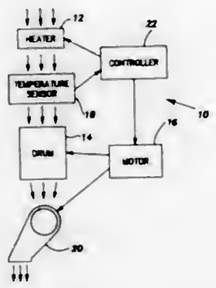
REVERSING CLOTHES DRYER AND METHOD THEREFOR

Dan F. Joslin, Fort Dodge, Iowa, assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Continuation of Ser. No. 40,766, Mar. 31, 1993, abandoned. This application Aug. 31, 1993, Ser. No. 115,395

Int. Cl.[6] F26B *3/00;19/00*

U.S. Cl. 34—499 **14 Claims**



1. A method for reducing the energy required to dry an article, comprising:

providing a rotatable drum for containing said article;

providing a heater for heating air;

providing a blower for moving heated air from said heater to said drum;

providing an electric motor for driving said drum and blower in a forward direction or a reverse direction, said blower providing a first airflow rate in the forward direction and a second airflow rate in the reverse direction, said first rate being greater than said second rate;

periodically increasing an amount of heat transferred to the article by driving said drum and blower in the reverse direction and alternately decreasing the amount of heat transferred to the article by driving said drum and blower in the forward direction and said heater cycling on and off during both said forward direction and said reverse direction.

5,555,646

APPARATUS FOR STEAMING A MATERIAL IN A SILO

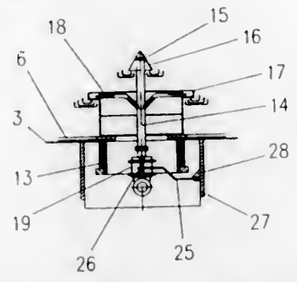
Reijo Kilpeläinen, Kitee; Risto Laukkanen, and Matti Virolainen, both of Savonlinna, all of Finland, assignors to Andritz-Patentverwaltungs-Gesellschaft M.B.H., Graz, Austria

Filed Feb. 7, 1994, Ser. No. 193,395

Claims priority, application Finland, Nov. 2, 1993, 930596

Int. Cl.[6] F26B *17/00*

U.S. Cl. 34—585 **20 Claims**



1. An apparatus for supplying steam into a silo, the silo having a bottom, at least one wall and a discharger, the discharger having a discharger arm, the discharger being mounted in a lower part of the silo by a bearing, the apparatus comprising a steam supply tubing connected to a steam source, the steam supply tubing having at least one steam feed pipe extending substantially from a central part of the bottom of the silo into an interior of the silo, the at least one steam feed pipe having a steam outlet which is movable within the silo to direct steam to different parts of the silo.

5,555,647

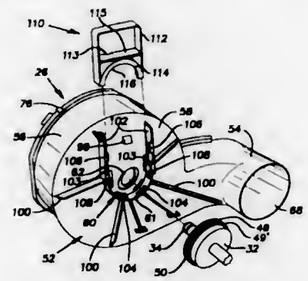
MOTOR MOUNTED TO BLOWER HOUSING

Kevin Torborg, and Victor E. Jelinek, both of Webster City, Iowa, assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Aug. 23, 1995, Ser. No. 518,554

Int. Cl.[6] F26B *11/02*

U.S. Cl. 34—601 **20 Claims**



1. An assembly for attaching an electric motor to a blower housing, said assembly comprising:

a support member projecting outwardly from a surface of said blower housing;

a generally cylindrical motor hub secured to said motor, said motor hub having a blower shaft extending outwardly therefrom and being engaged and supported by said support member; and,

a locking member which engages said motor hub and releasably secures said motor hub to said support member, said locking member being releasably secured to said blower housing and cooperating with said support member to retain said motor hub in position relative to said blower housing.

5,555,648

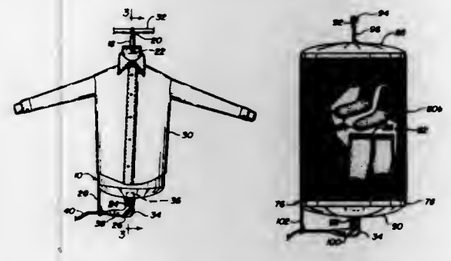
PORTABLE DEVICE FOR DRYING AND REMOVING WRINKLES FROM CLOTHING

Robert D. Griffin, P.O. Box 3083, Brentwood, Tenn. 37024-3083

Filed Sep. 12, 1995, Ser. No. 527,187

Int. Cl.[6] F26B *13/00*

U.S. Cl. 34—621 **20 Claims**



1. A portable device for drying and removing wrinkles from an article of clothing, which is for use with a portable dryer of the type having a handle, internal fan, and nozzle from which heated air is blown, wherein the device comprises:

an inflatable member having an interior and opposing first and second ends, the first end having an opening in communication with the interior, and further having a body portion extending between the first and second ends and comprised of an air permeable fabric which has an exterior surface and which is sized and shaped to fit within the article;

a hanging means fixedly connected to the second end of the inflatable member for hanging the inflatable member in a hanging orientation with the first end directly below the second end;

a sealing means associated with the opening for sealingly engaging the nozzle so that the nozzle is in communication with the interior of the inflatable member through the opening;

a fastener means for securing the portable dryer in a fixed position relative to the inflatable member at the same time that the sealing means is in engagement with the nozzle and the inflatable member is in a hanging orientation, wherein the fastener means comprises a looped strap having one end fixedly connected to the sealing means or the first end of the inflatable member, and further having an opposing free end, whereby the looped strap can be positioned around and in engagement with the portable dryer to secure it in position;

wherein the fabric has an air permeability that permits inflating the inflatable member to an inflated state and maintaining such inflated state by means of a continuous flow of heated air into the interior of the inflatable member from the nozzle of the portable dryer, when the nozzle is in sealed engagement with the sealing means and is secured in position by the fastener means, and wherein the article has an interior surface, whereby the inflatable member in said hanging orientation with its body portion within the article, and as maintained in the inflated state, has the exterior surface of its body portion in contact with the interior surface of the article so as to effectively dry and remove wrinkles from the article.

5,555,649

APPARATUS FOR DRYING A PAINTED SURFACE

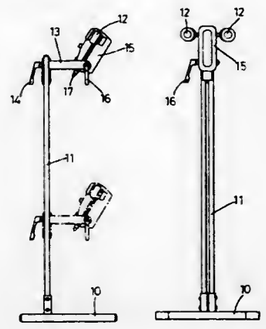
Peter Leo Phillipson, Washington, England, assignor to Edwin Trisk Systems Ltd., United Kingdom

Filed Feb. 27, 1995, Ser. No. 394,777

Claims priority, application United Kingdom, Sep. 15, 1994, 9418561

Int. Cl.[6] F26B *19/00*

U.S. Cl. 34—666 **18 Claims**



1. Apparatus for drying wet paint upon a painted surface, said apparatus comprising a base carrying an upright column such that the base and the upright column are portable, at least two air movers supported on said upright column and having the same elevation, said two air movers having air outlets directed away from each other and spaced horizontally at an angle between 4 degrees and 30 degrees of arc, said air outlets being angularly adjustable relative to the horizontal between predetermined limits, whereby the portability of the base and the upright column, the horizontal spacing and angular divergence between the air outlets of the respective air movers and the angular adjustability of said air outlets relative to the horizontal permit drying of wet paint on a painted surface without causing blemishes to the wet paint during drying.

5,555,650

LACELESS ATHLETIC SHOE

Mark A. Longbottom, 15 Thackeray Grove, Lockwood, Huddersfield, England, and Simon J. Peel, 5 Meadow Bank, Holnfirth, Huddersfield, England

Filed May 27, 1994, Ser. No. 250,546

Int. Cl.[6] A43B *5/00*

U.S. Cl. 36—114 **1 Claim**

1. An athletic shoe having a toe region for use by a wearer having an ankle region and a foot with a transverse tarsal joint, comprising:

a. an upper lacking laces and a tongue but comprising:

i. a continuous, essentially inexpansible, cushioned dorsal segment extending from the toe region to the portion of the

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5,555,652

LAND CLEARING APPARATUS

5,555,655

IDENTIFICATION DEVICE FOR A CONTAINER

i. a continuous, essentially inexpansible, cushioned dorsal segment extending from the toe region to the portion of the upper approximately above the transverse tarsal joint of the wearer's foot;

ii. an ankle segment integrally formed with the dorsal segment, defining an opening for receiving a wearer's foot, and comprising an elastic area surrounding the opening;

iii. means, comprising a loop attached to the ankle segment, for temporarily receiving the wearer's finger; and

iv. a system for cinching the shoe about the wearer's foot, comprising:

A. a buckle;

B. a first strap spanning the upper above the dorsal segment and attached to the buckle; and

C. means, comprising a second strap connected to the buckle, for attaching the first strap to the upper; and

b. an outsole comprising:

i. a fore section of rigid plastic;

ii. a rear section of rigid plastic;

iii. at least one groove laterally spanning the outsole and separating the fore and rear sections; and

iv. means, comprising woven carbon fibers coated with urethane and embedded in the fore section of the outsole, for providing torsional stability to the shoe.

5,555,651

FOOT SECURING DEVICE PARTICULARLY FOR SKI BOOTS

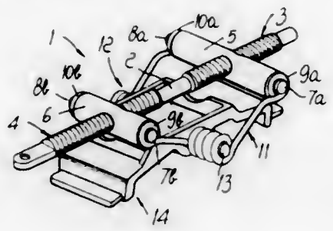
Claudio Sartor, Zero Branco, and Roberto Gorza, Feltre, both of Italy, assignors to Nordica S.p.A., Trevignano, Italy

Filed Jun. 23, 1995, Ser. No. 494,213

Claims priority, application Italy, Jul. 7, 1994, TV94A0079

Int. Cl.[6] A43B *5/04; 5/16*

U.S. Cl. 36—117.7 **7 Claims**



7. Foot securing device particularly for ski boots comprising a bar, a first threaded portion defined on said bar, a second threaded portion defined on said bar, an interspace defined on said bar between said first threaded portion and said second threaded portion, a first block threadedly engaging said first threaded portion, a second block threadedly engaging said second threaded portion, a plate having connected thereto a single pivot, said single pivot being arranged transversely with respect to said plate and said bar, at least one pair of linkages connecting said single pivot to said first block and to said second block, and at least one helical compression spring arranged coaxially with respect to said bar at said interspace, said first block and said second block being mutually movable towards and away from said helical compression spring upon rotating said bar, said first block and said second block engaging said helical compression spring upon being located at said interspace, said helical compression spring maintaining said first block and said second block in screw thread engagement with said first threaded portion and said second threaded portion when said first block and said second block are located at said interspace.

5,555,652

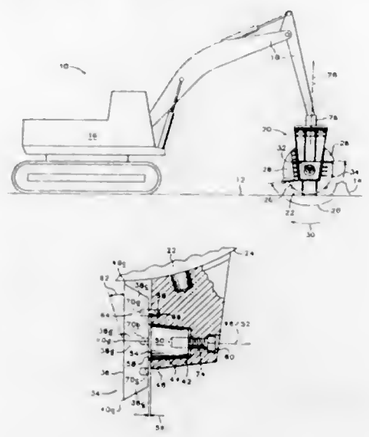
LAND CLEARING APPARATUS

Alan Ashby, 7263 Daisy St., Springfield, Oreg. 97478

Filed Jun. 30, 1994, Ser. No. 268,637

Int. Cl.[6] B27C *9/00;* **A01G** *23/08*

U.S. Cl. 37—189 **30 Claims**



1. A land clearing apparatus comprising:

a rotating member having an axis of rotation and a predefined attachment point through which a motive force is directed; and

removable impact structure attached to the rotating member at the attachment point by joinder structure, the impact structure having a substantially planar impact surface, and the joinder structure having an axis of alignment along which the impact structure is attached to and removed from the rotating member, with the axis of alignment being oriented relative to the impact surface to be about perpendicular to the impact surface and relative to the attachment point so that the impact surface, with the impact structure attached to the rotating member, faces the normal direction of rotation of the rotating member.

5,555,653

CRAFT HOOP ASSEMBLY

Robert E. Morgan, 2255 NE. Porter Rd., Blue Springs, Mo. 64014

Continuation-in-part of Ser. No. 379,889, Jan. 27, 1995, abandoned. This application Oct. 20, 1995, Ser. No. 546,559

Int. Cl.[6] D06C *3/08*

U.S. Cl. 38—102.2 **14 Claims**

1. A craft hoop assembly for securing material on which a craft is to be performed comprising:

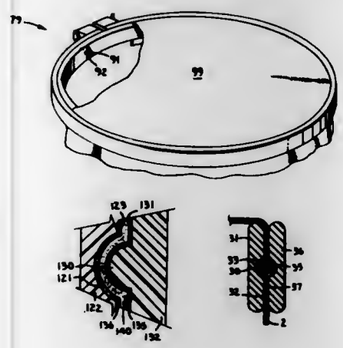
(a) an inner ring having an outer surface;

(b) an outer ring having an inner surface and positionable in circumscribing alignment with said inner ring;

(c) said inner ring having a groove formed in and circumscribing said inner ring outer surface;

(d) an elastic band securable within said groove such that a portion of said band extends beyond said inner ring outer surface; and

(e) said inner surface of said outer ring having a groove formed therein; said outer ring groove circumscribing said outer ring inner surface; said outer ring groove positioned on said outer ring in corresponding alignment with said inner ring groove such that said outer ring groove at least partially encloses said portion of said band extending beyond said inner ring outer surface from said inner ring groove.



5,555,654

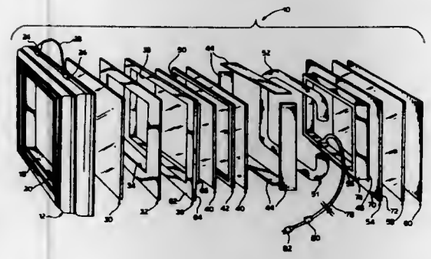
FRAMES HAVING LIGHTING TO ILLUMINATE GLASS ETCHINGS

Mark D. Hermann, 106 Mainsail Ct., Folsom, Calif. 95630

Filed Oct. 31, 1994, Ser. No. 332,585

Int. Cl.[6] G09F *13/00*

U.S. Cl. 40—714 **21 Claims**



17. A frame for displaying at least one glass etching with an artwork, comprising:

a. an outer frame member having a front surface and a cavity therethrough, wherein an inner edge is provided adjacent to the front surface;

b. a first inner frame member assembled within said cavity of said outer frame member and having an opening therethrough;

c. a transparent member assembled within said cavity of said outer frame member and located between said inner edge of said outer frame member and said first inner frame member;

d. a second inner frame member assembled within said cavity of said outer frame member and having an opening therethrough;

e. said first inner frame member and said second inner frame member for holding said at least one glass etching therebetween;

f. an illuminating means positioned between said first inner frame member and said second inner frame member for illuminating said at least one glass etching, and having means for absorbing heat generated therefrom;

g. a backing member assembled within said cavity of said outer frame member for holding said artwork between said second inner frame member and the backing member; and

h. means for securing said backing member to said outer frame member.

5,555,655

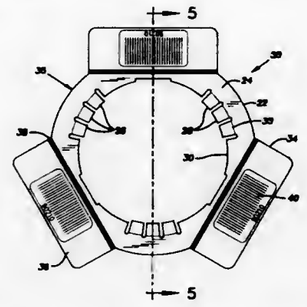
IDENTIFICATION DEVICE FOR A CONTAINER

John Yager, North Royalton; Bernard Lozar, Broadview Heights, both of Ohio, and Milton L. Klein, Crown Point, Ind., assignors to AGA AB, Lidingo, Sweden

Filed Sep. 26, 1994, Ser. No. 311,961

Int. Cl.[6] G09F *3/08*

U.S. Cl. 40—306 **19 Claims**



1. An identification device for a container having a threaded neck, comprising:

a body mountable on the neck and defining an inner edge adapted for fitting around the neck;

fingers having a base attached to the body outside the inner edge, extending inwardly from the body past the inner edge of the body, and adapted to engage threads of the neck;

a tag attached to the body by a flexible hinge, said tag extending outwardly and downwardly from the body prior to installation on the neck; and

an identification label on the tag.

5,555,656

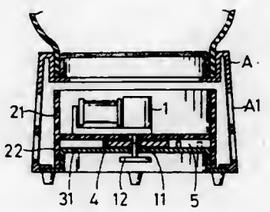
STRUCTURE OF CRYSTAL BALL PROVIDING DYNAMIC PHENOMENON IN THE BASE

Jian H. Liu, No. 3, Alley 202, Kao Fen Rd., Hsin-Chu City, Taiwan

Filed Mar. 24, 1995, Ser. No. 409,984

Int. Cl.[6] G09F *19/08*

U.S. Cl. 40—411 **7 Claims**



1. In a decorative device having a base, a structure providing a dynamic phenomenon in the base and including

a chassis having a platform with a central hole;

a stop mounted on said chassis platform;

a rotating pedestal having an axially extending, circumferential rim with teeth mounted thereon and having a platform with a central hole, said pedestal being mounted on said chassis such that said chassis platform and said pedestal platform are spaced apart;

a music bell fixed on said rotating pedestal platform, said music bell having a driving axle which extends through said central holes of said rotating pedestal and said chassis;

a gear having teeth and located in the space between said rotating pedestal platform and said chassis platform, and

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5,555,658

DECORATIVE LAMP ASSEMBLY ADAPTED TO

at least two sign modules each having side edges, a rear surface and at least one registration pad attached to said rear surface,

a gear having teeth and located in the space between said rotating pedestal platform and said chassis platform, and rigidly mounted on said driving axle of the music bell; and

a controller having a first end portion and a second end portion and pivotally mounted between said gear and the teeth formed on the circumference of said rotating pedestal such that said controller can swing, said controller having hook portion which can engage said pedestal teeth, said hook portion being formed on said first end portion of said controller,

the second end portion of said controller always being placed between the teeth of said gear such that said second end portion is pushed by said gear for moving said hook portion of said controller to engage with said teeth of said rotating pedestal; and such that when said controller is rotated for disengaging said hook portion from said teeth of said rotating pedestal, said second end portion can contact said stop of said chassis, and the reverse rotation of said gear is limited by said second end portion the rotation of which is stopped.

5,555,657

SYSTEM FOR FASTENING INTERCHANGEABLE ADVERTISEMENTS TO A SUPPORTING STRIP

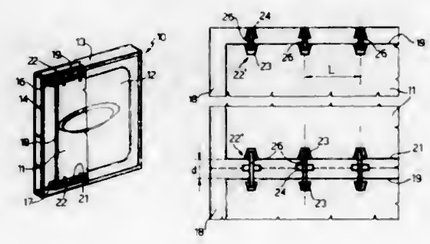
Franco Sorbini, Ivrea, Italy, assignor to Dima S.r.l., Ivrea, Italy

Filed Jan. 25, 1994, Ser. No. 186,301

Claims priority, application Italy, Jan. 26, 1993, TO93A0043

Int. Cl.[6] G09F *11/18*

U.S. Cl. 40—518 **12 Claims**



1. A system fastening interchangeable advertisements to a supporting strip, comprising:

at least two parallel rollers between which said supporting strip is wound and unwound, said rollers being rotatable for selecting the advertisement for display in a display window, each advertisement comprising two edges substantially perpendicular to a traveling direction of said supporting strip;

fastening labels located at each one of said two edges for removably fastening said advertisement to said supporting strip, each said fastening label comprising at least two adhesive elements consisting of a strongly adhesive high-temperature-resistant, two-sided adhesive layer removably bondable to said advertisement and to said supporting strip, said adhesive elements being provided on two opposite faces of a strip of transparent latex having a stretch coefficient between 600% and 800% to enable elastic displacement of the respective edges in relation to said supporting strip and in said direction, said adhesive elements including a protective cover film removable prior to fitment to said advertisement and said supporting strip.

5,555,658

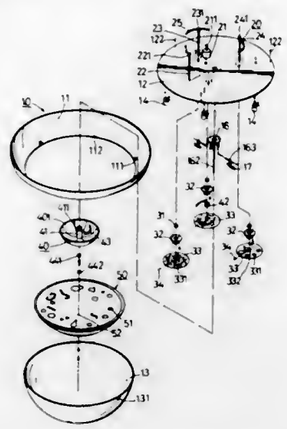
DECORATIVE LAMP ASSEMBLY ADAPTED TO PROVIDE SILHOUETTING EFFECTS

Chai-Chi Yu, No. 24, Lane 1, Ta-Chih St., Tan-Yang Tsun, Tan-Tzu Hsiang, Taichung Hsien, Taiwan

Continuation-in-part of Ser. No. 399,135, Mar. 6, 1995. This application May 24, 1995, Ser. No. 449,008

Int. Cl.[6] G09F *13/06*

U.S. Cl. 40—554 **2 Claims**



1. A decorative lamp assembly comprising:

an enclosure body having a cover portion formed with an external surface;

an electric bulb unit fixed in said enclosure body and including a small bulb unit consisting of a plurality of spaced small bulbs mounted in a central section of said enclosure body and a large bulb unit consisting of a circle of circumferentially arranged large bulbs;

a bowl-shaped transparent rotary member mounted rotatably in said enclosure body and located between said cover portion and said small bulbs, and between said cover portion and said large bulbs, said rotary member having a pattern unit indicated thereon;

a plurality of transparent rotary disks mounted rotatably within said rotary member between said cover portion and said smaller bulbs, and between said cover portion and said large bulbs, each of said disks having an opaque pattern unit formed thereon, each of said disks further having a vertical axis located radially of said rotary member between said small and large bulbs so that rays of light emitted from said smaller and large bulb units pass through said rotary disks and said rotary member and penetrate partially said cover portion to display silhouettes of said pattern units of said rotary disks and said rotary member on a central portion of the cover portion in an overlapping manner; and

a driving unit for rotating said rotary disks and said rotary member.

5,555,659

APPARATUS FOR MOUNTING FLEXIBLE BANNERS

Conrad Hade, South Salem, N.Y., assignor to Dinaco, Inc., Irvington-on-Hudson, N.Y.

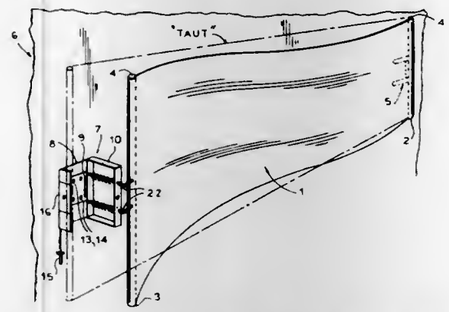
Filed Aug. 19, 1994, Ser. No. 292,834

Int. Cl.[6] G09F *17/00*

U.S. Cl. 40—604 **3 Claims**

1. Apparatus for quick mounting large banners, said apparatus comprising

(a) a flexible stretchable banner of at least 18 square feet in surface having free ends and a predetermined length area;



(b) a support structure to which a banner may be quickly attached in a predetermined plane;

(c) a first mounting bracket attached to said support structure and having first stationary hooked mounting rods for securing a first of said free ends of said stretchable banner;

(d) a second mounting bracket spaced from said first mounting bracket a distance substantially equal to the length of said flexible stretch banner and having a hinged cover member adapted to swing outwardly of said predetermined plane;

(e) a plurality of second hooked mounting rods carried by said hinged cover, each of said second hooked mounting rods is biased by a spring means for limited movement relative to said hinged cover member; said biasing spring means urging said second hooked mounting rods away from said first mounting bracket;

(f) whereby a second the free of ends of said flexible stretchable banner may be loosely attached to said second hooked mounting rods when said hinged cover member is swung outwardly of said predetermined plane to space said second hooked rods from said first hooked rods a distance less than the length of said banner; and said banner thereafter may be securely displayed when said cover member is return to said predetermined plane to allow said second hooked mounting rods to urge said second hooked rods away from said first hooked rods to make said banner taut in said plane.

5,555,660

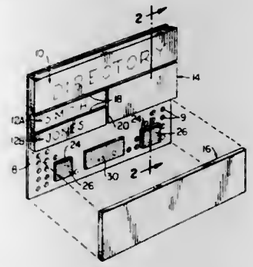
MODULAR SIGNAGE SYSTEM

Roger Whitehouse, 201 W. 92nd St., New York, N.Y. 10025, and Donall B. Healy, 35A Jane St., New York, N.Y. 10014

Continuation-in-part of Ser. No. 746,648, Aug. 15, 1991, Pat. No. 5,428,914. This application Feb. 10, 1994, Ser. No. 196,007

Int. Cl.[6] G09F *7/04*

U.S. Cl. 40—622 **27 Claims**



10. A modular sign, comprising:

a perforated base having a multiplicity of apertures spaced a predetermined distance apart in both horizontal and vertical directions;

at least two sign modules each having side edges, a rear surface and at least one registration pad attached to said rear surface, the size of said sign module being greater than that of said registration pad so that the sign module overlaps the registration pad, said registration pad including at least two projections for engagiog at least two of said apertures, said pad being located with respect to the edges of the associated sign module such that the edges of adjacent modules are separated by a predetermined distance to create thereby a reveal between adjacent modules when said registration projections are placed within appropriate ones of said apertures.

5,555,661

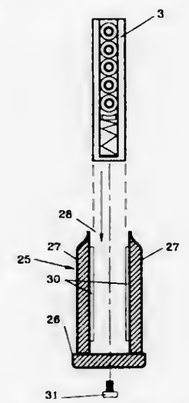
PISTOL GRIP MAGAZINE ADAPTOR

Edwin Yap, 9092 Talbert Ave., # 11, Fountain Valley, Calif. 92708

Filed Dec. 15, 1994, Ser. No. 356,704

Int. Cl.[6] F41A *9/71*

U.S. Cl. 42—49.02 **1 Claim**



1. A device for mounting in a hand gun handle magazine comprising:

a magazine clip adapter having a base pad with two clip adapter sides formed to fit against a magazine wall of the hand gun handle magazine;

the base pad having a clip screw to retain a bullet clip;

the magazine clip adapter having a volume to define a clip aperture therein into which said bullet clip may be loaded; and

the magazine clip adapter being held in the magazine by an attachment means.

5,555,662

LASER RANGE FINDING APPARATUS

James W. Teetzel, 14 Stratham Green, Stratham, N.H. 03885

Continuation-in-part of Ser. No. 303,860, Sep. 9, 1994, which is a continuation-in-part of Ser. No. 200,204, Jul. 23, 1994, Pat. No. 5,481,819, which is a continuation-in-part of Ser. No. 89,889, Jul. 12, 1993, Pat. No. 5,425,299, which is a continuation-in-part of Ser. No. 73,766, Jun. 8, 1993, Pat. No. 5,355,608. This application Dec. 5, 1994, Ser. No. 349,375

Int. Cl.[6] F41G *1/36*

U.S. Cl. 42—103 **6 Claims**

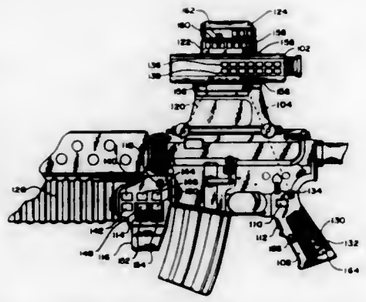
1. A range finding apparatus for determining the range to a selected target comprising:

pulsed laser ranging means for sending a timed laser signal to the target with said signal being reflected from the target;

laser pointing means for selectively pointing a laser spot at the target with said laser pointing means and said pulsed laser ranging means being in the same plane;

5,555,664

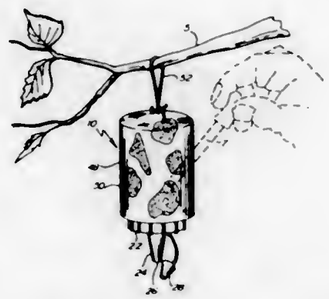
DEVICE FOR ATTRACTING ANIMALS



selection means for filtering out the reflections emanating from the target as result of the laser spot emitted by said laser pointing means and providing an output signal corresponding solely to the reflections received from said pulsed laser ranging means;

processing means for processing the output signal received from said selection means to provide a distance output signal that corresponds to the measured time of said timed pulsed laser signal to reach the target and return to said apparatus, said distance output signal corresponding to the range of the selected target.

5,555,663
HEATED ANIMAL SCENT LURE DISPENSER
John R. Burgeson, Anoka, Minn., assignor to Wildlife Research Center, Inc., Anoka, Minn.
Filed Nov. 14, 1994, Ser. No. 337,989
Int. Cl.[6] A01M *31/00*
U.S. Cl. 43—1 **33 Claims**



18. A heated animal scent lure dispenser for attracting animals, comprising:

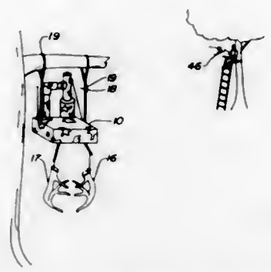
(a) a container with an interior, an exterior and an opening;

(b) a cap for at least partially closing the opening;

(c) a heating means placeable within the interior of the container for heating the container; and

(d) a wick comprised of a camouflaged knit fabric with fleece covering and insulating the container, the wick adapted for absorbing a scent lure placed thereon and for dispensing the scent lure heated thereon by the heating means within the container.

5,555,664
DEVICE FOR ATTRACTING ANIMALS
Robert S. Shockley, P.O. Box 2228, Conway, Ark. 72033
Filed Jan. 26, 1995, Ser. No. 378,538
Int. Cl.[6] A01M *31/06*
U.S. Cl. 43—1 **8 Claims**



1. An apparatus for attracting animals, comprising:

(1) an enclosure;

(2) a rattling device mounted to said enclosure for producing sounds of antlers rattling, said device comprising:

(a) two arms protruding from said enclosure, at least one of said arms having one end movable toward and away from the other of said arms;

(b) two rattling objects adapted to imitate said sounds of antlers rattling when striking contacts are made between said rattling objects, said rattling objects each respectively connected to a respective one of said arms; and,

(c) a first electro-mechanical drive means mounted in said enclosure and operatively connected to said at least one of said arms for causing movement thereof, and in turn causing striking contacts between said rattling objects to generate said sounds of antlers rattling;

(3) a scent producing device mounted to said enclosure, said scent producing device comprising:

(a) a support extension connecting said scent producing device to said enclosure;

(b) a refillable container mounted on said support extension and containing a scented material;

(c) a spray nozzle depressibly attached to said container for dispensing said scented material when depressed; and,

(d) a second electro-mechanical drive means, said second electro-mechanical drive means including linkage means and a lever engaged with said nozzle for depressing said nozzle to dispense said scented material;

(4) electrical power supply means mounted in said enclosure for activating said first and second electro-mechanical drive means; and,

(5) control means mounted in said enclosure and connected to said electrical power supply means for receiving a control signal and controlling the functions of said first and second electro-mechanical drive means corresponding to the signals received.

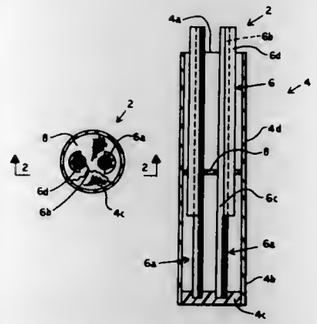
5,555,665
SCENT-RELEASING POLE FOR ATTRACTING DEER
John C. Fore, 34264 Hwy. 16 N., Denham Springs, La. 70726
Filed Apr. 12, 1995, Ser. No. 420,773
Int. Cl.[6] A01M *31/00*
U.S. Cl. 43—1 **4 Claims**

1. A scent-releasing taper for attracting deer, comprising:

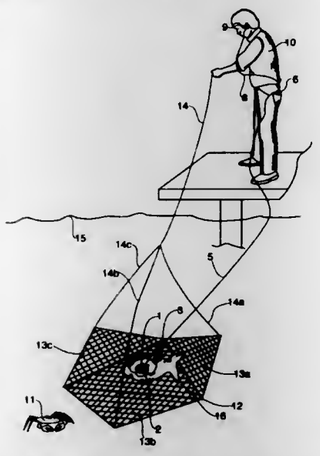
(a) an elongated combustible member;

(b) an inner layer of peat circumscribing an upper portion of the elongated combustible member; and

(c) an outer substantially semicilricular layer of wax impregnated with a scent which attracts deer, the layer of scent-impregnated wax overlapping in a one-hundred-and-eighty-degree configuration about half of the upper portion of the elongated combustible member and the inner layer of peat.



5,555,666
CRAB FISHING BY REMOTE MONITORING
Mark Glatzer, 12 Percy Williams Dr., East Islip, N.Y. 11730
Filed Jul. 22, 1994, Ser. No. 278,801
Int. Cl.[6] A01K *69/00*
U.S. Cl. 43—17 **4 Claims**



1. A device for use with a conventional crab trap, closeable from the surface by a trigger line, comprising:

audio transducer positioned within the trap,

an amplifier and speaker remotely located and adjacent the trigger line,

wire means connecting the audio transducer to the amplifier and speaker, and wherein the audio transducer is encased within a molded form which resembles bait, whereby said audio transducer, signals, via said wire means, amplifier and speaker, the occurrence of activity within said crab trap.

5,555,667
POSITION SENSING LIGHT DEVICE FOR A FISHING ROD
Tae H. Bae; Sang Y. Bae, and Sang I. Bae, all of 6898 Old Annapolis Rd., Linthicum, Md. 21090
Filed Jun. 28, 1995, Ser. No. 496,198
Int. Cl.[6] A01K *97/12*
U.S. Cl. 43—17 **7 Claims**

1. A position sensing light device for a fishing rod, comprising:

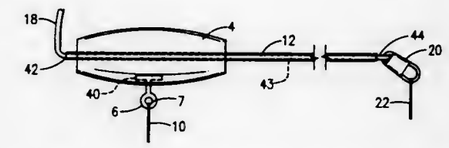
a T-shaped attachment for detachably mounting to said fishing rod, said T-shaped attachment including a gradually tapered opening cylinder defining an upper portion thereof for tightly and slidably clamping the fishing rod, and a tube including defining a lower portion thereof;

a tubular housing rotably assemblable with said tube of the T-shaped attachment, said tubular housing including a conducting base partition a cell battery, a light bulb and a mercury switch said cell battery slidably received on one side of said conducting base partition; and

a transparent cap tightly assemblable with said tubular housing covering the light bulb and the mercury switch,

whereby said light bulb is illuminated in response to said mercury switch when a fish is attempting to take a bait.

5,555,668
METHOD AND DEVICE FOR LOCATING BAIT AT DESIRED DEPTH WHILE FISHING
Bernard P. Brasseur, HCR 75, Box 86, Cornish, N.H. 03745
Filed Apr. 13, 1995, Ser. No. 421,686
Int. Cl.[6] A01K *93/00*
U.S. Cl. 43—43.15 **19 Claims**



1. A bait locating device for facilitating positioning of bait at a desired distance from a bottom of a body of water, said bait locating device comprising:

a floatation member for providing desired buoyancy to said bait locating device;

an attachment member being secured to said floatation member, said attachment member facilitating attachment of said bait locating device to a desired weighted member for sinking said bait locating device toward the bottom of the body of water; and

a spacer comprising first and second apertures which are both supported by said floatation member, said spacer having a longitudinal dimension which is at least twice that of a longitudinal dimension of said floatation member, and said spacer being supported by said floatation member so that, said second aperture is spaced a greater distance from an exterior surface of said floatation member than said first aperture whereby said second aperture, when engaged with a fishing line during use, spaces the fishing line a desired distance away from said floatation member.

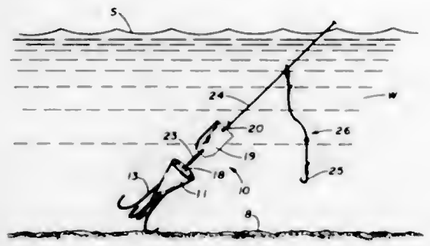
5,555,669
SURF FISHING SINKER

5,555,671
LIGHT WEIGHT FLY BOX

a housing fixedly positioned relative to a target area to be monitored for termite activity, said housing having at least

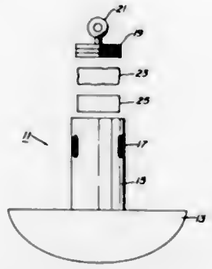
engaging said container and a washer member for sealably coupling the cap member to the container; and wherein said dispensing

5,555,669
SURF FISHING SINKER
Terry L. Fitzgerald, 1604 Park Ave., Melbourne, Fla. 32901
Filed Jun. 9, 1995, Ser. No. 489,059
Int. Cl.[6] A01K *95/00*
U.S. Cl. 43—44.96 **4 Claims**



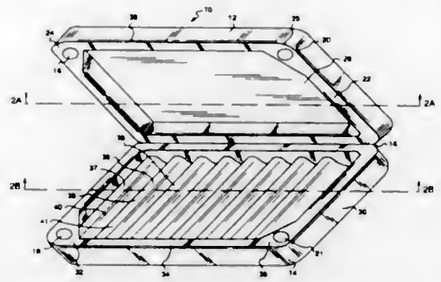
1. A fishing sinker assembly to position and hold a fishing line against wave action comprises, a monolithic body member having a tapered shape extending from a flat surface to a point, a plurality of fingers extending from said body member adjacent its point in spaced relation to said flat surface, a rudder secured in fixed rotational relation to said flat surface of said main body member, said fingers being deformable from a first position to a second and subsequent curved angular position in relation to said first position, and means for securing said rudder to said body member.

5,555,670
SUBMERSIBLE OBJECT WITH BAIT COMPARTMENT FOR A ATTRACTING FISH
Richard V. Troutman, Jr., 879 Charlotte, Stephenville, Tex. 76401
Filed Sep. 16, 1994, Ser. No. 307,514
Int. Cl.[6] A01K *97/02*
U.S. Cl. 43—44.99 **9 Claims**



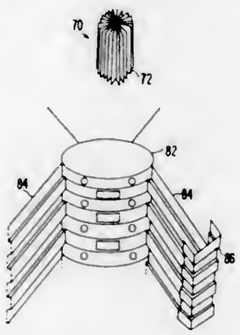
1. An apparatus for anchoring a vessel and attracting fish to an area proximate the vessel, the apparatus comprising:
- a weighted portion shaped to engage the bottom of a body of water, the weighted portion having sufficient weight to submerge the apparatus and to anchor a fishing boat against winds and currents;
- an upstanding shank secured to an upper surface of the weighted portion and terminating in means for attachment to an anchor line or chain; and
- a bait compartment formed in the shank to receive a quantity of fish-attracting material and having closure means selectively openable to permit access to the fish-attracting material, the shank being provided with means to permit the fish-attracting material to mix with water when the apparatus is submerged.

5,555,671
LIGHT WEIGHT FLY BOX
Bradford Voight, 315 West St., Needham Heights, Mass. 02194; Mark Wentworth, Wilmot, and Luke P. Janetos, Rollinsford, both of N.H., assignors to Bradford Voight, Needham, Mass.
Filed Dec. 5, 1994, Ser. No. 349,202
Int. Cl.[6] A01K *97/06*
U.S. Cl. 43—57.1 **13 Claims**



1. A unitary light-weight fly box for holding fishing flies, comprising:
- a bottom member made from two foamed plastic layers of different densities and fixed to one another, with the more dense foamed plastic on the outside of said bottom member, and the less dense foamed plastic on the inside of said bottom member;
- a top member made from said two foamed plastic layers of different densities and fixed to one another, with said more dense foamed plastic on the outside of said top member, and said less dense foamed plastic on the inside of said top member; and
- a living hinge interconnecting said top and bottom members along a first edge of each said member said living hinge also made from said two foamed plastic layers of different densities, to allow the box to be opened and closed.

5,555,672
SYSTEM FOR TERMITE DETECTION AND CONTROL
Barbara L. Thorne, 4306 Woodberry St., University Park, Md. 20782, and James F. A. Traniello, 11 Smith Ave., Lexington, Mass. 02173
Continuation-in-part of Ser. No. 941,460, Sep. 8, 1992, Pat. No. 5,329,726. This application Jul. 18, 1994, Ser. No. 277,420
Int. Cl.[6] A01M *1/20*
U.S. Cl. 43—124 **12 Claims**

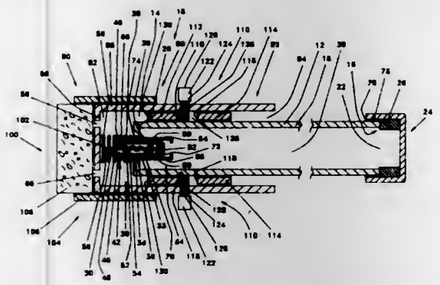


1. A system for monitoring and controlling termite infestation, said system including:
- a housing fixedly positioned relative to a target area to be monitored for termite activity, said housing having at least one opening defined therein,
- a first cartridge removably receivable within said housing, said first cartridge including a bait material for termites and having at least one opening defined therein, said opening in said first cartridge being oriented relative to said opening in said housing such that said respective openings in said housing and said first cartridge are at least partially aligned with each other when said first cartridge is received within said housing in a predetermined operational position,
- a second cartridge removably receivable within said housing when said first housing is removed from said housing, said second cartridge containing a pesticide-containing bait material, and having at least one opening defined therein, said opening in said second cartridge being oriented relative to said opening in said housing such that said respective openings in said housing and said second cartridge are at least partially aligned with each other when said second cartridge is received in said housing in said predetermined operational position,

said first and second cartridges being selectively interchangeably receivable in said housing,

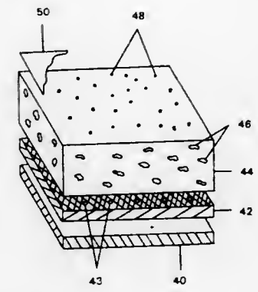
said first and said second cartridges each including means for partitioning the volume of said bait material of said respective bait cartridges into a plurality of different sections.

5,555,673
METHOD AND APPARATUS FOR APPLYING LIQUID
Wayne H. Smith, R.R. 2 Box 81, Leoti, Kans. 67861
Filed Nov. 14, 1994, Ser. No. 337,729
Int. Cl.[6] A01M *21/04*
U.S. Cl. 47—1.5 **3 Claims**



1. An apparatus (**10**) for dispensing a quantity of liquid comprising an elongated container (**12**); a valve assembly (**30**) secured to an end (**14**) of said elongated container communicating with inside of same for gravitationally releasing a liquid (**8**) into a dispensing assembly; a dispensing assembly (**80**) engaged to said elongated container for receiving a liquid dispensed from said valve assembly and dispensing said liquid from said apparatus; a regulating means (**110**) engaged to said dispensing assembly for retaining said dispensing assembly to the elongated container while simultaneously protecting said valve assembly from hyper-compression; said dispensing assembly comprising a generally hollow tubular wall member (**88**) defining a second proximal end (**90**) and a second distal end (**92**) thereof; said second proximal end of said tubular wall member having a generally circular end wall (**96**) secured thereto; said second distal end defining a dispenser open end (**94**); said dispensing assembly defining a dispenser cavity (**82**) therein; a generally circular platform member (**102**) secured to said generally circular end wall (**96**) such that said platform member is generally coaxial and generally parallel with said generally circular end wall; and said generally circular end wall having at least one aperture (**98**) disposed therein; a cap member (**24**) threadably secured to said container for containing said liquid; said cap member comprising a threaded inner face (**76**) for threadably engaging said container and a washer member for sealably coupling the cap member to the container; and wherein said dispensing assembly additionally comprises an end cap assembly (**104**) releasably secured thereto; said end cap assembly comprising fluid retaining means (**100**) for retaining liquid communicated thereto and transferring said liquid therefrom to an object; and said fluid retaining means comprising a cellulosic sponge member (**108**); and a pump member (**136**) disposed in said cap member (**24**) for pressurizing said container (**12**); and wherein said means for retaining said dispensing assembly comprises a pair of annular sleeves (**112,114**) secured to said container defining an annular channel (**120**) therebetween for receiving a screw member; a screw member (**122**) threadably disposed in said dispensing assembly for being received by said annular channel; said annular channel comprising a channel width wherein said screw member may longitudinally slide between said pair of annular sleeves within said channel.

5,555,674
SOD MATS CONSTRUCTED OF STABLE FIBERS AND DEGRADABLE MATRIX MATERIAL AND METHOD FOR PROPAGATION
Charles J. Molnar; Judith R. Molnar, both of 12 Malvern Ct. Devon, Wilmington, Del. 19810, and William H. Mitchell, Newark, Del., assignors to Charles J. Molnar, and Judith R. Molnar, both of Wilmington, Del.
Continuation-in-part of Ser. No. 95,651, Jul. 29, 1993, Pat. No. 5,344,470. This application Aug. 29, 1994, Ser. No. 297,231
Int. Cl.[6] A01G *1/00*
U.S. Cl. 47—56 **43 Claims**



1. A plant sod mat comprising:
a) a sod reinforcement wherein said sod reinforcement is comprised of a coherent sheet of stable fibers and a degradable matrix material which has been degraded in a range of from 0% to about 100%;
b) a layer of planting medium of greater than 1.5 cm thick on said sod reinforcement; and
c) viable plants growing in said planting medium wherein roots of said plants penetrate and entangle with said sod reinforcement and said sod mat having a weight per unit area of greater than 4 kgpsm.

5,555,675

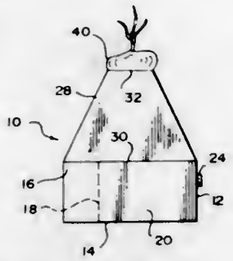
PLANT CULTIVATION APPARATUS AND METHOD

Blake Whisenant, P.O. Box 207, Hwy. 62, Parrish, Fla. 34219

Continuation-in-part of Ser. No. 315,501, Sep. 30, 1994, which is a continuation of Ser. No. 976,351, Nov. 17, 1992, Pat. No. 5,379,547, which is a continuation-in-part of Ser. No. 546,448, Jul. 2, 1990, Pat. No. 5,193,306. This application Jun. 7, 1995, Ser. No. 479,636

Int. Cl.[6] A01G *9/02*

U.S. Cl. 47—79 **12 Claims**



1. A plant cultivation container comprising a bottom surface and a peripheral wall extending from said bottom surface and terminating at an upper edge to thereby define an interior volume, at least one partition extending across said bottom surface and having a selected height relative to said bottom surface to divide said interior volume into a first and a second chamber, at least one wall extending from a section of said upper edge and sloping inwardly over a portion of said interior volume, said one wall including adjacent peripheral wall segments extending from the remainder of said upper edge to define an enclosure over said upper edge of said interior volume, said enclosure including an upper border defining an opening through which plants can grow when placed in soil disposed in said enclosure, said opening having a predetermined area that is less than the area bounded by said upper edge of said peripheral wall, said container including a flexible container bag having a surface dimension such that said bag will close said opening when placed thereon.

5,555,676

VERTICAL PLANTER APPARATUS AND METHOD

John F. Lund, Salt Lake City, Utah, assignor to A.C.T., Inc., Salt Lake City, Utah

Filed Nov. 3, 1994, Ser. No. 333,629

Int. Cl.[6] A01G *25/00*

U.S. Cl. 47—82 **10 Claims**

1. A vertical planter comprising:

a hollow column comprising at least two column modules, said column modules being mountable in an end-to-end relationship to form said hollow column;

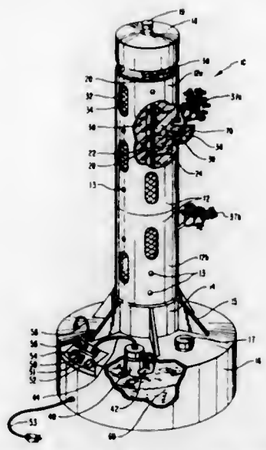
an enclosed reservoir for holding a body of water;

mounting means on said enclosed reservoir for mounting said hollow column in a vertical orientation on said enclosed reservoir;

a planting medium in said hollow column;

a plurality of planting ports formed in said hollow column, said planting ports providing access for plants to be planted in said planting medium;

a plurality of planter inserts for mounting in said planting ports, each of said planter inserts comprising a frame generally conforming to the outline of said planter ports, a planter cup mounted to said frame and extending outwardly from said frame to hold a body of said planting medium on the outside surface of said hollow column when said planter insert is mounted to said planting port said planter insert including a shield mounted to said frame above said planter cup and extending inwardly into said hollow column when said planter insert is mounted to said planting port; and



water distribution means for distributing water from said body of water to said planting medium for said plants, said water distribution means comprising a pump means for distributing said water, said water distribution means including moisture sensor means in said planting medium for sensing when said planting medium requires more water, said moisture sensor means activating said pump means to distribute said water to said planting medium.

5,555,677

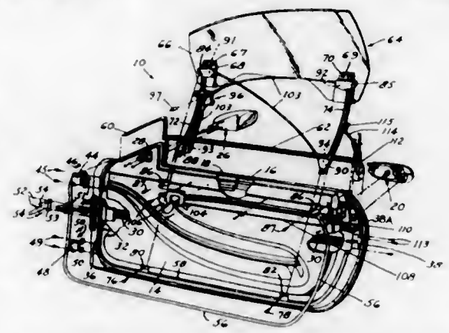
VEHICLE DOOR ASSEMBLY

Delbert D. DeRees, Romeo, and David J. Kowall, Hartland, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Division of Ser. No. 155,367, Nov. 22, 1993, Pat. No. 5,505,024. This application Jun. 6, 1995, Ser. No. 469,039

Int. Cl.[6] B60J *5/04*; **E05F** *11/48*

U.S. Cl. 49—502 **3 Claims**



1. The combination comprising a vehicle door assembly including an outer contoured panel, an inner contoured panel, the panels being connected at their side and bottom peripheral edges with spaced apart upper edges, and a pre-assembled glass and regulator track assembly adapted to being mounted as a complete assembly downwardly through the spaced apart upper edges of said panels into the space between the panels, wherein said glass and regulator track assembly includes substantially vertically oriented parallel tracks, a pair of lift plates slidably mounted in respective tracks, a glass secured at its lower front and rear edge portions to said pair of lift plates, regulator housings positioned adjacent respective upper and lower end portions of said parallel tracks, two upper and two lower mounting members and an opening formed in said inner panel, a crank assembly secured in said opening, said parallel track adapted to be secured at their upper and lower ends to respective mounting members, said regulator housings being secured to each of said two upper and two lower mounting members and to said upper and lower end portions of said parallel tracks, a drum in each said regulator housing and in said crank assembly, a rotatable crank arm secured to the drum in said crank assembly, and a cable slidably mounted around each of said drums and adapted to wrap fixedly around said drum in said crank assembly and connected to the lift plates for raising and lowering said lift plates and associated glass in response to manual rotation of said crank arm.

5,555,678

TUBULAR COLUMN OF HIGH RESISTANCE TO BUCKLING

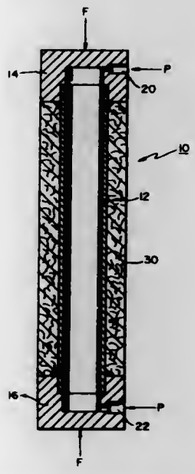
Raul A. I. Schoo, Bolivar 547, Piso 6, 1066 Buenos Aires, Argentina

Filed Feb. 15, 1994, Ser. No. 196,573

Claims priority, application Argentina, May 7, 1993, 324896

Int. Cl.[6] E04H *15/20*

U.S. Cl. 52—2.13 **9 Claims**



1. A tubular column having no moving parts and having a high resistance to buckling and being capable of sustaining longitudinal compressive loads applied to the ends of said tubular column, comprising:

(a) a single, seamless longitudinally extending metal tube having an outer surface and an interior portion devoid of any moving parts;

(b) opposing end caps for receiving and sealing the ends of said tube; and

(c) a highly pressurized fluid within said interior portion of said tube, said pressurized fluid having a pressure greater than atmospheric pressure, and generating internal longitudinal tensile stresses of relatively high values in said tube so as to stiffen and preserve said tube form when under compressive loading.

5,555,679

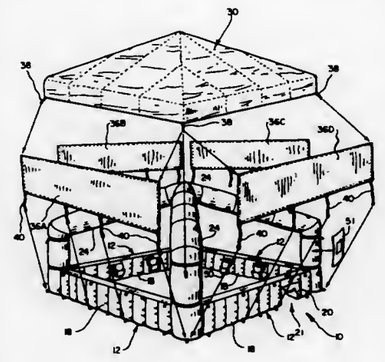
INFLATABLE DEVICE

Robert Scherba, 3671 Medina Line Rd., Richfield, Ohio 44286

Filed Oct. 24, 1994, Ser. No. 328,132

Int. Cl.[6] E04B *1/34*

U.S. Cl. 52—2.18 **15 Claims**



1. An inflatable device comprising:

an inflatable bar;

an inflating means having fluid communication with the bar for delivering a fluid to inflate the device;

a canopy demountably positioned above the bar;

a suspension means for retaining the canopy in position above the bar;

wherein the bar comprises four bar segments in a plane, and four roof tubes each having first and second ends, each segment essentially comprising a side of the bar, said sides interconnected by a roof tube near a tube first end, and said tubes interconnected at the second ends thereof to form a roof tube assembly, with fluid communication between said segments and said tubes of the assembly;

wherein each of said roof tubes projects upward, away from and essentially orthogonal to the plane of its interconnected bar segments to form an upstanding column portion, then further extending, angularly from the column to form a buttress portion of the tube, to a point of interconnection of the tubes above the bar;

wherein the canopy comprises a top portion and a side curtain portion;

said top canopy portion removably attached to the tube assembly;

said side curtain portion removably attached to the top canopy and further attached to one or more tubes of the tubing assembly; and,

further comprising at least one counter, each said at least one counter comprising a flat surface forming a countertop of the bar; and,

support means associated with each said at least one counter.

5,555,680

GUARD SCREEN FOR A RAIN GUTTER HAVING FLANGES FOR GRIPPING THE FRONT LIP OF A GUTTER

Ronald L. Sweers, 6165 E. Atherton Rd., Burton, Mich. 48519

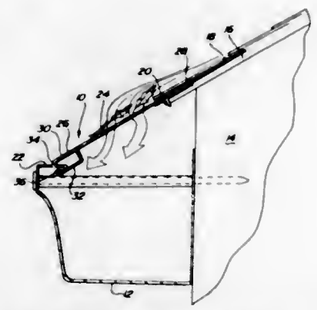
Filed Dec. 22, 1994, Ser. No. 363,641

Int. Cl.[6] E04D *13/076*

U.S. Cl. 52—12 **15 Claims**

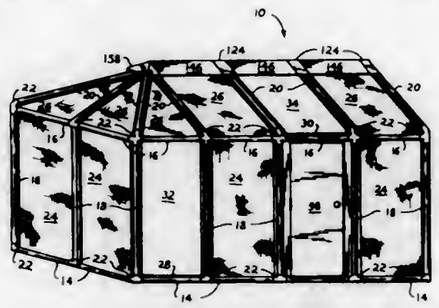
1. In combination with roof boards of a roof having shingles laid thereover and a longitudinally extending rain gutter having a front lip, the front lip having an upper surface and a downwardly extending edge, comprising:

an elongated screen body;



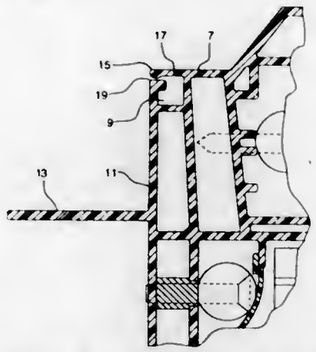
an upper arm interconnected with said screen body extending longitudinally of said screen body, said upper arm including a terminal end;
an upper arm flange extending downwardly from said terminal end of said upper arm;
a lower arm interconnected with said screen body extending longitudinally of said screen body, said lower arm including a terminal end;
a lower arm flange extending upwardly from said terminal end of said lower arm, said upper arm flange and said lower arm flange extending toward each other;
said upper arm and said lower arm defining a channel;
an elongated flanged member interconnected with said screen body and extending longitudinally of said screen body, said flanged member including a flange;
said channel being interconnectable with said lip of said gutter;
said lower arm in engagement with said downwardly extending edge of said front lip of said rain gutter;
said flange being disposable between said shingles and said roof boards; and
said screen body extending there between.

5,555,681
MODULAR BUILDING SYSTEM
Mark A. Cawthon, 305 Valleyvue Ct., Augusta, Ga. 30909
Filed Jul. 6, 1995, Ser. No. 498,562
Int. Cl.[6] E04H *15/00;* **E04B** *1/343*
U.S. Cl. 52—63 **20 Claims**



1. A modular building structure, comprising:
a plurality of elongate hollow base plate members and header plate members, with each of said base plate members and header plate members respectively including an integral flexible wall panel and roof panel selectively extendible therefrom and retractable therein;
a plurality of elongate hollow stud members and rafter members, and;
a plurality of connectors connecting said base plate members to said stud members, said stud members to said header plate members, and said header plate members to said rafter members to form said modular building structure, whereby;
a temporary, lightweight modular building structure including selectively retractable and extendible wall panels and roof panels is provided, with said wall panels and said roof panels providing for the selectable opening or closure of said modular building structure as desired.

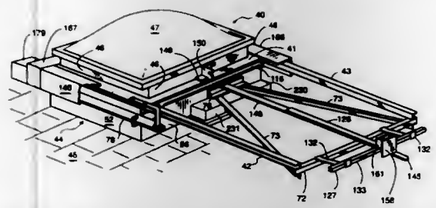
5,555,682
VINYL WINDOW FRAME WITH REMOVABLE COVERED ACCESSORY GROOVE
Domenic Colitto, Bolton, Canada, assignor to Royal Extrusions Limited, Woodbridge, Canada
Filed Nov. 16, 1994, Ser. No. 340,522
Int. Cl.[6] E04B *1/00;* **E06B** *7/28*
U.S. Cl. 52—100 **1 Claim**



1. A window frame made from a plastic material, said window frame having a side edge and a front face at generally right angles to one another, said front face having an inside surface and an outside surface, said side edge being a support surface for mounting said window in a wall opening with said outside surface of said front face being exposed from the opening, said frame having an accessory groove covered by said front face which has a removable strip over said accessory groove, said frame including first and second regions of weakness facilitating removal of said strip, said first region of weakness being provided in said inside surface without penetrating through and being hidden by said outside surface of said front face and said second region of weakness being provided in and visible exteriorly along said side edge of said frame.

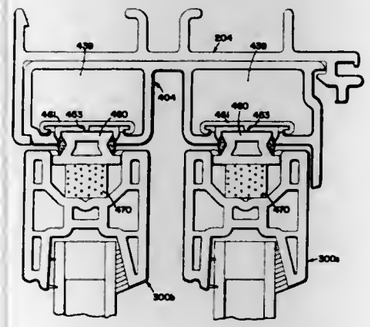
5,555,683
APPARATUS AND METHOD FOR OPENING AND CLOSING SKYLIGHTS
Arthur G. Schroeder, 3046 Lees Ave., Long Beach, Calif. 90808
Filed Oct. 19, 1994, Ser. No. 326,665
Int. Cl.[6] E04B *7/18*
U.S. Cl. 52—200 **34 Claims**

1. An apparatus for covering and uncovering an opening in a structure comprising:
a framing having front, rear, left and right side members with an opening therethrough which spans an opening in a structure;
a pair of parallel guides each having a left end, a right end and a length, one of the guide mounted on an outside surface of the front side member of the framing and the other guide mounted on an outside surface of the rear side member of the framing, the left end of each of the parallel guides being near the left side member of the framing and the right end of each of the guides extending beyond the right side member of the framing a predetermined distance;



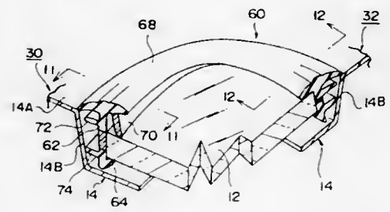
carriage means movably mounted on the parallel guides so that the carriage means can be moved over the length of the parallel guides, the carriage means having an opening therethrough about the same size as the opening through the framing, the carriage means adaptable for mounting a cover member thereon;
means for moving the carriage means over the length of the parallel guides;
a flexible screen having a size large enough to cover the opening through the framing, the screen having one end thereof connected to the left side of the carriage means;
screen storage means for rolling the other end of the screen onto for storage, the screen storage means rotatably supported by a stationary member at a location near and outside of the left side member of the framing; and
means for maintaining the screen in tension so that, when the carriage means is displaced away from the left side member of the framing, the screen will be unrolled from the screen storage means and tautly pulled over a space between the left side member of the framing rood the left side of the carriage means.

5,555,684
METHOD AND APPARATUS FOR SECURING INTERIOR TRIM TO A WINDOW FRAME
Dennis A. Galowitz, Stillwater, and Todd W. Bruchu, Lake Elmo, both of Minn., assignors to Andersen Corporation, Bayport, Minn.
Filed Oct. 19, 1994, Ser. No. 326,019
Int. Cl.[6] E06B *3/00*
U.S. Cl. 52—204.5 **31 Claims**



11. An assembly, comprising:
an extension member;
a frame; and
a receiving means on said frame for receiving said extension member when said extension member is in a first orientation relative to said receiving means and for retaining said extension member when said extension member is in a second orientation relative to said receiving means, wherein in said second orientation, said extension member extends in a direction generally perpendicular to a plane defined by said frame, wherein said receiving means has a channel formed therein, and said channel has a substantially trapezoidal cross-section bounded by a first sidewall, a second sidewall, and a bottom wall extending therebetween, and said first sidewall and said bottom wall cooperate to define an acute angle therebetween, and said second side wall and said bottom wall extend substantially perpendicular relative to one another, and said extension member has a cross-section bounded by a top edge and a bottom edge that extend parallel to one another, and first and second side edges that extend parallel to one another and perpendicularly away from opposite ends of said top edge to respective first and second angled edges, which extend parallel to one another from junctures with respective side edges to opposite ends of said bottom edge, and said first angled edge cooperates with said bottom edge to define said acute angle therebetween.

5,555,685
MOLDING FOR A FRONT GLASS
Koji Watanabe; Toru Sugita; Yasutomo Kobayashi; Masaharu Shibao, and Akimitsu Mita, all of Yokohama, Japan, assignors to NIFCO, Inc., Japan
Division of Ser. No. 143,781, Nov. 1, 1993. This application May 26, 1995, Ser. No. 451,738
Claims priority, application Japan, Nov. 4, 1992, 4-295137
Int. Cl.[6] B60J *10/02*
U.S. Cl. 52—204.597 **15 Claims**



1. A molding for mounting in a gap between an outer periphery of a front glass and a window frame of an automobile, comprising:
a section of material including a first pillar section extending into a first corner section, and a second pillar section extending into a second corner section, the corner sections being interconnected via a roof section, a cross-section of said section of material comprising (i) a leg portion having an upper portion, an intermediate portion, a lower portion, and first and second opposite sides, said leg portion being adapted to be received in a gap between an outer periphery of a front glass and a window frame of an automobile; (ii) a head portion extending from the upper portion of the leg portion and overhanging the leg portion, said head portion being adapted to traverse the gap and including upper and lower surfaces; (iii) a glass lip projecting from the first side of the leg portion, the glass lip being adapted to elastically abut a portion of the outer periphery of the front glass; (iv) at least one panel lip projecting from the second side of said leg portion, said panel lip being adapted to elastically abut and engage the window frame; and (v) a groove lip extending over a length of each of the pillar sections, said groove lip projecting from the lower surface of the head portion and being adapted to elastically contact the front glass, wherein
a depth of the leg portion extending below the head portion becomes gradually shorter as said leg portion extends from the first and second pillar sections to the respective corner section, and said intermediate portion of said leg portion is comprised of a material that is different from respective materials of the upper and lower portions of said leg portion, and

a depth of the groove lip extending below the head portion

5,555,688
DECORATIVE MOLDING STRIP SYSTEM

said wall track, the upper edge of said molding strip is angled

a depth of the groove lip extending below the head portion becomes gradually shorter as said groove lip extends from the first and second pillar sections to the respective corner sections, said leg portion, said head portion, said glass lip, said panel lip and said groove lip are integrally extrusion molded, and said groove lip is comprised of a material that is different from the respective materials of the leg portion, the head portion, the glass lip and the panel lip.

5,555,686

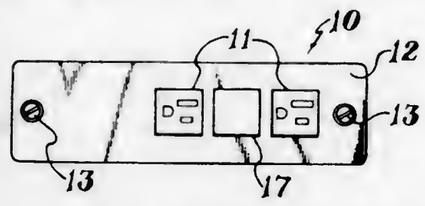
POWERED UTILITY BOARD

James F. Bird, 609 Westway Dr., Walker, Mich. 49504; Douglas E. Huesdash, 9916 68th Ave., Allendale, Mich. 49401; Lawrence E. Pierce, 2650 William Ave., Holland, Mich. 49424, and Robert L. Shaw, 1099 S. 96th Ave., Zeeland, Mich. 49464

Division of Ser. No. 893,665, Jun. 5, 1992, abandoned. This application Oct. 31, 1994, Ser. No. 331,991

Int. Cl.[6] E04B *5/48*

U.S. Cl. 52—220.1 **5 Claims**



1. A power module in combination with a solid, portable utility board, said utility board having a front surface and a back surface and at least one such surface being a utility substrate containing at least one aligned opening therethrough, said power module comprising a single flat member having a front planar surface and a back planar surface, an upper edge, and a lower edge;

said back planar surface having on at least one of its upper edge or lower edge, a lip, directed towards the back planar surface such that a rail is formed on at least one edge of the back planar surface to adapt to, and align with a front surface outside edge of the utility board;

said power module providing at least one fastening means to fasten the power module to the utility board and, said power module providing at least one power receptacle which is readily removable from the power module, and readily replaceable in the power module;

said power module having a boxlike covering which is attached to the back planar surface and which covers the fastening means and all power receptacles of the power module.

5,555,687

DECORATIVE MOLDING STRIP SYSTEM

Richard Logan, Oxford; Michael C. Clark, Columbiaville, and Daniel G. Meyer, Auburn Hills, all of Mich., assignors to Mid-America Building Products Corporation, Plymouth, Mich.

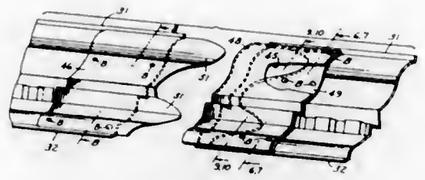
Continuation-in-part of Ser. No. 262,918, Jun. 20, 1994, abandoned, which is a continuation-in-part of Ser. No. 143,253, Oct. 26, 1993, Pat. No. 5,457,923, which is a continuation of Ser. No. 916,399, Jul. 20, 1992, abandoned. This application Dec. 30, 1994, Ser. No. 366,884

Int. Cl.[6] E04F *19/04*

U.S. Cl. 52—288.01 **16 Claims**

1. A decorative molding system removably installed at a juncture of a ceiling and a vertical wall, said molding system comprising:

a plurality of thin molding strips of flexible plastic having a length and an upper free edge, a lower free edge, a front surface and a back surface, said upper free edge being adapted



to lie against one of said ceiling and said vertical wall along a line spaced from the juncture of the ceiling and vertical wall and flex relative thereto, said lower free edge being adapted to lie against the other of said ceiling and said vertical wall along a line spaced from the juncture of the ceiling and vertical wall and flex relative thereto,

a plurality of flexible plastic clips,

each said flexible plastic clip having a first end and a second free end,

said flexible plastic clips being attached at spaced points along the length of the back surface of each molding strip such that the first end of each said clip is attached on the back surface of said molding strip at a point of attachment intermediate the upper free edge and lower free edge of said molding strip and said second free end of each said clip extends at an angle from said point of attachment,

said second free end of each said clip being capable of flexing relative to said point of attachment to said molding,

each said molding strip being sufficiently flexible about its length as well as its width to provide conforming engagement of its upper free edge and its lower free edge with the ceiling and vertical wall to provide conforming engagement with the ceiling and vertical wall,

a plurality of wall tracks of thin flexible plastic having a back surface, a front surface, an upper edge and a forward leading edge providing a gap between the leading edge and the front surface,

means for mounting the upper edge of each track on one of said ceiling and said vertical wall adjacent the juncture of said ceiling and said vertical wall such that said forward leading edge is spaced from the other of said ceiling and said vertical wall,

said forward leading edge of said track being capable of flexing relative to said upper edge of said track,

interengaging means on said second free end of said clip and said forward leading edge of said track such that when the thin molding strip with the flexible plastic clips attached thereto is mounted on said track by movement of each said second free end of each said clip into the gap between the leading edge of said track and the front surface, the second free end of each said clip is moved into the gap and said forward leading edge of said track are interengaged, such that each said thin molding strip is restrained against ready removal and such that when said molding strip is mounted on said wall track, the upper edge of said molding strip is angled outwardly from said track, such that said clip is positioned between said lower forward free edge of said wall track and its associated wall to cause the forward leading edge to flex so that said clip is retained by a snap-in fit and is removable while permitting the upper free edge and lower free edge of said molding strip to flex into conforming engagement with the ceiling and vertical wall,

each said molding strip having an axial projection at one end and an axial projection receiving cavity at the other end,

said projection on one end being received in a cavity of an adjacent molding strip.

5,555,688

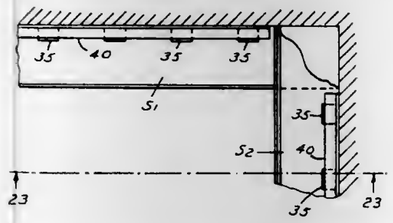
DECORATIVE MOLDING STRIP SYSTEM

Richard Logan, Oxford, Mich., assignor to Mid-America Building Products Corporation, Plymouth, Mich.

Continuation-in-part of Ser. No. 262,918, Jun. 20, 1994, abandoned, which is a continuation-in-part of Ser. No. 143,253, Oct. 26, 1993, Pat. No. 5,457,923, which is a continuation-in-part of Ser. No. 916,399, Jul. 20, 1992, abandoned. This application Dec. 30, 1994, Ser. No. 366,976

Int. Cl.[6] E04F *19/04*

U.S. Cl. 52—288.1 **3 Claims**



1. A decorative molding system removably installed at a juncture of a ceiling and a vertical wall in a room, said molding system comprising:

a plurality of thin molding strips of flexible plastic having a length and an upper free edge, a lower free edge, a front surface and a back surface, said upper free edge being adapted to lie against one of said ceiling and said vertical wall along a line spaced from the juncture of the ceiling and vertical wall and flex relative thereto, said lower free edge being adapted to lie against the other of said ceiling and said vertical wall along a line spaced from the juncture of the ceiling and vertical wall and flex relative thereto,

a plurality of flexible plastic clips,

each said flexible plastic clip having a first end and a second free end,

said flexible plastic clips being attached at spaced points along the length of the back surface of each molding strip such that the first end of each said clip is attached on the back surface of said molding strip at a point of attachment intermediate the upper free edge and lower free edge of said molding strip and said second free end of each said clip extends at an angle from said point of attachment,

said second free end of each said clip being capable of flexing relative to said point of attachment to said molding, each said molding strip being sufficiently flexible about its length as well as its width to provide conforming engagement of its upper free edge and its lower free edge with the ceiling and vertical wall to provide conforming engagement with the ceiling and vertical wall,

a plurality of wall tracks of thin flexible plastic having a back surface, a front surface, an upper edge and a forward leading edge providing a gap between the leading edge and the front surface,

means for mounting the upper edge of each track on one of said ceiling and said vertical wall adjacent the juncture of said ceiling and said vertical wall such that said forward leading edge is spaced from the other of said ceiling and said vertical wall,

said forward leading edge of said track being capable of flexing relative to said upper edge of said track,

interengaging means on said second free end of said clip and said forward leading edge of said track such that when the thin molding strip with the flexible plastic clips attached thereto is mounted on said track by movement of each said second free end if each said clip into the gap between the leading edge of said track and the front surface, the second free end of each said clip is moved into the gap and said forward leading edge of said track are interengaged, such that each said thin molding strip is restrained against ready removal and such that when said molding strip is mounted on said wall track, the upper edge of said molding strip is angled outwardly from said track, such that said clip is positioned between said lower forward free edge of said wall track and its associated wall,

a corner in the room being formed by a first flexible molding strip having clips thereon on one of said plurality of flexible molding strips mounted on a first track on one of said plurality of wall tracks along a first wall in said room and extends toward the corner of an intersection with an adjacent second wall in said room and an adjacent second flexible molding strip having clips thereon on one of said plurality of flexible molding strips is mounted on a second track on one of said plurality of wall tracks on the adjacent wall, each said first molding strip and said second molding strip having a free edge,

said adjacent second molding strip having said free edge cut at an angle to engage an outer surface of said first molding strip at an area spaced from said free edge of said first molding strip, said free edge of said second molding strip having a configuration corresponding to the configuration of the cross section of the first flexible molding strip after it is in tensioned position on the wall, such that when the second molding strip is snapped into position on the second wall, the cross section of the second flexible molding strip changes from the untensioned position to a tensioned position substantially the same as the cross section of the tensioned first molding strip on the first wall, the desired cross section of the free end of the second molding strip being achieved by cutting the untensioned end to the untensioned cross section such that it will assume the tensioned cross section when the second strip is snapped into position at the corner and engages the outer surface of the first strip.

5,555,689

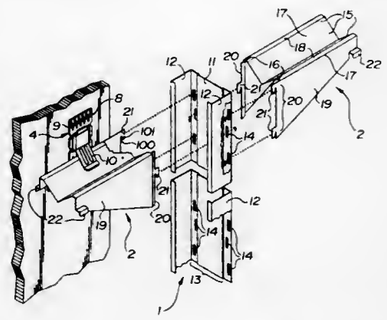
PARTITION WALL FRAMING ASSEMBLY FOR SUSPENDING GYPSUM BOARD PANELS

Thomas M. Gilmore, Edmonton, Canada, assignor to Athapap Trading Company Ltd., Alberta, Canada

Continuation-in-part of Ser. No. 193,951, Feb. 9, 1994, Pat. No. 5,426,904. This application Apr. 5, 1995, Ser. No. 417,599

Int. Cl.[6] E04B *5/52*

U.S. Cl. 52—489.1 **5 Claims**



1. A bracket adapted to be suspended from a vertical stud having facing flanges and a web, said bracket being further adapted to engage a suspension assembly attached to the back of a gypsum board facing panel to suspend the panel, said suspension assembly comprising a rearwardly and downwardly extending hanger member, said bracket comprising:

a pair of parallel, vertically extending, spaced apart side walls, each having first and second ends, said first end forming a vertical end edge;

shoulder means, associated with the side walls, adapted to engage and support the hanger members of facing panels;

the vertical end edges having projection means adapted to engage the stud to suspend the bracket from one side of the stud; and

means for interconnecting the two side walls to maintain them parallel.

5,555,690

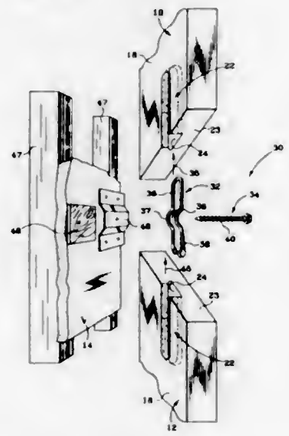
TILE MOUNTING SYSTEM

Edward Cosentino, P. O. Box 470, Marble, N.C. 28905

Continuation of Ser. No. 37,292, Mar. 26, 1993, Pat. No. 5,417,050, which is a continuation-in-part of Ser. No. 787,674, Nov. 4, 1991, abandoned, which is a continuation of Ser. No. 513,801, Apr. 24, 1990, abandoned. This application May 17, 1995, Ser. No. 446,907

Int. Cl.[6] E04B *2/00*

U.S. Cl. 52—506.08 **9 Claims**



1. A tile mounting system comprising:

a tile having a front face and a rear face, the rear face of said tile having an elongated groove extending substantially laterally of the tile and inwardly into said tile from the rear face, at least a portion of said groove being undercut in cross-section, a side wall of said undercut groove portion being slanted inwardly at an angle from a base of said groove to said rear face of said tile; and

an anchor member for both mounting and anchoring said tile to a supporting body, said anchor member including an insert portion for being mechanically fixedly secured within said undercut groove portion of said groove at a location spaced from and between opposite ends of said groove without the use of cement mortar or like bonding agent and having a side wall slanted at substantially the same angle as said side wall of said undercut groove portion to engage with said side wall of said undercut groove portion when said insert portion is mechanically fixedly secured within said undercut groove portion, and an attachment portion extending from said insert portion in a direction substantially perpendicular to the rear face of said tile when said insert portion is fixedly secured within said undercut groove portion, said attachment portion being at least partially threaded for being threadedly attached to said supporting body.

5,555,691

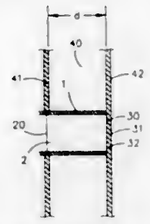
DRYWALL REPAIR SYSTEM

Thanh T. Nguyen, 8102 Amelis, No. 511K, Houston, Tex. 77055

Filed Sep. 22, 1995, Ser. No. 532,848

Int. Cl.[6] E04G *23/02*

U.S. Cl. 52—514 **6 Claims**



6. A method of repairing a fracture hole in one sheet of a drywall having two sheets of drywall separated by a stud spacing, comprising:

(a) selecting a hollow tubular guide which is slightly larger in cross sectional area than the fracture hole, said hollow tubular guide being open at both ends and having a length longer than the sum of said stud spacing and the thickness of said drywall;

(b) cutting a smooth hole about said fracture hole such that said smooth hole is substantially the same cross sectional area as the outer cross sectional area of said guide;

(c) inserting said guide through said smooth hole until the rear of the guide rests against the second sheet of drywall;

(d) inserting a plug having substantially the same cross sectional dimension as said guide into said guide, said plug being closed at both ends and having a length just slightly shorter than said stud spacing and the thickness of said drywall and having adhesive applied to the inserted end such that said plug is secured to second sheet of drywall;

(e) removing said guide; and

(f) applying plaster over said plug.

5,555,692

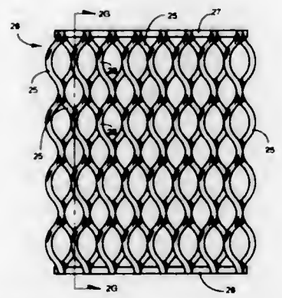
LATTICE STRUCTURE FORMED FROM CURVED ELEMENTS

Henry S. Griffith, 2900 San Juan Rd., Aromas, Calif. 95004

Continuation-in-part of Ser. No. 20,197, Mar. 21, 1994, Pat. No. Des. 360,531. This application Feb. 8, 1995, Ser. No. 385,809

Int. Cl.[6] E04C *2/42*

U.S. Cl. 52—662 **6 Claims**



1. A panel structure comprising:

a plurality of planar structural elements, each structural element having a curved centerline shaped as a repeating wave of constant wavelength and maxima and minima points of equal magnitude about a longitudinal axis in each wavelength, each element also having a substantially constant width in the a

plane of the element at a right angle to any tangent line to the curved centerline, and a substantially constant thickness at a right angle to the width, the width and thickness providing a substantially rectangular cross section having a width to thickness ratio of at least two to one;

wherein the structural elements are arranged in first and second planar layers with the longitudinal axes parallel and the elements in the second layer reversed maxima to minima from the elements in the first layer, and wherein the width of the elements of the first layer at-maxima points overlaps the width of the elements of the second layer at minima points, the width of the elements of the first layer at minima points overlaps the width of the elements of the second layer at maxima points, and wherein the elements of the two layers are joined at the areas of overlap.

5,555,693

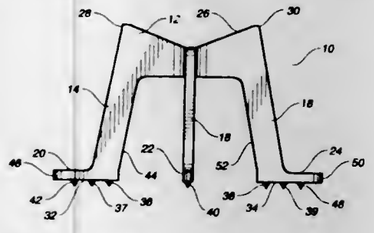
CHAIR FOR USE IN CONSTRUCTION

Felix L. Sorkin, 4115B Greenbriar Dr., Stafford, Tex. 77477

Filed Jan. 12, 1995, Ser. No. 372,053

Int. Cl.[6] E04C *5/20*

U.S. Cl. 52—689 **10 Claims**



1. A chair comprising:

a receiving area; and

a plurality of separate legs extending downwardly from said receiving area, each of said legs having a foot extending horizontally outwardly therefrom, a foot of one of said plurality of legs being separate from a foot of an adjacent leg, said receiving area and said plurality of legs being integrally formed together of a polymeric material, said foot having a generally planar bottom surface, said planar bottom surface having a projection extending downwardly therefrom, said projection having a point opposite said planar bottom of sufficient sharpness so as to engage a support surface upon which the chair is placed under load.

5,555,694

STRUCTURAL HANGER

Alfred D. Commins, Danville, Calif., assignor to Simpson Strong-Tie Company, Inc., San Leandro, Calif.

Filed Jan. 27, 1995, Ser. No. 379,277

Int. Cl.[6] E04B *1/38*

U.S. Cl. 52—702 **11 Claims**

1. A structural hanger connection comprising:

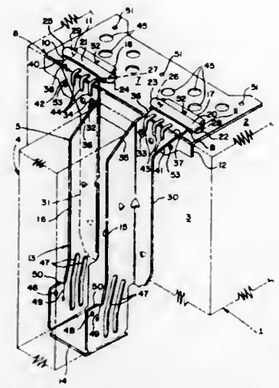
a. a supporting structure having a top surface and a front face;

b. a supported structure disposed at an angle to said front face of said supporting structure;

c. a structural hanger including:

1) a top flange element resting on said top surface of said supporting structure and formed with two pairs of first and second slots formed therein; and

2) a stirrup element formed with ends respectively woven through said slots and forming a connection with said top flange element and including a seat member and a pair of laterally spaced side members connected to said seat member engaging said supported structure;



d. said top flange element having a top surface flange resting on said top surface of said supporting structure wherein said two pairs of slots are formed therein;

e. each of said pairs of slots are spaced apart forming strip members attached at their ends to said top flange element; and

f. a portion of said ends of said stirrup element are formed in a compound curve after they pass through said first of said slots, extend beneath said respective strip members and emerge through said second of said slots.

5,555,695

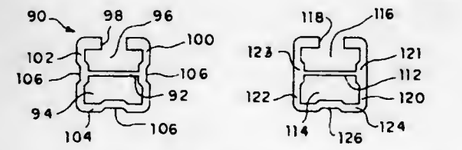
EXTRUSIONS PROVIDING FOR LOW DEFORMABILITY

Glorio J. Patsy, Jr., 925 McFarland/400 Blvd., Alpharetta, Ga. 30201

Continuation-in-part of Ser. No. 730,176, Jul. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 530,331, May 30, 1990, Pat. No. 5,076,033, which is a continuation-in-part of Ser. No. 361,112, Jun. 5, 1989, Pat. No. Des. 309,351. This application Apr. 26, 1993, Ser. No. 51,943

Int. Cl.[6] E04H *15/32;* **E04C** *3/00*

U.S. Cl. 52—730.4 **45 Claims**



1. A structural component for use in the construction of framed, flexible cover structures comprising:

a base member having a first end and a second end;

a first side member extending upward from said first end of said base member, said first side member having a first lower zone and a first upper zone, said first upper zone having a first width greater than a width of said first lower zone;

a second side member extending upward from said second end of said base member, said second side member having a second lower zone and a second upper zone, said second upper zone having a second width greater than a width of said second lower zone;

two walls, one of said two walls extending perpendicularly from and adjacent to said first upper zone of said first side member and the other of said two walls extending perpendicularly from and adjacent to said second upper zone of said second side member, said two walls defining a channel therebetween; and

an inner web member connecting and contactably extending between said first side member and said second side member,

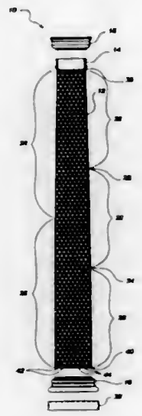
wherein said structural component defines a first interior cavity below said inner web member and a fabric attachment cavity above said inner web member, said structural component defining a substantially square cross-section.

5,555,696

FILAMENT WOUND ARCHITECTURAL COLUMN

William S. Morrison, III, 540 Frontage Rd., Suite 3255, Northfield, Ill. 60093, and Clint Ashton, Spanish Fork, Utah, assignors to William S. Morrison, III, Northfield, Ill.

Filed Mar. 20, 1995, Ser. No. 407,136
Int. Cl.[6] E04C *3/36*
U.S. Cl. 52—737.1 **15 Claims**



1. A structural support column comprising:

a one-piece unitary architectural column body having upper and lower halves bounded by upper and lower opposing ends, respectively, said column body being hollow and having tubular sidewalls comprised of a filament-wound composite of fiber-reinforced bonding agent and being less than ½ inch in thickness, wherein the column body tapers radially inwardly from a wider portion thereof to the upper end thereof in a manner conforming to an architectural column in which most of the tapering occurs in the upper half to the column body, wherein said tubular sidewalls are adapted to bear architectural axial load distributions of at least 6,000 psi applied thereto without failure of the composite.

5,555,697

METHOD FOR CONNECTING PRECAST CONCRETE UNITS

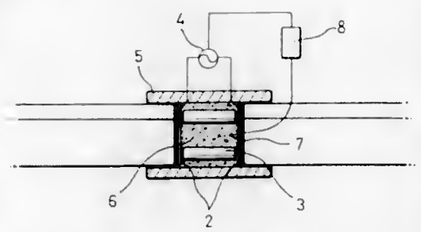
Sun J. Kim, Imchang Apt. 3dong 508ho, Juugsan-dong 187-26, Eunpyung-ku, Seoul, Rep. of Korea

Filed Jan. 12, 1995, Ser. No. 372,003
Claims priority, application Rep. of Korea, Jan. 12, 1994, 94-422
Int. Cl.[6] E04C *3/34*
U.S. Cl. 52—741.1 **1 Claim**

1. A method for connecting a pair of precast concrete units to each other to form a connecting point between the units comprising the steps of:

a) providing sheet-type wire nettings which have the same shape and size as that of the cross section of the precast concrete units;

b) positioning the wire nettings to cover the end surfaces of each of the pair of precast concrete units, and placing nonconductive spacers between the wire nettings to hold the wire nettings in their positions;



c) electrically connecting the wire nettings to the erminals of an electric power source;

d) positioning a temperature sensor between the wire nettings in the connecting point, and installing a form around the connecting point; and

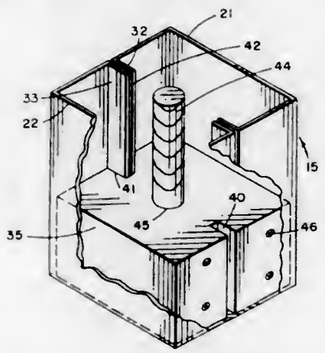
e) pouring concrete into the form, and applying an electric current from the power source to heat the concrete.

5,555,698

BUILDING PANEL APPARATUS AND METHOD

Theodure O. Mandish, 5055 State Rd. 46, Mims, Fla. 32754

Division of Ser. No. 173,058, Dec. 27, 1993, Pat. No. 5,417,023. This application Jan. 4, 1995, Ser. No. 368,362
Int. Cl.[6] E04B *2/56*
U.S. Cl. 52—745.17 **7 Claims**



1. A method of making a reinforcing stud comprising the steps of:

molding a pair of stud end members in a predetermined shape, each said stud end member having a pair of slots formed therein;

selecting a pair of elongated metal stud members, each having two end portions and each having a pair of elongated flanges shaped to fit into each said molded stud end member pair of slots;

attaching each end portion of each said selected elongated metal stud member to one said molded stud end member; and

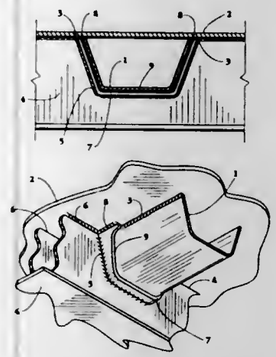
attaching an elongated reinforcing metal member through each molded stud member between said pair of attached elongated metal stud members, whereby a prefabricated stud is formed having center reinforcement for attaching in a wall panel.

5,555,699

CROSS-STIFFENED PANEL STRUCTURE

William R. Borthick, Glenpool, and Steven J. Fujan, Tulsa, both of Okla., assignors to Terex Corporation, Green Bay, Wis.

Filed Apr. 6, 1995, Ser. No. 418,176
Int. Cl.[6] E04C *2/38*
U.S. Cl. 52—801.11 **2 Claims**



2. A cross-stiffened panel structure comprising:

a deck plate;

a plurality of stiffening ribs welded in spaced apart relationship to said deck plate;

a plurality of transverse beams, each having cut-outs shaped to fit over the external contour of said stiffening ribs, the transverse beams being welded to said deck plate except at said cut-outs; and

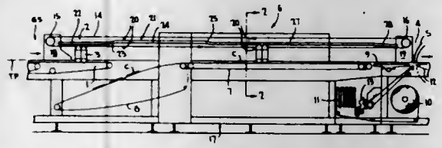
a reinforcing support means welded to said transverse beams at each of said cutouts and to said deck plate, said reinforcing support means being dimensioned so that a nominal gap is maintained between each said reinforcing support means and said stiffening ribs.

5,555,700

BOTTLE CONVEYING SYSTEM

Jean Marti, Kleve, Germany, assignor to Kisters Maschinenbau GmbH, Kleve, Germany

Filed Sep. 18, 1995, Ser. No. 529,544
Claims priority, application Germany, Nov. 24, 1994, 44 41 700.4
Int. Cl.[6] B65B *21/12;21/24*
U.S. Cl. 53—48.1 **7 Claims**



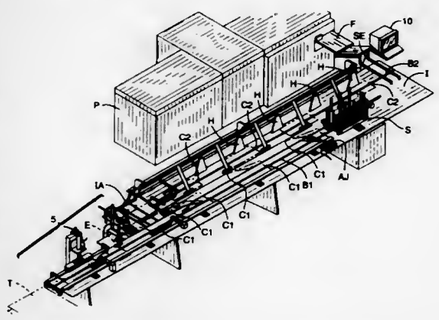
1. A system for conveying bottles, respectively having neck collars located beneath closures on the bottles, in a conveying direction from a grouping station at which the bottles are arranged in groups with bottles lying at least transversely to one another to a packaging station at which the bottle groups are packaged, comprising a machine frame having guide means extending in said direction between said stations and means defining a horizontal transport plane, said guide means comprising a plurality of guide tracks corresponding to the number of transversely lying bottles in the groups, each of said tracks having means engaging beneath the bottle collars and having a first horizontal section lying parallel to said transport plane followed in said conveying direction by an upwardly inclined section followed in said conveying direction by a second horizontal section parallel to said transport plane followed in said conveying direction by a downwardly inclined section followed in said conveying direction by a third horizontal section parallel to said transport plane, said packaging station including conveyor means on said frame at said third section, means on said frame for transporting packaging material to said conveyor means, said tracks at said third station being spaced above said conveyor means a predetermined distance permitting the groups of bottles to rest upon the packaging material, an endless moving belt or chain on said machine having a plurality of transversely extending rods for successively pushing against the groups of bottles for transporting same in said conveying direction along said guide tracks from said grouping station to a starting end of the packaging station.

5,555,701

ENVELOPE WETTING AND SEALING APPARATUS

Robert Fehringer, 3395 Rio Vista, Camino, Calif. 95709; William L. Hines, 5825 Walnut Ave., Sacramento, Calif. 95841; Motaz Qutub, 11044 Cobblestone Dr., Rancho Cordova, Calif. 95670; Jonathan D. Emigh, 7050 Mt. Aukum Rd., Somerset, Calif. 95684; Charles E. Preston, 9445 Central Ave., Orangevale, Calif. 95662; Robert Leitner, and David Smart, both of 1371 Jonas Ave., Sacramento, Calif. 95825

Filed Nov. 29, 1994, Ser. No. 346,514
Int. Cl.[6] B65B *7/02;51/02;57/12*
U.S. Cl. 53—75 **7 Claims**



1. For utilization with an envelope having a flap, a body, and a fold region connecting the flap to the body, a wetting and sealing apparatus for wetting the envelope flap with a liquid and sealing, after folding at the fold region, the wetted envelope flap to the envelope body, comprising:

a) controller means for monitoring envelope processing including detecting an assembly of a mismatched mail piece and for directing the wetting and sealing operations;

b) wetting means for applying the liquid producing an active adhesive to the envelope flap of a correctly assembled mailing piece; and

c) sealing means for sealing the wetted envelope flap to the envelope body of a correctly assembled mailing piece.

5,555,702

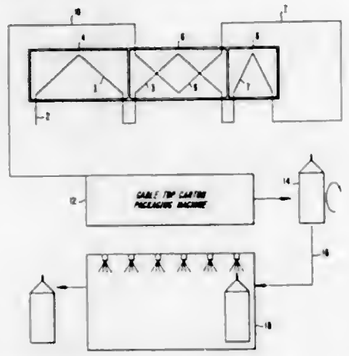
PROCESS AND APPARATUS FOR PACKAGING LIQUID

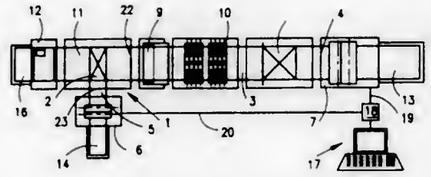
e. introducing all of said converted sterilant gas into said sterilization container;

5,555,706

METHOD AND APPARATUS FOR STACKING

5,555,702
PROCESS AND APPARATUS FOR PACKAGING LIQUID FOOD PRODUCTS
Charles E. Sizer, Hawthorn Woods, Ill., assignor to Tetra Laval Holdings & Finance S.A., Pully, Switzerland
Division of Ser. No. 58,261, May 10, 1993, Pat. No. 5,494,691. This application Jun. 6, 1995, Ser. No. 468,751
Int. Cl.[6] B65B *63/08*
U.S. Cl. 53—127 **9 Claims**



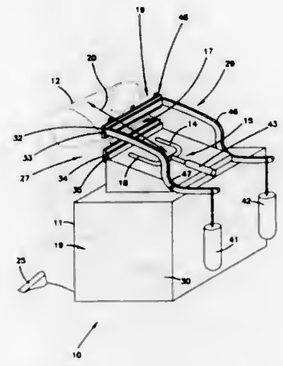


1. Apparatus for packaging liquid food products in gable top cartons comprising:
(a) heating means for heating a liquid food product, said heating means including a plurality of successively arranged heat exchanger sections and a conduit extending through each of said heat exchanger sections to convey the liquid food product through said heat exchanger sections with the liquid food product being heated to a higher temperature in each successive heat exchanger section until the liquid food product reaches a first temperature sufficient to render the product commercially sterile;
(b) cooling means for cooling the liquid food product from said first temperature to a second temperature that is lower than said first temperature, but sufficiently high to maintain the liquid food product commercially sterile;
(c) packaging means for filling gable top cartons with the liquid food product from step (b) and subsequently sealing the cartons, the packaging means including a reservoir and temperature control means for maintaining the liquid food product in the reservoir at said second temperature.

5,555,703
METHOD AND SYSTEM FOR PREPARING ITEMS TO BE MAILED
Jacobus F. Gombault, Drachten, and Gerhard Hidding, Heerenveen, both of Netherlands, assignors to Hadewe B.V.
Continuation of Ser. No. 34,162, Mar. 19, 1993, abandoned, which is a continuation of Ser. No. 822,856, Jan. 21, 1992, abandoned, which is a continuation of Ser. No. 547,228, Jul. 3, 1990, Pat. No. 5,099,633. This application Apr. 3, 1995, Ser. No. 416,459
Claims priority, application Netherlands, Jul. 3, 1989, 8901686
Int. Cl.[6] B65B *43/14;57/00;61/26;* **B65H** *39/02*
U.S. Cl. 53—411 **28 Claims**

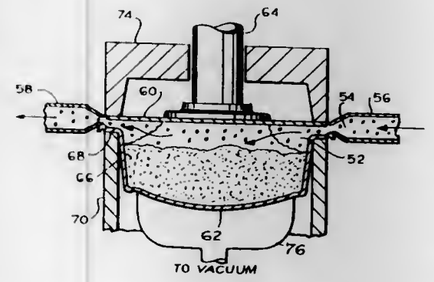
1. A method of preparing items to be mailed, comprising the steps of:
supplying instructions for printing a main document and a corresponding envelope to a control unit;
converting said instructions into separate printing instructions for printing the main document at a first printer and for printing the corresponding envelope at a second printer;
supplying said separate printing instructions to said first printer and to said second printer, respectively;
printing a main document sheet using the first printer;
directly passing said main document sheet from the first printer to a document supply path of the system for preparing items to be mailed and from said document supply path to an inserter station;
feeding a plurality of separate, prefabricated envelopes of width corresponding to said main document sheet to a hopper of the second printer;
feeding one of said envelopes from the hopper to the second printer;
printing information that corresponds to said main document sheet on said one envelope using the second printer;
individually conveying said printed envelope from the second printer along an envelope supply path of the system for preparing items to be mailed to the inserter station;
holding said envelope in an opened condition;
inserting said main document sheet into said printed envelope.

5,555,704
STERILIZATION SYSTEM
James E. Caufield, Oyster Bay, N.Y.; Ralph Torborg, Minnetonka, and Wilmer L. Adams, Fridley, both of Minn., assignors to A-Bio-Vac Inc., St. Louis Park, Minn.
Filed Sep. 24, 1993, Ser. No. 126,496
Int. Cl.[6] B65B *55/10*
U.S. Cl. 53—425 **9 Claims**



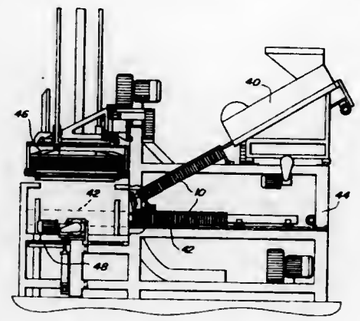
8. A method for the sterilization of items placed within a sterilization container comprising the following steps in sequence:
a. inserting the items into a sterilization container;
b. evacuating said sterilization container to remove the air within said sterilization container;
c. dispensing a predetermined amount of liquid sterilant into an evaporator;
d. heating said predetermined amount of sterilant liquid to convert it to a sterilant gas, whereby said evaporator contains only gas phase and liquid phase sterilant;
e. introducing all of said converted sterilant gas into said sterilization container;
e. sealing said sterilization container.

5,555,705
METHOD OF FILLING AND SEALING A DEFORMABLE CONTAINER
Roy Balcombe, Westminister, Calif., assignor to Kal Kan Foods, Inc., Vernon, Calif.
Continuation of Ser. No. 768,351, Sep. 30, 1991, Pat. No. 5,428,943, which is a continuation of Ser. No. 517,422, May 1, 1990, abandoned, which is a continuation of Ser. No. 244,829, Sep. 14, 1988, abandoned. This application May 11, 1995, Ser. No. 438,777
Int. Cl.[6] B65B *31/02;61/24*
U.S. Cl. 53—432 **2 Claims**



1. A method of filling and sealing a bi-stable container, subjected to a gaseous environment, with a product and having a bottom deformable between stable upward and downward positions and having a hoop member surrounding the side edges of the container, said method comprising the steps of:
placing the container having an unribbed bottom upon an anvil;
charging the container with the unribbed bottom in its stable downward position with a product to a level having a volume less than the container volume but equal to the filled volume with such level defining a headspace opening;
maintaining the unribbed bottom in its downward position with a vacuum suction cup;
positioning a generally flat lid adjacent to a sealing surface;
placing the container in a position to be steam flushed;
flushing out the headspace gas with steam;
placing the container below a sealing head;
mounting the sealing surface of said container along a leading edge of said anvil;
lowering said sealing head such that the sealing head seals the lid to said sealing surface of said container;
allowing the headspace to cool, and condensing the steam to water resulting in a vacuum within the headspace;
maintaining the unribbed bottom of the base in its downward position with a vacuum suction cup;
releasing the vacuum suction cup from the base of the container and returning the container to atmospheric pressure wherein hoop stress of said hoop member resists the bending stress around said unribbed bottom such that the unribbed bottom is inverted to its stable upwardly extended position thereby forcing the product into close contact with said lid to reduce the headspace between said product and said lid and wherein said lid remains in its generally flat configuration.

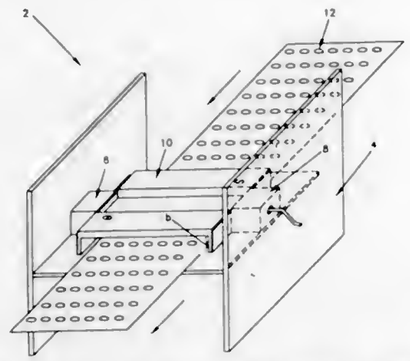
5,555,706
METHOD AND APPARATUS FOR STACKING PREFORMS FOR BLOW MOLDED PLASTIC CONTAINERS
Domenico Maoloni, Castorano; Adriano Pizi, Poggio di Bretta; Enrico Buonfigli, Ascoli Piceno, and Alastair R. Tweedie, Ospitaletto, all of Italy, assignors to Hoover Universal, Inc., Plymouth, Mich.
Filed May 24, 1995, Ser. No. 448,841
Int. Cl.[6] B65B *35/50*
U.S. Cl. 53—447 **6 Claims**



1. The method of filling a container having vertical side walls defining a storage space of uniform size in horizontal cross section, the container being filled with preforms for blow molded plastic containers, the preforms having a generally tubular shape with a closed end and a threaded end, said method comprising the steps of:
a) arranging the preforms in a first horizontal layer having a plurality of side-by-side rows of the preforms with all of the preforms having a common orientation, said layer corresponding in size and shape to said horizontal cross section of said container;
b) picking up a group of the preforms, the group being the alternate rows of the preforms
c) picking up another group of the preforms, the group being the remaining rows of the preforms
d) inverting one of the groups of picked up preforms so that they are in a threads down orientation
e) repositioning the groups of preforms having been inverted with the group of preforms having not been inverted in a second horizontal layer of preforms so that the preforms are in a threads end up orientation in one of the rows and in a threads end down orientation in an adjacent row of preforms;
f) simultaneously moving the second horizontal layer of preforms into the bottom of the container, the rows forming a pattern corresponding to the cross sectional shape of the container; and
g) repeating the above steps and moving consecutive layers of preforms into the container on top of the second horizontal layer in the bottom of the container.

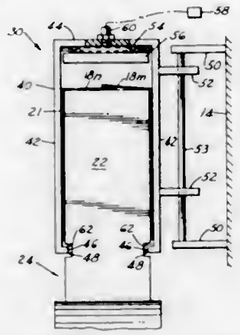
5,555,707
BLISTER PACK SCANNER DEVICE
Hans O. Schwenger, 730 Vail Rd., Parsippany, N.J. 07054
Filed Feb. 18, 1994, Ser. No. 198,728
Int. Cl.[6] B65B *57/08;57/18*
U.S. Cl. 53—493 **9 Claims**

1. A blister pack photoelectric laser sensor device for the detection of overfilled and defective blister cavities comprising:
a) a housing base;
b) a laser transmitter disposed at one end thereon;
c) a photoelectric sensor disposed opposite said transmitter for receiving a laser signal therefrom, and;



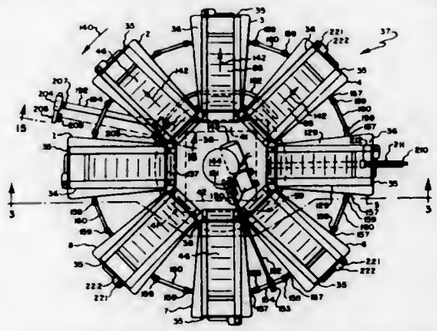
d) a scanner beam interference bar disposed between said transmitter and said sensor, said interference bar comprising a centrally grooved top surface for alignment of said laser beam, a bottom surface and two end posts that elevate the bottom surface of said bar slightly above the housing base to allow a plastic polymer blister pack web to pass therethrough.

5,555,708
PRESSURE CLOSING MECHANISM
Michael F. Shower, Waterford; Kenneth P. McDonald, Wixom, and Anthony J. Lukasiewicz, Howell, all of Mich., assignors to Elopak Systems A.G., Glattbrugg, Switzerland
Filed Apr. 21, 1995, Ser. No. 426,105
Int. Cl.[6] B65B *1/02*
U.S. Cl. 53—563 **11 Claims**



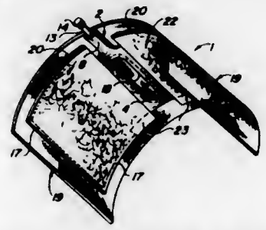
1. A carton tube closing device including in combination,
frame means,
supporting means including a mandrel and movably mounted upon said frame means, said mandrel serving to receive over an end thereof a carton tube whereof an end projecting beyond said end of said mandrel is to be closed,
driving means serving to move said supporting means relative to said frame means,
and pressing means disposed beyond said end of said mandrel and serving to act substantially axially of said mandrel to close said end of said tube,
wherein the improvement comprises tie means additional to said frame means, extending from said pressing means to said supporting means and retaining said pressing means relative to said supporting means against reaction forces extending substantially axially of said mandrel and produced by the pressing action of the pressing means, wherein said tie means comprises a yoke comprised of an end member and two oppositely disposed lateral members arranged to receive said mandrel therebetween, said pressing means being mounted in said yoke adjacent said end member and arranged to act between said end member and end parts of said carton tube to close the same, following entry of said mandrel through an open side of said yoke, wherein said yoke further comprises two inward protrusions extending towards each other from zones of the two lateral members and said supporting means further comprises two shoulders at respective opposite lateral sides of said mandrel and upon which the respective inward protrusions come to bear under said reaction forces.

5,555,709
CAROUSEL BAGGER MACHINE
Edward B. Savigny, Newfane, and James G. Savigny, Youngstown, both of N.Y., assignors to Ag-Pak, Inc., Gasport, N.Y.
Filed Oct. 10, 1995, Ser. No. 541,576
Int. Cl.[6] B65B *43/28*
U.S. Cl. 53—570 **17 Claims**

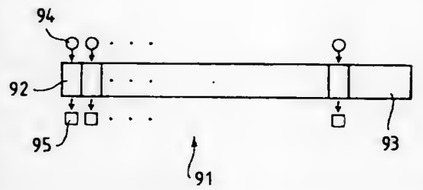


15. A carousel bagger comprising a frame, a single hopper mounted relative to said frame, a table rotatably mounted on said frame, a plurality of conveyor troughs mounted on said table, means for rotating said table to align each of said conveyor troughs sequentially under said hopper, each of said conveyor troughs including a trough and a conveyor, a bag-gripping mechanism mounted on each of said troughs, chutes mounted on each of said troughs between said conveyors and said bag-gripping mechanism, and chute-clogging detection means mounted relative to said chutes for detecting clogging of said chutes.

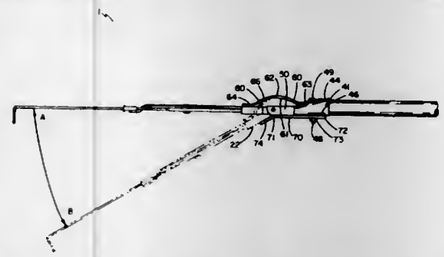
5,555,710
INFLATABLE SADDLE SUPPORT APPARATUS
Scott C. Smith, Rt. 2 Box 370-A, Marshall, Tex. 75670
Continuation-in-part of Ser. No. 283,205, Jul. 28, 1994. This application Oct. 13, 1994, Ser. No. 322,416
Int. Cl.[6] B68C *1/12;1/08*
U.S. Cl. 54—66 **16 Claims**



1. An inflatable saddle support apparatus for evenly distributing the pressure of a saddle on a horse, comprising a saddle bladder; at least one inflation chamber provided in said saddle bladder and an inflation tube communicating with said at least one inflation chamber; a saddle blanket sized to fit over said saddle bladder, said saddle blanket connected to said saddle bladder, for seating on the horse; and a pair of panels, each of said panels having at least one edge attached to said saddle blanket and comprising at least one first element of a loop-pile fastener attached to said saddle blanket and at least one second element of said loop-pile fasterner attached to each of said panels, for removably enclosing said saddle bladder between said saddle blanket and said panels, responsive to engagement of said first and second elements of said loop-pile fastener.



5,555,711
LAWN RAKE WITH SPRING PIVOTING HEAD
Richard G. Costa, 2 Milton St., Seekonk, Mass. 02771
Filed Jun. 29, 1995, Ser. No. 496,394
Int. Cl.[6] A01D *7/06*
U.S. Cl. 56—400.2 **9 Claims**

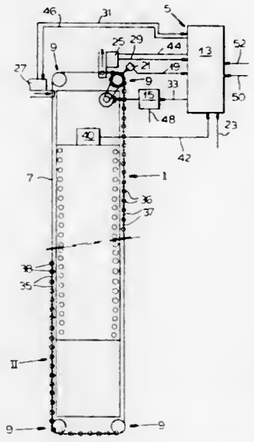


1. A lawn rake with spring pivoting head, comprising:
a rake head comprised of a plurality of flexible tines, each having a proximal end and a distal end, each tine distal end terminating in a bent end, said bent ends all being in the same direction, said tine proximal ends terminating in and being attached to a tine retainer clip, said tines being held in the same general plane by a tine guide which is adapted to evenly spread apart the distances between the tines gradually increasing the distances between tines from their proximal ends to their distal ends;
a handle portion comprised of an elongated cylindrical member having a proximal end and a distal end, said distal end being near to the rake head; and
a rake head engaging means comprised of:
a handle interface element; and
an elongated, spring element having a concave middle portion, a flat proximal portion and a flat distal portion, said flat portions of the spring element having a general longitudinal axis parallel to the general longitudinal axis of the rake, said proximal portion being attached to the said interface element and said handle cylindrical member, and said distal portion being positioned to engage said retainer clip;
said tine retainer clip being pivotally joined to said handle interface element.

5,555,712
METHOD FOR JUDGING THE QUALITY OF SLIVER IN TEXTILE MACHINE
Kazuhiko Nakade, Kyoto, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan
Filed Nov. 7, 1994, Ser. No. 336,221
Claims priority, application Japan, Nov. 10, 1993, 5-281513
Int. Cl.[6] D01H *7/46;7/92*
U.S. Cl. 57—264 **12 Claims**

1. A method for judging the quality of sliver in a textile machine, comprising the steps of:
(a) processing sliver into yarn in a textile machine having a multitude of spindles for processing sliver into yarn;
(b) monitoring the yarn with a monitor for monitoring yarn;
(c) providing a control computer for judging yarn quality;
(d) feeding results of the monitor to the control computer;
(e) causing the control computer to totalize the results of the monitor at predetermined times and take statistics with respect to yarn quality for each spindle;
(f) causing the control computer to, on the basis of changes with time of the yarn quality for each spindle, make a judgement as to whether one of the spindles is defective or whether the respective sliver is inferior; and
(g) when the judgement is that the spindle is defective, conducting inspection and adjustment of the spindle to effect the quality of the yarn produced.

5,555,713
APPARATUS FOR FEEDING BOBBINS AND BOBBIN CORES TO AND FROM A SPINNING OR TWISTING MACHINE
Holger Wussmann, Eislingen; Hartmut Kaak, Ebersbach/Fils, and Martin Mense, Holzminden, all of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach/Fils, Germany
Filed Dec. 15, 1994, Ser. No. 358,075
Claims priority, application Germany, Dec. 16, 1993, 43 43 019.8
Int. Cl.[6] B65H *54/02;* **D01H** *9/10;* **B65G** *23/04*
U.S. Cl. 57—281 **10 Claims**



1. An apparatus for feeding bobbin-winding cores and bobbins to and from a textile machine having regularly spaced work stations on opposite longitudinal sides of the machine, said apparatus comprising:
an endless transport belt extending around said machine and provided with:
a drive including a motor operatively connected with the belt for driving same,

means for accepting said bobbins from said work stations for

5,555,715

5,555,718
METHOD AND APPARATUS FOR INJECTING

means for accepting said bobbins from said work stations for movement of said bobbins away from said work stations to a removal position in which said bobbins are removed from said belt, and

means for receiving bobbin-winding cores from a supply position and carrying said bobbin-winding cores to said work stations;

a rotary member around which said belt passes in a direction change of said belt and positively engaged by said belt, and a sensor generating signals representing angular displacement of said rotary member as a measure of at least one parameter selected from an absolute position of said belt and a change in position of said belt; and

a control unit connected to said sensor and to said drive, controlling said drive, and provided with means receiving said signals and programmed to establish successive starting positions of said belt in response to said sensor signals and a set-point position in said control unit said sensor being an incremental angular position generator outputting a succession of pulses upon rotation of said rotary member, and said control unit being provided with means for counting pulses from said sensor after starting of said belt and for comparing a count value with a next set-point position, and upon agreement between said count value and said next set-point position, the drive is brought to standstill.

5,555,714

COMBING ROLLER

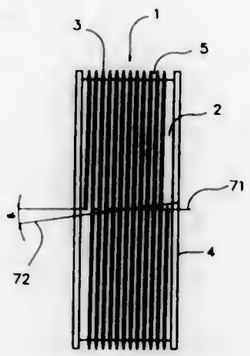
Milos Mladek; Oldrich Tesar; Jaroslav Kaplan; Ladislav Pirkl, all of Usti nad Orlici, and Dobroslav Musil, Brno, all of Czech Rep., assignors to Rieter Elitex, Czech Rep.

Filed Jun. 3, 1994, Ser. No. 253,544

Claims priority, application Czech Rep., Jun. 3, 1993, 1060-93

Int. Cl.[6] D01H *4/00*; D01G *15/00*

U.S. Cl. 57—408 **11 Claims**



1. A combing roller for use in a singling-out device of an open-end spinning machine, the combing roller comprising:

a cylindrical body having a circumference and a plurality of teeth formed on the circumference;

at least one spiral circumferential groove formed in the cylindrical body;

a plurality of recesses formed in the cylindrical body and intersecting with the at least one spiral circumferential groove to form the plurality of teeth; wherein

the recesses are disposed on the circumference of the cylindrical body at an angle of about 5° to about 45° relative to a force generating line which is parallel to a rotational axis of the cylindrical body and the recesses are oriented in a direction that is substantially perpendicular to the spiral circumferential groove.

5,555,715

SHAFTLESS SPINNING ROTOR OF AN OPEN-END SPINNING MACHINE

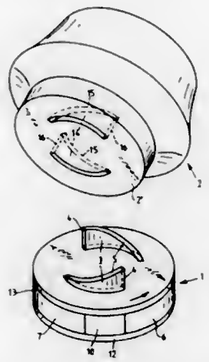
Anton Paweletz, Fellbach, and Wilhelm Birkenmaier, Weinstadt, both of Germany, assignors to SKF Textilmaschinen-Komponenten GmbH, Stuttgart, Germany

Filed Dec. 13, 1994, Ser. No. 354,626

Claims priority, application Germany, Dec. 14, 1993, 43 42 539.9

Int. Cl.[6] D01H *4/00*; F16C *32/06*

U.S. Cl. 57—414 **14 Claims**



1. In an open-end spinning machine having spinning stations and a magnetic and gas bearing with a stator at each of the spinning stations, a shaftless spinning rotor, comprising:

a series of spinning cups with different properties at each of the spinning stations for receiving fibers to be spun; and

an electric rotor at each of the spinning stations forming an axial field motor with the magnetic and gas bearing and the stator, said axial field motor individually driving a respective one of said spinning cups;

said spinning cups and said electric rotor having axially opposing end surfaces relative to a common axis of said spinning cups and said electric rotor, and said end surfaces of said electric rotor and of one of said spinning cups at a time being coupled together to form a functionally appropriately releasable connection as a structural unit at each of the spinning stations, wherein said releasable connection is formed by magnetic adhesion.

5,555,716

YARN HAVING MICROFIBER SHEATH SURROUNDING NON-MICROFIBER CORE

Jeffrey S. Dugan, Asheville, N.C., assignor to BASF Corporation, Mount Olive, N.J.

Filed Nov. 2, 1994, Ser. No. 334,028

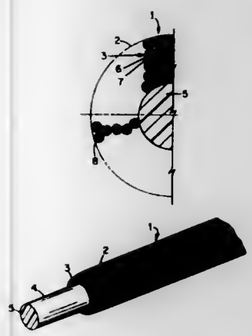
Int. Cl.[6] D02G *3/02;3/06*

U.S. Cl. 57—224 **31 Claims**

1. A microfiber-containing core-spun yarn comprising:

(A) a core comprising one or more non-micro fibers, and

(B) a sheath covering and twisted about said core, wherein said sheath comprises staple microfibers.



5,555,717

OPEN-END SPINNING DEVICE HAVING AN IMPROVED FIBER FEEDING CHANNEL

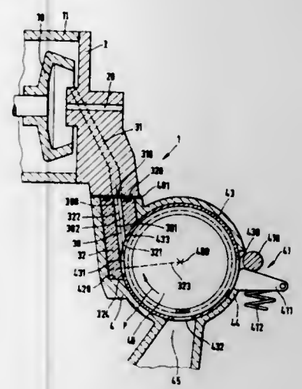
Edmund Schuller, Ingolstadt; Eva-Maria Greppmeier, Gachenbach, and Anton Furtmeier, Neustadt/Donau, all of Germany, assignors to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany

Filed May 1, 1995, Ser. No. 435,111

Claims priority, application Germany, May 13, 1994, 44 16 977.9

Int. Cl.[6] D01H *4/00*; D01B *1/00*

U.S. Cl. 57—413 **16 Claims**



1. An open-end spinning device, comprising:

a spinning element

an opener roller housed in an interior of a housing;

a fiber feeding channel extending from said housing to said spinning element, said fiber feeding channel comprising a first channel part and a second channel part which is movable relative to said first channel part so as to be alignable therewith, said first channel part comprising an insertion piece removably disposed within a recess defined in said housing; and

an elastic retaining element disposed in said housing and configured to apply an elastic force to said insertion piece biasing said insertion piece towards said opener roller in an operating position within said recess.

5,555,718

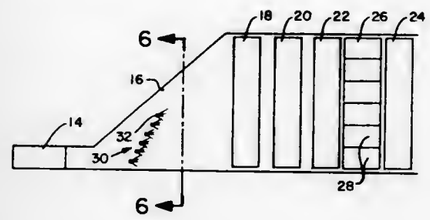
METHOD AND APPARATUS FOR INJECTING REACTANT FOR CATALYTIC REDUCTION IN A GAS TURBINE COMBINED CYCLE SYSTEM

David K. Anderson, East Longmeadow, Mass., and Mark R. Malo, Middletown, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Nov. 10, 1994, Ser. No. 337,994

Int. Cl.[6] F02C *6/18*

U.S. Cl. 60—39.02 **2 Claims**



1. A method of operating a gas turbine combined cycle system wherein said gas turbine combined cycle system comprises a gas turbine to generate power, a heat recover steam generator including an inlet section for flue gas from said gas turbine having a selected gas flow area, a heat transfer section containing heat transfer surface and a selective catalytic reactor section having a gas flow area larger than said selected gas flow area and an expanding transition section connecting said inlet section to said heat transfer section and wherein said expanding transition section includes a plurality of flow profile control pipes extending across said expanding transition section and arranged in a selected pattern adapted to redistribute the flue gas flow within said expanding transition section such that said flue gas flow is relatively uniformly distributed throughout the gas flow area of said heat transfer section, said method comprising the steps of:

a. burning a fuel with air whereby flue gas is formed containing NO_x and excess oxygen and passing said flue gas through a gas turbine and into said inlet section;

b. passing said flue gas through said expanding transition section over said plurality of flow profile control pipes and into said heat transfer section and into contact with said selective catalytic reactor section; and

c. injecting a reactant gas for reaction with NO_x in said selective catalytic reactor section into said flue gas in said expanding transition section through nozzles located across each of said flow profile control pipes whereby said reactant gas is uniformly distributed in said flue gas.

5,555,719

METHOD OF OPERATING A COMBINED CYCLE STEAM AND GAS TURBINE POWER GENERATING SYSTEM WITH CONSTANT SETTABLE DROOP

William I. Rowen, and Jens Kure-Jensen, both of Schenectady, N.Y., assignors to General Electric Co., Schenectady, N.Y.

Filed Feb. 15, 1994, Ser. No. 196,916

Int. Cl.[6] F02C *9/28*

U.S. Cl. 60—39.03 **9 Claims**

1. A method of operating a combined-cycle power generating system having a gas turbine, a steam turbine, and a generator, on a single shaft, comprising the steps of:

obtaining a first value representative of the total power output of the generator;

obtaining a second value representative of the power output of the steam turbine;

correlating the first and second values to obtain a third value representative of the power contribution solely of the gas turbine to the total power output of the generator;

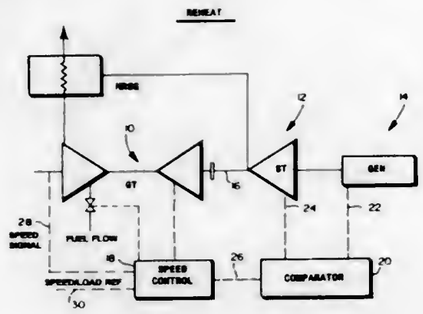
5,555,721

GAS TURBINE ENGINE COOLING SUPPLY CIRCUIT

drive shaft, for providing initial motive force through said drive shaft to initiate power generation from said prime mover and

5,555,724

CAPACITY DETERMINING SYSTEM IN EXHAUST



providing a speed governor for controlling fuel flow to the gas turbine as a function of an error signal between actual and reference speeds of the gas turbine; and

causing a proportional response of the speed governor to the error signal between the actual and reference speeds of the gas turbine and the third value for controlling the flow of fuel to the gas turbine.

5,555,720

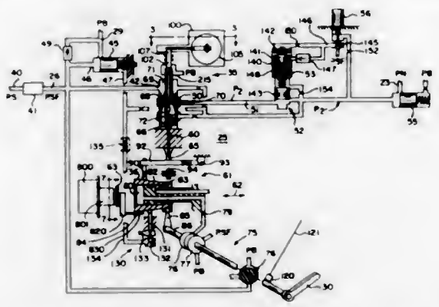
METHOD FOR METERING FUEL

Donald E. Wernberg, Rockford, Ill.; Gregory A. Molenaar, Loveland, Colo., and Daniel F. Miller, Beloit, Wis., assignors to Woodward Governor Company, Rockford, Ill.

Division of Ser. No. 182,444, Dec. 20, 1993, Pat. No. 5,490,379. This application Sep. 6, 1995, Ser. No. 523,951

Int. Cl.[6] F02C *9/28*

U.S. Cl. 60—39.03 **9 Claims**



1. A method of controlling the metering of fuel to an aircraft gas turbine engine utilizing both a manual control responsive to a power lever setting and an electronic control, the method comprising the steps of:

interposing a fuel metering valve between a high pressure fuel supply and an engine fuel line;

utilizing a 3-D cam to adjust the opening of the fuel metering valve;

electronically controlling a first axis of the 3-D cam to achieve fuel flow rates to the engine as determined by the electronic control;

coupling the power lever to a second axis of the 3-D cam to position the cam in accordance with power level settings;

electronically sensing a control system parameter to cause the fuel delivery to the engine to be a function of power lever setting under the control of the electronic control; and

locking the first axis in its controlled position upon shutdown of the electronic control to cause transfer to mechanical control of the 3-D cam without any transient in fuel supply caused by the transfer.

5,555,721

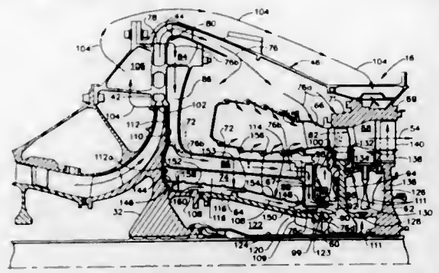
GAS TURBINE ENGINE COOLING SUPPLY CIRCUIT

John J. Bourneuf, Jamaica Plain, Mass.; Dean T. Lenahan, Cincinnati, Ohio; Daniel E. Demers, Ipswich, Mass., and Larry W. Plemmons, Fairfield, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Sep. 28, 1994, Ser. No. 313,951

Int. Cl.[6] F02C *7/12*

U.S. Cl. 60—39.75 **17 Claims**



1. In a gas turbine engine having an axis of rotation and a compressor driven by a turbine disposed downstream thereof, an apparatus for cooling said turbine comprising:

a first cooling air supply circuit comprising:

a primary cooling air source providing primary cooling air;

means for channelling said primary cooling air from said primary cooling air source to an annular manifold; and

means for discharging said primary cooling air from said manifold into a first turbine cavity to cool turbine components in flow communication therewith; and

a second cooling air supply circuit comprising:

a secondary cooling air source providing secondary cooling air, said secondary cooling air source comprising a secondary bleed apparatus in flow communication with compressor discharge airflow upstream of an inlet of a diffuser, said diffuser being in flow communication with said compressor;

means for channelling said secondary cooling air from said secondary cooling air source to an axially extending annular plenum of substantially uniform uninterrupted circumferential contour; and

means for discharging said secondary cooling air from said plenum into a second turbine cavity to cool turbine components in flow communication therewith.

5,555,722

INTEGRATED APU

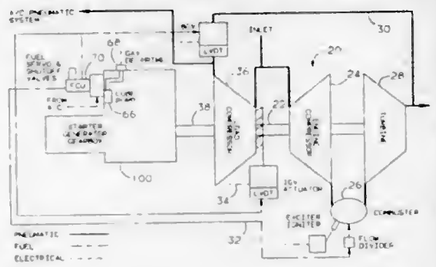
Kourosh Mehr-Ayin, Vista; W. J. Bialas, San Diego, and James A. Smith, Escondido, all of Calif., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 15, 1993, Ser. No. 153,237

Int. Cl.[6] F02C *7/26*

U.S. Cl. 60—39.142 **6 Claims**

1. An apparatus, attached to a prime mover having a rotatable



drive shaft, for providing initial motive force through said drive shaft to initiate power generation from said prime mover and thereafter to derive electric current from said prime mover, said apparatus and said prime mover being separably mounted to a common support structure, and said apparatus comprising:

a housing which is removable from said support structure independently of said primed mover, including therein a common bearing means for serving as a shared bearing between other components within said housing;

a starter/generator means mounted within said housing and supported by said common bearing means;

said starter/generator means having at least a d.c. input and an a.c. output; and

reduction gear means, mounted within said housing and supported by said common bearing means, for connecting said starter/generator means to said drive shaft and transmitting rotational force therebetween.

5,555,723

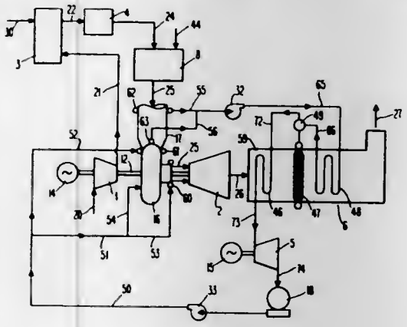
DUCTING FOR AN EXTERNAL GAS TURBINE TOPPING COMBUSTOR

Thomas E. Dowdy, Orlando, Fla., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 28, 1994, Ser. No. 235,001

Int. Cl.[6] F02C *6/00*

U.S. Cl. 60—39.182 **14 Claims**



1. A gas turbine power plant comprising:

a) a compressor for producing compressed air;

b) a combustor for burning a fuel in said compressed air so as to produce a hot compressed gas;

c) a turbine for expanding said hot compressed gas so as to generate power in a rotating shaft thereof, thereby producing an expanded gas wherein said compressor and said turbine are enclosed by a shell, and said combustor is disposed externally from said shell;

d) a duct disposed between said combustor and said turbine for directing the flow of said hot compressed gas there-between, said duct having a wall containing said hot compressed gas and wherein said duct wall forms a toroidal chamber encircling said turbine shaft, a plurality of water flow passages formed within said wall;

e) a source of feed water;

f) a steam generator having means for generating steam by transferring heat from said expanded gas to said feed water; and

g) means for flowing at least a portion of said feed water through said water flow passages in said duct wall and then through said steam generating means.

5,555,724

CAPACITY DETERMINING SYSTEM IN EXHAUST EMISSION CONTROL UNIT FOR INTERNAL COMBUSTION ENGINE

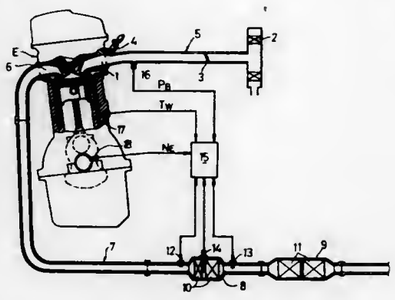
Seiji Hatcho; Yuichi Shimasaki; Takuya Aoki; Seiji Matsumoto; Hiroaki Kato; Takashi Komatsuda; Akihisa Saito, and Toshikazu Oketani, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1995, Ser. No. 377,740

Claims priority, application Japan, Jan. 25, 1994, 6-006548

Int. Cl.[6] F01N *3/28*

U.S. Cl. 60—276 **3 Claims**



1. An adsorbing capacity determining apparatus in an exhaust control system for an internal combustion engine, said exhaust control system including an unburned component adsorbing means for temporarily adsorbing or desorbing an unburned component in exhaust gas from the engine, said capacity determining apparatus comprising:

(a) upstream air-fuel ratio detecting means positioned upstream from said unburned component adsorbing means;

(b) downstream air-fuel ratio detecting means positioned downstream from said unburned component adsorbing means;

(c) an unburned component adsorbing state detecting means, coupled to said unburned component adsorbing means, for detecting the adsorbing or desorbing state of the unburned component adsorbing means; and

(d) determining means, coupled to the outputs of said upstream air-fuel ratio detecting means, said downstream air-fuel ratio detecting means, and said unburned component adsorbing state detecting means, for determining the adsorbing capacity of said unburned component adsorbing means as a function of the outputs of said upstream air-fuel ratio detecting means and said downstream air-fuel ratio detecting means, when said unburned component adsorbing state detecting means detects that said unburned component adsorbing means is in either the adsorbing state or the desorbing state.

5,555,725

CONTROL SYSTEM FOR ELECTRICALLY HEATED CATALYST OF INTERNAL COMBUSTION ENGINE

Yuichi Shimasaki; Takashi Komatsuda; Hiroaki Kato, and Takuya Aoki, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 17, 1995, Ser. No. 503,340

Claims priority, application Japan, Aug. 22, 1994, 6-196803

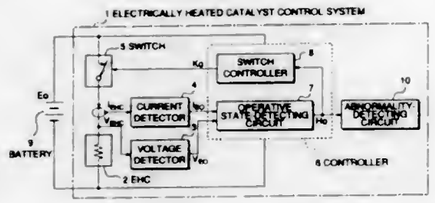
Int. Cl.[6] F01N *3/28*

U.S. Cl. 60—277 **18 Claims**

1. A control system for an electrically heated catalyst for purifying exhaust gases emitted from an internal combustion engine, comprising:

voltage-detecting means for detecting voltage applied to said electrically heated catalyst;

current-detecting means for detecting electric current flowing through said electrically heated catalyst;



switch means for making a changeover between supply and interrupt of power to said electrically heated catalyst;

operative state-detecting means for calculating a parameter indicative of an operative state of said electrically heated catalyst, based on an output from said voltage-detecting means and an output from said current-detecting means, and for detecting said operative state of said electrically heated catalyst, based on said parameter thus calculated; and

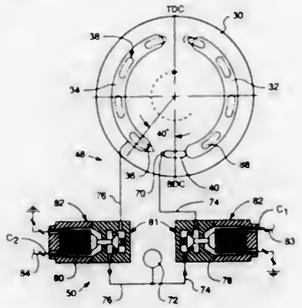
switch controller means for controlling operation of said switch means, based on an output from said operative state-detecting means.

5,555,726

ATTENUATION OF FLUID BORNE NOISE FROM HYDRAULIC PISTON PUMPS

Robert J. Huebner, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Mar. 31, 1995, Ser. No. 414,869
Int. Cl.[6] F16D *31/02*; **F04B** *49/00*
U.S. Cl. 60—469 **12 Claims**



1. Apparatus for the attenuation of fluid borne noise in a hydraulic system caused by flow ripples produced by a hydraulic piston pump that is drivingly connected by a pump input shaft to a power source, the hydraulic piston pump having an inlet passage, a discharge passage, a bottom dead center position (BDC) between the inlet passage and the discharge passage, and a plurality of piston ports that are rotatably disposed relative to the inlet passage, the bottom dead center position, and the discharge passage, the apparatus comprising:

a sensor arrangement operative to sense the piston pump's operating parameters and generate electrical signals representative of the pump's operating parameters;

a porting arrangement within the hydraulic piston pump including a secondary port disposed between the inlet passage and the discharge passage, a fluid chamber of a predetermined volumetric size, a first passageway connecting the secondary port with the fluid chamber, a second passageway connecting the fluid chamber with the discharge passage and an electrically controlled valve mechanism disposed in the first and second passageways and operative to control fluid flow between the secondary port, the fluid chamber and the discharge passage; and

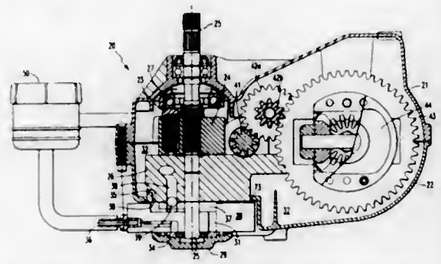
a microprocessor operative to receive the electrical signals representative of the pump's operating parameters, process the signals with respect to programmed parameters and transmit electrical command signals to the electrically controlled valve mechanism to selectively control the flow of fluid between the secondary port, the fluid chamber and the discharge passage in response to the pump's operating parameters.

5,555,727

AUXILARY PUMPS FOR AXLE DRIVING APPARATUS INCLUDING HYDROSTATIC TRANSMISSION

Ray Hauser, Decatur; Daryl Smothers, Sullivan, and John Schreier, Villa Grove, all of Ill., assignors to Hydro-Gear, Sullivan, Ill.

Filed Feb. 24, 1995, Ser. No. 394,144
Int. Cl.[6] F16D *39/00*
U.S. Cl. 60—488 **23 Claims**



1. An apparatus for transmitting power from a vehicle engine to an output shaft, comprising:

a housing having an opening formed therein;

a hydrostatic transmission disposed substantially within said housing, said hydrostatic transmission comprising a center section, disposed in communication with said opening, having hydraulic porting formed therein; a pump mounted on said center section and drivingly linked to said vehicle engine; and a motor mounted on said center section and hydraulically connected through said hydraulic porting to said pump, said motor being drivingly connected to said output shaft;

a sump containing hydraulic fluid in flow communication with said hydrostatic transmission for supplying hydraulic fluid thereto; and

an auxiliary pump in flow communication with said sump disposed adjacent to the external surface of said housing.

5,555,728

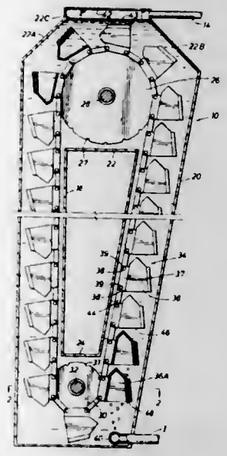
APPARATUS AND METHOD FOR PRODUCING POWER USING THE EXCESS PRESSURE IN NATURAL GAS PIPELINES

Kenneth W. Welch, Jr., Houston, Tex., assignor to Welch, Welch and Swanson, Houston, Tex.

Filed Feb. 3, 1995, Ser. No. 383,420
Int. Cl.[6] F03B *17/00*
U.S. Cl. 60—496 **6 Claims**

6. A method of reducing the pressure of gas in a transmission line to the pressure of a gas distribution system while using the pressure reduction to generate electricity, comprising the steps of:

flowing the gas sequentially through a plurality of water-filled vessels with the gas being introduced adjacent the bottom of each vessel to move one side of an endless chain of buckets in each of the vessels upwardly with the upwardly moving gas to produce electric power as the pressure of the gas drops an amount substantially equal to the hydrostatic pressure of the water in each vessel until the pressure of the gas is reduced to that of the distribution system.

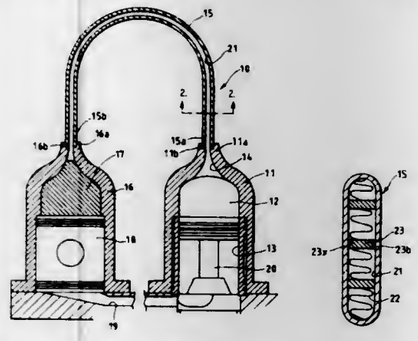


5,555,729

STIRLING ENGINE

Yutaka Momose; Koji Fujiwara, and Juniti Mita, all of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 15, 1994, Ser. No. 340,381
Claims priority, application Japan, Nov. 15, 1993, 5-284961
Int. Cl.[6] F28F *1/40*; **F02G** *1/044*
U.S. Cl. 60—517 **9 Claims**



1. A Stirling engine comprising:

a cylinder having an expansion space;

a heat accumulating unit;

a housing accommodating said heat accumulating unit; and

a single heating unit through which said expansion space is communicated with said heat accumulating unit, said heating unit being formed of a flattened pipe.

5,555,730

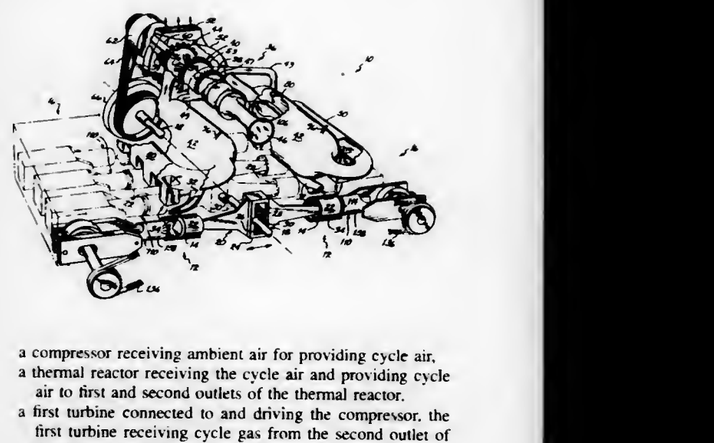
COOLING FOR GAS TURBINE-TWO STROKE PISTON COMPOUND ENGINE

Jack I. Hope, Hillsboro, Ohio, assignor to Haeco Partners, Ltd., Hillsboro, Ohio

Continuation-in-part of Ser. No. 328,121, Oct. 24, 1994. This application Feb. 21, 1995, Ser. No. 391,046
Int. Cl.[6] F02B *37/20*; **F01P** *1/06*
U.S. Cl. 60—606 **30 Claims**

1. A compound engine comprising:

a gas turbine unit including



a compressor receiving ambient air for providing cycle air,

a thermal reactor receiving the cycle air and providing cycle air to first and second outlets of the thermal reactor,

a first turbine connected to and driving the compressor, the first turbine receiving cycle gas from the second outlet of the thermal reactor, and

a second turbine having an input fluidly coupled to an output of the first turbine; and

a piston unit including

an intake manifold in fluid communication with the first outlet of the thermal reactor,

an exhaust manifold in fluid communication with the second outlet of the thermal reactor,

a crankshaft mechanically coupled to the second turbine,

a plurality of piston and cylinder assemblies, each of the plurality of piston and cylinder assemblies including

a cylinder bore surrounded by a cylinder wall,

a piston slidably mounted in the cylinder bore and having annular piston rings in sliding contact with the cylinder wall, the piston having one end operatively connected to the crankshaft for reciprocating motion within the cylinder bore,

an intake port in fluid communication with the intake manifold, the intake port being located in the cylinder wall proximate a bottom dead center position of a respective piston,

a first plurality of impingement cooling holes having

first ends in fluid communication with the intake manifold for receiving cycle air, and

second ends expelling and impinging cycle air at a high velocity on an outer area of a respective cylinder wall at a first location generally adjacent the piston rings of a respective piston located at a top dead center position.

5,555,731

PREHEATED INJECTION TURBINE SYSTEM

Joel H. Rosenblatt, P.O. Box 198, Summerland Key, Fla. 33042

Filed Feb. 28, 1995, Ser. No. 395,437
Int. Cl.[6] F01K *25/00*
U.S. Cl. 60—671 **20 Claims**

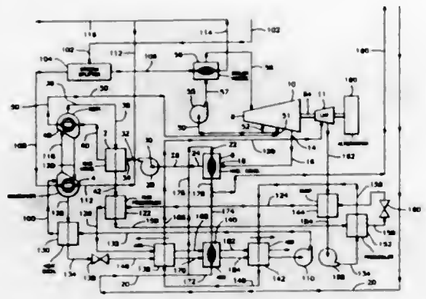
1. A power turbine system operating in an organic Rankine cycle with a thermodynamic medium flow therethrough comprising:

a power turbine having an inlet and an exhaust;

a first circulating thermodynamic turbine medium;

a low temperature engine system having a heat engine, and a second circulating thermodynamic turbine medium flowing through said heat engine and producing rejected waste heat during engine system operation;

means for regenerative heat transfer of said rejected waste heat by heat exchange relationship with said first turbine medium for preheating said first turbine medium to produce liquid phase medium at an elevated temperature not less than the temperature resulting from said preheating;



pump means having inlet means for receiving said liquid phase turbine medium at said elevated temperature, and outlet means;

injector means for injecting said liquid phase turbine medium from said pump outlet means into said turbine at at least one position therein for mixing with a flowing vapor stream of said first turbine medium flowing through said power turbine at a selected internal turbine pressure to produce a resulting mixture; and

means for controlling the mass flow of said injected liquid phase turbine medium into said turbine for effecting a selected vapor quality of said resulting mixture; and

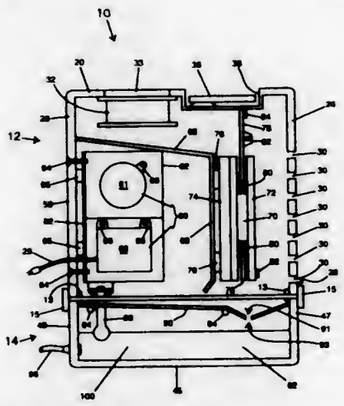
said first turbine medium comprising a thermodynamic medium having a tendency to diverge toward the superheated region from the saturation curve thereof during isentropic expansion of the vapor thereof across the pressure gradient traversed by the turbine cycle.

5,555,732

PORTABLE DEHUMIDIFIER

John Whiticar, 4705 NE Palmetto Dr., Jensen Beach, Fla. 34957

Filed Feb. 9, 1995, Ser. No. 385,835
Int. Cl.[6] F24F *1/00*
U.S. Cl. 62—3.4 **14 Claims**



1. A portable dehumidifier comprising:

a housing having an air inlet and an air outlet and an upper chamber and a lower chamber,

said upper chamber including a thermoelectric module and a power supply, said thermoelectric module separated from said power supply by a first wall,

said thermoelectric module further including a cold plate and a finned hot plate, said cold plate separated from said finned hot plate by a second wall,

an air passage, said air passage formed between said air inlet said air outlet, said first wall and said second wall,

a blower fan, said blower fan located in said upper chamber proximal said air outlet,

said lower chamber including a condensate reservoir, said condensate reservoir separated from said upper chamber by a vapor barrier, said vapor barrier including a channel, said channel located directly underneath said cold plate, said condensate reservoir further including a condensate exit means,

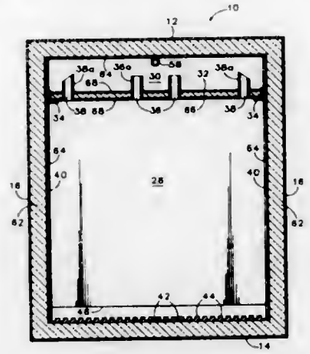
whereby air enters said upper chamber through said air inlet and comes in contact with said cold plate causing vapor entrained in the air to condense on said cold plate forming a condensate, said condensate falling onto said vapor barrier and passing through said channel into said condensate reservoir, said dehumidified air further passes over and cooling said finned hot plate and then exiting said upper chamber through said air outlet.

5,555,733

LOW-MAINTENANCE SYSTEM FOR MAINTAINING A CARGO IN A REFRIGERATED CONDITION OVER AN EXTENDED DURATION

John K. Claterbos, 240 SW. Cedar, Warrenton, Oreg. 97146, and Stephen C. Fulton, 3168 Harrison Dr., Astoria, Oreg. 97103

Division of Ser. No. 413,460, Mar. 29, 1995, abandoned, which is a division of Ser. No. 217,330, Mar. 23, 1994, Pat. No. 5,423,193. This application Dec. 8, 1995, Ser. No. 569,667
Int. Cl.[6] F25D *25/00*
U.S. Cl. 62—62 **10 Claims**



1. A method of preparing a cargo for refrigeration over an extended duration, said method comprising:

(a) providing an insulated enclosure having a cargo-enclosing portion comprising a majority of the volume of said enclosure, and a carbon dioxide-enclosing portion comprising a minority of the volume of said enclosure;

(b) providing an insulated barrier between said cargo-enclosing portion and said carbon dioxide-enclosing portion;

(c) placing said cargo in said cargo-enclosing portion and placing solid carbon dioxide in said carbon dioxide-enclosing portion;

(d) after step (c) has been completed, converting said solid carbon dioxide in said carbon dioxide-enclosing portion to a carbon dioxide gas while transferring heat from outside of said enclosure into said cargo-enclosing portion;

(e) simultaneously with step (d), venting said carbon dioxide gas from said carbon dioxide-enclosing portion into said cargo-enclosing portion to thereby transfer heat from within said cargo-enclosing portion to said carbon dioxide gas; and

(f) simultaneously with step (d), transferring heat from within said cargo-enclosing portion through said insulated barrier into said carbon dioxide-enclosing portion at a rate greater than the rate at which heat is transferred to said carbon dioxide gas in step (e), but at a rate no greater than 0.08 BTU per hour per square foot of area normal to the transfer of said heat, per degree Fahrenheit of temperature difference between said cargo-enclosing portion and said carbon dioxide-enclosing portion measured at respective locations immediately adjacent to said barrier;

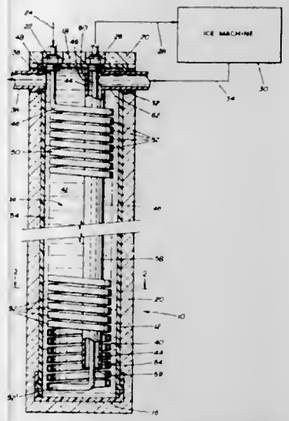
(g) step (c) comprising placing sufficient solid carbon dioxide in said carbon dioxide-enclosing portion to enable the performance of steps (d), (e) and (f) over a duration of at least 15 days without the need for replenishment of said solid carbon dioxide.

5,555,734

METHOD FOR REDUCING SEDIMENT PRECIPITATION ON HEAT EXCHANGERS SUCH AS WATER PRECHILLERS FOR ICE MACHINES

Daniel L. Welch, Del Rio, and Jeff L. Love, Leander, both of Tex., assignors to Maximicer, Austin, Tex.

Continuation-in-part of Ser. No. 218,348, Mar. 28, 1994, Pat. No. 5,379,603, which is a continuation-in-part of Ser. No. 39,844, Mar. 30, 1993, abandoned. This application Dec. 12, 1994, Ser. No. 353,668
Int. Cl.[6] F25C *1/12*
U.S. Cl. 62—66 **13 Claims**



1. In an apparatus for prechilling the warm tap water, fed into an ice maker machine to make ice cubes and the like, with the near freezing waste water ejected by the machine after one or more ice making cycles; comprising an insulated, elongated casing having top and bottom ends forming there between a closed reservoir housing a heat exchanger made of copper tubing or the like, said casing having a waste water inlet, a tap water inlet, a waste water overflow outlet, and a tap water outlet, the improvement wherein:

said heat exchanger has a coil having a plurality of spiral turns for maximum heat transfer followed by a substantially straight tube portion within and surrounded by said turns;

a first bulkhead connector connected to the inlet of said coil, a second bulkhead connector connected to the outlet of said straight tube, and each bulkhead connector being made at least in part of a material exhibiting a high resistivity to the flow of electric current, thereby insulating said coil from electric current flow therethrough;

a hollow member, closed at one end, spaced from said straight tube to be surrounded by said coil turns to form between said hollow member and said straight tube an elongated chamber whose bottom is open to the interior of said reservoir;

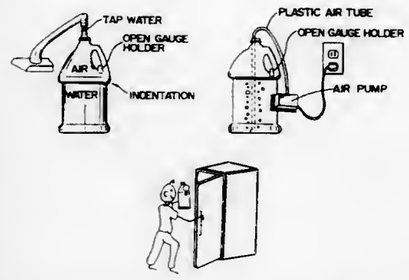
said chamber is fluidly coupled to said waste-water inlet, said coil is fluidly coupled to said tap water inlet, and said straight tube is fluidly coupled to said tap water outlet, whereby in use said warm tap water flows under pressure spirally toward the lowest one of said coil turns, thence within said straight tube and through said tap water outlet into said machine for making ice, and said cold waste water flows through said chamber, along and around said straight tube, into the interior of said reservoir, and therein along and around said coil turns, and exiting through said overflow outlet, thereby progressively and continuously increasing the temperature of said waste water after it is received from the machine and progressively and continuously decreasing the temperature of said tap water until it reaches said tap water outlet, whereat it has its lowest temperature.

5,555,735

REMOVAL OF VOLATILE ORGANIC POLLUTANTS FROM DRINKING WATER

Robert H. Elliott, Jr., 6027 Cannon Hill Rd., Fort Washington, Pa. 19034

Continuation of Ser. No. 353,184, Dec. 9, 1994, Pat. No. 5,458,184, which is a continuation-in-part of Ser. No. 88,671, Jul. 7, 1993, Pat. No. 5,372,012, which is a continuation-in-part of Ser. No. 894,941, Jun. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 693,565, Apr. 30, 1991, Pat. No. 5,152,150, which is a continuation of Ser. No. 581,676, Sep. 13, 1990, abandoned, which is a continuation of Ser. No. 395,568, Aug. 18, 1989, abandoned. This application Oct. 16, 1995, Ser. No. 543,755
Int. Cl.[6] F25B *19/00*
U.S. Cl. 62—100 **4 Claims**



4. The method of removing volatile, toxic substances from drinking water comprising the steps of:

providing (a) a vacuum gauge with a rubber stopper; (b) a length of plastic tubing, (c) an air pump; and (d) a plastic container having an opening covered with a removable cap by which the container can be opened and closed and a passageway configured to receive and hold the rubber stopper of a vacuum gauge;

removing said cap and partially filling said container with drinking water having a temperature range between approximately 135–145 degrees F.;

placing said tubing through said opening with one end adjacent the bottom of the container and connecting the other end to said air pump and aerating said water for a period of not more than approximately 10 minutes;

removing said tubing and replacing said cap and while closing off said passageway shake container and stopping at least once to release air;

after said shaking, immediately placing said vacuum gauge stopper in said vacuum gauge passageway;

storing said container with the vacuum gauge thereon substantially at room temperature until the vacuum gauge shows approximately 2–3 inches of mercury; and placing said container with the vacuum gauge thereon and showing approximately 2–3 inches of mercury in a refrigerator to permit the vacuum gauge to show approximately 5–9 inches of mercury.

5,555,736

REFRIGERATION SYSTEM AND METHOD

5,555,739

PIPING ARRANGEMENT OF AUTOMOTIVE AIR

5,555,736

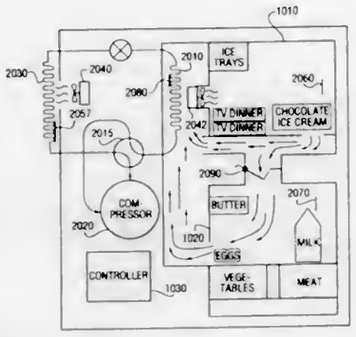
REFRIGERATION SYSTEM AND METHOD

Frank E. Wills, and Dean K. Norbeck, both of York, Pa., assignors to York International Corporation, York, Pa.

Division of Ser. No. 180,067, Jan. 11, 1994, Pat. No. 5,460,009. This application Jun. 5, 1995, Ser. No. 465,329

Int. Cl.[6] F25B *49/02*

U.S. Cl. 62—187 **12 Claims**



1. A refrigeration system comprising:

a housing defining a first compartment and a second compartment in fluid communications with the first compartment;

a first sensor for sensing the temperature in the second compartment;

first cooling means, connected to the first compartment, for cooling the first compartment to a temperature of less than 32° F.;

second cooling means, connecting the first and second compartments, for cooling the second compartment, said second cooling means comprising means for transferring air from the first compartment to the second compartment at a variable rate that is a function of the temperature in the second compartment sensed by the first sensor.

5,555,737

AIR CONDITIONER CONTROL SYSTEM FOR ELECTRIC VEHICLES

Yuji Takeo, Toyoake; Akira Isaji, Nishio; Toshihiro Nagata, Tokoname; Masaya Tanaka, and Kunio Iritani, both of Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 1, 1994, Ser. No. 352,796

Claims priority, application Japan, Dec. 2, 1993, 5-302721; Oct. 19, 1994, 6-253188

Int. Cl.[6] F25B *13/00*

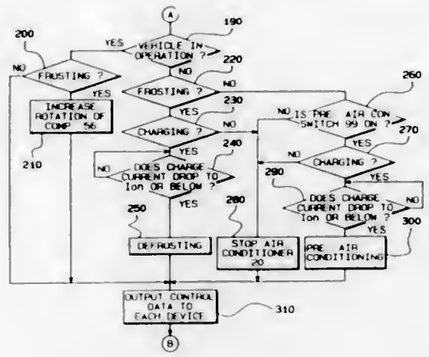
U.S. Cl. 62—230 **4 Claims**

1. An air conditioner control system for electric vehicles for controlling an air conditioner powered by a secondary battery installed in an electric vehicle, said system comprising:

current sensing means for sensing a charging current from an external power supply to said secondary battery; and

control means for operating said air conditioner and charging said secondary battery as necessary when said charging current sensed by said current sensing means has dropped to no more than a specified level during charging of said secondary battery

wherein said control means includes means for regulating current consumption by said air conditioner so that said current consumption by said air conditioner falls in a range of excess charging current, which does not drop a charging voltage of said secondary battery.



5,555,738

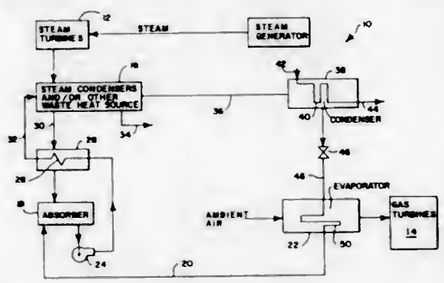
AMMONIA ABSORPTION REFRIGERATION CYCLE FOR COMBINED CYCLE POWER PLANT

Douglas J. DeVault, Rootstown, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Sep. 27, 1994, Ser. No. 313,699

Int. Cl.[6] F25B *27/00;* **F02C** *1/00;* **F02G** *3/00*

U.S. Cl. 62—238.3 **8 Claims**



1. A system for utilizing the rejected heat from a waste heat source to operate a refrigeration cycle for cooling ambient air for a gas turbine comprising:

a heat exchanger containing a strong solution of ammonia and water connected to said waste heat source to exhaust the rejected heat therein to vaporize the ammonia from the solution to form a high pressure ammonia vapor;

means for converting the vaporized ammonia from said heat exchanger to liquid ammonia;

means for throttling the liquid ammonia from said converting means to lower a pressure and temperature thereof;

evaporator means for cooling ambient air below an outside ambient air temperature by converting the liquid ammonia from said evaporator cooling means into a low pressure ammonia vapor and passing the cooled ambient air to a gas turbine compressor; and

means for supplying the low pressure ammonia vapor to an absorber for producing the strong solution of ammonia and water for said heat exchanger.

5,555,739

PIPING ARRANGEMENT OF AUTOMOTIVE AIR CONDITIONER

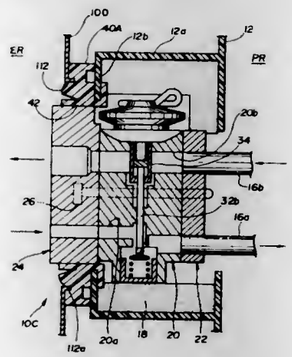
Toshisada Kujirai; Kaoru Ito; Yoshiaki Koga; Yutaka Moriyama; Norimitsu Takeshita; Yuji Ohira, and Takahiro Ono, all of Tokyo, Japan, assignors to Calsonic Corporation, Tokyo, Japan

Filed Dec. 22, 1994, Ser. No. 361,840

Claims priority, application Japan, Dec. 22, 1993, 5-068696 U; Sep. 22, 1994, 6-228264

Int. Cl.[6] B60H *1/32*

U.S. Cl. 62—244 **14 Claims**



1. In a motor vehicle having a dashboard by which an engine room and a passenger room are bounded and a cooler unit housing installed in said passenger room near said dashboard, said cooler unit housing containing an evaporator, the improvement comprising

an arrangement comprising:

means defining in said dashboard an opening;

a pipe joint positioned at and supported by the opening of said dashboard, said pipe joint having a first face facing toward said passenger room and a second face facing toward said engine room;

an expansion valve unit connected to said first face of said pipe joint;

coolant inlet and output pipes, each having one end connected to said evaporator and the other end to said expansion valve unit;

a grommet disposed between a peripheral portion of said opening and an outer wall portion of said pipe joint thereby to establish sealing therebetween

means for establishing a fluid communication between said expansion valve unit and given essential parts of a cooling system which are installed in said engine room;

a swelled portion integrally defined by said cooler unit housing, said swelled portion being directed toward said opening and housing therein said expansion valve unit; and

a heat and sound insulating material disposed within said swelled portion in a manner to cover said expansion valve unit.

5,555,740

MANUAL REFRIGERATION APPARATUS

Robert L. Stevenson, 1624 Cessford St., Lake Charles, La. 70601

Filed Jul. 12, 1995, Ser. No. 501,610

Int. Cl.[6] F25D *3/08*

U.S. Cl. 62—293 **20 Claims**

1. A portable manually operated refrigeration apparatus, comprising:

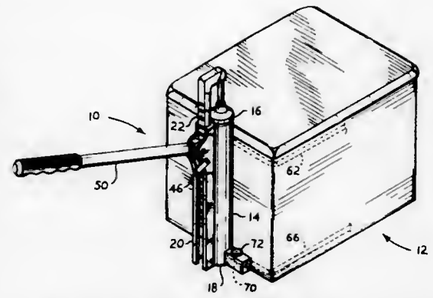
a sealed compressor cylinder having a first end and an opposite second end and including a piston therein, with said piston separating said cylinder into a variable first volume adjacent said first end and a variable second volume adjacent said second end and traveling between said first end and said second end of said cylinder and having a piston rod extending therefrom and exiting said first end of said cylinder through a seal disposed around said rod;

said cylinder further including a compression spring disposed therein, said compression spring urging said piston toward said second end of said cylinder;

at least one refrigerant line comprising a closed loop having a refrigerant return portion connected to said cylinder adjacent said first end and a refrigerant discharge portion connected to said cylinder adjacent said second end, and a compressible refrigerant disposed within said cylinder and said refrigerant line, and;

external spring compression means connected to said rod and providing for the actuation of said piston within said cylinder to compress said spring, said external means being operable solely by physical power provided by a person using said manually operated refrigeration apparatus, whereby;

said external means is operated to draw said rod from said cylinder and thereby move said piston toward said first end of said cylinder to compress said spring thereby, and said external means is then released to allow said spring to move said piston toward said second end of said cylinder, thereby compressing said refrigerant within said second volume and forcing said refrigerant to circulate through said closed loop refrigerant line and back to said cylinder, to provide cooling within said refrigerant line.



5,555,741

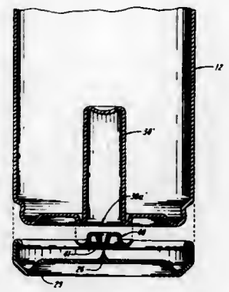
SELF-COOLING FLUID CONTAINER WITH INTEGRAL REFRIGERANT CHAMBER

Kenneth G. Oakley, North York, Canada, assignor to Envirochill International Ltd., Bridgetown, Barbados

Continuation of Ser. No. 130,770, Oct. 7, 1993, abandoned. This application May 18, 1995, Ser. No. 444,215

Int. Cl.[6] F25D *3/10*

U.S. Cl. 62—294 **29 Claims**



1. A self-cooling container for fluids, comprising:

A. a first chamber including lateral walls and a bottom wall for defining a fluid region interior thereto,

(g) heating means for elevating the temperature of air entering said scrubber section inlet to a temperature above the free ambient air temperature

a dehydrator in fluid communication between the first side of the first heat exchanger and the compressor, the controlled space

A. a first chamber including lateral walls and a bottom wall for defining a fluid region interior thereto,

B. a second chamber including walls for defining a refrigerant region interior thereto, said refrigerant region extending at least partially into said fluid region and being thermally coupled to said fluid region, and said refrigerant region being fluidicly isolated from said fluid region, wherein said first chamber is substantially cylindrical and said second chamber is integral with and extends from one end of said first chamber wherein said lateral walls and said bottom wall of said first chamber and said walls defining said refrigerant region are a single piece structure, wherein said refrigerant region extends into said fluid region from a set of peripheral points on said bottom wall of said first chamber, and wherein said refrigerant region is further defined by a cap spanning said opening affixed to said bottom wall at points near said periphery, said cap including an elongated, substantially conical port having a relatively large diameter proximal end facing said refrigerant region and having a relatively small diameter distal end opposite thereto, said distal end being spanned by a perforable center portion,

C. refrigerant dispersal assembly including:

i. means for forming a third chamber including walls for defining a dispersal region interior thereto, said dispersal region including a first portion adjacent to said refrigerant region and separated therefrom by a coupling portion of said walls of said refrigerant region, and including a second portion adjacent to said fluid region and separated therefrom by a coupling portion of said walls of said fluid region, said dispersal region and said fluid region being thermally coupled through said coupling portion of said walls of said fluid region, said third chamber being substantially closed and being vented to regions exterior to said container,

ii. cooling activation means for selectively forming a fluidic path from said refrigerant region to said dispersal region through said coupling portion of said walls of said refrigerant region.

5,555,742

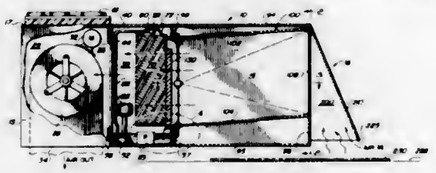
EVAPORATIVE COOLER WITH SCRUBBER AND ENTHALPIC HEATING SYSTEM

Franklyn F. Kelley, 7802 N. 36th Dr., Phoenix, Ariz. 85021

Continuation of Ser. No. 89,940, Jul. 12, 1993, Pat. No. 5,361,600. This application Nov. 8, 1994, Ser. No. 336,303

Int. Cl.[6] F28D *5/00*

U.S. Cl. 62—311 **9 Claims**



1. An evaporative cooling device comprising:

(a) an evaporative cooling section having a cabinet with an intake for air to be cooled and a discharge for cooled air;

(b) air delivery means having air moving means for inducing an air flow from said intake to the discharge;

(c) evaporative cooling media located at said intake;

(d) a sump for providing a water supply;

(e) means for delivering water from said sump to said evaporative cooling media;

(f) a scrubber section adjacent said evaporative cooler section and in communication with the intake for air to be cooled, said scrubber section including a housing having an inlet and at least one spray nozzle communicating with said sump oriented to spray finely divided water mist into the incoming air stream flowing to said evaporative cooler intake; and

(g) heating means for elevating the temperature of air entering said scrubber section inlet to a temperature above the free ambient air temperature.

5,555,743

APPARATUS FOR WATER SUPPLY OF AUTOMATIC ICE MAKING APPARATUS

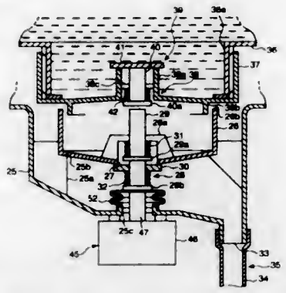
Hideharu Hatanaka, Osaka-fu, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Jan. 31, 1995, Ser. No. 380,992

Claims priority, application Japan, Jan. 31, 1994, 6-009173

Int. Cl.[6] F25C *1/10*

U.S. Cl. 62—347 **13 Claims**



1. A water supply device in an automatic ice maker for supplying an ice tray with water, the water supply device comprising:

a metered quantity container positioned above the ice tray and including a first water exit portion at a bottom portion of the quantity container;

a water supply tank positioned above the quantity container and including a second water exit portion for supplying water from the water supply tank to the quantity container;

a water exit valve mechanism for opening and closing the first water exit portion of the quantity container;

a water supply mechanism for opening and closing the second water exit portion of the water supply tank;

a valve operator device for controlling the water supply and water exit valve mechanisms so that, as a first process, the water supply and water exit valve mechanisms are respectively open and closed, as a second process, the water supply and water exit valve mechanisms are respectively closed and open, as a third process, the water supply and water exit valve mechanisms are both closed; and

a water supply member to direct water flowing from the first exit portion to the ice tray.

5,555,744

REFRIGERANT CIRCUIT FOR ICE MAKING MACHINES ETC.

Akihiko Hirano, Toyoake, Japan, assignor to Hoshizaki Denki Kabushiki Kaisha, Aichi, Japan

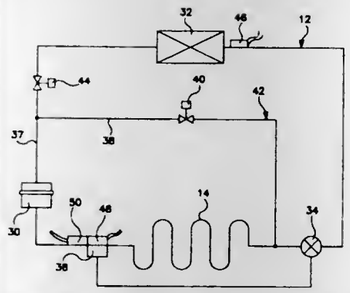
Filed Feb. 10, 1995, Ser. No. 386,682

Int. Cl.[6] F25C *5/10*

U.S. Cl. 62—352 **8 Claims**

1. A refrigerant circuit for an ice making machine and the like, said circuit comprising:

a freezing circuit in which a high-pressure and high-temperature vaporized refrigerant obtained after compression in a compressor is fed via a solenoid valve to a condenser, the refrigerant condensed to be liquefied in said condenser is then fed to an expansion means, the refrigerant expanded to be vaporized through said expansion means is further fed to an evaporator, and the vaporized refrigerant heated through heat exchange with said evaporator is fed back to said compressor; and



a hot gas circuit which bypasses said high-pressure and high-temperature vaporized refrigerant fed from said compressor to said evaporator via a hot gas valve so as to achieve ice releasing and the like at said evaporator;

said solenoid valve and said hot gas valve being designed to be let open and closed, respectively, during the freezing operation;

wherein said hot gas valve is designed to be let open with said solenoid valve still assuming an open posture, when the operation mode is switched to the ice releasing operation under the condition where the ambient temperature is higher than a predetermined level; and

said hot gas valve and said solenoid valve are designed to be let open and closed, respectively, when the operation mode is switched to the ice releasing operation under the condition where the ambient temperature is lower than the predetermined level.

5,555,745

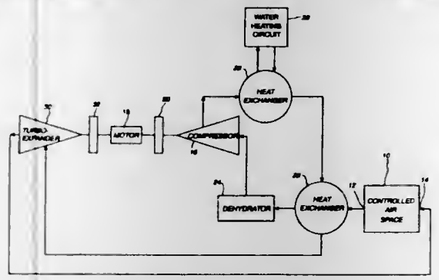
REFRIGERATION SYSTEM

Reza R. Agahi, Granada Hills, and Behrooz Ershagi, Irvine, both of Calif., assignors to Rotoflow Corporation, Gardena, Calif.

Filed Apr. 5, 1995, Ser. No. 417,842

Int. Cl.[6] F25D *9/00*

U.S. Cl. 62—401 **10 Claims**



1. A refrigeration system to cool a controlled space of ambient fluid, comprising

a compressor coupled in fluid communication with the controlled space;

a first heat exchanger having a first side being coupled in fluid communication between the controlled space and the compressor and a second side, the first side of the first heat exchanger including cooling fluid which is flow of ambient fluid from the controlled space to the compressor;

a turboexpander having an inlet and an outlet, the inlet being coupled in fluid communication with the compressor and the outlet being coupled in fluid communication with the controlled space, the second side of the first heat exchanger being coupled in fluid communication between the compressor and the turboexpander;

a dehydrator in fluid communication between the first side of the first heat exchanger and the compressor, the controlled space being an air space and the fluid communication being of air.

5,555,746

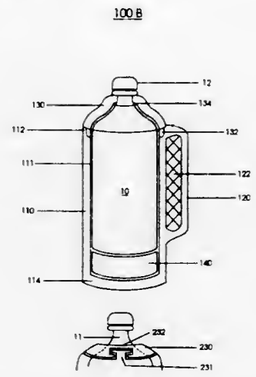
TWO LITER INSULATED COOLER CONTAINERS

Patrick Thompson, 2328 Burns Ave., Melbourne, Fla. 32935

Filed Jun. 8, 1995, Ser. No. 488,789

Int. Cl.[6] F25D *3/08*

U.S. Cl. 62—457.4 **9 Claims**



1. A portable holder for supporting and insulating the contents of a two liter disposable bottle located within the holder, comprising:

a substantially hollow cylindrical container formed from a molded high density plastic foam material, the container configured to wrap about and insulate a two liter disposable bottle;

a lid formed from a molded high density plastic foam material, the lid having an upper portion for abutting against a neck of the bottle and a lower connect portion that is removable from a mateable connect portion on the cylindrical container; and

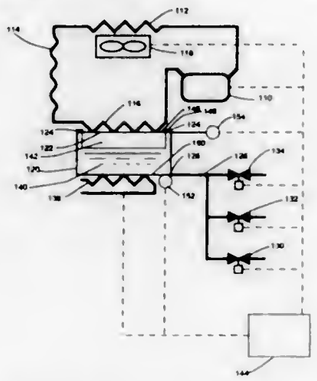
a single rounded handle having an indented recess layer disposed in a plane radially extending from said container, said handle further having a raised continuous rounded perimeter edge with a vertical portion disposed parallel to a side wall of the container and two horizontal portions disposed substantially perpendicular to said side wall of the container, with each horizontal portion respectively connected at one end to an upper and lower point on said side wall and each horizontal portion respectively attached at an other end to opposite ends of said vertical portion, so that said raised continuous rounded perimeter edge and said side wall thereby enclose a flat area and said indented recess layer is circumscribed by and contiguously attached to said side wall and said raised continuous rounded perimeter edge, said handle is formed from the same molded high density plastic foam material as the cylindrical container wherein said recess layer reinforces the connection between the raised continuous rounded perimeter edge and said side wall, and wherein the cylindrical container provides insulation for the two liter disposable bottle.

5,555,747

CONTROL OF CRYSTAL GROWTH IN WATER PURIFICATION BY DIRECTIONAL FREEZE CRYSTALLIZATION

William M. Conlon, Palo Alto, Calif., assignor to Polar Spring Corporation, Menlo Park, Calif.

Filed Jul. 28, 1994, Ser. No. 281,759
Int. Cl.[6] B01D *9/04*
U.S. Cl. 62—532 **14 Claims**



1. A Directional Freeze Crystallization System comprising:
a) a crystallizer means consisting of a heat exchanger,
b) a vessel for containing liquid to be purified
c) a cooling means for conveying a heat transfer fluid to said heat exchanger, said heat transfer fluid being at a temperature less than the freezing point of said liquid to be purified
d) a filling means for conveying said liquid to be putified into said vessel,
e) a draining means for conveying unfrozen liquid from said vessel,
f) a heating means for melting ice frozen on said heat exchanger,
g) a transfer means for conveying melted ice from said vessel
h) an accumulator connected by a fluid conduit to said vessel,
i) a quantity sensor to determine the volume of unfrozen liquid in said accumulator
j) a state sensor to determine the absence of frozen liquid in said vessel
j) control means for repeatedly sequentially actuating said filling means, cooling means, draining means, heating means and transfer means responsive to said quantity sensor and said state sensor to fill said vessel with liquid to be purified, freeze a fraction of said liquid to be purified adjacent to said heat exchanger, drain the unfrozen fraction of said liquid to be purified, melt the frozen fraction of said liquid to be purified, and convey the melted fraction from said vessel.

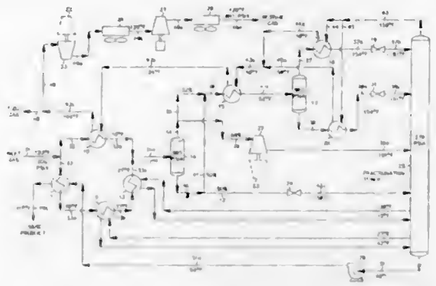
5,555,748

HYDROCARBON GAS PROCESSING

Roy E. Campbell; John D. Wilkinson; Hank M. Hudson, all of Midland, and Michael C. Pierce, Odessa, all of Tex., assignors to Elcor Corporation, Dallas, Tex.

Filed Jun. 7, 1995, Ser. No. 477,444
Int. Cl.[6] F25J *3/02*
U.S. Cl. 62—621 **17 Claims**

1. In a process for the separation of a gas stream containing methane, C_2 components, C_3 components and heavier hydrocarbon components into a volatile residue gas fraction containing a major portion of said methane and a relatively less volatile fraction containing at least a major portion of said C_3 components and heavier hydrocarbon components, in which process
(a) said gas stream is cooled under pressure to provide a cooled stream;



(b) said cooled stream is expanded to a lower pressure whereby it is further cooled; and
(c) said further cooled stream is fractionated at said lower pressure whereby at least a major portion of said C_3 components and heavier hydrocarbon components is recovered in said relatively less volatile fraction;
the improvement wherein said gas stream is cooled sufficiently to partially condense it; and
(1) said partially condensed gas stream is separated thereby to provide a first vapor stream and a first condensed stream;
(2) said first vapor stream is thereafter divided into gaseous first and second streams;
(3) said gaseous first stream is combined with at least a portion of said first condensed stream to form a combined stream;
(4) said combined stream is cooled and expanded to an intermediate pressure whereby it is partially condensed;
(5) said expanded partially condensed combined stream is separated at said intermediate pressure thereby to provide a second vapor stream and a second condensed stream;
(6) said second vapor stream is further cooled at said intermediate pressure to condense substantially all of it, expanded to said lower pressure, and thereafter supplied at a top feed position to a distillation column in a lower region of a fractionation tower;
(7) said second condensed stream is further cooled at said intermediate pressure, expanded to said lower pressure, and thereafter supplied to said distillation column at a first mid-column feed position;
(8) said gaseous second stream is expanded to said lower pressure and thereafter supplied to said distillation column at a second mid-column feed position; and
(9) the quantities and temperatures of said feed streams to the column are effective to maintain the tower overhead temperature at a temperature whereby at least a major portion of said C_3 components and heavier hydrocarbon components is recovered in said relatively less volatile fraction.

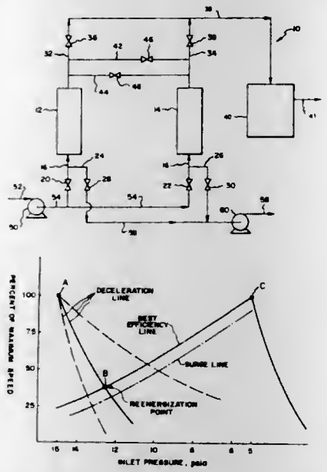
5,555,749

USE OF CENTRIFUGAL COMPRESSORS IN ADSORPTIVE SYSTEMS

Joseph G. Wehrman, Macungie, Pa.; Stephen J. King, Churt, and Kulwant S. Birdi, Harrow, both of England, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 28, 1995, Ser. No. 431,693
Int. Cl.[6] F25J *3/00*
U.S. Cl. 62—641 **10 Claims**

1. A method of cycling a centrifugal compressor, used as an exhauster in pressure swing or vacuum swing adsorption process, between full outlet to inlet pressure ratio and low outlet to inlet pressure ratio comprising the steps of:
installing a variable frequency drive unit to control a motor used to drive a compressor wheel of said centrifugal compressor,



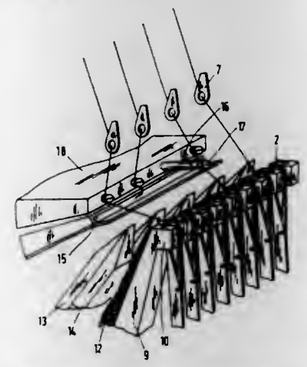
said variable frequency drive adjusted to match energy supplied to said motor for the speed of rotation required by said compressor wheel;
operating said compressor at a maximum speed of rotation required to maintain full pressure ratio for a predetermined time;
minimizing energy input to said motor to cause said compressor wheel to decelerate to a low point where said compressor wheel speed of rotation decreases to a point where the pressure ratio of the cycle matches the efficient compression ratio of the compressor; and
re-energizing said motor and increasing speed of rotation of said compressor wheel according to the best efficiency plot for said compressor until said full pressure ratio is reached.

5,555,750

METHOD AND MACHINE FOR WARP KNITTING FABRIC AND CUTTING PATTERN THREADS

Joachim Fischer, Rodgau, and Ingo Mayer, Heusenstamm, both of Germany, assignors to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Germany

Filed Sep. 8, 1995, Ser. No. 526,545
Claims priority, application Germany, Sep. 10, 1994, 44 32 222.4
Int. Cl.[6] D04B *21/06;27/06;35/34*
U.S. Cl. 66—145 B **18 Claims**



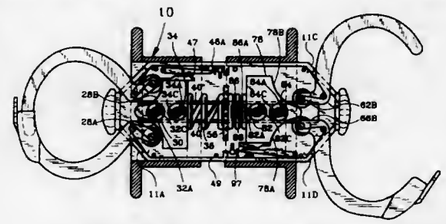
1. Process for producing a patterned knitted fabric having at least one pattern thread bound into a fabric ground, and employing a warp knitting machine having a needle bar, at least one fabric ground laying bar, at least one pattern laying bar carrying pattern thread guides, and a knock-over arrangement over which fabric can be pulled, comprising the steps of:
grasping pattern thread between the pattern thread guides and the knock-over arrangement;
severing pattern thread proximal to the knock-over arrangement;
holding pattern thread cut proximal said knock-arrangement for a predetermined time, out of a knitting process performed by said warp knitting machine;
binding again into the fabric ground, pattern thread held for the predetermined time;
cutting again through pattern thread near the knock-over arrangement no earlier than after a new stitch formation; and
removing freed cuttings of pattern thread.

5,555,751

SEMIAUTOMATIC OPERATED HANDCUFFS WITH PIVOTAL ARCUATE BLADES

Frederick W. Strickland, 1520 Blueberry Dr., Titusville, Fla. 32780, and Joseph L. Bastarache, Rte. 1 Box 396, Blowing Rock, N.C. 28605

Filed Oct. 31, 1994, Ser. No. 331,917
Int. Cl.[6] E05B *75/00*
U.S. Cl. 70—16 **8 Claims**



1. A set of handcuffs that are mechanically operated to encircle limbs of a suspect, comprising:
a.) a single, centrally positioned, generally rectangular box-like casing,
b.) a pair of arcuate blades pivotally mounted in each opposite end of said casing,
c.) a handle at each said end of said casing which telescopically slides over said casing,
d.) a cam assembly inside said casing at each end thereof, each cam assembly connected to a handle and slidable therewith, to cam an end of two arcuate blades to close the blades around a limb of a suspect, and
e.) a locking means at each end of said casing to prevent the opening of the blades.

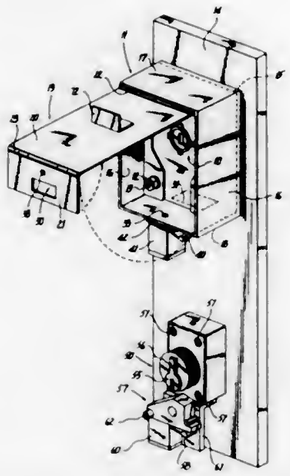
5,555,752

LOCK PROTECTION SYSTEM

John R. Fitzpatrick, 80 Midland St., Cold Spring Harbor, N.Y. 11724

Filed Aug. 16, 1994, Ser. No. 291,202
Int. Cl.[6] B65D *55/14*
U.S. Cl. 70—159 **7 Claims**

1. A security housing having a plurality of walls forming a closed box having a first wall of said plurality of walls hingedly attached to a second wall of said plurality of walls by first hinge means on a first end of said first wall of said plurality of walls so that said first wall is rotatable from a first position in which the box is closed to a second position in which the box is opened, the second and remaining of said plurality of walls forming said closed box being rigidly joined with one another in fixed relationship, said closed box comprising a wall formed with a first lock bolt receiving aperture, a panel comprising a second lock bolt receiving



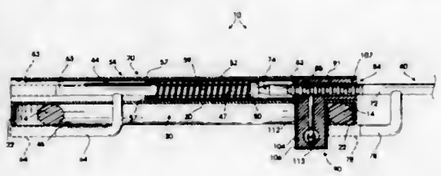
aperture in said panel, said panel being hingedly attached to a second end of said first wall of said plurality of walls so that said panel can be rotated toward and away from said first wall and can be extended into and enclosed in said closed box to prevent jimmying or prying of said panel and so that the first and second lock bolt receiving apertures are in alignment one behind the other when said first wall of said plurality of walls is in the first position.

5,555,753

VEHICULAR ANTI-THEFT STEERING WHEEL LOCK

Wayne Matlock, 1123 Wallace St., Malvern, Ark. 72104

Filed Oct. 11, 1994, Ser. No. 321,248
Int. Cl.[6] B60R *25/02*
U.S. Cl. 70—209 **18 Claims**



1. A vehicular anti-theft steering wheel locking device comprising:

a rigid, generally circular pan for substantially covering the steering wheel of a vehicle to be protected, the pan comprising a peripheral, downwardly projecting rim for preventing a thief or vandal from sawing through the steering wheel;

a locking assembly coupled to said pan, said locking assembly comprising:

a first hook for selectively engaging at least a portion of the steering wheel when the pan is deployed upon the steering wheel;

a second hook for engaging an opposite portion of the steering wheel when said device is installed, said second hook having an elongated outwardly projecting portion that prevents normal operation of the vehicle unless the device is first removed;

a lock projecting beneath said pan for locking said first and second hooks in engagement with said steering wheel; and,

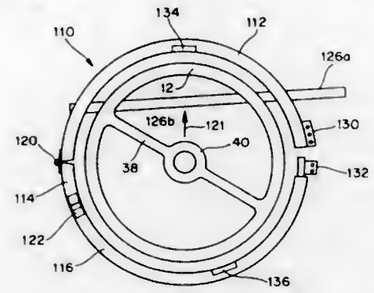
an elongated, rigid shroud secured to a top of said pan for protecting said locking assembly.

5,555,754

STEERING WHEEL SECURITY DEVICE

Louis Ferrante, 149-17 Reeves Ave., Flushing, N.Y. 11367

Continuation-in-part of Ser. No. 47,675, Apr. 15, 1993, Pat. No. 5,415,018. This application Feb. 10, 1995, Ser. No. 386,966
Int. Cl.[6] B60R *25/02*
U.S. Cl. 70—209 **7 Claims**



1. A security device, for use on a vehicle steering wheel having a rim supported from a central hub, comprising:

first rim protection means, of substantially semi-circular profile and having a circumferential skirt portion, for shielding a first portion of said rim of said steering wheel to inhibit cutting of said first portion of said rim;

second rim protection means, similar to said first rim protection means and hinged along a hinge axis, which extends in a first direction, to said first rim protection means for allowing rotation of said first rim protection means radially, relative to said semi-circular profile, said second rim protection means for shielding a second portion of said rim diametrically opposed to said first portion of said rim;

said second rim protection means including two sections, said two sections of said second rim protection means being hinged along a hinge axis, which extends in a direction which is non-parallel to said first direction, to allow one of said sections to be folded over said first rim protection means so as to substantially overlap said first rim protection means, thereby reducing the space required to store said security device when not in use;

an elongated member attached to said first rim protection means and having a length extending outwardly beyond said first rim protection means by at least one-fourth of the diameter of said steering wheel; and

locking means, having an unlocked state, for permitting relative rotation of said first and second rim protection means to enable said first and second rim protection means to be respectively placed in shielding position relative to said first and second portions of said rim and, having a locked state, for limiting relative rotation of said first and second rim protection means so as to inhibit removal of said security device from said steering wheel.

5,555,755

CONCEALED MECHANICAL ANTITHEFT DEVICE ON A MOTOR VEHICLE GEAR LEVER

Giovanni Padrin, Via Curtatone, Italy, assignor to M.M.T. Di Padrin Mario & C. S.N.C., Gallarate, Italy

Filed Aug. 8, 1994, Ser. No. 287,227
Claims priority, application Italy, Sep. 7, 1993, MI93A1918
Int. Cl.[6] B60R *25/06*
U.S. Cl. 70—247 **17 Claims**

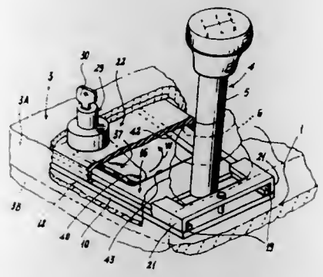
1. An antitheft device acting on a motor vehicle gear lever, said gear lever projecting from a gearshift protection part positioned in a vehicle passenger compartment, comprising

movement means movable relative to support means and arranged to cooperate operationally with said gear lever, said movement means comprising counteracting means arranged to cooperate operationally with said gear lever to press said gear lever against said support means and prevent its movement when the antitheft device is engaged and consequently to prevent use of the vehicle, said support means and said movement means being positioned in a concealed manner within the gearshift protection part between a removable upper closure portion of said protection part and a lower part of said protection part,

actuator means for causing movement of said movement means,

a lock for controlling said actuator means,

said movement means further comprising a plate-like element with one end acting as said counteracting means, said plate-like element comprising a polygonal hole, said actuator means comprising an elongate element contained within said hole and torsionally constrained at one of its ends to said lock, said elongate element being movable by said lock to a position in which said elongate element is, in a longitudinal direction, substantially parallel and adjacent to a side of said hole and a longitudinal axis of said elongate element is substantially parallel to the direction of movement of the gear lever when the antitheft device is engaged, said gear lever being contained within the antitheft device and being free to move therein when the antitheft device is deactivated.

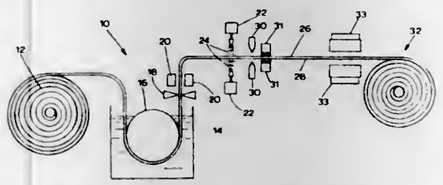


5,555,756

METHOD OF LUBRICATING STEEL STRIP FOR COLD ROLLING, PARTICULARLY TEMPER ROLLING

Harold L. Fischer, Chesterton; Ajay K. Singh, Griffith, and John M. Stadnik, Jr., Schererville, all of Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Jan. 24, 1995, Ser. No. 377,453
Int. Cl.[6] B21B *45/02;45/00*
U.S. Cl. 72—41 **32 Claims**



1. A method of increasing the stretchability of a strip of steel comprising:

annealing the steel strip:

applying to a surface of said steel strip, before or after said strip has been annealed, a coating of a liquid lubricant;

thereafter drying said liquid lubricant to form a dry lubricant film on said steel surface in an amount of at least 1 mg/ft^2; and

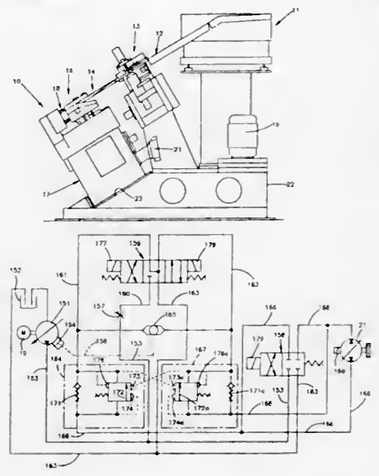
rolling said steel strip, having said dry lubricant film thereon, between at least one pair of steel mill in-line temper rollers, under pressure sufficient to elongate and reduce a thickness of said steel strip.

5,555,757

FLAT DIE THREAD ROLLER

Gregory A. Smith; Dale E. Foltz; Robert E. Wisebaker, all of Tiffin, and Robert E. Loy, Bucyrus, all of Ohio, assignors to The National Machinery Company, Tiffin, Ohio

Division of Ser. No. 390,992, Feb. 2, 1995, which is a division of Ser. No. 210,513, Mar. 18, 1994, Pat. No. 5,417,096, which is a division of Ser. No. 34,131, Mar. 22, 1993, Pat. No. 5,345,800, which is a division of Ser. No. 868,330, Apr. 14, 1992, Pat. No. 5,230,235, which is a division of Ser. No. 652,778, Feb. 8, 1991, Pat. No. 5,131,250. This application May 25, 1995, Ser. No. 451,132
Int. Cl.[6] B21H *3/06*
U.S. Cl. 72—88 **8 Claims**



1. A metal forming machine comprising a frame, a die carrier movably mounted on said frame, said frame and die carrier each providing a die pocket for one of a set of dies operable to cause flow of metal in a blank, a variable volume hydraulic pump, a rotary hydraulic motor being variable in speed by varying its volume and connected by torque transmitting elements to drive said die carrier for movement on said frame, and a control circuit for controlling the operation of said pump and rotary motor, said control circuit operating in a run mode to operate said pump at maximum volumetric output and controlling the speed of said die carrier by regulating the rotational speed of said rotary motor, said control circuit operating in a jog mode of operation to control said pump to operate at a controlled, low volumetric output and control said rotary motor to produce a maximum torque on said torque transmitting elements whereby full torque is available to cause movement of said die carrier at slow speeds during jog operation.

5,555,758

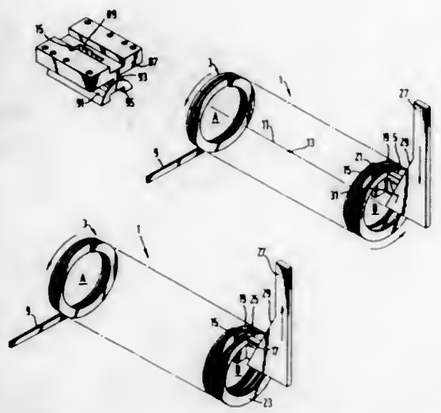
METHOD AND APPARATUS FOR CUTTING COILED WIRE

Michael S. Ellison, and Antony G. Hudson, both of Bradford, United Kingdom, assignors to Ellison Circlips Group Limited, Bingley, United Kingdom

PCT No. PCT/GB93/01816, § 371 Date Feb. 27, 1995, § 102(e) Date Feb. 27, 1995, PCT Pub. No. WO94/05445, PCT Pub. Date Mar. 17, 1994
PCT Filed Aug. 25, 1993, Ser. No. 387,809
Claims priority, application United Kingdom, Aug. 27, 1992, 9218247
Int. Cl.[6] B21F *11/00;3/02;* **B21D** *11/14*
U.S. Cl. 72—132 **9 Claims**

1. Apparatus for forming a plurality of aligned rings from a length of wire, comprising:

to said one chamber to allow limited hydraulic fluid flow to said reservoir during return stroking of said piston to thereby



means for introducing said wire to a coiling station to form a wire coil about a longitudinal axis and for feeding said coil in the direction of said axis from the coiling station;

a cutting station positioned downstream of the coiling station for receiving said coil, said cutting station including: (a) a stop engaged by a free end of the coil fed from the coil station, and (b) cutting means movable between cutting and non-cutting positions, said cutting means being sequentially operative, when a free end of the coil engages said stop, to move to its cutting position to cut a ring from the coil, said ring having a gap formed during cutting of the coil; and

means operative when said cutting means is moved to its non-cutting position to displace the ring from the cutting station to support means having a portion shaped to enter the gap in said ring to control the orientation of each ring cut during the sequential operation of the cutting means thereby preventing tangling of the rings.

5,555,759

WORKPIECE-DEFORMING TOOL AND DIE FOR USE IN A PUNCH PRESS

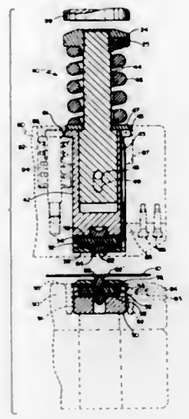
Ronald G. Rosene, Coon Rapids; John H. Morehead, White Bear Lake, and Richard L. Timp, Vadnais Heights, all of Minn., assignors to Wilson Tool International, Inc., White Bear Lake, Minn.

Filed Jan. 12, 1994, Ser. No. 177,691

Int. Cl.[6] B21D *5/14*

U.S. Cl. 72—179 **13 Claims**

1. A workpiece-deforming tool for use in a punch press comprising an elongated body having an elongated generally vertical guide for reception and reciprocal axial movement in a tool receiving aperture in a punch press, the body having a spring seat for engaging compressible spring biasing means of a tool receiving aperture and having a head at its upper end adapted to be struck by a ram, the body including an elongated generally vertical driver receivable in the guide for reciprocal axial movement in the guide, the guide bearing a rotatable workpiece-deforming roller, and a spring operatively positioned between the guide and the drive for transmitting downward pressure to the guide and the roller.



5,555,760

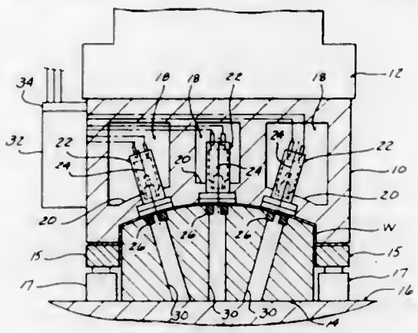
ACTUATOR-PUNCH ASSEMBLY WITH FORMING DIE INSTALLATION

Paul M. Kadis, 9685 Fox Meadow, Chardon, Ohio 44024

Filed Apr. 28, 1994, Ser. No. 234,326

Int. Cl.[6] B21D *28/24*

U.S. Cl. 72—334 **9 Claims**



1. A forming die arrangement for forming a sheet material workpiece comprising an upper die and a lower die adapted to be driven together in a press to form said workpiece interposed therebetween:

at least one actuator-punch assembly recessed into one of said dies, said actuator-punch assembly including a double acting hydraulic cylinder actuator arranged to drive a punch to pierce an opening through said workpiece after completion of the forming of said workpiece;

said hydraulic cylinder including a piston slidable in a cylinder with pressure chambers defined on either side of said piston, said piston drivingly connected to said punch to enable piercing of said workpiece upon pressurization of one of said chambers and advance stroking of said piston, and withdrawal of said punch upon pressurization of the other of said chambers and return stroking of said piston;

a hydraulic fluid pressure circuit connected to said hydraulic cylinder actuator to enable operation thereof, said hydraulic circuit including a pressure source and a low pressure reservoir, and valving alternately connecting the one or the other of said chambers to said pressure source or said reservoir respectively to cause advance and return stroking of said piston; and

a one way acting restriction through said piston allowing restricted flow past said piston only from said other chamber to said one chamber to allow limited hydraulic fluid flow to said reservoir during return stroking of said piston to thereby allow air bubbles to be carried back to said reservoir to be purged from said circuit.

5,555,761

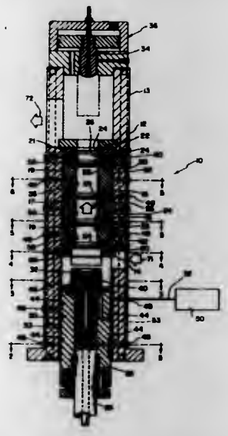
BODYMAKER TOOL PACK

Roderick A. Lavy, 6865 Alexander Dr., Piqua, Ohio 45356

Filed May 30, 1995, Ser. No. 453,193

Int. Cl.[6] B21D *22/00;* **B21B** *25/00*

U.S. Cl. 72—349 **22 Claims**



1. A tool pack for a bodymaker machine having a reciprocating punch for forming a workpiece in the form of a container, said tool pack comprising:

a plurality of ironing rings through which the punch reciprocates to form the workpiece;

a plurality of spacer rings interleaved between said ironing rings, each said spacer ring including a bore defined by a sidewall, the punch reciprocating through said bore; and

hydrostatic bearings formed along said sidewalls, said hydrostatic bearings providing fluid pressure against said workpiece and punch to thereby guide the punch and workpiece through the tool pack during punch reciprocation.

5,555,762

METHOD OF BENDING METALLIC PIPE

Yoshiro Kawamura, Kumamoto-ken; Isao Manabe, Neyagawa, and Shingo Nakashima, Osaka, all of Japan, assignors to Honda Giken Kogyo Kabushi Kaisha, Tokyo, and Marubishi Yuka Kogyo Kabushiki Kaisha, Osaka, both of Japan

Continuation of Ser. No. 126,204, Sep. 24, 1993, abandoned. This application Mar. 29, 1995, Ser. No. 411,301

Claims priority, application Japan, Oct. 12, 1992, 4-273031; Sep. 14, 1993, 5-228715

Int. Cl.[6] B21D *9/15*

U.S. Cl. 72—369 **18 Claims**

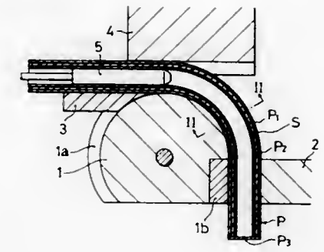
1. A method of bending a metallic pipe which comprises:

filling the pipe with a molten filling material comprising a fatty acid;

cooling the metallic pipe and filling material to room temperature to solidify the filling material;

bending the metallic pipe filled with solidified filling material; and

melting the filling material and separating it from the bent metallic pipe.



5,555,763

WORK LOADING AND UNLOADING DEVICE FOR BENDING MACHINE

Kazunori Takeshita, Kanagawa, Japan, assignor to Amada Metrecs Company, Limited, Kanagawa, Japan

Filed Jun. 27, 1994, Ser. No. 266,376

Claims priority, application Japan, Jun. 30, 1993, 5-162749

Int. Cl.[6] B21D *43/11*

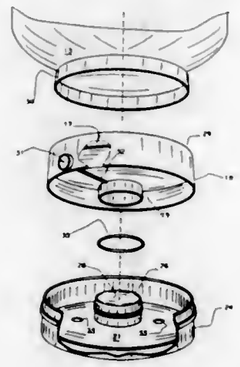
U.S. Cl. 72—420 **7 Claims**

1. A work loading and unloading device for a bending machine, comprising:

a 5-axis control robot provided with a work hand at an end thereof, for loading work to the bending machine and unloading a bent work from the bending machine, said work hand including a work hand body, a lower hand attached to said work hand body, an upper hand attached to said work hand body so as to be pivotal relative to said lower hand, and a double-work take-up detecting device attached to said work hand body, for detecting whether two works are clamped simultaneously between said lower and upper hands; and

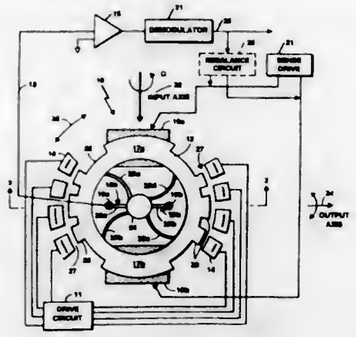
a single-work taking-up device for taking up only a single work from stacked works.

5,555,764
GAUGE FOR MONITORING THE CONTENT OF A PROPANE TANK
Curtis D. Dybas, RR 2, Box 2316, Lake George, N.Y. 12845
Filed May 31, 1994, Ser. No. 251,308
Int. Cl.[6] G01F 23/20
U.S. Cl. 73—296 1 Claim



1. A gauge to be placed below a propane-containing vessel for determining the quantity of propane in said vessel, said gauge comprising:
a) a platform member having upper and lower surfaces, a circular perimeter, a skirt wall of circular cylindric contour downwardly emergent from said perimeter, and a retaining wall directed upwardly with respect to said upper surface as an extension of said skirt wall,
b) a base disposed below said platform member and having top and bottom surfaces, a circular boundary, and a receiving wall of circular cylindric contour upwardly emergent from said boundary and configured to receive said skirt wall in close-fitting telescoping relationship, and thereby defining with said platform member an intervening enclosed region,
c) piston means of circular cylindric contour centered within said enclosed region in fixed engagement with one of said platform member and said base,
d) cylinder means of circular cylindric contour centered within said enclosed region in fixed engagement with one of said platform member and said base not already having said piston means, and configured to interact with said piston means in close-fitting reciprocal sliding relationship along a substantially vertical axis,
e) a sealing O-ring disposed between said piston means and said cylinder means to create a fluid-impermeable pressure-retaining chamber within said cylinder means,
f) pressure-indicating means disposed exteriorly of said enclosed region, and comprising an indicator needle which displays a weight reading based upon pressure generated within said chamber, said weight reading corresponding to the amount of propane in said vessel, and re-zeroing means permitting accommodation to the starting weight of a newly employed propane-containing vessel, and
g) conduit means interactively communicating between said chamber and said pressure-indicating means,
h) said platform member plus one of said piston means and cylinder means being a monolithic structure, and
i) said base plus one of said piston means and cylinder means being a monolithic structure.

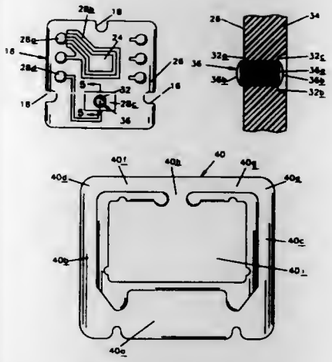
5,555,765
GIMBALLED VIBRATING WHEEL GYROSCOPE
Paul Greiff, Wayland, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.
Continuation of Ser. No. 16,139, Feb. 10, 1993, abandoned.
This application Nov. 14, 1994, Ser. No. 340,190
Int. Cl.[6] G01P 9/04
U.S. Cl. 73—504.09 23 Claims



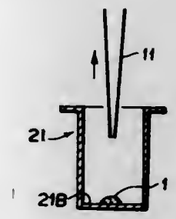
1. A vibrating wheel gyroscope comprising:
a support oriented in a first plane;
a wheel assembly disposed over said support and parallel to said first plane, said wheel assembly being adapted for vibrating rotationally in said first plane about a drive axis and being responsive to a rotational rate about an input axis coplanar to said first plane for providing an output torque about an output axis coplanar to said first plane, said wheel assembly comprising an inner hub, an outer wheel, and a plurality of spoke flexures extending between said inner hub and said outer wheel, wherein said plurality of spoke flexures flex in response to rotational vibration of said wheel assembly in said first plane about said drive axis, and are relatively stiff about said input axis and about said output axis; and
a post assembly between said support and said wheel assembly for flexibly supporting said wheel assembly from said support, said post assembly comprising a post extending substantially vertically from said support and at least one post flexure coupled between said post and said inner hub so as to suspend said inner hub over said support, wherein said at least one post flexure flexes about said output axis in response to said rotational rate, and is relatively stiff about said input axis.

5,555,766
ACCELERATION SENSOR APPARATUS AND METHOD FOR MAKING SAME
Larry K. Johnson, North Attleboro; Eric P. Reidemeister, Norton, both of Mass.; Robert O. Southworth, Pawtucket; Michael D. Gouin, North Smithfield, both of R.I.; William Silva, Taunton, and Andrew A. Amatruda, Jr., Attleboro, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Nov. 4, 1993, Ser. No. 148,042
Int. Cl.[6] G01P 15/125
U.S. Cl. 73—514.32 20 Claims

1. An acceleration sensor comprising a substrate having opposite top and bottom surfaces, at least the top surface being electrically insulative, an electrically conductive detect plate mounted on the top surface of the substrate, a bore extending through the substrate between the top and bottom surfaces of a preselected diameter, an electrically conductive mounting element disposed in the bore and having an end extending above the top surface by a selected distance, said mounting element having an outer surface portion which engages said bore of preselected diameter and requires a force of between 10 and 200 pounds to insert the mounting element into the bore for precisely and fixedly holding the mounting element in place after insertion while still allowing for movement and adjustments of the mounting element for calibration after insertion, an electrically conductive metal blade member having an attachment portion, a source plate portion and integral, resilient beam means extending between the attachment portion and the source plate portion, the attachment portion fixedly and electrically attached to the end of the mounting element extending above the top surface, electrically conductive circuit paths electrically connected with the detect plate and the mounting element, the source plate portion overlying the detect plate in selected spaced relation to form a capacitor and to be movable relative to the detect plate in response to an acceleration force to provide an electrical signal.

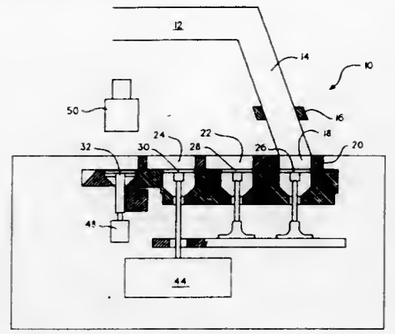


5,555,767
LIQUID MIXING METHOD
Yoshihiko Makino; Yoshio Saito, and Osamu Seshimoto, all of Saitama-ken, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa-ken, Japan
Filed Feb. 17, 1995, Ser. No. 390,035
Claims priority, application Japan, Feb. 25, 1994, 6-028324
Int. Cl.[6] G01N 1/38
U.S. Cl. 73—863 11 Claims



1. A liquid mixing method, wherein a small amount of a liquid sample is mixed with another liquid, the method comprising the steps of:
forming a droplet of a first liquid sample at an orifice of a first pipette tip;
after forming the droplet, moving the first pipette tip to bring the first liquid sample droplet into contact with an inner surface of a mixing vessel, whereby the first liquid sample is discharged into the mixing vessel; and
after discharging the first liquid sample into the mixing vessel, discharging a second liquid from an orifice of a second pipette tip to stir the first and second liquids with each other, whereby a substantially uniform mixed liquid is prepared.

5,555,768
METHOD AND APPARATUS FOR TESTING A MEDICINAL TABLET
Donald R. Shaffer, Acme; Richard A. Sanderson, McKeesport, and John Savko, Irwin, all of Pa., assignors to Elizabeth-Hata International, Inc., North Huntingdon, Pa.
Filed Mar. 24, 1995, Ser. No. 409,760
Int. Cl.[6] G01B 5/00
U.S. Cl. 73—865.8 9 Claims



1. An apparatus for testing a medicinal tablet said apparatus having a plurality of testing stations, said apparatus comprising:
a. a feeder for receiving said tablet and conveying said tablet to said plurality of testing stations of said apparatus;
b. a linear guide track along which said tablet is conveyed to said plurality of testing stations, said linear guide track comprising a plurality of receptacle units for receiving said tablet from said feeder and conveying said tablet to each of said plurality of testing stations;
c. a tablet thickness tester provided at one of said plurality of testing stations;
d. a tablet weight tester provided at one of said plurality of testing stations; and
e. a tablet hardness tester provided at one of said plurality of testing stations, said tablet hardness tester comprising:
i. a rotatable platen upon which said tablet is positioned;
ii. a visual identifier for recording the orientation of said tablet on said platen;
iii. means for rotating said platen to adjust the orientation of said tablet on said platen to a predetermined orientation;
iv. processing means for comparing the recorded orientation of said tablet on said platen with said predetermined orientation to control rotation of said platen;
v. an anvil which supports one side of said oriented tablet and a ram which provides a crushing force from a side opposite said one side of said tablet;
vi. means for positioning said anvil and ram to crush said tablet; and
vii. means for recording the force needed to crush said tablet.

9. A method for measuring the hardness of a medicinal tablet comprising the steps of:
a. positioning said tablet upon a rotatable platen;
b. visually recording the orientation of said tablet on said platen;
c. comparing said recorded orientation of said tablet to a predetermined orientation of said tablet;
d. rotating said platen to adjust the orientation of said tablet on said platen to said predetermined orientation;
e. positioning an anvil adjacent said oriented tablet to support one side of said tablet;
f. positioning a ram against a side opposite said one side of said tablet;
g. moving said ram against said tablet to crush said tablet; and
h. recording the force needed to crush said tablet.

5,555,769
CABLE OPERATED ROTARY CONTROL ASSEMBLY

portions extending to said nut end walls, the respective groove portions of the screw and nut defining a helical raceway;

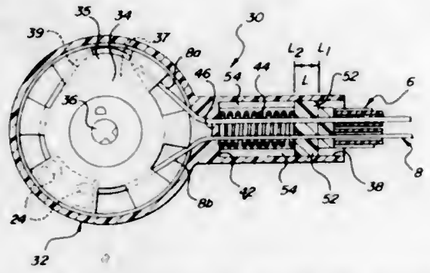
5,555,772
POSITION CONTROL APPARATUS FOR STEERING

5,555,769

CABLE OPERATED ROTARY CONTROL ASSEMBLY

Norman B. Lichtenberg, Troy, Mich., assignor to Teleflex Incorporated, Plymouth Meeting, Pa.

Filed May 3, 1995, Ser. No. 434,094
Int. Cl.[6] F16C *1/10*; F25B *29/00*
U.S. Cl. 74—89.22 **9 Claims**



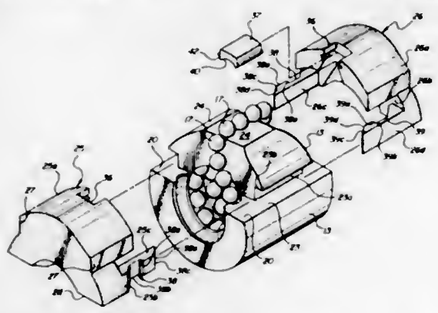
1. A rotary control assembly for imparting rotary movement, said assembly comprising:
an output housing;
an output pulley rotatably mounted on said housing;
a cable wrapped about the periphery of said pulley and extending in first and second segments away from said pulley to a spaced location;
an input device at said spaced location for moving said segments of said cable relative to each other to rotate said pulley;
a cable housing extending from said housing and along said first and second segments of said cable;
biasing means for urging said output housing and said cable housing apart to take up slack in said cable between said output pulley and said input device, and
a radially outwardly extending cam lobe on the periphery of said output pulley for disposition out of engagement with said cable in a first rotative position of said pulley and disposition underlying said cable in a second rotative position of said pulley.

5,555,770

BALL SCREW AND NUT SYSTEM

Randy W. Dolata, Linden, and Lisa A. Houlihan, Saginaw, both of Mich., assignors to Thomson Saginaw Ball Screw Company, Inc., Saginaw, Mich.

Filed Oct. 12, 1994, Ser. No. 321,966
Int. Cl.[6] F16H *25/22*
U.S. Cl. 74—459 **28 Claims**



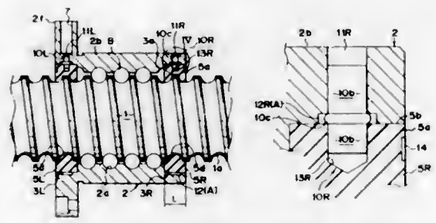
1. In a ball nut and screw assembly:
a) an axially extending metallic screw having exterior helical groove portions, and a coaxial metallic nut on said screw having opposite transversely extending axially outwardly facing end walls and interior helically complemental groove portions extending to said nut end walls, the respective groove portions of the screw and nut defining a helical raceway;
b) a train of load transfer bearing balls accommodated in said raceway; and
c) a ball return assembly including axially inward facing plastic end wall portions adjacent said nut end walls and having generally radially extending ball carrying tracks therein in communication with said raceway;
d) said ball return assembly including a ball return guide positioned externally of said nut and retained by at least one of said end wall portions, said guide having a ball-receiving surface parallel to the axis of the screw, the ball-receiving surface opening to said tracks to form conjunctively with said tracks a ball return trackway to said raceway which does not extend through said nut.

5,555,771

FIXING STRUCTURE FOR MOUNTING MEMBER OF A NUT

Daisuke Kuroiwa, 129, Toriba-machi; Shigeharu Kobayashi, 132-1, Toriba-machi, and Mitsuji Kanai, 1424-2, Aramaki-machi, all of Maebashi, Gunma-ken, Japan

Filed Jan. 19, 1994, Ser. No. 183,345
Claims priority, application Japan, Jan. 20, 1993, 5-007731
Int. Cl.[6] F16H *25/22*
U.S. Cl. 74—459 **7 Claims**



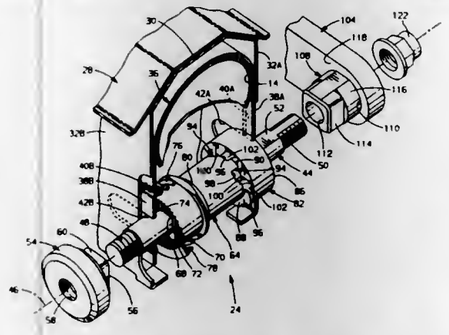
1. A fixing structure for a mounting member of a nut, comprising a screw shaft formed with a male thread on an outer peripheral surface thereof, a nut formed with a female thread on an inner peripheral surface thereof and formed with a stepped portion on the inner peripheral surface thereof at least at one end so as to provide a large-diametered portion, a mounting member for mounting on the stepped portion of said nut, and a pin member to position and fix said mounting member in a predetermined state on said nut,
characterized in that said pin member is resiliently diametrically inwardly deformable and has a large-diametered axially intermediate portion and smaller diameter opposite axial end portions, said large-diametered portion of said nut has a radial through-hole to which one of said end portions of said pin member fits, said mounting member has a pin insertion aperture alignable with said through-hole and to which the other end portion of said pin member fits, and an engagement recess larger in diameter than said through-hole and said pin insertion aperture is formed in a mating surface between the large-diametered portion of said nut and said mounting member to receive the large-diametered intermediate portion of said pin,
whereby when said mounting member is fitted to the stepped portion of said nut, and said through-hole and said pin insertion aperture are aligned with each other in the axial direction and the circumferential direction of said nut, said pin member can be inwardly deformed to reduce its diameter and inserted into said through-hole and said pin insertion aperture such that said large-diametered portion of said pin member is brought into engagement with said engagement recess and said opposite end portions of said pin member are resiliently pressed against said through-hole and said pin insertion aperture, thereby preventing slipping-out of said pin member to fix said mounting member on said nut.

5,555,772

POSITION CONTROL APPARATUS FOR STEERING COLUMN

Douglas M. Schneider, Bridgeport, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 31, 1994, Ser. No. 332,302
Int. Cl.[6] B62D *1/18*
U.S. Cl. 74—493 **8 Claims**



1. A position control apparatus for a motor vehicle steering column having a mast jacket moveable in a vertical plane through a range of adjusted positions comprising:
a stationary bracket having a stationary leg adjacent said mast jacket flexible perpendicular to said vertical plane,
a clamp means for preventing movement of said mast jacket through said range of adjusted positions when said clamp means is closed including a first jaw element on a first side of said stationary leg and a second jaw element on an opposite second side of said stationary leg,
a control lever having an angular stroke between a clamping position and a releasing position,
a first motion converting means connecting said control lever and said first jaw element operative to move said first jaw element through a first axial stroke in a first direction perpendicular to said vertical plane concurrently with pivotal movement of said control lever through said angular stroke thereof,
a second motion converting means between said control lever and said second jaw element operative to move said second jaw element through a second axial stroke in a second direction perpendicular to said vertical plane opposite to said first direction concurrently with pivotal movement of said control lever through said angular stroke thereof so that a total axial stroke between said first and said second jaw elements corresponding to pivotal movement of said control lever through said angular stroke thereof is the sum of said first and said second axial strokes of said first and said second jaw elements, and
a spring between said first jaw element and said stationary leg biasing said stationary leg against said second jaw element throughout said total axial stroke between said first and said second jaw elements.

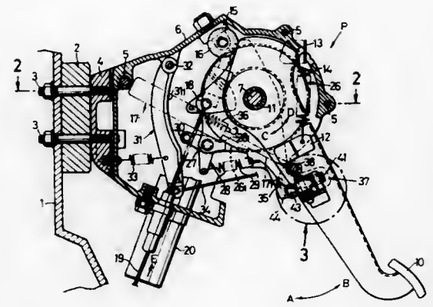
5,555,773

PARKING BRAKE SYSTEM

Kunio Naono; Atsushi Mori, and Akinori Sugimoto, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1994, Ser. No. 261,768
Claims priority, application Japan, Jun. 16, 1993, 5-145200
Int. Cl.[6] G05G *1/14*
U.S. Cl. 74—512 **9 Claims**

1. A parking brake system operable by manually operating a brake operating member by a driver, and operable by automatically operating the brake operating member by a drive source, said system comprising limiting means for limiting the movement of at least a portion of the brake operating member toward a brake force applying position of said brake operating member during an automatic operation of the brake operating member by the drive source,
wherein said brake operating member comprises a base end-side member connected to the drive source, and a tip end-side member operated by a driver, said base end-side and tip end-side members being pivotally supported by a folding shaft, and wherein during automatic operation of said brake operating member, the limiting means permits the tip end-side member to be folded about the folding shaft.

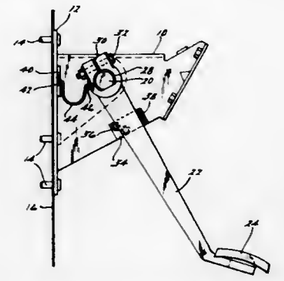


5,555,774

CONTROL PEDAL EFFORT REDUCTION AND RETURN ASSIST

Daniel H. Lauring, Hungtinton Woods; Ronald A. Smith, Milford, and Ralph P. Gesell, Dearborn, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 6, 1995, Ser. No. 399,260
Int. Cl.[6] B60K *23/02*; G05G *1/14;7/04*
U.S. Cl. 74—512 **3 Claims**



1. A device for operating a control pedal, comprising:
a pedal arm supported for pivoting movement about an axis;
a retainer fixed against displacement;
a spring formed of thin sheet having a U-shaped cross sectional body portion, a first leg secured on the retainer against displacement relative to the retainer, and a second leg secured on the pedal arm against displacement relative to the pedal arm, the spring developing a force due to resilient flexure of the body portion as the pedal arm is pivoted, the spring force being applied to the pedal arm and directed with respect to the axis to assist depression of the pedal arm to a depressed position and to restore the pedal arm to an undepressed position, wherein the pedal arm is formed with a first recess facing the retainer, the first recess adapted to receive the second leg therein, the retainer formed with a second recess facing the first recess, the second recess adapted to receive the first leg therein.

5,555,775

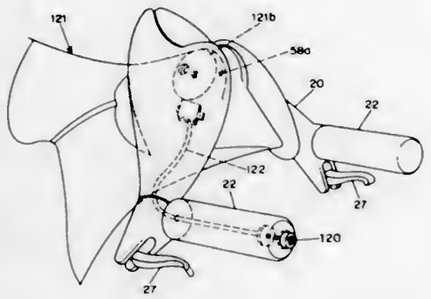
positioned so as to have a portion residing within said interior area between said first and second portions of said split

5,555,775

BICYCLE HANDLEBARS

Christopher D'Aluisio, Bethel, and Thomas C. Patterson, Westport, both of Conn., assignors to Cannondale Corporation, Georgetown, Conn.

Filed Sep. 8, 1994, Ser. No. 302,545
Int. Cl.[6] B62K *21/16*
U.S. Cl. 74—551.5 **14 Claims**



1. Adjustable bicycle handlebars comprising a mounting member adapted to be attached to a bicycle, a right handlebar having a handgrip portion, a left handlebar having a handgrip portion, means mounting the right handlebar on the mounting member for swinging movement in its entirety relative to the mounting member solely about a single pivot axis extending laterally to the right and obliquely forwardly and upwardly with respect to a longitudinal center plane of the bicycle for movement between a standard position and an aero position, means mounting the left handlebar on the mounting member for swinging movement in its entirety relative to the mounting member solely about a single pivot axis extending substantially laterally to the left and obliquely forwardly and upwardly with respect to the longitudinal center plane of the bicycle for movement between a standard position and an aero position, the handgrip portions of the handlebars when in the standard positions being below and laterally and forwardly of the mounting member and when in the standard positions being more widely spaced apart, lower and more rearwardly than when in the aero positions and the handgrip portions of the handlebars being swung upwardly, forwardly and inwardly when moved from the standard positions to the aero positions, and means coupling the right and the left handlebars for coordinated swinging movement between the standard and the aero positions so that when either one of the handlebars is moved between the standard and the aero positions the other handlebar moves with it.

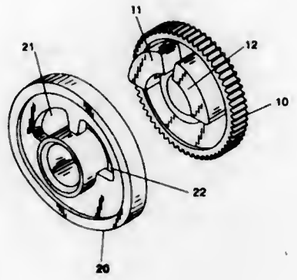
5,555,776

CAM INTEGRATED WITH A ROTATION SENSOR

Jack M. Gazza, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 21, 1994, Ser. No. 345,441
Int. Cl.[6] F16H *53/00*
U.S. Cl. 74—567 **15 Claims**

1. A mechanical driver and position sensing apparatus, comprising:
- a cam having a first opening, the cam having a first reflectivity;
- a gear having a first projection adapted for mating with said first opening such that a surface of said first projection protrudes through said first opening, the first projection having a second reflectivity different than said first reflectivity; and
- a sensor located for sensing said first and second reflectivities and indicating a predetermined rotation of said cam and gear by sensing a transition between said first and second reflectivities.

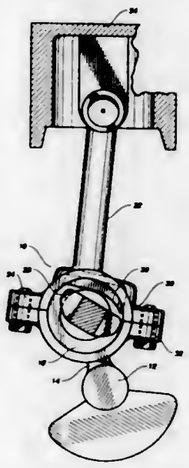


5,555,777

CRANK APPARATUS FOR A CRANKSHAFT OF A DIESEL ENGINE

John Bell, 20 Cottonwood, Babbitt, Minn. 55706

Filed Jul. 10, 1995, Ser. No. 500,116
Int. Cl.[6] F16C *11/02;9/04*
U.S. Cl. 74—595 **9 Claims**



1. An improved crank apparatus for a diesel engine comprising:
a crankshaft;
an arm extending outwardly of the crankshaft;
a crank pin affixed to said arm, said crank pin having a generally rectangular configuration, said crank pin having a first tab extending outwardly therefrom and a second tab extending outwardly from an opposite side of said crank pin;
a split sleeve having an elongated slot formed therein, said slot receiving said crank pin therein, at least one of said first and second tabs extending through an opening from said slot of said split sleeve, said split sleeve having a first portion and a second portion, said split sleeve having an interior area between said first and second portions, said at least one of said first and second tabs extending outwardly into said interior area between said first and second portions, said slot formed interior of said split sleeve, said opening extending outwardly from opposite sides of said slot, said crank pin movable through said opening relative to a rotation of the cranksbaft; and
a piston rod bearingly interconnected to said split sleeve, said piston rod having an insert key connected thereto and residing within said split sleeve in a position so as to contact said crank pin upon a rotation of the crankshaft, said insert key

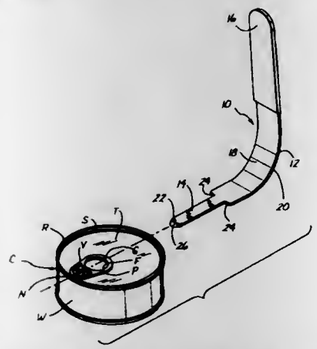
positioned so as to have a portion residing within said interior area between said first and second portions of said split sleeve.

5,555,778

CAN OPENER FOR PULL TOP CANS

Timothy P. Otters, 11317 Miller Rd., Whittier, Calif. 90604, and Mary J. Bolmgren, 10430 Palo Alto, Rancho Cucamonga, Calif. 91730

Filed Aug. 3, 1994, Ser. No. 285,075
Int. Cl.[6] B67B *7/16*
U.S. Cl. 81—3.55 **14 Claims**



1. A hand tool for use in opening pull-tab type cans, the cans having a raised rim about a can top and a planar tab attached by a rivet in a flat initial position to said can top, the tab including a ring portion defining a finger opening on one side of the rivet and a nose on an opposite side of the rivet such that lifting of the ring portion presses the nose against the can top to start a break in a score line circumferentially encompassing the can top including said tab, so that the break may then be extended circumferentially about the can top by pulling on the ring portion, said hand tool comprising:
- a tool body having an elongated working end connected to one end of a middle portion having a convexly curved underside and a handle fixed to said middle portion, said working end being dimensioned to pass under said ring portion, through said finger opening and into contact with said rim while at least part of said curved underside remains positioned over said can top within the rim of the can, such that said rim provides a first fulcrum point for pivotal movement of said working end towards said tab for lifting the ring portion to break the score line, and the tool body may then be rolled on said curved underside as a second fulcrum point against said can top in the opposite direction away from said tab to pull up on the ring portion for extending the break along the score line while lifting the can top away from the can, said curved underside having a relatively large radius of curvature so as to result in substantial translation of said second fulcrum point across said can top away from a starting point generally adjacent to said tab towards said rim and away from said tab while lifting said can top.

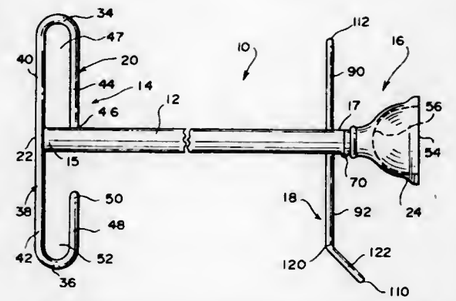
5,555,779

WHEELCHAIR PASSENGER DOOR OPENER

David J. Holden, 250 E. Alameda #331, Santa Fe, N.M. 87501

Filed Aug. 1, 1995, Ser. No. 509,817
Int. Cl.[6] B25B *33/00*
U.S. Cl. 81—15.9 **6 Claims**

1. A door opener for opening a door having a door latch comprising:
- a shaft having first and second ends;



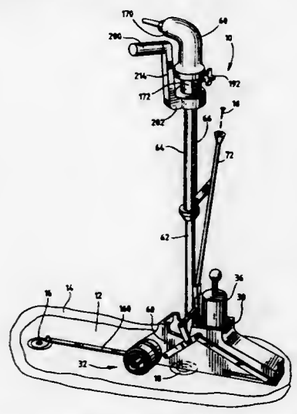
- a first end effector, permanently attached to said first end of said shaft for removably attaching the door opener to a lever type door latch;
- a second end effector, removably attachable to said second end of said shaft for removably attaching the door opener to a doorknob type door latch;
- a first handle for rotating said shaft to rotate said second end effector to operate the doorknob type latch;
- a second handle removably attachable to said shaft for rotating to said shaft rotate said first end effector to operate the lever type door latch;
- a hinge for pivoting said shaft with respect to said second effector; and,
- a third end effector removably attachable to said shaft near said second end for operating a pinch type door latch as said third end effector is brought into operating engagement with the latch and said shaft is pivoted with respect to said second end effector.

5,555,780

ROOFING WASHER-DISPENSING AND FASTENER-DRIVING MACHINE

John R. Beach, Elmhurst; Sigismund G. Paul, Park Ridge; Daniel J. Kenny, Itasca; Syed Riaz-Ul Hasan, Palatine, and James E. Doherty, Barrington, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Division of Ser. No. 281,358, Jul. 27, 1994, Pat. No. 5,445,297, which is a division of Ser. No. 51,056, Apr. 21, 1993, Pat. No. 5,347,707. This application May 22, 1995, Ser. No. 446,286
Int. Cl.[6] B25B *23/06*
U.S. Cl. 81—57.37 **3 Claims**



1. In a fastener-driving machine for driving fasteners through roofing washers for fastening at least one layer of roofing material to an underlayment, a combination comprising:

(a) an elongate, upright element having an upper end;
(b) a screw gun mounted to the upper end of the elongate,

5,555,782

WASTE TIRE SLICING MACHINE

5,555,783

CORE CUTTING MACHINE HAVING DIFFERENTIAL

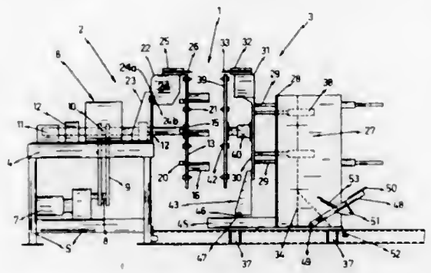
thereon, said holding screw having an axis which extends generally

(a) an elongate, upright element having an upper end;
(b) a screw gun mounted to the upper end of the elongate, upright element, the screw gun having a handle constituting a primary handle and extending in a generally perpendicular direction relative to the elongate, upright element, at a level near the upper end of the elongate, upright element;
(c) a secondary handle mounted to the elongate, upright element so as to extend in a generally perpendicular direction relative to the elongate, upright element, at a level approximating the level of the primary handle, and so as to define an angle within a range from an acute angle to a straight angle between the primary and secondary handles.

5,555,781
DRIVER OR BIT CONSTRUCTION
James L. Pool, Clarinda, Iowa; Robert A. Muto, Thompson, and Ronald J. Perkins, Willoughby, both of Ohio, assignors to The Lisle Corporation, Clarinda, Iowa
Filed Feb. 23, 1995, Ser. No. 393,227
Int. Cl.[6] B25B *23/00;23/16*
U.S. Cl. 81—436 **6 Claims**

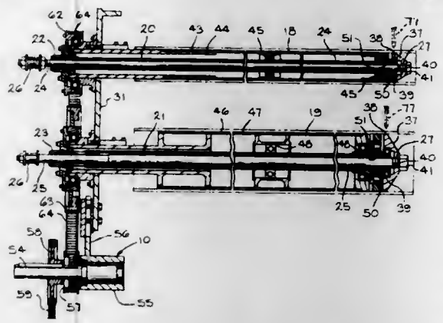
1. A bit construction for use in highly restricted access areas comprising, in combination separately made first and second elements joined by a brazing material to form a single bit by brazing techniques:
said first element consisting essentially of a bit member having a cylindrical shank defining a longitudinal axis for the bit member, said shank having a shaped end for engagement with and driving of a compatible fastener, said shaped end terminating with a planar transverse surface, said bit member also including an opposite cylindrical end, the shaped end having an axial length defined by the axial distance between the transverse surface and the opposite end of the shank, the opposite end of the shank having an axial length approximately equal to the axial length of the shaped end;
said second element consisting essentially of a separate cap member having a centerline axis, a polygonal configuration symmetrical about the centerline axis, and a bore extending partially through the cap along the centerline axis, said bore receiving the opposite, cylindrical end of the bit member, said bore being cylindrical and sized to slidably receive the opposite end of the shank, said bore having a depth approximately equal to the axial length of the opposite end of the bit member, the thickness of the cap member being less than 1.5 times the axial extent of the opposite end of the bit member to thereby minimize the axial dimension of the combination bit member and cap member, said bit member opposite end and said bore both being cylindrical with the bit member opposite end being fully retained in the bore and with the radial dimension of the opposite end being in the range of 0.002" to 0.006" less than the radial dimension of the bore; and
said brazing material connecting the elements, said bit member being brazed in the bore of the cup member to define a total axial length of the bit construction of less than two and one half times the axial length of the shaped end.

5,555,782
WASTE TIRE SLICING MACHINE
Gerardo Pagaza-Melero, Cuajimalpa; Raymundo Fernandez-Y-Sosa, Naucalpan de Juárez; Santiago Bastida-Sanchez; Agustin Bastida-Sanchez, both of Almolova de Juárez; Victor Pagaza-Melero, San Juan de Aragón, and Jesus F. Pagaza-Melero, Toluca, all of Mexico, assignors to Gerardo Pagaza-Melero, Cuajimalpa, Mexico
Filed Aug. 12, 1994, Ser. No. 289,892
Claims priority, application Mexico, Aug. 13, 1993, 934949
Int. Cl.[6] B23B *5/14*
U.S. Cl. 82—46 **10 Claims**



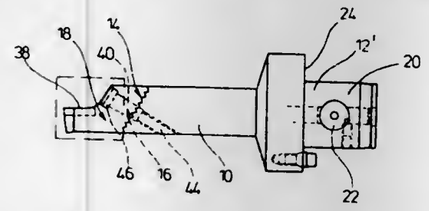
1. A waste tire slicing machine comprising:
a stationary module and a confronting movable carriage;
a rail on which said movable carriage is mounted to move towards and away from said stationary module;
brake means for stopping said movable carriage at a desired position on said rail, and brake releasing means to disengage said brake means from said rail;
said stationary module comprising
a first frame,
a rotatable shaft rotatively supported on said first frame,
a rotatable chuck plate coupled to said shaft for rotating therewith,
a motor coupled to said shaft for rotating said shaft and said chuck plate,
a plurality of tire supports generally perpendicularly projecting from the face of said chuck plate arranged in an array for supporting the beads of a tire adjacent the face of said chuck plate, and
first cutting means having one end mounted to said first frame and having a sharp edge at the opposite end projecting generally perpendicularly a predetermined distance from the face of said chuck plate;
said movable carriage comprising
a second frame,
a pusher plate slidably mounted on said second frame,
a rotational follower plate rotatively supported on said slidable pusher plate coaxial and parallel with respect to said slidable pusher plate and to said chuck plate,
pressure supplying means coupled to said slidable pusher plate for driving said pusher plate and said follower plate toward said chuck plate,
a plurality of hollow gaps in said follower plate aligned with said tire supports to permit the passage of the tire supports when said follower plate approaches said chuck plate, and
second cutting means having one end fixed to said slidable pusher plate and having a sharp edge at the opposite end projecting a predetermined distance generally perpendicularly from said follower plate, said sharp edge of said second cutting means being aligned with said first cutting means of said stationary module.

5,555,783
CORE CUTTING MACHINE HAVING DIFFERENTLY SIZED MANDRELS
David J. Pienta, Lambertville, Mich., assignor to Automatic Handling, Inc., Erie, Mich.
Filed Dec. 19, 1994, Ser. No. 358,800
Int. Cl.[6] B23B *5/14;* **B23D** *21/00*
U.S. Cl. 82—96 **7 Claims**



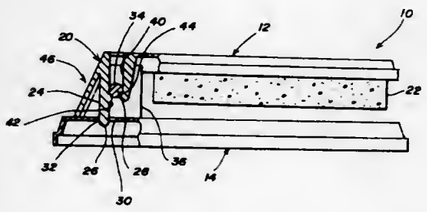
1. A core cutter machine comprising a base, at least two mandrels horizontally mounted above said base, a cutter assembly mounted adjacent each of said mandrels for cutting core tubes posted there each of said mandrels having a different outer diameter for receiving core tubes of different inside diameters, each of said mandrels including an inner drive tube and an outer driven tube surrounding said inner drive tube, a connector between said outer driven tube and said inner drive tube and motor means operatively connected to said inner drive tube, said outer driven tube including a drive surface, said connection comprising a moveable wedge member positioned between said inner drive tube and said outer driven tube and said drive surface.

5,555,784
LATHE TOOL
Werner Muendlein, Bietigheim-Bissingen, and Gerhard Scheer, Loechgau, all of Germany, assignors to Komet Praezixionswerkzeuge Robert Breuning GmbH, Besigheim, Germany
PCT No. PCT/EP92/02700, § 371 Date Aug. 22, 1994, § 102(e) Date Aug. 22, 1994, PCT Pub. No. WO93/10929, PCT Pub. Date Jun. 10, 1993
PCT Filed Nov. 24, 1992, Ser. No. 244,695
Claims priority, application Germany, Dec. 6, 1991, 41 40 301.0
Int. Cl.[6] B23B *29/08*
U.S. Cl. 82—158 **21 Claims**



1. In a lathe tool comprising a cylindrical shaft having thereon a support surface and a tool head carrying an exchangeable indexable cutting insert, said tool head having thereon a contact surface connected in face-to-face relation with said support surface, and a holding screw for connecting said tool head to said cylindrical shaft, said contact surface and said support surface being arranged at an acute angle slope with respect to a longitudinal axis of said cylindrical shaft and each having engaging straight tooth systems thereon, said holding screw having an axis which extends generally perpendicularly with respect to said support surface and said contact surface, said indexable cutting insert being arranged countersunk in a recess provided in a generally axially parallel flat surface extending generally through said axis of said cylindrical shaft and defining a chip chamber, said teeth of said straight tooth systems each extending generally parallel to each other and to said flat surface containing said indexable cutting insert, the improvement wherein a plane extending parallel to an interface between said contact surface and said support surface is sloped in a direction away from a plane containing said flat surface so as to define an obtuse angle therebetween, wherein said tool head and said cylindrical shaft have a fitted hole extending therein, an axis of each of which is perpendicular to a respective said contact surface and said support surface, wherein said parallel teeth of said straight tooth systems extend transversely with respect to the direction of said slope of said support surface and said contact surface, and wherein said holding screw has a fitted shaft thereon received in both of said fitted holes and extends in a direction through said tool head and said cylindrical shaft generally perpendicular to an inside an area defined by said interface between said contact surface and said support surface.

5,555,785
PAPER SLITTING DEVICE WITH INTEGRAL SPRING BIASING MEANS
William J. Scalise, and Donna J. Scalise, both of 10137 Bauer Rd., St. Louis, Mo. 63128
Filed Oct. 4, 1994, Ser. No. 317,772
Int. Cl.[6] B26F *1/18*
U.S. Cl. 83—589 **5 Claims**



1. A manually operable paper slitting device for slitting at least one individual paper sheet comprising first and second pivotally mounted platens having spring means interposed therebetween for normally biasing said platens away from each other, said first platen having spaced slitting blades extending from the first platen toward the second platen, said second platen having spaced complementary slots for receipt of the slitting blades when one of the platens is moved toward the other platen, said spring means comprising a first pair of resilient fingers, each of said first fingers having a free end extending from the first platen toward the second platen, said first fingers forming a bearing for the first platen about an axis, said first fingers received in slots in the second platen, said slots having a wall against which the free ends of the first fingers are stopped biasing the platens apart in an at rest position, said first fingers bending when a force is applied to one of said platens sufficient to move the one platen toward the other platen, said first fingers returning the one platen to the at rest position when the force is removed.

170–920 O.G.–96–5: QL3

5,555,786

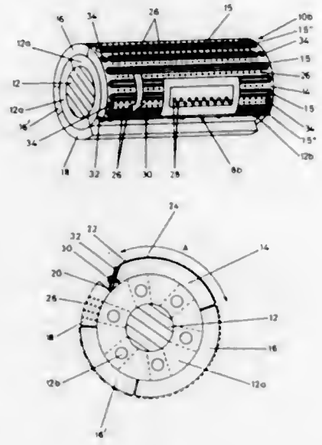
ROTARY PRESS CUTTERS

Roy W. Fuller, Leicester, United Kingdom, assignor to Magnaflex Systems Limited, Great Britain

Continuation-in-part of Ser. No. 8,617, Jan. 22, 1993, abandoned. This application Feb. 15, 1994, Ser. No. 196,698

Int. Cl.[6] B26D 7/26;1/62; B31B 1/20

U.S. Cl. 83—663 7 Claims



1. A rotary press cutter for the production of envelope blanks, comprising:

(a) a rotatable punching roller having a longitudinal blade anchorage face formed inwardly of its outer periphery, said punching roller rotatable around a longitudinally extending central axis;

(b) a flexible foil cutting die removably secured to said outer periphery of said punching roller, said flexible cutting die further comprising:

(i) a flexible body portion of magnetically permeable material;

(ii) at least one integral knife edge formed to a predetermined cutting shape, and upstanding from said body portion; and

(iii) an integral leading edge flange which is connected to said body portion by a radiussed portion and is preformed at an obtuse angle to said body portion;

(c) clamping means, associated with the blade anchorage face of said punching roller, for releasably clamping said leading edge flange only of said flexible foil cutting die against said anchorage face without creasing said flexible foil with said radiussed portion of said flexible foil cutting die overlying a complementary curved edge zone of said punching roller between its anchorage face and its outer periphery; and

(d) magnet means embedded in longitudinal slots in the outer periphery of the punching roller for releasably holding said body portion of said flexible foil cutting die against said outer periphery of said punching roller by magnetic attraction, said magnet means further comprising a plurality of permanent magnets embedded and secured in each slot with like poles facing one another and with each pair of facing like poles separated by a magnetically permeable pole piece, each of said magnets having a N-S orientation which is co-linear with a straight line passing through the north and south pole of such magnet, wherein at least one of said straight lines extends along an outer side of each of the embedded plurality of permanent magnets and lies in a plane which is tangent to the outer periphery of the punching roller.

5,555,787

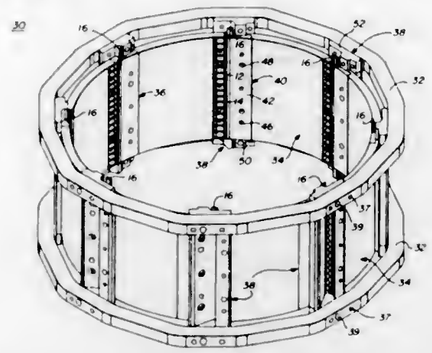
REPLACEABLE BLADE CARTRIDGE FOR A CENTRIFUGAL TYPE FOOD SLICER

Keith A. Barber; Ronald N. Bone, Jr., both of Grapevine; Kevin C. Cogan, Carrollton; Michael L. Dickerson, Arlington; Peter H. Glen; Lezley A. Griffith, both of Bryan; Gary R. Nightingale, Arlington; Edward L. Ouellette, Denton; Robert R. Petter, Jr., College Station, all of Tex., and Gary A. Semjenow, Topeka, Kans., assignors to Recot, Inc., Calif., and The Texas A&M University System, Tex.

Filed Nov. 12, 1993, Ser. No. 151,472

Int. Cl.[6] B26D 3/28

U.S. Cl. 83—698.11 7 Claims



1. A cutting head assembly for use with a centrifugal type slicer comprising:

upper and lower annular support rings;

a plurality of spaced head block assemblies having upper and lower ends attached to the upper and lower support rings, respectively;

a longitudinal cartridge slot of predetermined cross-sectional shape in each of said head block assemblies, said longitudinal slot extending generally in a longitudinal direction from said upper end to said lower end in each of said head block assemblies;

a plurality of shoe elements respectively disposed between said plurality of head block assemblies, each shoe element presenting a leading portion and a trailing portion, said leading portion of each shoe element being attached to a first one of said bead block assemblies and the trailing portion of the same shoe element being attached to a second one of said head block assemblies which is adjacent the first head block assembly; and

a blade and integrally formed casing forming a blade cartridge having substantially the same predetermined cross-sectional shape as said longitudinal cartridge slot and being slidably disposed within said longitudinal cartridge slot in each head block assembly such that a predetermined gap is formed between the blade and the trailing portion of an adjacent shoe element, said blade cartridge being slidable in said longitudinal direction and positioned solely by sliding the blade cartridge into the longitudinal cartridge slot.

5,555,788

SAW BLADE

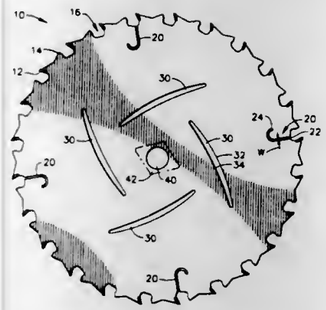
Ved P. Gakhar; Donald C. Pennington, Jr.; David H. Byrley; Alexander Grishin; Richard A. Dossett, and Manfred W. Schmidt, all of Louisville, Ky., assignors to Credo Tool Company, Woodburn, Oreg.

Filed Mar. 29, 1995, Ser. No. 410,078

Int. Cl.[6] B23D 61/02; B27B 33/08

U.S. Cl. 83—835 13 Claims

1. A blade for a circular saw, comprising: a body of a generally circular shape, said body having a preselected blade thickness, said



body having a peripheral surface having a preselected shape, said peripheral surface having a plurality of cutting teeth connected thereto for cutting in a cutting direction, said blade having a center arbor bore therethrough, said blade having an imaginary blade center point, said blade having at least three and not more than four identical J-shaped expansion slots therein, said J-shape expansion slots having an equal spacing therebetween about said peripheral surface, each said J-shaped expansion slot having a preselected opening width, said opening width being at least equal to said blade thickness, each said J-shaped expansion slot having a radial portion and an arcuate portion, said radial portion extending radially inward from said peripheral surface toward said imaginary blade center point for a preselected distance to a closest radial location, said arcuate portion starting at said closest radial location and arcing in said cutting direction, said arcuate portion having a preselected radius and an imaginary arc center point, said imaginary arc center point having a blade location between said peripheral surface and said arcuate portion and in said cutting direction from said radial portion, said arcuate portion having a J-shaped expansion slot closest location to said imaginary blade center point.

5,555,789

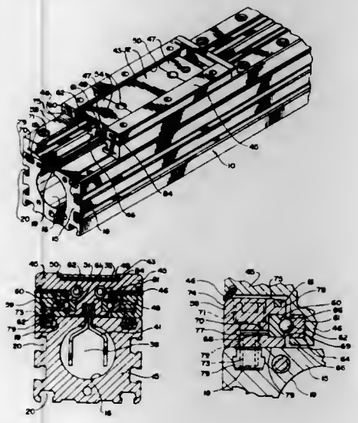
LINEAR MOTION DEVICE

Gary W. Rosengren, Brooklyn Park, and Philip M. Poeschl, Roseville, both of Minn., assignors to Tol-O-Matic, Inc., Hamel, Minn.

Filed Mar. 22, 1995, Ser. No. 408,487

Int. Cl.[6] F16J 15/18

U.S. Cl. 92—165 R 20 Claims



1. A linear motion device comprising:

an elongated body having a longitudinal axis extending in the direction of its elongation and a body length dimension measured in the direction of said longitudinal axis;

a carriage moveable in a linear path relative to said body along said longitudinal axis and having a carriage length dimension measured in the direction of said longitudinal axis, said carriage length being less than said body length; and

a linear bearing means positioned between said body and said carriage for supporting said carriage for movement along said linear path, said bearing means including

at least one elongated side rail having an elongated bearing receiving recess,

means for connecting said side rail to said body in an adjustable, operable position,

a first bearing member connected to said side rail within said recess, and

a second bearing member associated with said carriage for bearing cooperation relative to said first bearing member.

5,555,790

MECHANICAL INTERFACE ASSEMBLY, CONTAINER INCORPORATING A MECHANICAL INTERFACE ASSEMBLY AND TRANSPORTATION TAPE FOR SINGLE-PORTIONS OF GROUND COFFEE

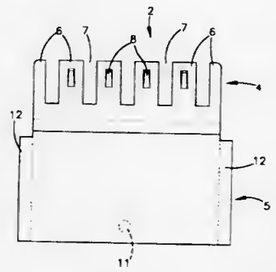
Anton Ackermann, Wolfwil, Switzerland, assignor to Cosmec S.R.L., Urgnano, Italy

Filed Jul. 13, 1994, Ser. No. 275,021

Claims priority, application Germany, Jul. 21, 1993, 43 24 468.8; Switzerland, Jul. 7, 1994, 2172/94

Int. Cl.[6] A47J 31/00

U.S. Cl. 99—289 T 31 Claims



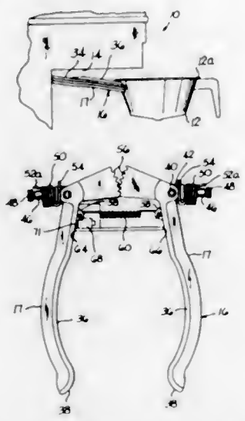
1. A mechanical interface assembly to serve as an interface between a transportation tape, provided with a plurality of single-portions of ground coffee and received in a container means, and a tape driver means of a coffee machine, said mechanical interface assembly comprising:

means for fixing a portion of said transportation tape and for positioning said portion of said transportation tape in a well defined position relative to said mechanical interface assembly;

a dimensionally stable lateral portion provided with positioning and/or fixing elements for definedly positioning said mechanical interface assembly and, thereby, said portion of said transportation tape with reference to said coffee machine; and

means on said mechanical interface assembly for engaging said container means and for fixing said mechanical interface assembly to said container means.

5,555,791
BEVERAGE DISPENSING APPARATUS HAVING ARTICULATING BASKET HOLDING ARMS FOR BASKETS HAVING VARYING DIMENSIONS
Robert C. McNeill, Jeffersonville, Ind., and Thomas J. Pfeifer, Louisville, Ky., assignors to Grindmaster Corporation, Louisville, Ky.
Filed May 9, 1995, Ser. No. 438,175
Int. Cl.[6] A47J *31/18*
U.S. Cl. 99—295 **15 Claims**



1. An improvement in an apparatus for the dispensing of beverages, said apparatus having a system for supplying and dispensing of a liquid over particulate beverage flavoring material located in a basket detachably secured to an underneath surface of said apparatus by a pair of arms associated with the frame of said apparatus, said arms having front end portions biased for grasping said basket beneath a substantially horizontal flange circumscribing the upper perimeter of said basket, said underneath surface having openings for the dispensing of liquids therethrough into said basket when positioned beneath said underneath surface,

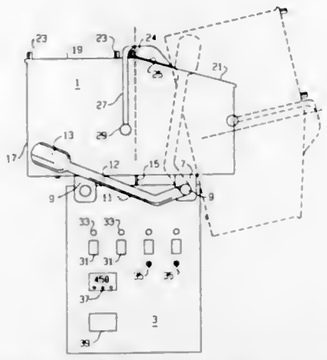
said improvement comprising a sub-assembly structure removably inserted into and attached to the apparatus and capable of a pivoting movement in a substantially vertical plane, said sub-assembly structure including said pair of arms biased into a rest position when a basket is not positioned therebetween, said front portions being provided with a surface for engaging said flange of said basket when said basket is pushed into position between said front end portions and beneath said underneath surface, said support structure including said arms being downwardly pivoted from said rest position proportionally to the thickness of said flange thereby providing continuous upward pressure against said flange and promoting a substantially gaseous tight seal about said openings independently of the thickness of said flange.

5,555,792
CORN POPPING KETTLE ASSEMBLY
Andrew M. Stein, Massapequa Park, and Andrew Jinks, Amityville, both of N.Y., assignors to Six Corners Development Company, Amityville, N.Y.
Filed Oct. 24, 1994, Ser. No. 328,325
Int. Cl.[6] A23L *1/18*
U.S. Cl. 99—323.9 **23 Claims**

1. A kettle assembly for popping corn comprising:

a bowl including a bottom portion, a sidewall enclosing an interior space, an aperture in the sidewall for entry of cooking oil, and an open top;

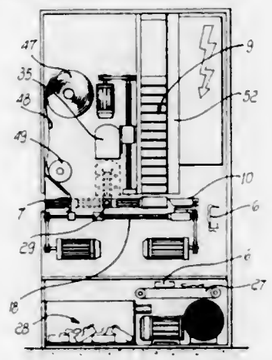
a base member positioned beneath the bottom portion of the bowl on which the bowl is mounted;



a lid member movable between a first position for covering the open top of the bowl and a second position which allows access to the bowl; and

means operatively associated with the bowl for heating the cooking oil.

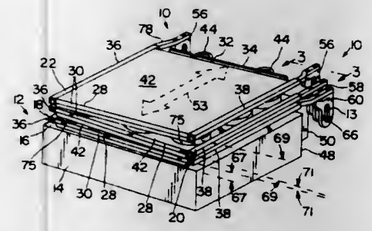
5,555,793
FOOD VENDING MACHINE PARTICULARLY WARM FOOD SUCH AS TOASTS, SANDWICHES, PIZZAS AND BRIOCHES
Ivan Toccbet, Via Pian dei Salesei 18, 31029 Vittorio Veneto (Province of Treviso), and Edoardo Scarpis, Via Zanucchi 2, 31014 Colle Umberto (Prov. of Treviso), both of Italy
Filed Mar. 16, 1995, Ser. No. 403,782
Claims priority, application Italy, Jul. 27, 1993, PN93A0056
Int. Cl.[6] A47J *27/00;37/00;* **G07F** *9/10*
U.S. Cl. 99—326 **24 Claims**



1. Vending machine for warm food products such as toasts, comprising: a first station for storing pre-packaged products in an appropriate refrigeration chamber; a second station for cutting a protective package of a container inside which the product to be processed is present; a pickup station arranged for receiving the product from the second station, said pickup station being formed by a gripper which is contrasted by springs and is such as to keep the product firmly clamped inside the gripper; a device for rotating said gripper about an axis of the gripper through 90° so as to arrange the gripper vertically with respect to a loading position; a vertically movable cooking station for receiving the product and capable of descending with the product for cooking and lifting once cooking of the product is complete; a device for extracting the processed product capable of having the gripper inserted therein once the gripper has been rotated another 90° by said device for rotating the gripper and capable of being moved in an

advancement direction; a paper feeder device for feeding a strip of napkins arranged along a perpendicular axis, the paper feeding device being arranged such that upon advancement of said device for extracting in the advancement direction the product is wrapped in said napkins before it appears at a dispensing slot for hygienic taking by a consumer; and electronic control means for interrupting a production cycle in the presence of abnormal conditions.

5,555,794
ADJUSTABLE HINGE APPARATUS
Robert J. Templeton, Danville, and Robert S. Ragan, Brownsburg, both of Ind., assignors to SaniServ, Inc., Indianapolis, Ind.
Filed Jun. 7, 1995, Ser. No. 476,620
Int. Cl.[6] A47J *37/06;37/12*
U.S. Cl. 99—349 **55 Claims**



1. An apparatus for use with a cooker having multiple stacked heating plates supporting foodstuff and a support pin mounted on the cooker to form a common pivot axis about which the plates pivot, the apparatus comprising

an array of hinges being positionable adjacent one another on the support pin, each hinge having a hinge block formed to include a pivot aperture sized for receiving the support pin therein and an arm affixed to the hinge block, the arms of adjacent hinges being attachable to consecutive stacked heating plates and the hinge block of each hinge being formed for sliding movement on the support pin substantially perpendicular to the pivot axis and independently of the adjacent hinges so that the plates are movable relative to one another to accommodate different thickness of foodstuff therebetween.

5,555,795
BAKING POT
Shu-Yen Tsai, No. 292, Sec. 2, Chung-Shan Rd., Tsuo-Shan Tsun, Ta-Tsun Hsiang, Changhua County, Taiwan
Filed Feb. 12, 1996, Ser. No. 599,854
Int. Cl.[6] A47J *37/00;37/06*
U.S. Cl. 99—446 **3 Claims**

1. A baking pot comprising:

a pot body having a bottom side and a hot air inlet at the center of the bottom side;

a trim mounted in the hot air inlet of said pot body, having a conical center hole;

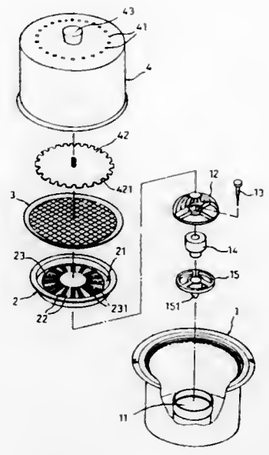
a bearing mounted in the conical center hole of said trim;

a turbine wheel having a wheel shaft turned in said bearing;

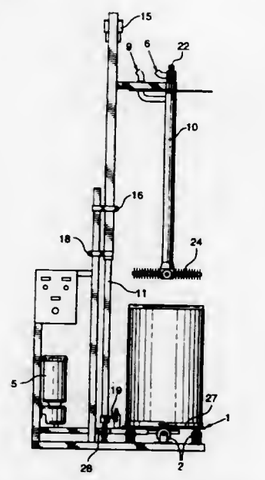
a drip plate mounted within said pot body above said turbine wheel, said drip plate comprising an annular recess around the border, a plurality of radial oil grooves and radial ribs alternatively arranged at the center and surrounded by said annular recess, said radial grooves respectively downwardly slope from the center of said drip plate to said annular recess for guiding collected grease to said annular recess, each radial rib having a plurality of air vents for passing hot air from said hot air inlet;

a grid mounted on said pot body above said drip plate; and

a pot cover covered on said pot body over said grid.



5,555,796
APPARATUS FOR HEATING OF BULK MATERIALS
Cornelis Kortschot, Cambridge, and Lowell D. Knieriem, Milton, both of Canada, assignors to Research Applications Inc., Ontario, Canada
Filed Jul. 28, 1994, Ser. No. 281,619
Claims priority, application Great Britain, Jul. 28, 1993, 9315592
Int. Cl.[6] A23C *7/00;* **B01F** *9/00;15/06*
U.S. Cl. 99—453 **12 Claims**



1. Apparatus for heating a viscous material in an open-topped cylindrical container, where heating reduces the viscosity of said material, thereby liquifying it, said apparatus comprising:

a platform rotatable about a vertical axis to rotate said container when placed coaxially on said platform;

a horizontally-oriented heating element mounted for vertical movement so as to be lowerable into and raisable from said container to apply heat to said material in a horizontal layer in the region of said heating element; and

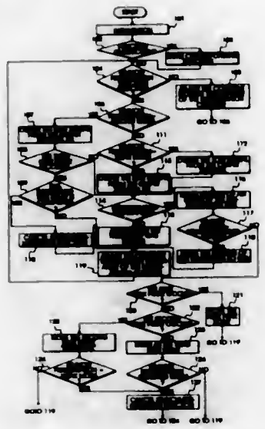
control means for gradually lowering said heating element through said material to heat progressively lower layers of said material within said container.

5,555,800

5,555,797
CONTROL SYSTEM AND METHOD FOR A KIMCHI FERMENTOR

Jae K. Chun, Suwoon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwoon, Rep. of Korea

Division of Ser. No. 278,230, Nov. 30, 1988, Pat. No. 5,142,969. This application Jul. 23, 1992, Ser. No. 917,375
Claims priority, application Rep. of Korea, May 28, 1988, 1988/6278
Int. Cl.[6] C12H *1/00*; A23B *4/00*
U.S. Cl. 99—468 32 Claims



1. A control system for a kimchi fermentor having a case for holding kimchi, an enclosure substantially containing said case, a compressor and evaporator for reducing the temperature within said enclosure, a heater for raising the temperature within said enclosure, and a fan for circulating a fluid within said enclosure comprising:

kimchi curing sensing means for producing a signal indicative of the extent of fermentation within said case;

temperature sensing means for producing a signal indicative of the temperature within said enclosure;

control means for generating control signals for controlling the temperature within said enclosure in response to said signal indicative of the extent of fermentation and said signal indicative of temperature; and

operating means for activating said compressor, said heater, and said fan in response to said control signals.

5,555,798
HOT PRESS FOR PRODUCING A MULTILAYERED SUBSTRATE

Akimi Miyashita, Toride; Mutsumasa Fujii, Ibaraki-ken, and Kenji Hisadomi, Tsuchiura, all of Japan, assignors to Hitachi Techno Engineering Co., Ltd., Tokyo, Japan

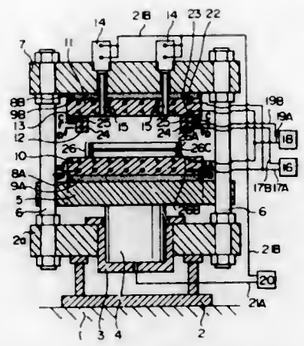
Filed Nov. 9, 1993, Ser. No. 149,616
Claims priority, application Japan, Nov. 9, 1992, 4-298536
Int. Cl.[6] B30B *15/34*
U.S. Cl. 100—93 P 4 Claims

1. A hot press for producing a multilayered substrate, comprising:

upper and lower bolsters disposed opposite to each other in a vertical direction and movable relative to and toward each other to press multilayered substrate blanks therebetween;

a main ram for imparting relative movement between said upper and lower bolsters to produce a press force;

upper and lower heating and cooling plates which are provided on the opposed surfaces of said upper and lower bolsters through heat insulating plates, respectively;



a frame provided on either one of the upper and lower heating and cooling plates, the multilayered substrate blanks being fitted into said frame, said frame being arranged such that said frame limits expansion of the multilayered substrate blanks when the multilayered substrate blanks are pressed and heated by the upper and lower heating and cooling plates;

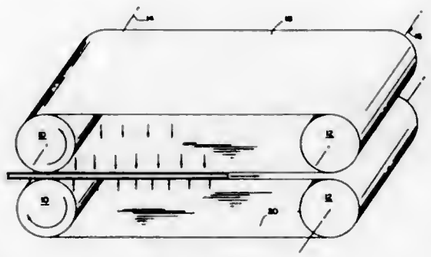
heating and cooling means for heating and cooling said upper and lower heating and cooling plates and said frame during bonding of said multilayered substrate blanks and four cooling said plates and said frame after the bonding; and

a forward-and-backward moving means provided on one of said bolsters on which said frame is provided, said forward-and-backward moving means moving forward and backward through the heat insulating plate and the heating plate which are provided successively on said one of bolsters.

5,555,799
NON-STICK LAMINATING ENDLESS BELT PRESS

Darryl Asnick; Gary McDowell; Hershel R. Henson, all of Albany, and Jerald Wille, Corvallis, all of Oreg., assignors to Teledyne Industries, Inc., Albany, Oreg.

Division of Ser. No. 295,013, Aug. 24, 1994. This application Jun. 5, 1995, Ser. No. 463,690
Int. Cl.[6] B30B *5/04*; *15/34*
U.S. Cl. 100—930 RP 1 Claim

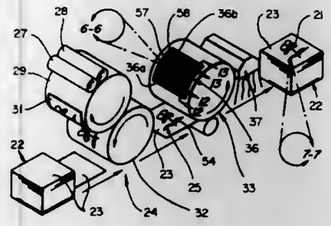


1. A laminating press for wood products, comprising at least one pair of heated drums rotating on parallel axes and an endless unplated belt running around said drums, and means for pressing a stack of materials to be laminated against said belt between said drums, wherein the belt consists essentially of an alloy of a metal selected from the group consisting of zirconium and titanium, and having a thermal diffusivity of at least 0.06 cm^2/sec and a Young's modulus of below 20 million psi.

5,555,800
APPARATUS FOR PRINTING COLOR IMAGES

Vic G. Rice, Santa Clara, Calif., assignor to Collor, Mountain View, Calif.

Continuation of Ser. No. 949,570, Sep. 23, 1992, Pat. No. 5,396,839. This application Mar. 9, 1995, Ser. No. 401,464
Int. Cl.[6] B31F *1/07*; B41F *19/02*
U.S. Cl. 101—23 15 Claims

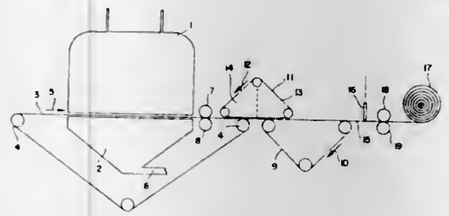


1. An embossing plate for use with a printing press to print an image in color on a medium comprising plate means adapted for mounting on the printing press and having a surface adapted for engagement with the medium, the surface having a pattern of three distinct surface relief configuration means thereon, the pattern of surface relief configuration means having a repetitive design which has portions of the surface corresponding respectively to each of the three surface relief configuration means whereby when the surface of the plate means is pressed against the medium by the printing press it forms three surface relief configurations in the medium which correspond to color separated halftones and each reflect a different primary color when viewed at a specific angle so as to form a printed copy of the color image.

5,555,801
APPARATUS AND METHOD FOR MANUFACTURING A DOUBLE-SIDED EMBOSSING FIBROUS WEB AND SUCH DOUBLE-SIDED WEB

Karl K. K. Kroyer, Le Vieux Moulin, 12, rue de la Libération, F-06520 Magagnosc, France

Continuation of Ser. No. 141,928, Oct. 28, 1993, abandoned. This application May 1, 1995, Ser. No. 431,826
Int. Cl.[6] B31F *1/07*; B44C *1/24*
U.S. Cl. 101—32 11 Claims

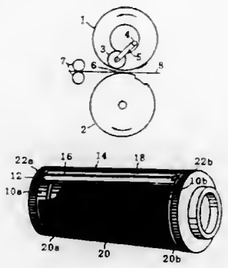


5. A method for producing an easily bent fibrous web having embossings on opposite sides thereof comprising the steps of (a) providing first and second rollers in nip-defining relationship, said first roller having a surface pattern thereon and said second roller having a smooth and hard surface, and (b) passing a fibrous web into said nip defined between first and second rollers so as to simultaneously emboss the fibrous web on opposite sides thereof.

5,555,802
PRINTING DRUM OF ROTARY STENCIL PRINTER HAVING FLEXIBLE PERFORATED CYLINDER INCORPORATING ALLOWANCE FOR BULGING OUT

Yoshiharu Ohinata; Nagon Takita, and Hideo Negishi, all of Minato-ku, Japan, assignors to Riso Kagaku Corporation, Tokyo, Japan

Filed Nov. 1, 1994, Ser. No. 332,073
Claims priority, application Japan, Nov. 12, 1993, 5-306028
Int. Cl.[6] B41L *13/04*
U.S. Cl. 101—116 3 Claims



1. In a rotary type stencil printer including a printing drum having a generally cylindrical configuration with opposite ends and perforated at a central circumferential area thereof, an internal press roller disposed in said printing drum, means for mounting said internal press roller to be selectively pressed against said printing drum from the inside thereof radially outwardly, and a back press means opposing said printing drum from the outside thereof along a generatrix thereof with a clearance left therebetween, said stencil printer carrying out a stencil printing to apply a stencil print on a print sheet supplied between said printing drum and said back press means with a perforated stencil sheet mounted around said printing drum and an ink supplied to the inside of said printing drum and squeezed by said internal press roller into the perforations of said printing drum with a simultaneous bulging out of a portion of said printing drum opposing said back press means so as thereby to cancel said clearance,

said printing drum comprising a frame body including two annular portions each having an outer circumference of a predetermined first circumferential length and providing said opposite ends of said printing drum and a transverse bar portion connecting said two annular portions with one another and equipped with a stencil sheet leading end mounting means for holding a leading end of a stencil sheet mounted around said printing drum, and a cylindrical body of a flexible perforated sheet having an inside circumference of a predetermined second circumferential length and disposed around said annular portions of said frame body such that axially opposite end portions of said cylindrical body are freely seated on outer circumferential surfaces of said two annular portions of said frame body and said cylindrical body defines said cylindrical configuration of said printing drum, wherein said second circumferential length of the inside circumference of said cylindrical body is greater than said first circumferential length of the outer circumferential surfaces of said annular portions of said frame body by as much as a predetermined amount which accommodates said bulge out of the portion of said printing drum opposing said back press means to cancel said clearance during the printing operation of the stencil printer.

5,555,803

(1, 4), in such a way that successive printing images are lined up virtually without a gap;

first spring means for moving the roller back and forth along the

5,555,803

WEB-FED ROTARY OFFSET PRINTING PRESS WITH BRIDGE PRINTING UNITS

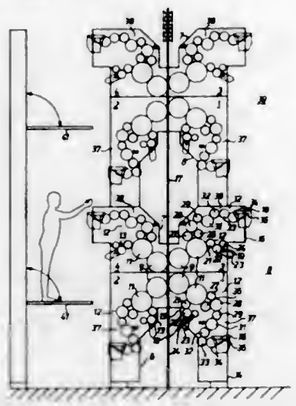
Helmut Holm, Erlabrunn, Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

Filed Jun. 21, 1995, Ser. No. 492,992

Claims priority, application Germany, Jun. 21, 1994, 44 21 437.5

Int. Cl.[6] **B41F** *5/16*

U.S. Cl. 101—180 **2 Claims**



1. A web-fed rotary offset printing press usable to print multiple colors on a web, said printing press comprising:

first and second bridge printing units, each of said first and second bridge printing units including two oppositely located individual printing units usable to print a vertically extending web on both sides, each of said individual printing units having a rubber blanket cylinder, a printing cylinder, and an inking unit cooperating with said printing cylinder, each of said inking units having an ink roller train including at least first and second ink transfer rollers and first and second ink spreading rollers, said ink roller trains in said two individual printing units of said first bridge printing unit extending generally vertically and parallel to said vertically extending web, said vertically extending ink roller trains affording operator access to said oppositely located individual printing units insaid first and second bridge printing units, said ink roller trains in said two individual printion units of said second bridge printion unit extending generally horizontally and perpendicular to vertically extending web, said horizontally extending ink roller trains affording reduced structural height to said printing press, said first and second bridge printing units being disposed alternatingly on top of each other in a preselectable manner to form a first H-shaped printing tower having a compact structure.

5,555,804

PERFECTING SHEET ROTARY OFFSET PRESS

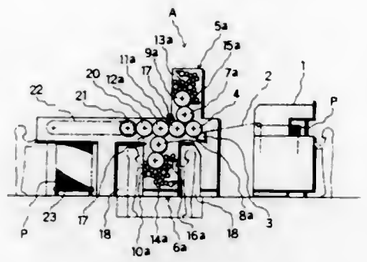
Yasutaka Kojima, Tokyo, Japan, assignor to Akiyama Printing Machine Manufacturing Company Ltd., Tokyo, Japan

Filed Jun. 21, 1994, Ser. No. 263,141

Claims priority, application Japan, Jun. 25, 1993, 5-155124

Int. Cl.[6] **B41F** *7/06*

U.S. Cl. 101—183 **5 Claims**



1. A perfecting sheet rotary offset press comprising:

a plurality of top surface printing units, each of said top surface printing units including an impression cylinder having a sheet gripper, a blanket cylinder a plate cylinder and an inking mechanism, said blanket cylinder, said plate cylinder and said inking mechanism being disposed above said impression cylinder; and

a plurality of back surface printing units, each of said back surface printing units including an impression cylinder having a sheet gripper, a blanket cylinder, a plate cylinder, and an inking mechanism, said blanket cylinder, said plate cylinder and said inking mechanism being disposed below said impression cylinder,

said top surface printing units and said back surface printing units being alternately arranged in adjacent pairs with their respective impression cylinders in contact with each other such that a line connecting the axes of each impression cylinder extends horizontally to transfer the sheet from the top surface printing unit to the back surface printing unit in the horizontal direction.

5,555,805

PRINTING UNIT FOR A WEB-FED PRINTING MACHINE

Joachim A. H. Lapp, Margetshochheim, Germany, assignor to De La Rue Giori S.A., Lausanne, Switzerland

Continuation-in-part of Ser. No. 301,489, Sep. 7, 1994. This application Aug. 2, 1995, Ser. No. 510,556

Int. Cl.[6] **B41F** *5/04;13/02*

U.S. Cl. 101—228 **2 Claims**

1. A printing unit for a web-fed printing machine comprising:

a first cylinder (**1**) and a second cylinder (**4**) cooperating together and forming a printing nip and cylinder pits (**3,6**), said first and second cylinders each have an axis,

said first and second cylinders (**1, 4**) include a plurality of printing saddles (**2, 5**) separated by said cylinder pits (**3, 6**), said printing saddles (**2, 5**) cooperate together to form an impression zone for printing having a circumferential length D,

said first and second cylinders (**1, 4**) being offset angularly relative to one another, in respect of the position of their printing saddles (**2, 5**) in order that the circumferential length D of the impression zone is adapted to a circumferential length (B) of a printing image,

whereby the web is transported at a variable speed in a so called pilgrim step mode which means that after each printing operation, when the web passes a cylinder pit (**3, 6**) it is retracted and accelerated again relative to the first and second cylinders (**1, 4**), in such a way that successive printing images are lined up virtually without a gap;

first and second release members (K, L) and first and second sensors (I,M) intended to control movement of the web,

said first release member (K) being fastened to the circumference of said first cylinder (**1**), said first sensor (I) activatable by the release member (K) and being installed in proximity of this first cylinder (**1**), one of said plurality of saddles (**2**) having a beginning (A) of the printing image in relation to the direction of rotation of the cylinders (**1, 4**),

said first release member (**K**) and said first sensor (I) are arranged in order that said sensor (**I**) generates a signal at the moment at which the beginning of a printing saddle (**2**) of the first cylinder (**1**) passes a connecting line between the axes of the first and second cylinders (**1, 4**), whereby the signal of this sensor (I) indicates the beginning of the printing,

said second release member (L) being fastened to the circumference of said second cylinder (**4**), said second sensor (M) being installed in proximity of this second cylinder (**4**), a printing saddle (**5**) of said plurality of saddles having an end corresponding to the an end (E) of the printing image in relation to the direction of rotation of the first and second cylinders (**1, 4**),

said second release member (L) and second sensor (M) are arranged in order that said sensor (M) generates a second signal at the moment at which the end of a printing saddle (5) of the second cylinder (**4**) passes the connecting line between the axes of the first and second cylinders (**1, 4**), whereby the signal of sensor (M) indicates the end of the printing; and

means for processing said signals of said sensors (I, M) and for obtaining signals corresponding to the circumferential length of the printing image signal C2–C1 and the moment of the printing end (signal C2).

5,555,806

ROLLER ASSEMBLY IN AN INKING UNIT OR A DAMPING UNIT OF A ROTARY PRINTING MACHINE

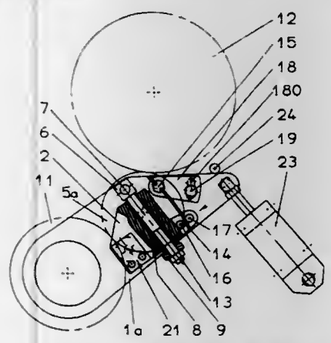
Nikolaus Nawrath, Igenhausen, Germany, assignor to Man Roland Druckmaschinen AG, Offenbach am Main, Germany

Filed Jan. 11, 1995, Ser. No. 371,221

Claims priority, application Germany, Jan. 11, 1994, 44 00 563.6

Int. Cl.[6] **B41F** *7/40;31/36*

U.S. Cl. 101—148 **9 Claims**



1. A roller assembly for damping and inking units of rotary printing machines, comprising:

a roller;

a base plate;

a bearing lever, the roller being mounted to the bearing lever;

a guide rod connected to the bearing lever and having a longitudinal axis;

a first pin connected to the base plate and one end of the guide rod so that the guide rod and bearing lever can pivot relative to the base plate;

first spring means for moving the roller back and forth along the axis of the guide rod, the first spring means including a pressure spring that surrounds the guide rod;

second spring means for moving the roller substantially perpendicular to the guide rod axis, the second spring means including a leaf spring having a first end and a second end;

a second pin rotatably mounted to the base plate, the first end of the leaf spring being connected to the second pin so as to be rotatable therewith;

two driving pins connected to the bearing lever so as to be next to one another, the second end of the leaf spring being arranged between the two driving pins so that the second end of the leaf spring can move the bearing lever relative to the base plate; and

means for releasably clamping the bearing lever to the base plate.

5,555,807

DEVICE FOR PROVIDING A TEMPORARY FLUIDIC COUPLING

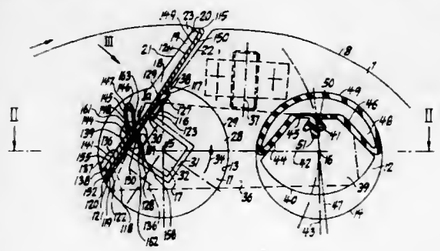
Alphonse Pollet, Sarcelles, France, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany, and Heidelberg Harns S.A., Montataire, France

Filed Aug. 22, 1994, Ser. No. 293,990

Claims priority, application France, Aug. 20, 1993, 93 10144

Int. Cl.[6] **B41F** *27/06;* **B41L** *29/06*

U.S. Cl. 101—415.1 **8 Claims**



1. A printing press comprising:

a frame;

a source of pressurized fluid;

a supply end-fitting connected at least temporarily to the source of pressurized fluid, the supply end-fitting rotationally fixed with respect to a first axis;

a plate cylinder having a supplied end fitting, the plate cylinder and the supplied end fitting disposed in the frame for rotation about the first axis, the plate cylinder having a bladder for operating a mechanism to attach a printing plate to the plate cylinder, the supplied end-fitting connected to the bladder, the supplied end-fitting having a transverse first annular face facing the supply end-fitting and defining the mouth of a first internal pipe for fluidic coupling with the bladder;

the supply end-fitting having a body and a piston, the piston having a transverse second annular face defining a mouth of a second internal pipe for fluidic coupling with the source of pressurized fluid, the second annular face facing the first annular face;

the piston sealedly and longitudinally slidably mounted inside the supply end-fitting body so that it can move between an active position where the second annular face is sealed against the first annular face for coupling the first and second internal pipes, and a rest position in which the piston is comparatively retracted inside the supply end-fitting so that the first and second annular faces are disjoined and the mouths of the first and second internal pipes being exposed to ambient pressure, the piston being forced into the active position when pressurized fluid is supplied from the source and the piston returning to the rest position when pressurized fluid is no longer sup-

plied from the source, the supply end fitting disconnected

5,555,811

PRINTING PLATE FEEDING PROCESS

directed said new printing plate leading edge into engagement with said plate leading edge grippers and into engagement

plied from the source, the supply end fitting disconnected from the cylinder in the rest position.

5,555,808

METHOD AND DEVICE FOR DETERMINING THE DEGREE OF SOILING OF A PRINTING UNIT OF A PRINTING MACHINE

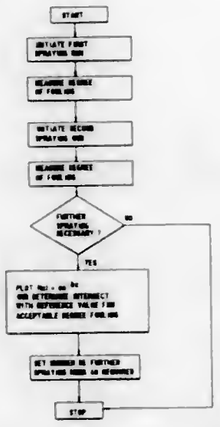
Karl-Hermann Miltner, Dossenheim, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Continuation of Ser. No. 72,416, Jun. 2, 1993. This application Feb. 14, 1995, Ser. No. 389,981

Claims priority, application Germany, Jun. 2, 1992, 42 18 127.5

Int. Cl.[6] B41F *35/00*

U.S. Cl. 101—425 **14 Claims**



1. A method for determining a degree of fouling of a printing unit of a printing machine, which comprises:

determining a degree of fouling of a washing medium used in washing a printing unit; and determining a degree of fouling of the printing unit from the degree of fouling of the washing medium, performing at least a first and a second spraying run on a printing unit with a washing medium; measuring the degree of fouling of the washing medium after the first and second spraying runs; and predicting a number of further spraying runs necessary in a washing cycle from the respective degrees of fouling in the first and second spraying runs.

5,555,809

ERASABLE PRINTING FORM

Alfred Hirt, Müchen; Barbara Nüssel, Friedberg, and Robert Weiss, Gersthofen, all of Germany, assignors to MAN Roland Druckmaschinen AG, Offenbach A.M., Germany

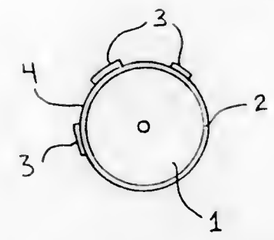
Division of Ser. No. 139,527, Oct. 20, 1993, Pat. No. 5,454,318. This application Jun. 5, 1995, Ser. No. 465,132

Claims priority, application Germany, Oct. 20, 1992, 42 35 242.8

Int. Cl.[6] B41N *1/14;3/03*

U.S. Cl. 101—451 **9 Claims**

1. A method for printing, comprising the steps of: providing an erasable printing form having an outer layer having a hydrophobic surface and micro-dipoles at least in the outer layer, the micro-dipoles having a strength sufficient for tightly bonding an agent having a hydrophilic effect to the surface, the printing form being produced by applying a masking material to the hydrophobic surface according to the image areas; and applying a hydrophilizing agent to the printing form during a production run to render non-image areas hydrophilic.



5,555,810

DEVICE FOR SUPPLYING PRINTING PLATES TO A PLATE CYLINDER AND FOR CARRYING AWAY THE SAME FROM THE PLATE CYLINDER

Jürgen A. Stiel, Ostheim, Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

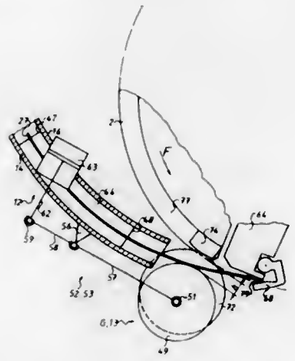
PCT No. PCT/DE93/00884, § 371 Date Mar. 16, 1995, § 102(e) Date Mar. 16, 1995, PCT Pub. No. WO94/06632, PCT Pub. Date Mar. 31, 1994

PCT Filed Sep. 17, 1993, Ser. No. 397,069

Claims priority, application Germany, Sep. 18, 1992, 42 31 906.4

Int. Cl.[6] B41F *27/06*

U.S. Cl. 101—477 **16 Claims**



1. A device for supplying and removing printing plates in a rotary printing press comprising:

a plate cylinder having a jacket surface;

a printing plate storage container with a guide compartment having a lower end with an outlet positioned adjacent said jacket surface of said plate cylinder;

a plate drive roller adjustably supported adjacent said lower end of said guide compartment;

means for positioning said plate drive roller into selectively one of three separate positions with respect to said jacket surface of said plate cylinder wherein in a first, application position, said plate drive roller is in engagement with a printing plate on said plate cylinder, wherein in a second, removal position, said plate drive roller is spaced from said plate cylinder at a first gap width and is usable to guide a plate end of a printing plate, and wherein in a third, supply position said plate drive roller is spaced from said plate cylinder at a second gap width and is usable to support a printing plate, said second gap width being less than said first gap width.

5,555,811

PRINTING PLATE FEEDING PROCESS

Wolfgang G. Ruckmann, and Erich G. Wieland, both of Würzburg, Germany, assignors to Koenig & Bauer Aktiengesellschaft, Würzburg, Germany

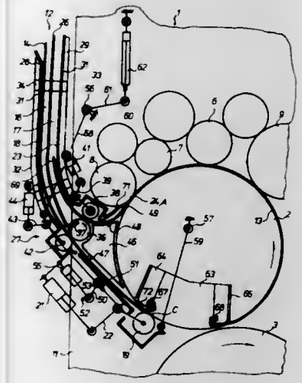
PCT No. PCT/DE93/00874, § 371 Date Mar. 17, 1995, § 102(e) Date Mar. 17, 1995, PCT Pub. No. WO94/06628, PCT Pub. Date Mar. 31, 1994

PCT Filed Sep. 16, 1993, Ser. No. 397,238

Claims priority, application Germany, Sep. 18, 1992, 42 31 900.5

Int. Cl.[6] B41F *21/00*

U.S. Cl. 101—477 **1 Claim**



1. A method for feeding printing plates to a plate cylinder of a rotary printing press including the steps of:

providing a plate cylinder having a peripheral surface including a cylinder depression;

rotating said plate cylinder at a first constant speed;

providing a printing plate removal and feed device having a housing with a new printing plate storage compartment having a lower, open end and a used printing plate storage compartment having a lower, open end;

locating said housing with said storage compartments adjacent said plate cylinder with said lower open ends adjacent said plate cylinder peripheral surface;

providing a new printing plate leading edge alignment unit having a releasable printing plate leading edge indexing stop in said new printing plate storage compartment;

placing a new printing plate having leading and trailing edges, and with said leading edge having an alignment device, in said new printing plate storage compartment with said alignment device in contact with said new printing plate leading edge indexing stop;

providing a printing plate conveying device in said housing adjacent said lower open ends of said storage compartments;

operating said printing plate conveying device at a second speed greater than said first speed;

releasing said new printing plate leading edge from said indexing stop and using said conveying device to accelerate said new printing plate to said second speed which is greater than said first constant speed of rotation of said plate cylinder;

providing printing plate leading edge grippers and printing plate trailing edge grippers in said cylinder depression;

including printing plate leading edge stops on said printing plate leading edge grippers;

opening said printing plate leading edge grippers when said plate cylinder is adjacent said lower end of said used printing plate storage compartment;

continuing said constant rotation of said plate cylinder at said first speed and causing a leading end of a used printing plate released from said opened printing plate leading edge grippers to enter said lower end of said used printing plate storage compartment;

directed said new printing plate leading edge into engagement with said plate leading edge grippers and into engagement with said leading edge stops by engaging said new printing plate with said printing plate conveying device;

continuing rotating said plate cylinder at said first speed;

providing a pressure roller in said new printing plate storage compartment adjacent said lower end;

using said pressure roller to apply pressure to said new printing plate as said new printing plate is applied to said plate cylinder; and

securing said trailing edge of said new printing plate to said plate cylinder using said printing plate trailing edge grippers.

5,555,812

ARRANGEMENT FOR THE SUPPLY AND REMOVAL OF PRINTING PLATES

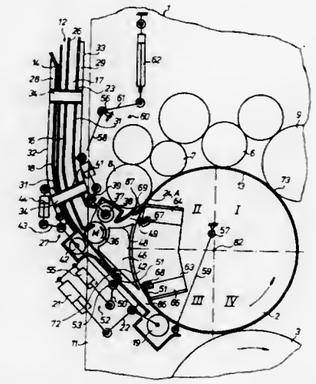
Wolfgang G. Ruckmann, and Erich G. Wieland, both of Würzburg, Germany, assignors to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

Filed Mar. 17, 1995, Ser. No. 397,239

Claims priority, application Germany, Sep. 18, 1992, 42 31 900.5; Sep. 16, 1993, 43 31 430.9

Int. Cl.[6] B41F *21/00*

U.S. Cl. 101—477 **5 Claims**



1. A printing plate supply and removal device for use in supplying and removing printing plates to a plate cylinder of a rotary printing press comprising:

plate cylinder having a peripheral jacket surface;

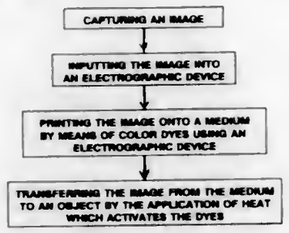
controlled grippers which cooperate with gripper support surfaces, said controlled grippers and said gripper support surfaces being fixed on said peripheral surface of said plate cylinder;

a printing plate storage container having a first compartment for the removal of printing plates from said plate cylinder and a second compartment for the supply of printing plates to said plate cylinder, said first compartment having a first compartment end and said second compartment having a second compartment end;

an arbitrary circle whose radius maximally coincides with a radius of said jacket of said plate cylinder and minimally coincides with a radius of a circle which extends below said gripper support surfaces, said first compartment end and said second compartment end being tangentially aligned with said arbitrary circle; and

a guide bar disposed between said first and second ends of said printing plate supply compartment and said printing removal compartment, said first and second ends being spaced from each other by said guide bar and being located apart from each other in the area of two directly adjoining quadrants of said plate cylinder.

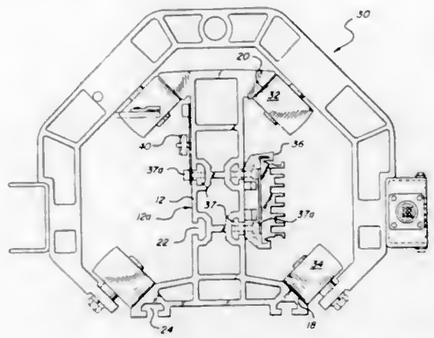
5,555,813
PERMANMENT HEAT ACTIVATED ELECTROGRAPHIC PRINTING PROCESS AND COMPOSITION
Nathan Hale, and Ming Xu, both of Mt. Pleasant, S.C., assignors to Sawgrass Systems, Inc., Mt. Pleasant, S.C.
Continuation-in-part of Ser. No. 299,736, Sep. 1, 1994, Pat. No. 5,488,907, which is a continuation-in-part of Ser. No. 195,851, Feb. 10, 1994, Pat. No. 5,431,501, which is a continuation-in-part of Ser. No. 724,610, Jul. 2, 1991, Pat. No. 5,302,223, which is a continuation-in-part of Ser. No. 549,600, Jul. 9, 1990, abandoned. This application Jan. 13, 1995, Ser. No. 372,520
Int. Cl.[6] B41F *1/16*
U.S. Cl. 101—492 **8 Claims**



1. A method of printing an image by means of an electrographic device using heat activated dyes, comprising the steps of:
a. preparing at least one ink composition comprising a heat activated dye and a molecular sieve;
b. printing said ink composition by means of an electrographic device onto a medium to form an image on said medium, wherein said printing of said ink composition by said electrographic device is at a temperature which is below a temperature at which a substantial portion of said ink composition is activated;
c. applying mechanical means to said image and binding said image to said medium without activating a substantial portion of said ink composition;
d. removing said medium from said electrographic device; and
e. transferring, at a location which is remote from said electrographic device said image from said medium onto a substrate on which the image is to appear by the application of heat to said medium at a temperature which is above the temperature at which said ink composition activates, so as to cause a substantial portion of said ink composition to activate, wherein said dye bonds to said substrate and said image is deposited onto said substrate from said medium and is bonded to said substrate.

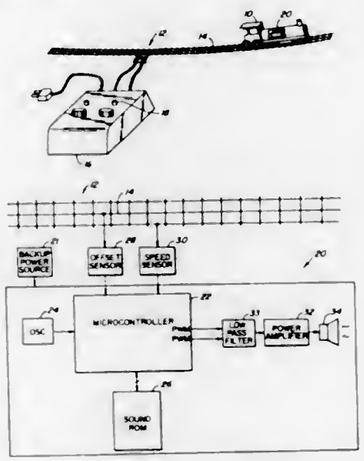
5,555,814
TRACK FOR SORTATION HANDLING EQUIPMENT
Kenneth E. Burkhalter, Chelsea, and Ron Cailey, Elk Rapids, both of Mich., assignors to Symorex Inc., Ann Arbor, Mich.
Continuation of Ser. No. 176,384, Jan. 3, 1994, abandoned. This application Jul. 6, 1995, Ser. No. 498,933
Int. Cl.[6] B61B *3/00*; E01B *25/08*
U.S. Cl. 104—107 **10 Claims**

1. For use in a train-type sortation system in which one or more cars or trolleys rides on a monorail-type track, an improved unitary track section comprising:
a vertical support member terminating at an upper end in a first narrower transverse leg and at a lower end in a second wider transverse base leg, the upper and base legs defining at distal ends thereof opposed, inwardly angled wheel bearing surfaces on each side of the vertical support member, wherein the upper wheel bearing surfaces are transversely spaced a distance less than the lower wheel bearing surfaces, such that outer ends of the upper wheel surfaces extend transversely from the vertical support a first distance less than inner ends



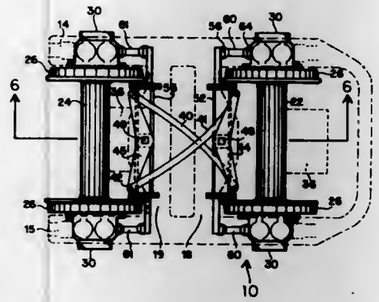
of the lower wheel bearing surfaces, the outer ends of the upper wheel surfaces comprising the outer ends of the upper transverse leg.

5,555,815
MODEL TRAIN HORN CONTROL SYSTEM
Neil P. Young, 3240 Bear Gulph Rd., Redwood City, Calif. 94062; Joe Thibodeau, Los Gatos; David Trubitt, San Carlos, and Dennis Fowler, Los Altos, all of Calif., assignors to Neil P. Young, Redwood City, Calif.
Filed Oct. 13, 1994, Ser. No. 322,892
Int. Cl.[6] B60L *1/00*
U.S. Cl. 104—296 **19 Claims**



1. A sound system for producing a variable sound from a model vehicle on a track, comprising:
a user input located on said model vehicle for receiving a user control signal, said user control signal having a variable duration;
a speed input for producing a second control signal indicating a desired speed of said vehicle along said track; and
a sound generation unit responsive to a combination of said user control signal and said second control signal for generating said variable sound, said Sound generation unit including a plurality of stored sound segments and circuitry for selecting varying combinations of said stored sound segments responsive to said user control signal and said second control signal;
wherein said variable sound varies in accordance with each of said first and second control signals.

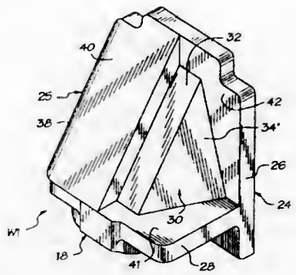
5,555,816
SELF STEERING RAILWAY TRUCK
Philip A. Jones, Boise, Id., assignor to M-K Rail Corporation, Boise, Id.
Filed Mar. 6, 1995, Ser. No. 399,198
Int. Cl.[6] B61D *1/00*; B61F *5/38*
U.S. Cl. 105—168 **24 Claims**



1. An improved self-steering wheel truck for use with a railway locomotive or powered transit car, said self-steering wheel truck including first and second longitudinally spaced wheel and axle assemblies, each having a pair of opposing wheels interconnected by an axle, a truck frame including a pair of parallel side frames, defining a longitudinal axis, interconnected by at least two transverse frame members, defining a transverse axis, means for rotatably carrying said truck frame on said first and second axle and wheel assemblies and permitting axle yaw for both the first and second axles, tractive force motors drivedly connected to the axles for driving the wheels, wherein the improvement comprises:
a pair of generally vertically oriented tractive force transmitting shafts each connected to an axle and pivotally mounted to one of the transverse frame members for transmitting tractive force from the axle and wheel assembly to the truck frame and for rotation in response to axle yaw; and
a pair of diagonally disposed resilient axle alignment arms, each connected to the first axle adjacent to a wheel and diagonally connected to the second axle adjacent to the corresponding opposing wheel, for transmitting, by flexing, an opposite axle yaw inducing force to the second axle responsive to a force externally inducing self-steering yaw of the first axle, and for urging said first and second axles into parallel spaced relationship upon removal of the externally induced self-steering yaw force.

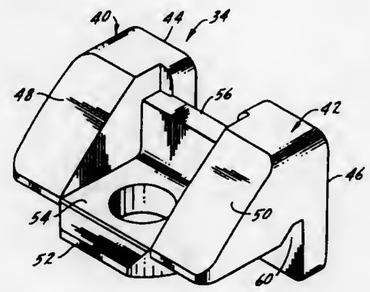
5,555,817
PAD OF SUBSTANTIALLY RIGID SYNTHETIC RESIN FOR A FRICTION WEDGE IN A BOLSTER POCKET
Armand P. Taillon, Chicago, Ill., and Philip J. Brunkhorst, Sioux City, Iowa, assignors to Standard Car Truck Company, Park Ridge, Ill.
Filed Jul. 1, 1994, Ser. No. 269,554
Int. Cl.[6] B61F *3/00*
U.S. Cl. 105—198.2 **20 Claims**

1. A friction wedge for use in a bolster of a railroad car truck having a bolster pocket, said bolster pocket having an inclined surface on a wall provided by the exterior surface of a terminal portion of said bolster, and spaced-apart vertical side walls generally perpendicular to said inclined surface and a horizontal plane, said friction wedge comprising,
a wedge-shaped metal body having a vertical wall with an outer surface thereof adapted to bear against a portion of a guide member of a side frame of said truck, a horizontal base member, and, a support body joining said vertical wall and said horizontal base member at their inner surfaces, said support body having a support surface inclined to said inner



surfaces, said support surface having a configuration adapted to coextensively, abuttingly complement a central portion of an inner surface of
a pad means comprising a substantially rigid and essentially non-deformable reaction injection molded polymer matrix infused with a minor proportion of polyethylene, said polymer matrix having a hardness in the range from 70–90 Shore D, said pad means being stable to thermal and oxidative degradation, fully dense, and having essentially no compressive deformation under pressure of 6900 kPa (1000 psi) and a temperature of 38.8° C. (100° F.); and,
said pad means having an inclined pad surface adapted to conform to said inclined surface of said bolster pocket;
whereby said wedge-shaped metal body causes said pad means to be adapted to bear against said inclined surface of said bolster pocket during operation of said railroad car truck.

5,555,818
DUAL FACE FRICTION WEDGE
Robert L. Bullock, Antioch, Ill., assignor to Standard Car Truck Company, Park Ridge, Ill.
Continuation of Ser. No. 243,827, May 17, 1994. This application Aug. 7, 1995, Ser. No. 511,760
Int. Cl.[6] B61F *3/00*
U.S. Cl. 105—198.2 **12 Claims**



1. A friction wedge for use in damping relative movement between a bolster and side frame of a railroad car truck, said wedge including a body formed and adapted to be positioned in a pocket of the bolster, said body having friction surface means, formed and adapted during normal use, to be in frictional contact with a wear resistant surface on the side frame, means for concentrating at least a portion of the load applied by the friction surface means to the wear resistant surface onto an area of the friction surface means furthest from the axis of said frame/bolster warp movement to thereby increase the resistance to side frame/bolster warp movement said concentrating means includes a recess which extends the full height of said wedge friction surface means.

5,555,819
structure having an underface and a plurality of individual modular

5,555,822
APPARATUS FOR DISSOCIATING BULK WASTE IN A

collection and processing apparatus, transferring the material from said stationary collection apparatus to a stationary fe-

5,555,819

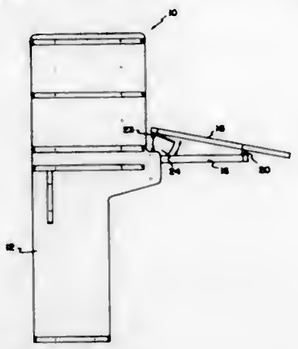
WORK STATION HAVING AN ADJUSTABLE WORK SURFACE

Edwin P. Lochridge, Atlanta, Ga., assignor to Metamorphosis Design & Development, Atlanta, Ga.

Continuation-in-part of Ser. No. 100,158, Aug. 2, 1993, abandoned. This application Feb. 6, 1995, Ser. No. 384,572

Int. Cl.[6] A47F 5/12

U.S. Cl. 108—9 **12 Claims**



1. A work station, comprising;

a support frame;

a work surface pivotably mounted on the support frame, having upper and lower surfaces;

an adjustment bar on the lower surface of the work surface, pivotably secured to the work surface, the adjustment bar comprising (a) an actuating portion which is oriented generally parallel to the lower surface of the work surface, is spaced from the lower surface of the work surface, and is disposed adjacent an edge of the work surface and (b) an engaging portion having an edge which is provided with a plurality of notches; and

a pin projecting from the support frame for engaging any one of the plurality notches;

the adjustment bar being pivotably secured to the work surface so that movement of the actuating portion toward the lower surface of the work surface can disengage the pin from one of the plurality of notches to allow the work surface to be set at a different angle by engaging the pin with a different notch, and upon release of the bar the edge of the engaging portion having the notches will be urged in a direction toward the pin.

5,555,820

PALLET WITH PLASTIC LEGS

Lyle H. Sheert, 1034 Stratford Pl., Bloomfield Hills, Mich. 48303

Continuation-in-part of Ser. No. 166,730, Mar. 1, 1988, Pat. No. 5,470,641, which is a continuation-in-part of Ser. No. 993,762, Dec. 18, 1992, Pat. No. 5,401,347. This application Apr. 24, 1995, Ser. No. 426,876

Int. Cl.[6] B65D 19/00

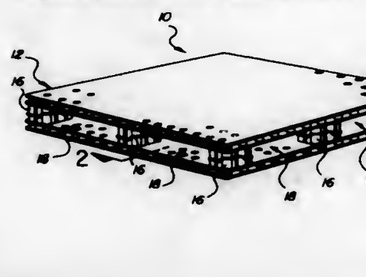
U.S. Cl. 108—51.1 **22 Claims**

1. A plastic pallet comprising a generally planar plastic platform structure having an underface and a plurality of individual modular legs extending downwardly from the underface in spaced relation, characterized in that:

a plurality of spaced downwardly facing attachment surfaces are defined on the underface of the platform structure;

each leg comprises a modular plastic structure of closed box configuration including an upper portion defining an upwardly facing attachment surface, a lower portion positioned in underlying relation to the upper portion, and an annular portion interconnecting the upper and lower portions to complete the closed box leg configuration and maintaining the upper and lower portions in spaced relation; and

the legs are secured to the platform structure by positioning the upwardly facing attachment surfaces of each leg adjacent a respective downwardly facing attachment surface on the underface of the platform structure and fusing the upper portion of each leg to the underface of the platform structure at the interface of the attachment surfaces to fixedly secure the legs in spaced relation to the underface of the platform structure.



5,555,821

APPARATUS AND PROCESS FOR REMOVING UNBURNED CARBON IN FLY ASH

Morris P. Martinez, 1705 E. 39th Ave., Denver, Colo. 80205

Filed Dec. 2, 1994, Ser. No. 348,463

Int. Cl.[6] F23N 5/22

U.S. Cl. 110—191 **14 Claims**

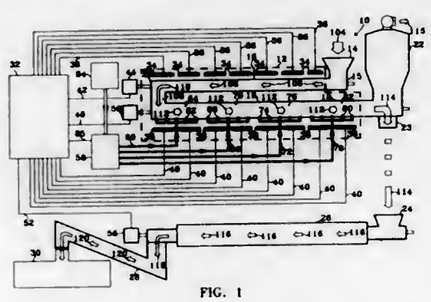


FIG. 1

1. An apparatus for removing unburned carbon in fly ash, the apparatus comprising:

a heating chamber for receiving the fly ash therein and for heating the fly ash in a range from 800 to 1200 degrees F.;

means for conveying the fly ash along a length of said heating chamber;

an oxygen supply connected to said heating chamber for providing oxygen to said heating chamber, the oxygen heating the fly ash and igniting the unburned carbon in the fly ash, the burning of the carbon acting as a fuel in combination with the oxygen for heating the fly ash and removing the remaining unburned carbon from the fly ash; and

means connected to said oxygen supply for regulating the amount of oxygen to said heating chamber and for regulating the temperature inside said heating chamber in a range of 800 to 1200 degrees F.

5,555,822

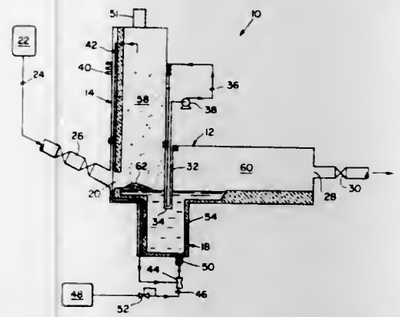
APPARATUS FOR DISSOCIATING BULK WASTE IN A MOLTEN METAL BATH

Eric P. Loewen, Oak Ridge, Tenn., and Arthur W. White, Haverhill, Mass., assignors to Molten Metal Technology, Inc., Waltham, Mass.

Filed Sep. 6, 1994, Ser. No. 301,235

Int. Cl.[6] F23G 7/00

U.S. Cl. 110—237 **8 Claims**



1. A reactor for dissociating bulk waste in a molten metal bath, comprising:

a) a bulk waste inlet;

b) a gas outlet;

c) a baffle within said reactor, said baffle having a lower edge which can be immersed by a molten metal bath within said reactor, whereby the baffle partitions a gaseous volume above the molten metal bath into a first region, proximate to said bulk waste inlet, and a second region, proximate to said gas outlet;

d) a gas conduit extending from said first region to a portion of said reactor beneath the second region; and

e) means for directing gas from the first region through the gas conduit into a portion of the molten metal batb beneath the second region, thereby equalizing gas pressure above the molten metal bath in the first and second regions during introduction of bulk waste into the first region.

5,555,823

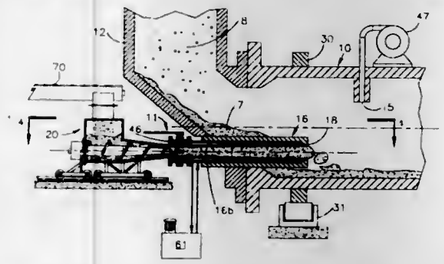
METHOD AND APPARATUS FOR FEEDING WASTE MATERIAL TO A DRY KILN

Ricky W. Davenport, P.O. Box 52154, Lafayette, La. 70505-2154

Filed Sep. 2, 1994, Ser. No. 300,077

Int. Cl.[6] F23G 5/22; F27B 7/32

U.S. Cl. 110—346 **42 Claims**



39. A method of delivering waste material on a continuous basis into the calcining portion of a rotating cement kiln of the precalciner type having a mineral bed including the steps of delivering waste material to be introduced into the cement kiln to a stationary collection and processing apparatus, transferring tbe material from said stationary collection apparatus to a stationary feeding apparatus having an extrusion tube attached thereto, feeding the material in a continuous manner through the feeding apparatus and extrusion tube, and discharging said material in a compacted form for incineration in the mineral bed.

5,555,824

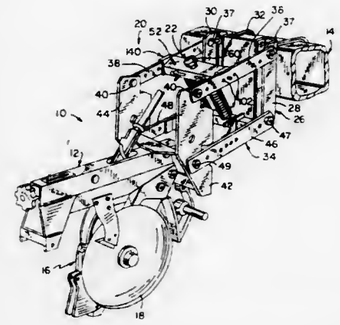
OPERATOR CONTROLLED PRESSURE APPLICATOR FOR THE FURROW FORMING MECHANISM OF A SEED PLANTER

John F. Stufflebeam, Romeoville, and Donald L. Ledermann, Darien, both of Ill., assignors to Case Corporation

Filed Jan. 31, 1995, Ser. No. 381,427

Int. Cl.[6] A01C 5/00

U.S. Cl. 111—62 **35 Claims**



1. A furrow-forming apparatus arranged in combination with a row unit on an agricultural implement, said apparatus having a frame adapted to be attached to a tool bar assembly, a furrow forming mechanism mounted on said frame, and a mounting assembly for mounting said frame and said furrow forming mechanism to said tool bar, said mounting mechanism comprising:

a linkage assembly including a pair of generally parallel longitudinally extending links pivotally attached at opposite ends to said tool bar and said frame; and

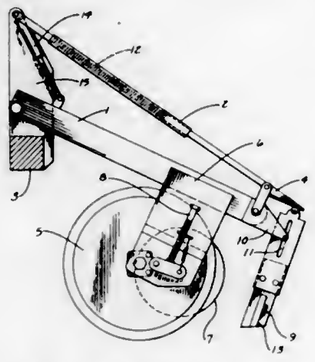
an operator controlled dual adjustment pressure applicator carried by said linkage assembly for applying selectively controlled pressures to said furrow forming mechanism, said pressure applicator comprising a movable support extending between and adjustable along said links, a pair of springs each connected at one end to said movable support and depending from said support for spring loading said links, a first adjustment mechanism for releasably locking said support in a plurality of selected positions along said links to move said one ends of the springs in a generally oblique direction relative to the axes of said springs to thereby adjust the effective length of the springs in a first manner, and a single operator controlled second adjustment mechanism for conjointly adjusting the said one ends of the springs along the respective axes thereof to thereby adjust the effective length of the springs in a second manner, each of said adjustment mechanisms thereby regulating the spring loading force applied by both of said springs and thus the pressure applied to said furrow forming mechanism.

5,555,825

DIRECT DRILL STUMP JUMP SEEDER

Ian Geddes, P.O. Box 82, Lake Bolac, Victoria 3351, Australia

PCT No. PCT/AU90/00427, § 371 Date Jul. 15, 1992, § 102(e) Date Jul. 15, 1992, PCT Pub. No. WO91/07079, PCT Pub. Date May 30, 1991
PCT Filed Sep. 17, 1990, Ser. No. 852,202
Claims priority, application Australia, Nov. 17, 1989, PJ7464
Int. Cl.[6] A01C *5/06*
U.S. Cl. 111—69 **17 Claims**



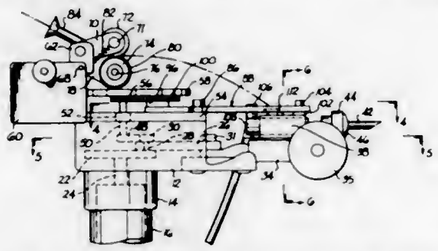
1. A direct drill seeding unit comprising:
a frame;
a splitter operatively connected to the frame;
a contour wheel operatively connected to the frame forward of the splitter, the contour wheel moving vertically up and down in response to changes in ground level; and
means for moving the splitter in a counteracting opposite vertical movement to the movement of the contour wheel to maintain the splitter at a substantially constant depth relative to ground level during operation of the direct drill seeding unit.

5,555,826

SHIFTING NEEDLE CARPET MENDER

William H. Satterfield, Dalton, Ga., assignor to Spencer Wright Industries, Inc., Dalton, Ga.

Filed Jul. 5, 1995, Ser. No. 498,401
Int. Cl.[6] D05C *15/06*
U.S. Cl. 112—80.04 **20 Claims**



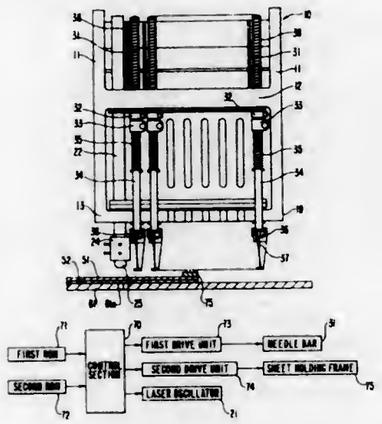
1. In a hand-held mending gun having a hollow needle elongated along a longitudinal axis, needle mounting means for mounting said needle for reciprocation along said axis, a rotary motor, first drive means coupling said motor to said needle mounting means for converting rotary motion of said motor to reciprocating motion of said needle to reciprocate said needle, the improvement comprising: second drive means coupling said motor to said needle mounting means for oscillating said needle laterally relative to said axis, said second drive means including a coupling member pivotably mounted for oscillation about a pivot axis substantially normal to said longitudinal axis, said coupling member having guide means coupled to said needle mounting means for oscillating said needle mounting means and thereby said needle laterally while permitting said needle mounting means and said needle to reciprocate.

5,555,827

SEWING MACHINE INCLUDING A LASER CUTTING SYSTEM, A SEWING METHOD, AND AN EMBROIDERING METHOD

Tanabe Tokuyoshi, Kagawa, Japan, assignor to Kabushiki Kaisha Tanabe Shishu, Kagawa, Japan

Filed Jul. 22, 1994, Ser. No. 277,312
Claims priority, application Japan, Jul. 28, 1993, 5-186138; Oct. 28, 1993, 5-270721; Jul. 1, 1994, 6-150992
Int. Cl.[6] D05B *21/00*
U.S. Cl. 112—102.5 **5 Claims**



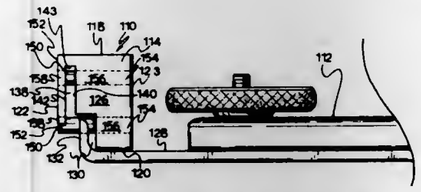
1. A sewing machine including a laser cutting system comprising:
a sewing machine table;
a needle bar movable in a vertical direction at a prescribed position on said sewing machine table;
a sheet holding frame for holding a sheet, said frame being movable in directions in an X-Y plane on said sewing machine table in synchronization with the vertical movement of said needle bar;
a laser oscillator for oscillating laser light capable of cutting the sheet held by said sheet holding frame on said sewing machine table;
an optical system for guiding the laser light oscillated from said laser oscillator so as to be condensed on the sheet; and
a control section for stopping said laser oscillator from oscillating laser light, moving said needle bar in the vertical direction, and intermittently moving said sheet holding frame in said X-Y plane so as to synchronize with the vertical movement of said needle bar, or alternatively for stopping the vertical movement of said needle bar, successively moving said sheet holding frame in said X-Y plane, and causing said laser oscillator to successively oscillate laser light.

5,555,828

EMBROIDERY HOOP ATTACHMENT ASSEMBLY

Donald G. Rowley, 5251 Saddleback Dr., Prescott Valley, Ariz. 86314-4321

Continuation-in-part of Ser. No. 394,900, Feb. 27, 1995, abandoned. This application Aug. 3, 1995, Ser. No. 510,770
Int. Cl.[6] D05C *9/04*
U.S. Cl. 112—103 **11 Claims**



1. An embroidery hoop attachment assembly for attaching an embroidery hoop to a hoop guide of an embroidery machine, the hoop guide including a hoop guide attachment bracket, said hoop attachment assembly comprising:
an embroidery hoop;
a hoop attachment bracket having a front face, said hoop attachment bracket being mounted to the embroidery hoop; and
at least two resilient pins attached to said hoop attachment bracket, said at least two resilient pins being spaced apart to receive the hoop guide attachment bracket, said pins cooperatively squeezing and retaining the hoop guide attachment bracket when said hoop attachment assembly is attached to the hoop guide attachment bracket;
said hoop attachment bracket being in the shape of a rectangular parallelpiped having a longitudinal axis, a top face, a bottom face, a front face, and a first end and a second end, said top face, said bottom face, and said front face extending in a direction parallel to said longitudinal axis between said first end and said second end; and
said hoop attachment bracket being attached to a flat peripheral portion of the embroidery hoop in a manner such that said bottom face lies flush against the flat peripheral portion of the embroidery hoop;
said hoop attachment bracket including a first cut-away portion extending between said first end and said second end to accommodate a raised edge at the periphery of the flat peripheral portion of the embroidery hoop, said first cut-away portion being formed at a corner of said parallelpiped.

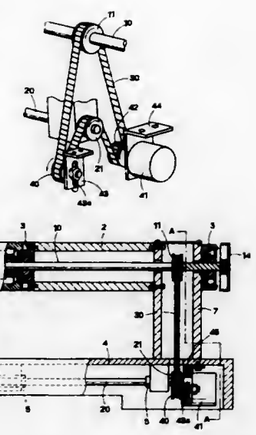
5,555,829

DRIVING APPARATUS FOR A SEWING MACHINE

Yutaka Katou, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jul. 10, 1995, Ser. No. 500,201
Claims priority, application Japan, Jul. 13, 1994, 6-161430
Int. Cl.[6] D05B *69/12*
U.S. Cl. 112—220 **7 Claims**

1. A driving apparatus for a sewing machine having a table, an upper rotary shaft provided horizontally above said table for driving a needle, a lower rotary shaft provided horizontally below said table for driving a shuttle, transmission means for transmitting a rotational force to rotate said upper rotary shaft and said lower rotary shaft in synchronous relationship with each other, and power means for providing said rotational force, wherein said transmission means comprises:
a first toothed member provided on said upper rotary shaft for rotating together therewith;
a second toothed member provided on said lower rotary shaft for rotating together therewith;
a double toothed belt provided on both sides thereof with teeth for meshing with said first toothed member and said second toothed member, respectively, and



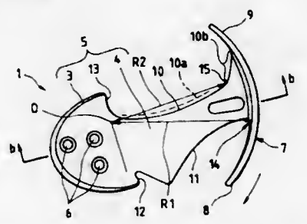
holding means for holding one side of said belt to be meshed with said first toothed member, and holding the other side of said belt to be meshed with said second toothed member,
wherein said power means includes an output shaft for driving said double toothed belt, said output shaft holding the one side of said belt to be meshed with said first toothed member, and holding the other side of said belt to be meshed with said second toothed member.

5,555,830

ROTARY THREAD TAKE-UP LEVER IN A SEWING MACHINE

Tatsuhito Akiyama, Tokyo, Japan, assignor to Juki Corporation, Tokyo, Japan

Filed Dec. 6, 1995, Ser. No. 568,418
Claims priority, application Japan, Dec. 6, 1994, 6-302433
Int. Cl.[6] D05B *49/04*
U.S. Cl. 112—248 **3 Claims**



1. A rotary thread take-up lever for acting on an upper thread in a sewing machine, comprising:
a base portion which is continuously rotatable around a predetermined axis in one direction; and
an arm extending outwardly from said base portion with respect to said axis, said arm including,
a front edge facing in the direction of rotation of said thread take-up lever and having a thread holding point, wherein the upper thread being lifted by said thread take-up lever is slid on said front edge, and
a rear edge facing in the direction opposite to the direction of rotation of said thread take-up lever and having a thread holding point, wherein the upper thread being supplied from said thread take-up lever is slid on said rear edge, and, when the upper thread is supplied maximumly, the upper thread is held by said thread holding points on said front and rear edges, respectively,

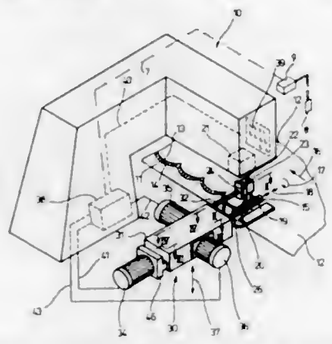
wherein the radius of rotation of said thread holding point on said rear edge is smaller than the radius of rotation of said thread holding point on said front edge.

5,555,831

FESTOONING MACHINE

Wolfgang Teeth, Kerken, and Dietmar Lippert, Pliezhausen, both of Germany, assignors to Maier-Unitas GmbH, Kongen, Germany

Filed Feb. 3, 1994, Ser. No. 191,414
Claims priority, application Germany, Feb. 9, 1993, 43 03 607.4
Int. Cl.[6] D05B *19/00*
U.S. Cl. 112—470.06 **57 Claims**



1. A festooning machine, comprising at least one movable transport element for a forward transportation and for transverse transportation of a sewing product, said transport element being formed as a transport roller; two vertically movable needles arranged at a distance near said transport element with an adjustable distance therebetween; a needle drive for vertically moving said needles; an independent drive unit which supports said transport element and provides movements of said transport element; an adjusting member which said drive unit engages at least one of said needles so as to displace said one needle with respect to said other needle to provide an adjustment of said distance between said needles; an electronic control device for controlling said drive unit, said drive unit being electronically controllable in dependence on stored and storable data for each movement of said transport element and for said adjustment of said distance between said needles, said drive unit having a motor for each movement of said transport element and for said adjustment of said distance between the needles by displacing said one needle.

5,555,832

APPARATUS FOR MANUFACTURING HOSIERY ITEMS AND KNITTING AND STITCHING MACHINES

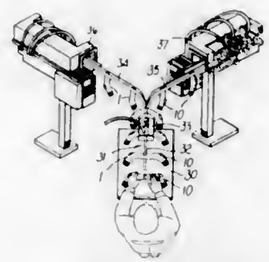
Andrea Conti, Florence, Italy, assignor to Conti Complett S.p.A., Milan, Italy

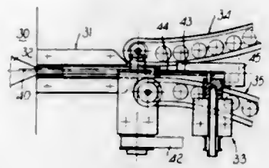
Filed Jul. 26, 1994, Ser. No. 279,865
Claims priority, application Italy, Jul. 30, 1993, FI93A0151
Int. Cl.[6] B26D *1/12;7/06;* D05B *7/00*
U.S. Cl. 112—470.155 **9 Claims**

1. A stitching machine for stitching toes of first and second hosiery items knitted so as to have a trim row which mutually interconnects the toes of said first and second hosiery items, said machine comprising:

a conveyor for conveying first and second hosiery items along an advancement direction;

an inlet guide provided on said conveyor for engaging a trim row mutually interconnecting toes of said first and second hosiery items;





cutting means for cutting said trim row engaged by said inlet guide for separating said first and second hosiery items placed on said conveyor into separated first and second hosiery items; and two independent stitching units;

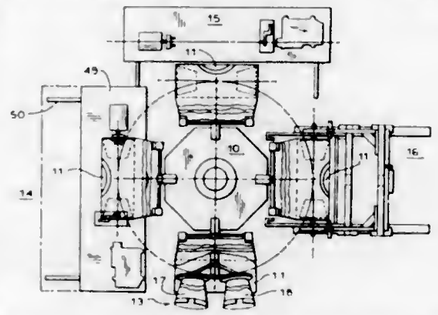
wherein said conveyor has traction means for transporting said separated first and second hosiery items along separate paths, from said cutting means to said two independent stitching units.

5,555,833

SLEEVE INSERTION SYSTEM FOR THE MANUFACTURE OF SHIRTS

Ernst Schramayr, Barneveld, and Tadeusz A. Olewicz, Clinton, both of N.Y., assignors to Jet Sew Technologies, Inc., Bowling Green, Ky.

Filed Aug. 22, 1994, Ser. No. 294,095
Int. Cl.[6] D05B *21/00*
U.S. Cl. 112—470.31 **25 Claims**



1. Apparatus for assembling and sewing sleeve sections to shirt bodies, which comprises

(a) a load fixture comprising a body form and a pair of sleeve cones,

(b) said sleeve cones being adapted for the loading thereon of tubular sleeve sections in outside-out orientation,

(c) said body form having a hollow interior including generally cylindrical shoulder-forming portions for receiving said sleeve cones internally at each end with said cones arranged in spaced apart relation and aligned substantially on a common axis, and having an exterior for supporting shoulder areas of a shirt body in inside-out orientation and in surrounding relation to said-sleeve sections,

(d) sewing means engageable with said sleeve sections and said shirt body for securing said sleeve sections to said shirt body while said shirt body is supported by said body form and said sleeve sections are supported by said sleeve cones, and

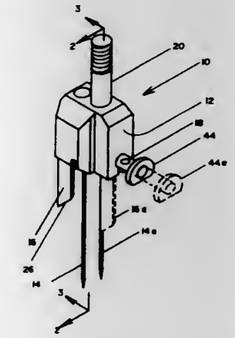
(e) means for supporting said sleeve cones within said body form during operation of said sewing means.

5,555,834

DOUBLE-NEEDLE CHUCK ASSEMBLY WITH MOVABLE KNIFE FOR SEWING MACHINE

Kevin B. Bonner, P.O. Box 339, Section, Ala. 35771

Filed Apr. 17, 1992, Ser. No. 869,946
Int. Cl.[6] D05B *37/04;3/06*
U.S. Cl. 112—129 **8 Claims**



1. A double-needle chuck assembly for a sewing machine comprising:

a supporting block;

means for attaching said block to a vertically reciprocating member of a sewing machine;

a pair of needles for producing two rows of stitches in a workpiece to be sewn vertically mounted in said block in spaced apart, parallel relation and defining a line therebetween;

a knife supported by said block and positioned to make a closed end slit in said workpiece perpendicular to said line between said needles and intermediate to said two rows of stitches produced by said needles; and

means associated with said block for moving said knife from a first operating position on one side of said line between said needles to a second operating position on the opposite side thereof comprising:

a track carried by said block and having an axis perpendicular to said line, a knife-supporting element slidably mounted for linear movement along said axis in said track, said knife being mounted in a fixed position on said element;

whereby said knife may be placed in trailing relation to said needles at each end of said closed end slit; and

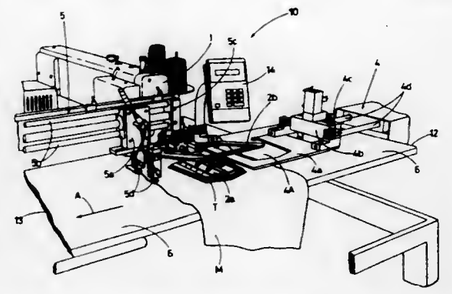
means carried by said block for removably securing said knife-supporting element in a first location along said axis whereby said knife is held in said first operating position and in a second location along said axis whereby said knife is held in said second operating position.

5,555,835

AUTOMATIC PROCEDURE FOR SEWING PRE-IRONED PATCH POCKETS

Carlo Campolucci, Corinaldo, Italy, assignor to J.A.M. - S.R.L., Italy

Filed Jun. 30, 1994, Ser. No. 268,282
Int. Cl.[6] D05B *21/00*
U.S. Cl. 112—475.07 **13 Claims**



1. In a sewing machine comprising a sewing station with a sewing head and a working surface extending from one end of the sewing machine to another end thereof, wherein a double clip is installed at the sewing station, the double clip including a fabric-holding plate and a pocket-holding plate, wherein the fabric-holding plate has a centering opening substantially conforming to a shape and a size of a pocket to be sewn to a clothing item, wherein the pocket-holding plate, being positioned within said centering opening, allows a certain distance between perimeters of the centering opening and the pocket-holding plate identifying a sewing line, and wherein, during the sewing of the pocket to the clothing item, a needle of the sewing head moves along said sewing line, a method for sewing the pocket to the clothing item, comprising the steps of:

a. providing a feeder on said one end of the sewing machine for feeding a clothing item to the sewing station, wherein the feeder includes an auxiliary fabric holder having an opening substantially conforming to the shape and the size of the pocket;

b. providing an unloading means for unloading the clothing item from the sewing station toward said another end of the sewing machine;

c. providing a controlling means for synchronization of operations of the feeder, unloading means and the double clip;

d. manually loading the clothing item on the working surface at said one end of the sewing machine while the auxiliary fabric holder is raised;

e. lowering the auxiliary fabric holder over the clothing item loaded onto the working surface;

f. manually applying the pocket within the opening of the auxiliary fabric holder;

g. automatically feeding the clothing item with the applied pocket by means of said feeder from said one end of the sewing machine to the sewing station;

h. automatically lowering the pocket-holding plate of the double clip into the opening of the auxiliary fabric holder;

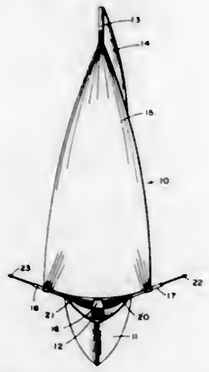
i. automatically raising the auxiliary fabric holder and returning it to said one end of the sewing machine;

j. automatically lowering the fabric-holding plate of the double clip onto the clothing item;

k. sewing the pocket to the clothing item; and

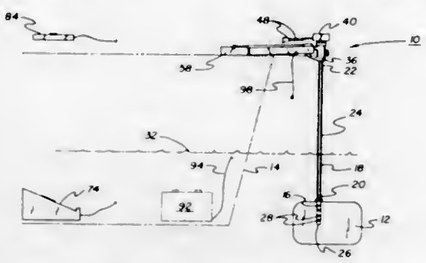
l. automatically unloading by said unloading means the clothing item with the sewn pocket from the sewing station to said another end of the sewing machine.

5,555,836
FOLDING SPINNAKER POLE SYSTEM
Douglas W. Lord, 734 N. Irma Ave., Orlando, Fla. 32803
Filed Dec. 5, 1995, Ser. No. 567,308
Int. Cl.[6] B63H *9/10*
U.S. Cl. 114—89 **13 Claims**



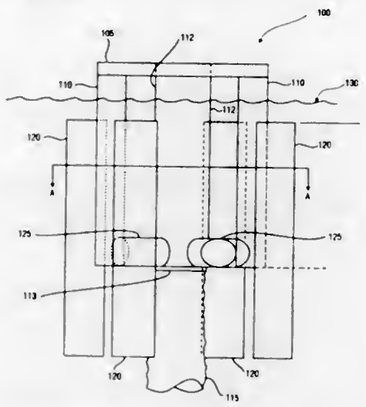
1. A sailing vessel comprising:
a hull having a mast supported thereon in a vertical direction from the hull;
a spinnaker pole support mounted to said hull forward of said mast;
a pair of spinnaker poles attached to said spinnaker pole support, each said spinnaker pole being positionable between a fully retracted and a fully open position and having biasing means biasing each said spinnaker pole towards a fully open position so that each said spinnaker pole can be retracted against a bias between an open and a retracted position; and
a spinnaker sail attached between said mast and said pair of spinnaker poles, whereby a spinnaker can be trimmed, jibed or headed up to a beam reach with a pair of spinnaker poles.

5,555,837
BOAT STABILIZING RUDDER SYSTEM
Floyd Marshall, 1530 Fogg Pike, Mt. Sterling, Ky. 40353-9584, and Terry Marshall, Rte. 4, Box 311 B, Winamac, Ind. 46996
Filed Jun. 22, 1995, Ser. No. 493,641
Int. Cl.[6] B63H *25/10;25/38*
U.S. Cl. 114—153 **6 Claims**



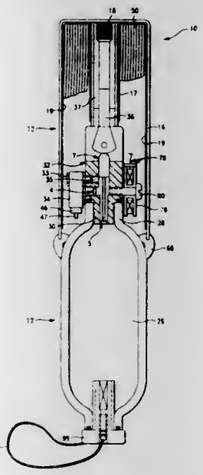
1. A new and improved boat stabilizing rudder system comprising, in combination:
a rudder formed of planar sheet material positionable in a vertical orientation and coupled with respect to a boat with which it is to be utilized for stabilizing the course of the boat, the rudder having vertically aligned apertures therethrough;
a vertically positioned support rod having a lower end, an upper end and an elongated central extent therebetween, the lower end being formed with plates having apertures therethrough adapted to be aligned with the apertures of the rudder, the upper end having mounted thereon a driven gear adapted for rotation about a vertical axis and the central extent adapted to position the upper end at a location above a waterline with the lower end beneath the waterline;
a bracket having an aperture extending therethrough in a vertical orientation, the aperture adapted to receive the upper end of the rod beneath the gear for rotation of the rod with the rudder therebeneath about a vertical axis, and also including a drive box with a motor and a driven shaft and a drive gear in driving contact with the driven gear and lines extending from the motor into the boat to which the rudder system is to be coupled, the bracket also having a horizontally disposed aperture therethrough with a first pivot pin constituting a hinge;
a pivot box mounted to the boat with which the rudder is to be utilized, the pivot box having horizontally disposed second apertures therethrough with a second pivot pin positioned through the second apertures;
a positioning rod having an exterior end with an outboard aperture receiving the first pivot pin and having an intermediate extent and an inboard aperture for receiving the second pivot pin, the positioning rod movable from a forward orientation wherein its exterior end is located over the water remote from the boat and in an inoperative position over the boat remote from the water for positioning the rudder in a stowed orientation;
control means with lines coupled to the lines of the motor for the actuation thereof, the control means including a foot-operated pedal to drive the motor in one direction or the other for rotating the rudder to an intended orientation, the control means also including a hand-operated control adapted for use as an alternative to the foot pedal;
a battery positionable within the boat with a line coupled to the motor for the energization thereof; and
a pull cord adapted for manipulation by a user to effect the movement of the positioning rod between the forward and inoperative orientation.

5,555,838
OCEAN THERMAL ENERGY CONVERSION PLATFORM
Gunnar B. Bergman, Santa Barbara, Calif., assignor to Seatek International, Inc., Santa Barbara, Calif.
Filed Oct. 31, 1994, Ser. No. 329,489
Int. Cl.[6] B63B *27/00*
U.S. Cl. 114—265 **21 Claims**



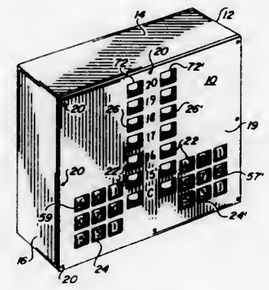
1. An ocean thermal energy conversion (OTEC) platform comprising:
a deck;
at least one buoyant column attached to said deck and extending below a sea surface;
at least one center column attached to said deck and extending below the sea surface, said center column being hollow and having an open top and an open bottom, said open top and open bottom permitting sea water to rise and fall within said center column;
a cold water pipe attached to said center column; and
at least one OTEC power module connected to said platform and submerged below the sea surface, said submerged power module acting as a pontoon to increase the stability of said platform.

5,555,839
INFLATABLE BALLOON SIGNAL DEVICE
Dwight M. Staten, Hayward, Calif., and Charles M. Staehle, Riviera Beach, Fla., assignors to Distress Signals, Inc., Hayward, Calif.
Filed Jun. 6, 1995, Ser. No. 470,334
Int. Cl.[6] B64B *1/40*
U.S. Cl. 116—210 **13 Claims**



1. An inflatable balloon signalling device comprising:
a bottom pressure vessel having an outlet end and cuntaining a lighter-than-air gas under pressure;
a top cap removably connected to said bottom pressure vessel to form a water-tight seal there between, said top cap and bottom pressure vessel in combination forming a pressure-resistant container;
an inflatable balloon bag having a balloon filler connector, said balloon bag having an airfoil configuration when inflated;
a gas release actuator assembly housed within said pressure-resistant container, and having an inlet end connected to said pressure vessel and an outlet end adapted to receive a balloon filling tube, and being in open communication with said balloon bag and said pressure vessel;
said balloon filing tube attached to said outlet end of said gas release actuator assembly and releasably attached to said balloon filler connector via a balloon release member;
a gas release lever arm pivotally connected to said gas release actuator assembly and adapted to release said lighter-than-air gas from said pressure vessel when said gas release lever arm is rotated; and
a rotatable spool mounted in proximity to said gas release actuator assembly and having a tether line connected to said rotatable spool and said balloon bag;
wherein said top cap is removably connected to said bottom pressure vessel by attachment of a threaded stud on said top cap to said gas release lever arm.

5,555,840
DART GAME SCORE BOARD
Willard F. Fougere, 37 Surrey Run, The Paddock, Dover, N.H. 03820
Filed May 2, 1994, Ser. No. 235,972
Int. Cl.[6] G09F *11/12;11/02;* **A63F** *9/02*
U.S. Cl. 116—223 **10 Claims**



1. A dart game score board, comprising:
(a) a case having a front cover and including at least one walled compartment therein, one wall of which is formed by at least a portion of said front cover and at least orthogonal array of at least three rows and three columns of window openings; and
(b) a plurality of scoring modules, equal in number to the number of said window openings, each of said scoring modules including an elongated substantially U shaped spool carrier, each spool carrier having side walls, said side walls having oppositely disposed bearing surfaces formed in axial alignment adjacent each end thereof, a pair of spools for each scoring module, each spool of said pair having first and second ends and each spool having an axle extending from the first and second ends respectively thereof, and each spool being rotatably mounted with the axle at each of the first and second ends of each spool in a corresponding one of the bearing surfaces of said spool carrier, each pair of spools having an endless belt, with scoring indicia thereon, circumventing each pair of spools and being in frictional engagement therewith, said plurality of scoring modules, when inserted in said at least one compartment forming an orthogonal array of indicia aligned with the window openings in the front cover of said case with a portion of a spool of each module extending through a corresponding window opening in said front cover, whereby said spools and said endless belt of each scoring module may be individually rotated to thus display the scoring indicia in the window openings for keeping score when playing a game of darts.

5,555,841

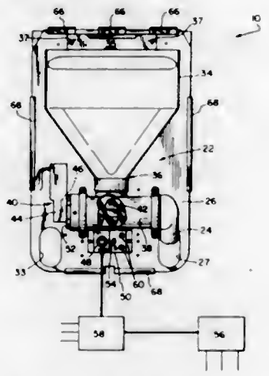
Patent Not Issued For This Number

5,555,842
METHOD AND APPARATUS FOR FEEDING HORSES

a tube including
a tube first end

5,555,847
DOG DIAPER

5,555,842
METHOD AND APPARATUS FOR FEEDING HORSES
Caryl M. Chocola, Okemos, Mich.; Timothy W. Momont, Wolcottville, and Charles R. Bird, Milford, both of Ind., assignors to KC Equine Systems, Inc., Okemos, Mich.
Filed Oct. 8, 1993, Ser. No. 134,540
Int. Cl.[6] A01K *5/02*
U.S. Cl. 119—51.11 **32 Claims**

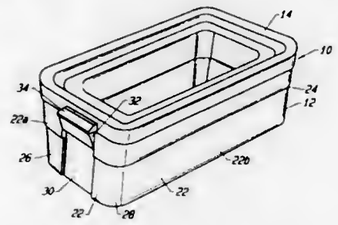


1. A system for delivering feed to plurality of stalls at predetermined intervals of time, said system comprising:
a plurality of feed dispensing devices for delivering said feed to said plurality of stalls upon receipt of an electrical control signal; and
means for generating said electrical control signal at predetermined intervals of time, said means for generating said electrical control signal including:
(a) a first timer which is operable to control when said plurality of feed dispensing devices are to initiate the delivery of feed to said plurality of stalls,and
(b) a plurality of second timers which are each operable to individually control the duration during which one of said feed dispensing devices delivers feed to one of said stalls after feed delivery is initiated by said first timer.

5,555,843
MULTI-PURPOSE FEEDER
William D. Harmon, 781 Corinth Dr., Jonesboro, Ga. 30236
Continuation-in-part of Ser. No. 17,386, Jan. 12, 1994. This application Jan. 11, 1995, Ser. No. 371,016
Int. Cl.[6] A01K *39/01*
U.S. Cl. 119—57.8 **8 Claims**

1. An apparatus for distributing feed from a reservoir of feed, the apparatus comprising:
a tube including
a tube first end
a tube second end, wherein the elongated axis of said tube extends between said tube first end and said tube second end, and
a tube wall
wherein said tube wall encircles and defines a passage internal to said tube,
wherein said tube wall further defines a pair of opposed apertures therethrough proximate to said tube first end, said pair of opposed apertures being in communication with said passage, and
wherein said tube wall further defines a third aperture therethrough proximate to said tube first end, said third passage being in communication with said passage; and
a tubular threaded fitting connected to said tube second end, said threaded fitting including
a radially extending, annular flange, and
an annularly threaded surface internal to said threaded fitting.

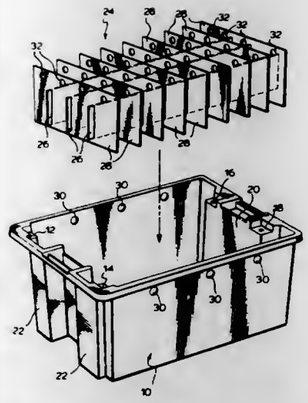
5,555,844
SCATTER FREE LITTER BOX
Norton Kolomeyer, 5694 Greenridge Rd., Castro Valley, Calif. 94552
Filed Jun. 12, 1995, Ser. No. 490,025
Int. Cl.[6] A01K *1/035*
U.S. Cl. 119—165 **6 Claims**



1. A litter box for containing animal litter for household cats, the litter box comprising:
a substantially rectangular container, having a bottom with four side walls and rounded corners interconnecting the sidewalls, wherein the interconnected sidewalls form an open top with a perimeter brim; and,
a removable cover frame with a substantially rectangular, central opening with an inner flat lip, an outer flat rim and an intermediate incline bevel between the inner lip and the outer rim, wherein the outer flat rim has an outer edge with a perimeter band perpendicular to the flat rim, the flat rim seating on the brim of the container with the perimeter band engaging the brim to retain the cover frame on the container during use, the incline bevel being directed inward and downward from the flat rim to the flat lip, wherein the flat rim and flat lip are substantially parallel with the bottom of the container with the outer rim higher than the inner lip when the cover frame is retained on the container.

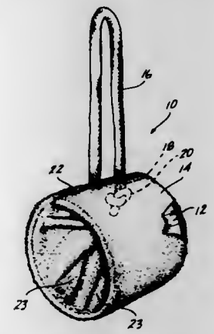
5,555,845
CONTAINER AND METHOD FOR TRANSPORTING LIVE CRUSTACEANS
Thomas S. Flynn, Suite 700, 5959 Spring Garden Road, Halifax, Nova Scotia, Canada
Filed Sep. 29, 1994, Ser. No. 313,603
Int. Cl.[6] A01K *63/02*
U.S. Cl. 119—201 **7 Claims**

1. A container for lobster and other live aquatic crustacean cargo comprising:



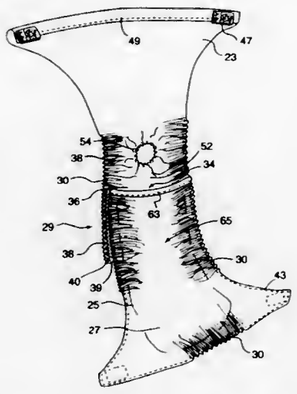
a bin stackable on similar bins; and
a divider assembly mountable within the bin, the divider assembly having runner partition walls to extend the full extent of the bin in one direction of the bin; and cross partition walls to extend the full extent of the bin at right angles to the runner partition walls, to divide the bin into compartments of a size to receive an individual live aquatic crustacean;
said cross partition walls being slidably positionable longitudinally of the runner partition walls within the bin to vary the size of the compartments in use.

5,555,846
BIRD SNUGGLY
Linda Van De Bogart, 30415 SE. 40th, Fall City, Wash. 98024
Filed Jan. 12, 1995, Ser. No. 371,951
Int. Cl.[6] A01K *29/00*
U.S. Cl. 119—708 **3 Claims**



1. A bird snuggly toy for use with a pet bird the toy comprising:
a tube having an approximately circular cross section sized to closely accommodate the bird, said tube having openings at both ends to allow the bird to enter the tube at either end;
a rope attached to the top of the tube at both ends and extending upward from the surface of the tube to form a loop to hang the toy from a bird cage, the rope being formed of a nontoxic material; and
a plush, soft, nontoxic material lining the interior and exterior of the tube, said material gathered to form a plurality of folds in said material that extend inward from the interior surface of the tube to provide a soft, compliant, plush surface into which the bird may snuggle, the folds compressing to conform to the shape of the bird when the bird presses against the folds.

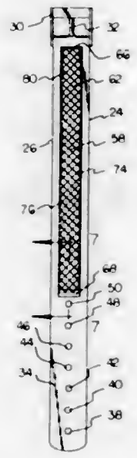
5,555,847
DOG DIAPER
Wanda M. Kelly, RR 4, D-727 Ammon Road, Moncton, NB, Canada
Filed Jul. 10, 1995, Ser. No. 500,171
Claims priority, application United Kingdom, Jul. 11, 1994, 9413956
Int. Cl.[6] A01K *13/00*
U.S. Cl. 119—850 **17 Claims**



2. Disposable diaper for a dog or other animal, wherein:
the diaper is of such a structure as to be suitable for placement upon the dog;
the diaper includes a means for constraining the diaper as to its position with respect to the tail of the dog;
the diaper includes a sheet of waterproof plastic material;
the diaper is formed with a pocket, comprising a front cover and an underlying rear cover, the rear cover of the pocket being formed in and of the plastic material;
the front cover has an upper extremity, which extends in the lateral or transverse right-left direction;
the diaper includes left and right lines of stitching extending in the longitudinal front-rear direction, and lying across the upper extremity;
at the lines of stitching, the front cover of the pocket, including the upper extremity, is stitched to the underlying rear cover;
the left and right lines of stitching are spaced apart laterally, whereby an unattached portion of the upper extremity is defined between the lines of stitching, the portion being an area in which the upper extremity is not attached to, but is separable from, the underlying area of the rear cover;
a mouth of the pocket is defined as the area between the unattached portion of the upper extremity of the front cover of the pocket and the underlying area of the sheet, whereby the upper extremity comprises a lip of the said mouth;
the pocket, and the mouth thereof, are so positioned in the diaper as, in use of the diaper on a dog, to receive solid excrement excreted by the dog.

5,555,848
PET/FLEA COLLAR
Wendy J. Trujillo, and Richard S. Trujillo, both of 17500 Hoot Owl Way, Morgan Hill, Calif. 95037
Filed May 17, 1995, Ser. No. 443,596
Int. Cl.[6] A01K *27/00*
U.S. Cl. 119—654 **1 Claim**

1. A new and improved pet/flea collar comprising, in combination:
a band of flexible material having an exterior surface and an interior surface and a first end and a second end and a pair of vertical side edges, the first end including a buckle formed of



a rigid material having a buckle tongue, the second end having a buckle engaging portion with a plurality of holes formed thereon for selective coupling with the buckle tongue, the holes including a first hole adjacent to a second hole and a last hole remote from the second hole, the first end further including a D-ring spaced from the buckle and being formed of a rigid material capable of receiving the second end upon coupling of the buckle and buckle engaging portion, the interior surface having a pile-type fastener assembly attached thereto and being adjacent to the last hole of the buckle engaging portion of the band, the band further having a predetermined length and width sized to be formed into a generally cylindrical configuration by coupling the buckle and the buckle engaging portion;

a flexible ribbon of air permeable material being a nylon mesh, the ribbon having an exterior surface and an interior surface and a first end and a second end with a pile-type fastener assembly and a pair of vertical sides edges, the ribbon having diamond configured holes therein, the ribbon being about 75% of the length of the band and positionable on the interior surface of the band with the first end of the ribbon spaced from the first end of the band and adjacent to the D-ring, the second end of the ribbon being adjacent to the last hole of the buckle engaging portion of the band, and the pair of vertical side edges being spaced from the vertical side edges of the band, the ribbon being permanently attached to the interior surface of the band by a stitched seam sewn along the first end and the vertical side edges of the ribbon and forming a pocket therein, the pocket having an opening formed at the second end of the ribbon and adjacent the last hole of the band, the pile-type fastener assembly of the ribbon being integral with the pocket opening and capable of engaging the pile-type fastener assembly of the band; and

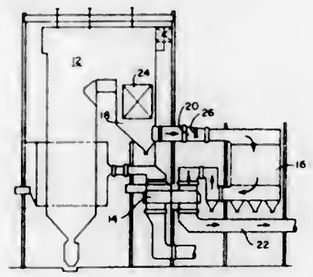
a strip of flexible material formed of an insecticide impregnate sized for placement in the pocket formed by the ribbon being attached to the band, the strip having a pair of rounded ends with a length about 75% of the length of the pocket, the strip capable of being slidably secured in the pocket when the pile-type fastener assembly of the ribbon couples with the pile-type fastener assembly of the band, the strip capable of being slidably removed form the pocket by disengaging the pile-type fastener assemblies of the ribbon and the band.

5,555,849

GAS TEMPERATURE CONTROL SYSTEM FOR CATALYTIC REDUCTION OF NITROGEN OXIDE EMISSIONS

Robert N. Wiechard, Granby, Conn.; John M. Banas, Warren, Mass., and Richard D. Brown, Newington, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 22, 1994, Ser. No. 362,792
Int. Cl.[6] B09B *3/00*; **F22B** *1/00*
U.S. Cl. 122—4 D **2 Claims**



1. A method of operating a steam generator process which generates a flue gas stream and in which an economizer heat exchanger is located in a flue gas pass of said steam generator for the transfer of heat from said flue gas stream to a feedwater stream in said economizer heat exchange and including a bypass circuit for said feedwater stream around said economizer heat exchanger, and further including a catalytic process located in said flue gas stream downstream of said economizer heat exchanger for reducing nitrogen oxides comprising controlling the temperature of the flue gas stream flowing from said flue gas pass to said catalytic process during low load operations including the steps of:

a. monitoring said flue gas stream temperature downstream of said economizer heat exchanger to determine when said temperature is less than a desired minimum level for said catalytic process;

b. at least partially opening said bypass circuit whereby at least some of said feedwater flows through said bypass circuit when said temperature is less than said desired minimum level; and

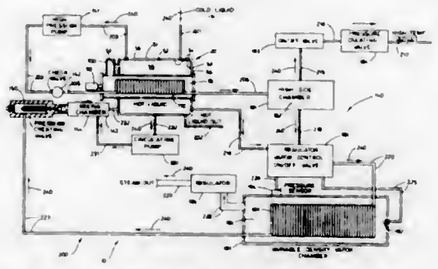
c. modulating said feedwater flow through said bypass circuit to maintain a desired flue gas stream temperature.

5,555,850

METHOD AND APPARATUS FOR HEATING LIQUID

Kevin M. Garcia, Clovis, Calif., assignor to Morris F. Garcia, Clovis, Calif.

Filed May 13, 1994, Ser. No. 242,128
Int. Cl.[6] F22B *37/10*
U.S. Cl. 122—248 **13 Claims**



1. A method for heating liquid comprising the steps of

pressurizing the liquid to a pressure sufficient substantially to prevent the conversion of the liquid to vapor when heated;

passing the resulting pressurized liquid along a conduit which is coiled to form a coil within a heating vessel; applying radiant heat to the coil of the conduit to heat the liquid;

drawing off liquid heated in said applying step; segregating said heated liquid into separate portions for individual usage retaining a first of said portions of the heated liquid for usage as a highest temperature heated liquid; and

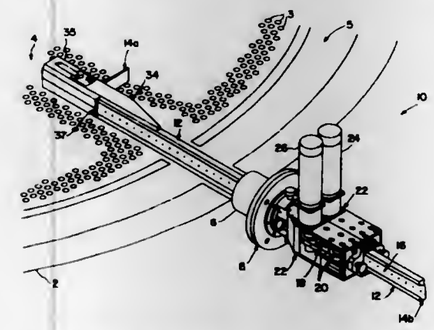
placing a second of said portions of the heated liquid in a liquid chamber substantially surrounding said heating vessel for heating of said second portion therefrom.

5,555,851

AUTOMATED SLUDGE LANCE

James P. Vandenberg, Cambridge, Canada, assignor to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 189,619, Feb. 1, 1994, abandoned. This application Apr. 3, 1995, Ser. No. 416,590
Int. Cl.[6] F28G *3/16*; **F22B** *37/52*
U.S. Cl. 122—392 **9 Claims**



1. An automated sludge lance for removing sludge located between tubes within a steam generator, comprising:

a U-shaped lance guide channel constructed to remotely move in a no-tube lane of a steam generator to a selected position, said U-shaped lance guide channel having a guide head attached at one end positioned inside the steam generator;

a waterlance movably contained within and held by said U-shaped lance guide channel, said waterlance being constructed to remotely move with and within said U-shaped lance guide channel and extend out from said U-shaped lance guide channel directed at a preset angle by said guide head and to a predetermined length between tubes inside a tube bundle in the steam generator, said waterlance further being constructed to receive a fluid and direct the fluid into the steam generator between tubes to remove sludge therefrom;

a first servo motor attached to a bracket and constructed to receive said U-shaped lance guide channel and to move said U-shaped lance guide channel with said waterlance to the selected position in the steam generator, said first servo motor being positioned outside the steam generator and engaging said U-shaped lance guide channel through a plurality of holes therein to position said U-shaped lance guide channel with said waterlance inside the no-tube lane of the steam generator from outside the steam generator; and

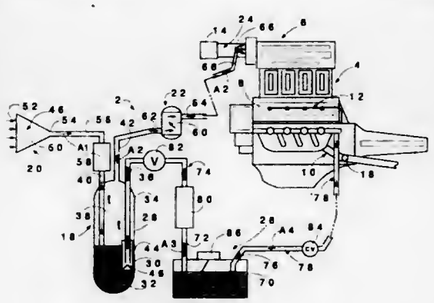
a second servo motor attached to a bracket and constructed to receive said U-shaped lance guide channel with said waterlance for moving said waterlance in and out from said U-shape lance guide channel in between the tubes of the steam generator, said second servo motor also being positioned outside the steam generator and engaging said waterlance through a plurality of holes therein to manipulate said waterlance in and out from said U-shaped lance guide channel and directed by said guide head between tubes inside the steam generator, said second servo motor controlling waterlance movement from outside said steam generator.

5,555,852

ALCOHOL INJECTION SYSTEM AND METHOD FOR INTERNAL COMBUSTION ENGINES

Louis D. Reymanandt, IV, 590 11th Ave., Vero Beach, Fla. 32962

Filed Jul. 31, 1995, Ser. No. 509,512
Int. Cl.[6] F02M *17/22*
U.S. Cl. 123—1 A **13 Claims**



1. In an improved fuel supply system for an internal combustion engine of a motor vehicle which includes an air intake manifold through which air passes to form a combustible mixture in the combustion chambers of said engine, an exhaust manifold through which combustion gases discharge from the combustion chambers of said engine and fuel charging means to charge fuel to said combustion chambers of said engine, the improvement which comprises in combination:

alcohol vaporization means, air stream means, a surge unit, a venturi unit, and an alcohol supply means,

said alcohol vaporization means comprising an enclosed vessel including a lower section to hold liquid alcohol, an upper section to contain alcohol vapors, a first inlet conduit to admit liquid alcohol into said lower section, a second inlet conduit to admit a stream of air into said lower section, a first outlet conduit to discharge alcohol vapors from said upper section and control means to manage the volume of liquid alcohol contained in said vessel,

said air stream means comprising a pressurized air supply device including an air inlet portion, an air outlet portion and first tubular means connecting said outlet portion to said second inlet conduit,

said surge unit comprising a baffled chamber, a third inlet conduit and a second outlet conduit, said first outlet conduit being connected to said third inlet conduit for flow of vaporized alcohol from said vessel into said surge unit,

said venturi unit comprising a fourth inlet conduit operatively connected to a discharge orifice positioned within said air intake manifold to discharge vaporized alcohol streamwise into said air which passes and said fourth inlet conduit extends externally of said air intake manifold for connection to said second outlet conduit for passage of vaporized alcohol streamwise from said surge unit to said orifice,

said alcohol supply means comprising a tank, a third outlet conduit to discharge liquid alcohol from said tank operatively connected by third tubular means to said first inlet conduit to charge liquid alcohol from said tank into said vessel, a fifth

inlet conduit into said tank and fourth tubular means connecting said fifth inlet conduit to said exhaust manifold to pressurize said tank with said combustion gases.

5,555,853

LIGHTWEIGHT BACK-PACK GENERATOR SET HAVING A SPARK-IGNITED ENGINE OPERATING ON MIDDLE DISTILLATE FUELS

Douglas M. Bowen, 6626 Riggs, Overland Park, Kans. 66202; Clint D. Gray, 1105-20 Deerfield Dr., Nepean, Canada; Douglas E. Campbell, 10608 W. 126th Terr.., Overland Park, Kans. 66213; David Collier, 6058 Malakoff Rd., RR 3, Richmond, Canada; Steven L. Hickman, 15000 E. 39th Terrace, Independence, Mo. 64055; Norman J. Hole, Box 517, 6215 Dunning Rd., Vars, Canada; Norman J. Kessens, 2224 NW 12th St., Blue Springs, Mo. 64015; Gary D. Webster, 76 Blackburn Ave., Ottawa, Canada; John H. Walker, 12015 Overbrook Rd., Leawood, Kans. 66209, and Daniel L. Walters, 513 Brad Circle, Blue springs, Mo. 64014

Filed Mar. 29, 1994, Ser. No. 219,096

Int. Cl.[6] F02M *31/00*; F02B *63/04*

U.S. Cl. 123—2 **50 Claims**

1. A lightweight, back-pack generator set comprising:

a back-pack frame having a means for attaching an engine and an alternator to said frame and adapted for carrying said generator set;

the engine being adapted to operate on a middle distillate fuel and comprising:

a spark-ignited internal combustion engine including a spark plug and a drive shaft rotatable by the engine;

an engine fuel reservoir for containing the middle distillate fuel;

a carburetor for mixing air with the distillate fuel and having an outlet and an inlet coupled to the engine fuel reservoir;

a manifold coupled between the carburetor outlet and a cylinder chamber for providing the air-fuel mixture to the cylinder chamber;

a means for starting the engine; and

a preheater for heating the manifold to facilitate start-up of the engine to cause the drive shaft to rotate, wherein the preheater heats the air-fuel mixture so that the spark plug ignites the middle distillate fuel during start-up; and

the alternator having a rotor coupled to said drive shaft for converting the mechanical rotational motion of the drive shaft into electrical energy.

5,555,854

COOLING SYSTEM FOR AN INTERNAL-COMBUSTION ENGINE OF A MOTOR VEHICLE COMPRISING A THERMOSTATIC VALVE WHICH CONTAINS AN ELECTRICALLY HEATABLE EXPANSION ELEMENT

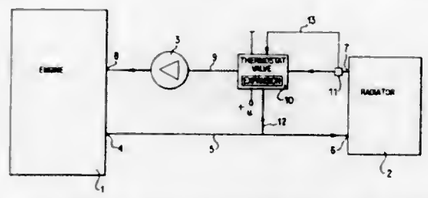
Gerhart Huemer, Neukeferloh; Heinz Lemberger, Unterföhring, and Peter Leu, Denkendorf, all of Germany, assignors to Behr-Thomson Dehnstoffregler GmbH, Kornwestheim, and Bayerische Motoren Werke AG, Munich, both of Germany

Filed Jan. 20, 1995, Ser. No. 376,560

Claims priority, application Germany, Jan. 20, 1994, 44 01 620.4

Int. Cl.[6] F01P *7/14*

U.S. Cl. 123—41.1 **4 Claims**



1. Cooling system for an internal-combustion engine of a motor vehicle, comprising:

a radiator having a radiator outlet;

a thermostatic valve coupled to the radiator by means of which the temperature of the coolant is controlled in a warm-up operation, a mixed operation and a radiator operation, the thermostatic valve containing an expansion element which is electrically heated for reducing the coolant temperature by increasing an opening of the thermostatic valve;

wherein the thermostatic valve containing the expansion element is designed such that the coolant temperature is controlled without any heating of the expansion element in said mixed operation to an upper operating limit temperature; and

a temperature switch coupled to the expansion element of the thermostatic valve, said temperature switch being switchable to directly signal the heating of the expansion element as required in order to shift the method of operation of the cooling system toward the radiator operation as a function of the coolant temperature detected at the or near the radiator outlet which approximates a load of the engine.

5,555,855

WATER CIRCULATION SYSTEM FOR MARINE ENGINE

Masanori Takahashi, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha dba Sanshin Industries Co., Ltd., Hamamtsu, Japan

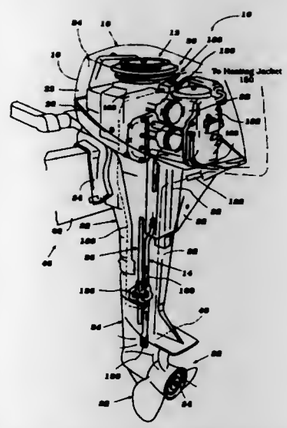
Filed Jan. 11, 1995, Ser. No. 371,413

Claims priority, application Japan, Jan. 11, 1994, 6-001285; Jan. 11, 1994, 6-001286; Jan. 11, 1994, 6-001287

Int. Cl.[6] F01P *7/14*

U.S. Cl. 123—41.08 **23 Claims**

1. A water circulation system for a watercraft engine of the type including an intake manifold and an exhaust discharge system, said water circulation system comprising a heating jacket configured to extends along at least a portion of the intake manifold and a control valve which communicates with said heating jacket through a first outlet port of said control valve, an engine water jacket formed within the engine, said engine water jacket being connected to said control valve such that water flow through said water circulation system flows through said engine water jacket and into said control valve, and a recirculation conduit which connects a second outlet port of said control valve to an inlet of the engine water jacket so as to recirculate water flow between said control valve and said engine water jacket, said control valve adapted to prevent water flow through said heating jacket when the temperature of the water



is below a desired preset lower temperature limit, and adapted to direct water flow through said first port and to prevent water flow through said second port when the temperature of the water entering said control valve from said engine water jacket is above a desired preset upper temperature limit.

5,555,856

OIL-COOLED RECIPROCATING INTERNAL COMBUSTION ENGINE

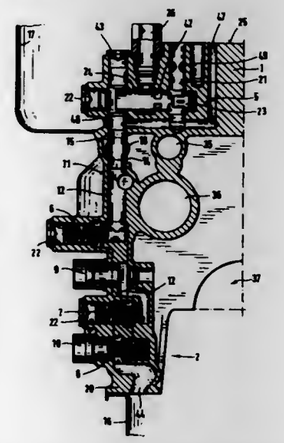
Lothar Bauer, Köln; Herbert Schleiermacher, Brühl; Werner Lemme, Rösrath, and Wolfgang Strusch, Köln, all of Germany, assignors to Klockner-Humboldt-Deutz AG, Cologne, Germany

Filed Dec. 15, 1994, Ser. No. 358,082

Claims priority, application Germany, Dec. 15, 1993, 43 42 799.5

Int. Cl.[6] F01P *3/00*

U.S. Cl. 123—41.42 **8 Claims**



1. An oil-cooled reciprocating internal combustion engine comprising:

a cylinder crankcase, said cylinder crankcase being sealingly closed by a cylinder head and an oil pan;

a crankshaft rotatably supported in said cylinder crankcase;

a cylinder liner in said cylinder crankcase;

a piston guided in said cylinder liner,

a connecting rod interconnecting said piston and said crankshaft; and

oil fittings in said cylinder crankcase (1), said oil fittings being positioned on said crankcase so as to be accessible from outside said engine, said oil fittings including an oil filter base (18), a pressurizer valve (6), a heating valve (7), an anti-draining valve (8), a heating supply connection (9) and a heating return connection (10); said pressurizer valve (6), said heating valve (7), said anti-draining valve (8), said heating supply connection (9) and said heating return connection (10) forming a valve strip (2).

5,555,857

FLUID LEVEL INDICATOR SYSTEM

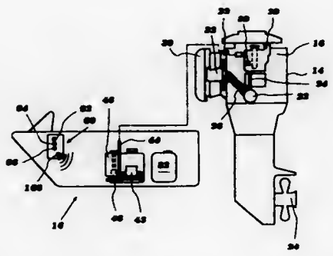
Isao Kanno, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 23, 1995, Ser. No. 447,898

Claims priority, application Japan, May 23, 1994, 6-108071

Int. Cl.[6] F01M *1/00*; G01F *23/20*

U.S. Cl. 123—73 AD **10 Claims**



1. An system for providing an indicator light operated by a fluid level sensor, comprising:

a power source providing a voltage to a first node;

a first circuit branch including a first switch connecting said first node to ground through a first LED when said first switch is closed; and

a second circuit branch connecting said first node to ground through a voltage dropping element and a second LED, wherein the voltage drop in said second circuit branch when said first switch is open is greater than the voltage at said first node when said first switch is closed, such that said second LED is normally on when said first switch is open, and said first LED is on and said second LED is off when said first switch is closed.

5,555,858

ENGINE MANAGEMENT SYSTEM

Masahiko Kateh, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed May 11, 1995, Ser. No. 439,489

Claims priority, application Japan, May 11, 1991, 6-120611

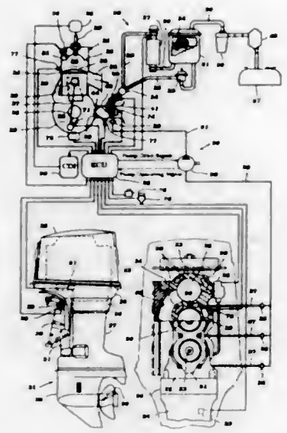
Int. Cl.[6] B63H *21/26*

U.S. Cl. 123—73 SC **78 Claims**

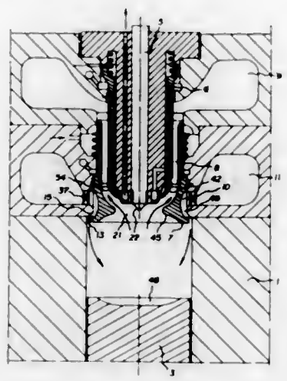
1. A two-cycle crankcase compression internal combustion engine having an induction system for delivering at least an air charge to a combustion chamber of said engine, said engine having an area where fuel and lubricant may accumulate as a fluid during engine operation, pumping means for pumping accumulated fluid from said area, means for sensing a condition, and control means for operating said pumping means only when said condition is sensed.

the abovementioned cylindrical wall, and mounted coaxially such that the inlet valve is situated on the outside of the

a cup-shaped tappet slidably disposed within the cylinder head for engaging said two cam members;



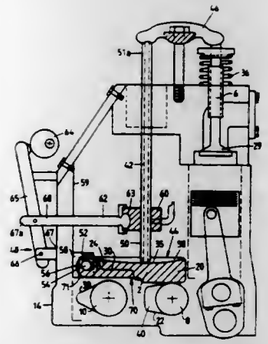
5,555,859
INTERNAL COMBUSTION ENGINES
Jean F. Melchior, and Thierry Andre, both of Paris, France, assignors to S.N.C. Melchior Technologie, France
Filed Sep. 7, 1994, Ser. No. 302,007
Claims priority, application France, Sep. 13, 1993, 93 10853
Int. Cl.[6] F01L *1/28*
U.S. Cl. 123—79 C **21 Claims**



1. Internal combustion engine comprising:
at least one variable-volume working chamber delimited by a cylindrical wall in which there slides a piston, the moving upper face of the said piston and a stationary cylinder head,
means for injecting atomized liquid fuel under high pressure into said at least one working chamber, which operates on a two-stroke cycle, with a loop-scavenging system across the cylinder head, controlled by at least one inlet valve interacting with a seat, so as to cause the working chamber to communicate cyclically with an inlet cavity, wherein said inlet cavity communicates with the means for supplying the engine with fresh air, and at least one exhaust valve interacts with a seat, so as to cause the working chamber to communicate cyclically with an exhaust cavity, wherein said exhaust cavity communicates with the system for exhausting the combustion gases from the engine;
said inlet and exhaust valves being of axisymmetric shape and having coincident axes, preferably coincident with the axis of the abovementioned cylindrical wall, and mounted coaxially such that the inlet valve is situated on the outside of the exhaust valve,
said seat of the inlet valve being integral with the cylinder head and orientated such that the pressure of the fluid contained in the working chamber exerts a force which tends to press said inlet valve onto its seat, and being situated close to the periphery of the upper part of said cylindrical wall in which the piston slides, and in contact with the cylinder head,
elastic return means for biasing said inlet valve against said seat integral with the cylinder head,
and means for generating a force which is parallel to the axis of the inlet valve and which points towards the piston, said force cyclically unseating said inlet valve from its seat, to cause the working chamber of the engine to communicate with the inlet cavity communicating with the means for supplying the engine with fresh air,
rotation-inducing means interposed between said inlet cavity and said seat of the inlet valve so as to impart an overall rotational movement around an axis substantially coincident with the axis of the said cylindrical wall, to the air introduced into the working chamber during scavenging of the engine,
and wherein the exhaust valve is of axisymmetric shape and includes a lower part of tubular shape which has an internal wall which slides, in a leaktight manner, by virtue of sealing means, around a central hub which is borne by the cylinder head, and wherein said lower part has a bearing surface coaxial with said tubular part, so that it can interact with a seat which is formed inside the lower part of said inlet valve, thus making it possible to cause the exhaust cavity to communicate with the working chamber by virtue of the annular space delimited radially by the inside wall of the inlet valve and by the outside wall of the exhaust valve,
elastic return means being provided for applying the bearing surface of the tubular lower part of said exhaust valve against the seat formed at the lower part of the inside wall of the said inlet valve,
and means for generating a force which is parallel to the axis of the exhaust valve and points towards the cylinder head away from the piston unseating said exhaust valve from its seat making it possible to cause the working chamber of the engine to communicate with said exhaust cavity communicating with the system for exhausting the combustion gases from said engine,
and wherein said means for injecting atomized liquid fuel under high pressure includes an injection nozzle which emerges into the working chamber substantially at the center of the said central hub.

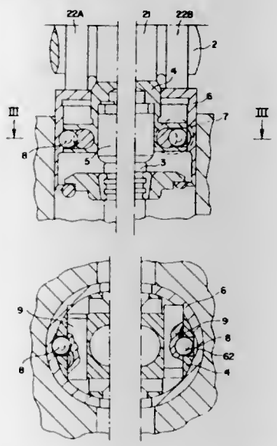
5,555,860
VALVE CONTROL MECHANISM
Donald C. Wride, 35 Helen Terrace, Valley View, South Australia, 5093, Australia
PCT No. PCT/AU92/00187, § 371 Date Jun. 2, 1994, § 102(e) Date Jun. 2, 1994, PCT Pub. No. WO92/19847, PCT Pub. Date Nov. 12, 1992
PCT Filed Apr. 24, 1992, Ser. No. 140,011
Claims priority, application Australia, Apr. 24, 1991, PK5759
Int. Cl.[6] F01L *1/04;1/18;* **F02D** *13/02*
U.S. Cl. 123—90.16 **9 Claims**

1. A control mechanism for an engine valve, comprising two rotatable cams which engage a lever at two follower regions at different position, the lever having a zone of application linked to the valve whereby rocking movement of the lever consequent on rotation of the cams causes opening and closing of the valve, wherein one of the two cams is in constant engagement with the lever and the other cam is in periodic engagement with the lever, a gap being provided between the other cam and its respective follower region when the other cam is not in periodic engagement with the lever, the width of the gap affecting the duration of opening and closing of the valve and its stroke length, said zone of application being linked to the valve by means comprising a



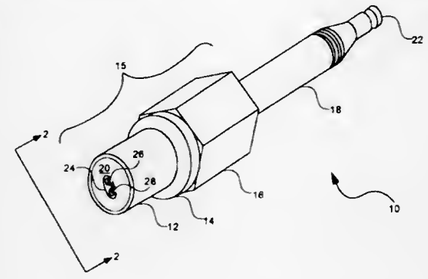
pushrod intermediate the lever and the valve such that one end of the pushrod engages the lever at the zone of application of the lever, the arrangement being such that said one end of the pushrod is movable along the lever to thereby vary the valve stroke length.

5,555,861
DRIVE FOR GAS EXCHANGE VALVES, PREFERABLY INLET VALVES FOR RECIPROCATING INTERNAL COMBUSTION ENGINES
Bertold Mayr, Gauting; Leopold Müller, Chemnitz, and Joachim Böhme, Lichenwalde, all of Germany, assignors to IAV Motor GmbH, Chemnitz, Germany
PCT No. PCT/DE93/00357, § 371 Date Oct. 14, 1994, § 102(e) Date Oct. 14, 1994, PCT Pub. No. WO93/22543, PCT Pub. Date Nov. 11, 1993
PCT Filed Apr. 22, 1993, Ser. No. 318,832
Claims priority, application Germany, Apr. 27, 1992, 42 13 856.6; Jul. 31, 1992, 42 25 796.4; Dec. 28, 1992, 42 44 287.7
Int. Cl.[6] F01L *13/00;1/14*
U.S. Cl. 123—90.16 **6 Claims**



1. A valve drive for controlling gas exchange valves of an internal combustion engine having a cylinder head, a valve stem and a longitudinal tappet axis comprising:
a camshaft having a first cam with a first cam profile and a second cam with a second cam profile greater than said first cam profile, said second cam comprising two cam members which abut both sides of said first cam;
a cup-shaped tappet slidably disposed within the cylinder head for engaging said two cam members;
a central tappet disposed within said cup-shaped tappet for engaging said first cam;
a lash adjuster disposed within said central tappet and supported against the valve stem; and
a hydraulic switching arrangement disposed between said cup-shaped tappet and said central tappet for selectively moving the valve stem according to said first and second cam profiles comprising:
(i) concave contours within one of said tappets oriented transverse to the longitudinal tappet axis;
(ii) radially-displaceable convex drivers within the other of said tappets for selectively engaging the concave contours when said cams are positioned at their base circles; and
(iii) a hydraulically-driven locking element movably supported in a plane oriented transverse to the longitudinal tappet axis for selectively displacing said drivers into the concave contours to lock said tappets together and move the valve stem according to said second cam profile and displacing said drivers out of the concave contours to unlock said tappets from each other and move the valve stem according to said first cam profile.

5,555,862
SPARK PLUG INCLUDING MAGNETIC FIELD PRODUCING MEANS FOR GENERATING A VARIABLE LENGTH ARC
Luigi P. Tozzi, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.
Filed Jul. 19, 1994, Ser. No. 277,197
Int. Cl.[6] F02P *23/00*
U.S. Cl. 123—143 B **10 Claims**



1. A spark plug device comprising:
a non-conductive substantially cylindrical shell, said shell including a first end and a second end, said first end defining a cavity therein;
a first electrode situated within said cavity;
a second electrode situated within said cavity;
magnetic field generating means attached to said shell near said cavity and producing a magnetic field, that, in conjunction with current flowing between said first and second electrode, urges a plasma arc established between said first and second electrodes in an outwardly direction from within said cavity, and wherein said shell provides electrical insulation between said first and second electrodes and said magnetic field generating means; and
wherein said first and said second electrodes define a diverging gap within said cavity.

5,555,863
AUTOMOBILE ENGINE STARTER

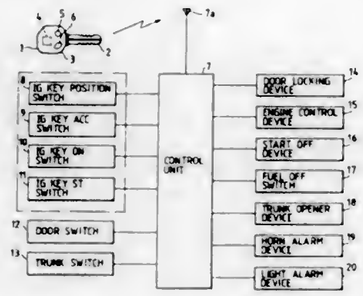
a first and second casing cover secured to said casing outer faces;

5,555,863

AUTOMOBILE ENGINE STARTER

Sadao Kokubu, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Dec. 16, 1994, Ser. No. 356,957
Claims priority, application Japan, Dec. 17, 1993, 5-317932
Int. Cl.[6] B60R *25/04*; **F02N** *11/08*
U.S. Cl. 123—179.3 **2 Claims**



1. An engine starter system for an automobile having a body with a side, an ignition key cylinder, and an engine, the engine starter system comprising:

a key having a transmission means for transmitting an atmospheric propagation signal containing an identification code;

reception means for receiving the atmospheric propagation signal, the reception means being provided on the body side of the automobile;

key detecting means for detecting the insertion of the key into the ignition key cylinder of the automobile, the key detecting means being provided in the ignition key cylinder; and

control means for outputting a signal for effecting the starting of the engine of the automobile on a first condition that the identification code contained in the atmospheric propagation signal matches a prestored identification code in the control means, and further on a second condition that the atmospheric propagation signal is received by the reception means before the key is turned in the key cylinder and within a predetermined time period after a key insertion detection signal is received by the control means from the key detecting means, when the predetermined time period expires and the atmospheric propagation signal has not been received by the reception means, the control means prevents the starting of the engine regardless of a match of the identification code contained in the atmospheric propagation signal with the prestored identification code in the control means.

5,555,864

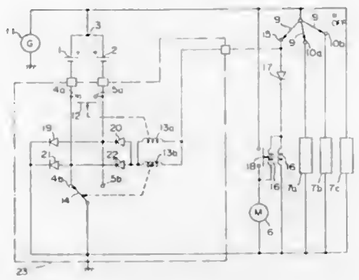
ELECTRIC SOURCE CONTROL DEVICE OF INTERNAL COMBUSTION ENGINE DRIVE VEHICLE

Tsutomu Miyakawa; Hideki Nishihara; Takaaki Kuga; Kazunori Shinohara, and Makoto Ishikawa, all of Ehime, Japan, assignors to Hukuto Manufacturing Co., Ltd., Japan

PCT No. PCT/JP93/01468, § 371 Date Aug. 2, 1995, § 102(e) Date Aug. 2, 1995, PCT Pub. No. WO95/10704, PCT Pub. Date Apr. 20, 1995
PCT Filed Oct. 13, 1993, Ser. No. 244,868
Int. Cl.[6] F02N *11/08*
U.S. Cl. 123—179.28 **5 Claims**

1. An electric source control device of an internal combustion engine drive vehicle characterized in that it comprises

a primary battery and a secondary battery which are mounted on said internal combustion engine drive vehicle, which are provided with a common terminal of (+) polarity and two independent terminals of (−) polarity and which supply an engine starter and loads with electricity,



a generator which charges said primary battery and said secondary battery through said common terminal of (+) polarity and which is driven by the engine of said internal combustion engine drive vehicle,

a primary control contact point which can connect the terminal of (−) polarity of said primary battery with the terminal of (−) polarity of said secondary battery and which can disconnect the former from the latter,

a secondary control contact point which can connect either of said terminals of (−) polarity of said primary battery and said secondary battery alternately with terminals of (−) polarity of said engine starter and said loads,

a tertiary control contact point which can connect said primary battery and said secondary battery with said engine starter when an engine switch is connected with the starting point, and

a control circuit in which when said engine switch is not connected with the starting point said primary control contact point moves to its OFF position to disconnect the terminal of (−) polarity of said primary battery from that of said secondary battery and said secondary control contact point is connected with only one of the terminals of (−) polarity of said primary battery and that of said secondary battery to make only one of said batteries supply said loads with electricity and

in which when said engine switch is connected with the starting point, said primary control contact point and said tertiary control contact point move to their ON positions to make both of said batteries supply said engine starter and said loads in parallel with electricity and simultaneously said secondary control contact point is switched to be connected with the one of the terminals of (−) polarity of said primary battery and said secondary battery from the other of the terminals of (−) polarity of said primary battery and said secondary battery.

5,555,865

AIR FLOW CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Yoon-Suk Kim, Kyungki-Do, Rep. of Korea, assignor to Hyundai Motor Company, Ltd., Seoul, Rep. of Korea

Filed Aug. 25, 1995, Ser. No. 519,523
Claims priority, application Rep. of Korea, Aug. 25, 1994, 94-21615
Int. Cl.[6] F02M *35/10*
U.S. Cl. 123—184.56 **5 Claims**

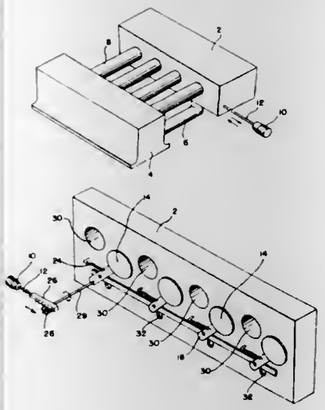
1. An air flow control device for an internal combustion engine, comprising:

a cylinder head of said internal combustion engine;

a plurality of low velocity and high velocity intake manifolds in communication with said cylinder head; and

a surge tank for temporarily storing fresh air, said surge tank being in communication with said cylinder head through said low and high velocity intake manifolds, said surge tank including:

a plurality of air passages disposed in said surge tank,



a plurality of on/off valve members for tightly opening and closing a corresponding one of each of the plurality of air passages, each said on/off valve member having a lever arm,

an elongated rod linked in a transverse orientation to each of said lever arms by a respective hinge pin,

a pinion rod having a first end fixed to a base end of one of the lever arms and extending perpendicularly therefrom,

an operating rod of an actuator, slidably inserted into said surge tank and positioned parallel to said elongated rod, and

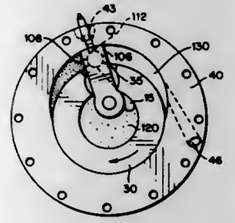
means for gearing a second end of said pinion rod to said operating rod, wherein upon actuating said operating rod, said means for gearing is rotated in a selected direction to correspondingly rotate said pinion rod and thereby force the lever of said valve member to rotate through an arc in a direction corresponding to the direction of rotation of said pinion rod, said elongated rod simultaneously actuating a remainder of said lever arms in a like direction, whereby in low and high speeds of the internal combustion engine, the on/off valve members selectively open and close the plurality of air passages.

5,555,866

ROTARY ENGINE

Jack A. Wilson, 121 Palmwood Dr., Pass Christian, Miss. 39571

Filed Jun. 6, 1995, Ser. No. 467,300
Int. Cl.[6] F02B *53/00*
U.S. Cl. 123—240 **28 Claims**



1. A rotary engine, comprising:

a hollow casing having outer faces and an interior surface defined by first and second intersecting cylindrical cavities;

a first and second casing cover secured to said casing outer faces;

a flywheel rotatably mounted to said first casing cover so as to rotate within said first cylindrical cavity of said casing, said flywheel having an inner cylindrical bore to define the radial boundaries of a compression chamber within said casing, said flywheel also having an outer surface combining with said casing interior surface defined by said second cylindrical cavity to thereby define the radial boundaries of an expansion chamber within said casing;

a power pack shaft secured to said first casing cover and extending the length of said casing through said compression chamber along the longitudinal of said second cylindrical cavity;

at least one power pack rotatably mounted on said power pack shaft for rotation through said compression and expansion chambers, said at least one power pack including an aft face, an input port and an output port in fluid communication with a combustion chamber at the outer end of said at least one power pack, said output port including at least one opening on said power pack aft face;

power pack engaging means to allow said at least one power pack to slidably engage and rotate with said flywheel;

intake means for permitting combustion elements to enter said compression chamber;

drive means for converting rotation of said flywheel into rotary power;

transport means for permitting combustion elements to flow from said compression chamber through the combustion chamber into said expansion chamber; and

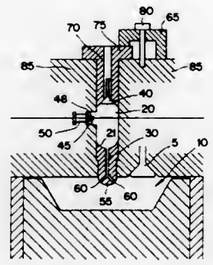
exhaust means for permitting release of combustion elements from said expansion chamber.

5,555,867

SWIRL FLOW PRECOMBUSTION CHAMBER

Paul D. Freen, Springfield, Ohio, assignor to Cooper Cameron Corporation, Houston, Tex.

Filed Sep. 30, 1994, Ser. No. 312,919
Int. Cl.[6] F02B *19/08*
U.S. Cl. 123—260 **18 Claims**



1. A combustion system comprising:

a main combustion chamber;

a precombustion chamber having a recess;

an igniter, disposed in the recess of the precombustion chamber, for igniting a combustible gas;

a communicating passage connecting the main combustion

a communicating passage connecting the main combustion chamber to the precombustion chamber, said passage being located so as to induce gas swirling in a vortical pattern in the precombustion chamber; and

the igniter is disposed in the precombustion chamber substantially on an axis of rotation of the vortical pattern.

5,555,868

GAS DELIVERY SYSTEM

Barry R. Neumann, Australind, Australia, assignor to Transcom Gas Technologies Pty. Ltd., Herdsman W.A., Australia

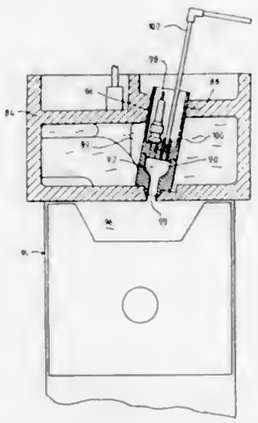
PCT No. PCT/AU92/00575, § 371 Date Nov. 21, 1994, § 102(e) Date Nov. 21, 1994, PCT Pub. No. WO93/08399, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 23, 1992, Ser. No. 232,133

Claims priority, application Australia, Oct. 23, 1991, PK9064

Int. Cl.[6] F02M *19/00*

U.S. Cl. 123—275 **9 Claims**



1. A gas delivery system for a gas fuelled internal combustion engine, the system comprising:

gas fuel delivery means for delivering a controlled amount of gaseous fuel to a region adjacent a source of ignition, said region comprising a pre-combustion zone located in a separate pre-combustion chamber which is located in immediate proximity to said ignition source and which is in direct communication through an orifice with a combustion zone located in a cylinder of the engine, said gas fuel delivery means comprising:

a single gas injector which is common to said pre-combustion zone and said combustion zone for said cylinder of the engine;

a first gas delivery line for delivering a controlled amount of gaseous fuel to said pre-combustion zone and a second gas delivery line for delivering a controlled amount of gaseous fuel to said combustion zone, both from said single gas injector common to said pre-combustion zone and said combustion zone for said cylinder, and

gas control means for controlling the relative proportions of gaseous fuel delivered by said first gas delivery line and said second gas delivery line from said single gas injector common to said pre-combustion zone and said combustion zone for said cylinder,

whereby, in use, combustion in said combustion zone can be achieved with minimum gaseous fuel by initiating ignition of gaseous fuel in said pre-combustion zone.

5,555,869

MULTI-VALVE ENGINE

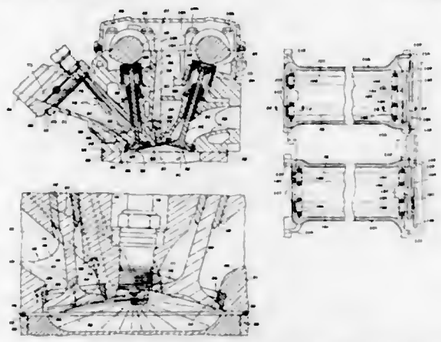
Masahiro Uchida, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Twata, Japan

Filed Aug. 29, 1994, Ser. No. 297,615

Claims priority, application Japan, Aug. 27, 1993, 5-234341; Aug. 27, 1993, 5-234342

Int. Cl.[6] F02B *15/00*

U.S. Cl. 123—308 **44 Claims**



1. A cylinder head assembly for an internal combustion engine having a lower surface adapted to cooperate with an associated cylinder bore in a cylinder block and a piston reciprocating therein to form a combustion chamber, a pair of side intake valve seats formed in said cylinder head surface and intersected by a plane containing the axis of the cylinder bore and lying substantially on one side of the plane, a center intake valve seat formed in said surface and disposed between said side intake valve seats and disposed completely on said one side of said plane, intake passages means formed in said cylinder head assembly and terminating at said valve seats, a spark plug mounted in said cylinder head assembly with its gap disposed in said combustion chamber, a plurality of poppet valves comprised of a pair of side poppet valves and a center poppet valve each having head portions adapted to control the flow through respective of the side and center intake valve seats, said valve head portions being connected to respective stem portions, each mounted for reciprocation in said cylinder head assembly, said side intake valves having their reciprocal axes disposed at a greater acute angle to the cylinder bore axis than said center intake valve, the lower surface of the head of said center poppet valve when in its closed position lying at an angle to a plane extending perpendicular to the cylinder bore axis no less than that of a plane passing between the lower peripheral edge of said center intake valve seat and the center of the gap of said spark plug so that the center poppet type intake valve does not mask any portion of the combustion chamber from flame travel upon the firing of said spark plug.

5,555,870

METHOD AND APPARATUS FOR SENSING AIR FLOW INTO A CYLINDER OF INTERNAL COMBUSTION ENGINE AND METHOD AND APPARATUS FOR CONTROLLING FUEL OF THE INTERNAL COMBUSTION ENGINE ARRANGED TO USE THE METHOD AND APPARATUS

Seiji Asano, Hitachinaka, Japan, assignor to Hitachi, Ltd., Japan

Filed Apr. 19, 1995, Ser. No. 425,687

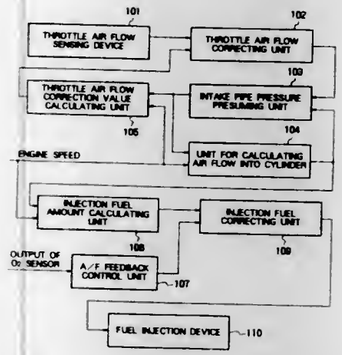
Claims priority, application Japan, Apr. 20, 1994, 6-081330

Int. Cl.[6] F02D *41/18*

U.S. Cl. 123—480 **28 Claims**

1. A method for sensing an air flow into a cylinder of an internal combustion engine, comprising the steps of:

determining a number of revolutions of said internal combustion engine;



determining a pressure of an intake pipe of said internal combustion engine and

deriving an air flow Qc into the cylinder of said internal combustion engine by the following linear expression, based on said number of revolutions and said pressure of the intake pipe;

whereby said linear expression is;

$$Qc=\alpha P+\beta$$

in which α is a coefficient indicating a gradient of the linear expression and defined according to said number of revolutions, β is a coefficient indicating an offset value of the linear expression and defined according to said number of revolutions, and P is a pressure value of said intake pipe.

5,555,871

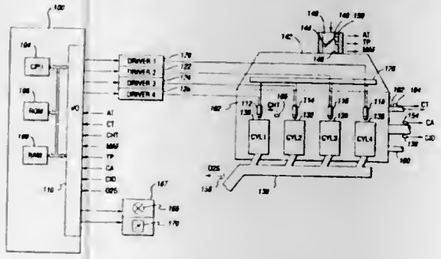
METHOD AND APPARATUS FOR PROTECTING AN ENGINE FROM OVERHEATING

Alexander Y. Gopp, Ann Arbor; Richard W. Sbaschnig, Dearborn, and Richard L. Buonocore, Sterling Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed May 8, 1995, Ser. No. 436,896

Int. Cl.[6] F02D *41/22;41/04;17/02*

U.S. Cl. 123—481 **23 Claims**



1. An overheat protection system for an internal combustion engine having cylinders and a cylinder head, the cylinders being independently deactivatable, the overheat protection system comprising:

a cylinder head temperature sensor operably coupled to sense the temperature of the cylinder head; and

a control system operably coupled to the cylinders and the cylinder head temperature sensor such that when the temperature of the cylinder head exceeds a maximum level, the control system deactivates at least one of the cylinders and rotates the deactivation of at least one of the engine cylinders such that no one cylinder is constantly fired thus providing engine cooling by drawing fresh air through the at least one deactivated cylinders.

5,555,872

FUEL PUMP CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE

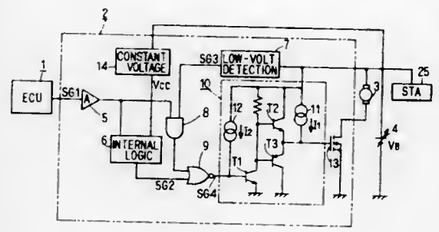
Shigeru Takeuchi, Gamagouri; Taketoshi Sato, Kariya, and Takahiko Hasegawa, Nukata-gun, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 24, 1995, Ser. No. 449,359

Claims priority, application Japan, May 26, 1994, 6-112875

Int. Cl.[6] F02M *37/04*

U.S. Cl. 123—497 **12 Claims**



1. A fuel control device for an internal combustion engine, said device comprising:

a switching element, connected in series with a battery and a drive motor for a fuel pump, for controlling an electric current from said battery to said motor;

a drive circuit, connected to a drive terminal of said switching element, for driving said switching element;

a control computer generating a first pump control signal in accordance with engine operating conditions;

a signal processing circuit, separate from said control computer and operated with a battery voltage of said battery, for producing a second pump control signal through a predetermined signal processing on said first pump control signal;

a low-voltage detection circuit, connected to said battery and separate from said control computer, for comparing said battery voltage with a threshold value indicative of a voltage level which assures a minimum drive voltage for an operation of said signal processing circuit, said detection circuit generating a detection signal indicative of a voltage condition of said battery voltage lower than said threshold value; and

a signal selection circuit, connected to said control computer, said signal processing circuit and said drive circuit and responsive to said detection signal, for selecting said first pump control signal and applying said first pump control signal to said drive circuit to drive said drive motor when said detection signal is produced and selecting said second pump control signal for said drive circuit when said detection signal is absent, said first pump control signal being determined to be more effective to drive said drive motor when said battery voltage is lower than said threshold value.

5,555,873

FUEL TANK SWITCHING APPARATUS

Jay A. Nolen, P.O. Box 9241, Evansville, Ind. 47724-7241

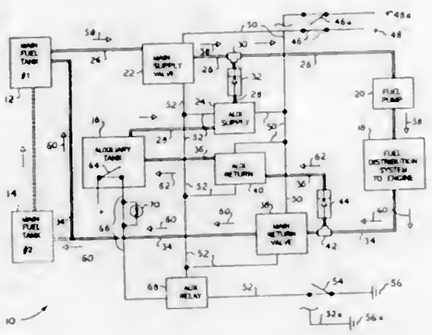
Filed Feb. 16, 1995, Ser. No. 389,394

Int. Cl.[6] F02B *13/00*

U.S. Cl. 123—575 **20 Claims**

1. A fuel tank switching apparatus for a motor vehicle, with the motor vehicle including at least a main fuel tank system, an engine fuel distribution system, and a parking brake system, said fuel tank switching apparatus comprising:

an outer envelope having an interior cavity, opposed side sur-



at least a main fuel supply valve providing for primary fuel supply from the main fuel tank system to the engine fuel distribution system of the motor vehicle, an auxiliary fuel tank system, and an auxiliary fuel supply valve providing auxiliary fuel supply from said auxiliary fuel tank system to the engine fuel distribution system of the motor vehicle, and;

automatic switching means communicating with said main fuel supply valve and said auxiliary fuel supply valve and controlled by operation of the vehicle parking brake system, with said automatic switching means closing said main fuel supply valve and opening said auxiliary fuel supply valve when the parking brake is applied, thereby causing stoppage of fuel delivery from the main fuel tank system and simultaneous initiation of fuel delivery from said auxiliary fuel tank system, and further opening said main fuel supply valve and closing said auxiliary fuel supply valve when the parking brake is released, thereby causing stoppage of fuel delivery from said auxiliary fuel tank system and simultaneous initiation of fuel delivery from the main fuel tank system of the motor vehicle, whereby;

switching from the main fuel tank system to said auxiliary fuel tank system of the motor vehicle is accomplished automatically without intervention of a vehicle operator when the vehicle parking brake is applied, and reversed when the vehicle parking brake is released.

5,555,874

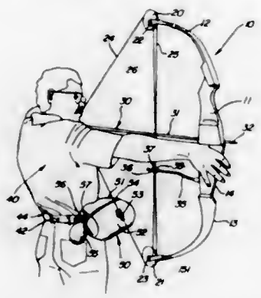
WAIST SUPPORTED BOW STRING STEADYING DEVICE FOR ARCHER

Huey P. Savage, Lake Forest, Calif., assignor to Savage Systems, Inc., Oak Grove, La.

Filed Oct. 12, 1994, Ser. No. 321,746

Int. Cl.° F41B *5/20*

U.S. Cl. 124—1 **17 Claims**



1. For use in steadying an archery bow having a bow string, a steadying device comprising:

an outer envelope having an interior cavity, opposed side surfaces, a hip-conforming surface and a front surface;

means for securing said outer envelope to an archer's waist such that said hip-conforming surface generally overlies the archer's hip; and

resilient means received within said outer envelope for resiliently supporting said front surface,

said steadying device being worn by an archer with said hip-conforming surface proximate the archer's hip such that said front surface extends outwardly and provides a resilient surface against which an archer may press a portion of a drawn bow string to steady a drawn bow and such that said opposed side surfaces extend between said front surface and said hip-conforming surface.

5,555,875

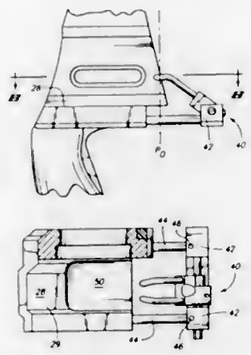
HANDLE RISER FOR AN ARCHERY BOW

Terry G. Martin, and Raymond Bray, both of Walla Walla, Wash., assignors to Martin Archery Inc., Walla Walla, Wash.

Filed Oct. 13, 1994, Ser. No. 323,268

Int. Cl.° F41B *5/22*

U.S. Cl. 124—44.5 **21 Claims**



1. A handle riser for an archery bow, comprising:

a main riser portion having an upper end, a lower end, and an intermediate region between the upper end and the lower end;

the main riser portion including an integral primary shelf portion located in the intermediate region of the main riser portion; and

a movably adjustable arrow rest assembly integrally incorporated into the shelf portion, the arrow rest being mounted for movement in fore and aft directions relative to the main riser portion between a normal arrow rest position and overdraw arrow rest positions.

5,555,876

CHIMNEY SAFETY AND CONTROL SYSTEM

Richard V. Francisco, Jr., and Jack E. Farrell, III, 1100 Pennsylvania Ave., Wilmington, Del. 19806

Filed Oct. 17, 1994, Ser. No. 324,242

Int. Cl.° F23L *11/00*

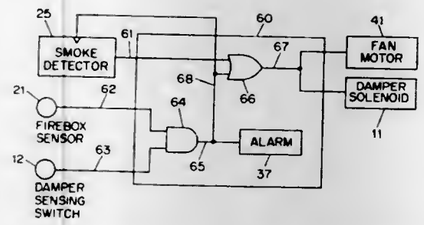
U.S. Cl. 126—504 **6 Claims**

1. A chimney safety control and alarm apparatus comprising:

a chimney, including a firebox cavity, a damper, and a flue;

a ventilation means, mounted to a top portion of the chimney, for ventilating the chimney;

a damper positioning means for adjusting the position of the damper;



a damper position detecting means for determining the position of the damper, said damper position detecting means producing a damper position signal indicating the position of the damper;

a firebox sensing means for sensing a predetermined condition of the firebox, said firebox sensing means producing a firebox signal indicating the presence of the predetermined condition;

a smoke detector located in proximity to the firebox to detect the presence of smoke, said smoke detector having an internal alarm, said smoke detector providing a single input/output lead, said internal alarm being activated by externally pulling said input/output lead to ground, said input/output lead also pulled to ground internally by said smoke detector when smoke has been detected by said smoke detector; and

a safety controller for activating the smoke detector internal alarm and the damper positioning means to open the damper and for activating the ventilation means to ventilate the chimney when the firebox signal received from the firebox sensing means indicates the presence of the predetermined condition within the firebox and the damper position signal received from the damper position detector means indicates that the damper is closed, said safety controller further activating said damper positioning means to open the damper and activating said ventilation means to ventilate the chimney when said smoke detector detects the presence of smoke in the proximity of said firebox;

said safety controller further comprising a transistor electrically coupled to said smoke detector input/output lead, said transistor for pulling said input/output lead to ground during the period in which the firebox signal is received from the firebox sensing means indicating the presence of the predetermined condition and the damper position signal is received from the damper position detector means indicating that said damper is closed, said safety controller transistor thereby activating said smoke detector internal alarm, for the period that said damper is open and said predetermined condition is detected in said firebox.

5,555,877

COVER FOR POND USED TO COLLECT SOLAR RADIATION

George S. Lockwood, P.O. Box 345, Carmel Valley, Calif. 93924-0345; John K. Bethune, Saratoga Springs, N.Y., and Andrew W. Lockwood, Carmel Valley, Calif., assignors to George S. Lockwood, Carmel Valley, Calif.

Filed Apr. 16, 1993, Ser. No. 49,684

Int. Cl.° F24J *2/42*

U.S. Cl. 126—565 **18 Claims**

1. A cover for withstanding stormy weather and increasing solar heating of a body of water in a reservoir having a bottom and a side edge extending upwardly from and surrounding the bottom, the cover comprising:

a) a sheet disposed over the body of water, the sheet being more transparent to visible radiation from the sun than to infrared radiation;

b) means for anchoring the sheet in a substantially horizontal plane down around its periphery to the side edge of the reservoir to prevent wind from lifting the sheet from the reservoir;

c) means forming a retaining wall extending above and around the periphery of the sheet;

d) means for covering the top of the sheet with a layer of water and holding the water on the sheet at a level substantially the same as the top of the retaining wall; and

e) means for drawing water from the top of the sheet.

5,555,878

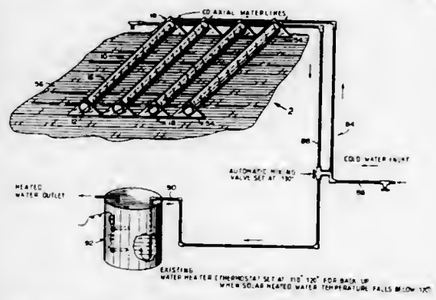
SOLAR ENERGY COLLECTOR

Scott Sparkman, P.O. Box 240471, Honolulu, Hi. 26824-0471

Filed Jan. 30, 1995, Ser. No. 380,635

Int. Cl.° F24J *2/10*

U.S. Cl. 126—657 **8 Claims**



1. An improved solar energy collector comprising:

a) a heat absorber to take in radiant energy and transfer the radiant energy to a heat transfer fluid carried thereby, said heat absorber including an elongated cylindrical storage tank, and a black nickel/selective coating placed upon an outer surface of said storage tank;

b) a transparent jacket to receive said heat absorber therein, whereby said jacket will allow the radiant energy to pass therethrough and reach said heat absorber, said transparent jacket being an elongated clear plastic tubular body having an internal diameter larger than an external diameter of said storage tank, so that when said storage tank is concentrically positioned within said tubular body, the chamber will longitudinally extend therebetween;

c) means for hermetically sealing said jacket and to form a chamber about said heat absorber, said hermetically sealing means including a pair of end capping assemblies, each of which is affixed to one end of said tubular body;

d) means for allowing the heat transfer fluid to enter and exit from said heat absorber, said heat transfer fluid enter and exit allowing means being a coaxial main port manifold which extends through one said end capping assembly, said manifold having an outer pipe fluidly connected to a first end of said storage tank and an inner narrow pipe extending through said outer pipe internally within said storage tank to approximate a second end of said storage tank, so that the heat transfer fluid can enter said outer pipe cold and then exit the inner narrow pipe hot; and

e) means for exhausting air out of the chamber, so as to produce a vacuum between said jacket and said heat absorber and to

insulate said heat absorber from an external environment, said

5,555,882

METHOD AND APPARATUS FOR REDUCING AMBIENT

insulate said heat absorber from an external environment, said air exhausting means including a vacuum tube which extends through one said end capping assembly and into the chamber, and a valve outlet on a distal end of said vacuum tube in the external environment, so that a vacuum pump can be attached to said value outlet and withdraw the air from the chamber to create the vacuum therein, each said end capping assembly including an end plate, an annular indium wire seal, and means for attaching said end plate transversely to an end of said tubular body with said annular indium wire seal therebetween.

5,555,879

SAFETY MASK

Arto A. Heiln, Fin-29120 Verkkoranta, and Teuvo A. Mattila, Vihäraumantie 82, FIN-28610 Pori, both of Finland

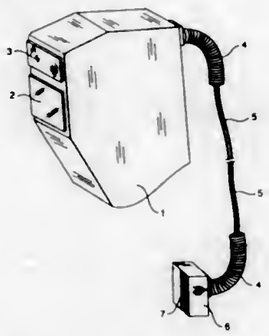
PCT No. PCT/FI93/00114, § 371 Date Nov. 15, 1994, § 102(e) Date Nov. 15, 1994, PCT Pub. No. WO93/18726, PCT Pub. Date Sep. 30, 1993

PCT Filed Mar. 23, 1993, Ser. No. 302,916

Claims priority, application Finland, Mar. 23, 1992, U920242

Int. Cl.[6] A62B *17/04*

U.S. Cl. 128—201.24 **8 Claims**



1. A safety mask comprising:
a hood for protecting a user's head;
a blower for providing inhalation air inside the hood;
an electrically driven motor for operating said blower; and
driving means for driving said motor, said driving means comprising a photoelectric cell for converting energy from light radiation to electrical energy and electrical leads connecting said photoelectric cell to said motor.

5,555,880

HIGH FREQUENCY OSCILLATORY VENTILATOR AND RESPIRATORY MEASUREMENT SYSTEM

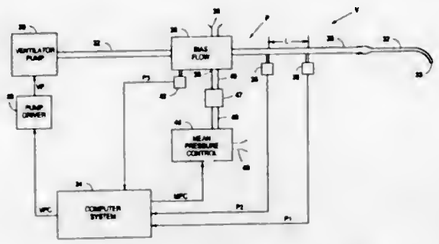
Dean C. Winter, San Antonio, Tex.; Ralph E. Harris, Cary, N.C., and Kevin S. Honeyager, San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Jan. 31, 1994, Ser. No. 190,322

Int. Cl.[6] A61M *16/00*

U.S. Cl. 128—204.21 **25 Claims**

1. A ventilator apparatus for providing assistance in breathing to a living subject, comprising:
a low compliance patient circuit tube having a first end and a second end;
means mounted to said patient circuit tube for providing fresh gas into said patient circuit tube and for exhausting exhaled gas out of said patient circuit tube;
an endotracheal tube intubated in the subject coupled to said first end of said patient circuit tube;



a pump for generating tidal volumes having an outlet coupled to said second end of said patient tube, said pump further comprising,
a closure having a cavity area, said closure including said pump outlet and an opening for communication with said cavity area,
a piston and a rolling seal covering said opening, said piston and said rolling seal allowing a relatively slow leak from said cavity area,
means for oscillating said piston, and
a flexible membrane provided within said cavity area between said pump outlet and said piston, said membrane dividing said cavity area into a first cavity between said membrane said outlet and a second cavity between said membrane and said piston, said membrane preventing communication of gas between said tube and said second cavity; and
wherein gas pressure developed in said patient circuit tube communicates to said first cavity deflecting said membrane towards said second cavity, wherein gas displaced by said membrane displacement in said second cavity escapes through said slow leak, wherein when said oscillating means oscillates said piston, said flexible membrane oscillates correspondingly generating tidal volumes through said patient circuit tube and said endotracheal tube.

5,555,881

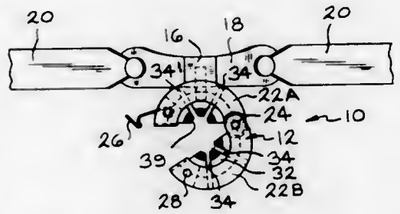
ENDOTRACHEAL TUBE POSITIONER

Russell L. Rogers, Munith, and Gary B. Challender, Grass Lake, both of Mich., assignors to Aeroquip Corporation, Maumee, Ohio

Filed Jul. 11, 1994, Ser. No. 273,409

Int. Cl.[6] A61M *25/01;31/00*

U.S. Cl. 128—207.17 **5 Claims**



1. An endotracheal tube positioner for use in retaining an endotracheal tube in a desired position with respect to a patient comprising in combination: a collar member formed from at least two body portions engaged together to define an axially oriented orifice extending therethrough, said body portions being joined together by at least one hinge member and at least one catch member; each of said body portions defining a clamping member, said clamping members being deflectively resilient for flexing and engaging and retaining endotracheal tubes of varying outside diameter as such tube is positioned in said orifice; and a strap member for securing said tube positioner in such desired portion.

5,555,882

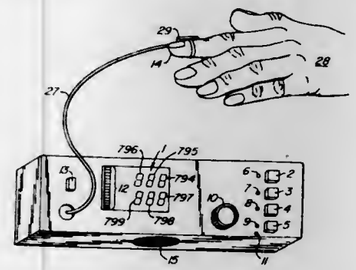
METHOD AND APPARATUS FOR REDUCING AMBIENT NOISE EFFECTS IN ELECTRONIC MONITORING INSTRUMENTS

Charles A. Richardson, San Francisco; Michael Bernstein, San Ramon; Jerry K. Okikawa, Oakland, and Terrence R. Bennett, Richmond, all of Calif., assignors to Nellcor Incorporated, Pleasanton, Calif.

Continuation of Ser. No. 965,684, Oct. 23, 1992, Pat. No. 5,368,224. This application Aug. 24, 1994, Ser. No. 295,349.

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—633 **7 Claims**



1. A pulse oximeter comprising:
(a) a sensor including two light sources and a photodetector, the two light sources alternately generating light pulses which pass through a patient's skin to produce attenuated optical signals monitored by the photodetector;
(b) a demultiplexer coupled to the sensor for separating the attenuated optical signals from the two light sources, the demultiplexer and the light sources operating at an adjustable selected demultiplexing frequency;
(c) a ROM having a plurality of available frequencies recorded;
(d) a first processor coupled to the demultiplexer and the ROM for periodically determining the noise associated with the available frequencies, the first processor selecting, and adjusting if necessary, the adjustable selected demultiplexing frequency; and
(e) a second processor coupled to the sensor for periodically determining the patient's blood oxygen saturation from the optical signals monitored by the photodetector.

5,555,883

LOOP ELECTRODE ARRAY MAPPING AND ABLATION CATHETER FOR CARDIAC CHAMBERS

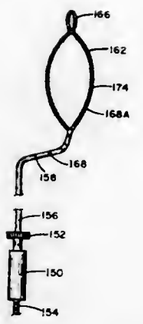
Boaz Avitall, 4868 N. Ardmore Ave., Milwaukee, Wis. 53217

Continuation of Ser. No. 156,283, Nov. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 909,869, Jul. 7, 1992, Pat. No. 5,263,493, which is a continuation-in-part of Ser. No. 840,162, Feb. 24, 1992, abandoned. This application Jan. 30, 1995, Ser. No. 380,204

Int. Cl.[6] A61N *1/05;* **A61B** *5/04*

U.S. Cl. 128—642 **2 Claims**

1. A cardiac catheter system comprising:
(a) a main vascular catheter having a distal and a proximal end and capable of negotiating a vascular system to enter into a cardiac chamber of interest, the main catheter further describing an internal lumen extending from the proximal end to the distal end;
(b) a recording and ablation working catheter system associated with the distal end of the main catheter and further including,
(1) an open terminal loop of memoried shape self-assumed by said loop upon deployment subject to external constraining forces forming a portion of said working catheter system, the loop having an exterior surface and carrying an electrode array including a plurality of individual electrode means for performing procedures selected from the group consisting of recording and ablation, including linear ablation, each said electrode means having an electrically conductive, externally exposed surface, the electrode array being arranged in spaced serial relation along the loop, wherein said memoried shape self-assumed by said loop upon deployment is asymmetric,



(2) a relatively short intermediate segment joining the loop with the distal end of the main catheter and determining a relative posture between said loop and said main catheter,
(3) insulated conductor means for connecting each of said electrode means individually with an electrical input/output device outside the catheter.

5,555,884

MEASURING METHOD BY USING RESONANCE OF A RESONANCE MEDIUM

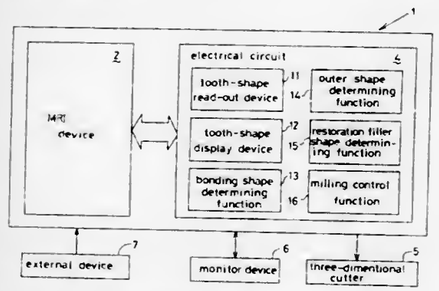
Yuusuke Nonomura, Nagoya, Japan, assignor to Kabushiki Kaisha Egawa, Nagoya, Japan

Filed Dec. 2, 1993, Ser. No. 160,162

Claims priority, application Japan, Dec. 16, 1992, 4-336089; Jan. 19, 1993, 5-006816; Feb. 18, 1993, 5-029474

Int. Cl.[6] A61B *5/055*

U.S. Cl. 128—653.2 **16 Claims**



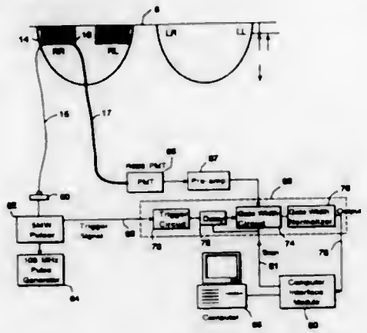
1. A method of determining a shape of an article based on resonant properties of an MRI contrast medium, comprising the steps of:
providing said article, wherein said article is one of teeth, a prosthesis, a jaw bone, and an implant structure and wherein said article lacks or is short of hydrogen protons;
providing said MRI contrast medium which is rich in hydrogen proton;
supplying said article with said MRI contrast medium, wherein said MRI contrast medium is in a liquid state at least when said MRI contrast medium is supplied to said article;
measuring said MRI contrast medium with an MRI device; and
determining said shape of said article on the basis of a configuration of said MRI contrast medium.

5,555,888

5,555,885
EXAMINATION OF BREAST TISSUE USING TIME-RESOLVED SPECTROSCOPY

Britton Chance, Marathon, Fla., assignor to Non-Invasive Technology, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 40,168, Mar. 30, 1993, Pat. No. 5,386,827, and a continuation-in-part of Ser. No. 876,364, Apr. 30, 1992, abandoned, which is a continuation of Ser. No. 287,847, Dec. 21, 1988, Pat. No. 5,119,815. This application Jul. 16, 1993, Ser. No. 93,208
Int. Cl.[6] A61B *6/00*
U.S. Cl. 128—654 **45 Claims**



1. A method for examination of breast tissue of a female subject using pulses of light of a selected wavelength, said method comprising the steps of:

(a) providing a support, positioned relative to the examined breast, comprising a set of input ports and a set of output ports separated by a selected distance, each said input port constructed to define an irradiation location of said breast, each said output port constructed to define a detection location of said breast,

(b) selecting locations of said input and output ports to examine a tissue region of the breast,

(c) introducing into the breast tissue, at said selected input port, pulses of light of a selected wavelength in the visible or infra-red range, said pulses having duration of less than about a nanosecond,

(d) detecting over time, at said selected detection port, photons of modified pulses that have migrated in the breast tissue,

(e) integrating said photons over at least two selected time intervals separately spaced over the arrival time of said modified pulses,

(f) calculating a value of an absorption coefficient (μ_a) of the examined breast tissue based on the number of photons integrated over each time interval, and

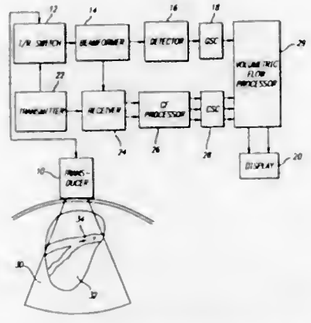
(g) characterizing the examined breast tissue based on said value of the absorption coefficient.

5,555,886
APPARATUS AND METHOD FOR DETECTING BLOOD VESSEL SIZE AND DIRECTION FOR DOPPLER FLOW MEASUREMENT SYSTEM

Lee Weng, and William H. Phillips, both of Issaquah, Wash., assignors to Siemens Medical Systems, Inc., Iselin, N.J.

Filed Sep. 28, 1995, Ser. No. 535,496
Int. Cl.[6] A61B *8/00*
U.S. Cl. 128—661.10 **21 Claims**

1. In an ultrasonic diagnostic system, including means for receiving Doppler information signals having frequency components representing fluid flow through a region of interest, and means for formatting said Doppler information signals for presentation on a graphical display, a method for measuring a volumetric flow rate of a vessel within the region of interest comprising the steps of:



selecting a vessel represented graphically on the display in which a volumetric flow rate measurement is desired;

searching in a plurality of directions that extend radially outward from a location defined within the selected vessel for an upper and a lower set of edge points that correspond to inner wall surfaces of the vessel;

fitting curves through the respective sets of edge points that define respective estimates of the inner wall surfaces;

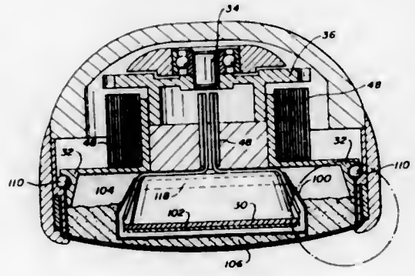
measuring an angular difference between the respective curves and a beam direction of the Doppler information signals; and

deriving a volumetric flow rate measurement of the selected vessel within a region defined hy the respective curves and based on the measured angular difference.

5,555,887
ULTRASONIC TRANSDUCER PROBE WITH HEAT DISSIPATING LENS

John D. Fraser, Woodinville; Loc Nguyen, Bothell, and Sherry Powell, Maple Valley, all of Wash., assignors to Advanced Technology Laboratories, Inc., Bothell, Wash.

Division of Ser. No. 155,416, Nov. 19, 1993, Pat. No. 5,402,793. This application Jan. 9, 1995, Ser. No. 370,275
Int. Cl.[6] A61B *8/00*
U.S. Cl. 128—663.01 **17 Claims**



1. An ultrasonic transducer probe having a piezoelectric transducer for scanning a patient with ultrasonic energy, said transducer having a transmitting surface from which ultrasonic energy is emitted and comprising:

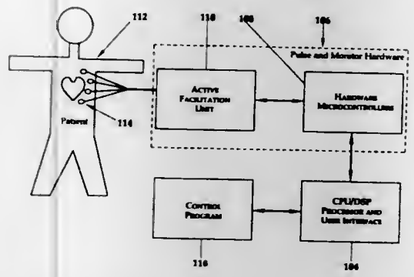
an acoustic lens covering said transmitting surface of said transducer and having an outer, patient contacting surface; and

a covering layer, located between said transmitting surface of said transducer and said patient contacting surface of said lens, and covering a substantial area of said transmitting surface for dissipating heat generated by said piezoelectric transducer.

5,555,888
METHOD FOR AUTOMATIC, ADAPTIVE, ACTIVE FACILITATION TO ACCESS MYOCARDIAL ELECTRICAL INSTABILITY

James E. Brewer, 2452 Southcrest Ave., Maplewood, Minn. 55119, and Ehssanollah Taghizadeh, 1785 Pleasant St., Lauderdale, both of Minn. 55113

Filed Feb. 27, 1995, Ser. No. 395,048
Int. Cl.[6] A61B *5/452*
U.S. Cl. 128—702 **21 Claims**



1. A method for assessing a patient's myocardial electrical instability, comprising the steps of:

(a) injecting a plurality of electromagnetic energy pulses into said patient's body;

(b) monitoring a plurality of electrocardiographic signals from said patient;

(c) recording changes in said electrocardiographic signals caused by said injecting of said electromagnetic energy pulses; and

(d) nonlinearly optimizing said injecting of said electromagnetic energy pulses automatically to maximize said recorded changes, whereby said myocardial electrical instability is assessed.

5,555,889
METHODS FOR DETECTING PROPENSITY FIBRILLATION

Hrayr S. Karagueuzian; George A. Diamond; Steven S. Khan; Timothy A. Denton, all of Los Angeles, Calif., and Steven Evans, Great Neck, N.Y., assignors to Cedars-Sinai Medical Center, Los Angeles, Calif.

Continuation-in-part of Ser. No. 701,753, May 17, 1991, abandoned, Ser. No. 716,665, Jun. 4, 1991, abandoned, and Ser. No. 541,581, Jun. 20, 1990, abandoned, said Ser. No. 716,665is a division of Ser. No. 541,581. This application Feb. 4, 1994, Ser. No. 191,099
Int. Cl.[6] A61B *5/0472*
U.S. Cl. 128—705 **3 Claims**

1. A method for detecting a propensity for ventricular fibrillation comprising the steps of

sensing an EKG signal;

constructing a phase plane plot of said EKG signal;

computing the fractal dimension of said phase plane plot by

a) superimposing a rectilinear grid on said phase plane plot;

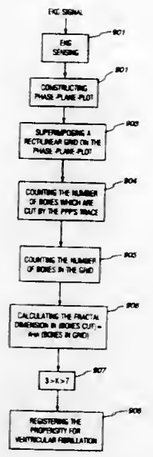
b) counting the number of boxes which are cut by the PPP's trace;

c) counting the number of boxes in the grid;

d) calculating the fractal dimension, K, according to the equation ln (# of boxes cut)=K* ln (# of boxes in grid);

e) determining whether K falls within the range of 3 to about 7;

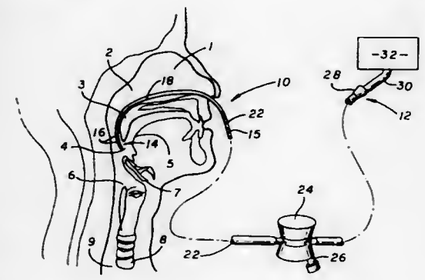
registering the propensity for ventricular fibrillation if the value is within this range.



5,555,890
PHARYNGEAL END-TIDAL CARBON DIOXIDE MEASURING CATHETER

Douglas A. Schaller, Hermosa Beach, Calif., assignor to University of Southern California, Los Angeles, Calif.

Continuation of Ser. No. 895,513, Jun. 8, 1992, abandoned. This application Feb. 25, 1994, Ser. No. 202,859
Int. Cl.[6] A61B *5/08*
U.S. Cl. 128—719 **4 Claims**



1. A catheter for use in measuring gas concentrations in a patient, said catheter having a lumen therethrough, a proximal end, a distal end including a plurality of gas intake ports, a proximal portion including a suction trap, and a rigid distal portion adjacent the distal end dimensioned to be received in and substantially conform to a patient's nasal passage and to terminate at a location away from the patient's posterior pharyngeal wall.

5,555,891
VIBROTACTILE STIMULATOR SYSTEM FOR DETECTING AND INTERRUPTING APNEA IN INFANTS

Leonard I. Eisenfeld, West Hartford, Conn., assignor to Hartford Hospital, Hartford, Conn.

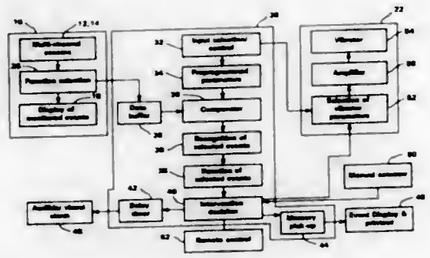
Continuation of Ser. No. 247,049, May 20, 1994, abandoned. This application Apr. 17, 1995, Ser. No. 424,590
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—721 **28 Claims**

1. A vibrotactile stimulator system for detecting and interrupting apnea in infants comprising

5,555,893

a housing which can be grasped by a hand, wherein the housing

contour extraction means, and then calculating a series of



(1) a multi-sensing monitor for sensing a plurality of physiological functions including means for detecting the respiratory rate of the infant and signal output means for reporting signals from said detecting means;

(2) a vibrotactile sensory stimulator including a cutaneous vibrator for engaging a peripheral sensory area on the infant, said vibrator being cyclically operable at a frequency above about 150 Hz to stimulate the infant and interrupt the apneic episode; and

(3) a control interface between the multi-sensing monitor and the stimulator for comparing the reported signals from the monitor for each physiological function with a preprogrammed standard to determine variations from the standard, said interface including means for integrating the variations for different functions and assessing a combination of said variations to indicate an apneic condition in the infant and means for triggering a timing means for delaying the transmission of a stimulator actuation until the apneic condition has persisted for a selected period, said interface including intervention output means for signaling actuation of the vibrotactile stimulator.

5,555,892

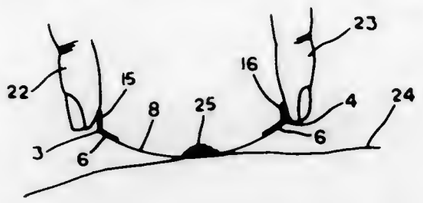
BIOPSY SHAVER

Clyde C. Tipton, 3820 Hunt Rd. #119, Tampa, Fla. 33614

Filed Nov. 14, 1994, Ser. No. 339,415

Int. Cl.[6] A61B *17/32*

U.S. Cl. 128—757 **3 Claims**



1. A surgical cutting tool for removing cutaneous specimens from the skin, said cutting tool comprising:

(a) a thin flexible blade having a substantially rectangular body with two lateral sides, a rear side, and a front side with a keen-edge;

(b) a thin flexible plastic body having two lateral sides, a rear side, a front side, a top surface, and a bottom surface, said front side having a substantially rectangular cavity to accept said blade, said blade being embedded thereto said cavity, said blade having said front keen-edge being exposed from said plastic body;

(c) a pair of straight flaps affixed to said lateral sides of said plastic body, said flaps being angled upwardly relative to said top surface of said plastic body whereby the angle between said flaps and said top surface is greater than ninety degrees but less than one hundred and eighty degrees.

5,555,893

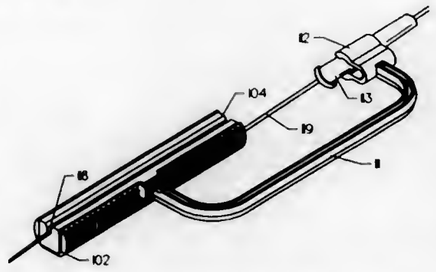
SHAFT MOVEMENT CONTROL APPARATUS

Steven S. Hackett, Maple Grove; Roger N. Hastings, Burnsville; Arnold W. Thornton, Roseville; Darlene A. Thometz, Maple Grove; Kenneth R. Larson, Bloomington; Scott P. Thome, Waite Park, and John W. Humphrey, Eden Prairie, all of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.

Continuation-in-part of Ser. No. 929,083, Aug. 12, 1992. This application Apr. 16, 1993, Ser. No. 48,492

Int. Cl.[6] A61B *5/00*

U.S. Cl. 128—772 **14 Claims**



1. An apparatus for cooperating with a catheter assembly, the assembly including a catheter having a longitudinal lumen and a shaft insertable in the lumen, comprising:

a. a housing for holding a proximal end of the catheter assembly against lateral motion, the housing having a longitudinal catheter receiving groove therein, the groove having a proximal end and a distal end and a longitudinally extending side opening therebetween through which the proximal end of the catheter can be placed into the groove; and

b. be a device for generating a differential holding force within the housing capable of preventing longitudinal motion of the shaft of the catheter assembly while allowing longitudinal motion of the catheter.

5,555,894

FORCE SENSATION EXHIBITING DEVICE, DATA INPUT DEVICE AND DATA INPUT EQUIPMENT

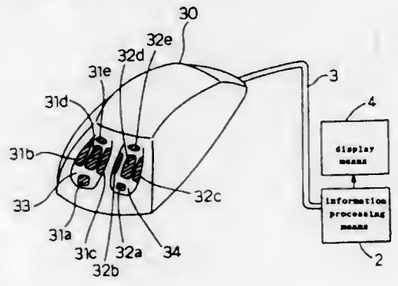
Yoshiaki Doyama, Hirakata; Masataka Ozeki, Osaka; Keizo Matsui, Kobe, and Yoshiteru Ito, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 2, 1994, Ser. No. 235,948

Claims priority, application Japan, May 11, 1993, 5-109529; Sep. 28, 1993, 5-241715; Dec. 28, 1993, 5-336976

Int. Cl.[6] A61B *5/103*

U.S. Cl. 128—782 **20 Claims**



1. A data input device, comprising:

a housing which can be grasped by a hand, wherein the housing is equipped with a detecting means for detecting a displacement or a pressure at a portion of the housing on which fingers are placed at a time of the grasping by the hand, wherein the detecting means provides input data, and

the data input device includes a means for determining an integral value or an incomplete integral value of a force detected by the detecting means, wherein the input data is optionally based on the integral value or the incomplete integral value of the force detected by the detecting means.

5,555,895

PROCESS AND DEVICE FOR EYE MOVEMENT ANALYSIS

Erik Ulmer, Marseilles, and Philippe Guillemant, Carnoux, both of France, assignors to Centre National De La Recherche Scientifique, Paris, France

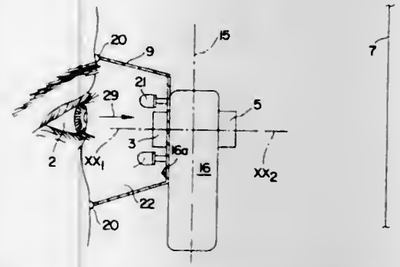
PCT No. PCT/FR94/00108, § 371 Date Sep. 21, 1994, § 102(e) Date Sep. 21, 1994, PCT Pub. No. WO94/16612, PCT Pub. Date Aug. 4, 1994

PCT Filed Jan. 28, 1994, Ser. No. 295,815

Claims priority, application France, Jan. 29, 1993, 93 01268

Int. Cl.[6] A61B *3/10*

U.S. Cl. 128—782 **8 Claims**



1. A device for analyzing the movement of at least one eye of a patient when said patient is looking along a line of sight, said line of sight defined as a substantially horizontal plain extending from a pupil of said eye, said device comprising:

a frame which said patient wears on his face like a pair of eye spectacles, said frame encircling each of the eyes of said patient, said frame including openings therein for allowing said patient to see out of said frame;

a principal module removably attached to said frame such that one eye of said patient is associated with said principal module and wherein said principal module obturates said opening of said frame when attached thereto, said principle module comprised of a first CCD camera for observing movements of said one eye and capable of delivering a first video signal representative of an image of said one eye, and a second CCD camera for observing movements of a predetermined scene which said eye is required to view, said second camera capable of delivering a second video signal representative of an image of said scene, which said scene is located in the vicinity of said patient, said principal module including at least one light-emitting diode for illuminating said eye with infrared light;

at least one horizontally operating photoreceptor for receiving infrared light reflected from said one eye, said horizontal receptor determining horizontal movements of said same one eye;

at least one vertically operating photoreceptor for receiving infrared light reflected from said one eye, said vertical receptor determining vertical movements of said same one eye;

a second means for digitizing said second video signal and analyzing and processing said second digital signal by identifying at least one image appearing in said scene through contour extraction means, and then calculating a series of coordinates of said object of said scene;

a first means for digitizing said first video signal and analyzing and processing said first digital signal by identifying said pupil of said eye through contour extraction means and then calculating a series of coordinates of a center of said pupil;

a first means for synchronizing said first and second video signals and a first means for multiplexing said first and second video signals in order to form a first multiplexed video signal comprised of two odd and even frames, one of said one and even frames being identical to a simultaneous frame of said first video signal and the other of said odd and even frames identical to a simultaneous frame of said second video signal;

a second means for synchronizing said first and second video signals and a second means for multiplexing said first and second video signals in order to form a second multiplexed video signal, said second multiplexed signal comprised of two odd and even frames, each of said frames comprising a consecutive assembly of alternating lines, said assembly of alternating lines identical to a set of lines associated with said first and second video cameras;

wherein said first video camera has a first optical axis and said second video camera has a second optical axis, each of said cameras connected together such that each of said respective optical axes exist on a common optical camera plane, said optical camera plane generally coexisting with said line of sight, said first optical axis extending towards the pupil and said second optical axis extending in a substantially opposed direction, said common optical camera plane allowing said device to directly correlate observed eye movements of said first video camera with said scenic movements observed by said other eye and recorded by said second video camera.

5,555,896

INTRAUTERINE CONTRACEPTIVE DEVICE

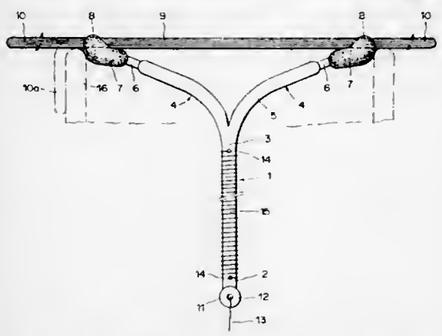
Hugo Cimber, Bernstrasse 34, Ch-3072 Ostermundigen, Switzerland

Filed Sep. 22, 1995, Ser. No. 532,295

Claims priority, application European Pat. Off., Sep. 26, 1994, 94810559

Int. Cl.[6] A61F *6/06*

U.S. Cl. 128—830 **9 Claims**



1. Intrauterine contraceptive device which can be inserted in the uterus by means of a small tube (**16**), containing a supporting stem (**1**) and, disposed at the front end (**3**) thereof in the direction of insertion, two branches (**4**) laterally spread apart, the branches (**4**) each bearing at their free ends a permanent closure member (**7**), which closure members (**7**) are intended and suitable for sealing the mouths of the Fallopian tubes into the uterus, each of the branches (**4**) comprising a comparatively stiff positioning portion (**5**) as well as a thin, flexible, and movable extension (**6**) disposed at the free end of the positioning portion (**5**), on which extension (**6**) the permanent closure member (**7**) is disposed, each closure member (**7**) being formed of a soft material, characterized in that a

temporary holding and positioning rod (9) with positioning ends (10) is disposed on the two closure members (7) in such a way that together with the supporting stem (t) it substantially forms the shape of a T, the holding and positioning rod being made of resorbable material.

5,555,897

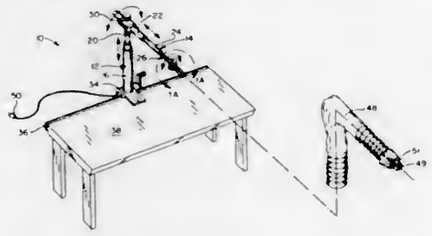
PERITONEAL DISTENSION ROBOTIC ARM

Robert L. Lathrop, Jr.; Rick E. Emerson, both of San Jose; James E. Wiley, Los Gatos; James M. Skienar, Santa Cruz; Albert K. Chin, Palo Alto; Frederick H. Moll, San Francisco, and David Forster, Woodside, all of Calif., assignors to Origin Medsystems, Inc., Menlo Park, Calif.

Division of Ser. No. 899,556, Jun. 16, 1992, Pat. No. 5,372,147. This application Sep. 16, 1994, Ser. No. 308,030

Int. Cl.[6] A61G *15/00*

U.S. Cl. 128—845 **32 Claims**



1. A positionable support structure adapted to be mounted on a table, said support structure comprising:

an extendible vertical post having a lower end and an upper end and comprising plurality of telescoping vertical segments;

means for removably securing the lower end of the vertical post to the table;

an extendible arm extending generally horizontally from the vertical post and having a proximal end and a distal end, said proximal end being pivotally secured to the a distal end, said proximal end being pivotally secured to the upper end of the vertical post, whereby the horizontal arm can be rotated about an axis defined by the vertical post;

means for releasably locking the position of the horizontal arm relative to the vertical post; and

means for vertical extension and retraction of the vertical post while the horizontal arm remains locked relative to the vertical post.

5,555,898

GASTRIC ACCESS DEVICE

Yutaka Suzuki, Chiba; Hideyuki Kashiwagi, Tokyo; Teruaki Aoki, Tokyo; Fumiichi Koshino, Tokyo, Japan; George J. Picha, Independence, and Anthony J. Szpak, Parma, Ohio, assignors to Applied Medical Research, Inc., Independence, Ohio

Filed Sep. 26, 1994, Ser. No. 311,918

Int. Cl.[6] A61B *19/00*

U.S. Cl. 128—898 **16 Claims**

1. A method for performing percutaneous surgery on a body, comprising the steps of:

forming an incision extending from an external surface of the body to an internal body cavity;

positioning within said cavity an entry port device having a tubular body, said tubular body having a bolster portion at one end and a dilator portion at an opposite end;

inserting said dilator portion into and through said incision whereby said tubular body extends through and projects from said incision and said bolster portion remains within said internal body cavity, said bolster portion preventing said device from unintentionally passing through said incision;

sliding an external bolster over said dilator portion and an exposed portion of said tubular body and in contact with said external surface;

severing said exposed portion of said tubular body to thereby remove said dilator portion from said tubular body;

inserting a surgical instrument through said tubular body and into said internal body cavity;

manipulating said surgical instrument to thereby perform a surgical procedure within said internal body cavity.

5,555,899

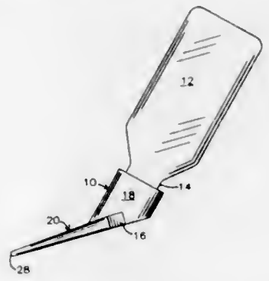
HAIR LIQUID APPLICATOR

Karen A. Foreman, 177 E. Dansville Rd., Dansville, Mich. 48819

Filed Oct. 31, 1994, Ser. No. 331,988

Int. Cl.[6] A45D *24/22*

U.S. Cl. 132—114 **2 Claims**



1. An applicator for applying liquid to hair adjacent the scalp comprising, in combination, a body having a longitudinal axis, a stem defined on said body, a circular cavity defined in said body stem having an axis obliquely angularly disposed to said body axis and having an inner surface, threads defined on said cavity inner surface, a flexible squeeze bottle having a threaded neck for receiving a hair treatment liquid, said bottle neck being threaded into said body cavity, a plurality of elongated substantially parallel spaced fingers extending from said body substantially parallel to said body longitudinal axis, each finger including a free terminating end, upper and lower sides and an inner end attached to said body, a passage defined in each of said fingers, each passage including an outlet intersecting the associated finger lower side adjacent the terminating end thereof and an inlet located within said body, a manifold passage defined in said body, each of said finger passages' inlets communicating with said manifold passage, and a supply passage interconnecting said manifold passage with said cavity whereby upon insertion of said fingers into the hair adjacent the scalp squeezing of said bottle causes liquid to enter said cavity, supply passage, manifold passage and finger passages and be applied upon hair adjacent said finger terminating ends adjacent the scalp, said fingers' free terminating ends being of a rounded convex configuration, said finger passages' outlets intersecting only said fingers' lower sides adjacent and inwardly spaced from said rounded convex configuration whereby said passages' outlets are free of edges facing toward said fingers' terminating ends to prevent snagging of the hair upon insertion of said fingers into the hair in the direction of said finger's length.

5,555,900

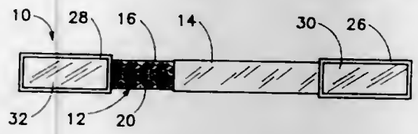
COSMETIC SKIN STRETCHING APPLIANCE AND METHOD OF USE

Willard P. Rich, 2500 NE. Ninth St., Apt. 204, Fort Lauderdale, Fla. 33304

Filed Apr. 17, 1995, Ser. No. 423,045

Int. Cl.[6] A45D *24/00*

U.S. Cl. 132—200 **4 Claims**



1. A cosmetic method comprising the steps of:

providing a substantially flexible band having an adjustable length and a first end and a second end opposite thereto;

further providing a covering for a body part of a user;

stretching a first skin area of said body part on a first side of said body part;

positioning said first end in juxtaposition to said first skin area at a first location on said first side of said body part;

stretching a second skin area of said body part on a second side of said body part substantially opposed to said first side of said body part;

positioning said second end in juxtaposition to said second skin area at a second location on said second side of said body part;

adjusting the length of said band to a length which will maintain the stretching of said first and second skin areas upon an attachment of said first end to one of said first location and said second location and said second end to the other of said first location and said second location;

after adjusting the length of said band, removing said band from said body part;

only upon completion of said steps of adjusting and removing, coupling said covering to said band; and

adhering said first end to said one of said first and said second location and said second end to said other of said first and said second location, to maintain the stretching of said first and said second skin area and to hold said covering in position on said body part.

5,555,901

HAIR FORMING DEVICE

Charles L. Camp, Jr., 177 Columbia St., and John W. Lindley, Jr., 206 E. Genesee St., both of Clyde, N.Y. 14433

Filed May 4, 1995, Ser. No. 434,850

Int. Cl.[6] A45D *8/04*

U.S. Cl. 132—273 **10 Claims**

1. A hair forming device, comprising:

a first ring member having a first outer periphery;

a second ring member having a second outer periphery and having means defining a hole extending entirely through said second ring member; and

a pin for linking said first ring member to said second ring member, said pin having a shaft having a constant diameter dimension and an enlarged head having a second diameter dimension of magnitude greater than that of said shaft, said pin having means for engaging said first ring member and for engaging said second ring member in tangential, abutting, overlying relationship, and said enlarged head of said pin having means for resiliently deforming and passing completely through said means defining said hole of said second ring member, thereby engaging said second ring member in abutting relationship to said first ring member by interference fit, and connecting said second ring member to said first ring member in tangential, abutting, relationship with said first and said second outer peripheries overlying one another.

5,555,902

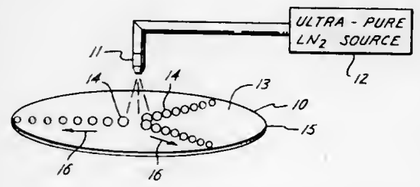
SUBMICRON PARTICLE REMOVAL USING LIQUID NITROGEN

Venugopal B. Menon, Austin, Tex., assignor to Sematech, Inc., Austin, Tex.

Division of Ser. No. 53,921, Apr. 26, 1993, Pat. No. 5,456,758. This application May 10, 1995, Ser. No. 438,936

Int. Cl.[6] B08B *3/02*

U.S. Cl. 134—199 **8 Claims**



1. An apparatus for removing particles from a surface of a semiconductor wafer comprising:

a housing for having a substantially clean interior;

a platen coupled and disposed within said housing for having said wafer reside thereon;

a nozzle disposed centrally above said wafer surface and coupled to said housing for introducing a nontoxic cryogenic liquid onto said wafer surface, such that said cryogenic liquid begins to evaporate to form a vapor layer above said surface;

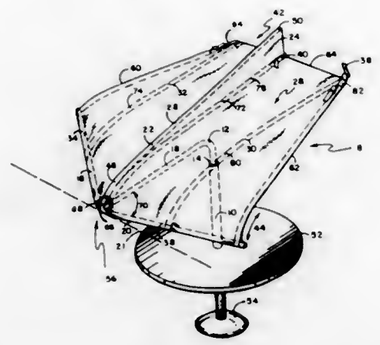
said cryogenic liquid sheeting or rolling across said wafer surface wherein not all of said cryogenic liquid evaporates prior to reaching an edge of said wafer such that said sheeting or rolling of said cryogenic liquid occurs above said vapor layer, wherein momentum from motion of said cryogenic liquid and surface tension between said cryogenic liquid and said particles dislodge particles that are exposed above said vapor layer by having said particles adhere to or engulfed by said cryogenic liquid as said cryogenic liquid transitions across said surface to remove said particles from said surface.

5,555,903

fixedly putting said casing in position inside said container body with said supporting member; and

assembling said gas cylinder by fitting the end of said valve with

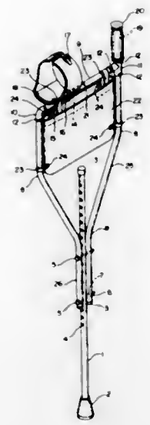
5,555,903
AERODYNAMIC UMBRELLA
Salvatore A. Rizzotti, 2 Elizabeth La., West Yarmouth, Mass. 02673
Filed Feb. 6, 1995, Ser. No. 383,796
Int. Cl.[6] A45B *3/00*
U.S. Cl. 135—16 8 Claims



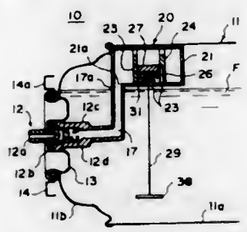
1. A aerodynamic umbrella for use outdoors where wind conditions can occur, comprising:
a vertically disposed mast;
a canopy having a front portion, a rear portion, a top and a length;
means to rotatably attach said front portion of said canopy to said mast;
means to pivot said canopy to face into the wind; and
a stabilizer member having a top edge extending from said top of said canopy along said length of said canopy;
wherein said means to rotatably attach said canopy to said mast include a horizontally disposed extension shaft having a first end and a second end, said horizontally disposed extension shaft at said second end rotatably engaged in a perpendicular relationship to said mast, said canopy attached at said front portion to said first end of said horizontally disposed extension shaft.

5,555,904
FOREARM CRUTCH
Walter E. Stockwell, 9252 So. Park, Tacoma, Wash. 98444
Filed Dec. 29, 1995, Ser. No. 580,894
Int. Cl.[6] A61H *3/02*
U.S. Cl. 135—68 6 Claims

1. A crutch capable of being used by a person in full upright position so that weight is borne by the forearm and the crutch is maneuvered by the forearm and hand, comprised of:
an adjustable length leg means,
a 'Y' Frame means consisting of two identical sides which have a stem of the 'Y' at the bottom, which adjustably communicate with the leg means, so as to adjust the over-all height of the crutch, and which side bends away from the stem a sufficient distance tp accommodate ½ the longest length of a user's forearm, then reverse bends to parallel the leg means and extend to just above the user's elbow, and a cross tube connected to the top of two sides by pop rivet means through an elbow fitting in the rear and a 'T' fitting on the front, the leg of the 'T' fitting opposite to the side, connecting by pop rivet means with a handgrip means,
a forearm support means being adjustably mounted along the length of the cross tube by suitable attachment means and adjustable in diameter by strap and buckle means.



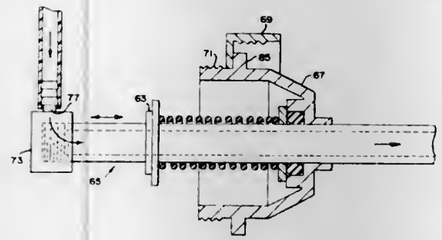
5,555,905
CASSETTE TYPE GAS CYLINDER WITH REMAINING VOLUME ALARM UNIT AND MANUFACTURING METHOD THEREOF
Hideo Mifune, and Yasuaki Nakamura, both of Shizuoka-ken, Japan, assignors to Tokai Corporation, Shizuoka-ken, Japan
PCT No. PCT/JP93/01311, § 371 Date May 16, 1994, § 102(e) Date May 16, 1994, PCT Pub. No. WO94/07083, PCT Pub. Date Mar. 31, 1994
PCT Filed Sep. 14, 1993, Ser. No. 244,086
Claims priority, application Japan, Sep. 16, 1992, 4-246560; Dec. 25, 1992, 4-346018; Jan. 11, 1993, 5-002455; May 7, 1993, 5-106700
Int. Cl.[6] G01F *23/00*
U.S. Cl. 137—15 31 Claims



1. A method for manufacturing a cassette type gas cylinder provided with a container for containing liquefied fuel gas, which is made up of a cylindrical container body, a annular top to be joined to one end of said container body and a lid to be joined to the center aperture of said top, and a valve fixed to the center of said lid for controlling the discharge of the liquefied fuel gas, said method comprising the steps of:
disposing a gas flow channel with one end thereof insertably fitted into the inner end of said valve in the axial direction and with the other end thereof extended upward into a gas space formed above the fuel level of said container body laid horizontally;
disposing a casing which is connected to the end of said gas flow channel for housing a remaining volume alarm unit which gives an alarm when the volume of remaining liquefied fuel is reduced to a predetermined level or less, and the outer surface of said casing being cylindrically shaped so as to be fitted along the inner surface of said container body and also joined to a radially extended supporting member;
inserting said casing to which the gas flow channel is fixed into said container body;

fixedly putting said casing in position inside said container body with said supporting member; and
assembling said gas cylinder by fitting the end of said valve with the end of said gas flow channel when said lid is attached to said top after said container body and said top are joined together.

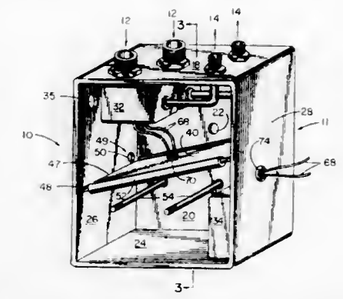
5,555,906
AUTOMATIC FLUSH VALVE ACTUATION APPARATUS FOR REPLACING MANUAL FLUSH HANDLES
Rocky Sheih, 2F, 43 Guana Hua S. Street, Hsin Chu, Taiwan, and Kenneth J. Muderiak, 4481 North Maryland Ave., Shorewood, Wis. 53211
Filed Sep. 12, 1994, Ser. No. 304,746
Int. Cl.[6] F16K *31/10*
U.S. Cl. 137—240 27 Claims



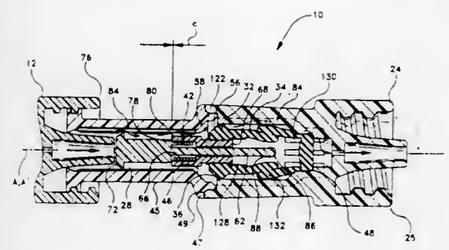
1. An automatic flush valve actuation apparatus for replacing a manually activated flush handle of a flush mechanism of a sanitary facility, such apparatus comprising: an enclosure containing a drive mechanism; a self-contained power source for the drive mechanism; means for sensing use of the sanitary facility; means for interconnecting the drive mechanism and the power source when the means for sensing detects a use of the sanitary facility; an adapter having first and second ends rigidly engaging the enclosure at the first end; a plunger pin having first and second ends slidably extending through the adapter, engaging the drive mechanism within the enclosure at a first end; and a threaded nut encircling the adapter and captured on the adapter by the enclosure at the first end of the adapter and by a hub at the second end of the adapter, the threaded nut, second end of the adapter and second end of the plunger pin being constructed to operably interact with the flush mechanism in a manner substantially identical to a nut, adapter, and plunger pin of the manually actuated flush handle.

5,555,907
DIVIDED BOX FOR VALVE CONTROLLER
Harald Philipp, 4812 Scott Rd., Lutz, Fla. 33549
Filed Jun. 2, 1995, Ser. No. 458,429
Int. Cl.[6] A47B *77/06*; F16K *51/00*
U.S. Cl. 137—312 6 Claims

1. An enclosure for an electrically powered valve controller and an electrically operated valve, the valve and the valve controller connected by electrical wires, the enclosure comprising a box, a lid and a clamping means clamping the lid to the box, the box comprising a vertically oriented back exterior wall, a top exterior wall, a bottom exterior wall, two side exterior walls and an internal dividing wall having at least a pair of ends and attached to one of the exterior walls, the internal dividing wall positioned between two of the exterior walls in a slanted manner, the dividing wall dividing the box into an upper chamber containing the electrically operated valve and a lower chamber containing the electrically powered valve controller, an opening in the dividing wall allowing passage of the wires between the upper and lower chambers, the box further comprising drainage means adjacent a lower end of the slanted dividing wall, the drainage means draining water leaking from the valve into the upper chamber, the drainage means conveying the water from the upper chamber along the slanted dividing wall and through a throughhole in one of the exterior walls to the outside of the box under the influence of gravity, the box further comprising throughholes adjacent the top wall for water inlet and outlet fittings.



5,555,908
VALVED PRN ADAPTER FOR MEDICAL ACCESS DEVICES
Floyd V. Edwards, Clarence, N.Y., and Douglas P. Orr, Sandy, Utah, assignors to Becton, Dickinson and Company, Franklin Lakes, N.J.
Filed Jun. 23, 1995, Ser. No. 494,133
Int. Cl.[6] F16K *15/18*
U.S. Cl. 137—329.1 22 Claims



1. A valved adapter for connecting a fluid handling device to a medical device comprising:
a body with a longitudinal axis and having a proximal end comprising a female luer fitting, a distal end and a passageway therethrough, said passageway having a chamber intermediate said distal end and said proximal end;
a valve contained within said chamber in a normally closed position but being operative to an open position, said valve comprising a relatively elongate resilient member having a proximal end and an axis substantially coaxial to said longitudinal axis, said resilient member being axially compressed in said chamber thereby biasing said valve to said normally closed position and
said valve further comprising a pusher disposed at said proximal end of said elongate resilient member, said pusher adapted to selectively displace said valve from said normally closed position to said open position, said pusher having a telescopic portion having an extended position and a collapsed position, said telescopic portion being biased to said extended position, and, said pusher being disposed to operate said valve to said open position only when said pusher is in said collapsed position.

5,555,909

CONNECTIONS FOR VALVES

Jeff Elliott, West Pennant Hills, Australia, assignor to Goyen Controls Co. Pty. Limited, Milperra, Australia

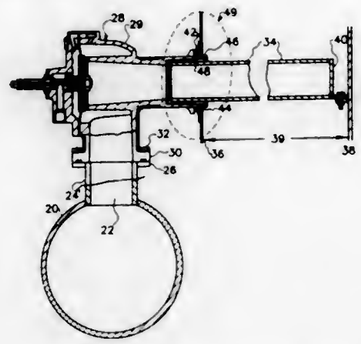
PCT No. PCT/AU92/00532, § 371 Date May 27, 1994, § 102(e) Date May 27, 1994, PCT Pub. No. WO93/07411, PCT Pub. Date Apr. 15, 1993

PCT Filed Oct. 1, 1992, Ser. No. 211,383

Claims priority, application Australia, Oct. 1, 1991, PK8667

Int. Cl.[6] F16L *5/00*

U.S. Cl. 137—359 **14 Claims**



1. A compressed air pressure tight sealing and joining arrangement for use in conjunction with a valve having an inlet port and an outlet port, the inlet port being connectable by an inlet pipe to a rigid header reservoir containing compressed air and the outlet being connectable to a compressed air delivery duct that passes through a clearance hole in a wall into an enclosed chamber, the delivery duct being arranged substantially perpendicular to the wall, the combination of a first sealing arrangement enabling sealing of the outlet port of the valve to the delivery duct and comprising a socket and the delivery duct and a second sealing means adapted to seal the socket and the delivery duct at the said hole and comprising an annularly shaped resilient seal having a skirt portion adapted to deformably bear against the wall surrounding said hole and wherein the skirt portion is tapered and extends both radially and axially outwardly from one end of a cylinder gripping portion adapted to be axially slidable over a predetermined one of either said socket or said delivery duct in order to seal between it and said hole.

5,555,910

PRESSURE RELIEF VALVES ADAPTED FOR LOW PRESSURE OPERATION

Walter W. Powell, Sugar Land; Milton N. Anderson, Jr., Houston; Louis R. Castaneda, Houston, and Aciel Martin, Houston, all of Tex., assignors to Groth Corporation, Houston, Tex.

Filed Aug. 30, 1994, Ser. No. 297,801

Int. Cl.[6] F16K *17/196*

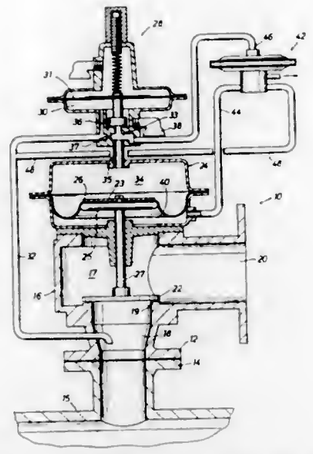
U.S. Cl. 137—488 **16 Claims**

1. A safety relief valve for a pressure vessel adapted to permit fluid flow from said pressure vessel at a predetermined fluid pressure in the pressure vessel; said safety relief valve comprising:

a valve body having an inlet in fluid communication with said pressure vessel and an outlet leading from said valve body;

a main valve member within said valve body mounted for movement between open and closed positions relative to said inlet to permit fluid flow from said outlet upon movement of said valve member to an open position;

a fluid pressure responsive control member for said main valve member secured to said main valve member for movement therewith between open and closed positions;



a dome chamber in said valve body on the side of said fluid pressure responsive control member opposite said main valve member;

a pilot valve in fluid communication with said dome chamber for controlling the movement of said main valve member;

an underdome chamber in said valve body on the opposite side of said fluid pressure responsive control member adjacent said main valve member;

an underdome control valve to control fluid communication to said underdome chamber from said inlet;

a fluid line from said inlet to said underdome control valve; and

an underdome fluid line from said underdome control valve to said underdome chamber;

said underdome control valve including an underdome valve member in a normally closed position blocking fluid communication from said inlet to said underdome chamber and permitting fluid communication from said inlet to said underdome chamber in an open position; said valve member being in continuous fluid communication with said inlet through said inlet fluid line and moving to an open position upon the reaching of a predetermined fluid pressure at said inlet thereby to increase the fluid pressure in said underdome chamber for assisting opening of the main valve member;

said pilot valve being in fluid communication with said underdome control valve to assist movement of said underdome control valve to an open position upon a predetermined increase in fluid pressure in said pressure vessel.

5,555,911

DIRECTIONAL CONTROL VALVE AND A VALVE ASSEMBLY USING DIRECTIONAL CONTROL VALVES

Yoshihiro Fukano; Shoichi Makado, and Takeshi Arakawa, all of Tsukuba-gun, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 238,727, May 5, 1994, Pat. No. 5,462,087. This application May 30, 1995, Ser. No. 453,955

Claims priority, application Japan, May 7, 1993, 5-029283 U; May 11, 1993, 5-132938

Int. Cl.[6] F15B *13/06*

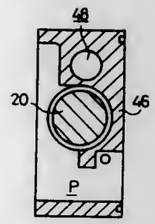
U.S. Cl. 137—625.69 **8 Claims**

1. A directional control valve comprising:

a valve member; and

a main valve body including a valve hole extending in a longitudinal direction, said valve hole having said valve member displaceably fitted and inserted therein, a supply port for supplying a pressurized fluid, at least one output port and at least one exhaust port, said main Valve body comprising linking surfaces for linking together a plurality of directional control valves, wherein said linking surfaces are respectively formed on a pair of opposing side surfaces of said main valve body;

wherein said supply port and said at least one exhaust port penetrate from one of said linking surfaces to the other of said linking surfaces on an opposite side surface of the main valve body in a perpendicular direction to said longitudinal direction of said valve hole, said main valve body further comprising a partition wall disposed on one of said linking surfaces, said partition wall being disposed parallel to said valve member extending in said longitudinal direction at substantially a same height as said valve member, so as to prevent the pressurized fluid flowing through said supply port from flowing in said perpendicular direction on one side of said valve member, while permitting said pressurized fluid to flow in said perpendicular direction on another side of said valve member.



5,555,912

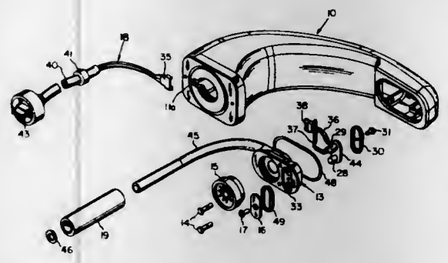
SPOUT ASSEMBLY FOR AUTOMATIC FAUCETS

Robert E. Saadi; Brian N. Creager; Allen R. Becker, all of Erie, Pa., and Stephen R. Kovey, Glen Ellyn, Ill., assignors to Zurn Industries, Inc., Erie, Pa.

Filed Apr. 20, 1995, Ser. No. 426,526

Int. Cl.[6] E03C *1/04;1/05*

U.S. Cl. 137—801 **6 Claims**



1. A spout assembly for an automatic faucet that is easily assembled and tamper-resistant comprising:

a transmitter and a receiver for use in detecting the presence of objects near the spout;

a hollow spout body having a threaded inlet opening and an outlet opening, the spout body shaped so that the inlet opening can be fastened over an opening in a surface with the outlet opening spaced therefrom;

a unitary waterway fitting for insertion in the outlet opening of the spout body, the waterway fitting comprising an inlet port, an outlet port and a passage therebetween, the waterway fitting also having a compartment for receiving and orienting both said transmitter and receiver;

a water conduit passing through the spout body and out the inlet opening and being connected to the inlet port of the waterway fitting;

an aerator threaded to the outlet port;

a cable assembly passing through the spout body and out the inlet opening and being connected at one end to the terminals on the transmitter and receiver;

a cap for sealing the interior side of the compartment;

a lens for sealing the exterior side of the compartment;

means for permanently fastening the waterway fitting into the spout body; and

means for sealing the waterway fitting in the outlet opening in the spout body.

5,555,913

PLASTIC HOSE WITH A COLORED AND/OR METALLIZED SURFACE

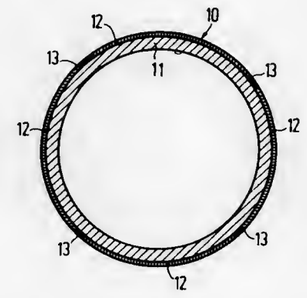
Armin Waidele, Lauterbach, and Dieter Katzer, Haslach, both of Germany, assignors to Hans Grohe GmbH & Co. KG, Germany

Filed Mar. 17, 1995, Ser. No. 406,042

Claims priority, application Germany, Jun. 1, 1994, 44 19 120.0

Int. Cl.[6] F16L *55/00*

U.S. Cl. 138—104 **19 Claims**



1. Plastic hose with a colored surface, at least one hot stamping film being provided as a carrier for the color and is connected to an at least partly externally visible outside surface of the hose, and wherein edges of the hot stamping film are arranged in mutually overlapping manner on the hose.

5,555,914

CRYOGENIC HEAT PIPE

Anna L. Baker, and Darryl F. Garrigus, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 404,015, Mar. 13, 1995, which is a division of Ser. No. 124,419, Jul. 28, 1993, Pat. No. 5,441,682, which is a continuation of Ser. No. 527,600, May 23, 1990, abandoned, and a continuation-in-part of Ser. No. 381,498, Jul. 18, 1989, which is a continuation-in-part of Ser. No. 698,496, Feb. 5, 1985, Pat. No. 5,041,321, which is a continuation-in-part of Ser. No. 667,568, Nov. 2, 1984, abandoned. This application Jun. 5, 1995, Ser. No. 465,281

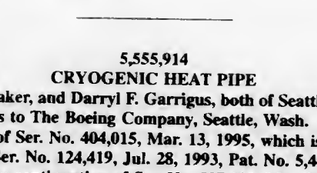
Int. Cl.[6] F16L *9/18;* **F28D** *15/02*

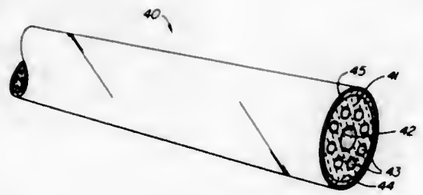
U.S. Cl. 138—115 **1 Claim**

1. A heat pipe comprising a core of porous ceramic composite, said core accommodating a central channel extending along the longitudinal axis of said pipe, and a plurality auxiliary channels radially displaced about said central channel, said auxiliary channels extending along the longitudinal axis of said pipe; a ceramic matrix laminate annularly surrounding said core; and a sealing coating at least annularly surrounding said laminate; wherein said porous ceramic composite comprising about 0–99 wt % ceramic fibers and about 1–100 wt % microparticles bound together as a porous matrix with a ceramic binder.

5,555,916

the weft yarn dominated fiber support surface having said uniform pattern of weft floats is formed to provide uniform

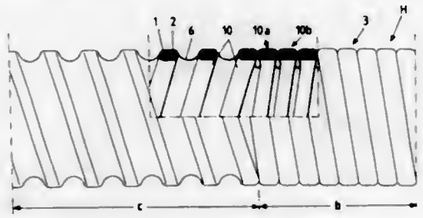




5,555,915
CLEANER HOSE

Shiro Kanao, 9-18, Nanpeidai 4-chome, Takatsuki-shi, Osaka, Japan

Filed Mar. 27, 1995, Ser. No. 411,223
Claims priority, application Japan, Apr. 1, 1994, 6-087507
Int. Cl.[6] F16L *11/11*
U.S. Cl. 138—133 **4 Claims**



1. A cleaner hose, comprising:

an elongated hose body including a reinforcement wire material and a hose wall, said reinforcement wire material being wound spirally and continuously over a whole length of said hose body, said hose body including a first end portion and a second end portion;

a first connection cylinder operative for connection to a cleaner operating pipe, said first connection cylinder being attached to said first end portion of said hose body; and

a second connection cylinder operative for attachment to a cleaner body, said second connection cylinder being attached to said second end portion of said hose body;

wherein said reinforcement wire material is shaped like a steeply slanted spiral in a portion of said hose body near at least one of said first end portion and said second end portion of said hose body so that first adjacent spiral portions of said reinforcement wire material are close to each other while said hose wall is loosened toward an inner circumferential surface of said hose body; and

wherein said reinforcement wire material is shaped like a gently slanted spiral in an intermediate portion of said hose body except said at least one of said first end portion and said second end portion of said hose body so that second adjacent spiral portions of said reinforcement wire material are separated from each other in an axial direction of said hose body,

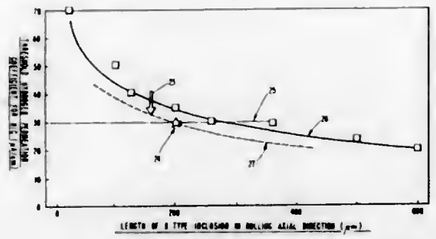
said cleaner hose further comprising:

a conductive wire; and a resin layer covering said reinforcement wire material and said conductive wire, said conductive wire being disposed adjacent to and parallel to said reinforcement wire material with an interval between said conductive wire and said reinforcement wire material, said resin layer having a recessed thin portion at a position between said reinforcement wire material and said conductive wire so that said reinforcement wire material and said conductive wire covered with said resin layer are easily separated from each other.

5,555,916
STEEL PRODUCT EXCELLENT IN SULFIDE CRACKING RESISTANCE

Takahiro Kushida, Amagasaki, Japan, assignor to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Mar. 9, 1994, Ser. No. 207,729
Claims priority, application Japan, Mar. 16, 1993, 5-81552
Int. Cl.[6] F16L *11/00;55/00*
U.S. Cl. 138—177 **12 Claims**

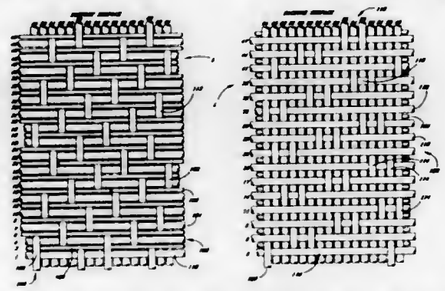


1. A mechanically worked and elongated steel product having a length extending in a longitudinal direction and having sulfide cracking resistance, the product comprising a steel matrix containing B type inclusions having lengths of ≦0.20 μm in the longitudinal direction, the steel matrix consisting essentially of 0.01–0.20 wt % of carbon, 0.01–0.5 wt % of silicon, 0.3–1.8 wt % of manganese, 0.01– 0.1 wt % of aluminum, ≦0.012 wt % of phosphorus, and ≦0.002 wt % of sulfur, the remainder being substantially iron and inevitable impurities, wherein a calcium/sulfur ratio is in a range of 2–10.

5,555,917
SIXTEEN HARNESS MULTI-LAYER FORMING FABRIC

Scott Quigley, Simpsonville, S.C., assignor to Wangner Systems Corporation, Greenville, S.C.

Filed Aug. 11, 1995, Ser. No. 514,322
Int. Cl.[6] D03D *13/00*
U.S. Cl. 139—383 A **24 Claims**



1. A wear resistant dual layer papermaking fabric having an upper paper fiber support surface and a lower machine contact surface;

said fiber support surface comprises a first plurality of weft yarns interwoven with warp yarns, said first weft yarns and said warp yarns being woven in a balanced twill weave pattern having weft floats passing over four warp yarns and beneath one warp yarn throughout each repeat of the weave pattern;

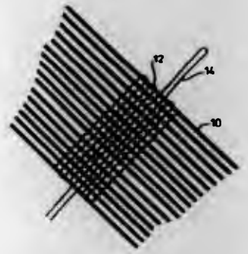
said machine contacting surface comprises a second plurality of weft yarns interwoven with said warp yarns, said second weft yarns and said warp yarns being woven in a second balanced twill weave having weft floats passing beneath at least twelve of said warp yarns and above at least two of said warp yarns throughout the weave pattern repeat whereby;

the weft yarn dominated fiber support surface having said uniform pattern of weft floats is formed to provide uniform drainage and fiber support and the weft yarn dominated machine contact surface having said uniform pattern of extended weft yarn floats is provided for extended wear resistance of said machine contact surface.

5,555,918
METHOD OF MAKING SLEEVE WITH INTEGRAL LACING CORD

Leonard Lusen, Lansdale, and Tammy S. Ebersole, Warminster, both of Pa., assignors to Bentley-Harris Inc., Exton, Pa.

Division of Ser. No. 184,877, Jan. 12, 1994, Pat. No. 5,467,802.
This application Aug. 23, 1995, Ser. No. 518,533
Int. Cl.[6] D03D *3/00*
U.S. Cl. 139—433 **5 Claims**



1. A method of weaving the cords on a fabric sleeve of substantially rectangular shape, said sleeve being flexible and being adapted to be wrapped around a bundle of elongated substrates, said method comprising:

weaving the sleeve on a shuttle loom from flexible warp and fill yarn;

displacing catch cords laterally outwardly preselected distances from the selvages of the sleeve fabric being woven; and

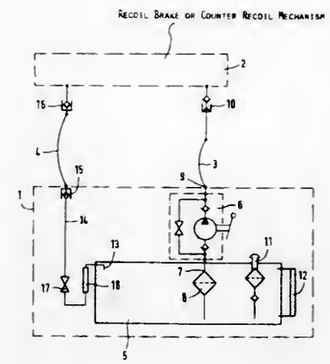
lifting the catch cords in timed relation to the picking of preselected fill yarns to effect a looping of the preselected fill yarn around the catch cords, thereby creating a tie cord extended from the fabric selvage by an amount equal to the displacement of the catch cords.

5,555,919
HYDRAULIC FILLING DEVICE FOR WEAPON RECOIL BRAKES AND/OR COUNTER RECIL MECHANISMS

Herbert Lipp, Duesseldorf, Germany, assignor to Rheinmetall Industrie GmbH, Ratigea, Germany

Filed Jan. 5, 1995, Ser. No. 368,588
Claims priority, application Germany, Jan. 7, 1994, 44 00 325.0
Int. Cl.[6] F41A *25/02;* **F15B** *1/00*
U.S. Cl. 141—59 **7 Claims**

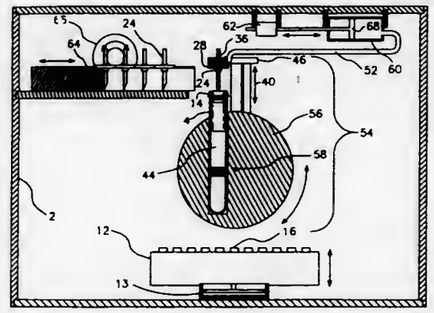
1. A hydraulic filling device for filling hydraulic control elements for recoil brakes and counter recoil mechanisms of a piece of artillery with the hydraulic control elements each having a respective filling connection and a ventilation connection, with a hydraulic fluid, the filling device comprising a tank that contains the hydraulic fluid, a pump for pumping the hydraulic fluid from said tank and connectible to the filling connection of a respective hydraulic control element to be filled, and a ventilation line for connecting said tank of the filling device containing the hydraulic fluid to the ventilation connection of the respective control element to be filled.



5,555,920
METHOD AND APPARATUS FOR ALIQUOTTING BLOOD SERUM OR BLOOD PLASMA

William J. Godolphin, Vancouver; Winona C. Specht; David P. Pires, both of North Vancouver, and Geoffrey T. Killiam, Burnaby, all of Canada, assignors to Automed Corporation, Richmond, Canada

Continuation-in-part of Ser. No. 57,306, May 5, 1993, Pat. No. 5,413,246, which is a continuation of Ser. No. 693,653, Apr. 30, 1991, Pat. No. 5,211,310. This application Sep. 3, 1993, Ser. No. 116,449
Int. Cl.[6] G01N *1/00*
U.S. Cl. 141—329 **9 Claims**



1. Apparatus for dispensing a liquid from a closed liquid sample collection tube into a closed sample cup comprising:

(a) an elongated closure piercing member having a first end shaped for piercing a stopper of a liquid sample collection tube and extending into the tube and a second end shaped for piercing a stopper of a sample cup and extending into the sample cup;

(b) liquid path means located within the closure piercing member for defining an opening through both stoppers when the closure piercing member is inserted through the stopper of the liquid sample collection tube and the stopper of the sample cup;

(c) first gas passage means to allow gas to be introduced into the interior of the liquid sample collection tube for the purpose of dispensing liquid from the tube;

(d) input means to produce a control signal indicative of a specified quantity of liquid to be dispensed; and

(e) controlling means responsive to the control signal to meter the introduction of gas into the liquid sample collectioo tube without moving the closure piercing member relative to the tube, so that the specified quantity of liquid is dispensed into the closed sample cup.

5,555,921

STOP STRIP FOR A PROTECTIVE HOOD ON WOOD SHAPING MACHINES

Georg Aigner, Thannenmais, Reisbach, Germany

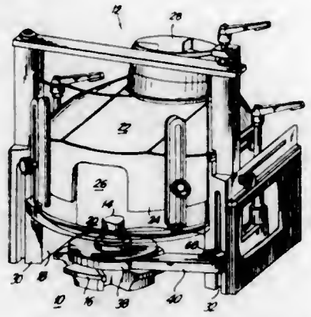
PCT No. PCT/EP93/00294, § 371 Date Aug. 15, 1994, § 102(e) Date Aug. 15, 1994, PCT Pub. No. WO94/05738, PCT Pub. Date Mar. 17, 1994

PCT Filed Oct. 25, 1993, Ser. No. 244,801

Claims priority, application Germany, Nov. 13, 1992, 42 38 449.4

Int. Cl.[6] **B27C** *5/04*; **F16B** *2/04*; **B27G** *21/00*; **B27B** *31/00*

U.S. Cl. 144—253.2 **9 Claims**



1. A vertically adjustable stop strip fastenable in a vertical groove in a protective hood for a wood shaping machine, the stop strip comprising: a strip member; a clamping member connected to the strip member and having a die with a mushroom-shaped head; and adjusting screw means for clamping the clamping member in the vertical groove, the head of the die being formed by two head parts shaped as circular disks, the disks being displaceable relative to one another by the adjusting screw means so that the disks can be spread apart against the walls of the groove.

5,555,922

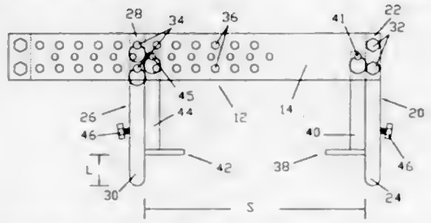
TIRE BEAD BREAKING TOOL

Larry F. Brunner, P.O. Box 768, Springfield, Vt. 05156

Filed Apr. 18, 1995, Ser. No. 423,840

Int. Cl.[6] **B60C** *25/125*

U.S. Cl. 157—1.17 **19 Claims**



1. A tire bead breaking tool for disengaging a tire bead from a rim of a wheel, the tire bead breaking tool comprising:

a header;

a first sidewall engaging leg having a first leg proximal end attaching to said header and a first leg distal end extending beyond said header;

a second sidewall engaging leg spaced apart from said first sidewall engaging leg by a leg separation S, said second sidewall engaging leg having a second leg proximal end attaching to said header and a second leg distal end extending beyond said header;

a first rim engaging jaw having a first jaw stem which is directly connected to and pivotably engaged with said first sidewall engaging leg;

a second rim engaging jaw having a second jaw stem which is directly connected to and pivotably engaged with said second sidewall engaging leg, said second rim engaging jaw being spaced apart by a jaw separation distance D from said first rim engaging jaw;

said first rim engaging jaw and second rim engaging jaw being positioned between said first sidewall engaging leg and said second sidewall engaging leg; and

means for advancing said first rim engaging jaw and said second rim engaging jaw toward each other.

5,555,923

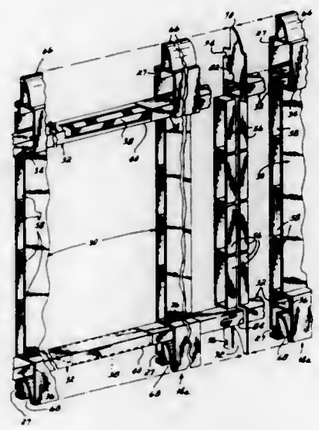
SECTIONAL DOOR HAVING MULTIPLE PIECE PANEL SECTIONS

Alan R. Leist, Cincinatti; Richard J. Lewis, Jr., Loveland, and William J. Sachs, Jr., Cincinnati, all of Ohio, assignors to Clopay Building Products Company, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 241,288, May 11, 1994. This application Dec. 21, 1994, Ser. No. 361,994

Int. Cl.[6] **E06B** *3/48*

U.S. Cl. 160—229.1 **43 Claims**



1. A door panel used to form one articulating section of an overhead sectional door, the door panel comprising:

a plurality of subpanels, each subpanel forming a portion of an overall length of said door panel;

a plurality of connecting bars, said connecting bars each having a length substantially less than the overall length of said door panel;

connector portions on each subpanel and each connecting bar for securing said connecting bars to adjacent subpanels placed end-to-end with said connecting bars extending in a lengthwise direction relative to said door panel; and,

at least one hinge support disposed at an edge of a least one subpanel for hingedly mounting said door panel to an adjacent door panel.

5,555,924

SQUEEZE PIN CONTROL METHOD AND APPARATUS FOR DIE CASTING MACHINE

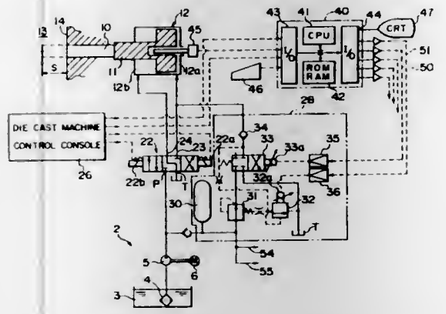
Norihiro Iwamoto, Sagamihara; Masayuki Takamura, Zama, and Tai Matsuda, Kawasaki, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo-To, Japan

Filed Oct. 25, 1994, Ser. No. 328,839

Claims priority, application Japan, Oct. 26, 1993, 5-267415; Sep. 8, 1994, 6-240550

Int. Cl.[6] **B22D** *18/02;27/11*

U.S. Cl. 164—4.1 **9 Claims**



1. A method of controlling a squeeze pin in a die casting machine for locally pressurizing melted metal charged into a cavity of a metal mold with at least one squeeze pin, comprising the steps of:

detecting a stroke S of the squeeze pin under no load condition of a squeeze pin cylinder for driving the squeeze pin;

setting a value (S−α) obtained by subtracting a small value α from the detected squeeze pin stroke S as a set stroke of the squeeze pin;

advancing the squeeze pin after a predetermined waiting time has been elapsed from when melted metal has been charged into the cavity completely;

detecting an actual stroke of the squeeze pin;

comparing a detected actual stroke value Sf with set limits (S−α±β, where β is an allowable deflection); and

if the comparison result is that Sf oversteps the set limits (S−α±β), correcting at least one of parameters of pressure and flow rate of hydraulic fluid supplied to the squeeze pin cylinder and the waiting time so that the detected stroke value Sf approaches the set stroke (S−α) in the succeeding casting cycle.

4. An apparatus for controlling a squeeze pin in a die casting machine for locally pressurizing melted metal charged into a cavity of a metal mold with at least one squeeze pin, comprising:

stroke detecting means for detecting an actual stroke S of the squeeze pin;

squeeze pin cylinder control means for controlling pressure and flow rate of hydraulic fluid supplied to a squeeze pin cylinder for driving the squeeze pin;

stroke correcting means for comparing a detected stroke value Sf of the squeeze pin after a predetermined time has elapsed from when the squeeze pin starts to be advanced by the squeeze pin cylinder, with a set stroke (S−α) obtained by subtracting a small value α from a full stroke S of the squeeze pin under no load of the squeeze pin cylinder; and if Sf oversteps set limits (S −α±β, where β is an allowable deflection), correcting pressure and/or flow rate of hydraulic fluid supplied to the squeeze pin cylinder and waiting time so that the detected stroke value Sf approaches the set stroke (S−α) in the succeeding casting cycle; and

control means for controlling the squeeze pin cylinder control means on the basis of the corrected result of said stroke correcting means.

5,555,925

VACUUM CASTING APPARATUS USING FLANGE-FREE STALK

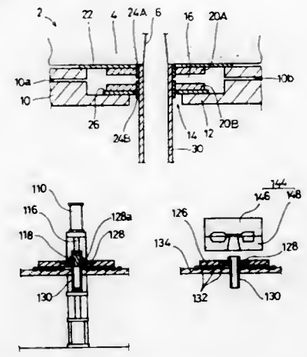
Mituyoshi Sato, Toyota; Minoru Uozumi, Aichi-gun, and Masao Nakayama, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 19, 1994, Ser. No. 307,424

Claims priority, application Japan, Oct. 12, 1993, 5-254408

Int. Cl.[6] **B22D** *18/06*

U.S. Cl. 164—255 **4 Claims**



1. A vacuum casting apparatus comprising:

a gas-tight chamber having an insertion hole for inserting a stalk and evacuated when performing vacuum casting;

a die accommodated in said gas-tight chamber;

a straight-tubular stalk inserted through the insertion hole of said gas-tight chamber for leading molten metal into said die; and

a first flange and a second flange mounted on an outer periphery of an insertion side end of said stalk in a spaced-apart relation in the longitudinal direction of said stalk, a flange surface of said first flange being in close contact with said gas-tight chamber, a flange surface of said second flange being in close contact with said die, a space between said first and second flanges being communicated with evacuating means.

5,555,926

PROCESS FOR THE PRODUCTION OF SEMI-SOLIDIFIED METAL COMPOSITION

Mitsuo Uchimura; Tsukasa Shinde; Kazutoshi Hironaka; Hiroyshi Takahashi, and Akihiko Nanba, all of Chiba, Japan, assignors to Rheo-Technology, Ltd., Japan

Filed Aug. 26, 1994, Ser. No. 296,746

Claims priority, application Japan, Dec. 8, 1993, 5-340248; Dec. 8, 1993, 5-340249; Dec. 8, 1993, 5-340250; Jul. 19, 1994, 6-187855

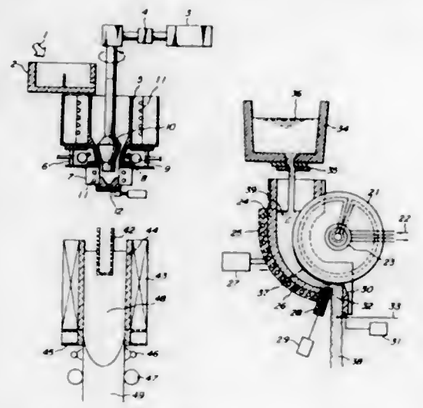
Int. Cl.[6] **B22D** *27/02;27/08*

U.S. Cl. 164—468 **6 Claims**

1. A process for continuously producing semi-solidified metal compositions having excellent castability comprising 1) pouring molten metal into an upper part of a cooling agitation mold, said cooling agitation mold comprising a cooling vessel, an agitator arranged in the vessel apart from an inner cooling face thereof and a nozzle for controlling an amount of slurry discharged from said cooling agitation mold, said slurry being a solid-liquid mixed phase containing non-dendritic primary solid particles dispersed therein, 2) agitating the molten metal and 3) adjusting a ratio of shear strain rate at a solid-liquid interface of said slurry to a solidification rate of said molten metal to a value exceeding 8000 in the cooling agitation mold while cooling to produce said slurry and 4) discharging the slurry from a lower part of the cooling agitation mold, said ratio being adjusted by adjusting said solidification rate according to formula (1):

wherein

$\dot{\gamma}$: shear strain rate at said solid-liquid interface (s^{-1})



solidification rate (s^{-1})=df_s/dt (1)

wherein

wherein dfs: solid fraction of semi-solidified metal composition discharged from said cooling agitation mold

dt: space volume of said cooling vessel (m^3)/discharge rate of said slurry (m^3/s),

and by adjusting said shear strain rate according to formulae (2) and (3):

$$\gamma=2\cdot r_1\cdot r_3\cdot\Omega/(r_1^2-r_1^2) \quad (2)$$

$$r_3=r_2-D=S+r_1 \quad (3)$$

wherein

γ: shear strain rate at said solid-liquid interface (s^{-1})

r_1: radius of said agitator (m)

r_2: inner radius of said cooling vessel (m)

Ω: angular velocity of said agitator (rad/s)

S: clearance (m) between said cooling vessel and said agitator

r_3: radius of molten metal in said cooling vessel (m)

D: thickness of a solidification shell (m) formed on said agitator.

3. A process for continuously producing semi-solidified metal compositions having excellent castability comprising 1) pouring molten metal into an upper part of a cooling agitation mold, said cooling agitation mold comprising a rotating cylindrical drum agitator having a horizontally rotational axis and a cooling wall member having a concave face along an outer periphery of the drum, a scraping member for scraping a solidification shell adhered to the outer periphery of the drum, and a nozzle for controlling the amount of a slurry discharged from said cooling agitation mold, said slurry being a solid-liquid mixed phase containing non-dendritic primary solid particles dispersed therein, 2) agitating the molten metal, 3) adjusting a ratio of shear strain rate at a solid-liquid interface of said slurry to a solidification rate of said molten metal adjusted to a value exceeding 8000 in the cooling agitation mold while cooling to produce said slurry and 4) discharging the slurry from a lower part of the cooling agitation mold, said ratio being adjusted by adjusting said solidification rate according to formula (1):

solidification rate (s^{-1})=df_s/dt (1)

wherein

dfs: solid fraction of semi-solidified metal composition discharged from said cooling agitation mold

dt: space volume of said cooling agitation mold (m^3)/discharge rate of said slurry (m^3/s),

and by adjusting said shear strain rate according to formulae (7) and (8):

$$\gamma=2\times(2\cdot\pi\cdot n)\times\{r_2\times(r_2+h)\}/(h^2+2\cdot r_2\cdot h) \quad (7)$$

$$r_2=r_1+t \quad (8)$$

wherein

γ: shear strain rate at said solid-liquid interface (s^{-1})

n: revolution number of said cylindrical drum agitator (s^{-1})

r_1: radius of said cylindrical drum agitator (m)

t: thickness of said solidification shell (m)

h: clearance between said solidification shell and said nozzle (m).

5. A process for continuously producing semi-solidified metal compositions having excellent castability comprising 1) pouring molten metal into an upper part of a cooling agitation mold, said agitation cooling mold comprising a cooling vessel, an electromagnetic induction coil arranged around an outer periphery of the vessel and a discharge nozzle for controlling the amount of slurry discharged from said cooling agitation mold, said slurry being a solid-liquid mixed phase containing non-dendritic primary solid particles dispersed therein, 2) agitating the molten metal and 3) adjusting a ratio of shear strain rate at a solid-liquid interface of said slurry to a solidification rate of said molten metal adjusting to a value exceeding 8000 in the cooling agitation mold while cooling to produce said slurry and 4) discharging the slurry from a lower part of the cooling agitation mold, said ratio being adjusted by adjusting said solidification rate according to formula 11:

solidification rate (s^{-1})=df_s/dt (11)

wherein

dfs: solid fraction of semi-solidified metal composition discharged from said cooling agitation mold and

dt: space volume in said cooling agitation mold (m^3)/discharge rate of said slurry (m^3/s)

and by adjusting said shear strain rate according to formulae (12), (13) and (14):

$$\gamma=\frac{\sigma(\Omega_c-\Omega_M)\,\alpha^2B_0^2}{4\mu}(r_2^2-r_1^2) \quad (12)$$

$$\Omega_M=\frac{\frac{\sigma\Omega_c\alpha^2B_0^2}{12\mu}(r_1-r_2)^2}{1+\frac{\sigma\alpha^2B_0^2}{12\mu}(r_1-r_2)^2} \quad (13)$$

$$Vr=\frac{\sigma(\Omega_c-\Omega_M)\,\alpha^2B_0^2}{8\mu r}(r^2-r_1^2)(r^2-r_2^2) \quad (14)$$

wherein

γ: shear strain rate (s^{-1})

σ: electric conductivity of the molten metal ($\Omega^{-1}\cdot s^{-1}$)

Ω_c: angular velocity of a rotating magnetic field in said cooling vessel formed by said electromagnetic induction coil (=2πf) (rad·s^{-1})

f: frequency applied to said electromagnetic induction coil (Hz)

Ω_M: average angular velocity of an agitation stream of said molten metal (rad·s^{-1})

B_0: magnetic flux density at blank operation (T)

α: magnetic efficiency in agitation of said molten metal

r_2: radius of said cooling agitation mold or radius of said solid-liquid interface (m)

r_1: radius of said nozzle

r: calculated radius of flow velocity of said molten metal (m)

Vr: peripheral flow velocity of said molten metal at a position of r (m/s).

5,555,927

THERMOSTAT SYSTEM HAVING AN OPTIMIZED TEMPERATURE RECOVERY RAMP RATE

Dipak J. Shah, Eden Prairie, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 7, 1995, Ser. No. 479,292

Int. Cl.[6] F23N *5/20;* **G05D** *23/00*

U.S. Cl. 165—239 **11 Claims**

1. A thermostat system in a space having a current space temperature that changes to an occupancy temperature is achieved at an occupancy time, the changing of the current space temperature caused by a heater or cooler, having a recovery start time that occurs at a recovery time prior to the occupancy time, the recovery time being a period of time needed for the current space temperature to be changed to the occupancy temperature, the recovery time determined by an optimized recovery ramp rate of a certain amount of space temperature change per unit time, comprising:

a first temperature sensor for sensing the current space temperature;

a second temperature sensor for sensing current outdoor ambient temperature of air external but proximate to the space;

a processor, connected to said first and second temperature sensors, having a memory, instruction processor and a clock;

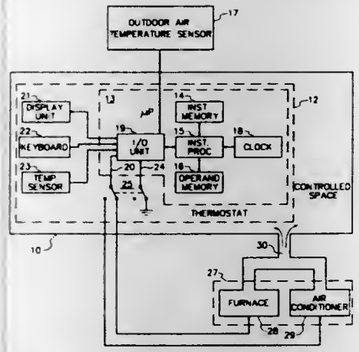
a space temperature changing unit having a heater and a cooler; and

a heat and cool mode selector connected to said processor and said space temperature changing unit; and

wherein:

the recovery start time is at the beginning of a period of recovery time prior to the occupancy time when the current space temperature is to be approximately the same as the occupancy temperature, the recovery time being determined by a recovery ramp rate of a certain amount of temperature change per unit time; and

the recovery ramp rate is based on (1) a difference between the current space temperature and the current outdoor ambient temperature at the recovery start time, (2) a thermal time constant based on a ratio of an average temperature difference between the current space temperature and the current outdoor ambient temperature during the recovery time when the space temperature is being changed to be approximately the same as the occupancy temperature, and of a time rate of change of the current space temperature during the recovery time, (3) a thermal time constant for a previous period of a recovery time having a similar time of day, and (4) a recovery ramp rate for the previous period of the recovery having the similar time of day.



5,555,928

LIQUID COOLED COOLING DEVICE

Hitoshi Inaba, Machida, and Tadahiro Ohmi, 1-17-301, Komegakubo 2-chome, Aoba-ku, Sendai-shi, Miyagi-ken 980, both of Japan, assignors to Tadahiro Ohmi, Miyagi-ken, and Takasago Netsugaku Kogyo Kabushiki Kaisha, Tokyo, both of Japan

PCT No. PCT/JP91/00919, § 371 Date Jan. 4, 1993, § 102(e) Date Jan. 4, 1993, PCT Pub. No. WO92/01198, PCT Pub. Date Jan. 23, 1992

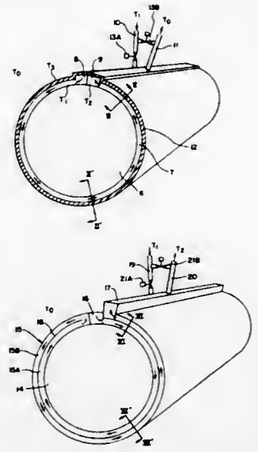
PCT Filed Jul. 10, 1991, Ser. No. 961,936

Claims priority, application Japan, Jul. 10, 1990, 2-181899

Int. Cl.[6] F25D *31/00;1/02;* **F28D** *7/00;7/10*

U.S. Cl. 165—47 **2 Claims**

1. A liquid cooled cooling device for cooling a heat generating section, comprising:



a double jacket portion defining a space for locating a heat generating section and covering an outer peripheral portion of said heat generating section, said double jacket portion including an inner portion and an outer portion which are arranged in series flow communication, said inner portion comprising an inner plurality of coolant passage cells and said outer portion comprising an outer plurality of coolant passage cells, said inner and outer pluralities of coolant passage cells arranged in parallel flow communication, each said inner coolant passage cell provided with an entrance pore, each said outer coolant passage cell provided with an exit pore, a flow-in portion for coolant arranged at one end of said inner portion, and a flow-out portion for cooling liquid arranged at one end of said outer portion, the flow directions of coolant in said inner portion and said outer portion being opposite; and

a flow controller valve disposed in circuit with and upstream of said flow-in portion for controlling the amount of coolant supplied to said flow-in portion whereby the temperature of coolant flowing into said flow-in portion can be caused to be lower than the atmospheric temperature in said space, and the difference between the temperature of coolant flowing out of said flow-out portion and said atmospheric temperature can be caused to be less than a predetermined amount.

5,555,929

HEAT EXCHANGER

Morio Ishikawa, Nukata-gun, Japan, assignor to Nippondenso Co., Ltd, Kariya, Japan

Filed May 23, 1995, Ser. No. 447,848

Claims priority, application Japan, May 23, 1994, 6-108749

Int. Cl.[6] F28F *9/02*

U.S. Cl. 165—76 **10 Claims**

1. A heat exchanger comprising:

a first part made of metallic core material and having a first connecting portion; and

a second part made of metallic core material and having a second connecting portion which is connected to said first connecting portion;

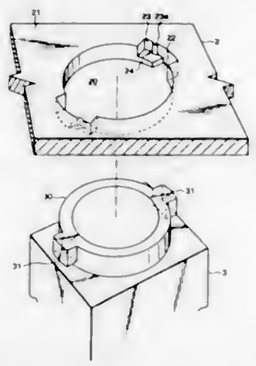
at least one of said first part and second part being partially covered with a brazing layer,

said first connecting portion and said second portion being connected to one another by melting said brazing layer after said first part and said second part are assembled,

said first connecting portion including a fitting concave portion,

said second connecting portion including a fitting convex portion which is press fitted into said fitting concave portion, and

said first connecting portion and said second connecting portion having said metallic core material exposed to opposing sur-



faces thereof so that each metallic core material directly contacts the other when said fitting convex portion is fitted into said fitting concave portion

wherein said fitting concave portion includes a protruding portion which protrudes inwardly from an inner surface of said fitting concave portion, said second part being press fitted into said first part by said protruding portion pressing said fitting convex portion.

5,555,930

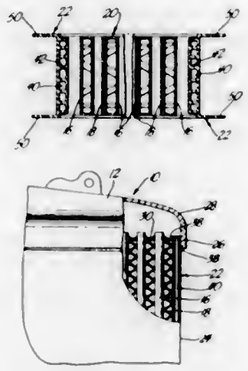
HEAT EXCHANGER ASSEMBLY WITH STRUCTURAL SIDE PASSAGEWAYS

James W. B. Lu, Mt. Pleasant, S.C., assignor to Behr Heat Transfer, Inc., Charleston, S.C.

Filed Jun. 24, 1994, Ser. No. 267,032

Int. Cl.[6] F28D *1/00;* **F28F** *7/00*

U.S. Cl. 165—81 **1 Claim**



1. A heat exchanger assembly (**10**) comprising:

a pair of manifolds (**12**, **14**) having openings (**13**, **15**) to convey fluid therethrough and including first and second distal ends (**26**);

a core member (**20**) connected between said pair of manifolds (**12**, **14**) and between said first and second distal ends (**26**) for conveying fluid between said manifolds (**12**, **14**) through said core member (**20**) for heat exchange;

said core member (**20**) including a plurality of fluid tubes (**16**) extending and connected between said manifolds for communicating fluid, a plurality of fins (**18**) connected between said fluid tubes (**16**) for enhancing heat exchange with fluid within said fluid tubes (**16**), and structural side support members (**22**) extending between said manifolds (**12**, **14**) at said distal ends (**26**) for supporting said fluid tubes (**16**) and said fins (**18**) between said side support members (**22**) and said manifolds (**12**, **14**);

said side support members (**22**) including fluid passageways (**40**) therethrough for unrestrictively communicating the fluid between said manifolds (**12**, **14**) while concurrently directing the fluid through said fluid tubes (**16**) to allow said side support members (**22**) and said fluid tube (**16**) to be uniformly thermally affected by the fluid;

said pair of manifolds (**12**, **14**) including a single inlet opening (**13**) and a single outlet opening (**15**) for providing flow of fluid into and out of said assembly (**10**);

said manifolds (**12**, **14**) including tank portions (**28**) having said inlet and outlet openings (**13**, **15**) and header portions (**30**) connected to said tank portions (**28**) to form said manifolds (**12**, **14**), said header portions (**30**) including a plurality of apertures (**36**) therein for receiving said fluid tubes (**16**) in connection therewith, and characterized by said header portions (**30**) spaced from said tank portions (**28**) at said distal ends for receiving said side support members (**22**) therebetween for communication of the fluid between said manifolds (**12**, **14**).

5,555,931

HEAT EXCHANGER FOR SEPARABLE AIR CONDITIONER

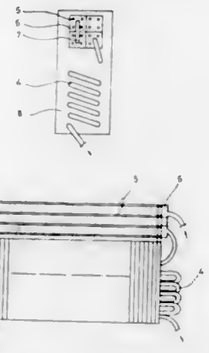
Dong-Jin Lee, and Jeom-Yul Yun, both of Seoul, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Aug. 1, 1994, Ser. No. 299,503

Claims priority, application Rep. of Korea, Sep. 3, 1993, 17667/1993; Sep. 3, 1993, 17668/1993

Int. Cl.[6] F28F *9/26*

U.S. Cl. 165—122 **1 Claim**



1. In a heat exchanger for an air conditioner comprising an air conditioner main body having a plurality of heat exchanging fins and a plurality of heat transfer tubes, a cross flow fan mounted in back of the air conditioner main body, and a casing for incasing both the air conditioner main body and the cross flow fan, wherein the improvement comprises:

tube banks provided on a predetermined upper section of said air conditioner main body including:

a plurality of small diameter tubes;

a plurality of distribution manifolds, said manifolds being connected to bundles of small diameter tubes respectively, thus to divide the plurality of small diameter tubes into several bundles of predetermined numbers of said tubes; and

a plurality of connection tubes connecting said distribution manifolds to each other, thus to cause said manifolds to communicate with each other;

said heat exchanging fins placed under said tube banks; said heat transfer tubes connected to said heat exchanging fins; and guide plates placed on opposed sides of both said tube bank and said heat transfer tubes

for supporting both the tube banks and the heat transfer tubes.

5,555,932

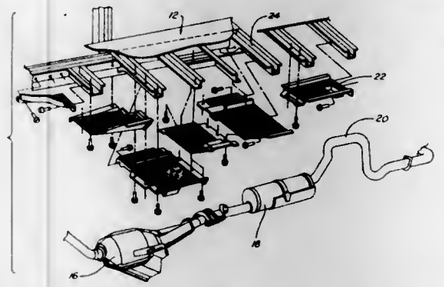
HEAT SHIELD FOR AN AUTOMOTIVE VEHICLE

Scott P. Dudley, Lake Orion, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 42,230, Apr. 2, 1993, abandoned. This application Jan. 31, 1995, Ser. No. 380,984

Int. Cl.[6] F28F *13/00;* **F28D** *17/00*

U.S. Cl. 165—135 **2 Claims**



1. An apparatus for preventing the transfer of heat from an exhaust system of an automotive vehicle to the floorpan of said vehicle, the apparatus comprising:

a shield stamped to conform generally to the shape of said floorpan, said shield including an inner layer and an outer layer that join together to form a plurality of pockets, said shield interposed between said exhaust system and said floorpan and being operative to prevent the transfer of heat from said exhaust system to said floorpan; and

a first phase change material comprising a salt having a melting point greater than 135° F. disposed in said plurality of pockets, said material being operative to absorb the heat generated by said exhaust system.

5,555,933

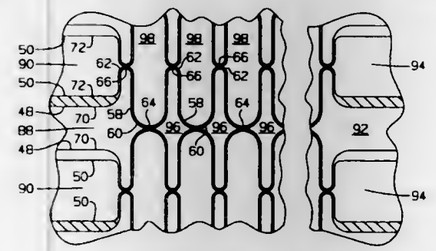
PRIMARY SURFACE HEAT EXCHANGER FOR USE WITH A HIGH PRESSURE RATIO GAS TURBINE ENGINE

Charles T. Darragh, San Diego; Leonard Holman, Chula Vista; Thomas M. Luckett, San Diego, and Michael E. Ward, Poway, all of Calif., assignors to Solar Turbines Incorporated, San Diego, Calif.

Filed Jul. 14, 1994, Ser. No. 274,879

Int. Cl.[6] F28F *3/08*

U.S. Cl. 165—166 **11 Claims**



1. A recuperator including a plurality of air cells, said air cells comprising:

a plurality of primary surface sheets having a heat transfer portion, a pair of end portions and a pair of transition portions defining a first surface and a second surface;

said plurality of primary surface sheets having a plurality of corrugations formed therein, each of said plurality of corrugations having a crest extending a preestablished axial distance above the first surface and a root extending a preestablished axial distance below the second surface, said preestablished axial distance above the first surface and the preestablished axial distance below the second surface being unequal.

5,555,934

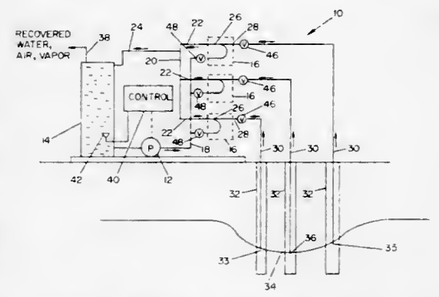
MULTIPLE WELL JET PUMP APPARATUS

Michael D. Haufler, Westminster, Md., assignor to R. E. Wright Environmental, Inc., Middletown, Pa.

Filed Jun. 12, 1995, Ser. No. 489,434

Int. Cl.[6] E21B *43/00*

U.S. Cl. 166—68 **7 Claims**



1. A multiple well pumping apparatus comprising:

at least two venturi jet pumps, each jet pump with a venturi input, a vacuum inlet, and an outlet;

a circulating pump interconnected with and delivering liquid to the venturi input of each jet pump; and

pipes interconnecting at least one jet pump vacuum inlet to a liquid intake within a well.

5,555,935

FLUID CONNECTOR FOR WELL

Norman Brammer, Aberdeen, Scotland; Brett R. McConaughy, Jurong, Singapore, and James A. Gariery, Houston, Tex., assignors to ABB Vetco Gray Inc., Houston, Tex.

Continuation-in-part of Ser. No. 294,679, Aug. 23, 1994, Pat. No. 5,465,794. This application Jun. 6, 1995, Ser. No. 470,104

Int. Cl.[6] E21B *34/10*

U.S. Cl. 166—88.1 **19 Claims**

1. A well production assembly comprising in combination:

a wellbore extending from the earth's surface downward to a fluid bearing formation located below the earth's surface;

a tubular wellhead housing located at an upper end of a string of casing which extends into the wellbore;

a production tree mounted to an upper end of the wellhead housing, having a bore and a production fluid outlet for delivering production fluids from the formation to the exterior of the tree, the tree having an inner mating surface and a fluid passage having a lateral portion extending through the tree with an inboard port at the inner mating surface;

an insert member landed concentrically within the bore of the tree, the insert member having an outer mating surface which mates with the inner mating surface of the tree;

a fluid passage extending through the insert member and having an outboard seal recess located on the outer mating surface of

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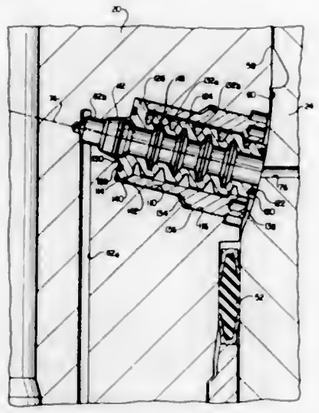
5,555,939

APPARATUS FOR EXTINGUISHING CHIMNEY FIRES

1. A plurality of automatic gas injection fire extinguishers set in a closed space, a number used determined by a volume of said



the insert member, registering with the inboard port of the fluid passage of the tree; and

a seal carried within the seal recess, having a face on an outer end which seals against the inner mating surface of the tree and surrounds the inboard port.

5,555,936

SCLEROGLUCAN GEL APPLIED TO THE OIL INDUSTRY

Rosangela Pirri, Montardon; Jacques Gadioux, Orthez, and Richard Riveno, Toulouse, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Division of Ser. No. 160,332, Dec. 2, 1993, which is a continuation of Ser. No. 783,126, Oct. 28, 1991, abandoned. This application Mar. 16, 1995, Ser. No. 405,181

Claims priority, application France, Oct. 29, 1990, 90 13385

Int. Cl.[6] E21B *33/138*

U.S. Cl. 116—295 **15 Claims**

1. A process for selectively reducing the permeability of a subterranean reservoir, which comprises:

(i) firstly, injecting a crosslinking agent solution, comprising at least one water-soluble complex of a polyvalent metal, into a well at a depth corresponding to a formation to be treated; and thereafter

(ii) secondly, injecting a solution of scleroglucan, having a scleroglucan content of between 150 and 5,000 ppm, to thereby form a layer of crosslinked scleroglucan gel.

5,555,937

METHOD AND COMBINATION OF MATERIALS FOR RELEASING A STUCK PIPE

James V. Fisk, Jr., Houston, and Jeffrey P. Kirsner, Friendswood, both of Tex., assignors to Baroid Technology, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 184,427, Jan. 21, 1994, Pat. No. 5,415,230. This application May 15, 1995, Ser. No. 440,584

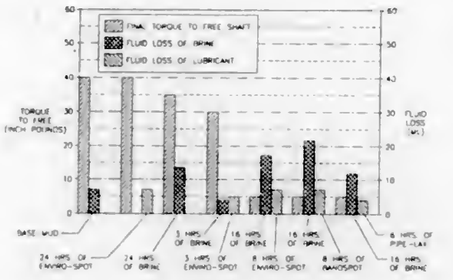
Int. Cl.[6] E21B *31/03*

U.S. Cl. 166—301 **16 Claims**

1. A method for releasing stuck pipe in a wellbore, comprising:

pumping a first, clear brine spotting fluid into the stuck region of the pipe; and

displacing over a period of about at least eight hours said first, clear brine spotting fluid from the stuck region of the pipe with a second spotting fluid having at least one component selected from the class of wetting agents, surfactants, lubricating agents, and mixtures thereof, whereby said stuck region of the pipe is first soaked with the first spotting fluid and is then soaked with the second spotting fluid for about at least eight hours, or until the stuck pipe has been freed, whichever happens first, in the stuck region of the pipe.



7. A new and improved combination of materials for freeing stuck pipe, comprising:

a first spotting pill comprised of clear brine;

a second spotting pill selected from the class of wetting agents, surfactants, lubricants, and mixtures thereof, said second spotting pill being sequentially spaced from said first spotting pill in the stuck pipe.

5,555,938

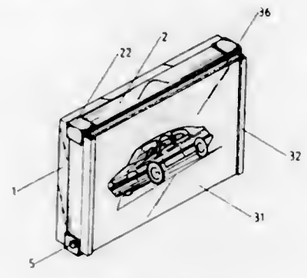
PICTURE-COMBINED FIRE EXTINGUISHER

Bae C. Tzeng, No. 67-4, Sec. 3, Jong Shan Road, Jong Her City, Taipei, Taiwan

Filed Dec. 12, 1994, Ser. No. 354,255

Int. Cl.[6] A62C *19/00*

U.S. Cl. 169—36 **3 Claims**



1. A picture-combined fire extinguisher comprising:

a glass-shelled fire extinguisher having a metal or plastic frame a front of which slightly extends beyond a front of said glass-shelled fire extinguisher; and

a show window pivotally connected to said frame of said glass-shelled fire extinguisher and consisting of a clear panel with a metal or plastic outer frame that extends from a rear side thereof and extends inwardly to form a space suitable for receiving a picture therein behind said clear panel.

5,555,939

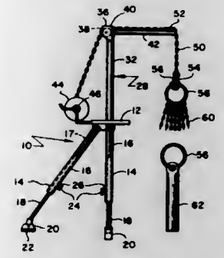
APPARATUS FOR EXTINGUISHING CHIMNEY FIRES

Martin T. Berger, 111 5th Ave. S.W., and Terry T. Then, 104 1st St. N.E., both of Epworth, Iowa 52045

Filed Oct. 27, 1995, Ser. No. 549,280

Int. Cl.[6] A62C *3/04*

U.S. Cl. 169—54 **11 Claims**



1. A portable apparatus for extinguishing chimney fires from the roof of a structure containing the chimney, said apparatus comprising: a main support bracket; a plurality of legs pivotally attached to and extending downwardly from the main support bracket so as to engage the roof; first adjustment means combined with each leg to provide for adjustment of the length of each leg independently of the other legs; a main support member extending upwardly from the main support bracket and terminating in an upper end, the main support member being rotatable relative to the support bracket; second adjustment means combined with the main support member to provide for adjustment of the height of the upper end of the main support member; a support arm extending outwardly from the upper end of the main support member and terminating in an outer end; a cleaner support line operatively connected to the main support bracket and carried by the support arm so that its free end extends downwardly from the outer end of the support arm; a cleaning device attached to the free end of the cleaner support line; and means to lower and raise the cleaning device by extending and retracting the cleaner support line.

5,555,940

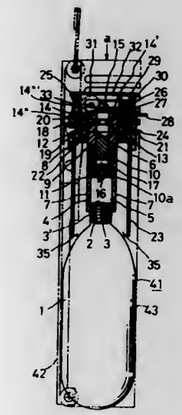
AUTOMATIC GAS INJECTION FIRE EXTINGUISHER

Masaru Fujiki, Tokyo, Japan, assignor to Glory Kiki Co., Ltd., Himeji, Japan

Filed May 3, 1994, Ser. No. 237,038

Int. Cl.[6] A62C *35/13*

U.S. Cl. 169—60 **7 Claims**



1. A plurality of automatic gas injection fire extinguishers set in a closed space, a number used determined by a volume of said closed space, each of said plurality of said automatic gas injection fire extinguishers comprising:

a cylinder which is filled with a fire extinguishing gas in a liquid state containing at least one of carbon dioxide and nitrogen having a cooling fire extinguishing function based on gasification latent heat of a liquified gas when gasified and an oxygen deficiency fire extinguishing function based on expansion thereof, said cylinder being sealed with a seal member,

a firing pin unit for breaking said seal member,

a cylinder receiving unit retaining said cylinder and supporting said firing pin unit,

a fixing unit for supporting said cylinder receiving unit,

a retainer unit for maintaining said firing pin unit in an inoperative state, and

a retainer operating device automatically releasing said retainer unit at a predetermined temperature, said retainer operating device having a first spring formed from a metal with a shape memory, said first spring being normally maintained in a slightly compressed state, and expanding at a predetermined temperature, thereby actuating said firing pin unit, breaking said seal member, and releasing said liquified gas,

wherein said fixing unit comprises a cylindrical member surrounding said cylinder receiving unit and forming a clearance between an upper end surface of said cylinder and a fully open end of said cylindrical member, gasified liquid gas traveling through said clearance to said closed space.

5,555,941

MACHINE FOR WORKING WITH A SUCTION SNOUT ON THE BALLAST OF A TRACK BED

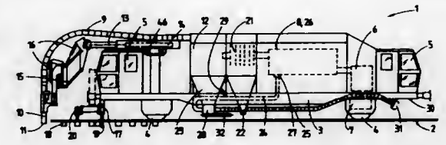
Josef Theurer, Vienna, and Herbert Wörgötter, Gallneukirchen, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Mar. 28, 1995, Ser. No. 412,297

Claims priority, application Austria, Apr. 13, 1994, 763/94

Int. Cl.[6] E01B *27/00*

U.S. Cl. 171—16 **9 Claims**



1. A machine for working on a ballast bed supporting a track, which comprises

(a) a machine frame,

(b) undercarriages supporting the machine frame on the track,

(c) a ballast storage receptacle on the machine frame,

(d) a suction arrangement on the machine frame, the suction arrangement comprising

(1) a suction unit and

(2) a suction conduit connected to the suction unit, the suction conduit terminating in a vertically and transversely adjustable suction snout defining a suction opening for aspirating ballast into the ballast storage receptacle,

(e) a compressed air generating unit on the machine frame,

(f) a compressed air conduit connecting the compressed air generating unit to the ballast storage receptacle for supplying compressed air thereto, and

(g) a blow conduit connected to the ballast storage receptacle for blowing stored ballast out of the receptacle.

5,555,942

BLADE CONTROL SYSTEM FOR USE IN A BULLDOZER

Shigenori Matsushita; Shigeru Yamamoto; Shu H. Zhang;

and retracting of said at least one rear bowl cylinder so as to move a bottom portion of the rear scraper and a bottom

5,555,946

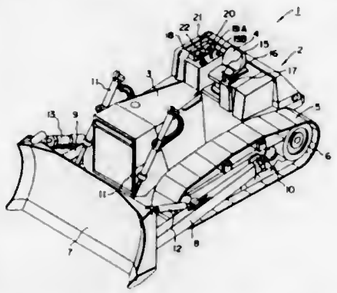
METHOD AND TOOL FOR USE IN COMMMENCING THE DRILLING OF A DEVIATED WELL

5,555,942

BLADE CONTROL SYSTEM FOR USE IN A BULLDOZER

Shigenori Matsushita; Shigeru Yamamoto; Shu H. Zhang; Satoru Nishita, and Kazushi Nakata, all of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 15, 1994, Ser. No. 260,394
Claims priority, application Japan, Jun. 16, 1993, 5-145058
Int. Cl.[6] A01B *67/00*
U.S. Cl. 172—3 **19 Claims**



1. A blade control system for use in a bulldozer having a body, comprising:

(a) driving mode setting means for setting an automatic blade control mode during dozing operation;

(b) running condition detector means for detecting whether a transmission is placed in forward range or reverse range; and

(c) blade controller means for: (i) controlling tilting and lowering of a blade such that when the running condition detector means has detected that the transmission is placed in forward range and the driving mode setting means has set the automatic blade control mode to start digging, a lower end of the blade is adjusted to a position horizontal in relation to said body and said blade is brought into contact with the ground, and (ii) controlling tilting and lowering of a blade such that when the running condition detector means has detected that the transmission is placed in reverse range and the driving mode setting means has set the automatic blade control mode, the lower end of the blade takes its backward moving position which is at least at a specified distance above the ground.

5,555,943

COMBINED LAWN AERATING AND WEED REMOVER APPARATUS AND METHOD OF USING SAME

David B. Blasczyk, 5752 Santa Clara Rd., Indian Hills, Colo. 80454-0384

Filed Apr. 11, 1995, Ser. No. 420,097
Int. Cl.[6] A01B *45/02*
U.S. Cl. 172—22 **13 Claims**

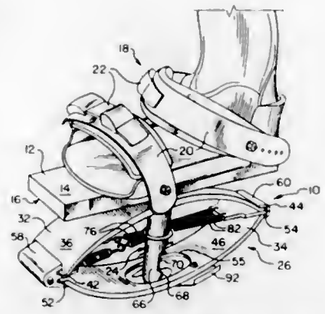
1. A lawn-aerating and weed-pulling apparatus for use by a user in removing weeds and aerating ground, the apparatus comprising:

a foot plate having a first side and a second side, said second side including a portion which is designed and adapted to be centered substantially directly under the center of the foot of a user;

means for releasably securing said foot plate to at least one foot of a user, said securing means being attached to said first side of said foot plate;

resilient biasing means secured to said second side of said foot plate; and

coring means for removing a plug of ground secured to said second side of said foot plate; whereby when said coring means is placed upon the ground, then upon exertion of a generally downward force on said foot plate, said resilient biasing means is compressed, thereby allowing said coring means to penetrate the ground, and whereby further, upon release of the generally downward force on said foot plate, said resilient biasing means urges said foot plate and said coring means away from the ground.

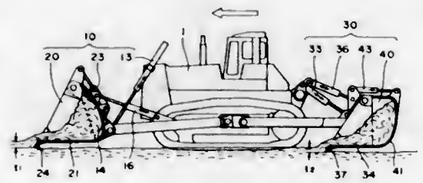


5,555,944

TWIN-SCRAPE DOZER

Kenzo Kimoto, Hirakata, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Sep. 6, 1994, Ser. No. 301,866
Claims priority, application Japan, Sep. 8, 1993, 5-247515
Int. Cl.[6] E02F *3/76*
U.S. Cl. 172—787 **18 Claims**



1. A twin-scrape dozer comprising:

a crawler tractor equipped with a traveling mechanism comprising left and right track frames provided at right and left sides of said crawler tractor, left and right track shoes, and left and right drive units;

a front earth loading and ejecting device mounted on a front portion of said crawler tractor;

at least one front lift cylinder for vertically moving said front earth loading and ejecting device;

a rear earth loading and ejecting device mounted on a rear portion of said crawler tractor; and

at least one rear lift cylinder for vertically moving said rear earth loading and ejecting device;

wherein said front earth loading and ejecting device comprises a front scraper, said front scraper having a cutting edge at a forward bottom end thereof, a front bowl member pivotably connected to the front scraper by at least one front pivot pin, and at least one front bowl cylinder for providing relative movement between the front scraper and the front bowl member about the at least one front pivot pin in response to extending and retracting of said at least one front bowl cylinder so as to move a bottom portion of the front scraper and a bottom portion of the front bowl member away from each other to form a front ejection port and toward each other to close the front ejection port, and

wherein said rear earth loading and ejecting device comprises a rear scraper, said rear scraper having a cutting edge at a forward bottom end thereof a rear bowl member pivotably connected to the rear scraper by at least one rear pivot pin, and at least one rear bowl cylinder for providing relative movement between the rear scraper and the rear bowl member about the at least one rear pivot pin in response to extending and retracting of said at least one rear bowl cylinder so as to move a bottom portion of the rear scraper and a bottom portion of the rear bowl member away from each other to form a rear ejection port and toward each other to close the rear ejection port;

whereby said front earth loading and ejecting device and said rear earth loading and ejecting device can be simultaneously utilized in an earth excavating and loading operation to load excavated material into said front bowl member and said rear bowl member while said crawler tractor is moving forwardly; and

whereby said front earth loading and ejecting device and said rear earth loading and ejecting device can be simultaneously maintained in an elevated traveling position in a traveling and conveying operation with loaded excavated material in each of said front bowl member and said rear bowl member and with the center of gravity of the thus loaded dozer being near the center of the dozer so that the dozer is well balanced during travel.

5,555,945

EARLY EVALUATION BY FALL-OFF TESTING

Roger L. Schultz, Stillwater, Okla.; H. Kent Beck, Copper Canyon; Paul D. Ringgenberg, Carrollton, both of Tex., and Ronald L. Hinkie, Marlow, Okla., assignors to Halliburton Company, Dallas, Tex.

Filed Aug. 15, 1994, Ser. No. 290,653
Int. Cl.[6] E21B *49/00*
U.S. Cl. 175—50 **22 Claims**

1. A method of testing a zone of interest in subsurface formation intersected by a well, comprising:

(a) providing a column of fluid in said well, said column of fluid having an overbalanced hydrostatic pressure at said subsurface formation greater than a formation pressure of said subsurface formation;

(b) running a testing string into said well, said testing string including a packer, a pressure monitor and a closure tool arranged to close a bore of said testing string;

(c) shutting in said subsurface formation by setting said packer and closing said bore of said testing string with said closure tool and thereby initially trapping said overbalanced hydrostatic pressure of said column of fluid in said well below said packer; and

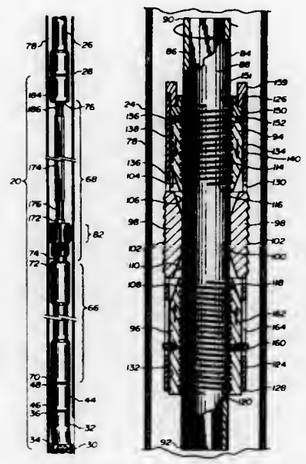
(d) after step (c), monitoring a pressure fall-off in said well below said packer.

5,555,946

METHOD AND TOOL FOR USE IN COMMMENCING THE DRILLING OF A DEVIATED WELL

Darrell Klatt, Box 355, Caroline, Canada

Filed Apr. 24, 1995, Ser. No. 427,407
Int. Cl.[6] E21B *7/08;4/18*
U.S. Cl. 175—061 **21 Claims**



1. A method for use in commencing the drilling of a deviated well from a point in a wellbore, the wellbore including a casing within it and the point defining a gap in the casing, using a non-rotary drill string having an attached drilling tool comprised of a drill bit for drilling the well, a downhole motor operatively connected to the drill bit for rotating the drill bit to drill the well, a tubular member connected between the downhole motor and the drill string and an anchor assembly, slidably mounted on and selectively actuated by the rotation of the tubular member, for releasably engaging the casing, the method comprising the steps of:

(a) positioning the drill string and the drilling tool in the wellbore;

(b) first engaging the tubular member with the anchor assembly such that rotation of the tubular member actuates the anchor assembly;

(c) setting the anchor assembly by rotating the drill string in a first direction in order that the drill string rotates the tubular member which actuates the anchor assembly such that the anchor assembly firmly engages the casing;

(d) disengaging the tubular member from the anchor assembly such that the tubular member may freely rotate within the anchor assembly;

(e) orienting the drill bit in a desired direction by rotating the drill string in order that the tubular member rotates within the anchor assembly to position the drill bit in the desired direction;

(f) second engaging the tubular member with the anchor assembly to support the tubular member and to inhibit further rotation of the tubular member in the first direction and thus maintain the desired direction of the drill bit while allowing the tubular member to move longitudinally relative to the anchor assembly; and

(g) drilling the well by moving the drill bit to the point and operating the downhole motor to rotate the drill bit in a second direction opposite to the first direction such that any reactive torque generated by the downhole motor urges the drill string and the tubular member to rotate in the first direction, while applying weight on the drill bit through the drill string in order that the tubular member moves longitudinally relative to the anchor assembly as the drill bit advances to drill the well from the point, so that the tubular member

moves longitudinally relative to the anchor assembly from a start position to an end position in which the tubular member can no longer move longitudinally relative to the anchor assembly.

11. A tool for connection to a non-rotary drill string for use in commencing the drilling of a deviated well from a point in a wellbore, the wellbore including a casing within it and the point defining a gap in the casing, the tool comprising:

(a) a drill bit for drilling the well;

(b) a downhole motor operatively connected to the drill bit for rotating the drill bit to drill the well;

(c) a tubular member connected between the downhole motor and the drill string such that rotation of the drill string will cause rotation of the tubular member and the drill bit;

(d) an anchor assembly slidably mounted about the tubular member such that the tubular member is movable longitudinally relative to the anchor assembly, which anchor assembly is actuated by the rotation of the drill string, for releasably engaging the casing and for maintaining the orientation of the drill bit during drilling of the well;

(e) means for actuating the anchor assembly to selectively set the anchor assembly in engagement with the casing upon the rotation of the drill string in a first direction and to selectively unset the anchor assembly from engagement with the casing upon the rotation of the drill string in a second direction;

(f) means for facilitating the orientation of the drill bit prior to drilling by rotation of the drill string so that the drill bit is oriented in a desired direction; and

(g) means for maintaining the orientation of the drill bit in the desired direction during drilling of the well when the anchor assembly is set by inhibiting the rotation of the drill string in the first direction caused by reactive torque generated in the drill string by the rotation of the drill bit in a second direction opposite to the first direction.

5,555,947

MOLE LAUNCHER AND A METHOD OF OPERATING A MOLE LAUNCHER

Roger S. A. Bunker, Witney, and David J. Goodall, Bursledon, both of Great Britain, assignors to British Gas, London, and Bonuscentre Limited, Minster Lovell, both of Great Britain

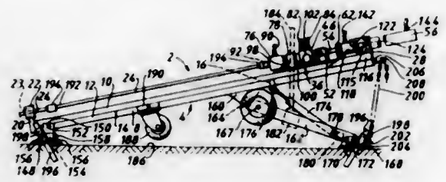
PCT No. PCT/GB93/02499, § 371 Date Aug. 9, 1995, § 102(e) Date Aug. 9, 1995, PCT Pub. No. WO94/13926, PCT Pub. Date Jun. 23, 1994

PCT Filed Dec. 3, 1993, Ser. No. 446,850

Claims priority, application United Kingdom, Dec. 4, 1992, 9225466; Mar. 3, 1993, 9304259

Int. Cl.[6] E21B *7/02*

U.S. Cl. 175—62 **28 Claims**



1. A mole launcher from which is propellable under fluid power a string of drill pipes having at a mole end of the string remote from the launcher a mole operable to bore an underground passage, said mole launcher comprising:

a double acting fluid powered piston and cylinder unit comprising a cylinder having a piston working therewithin and acting to reciprocate a connecting rod as said piston reciprocates,

a support means for supporting said double acting fluid powered piston and cylinder unit, said cylinder being mounted on said support means and being capable of longitudinal movement relative to the support means,

a connecting means for detachably connecting the connecting rod to a said drill pipe at a drive end of said drill pipe string when the launcher is in use and the mole is at the mole end of the string such that when the connecting rod performs linear strokes relative to the cylinder the linear movement of the rod is applied as linear movement to the drill pipe string which is pushed or pulled by said movement of the connecting rod, said cylinder being movable longitudinally relative to the support means between first and second positions,

a first disengageable restraining means for holding the connecting rod substantially stationary relative to said support means whereby under fluid power the cylinder can be moved from said first position to said second position and vice-versa,

a second disengageable restraining means for holding the cylinder substantially stationary longitudinally in said second position whereby under fluid power applied to the cylinder said connecting rod can be reciprocated relatively to the cylinder such that on an outward movement from the cylinder said connecting rod exerts pushing force on the string of drill pipes connected to the connecting rod in the course of use of the launcher, and wherein in said second position said cylinder projects beyond said support means and a disengageable engagement means is provided on the cylinder and said support means for supporting the cylinder and for restraining the cylinder from lifting away from said support means.

5,555,948

Patent Not Issued For This Number

5,555,949

ELECTRICALY OPERABLE WHEELCHAIR HAVING A CONTROLLER RESPONSIVE TO DIFFERENT TYPES OF INPUTS

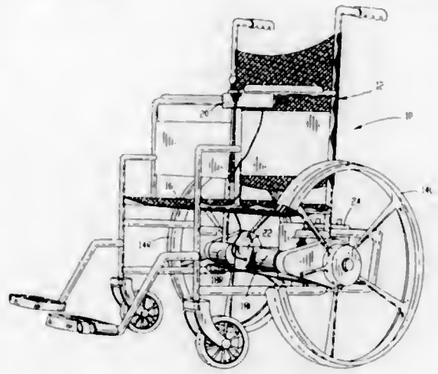
Caskel A. Stallard, Wichita, Kans., and Susan O. Scholl, Bozeman, Mont., assignors to Cerebral Palsy Research Foundation of Kansas, Wichita, Kans.

Continuation of Ser. No. 837,214, Feb. 18, 1992, abandoned.

This application Jul. 28, 1994, Ser. No. 281,638

Int. Cl.[6] B62D *11/04*

U.S. Cl. 180—6.5 **40 Claims**



1. An electrically operable wheelchair comprising:

a wheelchair framework having wheels and structure for supporting a user;

an electrically operable motor coupled with one of said wheels;

control means coupled with said motor for controlling the operation thereof and thereby the movements of said wheelchair in accordance with input signals received from a source thereof; and

an input device selected from a plurality of different types of user-operable input devices including means for coupling with said control means and operable for providing said input signals thereto, said different types of input devices being operable for providing a plurality of different types of input signals characteristic of the corresponding input device and representative of desired wheelchair movements,

said control means including means for responding to said plurality of different types of input signals for controlling said wheelchair movements; and

selector means for producing a selection signal representative of a selected one of said different types of input devices,

said control means including means for storing a plurality of computer program subroutines corresponding to said different types of user-operable devices, said control means being operable for executing said subroutines for controlling the movements of said wheelchair in accordance with input signals from the corresponding input device,

said control means further including means for receiving said selection signal and for responding thereto by retrieving for execution one of said subroutines corresponding to the type of input device represented by said selection signal.

5,555,950

BODY STRUCTURE FOR ELECTRIC VEHICLE

Junichi Harada; Takuji Tsuchida, Susono; Keiji Kunikita, Yokosuka; Katsuhisa Hasegawa, Toyota; Tadahiko Fuse, Yokosuka, and Tomoo Suzuki, Zushi, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, and Kanto Jidosha Kogyo Kabushiki Kaisha, Yokosuka, both of Japan

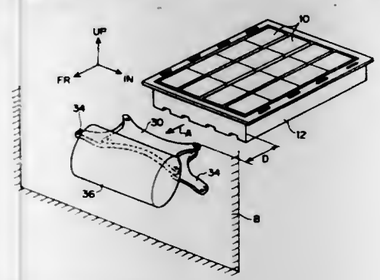
Continuation of Ser. No. 25,246, Mar. 2, 1993, abandoned.

This application Jan. 20, 1995, Ser. No. 376,660

Claims priority, application Japan, Mar. 4, 1992, 4-046596; Mar. 4, 1992, 4-046704; Oct. 26, 1992, 4-287784

Int. Cl.[6] B60K *1/04*; B62D *21/15*

U.S. Cl. 180—65.1 **3 Claims**



1. An electric vehicle comprising:

a main frame;

a sub-frame attached to said main frame;

a motor section attached to said main frame, said motor section being positioned forwardly of said sub-frame and spaced a predetermined distance therefrom;

a battery carrier having flange portions engageable with said main frame, each flange portion having a plurality of elongated holes of predetermined length with parallel sidewalls;

a plurality of fastener bolts fixedly secured to said main frame, each of said plurality of fastener bolts extending through a respective hole for securing said battery carrier to said main frame rearwardly of said sub-frame, and each of said plurality of fastener bolts having a diameter less than a spacing between said parallel sidewalls of respective ones of said plurality of elongated holes, said plurality of elongated holes permitting longitudinal movement of said battery carrier relative to said fastener bolts and said main frame;

said battery carrier being securely maintained by said plurality of fastener bolts to said main frame a predetermined distance from said sub-frame during normal vehicle operation;

said motor section impacting with said sub-frame, and said plurality of fastener bolts and said plurality of elongated holes permitting said battery carrier to move in a forwardly direction relative to said main frame for impact with said sub-frame, in the event of a frontal collision.

5,555,951

ELECTRICALLY OPERATED POWER STEERING APPARATUS WITH IMPROVED HOUSING ASSEMBLY

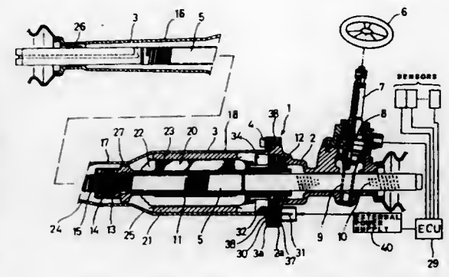
Mitsutaka Sugino, and Yasuo Shimizu, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 20, 1994, Ser. No. 309,892

Claims priority, application Japan, Sep. 24, 1993, 5-051780 U; Sep. 24, 1993, 5-051781 U

Int. Cl.[6] B62D *5/04*

U.S. Cl. 180—444 **6 Claims**



1. An electrically operated power steering apparatus comprising:

a housing assembly;

a steering shaft with a pinion mounted thereon, said steering shaft being rotatably supported by said housing assembly;

a rack shaft axially movably disposed in said housing assembly and held in mesh with said pinion;

an electric motor mounted coaxially on said rack shaft in said housing assembly and having a stator and a rotor; and

a ball-and-nut mechanism coaxially disposed about said rack shaft for transmitting power from said electric motor to said rack shaft;

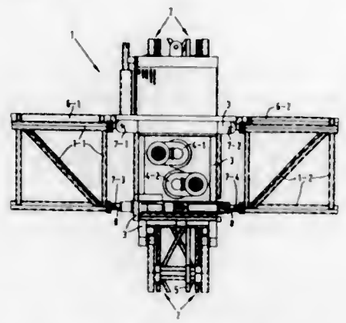
said housing assembly comprising a first housing and a second housing which are separate from and fastened to each other in an axial direction of said rack shaft, said pinion being housed in said first housing, said second housing including a smaller-diameter portion slidably supporting said rack shaft therein and a larger-diameter portion having an end joined to said first housing, said smaller-diameter portion and said larger diameter portion being formed in a unitary structure, said second housing further including a medium-diameter portion disposed between said smaller-diameter portion and said larger-diameter portion., said smaller-diameter portion and said medium-diameter portion being joined to each other by a first tapered portion, said medium-diameter portion and said larger-diameter portion being joined to each other by a second tapered portion, and said ball-and-nut mechanism being housed in said medium-diameter portion of said second housing, said stator being fixed to an inner surface of said larger-diameter portion, said rotor being rotatably disposed around said rack shaft in said larger-diameter portion.

5,555,952

5,555,954

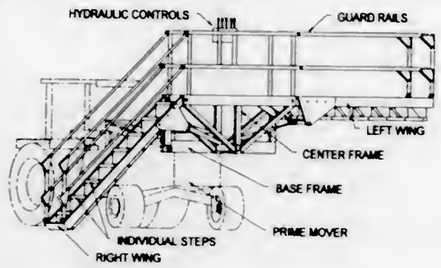
and wherein the base of said boards extend below said side flanges

5,555,952
PLATFORM, ADJUSTABLE IN HEIGHT
Johannes C. F. van Mol, Diessen; Johannes B. M. Ockhuizen, Tilburg, and Antonius H. J. Smits, O-Wen Middelbeers, all of Netherlands, assignors to HEK Manufacturing B.V., Middelbeers, Netherlands
Filed Apr. 14, 1994, Ser. No. 227,436
Claims priority, application Netherlands, Apr. 14, 1993, 9300629
Int. Cl.[6] E04G *1/20*
U.S. Cl. 182—18 **11 Claims**



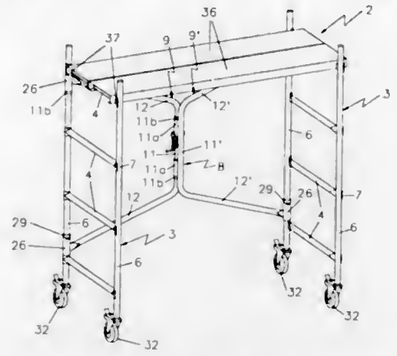
1. Platform equipped with a chair, which chair is displaceable along a mast, to each side of which platform a platform component can be affixed, characterised in that force indication means are fitted between each platform component and the chair, which force indication means are inserted mechanically in series with elastic means.

5,555,953
PORTABLE SCAFFOLDING ATTACHMENT FOR FRONT END LOADER OR FORKLIFT
Gary R. Henderson, 19353 Windward Cove, Gulfport, Miss. 39503
Filed Jan. 3, 1995, Ser. No. 368,010
Int. Cl.[6] E04G *1/00;* **B66F** *11/00*
U.S. Cl. 182—141 **1 Claim**



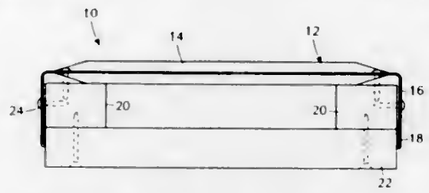
1. A scaffolding system comprising:
a center platform including a means to attach it to a prime mover such as a front end loader or forklift;
an appendage or wing from one or more sides of the center platform and including a means of rotating the wing or appendage in relation to the center platform;
a number of individual steps mounted in the appendage or wing and including a means for retaining the steps horizontal during rotation of the appendage or wing;
a means of rotating the center platform into a horizontal plane along its long axes.

5,555,954
COLLAPSIBLE-EXPANSIBLE SUPPORT ASSEMBLY
Paul R. Swiderski, Scott County, Ky., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Jul. 29, 1994, Ser. No. 283,245
Int. Cl.[6] E04G *1/34*
U.S. Cl. 182—152 **14 Claims**



1. A collapsible-expansible support assembly comprising:
a pair of vertically extending rung ladder frames, said ladder frames being adapted to be moved apart in expanded spaced, substantially parallel relation so that the rungs thereof can receive at least one support platform to be mounted thereon; a moveable collapsible-expansible truss assembly including opposed spaced remote distal ends pivotally mounted respectively to said ladder frames and adjacent proximal ends pivotally joined to each other; and, a unitary guide tract and pin assembly restricting and holding means cooperative with and between said pivotally joined proximal ends to automatically releasably lock and immobilize said collapsible-expansible truss assembly in at least one firm and immovable preselected position until intentionally released when said truss assembly has been moved to such preselected position.

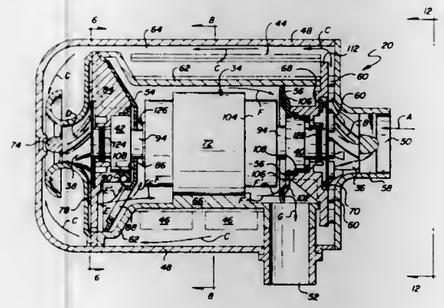
5,555,955
COMBINATION SCAFFOLD PLANK
Michael S. D'Alessio, Flushing, N.Y., assignor to Patent Construction Systems, Harsco Corporation, Paramus, N.J.
Filed Jun. 17, 1994, Ser. No. 261,466
Int. Cl.[6] E04G *1/15*
U.S. Cl. 182—222 **17 Claims**



1. A combination scaffold plank which is comprised of:
(A) a metal platform having:
(i) a rectangular base,
(ii) side flanges extending downwardly from each side of said rectangular base, and
(iii) return flanges extending inwardly from the end of said side flanges,
(B) a plurality of blocks secured to the lower surface of said metal platform, and
(C) one or more boards, each board secured to the base of two or more of said blocks,

and wherein the base of said boards extend below said side flanges and return flanges.

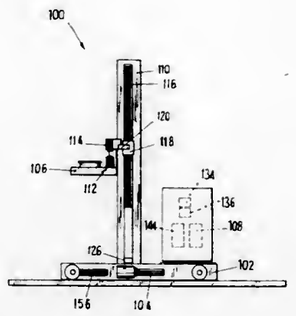
5,555,956
LOW CAPACITY CENTRIFUGAL REFRIGERATION COMPRESSOR
Mark G. Voss, Brighton, and William O. Harvey, Cadillac, both of Mich., assignors to Nartron Corporation, Reed City, Mich.
Continuation of Ser. No. 23,053, Feb. 25, 1993, Pat. No. 5,350,039. This application May 27, 1994, Ser. No. 250,282
Int. Cl.[6] F01M *1/00*
U.S. Cl. 184—6.16 **5 Claims**



1. An improved motor driven refrigerant compressor having a housing enclosing a motor and moving parts of the compressor including oppositely disposed first and second stage centrifugal impellers, the housing defining an internal fluid pathway for circulating a mixture of gaseous refrigerant and lubricant mist between said stages and within the housing, said pathway being generally bi-directionally concentric for circulating said mixture generally in two directions along an axis of said compressor and whereby all compressor interstage mixture flow occurs within said housing.

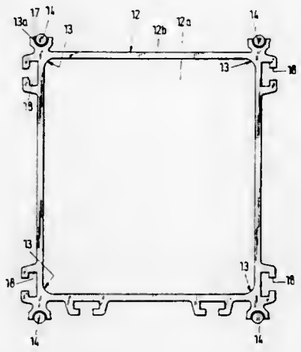
5,555,957
CONTROL SYSTEM FOR A MATERIALS-HANDLING DEVICE, ESPECIALLY FOR A SHELF STORAGE AND RETRIEVAL DEVICE
Herbert Dreher, Witten; Michael Hülsmann, Herdecke; Anton Münzebrock, and Guiliano Persico, both of Dortmund, all of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany
Filed Apr. 17, 1995, Ser. No. 423,163
Claims priority, application Germany, Apr. 15, 1994, 44 13 538.6
Int. Cl.[6] B66F *9/20*
U.S. Cl. 187—233 **18 Claims**

1. A system for controlling a materials-handling device including a horizontal travelling mechanism; a horizontal drive mounted on said travelling mechanism; a vertical mast connected to the horizontal travelling mechanism; a lift truck, being moveable along the mast; a lifting drive; a storage/retrieval drive attached to the lifting drive; and a signal converter for transmitting data signals, wherein the system comprises:



a plurality of contact conductors extending along the mast; and sliding contact means, positioned on the lift truck, for establishing an electrical connection between at least one of the plurality of contact conductors of the device and at least one of the storage/retrieval drive, the lifting drive and the signal converter.

5,555,958
SUPPORTING AND GUIDING ARRANGEMENT, IN PARTICULAR A POST FOR SHELF STORAGE AND RETRIEVAL DEVICES
Roland Staggl, Wetter, and Jörg Oser, Graz, both of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany
Filed Mar. 6, 1995, Ser. No. 398,896
Int. Cl.[6] B66B *7/02*
U.S. Cl. 187—406 **13 Claims**



1. A supporting and guiding arrangement for a shelf storage and retrieval device, comprising: a post having a box-like section bar with a hollow box cross section, grooves being formed at least in two opposite corners of the hollow box cross section; a holder arranged at each end of the section bar; and guide rails arranged in the grooves and having ends fixed to each holder.

5,555,959
PARTITIONED BICYCLE BRAKE SHOE PAD OF DIFFERENT COMPOSITIONS ON THE BRAKING

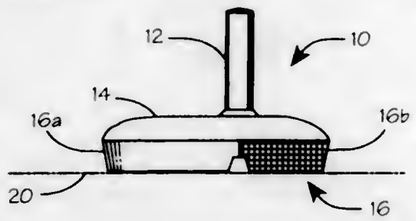
respective anchor point on the handle, the rear locations being spaced from each other;

5,555,962
DEVICE FOR OVERLOAD PROTECTION AND

5,555,959
PARTITIONED BICYCLE BRAKE SHOE PAD OF DIFFERENT COMPOSITIONS ON THE BRAKING SURFACE FOR SIMULTANEOUS CONTACT WITH THE RIM

Richard C. Everett, 225 Sunshine La., West Linn, Oreg. 97068

Continuation of Ser. No. 185,525, Jan. 24, 1994, abandoned, which is a continuation of Ser. No. 971,936, Nov. 5, 1992, abandoned. This application Jan. 18, 1995, Ser. No. 373,846
Int. Cl.[6] F16D *65/00*
U.S. Cl. 188—73.1 **7 Claims**

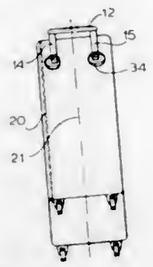


1. A brake shoe pad for a bicycle having a brake system urging a brake shoe against a wheel rim of the bicycle, the brake shoe pad comprising:
first and second pad portions, each pad portion having a rim engaging surface substantially coplanar with the other whereby the surfaces engage the rim substantially simultaneously, said pad portions being formed of different elastomeric compounds for imparting a different frictional characteristic to said brake shoe pad; and
wherein said first and second pad portion are molded as a unitary member.

5,555,960
ROLLING TRAVEL CASE

Georg Bartsch, Iserlohn, Germany, assignor to Sudhaus Schloss-Und Beschlagtechnik GmbH & Co., Iserlohn, Germany

Filed Apr. 13, 1995, Ser. No. 421,416
Claims priority, application Germany, Apr. 27, 1994, 9406969 U; Feb. 16, 1995, 295 02 521.2
Int. Cl.[6] A45C *5/14;13/00;13/26;13/30*
U.S. Cl. 190—115 **14 Claims**

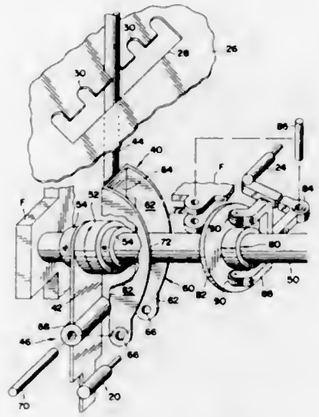


1. A rolling travel case comprising:
a body having top and bottom sides, generally vertical front and back ends, and side faces;
a plurality of horizontally spaced wheels on the bottom side, whereby the body can be rolled via the wheels on the ground;
a handle having a pair of spaced anchor points defining a pair of spaced front locations;
a pair of flexible leads each having an inner end secured at a respective rear location on the front end and an outer end secured at a respective one of the front locations to the respective anchor point on the handle, the rear locations being spaced from each other;
respective housings at the rear locations; and
respective spring means in the housings including at least one spring having one end secured to the respective lead and an opposite end to the respective housing for retracting the respective leads and pulling the handle against the front end.

5,555,961
ON THE GO GEAR SHIFTER

Jaroslav J. Olmr, 2919 N. 8th St., Sheboygan, Wis. 53083

Filed May 2, 1995, Ser. No. 433,264
Int. Cl.[6] B60K *41/22;* **G05G** *9/02*
U.S. Cl. 192—3.62 **10 Claims**

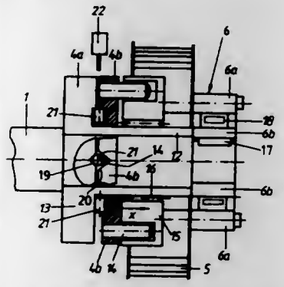


1. A mechanized apparatus including a prime mover, a driven member, a drive train including a gear box and a clutch for connecting said prime mover to said driven member; an on-the-go gear shifter including a control handle for changing gear ratios and for simultaneously actuating said clutch to disengage said driven member; an elongated slot for constraining the movement of said control handle along which said control handle is movable to change gear ratios, and a plurality of detent openings communicating with said slot for retaining said control lever in fixed gear positions;
wherein said control handle comprises a finger portion, and a control rod portion, and a hinge connecting said finger portion to said control rod portion; said hinge having an axis of rotation;
a shaft disposed beneath said slot to extend in parallel relationship with said detent openings, said shaft having an axis therealong;
means mounting said finger portion from said shaft for rotation about the axis thereof with said hinge axis transverse to the direction of said shaft axis;
a thrust collar mounted on said shaft for axial movement;
thrust surface means disposed on said control rod portion proximate said thrust collar for applying a force to said thrust collar as said control lever is moved from engagement in a detent opening into said slot to cause said thrust collar to move in an axial direction;
first link means for transmitting said axial movement of said thrust collar to said clutch for the control thereof;
second link means for connecting said control handle to said gear box for the control thereof.

5,555,962
DEVICE FOR OVERLOAD PROTECTION AND BRAKING OF A MACHINE PART DRIVEN BY A MOTOR

Gerhard Hinterlechner, Pforzheim, Germany, assignor to Micron Technology, Inc., Boise, Id.

PCT No. PCT/EP92/01544, § 371 Date Jan. 17, 1994, § 102(e) Date Jan. 17, 1994, PCT Pub. No. WO93/01912, PCT Pub. Date Feb. 4, 1993
PCT Filed Jul. 9, 1992, Ser. No. 211,562
Claims priority, application Germany, Jul. 17, 1991, 41 23 681.5
Int. Cl.[6] B60K *41/24;* **F16D** *67/02*
U.S. Cl. 192—12 R **5 Claims**



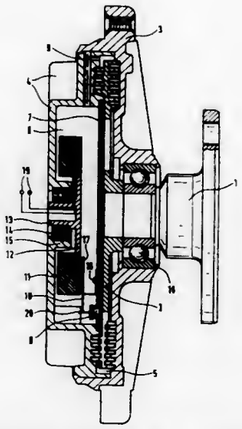
1. A torque overload and braking arrangement for stopping a machine driven tool in one of a stamping and bending machine, said tool indirectly driven by an eccentric disk attached to a driven shaft, said driven shaft connected by a belt to a drive motor having a drive shaft, said torque and braking arrangement comprising:
a linear combination of a brake device, a torque overload clutch, and a freewheel, each of which is mounted on said drive shaft of said motor, and a sensor capable of activating said brake device,
said torque overload clutch interposed between said brake device and said freewheel, and comprised of a positive clutch which disengages said drive shaft from said motor after a torque threshold is exceeded, said overload clutch comprised of a first and driving part attached to and non-rotatable with respect to the drive shaft and a second and disengaging part rotatably arranged on said drive shaft,
said sensor responsive to an overload of torque on said clutch by detecting a relative separating movement between said drive part and said disengaging part, wherein said sensor activates said brake device to stop rotation of said drive motor and to hold said drive shaft from rotating, and
wherein said freewheel has an outer ring, an inner ring, and pawls therebetween, said outer ring torsionally and rigidly connected to said disengaging part and said inner ring torsionally and rigidly connected to said drive shaft, said pawls operating freely in a driving direction of said motor, such that when said overload clutch disengages, said pawls of said freewheel engage said inner ring thereof to block rotation of said driven shaft, said freewheel being held by said brake device.

5,555,963
ELECTROMAGNETICALLY CONTROLLED HYDRAULIC CLUTCH

Hans Martin, Stuttgart, Germany, assignor to Behr GmbH & Co., Stuttgart, Germany

Filed Dec. 14, 1994, Ser. No. 358,581
Claims priority, application Germany, Dec. 23, 1993, 43 44 085.1
Int. Cl.[6] F16D *35/02;48/06*
U.S. Cl. 192—58.61 **19 Claims**

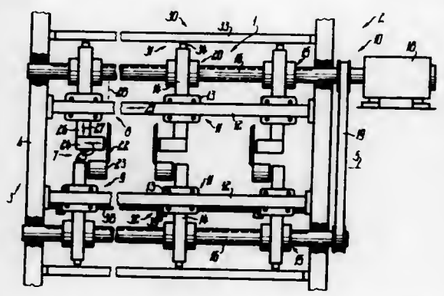
1. A hydraulic clutch comprising:
a driveshaft;
a housing rotatably mounted on the driveshaft, the housing having a working chamber, wherein the housing has a reservoir chamber divided from the working chamber by a dividing wall, the reservoir chamber and the working chamber communicating through a valve opening and a return channel;
a drive disc mounted on the driveshaft and rotatable in the working chamber;
an annular ring electromagnet positioned within the reservoir chamber, wherein the ring electromagnet is mounted to the housing so that the housing can rotate relative to the ring electromagnet; and
a valve lever mounted to the dividing wall, wherein the valve opening and closing are controlled by moving the valve lever with the ring electromagnet.



5,555,964
POWER TRANSMISSION, PARTICULARLY FOR AN ADJUSTING DEVICE

Rolf Thamphald, Beuren, Germany, assignor to bielomatik Leuze GmbH & Co., Germany

Filed Nov. 30, 1994, Ser. No. 346,627
Claims priority, application Germany, Dec. 18, 1993, 43 43 323.5
Int. Cl.[6] F16D *7/08*
U.S. Cl. 192—145 **31 Claims**



1. A power transmission for driving at least one driven unit (**8**, **9**) over a driven path comprising:
at least one clutch (**20**) including a drive input (**16**), a drive output (**14**) and a drive connection for operably transmitting a given driving momentum from said drive input (**16**) to said drive output (**14**) when said clutch (**20**) is in a transmitting state; and

170–920 O.G.–96–7: QL3

control means (**30**) for switching said clutch (**20**) between said

5,555,966

metering gate stations for selectively metering and diverting bulk

retracted within said conveying dimension (**6**); in the

control means (30) for switching said clutch (20) between said transmitting state and a released state in which such transmission of said given driving momentum is interrupted, said clutch (20) having transmission characteristics including a driving path of said drive output (14) and a driving time while said clutch (20) is in said transmitting state, wherein said control means (30) include a loading device (31) for operably positively setting said drive output (14) under a control load substantially counteracting said driving momentum, said control means (30) positively and variably controlling said loading device (31) as a function of at least one of said transmission characteristics to thereby provide varying first and second loading states, said loading device (31) positively triggering said clutch (20) to be in said transmitting state when said loading device (31) is in said first loading state and to be in said released state when said loading device (31) is in said second loading state.

5,555,965

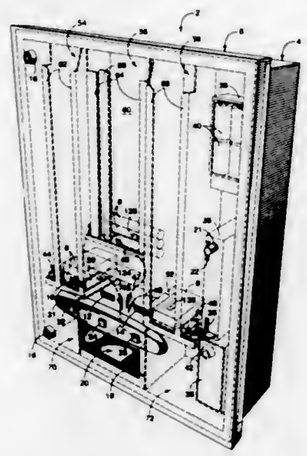
BATTERY OPERATED VENDING MACHINE FOR DISPENSING CYLINDRICAL AND TETRAHEDRON-SHAPED OBJECTS

Koji Mishina, 23-15-Imazaike Cho, Toyonaka City, Osaka, Japan

Filed Apr. 17, 1995, Ser. No. 424,147

Int. Cl.[6] G07F *11/10*

U.S. Cl. 194—217 **21 Claims**



1. A vending machine for dispensing a product comprising:

a first gravity feed compartment adapted to store products in a stack;

a rotary dispenser positioned below said first compartment, wherein said rotary dispenser is adapted to accept and rotatingly dispense products from said first compartment;

a second gravity feed compartment adapted to store products in a stack;

a first plunger dispenser positioned below said second compartment, wherein said plunger dispenser is adapted to laterally displace products from said second compartment;

control means for initiating product dispense cycles in each of said dispensers;

means for accepting currency for a product; and

a currency sensor adapted to send a currency signal to said control means when a predetermined amount of currency has been detected.

5,555,966

DEVICE FOR THE RECEIVING OF COINS AT A COIN-OPERATED AUTOMATIC MACHINE

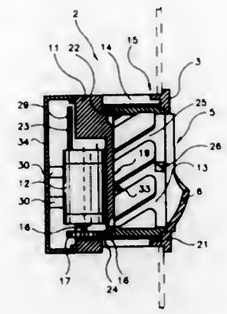
Tim Tod, Wohnsitz, Scotland, assignor to Dynamics Chinatec Systemtechnik GmbH, Hambur, Germany

Filed Aug. 5, 1994, Ser. No. 286,633

Claims priority, application Germany, Aug. 6, 1993, 43 26 303.8

Int. Cl.[6] G07D *1/00*

U.S. Cl. 194—343 **22 Claims**



1. A device for receiving coins at a coin-operated automatic machine comprising

a front plate;

a coin-insertion slot formed in the front plate;

a coin channel disposed following to the coin-insertion slot on a rear side of the front plate;

a coin opening disposed in the front plate for receiving a mixture of coins;

a continuous conveyor including a hollow cylinder forming a transporting agent and connected to the coin opening for receiving the mixture of coins for providing a coin collection space for the mixture of coins and connected to the coin channel to allow transport of individualized coins from the continuous conveyor to the coin channel; catch webs disposed rotation symmetrically relative to a rotation axis of the hollow cylinder and disposed on an inner face of the hollow cylinder;

a coin acceptance tester including a coin receiving station and connected to the coin channel such that coins, delivered from the coin channel, are led to the coil-receiving station of the coin acceptance tester,

a casing rear wall part of the continuous conveyor; an output opening in the casing rear wall part, wherein the catch webs are inclined in a direction of the output opening.

5,555,967

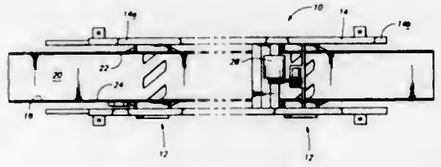
VIBRATORY DISTRIBUTOR FOR BULK ARTICLES

David W. Hufford, Walla Walla, Wash., assignor to Key Technology, Inc., Walla Walla, Wash.

Filed Jan. 23, 1995, Ser. No. 377,212

Int. Cl.[6] B65G *27/16*

U.S. Cl. 198—359 **28 Claims**



1. A vibratory distributor for receiving bulk articles and conveying such bulk articles in an article stream past a plurality of

metering gate stations for selectively metering and diverting bulk articles from the stream at one or more of the metering stations, comprising:

an elongated conveyor bed extending to the plurality of metering gate stations for receiving and supporting the bulk articles;

a vibratory drive operatively connected to the conveyor bed for vibrating the conveyor bed to convey the bulk articles in the stream having a wide swath between sides of the conveyor bed in a flow direction to the plurality of metering gate stations;

a metering gate assembly at each of the metering gate stations for selectively metering and diverting bulk articles from the stream across the wide swath;

each said metering gate assembly having two substantially horizontal, overlying metering gate elements in which the elements have complementary metering apertures formed therein that permit the bulk material to be diverted and pass therethrough when the apertures are vertically aligned and to prevent the bulk material from passing therethrough when the apertures are vertically misaligned;

wherein at least one of the metering gate elements is horizontally moveable relatively to the other metering gate element transverse to the article flow direction between an open aligned position to meter bulk articles therethrough and a closed misaligned position to prevent the passage of bulk articles therethrough; and

wherein the metering apertures of each metering gate elements are arranged with a segment of each aperture laterally overlapping an adjacent aperture to permit diverting bulk, articles across the wide swath of the stream.

5,555,968

CONVEYING SYSTEM FOR SHEET LAYERS

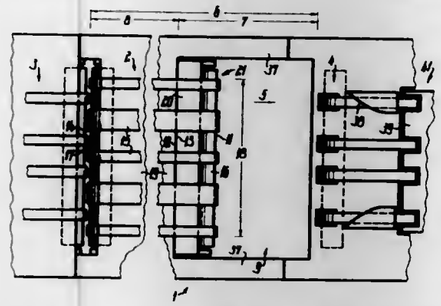
Joachim Seefeldt, Neuffen, and Horst Reichle, Lenningen-Gutenberg, both of Germany, assignors to bielomatik Leuze GmbH +Co., Germany

Filed Aug. 10, 1994, Ser. No. 288,564

Claims priority, application Germany, Aug. 12, 1993, 43 27 049.2

Int. Cl.[6] B65G *21/14*

U.S. Cl. 198—594 **32 Claims**



1. A conveying system (1) for sheet layers, the sheet layers being stackable into stacks (40), said conveying system comprising:

a conveyor (2) having a conveying dimension (6) in a conveying direction (5), said conveyor (2) defining a conveying plane (10), said conveyor (2) having a conveying width extension transverse to said conveying dimension, and said conveyor having separate first and second conveying portions (7, 8) along said conveying dimension including a residual conveying portion (8), at least one of said first and second conveying portions (7) being movable into different operating positions with respect to said residual portion (8) for modifying said conveying dimension (6), said at least one of said conveying portions (7) being movable as a motion portion between an extended position and a retracted position at least partly retracted within said conveying dimension (6); in the extended position, said motion portion (7) extending beyond said conveying dimension in the conveying direction (6), located substantially in said conveying plane (10) and having supporting ends including a front end (11) and a rear end (12), said motion portion (7) including conveyor runner means for engaging and conveying the sheet layers, said conveyor runner means including a plurality of individual exposed conveying runners (15) spaced, juxtaposed and distributed across said conveying width extension, thereby providing at least one runner gap between said individual conveying runners (15), supporting means for at least in said extended position substantially rigidly supporting the sheet layers in said conveying plane substantially entirely over said conveying width extension and at a distance from at least one of said supporting ends (11, 12) and,

passage prevention means for preventing dirt and objects from passing through said at least one runner gap; in said extended position and said retracted position, said passage prevention means including a shield (20) operationally covering said at least one runner gap.

5,555,969

DEVICE FOR FASTENING A GRIPPER BAR ON A CHAIN TRAIN IN A MACHINE THAT PROCESSES PLATE-LIKE WORKPIECES

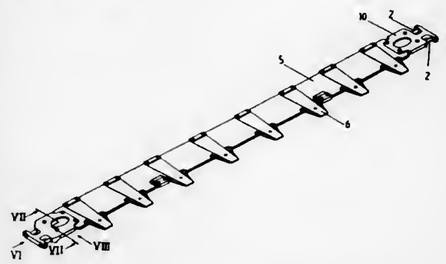
Marcel Yerly, Jouxtens, Switzerland, assignor to Bobst SA, Lausanne, Switzerland

Filed May 3, 1995, Ser. No. 432,639

Claims priority, application Switzerland, May 4, 1994, 01396/94

Int. Cl.[6] B65G *17/38*

U.S. Cl. 198—803.3 **8 Claims**



1. A device for fastening a gripper bar to a driving chain, said device having a first piece which has a first portion which forms an integral part of the chain in which it replaces a link, said first portion consisting of a vertical outer plate portion and a vertical inner plate portion linked by an inner connection and able to receive between them an upstream axle and downstream axle of the chain link, with each axle being eventually covered by a gearing cylinder, a horizontal plate portion for engaging on an upper surface of the end of the bar extending from the vertical inner plate portion and a counter-plate being inserted in the profiled piece of the bar and connected to the upper horizontal plate portion by fastening means extending through portions of an upper wall of the bar entrapped therebetween.

said key top is vertically guided by said cross link structure in

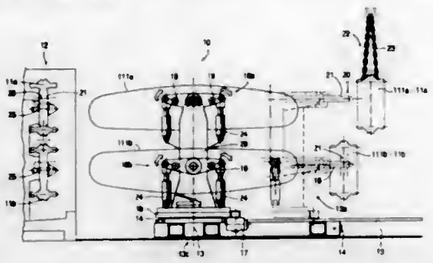
that, when the lip portion is inserted into the above-

5,555,970

DEVICE FOR THE QUICK CHANGE OF TRACKS

Enzo Coccolo, Gorizia, Italy, assignor to Danieli & C. Officine Meccaniche SpA, Buttrio, and Danieli Centro Maskin SpA, Pradamano, both of Italy

Filed Sep. 2, 1994, Ser. No. 299,635
Claims priority, application Italy, Sep. 21, 1993, UD93A0190
Int. Cl.[6] B65B *35/00*
U.S. Cl. 198—866 **3 Claims**



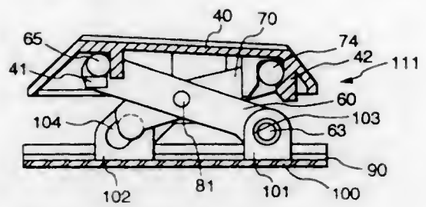
1. A combination of a traction unit having a pair of facing tracks for drawing sections therethrough and a device for changing tracks of the traction unit, the device for changing tracks comprising a movable trolley movable from a first position in cooperation with a support for a new track to be installed on the traction unit to a second position in cooperation with a traction unit for removing an old track from the traction unit and for installing a new track on the traction unit, the movable trolley being provided with a first withdrawal and delivery means for withdrawing a new track from the support and for delivering the new track to the traction unit and a second withdrawal and delivery means provided on the opposite side of the trolley as the first withdrawal and delivery means for withdrawing an old track from the traction unit, and means for rotating the trolley at least 180° about a vertical axis.

5,555,971

KEY SWITCH

Yasuo Takada, Fuchu-machi, Japan, assignor to SMK Corporation, Tokyo, Japan

Filed Jul. 6, 1995, Ser. No. 499,053
Claims priority, application Japan, Dec. 19, 1994, 6-334463
Int. Cl.[6] H01H *13/70*
U.S. Cl. 200—345 **4 Claims**



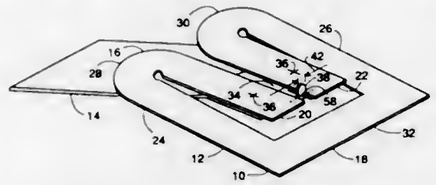
1. A key switch comprising:
a key top;
an elastic member in the form of a cup set upside down, which urges said key top upwardly;
a cross link structure made up of a substantially U-shaped outer link and a substantially U-shaped inner link which are rotatably coupled to each other at intersections, said cross link structure being rotatably supported below said key top;
a membrane switch sheet arranged under said elastic member and having a switch section which is confronted with a depressing portion of said elastic member; and
a rigid frame arranged under said membrane switch sheet, wherein:
said key top is vertically guided by said cross link structure in such a manner that said key top is moved parallel, thereby to cause said depressing portion to turn on and off said switch section;
said key top has an abutting portion on the lower surface thereof, which abuts against the upper surface of said elastic member;
said outer link includes a pair of arm portions whose end portions are supported by a pair of rotatably fixing portions which are raised from said frame and protruded over said membrane switch sheet; and
said inner link includes a pair of arm portions whose end portions are supported by a pair of slidably fixing portions which are raised from said frame and protruded over said membrane switch sheet.

5,555,972

SELF-STRESSING SNAP SPRING ASSEMBLY FOR ELECTRICAL CONTACTS

Pierre P. Schwab, 1768 SE. Clearmont St., Port. St. Lucie, Fla. 34983

Filed Sep. 8, 1995, Ser. No. 526,110
Int. Cl.[6] H01H *5/22*
U.S. Cl. 200—451 **18 Claims**



1. An auto-snap device, comprising:
a sheet metal spring member having a double-loop end opposite a closed end, said spring member having a first outer leg, a second outer leg, a first inner leg, a second inner leg, and a cross member, said first outer leg coupled to said first inner leg by way of a first loop at said double-loop end, said second outer leg coupled to said second inner leg by way of a second loop at said double-loop end, said first outer leg coupled to said second outer leg by way of said cross member at said closed end, said first inner leg being spaced apart from said second inner leg to define a gap therebetween;
a spring arm attached at an anchor point to at least one of said first inner leg and said second inner leg; and
a tab extending from said spring arm and protruding through said gap at a stress point to force said first inner leg and said second inner leg further apart than they would otherwise be in an unstressed state, thereby predictably distorting said sheet metal spring member to provide a predetermined spring response, said anchor point being spaced apart from said stress point said tab and said spring arm being integrally formed as a one-piece unit.

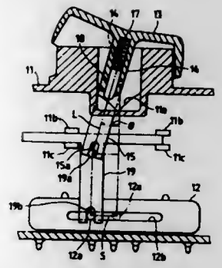
5,555,973

SLIDE SWITCH DEVICE

Senji Horisawa, Aichi, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Apr. 5, 1994, Ser. No. 222,937
Claims priority, application Japan, Apr. 7, 1993, 5-017359 U
Int. Cl.[6] H01H *23/16*
U.S. Cl. 200—561 **4 Claims**

1. A slide switch device comprising:
a turnable operating member having a plane of rotation;
a switch body with a side parallel to said plane of rotation, said switch body side having a closed-ended elongated slide slot and a movable contact slidable along said slot;



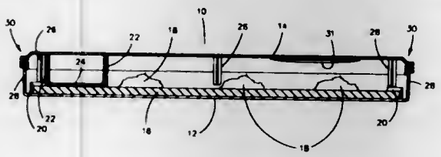
an arm provided with the operating member in such a manner than the arm is turned in rotation with the turn of said operating member; and
a motion converting member extending perpendicular to the length of the slide slot for converting rotation of the arm into a slide motion which is transmitted to the movable contact, the motion converting member being pivotly connected to the arm and slidably positioned between the movable contact in the switch body and the arm.

5,555,974

ENCLOSURE WITH OXYGEN SCAVENGING MATERIAL FOR STORING PAINTS MIXED ON ARTIST'S PALETTE

Donell C. Donald, 8850 Ferguson Rd., Suite 2063, Dallas, Tex. 75228, and Morgan H. Dunn, Carrollton, Tex., assignors to Donell C. Donald, Dallas, Tex.

Filed Jan. 11, 1995, Ser. No. 371,097
Int. Cl.[6] B44D *7/00*
U.S. Cl. 206—1.7 **16 Claims**



1. An enclosure for storing artist's paints on a palette comprising:
a substantially rectangular box having a bottom wall and four side walls depending substantially perpendicularly from the bottom wall, the four side walls each having edges defining an opening to the enclosure;
a palette having at least one or more mound of paint placed thereon and positioned within the enclosure:
a lid for sealing the opening;
an oxygen scavenging material contained within an air-permeable package having means for attaching to an inside surface of the enclosure.

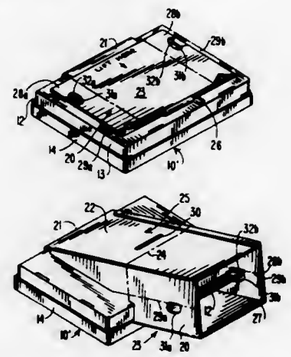
6. An enclosure for storing artist's paints on a palette comprising:
a substantially rectangular box having a bottom wall and four side walls depending substantially perpendicularly from the bottom wall, the four side walls each having edges defining an opening to the enclosure, the edges of each of the four side walls including a continuous lip portion canted outwardly around the opening;
a lid for sealing the opening, the lid including a channel along its peripbery for receiving the lip portion, the channel being defined between first and second resilient flanges depending from the lid, wherein the first flange has an inside surface angled slightly in the direction of the cant of the lip portion for cooperating with the lip to retain the lid on the box and wherein both flanges are spaced apart from each other such that, when the lip portion is inserted into the channel, the first and the second flanges bend away from, and press against, the lip;
a plurality of projections extending substantially perpendicular from the inside surface of the lid to a point to near the bottom wall of the box for holding an artist's palette substantially against the bottom wall of the box; and
an oxygen scavenging material contained within an air-permeable package having means for attaching to an inside surface of the enclosure.

5,555,975

SHIPPING CONTAINER CONVERTIBLE INTO DISPLAY STAND

Michael J. Smith, Orangeburg, N.Y., assignor to Arrow Art Finishers, Inc., Bronx, N.Y.

Filed Nov. 15, 1994, Ser. No. 339,952
Int. Cl.[6] B65D *5/50*
U.S. Cl. 206—762 **8 Claims**



1. A convertible shipping container comprising:
a) a tray-shaped receptacle for accommodating objects to be shipped in the container in its collapsed condition and displayed in the container in its erected condition, said receptacle including a bottom wall and a plurality of circumferential receptacle walls bounding an open end of said receptacle;
b) a base including a plurality of base walls and connected to said receptacle for displacement between a collapsed position thereof in which said base is flat and said base walls are substantially coextensive with said bottom wall of said receptacle, and an erected position in which said base walls extend along courses that give said base a substantially box-shaped configuration;
c) a tray-shaped cover for securing said base in said collapsed position thereof to said receptacle prior to conversion of the shipping container into a display stand, said cover having a confining wall for confining said base in said collapsed condition thereof between said confining wall and said bottom wall of said receptacle, and a plurality of cover skirt walls surrounding and extending perpendicularly away from said confining wall;
d) a tray-shaped lid for closing said open end of said receptacle to hold the objects within the receptacle prior to and during said conversion, said lid having a lid support wall for supporting the weight of said receptacle and its contents from below while said base is being displaced from its collapsed to its erected position with the lid support wall resting on a support surface and said bottom wall of said receptacle facing upwardly and being removable from said receptacle following reorientation of the container into a final position thereof in which said receptacle is situated on top of said base which is then in its fully erected condition, said lid having a plurality

of lid skirt walls surrounding and extending perpendicularly away from said lid support wall; and

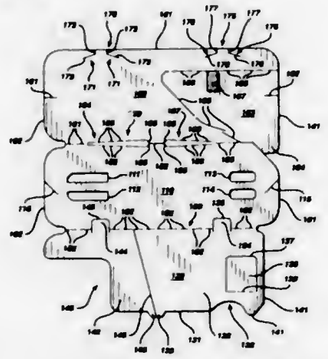
e) said cover skirt walls completely exteriorly overlapping said receptacle walls and said lid skirt walls to form an outer shipping box when said cover is assembled on said lid.

5,555,976

PACKAGING FOR A SURGICAL SUTURE

Pascal C. R. Pernot, Chartres, France, assignor to Ethicon, Inc., Somerville, N.J.

Filed Mar. 22, 1995, Ser. No. 408,503
Int. Cl.[6] A61B *17/06*
U.S. Cl. 206—63.3 **6 Claims**



1. A support-wrapping for a surgical suture and needle, comprising:

cuts and folds in a card blank that is made up of three elements that are connected together in pairs by respective fold lines, the thread of the suture being essentially situated between two adjacent elements of the support-wrapping, and the wrapping further including a pivotally-hinged opening flap having a hinge axis on the third element with the needle of the suture being fixed to said opening flap at a distance from its hinge axis and also from the zone where the thread emerges from between the two first-mentioned elements, such that on opening the support-wrapping, the pivoting of the opening flap causes the needle to be moved away from the basic structure of the support-wrapping, thereby facilitating subsequent grasping of the needle;

means for fixing the needle on the pivotally-hinged flap comprising a block of foam;

at least one fold line to give volume to the support-wrapping including two series of cuts that are substantially adjacent and parallel;

a middle element between two fold lines having windows designed to receive pegs that are used as supports for the suture while it is being coiled;

an element that has cuts opening out into its end edges and that slope relative thereto;

an element that is split into two portions by a line of cuts and wherein both of the two portions comprise a respective projecting tongue on respective opposite sides of the line of cut, which projecting tongues are designed to penetrate into a complementary cut so as to lock the support-wrapping;

at least one element having at least one projecting lug designed to cooperate with a complementary set of cuts in order to lock the support-wrapping in a closed position;

at least one element that has a hinged flap which is situated, after folding, so as to overlie windows formed in another element of the support-wrapping;

at least one element having a cutout situated to overlie windows placed in another element after the support-wrapping structure has been folded;

at least one element having cuts that open out in the end edges of the wrapping and that are designed to cooperate with complementary cuts formed in another element; and,

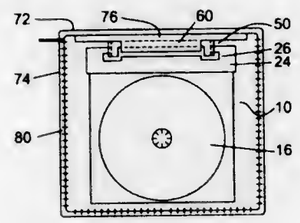
at least one set of cuts designed to cooperate with a projecting lug formed on an adjacent element wherein each set of cuts comprises two cuts each having a first segment that opens out into the longitudinal edge of the support-wrapping that is substantially orthogonal thereto, followed by a second segment diverging towards the inside of the wrapping.

5,555,977

SLEEVE AND STORAGE DEVICE FOR PLANAR ARTICLES

Scott J. Oshry, and Sean B. Brosmith, both of Palos Verdes, Calif., assignors to Roundhouse Products, Inc., Santa Monica, Calif.

Continuation of Ser. No. 131,079, Oct. 1, 1993, abandoned.
This application Jul. 18, 1995, Ser. No. 503,469
Int. Cl.[5] B65D *85/57*
U.S. Cl. 206—308.1 **6 Claims**



1. A storage device comprising:

a plurality of sleeve members, each of said sleeve members comprising:

a sleeve portion having an article receiving opening and enclosing a space adapted to receive a flat article; and

a connecting portion supporting said sleeve portion and having an edge which faces away from said sleeve portion, said connecting portion having an opening which extends to, and opens at, said edge; and

a flexible casing comprising:

an end panel having two mutually parallel edges, and two side panels each pivotally connected to said end panel at a respective parallel edge for movement into positions in which said side panels face one another;

a base secured to said end panel and having a rail which extends between said parallel edges, said rail being adapted to be inserted into said opening in said connecting portion of each of said sleeve members for detachably retaining each of said sleeve members in said casing; and

a sealing mechanism associated with said side panels for sealing said casing when said side panels face one another.

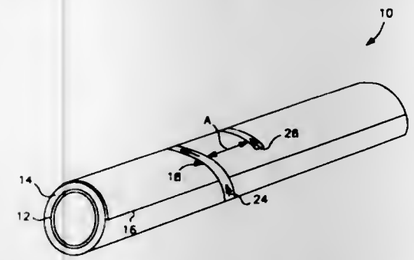
5,555,978

WOUND ROLL AND CLOSURE STRIP ASSEMBLY

Bertram F. Elsner, Hanover, Pa., assignor to Elsner Engineering Works, Inc., Hanover, Pa.

Filed Oct. 5, 1995, Ser. No. 539,715
Int. Cl.[6] B65D *85/671*
U.S. Cl. 206—410 **16 Claims**

1. A roll assembly comprising a length of web material having a free end, said web material wound into a cylindrical roll body having opposed body ends and a center with the free end extending between the body ends on the outside of the roll body; and a closure including a flexible body member having an opening end and a remote end, said opening and remote ends located inwardly



of the roll body ends, said body member extending helically around the center of the roll body a circumferential distance greater than 360° and crossing the free end of the web material with the opening and remote ends overlapping the body member, said opening end facing in the same direction as the free end of the web material, and an adhesive on the body member and releasably adhered to the roll body, portions of the body member each extending to either side of the free end of the web material a distance sufficiently long to secure the free end to the roll body and prevent unwinding.

13. A roll assembly comprising a roll of web material selected from the group consisting of metal, foil, and plastic film, the roll having a center, opposed roll ends and a diameter less than about 2.5 inches, and a web material free end extending between the roll ends; and an elongate plastic closure strip helically wound flat around the center of the roll more than 360° and crossing the free end of the web material, said strip including an opening end and a remote end, the opening end facing circumferentially in the same direction as the free end of the web material, overlapping a portion of the strip and spaced from the overlapped portion of the strip a distance of about 0.5 inch to about 1.0 inch, and a releasable adhesive on one side of the strip, said adhesive releasably adhered to the roll to hold the strip flat on the roll and prevent unwinding of the free end of the web material, and opening end-identifying indicia on the other side the strip, said indicia permitting a user to distinguish the opening end from the remote end to facilitate lifting of the opening end from the roll for unwinding of the web material.

5,555,979

PACKING UNIT WITH PACKED ELECTRIC LAMPS

Frank J. Baas, and Peter G. J. Vos, both of Weert, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

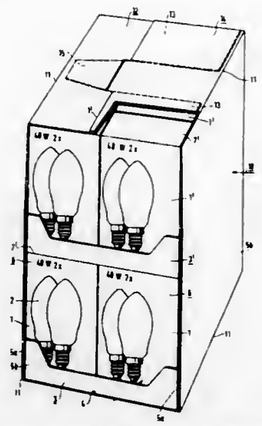
Filed Aug. 6, 1993, Ser. No. 103,477
Claims priority, application Netherlands, Aug. 17, 1992, 9201462; European Pat. Off., Oct. 30, 1992, 92203343
Int. Cl.[6] B65D *85/42*
U.S. Cl. 206—419 **18 Claims**

1. A packing unit with packed electric lamps comprising a plurality of cartons (1) of a rectangular block shape, in each one of which cartons at least one electric lamp (2) is present:

a tray (3) with a rectangular base wall (4) and mutually opposing first side walls (5*a*) and mutually opposing second side walls (5*b*) which first and second walls (5*a* and 5*b*) are interconnected and extend from the base wall (4), which tray is filled with said cartons, an outer envelope (10) which outer envelope is provided with a closure and in which outer envelope the tray filled with said cartons is accommodated,

the improvement wherein the outer envelope (10) is a wrapper which is folded about parallel folding lines (11) and is wrapped only around the base wall (4), of the tray (3), around the mutually opposing first side walls (5*a*) of the tray (3) and around sides (7) of each of the cartons (1) facing away from the base wall and which encloses the tray (3) and the cartons (1) with a clamping force.

5. A packing unit with packed electric lamps comprising a plurality of cartons (1) of a rectangular block shape, in each one of which cartons at least one lamp (2) is present:



a tray (3) with a rectangular base wall (4) and mutually opposing first side walls (5*a*) and mutually opposing second side walls (5*b*), which first side walls (5*a*) and second side walls (5*b*) are interconnected and extend from the base wall (4), which tray is filled with said cartons, and an outer envelope which outer envelope is provided with a closure and in which outer envelope the tray filled with said cartons is accommodated,

the improvement wherein the outer envelope is a wrapper (16) which is folded about parallel folding lines (11) and is wrapped only around the base wall (W), around the first side walls of the tray (3) and around sides (7) of each of the cartons (1) facing away from the base wall and which encloses the tray (3) and the cartons (1) with a clamping force and wherein the closure comprises a first end portion (12) of the envelope (10) with teeth (13) and a second end portion (14) with a forward projecting tongue (15), which tongue (15) projects between the teeth (13) and the tongue (15) when the teeth (13) lie inside the wrapper (10).

5,555,980

COLLAPSIBLE PALLETIZED CONTAINER

James B. Johnston, Loomis; James S. Tyler, Gridley, and Guy C. Blanchard, Sacramento, all of Calif., assignors to Johnson's Trading Post, Inc., Woodland, Calif.

Filed Sep. 23, 1994, Ser. No. 311,103
Int. Cl.[6] B65D *19/00*
U.S. Cl. 206—600 **30 Claims**

1. A container having an interior for supporting items within said interior thereof during transport, storage and handling, comprising in combination:

a base including a floor,

a plurality of first sidewalls supported by said base and extending substantially perpendicular to said floor, each first sidewall including at least two side edges,

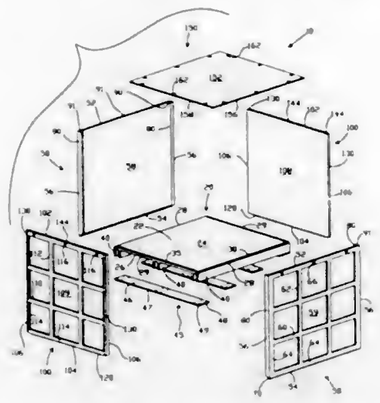
a plurality of second sidewalls separate from said first sidewalls and supported by said base, said second sidewalls extending substantially perpendicular to said floor, each said second sidewall including at least two lateral edges,

said base and said sidewalls defining an open-top interior,

at least one of said side edges including means integrally formed with said first sidewalls to prevent movement of said first sidewalls away from said interior, and

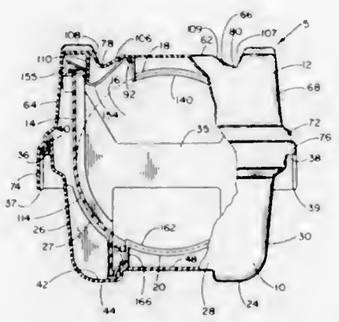
at least one of said lateral edges including means integral with said second sidewalls to prevent movement of said second sidewalls away from said interior, such that forces exerted upon said sidewalls by items stored within said interior are resisted by said first sidewall movement prevention means and said second sidewall movement prevention means,

wherein said means to prevent movement of said sidewalls away from said interior includes a means to connect said side edges



to said lateral edges, said connection means integrally formed in said side edges and said lateral edges, said connection means including a "J" shaped joint on one said edge and an "F" shaped joint on a connecting said edge.

5,555,981
WAFER SUSPENSION BOX
Barry Gregerson, Colorado Springs, Colo., assignor to Empak, Inc., Chanhassen, Minn.
Continuation of Ser. No. 136,316, Oct. 13, 1993, abandoned, which is a continuation-in-part of Ser. No. 887,965, May 26, 1992, Pat. No. 5,273,159. This application Apr. 18, 1995, Ser. No. 425,259
The portion of the term of this patent subsequent to Dec. 28, 2010, has been disclaimed.
Int. Cl.[6] B65D *85/90*
U.S. Cl. 206—711 **4 Claims**



1. A cushion for use in suspending disk products, said cushion comprising a plurality of spaced apart disk engaging members, each disk engaging member spanning a distance between common supports and said common supports oriented perpendicular to said disk engaging members, each said disk engaging member having a flexible disk engaging surface wherein said cushion is made of a material having a flexural creep of less than 1.5% deflection at 60° C. when measured in accordance with ASTM D2990.

2. A cushion system for use in suspending a plurality of disk products, said cushion system comprising:

(a) a first cushion having a plurality of spaced apart disk engaging members spanning common supports, said common supports oriented perpendicular to said plurality of spaced apart disk engaging members, and each said disk engaging member having a flexible disk engaging surface whereby said flexible disk engaging surface conforms to a profile edge of a suspended disk product

(b) a second cushion having a concave surface with a plurality of disk engaging members located in said concave surface; and

(c) said first and second cushions are made of a material having flexural creep of less than 1.5% deflection at 60° C. when measured in accordance with ASTM D2990.

3. A cushion system for use in suspending a plurality of disk products in a container, said cushion system comprising:

(a) a first cushion having a plurality of spaced apart disk engaging members, each said disk engaging member having a flexible disk engaging surface;

(b) a first and a second support, said first and second supports oriented perpendicular to said plurality of spaced apart disk engaging members and each said disk engaging member spanning said first and second supports;

(c) a first securing means on said first cushion for securing said first cushion to said container, said first securing means having a first portion on said first support and a second portion on said second support;

(d) a second cushion having a concave surface with a plurality of disk engaging members located in said concave surface;

(e) a second securing means on said second cushion for securins said second cushion to said container; and

(f) said first and second cushions are made of a material having flexural creep of less than 1.5% deflection at 60° C. when measured in accordance with ASTM D2990.

4. A cushion suspension and packaging apparatus for holding a plurality of disk products, said cushion suspension and packaging apparatus comprising:

(a) a package top having an upper surface and four walls extending transversely from said upper surface;

(b) a package base having a lower surface and four walls extending transversely from said lower surface;

(c) a first cushion having a plurality of parallel spaced apart, disk engaging members, each said disk engaging member having a flexible disk engaging surface whereby said flexible disk engaging surface conforms to a profile edge of a suspended disk product, first and second spaced apart supports oriented perpendicular to said plurality of disk engaging members, each said disk engaging member spans the distance between said first and second supports and said first cushion having means for securing said first cushion to said package top;

(d) a second cushion having a concave surface, a plurality of disk engaging members located in said concave surface and a pair of support members extending transversely from such concave surface with means for securing said second cushion to said package base;

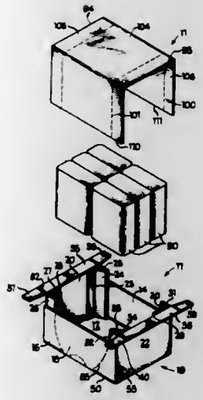
(e) a first cushion securing means located on said upper surface of said package top for securing said first cushion to said package base

(f) a second cushion securing means located on said lower surface of said package base for securing said second cushion to said package base; and

(g) said first and second cushions are made of a material having flexural creep of less than 1.5% deflection at 60° C. measured in accordance with ASTM D2990.

5,555,982
CONVERTIBLE SHIPPING CONTAINER-DISPLAY APPARATUS
Wayne H. Kuhn, Palos Park, and Robert B. Leftwich, Bolingbrook, both of Ill., assignors to Stone Container Corporation, Chicago, Ill.
Filed Dec. 29, 1994, Ser. No. 365,887
Int. Cl.[6] B65D *5/54;17/50*
U.S. Cl. 206—746 **8 Claims**

1. A shipping container apparatus for goods, which apparatus is operably configured for conversion from a shipping configuration for the containment and transportation of goods to a display



configuration for the facilitated presentation and display of said goods contained and shipped in said apparatus, said shipping container apparatus comprising:

a substantially self-supporting bottom portion, fabricated from a first material, the bottom portion including a bottom wall member, at least two first wall members operably emanating integrally from respective folds at respective bottom edges thereof from said bottom wall member at two substantially opposed first edges of said bottom wall member, at least two of said at least two first wall members having respective top edges operably disposed distal to said respective bottom edges thereof, said at least two first wall members being operably arranged relative to said bottom wall member so as to define and partially enclose a goods containing region having at least an open top portion,

said bottom portion further including at least two second wall members, operably emanating integrally from respective folds at respective bottom edges thereof from said bottom wall member at two substantially opposed second edges of said bottom wall member, said opposed second edges of said bottom wall member being operably disposed in substantially alternating relation with said opposed first edges of said bottom wall member, at least one of said at least two second wall members being shorter in height than the height of the open top portion so as to permit visual inspection of and access to said goods containing region upon said conversion of said apparatus to said display configuration;

at least one of said at least two first wall members being operably configured so as to extend from said bottom wall member upwardly above said at least one of said at least two second wall members, up to a position substantially adjacent said open top portion of said container apparatus;

means for covering said goods containing region, operably configured so as to cover the substantial entirety of said at least two second wall members, at least portions of said top edges of said at least two first wall members, and said open top portion,

said means for covering said goods containing region together with said bottom portion collectively, substantially fully enclosing and surrounding said goods in said shipping container apparatus;

said means for covering said goods containing region further including a substantially thin cover sheet member, operably positionable over said at least two second wall members, said at least portions of said top edge of at least one of said at least two first wall members, and said open top portion of said goods containing region,

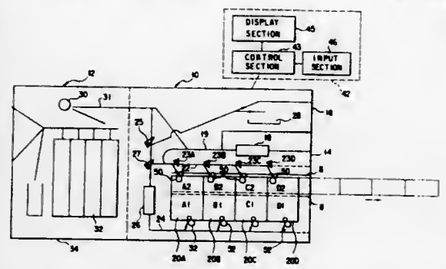
said means for covering said goods further being disposed in contact with said top edge of at least one of said at least two first wall members, at a position substantially adjacent the open top portion,

said substantially thin cover sheet member further being configured from a second material substantially thinner than said first material; and

means for facilitating conversion of said apparatus from said shipping configuration to said display configuration, by conditioning a substantial portion of said substantially thin cover sheet member to be severed and removed, in a facilitated manner, from a remaining portion of said substantially thin cover sheet member, which remaining portion remains substantially affixed to said container apparatus, so as to substantially uncover at least a portion of said open top portion of said goods containing region,

the means for facilitating conversion of said apparatus from said shipping configuration to said display configuration further including a pair of spaced apart frangibility means for severing said cover sheet extending, in a non-intersecting manner, from respective positions proximate to a first edge of said cover member toward an opposite second edge of said cover member, along said cover sheet member, so as to substantially demarcate said cover sheet member into said portion to be severed and removed, and two remaining portions, disposed in spaced relation to one another by said portion to be severed and removed.

5,555,983
CASH TRANSACTION APPARATUS
Satoru Yamagishi, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Sep. 21, 1994, Ser. No. 309,690
Claims priority, application Japan, Sep. 21, 1993, 5-235163
Int. Cl.[6] B07C *5/00*
U.S. Cl. 209—534 **6 Claims**



1. A cash transaction apparatus comprising:

a plurality of temporary stacking sections for temporarily stacking received banknotes that are to be externally removed from the temporary stacking sections, the temporary stacking sections each including a damaged-banknote temporary stacking section for temporarily stacking damaged banknotes;

a plurality of receiving sections for receiving the banknotes from the respective temporary stacking sections and for storing the banknotes therein, the receiving sections each including a damaged-banknote receiving section for receiving the damaged banknotes from the damaged-banknote temporary stacking section and for storing the damaged banknotes therein;

first discriminating means for discriminating denominations and damaged states of the banknotes received and for counting the banknotes received;

first distributing means for distributing the banknotes discriminated by the first discriminating means to the plurality of the temporary stacking sections in accordance with the denominations and damaged states;

instructing means for instructing collection of the banknotes stored in a designate one of the receiving sections;

collecting/conveying means for removing the banknotes from the designated receiving section and for conveying the removed banknotes to the plurality of temporary stacking sections;

with the base, and a slot defined in the plate for the tab to

the circumferential flange having a substantially vertical inte-

second discriminating means for discriminating denominations of the removed banknotes and for counting the removed banknotes; and

second distributing means for distributing the removed banknotes to the temporary stacking sections in accordance with the denominates by the second discriminating means.

5,555,984

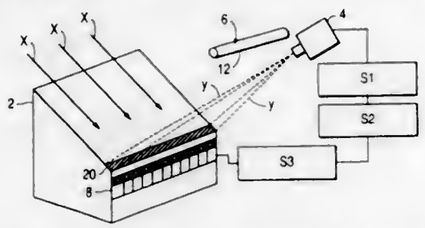
AUTOMATED GLASS AND PLASTIC REFUSE SORTER

Edward J. Sommer, Jr., Nashville; Michael A. Kittel, Unionville, and Ronald A. Quarles, Nolensville, all of Tenn., assignors to National Recovery Technologies, Inc., Nashville, Tenn.

Filed Jul. 23, 1993, Ser. No. 96,178

Int. Cl.[6] B07C *5/342*

U.S. Cl. 209—580 **10 Claims**



1. A device for sorting refuse objects, comprising:

(a) a feed slide on which a plurality of objects are feedable, including a separation region on which a plurality of objects are placeable;

(b) a light source, cooperating with the feed slide, positioned to direct light on the separation region;

(c) an ejector including a plurality of ejector units, positioned downward of the separation region; and

(d) a scanner, cooperating with the feed slide and light source, positioned to scan the separation region, determining when an object should be ejected, and controlling the ejector units; the scanner including a line scan camera and a determining unit; the determining unit including at least one processor and control software executing therein; the control software receiving input from the camera, and including video pixel locator logic, color determination and recognition logic, ejector control logic, and controlling the ejector units; the separation region including at least one scan line; a plurality of scan zones covering a portion of at least one scan line, each scan zone including a plurality of pixels; and each scan zone including at least one adjustable active area smaller than the scan zone.

5,555,985

SCREENING MACHINE

Yoshikazu Kobayashi, Hiroshima, Japan, assignor to Kabushiki Kaisha Mlike Tekkosho, Hiroshima, Japan

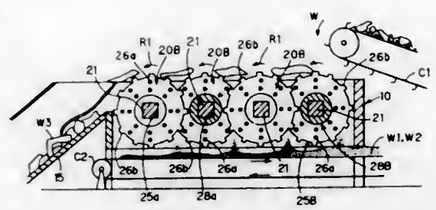
Division of Ser. No. 259,468, Jun. 14, 1994, Pat. No. 5,480,034. This application Jun. 7, 1995, Ser. No. 486,731

Claims priority, application Japan, Jun. 22, 1993, 5-176001; Dec. 1, 1993, 5-338816; Dec. 27, 1993, 5-353235; Feb. 7, 1994, 6-35368; Mar. 18, 1994, 6-73987; Mar. 18, 1994, 6-73988; May 12, 1994, 6-124600

Int. Cl.[6] B07B *13/05*

U.S. Cl. 209—667 **7 Claims**

1. A screening machine comprising a plurality of rotors (**20**) provided in a frame (**10**) such that axes of said rotors (**20**) are arranged parallel to one another from a supply side where objects to be screened (W) including mixed substances different at least in size are supplied from above by a conveying means (C1) to a discharge side where the remainders after screening are discharged,



and such that said rotors (**20**) are rotated in the same direction by a rotating drive means (**30**) to feed the objects to be screened on said rotors (**20**) from the supply side to the discharge side, and each rotor (**20**) further comprises a plurality of large diameter sections (**25**) and a plurality of small diameter sections (**28**) alternately disposed in the axial direction of each rotor (**20**) and arranged in a staggered relation in the feeding direction to define screening gaps (G) having desired dimensions between said large and small diameter sections (**25–28**) and wherein said plurality of said rotors (**20**) are classified into several groups arranged from the supply side to the discharge side, and the peripheral speeds of said rotors of the groups are decreased in order of the classified arrangement from the supply side to the discharge side.

5,555,986

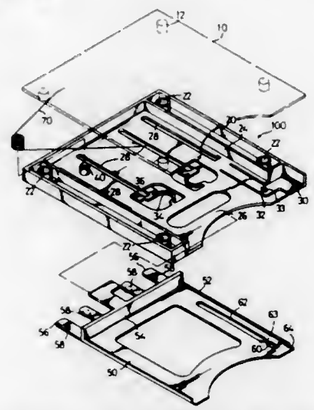
ACCOMMODATION CARTRIDGE FOR COMPACT DISCS RACKS

Ming Lee, 4th Fl., No. 44, Sec. 1, Mingte Rd., Tucheng City, Taipei Hsien, Taiwan

Filed Sep. 7, 1995, Ser. No. 524,519

Int. Cl.[6] A47G *29/00*

U.S. Cl. 211—40 **4 Claims**



1. An accommodation cartridge for a CD rack comprising:

a base having a U-shaped wall defining an entrance, a plurality of guides extending from a central portion of the base toward a portion of said U-shaped wall opposite to the entrance and formed on a bottom of the base, a pin protruding from the bottom of the base near the wall opposite to the entrance, a pliable piece formed near the entrance of the base with a tab protruding from the bottom of the base;

a spring mounted onto the pin within the base; and

a CD tray having a plate, a wall provided at an end facing the entrance for defining a space for receiving a CD case and an actuating plate for the spring, a corresponding number of teeth extending from an end opposite to the entrance each having a foot protruding from a bottom of the plate for slidably engaging with the guides, an aperture defined in the plate facing the tab for the tab to extend through when the tray is received with the base, and a slot defined in the plate for the tab to extend through and slide within the slot when the tray moves within the base.

5,555,987

SITE-ASSEMBLED FOLDING SHELF

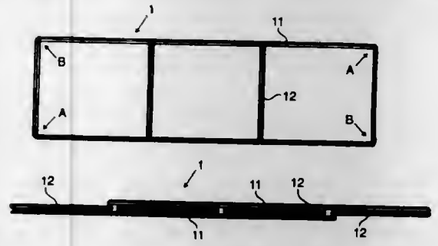
Sabro Yoshimura, c/o Naigai Co., Ltd. 16, 39-banchi, Fukakusa Mukaigawara-cho, Fushimi-ku,, Kyoto, Kyoto, Japan, and Hiroshi Yamamoto, 2-30-7 Kuboyama-cho, Hachioji, Tokyo, Japan

Filed Jun. 29, 1994, Ser. No. 269,054

Claims priority, application Japan, Jun. 30, 1993, 5-183468

Int. Cl.[6] A47F *5/00*

U.S. Cl. 211—153 **5 Claims**



1. A site-assembled folding shelf suitable for displaying merchandise and configured by assembling pipe members and pipe joints, comprising:

a plurality of pipe members having a substantially square interior cross-section;

a plurality of pipe joints having pipe anchor pins, each anchor pin adapted to engage the interior cross-section of one pipe member when the pipe member is rotated 45°, wherein at least one anchor pin is pivotally mounted to the pipe joint thereby permitting at least one pipe member to be swung with respect to the pipe joint.

5,555,988

CLOSURE WITH TAMPER-INDICATING CAP FOR INJECTON AND INFUSION BOTTLES

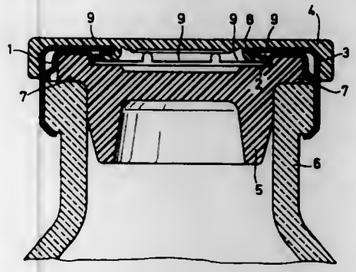
Hermann Koch, Mainz, and Hans-Joachim Loos, Ginsheim-Gustavsburg, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed May 2, 1995, Ser. No. 432,765

Claims priority, application Germany, May 4, 1994, 44 15 679.0

Int. Cl.[6] B65D *51/20*

U.S. Cl. 215—249 **4 Claims**



1. A closure for injection and infusion bottles, comprising:

a seal for enclosing an opening of a bottle, the seal including a circumferential flange for engaging a top edge of the bottle, the circumferential flange having a substantially vertical interior edge and a substantially vertical exterior edge opposite the interior edge; and

a seal cap having a first downwardly extending edge engaging the interior edge of the flange and defining an opening and a second downwardly extending edge engaging at least a portion of the exterior edge of the seal flange, an end proximate the second edge supported by the top edge of the container and spaced from the seal flange, the seal cap surrounding and mating with the seal flange.

5,555,989

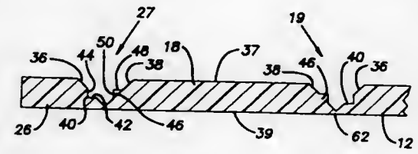
PLASTIC ENCLOSURES

Thomas F. Moran, Jr., Chagrin Falls, Ohio, assignor to Qube Corporation, Chagrin falls, Ohio

Continuation-in-part of Ser. No. 7,567, Jan. 22, 1993, Pat. No. 5,316,165, which is a continuation-in-part of Ser. No. 683,783, Apr. 11, 1991, abandoned. This application May 27, 1994, Ser. No. 251,741

Int. Cl.[6] B65D *7/00*

U.S. Cl. 220—62 **5 Claims**



1. A multiple place box-like enclosure, comprising:

a first side;

a second side;

a third side, said first side being joined to said third side by a first hinge line and said second side being joined to said third side by a second hinge line, said first side having an assembly edge opposite said first hinge line and two side edges perpendicular thereto and said second side having an assembly edge opposite said second hinge line and two side edges perpendicular thereto, said first, second, and third sides comprising a first piece;

a fourth side;

a fifth side;

a sixth side, said fourth side being joined to said sixth side by a third hinge line and a said fifth side being joined to said sixth side by a fourth hinge line, said fourth side having an assembly edge opposite said third hinge line and two side edges perpendicular thereto and said fifth side having an assembly edge opposite said fourth hinge line and two side edges perpendicular thereto, wherein said first side assembly edge is attached to said sixth side, said second side assembly edge is attached to said sixth side, said fourth side assembly edge is attached to said third side and said fifth side assembly edge is attached to said third side, said fourth, fifth, and sixth sides comprising a second piece; wherein said hinge lines are formed from grooves having an included angle between first and second groove walls of substantially 90 degrees, the cross section of each groove defining at least one ridge in a first groove wall which interfits with a furrow in a second groove wall when said hinge lines are folded.

5,555,990

STOCK SUPPORT SYSTEM

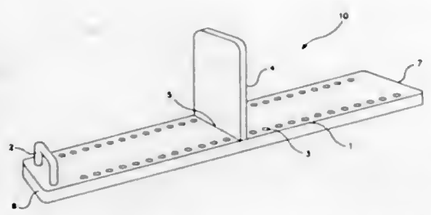
Steven W. Bechstein, 819 Webster St., Fort Wayne, Ind. 46802

Filed Jun. 6, 1994, Ser. No. 254,520

Int. Cl.[6] A47F *5/00*

U.S. Cl. 211—59.3 **11 Claims**

1. A method of displaying product on a shelf having a display end through the use of a stock support system including a base



having a first end, a member fixed to the first end of the base and having a height sufficient to prevent product from falling forward of the member, and a panel, having a greater height than the height of the member, adjustably coupled to the base to define an adjustable space between the member and panel that receives the product, the method comprising the steps of:

placing the base on the shelf so that the first end of the base is adjacent the display end of the shelf;

moving the base on the shelf away from the display end after product has been removed from the base;

tilting the base on the shelf so that product remaining on the base advances toward the member to a position previously occupied by product that has been removed;

uncoupling the panel from the base; and

recoupling the panel to the base so that the remaining product on the base adjoins and extends between the member and the panel.

5,555,991

PRODUCT-SUPPORTED ADVERTISING DISPLAY AND METHOD

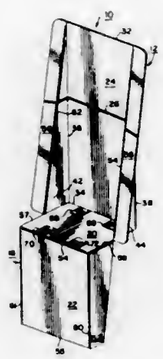
Kevin A. Hart, Vent House, Charing, Ashford, Kent TN27 OHH, England

Continuation-in-part of Ser. No. 19,638, Mar. 8, 1994, Pat. No. Des. 358,847. This application Mar. 16, 1994, Ser. No. 213,803

Claims priority, application United Kingdom, Sep. 17, 1993, 2033955

Int. Cl.[6] A47F *5/00*

U.S. Cl. 211—73 **24 Claims**



1. A point of sale advertising display supported by a packaged product, comprising:

a display base, the display base sized to rest on top of at least one packaged product and to support the at least one packaged product;

a display back, the display back coupled to and extending upwardly from the display base and capable of displaying advertising indicia, the display back substantially larger than the display base; and

opposing upright display wings coupled to the display base for supporting the display back in a substantially upright position.

5,555,992

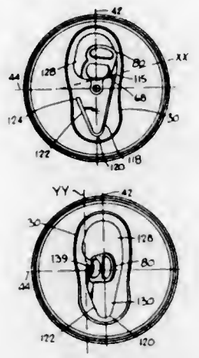
DOUBLE HINGED OPENING FOR CONTAINER END MEMBERS

William A. Sedgeley, Golden, Colo., assignor to Coors Brewing Company, Golden, Colo.

Continuation-in-part of Ser. No. 276,331, Jul. 15, 1994. This application Feb. 21, 1995, Ser. No. 393,140

Int. Cl.[6] B65D *17/34*

U.S. Cl. 220—269 **13 Claims**



1. A container end member for sealed association with a container body member to provide a sealed container comprising:

a container end member having a peripheral wall portion and an integral, central end wall portion;

a stay-on-tab;

mounting means for pivotally and rotationally mounting said stay-on-tab on said central end wall portion;

a score line groove defined between two spaced apart terminal ends formed in said central end wall portion for defining a severable panel portion;

said stay-on-tab having one end portion for applying a force on said severable panel portion to move said severable panel portion into said container;

said severable panel portion having a size that requires the application of force by said one end portion on at least two spaced apart locations of said severable panel portion to pivot said severable panel portion around a first hinge to open partially said severable panel portion and then to pivot said severable panel portion around a second hinge to sever completely said score line groove;

said second hinge retaining said stay-on-tab on said container end member;

said first hinge being adjacent one terminal end of said score line groove, the second hinge being adjacent the second terminal end of said score line groove and said first and second hinges being spaced apart.

5,555,993

BEVERAGE CAN AND PIVOTAL, SCREEN GUARD OPENER SYSTEM

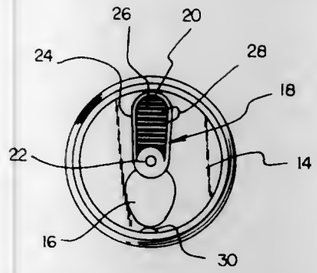
James T. Borkowski, 5125 Southern Star Ter., Columbia, Md. 21044, and Milton F. Borkowski, 12158 Mount Albert Rd., Ellicott City, Md. 21042

Filed Feb. 24, 1995, Ser. No. 393,661

Int. Cl.[6] B65D *17/34*

U.S. Cl. 220—269 **2 Claims**

1. A beverage can and pivotal guard opener system comprising:



a beverage can having a central, longitudinal axis and having a lid extending across an upper end thereof, the lid having a frangible opening which can be fractured to permit dispensing of contents from within the beverage can;

said beverage can further having a peripheral wall having a radially inwardly facing surface;

a guarded opening means having a frame thereabout, said guarded opening means being pivotally and rotatably mounted to the lid of the beverage can for facilitating opening of the frangible opening at a first position and further for precluding an entrance of debris through the frangible opening and into the beverage can at a second position; and

a lock tab extending radially inward from the inwardly facing surface of said peripheral wall proximal to the frangible opening, wherein the lock tab operates to receive a portion of the frame of the guarded opening means in an axial space provided between the lock tab and the lid to secure the guarded opening means relative to the lid when in said second position.

5,555,994

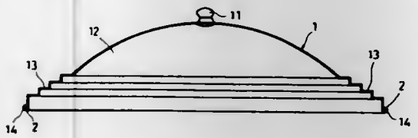
DOME COVER FOR COOKING UTENSILS

Ming-Chen Chen, No. 29, Alley 39, Lane 206, Sec. 2, Tai-Ho Rd., Ah-Yi Li, Changhua, Taiwan

Filed Jul. 25, 1995, Ser. No. 506,559

Int. Cl.[6] A47J *27/00*; **B65D** *51/00*

U.S. Cl. 220—287 **3 Claims**



1. A cover for covering cooking utensils of various configurations comprising:

(a) a cover body extending substantially radially about an axis, said cover body having a knob protruding axially therefrom, said cover body including a meshed portion defining a plurality of through openings;

(b) a stepped outer flange portion extending substantially radially from said cover body portion, said stepped outer flange portion including an outer tier and at least one inner tier for respectively engaging said cooking utensils having different configurations, said outer and inner tiers being coaxially disposed and respectively defining about said axis first and second diametric dimensions, said first diametric dimension being greater than said second diametric dimension, said outer tier being offset axially from said inner tier by a sidewall portion extending substantially axially therebetween; and,

(c) reinforcement means coupled to said outer flange portion, said reinforcement means being coaxially disposed about said outer flange portion.

5,555,995

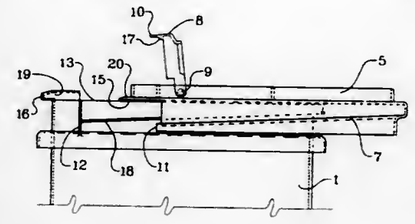
SQUARE CONTAINER FOR HAZARDOUS POWDERED MATERIALS

Herbert W. Galer, 303 Channel Run, Washington, N.C. 27889

Filed Mar. 31, 1995, Ser. No. 414,934

Int. Cl.[6] B65D *43/12*

U.S. Cl. 220—346 **3 Claims**



1. A thermoplastic container and closure comprising

(a) a container body having two substantially parallel container sides, a container front, a container back, and an open top defined by a chime,

(b) a closure of a shape generally similar to said open top, including a closure front, a closure back, and two parallel closure sides, said closure back and closure sides having skirts adapted to overlap said chime, and complementary substantially horizontal sealing surfaces,

(c) substantially horizontal sealing surfaces on said parallel container sides and container back adapted to mate with and form a tight seal with said complementary substantially horizontal sealing surfaces on said parallel closure sides and closure back when said closure is in a position covering said open top,

(d) complementary tapered guide surfaces on said container sides and said closure sides for guiding said closure frontwardly from the back of said container, said tapered guide surfaces adapted to force said closure downwardly to effect said tight seal between said substantially horizontal sealing surfaces on said parallel sides and container back,

(e) sealing surfaces on said container front and said closure front such that the sealing surface on said closure front engages beneath the sealing surface on the container front, when said closure is in a position covering said open top,

(f) a projecting nub at the front end of said guide surfaces of said closure sides, adapted to be lockably inserted into an aperture in said container body, when said closure is guided into place to cover said open top, and

(g) a hinged lock bar on said closure adapted to fixedly and sealably engage a lock bar receiving chime on said front of said container body when said closure is in a position covering said open top.

5,555,996

BAG-IN BOX WITH SPLIT LID

Arne Lang-Ree, Manhattan Beach; William P. Apps, Anaheim, and Jeff Ackermann, Manhattan Beach, all of Calif., assignors to Rehrig Pacific Company, Los Angeles, Calif.

Filed Aug. 6, 1993, Ser. No. 102,746

Int. Cl.[6] B65D *90/04*

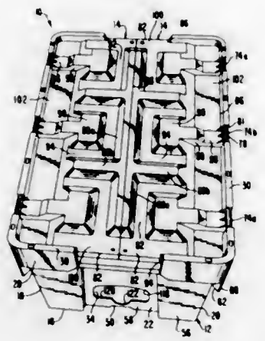
U.S. Cl. 220—403 **18 Claims**

1. A container adapted to form part of a fluid delivery system, comprising:

a generally rectangular bottom;

rectangularly arranged opposed side and end walls extending upwardly from said bottom;

an access aperture formed in one of said end walls for access to a spigot on a fluid-filled bag positioned within said container, said access aperture includes an enlarged portion, an edge



forming a lower side of said enlarged portion having a depending recess configured to receive said spigot when in its operative position;

a closure plate mounted on said one of said end walls to close said access aperture, and elongated slots on opposite sides of said access aperture and lugs on a surface of said closure plate for reception in said slots, said lugs being slidably movable within said slots for movement between said overlying and remote positions of said closure plate, said closure plate also including shoulder means formed on said closure plate adapted to engage said lower side of said enlarged portion of said access aperture to maintain said closure plate elevated above said depending recess when said closure plate is in its closed position; and

mounting means for mounting said closure plate for movement between a position overlying said access aperture and a position remote therefrom whereby said aperture means can be selectively opened and closed.

5,555,997

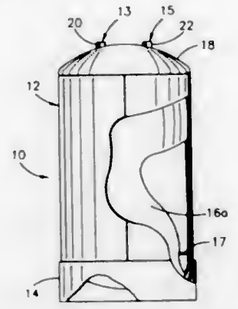
PRESSURE COMPENSATING WATER HEATER

Thomas G. Nogles, Broomall, Pa., assignor to Southcorp Water Heaters USA, Inc., Bala Cynwyd, Pa.

Continuation of Ser. No. 195,387, Feb. 14, 1994, abandoned. This application Oct. 3, 1995, Ser. No. 538,255

Int. Cl.[6] B65D *25/16*

U.S. Cl. 220—404 **8 Claims**



1. A lined water heater storage tank comprising:

an outer shell having ports connected to said outer shell for water flow into and out from said water heater storage tank; and

a liner within said outer shell having a water tight outer wall and fittings connected to said outer wall for water flow into and out from said liner, said fittings on said outer wall of said liner being mounted in said ports on said outer shell, said liner having a fluid tight pressure compensating cushion defined by an interior wall mounted to said outer wall of said liner and forming a pressure-tight seal with said outer wall at said fittings on said outer wall of said liner, said pressure compensating cushion containing a fluid having capacity to expand and contract to compensate for water pressure fluctuations within said water heater storage tank, said fluid in said pressure compensating cushion being more easily compressible than water.

5,555,998

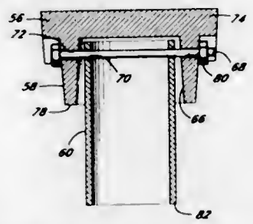
GATE VALVE LID

Daniel D. Coppola, 2301 Carroll St., North Las Vegas, Nev. 89030

Filed Feb. 8, 1994, Ser. No. 192,975

Int. Cl.[6] B65D *90/10;* **F16L** *5/00*

U.S. Cl. 220—484 **7 Claims**



3. An improved gate valve lid for placement over a mouth of a service box assembly, the service box assembly including an upper section and lower section, the lower section extending into the upper section, and wherein the lower section is centered over a gate valve, comprising:

a member having an upper portion having a substantially circular outer shape, a top end and a bottom end and a centerline running through said top and bottom ends, said upper portion of said member arranged to fit within the upper section of the service box assembly; and

a lower portion having a substantially circular outer shape, a first end connected to said upper portion and a centerline running therethrough, said centerline of said lower portion displaceable radially with respect to the upper portion for location within the lower section of the service box assembly.

5,555,999

SECONDARY CONTAINMENT FOR ABOVEGROUND FLAMMABLE AND COMBUSTIBLE LIQUID STORAGE TANKS

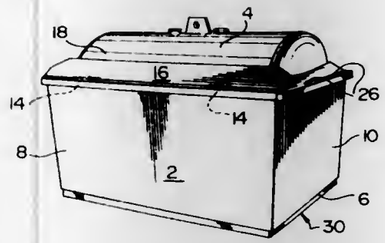
Stephen H. Wilcox, 2 Eastern Avenue, Haliburton Ontario, Canada

Filed Jun. 28, 1995, Ser. No. 496,090

Int. Cl.[6] B65D *25/18*

U.S. Cl. 220—565 **13 Claims**

8. An above-ground secondary containment unit in combination with a closed tank suitable for the safe storage of liquids, the unit comprising a rigid base, upwardly extending side walls, upwardly extending end walls transversely connecting the side walls and open top, the tank seated within and secured therein against relative movement by a linear strap means affixed to the side wall and extending across the top of the tank to the opposite side wall, side cover means hingedly secured to and extending from the side walls, resting on side outer surfaces of the storage tank for minimizing or preventing entry of precipitation and other materials between the tank and the containment unit when in use, end cover means affixed to and extending from the end walls, resting on the end outside surface of the storage tank for further minimizing or preventing entry of precipitation and the like therebetween while in use.



5,556,000

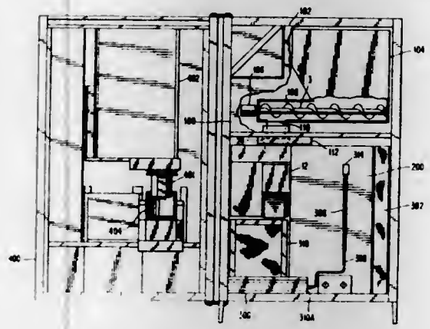
AUTOMATIC AIR HEATING SYSTEM FOR VENDING MACHINES

Wayne L. Covington, and Steven C. Price, both of Boise, Id., assignors to Ore-Ida Foods, Inc., Boise, Id.

Continuation of Ser. No. 20,715, Feb. 22, 1993, Pat. No. 5,419,239, which is a continuation-in-part of Ser. No. 855,927, Mar. 24, 1992, Pat. No. 5,203,253, which is a continuation-in-part of Ser. No. 594,382, Oct. 9, 1990, Pat. No. 5,097,754. This application Mar. 6, 1995, Ser. No. 399,375

Int. Cl.[6] A24F *27/14*

U.S. Cl. 221—150 A **38 Claims**



1. An apparatus for dispensing a predetermined quantity of a product comprising:

a means for storing the product to be dispensed;

a weighing means for weighing a metered portion of the product to be dispensed;

an auger for dispensing metered portions of the product from the product storing means into the weighing means; and

a trap door drive assembly for opening a trap door of said product dispensing apparatus and for dispensing said metered portion of product from said weighing means, wherein said trap door and said trap door drive assembly are formed as a unitized frame and hardware assembly which is mounted to said product storing means to maintain a fixed relationship between said trap door drive assembly and a trap door opening of said product storing means through which product is dispensed from said product storing means to said weighing means.

5,556,001

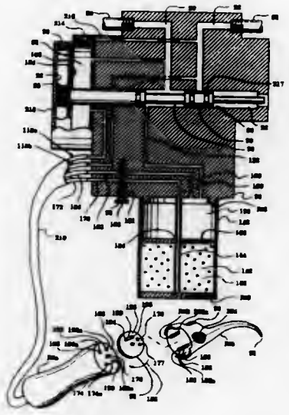
MIXING APPARATUS FOR FLUIDS OPERATIVE FROM A PRESSURIZED LIQUID 1 SUPPLY-DESIGN I

William R. Weissman, 4418 Vineland Ave., North Hollywood, Calif. 91602; Peter Liapis, 7188 Sunset Blvd. Suite 204, Los Angeles, Calif. 90069; George Sanchez, 22201 Ventura Blvd., and Bernardo Baran, 22201 Ventura Blvd., both of Woodland Hills, Calif. 91364

Filed Jun. 7, 1994, Ser. No. 255,703

Int. Cl.[6] E03C *1/04*

U.S. Cl. 222—1 **20 Claims**



1. A method for dispensing liquid 1 and liquid 2 from an orifice, comprising the steps of;

interposing a diverter valve between a liquid 1 supply inlet and a liquid 1 supply outlet wherein said diverter valve is configured to connect, in a first position thereof, said supply inlet and said supply outlet, and, in a second position thereof, a diverter outlet therefrom and said supply inlet;

configuring said diverter valve to move from said first valve position to said second valve position when a pressure bleed line is interrupted;

urging, with liquid 1 from said diverter outlet, a dispenser piston against liquid 2 in a container to dispense it therefrom;

conducting, separately, said liquid 1 and said liquid 2 from, respectively, said diverter outlet and said container, to a syringe defining an orifice therefrom;

selecting, with a control valve in said syringe that interrupts said bleed line, between said first position and said second position of said diverter valve; and

controlling, with said control valve, the flow of said liquid 1 and said liquid 2 from said orifice.

5,556,002

MEASURED LIQUID DISPENSING SYSTEM

Thomas S. Green, Atwater, Ohio, assignor to ABC TechCorp, Akron, Ohio

Filed Feb. 3, 1995, Ser. No. 383,306

Int. Cl.[6] B67D *5/08*

U.S. Cl. 222—21 **5 Claims**

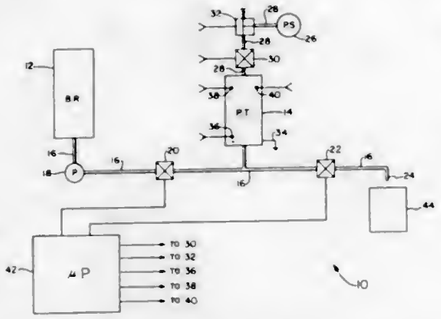
1. A measured liquid dispensing system, comprising:

a bulk reservoir maintaining a bulk quantity of a liquid material;

a measurement container interconnected with said bulk reservoir;

a pressure sensor received by said measurement container for sensing a pressure head therein;

a level sensor received by said measurement container for sensing the presence and absence of said liquid material in said measurement container at a particular level; and



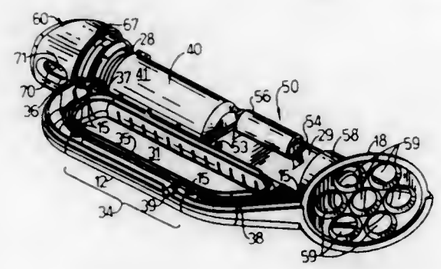
control means interconnected with said pressure and level sensors for determining the presence of a specific quantity of said liquid material within, and the effective dispensing of said specific quantity of said liquid material from said measurement container wherein said control means determines a volume of said liquid material within said measurement container as a function of said pressure head.

5,556,003

HAND-HELD PERSONAL DEFENSE APPARATUS

Douglas A. Johnson; Vince E. Johnson, both of Charlotte, and Feliciano S. Sabates, III, Davidson, all of N.C., assignors to Johnson, Sabates & Johnson LLC, Davidson, N.C.

Filed Sep. 11, 1995, Ser. No. 526,586
Int. Cl.[6] B67D *5/00*
U.S. Cl. 222—39 **18 Claims**



1. A hand-held personal defense apparatus for protecting a user against an attacker, said apparatus comprising:

a hollow housing defining an elongate handgrip and comprising an upper end and a lower end;

a strike element connected to at least one of said upper end and said lower end of said housing, said strike element comprising a rigid strike bar which extends in spaced relation along at least a substantial portion of the length of said handgrip so that the hand of the user may surroundingly grip said handgrip with said strike bar exposed on the outside of the hand;

alarm means positioned within said hollow housing for emitting an audible alarm;

defense fluid means positioned within said hollow housing for discharging a defense fluid; and

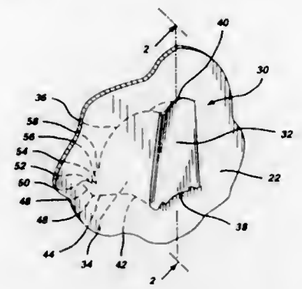
actuator means positioned adjacent said upper end of said housing for selectively activating said alarm means and for selectively activating said defense fluid means.

5,556,004

NINETY DEGREE POURING SPOUT

Robert J. Brucker, Barnardsville, N.J., assignor to Seal Spout Corporation, Liberty Corner, N.J.

Continuation-in-part of Ser. No. 30,563, Nov. 1, 1994. This application Feb. 24, 1995, Ser. No. 394,436
Int. Cl.[6] B65D *43/00*
U.S. Cl. 222—81 **10 Claims**



1. A pouring spout formed from a sheet of material and constructed to be inserted into a wall of a container comprising:

first and second bends in said sheet forming a central chute section, the central chute section including:

a top edge and a bottom edge;

a right side wall and a left side wall;

the side walls each comprising:

a curvilinear upper edge extending from the central chute section at a point above the bottom edge;

a puncture point constructed to pierce a container and allow the curvilinear upper edge to cut a groove to allow the side walls to enter a container;

a lower edge comprising:

an inner edge extending from the bottom edge of the central chute section to an end point;

said first and second bends disposed to position said inner edge substantially horizontal with respect to said bottom edge of said central chute section;

an outer edge extending from the end point of said inner edge to the puncture point and extending below the bottom edge of said central chute section;

a lobe formed on said curvilinear surface above said puncture point to form a detent between said lobe and said puncture point for coaction with said container;

said detent disposed no higher than said bottom edge of said central chute section to enable pivoting of said central chute section to at least ninety degrees from a wall of a container into which the spout is inserted.

5,556,005

COLLAPSIBLE SOAP DISPENSER

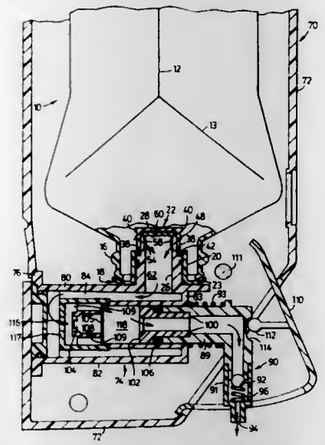
Stewart Banks, Brantford, Canada, assignor to Sprintvest Corporation NV, Netherlands Antilles

Filed Jan. 9, 1995, Ser. No. 370,035
Int. Cl.[6] B65D *35/54*
U.S. Cl. 222—96 **25 Claims**

1. A bottle and valve assembly for dispensing liquids when a dispensing probe is inserted within the valve assembly, comprising:

a) a bottle having a throat portion and an interior; and

b) a valve assembly including a first valve member being sealingly engagable in said throat portion and defining a channel extending therethrough, a second valve member having a channel and at least one aperture communicating with said channel therein, said second valve member being constrained to slide within said channel of said first valve member between a closed position wherein said at least one aperture is located within said channel of said first valve member and said throat portion is sealed closed, and an open position wherein a portion of said second valve member is located within said channel of said first valve member and said at least one aperture is at least partially free of said first valve member and in communication with said interior of said bottle, said channel of said second valve member being dimensioned to receive the dispensing probe and said valve assembly including means to seal said valve assembly to the probe when the probe is received within said channel of said second valve member.

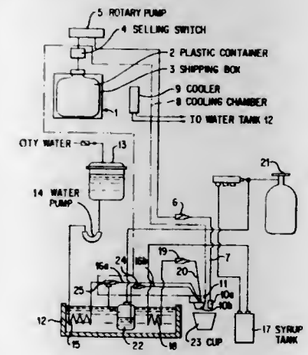


5,556,006

DRINK SUPPLY APPARATUS

Shigeki Sano, Mie, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 28, 1995, Ser. No. 413,209
Claims priority, application Japan, Apr. 5, 1994, 6-066334
Int. Cl.[6] B67D *5/56*
U.S. Cl. 222—129.1 **7 Claims**



1. A drink supply apparatus comprising:

a first drink supply system for supplying drink and including a disposable drink container, a pump connected to the container for discharging a specified amount of the drink from the container, a drink solenoid valve connected to the pump, and a drink nozzle connected to the drink solenoid valve;

a second drink supply system including a syrup supply line for discharging a syrup, said syrup supply line having a syrup tank for containing the syrup, a gas supply device connected to the syrup tank for ejecting the syrup under gas pressure in the gas supply device, a syrup cooling coil connected to the syrup tank, a syrup solenoid valve connected to the syrup cooling coil, and a syrup nozzle connected to the syrup solenoid valve for ejecting the syrup; and a chilled water supply line for supplying chilled water, said chilled water supply line having a water reservoir, a water cooling coil connected to the water reservoir, a chilled water solenoid valve connected to the water cooling coil, and a chilled water nozzle connected to the chilled water solenoid valve for electing water; and

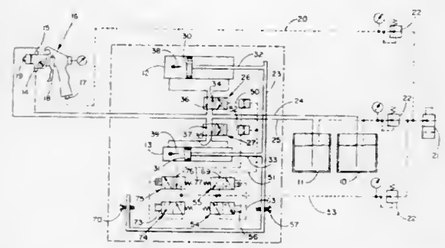
a housing for retaining the first and second drink supply systems therein.

5,556,007

PROPORTIONER FOR FLUID SPRAY GUN WITH AIR VALVE CONTROL

Charles O. Breitsprecher, Plymouth, Minn., assignor to Mattson Spray Equipment, Inc., Rice Lake, Wis.

Filed Feb. 13, 1995, Ser. No. 387,450
Int. Cl.[6] B67D *5/52*
U.S. Cl. 222—136 **3 Claims**



1. A proportioner having a pair of fluid cylinders, each cylinder containing a fluid-operated double-acting piston for separately feeding liquid to an air-operated spray gun in proportionate amounts from separate liquid sources during alternate strokes of the piston, the improvement comprising:

a liquid control valve for each cylinder, each liquid control valve having a first position for directing a liquid into one end of its associated cylinder from a liquid source and directing the liquid out the opposite end of its associated cylinder to the spray gun and a second position for directing the liquid out of said one end of its associated cylinder to the spray gun and into the opposite end of its associated cylinder from the fluid source;

means for attaching the cylinder pistons to one another so they move in unison;

sensors for detecting when the cylinder pistons reach the end of each stroke;

a first normally-closed air valve having a first plunger;

means for moving said first plunger to open said first air valve in response to one of said sensors;

a second normally closed air valve having a second plunger, said second air valve in air communication with said first air valve and in air communication with a liquid control valve;

said first air valve when open directing pressurized air to said second air valve to move said second plunger to open said second air valve;

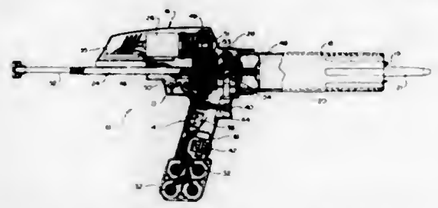
said second air valve when open directing a burst of pressurized air to said liquid control valve to move said liquid control valve from one position to the other instantaneously.

5,556,011

5,556,008
SOFT-CUP FEEDER
Brian H. Silver, Cary, and Larry D. Annis, Elgin, both of Ill., assignors to Medela, Inc., McHenry, Ill.
Filed Apr. 8, 1994, Ser. No. 225,279
Int. Cl.[6] B67D *1/07*
U.S. Cl. 222—192 **16 Claims**

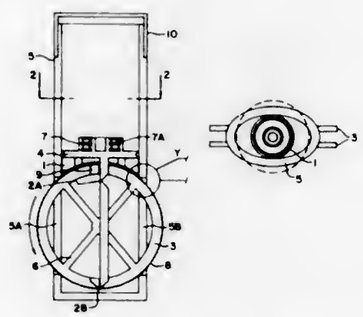
1. A utensil for feeding liquids, comprising:
a container for storing a supply of liquid, said container having an open end;
a cap member for closing said open end, said cap member including a one-way valve that functions to allow liquid to flow out from said container;
a liquid delivery element adapted to be attached to said container at said open end and in fluid communication with said one-way valve, said liquid delivery element including a reservoir portion for storing a quantity of liquid that has passed from said container through said one-way valve;
said liquid delivery element further including a spoon shaped feeding portion that receives liquid from said reservoir portion, said spoon shaped feeding portion being formed of a flexible resilient material said reservoir portion being in fluid communication with said spoon shaped feeding portion, and said spoon shaped feeding portion being adapted for feeding the liquid.

5,556,009
ADJUSTABLE CONSTANT PRESSURE CAULK GUN
Andrew R. Motzko, Burnsville, Minn., assignor to Wagner Spray Tech Corporation, Minneapolis, Minn.
Filed Jul. 18, 1994, Ser. No. 275,378
Int. Cl.[6] B65D *88/54*
U.S. Cl. 222—326 **18 Claims**



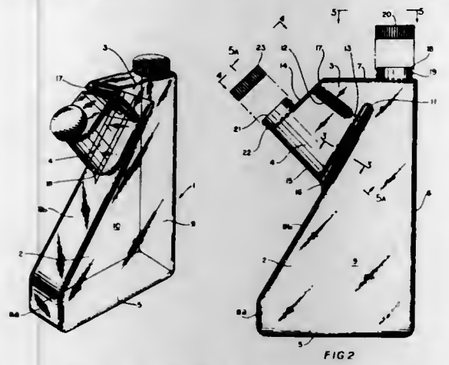
1. A motor control circuit adapted for controlling the pressure at which viscous materials such a caulk and adhesive are dispensed from a caulk gun, including:
an electronic switch adapted for controlling the flow of current through a caulk gun motor;
a feedback pressure circuit adapted for providing a feedback pressure signal representative of the actual pressure at which viscous materials are dispensed from the caulk gun, including load means adapted for interconnection to the motor for providing the feedback pressure signal as a function of the load on the motor;
an operator-adjustable pressure control adapted for providing a set-point pressure signal representative of a desired pressure for dispensing viscous materials from the caulk gun; and
a comparator connected to the electronic switch, feedback pressure circuit and pressure control, for comparing the feedback pressure signal to the set-point pressure signal, and adapted for controlling the switch as a function of the comparison to maintain the actual pressure at which the viscous materials are dispensed within a predetermined operating pressure band of the desired pressure.

5,556,010
GLUE STICK AND METHOD FOR ITS PRODUCTION
Hans Halm, Herne, Germany, assignor to UHU GmbH, Germany
Filed Jun. 29, 1994, Ser. No. 268,307
Claims priority, applicatioo Germany, Jul. 1, 1993, 43 21 967.5
Int. Cl.[6] B67D *5/42*
U.S. Cl. 222—386 **9 Claims**



1. A glue stick assembly fillable with a glue stick substance, having a piston for supporting the glue stick substance, a shell having a lower open end and an upper, open end, said shell configured surrounding the glue stick substance, a drive means arranged within the shell for providing up and down movement of the glue stick substance, said drive means comprising:
a connecting rod coupled to the piston at one end of said rod so as to drive the up and down movement of the glue stick substance; and
a double ring having a periphery which double ring engages in two mutually opposed slits arranged at the lower end of the shell, which double ring is coupled to said rod at the other end of said rod, said double ring having an abutment at its periphery for abutting said rod, said double ring being disposed so that the double ring can be actuated from outside the shell.

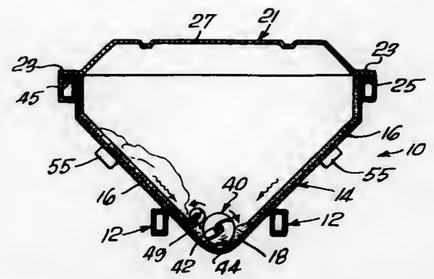
5,556,011
MEASURING CONTAINER
Robert M. Jennings, 4 Curtis Trail, Martinsville, N.J. 08836, and David A. Jennings, 28 Bayberry La., Mountainside, N.J. 07092
Continuation-in-part of Ser. No. 166,285, Dec. 13, 1993, abandoned. This application Sep. 27, 1994, Ser. No. 313,374
Int. Cl.[6] G01F *11/26*
U.S. Cl. 222—455 **32 Claims**



1. A container for measuring and dispensing a predetermined amount of flowable solid material, said container including a storage chamber, a measuring chamber and a dispensing chamber, said measuring chamber communicating with said storage chamber in such manner as to be fillable with material from said storage chamber upon tilting of said container from an initial position to a tilted position to pour material from said storage chamber into said measuring chamber, said measuring chamber having a closed bottom and fixed wall portions which define a constant volume chamber, one of said wall portions providing a barrier separating said measuring chamber from said dispensing chamber, said barrier wall portion extending from said closed bottom upwardly to a passage which communicates with said dispensing chamber and which enables said measuring chamber to be completely filled substantially to the level of said passage when the container is in said tilted position, said measuring chamber communicating with said dispensing chamber by way of said passage in such manner that upon reversion of the container to said initial position material will transfer from the measuring chamber to the dispensing chamber and surplus material which had not entered the measuring chamber will return to the storage chamber and that the measuring chamber will not be refilled from the storage chamber upon further tilting of the container to dispense the measured volume from the dispensing chamber.

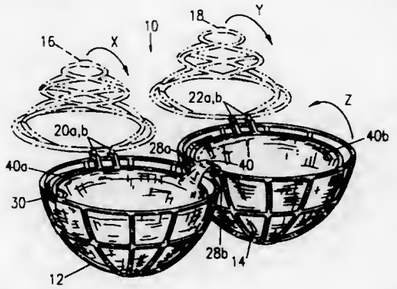
5,556,012
APPARATUS FOR HANDLING ENVIRONMENTALLY SENSITIVE MATERIALS
Thomas N. Ramey, 1529 Bernina Dr., Frazier Park, Calif. 93222
Continuation of Ser. No. 10,332, Jan. 28, 1993, abandoned. This application Sep. 12, 1994, Ser. No. 302,004
Int. Cl.[6] G01F *11/00*
U.S. Cl. 222—608 **9 Claims**

1. A system for storing, transporting and depositing environmentally sensitive materials in solid, liquid and gaseous form, or in combinations thereof, in an environmentally sound manner, comprising, in combination:
a vessel, said vessel being mounted on wheels to render said vessel mobile, said vessel being configured to have longitudinal side walls extending downwardly and inwardly to converge at a base member to define the low point of said vessel;
a discharge orifice at one end of said low point to discharge said environmentally sensitive materials in solid or liquid form;



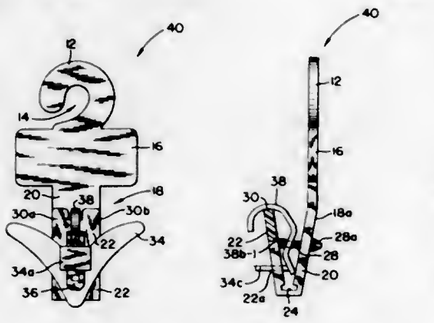
material movement means for moving solid material to said discharge orifice comprising a first auger extending longitudinally along said low point; a second, single, auger having a smaller diameter than said first auger, said second auger being positioned above said first auger and adjacent to a side wall so that the axis of said second auger is offset from the axis of said first auger;
power means connected to said first and second augers for rotating said second auger in a direction opposite to the direction of rotation of said first auger, so that said second auger breaks away material in said vessel, in immediate proximity to said second auger, and moves said environmentally sensitive solid material into the path of said first auger;
a filter system for removing gaseous pollutants from said environmentally sensitive materials; and
sealing means for sealing said vessel against inadvertent discharge of the environmentally sensitive materials contained therein.

5,556,013
INTIMATE GARMENT PROTECTOR
Bruno Franz P. Mayer, Santa Ana, Calif., assignor to Ingenious Design Products, Los Angeles, Calif.
Filed Jun. 2, 1994, Ser. No. 252,671
Int. Cl.[6] D06C *15/00*; **D06F** *35/00*
U.S. Cl. 223—84 **23 Claims**



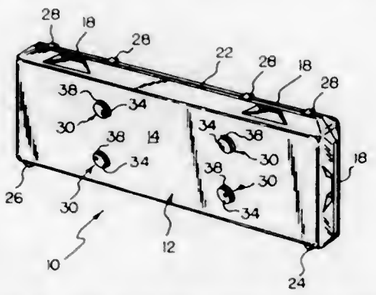
19. A garment protector comprising:
(a) first and second dome-shaped basket members hingingly connected to one another and inwardly rotatable toward one another such that a ball-shaped configuration is formed, at least one of the basket members including an open-cell wall arrangement having a network of annular support members and arcuate support members which are spaced apart to provide structural support to the basket member and allow water and detergent to penetrate into the garment protector when the garment protector is washed;
(b) a fastener for detachably maintaining the first and second basket members in the ball-shaped configuration: and
(c) at least a first biasing member within the first basket member for holding a portion of the garment against the first basket member.

5,556,014
HANGER COMPOSITE FOR DISPLAY OF NECKTIES WITH PREFORMED KNOTS
Chester Kolton, Westfield, and Stuart S. Spater, Livingston, both of N.J., assignors to B&G Plastics, Inc., Newark, N.J.
Continuation-in-part of Ser. No. 180,045, Jan. 11, 1994, Pat. No. 5,421,494. This application Dec. 29, 1994, Ser. No. 366,606
Int. Cl.[6] A47G *25/14;25/74*
U.S. Cl. 223—85 **13 Claims**



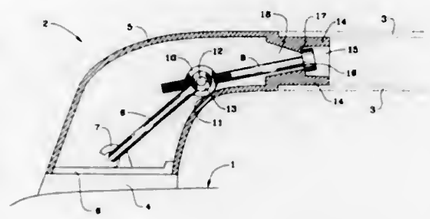
6. A hanger composite including:
(a) a first hanger including a tail having first and second portions folded about a fold area therebetween to define a tail loop; and
(b) a second hanger having a first portion thereof disposed retentively within said tail loop,
said second tail portion having a free end defining a recess so as to impart preselected orientation to said second hanger, said second hanger having a second portion resident in said recess.

5,556,015
CONTAINER WITH ACTIVATABLE MOUNTING ASSEMBLY
Robert C. Vincent, 104 Rose Twig La., North Wales, Pa. 19454
Filed Feb. 24, 1994, Ser. No. 210,192
Int. Cl.[6] B60R *9/055*
U.S. Cl. 224—328 **12 Claims**



1. A new and improved mounting assembly for a container for relatively large bulky items wherein said mounting assembly is adapted to support said container on an irregular surface, and wherein said container comprises at least one longitudinally elongated mounting surface defining a first longitudinal axis and a recess in said surface, said assembly comprising:
a longitudinally elongated support member defining a second axis,
means for movably mounting said support member within said recess and for permitting selective movement of said support member along said second axis between a first recessed position and a second extended position,
foot pad means having a bottom mounted on one end of said support member for engaging said irregular surface,
pivotal connection means between said foot pad means and said one end of said support member for permitting said foot pad to pivot relative to said axis when said member is axially moved from said first position to said second position, and
depression means located on the bottom of said foot pad means for selectively moving said support member between said first position where said foot pad means is substantially flush mounted relative to said mounting surface and said second position where said foot pad means extends beyond said mounting surface toward said irregular surface.

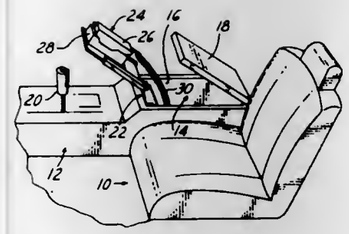
5,556,016
DEVICE FOR FASTENING A LOAD CARRIER
Jan-Ivar Arvidsson, Tranbärsstigen, Sweden, assignor to Industri Ab Thule, Hillerstorp, Sweden
Filed Jun. 22, 1993, Ser. No. 79,609
Claims priority, application Sweden, Jun. 24, 1992, 9201935
Int. Cl.[6] B60R *9/04*
U.S. Cl. 224—329 **17 Claims**



1. A device for fastening a load carrier to a vehicle body, the device comprising:
an adapter for attachment to a vehicle body, the adapter including an engagement member projecting outwardly of a contour of the vehicle body and including a hook-shaped catch;
a housing portion, the housing portion having a first end, the first end being removably engageable with the engagement member to prevent relative displacement between the first end of the housing portion and the vehicle body in directions along a surface of the vehicle body, the housing having an interior space;
a coupling device disposed in the interior space of the housing, the coupling device being removably engageable with the catch; and
a clamping device at least partially disposed in the interior space of the housing, the clamping device being connected to the coupling device and cooperating with the housing to move the coupling device inside the interior space of the housing to effect engagement between the coupling device and the catch and to move the first end of the housing into engagement with the engagement member, the clamping device being oriented such that the clamping device effects a significant force substantially parallel to a roof of the vehicle.

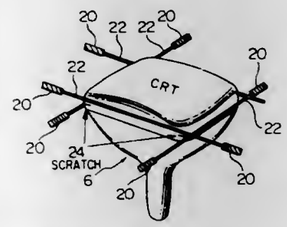
5,556,017
HINGED PHONE BRACKET FOR VEHICLE
Stanton E. Troy, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.
Filed Feb. 21, 1995, Ser. No. 391,799
Int. Cl.[6] B60R *7/00;7/10;9/00;11/00*
U.S. Cl. 224—549 **3 Claims**

1. A phone installation comprising:



a storage bin having a top opening and an upper inner surface adjacent the opening;
bracket means for supporting a phone for movement between an operating position outside the bin and a storage position within the bin including
a mount attached to the upper inner surface of the bin,
a slide adapted to hold the phone for sliding the phone between extended and withdrawn positions,
a single link having one end directly hinged to the mount and the other end directly hinged to the slide;
whereby the slide is movable from storage position to operating position by pivoting the slide to a position outside the bin and extending the slide to operating position.

5,556,018
METHOD AND APPARATUS FOR SPLITTING A CATHODE RAY TUBE
Kouzi Kanehira, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jun. 27, 1994, Ser. No. 265,768
Claims priority, application Japan, Jul. 9, 1993, 5-170518
Int. Cl.[6] H01J *9/50*
U.S. Cl. 225—2 **4 Claims**

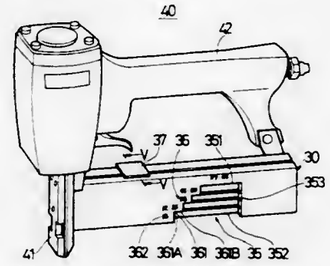


1. A method for splitting a cathode ray tube comprising the steps of making scratches at four corners of the cathode ray tube, disposing electrical heating wires to which tension is applied at positions at four sides of a panel portion of the cathode ray tube so as to flank the scratches from their two sides, applying heat to the cathode ray tube by the electrical heating wires, and thereby splitting the cathode ray tube.

5,556,019
BAG SEPARATOR AND DISPENSER
Joseph W. Morris, Hartsville, S.C., assignor to Sealed Air Corporation, Saddle Brook, N.J.
Filed Jul. 25, 1994, Ser. No. 279,912
Int. Cl.[6] B26F *3/02;* **B65H** *35/10*
U.S. Cl. 225—96 **6 Claims**

4. A device for dispensing articles wherein each article is attached to a next article to form a series of said articles, said each article of said series of articles and said next article in said series of articles having perforations with a slot therebetween for separating said each article from said next article, said series of articles rolled onto a core having two ends, said device comprising:
a pair of channels for holding said core so that said core can rotate in place within said channels;
a projection for engaging said slot of said next article of said series of articles so that said each article can be separated from said next article along said perforations;
first means for retarding rotation of said series of articles; and
second means carried by said channels for retarding rotation of said core, said second retarding means further comprises a pair of bars carried by said channel means, said core coming into engagement with said pair of bars as said series of articles is drawn across said projection.

5,556,020
POWER STAPLE GUN
Chang F. Hou, No. 52, Alley 17, Lane 20, Chung-Shan Road, Tai-ping Hsiang, Taichung Hsien, Taiwan
Filed Jul. 21, 1995, Ser. No. 505,001
Int. Cl.[6] B25C *1/04*
U.S. Cl. 227—109 **4 Claims**



1. A power staple gun comprising:
a gun body;
a staple nozzle downwardly extended from said gun body at one end;
a coupling frame downwardly extended from said gun body at an opposite end and substantially disposed in parallel to said staple nozzle;
a magazine connected between said staple nozzle and said coupling frame to hold staples, said magazine comprising two rectangular guide boards longitudinally disposed at two opposite sides, at least two pairs of parallel staple grooves within said guide boards for receiving staples of different lengths, and a staple loading port on one guide board, said staple loading port comprising a straight top side, a straight bottom side being an elongated through hole, a straight lateral side disposed closer to said coupling frame and connected between said straight top side and said straight bottom side, and a stepped lateral side disposed closer to said staple nozzle and connected between said straight top side and said straight

bottom side opposite to said straight lateral side, said stepped lateral side comprising a series of steps and a plurality of

5,556,025
GIFT WRAPPING SLEEVE

bottom side opposite to said straight lateral side, said stepped lateral side comprising a series of steps and a plurality of marks at one side by each step to show different lengths corresponding to said staple grooves, each step comprised of a horizontal portion and a vertical portion connected at right angles, the horizontal portions of said stepped lateral side being respectively aligned with said staple grooves; and

a follower member disposed in said magazine at one end for pushing staples toward said staple nozzle.

5,556,021

Patent Not Issued For This Number

5,556,022

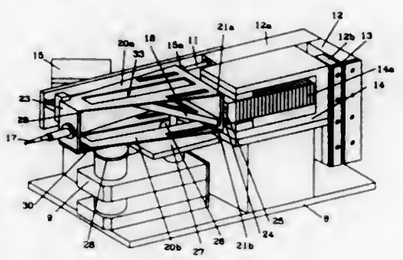
POLAR BOND HEAD

John W. Orcutt, and Galle Lin, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 983,092, Nov. 23, 1992, Pat. No. 5,330,089, which is a continuation of Ser. No. 691,944, Apr. 26, 1991. This application Jun. 6, 1994, Ser. No. 254,225

Int. Cl.[6] B23K *1/06*

U.S. Cl. 228—1.1 **8 Claims**



1. A polar motion table, comprising:

a table;

a pivot attached to said table;

a frame support attached to said pivot;

a frame mounted on said frame support;

a first motor for moving said frame with respect to said frame support in a linear direction, said linear direction extending generally radially with respect to said pivot; and

a second motor for moving said frame through an arc about said pivot.

5,556,023

METHOD OF FORMING SOLDER FILM

Takeo Kuramoto; Masataka Watabe; Satoshi Noda, all of Tokyo; Takashi Shoji, and Takekazu Sakai, both of Saitama, all of Japan, assignors to Showa Denko K.K., Tokyo, Japan

Continuation-in-part of Ser. No. 144,322, Nov. 1, 1993, abandoned. This application Oct. 31, 1994, Ser. No. 332,488

Claims priority, application Japan, Oct. 30, 1992, 4-315738; Jan. 11, 1993, 5-019366

Int. Cl.[6] B23K *1/20*

U.S. Cl. 228—248.1 **7 Claims**

1. A method of forming a solder film which comprises the steps of:

i. contacting the entire surface of an article with a tacky layer-forming solution; wherein said article comprises exposed predetermined areas of metallic surface, and said tacky layer-forming solution comprises at least one compound selected from the group consisting of benzotriazole derivatives, naphthotriazole derivatives, imidazole derivatives, benzoimidazole derivatives, mercaptobenzothiazole derivatives, benzothiazole thiofatty acid derivatives, and triazine derivatives;

ii. imparting tackiness to only said exposed predetermined areas of metallic surface by means of a chemical reaction between said tacky layer-forming solution and the metal in said exposed predetermined areas of metallic surface,

iii. adhering a powdered solder to the resulting tacky part; and

iv. melting the solder by heating to thereby form a solder film.

5,556,024

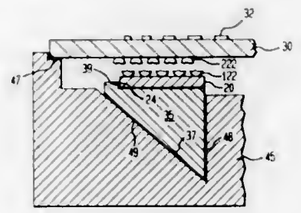
APPARATUS AND METHOD FOR REMOVING KNOWN GOOD DIE USING HOT SHEAR PROCESS

David C. Olson, Poughkeepsie, and Robert Phillips, III, Staatsburg, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 29, 1994, Ser. No. 315,319

Int. Cl.[6] H05K *3/30*; **B23K** *3/00*

U.S. Cl. 228—264 **7 Claims**



1. A process for separating an active or passive device from a device carrier, said process comprises:

(a) securing a removing means to said device, wherein said device is secured to said device carrier by at least one solder ball,

(b) placing said device carrier along with said device and said removing means onto a housing such that said removing means provides a pulling motion to said device,

(c) placing said housing in a thermal environment and heating said device until said solder reaches the solder liquidus temperature, whereupon said removing means pulls said device away from said device carrier, and wherein said housing has an incline and wherein said removing means slides on said incline with said device, after said device has separated from said device carrier, thereby separating said device from said device carrier.

5,556,025

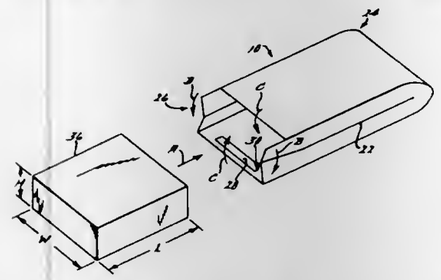
GIFT WRAPPING SLEEVE

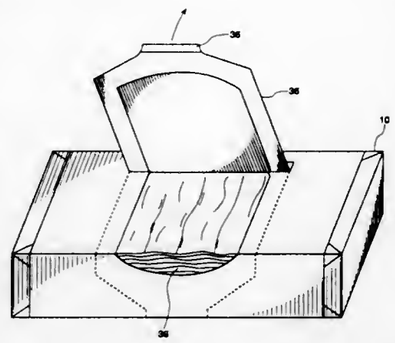
Alan B. Sloan, 5248 Breeze Hill Pl., Troy, Mich. 48098

Continuation of Ser. No. 44,959, Apr. 8, 1993, abandoned. This application Nov. 29, 1994, Ser. No. 346,365

Int. Cl.[6] B65D *30/10*

U.S. Cl. 229—87.19 **1 Claim**





1. A gift wrapping sleeve in combination with a hexahedronally-shaped article, a said hexahedronally-shaped box having a predetermined length, width and height, comprising:

a non-self-supporting sheet material, said sheet material having a decorative exterior surface and being configured to form a first pair of opposite side walls and a second pair of opposite side walls, said first and second pairs of opposite side walls each having a first end portion, a second end portion and an intermediate portion therebetween, said first end portions being closed at the terminal ends thereof to provide a stop when the hexahedronally-shaped box is placed into said sheet material, and said second end portion of said first pair of opposite side walls defining an opening and having means for closing said second end of each of said pairs of opposite side walls, an adhesion means is provided at said second end for securing said walls together to close said opening, said adhesive means is adhesive tape; and wherein

each said pairs of opposite side walls are dimensioned to extend beyond the predetermined length of the hexahedronally-shaped box, and said intermediate portion is dimensioned to conform to the width and height of the hexahedronally-shaped article, one wall of said first pair of opposite sides is longer than the other wall at said second end whereby said longer wall can be folded;

said sleeve is to be manually wrapped securely about the width and height of the hexahedronally-shaped box, and said first and second ends of said pairs of opposite side walls extend beyond the length of the hexahedronally-shaped box on either side thereof and said second ends converge toward one another and are attached together upon wrapping of the article such that said closed ends form an angle to one another to provide an overall arcuate appearance when viewed in side elevation when expanded to hold the hexahedronally-shaped box.

two second side walls and two end walls, each end wall being constructed by a first flap, two second flaps and a third flap; the first flap being integral with and extending from either one of the first side walls; the two second flaps being integral with and extending from the second side walls, and being integral with the third flap, the third flap being integral with and extending from the other of said first side walls; there being a first, second and third fold lines between the first, second and third flaps and their integral side walls, respectively; there being a fourth fold line between each of said second flaps and said third flaps; and there being a fifth fold line on each of said second flaps, which extends diagonally from one apex of the second flap formed at the point of intersection between the second and the fourth fold lines, to the opposed apex of the second flap; said end walls are formed each by first folding internally along the second, third and fourth fold lines and externally along the fifth fold line, until said third flap is normal to the first and second side walls of the box and then folding said first flap internally along said first fold line and fixing said first flap over said third flap;

the openings left at the end walls after folding of the flaps are sealed by a patch of adhesive film which is essentially impermeable to fluid;

at least one of said side walls having a resealable closure assembly defining an opening in the envelope for product access and comprising a flap integral with the envelope at one side thereof which forms a hinge between said flap and the envelope, said assembly further comprises an adhesive label covering said flap and extending over its boundaries to adjacent portions of the envelope, to seal the opening prior to a first use and to reseal the opening between uses; said label having a tab at a portion thereof remote from the hinge for opening the closure.

5,556,026

BOX

Efraim Blankitny, Natanya, Israel, assignor to Blank Paper Products Ltd., Akiva, Israel

Continuation of Ser. No. 239,250, May 6, 1994, abandoned. This application Nov. 14, 1995, Ser. No. 558,616

Claims priority, application Israel, Jun. 3, 1993, 105898; Mar. 24, 1994, 109106

Int. Cl.[6] B65D *17/32*

U.S. Cl. 229—123.1 **4 Claims**

1. A box having an envelope made essentially of cardboard for containing a product, at least one face of the cardboard being coated by a coating which is essentially impermeable to fluids; the box having a rectangular prismatic shape with two first side walls,

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5,556,027

HYDRONIC HEATING OUTDOOR TEMPERATURE RESET SUPPLY WATER TEMPERATURE CONTROL SYSTEM

Joachim Fiedrich, 20 Red Pine Dr., Carlisle, Mass. 01741

Continuation of Ser. No. 222,884, Apr. 5, 1994, abandoned. This application Sep. 18, 1995, Ser. No. 529,938

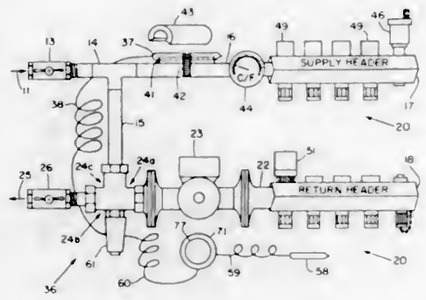
Int. Cl.[6] F24D *3/00*

U.S. Cl. 237—8 C **28 Claims**

21. In a hydronic heating system having a source of hot supply water and a reservoir of cooler return water, a supply water line from said source, a return water line to said reservoir and at least one heating loop through which water flows from said supply line to said return line, the improvement comprising:

(a) a three-way valve in said system for feeding return water directly from said return water line to the supply water line to reduce the temperature of water flow to said heating loop (loop water temperature),

(b) a thermostatic control for controlling said valve to vary said loop water temperature, including



(c) a loop water temperature bulb sensor containing thermostatic fluid responsive to said loop water temperature,
(d) an outdoor temperature bulb sensor containing thermostatic fluid responsive to outdoor temperature,
(e) a thermostatic valve actuator attached to said valve,
(f) thermostatic fluid capillary tubes connecting said thermostatic fluid from said bulbs to said actuator,
(g) a thermostatic fluid adjusting device for said thermostatic fluid for adjusting the effects of said outdoor bulb temperature on said valve position and
(h) said bulbs, capillaries, actuator and adjusting device contain a common thermostatic fluid that expands as its temperature increases,
(i) whereby said loop water temperature is increased when said outdoor temperature falls.

5,556,028

DEVICE AND PROCESS FOR HEATING A PASSENGER COMPARTMENT OF A MOTOR VEHICLE

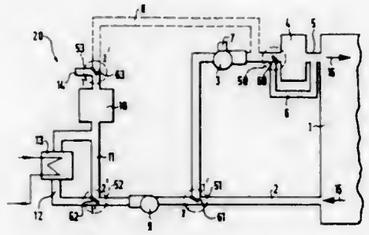
Noureddine Khelifa, Stuttgart, Germany, assignor to Behr GmbH & Co., Stuttgart, Germany

Filed Apr. 12, 1995, Ser. No. 420,786

Claims priority, application Germany, Apr. 27, 1994, 44 14 595.0

Int. Cl.[6] B60H *1/02*

U.S. Cl. 237—12.3 A **11 Claims**



1. A device for heating a passenger compartment in a motor vehicle, comprising:
a heating device for warming up an air current fed to the passenger compartment; and
a sorption reactor with a sorbent received therein through which at least part of the air current flows,
wherein a sorptive capacity of the sorbent received in the sorption reactor is chosen in accordance with a warm-up time of the heating device such that the air current flowing through the sorption reactor and fed to the passenger compartment can be dried in an uninterrupted adsorption operation until a predeterminable air-outlet temperature is reached at the heating device.

5,556,029

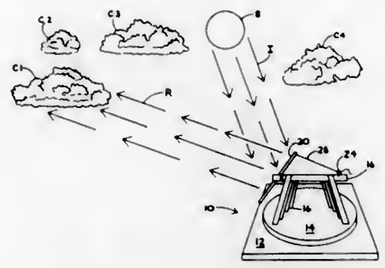
METHOD OF HYDROMETEOR DISSIPATION

Gary B. Griese, 558 Gladys Ave., Elmhurst, Ill. 60126

Filed Sep. 12, 1994, Ser. No. 304,743

Int. Cl.[6] A01G *15/00*

U.S. Cl. 239—2.1 **9 Claims**



1. A method of dissipating a hydrometeor comprising:
directing from the surface of the earth reflected sunlight that is absorbed by water into the hydrometeor to be dispersed for a sufficient duration of time and in an amount to impart sufficient energy to the water of the hydrometeor to dissipate at least a portion of the hydrometeor.

5,556,030

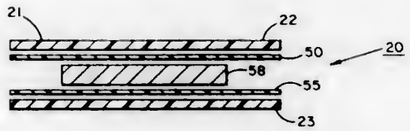
AIR FRESHENER AND/OR DEODORIZER DISPENSING SYSTEM

Leonard Paul, 13 Stuart Dr., Bloomfield, Conn. 06002

Continuation-in-part of Ser. No. 163,338, Dec. 6, 1993, Pat. No. 5,372,303. This application Nov. 1, 1994, Ser. No. 333,027

Int. Cl.[6] A61L *9/12*

U.S. Cl. 239—56 **17 Claims**



4. A dispensing system for providing controlled, long-term release of an air freshening and/or a deodorizing fragrance, said system comprising
A. a container formed from two independent, multi-layered, flexible sheets and incorporating a sealed holding zone;
B. a highly concentrated, long-lasting, air freshening/deodorizing composition contained within the holding zone and comprising
a. between about 90% and 99% by weight of the entire composition of at least one oil-based fragrance, and
b. between about 1% and 10% by weight of the entire composition of a fixative;
C. fragrance holding means mounted in the holding zone of the container and incorporating the air freshener/deodorizing composition;
D. a first permeable membrane layer mounted in the container and positioned between the fragrance holding means and one of said multi-layered flexible sheets for controlling the rate of dispersion of the air-freshening/deodorizing composition;
E. a second permeable membrane layer positioned in juxtaposed spaced relationship with the first membrane layer, with the fragrance holding means sandwiched therebetween; and
F. a composition dispensing portal
a. formed in the container in a normally sealed configuration to prevent the release of the air freshening/deodorizing composition from the holding zone until desired, and

b. controllably openable for providing a fragrance dispensing portal, whereby the air freshening/deodorizing fragrance is able to exit from the fragrance holding means into the ambient surroundings after passage through at least one permeable membrane layer.

5,556,031

FUEL INJECTION NOZZLE HAVING A VALVE AND A CONTROL ELEMENT FOR CONTROLLING FUEL PRESSURE ACTING ON A SURFACE OF THE VALVE

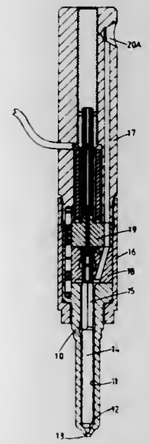
Michael P. Cooke, and George N. Felton, both of Gillingham, Great Britain, assignors to Lucas Industries Public Limited Company, Solihull, England

Filed Oct. 5, 1994, Ser. No. 318,090

Claims priority, application United Kingdom, Oct. 8, 1993, 9320798

Int. Cl.[6] F02M *47/00*

U.S. Cl. 239—124 **6 Claims**



1. A fuel injection nozzle for supplying fuel to an internal combustion engine comprising a nozzle body, a bore formed in the body and a seating at one end thereof, valve means movable axially within the bore, the valve means being shaped for cooperation with the seating and being movable away from the seating to permit fuel flow past the seating through an outlet orifice, a fuel inlet in the body, a first surface defined by the valve means and against which fuel pressure from the inlet can act to lift the valve means away from the seating, a second surface defined by the valve means and against which fuel pressure can act to hold the valve means in engagement with the seating, a restrictor through which fuel under pressure from said inlet is applied to said second surface, a control element operable by a control signal from external of the nozzle to reduce the fuel pressure acting on said second surface, said control element comprising a tubular valve element, resilient means acting to urge an end of said tubular valve element into engagement with said second surface, passage means through which the interior of said tubular valve element is in communication with a drain and an actuator including an armature and a solenoid, operable to lift said end of the tubular valve element away from said second surface thereby to lower the fuel pressure acting on said second surface.

5,556,032

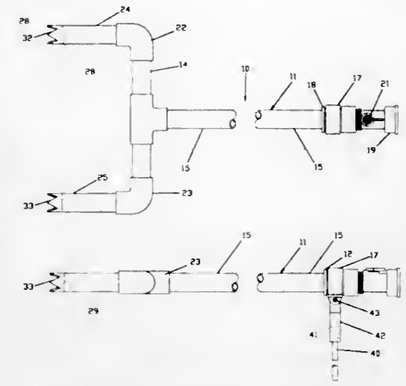
DUAL LEVEL WATERING DEVICE

Andy Varrichione, 1215 Clearview Dr., Port Charlotte, Fla. 33953

Filed May 30, 1995, Ser. No. 453,458

Int. Cl.[6] B05B *15/06;1/14*

U.S. Cl. 239—279 **1 Claim**



1. A watering device for delivering a uniform flow of water through a plurality of discharge outlets comprising:
an elongate pipe having a first end and a second end for accommodating water pressure therethrough,
a coupling at said first end of said pipe for connection to a pressurized flow of water,
a header connected to said pipe at said second end remote from said coupling,
at least two spaced water distribution conduits connected to said header and extending outwardly thereof,
a water flow restraining means secured in said distribution conduits adjacent the ends thereof remote from said header,
a control valve in said elongate pipe adjacent said coupling,
a support means including a swivel attachment connected to said pipe adjacent said control valve so that said at least two distribution conduits and said support means form a triangular support for said watering device,
an opening in said header intermediate said at least two distribution conduits, and a flow restraining means secured in said opening for providing an additional watering outlet,
said flow restraining means in said header of such size as to allow a major portion of the water moving through said header to be distributed through said at least two distribution conduits,
said at least two distribution conduits disposed parallel to said elongate pipe and equally spaced therefrom along said header,
a swivel ring rotatably secured to said swivel attachment and mounted on said elongate arm, said control valve positioned intermediate said coupling and said swivel ring,
said flow restraining means in said header of such size as to allow a major portion of the water moving through said header to be distributed through said at least two distribution conduits,
said elongate pipe and said at least two distribution conduits made of PVC and said support means made of a suitable metal, and
said at least two distribution conduits notched at their ends to allow greater distribution of water and more securely contact the ground,
whereby said watering device may be placed at any desired location and left unattended while a selected uniform water supply is delivered through said at least two distribution conduits, and the flow restraining means in said header provides additional watering while selectively reducing the water pressure at said flow restraining means in said distribution conduits.

5,556,033

the base member having a distribution bore extending along the length of the cooling segment and being in communication with

5,556,033

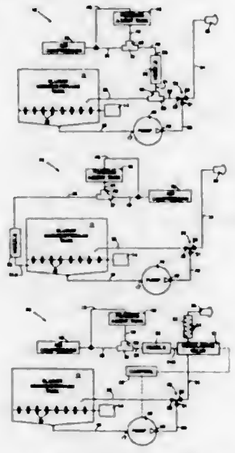
AN APPARATUS FOR FORMING A FOAMED OUTDOOR PROTECTIVE COVER LAYER

Thomas J. Nachtman, Temperance, Mich., assignor to New Waste Concepts, Inc., Perrysburg, Ohio

Continuation of Ser. No. 3,633, Jan. 13, 1993, abandoned, which is a continuation-in-part of Ser. No. 823,186, Jan. 21, 1992, abandoned, which is a continuation of Ser. No. 639,285, Jan. 10, 1991, Pat. No. 5,082,500, which is a continuation-in-part of Ser. No. 350,599, May 10, 1989, abandoned. This application Dec. 12, 1994, Ser. No. 353,954

Int. Cl.[6] B05B *7/26*

U.S. Cl. 239—343 **10 Claims**



1. An apparatus for applying a sprayable foamed composition for forming a cover layer over a selected material, the apparatus comprising:

a storage tank adapted to contain a slurry including ingredients of a sprayable composition for forming a cover layer over a selected material, said storage tank having an outlet port;

a pump adapted to pump said slurry, said pump having an intake port and a discharge port, said pump intake port connected to said storage tank outlet port;

a regulating valve having first and second inlet ports and an outlet port, said regulating valve operable to vary the amount of flow from said second inlet port to said outlet port, said first inlet port being coupled to said pump discharge port;

a spray nozzle connected to said outlet port of said regulating valve; and

a foam generator connected to said second inlet port of said regulating valve, said regulating valve being operable to combine foam produced by said foam generator with said pumped slurry to produce a foamed composition, said regulating valve being adjustable to vary the rate of addition of foam to said pumped slurry to control the density of said foamed composition.

5,556,034

FUEL INJECTION VALVE

Akihiro Sakakida; Hideo Ohara; Hiroyuki Miyake, and Kazunari Kaneshima, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 5, 1994, Ser. No. 353,272

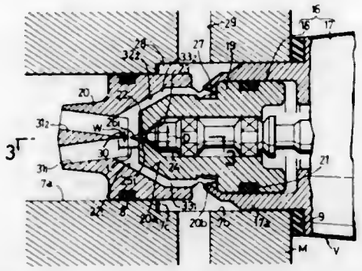
Claims priority, application Japan, Dec. 6, 1993, 5-305380

Int. Cl.[6] F02M *69/04*

U.S. Cl. 239—417.3 **8 Claims**

6. A fuel injection valve comprising:

(a) a valve housing having a valve body, a valve seat on an inner surface of said valve body, a fuel injection hole positioned in



a center of said valve seat, and air supply passages for supplying assist air to fuel injected from said fuel injection hole;

(b) a valve member coaxially aligned with said valve seat, said valve member having a pintle formed on a front end thereof, said pintle being coaxially aligned with said fuel injection hole and positioned therein; and

(c) a valve cap positioned in a front portion of said valve body, in front of said fuel injection hole, said valve cap having a pair of diverging injection holes, said diverging injection holes diverging from each other in a forward direction, and junction means positioned to a rear of said diverging injection holes and in front of said fuel injection hole, said junction means having a narrow flat surface opposed to said fuel injection hole: wherein

(d) a diameter of the fuel injection hole (D), a width of said narrow flat surface of the junction means (W), and a distance (L) from the fuel injection hole to the narrow flat surface of the junction means satisfy the following relationships:

$$0.04<W/D<0.4 \quad \text{(i)}$$

$$0.5<L/D<10 \quad \text{(ii)}.$$

5,556,035

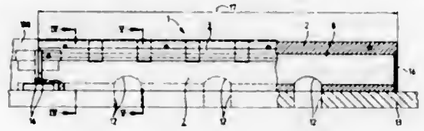
ARRANGEMENT FOR COOLING ROLLED STRIPS

Dieter Daub, Hilchenbach, Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

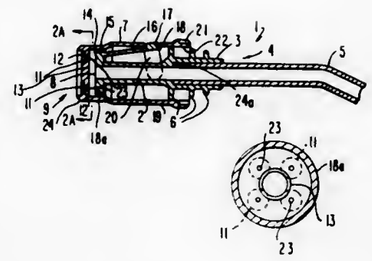
Filed Nov. 1, 1994, Ser. No. 332,998

Claims priority, application Germany, Nov. 2, 1993, 43 37 342.9

Int. Cl.[6] B05B *1/00*

U.S. Cl. 239—455 **5 Claims**

1. An arrangement for cooling rolled strips, particularly for laminar strip cooling during rolling of aluminum strips, the arrangement comprising at least one cooling segment having end faces, the cooling segment having a length, a cover mounted on each of the end faces for closing the cooling segment, the cooling segment defining a media gap for discharging cooling medium with low pressure, the media gap extending over the entire length of the cooling segment, the media gap being configured such that when two or more cooling segments are placed against each other at the end faces thereof, a continuous transition-free media gap extends along the cooling segments, wherein the at least one cooling segment comprises a base member, the covers being mounted flush in the base member without covering the media gap,

the base member having a distribution bore extending along the length of the cooling segment and being in communication with the media gap, the at least one cooling segment further comprising at least one supply connection for supplying cooling medium to the distribution bore, wherein the base member has an opening defining an inclined guide surface, the opening being in communication with the distribution bore, further comprising a sliding wedge mounted on the base member and extending into the opening, the sliding wedge having a guide surface, the guide surface of the opening and the guide surface of the sliding wedge forming the media gap, and wherein the sliding wedge has a nose, the nose extending into the distribution bore.



5,556,036

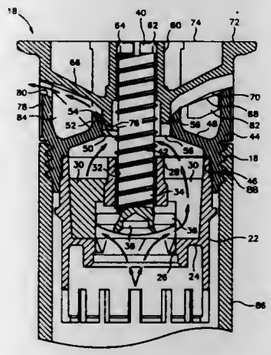
ADJUSTABLE ARC SPINKLER NOZZLE

Thomas G. Chase, San Marcos, Calif., assignor to Hunter Industries Incorporated, San Marcos, Calif.

Filed Oct. 26, 1994, Ser. No. 329,256

Int. Cl.[6] B05B *1/32;1/26*

U.S. Cl. 239—457 **18 Claims**



1. An adjustable arc sprinkler nozzle, comprising:

a first body member having a through passage including an inlet end of a first diameter having means for attachment to a source of pressurized water and an outlet end having a first spiral edge having axially offset ends; and

a second body member mounted coaxially of and rotatable relative to said first body member and having means defining a second spiral edge positioned for selectively overlapping said first spiral edge for defining a selectively adjustable arcuate outlet orifice, said outlet orifice having a predetermined height and an adjustable width; and

means including said first spiral edge and said second spiral edge having a minimum diameter relative to said first diameter for maximizing said predetermined height relative to said width, wherein said minimum diameter of said means including said first and second spiral edges is about one-half said first diameter.

5,556,037

ADJUSTABLE SPRAY HEAD

Noel S. D. Wood, Hunter'a Hill, Australia, assignor to Exell Trading Pty. Limited, Glenorie, Australia

Continuation of Ser. No. 240,654, Oct. 11, 1994, abandoned. This application Dec. 8, 1995, Ser. No. 569,305

Claims priority, application Australia, Nov. 11, 1991, PK9408

Int. Cl.[6] B05B *1/32;1/14*

U.S. Cl. 239—458 **19 Claims**

1. A spray head comprising a tubular body having an inlet and an outlet, a cap rotatably and slidably mounted on said body covering said outlet and having a plurality of spray forming nozzles therein, and a protrusion fixed on said tubular body and resiliently movable in a radial direction relative to said tubular body, said cap having a partial helical slot therein into which said protrusion is receivable, engagement of said protrusion and slot converting rotational movement of said cap into longitudinal movement thereof to adjust the position of said spray forming nozzles relative to said outlet, and said cap being releasable from said tubular body by radial depression of said protrusion and disengagement thereof from said slot.

5,556,038

METHOD FOR PRODUCING ULTRA FINE PARTICLES

Masayoshi Nakamura; Teruaki Ohki, and Shougo Kodama, all of Tokyo, Japan, assignors to Showa Shell Sekiyu K.K., Tokyo, Japan

Filed Sep. 16, 1994, Ser. No. 305,965

Claims priority, application Japan, Sep. 20, 1993, 5-256444

Int. Cl.[6] B02C *23/36*

U.S. Cl. 241—17 **9 Claims**

1. A method for producing ultra fine particles, said method comprising wet grinding particles with a media agitation mill, wherein ceramic particles having an average particle diameter of about 300 μm or smaller are used as grinding media in the media agitation mill, wherein said method comprises wet grinding particles with a media agitation mill for 415 seconds or less.

5,556,039

CRUSHING MACHINE APPARATUS AND A METHOD FOR CLEANING THE CRUSHING MACHINE APPARATUS

Masaaki Minamimura; Haruo Okada, and Kikuo Sakurada, all of Nagano, Japan, assignors to Nissei Plastic Industrial Co., Ltd., Nagano, Japan

Filed Oct. 28, 1994, Ser. No. 331,096

Int. Cl.[6] B02C *4/08;23/24*

U.S. Cl. 241—18 **19 Claims**

12. A method of cleaning a crushing machine, which includes a casing and at least one crushing blade rotatably disposed in said casing to crush scrap into crushed material, comprising the steps of:

turning said at least one crushing blade in a first direction while jetting compressed air through first jetting holes, wherein said first jetting holes are connected to a first compressed air passageway formed in a rotary shaft of said at least one crushing blade and wherein said first jetting holes are opened in the outer periphery of said at least one crushing blade to jet said compressed air radially outward from said at least one crushing blade; and

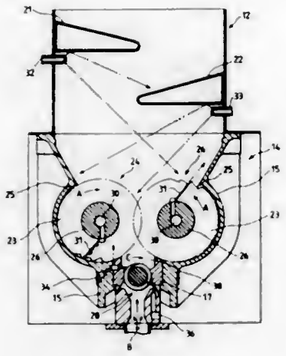
removing said crushed material, which is crushed by said at least one crushing blade, out of said crushing machine through a discharging outlet of a collector which discharges said crushed material.

5,556,043

ANGLED-RIB BLOCKING SLAB FOR PULPWOOD GRINDER

5,556,045

PROCESS FOR PRODUCING TAPERED WINDINGS OF THREAD WITH SPOOL SPEED CONTROL

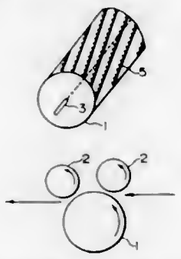


5,556,040

METHOD AND APPARATUS FOR IMPROVING DISPERSIBILITY OF VEGETABLE FIBER

Shoichiro Irie; Motonobu Abe, and Norihito Akiyama, all of Yokohama, Japan, assignors to ASK Corporation, and Sanshin Thermal Insulation Co., Ltd., both of Yokohama, Japan

Filed Jan. 19, 1994, Ser. No. 183,290
Claims priority, application Japan, May 21, 1993, 5-120113
Int. Cl.[6] B02C *4/08;4/28*
U.S. Cl. 241—24.29 14 Claims



1. A method of improving dispersibility of vegetable fiber, the method comprising the steps of: unraveling entwined fibers in a body of vegetable fibers by passing the body of vegetable fibers including the entwined fibers, which are obtained by opening up a vegetable material, through at least one set of rolls in the absence of a continuous water phase to improve dispersibility of the vegetable fibers, said at least one set of rolls comprising at least two spaced rolls having a multiplicity of protruding members; and

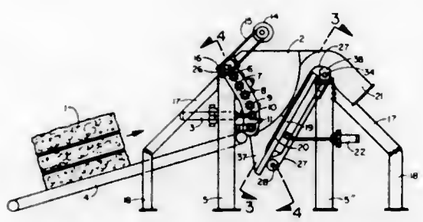
rotating the at least two spaced rolls in said at least one set in the same direction with relative movement between each other at a periphery to apply shear forces to the body of fibers, such that the shear forces are applied between oppositely moving surfaces to unravel the entwined fibers.

5,556,041

APPARATUS AND METHOD FOR DEBALING BALES

Donald C. Cheesman, and Mark W. Spencer, both of 993 Lake Country Ct., Oconomowoc, Wis. 53066

Filed May 23, 1995, Ser. No. 477,716
Int. Cl.[6] B02C *19/12;23/08*
U.S. Cl. 241—24.14 7 Claims



7. A method of debaling bales, wherein the improvement comprises;

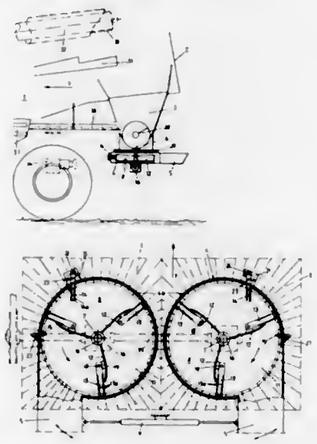
a picker cartridge having a plurality of picker wheels mounted on a shaft and a plurality of picker shafts and said picker wheels in said picker cartridge and said picker shafts with said picker wheels revolving at 30 to 500 rpm contact bales to be debaled and debaled material including wire binding scrap flowing onto upward revolving endless belt over an inclined magnet bank and said wire binding scrap conveyed upward and over the upper end of said inclined magnet bank and debaled material free of said wire binding scrap collected at the bottom end of said inclined magnet bank.

5,556,042

COMBINE CHOPPER ATTACHMENT WITH PIVOTAL BROADCAST DISCHARGE CHUTE

Alfons Roberg, Hersewinkel, Germany, assignor to Claas oHG Beschrankt haftende offene Handelsgesellschaft, Harsewinkel, Germany

Filed Aug. 24, 1995, Ser. No. 519,024
Claims priority, application Germany, Sep. 7, 1994, 44 31 802.2
Int. Cl.[6] B02C *18/08;21/02*
U.S. Cl. 241—101.76 12 Claims



1. A chopper attachment, to be attached to a combine for chopping straw or chaff material, the combine having an outlet hood, the chopper attachment comprising:

at least one delivery funnel which can be fixed in place on the outlet hood of the combine;

a cup-shaped rotor housing disposed under the delivery funnel;

an ejection chute connected with the rotor housing;

wherein the cup-shaped rotor housing is disposed underneath the delivery funnel and is capable of being pivoted back and forth around a vertical pivot axis (**6**) on a shaft (**7**);

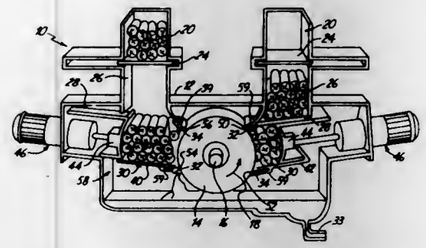
a chopping and ejection unit (**8**) disposed in the cup-shaped rotor housing (**4**), which in use rotates around the shaft (**7**) extended coaxially with the vertical pivot axis (**6**) and chops the material and ejects it at the same time.

5,556,043

ANGLED-RIB BLOCKING SLAB FOR PULPWOOD GRINDER

James H. Bittinger, Jr., Duluth, Minn., assignor to Lake Superior Paper Industries, Duluth, Minn.

Filed Feb. 6, 1995, Ser. No. 383,918
Int. Cl.[6] B02C *4/28*
U.S. Cl. 241—282 18 Claims



1. A pulpwood grinder having: a frame; a grindstone for rotation in a direction of travel; and a blocking slab, the blocking slab comprising:

a first rib extending the length of the grindstone and having a convex leading side with an apex;

wherein the rib is affixable to the frame proximate the grindstone such that the leading side and the apex are arranged opposing the direction of travel; and

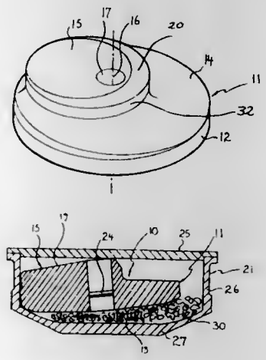
wherein the rib includes a trailing side opposite the leading side.

5,556,044

PULVERISING DISC

Barry R. Hobson, Bassendean, Australia, assignor to East Bank Holdings Pty Ltd., Western Australia, Australia

Filed Feb. 8, 1995, Ser. No. 385,598
Claims priority, application Australia, Feb. 8, 1994, PM3742; Jul. 4, 1994, PM6620
Int. Cl.[6] B02C *15/00*
U.S. Cl. 241—296 13 Claims



1. A pulverizing disc comprising:

a main body of generally cylindrical shape; and,

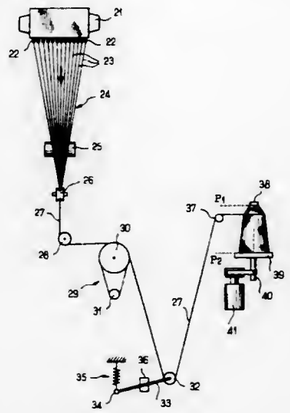
a second body supported on an upper surface of said main body in a manner so that said first body and said second body are fixed relative to each other when said pulverizing disc moves, said second body being disposed eccentrically of said main body.

5,556,045

PROCESS FOR PRODUCING TAPERED WINDINGS OF THREAD WITH SPOOL SPEED CONTROL

Timothy Johnson, Vimines; Patrick Moireau, Curienne, both of France, and Gunther Mager, Stolberg, Germany, assignors to Vetrotex France, S.A., Chambery, France

Filed Apr. 7, 1994, Ser. No. 224,531
Claims priority, application France, Apr. 8, 1993, 93 04166
Int. Cl.[6] B65H *54/02;54/28*
U.S. Cl. 242—18 G 15 Claims



1. Process for producing a tapered glass winding, comprising the steps of:

continuously mechanically drawing a multiplicity of strings of molten glass from orifices of a spinneret;

coating the glass filaments with a size;

gathering the sized filaments into a thread;

using a drawing device over which the thread passes to make uniform the drawing speed of the thread at the drawing device;

winding the thread having a uniform drawing speed on a rotating support via a reciprocating thread guide;

rotatably driving said support using motor having a motor controller;

controlling the speed and length of reciprocating stroke of said thread guide;

using a dancing roller to measure a difference between said drawing speed and a winding speed of said thread on the support; and

controlling the motor controller such that the rotational speed of said support is controlled in response to said measured difference, wherein said rotational speed of said support progressively decreases with each successive layer wound on the support and progressively varies between two values during winding of each layer.

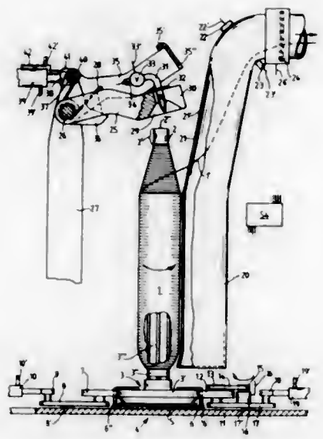
5,556,046

APPARATUS FOR PREPOSITIONING A YARN END ON SPINNING COPS FOR SUBSEQUENT UNWINDING IN A BOBBIN WINDING MACHINE

Wolfgang Irmen, Mönchengladbach, and Helmut Kohlen, Erkelenz, both of Germany, assignors to W. Schlafhorst AG & Co., Moenchengladbach, Germany

Filed Jul. 6, 1995, Ser. No. 498,998
Claims priority, application Germany, Jul. 12, 1994, 44 24 462.2
Int. Cl.[6] B65H *54/00;69/04*
U.S. Cl. 242—18 R 12 Claims

1. An apparatus for prepositioning a yarn end on a tubular spinning cop in preparation for subsequent unwinding in a bobbin



winding machine, comprising a drive for rotating the cop about its longitudinal axis at a cop preparation station, a suction nozzle stationarily disposed at the cop preparation station for aspirating and holding the yarn end, the nozzle having a yarn receiving slit extending lengthwise of the cop to a terminal end of the slit axially beyond a nose portion of the cop, a cutting device for cutting the yarn end to length, a yarn guide means for delivering a first portion of the yarn end to the nose portion of the cop for placing nose windings of the yarn thereabout, the yarn guide means being movable relative to the cop at the cop preparation station between an inactive position spaced axially from the nose portion of the cop and an active position generally alongside the nose portion of the cop, means for inserting a remaining portion of the yarn end into a tubular interior of the spinning cop, yarn retaining means selectively movable into and out of contact with the nose portion of the cop and having an opening for delivery of the yarn end therethrough to the nose portion of the cop, and means for controlling movement of the yarn guide means into the active position during placement of nose windings about the nose portion of the cop and the inactive position after placement of the nose windings and for controlling activation of the yarn inserting means and movement of the yarn retaining means out of contact with the nose portion of the cop after movement of the yarn guide means into the inactive position.

5,556,047

MOTOR OPERATED FISHING REEL

Kazuya Nanbu, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Continuation of Ser. No. 96,415, Jul. 26, 1993, Pat. No. 5,397,071. This application Sep. 30, 1994, Ser. No. 314,276

Int. Cl.[6] A01K *89/017*

U.S. Cl. 242—250 **8 Claims**

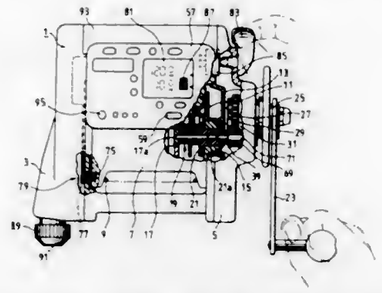
1. A motor-operated fishing reel comprising:

a reel body having first and second side plates laterally spaced apart from each other, said first and second side plates defining first and second side surfaces, respectively, said side surfaces being oppositely positioned with respect to said reel body;

a spool rotatably supported on said reel body and located between said first and second side plates, said spool rotating about a spool axis extending from said first side plate to said second side plate;

a motor for driving said spool to rotate at a predetermined rotational speed;

transmission means for transmitting rotation from the motor to said spool;



a manual handle rotatably supported on said first side plate for manually driving said spool to rotate, said manual handle projecting from said first side surface; and

a motor regulator for varying said predetermined rotational speed, said regulator having a manipulation lever pivotally supported on said first side plate for selectively varying said predetermined rotational speed, said motor regulator is located at an upper front portion of said first side plate with respect to said spool axis, wherein said motor regulator is substantially disposed along said first side surface.

5,556,048

BACKLASH PREVENTIVE DEVICE FOR USE IN A DUAL BEARING TYPE REEL FOR FISHING

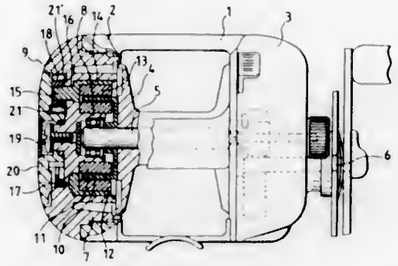
Hiroshi Hashimoto, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Filed Sep. 8, 1994, Ser. No. 302,425

Claims priority, application Japan, Sep. 14, 1993, 5-054383 U

Int. Cl.[6] A01K *89/02*

U.S. Cl. 242—288 **8 Claims**



1. A backlash preventive device in combination with a dual bearing type fishing reel having a spool supported rotatably between two side plates of a reel main body and a through-hole formed through one of said side plates for permitting replacement of said spool from said main body, said device comprising:

a conductor rotatable in linking with said spool; and

a unit body removably fitted into said through-hole, and including:

a bearing portion for supporting one end of a spool shaft of said spool;

a spool brake device for generating an eddy current in cooperation with said conductor;

an adjust body for adjusting an amount of generation of said eddy current, said adjust body being rotatably supported on said unit body substantially coaxially with respect to said bearing portion; and

a gear disposed between said adjust body and said spool brake.

5,556,049

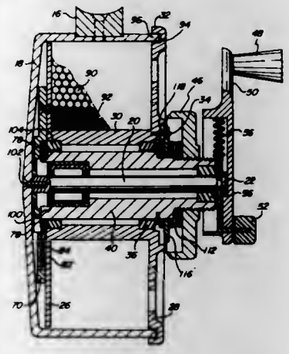
ANTI-REVERSE FISHING REEL WITH DRAG CONTROL AND REPLACEABLE SPOOL

M. Dickson Bennett, Norwalk, and Glenn Holcomb, Newtown, both of Conn., assignors to Dickson Product Development, Inc., Norwalk, Conn.

Filed Jun. 7, 1994, Ser. No. 255,063

Int. Cl.[6] A01K *89/016;89/033*

U.S. Cl. 242—295 **20 Claims**



1. A fishing reel comprising:

a housing having an arbor extending therefrom;

a crank assembly having a crank arm with a shaft extending therefrom, said shaft having a hollow core adapted to be rotatably and detachably mounted on said arbor via a latch mounted to said crank arm for releasably engaging a terminal end of said arbor; and

a spool adapted to be rotatably and detachably mounted on said shaft, said spool including a hub for bolding fishing line;

wherein said latch releasably secures said shaft to said arbor and thereby releasably secures said spool on said shaft within said housing.

5,556,050

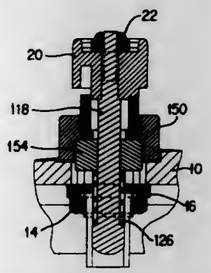
VARIABLE CLICK MECHANISM FOR LEVER DRAG REEL

Eric K. Baisch, and Leroy G. Blimegger, both of Philadelphia, Pa., assignors to Penn Fishing Tackle Manufacturing Co., Philadelphia, Pa.

Filed Mar. 7, 1994, Ser. No. 207,409

Int. Cl.[6] A01K *89/033*

U.S. Cl. 242—296 **14 Claims**



1. In a reel, having sides embracing a spool and a click mechanism mounted through one of said sides to exert a drag on said spool when it is rotated, an improved click means for providing independent adjustment to vary the drag created by said click mechanism against said reel and vary the resulting noise created by said click mechanism, comprising:

a. a hollow, generally cylindrical bushing having axially extending slots therein, retaining a spring and a tongue in sliding engagement for intermittently engaging detents in a ratchet which rotates with said spool; said bushing, tongue and spring being in engagement with one another so that said click mechanism makes said noise and provides said drag on said spool in response to the force exerted by said spring on said tongue when said spool is rotated;

b. means engaged with and coacting with said spring, tongue and bushing for moving said tongue between a first position wherein said tongue does not engage said ratchet and a second position wherein said tongue engages said ratchet; and

c. means for varying the spring force applied by said tongue against said ratchet in said second position, comprising: a manually operable cam means in sliding engagement with said bushing and having cam surfaces thereon; and

cam follower means having a generally cylindrical body portion in sliding engagement within said hollow portion of said bushing, and ear portions extending outwardly in planes parallel to the axis of said cylindrical body portion, said ear portions extending into and being in sliding engagement with said axially extending slots and engaged with said spring and positioned to engage and follow said cam surfaces to force said tongue into engagement with said ratchet depending on the position of said cam followers on said cam surfaces.

5,556,051

TAPE CARTRIDGE HAVING A FRONT LID WITH A COVERING WALL

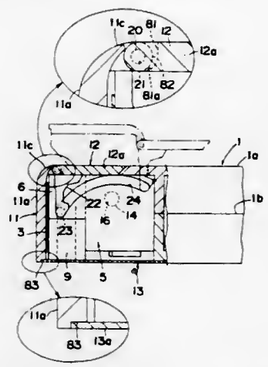
Hikaru Mizutani, Toyonaka; Yoshimi Maehara, Ootsu; Tatsumi Nishijima, Yokohama; Hidekazu Takeda, Fujisawa; Kenji Ogiro, Yokohama, and Nobuyuki Kaku, Kanagawa-ken, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, and Hitachi, Ltd., Tokyo, both of Japan

Division of Ser. No. 111,597, Aug. 25, 1993. This application Apr. 12, 1995, Ser. No. 420,591

Claims priority, application Japan, Aug. 26, 1992, 4-252224; Oct. 16, 1992, 4-304949; Nov. 20, 1992, 4-335222; Nov. 27, 1992, 4-318160; Nov. 30, 1992, 4-345346; Dec. 2, 1992, 4-350341

Int. Cl.[6] G11B *23/04;23/087*

U.S. Cl. 242—347.1 **6 Claims**



1. A tape cartridge which comprises:

a main casing containing a tape, the main casing having an upper wall with an upper surface, including ports for drawing out tape formed on a front portion of the main casing at left and right sides thereof, and a pocket with an upper surface at a rear side for tape loading, the pocket being open at upper and lower sides and front side of the pocket between said ports and formed in a recess at said front portion of the main casing.

a front lid having a front wall pivotally supported for upward movement on said front portion of the main casing by a shaft for selective movement between a closed position and an upward rotated open position for closing and opening, respectively, of said front portion of the main casing,

an upper lid for selectively opening and closing an upper face of the pocket along with the opening and closing, respectively, of the front lid, the upper lid having a main face plate being pivotally connected by way of pins at a forward edge of said main face plate of the upper lid to an upper edge of said front wall of said front lid, said main face plate being spaced above an upper surface of said main casing when said front lid is in the open position, and

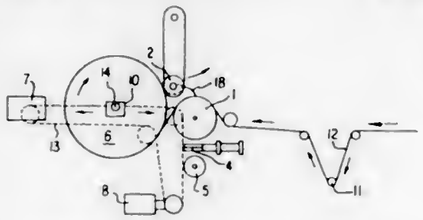
means provided between said main casing and said upper lid for guiding said upper lid so that said main face plate of said upper lid is withdrawn towards a rear portion on said upper surface of said pocket along with said upward opening rotation of said front lid such that said main face plate extends substantially parallel to said upper surface of said main casing throughout a full range of movement of said main face plate, wherein an upward and rearward extending covering wall is integrally formed at said upper edge of said front wall of said front lid for extending over and covering the forward edge of said main face plate of said upper lid when said front lid is in said closed position.

5,556,052

METHOD AND APPARATUS FOR WINDING

Dennis A. Knaus, 315 S. 45th St., Suite 1G, Philadelphia, Pa. 19104

Filed Jul. 23, 1993, Ser. No. 95,177
Int. Cl.[6] B65H *18/16;19/26*
U.S. Cl. 242—412.3 **30 Claims**



1. An apparatus for winding, comprising:

a winding roll for rotatingly accumulating a web of material;

a primary roll, in close proximity to, but spaced apart from, said winding roll, for feeding a web of material onto said winding roll at a speed not less than the surface speed of the exterior surface of said winding roll;

a secondary roll for driving said winding roll, said secondary roll being in rotatable contact with said winding roll; and

a motor for driving said secondary roll;

wherein said motor maintains an essentially constant speed ratio between said primary and secondary rolls.

5,556,053

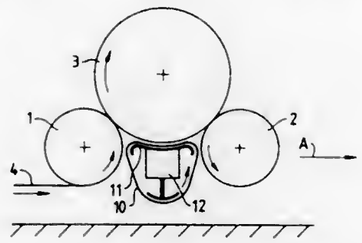
WINDER FOR WINDING A TRAVELING PAPER WEB

Klaus Henseler, Titisee-Neustadt, Germany, assignor to Voith Sulzer Papiermaschinen GmbH, Heidenheim, Germany

Filed May 24, 1995, Ser. No. 449,726
Claims priority, application Germany, May 31, 1994, 44 18 900.1
Int. Cl.[6] B65H *18/20*
U.S. Cl. 242—541.6 **10 Claims**

1. A winder for winding a traveling paper web, comprising:

two king rolls arranged to form a winding bed for supporting a paper roll, the paper roll having a radius and a circumference;



a revolving support belt positioned and configured to loop around the paper roll over part of the circumference of the paper roll, the support belt being arranged between the two king rolls;

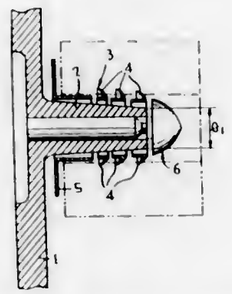
a support element arranged to be forcible on the support belt, the support element including a support surface arranged such that the support belt slides on said support surface during revolution of said support belt, said support surface having a radius, said radius being variable in accordance with the radius of the paper roll.

5,556,054

ANTI-THEFT DISTRIBUTION FOR ROLL MATERIALS

Jean-Louis Neveu, Lery, France; Rudolph W. Schutz, Walnut Creek, and George Lipp, San Francisco, both of Calif., assignors to Kaysersberg, S.A., France

Division of Ser. No. 215,469, Mar. 21, 1994, Pat. No. 5,445,345, which is a division of Ser. No. 828,295, Jan. 30, 1992, Pat. No. 5,323,980. This application May 31, 1995, Ser. No. 455,338
Int. Cl.[6] B65H *16/04;18/04*
U.S. Cl. 242—597.6 **4 Claims**



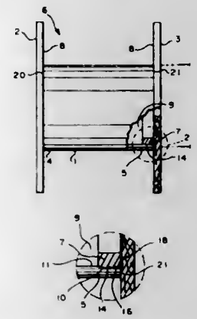
4. Anti-theft dispenser constructed and arranged to receive a core-free roll of material, said dispenser comprising a substantially planar support; a shaft rigidly and perpendicularly affixed to said support at a first end of said shaft; a compressible anti-extraction means which includes a plurality of flexible, compressible rings wherein each of said rings comprises a cylindrical part coaxially rotatably mounted on said shaft and elements disposed circumferentially on said cylindrical part and having respective ends connected to said cylindrical part in a cantilever configuration and wherein said elements have respective free ends pointing towards said support so as to form hook-like members; and positioned on a second end of said shaft, a means structured to retain said compressible anti-extraction means on said shaft while allowing a core-free roll of material to be inserted on the dispenser.

5,556,055

DISPOSABLE DRUM WITH FRICTION FIT COMPONENTS

Ulf Lindstrand, Fengersfors, Sweden, assignor to Ulvator AB, Enkoping, Sweden

Filed Nov. 22, 1993, Ser. No. 155,637
Int. Cl.[6] B65H *75/14;75/18*
U.S. Cl. 242—608.2 **15 Claims**



1. A disposable drum for carrying a coil of an elongated easily coiled object, comprising:

a cylindrical sleeve having first and second end surfaces, an outer surface which is adapted to receive a coil and which has an outer diameter, and an inner surface adjacent said end surfaces and having an inner diameter;

first and second circular end pieces having a diameter significantly greater than said outer diameter, so as to define a volume with said outer surface of said sleeve for maintaining an easily coiled object thereon, each said end piece diameter being at least 500 mm;

attachment means for attaching said end pieces to said sleeve at said end surfaces of said sleeve, said attachment means comprising: first and second cylindrical flanges having a diameter approximately the same as said inner diameter, said first flange concentric and integral with said first circular end piece, and extending axially outwardly from said first circular end piece an axial distance of about 20–50 mm; and said second flange concentric and integral with said second circular end piece, and extending axially outwardly from said second circular end piece an axial distance of about 20–50 mm; and

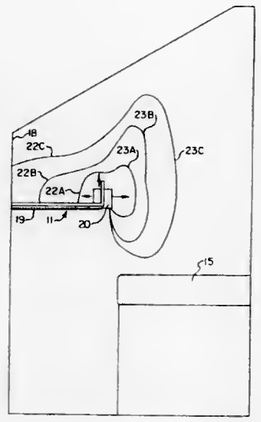
said first cylindrical flange having a friction fit with said inner surface of said cylindrical sleeve adjacent said first end surface, and said second cylindrical flange having a friction fit with said inner surface of said cylindrical sleeve adjacent said second end surface, so that a stable joint is provided between said sleeve and said first and second end pieces at said first and second end surfaces of said sleeve, wherein said flanges have non-threaded outer surfaces which form the friction fit with said inner surface of said sleeve, and further comprising at least one peripheral sharp edged protrusion extending outwardly from said outer surface of each of said flanges, engaging said inner surface of said sleeve.

5,556,056

ADAPTABLE AIRCRAFT AIRBAG PROTECTION APPARATUS AND METHOD

Robert C. Kalberer, Boulder, Colo.; Kevin W. Kreutzer, Vacaville, Calif., and Dan Goor, Colorado Springs, Colo., assignors to Flight Safety Systems, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 54,925, Apr. 28, 1993, Pat. No. 5,335,884, which is a continuation-in-part of Ser. No. 973,798, Nov. 9, 1992, Pat. No. 5,301,902. This application Aug. 8, 1994, Ser. No. 287,386
Int. Cl.[6] B64D *25/00*
U.S. Cl. 244—121 **9 Claims**



1. Apparatus for minimizing the prospect for loss of control of an aircraft that has a control yoke assembly, the control yoke assembly including a generally horizontally extending post that defines an axis, said post extending from a control panel to a hand member that is manually grippable by an individual for linear motion of said post along said axis to control pitch of the aircraft, and for rotary motion of said post about said axis to control roll of the aircraft, comprising:

an airbag assembly including an inflatable airbag mounted relative to said post, said airbag assembly operating to expand so as to substantially fill a space both between said control panel and the individual, and

means mounting said airbag assembly for free movement along a line that extends generally parallel to said axis, while retaining said airbag assembly against movement in any other direction,

whereby said airbag assembly will assume a neutral position along said line parallel to said axis.

5,556,057

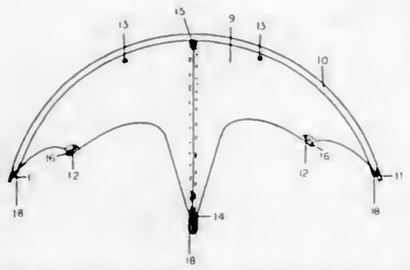
VARIABLE GEOMETRY KITE

David V. Davies, 36 Lawrence Drive, Ickenham, Middlesex UB10 8RW, United Kingdom

Filed Mar. 30, 1995, Ser. No. 413,595
Claims priority, application United Kingdom, Apr. 27, 1993, 9308686; Mar. 14, 1994, 9404893
Int. Cl.[6] B64C *31/06*
U.S. Cl. 244—153 R **21 Claims**

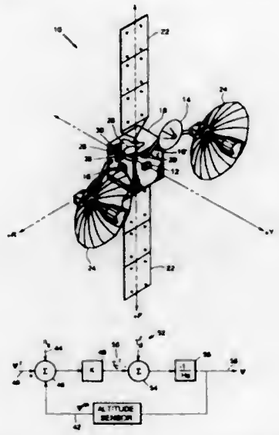
1. A variable geometry kite, which comprises:

a) a frame structure comprised of a flexible material and having a main spar member to form a continuous flexible leading edge for the frame structure, the flexible material arranged and constructed to permit the main spar member to move between a static, non-flight straight position of greatest length and a swept-back, in-flight, curved position in use;



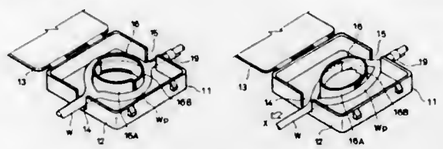
b) left and right spar members, each having a one and other end and respectively attached at the one end to the left and right ends of the main spar member to act as control longerons;
c) semi-rigid joint elements to attach the one end of the respective left and right spar members to the main spar member, the joint elements arranged and constructed to permit pivoted resistive selective movement of the left and right spar members in relation to the main spar member in response to forces occurring in flight and to maintain the left and right spar members at a generally controlled angle to the immediate adjacent section of the main spar member;
d) multiple control line means to include a control line being attached to the left spar member and a control line attached to the right spar member to control and to correlate the movements of the left and right spar members by a kite user; and
e) a sail in a selected sail shape and fitted onto said frame structure.

5,556,058
SPACECRAFT ATTITUDE DETERMINATION USING SUN SENSOR, EARTH SENSOR, AND SPACE-TO-GROUND LINK
Douglas J. Bender, Redondo Beach, Calif., assignor to Hughes Electronics, Los Angeles, Calif.
Filed May 16, 1994, Ser. No. 243,669
Int. Cl.[6] B64G *1/24;1/36*
U.S. Cl. 244—171 **19 Claims**



1. A system for determining a three-axis attitude measurement of a spacecraft, the spacecraft including a spacecraft body having pitch, roll, and yaw axes, means for receiving signals indicative of spacecraft operating conditions, an Earth sensor disposed within the spacecraft body for creating attitude reference signals indicative of a roll-axis attitude and a pitch-axis attitude, and means for generating error signals indicative of an azimuth attitude error and an elevation attitude error with respect to a first target ground station, the generating means being disposed within the spacecraft body, the system comprising:
a sun sensor mounted on the spacecraft body having a predetermined field-of-view and being operative to create sun sensor signals indicative of a pitch-axis attitude and a yaw-axis attitude, while the Sun is within the field-of-view; and
a processor, in communication with the sun sensor, the Earth sensor, and the means for generating error signals, for combining a plurality of signals selected from the group consisting of the attitude reference signals, the sun sensor signals, and the error signals, wherein the plurality of signals is selected based on an associated accuracy of the signals so as to determine a three-axis attitude measurement of the spacecraft while reducing three-axis attitude measurement error.

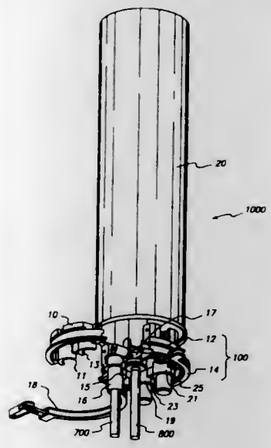
5,556,059
DEVICE FOR GUIDING WIRE HARNESS OF STEERING COLUMN
Yuji Maeda; Seiji Ito, and Chiaki Chida, all of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Jun. 28, 1994, Ser. No. 266,556
Claims priority, application Japan, Jun. 28, 1993, 5-157569; Dec. 15, 1993, 5-315423
Int. Cl.[6] F16L *3/00*
U.S. Cl. 248—49 **22 Claims**



1. A device for guiding a wire harness connected to a steering column, comprising:
a protector for accommodating a part of said wire harness therein to protect said part from an outside hazard, said part being provided with a a reserve part; and
urging means for urging said reserve part to return to an original configuration thereof when said reserve part is expanded, and wherein said urging means are provided inside said protector.

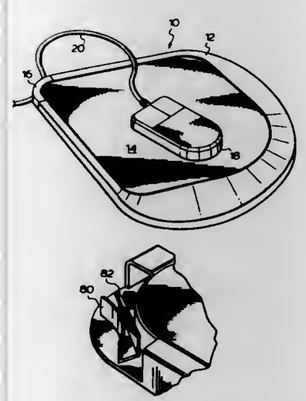
5,556,060
AERIAL PEDESTAL BELOW GRADE OR BURIED OPTICAL FIBER
Gail J. Bingham, Menlo Park; Jeff Haller, San Francisco, and Mathew Steinberg, Santa Clara, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.
Division of Ser. No. 187,585, Jan. 26, 1994, Pat. No. 5,446,823. This application Jun. 1, 1995, Ser. No. 457,420
Int. Cl.[6] F16L *3/00*
U.S. Cl. 248—49 **4 Claims**

1. A hanger member for use with a telecommunications closure positioned for hanging along a load bearing wire strand or tubular member, the hanger comprising:
a hook shaped body member having a curved hook and a wider base away from the curve of the hook;
apertures located in the wider base for affixing to a telecommunications closure;
a tubular member positioned along the base to provide for a grounding point, said tubular member capable of being broken off and removed if no grounding is desired; and
tab members substantially adjacent to an interior curved portion of the hook when one of the tab members can be bent at any angle away from the plane of the hanger to provide a detent in the hanger for grounding and grabbing of a wire strand while



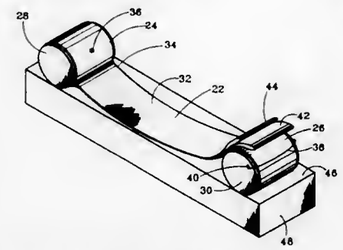
the other tab member when bent away from the base provides a wider radius of curvature for the hook portion to provide locating and grounding of the hanger member to a second larger body.

5,556,061
MOUSE PAD
Robert G. Dickie, Nowmarket, Canada, assignor to Mousepad Innovations Inc., King City, Canada
Filed Sep. 16, 1994, Ser. No. 307,213
Int. Cl.[6] B43L *15/00*
U.S. Cl. 248—51 **16 Claims**



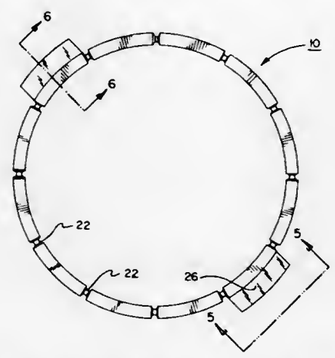
1. A mouse pad apparatus comprising a base supporting a mouse-receiving surface and a cord retainer for retaining a cord of a computer mouse, said cord retainer comprising an open passageway in said base and a cover for releasably covering said open passageway, said open passageway having entry points substantially in the same plane for releasably retaining said cord substantially co-planar with said mouse-receiving surface.

5,556,062
PADDING AND CHOCKING APPARATUS FOR PIPE JOINTS AND/OR PIPE SECTIONS
William A. Ellett, 6010 River Road Cir., Shreveport, La. 71105, and James D. Bialock, P.O. Box 1814, Baytown, Tex. 77522
Filed Oct. 14, 1994, Ser. No. 323,046
Int. Cl.[6] F16L *3/16*
U.S. Cl. 248—55 **20 Claims**



1. A pipe support apparatus comprising:
a length of flexible webbing having a first receptacle formed at one end of said length and a second receptacle formed adjacent an opposite end of said webbing;
a first rigid member received within said first receptacle;
a second rigid member received within said second receptacle; and
a pipe support skid having a top surface in juxtaposition with a bottom surface of said webbing,
wherein each of said first and second rigid members has a beight greater than a thickness of said webbing, said length of webbing forms a pipe receiving surface between said first and second rigid members and said pipe receiving surface is a top surface of said webbing.

5,556,063
TRASH BAG RETAINING BAND
Billy S. Boyd, R.D. #2 Box 290, Brogue, Pa. 17309
Filed Oct. 26, 1994, Ser. No. 329,638
Int. Cl.[6] B65B *67/00*
U.S. Cl. 248—99 **1 Claim**



1. A trash bag retaining band for holding a trash bag in a secured position in a trash can for filling with trash and further preventing over-filling of the trash bag comprising:
an integral ring formed of an elastic polymeric material sufficiently expandable and having a diameter smaller than an outside diameter of the trash can for allowing the standard-sized trash can to be inserted therein and sufficiently retractable for frictionally gripping the inserted standard-sized trash can; the ring having an exterior surface; an interior surface; a

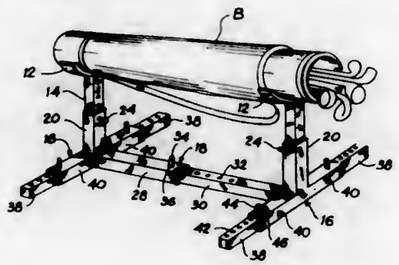
top edge and a bottom edge interconnecting the surfaces; a

5,556,067

wherein each of said front legs is attached to the outer end of

top edge and a bottom edge interconnecting the surfaces; a plurality of equally-spaced annular grooves integrally formed on the ring with each groove positioned essentially perpendicular to the circumferential extent of the ring such that the grooves thereby create an interconnected linkage of upstanding and rectangular tabs, the annular grooves adapted to flatten out when stretched and grip the trash bag when tension is released thereby ensuring more bolding power; and a pair of diametrically positioned integral tabs of the linkage each having a generally rectangular planar horizontal piece extended perpendicularly outwards from a central extent of its exterior surface to thereby create a tri-tab having a generally T-shaped vertical cross-section and with each tri-tab serving as a handle for allowing a user a firm grip for expanding the ring.

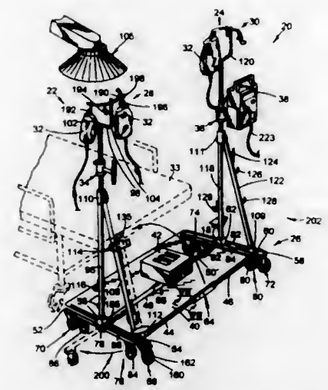
5,556,064
GOLF BAG AND ACCESSORY CRADLE
Alexis M. Cowe, 911 Camino Corrida, Tucson, Ariz. 85737
Filed May 23, 1994, Ser. No. 247,574
Int. Cl.[6] F16M *11/38*
U.S. Cl. 248—172 **12 Claims**



1. A cradle for holding a golf bag in an elevated, substantially horizontal position over a supporting surface, comprising:
(a) a horizontal base consisting of two horizontal transverse members rigidly and transversely connected by a horizontal longitudinal brace therebetween, said transverse members having a flat underside adapted to be in frictional contact with said support surface;
(b) a pair of vertical support members extending from said horizontal base;
(c) a bracket rigidly connected to each of said pair of vertical support members, each said bracket consisting of an upward-rounded channel section disposed in longitudinal alignment with the other bracket and with said horizontal longitudinal brace sized to receive and securely hold in place a cross-section of a golf bag therein; and
(d) a storage compartment releasably attached to said cradle and including means for stowing golf accessories.

5,556,065
INTENSIVE CARE EQUIPMENT CARRIAGE
Robert D. Wadley, 20 S. Sprague, Coldwater, Mich. 49036
Filed Oct. 19, 1994, Ser. No. 326,010
Int. Cl.[6] A47F *7/00*
U.S. Cl. 248—129 **29 Claims**

1. A carriage for an intensive care patient, comprising:
first and second sections, each section including a base, a pole extending upwardly from said base;
at least one equipment carried on at least one of said first and second section poles;
at least one quick-disconnect connector detachably connecting said first and second sections, whereby said first and second

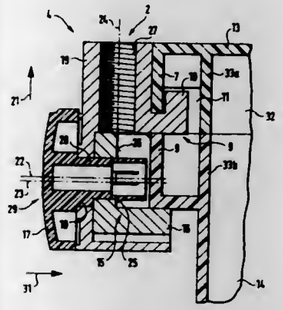


sections are interconnected to form a multiple pole carriage and disconnected to form a plurality of single pole carriages.

5,556,066
INSTALLATION STRUCTURE OF OUTDOOR COMMUNICATION DEVICE
Masayuki Negishi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Oct. 26, 1994, Ser. No. 329,269
Int. Cl.[6] F21V *21/00*
U.S. Cl. 248—218.4 **4 Claims**

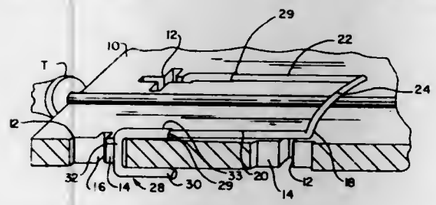
1. An installation structure, comprising:
an outdoor communication device having an antenna on a top portion thereof and having a connector on a bottom portion thereof; and
a mounting pole in a form of a selfsupported pole having a communication device mounting part on a top portion thereof, said mounting pole having a hollow interior area in which wirings that are electrically connected to said communication device mounting part are laid therethrough so as to not be exposed to an exterior area with respect to the mounting pole;
wherein said outdoor communication device is electrically connected with said communication device mounting part when said connector is mounted onto said communication device mounting part, and
wherein said wirings are electrically connected with said connector when said connector is mounted onto said communication device mounting part.

5,556,067
LABORATORY APPARATUS WITH RECEPTACLE FOR A STAND ROD
Hans König, Buggingen-Seefelden; Kai Koch, Ehrenstetten, and Rainer Dietsche, Münstertal, all of Germany, assignors to Janke & Kunkel GmbH & Co. KG, IKA-Labortechnik, Staufen, Germany
Filed Dec. 8, 1994, Ser. No. 352,016
Claims priority, application Germany, Dec. 8, 1993, 43 41 774.4
Int. Cl.[6] A47B *96/06*
U.S. Cl. 248—220.21 **20 Claims**



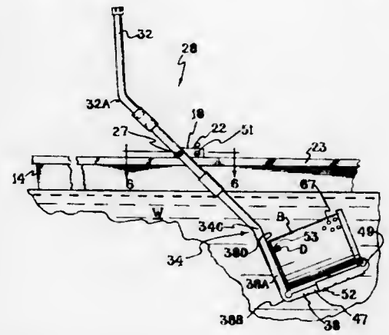
1. A laboratory apparatus comprising a housing (12) having a housing upper part (13) and a housing lower part (14), a guide rail having two guide rail parts (7, 8) spaced from one another and forming between them a guide slot, one of the guide rail parts being joined with the housing upper part (13) and the other guide rail part being joined with the housing lower part (14), a receptacle for a stand rod for affixing accessories to the apparatus, said receptacle (2) being provided on a separate stand-rod bolder (4), and means for fastening said stand-rod holder (4) to the laboratory apparatus in adjustable and position-fixable manners.

5,556,068
PEGBOARD ARTICLE HOLDER
Yakov Gorelik, 270 N. Chesterfield Rd., Columbus, Ohio 43209-1200
Filed Oct. 17, 1994, Ser. No. 325,106
Int. Cl.[6] A47F *5/00*
U.S. Cl. 248—220.41 **6 Claims**



1. An article holding assembly which comprises;
a pegboard having a front surface, a rear surface and a plurality of cruciform openings which extend between said front and rear surface and each defined by a horizontal slot and a vertical slot;
a support bracket having a pair of arms and a central tool engaging element therebetween;
a U-shaped clip end attached to one end of each arm for mounting the support bracket to said pegboard;
wherein each of said U-shaped clip ends has a front leg, a back leg, a lateral leg intermediate said front leg and said back leg, and said front leg is connected to one end of said back leg by a lateral leg;
wherein each of said front legs is attached to the outer end of one of said arms;
wherein each of said back legs extends substantially parallel to said arm adjacent said front leg;
wherein each of said back legs has a length less that of said horizontal and lateral slots such that said back legs are adapted to pass through said horizontal and vertical slots; and
wherein at least one of said back and front legs of said U-shaped clip is resiliently biased toward the other of said back and front legs to tightly clamp said front leg to said front surface of said pegboard and said back leg to said rear surface of said pegboard.

5,556,069
BAIT BUCKET TENDER
James A. Malmberg, S208 Delta College, University Center, Mich. 48710
Filed Dec. 6, 1993, Ser. No. 161,602
Int. Cl.[6] A01K *97/00*
U.S. Cl. 248—291.1 **30 Claims**

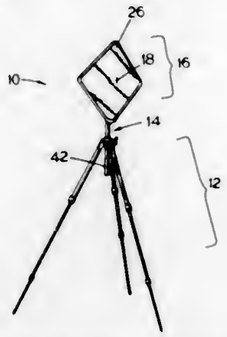


1. Apparatus for mounting a live fish bucket on the hull of a boat which is movable through water in a forward longitudinal path of travel comprising:
a frame bar having a fish bucket mounting portion at one end thereof;
pivot means swingably mounting said frame bar for swinging movement in a to-and-fro path of travel located in a plane generally parallel to the said longitudinal path of travel of said boat; and
means on said frame bar for swinging said frame bar between a fish submerging position, in which at least a portion of fish bucket is submerged in water, and a fish access position, in which said fish bucket is raised alongside said boat to a raised position, to facilitate access to any fish located in said fish bucket;
latch means for detachably holding said frame bar in said fish access position;
said latch means being normally disposed in a latching position in the path of said frame bar and including cam means thereon engageable by said frame bar as said frame bar moves from said fish submerging position to said fish access position to laterally inwardly force said latch means to a laterally inwardly retracted position out of said path.

5,556,070
SIGNAL LIGHT ALIGNMENT DEVICE AND METHOD OF ALIGNING SIGNAL LIGHTS

Garry W. Vlebrock, 1104 Westwood Dr., Jefferson Clty, Mo. 65109

Continuation of Ser. No. 11,782, Aug. 16, 1993, Pat. No. Des. 357,881. This application Apr. 3, 1995, Ser. No. 415,539
Int. Cl.[6] A47F *1/14*
U.S. Cl. 248—469 **10 Claims**

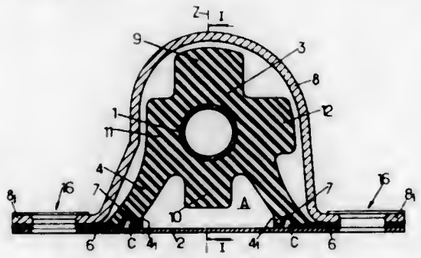


1. A portable signal light alignment device comprising:
a supporting structure, said supporting structure being portable between testing sites and providing for height adjustment and capable of being secured at a given height at each testing site;
a mounting means atop said supporting structure, said mounting means providing vertical angular adjustment and capable of being secured at a given angle; and
a reflective bead having a high efficiency reflective material providing a reflective front surface a rigid center support, and a rear support plate mounting bracket, said high efficiency reflective material having a flat surface area for receiving and reflecting light from a signal light being aligned attached to a front surface of said rigid support plate; said rigid support plate providing structural support for said reflective front surface and said rear surface plate; said mounting bracket attached to said rigid center support plate and attaches said reflective bead to said mounting means.

5,556,071
HYDRAULIC VIBRATION-DAMPING MOUNTS

Alain Bellamy, Naveil; Denis Reh, Chateaudun; André Girard, La Chapelle du Noyer, and Gilles Chenais, Marboue, all of France, assignors to Hutchinson, Paris, France

Filed Aug. 22, 1994, Ser. No. 294,473
Claims priority, application France, Oct. 5, 1993, 93 11848
Int. Cl.[6] F16M *13/00*
U.S. Cl. 248—634 **11 Claims**

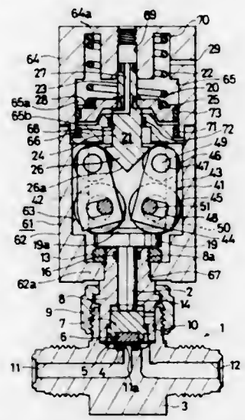


1. A hydraulic vibration-damping mount intended to be interposed between two rigid elements in order to damp out vibrations between these two elements, essentially in a main direction of vibration Z, this mount including a first rigid reinforcing member and a second rigid reinforcing member which can be secured respectively to the two rigid elements to be joined together, an elastomeric body which is molded as a single piece and which includes a thick wall joining the two rigid reinforcing members to one another and partially delimiting a working chamber, this elastomeric body further including a freely deformable thin wall which partially delimits a compensation chamber communicating with the working chamber via a narrow duct, the two chambers and the narrow duct being filled with a liquid, one of the two reinforcing members, hereafter termed second reinforcing member, being a plate extending substantially parallel to an overall plane which is substantially perpendicular to the main direction of vibration Z, said plate exhibiting a support face secured in leaktight fashion to the elastomeric body in order to delimit, together with the elastomeric body, the two chambers and the narrow duct, the thick wall exhibiting a substantially peripheral first edge which is secured to said support face, wherein the thin wall substantially exhibits the shape of a bell including a substantially peripheral second edge which is secured to said support face, said thin wall being substantially completely separated from said thick wall and being connected to the thick wall only by part of said peripheral second edge, and the working chamber and compensation chamber being juxtaposed nonconcentrically on said support face.

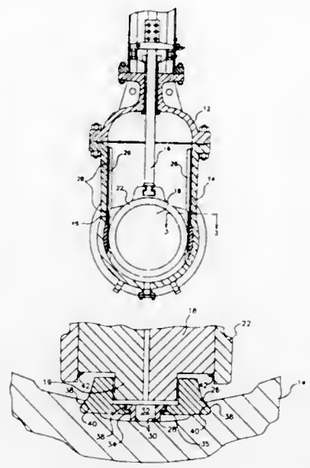
5,556,072
CONTROLLER

Shigeru Itoi, and Kenji Yamamoto, both of Osaka, Japan, assignors to Fujikin Incorporated, Osaka, Japan

Filed Nov. 3, 1994, Ser. No. 334,384
Claims priority, application Japan, Nov. 12, 1993, 5-283327
Int. Cl.[6] F16K *31/12*
U.S. Cl. 251—58 **4 Claims**



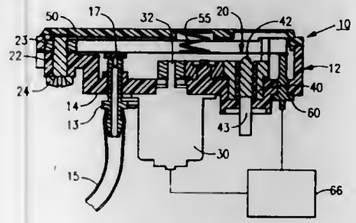
1. A controller comprising a valve body having a valve element and a valve seat defining therebetween a fluid channel openable and closable with reciprocating upward and downward movement of a valve stem, a casing fixed to an upper portion of the valve body, an operating rod provided in an upper inside portion of the casing and movable upward and downward, drive means for moving the operating rod upward and downward, and force transmission means provided in a lower inside portion of the casing for transmitting a force acting on the operating rod to the valve stem, the force transmission means comprising a first roller contact member having a conical surface extending vertically downward from a lower end of the operating rod, a second roller contact member provided at an upper end of the valve stem, a pair of opposed roller support members arranged between the two roller contact members symmetrically with respect to the axis of the first roller contact member, a pair of rollable rollers each being rotatably supported by each of the roller support members at an upper portion thereof and in bearing contact with a conically tapered face of the first roller contact member, and a pair of push rollers each being rotatably supported by a push roller shaft engaging each of the roller support members at a lower portion thereof and being in bearing contact with an upwardly facing roller support surface of the second roller contact member, said push roller shaft being provided at each of its opposite ends with an eccentric pivot integral therewith and received in said roller support members so as to render said roller support members pivotally movable about an axis perpendicular to and laterally spaced from the axis of the first roller contact member.



5,556,073
LINEAR CONTROL VALVE

Thaddeus J. Wawro, Auburn; Alan S. Knieriem, Baldwinsville; Zoran I. Psenicnik, Skaneateles, all of N.Y., and Dale E. Finch, Tampa, Fla., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Feb. 1, 1995, Ser. No. 382,286
Int. Cl.[6] F16K *31/04;1/16;* **A61B** *5/02*
U.S. Cl. 251—129.11 **11 Claims**



1. A linear control valve suitable for providing fluid control which includes valve housing,
a flexible cantilevered beam located within said housing, said beam having one end that is secured against movement, and a free end,
said beam being made of a spring material and arranged to close against the seal means of a fluid port positioned adjacent said secured end when said beam is in a first position, and to fully open said port when said beam is flexed to a second position.
deflecting means acting on said free end of said beam for flexing the beam about said secured end between said first and second positions, and
a motor secured to said housing and connected to said deflecting means for selectively positioning said deflecting means into and out of engagement with said free end to flex and move said beam between said first and second positions thereby controlling fluid flow through said port.

5,556,074
HIGH TEMPERATURE VALVE

Fred R. O'Brien, Long Beach, and Jerry E. Martin, Fullerton, both of Calif., assignors to Pacific Valves, Long Beach, Calif.

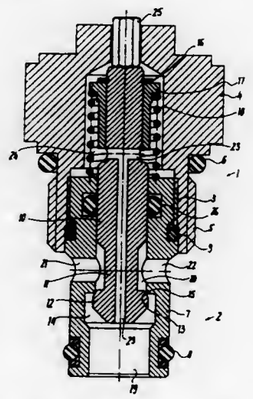
Filed Jul. 3, 1995, Ser. No. 497,822
Int. Cl.[6] F16K *3/316*
U.S. Cl. 251—329 **13 Claims**

1. A valve comprising:
a body having a passage therethrough;
a valve seat connected to the body;
a stop movable with respect to the body and having an open position and a closed position, the stop sealably engaging the valve seat in the closed position;
a guide channel connected to said body and slidably engaging the stop;
a primary means for connecting the guide channel to the body; and
a secondary means for connecting the guide channel to the body.

5,556,075
HIGH PRESSURE VALVE

Günter Weber, Hauptplatz 23, A-2474 Gattendorf, Austria

PCT No. PCT/AT91/00112, § 371 Date Apr. 15, 1993, § 102(e) Date Apr. 15, 1993, PCT Pub. No. WO92/07208, PCT Pub. Date Apr. 30, 1992
PCT Filed Oct. 17, 1991, Ser. No. 39,254
Claims priority, application Austria, Oct. 18, 1990, 2101/90
Int. Cl.[6] F16K *25/00*
U.S. Cl. 251—368 **8 Claims**



1. A pressure compensated high pressure valve, comprising:
means forming a valve housing having an elongate recess therein;
valve seat means positioned within said elongate recess and comprising an annular ridge made of steel;
valve spindle means provided with integral valve head means comprising a substantially conical surface adapted in the closed condition of said valve to engage said annular ridge, said valve spindle means, said valve bead means and said surface being made of aluminum; and

means for moving said conical surface into and out of engage-

hardness (HRS): 90 to 120

5,556,080

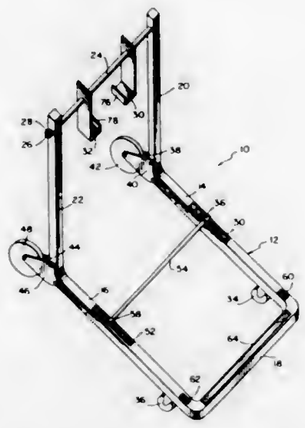
means for moving said conical surface into and out of engagement with said annular ridge.

5,556,076

TOILET LIFTING AND TRANSPORTING DEVICE

Ken Jacquay, Alexandria, Va., assignor to Water Management, Inc., Alexandria, Va.

Filed Apr. 6, 1995, Ser. No. 417,997
Int. Cl.[6] B60P *1/48*
U.S. Cl. 254—8 R **4 Claims**



1. A toilet lifting and transporting device comprising a U-shaped base member comprising first and second parallel side members and a bight member interconnecting a first end of each side member, wheel means mounted on said base frame for supporting said frame in a substantially horizontal position, an inverted U-shaped frame comprising first and second support legs connected to a second end of each side member and extending vertically upwardly at substantially right angles to said base frame, a cross member connected between upper ends of said support members, support means slidably and pivotally mounted on said cross member for engaging a rearwardly extending flange on a toilet upon tilting of said device about said wheel means and lifting said toilet upon return of said device to a position wherein the support frame is vertically disposed and a support member adjustably and detachably mounted on said side members of said base frame for underlying and supporting a forward end of the toilet.

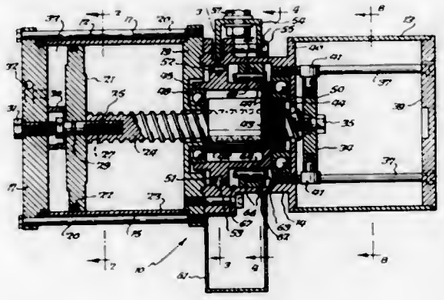
5,556,077

AIR LIFTING AND BALANCING UNIT

Robert O. Braesch; Peter L. Hong, both of Laurens, Iowa; Thomas A. Mefferd, Murrells Inlet, S.C., and Michael D. Olson, Laurens, Iowa, assignors to Columbus McKinnon Corporation, Amherst, N.Y.

Continuation of Ser. No. 165,701, Dec. 10, 1993, Pat. No. 5,439,200. This application Apr. 20, 1995, Ser. No. 425,603
Int. Cl.[6] B66D *1/48;1/10;* **F16D** *31/02*
U.S. Cl. 254—267 **10 Claims**

1. An air lifting and balancing unit comprising a cylinder, a piston in said cylinder, a ball screw affixed to said piston, a ball nut, means mounting said ball nut for rotation on said ball screw, and drum means mounted on said ball nut for moving an elongated member which carries a load.

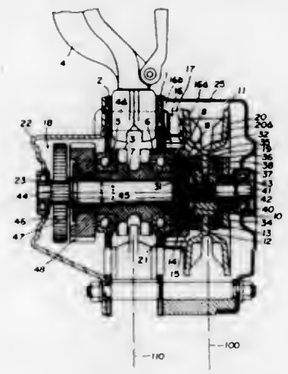


5,556,078

MANUAL HOIST AND TRACTION MACHINE

Haruo Kubota; Yoshio Nishi; Yoshio Ueno; Yasuo Wada, and Munenobu Honda, all of Osaka, Japan, assignors to Elephant Chain Block Company Limited, Osaka, Japan

Filed Dec. 13, 1993, Ser. No. 165,705
Claims priority, application Japan, Dec. 16, 1992, 4-336141; Dec. 3, 1993, 5-304222
Int. Cl.[6] B66D *1/14;5/02;* **F16D** *55/02;* **B60T** *11/10*
U.S. Cl. 254—368 **10 Claims**



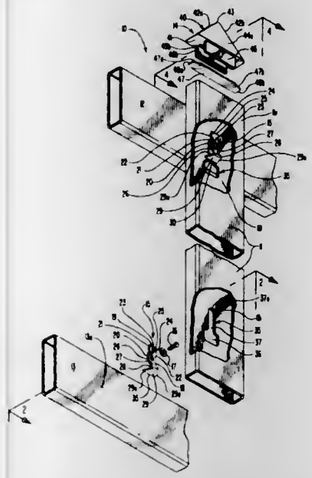
1. A manual hoist and traction machine comprising:
first and second side plates;
a load sheave supported between said first and second side plates by first and second bearings;
a driving shaft for driving said load sheave;
a driven member coupled with said driving shaft and having a friction surface;
a driving member threadedly mounted to said driving shaft and having a friction surface opposite to the friction surface of said driven member; and
a mechanical brake provided between said driven member and said driving member and comprising a braking ratchet wheel having friction surfaces at both axial sides; a braking pawl engageable with said braking ratchet wheel at an outer periphery thereof; first and second lining plates interposed between the friction surfaces of said driven member and braking ratchet wheel and between the friction surfaces of said braking ratchet wheel and driving member, respectively, wherein said lining plates comprise heat resistant fiber, a friction regulating agent and bonding agent which are mixed in the following ratio:
heat resistant fiber: 28 to 35 (V %)
friction regulating agent: 20 to 37 (V %)
bonding agent: 35 to 45 (V %)
and have the following resulting characteristics:
hardness (HRS): 90 to 120
bending strength (Kgf/mm^2): 9 to 15
maximum strain (10^{-3} mm/mm): 12 to 16
compressive strength (Kgf/mm^2): 15 to 20
coefficient of friction (200° C.): 0.25 to 0.60.

5,556,079

FENCING SYSTEM WITH MOUNTING CLIPS

Ronald R. West, 545 E. 200 N., Provo, Utah 84606

Filed May 1, 1995, Ser. No. 432,936
Int. Cl.[6] E04H *17/14*
U.S. Cl. 256—22 **5 Claims**



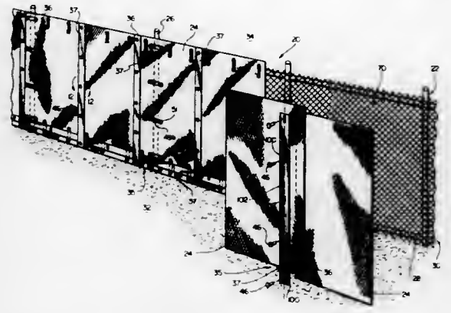
1. A fencing system that provides for constructing a picket type fence by joining cross member ends onto upright posts and parallel spaced pickets onto at least a pair of cross members comprising, a first fence member formed from a section of a plastic tube material for receiving at least one mounting clip fitted thereto, and a second fence member formed from a section of a plastic tube that includes at least one keyhole opening, formed on a wall of said section of the plastic tube, said keyhole opening consists of a narrow rectangular upper section and a wider lower section; and said mounting clip formed from a section of a stiff material to have a uniform thickness and includes a narrow flat rectangular shaped center portion that receives a fastener fitted therethrough for coupling to said first fence member and includes a top portion having approximately the same width as said center portion and is bent across said center portion at a first bend upwardly and, spaced therefrom, is bent thereacross downwardly at a second bend such that said top portion is essentially parallel to said center portion with the distance between said first and second bends being approximately equal to the thickness of said wall of said section of the plastic tube and said mounting clip further including a bottom portion to fit through said keyhole opening wider lower section, and which said mounting clip bottom portion terminates in an edge that has a greater length than the width of said keyhole opening narrow rectangular upper section, and said mounting clip bottom portion is bent upwardly at a first bend across a lower end of said mounting clip center portion, and spaced apart from said bottom portion first bend, is bent downwardly at a second bend across a midsection of said bottom portion whereby said mounting clip bottom portion edge approximately aligns with an undersurface of said mounting clip center portion.

5,556,080

FENCE SYSTEM

Larry L. Vise, Birmingham, Ala., assignor to Alabama Metal Industries Corporation, Birmingham, Ala.

Continuation-in-part of Ser. No. 58,577, May 6, 1993, Pat. No. 5,421,557. This application Mar. 21, 1995, Ser. No. 407,616
Int. Cl.[6] E04H *17/16*
U.S. Cl. 256—24 **20 Claims**



1. A fence system comprising:
a support structure;
a plurality of foraminous panels attached to said support structure, each of said foraminous panels having a plurality of open cells therein;
a barrier being defined by said plurality of said panels attached to said support structure, said barrier defining an attack side and a secure side;
a fastener having a shank and a head formed on one end of said shank;
a retaining portion attachable to said shank for securing said fastener to said panel;
neighboring panels of said plurality of panels having overlapping portions defining an overlapping area, said neighboring panels being oriented for aligning a plurality of corresponding cells in said overlapping area; and
at least one elongated reinforcing member having a plurality of apertures therein positioned over said overlapping area on said attack side of said barrier with corresponding ones of said fasteners extending through said apertures in said reinforcing member and through said neighboring foraminous panels in said overlapping area, said fasteners extending through said apertures in said reinforcing member for securing said reinforcing member to said attack side of said barrier, said reinforcing member strengthening said overlapping area and providing additional deterrence to prevent a breach of said barrier.

5,556,081

SUSPENSION ARM MADE OF FIBER REINFORCED PLASTIC AND MANUFACTURING METHOD THEREOF

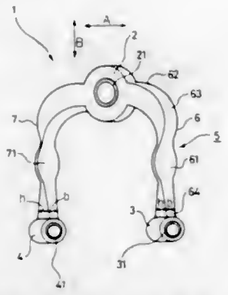
Morimichi Miura, Gamagouri, and Tadao Oota, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi-ken, Japan

Filed Jul. 28, 1994, Ser. No. 281,519
Claims priority, application Japan, Aug. 6, 1993, 5-196251
Int. Cl.[6] B60G *7/00*
U.S. Cl. 267—47 **7 Claims**

1. A suspension arm provided between a body and a wheel of a vehicle, the suspension arm comprising:
a wheel-side connecting member connected to a portion of the wheel;
at least one vehicle-side connecting member connected to a portion of the vehicle body; and

a bottom piece fixed at a lower end of the inner tube and forming a compression-side communication passage capable

said plurality of adaptors includes an annular spacer having a pair of concentric integral rings, each ring being of a different



at least one an arm member corresponding to the at least one vehicle-side connecting member and extending between said wheel-side connecting member and said vehicle-side connecting member,

wherein a width of a center of said arm member is smaller than that of other portions of said arm member that are adjacent the at least one vehicle-side connecting member and the wheel-side connecting member, said width being measured in a longitudinal direction of the vehicle, and a thickness of the center of said arm member is greater than other portions of said arm member that are adjacent the at least one vehicle-side connecting member and the wheel-side connecting member, said thickness being measured in a vertical direction of said vehicle.

5,556,082

CUSHION UNIT

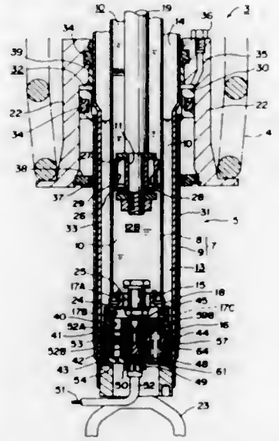
Hideki Takasaki, Saitama, Japan, assignor to Showa Corporation, Gyoda, Japan

Filed Nov. 9, 1994, Ser. No. 336,545

Claims priority, application Japan, Dec. 7, 1993, 5-339875; Dec. 7, 1993, 5-339876

Int. Cl.[6] B60G *13/00*

U.S. Cl. 267—218 **5 Claims**



1. A cushion unit having an hydraulic shock absorber disposed along a vertical axis, said shock absorber constructed of a cylinder with an inner tube and an outer tube, the inner tube filled with a hydraulic fluid and retaining a piston therein which is slidably disposed along the axis to define an upper and a lower piston pressure chamber, the inner and outer tubes defining therebetween a reserve chamber which is filled with a gas and the same hydraulic fluid,

a bottom piece fixed at a lower end of the inner tube and forming a compression-side communication passage capable of allowing the hydraulic fluid to flow from the lower piston pressure chamber into the reserve chamber and an extension-side communication passage capable of allowing the hydraulic fluid to flow from the reserve chamber into the lower piston pressure chamber,

the piston having a piston rod with an outer periphery extending therefrom with a rod spring bracket disposed on said outer periphery of the piston rod,

a cylinder spring bracket disposed on an outer periphery of the outer tube and a suspension spring capable of producing a reaction force when acted upon, the suspension spring interposed between the rod spring bracket and the cylinder spring bracket, the cushion unit further comprising:

a spring bracket pressure chamber interposed between said cylinder spring bracket and said outer tube, said spring bracket pressure chamber formed such that the cylinder spring bracket can be slid in the axial direction of the cylinder by pressure of the hydraulic fluid acting thereagainst;

a housing integrally connected to said bottom piece and fixed at a lower end of the outer tube, the housing provided with a flow passage which connects the compression-side communication passage of the bottom piece to the reserve chamber, and flow passages which connect the compression-side communication passage of the bottom piece to the spring bracket pressure chamber, as well as a flow passage connecting the spring bracket pressure chamber to the reserve chamber;

open/close valves disposed in the flow passage connecting the compression-side communication passage of the bottom piece to the reserve chamber and in the flow passage connecting the spring bracket pressure chamber to the reserve chamber, said open/close valves operable in one of an open and a closed position in response to an open/close external demand thereupon;

a check valve disposed in one of the flow passages connecting the compression-side communication passage to the spring bracket pressure chamber, said check valve capable of allowing the hydraulic fluid to flow from the compression-side communication passage into the spring bracket pressure chamber; and

wherein the hydraulic fluid flows through the compression-side communication passage of the bottom piece via the check valve and into the spring bracket pressure chamber when the open/close valves close the flow passage which connects the compression-side communication passage of the bottom piece to the reserve chamber in response to a close external demand, said flow into the spring bracket pressure chamber increasing the reaction force of the suspension spring so as to raise a height of the vehicle body, and when the open/close valves open the flow passage connecting the spring bracket pressure chamber to the reserve chamber in response to an open external demand, the hydraulic fluid in the spring bracket pressure chamber is returned to the reserve chamber, thereby decreasing the reactive force of the suspension spring so as to lower said height of the vehicle body.

5,556,083

TORSION BAR WITH VARIABLE SPRING CONSTANT

Kenichi Furihata, and Atsushi Takahashi, both of Fujisawa, Japan, assignors to Isuzu Motors Limited, Tokyo, Japan

Filed Apr. 4, 1995, Ser. No. 416,274

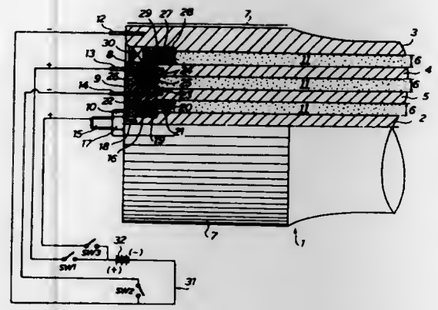
Claims priority, application Japan, Apr. 4, 1994, 6-065993

Int. Cl.[6] F16F *1/14*

U.S. Cl. 267—277 **10 Claims**

1. A torsion bar with a variable spring constant comprising:

a plurality of hollow torsion-bar members having different diameters and arranged coaxially;



electrorheological fluid loaded in a clearance between each two adjacent hollow torsion-bar members and capable of increasing its viscosity upon application of a predetermined voltage to hold a desired pair of said adjacent torsion-bar members together as a unit; and

electric terminals installed at one end of each hollow torsion-bar member to apply voltage to said electrorheological fluid.

5,556,084

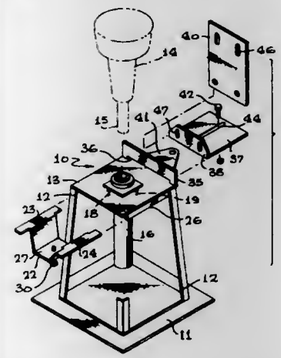
UNIVERSAL TRANSMISSION STAND

Douglas Hodges, 672 W. 12th St., San Pedro, Calif. 90731

Filed Feb. 22, 1995, Ser. No. 392,198

Int. Cl.[6] B66F *3/00*

U.S. Cl. 269—60 **3 Claims**



1. A universal transmission support stand comprising:

a base;

a support plate having edge marginal regions and a central opening;

elongated posts connecting said base with said support plate whereby said support is elevated over said base in fixed spaced relationship therewith;

a plurality of adaptors;

a selected one of said adaptors detachably carried on said support plate and seated in said central opening so as to accept load forces for distribution via said support plate to said base;

said plurality of adaptors includes an annular spacer having a pair of concentric integral rings, each ring being of a different diameter and with a common coextensive bore.

5,556,085

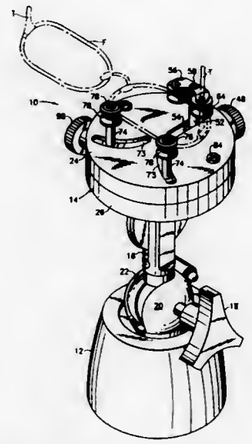
WORK HOLDER FOR EYEGLASSES

Adelard N. Cyr, 16 Dunrobin La., Watertown, Conn. 06795

Filed Jul. 21, 1995, Ser. No. 505,460

Int. Cl.[6] B25B *1/00*

U.S. Cl. 269—75 **6 Claims**



1. A work holder for eyeglasses comprising:

a. a support base,

b. a clamping head swivelly mounted on the support base, the head comprising:

1) a housing,

2) a first adjustable jaw assembly comprising a first adjustment screw extending laterally into the housing, a first shuttle in the housing and a first clamping jaw extending outward from the shuttle, the screw threadedly received into an opening in the shuttle and held by the housing against axial movement with respect to the housing, the first clamping jaw having spaced first concave holding surfaces thereon,

3) a second adjustable jaw assembly comprising a pair of arms in the housing, each pivoted at one end in the housing and extending generally away from the first adjustable jaw assembly, the distal ends of the arms carrying a second clamping jaw extending outward from the head comprising spaced second concave holding surfaces, a pair of second shuttles pivoted to the arms respectively intermediate the pivots and distal ends, a second adjustment screw extending laterally into the housing, the second adjustment screw being held by the housing against axial movement, the second adjustment screw having thread portions of opposite sense, the portions being threadedly received into openings in the second shuttles respectively,

whereby turning the second adjustment screw in one direction moves the second concave holding surfaces toward each other and toward the first concave holding surfaces, and turning the first adjustment screw in one direction moves the first concave holding surfaces toward the second concave holding surfaces, such movement adapted to have the holding surfaces engage and clampingly support a framed lens of a pair of eyeglasses.

5,556,086

goal is connected to the backboard which is connected to the

5,556,086

METHOD FOR ASSEMBLING A POSTAL ITEM AS WELL AS A SYSTEM AND AN ALIGNING STATION FOR CARRYING OUT THIS METHOD

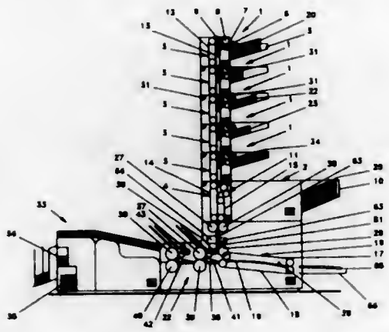
Christiaan A. Munneke, Surhuisterveen, and Jelchienus A. van der Werff, Montfoort, both of Netherlands, assignors to Hadewe B.V., Drachten, Netherlands

Filed Feb. 18, 1993, Ser. No. 19,431

Claims priority, application Netherlands, Feb. 18, 1992, 9200294

Int. Cl.[6] **B42C** *1/00;* **B65H** *7/02*

U.S. Cl. 270—46 **42 Claims**



1. A method for assembling a postal item using a system comprising a first delivery station, at least one next delivery station, a scanner, and a folding station, in which

documents of mutually different lengths are delivered by said delivery stations,

at least some of the documents are individually passed and scanned by a scanner at a location downstream of the delivery stations,

said delivered and scanned documents are transported and are gathered into a stack and moved relative to each other until the document edges on one side of the documents are substantially in alignment, wherein the gathering and aligning of delivered documents, at least partly, occurs downstream of said delivery stations and upstream of said folding station,

which stack is supplied to the folding station in a direction transverse to said aligned edges.

5,556,087

APPARATUS FOR PROCESSING PRINTED PRODUCTS

Reinhard Gösslinghoff, Wetzikon, Switzerland, assignor to Ferag AG, Switzerland

Filed May 26, 1995, Ser. No. 451,193

Claims priority, application Switzerland, May 31, 1994, 01692/94

Int. Cl.[6] **B65H** *39/045;39/105*

U.S. Cl. 270—58.18 **12 Claims**

1. An apparatus for processing printed products, comprising:

receiving compartments that are driven in rotation along a continuous movement path, said receiving compartments arranged one behind the other;

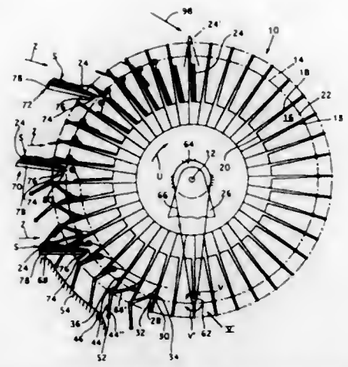
wall elements extending transverse to the direction of rotation of said receiving compartments, said receiving compartments being delimitted by said wall elements;

each receiving compartment including an opening located on the outside with respect to the continuous movement path and through which printed products can be inserted into the receiving compartments;

a belt conveyor for feeding printed products, said belt conveyor including a discharge end that said openings of the rotating receiving compartments are adapted to move past such that a printed product can be fed from the discharge end, through the opening into a receiving compartment with its leading edge first;

a conveying-roller pair provided adjacent said opening of each receiving compartment, said conveying-roller pair forms a conveying gap said conveying-roller pair including a driven roller; and

said conveying-roller pair, when moving past said discharge end of the belt conveyor, receiving between its rollers one fed printed product and clamping said printed product in said conveying gap and then conveying the firmly clamped printed product into the receiving compartment.



5,556,088

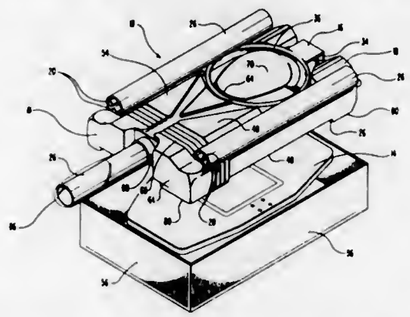
APPARATUS AND METHOD FOR PACKAGING A BASKETBALL GOAL SYSTEM WITH WEIGHT-FILLABLE BASE

Barry D. Mower, Layton, and Lonny R. Matherne, Plain City, both of Utah, assignors to Lifetime Products, Inc., Clearfield, Utah

Continuation-in-part of Ser. No. 97,678, Jul. 27, 1993, Pat. No. 5,377,976, which is a continuation-in-part of Ser. No. 13,611, Feb. 4, 1993, Pat. No. 5,248,140. This application Dec. 29, 1994, Ser. No. 366,226

Int. Cl.[6] **A63B** *63/08;* **F16M** *13/00*

U.S. Cl. 273—1.5 R **19 Claims**



1. A basketball packaging and shipping assemblage for disposition within an outer relatively flat container and capable of assembly with a backboard and a pole into a basketball system, the packaging and shipping assemblage comprising:

a basketball goal for connection to the backboard;

a hollow ballast-receiving base capable of assembly with said basketball goal and with the backboard and the pole to form the basketball system wherein said base supports the pole in a stationary, substantially upward position and said basketball goal is connected to the backboard which is connected to the pole so that said basketball goal is suspended at an elevation above said base, said base having an exterior contour for receiving and retaining said basketball goal within the container and impeding shifting movement of said basketball goal within the container during shipping, the exterior contour of said base comprising a goal recess for receiving and retaining said basketball goal within the container.

5,556,089

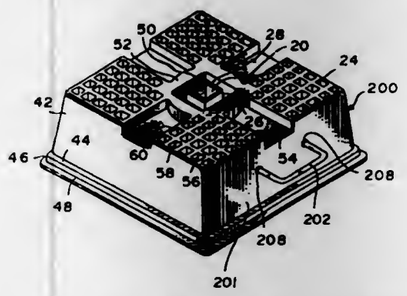
SAFETY BASE WITH ANCHOR, METHODS OF USING AND MAKING, AND ASSOCIATED TOOL

Roger E. Hall, 134 N. Spruce, Elizabethtown, Pa. 17022

Division of Ser. No. 940,752, Sep. 8, 1992, Pat. No. 5,415,394, which is a continuation of Ser. No. 669,088, Mar. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 595,577, Oct. 11, 1990, abandoned, which is a division of Ser. No. 442,465, Nov. 30, 1989, Pat. No. 4,979,710, which is a continuation of Ser. No. 194,276, May 16, 1988, abandoned, which is a continuation of Ser. No. 647,534, Sep. 5, 1984, Pat. No. 4,744,561, which is a continuation-in-part of Ser. No. 472,241, Mar. 4, 1983, Pat. No. 4,531,733, which is a continuation-in-part of Ser. No. 395,279, Jul. 6, 1982, Pat. No. 4,398,715, which is a continuation of Ser. No. 234,618, Feb. 17, 1981, abandoned, which is a division of Ser. No. 18,844, Mar. 8, 1979, Pat. No. 4,266,768, which is a continuation-in-part of Ser. No. 758,638, Jan. 12, 1977, abandoned. This application May 15, 1995, Ser. No. 441,634

Int. Cl.[6] **A63B** *71/00*

U.S. Cl. 273—25 **4 Claims**



1. A ground anchor for an athletic base system adapted to receive a support post therein through a top surface thereof, said ground anchor comprising:

a ground anchor housing having a tube extending therein for receiving a support post, and a substantially horizontal upper wall extending outwardly from said tube and at least one side wall defining a substantially hollow interior surrounding said tube adapted to be filled with hardenable material, said ground anchor housing having means for receiving a handle means located in said at least one side wall;

at least one handle means securely retained by said ground anchor housing through said receiving means, said handle means having a gripping surface spaced apart from and extending substantially parallel to said side wall.

5,556,090

KIT FOR BASEBALL FIELD

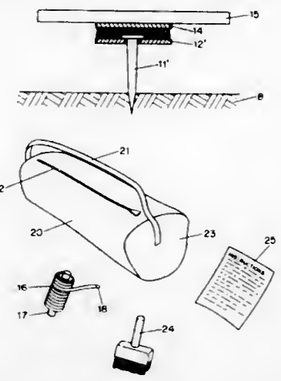
Jeffrey Coleman, 15 W. 84th St., New York, N.Y. 10024

Filed Sep. 6, 1995, Ser. No. 524,222

Int. Cl.[6] **A63B** *71/00*

U.S. Cl. 273—25 **14 Claims**

1. A kit for use in bringing into existence a regulation size baseball field comprising:



(a) 3 regulation size bases having Velcro patches fixedly attached to a flat surface of each of said basis;

(b) 1 regulation size home plate having a Velcro patch fixedly attached to a flat surface thereof;

(c) 1 regulation size pitcher's plate having a Velcro patch fixedly attached to a flat surface thereof;

(d) 5 Velcro patches;

(e) 5 metal stakes;

(f) 1 measuring tape provided with marks along the length thereof at 60 feet 6", 90 feet and 127 feet 3⅛"; and

(g) a bag for containing (a)–(f).

5,556,091

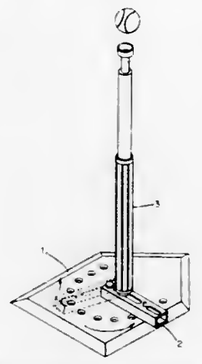
BASEBALL HOLDER FOR BASEBALL BATTING PRACTICE

Mike Lin, No. 32, Lane 395, Shui Yuan Road, Nan Tsun Li, Fen Yuan City, Taiwan

Filed Jun. 14, 1995, Ser. No. 490,254

Int. Cl.[6] **A63B** *69/40*

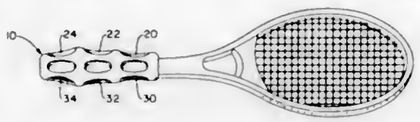
U.S. Cl. 273—26 R **1 Claim**



1. A baseball holder comprising a home plate, an upright support for supporting a baseball for batting, and a mount fastened to said home plate to hold said upright support in place, wherein said home plate has a pivot bolt at the center and a plurality of locating holes spaced around said pivot bolt; said mount is made of a hollow, flat, elongated block turned about said pivot bolt, having two elongated mounting slots longitudinally aligned at a top side thereof for mounting said upright support and a spring-supported locating bolt inserted into one locating hole on said home plate; said upright support has a bottom end terminating in a headed coupling rod inserted in one longitudinal mounting slot on said

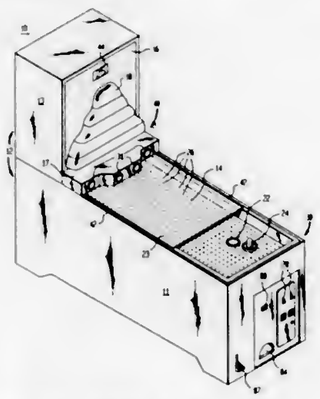
mount and moved therein and then firmly secured to said mount by friction through a rotary motion.

5,556,092
ERGONOMIC HANDLE
Randall R. Theken, 1115 Robinson Ave., Barberton, Ohio 44203
Filed Oct. 24, 1994, Ser. No. 328,027
Int. Cl.[6] A63B *49/00*; **B25G** *1/00*
U.S. Cl. 273—75 **12 Claims**



1. A handle grip having a longitudinal axis, extending between an instrument end and a butt end, the grip comprising a first concentric gripping ridge, and a second concentric gripping ridge, the area between the instrument-end of the handle and the first concentric gripping ridge defining a first gripping valley, the area between the second concentric gripping ridge and the first concentric gripping ridge defining a second gripping valley, said first gripping valley and said second griping valley each including flattened grip areas which comprise ovals with the longitudinal axis in the direction of the longitudinal axis of the handle grip and wherein there are about 4 to about 8 ovals about the circumference of each valley, and the area between the butt-end of the instrument and the second gripping ridge defining a gripping sloped area, the diameter of the first gripping ridge exceeding the diameter of the first gripping valley, the diameter of the second gripping ridge exceeding the diameter of the first gripping ridge and the butt-end of the instrument forming a smooth, generally rounded profile.

5,556,093
ONE PLAYER AIR CUSHION TABLE GAME WITH IMPROVED PUCK CAPTURE MECHANISM
Jeffrey R. Lankiewicz; Robert C. Schneider, both of Toms River, and Gary J. Warner, Kendall Park, all of N.J., assignors to Coin Concepts, Inc., East Brunswick, N.J.
Filed Mar. 22, 1995, Ser. No. 408,227
Int. Cl.[6] A63B *71/04*
U.S. Cl. 273—126 A **20 Claims**



1. A table game apparatus including a low friction playing surface having a player end, two sides and a goal end opposite said player end, target means proximate said goal end, a slidable projectile for sliding on said playing surface, and a striker for hitting said slidable projectile and driving it from said player to said goal end, the improvement comprising:

barrier means for deflecting said slid able projectile back to said player during play of said game when said barrier means is in a first position and for permitting said slidable projectile to pass under said barrier means at the end of said game when said barrier means is in a second position, said barrier means comprising an inflexible boom having a substantially straight, vertical face and a resilient bumper strip attached to said vertical face of said boom;

a hinge means for connecting said barrier means to said apparatus;

barrier drive means for driving said barrier means between said first and second positions;

a crank means connected to said barrier drive means;

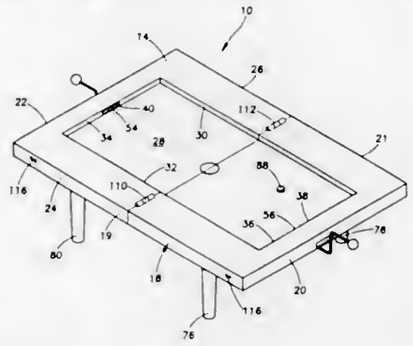
a link means connected between said crank means and said barrier means;

a bin located behind said goal end for collecting said puck when said barrier drive means in said second position;

a chute means for delivering said puck from said bin to the player; and,

electronic controller means for controlling said barrier drive means.

5,556,094
HOCKEY-TYPE GAME
Hari R. Shiledar Baxi, 8 Churchill Sq., Schenectady, N.Y. 12309
Filed Jun. 26, 1995, Ser. No. 494,034
Int. Cl.[6] A63F *7/06*
U.S. Cl. 273—108.5 **7 Claims**



1. A hockey game comprising:

a) a planar rectangular frame; a top surface on the planar rectangular frame; a bottom surface on the planar rectangular frame;

b) the frame comprising:
opposed outer minor walls connected to the top and bottom surfaces; and
opposed outer major walls connected to the top and bottom surfaces;

c) a playing area defined in the frame comprising:
opposed major side walls ; and
opposed minor side walls connected to the opposed major side walls;

d) a goal member disposed on each of the minor sides walls comprising:
an first aperture disposed in the center of each minor side wall;
an second aperture disposed in the center of outer minor wall; and

a passage communicating between the first aperture and the second aperture;

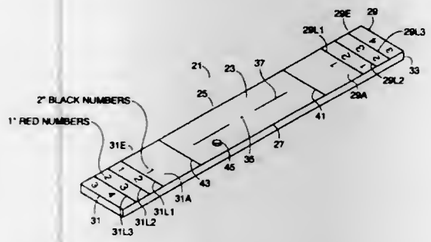
e) a goal tending member disposed proximate each goal member comprising:
a slot disposed proximate each of the first apertures, the slot communicating with the bottom surface of the planar rectangular frame;
a bent wire member comprising:
a first vertical portion of the bent wire member slidably engaging each slot;
a first horizontal portion of the bent wire, the first horizontal portion extending beyond the nearest of the opposed outer minor walls of the frame;
a second vertical portion of the bent wire member; and
a second horizontal member of the bent wire member;
an upstanding block member fixedly attached to an end of the first vertical portion;
a gripping member fixedly attached to an end of the second horizontal member; and
whereby the bent wire may be selectively positioned within the slot;

f) a plurality of support legs;

g) a movable playing piece disposed within the playing area; and

h) a plurality of sticks for striking the movable playing piece.

5,556,095
SHUFFLE BOARD GAME BOARD WITH A HANDICAP SCORING SYSTEM
Kelye Stites, 7100 Burns St., Richland Hills, Tex. 76118
Filed Sep. 21, 1995, Ser. No. 531,630
Int. Cl.[6] A63B *67/14*
U.S. Cl. 273—126 R **6 Claims**



1. A game board comprising:

an elongated rectangular board having a length and a width with two opposite elongated side edges and first and second opposite end edges which are transverse to said side edges,

said board having a midpoint located between said first and second end edges,

a first area located at said first end between said first end edge and a first position spaced between said midpoint and said first end edge,

a second area located at said second end between said second end edge and a second position spaced between said midpoint and said second end edge,

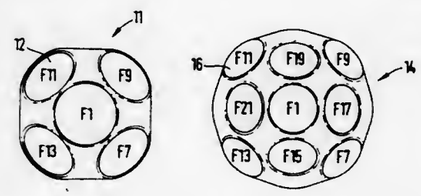
a first series of spaced apart number symbols being at least the numbers 1, 2, 3, 4 formed on said top side between said first position and said first end edge with each succeeding number of said first series from said first position being located closer to said first end edge, and having a greater magnitude than the preceding number,

a second series of spaced apart number symbol being at least the numbers 1, 2, 3, 4 formed on said top side between said second position and said second end edge, with each succeeding number of said second series from said second position to said second end edge being located closer to said second end edge and having a greater magnitude than the preceding number,

a third series of spaced apart number symbols being at least the number 1, 2, 3 formed on said top side between said first position and said first end edge and spaced laterally from said first series with each succeeding number of said third series being located closer to said first end edge and having a greater magnitude than the preceding number,

a fourth series of spaced apart number symbols being at least the numbers 1, 2, 3 formed on said top side between said second position and said second end edge and spaced laterally from said second series with each succeeding number of said fourth series being located closer to said second end edge and having a greater magnitude than the preceding number.

5,556,096
DICE
Alfred A. C. Eardley, 20A Mayfield Avenue, Orpington, Kent BR6 0AL, United Kingdom; Darryl Eardley, 139 Allcrest Rd., Bromley, Kent, and Blake Eardley, 23 Blackhorse Rd., Sidcup, Kent, both of United Kingdom
Continuation-in-part of Ser. No. 768,705, Oct. 18, 1991, abandoned. This application Mar. 28, 1994, Ser. No. 219,019
Int. Cl.[6] A63F *9/04*
U.S. Cl. 273—146 **5 Claims**



1. A die comprising a center and a plurality of faces arranged in opposed pairs on opposite sides of said center, said faces being substantially identical and substantially equally spaced from the center of the die, each of said faces including a center point substantially lying on an axis passing through the center of the die, said axes being substantially symmetrically spaced one from the other relative to the center of the die, wherein said plurality of faces comprises fourteen substantially circular faces defining seven equilength axes, said axes having bearings and elevations relative to a reference axis substantially as follows:

AXIS	BEARING (°)	ELEVATION (°)
A1	*	90.00
A2	0.00	0.00
A3	90.00	0.00
A4	45.00	$\sin^{-1}(1/3)^{1/2}$
A5	135.00	$\sin^{-1}(1/3)^{1/2}$
A6	225.00	$\sin^{-1}(1/3)^{1/2}$
A7	315.00	$\sin^{-1}(1/3)^{1/2}$

(*the bearing of this axis may be assigned any value between 0°and 360°).

5,556,097

HOLLOW CLUB HEAD WITH WELDED HOSEL

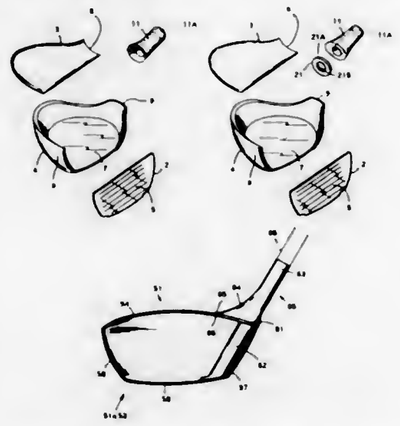
Eimatsu Endo, and Kenji Kobayashi, both of Tsubame, Japan, assignors to Kabushiki Kaisha Endo Seisakusho, Japan

Division of Ser. No. 245,874, May 19, 1994, abandoned. This application Dec. 28, 1994, Ser. No. 359,418

Claims priority, application Japan, May 31, 1993, 5-129620; May 19, 1993, 5-117328; Dec. 28, 1993, 5-334330; Feb. 18, 1994, 6-21399; Feb. 22, 1994, 6-24319; Feb. 28, 1994, 6-30240; Mar. 7, 1994, 6-35844; Apr. 5, 1994, 6-67365; Apr. 6, 1994, 6-68786

Int. Cl.[6] A63B *53/04*

U.S. Cl. 473—309 **5 Claims**



1. A golf club comprising a shaft, a metallic and hollow head body, and a hosel member combined with a heel side of the head body for connecting said shaft thereto, said golf club head integrally formed from a plurality of metallic crusts including a face crust, an upper crust, a side-peripheral crust and a sole crust,

said upper crust formed with an arc-shaped cutting on one side;

the hosel member having a truncated cone-like configuration tapered radially outwardly toward a lower end defining a peripheral side wall along its outer periphery, said peripheral side wall smoothly connected to the arc-shaped cutting by abutting against a side edge thereof, having a thickness equal to the upper crust and forming a part thereof, said hosel member being formed thicker at its lower end, as compared to its upper end, for joining an upper side of the head body thereto; and

a lower end of the shaft being provided evenly relative to the lower end of the hosel member, or otherwise, protrudes slightly downward relative to the same.

5,556,098

THREE-PIECE SOLID GOLF BALL

Hiroshi Higuchi; Hisashi Yamagishi, both of Yokohama; Yoshinori Egashira, Hidaka, and Tadatoshi Yamada, Mitaka, all of Japan, assignors to Bridgestone Sports Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1994, Ser. No. 271,983

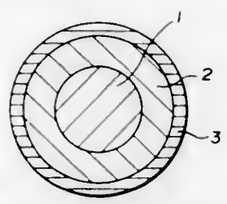
Claims priority, application Japan, Jul. 8, 1993, 5-193064

Int. Cl.[6] A63B *37/06*

U.S. Cl. 473—373 **9 Claims**

1. A three-piece solid golf ball comprising; a center core, an intermediate layer, and a cover enclosing the core through the intermediate layer,

said center core formed of a polybutadiene base rubber and having a diameter of at least 26 mm, a specific gravity of less than 1.4, and a hardness up to 80 on JIS C scale,



said intermediate layer formed of a thermoplastic polyester elastomer and having a thickness of at least 1 mm, a specific gravity of less than 1.2, and a hardness of less than 80 on JIS C scale, and

said cover having a thickness of 1 to 3 mm, and a hardness of at least 85 on JIS C scale.

5,556,099

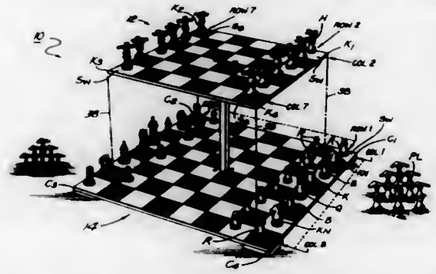
THREE DIMENSIONAL CHESS GAME

Roubik Mardirosian, 1133 N. Cedar St., Glendale, Calif. 91207

Filed Mar. 6, 1995, Ser. No. 399,189

Int. Cl.[6] A63F *3/02*

U.S. Cl. 273—241 **16 Claims**



1. A method of playing a three-dimensional board game, said game having multiple tiers and playing pieces positionable on said multiple tiers, said playing pieces having roles defining advancing and capturing capabilities, said method comprising the steps of:

providing a plurality of role-static pieces, each of said role-static pieces having one role and remaining in said one role for the duration of said game;

providing a plurality of role-altering pieces, each of said role-altering pieces being capable of altering between a first role and a second role, said first and second roles defining different advancing or capturing capabilities, said role-altering pieces being configured to provide a base member and a removable member, said members when separated designating said role-altering pieces being in said first role and when joined designating said role-altering pieces being in said second role;

altering between said first and second roles of said role-altering pieces when said role-altering pieces move between said tiers, said step of altering comprising a step of separating or joining said members.

5,556,100

GAME OF THE IMMUNE SYSTEM

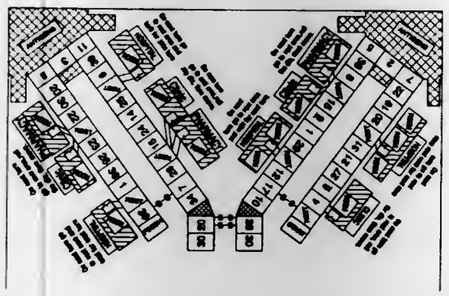
Mark F. Taylor, and Sally W. Jackson, both of Waco, Tex., assignors to Baylor University, Waco, Tex.

Filed May 31, 1995, Ser. No. 455,644

Int. Cl.[6] A63F *3/00*

U.S. Cl. 273—249 **16 Claims**

1. A board game apparatus for teaching the immune system to players of the game comprising:



a playing board having a continuous main course divided into a sequence of playing spaces, a first portion of said playing spaces having numbers in a random order with a single said number printed in each space, a second portion of the spaces being rest spaces with each rest space associated with a health facility, a start space and a finish space;

a chance device actuable by a player to determine the number of said playing spaces to be moved by the player;

a plurality of distinctive tokens constituting playing pieces, a separate one of said playing pieces to be utilized by a separate one of the players playing in the game;

a disease handout comprising a list of diseases and allergies that involve the immune system, with descriptions of the diseases and allergies and the types of immune response mounted against the diseases if so applicable;

a plurality of cards, each corresponding to a helper T cell with a specific receptor shape that can interlock with a separate bacterial or viral pathogen associated with a disorder listed in said handout; and

a set of numbered immune scenarios, each said scenario having a number corresponding to the number of a separate said playing space and relating its corresponding said playing space to a specific disease or allergy in said handout.

5,556,101

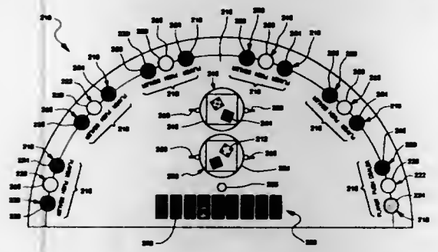
DICE BETTING GAME AND METHOD FOR PLAYING

Sarmad S. Jabro, 5424 High Court Way, West Bloomfield, Mich. 48323

Filed May 30, 1995, Ser. No. 452,972

Int. Cl.[6] A63F *9/04*

U.S. Cl. 273—274 **11 Claims**



1. A betting game employing a first pair of dice or their equivalent for producing a random first set of numbers S1 including:

a playing surface;

at least one player station including a first betting zone and a second betting zone;

said first betting zone including an indicia marked on said playing surface representing a second numerical set S2 corresponding to the total of the first pair of dice;

said second betting zone including an indicia marked on said playing surface representing a third numerical set S3 mutually exclusive of said second numerical set S2 and corresponding to the total of the first pair of dice; and characterized by:

a dealer station including a first dice spinner for spinning the first pair of dice; and

at least one of said player stations including a second dice spinner whereby said second dice spinner spins a second pair of dice or their equivalent for producing a random fourth set of numbers S4.

5,556,102

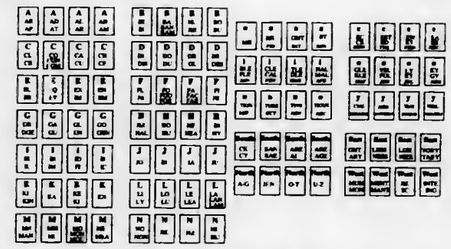
APPARATUS AND METHOD OF PLAYING A WORD COMPOSITION GAME WHERE COMPASS DIRECTION ASSIGNED TO EACH PLAYER AND THE TIME WHEN THE GAME IS PLAYED AFFECTS GAME PLAY

Pingsheng Huang, 20 Alpine Rd., Towaco, N.J. 07082

Filed Jan. 30, 1995, Ser. No. 380,818

Int. Cl.[6] A63F *1/00*; **G09B** *19/22*

U.S. Cl. 273—299 **5 Claims**



1. A playing apparatus for composing words by at least two players, at a playing time, each being assigned an unique direction defined by a compass, the playing apparatus comprising a set of playing pieces, each having a first surface and a second surface, said first surface of each of said playing pieces having a plurality of wording groups, each of said wording groups comprising a plurality of letters, at least one of the wording groups, being identified as an indicative wording for distinction of said playing pieces, comprising a word from a basic group comprising alphabetic letters and combination of at least two of the alphabetic letters, a vowel group comprising a plurality of letters and indicia identifying different periods of time during a calendar year and a space group comprising directional wordings defined by the compass, said playing pieces with the indicative wording from the vowel group and the space group being given a substitution power to substitute missing letters in composing words when the indicative wording matches the playing time and the unique direction assigned to each of the players, respectively, whereby each of the players has an equal chance to the time sensitive playing pieces and advantageous directional playing pieces over others, said second surfaces of said playing pieces having a substantially identical graphics with an inherent orientation therein for undistinction of said playing pieces when said second surfaces of said playing pieces are displayed.

5,556,103

STRUCTURE OF DARTBOARDS

Miguel A. Quetglas Ariño, Pol. Ind. "Can Magi" c/Joan Buscalla, Nave 1 A E-08190 Sant Cugat (Barcelona), Spain

Filed Jun. 6, 1995, Ser. No. 467,879

Claims priority, application Spain, Jun. 21, 1994, P9401397; Jul. 13, 1994, P9401600

Int. Cl.[6] F41J *3/00;3/02*

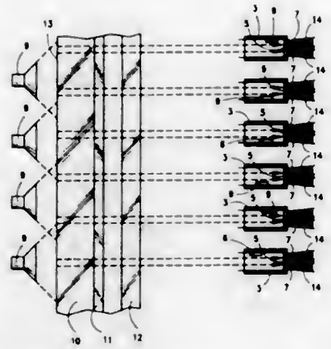
U.S. Cl. 273—371 **3 Claims**

1. Improvements in the structure of a dartboard of the type in which a playing area of the dartboard comprises a plurality of sector divisions with front walls having a plurality of evenly

a frame attached to said rigid planar structure and comprising at

5,556,107

COMPUTER GAME APPARATUS FOR PROVIDING



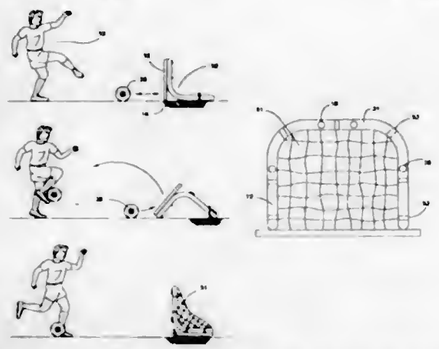
distributed holes provided by a plurality of individual rearwardly displaceable sector boxes each with a front wall with a plurality of through holes comprising a portion of said evenly distributed holes, each of said boxes having a rearwardly opening internal chamber and a rear edge thereabout, and rearwardly extending projections on said rear edge, said playing area, rearward of said boxes, having a body comprising a board with a printed circuit, a resilient, shock-absorbing pad and a common rear support, an electrical connection being established by rearward movement of said projections on the rear edge of each sector box; wherein inside each sector division and in distinct regions defined thereby are lights of different colors indicative of different value receiving areas, the lights being controlled by an electric circuit connected to a logic board of the dartboard which, before the start of the game, brings about simultaneous lighting of the lights as an aiming point, said lights protecting illumination visible through the holes in the front wall of each sector box, the illumination disappearing immediately before the throwing of the dart in play, and, once in play, single colored lights, corresponding to the sector boxes struck by darts illuminating and being visible forward of the dartboard through the holes in the front walls of the struck sector boxes.

5,556,104

SOCCER PRACTICE DEVICE

Jose E. Guillen, Jr., 8211 Holiday, Houston, Tex. 77075

Filed Apr. 12, 1995, Ser. No. 421,372
Int. Cl.[6] A63B *63/00*
U.S. Cl. 273—396 **8 Claims**



1. A practice device for use in practicing a sport, said device comprising:

a rigid planar structure, said structure having at least one exposed substantially unobstructed surface against which a resilient ball may be deflected;

a frame attached to said rigid planar structure and comprising at least one member which may be positioned such that it is substantially perpendicular to said rigid planar structure;

netting material fastened to said frame such that a goal is formed when said rigid planar structure is fastened face-down to a playing surface; and

fixturing means wherein said practice device may be fixtured to said playing surface.

5,556,105

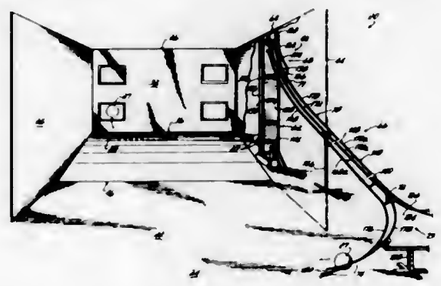
Patent Not Issued For This Number

5,556,106

SOCCER TRAINING DEVICE AND METHOD OF TRAINING

Gregory D. Jurcisin, 114 Cleveland Ave., Milford, Ohio 45150

Filed Jun. 14, 1995, Ser. No. 490,226
Int. Cl.[6] A63B *69/00*
U.S. Cl. 273—411 **30 Claims**



1. A soccer training device for returning soccer balls to first and second kicking locations comprising:

first and second screens located first and second distances away from the first and second kicking locations, respectively, the first and second screens adapted to receive and absorb kinetic energy of soccer balls kicked from the first and second kicking locations, respectively;

first and second troughs located adjacent the first and second screens, respectively, each of the troughs located relative to a respective screen to receive soccer balls dropping from its respective screen and convey the soccer balls to a trough discharge;

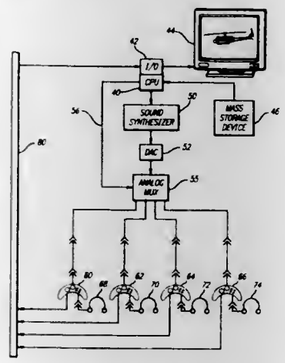
a conveyor located between the first and the second screens and having a first end located adjacent the trough discharges of the first and second troughs, the conveyor conveying the soccer balls along a single conveying path proximate the first end toward a second end of the conveyor located adjacent the first and the second kicking locations, the conveyor further having first and second discharge paths directed toward the first and second kicking locations, respectively, for discharging at desired velocities first ones of the soccer balls in a first direction toward the first kicking location and second ones of the soccer balls in a second, different direction toward the second kicking location.

5,556,107

COMPUTER GAME APPARATUS FOR PROVIDING INDEPENDENT AUDIO IN MULTIPLE PLAYER GAME SYSTEMS

Andrew L. Carter, Saratoga, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Jun. 15, 1995, Ser. No. 490,549
Int. Cl.[6] A63F *9/22*
U.S. Cl. 463—35 **15 Claims**



1. A computer game apparatus for providing separate and independent audio to a first and a second user, comprising:

storage means for storing sound data;

processor means operating under the control of a program and coupled to said storage means, for selecting and retrieving first sound data for said first user and second sound data for said second user;

sound synthesizer means coupled to receive said first and second sound data and converting said sound data into first and second digital audio signals, respectively;

digital to audio converter (DAC) means for receiving said first and second digital audio signals from said sound synthesizer means and converting said first and second digital audio signals into corresponding first and second analog audio signals;

routing means coupled to receive said first and second analog audio signals and selectively providing said first analog audio signals to said first user and said second analog audio signals to said second user;

a listening device coupled to said routing means and provided to said first and second users to convert said first and selectively second analog audio signals to sound waves such that said first user hears said first analog audio signals and said second user hears said second analog audio signals.

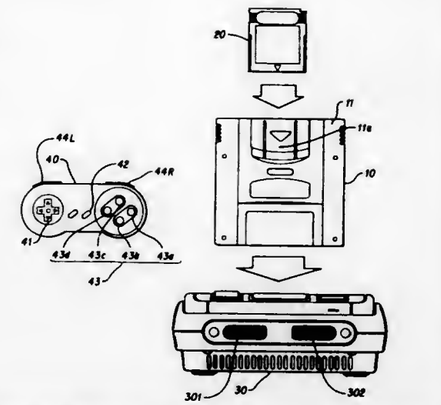
5,556,108

GAME SIGNAL CONVERSION APPARATUS

Masakazu Nagano, and Mitsuhiro Takano, both of Kyoto, Japan, assignors to Nintendo Co., Ltd., Kyoto, Japan

Filed Jan. 24, 1995, Ser. No. 377,586
Claims priority, application Japan, Jan. 25, 1994, 6-023734
Int. Cl.[6] A63F *9/22;* **G06F** *17/00*
U.S. Cl. 463—45 **6 Claims**

1. A game signal conversion apparatus by which a cartridge for a first game machine which includes a first storage means storing image display data, said first game machine displaying a character for a game with two or more kinds of gradations or color tones for each dot on the basis of the image display data, is made to be used in a second game machine capable of displaying a character for a game with a plurality of color tones larger than the number of kinds of color tones capable of being displayed in the first game machine,



said first storage means storing in advance said image display data including character data for a plurality of characters each represented with two or more kinds of gradations or color tones for each dot, and display control data for controlling display of the plurality of characters,

said second game machine being used through connection to a color television, and including at least a second storage means storing color palette data for color-display, and a color image signal generator for generating, on the basis of the image display data for specifying one of the two or more kinds of gradations or color tones and the color palette data stored in the second storage means, a color image signal of a color selected out of a large number of kinds of colors corresponding to the two or more kinds of gradations or color tones,

said game signal conversion apparatus, comprising:

a connector to which said cartridge for said first game machine is detachably attached;

a color palette selector which selects a color palette for displaying the character with a color according to a combination of a plurality of color information corresponding to the number of the kinds of gradations or color tones of a single character by designating the color for each of said two or more kinds of gradations or color tones;

color information writing circuitry for writing the color information of the color palette selected by said color palette selecting selector into said second storage means; and

an image data generator which generates, on the basis of the character data and display control data stored in said first storage means included in said cartridge for said first game machine connected to said connector, image data for designating one of two or more kinds of gradations or color tones similar to that of the first game machine for each dot, and which applies the image data to said color image signal generator.

5,556,109

METHOD OF SEALING AND SEAL FOR A STARTER BAR HEAD TO BE USED IN A CONTINUOUS CASTER

Alfred Trauner, Perg, and Gernot Lettmayr, St. Florian, both of Austria, assignors to Voest-Alpine Industrieanlagenbau GmbH, Austria

Filed Mar. 29, 1994, Ser. No. 219,649
Claims priority, application Austria, Mar. 30, 1993, 644/93
Int. Cl.[6] F16J *15/16;* **B22D** *11/08*
U.S. Cl. 277—1 **22 Claims**

1. A sealing means for a starter bar head having a front face and side faces, to be used in a continuous casting plant, the casting plant including a continuous casting mold with mold side walls having lower ends and defining a mold cavity and a gap provided between said mold side walls and said side faces of said starter bar head, said sealing means comprising:

the exposed portion of the rotatable seal ring to a location

around said one seal face, said first grooves being angled to

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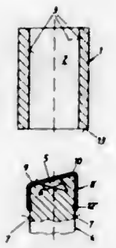


side parts extending into said gap under direct contact with said side faces of said starter bar head and said mold side walls; and

a heat resistant cover part connected with said side parts and at least partially covering said front face of said starter bar head, said cover part being located, when inserted into said casting mold with said starter bar head, to be free and uncovered relative to said mold cavity of said continuous casting mold prior to introduction of steel into said casting mold.

5,556,110

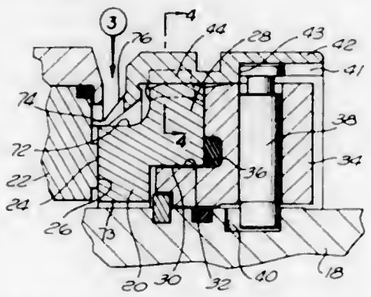
VENCLOSURE FOR BRITTLE MECHANICAL FACE MATERIALS

Joseph A. Marsi, Palos Verdes, and Milton E. Cook, Huntington, both of Calif., assignors to BW/IP International, Inc., Long Beach, Calif.

Continuation of Ser. No. 939,300, Sep. 2, 1992, abandoned. This application Jul. 14, 1994, Ser. No. 272,998

Int. Cl.[6] F16J *15/34*

U.S. Cl. 277—38 **16 Claims**



1. A mechanical seal assembly for separating a high pressure fluid and a low pressure fluid, and associated with a rotatable shaft and a stationary housing, said assembly comprising:

a rotatable seal ring having a radially-disposed seal face;

a non-rotatable seal ring connected to the housing, said non-rotatable seal ring having a radially-disposed seal face disposed in facing relationship with the seal face of the rotatable seal ring;

a cylindrical ring connected to the shaft, the cylindrical ring encircling the rotatable seal ring and drivingly connected thereto;

the rotatable seal ring having an exposed portion extending axially out of the cylindrical ring toward the non-rotatable seal ring said exposed portion defining an unnotched radially outwardly facing cylindrical surface extending axially from the seal face of the rotatable seal ring and an unnotched radially inwardly facing cylindrical surface extending axially from the seal face of the rotatable seal ring; and

an annular shroud mounted to and extending from the cylindrical ring toward the seal face of the rotatable seal ring, the shroud extending axially substantially the full axial length of the exposed portion of the rotatable seal ring to a location closely adjacent the seal face of the rotatable seal ring to enshroud the rotatable seal ring and keep it together if it shatters;

wherein the annular shroud is disposed relative to the rotatable seal ring so as not to produce any significant radially directed contact forces between the shroud and the rotatable seal ring during normal operation of the mechanical seal assembly.

5,556,111

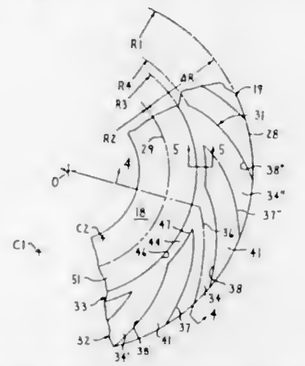
FACE SEAL WITH ANGLED GROOVES AND SHALLOW ANNULAR GROOVE

Josef Sedy, Mount Prospect, Ill., assignor to Durametallic Corporation, Kalamazoo, Mich.

Continuation of Ser. No. 115,153, Sep. 1, 1993, abandoned, and a continuation of Ser. No. 115,154, Sep. 1, 1993, abandoned. This application May 19, 1995, Ser. No. 445,428

Int. Cl.[6] F16J *15/34*

U.S. Cl. 277—96.1 **7 Claims**



1. A fluid seal device cooperating between a housing and a rotatable shaft for creating a fluid seal between high and low pressure regions, said device comprising:

a first seal ring mounted on the shaft for rotation therewith and a second seal ring disposed adjacent the first seal ring and being nonrotatably mounted relative to the housing;

said first and second seal rings respectively defining thereon opposed first and second flat annular seal faces adapted to substantially axially abut to define an annular seal interface which extends radially therebetween and is defined by radially spaced high and low pressure diameters which respectively communicate with said high and low pressure regions, one of said seal rings being axially movable and normally urged axially toward the other seal ring;

a groove pattern formed in one of said seal faces and communicating with the high pressure region for causing a thin film of pressurized fluid to be interposed between said seal faces to create a small clearance therebetween;

said groove pattern including first groove means formed in said one seal face for creating a hydrodynamic fluid seal between the opposed seal faces when the first and second seal rings relatively rotate, said first groove means being disposed adjacent the high pressure diameter of said seal interface;

said groove pattern including second groove means formed in said one seal face for creating a hydrostatic fluid seal between said opposed seal faces when said first and second seal faces are substantially stationary, said second groove means being disposed radially from said first groove means;

said one seal face defining thereon an annular non-grooved flat land extending radially between said low pressure diameter and said second groove means;

said first groove means includes a plurality of first grooves disposed in generally uniformly angularly spaced relationship around said one seal face, said first grooves being angled to project circumferentially and radially from said high pressure diameter, said first grooves terminating at inner ends;

said second groove means including a shallow annular groove formed in said one seal face in concentric relationship to the respective seal ring, said shallow annular groove being disposed radially of but directly adjacent said inner ends of said first grooves, said shallow annular groove being disposed in direct and open fluid communication with and circumferentially connecting the inner ends of said first grooves, and said shallow annular groove defining a radial boundary of said annular land; and

said first grooves having an average depth which is several times greater than the depth of said annular groove.

5,556,112

SHAFT SEALING RING WITH FLEXIBLE HINGED SEALING LIP

Hans-Jürgen Brandt, Hamburg, Germany, assignor to Martin Merkel GmbH & Co KG, Hamburg, Germany

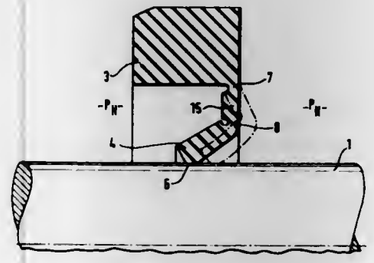
PCT No. PCT/EP93/02720, § 371 Date Mar. 29, 1995, § 102(e) Date Mar. 29, 1995, PCT Pub. No. WO94/08160, PCT Pub. Date Apr. 14, 1994

PCT Filed Oct. 5, 1993, Ser. No. 406,941

Claims priority, application Germany, Oct. 5, 1992, 92 13 373 U

Int. Cl.[6] F16J *15/32*

U.S. Cl. 277—152 **9 Claims**



1. In a shaft sealing ring mountable on a shaft having a surface with a sealing zone wherein the ring comprises an annular holder (**3**) and an annular sealing part which is made up of a sealing lip (**4**) and a substantially radially extending connecting section (**5, 15**) connecting the sealing lip to the holder, said sealing lip extending toward the surface (**1**) of the shaft for engagement with the sealing zone and for delineating a pressure difference across the sealing lip from a high-pressure side to a low-pressure side when mounted on said shaft, said sealing lip (**4**) enclosing an acute angle with the surface (**1**) of the shaft at the sealing zone and the connecting section (**5, 15**) undergoing an axial deformation toward the low-pressure side (P_N) under the pressure difference to be sealed, the improvement wherein the connecting section (**5, 15**) is less resistant to bending than the sealing lip (**4**) and includes first and second radially spaced parts, the first part (**8**) of the connecting section (**5, 15**), which lies closer to the surface (**1**) of the shaft than the second part (**7**) of the connecting section (**5, 15**) being deformed further toward the low-pressure side (P_N) under a pressure difference to be sealed than the second part (**7**) of the connecting section, the end of the sealing lip (**4**) connected to the connecting section being movable axially toward the low-pressure side and radially away from the surface (**1**) of the shaft under the pressure difference to be sealed to maintain or increase said angle between the sealing lip (**4**) and the surface of the shaft at the sealing zone.

5,556,113

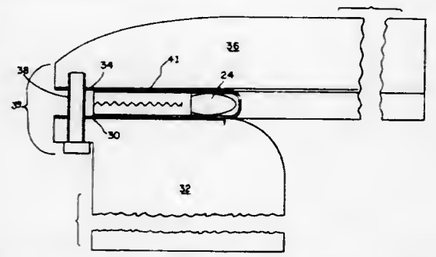
O-RING ENVELOPE GASKET

Franklyn J. Amorese, Hilton, and Anthony S. Bellavia, Spencerport, both of N.Y., assignors to Pfaudler, Inc., Rochester, N.Y.

Continuation-in-part of Ser. No. 43,462, Apr. 2, 1993, abandoned. This application Sep. 19, 1994, Ser. No. 308,157

Int. Cl.[6] F16J *15/10*

U.S. Cl. 277—233 **10 Claims**



1. A gasket for sealing two flange faces against each other comprising at least two compressible layers, a reinforcing metal ring sandwiched between the compressible layers, said compressible layers and metal ring having a combined thickness and an inner and an outer edge, a resilient O-ring separate and detached from said compressible layers and metal ring located proximate the inner edge of the combined compressible layers and metal ring, said O-ring having an inner edge and having a diameter greater than said combined thickness, and a fluoropolymer sheet enveloping the O-ring and combined compressible layers and metal ring to form the gasket such that when the gasket is installed the fluoropolymer sheet contacts both flange faces and covers the inner edge of the O-ring and the O-ring is compressed to a thickness equal to the combined thickness.

5,556,114

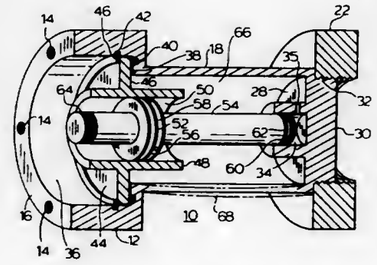
HYDRAULIC EXPANDING AND CONTRACTING MANDREL

Mario Fabris, Grimsby, Canada

Filed Jun. 20, 1995, Ser. No. 492,797

Int. Cl.[6] B23B *31/30;31/40*

U.S. Cl. 279—2.08 **6 Claims**



1. A mandrel for mounting and clamping a suitable work piece thereon,

said mandrel comprising a housing having a hollow cylinder contained therein; the cylindraceous walls of said cylinder being composed of an elastic material,

said cylinder having a predetermined length and diameter and enclosing an interior cavity of a cylindraceous shape,

said cavity being filled with a fluid,

piston means to pressurize the fluid in said cavity sealedly mounted coaxially within said cavity and extending the length of said cavity and having one end protruding outside said

cavity and being accessible from outside of said cavity so as to enable said piston means to be axially movable by external

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ADJUSTABLE RIDING TOY WITH INTERCHANGEABLE

5,556,118

FLAT BED CART

cavity and being accessible from outside of said cavity so as to enable said piston means to be axially movable by external piston motion inducing means to compress said fluid to expand the diameter of said hollow cylinder at the point of mounting a suitable workpiece thereon to cause the workpiece to be clamped on said mandrel.

5,556,115

VEHICLE SUSPENSION SYSTEMS

Christopher B. Heyring, Dunsborough, Australia, assignor to Kinetic Limited, Western Australia, Australia

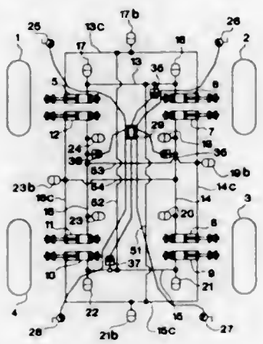
PCT No. PCT/AU93/00147, § 371 Date Sep. 27, 1994, § 102(e) Date Sep. 27, 1994, PCT Pub. No. WO93/19945, PCT Pub. Date Oct. 14, 1993

PCT Filed Apr. 2, 1993, Ser. No. 307,582

Claims priority, application Australia, Apr. 2, 1992, PL1698

Int. Cl.[6] B60S *9/20*

U.S. Cl. 280—6.12 **18 Claims**



1. A vehicle suspension system comprising a plurality of wheel assemblies arranged in longitudinal and lateral spaced relation to a vehicle body, each wheel assembly including a wheel and first and second fluid rams each operably connected between the wheel and the vehicle body to support the vehicle body, the first fluid ram of each two laterally spaced wheel assemblies being in direct fluid communication by respective lateral fluid circuits, and the second fluid rams each being double acting fluid rams having upper and lower chambers, said double acting second fluid rams of the respective longitudinally spaced wheel assemblies on each side of the vehicle having the respective upper chambers thereof in direct fluid communication and the respective lower chambers thereof in direct fluid communication by respective upper and lower longitudinal conduits the respective upper longitudinal conduits on the respective sides of the vehicle being in direct fluid communication with the respective lower longitudinal conduit on the opposite side of the vehicle, sensor means adapted to generate signals indicative of the positional relations of each of said laterally and longitudinally spaced wheels relative to the vehicle body, control means arranged to receive said signals and compare said positional relations with a respective preset datum position, and adjustment means operable in response to variation of the positional relation of each wheel from the respective datum position beyond a preset limit to adjust the volume of fluid in the lateral and longitudinal fluid circuits to establish a positional relation within said preset limit.

5,556,116

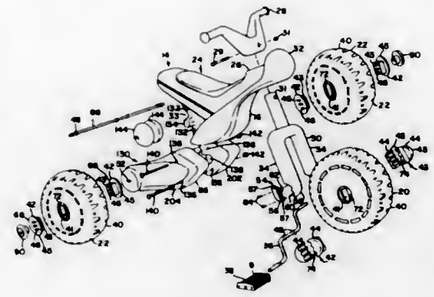
ADJUSTABLE RIDING TOY WITH INTERCHANGEABLE BACK ENDS

Christopher W. Sloss, Olney; Barry J. Davignon, Robinson, and Duane J. Niemeyer, Olney, all of Ill., assignors to Roadmaster Corporation, Olney, Ill.

Continuation of Ser. No. 430,726, Apr. 28, 1995, and a continuation-in-part of Ser. No. 35,039, Feb. 17, 1995, and a continuation-in-part of Ser. No. 34,324, Feb. 1, 1995, abandoned, and a continuation-in-part of Ser. No. 33,934, Jan. 24, 1995, Pat. No. Des. 369,331. This application Jun. 2, 1995, Ser. No. 459,738

Int. Cl.[6] A63C *17/18*

U.S. Cl. 280—7.15 **15 Claims**



1. A combination of four members, three of which fit together to form a bicycle and three of which fit together to form a tricycle, the four members comprising:

a) a body having a first and second body end, the second body end having a first and second side, at least a first protrusion on the first side, the first side having a first recession formed around the first protrusion;

b) a front wheel rotatably connected to the first body end;

c) a bicycle back end comprising:

i) at least one prong back end, each prong back end connectable to the second body end, the first recession for receiving the at least one prong back end, and each prong back end having a depression for receiving said protrusion; and

ii) an only rear wheel rotatably connected to each prong back end; and

d) a tricycle back end comprising:

i) at least one prong back end, each prong back end connectable to the second body end, the first recession for receiving the at least one prong back end, and each prong back end having a depression for receiving said protrusion; and

ii) only first and second rear wheel, each rear wheel rotatably connected to each prong back end.

5,556,117

RUGGED TERRAIN CART

George R. Szeremeta, 646 Westminster Dr., Pasadena, Calif. 91105

Filed May 13, 1994, Ser. No. 242,744

Int. Cl.[6] B62B *3/00*

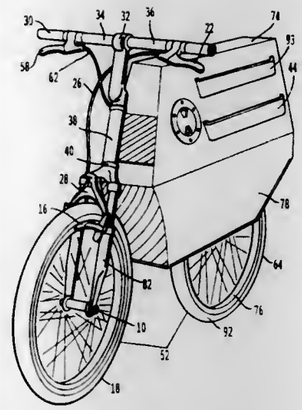
U.S. Cl. 280—47.11 **8 Claims**

1. A rugged terrain cart, being attendant propelled, for the carrying a workload comprising:

a plurality of ground engaging wheels, the ground engaging wheels being positioned in an approximate in-line wheel position in relation to the normal direction of forward travel, with

a forward ground engaging wheel and

a rear ground engaging wheel,



a rigid forward wheel mounting assembly which provides a mount for said forward ground engaging wheel,

a pivot means interconnecting said rigid forward wheel mounting assembly to

a rigid frame so as to allow said rigid forward wheel mounting assembly and said forward ground engaging wheel the means to pivot to the right and to the left of the normal in-line wheel position about an approximate vertical axis in relation to the lateral plane of the cart,

a handle means, adapted to be grasped by the hands of the attendant, which is interconnected to said rigid forward wheel mounting assembly,

said rigid frame being of monocoque construction, the exterior surface of said rigid frame being fully functional and advantageous in respect to the attachment and transportation of a workload, said rigid frame having

a left side frame member and

a right side frame member,

said left side frame member and said right side frame member extending longitudinally so as to define a substantially horizontal workload supporting platform atop said rigid frame which extends from a position approximately level and adjacent said handle means to the rearmost portion of the cart,

said right side frame member having

a upper load attachment rail and

a lower load attachment rail,

said left side frame member having said upper load attachment rail and said lower load attachment rail, said rigid frame forming an interior storage area,

a waterproof storage means, being fully functional and advantageous in respect to the storage of a workload and being accessible by virtue of,

a waterproof access hatch, being of the type utilized as marine waterproof inspection ports, said waterproof access hatch being mounted within a section of said rigid frame selected from the group consisting of said right side frame member and said left side frame member, said handle means, being adapted to be grasped by the hands of the attendant while walking along beside said rugged terrain cart, serving to provide the attendant the ability to effect control over the cart while in use,

whereby the attendant, as a nonoccupant, may easily, efficiently and precisely propel, steer, and maneuver the cart and transport heavy loads without having to exert a burdensome force in order to balance the cart, and the workload, fore and aft along the longitudinal plane of the vehicle.

5,556,118

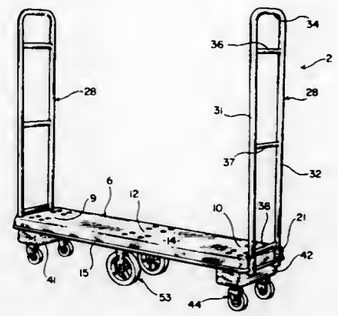
FLAT BED CART

Alan R. Kern; John A. LaFleur, both of Richmond; George Hand, Midlothian, and Bruce Ferris, Richmond, all of Va., assignors to Rebrig International, Inc., Richmond, Va.

Filed Jan. 5, 1995, Ser. No. 368,899

Int. Cl.[6] B62B *3/00*

U.S. Cl. 280—47.16 **26 Claims**



1. A flat bed cart comprising:

an elongated bed constituted by a unitary molded plastic member having first and second longitudinally spaced ends, a generally planar upper side, a bottom side and generally upstanding sidewalls, said bottom side including a plurality of ribs, a pair of spaced, longitudinally extending slots and first and second sets of integrally molded fastener mounting pads, each of said fastener mounting pads including a plurality of grouped holes extending through the upper and bottom sides of said bed with said first and second sets of fastener mounting pads being laterally spaced adjacent the first and second ends of said bed respectively;

a pair of longitudinally extending metal reinforcing bars respectively positioned within said pair of slots;

a pair of support blocks, each of said support blocks including a plurality of bores extending therethrough and being positioned across a respective set of said first and second sets of fastener mounting pads;

a plurality of wheel assemblies; and

a plurality of fasteners for securing each of said wheel assemblies, said reinforcing bars and said support blocks simultaneously to said bed with said fasteners being engaged with said wheel assemblies while extending through said bores and within said fastener mounting pads.

5,556,119

CONTROL ARM FOR USE IN A VEHICLE WHEEL SUSPENSION SYSTEM

Tomasz Buchner, and David E. Kelly, both of St. Catharines, Canada, assignors to TRW Inc., Lyndhurst, Ohio

Filed Feb. 17, 1995, Ser. No. 390,656

Int. Cl.[6] B60G *3/00*

U.S. Cl. 280—96.1 **22 Claims**

1. A control arm for use in a vehicle suspension system having a vehicle frame and a steering knuckle pivotable relative to the frame, said control arm comprising:

a first member including a first portion connectable to the vehicle frame, a second portion connectable to the steering knuckle, and a connecting portion interconnecting said first and second portions;

a second member including a third portion connectable to the vehicle frame and a rod portion extending from said third portion, said rod portion including a terminal end connected to said connecting portion of said first member;

means for rigidly connecting said terminal end of said rod portion to said connecting portion of said first member to

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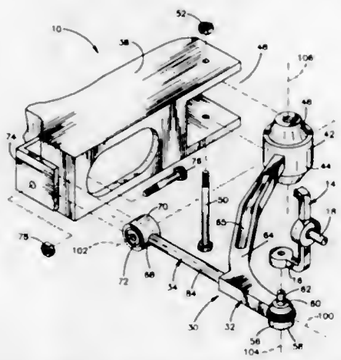
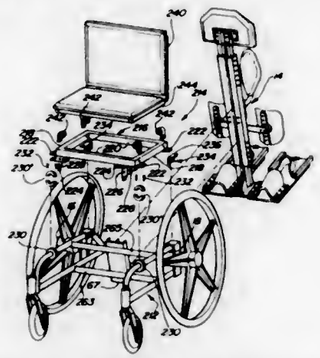
MOTORIZED ASSISTANCE DEVICE ADAPTABLE ON AN

wall and substantially lower than said pivot points, said cable causing the tightening of said pad against said enclosed boot



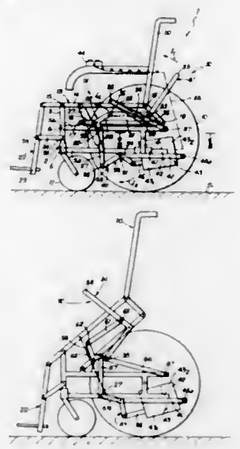
prevent relative movement between said first and second members, said means including a threaded extension extending from said terminal end of said rod portion received in a threaded opening in said connecting portion of said first member.

5,556,120
AMULATORY WHEELSTAND - WHEELCHAIR INTERFACE
Daniel W. Davis, 1367 Merle Ave., Burton, Mich. 48509
Continuation-in-part of Ser. No. 2,146, Jan. 11, 1993, Pat. No. 5,340,139. This application Aug. 23, 1994, Ser. No. 294,595
Int. Cl.[6] B62B *9/00*
U.S. Cl. 280—304.1 **7 Claims**



1. An interface for adapting parallel horizontal rails of an ambulatory wheelstand frame to accept a seat for use as a wheelchair, said interface comprising:
a pair of spaced parallel side members and a pair of spaced cross members interconnecting said side members, said side and cross members forming a rectangular frame structure;
tab means on said frame structure for supporting said frame structure on the horizontal rails, said tab means includes a pair of spaced tabs extending outwardly from each of said side members to overlie the horizontal rails;
locking means positioned on the rails, said locking means includes a collar located adjacent a forward end of each of the horizontal rails against which a forward one of said pair of tabs on each side member can abut to prevent forward movement of said frame structure on the wheelstand frame;
lock means on said frame structure; and
wherein said tab means, locking means and lock means are operably associated to detachably locate and lock said frame structure on the wheelstand frame.

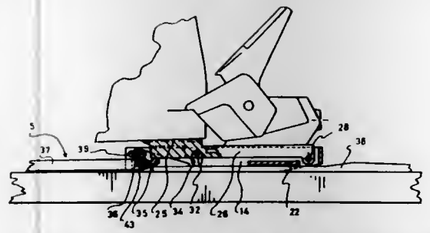
5,556,121
MOTORIZED ASSISTANCE DEVICE ADAPTABLE ON AN ELEVATOR WHEELCHAIR AND ELEVATOR WHEELCHAIR INCORPORATING SAME
Bernard Pillot, Romans, France, assignor to International Diffusion Consommateurs I.D.C., France
Continuation of Ser. No. 120,914, Sep. 15, 1993, abandoned. This application Oct. 12, 1995, Ser. No. 542,329
Claims priority, application France, Sep. 15, 1992, 92 11231
Int. Cl.[6] A61G *5/00*
U.S. Cl. 280—304.1 **18 Claims**



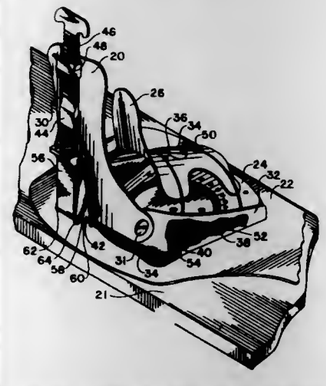
1. A motorized assistance device, adaptable on an elevator wheelchair including a chassis supporting an articulated structure connected to said chassis by at least one manual maneuvering assembly, said device comprising:
a supporting cradle intended to be attached to the chassis by fixation members,
a motorization unit mounted on the cradle and including a mobile member, with reversible displacement, operatively connected to a transmission, said motorization unit being of the reversible electrical type and is pivotally mounted to a rear portion of the cradle,
at least one articulated system actuated by the transmission and including a first set of levers intended to act on the articulated structure, and a second set of levers actuated by the first set of levers for acting on the maneuvering assembly,
and means for controlling operation of the motorization unit.

5,556,122
DEVICE FOR MODIFYING THE FORCE DISTRIBUTION OF A SKI OVER ITS GLIDING SURFACE AND A SKI EQUIPPED WITH SUCH A DEVICE
Joël Arduin, Metz-Tessy, and Jacques Le Masson, Cran-Gevrier, both of France, assignors to Salomon S.A., Metz-Tessy, France
PCT No. PCT/FR92/01120, § 371 Date Jul. 29, 1994, § 102(e) Date Jul. 29, 1994, PCT Pub. No. WO93/14837, PCT Pub. Date Aug. 5, 1993
PCT Filed Dec. 2, 1992, Ser. No. 256,629
Claims priority, application France, Jan. 31, 1992, 92 01248
Int. Cl.[6] A63C *5/07*
U.S. Cl. 280—602 **31 Claims**

1. A device for modifying force distribution of a ski over a gliding surface of the ski, the ski having a lower base, the lower base having a central zone, a forward portion and a rearward portion, said device comprising:
an elongated stiffening blade having a front end and a rear end, the front end of the stiffening blade being adapted to be affixed to the forward portion of the lower base of the ski and the rear end of the stiffening blade being adapted to be affixed to the rearward portion of the lower base of the ski;
a sensor element for supporting only a portion of the sole of the boot and for capturing a vertical thrust force of the boot; and
a connection between the sensor element and the stiffening blade for transmitting to the stiffening blade, in the form of a force oriented generally horizontally and in a longitudinal direction toward at least one of the front end of the stiffening blade and the rear end of the stiffening blade, at least a portion of the vertical thrust force of the boot.

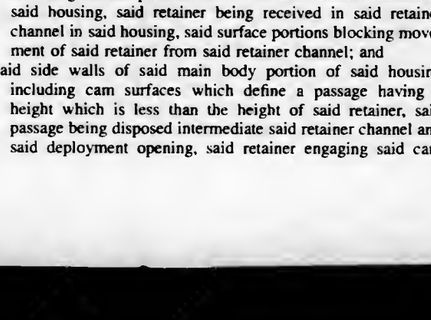


5,556,123
SNOWBOARD BINDING WITH COMPENSATING PLATE
Louis Fournier, 11 359 ave royale, Beauport, Québec, Canada
Filed May 12, 1994, Ser. No. 241,479
Int. Cl.[6] A63C *9/00*
U.S. Cl. 280—607 **6 Claims**



1. A boot binding system for a snowboard comprising:
a contour wall outlining a boot and comprising a rear, a centre and a front section, said rear section adapted to receive a heel, said rear section defining a "U" comprising a web and two wings, when seen from above, said wings of said "U" comprising two pivot points facing each other,
a generally horizontal pad adapted to cover said centre over said boot to maintain said boot within the confines of said contour wall;
a leg support element mounted so as to support the back of a user's leg and pivotedly attached to said rear section in said pivot points, said leg support element adapted to be moved circumferentially on said pivot points from a first generally horizontal position allowing insertion of the boot above said leg support element and behind said pad, up to a second generally vertical position, the boot being enclosed between said leg support element, said pad and said contour wall,
a cable joining said support element to said pad, adapted for passing circumferentially around said pivot points, said cable comprising at least one cable guide placed on said contour wall and substantially lower than said pivot points, said cable causing the tightening of said pad against said enclosed boot when said leg support element is moved to said generally vertical position.

5,556,124
AIR BAG MODULE
Mark O. Olson, Waterford, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio
Filed Jan. 24, 1995, Ser. No. 377,475
Int. Cl.[6] B60R *21/20*
U.S. Cl. 280—728.2 **13 Claims**



1. A vehicle occupant safety apparatus comprising:
a housing including a main body portion and first and second end plates together defining a chamber in said housing, said main body portion of said housing and said end plates together defining a deployment opening in said housing, said housing having an axis extending between said end plates;
an inflatable vehicle occupant restraint in said chamber for, when inflated through said deployment opening, restraining an occupant of a vehicle;
a retainer for securing said inflatable vehicle occupant restraint in said chamber; and
an inflator for, when actuated, inflating said inflatable vehicle occupant restraint;
said inflator including first fastener means for securing said inflator to at least one of said end plates of said housing with said inflator disposed between said end plates;
said retainer including second fastener means for securing said end plates to said main body portion of said housing with said retainer disposed between said end plates;
said retainer being connected with said inflatable restraint and being movable with said inflatable restraint through said deployment opening into said chamber in said housing to position said inflatable restraint in said housing between said first and second end plates;
said main body portion of said housing including first and second side walls and a central wall which extends transverse to said first and second side walls and which interconnects said first and second side walls to form a generally C-shaped configuration, said retainer being movable in a direction toward said central wall of said main body portion of said housing through said deployment opening into said chamber in said housing;
said side walls of said main body portion of said housing including surface portions which define a retainer channel in said housing, said retainer being received in said retainer channel in said housing, said surface portions blocking movement of said retainer from said retainer channel; and
said side walls of said main body portion of said housing including cam surfaces which define a passage having a height which is less than the height of said retainer, said passage being disposed intermediate said retainer channel and said deployment opening, said retainer engaging said cam

surfaces and resiliently deflecting said side walls apart as said

a module cover for covering said deployment opening, said module cover having a tear seam configured to open during

surfaces and resiliently deflecting said side walls apart as said retainer moves through said passage into said retainer channel, said side walls returning to an undeflected position when said retainer moves into said retainer channel.

5,556,125

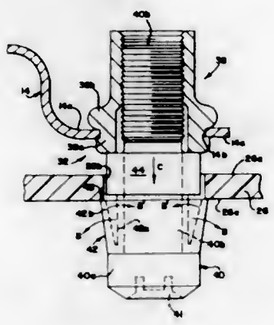
AIR BAG INFLATOR FOR SNAP-ON ATTACHMENT TO A STEERING WHEEL

Merle K. Ricks, Layton; Daniel Sorenson, Salt Lake City, both of Utah; John A. Duran, Glendora, and Javier Vargas, Montebello, both of Calif., assignors to Morton International, Inc., Chicago, Ill., and Avibank Mfg., Inc., Burbank, Calif.

Filed Jul. 21, 1995, Ser. No. 505,592

Int. Cl.[6] B60R *21/20*

U.S. Cl. 280—728.2 **20 Claims**



1. In combination, an air bag inflator module adapted for rapid snap-on attachment onto a support provided in a motor vehicle, said inflator module including:

a base facing and movable directly toward the support for fixed attachment thereto; and

a snap-on fastener extending between said base and the support, one of said base and the support having an opening for receiving a first portion of said fastener extended therethrough and the other of said base and the support having a second portion of said fastener permanently mounted thereon for supporting said first portion projecting outwardly of said one of said base and the support, holding skirt means on said first portion of said fastener compressible radially inwardly when said first portion is passed through said opening and expandable radially outwardly, and after passage having an edge for engaging a surface of said one of said base and the support around said opening for retaining said fastener in interconnecting relation between said base and the support, and release means for disconnecting said first and second portions of said fastener for permitting said inflator module to be detached from said support while said holding skirt means is still expanded.

5,556,126

AIR BAG DEPLOYMENT DOOR

Chienhom Lee, Rochester Hills, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

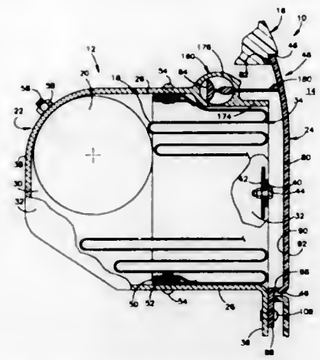
Filed Apr. 25, 1995, Ser. No. 428,055

Int. Cl.[6] B60R *21/16*

U.S. Cl. 280—728.3 **13 Claims**

1. Apparatus for use with an inflatable vehicle occupant restraint, said apparatus comprising:

means for defining a deployment opening through which the restraint moves in an outward direction upon inflation of the restraint;



a door panel which extends across said deployment opening and against which the restraint moves forcefully upon inflation of the restraint;

a stress riser which is ruptured by the force of the restraint moving against said door panel;

hinge means for supporting said door panel for pivotal movement away from said deployment opening when said stress riser has been ruptured; and

spring clamp means for clamping against said hinge means and for dissipating energy by enabling said force to move said hinge means in said outward direction against a bias of said spring clamp means.

5,556,127

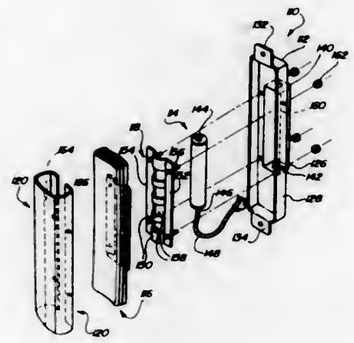
SEAT MOUNTED SIDE IMPACT MODULE

Jonathan P. Hurford, Lake Orion, and Mohamed Boumarafi, Rochester Hills, both of Mich., assignors to Takata, Inc., Auburn Hills, Mich.

Filed Jun. 26, 1995, Ser. No. 494,537

Int. Cl.[6] B60R *21/22*

U.S. Cl. 280—730.2 **14 Claims**



1. A side impact air bag module assembly for mounting to a vehicle seat of the type having a generally vertically extending seat frame member said assembly comprising:

a housing having a deployment opening with a back surface having a shallow-well portion contiguous with a deep-well portion;

an inflator including mounting means configured for mounting said inflator within said housing deep-well portion;

an inflatable side impact air bag having an inflation opening and a pair of flaps provided in opposed relationship about said inflation opening, said flaps including mounting holes;

a module cover for covering said deployment opening, said module cover having a tear seam configured to open during air bag deployment;

retaining means configured to engage said air bag flaps and said module cover, said retaining means affixing said air bag flaps and said module cover to said housing; and

mounting means for enabling attachment of said assembly to the vehicle seat, said mounting means configured such that said housing deep well portion is positionable at least partially inboard of an outboard surface of the vehicle seat frame member.

5,556,128

SAFETY ARRANGEMENT FOR A VEHICLE OCCUPANT

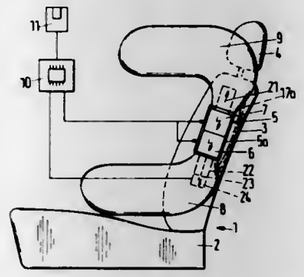
Ruprecht Sinnhuber, Gifhorn, and Helmut E. Müller, Isenbüttel, both of Germany, assignors to Volkswagen AG, Wolfsburg, Germany

Filed Sep. 12, 1995, Ser. No. 527,080

Claims priority, application Germany, Nov. 24, 1994, 44 41 818.3

Int. Cl.[6] B60R *21/22*

U.S. Cl. 280—730.2 **20 Claims**



1. A safety arrangement for a vehicle occupant comprising an airbag arrangement having a first airbag compartment positioned to protect the occupant's head and a second airbag compartment positioned to protect the occupant's torso during a side collision, gas generator means actuatable in response to a signal from a collision sensor, and control means for controlling the activation of the gas generator means, wherein the gas generator means and the airbag arrangement are assembled as a unit and attached to a vehicle component or structural part and wherein the first and second airbag compartments have different filling characteristics and the first airbag compartment has a longer relaxation time than the second airbag compartment and the first and second airbag compartments, when filled with gas from the gas generator means, extend forwardly in vertically spaced relation substantially in the direction of view of the vehicle occupant and provide a substantially C-shaped contour in side view.

5,556,129

VEHICLE SEAT BACK WITH A HEAD SIDE IMPACT AIR BAG

Sorin Coman, Madison Hts; Frank Wu, Novi, and Robert L. Demick, Eastpointe, all of Mich., assignors to Hoover Universal, Plymouth, Mich.

Filed May 16, 1995, Ser. No. 441,813

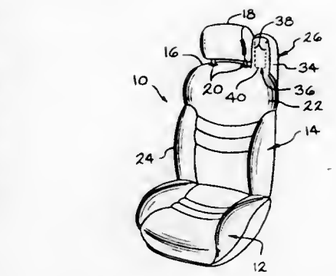
Int. Cl.[6] B60R *21/22*

U.S. Cl. 280—730.2 **6 Claims**

1. A vehicle seat assembly comprising:

a generally horizontal seat cushion having a rear end;

a seat back extending upwardly at said rear end of said seat cushion, said seat back having opposite lateral sides and an upper end;



a tower extending above said seat back upper end adjacent one lateral side of said seat back; and

an inflatable air bag stowed above said seat back upper end within said tower, said air bag being inflatable to a deployed position extending forward from said tower to provide an air bag above the upper end of said seat back along said one lateral side adjacent the head of a seat assembly occupant.

5,556,130

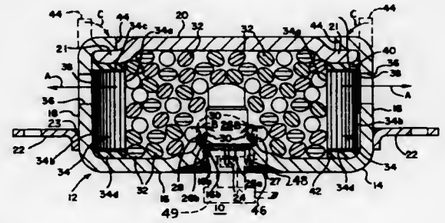
SINGLE SIDE WALL AIR BAG INFLATOR

Brian H. Fulmer, Farr West, Utah, assignor to Morton International, Inc., Chicago, Ill.

Filed Oct. 5, 1994, Ser. No. 318,237

Int. Cl.[6] B60R *21/28*

U.S. Cl. 280—741 **2 Claims**



1. An air bag inflator including a single side wall housing for containing ignition means, pyrotechnic gas generating means and filter means, comprising:

a cup-shaped base having an annular bottom wall with a central opening for access to said ignition means and an integrally formed, ported, side wall extending upwardly of said bottom wall and having a radially inwardly directed upper end flange;

a top wall spaced above said bottom wall closing off said upper end of said side wall for protectively containing said gas generating means and said filter means and having an outer peripheral edge portion facing and sealed with said upper end flange to close said housing;

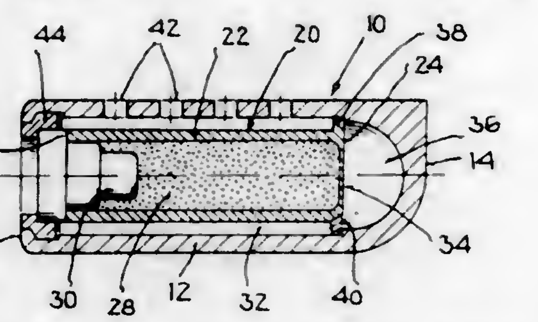
ignition means comprising a high energy electrically activated ignition train having a body formed with an outer face closing said central opening of said annular bottom wall;

annular seal means for sealing between said ignition train body and said bottom wall around said central opening;

said ignition means including electrical terminal means projecting from said outer face adapted for interconnection with an external connector having a body with one or more deflectable legs; and

clip means on said bottom wall having an opening for receiving said connector body and an edge portion of said opening adapted to be engaged by a deflectable leg of said body for holding said connector in interconnected relation with said terminal means.

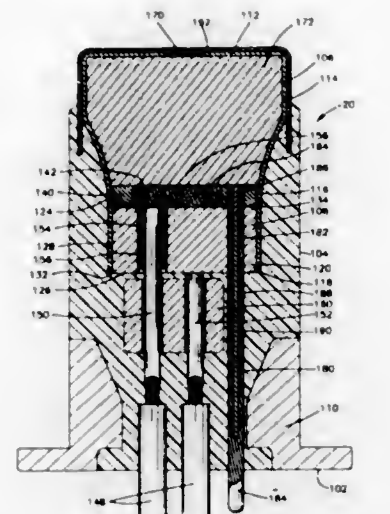
5,556,131
GAS GENERATOR FOR SIDE IMPACT PROTECTION
Richard Bender, Lauf, and Lothar Maier, Tüssling, both of Germany, assignors to Temic Bayern-Chemie Airbag GmbH, Aschau, Germany
Filed Mar. 13, 1995, Ser. No. 403,099
Claims priority, application Germany, May 3, 1994, 44 15 523.9
Int. Cl.⁶ B60R *21/26;21/16;21/02*
U.S. Cl. 280—741 **22 Claims**



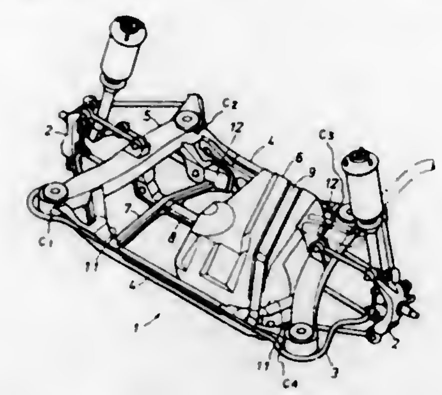
1. A gas generator for an airbag serving to protect against side impact in a vehicle, comprising:
a housing having a peripheral wall with outlet apertures and being sealed at one front end;
a sealed fluid-tight propellant tank which serves as a combustion chamber and which has a peripheral wall and first and second front ends;
a propellant disposed in said propellant tank;
a bursting diaphragm, which bursts upon ignition of said propellant, disposed at and sealing said first front end of said propellant tank, said bursting diaphragm having a diameter corresponding to an inside diameter of said housing;
said propellant tank being arranged in said housing such that, to allow afterburning, an annular chamber is formed between said peripheral walls of said housing and of said propellant tank, and such that a further afterburn chamber is formed between said sealed one front end of said housing and said bursting diaphragm;
an igniter for the propellant disposed at said second front end of said propellant tank and sealing both said second front end of said propellant tank and a second front end of said housing;
at least one through-flow aperture extending between said further afterburn chamber and said annular chamber and arranged such that hot gas entering said annular chamber through said at least one through-flow aperture flows through the entire annular chamber before passing through said outlet apertures formed in said peripheral wall of said housing; and,
an external flange provided on said peripheral wall of said housing for attaching the gas generator to a part of the vehicle as well as for attaching the airbag.

5,556,132
VEHICLE OCCUPANT RESTRAINT WITH AUTO IGNITION MATERIAL
William P. Sampson, Mesa, Ariz., assignor to TRW Inc., Lyndhurst, Ohio
Filed Apr. 13, 1995, Ser. No. 421,736
Int. Cl.⁶ B60R *21/26*
U.S. Cl. 280—741 **17 Claims**

1. An apparatus for inflating a vehicle occupant restraint, said apparatus comprising:
(a) an inflator housing;
(b) gas generating material within said housing;
(c) an initiator for igniting said gas generating material, said initiator comprising a container containing an output charge, which when ignited, ignites said gas generating material, said initiator also having electrical conductor means extending into said container for igniting said output charge when a predetermined current travels through said electrical conductor means, said initiator further including a heat conductive member extending into said container and having a surface external to said container and said housing; and
(d) auto ignition material in said container and in physical contact with said heat conductive member, said auto ignition material being ignitable at a temperature lower than the ignition temperature of said gas generating material and ignitable to ignite said output charge which in turn ignites said gas generating material.

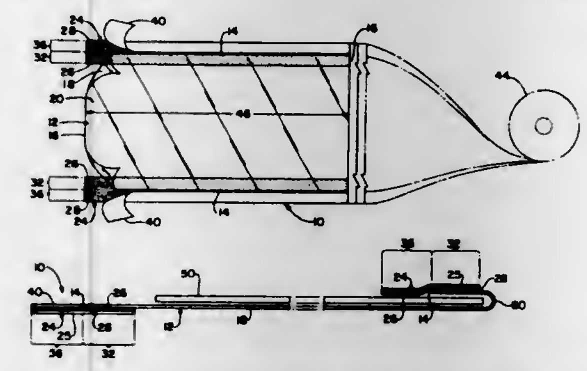


5,556,133
AUTOMOTIVE FUEL TANK MOUNTING ASSEMBLY
Yasunori Oku; Teruaki Anzawa; Tsutomu Ogawa, and Shinji Hinosawa, all of Saitama-ken, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 23, 1995, Ser. No. 448,263
Claims priority, application Japan, Jul. 26, 1994, 6-193533
Int. Cl.⁶ B62D *21/00*
U.S. Cl. 280—781 **18 Claims**



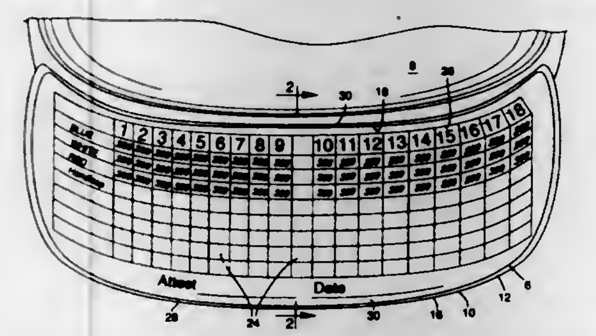
1. A fuel tank and fuel tank mounting assembly for mounting said fuel tank on a subframe of an automotive vehicle body, comprising:
a subframe including a pair of side members and a pair of cross members having a wheel suspension system attached thereto, and adapted to be mounted on a vehicle body, said subframe defining at least a first support means for restricting a vertical movement of said fuel tank, and a second support means for restricting a fore-and-aft movement of said fuel tank, wherein said first support means are upper surfaces of lateral and longitudinal reinforcement members and said second support means are side surfaces of said cross members, said side members being at a higher vertical elevation than said cross members; and
means for holding said fuel tank against said first and second support means, wherein said holding means is at least one strap contacting an upper surface of said fuel tank.

5,556,134
SELF-SEALING COVER FOR DUST JACKETS
Charles J. Barnette, Akron, Ohio, assignor to Kent Adhesive Products Co., Kent, Ohio
Filed Oct. 7, 1994, Ser. No. 319,923
Int. Cl.⁶ B42D *3/00;3/02*
U.S. Cl. 281—29 **19 Claims**



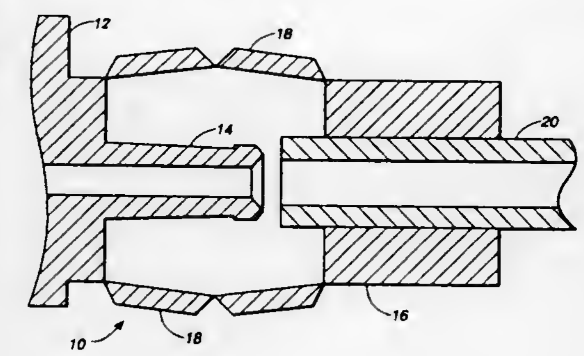
1. A cover for a dust jacket which has a front surface and a back surface with edges therebetween, comprising:
a film having an exterior surface and an interior surface, said interior surface covering the entire front surface of the dust jacket;
at least one paper strip having selectively disposed thereon a pressure sensitive adhesive that is partially affixed to a longitudinal edge of one of said exterior surface and said interior surface; and
a release material selectively disposed on any remaining pressure sensitive adhesive not affixed to one of said exterior surface and said interior surface whereupon said remaining pressure sensitive adhesive is securable to the back surface of the dust jacket.

5,556,135
SCORE CARD
Marvin G. Duncan, 1807 SE. Miller St., Portland, Oreg. 97202
Filed Dec. 19, 1994, Ser. No. 358,817
Int. Cl.⁶ A42B *1/24*
U.S. Cl. 283—48.1 **3 Claims**



1. In combination with a hat having a front bill of stiff material comprising a firm supporting lower surface, a score card having opposite surfaces one surface of which is printed with scoring indicia, and a pressure sensitive adhesive on the surface opposite the surface printed with scoring indicia, the pressure sensitive adhesive removably attaching the score card to the lower surface of the stiff front bill of the hat, whereby to enable writing a score on the surface of the score card printed with scoring indicia.

5,556,136
CONNECTOR FOR FLEXIBLE MEDICAL TUBING
Peter Von Berg, 29 S. Ridge West, Tiburon, Calif. 94920
Filed Apr. 25, 1995, Ser. No. 428,912
Int. Cl.⁶ F16L *55/00*
U.S. Cl. 285—23 **4 Claims**



1. A connector for medical tubing comprising:
a connector body portion;
an articulating linkage member attached to said connector body portion;
a collar member attached to said articulating for axial movement relative to said connector body portion between an extended configuration and a compressing configuration, said collar member adapted for insertion onto a segment of tubing; and
a tubing connector member attached to said connector body portion, said tubing connector member adapted for insertion into a segment of tubing;
wherein when a segment of tubing is inserted into said collar member in its extended configuration, said articulating linkage member enables said collar member to be axially moved toward said connector body portion and over said tubing connector member to its compressing configuration after inserting the segment of tubing onto said tubing connector member thereby capturing and compressing said segment of tubing between said collar member and said tubing connector member.

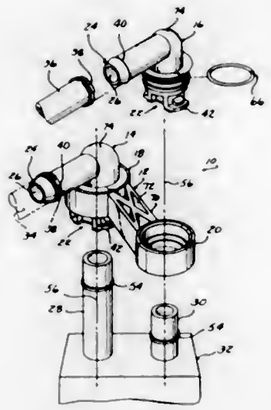
5,556,137
FLUID CONNECTOR ASSEMBLY
Martin Ream, Ortonville, Mich., assignor to ITT Automotive, Inc., Auburn Hills, Mich.
Filed Oct. 31, 1994, Ser. No. 331,681
Int. Cl.⁶ F16L *35/00*
U.S. Cl. 285—26 **20 Claims**

1. A spacer for positioning at least two differently sized conduit members with respect to one another for cooperative engagement with a pair of axially off-set, correspondingly sized tubular ports of a motor vehicle heater core, comprising:
at least two means for receiving said at least two differently sized conduit members wherein each of said receiving means has a longitudinal axis and is correspondingly sized to receive said differently sized conduit members; and
rigid means for connecting said receiving means wherein said longitudinal axes are substantially parallel, and said receiving means are radially spaced and axially off-set for providing one-way assembly of said conduit members with said correspondingly sized, axially off-set tubular ports of said heater core.

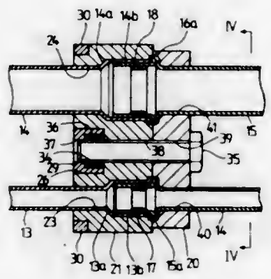
5,556,139
HYDRAULIC COUPLING

5,556,140
DOOR HANDLE ASSEMBLY WITH EMERGENCY-

5,556,141
CABINET DOOR LATCH

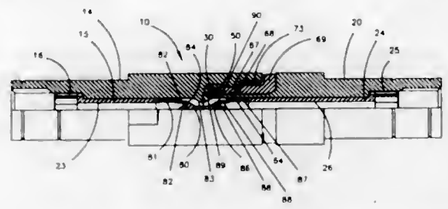


5,556,138
PIPE CONNECTING DEVICE
Hiroshi Nakajima, Chiryu, and Toshio Tsuboko, Anjo, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Mar. 28, 1995, Ser. No. 411,566
Claims priority, application Japan, Mar. 28, 1994, 6-057312
Int. Cl.[6] F16L *35/00;23/02;3/22*
U.S. Cl. 285—137.1 **20 Claims**



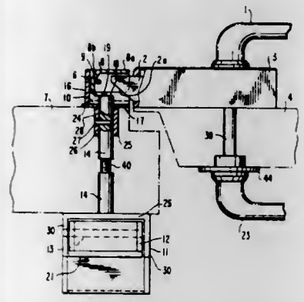
1. A pipe connecting device comprising:
- a first pipe and second pipe that a fluid flows therein and have engaged portions respectively protruding at respective outer periphery of their one ends thereof in a direction approximately perpendicular to a direction which said fluid flows in;
- a third pipe and fourth pipe connected to said one end of said first and second pipes;
- a fix plate having an engaging portion which engages simultaneously with said engaged portions of said first and second pipe;
- a connecting flange having a plurality of dividing flanges, said plurality of dividing flanges holding said third and fourth pipes on divided surfaces thereof;
- a screw means for tightening said fix plate and said connecting flange;
- a nut means for receiving said screw means;
- a holding portion formed with an insert hole which has a rotation shape for one of said screw means and nut means at one of said divided surfaces of one of said plurality of dividing flanges; and
- a receiving portion engaging with said holding portion to cover said insert hole at the other one of said divided surfaces of one of said plurality of dividing flanges.

5,556,139
HYDRAULIC COUPLING
Steven Wilkins, Union City, Pa., assignor to Snap-Tite, Inc., Union City, Pa.
Continuation-in-part of Ser. No. 145,688, Oct. 29, 1993, abandoned. This application Feb. 17, 1994, Ser. No. 197,635
Int. Cl.[6] F16L *37/28*
U.S. Cl. 285—111 **19 Claims**



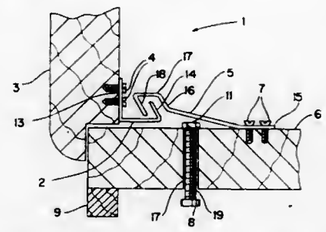
1. A hydraulic undersea coupler including a female member and a male member movable between coupled and uncoupled conditions, a first wall means defining a first passage through said female member, a second wall means defining a second passage through said male member, said first passage having formed in said wall means a shoulder defined by first and second radially spaced and axially extending surfaces and first and second axially spaced and radially extending surfaces, said male member having a first end portion residing in said first passage of said female member in said coupled condition and permitting flow of fluid through said first and second passages, said first end portion of said male member having an external surface spaced from said first axially extending surface and close to said second axially extending surface in said coupled condition, said external surface and said first axially extending and radially extending surfaces defining an annularly extending space, an annularly extending and in cross section generally rectangularly shaped sealing member residing in said annular space, said sealing member having inner and outer circumferentially extending surfaces lying adjacent said external surface and first axially extending surface respectively, said sealing member having first and second end surfaces with said first end surface being adjacent said first radially extending surface, an annularly extending retainer member having first and second axially spaced end surfaces with said first axially spaced end surface abutting said second end surface of said sealing member to hold said sealing member in said annular space, a first wall extending into said first end surface of said sealing member defining a first cavity facing said first radially extending surface and creating a generally C-shaped appearance in cross section, said first cavity forming first and second leg members in said first end surface of said seal, said first and second leg members of said first cavity urge said inner and outer circumferentially extending surface of said seal into engagement with said external surface of said male member and said first axially extending surface of said female member, respectively, upon the application of pressure within said coupler, a second wall extending into said outer circumferentially extending surface of said sealing member defining a second cavity facing said first axially extending surface and creating a generally U-shaped appearance in cross section, said second cavity residing intermediate said first and said second end surfaces, said second cavity defining third and fourth legs: said third and fourth legs or said second cavity urge said first end surface of said seal against said first radially extending surface of said female member and said second end surface of said seal against said retainer upon the application of pressure externally to said coupler, and, said sealing member being constructed of a polymeric elastomeric material having a tensile strength of at least 5000 psi, a flexural modulus of elasticity of at least 300,000 psi and having a high chemical resistance to acids, alkalis, hydrocarbons, ketones, ethers, esters, alcohols and salt solutions.

5,556,140
DOOR HANDLE ASSEMBLY WITH EMERGENCY-UNLOCKING FUNCTION
Kouichi Sakagami, Tokyo, Japan, assignor to Takigen Manufacturing Co. Ltd., Tokyo, Japan
Filed Feb. 3, 1994, Ser. No. 191,809
Claims priority, application Japan, Mar. 1, 1993, 5-013636 U
Int. Cl.[6] E05B *65/10;15/02*
U.S. Cl. 292—92 **5 Claims**



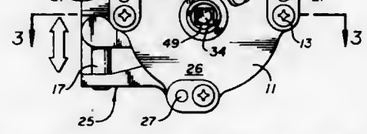
1. A handle assembly with an emergency-unlocking function, comprising:
- a handle unit (**3**) fixedly mounted on a door (**4**), said handle unit (**3**) being operated by swingably operating a handle (**1**) to slidably move a latch bar (**2**) back and forth;
- a lock (**5**) for preventing said handle (**1**) from being swingably operated and for preventing said latch bar (**2**) from slidably moving back and forth, said lock (**5**) being fixedly mounted in said bandle unit (**3**);
- a socket-member casing (**6**) for receiving a front-end portion of said latch bar (**2**) therein said socket-member casing (**6**) being fixedly mounted on a stationary frame element (**7**);
- a socket member (**8**) which is engagable with and disengageable from said front-end portion of said latch bar (**2**) and which is pivoted to side walls (**10**) of said socket-member casing (**6**) through a vertical pivot (**9**) so as to be swingable back and forth;
- a pedal casing (**11**) fixedly mounted on said stationary frame element (**7**) behind said socket-member casing (**6**);
- a manually-operated pedal (**12**) pivoted to said pedal casing (**11**) through a first horizontal pivot (**13**);
- a holding rod (**14**) having its base-end portion pivoted to one end portion of said manually-operated pedal (**12**) through a second horizontal pivot (**15**), said manually-operated pedal (**12**) being provided with a depressing portion (**21**) in its another end portion which is diametrically opposed to said one end portion on said first horizontal pivot (**13**), said holding rod (**14**) perpendicularly penetrating said stationary frame element (**7**) and having its front-end surface (**18**) abutted against a stop portion (**19**) of said socket member (**8**), said stop portion (**19**) being provided behind said vertical pivot (**9**); and
- a spring (**20**) for biasing said pedal (**12**) and said holding rod (**14**) into said socket-member casing (**6**) in a slidable manner, said spring (**20**) being disposed between said pedal casing (**11**) and said manually-operated pedal (**12**), whereby the door (**4**) can be opened by depressing the manually-operated pedal (**12**) pivoted at (**15**) and thereby withdrawing said holding rod (**14**) from contact with the stop portion (**19**) of said socket member (**8**).

5,556,141
CABINET DOOR LATCH
Charles Rogers, 9947 Wish Ave., Northridge, Calif. 91325
Filed Sep. 12, 1995, Ser. No. 526,998
Int. Cl.[6] E05C *19/10*
U.S. Cl. 292—99 **4 Claims**



1. A cabinet door latch for retaining a cabinet door closed comprising:
- a rigid element mounted on the inside of said cabinet door,
- said rigid element having one end attached to said cabinet door and a free end,
- said free end having a hook-shaped portion,
- a resilient element having one end attached to a floor of a cabinet and a free end,
- said free end having a hook-shaped portion,
- said hook-shaped portions interengaging to maintain said cabinet door in a closed position,
- means extending through said floor of said cabinet for releasing said hook-shaped portions so said cabinet door may be opened.

5,556,142
ROTARY HOOK TENSION-SHEAR LATCH
Frank A. Zankich, San Pedro, Calif., assignor to Hartwell Corporation, Placentia, Calif.
Filed Apr. 13, 1995, Ser. No. 421,749
Int. Cl.[6] E05C *19/10;5/00*
U.S. Cl. 292—101 **9 Claims**



9. A latch and keeper combination for joining one member to another member under tension and shear loading, including:
- a keeper for attaching to one member and having a bracket with an eye bolt and a bushing included therein; and
- a latch for attaching to another member and having a housing with a cover and a hook, a lever and a shear pin included therein;
- with said hook and lever rotatably mounted in said housing for rotation about an axis;
- said hook having an arcuate finger for engaging said keeper eye bolt;
- with said shear pin mounted in said housing for sliding into and out of said keeper bushing, and first means for interengaging said lever and pin for driving said pin by said lever;

said hook and lever having second interengaging means for rotation of said lever by said hook to a closed position to

said pivoting means from the outer side of the door, and means for lockingly securing said operating means to prevent unauthorized

said biasing means when the rod is moved inwardly so as to

5,556,146

said hook and lever having second interengaging means for rotation of said lever by said hook to a closed position to engage said shear pin with said bushing when said hook engages said eye bolt, and having third interengaging means for rotation of said lever by said hook to an open position to disengage said shear pin from said bushing when said hook disengages said eye bolt;

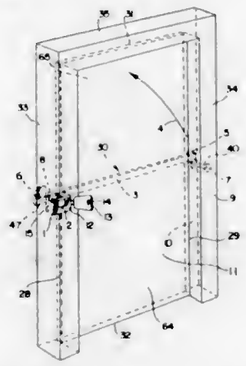
a plunger carried in said housing for translation along said axis, and a spring in said housing for urging said plunger outward along said axis,

said plunger and hook having fourth interengaging means for locking said hook in said closed position, said fourth interengaging means including a projecting tab on said plunger and a notch in said hook for receiving said tab when said spring is compressed, said plunger being of a length to project beyond said hook when in said open position, and with the engagement of said tab in said notch preventing said plunger from projecting beyond said hook;

said lever including first and second projecting bosses and said hook having a throat and a shoulder, with said hook throat engaging said first boss to move said pin into said bushing, and with said hook shoulder engaging said second boss to move said pin out of said bushing,

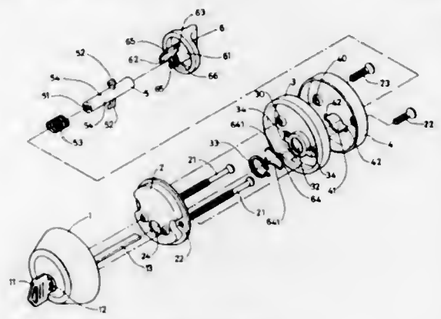
said hook including a first sleeve projecting along said axis in a first direction, said first sleeve having angularly spaced shoulders projecting parallel to said axis and defining said notch therebetween, and said hook including a second sleeve projecting along said axis in a direction opposite to said first direction for slidingly receiving said plunger, and an internal axial opening for receiving a rotation drive tool which also depresses said plunger to compress said spring.

5,556,143
DOOR SECURITY APPARATUS
Joseph N. Robinson, 158 Eaton St., Buffalo, N.Y. 14208
Division of Ser. No. 230,604, Apr. 21, 1994, abandoned. This application Mar. 20, 1995, Ser. No. 406,633
Int. Cl.[6] B05C *19/00*
U.S. Cl. 292—302 **8 Claims**



4. In combination with a door having outer and inner sides and a pair of parallel edges and a door frame having a pair of parallel portions disposed adjacent the parallel edges respectively when the door is closed, said door being hingedly connected along one of said parallel edges to one of said parallel portions of said door frame, apparatus for securing the door against forced entry comprising a bar sized to extend, in a first position, across the width of the inner side of the door and having end portions to extend beyond said door edges respectively, means for holding said bar end portions against said frame portions respectively to counteract a force applied to the outer side of the door during an attempted forced entry, means for pivoting said bar to a second position clear of the door so that the door can be opened, means for operating said pivoting means from the outer side of the door, and means for lockingly securing said operating means to prevent unauthorized persons from operating said pivoting means, wherein said bar holding means comprising a first bracket having a first portion attached to said one frame portion, a second portion extending normal to said one frame portion, and a third portion extending downwardly from said second portion and spaced from said first portion to receiving one of said bar end portions between said third portion and said one frame portion, said bar holding means further comprising a second bracket having a first portion attached to the other of said frame portions, a second portion extending normal to said other frame portion, and a third portion extending upwardly from said second portion of said second bracket and spaced from said first portion of said second bracket to receive the other of said bar end portions between said second bracket third portion and said other frame portion, and wherein said pivoting means comprises a handle attached to said one bar end portion and extending through said one frame portion to effect pivoting movement of said bar to a vertical position with said other bar and portion moving upwardly from said second bracket, the combination further comprising spring means for holding said handle in a position so that said bar is in said second position when the door securing apparatus is not in use.

5,556,144
AUXILIARY DOOR LATCH HAVING A LOCKING DEVICE
Jui-Chang Lin, Kaohsiung Hsien, Taiwan, assignor to Taiwan Fu Hsing Industrial Co., Ltd., Kaohsiung Hsien, Taiwan
Filed Jun. 29, 1994, Ser. No. 267,357
Int. Cl.[6] E05B *3/00*
U.S. Cl. 292—336.3 **3 Claims**



1. An auxiliary door latch comprising:

a base plate for securing to a door panel;

a spindle extended through said base plate for engaging with and for actuating a latch bolt;

a board secured to said base plate and including an aperture formed therein, at least one cavity formed beside said aperture;

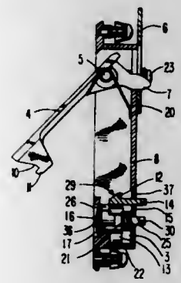
a rotatable knob including a tube extended through said board and extended toward said base plate, said tube including at least one slot formed therein, said slot including a depression formed therein distal to said base plate;

a rod axially slidably engaged in said tube and including a first end having a channel formed therein for slidably engaging with said spindle and arranged such that said spindle and said rod rotate in concert, said rod including a second end extending outward of said knob for moving the rod inwardly in said tube by depressing the second end of the rod, at least one leg extended radially from said rod for engaging with said slot and said depression of said tube, said leg being rotated to align with said cavity of said board when said knob is rotated;

means for biasing said leg away from said base plate, said leg being forced to engage with said cavity of said board against said biasing means when the rod is moved inwardly so as to prevent said rod from rotating relative to said board; and

means for catching said tube to said rod so as to prevent said rod from moving outward of said knob.

5,556,145
PUSH BUTTON-OPERATED FLUSH TYPE HANDLE ASSEMBLY
Kunihiko Takasaki, Tokyo, Japan, assignor to Takigen Manufacturing Co. Ltd., Tokyo, Japan
Filed Jul. 10, 1995, Ser. No. 500,345
Claims priority, application Japan, Aug. 12, 1994, 6-212127
Int. Cl.[6] E05B *3/00*
U.S. Cl. 292—336.3 **4 Claims**



1. A push button-operated flush type handle assembly, characterized in that:

a casing (**1**) is provided with a concave housing (**2**) and a guide hole (**3**) adjacent to said concave housing (**2**);

a projectable and retractable handle body (**4**) pivotally mounted in said concave housing (**2**) through a cross pivot (**5**), and swingably urged by a first spring (**20**) in a projecting direction;

said handle body (**4**) being further provided with a first operating projection (**7**) which projects rearward from a rear side of said handle body (**4**) for rotatably driving a lock plate (**6**);

a first escape hole (**9**) provided in a bottom wall (**8**) of said casing (**1**) to permit said first operating projection (**7**) to pass therethrough;

a push button (**16**) mounted in said guide hole (**3**);

a latch element (**29**) fitted to said push button (**16**) is also mounted in said guide hole (**3**);

said latch element (**29**) being slidably urged toward said cross pivot (**5**) by a second spring (**22**);

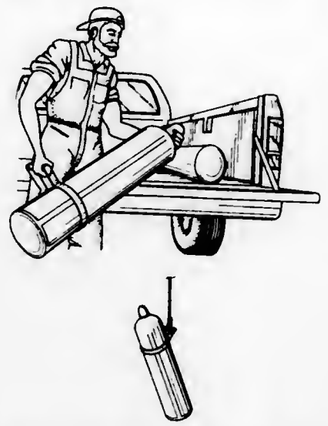
a locking projection (**12**), which is engaged with and disengaged from a receiver projection (**11**) of said handle body (**4**) and is provided in a front end of said latch element (**29**);

said latch element (**29**) being provided with a second operating projection (**14**) in a rear side to have said second operating projection (**24**) project rearward from said rear side;

a second escape hole (**15**) provided in said bottom wall (**8**) of said casing (**1**) to permit said second operating projection (**14**) to pass therethrough; and

a first oblique cam surface (**18**), which abuts on a second oblique cam surface (**19**) of said latch element (**29**), provided in said push button (**16**).

5,556,146
CYLINDER GRIP
Robert E. Kirk, 641 Hwy. 12E, Townsend, Mont. 59644
Filed May 10, 1995, Ser. No. 438,560
Int. Cl.[6] B65D *63/18;* **B65G** *7/12*
U.S. Cl. 294—31.1 **10 Claims**



1. An apparatus combination of a grip and a lifting member selected from the group consisting of a hand, a hook, a chain, and combinations thereof for lifting and carrying a gas cylinder, comprising:

a substantially circular and flat band hoop having bent end portions extending outward;

a handle rigidly attached to the hoop at said end portions and lying in a plane described by said band hoop;

the diameter of the band hoop being dimensioned and configured to be slightly larger than the diameter of a gas cylinder to be gripped, lifted and carried, such that, when slightly tilted as by grasping the handle by a member, the grip's hoop is caused to cant to tightly and frictionally engage the cylinder to be carried; and

the handle affixed to said hoop is spaced apart a distance from the band hoop, whereby a substantial gap for insertion of a lifting member is provided to facilitate secure grasping of said grip;

whereby, after carrying of the cylinder, said grip's band hoop is canted again to its initial position with said gas cylinder and easily slipped off the gas cylinder.

5,556,147
WAFER TRAY AND CERAMIC BLADE FOR SEMICONDUCTOR PROCESSING APPARATUS
Sasson Somekh, Los Altos Hills; Kevin Fairbairn, Saratoga; Gary M. Kolstoe, Fremont; Gregory W. White, San Carlos, and W. George Faraco, Jr., Saratoga, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.
Division of Ser. No. 205,711, Mar. 3, 1994, which is a continuation-in-part of Ser. No. 93,236, Jul. 15, 1993, abandoned. This application May 10, 1995, Ser. No. 438,328
Int. Cl.[6] B25J *15/06*
U.S. Cl. 294—64.1 **9 Claims**

9. A composite ceramic blade for holding a substrate, wherein said blade can withstand substrates of varying temperature, comprising:

(a) an upper ceramic layer having an upper and a lower surface;

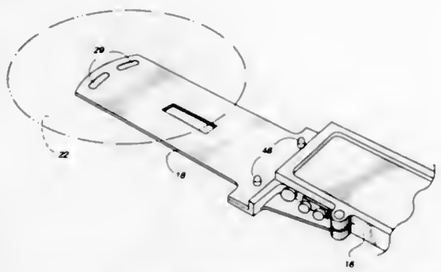
(b) a lower ceramic layer having an upper surface permanently attached to said lower surface of said upper ceramic layer;

(c) at least one integral passageway formed within said composite ceramic blade by forming a channel in one of said surfaces permanently attached to one another, such that the channel

a hook portion having an upper U-shaped piece, the U-shaped

5,556,150
MULTIPURPOSE PROBE

5,556,152
TAILGATE



formed in said one surface cooperates with the surface attached thereto to form said integral passageway within said ceramic blade;

(d) at least one port defined in and extending through at least one of said layers and in communication with said at least one integral passageway for transmitting a vacuum to said integral passageway; and

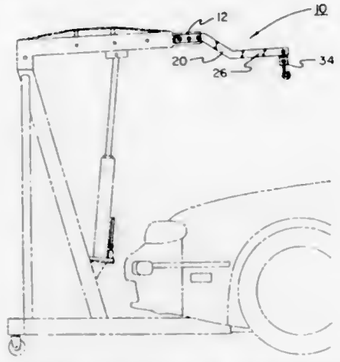
(e) one or more apertures in said upper ceramic layer adjacent to a leading edge of said blade and extending from said upper surface of said upper ceramic layer through said upper ceramic layer to said integral passageway, and spaced from said port, to thereby provide a vacuum at said one or more apertures, so as to render said blade capable of retaining a substrate placed over said one or more apertures.

5,556,148

ATTACHMENT DEVICE FOR MOTOR CRANES

Richard L. Skinner, 4230 E. Pakes Rd., Stanton, Mich. 48888

Filed Sep. 28, 1994, Ser. No. 314,096
Int. Cl.[6] B60P *1/48*; **B66C** *1/10*
U.S. Cl. 294—67.1 **2 Claims**



1. An attachment device for motor cranes for attaching to an arm of a motor crane to facilitate lifting engines out for repair or replacement comprising, in combination:

a securement portion having a first end and a second end, the first end having a plurality of apertures formed therethrough, the apertures aligning with apertures formed in the motor crane for securement thereto;

an intermediate portion having a first end and a second end, the first end of the intermediate portion integral with the second end of the securement portion, the intermediate portion extending downwardly from the securement portion;

an extension portion having a first end and a second end, the first end of the extension portion integral with the second end of the intermediate portion, the second end of the extension portion having an aperture formed therethrough;

a hook portion having an upper U-shaped piece, the U-shaped piece having two upwardly extending portions and a lower portion therebetween, the two upwardly extending portions having an aperture formed therethrough, the aperture of the two upwardly extending portions aligning with the aperture formed through the second end of the extension portion and pivotally coupled therewith by a nut and bolt, the lower portion having an aperture formed therethrough, a lower U-shaped piece having two downwardly extending portions and an upper portion therebetween, the upper portion having an aperture formed therethrough, the aperture of the upper portion aligning with the aperture formed in the lower portion of the U-shaped piece and rotatably coupled therewith by a double bolt, the two downwardly extending portions having an aperture formed therethrough, a hook having a securement end and a hooked end, the securement end having an aperture formed therethrough, the aperture of the securement end aligning with the aperture formed through the two downwardly extending portions of the lower U-shaped piece and pivotally coupled therewith by a nut and bolt;

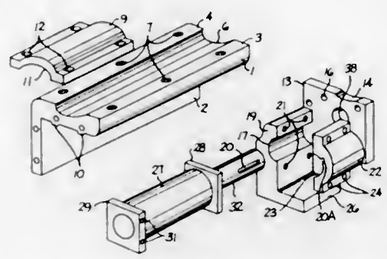
a chain securement portion having a plurality of chain links theresecured, the chain securement portion coupling with the hooked end of the hook of the hook portion, the plurality of chain links having an engine support portion thereattached, the engine support portion securable to the engine.

5,556,149

GRIPPER DEVICE

Fred C. Eicher, Prospect; Charles F. Evans, Jr., and Charles F. Evans, III, both of Louisville, all of Ky., assignors to Turn-Act, Inc., Louisville, Ky.

Filed Jul. 13, 1994, Ser. No. 274,421
Int. Cl.[6] B66C *1/10*
U.S. Cl. 294—104 **7 Claims**



1. A rotary clamping device for mounting on a support arm, comprising:

a rotary actuator, including first and second heads and a rotary output shaft extending through one of said heads, said output shaft having a free end;

an L-shaped base including first and second legs, each of said legs having an inner surface and an outer surface, wherein said rotary actuator is mounted on said base adjacent to the inner surfaces of said legs, and wherein the outer surface of said second leg defines a first elongated recess;

an elongated clamp plate defining a second elongated recess and removably fastened to the outer surface of said second leg opposite said first elongated recess for connecting said base to a support arm;

an end plate mounted on said base and supporting the free end of said output shaft; and

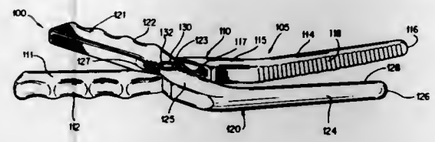
a gripping arm mounted on said rotary output shaft for rotation with said rotary output shaft.

5,556,150

MULTIPURPOSE PROBE

Stuart Ampel, Boca Raton, Fla., assignor to Ampel Probe Corporation, Boca Raton, Fla.

Continuation-in-part of Ser. No. 267,473, Jun. 28, 1994, abandoned. This application Oct. 14, 1994, Ser. No. 323,231
Int. Cl.[6] B25B *7/02*
U.S. Cl. 294—118 **15 Claims**



11. A method for searching a hidden location on the person of a suspect for an object and removing the object, comprising the steps of: inserting into the hidden location a probe having first and second

probe elements, each of said probe elements having a handle portion and a jaw portion;

detecting the object by contact with said jaw portions;

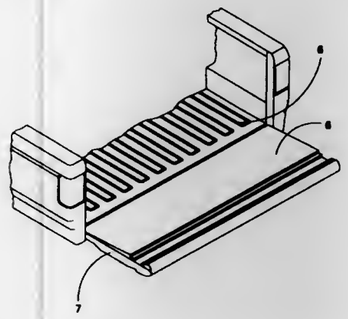
grasping the object between said jaw portions; and removing the object from the hidden location.

5,556,151

TAILGATE RULER AND FIXTURING DEVICE

Daniel D. New, and William G. New, both of P.O. Box 881-170, Conroe, Tex. 77301

Continuation of Ser. No. 240,325, May 10, 1994, abandoned. This application Jun. 5, 1995, Ser. No. 460,849
Int. Cl.[6] B60R *13/01*
U.S. Cl. 296—39.2 **4 Claims**



3. A material fixturing device comprising:

a body, said body including scalar demarcations along its length and a channel formed within said body; said channel comprising at least one pair of opposite sidewalls having a separation distance corresponding to the width of material which is to be secured between said sidewalls;

fixturing means wherein lumber and Other building materials may be restrained; and

fastening means whereby said body may be fastened to a structure on a mobile container;

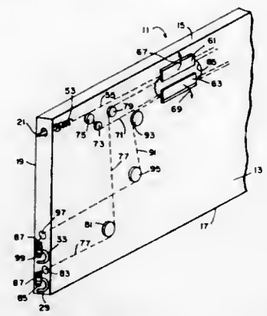
the material fixturing device being integrally formed on the inside surface of the tailgate of said mobile container, said inside surface facing the interior of the cargo storage area of said mobile container when in the closed position.

5,556,152

TAILGATE

Charles L. Dunlap, deceased, late of Arlington, Tex., and by Lauriene D. Dunlap, legal representative, 6110 Pleasant Ridge Rd., Apartment 3398, Arlington, Tex. 76016

Filed Sep. 11, 1995, Ser. No. 526,389
Int. Cl.[6] B62D *33/03*
U.S. Cl. 296—57.1 **4 Claims**



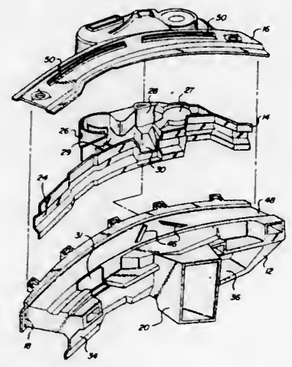
1. A tailgate assembly apparatus, comprising a tailgate mount connected to a truck and a tailgate connected to the tailgate mount, the tailgate having a pair of latches mounted on the tailgate near an upper edge and mounted on the mount near the upper edge, a first pair of disconnectable hinges mounted on the tailgate near a lower edge and mounted on the mount near a lower end of the mount, a second pair of disconnectable hinges mounted on the tailgate above the first pair of hinges and mounted on the mount above the first pair of hinges and near a bed of the truck, means for unlatching the first pair of latches and disengaging the first pair of hinges and rotating the tailgate inward in the mount against a bed of the truck, and for unlatching the pair of latches and disengaging the second pair of hinges and rotating the tailgate outward.

5,556,153

INSTRUMENT PANEL ASSEMBLY

Josh Kelman, Dover, and Lee E. Gridley, Ossipee, both of N.H., assignors to Davidson Textron Inc., Dover, N.H.

Filed Oct. 14, 1994, Ser. No. 323,007
Int. Cl.[6] B62D *25/08*
U.S. Cl. 296—70 **3 Claims**



1. An instrument panel assembly for use in an automobile having a heating, ventilating, and air conditioning system comprising:

an instrument panel carrier of one piece molded plastic construction,

a front of dash panel of one piece molded plastic construction

truck bed cover comprising a frame section comprising plurality of rigid frame members; and a flexible tarpaulin section

5,556,158

a front of dash panel of one piece molded plastic construction having a lower housing part having portions for supporting components of the heating, ventilating and air conditioning system, and

a top panel of one piece molded plastic construction having an upper housing part,

one of said panels having a duct close out member,

one of said panels having air outlets, and

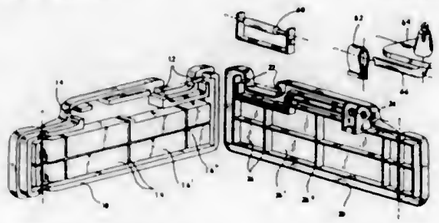
the instrument panel carrier, the front of dash panel and the top panel being secured to each other so that the upper and lower housing parts cooperate to provide a housing for the components of the heating, ventilating, and air conditioning system and so that the duct close out member cooperates with the instrument panel carrier to provide an air distribution duct that communicates with the housing and the air outlets.

5,556,154

VISOR WITH TWO-PART CORE

Francis Vaxelaire, Vesoul, France, assignor to Gebr. Happich GmbH, Germany

Filed Oct. 25, 1994, Ser. No. 328,862
Int. Cl.[6] B60J *3/00*
U.S. Cl. 296—97.1 **11 Claims**



1. A visor core comprising:

a first core half and a second core half each formed of a thermoplastic material, the first core half being a completely separate element from the second core half whereby before being joined together, the core halves are unattached;

each of the first and second core halves having a respective inner surface facing toward the other inner surface of the other core half and each core half also having a respective opposite outer surface;

the separate core halves being joined together with their inner surfaces engaged;

first aligning members disposed over substantially the entire surface of the inner surface of the first core half;

second aligning members located on the inner surface of the second core half and the second aligning members being shaped for engaging with the first aligning members for aligning the second core half relative to the first core half;

wherein when the separate first and second core halves are joined together, the core halves are aligned by the engagement of the first aligning members with the second aligning members.

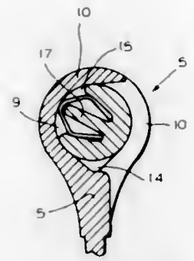
5,556,155

BEARING DEVICE, IN PARTICULAR FOR PIVOTALLY MOUNTED SUN VISORS IN VEHICLES

Patrick Welter, La Chambre, France, assignor to Gebr. Happich GmbH, Germany

Filed Jul. 27, 1995, Ser. No. 508,346
Claims priority, application Germany, Aug. 2, 1994, 44 27 445.9
Int. Cl.[6] B60J *3/02*
U.S. Cl. 296—97.12 **6 Claims**

1. A bearing device for a pivotally mounted vehicle sun visor, wherein the sun visor includes a sun visor body;



the bearing device including,

a bearing shaft having an end for supporting the visor body,

a bearing body for inclusion in the sun visor body and around which the sun visor body can be swiveled between first and second positions; a plastic material reinforcement frame for inclusion in the sun visor body, and the bearing body being molded on the frame in the sun visor body;

the bearing body being shaped to define a bearing bore for receiving therein the end of the bearing shaft for supporting the sun visor, the bearing body comprising two rows of ribs for defining the bearing bore, wherein each row of ribs comprises at least two approximately semicircularly shaped individual ribs, and the ribs of each row being located in a line one next to the other and being spaced apart from each other defining gaps between adjacent ribs in the respective row, and the ribs of each row being so placed and shaped as to fill the gaps in the other row of ribs;

the bearing shaft being inserted in the bearing bore, the shaft including an axially extending groove therein and the groove including lateral groove walls in the bearing shaft for defining the groove;

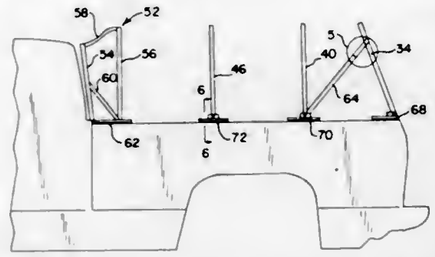
a U-shaped spring including legs which extend into the groove walls and the legs contact the walls of the groove and the spring extends over the length of the groove and contacting the groove walls, the spring having a web and the spring being loaded such that the web of the spring is urged outwardly from the groove and against the interiors of the ribs, for controlling the swiveling of the shaft with reference to the ribs of the bearing body which the spring engages.

5,556,156

FLEXIBLE COLLAPSIBLE UTILITY TRUCK BED COVER

Alan J. E. Kirk, R.D. #2, Box 533D, Rte. 982, Mt. Pleasant, Pa. 15666

Filed Oct. 1, 1993, Ser. No. 130,282
Int. Cl.[6] B60P *7/04; 3/34*
U.S. Cl. 296—100 **11 Claims**



1. In combination with a utility truck having an open bed with front and rear walls projecting upwardly from said bed and first and second lateral walls upwardly projecting from said bed and perpendicularly interposed between said front and rear walls, a

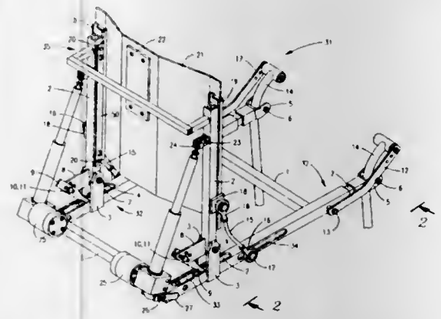
truck bed cover comprising a frame section comprising plurality of rigid frame members and a flexible tarpaulin section, said frame member having first and second terminal ends and being fixed at the first end to the first side wall of the bed and projecting upwardly then laterally then downwardly and being fixed at its second terminal end to the second lateral wall and said rigid frame members together supporting the flexible tarpaulin section, wherein each of the rigid frame members is segmented into a plurality of sections abutting end to end and wherein the plurality of rigid frame members includes a rearwardly positioned rear rigid frame member which is pivotally connected to the first and second lateral walls to pivot longitudinally in a vertical arc, respectively, at its first and second terminal ends and there is a supporting rigid frame member positioned adjacent to and longitudinally forward of the rear rigid frame member and from a point adjacent to where the supporting rigid frame member is connected to one of said lateral walls there is at least one arm means which extends to be connected to and support the rear rigid frame member.

5,556,157

NO-SHEAR POWER RECLINE SYSTEM FOR WHEELCHAIRS

Patrick L. Wempe, 204 NW Courtland, Topeka, Kans. 66606-1265

Filed Dec. 21, 1994, Ser. No. 360,571
Int. Cl.[6] A47C *1/02*
U.S. Cl. 297—68 **12 Claims**



5. An apparatus for attachment to a wheelchair, comprising:

at least one seat frame member;

at least one telescoping linkage slidably received within said seat frame member, said linkage telescoping between a retracted position configured to locate a forward end of said linkage immediately adjacent a forward edge of the seat frame member and an extended position configured to locate said forward end remote from the forward edge of the seat frame member, said linkage moving along a telescoping path parallel to a length of said seat frame member;

at least one leg rest supportably and pivotally mounted at a hinge point directly to said forward end of said telescoping linkage, said leg rest pivoting about said hinge point, said telescoping linkage moving said hinge point and said leg rest along said telescoping path to move said leg rest forward and backward in a direction parallel to said length of said seat frame member;

a back frame for supporting a back of a user, said back frame including a bottom end pivotally mounted to said seat frame member;

extension means for forcing said telescoping linkage to extend forward from said seat frame member; and

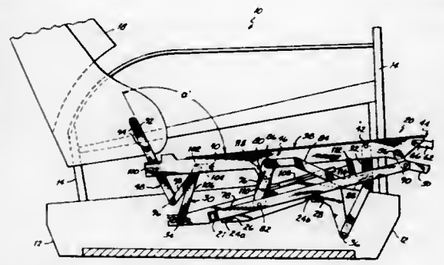
retraction means for forcing said telescoping linkage to retract rearward into said seat frame member.

5,556,158

MECHANISM FOR RECLINING FURNITURE

Glenn N. Wiecek, Shelbyville, Ky., assignor to L&P Property Management Co., Chicago, Ill.

Filed Jul. 19, 1994, Ser. No. 276,987
Int. Cl.[6] A47C *1/02*
U.S. Cl. 297—85 **21 Claims**



17. In a linkage mechanism for an item of reclining furniture having a seat, a footrest and a backrest movable between a fully upright position and a semi-reclined TV position, said mechanism including a seat link adapted to support said seat, a backrest link connected at a first predetermined angle to said seat link when in said fully upright position and adapted to support said backrest, a base mounting plate adapted to be connected to frame structure of said item of reclining furniture, and linkage connected between said seat link and said base mounting plate, said linkage including drive linkage connected with actuating linkage for moving said mechanism from said fully upright to said semi-reclined, TV position, wherein the improvement comprises:

a backrest control link operatively connected directly between said backrest link and a rear drive link of said drive linkage, said backrest control link and said rear drive link operative to pivot said backrest link from said first predetermined angle with respect to said seat link to a second, larger predetermined angle with respect to said seat link during movement of said mechanism from said fully upright position to said semi-reclined TV position and wherein the second, larger predetermined angle is maintained independent of a maintained application of rearward pressure on the backrest.

5,556,159

DEVICES FOR LOCKING THE ADJUSTABLE COMPONENTS OF VEHICLE SEATS IN POSITION IN THE EVENT OF A SHOCK

Joël Canteleux, Armenonville, France, assignor to Bertrand Faure Automobile "BFA", France

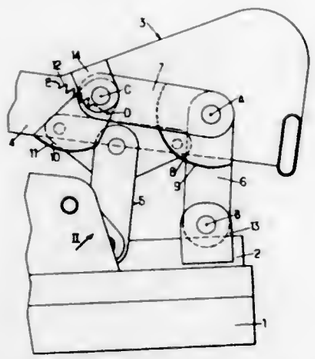
Filed Jul. 6, 1993, Ser. No. 85,942
Claims priority, application France, Jul. 3, 1992, 92 08243
Int. Cl.[6] B60N *2/42*
U.S. Cl. 297—216.1 **6 Claims**

6. A vehicle seat comprising two locking devices placed on respective sides of the seat, each of said devices including a flyweight suspended from an axis, responsive to deceleration of a vehicle, and disposed to lock a hinge once said deceleration exceeds a certain threshold, each of said devices further comprising a scissors linkage comprising first and second links having respective first ends pivotally mounted to each other about a first transverse horizontal axis, a second end of the first link being pivotally mounted about a second transverse horizontal axis linked to a support of a position-adjustable component of the vehicle seat, a second end of the second link being pivotally mounted about a third transverse horizontal axis disposed behind the first end of the second link and linked to the position-adjustable component, and a circular sector having a rough cylindrical surface centered on the first axis and secured to the first link, the flyweight being suspended from the third axis and including a rough cylindrical bearing surface eccentric relative to said third axis and suitable for

rearward urging means interposed between the seat member

5,556,162

a fifth straight tubular crossbar connecting said forepart of said



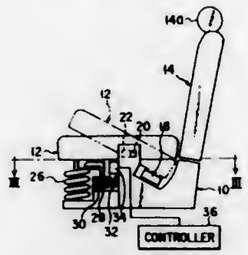
co-operating with a wedging effect with said cylindrical surface of the circular sector, and including a spring interposed between the position-adjustable component and the flyweight to urge the flyweight angularly rearwards while the spring is in a rest position and to urge the flyweight angularly forwards while the spring is in a locking position.

5,556,160

SEAT WITH USER PROTECTING MEANS

Tatuya Mikami, Crest Suehiro 302, 2-13-20, Suehiro, Ichikawa-shi, Chiba-ken, Japan

Filed Oct. 4, 1994, Ser. No. 317,873
Int. Cl.[6] B60N 2/42
U.S. Cl. 297—216.1 **4 Claims**



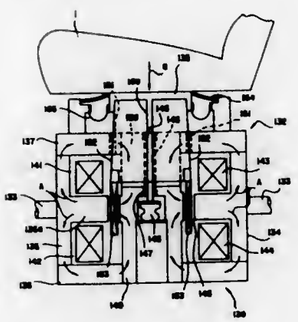
2. A seat with user protecting means comprising: a leg member;
a backrest member attached to the leg member so as to extend upward therefrom;
a seat member attached to the leg member so as to be rotatable between a seating position in which the seat member is arranged substantially horizontally and an inclined position in which at least a rear end portion of the seat member located on a backrest side of the leg member is arranged below a front end portion of the seat member located opposite to the rear end portion thereof; and
seat member rotation means for holding the seat member in the seating position and allowing the seat member to rotate selectively from the seating position to the inclined position, said seat member rotation means including:
rotational supporting means interposed between the seat member and the leg member at a position set back from the front end portion of the seat
member, supporting the seat member so as to be rotatable with respect to the leg member, and allowing the seat member to move in back and forth directions of the seat with respect to the leg member;
rearward urging means interposed between the seat member and the leg member and urging the seat member in a backward direction of the seat with respect to the leg member;
rotational urging means interposed between the seat member and the leg member at a position located between the front end portion of the seat member and a rotation center of the seat member with respect to the leg member; and
seating position retaining means adapted to engage with one of the seat member in the seating position and the rotational urging means, thereby holding the seat member in the seating position, and to be disengaged with one of the seat member in the seating position and the rotational urging means, thereby allowing the seat member to rotate from the seating position to the inclined position by the urging force of the rotational urging means, when an impact force is applied to the seat and the seat member moves forward for a predetermined distance by the force of inertia against the urging force of the rearward urging means.

5,556,161

APPARATUS FOR VIBRATING SEATS

Masahiro Fukuoka, Aichi, Japan, assignor to Fukuoka Kagaku Ltd., Nishikamo-gun, Japan

Division of Ser. No. 194,356, Feb. 10, 1994, which is a continuation-in-part of Ser. No. 987,481, Dec. 4, 1992, Pat. No. 5,348,370. This application Dec. 19, 1994, Ser. No. 358,244
Int. Cl.[6] A47C 31/00
U.S. Cl. 297—217.3 **1 Claim**



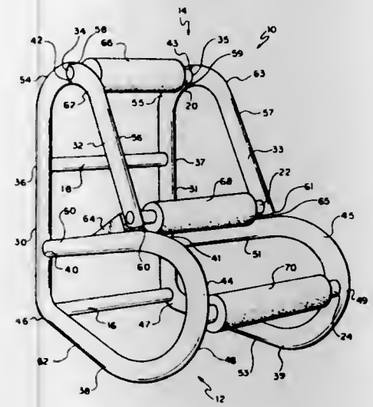
1. An apparatus for vibrating a seat comprising:
a driver's seat;
means for vibrating said driver's seat; and
means for controlling vibration of said means for vibrating the driver's seat,
wherein means for vibrating said driver's seat includes an iron core installed under said driver's seat, a support body for supporting said driver's seat, an elastic body elastically supporting a lower end of said support body and installed on said iron core, annular spaces formed in upper and lower ends of said iron core, an annular exciting coil arranged concentrically in each of said annular spaces, a cavity in each of said exciting coils and connecting said annular spaces, at least an annular driving coil installed in a cavity for freely sliding vertically, a bore extending downward from the upperside of said iron core into an upper annular space of both annular spaces of said upper and lower ends of said iron core, a connecting piece in said bore and said upper annular space and connecting the upper part of said support body and said annular driving coil and means for supplying direct current to said exciting coils, and supplying alternating current to said annular driving coil so that said annular driving coil may be vertically vibrated.

5,556,162

CHILD SEAT PROTECTION DEVICE

Roger A. Raffini, 10 Sunset Hill Rd., Georgetown, Conn. 06829

Filed Sep. 5, 1995, Ser. No. 523,468
Int. Cl.[6] A47C 1/08
U.S. Cl. 297—256.15 **12 Claims**



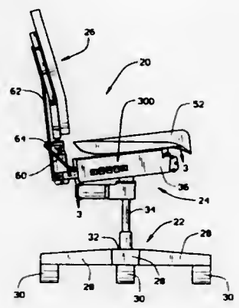
10. A protective device for surrounding a child in a child seat, the device comprising: a framework defining an interior space, said framework including;
a right side part and a left side part, each said side part including,
a primary tubular member having a first end and a second end, said primary member forming a planar shape, said shape including a straight back portion and a bottom portion, said first end attached to said back portion to form a loop in said bottom portion, said loop including a curved corner below said first end and a curved forepart opposite said curved corner, said bottom portion further including a straight top segment connecting said curved forepart to said first end and a straight bottom segment connecting said curved forepart to said curved corner, said curved corner maintaining an obtuse angle between said straight back portion and said straight bottom segment, said straight back portion connecting said curved corner with a curved back top portion, and said curved back top portion terminating at said second end,
a secondary tubular member having a top end and a bottom end, said secondary member forming a straight front portion below a curved front top portion, said straight front portion terminating at said bottom end, said curved front top portion terminating at said top end, said curved front top portion pivotally attached to said curved back top portion of said primary member, and
a triangular stop projecting from said straight top segment of said primary member, said triangular stop preventing said bottom end of said secondary member from nearing said straight back portion of said primary member;
a first straight tubular crossbar connecting said curved corner of said right side part with said curved corner of said left side part;
a second straight tubular crossbar connecting said straight back portion of said right side part with said straight back portion of said left side part;
a third straight tubular crossbar connecting said curved back top portion of said right side part with said curved back top portion of said left side part, said third straight tubular crossbar encircled by a cylindrical pad;
a fourth straight tubular crossbar connecting said bottom end of said right side part with said bottom end of said left side part, said fourth straight tubular crossbar encircled by a cylindrical pad; and
a fifth straight tubular crossbar connecting said forepart of said right side part with said forepart of said left side part, said fifth straight tubular crossbar encircled by a cylindrical pad.

5,556,163

AUTOMATICALLY ADJUSTABLE OFFICE AND TASK CHAIRS

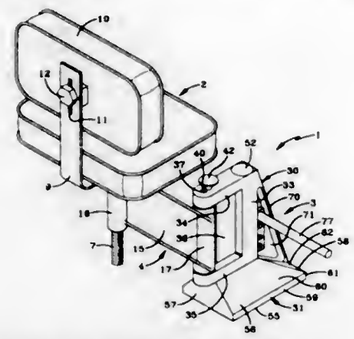
M. Weldon Rogers, III, St. Louis, Mo.; Bruce E. Bogart, Greenville, Ind.; David L. Gerke, Blytheville, Ark.; Robert A. Eberle, Kansas City, Mo., and Craig Thomas, Osceola, Ark., assignors to EAC Corporation, St. Louis, Mo.

Filed Aug. 17, 1994, Ser. No. 272,923
Int. Cl.[6] A47C 3/40
U.S. Cl. 297—330 **13 Claims**



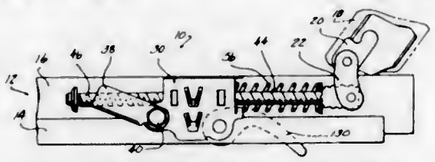
1. A cordless, power-adjustable office or task chair comprising:
a chair base;
an adjustable column supported on the chair base, comprising telescoping upper and lower members;
a bottom plate mounted on the adjustable column;
a top plate hingedly mounted to the bottom plate generally at the front of the chair for tilting forwardly and rearwardly with respect to the bottom plate;
a seat slidably mounted on the top plate for sliding movement in the forward and rearward directions with respect to the top plate;
a bracket extending rearwardly and upwardly from the top plate, and a back support strap hingedly mounted to the bracket for pivoting forwardly and rearwardly about a generally horizontal axis, and a chair back slidably mounted on the support strap for axial movement with respect to the support strap;
a seat height adjustment mechanism, including an electric motor, for moving the upper and lower members of the adjustable column relative to each other to raise and lower the height of the seat;
a seat tilt adjustment mechanism, including an electric motor, for moving the top plate relative to the bottom plate to adjust the angle of tilt of the seat;
a seat position adjustment mechanism, including an electric motor, for moving the seat relative to the top plate;
a back tilt adjustment mechanism, including an electric motor, for moving the back support strap to tilt the chair back forwardly and rearwardly;
a back height adjustment mechanism, including an electric motor, for moving the back axially with respect to the back support strap; and
a seat height switch for controlling the seat height adjustment mechanism, a seat tilt switch for controlling the seat tilt adjustment mechanism, a seat position switch for controlling the seat position adjustment mechanism, a back tilt switch for controlling the back tilt adjustment mechanism; and a back height switch for controlling the back height adjustment mechanism, each of the switches being positioned so as to be operable by a user seated on the chair.

5,556,164
PEDESTAL SEAT
Earl Cindea, 6024 Pine Creek, N. W., North Canton, Ohio 44720, and Thomas Farnsworth, P.O. Box 909, Hartville, Ohio 44632
Filed Oct. 12, 1994, Ser. No. 321,797
Int. Cl.[6] A47C *1/023*
U.S. Cl. 297—344.22 **16 Claims**



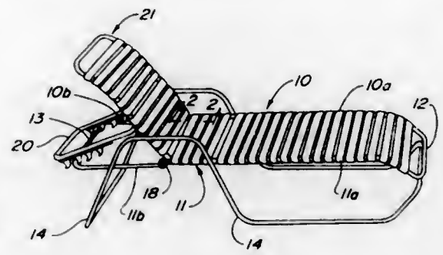
1. A pedestal seat including:
a pedestal having a base adapted to be attached to a support surface, and a column extending vertically upwardly from said base;
the base having a pair of ends whereby one of the base ends is inclined outwardly and downwardly from the column;
a seat;
a swing arm connected to the seat;
pivot means for pivotally mounting the seat in a cantilever fashion on the pedestal by the swing arm;
said column and pivot means being located in a vertical plane which extends through a center of the base with said base being symmetrical about said plane, when the pedestal is attached to the support surface;
a reinforcing flange extends between said one base end and the column and is located in the plane and
the column extending beyond an end of the base along said vertical plane.

5,556,165
INFINITELY ADJUSTABLE LINEAR ACTUATOR FOR VEHICLE SEAT
Joseph Pickles, 4861 Moonglow Dr., Troy, Mich. 48098
Filed Jun. 17, 1994, Ser. No. 262,044
Int. Cl.[6] B60N *7/22*
U.S. Cl. 297—362.14 **38 Claims**



1. A linear actuator for adjusting the position of one movable component relative to another component, the linear actuator comprising:
a threaded shaft;
a rotatable element having an internally threaded bore threadingly engaged with the shaft;
a housing having opposed ends, the housing disposed about the rotatable element;
first and second bearing means, mounted at the opposite ends of the housing, for providing bearing surfaces for the rotatable element, the first and second bearing means spaced apart to permit axial movement of the rotatable element therebetween into rotatable engagement with one of the first and second bearing means under axial loads on the shaft; and
means, mounted on the housing, for displacing the rotatable element from engagement with either of the first and second bearing means to a non-rotatable position disengaged from both of the first and second bearing means.

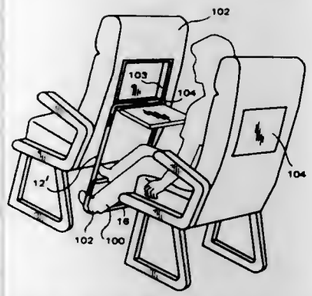
5,556,166
RECLINING BRACKET LOUNGE CHAIR
Blake Synnestvedt, Tempe, Ariz., assignor to Desert Craft Casual Furniture Co., Tempe, Ariz.
Filed Mar. 16, 1995, Ser. No. 406,037
Int. Cl.[6] B60N *2/02*
U.S. Cl. 297—377 **5 Claims**



1. In a lounge chair having a substantially rectangular base frame comprised of elongated side frame members and end members interconnecting the side frame members, said lounge chair further comprising an adjustable back support on the frame positioned at a location intermediate the end members, the back support being movable between a generally upright position and a reclined position;
said side frame members each being subdivided into a first raised portion and a second lowered portion, the first and second portions having axially opening receptacles facing generally towards each other;
means for connecting the back support to the side frame members comprising a fitting for each said frame member, each said fitting having a pair of axial projections disposed on parallel axes offset from each other and extending in opposite directions;
each of said axial projections of a fitting being fixedly secured within one of said facing receptacles, and hinge means for the back support comprising pivot pins passing through the receptacles of the first raised portions and the projections secured within the receptacles; and
the offset between the projections of each fitting being of sufficient magnitude to create a vertical clearance space between the back support and the second, lowered portions of the side frame members, said clearance space being sufficient to prevent injury to the fingers of a user of the lounge chair when the back support is moved to the reclined position.

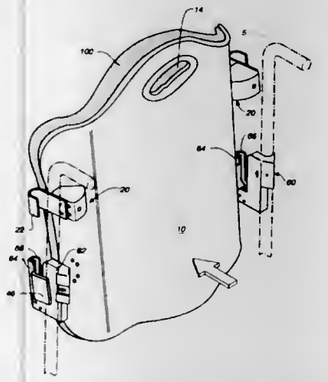
5,556,167
COLLAPSIBLE FOOT REST FOR SEAT BACKS
Helen F. Johnsoo Siemion, P.O. Box 423, Leavenworth, Wash. 98826
Filed Jun. 30, 1995, Ser. No. 497,543
Int. Cl.[6] A47C *7/52*
U.S. Cl. 297—423.15 **7 Claims**

1. A collapsible foot rest disposed to stuffing in a carry-on bag comprising



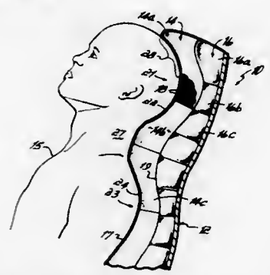
two flexible sides in parallel each with first and second ends and with a base rung joining side first ends forming a "U" shape with distal second ends mutually attached to form a closed loop, all exclusively of supple cord suitable for stuffing,
one or more additional spaced apart rungs of flexible, supple cord secured parallel to the base rung between the sides to optionally support a first foot on a rung at a selective height and a second foot on a rung at a different height, all also exclusively of supple cord suitable for stuffing,
pliant means for mutually attaching one distal second end to the other distal second end to form the closed loop such that the foot rest can hang from the closed loop.

5,556,168
WHEELCHAIR BACK SYSTEM
John C. Dinsmoor, III, Westminster; Barry Van Everen, Loveland; Michael W. Johnson, Lafayette, and Grant C. Denton, Boulder, all of Colo., assignors to Jay Medical Ltd., Boulder, Colo.
Filed Jun. 17, 1994, Ser. No. 261,529
Int. Cl.[6] A47C *7/42*
U.S. Cl. 297—440.2 **14 Claims**



1. A wheelchair back system for mounting to a pair of spaced apart vertical posts of a wheelchair back frame, comprising:
a relatively rigid shell member;
a pair of upper hooks attached to said shell member proximate opposite sides of said shell member and adapted to be supported by the vertical posts of the wheelchair back frame;
a pair of lower hooks attached to said shell member proximate opposite sides of said shell member and adapted to be supported by the vertical posts of the wheelchair;
a pair of mounting units adapted to be mounted on the vertical posts of the wheelchair and formed to receive and releasably secure at least one of said upper hooks and said lower hooks to said mounting units, said mounting units having a pawl arm and a retaining arm mounted for movement thereto and biased toward each other to positively lock one of said hooks therebetween, said pawl arm and said retaining arm being mounted for movement together in the same direction in a locked condition around said one of said hooks over a limited range of movement to prevent unintentional release of said one of said hooks from said mounting units during use of said wheelchair back system; and
said mounting units being further formed to produce relative displacement of said pawl arm and said retaining arm away from each other to automatically release said one of said hooks from said mounting units for removal of said shell member from the wheelchair back frame by displacement of said shell member substantially beyond said limited range of movement.

5,556,169
MULTI-LAYER CONFORMABLE SUPPORT SYSTEM
Milton E. Parrish, 587 Ibold Rd., Loveland, Ohio 45140, and Ethan J. Mesmer, 4582 Roxbury Cir. Apt., 1B, Batavia, Ohio 45103
Filed Jul. 15, 1994, Ser. No. 275,915
Int. Cl.[6] A47C *27/10*
U.S. Cl. 297—452.28 **25 Claims**



1. A multi-layer support system for conforming to and supporting an object comprising:
a first fluid-sealed layer containing a plurality of beads, the first layer comprising a plurality of compartments independently sealed from one another such that fluid may be introduced and evacuated from a first of the fluid-sealed first layer compartments independently from the fluid introduction and evacuation from a second of the first layer compartments, the beads being movable within compartments of the first layer when fluid is introduced to the first layer compartments and being inhibited from motion when an amount of the fluid is evacuated from the first layer compartments, the first layer compartments being conformable to the surface contours of an object placed thereon when fluid is introduced and the beads move freely within the first layer, whereby a rupture of said first compartment does not affect said second of the first layer compartments;
a second fluid-sealed layer adjacent the first layer and external to said first fluid-sealed layer, at least a portion of the second layer moving when fluid is introduced to the second layer, and the first and second layers being coupled together such that movement of a portion of the second layer operatively acts on a portion of said first layer externally of the first layer and causes movement of at least one of said first layer compartments to further conform said first layer;
a fluid supply system in communication with said first layer compartments, the fluid supply system being operable to introduce fluid into the compartments so that the first layer compartments independently conform to the surface contours of an object contacting the first layer, and further being operable to evacuate an amount of fluid from the conformed first layer compartments to inhibit the motion of the beads therein and set the first layer into a rigid contoured layer

5,556,173

which follows a portion of the object surface contours, the fluid supply system further in communication with the second layer to introduce fluid to the second layer and move the at least one first layer compartment toward the object to further conform the first layer compartment to the object surface contours;

whereby introducing fluid to the first layer compartments and second layer and evacuating fluid from the first layer compartments provides a rigid, contoured surface which supports the object safely and securely.

5,556,170

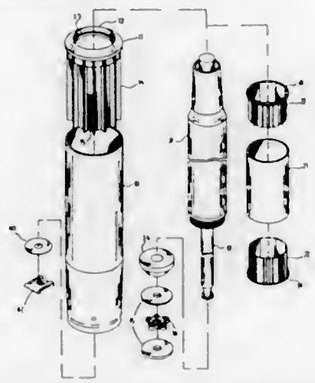
SLEEVE STRUCTURE OF AN OFFICE CHAIR

Yu-Shan Lai, No. 5-1, Hou Tsuo Tzu, and Kuan-Jen Lin, No. 784, I-Chiao St., both of Chia-I City, Taiwan

Filed Aug. 22, 1995, Ser. No. 517,967

Int. Cl.[6] A47C *15/00*

U.S. Cl. 297—463.1 **1 Claim**



1. A sleeve structure of an office chair, comprising a sleeve body, a steel circular tube, a pneumatic bar, a bar seat tube, a plastic pad, two washers, a plum blossom-shaped bearing plate disposed with steel balls and an extensible rod, said sleeve structure being characterized in that:

the sleeve body is a plastic hollow flexible member having a sleeve hole and an annular stopper at each of two ends thereof, multiple equally spaced axial ribs are arranged on the outer surface of the sleeve body and several equally spaced axial slits are formed on the sleeve body;

two polygonal plastic fitting members each respectively fitted in each of two ends of the steel circular tube to form an assembly, each fitting member of said two polygonal plastic fitting members having an annular stopper at an end thereof; and

the assembly being forcedly fitted into the sleeve hole of the sleeve body by a machine and locked between the stopper at each of the two ends of the sleeve body.

5,556,171

SEAT BELT BEZEL ASSEMBLY

Craig A. Busch, Armada, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Feb. 21, 1995, Ser. No. 392,377

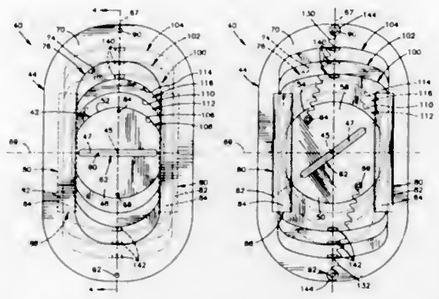
Int. Cl.[6] B60R *22/00;22/06*

U.S. Cl. 297—483 **22 Claims**

1. Apparatus comprising:

seat belt webbing;

bezel means for defining a slot through which said seat belt webbing is movable in a lengthwise direction, said bezel means having an axis parallel to said lengthwise direction; and



support means for supporting said bezel means for movement under the influence of said seat belt webbing in accordance with the size of a vehicle occupant wearing said seat belt webbing, said support means thus supporting said bezel means for sliding movement in opposite directions perpendicular to said axis and for rotation about said axis at any location of said bezel means within the range of said sliding movement.

5,556,172

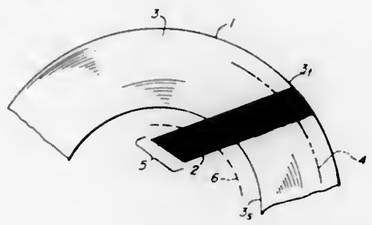
BRUSH SEAL BRISTLE CUTTING METHOD

Harold Howe, Orlando, Fla., assignor to Technetics Corporation, Deland, Fla.

Filed May 11, 1994, Ser. No. 240,555

Int. Cl.[6] A46D *1/08*

U.S. Cl. 300—21 **8 Claims**



1. In the manufacture of a brush seal, comprising a plate having a plurality of bristles joined to and projecting from an edge of the plate, wherein the free ends of the bristles are machined evenly and smoothly to provide enhanced sealing, said plate being held in-place during the machining operation,

the improvement which comprises, after said bristles are joined to the plate, infiltrating a liquid binder material into the linear interstices formed by said packed bristles, such that the interstices are filled with the liquid at least from said edge of the plate to a distance beyond the desired working length of the bristles,

causing the liquid to harden and form a rigid, monolithic composite of bristles and infiltrated binder material, and

machining the composite along a line defining the desired working length of the bristles.

5,556,173

DEVICE AND METHOD FOR TERMINATION AN AUTOMATIC BRAKING PROCESS IN MOTOR VEHICLES

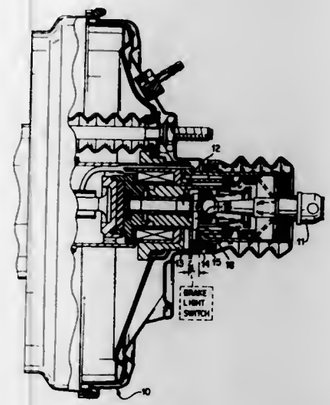
Manfred Steiner, Winnenden, and Christoph Steffl, Blaufelden, both of Germany, assignors to Mercedes-Benz AG, Germany

Filed Nov. 8, 1994, Ser. No. 337,443

Claims priority, application Germany, Nov. 8, 1993, 43 38 070.0

Int. Cl.[6] B60T *13/74*

U.S. Cl. 303—3 **11 Claims**



1. A device in a motor vehicle for terminating, upon fulfillment of a breaking-off criteria, an automatic braking process which has been triggered by a control unit as a function of brake pedal actuation, comprising a brake system in which a brake pedal force is transmitted via a pressure rod to a brake booster, a switching device having an actuation element and a switching element, wherein the switching element includes switch means actuatable via a common switching cam actuatable on by the actuation element for providing a make contact and a break contact, one of the actuation and switching elements of the switching device being rigidly connected to the pressure rod, and the other of the actuation and switching elements being arranged on a component movable only with respect to the pressure rod with a a predetermined amount of play, which component carries out, at least with a movement of the brake pedal in a direction of a rest position thereof, a relative movement with respect to the pressure rod within the predetermined amount of play, such that at least the relative movement causes a switching process of the switching element and the switching process is thus used as a breaking-off criterion of the automatic braking process.

5,556,174

ANTILOCK BRAKE SYSTEM

Helmut Wiss, Moeglingen, and Rolf Maier, Kernen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed May 5, 1995, Ser. No. 435,667

Claims priority, application Germany, May 6, 1994, 44 16 007.0

Int. Cl.[6] B60T *8/32*

U.S. Cl. 303—191 **4 Claims**

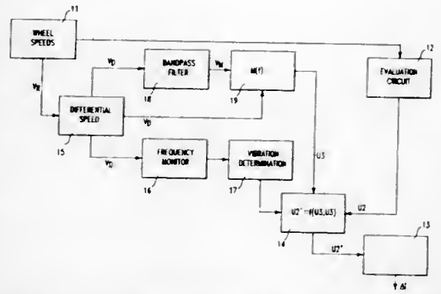
1. Antilock brake system for a vehicle comprising

valve means for controlling brake pressure at the wheels,

sensors for determining wheel speeds V_R,

evaluation circuit means for determining activation times of said valve means based on said wheel speeds V_R,

means for determining a differential speed signal V_D from said wheel speeds V_R,



means for determining whether said signal V_D has superimposed thereon a frequency ω,

means for determining when said frequency ω lies within a frequency range typical of drive train vibrations,

means for producing a vibration signal from said differential speed signal V_D when said frequency ω lies within said range typical of drive train vibrations,

means for determining when said vibration signal exceeds a threshold,

means for determining an engine speed signal V_M,

means for determining a torsional moment M(t) based on the difference between the engine speed signal V_M and the differential speed signal V_D, and

means for modifying said activation times in dependence on said torsional moment so that said drive train vibrations decay when said vibration signal exceeds said threshold.

5,556,175

SOLENOID VALVE WITH BALL ATTRACTED TOWARDS SEATING BECAUSE OF NEGATIVE PRESSURE

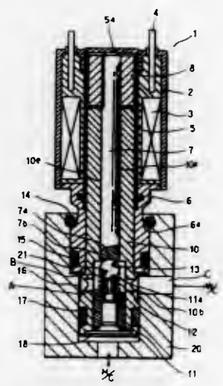
Hideyuki Hayakawa, Nishio; Masuhiro Kondoh, Oobu; Makoto Imaeda, Okazaki; Yuzo Imoto, Chita, and Kenji Takeda, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 28, 1995, Ser. No. 428,115

Claims priority, application Japan, Oct. 30, 1992, 4-292939; Jun. 18, 1993, 5-147610

Int. Cl.[6] F16K *31/06*

U.S. Cl. 303—119.2 **22 Claims**



1. A solenoid valve disposed between a master cylinder of a vehicle and a wheel cylinder of a wheel of said vehicle for performing a pressure increase control for an anti-lock brake operation, said valve comprising:

a moving member for moving responsive to electromagnetic power acting thereon, said moving member having two ends;

a communication interruption member, having a configuration of a spherical surface, for moving responsive to movement of said moving member;

a seat member having a tapered surface as a contacting surface, for interrupting a supply of fluid from said master cylinder to said wheel cylinder side when a portion of the configuration of a spherical surface on said communication interruption member is in contact therewith; and

pressing means for pressing said communication interruption member in the direction away from said seat member;

wherein while said communication interruption member moves from a state in which said communication interruption member is pushed by said moving member and is in contact with said seat member to a state in which said communication interruption member separates from said seat member by a pressing power of said pressing means when a pushing power by said moving member disappears, said communication interruption member is attracted toward said seat member against pressing force of said pressing means by means of a negative pressure which is formed only when the fluid flows through an area between said communication interruption member and said seat member and thereby flow of said fluid which flows through the area between said communication interruption member and said seat member is restricted.

5,556,176

METHOD FOR CONTROLLING VEHICLE BRAKE PRESSURE AS A FUNCTION OF THE DEVIATION OF THE ACTUAL SLIP OF WHEELS RELATIVE TO A DESIRED SLIP

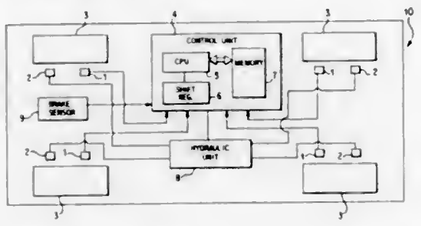
Peter Bösch, Esslingen; Karl-Eugen Laubacher, Köngen; Dieter Ammon, Stuttgart, and Manfred Steiner, Winnenden, all of Germany, assignors to Mercedes-Benz AG, Germany

Filed May 30, 1995, Ser. No. 452,532

Claims priority, application Germany, May 28, 1994, 44 18 772.6

Int. Cl.[6] B60T *8/32*

U.S. Cl. 303—165 **14 Claims**



1. Method for controlling brake pressure in a vehicle as a function of a deviation of actual slip of wheels of said vehicle relative to a desired slip, said method comprising the steps of:

detecting wheel speeds of the vehicle wheels;

determining vehicle speed based on detected wheel speeds;

determining actual slip for each wheel of said vehicle based on the wheel speeds and the vehicle speed;

determining a desired slip value for each wheel of said vehicle based on the vehicle speed and the detected wheel speed; and

generating a brake pressure gradient at brake cylinders at each of said wheels, which brake pressure gradient is a function of a difference between the actual slip and the desired slip for each of said wheels.

5,556,177

PROTECTING ABS SKID DETECTION AGAINST DATA CORRUPTION

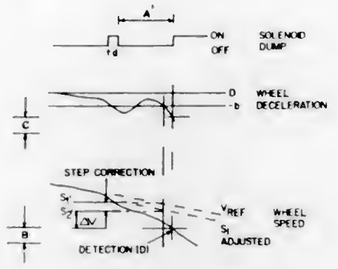
Alan L. Harris, Coventry; Mark I. Phillips, Birmingham, and Mark L. Howell, Leamington Spa, all of England, assignors to Lucas Industries Public Limited Company, Solihull, England

Filed Jan. 30, 1995, Ser. No. 380,696

Claims priority, application United Kingdom, Jan. 29, 1994, 9401728

Int. Cl.[6] B60T *8/34*

U.S. Cl. 303—174 **8 Claims**



1. An ABS skid detection protection system for a vehicle having wheels, comprising:

(a) means for determining the prevailing accelerations of the vehicle wheels;

(b) means for detection of a predetermined level of deceleration at a wheel;

(c) means for detecting, memorizing and holding for a prescribed period the wheel speed value at said predetermined deceleration level;

(d) means for establishing the elapsed time since said wheel speed value was memorized;

(e) means for detecting whether the angular acceleration of a monitored wheel first falls below and then re-establishes said predetermined deceleration level within said prescribed period; and

(f) means for correcting the memorized value of wheel speed by subtracting from it an amount equal to the vehicle deceleration multiplied by said elapsed time since said wheel speed value was memorized.

5,556,178

STORAGE RECEPTACLE FOR STORING OF OBJECTS IN A PLURALITY OF RECEPTACLES

Walter Groebly, Hoechweg, CH-8914 Aeugst, Switzerland

Filed May 25, 1994, Ser. No. 248,888

Claims priority, application Germany, May 26, 1993, 43 17 422.1

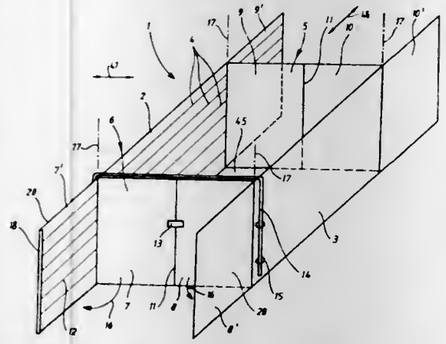
Int. Cl.[6] A47B *87/00*

U.S. Cl. 312—107 **20 Claims**

1. A storage receptacle with a rear wall and a front wall as well as two lateral walls, in which guide rails are provided at equal heights, said guide rails engaging a plurality of further receptacles fitted in the storage receptacle for slidable movement, the plurality of further receptacles provided in said storage receptacle having different volumes and able to fill up the whole interior space of said storage receptacle,

said further receptacles being slidably mounted in several planes one above the other and also one behind the other in said storage receptacle, by means of several guide rails provided at equal heights on said lateral walls,

the height of some of Said further receptacles being greater than the distance between each of said guide rails,



characterized in that at least one of the rear wall or front wall is embodied to be moveable and contains guide rails which, after movement of the at least one rear wall or front wall, align with the guide rails of corresponding adjoining wall of said lateral walls.

5,556,179

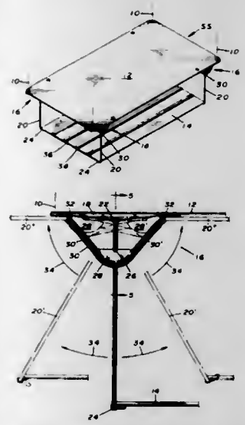
RETRACTABLE SUSPENSION SHELF

Merwyn C. Weidner, P.O. Box 98574, Des Moines, Wash. 98198

Continuation-in-part of Ser. No. 55,569, May 3, 1993, Pat. No. 5,385,399, and a continuation-in-part of Ser. No. 368,433, Dec. 30, 1994. This application Jan. 9, 1995, Ser. No. 370,155

Int. Cl.[6] A47F *7/00*

U.S. Cl. 312—190 **12 Claims**



1. A retractable suspension shelf adapted to be mounted under a supporting surface and be readily movable from a position of use with the shelf situated below and generally equispaced from said supporting surface to a position of nonuse or storage with all its parts situated adjacent to said supporting surface, said shelf comprising:

a shelf panel, and leg assemblies each comprising a pedestal mounted in fixed relationship to said supporting surface, and a leg pivotally interconnecting said pedestal and said shelf panel, at least one of said leg assemblies comprising a lateral bend intermediate the span thereof between said pedestal and said shelf, and tensioned spring means spanning said pedestal and said lateral bend and exerting force on said lateral bend to frictionally restrain movement of said leg when said leg is in a substantially perpendicular position with respect to said supporting surface and to maintain said leg close to said supporting surface when said leg is in an other than a substantially perpendicular position with respect to said supporting surface.

5,556,180

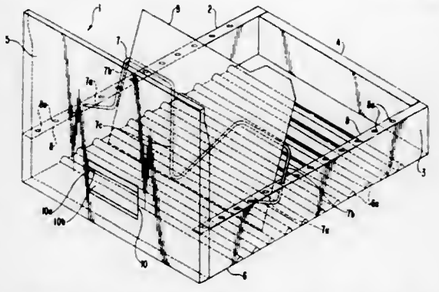
FILING CABINET DRAWER

Regis R. Miller, Dover; George E. Mellor, Smyrna; Theodore W. Norman, Sr.; Mary V. Jamieson, both of Dover; Michael J. Thompson, Smyrna; Willis Sherrod, Sr., Camden; Dana H. Clarke, Hartly; Jerome D. Webb, Wyoming, and Robert D. Wisniewski, Felton, all of Del., assignors to General Metalcraft, Inc., Dover, Del.

Filed Sep. 20, 1994, Ser. No. 309,445

Int. Cl.[6] A47B *63/00*

U.S. Cl. 312—193 **10 Claims**



1. A filing cabinet drawer comprising a rear wall, a front wall, two spaced side walls connecting said front wall and said rear wall, and a bottom wall, each of said side walls including a ledge portion having a plurality of openings therein spaced in a longitudinal direction of the respective ledge portions, at least one support member for supporting articles in the filing cabinet drawer, and a plurality of spaced retainers provided along the bottom wall for retaining lower edges of the articles contained in the filing cabinet drawer in a specific position, the at least one support member for supporting the articles in the filing cabinet drawer in such a manner that the articles are held in a substantially upright position, wherein the at least one support member includes a pair of spaced leg portions respectively terminating in bent end leg portions, and wherein said spaced leg portions are respectively accommodated in a first pair of said openings in the respective ledge portions and the bent end portions are accommodated in a second pair of said openings spaced from said first pair of openings so as to enable the support member to be adjusted in dependence upon the number of articles placed in the filing cabinet drawer.

5,556,181

ADJUSTABLE LEVEL PLAY DESK FOR A CHILD

Victor J. Bertrand, Ile Bizard, Canada, assignor to The Ritvik Group Inc., Quebec, Canada

Filed May 22, 1995, Ser. No. 445,021

Claims priority, application Canada, Jan. 24, 1995, 2140940

Int. Cl.[6] A47B *77/10*

U.S. Cl. 312—313 **20 Claims**

1. An adjustable level play desk for a child, comprising:

at least three elongated legs of substantially circular cross section, each of the legs having a lower end for resting on the ground and an outer cylindrical surface provided with first locking means, the first locking means comprising spaced apart locking buttons projecting outwardly from the outer cylindrical surface along a longitudinal direction of the leg;

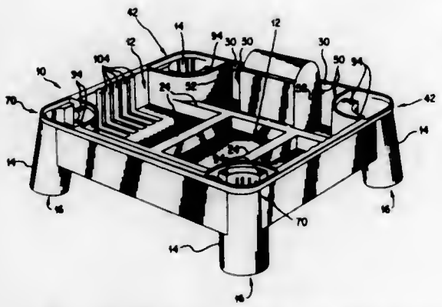
a top body having an upper play surface, and a plurality of sleeves comprising at least three sleeves oriented downwardly when in use, the sleeves being for slidably receiving respec-

5,556,183

DRAWER

5,556,186

LIGHT CONTROL GRID FOR



tively the legs, the sleeves being solid with the top body at positions providing steadiness thereof, each of the sleeves having:

a lower opening for receiving a corresponding leg, and

an inner cylindrical surface provided with second locking means projecting inwardly from the inner cylindrical surface for removably engaging with the first locking means of the corresponding leg upon a predetermined rotation thereof to lock the corresponding leg with respect to the sleeve, and a guiding means for guiding the corresponding leg along a longitudinal direction of the sleeve;

wherein the locking buttons having a round shape such that adjacent facing outer surfaces of the buttons converge to define a curved space between the buttons for guiding the second locking means into a locking position between the spaced buttons, whereby, in operation, the play surface is adjusted with respect to the child according to a given level by sliding and locking the legs with respect to the sleeves.

5,556,182

CABINET DRAWER GUIDE ASSEMBLIES

Pepper Y. Lai, 1305 Pepper Hill Rd., Greensboro, N.C. 27407

Filed Jun. 12, 1995, Ser. No. 489,479

Int. Cl.[6] A47B *88/14*

U.S. Cl. 312—334.19 **8 Claims**

1. A side-mounted drawer slide assembly for mounting a drawer within a cabinet having an elongated wall component engagable with an elongated drawer component for relative movement therebetween, said drawer component comprising a generally L-shaped channel member, said L-shaped channel member defining a tack nail, said tack nail for attaching said drawer component to said drawer, said wall component comprising an elongated U-shaped channel member having a base and two laterally extending legs, said U-shaped channel member comprising a tack-nail, a roller assembly, said roller assembly vertically adjustable on said U-shaped channel member, said roller assembly comprising a back plate, a pair of opposing brackets, said brackets slidably receiving said back plate, said opposing brackets affixed to said base of said U-shaped channel member.

5,556,183

DRAWER

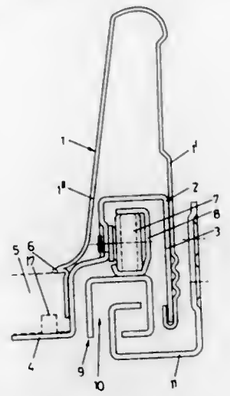
Klaus Brüstle, Höchst; Edgar Huber, Hard, and Erich Röck, Höchst, all of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed May 13, 1994, Ser. No. 242,242

Claims priority, application Austria, May 13, 1993, A947.93

Int. Cl.[6] A47B *88/00*

U.S. Cl. 312—348.1 **9 Claims**



1. A drawer assembly comprising:

a drawer side wall having a cover strip;

a metal pull-out rail rigid with said side wall, said rail having a lower horizontal flange;

a drawer bottom plate supported on said flange with a lateral edge of said bottom plate being covered by said cover strip, said bottom plate having in a bottom thereof a longitudinal groove;

a plurality of first and second flap portions integral with said flange and punched from the material thereof, said flap portions being aligned rectilinearly along said flange;

each said first flap portion being bent toward said bottom plate and having a width in a direction transverse to a longitudinal dimension of said flange such that said first flap portion fits into said groove in said bottom plate; and

each said second flap portion being bent toward said bottom plate and having a width in said direction that is greater than said width of said first flap portion, such that said second flap portion abuts said bottom plate without fitting into said groove and thus urges said bottom plate toward said cover strip.

5,556,184

IMAGINOGRAPH

Rahim Nader-Esfahani, 141 Crickle Wood Lane, London, United Kingdom

PCT No. PCT/GB92/01734, § 371 Date Apr. 11, 1994, § 102(e) Date Apr. 11, 1994, PCT Pub. No. WO93/07532, PCT Pub. Date Apr. 15, 1993

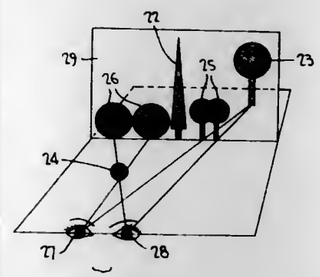
PCT Filed Sep. 21, 1992, Ser. No. 211,639

Claims priority, application United Kingdom, Oct. 9, 1991, 9121418

Int. Cl.[6] G03B *35/00*

U.S. Cl. 353—10 **7 Claims**

1. A combination picture consisting essentially of a substantially planar support member, the support member carrying a first two-dimensional image of a three-dimensional scene and, superimposed thereon a second two-dimensional image of the three-dimensional scene and in the same color or colors as the first two-dimensional image but as seen from a position laterally displaced by a distance from that from which said first two-



dimensional image is viewed, superimposition of the first two-dimensional image and the second two-dimensional image being such that a common point of visual interest in the three-dimensional scene of each two-dimensional image is positioned on said support member at a common point.

5,556,185

IMAGE PROJECTING APPARATUS PROVIDED WITH CARTRIDGE LOADING DEVICE

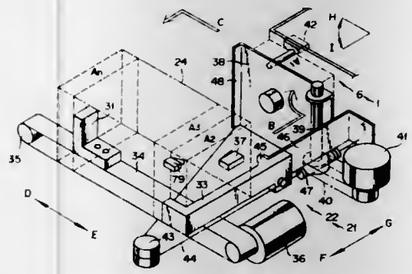
Keiichiro Bungo; Yoshinori Maruyama, and Norimasa Kubota, all of Machida, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 951,082, Sep. 25, 1992, abandoned. This application Jul. 28, 1994, Ser. No. 281,859

Claims priority, application Japan, Sep. 25, 1991, 3-273416; Sep. 25, 1991, 3-273417; Jul. 3, 1992, 4-200375; Jul. 6, 1992, 4-201992; Jul. 15, 1992, 4-210950

Int. Cl.[6] G03B *21/00*

U.S. Cl. 353—26 R **36 Claims**



1. An image projecting apparatus for projecting an image recorded in a microfilm retained in a cartridge set at a prescribed position, comprising:

a storing part for storing a plurality of the cartridges;

extracting means for removing a cartridge from said storing part; and

a positioning member for positioning the removed cartridge at said prescribed position and movable between a first position and a second position, at said first position the positioning member opening for introducing the cartridge removed from the storing part and at said second position the positioning member locating the introduced cartridge at the prescribed position.

5,556,186

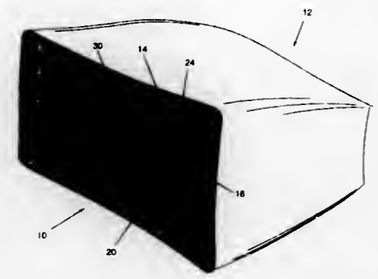
LIGHT CONTROL GRID PHOTOGRAPHER'S LIGHT SOURCE

Stephen E. Pilby, 9529 - 73 Avenue, Edmonton Alberta, Canada

Filed Sep. 15, 1994, Ser. No. 306,593

Int. Cl.[6] G03B *15/02*

U.S. Cl. 362—16 **4 Claims**



2. A light control grid for a photographer's light source, the light source having a rigid frame defining an aperture, the grid comprising:

a grid of flexible fabric strips having a perimeter bounding the grid on four sides and forming plural connected open ended laterally bounded light channels;

the perimeter being formed of a flexible strip of material having means to attach the grid to the rigid frame across the aperture of the light source on each of the four sides of the perimeter of the grid; and

reflecting strips on inside edges of peripheral strips forming the grid.

5,556,187

VEHICULAR DISPLAY DEVICE

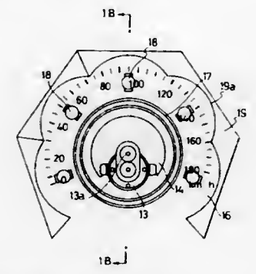
Yoshiyuki Furuya, and Michihisa Masuda, both of Susono, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Sep. 27, 1994, Ser. No. 310,768

Claims priority, application Japan, Sep. 28, 1993, 5-241128

Int. Cl.[6] G01D *11/28*

U.S. Cl. 362—27 **4 Claims**



1. A vehicular display device comprising:

a dial having an opening in a center thereof and including characters around said opening on a front side thereof;

a disk pointer located at said opening of said dial;

a movement located on a rear side of said dial and disk pointer to drive said disk pointer;

a plurality of bulb light sources arranged around said movement;

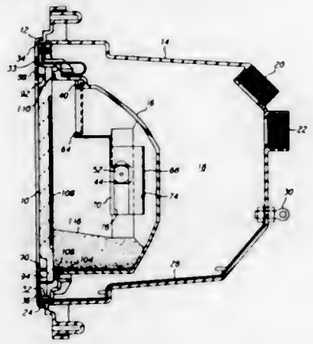
a first reflector located between said light sources and said movement to reflect and guide light from said light sources to said disk pointer; and

(ii) a first parabolically curved, reflectorized wall portion

parent cover being overlaid on said optically sensitive element

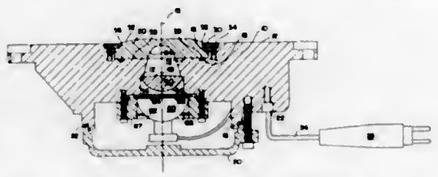
a second reflector locating outwardly of said light sources and having reflecting curved surfaces respectively guiding light of said light sources to said first reflector, each of said reflecting curved surfaces of said second reflector being made of a concave reflecting curved surface in the shape of a Fresnel lens.

5,556,188
WET NICHE LIGHT
Charles B. Poppenheimer, La Canada-Flintridge, Calif., assignor to GTY Industries, Sylmar, Calif.
Division of Ser. No. 221,692, Mar. 31, 1994, Pat. No. 5,483,428, which is a division of Ser. No. 981,014, Nov. 24, 1992, Pat. No. 5,349,505. This application May 22, 1995, Ser. No. 446,400
Int. Cl.[6] F21V *25/00*
U.S. Cl. 362—101 **3 Claims**



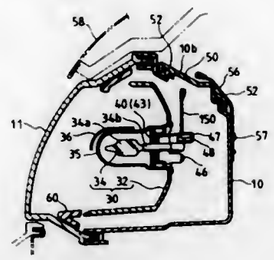
1. A wet niche light comprising
an electrically nonconductive forming shell including a front opening;
an electrically nonconductive housing mounted within and spaced from said electrically nonconductive forming shell and being received through said front opening;
one or more lamp sockets mounted in said housing;
an electrically conductive ring extending about said front opening and including an electrically conductive strap extending away from said front opening; and
a terminal extending through said electrically nonconductive forming shell and being electrically coupled with said strap.

5,556,189
OMNI-DIRECTIONAL AIRPORT TAXIWAY LIGHT AND FIXTURE
David E. Wallis, Simi Valley, Calif., assignor to Hughey & Phillips, Simi Valley, Calif.
Filed Apr. 5, 1995, Ser. No. 416,952
Int. Cl.[6] E01F *9/053*
U.S. Cl. 362—153.1 **20 Claims**



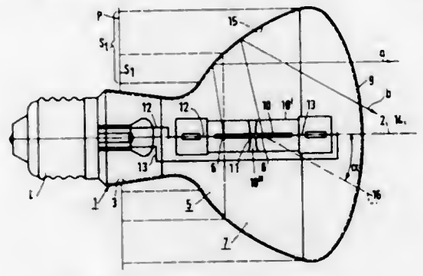
15. An omni-directional taxiway light comprising:
(a) means for holding, in a water-tight fashion, electrical components including a lamp;
(b) means for focusing light from the lamp to a focal point; and
(c) means for spreading light passing through the focal point into a hemispherical pattern.

5,556,190
HEADLAMP FOR A VEHICLE
Akira Saijo, Shizuoka, Japan, assignor to Koito Manufacturing Co., Ltd., Tokyo, Japan
Filed May 24, 1995, Ser. No. 449,096
Claims priority, application Japan, May 24, 1994, 6-109232
Int. Cl.[6] H01R *33/00*
U.S. Cl. 362—226 **10 Claims**



1. A headlamp for a vehicle comprising:
a light bulb;
a reflector accommodating said light bulb such that said light bulb is parallel to a longitudinal direction of the vehicle, said reflector having a bulb insertion hole into which said light bulb is inserted; and
a lamp body for storing said reflector, said lamp body including,
a front opening,
a peripheral wall adjacent to said front opening,
a back wall opposite to said front opening, and
a replacement opening formed in said peripheral wall.

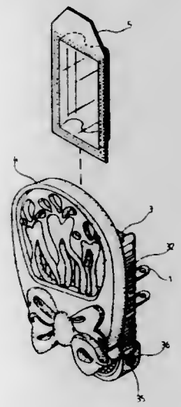
5,556,191
ELECTRIC REFLECTOR LAMP
Egbertus J. P. Maassen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 7, 1995, Ser. No. 400,216
Claims priority, application European Pat. Off., Mar. 10, 1994, 94200614
Int. Cl.[6] F21M *3/14*
U.S. Cl. 362—256 **12 Claims**



1. An electric reflector lamp, comprising:
a lamp vessel defining an axis of symmetry and having
(i) a neck-shaped lamp wall portion,

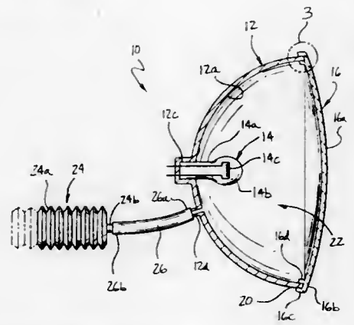
(ii) a first parabolically curved, reflectorized wall portion which merges into the neck-shaped wall portion and has a first focus substantially on the axis of symmetry,
(iii) a second parabolically curved, reflectorized wall portion which has a second focus substantially on the axis of symmetry, and
(iv) a light-transmitting window opposite the neck-shaped wall portion;
a substantially linear electric light source with a geometric center, axially arranged in the lamp vessel in the first and the second focus; and
current conductors connecting the light source to the exterior of the lamp vessel, characterized in that
the first reflectorized wall portion is a paraboloid having a first axis which coincides with the axis of the lamp vessel,
the second reflectorized wall portion is a body of revolution of a branch of a parabola having a second axis which does not coincide with the axis of the lamp vessel and which encloses an acute angle α with the axis of the lamp vessel, and
the first and the second focus are separate from one another.

5,556,192
PERFUMER STRUCTURE WITH AN OPTICALLY CONTROLLED NIGHT LAMP
Shih-Lin Wang, Shin Tien, Taiwan, assignor to Yeti Shine Co., Ltd., Shin Tien, Taiwan
Filed Jul. 18, 1995, Ser. No. 504,053
Int. Cl.[6] F21V *23/00*
U.S. Cl. 362—276 **1 Claim**



1. A perfumer structure with an optically controlled night lamp, comprising a heat conducting portion and a face board, said perfumer structure being characterized in that:
said heat conducting portion includes a plug formed by two identical bare copper plates, a heat conductor welded between said copper plates to form a circuit, a heat conductive and fireproof plastic material wrapping said copper plates and said heat conductor, and a plastic housing made by means of integral injection molding, said housing being formed with a central insertion channel for locating a solid perfume therein, two lateral boards being disposed on two sides of said insertion channel and several locating holes being formed on each lateral board, a convex guide rail being disposed at a central portion of said insertion channel for guiding the solid perfume when inserted into said insertion channel, said housing having a receptacle for receiving an optically controlled night lamp circuit board including a rectifier which converts AC into DC so as to supply power for a lamp, an optically sensitive element being disposed on one side of said receptacle for receiving ambient light and controlling said rectifier, a transparent cover being overlaid on said optically sensitive element for protecting an optically sensitive surface thereof; and
said face board is associated with said housing, a front face of said face board can be designed with various patterns, two engaging grooves being formed on two sides of a back face of said face board corresponding to said lateral boards of said housing in width, several locating posts being disposed in said engaging grooves corresponding to said locating holes of said housing, whereby said face board can be engaged with said housing with said lateral boards inserted into said engaging grooves and said locating posts inserted into said locating holes, a joint section between said face board and said housing 3 being sealed by thermal fusion.

5,556,193
MOTOR VEHICLE LAMP WITH IMPROVED VENTILATING MEANS
Richard M. Ferrell, Livonia, Mich., assignor to ADAC Plastics, Inc., Grand Rapids, Mich.
Filed Jun. 6, 1995, Ser. No. 471,763
Int. Cl.[6] F21V *29/00*
U.S. Cl. 362—294 **16 Claims**



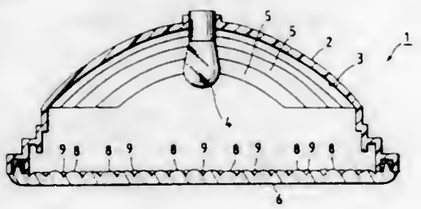
1. A vehicle lamp comprising:
a lamp housing;
a cover coacting with the housing to define a sealed lamp chamber;
a light source positioned in the chamber and operative to generate light within the chamber for forward projection through the cover to provide illumination; and
compensator means operative in response to variations in chamber temperature to compensatingly vary the chamber volume thereby to maintain an essentially constant pressure in the chamber irrespective of temperature variations.

5,556,194
VEHICULAR LAMP HAVING GLITTERING APPEARANCE
Kazunori Natsume, and Nobuhiro Taki, both of Shimizu, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan
Filed Dec. 21, 1994, Ser. No. 360,960
Claims priority, application Japan, Dec. 21, 1993, 5-072917 U
Int. Cl.[6] F21M *3/00*
U.S. Cl. 362—299 **13 Claims**

1. A vehicular lamp comprising:
a lamp body having a front opening and a reflector;
a light source mounted in said lamp body;
an outer lens covering said front opening of said lamp body, said outer lens having a plurality of sectional areas each having formed therein cylindrical steps diffusing light in a first direc-

winch cable is unreeled, the fixture is lowered from the first

required to maintain the speed of rotation of the motor constant begins to decrease after a period of increasing required



tion, said cylindrical steps in adjacent sectional areas being shifted from each other; and

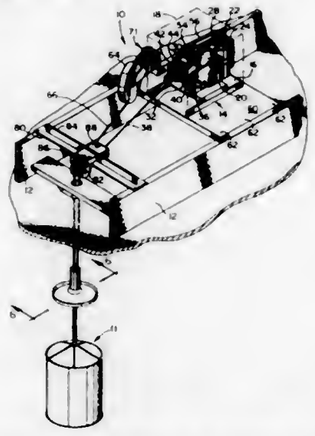
means for diffusing light emitted from said light source, said diffusing means being disposed on said reflector of said lamp body, and said diffusion means diffusing light in a second direction substantially perpendicular to said first direction.

5,556,195

MOTORIZED ELECTRICAL APPARATUS FOR MOVEMENT OF AN ELECTRICAL FIXTURE WITH UNINTERRUPTED ELECTRICITY

Harlan Glebe, Blue Bell, Pa., assignor to Suhar Corporation, Blue Bell, Pa.

Filed Feb. 7, 1995, Ser. No. 385,014
Int. Cl.[6] F21V *21/16*
U.S. Cl. 362—386 **16 Claims**



1. A motorized electrical apparatus for movement of an electrical fixture with uninterrupted electricity provided to the fixture comprising:

a powered winch assembly for vertical movement of the fixture between a first, in-use position and a second, service position, the winch assembly including a moveable winch cable having a first end, which is anchored to the winch, and a second end, which engages the fixture;

a retractable cable reel assembly having an electric cable for providing electricity to the fixture, the electric cable having a first end, which is electrically connected to an electric power supply, and a second end, which is electrically connected to the fixture;

a pulley support assembly for mounting a pulley in a position above the fixture for guiding the winch cable and the electric cable as the fixture is moved between the first and second positions to maintain the fixture generally centered below the first position; and

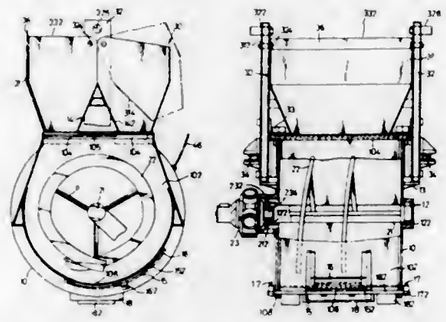
a control switch for activating the winch assembly to move the fixture between the first and second positions such that as the winch cable is unreeled, the fixture is lowered from the first position to the second position and the electric cable is unreeled from the retractable cable reel assembly by the movement of the fixture.

5,556,196

CEMENT CHARGING, MIXING AND POURING APPARATUS ATTACHED ON A HEAVY DUTY MACHINE

Yeong-sen Lin, No. 441, Hsingho Rd., Salu Chen, Taiwan

Filed Aug. 21, 1995, Ser. No. 517,559
Int. Cl.[6] B28C *5/12;7/04*
U.S. Cl. 366—18 **14 Claims**



1. A cement mixer mounted on a linkage of an arm assembly of a heavy-duty machine, comprising:

a barrel having a top opening for receiving materials to be mixed onto the barrel and a bottom opening for discharging mixed materials out of the barrel;

a first valve and a second valve mounted on the barrel for respectively controlling an opening and closing of the top and bottom openings;

an agitator assembly rotatably mounted in the barrel and used to agitate the materials to be mixed in the barrel;

a mounting beam connecting the barrel to the linkage;

a charging assembly mounted on the mounting beam and positioned above the barrel and used to receive the materials to be mixed and transferring a predetermined amount of the materials to be mixed into a barrel through the top opening thereof;

a weight measuring device provided on the mounting beam and used to measure weight of the materials received in the charging assembly; and

means for controlling the orientation of the cement mixer relative to the linkage.

5,556,197

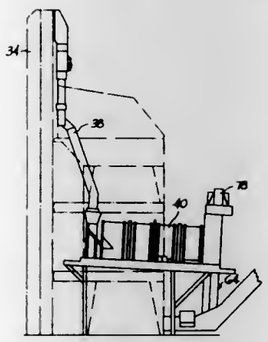
ASPHALT PLANT FOR BOTH CONTINUOUS AND BATCH OPERATION

Leonard A. Loesch, Prospect, Ky., assignor to GenTec Equipment Company, Louisville, Ky.

Filed Nov. 4, 1994, Ser. No. 334,528
Int. Cl.[6] B28C *5/20*
U.S. Cl. 366—22 **3 Claims**

1. In an asphalt plant for both continuous and batch operation, including a bin for holding aggregate material and a bucket elevator to receive the aggregate material and carry it upwardly;

the improvement comprising a drive for the bucket elevator, including a backstop which prevents the bucket elevator from travelling backwards when stopped under load, and wherein said plant further comprises: a rotary mixer located so as to receive aggregate from the bucket elevator, and a rotary mixer drive including a sprocket around the rotary mixer and a chain wrapped around said sprocket for driving the rotary mixer.

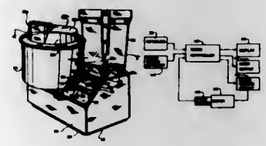


5,556,198

MULTIPURPOSE FOOD MIXING APPLIANCE SPECIALLY ADAPTED FOR KNEADING DOUGH

Thomas D. Dickson, Jr., 10439 Edinburgh, Highland, Utah 84003, and Kent W. Mabey, 2183 West 7175 South, West Jordan, Utah 84084

Continuation of Ser. No. 938,012, Aug. 27, 1992, Pat. No. 5,380,086. This application Jan. 10, 1995, Ser. No. 371,076
Int. Cl.[6] B29B *7/16;7/28*
U.S. Cl. 366—97 **14 Claims**



1. A food mixing appliance adapted to knead dough comprising:

an A.C. electric motor;

a mixing receptacle;

kneading implement means for kneading dough within the mixing receptacle;

drive means coupling the electric motor to the kneading implement means;

motor control means for controlling the phase angle of A.C. power applied to the motor to maintain speed of rotation of the motor substantially constant during kneading of dough;

sensing means for monitoring the power required to maintain the speed of rotation of the motor constant during kneading of dough, said sensing means monitoring the phase angles of A.C. power applied to the motor, increasing phase angles indicating increasing power being applied to the motor and decreasing phase angles indicating decreasing power being applied to the motor; and

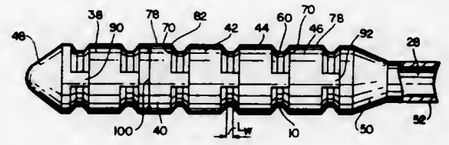
means for stopping operation of the motor when the sensing means for monitoring the power required to maintain the speed of rotation of the motor constant detects that the power required to maintain the speed of rotation of the motor constant begins to decrease after a period of increasing required power.

5,556,199

VIBRATOR WITH COVERING AND RELATED METHOD

Fred Oswald, 65 Channel Dr., Port Washington, N.Y. 11050

Filed Dec. 14, 1994, Ser. No. 355,964
Int. Cl.[6] B01F *11/00*
U.S. Cl. 366—120 **8 Claims**



4. A vibrator comprising a vibrating means for vibrating an at least partly fluid mass, and wherein heat is generated incidental to the generation of vibration, said mass including matter adapted to harden upon being cured, and a covering means on the vibrating means and of a material to minimize shock on relatively rigid structures when encountered within said mass, said covering means defining passages distributed along said vibrating means to permit access to the vibrating means by the fluid mass to cool the vibrating means, said passages at least in part flaring outwardly commencing at and away from the vibrating means and being devoid of undercuts and recesses whereby to avoid the retention of hardened matter within said passages, the vibrating means including a metallic outer shell which is partly exposed to the fluid mass by said passages, said vibrator further comprising protrusions on the shell, said material being bonded to the shell and to said protrusions.

5,556,200

APPARATUS FOR MIXING A FIRST FLUID INTO A SECOND FLUID USING A WEDGE-SHAPED, TURBULENCE-INDUCING FLOW RESTRICTION IN THE MIXING ZONE

Rolf Ekholm, and Ulf Jansson, both of Karlstad, Sweden, assignors to Kvaerner Pulping Technologies Aktiebolag, Sweden

Continuation-in-part of Ser. No. 222,942, Apr. 5, 1994, abandoned. This application Apr. 28, 1995, Ser. No. 430,595
Claims priority, application Sweden, Feb. 7, 1994, 9400387; Sep. 9, 1994, 9403010
Int. Cl.[6] B01F *5/06*
U.S. Cl. 366—175.2 **20 Claims**

1. An apparatus for mixing a first fluid into a second fluid, comprising:

a housing having a flow chamber, the flow chamber defining a principal direction of flow for the second fluid, the flow chamber having first and second walls that converge in a wedge shape as viewed in a plane transversely to the principal direction of flow of the second fluid;

a flow restrictor member disposed in the flow chamber, the flow restrictor member having first and second sides that converge in a wedge shape as viewed in a plane transversely to the principal flow direction of the second fluid;

a first gap formed between the first side of the flow restrictor member and the first wall of the flow chamber;

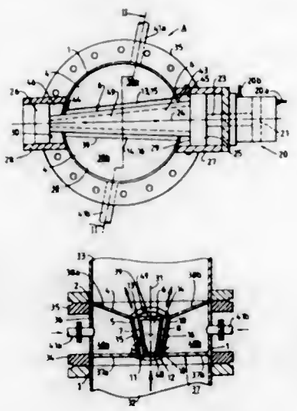
a second gap formed between the second side of the flow restrictor member and the second wall of the flow chamber; and

means for introducing the first fluid into at least one of the first and second gaps, the means for introducing the first fluid being disposed in the region of said first and second gaps.

5,556,202

comprising:

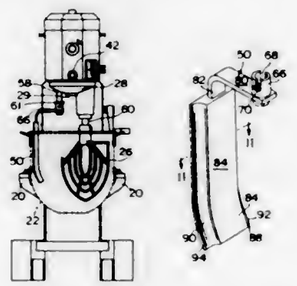
detecting a temperature of the sample corresponding to the



5,556,201
BOWL SCRAPER FOR COMMERCIAL OR INDUSTRIAL SIZE FOOD MIXERS

Loren Veltrop, Deerfield, and Joel G. Friedl, Bloomingdale, both of Ill., assignors to Middleby Marshall Inc., Elgin, Ill.

Filed Jul. 21, 1995, Ser. No. 505,747
Int. Cl.[6] B01F *7/30*
U.S. Cl. 366—203 **11 Claims**

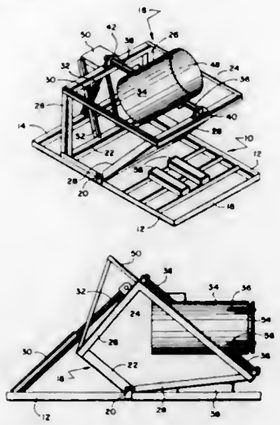


1. A bowl scraper for an industrial size mixer, said scraper comprising a mandrel having a horizontal section with a connector affixed thereto and a vertical section shaped to conform to interior wall contours of a bowl, an elongated elastomeric boot having a central void extending through substantially a length thereof, said vertical section of said mandrel and said void having substantially the same cross sectional shape and size so that said elastomeric boot slips on to and off of said vertical section of said mandrel with enough friction to hold said boot in place when on said mandrel, said connector comprising a socket having at least one L-shaped slot therein, a shaft on said mixer having at least one horizontally disposed pin extending therefrom, said at least one horizontal pin having dimensions enabling it to enter said L-shaped slot when said socket is fitted over the end of and pushed up said shaft, a ring slidably fitted over said shaft at a position above said at least one horizontal pin, a vertical pin dependent from said ring and dimensioned to fit into said L-shaped slot when said vertical pin is aligned with said at least one horizontal pin, said vertical pin falling through a vertical part of said L-shaped slot to trap said at least one horizontal pin in a toe of said L-shaped slot when said socket is rotated while on said shaft.

5,556,202
PIVOTTY MOUNTED DRUM TYPE MIXER

Gordon J. Dorn, RR 1, Box 302, Denver, Iowa 50622

Filed Jul. 31, 1995, Ser. No. 509,446
Int. Cl.[6] B01F *9/02*
U.S. Cl. 366—213 **4 Claims**



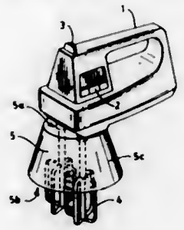
1. A drum-type mixer for mixing two or more materials, said mixer comprising: a base supporting frame for supporting the mixer, a subframe mounted on the base supporting frame and having a lower frame and an upper frame that are spaced from each other and rigidly joined together, the upper frame having a central open area, a cylindrical-shaped main drum having an exterior surface extending between two circular-shaped ends that define an interior of the drum with a longitudinal axis extending through the ends, a rotatable shaft operatively connected to the drum with the axis of rotation of the shaft at an angle to the longitudinal axis of the drum for rotating the drum eccentrically when the shaft rotates, the rotatable shaft being affixed to the exterior surface of the drum and not extending into the interior of the drum, attachment means for supporting the rotatable shaft on the upper frame with the drum positioned in the central open area of the upper frame, pivot means mounting the lower frame of the subframe to the base supporting frame to provide for pivotal movement of the subframe, and power means connected between the base supporting frame and the subframe to pivotally move the subframe and the main drum from a first mixing position to a second loading and unloading position and from the second loading and unloading position to the first mixing position.

5,556,203
SPLASH GUARD

Gregory M. Filias, 125-127 Daniel St., Portsmouth, N.H. 03801

Filed Aug. 28, 1995, Ser. No. 519,770
Int. Cl.[6] B01F *15/00*
U.S. Cl. 366—347 **10 Claims**

1. A splash guard for use with a food mixer, said splash guard

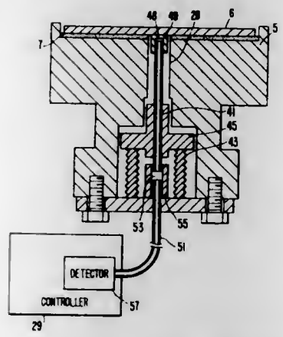


comprising:
a partial enclosure open at one end, and means for releasably affixing said splash guard to said mixer,
said means for affixing said splash guard comprising hook and loop fastening means.

5,556,204
METHOD AND APPARATUS FOR DETECTING THE TEMPERATURE OF A SAMPLE

Naoyuki Tamura, Yamaguchi-ken; Manabu Edamura, Ibaraki-ken, and Kazue Takahashi, Yamaguchi-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 724,801, Jul. 2, 1991, Pat. No. 5,320,982. This application May 19, 1994, Ser. No. 246,300
Claims priority, application Japan, Jul. 2, 1990, 2-172757; May 19, 1993, 5-116965
Int. Cl.[6] G01K *11/32;11/20*
U.S. Cl. 374—161 **4 Claims**



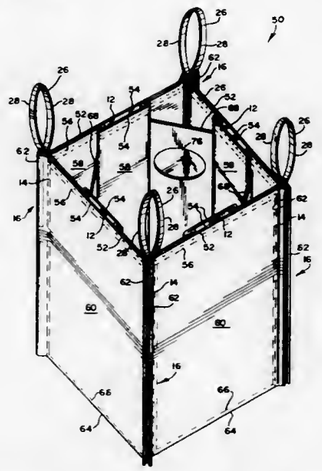
1. A temperature detector for a sample comprising:
a movable optical fiber having one end at which a phosphor is mounted and another end, said movable optical fiber transferring a fluorescence from said phosphor to said another end, said fluorescence being changed in accordance with a temperature thereof;
a fixed optical fiber having a first end facing and spaced apart from said another end of said movable optical fiber for receiving said fluorescence and a second end to which said fluorescence is transferred through said fixed optical fiber;
a detector optically connected to said second end of said fixed optical fiber for detecting a temperature from said fluorescence received therein; and
an actuating member for moving said movable optical fiber to a position wherein a thermal contact between said sample and said phosphor is made and thereby changing a distance between said another end of said movably optical fiber and said first end of said fixed optical fiber.

4. A method for detecting the temperature of a sample mounted on a sample stand, comprising the steps of:
moving a movable optical fiber toward a back surface of the sample until a phosphor provided at one end of the movable optical fiber is in thermal contact with the sample by changing a distance between another end of the movable optical fiber and a first end of a fixed optical fiber;
transferring a fluorescence from the phosphor from the one end of the movable optical fiber through the movable optical fiber to the another end of the movable optical fiber;
transferring the fluorescence from the another end of the movable optical fiber to the first end of the fixed optical fiber separated from the another end of the movable optical fiber by a gap;
transferring the fluorescence from the first end of the fixed optical fiber to a second end of the fixed optical fiber;
detecting a temperature of the sample corresponding to the fluorescence with a detector optically connected to the second end of the fixed optical fiber.

5,556,205
FLEXIBLE, INTERMEDIATE BULK CONTAINER

Ian G. Gallie, Woodlands, and John R. Thorpe, Zinkwazi, both of South Africa, assignors to Nampak Products Limited, Santon, South Africa

Filed Dec. 21, 1994, Ser. No. 361,117
Claims priority, application South Africa, Dec. 27, 1993, 93/9699; Apr. 5, 1994, 94/2364
Int. Cl.[6] B65D *30/08;30/20;33/14*
U.S. Cl. 383—24 **11 Claims**

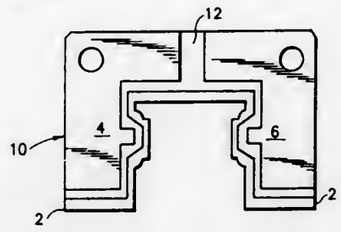


1. A flexible intermediate bulk container, which includes four tubular elements sewn to one another along longitudinally extending seams to form a closed configuration having four side walls, each side wall comprising one of the tubular elements and each pair of adjacent elements defining a corner of the container; and four diagonal panels, a panel being sewn to each pair of adjacent elements so that a diagonal panel spans each corner.

5,556,206
REPLACEMENT WIPER FOR LINEAR BEARING SYSTEMS

Guy M. Bigwood, Hamden, Conn., assignor to Ameropean Corp., North Haven, Conn.

Filed Oct. 24, 1994, Ser. No. 327,983
Int. Cl.[6] F16C *33/76*
U.S. Cl. 384—15 **2 Claims**



1. An improved elastomer wiper for guide rails in linear motion systems wherein said improved wiper comprises a flat inverted

"U" shaped elastomer pad, said pad having inner walls which conform to the configuration of said guide rails and wiper lips

ing a plurality of hydrostatic bearing pads that open toward said bearing surface, said bearing bushing having relative

retaining ring is pressed against the inner periphery of said knuckle

"U" shaped elastomer pad, said pad having inner walls which conform to the configuration of said guide rails and wiper lips which contact said guide rails, said "U" shaped pad having outer walls which conform to the configuration of the carriage face which traverses said guide rails, said pad extending between said inner and outer walls, said pad having holes therethrough, said holes aligning with threaded holes in said carriage face, two inverted "L" shaped metal plates said metal plates being bonded to said inverted "U" shaped pad, conforming to said outer wall base and top, said two plates having a gap therebetween on said top exposing a portion of said elastomer pad, said metal plates conforming to support said wiper lips on said inner walls of said inverted "U" shaped pad, said bonded wiper having holes therethrough, said holes in alignment with said holes in said pads and threaded holes in said carriage end, said gap between said inverted "L" shaped metal plates permitting said exposed elastomer to be flexed over said guide rails and fastened to said carriage ends by bolts passing through said holes to threadably engage said carriage end to rigidly fasten said wiper assembly to said carriage end wherein said supported wiper lips engage said guide rails.

5,556,207

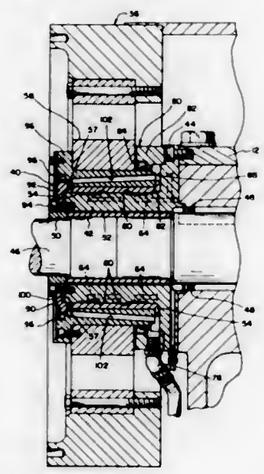
HYDROSTATIC/HYDRODYNAMIC FLYWHEEL BEARING FOR A PRESS

Edward A. Daniel, 9300 Holthaus Rd., Fort Loramie, Ohio 45845

Continuation of Ser. No. 271,762, Jul. 7, 1994, abandoned. This application Dec. 15, 1995, Ser. No. 573,572

Int. Cl.[6] F16C *32/06*

U.S. Cl. 384—115 **15 Claims**



1. A mechanical press comprising:
a frame structure with a crown and a bed;
a slide for reciprocating movement in opposed relation to said bed;
a flywheel assembly rotatably driven by a drive mechanism, said flywheel assembly including a flywheel rotatable relative to said frame structure;
a crankshaft rotatably disposed within said crown and in driving connection with said slide, said crankshaft selectively connectable with said flywheel for driving rotation thereby; and
a flywheel bearing supporting said flywheel assembly, said bearing comprising:
a quill assembly having a quill nonrotationally connected to the press;
a bearing bushing connected to said flywheel assembly and having an internal bore which forms a bearing surface disposed about said quill with a clearance, said quill including a plurality of hydrostatic bearing pads that open toward said bearing surface, said bearing bushing having relative rotation with said quill during press operation;
a pump in communication to said hydrostatic bearing pads to supply pressurized fluid thereto, said pump supplying sufficient fluid to create both a hydrostatic bearing and a hydrodynamic bearing between said bearing bushing and said quill; and
wherein said plurality of bearing pads are located in at least two rows separated by an axial distance about said quill, whereby tipping of said flywheel is resisted.

5,556,208

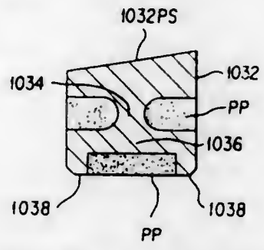
LOW PROFILE THRUST BEARINGS HAVING SPACED PADS AND METHODS OF MAKING THE SAME

Russell D. Ide, 122 Ridge Dr., Exeter, R.I. 02822

Division of Ser. No. 166,020, Dec. 14, 1993, Pat. No. 5,503,479, which is a continuation-in-part of Ser. No. 956,038, Oct. 2, 1992, Pat. No. 5,284,392, which is a continuation-in-part of Ser. No. 685,148, Apr. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 309,081, Feb. 8, 1989, Pat. No. 5,137,373, which is a continuation-in-part of Ser. No. 283,529, Oct. 19, 1988, Pat. No. 5,112,143, which is a continuation-in-part of Ser. No. 55,340, May 29, 1987, abandoned. This application Jun. 2, 1995, Ser. No. 458,712

Int. Cl.[6] F16C *17/03*

U.S. Cl. 384—117 **8 Claims**



1. A hydrodynamic fluid film bearing for pressurizing a liquid so as to support a shaft for rotation about an axis on a pressurized liquid film, the bearing comprising: a plurality of substantially circumferential bearing pads each having a pad face, a leading edge and a trailing edge and being spaced evenly about the circumference of the shaft, the pad face being inclined between 0° to 45° relative to the axis of the shaft, a bearing housing extending radially outside the bearing pads and encircling the bearing pads and a plurality of support members arranged such that a support member extends radially between each one of the pads and the bearing housing so as to support the pads on the bearing housing for pivoting movement, each of the support member having a radial length and a circumferential width, whereby under load, the support members deflect relative to the shaft so as to form a converging wedge between the shaft and pad surfaces, the converging wedge causing pressurization of the liquid so as to form a pressurized liquid film between the shaft and pad.

5,556,209

DOUBLE-ROW BALL BEARING

Rikuro Obara, and Katashi Tatsuno, both of Nagano-ken, Japan, assignors to Minebea Kabushiki-Kaisha, Nagano-ken, Japan

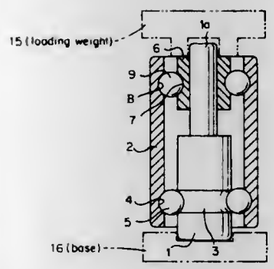
Continuation-in-part of Ser. No. 999,647, Dec. 31, 1992, abandoned. This application Oct. 6, 1994, Ser. No. 318,942

Claims priority, application Japan, Oct. 6, 1992, 4-292126

Int. Cl.[6] F16C *33/60*

U.S. Cl. 384—504 **5 Claims**

1. A double-row ball bearing comprising



(a) a stepped axle (1) having a large diameter portion and a small diameter portion (1*a*) and a sleeve (2),
(b) an axle ball race (3) formed on an outer peripheral surface of said large diameter portion of said stepped axle (1),
a first sleeve ball race (4) formed on a first portion of an inner peripheral surface of said sleeve (2), and
a plurality of balls (5) disposed between said axle ball race (3) and said first sleeve ball race (4); and
(c) a slidable short straight tubular inner ring (6),
said tubular inner ring having an inner-ring ball race (7) formed on its outer peripheral surface,
said tubular inner ring slidably mounted on said small diameter portion (1*a*) of said axle (1),
a second sleeve ball race (8) formed on a second portion of the inner peripheral surface of said sleeve (2) spaced apart from said first portion of said inner peripheral surface, and
a plurality of balls (9) disposed between said inner-ring ball race (7) and said second sleeve ball race (8); and
means for adhesively fixing said slidable inner ring (6) on said axle (1) under a pre-loaded condition.

5,556,210

WHEEL BEARING ASSEMBLY

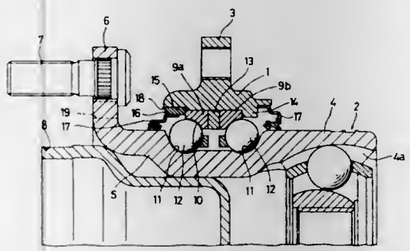
Yoshikazu Fukumura, Iwata, Japan, assignor to NTN Corporation, Osaka, Japan

Filed May 31, 1995, Ser. No. 455,483

Claims priority, application Japan, May 31, 1994, 6-118746; May 31, 1994, 6-118793

Int. Cl.[6] F16C *19/08*

U.S. Cl. 384—517 **23 Claims**



1. A bearing assembly for a vehicle wheel comprising a wheel driving ring having a flange for coupling a vehicle wheel at one end thereof, a cylindrical knuckle supporting said wheel driving ring, a pair of counterbored outer rings mounted in said knuckle with their thicker ends facing each other, balls received in two rows of ball raceways formed on said respective counterbored outer rings and two rows of ball raceways formed in the outer periphery of said wheel driving ring, two diametrically divided spacers inserted between said pair of counterbored outer rings for keeping said balls pre-loaded, said knuckle having a flange provided on its inner periphery at one end thereof to prevent axial movement of said counterbored outer rings, characterized in that a retaining ring is pressed against the inner periphery of said knuckle at the other end thereof and at the same time pressed against the thinner end of one of said counterbored outer rings to axially urge said one of said counterbored rings.

5,556,211

24 PIN DOT PRINTER HEAD AND METHOD OF MAKING THE SAME

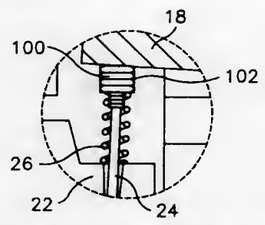
Tai-Eun Kwon, Suwon, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Sep. 12, 1994, Ser. No. 304,188

Claims priority, application Rep. of Korea, Sep. 10, 1993, 18227/1993

Int. Cl.[6] B41J *2/25*

U.S. Cl. 400—124.11 **26 Claims**



1. A method for manufacturing a print wire for a 24-pin dot printer head comprising the following sequential steps of:
heating a wire rod at a specified temperature for a specific length of time;
annealing the wire rod at a predetermined rate;
cold forging one end of the wire rod to form a needle cap with two successively different diameters with respect to the diameter of the wire rod; and
plating the entire wire rod including the needle cap with nickel plating.

5,556,212

Patent Not Issued For This Number

5,556,213

TAPE PRINTER HAVING A HALF-CUT MECHANISM

Yasunori Kudo; Manabu Shibata, and Takahisa Misawa, all of Tokyo, Japan, assignors to Max Co., Ltd., Japan

Filed Mar. 30, 1994, Ser. No. 219,904

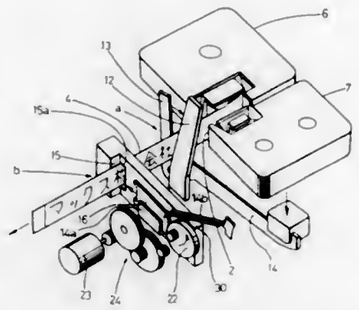
Claims priority, application Japan, Mar. 30, 1993, 5-097127

Int. Cl.[6] D41J *11/70*

U.S. Cl. 400—621 **6 Claims**

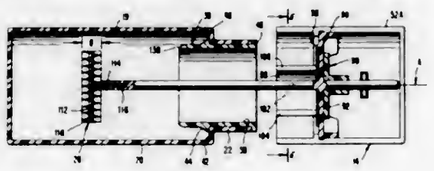
1. A tape printer for printing on a laminated tape formed of a printing tape and a separate paper, said tape printer comprising:
a printer head disposed in a printing section of said tape printer for printing characters on said printing tape;
a half-cut means for cutting only said printing tape of said laminated tape; and
a tape moving means for moving said laminated tape from said printing section to said half-cut means, wherein said half-cut means includes:
a tape receiving stand having a surface on which said laminated tape is moved; and
a cutter member comprising:
a base plate having a pair of guide legs disposed substantially next to each other in a tape width direction so that said laminated tape is disposed therebetween,
a cutter blade secured on said base plate, and

5,556,215



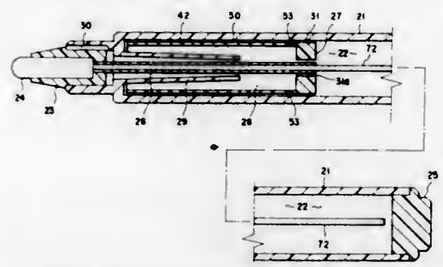
a base plate moving means for moving said base plate and said cutter blade in such a manner that said guide legs directly abut against the surface of said tape receiving stand and said cutter blade cuts only said printing tape on the surface of said tape receiving stand.

5,556,214
MASCARA CASE FOR T-SHAPED APPLICATOR WAND
Salvatoare J. Ascolese, Edison, N.J., assignor to Charbelle Ltd., Los Angeles, Calif.
Filed Aug. 11, 1994, Ser. No. 288,255
Int. Cl.[6] A45D *40/00*; A56B *11/00*
U.S. Cl. 401—126 **20 Claims**



1. A mascara case, comprising:
a vial for storing mascara and including:
a passage of oblong cross section affording access to an interior of said vial,
a first oblong sealing portion surrounding an inlet of said passage, and
a first locking member; and
a cap mountable on said vial for closing said passage, said cap including a casing having:
a mascara wand defined by an axially extending stem and an applicator brush disposed at an end of said stem and extending generally transversely relative thereto,
a second oblong sealing portion engageable in an axial direction with said first sealing portion for creating a seal around said passage, and
a second locking member, one of said first and second locking members being movable relative to the other of said first and second locking members and engageable therewith for drawing said cap and vial axially toward one another and thereby drawing said first and second sealing portions axially together.

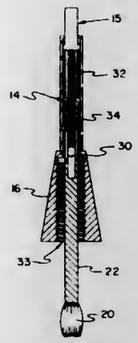
5,556,215
WRITING INSTRUMENT WITH OVERFLOW CHAMBER
Jiro Hori, 61-2, Kamihiroya, Tsurugashima-shi, Saitama-ken, Japan
Filed May 12, 1994, Ser. No. 242,009
Claims priority, application Japan, May 13, 1993, 5-111752
Int. Cl.[6] B43K *8/04*; *7/08*; *5/10*
U.S. Cl. 401—199 **8 Claims**



1. A writing instrument comprising:
a writing instrument body having a front end;
a nib provided on said front end of said writing instrument body;
an ink reservoir formed in said writing instrument body, for storing ink;
an ink supplying passage for supplying ink from said ink reservoir to said nib;
a hollow feeder chamber formed in said writing instrument;
an atmosphere communicating passage for causing said feeder chamber to communicate with the atmosphere; and
a capillary flow passage formed separately from said ink supplying passage, for causing said ink reservoir to communicate with said feeder chamber, said capillary flow passage having such a small cross-sectional area as to hold said ink in said capillary flow passage due to a surface tension of said ink, said writing instrument body having an interior and an inner periphery, a partition member which has an outer periphery dividing said interior of said writing instrument into said ink reservoir and said feeder chamber, said capillary flow passage comprising an annular space formed between said inner periphery of said writing instrument and said outer periphery of said partition member.

5,556,216
SCAVENGING CAP APPLICATOR
Sol Mayesh, 32099 Box D Rd. 122, Visalia, Calif. 93291
Filed Jan. 30, 1995, Ser. No. 381,413
Int. Cl.[6] A46B *11/00*
U.S. Cl. 401—127 **1 Claim**

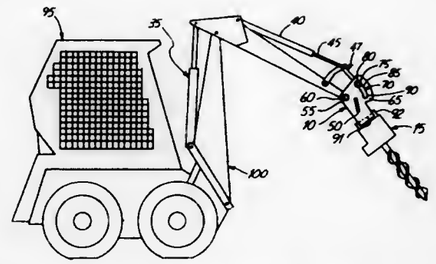
1. A new scavenging cap assembly for extracting liquids from an existing bottle-like container comprising:
an applicator and stem assembly, wherein the applicator and stem assembly comprises a brush-like applicator member and an elongate cylindrical stem member having an applicator engagement portion, a drive pin receiver cavity bounded by a sidewall, a plurality of outwardly facing slots formed on the sidewall and a spring engagement portion;
an actuator for transferring manual force motion to said applicator and stem assembly;
a driver pin affixed to said actuator, wherein said driver pin has an elongate body terminating in an applicator and stem assembly engagement means whereby axial translation of said driver pin is converted to rotation of said applicator and stem assembly wherein said driver pin has a cylindrical shape and furthermore having a uniform diameter at a first free end thereof affixed to said actuator and an enlarged diameter at a second end thereof having a centrosymmetric right triangle raised surface portion, wherein said engagement means comprises a ratchet whereby said ratchet converts translational motion of said drive pin to rotational motion of the applicator and stem assembly and further provides latching of the applicator and stem assembly in an extended and retracted thereof, wherein said drive pin receiver cavity comprises an elongate right cylindrical cavity having a uniform diameter throughout and terminating in a driver pin engagement surface including a centrosymmetric right triangle recessed portion engaging said driver pin;



wherein said applicator engagement portion comprises a crimp for permanently affixing said applicator to said stem member;
a cap member threadedly engaging said bottle-like container wherein said cap member has said applicator and stem assembly disposed within a centrally positioned through bole and furthermore said applicator and stem assembly is susceptible to selectable manual latching in a retracted and extended disposition permitting engagement of said applicator with a liquid contained within said bottle-like container;
a seal member affixed to said cap member and slidably engaging portions of the applicator and stem assembly, wherein said seal member comprises a resilient washer-like gasket disposed within an internally formed slot of said cap member and furthermore said gasket fills said slot and slidably engages said stem member thereby precluding passage of liquid along said applicator stem past said seal member outwardly from said bottle-like container;
a spring member affixed to said cap member and slidably engaging portions of the applicator and stem assembly;
wherein a stem member has an actuator portion forming a free end external to said cap member wherein said actuator portion is cylindrical in form and is engagable by human fingers to impart axial force thereto; and
wherein said stem member comprises a smooth surfaced cylinder of metallic composition having a first end portion engaging said applicator, a centrally disposed portion having an internal elongate cylinder cavity open at an end thereof, a plurality of latch engaging slots formed exteriorly and partially penetrating walls thereof wherein each slot has a step and flat landing formed therein, and a second end portion having a circumferential ridge formed thereon wherein said ridge engages said spring member.

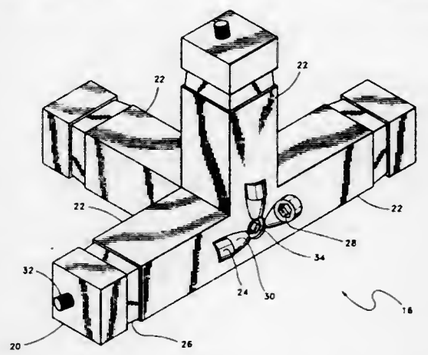
5,556,217
AUGER MOUNT
Charles Deyo; Verne C. Watts, and Wally L. Kaczmarski, all of Lisbon, N. Dak., assignors to Clark Equipment Company, Woodcliff Lake, N.J.
Filed Jul. 11, 1994, Ser. No. 273,504
Int. Cl.[6] F16C *11/00*
U.S. Cl. 403—61 **16 Claims**

11. An auger mount for attaching an auger to a vehicle, the vehicle having a boom and at least one link, the auger mount comprising:



a first mounting plate having an auger end, a dipper end, and a pivot aperture adjacent to the dipper end, the pivot aperture suitable for pivotal attachment to the boom;
at least one fin portion defining a slot suitable for slidable attachment to the link, the slot having an intermediate portion and two closed ends wherein the auger mount is freely pivotable about the pivot aperture when the link is at the intermediate portion and is controllably pivotable by the link, relative to the boom, when the link pin is at either one of the two ends, the fin portion attached to the mounting plate adjacent the dipper end; and
means for attaching the auger to the auger mount.

5,556,218
TUBING CONNECTOR
John L. Homer, 6668 Salem Dr., Fishers, Ind. 46038
Filed Apr. 14, 1995, Ser. No. 421,918
Int. Cl.[6] F16B *7/00*
U.S. Cl. 403—170 **5 Claims**



1. A system of construction including square tubing having inner walls and a connector for connecting the tubing, wherein the improvement comprising:
said connector having a plurality of arms for receiving the square tubing;
wherein each of said plurality of arms having a longitudinal axis and being connected at a common area and extending orthogonally outward with respect to each other from the common area;
wherein each of the arms having four sidewalls extending parallel to the respective longitudinal axis, a free end wall disposed perpendicularly to the respective sidewalls, an exterior wedge surface disposed adjacent to the free end wall, and an aperture extending through along the length of the arm; and
securing means associated with each of the arms and disposed distal from the common area for securing each of the arms to the respective tubing; and

activating means associated with each of the arms and disposed proximate to the common area for activating the respective securing means;

wherein said securing means being a wedge block having a threaded hole and an interior wedge surface which complements and communicates with the exterior wedge surface of the respective arm;

wherein said activating means being a draw bolt which extends through the aperture of the respective arm and threadedly engages said threaded hole of the respective wedge block for drawing the wedge block toward the common area to force the wedge block against the inner walls of the respective tubing to secure the tubing to the arm;

wherein at least one of the arms being provided with said aperture which extends through one of the respective sidewalls to the free end wall whereby the respective draw bolt extends through said one of said sidewalls and the free end wall to threadedly engage the respective wedge block for drawing the wedge block to secure the respective tubing to the arm.

5,556,219

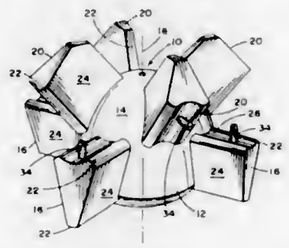
CONNECTOR FOR A FRAMEWORK STRUCTURE

William R. Mason, 2322 Pine Tree Ct., Kissimmee, Fla. 34744

Filed Dec. 19, 1994, Ser. No. 358,824

Int. Cl.[6] F16B *7/22*; **E04B** *1/58*

U.S. Cl. 403—176 **5 Claims**



1. A framework connector comprising:

a main body having a hemispherical surface;

a plurality of solid, non-circular projections extending outwardly from said hemispherical surface of said main body, each of said projections having at least three longitudinally extending, circumferentially spaced land areas, two of said three land areas being relatively closely spaced and defining a surface therebetween, another of said land areas being located opposite said surface; and

at least one fixed, non-compressible post extending generally normal from each said surface of said projections.

5,556,220

PLASTIC FASTENING PLUG, ESPECIALLY FOR FURNITURE HARDWARE

Horst Lautenschläger, Reinheim, and Gerhard Lautenschläger, Brensbach-Wersau, both of Germany, assignors to MEPLA-Werke Lautenschläger GmbH & Co. KG, Germany

Filed May 25, 1995, Ser. No. 450,128

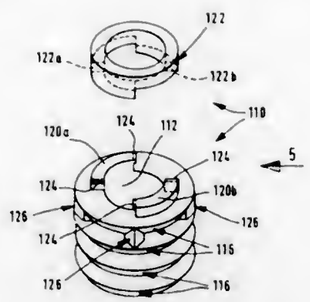
Claims priority, application Germany, Jun. 3, 1994, 44 19 422.6

Int. Cl.[6] F16B *7/00;13/00;31/00;* **F16D** *9/00*

U.S. Cl. 403—298 **4 Claims**

1. A plastic fastening plug, installable in a corresponding bore, for fastening furniture hardware on furniture pieces, comprising:

an elongated stem portion, having a hardware fastening end and an outer circumferential surface, for releasably fastening an associated hardware part;



a plurality of annular circumferential projections extending from the outer circumferential surface and offset along the length of the fastening plug, each annular projection having a triangular cross-section forming a gripping ridge;

a neck portion between a first annular projection and the hardware fastening end;

a spacer ring (**22**, **122**) disposed at the hardware fastening end and extending beyond the neck portion (**20**, **120***a*, **120***b*) for contacting the fastening plug (**10**, **110**) with the bottom of the hardware part (**30**), the spacer ring having a thickness measured lengthwise of the fastening plug which is slightly greater than the thickness of the neck; and

break-away means (**24**, **124**) connecting the spacer ring (**22**, **122**) to the neck portion, wherein the spacer ring is integrally formed on the neck portion by the break-away means during the manufacture of the fastening plug (**10**, **110**) such that the spacer ring is removably connected to the fastening plug; and

wherein the neck and the spacer ring are shaped such that the spacer ring can be thrust lengthwise of the fastening plug against the neck (**20**, **120***a*, **120***b*).

5,556,221

FASTENING DEVICE FOR BARS OF A ROOF RACK

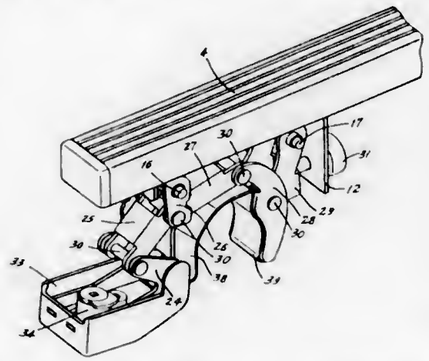
Harald Brunner, Solingen, Germany, assignor to Happich Fahrzeug-Dachsysteme GmbH, Germany

Filed Apr. 14, 1995, Ser. No. 423,007

Claims priority, application Germany, May 9, 1994, 44 16 339.8

Int. Cl.[6] F16B *2/02*

U.S. Cl. 403—322 **8 Claims**



1. A fastening device adapted to be incorporated as part of a transverse support for attachment to a railing bar of a motor vehicle roof rack, comprising:

a housing having a fixed clamping jaw capable of resting on the railing bar; and

a lever mechanism mounted to said housing and including a bell-crank lever pivotally fixed in said housing and serving as a clamping lever, an intermediate lever pivotally attached at one end thereof to said bell-crank lever, a positioning lever and a strap, said intermediate lever having a pivotal connection at another end thereof to said positioning lever and said strap, said positioning lever spaced from said pivotal connection to said intermediate lever and said strap is pivotally mounted to said housing, said strap spaced from its pivotal connection to said positioning lever and said intermediate lever is pivotally connected to a lower clamping jaw disposed opposite said fixed clamping jaw, said lower clamping jaw at a position along its length being pivotally connected to an adjustment lever which is pivotally mounted to said housing, said adjustment lever capable of being pivoted about its pivotal mounting to said housing by a displacement element.

5,556,222

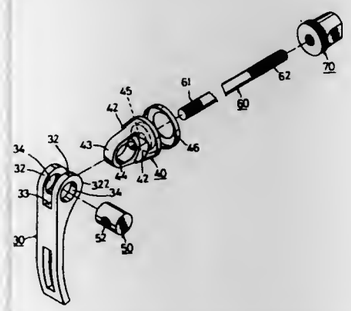
QUICK RELEASE MECHANISM

Chun-Hsung Chen, No. 18-1, Nan-Yang Rd., Feng-Yuan City, Taichung Hsien, Taiwan

Filed Feb. 8, 1995, Ser. No. 385,353

Int. Cl.[6] B25G *3/18;* **F16B** *21/00;* **F16D** *1/12*

U.S. Cl. 403—323 **2 Claims**



1. A quick release mechanism including a cylindrical rod having two opposed ends and an intermediate portion formed with a diametrically extending screw hole,

a mounting shaft having a first threaded end connected threadably to said screw hole of said cylindrical rod, and a second threaded end,

a locking nut connected threadably to said second threaded end of said mounting shaft, and

a manually operated lever having an end portion and a pair of spaced lugs which extend longitudinally from said end portion and which are formed with aligned eccentric holes that receive respectively said opposed ends of said cylindrical rod therein, each of said lugs having a cam edge,

wherein the improvement comprises:

a pressing member having a concave surface in contact with said cam edges of said manually operated lever and a generally U-shaped connecting member which has two distal ends extending integrally from said surface of said pressing member, said connecting member and said pressing member cooperatively defining therebetween an oblong receiving space for receiving said cylindrical rod therein, said pressing member being formed therethrough with a through-hole which is aligned with an axis of said connecting member and which is communicated with said receiving space so as to permit said first threaded end of said mounting shaft to extend into said receiving space through said through-hole and to connect threadably with said screw hole of said cylindrical rod, said connecting member and said cylindrical rod filling up a space formed between said lugs.

5,556,223

COUPLING

Eugen Fabel, Buchfeldterrasse 2, 6033 Buchrain, Switzerland

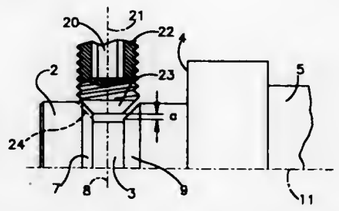
PCT No. PCT/GH93/00288, § 371 Date Oct. 26, 1994, § 102(e) Date Oct. 26, 1994, PCT Pub. No. WO94/15110, PCT Pub. Date Jul. 2, 1994

PCT Filed Dec. 17, 1993, Ser. No. 290,821

Claims priority, application Switzerland, Dec. 18, 1992, 3858/92

Int. Cl.[6] F16D *1/08;1/06;* **B23B** *31/02*

U.S. Cl. 403—362 **19 Claims**



19. A coupling for joining a tool to a driving unit comprising:

a first coupling part centered on a coupling axis and having a first contact surface which extends perpendicular to said coupling axis;

a second coupling part arranged successively with said first coupling part on said coupling axis, said second coupling part having a second contact surface which extends perpendicular to said coupling axis and which faces said first contact surface of said first coupling part;

said first coupling part having a clamping trunnion which projects from said first contact surface and which is substantially rotationally symmetrical to said coupling axis, said clamping trunnion having at least one clamping surface which is inclined with respect to said coupling axis;

said second coupling part having a reception bore for receiving said clamping trunnion, said reception bore emanating from said second contact surface, said reception bore being disposed about said coupling axis, said clamping trunnion being inserted completely into said reception bore, said first and second contact surfaces engaging one another;

said second coupling part further having at least one radial opening extending from said reception bore to the outside of said second coupling part, said at least one radial opening being located in a clamping plane which is parallel to said first and second contact surfaces; and

at least one cylindrical clamping element lying in said clamping plane and having a conically tapering end, said at least one clamping element being located in said at least one radial opening in said second coupling part, said at least one clamping element engaging said at least one clamping surface to produce a clamping force in the direction of said coupling axis urging said first and second contact surfaces together;

said at least one clamping surface of said clamping trunnion having an indentation corresponding in shape to the shape of a portion of said conically tapering end of said clamping element;

said indentation being located in a work hardened zone of the material of said clamping trunnion and being defined by a hardened surface of said work hardened zone.

5,556,224

b. applying at least one large aggregate layer in said region to

of said elongated leveling means and responsive to said radiant energy beam unless blocked by said obstruction

5,556,228

BLOCK FOR CONTROLLING SOIL EROSION

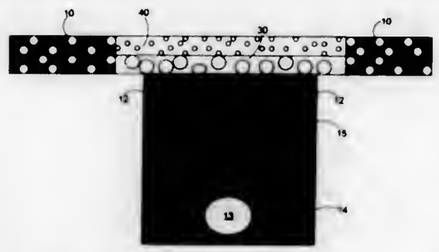
5,556,224
SHIFTER HANDLE ASSEMBLY
Don L. Niskanen, Spring Lake, Mich., assignor to Grand Haven Stamped Products, Grand Haven, Mich.
Filed Feb. 14, 1994, Ser. No. 388,243
Int. Cl.[6] B25G *3/00*; **F16B** *7/10*; **F16D** *1/00*; **C21B** *11/00*
U.S. Cl. 403—379 **18 Claims**

1. A shifter handle subassembly for attachment to a shifting lever of a shifting mechanism of a vehicle, said lever being an elongated rod having a non-circular cross section and a recessed area extending laterally around at least a portion of the circumference of said lever;

a shifter handle comprised of a plurality of handle components including an outer handle component, an intermediate absorption handle component and an inner handle component each having longitudinally extended bores and connected together in a telescoping fashion, said inner handle component having its bore insertable over said shifter lever, said outer handle component, intermediate absorption handle component, and inner handle component each having at least one aperture extending laterally into each of their said bores and and adapted to be aligned with said recessed area of said lever when said handle is inserted on said shifting lever; and

a retaining clip inserted partially into some of said apertures, said retaining clip having arms aligned with said recessed area whereby when said clip is inserted entirely within all of said apertures, said arms will be positioned in the recessed area of said shifter lever to thereby lock said shift handle on said shifter lever.

5,556,225
METHOD FOR REPAIRING ASPHALT PAVEMENT
Frederick W. Marino, Swampscott, Mass., assignor to Felix A. Marino Co., Inc., Peabody, Mass.
Filed Feb. 14, 1995, Ser. No. 388,250
Int. Cl.[6] E01C *21/00*
U.S. Cl. 404—77 **13 Claims**



1. A method of repairing asphalt pavement over a trench containing backfill, and characterized by a peripheral wall defining the trench, comprising the steps of:

a. cutting back the pavement to provide a region overlying the trench and extending beyond the peripheral wall;

b. applying at least one large aggregate layer in said region to establish a set of one or more large aggregate layers, said set having an uppermost layer, whereby the peripheral wall of the trench is bridged;

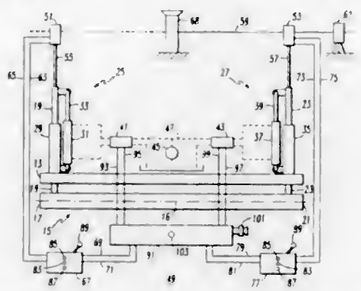
c. applying at least one small aggregate layer overlying the uppermost large aggregate layer to establish a set of one or more small aggregate layers, said set having an uppermost layer; and

d. applying heat to at least one of said uppermost layers;

said large aggregate layer being a heated virgin first bituminous concrete including relatively large aggregate mixed with a liquid asphalt binder, or a substantially non-polymerized thermoplastic first bituminous concrete including relatively large aggregate mixed with a liquid asphalt binder containing n-pentane soluble fractions of asphalts and being repetitively softenable in response to repetitive applications of infrared radiation, and

said small aggregate layer being a heated virgin second bituminous concrete including a relatively small aggregate mixed with a liquid asphalt binder, or a substantially non-polymerized thermoplastic second bituminous concrete including a relatively small aggregate mixed with a liquid asphalt binder containing n-pentane soluble fractions of asphalts and being repetitively softenable in response to repetitive applications of infrared radiation, whereby a patch is formed in said pavement.

5,556,226
AUTOMATED, LASER ALIGNED LEVELING APPARATUS
Howard E. Hohmann, Jr., Saxonburg, Pa., assignor to Garceveur Corporation, Louisville, Ky.
Filed Feb. 21, 1995, Ser. No. 391,200
Int. Cl.[6] E01C *23/07*
U.S. Cl. 404—84.1 **10 Claims**



1. Apparatus for leveling a flowable material relative to a projected leveling plane established by a radiant energy beam in a location having obstructions which block said radiant energy beam from portions of said projected leveling plane, said apparatus comprising:

elongated leveling means having a longitudinal axis, a first end and a second end;

support means for supporting and moving said elongated leveling means generally transversely to said longitudinal axis, to level said flowable material, said support means including first elevation adjustment means for adjusting elevation of said first end of said elongated leveling means in response to a first adjustment signal, and a second elevation adjustment means for adjusting elevation of said second end of said elongated leveling means in response to a second adjustment signal; and

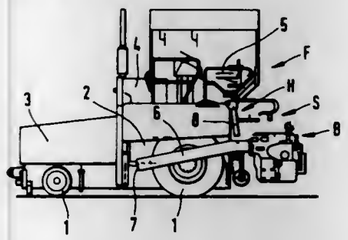
radiant energy beam alignment means comprising:

first and second spaced apart radiant energy beam detectors carried by said elongated leveling means with said first radiant beam detector positioned adjacent said first end of said elongated leveling means and responsive to said radiant energy beam unless blocked by said obstruction for generating a first detector signal indicating relative elevation of said test radiant energy beam detector with respect to said projected leveling plane, and with said second radiant energy beam detector positioned adjacent said second end of said elongated leveling means and responsive to said radiant energy beam unless blocked by said obstruction for generating a second detector signal indicating relative elevation of said second radiant energy beam detector with respect to said projected leveling plane; and

control means responsive to said first and second detector signals for generating said first adjustment signal associated with said first detector signal for application to said first adjustment means to adjust the elevation of said first end of said elongated leveling means when said first detector signal indicates that elevation of said first radiant energy beam detector deviates by more than a predetermined amount from said projected leveling plane, for generating said second adjustment signal associated with said second detector signal for application to said second adjustment means to adjust the elevation of said second end of said elongated leveling means when second detector signal indicates that elevation of said second radiant energy beam detector deviates by more than said predetermined amount from said projected leveling plane,

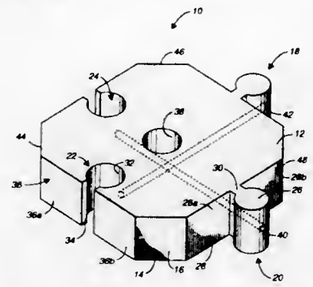
switching control means for detecting an interruption in one of said first and second adjustment signals such as when one of said first and second radiant energy beam detectors is blocked from receiving said radiant energy beam by said obstruction, and for using the uninterrupted detector signal generated by said one radiant energy beam detector for generating both said first and second adjustment signals.

5,556,227
ROAD FINISHER
Alfred Ulrich, Gorxheimertal, Germany, assignor to Joseph Vogele AG, Germany
Filed Apr. 20, 1995, Ser. No. 426,126
Claims priority, application Germany, Apr. 21, 1994, 9406683 U
Int. Cl.[6] E01C *19/28*
U.S. Cl. 404—101 **13 Claims**



1. In a road finisher having a chassis, which is movable on a travelling gear and which carries a front stock hopper, a primary drive unit, a paving screed which is dragged at the rear and which is articulated on said chassis via lateral outriggers, and a lifting device which is provided between said chassis and said outriggers and by means of which the paving screed can be moved to a transport position raised from the ground, the improvement comprising a dynamic absorber system comprising an (i) actuable support for supporting the paving screed while the screed occupies the transport position, wherein the screed is attached via the outriggers to the actuable support and to the chassis, the actuable support being elastic relative to the chassis in the vertical direction, and (ii) an absorber mass defined by the paving screed.

5,556,228
BLOCK FOR CONTROLLING SOIL EROSION
Lee A. Smith, 6917 Sunday Pl., Fort Worth, Tex. 76133
Filed Feb. 6, 1995, Ser. No. 383,825
Int. Cl.[6] E02B *3/12*
U.S. Cl. 405—16 **21 Claims**



1. A block for controlling erosion of soil, comprising;

a body formed of a substantially heavy material, said body having a peripheral side edge with eight edge faces, and a top surface and a bottom surface;

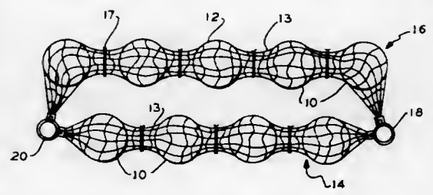
said body including a respective cavity formed in two said edge faces of the body, and an entrance opening that connects each cavity to a respective edge face being smaller than the cavity;

a respective arm formed outwardly from each of two other edge faces of the body, each said arm having an enlarged end portion fittable into a respective cavity of another similar block, and an extension portion of each said arm connecting said other edge face to the respective enlarged end portion, and each said extension portion is loosely fittable in a respective entrance opening to a cavity of another similar block;

the enlarged end portion of said arms of said block being minimally movable radially within the respective cavities of the other similar blocks so as to maintain a given space between the blocks, and said block including four blank edge faces having no arm or cavity, each blank edge face being disposed between edge faces having one of either an arm or cavity, said blank edge faces cooperating with corresponding blank edge faces of three other similar blocks for allowing vegetation growth between four similar blocks; and

each said cavity of said block and a respective arm of other similar blocks being interlockable together such that said block and said other similar blocks cannot be radially separated, but allowed to rotate about a vertical axis such that said block can rotate with respect to said other similar blocks and remain interlocked thereto.

5,556,229
SHORELINE EROSION CONTROL SYSTEM
Robert J. Bishop, and Justin D. Bishop, both of 1083 Bloomfield Ave., W. Caldwell, N.J. 07006
Filed Jan. 4, 1995, Ser. No. 368,649
Int. Cl.[6] E02B *3/04*
U.S. Cl. 405—27 **9 Claims**



1. A shoreline erosion control system comprising:

a plurality of like rotatable hollow spherical elements extending in a line spaced from and along a shoreline in the path of

5,556,231
SEVERABLE LEACHING CHAMBER WITH END CAP

5,556,233
ROCK ANCHOR ASSEMBLY

a plurality of like rotatable hollow spherical elements extending in a line spaced from and along a shoreline in the path of waves flowing to and from said shoreline, said elements having openings for the passage of water therethrough;

movable means for holding said elements together in said line with a given spacing therebetween, said movable means being a common flexible netting enclosing said elements and having wide area sections around said elements and narrow restricted sections in the spacing therebetween;

means for restricting the dimension of said netting in said narrow sections;

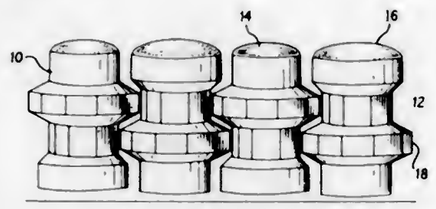
a plurality of air filled balls disposed within each hollow spherical element, said elements being subject to rotation by said waves; and means for limiting the movement of said means for holding said elements including anchoring means secured to the sea bed, the ends of said netting being secured to said anchoring means to limit movement of said netting and elements.

5,556,230

CONCRETE ARMOR UNIT FOR THE PROTECTION OF COASTAL, SHORE LINES AND HYDRAULIC STRUCTURES

George F. Turk, and Jeffrey A. Melby, both of Vicksburg, Miss., assignors to U.S. Army Corps of Engineers as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 19, 1994, Ser. No. 325,012
Int. Cl.[6] E02B *3/06*
U.S. Cl. 405—29 **18 Claims**



1. An armor revetment unit for breakwater, jetties, and the like, the unit comprising:

a monolithic cylindrical structure made up of multiple coaxial aligned cylindrical subportions of varying diameter having at least one uniform circumferential sidewall groove cutout along the cylindrical structure's length which forms a means for interlocking a sidewall of substantially similar armor revetment units for placement along a shoreline, each sidewall groove cutout is defined by a quadrangle surface in cross-section, the quadrangle surface lies within a longitudinal cross-section containing an axis of the cylindrical structure;

the cylindrical structure has two end surfaces, a large end surface and a small end surface where the large end surface is larger in diameter than the small end surface;

each of the two end surfaces are juxtaposed with one of the cylindrical subportions; and in which the means for interlocking multiple armor revetment units further comprises keyed flat surfaces that forms a polygon as defined by a planar cross-section normal to a longitudinal axis of the cylindrical structure at: i) the inner portion of the uniformly circumferential groove and ii) on at least one of the cylindrical subportions,

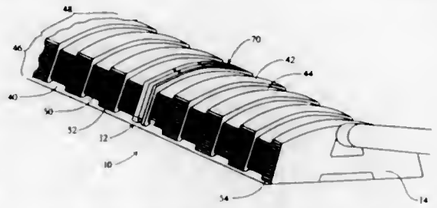
whereby stability is enhanced due to more restriction in motion by interlocking normal to the shoreline's slope the substantially similar armor revetment units for placement along the shoreline.

5,556,231

SEVERABLE LEACHING CHAMBER WITH END CAP

H. John Sidaway, McComb, and Douglas O. Hamilton, Findlay, both of Ohio, assignors to Hancor, Inc., Findlay, Ohio

Filed Sep. 1, 1994, Ser. No. 299,828
Int. Cl.[6] E02B *13/00*
U.S. Cl. 405—48 **14 Claims**



1. A chamber for receiving fluids to be dispersed, the chamber comprising:

separated side walls, each side wall having louvers defined therein to allow the fluid to be dispersed therethrough;

vaulted portions spanning upper edges of the side walls, the vaulted portions and the side walls terminating at a first end including a first coupling construction and at a second end including a second coupling construction; and

an inlet end cap connected with the first end coupling construction, the inlet end cap including:

an inlet for receiving a fluid conveying conduit;

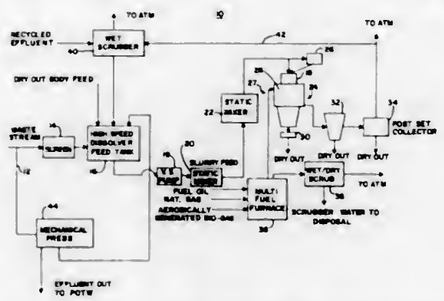
a diffuser contiguous to the inlet for diffusing received fluid.

5,556,232

NON-HAZARDOUS, NON-SPETIC LIQUID WASTE DRYING PROCESS

Raymond J. Malmgren, New Lenox, Ill., assignor to Land & Lakes Company, Park Ridge, Ill.

Filed Jun. 7, 1995, Ser. No. 472,300
Int. Cl.[6] B09B *1/00;* **C02F** *1/02*
U.S. Cl. 405—129 **21 Claims**



1. A method for recovering solid waste from a non-hazardous, non-septic liquid waste stream, comprising the steps of:

(a) powering a drying gas heating mechanism using aerobically generated biogas as a power source;

(b) passing at least a portion of the liquid waste stream through a mixer prior to drying the at least portion of the liquid waste stream;

(c) substantially atomizing the waste stream output from the mixer;

(d) drying the atomized waste stream using the heated drying gas; and

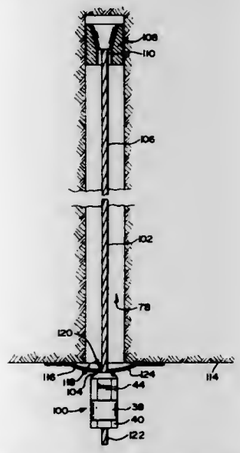
(e) passing waste particulate, produced by the step of drying, through a particulate collector to produce collected solid particulate.

5,556,233

ROCK ANCHOR ASSEMBLY

Vilmos Kovago, Edenvale, South Africa, assignor to RSC Mining (Proprietary) Limited, South Africa

Filed Dec. 22, 1994, Ser. No. 361,956
Claims priority, application South Africa, Dec. 23, 1993, 93/9668; Jun. 3, 1994, 94/3910
Int. Cl.[6] E02D *17/00;* **E21D** *20/00;21/0002;* **F16B** *31/02*
U.S. Cl. 405—259.4 **10 Claims**



10. A yielding anchor assembly which includes

an elongate element;

an enlarging means carried on at least a portion of the elongate element for enlarging a transverse dimension of said portion of the elongate element, said transverse dimension being reducible on the application of a suitable force applied to the enlarging means; and

a tensioning device for tensioning the elongate element, the tensioning device defining a passage through which the elongate element slips when said suitable tension is exceeded, the passage being dimensioned so that when the tension is exceeded, the suitable force is applied to the enlarging means to reduce the transverse dimension and to permit the portion to be drawn through the passage.

5,556,234

MINE ROOF BOLT ASSEMBLY

John G. Oldsen, Butler, and John C. Stankus, Canonsburg, both of Pa., assignors to Jennmar Corporation, Pittsburgh, Pa.

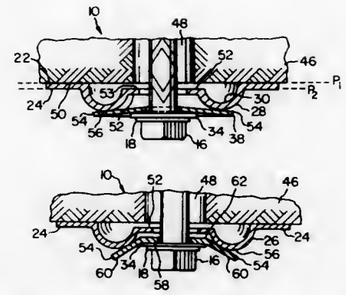
Filed May 2, 1995, Ser. No. 433,865
Int. Cl.[6] E21D *21/00;* **F16B** *43/02*
U.S. Cl. 405—259.1 **17 Claims**

1. A mine roof bolt assembly comprising:

a tensionable roof bolt having a shaft;

a bearing plate having a contacting surface that is adapted to substantially contact a mine roof, an opposite surface defined by an embossment having a convex shape and a concave shape, and an aperture through which said roof bolts extends; and

a deformable washer comprising a first convex shaped surface, a second concave surface positioned opposite to said first surface and an aperture through which said bolt passes, whereby said first surface of said deformable washer is adapted to abut against said opposite surface of said bearing plate prior to tensioning said mine roof bolt and said deformable washer plastically deforms as said mine roof bolt is tensioned so that the shape of the plastically deformed washer is geometrically different than that of the washer prior to deformation.



10. A method for installing a mine roof bolt assembly having a bearing plate with an embossment and a contacting surface, comprising:

forming a mine roof hole in a mine roof;

placing the contacting surface of the bearing plate against the mine roof;

placing a deformable washer in contact with the embossment of the bearing plate;

passing a shaft of a mine roof bolt through the deformable washer and the bearing plate into the mine roof hole; and

tensioning the mine roof bolt such that the deformable washer permanently plastically deforms on the embossment.

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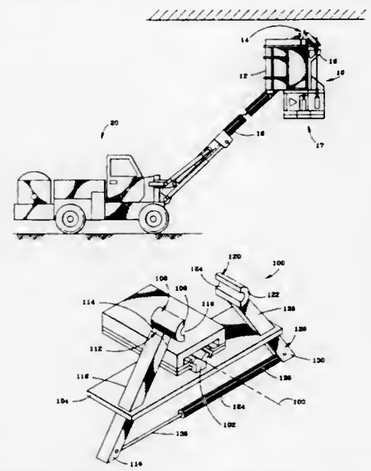
ROCK BOLTER

Ward D. Morrison, Claremont, and Perry L. Coombs, both of Claremont, N.H., assignors to Cannon Industries, Inc., Claremont, N.H.

Continuation-in-part of Ser. No. 140,299, Oct. 20, 1993, abandoned. This application Feb. 17, 1995, Ser. No. 390,746
Claims priority, application Canada, Oct. 19, 1994, 2118447
Int. Cl.[6] E21D *20/00*
U.S. Cl. 405—303 **16 Claims**



1. A stinger/centralizer for a rock bolter having a feed shell with a feed shell axis comprising:

a stinger base affixed with respect to the feed shell;

a first head element having a first head rock engaging surface and a first head cavity therein;

a first head arm attached to said first head element, said first head arm movably engaged with said stinger base;

a second head element having a second head rock engaging

5,556,237

opened to permit conveying gas and said particles to flow from

5,556,240

a second head element having a second head rock engaging surface and a second head cavity therein;

a second head arm attached to said second head element, said second head arm movably engaged with said stinger base; and

means for engaging said first head element with said second head element such that said first head cavity and said second head cavity provide a centralizer passage which is substantially parallel to the feed shell axis.

5,556,236

CONVEYOR SYSTEM FOR ROD-LIKE ARTICLES

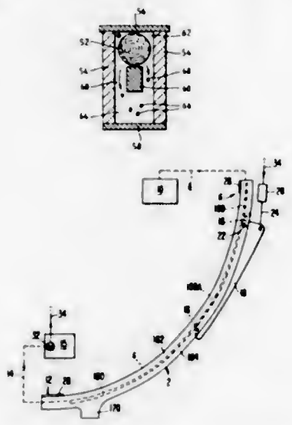
Albert D. Seim, II; Herman J. Steinbuchel, and Charles R. Willing, all of Richmond, Va., assignors to Molins PLC, Milton Keynes, United Kingdom

Continuation of Ser. No. 149,934, Nov. 10, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 473,939

Claims priority, application United Kingdom, Nov. 11, 1992, 9223612

Int. Cl.[6] B65G *51/02*

U.S. Cl. 406—3 **17 Claims**



1. A conveyor system for rod-like articles comprising: a distributor unit, a receiver unit, means defining a path for said articles along which the articles are conveyed pneumatically from the distributor unit and into the receiver unit, means defining a discontinuity in said path, a gate displaceable between a first position in which said gate bridges said discontinuity so that the articles are conveyed along said path across said discontinuity and a second position in which the articles exit said path at said discontinuity, signal generating means downstream of said discontinuity for generating signals responsive to passage or occupation of said articles along said path downstream of said discontinuity and means for moving said gate between said first position and said second position, said moving means including actuating means responsive to said signals.

7. A conveyor system for filter rods containing particulate filter material comprising a pneumatic transport duct having a first longitudinally extending region for conveying the filter rods, a second longitudinally extending region for collecting the material which has become separated from the filter rods, transverse path means for allowing said material to pass from said first region to said second region, and means for removing said material from said second region.

5,556,237

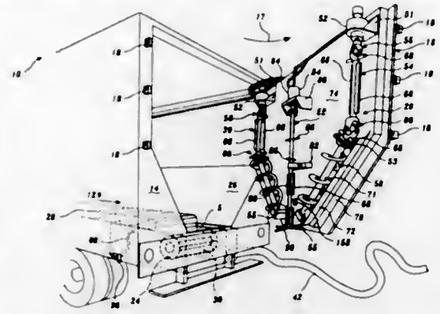
APPARATUS AND METHOD FOR DISPENSING AND DISTRIBUTING LOOSE PARTICULATE MATERIALS

Arlen L. Rexius, Eugene, Oreg., assignor to Rexius Forest By-Products, Inc., Eugene, Oreg.

Filed Oct. 7, 1994, Ser. No. 319,494

Int. Cl.[6] B65G *53/08*

U.S. Cl. 406—32 **19 Claims**



1. An apparatus for dispensing and distributing loose particulate material, the apparatus comprising:

a container for holding and transporting the loose particulate material;

a feeder that regulates the flow of loose particulate material out of the container;

one or more rotatable vertically oriented augurs located above the feeder to move loose particulate material into the feeder;

a drive system operatively attached to the augers to rotate the augers;

a blower that produces an air stream that blows loose particulate material exiting the feeder through a hose coupled to the apparatus; and

a moving floor located within the container to move the loose particulate material into the feeder and augers.

5,556,238

PROCESS AND APPARATUS FOR INTRODUCING A SOLID INTO A REACTOR

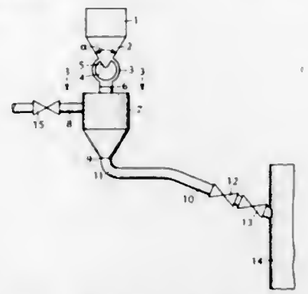
Jean-Claude Chinh, Lavera, France, assignor to BP Chemicals Limited, London, England

Filed May 6, 1994, Ser. No. 238,929

Claims priority, application France, May 19, 1993, 93 06331

Int. Cl.[6] B65G *53/16*

U.S. Cl. 406—136 **12 Claims**



1. A process for introducing fine particles of a solid into a reactor containing a gas under predetermined pressure above atmospheric pressure through a feed enclosure connected to the reactor by an injection pipe connected at one end to the enclosure and at an opposite end to the reactor through entry means which can be opened to permit conveying gas and said particles to flow from said injection pipe into said reactor and which can be closed to prevent flow of the conveying gas and said particles from said injection pipe into said reactor, said process comprising:

while said entry means is closed, introducing said particles into said feed enclosure and permitting most of the particles to settle at rest;

after most of said particles have settled at rest and while said entry means remains closed, introducing the conveying gas under pressure into said feed enclosure at a position thereon which causes said particles to become suspended in the conveying gas introduced into said enclosure and until a pressure of said conveying gas in said enclosure is higher than said predetermined pressure; and

thereafter, opening said entry means and permitting said gas in said feed enclosure with the particles suspended therein to flow from said feed enclosure through said injection pipe and into said reactor.

5,556,239

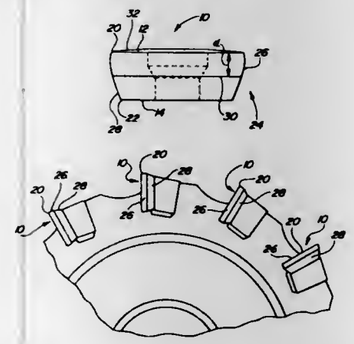
POSITIVE CUTTING INSERT WITH COMPOUND CLEARANCE FACES

Lee Reiterman, Royal Oak, Mich., assignor to Valenite Inc., Madison Heights, Mich.

Continuation of Ser. No. 139,354, Oct. 18, 1993, abandoned. This application Oct. 24, 1995, Ser. No. 548,166

Int. Cl.[6] B23C *5/02*

U.S. Cl. 407—113 **3 Claims**



1. A polygonal, indexable insert for peripheral rotary cutters comprising:

a top surface, a planar bottom surface smaller than said top surface, and a side wall intersecting said bottom surface to define a clearance edge and extending outward from said bottom surface at an obtuse angle and intersecting said top surface to define a body; said intersection of said side wall and said top surface defining a cutting edge; said side wall comprised of side flank portions which extend from one corner of the insert to an adjacent corner of the insert; each side flank portion comprised of a primary clearance surface positioned adjacent to the cutting edge and a secondary clearance surface positioned adjacent to the bottom surface; said primary clearance surface being convexly curved in a direction from said cutting edge to a junction line some distance along said sidewall intermediate said top and bottom surface such that the primary clearance surface is curved in a direction transverse to a length of the cutting edge; said secondary clearance surface being planar and extending along said sidewall from said clearance edge to said junction line.

5,556,240

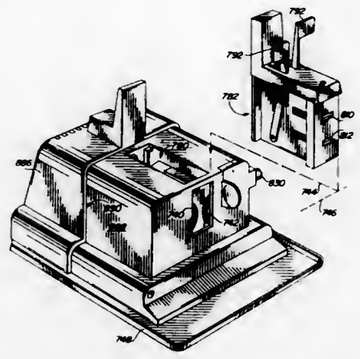
KEY POSITIONING FIXTURE FOR A KEY CUTTING MACHINE

Robert E. Almblad, Mundelein, Ill., assignor to Axxess Technologies, Inc., Tempe, Ariz.

Continuation-in-part of Ser. No. 207,837, Mar. 8, 1994, Pat. No. 5,443,339, which is a continuation of Ser. No. 769,921, Sep. 30, 1991, Pat. No. 5,314,274, which is a continuation-in-part of Ser. No. 425,731, Oct. 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 260,815, Oct. 21, 1988, abandoned. This application Sep. 26, 1994, Ser. No. 312,418

Int. Cl.[6] B23C *3/35*

U.S. Cl. 409—81 **25 Claims**



1. A key positioning fixture for a key cutting machine capable of duplicating a double-sided key having a longitudinal centerline, a head, a shank with parallel-oriented first and second edge surfaces and parallel-oriented first and second sides, a blade having first and second opposing edges for receiving bits and defining a bitted surface along the length of each blade edge, the key cutting machine including a key follower for engaging and tracing a bitted surface of a master key and a key cutter for engaging and reproducing the bitted surface of the master key on the blade of a key blank, the key positioning fixture comprising:

a. first key alignment element having a longitudinal centerline, and including

i. an upper clamping element including an upper clamping surface oriented parallel to the key alignment element longitudinal centerline, the spacing between the first clamping surface and the longitudinal centerline defining a distance D1;

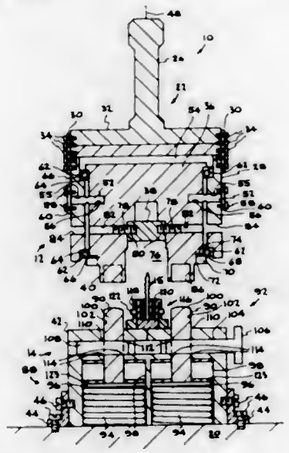
ii. an opposing lower clamping element including a lower clamping surface oriented parallel to the key alignment element longitudinal centerline, the spacing between the lower clamping surface and the longitudinal centerline defining a distance D2, such that the upper and lower clamping surfaces define parallel-oriented, opposing surfaces configured to engage and clamp the first and second edge surfaces of the key shank;

b. a position control element engaging the upper and lower clamping elements of the first key alignment element for controlling the spacing between the upper and lower clamping surfaces while maintaining distance D1 equal to distance D2 to cause the upper and lower clamping surfaces to engage and clamp the first and second edge surfaces of the key shank to orient the key centerline parallel to the key alignment element longitudinal centerline and to decrease the vertical distance between the key centerline and the first key alignment element centerline substantially to zero; and

c. a second key alignment element including first and second clamping surfaces for engaging the first and second sides of the key blade to maintain the key in a fixed position with one of the blade edges remaining fully exposed to permit either key following or key cutting operations.

170-920 O.G.-96-10: QL3

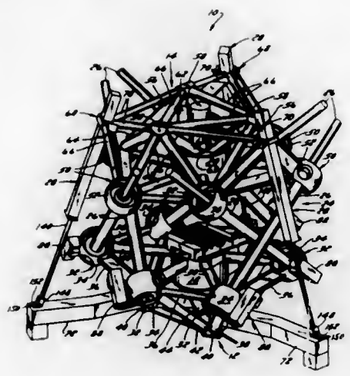
5,556,241
QUICK STOP DEVICE
Roger L. Hipwell, 35 Hounds Ditch La., Duxbury, Mass. 02332, and Andrew J. Hazelton, 3877 Army St., San Francisco, Calif. 94131
Filed Jan. 25, 1995, Ser. No. 378,427
Int. Cl.[6] B23C *9/00;* **B23B** *1/00;35/00;* **B23Q** *17/09*
U.S. Cl. 409—131 **20 Claims**



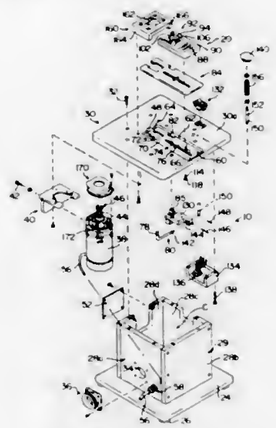
19. A method for abruptly interrupting the cutting of a workpiece by a cutter to facilitate examination of characteristics of the cut, comprising the steps of:
securing the workpiece within a rotatable workpiece holder having a stop that travels along an annular path during rotation;
fastening the workpiece holder to an outer housing by a shear pin;
mounting the cutter in proximity to the workpiece holder;
rotating the outer housing and the workpiece holder;
moving the workpiece into contact with the cutter;
cutting the workpiece; and
forcing a plunger into the annular path to abruptly stop rotation of the workpiece holder, thereby shearing the shear pin to permit continued rotation of the outer housing.

5,556,242
SPACE FRAME FOR A MACHINE TOOL
Paul C. Sheldon, Mequon, and Edward E. Kirkham, Brookfield, both of Wis., assignors to Giddings & Lewis, Inc., Fond du Lac, Wis.
Filed Jun. 17, 1994, Ser. No. 261,682
Int. Cl.[6] B23C *1/06*
U.S. Cl. 409—132 **34 Claims**

25. A method for moving a machine tool framework to cooperate with a designated object and for providing structural rigidity in the machine tool framework while eliminating mass, the method comprising the steps of:
assembling a plurality of struts into a space framework;
interconnecting the plurality of struts at a plurality of strut connection points;
mounting a machine tool component to selected struts of the plurality of struts;
orienting the struts so they substantially counteract resulting stresses in either compression or tension when forces are placed against the machine tool component;
moving the space frame with respect to the designated object; and
causing an interaction between the machine tool component and the designated object.

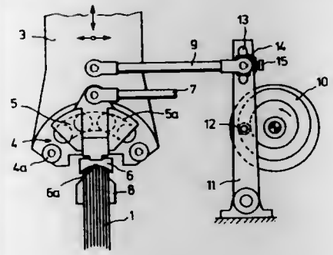


5,556,243
NECK DOWN CUTTER
William H. Bory, Baltimore, Md., assignor to Chesapeake Corporation, Baltimore, Md.
Filed Sep. 23, 1994, Ser. No. 310,981
Int. Cl.[6] B23D *7/08;1/00;* **B27G** *5/00*
U.S. Cl. 409—226 **21 Claims**



20. A method of notching parallel sides in a rectangular specimen of corrugated material, comprising the steps of:
(a) placing the specimen in a sample holder;
(b) relatively moving the sample holder, with specimen thereon, and a cutting element together to form a first notch in one of the said sides;
(c) relatively moving the sample holder, with specimen thereon, and the cutting element away from each other;
(d) removing the specimen from the holder and repositioning it to expose the other of said parallel edges yet to be cut; and
(e) repeating steps (b) and (c).

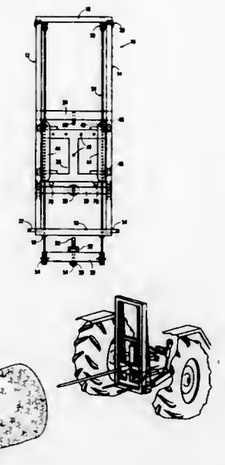
5,556,244
METHOD OF AND APPARATUS FOR BACKING BOOK BLOCKS
Kurt Begemann, Lohne; Horst Rathert, Minden, and Manfred Albrecht, Lubbecke, all of Germany, assignors to Kolbus GmbH & Co. KG, Rahden, Germany
Filed Mar. 13, 1995, Ser. No. 402,716
Claims priority, application Germany, Mar. 18, 1994, 44 09 319.5
Int. Cl.[6] B42C *5/02*
U.S. Cl. 412—30 **27 Claims**



1. In apparatus for backing book blocks by mechanical means, the book blocks having been rounded and being held in a clamped condition, the clamped book block having generally parallel sides and a convex spine region which extends between said sides, the center line of the spine region lying in a plane which is substantially parallel to said sides, the backing apparatus including a pressing beam having a contact surface which applies a compressive force to the spine of the book block, the backing apparatus further including a load-bearing component which supports a carrier on which the pressing beam is mounted, the carrier being movable relative to the load-bearing component to thereby impart swinging movements to the pressing beam, the improvement comprising:
means for displacing the center line of the contact surface of the pressing beam relative to the plane of the center line of the clamped book block during the swinging movements of the pressing beam to thereby generate tangential movements of the pressing beam which are superimposed on the swinging movements, the tangential movements being in directions which are generally away from said plane; and
means for relieving the compressive force applied to the book block during movements of the pressing beam contact surface center line generally toward said plane.

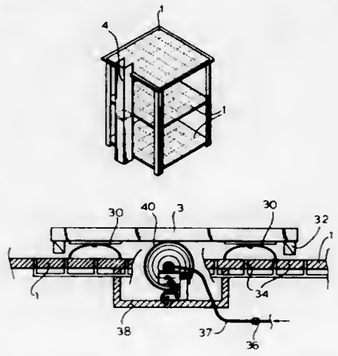
5,556,245
TRACTOR MOUNTED LIFTING APPARATUS
Billy Moss, 2065 Carters Creek Pike, Franklin, Tenn. 37064
Filed Dec. 9, 1994, Ser. No. 353,455
Int. Cl.[6] B66F *9/04*
U.S. Cl. 414—24.5 **11 Claims**

1. An apparatus for lifting, lowering and placing bales of hay, which apparatus is adapted to be mounted on a tractor having lower arms of a three point hitch powered by the tractor engine, said apparatus comprising,
a longitudinal frame member having at least one coupling member for coupling to and being supported by at least one lower arm of the tractor three point hitch and having a second coupling member for coupling to the top link tractor mount of the tractor three point hitch for positioning the frame member in a generally upright position with respect to the tractor,
a platform member mounted on said frame member for guided movement in the longitudinal direction of said frame member,
at least one force applying member coupled to said platform for raising and lowering said platform relative to said frame member in response to the tractor three point hitch lower arm raising and lowering said frame member,



a bale engaging assembly coupled to said platform,
said second coupling member comprises an assembly having a length variable under the control of the tractor operator for rotating said frame member to a number of angular positions within the vertical center plane of the tractor, and
wherein said at least one force applying member comprises at least one cable having a first end for being fixed relative to said frame member and a second end for being coupled to said platform, said apparatus further comprising cable guide members positioned to cause said cable to raise and lower said platform relative to said frame member in response to the respective raising and lowering of said frame member by the tractor lower arm.

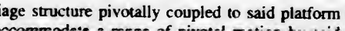
5,556,246
AUTOMATED STORAGE SYSTEM
Yuval Broshi, Ramat Gan, Israel, assignor to ASSA Industries Ltd., Ramat Gan, Israel
Continuation-in-part of Ser. No. 40,190, Mar. 29, 1993, abandoned. This application Jan. 27, 1995, Ser. No. 380,849
Claims priority, application Israel, Mar. 31, 1992, 101435
Int. Cl.[6] B65G *1/04;* **E04H** *6/34*
U.S. Cl. 414—278 **6 Claims**



1. A system for storing, retrieving and transporting goods, comprising:
a pallet carrying goods to be stored, retrieved and transported and including:

a plate having a top surface receiving said goods and a

while the carousel remains in continuous motion, the extractor



a carriage structure pivotally coupled to said platform structure

a plate having a top surface receiving said goods and a bottom,

a plurality of short legs projecting downwardly from said bottom and supporting said pallet at rest, and

a plurality of downwardly open flexible cells formed on said bottom and adapted to laterally confine respective air cushions supporting said plate during travel thereof;

at least one storage area formed with a floor subdivided into rectangular units at each of which said pallet can be positioned, each of said rectangular units comprising:

air-outlet means communicating with a source of pressurized air for supplying pressurized air to said cells to form said air cushions,

control means for selectively controlling the supply of air to selective air-outlet means of said units to support said pallet as said pallet travels over selected units to position said pallet on said floor, said pallet resting by said legs on said floor upon termination of the supply of pressurized air at a selected one of said units, and

lateral motion means and longitudinal motion means operatively connected to said pallet as said pallet is displaced over a respective unit to displace the pallet selectively in lateral and longitudinal directions, respectively; and

computer means connected to all of said motion means and control means of all of said units for operating said control means and said motion means selectively to displace said pallet aislefree from one of said units to another of said units over said storage area.

5,556,247

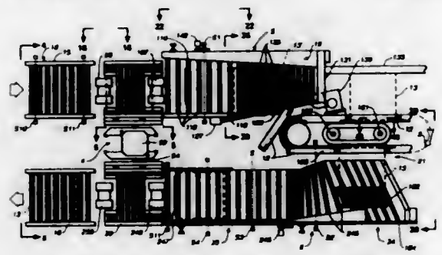
ORGANIZER SYSTEM AND METHOD FOR A ROTATABLE STORAGE STRUCTURE

Robert Lichti, Sr., Lake Almanor Peninsula, and Clay Bernard, II, Pt. Richmond, both of Calif., assignors to Computer Aided Systems, Inc., Hayward, Calif.

Continuation of Ser. No. 794,294, Nov. 14, 1991, Pat. No. 5,282,712, which is a continuation of Ser. No. 481,575, Feb. 16, 1990, abandoned, which is a division of Ser. No. 192,419, Apr. 29, 1988, Pat. No. 4,983,091, which is a continuation-in-part of Ser. No. 824,718, Jan. 31, 1986, abandoned, said Ser. No. 821,257and Ser. No. 31,989, Mar. 30, 1987, abandoned, is a continuation-in-part of Ser. No. 732,927, May 13, 1985, abandoned. This application Oct. 18, 1993, Ser. No. 139,566

Int. Cl.° B65G *1/10*

U.S. Cl. 414—331 **22 Claims**



1. A storage system for storage and retrieval of material goods, the storage system comprising:

a storage carousel including a multiplicity of container support racks arranged in side-by-side fashion, means forming a continuous track, and means for moving the container support racks about the continuous track, each said container support rack including rack attachment means;

a multiplicity of containers adapted to receive material goods, each said container having container attachment means for cooperating with the rack attachment means to releasably secure the container to a particular container support rack;

an extractor assembly disposed adjacent the storage carousel for disengaging a selected container from its corresponding rack while the carousel remains in continuous motion, the extractor assembly including a tilt lifting means for lifting one side of the selected container to disengage it from its associated rack and a removal section wherein the selected container is supported and moved away from the carousel;

an inserter assembly disposed adjacent the carousel for attaching a selected container to a selected container support rack while the carousel remains in continuous motion; and

a control means for controlling the operation of the storage carousel, the extractor assembly and the inserter assembly to facilitate the storage and retrieval of the containers.

5,556,248

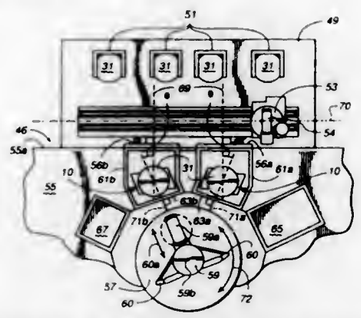
SEMICONDUCTOR WAFER CASSETTE TRANSFER SYSTEM

Howard E. Grunes, Santa Cruz, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 4,331, Jan. 14, 1993, Pat. No. 5,387,067. This application Jan. 30, 1995, Ser. No. 380,548

Int. Cl.° B65G *1/07*

U.S. Cl. 414—416 **24 Claims**



1. A system for storing and transferring a planar substrate having a primary plane and a primary width, the system comprising:

(a) a substrate storage;

(b) a first substrate transfer means, having a maximum first width W_1 which is less than the primary width of the substrate and means for constraining movement of the substrate, for transferring the substrate along a first transfer axis associated with the substrate storage, to or from the substrate storage;

(c) a second substrate transfer means, having a maximum second width W_2 which is less than the primary width of the substrate, for transferring the substrate along a second transfer axis non-parallel to the first transfer axis and associated with the substrate storage, to or from the substrate storage; and

(d) first and second substrate edge supports associated with the substrate storage and for supporting the substrate at its edges, the first and second substrate edge supports being arranged to permit transfer of the substrate to or from the substrate storage by both the first and second substrate transfer means in a rectilinear manner without the substrate storage being rotated about an axis perpendicular to the primary plane of the substrate.

5,556,249

CARGO LOADING AND UNLOADING SYSTEM FOR USE WITH UTILITY VEHICLE HAVING BED

Daniel M. Heine, 3010B W. 107th Pl., Westminster, Colo. 80030

Filed Jun. 9, 1995, Ser. No. 488,847

Int. Cl.° B60P *1/43*

U.S. Cl. 414—500 **15 Claims**

1. A cargo loading and unloading system for a utility vehicle having a bed, said system comprising:

(a) a movable sled for retaining cargo items, said sled including

(i) a base having a pair of opposite ends and a pair of opposite sides,

(ii) a pair of outer wheels attached adjacent to each of said opposite ends along said opposite sides of said base, said outer wheels being adapted for moving said sled on the ground, and

(iii) a pair of inner wheels attached underneath each of said opposite ends of said base so as to extend below said base adjacent to said opposite sides thereof and substantially adjacent to said outer wheels;

(b) a platform mountable to the bed of the utility vehicle for receiving thereon said sled, said platform including a base having a pair of opposite sides;

(c) a ramp for receiving thereover said inner wheels of said sled for facilitating moving said sled up onto and down from said platform, said ramp including a pair of opposite sides and a pair of opposite ends, a first of said opposite ends of said ramp for contacting the ground to support said ramp in an inclined orientation such that a second of said opposite ends of said ramp is engaged with said platform at a rear end of the bed; and

(d) means interconnecting said platform and said sled for controlling the movement of said sled between the ground and the bed of the utility vehicle.

5,556,250

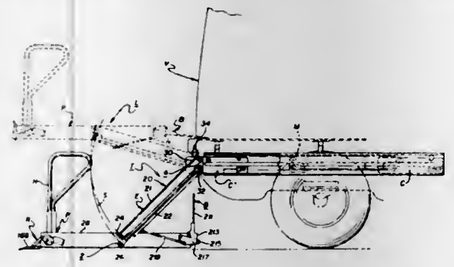
VEHICLE LIFTS

Percy Fretwell, Lancashire, England; Stanton D. Saucier, Tarzana, and Bernard G. Doucet, Woodland Hills, both of Calif., assignors to Ricon Corporation, Pacoima, Calif.

Continuation of Ser. No. 67,724, May 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 681,542, May 3, 1991, Pat. No. 5,293,973. This application May 24, 1995, Ser. No. 449,777

Int. Cl.° B60P *1/44*

U.S. Cl. 414—558 **24 Claims**



1. A lift adapted to be affixed to a vehicle for movement of a load between raised and lowered positions, the lift comprising:

a platform structure for receiving the load to be moved between the raised and lowered positions;

a carriage structure pivotally coupled to said platform structure to accommodate a range of pivotal motion by said platform structure between said raised and lowered positions and embracing a stowage position existing intermediate said raised and lowered positions, said carriage structure including a first engaging member;

a mounting enclosure affixed to said vehicle and having a frame defining a space to receive at least part of said carriage structure and said platform structure, said mounting enclosure having a second engaging member for mounting encasement with said first engaging member;

a first motive means conditionally actuated for driving said platform structure in said pivotal range of motion;

a second motive means conditionally actuated for driving at least one of said first and second engaging members to move said carriage structure in and out of said mounting enclosure; and

control apparatus for said first and second motive means, said control apparatus including a sensor unit detecting the platform structure substantially approaching said stowage position and said sensor unit being conditionally operative during select intervals to actuate said first motive means to adjust for alignment between said platform structure and said carriage for attaining said stowage position prior to said second motive means being actuated for drawing said carriage structure and at least part of said platform structure into said mounting enclosure.

5,556,251

SHEET FINISHER

Masakazu Hiroi, and Yoshifumi Takehara, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

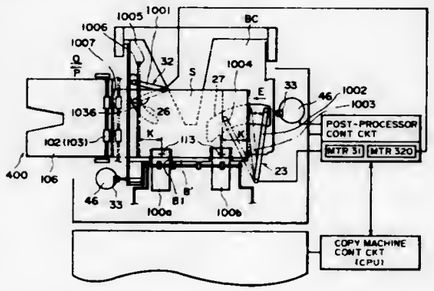
Continuation of Ser. No. 17,372, Feb. 12, 1993, abandoned.

This application Jun. 5, 1995, Ser. No. 465,612

Claims priority, application Japan, Feb. 12, 1992, 4-059501; Feb. 12, 1992, 4-059502; Feb. 12, 1992, 4-059503; May 22, 1992, 4-130832

Int. Cl.° B65H *31/30*

U.S. Cl. 414—790.3 **25 Claims**



1. A sheet post-processing apparatus, comprising:

at least one tray means for stacking discharged sheets to form a stack of sheets;

stacker means, disposed adjacent to said at least one tray means, for receiving a set of sheets from said at least one tray means;

transfer means for transferring a set of sheets from said at least one tray means to said stacker means;

control means operable in a first mode, in which a set of sheets is transferred from said at least one tray means to said stacker means, and in a second mode, in which the set of sheets remains in said at least one tray means without being transferred to said stacker means, to permit removal of the set of sheets from said at least one tray means; and

retracting means, responsive to said control means, for retracting said stacker means to a position where removal of the set of sheets from said at least one tray means is unobstructed by

said stacker means, by relative movement between said at least one tray means and said stacker means when said control means is operable in the second mode.

5,556,252

STACK LIFTING APPARATUS AND METHOD

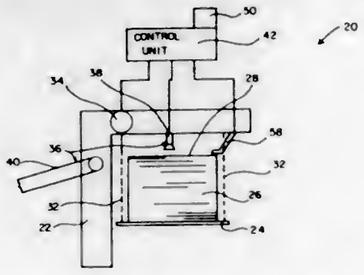
Richard Kuster, Darmstadt, Germany, assignor to MAN Roland Druckmaschinen AG, Germany

Filed Mar. 27, 1995, Ser. No. 410,706

Claims priority, application Germany, Mar. 25, 1994, 44 10 384.0

Int. Cl.[6] **B65G** *59/02*

U.S. Cl. 414—796.7 **19 Claims**



19. A method for feeding sheets from a top of a sheet stack supported on a stack lifting table to a sheet processing machine, the method comprising the steps of, raising the stack lifting table supporting the sheet stack until the top of the sheet stack has reached a predetermined maximum level, feeding the sheets from the top of the sheet stack to the sheet processing machine to lessen the stack height until the top of the sheet stack has reached a predetermined minimum level, determining a rate at which the stack height is lessened as sheets are fed from the stack lifting table by utilizing the distance between the predetermined maximum and minimum levels and a value corresponding to the speed at which sheets are fed from the stack, and continuously raising the stack lifting table at a rate corresponding to the rate at which the feeding of the sheets lessens the stack height to maintain the top of the stack at substantially a constant height as sheets are fed to the sheet processing machine.

5,556,253

AUTOMATIC PIPE-LOADING DEVICE

Peter C. Rozendaal, and David P. Langenfeld, both of Pella, Iowa, assignors to Vermeer Manufacturing Company, Pella, Iowa

Filed May 11, 1995, Ser. No. 438,696

Int. Cl.[6] **B65G** *59/06*

U.S. Cl. 414—797.7 **7 Claims**

1. An automatic load device for loading pipe onto a machine having a fixed pipe receiving location, said device comprising:

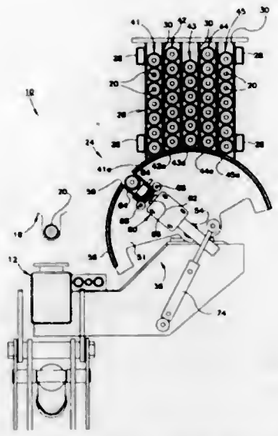
a magazine containing a plurality of pipes disposed in said magazine for gravity feed discharge through at least a first discharge opening of a discharge end of said magazine;

a pipe transfer member mounted for movement through a path of travel between a plurality of positions including at least a first pipe load position and a pipe unload position;

said pipe transfer member having a surface opposing said discharge end throughout movement of said pipe transfer member through said path of travel, said surface including a pipe receiving pocket sized and positioned to receive a pipe discharged through said first discharge opening when said pipe transfer member is in said first pipe load position and a remainder of said surface disposed to block discharge of a pipe from said first discharge opening when said pipe transfer member is in a position other than said first pipe load position;

said pipe transfer member including a pipe grip for grasping a pipe received within said pipe receiving pocket and releasing said grasped pipe into said receiving location of said machine when said pipe transfer member is in said pipe unload position; and

said magazine includes a plurality of pipe discharge openings and said plurality of positions of said pipe transfer member includes a plurality of pipe load positions with respective ones of said plurality of pipe load positions associated with individual ones of said plurality of pipe discharge openings for a pipe to be discharged from any selected one of said discharge openings into said pipe receiving pocket when said pipe transfer member is in a pipe load position associated with said selected one.



5,556,254

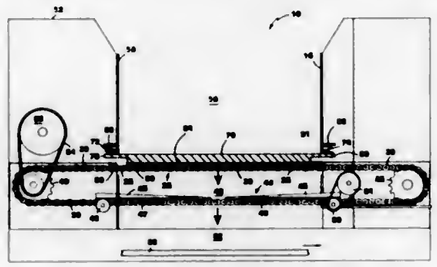
PAPER SET FEEDING

James A. Darcy, Windham, and Thomas E. Weeks, Manchester, both of N.H., assignors to Standard Duplicating Machines Corporation, Andover, Mass.

Filed Jun. 7, 1995, Ser. No. 486,931

Int. Cl.[6] **B65G** *59/06*; **B65H** *3/24*

U.S. Cl. 414—798.1 **26 Claims**



1. A sheet set feeder comprising:

a housing including a hopper for receiving a stack of sheet sets comprising a bottommost sheet set having a first end and a second end and a next-to-bottommost sheet set having a first end and a second end, the first end of the bottommost sheet set being offset-jogged with respect to the first end of the next-to-bottommost sheet set; and

a shutter mechanism supported by said housing and disposed at least in part beneath said hopper, said shutter mechanism defining an aperture sized to admit the bottommost sheet set and the next-to-bottommost sheet set,

said shutter mechanism including a driver for moving at least a portion of said shutter mechanism with respect to said hopper from a first position wherein said aperture is disposed beneath the first end of the bottommost sheet set to a second position wherein said aperture is disposed beneath the second end of the bottommost sheet set,

said shutter mechanism including a first retainer for supporting the next-to-bottommost sheet set when said aperture is disposed beneath the first end of the bottommost sheet set.

5,556,255

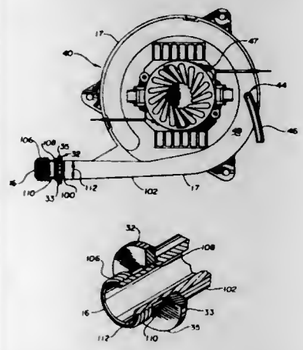
INTEGRAL THREADED TURBINE OUTLET

Joseph W. Kieffer, Rogers, Minn., assignor to Wagner Spray Tech Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 335,003, Nov. 9, 1994. This application Feb. 15, 1995, Ser. No. 389,093

Int. Cl.[6] **F04D** *29/62*; *29/00*

U.S. Cl. 415—212.1 **5 Claims**



1. An improved air outlet for portable paint spraying equipment of the type having a die cast turbine enclosure, the improved air outlet comprising a die cast extension of the turbine enclosure integrally formed therewith and having a die cast threaded end extending therefrom for direct coupling to a flexible hose used to provide atomizing air for a high volume low pressure portable paint spray gun, the extension projecting generally tangentially of the turbine enclosure and having a diameter approximately equal to the flexible hose to be coupled thereto and wherein the threaded end has a proximal threaded portion and a distal threaded portion separated by a reduced diameter unthreaded intermediate portion.

5,556,256

SWIVEL MECHANISM FOR AN ELECTRICAL FAN

Steve Shao, 6 Surro Dr., Framingham, Mass. 01701

Continuation-in-part of Ser. No. 281,041, Jul. 27, 1994, Pat. No. 5,458,462. This application Mar. 27, 1995, Ser. No. 410,768

Int. Cl.[6] **F04D** *29/36*

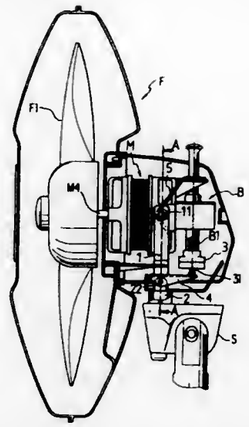
U.S. Cl. 416—100 **20 Claims**

13. An electrical fan comprising;

a moving fan head including a rotating fan motor with a fan blade rotatably coupled thereto for providing an airstream therefrom,

a stationary base, and

a swivel mechanism connecting and limiting said fan head and said base, for controlling the position of said fan head relative to said base and including;



a fan head support pivotably engaging said base about a first pivot axis and pivotably engaging said fan head about a second pivot axis perpendicular to said first pivot axis to allow universal pivoting of said fan head relative to said base,

a biasing spring fixedly engaging said fan head during all fan head positions allowed by said swivel mechanism to balance gravitational forces thereon about one or both of said pivot axes,

a rotating link coupled to said rotating motor by a speed reducing mechanism, and having a rotating link axis fixedly positioned relative to said fan head, said rotating link having a first socket portion integrally formed therein at a distance from said rotating link axis, and having a second socket portion attached to said first socket portion to thereby form a connection socket,

a swinging link including a spherical connection portion captured by said connection socket and thereby connected to said rotating link and universally pivotable relative thereto, said swinging link further being connected to said base at a swing axis not parallel to said rotating link axis, and said swinging link further being plano-pivotable relative to said base about said swing axis, and

whereby rotation of said motor causes continuous and sinusoidal pivoting of said fan head simultaneously about said first and second pivot axes, thereby moving said fan head relative to said base to continuously redirect said airstream in a substantially conical pattern.

5,556,257

INTEGRALLY BLADED DISKS OR DRUMS

Derek J. Foster; Peter J. Gillbanks, and Keith C. Moloney, all of Bristol, England, assignors to Rolls-Royce plc, London, England

Filed Dec. 2, 1994, Ser. No. 352,867

Claims priority, application United Kingdom, Dec. 8, 1993, 9325135

Int. Cl.[6] **F01D** *5/14*

U.S. Cl. 416—241 R **13 Claims**

1. A method of making an integrally bladed disc in which at least some of a multiplicity of integrally formed blades spaced apart around the disc and consisting of a first material are provided with a tip coating of a second material, the method comprising the steps of:

forming a blank of the first material to a part finished state prior to the forming of the blades;

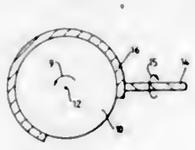
applying to selected portions of a surface of said blank a coating of the second material; and subsequently forming the blades.

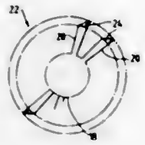
5,556,259

VORTEX GENERATING FLUID INJECTOR ASSEMBLY

5,556,262

FREE-PISTON ENGINE HAVING A FLUID ENERGY



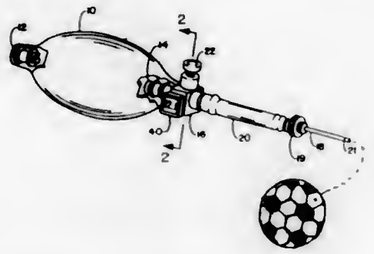


5,556,258

SQUEEZEBULB OPERATED SPORTS BALL PUMP

Robert F. Lange, 836 Balboa Ct., San Diego, Calif. 92109, and Charles W. Davey, 838 Balboa Ct., San Diego, Calif. 92109

Filed Jun. 12, 1995, Ser. No. 489,898
Int. Cl.[6] F04B 43/00
U.S. Cl. 417—63 12 Claims



1. A lightweight, flexible-bodied one-handed pump designed for optimum portability for use in low-pressure applications in which a mechanical advantage is not required for manual inflation, comprising:

(a) a flexible palm-sized squeezebulb defining an internal air chamber with an inlet and an outlet;

(b) an inlet check valve mounted in said inlet to admit ambient air into said squeezebulb;

(c) a needle adaptor having a pinhole outlet for use in inserting into a needle valve of a sports ball to deliver air thereto when said squeezebulb is squeezed;

(d) a flexible extension tube connecting and communicating between said outlet and said needle adaptor such that said outlet and said extension tube together define a passageway downstream of the air chamber of said squeezebulb and upstream of said needle adaptor;

(e) an outlet check valve defined in said passageway to obstruct backflow, whereby repeatedly squeezing and releasing said squeezebulb pumps consecutive bursts of air inhaled through said inlet to said needle adaptor; and

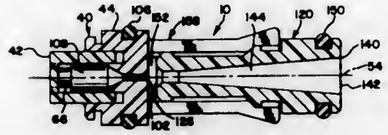
(f) a relief valve the downstream of said outlet check valve operable to vent downstream pressure from a sports ball to the atmosphere for adjusting ball pressure after inflation, and for deflating same for storage between uses.

5,556,259

VORTEX GENERATING FLUID INJECTOR ASSEMBLY

Russel L. Hlavenka, Oconomowoc, Wis., assignor to Fleck Controls, Inc., Brookfield, Wis.

Filed Jun. 6, 1995, Ser. No. 473,566
Int. Cl.[6] F04F 5/00
U.S. Cl. 417—194 11 Claims



1. A fluid injector assembly for drawing a first fluid into the flow of a second fluid, said injector assembly including:

an eductor including an inlet having a plurality of openings, a first outlet port, and a first fluid passage extending between said inlet and said first outlet port, said openings being disposed generally tangential to said first fluid passage, said inlet adapted to be placed in fluid communication with the second fluid such that the second fluid flows through said first fluid passage from said inlet to said first outlet port; and

a throat including an inlet port, a second outlet port, and a second fluid passage extending between said inlet port and said second outlet port, said inlet port of said throat being spaced apart from said first outlet port of said eductor thereby forming a gap therebetween, said gap adapted to be placed in fluid communication with the first fluid;

whereby as the second fluid flows through said first fluid passage, said tangential openings of said eductor cause the second fluid to swirl as the second fluid flows out of said first outlet port of said eductor into said gap thereby creating a low pressure zone within said gap which draws the first fluid into said gap wherein the first fluid and the second fluid enter said inlet port of said throat and flow through said second fluid passage.

5,556,260

MULTIPLE-CYLINDER PISTON TYPE REFRIGERANT COMPRESSOR

Kenji Takenaka; Hiroaki Kayukawa; Masafumi Ito; Osamu Hiramatsu; Suguru Hirota, and Taro Ozeki, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

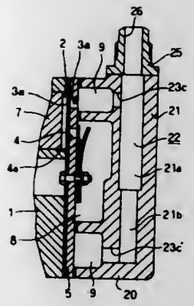
Filed Apr. 28, 1994, Ser. No. 234,311
Claims priority, application Japan, Apr. 30, 1993, 5-103902; Nov. 12, 1993, 5-283638
Int. Cl.[6] F04B 27/08;39/00
U.S. Cl. 417—269 11 Claims

1. A multiple-cylinder piston type compressor for a refrigeration system comprising:

an axially extending cylinder block means having a plurality of axial cylinder bores arranged around the central axis thereof;

a plurality of reciprocatory pistons received in said axial cylinder bores of said cylinder block means;

a cylinder head arranged so as to close one axial end of said cylinder block means with a valve plate interposed therebetween and having therein a discharge chamber and a suction chamber, said discharge chamber being formed in a radially central region of said cylinder head and said suction chamber being formed in a radially outer region thereof surrounding said discharge chamber; and



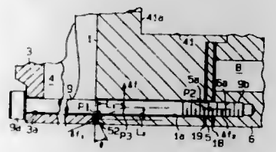
a refrigerant gas intake passage for receiving a refrigerant gas and having communicating passages providing direct communication between said gas intake passage and said suction chamber at two circumferentially spaced apart locations within said suction chamber, said refrigerant gas intake passage extending straight between said two locations.

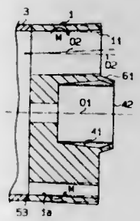
5,556,261

PISTON TYPE COMPRESSOR

Kazuya Kimura; Shigeyuki Hidaka, and Yoshitami Kondo, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Jun. 26, 1995, Ser. No. 494,884
Claims priority, application Japan, Jun. 27, 1994, 6-145062
Int. Cl.[6] F04B 1/12
U.S. Cl. 417—269 24 Claims





1. A piston type compressor for sucking and compressing gas by a plurality of pistons reciprocated in a casing in accordance with the rotation of a drive shaft supported in the casing, the compressor comprising:

a plurality of casing components disposed along an axis of the drive shaft and mated with one another for forming said casing; and

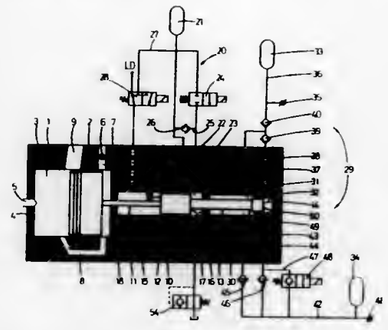
means for suppressing a bending moment generated in a specific one of the casing components when the casing components are compressed in a direction parallel to the axis of the drive shaft.

5,556,262

FREE-PISTON ENGINE HAVING A FLUID ENERGY UNIT

Peter A. J. Achten, Eindhoven, and Theodorus G. Potma, Kaag, both of Netherlands, assignors to Innas Free Piston B.V., Breda, Netherlands

PCT No. PCT/NL92/00209, § 371 Date May 18, 1994, § 102(e) Date May 18, 1994, PCT Pub. No. WO93/10342, PCT Pub. Date May 27, 1993
PCT Filed Nov. 19, 1992, Ser. No. 244,150
Claims priority, application Netherlands, Nov. 19, 1991, 9101931
Int. Cl.[6] F02B 71/04;71/02; F01B 11/02
U.S. Cl. 417—364 6 Claims



1. Free-piston engine having a fluid energy unit including one or more pressure accumulators, the free-piston engine comprising a cylinder and a piston within the cylinder limiting one side of a combustion room and reciprocating in the cylinder between a first position in which the volume of the combustion room in the cylinder is at a maximum, and a second position in which the volume of the combustion room in the cylinder is at a minimum, an expansion stroke of the piston from the second to the first position taking place by expansion pressure within the combustion room and mechanical energy rendered to the piston by the expansion pressure being converted into hydraulic energy within the engine, the piston being equipped with a plunger-shaped extension comprising first, second and third axial faces, wherein at least the first and third axial faces limit displacement rooms the volume of which is reduced during the expansion stroke of the piston, said displacement rooms comprising supply and discharge means for supplying and discharging fluid to and from the respective displacement rooms from and to said at least one or more pressure accumulators, and at least the second axial face directed opposite to said third axial face and limiting a pressurized room in the first position of the piston in order to hold the piston in said first position prior to moving back to the second position, characterized in that of at least all displacement rooms of which the fluid contained therein is a liquid, the supply and discharge means connecting thereto comprise separate first and second channel means, and that the plunger-shaped extension drives displaceable closure means preventing discharge or supply, respectively, of liquid from or to, respectively, the displacement room via the first channel means unless during a first part of the expansion stroke and a second part of the compression stroke of the piston, respectively, and the first channel means having a low flow resistance, the second channel means comprising a quickly closing non-return valve and having a small waste volume of liquid at the end of the expansion stroke of the piston by arranging said quickly closing non-return valves near to the respective displacement rooms.

5,556,263

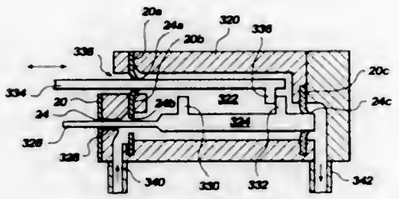
VOLUMETRIC PUMP AND VALUE

Stephen C. Jacobsen, and Clark C. Davis, both of Salt Lake City, Utah, assignors to Sarcos Group, Salt Lake City, Utah

Division of Ser. No. 157,693, Nov. 23, 1993. This application Jun. 6, 1995, Ser. No. 469,473

Int. Cl.[6] F04B *7/00*

U.S. Cl. 417—490 **1 Claim**



1. A volumetric pump and fluid flow control valve system comprising

a housing having a central hollow, an inlet and an outlet, both for communicating with the central hollow, and a third opening,

a first sheet of resilient material disposed in the housing between the inlet and the central hollow, with an aperture formed in the sheet,

a second sheet of resilient material disposed in the housing between the outlet and the central hollow, with an aperture formed in the second sheet,

a third sheet of resilient material disposed over the third opening, said third sheet having an opening therein,

an elongate valve spool disposed to move longitudinally within the central hollow of the housing between a first position in which the aperture in the first sheet is unplugged and the aperture in the second sheet is plugged, to allow fluid to flow through the inlet into the central hollow, and a second position in which the aperture in the first sheet is plugged and the aperture in the second sheet is unplugged, to allow fluid to flow from the central hollow and out the outlet,

an elongate plunger means extending through the aperture in the third sheet of material and into the central hollow for reciprocating back and forth to alternately move farther into the central hollow and then move the valve spool to the first portion, and move farther out of the central hollow and then move the valve spool to the second position, and

means for causing the plunger means to reciprocate.

5,556,264

LOW PROFILE POSITIVE DISPLACEMENT PUMP SYSTEM

Dallas W. Simonette, Andover, Minn., assignor to GP Companies, Inc., Mendota Heights, Minn.

Filed Jul. 28, 1995, Ser. No. 508,586

Int. Cl.[6] F04B *49/00*

U.S. Cl. 417—307 **11 Claims**

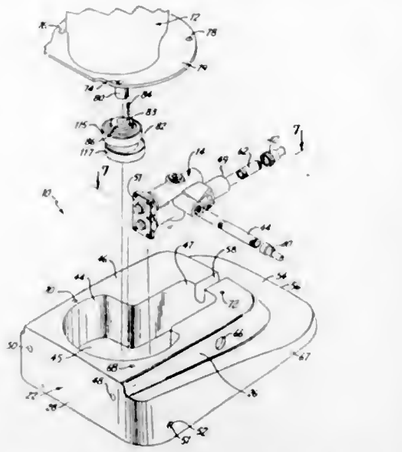
1. A low profile positive displacement pump, suitable for being driven by a gasoline powered engine, the engine having a vertical rotational engine shaft, comprising:

a pump housing including a fluid inlet, a fluid outlet and at least one horizontal bore fluidly connected to the fluid inlet and outlet for receiving a plunger;

at least one plunger, each plunger positioned in the bore for reciprocating movement, each plunger having a driven end;

a base including a cavity for retaining the pump housing, having connecting means for mounting an engine directly to the pump housing;

a vertical rotational pump shaft adapted for coupling to a vertically oriented engine shaft, the pump shaft having a central rotational axis;



at least one eccentric camming surface on the pump shaft for directly or indirectly contacting the driven end of the plunger and for causing the plunger to move in a first direction perpendicular to the central axis of the pump shaft;

a spring positioned in the bore for causing the plunger to move in a second direction opposite the first direction;

at least one inlet check valve mounted in the pump housing and fluidly connected to the fluid inlet;

at least one outlet check valve mounted in the pump housing and fluidly connected to the fluid outlet;

an unloader valve mounted in the pump housing and fluidly connected to the fluid outlet and fluid inlet; and

wherein the base is adapted for mounting directly to a mounting flange of a gasoline powered engine and wherein the base fixes the position of each eccentric camming surface with respect to each driven end.

5,556,265

MULTI-PISTON TYPE REFRIGERANT COMPRESSOR WITH MEANS FOR DAMPING SUCTION AND DISCHARGE GAS PULSATION

Hiromi Michiyuki; Hayato Ikeda; Masanobu Yokoi, and Hisato Kawamura, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Oct. 2, 1995, Ser. No. 538,411

Claims priority, application Japan, Oct. 5, 1994, 6-241591

Int. Cl.[6] F04B *39/12*

U.S. Cl. 417—312 **8 Claims**

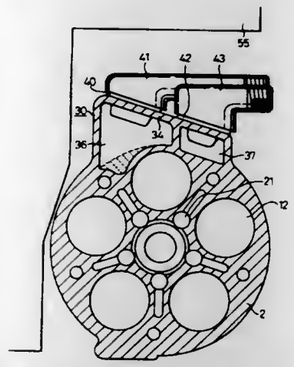
1. A multi-piston type refrigerant compressor provided with a muffling means, which comprises:

a cylinder block means having a horizontally extending central axis, and a generally cylindrical body portion defined around the central axis and having a plurality of cylinder bores arranged equidistantly around the horizontal central axis;

a plurality of piston elements reciprocating in said plurality of cylinder bores to implement suction of a refrigerant gas, compression of the refrigerant gas, and discharge of the compressed refrigerant gas;

an upright wall means extending from an upper portion of said cylindrical body portion so as to define enclosed upright chambers having upward openings, said enclosed upright chambers having an appreciable amount of volume; and

a plate-like covering means for covering said upward openings of said enclosed upright chambers to form; said muffling means including a suction pulsation damping chamber and a discharge pulsation damping chamber hermetically isolated from said suction pulsation damping chamber by a partition wall means arranged between said enclosed upright chambers,



said plate-like covering means being provided, therein, with a suction gas introducing port to which a suction gas pipe is connected, and a discharge gas delivering port to which a delivery gas pipe is connected,

wherein said upright wall means is formed so as to define an uppermost end thereof extending around said upward openings and lying in a plane inclined with respect to a horizontal plane containing therein said horizontal central axis of said cylindrical body of said cylinder block means to thereby allow said plate-like covering means to be inclined.

5,556,266

DEVICE FOR FEEDING PRESSURIZED LIQUID TO A HYDRAULIC CIRCUIT

Ulrico Walchhutter, Milan, Italy, assignor to S.I.T.I. Societa Impianti Termoelecttrici Industriali, Marano Ticino, Italy

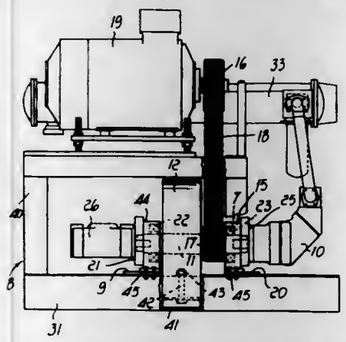
PCT No. PCT/EP92/01224, § 371 Date Dec. 10, 1993, § 102(e) Date Dec. 10, 1993, PCT Pub. No. WO92/22747, PCT Pub. Date Dec. 23, 1992

PCT Filed Jun. 2, 1992, Ser. No. 162,099

Claims priority, application Italy, Jun. 11, 1991, MI91A1610

Int. Cl.[6] F04B *17/00*

U.S. Cl. 417—362 **18 Claims**



1. A device for feeding pressurized liquid to a hydraulic circuit, said device comprising: a motor, a flywheel mounted on a flywheel shaft, a positive-displacement pump having a pump shaft mounted on said flywheel shaft with a coupling which prevents any possible rotation between said flywheel shaft and said pump shaft, a containment and supporting structure for said flywheel and a motion transmission element suitable for transmitting motion from said motor to said flywheel shaft; an axis of said flywheel shaft and an axis of said pump shaft being exactly the same; said structure rigidly supporting: a first seat for supporting a first bearing of said flywheel shaft, a second seat for supporting said pump, and a supporting member which supports both a pump seat for supporting said pump and a third seat for supporting a second bearing of said flywheel shaft.

5,556,267

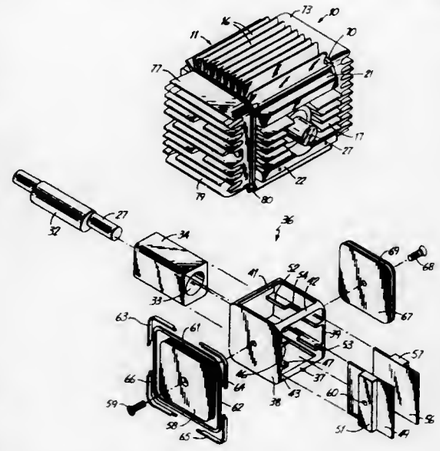
DOUBLE ACTING PUMP

Craig N. Hansen, Minnetonka, Minn., assignor to Hansen Engine Corporation, Minnetonka, Minn.

Continuation-in-part of Ser. No. 4,478, Feb. 5, 1993, Pat. No. Des. 352,041. This application Oct. 31, 1994, Ser. No. 332,527

Int. Cl.[6] F04B *11/00*

U.S. Cl. 417—534 **19 Claims**



1. A pump for moving fluid comprising: a housing having a first and second end and an internal chamber extended between said first and second ends, a piston assembly having a first end and a second end located within said chamber, said piston assembly having a first piston at the first end thereof and a second piston at the second end thereof, means mounted on the housing operable to move the piston assembly and first and second pistons in said chamber, said piston assembly includes a body having a first wall and a second wall on opposite ends of the body, a first plate located adjacent the inside of the first wall, a second plate located adjacent the inside of the second wall,.means securing the first piston to the first wall and the first plate to the first wall, means securing the second piston to the second wall and the second plate to the second wall, said first and second plates being laterally spaced from each other, said means mounted on the housing operable to move the piston assembly including a shaft rotatably mounted on the housing, an eccentric member joined to said shaft, and a block having a bore accommodating the eccentric member, said block having opposite sides engageable with said first and second plates whereby said block has reciprocating movement in response to rotation of the shaft thereby moving the piston assembly in said chamber to pump said fluid, first valve plate means mounted on the first end of the housing closing one end of the chamber, second valve plate means mounted on the second end of the housing closing the other end of the chamber, each of said first and second valve plate means having a fluid intake valve allowing fluid to flow into the internal chamber and a fluid exhaust valve allowing fluid to flow out of the internal chamber, a first end cap located in engagement with the first valve plate means, means securing the first end cap and first valve plate means to the first end of the housing, a second end cap located in engagement with the second valve plate means, and means securing the second end cap and second valve plate means to the second end of the housing, said first and second end caps having fluid intake and fluid exhaust ports allowing fluid to flow toward and away from the first and

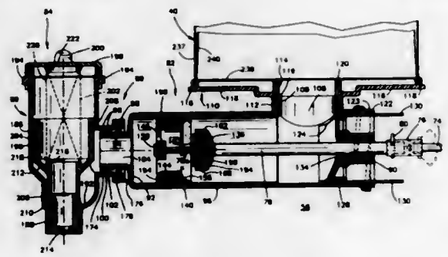
second valve plate means in response to movement of the piston assembly in said chamber.

5,556,268

RECIPROCATING PUMP WITH COOPERATING PISTON SHEARING PORTIONS

Robert T. Topper, Heber Springs; John W. Gilliom, Wooster, and James M. Tucker, Conway, all of Ark., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Division of Ser. No. 166,236, Dec. 10, 1993, Pat. No. 5,494,194. This application May 30, 1995, Ser. No. 453,487
Int. Cl.[6] F04B *7/04*
U.S. Cl. 417—553 **4 Claims**



1. A motor driven pump comprising:
an inlet means for said material;
an outlet means for said material; and
reciprocating pump means connected between said inlet means and said outlet means to establish fluid communication therebetween, said pump means having a pump member linearly movable in two directions, said pump member, when moving in one of said linear directions, pressurizing said viscous material to move it toward said outlet means while simultaneously suctioning said material from said inlet means, said pump member being movable in the other of said linear directions without causing substantial movement of said viscous material toward said inlet means or from said outlet means, said pump member having two portions that are movable relative to each other, said portions moving toward each other when moving in said one linear direction, and away from each other when moving in the other linear direction, said portions including shearing means for deforming or cutting through particulate matter located at an interface area between said portions wherein said portions can move freely toward each other without interference from said particulate matter.

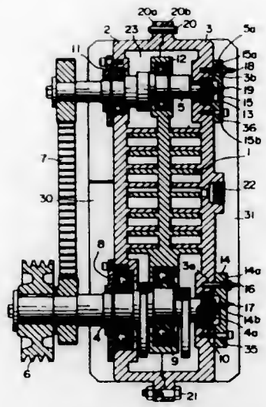
5,556,269

SCROLL-TYPE COMPRESSOR AND METHOD OF ASSEMBLING THE SAME

Akira Suzuki, Shimizu; Shigeru Machida, Ibaraki-ken, and Isamu Kawano, Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 1, 1995, Ser. No. 396,760
Claims priority, application Japan, Mar. 18, 1994, 6-048279
Int. Cl.[6] F04C *18/04;23/00;* **B23Q** *3/00*
U.S. Cl. 418—55.2 **4 Claims**

1. A scroll compressor comprising:
an orbiting scroll member having an end plate and scroll wraps on both sides of said end plate;
stationary scroll members disposed on both sides of said orbiting scroll member, each said stationary scroll member having an end plate and a spiral wrap for meshing in engagement with the one of said scroll wraps of said orbiting scroll member facing said stationary scroll member;



a crankshaft and an auxiliary crankshaft supported for rotation at both ends thereof respectively by both said stationary scroll members, said crankshaft and auxiliary crankshaft being drivingly connected to said orbiting scroll member to provide orbital movement to said orbiting scroll member;
means for driving said crankshaft and said auxiliary crankshaft in synchronization with each other;
locating members provided on one of said stationary scroll members so as to oppose adjacent axial end surfaces of said crankshaft and said auxiliary crankshaft;
knock-pin holes provided in both said stationary scroll members on both sides of said orbiting scroll member so as to locate said stationary scroll members relative to each other;
knock-pin holes formed in said locating members and said one stationary scroll member so as to locate said locating members and said stationary scroll members relative to each other; and
knock-pin holes formed in said locating members and said crankshaft and said auxiliary crank shaft so as to locate said crankshaft and said auxiliary crankshaft relative to corresponding ones of said locating members.

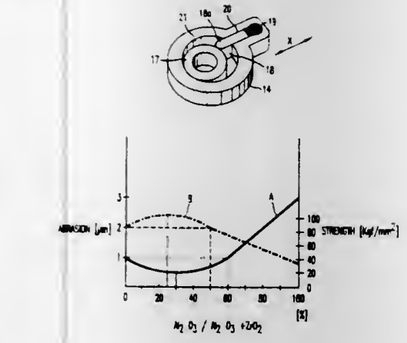
5,556,270

BLADE FOR A ROTARY COMPRESSOR

Kenji Komine; Wataru Ikeda; Mamoru Egawa; Kastuhiro Shinosawa; Hiroyuki Isegawa; Kazuo Honaga; Yutaka Abe; Tsuneji Kameda, and Shinobu Sato, all of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 116,975, Sep. 7, 1993, Pat. No. 5,401,149. This application Mar. 16, 1995, Ser. No. 405,073
Claims priority, application Japan, Sep. 16, 1992, 04-246074; Feb. 16, 1993, 05-026358; Aug. 24, 1994, 6-199167
Int. Cl.[6] F01C *21/00*
U.S. Cl. 418—179 **20 Claims**

1. A blade member for a rotary compressor, comprising a sintered body which comprises:
50 to 98.5 wt. % of zirconia;
10 to 49.5 wt. % of alumina; and
0.5 to 10 wt. % of a stabilizing material,
wherein the stabilizing material comprises at least one member selected from the group consisting of magnesia, calcia, ceria and an oxide of a rare-earth metal and,
said blade member has a Vickers hardness Hv of 1350 to 1550.

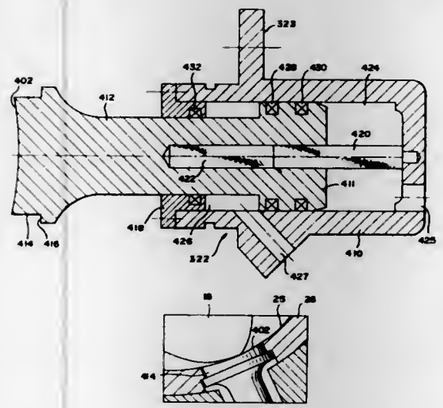


5,556,271

VALVE SYSTEM FOR CAPACITY CONTROL OF A SCREW COMPRESSOR AND METHOD OF MANUFACTURING SUCH VALVES

Jan A. Zuercher, Spanish Fort; John Q. Richardson, Daphne, both of Ala., and Arthur R. Legault, Suwance, Ga., assignors to Coltec Industries Inc., New York, N.Y.

Filed Nov. 23, 1994, Ser. No. 346,244
Int. Cl.[6] F04C *18/16;29/10;* **F16K** *31/363*
U.S. Cl. 418—201.2 **9 Claims**



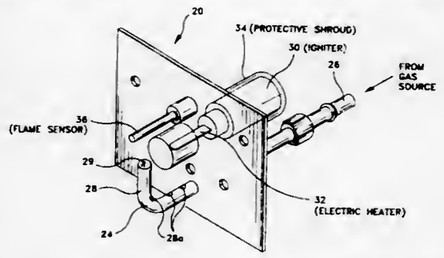
1. In a variable capacity screw compressor, a lift valve communicating with a compression chamber of the compressor comprising:
a valve housing;
a piston reciprocally received within said valve housing;
a shaft having a first end connected to said piston and a second end extending from said housing;
a valve surface connected to said second end of said shaft and exposed to said compression chamber, and
displacement means for displacing said piston within said housing, said displacement means comprising
a first pressure passage communicating with said housing adjacent a side of said piston, said first pressure passage being in selective fluidic communication with one of an inlet pressure and an outlet pressure of the variable capacity screw compressor and extending from the lowermost surface within said housing, and
a second pressure passage communicating with said housing adjacent an opposed side of said piston, said second pressure passage being in selective fluidic communication with one of the inlet pressure and the outlet pressure of the variable capacity screw compressor and extending from a lower surface of said housing;
wherein said valve surface is positively displaced toward the compression chamber of the variable capacity screw compressor in response to the selective application of inlet fluid pressure to said first pressure passage and outlet fluid pressure to said second pressure passage and positively displaced away from the compression chamber of the variable capacity screw compressor in response to the selective application of outlet fluid pressure to said first pressure passage and inlet fluid pressure to said second pressure passage to vary the capacity of the screw compressor.

5,556,272

PILOT ASSEMBLY FOR DIRECT FIRED MAKE-UP HEATER UTILIZING IGNITER SURROUNDED BY PROTECTIVE SHROUD

Richard G. Blasko, Hubbart, Ohio, and Richard A. Mortimer, Mercer, Pa., assignors to Thomas & Betts Corporation, Memphis, Tenn.

Filed Jun. 27, 1994, Ser. No. 266,064
Int. Cl.[6] F23Q *7/10;7/22*
U.S. Cl. 431—75 **4 Claims**



1. An ignition assembly for a direct fired make-up air heater, said heater having at least one burner disposed therein for heating an incoming supply of cold air, said burner operatively communicating with a source of combustible gas, said ignition assembly comprising:
a pilot tube disposed adjacent said at least one burner, having an open end in communication with said gas source and a gas discharge end, said pilot tube being L-shaped and said open end being oriented at a substantially right angle relative to said discharge end, said discharge end comprising plural discharge ports disposed around the right angle bend of said L-shape pilot tube;
an electric heating element disposed adjacent said discharge ports, operative to ignite gas discharged through said ports to produce a pilot flame; and
wind resisting means surrounding at least a portion of said heating element for protecting said heating element from said incoming supply of cold air.

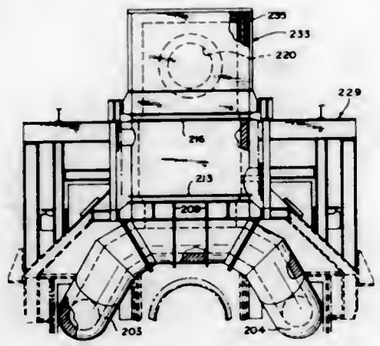
5,556,273

COMBUSTION SYSTEM FOR A STECKLE MILL

William J. Mangham, Brookwood; Charles D. McPherson, Mulga, and Donald N. Mohr, Northport, all of Ala., assignors to Tuscaloosa Steel Corporation, Tuscaloosa, Ala.

Filed Oct. 28, 1994, Ser. No. 331,099
Int. Cl.[6] F26B *13/00*
U.S. Cl. 432—8 **14 Claims**

1. In a steckel mill including first and second coil furnace units respectively positioned upstream and downstream of an adjustable roller assembly through which a slab of metal is repeatedly passed in order to produce a progressively thinned and elongated metal



sheet that is alternately heated and coiled within the first and second coil furnace units, a combustion system for each of said first and second coil furnace units comprising:

a plurality of burner units;

means for supplying a combustible fluid to each of said plurality of burner units at a controlled rate;

means for supplying a combustible gas to each of said plurality of burner units at a controlled rate, said combustible gas supplying means including a blower unit and a first combustible gas supply line extending from said blower unit to said plurality of burner units;

at least one exhaust duct for directing a flow of combustion products from said plurality of burner units to an exhaust outlet; and

at least one recuperator positioned in-line with said exhaust duct and between the first combustible gas supply line and said plurality of burners, said recuperator defining first and second distinct flow paths arranged in heat transfer relationship to one another, said first flow path receiving a flow of high-temperature combustion products from said exhaust duct and the second flow path receiving a flow of combustible gas from said first combustible gas supply line such that, as the flow of combustible gas travels through said recuperator toward said plurality of burner units, the flow of combustible gas is pre-heated by the flow of combustion products.

5,556,274

DRYING APPARATUS AND METHOD FOR PUMPABLE MATERIALS

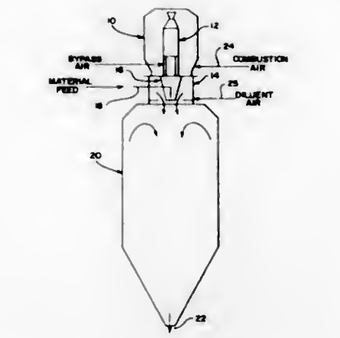
Gordon E. Ettle, Minneapolis, and Richard W. Ozer, Golden Valley, both of Minn., assignors to Hosokawa Bepex Corporation, Minneapolis, Minn.

Filed Mar. 15, 1995, Ser. No. 404,254

Int. Cl.[6] F27D *1/08*

U.S. Cl. 432—159 **12 Claims**

1. In a particulate material drying apparatus including a pulse combustor, an associated combustion chamber, means for introducing fuel and combustion air to the combustion chamber whereby the combination of the pulse combustor and combustion chamber generates a pulsating flow of hot gases, a material feed introduction chamber receiving said hot gases, means for introducing material to be dried into said introduction chamber for contact therein with said flow of hot gases, and a drying chamber connected to said introduction chamber for receiving the mixture of material and hot gases exiting from said introduction chamber, the improvement wherein said drying chamber comprises an enclosing wall, a porous inner wall spaced inwardly from said enclosing wall, an annular space defined between said enclosing wall and said porous inner wall, and means for introducing fluid under pressure into said annular space whereby said fluid passes through said porous inner wall and deters build-up of material on the inner surface of said porous inner wall.



5,556,275

HEAT TREATMENT APPARATUS

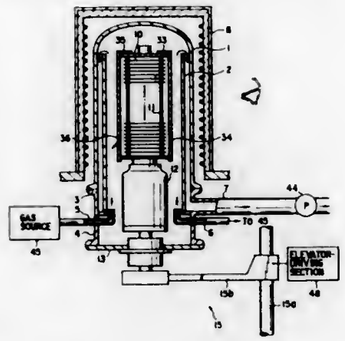
Kazunari Sakata, Sagamihara; Kenji Tago, Kofu, and Mitsuo Mizukami, Sagamihara, all of Japan, assignors to Tokyo Electron Limited, Tokyo, and Tokyo Electron Tohoku Limited, Esashi, both of Japan

Filed Sep. 30, 1994, Ser. No. 317,653

Claims priority, application Japan, Sep. 30, 1993, 5-268274; Dec. 24, 1993, 5-347532

Int. Cl.[6] F27D *3/12*

U.S. Cl. 432—241 **19 Claims**



1. A heat treatment apparatus comprising:

a holder for holding a plurality of disk-shaped objects layered one upon the other in a vertical direction such that the objects are arranged coaxially and spaced at predetermined intervals, each of said objects having an orientation flat portion at a circumference thereof, with said holder holding said objects with the orientation flat portions aligned with one another to form a column of orientation flat portions;

a process chamber in which the objects held by said holder are processed by using a process gas; and

a hollow cylindrical cover surrounding an entire circumferential surface of the plurality of objects held by said holder with a predetermined distance provided between said cover and said circumferential surface, said cover having a plurality of gas ports permitting said process gas introduced into said process chamber to flow inward to reach a region where the objects held by the holder are positioned, said gas ports serving to control the amount of the process gas which is brought into contact with the objects;

wherein an inner surface portion of said cover which faces the column of the orientation flat portions of said plurality of objects is a flat surface.

5,556,276

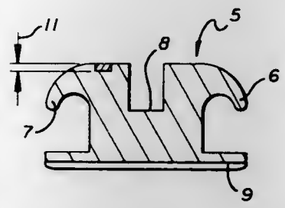
LASER ANNEALING MARKING OF ORTHODONTIC APPLIANCE

Patrick Roman, Escondido, Calif., and Orlan Hayes, Orlando, Fla., assignors to Lancer Orthodontics, Inc., San Marco, Calif.

Filed Oct. 24, 1994, Ser. No. 327,733

Int. Cl.[6] A61C *7/12*

U.S. Cl. 433—8 **27 Claims**



1. A method for surface treating an orthodontic appliance, comprising the steps of:

providing an orthodontic appliance having an outer surface;

marking a selected portion of said outer surface by applying a laser beam of sufficient power to anneal said selected portion, thereby causing the selected area to become visible on said outer surface, wherein said marking step does not create any surface irregularity on the outer surface.

5,556,277

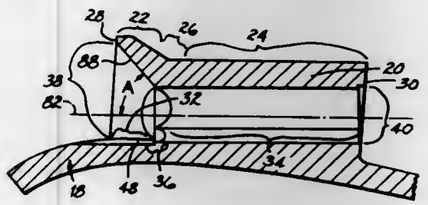
FLARED BUCCAL TUBE HAVING AN INTERNALLY TAPERED MESIAL SECTION

Haruyama Yawata, Huntington Beach, and James J. Hilgers, Laguna Niguel, both of Calif., assignors to Ormco Corporation, Glendora, Calif.

Filed May 1, 1995, Ser. No. 432,078

Int. Cl.[6] A61C *3/00*

U.S. Cl. 433—17 **26 Claims**



1. A buccal tube, comprising:

a base adapted to be secured to a tooth; and

a tubular body connected to said base, said tubular body having mesial and distal sections integrally connected at a mesial-distal interface, said mesial and distal sections having mesial and distal ends, respectively, defining the opposite ends of said tubular body, said mesial and distal sections having mesial and distal bores, respectively, communicating at a mesial bore-distal bore interface, said mesial and distal bores having mesial and distal openings, respectively, at their mesial and distal ends, respectively, said distal section having an exterior surface,

said mesial section being tapered, with said mesial opening of said mesial bore having cross-sectional dimensions exceeding the cross-sectional dimensions of the exterior surface of said distal section, said mesial bore tapering along its length to said mesial bore-distal bore interface.

5,556,278

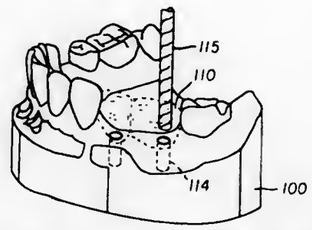
METHOD FOR MAKING AND USING A TEMPLATE FOR A DENTAL IMPLANT OSTEOTOMY AND COMPONENTS RELATING THERETO

Sean W. Meitner, 1077 Oakwood Dr., Victor, N.Y. 14564

Filed Sep. 7, 1994, Ser. No. 302,344

Int. Cl.[6] A61C *3/00*

U.S. Cl. 433—75 **44 Claims**



1. A method for locating a dental implant osteotomy in an edentulous space of a patient's mandible or maxilla, comprising the steps of:

forming a cast arch including the edentulous space;

temporarily locating a diagnostic tooth set-up in the edentulous space of the cast arch corresponding to a desired location of a prosthetic tooth in the edentulous space of the patient's mandible or maxilla; and

drilling a hole through the tooth set-up and into the cast arch wherein the location and orientation of the hole correspond to an optimum location and orientation of the dental implant osteotomy.

5,556,279

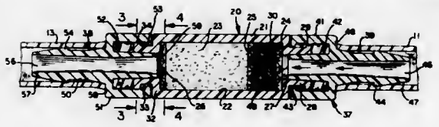
WATER PURIFICATION SYSTEM FOR DENTAL INSTRUMENT

Leo H. Wolf, 1209 Golf View Dr., and Mark F. Wolf, 498 County Trunk Hwy. M, both of River Falls, Wis. 54022

Continuation-in-part of Ser. No. 97,162, Jul. 23, 1993, Pat. No. 5,370,534, which is a continuation-in-part of Ser. No. 973,454, Nov. 9, 1992, Pat. No. 5,230,624. This application Dec. 1, 1994, Ser. No. 348,060

Int. Cl.[6] A61C *1/10;17/02*

U.S. Cl. 433—82 **39 Claims**



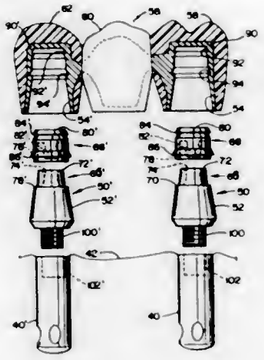
1. A dental apparatus having a fluid supply system connected to a fluid source system comprising: a dental instrument having first tube means, second tube means receiving fluid from the first tube means, fluid purification means releasably mounted on the first tube means and the second tube means, the fluid purification means including filter means and disinfectant means operable to treat, filter, purify and supply a disinfectant to the fluid as the fluid passes through the disinfectant means, the second tube means having an inner surface passivated with the disinfectant to create and maintain a biostatic equilibrium of the disinfectant moving between the inner surface of the second tube means and the fluid flowing through the second tube means, the disinfectant remaining as a residual in the fluid as the fluid moves through the second tube means and the dental instrument whereby when the fluid is discharged from the dental instrument the fluid is in a microbiologically pure condition and contains the disinfectant, the disinfectant neutralizing contaminants drawn back into the fluid supply system and resisting colonization of microorganisms on the inner surface of the second tube means with the purification means preventing

aspirated contaminants from traveling back beyond the purification means to prevent cross infection, and means connected to the first tube means and second tube means to releasably attach the fluid purification means to the first and second tube means.

5,556,280
METHOD AND APPARATUS FOR APPLIANCE MOUNTING

Mark S. Pelak, 914 SW. Santa Barbara Pl., Cape Coral, Fla. 33941

Filed May 31, 1994, Ser. No. 251,598
Int. Cl.[6] A61C *8/00*
U.S. Cl. 433—172 **20 Claims**



1. Apparatus for removably mounting a dental appliance, such as an artificial tooth, a full or partial denture, a bridge or other appliance, in a mouth, comprising:

(a) an abutment member adapted to be affixed in a mouth, said abutment member having a tapered support surface which extends away from the affixation area on one jaw toward the opposing jaw,

(b) said tapered support surface being formed to be received in and mate with a complementary surface formed in an appliance to provide a support surface for such appliance so that the appliance need not depend upon gum tissue for support, thereby enabling design of an appliance to fully conceal the area of affixation and said abutment member for esthetic appearance while providing the look of natural teeth,

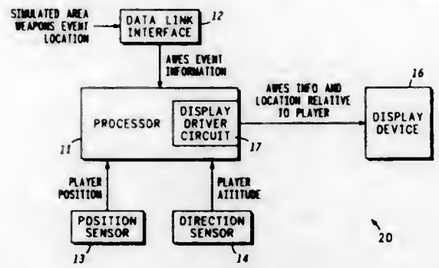
(c) first and second coupling means adapted to be respectively secured to said abutment member and an appliance for removably retaining an appliance on said abutment member, said coupling means carrying means for releaseable engagement of said coupling means in response to placement of an appliance on said abutment member and removal of an appliance from said abutment member which can be accomplished by the wearer, thereby permitting removal by the wearer for hygenic and tissue stimulation purposes in the area concealed by an appliance,

(d) the mating of said tapered support surface of said abutment member with the complementary receiving surface of an appliance accurately guiding said first and second coupling means into a coupling relationship to removably retain an appliance on said tapered support surface of an abutment member.

5,556,281
SIMULATED AREA WEAPONS EFFECTS DISPLAY ARRANGEMENT

Mark R. FitzGerald, Phoenix, and Craig T. Griffin, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 17, 1994, Ser. No. 197,903
Int. Cl.[6] F41G *1/01*
U.S. Cl. 434—16 **12 Claims**



1. In a simulated area weapons effective system, a display method for providing information to troops and vehicles relative to simulated rounds of munition, said display method comprising the steps of:

providing to a processor by a position sensor a position of a troop or a vehicle:

receiving by a data link information of a simulated round of munition;

receiving by the processor the information from the data link;

displaying by a display device the information relating to said simulated round of munition; and

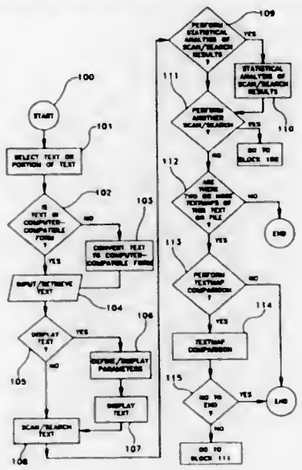
said step of displaying including a step of displaying a graphical representation of all simulated rounds of munition within a predefined proximity of said display device from an observer's line-of-sight.

5,556,282
METHOD FOR THE GEOGRAPHICAL PROCESSSING OF GRAPHIC LANGUAGE TEXTS

R. David Middlebrook, 47 Hemlock Cir., Princeton, N.J. 08540

Filed Jan. 18, 1994, Ser. No. 184,493
Int. Cl.[6] G09B *21/00*
U.S. Cl. 434—178 **9 Claims**

1. A method of producing a graphical representation of text



contained within a document to enable a person to obtain some comprehension of said text without reading all of said text, comprising the steps of:

producing an image of at least some of said text, wherein individual words contained within said text are indecipherable within said image to a person viewing said image;

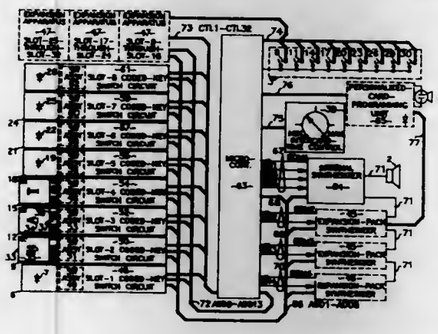
identifying at least one common feature contained within said text, wherein said at least one common feature is selected from a group consisting of: physical appearance of text, phonetics of text, meaning of text, usage of text, definition of text, location of text and distribution of text; and

segmenting said image into a first plurality of visually distinguishable segments to create a first map, wherein each of said visually distinguishable segments on said first map corresponds to at least one of said common features in said text, thereby enabling a person viewing said image to comprehend where each said common features occurs within said text without reading said text.

5,556,283
CARD TYPE OF ELECTRONIC LEARNING AID/ TEACHING APPARATUS

William Stendardo, 407 Leonia Ave., Bogota, N.J. 07603, and David Weisman, 30 Mill Valley La., Stamford, Conn. 06903

Filed Sep. 8, 1994, Ser. No. 302,493
Int. Cl.[6] G09B *7/00*
U.S. Cl. 434—188 **37 Claims**



1. A card type of electronic learning aid/teaching apparatus comprising a plurality of card means;

each of said card means having a surface on which a sensory-information representation in visual, tactile, and/or odorous form is provided to present pictorial-symbol information and/or language-symbol information, to include imagery, alphabetic letters, phonemes, words, text, numerals, and/or arithmetical symbols;

coding means associated with each of said plurality of card means, identifying said sensory-information representation;

a first housing means having a plurality of card slots in combination with a visually and functionally distinctive button associated with each said card slot wherein one of a plurality of said card means may be inserted in each of said card slots;

decoding means for reading said coding means;

operator-input means whereby an input signal is generated as a result of selection by the operator, by the pressing of one of said visually and functionally distinctive buttons;

a memory means containing audio information as vocal expression and/or nonvocal sound corresponding to each of said plurality of card means;

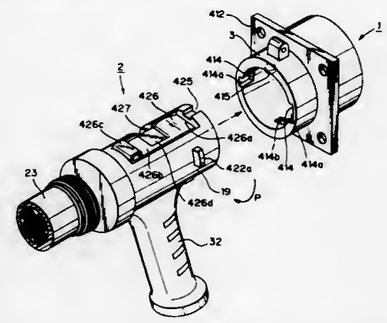
a control means associated with said decoding means reacting to said input signal, by the pressing of one of said visually and functionally distinctive buttons thereby accessing from said memory means said audio information corresponding to said particular card means; and

output means associated with said memory means and said control means for converting said audio information, as vocal expression and/or nonvocal sound, into sensory-output information representative of a particular one of said card means.

5,556,284
CHARGE COUPLING FOR ELECTRIC VEHICLE

Hikaru Itou; Sho Miyazaki; Tsutomu Tanaka; Masashi Saito; Shinichi Yamada; Shigekazu Wakata, and Eiji Saijo, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan

Division of Ser. No. 273,211, Jul. 11, 1994, Pat. No. 5,458,496.
This application May 22, 1995, Ser. No. 446,453
Claims priority, application Japan, Jul. 12, 1993, 5-195443; Jul. 14, 1993, 5-197862; Jul. 15, 1993, 5-198957; Aug. 18, 1993, 5-226472; Aug. 20, 1993, 5-228038; Aug. 31, 1993, 5-240447; Sep. 20. 1993, 5-257650
Int. Cl.[6] H01R *23/26*
U.S. Cl. 439—34 **1 Claim**



1. A charge coupling for conducting current from a charger to a battery of an electric vehicle, when a supply connector connected to said charger is fully fitted to a vehicle inlet provided on said electric vehicle, the coupling comprising;

a locking device for temporarily locking said supply connector to said vehicle inlet at a half fitted position,

said supply connector being connected to the charger via a charge cable, the supply connector being provided in a connector housing with coaxial supply terminals;

said vehicle inlet being provided in an inlet housing with coaxial terminals adapted to couple with said supply terminals;

said locking device being provided on a circumference of a distal end of either said vehicle inlet or said supply connector, said locking device including a spiral groove extending from a half fitting position of said supply connector relative to said vehicle inlet, to a complete fitting position of said supply connector relative to said vehicle inlet, and an engagable boss projecting from a distal end of one of said vehicle inlet and said supply connector, said engagable boss being adapted to detachably engage with said spiral groove;

said supply connector being provided, on an outer periphery, with a handle for assisting rotation of said supply connector whereby said engagable boss moves into said spiral groove between an outer end and a terminating end thereof, and

a holding member provided on either said vehicle inlet or said supply connector, to maintain said supply connector at said

5,556,286
BOARD TO BOARD CONNECTOR

5,556,287
VISUAL INDICATION OF FULLY SEATED POSITION OF

a holding member provided on either said vehicle inlet or said supply connector, to maintain said supply connector at said complete fitting position in said vehicle inlet when said engagable boss reaches said terminating end of said spiral groove.

5,556,285

ELECTRICAL CONNECTOR

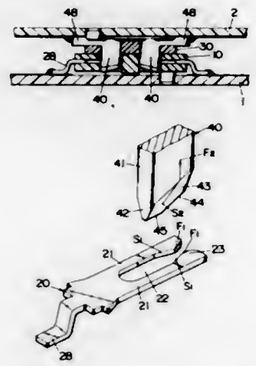
Hisahiro Ono, Tsu, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Nov. 18, 1994, Ser. No. 341,122

Claims priority, application Japan, Dec. 15, 1993, 5-314889; Apr. 25, 1994, 6-086815

Int. Cl.[6] H01R *9/09;13/10*

U.S. Cl. 439—74 **6 Claims**



1. An electrical connector comprising:

a socket having a planar socket base mounting a plurality of flat contacts extending generally in parallel with said socket base, each of said flat contacts formed with a slot;

a plug having a planar plug base carrying a plurality of posts extending perpendicular to said plug base, each of said posts being adapted to have its end engaged into said slot with said plug base held in parallel with said socket base for electrical interconnection between said posts and said contacts,

said flat contacts having a pair of elongated legs which defines therebetween said slot, said elongated legs formed at their free ends respectively with bulges projecting to give a constriction at one end of said slot between said legs so that said slot has a varying width along the length of said slot,

said post comprising a trunk and a pilot at an end of said trunk, said trunk and pilot being dimensioned to have a length extending along the length of said slot, a thickness along the width of said slot, and a height in the projecting direction of said post,

said slot having a wider section with a width which is greater than the thickness of said trunk and a narrow section at said constriction with a width which is less than the thickness of said trunk,

said pilot being tapered to have opposed inclined side faces and a tip of reduced thickness,

said pilot being cut off at one longitudinal end portion thereof to define thereat a beveled edge which is angled with a remaining square edge at the tip of said pilot,

said pilot dimensioned to be inserted into said slot with said square edge leading into said wider section and with said beveled edge leading into said narrow section so that said post is engaged at a portion adjacent said opposed inclined side faces with said bulges.

5,556,286

BOARD TO BOARD CONNECTOR

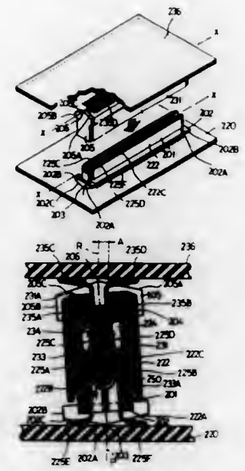
Hiroshi Ikesugi, and Junichi Miyazawa, both of Yokohama, Japan, assignors to Molex Incorporated, Lisle, Ill.

Filed Apr. 10, 1995, Ser. No. 419,578

Claims priority, application Japan, May 25, 1994, 6-007099 U

Int. Cl.[6] H01R *9/09*

U.S. Cl. 439—74 **22 Claims**



1. In an electrical connector for mounting on the surface of a circuit board, including:

an elongate dielectric housing having a longitudinal centerline, a pair of sidewalls extending generally parallel to said centerline, and a pair of rows of terminal receiving cavities, said rows being positioned on opposite sides of the longitudinal centerline of said housing and extending in a direction generally parallel to said longitudinal centerline, and a support flange positioned at each of opposite ends of said housing, said support flanges having a lower surface adapted to be mounted generally adjacent said circuit board;

a plurality of terminals secured within respective ones of said cavities, each terminal including a contact portion for contacting a mating electrical component, a securing section for securing said terminal within said housing and a tail portion adapted for soldering said terminal to a selected conductor of said circuit board, said tail portions of said plurality of terminals having ends that generally define a common plane;

characterized in that:

said lower surface of said support flanges including a central region and a pair of outer regions, said central region being generally located centrally of the support flange and said outer regions being located on opposite sides of said central region, said outer regions each diverging generally away from said common plane as they extend away from said first region, said central region including a portion located closer to said common plane than said outer regions, whereby upon mounting said electrical connector upon a circuit board, said electrical connector may rotate slightly until one of said outer regions of each support flange contacts said circuit board

5,556,287

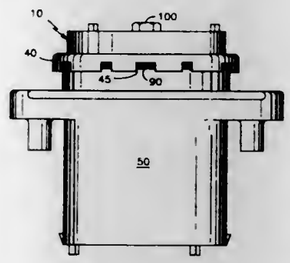
VISUAL INDICATION OF FULLY SEATED POSITION OF BOLT-DRIVEN CONNECTOR

Brent A. Kuhn, Novi, and Chong H. Yi, Dearborn, both of Mich., assignors to United Technologies Automotive, Inc., Dearborn, Mich.

Continuation of Ser. No. 238,603, May 4, 1994, abandoned. This application Aug. 24, 1995, Ser. No. 518,943

Int. Cl.[6] H01R *13/64*

U.S. Cl. 439—89 **6 Claims**



1. An electrical connector having a visual indication of whether or not an electrical connector is fully seated, comprising:

a first connector half, said first connector half having a first mating face surface, said first connector half further having an overhanging lip extending from the first mating face surface, said overhanging lip having a color; and

a second connector half, said second connector half having a second mating face surface, said second connector half having a color, said first and second mating face surfaces adapted to rest near each other when said first and second connector halves are engaged to each other, said second connector half further having a visually distinct portion along at least a portion of a circumference of said second mating face surface, said visually distinct portion having a color visually distinct from said color of said overhanging lip and visually distinct from said color of said second connector half, said overhanging lip occluding view of said visually distinct portion when said first and second connector halves are engaged and fully seated.

5,556,288

PROTECTIVE COVER FOR CONNECTOR

Takashi Ishii, and Toru Nagano, both of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 981,849, Nov. 25, 1992, abandoned. This application Apr. 8, 1994, Ser. No. 224,719

Claims priority, application Japan, Nov. 29, 1991, 3-98852 U; May 26, 1993, 5-123753

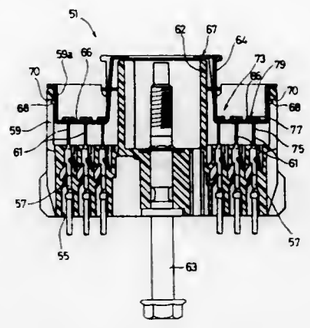
Int. Cl.[6] H01R *13/44*

U.S. Cl. 439—135 **10 Claims**

1. A protective cover mounted on a connector having a housing within which a plurality of terminals is received, the connector including a hood section adjacent to said housing and having an opening, wherein the terminals extend from said housing to said hood section and electrical contact portions of the terminals are arranged in a predetermined arrangement within the hood section;

said protective cover comprising a cover body fitted in the opening in the hood section, said coverbody including arrangement confirming means for confirming whether or not the electrical contact potions are arranged in the predetermined arrangement;

wherein said arrangement confirming means includes a plurality of terminal confirming holes through which an operator can view tops of the electrical contact portions, said terminal confirming holes being arranged so as to correspond to the predetermined arrangement of the electrical contact portions.



5,556,289

SAFETY COVER FOR AN ELECTRICAL OUTLET

Ira C. Holbrook, Jr., 365 Cherry Hill Rd., Elkton, Md. 21921

Filed Jan. 17, 1995, Ser. No. 371,526

Int. Cl.[6] H01R *13/44*

U.S. Cl. 439—135 **1 Claim**

1. A safety cover for an electrical outlet for preventing unauthorized access to an electrical socket and thereby precluding possible electrical shock comprising, in combination:

a rectangular box-shaped rigid plastic container having a back wall with a periphery extended outwards therefrom and thereby defining a hollow interior, an opening to the interior, and a rim bounding the opening and with the periphery formed of a planar rectangular short top wall, a planar rectangular short bottom wall, and a pair of planar rectangular long side walls extended therebetween, each wall having an interior surface and an exterior surface, the back wall including a pair of socket holes formed thereon with each socket hole having a top edge, a bottom straight edge, and a pair of outwardly curved side edges therebetween, the back wall further including a screw hole disposed thereon between the socket holes and with the socket holes and screw holes alignable with a pair of sockets plugs and a screw hole of an electrical receptacle, wherein a screw may be use for coupling the back wall of the container to the electrical receptacle such that the socket plugs are projected within the interior, each short wall further including a through hole disposed thereon at a location adjacent to the rim and one of the long walls and with both of the through holes aligned about a common vertical axis, one of the long walls including an upper pair of horizontal spaced tabs and a lower pair of horizontal spaced tabs with each tab extended inwards from the interior surface of the long wall towards the interior, each of the tabs having a through hole disposed thereon and with the through holes of the tabs aligned along the same common vertical axis as the through holes on the short walls;

a metal latch including an upper rod, a lower rod, an upper spring, and a lower spring, the upper rod having a rectangular

head end, a cylindrical intermediate portion, and a bifurcated

head end, a cylindrical intermediate portion, and a bifurcated tip end with a coupling hole disposed therethrough, the lower rod having a head end and a flattened tip end with a coupling hole disposed therethrough, the upper rod slidably received within the through hole of the top wall and the through holes of the upper tabs with its head end positioned adjacent to the exterior surface of the top wall and with its tip end positioned directly below the upper pair of tabs, the lower rod slidably received within the through hole of the bottom wall and within the through holes of the lower tabs with its head end positioned adjacent the exterior surface of the bottom wall and its tip end positioned directly above the lower tabs facing the tip end of the upper rod for slidable insertion therein, the upper spring separately disposed about the upper rod between the interior surface of the top wall and the nearest tab of the upper pair, the lower spring separately disposed about the lower rod between the interior surface of the bottom wall and the nearest tab of the lower pair, the head ends of the rods inwardly depressible for urging the tip ends of the rods together such that their coupling holes are aligned about a common horizontal axis and with the head ends releasable for allowing the springs to urge the tip ends of the rods apart:

a rectangular planar rigid plastic lid having an exterior surface, an interior surface, and a periphery interconnecting the surfaces formed of a pair of short edges with a pair of long edges extended therebetween, the lid hingably coupled to the long wall of the container remote from the tabs and with the lid positionable over the opening of the container such that the exterior surface thereof is located flush with the rim, the lid further having a pair of rectangular plug holes formed thereon, each plug hole separately alignable with a socket hole of the back wall of the container about a common axis of symmetry when the lid is closed, the lid including two sets of plastic clips with each set including four clips and with each clip of a set integral with the interior surface near a separate corner of each plug hole, the lid additionally including a peg coupled to and extended outwards from the interior surface and with the peg having a base end, a tip end, and an intermediate necked portion therebetween and with the necked portion disposable within aligned coupling holes of the rods of the latch when the head ends are depressed and securable therebetween when the head ends are released, wherein the latch mechanism and peg combination is designed to preclude the latching mechanism from being actuated by children; and

a pair of rectangular planar rigid plastic doors for precluding any possibility of inward infiltration with each door having an exterior surface, an interior surface, and a periphery formed of a top edge with a long upper lip formed therealong, a bottom edge with a short lower lip formed thereon, and a pair of side edges extended therebetween, each door snapidly removably coupled within a separate plug hole of the lid with the upper lip engaged with an upper pair of clips and the lower lip engaged with a lower pair of clips, each door further having a rectangular cut out formed on the midpoint of the bottom edge thereof and with the cut outs on the doors defining a pair of egress holes when the doors are snapidly coupled to the lid, each egress hole adapted to receive an electrical cord of an electrical plug disposed within the interior of the container through one of the corresponding plug holes.

5,556,290

SELF-SWITCHING CONNECTOR FOR ELECTRONIC SYSTEMS

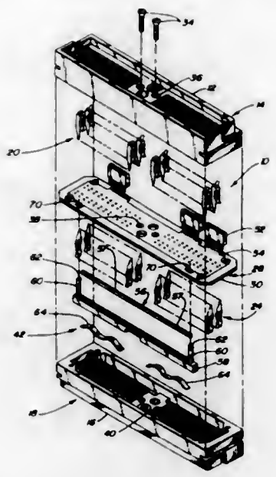
William A. Northey, Etters, and Harold W. Sundy, Landisburg, both of Pa., assignors to Berg Technology, Inc., Reno, Nev.

Continuation of Ser. No. 108,051, Aug. 17, 1993, abandoned. This application May 12, 1995, Ser. No. 439,861

Int. Cl.[6] H01R *13/703*

U.S. Cl. 439—188 **15 Claims**

1. A self-switching interposer for connecting a mating connector to a connector interface in an electronic system, comprising:



a housing;

a first plurality of terminals supported in said housing, said housing and said first plurality of terminals being constructed and arranged to mate with a mating connector;

a second plurality of terminals supported in said housing, said housing and said second plurality of terminals further being constructed and arranged to mate with a connector interface;

connecting means in said housing for electrically connecting said first plurality of terminals, respectively, to said second plurality of terminals in a predetermined relationship; and

switching means for electrically connecting at least a group of said pluralities of connected terminals with an electronic network if said housing is not mated to a mating connector, said switching means comprising an elongated switching bar having an electrically conductive pattern thereon for engaging a switching area on said connecting means that comprises a row of contacts, connected to said group of terminals and said network, when said housing is not fully mated to its respective connector interface or mating connector, said switching means further comprising mechanical means for disconnecting said switching bar from said switching area when said housing is mated to a mating connector, said electrically conductive pattern being consistent with desired electrical connections between said contacts, whereby a connector interface will be coupled to said network except when said interposer is mated with a mating connector.

5,556,291

JOINT CONNECTOR

Osamu Ito, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Mie, Japan

Filed May 11, 1994, Ser. No. 240,550

Claims priority, application Japan, May 14, 1993, 5-136849

Int. Cl.[6] H01R *29/00*

U.S. Cl. 439—189 **13 Claims**

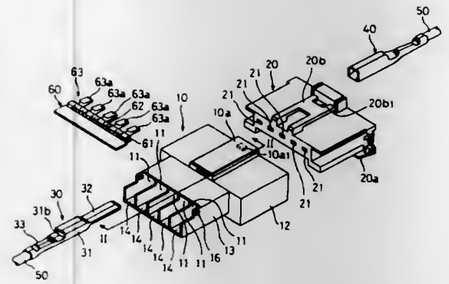
1. A joint connector for connecting a plurality of wires, the joint connector comprising:

terminals holding the respective wires; and

a connector housing including;

terminal receiving chambers for receiving the respective terminals, and

a retainer being abutted against said terminals to retain said terminals in their respective predetermined positions, said retainer having a retainer body and a joint member comprising a resilient portion, said joint member mounted on said retainer body for resiliently contacting and electrically short-circuiting predetermined ones of said terminals.



5,556,292

CABLE CONNECTOR

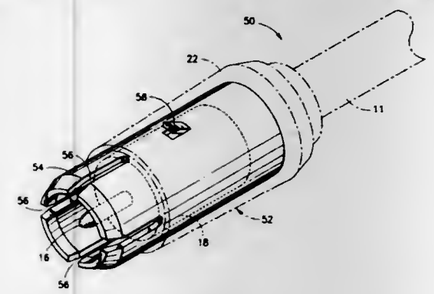
Tatsuo Kato; Katsuhiko Kishi, and Takeshi Matsuda, all of Yokohama, Japan, assignors to SMK Corporation, Tokyo, Japan

Filed Mar. 23, 1995, Ser. No. 410,034

Claims priority, application Japan, Apr. 22, 1994, 6-107740

Int. Cl.[6] H01R *27/00*

U.S. Cl. 439—218 **10 Claims**



1. A cable connector, comprising:

a plug for alternate connection to first and second receptacles;

said first and second receptacles having first and second tubular grounding terminals, respectively;

said first grounding terminal having a first inner diameter;

said second grounding terminal having a second inner diameter;

said second inner diameter being smaller than said first inner diameter;

said plug having a generally tubular sleeve for fitting inside a grounding terminal;

a chamfer at an end of said sleeve;

a plurality of slits longitudinally disposed in said sleeve, extending through said chamfer;

said sleeve having an unstressed outer diameter;

said unstressed outer diameter being effective for providing an elastic interference fit in said first inner diameter; and

said chamfer and said plurality of slits permitting said sleeve to compress to form an interference fit inside said second inner diameter.

5,556,293

MOUNTING APPARATUS FOR BALL GRID ARRAY DEVICE

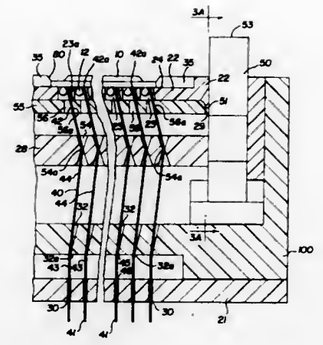
Wayne K. Pfaff, 309 Steeplechase, Irving, Tex. 75062

Continuation-in-part of Ser. No. 258,348, Jun. 10, 1994, Pat. No. 5,419,710. This application Feb. 1, 1995, Ser. No. 382,489

Int. Cl.[6] H01R *11/22*

U.S. Cl. 439—266 **23 Claims**

1. Apparatus for mounting a ball grid array device comprising:



(a) a support member having a support face with a plurality of windows therein arranged in a pattern to correspond with and receive terminal balls depending from the face of a ball grid array device when said device is positioned on said support face;

(b) a base member substantially parallel with and spaced from said support member;

(c) a biasing plate disposed between said support member and said base member having a plurality of apertures therein arranged in a pattern substantially corresponding with but laterally offset from said windows;

(d) a plurality of elongated contact members anchored in said base member, each having an interconnetion end and a free end disposed on opposite sides of a central section with said central section projecting through an aperture in said biasing plate and said free end positioned in a window in said support member and arranged such that central section is biased by said biasing plate to form a curve extending from said base member to said free end; and

(e) means for causing relative movement between said terminal balls and said free ends to urge said free ends into contact with the terminal balls above the horizontal centerline of each said terminal ball.

5,556,294

ELECTRICAL PLUG CONNECTOR

Werner Hofmeister, Muehlacker, and Michael Schoenfeld, Leinfelden-Echterdingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed May 26, 1994, Ser. No. 249,862

Claims priority, application Germany, Jun. 21, 1993, 43 20 491.0

Int. Cl.[6] H01R *13/52*

U.S. Cl. 439—281 **5 Claims**

1. An electric plug connection comprising

a plug (**11**) having a plug housing (**13**);

a counterpart socket (**12**),

said plug housing (**13**) being dimensioned to be received in said counterpart socket (**12**) and defining an outer surface located within said counterpart socket;

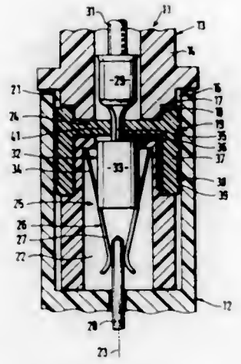
a contact part (**28**) located in the counterpart socket;

a contact carrier (**14**) located in the plug housing and made of electrically insulating material, said contact carrier being formed with a receiving chamber (**22**);

a contact element (**25**) located in said chamber and supported therein;

a connection segment (**29**) including a contact segment (**26**) for connection to an electric line (**31**), electrically conductively and mechanically connectable via said contact segment (**26**) with the contact part (**28**) within the counterpart socket (**12**);

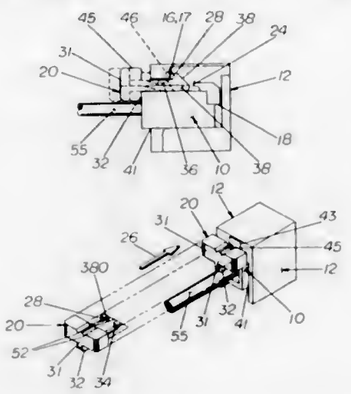
an intermediate segment (**32**) located between said connecting segment (**29**) and the contact segment (**26**) of the contact element (**25**); and



a packing element (19) located in the plug (11) and, in connected or plugged-in state of the connection, coupling the plug (11) to the counterpart socket (12),

wherein the packing element (19) includes an uninterrupted, circumferentially closed rubber-elastic element comprising a base body (37) circumferentially engaging the outer surface of the contact carrier (14), and a retaining segment (41) located and guided in a transverse bore (24) extending through the contact carrier (14).

5,556,295
MODULAR PLUG LOCKING SYSTEM
William C. McFadden, La Canada, and Stanley D. Tout, Arcadia, both of Calif., assignors to Dynametric, Inc., Monrovia, Calif.
Filed Feb. 17, 1995, Ser. No. 390,095
Int. Cl.[6] H01R *13/639*
U.S. Cl. 439—301 **42 Claims**



1. Device for locking a modular plug in a modular receptacle, comprising in combination:

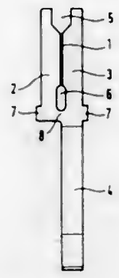
a frangible locking member disintegral from said modular plug;

an internal first catch on said frangible locking member adapted to catch an inside of said modular receptacle;

said internal first catch inaccessible from outside said modular receptacle when said frangible locking member and said modular plug are in place in said modular receptacle; and

a second catch on said frangible locking member adapted to detain said modular plug in said modular receptacle until said frangible locking member has been broken up.

5,556,296
ASYMMETRIC CONTACT AND TERMINAL STRIP EQUIPPED WITH SUCH CONTACTS
Jean-Paul Dussausse, Paris, and Daniel Prudhon, Pierrelos, both of France, assignors to Filotex, Draveil, France
Filed Nov. 17, 1994, Ser. No. 343,942
Claims priority, application France, Nov. 18, 1993, 93 13783
Int. Cl.[6] H01R *4/24*
U.S. Cl. 439—404 **2 Claims**



1. Terminal strip comprising:

an insulative body; and

a plurality of substantially flat elongate asymmetric contacts supported by said insulative body, each of said contacts having a first end part, a second end part opposite said first end part, and a coupling part between the first and second end parts, wherein said second end part is narrower than said first end part, and said second end part is offset to one side of a central axis of said first end part and said coupling part, wherein

said contacts are arranged in two parallel rows so as to face each other, and wherein the first end parts of said contacts are accessible from one side of said insulative body and the second end parts of said contacts are curved toward a central plane defined between the two rows at another side of said insulative body, wherein said contacts are arranged in successive pairs each comprising first and second types of said contacts in opposite rows with their second end parts on right and left sides, respectively, of the central axis of the first end part and the coupling part of each of said contacts, and wherein a first distance (d1) is defined between the second end parts of the contacts of each pair, said first distance being relatively small compared to a second distance (d2) defined between the second end parts of adjacent contacts of two different pairs.

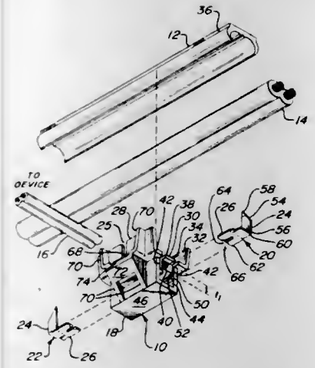
5,556,297
SNAP-ON EXTENSION WIRE SOCKET WITH ELECTRICAL CONDUCTOR INSULATION PIERCER
Douglas R. Bray, Medford, N.J., and Michael M. Strazhnik, Philadelphia, Pa., assignors to Sea Gull Lighting, Riverside, N.J.
Filed Oct. 31, 1994, Ser. No. 332,021
Int. Cl.[6] H01R *4/24*
U.S. Cl. 439—405 **13 Claims**

1. An extension wire socket for attachment to insulated electrical conductors, the socket accepting at least one terminal end of at least one extension wire, the socket comprising:

(a) a nonconductive housing including

(i) a U-shaped portion defined by a base and opposed tabs extending from the base, the base having an upper surface facing the conductors and a lower surface, the U-shaped portion being dimensioned to surround the conductors, and

(ii) a chamber adjacent to the base of the U-shaped portion, the chamber including ribs extending therein for forming a slot between the ribs and the base lower surface, and

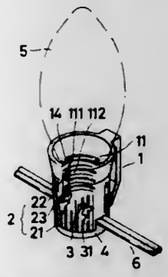


(b) at least one electrical connector supported by the housing for electrically connecting the terminal end of the extension wire to one of the conductors, each connector including

(i) a first portion having a spiked prong associated therewith for piercing the insulation of one of said conductors when the socket is attached to the conductors and making conductive contact with the conductor, the spiked prong being located in the U-shaped portion, and

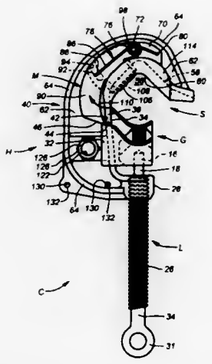
(ii) a second portion attached to the first portion and being located in the chamber, flush against the base lower surface and fitting into the slot, the second portion having an insulation displacement terminal associated therewith for attachment to the terminal end of the extension wire, the insulation displacement terminal being located in the chamber.

5,556,298
CHRISTMAS LAMP SET
Shun-Feng Huang, No. 13, Lane 84, Nei Hu Road, Hsin-Chu City, Talwan
Filed Nov. 21, 1995, Ser. No. 561,280
Int. Cl.[6] H01R *4/24*
U.S. Cl. 439—419 **3 Claims**



1. A Christmas lamp set comprising: a socket, a long conductor, a short conductor, a bottom cover, an electric wire and a bulb; the socket being provided with a threaded wall, a trench for holding the long conductor, two through holes for both conductors to be inserted therethrough and two fixing holes for fixing the bottom cover; each of both conductors having a piercing end for connecting with the electric wire to conduct electricity, the short conductor being fixed with one of said through holes to connect with the electric wire and the bulb by means of its piercing end and the other end respectively; after the long conductor is fixed inside the trench with the piercing end being through another of said through holes and after the short conductor is fixed with its upper end bent slightly, the bulb is made to screw into the socket to connect with both conductors, an elastic protrusion being provided on said long conductor to press a copper portion of the bulb by means of its elasticity; then the electric wire is clipped between the socket and the bottom cover so that the piercing ends can piercing is plastic cover to connect with its leads to conduct electricity therethrough; wherein the characteristics are that a thread fencing porting of the threaded wall overpassing the trench is provided to prevent the long conductor from being bent downward when screwing the bulb into the socket.

5,556,299
SELF-LATCHING CLAMP FOR POWER LINES
Ronald J. Finke, Pasadena, Tex., assignor to Houston Industries Incorporated, Houston, Tex.
Filed Mar. 23, 1995, Ser. No. 409,335
Int. Cl.[6] H01R *13/00*
U.S. Cl. 439—479 **31 Claims**



1. A clamp for connecting onto a power line, comprising:

(a) stirrup means for fitting onto the power line;

(b) movable gripping jaw means for gripping the power line in said stirrup means;

(c) stop means for retaining said gripping jaw means in an open position, spaced from contact with the powerline;

(d) spring means for urging said gripping jaw means into position holding the power line in said stirrup means when said stop means is released; and

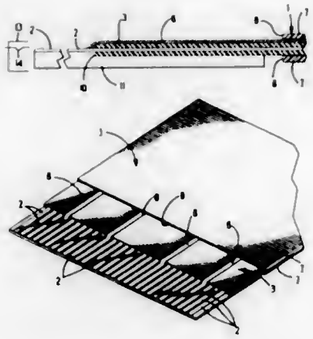
(e) contact means mounted in said stirrup means and engageable by the power line for releasing said stop means to allow said spring means to urge said gripping jaw means into position holding the power line in said stirrup means.

5,556,300
END CONNECTION FOR A FLEXIBLE SHIELDED CABLE CONDUCTOR
Stephen M. Parker, High Poiot, N.C., assignor to The Whitaker Corporation, Wilmington, Del.
Filed Nov. 14, 1994, Ser. No. 338,931
Int. Cl.[6] H01R *9/07*
U.S. Cl. 439—497 **11 Claims**

1. A connection on an end of an electrical cable, comprising: a flexible and flat conductive shield, a flexible ribbon of insulation separating the shield from multiple flexible signal conductors extending along the insulation, at least one flexible ground conductor between the insulation and the shield, the signal conductors and each said ground conductor extending to a common plane beyond said end of the insulation, and the signal conductors and each said ground conductor being laminated to a surface on a plate of insulation for use as an electrical connector for mating with a member having correspondingly arranged conductors.

a detachable cap for covering an outer periphery of said housing so as to cover each of the cutout portions formed on the outer

5,556,306
STAMPED CANTILEVER CONTACT HAVING CLOSED-TYPE ENGAGEMENT PORTION

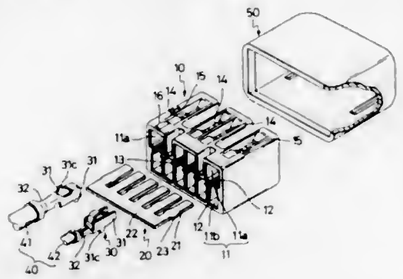


5,556,301

METHOD AND APPARATUS FOR CONNECTING A PLURALITY OF TERMINALS WITHIN A SINGLE HOUSING

Masamitsu Chishima, and Yutaka Noro, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan

Filed Nov. 22, 1994, Ser. No. 346,225
Claims priority, application Japan, Nov. 25, 1993, 5-067941 U; Dec. 22, 1993, 5-073557 U
Int. Cl.[6] H01R *31/08*
U.S. Cl. 439—507 15 Claims



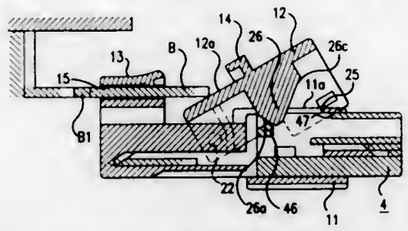
1. A joint connector comprising:
a plate-shaped short circuit terminal;
a terminal strip having a flexible connecting piece connected at an end of a connecting wire, said flexible connecting piece protruding in a direction perpendicular to a longitudinal axis of the wire, said terminal strip also having an engaging recess portion provided on a side opposite to the flexible connecting piece;
a housing having a central chamber extending into a first peripheral wall for accommodating and holding said plate-shaped short circuit terminal, said housing having a plurality of parallel terminal accommodating chambers extending into the first peripheral wall and adjacent the central chamber, wherein a communicating hole is provided to communicate each of the terminal accommodating chambers with the central chamber, and wherein said flexible connecting piece is protrudable into said central chamber through said communicating holes when said terminal strip is inserted into one of said plurality of terminal accommodating chambers, each of said terminal accommodating chambers also having a flexible lock arm engageable with said engaging recess portion, each of said flexible lock arms being provided on a side opposite to a side where said central chamber is formed, wherein a second peripheral wall having a cutout portion for each of said lock arms is provided so that an inside of the housing can be communicated with an outside of the housing; and
a detachable cap for covering an outer periphery of said housing so as to cover each of the cutout portions formed on the outer periphery of said housing.

5,556,302

ELECTRICAL CONNECTOR

Osamu Taniuchi; Hisashi Konoya, and Youichi Nankoh, all of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan

Filed Feb. 8, 1995, Ser. No. 386,910
Claims priority, application Japan, Feb. 8, 1994, 6-036443
Int. Cl.[6] H01R *13/60*
U.S. Cl. 439—533 18 Claims



1. An electrical connector assembly for attachment to a support member (B) provided on an object to which the connector assembly is to be fixed in use, the connector assembly comprising a male connector and a female connector each having a free end for mutual engagement along an assembly axis, one of said connectors having a lever pivoted thereon and the other of said connectors having a lever receiving aperture and a lever abutment, said lever being engageable in said aperture with said lever abutment and being pivotable around a pivot axis in use from an open position to a closed position flush with the outer surface of said one connector thereby urging the male and female connector into a fully coupled state, wherein said one connector includes a support receiving member for engagement with said support member (B), the support receiving member being adapted to ensure movement of said lever to said closed position on full engagement with said support member (B).

5,556,303

Patent Not Issued For This Number

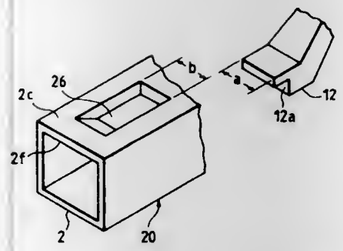
5,556,304

ELECTRIC CONNECTION TERMINAL

Keishi Jinno, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Mar. 28, 1995, Ser. No. 411,464
Claims priority, application Japan, Mar. 28, 1994, 6-056991
Int. Cl.[6] H01R *13/40*
U.S. Cl. 439—595 10 Claims

1. An electric connection terminal comprising:
an engagement portion adapted to be engaged by a forward end of a flexible engagement arm formed in a terminal reception hole when said electric connection terminal is inserted into said terminal reception hole;
a guide surface formed forwardly of said engagement portion in the insertion direction, said forward end of said flexible engagement arm sliding along said guide surface when the terminal is inserted into the reception hole; and
a concave portion formed on said guide surface, the width of said concave portion in the direction perpendicular to said insertion direction being smaller than the width of said forward end of said flexible engagement arm so that said forward end does not deflect into said concave portion.

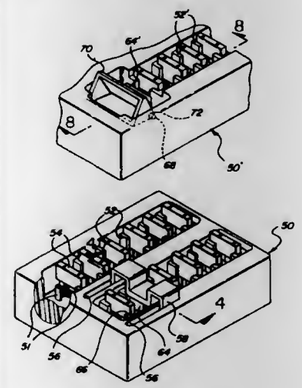


5,556,305

FUSE LOCKOUT MECHANISM

Conrad L. Naegelin, Redford, Mich., assignor to Yazaki Corporation, Tokyo, Japan

Filed Apr. 7, 1995, Ser. No. 418,935
Int. Cl.[6] H01R *33/95*
U.S. Cl. 439—622 10 Claims



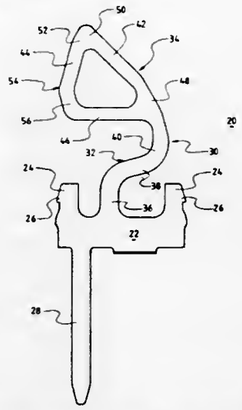
1. A fuse junction box comprising:
a plurality of fuse receptacles formed in the fuse junction box and adapted to operatively receive electric fuses, the plurality of fuse receptacles including a first fuse receptacle and a second fuse receptacle, the first fuse receptacle connecting an electrical device to a first power supply circuit when a fuse is present therein and the second fuse receptacle alternatively connecting the electrical device to a second power supply circuit when the fuse is present therein; and
blocking means moveable between a first position permitting the fuse to be present in the second fuse receptacle while physically obstructing the first fuse receptacle so that no fuse can be present therein, and a second position permitting the fuse to be present in the first fuse receptacle while physically obstructing the second fuse receptacle so that no fuse can be present therein;
wherein the fuse when present in the first fuse receptacle physically interferes with the blocking means to inhibit movement of the blocking means away from the second position, and the fuse when present in the second fuse receptacle physically interferes with the blocking means to inhibit movement of the blocking means away from the first position.

5,556,306

STAMPED CANTILEVER CONTACT HAVING CLOSED-TYPE ENGAGEMENT PORTION

Yu-Hsu Lio, Fremont, and Lee-Ming Cheng, Cupertino, both of Calif., assignors to Hon Hai Precision Ind. Co., Ltd., Taiwan

Filed Dec. 2, 1994, Ser. No. 349,059
Int. Cl.[6] H01R *23/70*
U.S. Cl. 439—637 1 Claim



1. A contact for use with a card edge connector, comprising:
a horizontal base;
at least one retention section extending from said horizontal base;
a contact section extending upwardly from said base, said contact section further including a curved beam body in a lower portion and an engagement portion in an upper portion, wherein said engagement portion is of substantially and completely a rigid closed-type configuration whereby a deformation of said engagement portion is much smaller than a displacement of said beam body;
said engagement portion comprising a suspension section, an engaging section and a holding section; wherein
the suspension section generally upwardly extends from a top portion of the curved beam body, the engaging section generally downwardly extends from a top portion of the suspension section, and the holding section is integrally connected between a lower end of the suspension section and a lower end of the engaging section whereby the top portion of the curved beam is connected to the suspension section and the holding section and is substantially spaced far away from and opposite to the engaging section.

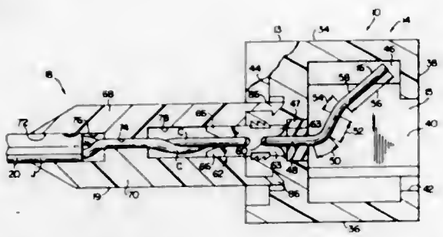
5,556,307

MODULAR TELECOMMUNICATION JACK ASSEMBLY

James J. Johnston, Newington, Conn., assignor to The Wiremold Company, West Hartford, Conn.

Filed Nov. 29, 1994, Ser. No. 345,994
Int. Cl.[6] H01R *23/02*
U.S. Cl. 439—676 31 Claims

1. A modular telecommunication jack assembly for mating connected engagement with a modular telecommunication plug having a plugging rear end portion carrying a plurality of fixed contacts, each of said fixed contacts having rearwardly and upwardly exposed contact surface, said modular telecommunication jack comprising a jack housing defining a plug receptacle opening outwardly through the front end of said housing a plurality of substantially identical axially elongate resilient spring wire contact members, and mounting means for supporting said contact members in cantilever positions and in parallel planes within said plug receptacle, each of said contact members having a plurality of



integrally connected segments including a mounting segment secured to said mounting means and a forwardly and upwardly extending contact segment terminating at a free upper end and defining a forwardly and downwardly facing contact engaging portion for engaging the contact surface on an associated one of the fixed contacts when the plug is in mating connected engagement with said jack, each of said spring wire contact members having another end, said jack assembly including a plurality of axially elongate solid wire conductors having terminal ends, and coupling means for connecting each of said conductors to an associated one of said contact members and including a plurality of double ended insulation displacement type connectors equal in number to said contact members, each of said connectors having a pair of opposing legs at one end grippingly engaging opposite sides of an associated said another end and extending in an axial direction relative to said associated another end and a pair of opposing arms at its opposite end, each of said terminal ends disposed between and grippingly engaged by an associated said pair of opposing arms.

5,556,308

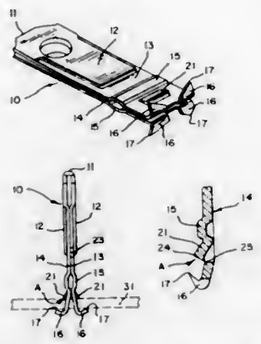
BLADE FOR PRINTED CIRCUIT BOARD TO ACCESS 120V AC OUTLET CURRENT

Donald C. Brown, Freehold; N. Steven Dwarica, Toms River, and Suzanne V. Hickey, Brick, all of N.J., assignors to Heyco Stamped Products, Inc., Toms River, N.J.

Continuation-in-part of Ser. No. 480,827, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 428,492, Apr. 27, 1995, abandoned. This application Juo. 7, 1995, Ser. No. 480,826

Int. Cl.[6] H01R *13/04;13/432*

U.S. Cl. 439—746 **11 Claims**



1. A stamped metal blade to access electric outlet line current in an assembly of a printed circuit board and at least two electric contact blades securely engaged with said printed circuit board in electrical contact with a printed circuit, each said blade having a first fold and a second fold, said folds defining a first end of said blade, each fold apposed to the other one; having a length; a pad; a portion of a bubble; a tab tapering outward; and a second end including fingers, said pad extending on a plane along said length toward but not including said bubble portion, said blade having a thickness along said plane, said thickness defined by said pads, said bubble portions athwart said blade on said plane and being of substantially the thickness defined by said pads; said fingers being resilient; extending substantially perpendicularly outwardly beyond said thickness; and with a slight incline inward toward said first end, said fingers including sharp ends, said tab including an end, and said tab end and said fingers spaced apart substantially a distance equal to the thickness of said printed circuit board.

5,556,309

BATTERY TERMINAL CONNECTOR

Barry L. Sharpe, and Elan D. Mathleson, both of Sydney, Australia, assignors to Matson Automotive Industries Pty Ltd, Greenacre, Australia

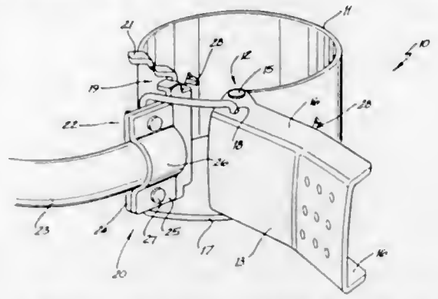
PCT No. PCT/AU93/00218, § 371 Date Nov. 8, 1994, § 102(e) Date Nov. 8, 1994, PCT Pub. No. WO93/23894, PCT Pub. Date Nov. 25, 1993

PCT Filed May 12, 1993, Ser. No. 335,768

Claims priority, application Australia, May 12, 1992, PL2382

Int. Cl.[6] H01R *4/48;11/22*

U.S. Cl. 439—759 **17 Claims**



1. A snap-lock battery terminal comprising an annular ring of substantial longitudinal extent and minimal radial thickness which is longitudinally slit to form two ends, a lug protruding outwardly from the ring, said lug being used to attach an electric cable thereto, said annular ring having at one said end a manually graspable pivotal member pivotally connected thereto at a first location, said pivotal member having a clamping member pivotally connected thereto at a second location spaced from said first location, said annular ring further having its other end bent radially outward and including at least two spaced socket means with either of which said clamping member is able to engage, wherein said pivotal member when pivoted towards said annular ring with said clamping member engaged in one of said socket means simultaneously draws together the two ends of said annular ring and firstly increases, and then slightly decreases, the distance between said first and second locations.

5,556,310

PROTECTIVE ASSEMBLY FOR THE STEERING RAM OF A MARINE OUTBOARD MOTOR

Michael J. Gandarillas, 305 Bull Run Dr., Hopewell, Va. 23860

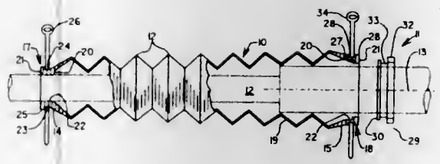
Filed Dec. 21, 1995, Ser. No. 576,512

Int. Cl.[6] B63H *5/12*

U.S. Cl. 440—61 **5 Claims**

1. A boot system interactive with an access port of a marine outboard motor and adapted to protectively enclose an elongated steering component emergent from said port, said boot system comprising:

A) a resilient hollow boot of monolithic construction having an accordion-pleated wall portion of circular cross-sectional configuration elongated upon a center axis between opposed first and second extremities having first and second attachment



sleeves, respectively, of thicker construction than the wall of said accordion-pleated portion and bounded by axially spaced innermost and outermost extremities and radially spaced internal and external surfaces, said first sleeve having a circular cylindrical internal surface configuration centered upon said axis and an external surface configuration having a circular cylindrical shoulder and an outwardly directed flange positioned at said outermost extremity, said second sleeve having an inwardly directed annular abutment shoulder contiguous with said outermost extremity and a first annular groove inwardly recessed from said external surface, and

B) an internally threaded receiving nut adapted to threadably engage said access port and bounded by axially spaced forward and rearward extremities and radially spaced internal and external surfaces, said external surface having a hexagonal contour adjacent said forward extremity, and a second recessed annular groove axially positioned between said forward and rearward extremities and configured to receive the annular abutment shoulder of said second sleeve.

5,556,311

OUTBOARD MOTOR EXHAUST COOLING

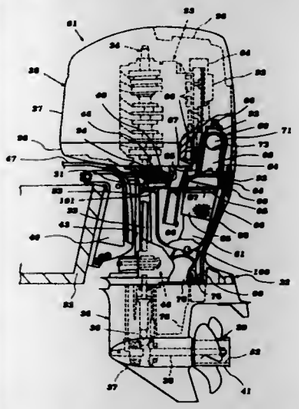
Hiroaki Fujimoto, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jul. 21, 1995, Ser. No. 505,098

Claims priority, application Japan, Jul. 28, 1994, 6-194575

Int. Cl.[6] B63H *21/32*

U.S. Cl. 440—89 **15 Claims**



1. An outboard motor comprised of the power head containing an internal combustion engine and a surrounding protective cowling, a drive shaft housing and lower unit depending from said power head and containing a propulsion device for an associated water craft, transmission means for driving said propulsion device from said engine, an exhaust guide interposed between said engine and said drive shaft housing and lower unit, a plurality of exhaust openings in said exhaust guide, said engine having at least one exhaust port for discharging combustion products therefrom, an exhaust system for discharging exhaust gases from said exhaust port to the atmosphere through a body of water which the associated water craft is operating under at least some running conditions, said exhaust system including parts which communicate with said exhaust guide exhaust openings for flow therethrough, a cooling pump for pumping water from the body of water in which said watercraft is operating, and conduit means for delivering at least a portion of the water pumped by said water pump directly to a cooling jacket formed in said exhaust guide around said exhaust openings.

5,556,312

BEARING ARRANGEMENT FOR MARINE TRANSMISSION

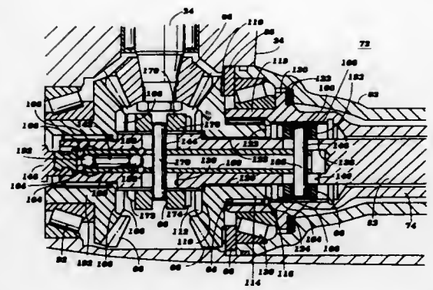
Hiroshi Ogino, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka-ken, Japan

Continuation-in-part of Ser. No. 346,383, Nov. 29, 1994, Pat. No. 5,514,014. This application May 31, 1995, Ser. No. 455,048

Claims priority, application Japan, Nov. 29, 1993, 5-298250; May 31, 1994, 6-118799

Int. Cl.[6] B63H *21/28*

U.S. Cl. 440—75 **30 Claims**



1. A marine outboard drive comprising a transmission including at least a first driven gear having a bearing hub and a corresponding first clutch which is coupled to a first propulsion shaft of said outboard drive to selectively couple said first driven gear to said first propulsion shaft, said first propulsion shaft extending along a drive axis with said bearing hub rotatably supported about said drive axis, said first propulsion shaft having a hollow rim which surrounds at least a portion of said bearing hub of said first gear.

5,556,313

OUTBOARD DRIVE TRANSMISSION

Hiroshi Ogino, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Shizuoka-ken, Japan

Continuation-in-part of Ser. No. 346,383, Nov. 29, 1994, Pat. No. 5,514,014. This application May 31, 1995, Ser. No. 455,064

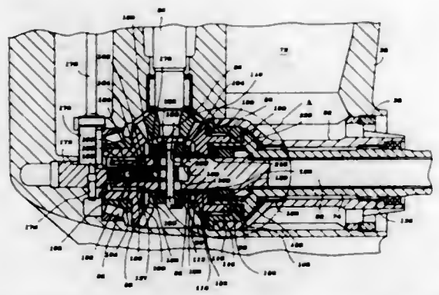
Claims priority, application Japan, Nov. 29, 1993, 5-298250; May 31, 1994, 6-119148

Int. Cl.[6] B63H *21/28*

U.S. Cl. 440—75 **29 Claims**

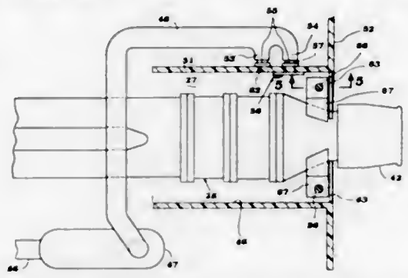
1. A transmission for a watercraft outboard drive, said transmission comprising first and second counter-rotating gears, a first clutch connected to a first propulsion shaft and adapted to selectively engage either said first gear or second gear to establish either a first or a second drive condition, and a second clutch coupled to said first clutch and connected to a second propulsion shaft, said second clutch adapted to selectively engage said second gear under one of said drive conditions, said first shaft including a step which receives a first member and said second shaft includes an abutment surface which a second member acts against, said first and second members being arranged to act against each other in a manner allowing the transfer of thrust loading on said first shaft to said

forming an electrically insulating layer on said resistive layer;



second shaft through said step and said abutment surface under one of said drive conditions.

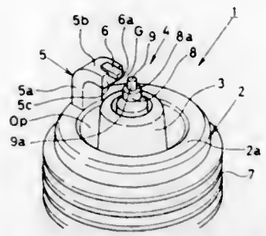
5,556,314
EXHAUST SYSTEM FOR WATERCRAFT
Yoshihide Fukuda, and Shigeyuki Ozawa, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushuki Kaisha, Hamamatsu, Japan
Filed Mar. 8, 1995, Ser. No. 399,055
Claims priority, application Japan, Mar. 8, 1995, 6-02191
Int. Cl.[6] B63H *21/32*
U.S. Cl. 440—89 **17 Claims**



1. A watercraft comprised of a hull defining a tunnel in the underside thereof, said tunnel terminating at one end in a tunnel opening extending through the hull for directly communicating said tunnel with the atmosphere, a propulsion unit for propelling said watercraft contained within said tunnel, an internal combustion engine supported within said hull and driving said propulsion unit, said engine having at least one exhaust port, exhaust pipe means for delivering exhaust gases from said exhaust port to an exhaust opening within said tunnel, and flow control means for restrictively controlling the flow through at least said tunnel opening for controlling the communication of said tunnel with the atmosphere.

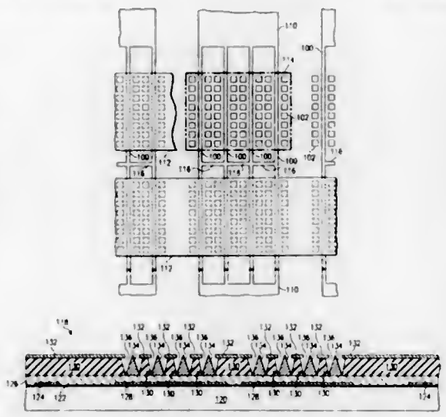
5,556,315
METHOD OF MAKING A SPARK PLUG FOR AN INTERNAL COMBUSTION ENGINE
Junichi Kagawa, Nagoya, Japan, assignor to NGK Spark Plug Co., Ltd., Nagoya, Japan
Division of Ser. No. 268,546, Jul. 6, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 468,952
Claims priority, application Japan, Jul. 6, 1993, 5-167073; Jul. 6, 1993, 5-167074
Int. Cl.[6] H01T *21/02*
U.S. Cl. 445—7 **10 Claims**

1. In a method of making a spark plug in which a spark gap is provided between an elevational side of a center electrode axially



extended in an insulator supported within a metallic shell and one end of a spark-erosion resistant noble metal tip secured to an outer electrode, the method comprising steps of:
(a) securing an outer electrode to a metallic shell so that at least a portion of the outer electrode is directed inwardly of a front open end of the metallic shell, the outer electrode having an inner surface, an outer surface and an end surface;
(b) supporting a center electrode in an insulator in the metallic shell and
(c) attaching a spark-erosion resistant noble metal tip to the outer surface of the outer electrode while maintaining a predetermined distance between an elevational side of the Center electrode and one end of the spark-erosion resistant noble metal tip.

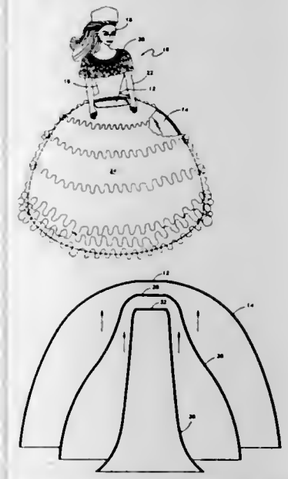
5,556,316
CLUSTERED FIELD EMISSION MICROTIPS ADJACENT STRIPE CONDUCTORS
Robert H. Taylor, Richardson; Kenneth G. Vickers, Whitesboro; Bruce E. Gnade, Dallas; Arthur M. Wilson, Richardson, and Charles E. Primm, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 378,331, Jan. 26, 1995, which is a continuation-in-part of Ser. No. 341,740, Nov. 18, 1994. This application Jun. 7, 1995, Ser. No. 476,776
Int. Cl.[6] H01J *1/30;9/18*
U.S. Cl. 445—50 **16 Claims**



1. A method of fabricating an electron emission apparatus comprising the steps of:
providing an insulating substrate;
depositing a first layer of conductive material on said substrate and forming therefrom conductive stripes, conductive plates adjacent said stripes, and bus regions interconnecting said stripes at the ends thereof;
forming a layer of an electrically resistive material on said substrate overlying said conductive stripes and said conductive plates;

forming an electrically insulating layer on said resistive layer;
forming a second conductive layer on said insulating layer in regions over said conductive plates;
forming apertures in said second conductive layer in said regions over said conductive plates, said apertures extending through said insulating layer; and
forming microtip emitters on said resistive layer, each emitter formed within a corresponding one of said apertures in said second conductive layer.

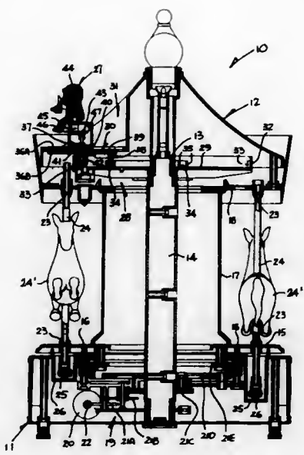
5,556,317
DOLL STAND SET
Sharon R. Woolard, Rte. 2, Box 495, Washington, N.C. 27889
Filed Apr. 24, 1995, Ser. No. 427,158
Int. Cl.[6] A63H *3/50;* **A47B** *91/00*
U.S. Cl. 446—268 **2 Claims**



1. A hidden stand for supporting a doll figure comprising:
a nested set of shells, adapted to rest on a planar surface, having:
a first shell being hemispherical shaped;
a second shell being bell-shaped inside and removable from the first shell;
a third shell being horn-shaped inside and removable from the second shell;
a surface on each shell for displaying garments;
an apex on each of the shells;
an aperture in the apex of the shells of a size and dimension to receive the legs and lower torso of a doll figure;
the aperture of each shell aligned to receive the legs and lower torso of a doll figure when the shells are nested;
whereby a garment worn by the doll figure will over lie and hide the shells.

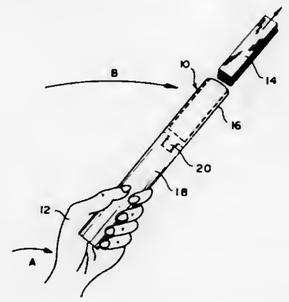
5,556,318
TOY CARROUSEL
Moon-Lam So, Kowloon, Hong Kong, assignor to May Cheong Toy Products Factory Limited, Hong Kong, Hong Kong
Filed Apr. 11, 1995, Ser. No. 420,207
Int. Cl.[6] A63H *13/20*
U.S. Cl. 446—236 **10 Claims**

1. A toy carrousel comprising a body which is formed by a stationary base part and a top part supported above the base part for rotation about a vertical axis, said base part including a vertical member having an upper end reaching into the top part and said top part supporting at least one decorative figure atop, a first drive



mechanism provided in the base part for rotating the top part, said drive mechanism being formed by a motor and a train of gears to be driven by the motor to rotate the top part, and a second drive transmission mechanism provided at the upper end of the vertical member for setting the decorative figure into individual motion relative to the top part upon rotation of the top part; wherein the second drive transmission mechanism is provided by a toothed member supported on the upper end of the vertical member and by a gear associated with the decorative figure, which gear is arranged to be in engagement with the toothed member so as to be rotated thereby upon rotation of the top part in order to set the decorative figure into individual motion.

5,556,319
CONFETTI LAUNCHING DEVICE
James O. Watkins, 14920 Mt. Nebo Rd., Poolesville, Md. 20837
Continuation-in-part of Ser. No. 80,534, Jun. 24, 1993, Pat. No. 5,403,225, which is a continuation-in-part of Ser. No. 51,355, Apr. 23, 1993, Pat. No. 5,352,148. This application Jan. 4, 1995, Ser. No. 368,500
Int. Cl.[6] A63H *37/00*
U.S. Cl. 446—475 **3 Claims**



1. A wand for launching confetti into the air, said wand comprising:
(a) a barrel portion having at least one cavity of a size and shape such as to receive and contain a stack of tetragonal shaped pieces of confetti, said cavity being closed at one end;
(b) at least one stack of tetragonal shaped confetti in said cavity, said at least one stack of confetti being wrapped by a wrapper to form a wrapped bundle of confetti;

(c) a handle portion connected to said barrel portion, said handle

5,556,323

in said viewing zone to facilitate observation through said

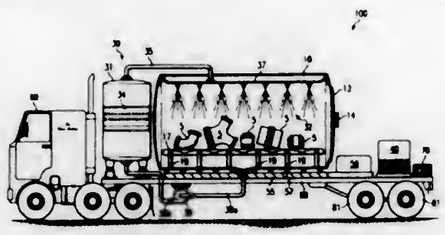
(c) a handle portion connected to said barrel portion, said handle portion being of substantially longer length than said barrel portion whereby, upon grasping said handle portion and waving said barrel portion rapidly in an arcuate path, said wrapped bundle of tetragonal shaped confetti is forcefully ejected from said cavity high into the air.

5,556,320

MOBILE VIBRATING ABRASIVE CLEANING APPARATUS

Bryan C. Baker, Houston, Tex., assignor to Drilltec Patents & Technologies Company, Inc., Houston, Tex.

Filed Jan. 7, 1994, Ser. No. 178,737
Int. Cl.[6] B24B *51/00*
U.S. Cl. 451—5 **8 Claims**



1. A mobile vibrating abrasive cleaning apparatus for cleaning an article with a cleaning fluid having abrasive media, the apparatus comprising:
(a) a frame having wheels;
(b) a cleaning container supported by the frame for holding the article during cleaning;
(c) a vibrator supported by the frame and operatively connected to the cleaning container to impart vibrations to the cleaning container;
(d) cleaning fluid entry port mounted inside the cleaning container and positioned to provide cleaning fluid to the article during cleaning;
(e) cleaning fluid drain operatively connected to the cleaning container for draining cleaning fluid from the cleaning container;
(f) cleaning fluid surge tank supported by the frame and in fluid communication with the cleaning fluid entry port and the cleaning fluid drain;
(g) fluid circulator for circulating the cleaning fluid and abrasive media, from the surge tank, through the entry port to the cleaning tank and through the drain to the surge tank;
(h) controller supported by the frame and operatively connected to the vibrator and the fluid circulator; and
(i) power supply for supplying power to the vibrator and the fluid circulator.

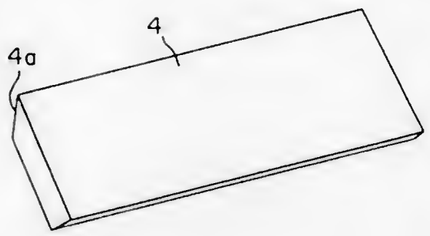
5,556,321

METHOD AND APPARATUS FOR GRINDING ELONGATED KNIFE BLADE

Yoshiyuki Kasahara, Aichi-Ken; Hajime Segawa, Komaki; Mikio Yamauchi, Nagoya; Toshihiro Kuno, Oobu; Hiroshige Mizutani, Kuwana, and Yuzo Kawai, Kariya, all of Japan, assignors to Kabushiki Kaisha Taihei Seisakusho, Aichi-Ken, Japan

Filed Feb. 7, 1994, Ser. No. 192,712
Int. Cl.[6] B24B *1/00*
U.S. Cl. 451—5 **32 Claims**

17. An apparatus for grinding an elongated knife blade having a cutting edge along a longitudinal side thereof, comprising:
a blade mount having a mounting surface for fixedly mounting the elongated knife blade thereon;



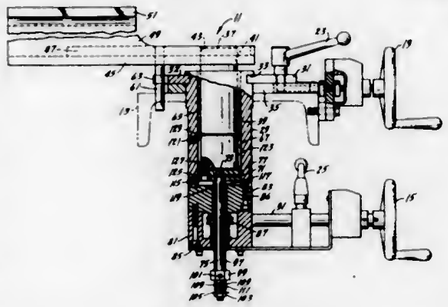
a grinding wheel;
a carriage movable reciprocatingly along the knife blade on the blade mount and carrying the grinding wheel;
motive means for moving the carriage so as to cause the grinding wheel carried by the carriage to reciprocatingly move along and in contact with the cutting edge of the knife blade to grind the same; and
cooling means provided for the mounting surface of the blade mount for maintaining a major portion of a major surface of the knife blade mounted on said mounting surface in constant contact with a cooling medium supplied to the cooling means, while the grinding wheel is grinding the cutting edge.

5,556,322

PNEUMATIC MECHANISM FOR THE APPLICATION OF UNIFORM PRESSURE TO A MECHANICALLY ADJUSTABLE SPINDLE

Ronald N. Ford, Lockport, Ill., assignor to Sommer & Maca Industries, Inc., Chicago, Ill.

Filed Sep. 5, 1995, Ser. No. 523,226
Int. Cl.[6] B24B *49/00*
U.S. Cl. 451—21 **3 Claims**



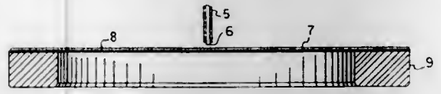
1. A pneumatic spindle lifting assembly including:
a support shelf,
a piston attached at its non-pressure end to said support shaft,
a cylinder receiving said piston for telescopingly sliding movement of said piston relative to said cylinder,
a lifting stop rod connected to the pressure end of said piston,
an externally threaded tube engaging said pressure end of said piston and telescopingly receiving said lifting stop rod,
a worm wheel threadingly engaged with said threaded tube,
a worm gear operatively engaged with said worm wheel,
a hand wheel connected to said worm gear for rotating said worm gear and said worm wheel,
an adjustable connection between said lifting stop rod and said threaded tube to permit limited lifting movement of said lifting stop rod relative to said threaded tube, and
a port located in said cylinder for directing pressurized air against said pressure end of said piston to lift said piston and said lifting stop rod relative to said threaded tube.

5,556,323

METHOD OF POLISHING OPTICAL CONNECTORS

James P. Luther; Dennis M. Knecht; Sherrh C. Reinhardt, and Karen Petzold, all of Hickory, N.C., assignors to Siecor Corporation, Hickory, N.C.

Filed Jun. 30, 1994, Ser. No. 268,981
Int. Cl.[6] B24B *1/00*
U.S. Cl. 451—28 **1 Claim**



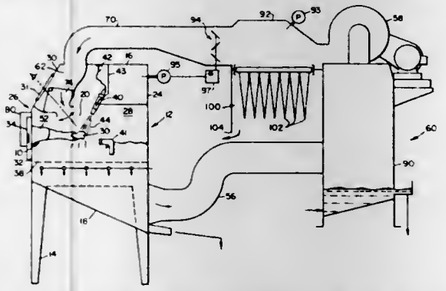
1. A method of manufacturing a glass waveguide and ceramic ferrule assembly for use in an optical fiber connector, comprising the steps of:
(a) inserting a distal end of the waveguide into the ferrule so that the waveguide protrudes slightly beyond the end of the ferrule;
(b) polishing the end of the waveguide and ferrule assembly with an aqueous slurry with a neutral pH and comprising silicon dioxide and cerium oxide; and
(c) then polishing the waveguide and ferrule assembly distal end with a solution having a pH of about 4 or less.

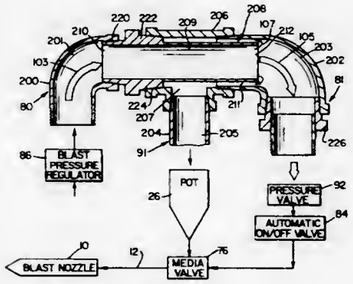
5,556,324

BLASTING CABINET

James D. Shank, Jr., Vestal, N.Y., assignor to Church & Dwight Co., Inc., Princeton, N.J.

Filed Feb. 17, 1995, Ser. No. 390,039
Int. Cl.[6] B24C *9/00*
U.S. Cl. 451—89 **22 Claims**





1. A blast cabinet for cleaning surfaces of articles with an abrasive blast media comprising:
a housing defining a blast chamber with an interior;
a blast nozzle disposed in said blast chamber interior and connected to a source of an abrasive blast media for directing a flow of the blast media against a surface of an article to be cleaned in said blast chamber interior whereby said blast media normally is dispersed throughout said blast chamber interior in a manner so as to obscure visual observation of a portion of the article being cleaned from outside said blast chamber;
observation means for observing the article being cleaned in said interior including a window placed in said housing and an inner viewing port situated in the vicinity of but spaced from the article to be cleaned to provide a viewing zone between said inner viewing port and the article to be cleaned, so that an operator outside said blast chamber can direct his or her line of sight through said window and said inner viewing port and observe the article being cleaned;
gas delivery means in fluid communication with said inner viewing port for directing a flow of gas into said viewing zone for purging away a sufficient amount of blast media dispersed in said viewing zone to facilitate observation through said window and said inner viewing port of at least a portion of said article being cleaned,
ventilation means to remove spent blast media and air from said interior of said housing, and,
air supply means to recycle said air removed from the interior to said gas delivery means for directing said recycled air into the interior of said blast cabinet as said flow of gas into said viewing zone,
said gas delivery means including a fixed chute place in said interior adjacent said window, said fixed chute including a first open end in communication with said air supply means, an opening adjacent said window and a second open end communicating with said inner viewing port, said inner viewing port being rotatable about said second open end of said fixed chute.

5,556,325

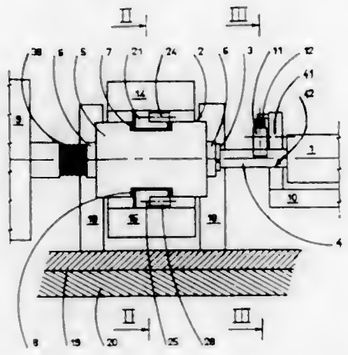
PRESSURIZATION SYSTEM FOR ABRASIVE SUPPLY POT

James D. Shank, Jr., Vestal, N.Y., assignor to Church & Dwight Co., Inc., Princeton, N.J.

Filed Jun. 15, 1995, Ser. No. 490,591
Int. Cl.[6] B24C *7/00*
U.S. Cl. 451—101 **24 Claims**

1. An abrasive blast system comprising:
a supply pot having an inlet for filling same with abrasive and an outlet for discharging abrasive therefrom,
a blast hose and blast nozzle apparatus for receiving the discharged abrasive,
a source of compressed air,
piping communicating with (1) said source of compressed air, (2) a first inlet to said supply pot and (3) a second inlet to said blast hose and blast nozzle apparatus, said piping communicating with said first and second inlets downstream from said source of compressed air and with said second inlet downstream from said first inlet,
diverter means in said piping to carry a compressed air stream in said piping from said source directly to said second inlet to said blast hose and blast nozzle apparatus thereby by-passing said first inlet to said supply pot, said diverter means allowing backflow of compressed air in said piping from said second inlet to said first inlet for said supply pot to pressurize said supply pot.

5,556,326
FLOATING ROTARY DRIVE DEVICE OF A WORKPIECE TO BE MACHINED BY GRINDING
Louis Rouyer, Clamart, and Jacques Bastin, Sainte Genevieve des Bois, both of France, assignors to Createc Rollers, Sainte-Genevieve-des-Bois, France
PCT No. PCT/FR92/00915, § 371 Date Jul. 18, 1994, § 102(e) Date Jul. 18, 1994, PCT Pub. No. WO93/06966, PCT Pub. Date Apr. 15, 1993
PCT Filed Oct. 2, 1992, Ser. No. 211,507
Claims priority, application France, Oct. 2, 1991, 91 12123
Int. Cl.[6] B24B *41/06*
U.S. Cl. 451—246 **8 Claims**



1. A floating rotary drive device sequentially holding a workpiece of a series of workpieces to be supported with slack while each workpiece is machined by grinding while the workpiece is rotated about a slack axis of rotation, comprising a motor having an output shaft, a chuck (2) rotatable about an axis of rotation which chuck is attached to the output shaft of the motor (9), by a flexible control (30) and positioning means for positioning the machined workpiece after it has been ground, characterized in that the device comprises:

(a) coupling means (14, 39, 15, 40) for automatic coupling of the workpiece to be ground with the chuck;

(b) the coupling means being actuatable at the end of a machining operation to bear against the chuck to center the chuck with its axis of rotation coincident with the specific axis of rotation of the machined workpiece in a final position and to immobilize the chuck in the final position during the removal of the machined workpiece and during the fitting of a sequential workpiece to be machined;

(c) the coupling means being subsequently actuatable to free the chuck from immobilization after the fitting of a subsequent workpiece to be machined to ensure slack when the subsequent workpiece is subjected to grinding.

5,556,327
APPARATUS AND METHODOLOGY FOR APPLYING FORCE TO A WORKPIECE
Gary Jenkins, 9 Granville Rd., Cambridge, Mass. 02138; Richard Mitrano, 106 Wildwood Rd., Andover, Mass. 01810, and Curtis A. Vock, 28-A Federal St. #12, Salem, Mass. 01970
Filed Oct. 13, 1994, Ser. No. 322,606
Int. Cl.[6] B24B *7/00*
U.S. Cl. 451—278 **6 Claims**

1. A razor sharpener for sharpening a rotary razor head, comprising

a housing member,

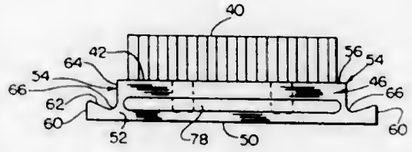
a first magnet held stationary within said housing member,

a second magnet slideably engaged with said housing member and arranged such that said second magnet is repelled from said first magnet in at least one direction, said second magnet being slideably engaged with said housing member along said one direction, and

motor means, coupled to said housing member, having a motor and abrasion means adjacent to said second magnet, said motor driving said abrasion means to sharpen a rotary razor head forced against said abrasion means,

said second magnet being spaced apart to accommodate the rotary razor head therebetween wherein said second magnet forces the rotary razor head against said abrasion means.

5,556,328
ABRASIVE FILAMENT HONING TOOL AND METHOD OF MAKING AND USING SAME
Alfred F. Scheider, 3910 Wild Cherry Trail, Orange, Ohio 44122, and R. Brown Warner, 28200 Hilliard Blvd., Westlake, Ohio 44145
Division of Ser. No. 970,865, Nov. 3, 1992, Pat. No. 5,318,603, which is a continuation-in-part of Ser. No. 508,060, Apr. 11, 1990, Pat. No. 5,216,847, which is a continuation-in-part of Ser. No. 228,438, Aug. 5, 1988, Pat. No. 5,129,191. This application Mar. 10, 1994, Ser. No. 209,436
Int. Cl.[6] B24D *11/00*
U.S. Cl. 451—463 **8 Claims**



1. A honing tool comprising an elongated cup element, a bundle of tightly packed parallel abrasive containing plastic fingers secured in the bottom of said cup element and projecting therefrom a short distance to form a uniform tool face comprising the tightly compacted tips of said fingers, said abrasive containing plastic fingers being rectangular in transverse sectional configuration and randomly packed.

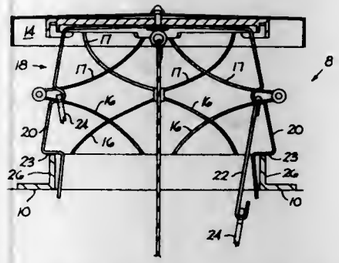
5,556,329
CHIMNEY DAMPER WITH LOCKING MECHANISM
Hal A. VonSick, Louisville, Ky., assignor to Fireplace Technologies, Inc., Louisville, Ky.
Filed Feb. 23, 1995, Ser. No. 393,345
Int. Cl.[6] F23L *17/10*
U.S. Cl. 454—4 **7 Claims**

7. A chimney damper, comprising:

a frame;

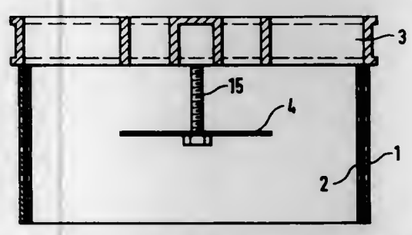
a cap;

a spring for biasing the cap to an open position, separated from the frame; and



a locking mechanism for locking the damper in the open position in the event of a chimney fire, wherein said locking mechanism includes a fusible link which is adapted to fail at a high temperature.

5,556,330
FLOOR OUTLET
Wolfgang Schweikert, Stolberg, Germany, assignor to H. Krantz-TKT GmbH, Bergisch Gladbach, Germany
Filed Feb. 9, 1995, Ser. No. 386,006
Claims priority, application Germany, Feb. 23, 1994, 44 05 867.5
Int. Cl.[6] F24F *13/06*
U.S. Cl. 454—289 **5 Claims**

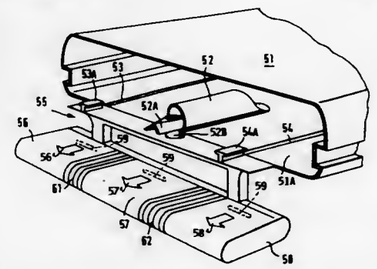


1. In a floor mountable air outlet comprising a cylindrical casing having an upwardly open mouth, a circular plate covering said mouth and a circular disk parallel to said plate having adjusting means for shifting said circular disk toward and away from said plate from an upper position adjacent said plate to a lower position spaced from said plate, said plate including outlet openings, the improvement wherein said outlet openings are comprised of a first series of uniformly spaced openings extending radially of said plate, said first series being arranged with their radial innermost ends terminating a first distance from the center of said circular plate, a second series of uniformly spaced openings extending radially of said plate, the openings of said second series having their radial outermost extremities located in the area of said plate between said center and said radial innermost ends of the openings of said first series, said openings of said first and second series being angularly inclined in a common direction relative to the plane of said plate, said disk in said upper position blocking said openings of said second series.

5,556,331
FUME HOOD WITH AIR FOIL MEMBER
John M. Bastian, Manitowoc, Wis., assignor to Fisher Hamilton Scientific Inc., Two Rivers, Wis.
Filed Jan. 20, 1995, Ser. No. 371,948
Int. Cl.[6] B08B *15/02*
U.S. Cl. 454—56 **13 Claims**

13. A fume hood apparatus comprising: a base member that defines a substantially flat work surface; sidewalls; and a cover; said base member, sidewalls and cover defining an enclosed work space and an access opening; said apparatus including a moveable sash for closing the opening and an air foil member mounted proximate an edge portion of the base member for directing air flow through the opening and into the work space; a portion of the air foil normally extending through the opening, inwardly of the work space, a predetermined distance above the edge portion of the base member to divide the access opening into top and bottom portions and having a surface that lies substantially flush with the work surface of the base member.

5,556,332
AIR DUCT FOR A POSITION ADJUSTABLE SERVICE PANEL
Markus Schumacher, Bremen, Germany, assignor to Daimler-Benz Aerospace Airbus GmbH, Hamburg, Germany
Filed Jan. 24, 1994, Ser. No. 184,984
Claims priority, application Germany, Jan. 22, 1993, 43 01 681.2
Int. Cl.[6] B64D *13/00*
U.S. Cl. 454—76 **19 Claims**



1. An air supply apparatus, comprising a service panel, an air outlet in said service panel, a hollow air duct, at least one air tap member connected to said hollow air duct for withdrawing air from said hollow air duct, and a positioo adjustment device for feeding air from said hollow air duct through said air tap member to said air outlet of said service panel, so that said service panel is position adjustable, and wherein said position adjustment device comprises a longitudinal gap in said hollow air duct having at least one elastic sealing lip biased to normally close said longitudinal gap, a sealing guide slide (2, 15) slidingly fitting into said longitudinal gap, said air tap member (10, 16) being carried on said sealing guide slide, said air tap member passing through said sealing guide slide for permitting an air flow out of said hollow air duct through said air

tap member into said air outlet of said service panel, said sealing

5,556,334

means for deflecting flow from said divergent outlet, and support

said threshing unit for transferring substantially threshed straw; a

tap member into said air outlet of said service panel, said sealing guide slide having at least two guide elements (8, 9) forming at least one sealing slot in which said at least one sealing lip of said bollow air duct is slidingly received in a sealed manner, so that said sealing guide slide is adjustable in its position along said longitudinal gap in said hollow air duct while said sealing lip and said at least two guide elements maintain a continuous seal around said air tap member and between said sealing lip and said hollow air duct.

5,556,333

AIR-DISTRIBUTOR BOX

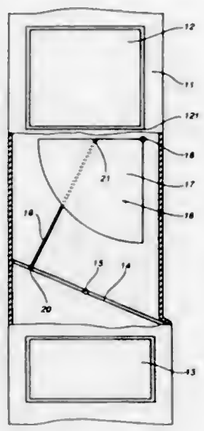
Günther Sigmund, Sindelfingen, Germany, assignor to Mercedes-Benz AG, Germany

Filed Dec. 2, 1994, Ser. No. 353,239

Claims priority, application Germany, Dec. 2, 1993, 4341056.1

Int. Cl.[6] B60H *1/26*

U.S. Cl. 454—143 **7 Claims**



1. An air-distributor box for a motor vehicle heating air-conditioning system, comprising a first air outflow orifice for connection of a lateral nozzle arranged laterally in a motor vehicle dashboard, a second air-outflow orifice arranged below the first air-outflow orifice for ventilating a motor vehicle foot space, and an air flap controlling an air stream to the second air-outflow orifice, wherein the first air-outflow orifice is associated with a throttle diaphragm arranged to control an orifice cross-section of the first air-outflow orifice, and the throttle diaphragm and air flap are positively coupled such that the throttle diaphragm maximally but not completely throttles the orifice cross section of the first air-outflow orifice in the open position of the air flap allowing a full air stream to the second air-outflow orifice and exposes the orifice cross section of the first air outflow orifice completely in a closing position of the air flap shutting off the air stream to the second air-outflow orifice, whereby, when the orifice cross-section of the first air-outflow orifice is throttled to the maximum extent by the throttle diaphragm, an incomplete covering of the first air-outflow orifice occurs.

5,556,334

VENTILATION NOZZLE FOR VEHICLE INTERIOR

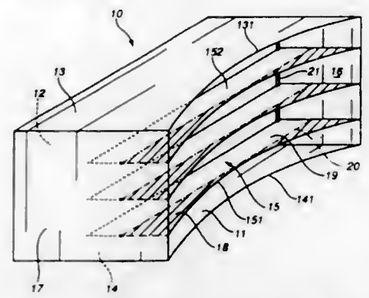
Gerhard Cecotti, Grafenau; Josef Cecotti, Aidlingen, and Rolf Röhm, Jettingen, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Dec. 19, 1995, Ser. No. 576,433

Claims priority, application Germany, Dec. 19, 1994, 44 45 326.4

Int. Cl.[6] B60H *1/34*

U.S. Cl. 454—155 **8 Claims**



1. Ventilation nozzle for the interior of a vehicle having a box-shaped nozzle housing which can be joined to an air duct and is accommodated flush in wall surfaces of the interior, and having a set of mutually parallel, pivotable fins for influencing the direction of flow of air emerging from a nozzle housing opening, which fins extend in the housing opening between two opposite housing walls of the nozzle housing,

wherein the fins and those housing walls of the nozzle housing which are parallel to the fins each have a front edge extending in a curved manner for matching to curved wall surfaces of the interior,

wherein each fin is divided in a longitudinal air flow direction into a front part, which has the curved front edge, and into a rear part which continues immediately from the front part, upstream of the air flow,

wherein the front parts of the fins are fastened rigidly to those housing walls of the nozzle housing which extend transversely with respect to the fins, and

wherein the rear parts are held on the associated front parts via a pivot bearing and are coupled to one another for the purpose of a joint pivoting movement.

5,556,335

THERMALLY CONTROLLED DIFFUSERS

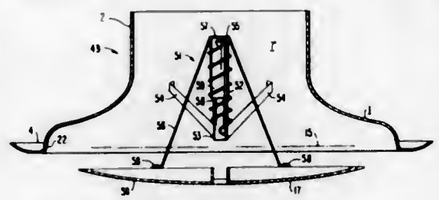
Noel V. Holyoake, Pakuranga, New Zealand, assignor to Holyoake Industries Limited, Auckland, New Zealand

Filed Mar. 21, 1994, Ser. No. 215,938

Claims priority, application New Zealand, Mar. 23, 1993, 247231

Int. Cl.[6] F24F *11/02;13/06*

U.S. Cl. 454—258 **5 Claims**



1. A thermally controlled diffuser comprising:

means for connecting said diffuser to a duct,

a divergent outlet,

means for deflecting flow from said divergent outlet, and support means for supporting said means for deflecting flow in a predetermined positional relationship with respect to said divergent outlet, wherein said support means includes a fixed member, a movable member which is coaxial with said fixed member and slides longitudinally with respect to said fixed member, and a temperature sensitive mechanism interposed between said fixed member and said movable member, whereby said positional relationship between said outlet and said means for deflecting flow may be varied depending on a temperature sensed by said temperature sensitive mechanism so as to produce a variation in the outlet flow pattern of said diffuser;

said means for deflecting flow being movable from a position within said divergent outlet to a postion spaced outwardly of said divergent outlet, and being of lesser radial extent than the radial extent of the outlet of said divergent outlet;

whereby, when said means for deflecting flow is located within said divergent outlet, exiting air is constrained to move axially outwards of said divergent outlet, and, when said means for deflecting flow is spaced outwardly of said divergent outlet, exiting air is constrained to move radially outwards of said divergent outlet.

5,556,336

Patent Not Issued For This Number

5,556,337

SELF-PROPELLING HARVESTER THRESHER

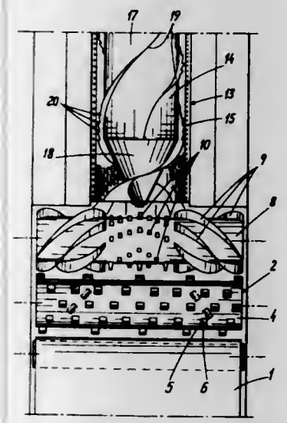
Franz Tophinke; Josef Stovesand; Franz Heidjann, and Johannes Dammann, all of Harsewinkel, Germany, assignors to CLAAS OHG beschraebkt haftende offene, Harsewinkel, Germany

Continuation-in-part of Ser. No. 128,489, Sep. 28, 1993, Pat. No. 5,454,758. This application Mar. 31, 1995, Ser. No. 414,806

Claims priority, application Germany, Sep. 28, 1992, 42 32 450.5

Int. Cl.[6] A01F *12/10*

U.S. Cl. 460—70 **18 Claims**



1. A self-propelling harvester thresher, comprising means for cutting and transporting a harvested product; threshing unit arranged after said means and operating in accordance with the principle of radial flow, said threshing unit including a threshing basket and a threshing drum; a transferring drum arranged after said threshing unit for transferring substantially threshed straw; a separating unit transporting the harvested product in accordance with the principle of axial flow against a travelling direction of the harvester thresher, said separating unit including at least one separating rotor and a separating housing provided with a drawing-in opening, said threshing drum being provided with a plurality of threshing segments arranged on its periphery and offset relative to one another, said transferring drum in its region preceding said drawing-in opening of said separating housing being provided with a plurality of drivers which are arranged on a periphery of said transferring drum and are offset relative to one another similarly to said threshing segments of said threshing drum, said drivers being formed as individual point-like elements which are spaced from one another in an axial direction and in a circumferential direction of said transferring drum and engage in a product accumulation in a point-like manner so as to loosen and to spread the product accumulation and transport parts of the product accumulation in a longitudinal direction of the harvester thresher while other parts of the material accumulation remain behind.

5,556,338

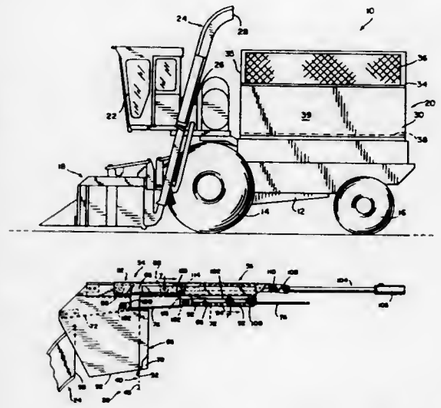
COTTON HARVESTER RECEPTACLE

Michael J. Covington, LaGrange, Ill., assignor to Case Corporation, Racine, Wis.

Filed May 11, 1995, Ser. No. 438,783

Int. Cl.[6] A01D *46/10;* **A01F** *12/60*

U.S. Cl. 460—119 **22 Claims**



1. A receptacle for a cotton harvester having a main frame, harvesting structure for removing cotton materials from cotton plants, cotton material elevating structure operatively associated with and upwardly extending from the harvesting structure and having a discharge opening, and a receptacle for receiving cotton materials from the elevating structure, said receptacle comprising:

a basket for holding cotton materials received from the elevating structure, said basket including a lower basket portion mounted on the main frame, an upper basket portion telescopically received by the lower basket portion for vertical movement between an extended field working position and a retracted storage position, said upper basket portion defining an inlet opening, and an extendable/retractable hood assembly carried by the upper basket portion for guiding cotton materials between the discharge opening of the elevating structure and the inlet opening of said upper basket portion, with at least a portion of the hood assembly extending vertically over an upper end portion of the cotton material elevating structure when the hood assembly is in an extended position, and wherein when said hood assembly is moved to a retracted position the hood assembly is removed from interfering contact with the duct structure thereby allowing the upper basket

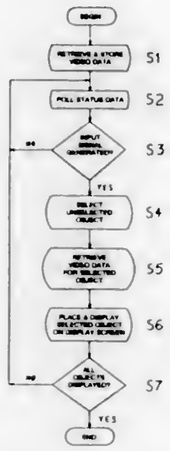
portion to be lowered into its retracted storage position thus facilitating transportation and storage of the cotton harvester.

5,556,339

COMPUTER PICTURE TOY FOR INFANTS AND VERY YOUNG CHILDREN

Justin R. Cohen, 10010 Waisham Ct., Richardit, Va. 23233

Filed Jun. 27, 1995, Ser. No. 495,024
Int. Cl.[6] A63F 9/24
U.S. Cl. 463—1 **17 Claims**



1. A computer toy for infants and very young children, utilizing a computer with an audio output, a display screen, and an input device, the object of which toy is to allow the user to engage in interactive play with the computer, the computer toy comprising:

(a) a library means for storing video data which corresponds to placing and displaying each of a group of predetermined objects at an associated predetermined location, said objects comprising separate elements of a predetermined composite picture such that said placing and displaying of said objects simulates an amusing activity;

(b) a detection means for detecting input signals which are generated and sent to the computer by the input device whenever the input device is activated by the user whereby the user is able to control the pace of said simulation;

(c) a selection means for selecting at least one object from said group of predetermined objects;

(d) a video means for retrieving the stored video data associated with a selected object and sending the video data to the display screen whereby video corresponding to displaying the selected object is generated; and

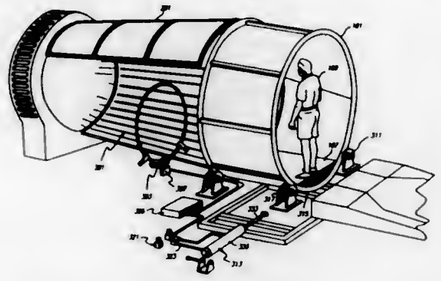
(e) a control means for enabling, whenever an input signal is detected by said detection means, said selection means to select at least one object from said group of predetermined objects and said video means to retrieve and output the stored video data associated with the selected objects, whereby a computer simulation of an amusing activity automatically progresses.

5,556,340

AMUSEMENT RIDE ASSEMBLY WITH ROTATING TUBE SYNCHRONIZED WITH AN IMAGE

William R. Bohn, Granada Hills; Shelly Short, Pasadena, and Joseph O. Garlington, La Crescenta, all of Calif., assignors to The Walt Disney Company, Burbank, Calif.

Filed Aug. 25, 1995, Ser. No. 519,483
Int. Cl.[6] A63G 31/16
U.S. Cl. 472—59 **9 Claims**



1. An amusement apparatus for creating an illusion of travel in a preprogrammed environment comprising:

a cylindrical member;

actuating means operatively associated with said cylindrical member for imparting motion to said cylindrical member to cause roll;

means for independently limiting the extend or foll movement of said cylindrical member;

a tube positioned after said cylindrical member, having a circular enclosure, adapted to register with said cylindrical member and oriented with a direction of observation;

a screen disposed in rear of said tube;

an image generator to simulate the view during the ride or flight;

means for projecting an image from said image generator to said screen, viewable by looking at said screen and representing a view from a moving vehicle; and

drive means for changing position of said cylindrical member in synchronism with changes in said moving image, in a manner that generates resulting physical forces on occupants of said cylindrical member simulating at least some of the forces that would be applied to them in actual motion of a frame depicted by said image, creating the illusion of flying or riding.

5,556,341

BILLIARD BALL RACK

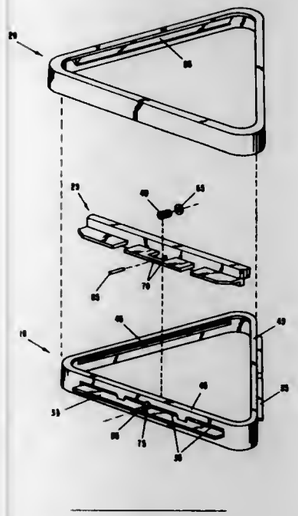
Russell H. Bonn, Jr., 10508 Towner, NE., Albuquerque, N.M. 87112

Filed Dec. 6, 1995, Ser. No. 568,194
Int. Cl.[6] A63D 15/00
U.S. Cl. 473—40 **16 Claims**

1. A billiard ball rack for arranging balls on a table into a compact predetermined arrangement of balls, comprising:

a frame comprising at least three sides, said frame being large enough to surround loosely grouped balls; and

packing bar means affixed to said frame for pushing the balls away from said at least three sides towards a center of said frame.

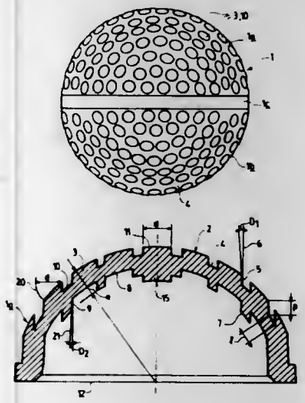


5,556,342

BALL HAVING SURFACE INDENTATIONS FOR GAMES OF BOWLS AND PROCESSES FOR OBTAINING SUCH A BALL

Vartan Berberian, 16 rue Michel-le-Comte, 75003 Paris, France

Filed Feb. 21, 1995, Ser. No. 347,369
Claims priority, application France, Jun. 10, 1992, 92 096969
Int. Cl.[6] A63B 37/14;39/08
U.S. Cl. 473—125 **20 Claims**



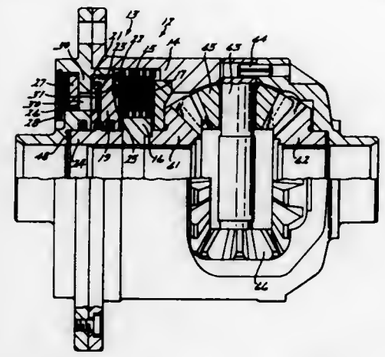
1. Bowl for games of bowls, comprising an external face (2) a base surface (4) and a relief pattern of a plurality of indentations (3, 103) having peaks and valleys wherein said peaks of said indentations are defined by said external face, and said valleys between said indentations are defined by said base surface, and wherein said relief pattern is uniformly distributed over at least 90% of said base surface (4) and wherein said indentations occupy a surface area that is at least 30% of said base surface (4); and wherein each indentation is substantially cylindrical about an axis, wherein the axis of each indentation being substantially parallel to each other within a small offset angle (D_1), for facilitating disengaging a tool during production of said bowl by forging, closed-die forging or casting.

5,556,343

METHOD AND DEVICE FOR CONTROLLING A COUPLING

Theodor Gassmann, Siegburg, and Franz-Josef Oberdörster, Neunkirchen-Seelscheid, both of Germany, assignors to GKN Automotive AG, Lohmar, Germany

Filed Aug. 17, 1994, Ser. No. 292,337
Claims priority, application Germany, Dec. 17, 1993, 43 43 307.3
Int. Cl.[6] F16D 35/02
U.S. Cl. 475—87 **51 Claims**



1. A method of controlling a coupling for transmitting torque between two parts rotatable relative to one another, comprising:

providing a friction coupling with friction elements which are alternately non-rotatably connected to one and other of the parts rotatable relative to one another, the friction coupling being subjectable to load by at least one adjustable piston which delimits one end of a pressurized chamber in a rotational housing, said pressurized chamber being filled with a viscous fluid connected to a reservoir and accommodating a rotational member rotatable relative thereto;

rotating the rotational member relative to the pressurized chamber;

applying pressure to the piston which is generated by shearing action of a viscous fluid contained in at least one sealed shear channel extending between the piston and rotational member in the circumferential direction; and

controlling supplying fluid to the shear channel from the reservoir and tapping off pressure from the shear channel for the purpose of subjecting the piston to load as a function of the direction of relative rotation of the parts rotatable relative to one another in such a way that the fluid is supplied to what constitutes a front end of the shear channel, with reference to the direction of relative rotation, and that the pressure is tapped off from what constitutes a rear end of the shear channel with reference to the direction of relative rotation.

5,556,344

LIMITED SLIP DIFFERENTIAL WITH REDUCED PRELOAD

Paul F. Fox, Ft. Wayne, Ind., assignor to Auburn Gear, Inc., Auburn, Ind.

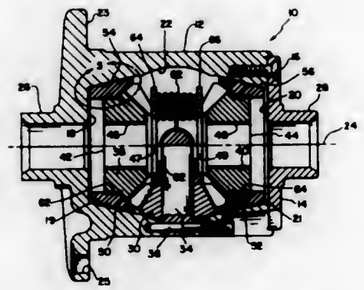
Filed Dec. 22, 1994, Ser. No. 362,791
Int. Cl.[6] F16H 48/22
U.S. Cl. 475—235 **10 Claims**

1. A limited slip differential, comprising:

a casing having at least two case parts, including a first case part and a second case part, said casing having a first clutch surface;

an axle receiving side gear disposed in said casing;

a cone clutch associated with said side gear, said cone clutch disposed generally concentrically about a longitudinal axis



and having a second clutch surface generally parallel with and disposed adjacent to said first clutch surface, said second clutch surface disposed at an angle of between about 3° and 7° relative to said longitudinal axis; and

means for biasing said second clutch surface with respect to said first clutch surface, said biasing means effecting a preload force of between about −200 to +500 pounds against said side gear in a direction generally parallel to said longitudinal axis.

5,556,345

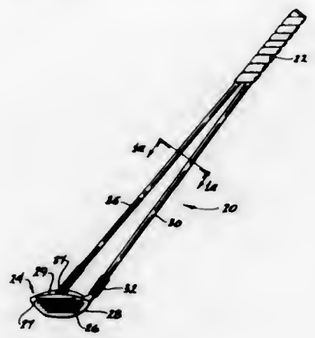
GOLF CLUB WITH IMPROVED SHAFTS

Richard F. Whitesell, P.O. Box 66, Clarence, N.Y. 14031

Filed Aug. 7, 1995, Ser. No. 511,690

Int. Cl.° A63B *53/02;53/14*

U.S. Cl. 473—314 **19 Claims**



1. A golf club comprising:

a plurality of club shafts each having first and second terminal end portions, a club head, means for gripping said golf club, each of said club shafts being affixed to said club head as measured from a toe portion of the club head at said first terminal end portions of said shafts at angles which are obtuse to the generally horizontal plane of said club head, and said means for gripping said golf club being affixed axially to said club shafts at said second terminal end portions of said club shafts, each of said shafts being spaced from one another for the length of said club shafts except for said second terminal end portions wherein said shafts generally converge.

5,556,346

PRETENSIONING FORCE ADJUSTMENT OF CONTINUOUSLY VARIABLE TRANSMISSION

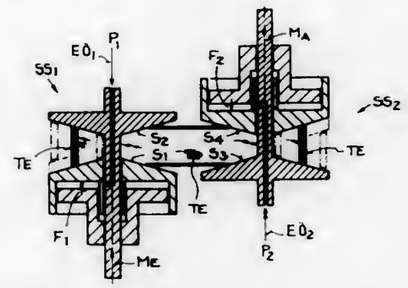
Michael Genzel, Roestal; Gerhard Hettich, Dietenhofen, and Norbert Ramm, Braunschweig, all of Germany, assignors to Temic Telefunken Microelectronic GmbH, Heilbronn, Germany

Filed May 15, 1995, Ser. No. 440,927

Claims priority, application Germany, May 18, 1994, 44 17 346.6

Int. Cl.° F16H *59/00*

U.S. Cl. 474—28 **11 Claims**



1. A method of adjusting a pretensioning force for a transmission element of a continuously variable transmission, the continuously variable transmission having two disc assemblies, each disc assembly having two discs axially movable relative to one another by applying a contact force thereto, the transmission element connecting the two disc assemblies together, comprising the steps of:

A) determining an actual length of the transmission element;

B) determining an initial pretensioning force and applying the initial pretensioning force to both of the disc assemblies, the initial pretensioning force being selected so that excessive slip does not occur between the discs and the transmission element;

C) reducing the initial pretensioning force to a reduced pretensioning force;

D) determining a theoretical length of the transmission element during a movement of the transmission element, the theoretical length being a length at which excessive slip does not occur between the discs and the transmission element;

E) comparing the actual length of the transmission element with the theoretical length of the transmission element to determine a slip status of the transmission element; and

F) changing the reduced pretensioning force in dependence on the slip status by performing one of the following steps:

decreasing the reduced pretensioning force when the actual length of the transmission element and the theoretical length of the transmission element are the same; and

increasing the reduced pretensioning force when the actual length of the transmission element and the theoretical length of the transmission element are different.

5,556,347

TENSION DEVICE FOR BICYCLE CHAIN

Robert Z. Liu, No. 9 Alley 62, Lane 168, Feng Dong Road, Feng Yuan City, Taichung County, Taiwan

Filed Sep. 13, 1995, Ser. No. 527,693

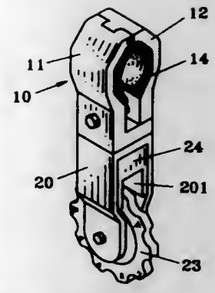
Int. Cl.° F16H *7/08*

U.S. Cl. 474—110 **2 Claims**

1. A tension device for tensioning a chain of a bicycle, said tension device comprising:

a coupler including two jaw members secured together so as to define a space therein for coupling to the bicycle,

a bracket rotatably secured to said coupler and including a pair of lugs, and



a sprocket rotatably supported between said lugs and provided for engaging with the chain so as to tension the chain,

said sprocket and said bracket being rotatable relative to said coupler for suitably supporting the chain in place, said sprocket and said bracket including a distance smaller than a width of the chain so as to prevent the chain from disengaging from said sprocket.

5,556,348

TOROIDAL-TYPE CONTINUOUSLY VARIABLE TRANSMISSION

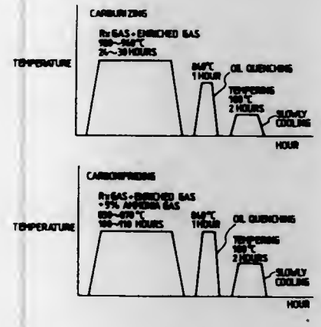
Hideki Kokubu; Tsutomu Abe, and Hiroshi Machida, all of Kanagawa, Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Aug. 31, 1994, Ser. No. 296,922

Claims priority, application Japan, Aug. 31, 1993, 5-238710

Int. Cl.° F16H *15/38;* **F16C** *33/00;* **C23C** *8/22*

U.S. Cl. 476—40 **9 Claims**



1. A toroidal-type continuously variable transmission comprising:

an input side disk disposed on an input shaft;

an output side disk disposed on an output shaft; and

a power roller for transmitting motive power of the input shaft to the output shaft while engaging both the input side disk and the output side disk,

wherein the input side disk, the output side disk, and the power roller are subjected to one of a carburizing and grinding process and a carbonitriding and grinding process so that effective carburized depths of the input side disk, the output side disk, and the power roller are limited to a range between 2.0 mm and 4.0 mm.

5,556,349

SHIFT CONTROL APPARATUS FOR AUTOMATIC TRANSMISSION

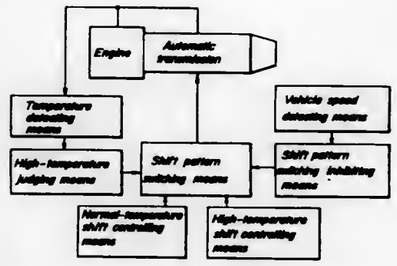
Shigeru Ishii, Atsugi; Yoshihide Shinso; Takeki Jozaki, both of Zama; Shigeki Shimanaka, Hadano; Shuji Kurokawa, Machida, and Hideharu Yamamoto, Odawara, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 26, 1995, Ser. No. 429,502

Claims priority, application Japan, Apr. 28, 1994, 6-092350

Int. Cl.° B60K *41/02*

U.S. Cl. 477—76 **3 Claims**



1. A shift control apparatus for a vehicle automatic transmission comprising:

a normal-temperature shift control means for providing a first shift pattern and performing a shift operation under a normal temperature condition, based on said first shift pattern;

a high-temperature shift control means for providing a second shift pattern and performing a shift operation under a high temperature condition, based on said second shift pattern;

a temperature detecting means for detecting a temperature which is related to at least one of an automatic transmission and an engine connected to said transmission;

a high-temperature judging means for judging whether or not the temperature detected by said temperature detecting means is higher than a predetermined temperature;

a high-temperature judging means for judging whether or not the temperature detected by said temperature detecting means is higher than a predetermined temperature;

a shift pattern switching means for performing a switching between said normal-temperature shift control means and said high-temperature shift control means, and activating said high-temperature shift control means when the temperature detected by said temperature detecting means has been judged to be higher than said predetermined temperature;

a vehicle speed detecting means for detecting a vehicle speed; and

a shift pattern switching inhibiting means for inhibiting the switching between said normal-temperature shift control means and said high-temperature shift control means by said shift pattern switching means, even when the temperature detected by said temperature detecting means has been judged by said high-temperature judging means to be higher than said predetermined temperature, if the vehicle speed detected by said vehicle speed detecting means is lower than a predetermined speed.

5,556,350

DIFFERENTIAL DRIVE

Heinz Madsack, Overath, Germany, assignor to GKN Viscodrive GmbH, Germany

Filed Aug. 29, 1994, Ser. No. 297,156

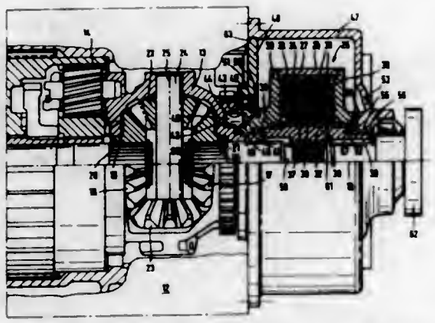
Claims priority, application Germany, Aug. 31, 1993, 43 29 248

Int. Cl.° B60K *17/20;23/04*

U.S. Cl. 475—85 **6 Claims**

1. A differential drive comprising:

a rotatably driven differential housing supported in a housing;



two driving bevel gears are equi-axially arranged and rotatably supported in said differential housing;

at least two differential bevel gears which engage the driving bevel gears are rotatably supported in the differential housing around a rotational axis which intersects a rotational axis of the driving bevel gears at a right angle;

means for arranging a viscous coupling next to the differential housing, said viscous coupling including a coupling housing and a hub arranged coaxially around one another and rotatably relative to one another, formed between said coupling housing and said hub, an operating chamber radially overlapping outer plates and inner plates, in a certain sequence, non-rotatably associated with said coupling housing and the hub in said operating chamber; and

the remaining part of the operating chamber at least partially filled with a highly viscous medium, said viscous coupling may be arranged between the differential housing and the driving bevel gear, with the coupling housing of the viscous coupling connectable to the differential housing and said hub via the driving bevel gear and coupling means;

said differential housing includes a cylindrical bearing face centered on the rotational axis of the driving bevel gear;

a rolling contact bearing in a bearing carrier on said coupling housing directly or indirectly supporting the differential housing;

said differential housing, in a region adjoining said bearing face, including a connecting face which extends radially relative to the rotational axis, at least one connecting bore in said connecting face which extends parallel to the rotational axis, at least one coupling pin insertable in said at least one connecting bore for establishing a non-rotating connection between the differential housing and the coupling housing of a viscous coupling; and

a flange housing secured to the housing which removably accommodates the bearing carrier.

5,556,351

DIFFERENTIAL APPARATUS

Kenji Hiraishi; Shingo Saeki; Kazuyuki Yamazaki, and Takao Nakajima, all of Tochigi-ken, Japan, assignors to Tochigi Fuji Sangyo Kabushiki Kaisha, Japan

Filed Apr. 28, 1994, Ser. No. 234,130

Claims priority, application Japan, Apr. 28, 1993, 5-022367 U; Oct. 14, 1993, 5-256872

Int. Cl.[6] F16H *48/10;57/04*

U.S. Cl. 475—160 **6 Claims**

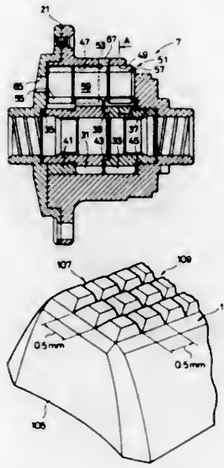
1. A differential apparatus, comprising:

a differential casing rotated by an engine drive power;

pinion gears slidably and rotatably accommodated in accommodating holes formed in said differential casing;

a pair of side gears linked with each other via said pinion gears, for transmitting the engine drive power to vehicle wheels differentially; and

means for supplying lubricant to sliding surfaces between inner walls of the accommodating holes and said pinion gears, said



means including oil grooves formed into a mesh pattern at tooth crests of said pinion gears.

5,556,352

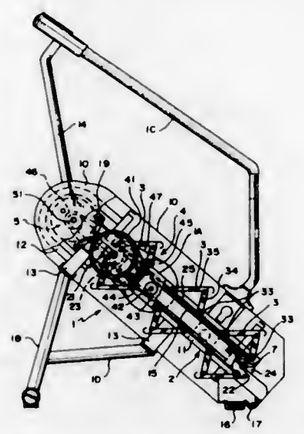
STAIR EXERCISER

Shao-Ying Chang, No. 764, Chung Shan South Road, Yang Mei, Taoyuan, Taiwan

Filed May 17, 1995, Ser. No. 442,777

Int. Cl.[6] A63B *22/04*

U.S. Cl. 482—52 **5 Claims**



1. A stair exerciser performing cyclical action in continuity by the body weight and action of the person who steps on the stairs thereof and controlling the operating speed and the resistance by means of a speed controller, comprising:

a structural frame constituting a staircase having hand rails,

a pair of chain sprocket assemblies synchronously revolvably inclinedly disposed in a cyclical manner on the inner side of the two side brackets of the structural frame to constitute a chain conveyor,

plurality of steps disposed across the chain sprocket assemblies and capable of moving cyclically following the revolving chain sprocket assemblies,

a transmission device disposed on the outer side of the two side brackets of the structural frame for transmission to the speed controller of the driving torque produced by the chain sprocket assemblies,

an electro-magnetic brake to adjust and control the downwardly running speed of the steps driven by the chain sprocket assemblies, and

a control panel disposed on the front upper portion of the structural frame for adjusting the setting of start and stop of the machine and the steps running speed controlled via the speed controller;

wherein the steps are span between the two chains and are equi-spaced along the outer side of the two chains and include two spaced-apart parallel transverse shafts with two ends fixed on the two chains, two pairs of rollers rotatably pivoted to the respective ends of the two shafts, a pair of rising links having the root end pivotably connected to the two ends of the lower shaft on the inner side of the two rollers and the other end extending upwardly, a pair of channel type horizontal links having the root end rotatably connected to the two ends of the upper shaft corresponding in position to the rising links and the other end extending horizontally outwardly, two pins for pivotably connecting other free ends with each other of a pair of the rising and horizontal links, and a step plate spanning on a pair of the horizontal links, wherein a space is maintained between the pivoted root end at the shaft side of each of the rising links and the pivoted root end at the other shaft side of the horizontal link therebeneath and there is provided a spacer between each roller and the pivoted root end of each link.

5,556,353

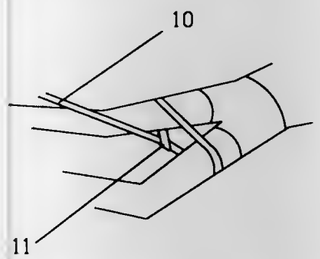
TETHERED LASSO FOR STATIONARY SWIMMING

John A. Beers, 18605 McCoy Ave., Port Charlotte, Fla. 33948

Continuation-in-part of Ser. No. 125,740, Sep. 24, 1993, abandoned. This application Sep. 13, 1994, Ser. No. 305,209

Int. Cl.[6] A63B *69/12;21/04*

U.S. Cl. 482—55 **4 Claims**



1. A device for holding a swimmer in a selected location in a swimming pool in a manner that permits unrestrained swimming strokes comprising:

a single strip of smooth, stretchable vinyl strap material having a first end and a second end, said material having a sufficient length to enwrap a swimmer and to reach a fixed object near the pool, said vinyl strap having a width in the range of five eights to three quarters of an inch, and a thickness between 0.025 to 0.050 inches,

a first end tied off to a fixed object near the swimming pool,

a second end having an eye formed thereon by bending said material back on itself and sealing said end in place, said eye being in the range between four to six inches in diameter, and,

a running slip knot formed on said second end by pulling said strap material through said eye to form a lasso type loop, said loop being placed around a first position on a swimmer's lower body for a first style of swimming stroke, and said loop being placed around a second position on a swimmer's lower body for a second style of swimming stroke, for wrapping around the swimmer's body and restraining the lower body of said swimmer,

whereby said vinyl strap material will conform to a swimmer's body and remain in place when tension is continued by said swimming strokes.

5,556,354

SHIFTING ARRANGEMENT FOR A CHANGE GEAR DRIVE IN MULTISPEED HUBS FOR BICYCLES

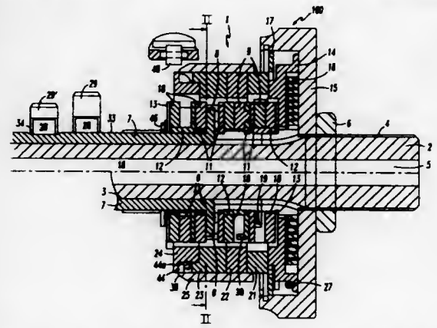
Gerhard Meier-Burkamp, Bergrheinfeld, Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Apr. 28, 1995, Ser. No. 430,502

Claims priority, application Germany, Apr. 30, 1994, 44 15 266.3

Int. Cl.[6] F16H *3/62*

U.S. Cl. 475—275 **20 Claims**



1. A multi-speed hub for a bicycle having a frame and at least one wheel, the multi-speed hub for mounting the at least one wheel to the frame, said hub comprising:

a shaft for being non-rotationally connected to the frame;

input means for inputting rotational power to the hub;

sleeve means disposed concentrically about said shaft means for receiving rotational power from said input means and transferring rotational power to the at least one wheel, said sleeve means comprising means for being connected to the at least one wheel;

transmission means disposed within said sleeve means about said shaft means for transferring the input rotational power from said input means to said sleeve means;

said transmission means comprising at least one sun gear rotatably disposed about said shaft means, said at least one sun gear being rotatable in at least a first direction of rotation about said shaft means, and said at least one sun gear being engageable with said shaft means and disengageable from said shaft means to provide at least two different speeds of said hub;

said at least one sun gear comprising an inner portion disposed towards said shaft means, and said at least one sun gear comprising at least one first member pivotably disposed on said inner portion of said at least one sun gear;

said shaft means defining a longitudinal axis, and said shaft means comprising:

at least one surface for engaging with said at least one first member in at least said first direction of rotation of said sun gear about said shaft means to non-rotatably engage said at least one sun gear with said shaft means; and

means for selectively inhibiting engagement of said at least one first member with said at least one surface;

said means for selectively inhibiting engagement being disposed before said at least one projection in said first direction of rotation;

said means for selectively inhibiting engagement being selectively pivotable between a first position and a second

position, said first position for permitting engagement between said at least one first member and said at least one surface, and said second position for inhibiting engagement of said at least one first member with said at least one surface;

said means for selectively inhibiting engagement being selectively pivotable about a pivot axis, said pivot axis being substantially parallel to said longitudinal axis and offset radially from said longitudinal axis; and

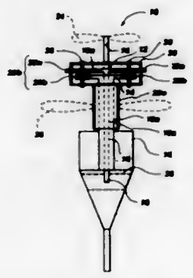
said hub additionally comprising means for selectively pivoting said means for selectively inhibiting engagement between said first and second positions.

5,556,355

TRANSMISSION WITH PLANETARY MULTI-GEAR MEMBERS

Stanislaw Ostrowski, Gusher, Utah, assignor to Humming Bird Inc., Gusher, Utah

Filed Aug. 15, 1994, Ser. No. 290,237
Int. Cl.[6] F16H *1/28*
U.S. Cl. 475—332 **11 Claims**



1. If A transmission device comprising:

an input shaft for receiving rotational power from an attached power source;

a fixed input gear coaxially mounted on the input shaft;

at least one intermediate, planetary gear disposed in meshing engagement with the fixed input gear;

an intermediate shaft concentrically coupled to the at least one intermediate, planetary gear in fixed relationship;

at least one secondary planetary gear rigidly coupled to the intermediate shaft and having a differing gear ratio from the intermediate planetary gear such that the intermediate shaft and the at least one intermediate and secondary planetary gears form at least one planetary multi-gear member;

a central gear disposed in meshing engagement with the secondary planetary gear and being positioned in substantial co-axial orientation with respect to the input gear and input shaft; and

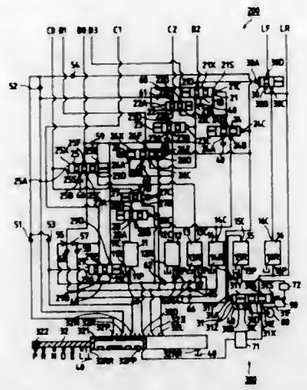
output means having the intermediate shaft rotatably journalled therein for (i) holding the intermediate and secondary planetary gears in meshing engagement with the input gear and central gear, respectively, and (ii) rotating at a different rate of angular rotation from the input shaft responsive to rotational movement of the planetary gears relative to the central gear.

5,556,356

HYDRAULIC CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION OF A VEHICLE

Naoki Hakamada; Mitsuo Inagaki, both of Okazaki; Yoriaki Ando, Nagoya, and Kunihiro Kubo, Nishio, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Nov. 18, 1994, Ser. No. 344,579
Claims priority, application Japan, Nov. 19, 1993, 5-290871
Int. Cl.[6] F16H *61/26*
U.S. Cl. 477—163 **3 Claims**



1. A hydraulic control system for an automatic transmission of a vehicle, the automatic transmission including a power train having a plurality of frictional elements which are selectively brought into engagement and disengagement by a hydraulic pressure input according to an operation schedule for establishing a desired gear ratio, the hydraulic control system comprising:

a hydraulic pressure source constructed and arranged to provide a hydraulic pressure;

a hydraulic circuit constructed and arranged to supply said hydraulic pressure from said hydraulic pressure source to the plurality of the frictional elements in the automatic transmission;

a plurality of first solenoid valves disposed in said hydraulic circuit between said hydraulic pressure source and the frictional elements, each solenoid valve having a pressure input, a pressure output, and pressure drain ports, each first solenoid valve being constructed and arranged to operate between first and second valve positions, wherein said pressure input is supplied by said hydraulic pressure from said hydraulic pressure source, said first valve position establishing fluid communication between said pressure input and pressure output so that said hydraulic pressure is output from said pressure output, said second valve position establishing fluid communication between said pressure output and said pressure drain port;

a plurality of directional control valves connected to said hydraulic pressure source, each directional control valve operating between first and second directional control valve positions in response to said hydraulic pressure source, said first directional control valve position establishing fluid communication between one of the frictional elements and one of said pressure outputs, said second directional control valve position being such that said hydraulic pressure acting on the one of the frictional elements is relieved;

valve controlling means for switching said first solenoid valves between said first and second valve positions according to the operation schedule for establishing the desired gear ratio; and

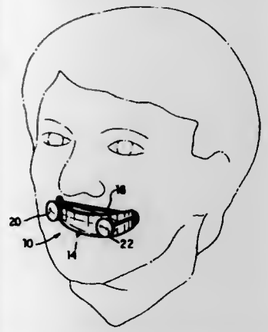
pressure regulator means for temporarily reducing said hydraulic pressure provided to the frictional elements upon an initial application of said hydraulic pressure to the frictional elements, said pressure regulator means comprising a pressure regulator valve and a second solenoid valve, said pressure regulator valve being responsive to an input pressure so as to temporarily reduce said hydraulic pressure, said second solenoid valve modifying said input pressure to temporarily reduce said hydraulic pressure supplied to the frictional elements, upon the initial engagement of the frictional elements.

5,556,357

FACE, NECK AND CHIN EXERCISER

Beverly I. Hanna, 7954 Two Mile Rd., Lakeview, Mich. 48850

Filed Nov. 14, 1995, Ser. No. 565,625
Int. Cl.[6] A63B *23/03;21/02*
U.S. Cl. 482—11 **13 Claims**



1. An exercise device adapted to be positioned in an exerciser's mouth, said exercise device comprising;

an elongated continuous elastic member that is nonrigid, said elongated elastic member having a first end and a second end;

a first anchor disposed at said first end of said elastic member adapted to be positioned in a first corner of the exerciser's mouth; and

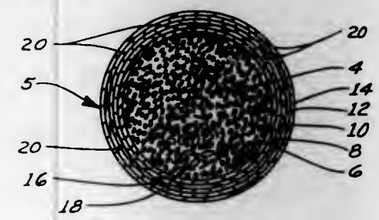
a second anchor disposed at said second end of said elastic member adapted to be positioned in a second corner of the exerciser's mouth, such that said elastic member exerts tension on the exerciser's mouth during exercise.

5,556,358

DEFORMABLE GRIP

Mark A. Scatterday, 4001 N. 54th Pl., Phoenix, Ariz. 85018

Continuation of Ser. No. 21,520, Feb. 22, 1993, Pat. No. 5,350,342. This application Aug. 22, 1994, Ser. No. 294,638
Int. Cl.[6] A63B *23/16*
U.S. Cl. 482—49 **4 Claims**



1. A semi-resilient exercise grip comprising:

a core in the form of a deformable mixture of tightly packed individual dry particles that are in continuous contact with each other;

a dry lubricant interspersed among the particles that form the core and wherein said lubricant is powdered talc; and

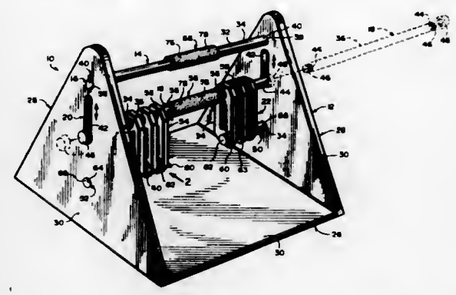
a resilient covering surrounding said core; and wherein the grip is held in a user's hand in a nondeformed spherical first shape and is then compressed by the user's hand to assume a second shape that is non-spherical, upon the release of compressive force, the grip will assume a third, non-spherical shape.

5,556,359

HAND GRIP EXERCISE DEVICE

David Clementi, 84 Mayflower Ave., Massapequa Park, N.Y. 11762

Filed Jun. 12, 1995, Ser. No. 489,923
Int. Cl.[6] A63B *23/16*
U.S. Cl. 482—49 **3 Claims**



1. An improved hand grip exercise device comprising:

a) a framework, said framework including a bas plate and a pair of side panels, in which each said side panel extends upwardly from one opposite side edge of said base plate, said base plate being rectangular shaped and fabricated out of a strong lightweight material, said each said side panel being triangular shaped and fabricated out of a strong lightweight material, said base plate and said side panels being integral, so as to form one complete unit;

b) a first rod, said first rod being a first elougated solid cylindrical bar, said first elongated solid cylindrical bar being fabricated out of a strong lightweight material;

c) means for mounting said first rod in a generally horizontal stationary position within said framework, said first rod mounting means including each said side panel of said framework having an upper aperture therethrough, so that each end of said first rod can be force fitted into each said upper aperture of each said side panel to be retained thereto;

d) a second rod, said second rod being a second elongated solid cylindrical bar, said second elongated solid cylindrical bar being fabricated out of a strong lightweight material;

e) means for mounting said second rod in a generally horizontal movable position within said framework, that is spaced below said first rod, said second rod mounting means including each said side panel of said framework having a vertical slot below said first rod mounting means, so that each end of said second rod can slide within each said vertical slot of each said side panel, said second rod mounting means further including said opposite ends of said second rod being externaly threaded, and a pair of internally threaded caps, in which each said cap threads onto one said end of said second rod, to maintain said second rod between said vertical slots in said framework;

f) mean for biasing said second rod away from said first rod within said framework, so that a person can grip said first rod and said second rod by the hand and squeeze said second rod towards said first rod, to increase the strength of the grip and the fitness of the hand; and

g) a pair of padded sleeves, each said padded sleeve including an inner tubular hollow core fabricated out of a strong lightweight material, and an outer tubular bollow covering fabricated out of a soft squeezable material and fitted over said inner tubular hollow core; and

h) means for maintaining each said padded sleeve centrally to

second end, whereby said self-releasing pin automatically releases a selected number of the vertical stack of weights

h) means for maintaining each said padded sleeve centrally to said first rod and said second rid, so that the hand of the person can comfortably grip said padded sleeves, said maintaining means being a pair of setscrews, in which each said setscrew is threaded transversely through each said padded sleeve, so as to engage with said first rod and said second rod.

5,556,360

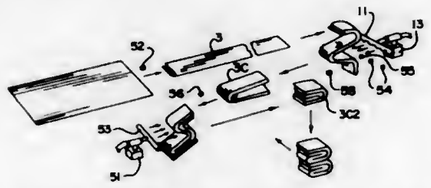
HIGH PRODUCTION FOLDER CONSTRUCTION

Kasimir Kober, Niles, and Martin T. Borucki, Chicago, both of Ill., assignors to Chicago Dryer Company, Chicago, Ill.

Continuation-in-part of Ser. No. 925,283, Aug. 4, 1992, Pat. No. 5,300,007, which is a continuation of Ser. No. 676,299, Mar. 27, 1991, abandoned. This application Jan. 28, 1994, Ser. No. 188,309

Int. Cl.[6] B65H *45/04*

U.S. Cl. 493—23 **22 Claims**



1. A folding apparatus comprising conveyor means for moving foldable articles along a path of movement; opposed first and second air discharge means disposed adjacent the path of movement for discharging air in a variable sequence and folding opposed panel portions of such foldable articles over intermediate panel portions of such foldable articles; each of such foldable articles having a length no greater than the length of either of said air discharge means; means for measuring the size of each of such foldable articles moving on said conveyor means; and means for controlling the specific sequence of air discharge by said first and second air discharge means for each of such foldable articles responsive to such article size measuring means.

5,556,361

FOLDABLE EXERCISE DEVICE CAPABLE OF SIMULATING A HORSE RIDING

Nien-Yuan Liao, No. 264, Sec. 2, Shi-Tung Rd., Taichung, Taiwan

Filed Jul. 5, 1995, Ser. No. 498,470

Int. Cl.[6] A63B *21/00*

U.S. Cl. 482—72 **5 Claims**

1. A foldable horse-riding exercise device comprising:

a base comprising a front support rod, a rear support rod, two cross rods, and a support frame, said front support rod being fastened at a top end thereof with a front end of said rear support rod such that said front support rod and said rear support rod form a predetermined angle, said two cross rods being fastened respectively and horizontally with bottom free ends of said front support rod and said rear support rod, said support frame provided with an elongated aperture and fastened at a bottom thereof with said base;

a pull rod fastened pivotally at a midsegment thereof with said support frame and including two pedals fastened thereto;

a seat rod fastened pivotally at one end thereof with said top and of said front support rod (22) and provided at another end thereof with a seat pad; and

a linking member disposed in said elongated aperture of said support frame such that said linking member is fastened pivotally at one end thereof with said pull rod, and that said linking member is fastened pivotally at another end thereof with said seat rod;

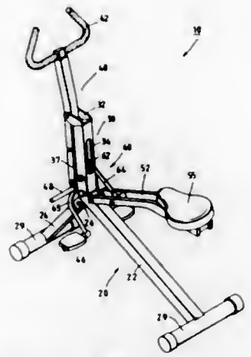


FIG 1

said rear support rod including on a top of a front end thereof a pivoting portion having a fastening means, said rear support rod further including on an underside of said front end thereof a first fastening portion having on a front end thereof a locating portion;

said front support rod being fastened pivotally at a top end thereof with said fastening portion of said rear support rod such that said front support rod can be so swiveled as to be located by said locating portion of said rear support rod;

said support including at a bottom thereof a fastening portion and being fastened pivotally with said pivoting portion of said rear support rod such that said fastening portion of said support frame is corresponding in location to said fastening portion of said pivoting portion of said rear support frame;

said linking member comprising two link rods which are fastened end to end pivotally and are further fastened respectively at a free end thereof with said pull rod and said seat rod.

5,556,362

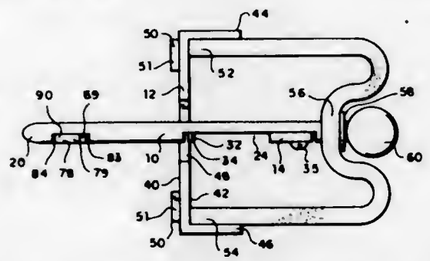
AUTOMATIC WEIGHT STACK PIN SELECTOR

Allen M. Whipps, 5134 Pine Meadow Dr., Grandville, Mich. 49418

Filed Mar. 20, 1995, Ser. No. 407,065

Int. Cl.[6] A63B *21/062*

U.S. Cl. 482—98 **17 Claims**



1. A self-releasing pin for a weight training machine of the type having a vertical stack of weights, said self-releasing pin comprising:

a shaft having first and second ends;

a bracket having first and second faces, said shaft being capable of reciprocating movement with respect to said bracket;

a retaining member pivotally attached to one of said bracket and said shaft; and

a U-shaped rubber spring biasing means provided intermediate said second end and said bracket, said biasing means being fixed to said bracket and to said shaft proximate to said second end, whereby said self-releasing pin automatically releases a selected number of the vertical stack of weights from engagement with a lifting bar when the selected number of the vertical stack of weights is returned to a resting position.

5,556,363

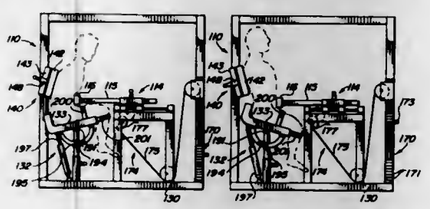
LINEAR MOVEMENT, TRUNK MUSCLE EXERCISE METHOD

Kenneth M. Hutchins, 350 Hiden Pines Cir., Casselberry, Fla. 32707

Division of Ser. No. 219,974, Mar. 30, 1994, Pat. No. 5,460,587, which is a continuation-in-part of Ser. No. 877,619, May 1, 1992, Pat. No. 5,299,998, which is a continuation-in-part of Ser. No. 598,131, Oct. 16, 1990, Pat. No. 5,147,259. This application Oct. 19, 1995, Ser. No. 545,086

Int. Cl.[6] A63B *23/02*

U.S. Cl. 482—101 **5 Claims**



1. A method of exercising lower back muscles of a person comprising the steps of:

placing the person in a seated position with the person's upper torso region braced against an upper back rest and the person's pelvic region braced against a lower back rest, the person's thighs extending generally perpendicular to the person's back;

actuating a plunger mechanism against the person's abdominal region with a substantially constant force over a preselected range of motion; and

causing the person to alternately push inward and outward against the plunger mechanism by flexing of the person's pelvic and lower back muscles with concurrent pivoting of the person's upper back with respect to the person's lower back.

5,556,364

CUP BOTTOM INCURL WORKSTATION FOR A CUP MAKING MACHINE

Daryl R. Koazal, Wauwatosa, Wis., assignor to Paper Machinery Corporation, Milwaukee, Wis.

Filed Sep. 22, 1994, Ser. No. 310,833

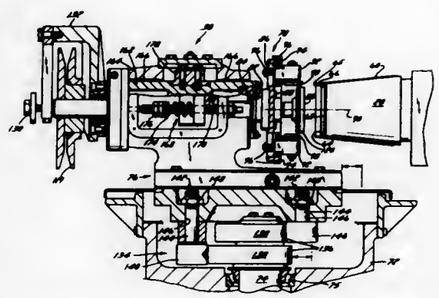
Int. Cl.[6] B31B *1/74*; **B21D** *51/32*

U.S. Cl. 493—109 **20 Claims**

1. A paperboard cup bottom incurl workstation useful in combination with a cup making machine having a rotating turret with a plurality of mandrels, each mandrel being coordinated to become a registered mandrel as it moves into a position proximate the bottom incurl station, the registered mandrel being configured to receive a bottom blank having an outer lip and a sidewall blank including a flap that is curled inwardly over the outer lip to create a recessed area in the bottom of the cup, the bottom incurl workstation comprising:

a central flap guide having a peripheral surface; and

a rotatable roller assembly having an array of rollers disposed to contact a bottom edge of the flap, each roller being movable along the peripheral surface and having an arcuate surface extending into cooperation with the peripheral surface, wherein as the registered mandrel moves closer to the array of rollers and the flap guide, the bottom edge of the flap is directed inwardly along the arcuate surfaces of the rollers to the peripheral surface which is configured to guide the flap into the recessed area.



5,556,365

SPIRALLY-WOUND EASY-OPEN CONTAINER HAVING A SCORE CUT OPENING PANEL

Michael T. Drummond, Florence; William C. Suski; Calvin G. Hill, both of Hartsville; James W. Lowry, Florence, all of S.C., and Rodney W. Roberts, Otisco, Ind., assignors to Sonoco Products Company, Hartsville, S.C.

Division of Ser. No. 283,648, Aug. 1, 1994, Pat. No. 5,482,205. This application Nov. 13, 1995, Ser. No. 555,009

Int. Cl.[6] B31C *3/00*

U.S. Cl. 493—299 **6 Claims**

1. A method of manufacturing an easy-open container comprising the steps of:

providing a flexible barrier liner layer in strip form, feeding the liner layer strip to a mandrel, and spirally-winding the liner layer strip on the mandrel while forming overlapping liner layer edge portions;

providing a paperboard bodywall layer in strip form, feeding the bodywall layer strip to the mandrel while forming spaced tab cuts through the bodywall layer and extending inwardly from one outer longitudinal edge thereof to define an easy-open pull tab and simultaneously forming diverging lines of score cuts through the bodywall layer strip and each extending inwardly from respective tab cuts to the other outer longitudinal edge of the bodywall layer strip to define an easy-open panel, and spirally-winding and positioning the bodywall layer strip onto the spirally-wound liner layer on the mandrel in a manner such that the longitudinal edges of the bodywall layer strip are adjacent each other to form a continuous tube having a spiral seam extending the length thereof;

providing a flexible label layer in strip form, feeding the label layer strip to the mandrel while forming spaced tab cuts through the label layer strip and extending inwardly from one outer longitudinal edge thereof to define an easy-open pull tab and spirally-winding the label layer strip onto the continuous tube on the mandrel with the longitudinal edges of the label

layer strip in overlapped relation and positioned to one side of the spiral seam in the bodywall layer and while positioning the pull tab in the label layer in superimposed position over the pull tab in the bodywall layer;

controlling tension on the bodywall layer strip and on the label layer strip during the steps of feeding such strips to the mandrel to ensure the superimposed position of the pull tabs in such strips; and

cutting the thus wound tube into individual container lengths.

5,556,366

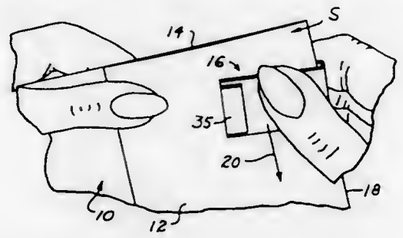
FINGER-PROTECTING PAPER CREASER

Charles E. Studebaker, 5753 Greendale Dr., Galloway, Ohio 43119

Continuation-in-part of Ser. No. 27,093, Mar. 5, 1993, Pat. No. 5,336,155, which is a continuation-in-part of Ser. No. 831,518, Feb. 5, 1992, abandoned. This application May 18, 1994, Ser. No. 245,891

Int. Cl.[6] B65H *45/12;45/28*

U.S. Cl. 493—405 **15 Claims**



1. An open-ended finger-protecting device for forming a crease in a doubled-over paper sheet along a line extending away from a given sheet edge by supporting the device with at least one finger of one hand and with an open end of said finger-protecting device placed on opposite sides of the doubled-over sheet to be creased, compressing the sheet adjacent said line and then laterally drawing the device from said given edge to a location remote from said given edge along the crease to be formed, said device comprising:

a pair of laterally-positioned elongated arms having facing pressure-applying creasing surfaces and each having dimensions sufficient to essentially protect a person's fingers from contact with said paper sheet when the device is drawn along the line to be creased; said arms being of essentially the same length and having blunt distal ends, said arms at said blunt distal ends being sufficiently wide to enable the device to stand upright by means of said blunt ends on a flat horizontal surface;

a hinge portion connecting said arms at one end and forming a throat portion open from said hinge portion toward remote ends of said arms, said hinge portion enabling pressure to be controllably applied by the person's fingers to said arms when closing said throat portion and urging said creasing surfaces together; and

gripping means connected to at least one of said arms resisting slippage of the person's fingers from said arms as they are drawn laterally along the crease to be formed with their pressure-applying surfaces pressed against the paper sheet.

5,556,367

COVER TYPE ENDOSCOPE APPARATUS

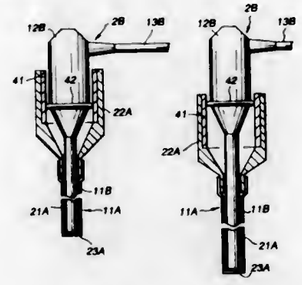
Hisao Yabe; Yoshio Tashiro; Yoshihiro Iida; Akira Suzuki; Hideo Itoh; Minoru Yamazaki; Osamu Tamada, and Yasuhito Kura, all of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1993, Ser. No. 38,659

Claims priority, application Japan, Mar. 5, 1993, 5-009178 U; Mar. 5, 1993, 5-009179 U; Mar. 5, 1993, 5-045565

Int. Cl.[6] A61B *1/04*

U.S. Cl. 600—124 **5 Claims**



1. A cover type endoscope apparatus comprising:

an endoscope cover; and

an endoscope to be covered which is insertable into said endoscope cover, wherein

an inner periphery of said endoscope cover includes a connector for fixing a fitting portion fitted to an engaging portion provided in an outer periphery of said endoscope to be covered, wherein said fitting portion holds and fixes at least one portion of said endoscope to be covered and wherein said connector includes a cover position adjusting means for adjusting the longitudinal axial position of said cover covering said endoscope to be covered.

5,556,368

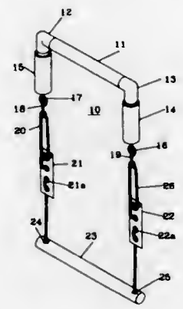
EXERCISE APPARATUS

Ted R. Akin, 1332 Garden Ter., Irving, Tex. 75060

Filed Oct. 19, 1994, Ser. No. 325,065

Int. Cl.[6] A63B *21/02*

U.S. Cl. 482—124 **2 Claims**



1. A hand held exercise apparatus comprising;

a first bar having first and second ends, and a longitudinal axis,

an outer rotatable surface on said first bar rotatable over the longitudinal axis;

a pair of side bars with a hand grip integral with each of said side bars, each side bar having first and second ends, said first end of one of said pair of side bars is attached adjacent to the first end of said first bar, and said first end of the other of said pair of side bars is attached adjacent to the second end of said first bar, said side bars oriented perpendicular to said first bar;

a pair of attachment points, one each adjacent to the second end of each of said pair of side bars; and

at least one accessory device for attaching to said side bars to be used in conjunction with said first bar and pair of side bars to perform exercises additional and supplemental to exercises performed solely with the first bar and side bars.

5,556,369

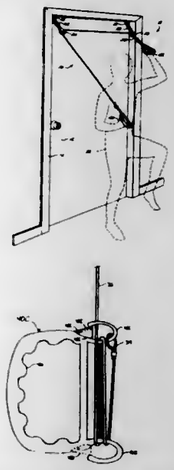
EXERCISE DEVICE

William J. Roberts, 22 Fisher Ave., Wellesley, Mass. 02181

Continuation-in-part of Ser. No. 516,790, Apr. 30, 1990, Pat. No. 5,176,602, which is a continuation-in-part of Ser. No. 274,705, Nov. 15, 1988, Pat. No. 4,921,245, which is a continuation of Ser. No. 929,409, Nov. 10, 1986, abandoned. This application Jan. 4, 1993, Ser. No. 201

Int. Cl.[6] A63B *21/00*

U.S. Cl. 482—131 **4 Claims**



1. In an exercise device adapted for connection to a doorframe, the improvement comprising:

inelastic tether means for performing a plurality of distinct kinesthetic exercises with a wide range of body motion including:

an inelastic cable and a pair of separate reciprocating pulleys adapted for quick releasable and replaceable coupling to the doorframe in a freely rotatable manner, said cable having a handle at each end and being reeved through said pulleys intermediate its ends, and adjustment means for adjusting the length of the cable such that the exercise device can be employed to accommodate a variety of kinesthetic exercises, said adjustment means including at least one said handle having a closable means for cinching and storing the cable; and

attachment means for attachment of the exercise device to a doorframe, between the doorframe and the closed door, and providing free rotation of the exercise device in both vertical and horizontal planes over a wide range of motion, the attachment means including:

anchor means for defining a plurality of fixable locations on the doorframe from which kinesthetic exercises can be supported; and

safety coupling means for attachment of said tether means and for accommodating a wide range of motion;

said attachment means providing at least two spaced-apart gravitational stability points to maintain balance and safety during use suitable for a variety of kinesthetic exercises.

5,556,370

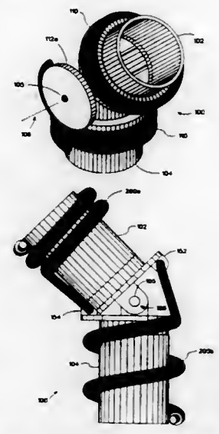
ELECTRICALLY ACTIVATED MULTI-JOINTED MANIPULATOR

Ronald S. Maynard, Sunnyvale, Calif., assignor to The Board of Trustees of the Leland Stanford Junior University, Palo Alto, Calif.

Filed Jul. 28, 1993, Ser. No. 99,369

Int. Cl.[6] A61B *1/01*

U.S. Cl. 600—151 **6 Claims**



1. An endoscope incorporating a manipulator joint assembly comprising:

a first joint half;

a second opposing joint half movably connected at a joint axis with said first joint half for providing one or more degrees of freedom with respect to said first joint half;

actuator means comprising a first negative coefficient of expansion actuator coiled around the circumference of said first joint half and having a connection with said second joint half and a second negative coefficient of expansion actuator coiled around the circumference of said second joint half and having a connection with said first joint half; said negative coefficient of expansion actuators being responsive to an electrical or thermal input signal to move one said joint half with respect to the other about said axis.

5,556,371

DEVICE FOR TRANSANAL RESECTATE EXTRACTION

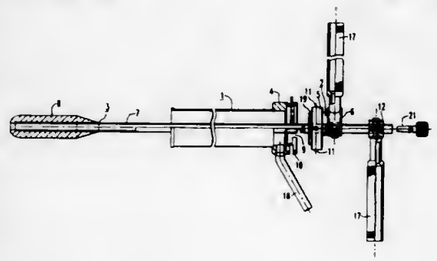
Heinrich Schülken, Stutensee-Staffort, and Karl Schlipf, Karlsruhe, both of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Germany

Filed Aug. 18, 1994, Ser. No. 303,751

Claims priority, application Germany, Feb. 22, 1992, 42 05 488.5

Int. Cl.[6] A61B *1/00;1/31*

U.S. Cl. 600—201 **10 Claims**



1. A device for transanal resectate extraction comprising:

circuitry including a processor, means for generating a pulsed

5,556,374

PATELLAR ALIGNMENT DEVICE

(d) a cover sheet adjacent to and covering said outer surface of

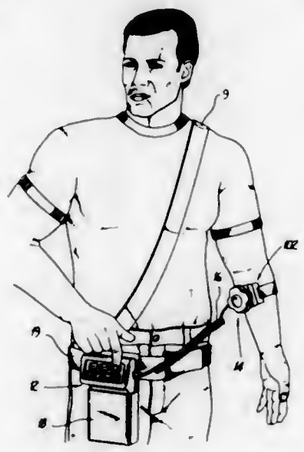
1. A device for transanal resectate extraction comprising:
a) a rectoscope sleeve with a proximal tubular end portion,
b) a connecting piece sealingly but removably mounted onto said proximal tubular end portion of said rectoscope sleeve for closing said rectoscope sleeve and including a bore extending parallel to the axis of said rectoscope sleeve,
c) a resectate extractor having a tubular portion extending through said bore and having a distal end with a protector portion comprising a cylindrical portion with a semispherical end and a conical transition portion between said cylindrical portion and said tubular portion, said tubular portion being axially slidable in said bore in essentially sealing relationship therewith, said protector portion having an axial passage of a diameter corresponding to the inner diameter of said tubular portion and having an outer diameter smaller than the inner diameter of said rectoscope sleeve so as to be capable of being received therein and at least as large as the outer diameter of said tubular portion, said axial passage receiving grasping pincers such that they are movable forwardly through said tubular portion and through said protector portion for grasping resectate and holding it while said protector portion with said grasping pincers and the resectate grasped thereby is retracted into said rectoscope sleeve.

5,556,372

APPARATUS FOR ULTRASONIC BONE TREATMENT

Roger J. Talish, Fairfield; John P. Ryaby, Essex Fells; Kenneth J. Scowen, Springfield, and Kenneth J. Urgovitch, Clifton, all of N.J., assignors to Exogen, Inc., West Caldwell, N.J.

Filed Feb. 15, 1995, Ser. No. 389,148
Int. Cl.[6] A61B *17/56*
U.S. Cl. 601—2 **16 Claims**



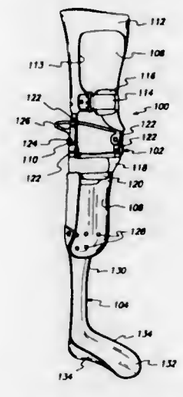
1. An apparatus for ultrasonically treating an injury comprising:
a portable self-contained main operating unit having an internal power source and dimensioned to be carried by a patient during treatment, a support fixture configured and adapted for attachment adjacent an external site corresponding to an internal injury remote from said main operating unit, and an ultrasonic transducer treatment head module operatively connected to said main operating unit and including means for detachably engaging said support fixture, said treatment head module having an ultrasonic signal generator and signal generator circuitry operatively associated therewith, said main operating unit having a display panel coupled to said signal generator circuitry to display treatment sequence data and a keypad coupled to said signal generator circuitry to permit user control, of said signal generator, said signal generator circuitry including a processor, means for generating a pulsed signal, and a switch coupled to said processor for regulating said pulsed signal.

5,556,373

BODY-WORN ORTHOPEDIC DEVICE THAT INCLUDES INDIVIDUAL CONNECTED MODULES, AND A METHOD OF MANUFACTURING AND DESIGNING SUCH AN ORTHOPEDIC DEVICE

Wallace M. Motloch, 262 Beachview Ave., Unit #2, Pacifica, Calif. 94044

Division of Ser. No. 945,413, Sep. 16, 1992, Pat. No. 5,344,390. This application Jul. 7, 1994, Ser. No. 271,750
Int. Cl.[6] A61F *5/00;* **A61B** *19/00*
U.S. Cl. 602—6 **10 Claims**



1. A method of manufacturing a body-worn orthopedic device for use by a physically impaired individual to aid in alignment of the individual's tibia and femur, comprising the steps of:
fabricating a knee module for being positioned on an individual's knee as well as portions of the individual's leg located above and below the knee, said step of fabricating the knee module including:
determining the dimensions and configuration of the individual's lower thigh;
fabricating a lower thigh engaging portion to closely contact the individual's lower thigh based upon the determined dimensions and configuration of the individual's lower thigh;
determining the dimensions and configuration of the individual's calf;
fabricating a calf engaging portion to closely contact the individual's calf based upon the determined dimensions and configuration of the individual's calf;
connecting the lower thigh engaging portion to the calf engaging portion by a hinge means that permits movement of the calf engaging portion relative to the lower thigh engaging portion;
providing said hinge means with locking means for permitting said calf engaging portion to be locked in a substantially axially aligned position with respect to said lower thigh engaging portion; and
fabricating a lower module for engaging the individual's lower leg and foot, and connecting the lower module to the calf engaging portion of the knee module wherein said step of fabricating said lower module includes fabricating said lower module from a composition of material that is different from the composition of material from which said lower thigh engaging portion and said calf engaging portion are fabricated.

5,556,374

PATELLAR ALIGNMENT DEVICE

Kathleen J. Grace; Anne M. Foute, both of 7182 Caminito Zabala, San Diego, Calif. 92122, and John P. Buser, 837 Coraish Dr., San Diego, Calif. 92107

Filed Oct. 4, 1994, Ser. No. 317,755
Int. Cl.[6] A61F *3/00;5/00;13/06*
U.S. Cl. 602—26 **20 Claims**

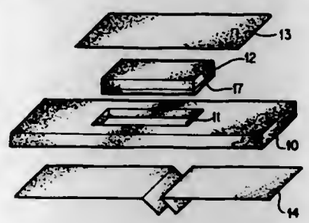
12. An orthopedic device for aligning the patella into a proper anatomical orientation which comprises:
means adherable over the patella of a patient for establishing a first attachment point over the patella;
a sleeve formed with an aperture, a leg of the patient being insertable into said sleeve to project said first attachment point through said aperture;
means for establishing a second attachment point to said sleeve, said second attachment point being distanced from said first attachment point; and
means simultaneously attachable to said first attachment point and to said second attachment point for applying a selectively orientable force to said first attachment point to align the patella.

5,556,375

WOUND DRESSING HAVING A FENESTRATED BASE LAYER

Ralph Ewall, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jun. 16, 1994, Ser. No. 260,583
Int. Cl.[6] A61F *13/00*
U.S. Cl. 602—58 **20 Claims**



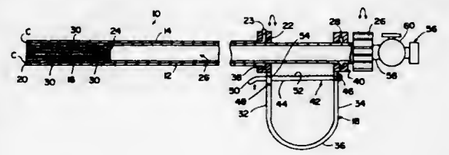
1. A wound dressing comprising:
(a) a flexible conformable base layer that is a barrier to liquids, gas and microorganisms, said base layer including a fenestration therein shaped to surround a wound out of contact therewith, said base layer comprising an upper surface and a lower surface;
(b) an adhesive on said lower surface of said base layer for tightly adhering said base layer to skin surrounding the wound;
(c) a liquid and gas permeable absorbent pad comprising a wound facing inner surface and an opposing outer surface, said pad being positioned within and surrounded by said fenestration in said base layer to be in contact with a wound; and
(d) a cover sheet adjacent to and covering said outer surface of said pad, said cover sheet being adhered to said upper surface of said base layer around said fenestration and being impermeable to microorganisms and liquid and permeable to moisture vapor and gas.

5,556,376

MULTIFUNCTIONAL DEVICES HAVING LOOP CONFIGURED PORTIONS AND COLLECTION SYSTEMS FOR ENDOSCOPIC SURGICAL PROCEDURES AND METHODS THEREOF

InBae Yoon, 2101 Highland Ridge Dr., Phoenix, Md. 21131

Continuation-in-part of Ser. No. 45,768, Apr. 14, 1993, Pat. No. 5,451,204, Ser. No. 600,557, Oct. 23, 1990, abandoned, and Ser. No. 596,937, Oct. 15, 1990, abandoned, which is a continuation-in-part of Ser. No. 222,776, Jul. 22, 1988, abandoned, said Ser. No. 45,768is a continuation-in-part of Ser. No. 789,599, Nov. 8, 1991, abandoned, which is a division of Ser. No. 556,081, Jul. 24, 1990, Pat. No. 5,074,840, said Ser. No. 600,557is a continuation-in-part of Ser. No. 556,081. This application Aug. 8, 1994, Ser. No. 287,007
Int. Cl.[6] A61F *13/20*
U.S. Cl. 604—15 **34 Claims**



1. A multifunctional device for use in endoscopic procedures in the body comprising
an elongate outer member having a distal end and a proximal end;
an elongate inner member disposed in said outer member and having a distal end and a proximal end, at least one of said outer member and said inner member being movable relative to the other of said outer member and said inner member; and
a loop forming portion connected between said outer member and said inner member for being introduced in the body through a narrow portal, said loop forming portion including at least one strip of absorbent material having a first end attached to said outer member and a second end attached to said inner member, said strip of material being movable from a non-deployed position wherein said strip is disposed in a substantially straight configuration to facilitate introduction in the body and a deployed position wherein said strip is folded to form a loop within the body in response to relative movement of said at least one of said outer member and said inner member.

5,556,377

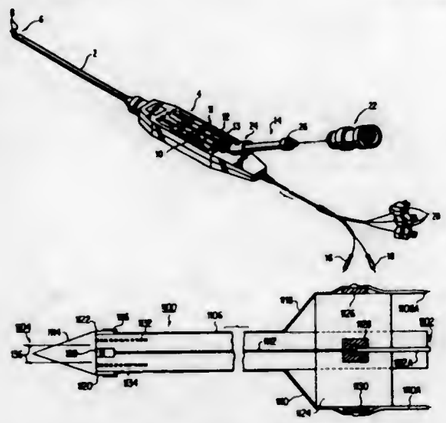
MEDICAL PROBE APPARATUS WITH LASER AND/OR MICROWAVE MONOLITHIC INTEGRATED CIRCUIT PROBE

Arye Rosen, Cherry Hill, N.J.; Stuart D. Edwards, Los Altos, Calif.; Ronald G. Lax, Granvalley, Calif.; Hugh R. Sharkey, Redwood City, Calif., and Ingemar H. Lundquist, Pebble Beach, Calif., assignors to Vidamed, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 929,638, Aug. 12, 1992, abandoned, and Ser. No. 12,370, Feb. 2, 1993, Pat. No. 5,370,675, and Ser. No. 62,364, May 13, 1993, Pat. No. 5,435,805, and Ser. No. 61,072, May 14, 1993, Pat. No. 5,385,544, and Ser. No. 61,647, May 13, 1993, Pat. No. 5,421,819. This application Dec. 22, 1993, Ser. No. 172,448

Int. Cl.[6] A61B *17/39*

U.S. Cl. 604—22 24 Claims



1. A medical probe device comprising a catheter having at least one stylet port, at least one flexible stylet disposed within the catheter, means for each stylet outwardly through a stylet port and through intervening tissue to target tissue, each stylet comprising an electrical conductor enclosed within a non-conductive sleeve, and an integrated circuit at the distal ends of the stylets for emitting electromagnetic energy which is delivered as ablative power to the target tissue.

5,556,378

DEVICE FOR IRRIGATION OF BODY CAVITIES

Karl Storz, Auf dem Schildrain 39, 78532 Tuttlingen, Germany, and Pavel Novak, Stettemerstr, 117, CH-8207 Schaffhausen, Switzerland

Continuation-in-part of Ser. No. 77,720, Jun. 17, 1993, abandoned. This application Sep. 19, 1994, Ser. No. 308,251

Claims priority, application Germany, Jun. 17, 1992, 42 19 890.0

Int. Cl.[6] A61M *1/00*

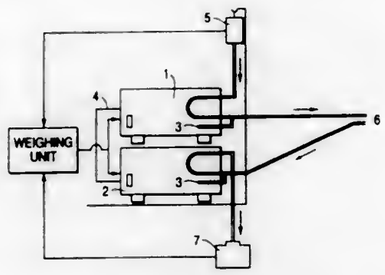
U.S. Cl. 604—31 20 Claims

1. A device for the irrigation of a body cavity comprising:

two pumps, one of the pumps operating as an irrigation pump and another of the pumps operating as a suction drainage pump, the two pumps being connectable with the body cavity to be irrigated via suction and drainage conduits which are placed into the body cavity in an endoscopic instrument so that a simultaneous irrigation and suction drainage of the body cavity is performed;

a pressure sensor unit; and

a control means for controlling the two pumps with the pressure sensor unit having two pressure sensors, one of the two pressure sensors detecting pressure of the irrigation pump and another of the two pressure sensors detecting pressure of the



suction drainage pump with output signals produced by the two pressure sensors being applied to the control means with the control means controlling the two pumps in a master-slave operation causing the suction drainage pump to be regulated based on the output signals of the two pressure sensors as well as a set r.p.m. of the irrigation pump in response to adjustment of the irrigation pump.

5,556,379

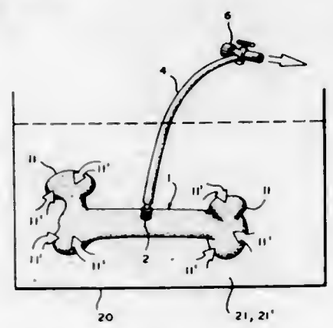
PROCESS FOR CLEANING LARGE BONE GRAFTS AND BONE GRAFTS PRODUCED THEREBY

Lloyd Wolfinbarger, Norfolk, Va., assignor to Lifenet Research Foundation, Virginia Beach, Va.

Continuation-in-part of Ser. No. 293,206, Aug. 19, 1994, abandoned. This application Feb. 27, 1995, Ser. No. 395,113

Int. Cl.[6] A61M *31/00*

U.S. Cl. 604—49 58 Claims



1. A process for cleaning large bone grafts, comprising:

selecting a large substantially intact bone;

removing excess cartilage from at least one articulating surface of the bone;

preparing an opening through the cortical layer of the bone to permit access of a vacuum line to the bone cavity;

attaching a vacuum line via the opening for application of vacuum to the bone cavity;

immersing the bone in a solution within a container wherein the solution includes at least one solvent for bone marrow; and

applying a vacuum to the vacuum line to draw the solution through the at least one cartilaginous articulating surface and then through the bone cavity so as to draw the solution and solubilized bone marrow through the vacuum line to exit the bone at the opening.

5,556,380

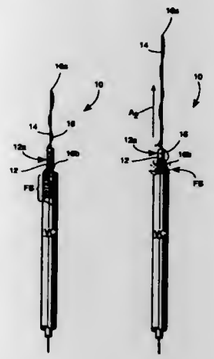
METHOD FOR REMOVING FIBRIN SHEATHS FROM CATHETERS

Mark T. Ridinger, and Paul V. Suhocki, both of Durham, N.C., assignors to Duke University, Durham, N.C.

Filed Apr. 5, 1995, Ser. No. 417,018

Int. Cl.[6] A61B *17/36*; A61M *25/01*

U.S. Cl. 604—52 4 Claims



1. A procedure for removing a fibrin sheath from a distal end of a venous catheter comprising:

(i) intraluminally advancing a medical device having a tubular member, a central wire positioned within said tubular member and a snare wire connected at one end to said central wire and at another end to said tubular member;

(ii) manipulating said medical device to position a segment of said snare wire proximally of said another end thereof adjacent the fibrin sheath at the distal end of the venous catheter;

(iii) effecting relative rotation between said central wire and said tubular member to cause said snare wire segment to wrap around the distal end of the venous catheter; and then

(iv) causing said wrapped snare wire segment to advance in a distal direction relative to the distal end of the venous catheter to thereby strip the fibrin sheath therefrom.

5,556,381

IMPLANTABLE ACCESS DEVICES

William D. Ensminger, and Robert F. Gavin, both of Ann Harbor, Mich., assignors to The Michigan TransTech Corporation, Ann Arbor, Mich.

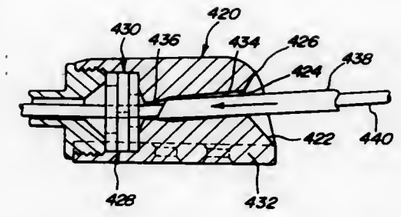
Continuation of Ser. No. 407,483, Mar. 15, 1995, Pat. No. 5,476,451, which is a continuation of Ser. No. 259,053, Jun. 13, 1994, Pat. No. 5,417,656, which is a continuation of Ser. No. 148,394, Oct. 8, 1993, Pat. No. 5,350,360, which is a division of Ser. No. 940,619, Sep. 4, 1992, Pat. No. 5,281,199, which is a continuation-in-part of Ser. No. 818,626, Jan. 10, 1992, Pat. No. 5,226,879, which is a continuation-in-part of Ser. No. 654,661, Feb. 15, 1991, Pat. No. 5,180,365, which is a continuation-in-part of Ser. No. 539,793, Jun. 18, 1990, Pat. No. 5,053,013, which is a continuation-in-part of Ser. No. 487,541, Mar. 1, 1990, Pat. No. 5,057,084. This application Jun. 6, 1995, Ser. No. 465,841

Int. Cl.[6] A61M *5/00*

U.S. Cl. 604—93 5 Claims

1. An access device for implanting beneath the skin of a patient and permitting fluid communication between an internal catheter and a filament such as a hypodermic needle with an external catheter positioned coaxially therein, said needle and said external catheter respectively having first and second outer diameters of predetermined size, said access device comprising:

a housing having a funnel shaped entrance orifice, an exit orifice, and a passageway therebetween, said entrance orifice having a decreasing cross-sectional area and defining a target



area for insertion of said filament, said entrance orifice directing said filament when introduced therein toward and into said passageway, said passageway connecting said entrance orifice with said exit orifice and having a throat area generally adjacent to said entrance orifice, at least a portion of said throat area exhibiting a shape prohibiting insertion of said needle therepast but allowing for further insertion of said external catheter therethrough;

a valve means positioned within said passageway and normally remaining closed for providing resistance to flow of fluids through said passageway, said valve means also permitting passage of said external catheter therethrough for enabling said external catheter to communicate with said internal catheter; and

mounting means for subcutaneously mounting said access device.

5,556,382

BALLOON PERFUSION CATHETER

Daniel O. Adams, Orono, Minn., assignor to SciMed Life Systems, Inc., Maple Grove, Minn.

Filed Aug. 29, 1995, Ser. No. 520,755

Int. Cl.[6] A61M *29/00*

U.S. Cl. 604—96 24 Claims

1. In a balloon perfusion catheter including an elongate shaft having a proximal end and a distal end, and an inflation lumen extending from the proximal end to the distal end, the improvement comprising:

a. a balloon carried by the shaft at the distal end, in fluid communication with the inflation lumen; and

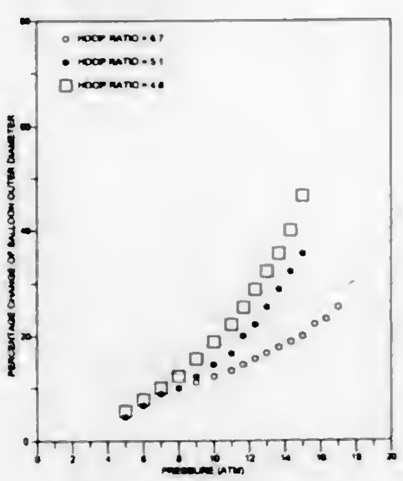
b. a structure for providing a perfusion passage while the balloon is in an inflated state, the perfusion passage having a generally open proximal opening, a generally open distal opening, and a generally open side opening, the structure including a support member secured against the balloon for supporting the passage while the balloon is in an inflated state.

5,556,383

BLOCK COPOLYMER ELASTOMER CATHETER

the platform making contact with the patient only on peripheral edge portions of the circumferentially-spaced fingers.

5,556,383
BLOCK COPOLYMER ELASTOMER CATHETER BALLOONS
Lixiao Wang, Maple Grove, and Jianhua Chen, Brooklyn Park, both of Minn., assignors to Scimed Lifesystems, Inc., Maple Grove, Minn.
Continuation-in-part of Ser. No. 204,554, Mar. 2, 1994, abandoned. This application Mar. 2, 1995, Ser. No. 397,837
Int. Cl.^{6} A61M *29/00*
U.S. Cl. 604—96 **17 Claims**



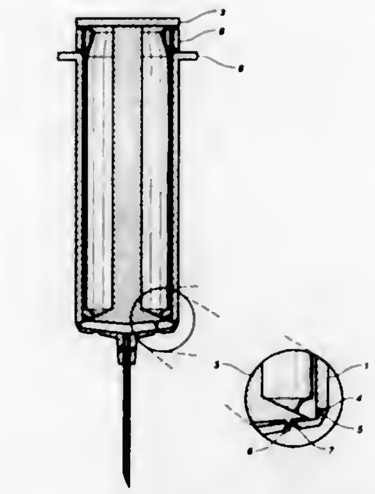
1. A balloon for a medical device formed from a length of tubing of a polymer material by radial expansion of the tubing under pressure, the polymer material comprising a block copolymer thermoplastic elastomer characterized as follows:
the block copolymer is represented by the formula:

$$HO-(\underset{\substack{\| \\ O}}{C}-PA-\underset{\substack{\| \\ O}}{C}-O-PE-O)_n-H$$

in which PA is a polyamide hard segment of molecular weight in the range of 500–8,000;
PE is a polyether soft segment of molecular weight in the range of 500–2,500 and the repeating number n is between 5 and 10, the polyamide hard segments are polyamides of C_6 or higher carboxylic acids and C_6 or higher organic diamines or of C_6 or higher aliphatic ω-amino-α-acids, and the polyether soft segments are polyethers of C_2–C_{10} diols;
the block copolymer has a flexural modulus of less than about 150,000 psi;
the block copolymer has a hardness, Shore D scale, of greater than 60; and
the percentage by weight of the block polymer attributable to the hard segments is between about 50% and about 95%.

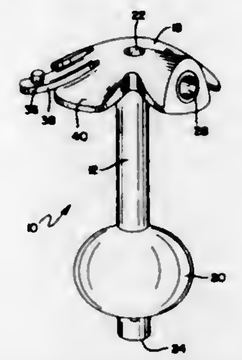
5,556,384
SELF-DESTRUCTIVE HYPODERMIC SYRINGE
Fernando A. F. da Encarnacão, Rua Leobina Pereira, 38 (J. S ão Paulo, 50910-260 Recife, Brazil
Filed Apr. 17, 1995, Ser. No. 423,553
Claims priority, application Brazil, Jul. 18, 1991, 9103269
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 604—110 **8 Claims**

1. A self destructive syringe comprising:
a cylindrical body having a needle at one end;
a breakable ring formed in said end of said cylindrical body adjacent said needle;
a piston slidably received within said cylindrical body, said piston having a sealing member extending circumferentially therearound so as to form an air-tight seal with an inner wall of said cylindrical body, said piston having a frontal portion



with a sharp point formed thereon, said sharp point having a sharpness suitable for perforating said breakable ring upon contact with said breakable ring; and
a retaining ring means formed in said cylindrical body generally adjacent said end, said retaining ring means for encasing said sealing member of said piston when said sharp point contacts said breakable ring, said retaining ring means having sharp edges so as to damage said sealing member of said piston when said piston is moved from said end of said cylindrical body.

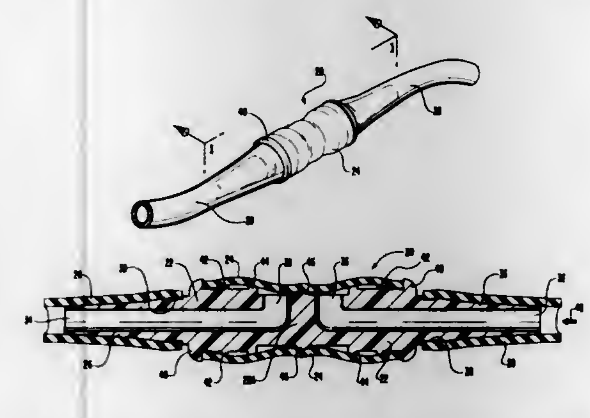
5,556,385
IMPROVED PERCUTANEOUS ACCESS DEVICE
Erik Andersen, Gurnee, Ill., assignor to Corpak, Inc., Wheeling, Ill.
Filed Dec. 6, 1994, Ser. No. 349,897
Int. Cl.^{6} A61M *29/00*
U.S. Cl. 604—174 **10 Claims**



1. In a device for percutaneous administration of fluids from a fluid source into a body cavity, vessel or organ of a patient, the device including a tube having a fluid lumen, an inflatable member and an inflation lumen and defined by a proximal end lying outside of the patient and a distal end lying within the patient, the proximal end of the fluid lumen being in fluid communication with the fluid source and the distal end disposed within the patient, the proximal end of the inflation lumen in communication with the inflatable member disposed within the patient, the improvement comprising:
a retention platform disposed about the proximal end of the cube, the platform having an underside surface with a raised central portion defining a recess which is generally arcuate-shaped and which occupies a major portion of the extent of the platform;
said retention platform having a plurality of circumferentially-spaced fingers extending radially outward from the proximal end of the tube, the circumferentially-spaced fingers having a width which increases as said fingers extend outward;

the platform making contact with the patient only on peripheral edge portions of the circumferentially-spaced fingers.

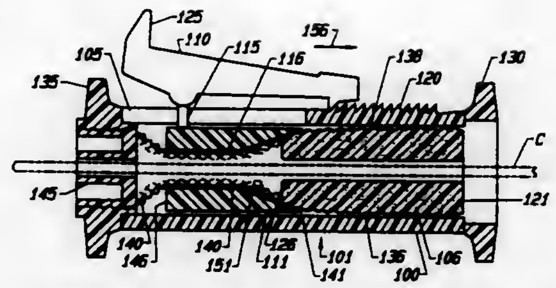
5,556,386
MEDICAL PRESSURE RELIEF VALVE
Robert J. Todd, Salt Lake City, Utah, assignor to Research Medical, Inc., Salt Lake City, Utah
Filed Apr. 3, 1995, Ser. No. 415,360
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 604—247 **14 Claims**



1. A pressure relief valve for preventing overpressure conditions in medical fluid delivery circuits utilizing positive pressure pumping, comprising;
a valve body member, said valve body member including
first and second connector elements for use in connecting the pressure relief valve into a medical fluid delivery circuit,
first and second bores, said bores passing through the first and second connector elements, respectively, and exiting at respective first and second exit ports on the side of the valve body member, and
a valve seat, said valve seat comprising a raised ridge element on the valve body member between said first and second exit ports; and
a tubular valve member formed from an elastic material, said tubing valve member being placed in elastic tension in sealing engagement over the valve body member so as to cover the first and second exit ports and the valve seat.

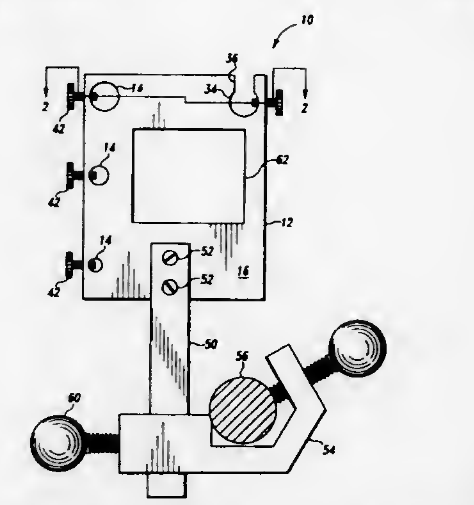
5,556,387
METHOD OF MANUFACTURING ADJUSTABLE VALVE FOR SURGICAL APPLICATIONS
Kenneth H. Mollenauer, Santa Clara; George D. Hermann, Los Gatos; Thomas A. Howell, Palo Alto, and Michelle Y. Monfort, Los Gatos, all of Calif., assignors to Thomas J. Fogarty, Portola Valley, Calif.
Division of Ser. No. 290,401, Aug. 15, 1994, which is a division of Ser. No. 992,145, Dec. 17, 1992, Pat. No. 5,338,313. This application Nov. 6, 1995, Ser. No. 554,125
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 604—249 **7 Claims**

1. A method of manufacturing a surgical valve, comprising the steps of:
(a) providing:
(1) a substantially cylindrical braided sleeve having a first end and a second end,
(2) a sealing body having an axial passage,
(3) a substantially cylindrical valve body having an outer surface and an inner bore, and
(4) a toroidal body having a tapered bore;
(b) inserting the sealing body into the braided sleeve;
(c) attaching the sealing body to the first end of the braided sleeve;



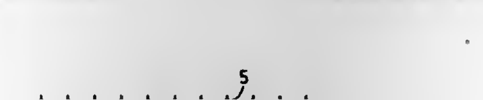
(d) threading the second end of the braided sleeve through the bore of the toroidal body, the diameter of the tapered bore of the toroidal body increasing towards the sealing body;
(e) inserting the braided sleeve, the toroidal body, and the sealing body into the bore of the valve body; and
(f) attaching the second end of the braided sleeve to the valve body.

5,556,388
SAFETY RETENTION AND RECAPPING DEVICES FOR HYPODERMIC NEEDLES/INTRAVENOUS INJECTION/PORTS
Frederick C. Johlin, Jr., Iowa City, Iowa, assignor to Advanced Medical Concepts Incorporated, Iowa City, Iowa
Continuation of Ser. No. 893,493, Jun. 4, 1992, abandoned. This application Feb. 14, 1994, Ser. No. 195,568
Int. Cl.^{6} A61M *5/00*
U.S. Cl. 604—263 **2 Claims**



1. In combination, a hypodermic needle cover, an intravenous injection port, and a device for facilitating the safe handling of hypodermic needles and intravenous injection ports, said combination comprising:
a hypodermic needle cover;
an intravenous injection port including an intravenous injection port hub and associated tubing connected thereto; and
a substantially flat plate having a top and a bottom surface and a peripheral edge thereabout, said plate defining:
a needle cover retaining bore extending through said plate between said top and bottom surfaces of said plate, said needle cover retaining bore being sized for partially receiving and seating a needle cover therein;
an intravenous injection port bore extending through said plate between said top and bottom surfaces of said plate, said intravenous injection port bore being sized for partially receiving and seating an intravenous injection port hub therein;
an elongated slot extending through said plate between said top and bottom surfaces of said plate and extending from said intravenous injection port bore to the periphery of said

plate, said slot being sized so as to permit transverse



5,556,394
ABSORBENT ARTICLE WITH MULTIPLE ZONE

plate, said slot being sized so as to permit transverse passage of said intravenous injection port's associated tubing therethrough but yet to prevent transverse passage of the port hub through said slot; and

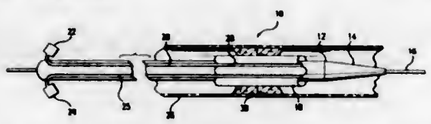
wherein said needle cover is partially received and seated within said needle cover retaining bore; and wherein said intravenous injection port hub is partially received and seated within said intravenous injection port bore with transverse movement of said intravenous injection port hub through said elongated slot being prevented owing to the reduced size of said slot relative to said intravenous injection port hub.

5,556,389

METHOD AND APPARATUS FOR TREATING STENOSIS OR OTHER CONSTRICTION IN A BODILY CONDUIT

Samuel F. Liprie, 424 W. McNeese St., Lake Charles, La. 70605

Filed Mar. 31, 1994, Ser. No. 220,681
Int. Cl.[6] A61M *5/00*
U.S. Cl. 604—264 **8 Claims**



1. A device for treating an occlusion or a constriction in a vessel or other conduit in the body, comprising:

a flexible, elongated, hollow catheter having a distal end and a proximal end, said catheter provided with a first aperture at said distal end and a second aperture at the proximal end;

a ribbed balloon having a distal end and a proximal end encircling a portion of the catheter proximate to said distal end;

a first conduit extending along the exterior surface of said catheter from said proximal end of said catheter to said ribbed balloon;

a source for inflating said ribbed balloon connected to conduit for inflating said ribbed balloon pretreating the inclusion or constriction while allowing liquid to flow around a portion of said ribbed balloon with said ribbed balloon is inflated;

a flexible, elongated guide wire maneuvered to the site of the occlusion or constriction prior to said catheter being maneuvered to the site of the occlusion or constriction, wherein said guide wire travels through the interior of said catheter, said guide wire comprising a hollow conduit and a removable inner core; and

a means for injecting a contrast dye into the body for determining the location of said catheter and said guide wire in the body, wherein said means for injecting a contrast dye injects the contrast dye through said hollow conduit of said guide wire.

5,556,390

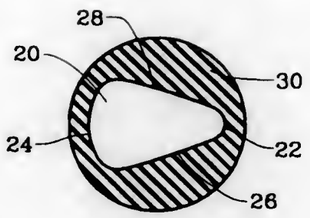
CATHETER WITH OVAL OR ELLIPTICAL LUMENS

Allen J. Hicks, Woodinville, Wash., assignor to Quinton Instrument Company, Bothell, Wash.

Filed Mar. 7, 1995, Ser. No. 400,228
Int. Cl.[6] A61M *25/00*
U.S. Cl. 604—280 **31 Claims**

1. A dual lumen catheter for use in the body of the patient comprising;

an elongated and generally cylindrical body portion having distal and proximal end portions and a pair of opposingly oriented lumens extending therebetween wherein the cross sectional area of said catheter includes each of said lumens formed of a first curved end with a first acute radius of curvature and a second curved end with a second acute radius of curvature and said first radius of curvature is greater than said second radius of curvature and said first and second



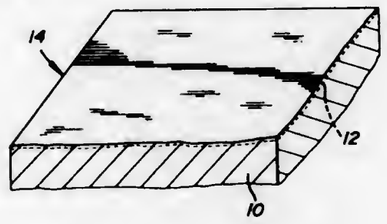
curved ends face each other and further include generally elongate side portions therebetween.

5,556,391

SURGICAL SPONGE DEVICE

Ronald J. Cercone, East Lyme; Dom L. Gatto, Branford; Arthur A. Gertzman, Woodbridge, and Douglas R. Valentine, Oakdale, all of Conn., assignors to Merocel Corporation, Mystic, Conn.

Filed Oct. 1, 1993, Ser. No. 130,433
Int. Cl.[6] A61F *13/15;13/20*
U.S. Cl. 604—369 **14 Claims**



1. A surgical sponge device comprising;

a sterile surgical device body constructed of an open cell polyvinyl acetal foam material having a pore diameter size which is not greater than 1.2 mm and instantaneous wicking properties, at least one surface of said body being treated to form a layer with reduced porosity with the pore diameters of the layer ranging from 0.01 to 0.45 mm and a thickness which is less than ½ the thickness of the device body, a controlled absorbency and a substantially closed outer surface reducing tissue ingrowth and device removal shear forces.

5,556,392

COMPOSITE NONWOVEN MATERIAL AND APPLICATION TO ANY ABSORBENT ARTICLE OF HYGIENE

Jean P. Koczab, Bondues, France, assignor to Peaudouce, Linselles, France

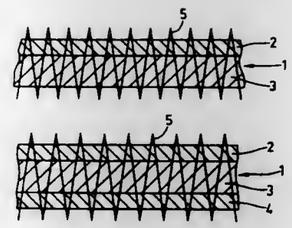
PCT No. PCT/FR93/01132, § 371 Date May 17, 1995, § 102(e) Date May 17, 1995, PCT Pub. No. WO94/12714, PCT Pub. Date Jun. 9, 1994
PCT Filed Nov. 18, 1993, Ser. No. 436,223
Claims priority, application France, Nov. 20, 1992, 92 13998
Int. Cl.[6] A61F *13/15;13/20*
U.S. Cl. 604—378 **18 Claims**

1. A composite nonwoven material, comprising:

a first layer made up of a nonwoven material which is permeable to body fluids and,

a sheet of carded fiber, permeable to body fluids,

a second nonwoven layer,



the sheet of carded fiber is arranged between the first and second nonwoven layers,

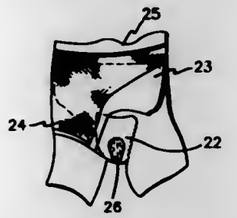
the second nonwoven layer has a weight per unit area lower than a weight per unit area of the first nonwoven layer, and the first and second nonwoven layers and the sheet of carded fibers are bound by needling.

5,556,393

INSERT FOR AN ABSORBENT ARTICLE

Peter Rönnberg, Mölndal, Sweden, assignor to Molnlycke AB, Goteborg, Sweden

PCT No. PCT/SE92/00124, § 371 Date Aug. 19, 1993, § 102(e) Date Aug. 19, 1993, PCT Pub. No. WO92/15269, PCT Pub. Date Sep. 17, 1992
PCT Filed Feb. 28, 1992, Ser. No. 107,706
Claims priority, application Sweden, Mar. 1, 1991, 9100593
Int. Cl.[6] A61F *13/15*
U.S. Cl. 604—385.2 **10 Claims**



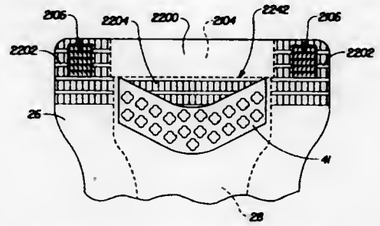
10. An insert which is intended to be worn by a male incontinent and to be placed, in use, around the male incontinent's genitals, within an absorbent article, said insert having a basin-shaped configuration having a thickness and comprising edge parts surrounding a liquid transfer region having at least one perforation which penetrates through the whole thickness of the insert for allowing liquid to flow through the insert, said insert transfer region having a higher permeability to liquid than the edge parts surrounding the transfer region, elastic devices being disposed in said edge parts thereby retaining the basin-shaped configuration of the insert in use and holding the insert firmly around the male incontinent's genitals.

5,556,394

ABSORBENT ARTICLE WITH MULTIPLE ZONE STRUCTURAL ELASTIC-LIKE FILM WEB EXTENSIBLE WAIST FEATURE

Donald C. Roe, West Chester; David J. K. Goulait; Sheila S. Rodriguez, both of Cincinnati; Edward P. Carlin, Maineville; Kimberly A. Dreier, Cincinnati; Carolyn M. Jasper, Cincinnati, and Dean J. Daniels, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 203,456, Feb. 28, 1994. This application May 24, 1995, Ser. No. 448,938
Int. Cl.[6] A61F *13/15*
U.S. Cl. 604—385.2 **10 Claims**



1. An disposable absorbent article having a front waist region and a back waist region, the absorbent article comprising:

a chassis assembly comprising a liquid pervious top sheet, a liquid impervious backsheet joined with said topsheet, and an absorbent core positioned between said topsheet and said backsheet;

a pair of extensible leg cuffs, each extensible leg cuff comprising a leg flap panel joined to and extending laterally outwardly from said chassis assembly, said leg flap panel being extensible in the lateral direction allowing said leg flap panel to expand in the lateral direction to provide additional void volume; and

an extensible back waist feature positioned in said back waist region, said extensible back waist feature joined to an extending longitudinally outwardly from said chassis assembly, said extensible back waist feature comprising:

(a) a hip panel extending longitudinally outwardly from said absorbent core, said hip panel being extensible in a direction having vector component in the lateral direction;

(b) a central waistband panel joined to and extending longitudinally outwardly from said hip panel, said central waistband panel being extensible in a direction having a vector component in the lateral direction, the extension force of said central waistband panel being greater than the extension force of said hip panel; and

(c) a pair of side panels joined to and extending laterally outwardly from said central waistband panel and at least a portion of said hip panel, each said side panel being extensible in a direction having a vector component in the lateral direction.

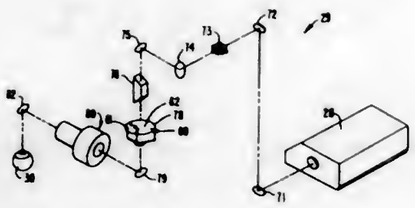
5,556,395

METHOD AND SYSTEM FOR LASER TREATMENT OF REFRACTIVE ERROR USING AN OFFSET IMAGE OF A ROTATABLE MASK

John K. Shimmick, Redwood City; William B. Telfair, San Jose; Charles R. Munnerlyn, Sunnyvale, and Herrmann J. Glockler, Cupertino, all of Calif., assignors to VISX Incorporated, Santa Clara, Calif.

Continuation of Ser. No. 58,600, May 7, 1993, abandoned. This application Oct. 25, 1994, Ser. No. 328,937
Int. Cl.[6] A61F *9/00;* **A61N** *5/06;* **A61B** *3/10*
U.S. Cl. 606—4 **20 Claims**

1. An ophthalmological surgery system for performing ablative photodecomposition of a corneal surface, said system comprising:



a laser beam generating device for producing a beam of radiation along a path;

a beam profiling mask arranged along said path, said mask having opaque and transparent regions for shaping the beam to a desired profile;

means for rotating said mask so as to rotate said profile; and

means for translationally displacing the profiled beam from the path to a position offset from a center of rotation corresponding to a desired center of ablation and for varying the position of the offset profiled beam about a center of rotation corresponding to a desired ablation center.

5,556,396

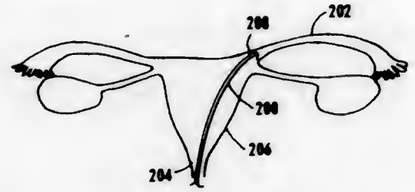
METHOD FOR TUBAL ELECTROLIGATION

Donald Cohen, Irvine; Derek J. Daw, Costa Mesa, both of Calif.; George F. Kick, Medina, Ohio, and George M. Acosta, Long Beach, Calif., assignors to Endovascular, Inc., Costa Mesa, Calif.

Continuation of Ser. No. 215,932, Mar. 22, 1994, abandoned, which is a continuation-in-part of Ser. No. 183,994, Jan. 18, 1994, Pat. No. 5,437,664. This application Mar. 28, 1995, Ser. No. 411,857

Int. Cl.[6] A61B *17/36*

U.S. Cl. 606—42 **2 Claims**



1. A method for ligating a fallopian tube, comprising the steps of:

(a) providing an electrically energizable electrode having a power supply;

(b) advancing the electrode into the fallopian tube such that the electrode is juxtaposed with the wall of the fallopian tube;

(c) establishing contact between the wall of the fallopian tube and the electrode;

(d) energizing the electrode until the fallopian tube collapses around the electrode to thereby block the fallopian tube;

(e) measuring at least one parameter selected from the group of preselected parameters consisting of: power supply output voltage, time rate of change of power supply output voltage, power supply output power, time rate of change of power supply output power, power supply output current, time rate of change of power supply output current, power supply output electrical impedance, time rate of change of power supply output electrical impedance, phase difference between power supply voltage and current, electrode temperature;

(f) establishing a setpoint having a variable predetermined value, the predetermined value being a function of at least one of said preselected parameters; and

(g) decreasing energization of the electrode when the parameter reaches the setpoint.

5,556,397

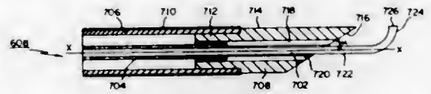
COAXIAL ELECTROSURGICAL INSTRUMENT

Gary Long, Cincinnati, and Michael Johnson, Milford, both of Ohio, assignors to Laser Centers Of America, Cincinnati, Ohio

Filed Oct. 26, 1994, Ser. No. 329,342

Int. Cl.[6] A61B *17/39*

U.S. Cl. 606—48 **18 Claims**



1. A coaxial electrosurgical instrument for performing surgical procedures on tissue, comprising:

an elongate, tubular, outer electrode covered with an insulating sleeve which leaves a distal end portion of the outer electrode uninsulated;

an elongate, inner electrode, located coaxially within the outer electrode and electrically insulated therefrom such that a distal uninsulated end portion of the inner electrode extends to a predetermined length from the distal uninsulated end portion of the outer electrode to enable simultaneous electrical contact by the distal uninsulated end portions of both the inner and outer electrodes with the tissue to be operated on; and

means for providing an alternating electrical voltage difference at a controlled frequency between the inner and outer electrodes;

wherein the distal end portion of the outer electrode has a transverse end surface inclined at an acute first angle relative to a common axis of the inner and outer electrodes.

5,556,398

EXTERNAL SELF-RETAINING AND STRESSED FIXATOR FOR FIXING LARGE TUBULAR BONES

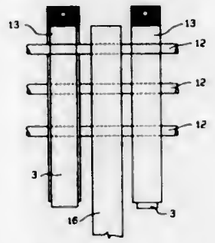
Tibor Bagits, Lekai Janos ter 15, Budapest, Hungary; Endre Criffer, Bakatus u., Budapest, Hungary, and Mihaly Szacsky, Varosmajor u. 26/b, Budapest, Hungary

Continuation of Ser. No. 117,890, Oct. 25, 1993, abandoned. This application Dec. 2, 1994, Ser. No. 349,150

Claims priority, application Hungary, Mar. 5, 1991, 702/91

Int. Cl.[6] A61B *17/64*

U.S. Cl. 606—59 **7 Claims**



7. An improved disposable external fixator for fixing fractured bones comprising:

a) an elongated member with a plurality of bores (4) disposed therein and pins (12) having opposite ends, with one of said ends received in said bores (4) and the other of said ends disposed outwardly of said elongated member for boring into only one side of said fractured bones, said elongated member being defined by a single fixing rod (3) having a longitudinal axis and opposite ends and with said bores (4) being spaced from each other and axially aligned and having a diameter larger than the diameter of the pins (12) received in them; and

b) a stretching tube (13) slideably and rotatably mounted onto at least one of said opposite ends of the fixing rod (3), said tube (13) being provided with a longitudinal slot (14) with laterally extending recesses (15) having a self-locking angular configuration with respect to said longitudinal axis.

5,556,399

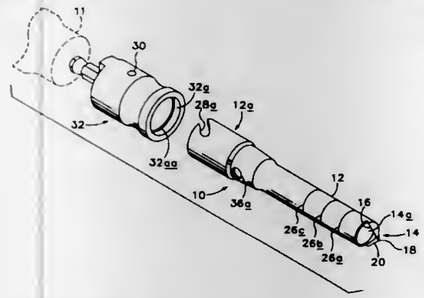
BONE-HARVESTING DRILL APPARATUS AND METHOD FOR ITS USE

Randall J. Huebner, 18560 SW. Hart Rd., Aloha, Oreg. 97005

Filed Feb. 14, 1995, Ser. No. 389,115

Int. Cl.[6] A61B *17/32;17/56;17/16*

U.S. Cl. 606—80 **19 Claims**



1. A bone-harvesting drill bit comprising:

an elongate generally cylindrical hollow shank section having a distal end and a proximal end and a long axis extending therebetween, the distal end having first and second points disposed on the perimeter thereof; and

a tip section extending from the distal end of the hollow shank, the tip section defined by a first lip extending from the first point on the distal end of the hollow shank to an apex located on the long axis, a second lip extending from the second point to the apex and a solid portion extending between said lips from said hollow shank to a sharp point at the apex, where the solid portion has an interior surface and an exterior surface and the first lip has a bevel between the interior and exterior surfaces to form an acutely sharp cutting edge at the exterior surface so that the drill bit may be rotated so that the cutting edge cuts the bone and the bevel guides resulting bone chips into the hollow shank.

5,556,400

METHODS OF PREPARING AND INSERTING FLEXIBLE INTRAOCULAR LENSES AND A CONFIGURATION FOR FLEXIBLE INTRAOCULAR LENSES

Scott W. Tunis, 2000 NE. 49th St., Ft. Lauderdale, Fla. 33308

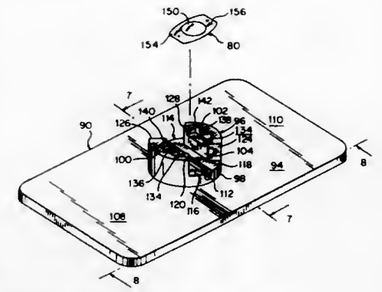
Division of Ser. No. 364,013, Dec. 27, 1994. This application Mar. 29, 1995, Ser. No. 412,574

Int. Cl.[6] A61B *17/00*

U.S. Cl. 606—107 **18 Claims**

1. A method of non-randomly folding a flexible intraocular lens multiple times to have a diameter less than 50 percent of its original diameter, wherein the lens has an optical portion for alignment with pupil of an eye and a pair of opposed haptic portions for intraocular fixation, the method comprising the steps of:

mounting the lens on a rigid template having portions engaging the lens, which portions do not move either with respect to the lens or to one another;



holding the lens with a first forceps;

gripping the lens with a second forceps;

folding the lens by pressing the lens up against at least one blade of a pair of blades of the first forceps while the lens is retained on the template to dispose the lens in a folded configuration completely between the blades of the first forceps;

removing the blades of the second forceps from engagement with the lens; and

squeezing the folded lens between the blades of the first forceps to minimize the size of the folded lens whereby the folded lens may be inserted through a surgical incision of minimal length in the eye.

5,556,401

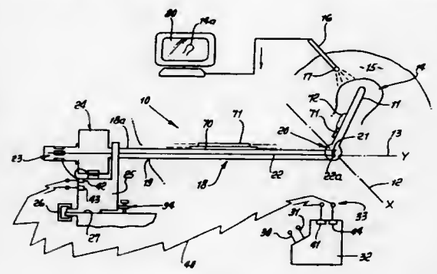
UTERUS MANEUVERING AND ASSOCIATED APPARATUS AND METHOD, WITH CONTROLLED DRIVE

James C. Caillouette, 685 Oak Knoll Cir., Pasadena, Calif. 91106

Continuation-in-part of Ser. No. 447,347, May 23, 1995. This application Jul. 20, 1995, Ser. No. 504,899

Int. Cl.[6] A61B *17/42*

U.S. Cl. 606—119 **57 Claims**



1. In a uterus maneuvering apparatus, the combination comprising:

a) a lengthwise elongated boom, and a strut carried at one end of the boom to be pivoted relative to the boom, the strut and boom adapted to be inserted via the vaginal canal to locate the strut to project into the uterine cavity,

b) actuator means associated with the boom and strut for effecting controlled pivoting of the strut about a first axis and the boom about a second axis, said axes being relatively perpendicular,

c) said actuator means including worm gear mechanism through which said controlled pivoting is effected,

d) control means for controlling said actuator means, and including a servo system having an extra-corporeal manual control means, for coupling between said manual control means and actuator means, said coupling including electrical signal transmission means,

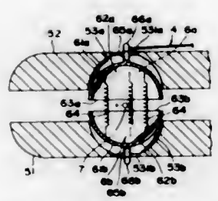
e) said actuator means including:

5,556,405

UNIVERSAL DILATOR WITH RECIPROCAL INCISOR

e) said actuator means including:
i) a first electrically responsive actuator to affect pivoting of the strut about said first axis, through a first section of said worm gear mechanism, and
ii) a second electrically responsive actuator to effect pivoting of the boom, about said second axis, through a second section of said worm gear mechanism,
f) and including a rotary link extending within the boom and coupling between the first actuator and said strut.

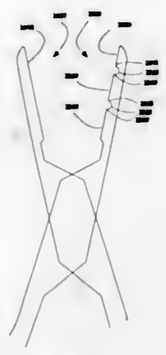
5,556,402
NEEDLE HOLDER HAVING ROTATABLE HOLDING MEMBER
Zhongren Xu, Kanagawa-ken, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 23, 1994, Ser. No. 346,309
Claims priority, application Japan, Nov. 24, 1993, 5-317382
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—147 **17 Claims**



1. A needle holder adapted to be passed from the outside of a body to the inside of a body cavity through a communicating tube to enable a needle to be inserted into the body cavity, comprising:
an elongated insertion rod having a tip portion;
holding means provided at the tip portion of the insertion rod for removably holding the needle, said holding means being rotatable in any direction with respect to the tip portion of said insertion rod;
position control means operatively associated with said holding means for adjusting the position of a needle to be held by said holding means by rotating said holding means, said position control means being operable from the outside of the body;
fixing means operatively associated with said holding means for fixing said holding means with respect to said insertion rod in a state in which said holding means has been adjusted by said position control means; and
switching means operatively associated with said fixing means for switching the state of said holding means between a first state in which said holding means is adjustable with respect to said insertion rod through operation of said position control means and a second state in which said holding means is fixed with respect to said insertion rod by said fixing means.

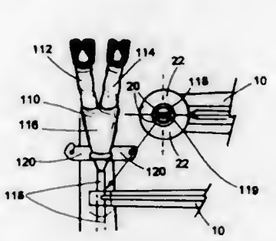
5,556,403
SURGICAL NEEDLE HOLDER FOR SECURING A NEEDLE AT A SELECTED POSITION
Peter Michalos, 137 Hampton Rd., South Hampton, N.Y. 11968
Filed Feb. 8, 1995, Ser. No. 385,718
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—148 **3 Claims**

1. A surgical needle holder comprising:



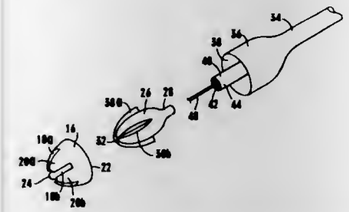
a first member including a first handle and a first jaw coupled to the first handle, the first jaw defining a first flat surface; and
a second member, pivotally coupled to the first member to allow movement of the needle holder between an open position and a closed position, including a second handle and a second jaw coupled to the second handle, the second jaw defining a longitudinal axis, and a plurality of grooves each defining a groove width, each groove oriented transverse to the longitudinal axis, wherein a ratio of a distance between adjacent grooves and a groove width is greater than 5.

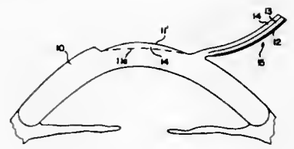
5,556,404
METHOD FOR MAINTAINING FLOW THROUGH CATHETER
Alan D. Belanger, 1065 E. Giles Rd., Muskegon, Mich. 49445, and Steven M. Schmitt, 2967 McDermott St., Muskegon, Mich. 49444
Continuation-in-part of Ser. No. 333,472, Nov. 2, 1994, abandoned. This application Dec. 18, 1995, Ser. No. 573,652
Int. Cl.[6] A61M *39/00;25/00*
U.S. Cl. 606—151 **11 Claims**

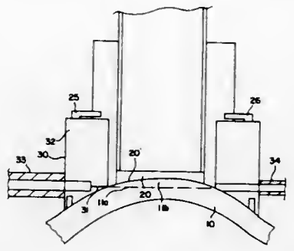


1. A method of remedying the situation of having a kinked tubing, comprising the steps of:
providing a first concave clamping surface;
seating the tubing kink in the first concave clamping surface;
providing a second concave clamping surface;
also seating the tubing kink in the second concave clamping surface; and
squeezing said first and said second concave clamping surfaces together to define a cylindrical passage between said first and said second clamping surfaces and press the tubing kink into conformity with the cylindrical passage defined between said first and said second concave clamping surfaces.

5,556,405
UNIVERSAL DILATOR WITH RECIPROCAL INCISOR
Banning G. Lary, Miami, Fla., assignor to Interventional Technologies Inc., San Diego, Calif.
Filed Oct. 13, 1995, Ser. No. 543,091
Int. Cl.[6] A61B *17/22*
U.S. Cl. 606—159 **18 Claims**







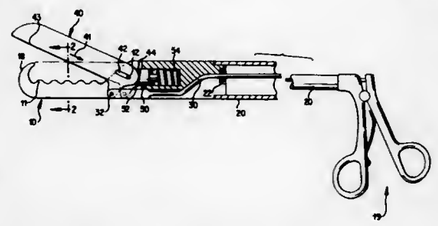
1. A device for incising and dilating a stenosis in a vessel which comprises:
a base member;
a plurality of blades mounted on said base member;
a housing formed with a plurality of slits;
a placement catheter, said placement catheter being formed with a lumen and having a distal end, said distal end of said placement catheter being attached to said housing to form a chamber therebetween, said base member being positioned in said chamber with said blades aligned with said slits; and
a push-pull catheter inserted through said lumen of said placement catheter and attached to said base member for movement of said base member in said chamber between a first position wherein said blades are withdrawn into said housing for use of said device as a dilator and a second position wherein said blades extend through said slits of said housing for use of said device as an incisor.

18. A method for manufacturing a device for incising and dilating a stenosis in a vessel of a patient which comprises the steps of:
mounting a plurality of blades on a base member;
positioning said base member adjacent a housing, said housing being formed with a plurality of slits, and said base member being positioned with said plurality of blades aligned with respective said slits;
attaching a push-pull catheter to said base member;
inserting said push-pull catheter through the lumen of a placement catheter for slidable movement therebetween; and
attaching said placement catheter to said housing over said base member to create a chamber between said housing and said placement catheter, said base member being moveable in said chamber between a first position wherein said blades are withdrawn into said chamber and a second position wherein said blades extend from said chamber and from said housing for incising the stenosis.

5,556,406
CORNEAL TEMPLATE AND SURGICAL PROCEDURE FOR REFRACTIVE VISION CORRECTION
Eugene I. Gordon, Mountainside; Peretz Feder, Englewood, and M. Ekramul H. Khan, Newark, all of N.J., assignors to Medjet Inc., Edison, N.J.
Filed Sep. 12, 1994, Ser. No. 304,245
Int. Cl.[6] A61B *17/32*
U.S. Cl. 606—166 **25 Claims**

1. A method for the selective, accurate removal of layers of corneal tissue, and change of curvature thereof, for refractive vision correction of an eye, comprising the steps of:
a) determining dimensions, shape and position of an anterior portion of the corneal tissue which is to be removed to provide an appropriate refractive vision correction;
b) defining an internal surface, along which the corneal tissue is to be cut for removal of the anterior portion of the corneal tissue, to provide the appropriate refractive correction;
c) deforming the anterior portion of the corneal tissue with deformation means whereby the internal surface to be cut assumes a planar configuration; and
d) cutting along the planar surface with a micro-keratome comprised of a high speed water jet; and wherein said deformation means comprises a template adapted specifically to be placed and centered on the anterior portion of the corneal tissue to be removed, whereby the template comprises a surface therein to which the anterior portion, to be removed, is adapted to be fitted and deformed by such fitting, the deformation being predeterminately controlled, such that the internal surface to be cut, at the base of the anterior portion assumes a planar configuration, which is accessible for the cutting thereof, beyond an end of the template.

5,556,407
ANVIL SHEARS FOR SURGICAL PURPOSES
Helmut Wurster, Mozartstrasse 20, D-7519 Oberderdingen, and Karl Von Rauch, Lindenstr. 13, 2217 Kellinghusen, both of Germany
Filed Feb. 12, 1993, Ser. No. 17,268
Claims priority, application Germany, Feb. 12, 1992, 42 04 051.5
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—174 **10 Claims**



1. Anvil shears for surgical purposes, comprising:
an anvil, which is fixed to a distal end of an instrument tube;
a blade pivotably fitted to the anvil and longitudinally displaceable with respect to the anvil;
an operating rod longitudinally displaceable in the instrument tube and coupled to the blade such that movement of the operating rod pivots the blade with respect to the anvil;

handle parts movable against one another and coupled to the operating rod to control longitudinal displacement of the

1. A surgical scalpel comprising:
(a) a handle defining a chamber at the distal end and an opening

said substantially D-shaped cross-sections serving to maximize that portion of said substantially hollow void region within

5,556,412
BLOOD VESSEL OCCLUSION TROCAR

handle parts movable against one another and coupled to the operating rod to control longitudinal displacement of the operating rod; and

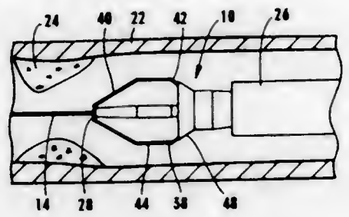
a spring pressing the blade with a spring force towards a distal end of the anvil shears, the spring force having a magnitude that allows the blade to move longitudinally relative to the anvil towards a proximal end of the anvil shears when a closing force exceeds the spring force to thereby provide a sawing cut.

5,556,408

EXPANDABLE AND COMPRESSIBLE ATHERECTOMY CUTTER

Lawrence Farhat, Carlsbad, Calif., assignor to Interventional Technologies Inc., San Diego, Calif.

Filed Apr. 27, 1995, Ser. No. 429,939
Int. Cl.[6] A61B *17/14;17/22*
U.S. Cl. 606—180 **17 Claims**



1. An atherectomy cutter which comprises:

a rotatable torque tube having a lumen, said torque tube having a distal end;

a proximal hub mounted at said distal end of said torque tube for rotation therewith;

a distal hub positioned distally from said proximal hub at a predetermined separation therefrom;

a plurality of resilient blades, each said blade having a distal end connected to said distal hub and a proximal end connected to said proximal hub, said blades defining a cutting radius, said cutting radius being resiliently compressible with a corresponding increase in said predetermined separation between said proximal hub and said distal hub; and

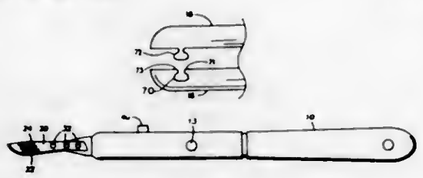
a flexible conically-shaped funnel tapered with an increasing cross-section in a distal direction and formed with an interior surface, said funnel extending distally from said distal end of said torque tube and attached thereto in fluid communication with said lumen of said torque tube at least a portion of each said blade being positioned within said funnel and against said interior surface.

5,556,409

DISPOSABLE SCALPEL

Michael L. Haining, 6731 Ashmore, Houston, Tex. 77069

Filed Aug. 4, 1995, Ser. No. 511,453
Int. Cl.[6] A61B *17/14*
U.S. Cl. 606—181 **6 Claims**



1. A surgical scalpel comprising:

(a) a handle defining a chamber at the distal end and an opening at the proximal end;

(b) a surgical blade retractable mounted within said chamber;

(c) first means secured to said blade and extending externally of said chamber to move said blade from an first exposed position through said opening to a second position completely within said chamber; and

(d) a closure means internal of said opening to seal said opening after said blade has been retracted.

5,556,410

SURGICAL NEEDLE WITH STRESS-RELOCATION MEANS

Werner Mittermeir, Prospect Heights, Ill., and Wayne J. Black, Vancouver, Wash., assignors to M3 Systems, Inc., Northbrook, Ill.

Filed Sep. 27, 1993, Ser. No. 127,633
Int. Cl.[6] A61B *17/34*
U.S. Cl. 606—185 **3 Claims**

1. A surgical needle for use in the location and marking of a lesion in a mass of soft tissue, said surgical needle comprising:

cannula means for manual insertion into the mass of soft tissue, said cannula means having a substantially cylindrical shaft defining a substantially hollow void region within said shaft, a cutting point located at an insertion end and a second end opposite said insertion end, said cannula means having a longitudinal axis;

hook-wire means positioned within said cylindrical shaft of said cannula means for flexibly marking the lesion in the mass of soft tissue, said hook-wire means including a hook-wire member;

said cannula means further serving to rigidly support said hook-wire means during insertion into the mass of soft tissue, said hook-wire means being capable of telescopically extending out of said cannula means at and beyond said insertion end;

said hook wire means further including anchoring means for restrainably locating said hook-wire member proximate the lesion in the mass of soft tissue, said anchoring means including a hook member, said hook member being capable of springedly assuming a substantially acute angle relative to said hook-wire member upon extension of said hook-wire means from said cannula means, said cannula means being wholly removable from said anchoring means following location and marking of the lesion by said hook-wire means;

said hook member overlaying at least a portion of said hook-wire member, said portion comprising a hook overlay region; and

reinforcement means for minimizing the potential for breakage of said hook-wire means within the mass of soft tissue after extension out of and beyond said insertion end of said cannula means, said reinforcement means including said hook member and at least said hook overlay region of said hook-wire member, each having substantially D-shaped cross-sections including a substantially flat side and a substantially cylindrical side opposite said substantially flat side,

said substantially D-shaped cross-sections serving to maximize that portion of said substantially hollow void region within said shaft, which may be occupied simultaneously by said hook overlay region and said hook member prior to said extension of said hook-wire means,

said reinforcement means further including said hook overlay region and said hook member each having widths, defined at said substantially flat side of each and substantially perpendicular to said longitudinal axis, closely approximating the diameter of said substantially hollow void region, so as to further maximize the structural size and integrity of said hook overlay region and hook member, to minimize the occurrence of breakage therebetween, and

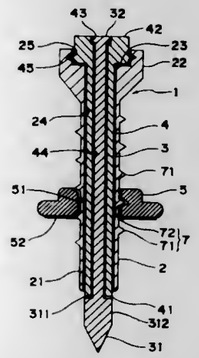
said hook member and said hook overlay region, each having said D-shaped cross-sections juxtaposed to one another at their respective flat sides, prior to said extension, and further meeting at a fold-point projectable out of and beyond said insertion end of said cannula means.

5,556,411

TROCAR ASSEMBLY HAVING A CANNULA RETAINING MEMBER

Toshimitsu Taoda, Sennan-gun, and Masao Horie, Ohtsu, both of Japan, assignors to Nissho Corporation, Osaka-fu, and Getz Bros. Co., Ltd., Tokyo-to, both of Japan

Filed Jul. 8, 1994, Ser. No. 271,986
Claims priority, application Japan, Jul. 9, 1993, 5-194076
Int. Cl.[6] A61B *17/34*
U.S. Cl. 606—185 **8 Claims**



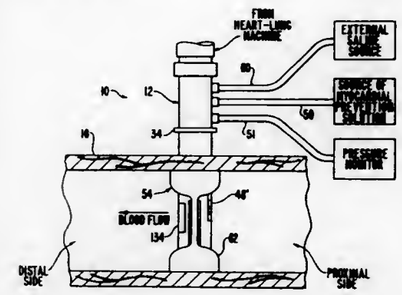
1. A trocar assembly comprising a cannula, a sheath located in said cannula so as to be rotated and moved along therewith, a trocar needle rotatably held by the sheath, said trocar needle including a sharp-edged portion having a diameter larger than a diameter of said sheath, and a cannula-retaining member having a through-hole for inserting the cannula therein and being provided at a bottom thereof with an adhesive layer for fixing the cannula in place on the skin of a patient, said cannula and the cannula-retaining member each having means for engagement with one another, said engagement means permitting the cannula to move forward continuously or continually through said through-hole of the cannula-retaining member as well as to fix the cannula in a desired position.

5,556,412

BLOOD VESSEL OCCLUSION TROCAR

John D. Hill, 2040 Broadway, Apt. 101, San Francisco, Calif. 94115

Division of Ser. No. 209,280, Mar. 14, 1994, Pat. No. 5,499,996, which is a division of Ser. No. 808,767, Dec. 17, 1991, Pat. No. 5,330,498. This application Jun. 7, 1995, Ser. No. 479,408
Int. Cl.[6] A61B *17/00*
U.S. Cl. 606—194 **13 Claims**



1. A method of occluding a blood vessel in a patient comprising the steps of:

selecting a site along the length of the blood vessel;

incising the wall of said blood vessel at said site to provide an opening therein extending substantially perpendicularly to the longitudinal axis of said blood vessel;

inserting an expandable diaphragm in a collapsed condition through said opening into the interior of said blood vessel; and

admitting fluid to said diaphragm to cause radial expansion thereof at said site into sealing relation with the interior surface of said blood vessel wall,

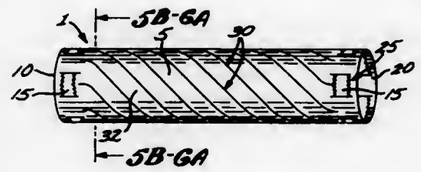
in which said diaphragm-inserting step includes the step of housing said diaphragm in a collapsed condition within a trocar and extending at least that portion of said trocar containing said diaphragm through said opening into the interior of said blood vessel.

5,556,413

COILED STENT WITH LOCKING ENDS

Sharon Lam, San Jose, Calif., assignor to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Filed Mar. 11, 1994, Ser. No. 209,827
Int. Cl.[6] A61M *29/00*
U.S. Cl. 606—198 **27 Claims**



1. An intraluminal stent implantable in a body lumen, comprising:

a cylindrical stent body having a first reduced diameter and an adjustable second expanded diameter;

a first end and a second end on said cylindrical stent body;

means for expanding said cylindrical stent body from said first reduced diameter to said adjustable second expanded diameter so that said cylindrical stent body engages said body lumen;

means for expanding said first end and said second end from a first reduced diameter to an adjustable, second expanded diameter, so that said first end and said second end lock said cylindrical stent body in an expanded configuration;

means for locking said first end and said second end in said second expanded diameter;

said locking means including at least one ring having at least a pair of overlapping edges; and

a plurality of teeth on at least one of said overlapping edges;

whereby said rings are expanded from said first diameter to said adjustable, second expanded diameter so that said teeth engage in an interlocking relationship to hold said rings in said second expanded diameter configuration.

5,556,414

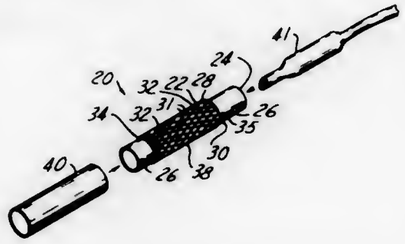
COMPOSITE INTRALUMINAL GRAFT

Zoltan G. Turi, West Bloomfield, Mich., assignor to Wayne State University, Detroit, Mich.

Filed Mar. 8, 1995, Ser. No. 400,902

Int. Cl.[6] A61M *29/00*

U.S. Cl. 606—198 **21 Claims**



1. An assembly for insertion into a body passageway comprising:

a. a cylindrical-shaped member having first and second ends, a longitudinal axis between said ends, one or more structural members between said ends defining a peripheral wall, and a longitudinal passage along said longitudinal axis between said ends, said cylindrical-shaped member having a first diameter which permits intraluminal delivery of said cylindrical-shaped member into a body passageway having a lumen, and second diameter greater than said first diameter, whereby said cylindrical-shaped member is expandable to contact or to expand the lumen of the body passageway;

b. a blood vessel within said longitudinal passage of said cylindrical-shaped member, said blood vessel being at least as long as said axial extent of said longitudinal passage and having a radial extent corresponding to the radial extent of said peripheral wall when said cylindrical-shaped member is in an expanded condition; and

c. securing means for securing said blood vessel within said cylindrical-shaped member to cause said blood vessel to move with said cylindrical-shaped member to and from said first diameter and said second diameter.

5,556,415

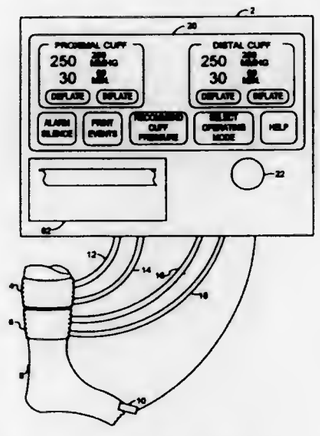
PHYSIOLOGIC TOURNIQUET FOR INTRAVENOUS REGIONAL ANESTHESIA

James A. McEwen, 10551 Bamberton Dr., Richmond, Canada, and Michael Jameson, 2365 Badger Rd., North Vancouver, Canada

Continuation-in-part of Ser. No. 935,785, Aug. 27, 1992, Pat. No. 5,352,195, which is a continuation-in-part of Ser. No. 471,514, Jan. 29, 1990, Pat. No. 5,254,087. This application Aug. 26, 1994, Ser. No. 297,256

Int. Cl.[6] A61B *17/12*

U.S. Cl. 606—202 **15 Claims**



1. Safety apparatus for dual cuff tourniquet system, comprising:

an inflatable and deflatable first cuff;

an inflatable and deflatable second cuff;

monitoring means for monitoring pressure in the first and second cuffs;

control means for permitting an operator to initiate inflation of the first and second cuffs above a minimum pressure level, and for permitting an operator to initiate deflation of the first and second cuffs; and

safety means connected to the monitoring means and to the control means and dependent upon the level of pressure in the first cuff for preventing deflation of the second cuff if the pressure level in the first cuff is beneath the minimum pressure level and for allowing deflation of the second cuff if the pressure level in the first cuff is not beneath the minimum pressure level.

5,556,416

ENDOSCOPIC INSTRUMENT

George A. Clark, East Windsor, N.J.; Steven K. Heisel, Buffalo; Arlen L. Johnson, Plymouth, both of Minn.; Chris Robinson, Lawrenceville, N.J., and Mark K. Dana, Shorewood, Minn., assignors to Valleylab, Inc., Boulder, Colo.

Filed Oct. 12, 1993, Ser. No. 134,560

Int. Cl.[6] A61B *17/00*

U.S. Cl. 606—205 **16 Claims**

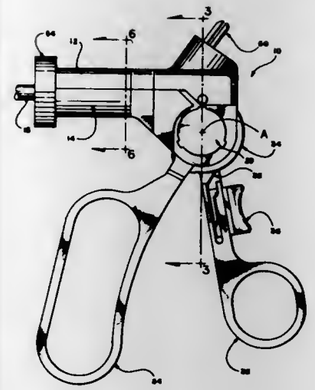
1. An endoscopic instrument comprising:

a. a housing with a central axis extending there through;

b. an instrument shaft extending from said housing;

c. an actuator mounted for sliding movement along said instrument shaft;

d. an end effector located at an end of said instrument shaft and connected to said actuator such that the end effector is selectively operable to first and second orientations by movement of said actuator relative to said instrument shaft;



e. a thumb handle mounted for rotation about said central axis and extending at least partly into said housing and configured for engaging at least the thumb of a user;

f. a finger handle mounted for rotation about said central axis and extending at least partly into said housing and configured for engaging at least one of the other fingers of the user;

g. a rocker arm for engaging said actuator and mounted for rotation about said central axis;

h. a first lock and release mechanism for selectively connecting a first of said thumb handle and said finger handle with said rocker arm, such that said first lock and release mechanism is selectively operable to release and lock positions, such that when said first lock and release mechanism connects said first handle to said rocker arm and said first look and release mechanism is in said lock position, said first handle rotates about said central axis relative to said housing with said rocker arm whereby said movement of said first handle relative to said housing causes said rocker arm to engage said actuator and thereby move said end effector from said first orientation toward said second orientation and, when said first lock and release mechanism is in said release position such that said first handle is not connected to said rocker arm, said first handle may rotate about said central axis relative to said housing independent of said rocker arm; and

i. a second lock and release mechanism for selectively connecting said second of said thumb handle and said finger handle with said housing such that said second lock and release mechanism is selectively operable to release and lock positions which, when said second lock and release mechanism connects said second handle to said housing and said first lock and release mechanism in the lock position, said second handle is fixed to rotate with said housing, and when said second lock and release mechanism is in the release position such that said second handle is not connected to said housing, said second handle is free to rotate about said central axis relative to said housing.

5,556,417

LUMINESCENT EYE FIXATION DEVICE

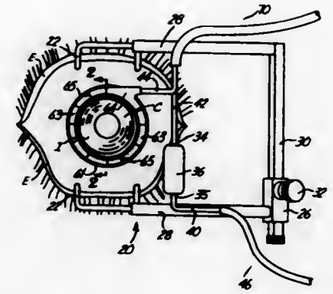
Neal A. Sher, Minneapolis, Minn., assignor to EyeFix, Inc., Minneapolis, Minn.

Filed Mar. 23, 1994, Ser. No. 216,726

Int. Cl.[6] A61F *9/00*; **A61B** *17/02*

U.S. Cl. 600—236 **17 Claims**

1. An ophthalmic instrument for fixating a patient's eye during an ophthalmic procedure, comprising a fixation structure adapted to engage a surface of the eye adjacent the cornea, at least a portion of the fixation structure including phosphorescent material visible to a physician in the dark, thereby enabling the physician to visualize the location of the ophthalmic instrument as a point of reference which can be used in a dark operating environment to determine the relative location of the cornea.



5,556,418

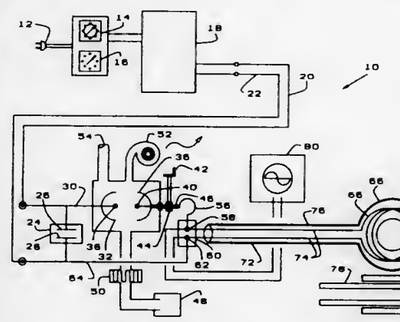
METHOD AND APPARATUS FOR PULSED MAGNETIC INDUCTION

Panagiotis T. Pappas, 13900 Panay Way, Marina Del Rey, Calif. 90292

Filed Jul. 6, 1993, Ser. No. 87,911

Int. Cl.[6] A61N *1/00*

U.S. Cl. 607—1 **17 Claims**



1. Apparatus for pulsed magnetic induction comprising:

means for creating a plasma containing at least one specific desired gaseous element,

means for supplying energy to excite atoms of said gaseous element to oscillate at characteristic radio eigenfrequencies and magnetic frequencies, and

means for inductively applying pulses of said radio eigenfrequencies and the magnetic frequencies produced to a target matter to cause selective absorption of energy by atoms of said specific element within said matter similar to the atoms of said specific element due to resonance.

5,556,419

IMPLANTABLE CARDIAC STIMULATOR WITH ANALYZER THAT CONTINOUSLY COMPARES RADIUS OF DERIVED HEART SIGNAL

Karin Jarverud, Stockholm, and Kjell Noren, Solna, both of Sweden, assignors to Pacesetter AB, Solna, Sweden

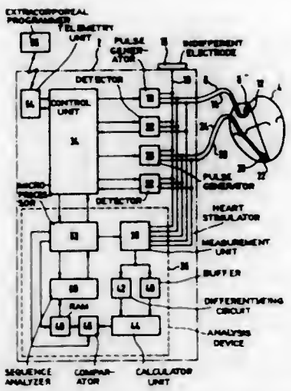
Filed Nov. 17, 1994, Ser. No. 342,051

Claims priority, application Sweden, Dec. 3, 1993, 9304029

Int. Cl.[6] A61B *5/04*; **A61N** *1/36*;*1/362*

U.S. Cl. 607—9 **22 Claims**

1. A device for analyzing electrical signals from a heart comprising:

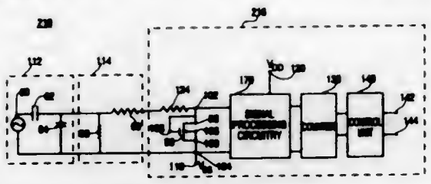


measuring means for generating a measurement signal related to electrical activity of a heart;

differentiating means, connected to said measurement means and receiving said measurement signal therefrom, for forming a first derivative of said measurement signal; and

evaluation means, connected to said measurement means and to said differentiating means and receiving said measurement signal and said first derivative of said measurement signal respectively therefrom, for plotting said measurement signal relative to said first derivative as coordinates in a coordinate system to obtain a resulting curve having a radius from said curve to an origin of said coordinate system, said radius exhibiting fluctuating values during each heart cycle of said heart, and for continuously monitoring said fluctuating values of said radius for identifying abnormal conditions of said heart dependent on said fluctuating values of said radius during each heart cycle.

5,556,420
INPUT PROTECTION CIRCUIT FOR PACEMAKER ACTIVITY SENSOR PROCESSING CIRCUITRY
Said Mortazavi, Sherman Oaks, and Alan Vogel, Saugus, both of Calif., assignors to Pacesetter, Inc., Sylmar, Calif.
Filed Dec. 29, 1994, Ser. No. 365,667
Int. Cl.[6] A61N *1/36*
U.S. Cl. 607—9 **32 Claims**



1. A rate responsive pacemaker, comprising:

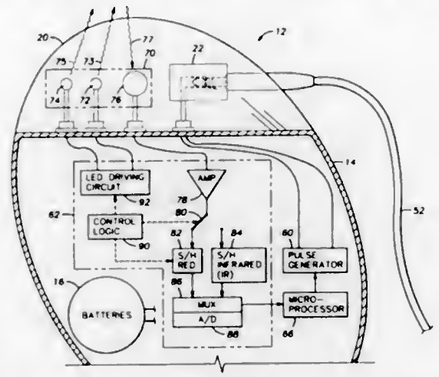
a pulse generator for generating pacing pulses at an adjustable rate;

a physiologic sensor for providing signals indicative of metabolic demand;

a processing and control circuit, coupled to the pulse generator and the physiologic sensor, for determining the rate at which the pulse generator generates pacing pulses in accordance with the signals provided by the physiologic sensor; and

a transistor circuit, coupled to the processing and control circuit and the physiologic sensor, for protecting the processing and control circuit from voltages generated by the physiological sensor that are greater than a first threshold and less than a second threshold.

5,556,421
IMPLANTABLE MEDICAL DEVICE WITH ENCLOSED PHYSIOLOGICAL PARAMETER SENSORS OR TELEMETRY LINK
David Prutchi, and Patrick J. Paul, both of Lake Jackson, Tex., assignors to Intermedics, Inc., Angleton, Tex.
Filed Feb. 22, 1995, Ser. No. 392,181
Int. Cl.[6] A61N *1/00*
U.S. Cl. 607—36 **48 Claims**



1. An implantable medical device for implantation into a living body, said device comprising:

a container having a chamber housing electrical components therein;

a header attached to said chamber;

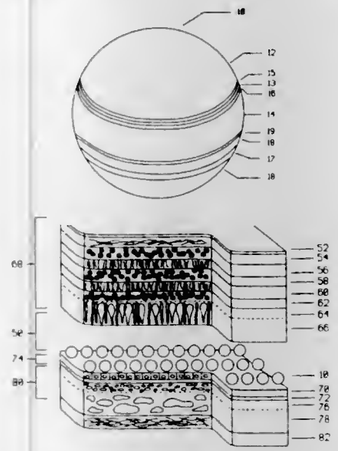
at least one sensor sealed and encapsulated within said header; and

leads electrically interconnecting said sensor and said electrical components.

5,556,422
METHOD FOR PREVENTING POSTSURGICAL DEEP VEIN THROMBOSIS BY ELECTRICAL STIMULATION
Jack H. Powell, III; Joseph J. Seaman, both of Newman; Russell A. Foley, Fayetteville, and JoAnn Leahy, Atlanta, all of Ga., assignors to Medtronic, Inc., Minneapolis, Minn.
Continuation of Ser. No. 987,851, Dec. 9, 1992, Pat. No. 5,358,513. This application Jun. 27, 1994, Ser. No. 266,089
Int. Cl.[6] A61N *1/36*
U.S. Cl. 607—48 **9 Claims**

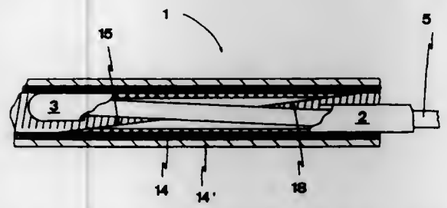
1. A method for preventing postsurgical deep vein thrombosis in a leg of a patient, the method comprising applying to the leg of the patient an electrical current which stimulates contraction of at least one muscle of anterior to anterior lateral compartments of the leg to produce foot dorsiflexion and passive stretching of posterior musculature soft tissue of the leg, said passive Stretching to be accomplished in the absence of any applied electrical current stimulating the contraction of gastrocnemius or soleus muscles, said dorsiflexion and stretching stimulated repeatedly by the application of the electrical current at a predetermined, regular interval whereby blood flow in the deep leg veins of said leg is increased.

5,556,423
INDEPENDENT PHOTOELECTRIC ARTIFICIAL RETINA DEVICE AND METHOD OF USING SAME
Alan Y. Chow, Wheaton, and Vincent Chow, Hanover Park, both of Ill., assignors to Alan Y. Chow, Wheaton, Ill.
Continuation-in-part of Ser. No. 56,672, May 3, 1993, Pat. No. 5,397,350. This application Apr. 20, 1994, Ser. No. 230,504
Int. Cl.[6] A61N *1/05*
U.S. Cl. 607—54 **39 Claims**



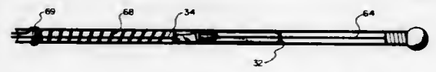
1. A method of producing artificially formed vision in an eye, comprising the step of introducing a plurality of discrete microscopic photoelectric devices into the subretinal space of the eye wherein at least some of said photoelectric devices include a capacitative storage element that produces opposite direction electrical currents in light and darkness, permitting formed vision of light and dark images as a result of light and dark images received by the retina.

5,556,424
LEAD EXTRACTOR WITH BEVELLED CLAMP
Manfred Hecheri, Efringen-Kirchen, and Jorg Reinhardt, Grenzach-Whylen, both of Germany, assignors to VascoMed Institut fur Kathetertechnologie GmbH, D-79576 Weil am Rhein, Germany
Filed Nov. 23, 1994, Ser. No. 344,136
Claims priority, application Germany, Nov. 25, 1993, 43 40 151.1
Int. Cl.[6] A61N *1/04;1/02;1/372*
U.S. Cl. 607—116 **10 Claims**



1. An extractor, for extracting cardiac pacemaker electrodes implanted in tissue, said extractor comprising an elongated flexible guide barrel having a distal end and a proximal end, said proximal end joined to a handle element, said distal end having a beveled face which is angled relative to the longitudinal axis of the guide barrel, a pull wire disposed in the guide barrel and having a distal end, the distal end of the pull wire connected to a clamping element, said clamping element having a bevelled end face which is substantially complementary to and faces the bevelled distal end face of the guide barrel, a longitudinal recess in said guide barrel and oriented in the axial direction of the guide barrel, the length of the bevelled distal end face of the guide barrel in the axial direction of the guide barrel corresponding to a multiple of the outside diameter of the guide barrel.

5,556,425
ESOPHAGEAL/STOMACH PLACEMENT ELECTRODE
Roy Hewson, Tamworth, N.H.; J. Richard Hewson, Plymouth, and Carl E. Hewson, Yarmouth, both of Mass., assignors to Brunswick Biomedical Technologies, Inc.
Filed Nov. 28, 1994, Ser. No. 345,529
Int. Cl.[6] A61N *1/05*
U.S. Cl. 607—124 **14 Claims**



8. An esophageal/stomach placement electrode for placing an electrode in a body comprising:

a tube having a proximal end and a distal end adapted to be inserted into an esophagus,

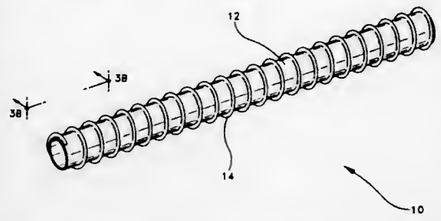
an electrode carried by said tube in the region of the distal end,

a rigidizing means for rigidizing a portion of said tube which is inside the tube and axially movable therein,

means for biasing said rigidizing means toward the distal end of the tube, and

an actuating mechanism for angularly displacing the distal end of the tube, said actuating mechanism being disposed entirely within the tube and controlled from a point external from the body for causing the distal end of the tube to angularly displace.

5,556,426
PTFE IMPLANTABLE TUBULAR PROSTHESES WITH EXTERNAL COIL SUPPORT
Nicholas Popadiuk, Hillsborough; Horng-Ban Lin, Pompton Lakes, and Richard J. Zdrahala, Montville, all of N.J., assignors to Meadox Medicals, Inc., Oakland, N.J.
Filed Aug. 2, 1994, Ser. No. 284,904
Int. Cl.[6] A61F *2/06;2/04*
U.S. Cl. 623—1 **14 Claims**



1. An implantable luminal device, comprising:

an elongate flexible tube of a first fluoropolymer, said tube having a node/fiber microstructure, which is sufficiently porous to permit tissue ingrowth when implanted in the body; and

a support component comprising at least one flexible filament of a second fluoropolymer, said at least one filament wrapped helically around an external wall of the tube;

170-920 O.G.-96-12: QL3

wherein said first and second fluoropolymers have substantially

the spring means include at least one pair of opposed coils, and said pair of opposed coils winds up in response to growth of

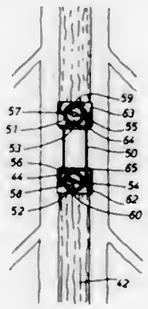
the joint heads (1, 8) are connected rigidly to each other, and the sockets (2, 9) are connected rigidly to each other;

wherein said first and second fluoropolymers have substantially the same crystalline melting point, said flexible filament being cosintered with and fused to said exterior wall of said tube.

5,556,427
ORBITAL IMPLANT AND METHOD
Jean-Francois Durette, 1170 East, Henri-Bourassa Blvd., Montreal, Quebec, Canada
Division of Ser. No. 206,956, Mar. 7, 1994. This application Jun. 7, 1995, Ser. No. 482,937
Int. Cl.[6] A61F 2/14
U.S. Cl. 623—4 **4 Claims**

1. A method for making an orbital implant for coupling with an ocular prosthesis to replace an eye following evisceration or enucleation, said method comprising: forming a generally spherical-shaped implant sized to replace the volume of the eye, the sphere being formed of an absorbable bio-material and having an anterior surface and a posterior surface when implanted; forming a passageway in the implant extending inwardly toward the center of the implant from the anterior surface; and inserting a peg of non-microporous material in the passageway to provide a means for direct integration of the implant with the ocular prosthesis.

5,556,428
APPARATUS AND METHOD FOR PROMOTING GROWTH AND REPAIR OF SOFT TISSUE
Mrugesh K. Shah, 4314 Montevideo, Pasadena, Tex. 77504
Filed Sep. 29, 1993, Ser. No. 128,809
Int. Cl.[6] A61F 2/08; A61B 17/08
U.S. Cl. 623—13 **9 Claims**



1. A removable biocompatible device for promoting growth of soft tissue comprising:
spring means having a first end and a second end:
attachment means for removably securing said first end of said spring means to a soft tissue;
fixation means for removably securing said second end of said spring means to a second point, such that tension is created by the spring means in the soft tissue, and in a direction along a line drawn from the attachment means to the second point, wherein:
the spring means include at least one pair of opposed coils, and said pair of opposed coils winds up in response to growth of attached soft tissue.

5,556,429
JOINT RESURFACING SYSTEM
Jeffrey C. Felt, Greenwood, Minn., assignor to Advanced Bio Surfaces, Inc., Greenwood, Minn.
Filed May 6, 1994, Ser. No. 239,248
Int. Cl.[6] A61F 2/28
U.S. Cl. 623—16 **17 Claims**

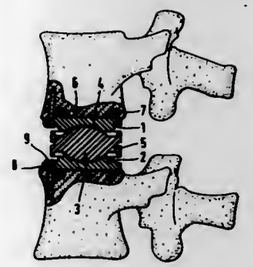
1. A method for repairing or resurfacing the site of an injured articulating joint, the method comprising the steps of:
(a) providing a curable biomaterial; and
(b) performing the surreal steps of:
(i) accessing and preparing the joint site for receipt of the biomaterial;
ii) delivering a quantity of the curable biomaterial to the prepared joint site;
(iii) curing the delivered biomaterial in such a manner that the cured biomaterial is permanently retained in apposition to the prepared site; and contouring the cured, retained biomaterial to achieve a desired conformation approximating that of the natural joint, wherein steps (i) through (iii) are each performed using minimally invasive surgical means.

5,556,430
FLEXIBLE MEMBRANCES PRODUCED FROM ORGANIC BONE MATRIX FOR SKELETAL REPAIR AND RECONSTRUCTION
El Gendler, 917 S. Shenandoah, Los Angeles, Calif. 90035
Division of Ser. No. 150,845, Nov. 12, 1993, Pat. No. 5,464,439, which is a division of Ser. No. 4,093, Jan. 13, 1993, Pat. No. 5,306,304, which is a continuation of Ser. No. 606,449, Oct. 31, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 468,963
Int. Cl.[6] A61F 2/28
U.S. Cl. 623—16 **3 Claims**

1. A method for the production of a flexible organic bone sheet having a predetermined thickness useful for the in vivo repair or replacement of preselected portions of an animal skeletal system comprising machining natural bone to form said continuous sheet having a thickness up into about 1.5 millimeters, and subsequently demineralizing said sheet, wherein the thickness of said sheet is such that the sheet has sufficient flexibility to allow the sheet to be shaped to conform to the configuration of a skeletal region to be repaired and sufficient tensile strength to allow the sheet to be so shaped without damage to the sheet.

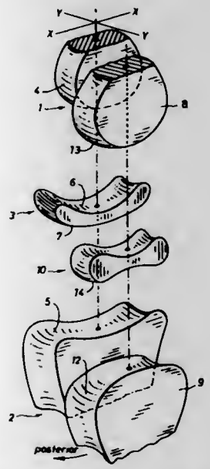
5,556,431
INTERVERTEBRAL DISC ENDOPROSTHESIS
Karin Büttner-Janz, Reetzer Weg 63, 0 - 1144 Berlin, Germany
Continuation of Ser. No. 28,978, Mar. 10, 1993, abandoned. This application Aug. 9, 1994, Ser. No. 287,701
Claims priority, application Germany, Mar. 13, 1992, 42 08 115.7
Int. Cl.[6] A61F 2/44
U.S. Cl. 623—17 **7 Claims**

1. An intervertebral disc endoprosthesis for insertion in a vertebral space between two confronting vertebrae to permit substantially full natural movement of the confronting vertebrae, the endoprosthesis comprising a bottom plate, a top plate parallel to the bottom plate and facing in an opposite direction therefrom, end an intermediate core having an articular surface defining a center of articulation of the endoprosthesis, each plate having a front edge, a rear edge, and an outer surface configured to be positioned within the vertebral space and to bear against one of the two



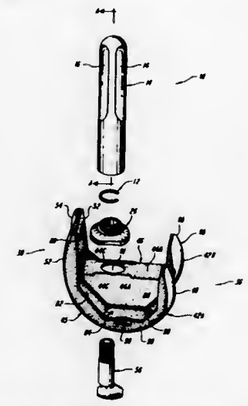
confronting vertebrae, at least one of the bottom and the top plates having means along the front edge for receiving at least one bone screw, said screw receiving means being arranged for positioning within the vertebral space and being configured to receive said bone screw at an angle that is within about thirty degrees of a right angle relative to the outer surface of the plate that also is positioned within the vertebral space, said articular surface of said endoprosthesis providing multidirectional articulation including rotation of the adjacent vertebrae and said center of articulation being spaced substantially from but displaced towards the rear edges of the plates.

5,556,432
ARTIFICIAL JOINT
Dietmar Kubein-Meesenburg, Kreiensen, and Hans Nagerl, Klein-Lengden, both of Germany, assignors to Joachim Theusner, Munchen, Germany
Filed Feb. 9, 1993, Ser. No. 15,206
Claims priority, application Germany, Dec. 11, 1991, 41 40 837.3; Jan. 31, 1992, 42 02 717.9
Int. Cl.[6] A61F 2/38
U.S. Cl. 623—20 **10 Claims**



1. An endoprosthesis for the human knee joint, comprising:
a first prosthetic joint consisting of a first joint head (1) and a first socket (2), and a second prosthetic joint consisting of a second joint head (8) and a second socket (9); wherein
the prosthetic joints are arranged in parallel to each other in such a manner that the respective rotational axes (X, Y,/X1, Y1) of both joints are parallel to each other and the second prosthetic joint is shifted to the back with respect to the first prosthetic joint in the sagittal plan;
the joint heads (1, 8) are connected rigidly to each other, and the sockets (2, 9) are connected rigidly to each other;
the joint heads (1, 8) and the sockets (2, 9) have longitudinal surface areas that are surface segments of a toms and that have functional surface areas in sagittal and frontal planes that are perpendicular with respect to each other, the functional planes presenting in each one of the individual planes a single circular cross section contour with constant radius;
the functional surface areas, with circular cross section contours, of the joint head and socket (1, 2) of the first prosthetic joint, in both planes, are shaped in a convex-concave shape, and the circular cross section contours of the functional surfaces of the joint head and socket (8, 9) of the second prosthetic joint are shaped in a convex—convex shape with radii (R_8, R_9) in the sagittal plane and are shaped in a convex-concave shape with radii (R_{81}, R_{91}) in the frontal plane; and
the joint geometry of the functional surface areas with respect to each other is determined in each of the two planes by a joint chain with two joint axes (M_1, M_2, M_{11}, M_{22}; M_8, M_9, M_{81}, M_{91}) of the functional surfaces with the radii (R_1, R_2, R_{11}, R_{22}, R_8, R_9, R_{81}, R_{91}) of the associated cross-section contours.

5,556,433
MODULAR KNEE PROSTHESIS
Stefan M. Gabriel, Lakeville, and David G. Sheenhan, Carver, both of Mass., assignors to Johnson & Johnson Professional, Inc., Raynham, Mass.
Filed Dec. 1, 1994, Ser. No. 347,828
Int. Cl.[6] A61F 2/38
U.S. Cl. 623—20 **22 Claims**



1. A modular knee prosthesis comprising
a femoral component having a pair of spaced apart condylar portions each having a superior, articulation surface and an inferior surface, the femoral component further including a boss structure disposed between and connecting the condylar portions, the boss structure having an inferior surface that extends, in a first orientation, generally horizontally in a transverse plane, and an opposed superior surface having a cavity formed therein that terminates in a substantially spherically-shaped endwall, wherein an aperture having an elongated configuration in the transverse plane extends between the inferior and superior surfaces of the boss structure;
an elongate stem member means for mounting within the medullary canal of a distal portion of a femur, the stem member having a closed proximal end and an open distal end;
a collar means for mounting upon the distal end of the stem member, the collar means having a distal surface that is substantially transverse to a longitudinal axis of the stem member when mounted thereon, the collar distal surface and

the inferior surface of the boss structure defining a selected

CHEMICAL

5,556,435
MIXTURES FIBER-REACTIVE DYES AND USE THEREOF FOR DYEING FIBER

-continued

(2b)

the inferior surface of the boss structure defining a selected mounting angle therebetween; and

at least one securing bolt for mounting within the aperture of the boss structure, the securing bolt having a head portion with a spherical first surface from which an elongate shaft portion extends, wherein the engagement between the spherically-shaped endwall of the boss structure and the spherical first surface of the bolt head within the aperture enables mounting at a plurality of mounting angles.

5,556,434

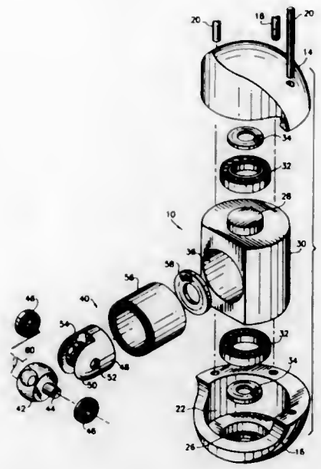
REPLACEMENT HIP JOINT

Norman Epstein, Rte. No. 301, Carmel, N.Y. 10512, and Steven B. Zelicof, 12 Seneca Rd., Scarsdale, N.Y. 10583

Filed Mar. 6, 1995, Ser. No. 398,891

Int. Cl.[6] A61F *2/34*

U.S. Cl. 623—22 **13 Claims**



1. An implantable artificial hip joint adapted to be inserted in a cavity of a natural acetabulum to simulate three axis of movement of a natural hip, said hip joint comprising:

an artificial hip joint housing configured to be positioned in the acetabulum of the user;

a horizontal swivel means having a central opening therein rotatably disposed within said hip joint housing;

a first rotatable bearing means for movably mounting said horizontal swivel means in said joint housing;

a universal assembly housed in said central opening of said horizontal swivel;

a second rotatable bearing means for movably mounting said universal assembly in said central opening of said horizontal swivel means; and

a stem removably mounted to said universal assembly, said stem configured to be implanted in the femur of the user whereby movement of said stem is translated into movement by said universal assembly and said horizontal swivel to simulate movement of the natural hip.

5,556,435

MIXTURES FIBER-REACTIVE DYES AND USE THEREOF FOR DYEING FIBER

Werner H. Russ, Flörsheim; Kurt Hussong, Bad Soden; Karl Krieger, Hünstetten, and Uwe Mrotzeck, Kelkheim, all of Germany, assignors to Hoechst AG, Germany

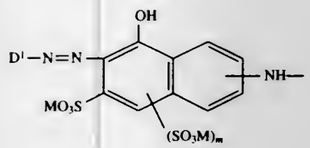
Filed May 2, 1995, Ser. No. 433,700

Claims priority, application Germany, May 2, 1994, 44 15 313.9

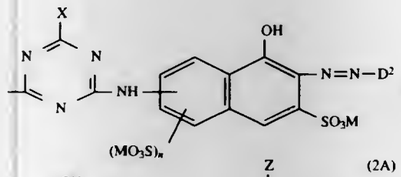
Int. Cl.[6] D06P *1/38;* **C09B** *67/22*

U.S. Cl. 8—549 **5 Claims**

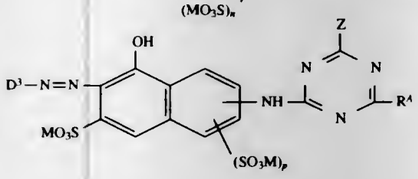
1. A dye mixture comprising one or more disazo dyes of the formula (1) and one or more monoazo dyes of the formula (2A) or (2B) or (2C) or a mixture of these monoazo dyes in a ratio of the dyes (1) to the dyes (2A), (2B) and (2C) of from 95 to 50% by weight: from 5 to 50% by weight:



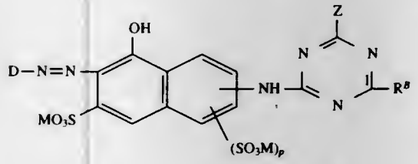
(1)



(2A)



(2B)

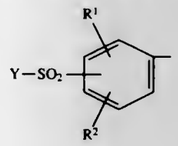


(2C)

in which:

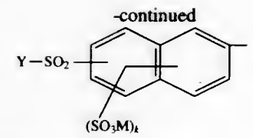
M is hydrogen or an alkali metal;

D^1 is a group of the formula (2a) or (2b)



(2a)

-continued



(2b)

in which

R^1 is hydrogen, methyl, ethyl, methoxy, ethoxy, sulfo or carboxy,

R^2 is hydrogen, methyl, ethyl, methoxy, ethoxy or sulfo,

Y is vinyl or is ethyl containing in the β-position a substituent which can be eliminated by alkali to form the vinyl group,

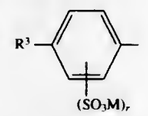
M is as defined above, and

k is the number zero, 1 or 2 (where if k is zero this group is hydrogen);

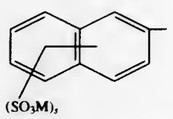
D^2 has one of the meanings given for D^1;

D^3 has one of the meanings given for D^1;

D is a group of the formula (3a) or (3b)



(3a)



(3b)

in which

R^3 is hydrogen, methoxy, ethoxy, methyl or ethyl,

M is as defined above,

r is the number zero, 1 or 2 (where if r is zero this group is hydrogen) and

s is the number 1, 2 or 3;

X is chlorine, fluorine, hydroxy, cyanoamino or alkylamino of 1 to 4 carbon atoms;

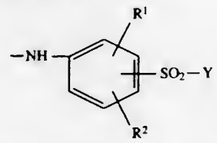
m is the number zero or 1 (where if m is zero this group is hydrogen);

n is the number zero or 1 (where if n is zero this group is hydrogen);

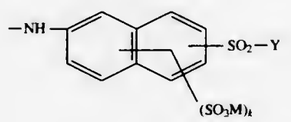
p is the number zero or 1 (where if p is zero this group is hydrogen);

Z is chlorine or fluorine;

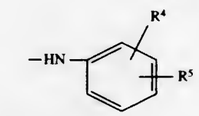
R^4 is chlorine, hydroxy, phenoxy, morpholino or a group of the formula (4a), (4b) or (4c)



(4a)



(4b)



(4c)

in which

R^1, R^2, Y, M and k are as defined above,

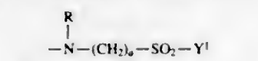
R^4 is hydrogen, sulfo, carboxy, methyl, ethyl, methoxy, ethoxy or hydroxy, and

R^5 is hydrogen, sulfo, methyl, ethyl, methoxy or ethoxy;

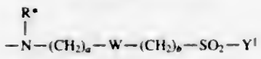
R^B is a group of the formula (5a), (5b) or (5c)

an oil mixture comprising a heavy oil fraction impregnated in

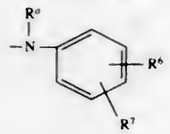
R^8 is a group of the formula (5a), (5b) or (5c)



(5a)



(5b)



(5c)

in which

Y^1 is vinyl or is ethyl substituted in the β-position by an alkali-eliminable substituent, the substituent being selected from alkanoyloxy of 2 to 5 carbon atoms, benzoyloxy, sulfobenzoyloxy, phenylsulfonyloxy, tolylsulfonyloxy, phosphato, sulphato, thiosulphato and dialkylamino with alkyls of 1 to 4 carbon atoms,

R is hydrogen or phenyl unsubstituted or substituted by 1 or 2 substituents from the group consisting of methyl, ethyl, methoxy, ethoxy, sulfo and carboxy, or is alkyl of 1 to 4 carbon atoms, or is a group of the formula $—(CH_2)_a—SO_2—Y^1$ where Y^1 is as defined above and a is the number 1, 2 or 3,

a is the number 1, 2 or 3,

b is the number 2 or 3,

W is a group of the formula —O— or —NH—,

R^8 is hydrogen or phenyl unsubstituted or substituted by 1 or 2 substituents from the group consisting of methyl, ethyl, methoxy, ethoxy, sulfo and carboxy, or is alkyl of 1 to 4 carbon atoms or is a group of the formula $—(CH_2)_a—W—(CH_2)_b—SO_2—Y^1$ where a, b, W and Y^1 are as defined above

Ro is hydrogen, methyl, ethyl or β-sulfoethyl,

R^6 is hydrogen, methyl, ethyl, methoxy, ethoxy, sulfo, carboxy, hydroxy or a group of the formula $—(CH_2)_a—SO_2—Y$ where Y and a are as defined above, and

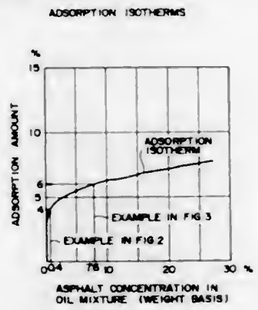
R^7 is hydrogen, methoxy, ethoxy or sulfo.

5,556,436

SOLID FUEL MADE FROM POROUS COAL AND PRODUCTION PROCESS AND PRODUCTION APPARATUS THEREFORE

Kazuhito Yagaki; Osamu Okuma; Takuo Shigehisa, and Tetsuya Deguchi, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Dec. 27, 1994, Ser. No. 364,753
Claims priority, application Japan, Dec. 27, 1993, 5-331729
Int. Cl.[6] C10L *1/32;9/00*
U.S. Cl. 44—626 **13 Claims**



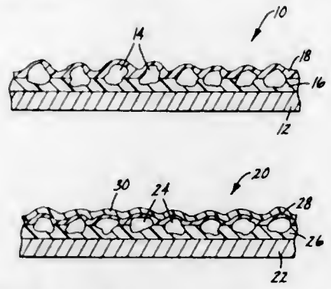
1. A solid fuel comprising:
a porous coal; and
an oil mixture comprising a heavy oil fraction impregnated in fine pores of said porous coal and a solvent fraction dispersing the heavy oil fraction for impregnating the fine pores of said porous coal.

5,556,437

COATED ABRASIVE HAVING AN OVERCOATING OF AN EPOXY RESIN COATABLE FROM WATER

Chong S. Lee, Woodbury, and Scott J. Buchanan, Minneapolis, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 610,701, Nov. 14, 1990, abandoned. This application Aug. 16, 1995, Ser. No. 515,748
Int. Cl.[6] B24D *3/34*
U.S. Cl. 51—298 **17 Claims**



1. A coated abrasive product comprising:
a. a backing;
b. a make coat overlying said backing;
c. a plurality of abrasive grains supported on and adherently bonded to said backing by means of said make coat; and
d. a size coat overlying said abrasive grains and said make coat, wherein said size coat is formed from a composition comprising an epoxy resin coatable from water, an emulsifier for said epoxy resin, a curing agent, a grinding aid dispersed in said epoxy resin, and water.

5,556,438

COMPOSITE ABRASIVE PRODUCTS

Gary J. Kardys, Wynantskill, and Robert G. Kelly, Latham, both of N.Y., assignors to Norton Company, Worcester, Mass.

Filed Sep. 21, 1994, Ser. No. 310,172
Int. Cl.[6] B24D *3/00*
U.S. Cl. 51—309 **8 Claims**

1. A composite abrasive product comprising a random nonwoven fibrous web with abrasive particles adhered thereto by means of an organic polymer wherein the abrasive particles are shaped particles of an abrasive material having a substantially uniform cross-sectional shape along a longitudinal axis and an aspect ratio of at least 1.5:1.

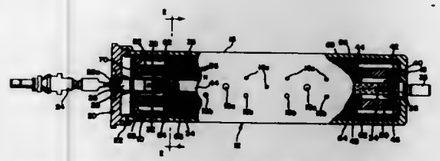
5,556,439

UNITARY FILTER FOR PYROTECHNIC AIR BAG INFLATOR

Linda M. Rink, Liberty, and Christopher Hock, Uintah, both of Utah, assignors to Morton International, Inc., Chicago, Ill.

Continuation of Ser. No. 114,211, Aug. 30, 1993, abandoned. This application Apr. 7, 1995, Ser. No. 418,910
Int. Cl.[6] B01D *46/00*
U.S. Cl. 55—487 **22 Claims**

1. A filter for a pyrotechnic airbag inflator, comprising:



a hollow, tubular sleeve formed of strong, rigid, carbonaceous open celled material covered with a ceramic coating, said sleeve having a gas permeability rating in the range of 10–50 CFM per square foot of surface area under a pressure drop of ½" of water; and
a tubular liner inside said sleeve formed of thin porous ceramic paper having a gas permeability rating of 30–200 CFM per square foot of surface area at a pressure drop of ½" of water.

5,556,440

PRESSURE-ACTUATED RADIAL AIR FILTER SEAL

Gene Mullins; Zemin Jiang, and Art P. Piccirilli, all of Cookeville, Tenn., assignors to Fleetguard, Inc., Nashville, Tenn.

Filed Oct. 20, 1994, Ser. No. 326,756
Int. Cl.[6] B01D *46/24*
U.S. Cl. 55—498 **5 Claims**

1. An annular filter seal for receipt by a generally cylindrical filter element which is installed within a generally cylindrical filter housing, said filter housing defining a hollow interior and having a substantially planar end panel which defines an end opening, said filter housing including a generally cylindrical outlet member which is assembled to said substantially planar end panel and which includes a center post portion that extends into said hollow interior, said filter seal comprising:
an annular body portion formed with an annular receiving channel which is sized to receive one end of said filter element; and
an annular sealing lip portion disposed in spaced relation to said receiving channel and including a radial-sealing surface configured with two inwardly directed curved annular ribs constructed and arranged to provide radial sealing against the center post portion of said outlet member while in tension, said two inwardly directed curved annular ribs being axially separated by an annular recess of a concave radiused cross section, said annular sealing lip portion further including a radiused annular axial-sealing surface which is constructed and arranged to provide axial sealing against the substantially planar end panel of said housing when said axial-sealing surface is in compression, said axial-sealing surface being connected to one of said two curved annular ribs by an annular inclined portion.

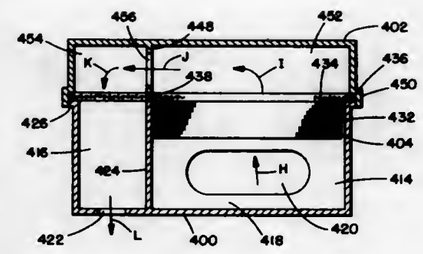
5,556,441

AIR FILTER FOR INTERNAL COMBUSTION ENGINE

Robert A. Courtwright, Evans, and Edgar Grisby, Jr., Augusta, both of Ga., assignors to Textron Inc., Providence, R.I.

Division of Ser. No. 156,811, Nov. 22, 1993. This application May 5, 1995, Ser. No. 435,199
Int. Cl.[6] B01D *46/00*
U.S. Cl. 055—502 **4 Claims**

1. An air filter for an internal combustion engine comprising:
a filter element;



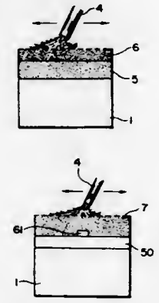
a substantially flat support connected to one side of the filter element, the flat support having apertures therethrough to allow air to pass through the support; and a seal connected to a perimeter of the flat support wherein the air filter has a first section and a second section, the first section is comprised of the entire filter element, a first portion of the flat support, and a first portion of the seal, the second section is comprised of a remaining second portion of the flat support and a second portion of the seal, and a remaining third portion of the seal is located at a junction between the first and second sections, wherein the second portion of the flat support is substantially open with the filter element being located only against the first portion of the flat support, and the first and second portions of the flat support are spaced from each other by the third portion of the seal.

5,556,442

METHOD FOR FABRICATING AN OPTICAL WAVEGUIDE

Hiroo Kanamori; Akira Urano; Haruhiko Aikawa; Shinji Ishikawa; Chisai Hirose, and Masahide Saito, all of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 986,001, Dec. 4, 1992, Pat. No. 5,385,594. This application Jun. 23, 1994, Ser. No. 264,301
Claims priority, application Japan, Dec. 6, 1991, 3-323093
Int. Cl.[6] C03C *17/00;* **G02B** *6/10*
U.S. Cl. 65—17.4 **7 Claims**



1. A process for forming an optical waveguide, comprising the steps of:
(a) depositing glass soot on a substrate by Flame Hydrolysis Deposition to form a first porous vitreous layer having a first bulk density,
(b) forming a second porous vitreous layer having a second bulk density in a top surface of the first porous vitreous layer, where the second bulk density is larger than the first bulk density and a surface of said second porous vitreous layer is exposed in the step (b);
(c) depositing glass soot containing a refractive index increasing dopant on the second porous vitreous layer by Flame

Hydrolysis Deposition to form a third porous vitreous layer having a third bulk density; and

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5,556,444

GLASS SHEET BENDING METHOD

chamber by injecting steam at a temperature of from about 212 degrees F. to about 500 degrees F. into said rotatable

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5,556,448

ELECTROSTATIC PRECIPITATOR THAT OPERATES IN

Hydrolysis Deposition to form a third porous vitreous layer having a third bulk density; and

(d) heating the first, second, and third porous vitreous layers to form an under cladding portion and a core portion comprising transparent glass layers, the under cladding portion being formed from the first and second porous vitreous layers and said core portion being formed from said third porous vitreous layer.

5,556,443

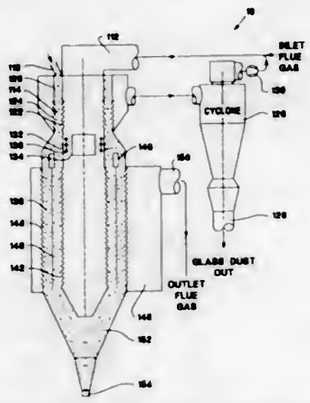
METHOD FOR CULLET PREHEATING AND POLLUTION EMISSION REDUCTION IN THE GLASS MANUFACTURING PROCESS

Jeffery C. Alexander, Newbury, Mass., assignor to Edmeston AB, Vastra Frounda, Sweden

Continuation of Ser. No. 998,836, Dec. 29, 1992, abandoned. This application Mar. 18, 1994, Ser. No. 210,083

Int. Cl.[6] C03B *5/237*

U.S. Cl. 65—27 **12 Claims**



1. A method for reducing particulate pollution emission from glass furnace exhaust gases, comprising the steps of:

(a) providing a first bed of moving raw cullet, the raw cullet having impurities adhered to its surface including moisture and fine glass dust material;

(b) passing glass furnace exhaust gases through the raw cullet, the exhaust gases containing particulates and condensible acids, the velocity of the exhaust gases through the raw cullet being such that the exhaust gases are cooled to a temperature above the acid dew point;

(c) entraining substantially all of the moisture and fine glass dust material from the raw cullet into the glass furnace exhaust gases passing therethrough and thereafter separating the fine glass dust material from the exhaust gases;

(d) heating the raw cullet to a temperature above the acid dew point of the exhaust gases, thereby forming cleaned, preheated cullet;

(e) electrostatically ionizing the particulates in the cooled exhaust gases exiting the raw cullet in the first bed;

(f) forming a second bed of moving cullet with the cleaned, preheated cullet from the first bed;

(g) electrically polarizing the cullet in the second bed;

(h) passing the cooled exhaust gases through the electrically polarized cullet in the second bed and depositing thereon substantially all of the electrostatically ionized particulates in the cooled exhaust gases, thereby forming cleaned exhaust gases;

(i) discharging the cleaned exhaust gases; and

(j) discharging the cullet in the second bed, including the deposited particulates and dust material, to the glass melting furnace.

5,556,444

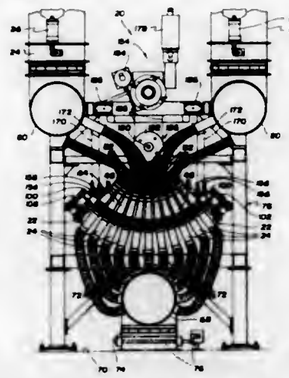
GLASS SHEET BENDING METHOD

Pauli T. Reunamaki, Perrysburg, Ohio, assignor to Glasstech, Inc., Perrysburg, Ohio

Division of Ser. No. 138,739, Oct. 18, 1993, Pat. No. 5,498,275. This application Oct. 23, 1995, Ser. No. 551,909

Int. Cl.[6] C03B *23/023*

U.S. Cl. 65—106 **6 Claims**



1. A method for bending a heated glass sheet comprising:

locating the heated glass sheet between a pair of opposed deformable molds each of which includes mold members;

supporting the mold members of the deformable molds by a pair of linkages each of which includes connector links extending therebetween and fixedly connected thereto as well as having pivotal connections to each other about axes that are moved to extend parallel to the glass sheet throughout the bending; and

bending the deformable molds with both molds engaging The glass sheet to provide the bending thereof as control links of the linkages are moved such that pivotal connections thereof to the connector links have axes that are maintained perpendicular to the glass sheet throughout the bending.

5,556,445

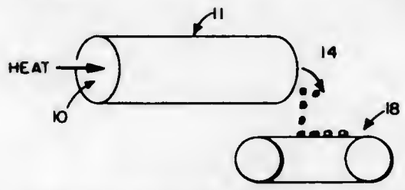
STEAM TREATMENT OF MUNICIPAL SOLID WASTE

Mark K. Quinn, 210 Baronne St., New Orleans, La. 70112, and Bruce E. Unangst, Slidell, La., assignors to Mark K. Quinn, New Orleans, La.

Continuation of Ser. No. 996,132, Feb. 23, 1993, abandoned, which is a continuation of Ser. No. 681,765, Apr. 8, 1991, abandoned. This application Sep. 22, 1994, Ser. No. 310,574

Int. Cl.[6] B09B *3/00*; **A61L** *11/00*

U.S. Cl. 71—11 **1 Claim**



1. A method for treating solid municipal waste material containing inorganic and organic waste comprising:

a. feeding said waste material into a rotatable chamber having a first end for receiving said waste material and a second end for discharging waste material from said rotatable chamber, said rotatable chamber being open to the atmosphere,

b. adding water to said rotatable chamber,

c. heating said waste material in said chamber from about 10 minutes to about 90 minutes while rotating said rotatable chamber by injecting steam at a temperature of from about 212 degrees F. to about 500 degrees F. into said rotatable chamber to heat said waste material to a temperature of from about 212 degrees F. to about 500 degrees F. to sterilize waste material and soften said organic waste material,

d. conveying said waste material through said rotatable chamber and removing treated waste material from said rotatable chamber while said rotatable chamber is rotating and said steam is being injected, and

e. separating a portion of said inorganic waste from said organic waste.

5,556,446

MACHINABLE BRASS COMPOSITIONS

Paul E. Matthews, Lawrenceville, N.J., and Thomas W. Pelletiers, II, Bethlehem, Pa., assignors to United States Bronze Powders, Flemington, N.J.

Continuation of Ser. No. 94,017, Sep. 29, 1993, Pat. No. 5,445,665. This application May 19, 1995, Ser. No. 445,178

Claims priority, application United Kingdom, Jan. 29, 1991, 9101828

Int. Cl.[6] C22C *9/04*

U.S. Cl. 75—255 **14 Claims**

1. A brass powder metallurgy composition for use in manufacturing a brass part by powder metallurgy techniques, said composition comprising:

(a) from about 70–90 percent by weight copper;

(b) from about 10–30 percent by weight zinc; and

(c) from about 0.1–1.5 percent by weight graphite as an addition to improve the machinability of the resultant brass part.

5,556,447

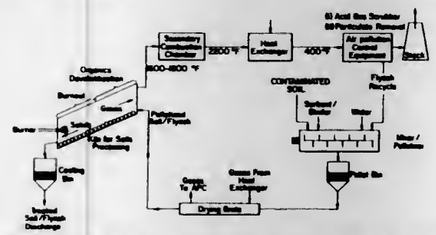
PROCESS FOR TREATING METAL-CONTAMINATED MATERIALS

Srivats Srinivasachar, Sturbridge; Joseph Morency, Salem, both of Mass., and Daniel C. Itse, Fremont, N.H., assignors to Physical Sciences, Inc., Andover, Mass.

Filed Jan. 23, 1995, Ser. No. 256,552

Int. Cl.[6] C22B *43/00*

U.S. Cl. 75—670 **35 Claims**



1. A process for treating waste, soils or other material contaminated with mercury in order to render the mercury non-leachable, comprising:

a. heating the waste, soils or other material to a temperature sufficient to volatilize the mercury and to form a gas stream having mercury vapor and ash particles entrained therein;

b. providing in contact with the gas stream a carbonaceous material which adsorbs the mercury thereby removing it from the gas stream, and removing the carbonaceous material with the mercury adsorbed thereon from the gas stream;

d. separating the carbonaceous material from the ash particles; and

e. recovering the mercury by heating the mercury-laden carbonaceous material in the presence of a purge gas to a temperature sufficient to volatilize the mercury thereby forming a gas stream containing mercury Vapor and cooling the gas stream to a temperature sufficient to condense the mercury.

5,556,448

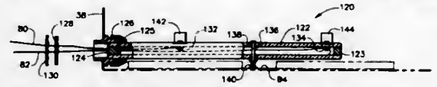
ELECTROSTATIC PRECIPITATOR THAT OPERATES IN CONDUCTIVE GREASE ATMOSPHERE

William A. Cheney; John T. Grady, Jr., both of Cincinnati, Ohio; Victor L. Sellers, Park Hills, Ky.; Kevin Lefler, New Richmond, and Robert S. Wilks, Loveland, both of Ohio, assignors to United Air Specialits, Inc., Cincinnati, Ohio

Filed Jan. 10, 1995, Ser. No. 370,865

Int. Cl.[6] B03C *3/68*

U.S. Cl. 95—6 **10 Claims**



7. In an improved high-voltage power supply that contains an input rectifier stage, a switching regulation stage, and a step-up high voltage rectification output stage, the improvement comprising: an output current detector that creates a first signal related to the total output current being supplied by said power supply; a first comparator that determines whether or not said first signal is greater than a first predetermined magnitude and creates a second signal; a first timer that receives said second signal from the first comparator and, when said second signal is active, said first timer runs in an ON-delay mode until it times out, thereby creating a third signal which energizes a first warning lamp; a second comparator that determines whether or not said first signal is greater than a second predetermined magnitude and creates a fourth signal; a second timer that receives said fourth signal from the second comparator and, when said fourth signal is active, said second timer runs in an ON-delay mode until it times out, thereby creating a fifth signal which energizes a second warning lamp and energizes a clamping circuit that clamps the allowable total output current of said power supply to a maximum value substantially equal to a value corresponding to said second predetermined magnitude.

9. A method of supplying high-voltage power using a power supply that contains an input rectifier stage, a switching regulation stage, and a step-up high voltage rectification output stage, the improvement comprising the steps of: detecting the total output current being supplied by said power supply; determining whether or not said total output current is greater than a first predetermined magnitude; waiting for a first predetermined time interval and illuminating a first warning lamp if said total output current is continuously greater than said first predetermined magnitude for the entire first predetermined time interval; determining whether or not said total output current is greater than a second predetermined magnitude; waiting for a second predetermined time interval and illuminating a second warning lamp if said total output current is continuously greater than said second predetermined magnitude for the entire second predetermined time interval, and clamping the allowable total output current to a value substantially equal to said second predetermined magnitude.

5,556,449

ACID GAS FRACTIONATION PROCESS FOR FOSSIL FUEL GASIFIERS

Richard W. Baker, Palo Alto, and Kaaeid A. Lokhandwala, Menlo Park, both of Calif., assignors to Membrane Technology and Research, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 143,283, Oct. 25, 1995, Pat. No. 5,401,300, Ser. No. 143,285, Oct. 25, 1993, Pat. No. 5,407,466, and Ser. No. 143,496, Oct. 25, 1993, Pat. No. 5,407,467. This application Mar. 27, 1995, Ser. No. 411,329

Int. Cl.[6] B01D *53/22*;*53/14*

U.S. Cl. 95—49 **34 Claims**

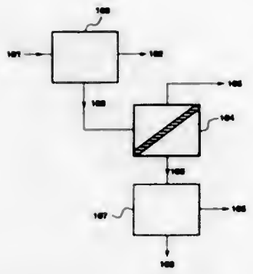
1. A process for treating a gas stream from a fossil fuel gasification process, said gas stream comprising hydrogen sulfide and carbon dioxide, and said process comprising:

(a) carrying out an acid gas removal step on said gas stream from said fossil fuel gasification process, thereby generating an acid gas stream enriched in said hydrogen sulfide and said carbon dioxide compared with said gas stream;

b) from about 10 weight percent to about 20 weight percent imidazoline;

C) aldehydes and aldehyde acetals,

D) alcohols having at least two hydroxyl groups, and, optionally,



(b) carrying out a membrane fractionation step, comprising:
(i) passing said acid gas stream across the feed side of a fractionation membrane having a feed side and a permeate side;
(ii) withdrawing from said feed side a residue stream depleted in said hydrogen sulfide compared with said acid gas stream;
(iii) withdrawing from said permeate side a permeate stream enriched in said hydrogen sulfide compared with said acid gas stream;
said membrane fractionation step being characterized in that said fractionation membrane exhibits a mixed gas selectivity for said hydrogen sulfide over said carbon dioxide of at least about 3, as measured with mixtures containing at least said hydrogen sulfide and said carbon dioxide and at a feed pressure of at least 200 psig;
(c) further treating said permeate stream in a sulfur-fixing step.

5,556,450

NEUTRAL SELF-SHINE EMULSION FOR THE CARE OF FLOORS (III)

Birgit Skodell; Rainer Osberghaus, both of Duesseldorf; Karl-Heinz Rogmann, Ratingen; Heiko Faubel, Wermelskirchen, and Harald Bousek, Duesseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP93/03487, § 371 Date Jun. 21, 1995, § 102(e) Date Jun. 21, 1995, PCT Pub. No. WO94/14909, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 10, 1993, Ser. No. 464,664

Claims priority, application Germany, Dec. 22, 1992, 42 43 472.6

Int. Cl.[6] C09D *191/06;191/08*

U.S. Cl. 106—10 **6 Claims**

1. An aqueous, floor care, self-shine emulsion composition having a pH of 5 to 9, said composition comprising from 2 to 50% by weight of a natural or synthetic wax selected from the group consisting of montan ester wax, paraffin wax, carnauba wax, and mixtures thereof, and from 1% to 5% by weight of an alcohol selected from the group consisting of benzyl alcohol, 2-phenylethanol, 2-phenoxyethanol and mixtures thereof.

5,556,451

OXYGEN INDUCED CORROSION INHIBITOR COMPOSITIONS

Ljiljana V. Minevski, The Woodlands, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Jul. 20, 1995, Ser. No. 504,635

Int. Cl.[6] C23F *11/00*

U.S. Cl. 106—14.13 **8 Claims**

7. A composition effective for inhibiting oxygen induced corrosion of metals in contact with an aqueous solution, said composition comprising:
a) from about 1 weight percent to about 15 weight percent hydroxybenzoic acid;
b) from about 10 weight percent to about 20 weight percent imidazoline;
c) from about 20 to about 70 weight percent heavy aromatic naphtha;
d) up to about 40 weight percent C_2–C_6 alkanol;
e) up to about 15 weight percent dimer trimer acid;
f) up to about 10 weight percent C_2–C_6 alkanoic acid;
g) up to about 10 weight percent C_2–C_6 alkanediol; and
h) up to about 20 weight percent polymerized tall oil fatty acid.

5,556,452

MOULDING MATERIALS AND SPINNING MATERIALS CONTAINING CELLULOSE

Wolfram Kalt, Lenzing; Johann Männer, Weyregg, and Heinrich Firgo, Vöcklabruck, all of Austria, assignors to Lenzing Aktiengesellschaft, Lenzing, Austria

Filed Aug. 19, 1994, Ser. No. 293,056

Claims priority, application Austria, Sep. 14, 1993, 1857/93

Int. Cl.[6] C08L *1/02;1/24;* **C09D** *101/02;101/24*

U.S. Cl. 106—166.01 **35 Claims**

1. A composition for moulding or spinning comprising cellulose, aqueous tertiary amine oxide, nonsolvent, and a stabilizer component comprising one or more stabilizers which altogether have a basic and an antioxidant action wherein said stabilizer having basic action is a nonphosphate material and said stabilizer component having antioxidant action comprises an antioxidant selected from the group consisting of tannins, phenols, glyceraldehyde, and one or more organic compounds having at least four carbon atoms and at least two conjugated double bonds, wherein the organic compound contains at least two selected from the group consisting of hydroxyl and an amino group having at least one hydrogen atom, and combinations thereof.

5,556,453

METHOD OF INCREASING MISTING IN SPRAYABLE DISPERSION OF COLLIDAL SILICA WITH XANTHAN GUM

Robert A. LaBrash, Roseville, and Stephen M. Willging, Minneapolis, both of Minn., assignors to H. B. Fuller Licensing & Financing Inc., Arden Hills, Minn.

Division of Ser. No. 81,543, Jun. 23, 1993, abandoned. This application May 12, 1995, Ser. No. 439,999

Int. Cl.[6] C09D *105/00;7/12*

U.S. Cl. 106—205.01 **8 Claims**

1. The method of decreasing the misting of sprayable non-skid compositions of aqueous dispersions of colloidal silica comprising including in the composition a quantity of xanthan gum, wherein the amount of gum is about 0.15 parts or greater, based on a composition of 100 parts.

5,556,454

MODIFIED NATURAL RESIN ESTERS, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS BINDER RESINS IN PRINTING INKS

Albert Bender, Mainz, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Feb. 1, 1995, Ser. No. 381,771

Claims priority, application Germany, Feb. 4, 1994, 44 03 547.0

Int. Cl.[6] C09D *11/08;193/00*

U.S. Cl. 106—218 **8 Claims**

1. A toluene-soluble modified natural resin ester prepared by reacting at least one compound from each of the following substance groups A) to D)
A) natural resins and natural resin acids,
B) monocyclic and polycyclic phenols which are polyfunctional towards oxo compounds,
C) aldehydes and aldehyde acetals,
D) alcohols having at least two hydroxyl groups, and, optionally, further compounds selected from the substance groups:
E) α,β-ethylenically unsaturated carboxylic acids and their anhydrides,
F) fatty acids and fatty acid esters,
G) ethylenically unsaturated monomers,
H) ethylenically unsaturated hydrocarbon resins in the presence of
I) lithium compounds
at a temperature of from 100° to 300° C. with elimination of water.

5,556,455

Patent Not Issued For This Number

5,556,456

PIGMENT COMPOSITIONS

Hiroki Inoue, Osaka; Yoshiaki Hayashi, Hyogo; Hideki Senba, Osaka; Keisuke Ito, Osaka, and Makoto Akita, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

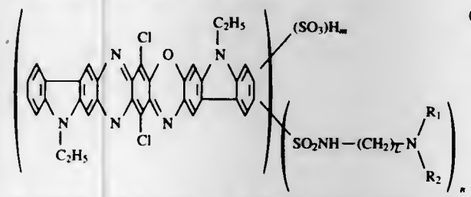
Filed Dec. 27, 1994, Ser. No. 363,882

Claims priority, application Japan, Dec. 27, 1993, 5-333786

Int. Cl.[6] C08K *5/00*

U.S. Cl. 106—494 **4 Claims**

1. A pigment composition which comprises an organic pigment and (a) a dioxazine pigment derivative represented by the following formula (I) in the free acid form;



(I)

wherein R_1 and R_2 are same or different and each represents a substituted or unsubstituted, saturated or unsaturated aliphatic hydrocarbon group having up to 20 carbon atom or an aromatic hydrocarbon group, or R_1 and R_2, together with the nitrogen atom to which they are attached, form a heterocyclic ring which may contain an additional hereto atom selected from nitrogen, oxygen and sulfur; L is an integer of 1–6; m is 0.5–3; and n is 0.5–3.5 provided that total of m and n is 1–5, or (b) a mono-, di- or trivalent metal, ammonium or organic amine salt thereof.

5,556,457

RECOVERY OF STEEL PLANT REVERT MATERIALS THROUGH CEMENTITIOUS AGGLOMERATION

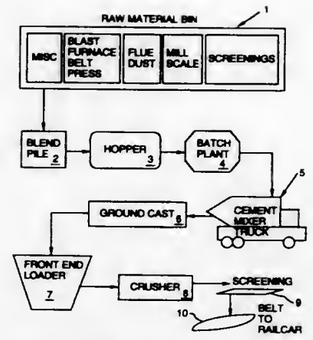
Raymond R. Terza, McMurray, and Eugene A. Bogdan, North Huntingdon, both of Pa., assignors to USX Corporation, Pittsburgh, Pa.

Filed Apr. 21, 1995, Ser. No. 426,107

Int. Cl.[6] C04B *18/04;18/14*

U.S. Cl. 106—697 **9 Claims**

1. A process for recovery of iron, carbon and flux units contained in revert materials comprising iron and steelmaking waste materials including blast furnace flue dust and sludge, said method comprising mixing the revert materials together, adding sufficient water to increase the moisture content of the revert materials to about 14 to 20 percent by weight, then adding Portland cement as a sole binder in an amount of about 10 to 15% by weight of the revert/cement mixture, mixing the wet revert materials and cement



together to form a mixture, casting the mixture, curing the cast mixture to hydrate the cement thereby improving the high-temperature strength of the cast material, breaking the cast material into particles suitable for recycling into a blast furnace, and recycling the particles into a blast furnace.

5,556,458

CEMENTITIOUS COMPOSITIONS

John W. Brook, Mantua; David F. Factor, Hiram; Frederick D. Kinney, Broadview Hts., all of Ohio; Celeste L. McCallen, Wexford, Pa., and Andrea M. Young, Redondo Beach, Calif., assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 55,612, Apr. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 10,681, Jan. 28, 1993, abandoned, which is a continuation of Ser. No. 800,786, Nov. 27, 1991, abandoned. This application Oct. 6, 1994, Ser. No. 320,847

Claims priority, application Switzerland, Nov. 18, 1992, 3538/92

Int. Cl.[6] C04B *7/12;24/04;28/04*

U.S. Cl. 106—708 **20 Claims**

1. A cementitious composition consisting essentially of
(a) 20–27% by weight of a cementitious material;
(b) 50–80% by weight of a fly ash which has a calcium oxide content of from 15–45% by weight of said fly ash;
(c) 0.5–8% by weight of a hydroxytricarboxylic acid or salt thereof; and
(d) a water-soluble source of alkali metal ions in an amount of at least 0.5% by weight based on the total weight of (a) and (b), the % by weight in (a), (b) and (c) being based on the total weight of (a), (b) and (c).

5,556,459

METHOD FOR THE REDUCTION OF SO_2 EMISSIONS AS GENERATED BY THE FLUID BED CEMENT PROCESS

Sidney M. Cohen, 2518 Washington St., Allentown, Pa. 18104, and Michael E. Prokesch, 3008 Old Bethlehem Pike, Zionhill, Pa. 18981

Filed Jun. 8, 1995, Ser. No. 482,927

Int. Cl.[6] C04B *7/45*

U.S. Cl. 106—744 **20 Claims**

12. A process of producing cement clinker in a fluidized bed comprising the steps of:
preparing a feed material for the fluidized bed by combining cement forming raw materials with a carbon bearing material fuel source for the fluidized bed and a source of potassium bearing material to form a mixture and forming the mixture into nodules;
establishing and maintaining a fluidized bed of the feed material by supplying the nodules to a vessel and passing air upwardly

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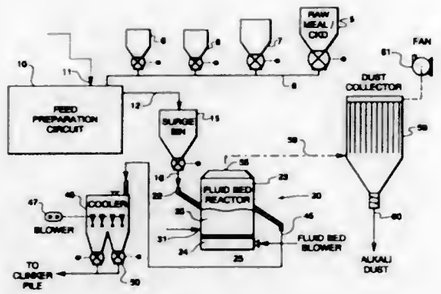
5,556,463

CRYSTALLOGRAPHICALLY ORIENTED GROWTH OF

irradiating a periphery of the flange of the vibration plate with at



through the material within the vessel at a velocity sufficient to maintain the nodules in a fluidized state;

thermally processing the feed material within the fluidized bed by combustion of the carbon bearing material in an amount sufficient to provide from 60 to 90% of the fuel needed to maintain the fluidized bed at a temperature in the range of approximately 2350° to 2450° F. and supplying the balance of the fuel needed to the fluidized bed to produce cement clinker and a gaseous stream including SO_2, and

reacting potassium from the add-on potassium source with SO_2 to produce potassium sulfate solids;

filtering the potassium sulfate solids from the gas stream; and

discharging cement clinker from the vessel.

5,556,460

DRYING SHRINKAGE CEMENT ADMIXTURE

Neal S. Berke, Chelmsford, Mass.; Michael P. Dallaire, Dover, N.H.; Ellis M. Gartner, Silver Spring; Awdhoot V. Kerkar, Columbia, both of Md., and Timothy J. Martin, West Sussex, England, assignors to W.R. Grace & Co.-Conn., New York, N.Y.

Filed Sep. 18, 1995, Ser. No. 529,389

Int. Cl.[6] C09D 7/12; C08L 71/02

U.S. Cl. 106—823 **11 Claims**

1. A cement admixture capable of enhancing inhibition of drying shrinkage comprising a mixture of:

A) at least one oxyalkylene glycol, oxyalkylene ether glycol or mixtures thereof having a molecular weight of up to about 4000; and

B) a comb polymer of a molecular weight of from 2,000 to 100,000 having (i) carboxylic acid anhydride, free carboxylic acid or its ammonium, alkali or alkaline earth metal salt and (ii) C_2–C_5 oxyalkylene units or mixtures of said units, wherein said units (i) or (ii) being pendant from the polymer backbone chain and said units (ii) provide the majority of the molecular weight of said polymer

said component A and component B are in a weight ratio of 1:1 to 100:1.

5,556,461

METHOD FOR PRODUCING A SILICON SINGLE CRYSTAL BY A FLOAT-ZONE METHOD

Masanori Kimura, and Hirotoshi Yamagishi, both of Annaka, Japan, assignors to Shin-Etsu Handotai Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1994, Ser. No. 260,919

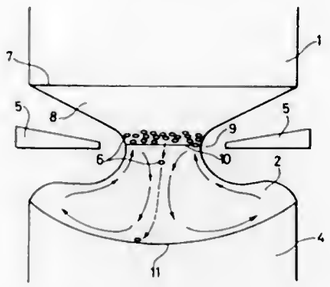
Claims priority, application Japan, Jun. 18, 1993, 5-147231

Int. Cl.[6] C30B 13/02

U.S. Cl. 117—52 **13 Claims**

1. A method of producing a silicon single crystal by the floating-zone method, comprising the steps of:

providing a polysilicon rod having an average grain length of 10 to 1000 μm;



heating a portion of the polysilicon rod to form a molten zone while applying a magnetic field of 300 to 1000 gauss to the molten zone;

passing the molten zone through the length of the polysilicon rod, thereby converting the polysilicon rod into a silicon single crystal ingot through a one-pass zoning of the floating zone method; and

post-heating the silicon single crystal being grown.

5,556,462

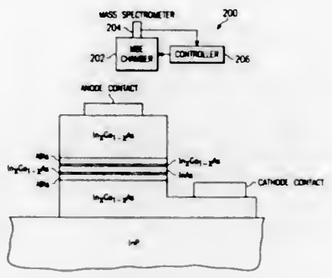
GROWTH METHOD BY REPEATEDLY MEASURING FLUX IN MBE CHAMBER

Francis G. Celii; Yung-Chung Kao, both of Dallas, and Andrew J. Purdes, Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 133,699, Oct. 8, 1993, Pat. No. 5,399,521. This application Dec. 5, 1994, Ser. No. 349,713

Int. Cl.[6] C30B 23/00

U.S. Cl. 117—85 **6 Claims**



1. A method of molecular beam epitaxy layer growth, comprising the steps of:

directing a first beam of first growth species at a wafer in a growth chamber;

repeatedly measuring first flux of reflection of said first beam from said wafer to obtain first flux measurement signals;

directing a second beam of second growth species at said wafer in said growth chamber;

repeatedly measuring second flux of reflection of said second beam from said wafer to obtain second flux measurement signals;

integrating said first flux measurement signals and said second flux measurement signals over time; and

controlling the growth of said first growth species and said second growth species based on said integration of said first flux measurement signals and said second flux measurement signals.

5,556,463

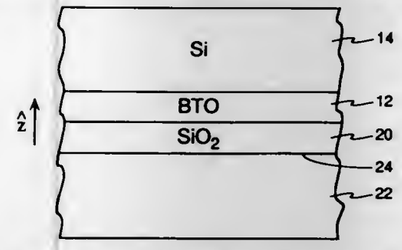
CRYSTALLOGRAPHICALLY ORIENTED GROWTH OF SILICON OVER A GLASSY SUBSTRATE

Charles S. Guenzer, 3852 Grove Ave., Palo Alto, Calif. 94303

Division of Ser. No. 222,738, Apr. 4, 1994, Pat. No. 5,478,653. This application Jun. 5, 1995, Ser. No. 462,006

Int. Cl.[6] C30B 25/18

U.S. Cl. 117—90 **10 Claims**



1. A method of forming a layer of crystallographically oriented silicon, comprising the steps of:

a first step of depositing a crystallographically oriented layer of a layered perovskite on a glass surface; and

a second step of depositing a layer of crystallographically oriented silicon over and in templating contact with said layer of layered perovskite.

5,556,464

VIBRATION PLATE OF A SPEAKER AND METHOD FOR PRODUCING SAME

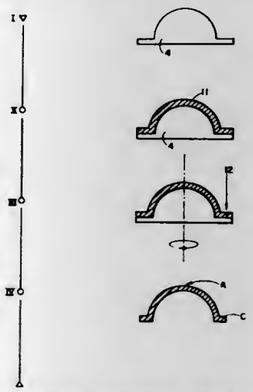
Keiichiro Tanabe, and Naoji Fujimori, both of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 91,689, Jul. 15, 1993, Pat. No. 5,432,004. This application Feb. 10, 1995, Ser. No. 387,110

Claims priority, application Japan, Jul. 15, 1992, 4-212253

Int. Cl.[6] C30B 29/04

U.S. Cl. 117—106 **12 Claims**



1. A method of producing a vibration plate of a speaker comprising the steps of:

providing a substrate body having a central part and an outer flange,

introducing the substrate into a vacuum chamber,

heating the substrate body,

supplying a material gas including carbon and hydrogen to the vacuum chamber,

depositing crystalline diamond on the substrate body by a CVD method to form a central part and an outer flange of the vibration plate, and

irradiating a periphery of the flange of the vibration plate with at least one laser beam so that at least a portion of the flange is converted to non-diamond carbon while the central part is maintained as crystalline diamond.

5,556,465

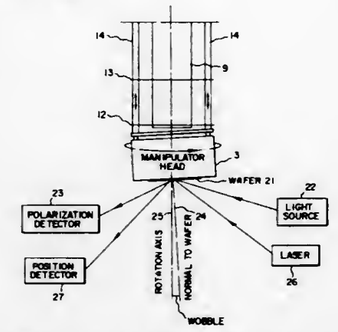
SAMPLE TREATMENT APPARATUS FOR USE IN MOLECULAR BEAM EPITAXY

Tapani Levola, Turku, Finland, assignor to DCA Instruments Oy, Turku, Finland

Filed Sep. 15, 1994, Ser. No. 305,326

Int. Cl.[6] C30B 35/00

U.S. Cl. 117—202 **7 Claims**



1. An apparatus for use in Molecular Beam Epitaxy (MBE) in a vacuum in order to grow thin films, wherein the apparatus comprises a rotatable manipulator head adapted for mounting of a substrate, and aligning elements to align an axis normal to the substrate sufficiently parallel to the rotation axis of the manipulator in the vacuum to provide real time information on growth parameters of a layer of said substrate by ellipsometry, such that an angle between said axis normal to the substrate and said rotation axis is 0.2 degrees or less.

5,556,466

COATING PLANT

Wolfram Martin, Ilsfeld; Hartwig Besinger, Erdmannhausen, and Heinrich Weeber, Asperg, all of Germany, assignors to Duerr GmbH, Stuttgart, Germany

Filed Aug. 29, 1994, Ser. No. 297,298

Claims priority, application Germany, Sep. 1, 1993, 43 29 384.0

Int. Cl.[6] B05C 13/02

U.S. Cl. 118—67 **39 Claims**

1. Coating plant for workpieces, comprising:

a coat application section including a skid conveyor extending therethrough at a first level,

a coat drier section following said application section and comprising a drier booth and a drier conveyor, said drier conveyor extending through said drier booth and said coat drier section;

said drier booth being arranged at a second level, which is higher than said first level;

said skid conveyor passing through the coat application section and moving workpieces set on skid frames through the coat application section at a process feeding speed for the application of the coating, and

said drier conveyor following the skid conveyor and conveying the skid frames with the coated workpieces set thereon through the coat drier section, said drier conveyor moving the skid frames at the process feeding speed along a skid frame path through said drier booth and the coat drier section,

said drier conveyor extending beneath the skid frame path in a take over section for taking over said skid frames at said first

5,556,468

APPLICATOR FOR MELTABLE PRODUCTS, IN

tape pay-out means provided in the operating means for paying out a coating film transfer tape for supply;

5,556,471

METHOD AND APPARATUS FOR DISPENSING FOAM

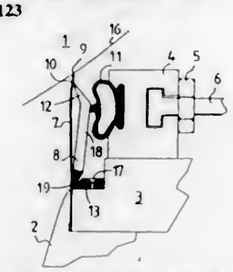
level and thereafter lifting said skid frames to said drier booth at said second level via a conveyor section extending parallel to an inclined plane from said first level to said second level to subsequently convey said skid frames through said drier booth.

5,556,467

ASSEMBLY FOR LOADING A DOCTOR BLADE

Jukka Koskinen, Helsinki, and Aaron Mannio, Järvenpää, both of Finland, assignors to Valmet Corporation, Helsinki, Finland

Filed Apr. 18, 1994, Ser. No. 228,861
Claims priority, application Finland, Apr. 16, 1993, 931722
Int. Cl.[6] B05C *11/04*
U.S. Cl. 118—123 **27 Claims**



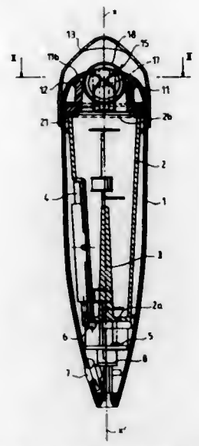
1. An assembly for loading a doctor blade of a coater apparatus, comprising:
- a doctor blade support beam;
- a doctor blade mounted to said support beam and having a tip;
- a backing member mounted to said support beam, a tip of said backing member adapted to rest against said doctor blade substantially adjacent to the doctor blade tip; and
- loading means for pressing said backing member against said doctor blade for providing a force for loading said doctor blade;
- said backing member being divided along its longitudinal axis into segments by cuts transverse to the longitudinal axis, said cuts extending from the tip of the backing member, and said backing member being formed of a material sufficiently rigid to transfer the force applied by said loading means to said doctor blade tip, the material forming said backing member and the shape of said backing member being selected so as to substantially eliminate sliding movement between said doctor blade and the tip of said backing member when the loading of said doctor blade changes.

5,556,468

APPLICATOR FOR MELTABLE PRODUCTS, IN PARTICULAR DEPILATORY WAX

Marc Legrain, Civrieux en dombes, and Daniel Combe, Jassan Riottier, both of France, assignors to SEB S.A., Selongey Cedex, France

Filed Jun. 14, 1994, Ser. No. 261,061
Claims priority, application France, Jun. 14, 1993, 93 07341
Int. Cl.[6] B05C *5/04*
U.S. Cl. 118—202 **21 Claims**



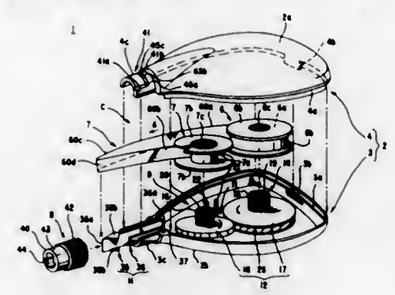
1. An applicator for a meltable product comprising: a case, a reservoir in said case for holding a quantity of the product, the reservoir having an outlet opening and being made at least in part of a thermally conductive material, heating means in thermal communication with the thermally conductive material of the reservoir, and an applicator roller disposed in the outlet opening, wherein said applicator roller comprises a core composed at least partly of thermally conductive material and a layer of plastic material surrounding said core for delivering the product.

5,556,469

COATING FILM TRANSFER TOOL

Kouhei Koyama, Osaka; Shigeru Tamai, Ikeda, and Masatoshi Shintani, Sanda, all of Japan, assignors to Seed Rubber Company Limited, Osaka, Japan

Filed Nov. 23, 1994, Ser. No. 346,241
Claims priority, application Japan, Dec. 3, 1993, 5-339247
Int. Cl.[6] B05C *17/00*
U.S. Cl. 118—257 **18 Claims**



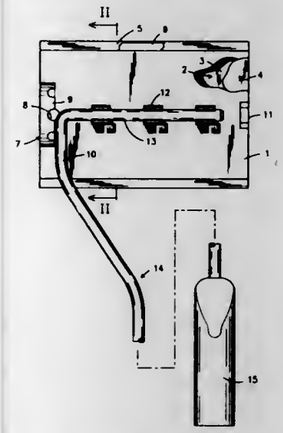
1. A coating film transfer tool comprising:
- operating means configured and dimensioned for allowing hand-held operation by one hand;
- tape pay-out means provided in the operating means for paying out a coating film transfer tape for supply;
- tape pressing means projecting from a front end of the operating means for pressing the coating film transfer tape supplied by the tape pay-out means against a transfer area; and
- tape collecting means provided in the operating means for collecting the coating film transfer tape guided through a pressing part in a front end of the tape pressing means after it is used,
- wherein the front end pressing part of the tape pressing means is adjustable in angle about its axial center.

5,556,470

SUPPORT FOR A PAINT COATING PAD

Gerd Gruber, Feuchtwangan, Germany, assignor to Rota-Plast Werk Sauer GmbH & Co., Dinkelsbühl, Germany

Filed Feb. 8, 1995, Ser. No. 385,558
Claims priority, application Germany, Feb. 15, 1994, 9402464 U
Int. Cl.[6] B05C *1/00*
U.S. Cl. 118—264 **18 Claims**



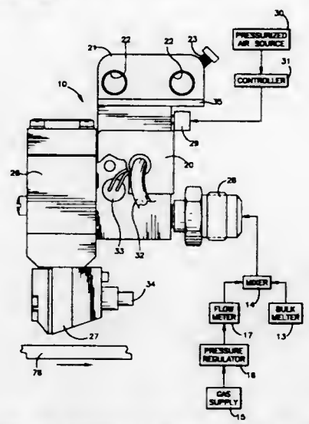
1. A support for a paint coating pad and a handle, the coating pad having a support layer and a bottom layer for applying coatings to substantially planar surfaces, the handle having a wire piece and a grip, the wire piece having a shaft and an offset section, the support for the paint coating pad and handle comprising,
- a base plate having top and bottom surfaces, the coating pad support layer juxtaposed to the bottom surface of the base plate when the coating pad is attached to the base plate,
- a plurality of upwardly extending projections attached along the top surface of the base plate forming pairs of opposed snap-lock support arms, the pairs of opposed snap-lock support arms defining a boundary for receiving the shaft of the wire piece, and
- a latch block positioned on the top surface of the base plate along a first edge and having a plurality of radially extending locking grooves formed therein for receiving and securing the offset section of the wire piece, the plurality of radially extending locking grooves permitting the handle to be attached to the base plate at a plurality of working angles.

5,556,471

METHOD AND APPARATUS FOR DISPENSING FOAM MATERIALS

George E. Boccagno, Lawrenceville, Ga.; Lawrence B. Saidman, Avon Lake, and Robert L. Wacker, Wellington, both of Ohio, assignors to Nordson Corporation, Westlake, Ohio

Filed May 17, 1994, Ser. No. 245,225
Int. Cl.[6] B05B *1/00*
U.S. Cl. 118—300 **29 Claims**



1. Apparatus for dispensing a polymer foam, which comprises:
- a supply system which forms and supplies a pressurized solution of intermixed polymeric material and gas, the polymeric material remaining intermixed with the gas while the solution is maintained above a critical pressure, the mixture forming a foam when it is below the critical pressure; and
- a dispenser connected to the supply system to receive the pressurized solution therefrom, the dispenser having an elongated slot, the dispenser dispensing the pressurized solution in wide band through the elongated slot, the solution being maintained above the critical pressure until just before the solution emerges from the elongated slot.

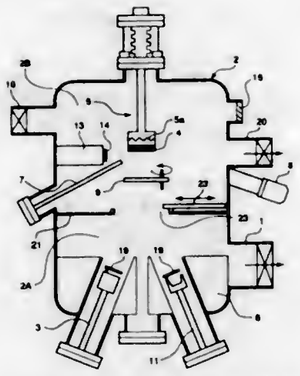
5,556,472

FILM DEPOSITION APPARATUS

Takao Nakamura, and Michitoma Iiyama, both of Osaka, Japan, assignors to Sumitomo Electric Industries, LTD, Osaka, Japan

Continuation of Ser. No. 987,756, Dec. 9, 1992, abandoned.
This application May 30, 1995, Ser. No. 454,483
Claims priority, application Japan, Dec. 9, 1991, 3-350304; Dec. 12, 1991, 3-351671; Dec. 12, 1991, 3-351672; Dec. 12, 1991, 3-351673; Apr. 30, 1992, 4-137789; Dec. 8, 1992, 4-351724
Int. Cl.[6] C23C *14/00*
U.S. Cl. 118—719 **5 Claims**

1. A film deposition apparatus comprising:
- a vacuum chamber provided with a partition means for dividing said vacuum chamber into a first sub-chamber and a second sub-chamber, said partition means including an opening for introducing a vacuum impedance for molecular flows between said first sub-chamber and said second sub-chamber so that a pressure difference can be created between said first sub-chamber and said second sub-chamber when said opening is open;
- a gate valve provided on said partition means for hermetically closing said opening of said partition means so as to shut of the molecular flows between said first sub-chamber and said second sub-chamber;
- at least one evaporation source provided in said first sub-chamber in communication with an internal space of said first sub-chamber;



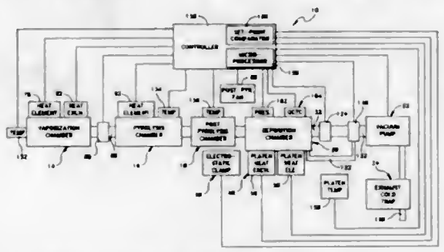
a main evacuating means coupled to said first sub-chamber for evacuating said first sub-chamber to an ultra-high vacuum;
a substrate holder located within said second sub-chamber for holding a substrate to be deposited;
means for heating said substrate;
a gas supplying means provided in said second sub-chamber so as to supplying a predetermined gas to said second sub-chamber; and
an auxiliary evacuating means coupled to said second sub-chamber for evacuating said second sub-chamber to an ultra-high vacuum when said gate valve is closed; and further including a sputtering cathode provided in said second sub-chamber of said vacuum chamber and capable of holding a target, and a laser window provided in said second sub-chamber for allowing a laser beam emitted from a laser device located at an outside of said vacuum chamber, to pass through said laser window so as to hit against said target held by said sputtering cathode, whereby a film can be deposited by a selected one of a molecular beam epitaxy, a sputtering and a laser ablation.

5,556,473

PARYLENE DEPOSITION APPARATUS INCLUDING DRY VACUUM PUMP SYSTEM AND DOWNSTREAM COLD TRAP

Roger A. Olson, Amery, Wis.; John Wary, Noblesville, Ind., and William F. Beach, Bridgewater, N.J., assignors to Specialty Coating Systems, Inc.

Filed Oct. 27, 1995, Ser. No. 549,130
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—719 **2 Claims**



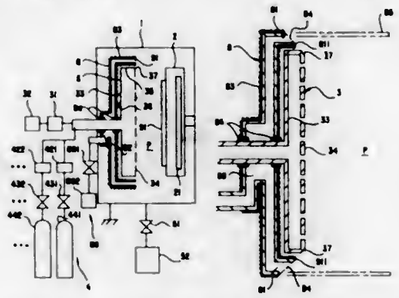
1. A parylene deposition apparatus comprising:
a vacuum chamber system including a vaporization chamber, a pyrolysis chamber coupled to said vaporization chamber, and a deposition chamber coupled to said pyrolysis chamber for receiving gaseous parylene monomer from said pyrolysis chamber;
an oilless, dry vacuum pump having an inlet connected directly to said vacuum chamber system for creating sub-atmospheric conditions within said vacuum chamber system; and
trap means connected to an outlet of said vacuum pump for trapping excess unpolymerized monomer passing through the vacuum pump.

5,556,474

PLASMA PROCESSING APPARATUS

Satoshi Otani, Osaka; Hiroya Kirimura, Kyoto; Hajime Kuwahara, Kyoto; Takao Tabata, Kyoto; Takahiro Nakahigashi, Kyoto, and Hiroshi Murakami, Kyoto, all of Japan, assignors to Nissin Electric Co., Ltd., Kyoto, Japan

Filed Dec. 13, 1994, Ser. No. 357,297
Claims priority, application Japan, Dec. 14, 1993, 5-313086
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—723 E **18 Claims**



1. In a plasma processing apparatus comprising:
a power application electrode for generating plasma, and
an electrode opposed thereto disposed in a process chamber which can be set to a vacuum pressure by an exhaust device,
means to apply electric power to said power application electrode to generate the plasma from a process gas introduced between said electrodes, and
means to process a plasma on a substrate mounted on one of said electrodes in the plasma,
the improvement in said apparatus comprising:
a particle discharge duct which surrounds a periphery and a rear side of said power application electrode and has an opening at a position neighboring to said periphery of said power application electrode; and
exhaust means connected to said duct at a position corresponding to a central portion of said rear side of said power application electrode.

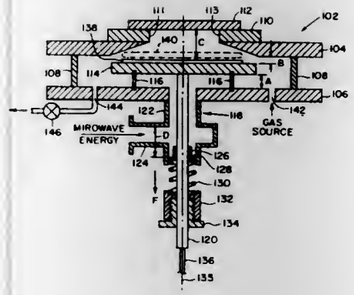
5,556,475

MICROWAVE PLASMA REACTOR

Matthew M. Besen, Tewksbury; Evelio Sevillano, Lexington, and Donald K. Smith, Arlington, all of Mass., assignors to Applied Science and Technology, Inc., Woburn, Mass.

Filed Jun. 4, 1993, Ser. No. 72,272
Int. Cl.[6] C23C *16/00*
U.S. Cl. 118—723 MP **39 Claims**

1. A microwave plasma reactor, comprising:
a chamber for containing a gas to be energized into a plasma with microwave energy;
an electrode having two surfaces and located in said chamber for radiating microwave energy from one of its surfaces into said chamber to form the plasma proximate said radiating surface;
means for introducing microwave energy onto the other of the two electrode surfaces for providing the energy to form the plasma; and
means for cooling said electrode.

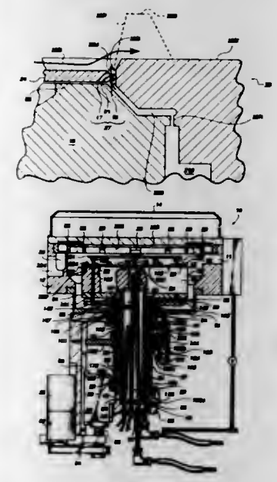


5,556,476

CONTROLLING EDGE DEPOSITION ON SEMICONDUCTOR SUBSTRATES

Lawrence C. Lei, Milpitas, and Cissy Leung, Fremont, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 200,862, Feb. 23, 1994. This application Oct. 21, 1994, Ser. No. 327,462
Int. Cl.[6] C23C *16/00*; B44C *1/22*
U.S. Cl. 118—728 **25 Claims**



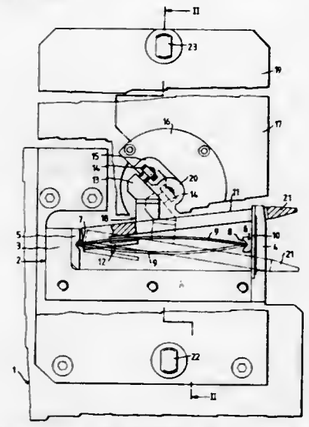
1. An apparatus for processing a generally planar substrate including a circumferential edge and a first face for processing and a second face, comprising:
(i) a housing defining a substrate processing chamber;
(ii) a substrate support disposed in the chamber for receiving a substrate for processing thereon;
(iii) a substrate receiving pocket defined by the substrate support and including a floor for supporting the substrate and a wall, the receiving pocket being sized to expose the entire first face for processing; and
(iv) a gas inlet positioned to direct a gas along the circumferential edge of the substrate when the substrate is received in the pocket.

5,556,477

TRANSPORT DEVICE FOR SUBSTRATES TO BE COATED IN A VACUUM COATING SYSTEM

Herbert Nähring, Rodenbach; Hans Wolf, Erlensee, and Jürgen Mulderer, Alzenau, all of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Germany

Filed May 24, 1995, Ser. No. 449,676
Claims priority, application Germany, Jun. 9, 1994, 44 20 113.3
Int. Cl.[6] C23C *16/00;14/56*
U.S. Cl. 118—728 **17 Claims**



1. Transport device for substrates to be coated in a vacuum coating system with a substrate carrier plate removably attached to a support element of a base, the carrier plate being designed to hold at least one substrate, characterized in that the substrate carrier plate (**17**) is clamped to the support element (**19**) at least at one point by means of a centering pin (**22, 23**), which projects from the plane of the support element (**19**) and fits into a hole (**24, 25**) in the substrate carrier plate (**17**), and at least at one other point by means of a clamping device (**18**); in that the clamping device (**18**) is mounted on the base (**2**), on a control part (**11**), in such a way that it can move between a clamping position and a release position through the displacement of an actuating arm (**21**), the clamping device being provided with a tensioning roller (**14**), which is supported on a ramp (**15**) on the substrate carrier plate (**17**), the substrate carrier plate (**17**) having an opening (**20**) to allow the passage of the tensioning roller (**14**), the tensioning roller (**14**) being located behind this opening when in the release position; and in that the ramp (**15**) leads away from this opening (**20**) in the direction in which the tensioning roller (**14**) travels, the distance between the ramp and the opening (**20**) increasing with the distance from the support element (**19**).

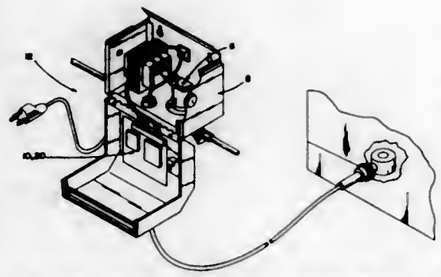
5,556,478

SELF-OPTIMIZING DETERGENT CONTROLLER FOR MINIMIZING DETERGENT SET-POINT OVERSHOOT

Daniel F. Brady, Eagan; John E. McCall, Jr., West St. Paul; Clyde A. Bailey, Hastings, and James L. Copeland, Burnsville, all of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Division of Ser. No. 849,750, Mar. 12, 1992, Pat. No. 5,404,893. This application Jan. 12, 1995, Ser. No. 372,052
Int. Cl.[6] B08B *7/04*
U.S. Cl. 134—18 **14 Claims**

1. An apparatus for optimizing detergent concentration in a warewashing machine with minimal overshoot, comprising:
means for determining whether a detergent needs to be added to a wash solution;
means for feeding the detergent into the wash solution;
sensor means for measuring a detergent concentration in the wash solution;



means for calculating a rate of increase for the detergent concentration in the wash solution; and

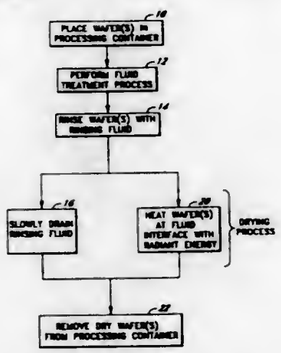
means for determining an appropriate on-time and off-time for the means for feeding using derivative control, wherein the appropriate on-time and off-time is determined based on balancing the rate of increase for the detergent concentration in the wash solution and compensation for any latency time with a need to minimize overshoot in the detergent concentration wherein the means for determining further comprises means for discontinuing the means for feeding when overshoot in the detergent concentration is anticipated based upon the rate of increase.

5,556,479

METHOD AND APPARATUS FOR DRYING SEMICONDUCTOR WAFERS

Mario E. Bran, Garden Grove, Calif., assignor to Verteq, Inc., Santa Ana, Calif.

Filed Jul. 15, 1994, Ser. No. 275,807
Int. Cl.[6] B08G *3/12*
U.S. Cl. 134—1.3 **6 Claims**



1. A method for drying a semiconductor wafer at the completion of cleaning or other liquid processing of the wafer which leaves the wafer immersed in rinse water, said method comprising the steps of:

draining the rinse water from the wafer;

simultaneously with said draining, heating the wafer at the interface between the water and a gas which replaces the water, the wafer portions at the interface being heated to a temperature greater than the temperature of the water; and

continuing said draining and heating steps until said interface moves with respect to the wafer over essentially the entire surface of one side of the wafer;

wherein said draining is performed at a sufficiently slow rate such that the water on the wafer at said interface flows away from the wafer without evaporation from the wafer and the wafer emerges from the water with substantially no water on the heated surface of the wafer exposed to the gas.

5,556,480

PROCEDURE FOR DISINFECTING AND CLEANING CONTACT LENSES

Carlos P. Rontome, and Santiago N. Padilla, both of Madrid, Spain, assignors to Dirygesa, S.L., Madrid, Spain

Continuation-in-part of Ser. No. 879,781, May 6, 1992, abandoned. This application Aug. 22, 1994, Ser. No. 293,726
Claims priority, application Spain, May 7, 1991, 9101121
Int. Cl.[6] B08B *3/00;7/00*
U.S. Cl. 134—26 **20 Claims**

1. A process for cleaning and disinfecting contact lenses to be worn in contact with an eye, comprising

submerging a contact lens in a container containing an aqueous solution of hydrogen peroxide and a totally non-coated tablet form;

producing initially a controlled destabilizing of the hydrogen peroxide using a destabilizer in order to obtain an activation thereof due to increased oxygen lability and mobility throughout the whole solution, with consequent increase of its germicide and cleaning effects; and

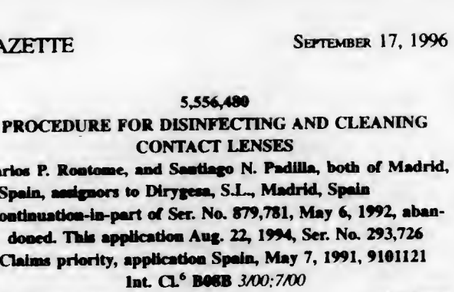
reducing by degradation of the hydrogen peroxide a concentration of hydrogen peroxide down to a level allowing the solution to be compatible with the eye.

5,556,481

USE OF A COLOSTRUM OR BREAST MILK TO INHIBIT THE ACCUMULATION OF PROTEINS AT THE SURFACE OF SYNTHETIC POLYMERS USED IN CONTACT WITH BIOLOGICAL SYSTEMS; APPLICATION TO THE CARE OF CONTACT LENSES

Joel Baguet, Lyons, France, assignor to Essilor International, Paris, France

Division of Ser. No. 268,046, Jun. 28, 1994, abandoned. This application Nov. 20, 1995, Ser. No. 560,619
Int. Cl.[6] C08L *89/00;5/00*
U.S. Cl. 134—26 **15 Claims**



1. Process for inhibiting the accumulation of proteins at the surface of a synthetic polymer which comprises contacting the surface of said synthetic polymer with a solution comprising colostrum or breast milk of human or mammalian origin.

14. Process for care of contact lenses, comprising the incubation, at room temperature, of the said lenses in a solution comprising colostrum or breast milk of human or mammalian origin, for a period of between 1 and 16 hours, followed by a rinsing in buffer solution isotonic to the lachrymal medium before being replaced over the eye of the wearer.

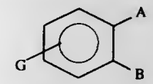
5,556,482

METHOD OF STRIPPING PHOTORESIST WITH COMPOSITION CONTAINING INHIBITOR

Irl E. Ward, Bethlehem, and Francis W. Michelotti, Easton, both of Pa., assignors to Ashland, Inc., Dublin, Ohio

Continuation-in-part of Ser. No. 433,677, May 4, 1995, which is a continuation-in-part of Ser. No. 983,257, Nov. 30, 1992, Pat. No. 5,417,877, which is a continuation-in-part of Ser. No. 647,487, Jan. 25, 1991, abandoned. This application Jul. 11, 1995, Ser. No. 501,206
Int. Cl.[6] C23G *5/036;1/14;1/18;* B08B *3/08*
U.S. Cl. 134—38 **1 Claim**

1. In a process of stripping comprising the steps of applying a stripping composition containing an organic polar solvent and a basic amine to a substrate having a photoresist coating and removing said stripping composition and said photoresist coating from said substrate, the improvement wherein said composition is an admixture which further contains an effective inhibiting amount of the formula:



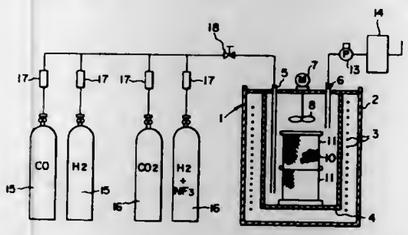
wherein G is hydrogen and A and B are hydroxyl, and said polar solvent and said basic amine are different.

5,556,483

METHOD OF CARBURIZING AUSTENITIC METAL

Masaaki Tahara, Takatsuki; Haruo Senbokuya, Tondabayashi; Kenzo Kitano, Kawachinagano; Tadashi Hayashida, Sakai, and Teruo Minato, Hashimoto, all of Japan, assignors to Daido Hoxan, Inc., Sapporo, Japan

Filed Oct. 19, 1994, Ser. No. 325,666
Claims priority, application Japan, Apr. 18, 1994, 6-078677
Int. Cl.[6] C23C *8/20;8/22;* C21D *1/06*
U.S. Cl. 148—206 **12 Claims**



1. A method of carburizing austenitic metal comprising steps of holding austenitic metal in a fluoride-containing gas atmosphere with heating prior to carburizing and carburizing the austenitic metal at a temperature not more than 680° C.

5,556,484

METHOD FOR REDUCING ABNORMAL GRAIN GROWTH IN NI-BASE SUPERALLOYS

Charles P. Blankenship, Jr., Niskayuna, N.Y.; Duk N. Yoon, Seoul, Rep. of Korea; Michael F. Henry, Schenectady, N.Y., and Mark G. Benz, Burnt Hills, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 26, 1995, Ser. No. 429,506
Int. Cl.[6] C23C *8/20*
U.S. Cl. 148—211 **22 Claims**

1. A method of reducing the tendency for growth of abnormally large gains in the surface region of Ni-base superalloys, comprising the steps of:

selecting a forging preform formed from a Ni-base superalloy having a microstructure comprising a mixture of γ and γ' a γ' solvus temperature (T_S) and an initial carbon concentration C_I;

forging the forging preform into a forged article; and

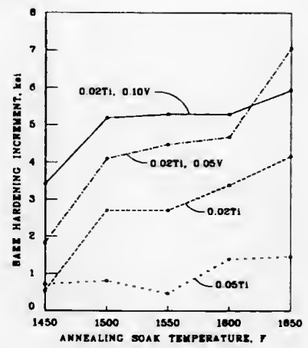
annealing the forged article in a carburizing environment so that a carbon concentration (C_A) exists in a surface region that is greater than or equal to C_I.

5,556,485

BAKE HARDENABLE VANADIUM CONTAINING STEEL AND METHOD OF MAKING THEREOF

Keith A. Taylor, Coplay, and John G. Speer, Bethlehem, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Nov. 7, 1994, Ser. No. 335,004
Int. Cl.[6] C21D *8/04;* C22C *38/12*
U.S. Cl. 148—320 **22 Claims**



1. In a method of making a rolled steel article comprising the steps of casting a low carbon steel containing carbon, manganese, aluminum, nitrogen with the balance iron and incidental impurities and hot rolling said steel, the improvement comprising:

providing said steel with a composition consisting essentially in weight percent of between 0.0005 and 0.0028% carbon, between zero and less than 0.04% nitrogen, between zero and less than 0.5% of a nitride forming element, between zero and 0.5% aluminum, between zero and up to 2.5% manganese, between 0.005 0.03 and 0.094% vanadium with the balance iron and inevitable impurities, wherein said vanadium contributes to improved bake hardenability of said steel when subjected to paint baking.

5,556,486

a U-shaped member having a intermediate portion and two

5,556,491

5,556,486

COMPOSITE MATERIAL HAVING AN INTERMETALLIC MATRIX OF ALNI REINFORCED BY SILICON CARBIDE PARTICLES

Henri Abiven, Oinville-sur-Montcient; Christophe Colin, La Jolie; Jean Bouix, Lyons; Michel Macari, St Laurent de Mure, and Jean-Claude Viala, Villeurbanne, all of France, assignors to Aerospatiale SOciete Nationale Industrielle, France

Filed Jul. 12, 1994, Ser. No. 273,648
Claims priority, application France, Jul. 12, 1993, 93 08557
Int. Cl.[6] C22C *19/03;30/00*
U.S. Cl. 148—429 **18 Claims**

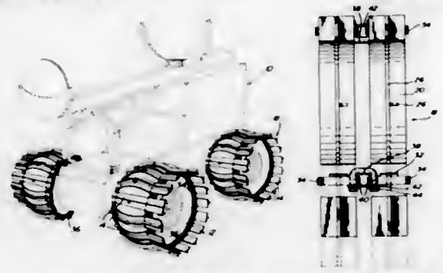
1. Composite material comprising a matrix mainly constituted by an intermetallic compound of Al and Ni comprising 43 to 63 atom % nickel, and containing in solid solution 1.5 to 30 atom % silicon and a reinforcement formed from silicon carbide (SIC) particles dispersed in said matrix.

5,556,487

TRACK DEVICE HAVING WHEEL WIDENING EFFECT

Bruno Collard, Lattérière, Canada, assignor to Soudures et Chaines Pedno Inc., Canada

Filed Mar. 14, 1995, Ser. No. 404,052
Claims priority, application Canada, Jan. 27, 1995, 2141239
Int. Cl.[6] B60C *27/20*
U.S. Cl. 152—228 **5 Claims**



1. A track device for mounting on a pneumatic tire fitted to the wheel of a vehicle to improve the buoyancy and traction of the vehicle over very soft terrain, said pneumatic tire comprising a tread surface across the width of the tire, a pair of side walls and an axis of rotation, said track device comprising:

a plurality of bridge-like longitudinal and rigid traction blades having an inside surface made to rest on said tire across the width of said tread surface and a ground engaging outside surface, said traction blades being disposed on said tire in generally closely spaced-apart and parallel relationship to form an endless track;

each said traction blade comprising: an intermediate bridge-like portion made to conform to the general cross-sectional shape of the tire,

essentially flat side portions outwardly projecting from either side of said intermediate portion and generally parallel to the axis of rotation of said tire, said sides portions sufficiently projecting beyond the width of said tire so as to provide a widening of said wheel of at least twenty percent of the width of said tire, thereby increasing the buoyancy and traction of said vehicle over very soft and muddy terrain,

on its inside surface, side members, integral with said traction blade and adapted to rest against the side walls of said tire so as to maintain said traction blade positioned over said tire,

at least one longitudinal rib element integral with said traction blade and outwardly projecting from said outer surface of said traction blade so as to provide additional traction to said track device and additional strength to said traction blade;

link elements for interconnecting said traction blades so that the traction blades form a tight track around said tire, said link elements comprising:

a U-shaped member having a intermediate portion and two leg portions, said U-shaped member being adapted to link adjacent traction blades by insertion of each leg portion of said U-shaped member into a corresponding apertured member integral with said inside surface of said traction blade,

a longitudinal flat member having bores in each longitudinal end adapted to receive therethru said leg portions of said U-shaped member,

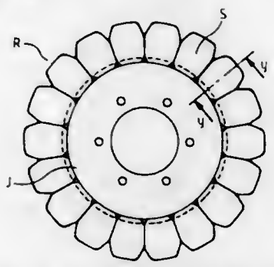
fastening means to fasten said longitudinal flat member to said leg portions of said U-shaped member.

5,556,488

TIRE HAVING A PLURALITY OF INDEPENDENT REMOVABLE AND REINFORCED SECTORS

Jean Gergele, Chatel-Guyon; Armand Le Gall, Clermont-Ferrand; Jean-Pierre Pompier, Volvic, and Michel Remond, Riom, all of France, assignors to Compangnie Générale Des Etablissements Michelin - Michelin & CIE, Clermont-Ferrand Cedex, France

PCT No. PCT/EP93/00411, § 371 Date Aug. 11, 1994, § 102(e) Date Aug. 11, 1994, PCT Pub. No. WO93/16890, PCT Pub. Date Sep. 2, 1993
PCT Filed Feb. 22, 1993, Ser. No. 284,615
Claims priority, application France, Feb. 28, 1992, 92 02483
Int. Cl.[6] B60C *3/00;5/24;15/024;15/04*
U.S. Cl. 152—198 **25 Claims**



1. A tire formed of a plurality of inflatable and removable pneumatic sectors (S) which are circumferentially adjacent to each other when mounted on an appropriate rim (J) with circularly continuous base, the tire characterized by the fact that each sector (S) comprises a tread (2) connected to four sidewalls (40, 50), two of these sidewalls (50) being circumferentially adjacent to the sidewalls (50) of the adjacent sectors (S) and the other two (40) forming the sidewalls of the tire, these sidewalls (40, 50) terminating in meridian beads not in contact with the mounting rim (J) and reinforced by meridian bead wires (11) and in circumferential beads assuring the mounting of the sectors (S) on the rim (J) and reinforced by circumferential bead wires (10) connected to the meridian bead wires (11) and to which at least one reinforcing armoring (4) of non-stretchable cords or cables is anchored, said reinforcing armoring (4) being radially adjacent to at least one tread (2) reinforcement armoring (8).

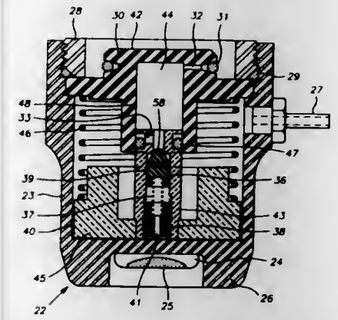
5,556,489

WHEEL-MOUNTED TIRE INFLATOR

John Curlett, Watsonville, and Glen J. Brown, Santa Cruz, both of Calif., assignors to Pacific Aeromotive Corporation, Santa Cruz, Calif.

Continuation-in-part of Ser. No. 181,043, Jan. 14, 1994, abandoned. This application Aug. 16, 1994, Ser. No. 291,159
Int. Cl.[6] B60C *23/12;* **F04B** *31/00;19/22*
U.S. Cl. 152—418 **4 Claims**

1. A pump for use with a pneumatic tire mounted on a rim to keep said tire from becoming underinflated comprising:



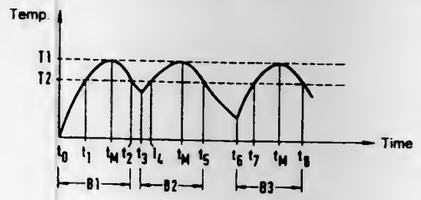
a cylinder attached to said rim; a piston within said cylinder; the axis of said cylinder and said piston being disposed radially upon said rim; a first passage for unpressurized outside air to enter said pump; a second passage to allow pressurized air to enter said tire from said pump; a check valve within said second passage, said check valve including a tapered annular groove; a passage between said cylinder and the bottom of said groove, and an o-ring seating on the walls of said groove, said o-ring moving away from said groove walls to allow flow of pressurized air into said tire whenever cylinder pressure exceeds tire pressure; said pump being operated by centrifugal force which causes said piston to move radially outward and by spring means which forces said piston to move radially inward.

5,556,490

INDICATING BINDING TIMES

Jan Tholérus, Täby, Sweden, assignor to Bindomatic AB, Stockholm, Sweden

Filed Aug. 12, 1994, Ser. No. 289,798
Claims priority, application Sweden, Aug. 13, 1993, 9302636
Int. Cl.[6] B32B *31/00*
U.S. Cl. 156—64 **9 Claims**



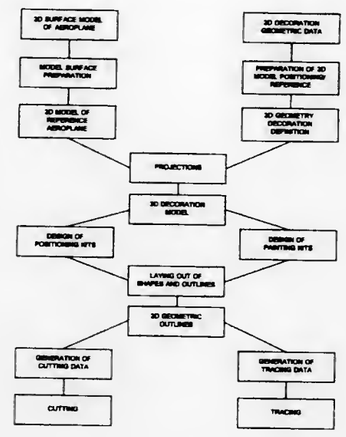
1. A method for indicating in file binding apparatus a binding time for at least one file placed on a heating element therein, the apparatus including thermostat means adapted for switching on at a first predetermined temperature and switching off at a second predetermined temperature higher than the first predetermined temperature, and indicating means controlled by an output signal from the thermostat means, comprising the steps of determining a binding time based on the time required to heat the heating element to the second predetermined temperature and the time it takes for the heating element to cool from the second predetermined temperature to the first predetermined temperature, and indicating the determined binding time by the indicating means.

5,556,491

METHOD AND DEVICE FOR MANUFACTURING ADHESIVE ELEMENTS TO BE APPLIED TO A THREE-DIMENSIONAL SURFACE FOR THE PURPOSE OF DECORATING IT

Guy Servanty, Leguevin, and Philippe Obry, Beauzelle, both of France, assignors to C.A.S.O. Conception Aéronautique du Sud-Ouest, Blagnac, and AEROSPATIALE, Paris, both of France

Filed Jul. 8, 1993, Ser. No. 87,333
Claims priority, application France, Jul. 10, 1992, 92 08890
Int. Cl.[6] B32B *31/00*
U.S. Cl. 156—64 **6 Claims**



1. Process for manufacturing adhesive elements (8, 12, 19, 31–34) to be applied to a three-dimensional surface (7) for use in decorating it, the elements comprising two-dimensional elements to be adhered to areas of said three-dimensional surface, comprising

a) memorizing a three-dimensional model which consists of a mathematical representation of a three-dimensional surface (7) to be decorated,

b) memorizing the coordinates of reference lines and/or points (7a, 7b, 7c, 7d) of the three-dimensional surface (7) so as to obtain a referenced three-dimensional model,

c) memorizing a two-dimensional model consisting of a mathematical representation of outlines defining the areas to be decorated, projected in one plane,

d) carrying out transformation computations on the two-dimensional model to obtain a referenced two-dimensional model positioned in relation to reference lines and/or points,

e) carrying out computations on a projection of the referenced two-dimensional model onto the referenced three-dimensional model so as to obtain a mathematical representation of the outlines of the areas to be decorated on the three-dimensional surface, associated with the reference lines and/or points,

f) carrying out laying-out computations on the mathematical representation obtained in step (e) to obtain data representative of the layout of the outlines of the areas to be decorated and of the reference lines and/or points,

g) cutting out adhesive elements (8, 12, 19, 31–34) using a numerically-controlled cutting machine (3) driven by the data obtained in step (f),

h) and marking on at least some of said cut-out adhesive elements (8, 12, 19, 31–34), the reference points and/or lines, using a numerically-controlled tracing machine (5) driven from the data obtained in step (f).

5,556,492

surface of the sensor and the interior surface of the windshield,

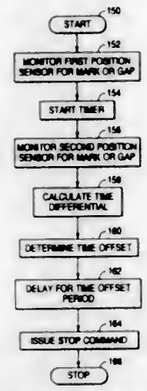
the annular bead and forms an annular sealing web joining the lid flange and the barrel border.

material is pulled into the die at a very slow rate or pulling of the continuous material into the die is discontinued while the

5,556,492
LABELING MACHINE HAVING A WEB VELOCITY COMPENSATOR DEVICE

James P. Vonderhorst, New Freedom, Pa., and Robert C. Jennens, Jr., Westminster, Md., assignors to Exact Packaging, Inc., New Freedom, Pa.

Filed Nov. 7, 1994, Ser. No. 337,216
Int. Cl.[6] B32B *31/00*
U.S. Cl. 156—64 **21 Claims**



18. A method of compensating for variations in linear velocity of a continuous web of material having a plurality of labels thereon, said web being conveyed along a feed path of a labeling machine by a drive mechanism during a plurality of sequential drive actuation periods, comprising the steps of:

measuring said linear velocity of said web;

processing said linear velocity of said web to generate a time delay offset, said time delay offset representing a desired time delay between the sensing of a stop condition and the issuance of a stop command;

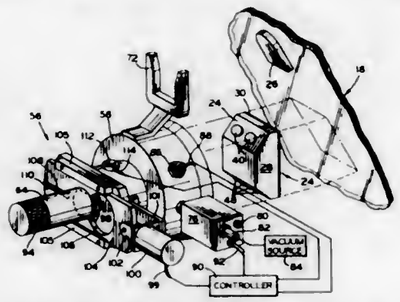
sensing a stop condition indicating that said continuous web should be stopped; and

issuing a stop command at a time equal to said time delay offset after said stop condition has been sensed.

5,556,493
MOUNTING AN OPTICAL MOISTURE SENSOR ON A WINDSHIELD USING A VACUUM CHAMBER DEVICE

Rein S. Teder, Bloomington, Minn.; Dennis L. Bomer, Walbridge, Ohio, and Michael A. Niver, Onalaska, Wis., assignors to Libbey-Owens-Ford Co., Toledo, Ohio

Filed Jan. 13, 1995, Ser. No. 372,566
Int. Cl.[6] B29C *65/00*
U.S. Cl. 156—64 **9 Claims**



1. A method for mounting a sensor on an interior surface of a windshield to eliminate air pockets between an optical interface surface of the sensor and the interior surface of the windshield, said method comprising the steps of:

a) applying an adhesive to an optical interface surface of a sensor;

b) positioning the sensor in a holder on a longitudinally moveable drive shaft in a cavity of a vacuum chamber device such that the optical interface surface is located adjacent an aperture in the vacuum chamber device;

c) positioning the vacuum chamber device against a windshield at a sensor mounting point such that the windshield sealably encloses the aperture in the vacuum chamber;

d) connecting a vacuum source through a control valve to the vacuum chamber device and evacuating the cavity of the vacuum chamber device;

e) longitudinally moving the drive shaft to adhere the sensor to the windshield at the sensor mounting point while maintaining a vacuum such that the optical interface surface of the sensor is secured by the adhesive to the interior surface of the windshield in a vacuum;

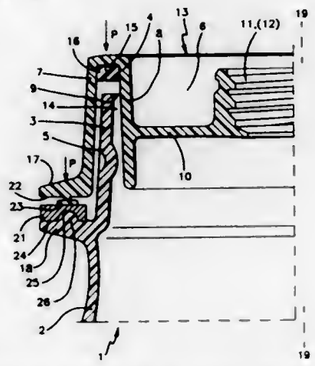
f) opening the control valve to return the cavity of the vacuum chamber device to atmospheric pressure; and

g) removing the vacuum chamber device from about the sensor secured to the windshield.

5,556,494
PROCESS FOR MANUFACTURING AND RECONDITIONING A REUSABLE BARREL OF SYNTHETIC RESIN

Udo Schutz, Ruckersteg 4, 56242 Selters, Germany

Division of Ser. No. 166,843, Dec. 15, 1993. This application Jan. 19, 1995, Ser. No. 374,076
Claims priority, application Germany, Dec. 16, 1992, 42 42 370.8
Int. Cl.[6] B29C *65/18;* **B65B** *7/00*
U.S. Cl. 156—69 **1 Claim**



1. Process for the production of reusable barrels of synthetic resin, said process comprising:

placing a continuously extending heating tool onto a border of a barrel body, said heating tool having a continuous annular groove disposed in the underside surface of the heating tool,

placing a bunghole lid having a lid flange with an annular extension molded to the underside of the lid flange on said heating tool, said annular extension being coaxial to the lid axis,

applying pressure to said lid,

heating for a sufficient period of time to melt the annular extension and to form a continuous annular bead in the topside of the barrel border,

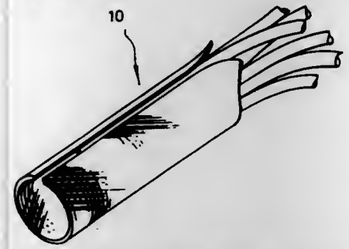
lifting the lid and the heating tool from the barrel border, and thereafter,

placing the lid with the annular extension under pressure onto the barrel border such that the annular extension is welded to the annular bead and forms an annular sealing web joining the lid flange and the barrel border.

5,556,495
METHODS OF MAKING SHAPED FABRIC PRODUCTS

Michael A. Ford, West Chester; Richard A. Barlow, Newtown Square, both of Pa., and Martin L Jacobs, Bedford, N.H., assignors to Bentley-Harris Inc., Exton, Pa.

Division of Ser. No. 787,900, Nov. 5, 1991, Pat. No. 5,413,149. This application Apr. 6, 1995, Ser. No. 418,076
Int. Cl.[6] F16L *11/00;* **B32B** *31/00*
U.S. Cl. 156—148 **5 Claims**



1. A method of making a flexible, abrasion- and kink-resistant sleeve product having a substantially circular cross-section with respect to a central longitudinal axis, said sleeve providing protection for elongated articles such as wires, cables, hoses and conduits, said sleeve having an ARP abrasion resistance of at least 25,000 cycles, the method comprising:

providing warp and fill ends of resilient monofilaments, at least said warp monofilaments being of a resiliently settable material;

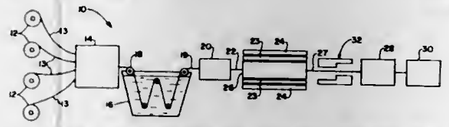
forming a sleeve product by relatively loosely interlacing said selected warp and fill monofilament ends to provide an open construction having uniformly dispersed openings; and

resiliently setting at least one of said resilient monofilament warp ends in a spiral configuration extending at an acute angle with respect to said central longitudinal axis.

5,556,496
PULTRUSION METHOD FOR MAKING VARIABLE CROSS-SECTION THERMOSET ARTICLES

Joseph E. Sumerak, Blue Heron Dr., Solon, Ohio 44139

Filed Jan. 10, 1995, Ser. No. 370,798
Int. Cl.[6] B29C *70/52*
U.S. Cl. 156—166 **17 Claims**



1. A method for preparing a fiber-reinforced thermoset article, comprising:

a) heating at least a portion of a die to a first temperature which is sufficiently high to cause a heat curable thermosetting resin composition to cure;

b) pulling a first portion of a continuous material comprised of reinforcing fibers which are impregnated with said heat curable thermosetting resin composition through said heated die to substantially cure the resin of said first portion thereby forming a substantially cured first portion; and

c) cooling at least said portion of said die from said first temperature to a second temperature, said second temperature being sufficiently low to prevent said heat curable thermosetting resin composition from curing, wherein the continuous material is pulled into the die at a very slow rate or pulling of the continuous material into the die is discontinued while the die is being cooled;

d) pulling a second portion of said continuous material through and out of said cooled die to provide a substantially uncured second portion and a sharp transition between the substantially uncured second portion and the substantially cured first portion;

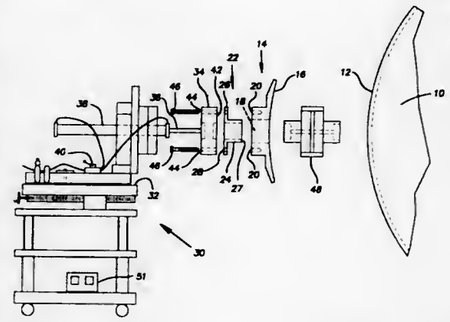
e) reshaping said substantially uncured second portion; and

f) curing the second reshaped portion.

5,556,497
FITTING INSTALLATION PROCESS

James C. Murphy; Kevin Goodge, and Jim Hlebovy, all of Chardon, Ohio, assignors to Essef Corporation, Chardon, Ohio

Filed Jan. 9, 1995, Ser. No. 370,526
Int. Cl.[6] B29C *65/02;65/20*
U.S. Cl. 156—172 **12 Claims**



1. A method of manufacturing a fluid containing vessel having a fitting, comprising the steps of:

forming a liner defining the vessel;

providing a preformed fitting having a top surface;

providing an insert comprising an annular body having a flange at one end of the annular body and an edge at another end of the annular body;

installing the annular body of the insert in the fitting and engaging the flange of the insert with the top surface of the fitting; and

positioning the fitting on a wall of the liner; and welding the edge of the annular body of the insert to the wall; the flange of the insert retaining the fitting on the wall.

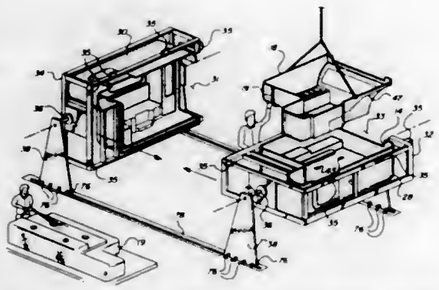
5,556,498
METHOD OF MANUFACTURING A RECREATIONAL VEHICLE CABIN

Raymond W. Blanchard, White Lake, Mich., assignor to Roamer Corporation, Auburn Hills, Mich.

Filed Dec. 19, 1994, Ser. No. 358,719
Int. Cl.[6] B29C *65/52;* **B62D** *29/04*
U.S. Cl. 156—245 **8 Claims**

1. A method of producing a recreational vehicle cabin by forming a right cabin segment and a left cabin segment and subsequently joining the segments into a unitary structure, the method comprising the steps of:

5,556,501
SILICON SCAVENGER IN AN INDUCTIVELY COUPLED



fabricating a right female mold having a longitudinal axis and a molding cavity shaped to match the exterior contours of the right cabin segment, the periphery of the molding cavity defining a substantially planar right mold edge lying parallel with the right mold longitudinal axis;

fabricating a left female mold having a longitudinal axis and a molding cavity shaped to match the exterior contours of the left cabin segment, the periphery of the mold cavity defining a substantially planar left mold edge lying parallel with the left mold longitudinal axis;

forming a right and a left exterior shell segment inside of the right and left female molds respectively;

forming at least one rigid left interior shell segment outside of the left female mold and at least one rigid right interior shell segment outside of the right female mold, the left and right interior shell segments shaped to fit inside of and match at least a portion of the inside contours of the left and right exterior shell segments respectively;

securing the at least one left and at least one right interior shell segments inside of the left and right exterior shell segments respectively to form the left and right cabin segments respectively;

rotating the right and left female molds about their respective longitudinal axes to place the right and left mold edges in vertical and parallel planes;

moving at least one of the female molds to place the right and left mold edges in abutting registry with one another;

joining the left and right cabin segments together to form a unitary structure by applying a joining material along the inside of the registered right and left mold edges, access to the inside of the structure being provided by at least one access cutout passing through at least one of the female molds; and

separating the female molds and removing the unitary structure therefrom.

5,556,499

DELAMINATING METHOD AND APPARATUS

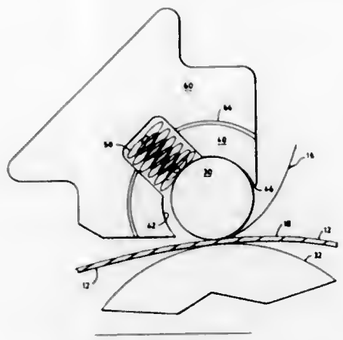
Arthur H. Clough, Hardwick, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 1, 1994, Ser. No. 347,882

Int. Cl.[6] B32B *35/00*

U.S. Cl. 156—344 **32 Claims**

23. A method of peeling a layer from a laminate including the steps of: peeling the layer about a rotatable peel rod, and continuously supporting the rod along a longitudinal dimension against a surface of a bearing as the layer is being peeled.



5,556,500

PLASMA ETCHING APPARATUS

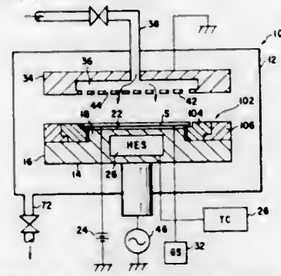
Makoto Hasegawa, Kawasaki; Hiromi Sakima, Machida; Hiromitsu Kanbara, Kawasaki; Yoshio Ishikawa, Kofu; Yasuo Imamura, Yokohama, and Makoto Aoki, Tama, all of Japan, assignors to Tokyo Electron Limited, Tokyo, and Kabushiki Kaisha Toshiba, Kawasaki, both of Japan

Filed Mar. 3, 1995, Ser. No. 398,667

Claims priority, application Japan, Mar. 3, 1994, 6-033645

Int. Cl.[6] H05H *1/00*

U.S. Cl. 156—345 **9 Claims**



1. An apparatus for etching an etching target on a major surface of a substrate by using a plasma, comprising:

a process chamber defining a vacuum process space for containing and processing said substrate;

a supply system for introducing an etching gas to be made into a plasma into said process chamber;

an exhaust system for exhausting said process chamber;

a pair of counter electrodes provided within said process chamber and opposed to each other;

a support member, provided within said process chamber, for supporting said substrate such that said major surface is exposed within said process space;

a power supply for applying a voltage between said counter electrodes so as to generate an electric field for making said etching gas into a plasma; and

a focus ring having a surface surrounding said major surface of the substrate, said surface of the focus ring comprising first and second surrounding surfaces exposed to said process space and located inside and outside, respectively, said first surrounding surface being formed of an electrically conductive material which produces no such a reaction product as to be substantially adsorbed on the etching target by contact with said etching gas, said second surrounding surface being formed of a material containing a component which is a main component of said etching target and produces such a reaction product as to be substantially adsorbed on the etching target by contact with said etching gas, so that said reaction product generated from said second surrounding surface diffuses to said major surface of said substrate while said plasma is being generated, thereby correcting a distribution of the amount of the reaction product on said major surface.

5,556,501

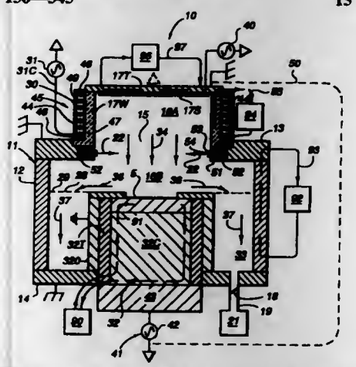
SILICON SCAVENGER IN AN INDUCTIVELY COUPLED RF PLASMA REACTOR

Kenneth S. Collins; Craig A. Roderick, both of San Jose; John R. Trow, Santa Clara; Chan-Lon Yang, Los Gatos; Jerry Y. Wong, Fremont; Jeffrey Marks, San Jose; Peter R. Keswick, Newark; David W. Groechel, Sunnyvale; Jay D. Pinson, II, San Jose, all of Calif.; Tetsuya Ishikawa, Chiba, Japan; Lawrence C. Lei, Cupertino, Calif.; Masato M. Toshima, Sunnyvale, Calif., and Gerald Z. Yin, Cupertino, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 722,340, Jun. 27, 1991, abandoned, which is a continuation-in-part of Ser. No. 626,050, Dec. 7, 1990, abandoned, which is a continuation-in-part of Ser. No. 624,740, Dec. 3, 1990, abandoned, which is a continuation-in-part of Ser. No. 559,947, Jul. 31, 1990, abandoned, which is a continuation-in-part of Ser. No. 416,750, Oct. 3, 1989, Pat. No. 5,223,457. This application Apr. 1, 1993, Ser. No. 41,796

Int. Cl.[6] C23F *1/02*

U.S. Cl. 156—345 **15 Claims**



1. An RF plasma processing apparatus for processing of workpieces comprising:

a) a vacuum chamber in which a plasma is generated;

b) a workpiece support member adapted for supporting workpieces to be processed within the chamber;

c) a gas inlet mounted in the chamber for supplying a plasma precursor processing gas to the chamber;

d) RF power source means for supplying first and second RF power signals;

e) a coil antenna coupling RF energy from the first RF power signal into the chamber so as to form a high density plasma from said processing gas;

f) a cathode electrode below or part of the workpiece support member electrically coupled to the second RF power signal so as to create an electric field which assists in attracting charged particles from the plasma toward the cathode electrode; and

g) a second electrode disposed above said cathode electrode and comprising silicon for chemically interacting with components of said processing gas; wherein said second electrode is controllably heated to increase its reactivity.

5,556,502

OPTICAL FIBER CABLE CHEMICAL STRIPPING FIXTURE

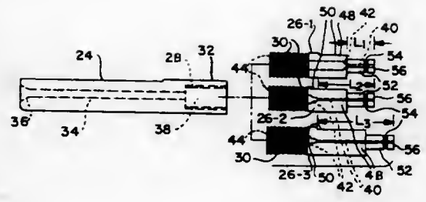
John R. Kolasinski, Greenbelt, and Alexander M. Coleman, Brandywine, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 254,360, May 31, 1994, Pat. No. 5,451,294. This application Apr. 25, 1995, Ser. No. 428,598

Int. Cl.[6] B44C *1/22*

U.S. Cl. 165—345 **10 Claims**

1. Apparatus for chemically stripping a portion of a coating covering an optical fiber of an optical fiber cable, comprising:



a fixture including a chemically inert handle member connectable to a chemically inert fixture body member for holding an end portion of an optical fiber cable,

said optical fiber cable being comprised of an optical fiber, a coating covering the optical fiber, and at least one outer jacket coveting both the coating and the optical fiber, and

said fixture body member further comprising an elongated inert body member having a forward central longitudinal axial bore and having a diameter for passing said exposed length of optical fiber, said coating, and said at least one outer jacket to an outer end thereof,

whereby when a portion of said coating extends beyond the forward bore and it is immersed in a coating stripping solution, the coating extending beyond the forward bore is softened for removal from said optical fiber while leaving a coating intact within the fixture body member.

5,556,503

APPARATUS FOR THINNING A SEMICONDUCTOR FILM ON AN INSULATING FILM

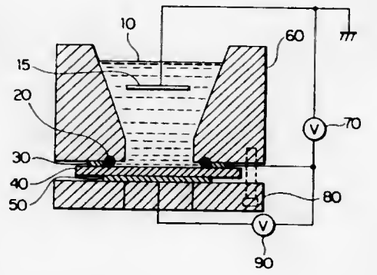
Atsushi Ogura, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 27, 1995, Ser. No. 534,442

Claims priority, application Japan, Sep. 27, 1994, 6-231652; Apr. 24, 1995, 7-97338

Int. Cl.[6] H01L *21/00*

U.S. Cl. 156—345 **10 Claims**



1. A semiconductor-film thinning apparatus for thinning down a semiconductor active layer formed on a base substrate via an insulating film, comprising:

potential-difference applying means for applying a potential difference between said base substrate and said semiconductor active layer to form a depletion layer or an inversion layer and a depletion layer at an interface between said semiconductor active layer and said insulating film; and

etching means for etching said semiconductor active layer by chemical etching using a solution or a chemical etching medium consisting of gas.

5,556,504

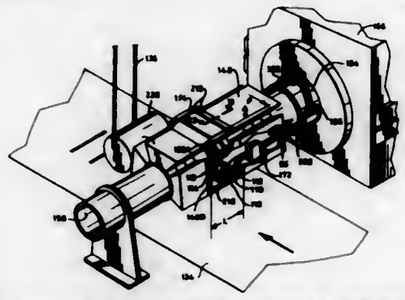
APPARATUS FOR PLACING DISCRETE PARTS TRANSVERSELY ONTO A MOVING WEB

Gregory J. Rajala; Paul M. Niemi, and Daniel J. Ostrefsky, all of Neenah, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 381,364, Jan. 31, 1995, which is a continuation-in-part of Ser. No. 186,352, Jan. 25, 1994. This application Jun. 2, 1995, Ser. No. 459,606

Int. Cl.[6] B32B *31/00*

U.S. Cl. 156—519 **14 Claims**



1. Apparatus for taking discrete parts traveling at a first speed in a first direction in a taking zone and transferring the discrete parts to a receiver traveling at a second speed in a second direction in a transfer zone, said apparatus comprising:

a transfer assembly mounted on a shaft for rotation about a first axis oriented in a third direction transverse to and disposed in a plane parallel with the first direction, said transfer assembly including a shell segment supported by said shaft and at least one transport head rotatably mounted on said shell segment for taking the discrete parts in the taking zone, wherein a leading edge of the discrete parts are oriented at a first angle with respect to the first direction of travel, and for transferring the discrete parts to the receiver in the transfer zone;

first driver means for rotating said transfer assembly about said first axis at a variable velocity so that said transport head travels substantially at the first speed as the discrete parts are taken onto the transport head in the taking zone, and travels at the second speed as the discrete parts are applied to the receiver in the transfer zone; and

means for transferring drive from said first driver means to said transport head comprising a cam drive means, input shaft and output means, said cam drive means having a cam circumferentially secured to a drum affixed to a gear box and a cam follower movably affixed to said cam, said output means having an actuating arm movably connected to said transport head through a crank clevis wherein said transferring drive means rotates said transport head about a second axis transverse to said first axis to thereby orient the leading edge of the discrete part at a second angle different from the first angle as measured with respect to the second direction of travel of the receiver in the transfer zone.

12. Apparatus for taking discrete parts traveling at a first speed in a first direction in a taking zone and transferring the discrete parts to a receiver traveling at a second speed in a second direction in a transfer zone, said apparatus comprising:

a transfer assembly mounted on a shaft for rotation about a first axis oriented in a third direction transverse to, and disposed in a plane parallel with, the first direction, said transfer assembly including a shell segment supported by said shaft and at least one transport head rotatably mounted on said shell segment for taking the discrete parts in the taking zone and for transferring the discrete parts to the receiver in the transfer zone, wherein a leading edge of the discrete parts are oriented at a first angle with respect to the first direction of travel;

first driver means for rotating said transfer assembly about said first axis at a variable velocity so that said transport head travels substantially at the first speed as the discrete parts are taken onto the transport head in the taking zone, and travels at the second speed as the discrete parts ere applied to the receiver in the transfer zone, said first driver means includes a gear box comprising a second driver means and a driven means which in combination rotate said transfer assembly, said second driver means and said driven means including a pair of complementary noncircular gears;

means for transferring drive from said first driver means to said transport head to rotate said transport head about a second axis transverse to said first axis to thereby orient the leading edge of the discrete part at a second angle different from the first angle as measured with respect to the second direction of travel of the receiver in the transfer zone; and

vacuum means for providing vacuum to said transport head having control means for applying and removing vacuum to and from said taking portion of said transport head, said control means includes:

slip ring fixedly secured to said shell segment and movably mounted for rotation about an outer circumferential wall of a tubular conduit;

first array of suction ports in said outer circumferential wall along a portion of a path of rotation of said slid ring; and

second array of suction ports circumferentially disposed about a portion of said slip ring so that said second array suction ports become aligned with said first array suction ports as said slid ring rotates about said tubular conduit, thereby supplying suction to said taking portion of said transport head.

5,556,505

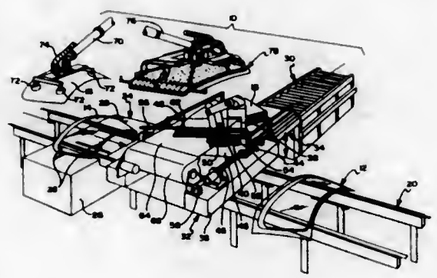
WINDSHIELD ASSEMBLY SYSTEM

Robert A. Hill, Melvindale, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 5, 1994, Ser. No. 277,921

Int. Cl.[6] B32B *31/04;* **B65G** *49/06;57/04;* **B65H** *3/32*

U.S. Cl. 156—570 **4 Claims**



1. A windshield assembly system for assembling windshield assemblies for vehicles comprising:

a conveyor for delivering at least two plys of glass to an assembly station;

a first robot for lifting one of the two plys from said conveyor;

at least one separator for separating at least a portion of a top adhesive sheet from a lower adhesive sheet on a stack of adhesive sheets, wherein said at least one separator comprises an edge separator having a knife moveable along an edge of the top adhesive sheet to separate the edge of the top adhesive sheet from the lower adhesive sheet in the stacks; and

a second robot having a handler for gripping and removing the separated top adhesive sheet and placing the removed adhesive sheet adjacent the other one of the two plys, whereby the first robot places the one of the two plys adjacent the removed adhesive sheet to assemble the windshield assembly.

5,556,506

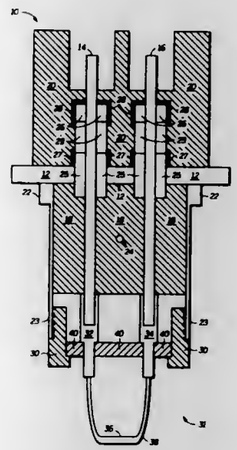
METHOD FOR FORMING A CONDUCTIVE LAYER OF MATERIAL ON AN INTEGRATED CIRCUIT SUBSTRATE

Michael A. Contreras, Austin, and Robert E. Anderson, Cedar Park, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 18, 1995, Ser. No. 573,981

Int. Cl.[6] C23C *14/00*

U.S. Cl. 156—625.1 **30 Claims**



1. A method for forming a conductive layer of material on an integrated circuit substrate comprising the steps of:

providing an etch chamber having an integrated circuit substrate therein, the etch chamber having a plasma ignitor, the plasma ignitor comprising a first conductive lead, a second conductive lead, a first dielectric housing, and a filament, the filament having a first terminal and a second terminal, wherein the first conductive lead is electrically coupled to the first terminal of the filament and the second conductive lead is electrically coupled to the second terminal of the filament, and wherein the first dielectric housing encases a first portion of the first conductive lead and a first portion of the second conductive lead such that the first portion of the first conductive lead is electrically isolated from the first portion of the second conductive lead and the first portion of the first conductive lead is kept at a fixed distance apart from the first portion of the second conductive lead;

introducing a gas into the etch chamber;

using the plasma ignitor to initiate a plasma in the etch chamber;

using the plasma to etch the integrated circuit substrate and to form an etched surface; and

depositing the conductive layer of material on the etched surface.

5,556,507

MULTIFUNCTIONAL CONTACTLESS INTERCONNECT TECHNOLOGY

Nitin Parekh, Los Altos, and Dominic Massetti, Scotts Valley, both of Calif., assignors to Silicon Systems, Inc., Tustin, Calif.

Filed Mar. 3, 1994, Ser. No. 206,444

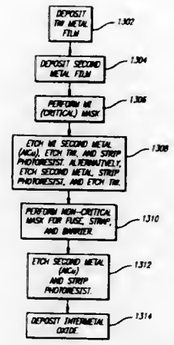
Int. Cl.[6] H01L *21/00*

U.S. Cl. 156—656.1 **70 Claims**

1. A method for forming a barrier layer structure on a silicon substrate, comprising the steps of:

depositing a single metallization layer comprising a barrier layer film and a metal film on said silicon substrate;

applying a first photoresist layer on said metal film;



exposing a pattern in said first photoresist layer using a first mask wherein a first portion of said first mask has a first mask pattern that forms a first pattern in said first photoresist layer;

wherein said first pattern is for defining said barrier layer structure;

developing said first photoresist layer;

etching said barrier layer film and said metal film to remove first areas of said barrier layer film and said metal film underlying said first pattern, to expose first areas of said silicon substrate and to partially form said barrier layer structure according to said first pattern;

stripping said first photoresist layer to expose second areas of said metal film;

applying a second photoresist layer on said second areas of said metal film and on said first areas of said silicon substrate;

exposing a second layer pattern in said second photoresist layer using a second mask for deeming a region of said second areas of said metal film to be etched;

developing said second photoresist layer to expose said region of said metal film to be removed;

etching to remove said region of said metal film and removing said second photoresist to complete formation of said barrier layer structure.

5,556,508

METHOD FOR TREATING PULP

Rolf Ekholm, and Ulf Jansson, both of Karlstad, Sweden, assignors to Kvaerner Pulping Technologies Aktiebolag, Sweden

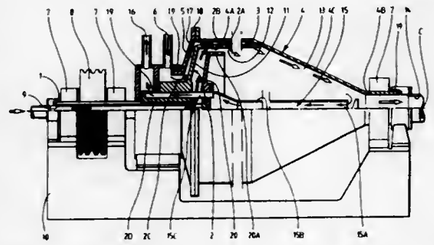
PCT No. PCT/SE93/00115, § 371 Date Sep. 30, 1994, § 102(e) Date Sep. 30, 1994, PCT Pub. No. WO93/21377, PCT Pub. Date Oct. 28, 1993

PCT Filed Feb. 16, 1993, Ser. No. 313,135

Claims priority, application Sweden, Apr. 8, 1992, 9201114

Int. Cl.[6] D21C *9/02;* **D06B** *1/02*

U.S. Cl. 162—60 **9 Claims**



1. Method for washing a fibre suspension, comprising the steps of:

feeding the fibre suspension into an undivided annular displacement space that rotates around an axis of symmetry, the displacement space having an outer limiting, permeable surface;

supplying, with pressure external to the displacement space, a fluid through the permeable outer surface of the displacement space;

rotating the displacement space with a rotational speed sufficient to establish, by centripetal acceleration of the fibre suspension, a fibre layer between the fluid supplied through the permeable outer surface of the displacement space and a remaining part of the fibre suspension, the fibre layer providing a pressure against the outer limiting surface of the displacement space which at least essentially balances a pressure from the fluid; and

moving the fibre suspension and the fluid through the displacement space and discharging the fibre suspension and the fluid from the displacement space.

5,556,509

PAPER STRUCTURES HAVING AT LEAST THREE REGIONS INCLUDING A TRANSITION REGION INTERCONNECTING RELATIVELY THINNER REGIONS DISPOSED AT DIFFERENT ELEVATIONS, AND APPARATUS AND PROCESS FOR MAKING THE SAME

Paul D. Trokhan, Hamilton, and Dean V. Phan, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 29, 1994, Ser. No. 268,213
Int. Cl.[6] D21H *15/02*
U.S. Cl. 162—111 **12 Claims**

1. A paper structure comprising:

a first region disposed at a first elevation and having a first thickness;

a second region disposed at a second elevation different from the first elevation and having a second thickness; and

a third transition region interconnecting the first region and the second region, the third region having a third thickness, the third thickness greater than the second thickness, and the third thickness greater than the first thickness.

5,556,510

METHOD FOR INHIBITING THE DEPOSITION OF ORGANIC CONTAMINANTS IN POLP AND PAPERMAKING PROCESSES

David D. Dreisbach; Mark E. Laurint, and Tien-Feng Ling, all of Jacksonville, Fla., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 184,612, Jan. 21, 1994, abandoned, which is a continuation of Ser. No. 29,209, Mar. 10, 1993, Pat. No. 5,292,403. This application Apr. 25, 1995, Ser. No. 428,593
Int. Cl.[6] D21H *21/02*
U.S. Cl. 162—158 **9 Claims**

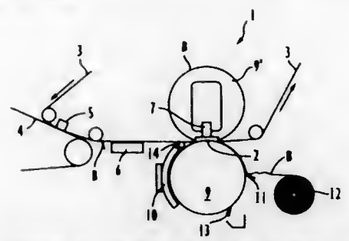
1. A method for inhibiting the deposition of organic contaminants in a pulp and papermaking system comprising adding to the system an effective amount for the purpose of a detackifying composition comprising (a) cationic starch and (b) an anionic surfactant selected from the group consisting of sodium N-methyl-N-oleyl taurate, tetrasodium N-(1,2-dicarboxyethy)-N-octadecenyl sulfosuccinamate, alkyl diphenyl oxidized sulfonate, a free acid of an organic phosphate, a copolymer of diisobutylene and hydrolyzed maleic anhydride and a styrene/hydrolyzed maleic anhydride copolymer, wherein the weigh ratio of (a):(b) is about 1:1.

5,556,511

PROCESS FOR DRYING PAPER WEBS

Reinhard Bluhm, Berg, and Thomas Gotz, Hagnau, both of Germany, assignors to Sulzer-Escher Wyss GmbH, Ravensburg, Germany

Filed Dec. 15, 1994, Ser. No. 313,136
Claims priority, application Germany, May 16, 1992, 42 16 264.5
Int. Cl.[6] D21F *11/02*
U.S. Cl. 162—206 **18 Claims**



1. A process for removing water from a paper web in the production of toilet paper, the web having a final dry weight of at least 60%, the process comprising:

guiding a moist paper web and at least one water-absorbing felt through at least one press zone between two press areas;

transferring, in one of before or within the at least one press zone, at least an amount of heat into the paper web so that steam pressure being formed within a fiber structure of the paper web is greater than ambient pressure and less than a pressure existing in the press zone; and

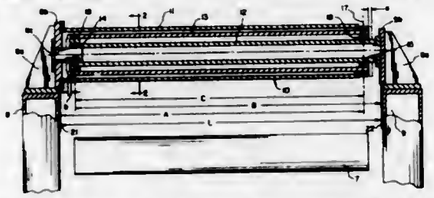
adjusting pressure and temperature conditions within the press zone such that, at an end portion of the press zone, the steam pressure within the water is slightly greater than ambient pressure, so that a portion of the water remaining in the paper web controllably evaporates and breaks up the fiber structure of the paper web due to sudden expansion of the paper web upon exiting a press gap of the press zone.

5,556,512

BEAM FOR A PAPER MAKING MACHINE FRAME

Edwin X. Graf, Menasha, Wis., assignor to Voith Sulzer Papiermaschinen GmbH, Heidenheim, Germany

Continuation of Ser. No. 57,123, May 3, 1993, abandoned. This application Jan. 27, 1995, Ser. No. 379,846
Int. Cl.[6] D21F *7/00*
U.S. Cl. 162—272 **10 Claims**



1. A paper-making machine for the production of a fibrous material web, said paper-making machine including at least one of a rotatable roll and rotatable cylinder operably associated with said web and installed in a machine frame, said paper-making machine frame comprising:

a first frame component and a second frame component, the first frame component comprising one of a tending side frame component and a drive side frame component, and the second frame component comprising an other of the tending side frame component and the drive side frame component;

a cross beam connecting said first frame component with said second frame component and structured to stiffen the paper-making machine frame, said beam including:

a first partial beam coupled to the first frame component, said first partial beam being coupled to said first frame component at a first interface;

a second partial beam coupled to the second frame component, said second partial beam being coupled to said second frame component at a second interface, said second partial beam overlapping the first partial beam; and

a coupling beam, said coupling beam being coupled to said first partial beam at a first coupling point and to said second partial beam at a second coupling point;

said first coupling point being situated closer to the second frame component than to the first frame component, and the second coupling point being situated closer to the first frame component than to the second frame component;

said partial beams and said coupling beam each having a coefficient of thermal expansion, wherein the coefficient of thermal expansion of the coupling beam is greater than the coefficient of thermal expansion of each of the two partial beams; the two interfaces being stationary during thermal length change of the partial beams and the coupling beam, and the coupling points being movable during said thermal length change;

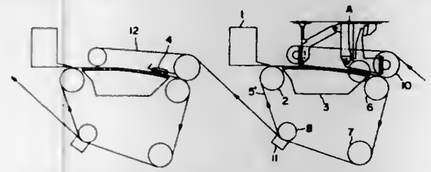
the partial beams being positioned such that the first partial beam bears movably on the second frame compoonent, and the second partial beam bears movably on the first frame component; the first partial beam bearing movably on the second frame component by means of an axial guide comprising a sliding bushing, and the second partial beam bearing movably on the first frame component by means of an axial guide comprising a journal.

5,556,513

MULTI-LAYER PAPER SHEET FORMING SYSTEM

Hiroto Shimazu; Takashi Bando, both of Mihara, and Masateru Tokuno, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, and SK Engineering, Ltd., both of Tokyo, Japan

Filed Jul. 14, 1994, Ser. No. 273,136
Claims priority, application Japan, Jul. 15, 1993, 5-196774; Sep. 8, 1993, 5-223375; May 25, 1994, 6-110672
Int. Cl.[6] D21F *11/04*
U.S. Cl. 162—304 **3 Claims**



1. A multi-layer paper sheet forming system, comprising:

one endless loop of felt, said felt having a traveling direction in said endless loop;

a plurality of short wire cloth sections disposed along said endless loop of felt, wherein each of said plurality of short wire cloth sections comprises an endless short wire cloth and a stationary dewatering instrument comprising an upper surface having a curvature such that said dewatering instrument has a curved portion disposed along said endless short wire cloth such that said endless short wire cloth is between said felt and said curved portion such that said felt can engage stock liquor at an initial engagement point between said felt and said short wire cloth on said curved portion of said dewatering instrument and travel with the stock liquor sandwiched between said short wire cloth and said felt during paper sheet forming so as to form combined paper layers;

a movable return roll disposed along said endless loop of felt so as to engage said felt between respective ones of said plurality of short wire cloth sections such that said felt is movable so that said initial engagement point is movable along said curved portion of said dewatering instrument of one of said plurality of short wire cloth sections, said movable return roll being further disposed above the one of said plurality of short wire cloth sections, wherein said felt at least partially wraps around said short wire cloth of the one of said plurality of short wire cloth sections, and wherein said one endless loop of felt comprises a subsidiary loop of said felt above said dewatering instrument of the one of said plurality of short wire cloth sections; and

a shoe blade disposed within said subsidiary loop opposite to said dewatering instrument and biased against said felt toward said dewatering instrument with a variable pressure, said shoe blade comprising a surface having a first portion in contact with said felt and another portion inclined towards said felt so as to define a wedge space between said felt and said inclined portion that converges in the traveling direction of said felt;

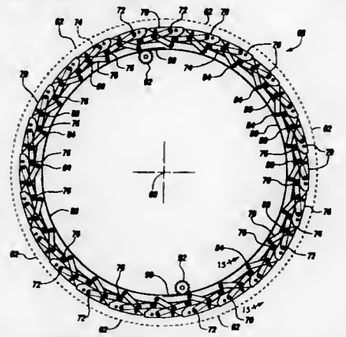
wherein said plurality of short wire cloth sections are disposed at substantially the same level relative to the horizontal along said endless loop of felt.

5,556,514

EXTENDED NIP PRESS APPARATUS WITH GEARED BLANKET EDGE CLAMP

James J. Didier, Beloit, Wis., assignor to Beloit Technologies, Inc., Wilmington, Del.

Filed May 26, 1995, Ser. No. 451,389
Int. Cl.[6] D21F *3/02*
U.S. Cl. 162—358.3 **17 Claims**



1. An extended nip press apparatus for removing water from a web of paper, comprising:

a press frame;

a backing roll rotatably supported relative to the frame;

an elongated nip shoe defining a concave surface, the concave surface cooperating with the backing roll for defining therebetween an extended nip for the passage therethrough of the web;

a blanket defining an endless loop, wherein the blanket extends through the nip such that the web is disposed between the blanket and the backing roll, the blanket further defining a first and second lateral edge, the edges being spaced from one another;

two opposed heads secured to the frame, at least one of said heads being rotatably secured to the frame, each head having a sealing surface for sealing one of the blanket lateral edges against the head, the seal so formed preventing egress of lubricant disposed between the nip shoe and the blanket;

a plurality of clamping shoes having clamping surfaces thereon, wherein the clamping shoes are peripherally spaced about the axis of rotation of the at least one head and are positioned to

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5,556,516

(c) passing vaporized carbon from said vaporization zone

said outer pole of another adjacent magnetron are of opposite

engage the at least one head sealing surface, and wherein a blanket edge is positioned between the sealing surface and the clamping surfaces on the plurality of clamping shoes; and

a cam having a link connected to each clamping shoe of the plurality of clamping shoes, such that movement of the cam causes each clamping shoe to be displaced radially outwardly to bring the clamping shoe clamping surfaces into engagement with the blanket against the at least one head sealing surface.

5,556,515

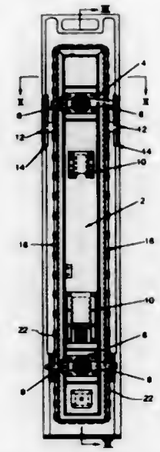
COKE OVEN DOOR

Joseph S. Giunta, Monroeville; Jerry Haan, North Huntingdun, both of Pa., and John F. McDermott, Columbus, N.C., assignors to USX Corporation, Pittsburgh, Pa.

Filed Nov. 15, 1994, Ser. No. 339,855

Int. Cl.[6] C10B *25/08;25/06;25/16*

U.S. Cl. 202—248 **5 Claims**



1. A removable coke oven door for a coking chamber within a coke oven battery, which includes a metal frame, means for latching the door in a closed position, a sealing member extending around the perimeter of the frame having forward edges adapted to contact a sealing surface on a coking chamber door jamb for effecting a continuous seal, the coke oven battery also having at least one attached protrusion extending outwardly from the battery proximate the coking chamber, said door comprising a door plug having edges passing with clearance and fitting into the coking chamber, said plug having a refractory inner surface that forms an interior end wall of the coking chamber, said inner surface having a raised portion adjacent and spaced from the edges of the door and wherein a first plane is formed by the perimeter of an innermost edge of the raised portion of said inner surface, said door further having a first horizontal dimension extending in a direction of a length of the coking chamber and between said forward edges of said sealing member and said first plane, and said coke oven battery having a second horizontal dimension extending in a direction of a length of the coking chamber and between the sealing surface on the door jamb and a second plane that is parallel to a plane formed by said sealing surface of the door jamb and which second plane includes the furthest point on the protrusion from the sealing surface on the door jamb, wherein the first dimension is greater than the second dimension, so that when the coke oven door is being placed on the coking chamber and is improperly aligned, the raised portion of the inner surface of said door plug comes into contact with the coking chamber door jamb to stop further movement of the door and prevent the sealing member from coming into contact with the protrusion.

5,556,516

METHOD FOR THE PURIFICATION OF 1-AMINOPROPANEDIOL-2,3

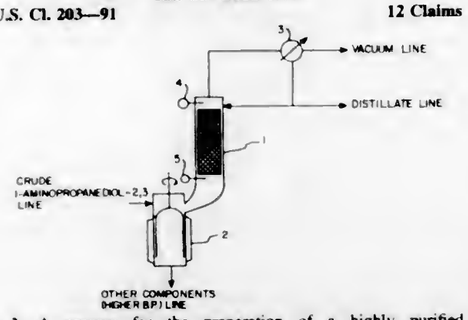
Hiroshi Koyama, and Etsuo Takemoto, both of Hiroshima, Japan, assignors to Daicel Chemical Industries, Ltd., Osaka-fu, Japan

Division of Ser. No. 20,437, Feb. 22, 1993, which is a continuation of Ser. No. 739,068, Aug. 1, 1991, abandoned. This application Mar. 27, 1995, Ser. No. 411,208

Claims priority, application Japan, Aug. 1, 1990, 2-204395; Jul. 8, 1991, 3-166603

Int. Cl.[6] B01D *3/10*

U.S. Cl. 203—91 **12 Claims**



1. A process for the preparation of a highly purified 1-aminopropanediol-2,3, comprising distilling a crude 1-aminopropanediol- 1,3 containing at least 0.30% of 2-aminopropanediol- 1,3 based on the weight of 1-aminopropanediol-2,3 in a temperature range of from 80° to 200° C. and a pressure range of from 0.1 to 30 Torr using a distillation column, said distillation column having a pressure loss of not more than 0.5 Torr per one theoretical plate such that highly purified 1-aminopropanediol-2,3 containing less than 0.30% by weight of 2-aminopropanediol-1,3 is obtained.

5,556,517

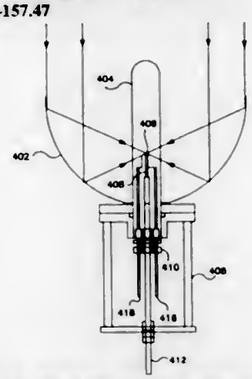
SOLAR PROCESS FOR MAKING FULLERENES

Richard Smalley, Houston, Tex., assignor to William Marsh Rice University, Houston, Tex.

Continuation of Ser. No. 82,414, Jun. 28, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 483,045

Int. Cl.[6] C01B *31/02*

U.S. Cl. 204—157.47 **8 Claims**



1. A process for generating fullerenes which comprises:

(a) vaporizing carbon in a vaporization zone by contacting a carbon source with concentrated solar energy in an atmosphere selected to form fullerenes;

(b) establishing a solar energy flux in a separate bright zone at a level sufficient to maintain carbon vapor in a form having carbon clusters of about 30 or less carbon atoms;

(c) passing vaporized carbon from said vaporization zone through said bright zone by establishing a gas flow through said vaporization zone and said bright zone, whereby the carbon vapor in said bright zone expands to provide a lower concentration of carbon in the carbon vapor, and the carbon vapor in said bright zone is maintained in said form; and

(d) passing the vaporized carbon in said form from said bright zone through a dark fullerene growth and annealing zone maintained under conditions to promote both reaction of the carbon in the carbon vapor to form fullerenes, and annealing of fullerenes, by continuing said gas flow through said dark fullerene growth and annealing zone.

5,556,518

ELECTROCOATING COMPOSITIONS AND METHODS THEREFOR

Patrick J. Kinlen, 1348 Remington Oak Ter., Fenton, Mo. 63026, and Robert E. W. Jansson, 14215 Cypress Hill Dr., Chesterfield, Mo. 63017

Filed Feb. 21, 1995, Ser. No. 393,128

Int. Cl.[6] C25D *13/00*

U.S. Cl. 204—484 **14 Claims**

1. A method for forming a coating on an electrically conductive surface comprising the steps of:

(a) immersing said electrically conductive surface in an aqueous bath comprising a cathodically electrodepositable mixture of an ionic intrinsically insulative polymer (IIP) and an organic acid salt of an intrinsically conductive polymer (ICP);

(b) applying a voltage between an electrode and said surface acting as a cathode in the bath to deposit a polymeric coating of said mixture on said surface; and

(c) curing said polymeric coating.

5,556,519

MAGNETRON SPUTTER ION PLATING

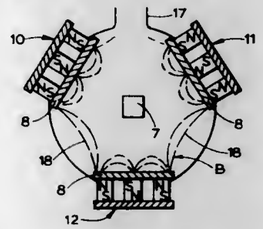
Dennis G. Teer, Tibbetts Close, Worcester Road, Sharwley, WR6 6TD, England

Continuation of Ser. No. 927,523, Sep. 15, 1992. This application Mar. 17, 1994, Ser. No. 210,246

Claims priority, application United Kingdom, Mar. 17, 1990, 9006073

Int. Cl.[6] C23C *14/35*

U.S. Cl. 204—192.12 **10 Claims**



1. A magnetron sputter ion plating apparatus comprising:

electric field means;

holding means for supporting a substrate to be coated;

magnetic field means;

said magnetic field means comprising at least two magnetrons each having an inner pole and an outer pole, said outer pole being of polarity opposite to that of said inner pole, wherein in use a substrate to be coated is provided at said holding means and is electrically biased by said electric field means to be a cathode so as to attract ions to said substrate;

said electric field means generating an electric field directed towards said substrate to be coated;

and wherein at least one of said magnetrons is an unbalanced magnetron, and said outer pole of one said magnetron and said outer pole of another adjacent magnetron are of opposite polarity and are near enough to each other so that a substantial magnetic field extends between said outer poles, so as to prevent substantial escape of ionizing electrons between the adjacent magnetrons so that these said electrons are not lost and are available to increase the ionization at said electrically biased substrate;

and wherein said magnetic field means generates a plasma holding field, said plasma holding field being generated by direct magnetic linkage between said outer poles of said adjacent magnetrons, and wherein said substrate is inside said plasma holding field.

5,556,520

METHOD FOR CONTROLLING A REACTIVE SPUTTERING PROCESS

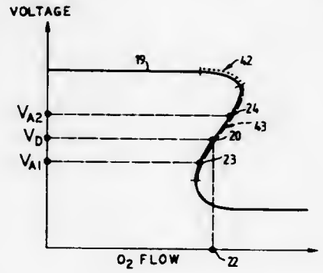
Rudolf Latz, Rodgau, Germany, assignor to Leybold Aktiengesellschaft, Hanau, Germany

Continuation of Ser. No. 989,700, Dec. 14, 1992, abandoned, which is a continuation of Ser. No. 692,925, Apr. 29, 1991, abandoned. This application May 8, 1995, Ser. No. 436,651

Claims priority, application Germany, Mar. 1, 1991, 41 06 513.1

Int. Cl.[6] C23C *14/34*

U.S. Cl. 204—192.13 **10 Claims**



1. Method for controlling a reactive sputtering process comprising

providing a cathode bearing a target to be sputtered in an evacuable chamber,

supplying reactive gas to said chamber for reactive sputtering said target to produce a layer comprising a chemical compound having a metallic component, said layer emitting secondary electrons during sputtering,

reactively sputtering said target by connecting said cathode to a power supply for producing a cathode discharge voltage V and a cathode discharge current I,

keeping power P=IV constant, thereby providing a physical characteristic curve of discharge voltage versus reactive gas flow having an overall slope and a working portion on which a desired working voltage is located, said working portion having a slope of opposite sign than said overall slope,

decreasing the reactive gas flow when said physical characteristic curve dictates increasing said reactive gas flow to achieve said desired working voltage, and

increasing the reactive gas flow when said physical characteristic curve dictates decreasing said reactive gas flow to achieve said desired working voltage.

5,556,521

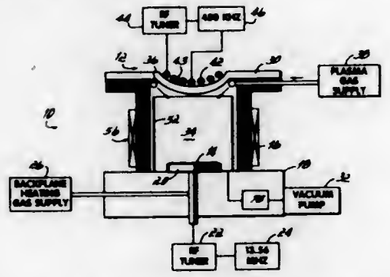
SPUTTER ETCHING APPARATUS WITH PLASMA SOURCE HAVING A DIELECTRIC POCKET AND CONTOURED PLASMA SOURCE

Ebrahim Ghanbari, West Nyack, N.Y., assignor to Sony Corporation, Tokyo, Japan, and Materials Research Corporation, Orangeburg, N.Y.

Filed Mar. 24, 1995, Ser. No. 410,362

Int. Cl.[6] C23C *14/34*; C23F *1/02*

U.S. Cl. 204—192.32 **26 Claims**



1. A processing apparatus for sputter etching the surface of a substrate with an ionized plasma, the apparatus comprising:

a processing chamber defining a processing space and including a substrate support therein for supporting and electrically biasing a substrate in said processing space;

a gas inlet for introducing sputtering gas into said processing space proximate the substrate support; and

a plasma source coupled to an end of the processing chamber to seal the chamber and create a plasma within the chamber, the plasma source comprising:

a dielectric plate having a non-conductive pocket portion with a convexly-curved inner surface and a concavely-curved outer surface, the pocket portion physically extending into said processing space in the chamber toward said substrate support and terminating proximate the substrate support so that the concavely-curved outer surface curves outwardly in the direction of said substrate support;

an inductive coil positioned outside of the chamber and inside the pocket portion of said dielectric plate, the inductive coil being contoured inside of said pocket portion along the convexly-curved inner surface to have a generally concave shape in the direction of the substrate support which coincides with the concavely-curved outer pocket surface of the pocket, the concavely shaped coil operable to efficiently inductively couple energy through the pocket portion to said sputtering gas for generating and sustaining a plasma of ionized gas particles;

the concavely shaped coil and coinciding concavely-curved outer pocket surface creating a high density uniform plasma of ionized particles proximate a surface of a biased substrate to bombard the surface thereof and produce a high sputter etching rate uniformly across the substrate surface.

5,556,522

FILTER ASSEMBLY

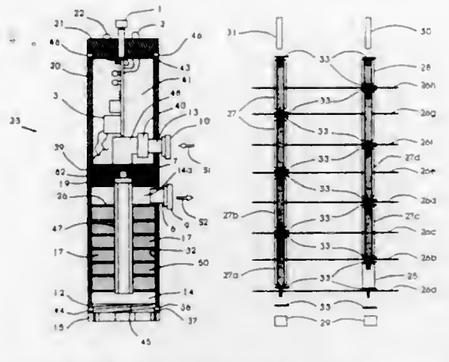
Rex K. Ingalls, 1520 Lake Christopher Dr., Virgina Beach, Va. 23464; Harold H. Casey, 1105 Stoney Brook Landing, Chesapeake, Va. 23320, and Rodger T. Moloney, 1400 London Blvd., Portsmouth, Va. 23704

Continuation of Ser. No. 128,607, Sep. 29, 1993, abandoned, which is a continuation-in-part of Ser. No. 920,853, Jul. 28, 1992, abandoned. This application Sep. 2, 1994, Ser. No. 300,839

Int. Cl.[6] C25B *9/00*

U.S. Cl. 204—269 **10 Claims**

1. A filter assembly comprising:



a housing member, said housing member having a top end and a bottom end, and a substantially cylindrical exterior wall, and said housing member is constructed of an electrically non-conductive material;

means for temporarily closing said top end of said cylindrical housing member;

said means for temporarily closing said top end of said cylindrical housing member comprising a first cap member;

means for temporarily closing said bottom end of said housing member;

said means for temporarily closing said bottom end of said housing member comprising a second cap member;

a water-tight bulkhead member secured to said housing member disposed intermediately between said top end and said bottom end of said housing member;

a first chamber interior to said housing member extending from said bulkhead member to said first cap member;

said housing member further comprising a substantially cylindrical first interior wall surrounding said first chamber;

a second chamber interior to said housing member extending from said bulkhead member to said second cap member;

said housing member further comprising a substantially cylindrical second interior wall surrounding said second chamber;

fluid inlet means;

said fluid inlet means comprising first conduit means extending from the exterior of said housing member into said first chamber and second conduit means extending from said first conduit means inside of said first chamber into said second chamber;

said second conduit means comprising a substantially straight, electrically non-conductive first pipe member having a first end and a second end;

fluid outlet means;

said fluid outlet means comprising third conduit means extending from said second chamber to the exterior of said housing member;

a plurality of parallel porous electrode plate members disposed inside of said second chamber perpendicular to said second interior wall;

particulate screening means disposed between each of said plurality of electrode plate members;

said particulate screening means comprising a porous disc member;

first, second and third electrode plate openings in each of said electrode plate members, each of said second electrode plate openings are larger than said third electrode plate openings;

first, second and third disc openings in each of said porous disc members, each of said second disc openings are larger than said third disc openings;

wherein said first pipe member extends through said first electrode plate first opening in each of said electrode plate members and through said first disc opening in each of said porous disc members;

and further comprising means for supporting said plurality of electrode plate members from said bulkhead member;

wherein said means for supporting said plurality of electrode plate members from said bulkhead member comprises;

a first conductor member attached to said bulkhead member and extending through said bulkhead member from said first chamber to said second chamber;

a second conductor member attached to said bulkhead member and extending through said bulkhead member from said first chamber to said second chamber;

a plurality of electrically conductive rigid connector members, each of said connector members having a first end and a second end and an elongated body portion, each said elongated body portion is surrounded with insulation, and the first end of each of said connector members having a female thread and the second end of each of said connector members having a male thread;

wherein a first of said connector members is in electrical communication with said first conductor member and is secured to and in electrical communication with a first of said electrode plate members, and the second end of said first connector member passes through the third opening in said first electrode plate member;

and wherein the second end of said first connector member is secured to the first end of a second of said connector members;

and wherein said second connector member is secured to and in electrical communication with a third of said electrode plate members, and the second end of said second connector member passes through the third opening in said third electrode plate member;

and wherein a third of said connector members is in electrical communication with said second conductor member and is secured to and in electrical communication with a second of said electrode plate members, said second electrode plate member is disposed between said first electrode plate and said third electrode plate, and wherein the second end of said third connector member passes through the third opening in said second electrode plate member;

and wherein the second end of said third connector member is secured to the first end of a fourth of said connector members;

and wherein said fourth connector member is secured to and in electrical communication with a fourth of said electrode plate members, and the second end of said fourth connector member passes through the third opening in said fourth electrode plate member;

and wherein said elongated rigid body portion of said second connector member passes through said second opening in said second electrode plate member;

and wherein said elongated rigid body portion of said third connector member passes through said second opening in said first electrode plate member;

and wherein said elongated rigid body portion of said fourth connector member passes through said second opening in said third electrode plate member;

and wherein said second end of said first pipe member opens into said second chamber.

5,556,523

APPARATUS FOR ELECTROLYZING WATER

Motoharu Satoh, Honio, and Kazushige Watanabe, Maebashi, both of Japan, assignors to Sanden Corporation, Isesaki, Japan

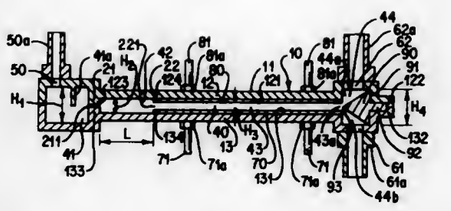
Filed May 19, 1995, Ser. No. 445,114

Claims priority, application Japan, May 19, 1994, 6-105758

Int. Cl.[6] C02F *1/461*

U.S. Cl. 204—272 **30 Claims**

1. In an apparatus for electrolyzing water including a casing within which a hollow space is defined for guiding water therethrough, said hollow space including a first end and a second end which is opposite to said first end, said hollow space including a first chamber section at said first end and second chamber section



at said second end, said first and second chamber sections being aligned along a first line which connects said first end and second end;

an inlet port at said first chamber section to conduct water into said first chamber section from outside of said apparatus;

separate first and second outlet ports at said second chamber section to conduct the water to outside of said apparatus from said second chamber section;

a wall in said hollow space of said casing located at a boundary between said first and second chamber sections along a second line perpendicular to said first line to separate said first chamber section from said second chamber section;

a communication path through said wall to provide communication from said first chamber section to said second chamber section;

potential difference generating means provided at said second chamber section for generating potential difference at said second chamber section to electrolyze the water which flows through said second chamber section, the improvement comprising:

said communication path including fluid friction generating means for generating fluid friction along said second line when the water passes through said communication path so that a distribution of flow speed of the water in said second chamber section becomes substantially uniform with respect to said second line.

5,556,524

ELECTRON-CONDUCTING MOLECULAR PREPARATIONS

Martin Albers, Tampere, Finland, assignor to Valtion Teknillinen Tutkimuskeskus, Finland

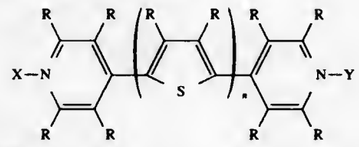
Filed Feb. 16, 1995, Ser. No. 389,597

Claims priority, application Finland, Feb. 16, 1994, 940738

Int. Cl.[6] C25B *13/00*; H01B *1/00*; G01N *27/26*

U.S. Cl. 204—296 **20 Claims**

1. A conductor structure for conducting electrons, comprising a first end structured and arranged to receive electrons and a second end structured and arranged to donate electrons, wherein the conductor structure comprises, acting as a molecular conductor conducting electrons along its molecular structure, a compound with the following general formula (I):



(I)

wherein

n represents an integer from 1 to 12

the groups X and Y are identical or different and denote functional substituents bound to the pyridine nitrogen, or one or both of X and Y are absent, and

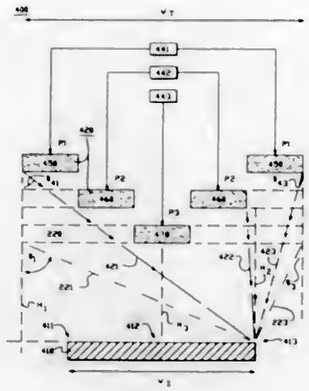
R, being identical or different, represent a hydrogen atom or an aliphatic side chain introduced for enhancing the solubility of the molecule in organic solvents, containing any number of carbon atoms.

5,556,525

PVD SPUTTER SYSTEM HAVING NONPLANAR TARGET CONFIGURATION AND METHODS FOR OPERATING SAME

Zoran Krivokapic, Santa Clara, and David S. Bang, Palo Alto, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 30, 1994, Ser. No. 316,090
Int. Cl.[6] C23C *14/34*
U.S. Cl. 204—192.12 **28 Claims**



1. A method for sputter depositing material onto a substantially planar surface of a supplied substrate, said substrate surface having a top surface plane associated therewith, said method comprising the steps of:

(a) providing a nonplanar target composed of the material to-be-sputter deposited onto the substrate surface, said target having first; second/and third material-emitting portions defined to extend over a prespecified target width;

(b) positioning the nonplanar target relative to the substrate surface such that the first material-emitting portion is at a respective first height relative to the top surface plane of the substrate, and such that the second material-emitting portion is at a respective and different second height relative to the top surface plane, and such that the third material-emitting portion is at a respective third height relative to the top surface plane, and such that a maximum angle of attack is defined for all linear trajectories of deposition material moving from the nonplanar target to corresponding points on the substrate surface, an angle of attack being an angle made between a corresponding linear trajectory and a normal of said top surface plane, said maximum angle of attack being less than a hypothetical maximum angle of attack that would have been provided by a hypothetical planar target having a single planar material-emitting portion extending over said target width and being positioned parallel to the substrate surface at a hypothetical height equal to the smallest of the first, second, and third heights; and

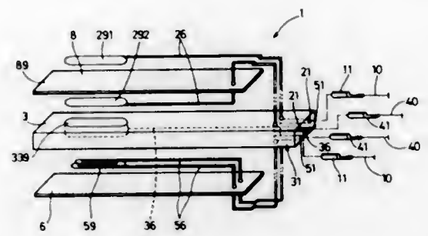
(c) separately applying emission-inducing energy to the first, second, and third portions of the nonplanar target, the emission-inducing energy being applied in the form of a first emission-inducing power supplied respectively to the first material-emitting portion of the target, a different second emission-inducing power supplied respectively to the second material-emitting portion of the target, and a third emission-inducing power supplied respectively to the third material-emitting portion of the target, so as to induce respective rates of emission of deposition material from the respective first, second, and third material-emitting portions of the nonplanar target to the substrate surface.

5,556,526

GAS SENSOR HAVING ENHANCED EXTERNAL CONNECTIVITY CHARACTERISTICS

Kenji Fukaya, Chiryu; Makoto Hori, Ogaki; Masahiro Hamaya, Anjo; Minoru Ota, Okazaki; Syuichi Nakano, Kariya, and Tomoji Fukaya, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 24, 1995, Ser. No. 409,527
Claims priority, application Japan, Mar. 24, 1994, 6-079334; Apr. 29, 1994, 6-113969
Int. Cl.[6] G01N *27/26*
U.S. Cl. 204—425 **15 Claims**



1. A gas sensor comprising:

a base member;

a detecting unit mounted on said base member for detecting a gas concentration;

electrodes mounted on said detecting unit; cylindrical contacts buried integrally in an end portion of said base member;

and electric leads interposed between said cylindrical contacts and said electrodes, and contacting fixtures for external lead wires fitted in and contacted with said cylindrical contacts so that they are connected with the cylindrical contacts.

5,556,527

PROCESS FOR FORMATION OF MULTILAYER FILM

Kazuo Igarashi, Wako; Kengo Takano, both of Nishitama-gun; Toshiharu Morita; Hiroaki Saito, Hidaka; Yukio Hashizume, Sayama; Tokio Suzuki, Kanuma; Hirohisa Tashiro, Kanuma; Mituru Muramoto, Kanuma, and Katsunori Sato, Kanuma, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, and Kansai Paint Co., Ltd., Japan

Filed Jul. 5, 1995, Ser. No. 498,476
Claims priority, application Japan, Jul. 5, 1994, 6-174903
Int. Cl.[6] C25D *13/00*
U.S. Cl. 204—488 **32 Claims**

1. A process for forming a multilayer film on a substrate, which comprises:

applying a cationic electrocoating (A) and an intermediate coating (B), in the given order to a surface of the substrate, followed by heat-curing,

applying thereon a coloring base coating (C) which forms a colored film having a value of N7 to N9 in Munsell's color system,

applying, without curing the coloring base coating (C) applied above, an iridescent base coating (D) containing a scaly mica powder coating with titanium oxide, followed by preliminary drying at 50°–100° C., and

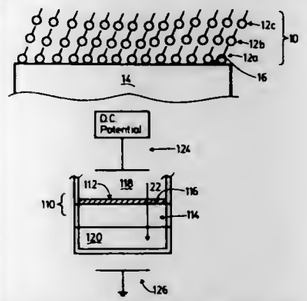
applying a clear coating (E), followed by heating to subject films of the coatings (C), (D) and (E) simultaneously to crosslinking and curing, wherein the coloring base coating (C) and the iridescent base coating (D) are each a thermosetting aqueous coating containing, as vehicle components, an acrylic resin emulsion (a), a urethane resin emulsion (b) and a crosslinking agent (c).

5,556,528

STRUCTURES WITH FIELD RESPONSIVE PERMEATION CONTROL

Paul W. Bohn, Champaign, and Wenyuan Lu, Urbana, both of Ill., assignors to Biotechnology Research & Development Corporation, Peoria, Ill.

Filed May 10, 1994, Ser. No. 240,244
Int. Cl.[6] G01N *27/26;27/447*
U.S. Cl. 204—600 **18 Claims**



1. An electric-field responsive assembly useful with target molecules, comprising:

a fluid source with target molecules therein;

a fluid reservoir spaced from the fluid source, the source, and the reservoir defining a fluid passageway therebetween;

a support being interposed in the passageway, the support permitting target molecules to diffuse therethrough; and

at least one monomolecular layer carried on a surface of the support, the one and any additional monomolecular layers together forming an active control structure, at least one layer of the active control structure is an admixture of molecular species, at least a majority of the molecular species having a large ground state dipole moment, each monomolecular layer having closely packed, dipolar molecules that are substantially aligned along their long axes, the active control structure having an average off permeability value for target molecules in the absence of an electric field or in the presence of an electric field below a threshold value, the active control structure having an on permeability value to target molecules when at least the electric field threshold value is applied thereacross, the on permeability value being enhanced with respect to the off permeability value.

5,556,529

DNA BASE SEQUENCER

Ryozi Nemoto, Honzyo, Japan, assignor to Hitachi Electronics Engineering Co., Ltd., Tokyo, Japan

Filed Jul. 10, 1995, Ser. No. 500,204
Claims priority, application Japan, Jul. 13, 1994, 6-183028
Int. Cl.[6] G01N *27/26;27/447*
U.S. Cl. 204—612 **6 Claims**

1. A DNA base sequencer, comprising a flat plate type gel electrophoretic means that has multiple tracks for electrophoresing DNA fragments and which is held in a vertical position, a light exciting laser light applying means that applies laser light to the respective tracks in said electrophoretic means from one lateral side thereof in such a way that it crosses said tracks at right angles, and a fluorescence detecting means that detects the fluorescence as generated from the DNA fragments illuminated with the laser light and which converts the detected fluorescence to an electric signal, the improvement wherein:

said fluorescence detecting means comprises a fluorescence condensing lens, fluorescence filtering means and a solid-state imaging device, said fluorescence filtering means being composed of at least two filters that selectively transmit fluorescences having difference wavelengths and that are staggered with each other along a common longitudinal axis;

wherein each of said filters comprises a dielectric multi-layered film coated on a transparent glass substrate and has multiple windows of the same shape and size formed on a straight line by removing selected areas of said film; and

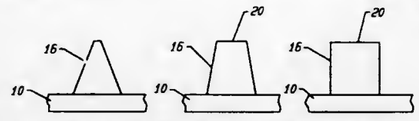
wherein said fluorescence filtering means is composed by superposing said filters in such a way that the windows in one film will not overlap those in the other film but are staggered with the latter.

5,556,530

FLAT PANEL DISPLAY HAVING IMPROVED ELECTRODE ARRAY

Walter Finkelstein, Rockville, Md., and John H. Hall, San Jose, Calif., assignors to Walter J. Finklestein, Rockville, Md.

Filed Jun. 5, 1995, Ser. No. 460,784
Int. Cl.[6] C25D *5/02;7/12;5/34;9/04*
U.S. Cl. 205—122 **5 Claims**



1. A method of fabricating a field emission electrode array for a flat panel display comprising the steps of:

(a) providing a support substrate having a silicon body with a first major surface,

(b) selectively etching said major surface to form an array of electrodes extending from said substrate,

(c) electrolytically etching pores in said array of electrodes, and

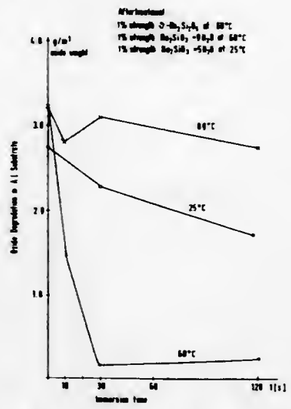
(d) electroplating a film of a carbon compound on surfaces of said array of electrodes including in said pores.

5,556,531

PROCESS FOR THE AFTERTREATMENT OF ALUMINUM MATERIALS SUBSTRATES OF SUCH MATERIALS AND THEIR USE FOR OFFSET PRINTING PLATES

Wolfgang Wiedemann, Geisenheim, Germany, assignor to Agfa-Gevaert AG, Leverkusen, Germany

Filed May 5, 1995, Ser. No. 435,162
Claims priority, application Germany, May 21, 1994, 44 17 907.3
Int. Cl.[6] C25D *11/24*
U.S. Cl. 205—153 **21 Claims**



1. A process for the treatment of a material having an aluminum oxide layer comprising the steps of:

(a) treating the aluminum oxide layer with an aqueous solution of a pure and crystalline alkali metal silicate, and

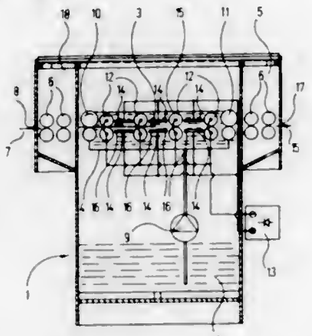
sweeping from said third potential to a fourth potential higher than said hydrogen peroxide detect potential at a fixed rate.

a polluted water reservoir for collecting used water from said washing installation;

wherein each layer of beads between each set of plates are offset from beads in adjacent layers, and wherein the louver panels

(a) treating the aluminum oxide layer with an aqueous solution of a pure and crystalline alkali metal silicate, and
(b) rinsing the treated aluminum oxide layer with ion-containing water.

5,556,532
MANUFACTURE OF A MULTILAYER LAMINATE
Joachim Markowski, Geldern, Germany, assignor to Hans Hölhmüller Maschinenbau GmbH & Co., Herrenberg, Germany
Filed Nov. 2, 1994, Ser. No. 333,991
Claims priority, application Germany, Nov. 6, 1993, 43 37 988.5
Int. Cl.[6] C25F 5/00
U.S. Cl. 205—705 **21 Claims**

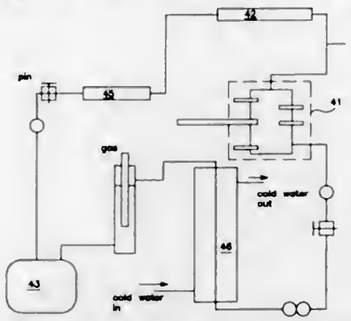


1. A process for the manufacture of a multilayer laminate which comprises layers of electrically conducting and insulating materials respectively, which comprises:
(a) connecting black- or brown-oxidised copper laminates as a cathode exposed to electrolyte in an electrolysis cell in a treatment chamber inside a housing, and conveying the cathode in horizontal orientation in the electrolyte;
(b) generating hydrogen in statu nascendi at the cathode during electrolysis in the cell by which copper oxide present on metallic regions of the laminates is at least partially reduced to reduce the formation of pink rings; and
(c) integrating the laminates into the multilayers.

5,556,533
VOLTAGE APPLYING METHOD FOR HYDROGEN-TYPE ENZYME ELECTRODE
Yoshiteru Nozoe, and Kazuharu Murata, both of Kitamoto, Japan, assignors to A & D Company Limited, Tokyo, Japan
Division of Ser. No. 284,116, Aug. 2, 1994. This application Jun. 6, 1995, Ser. No. 471,779
Claims priority, application Japan, Aug. 3, 1993, 5-192452; Nov. 30, 1993, 5-68460 U
Int. Cl.[6] G01N 27/26
U.S. Cl. 205—777.5 **12 Claims**

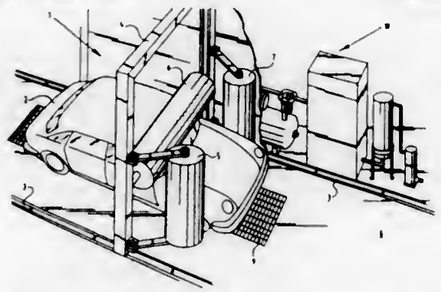
1. A voltage applying method for a hydrogen enzyme electrode having a pair of working electrodes, a reference electrode and a counter electrode comprising:
detecting a contact of a test specimen with said enzyme electrode;
keeping a potential applied to said working electrodes at a first potential of substantially zero for a first preset time;
applying a second potential which is higher than a hydrogen peroxide detect potential to said working electrodes for a second preset time;
dropping said second potential to a third potential below zero potential;
sweeping from said third potential to a fourth potential higher than said hydrogen peroxide detect potential at a fixed rate.

5,556,534
ELECTROCHEMICAL OXYGEN AND PH SENSORS EMPLOYING FLUORIDE BASED SOLID-STATE ELECTROLYTES
Charles B. Alcock, Toronto, Canada, and Nikesh Bakshi, South Bend, Ind., assignors to The University of Notre Dame, Notre Dame, Ind.
Filed Mar. 14, 1995, Ser. No. 404,473
Int. Cl.[6] G01N 27/26
U.S. Cl. 205—787.5 **18 Claims**



1. A method for detecting the pH of an aqueous medium, said method comprising:
contacting an aqueous medium with an electrochemical sensor comprising a closed-end cylinder shaped fluoride based solid-state electrolyte having an inner and outer surface and an internal reference electrode in contact with said inner surface, where in said contacting step, said aqueous medium is contacted with said outer surface of said electrolyte;
measuring the resultant emf across said electrolyte; and
determining the pH of said aqueous medium from said measured emf.

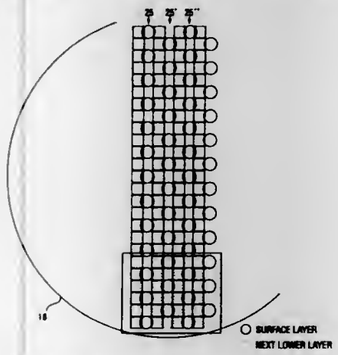
5,556,535
FILTRATION SYSTEM FOR RECYCLING WATER USED IN A CAR WASH
N. Van Der Est, Ambacht, Netherlands, assignor to Micro Tec B.V., Oostzaan, Netherlands
Filed Oct. 28, 1994, Ser. No. 331,386
Claims priority, application Netherlands, Nov. 5, 1993, 9301927
Int. Cl.[6] B01D 36/00
U.S. Cl. 210—140 **4 Claims**



1. An automatic automobile washing installation water filtering system, said system comprising:

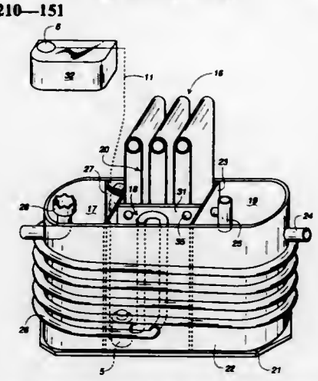
a polluted water reservoir for collecting used water from said washing installation;
a filter disposed downstream in a direction of flow of said used water from said reservoir;
a pumping device configured to pump said used water from said reservoir through said filter;
at least one flow limiting device disposed in series between said pumping device and said filter, said flow limiting device providing a flow of said used water through said filter, said flow limiting device comprising a plurality of parallel flow limiting channels each of which narrows in the direction of said used water flow, said narrowing channels defined at least in part by elastic elements housed in annular housings having an inlet opening at an upstream surface and a relatively smaller outlet opening at a downstream surface, said annular housings being disposed in a plate sandwiched between two end flanges having openings which correspond to said inlet and outlet openings;
a discharge path defined from said filter to a collection reservoir of said system for recycling purified water from said filter to said collection reservoir;
a rinsing liquid supply line in fluid communication with said filter and configured to draw a rinsing liquid from a rinsing liquid source and to direct said rinsing liquid through said filter in a direction opposite to that of said used water through said filter;
means for periodically and automatically isolating said filter from said used water flow and connecting said filter to said rinsing liquid supply line to periodically rinse said filter;
a chemical cleaning solution supply line in fluid communication with said filter and configured to draw a chemical cleaning solution from a cleaning solution source and to direct said solution into said filter; and
means for periodically and automatically isolating said filter from said used water flow and connecting said filter to said chemical cleaning solution supply line for soaking said filter for a time period in said solution adequate for cleaning said filter.

5,556,536
BACTERIAL BED
Philip E. Turk, Galveston, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.
Division of Ser. No. 263,656, Jun. 20, 1994, Pat. No. 5,482,630. This application Mar. 22, 1995, Ser. No. 408,371
Int. Cl.[6] C02F 3/10
U.S. Cl. 210—150 **6 Claims**



1. A bacterial bed comprising:
a plurality of suspended beads sandwiched between a plurality of plates of louver panels having a plurality of openings,
wherein a layer of the beads are arranged between a set of plates such that the layer of beads are present in every other openings,
wherein each layer of beads between each set of plates are offset from beads in adjacent layers, and wherein the louver panels are arranged longitudinally in the bed.

5,556,537
EQUIPMENT FOR CLEANING WASTE WATER
Tapio Saarenketo, Rovaniemi, Finland, assignor to Vapo OY, Jyvaskyla, Finland
Filed Dec. 3, 1992, Ser. No. 985,577
Int. Cl.[6] C02F 3/08
U.S. Cl. 210—151 **12 Claims**

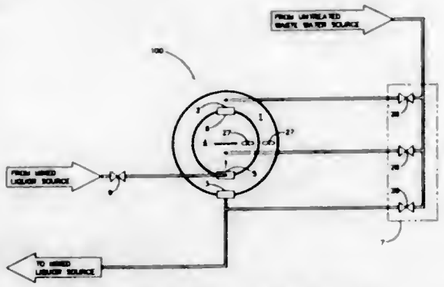


1. A waste water tank, which includes walls delimiting at least one sedimentation space for waste water, wherein:
the wall of the sedimentation space of the tank define a casing; and further comprising
spirally coiled pipe (**1**, **26**) engaging an exterior surface of the casing and at least partly functioning as a flocculation pipe (**13**); and
means structurally securing the pipe to the exterior surface of the casing, so that the pipe imparts structural stiffness to the tank.

9. A waste water cleaning unit which includes a presedimentation space (**19**), a flocculation pipe (**26**), a sedimentation space (**17**), an intermediate space (**20**) between the pre-sedimentation space and the sedimentation space, and a pump (**5**), as well as chemical dosing devices (**6**) in order to achieve a mixing flow, wherein:
at least the pre-sedimentation space (**19**) and the sedimentation space (**17**) comprise a pipe-like casing (**22**) including a cylinder and a base plate (**21**) to form a tank divided by means of intermediate walls (**23**,**31**) into separate spaces (**17**, **18**, **19**, **20**); and
the flocculation pipe (**26**) is coiled spirally onto an outer surface of tile casing (**22**) and is structurally attached to tile outer surface in order to increase mechanical structural strength and stiffness of the casing.

5,556,538
DENITRIFICATION SYSTEM
Gary J. Beard, 5131 Bull Run, Baton Rouge, La. 70817, and Harold J. Beard, 1111 Colonial Dr., Baton Rouge, La. 70806
Filed Nov. 22, 1994, Ser. No. 343,715
Int. Cl.[6] C02F 3/30
U.S. Cl. 210—194 **6 Claims**

1. An apparatus for the denitrification of wastewater, for use in a wastewater treatment system having a mixed liquor source, comprising:
(1) two or more non-aerated continuous channels, said channels being fluidly connected in a series, each said channel comprising:
(i) an upper portion;
(ii) a lower portion;



(iii) an inlet in said lower portion of said channel;
(iv) an outlet in said upper portion of said channel;
(v) a circulating means for circulating said wastewater in said channel;
(vi) an inlet flow means for flowing said wastewater from said mixed liquor source to said inlet of an initial channel of said series; and
(vii) an outlet flow means for flowing said wastewater from said outlet of a final channel of said series to said mixed liquor source;

(2) a selectively controllable raw sewage manifold fluidly connecting an untreated wastewater source to one or more of said channels and said mixed liquor source, said raw sewage manifold comprising one or more raw sewage inlets which are connected to said one or more channels;

(3) wherein said channels are concentrically arranged and each said channel further comprises vertical sidewalls, and wherein immediately adjacent upstream and downstream channels in said series share a sidewall, said upstream channel outlet and said downstream channel inlet together comprising a transfer box located in said shared sidewall, said transfer box comprising:

(i) a weir having a top end, said top end of said weir extending into said upper portion of said upstream channel; and

(ii) a transfer box bottom and a channel inlet wall having a downstream opening, said downstream opening being adjacent to said lower portion of said downstream channel.

5,556,539
APPARATUS FOR SEPARATING A LIQUID MIXTURE BY PERVAPORATION

Masaaki Mita; Kenji Sugimoto; Seiji Sudoh, all of Kitakyushu; Katashi Shioda, Hatano, and Moriyoshi Kudoh, Buzen, all of Japan, assignors to Mitsubishi Chemical Corporation, and Mitsubishi Kasei Engineering Corporation, both of Tokyo, Japan

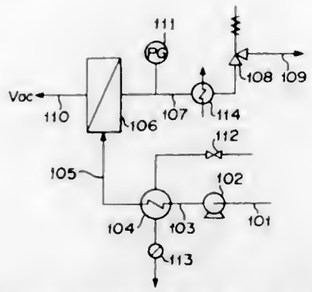
Filed Feb. 24, 1994, Ser. No. 201,033
Claims priority, application Japan, Feb. 26, 1993, 5-038524; Feb. 26, 1993, 5-038525; Mar. 4, 1993, 5-043954; Mar. 10, 1993, 5-076270; Mar. 11, 1993, 5-077647; Mar. 11, 1993, 5-077648
Int. Cl.[6] B01D *61/00;61/36;65/00*
U.S. Cl. 210—195.2 **10 Claims**

1. An apparatus for separating a liquid by pervaporation, which comprises:

at least one pervaporation membrane module unit for separating a liquid to be treated into a permeated fluid and a non-permeated liquid,

a supply line connected to said pervaporation membrane module unit and supplying the liquid to be treated to the membrane module unit,

a withdrawing line withdrawing a permeated fluid from the membrane module unit and a withdrawing line withdrawing a non-permeated liquid, wherein said supply line is provide with a pressure pump for transporting the liquid and a heater, and a final withdrawing line withdrawing the non-permeated liquid is provided with a pressure regulating valve; and

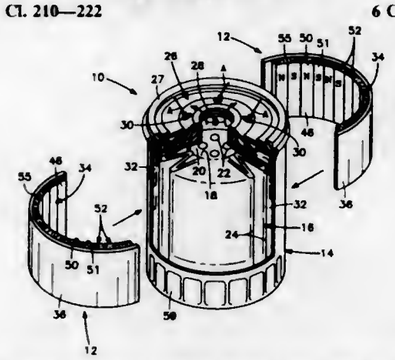


a cooler provided between said at least one pervaporation membrane module unit and the pressure regulating valve in the final withdrawing line withdrawing the non-permeated liquid.

5,556,540
MAGNETIC ASSEMBLY FOR A CLOSED PRESSURIZED FLOW PATH OF LUBRICATING OIL

William J. Brunsting, 2171 Eagleton La., Lake Havasu City, Ariz. 86403

Continuation-in-part of Ser. No. 268,828, Jun. 30, 1994, abandoned. This application Sep. 5, 1995, Ser. No. 523,594
Int. Cl.[6] B01D *35/06*
U.S. Cl. 210—222 **6 Claims**



1. In combination with a canister having a sheet material ferrous outer wall enclosing an internal chamber, said outer wall having an exterior surface and an interior surface, said interior surface forming the enclosing wall surface of said internal chamber, said outer wall having a first thickness, a liquid containing entrained ferrous particles to circulate through said internal chamber, a magnetic assembly for removing said entrained ferrous particles from said liquid, said magnetic assembly comprising:

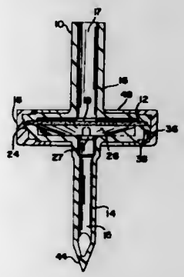
a magnetic member having a magnetic force exerted from an internal surface thereof, said internal surface being mounted directly onto said exterior surface of said outer wall and securely retained against said outer wall solely by said magnetic force, said magnetic member generating a magnetic field within said internal chamber which attracts said ferrous particles and holds said ferrous particles against said interior surface of said outer wall preventing said ferrous particles from exiting said internal chamber, said magnetic member having a plurality of regions of alternating polarity where each said region is juxtaposed to a directly adjacent said region of alternate polarity not having any air gap between directly adjacent regions, said magnetic member having an external surface opposite said internal surface; and

a flux amplifier member composed of ferrous sheet material having a second thickness, said flux amplifier member being mounted directly against said external surface of said magnetic member completely covering such, said flux amplifier member having sufficiently high permeance to direct said magnetic field proximate said magnetic member and substantially increase the strength of said magnetic field within said internal chamber when compared to using said magnetic member without said flux amplifier member, thereby more effectively attracting and holding said ferrous particles against said interior surface of said outer wall.

5,556,541
PROCESS FOR MAKING HERMETICALLY SEALED FILTER UNITS AND FILTERS MADE THEREBY

Rick R. Ruschke, McHenry, Ill., assignor to Filtertek, Inc., Hebron, Ill.

Filed Apr. 26, 1994, Ser. No. 233,068
Int. Cl.[6] B01D *27/08;35/30*
U.S. Cl. 210—232 **8 Claims**



1. A filter assembly for a filter unit comprising:

(a) a first thermoplastic housing member having a fluid port and a pre-molded skirt depending from substantially the entire periphery of said first housing member;

(b) a second thermoplastic housing member axially positioned opposite the first housing member, the second housing member having a fluid port and an outer diameter slightly smaller than an inner diameter of the skirt of the first housing member;

(c) a porous filter element sandwiched between the first and second housing members, the edge of the filter element extended to the pre-molded skirt, the pre-molded skirt not being infused into the filter element until a subsequent injection molding of a thermoplastic overmold over the housing members;

(d) a thermoplastic overmold which is injection molded over the periphery of the housing members sealing the periphery of the housing members, said injection molding causing the peripheral edge of the second housing to become fused to the inside surface of the skirt of the first housing member, said injection molding further causing the pre-molded skirt to infuse into the edge of the filter element forming thereat a substantially continuous leak-proof matrix of thermoplastic material permeated through the pores of the filter element.

5,556,542
FLUID FILTER ASSEMBLY

Claude L. Berman, and Donald W. Beach, both of Cookeville, Tenn., assignors to Fleetguard, Inc., Nashville, Tenn.

Continuation of Ser. No. 128,991, Sep. 29, 1993, abandoned. This application May 17, 1995, Ser. No. 442,642
Int. Cl.[6] B01D *27/00*
U.S. Cl. 210—232 **24 Claims**

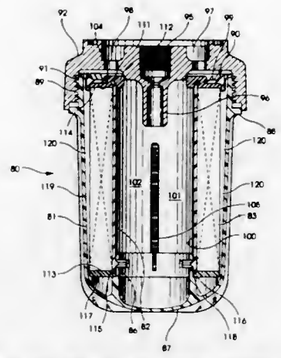
10. A snap-together filter assembly for filtering fluids comprising:

an injection molded plastic outer shell having an open end and means defining a hollow interior and including a closed base opposite to said open end, an integral annular wall extending into the hollow interior from said closed base toward said open end;

a filtering element having means defining a hollow center portion and being disposed within the hollow interior of said outer shell;

an integral endplate and centertube member having an endplate portion and a centertube, wherein said centertube and said annular wall each include connecting means thereon for defining a snap-together interface between said centertube and said integral annular wall to secure the endplate and centertube member to the outer shell, said centertube extending through the hollow center portion of said filtering element, said endplate portion having means defining a plurality of inlet flow apertures and an exit flow aperture, said endplate portion further having means defining an integral annular wall which is disposed outwardly of said centertube and which is generally concentric with said centertube; and

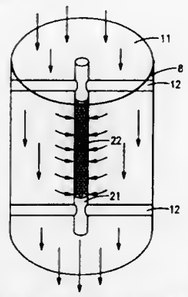
wherein said plurality of inlet flow apertures is disposed radially outward of said integral annular wall defined by said endplate portion and wherein said exit flow aperture is generally centered within said centertube.



5,556,543
FILTER FOR FILTERING GASEOUS AND LIQUID MEDIA

Hermann Trabold, Richolfstrasse 64, D-6980 Wertheim, Germany

Continuation of Ser. No. 859,296, Jul. 9, 1992, abandoned. This application Jun. 22, 1994, Ser. No. 266,801
Claims priority, application Germany, Sep. 25, 1990, 40 30 304.7
Int. Cl.[6] B01D *27/06*
U.S. Cl. 210—435 **14 Claims**



4. A filter for filtering gaseous and liquid medium comprising a filter housing with a medium inlet, and a medium outlet and a porous filter packing, contained within said filter housing, made of a deformable material suitable for filtering the medium as the

medium flows through said filter packing from said inlet to said outlet, said filter packing defining an entry surface through which the medium to be filtered enters said filter packing from said medium inlet,

wherein a rigid hollow central core member extends through said filter packing and said filter packing locates said central core member at a fixed position within the filter housing, said core member is provided with a plurality of openings therein, and at least one end of the core member is open to facilitate the flow of medium through the plurality of openings and either in or out of the at least one open end of the core member to one of said inlet and said outlet, and

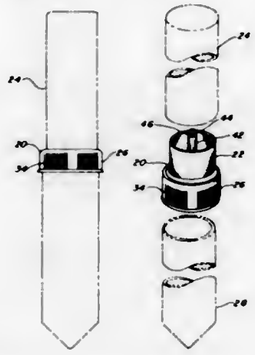
a stabilization element extends adjacent and parallel to said entry surface, entirely across a width of said filter packing, and is attached to said filter packing, entirely across the width of said filter packing, a central portion of said stabilization element is attached to an end of said core member, said core member supports said stabilization element at a fixed location in said housing and adjacent to said entry surface, and said stabilization element supports said filter packing, thereby maintaining a stable form of said filter packing.

5,556,544

CONCENTRATOR & FILTER

Emmanuel R. Didier, 111 Marquez Pl., Pacific Palisades, Calif. 90272

Filed Sep. 8, 1995, Ser. No. 525,182
Int. Cl.[6] B01D *35/28*
U.S. Cl. 210—436 **13 Claims**



1. A fecal parasite concentrator filter comprising:

(a) a cylindrical body having a first end and a second end,

(b) sample vial connection means integrally molded with the body first end for fastening a sample vial containing a liquid diluent fecal specimen,

(c) centrifuge tube connection means integrally molded with the body second end for attaching a centrifuge tube thereupon,

(d) a filter integrally molded with the body and extending into the centrifuge tube connecting means and terminating across the body at right angles for straining and retaining excess fecal debris from a liquid diluent specimen,

(e) a hollow stem integrally molded with said filter, the hollow stem centrally upstanding and parallel with the body first end, the hollow stem abutting the filter at a filter abutment end being coterminous therewith, an upstanding end of the hollow stem at an opposite end to the filter abutment end, for equalizing pressure between the sample vial and the centrifuge tube connected to the body ends when liquid diluted fecal specimen flows therebetween, and

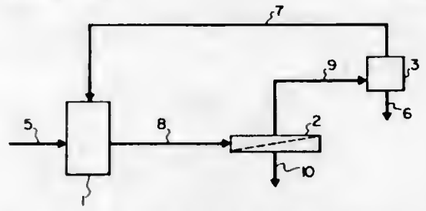
(f) a truncated end inherent with the hollow stem having a plurality of orifices permitting air to pass therethrough while restricting solid matter.

5,556,545

REMOVAL OF ARSENIC FROM AQUEOUS LIQUIDS WITH SELECTED ALUMINA

Konstantin Volchek, Burlington; Saviz Mortazavi, Nepean, and Harry Whittaker, Manotick, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by The Secretary of State for the Environment, Ottawa, Canada

Filed Mar. 3, 1994, Ser. No. 205,486
Claims priority, application Canada, Mar. 4, 1993, 2090989
Int. Cl.[6] C02F *1/28*
U.S. Cl. 210—651 **12 Claims**



1. A process for removing arsenic from aqueous liquids, comprising:

a) providing an aqueous liquid having a pH within the range of 5–7, and containing arsenic in its higher oxidation state (As^{V}) and contacting the aqueous liquid with activated alumina adsorbent selected to have a particle size below 200 micrometers diameter and with sufficient porosity and pore diameters above 100 Angstroms, to achieve arsenic removal to 50 ppb or less within 1 hour and agitating said aqueous liquid with said adsorbent until said removal is achieved;

b) separating the loaded adsorbent from the liquid; and

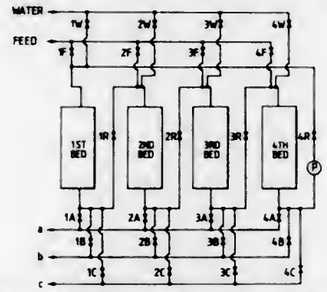
c) recovering water with residual arsenic concentration of 50 ppb or less.

5,556,546

METHOD OF SEPARATION INTO THREE COMPONENTS USING A SIMULATED MOVING BED

Masatake Tanimura, and Masao Tamura, both of Tokyo, Japan, assignors to Mitsubishi Kasei Engineering Company, Tokyo, Japan

Filed Dec. 23, 1994, Ser. No. 362,927
Claims priority, application Japan, Dec. 27, 1993, 5-333242
Int. Cl.[6] B01D *15/08*
U.S. Cl. 210—659 **9 Claims**



1. A method of separating a feed stock containing at least a component A that interacts strongly with an adsorbent, a moderately interacting components B and a weakly interacting component C into at least three fractions, one being rich in component A, a second being rich in component B and a third being rich in component C, by chromatography using a simulated moving bed that includes four unit beds and which is adapted to permit unidirectional internal liquid flow, said method comprising the stages of:

(a) with liquid flow being permitted from first to third unit beds, feeding an eluant into the first unit bed and the feed stock into the third unit bed, respectively, and simultaneously withdrawing part of the effluent from the first unit bed from the system as a fraction rich in component B and the effluent from the third unit bed from the system as a fraction rich in component C, respectively;

(b) with liquid circulation being permitted through the simulated moving bed, moving the liquid in the simulated moving bed downstream without liquid feed to or withdrawal from the simulated moving bed; and

(c) with liquid flow being permitted from the second to first unit beds, feeding the eluant to the second unit bed and simultaneously withdrawing the effluent from the first unit bed from the system as a fraction rich in component A;

wherein, after the above stages (a) to (c) are performed as one step, the step is repeated except that feed stock and eluant are fed to and effluents are withdrawn from the unit beds which exist immediately downstream of the respective corresponding unit beds.

5,556,547

METHOD OF IMPROVING THE CONTAMINANT RESISTANCE OF A SMECTITE CLAY BY REWETTING AND IMPREGNATING THE CLAY WITH A WATER-SOLUBLE POLYMER, AND REDRYING THE POLYMER-IMPREGNATED CLAY

Laura Kajita, St. Charles, Ill., assignor to AMCOL International Corporation, Arlington Heights, Ill.

Division of Ser. No. 128,598, Sep. 29, 1993, Pat. No. 5,407,879. This application Oct. 27, 1994, Ser. No. 330,315
Int. Cl.[6] C02F *11/00*
U.S. Cl. 210—751 **17 Claims**

1. A method of solidifying a sludge comprising mixing a smectite clay with said sludge in an amount sufficient to thicken the sludge so that no free liquid remains after a 24 hour period after the smectite clay and sludge are mixed, the improvement comprising the smectite clay,

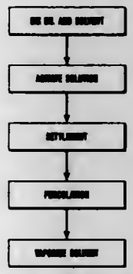
said smectite clay being treated by impregnating the clay with dissolved polymer from an aqueous solution in an amount of at least 0.5% by weight, based on the dry weight of the clay, and rewetting the clay with water to a moisture content of more than about 12% by weight, based on the dry weight of the clay, and then drying the rewetted, polymer-impregnated clay to a moisture content of about 12% by weight or less, based on the dry weight of the clay.

5,556,548

PROCESS FOR CONTAMINATED OIL RECLAMATION

Craig R. Mellen, Salt Lake City, Utah, assignor to Interline Hydrocarbon Inc., Casper, Wyo.

Division of Ser. No. 522,642, May 14, 1990, Pat. No. 5,286,380. This application Feb. 15, 1994, Ser. No. 197,473
Int. Cl.[6] B01D *36/00;17/09;1/02*
U.S. Cl. 210—806 **4 Claims**



1. A process for reclaiming contaminated motor oil comprising the steps of:

(a) combining contaminated motor oil with an aliphatic solvent in a ratio of between five parts of said aliphatic solvent to one part of said contaminated motor oil and fifteen parts of said aliphatic solvent to one part of said contaminated motor oil to form a solution in a first reaction vessel having top and bottom ends;

(b) agitating said solution by allowing heated liquid solvent to bubble up through said solution, said heated liquid solvent being introduced through the bottom end of the first reaction vessel;

(c) allowing said solution to settle gravitationally;

(d) percolating said solution through a filter; and

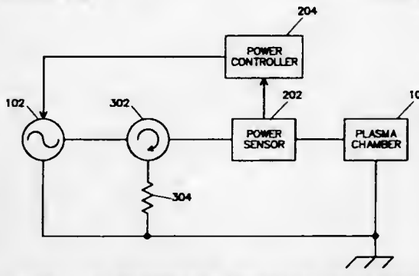
(e) recovering said aliphatic solvent for reuse.

5,556,549

POWER CONTROL AND DELIVERY IN PLASMA PROCESSING EQUIPMENT

Roger Patrick, Santa Clara, Calif., and Frank A. Bose, Wettingen, Switzerland, assignors to LSI Logic Corporation, Milpitas, Calif.

Filed May 2, 1994, Ser. No. 236,444
Int. Cl.[6] H05H *1/00*
U.S. Cl. 216—61 **13 Claims**



1. A method for measuring and controlling process parameters in a plasma processing system, said method comprising the steps of:

monitoring power, voltage, current, phase angle between the voltage and current, direct current bias, harmonic content and impedance at a plasma chamber electrode; and

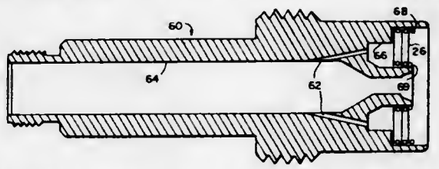
controlling the output of a radio frequency power source so as to maintain desired values for the power, voltage, current, phase angle between the voltage and current, direct current bias, harmonic content and impedance at the plasma chamber electrode.

5,556,550

GAS LENS COLLET BODY

Steve Fyffe, Wimauma, Fla., assignor to Welding Nozzle Internation, Palmetto, Fla.

Filed Mar. 31, 1995, Ser. No. 414,115
Int. Cl.[6] B23K *9/16*
U.S. Cl. 219—75 **1 Claim**



1. A gas lens collet body for use in a gas tungsten arc welding torch comprising a stem portion having an axial center line and a central bore extending co-axially with said axial center line through said stem for receiving and mounting a collet and electrode and defining a shield gas passage and an outer body shell

integrally connected at one end to said stem and defining an annular passage between said body shell and said stem portion, wherein said body shell and said stem portion are constructed from a single piece of solid copper having said passages formed therein, and

further comprising screen means mounted in an outlet end of said annular passage and a plurality of additional passages extending between said central bore and said annular passage at an angle of 10°–15° relative to said center line, whereby a shield gas may be directed from said central bore through said additional passages for impingement directly on said screen means in said annular passage.

5,556,551

WIRE ELECTRIC DISCHARGE MACHINE

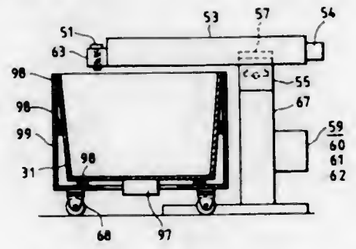
Tsutomu Matsushima, and Toshimitsu Sakakibara, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 26,763, Mar. 5, 1993. This application Jun. 7, 1995, Ser. No. 477,242

Claims priority, application Japan, Mar. 6, 1992, 4-49618

Int. Cl.[6] B23H *7/10*

U.S. Cl. 219—69.12 **12 Claims**



1. A wire electric discharge machine comprising:

wire electrode collecting means for collecting a wire electrode previously used for electric discharge machining, said wire electrode collecting means having an upper section thereof;

vibrating means for vibrating said wire electrode collecting means;

a movable wire guide for guiding the used discharge electrode to said wire electrode collecting means, said movable wire guide being disposed above said wire electrode collecting means.

5,556,552

HEAD FOR AND METHOD OF SPOT WELDING

Paul Leon, 2, Impasse des Sablons, 27630 Berthenonville, France

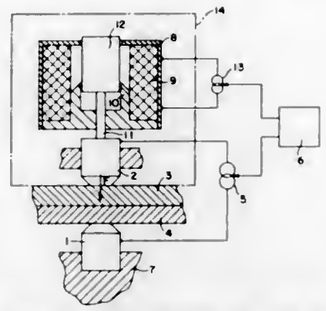
Continuation-in-part of Ser. No. 207,394, Mar. 8, 1994, abandoned. This application Mar. 17, 1995, Ser. No. 407,059

Claims priority, application France, Mar. 10, 1993, 93 02976

Int. Cl.[6] B23K *11/00*

U.S. Cl. 219—86.32 **9 Claims**

9. A welding machine comprising a pair of welding electrodes, electromagnetical means having a winding for moving said pair of welding electrodes together or apart responsive to an energization or deenergization of said winding, a transistor for controlling the energization or deenergization of said winding, said energization being normally at a given voltage level when said electrodes are together and stationary, sensor means coupled to measure an intensity of an energizing current in said winding, and control means responsive to said sensor means for controlling said transistor to apply an energizing voltage at a higher level during said moving of said electrodes, said sensor means having a current pick up coil associated with a coupling between an emitter on said transistor and said winding, and means responsive to said sensor means for



applying said higher level of energizing voltage during an inductive lag time while magnetic flux is building in said winding.

5,556,553

RECYCLE PROCESS FOR REGENERATION OF AMMONIACAL COPPER ETCHANT

Gerald A. Krulik, San Clemente, Calif.; Nenad V. Mandich, Homewood, Ill., and Rajwant Singh, Fullerton, Calif., assignors to Applied Electroless Concepts, Inc., San Clemente, Calif.

Filed May 23, 1995, Ser. No. 447,752

Int. Cl.[6] B44C *1/22;* **C23F** *1/00*

U.S. Cl. 216—93 **11 Claims**

1. A process for the purification of spent ammoniacal alkaline copper etchant containing more than about 100 g/l copper in solution which comprises the steps of:

a) Bringing fresh ammoniacal copper etchant containing less than 100 g/l copper to an operating temperature, between 40° C. and 90° C.;

b) Physically contacting the fresh ammoniacal etchant with a quantity of aluminum metal;

c) Mixing spent ammoniacal etchant containing dissolved copper with the fresh etchant at a controlled rate while monitoring the temperature of the resulting mixture;

d) Controlling the temperature of the mixture at operating temperature using cooling and heating to maintain the temperature of the mixture between 40° C. and 90° C.;

e) Maintaining the pH of the mixture above 8.0 by additions of ammonia to the mixture;

f) Separating substantially copper-free ammoniacal etchant solution from the metallic copper and aluminum hydroxide precipitates formed by reaction of aluminum metal and dissolved copper in the mixture;

g) Reconstituting fresh ammoniacal etchant by additions to reconstitute the pH, specific gravity, and chemical composition of the separated etchant solution.

5,556,554

WIRE-CUT ELECTRICAL DISCHARGE MACHINE AND METHOD WHICH AUTOMATICALLY CALCULATES THE SHAPE, NUMBER AND ARRANGEMENT OF BRIDGING MEMBERS

Hiroaki Morishita, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

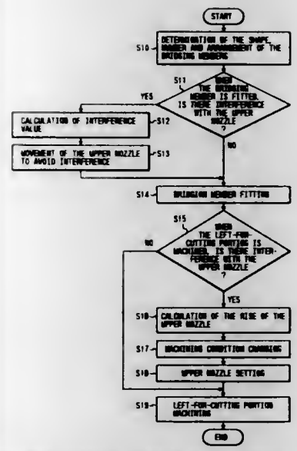
Filed Jan. 23, 1995, Ser. No. 377,091

Claims priority, application Japan, Jul. 7, 1994, 6-156020

Int. Cl.[6] B23H *1/00;7/02*

U.S. Cl. 219—69.12 **20 Claims**

1. A wire-cut electrical discharge machining method wherein bridging members are disposed by a bridging device across a workpiece and a core formed by cutting said workpiece into a contour shape using a wire electrode passed between an upper wire guide and a lower wire guide, said core being held by said bridging



members, and subsequently a portion left for cutting is machined, said method comprising the steps of:

calculating the weight of said core;

calculating values defining the shape of said core;

selecting from the results of said calculations at least one of the shape, number and arrangement positions of said bridging members required to machine the left-for-cutting portion of said core and required to hold said core to substantially maintain an original positional relationship when the left-for-cutting portion of said core is machined;

placing said selected bridging members across said core and said workpiece and clear of said left-for-cutting portion before said left-for-cutting portion is machined;

machining the left-for-cutting portion of said core;

judging interference between the bridging member and the upper nozzle; and

moving the upper nozzle to a non-interference position if it has been determined in said judgment that interference will occur.

5,556,555

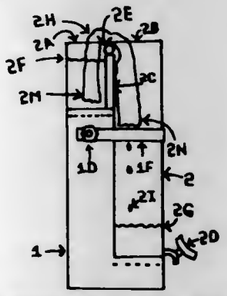
METHOD AND APPARATUS FOR FILTERING USING FILTER MOUNTED ON TANK PARTITION WALL

Solomon Schulzinger, P.O. Box-163, Orlando, Fla. 32802

Filed Jan. 20, 1995, Ser. No. 375,610

Int. Cl.[6] B01D *37/00;35/027*

U.S. Cl. 210—767 **2 Claims**



1. A method of filtering impurities from liquids comprising:

A) providing a stand having a first, elevated surface, and a second portion which is less elevated that the first surface;

B) providing a container to be supported by the stand, the tank having a vertical partitioning wall arranged such that the wall together with a first portion of the container defines boundaries of a first tank and the wall together with a second portion of the container define boundaries of a second tank, the tanks substantially resting on and supported by the respective surfaces of the stand;

C) securing a fabric filter on top of the wall;

D) introducing liquid into the first tank, and

E) removing filtered liquid from a faucet provided at the bottom of the second tank 1.

5,556,556

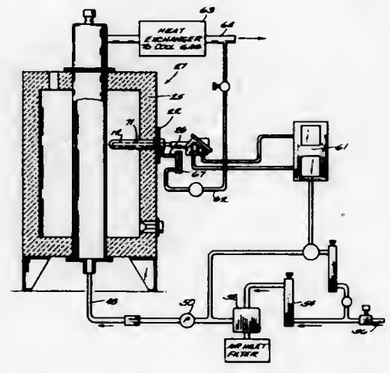
METHOD FOR PRODUCING ENDOTHERMIC ATMOSPHERES AND NON-CATALYTIC PROBE THEREFOR

Robert N. Blumenthal, 17470 Bard Ct., Brookfield, Wis. 53005, and Andreas T. Melville, 204 N. 86th St., Milwaukee, Wis. 53226

Continuation of Ser. No. 212,370, Mar. 11, 1994, abandoned, which is a division of Ser. No. 800,607, Nov. 27, 1991, Pat. No. 5,324,415, which is a continuation of Ser. No. 364,024, Jun. 9, 1989, abandoned. This application Dec. 20, 1994, Ser. No. 359,869

Int. Cl.[6] G01N *27/409*

U.S. Cl. 205—784.5 **10 Claims**



1. A method for producing within a reaction chamber a treatment atmosphere having a carbon potential and subject to formation of carbon when exposed to a prescribed sooting temperature condition, the method comprising the steps of:

heating the reaction chamber to a desired temperature condition above the prescribed sooting temperature condition,

reacting a mixture of gases to produce a treatment atmosphere at the desired temperature condition within the heated reaction chamber,

locating an external sensor within a sample tube outside the reaction chamber for analyzing an atmosphere sample, the sample tube having an interior that extends along an axis and has a distal end, the external sensor being located within the sample tube interior near the distal end,

heating at least the distal end of the sample tube interior to the desired temperature condition,

withdrawing a sample of the treatment atmosphere from the reaction chamber through a gas pipe while cooling the sample from the desired temperature condition within the gas pipe to a temperature condition below the prescribed sooting temperature condition,

reheating the treatment atmosphere sample to the desired temperature condition within the sample tube interior for analysis by the external sensor at the distal end by flowing the treatment atmosphere sample, while in the temperature condition below the prescribed sooting temperature condition, from the gas pipe into the sample tube interior through an inlet having an axis that is generally parallel to the sample tube interior axis, which directs the treatment atmosphere sample within

the sample tube interior in a flow path that is generally parallel to the sample tube interior axis and extends toward the distal end,

increasing the linear flow rate of the treatment atmosphere sample in said flow path compared to its linear flow rate in the gas pipe by constricting the flow of the treatment atmosphere sample along at least a portion of the flow path before reaching the distal end,

generating an output signal based upon the analysis by the external sensor of the treatment atmosphere sampled in the distal end of the sample tube interior, and

controlling the reacting of the mixture of gases in response to the output signal of the external sensor.

5,556,557
METHOD OF PARTITIONING BLOOD USING POLYESTERS

William L. O'Brien, Cincinnati, and Alan C. Kilbarger, Milford, both of Ohio, assignors to Henkel Corporation, Plymouth Meeting, Pa.

Division of Ser. No. 390,898, Feb. 16, 1995, which is a continuation of Ser. No. 100,535, Jul. 30, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 463,374
Int. Cl.⁶ B01D *21/26;* **C08G** *63/02*

U.S. Cl. 210—787 **14 Claims**

1. A method of partitioning blood comprising the steps of:

(i) placing an effective amount of a polyester comprising the repeating units A and B of the formula:

A=the group (—O—R_A—O—) from a dimer diol and

B=

$$(-\underset{\underset{O}{\|}}{C}-R_B-\underset{\underset{O}{\|}}{C}-)$$

wherein R_A has the empirical formula:

$C_{36}H_{70}$

and R_B is a member selected from the group consisting of a divalent aliphatic chain of 1–34 carbon atoms, a divalent cycloaliphatic chain of 3–34 carbon atoms, a divalent arylene chain of from 9–34 carbon atoms, a divalent alkarylene chain of from 7–34 carbon atoms, and a divalent alkaryalkylene chain of from 8–34 carbon atoms, and mixtures thereof, in combination with a filler and a compatible stabilizer, and optionally a pigment into a blood collecting tube,

(ii) introducing the blood to be partitioned, and

(iii) effecting the partitioning of the said blood through the action of centrifugal force.

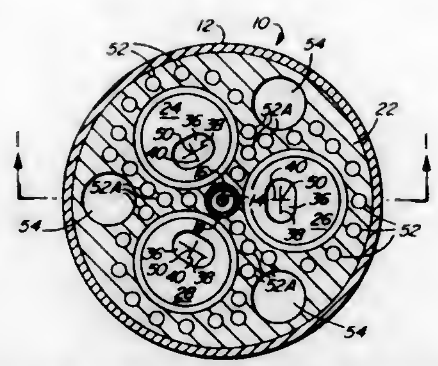
5,556,558
PLASMA JET CONVERGING SYSTEM

Douglas A. Ross, Richmond, and Alan Burgess, North Vancouver, both of Canada, assignors to The Universtiy of British Columbia, Vancouver, Canada

Filed Dec. 5, 1994, Ser. No. 352,709
Int. Cl.⁶ B23K *10/00*

U.S. Cl. 219—121.5 **20 Claims**

1. A plasma jet directing system for directing a plurality of plasma jets into converging relationship to entrap a reactant stream comprising a body portion having a central reactant injection passage means extending substantially concentric with a central axis, at least two plasma gas passages, each said plasma gas passage having an inlet end and an outlet end, said gas passages converging toward each other and toward said central reactant passage means in a direction flow of plasma gases through said converging gas passages from said inlet end toward said outlet end, said gas passages being symmetrically positioned relative to said



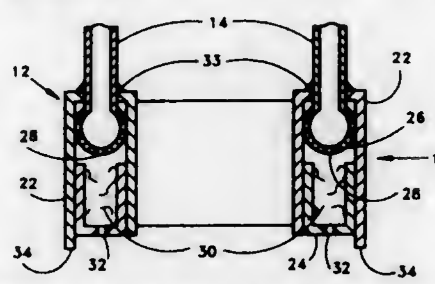
central axis, each of said gas passages having a longitudinal axis extending axially of its said gas passage and converging toward said central passage in said direction of flow at an acute angle to said central axis a minor axis substantially radial to said central axis and a major axis substantially perpendicular to said minor axis at their point of intersection, each said minor axis being shorter than its major axis so that each said gas passage has a cross sectional shape that is symmetrically elongated on opposite sides of its minor axis, each said gas passage having a plasma jet shaping wall defining a major side of its passage at its gas passages outlet end, said jet shaping wall being spaced from an imaginary plane positioned adjacent said outlet end of its gas passage and extending substantially perpendicular to said minor axis and positioned between said jet shaping wall and said central axis, said imaginary plane being spaced from said jet shaping wall at an intersection of said minor axis with said jet shaping wall by a distance equal to or greater than spacing between said imaginary plane and points of said jet shaping wall on opposite sides of said minor axis.

5,556,559
BACKSIDE SHIELDING ASSEMBLY FOR PLASMA ARC WELDING

Gerald W. Bjorkman, Jr., Madison; Samuel D. Clark, Woodsville, and Clinton A. Craig, deceased, late of Madison, all of Ala., assignors to Lockheed Martin Corporation, Bethesda, Md.

Filed Feb. 28, 1995, Ser. No. 395,716
Int. Cl.⁶ B23K *10/00;9/16*

U.S. Cl. 219—121.51 **10 Claims**



1. A backside shielding assembly for plasma arc welding which comprises:

a pair of spaced elongated closed boxes;

mounting means for maintaining said boxes at a selected spaced, substantially parallel, relationship;

means for adjusting the spacing between said boxes and for locking said boxes in a position a selected distance apart;

first sides of both of said boxes lying in a first plane and second, opposite, sides of both of said boxes lying in a second plane;

at least one gas inlet tube penetrating the first side of each box;

an elongated tube within each box adjacent to said first side and in fluid flow communication with said inlet tube;

a plurality of perforations through each of said elongated tubes; and

a quantity of flow diffusing material within each box;

a plurality of perforations through said second sides of said boxes.

5,556,560
WELDING ASSEMBLY FOR FEEDING POWDERED FILLER MATERIAL INTO A TORCH

Tom Ahola, and Kari Ahola, both of Klaukkala, Finland, assignors to Plasma Modules Oy, Helsinki, Finland

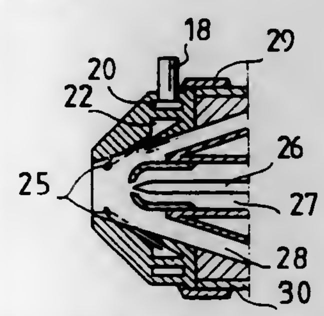
PCT No. PCT/FI93/00109, § 371 Date Sep. 28, 1994, § 102(e) Date Sep. 28, 1994, PCT Pub. No. WO93/19882, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 22, 1993, Ser. No. 307,825

Claims priority, application Finland, Mar. 31, 1992, U 920268

Int. Cl.⁶ B23K *10/00*

U.S. Cl. 219—121.45 **33 Claims**



1. An assembly for feeding, in addition to other materials, a powderized filler material in a welding torch comprising:

a body part having an interior and a first tip section;

elements contained within the interior of the body part, suited to establish a welding flame;

a nozzle piece enclosing the welding flame at the first tip section; said nozzle piece having a second tip section;

at least one inlet channel for conveying the filler material to the second tip section, said at least one inlet channel having a flow area;

nozzle elements for directing a filler material flow into the welding flame at the second tip section;

said body part defining a space arranged in fluid communication with the nozzle elements, said nozzle elements being located between said space and said second tip section so that the nozzle elements form an exit from said space towards the second tip section; and

at least two first branches forked from the end of said inlet channel, said at least two first branches having a first combined flow area which is greater that said flow area of said at least one inlet channel, said at least two first branches being suited to divide and retard the filler material flow and divert its flow direction and guide the flow to said space arranged in fluid communication with the nozzle elements.

5,556,561
METHOD OF FORMING A WELD JOINT OF AUSTENITIC STAINLESS STEEL/FERRITIC STEEL

Kaneyasu Ishikawa; Fumio Mitsuura, and Fujimitsu Masuyama, all of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

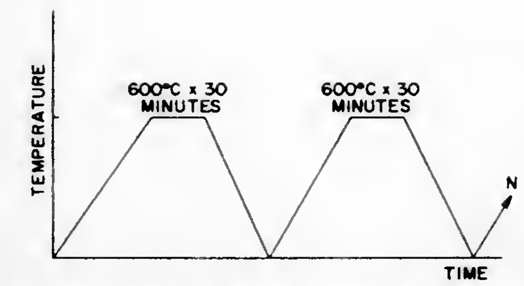
Filed Jan. 9, 1995, Ser. No. 370,108

Claims priority, application Japan, Feb. 17, 1994, 6-020481

Int. Cl.⁶ B23K *35/00;* **C22C** *38/40;19/05*

U.S. Cl. 219—137 WM **3 Claims**

1. A method of joining an austenitic stainless steel and a ferritic steel, which comprises forming a weld joint between the austenitic stainless steel and the ferritic steel, said ferritic steel consisting essentially of 0.03 to 0.12% carbon, 0.70% or less silicon, 0.10 to 1.50% manganese, 0.030% or less phosphorus, 0.015% or less



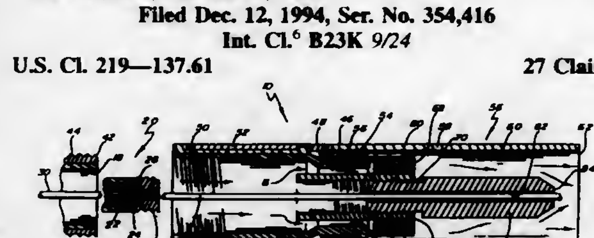
sulphur, 1.50 to 3.50% chromium, 0.40% or less molybdenum, 1.00 to 3.00% tungsten, 0.10 to 0.35% vanadium, 0.01 to 0.10% niobium, 0.030% or less Sol. aluminum, 0.020% or less boron, 0.030% or less nitrogen, and a balance of iron.

5,556,562
WELDING ASSEMBLY

John C. Sorenson, Bloomington, Minn., assignor to J. W. Harris Co., Inc., Cincinnati, Ohio

Filed Dec. 12, 1994, Ser. No. 354,416
Int. Cl.⁶ B23K *9/24*

U.S. Cl. 219—137.61 **27 Claims**



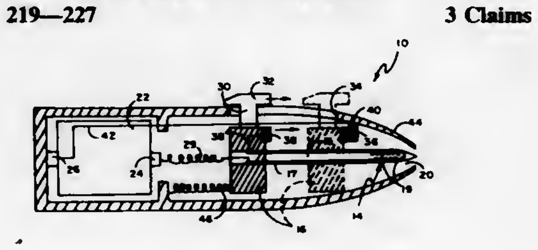
1. An improved welding assembly wherein the welding assembly includes a continuous metal wire electrode which is charged and passed through a contact tip while a work piece is oppositely charged, the improvement comprising the contact tip being made of an alloy of 99% to 50% copper and 1% to 50% carbon, the copper component providing high electrical conductivity throughout the contact tip and the carbon component providing increased lubricity throughout the contact tip.

5,556,563
TICK REMOVAL DEVICE COMPRISING ELECTRICALLY HEATED RETRACTABLE TWEEZERS

Christian P. von der Heyde, 81 McNeil Cir., Marlborough, Mass. 01752, and Michael E. Backus, 256 Webster St., Newton, Mass. 02166

Filed Apr. 10, 1995, Ser. No. 419,729
Int. Cl.⁶ A61B *17/50;* **H05B** *1/00*

U.S. Cl. 219—227 **3 Claims**



1. A device for the removal of a tick attached to an animal or person, comprising:

a casing having a front end, a rear end and an interior cavity

at least two temperature sensors are provided for inserting

1. A combined microwave and gas-heating oven, comprising a

average anode current is determined and said processor

a casing having a front end, a rear end and an interior cavity defined therein, said casing having an exterior wall, an interior wall and an opening defined in said casing at said front end;

first and second channels defined in said interior wall disposed opposite to one another and tapering inwardly toward one another at the front of said casing;

first and second tweezer arms, each having a pointed first end and a second end, said first and second tweezer arms disposed, respectively, within said first and second channels;

a slide member having a top, said slide member interconnected to said second ends of said tweezer arms;

control means to move said slide member within said casing, said slide member in its use mode adapted to be moved from a first rearward position to a second forward position to advance said first and second tweezer arms within said first and second channels out said opening in said front end of said casing and move said pointed ends toward one another by said tweezer arms' contact with said inwardly tapering channels, said tweezer arms moving closer together as they extend out said front end of said casing to grasp said tick, and in its storage mode to be moved rearward from its second forward position to its first rearward position, allowing said tweezer arms to spread apart; and

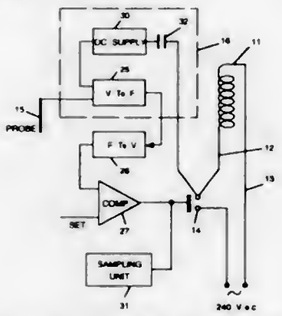
means to heat said first and second tweezer arms when said first and second tweezer arms are in their second forward position to heat a tick when grasped by said first ends of said first and second tweezer arms to cause said tick to release its grip on said animal or person.

5,556,564

CONTROL UNIT FOR CONTROLLING THE TEMPERATURE OF A DOMESTIC WATER SUPPLY

Lupu Wittner, Netanya, Israel, assignor to Target Custom Made Software & Computer Ltd., Ramat Gan, Israel

Filed May 2, 1995, Ser. No. 433,711
Claims priority, application Israel, May 2, 1994, 109502
Int. Cl.[6] H05B *1/02*
U.S. Cl. 219—494 **14 Claims**



1. A control unit for controlling the temperature of a domestic water supply, the control unit comprising:

an electrical immersion heater for inserting into a water tank so as to heat substantially all the water therein;

a set means accessible to a user of the domestic water supply for setting a desired water temperature and producing a corresponding set signal;

a source of electrical power for supplying electricity to the immersion heater; and

a controllable switch connected between the source of electrical power and the electrical immersion heater, and being responsive to a sensor signal and to the set signal for closing if the actual water temperature is lower than the desired water temperature and for opening if the actual water temperature is greater than the desired water temperature;

wherein:

at least two temperature sensors are provided for inserting into the water tank at different predetermined heights thereof so as to produce corresponding sensor signals each representative of actual water temperature of a corresponding fractional volume of water in the tank, and

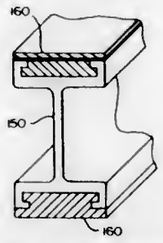
a display is coupled to each temperature sensor and is responsive to the corresponding sensor signal produced thereby for displaying a representation of the actual water temperature of the corresponding fractional volume of water in the tank.

5,556,565

METHOD FOR COMPOSITE WELDING USING A HYBRID METAL WEBBED COMPOSITE BEAM

Brad L. Kirkwood, Kent; Michael M. Stepan, Langley, and Paul J. Patt, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 7, 1995, Ser. No. 483,407
Int. Cl.[6] H05B *6/10*
U.S. Cl. 219—633 **11 Claims**



1. A method for joining organic matrix composite materials to form aerospace structure, comprising the steps of:

(a) assembling a preform to define a bondline, the preform having a prefabricated organic matrix resin composite adjacent a hybrid metal webbed composite capped beam, the beam having a beam web and at least one beam cap, the beam web including a flange for capturing the beam cap and being aligned with the bondline; and

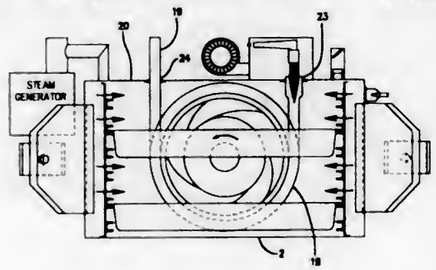
(b) inducing a current in the flange to heat the bondline sufficiently to join the composite to the beam cap through a resin weld.

5,556,566

COMBINED GAS-MICROWAVE COOKING OVEN WITH STEAM OPERATION

Massimo Cappello, Venice, and Claudio Marchesin, Pordenone, both of Italy, assignors to Zanussi Grandi Impianti S.p.A., Pordenone, Italy

Filed Jun. 1, 1995, Ser. No. 456,766
Claims priority, application Italy, Jun. 22, 1994, PN94A0041
Int. Cl.[6] H05B *6/64*; **F24C** *1/02*
U.S. Cl. 219—683 **10 Claims**



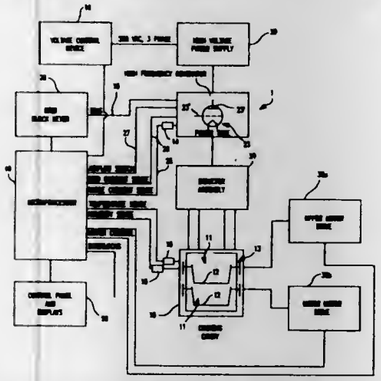
1. A combined microwave and gas-heating oven, comprising a cooking chamber (6); one or more magnetrons for generation of microwaves; several hollow heating elements (5) arranged within the chamber; an external boiler; and a conduit (23) in communication between the boiler and an interior of the chamber suitable for feeding steam from the external boiler into the interior of the cooking chamber, characterized by the fact that the heating elements (5) comprise essentially vertical tubes that cross the cooking chamber from a base to a top thereof, thereby allowing products of combustion of inflammable gases to pass through the heating elements (5) and that insides of the heating elements are not in gaseous communication with the interior of the cooking chamber.

5,556,567

SYSTEM AND PROCESS FOR CONTROLLING DIELECTRIC OVENS

Tim A. Landwehr, West Alexandria; Gary L. Mercer, Eaton, and Joseph P. Miklos, Germantown, all of Ohio, assignors to Henny Penny Corporation, Eaton, Ohio

Filed May 9, 1994, Ser. No. 239,524
Int. Cl.[6] H05B *6/50*
U.S. Cl. 219—779 **14 Claims**



1. A control system for controlling the heating of a product in a dielectric oven, comprising:

at least one dielectric heating circuit including an electromagnetic energy source having an anode operating at a frequency determined by at least one inductor and electrically connected to at least a pair of capacitors, wherein each capacitor includes two capacitor plates and at least one of said capacitor plates is moveable, such that each pair of capacitors forms a variable capacitor in which said product to be heated is a dielectric;

at least one ammeter, electrically connected to said anode, for measuring actual current at said anode;

a motor, mechanically connected to at least one of the plates of at least one of said capacitors, for increasing or decreasing a distance between the plates of at least one of said capacitor, thereby adjusting the electromagnetic energy applied to said product; and

a processor, connected to said at least one ammeter and said motor, for receiving ammeter measurements whereby the distance between said pair of capacitor plates is determined; for receiving, storing, and retrieving a requested anode current; for comparing the requested anode current to the actual anode current to determine whether to increase or decrease the distance between the plates of at least one of said capacitors thereby increasing or decreasing said actual anode current; and for instructing said motor to adjust said distance between said plates;

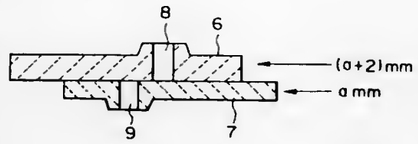
wherein said electromagnetic energy source has a duty cycle adjusted by a keying device and said processor is connected to said keying device and includes a timer, whereby an actual average anode current is determined and said processor receives, stores, and retrieves a requested average anode current and compares said requested average anode current to the average actual anode current to determine whether to increase or decrease the duty cycle and thereby increase or decrease said actual average anode current.

5,556,568

SLIDE GATE PLATE

Shigeki Niwa, Toyoake; Etsuhiro Hasebe, Kariya; Kazuo Itoh, Chiryu; Toshihiro Indoh, Nagoya, and Masamichi Asai, Kariya, all of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1995, Ser. No. 420,779
Claims priority, application Japan, Apr. 12, 1994, 6-073177
Int. Cl.[6] B22D *41/30*
U.S. Cl. 222—600 **22 Claims**



1. A slide gate plate assembly serving as a molten metal flow-rate control member for use in a molten metal discharging device, comprising an of at least one stationary plate having a nozzle hole therein and a slide plate having a nozzle hole therein, said plates being designed so that one of said plates is thicker than the other plate by 1.5 mm or more.

5,556,569

NON-CONVENTIONAL OVERBASED MATERIALS

Nai Z. Huang, Mayfield Heights, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Apr. 6, 1995, Ser. No. 418,046
Int. Cl.[6] C10M *159/00*
U.S. Cl. 508—545 **47 Claims**

1. A process for preparing an overbased organic composition, comprising reacting

(a) a mixture comprising

(i) an organic compound comprising at least one hydrocarbyl group containing in total at least 6 non-aromatic carbon atoms or at least 10 carbon atoms which comprise an aromatic structure, and a polar group containing at least one nitrogen, oxygen, or sulfur atom, said compound being substantially free from acidic hydrogen atoms or NH, OH, and SH groups and from functional groups which provide such organic compounds with acidic hydrogen atoms or NH, OH, or SH groups upon hydrolysis,

(ii) a reaction medium comprising at least one organic solvent for the organic compound of (i), said reaction medium being a material which does not form a soluble salt of the metal base of (iii),

(iii) a metal base in an amount in excess of one equivalent of base per mole of nitrogen, oxygen, and sulfur atoms in said organic compound (i); and

(iv) a catalytic amount of an organic material capable of forming a salt with said metal base which is soluble in said reaction medium;

with

(b) a low molecular weight acidic material.

5,556,570

CARBONACEOUS FERROMAGNETICS AND METHOD FOR THE PREPARATION THEREOF

Hisashi Ueda, Tsukuba, Japan, assignor to Japan as represented by Director General of Agency of Industrial Science and Technology, Japan

Filed Sep. 16, 1994, Ser. No. 307,055

Claims priority, application Japan, Sep. 27, 1993, 5-262969

Int. Cl.[6] C01B *31/02;* **H01F** *1/42*

U.S. Cl. 252—62.51 R **8 Claims**

1. A method for the preparation of a carbonaceous ferromagnetic material which comprises the steps of:

(a) dissolving or dispersing an aromatic ring compound having at least two atoms or groups selected from the group consisting of hetero atoms and carbonyl groups, the carbon atom of the carbonyl group being a member of the ring structure in the aromatic compound, and a compound of a ferromagnetic metallic element in a solvent capable of at least partly dissolving the aromatic ring compound and the compound of a ferromagnetic metallic element to prepare a solution or blend;

(b) removing the solvent from the solution or blend to give a dry blend of the aromatic ring compound and the ferromagnetic metal compound;

(c) subjecting the dry blend obtained in step (b) to thermal decomposition of the aromatic ring compound by heating at a temperature not exceeding 800° C. in an atmosphere containing halogen or a halogen-generating agent to effect carbonization of the aromatic ring compound into a carbonization product; and then

(d) removing the ferromagnetic metal compound from the carbonization product by dissolving away with hydrochloric acid and ammonia water.

5,556,571

MAGNETITE PARTICLES AND PROCESS FOR PREPARING THE SAME

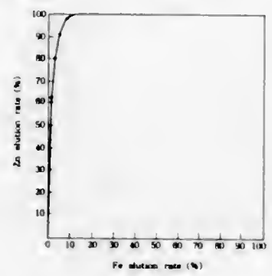
Masachika Hashiuchi; Takeshi Miyazono; Hiroyuki Watanabe, and Tadashi Yamanishi, all of Okayama, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Okayama, Japan

Filed Aug. 4, 1995, Ser. No. 511,262

Claims priority, application Japan, Aug. 5, 1994, 6-202947; Aug. 5, 1994, 6-202948

Int. Cl.[6] H01F *1/11;1/36*

U.S. Cl. 252—62.56 **4 Claims**



1. Magnetite particles characterized in that they have surfaces each covered with a thin film of iron-zinc oxides and have a saturation magnetization of at least 79 emu/g, a degree of blackness (L) of at most 19.5 as measured with a differential colorimeter, and an oil absorption of at least 30 ml/100 g as measured according to JIS K 5101.

5,556,572

RUBBER COMPOSITION FOR CLEANING MOLDS AND EXHIBITING REDUCED AMINO-ALCOHOL VOLATILIZATION AND AMMONIA ODOR, AND METHOD FOR USE THEREOF

Koutaro Nishinaka, and Yasuyoshi Kawaguchi, both of Tokyo, Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Jun. 6, 1995, Ser. No. 470,121

Claims priority, application Japan, Jun. 15, 1994, 6-133218

Int. Cl.[6] C11D *3/37;7/20;7/50;* **C23G** *5/02*

U.S. Cl. 510—188 **20 Claims**

1. A rubber composition for cleaning a mold which comprises 100 parts by weight of a natural rubber and/or a synthetic rubber, 2 to 30 parts by weight of an amino-alcohol salt in terms of an amino-alcohol content wherein the acid for forming the amino-alcohol salt is at least one acid selected from the group consisting of monocarboxylic acids and dicarboxylic acids both of which have 46 or less carbon atoms and inorganic acids, 5 to 50 parts by weight of a glycol selected from the group consisting of ethylene glycol, diethylene glycol, triethylene glycol, propylene glycol and dipropylene glycol, 30 to 90 parts by weight of an adsorbent selected from the group consisting of carbon black, silica, active alumina, active carbon, magnesium oxide, titanium oxide, magnesium carbonate, calcium carbonate, bentonite and diatomaceous earth and 0.5 to 10 parts by weight of an organic peroxide.

20. A method for cleaning a mold soiled by repeatedly vulcanizing an unvulcanized rubber article which comprises the steps of sticking the sheet of a rubber composition for cleaning the mold described in any one of claims **1–19** on the surface of the unvulcanized rubber article which comes in contact with the mold, placing the cleaning rubber article attached the sheet in the mold, heating the article to allow the cleaning rubber article to adsorb soils, and then taking the cleaning rubber article out of the mold.

5,556,573

PROCESS FOR THE PRODUCTION OF STORABLE NONIONIC SURFACTANTS

Manfred Weuthen, Solingen; Thomas Engels, Frechen; Herman Hensen, Haan; Holger Tesmann, Juechen, and Dieter Nickel, Erkrath, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP93/01939, § 371 Date Jan. 26, 1995, § 102(e) Date Jan. 26, 1995, PCT Pub. No. WO94/03569, PCT Pub. Date Feb. 17, 1994

PCT Filed Jul. 21, 1993, Ser. No. 374,687

Claims priority, application Germany, Jul. 30, 1992, 42 25 224.5

Int. Cl.[6] C11D *1/66;3/02;7/02*

U.S. Cl. 510—535 **3 Claims**

1. A process for the production of an aqueous storable nonionic surfactant which comprises adding from about 0.01 to about 0.5% by weight of an iron (III) ion to an aqueous medium containing an alkyl glycoside or alkenyl glycoside of the formula (I):

$$R^1O—(G)_p \qquad (I)$$

wherein R^1 is a linear alkyl or alkenyl radical having from 6 to 22 carbon atoms, G is a sugar unit containing 5 or 6 carbon atoms, and p is a number of from 1 to 10.

5,556,574

EMULSION OF VISCOUS HYDROCARBON IN AQUEOUS BUFFER SOLUTION AND METHOD FOR PREPARING SAME

Hercilio Rivas, Santa FeéNorte; Socrates Acevedo, Edo. Miranda, and Xiomara Gutierrez, Caracas, all of Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Continuation of Ser. No. 413, Jan. 4, 1993, Pat. No. 5,480,583, which is a continuation-in-part of Ser. No. 801,472, Dec. 2, 1991, Pat. No. 5,419,852. This application Jun. 7, 1995, Ser. No. 477,404

Int. Cl.[6] B01J *13/00;* **C10L** *1/32;* **F17D** *1/17*

U.S. Cl. 252—311.5 **11 Claims**

1. A viscous hydrocarbon-in-aqueous buffer solution emulsion, comprising:

a viscous hydrocarbon discontinuous phase having a salt content by weight of less than or equal to about 15 ppm and having a water content of less than or equal to about 0.1%; wherein the viscous hydrocarbon phase is comprising two distinct phases a first large droplet size D_L of between about 10 μm to about 40 μm, and second small droplet size D_S of less than or equal to about 5 μm; and

a basic aqueous buffer solution continuous phase containing a buffer additive in a concentration of at least 500 ppm, an alkali additive in a concentration of between about 50 ppm to about 500 ppm and a natural surfactant, the buffer additive is a water soluble amine selected from the group consisting of ethylamine, diethylamine, triethylamine, propylamine, sec-propylamine, dipropylamine, butylamine, sec-butylamine, tetramethylammonium hydroxide, tetrapropylammonium hydroxide and mixtures thereof, the alkali additive is selected from the group consisting of sodium chloride, potassium chloride, sodium nitrate, potassium nitrate, calcium nitrate, magnesium nitrate and mixtures thereof and the natural surfactant is an inactive surfactant naturally contained in the viscous hydrocarbon and is selected from the group consisting of carboxylic acids, phenols, esters and mixtures thereof and which inactive surfactant is extracted and activated by the buffer additive so as to stabilize the viscous hydrocarbon-in-aqueous buffer solution emulsion.

5,556,575

CORROSION INHIBITION IN REFINERIES USING THE REACTION PRODUCT OF HYDROCARBYL SUCCINIC ANHYDRIDE AND AN AMINE

Elizabeth Babalan-Kibala, Fulshear; Veronica K. Braden; Michael K. Poindexter, both of Sugar Land, all of Tex., and Christopher J. Murphy, Geneva, Ill., assignors to Nalco/Exxon Energy Chemicals L.P., Sugarland, Tex.

Continuation-in-part of Ser. No. 179,428, Jan. 10, 1994, abandoned. This application Mar. 30, 1995, Ser. No. 413,340

Int. Cl.[6] C23F *11/14*

U.S. Cl. 252—394 **28 Claims**

1. A method for inhibiting acid corrosion of metallic surfaces hydrocarbon distillation towers comprising: contacting the surfaces of said distillation tower with an effective amount of a film-forming mono, di, or tri-imide reaction product of a hydrocarbyl succinic anhydride and an amine having at least one primary amine group, wherein the hydrocarbyl substituent of the hydrocarbyl succinic anhydride is selected from the group consisting of alkyl or alkenyl group containing from about 5 to about 50 carbon atoms, said mono, di, or tri-imide reaction product having a molecular weight of from about 400 to about 2,000.

5,556,576

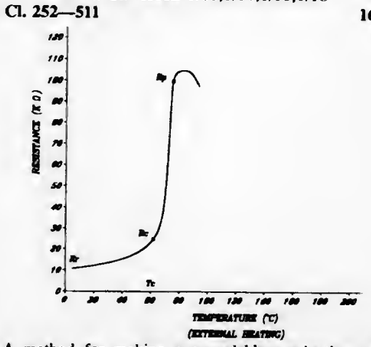
METHOD FOR PRODUCING CONDUCTIVE POLYMERIC COATINGS WITH POSITIVE TEMPERATURE COEFFICIENTS OF RESISTIVITY AND ARTICLES MADE THEREFROM

Yong C. Kim, 1105 Dong 5, Daelim Apartment, Jamwon-Dong, Seoul, Rep. of Korea, and Hiroshi Nishino, 20-35 Yokodai 3-chome, Isogo-Ku, Yokohama, Japan

Filed Sep. 22, 1995, Ser. No. 532,536

Int. Cl.[6] H01B *1/00;1/14;1/16;1/18*

U.S. Cl. 252—511 **16 Claims**



1. A method for making a spreadable conductive polymeric coating having a positive temperature coefficient of resistivity, comprising the following sequential steps:

placing an aromatic solvent in a heated stirring vessel, stirring, and heating to a temperature between 40 and 60 degrees Celsius;

adding a quantity of substrate-forming material selected from the group consisting of thermoplastic resins, uncured thermosetting resins, and elastomers, which contains no diene monomer, equal to 25% to 40%, by weight, of a conductor powder to be added in a later step and continuing to stir;

adding a quantity of a paraffin equal to **25%** to **40%**, by weight, of the conductor powder to be added and continuing to stir until all solids are dissolved;

adding a fine conductor powder selected from the group consisting of graphite, carbon black, metal powder, metal-coated microbeads, and mixtures thereof, and continuing to stir until a smooth paste is formed; and

mix-kneading the paste until a substantially uniform dispersion of the fine conductor powder in the paste is achieved.

5,556,577

HIGH FOAMING NONIONIC SURFACTANT BASED LIQUID DETERGENT

Gilbert S. Gomes, Somerset, N.J.; Rita Erilli, Rocourt, Belgium, and Ronald Kern, Buttzville, N.J., assignors to Colgate-Palmolive Co., Piscataway, N.J.

Continuation-in-part of Ser. No. 91,513, Jul. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 893,138, Jun. 3, 1992, abandoned. This application Feb. 21, 1995, Ser. No. 391,281

Int. Cl.[6] C11D *1/831;1/90*

U.S. Cl. 510—383 **9 Claims**

1. A high foaming light duty liquid detergent composition consisting essentially of:

(a) 13% to 25% of a water soluble nonionic surfactant selected from the group consisting of primary and secondary C8–C18 alkanol condensates with 5 to 30 moles of ethylene oxide, condensates of C8–C18 alkylphenol with 5 to 30 moles of ethylene oxide and propylene oxide having a weight ratio of total alkylene oxide content of 60% to 85% by weight and condensates of 2 to 30 moles of ethylene oxide with sorbitan mono and tri-C10–C20 alkanoic acid esters having an HLB of 8 to 15, said nonionic surfactant consisting of the primary surfactant and major ingredient in said detergent composition;

(b) 2% to 12% of a water-soluble betaine;

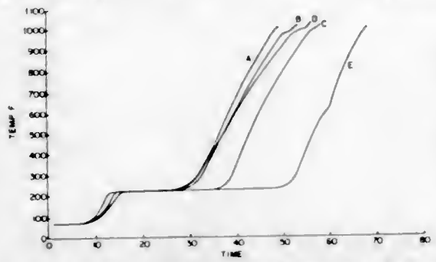
a cover member, said cover member having a peripheral flange

detecting the rotational torque of the injection screw in corre-

5,556,583

(b) 2% to 12% of a water-soluble betaine;
(c) 8% to 16% of a metal or ammonium salt of an ethoxylated alkyl ether sulfate; and
(d) the balance being water as an aqueous medium in which said nonionic surfactant, said metal or ammonium salt of said ethoxylated alkyl ether sulfate and said betaine are solubilized in said water, wherein the composition does not contain any amine oxide, clay fatty acid or a metal salt of a fatty acid, sulfonate surfactant, polymeric surfactant or an alkyl sulfate surfactant, and the concentration of said nonionic surfactant is always greater than the concentration of said ethoxylated alkyl ether sulfate surfactant and said betaine surfactant.

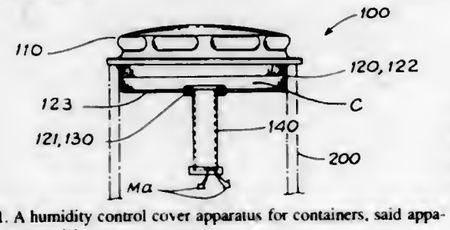
5,556,578
AGGREGATE CONTAINING HYDRATION WATER IN SPRAY APPLIED FIREPROOFING
Philip L. Berneburg, Cabin John, Md.; Antone J. Freitas, Quincy, and Ralph Pisaturo, Wakefield, both of Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.
Filed Dec. 23, 1993, Ser. No. 173,334
Int. Cl.[6] G09K *21/00;* **C04B** *111/28*
U.S. Cl. 252—604 **10 Claims**



1. A sprayable fireproofing composition, comprising a hydraulic cementitious binder, said binder being used in an amount of at least 10% dry weight in said composition, and bauxite as a hydration water-containing hard aggregate, said bauxite having the following sieve analysis:

Screen #	% Retained-Cumulative
+40	1% maximum
−40, +60	0–35%
−60, +100	65% minimum
−100, +200	95 minimum.

5,556,579
TOBACCO JAR COVER HAVING HUMIDITY CONTROL AND METHOD OF USE
Mark R. Newman, P.O. Box 17009, Tucson, Ariz. 85731
Filed Jul. 25, 1995, Ser. No. 506,481
Int. Cl.[6] B01F *3/04*
U.S. Cl. 261—99 **6 Claims**

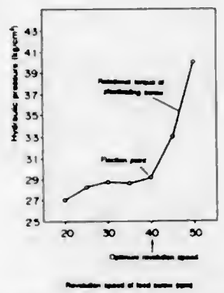


1. A humidity control cover apparatus for containers, said apparatus comprising:
a cover member, said cover member having a peripheral flange portion for engaging an opening of a container;
a cover mount member, said cover mount member being provided with peripheral structure for engaging said flange portion;
a humidity control member; and
a mechanical interface member, said cover mount member being provided with an opening for mounting said mechanical interface member, and said humidity control member being detachably mounted to said mechanical interface member.

5,556,580
LIPOSOME CONTINUOUS SIZE REDUCTION METHOD AND APPARATUS
Robert L. Suddith, Robbinsville, N.J., assignor to The Liposome Company, Inc., Princeton, N.J.
Continuation of Ser. No. 132,159, Oct. 5, 1993, abandoned, which is a continuation of Ser. No. 576,174, Aug. 30, 1990, abandoned, which is a continuation of Ser. No. 36,980, Apr. 16, 1987, abandoned. This application May 10, 1995, Ser. No. 437,906
Int. Cl.[6] A61K *9/127;* **B01J** *13/20;* **B28B** *1/54*
U.S. Cl. 264—4.3 **10 Claims**

1. A method of producing size reduced liposomes in the absence of a filter membrane comprising passing the liposomes through a non-uniform pore size frit having a pore size designation of from at least about 100 nm to about 500 nm, wherein the passage is under a continuous pressure of greater than about 100 pounds per square inch and at a flow rate of at least about 10 ml/minute/cm^2 frit surface area, and wherein substantially all of the size-reduced liposomes have a diameter less than the pore size designation of the frit.

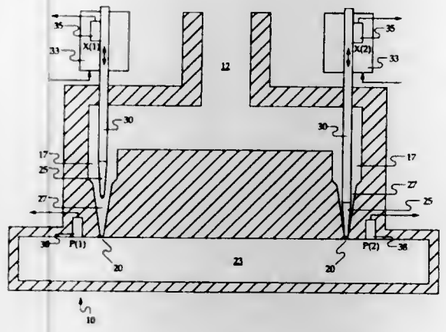
5,556,581
METHOD OF INJECTION MOLDING POLYETHYLENE TEREPHTHALATE
Hidemi Aoki; Yasuhiko Takeuchi, and Kazuo Anzai, all of Hanishina-gun, Japan, assignors to Nissei Plastic Industrial Co., Ltd., Nagano-ken, Japan
Division of Ser. No. 292,510, Aug. 18, 1994. This application May 26, 1995, Ser. No. 452,425
Claims priority, application Japan, Aug. 24, 1993, 5-229664; Mar. 7, 1994, 6-059788
Int. Cl.[6] B29B *7/62*
U.S. Cl. 264—40.1 **3 Claims**



1. A method of injection molding a polyethylene terephthalate in which with an injection screw included in an injection cylinder having a vent, an irregular-shape polyethylene terephthalate having irregular size and shape is forcedly fed by a feed screw from a material feeder on the rear portion of the injection cylinder and plasticated by the rotation of the injection screw, and said polyethylene terephthalate is injection molded into a required molded article, comprising the steps of:

detecting the rotational torque of the injection screw in correspondence with the revolution speed of the feed screw during material feed;
determining a flection point of the rotational torque based on the correspondence of the revolution speed of the speed screw verses the rotational torque of the injection screw; and
operating the feed screw at a revolution speed within a range around the flection point of the rotational torque so as to provide a stable feed rate of the molding material and to avoid difficulty in rotating the injection screw.

5,556,582
INJECTION MOLDING GATE FLOW CONTROL
David O. Kazmer, San Francisco, Calif., assignor to Stanford University, Stanford, Calif.
Filed Feb. 17, 1995, Ser. No. 340,177
Int. Cl.[6] B29C *45/22;45/77*
U.S. Cl. 264—40.1 **2 Claims**

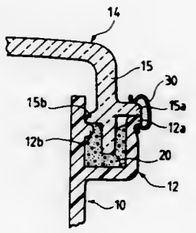


1. A method for injection molding, the method comprising:
initiating a flow of mold material through a first gate into a mold cavity;
sensing a first process condition;
determining a first target process condition;
comparing the first sensed process condition and the first target process condition;
generating a first control signal based at least in part on the comparison between the first sensed process condition and the first target process condition;
adjusting a first valve to change the effective size of the first gate while mold material is flowing through the first gate, wherein the first valve is adjusted based at least in part on the first control signal;
initiating a flow of mold material through a second gate into the mold cavity;
sensing a second process condition;
determining a second target process condition;
comparing the second sensed process condition and the second target process condition;
generating a second control signal based at least in part on the comparison between the second sensed process condition and the second target process condition;
adjusting a second valve to change the effective size of the second gate while mold material is flowing through the second gate, wherein the second valve is adjusted based at least in part on the second control signal; and
preferentially increasing the flow of mold material through the first gate in comparison with the flow of mold material through the second gate by adjusting at least one of the first and second valves while mold material is flowing through at least one of the gates.

5,556,583
ENCAPSULATION METHOD
Nansei Tashiro, Sodegaura-machi, Japan, and Osamu Maruyama, Jakarta, Indonesia, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan
Continuation of Ser. No. 677,185, Mar. 29, 1991, abandoned. This application Feb. 2, 1994, Ser. No. 190,586
Int. Cl.[6] B01J *13/02*
U.S. Cl. 264—4.1 **2 Claims**

1. An encapsulation method wherein one or more hydrophobic liquid and/or solid materials are encapsulated by a process including the steps of:
a) preparing an organic phase consisting of a mixture of:
i) self-dispersible resin, selected from the group consisting of vinyl resins and urethane resins, which through the action of an aqueous phase, is self-dispersible into particles with a diameter of up to about 0.1 μm; and
ii) said one or more hydrophobic liquid and/or solid materials; and
b) combining an aqueous phase with said organic phase, whereby said one or more hydrophobic liquid and/or solid materials become encapsulated by said self-dispersible resin.

5,556,584
PROCESS OF FORMING A SEAL STRUCTURE FOR A VEHICULAR LAMP
Kazuhiro Yamazaki; Kazuo Akiyama, and Michihiko Suzuki, all of Shizuoka, Japan, assignors to Koito Manofacturing Co., Ltd., Tokyo, Japan
Filed Dec. 1, 1993, Ser. No. 159,749
Claims priority, application Japan, Dec. 4, 1992, 4-325815
Int. Cl.[6] B29C *44/06;44/12*
U.S. Cl. 264—46.5 **5 Claims**



1. A method of sealing a lens to a lamp body, said lens including a flange (**15***a*) extending around the periphery thereof and a leg portion extending from said flange, said lamp body including a groove (**12**) extending around a front peripheral portion thereof and defined by an extension portion (**12***a*), comprising the following steps:
injecting a foam sealant into said groove when said sealant is in a liquid state;
inserting said leg portion of said lens into said groove while said foam sealant remains in said liquid state;
allowing said foam sealant to expand such that said foam sealant at least partially surrounds said leg portion and assumes a semi-solid state thereby retaining said leg portion of said lens within said groove; and
forcing said leg portion further into said groove after said foam sealant has expanded and assumed said semi-solid state to thereby compress said foam sealant and, thereafter, mechanically fastening said flange of said lens to said extension portion of said lamp body, wherein in said inserting step said leg portion is inserted to an extent that a space of a predetermined distance remains between said flange and said extension portion so that said leg portion of said lens does not contact a bottom of said groove.

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5,556,587
METHOD OF MANUFACTURING CERAMICS USING A

wherein (i) said outer surface of the pin has at least one groove therein or (ii) said pin is configured to provide a fiber other

5,556,585

DIELECTRIC CERAMIC BODY INCLUDING TIO2 DISPERSION IN CRYSTALLIZED CORDIERITE MATRIX PHASE, METHOD OF PRODUCING THE SAME, AND CIRCUIT BOARD USING THE SAME

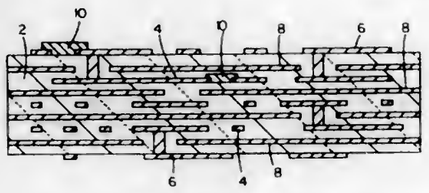
Shinsuke Yano, Nagoya; Hirofumi Yamaguchi, Komaki, and Takami Hiral, Aichi-ken, all of Japan, assignors to NGK Insulators, Ltd., Japan

Continuation of Ser. No. 93,804, Jul. 19, 1993, abandoned, which is a division of Ser. No. 733,633, Jul. 22, 1991, Pat. No. 5,262,595. This application Dec. 22, 1994, Ser. No. 361,710

Claims priority, application Japan, Jul. 25, 1990, 2-196528; Jul. 25, 1990, 2-196529

Int. Cl.° C04B *35/195*

U.S. Cl. 264—56 **5 Claims**



1. A method of producing a dielectric ceramic body, comprising the steps of:

preparing a mixture of a cordierite glass powder and a TiO_2 powder which has a proportion satisfying formulas, $70 \leqq x < 100$, $4 \leqq y \leqq 30$, and $x+y=100$, where x and y represent contents in weight % of said cordierite glass powder and said TiO_2 powder, respectively;

forming an unfired body which comprises the prepared mixture of said cordierite glass powder and said TiO_2 powder; and

firing said unfired body at a temperature not higher than 1100° C., thereby to densify said mixture, and crystallize said cordierite glass powder to produce a crystallized matrix phase of cordierite, and a phase of TiO_2 particles which is dispersed in said matrix phase.

5,556,586

PROCESS FOR MANUFACTURING A HEAT INSULATING MATERIAL

Boris V. Shchetanov; Galina T. Mizyurina; Vladimir N. Gribkov; Radii E. Shalta, and Evgueni B. Kachanov, all of Moscow, U.S.S.R., assignors to Aerospatiale Societe Nationale Industrielle, France, and VIAM-All Russian Institut of Aviation Materials, U.S.S.R.

Filed Mar. 16, 1995, Ser. No. 404,917

Claims priority, application France, Mar. 16, 1994, 94 03047

Int. Cl.° C04B *41/45*

U.S. Cl. 264—62 **11 Claims**

1. A process for manufacturing a heat insulating material comprising alumina based fibers and aluminosilicate binder, said process comprising the following steps:

a) milling alumina based fibers, having a mean diameter less than or equal to 2 μm, in water until a mean aspect ratio (l/d) of 30 to 130 is obtained;

b) vacuum molding a billet from the resulting aqueous, fibrous, flowing slurry;

c) fixing said billet in a frame, while compressing it slightly;

d) drying said slightly compressed billet in the frame to form a dried billet;

e) preparing an aluminosilicate binder having low durability;

f) impregnating the dried billet, fixed in the frame, with the binder;

g) gelling the binder to produce a semi-finished product;

h) removing the semi-finished product from the frame;

i) drying the semi-finished product; and

j) firing the semi-finished product.

5,556,587

METHOD OF MANUFACTURING CERAMICS USING A POROUS MOLD

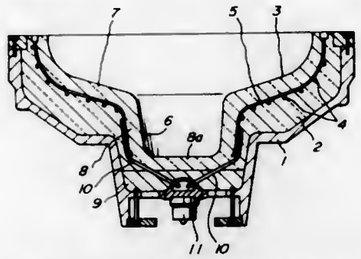
Yoshio Funahashi, Komaki; Masao Kogai, Nagoya; Katsura Kasugai, Ichimiya, and Hideki Kato, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan

Division of Ser. No. 167,028, Dec. 16, 1993, Pat. No. 5,451,152, which is a continuation-in-part of Ser. No. 155,136, Nov. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 855,478, Mar. 23, 1992, abandoned, which is a continuation of Ser. No. 539,334, Jun. 18, 1990, abandoned. This application May 26, 1995, Ser. No. 452,286

Claims priority, application Japan, Jun. 21, 1989, 1-158554

Int. Cl.° B28B *1/26;7/12*

U.S. Cl. 264—86 **4 Claims**



1. A method of manufacturing a ceramic product having small diameter hollow cylindrical central core portion with a closed head portion and a large diameter shed portion extending from the core portion in a radial direction, comprising the steps of pressing a batch of a ceramic material on a mold surface of a porous mold comprising a mold central portion and a mold outer peripheral portion contiguous with the central portion, wherein the mold surface is of a shape corresponding to outer shapes of the cylindrical central core portion and the large diameter shed portion of the ceramic product, to mold the ceramic product, thereafter blowing a gas out of the mold surface to release the ceramic molded product from the mold, wherein a water absorption percentage of a mold surface side portion of the mold outer peripheral portion is larger than a water absorption percentage of the mold central portion.

5,556,588

SYSTEM AND METHOD FOR APPLYING A BLADDER RELEASE BETWEEN A GREEN TIRE AND A BLADDER IN A TIRE MOLDING MACHINE

Mike S. Coyne, Danville, Va.; Stanley A. Crisp, Lillington, N.C., and Jim E. Newman, Ringgold, Va., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 6, 1995, Ser. No. 369,748

Int. Cl.° B28B *17/00;* **B29C** *35/00*

U.S. Cl. 264—130 **14 Claims**

1. In a tire molding machine for curing a green tire including a tire mold having an inflatable bladder therein for pressing the green tire against an inner surface of said tire mold, and a tire loader for picking up said green tire and loading said green tire into said tire mold about said inflatable bladder, the improvement comprising;

a lubricating system mounted to said tire loader for automatically spraying a bladder release into a space between said green tire and said inflatable bladder, said lubricating system including one or more spray nozzles which are removably disposed in said space between said green tire and said inflatable bladder.

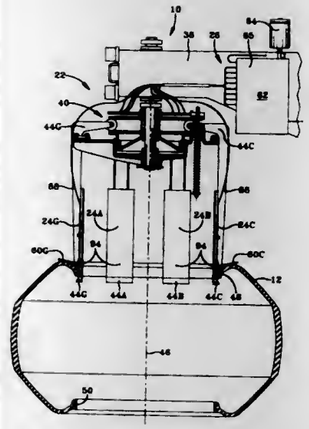
8. The method of curing a green tire in a tire molding machine comprising the steps of:

loading said green tire with a tire loader about an inflatable bladder disposed within a tire mold of said tire molding machine;

automatically spraying a bladder release from a lubricating system having one or more spray nozzles mounted on said tire loader into a confined space between said green tire and said inflatable bladder, said bladder release being sprayed through said one or more spray nozzles which are removably disposed within said confined space;

releasing said green tire within said tire mold from said tire loader; and

raising said tire loader away from said tire mold.



5,556,589

PROCESS OF USING A SPIN PACK FOR MULTICOMPONENT FIBERS

Shiv Sibal, Conyers, Ga., assignor to Hercules Incorporated, Wilmington, Del.

Filed Sep. 7, 1994, Ser. No. 301,914

Int. Cl.° D01D *5/253;* **D01F** *8/06;8/12;8/14*

U.S. Cl. 264—172.12 **24 Claims**

1. A method of spinning multicomponent fibers, which comprises:

A. providing a spinning pack comprising:

(I) a spinneret assembly comprising at least one spinning orifice, a distribution plate, a flow space therebetween, and a solid pin disposed within said spinning orifice and extending into said flow space, said solid pin having an outside surface and having at least one inner fluid flow channel extending longitudinally therethrough; and

(II) a flow assembly operably associated with the spinneret assembly and comprising separate first and second flow channels for distributing first and second liquid spinnable compositions to said spinneret assembly, said first flow channel in fluid communication with said inner fluid flow channel of said pin and said second flow channel extending about the circumference of the distribution plate and in fluid communication with the outside surface of said pin;

B. providing the first liquid spinnable composition to said first flow channel in the flow assembly and the second liquid spinnable composition to said second flow channel in the flow assembly; and

C. drawing from the spinneret orifice a multicomponent fiber comprising the first and second compositions;

wherein said first liquid spinnable composition flows through said first flow channel and said inner fluid flow channel of said pin to be spun through said spinning orifice;

wherein said second liquid spinnable composition flows through said second flow channel about the circumference of the distribution plate, into said flow space, and longitudinally around the outside surface of said pin effect to be co-spun through the spinning orifice with the first spinnable liquid; and

wherein (i) said outer surface of the pin has at least one groove therein or (ii) said pin is configured to provide a fiber other than a concentric single sheath/single core fiber.

5,556,590

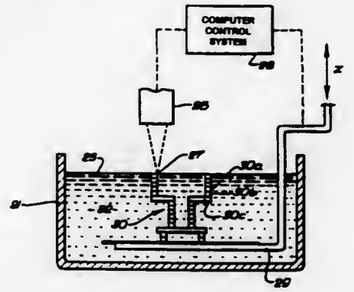
APPARATUS FOR PRODUCTION OF THREE-DIMENSIONAL OBJECTS BY STEREOLITHOGRAPHY

Charles W. Hull, Arcadia, Calif., assignor to 3D Systems, Inc., Valencia, Calif.

Continuation of Ser. No. 299,878, Sep. 1, 1994, abandoned, which is a division of Ser. No. 967,303, Oct. 20, 1992, Pat. No. 5,344,298, which is a continuation of Ser. No. 749,125, Aug. 23, 1991, Pat. No. 5,174,943, which is a continuation of Ser. No. 637,999, Jan. 4, 1991, abandoned, which is a continuation of Ser. No. 493,498, Mar. 14, 1990, abandoned, which is a division of Ser. No. 340,894, Apr. 19, 1989, Pat. No. 4,929,402, which is a continuation of Ser. No. 161,346, Feb. 19, 1988, abandoned, which is a continuation of Ser. No. 792,979, Dec. 19, 1985, abandoned, which is a division of Ser. No. 638,905, Aug. 8, 1984, Pat. No. 4,575,330. This application Jun. 7, 1995, Ser. No. 484,399

Int. Cl.° B29C *35/08;41/02*

U.S. Cl. 264—401 **7 Claims**



1. An apparatus for producing a three-dimensional object from a medium capable of solidification when subjected to synergistic stimulation, said apparatus comprising:

a container for holding said medium;

means for viewing said object during formation and for shielding a viewer from excess synergistic stimulation; and

means for forming successive cross-sectional layers of structure of said object at a surface of said medium, said forming means including means for adhering each successive cross-sectional layer of structure to a preceding cross-sectional layer of structure to produce said object.

5. A method of producing a three-dimensional object from a medium capable of solidification when subjected to synergistic stimulation, comprising the steps of:

providing data representing the three-dimensional object to be formed;

providing synergistic stimulation;

forming successive layers of medium adjacent to any previously formed cross-sectional layers of structure;

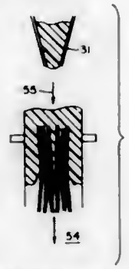
forming and adhering successive cross-sectional layers of structure by exposing said medium to said synergistic stimulation in response to said data, whereby a plurality of adhered cross-sectional layers of structure form the three-dimensional object; and

protecting an operator from excess synergistic stimulation and allowing viewing of the object during formation.

5,556,591
MEMBRANE SEALING TECHNIQUES USING THERMOPLASTIC POLYMERS

Eric Jallerat, Ville D'Avray, and Jean Lemonnier, Le Vesinet, both of France, assignors to Millipore S.A., Saint Quentin-En-Yvelines Cedex, France

Continuation-in-part of Ser. No. 5,710, Jan. 19, 1993, Pat. No. 5,413,925. This application Aug. 19, 1994, Ser. No. 292,982
Claims priority, application France, Jan. 21, 1992, 9200591
Int. Cl.[6] B29C *39/10;65/54*
U.S. Cl. 264—516 **6 Claims**

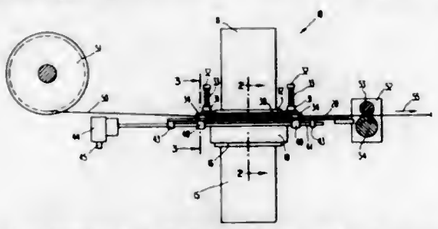


1. A process for potting hollow fibers within a body, comprising the steps of:
a. forming a bundle of hollow fibers within a hollowed portion of said body, said fibers being substantially aligned longitudinally and uniformly spaced within said hollowed portion;
b. dispensing along the longitudinal axis of said bundle a molten thermoplastic composition into said hollowed portion at a contact temperature which is below the melting point of the hollow fibers but which is sufficient to lower the viscosity of said molten composition to allow said composition to flow around all fibers within the bundle;
c. applying a pressure differential to the body to assist the flow of the thermoplastic composition between each of the hollow fiber elements and the interior of the body;
d. said bundle being at a temperature low enough to cause solidification of said molten thermoplastic composition substantially upon contact with said bundle, whereby a solid thermoplastic block is formed encapsulating said bundle within said hollowed portion to create an impervious seal around every hollow fiber in said bundle and the interior of said body.

5,556,592
FILTER INDEXING APPARATUS FOR FILTERING MOLTEN METAL

Jay Hitchings, 1393 Piedmont Dr., Downingtown, Pa. 19335

Filed Aug. 15, 1994, Ser. No. 290,181
Int. Cl.[6] C21B *3/04;* **B01D** *33/00*
U.S. Cl. 266—227 **22 Claims**

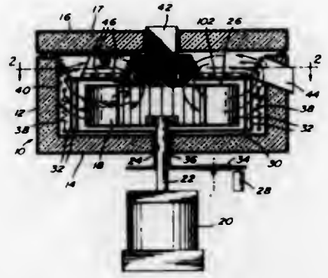


1. An apparatus for filtering molten metal comprising:
(a) inlet means for supplying molten metal comprising means for containing the molten metal;
(b) outlet means in fluid flow communication with the inlet means for receiving molten metal comprising means for containing the molten metal;
(c) a filter for molten metal having a first portion sandwiched in an area between the inlet and outlet means; and
(d) means for serially indexing a second portion of the filter for molten metal into the area between the inlet and outlet means comprising means for moving the inlet means and the outlet means away from each other and means for advancing the second portion of the filter into the area between the inlet and outlet means while the inlet and outlet means are moved away from each other.

5,556,593
METHOD AND APPARATUS FOR HEAT TREATING METAL PARTS

Mario Grenier, 1324 de la Montagne, St. Nicolas, Quebec, Canada

Filed Dec. 14, 1995, Ser. No. 358,580
Claims priority, application United Kingdom, Dec. 14, 1993, 9325571
Int. Cl.[6] C21D *1/06*
U.S. Cl. 266—257 **13 Claims**



1. Apparatus for heat treating metal parts comprising:
a heat insulated enclosure including a hollow cylindrical member defined by a circumferential wall, a bottom wall and a removable cover;
said enclosure having an inlet port for introducing metal parts therein, and an outlet port for removing heat treated metal parts therefrom;
means mounted in said enclosure to support metal parts introduced therein through said inlet port and to continuously move same towards said outlet, where they are removed from said enclosure;
said inlet port comprising an opening formed in said removable cover and generally aligned with an area of said support means intended to receive said metal parts to be heat treated;
said outlet port comprising a chute provided in said circumferential wall and located at a level corresponding to that of said support means;
said support means comprising a rotatable disk mounted in said enclosure, and means operatively connected to said disk to cause rotation thereof;
means for providing a continuous flow of heated air capable of heat treating said metal parts by crossing said metal parts; and
means causing said flow of heated air to cross said metal parts substantially at right angle thereto as the latter are being moved on said support means.

5,556,594
CORROSION RESISTANT AGE HARDENABLE NICKEL-BASE ALLOY

Richard B. Frank, Muhlenberg Township; Terry A. DeBold, Wyomissing; Sunil Widge, Rockland Township, and James W. Martin, Spring Township, all of Pa., assignors to CRS Holdings, Inc., Wilmington, Del.

Filed May 30, 1986, Ser. No. 869,138
Int. Cl.[6] C22C *19/05*
U.S. Cl. 420—448 **34 Claims**

1. An age hardenable nickel base chromium, molybdenum, alloy which when solution treated and age hardened, has a 0.2% yield strength greater than 100 ksi combined with resistance to pitting and crevice corrosion and to stress corrosion cracking in chloride and sulfide environments at elevated temperatures up to about 500° F. without requiring working below its recrystallization temperature, said alloy in weight percent consisting essentially of about

	(w/o)
Carbon	0.1 Max.
Manganese	5 Max.
Silicon	1 Max.
Phosphorus	0.03 Max.
Sulfur	0.03 Max.
Chromium	16–24
Molybdenum	7–12
Tungsten	4 Max.
Niobium	2–6
Titanium	0.50–2.5
Aluminum	Trace–1
Boron	0.02 Max.
Zirconium	0.50 Max.
Cobalt	5 Max.
Copper	0–3
Nitrogen	0–04 Max.
Iron	20 Max.

the balance being at least about 57% nickel, the sum of the percent chromium and molybdenum being not greater than 31, and the sum of the percent niobium, titanium and aluminum being such that the total atomic percent thereof is about 3.5 a/o to 5 a/o when calculated as 0.64 (w/o Nb)+ 1.24 (w/o Ti)+2.20 (w/o Al).

5,556,595
SHEET MATERIAL FOR ELIMINATING METHYL BROMIDE, A MATERIAL THEREFOR OBTAINED BY WORKING THE SHEET INTO A FILTER FORM, AND A METHOD FOR ELIMINATING METHYL BROMIDE WITH THE SAME

Toshiyuki Suzuki, Ohmiya; Shigeru Maeda; Shigeo Hayashimoto, both of Takasaki; Mikio Ogawa, Fujioka, and Norikazu Yoshida, Takasaki, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

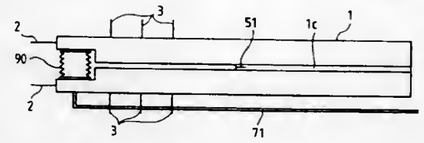
PCT No. PCT/JP93/01299, § 371 Date May 12, 1994, § 102(e) Date May 12, 1994, PCT Pub. No. WO94/06540, PCT Pub. Date Mar. 31, 1994
PCT Filed Sep. 10, 1993, Ser. No. 240,760
Claims priority, application Japan, Sep. 14, 1992, 4-269110; Jun. 30, 1993, 5-183254
Int. Cl.[6] A01N *25/18*
U.S. Cl. 422—32 **14 Claims**

1. A sheet material for eliminating methyl bromide, which is produced by impregnating an activated carbon-containing paper made from a dispersion liquid containing activated carbon powders and cellulose fiber with at least one amine compound selected from the group consisting of monoethanolamine, diethanolamine, triethylenediamine, hexamethylenetetramine, morpholine, piperazine and alkylaminopyridine; and drying it.

5,556,596
CORROSIVE ENVIROMENT SENSOR, CORROSIVE ENVIROMENT MEASURING APPARATUS AND CORROSIVE ENVIROMENT CONTROL SYSTEM

Makoto Hayashi; Satoshi Kanno, both of Hitachi, and Naoto Saito, Chiyoda, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 74,320, Jun. 9, 1993, Pat. No. 5,378,429. This application Sep. 21, 1994, Ser. No. 308,542
Claims priority, application Japan, Jun. 10, 1992, 4-150892
Int. Cl.[6] C01N *17/00*
U.S. Cl. 422—53 **14 Claims**

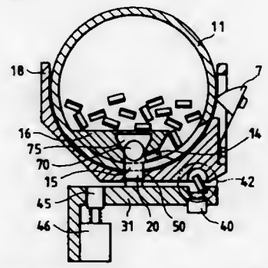


1. A double cantilever type sensor comprising:
an elongate metal member having a pair of beam portions, each extending in a length direction between first and second ends of said member, and having a crack growth portion formed therein and extending in the length direction of said member from a crack starting end toward said second end, said crack starting end being at an intermediate portion between said first and second ends of said member and being between said pair of beam portions;
a changeable load member disposed between said beam portions around said first end of said member for applying a load to said crack growth portion, said changeable load member having an expansible chamber; and
means for supplying pressurized fluid to said expansible chamber to displace said beam portions so that stress intensity factor at a crack growing point is always constant.

5,556,597
TEST STRIP SUPPLY APPARATUS

Isao Shindo; Shigeo Mutou; Susumu Kai, all of Hitachinaka, and Tokio Omori, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 3, 1995, Ser. No. 433,569
Claims priority, application Japan, May 11, 1994, 6-097160
Int. Cl.[6] G01N *35/00*
U.S. Cl. 422—63 **5 Claims**



1. A test strip supply apparatus comprising a container having a test strip accommodation room for accommodating a plurality of elongate test strips having a reagent dipping layer, and a through groove, for taking out the test strips, formed on a wall of the container, wherein said test strip supply apparatus supplies the test strips from said container to a predetermined position outside of the container through the through groove by rotating the container, said test strip supply apparatus comprising,
a guide part formed in the container for bringing one of the plurality of test strips in the test strip accommodation room into the through groove, and

an approach block member positioned in said guide part and

5,556,601

an approach block member positioned in said guide part and arranged so as to protrude or retreat in a test strip guide passage by rotation of said container, said approach block member preventing more than said one of the test strips from passing through the through groove at a given time.

5,556,598

DEVICE AND METHOD FOR AFFINITY SEPARATION

Raybuck P. Margaret, Pontyclun Mid Glamorgan; Kenrick K. Michael, Cardiff, and Parry A. David, London, all of United Kingdom, assignors to Amersham International plc., United Kingdom

Filed Sep. 13, 1993, Ser. No. 119,649

Claims priority, application European Pat. Off., Sep. 18, 1992, 92308536

Int. Cl.[6] B01L *3/02*

U.S. Cl. 422—10 D **12 Claims**

1. A device for capturing a component present in a fluid, comprising a pipette tip having an open rearward end internally tapered to be a friction fit on a pipette for drawing fluid into the pipette tip, an open forward end, and at least one membrane bonded to and extending across said forward end of the pipette tip, said at least one membrane being a woven or non-woven mesh of fibers and incorporating a specific binding partner of said component to be captured, and said pipette tip being frusto-conical decreasing in internal diameter towards said forward end, wherein the pipette tip is constructed of a brittle plastics material and has between said forward and rearward ends a circumferential line of weakening, provided by an external groove, whereby the pipette tip can be broken manually along said line of weakening.

5,556,599

BLOOD SAMPLE/FLUID SYSTEM

Syed M. Ahmed, 2836 Sandberg St., Riverside, Calif. 92506

Filed Jun. 29, 1992, Ser. No. 907,751

Int. Cl.[6] B01L *3/00*

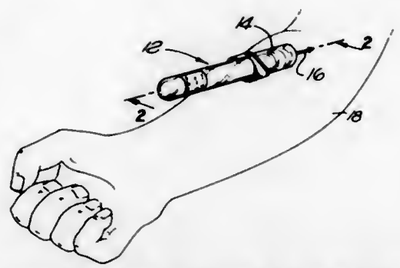
U.S. Cl. 422—102 **4 Claims**

1. A blood sample/fluid system comprising:

a pair of tubes formed of identically shaped concentric cylinders, each tube closed at one end and open at the other end, one of said tubes being a solid fluid retaining enlarged diameter tube having an outer surface and an inner surface, the other tube being a solid fluid retaining reduced diameter tube having an outer surface and an inner surface, the reduced diameter tube being positioned in said enlarged diameter tube; said reduced diameter tube being removable from said enlarged diameter tube;

a locking ring positioned around the outer surface of said reduced diameter tube at the open end thereof and adjacent the inner surface of said enlarged diameter tube for enabling the reduced diameter tube to be spaced from the enlarged diameter tube adjacent the open end of the enlarged diameter tube and provide a tight seal between said tubes; and

identifying labeling means positioned on the outer surface of said enlarged diameter tube for providing identity for both tubes when said reduced diameter tube is positioned in said enlarged diameter tube and for said enlarged diameter tube when said reduced diameter tube is removed from said enlarged diameter tube.



5,556,600

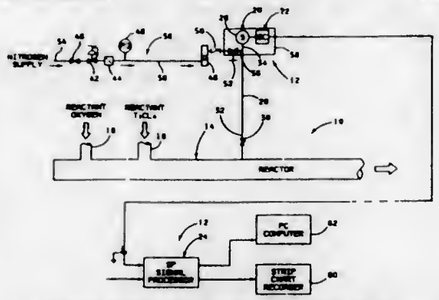
METHOD AND APPARATUS FOR ENHANCING PRODUCTION OF TIO_2

Vernon D. Gebben, Oklahoma City, Okla., and Walter D. Bruce, Columbus, Miss., assignors to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

Division of Ser. No. 390,190, Feb. 17, 1995, which is a continuation of Ser. No. 156,005, Nov. 23, 1993, abandoned. This application May 26, 1995, Ser. No. 452,226

Int. Cl.[6] G05D *7/00;* **G01L** *7/00;* **G01F** *1/00*

U.S. Cl. 422—108 **5 Claims**



1. A control apparatus for enhancing production of TiO_2 by increasing the efficiency of a combustion reaction between $TiCl_4$ and O_2 reactants in a reactor assembly, said reactor assembly having a flow adjustable reactant supply means, the control apparatus being operably connected to the reactor assembly to receive signals therefrom, process and convert said signals to control signals which controls pressure fluctuations within said reactor assembly comprising:

sensor means in fluid communication with said reactor assembly for sensing pressure fluctuations in fluids in the reactor assembly and outputting signals proportional to the sensed pressure fluctuations;

signal amplification means connected to said sensor means for amplifying the output signals and for providing signals substantially free of frequency components not related to sounds of uneven combustion within said reactor assembly; and

signal processor means connected to said signal amplification means and to means for adjusting the flow of reactants to the reactor assembly for converting the amplified signals into control signals so that the flow of at least one of the reactants into the reactor assembly can be controlled to maintain predetermined pressure fluctuations within the reactor assembly.

5,556,601

PROCESS OF MANUFACTURING A TANK OF LOW UNITARY WEIGHT NOTABLY USABLE FOR STOCKING FLUIDS UNDER PRESSURE

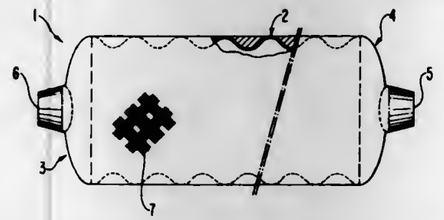
Michel Huvey, Bougival, and Jacques Cheron, Maisons Lafitte, both of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Division of Ser. No. 229,008, Apr. 18, 1994, Pat. No. 5,375,735, which is a continuation of Ser. No. 794,021, Nov. 19, 1991, abandoned. This application Nov. 17, 1994, Ser. No. 341,084

Claims priority, application France, Nov. 19, 1990, 90 14490

Int. Cl.[6] B65H *81/00*

U.S. Cl. 156—172 **12 Claims**



1. A process for manufacturing a tank for containing fluids under pressure, comprising:

(a) providing an inner sheath comprised of two hemispherical or ellipsoidal bottoms and of a corrugated cylindrical zone having circumferential corrugations providing alternating ridges and grooves arranged from one end to the other end of said zone, said grooves defining hollow outer portions on the cylindrical zone and at least one of the bottoms including at least one opening and means in said at least opening for enabling selective communication with an interior of the inner sheath,

(b) filling at least part of each of the hollow outer portions of the corrugated cylindrical zone of the inner sheath with a composition comprising a stabilizable resin and reinforcing fiber for reinforcing the corrugated cylindrical zone of the inner sheath,

(c) subjecting the reinforced corrugated cylindrical zone to a treatment which effects stabilization of the stabilizable composition, and

(d) depositing on an entire outer surface of the reinforced sheath, except for the at least one openings, a longitudinal reinforcement for withstanding longitudinal traction to provide a reinforced tank.

5,556,602

DEVICE IN A REACTOR FOR GASIFYING SPENT LIQUOR

Bengt Nilsson, Skoghall, Sweden, assignor to Chemrec Aktiebolag, Karlstad, Sweden

PCT No. PCT/SE93/00406, § 371 Date Oct. 26, 1994, § 102(e) Date Oct. 26, 1994, PCT Pub. No. WO93/23502, PCT Pub. Date Nov. 25, 1993

PCT Filed May 10, 1993, Ser. No. 325,365

Claims priority, application Sweden, May 19, 1992, 9201561

Int. Cl.[6] D21C *11/00*

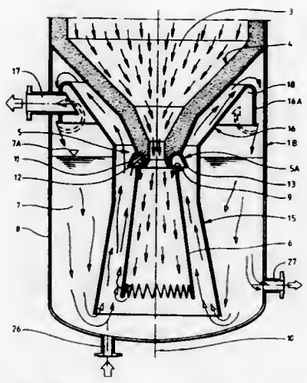
U.S. Cl. 422—185 **9 Claims**

1. A device for thermally decomposing stock, comprising:

a reactor having a chamber in which thermal decomposition takes place, said chamber having an outlet; and

a separation zone comprising a housing containing a liquid bath for separating out components contained in a gas stream leaving the chamber, and a tipping chute;

wherein said tipping chute has a first and a second end, said first end being disposed adjacent said outlet of the chamber, said second end being disposed within the housing for containing the liquid bath; and



wherein a cross-sectional area of said second end of said tipping chute is larger than a cross-sectional area of said first end of said tipping chute.

5,556,603

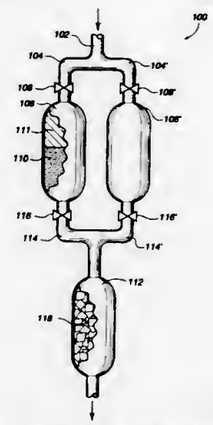
PROCESS FOR THE PURIFICATION OF HYDROGEN AND A PURIFIER THEREFOR

Marco Succi, Milan, Italy, and D'Arcy Lorimer, San Luis Obispo, Calif., assignors to Saes Getters S.p.A., Italy

Division of Ser. No. 386,325, Feb. 10, 1995, which is a continuation of Ser. No. 86,573, Jul. 6, 1993, abandoned, which is a continuation of Ser. No. 825,096, Jan. 24, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 471,638

Int. Cl.[6] B01J *19/00;* **B01D** *53/02;* **C01B** *21/00;3/02*

U.S. Cl. 422—213 **7 Claims**



1. A purifier for the removal of impurities from an impurity-containing hydrogen gas without generating methane, said impurities including carbon monoxide and nitrogen, said purifier comprising:

A. a gas inlet in fluid communication with a first hydrogen gas purification chamber, said first hydrogen gas purification chamber including a bed of particulate material said particulate material including at least 5% elemental nickel by weight, said particulate material being maintained at a temperature between 0° C. and 50° C. to remove said carbon monoxide to produce a partially purified hydrogen gas; and

B. a second hydrogen gas purification chamber in fluid communication with said first hydrogen gas purification chamber, said second hydrogen gas purification chamber including a bed of getter material maintained at a temperature between

200° C. and 500° C. to remove nitrogen from said partially

a regeneration zone (8) operating at a pressure less than the

5,556,607

a) spinning a mixture of vapor phase growth carbon fibers

200° C. and 500° C. to remove nitrogen from said partially purified hydrogen gas to produce a purified hydrogen gas having less than 20 ppb carbon monoxide and nitrogen impurities, said second hydrogen gas purification chamber being in fluid communication with a purified hydrogen gas outlet

wherein said first and second hydrogen gas purification chambers are maintained under conditions effective to prevent the production of methane during the purification of said impurity-containing hydrogen gas.

5,556,604

METHOD AND APPARATUS FOR PURIFYING EXHAUST GASES FROM INTERNAL COMBUSTION ENGINES

Wolfgang Zahn, Ludwigsburg; Gunter Loose, Remseck, and Axel Hirschmann, Goeppingen, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Mar. 1, 1995, Ser. No. 396,958

Claims priority, application Germany, Mar. 3, 1994, 44 06 648.1

Int. Cl.[6] F01N *3/00*

U.S. Cl. 423—213.7 **1 Claim**

1. A method for purifying exhaust gases from an internal combustion engine having a catalyzer system which includes a first catalyzer and at least one second catalyzer arranged downstream of the first catalyzer, for the conversion of HC, CO and NO_x exhaust gas constituents, said exhaust gases flowing through both catalyzers during an entire operating period of the internal combustion engine, the first catalyzer being suitable for at least a catalytic conversion of HC and CO exhaust gas constituents, the method comprising the steps of:

operating the first catalyzer over-stoichiometrically ($\lambda>1$) during a cold starting phase in order to reduce HC and CO emissions; and

at least largely deactivating the catalytic conversion of the exhaust gas in the first catalyzer when the at least one second catalyzer reaches its operating temperature in which a λ-controlled, stoichiometric exhaust gas composition is used, the catalytic conversion occurring in the second catalyzer.

5,556,605

METHOD OF SEPERATING SULPHUR COMPOUNDS

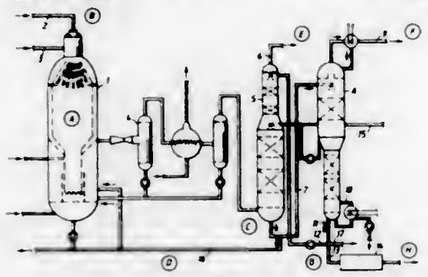
Lars Stigsson, Hammarö , Sweden, assignor to Chemrec Aktiebolag, Karlstad, Sweden

Continuation of Ser. No. 205,651, Mar. 4, 1994, abandoned. This application Sep. 15, 1995, Ser. No. 528,662

Claims priority, application Sweden, Mar. 11, 1993, 9300803

Int. Cl.[6] B01D *53/48;53/52*

U.S. Cl. 423—220 **17 Claims**



1. A method for separating sulphur compounds from a gas flow containing carbon dioxide and hydrogen sulphide, generated in connection with partial oxidation of a spent cellulose liquor under pressure, comprising the steps of:

supplying the gas to a gas washing system comprised of:

a gas-liquid contact zone (5) operating at a pressure exceeding atmospheric pressure; and

a regeneration zone (8) operating at a pressure less than the pressure in the gas-liquid contact zone (5);

introducing the gas into the gas-liquid contact zone (5), the gas having a carbon dioxide partial pressure exceeding 0.2 atm;

contacting the gas with an alkaline absorption liquid containing alkali metal compounds in the gas-liquid contact zone (5);

withdrawing an alkaline liquid (7) containing alkali metal hydrogen sulphide from the gas-liquid contact zone (5);

transferring the alkaline liquid (7) to the regeneration zone (8);

expelling the hydrogen sulphide from the alkali liquid containing alkali metal hydrogen sulphide;

withdrawing from the regeneration zone (8) the hydrogen sulfide in the form of a gas (9);

withdrawing an alkaline liquid (12) containing substantially alkali metal carbonate from the regeneration zone (8) and recirculating the alkaline liquid to the gas-liquid contact zone (5);

supplying a second alkaline liquid containing carbonate, hydrogen carbonate, or a combination thereof in excess of the liquid (12) recirculated from the regeneration zone (8) to the gas washing system; and

withdrawing a liquid flow (13, 17) from the regeneration zone (8) and removing the liquid flow (13, 17) from the gas washing system, the liquid flow (13, 17) substantially corresponding in amount to the supply of the second alkaline liquid containing carbonate, hydrogen carbonate, or a combination thereof, the liquid flow including being substantially free from sulphides.

5,556,606

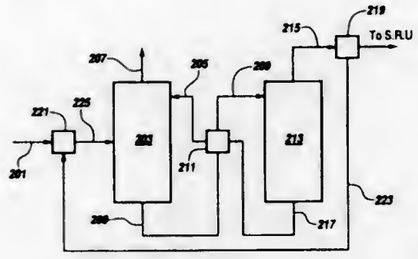
METHOD AND APPARATUS FOR CONTROLLING THE HYDROGEN SULFIDE CONCENTRATION IN THE ACID GAS FEEDSTOCK OF A SULFUR RECOVERY UNIT

Tofik K. Khanmamedov, P.O. Box 741702, Dallas, Tex. 75374-1702

Filed Oct. 7, 1994, Ser. No. 319,746

Int. Cl.[6] C01B *17/16;17/00*

U.S. Cl. 423—228 **17 Claims**



1. A process for controlling the hydrogen sulfide concentration in an acid gas stream and the hydraulic loading of a sulfur recovery unit wherein the sulfur recovery unit is supplied with hydrogen sulfide from a sour gas treatment, in which sour gas is contacted with an absorbent selective for hydrogen sulfide and an acid gas containing hydrogen sulfide is formed by thermally regenerating the absorbent, and wherein the hydrogen sulfide in the acid gas is partially oxidized to produce elemental sulfur by the Claus process and a tail gas containing hydrogen sulfide and sulfur dioxide exits the sulfur recovery unit, the process comprising:

contacting the sour gas stream in an absorber with an absorbent selective for hydrogen sulfide;

thermally stripping the absorbent to form an acid gas stream;

recycling a portion of the acid gas stream to the absorber; and

directing a portion of the acid gas stream to a sulfur recovery unit.

5,556,607

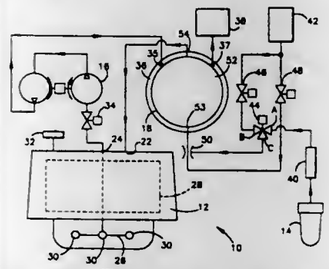
STERILIZATION APPARATUS AND METHOD FOR MULTICOMPONENT STERILANT

Robert W. Childers, Garner; James R. Rickloff, Cary; Thaddeus J. Mielnik, Apex, all of N.C., and Kenneth J. Klobusnik, Lake City, Pa., assignors to American Sterilizer Company, Erie, Pa.

Division of Ser. No. 279,688, Jul. 25, 1994, Pat. No. 5,492,672, which is a continuation of Ser. No. 851,415, Mar. 13, 1992, abandoned. This application Sep. 19, 1995, Ser. No. 530,577

Int. Cl.[6] A61L *2/20;9/00*

U.S. Cl. 422—300 **6 Claims**



1. Apparatus for sterilizing items having at least two open ends and a fluid flow path between the open ends comprising:

a sterilization chamber having an inlet port and an exhaust port;

manifold means fluidly coupled to either the inlet port or the exhaust port and having a plurality of seats, each seat for fluid connection to fluid flow paths of one item;

means for creating a negative pressure differential downstream of the exhaust port;

a source of liquid sterilant;

means for vaporizing the liquid sterilant;

valve means intermediate the source of liquid sterilant and the vaporizing means for pulsing successive increments of liquid sterilant into the vaporizing means;

fluid connection means for fluidly connecting the source of liquid sterilant, the valve means, the vaporizing means and the chamber;

an air flow path through the vaporizing means and at least that portion of the fluid connection means passing from the vaporizing means to the chamber;

means for opening the exhaust port to flow the sterilant vapor and air through the inlet port and out of the chamber through the outlet port for a first period of time while maintaining the chamber pressure at a subatmospheric predetermined level, and for closing the exhaust port to stop the flow of sterilant vapor and air into and out of the chamber for a second period of time while maintaining the chamber pressure at said predetermined subatmospheric pressure; and

means for successively repeating in an alternating fashion the flowing and the stopping of the flow of sterilant vapor and air into and out of the chamber a plurality of times while maintaining the chamber pressure at said predetermined subatmospheric pressure.

5,556,608

CARBON THREAD AND PROCESS FOR PRODUCING IT

Makoto Katsumata; Hidenori Yamanashi, and Hitoshi Ushijima, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Division of Ser. No. 47,066, Apr. 28, 1993, Pat. No. 5,399,330. This application Dec. 6, 1994, Ser. No. 354,052

Claims priority, application Japan, Feb. 15, 1991, 3-042331

Int. Cl.[6] D01F *9/12*

U.S. Cl. 423—447.4 **5 Claims**

4. A process for producing a carbon thread of improved electrical conductivity comprising the steps of:

a) spinning a mixture of vapor phase growth carbon fibers (VGCF) and a carbonizable carbon-containing compound to form a spun thread of the mixture which is longer than said VGCF, and

b) heat-treating the spun thread of the mixture to carbonize the spun thread,

wherein:

the composition of said spun thread and the conditions of said heat treating are sufficient to enhance the electrical conductivity thereof to be greater than the electrical conductivity of said VGCF and said spun thread has an electric conductivity which makes it suitable for use as an electroconductive element.

5,556,609

YIGSR PEPTIDE RADIOPHARMACEUTICAL APPLICATIONS

Paul O. Zamora, Albuquerque, N.M., assignor to RhoMed Incorporated, Albuquerque, N.M.

Continuation-in-part of Ser. No. 840,077, Feb. 20, 1992, Pat. No. 5,443,816. This application Dec. 30, 1992, Ser. No. 998,910

Int. Cl.[6] A61K *51/00;* **C07K** *2/00;* **C07F** *5/00*

U.S. Cl. 424—1.69 **18 Claims**

1. A method of performing a diagnostic procedure in a patient, comprising the steps of:

a) preparing a medically useful metal ion-labeled peptide comprising a peptide sequence comprising the sequence YIGSR (SEQ. ID No. 1) and a medically useful metal ion; and

b) administering an effective amount of the medically useful metal ion-labeled peptide to the patient.

5,556,610

GAS MIXTURES USEFUL AS ULTRASOUND CONTRAST MEDIA, CONTRAST AGENTS CONTAINING THE MEDIA AND METHOD

Feng Yan, Carouge; Michel Schneider, Troinex, both of Switzerland, and Jean Brochot, Feigeres, France, assignors to Bracco Research S.A., Switzerland

Continuation-in-part of Ser. No. 991,237, Dec. 16, 1992, Pat. No. 5,413,774. This application Nov. 30, 1994, Ser. No. 352,108

Int. Cl.[6] A61K *49/00*

U.S. Cl. 424—9.52 **26 Claims**

1. An injectable ultrasound contrast medium comprising biocompatible at body temperature gaseous substances which when in suspension in an aqueous carrier liquid containing usual surfactants, additives and stabilisers provide contrast agents for ultrasound echography, wherein the medium is a mixture of gases (A) and (B) in which, at least one of the gases (B), present in an amount of between 0.5–41% by vol., has a molecular weight greater than 80 daltons and its solubility in water is below 0.0283 ml of gas per ml of water measured under standard conditions, the balance of the mixture being gas A.

5,556,611

VITAMIN A AEROSOL-INHALANT PREPARATIONS AND METHOD

Hans K. Biesalski, Albig, Germany, assignor to Hermes Fabrik pharmazeutischer Praparate, Grosshesselohe, Germany

Continuation of Ser. No. 839,547, Feb. 19, 1992, abandoned, which is a division of Ser. No. 346,439, May 2, 1989, Pat. No. 5,112,598. This application Apr. 21, 1995, Ser. No. 426,344

Int. Cl.[6] A61L *9/04;* **A61K** *9/14;* **A01N** *31/04*

U.S. Cl. 424—46 **4 Claims**

1. A method for preventing and treating mucosal diseases of the epithelia of the tracheobronchial tract, said epithelia being suscep-

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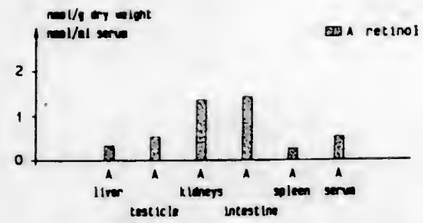


tible to treatment with vitamin A, in a human or animal subject, said method comprising topically applying to the mucosal site of the epithelia of a subject suffering from said disease a therapeutically effective amount of a pharmaceutical preparation in the form of an aerosol inhalate comprising at least one active substance selected from the group consisting of an ester of retinoic acid and an ester of retinol for those in need thereof, with solid or liquid particles distributed in the formed inhalate of about 10^{-7} to 10^{-1} cm in diameter.

5,556,612

METHODS FOR PHOTOTHERAPEUTIC TREATMENT OF PROLIFERATIVE SKIN DISEASES

R. Rox Anderson, Lexington, Mass.; Luciana Hruza, St. Louis, Mo., and Nikiforos Kollias, Belmont, Mass., assignors to The General Hospital Corporation, Boston, Mass.

Filed Mar. 15, 1994, Ser. No. 213,126
Int. Cl.[6] A61K *7/40;7/42*
U.S. Cl. 424—59 **15 Claims**

1. A method for treating a proliferative skin disorder in a human patient is needed thereof having affected and non-affected areas of skin, wherein said disorder results in said affected areas of skin being sloughed off at a greater rate than said non-affected areas of skin, said method comprising the steps of:

(a) topically applying to said affected and non-affected areas of skin a sunscreen providing photo-protection,

(b) waiting for a time period sufficient for skin of said affected areas to be sloughed off to a greater degree than skin of said non-affected areas, and

(c) exposing said affected and non-affected areas of skin of said patient to a selected level of optical radiation, said level of radiation being sufficient to treat said affected areas of skin and being insufficient to cause significant damage to said non-affected areas of skin.

5,556,613

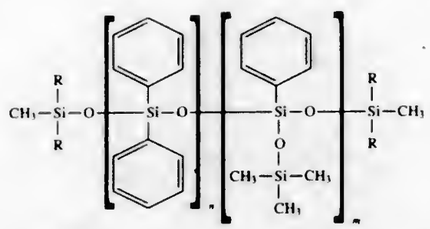
ANHYDROUS COSMETIC OR DERMATOLOGICAL COMPOSITION CONTAINING THE COMBINATION OF A SILICONE OIL AND A WAX MADE FROM AN ETHYLENE HOMOPOLYMER OR COPOLYMER

Pascal Arnaud, Creteil, and Myriam Meilhat, L'Hay Les Roses, both of France, assignors to L'Oreal, Paris, France

Filed Jan. 25, 1995, Ser. No. 377,382
Claims priority, application France, Jan. 26, 1994, 94 00843
Int. Cl.[6] A61K *7/02;7/027*
U.S. Cl. 424—64 **12 Claims**

1. A silicone oil-based anhydrous cosmetic or dermatological composition containing a homogeneous fatty phase, said fatty phase comprising a mixture of:

(i) at least one silicone oil, in an amount ranging from 5 to 97% of the total weight of said fatty phase, having the formula:


(I)

wherein:

R represents alkyl having 1 to 30 carbon atoms, aryl or aralkyl,

n represents a whole number between 0 to 100, and

m represents a whole number between 0 and 100, provided that the sum of n + m is between 1 and 100; and

(ii) a wax in an amount ranging from 3 to 50% by weight based on the total weight of said fatty phase having a melting point between 50° and 135° C. said wax being a homopolymer or copolymer having a molecular weight between 200 and 1,500 and being selected from the group consisting of ethylene homopolymers and copolymer of ethylene with a monomer having the formula:

$$CH_2{=}CH{-}R' \quad \text{(II)}$$

wherein:

R' represents alkyl having 1 to 30 carbon atoms, aryl or aralkyl.

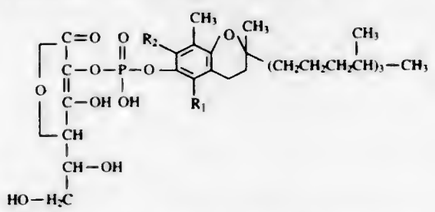
5,556,614

DEODORANT COMPOSITION

Kazumi Ogata, Toyonaka, and Osamu Kawahira, Sakai, both of Japan, assignors to Senju Pharmaceutical Co., Ltd., Osaka, Japan

Filed Oct. 17, 1994, Ser. No. 323,618
Claims priority, application Japan, Oct. 22, 1993, 5-264438
Int. Cl.[6] A61K *7/32;31/66*
U.S. Cl. 424—65 **1 Claim**

1. A method for deodorizing malodors which comprises contacting a source of the malodors with a deodorizing effective amount of a phosphoric diester compound of the formula



wherein R_1 and R_2 are the same or different and each represents a hydrogen atom or a methyl group or a pharmacologically acceptable salt thereof.

5,556,615

CLEAR CONDITIONING COMPOSITION

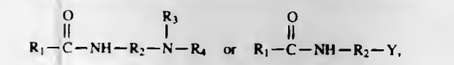
Ben Janchitraponvej, Niles; William J. Brown, Flossmoor, and Patricia Lee, Chicago, all of Ill., assignors to Helene Curtis, Inc., Chicago, Ill.

Division of Ser. No. 40,116, Mar. 30, 1993, Pat. No. 5,328,685. This application May 9, 1994, Ser. No. 240,010
Int. Cl.[6] A61K *7/075*
U.S. Cl. 424—70.11 **19 Claims**

1. A clear hair conditioning composition comprising:

(a) about 0.4% to about 15% by weight of an amidoamine salt, wherein the amidoamine salt comprises:

(i) an amidoamine compound having a general structure:



or a mixture thereof, wherein R_1 is a fatty acid chain containing from about 11 to about 21 carbon atoms; R_2 is an alkylene group containing from two to about four carbon atoms; R_3 is hydrogen, a methyl group, an ethyl group or a hydroxyalkylene group containing from one to about three carbon atoms; R_4 is a methyl group, an ethyl group or a hydroxyalkylene group containing from one to about three carbon atoms; and Y is an organic heterocyclic nitrogen-containing moiety, and

(ii) a sufficient amount of a suitable acid to neutralize the amidoamine compound and provide a composition pH of about 4 to about 7;

(b) about 0.1% to about 5% by weight of a silicone compound having at least two quaternary ammonium moieties; and

(c) an aqueous carrier,

wherein the amidoamine compound is present in a sufficient amount to provide a clear composition, and

wherein the amidoamine compound and the silicone compound are present in a weight ratio of amidoamine compound to silicone compound of at least about 2.8 to 1, such that the composition is clear when free of a coupling agent.

5,556,616

STABLE CONDITIONING SHAMPOO HAVING A HIGH FOAM LEVEL CONTAINING A GRAFT COPOLYMERS OF POLYETHYLENEIMINE AND SILICONE AS A CONDITIONER

Ben Janchitraponvej, Niles, and William Brown, Flossmoor, both of Ill., assignors to Helene Curtis, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 62,606, May 17, 1993, Pat. No. 5,417,965, which is a continuation-in-part of Ser. No. 719,818, Jun. 24, 1991, Pat. No. 5,221,530. This application Aug. 31, 1994, Ser. No. 298,944
Int. Cl.[6] A61K *7/075*
U.S. Cl. 424—70.122 **20 Claims**

1. A conditioning shampoo for thoroughly cleansing and conditioning hair while maintaining foam comprising about 60% to about 90% water by total weight of the conditioning shampoo, an anionic surfactant in an amount of about 5% to about 65% by total weight of the conditioning shampoo; and a graft copolymer of polyethyleneimine on a polymethylsiloxane backbone as a conditioning agent in an amount of about 0.01% to about 20% by total weight of the conditioning shampoo, wherein the polyethyleneimine contains repeating units of $(CH_2CH_2NH)_n$, wherein n is about 15 to about 2500.

5,556,617

COMPOSITION PROVIDING A LASTING COSMETIC AND/OR PHARMACEUTICAL TREATMENT OF THE UPPER EPIDERMAL LAYERS BY TOPICAL APPLICATION ON THE SKIN

Alain Ribier, Paris; Pascal Richart, L'Hay-Les-Roses, and Rose-Marie Handjani, Paris, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 50,315, May 10, 1993. This application Jun. 7, 1995, Ser. No. 473,359
Claims priority, application France, Sep. 13, 1991, 91 11344
Int. Cl.[6] A61K *7/48*
U.S. Cl. 424—78.02 **3 Claims**

1. A composition for the treatment of the upper epidermal layers of the skin, said composition comprising, in a carrier suitable for topical application to the skin, nanocapsules of a nonbiodegradable polymer encapsulating an oily phase, said nonbiodegradable polymer is selected from the group consisting of a vinyl chloride-vinylacetate copolymer and a methacrylic acid-methacrylic acid methyl ester copolymer,

said oily phase, encapsulated in said nanocapsules of said nonbiodegradable polymer, containing an oil selected from the group consisting of ethylhexyl p-methoxycinnamate; 4-tert-butyl-4'-methoxydibenzoylmethane; thyme oil; pentaerythritol tetra(2-ethylhexanoate) and alpha-tocopherol

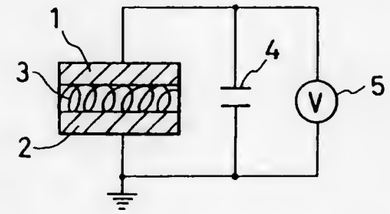
said nanocapsules of said nonbiodegradable polymer having a size ranging from 100 to 1,000 nm and being present in an amount ranging from 0.1 to 20 percent by weight based on the total weight of said composition.

5,556,618

ANTIBACTERIAL ELECTRET MATERIAL

Katsutoshi Ando; Masanori Takahashi, and Goro Kondou, all of Otsu, Japan, assignors to Industries, Inc. Toray, Tokyo, Japan

PCT No. PCT/JP93/00016, § 371 Date Dec. 21, 1993, § 102(e) Date Dec. 21, 1993, PCT Pub. No. WO93/14510, PCT Pub. Date Jul. 22, 1993
PCT Filed Jan. 8, 1993, Ser. No. 108,644
Claims priority, application Japan, Jan. 8, 1992, 4-001722
Int. Cl.[6] A61K *47/30*
U.S. Cl. 424—78.08 **12 Claims**



1. An antibacterial electret material comprising a synthetic organic polymer having a volume resistivity of 10^{13} Ω·cm or above mixed with 0.01 to 2% by weight of at least one electret stabilizer selected from the group consisting of a hindered amine compound, a nitrogenous hindered phenol compound, a metallic salt hindered phenol compound, a phenol compound, a sulfur compound and a phosphorus compound and 0.1 to 4% by weight of an antibacterial metal-ion-containing inorganic compound selected from the group consisting of a metal-ion-containing zeolite; a metal-ion-containing soluble glass and a metal-ion-containing zirconium phosphate,

whereby antibacterial activity is increased as a result of the presence of said antibacterial metal-ion-containing compound, in comparison to an otherwise similar material which contains no antibacterial metal-ion-containing compound,

said antibacterial electret material having a surface charge density of 1×10^{-10} C/cm^2 or above.

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CROSSLINKED POLYMERIC AMMONIUM SALTS

Susan D. Royce; Garret D. Figuly, both of Wilmington; Nitya P. Khasat, Newark, and Jose R. Matos, New Castle, all of Del., assignors to The Du Pont Merck Pharmaceutical Company, Wilmington, Del.

Continuation-in-part of Ser. No. 182,954, Jan. 19, 1994, which is a continuation-in-part of Ser. No. 932,449, Aug. 20, 1992, abandoned. This application Feb. 24, 1994, Ser. No. 202,395

Int. Cl.[6] A61K *31/785*

U.S. Cl. 424—78.08 **36 Claims**

1. A solution polymerization process for preparing a crosslinked polymeric ammonium salt or a pharmaceutically acceptable salt form thereof, said crosslinked polymeric ammonium salt comprising ammonium nitrogen atoms linked by segments to other ammonium nitrogen atoms, wherein:

about 25% or more of the segments which link ammonium nitrogen atoms are group Y wherein each Y is independently

$$-(CR^1R^2)_b-$$

wherein b is an integer of 7 to about 20, and each R^1 and R^2 is independently C_1–C_{20} alkyl or hydrogen;

the remainder of the nitrogen atoms are linked by segments Z wherein each Z is independently a hydrocarbylene radical containing 2 to 50 carbon atoms, said hydrocarbylene radical optionally containing one or more hydroxyl, ether, amino, thioether, keto, or silyl groups or heterocyclic rings;

wherein about 25% or more of the ammonium nitrogen atoms are secondary ammonium nitrogen atoms;

wherein said crosslinked polymeric ammonium salt is insoluble in water, is a bile acid sequestrant with a B_{max}/K_d value for cholate of greater than 0.75; and wherein at least some of said ammonium nitrogen atoms are part of a crosslinked network; said process comprising:

reacting in a suitable solvent a bifunctional organic compound of the formula X—Y—X or X—Z—X, where X is a leaving group suitable for amine alkylations, and a diamine, of the formula H_2N—Y—NH_2 or H_2N—Z—NH_2, in the presence of an aqueous solution soluble organic polymer template to form a gel; and

removing the template from the gel after the formation of the gel.

5,556,620

USE OF RECOMBINANT COLONY STIMULATING FACTOR-1 TO ENHANCE WOUND HEALING

Peter Ralph, Orinda; Sharon Auckerman, Yountville, and James Devlin, Lafayette, all of Calif., assignors to Cetus Oncology Corporation, Emeryville, Calif.

Continuation of Ser. No. 24,094, Feb. 26, 1993, abandoned, which is a continuation of Ser. No. 585,256, Apr. 5, 1990, abandoned, which is a continuation-in-part of Ser. No. 243,253, Sep. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 99,872, Sep. 22, 1987, Pat. No. 5,104,650, which is a continuation-in-part of Ser. No. 876,819, Jun. 20, 1986, abandoned, which is a continuation-in-part of Ser. No. 821,068, Jan. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 756,814, Jul. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 744,924, Jun. 14, 1985, abandoned, which is a continuation-in-part of Ser. No. 728,834, Apr. 30, 1985, abandoned, which is a continuation-in-part of Ser. No. 698,359, Feb. 5, 1985, abandoned. This application Mar. 31, 1994, Ser. No. 220,454

Int. Cl.[6] A61K *38/19*

U.S. Cl. 424—85.1 **8 Claims**

1. A method for promoting repair of dermal tissue damage in mammals which comprises administering systemically or locally surrounding said tissue damage in said mammal an effective amount of recombinant colony stimulating factor-1 (CSF-1).

5,556,621

TISSUE PLASMINOGEN ACTIVATOR AND METHOD OF USE

Yasushi Kawauchi, Tokyo; Toshiyuki Takemoto, Saitama; Makoto Takayama; Masami Yokota, both of Tokyo; Masao Kato, Saitama; Kimio Katsuta, Saitama, and Hiroshi Gushima, Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 810,561, Dec. 20, 1991, abandoned, which is a continuation of Ser. No. 474,113, Apr. 27, 1990, abandoned. This application May 4, 1994, Ser. No. 237,249

Claims priority, application Japan, Oct. 29, 1987, 62-274770; Dec. 18, 1987, 62-320785; Mar. 23, 1988, 63-70126; Jul. 27, 1988, 63-189351

Int. Cl.[6] A61K *38/49;* **C12N** *9/50;9/64*

U.S. Cl. 424—94.64 **3 Claims**

1. A novel tissue plasminogen activator having the following amino acid sequence in which, compared to human t-PA, Kringle 1 is deleted and Arg 275 is substituted by Glu:

H_2N-R-Ser Tyr Gln Val Ile Cys Arg Asp Glu Lys
Thr Gln Met Ile Tyr Gln Gln His Gln Ser
Trp Leu Arg Pro val Leu Arg Ser Ash Arg
Val Glu Tyr Cys Trp Cys Asn Ser Gly Arg
Ala Gln Cys His Ser Val Pro Val Lys Set
Cys Ser Glu Pro Arg Cys Phe Asn Gly Gly
Thr Cys Gln Gln Ala Leu Tyr Phe Ser Asp
Phe Val Cys Gln Cys Pro Glu Gly Phe Ala
Gly Lys Cys Cys Glu Ile Asp Thr Arg Ala
Thr Ser Glu Gly Asn Ser Asp Cys Tyr Phe
Gly Ash Gly Ser Ala Tyr Arg Gly Thr His
Set Leu Thr Glu Ser Gly Ala Ser Cys Leu
Pro Trp Asn Ser Met Ile Leu Ile Gly Lys
Val Tyr Thr Ala Gln Asn Pro Set Ala Gln
Ala Leu Gly Leu Gly Lys His Ash Tyr Cys
Arg Ash Pro Asp Gly Asn Ala Lys Pro Trp
Cys His Val Leu Lys Asn Arg Arg Leu Thr
Trp Glu Tyr Cys Asp Val Pro Ser Cys Ser
Thr Cys Gly Leu Arg Gln Tyr Set Gln Pro
Gln Phe-Y-Gly Gly Leu Phe Ala
Asp Ile Ala Ser His Pro Trp Gln Ala Ala
Ile Phe Ala Lys His Arg Arg Ser Pro Gly
Glu Arg Phe Leu Cys Gly Gly Ile Leu Ile
Ser Ser Cys Trp Ile Leu Ser Ala Ala His
Cys Phe Gln Glu Arg Phe Pro Pro His His
Leu Thr Val Ile Leu Gly Arg Thr Tyr Arg
Val Val Pro Gly Glu Glu Glu Gln Lys Phe
Glu Val Glu Lys Tyr Ile Val His Lys Glu
Phe Asp Asp Asp Thr Tyr Asp Asn Asp Ile
Ala Leu Leu Gln Leu Lys Ser Asp Ser Ser
Arg Cys Ala Gln Glu Ser Ser Val Val Arg
Thr Val Cys Leu Pro Pro Ala Asp Leu Gln
Leu Pro Asp Trp Thr Glu Cys Glu Leu Ser
Gly Tyr Gly Lys His Glu Ala Leu Ser Pro
Phe Tyr Ser Glu Arg Leu Lys Glu Ala His
Val Arg Leu Tyr Pro Ser Ser Arg Cys Thr
Ser Gln His Leu Leu Asn Arg Thr Val Thr
Asp Asn Met Leu Cys Ala Gly Asp Thr Arg
Ser Gly Gly Pro Gln Ala Asn Leu His Asp
Ala Cys Gln Gly Asp Ser Gly Gly Pro Leu
Val Cys Leu Asn Asp Gly Arg Met Thr Leu
Val Gly Ile Ile Ser Trp Gly Leu Gly Cys
Gly Gln Lys Asp Val Pro Gly Val Tyr Thr
Lys Val Thr Asn Tyr Leu Asp Trp Ile Arg
Asp Asn Met Arg Pro-COOH

wherein -Y- represents Glu Ile Lys, COOH represents the carboxy terminal and R is a single bond and represents:

Met Asp Ala Met Lys Arg Gly Leu Cys Cys
Val Leu Leu Leu Cys Gly Ala Val Phe Val
Ser Pro Ser Gln Glu Ile His Ala Arg Phe
Arg Arg Gly Ala Arg,
Gly Ala Arg,
Met,
or,
Met Gly Ala Arg.

5,556,622

METHOD OF TREATMENT FOR STOMA-PERIPHERAL INFLAMMATION DISEASES

Yasuo Uehara, Iruma, and Michihito Ise, Kawagoe, both of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

Filed May 25, 1995, Ser. No. 450,466

Claims priority, application Japan, May 27, 1994, 6-138071

Int. Cl.[6] A61K *33/44*

U.S. Cl. 424—125 **3 Claims**

1. A method of treating stomaperipheral inflammation diseases in a patient in need thereof, comprising orally administering to said patient an effective amount of a pharmaceutical composition in dosage unit form comprising a spherical activated carbon having a particle size of 0.05 to 2 mm.

5,556,623

ANTIBODY-DRUG CONJUGATES

Russell L. Barton, Indianapolis; Deborah L. Guttman-Carlisle, Sheridan, and Gary A. Koppel, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 30, 1993, Ser. No. 40,323

Int. Cl.[6] A61K *39/395;39/44*

U.S. Cl. 424—179.1 **2 Claims**

1. A method of inhibiting the growth of neoplasms in a mammalian host comprising parenterally administering an effective amount an immunoconjugate of the formula

$$[R^1-CO-\underset{\displaystyle HC-R^2}{\overset{\displaystyle \|}{C}}-CO-NH-CH_2-CH_2-CO]_m\text{-Ab}$$

wherein

R^1 is C_1–C_4 alkyl;

R^2 is a monovalent drug derivative having a reactively-available amino, hydroxy or thiol function;

m is an integer from 1 to 10; and

Ab is an antibody, or antigen-binding fragment thereof, which specifically binds an antigen associated with a ceil, tissue, or neoplasm to which delivery of the drug is desirable, to such a mammalian host in need of said treatment.

5,556,624

METHOD OF IMMUNOPOTENTIATING AND PROTECTING AN ANIMAL FROM *E. COLI* INFECTIONS USING A COMBINATION OF *ROSA ROXBURGHII, ARTEMISIAE ARGYI FOLIUM* AND *BRASSICA OLERACEA VAR. CAPITATA L.*

Seiichi Araki; Mamoru Suzuki; Masatoshi Fujimoto, all of Ibaraki, and Tadashi Ueki, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 285,980, Aug. 4, 1994, which is a division of Ser. No. 133,708, Oct. 7, 1993, abandoned. This application Nov. 1, 1994, Ser. No. 333,079

Claims priority, application Japan, Oct. 7, 1992, 4-291995; Oct. 7, 1992, 4-291996; May 25, 1993, 5-144345; Jul. 30, 1993, 5-206808

Int. Cl.[6] A61K *35/78*

U.S. Cl. 424—195.1 **5 Claims**

1. A method for immunopotentiating and protecting an animal from an infection caused by *Escherichia coli*, which comprises administering a pharmaceutically effective amount of a mixture of *Rosa roxburghii, Artemisiae argyi folium* and *Brassica oleracea* var. capitata L. to the animal.

5,556,625

PHARMACEUTICAL COMPOSITION COMPRISING *ROSA ROXBURGHII, ARTEMISIAE ARGYI* FOLIUM AND *BRASSICA OLERACEA VAR. CAPITATA L.* USED TO REDUCE THE SYMPTOMS OF DIARRHEA

Seiichi Araki; Mamoru Suzuki; Masatoshi Fujimoto, all of Ibaraki, and Tadashi Ueki, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 133,708, Oct. 7, 1993, abandoned. This application May 3, 1995, Ser. No. 433,312

Claims priority, application Japan, Oct. 7, 1992, 4-291995; Oct. 7, 1992, 4-291996; May 25, 1993, 5-144345; Jul. 30, 1993, 5-206808

Int. Cl.[6] A61K *35/78*

U.S. Cl. 424—195.1 **4 Claims**

1. A method of reducing the symptoms of diarrhea in an animal which comprises administering a pharmacologically effective amount of a mixture of *Rosa roxburghii, Artemisiae argyi folium* and *Brassica oleracea* var. capitata L. to the animal.

5,556,626

ANTINEOPLASTIC DRUG OF PLANT ORIGIN AND PROCESS FOR THE PREPARATION THEREOF

Claudio D'Arrigo, 2 Via Elea, I-00183 Rome RM, Italy

PCT No. PCT/IT92/00106, § 371 Date Apr. 21, 1993, § 102(e) Date Apr. 21, 1993, PCT Pub. No. WO93/04689, PCT Pub. Date May 18, 1993

PCT Filed Aug. 25, 1992, Ser. No. 39,270

Claims priority, application Italy, Aug. 28, 1991, RM91A0637

Int. Cl.[6] A61K *35/78*

U.S. Cl. 424—195.1 **27 Claims**

1. A process for producing an antineoplastic substance comprising:

(a) macerating and extracting a fruit of the species *Phoenix canadiensis, Phoenix dactylifera, Chamaerops excelsa* or *Chamaerops humilis* of the family Palma, in an alcohol to produce an alcoholic extract;

(b) stirring or shaking said alcoholic extract of step (a) with chloroform to produce an alcohol-chloroform phase and an aqueous phase;

(c) concentrating said aqueous phase of step (b) by evaporation to produce a concentrated aqueous phase; then either

(d) adding ethyl alcohol to said concentrated aqueous phase of step (c) to form a suspension;

(e) adding petroleum ether to said suspension of step (d) with stirring to produce a precipitate having a limpid floating portion and a remaining portion;

(f) collecting, filtering, and drying said limpid floating portion of said precipitate of step (e) to obtain an amorphous substance;

(g) solubilizing and concentrating said amorphous substance of step (f) in methanol until a concentrated methanolic solution is obtained;

(h) adding isopropyl alcohol to said concentrated methanolic solution to produce a fine suspension; and

(i) drying said fine suspension to produce a powder;

or

(m) adding methyl alcohol to said concentrated aqueous phase of step (c) to produce a fine suspension;

(n) stirring said fine suspension of step (m) and adding an equal volume of ethyl ether to produce a large, flaky precipitate having a floating portion;

(o) removing said floating portion of said large, flaky precipitate of step (n) to obtain a remaining portion of said large flaky precipitate;

(p) suspending the remaining portion of said large, flaky precipitate of step (o) in isopropyl alcohol; and

(q) drying said remaining portion of said large, flaky precipitate of step (p) to produce said antineoplastic substance.

5,556,627

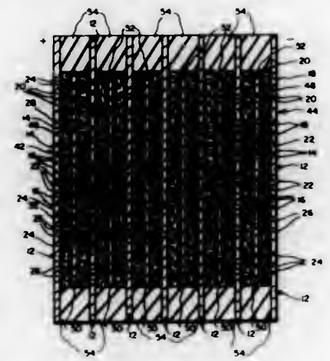
BIPOLAR BATTERY CELLS, BATTERIES AND METHODS

Rodney M. LaFollette, Provo, Utah, assignor to Bipolar Technologies, Inc., Provo, Utah

Continuation-in-part of Ser. No. 440,407, May 12, 1995, abandoned, which is a division of Ser. No. 321,692, Oct. 12, 1994, abandoned. This application Nov. 9, 1995, Ser. No. 556,235

Int. Cl.[6] H01M *10/18*

U.S. Cl. 429—210 **16 Claims**



1. A bipolar cell comprising:

a bipolar substrate plate comprised of serially conductive contiguous strands of carbon and a cured filler comprised of a cured mix comprising carbon particles and a fluoroelastomeric material the plate comprising two opposed generally flat surfaces;

an electrode integrally inseparably and conductively joined to each of the two plate surfaces.

5,556,628

FREE-FLOWING PSEUDOPLASTIC COSMETIC COMPOSITIONS/SUSPENSIONS

Paul-Jöel Derian, Fontenay-Aux-Roses, and Claudie Willemin, Paris, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Filed Aug. 5, 1993, Ser. No. 102,195

Claims priority, application France, Aug. 5, 1992, 92 09692

Int. Cl.[6] A61K *7/06*

U.S. Cl. 424—401 **15 Claims**

1. A pseudoplastic free-flowing cosmetic composition comprising a stable and homogeneous suspension in water of water-insoluble particulates; the anionic surfactant sodium lauryl ether sulfate, a nonionic or amphoteric cosurfactant selected from the group consisting of a sucroglyceride, an ethoxylated fatty acid alcohol, a betaine, a sultaine, and an imadazoline compound; and an electrolyte; wherein said surfactant and cosurfactant are present in such amounts as to impart pseudoplasticity thereto with a yield point of at least 0.2 Pa and constituting spherulites suspended within a lamellar phase, and further wherein the suspension is in water devoid of organic solvent.

5,556,629

METHOD OF PREPARING MICROEMULSIONS

Frank J. Traver, Troy, and James H. Merrifield, Balston Spa, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 120,616, Sep. 13, 1993, abandoned, which is a continuation-in-part of Ser. No. 759,275, Sep. 13, 1991, Pat. No. 5,244,598. This application Nov. 15, 1993, Ser. No. 153,324

Int. Cl.[6] A61K *7/00;* **B01J** *13/00*

U.S. Cl. 424—401 **20 Claims**

1. A transparent oil-in-water silcone-containing microemulsion, prepared by the technique of emulsion polymerization comprising the steps of:

a) blending

1) a polyorganosiloxane optionally having an amino content of from about 0.6 to about 3.0 milliequivalents per gram and comprising:

(i) $R_aQ_bSiO_{(4-a-b)/2}$ units; and

(ii) $R_cSiO_{(4-c)/2}$ units

where R is a hydrocarbon or hydrocarbon radical having from 1 to about 6 carbon atoms, Q is a polar radical having the general formula R^1NHZ, Wherein R^1 is a divalent linking group comprised of carbon and hydrogen atoms; carbon, hydrogen and oxygen atoms, or carbon, hydrogen and sulfur atoms; and Z is a radical selected from the group consisting of hydrogen atoms, alkyl radicals containing from 1 to 4 carbon atoms, and $—CH_2CH_2NH_2$ radicals wherein a assumes values ranging from about 1 to about 2, assumes values ranging from about 1 to about 3, a+b is less than or equal to 3, and c ranges from about 1 to about 3;

(2) from about 10 to 60 parts by weight per part 100 parts of A(1) of at least one surfactant, said surfactant being a polyethylene glycol type surfactant, wherein at least one of the surfactants is insoluble in the polyorganosiloxasne;

(3) water in the amount of from about 100 to about 300 parts by weight based on the weight of the oil and surfactant mixture;

(4) an alkali metal hydroxide selected from the group consisting of lithium, sodium, potassium, rubidium, and cesium hydroxides in the amount of from about 1 to about 20 parts by weight per weight of A(1);

b) homogenizing the blend of a step a) at a pressure ranging from 1,000 to 15,000 psig;

c) re-homogenizing the blend of step b) under the conditions of step b);

d) heating the blend at a temperature ranging from about 50° to about 150° C. for a period of time ranging from about one to about ten hours until the solids content of the blend ranges from about ten weight percent to about fifty weight percent; and

e) buffering the blend to a pH ranging from about 3 to about 7 by adding an effective amount of an acid selected from the group consisting of a weakly acidic carboxylic acids having four or fewer carbon atoms; whereby the average particle size of the emulsion ranges from about 0.001 to about 0.050 microns, wherein the haze of said microemulsion as defined by ASTM test D871 is below about 150.

13. Cosmetic formulations for personal care products comprising the microemulsion of claim 1.

5,556,630

COLD CREAMS CONTAINING ACYL LACTYLATES

Alexander P. Znaiden, Trumbull; Susan C. Wivell, Madison, and Virginia R. Kickertz, Stratford, all of Conn., assignors to Chesebrough-Pond'a USC Co., Division of Conopco, Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 367,658, Jan. 3, 1995, abandoned. This application Apr. 25, 1995, Ser. No. 427,787

Int. Cl.[6] A61K *7/48*

U.S. Cl. 424—401 **7 Claims**

1. A cold cream cosmetic composition comprising:

(i) from about 10 to about 50% by weight of water;

(ii) from about 0.5 to about 40% by weight of a wax;

(iii) from about 10 to about 80% by weight of mineral oil;

(iv) from about 0.01 to about 20% by weight of a behenoyl lactylate salt.

5,556,631

WATER RESISTANT PESTICIDE COMPOSITIONS

Donald W. Kelley, 608 N. Palestine, Athens, Tex. 75751

Filed Sep. 30, 1994, Ser. No. 315,937

Int. Cl.[6] A01N *25/26*

U.S. Cl. 424—410 **20 Claims**

1. A water resistant solid pesticide composition which comprises:

a solid pesticide carrier on which there has been applied a pesticide and

a coating on said pesticide treated solid carrier of polyols selected from the group consisting of a long chain fatty acid poly ester of sucrose, sorbitol, sorbinose, glycerol, or raffinose.

5,556,632

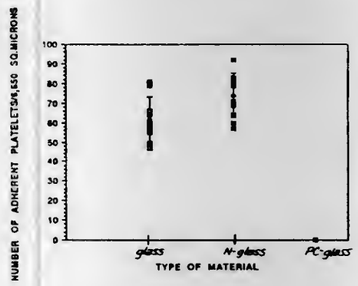
PHOSPHOLIPID MODIFIED NON-THOMBOGENIC SURFACE

Anja S. Kohler, Stillwater; Daniel L. Mooradian, Eagan, and Leo T. Furcht, Minneapolis, all of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Mar. 17, 1995, Ser. No. 406,124

Int. Cl.[6] A61F *2/02*

U.S. Cl. 424—423 **19 Claims**



1. A biocompatible material comprising a substrate and a phospholipid moiety covalently attached thereto in an amount and orientation effective to provide an improved nonthrombogenic surface relative to the substrate without the phospholipid moiety covalently attached thereto.

170-920 O.G.-96-14: QL3

5,556,633

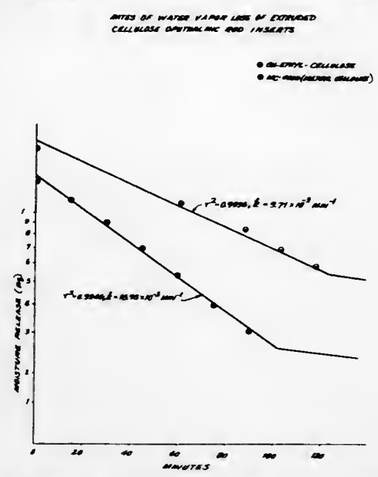
DRUG DELIVERY OPHTHALMIC INSERT AND METHOD FOR PREPARING SAME

Heskel M. Haddad, 1200 Fifth Ave., New York, N.Y. 10029, and Spiro P. Loucas, 16 Toni Ct., Plainview, N.Y. 11803

Continuation of Ser. No. 770,132, Oct. 1, 1991, Pat. No. 5,229,128, which is a continuation of Ser. No. 291,426, Dec. 23, 1988, abandoned, which is a continuation of Ser. No. 873,021, Jun. 11, 1986, abandoned. This application Apr. 28, 1993, Ser. No. 20,143

Int. Cl.[6] A61F *2/14;9/14;* **A61K** *9/14;* **B29B** *9/06;* **B28B** *3/20*

U.S. Cl. 424—427 **16 Claims**



1. An opbthalmic insert capable of the sustained release of a desired amount of an ophthalmically acceptable therapeutic substance into the eye of a patient, said insert being comprised of a therapeutically effective amount of an ophthalmically acceptable water soluble solid polymer having been admixed with water to form a paste; and with said paste having been extruded with extrusion means, dried, and cut to form a rod shaped insert with a minimum length of 0.1 mm and of a size suitable for insertion and with a configuration and minimized surface area of less than 3 mm^2 so that upon use, the therapeutic substance is released over a pre-determined period of time.

5,556,634

PREPARATION OF NEAR-NEUTRAL ANIONIC SALT FEED MINERALS

William P. Moore, Hopewell, Va., assignor to The Vigoro Corporation, Chicago, Ill.

Filed Apr. 13, 1995, Ser. No. 421,199

Int. Cl.[6] A61K *33/00*

U.S. Cl. 424—438 **17 Claims**

1. A method of preparing a near-neutral, particulate, homogeneous, mineral composition, which contains an excess of strong anions over strong cations, for supplementing ruminant animal feeds, the method comprising:

(a) admixing magnesium and calcium chlorides with a molecular excess of ammonium sulfate, and an amount of water sufficient to create a liquid phase;

(b) heating the admixture until sufficient magnesium and calcium chlorides and ammonium sulfate dissolve to initiate a liquid phase metathetical chemical reaction;

(c) continuing heating and mixing until the liquid phase metathetical reaction has formed damp particles of magnesium sulfate and calcium sulfate and ammonium chloride homogeneously combined with the molecular excess of ammonium sulfate; and

(d) drying the damp particles until free moisture content is between 1 and 20 percent.

5,556,638

FLURBIPROFEN-CONTAINING IMMEDIATE-EFFECT

woven gauze made from stainless steel wire 0.635 mm in diameter and having nominal mesh apertures of 2.00 mm

(d) drying the damp particles until free moisture content is between 1 and 20 percent.

5,556,635

FILMS BASED ON COPOLYMERS, THEIR APPLICATIONS IN TRANSDERMAL SYSTEMS AND THEIR PROCESSES OF PREPARATION

Michel Istin, Gif-Sur-Yvette; Jean-Marc Grognet, Orsay, and Charles Darnez, Bordeaux-Cauderan, all of France, assignors to Spi-Bio, Gif-Sur-Yvette, France

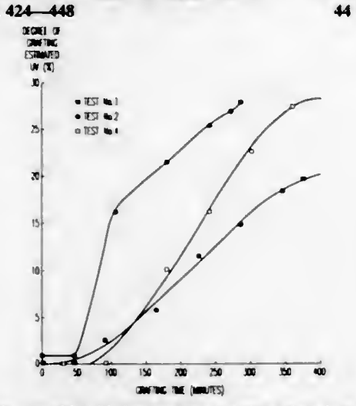
PCT No. PCT/FR93/01272, § 371 Date Oct. 24, 1994, § 102(e) Date Oct. 24, 1994, PCT Pub. No. WO94/14425, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 20, 1993, Ser. No. 284,669

Claims priority, application France, Dec. 21, 1992, 92 15377

Int. Cl.[6] A61F *13/00*

U.S. Cl. 424—448 **44 Claims**



1. A film, capable of being used as an active principle matrix in a transdermal system, comprising:

a hydrophobic ethylene/vinyl acetate polymer containing at least one active principle and composed of 10–50 wt. % of hydrophilic inclusions consisting of a hydrophilic polymer formed from at least one hydrophilic monomer selected from the group consisting of acrylamide, methylolacrylamide, diacetone acrylamide, maleic acid, acrylic acid, fumaric acid, itaconic acid, propylene glycol acrylate, ethylene glycol methacrylate, methacrylamide, methacrylic acid, propylene glycol methacrylate, hydroxyethyl methacrylate, dimethylaminoethyl methacrylate, N-vinylpyrrolidone, vinylacetic acid and vinylsulfonic acids.

5,556,636

ADHESIVE COMPOSITION FOR MEDICAL USE

Yoshiaki Yano, Kakogawa; Kazuyuki Takeo, and Takayoshi Hidaka, both of Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

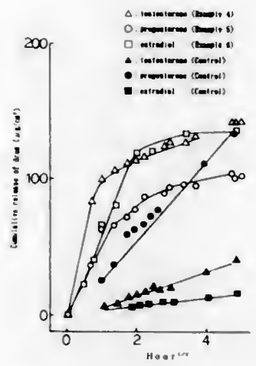
Continuation of Ser. No. 92,825, Jul. 19, 1993, abandoned, which is a division of Ser. No. 773,262, Oct. 9, 1991, abandoned. This application Oct. 6, 1994, Ser. No. 319,085

Claims priority, application Japan, Oct. 22, 1990, 2-284745; Oct. 25, 1990, 2-289259

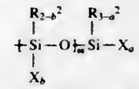
Int. Cl.[6] A61F *13/00*

U.S. Cl. 424—448 **10 Claims**

1. A transdermal drug delivery preparation comprising at least one transdermally absorbable pharmaceutical compound selected from the group consisting of testosterone, progesterone and estradiol of which an amount of not less than 39% is released within one hour after application, and an adhesive composition as a drug carrier, said adhesive composition comprising a tackifier resin and an oxyalkylene polymer having at least one silicon-containing



group, which can be crosslinked through a siloxane of said group, wherein said silicon-containing group is represented by the formula II:



(II)

wherein X represents an hydroxyl group or hydrolytic group and when there are two or more X groups, the X groups may be the same or different; R^2 represents a monovalent hydrocarbon group having 1 to 20 carbon atoms or a triorganosiloxy group represented by $(R')_3SiO—$, wherein R' represents a monovalent hydrocarbon group having 1 to 20 carbon atoms and the three R' groups may be the same or different, and when there are two or more R^2 groups, the R^2 groups may be the same or different; a represents 0, 1, 2 or 3; b represents 0, 1 or 2; $1 \leqq a+mb$, wherein m represents 0 or an integer of 1 to 19, and when m is 2 or more, the b numbers may not be identical.

5,556,637

WATER CONTAINING LIPOSOME SYSTEM

Jörg Hager, Köln; Manfred Dürr, Pulheim-Dansweiler, and Ernst Lünebach, Erftstadt-Lechenich, all of Germany, assignors to A. Nattermann & Cie. GmbH, Köln, Germany

Continuation of Ser. No. 29,977, Mar. 12, 1993, abandoned, which is a continuation of Ser. No. 738,837, Aug. 1, 1991, abandoned. This application Jan. 11, 1995, Ser. No. 371,380

Claims priority, application Germany, Aug. 6, 1990, 40 24 886.0; Mar. 19, 1991, 41 08 902.2; Jul. 10, 1991, 41 22 744.1

Int. Cl.[6] A61K *9/127*

U.S. Cl. 424—450 **6 Claims**

1. A liposome composition consisting essentially of at least one uncharged phospholipid, said uncharged phospholipid comprising at least 90% by weight of phosphatidylcholine, at least one negatively charged phospholipid, said negatively charged phospholipid being a salt of a phosphatidylglycerol, a pharmaceutically active substance and water forming an aqueous phase for said liposome composition, wherein the mass ratio of the uncharged phospholipid to the charged phospholipid is in the range of 100:1 to about 400:1, and the total phospholipid content of the liposome composition is between 0.50 and 20% by weight.

5,556,638

FLURBIPROFEN-CONTAINING IMMEDIATE-EFFECT MEDICAMENT AND ITS USE

Jens-Christian Wunderlich, Heidelberg; Otto Schuster, Bad Soden; Helmut Lukas, Neu-Isenburg, and Ursula Schick, Schriesheim, all of Germany, assignors to Alfatec Pharma GMBH, Heidelberg, Germany

PCT No. PCT/DE92/01008, § 371 Date Sep. 16, 1994, § 102(e) Date Sep. 16, 1994, PCT Pub. No. WO93/10766, PCT Pub. Date Jun. 10, 1993

PCT Filed Dec. 4, 1992, Ser. No. 244,614

Claims priority, application Germany, Dec. 5, 1991, 41 40 184.0

Int. Cl.[6] A61K *9/51;31/19*

U.S. Cl. 424—468 **20 Claims**

1. An immediate-effect medicament for the treatment of painful and/or inflammatory, and also febrile, disorders, containing flurbiprofen in addition to customary pharmaceutical excipients and auxiliaries, wherein the flurbiprofen is present in the form of a pharmaceutically administrable nanosol which contains gelatin, a collagen hydrolyzate or a gelatin derivative as the excipient, the nanosol

a) having an inner phase of flurbiprofen which has a particle size of 10–800 nm and possesses a surface charge,

b) an outer phase of gelatin, a collagen hydrolyzate or a gelatin derivative, which is oppositely charged, and

c) an approximate or complete isoionic state of charge of the inner and outer phase and

d) being physiologically absorbable.

5,556,639

WATER-DISPERSIBLE TABLETS

Krystyna E. Fielden, Kent, United Kingdom, assignor to Glaxo Wellcome Inc., Research Triangle Park, N.C.

PCT No. PCT/GB92/00163, § 371 Date Jul. 13, 1993, § 102(e) Date Jul. 13, 1993, PCT Pub. No. WO92/13527, PCT Pub. Date Aug. 20, 1992

PCT Filed Jan. 29, 1992, Ser. No. 90,111

Claims priority, application United Kingdom, Jan. 31, 1991, 9102019; Nov. 22, 1991, 9124803; Nov. 22, 1991, 9124807; Nov. 25, 1991, 9125005

Int. Cl.[6] A61K *9/34*

U.S. Cl. 424—480 **9 Claims**

1. A process for the preparation of a water-dispersible tablet having lamotrigine and comprising 3% to 90% w/w lamotrigine, 0.25 to 40% of a pharmaceutically acceptable swellable clay and an additional pharmaceutically acceptable disintegrating agent; said process comprising bringing lamotrigine into association with said swellable clay and additional disintegrating agent to form granules, and then compressing the granules to form a tablet which is capable of dispersing in water within a period of 3 minutes to provide a dispersion which is capable:

a) of dispersing in water to provide a dispersion which passes through a sieve screen with a mesh aperture of 710 μm;

b) of disintegrating within three minutes when examined by the following apparatus and method in accordance with the test for dispersible tablets of the British Pharmacopoeia, 1988, volume II, page 895; said apparatus consisting of:

(i) a rigid basket-rack assembly supporting six cylindrical glass tubes 75.0 to 80.0 mm long, 21.5 mm in internal diameter and with a wall thickness of about 2 mm;

(ii) a cylindrical disc for each tube, each 20.55 to 20.85 mm in diameter and 9.35 to 9.65 mm thick, made of transparent plastic with a relative density of 1.18 to 1.20, pierced with five holes, each 2 mm in diameter, one in the centre and the other four spaced equally on a circle of radius 6 mm from the center of the disc, there being four equally spaced grooves cut in the lateral surface of the disc in such a way that at the upper surface of the disc they are 9.5 mm wide and 2.55 mm deep and at the lower surface 1.6 mm square;

(iii) two superimposed transparent plastic plates 90 mm in diameter and 6 mm thick, perforated by six holes having the same diameter as the tubes and holding the tubes vertically, the holes being equidistant from the centre of the plate and equally spaced from one another, and a piece of woven gauze made from stainless steel wire 0.635 mm in diameter and having nominal mesh apertures of 2.00 mm attached to the underside of the lower plate;

(iv) said plates being held rigidly in position and 77.5 mm apart by vertical metal rods at the periphery and a metal rod fixed to the center of the upper plate to enable the assembly to be attached to a mechanical device capable of raising and lowering it smoothly through a distance of 50 to 60 mm at a constant frequency of between 28 and 32 cycles per minute;

(v) said assembly being suspended in water at 19° to 21° C. held in a 1000-ml beaker, the volume of water being such that when the assembly is in the highest position the wire mesh is at least 15 mm below the surface of the water and when the assembly is in the lowest position the wire mesh is at least 25 mm above the bottom of the beaker and the upper open ends of the tubes remain above the surface of the water;

said method consisting of introducing one tablet into each of the six tubes, suspending said assembly in the beaker containing the water and operating the apparatus for a maximum period of three minutes so that all six of the tablets disperse.

5,556,640

DRY GEL COMPOSITION

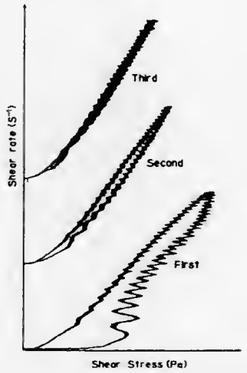
Yoji Ito, and Yasuo Hirai, both of Tokyo, Japan, assignors to Showa Yakuhin Kako Co., Ltd., Tokyo, Japan

Division of Ser. No. 196,070, Feb. 28, 1991, Pat. No. 5,496,563. This application Jun. 5, 1995, Ser. No. 464,559

Claims priority, application Japan, Aug. 30, 1991, 3-220435

Int. Cl.[6] A61K *9/14;9/16*

U.S. Cl. 424—489 **6 Claims**



1. A dry gel composition consisting essentially of a medicine which can be orally administered, a gelling agent and a binder as essential ingredients, wherein said medicine is present in an amount of up to 40% by weight, said gelling agent is present in an amount of at least 3% by weight and said binder is present in an amount of up to 5% by weight, all weights based on the weight of the whole composition, wherein the composition is capable of forming an aqueous gel composition having a viscosity of about 100 to 500 cP upon mixing with 2 to 15 parts by weight of water per part by weight of the composition at a temperature of 40° C. or below.

5,556,641

LIGHT STABLE COLOR COMPOSITIONS

George C. Lambridis, Wayne, and Nathanial Goodwin, Newark, both of N.J., assignors to Whittaker, Clark & Daniels, Inc., South Plainfield, N.J.

Continuation of Ser. No. 18,089, Feb. 16, 1993, abandoned. This application Jun. 17, 1994, Ser. No. 261,409

Int. Cl.[6] A61K *9/14*

U.S. Cl. 424—490 6 Claims

1. A coated particle comprising a colorant-containing particle susceptible to degradation by light, wherein the colorant-containing particle comprises an organic dye laked onto a suitable substrate selected from the group consisting of alumina, zinc oxide, aluminum benzoate, calcium carbonate, titanium dioxide, and combinations thereof, the colorant-containing particle having a coating comprising propylons glycol and a carrier selected from the group consisting of titanium dioxide, zinc oxide, aluminum hydroxide and combinations thereof, the coating being present in an amount effective to form a protective barrier against light which causes fading and discoloration of the colorant-containing particle.

5,556,642

METHOD FOR PRODUCING SUSTAINED RELEASE MICROSPHERE PREPARATION

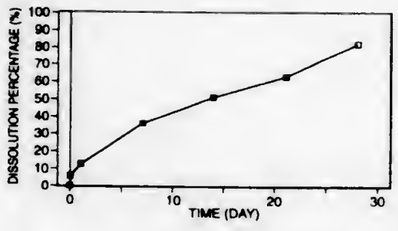
Masao Kobayashi, Kyoto; Yukiko Nishioka, Toyonaka; Takehiko Suzuki, Toyono-gun, and Yashuhisa Matsukawa, Osaka, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Jul. 12, 1993, Ser. No. 89,194

Claims priority, application Japan, Jul. 16, 1992, 4-189181

Int. Cl.[6] A61K *9/48;9/14;9/16;9/50*

U.S. Cl. 424—502 6 Claims



1. A method for producing a sustained release microsphere preparation, which comprises the steps of:

(1) dissolving a water-insoluble biodegradable polymer and a water-soluble pharmaceutically active ingredient in a solvent or solvents in which the water-insoluble biodegradable polymer and the water-soluble pharmaceutically active ingredient both can dissolved,

(2) removing the solvent or solvents to form a solid dispersion of a water-soluble pharmaceutically active ingredient dispersed homogeneously in a water-insoluble biodegradable polymer,

(3) dissolving the resulting solid dispersion in a water-immiscible organic solvent having a boiling point of below 100° C. to form a solution,

(4) emulsifying the resulting solution (oil phase) into an aqueous phase to give an oil in water (O/W) emulsion, and

(5) removing the water-immiscible organic solvent from the oil phase of the resulting emulsion to produce a sustained release microsphere preparation.

5,556,643

ANTICOAGULANT COMPOSITIONS

Leo F. Bohanon, Oconomowoc; Robert A. Adams, Brookfield, and Daniel R. Kruszka, Janesville, all of Wis., assignors to Hydrite Chemical Co., Brookfield, Wis.

Filed Dec. 22, 1993, Ser. No. 171,993

Int. Cl.[6] A61K *33/42;33/08;31/19*

U.S. Cl. 424—602 4 Claims

1. An anticoagulant composition for animal blood consisting essentially of alkaline metal ions, polycarboxylic acid ions, and polyphosphate selected from the group consisting of sodium hexametaphosphate, sodaphos, glass H [(NAP03)21], sodium tripolyphosphate, tetrapotassium pyrophosphate and potassium tripolyphosphate.

5,556,644

NUTRITIONAL SUPPLEMENT FOR THE ELDERLY

Ranjit K. Chandra, St. Johns, Canada, assignor to Chandra Consultants, St. Johns, Canada

Division of Ser. No. 971,622, Nov. 5, 1992, abandoned. This application Feb. 3, 1995, Ser. No. 383,490

Int. Cl.[6] A61K *33/34;33/32;33/26;33/14*

U.S. Cl. 424—630 2 Claims

1. A method of improving the immunological status of elderly persons consisting essentially of the steps of:

providing to elderly persons individual dosages of a nutritional supplement consisting essentially of:

about 400 RE of Vitamin A;

about 16 mg of Beta-carotene;

about 2.2 mg of Thiamin (B1);

about 1.5 mg of Riboflavin (B2);

about 16 mg of Niacin;

about 3 mg of Vitamin B6;

about 400 ug of Folate;

about 4 ug of Vitamin B12;

about 80 mg of Vitamin C;

about 4 mg of Vitamin D;

about 44 mg of vitamin E;

about 16 mg of Iron;

about 14 mg of Zinc;

about 1.4 mg of Copper;

about 20 ug of Selenium; and

about 200 ug of Iodine; and

administering said individual dosages of said nutritional supplement to elderly persons.

5,556,645

METHODS OF ENHANCING WOUND HEALING AND TISSUE REPAIR

Richard Bockman, 180 E. 79th St., New York, N.Y. 10021, and Peter Guldon, 1228 Biscayne Blvd., Union, N.J. 07083

Continuation of Ser. No. 910,118, Sep. 14, 1992, abandoned, which is a continuation-in-part of Ser. No. 464,361, Jan. 12, 1990, abandoned. This application Apr. 26, 1995, Ser. No. 430,142

Int. Cl.[6] A61K *33/24;31/28*

U.S. Cl. 424—650 10 Claims

1. A method of enhancing connective and support tissue repair and augmentation, wherein the tissue is selected from the group consisting of skin, tendon, fascia, and collagen-containing tissues that encapsulate organs, comprising administering an amount of a pharmaceutically acceptable gallium-containing compound which is effective for enhancing connective and support tissue repair and augmentation and providing therapeutic levels of elemental gallium.

5,556,646

Patent Not Issued For This Number

5,556,647

ENCAPSULATION MOLD

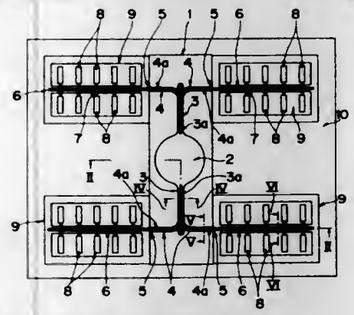
Mitsuhiro Abe, Hirakata, and Mitsuo Yamada, Osaka, both of Japan, assignors to Matsuchita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Dec. 7, 1994, Ser. No. 350,525

Claims priority, application Japan, Mar. 7, 1994, 6-35515

Int. Cl.[6] B29C *45/02*

U.S. Cl. 425—127 20 Claims



1. An encapsulation mold comprising:

first and second retainer plates mounted in mutually confronting relation;

a pot for heating resin inserted therein, said pot being mounted to one of said first and second retainer plates;

a plunger, movably mounted in said pot, for extruding the resin from a bottom of said pot; and

wherein one of said retainer plates includes:

a cull portion, arranged opposite said pot, for receiving the resin extruded from said pot;

a plurality of package portions for receiving resin extruded by said plunger from said pot into said cull portion, and for forming electric elements from the resin;

a plurality of runners connected between said cull portion and said package portions for guiding the resin extruded into said cull portion toward and into said package portions; and

a longitudinal projection mounted in at least one of said runners so as to project into a central part thereof and extend longitudinally therealong.

5,556,648

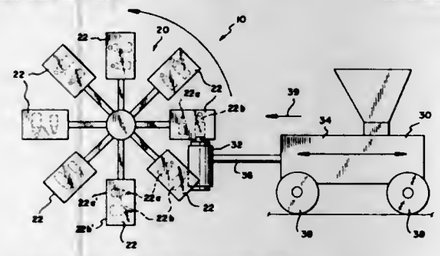
QUICK BOTTLE PRODUCTION CHANGEOVER UTILIZING MULTI-CAVITY MOLDS IN AN EXTRUSION BLOW MOLDING SYSTEM

Danny L. Budzynski, Dublin, and Gary S. Bliss, Beavercreek, both of Ohio, assignors to Dowbrands Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 80,456, Jun. 18, 1993, Pat. No. 5,433,916. This application Jun. 13, 1994, Ser. No. 259,025

Int. Cl.[6] B29C *49/78*

U.S. Cl. 425—150 13 Claims



1. A blow molding apparatus comprising:

a blow mold having first and second blow mold halves which are engageable and disengageable with one another, said first and second blow mold halves defining first and second inner cavities when said mold halves are engaged, said first cavity having a first shape and said second cavity having a second shape which differs from said first shape;

first and second displacement mechanisms connected respectively to said first and second mold halves for moving said first and second mold halves into and out of engagement with one another;

an extrusion apparatus having a die head through which a parison is extruded;

a locator mechanism connected with one of said blow mold and said extrusion apparatus for changing the positioning between said blow mold and said die head to allow capture of an extruded parison by said blow mold within a desired one of said first and second inner cavities such that said extruded parison can be formed into an article having substantially the same shape as said desired one of said first and second inner cavities;

said blow mold halves having opposing portions which engage and clamp off a portion of the captured parison when said mold halves are engaged; and

a blow pin extending through an orifice in one of said first and second mold halves for passing pressurized fluid into the interior of said parison to blow said parison against said first and second mold halves to form said article.

5,556,649

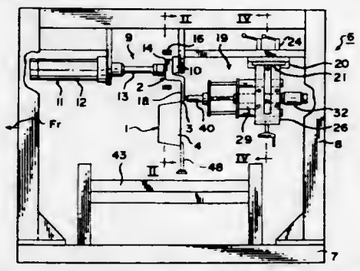
DEVICE FOR REMOVING RUNNERS FROM MOLDED PRODUCTS

Kouichi Sumioka; Motohiro Haji; Toshiiku Suzuki; Masao Sonobe, and Noriyuki Naitoh, all of Iwata, Japan, assignors to Yamaha Motor Co., Ltd., Japan

Filed Aug. 30, 1993, Ser. No. 113,253

Int. Cl.[6] B29C *37/02*

U.S. Cl. 425—215 12 Claims



1. A device for removing runner portions that are joined to product portions of an intermediate molded product by a gate zone comprising:

means for holding one of the runner and product portions in a fixed position;

a hammer member;

means for vibrating said hammer member between a fully retracted position proximate a portion of said means for vibrating and a fully extended position distal said portion of said means for vibrating to cause repeated striking of said intermediate product by the hammer member when said hammer member is in its extended position for separating the runner and product portions at the gate zone, said vibrating means including a cylinder, a piston slidably received within the cylinder so as to define two variable volume chambers within the cylinder, and a piston rod having a first end secured to the piston and a second end extending out of said cylinder, said hammer member being fixedly secured to the second end of said piston rod; and

control means for activating and deactivating said vibrating means, said control means positioning said hammer member in one of said fully retracted and fully extended positions upon deactivation of said vibrating means, said control means including an automatic switching valve for sequentially controlling compressed fluid flow to said two variable volume chambers and an atmospheric release valve for opening one of

said to variable volume chambers to atmosphere upon deacti-

1. A method of coextruding ice confection and a fat-containing

said to variable volume chambers to atmosphere upon deactivation of said vibrating means, said atmospheric release valve comprising a three-way valve that is in fluid communication with each of said two variable volume chambers and with an exhaust passage which passes from inside said cylinder to outside of said cylinder, said control means functioning to open said exhaust passage to atmosphere when said vibrating means is activated and to close said exhaust passage to prevent communication with atmosphere when said vibrating means is deactivated.

5,556,650

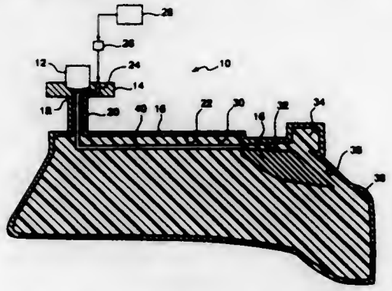
INJECTION MOLDING SYSTEM UTILIZING PRIMARY AND SECONDARY RESIN FLOW PATHS

Michael Ladney, Naples, Fla., assignor to Melea Limited, Southfield, Mich.

Division of Ser. No. 183,509, Jan. 18, 1994, Pat. No. 5,417,916. This application Mar. 10, 1995, Ser. No. 401,814

Int. Cl.[6] B29C *45/00*

U.S. Cl. 425—546 **1 Claim**



1. An injection molding system for injection molding a hollow plastic article, the system including a source of pressurized fluid, an injection nozzle for supplying molten plastic resin, and a mold having an injection aperture, an article-defining cavity and a primary resin flow path which extends from the injection aperture to a first portion of the article-defining cavity, wherein the improvement comprises:

a secondary resin flow path extending outside of the article-defining cavity from the first portion of the article-defining cavity to a second portion of the article-defining cavity to communicate a first portion of the molten plastic resin displaced from the first portion of the article-defining cavity to the second portion of the article-defining cavity by a charge of pressurized gas from the source of pressurized fluid and means for communicating the charge of pressurized gas from the source of pressurized fluid to the first portion of the article-defining cavity to displace the first portion of the molten plastic resin through the secondary resin flow path.

5,556,651

INJECTION MOLDING METAL MOLD

Seiichi Watanabe, and Morio Fujiwara, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 13, 1995, Ser. No. 421,266

Claims priority, application Japan, Apr. 20, 1994, 6-104400

Int. Cl.[6] B29C *45/44*

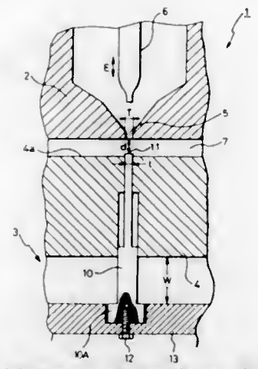
U.S. Cl. 425—556 **8 Claims**

1. An injection molding metal mold, comprising:

a fixed mold;

a movable mold, disposed opposite said fixed mold, being movable in a direction towards and away from said fixed mold;

an injection cavity, disposed between said fixed mold and said movable mold, into which a melted resin is injected;



at least one injection gate, disposed in one of said fixed mold and said movable mold, through which the resin is injected into said injection cavity, said injection gate having a gate diameter of 0.7 to 2.0 mm; and

a readily replaceable member, buried in one of said fixed mold and said movable mold directly opposite said injection gate, wherein a distance between said injection gate and said replaceable member is within a range from 0.2 to 2.0 mm, and a width of said replaceable member is designated to satisfy the following expression:

$$0.6 \times (\text{gate diameter } T) \leq (\text{replaceable member width } t).$$

5,556,652

COMESTIBLES CONTAINING STABILIZED HIGHLY ODOROUS FLAVOR COMPONENT DELIVERY SYSTEMS

Subraman R. Cherukuri, Towaco, N.J.; Gerald E. Battist, Reston, and Jose F. Zamudio-Tena, Vienna, both of Va., assignors to Fuisz Technologies Ltd., Chantilly, Va.

Filed Aug. 5, 1994, Ser. No. 286,286

Int. Cl.[6] A23G *3/30*

U.S. Cl. 426—5 **40 Claims**

1. A chewing gum composition comprising:

(i) a gum base present in an amount between about 5% and about 85% by weight; and

(ii) a particulate flavor delivery system comprising a non-fat solid substrate having adsorbed thereon or absorbed therein a mixture comprising a highly odorous flavor oil component and a medium chain triglyceride.

5,556,653

EXTRUSION OF MATERIALS

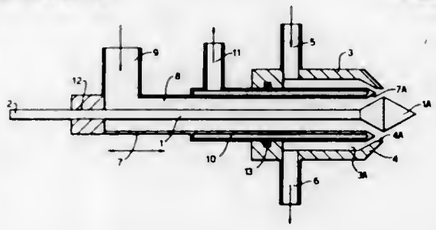
Gary N. Binley, Kettering, United Kingdom, assignor to Good Humor-Breyers Ice Cream, Division of Conopco, Inc., Green Bay, Wis.

Filed Mar. 24, 1995, Ser. No. 410,196

Claims priority, application European Pat. Off., Mar. 30, 1994, 94302294

Int. Cl.[6] A23G *3/00;9/04*

U.S. Cl. 426—101 **4 Claims**



1. A method of coextruding ice confection and a fat-containing couverture containing from about 20% by weight fat wherein ice confection at a temperature in the range about −2° C. to about −25° C. is extruded from a first volume and molten supercooled, fat-containing couverture is extruded from a second volume thermally separated from the first volume to contact an external surface of the extruded ice confection.

5,556,654

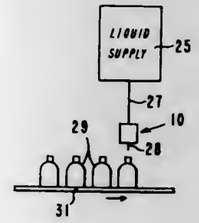
MAGNET BEVERAGE TREATMENT

Leo J. Fregeau, 6540 Pontiac Dr., La Grange, Ill. 60525

Continuation of Ser. No. 899,585, Jun. 18, 1992, abandoned, which is a continuation of Ser. No. 579,589, Sep. 10, 1990, abandoned, which is a continuation of Ser. No. 87,964, Aug. 17, 1987, abandoned, which is a continuation of Ser. No. 834,118, Feb. 25, 1986, abandoned, which is a continuation of Ser. No. 906,790, May 17, 1978, abandoned. This application May 26, 1993, Ser. No. 67,171

Int. Cl.[6] B01D *35/06*

U.S. Cl. 426—234 **7 Claims**



1. A method of treating a beverage selected from the group consisting essentially of ethyl alcohol containing liquids, fruit juices, coffee, tea, extruded soy protein, and chicken soup, to change the flavor thereof, said method consisting essentially of the steps of

establishing a substantially constant magnetic field by the use of a plurality of magnets with a minimum strength of about 3000 Gauss, and

passing the liquid through the field so that the flavor thereof is changed.

5,556,655

METAL ION COMPOSITIONS AND METHODS FOR IMPROVING WHEAT-BASED PRODUCTS

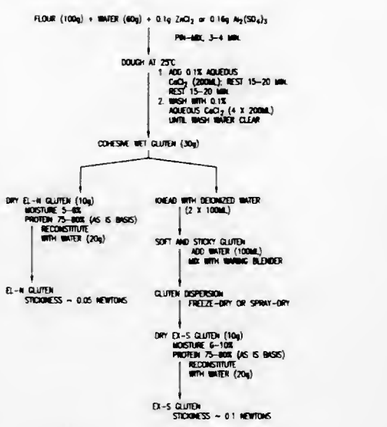
Keswara R. Vadlamani, and Paul A. Seib, both of Manhattan, Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Continuation-in-part of Ser. No. 382,986, Feb. 3, 1995, abandoned. This application Aug. 25, 1995, Ser. No. 519,243

Int. Cl.[6] A23L *1/272*

U.S. Cl. 426—270 **83 Claims**

1. A product comprising an amount of a wheat-derived component mixed with a source of Zn^{+2} ion, said source being present at a level to yield at least about 0.02% by weight Zn^{+2} ion in the product, based upon the weight of said wheat-derived component taken as 100% by weight, said product being essentially free of chlorophyll.



5,556,656

INJECTION MOULDING MACHINE

Alfred Lampl; Heinz Leonhartsberger, both of Schwertberg; Otto Urbanek, Linz; Gerhard Wimbauer, Schwertberg, and Helmut Naderhirn, Perg, all of Austria, assignors to Engel Maschinenbau Gesellschaft GmbH, Schwertberg, Austria

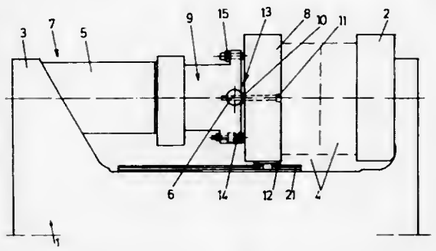
PCT No. PCT/AT94/00112, § 371 Date Apr. 6, 1995, § 102(e) Date Apr. 6, 1995, PCT Pub. No. WO95/04643, PCT Pub. Date Feb. 16, 1995

PCT Filed Aug. 11, 1994, Ser. No. 411,743

Claims priority, application Austria, Aug. 11, 1993, 1601/93; Sep. 2, 1993, 1763/93

Int. Cl.[6] B29C *45/64*

U.S. Cl. 425—589 **22 Claims**



1. Injection moulding machine with a machine frame, one stationary and one movable die platen and, a hydraulic or electro-mechanical closing mechanism carried on an end plate of the machine frame, said closing mechanism being provided with a closing piston moveable with respect to the end plate, the closing mechanism for displacing the movable die platen on guide rails provided on the machine frame, wherein the end plate upon which the moveable die is supported and the stationary die platen are connected exclusively by the machine frame, and the die platens locked together are inclined, under the influence of the closing mechanism, slightly out of a plane perpendicular to the machine frame, and a hinge is provided near to the closing piston which joins together a hinge part assigned to the machine frame and a hinge part assigned to the moveable die platen, characterized in that, when hinged, apart from a tilting movement, the hinge part belonging to the movable die platen performs a radial displacement relative to the machine frame, the radial displacement directed preferably approximately normally to the longitudinal axis of the machine.

5,556,657

5,556,659

pressing at least one portion of the dough strand near the center of the dough strand into a portion of the dough strand near the

reddening the stuffed batter product to obtain a reddened product; and

5,556,657

PROCESS FOR PREPARING SHEET-LIKE SOYBEAN PROTEIN FOODS

Kenichi Akazaki, Nishinomiya, and Hirokazu Tatsubo, Yao, both of Japan, assignors to Fuji Oil Company, Limited, Osaka-fu, Japan

Continuation-in-part of Ser. No. 391,510, Feb. 21, 1995. This application Dec. 5, 1995, Ser. No. 567,402

Claims priority, application Japan, Feb. 22, 1994, 6-024263

Int. Cl.[6] A23L *1/00*

U.S. Cl. 426—241 **5 Claims**

1. A process for preparing a sheet-like soybean protein food having a swollen appearance which comprises molding a soybean protein raw material mixture, without addition of any damping agent, into a sheet of 0.1 to 20 mm in thickness, and irradiating it intermittently by a microwave at least three times to obtain the sheet-like soybean protein food having a water content of 38.5 to 68% by weight and an average pore diameter of 2 to 0.5 mm.

5,556,658

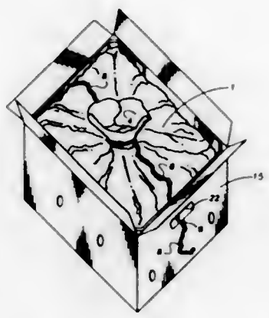
METHOD FOR PACKAGING, STORING AND VENTILATING PRODUCE

Gustavo Raudales, San Pedro Sula, Honduras; Raul Fernandez, San Jose, Costa Rica; Franklin Sanabria, San Jose, Costa Rica; Rodrigo Barsallo, San Jose, Costa Rica; Salomon Chong, San Pedro Sula, Honduras; Elmer Howell, San Jose, Costa Rica; Francisco Rodriguez, San Jose, Costa Rica; Randall Petersen, San Jose, Costa Rica, and Daniel Mullock, Cincinnati, Ohio, assignors to Chiquita Brands, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 160,890, Nov. 30, 1993, Pat. No. 5,433,335. This application Nov. 18, 1994, Ser. No. 342,085

Int. Cl.[6] B65B *25/04*

U.S. Cl. 426—411 **15 Claims**



1. A method of ventilating and storing a plurality of stacked boxes of produce, said produce contained in an inner container disposed within each of said boxes, said boxes being of a substantially rigid construction and having at least one ventilation opening;

each of said inner containers having a top portion, and a bottom portion;

each of said inner containers closed at said top portion; and

said top portion of each of said inner containers having attached thereto a means for opening said inner container;

comprising the steps of:

(a) opening said inner containers using said opening means, without opening said boxes, and without unstacking said boxes, so as to provide increased ventilation to said produce within said inner containers through said at least one ventilation openings;

(b) storing said containerized produce.

5,556,659

PREPARATION OF REDUCED-CALORIE COATED FROZEN CONFECTIONERY

Mayda T. De Pedro, Canoga Park; Fe S. Estiandan, Northridge; Michael L. Talbot, Valencia, all of Calif., and Helmut Traitler, Corseaux, Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Continuation of Ser. No. 149,996, Nov. 10, 1993, abandoned. This application Dec. 1, 1995, Ser. No. 566,164

Int. Cl.[6] A23G *9/04*

U.S. Cl. 426—302 **11 Claims**

1. A process for preparing a reduced-calorie coated frozen confectionery comprising coating a frozen confectionery with a water-in-oil emulsion, wherein the emulsion comprises 40% to 55% by weight water, 2% to 4% by weight of an emulsifier system comprising decaglycerine decaoleate, and less than about 3% by weight water-soluble compounds.

5,556,660

PROCESS FOR SHAPING A STRAIGHT ROPE OF DOUGH INTO A PRETZEL

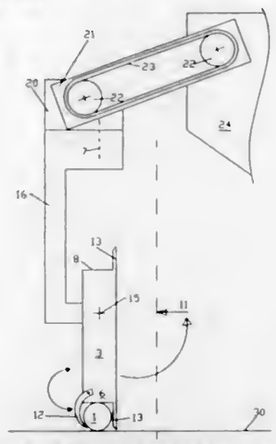
Otto Schutz, Albert-Roesshaupter-Str. 65, D-81369 Munchen, Germany

Filed Jan. 26, 1995, Ser. No. 379,509

Claims priority, application Germany, Jul. 29, 1992, 42 25 066.8

Int. Cl.[6] A21C *3/08*

U.S. Cl. 426—499 **20 Claims**



1. A process for deforming a straight dough strand to form a pretzel, the dough strand having a central portion and having two ends, the process comprising the steps of:

receiving from a plane surface the central portion of the straight dough strand in a front region of a receiving mold part, said front region having a circumferential surface at least partly adapted to the form of a pretzel;

tilting upward into an approximately vertical position the receiving mold part thereby lifting the center portion of the dough strand;

rotating through approximately a full revolution relative to the ends of the dough strand the receiving mold part, with the central part of the dough strand therein, about an axis approximately perpendicular to the plane surface, thereby twisting the dough strand;

displacing the receiving mold part relative to the ends of the dough strand, the displacement being in a direction and perpendicular to the line delimited by the ends of the dough strand;

tilting downward the receiving mold part into nearly parallel arrangement with the plane surface to deposit the dough strand upon the plane surface;

releasing the pretzel from the receiving mold part; and

pressing at least one portion of the dough strand near the center of the dough strand into a portion of the dough strand near the ends of the dough strand to form the dough strand into a pretzel.

5,556,661

PROCESS FOR PREPARING DUMPLINGS FROM STARCH SPONGE IN BOIL-IN-BAG PACKAGE

Klaus Bezner, Untergruppenbach-Unterheinrie; Horst Klukowski, Heuenstadt-Kochertuern, and Hans Schupp, Erlenbach, all of Germany, assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Jun. 9, 1995, Ser. No. 489,089

Claims priority, application Germany, Jun. 14, 1994, 44 20 702.6

Int. Cl.[6] A21D *10/02*

U.S. Cl. 426—549 **7 Claims**

1. A process for the production of dimensionally stable, sliceable, starch-containing dumplings in a boil-in-bag package, which comprises

a) at least a partially gelatinizing a starch-containing starting material;

b) freezing the partially gelatinized, starch-containing material to form a frozen starch;

c) comminuting the frozen starch;

d) thawing and dewatering the frozen and comminuted starch by pressing and/or drying to form a comminuted starch sponge; and

e) packaging the comminuted starch sponge in a porous boil-in-bag package,

such that the comminuted starch sponge and remaining head space in the bag are dimensioned in such a way that the comminuted starch sponge completely fills the boil-in-bag package and forming a single dimensionally stable, sliceable, edible dumpling product comprising the comminuted starch sponge, resulting from absorbing water through the porous bag during cooking in water and from the pressure of the hydrated contents of the bag against the bag wall.

5,556,662

LOW FAT SAUSAGE MANUFACTURE

Sung Hee Cheong, Helsingborg, Sweden, assignor to Nestec S.A., Vevey, Switzerland

Filed Jun. 23, 1994, Ser. No. 264,779

Claims priority, application European Pat. Off., Jul. 5, 1993, 93810472

Int. Cl.[6] A23L *1/317*

U.S. Cl. 426—646 **18 Claims**

1. A process for preparing a low fat sausage product comprising:

grinding a lean meat to obtain a ground meat;

firstly, chopping the ground meat for from 2 mins to 10 mins to obtain a chopped meat, and during chopping, adding a nitrite curing salt and ice to the ground meat being chopped and adding liquid nitrogen to maintain the temperature of the meat being chopped between −2° C. and 3° C. to obtain a chopped meat product,

secondly, further chopping the chopped meat product for up to 10 mins and during the further chopping, adding fat to the chopped meat product and then chopping the fat and adding liquid nitrogen to maintain the temperature of the chopped meat product and fat being chopped between 1° C. and 10° C. to obtain a chopped meat and fat product,

wherein the ground meat, added fat, ice and nitrite salt are present in amounts so that the chopped meat and fat product has a fat content of from 1% to 20% by weight based upon the weight of the chopped meat and fat product; and

thirdly, further chopping the chopped meat and fat product until the chopped meat and fat product has a temperature between 12° C. and 15° C. to obtain a batter product;

stuffing the batter product in a container selected from the group consisting of casings and cans for containing the batter product;

reddening the stuffed batter product to obtain a reddened product; and

heating the reddened product at a temperature of from 70° C. to 125° C. to obtain a sausage product.

5,556,663

EXCIMER FLUORESCENCE METHOD FOR DETERMINING CURE OF COATINGS

Eng-Pi Chang, Arcadia; Yao-Feng Wang, Diamond Bar, both of Calif.; Mitchell A. Winnik, Ontario, Canada, and Maris Ziemelis, Midland, Mich., assignors to Avery Dennison Corporation, Pasadena, Calif.

Filed Dec. 30, 1994, Ser. No. 367,054

Int. Cl.[6] B05D *5/12*

U.S. Cl. 427—8 **40 Claims**

1. A method for determining the degree of cure of a polymer coating formed by the polymerization of a curable coating mixture of reactants comprising the steps of:

(a) adding to the coating mixture an amount of a fluorescent modified reactant that comprises one of the reactants of the coating mixture having added thereto by chemical reaction, a fluorescent tag that is able to fluoresce in both monomer and excimer states;

(b) applying the coating mixture containing the fluorescent modified reactant to a substrate to form a coated film;

(c) curing the coated film;

(d) exposing the coated film to an excitation light source;

(e) measuring the intensity of the emissions from the fluorescent modified reactant contained in the coated film in each of the monomer and excimer emission states; and

(f) comparing the intensity of the monomer emission to the intensity of the excimer emission to determine degree of cure.

5,556,664

METHOD OF FORMING A PHOSPHOR SCREEN

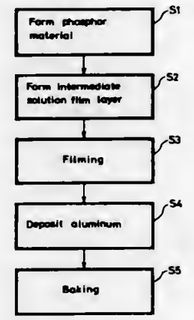
Koichiro Sasa; Shuji Kuramoto, both of Gifu, and Haruo Kato, Aichi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 7, 1994, Ser. No. 302,052

Claims priority, application Japan, Sep. 10, 1993, 5-226086

Int. Cl.[6] B05D *5/06*

U.S. Cl. 427—64 **3 Claims**



1. A method of forming a phosphor screen on an inner surface of a panel, comprising the steps of:

depositing a phosphor material on an inner surface of a panel;

coating an intermediate film layer solution comprising an aqueous solution containing from about 0.5 to about 5.0% by weight of a compound selected from the group consisting of: oxalic acid, ammonium oxalate and boric acid on said phosphor material to provide an intermediate film layer;

crystallizing said intermediate film layer by evaporating water from the intermediate film layer to increase the concentration of the intermediate film layer solution and crystallize and

precipitate said compound present in said intermediate film layer solution on said phosphor material;

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METHOD OF FORMING WATER-REPELLENT FILM ON

applying a water-borne or solvent-borne color base paint to a primed or intercoated surface of the substrate;

a connecting member connecting said first and second conductive layers, said connecting member being formed in the hole

precipitate said compound present in said intermediate film layer solution on said phosphor material;
forming a lacquer film layer on said intermediate film layer;
forming a metal-backing layer on said lacquer film layer; and
removing said intermediate film layer and said lacquer film layer by baking.

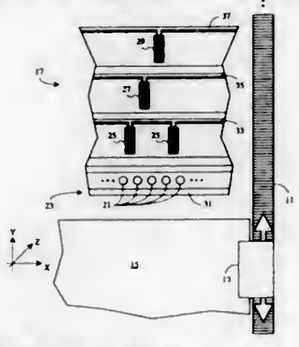
5,556,665

MENISCUS COATING OF CRT SCREENS

Roland W. Norris, Hanover Park, and Hua-Sou Tong, Arlington Heights, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Nov. 3, 1992, Ser. No. 970,906
Int. Cl.[6] B05D *5/06*
U.S. Cl. 427—64 **16 Claims**

1. A device for producing a color video display screen having



lines of screen elements comprising:
(a) a meniscus coater having a plurality of meniscus producing surfaces,
(b)(1) each said meniscusproducing surface being constructed to provide a meniscus of a screen element liquid having a width sized to produce a meniscus application on the display screen equal to or slightly greater than a desired screen element line width on the display screen, and
(b)(2) said meniscus producing surfaces being arranged in at least one array of the desired order, spacing, and sequence to replicate the desired pattern of screen element lines of the display screen.

5,556,666

PROCESS FOR PREPARING COLOR CONTRASTS ON ARTICLES OBTAINED BY MOLDING FROM POLYMERIZABLE COMPOSITIONS

Franco Marciandi, and Marco Bertani, both of Milan, Italy, assignors to Atohaas Holding C.V., Haarlem

Filed May 30, 1995, Ser. No. 453,803
Claims priority, application Italy, Jun. 1, 1994, MI94A1130
Int. Cl.[6] B32B *27/36*
U.S. Cl. 427—133 **7 Claims**

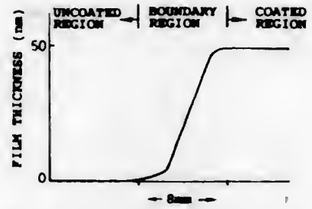
1. Molding process of articles having color contrast areas on the surface comprising coating the surface or part of the surface of a mold with a polymerized colored composition before filling the mold with a polymerizable fluid composition wherein the colored composition is a fluid, stable and redispersable dispersion, which comprises:
a) a solvent consisting essentially of polymerizable liquid monomers, optionally in admixture with a non-polymerizable volatile organic solvent;
b) a coloring composition comprising from 0.1 to 10% by weight of an inorganic pigment or from 0.0001 to 1% by weight of an organic pigment or organic dye;
c) from 1 to 30% by weight of an unsaturated polyester resin soluble in the solvent a).

5,556,667

METHOD OF FORMING WATER-REPELLENT FILM ON TRANSPARENT PANEL

Toyoyuki Teranishi; Hiroaki Kobayashi, both of Kanagawa, and Jun Kawaguchi, Tokyo, all of Japan, assignors to Nippon Sheet Glass Co., Ltd., Japan

Filed Dec. 8, 1994, Ser. No. 352,551
Claims priority, application Japan, Dec. 8, 1993, 5-307823
Int. Cl.[6] B05D *5/06;1/34;* **C03C** *17/30;17/34*
U.S. Cl. 427—164 **10 Claims**



1. A method for forming a water-resistant film on a transparent panel, comprising:
applying a coating solution comprising a coating agent to a surface of the transparent panel in a region to be coated;
applying a solvent for the coating agent to a surface of the transparent panel in a region not to be coated and in partly overlapping relation with the coating solution applied to the region to be coated, the coating solution being diluted in a boundary region between the region to be coated and the region not to be coated;
drying the coating solution and solvent applied to the transparent panel into a wet film, the thickness of the wet film being progressively reduced in the boundary region in the direction of the region not to be coated; and
baking the wet film to form a water-resistant film on the transparent panel.

5,556,668

RUBBERIZED PAINT COATING PROCESS

Jenny W. Y. Chun, Kowloon, Hong Kong, assignor to Victory Concept Industries, Ltd., Kowloon, Hong Kong

Filed Jui. 13, 1995, Ser. No. 502,107
Int. Cl.[6] B05D *3/02*
U.S. Cl. 427—378 **10 Claims**

1. A process for applying a rubberized paint coating to a plastic surface comprises the steps of:
diluting rubberized paint with a diluent having a composition of comparatively larger fractions of xylene and cyclohexanone and comparatively smaller fractions of methyl isobutyl ketone (MIBK) and butylcellusolve,
spraying the diluted paint on the plastic surface in successive coats, then
drying the spray-painted surface.

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COATING WITH CARBOXYL AND CARBOXYLATE-CONTAINING POLYMER AND HYDROXYL AND EPOXY-CONTAINING POLYMER

Shigeyuki Sasaki, Takatsuki; Takeshi Takagi, Yawata, and Yoshitaka Okude, Hirakata, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Division of Ser. No. 385,816, Feb. 9, 1995, Pat. No. 5,508,353.
This application Dec. 11, 1995, Ser. No. 570,568
Claims priority, application Japan, Feb. 9, 1994, 6-15152
Int. Cl.[6] B05D *3/02*
U.S. Cl. 427—410 **3 Claims**

1. A process for forming a cured film on a substrate comprising:
priming or intercoating the substrate;

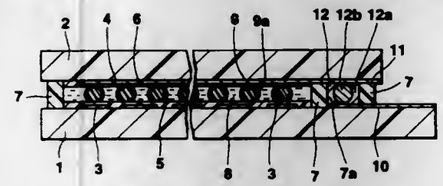
applying a water-borne or solvent-borne color base paint to a primed or intercoated surface of the substrate;
applying a clear coating composition to a base coated surface of the substrate without curing a base coating layer; and
baking both the base coating layer and the clear coating layer to cure;
an improvement being present in that the clear coating composition comprises: (a) 20 to 80% by weight of a polymer having carboxyl and carboxylate groups prepared by half-esterifying
(1) a polymer having carboxyl and anhydride groups prepared by copolymerizing (i) 5 to 90% by weight of a carboxyl group-containing ethylenically unsaturated monomer prepared by half-esterifying a hydroxyl group-containing ethylenically unsaturated monomer with an anhydride group-containing compound in an molar ratio of the hydroxyl group to the anhydride group of 1/1.0 to 1/0.5, (ii) 10 to 40% by weight of an anhydride group-containing ethylenically unsaturated monomer and (ill) 0 to 85% by weight of a copolymerizable ethylenically unsaturated monomer which is different from (i) and (ii), with
(2) a monoalcohol having 1 to 12 carbon atoms; and (b) 20 to 80% by weight of a polymer having hydroxyl and epoxy groups prepared by copolymerizing (1) 5 to 60% by weight of a hydroxyl group-containing ethylenically unsaturated monomer, (2) 10 to 60% by weight of an epoxy group-containing ethylenically unsaturated monomer and (3) 0 to 85% by weight of a copolymerizable ethylenically unsaturated monomer which is different from (1) and (2).

5,556,670

LIQUID CRYSTAL DISPLAY PANEL

Ichiro Mihara; Minoru Kumagai, both of Akishima, and Kunpei Kobayashi, Fussa, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 134,322, Oct. 8, 1993, abandoned. This application May 3, 1995, Ser. No. 433,029
Claims priority, application Japan, Oct. 15, 1992, 4-301524; Sep. 20, 1994, 6-250138
Int. Cl.[6] G02F *1/1339*
U.S. Cl. 428—1 **5 Claims**



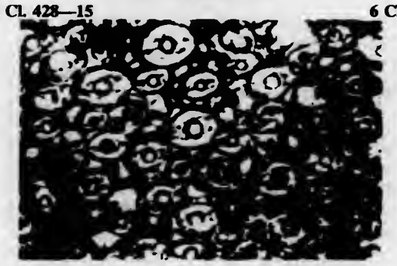
1. A liquid crystal display panel comprising:
first and second flexible substrates, said substrates facing each other;
first and second conductive layers, said conductive layers respectively being disposed on respective innerfaces of said respective substrates;
first and second orientation layers, said orientation layers respectively being disposed on said first and second conductive layers;
a sealing member interposed between said first and second substrates for sealing perimeters of said first and second substrates together to define a cavity between said first and second substrates, said sealing member having a hole formed in said sealing member and said sealing member being formed of a material whose curing reaction proceeds at a room temperature;
a plurality of spacers interposed in the cavity defined between said first and second substrates, each of said spacers being brought into contact with said first and second orientation layers and being fixed to said first and second orientation layers by an adhesive agent which is made of a material selected from the group consisting of a thermoplastic resin and a thermosetting resin and which is respectively formed over a surface of each said spacer;
a connecting member connecting said first and second conductive layers, said connecting member being formed in the hole of said sealing member and said connecting member being made of a thermosetting resin in which conductive particles are dispersed, and wherein said thermosetting resin of said connecting member is a material whose curing reaction proceeds at a higher temperature than said room temperature; and
a liquid crystal material filled in the cavity defined between said first and second substrates.

5,556,671

ARTIFICIAL SNOW IN AN AGGREGATE FORM OF SNOW GRANULES

Yuichiro Miura, Sapporo; Kazuo Hirano, Tokyo; Takayuki Nate, Yokohama; Taiji Kambayashi, Yamatotakada; Masahisa Ohtsuka, 2191-1, Kamikotzumi, Ohizumimachi, Ohragun, Gunma-ken, and Toshitake Nagai, Ojimamachi, all of Japan, assignors to Miura Dolphins Co., Ltd.; Tonen Corporation, both of Tokyo; Osaka Organic Chemical Industry Co., Ltd., Osaka; Tonen Chemical Corporation, Tokyo; Sanyo Electric Co., Ltd., Moriguchi, and Masahisa Ohtsuka, Ohizumimachi, all of Japan

Division of Ser. No. 114,443, Aug. 30, 1993, Pat. No. 5,436,039, which is a division of Ser. No. 648,186, Jan. 31, 1991, Pat. No. 5,266,367. This application Mar. 15, 1995, Ser. No. 404,318
Claims priority, application Japan, Feb. 2, 1990, 2-24069; Jun. 9, 1990, 2-150729; Jun. 9, 1990, 2-150730; Aug. 14, 1990, 2-214697
The portion of the term of this patent subsequent to Aug. 11, 2009, has been disclaimed.
Int. Cl.[6] F25C *3/00*
U.S. Cl. 428—15 **6 Claims**



1. A snow quality improver comprising a super absorbent polymer in granule form wherein said super absorbent polymer has the following characteristics:
(a) said polymer retains its original granule form after water absorption without sticking to other granules;
(b) said polymer has a detonized-water absorbability of about 30 to 500 times the weight of the dry polymer;
(c) said polymer has an average particle size of about 20 to 500 μm before water absorption; and
(d) said polymer has an average particle size of about 0.05 to 5 mm after water absorption.

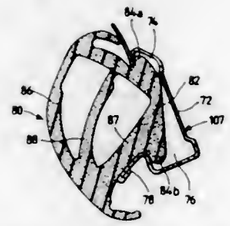
5,556,672

WEATHER STRIP ATTACHING STRUCTURE

Keiji Akachi, and Atsushi Hikosaka, both of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai-gun, Japan

Continuation of Ser. No. 32,550, Mar. 17, 1993, abandoned. This application Jan. 11, 1995, Ser. No. 371,491
Claims priority, application Japan, Mar. 18, 1992, 4-092217
Int. Cl.[6] F06B *7/16*
U.S. Cl. 428—33 **6 Claims**

1. The combination of a weather strip and a retainer provided along a door opening of a vehicle body,
wherein said weather strip comprises:



a hollow sealing portion abutted against an edge portion of a door glass plate; and

a base portion having first and second engaging protrusions for engaging with first and second engaging portions of said retainer;

said hollow sealing portion having at least one inclined side wall against said base portion,

wherein said retainer comprises:

a bottom for mounting on said vehicle body;

said first and second engaging portions formed at opposite ends of said bottom, said first engaging portion being disposed at an outer side of the vehicle body and said second engaging portion being disposed at an inner side of the vehicle body, said base portion being in contact with the retainer between the first and second engaging portions; and

an inclined supporting portion extended from said second engaging portion, for supporting said inclined side wall of said hollow sealing portion of said weather strip,

wherein the depth of said second engaging portion is at least 1.5 to 2.5 times the thickness of said second engaging protrusion,

wherein a width of said hollow sealing portion is greater than a width of said base portion and a width of said base portion is substantially equal to a width of said retainer including said first and second engaging portions, and

wherein said weather strip is attached to said retainer by engagement of the first engaging protrusion of the weather strip with the first engaging portion of the retainer, engagement of the second engaging protrusion with the second engaging portion, and engagement of the inclined supporting portion with the inclined side wall of the hollow sealing portion, which is extended from said base portion to have the same inclination as the inclined supporting portion of the retainer.

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TRANSPARENT COMPOSITE STRUCTURAL ELEMENTS AND METHODS FOR PRODUCING SAME

André Giraud, Levallois-Perret, France, assignor to Compagnie Generale D'Innovation et de Developpement COGIDEV, Rueil Malmaison, France

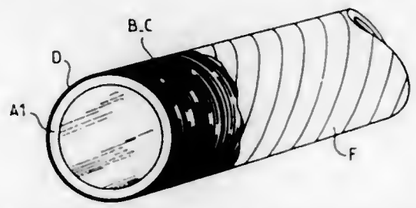
PCT No. PCT/FR92/00642, § 371 Date Jan. 7, 1994, § 102(e) Date Jan. 7, 1994, PCT Pub. No. WO93/01372, PCT Pub. Date Jan. 21, 1993

PCT Filed Jul. 6, 1992, Ser. No. 182,206

Claims priority, application France, Jul. 8, 1991, 91 08552

Int. Cl.[6] **B32B** *9/00*

U.S. Cl. 428—34.4 **30 Claims**



1. A transparent composite structural member capable of withstanding mechanical stresses, comprising:

at least one transparent glass member selected from the group consisting of stem, reed, tube, strip, sheet, bead, particle and fragment;

transparent fibers;

a cured transparent resin, in which said transparent fibers are imbedded, and in which said at least one transparent glass member, to the extent consisting of bead, particle and fragment is imbedded;

said transparent fibers, and said resin, being bonded to said at least one transparent glass member to the extent consisting of stem, reed, tube, strip and sheet;

said cured resin exhibiting a refractive index which, at a wavelength of 510 to 520 nm, does not differ by more than 0.01 from that of said transparent fibers and from that of said at least one transparent glass member;

said transparent fibers being preferentially located in a region of said member which are at least one of: subject to maximum tensile stress and subject to impact, in use; and

said at least one glass member being preferentially located in a region of said member which are at least one of: subject to maximum compressive stress and required to be of greatest rigidity.

5,556,674

READY-TEAR PACKAGING

Daniel Meilhon, Sort-en-Chalosse, France, assignor to Sodap, Dax-Cedex, France

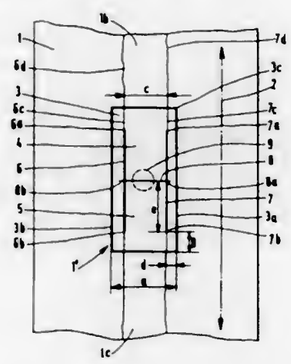
Filed Oct. 9, 1992, Ser. No. 958,735

Claims priority, application France, Oct. 11, 1991, 91 12555

The portion of the term of this patent subsequent to Oct. 18, 2011, has been disclaimed.

Int. Cl.[6] **B65B** *53/02;* **B65D** *65/26*

U.S. Cl. 428—34.9 **16 Claims**



1. A ready-tear coextrudate, heat-shrinkable thermoplastic film packaging material comprising (a) at least one layer of a polyolefin; and (b) at least one layer of an ionic copolymer which comprises the copolymerizate of (1) an α-olefin of the formula $R—CH=CH_2$ wherein R is hydrogen or an alkyl radical having from 1 to 8 carbon atoms, with (2) an α-β-ethylenically unsaturated carboxylic acid comonomer having from 3 to 8 carbon atoms, with the proviso that from 10% to 90% of the carboxylic acid functions of said copolymer are ionized by neutralization via metallic ions distributed over the copolymer, said packaging material further comprising tear initiating means oriented in a direction substantially perpendicular to the direction of coextrusion of said film, and said tear initiating means comprising at least one tab or pull member provided in a reinforced or thickened region of said film.

5,556,675

BLOW MOLDED ARTICLES

Kazuhito Yamamoto; Hiroji Niimi; Yoji Yamamoto, and Susumu Hatabu, all of Kuga-gun, Japan, assignors to Mitsui Petrochemical Industries Ltd., Yamaguchi, Japan

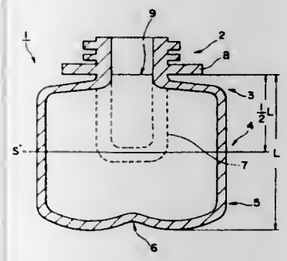
Division of Ser. No. 301,440, Sep. 9, 1994, which is a continuation of Ser. No. 29,914, Mar. 11, 1993, abandoned, which is a continuation of Ser. No. 569,993, Aug. 20, 1990, abandoned.

This application May 15, 1995, Ser. No. 440,995

Claims priority, application Japan, Aug. 31, 1989, 1-225755; Aug. 31, 1989, 1-225756; Aug. 31, 1989, 1-225757; Aug. 31, 1989, 1-225758; Aug. 31, 1989, 1-225760; Aug. 31, 1989, 1-225761; Aug. 31, 1989, 1-225762; Aug. 31, 1989, 1-225763; Aug. 31, 1989, 1-225764

Int. Cl.[6] **B65D** *23/00*

U.S. Cl. 428—36.92 **18 Claims**



1. A blow molded article having excellent transparency, moldability and gas barrier properties,

wherein the blow molded article is composed of a copolyester having an intrinsic viscosity (η) of 0.5–1.5 dl/g formed by esterification of dicarboxylic acid with a dihydroxy compound,

said dicarboxylic acid comprising 80–99.5 mol % of terephthalic acid and 0.5–20 mol % of 2,6-naphthalene-dicarboxylic acid, said dihydroxy compound comprising ethylene glycol, and is highly oriented so that the stretch index defined by the following equations becomes not less than 130 cm.

$$\text{Stretch index} = \frac{\text{Internal volume of oriented bottle (excluding stopper portion)}}{\text{Internal volume of unoriented preform (excluding stopper portion)}} \times \frac{1}{f}$$

$$f = \frac{\text{Internal surface area of oriented bottle (excluding stopper portion)}}{\text{Internal volume of oriented bottle (excluding stopper portion)}} \ (\text{cm}^{-1}).$$

5,556,676

TUNNEL INTERIOR CONSTRUCTION

Masafumi Fukumoto, Amagasaki, Japan, assignor to Nisshin Chemical Industry Co. Ltd., Hyogo, Japan

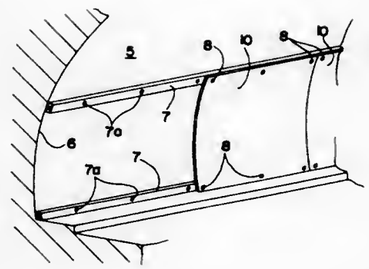
Filed Jul. 29, 1993, Ser. No. 99,218

Claims priority, application Japan, Jan. 22, 1993, 5-001288 U

Int. Cl.[6] **B29D** *22/00*

U.S. Cl. 428—36.1 **3 Claims**

1. A tunnel structure having interior walls lined with a plurality of liner elements, each of the elements comprises a composite panel in which a fibrous glass layer is laminated over a hard substrate, and a fluoropolymer surface layer is laminated over said fibrous glass layer, the fluoropolymer side of each element facing outwardly from the interior wall of the tunnel.



5,556,677

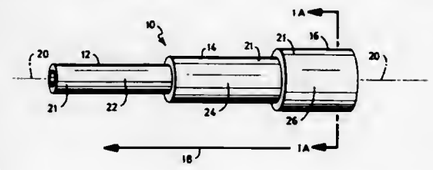
COMPOSITE SHAFT STRUCTURE AND MANUFACTURE

Peter A. Quigley, Pocasset; Steven C. Nolet, Leominster, both of Mass., and James L. Gallagher, Tiverton, R.I., assignors to Composite Development Corporation, West Wareham, Mass.

Filed Jan. 7, 1994, Ser. No. 178,664

Int. Cl.[6] **B32B** *5/06;29/02;* **B29D** *22/00;* **B65H** *81/00*

U.S. Cl. 428—36.2 **29 Claims**



1. In an axially extending composite member having a plurality of plies and having primary bending stiffness along a longitudinal axis, the improvement comprising

A) at least one interior ply structured with a matrix material and with a first fiber component clockwise helically oriented and bi-axially braided with a second fiber component counter-clockwise helically oriented for providing a first fraction of the bending stiffness of said composite member and for providing impact resistance,

B) at least one intermediate ply structured with

i) said matrix material,

ii) an axially extending third fiber component having a first helical orientation relative to said longitudinal axis,

iii) a fourth helically oriented fiber component interwoven with said axially extending third fiber component and oriented clockwise relative to said first helical orientation, and

iv) a fifth helically oriented fiber component interwoven with said axially extending third fiber component and oriented counter-clockwise to said first helical orientation,

said intermediate ply being exterior to said interior ply and providing a second fraction of the bending stiffness and providing primary load-carrying strength of the member, and

C) at least one exterior ply exterior to said intermediate ply said exterior ply structured with said matrix material and with a sixth fiber component clockwise helically oriented and bi-axially braided with a seventh fiber component counter-clockwise helically oriented for providing a third fraction of the bending stiffness and for providing abrasion resistance,

wherein said second fraction is greater than either of said first and third fractions.

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PLASTICS TUBE HEAD PROVIDED WITH A LINING

5,556,680

COVER BELT FOR A DUCT

to 25% and comprising a dye material; a polymeric material, said polymeric material being a silicon varnish wherein the ratio of

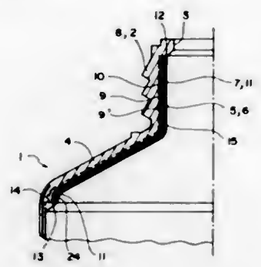
an inner fuzzy lamination sheet having the properties of fuzziness, softness and surfaces properties of flexibility so as to not

5,556,678

PLASTICS TUBE HEAD PROVIDED WITH A LINING HAVING A BARRIER EFFECT AND AN INTERNAL MEMBER WHICH CAN BE USED FOR THIS LINING

Alain Jupin, Sainte Menehould, and Gerard Chapet, Paris, both of France, assignors to Cebal SA, Clichy, France

Filed Nov. 15, 1991, Ser. No. 792,608
Claims priority, application France, Jul. 25, 1991, 91 09689
Int. Cl.[6] B65D *23/02*
U.S. Cl. 428—36.6 **8 Claims**



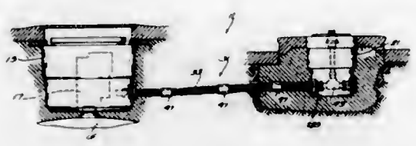
1. A plastic tube head comprising a pre-formed internal laminate integrally molded to a unitary plastic neck and a plastic substantially truncated cone-shaped shoulder, said pre-formed internal laminate comprising at least three polymeric lamina, said at least three lamina comprising an exterior lamina and an interior lamina each having a thickness of between 0.25 to 1.2 mm and a low softening temperature, said exterior and interior lamina being selected from the group consisting of PE, P an PET, and an intermediate high softening temperature barrier effect lamina of between 0.008 to 0.05 mm thickness sandwiched between said exterior and interior lamina, said barrier effect lamina being selected from the group consisting of EVOH, PVDC, PAN, PVDF, PA, saran and metaxylene diamine 6, an pre-formed internal laminate lining at least 80% of the internal height of the neck and at least 50% of the substantially truncated cone-shaped shoulder with said exterior lamina embedded in said neck and shoulder and said interior lamina generally non-embedded in said neck and shoulder.

5,556,679

FLEXIBLE DUAL WALL HOSE OR PIPE ASSEMBLY

Harold F. Booles, Little Rock, Ark., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Apr. 15, 1994, Ser. No. 228,476
Int. Cl.[6] G01M *3/00*
U.S. Cl. 428—36.91 **10 Claims**



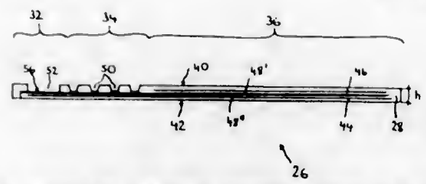
1. A composite pipe assembly comprising an inner flexible pipe extending lengthwise and being defined by a wall which includes a plurality of corrugations in serially adjacent lengthwise relation, and an outer flexible pipe which is spaced outwardly from said inner pipe and forms an enclosure for said inner pipe, and which is defined by a wall including a lengthwise inwardly open channel restricting flexibility in one direction, and a series of axially adjacent corrugations extending transversely to and from said lengthwise channel.

5,556,680

COVER BELT FOR A DUCT

Lars Hellman, Stockholm, Sweden, assignor to Ipaco B.V., Netherlands

Filed Nov. 14, 1994, Ser. No. 339,117
Claims priority, application Luxembourg, Nov. 3, 1993, 88421; Nov. 19, 1993, 88427
Int. Cl.[6] B32B *3/10;3/14;23/02;* **F16G** *1/04*
U.S. Cl. 428—56 **18 Claims**



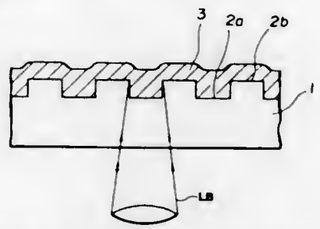
1. A cover belt of a flexibly deformable material for a duct, having a width and a longitudinal direction, an underside facing the duct, an opposed topside and a neutral plane defined between said underside and said topside, said cover belt comprising:
(1) a lateral securing strip for securing the cover belt along a duct;
(2) a cover strip for covering a duct, said cover strip width being sufficient to span the duct and be supported on both sides of the duct;
(3) a joint strip flexibly connecting said securing strip to said cover strip;
(4) the combined widths of each of said lateral securing strip, and said joint strip and said cover strip constituting substantially the full width of said cover belt; and
(5) reinforcements embedded in said cover belt, said reinforcements including:
(a) at least one fabric reinforcing layer in said cover belt, said fabric reinforcing layer being embedded in said cover belt in the area of the neutral plane of said cover belt and extending in the longitudinal direction of the belt over substantially the full width of said cover belt, and
(b) at least one layer of metallic reinforcing elements transverse to the longitudinal direction of said cover belt, said reinforcing elements being between the underside of said cover belt and said fabric reinforcing layer and extending over substantially the full width of said cover belt.

5,556,681

OPTICAL INFORMATION RECORDING MEDIUM

Yoko Matsuzawa; Shin-Ichiro Tamura, and Katsuya Shirai, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 2, 1994, Ser. No. 299,656
Claims priority, application Japan, Sep. 8, 1993, 5-223268
Int. Cl.[6] B32B *3/00*
U.S. Cl. 428—64.1 **5 Claims**



1. An optical information recording media comprising a transparent substrate having pits and lands corresponding to information signals formed therein, and a reflective layer disposed on the transparent substrate, the reflective layer having a reflectance of 15

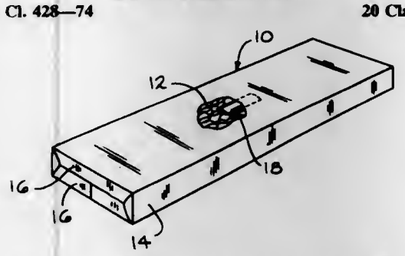
to 25% and comprising a dye material; a polymeric material, said polymeric material being a silicon varnish wherein the ratio of Si—OH groups to Si—CH_3 groups is from about 18 to about 25%; and from about 7 to about 10% by weight based on the weight of said polymeric material of a titanium coupling agent.

5,556,682

FIBROUS GLASS INSULATION ASSEMBLY

Patrick M. Gavin, Newark; Jean E. Schelhorn, Granville; David P. Aschenbeck, Newark, and Carl R. Strauss, Granville, all of Ohio, assignors to Owens Corning Fiberglas Technology, Inc., Summit, Ill.

Continuation-in-part of Ser. No. 236,868, May 2, 1994, Pat. No. 5,466,504. This application Aug. 29, 1995, Ser. No. 521,081
Int. Cl.[6] B32B *5/16;1/06*
U.S. Cl. 428—74 **20 Claims**



1. A non-evacuated fibrous glass insulation assembly (**10**) comprising:
at least one fibrous glass body (**12**);
a moisture barrier (**14**) substantially enclosing said at least one fibrous glass body (**12**); and
a desiccant (**18**) positioned within said moisture barrier (**14**) and adjacent said fibrous glass body (**12**) for removing moisture from said fibrous glass body (**12**).

5,556,683

PROTECTIVE PLASTIC LAMINATES AND METHOD OF MANUFACTURING LAMINATED PROTECTIVE PLASTIC SLEEVES

Anthony G. Ranalli, Park Ridge, Ill., assignor to C-Line Products, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 253,684, Jun. 2, 1994. This application Oct. 20, 1994, Ser. No. 326,485
Int. Cl.[6] B32B *9/00*
U.S. Cl. 428—76 **10 Claims**

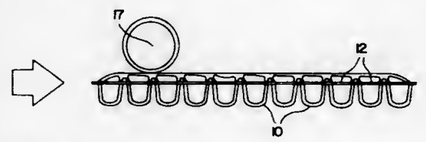
1. A protective sleeve for storage of a recording medium item comprising:
a front pocket forming sheet having the properties of transparency and stability so as to form a high quality compact disk pocket;
an inner fuzzy lamination sheet having the properties of fuzziness, softness and surfaces properties of flexibility so as to not scratch the surface of a compact disk for contacting said item said inner fuzzy lamination sheet including a thermal bonded polypropylene fabric sheet, an intermediate polypropylene adhesive layer and a clear polypropylene sheet, said thermal bonded polypropylene fabric sheet being laminated with said intermediate adhesive layer sheet to said clear polypropylene film sheet;
said front pocket forming sheet being thermally welded to said inner fuzzy lamination sheet along the perimetrical edges of the inner fuzzy lamination sheet, but not welded to at least one section along the perimetrical edges of the inner fuzzy lamination sheet, thereby creating a front pocket having a front opening for insertion of recording media between said front sheet and said inner fuzzy lamination sheet.

5,556,684

MANUFACTURING PROCESS FOR SYNTHETIC FIBER CARPETS FIXED BY FUSION AT REGULAR INTERVALS WITH CREST OR TUFTS, WITHOUT USING GLUES OR USING SMALL AMOUNTS OF GLUES, WHERE THREADS DO NOT LOOSEN AND THUS OBTAINING THE CARPETS

Miguel Forero, Carrera 7, No. 26-20, 21st Floor, Santafe de Bogota D.C., Colombia

Filed Feb. 4, 1994, Ser. No. 192,170
Int. Cl.[6] B32B *3/02;* **D05C** *17/00*
U.S. Cl. 428—95 **4 Claims**



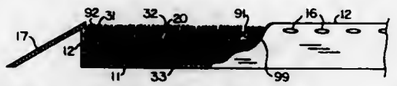
3. A tufted carpet consisting essentially of:
a primary base;
a plurality of tufts made from a synthetic fiber, each of said tufts having a looped portion on an underside of the base, each of said looped portions being fused to the underside of the base and to one or more adjacent looped portions using heat and pressure, thereby forming a homogeneous coat of the looped portions on the underside of the primary base; and
a secondary base made from the same synthetic fiber as the tufts fused to the homogeneous coat of the looped portions on the underside of the primary base.

5,556,685

SHOE WIPING MAT ASSEMBLY

Glenn M. Swicegood, Jr., 8514 Kiley Ct., St. Augustine, Fla. 32092

Filed Jul. 25, 1995, Ser. No. 507,003
Int. Cl.[6] A47K *7/02;* **A47L** *23/22;* **B32B** *3/02*
U.S. Cl. 428—95 **14 Claims**



1. A shoe wiping mat assembly comprising:
(A) a liquid retention compartment formed by the combination of a bottom member and a number of generally upstanding side walls, said liquid retention compartment containing a liquid having an upper surface;
(B) support means positioned within said liquid retention compartment, said support means comprising relatively rigid and

non-compressible members which combine to create a generally horizontal support surface capable of supporting the soles of shoes a distance above said bottom member, said support surface having a number of open areas and said support surface being positioned below said upper surface of said liquid;

(C) cleaning means positioned within said liquid retention compartment, said cleaning means extending above said bottom, said support means, said support surface and said upper surface of said liquid.

5,556,686

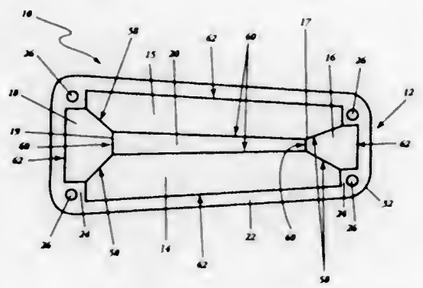
STREET ADDRESS DISPLAY

Christian D. O'Shea, 615 Idlewood Dr., Clarksville, Tenn. 37043

Continuation-in-part of Ser. No. 176,538, Jan. 3, 1994, abandoned. This application Sep. 20, 1994, Ser. No. 309,172

Int. Cl.[6] B32B *3/06;* **G09F** *19/00*

U.S. Cl. 428—99 **16 Claims**



1. A street address display for displaying a street address to a vehicle passing said display on an adjacent roadway, the vehicle having headlights with a low beam position, the headlights in the low beam position emitting a low beam having a beam illumination path with lower and upper margins, said street address display comprising:

a. a housing having first and second viewing faces, said first and second viewing faces connected at their side edges by first and second end walls, said first and second viewing faces and said first and second end walls connected along their top edges to form a top of said housing, said top of said housing extending vertically above a display mounting surface to a housing top line which is below the upper margin of the headlight beam path when the lower margin of the headlight beam path illuminates a bottom edge of said housing, said top of said housing being closer to the display mounting surface than the upper margin of the beam path, said housing top line also being proximate the display mounting surface such that said display does not obstruct vehicle ingress and egress along the mounting surface;

b. said first and second viewing faces and said first and second end walls connected along their bottom edges to a base, said base including means for securing said display to the mounting surface;

c. one or more figures, said figures used to indicate a street address, said figures attached to at least one of said first and second viewing faces; and

d. a rib extending from said base beneath said first end wall along a central line of an inner surface of said first end wall along a central line of a bottom surface of said top along a central line of said second end wall to the said base beneath said second end wall.

5,556,687

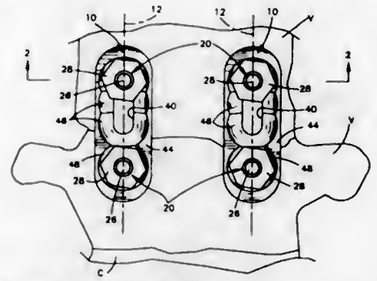
COMPOSITE STRUCTURE SUITABLE FOR USE AS A BONE PLATE AND METHOD FOR MAKING SAID STRUCTURE

Carl R. McMillin, Brecksville, Ohio, assignor to AcroMed Corporation, Cleveland, Ohio

Filed Oct. 14, 1994, Ser. No. 323,251

Int. Cl.[6] A61F *2/44;* **B32B** *5/12;29/02;* **D04C** *1/00*

U.S. Cl. 428—113 **50 Claims**



1. A composite structure comprising:

a radially inner portion of matrix material;

a radially outer portion of matrix material circumscribing said inner portion;

braided reinforcing fibers extending throughout said inner portion substantially transverse to an axis along which said composite structure is subject to splitting to resist splitting of said composite structure along said axis; and

braided reinforcing fibers extending throughout said outer portion substantially parallel to said axis to resist bending of said composite structure;

said directions of said reinforcing fibers resulting from heating and consolidating a preform made of matrix material and braided reinforcing fibers;

said composite structure including a plurality of openings for receiving fasteners.

5,556,688

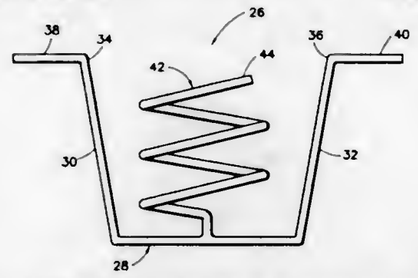
WALL PATCHING DEVICE AND METHOD

James A. Cox, 116 Rue du Bois, Cherry Hill, N.J. 08003

Filed Feb. 27, 1995, Ser. No. 394,706

Int. Cl.[6] B32B *3/04;* **E04G** *23/02*

U.S. Cl. 428—122 **3 Claims**



1. A wall patching device for repairing an opening in a surface, said opening defined by an edge surrounding said opening, said article comprising:

at least one bracket having a substantially "U"-shaped body with legs terminating at end portions and a flange connected to each said end portion, said flanges extending outwardly in substantially opposite directions, and said flanges being movable with respect to each other in said substantially opposite directions in an uninstalled condition and being inserted into said edge of said opening in an installed condition, said at least one bracket forming a cage when said flanges are in said installed condition; and

a support positioned within an interior of said cage and being sized and shaped to substantially fill said interior of said cage and having at least one elongated element extending into said interior of said cage from a base of said bracket to which a patch material bonds.

5,556,689

MICROPOROUS THERMAL INSULATION MOLDING

Günter Kratel, Durach-Bechen; Günter Stohr, Durach; Martin Gross, Kämpfelbach, and Eugen Wilde, Knittlingen, all of Germany, assignors to Wacker-Chemie GmbH, Munich, and Elektro-Gerätebau GmbH, Oberderdingen, both of Germany

Filed Mar. 25, 1994, Ser. No. 217,923

Claims priority, application Germany, Mar. 31, 1993, 43 10 613.7

Int. Cl.[6] C04B *33/32;* **E04B** *1/74*

U.S. Cl. 428—137 **9 Claims**

1. A microporous thermal insulation molding comprising:

compressed thermal insulation material comprising:

30–100% by weight of finely divided metal oxide;

0–50% by weight of opacifier;

0–50% by weight of fiber material; and

0–15% by weight of inorganic binder;

said thermal insulation material has channel pores and at least one surface having channel pores having a cross-sectional area of the pore of 0.01–8 mm^2 and having an intrusion depth of 5–100%, based on the thickness of the thermal insulation material, with 0.004–10 channel pores being present per 1 cm^3 of the surface of the thermal insulation material, said channel pores increase the diffusion of water vapor from the interior of the thermal insulation material to the surface of the thermal insulation material to avoid localized pressure build up.

5,556,690

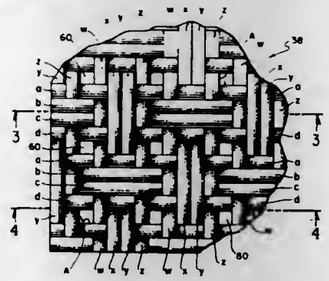
COMPOSITE RAVEL-FREE NEEDLEWORK FABRIC AND METHOD OF PRODUCING SAME

Marcella M. Katz, Los Angeles, Calif., assignor to DeLaLott Corporation, Los Angeles, Calif.

Filed Aug. 21, 1995, Ser. No. 517,283

Int. Cl.[6] B32B *3/10*

U.S. Cl. 428—137 **11 Claims**



1. A composite laminated, non-distortable, needlework fabric material having ravel-free edges and comprised of:

a) a primary layer of non-elastic, open-mesh woven needlework fabric material having a uniform gridwork pattern with mesh apertures defined by the warp and weft threads of said fabric, said apertures being equal to or larger in their major dimension than the threads forming said fabric material, and said material presenting an exposed surface and a laminate interface surface with the crest portions of said threads on the interface surface being pre-coated and impregnated with a synthetic resin adhesive; and

b) a relatively thin secondary mesh-stabilizing layer of sheer non-elastic, random-spun synthetic fiber sheet material coextensively interfaced with said primary layer at its interface surface and permanently bonded to the crest portions of the warp and weft threads of said woven needlework material by said adhesive, the apertures of said primary layer being functionally free of said adhesive and the gridwork design of said primary layer remaining distinctly visible through said secondary layer, said laminated needlework fabric material being adaptable for receiving needlework designs and patterns imprinted on either of its outer surfaces.

5,556,691

BIAXIALLY ORIENTED LAMINATED POLYESTER FILM AND MAGNETIC RECORDING MEDIUM HAVING THE SAME AS BASE FILM

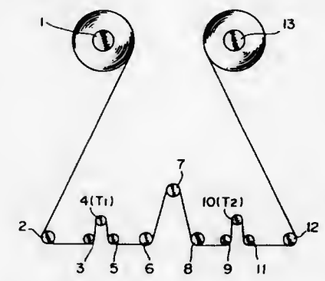
Masami Etchu, Yokohama; Hirofumi Murooka; Kei Mizutani, both of Sagamihara, and Makoto Handa, Yamato, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jan. 26, 1994, Ser. No. 186,585

Claims priority, application Japan, Jan. 27, 1993, 5-011772; Dec. 9, 1993, 5-309159

Int. Cl.[6] B32B *5/16*

U.S. Cl. 428—141 **25 Claims**



1. A biaxially oriented laminated polyester film comprising:

(A) a first thin polyester layer having a thickness of 0.5 to 2 μm, formed of an aromatic polyester containing:

(a1) large-diameter inert particles having an average particle diameter of 0.4 to 2.0 μm and

(a2) small-diameter inert particles having an average particle diameter of 0.01 to 0.3 μm,

the content of the large-diameter inert particles (a1) in the first thin layer being 0.05 to 0.5% by weight and the content of the small-diameter inert particles (a2) in the first thin layer being 0.05 to 0.5% by weight, both based on the weight of the first thin layer,

(B) a second polyester layer formed of an aromatic polyester containing:

(b1) large-diameter inert particles having an average particle diameter of 0.4 to 2.0 μm, and

(C) a third thin polyester layer having a thickness of 0.5 to 3 μm, formed of an aromatic polyester containing:

(c1) large-diameter inert particles having an average particle diameter of 0.4 to 2.0 μm and

(c2) small-diameter inert particles having an average particle diameter of 0.01 to 0.3 μm,

the content of the large-diameter inert particles (c1) in the third thin layer being 0.05 to 0.5% by weight and the content of the small-diameter inert particles (c2) in the third thin layer being 0.05 to 0.5% by weight, both based on the weight of the third thin layer,

the first thin polyester layer, the second polyester layer and the third thin polyester layer being laminated in the above order.

the biaxially oriented laminated polyester film satisfying the

than 0.1, said dielectric base layer having a refractive index

5,556,698

the biaxially oriented laminated polyester film satisfying the following expression (1),

$$0.4 < \frac{W_2 \cdot D_2}{W_1 \cdot D_{13}} < 2.5 \quad (1)$$

wherein:

W_1 is the content (wt %) of the large-diameter inert particles (a1) in the first thin polyester layer,

W_2 is the content (wt %) of the large-diameter inert particles (b1) in the second polyester layer,

D_{13} is a total of the thickness (μm) of the first thin polyester layer and the thickness (μm) of the third thin polyester layer, and

D_2 is the thickness (μm) of the second polyester layer.

5,556,692

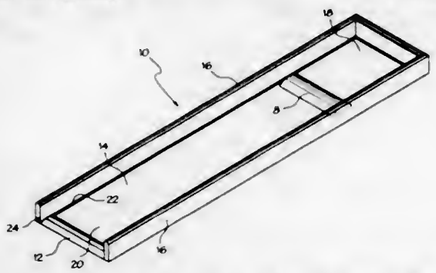
DUAL PURPOSE PARKING PAD

Joe Zheng, P.O. Box 2083, Danbury, Conn. 06804

Filed Dec. 22, 1994, Ser. No. 362,172

Int. Cl.[6] B32B *3/00*

U.S. Cl. 428—156 **9 Claims**



1. A parking pad for a vehicle for collecting droppings falling from the vehicle and signaling the operator of the vehicle to park the vehicle properly, the pad comprising:

an elongated member of a similar length of the vehicle, having a flat surface, two sides, first and second ends, the first end having a slope for the vehicle to smoothly move onto the surface of the elongated member; the second end being elevated so that the flat surface is inclined;

a wall raised above the flat surface and extending along the two sides and the second end and being integral with the elongated member;

a bump pad being positioned between the two sides and close to the second end; and

means for attaching the bump pad to the surface of the elongated member.

5,556,693

IMAGE-RETRANSFERABLE SHEET FOR A DRY IMAGE-TRANSFERRING MATERIAL

Mitsuo Yamane, Yokkaichi, and Takashi Kawaguchi, Aichi-ken, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi-ken, Japan

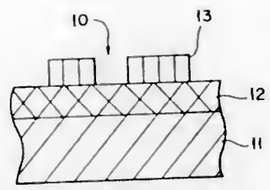
Continuation of Ser. No. 253,323, Jun. 3, 1994, abandoned, which is a continuation of Ser. No. 617,356, Nov. 23, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 488,451

Claims priority, application Japan, Dec. 6, 1989, 1-318535; Dec. 6, 1989, 1-318539; Dec. 25, 1989, 1-335494; Feb. 13, 1990, 2-33261

Int. Cl.[6] B41M *5/00*

U.S. Cl. 428—195 **10 Claims**

1. An image-retransferable sheet for retransferring an ink image, transferred thereon through a heat-sensitive transfer process, onto a desired image receiving material through a pressure-sensitive transfer process, the image-retransferable sheet comprising:



a substrate having a first surface and a second surface opposite to the first surface;

a layer of a surface treating agent formed on the first surface of said substrate, said layer having a thickness in a range of 1 to 20 μm and having an exposed surface not adjacent the substrate, said layer having a tensile strength of from 1 to 100 kg/cm^2, said surface treating agent having at least one of a melting point of at least 100° C., a softening point of at least 100° C., and a melt viscosity at 100° C. of at least 1000 poises; and

an ink image on the exposed surface of said layer of the surface treating agent formed on said substrate, said ink image being transferred through a heat-sensitive transfer process onto the exposed surface of said layer, whereby the ink image is retransferred onto a desired image receiving material together with the surface treating agent, the surface treating agent having the ink image received thereon being removed from the first surface of said substrate by application of pressure to the second surface of said substrate in a pressure-sensitive transfer process, so that the surface treating agent covers said ink image retransferred on the image receiving material.

5,556,694

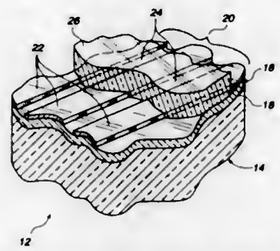
FACEPLATE FOR A TOUCH-SENSITIVE VIDEO DISPLAY UNIT

R. Russel Austin, Novato, Calif., assignor to Photran Corporation, Lakeville, Minn.

Filed Dec. 7, 1994, Ser. No. 350,968

Int. Cl.[6] B32B *7/00*

U.S. Cl. 428—212 **14 Claims**



1. A faceplate for a touch-sensitive video display comprising:

a transparent substrate having a refractive index;

a transparent dielectric base layer deposited on a selected surface of said transparent substrate, said base layer having a thickness between about 70 and 110 nanometers and extending continuously over said selected surface;

a pattern of co-planar, adjacent transparent electrode-regions formed on said dielectric base layer, said electrode-regions having spaces therebetween, and said electrode-regions formed from a transparent conductive layer having a thickness between about 8 and 25 nm;

a transparent dielectric protective-layer covering said electrode-regions and said spaces, said dielectric protective-layer having a thickness greater than about 250 nm; and

said transparent conductive layer having a refractive index between about 1.9 and 2.2 and an extinction coefficient less than 0.1, said dielectric base layer having a refractive index greater than the refractive index of said substrate and less than the refractive index of said transparent conductive layer, and said dielectric-protective-layer having a refractive index less than the refractive index of said base layer.

5,556,695

DELAMINATING ARMOR

Bernard Mazelsky, West Covina, Calif., assignor to ARA, Inc., Industry, Calif.

Continuation-in-part of Ser. No. 173,400, Mar. 24, 1988, abandoned. This application Sep. 26, 1989, Ser. No. 412,906

Int. Cl.[6] B05D *1/32;3/10;* **F41H** *1/02;5/04*

U.S. Cl. 428—229 **26 Claims**

1. Armor comprising:

multiple plies of an energy absorbing cloth made of high strength structural fiberglass fibers to which a resin has been applied and cured thereon wherein said fibers were treated with a substance serving to retard absorption of a curable resin solution by functioning as a repellent to said solution prior to application of a solution containing curable resin to said treated fibers, said fibers having a coating of a coupling agent used to promote bonding with said curable resin.

5,556,696

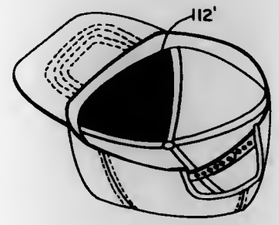
STIFFENING MATERIAL FOR HEADWEAR AND THE LIKE

Fred J. Pinkus, 1254 Knox Dr., Yardley, Pa. 19067-4424

Filed Sep. 23, 1994, Ser. No. 310,874

Int. Cl.[6] D03D *3/00*

U.S. Cl. 428—229 **19 Claims**



1. A woven fabric comprising a warp yarn having a cross-section diameter of less than 15/1 and is woven at more than 58 ends per inch and a filler yarn.

5,556,697

SEMICONDUCTIVE POWER CABLE SHIELD

Cindy L. Flenniken, Indianapolis, Ind., assignor to BICC Cables Corporation, Indianapolis, Ind.

Filed Mar. 24, 1994, Ser. No. 217,116

Int. Cl.[6] B32B *5/16;* **C08K** *3/04*

U.S. Cl. 428—323 **17 Claims**

1. A vulcanizable semiconductive shield composition, comprising: (a) a linear, single-site catalyzed polymer comprising ethylene polymerized with at least one comonomer selected from the group consisting of C_3 to C_{20} alpha-olefins, (b) a carbon black selected from the group consisting of a furnace carbon black that contains ash in an amount of 50 ppm or less, sulfur in an amount of 50 ppm or less, and has crystal dimensions L_a and L_c of 30 Å or less, and a furnace carbon black having an ASTM grade of N-351, and (c) a crosslinking agent.

5,556,698

MAGNETIC RECORDING MEDIUM HAVING A BINDER CONTAINING AMINOALKYLPHOSPHONATE SALT FUNCTIONAL GROUPS

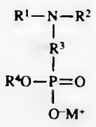
Charles J. Amirsakis, Lake Geneva, Wis.; David E. Vietti, Cary, Ill.; Daniel P. Heberer, McHenry, Ill.; Louis C. Dolmon, Woodstock, Ill., and Lawrence Picchiotti, Schaumburg, Ill., assignors to Morton International, Inc., Chicago, Ill.

Division of Ser. No. 238,296, May 5, 1994. This application May 30, 1995, Ser. No. 452,804

Int. Cl.[6] G11B *5/702*

U.S. Cl. 428—323 **6 Claims**

1. A magnetic recording medium comprising a non-magnetic support and a magnetic coating thereon, said coating comprising a binder resin and magnetic particles dispersed therein, said binder resin selected from the group consisting of a polyurethane and a polyester and which incorporates a functional group having the formula:



wherein R^1 and R^2 are the same or different oxyalkylene radicals having from 2 to 8 carbon atoms, R^3 is an alkylene radical having from 1 to 8 carbon atoms, or an aralkylene radical having from 7 to 10 carbon atoms, R^4 is an alkyl radical having from 1 to 12 carbon atoms, a cycloalkyl radical having from 5 to 12 carbon atoms, or an aryl radical having from 6 to 12 carbon atoms wherein the aryl radical may contain a halogen atom, a hydroxyl group, or an amino group, and M^+ is a metal ion or an ammonium ion.

5,556,699

ANTIBIOTIC ZEOLITE-CONTAINING FILM

Reiji Niira, deceased, late of Kokubunki; Tatuo Yamamoto, Inazawa, and Masashi Uchida, Nagoya, all of Japan, assignors to Shingawa Fuel Co. Ltd., and Shinanen New Ceramic Corporation, both of Japan

Continuation of Ser. No. 996,490, Dec. 23, 1992, abandoned, which is a continuation of Ser. No. 210,820, Jun. 24, 1988, abandoned. This application Jun. 5, 1995, Ser. No. 461,165

Claims priority, application Japan, Jun. 30, 1987, 62-162710

Int. Cl.[6] B01D *39/08*

U.S. Cl. 428—323 **16 Claims**

1. A transparent self supporting antibiotic film comprising at least one organic polymeric film containing antibiotic zeolite, the content of the antibiotic zeolite being 25 to 100 mg per 1 m^2 of the organic polymeric film and the thickness of the organic polymeric film being not more than 10 microns, the antibiotic zeolite being selected from those of which ion-exchangeable ions are partially or completely ion-exchanged with antibiotic ions selected from the group consisting of silver, copper and zinc ions, and the antibiotic metal ions being contained in the zeolite in an amount ranging from 0.1 to 15% by weight on the basis of the weight of the zeolite; wherein antibiotic activity is fully effective and complete (100%).

5,556,700

CONDUCTIVE POLYANILINE LAMINATES

Keiichi Kaneto, Fukuoka, Japan; Yonggang Min, Philadelphia, and Alan G. MacDiarmid, Drexel Hill, both of Pa., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Mar. 25, 1994, Ser. No. 218,130

Int. Cl.[6] B23B *9/04*

U.S. Cl. 428—332 **21 Claims**

1. A controllably deformable laminate comprising:

5,556,703

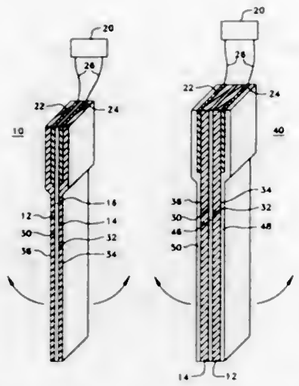
ABSORBENT PHYCOCOLLOIDS AND A METHOD FOR

5,556,705

NEUTRAL METAL COMPLEX SALTS

5,556,707

MAGNETIC RECORDING MEDIUM HAVING A



(a) a first flexible layer comprising an electronically conductive salt of polyaniline;
(b) a second flexible layer of electronically conductive material, surmounting said first layer, said second layer comprising a polymeric material comprising polyaniline, polypyrrole, or polyacetylene; and
(c) a flexible, electronically insulating and ionically non-conducting layer, interposed between said first and said second electronically conductive polymeric layers.

5,556,701

RECORDING MEDIUM FOR THERMAL TRANSFER RECORDING

Kenji Abe, and Satoru Sugita, both of Tochigi, Japan, assignors to Sony Chemicals Corporation, Tokyo, Japan

Filed Dec. 28, 1994, Ser. No. 365,573
Claims priority, application Japan, Dec. 28, 1993, 5-337259
Int. Cl.[6] B41M *5/40*
U.S. Cl. 428—336 **7 Claims**

1. A recording medium for thermal transfer recording comprising:
a backing;
a primer layer provided on said backing; and
a thermally fusible ink layer provided on said primer layer, wherein said primer layer comprises a caprolactone oligomer having a number-average molecular weight of 10000 or less.

5,556,702

METAL PLATED CARBON MATERIAL AND METHOD OF PRODUCING THEREOF

Makoto Katsumata; Hidenori Yamanashi, and Hitoshi Ushijima, all of Gotenba, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Aug. 29, 1994, Ser. No. 297,041
Claims priority, application Japan, Aug. 31, 1993, 5-216037
Int. Cl.[6] B32B *5/16*
U.S. Cl. 428—402 **6 Claims**

1. A metal plated carbon material, comprising a carbon material of an intercalation compound including at least two graphite layers and at least one metal chloride compound between the graphite layers, and a uniform layer of metal plated on the surface of said carbon material.

5,556,703

ABSORBENT PHYCOCOLLOIDS AND A METHOD FOR THEIR MANUFACTURE

James R. Gross, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 977,459, Nov. 18, 1992. This application May 23, 1995, Ser. No. 448,062
Int. Cl.[6] B32B *1/00*
U.S. Cl. 428—402 **4 Claims**

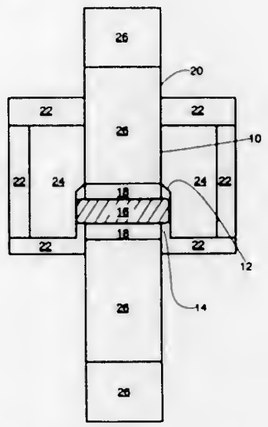
2. An absorbent product, said absorbent product comprising a water-swellable, substantially water-insoluble particle, said particle comprising:
an outer shell comprising a water-swellable, substantially water-insoluble phycocolloid selected from the group consisting of algin and carrageenan; and
an interior void defined by said outer shell, said void containing the phycocolloid as a solid particle.

5,556,704

CARBON FIBER-REINFORCED CARBON COMPOSITE MATERIAL

Dusan C. Prevorsek, Morristown, and Hsin L. Li, Parsippany, both of N.J., assignors to AlliedSignal Inc., Morris Township, N.J.

Division of Ser. No. 13,895, Feb. 5, 1993, Pat. No. 5,582,392. This application Sep. 13, 1994, Ser. No. 305,530
Int. Cl.[6] C04B *35/52*
U.S. Cl. 428—408 **19 Claims**



1. A carbon-carbon composite material manufactured by a method comprising heating a mixture of a polymeric material which yields carbon when heated to a temperature of at least 600° C. and carbon fibers to a temperature of at least 600° C. whilst the mixture is acted upon by press means to apply a substantially uniaxial compressive load and is acted upon by a lateral restraining means to control the lateral deformation of said mixture during application of said compressive load, said lateral restraining means comprising a tubular mold having a variable diameter and maintaining the applied temperature, the uniaxial compressive load and said lateral restraining means to consolidate the mixture whilst in its softened condition, to substantially wholly carbonize the material, and to densify the material during the carbonizing process.

5,556,705

NEUTRAL METAL COMPLEX SALTS

Axel Bottcher, Wesel; Manfred Doring, Jena, and Jürgen Zehrfeld, Voerde, all of Germany, assignors to Rutgerswerke Aktiengesellschaft, Germany

Division of Ser. No. 119,026, Sep. 9, 1993, Pat. No. 5,439,863. This application Feb. 13, 1995, Ser. No. 388,133
Claims priority, application Germany, Sep. 22, 1992, 42 31 622.7
Int. Cl.[6] C08G *65/10*
U.S. Cl. 428—413 **4 Claims**

1. A storage stable prepreg comprising an epoxy resin or a polyurethane resin containing a neutral metal complex salt with additional coordinated ligands prepared by reacting a complex-forming metal salt of the metal M as defined below with a chelating ligand and a Lewis base in water and the optional presence of a solubilizer and an inorganic auxiliary base which forms a soluble salt with the acid radical of the metal salt in stoichiometric amounts while inputting energy in the form of a member selected from the group consisting of shear forces, ultra sound, microwaves and laser beams to form neutral complexes and recovering the product in fine crystalline form, the reaction being represented by the equation:

$$M_m{}^{o+}[SR^{b-}]_n + m[xLcH + ,B] \xrightarrow{\text{inorg.base}} m\{L_xMB_y[SR^{b-}]p\text{-}o + oSR^{b-} + cH^+\}$$

wherein
M is a metal ion selected from the group consisting of cobalt, nickel, iron, zinc, manganese, copper, mercury, zirconium, tin, cadmium, titanium, vanadium, indium, silver, chromium and antimony, SR is an acid radical of an organic or inorganic acid, B is a Lewis base and L is a chelating ligand, wherein
m·a=b·n≧m (c·x)
x·c≦a and n/m=p, m·o≦p, and
a=an integer of 1–8,
b=an integer of 1–3,
c=an integer of 0–4,
m=an integer of 1–3,
n=an integer of 1–8,
o=an integer of 0–8,
x=an integer of 0–4,
y=an integer of 8–15
as the sole curing catalyst.

5,556,706

CONDUCTIVE LAYERED PRODUCT AND METHOD OF MANUFACTURING THE SAME

Katsuya Wakita, Nara; Shu Hotta, Kawasaki; Nobuo Sonoda, Settsu, all of Japan, and Yang Yang, Santa Barbara, Calif., assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 6, 1993, Ser. No. 132,348
Int. Cl.[6] B32B *9/04*
U.S. Cl. 428—421 **8 Claims**

1. A conductive layered product, comprising an oligothiophene compound having a degree of polymerization of four to six adhered to a surface of a polytetrafluoroethylene film, wherein molecules of said polytetrafluoroethylene are oriented in a direction, and wherein molecular chains of said oligothiophene compound are oriented and crystallized in a direction parallel to the orientation direction of said polytetrafluoroethylene.

5,556,707

MAGNETIC RECORDING MEDIUM HAVING A LUBRICANT COMPRISING A PHOSPHORIC ACID MONOESTER AND A FLUOROCARBOXYLIC ACID ESTER

Kazuyuki Usuki; Toshio Ishida, and Tadashi Yasunaga, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 10, 1995, Ser. No. 401,999
Claims priority, application Japan, Mar. 11, 1994, 6-041371
Int. Cl.[6] G11B *5/72*
U.S. Cl. 428—421 **5 Claims**

1. A magnetic recording medium having a ferromagnetic metal thin film formed over a non-magnetic base, wherein the improvement comprises a lubricant layer provided over the ferromagnetic metal thin film, said lubricant layer containing a phosphoric monoester compound which is represented by the following formula (1), and an alkylene oxide group-containing fluorinated carboxylic acid ester compound which is represented by the following formula (2) or (3):

$$R^1\text{—}OPO(OH)_2 \qquad \text{Formula (1)}$$

where R^1 is a hydrocarbon group having from 8 to 26 carbon atoms;

$$Rf^1\text{—}R^2\text{—}COO\text{—}(R^3O)_n\text{—}R^4 \qquad \text{Formula (2)}$$

$$Rf^2\text{—}R^2\text{—}COO\text{—}(R^3O)_n\text{—}R^4\text{—}Rf^3 \qquad \text{Formula (3)}$$

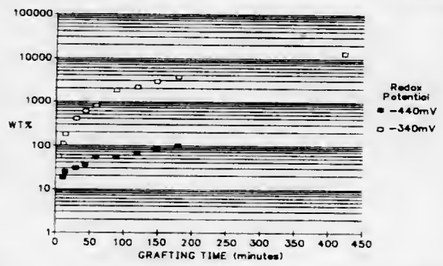
where Rf^1, Rf^2, Rf^3: $(CF_3)_a CF_{3-a}(CF_2)_b$—a: 1 to 3 a+b: 1 to 11 n=1 to 8
R^2 is an alkylene or alkenyl group having from 2 to 14 carbon atoms;
R^3 is an alkylene group having from 1 to 4 carbon atoms; and
R^4 is an alkylene group having from 2 to 18 carbon atoms.

5,556,708

PROCESS FOR GRAFTING OF NITROGEN CONTAINING POLYMERS AND POLYMERS OBTAINED THEREBY

Hans-Heinrich Hörl, Bovenden; Dietmar Nussbaumer, and Eberhard Wünn, both of Göttingen, all of Germany, assignors to Sartorius AG, Gottingen, Germany

Continuation of Ser. No. 829,022, May 1, 1992, abandoned. This application Jul. 1, 1994, Ser. No. 269,999
Claims priority, application Germany, Sep. 6, 1989, 39 29 647.4
Int. Cl.[6] B32B *27/00*
U.S. Cl. 428—424.2 **17 Claims**



1. A method of conducting a graft polymerization reaction between the components A and B, wherein
component A comprises at least one ethylenically unsaturated monomer and
component B comprises a nitrogen-containing polymer selected from the group consisting of polyamides, polysulfonamides, polyurethanes, and polymers having primary or secondary amino groups in a side chain.

the method comprising contacting component B with component A in an aqueous environment in the presence of two reactants

b is from i to 20, c and d are the same or different and each is from 0 to 5, and Ar is a para- or meta-disubstituted aryl group,

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DIFFUSION BARRIER FOR PROTECTIVE COATINGS

5,556,715

WELDABLE COLORED STEEL SHEET

the method comprising contacting component B with component A in an aqueous environment in the presence of two reactants, said two reactants consisting essentially of (1) carbon tetrachloride and (2) a reducing agent selected from of sodium dithionite, rongalite, hydrazine, and ascorbic acid.

5,556,709

PHOTOCURABLE RESIN COMPOSITION FOR GLASS LAMINATION, LAMINATED GLASS PRODUCT AND PROCESS FOR ITS PRODUCTION

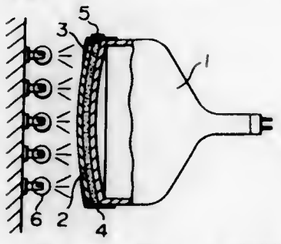
Toshiyuki Kato; Syunzi Ito, and Tsunehiko Shimizui, all of Machida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 296,935, Sep. 6, 1994, Pat. No. 5,461,086, which is a continuation of Ser. No. 887,839, May 26, 1992, abandoned, which is a division of Ser. No. 769,480, Oct. 1, 1991, Pat. No. 5,190,992, which is a continuation of Ser. No. 190,169, May 4, 1988, abandoned. This application Jun. 1, 1995, Ser. No. 457,112

Claims priority, application Japan, May 13, 1987, 62-116455; May 13, 1987, 62-116456; Aug. 6, 1987, 195364

Int. Cl.[6] B32B *17/06*

U.S. Cl. 428—426 **4 Claims**



1. A laminated glass product having as an interlayer a photocurable resin, a cured product of which has a volume resistivity of less than 5×10^9 Ω.cm.

5,556,710

METAL COATING USEFUL FOR RENDERING THE SURFACE OF THE METAL BIOCOMPATIBLE

Jeremy C. Russell; Yiannakis P. Yianni, both of Middlesex, and Stephen A. Charles, Oxon, all of United Kingdom, assignors to Biocompatibles Limited, Middlesex, United Kingdom

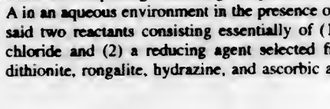
Filed May 3, 1995, Ser. No. 331,529

Claims priority, application United Kingdom, Apr. 24, 1992, 9208950; Nov. 16, 1992, 9224031

Int. Cl.[6] B32B *15/04; C07F 9/09*

U.S. Cl. 428—457 **12 Claims**

1. A compound of formula (I)



(I)

in which the groups R are the same or different and each is hydrogen or a straight or branched C_1–C_4 alkyl group, n is from 2 to 4, X is a straight or branched C_{1-30} alkylene group, or X is a group of formula $-(CH_2CH_2O)_b-$, or $-(CH_2)_c-Ar-(CH_2)_d-$ where b is from 1 to 20, c and d are the same or different and each is from 0 to 5, and Ar is a para- or meta-disubstituted aryl group, which is optionally further substituted by one or more C_1–C_4 alkyl groups; and either

(a) Y is a valence bond or a divalent functional or heterocyclic group selected from $-(X')C(=T)N(H)-$, where X' is a straight or branced C_{1-30} alkytene group, or a group of formula $-(CH_2CH_2O)_b-$, or $-(CH_2)_c-Ar-(CH_2)_d-$ where b is from i to 20, c and d are the same or different and each is from 0 to 5, and Ar is a para- or meta-disubstituted aryl group, which is optionally further substituted by one or more C_1–C_4 alkyl groups and T is oxygen or sulphur,

$-C(=T)-$ where T is oxygen, sulphur or NH,

$-C(=T)N(H)-$ where T is oxygen, sulphur or NH,

and $-Het-Y^1-$ where Y^1 is a single bond, oxygen or sulphur, or an alkoxy or alkylthio group containing from 1 to 10 carbon atoms, and Het is a beterocyclic group; and

Z is hydrogen or a group $-SZ^1$ where

Z^1 is an alkyl, cycloalkyl, alkylcycloalkyl, aryl, alkylaryl, heterocyclic, alkylheteroyclic group or a group of formula (II):

(II)

where Y, X, R and n are as hereinbefore defined; or

(b) Y is a trivalent alkylene group,

Z is a group $-SZ^1$ and

Z^1 is an alkylene group, unsubstituted or substituted by alkyl, aryl, alkylaryl, cycloalkyl or alkylcycloalkyl groups and bonded to the group Y so —Y—S—Z^1 form a 5 to 8 membered ring containing a disulphide linkage;

or a hydrate thereof.

5,556,711

DECOMPOSABLE COMPOSITE MATERIAL

Masanobu Ajioka, Kanagawa-Ken; Katashi Enomoto, Fukuoka-Ken; Akihiro Yamaguchi, and Kazuhiko Suzuki, both of Kanagawa-Ken, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Continuation of Ser. No. 78,847, Jun. 21, 1993, abandoned. This application Jan. 30, 1995, Ser. No. 380,311

Claims priority, application Japan, Jun. 29, 1992, 4-170806

Int. Cl.[6] B32B *15/08; 27/42*

U.S. Cl. 428—460 **5 Claims**

1. A multilayer composite completely decomposable in an alkaline environment consisting of an aluminum layer and a thermoplastic polymer layer consisting essentially of at least one material selected from the group consisting of polylactic acid and a copolymer of lactic acid and another hydroxycarboxylic acid, wherein the polylactic acid and the copolymer of lactic acid and another hydroxycarboxylic acid have a weight average molecular weight of 70,000 or more.

5,556,712

BASE FILM FOR PHOTOGRAPHIC FILM

Manabu Kimura, and Hideshi Kurihara, both of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 18, 1995, Ser. No. 423,985

Claims priority, application Japan, Apr. 19, 1994, 6-080365; May 6, 1994, 6-094338

Int. Cl.[6] G03C *1/795;* **C08G** *63/18;* **B32B** *27/06*

U.S. Cl. 428—480 **17 Claims**

1. A base film for a photographic film, which

(A) consists essentially of polyethylene-2,6-naphthalenedicarboxylate containing naphthoic acid unit in an amount, in terms of methyl naphthoate, of 2 to 1,000 ppm,

(B) has a light transmittance, T_{400}, of at least 95%/cm at a wavelength of 400 nm when a solution of 10 mg/ml of the polyethylene-2,6-naphthalenedicarboxylate in a hexafluoroisopropanol/chloroform mixed solvent having a hexafluoroisopropanol/chloroform weight ratio of ⅔ is measured,

(C) has a yellow index Y_{ID} of at most 5, and

(D) has a haze value of 2.0% or less.

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DIFFUSION BARRIER FOR PROTECTIVE COATINGS

Gerald R. Leverant, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Apr. 6, 1995, Ser. No. 417,930

Int. Cl.[6] B32B *15/00;15/18;* **C23C** *14/48*

U.S. Cl. 428—610 **30 Claims**

1. A method for creating a diffusion barrier for protective coatings comprising:

placing a superalloy component having an outer surface in a vacuum chamber;

evacuating said chamber to a base pressure of about 10^{-5} torr or less;

condensing a submicron layer of rhenium atoms onto said outer surface of said component;

substantially simultaneously bombarding said outer surface of said component with an energetic beam of substantially inert ions at an energy of at least about 0.25 keV and a rate of arrival sufficient to adhere said rhenium to said outer surface.

5,556,714

METHOD OF TREATING SAMPLES

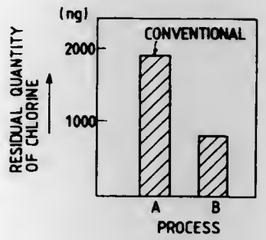
Ryooji Fukuyama; Makoto Nawata, both of Kudamatsu; Yutaka Kakehi, Hikari; Hironobu Kawahara; Yoshiaki Sato, both of Kudamatsu; Yoshimi Torii, Tachikawa; Akira Kawaraya, and Yoshie Sato, both of Kudamatsu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 966,849, Oct. 27, 1992, Pat. No. 5,380,397, which is a continuation of Ser. No. 569,021, Aug. 17, 1990, abandoned. This application Sep. 29, 1994, Ser. No. 315,260

Claims priority, application Japan, Aug. 28, 1989, 1-218523; Nov. 2, 1989, 1-284711; May 9, 1990, 2-117596

Int. Cl.[6] B32B *15/20*

U.S. Cl. 428—620 **12 Claims**



1. A sample made by a method, comprising:

a step for providing a substrate, and, provided thereover, a wiring metal including an aluminum-containing layer and another layer composed of Ti, N, or W components, and a resist;

a step for etching said wiring metal of said sample by using a plasma including a halogen component to produce a residual having said halogen component on at least a part of a surface of said sample; and

a step for removing said resist and said residual by using a plasma including an oxygen component and a hydrogen component but excluding a halogen component.

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WELDABLE COLORED STEEL SHEET

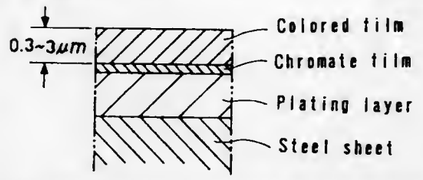
Naoto Yoshimi; Toyofumi Watanabe, and Masaaki Yamashita, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Continuation of Ser. No. 856,244, Mar. 25, 1992, abandoned. This application Aug. 15, 1994, Ser. No. 290,676

Claims priority, application Japan, Mar. 29, 1991, 3-089149

Int. Cl.[6] B22B *15/08*

U.S. Cl. 428—623 **9 Claims**



1. A weldable colored steel sheet comprising a steel sheet having a surface plated with zinc or zinc alloy, and carrying a chromate film formed on said plated surface and having a coating weight of 10 to 200 mg/m^2 in terms of metallic chromium, and a colored film formed on said chromate film from a composition comprising 100 parts by weight of a water-soluble or water-dispersible thermosetting resin as a base resin and 1 to 200 parts by weight of a coloring agent selected from the group consisting of a metal complex of azo dye having at least one hydroxyl group per molecule, a phthalocyanine dye having at least one hydroxyl group per molecule, and a combination of said metal complex of azo dye and said phthalocyanine dye, said colored film having a thickness of 0.3 to 3.0 microns, and a color other than black.

5,556,716

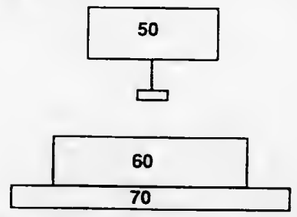
X-RAY PHOTOCONDUCTIVE COMPOSITIONS FOR X-RAY RADIOGRAPHY

Norman Herron, Newark, and Ying Wang, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 25, 1994, Ser. No. 296,213

Int. Cl.[6] B32B *9/00*

U.S. Cl. 428—688 **17 Claims**



1. An x-ray radiography apparatus having an x-ray source, an electrostatic image reader and an x-ray sensitive image receptor characterized by:

said image receptor including an x-ray photoconductor composition comprising (1) clusters of at least one semiconductor selected from the group consisting of VB-VIB semiconductors, VB-VIIB semiconductors, IIB-VIB semiconductors, IIB-VB semiconductors, IIIB-VB semiconductors, IIIB-VIB semiconductors, IB-VIB semiconductors, and IVB-VIIB semiconductors, and (2) an organic binder which comprises a polymer component which is essentially non-carrier transporting in the absence of x-rays and optionally a carrier transporting additive component; said cluster component (1) being at least about 0.1 percent by weight of the x-ray photoconductor composition and said organic binder being present in an effective amount to bind the clusters, provided that when the organic binder is essentially non-carrier transporting in the

presence of x-rays, the cluster component (1) is at least about 15 percent by volume of the x-ray photoconductor composi-

layer having a face-centered cubic structure is provided on a portion of said anti-ferromagnetic layer.

conductive matrix including a metallic oxide material which

5,556,722

presence of x-rays, the cluster component (1) is at least about 15 percent by volume of the x-ray photoconductor composition.

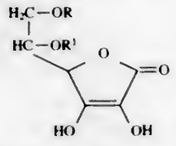
5,556,717

COATING-TYPE MAGNETIC RECORDING MEDIUM COMPRISING AN ASCORBIC ESTER COMPOUND IN OR ON A MAGNETIC RECORDING LAYER

Hirofumi Kondo, Miyagi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 21, 1994, Ser. No. 326,959
Claims priority, application Japan, Oct. 27, 1993, 5-269286
Int. Cl.[6] G11B *5/66; 5/70*
U.S. Cl. 428—694 B **3 Claims**

1. A magnetic recording medium comprising:
a non-magnetic support having a surface; and
a magnetic coating layer disposed on said surface, said magnetic coating layer consisting essentially of:
a magnetic metal powder;
a resin binder; and
an ester of ascorbic acid and at least one carboxylic acid, said carboxylic acid having not greater than 14 carbon atoms, said ester having the formula:



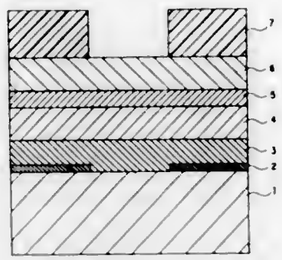
wherein R and R' independently represent hydrogen or an acyl group residue of said carboxylic acid, at least one of R and R' being an acyl group residue of said carboxylic acid.

5,556,718

MAGNETORESISTIVE HEAD

Yoshihiro Motomura, and Suzuki Tetsuhiro, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 18, 1993, Ser. No. 62,221
Claims priority, application Japan, May 18, 1992, 124024; Feb. 16, 1993, 026362
Int. Cl.[6] G11B *5/66*
U.S. Cl. 428—694 R **17 Claims**



1. In a magnetoresistive head comprising a substrate, a ferromagnetic magnetoresistive effect layer dispose on said substrate, an anti-ferromagnetic layer for generating a longitudinal bias magnetic field by an exchange force with respect to said ferromagnetic magnetoresistive effect layer, said anti-ferromagnetic layer being provided in direct contact with said ferromagnetic magnetoresistive effect layer and composed of or mainly composed of FeMn, and means for generating a transversal bias magnetic field in said ferromagnetic magnetoresistive effect layer, wherein a ground layer having a face-centered cubic structure is provided on a portion of said anti-ferromagnetic layer.

5,556,719

METHOD FOR MAKING HIGH CAPACITY HYDROGEN STORAGE ELECTRODE AND HYDRIDE BATTERIES USING SAME

Kuochih Hong, 1790 Rollingwoods, Troy, Mich. 48098; Kuoshiu Hong, 10F, No. 8, Li-Nung Street, Sec 1, Taipei, Taiwan, and Huiyim Hong, 4F, No. 9, 32 Nung, Alley 189, Cheng-Tai Road, Sec 1, Wu-ku Hsiang, Taipei, Hsien, Taiwan

Continuation-in-part of Ser. No. 189,080, Jan. 28, 1994, Pat. No. 5,501,917. This application Jun. 27, 1994, Ser. No. 266,187
Int. Cl.[6] H01M *4/24*
U.S. Cl. 429—218 **7 Claims**

1. An electrochemical cell comprising of:
(1) A container,
(2) A metal oxide positive electrode;
(3) A hydrogen storage/hydride electrode as a negative electrode, wherein said negative electrode comprises of a hydrogen storage material having composition represented by the formula:

$$Ti_aZr_bNi_cNb_xR_yM_z$$

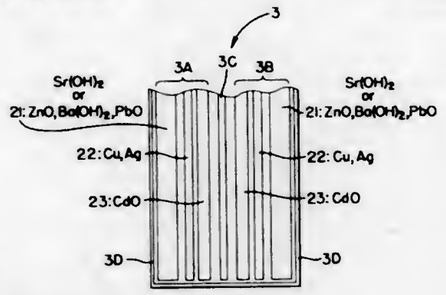
and its hydride thereof, where R is at least one element selected from the group consisting of B, Zn, Hf, Bi, Sn, W, Mo, and Sb; M is at least one element selected from the group consisting of Li, Na, K, Rb, Cs, S and P; and the atomic ratios; a, b, c, x, y and z are defined by; $0.02 \leqq a \leqq 0.70$, $0.02 \leqq b \leqq 0.70$, $0.05 \leqq c \leqq 0.80$, $0.02 \leqq y \leqq 0.50$, $0.005 \leqq z \leqq 0.30$, $0 \leqq x \leqq 0.30$, and $a+b+c+x+y+z=1.00$.
(4) A separator, placed between said negative and positive electrodes, said separator and said positive and negative electrodes being placed in said container;
(5) An electrolyte; placed in said container in contact with said negative and positive electrode and with said separator.

5,556,720

SEALED ZINC SECONDARY BATTERY AND ZINC ELECTRODE THEREFOR

Allen Charkey, Brookfield, Conn., assignor to Energy Research Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 292,614, Aug. 18, 1994, Pat. No. 5,460,899. This application May 1, 1995, Ser. No. 431,556
Int. Cl.[6] H01M *4/48; 10/24*
U.S. Cl. 429—59 **28 Claims**



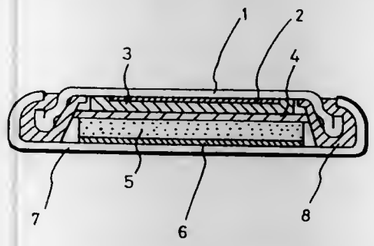
1. Apparatus comprising:
at least one zinc negative electrode, said zinc negative electrode including: a zinc active material; one of a $Ba(OH)_2$ and $Sr(OH)_2$ material present in an amount in the range of 15–40 percent of the weight of said zinc negative electrode; and a conductive matrix including a metallic oxide material which is more electropositive than zinc, which is one of PbO, Bi_2O_3, CdO, Ga_2O_3 add Tl_2O_3, and which is present in an amount in the range of 5–20 percent of the weight of said zinc negative electrode;
said zinc negative electrode further including a porous hydrophobic element and being formed by first and second electrode assemblies with said porous hydrophobic element disposed therebetween, each of said first and second electrode assemblies comprising: an active element containing a part of said zinc active material, said one of said $Ba(OH)_2$ and $Sr(OH)_2$ material and metallic oxide material; a current collector element having a first face abutting said active element; and a gas recombination catalytic element containing a metallic oxide which is more electro-positive than zinc and has a chemical or electrochemical affinity for oxygen, said gas recombination catalytic element abutting a second face of said current collector element and abutting said porous hydrophobic element;
an electrolyte containing an electrolyte constituent which is 5–20 percent of the weight of said electrolyte;
at least one positive electrode; and
a container in which is disposed each said zinc negative electrode, each said positive electrode and said electrolyte.

5,556,721

NON-AQUEOUS ELECTROLYTE SECONDARY BATTERY AND PRODUCTION METHOD OF THE SAME

Tomio Sasaki, Tokyo; Tsugio Sakai, and Kensuke Tahara, both of Sendai, all of Japan, assignors to Seiko Instruments Inc., and Seiko Electronic Components Ltd., both of Japan

Filed Jul. 13, 1994, Ser. No. 274,633
Claims priority, application Japan, Jul. 13, 1993, 5-173313
Int. Cl.[6] H01M *4/36*
U.S. Cl. 429—218 **16 Claims**



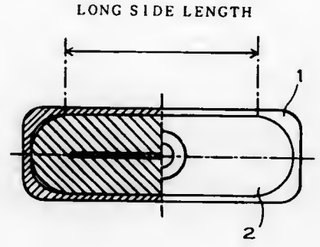
1. A non-aqueous electrolyte secondary battery comprising:
a negative electrode having an active material comprised of silicon or a silicon alloy containing lithium represented by composition formula Li_xSi where x satisfies $0 \leqq x \leqq 1$, the silicon or silicon alloy containing absorbed lithium ions resulting from an electrochemical reaction between the negative electrode and a lithium metal or a material containing lithium;
a positive electrode having an active material comprised of a transition metal oxide; and
a lithium ion-conductive non-aqueous electrolyte having at least one lithium compound and an organic solvent or a solid polymer.

5,556,722

TIGHTLY SEALED PRISMATIC BATTERY

Satoshi Narukawa, Sumoto; Toru Amazutsumi, Tsuna-gun; Hiyoshi Tamaki, and Yasuhiro Yamauchi, both of Sumoto, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed May 17, 1995, Ser. No. 442,826
Claims priority, application Japan, May 31, 1994, 6-118690
Int. Cl.[6] H03M *2/02*
U.S. Cl. 429—163 **7 Claims**



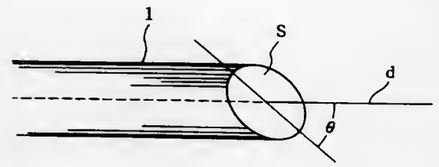
1. A sealed prismatic battery comprising:
a non-circular spiral electrode unit which is a laminate of a positive electrode plate, a negative electrode plate, and a separator between the two electrode plates, said laminate being wound into a non-circular spiral shape; and
a prismatic shaped can formed in a prismatic box shape and having corner regions and straight-line regions, said non-circular spiral electrode unit being enclosed in said prismatic shaped can; and
wherein said corner regions of said prismatic shaped can are greater in thickness than said straight-line regions of said prismatic shaped can.

5,556,723

NEGATIVE ELECTRODE FOR USE IN A SECONDARY BATTERY

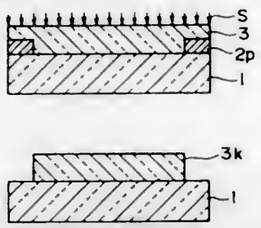
Takahisa Ohsaki; Norio Takami, both of Yokohama; Yoshiyuki Nishimura, and Toshio Tamaki, both of Kamisu-machi, all of Japan, assignors to Kabushiki Kaisha Toshiba, and Petoca, Ltd., both of Tokyo, Japan

Filed Sep. 15, 1994, Ser. No. 306,614
Claims priority, application Japan, Sep. 17, 1993, 5-253627
Int. Cl.[6] H02M *4/58*
U.S. Cl. 429—218 **2 Claims**



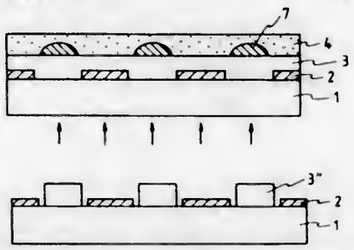
1. A negative electrode for use in a secondary battery, comprising milled carbon fibers derived from mesophase pitch wherein the milled carbon fibers each has a fiber cut surface and a fiber axis intersecting with each other at cross angles, the smaller one thereof being at least 65° on the average, and has an aspect ratio (ratio of the length to the diameter of the carbon fiber) ranging from 1 to 20 and a fiber diameter variation coefficient ranging from 10 to 50%.

5,556,724
PHASE SHIFT PHOTOMASK AND METHOD OF PRODUCING SAME
Norihiro Tarumoto; Hiroyuki Inomata, and Takashi Tominaga, all of Tokyo-To, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan
Filed Nov. 9, 1993, Ser. No. 149,220
Claims priority, application Japan, Nov. 10, 1992, 4-324764; Dec. 3, 1992, 4-349982
Int. Cl.[6] G03F *9/00*
U.S. Cl. 430—5 **14 Claims**



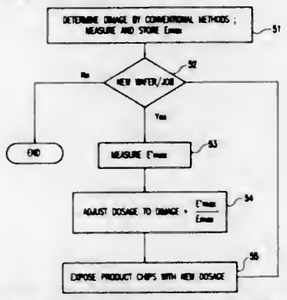
1. A method for producing a phase shift photomask comprising the steps of:
coating a transparent film serving as a phase shifter onto a substrate;
solidifying the transparent film in a photomask-pattern-forming area excluding a peripheral area of the substrate, while leaving the transparent film in the area excluding the photomask-pattern-forming area unsolidified; and
removing the unsolidified transparent film by etching in order to leave the solidified transparent film only in the photomask-pattern-forming area.

5,556,725
METHOD FOR FABRICATING A HALF-TONE TYPE PHASE SHIFT MASK
Young M. Ham, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Rep. of Korea
Filed Dec. 29, 1994, Ser. No. 365,909
Claims priority, application Rep. of Korea, Dec. 31, 1993, 1993-31845
Int. Cl.[6] G03F *9/00*
U.S. Cl. 430—005 **6 Claims**



1. A method for the fabrication of a phase shift mask, comprising the steps of:
forming chrome patterns on a transparent substrate;
coating a phase shift layer and a negative photosensitive film on the entire area of the resulting structure, in sequence;
exposing the photosensitive film to a light incident from the backside of the transparent substrate with the chrome patterns serving as a mask and developing the photosensitive film, to form photosensitive film patterns on the phase shift layer;
etching the phase shift layer to form phase shift patterns which are each positioned between the chrome patterns, with the photosensitive film patterns serving as a mask;
subjecting the chrome patterns to wet etching, to conduct etching at the upper surface and the opposite edges of the chrome patterns so that each of the chrome patterns are spaced from each of the phase shift patterns; and
removing the photosensitive film patterns, whereby a portion of the transparent substrate is exposed through the spaces between the etched chrome patterns and the phase shift patterns.

5,556,726
PHOTOLITHOGRAPHIC DOSE DETERMINATION BY DIFFRACTION OF LATENT IMAGE GRATING
Chi-Min Yuan, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.
Continuation of Ser. No. 241,546, May 12, 1994, Pat. No. 5,476,738. This application Jun. 29, 1995, Ser. No. 514,466
Int. Cl.[6] G03F *7/20*
U.S. Cl. 430—30 **2 Claims**



2. A method of exposing product chips to optimal exposure dosage of light comprising the steps of:
providing a photoresist to be bleached;
placing a mask over the photoresist, said mask consisting of transparent and semitransparent regions, said semitransparent regions providing partial transmission of light to the photoresist;
exposing said photoresist to light through said mask;
measuring the exposure of said photoresist to energy until said photoresist is fully bleached;
calculating an optimal exposure dosage required from measurements of exposure of said photoresist; and
exposing product chips to said optimal exposure dosage.

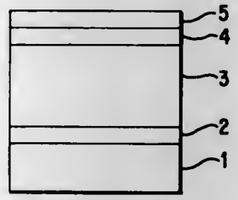
5,556,727
COLOR TONER, METHOD AND APPARATUS FOR USE
Roger N. Ciccarelli, Rochester; Jacques C. Bertrand, Ontario; Thomas R. Pickering, Webster, and Denise R. Bayley, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Oct. 12, 1995, Ser. No. 542,373
Int. Cl.[6] G03G *9/09;13/01;15/01*
U.S. Cl. 430—45 **36 Claims**

28. An imaging process which consists essentially of the generation of an electrostatic image on a photoconductive imaging member followed by the development thereof with a combination, set, or garnut of toners, and wherein four toners are selected, and which toners are comprised of a cyan toner, a magenta toner, a yellow toner, and a black toner, each of said toners being comprised of resin and pigment, and wherein the pigment for the cyan toner is a β copper phthalocyanine, the pigment for the magenta toner is a xanthene silicomolybdic acid salt of Rhodemine 6G basic dye, the pigment for the yellow toner is a diazo benzidine, and the pigment for the black toner is carbon black; thereafter transferring the developed image to a substrate, and fixing the image thereto, and wherein said cyan pigment, said magenta pigment, and said yellow pigment are prepared by flushing process, and which process consists essentially of mixing a wet cake of said magenta pigment, a wet cake of said yellow pigment, and a wet cake of said cyan pigment with said resin, thereafter heating to remove water enabling a pigment amount of from about 25 to about 50 weight percent, and wherein each of the resulting pigmented resin concentrate product is mixed and diluted with additional toner resin to generate cyan, magenta and yellow toners, each containing said cyan, magenta and yellow pigments respectively, being present in an amount of from about 20 to about 40 weight percent.

5,556,728
PHOTOCONDUCTOR ELEMENT OF AN ELECTROPHOTOGRAPHIC DEVICE
Sumitaka Nogami; Hideki Kina, and Kaneyuki Mantoku, all of Nagano, Japan, assignors to Fuji Electric Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1994, Ser. No. 204,603
Claims priority, application Japan, Mar. 1, 1993, 5-039140; Jun. 15, 1993, 5-142415
Int. Cl.[6] G03G *15/04*
U.S. Cl. 430—64 **12 Claims**

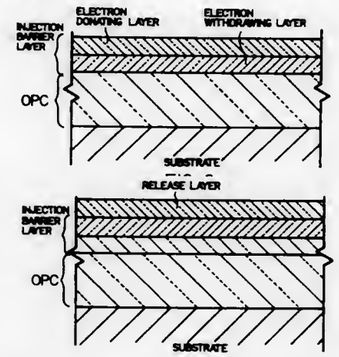
1. An electrophotographic element comprising:
a conductive substrate;
a photosensitive layer; and
an intermediate layer positioned between the conductive substrate and the photosensitive layer;
wherein the intermediate layer comprises
an intermediate-layer material comprising iodine bound to a product resulting from the reaction of a melamine resin and a material selected from the group consisting of aromatic carboxylic acid and aromatic carboxylic acid anhydride.

5,556,729
NEGATIVELY CHARGEABLE ELECTROPHOTOGRAPHIC PHOTORECEPTOR
Yuzuru Fukuda; Tsuyoshi Ohta; Masato Ono; Taketoshi Higashi, and Shigeru Yagi, all of Minamiashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan
Continuation of Ser. No. 197,746, Feb. 17, 1994, abandoned. This application Jun. 5, 1995, Ser. No. 464,466
Claims priority, application Japan, Feb. 19, 1993, 5-053266
Int. Cl.[6] G03G *5/082*
U.S. Cl. 430—65 **7 Claims**



1. An electrophotographic photoreceptor comprising: (1) an electrically conductive substrate, (2) a charge injection blocking layer formed on said electrically conductive substrate, (3) a single-layer photoconductive layer formed on said charge injection blocking layer, said photoconductive layer consisting essentially of amorphous silicon containing 0.01 to 5 ppm boron, (4) a positive hole capturing layer formed on said photoconductive layer, said positive hole capturing layer consisting essentially of amorphous silicon and optionally boron, and (5) a surface layer formed on said positive hole capturing layer, wherein the boron concentration of said positive hole capturing layer is less than the boron concentration of said photoconductive layer and wherein said photoreceptor is negatively chargeable.

5,556,730
CHARGE INJECTION BARRIER FOR POSITIVE CHARGING ORGANIC PHOTOCONDUCTOR
Khe C. Nguyen, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Division of Ser. No. 180,750, Jan. 12, 1994, Pat. No. 5,476,604. This application Nov. 1, 1995, Ser. No. 548,348
Int. Cl.[6] G03G *5/09;5/147*
U.S. Cl. 430—66 **3 Claims**



1. An organic photoconductor for electrophotography comprising:
a conductive substrate;
an organic photogenerating layer on top of said conductive substrate, said photogenerating layer comprising a photogenerating pigment component uniformly dispersed in an organic binder material, and a charge transporting component also uniformly dispersed in said organic binder material; and
a charge injection barrier layer on top of said photogenerating layer, said injection barrier layer comprising:
a cross-linked organic binder material comprising polyvinyl alcohol (PVA), and
a positive charge injection prohibiting molecule selected from the group consisting of amino compounds having the general formulas:

$$NH_2—R_1—(NR_2)_n—R_3 \quad (9)$$

$$NH_2—A(NR_2)_n—R_3 \quad (10)$$

$$NH_2—R_1—(NHR_2)_n—Si(OR_5)_3 \quad (11)$$

$$NH_2—A—Si(OR_5)_3 \quad (12),$$

or from the group consisting of hydroxy or mercapto compounds having the general formulas:

$$HO—R_1—COOR_2 \quad (13)$$

$$HS—R_1—COOR_2 \quad (14)$$

$$R_1—R_2(OH)_n—R_3 \quad (15)$$

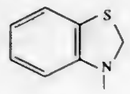
$$R_1—R_2(SH)_n—R_3 \quad (16)$$

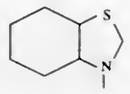
$$NH_2—R_1(OH)_m—(NR_2)_n—R_3 \quad (17)$$

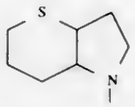
$$NH_2—A(OH)_m—(NR_2)_n—R_3 \quad (18)$$

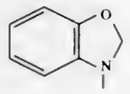
Where, for formulas 9–18 above:
R_1, R_3, R_5=alkyl, alkoxy, allyl, aryl, with and/or without the following substituent groups: —NO_2, —CN, —OH, —SH, —SO_2, —$SOCl_2$, —S, =C=O, —COOR, —CHO, —Cl, —Br, —I, or —F;
R_2 is hydrogen, alkyl, alkoxy, or aryl with and/or without the following substituent groups —NO_2, —CN, —OH, —SH, —SO_2, —$SOCl_2$, —S, =C=O, —COOR, —CHO, —Cl, —Br, —I, or —F;

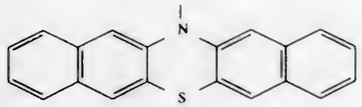
A=hetrocyclic compounds selected from the group consisting of:

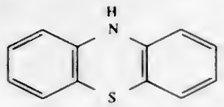
(19) 

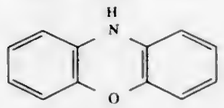
(20) 

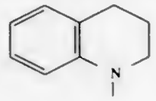
(21) 

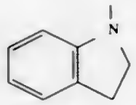
(22) 

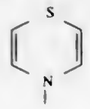
(23) 

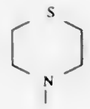
(24) 

(25) 

(26) 

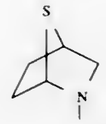
(27) 

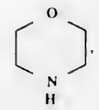
(28) 

(29) 

-continued

(30)

(31) 

(32) 

and m.n=1,2 . . . 5.

5,556,731

Patent Not Issued For This Number

5,556,732

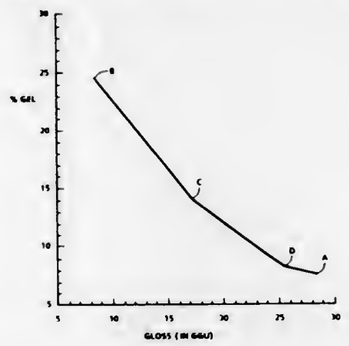
PROCESSES FOR PREPARING TONERS WITH SELECTABLE GLOSS

Che C. Chow, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 30, 1995, Ser. No. 453,177

Int. Cl.[6] G03G *9/087*

U.S. Cl. 430—137 **26 Claims**



1. A process for preparing low fix temperature toner mixture comprising melt blending a colorant, and a resin mixture comprised of a first polyester resin with a low gloss value, and a second polyester resin with a high gloss value, wherein the first polyester resin is present in an amount of from about 20 to about 80 weight percent of the resin mixture and contains of from about 20 to about 40 weight percent crosslinked gel content and has a gloss value of from about 5 to about 10 gloss units, and the second polyester resin is present in an amount of from about 80 to about 20 weight percent of the resin mixture and contains from 5 to about 15 weight percent crosslinked gel content and has a gloss value of from about 20 to about 30 gloss units, wherein the resulting melt blended toner mixture has an intermediate gloss value of about 10 to about 25 Gardner gloss units at 188° C. and 1.05 developed mass per area, and wherein the crosslinked gel content remains substantially constant throughout the process.

5,556,733

THERMAL DEVELOPMENT DIAZO COPYING MATERIAL

Shigeru Kusakata, Susono, and Masanori Rimoto, Mishima, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 4, 1994, Ser. No. 205,565

Claims priority, application Japan, Mar. 5, 1993, 5-070905; Sep. 30, 1993, 5-269863

Int. Cl.[6] G03C *1/60;5/18;* G03F *7/021*

U.S. Cl. 430—162 **6 Claims**

1. A thermal development diazo copying material comprising a support, a diazo layer comprising a diazo compound on said support, and a coupler layer comprising a coupling component, an alkali-soluble styrene—acrylic acid copolymer and a thermofusible material overlaid on said diazo layer.

5,556,734

RADIATION SENSITIVE RESIN COMPOSITION COMPRISING COPOLYMER OF ISOPROPENYLPHENOL AND T-BUTYL(METH)ACRYLATE

Mikio Yamachika, Kuwana, Japan; Eiichi Kobayashi, Albany, Calif.; Toshiyuki Ota, and Akira Tsuji, both of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

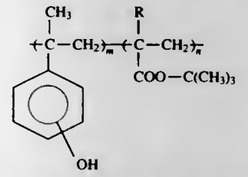
Filed Dec. 23, 1994, Ser. No. 363,269

Claims priority, application Japan, Dec. 24, 1993, 5-345792; Oct. 7, 1994, 6-268112

Int. Cl.[6] G03C *1/73*

U.S. Cl. 430—270.1 **17 Claims**

1. A radiation sensitive resin composition which comprises (A) a copolymer represented by the following general formula (1) and (B) a radiation sensitive acid generator:

(1) 

wherein R represents a hydrogen atom or a methyl group and m and n are integers representing the numbers of the respective recurring units and satisfying the relations $0.1 \leqq m/(m+n) < 0.5$ and $0.5 < n/(m+n) \leqq 0.9$.

5,556,735

IMAGE-FORMING PROCESS

Nicholas E. Ivory, Glastonbury, and Wrenford J. Thatcher, Frome, both of England, assignors to Coates Brothers PLC, Kent, United Kingdom

Continuation of Ser. No. 960,422, Dec. 23, 1992, abandoned.

This application Nov. 30, 1994, Ser. No. 351,137

Claims priority, application United Kingdom, Jun. 27, 1990, 9014325; Mar. 27, 1991, 9106561

Int. Cl.[6] G03F *7/00*

U.S. Cl. 430—315 **3 Claims**

1. A process for the formation of a pattern solder resist upon a printed circuit board which comprises the steps of:

(i) forming a solder resist layer by a process chosen from the group of processes consisting of screen printing, curtain coating, electrostatic spraying, dip coating, roller coating, spin coating and spraying, said solder resist consisting essentially of an aqueous emulsion of a photocurable organic solvent solution of an epoxy acrylate derived from an epoxy novalak resin selected from the group of resins consisting of resins produced by reacting ethylenically unsaturated carboxylic acid and polyepoxy compound, and resins produced by reacting ethylenically unsaturated carboxylic acid, polyepoxy compound and dicarboxylic anhydride, upon substantially the entire surface of the board;

(ii) drying the solder resist layer to a non-tacky state by removing said organic solvent and water of said aqueous emulsion;

(iii) imagewise exposing the solder resist layer to radiation to cure portions of the solder resist layer exposed to the radiation;

(iv) removing portions of the solder resist layer which are unexposed, and thereby uncured, by washing with an aqueous solution of an alkali, thereby leaving said cured portions to form a patterned solder resist;

(v) completely drying the patterned resist layer; and

(vi) applying solder to the circuit board, thereby soldering connections left exposed after portions of the solder resist are removed.

5,556,736

METHOD FOR PROCESSING A SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL AND PRODUCING A COLOR IMAGE

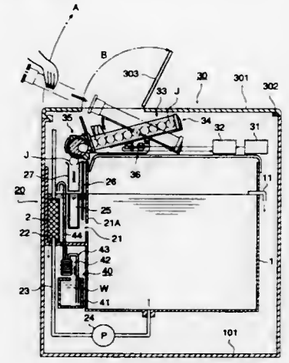
Tsuyoshi Haraguchi, and Ichiro Tsuchiya, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 19, 1994, Ser. No. 326,094

Claims priority, application Japan, Nov. 11, 1993, 5-282686

Int. Cl.[6] G03C *5/18;5/26*

U.S. Cl. 430—399 **14 Claims**



1. A method for processing an exposed silver halide color photographic photosensitive material, comprising the step of developing the exposed material with a color developer containing a p-phenylenediamine color developing agent in a color development tank of an automatic developing apparatus, and wherein water and a solid color developing composition comprising a p-phenylenediamine color developing agent having a water-solubilizing group selected from the group consisting of $-(CH_2)_n-CH_2OH$, $-(CH_2)_m-NHSO_2-(CH_2)_n-CH_3$, $-(CH_2)_m-O-(CH_2)_n-CH_3$, $-(CH_2CH_2O)_nC_mH_{2m+1}$ (wherein m and n independently represent an integer of not less than 0), —COOH and $-SO_3H$ are separately added to the color developer to replenish the color developer, wherein the replenishing amount of the water is 30 to 75 ml per m^2 of the material processed and the replenishing amount of the color developing agent is 0.024 to 0.066 mol per liter of the replenishing amount of the water.

5,556,737

METHOD FOR FORMING COLOR IMAGE IN SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL HAVING REFLECTIVE SUPPORT COATED WITH COMPOSITION OF POLYESTER RESIN AND WHITE PIGMENT

Keiichi Nakamura, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa-ken, Japan

Filed Nov. 30, 1993, Ser. No. 159,495

Claims priority, application Japan, Nov. 30, 1992, 4-340988

Int. Cl.[6] G03C *5/38;1/85;1/76;11/00*

U.S. Cl. 430—400 **26 Claims**

1. A method for forming a color image in a silver halide color photographic material comprising a reflective support having coated thereon a composition comprising a polyester resin and a white pigment mixed and dispersed in said polyester resin, at least one yellow color forming silver halide photosensitive emulsion layer, at least one magenta color forming silver halide photosensitive emulsion layer and at least one cyan color forming silver halide photosensitive emulsion layer on said support, each of said yellow, magenta and cyan color forming silver halide photosensitive emulsion layers having silver halide grains containing 95 mol % or more of silver chloride and positioned on a side of said support containing said composition thereon, wherein said method comprises the steps of:

(i) exposing imagewise said silver halide color photographic material to light,

(ii) developing said imagewise exposed silver halide color photographic material in a color developer solution,

(iii) subjecting said developed silver halide color photographic material to a desilvering bath,

(iv) subjecting said silver halide color photographic material to a washing bath or to a stabilizing bath, and

(v) drying said developed silver halide color photographic material,

wherein the amount of replenishment for said desilvering bath (iii) is 0.5 to 3 times the amount of the color developer solution carried over from said developer solution (ii) into said desilvering bath (iii).

5,556,738

SILVER HALIDE PHOTOGRAPHIC ELEMENT AND PROCESSING METHOD THEREOF

Yasuhiko Takamuki, and Ken Nagami, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 13, 1995, Ser. No. 502,216

Claims priority, application Japan, Jul. 18, 1994, 6-165385; Aug. 24, 1994, 6-199731

Int. Cl.[6] G03C *1/77*

U.S. Cl. 430—526 **10 Claims**

1. A silver halide photographic element comprising a support having, on at least one side thereof, a light-sensitive silver halide emulsion layer and a nonlight-sensitive hydrophilic colloidal layer, wherein said nonlight-sensitive layer contains organic material-aggregation particles; and gelatin contained in the total hydrophilic colloidal layers provided on one side of the support amounts to a range of 1.3 to 2.5 g per m^2 of a photographic element.

10. A method of processing the photographic element as claimed in claim 1 with an automatic processor, comprising developing the exposed photographic element in a developer, fixing the element in a fixer, washing and drying, wherein said developer is replenished by a developer-replenishing solution at a rate of 35 to 94 ml/m^2 of the element, said photographic element being processed over a period of time of 10 to 30 seconds in total.

5,556,739

PHOTOGRAPHIC SUPPORT

Kenji Nakanishi; Takatoshi Yajima; Hiromitsu Araki; Hideyuki Kobayashi, all of Hino; Yoshioki Ohkubo; Tetsutaro Hashimura, both of Hofu, and Hiroshi Naito, Yamaguchi, all of Japan, assignors to Konica Corporation, Japan

Filed Mar. 14, 1994, Ser. No. 214,962

Claims priority, application Japan, Mar. 30, 1993, 5-072476

Int. Cl.[6] G03C *1/795;1/93*

U.S. Cl. 430—533 **9 Claims**

1. A silver halide photographic light sensitive material comprising a support and provided thereon, a silver halide emulsion layer, said support being comprised of at least two polyester layers comprising a first layer containing a first polyester and a second layer containing a second polyester adjacent to the first layer, the first polyester and second polyester each comprising a first monomer unit from a polyalkylene glycol and a second monomer unit from an aromatic dicarboxylic acid having a metal sulfonate group, wherein the difference between the second monomer unit content of the first polyester and that of the second polyester, ΔSIP is 1 to 4.5 mol %, the second monomer unit content being expressed based on the total content of monomer units from dicarboxylic acids contained in the first polyester and the second polyester.

5,556,740

HEAT-DEVELOPABLE PHOTOSENSITIVE MATERIAL

Takatugu Suzuki; Atsushi Tomotake; Hidenobu Ohya, and Nobuyuki Takiyama, all of Tokyo, Japan, assignors to Konica Corporation, Japan

Filed Nov. 20, 1995, Ser. No. 560,889

Claims priority, application Japan, Nov. 24, 1994, 6-289934

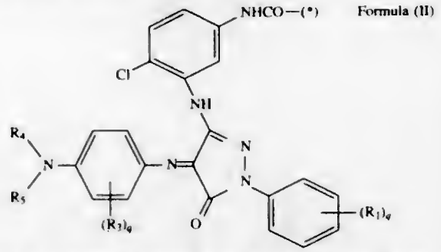
Int. Cl.[6] G03C *8/12;8/40*

U.S. Cl. 430—559 **7 Claims**

1. A heat-developable photosensitive material for use in diffusion transfer process, comprising a support having in one or more layers a hydrophilic binder, photosensitive silver halide and dye-providing compound, wherein said dye-providing compound is represented by the following formula (I),

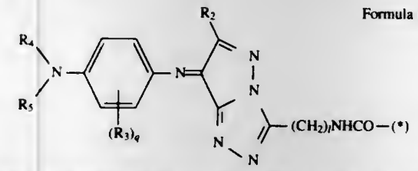
$$\{A\text{-}(J_1)_a\text{-}(X)_b\}_c\text{-}J_2\text{-Dye} \qquad \text{Formula (I)}$$

wherein A represents a 1,3-sulfur-nitrogen compound residue capable of releasing $[\text{-}(J_1)_a\text{-}(X)_b]_c\text{-}J_2$-Dye residue upon cleavage in the presence of a silver ion or a soluble silver complex; J_1 represents a divalent linking group and J_2 represents a divalent or trivalent linking group; X represents a divalent linking group selected from —CO—, —COO—, —CONH—, —SO_2—, —SO_2NH—, —SO_3—, —NHCO—, —$NHSO_2$— and —O—; a and b independently represent 0 or 1; c represents 1 or 2; Dye represents a group represented by the following formula (II), (III) or (IV).



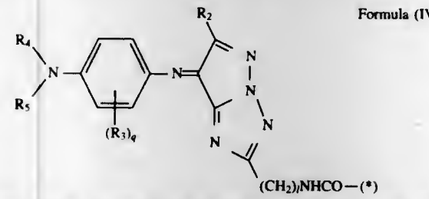
Formula (II)

wherein R_1 represents a halogen atom, alkyl group, alkoxy group, aryloxy group, acylamino group, sulfonylamino group, carbamoyl group or sulfamoyl group; R_3 represents an alkyl group, acylamino group or alkoxy group; R_4 and R_5 independently represent an alkyl group, cycloalkyl group or aryl group, and R_4 and R_5 may be combined with each other to form a ring; p is an integer of 0 to 5; q is an integer of 0 to 4; provided that Dye represented by the above formula (II) is bonded, at the position (*), with $[A\text{-}(J_1)_a\text{-}(X)_b]_c\text{-}J_2$- residue.



Formula (III)

wherein R_2 represents an alkyl group, cycloalkyl group, aryl group, heterocyclic group, alkoxy group, aryloxy group, acylamino group, sulfonylamino group or anilino group; R_3, R_4 and R_5 each are the same as R_3, R_4 and R_5 as defined in formula (II); q represents an integer of 0 to 4; l represents an integer of 1 to 3; provided that Dye represented by the above formula (III) is bonded, at the position (*), with $[A\text{-}(J_1)_a\text{-}(X)_b]_c\text{-}J_2$- residue.



Formula (IV)

wherein R_2, R_3, R_4 and R_5 are the same as R_2, R_3, R_4 and R_5 defined in formula (III); q represents an integer of 0 to 4; l represents an integer of 1 to 3; provided that Dye represented by the above formula is bonded, at the position (*), with $[A\text{-}(J_1)_a\text{-}(X)_b]_c\text{-}J_2$- residue.

5,556,741

SILVER HALIDE EMULSION, METHOD OF MANUFACTURING THE SAME, AND PHOTOSENSITIVE MATERIAL USING THIS EMULSION

Yoichi Suga; Yoshio Ishii, and Masakazu Morigaki, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 7, 1995, Ser. No. 476,335

Claims priority, application Japan, Jun. 13, 1994, 6-153085

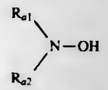
Int. Cl.[6] G03C *1/005;1/08*

U.S. Cl. 430—569 **25 Claims**

1. A method of manufacturing a silver halide emulsion, which comprises:

subjecting a silver halide emulsion to reduction sensitization;

adding to said reduction sensitized emulsion at least one radical scavenger represented by formula (A):



Formula (A)

wherein R_{a1} represents an alkyl group, and alkenyl group, an aryl group, a heterocyclic group, an acyl group, a sulfonyl group, a sulfinyl group, a carbamoyl group, a sulfamoyl group, an alkoxycarbonyl group, or an aryloxycarbonyl group; R_{a2} is a hydrogen atom or a group represented by R_{a1}, with the proviso that when R_{a1} is an alkyl group, an alkenyl group, or an aryl group, R_{a2} is a heterocyclic group, an acyl group, a sulfonyl group, a sulfinyl group, a carbamoyl group, a sulfamoyl group, an alkoxycarbonyl group, or an aryloxycarbonyl group; and R_{a1} and R_{a2} may combine together to form a 5- to 7-membered ring; and

subjecting said reduction sensitized emulsion to gold chalcogen sensitization;

wherein said radical scavenger is added prior to completion of said gold chalcogen sensitization.

5,556,742

NOBLE METAL COMPLEXES TO SENSITIZE SILVER HALIDE EMULSIONS

Charles G. Barlow, St. Paul, Minn.; Peter R. Johns, Rochester, N.Y., and Peter D. Sills, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 30, 1995, Ser. No. 521,544

Int. Cl.[6] G03C *1/09*

U.S. Cl. 430—601 **19 Claims**

1. A method for sensitizing photographic silver halide emulsions which comprises sensitizing a photographic silver halide emulsion in the presence of a hydrido-phosphine platinum(II) compound.

5,556,743

METHOD FOR IMMOBILIZING DYE ON SUBSTRATES

David J. Gibboni, Drexel Hill, Pa., and Wai T. Law, Sewell, N.J., assignors to ActiMed Laboratories, Inc., Burlington, N.J.

Continuation-in-part of Ser. No. 833,423, Feb. 10, 1992, abandoned. This application May 17, 1994, Ser. No. 243,876

Int. Cl.[6] C12Q *1/00;1/28;1/60;* **G01N** *33/551*

U.S. Cl. 435—4 **18 Claims**

1. A matrix for colorimetrically detecting or quantifying hydrogen peroxide in a sample comprising:

a film-forming component to which is covalently bonded a first dye, and

a film-opening component to which is covalently bonded a second dye;

wherein said first dye and said second dye are optionally the same;

said film-opening component comprises small insoluble particles which impregnate the film former matrix and are not reactive with any reagents associated with the film-forming component.

5,556,744

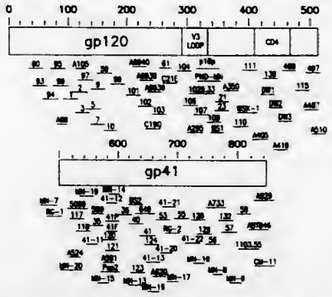
METHODS AND COMPOSITIONS FOR DIAGNOSING AND TREATING CERTAIN HIV INFECTED PATIENTS

David B. Weiner, Merion Station; Kenneth E. Ugen, Philadelphia, and William V. Williams, Havertown, all of Pa., assignors to The Trustees of the University of Pennsylvania, and The Wistar Institute of Anatomy & Biology, both of Philadelphia, Pa.

Continuation-in-part of Ser. No. 891,451, May 29, 1992, abandoned. This application Mar. 24, 1994, Ser. No. 218,025

Int. Cl.[6] C12Q *1/70*

U.S. Cl. 435—5 **2 Claims**



1. A method for determining whether or not a mother will transmit HIV-1 to a fetus in a given pregnancy comprising:

(a) providing a biological sample from an HIV-infected woman;

(b) incubating said sample with a collection of HIV peptides comprising at least one peptide selected from the group consisting of gp120-derived peptides:

SEQ ID NO: 1: YDTEVHNVWATHACV,

SEQ ID NO: 2: RKSIGIQRGPGR,

tions appropriate for the binding of the monoclonal antibody

having a different sequence complementary to the analyte comprising performing the hereinbelow steps in the order presented:

presenting a representation of said current candidate oligonucleotide probe to the user.

SEQ ID NO: 2: RKSIGIQRGPGR,
SEQ ID NO: 3: KQFINMWQEVGKAMYAPP,
SEQ ID NO: 4: CFRPGGGDMRDNWREL,
SEQ ID NO: 10: TLPCASDAKAYDTEV,
SEQ ID NO:137: CNNKTFNGTGPCTNVSTVQ,
SEQ ID NO:133: VVQREKRAVGIG,
SEQ ID NO:134: YNKRKRIHIQRGPGRAFYTTKNII,
SEQ ID NO:194: KQIINMWQEVGKAMYACTRP-NNNTRKSIRIQRGPG,

and at least one peptide selected from the group consisting of gp41-derived peptides:

SEQ ID NO: 5: QNNLLRAIEAQQHLLQLTVWGI,
SEQ ID NO: 6: CQNQQEKNEQELLEL,
SEQ ID NO: 7: ELDKWASLWNWFNITNWLWY,
SEQ ID NO: 8: VTRIVELLGRRGWEALKYWW,
SEQ ID NO: 30: FSYHRLRDLLLIVTR,
SEQ ID NO: 31: NATAIAVAEGTDRVIEVVQGAYRAI,
SEQ ID NO: 121: LGIWGCSGKLIC,
SEQ ID NO:170: YIKIFIMIVGGLVG,
SEQ ID NO:159: DTSGRLVHGFLAIIW,
SEQ ID NO:171: HIPTRIRQGLERALL, and
SEQ ID NO:165: HMLQLTVWGIKQLQAR;

(c) determining the number of peptides in said collection reacted with said sample;

(d) comparing the number of reacting peptides to a standard, wherein said standard provides a pattern of peptide reaction with a sample from a patient of transmission status,

wherein a non-transmissible HIV sample is indicated by reaction of said sample with at least about two fold more peptides than react with said standard.

5,556,745

METHOD FOR THE DETECTION AND QUANTITATIVE DETERMINATION OF ANTIGEN IN A TEST SAMPLE CONTAINING IMMUNE COMPLEXES OF ANTIGEN BOUND TO ANTIBODIES AND TO RHEUMATOID FACTORS

Jörg Schüpbach, Bachtalsteig 4, CH-5400 Ennetbaden, and Jürg Böni, Kollerstrasse 8, CH-5430 Wettingen, both of Switzerland

Filed Jun. 3, 1994, Ser. No. 253,297
Int. Cl.[6] C12Q *1/00*
U.S. Cl. 435—5 **11 Claims**

1. A method for the detection and quantitative determination of an antigen in a test sample containing immune complexes of the antigen bound to antibodies specific for the antigen and to rheumatoid factors, said method comprising:

a. heat-treating the sample at about neutral or physiological pH at a temperature of about 100° C. for 3 to 10 minutes, such that the antibodies present in the immune complexes no longer bind the antigen, thereby releasing the antigen from the immune complexes and eliminating interference with rheumatoid factors; and

b. testing the heat-treated sample in an antigen assay which uses reagents which recognize the heat-treated antigen.

5,556,746

ANTIBODIES SPECIFIC FOR THE GROUP ANTIGEN OF ASTROVIRUSES

John E. Herrmann, Northboro, and Neil R. Blacklow, Weston, both of Mass., assignors to University of Massachusetts Medical Center, Worcester, Mass.

Continuation of Ser. No. 375,982, Jul. 5, 1989, abandoned. This application Jun. 14, 1994, Ser. No. 259,405
Int. Cl.[6] C12Q *1/70;* C12N *15/06;5/12;* C07K *16/14*
U.S. Cl. 435—5 **11 Claims**

1. An immunoassay for detecting the presence or absence of an astrovirus in a biological sample, comprising:

a) contacting the biological sample with labeled monoclonal antibody produced by hybridoma cell line 8E7 under conditions appropriate for the binding of the monoclonal antibody to the astrovirus group antigen; and

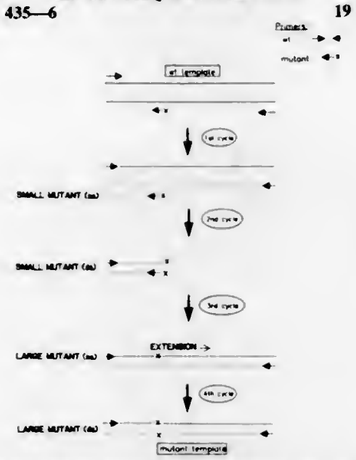
b) detecting the presence or absence of binding of the labeled monoclonal antibody as an indication of the presence or absence of an astrovirus in the biological sample.

5,556,747

METHOD FOR SITE-DIRECTED MUTAGENESIS

Ramesh Kumar, Lawrenceville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 9, 1990, Ser. No. 549,787
Int. Cl.[6] C12Q *1/68;* C12P *19/34*
U.S. Cl. 435—6 **19 Claims**



1. A method for the incorporation of mutations into one or both strands of a target double stranded DNA molecule derived from a starting nucleic acid molecule comprising:

(a) contacting the target double stranded DNA molecule derived from a starting nucleic acid molecule simultaneously with two primers flanking the nucleotides to be mutated and a mutagenic third primer; and

(b) subjecting the resulting reaction mixture to a sufficient number of rounds of PCR to generate the mutations in one or both strands of the target double stranded DNA molecule and amplify the mutated DNA sequence.

5,556,748

METHODS OF SANDWICH HYBRIDIZATION FOR THE QUANTITATIVE ANALYSIS OF OLIGONUCLEOTIDES

Allan S. Douglas, Ridgewood, N.J., assignor to Xenopore Corporation, Hawthorne, N.J.

Filed Jul. 30, 1991, Ser. No. 737,469
Int. Cl.[6] C12Q *1/68*
U.S. Cl. 435—6 **16 Claims**

1. A method of quantitative analysis of an oligonucleotide analyte, said analysis using an assay plate prepared with masked receptor sites and two sensitized polynucleotide DNA probes, each having a different sequence complementary to the analyte comprising performing the hereinbelow steps in the order presented:

(a) attaching the first DNA probe to the receptor sites;

(b) then performing the following two substeps in any order, that is sequentially or in reverse order:

(1) hybridizing the oligonucleotide analyte to the complementary portions of the first and second DNA probes;

and,

(2) labeling by the attachment of an indicator to the second DNA probe; and,

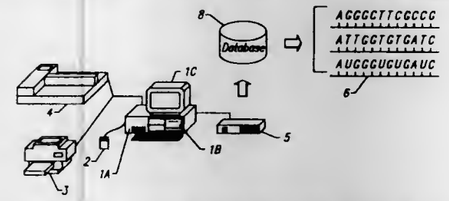
(c) detecting the intensity of the indicator and thereby obtaining a quantitation of said oligonucleotide analyte.

5,556,749

OLIGOPROBE DESIGNSTATION: A COMPUTERIZED METHOD FOR DESIGNING OPTIMAL DNA PROBES

Masato Mitsuhashi, Irvine, Calif.; Allan J. Cooper, Bellvue, Wash.; Michael S. Waterman, Culver City, Calif., and Pavel A. Pevzner, State College, Pa., assignors to Hitachi Chemical Research Center, Inc., Irvine, Calif.

Filed Nov. 12, 1992, Ser. No. 975,526
Int. Cl.[6] C12Q *1/68;* G06F *15/16;17/00*
U.S. Cl. 435—6 **97 Claims**



52. A method for designing candidate oligonucleotide probes by performing hybridization strength modeling on gene sequences which is determined by numbers of matching sequences for use with a gene sequence data source comprising the steps of:

introducing user-selected gene sequences into a computer system;

accessing-gene sequence data from said gene sequence data source;

storing said user-selected gene sequence in the memory of the computer system;

accessing the gene sequence source to introduce the user-selected set of gene sequence data and a user-selected set of target gene sequence data from said gene sequence data source into the computer system;

storing said gene sequence data and said target gene sequence data in the memory of the computer system;

determining a minimum oligonucleotide probe length;

creating a look-up hash table and linked list in memory for each gene sequence in said gene sequence data and each of said target gene sequences;

calculating the minimum length of any matching gene subsequence of said gene sequence data and said target gene sequence data;

comparing each base pair character in each said target sequence stored in a hash table in memory to each base pair character of said gene sequence stored in a hash table in memory;

determining a matching seed by determining if the said comparison results in a matching gene subsequence of length equal to said calculated minimum length;

comparing base pair characters behind and ahead of said seed to determine if there exists an extended match of a subsequence of base pair characters of length greater than the calculated minimum length, resulting in a current hit sequence;

calculating whether said current hit sequence is longer than said minimum oligonucleotide probe length, resulting in a current candidate oligonucleotide probe;

storing said current candidate oligonucleotide probe in the memory of the computer system; and

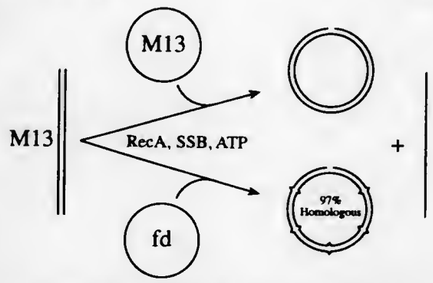
presenting a representation of said current candidate oligonucleotide probe to the user.

5,556,750

METHODS AND KITS FOR FRACTIONATING A POPULATION OF DNA MOLECULES BASED ON THE PRESENCE OR ABSENCE OF A BASE-PAIR MISMATCH UTILIZING MISMATCH REPAIR SYSTEMS

Paul L. Modrich, Chapel Hill, N.C.; Shin-San Su, Newton, Mass.; Karin G. Au, Durham, N.C.; Robert S. Lahue, Northboro; Deani L. Cooper, Watertown, both of Mass., and Leroy Worth, Jr., Durham, N.C., assignors to Duke University, Durham, N.C.

Continuation-in-part of Ser. No. 2,529, Jan. 11, 1993, abandoned, which is a continuation of Ser. No. 350,983, May 12, 1989, abandoned. This application Nov. 1, 1993, Ser. No. 145,837
Int. Cl.[6] C12Q *1/68;* C12P *19/34*
U.S. Cl. 435—6 **17 Claims**



1. A method for eliminating DNA molecules containing one or more base pairing mismatches from a population of heterohybrid duplex DNA molecules formed by base pairing of single-stranded DNA molecules obtained from a first source and a second source, comprising the steps of:

digesting genomic DNA from said first and said second source with a restriction endonuclease,

methylating the DNA from one of said sources,

denaturing said DNA from said first and said second source,

mixing DNA from said first and said second source in the presence of a recombinase protein, proteins of a mismatch repair system that modulate said recombinase protein, single-strand binding protein, and ATP, such that DNA duplexes form in homologous regions of DNA molecules from said first and said second source and the presence of a base pair mismatch results in regions that remain single-stranded, and

removing molecules that contain a said single-stranded region from said population.

5,556,751

SELECTIVE AMPLIFICATION SYSTEM USING Q-BETA REPLICASE

James E. Stefano, Hopkinton, Mass., assignor to Amoco Corporation, Chicago, Ill.

Continuation of Ser. No. 132,685, Oct. 6, 1993, abandoned, which is a continuation of Ser. No. 851,221, Mar. 10, 1992, abandoned, which is a continuation of Ser. No. 514,518, Apr. 25, 1991, abandoned. This application Apr. 5, 1994, Ser. No. 222,566
Int. Cl.[6] C12P *19/34;* C12Q *1/68*
U.S. Cl. 435—6 **6 Claims**

1. A hybridization assay for the detection of a target nucleic acid, comprising the steps of:

a) providing a replicatable mutant MDV RNA molecule linked to an RNA probe sequence which is substantially complemen-

170–920 O.G.–96–15: QL3

tary to a portion of the target nucleic acid, the mutant MDV

5,556,755

METHOD FOR DETECTING *BRANHAMELLA*

surface of the mammalian cell, with a plurality of compounds,

agent of meningitis, said protein or peptide is a chemokine involved in cell chemotaxis, and wherein said Meningitis

tary to a portion of the target nucleic acid, the mutant MDV RNA molecule being resistant to a fluorescent dye which binds to wild type MDV RNA and which inhibits replication of wild type MDV RNA by Q-beta replicase;

b) contacting the mutant MDV RNA molecule with a solution to be tested for the presence of the target nucleic acid, under conditions appropriate for hybridization between complementary nucleic acid sequences, thereby forming a mutant MDV RNA-target nucleic acid complex;

c) isolating the mutant MDV RNA target nucleic acid complex;

d) contacting the mutant MDV RNA-target nucleic acid complex with Q-beta replicase, in the presence of the fluorescent dye which binds to wild type MDV RNA, under conditions appropriate for amplification of the mutant MDV RNA and inhibition of replication of wild type MDV RNA; and

e) detecting amplified mutant MDV RNA as an indication of the presence of target nucleic acid in the solution to be tested.

5,556,752

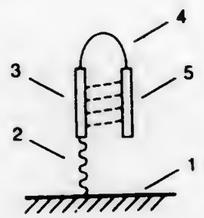
SURFACE-BOUND, UNIMOLECULAR, DOUBLE-STRANDED DNA

David J. Lockhart, Santa Clara, Calif.; Dirk Vetter, Freiburg, Germany, and Martin Diggelmann, Niederdorf, Switzerland, assignors to Affymetrix, Inc., Santa Clara, Calif.

Filed Oct. 24, 1994, Ser. No. 327,687

Int. Cl.[6] C12Q *1/68*; C07H *21/00*

U.S. Cl. 435—6 **6 Claims**



1. A synthetic unimolecular, double-stranded oligonucleotide library comprising a plurality of different members, each member having the formula:

$$Y—L^1—X^1—L^2—X^2$$

wherein,

Y is a solid support;

X^1 and X^2 are a pair of complementary oligonucleotide's;

L^1 is a spacer;

L^2 is a linking group having sufficient length such that X^1 and X^2 form a double-stranded oligonucleotide.

5,556,753

DNA ENCODING HUMAN α 1 ADRENEGRIC RECEPTORS AND USES THEREOF

Jonathan A. Bard, Wyckoff; Carlos Forray, Waldwick, both of N.J., and Richard L. Weinshank, New York, N.Y., assignors to Synaptic Pharmaceutical Corporation, Paramus, N.J.

Continuation of Ser. No. 952,798, Sep. 25, 1992, abandoned. This application Nov. 4, 1994, Ser. No. 334,698

Int. Cl.[6] C12Q *1/00*; C12P *21/06*; A61K *38/00*; C07K *1/00*

U.S. Cl. 435—6 **10 Claims**

1. A method of screening chemical compounds to identify drug candidates which bind to a human α_{1c} adrenergic receptor subtype on the surface of a cell which comprises contacting a plurality of mammalian cells, wherein each cell comprises a plasmid adapted for expression in the cell, wherein the plasmid comprises DNA which expresses the human α_{1c} adrenergic receptor subtype on the surface of the mammalian cell, with a plurality of compounds, determining those compounds which bind to the human α_{1c} adrenergic receptor subtype expressed on the surface of any such mammalian cell, so as to thereby identify drug candidates which bind to the human α_{1c} adrenergic receptor subtype.

5,556,754

METHODS FOR ASSESSING THE ABILITY OF A CANDIDATE DRUG TO SUPPRESS MHC CLASS I EXPRESSION

Dinah S. Singer, Chevy Chase; Leonard Kohn, Bethesda, both of Md.; Edna Mozes, Rehovot, Ill.; Motoyasu Saji, Rockville, Md.; Jocelyn Weissman, Silver Spring, Md.; Giorgio Napolitano, Rockville, Md., and Fred D. Ledley, Houston, Tex., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 73,830, Jun. 7, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 480,525

Int. Cl.[6] C12Q *1/68*; C12P *19/34*; C07H *21/04*

U.S. Cl. 435—6 **17 Claims**

1. A method for assessing the therapeutic potential of a candidate drug for treating autoimmune diseases by assessing the ability of said candidate drug to suppress MHC Class I molecules, said method comprising,

(a) treating mammalian cells with said drug;

(b) obtaining protein extracts from said cells in step (a) and combining said protein extracts with a MHC Class I regulatory nucleic acid sequence to allow formation of complexes between at least one protein from said extract and said MHC class I regulatory nucleic acid sequence;

(c) detecting said complexes; wherein a decrease or increase in quantity of said complexes indicates said drug's potential in treating autoimmune diseases, said autoimmune diseases being selected from the group consisting of rheumatoid arthritis, psoriasis, juvenile diabetes, primary idiopathic myxedema, systemic lupus erythematosus, autoimmune asthma, myasthenia gravis, scleroderma, chronic hepatitis, Addison's disease, hypogonadism, pernicious anemia, vitiligo, alopecia areata, Coeliac disease, autoimmune enteropathy syndrome, idiopathic thrombocytic purpura, acquired splenic atrophy, idiopathic diabetes insipidus, infertility due to antispermatazoan antibodies, sudden hearing loss, sensoneural hearing loss, Sjogren's Syndrome, polymyositis, autoimmune demyelinating diseases, multiple sclerosis, transverse myelitis, ataxic sclerosis, pemphigus, progressive systemic sclerosis, dermatomyositis, polyarteritis nodosa, chronic hepatitis, hemolytic anemia, progressive systemic sclerosis, glomerular nephritis and idiopathic facial paralysis.

5,556,755

METHOD FOR DETECTING *BRANHAMELLA CATARRHALIS*

Timothy F. Murphy, East Amherst, N.Y., assignor to The Research Foundation of State University of New York, Amherst, N.Y.

Filed Sep. 29, 1993, Ser. No. 129,719

Int. Cl.[6] C12Q *1/68*; C12P *19/34*; C07H *21/04*; C12N *15/00*

U.S. Cl. 435—6 **10 Claims**

1. A composition, for detection of *Branhamella catarrhalis* in a clinical specimen, consisting essentially of a purified and isolated oligonucleotide, said oligonucleotide consists of a nucleic acid sequence which

(a) consists of from about 15 nucleotides to about 20 nucleotides in a sequence selected from a gene designated by nucleotide position 88 to nucleotide position 1446 of SEQ ID No. 14 or said gene's complementary strand;

(b) has a cytosine and guanine content which is lower than adenosine and thymidine content; and

(c) has been synthesized to complement and specifically hybridize to regions of said gene or its complementary strand.

5,556,756

GOLD SOL OF LESS THAN 5 NM TEST METHOD AND REAGENT KIT THEREFOR

Egil Olsen, Strommen, and Ørjan Olsvik, Oslo, both of Norway, assignors to NYCOMED AS, Norway

Continuation of Ser. No. 536,609, Aug. 27, 1990, abandoned. This application Jun. 5, 1992, Ser. No. 895,244

Claims priority, application United Kingdom, Jan. 13, 1988, 8800702

Int. Cl.[6] G01N *33/53*

U.S. Cl. 435—7.1 **20 Claims**

1. A method for the qualitative or quantitative determination of an analyte in a test sample wherein a reagent comprising a gold sol bound to a substance capable of specifically binding to said analyte or to a specific binding partner therefor, is caused to be immobilized in bound form on a membrane support to provide an indication of the presence or quantity of the analyte in the sample by detection of the presence of intensity of color of immobilized gold sol, characterized in that at least 75% by weight of the gold particles of the gold sol have a mean diameter of less than 5 nanometers and not less than 3 nanometers with the provision that the analyte and the substance capable of specifically binding to the analyte are an antigen/antibody or hapten/antibody pair.

5,556,757

PEPTIDES REPRESENTING EPITOPIC SITES FOR BACTERIAL AND VIRAL MENINGITIS CAUSING AGENTS AND THEIR CNS CARRIER AND USES THEREOF

Diane V. Alstyne, and Lawrence R. Sharma, both of Vancouver, Canada, assignors to Insight Biotek, Inc., St. Michaels, Barbados

Division of Ser. No. 127,499, Sep. 28, 1993. This application Jun. 7, 1995, Ser. No. 482,847

Int. Cl.[6] G01N *33/53*; *33/554*; *33/569*; C07K *7/00*

U.S. Cl. 435—7.2 **2 Claims**

1. A peptide having the formula

aXb,

wherein

a is linked to X by a simple peptide bond and b is linked to X by a simple peptide bond,

wherein

X is a Meningitis Related Homologous Antigenic Sequence contained in the amino acid sequence of a protein or peptide found in a bacterium or virus that is an etiologic agent of meningitis, said protein or peptide is a chemokine involved in cell chemotaxis, and wherein said Meningitis Related Homologous Antigenic Sequence is at least 7 sequential amino acids and conservative substitutions or modifications thereof selected from the group consisting of:

(i) the amino acid sequence of the Structural Polyprotein of a strain of Rubella virus that corresponds to AA_{102}--AA_{108} of said protein of the M33 strain of Rubella virus as set forth in SEQ ID NO:1;

(ii) the amino acid sequence of the Structural Polyprotein of a strain of Rubella virus that corresponds to AA_{89}--AA_{95} of said protein of the M33 strain of Rubella virus as set forth in SEQ ID NO:1;

(iii) the amino acid sequence of the Structural Polyprotein of a strain of Rubella virus that corresponds to AA_{313}--AA_{319} of said protein of the M33 strain of Rubella virus as set forth in SEQ ID NO:1;

(iv) the amino acid sequence of the Structural Polyprotein of a strain of Rubella virus that corresponds to AA_{103}--AA_{109} of said protein of the Therien strain of Rubella virus as set forth in SEQ ID NO:8;

(v) the amino acid sequence of the Structural Polyprotein of a strain of Rubella virus that corresponds to AA_{90}--AA_{96} of said protein of the Therien strain of Rubella virus as set forth in SEQ ID NO:8;

(vi) the amino acid sequence of the Structural Polyprotein of a strain of Rubella virus that corresponds to AA_{314}-AA_{320} of said protein of the Thorion strain of Rubella virus as set forth in SEQ ID NO:8;

(vii) the amine acid sequence of the Gag Polyprotein of an isolate of the HIV-1 that corresponds to AA_{145}--AA_{151} of the Gag Polyprotein of the LV isolate of HIV-1 as set forth in SEQ ID NO:11;

(viii) the amine acid sequence of the Envelope Polypretain Precursor of an isolate of the HIV-1 that corresponds to AA_{655} to AA_{661} of the Envelope Polypretain Precursor of the LAV-1a isolate of HIV-1 as set forth in SEQ ID NO:14;

(ix) the amine acid sequence that corresponds to AA_{99}--AA_{105} of the Lipoprotein E Precursor of *Haemophilus influenzae* as set forth in SEQ ID NO:17;

(x) the amine acid sequence that corresponds to AA_1 to AA_5 of the Opacity-Related Protein POPM3 of *Neisseria meningitidis* as set forth in SEQ ID NO:20;

(xi) the amine acid sequence that corresponds to A_{123} to AA_{129} of the Pneumococcal Surface Protein A of *Streptococcus pneumoniae* as set forth in SEQ ID NO:23;

(xii) the amine acid sequence that corresponds to AA_{151}--AA_{157} of the Protein P60 Precursor of *Listeria monocytogenes* as set forth in SEQ ID NO:26;

(xiii) the amine acid sequence that corresponds to AA_{181}--AA_{187} of the Protein P60 Precursor of *Listeria monocytogenes* as set forth in SEQ ID NO:26;

(xiv) the amine acid sequence that corresponds to AA_{249}--AA_{255} of the Protein P60 Precursor of Listeria monocytogenes as set forth in SEQ ID NO:26;

(xv) the amine acid sequence that corresponds to A_{292}--AA_{298} of the Protein P60 Precursor of *Listeria monocytogenes* as set forth in SEQ ID NO:26;

(xvi) the amine acid sequence of a variant of the chemokine human Monocyte Chemoattractant Factor hMCP-1, that corresponds to AA_{93}--AA_{99} of hMCP-1 as set forth in SEQ ID NO:35; and

(xvii) the amino acid sequence of the chemokine hMCP-3, that corresponds to AA_{61}--AA_{67} of hMCP-3 as set forth in SEQ ID NO: 38,

wherein

a is an amino terminus which comprises

(i) one to eight sequential amino acids from the native amino acid sequence of the protein immediately N-terminal to said X, or conservative substitutions in or modifications of said native amino acid sequence or

(ii) a substituent effective to facilitate coupling of the peptide to another moiety

and wherein

b is a carboxy terminus which comprises

(i) one to eight sequential amino acids from the native amino acid sequence of the protein immediately C-terminal to said X or conservative substitutions in or modifications of said native amino acid sequence or

(ii) a substituent effective to facilitate coupling of the peptide to another moiety.

5,556,758

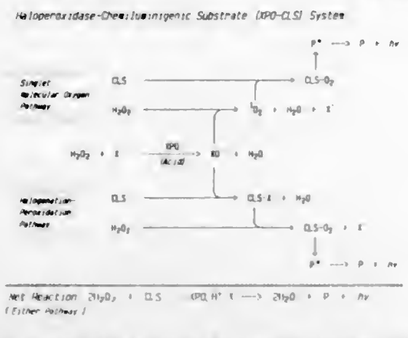
HALOPEROXIDASE ACID OPTIMUM CHEMILUMINESCENCE ASSAY SYSTEM

Robert C. Allen, Little Rock, Ark., assignor to ExOxEmis, Inc., Little Rock, Ark.

Continuation of Ser. No. 109,142, Aug. 19, 1993, abandoned, which is a continuation of Ser. No. 830,760, Feb. 3, 1992, abandoned, which is a continuation of Ser. No. 417,276, Oct. 5, 1989, abandoned. This application May 19, 1994, Ser. No. 245,839

Int. Cl.[6] G01N *33/535*

U.S. Cl. 435—7.9 **40 Claims**



1. A method for determining the presence or amount of an analyte selected from one member of the group consisting of peroxide, halide, haloperoxidase enzyme, chemiluminigenic substrate for said enzyme and analytes capable of producing or consuming peroxide, halide, haloperoxidase or chemiluminigenic substrate in one or more preliminary reactions, in a sample suspected of containing an unknown amount of the analyte, said method comprising contacting the sample with an assay solution comprising a known, non-rate limiting amount of the other members of the group, maintaining the pH of the assay solution in the range of about 4 to about 7, measuring at least one characteristic of light emitted by the assay solution, and comparing the characteristic of the light measured with that of a standard solution containing a known amount of the analyte as a measure of the presence or amount of the analyte in the sample.

5,556,759

ASSAY AND METHOD FOR DETERMINING NEWBORN RISK FOR SUDDEN INFANT DEATH SYNDROME

Peter G. Beach, 6780 SW. 205th Ct., Portland, Oreg. 97007

Filed Aug. 2, 1993, Ser. No. 100,667

Int. Cl.[6] G01N *33/537;33/543;33/564*

U.S. Cl. 435—7.9 **20 Claims**

6. A method for determining whether a newborn is at increased risk for SIDS comprising the steps of:

collecting a blood sample from the newborn within four days of birth;

quantifying the amount of IgM specific for IgG (MAG) in the sample by:

contacting IgM from the sample with a first IgG having specific affinity for IgM under conditions which promote binding between IgM and the first IgG, wherein a portion of the IgM bound to the first IgG is MAG complexed with a second IgG derived from the sample;

separating the first IgG with associated IgM and second IgG from the other blood sample constituents;

measuring the quantity of second IgG separated from the sample, thereby indirectly indicating the quantity of MAG in the sample; and correlating the MAG level with standards to determine the newborn's risk for SIDS.

5,556,760

METHOD FOR ASSAYING UREASE

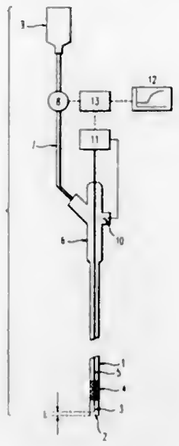
Michihiro Nakamura; Satomi Matsui; Keiko Oka; Hitoshi Tsuruta, all of Kurashiki; Yoshihiro Koori, Fukui-ken; Takuji Kato, Fukui-ken, and Shigeji Ito, Fukui-ken, all of Japan, assignors to Biosensor Research Laboratories Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1995, Ser. No. 381,000

Claims priority, application Japan, Jun. 2, 1994, 6-145327

Int. Cl.[6] C12Q *1/58;* **A61B** *5/04*

U.S. Cl. 435—12 **7 Claims**



1. A method for assaying urease on a targeted solid body surface comprising:

(a) contacting an end opening of a thin tube with a targeted solid body surface to form a space between said targeted solid body surface and an inner wall surface of said thin tube;

(b) supplying a urea solution into said space to bring said urea solution into contact with said targeted solid body surface;

(c) determining a pH change of said urea solution in said space with a pH electrode, said pH electrode comprising a sensing portion whose tip is arranged in said space to be not more than 5 mm away from said end opening of said thin tube; and

(d) correlating the pH change determined in step (c) with the presence of urease where an increase in pH indicates the presence of urease.

5,556,761

TEST STRIP FOR BLOOD GLUCOSE TESTING

Kevin J. Phillips, 132 Main St., Chester, S.C. 29706

Filed Apr. 26, 1994, Ser. No. 233,376

Int. Cl.[6] G12Q *1/54;* **G01N** *31/00;21/00*

U.S. Cl. 435—14 **19 Claims**

1. A test strip for use with a photometer for determining blood glucose levels, comprising a substrate having a red colored reagent thereon, wherein the reagent comprises at least one enzyme, at least one chromophore, and at least one red dye additive.

5,556,762

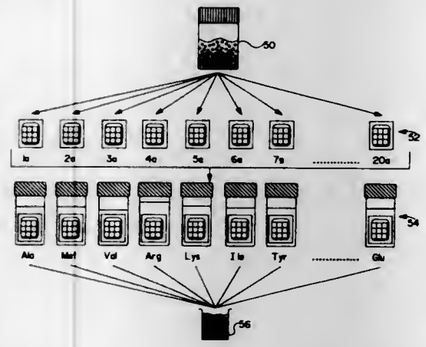
SCANNING SYNTHETIC PEPTIDE COMBINATORIAL LIBRARIES: OLIGOPEPTIDE MIXTURE SETS HAVING A ONE PREDETERMINED RESIDUE AT A SINGLE, PREDETERMINED POSITION, METHODS OF MAKING AND USING THE SAME

Clemencia Pinilla; Jon R. Appel, Jr., both of Cardiff, and Richard A. Houghten, Solana Beach, all of Calif., assignors to Houghten Pharmaceutical Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 797,551, Nov. 19, 1991, abandoned, which is a continuation-in-part of Ser. No. 701,658, May 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 617,023, Nov. 21, 1990, abandoned. This application Sep. 11, 1992, Ser. No. 943,709

Int. Cl.[6] G01N *33/53*

U.S. Cl. 435—7.21 **17 Claims**



1. A process for providing the amino acid residue sequence of an oligopeptide ligand that specifically binds to an acceptor that comprises the steps of:

(a) providing separate pluralities of sets of self-solubilizing, unsupported mixed oligopeptides, each of said pluralities having sets that consist essentially of a mixture of equimolar amounts of linear oligopeptide chains containing five to about ten amino acid residues in each chain, the members of each set having one of at least six different predetermined amino acid residues at a single, predetermined position of the oligopeptide chain, and having said at least six different amino acid residues at the same other positions of the oligopeptide chain, each set having equimolar amounts of said at least six different amino acid residues at said other positions in the oligopeptide chain, but differing from the other sets in that the identity and chain position of the one of at least six predetermined amino acid residues present at the predetermined chain position within each set is different between the sets, each plurality of sets differing from the other plurality of sets by the chain position of said one of at least six different predetermined amino acid residues, the number of sets in said separate pluralities of sets being equal to the product of the number of different amino acid residues present at said predetermined chain positions containing said one of at least six different residues times the number of different chain positions containing said one of at least six predetermined amino acid residues;

(b) separately admixing each set with said acceptor in an aqueous medium at a set concentration of about 0.1 milligrams per liter to about 100 grams per liter, separately assaying the binding of each set to said acceptor, and determining the one or more sets that provided specific binding for each different chain position,

the identity and position of the amino acid residue of said each one or more sets that provided specific binding for each chain position providing the amino acid residue sequence for the ligand that specifically binds to said acceptor.

5,556,763

EVALUATION AND TREATMENT OF PATIENTS WITH PROGRESSIVE IMMUNOSUPPRESSION

Augusto C. Ochoa, Frederick; Dan L. Longo, Kensington; Paritosh Ghosh, Frederick, and Howard A. Young, Geithersburg, all of Md., assignors to United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 31,434, Mar. 15, 1993, abandoned, which is a continuation-in-part of Ser. No. 987,966, Dec. 11, 1992, which is a continuation-in-part of Ser. No. 863,262, Apr. 6, 1992, Pat. No. 5,296,353. This application Mar. 17, 1993, Ser. No. 34,832

Int. Cl.[6] A61K *49/00;* **G01N** *33/574*

U.S. Cl. 435—7.23 **11 Claims**

1. A method of determining the level of immunosuppression in a mammal, said method comprising the steps of:

a) determining the pattern of transcription factors of the NF-κB/rel family in a nuclear extract of a T lymphocyte preparation from a mammal; and

b) comparing said pattern with the pattern characteristic of a comparable T lymphocyte preparation from a non-immunosuppressed individual of the same mammalian species, a significant departure from the pattern in the non-immunosuppressed individual indicating a significant degree of immunosuppression in the mammal.

5,556,764

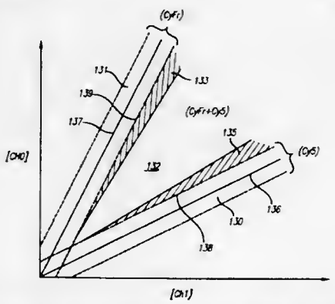
METHOD AND APPARATUS FOR CELL COUNTING AND CELL CLASSIFICATION

Ning L. Sizto, Fremont, and Louis J. Dietz, Mountain View, both of Calif., assignors to Biometric Imaging, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 18,762, Feb. 17, 1993, abandoned. This application May 2, 1994, Ser. No. 236,645

Int. Cl.[6] G01N *33/53*

U.S. Cl. 435—7.24 **15 Claims**



1. A method for analyzing a sample containing cells to detect and characterize target cells having first detectable characteristics and second detectable characteristics in a fixed volume capillary that contains a fluorescent background which exhibits background characteristics, the method comprising:

scanning the fixed volume capillary containing the sample to generate a first channel of data and a second channel of data, wherein the first channel of data includes the first detectable characteristics and first background characteristics and the second channel of data includes the second detectable characteristics and second background characteristics;

sampling the first and the second channels of data to produce corresponding first and second sets of pixel values;

loading the first and the second sets of pixel values into a pixel map buffer;

analyzing the first and the second sets of pixel values in the pixel map buffer to identify a peak event indicative of the target cell;

saving a first neighborhood of pixel values from the first set of pixel values and a second neighborhood of pixel values from

b) treating said crude plasminogen fraction with ethanol so as to form an ethanolic solution and to precipitate non-plasminogen

(iii) adding one or more aminoacyl-tRNAs or misaminoacyl-tRNAs, wherein an amino acid component to be incorporated

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5,556,771

STABILIZED COMPOSITIONS OF REVERSE

saving a first neighborhood of pixel values from the first set of pixel values and a second neighborhood of pixel values from the second set of pixel values for the peak event;

performing linear regression to correct for detection of the second detectable characteristics in the first channel and for detection of the first detectable characteristics in the second channel;

filtering the first neighborhood of pixel values and the second neighborhood of pixel values for the peak event using predetermined peak characteristic so as to adjust for the first and the second background characteristics;

generating a first intensity value from the first neighborhood and a second intensity value from the second neighborhood for the peak event; and

comparing the first intensity value and the second intensity value for the peak event to a first threshold to classify the target cell.

5,556,765

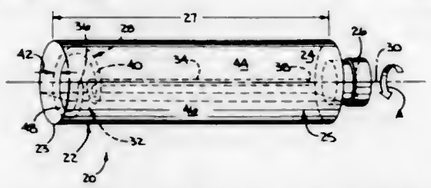
REACTOR USING TUBULAR SPIROIDS FOR GAS/LIQUID PROPULSION

Richard R. Dedolph, 22W510 71st. St., Naperville, Ill. 60540

Filed Feb. 18, 1994, Ser. No. 199,385

Int. Cl.[6] B01F *9/02;* **B01J** *10/02;* **C12M** *1/10;3/04*

U.S. Cl. 435—41 **47 Claims**



1. A reactor capable of maintaining a controlled environment in a reaction vessel to facilitate a reaction, the reactor comprising:

a rotatable reaction vessel defining a reaction chamber capable of holding a gas phase reactant and a liquid phase reactant; and

a spiroid having successive coils operably associated with the reaction chamber, the spiroid also being operably associated with the reaction vessel so that rotation of the reaction vessel causes rotation of the spiroid and movement of gas phase reactant in the reaction chamber through the spiroid, the spiroid having an upstream direction extending from an outlet to an inlet with each successive coil having a volume less than the volume of the upstream coil.

5,556,766

METHOD OF PRODUCING LYS-PLASMINOGEN

Yendra Linnau, and Ernst Hetzl, both of Vienna, Austria, assignors to Immuno Aktiengesellschaft, Austria

Division of Ser. No. 41,332, Apr. 1, 1993, Pat. No. 5,371,007, which is a continuation of Ser. No. 900,794, Jun. 22, 1992, abandoned, which is a continuation of Ser. No. 378,277, Jul. 11, 1989, abandoned. This application Aug. 18, 1994, Ser. No. 292,290

Claims priority, application Austria, Jul. 28, 1988, 1919/88

Int. Cl.[6] C12P *21/06;* **C12N** *9/00;9/68*

U.S. Cl. 435—68.1 **3 Claims**

1. A method for producing lys-plasminogen from blood plasma or blood plasma products, having a specific activity of at least 17.5 caseinolytic units per mg protein, at least 50 nmoles plasminogen per mg nitrogen as well as an electrophoretic purity of at least 90%, which method comprises the steps of:

a) extracting a Cohn fraction III precipitate from blood plasma or blood products with a phosphate buffer in the presence of from 0.1 to 100 KIU aprotinin per ml buffer solution so as to obtain a crude plasminogen fraction containing plasmin,

b) treating said crude plasminogen fraction with ethanol so as to form an ethanolic solution and to precipitate non-plasminogen proteins from the fraction,

c) isolating plasminogen from the ethanolic solution by adsorption on immobilized lysine and by subsequent elution so as to obtain purified plasminogen,

d) precipitating said purified plasminogen by a precipitating agent selected from the group consisting of ammonium sulfate and polyethylene glycol (PEG) so as to obtain a precipitate, and centrifuging to separate said precipitate,

e) dissolving said precipitate so as to obtain a solution containing plasminogen and plasmin and dialyzing said solution at a temperature of about 1°–20° C. and for a period of time of from 6 to 6 hour sufficient to convert plasminogen into lys-plasminogen, said solution having a plasmin activity of from 0.01 to 0.1 μmoles/ml min relative to chromogenic substrate H-D-valyl-L-leucyl-L-lysine-p-nitroanilide dihydrochloride,

f) interrupting the conversion of plasminogen into lys-plasminogen by adding 10 to 200 KIU aprotinin, and

g) lyophilizing the solution containing lys-plasminogen so as to obtain a lyophilisate of lys-plasminogen.

5,556,767

POLYNUCLEOTIDE ENCODING MACROPHAGE INFLAMMATORY PROTEIN GAMMA

Craig A. Rosen, Laytonsville; Haodong Li, Germantown; Steven Ruben, Olney, and Mark D. Adams, North Potomac, all of Md., assignors to Human Genome Sciences, Inc., Rockville, Md.

Filed Dec. 22, 1993, Ser. No. 173,209

Int. Cl.[6] C12N *15/12;* **C07K** *14/52*

U.S. Cl. 435—69.1 **32 Claims**

1. An isolated polynucleotide comprising a polynucleotide having at least a 95% identity to a member selected from the group consisting of:

(a) a polynucleotide encoding a polypeptide comprising the amino acid sequence as set forth in SEQ ID NO:2;

(b) a polynucleotide encoding a polypeptide comprising amino acid 1 to amino acid 69 as set forth in SEQ ID NO:2; and

(c) a polynucleotide which is complementary to the polynucleotide of (a) or (b).

18. A host cell transformed with the polynucleotide of claim **1**.

25. A process for producing a polypeptide comprising:

in a host cell according to claim **18** expressing the polypeptide encoded by said polynucleotide; and

recovering said expressed polypeptide.

5,556,768

METHOD FOR PREPARING PEPTIDES AND PROTEINS UTILIZING RIBOSOME

Nobuhiko Yamashita, Takatsuki, Japan, assignor to Osaka Gas Company Limited, Osaka, Japan

Filed Jun. 28, 1994, Ser. No. 266,750

Claims priority, application Japan, Jun. 29, 1993, 5-158662

Int. Cl.[6] C12P *21/02*

U.S. Cl. 435—69.1 **7 Claims**

1. A method for synthesizing a peptide or protein having a desired amino acid sequence by a stepwise extension reaction comprising:

(i) preparing as a template an artificial mRNA having a repeat structure of multiple genetic codons different from each other;

(ii) preparing aminoacyl-tRNAs wherein a corresponding naturally-occurring amino acid binds to tRNA and misaminoacyl-tRNAs wherein a non-corresponding naturally-occurring or non-naturally-occurring amino acid binds to tRNA, in which said aminoacyl-tRNAs and misaminoacyl-tRNAs correspond to each of said multiple genetic codons and are Used in the following step (iii); and

(iii) adding one or more aminoacyl-tRNAs or misaminoacyl-tRNAs, wherein an amino acid component to be incorporated into said peptide or protein binds to tRNA, to a system for in vitro protein synthesis containing said mRNA and ribosome, and extending stepwise the chain of said peptide or protein.

5,556,769

COUPLED REPLICATION-TRANSLATION METHODS AND KITS FOR PROTEIN SYNTHESIS

Ying Wu, 4084 Crystal Dawn La., Apt. 201, San Diego, Calif. 92122; Lyubov A. Ryabova, Apt. 51, Bldg., 29, Microraion V, 142297 Puschino, Moscow Region; Oleg V. Kurnasov, Apt. 104, Bldg. 22, Microraion G, 142292 Puschino, Moscow Region, both of Russian Federation; Igor Y. Morosov, 2, rue de Candolle, 75005 Paris, France; Viktor I. Ugarov, Apt. 77, Bldg., 5, Microraion D, 142292 Puschino, Moscow Region, Russian Federation; Elena V. Volianik, 6 Dawson House, Walden Street, London E1.2BD, United Kingdom; Alexander B. Chetverin, Apt. 238, Bldg. 24, Microraion AB, 142292 Puschino, Moscow Region, Russian Federation; David Zhang, 82-24 165th St., Jamaica, N.Y. 11432; Fred R. Kramer, 561 W. 231st St., Riverdale, N.Y. 10463, and Alexander S. Spirin, Apt. 44, Bldg., 27, Microraion V, 142292 Puschino, Moscow Region, Russian Federation

Continuation of Ser. No. 71,290, Jun. 2, 1993, abandoned, which is a continuation of Ser. No. 950,805, Sep. 24, 1992, abandoned. This application Aug. 23, 1994, Ser. No. 294,610

Int. Cl.[6] C12P *21/02;* **C07H** *21/04*

U.S. Cl. 435—69.1 **44 Claims**

1. A coupled replication-translation process for the cell-free synthesis of protein comprising incubating in a single reaction vessel

a. an RNA-directed RNA polymerase, a compatible veplicatable recombinant mRNA, and ribonucleoside triphosphate precursors of RNA; and

b. a cell-free translation system for protein synthesis.

5,556,770

METHOD OF PREPARING A COMPOSITION THAT ENHANCES

Renee J. Sugasawara, Rockville, Md., assignor to Igen, Inc., Gaithersburg, Md.

Continuation of Ser. No. 240,535, May 10, 1994, abandoned, which is a continuation of Ser. No. 101,341, Aug. 2, 1993, abandoned, which is a continuation of Ser. No. 683,086, Apr. 10, 1991, abandoned, which is a continuation of Ser. No. 822,826, Jan. 27, 1986, abandoned. This application Apr. 27, 1995, Ser. No. 430,119

Int. Cl.[6] C07K *1/14;1/16;1/22;* **C12P** *21/00*

U.S. Cl. 435—70.1 **1 Claim**

1. A method to prepare a composition which enhances hybridoma growth said method comprises:

(a) culturing the J774A.1 macrophage cell line (ATCC No. TIB 67) in growth media containing an amount of LPS effective to stimulate the production of a factor which enhances hybridoma growth;

(b) obtaining said growth media from step (a) free of cells and passing said growth media over a polymyxin B Sepharose column to remove said LPS;

(c) recovering fractions from said polymyxin B Sepharose column from which said LPS has been removed;

(d) concentrating the fractions obtained in step (c) by enclosing said fractions in a dialysis bag having a 6000– 8000 MW pore size and diaryzing against carboxymethyl cellulose flakes, to obtain a concentrate;

(e) applying said concentrate to a size-fractionating column; and recovering fractions from said size-fractionating column in the molecular weight range of 35–45 kD wherein the size fractionating column is a Sephacryl s300 column.

5,556,771

STABILIZED COMPOSITIONS OF REVERSE TRANSCRIPTASE AND RNA POLYMERASE FOR NUCLEIC ACID AMPLIFICATION

Nancy L. Shen; Daniel L. Kacian; James G. Putnam, and William M. Davis, all of San Diego, Calif., assignors to Gen-Probe Incorporated, San Diego, Calif.

Filed Feb. 10, 1995, Ser. No. 387,011

Int. Cl.[6] C07H *21/02;21/04;* **C12Q** *1/68;* **C12P** *19/34*

U.S. Cl. 435—91.2 **6 Claims**

1. A kit for amplification of a target nucleic acid comprising a reverse transcriptase and an RNA polymerase combined in a single lyophilized formulation together with a cryoprotectant stabilizing agent selected from the group consisting of trehalose and polyvinyl pyrrolidone, wherein upon rehydration of said lyophilized formulation and addition of the target nucleic acid in the presence of oligonucleotide primers, some or all of said target nucleic acid will be amplified.

5,556,772

POLYMERASE COMPOSITIONS AND USES THEREOF

Joseph A. Sorge, Rancho Santa Fe, and Rebecca L. Mullinax, San Diego, both of Calif., assignors to Stratagene, La Jolla, Calif.

Continuation-in-part of Ser. No. 164,290, Dec. 8, 1993. This application Feb. 16, 1994, Ser. No. 197,791

Int. Cl.[6] C12P *19/34;* **C12Q** *1/68*

U.S. Cl. 435—91.2 **13 Claims**

1. A kit for the synthesis of a polynucleotide, said kit comprising:

(a) a first DNA polymerase, wherein said first polymerase possesses 3'-5' exonuclease activity selected from the group consisting of *Pyrococcus furiosus* DNA polymerase, Thermotoga maritima DNA polymerase, Thermococcus litoralis DNA polymerase, and Pyrococcus GB-D DNA polymerase, and

(b) a second DNA polymerase, wherein said second polymerase lacks 3'-5' exonuclease activity selected from the group consisting of *Thermus aquaticus* DNA polymerase, (exo–) Thermococcus litoralis DNA polymerase, (exo–) *Pyrococcus furiosus* DNA polymerase, and (exo–) Pyrococcus GB-D DNA polymerase.

5,556,773

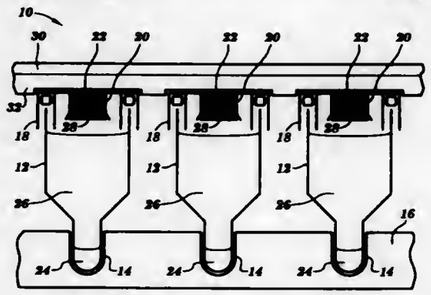
METHOD AND APPARATUS FOR NESTED POLYMERASE CHAIN REACTION (PCR) WITH SINGLE CLOSED REACTION TUBES

Joseph Yourna, 1662 New Scotland Rd., Slingerlands, N.Y. 12159

Continuation-in-part of Ser. No. 103,194, Aug. 6, 1993, abandoned. This application Aug. 18, 1994, Ser. No. 292,524

Int. Cl.[6] C12P *19/34;* **C12Q** *1/68;1/70;* **C12N** *11/02*

U.S. Cl. 435—91.2 **8 Claims**



1. A method for performing a nested polymerase chain reaction in a single, closed reaction container, wherein said nested poly-

merase chain reaction includes first and second amplification processes each comprising at least one amplification step, each amplification step of said first amplification process employing an outer primer set including at least one outer primer, each amplification step of said second amplification process employing an inner primer set including at least one inner primer, comprising the steps of:

introducing a reaction mixture containing the outer primer set for the first amplification process of said nested polymerase chain reaction into a first portion of said reaction container;

physically sequestering a reaction mixture containing the inner primer set for the second amplification process of said nested polymerase chain reaction in a second portion of said reaction container;

closing said reaction container, said reaction container remaining closed during the first and second amplification processes of said nested polymerase chain reaction;

performing the first amplification process of said nested polymerase chain reaction using the reaction mixture for said first amplification process;

introducing the reaction mixture for the second amplification process of said nested polymerase chain reaction into the first portion of said reaction container after performing said first amplification process; and

performing the second amplification process of said nested polymerase chain reaction.

5,556,774

SELECTIVE DETECTION OF VIABLE AND INFECTIOUS CRYPTOSPORIDIUM OOCYSTS WITH THE HELP OF THE POLYMERASE CHAIN REACTION (PCR)

Albrecht Wiedenmann, Waldackerweg 75/1, D-73732 Esslingen, and Renata Filkorn, Justinus Kerner Str. 19, D-72622 Nuertingen, both of Germany

Filed Mar. 14, 1995, Ser. No. 401,232

Claims priority, application Germany, Mar. 16, 1994, 44 08 700.4

Int. Cl.[6] C12P *19/34;* **C12Q** *1/68;* **C07H** *21/04*

U.S. Cl. 435—91.2 **2 Claims**

1. A method for the detection of infectious Cryptosporidium oocysts using the polymerase chain reaction (PCR) comprising:

a) isolating oocysts from a sample material to form a *Cryptosporidium oocyst* suspension;

b) adding to said *Cryptosporidium oocyst* suspension substances or combinations of substances selected from the group consisting of HCL, human or animal gall acids or their salts, or enzymes derived from pancreatic secretions, which simulate in vitro the physiological environment of a human or animal digestive system provoking active excystation of viable and infectious sporozoites;

c) releasing nucleic acids from only said sporozoites;

d) performing PCR amplification of nucleic acids of only actively excysted sporozoites;

e) detecting PCR products as a means of detecting Infectious *Cryptosporidium oocysts.*

5,556,775

METHOD OF PRODUCING β-CYCLODEXTRIN

Isao Karube, Kawasaki, and Nobuyuki Yoshida, Tokyo, both of Japan, assignors to Akebono Brake Industry Co., Ltd., Tokyo, and Akebono Research and Development Center, Ltd., Saitama, both of Japan

PCT No. PCT/JP93/01193, § 371 Date Jun. 22, 1994, § 102(e) Date Jun. 22, 1994

PCT Filed Aug. 25, 1993, Ser. No. 211,920

Claims priority, application Japan, Aug. 25, 1992, 4-226156

Int. Cl.[6] C12P *19/18*

U.S. Cl. 435—97 **6 Claims**

1. A method of producing β-cyclodextrin, comprising the steps of:

enzymatically converting a substrate consisting essentially of maltose into β-cyclodextrin, using cyclodextrin glucanotransferase, in a solution containing 30 to 80 vol % of an organic solvent, at a temperature lower than 40° C., at a pH and for a time sufficient to generate β-cyclodextrin, said organic solvent capable of precipitating 50% or more of β-cyclodextrin if added to a solution containing β-cyclodextrin, wherein only β-cyclodextrin is substantially generated and precipitated in the solution such that any generated β-cyclodextrin is substantially degraded in the absence of said solvent; and

recovering the precipitated β-cyclodextrin from the solution.

5,556,776

SUCRASE GENE DERIVED FROM CORYNEFORM BACTERIA

Makoto Tsuchiya, and Kiyoshi Miwa, both of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Sep. 23, 1994, Ser. No. 311,174

Int. Cl.[6] C12P *13/04;13/14;13/08;* **C07H** *21/04*

U.S. Cl. 435—106 **7 Claims**

1. A DNA fragment having a nucleic acid sequence encoding the polypeptide encoded by the nucleic acid sequence from base 2,338 to base 3,609 of SEQ ID NO:4.

5,556,777

IMMUNOSUPPRESSIVE PHARMACEUTICAL COMPOSITIONS NEW BIOLOGICAL ACTIVITY FROM A MARINE AGROBACTERIUM SP.

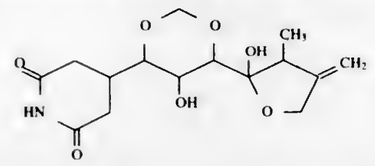
Glynn T. Faircloth, Jr., Cambridge, Mass.; Francisco R. Millan; Librada M. C. Fernandez, both of Leon, Spain, and Cristina A. Sarabia, Madrid, Spain, assignors to PharmaMar, s.a., Madrid, Spain

Filed Sep. 9, 1993, Ser. No. 118,989

Int. Cl.[6] C12N *1/20*

U.S. Cl. 435—118 **2 Claims**

1. A fermentation process for producing and accumulating the compound sesbanimide, which has the following structure:



comprising cultivating Agrobacterium PH-103, CECT 4458 under controlled aerobic fermentation conditions in an aqueous nutrient medium at about neutral pH, and at from about 25° to about 30° C. for from about 30 to about 100 hours, followed by recovery of sesbanimide from the medium.

5,556,778

CRYSTALLINE INHA ENZYME-NADH COMPLEX

James Sacchettini, New Rochelle, N.Y., assignor to Albert Einstein College of Medicine of Yeshiva University, A Division of Yeshiva University, Bronx, N.Y.

Continuation of Ser. No. 307,376, Sep. 16, 1994, abandoned, which is a continuation-in-part of Ser. No. 234,011, Apr. 28, 1994. This application Jun. 16, 1995, Ser. No. 491,146

Int. Cl.[6] C12N *9/02;* **C30B** *29/58*

U.S. Cl. 435—189 **1 Claim**

1. An isolated Inha enzyme-NADH crystallized complex in the form of a hexagon with a space group $P6_222$, and having unit cell constants of a=b=100.1 Å, c=140.4 Å, and α=β=90°, γ=120°.

5,556,779

COMPOUNDS AND METHODS USEFUL FOR REDUCTIVE DEHALOGENATION OF ALIPHATIC HALOCARBONS

Aditya Khindaria, Logan; Thomas A. Grover, Hyde Park, and Steven D. Aust, North Logan, all of Utah, assignors to Utah State University Foundation, Logan, Utah

Continuation-in-part of Ser. No. 1,106, Jan. 5, 1993, Pat. No. 5,389,356. This application Feb. 13, 1995, Ser. No. 388,252

Int. Cl.[6] C12P *3/00;* **C02F** *3/02*

U.S. Cl. 435—192 **35 Claims**

1. A method of degrading an aliphatic halocarbon, the method comprising the steps of:

(1) providing a reaction mixture containing:

(a) a peroxidase to serve as a free radical generating catalyst;

(b) a suitable mediator which can be oxidized by said peroxidase to form the free radical of said mediator, said free radical of said mediator being an oxidizing agent;

(c) a suitable reductant which can be oxidized by said free radical of said mediator to form the free radical of said reductant, said free radical of said reductant being a reducing agent;

(2) exposing an aliphatic halocarbon to the reaction mixture; and

(3) allowing the aliphatic halocarbon to become dehalogenated through reaction with a reducing agent generated within the reaction mixture.

5,556,780

CDNAS ENCODING MOUSE AND RAT TYPE-2 ANGIOTENSIN II RECEPTORS AND THEIR EXPRESSION IN HOST CELLS

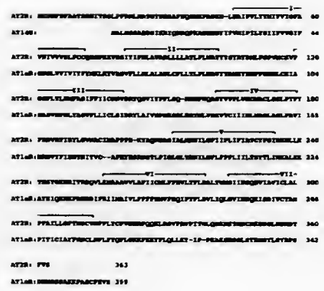
Victor Dzau, and Masashi Mukoyama, both of Stanford, Calif., assignors to The Board of Trustees for the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 100,486, Jul. 30, 1993. This application Nov. 5, 1993, Ser. No. 148,209

Int. Cl.[6] C12N *15/12;15/63;5/10;1/21*

U.S. Cl. 435—240.2 **5 Claims**

1. An isolated nucleic acid other than a natural chromosome encoding the amino acid sequence of SEQ ID NO:2 or SEQ ID NO:3.



5,556,781

DNA ENCODING ENZYME, RECOMBINANT DNA AND ENZYME, TRANSFORMANT, AND THEIR PREPARATIONS AND USES

Michio Kubota, Osaka; Keiji Tsusaki, Okayama; Kazuko Hattori, Okayama, and Toshiyuki Sugimoto, Okayama, all of Japan, assignors to Kabushiki Kaisha Hayashibara Sebutsu Kagaku Kenkyujo, Okayama, Japan

Filed Mar. 7, 1995, Ser. No. 399,646

Claims priority, application Japan, Mar. 7, 1994, 5-59834; Mar. 7, 1994, 5-59840

Int. Cl.[6] C12N *9/24;1/20;15/00;* **C07H** *21/04*

U.S. Cl. 435—200 **26 Claims**

1. A DNA molecule, which is derived from a microorganism selected from the genera consisting of Rhizobium, Arthrobacter, Brevibacterium, and Micrococcus, encoding an enzyme which releases trehalose from a non-reducing saccharide having a trehalose structure as an end unit and having a degree of glucose polymerization of 3 or higher.

5,556,782

TRANSFORMED MAMMALIAN CELLS CAPABLE OF EXPRESSING CECROPIN B

Richard K. Cooper, and Frederick M. Enright, both of Baton Rouge, La., assignors to Board of Supervisors of Louisiana State University and Agricultural & Mechanical College, Baton Rouge, La.

Continuation of Ser. No. 85,282, Jun. 30, 1993, abandoned. This application May 25, 1995, Ser. No. 450,252

Int. Cl.[6] C12N *5/10;15/85*

U.S. Cl. 435—240.2 **8 Claims**

1. A transformed mammalian cell in vitro, wherein said mammalian cell comprises an exogenous gene encoding cecropin B; wherein said cecropin B gene is stably incorporated into a chromosome of said mammalian cell; and wherein the expression of said cecropin B gene is "induced in response to a pathogen of said transformed mammalian cell and is" controlled by an inducible cecropin B promoter identical to the cecropin B promoter contained in the pCEP plasmid of *E. coli* strain ATCC accession number 69342, or is controlled by an inducible promoter having the regulatory properties of the inducible cecropin B promoter contained in the pCEP plasmid of *E. coli* strain ATCC accession number 69342.

5,556,783

METHODS OF CULTURING AND MODULATING THE

5,556,786

ANHIDROTIC ECTODERMAL DYSPLASIA GENE AND

including interfering substances other than fructosamine a measurable second change of color in the same predetermined

tagging each of a predetermined plurality of DNA fragments ending in a different base with a different fluorescent tag;

5,556,783

METHODS OF CULTURING AND MODULATING THE GROWTH OF HAIR FOLLICULAR STEM CELLS

Robert M. Lavker, Malvern, Pa.; Tung-Tien Sun, Scarsdale, and Jing-Shan Yang, New York, both of N.Y., assignors to Trustees of Univ. of Penna, Philadelphia, Pa., and New York Univ., New York, N.Y.

Continuation of Ser. No. 971,687, Nov. 4, 1992, Pat. No. 5,279,969, which is a continuation of Ser. No. 676,185, Mar. 27, 1991, abandoned. This application Jul. 1, 1993, Ser. No. 86,199

Int. Cl.[6] C12N *5/00;5/02*

U.S. Cl. 435—240.21 **7 Claims**

1. A method of culturing hair follicular stem cells comprising:
isolating from the upper portion of a hair follicle a subpopulation of follicular keratinocytes comprising hair follicular stem cells;
dispersing said isolated keratinocytes into a single cell suspension; and
growing said dispersed isolated keratinocytes together with 3T3 feeder cells or in a serum-free medium, thereby producing a hair follicular stem cell culture.

5,556,784

BACILLUS THURINEGIENSIS ISOLATES ACTIVE AGAINST LEPIDOPTERAN PESTS

Chi-Li Liu, Davis, Calif., assignor to Novo Nordisk Entotech, Inc., Davis, Calif.

Continuation-in-part of Ser. No. 981,048, Nov. 24, 1992, abandoned. This application Nov. 23, 1993, Ser. No. 157,363

Int. Cl.[6] C12N *1/20;* **A01N** *63/00*

U.S. Cl. 435—252.5 **3 Claims**

1 2 3 4 5 6 7 8 9 10 11 12 13 14

1. A biologically pure *Bacillus thuringiensis* strain or a spore of said strain, wherein said strain is Bacillus having all the identifying characteristics of *Bacillus thuringiensis* NRRL B-21014 or *Bacillus thuringiensis* NRRL B-21015.

5,556,785

LACTOBACILLUS USED TO ENHANCE IMMUNOLOGICAL FUNCTIONS

Tsunetaro Kishida, Kyoto, Japan, assignor to Institut Pasteur de Kyoto, Kyoto; Shinwa Pharmaceutical Co., Ltd., Toyama, and Nitto Pharmaceutical Industries Ltd., Kyoto, all of Japan

Filed Oct. 27, 1993, Ser. No. 141,599

Claims priority, application Japan, Nov. 24, 1992, 4-313268

Int. Cl.[6] C12B *1/24;1/225*

U.S. Cl. 435—252.9 **7 Claims**

1. A composition comprising powdered *Lactobacillus brevis* subsp. *coagulans* FERM BP-4693.

5,556,786

ANHIDROTIC ECTODERMAL DYSPLASIA GENE AND METHOD OF DETECTING SAME

Juha Kere, Helsinki, Finland; David Schlessinger, University City, Mo., and Albert de la Chapelle, Helsingfors, Finland, assignors to Washington University, St. Louis, Mo.

Filed Apr. 27, 1993, Ser. No. 52,997

Int. Cl.[6] C12N *15/00;* **C07H** *21/04*

U.S. Cl. 435—320.1 **5 Claims**

1. A cloning vector comprising a DNA sequence of the human anhydrotic ectodermal dysplasia (EDA) gene, wherein an RNA preparation of said vector is capable of expressing human EDA gene product in skin cell culture.

5,556,787

MANGANESE III METHOD FOR CHEMICAL OXYGEN DEMAND ANALYSIS

Donald G. Miller, Slater, Iowa, assignor to Hach Company, Ames, Iowa

Filed Jun. 7, 1995, Ser. No. 475,187

Int. Cl.[6] G01N *33/18*

U.S. Cl. 436—62 **21 Claims**

1. A method of analysis of aqueous samples for Chemical Oxygen Demand (COD), said method comprising:
using as an analysis reagent a mixture of stabilized Mn III ion and a concentrated inorganic acid, and
adding to said analysis reagent a test amount of an aqueous sample, and thereafter determining from the amount of Mn III ion reduced to Mn II ion, the COD of said aqueous sample.

5,556,788

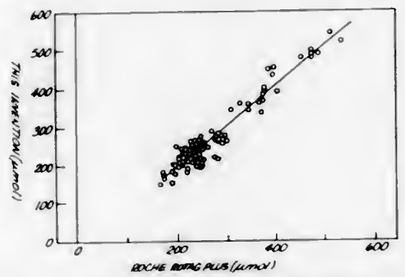
FRUCTOSMAINE REAGENT AND CALIBRATOR SYSTEM

Shing F. Kwan, Ventura, and Marjorie Bravo-Leerabhandh, Thousand Oaks, both of Calif., assignors to Medical Analysis Systems, Inc., Camarillo, Calif.

Continuation of Ser. No. 895,606, Jun. 8, 1992, Pat. No. 5,312,760. This application May 9, 1994, Ser. No. 239,610

Int. Cl.[6] G01N *33/74*

U.S. Cl. 436—87 **6 Claims**



1. A reagent system for the determination of fructosamine in sera which comprises:
(a) a first liquid alkaline aqueous reagent containing a tetrazolium salt which reacts with all reactive substances in sera including fructosamine and interfering substances to exhibit a measurable first change of color within a predetermined time span of less than about 10 minutes in consequence of the reaction of the tetrazolium salt with fructosamine and the interfering substances; and
(b) a second alkaline aqueous reagent identical to the first alkaline aqueous reagent but including a substance which inhibits reaction of fructosamine with the tetrazolium salt by binding or complexing to the fructosamine to produce by reduction of the tetrazolium salt with the reactive substances including interfering substances other than fructosamine a measurable second change of color in the same predetermined time span as the first reagent to enable the determination of fructosamine concentration in sera by the difference in the first color change produced using the first alkaline aqueous reagent which reacts with fructosamine and the second color change produced using the second alkaline aqueous reagent, each color change produced on the same proportional amount of sera and after identical predetermined time spans.

5,556,789

DEVICE FOR THE SIMULTANEOUS DETERMINATION OF SEVERAL ANALYTES

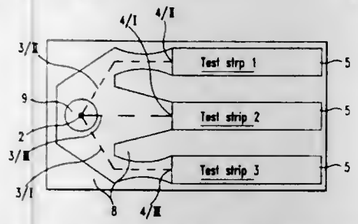
Ada Goerisch-Graw, Grosskarlbach; Reinhard Baer, Mannheim, and Rolf Lerch, Ilvesheim, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

Filed Jul. 1, 1994, Ser. No. 270,162

Claims priority, application Germany, Jul. 15, 1993, 43 23 672.3

Int. Cl.[6] G01N *33/00*

U.S. Cl. 436—169 **10 Claims**



1. Device for delivery of a liquid sample to multiple withdrawal zones at substantially the same time, said device comprising
a plurality of sample withdrawal zones,
fibrous capillary active transport means comprising a sample application zone and a plurality of transport paths connecting respective said sample withdrawal zones to said sample application zone, said fibrous capillary active transport means being free of reagents which react with analytes to be determined, and
retardation means provided in at least one of said transport paths and arranged so that liquid sample applied to said sample application zone arrives simultaneously at each of said sample withdrawal zones.

5,556,790

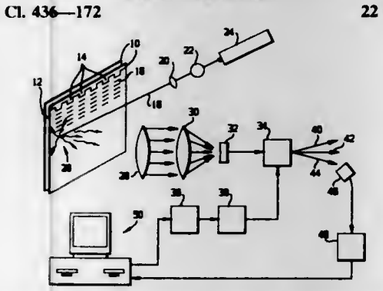
METHOD FOR AUTOMATED DNA SEQUENCING

John W. Pettit, 7808 Potters Mill Ct., Derwood, Md. 20855

Filed Dec. 5, 1994, Ser. No. 353,311

Int. Cl.[6] G01N *33/68*

U.S. Cl. 436—172 **22 Claims**



1. A method for automating the sequencing of DNA fragments, comprising the steps of:
tagging each of a predetermined plurality of DNA fragments ending in a different base with a different fluorescent tag;
stimulating the emission of light at its characteristic wavelength from each of said fluorescent tagged plurality of DNA fragments;
focusing the emission of fluorescent light from each of said fluorescent tagged plurality of DNA fragments as substantially parallel rays of light onto an acousto-optic tunable filter;
controlling the operation of said acousto-optic tunable filter under control of a digital data processor such that only light at a predetermined wavelength is diffracted and exits from said acoustic-optic tunable filter at at least one angle to a main beam of light exiting from said acousto-optic tunable filter; and
detecting at least one diffracted light beam exiting said acoustic-optic tunable filter to produce an electrical representation of said fluorescent light emissions of said plurality of DNA fragments.

5,556,791

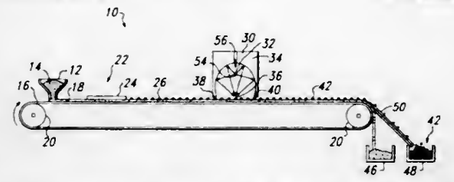
METHOD OF MAKING OPTICALLY FUSED SEMICONDUCTOR POWDER FOR SOLAR CELLS

Gary D. Stevens, Dallas, Tex., and Francois A. Padovani, Westwood, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 3, 1995, Ser. No. 368,229

Int. Cl.[6] H01L *31/18*

U.S. Cl. 437—4 **14 Claims**



1. A method of forming semiconductor particles, comprising the steps of:
a) defining a plurality of spaced piles of semiconductor feedstock upon a refractory layer; and
b) directing optical energy to said plurality of semiconductor feedstock piles of sufficient energy to at least partially melt said semiconductor feedstock and define said semiconductor particles, wherein said method further comprising the step of defining said refractory layer upon a conveyor medium, and advancing said conveyor medium to advance said semiconductor feedstock piles past said directed optical energy.

5,556,792

PROCESS FOR MANUFACTURING A POWER INTEGRATED CIRCUIT ("PIC") STRUCTURE WITH A VERTICAL IGBT

Raffaele Zambrano, San Giovanni la Punta, Italy, assignor to Consorzio per la Ricerca sulla Microelecttronica Nel Mezzogiorno, Catania, Italy

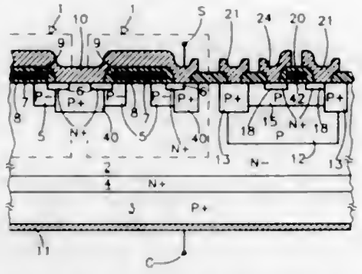
Division of Ser. No. 443,908, May 17, 1995. This application Jun. 7, 1995, Ser. No. 472,196

Claims priority, application European Pat. Off., May 19, 1994, 94830230

Int. Cl.[6] H01L *21/70;49/00*

U.S. Cl. 437—6 **10 Claims**

1. A process for manufacturing a PIC structure comprising a vertical IGBT and a driving and control circuit comprising at least first conductivity type-channel MOSFETs, the method comprising the steps of:
a) forming at least one buried region of a second conductivity type within a lightly doped semiconductor layer of a first conductivity type superimposed over a heavily doped semi-



conductor substrate of the second conductivity type providing a first electrode of the vertical IGBT;

b) selectively introducing a dopant of the second conductivity type into the lightly doped semiconductor layer to form at least one well region of the second conductivity type;

c) selectively introducing a high dose of a dopant of the second conductivity type into the lightly doped semiconductor layer to simultaneously form heavily doped body regions for the IGBT, and at least one heavily doped annular region defining, with a respective buried region, a lightly doped isolated region of the first conductivity type isolated from the lightly doped semiconductor layer and containing at lease one well region of the second conductivity type;

d) forming a gate oxide layer over the lightly doped semiconductor layer;

e) forming a polysilicon layer over the gate oxide layer;

f) selectively removing the polysilicon layer to form insulated gate regions for the IGBT and for the MOSFETs of the driving and control circuitry;

g) selectively introducing a dopant of the second conductivity type into the lightly doped semiconductor layer to form body regions for the IGBT;

h) selectively introducing a high dose of a dopant of the first conductivity type into the heavily doped body regions and the body regions to form a second electrode of the IGBT, and into the well region, at the sides of the insulated gate regions, to form source and drain regions for the MOSFETs of the driving and control circuitry.

5,556,793

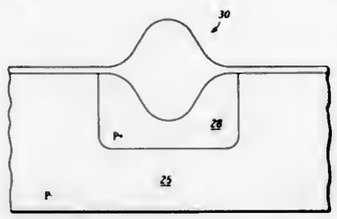
METHOD OF MAKING A STRUCTURE FOR TOP SURFACE GETTERING OF METALLIC IMPURITIES

Steven J. Adler, Tempe; George W. Hawkins, Mesa; Israel A. Lesk, Phoenix; Peter L. Pegler, and Hassan Pirastehfar, both of Mesa, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 842,953, Feb. 28, 1992, abandoned. This application Nov. 1, 1993, Ser. No. 144,623

Int. Cl.[6] H01L *21/322*

U.S. Cl. 437—11 **5 Claims**



1. A method for fabricating a top surface gettering structure, which comprises the steps of:

providing a semiconductor chip having at least one active area and at least one inactive area;

doping a first region of the at least one inactive area through a top surface, the dopant surface concentration of the first region being at least approximately 5×10^{19} atoms/cm^3;

forming at least one oxide layer having a bird's head structure in the first region in contact with at least one portion of the first region having the dopant; and

forming a plurality of precipitation nuclei along a border of the first region and the oxide layer.

5,556,794

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING LOW SODIUM CONCENTRATION

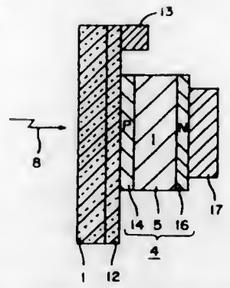
Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Division of Ser. No. 350,115, Nov. 29, 1994, which is a division of Ser. No. 694,406, May 1, 1991, Pat. No. 5,391,893, which is a continuation-in-part of Ser. No. 860,441, May 7, 1986, Pat. No. 5,043,772. This application May 10, 1995, Ser. No. 438,374

Claims priority, application Japan, May 7, 1985, 60-96391; May 7, 1985, 60-96392

Int. Cl.[6] H01L *21/306;31/20*

U.S. Cl. 437—13 **7 Claims**



1. In a method of manufacturing a semiconductor device having a non-single crystalline semiconductor layer comprising an intrinsic silicon which contains hydrogen or halogen and is formed by a vapor phase reaction in a reaction chamber, the improvement comprising the step of treating the inside of said reaction chamber with a gas containing chlorine prior to the formation of said semiconductor layer at a sufficiently high temperature in order to remove sodium from the inside of the reaction chamber.

6. A method of manufacturing a semiconductor device comprising the steps of:

removing sodium from an inside of a reaction chamber; and then

forming a non-single crystalline semiconductor layer comprising an intrinsic silicon semiconductor containing hydrogen or halogen on a substrate by a vapor phase reaction in said reaction chamber,

wherein said semiconductor layer contains sodium at a concentration less than 5×10^{18} atoms/cm^3.

5,556,795

QUANTUM WELL SUPERLUMINESCENT DIODE

Charles B. Morrison, Brewster, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 819,548, Jan. 10, 1992, Pat. No. 5,329,134. This application Feb. 25, 1994, Ser. No. 202,146

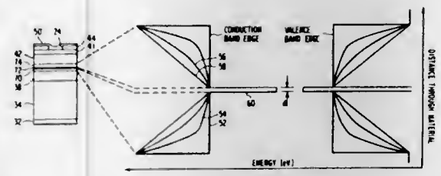
Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—23 **17 Claims**

1. A method of making a superluminescent diode including steps of:

forming an active layer having a thickness on an order of a carrier deBroglie wavelength;

forming a quantum well in said active layer;



forming a waveguide adjacent said active layer, said waveguide being formed to have ends and an axis; and

forming termination means at said ends of said waveguide, wherein said termination means are inclined with respect to said axis.

5,556,796

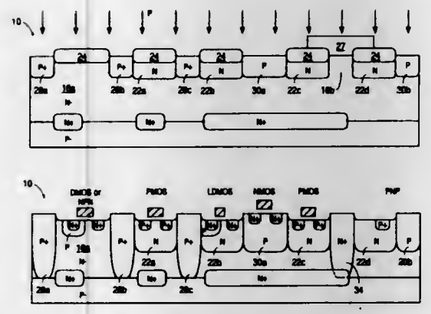
SELF-ALIGNMENT TECHNIQUE FOR FORMING JUNCTION ISOLATION AND WELLS

Martin E. Garnett, Los Gatos, and Michael R. Hsing, San Jose, both of Calif., assignors to Micrel, Inc., San Jose, Calif.

Filed Apr. 25, 1995, Ser. No. 428,929

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—31 **17 Claims**



2. A method for forming a semiconductor structure comprising the steps of:

(1) forming a patterned nitride layer overlying a semiconductor material of a first conductivity type to expose first portions of said semiconductor material;

(2) depositing dopants of either said first conductivity type or a second conductivity type into said first portions as defined by said nitride layer to form first doped regions in said semiconductor material;

(3) growing a layer of oxide over said first doped regions;

(4) removing said nitride layer, but not removing said oxide, to expose second portions of said semiconductor material previously underlying said nitride layer;

(5) forming a first masking layer to selectively mask one or more of said second portions from dopants in a subsequent doping step; and

(6) depositing dopants of either said first conductivity type or said second conductivity type into said second regions not masked by said first masking layer to form second doped regions, said oxide masking said first doped portions from dopants during this step, said second doped regions being self-aligned with said first doped regions, wherein said semiconductor-material is an epitaxial layer of said first conductivity type formed over a substrate of said second conductivity type, wherein said first doped regions are well regions of said first conductivity type, and wherein said second doped regions are isolation regions of said second conductivity type extending from a surface of said epitaxial layer to said substrate.

5,556,797

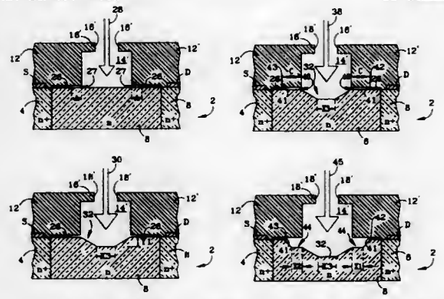
METHOD OF FABRICATING A SELF-ALIGNED DOUBLE RECESS GATE PROFILE

Tom Y. Chi, San Gabriel; Liping D. Hou, Rancho Palos Verdes; Kusol Lee, Gardena; Danny Li, Torrance; Isbver K. Naik, Rancho Palos Verdes, and Tom Quach, Torrance, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 30, 1995, Ser. No. 453,676

Int. Cl.[6] H01L *21/8258*

U.S. Cl. 437—405 **11 Claims**



1. A method of forming a desired recess profile in a semiconductor substrate, comprising:

forming a first mask layer in direct contact with said substrate, wherein said first mask layer has a thickness of 30–70 angstroms,

forming a second mask layer with an opening over said first mask layer;

forming an initial opening through said first mask layer to expose the substrate beneath said first opening in said second mask layer, with said initial opening being at least as wide as said first opening in said second mask layer,

forming an initial recess in said substrate through said first opening in said second mask layer, wherein said initial recess has a first width,

uniformly expanding said initial opening in said first mask layer to form a subsequent opening in Said first .mask layer, and

forming a second recess in said substrate wherein said second recess has a second width which is wider than said first width and is centered on said initial recess.

5,556,798

METHOD FOR ISOLATING NON-VOLATILE MEMORY CELLS

Gary Hong, Hsin-Chu, Taiwan, assignor to United Microelectronics Corp., Hsinchu, Taiwan

Filed Dec. 1, 1994, Ser. No. 347,715

Int. Cl.[6] A01L *21/8247*

U.S. Cl. 437—43 **7 Claims**

1. A method of fabricating semiconductor integrated circuit non-volatile memory cells having memory cell isolation comprising the steps of:

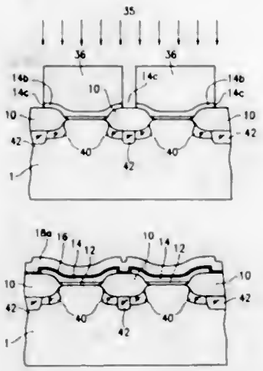
defining active regions of said memory cells on a semiconductor substrate of a first conductivity type by forming a masking layer, said masking layer leaving exposed regions of the semiconductor substrate;

implanting impurities of the first conductivity type into said semiconductor substrate to form lightly-doped regions of the first conductivity type in the regions exposed by said masking layer;

utilizing said masking layer as shielding for an oxidation procedure of said semiconductor substrate to form field oxide layers of said memory cells on top of said lightly-doped regions of the first conductivity type;

removing said masking layer;

forming an oxide layer on top of said active regions of said memory cells;



forming floating gate strip layers for said memory cells each on top of one of said field oxide layers and said oxide layer, wherein said floating gate strip layers are divided by isolating trenches and aligned on top of said oxide layers with edges extending outwardly to cover a portion of the width of said field oxide layers;

implanting impurities of the first conductivity type through said isolating trenches between said floating gate strip layers to form heavily-doped regions of the first conductivity type in said semiconductor substrate, said heavily-doped regions being formed within said lightly-doped regions located underneath said field oxide layers;

forming subsequently on top of said substrate a gate dielectric layer and word line polysilicon layer and implementing an etching procedure against said gate dielectric and word line polysilicon layers to form independent word lines and isolated floating gate layers, said floating gate layers being covered by said word lines; and

implanting impurities of a second conductivity type into said active regions utilizing said word lines and field oxide layers as masks to form drains and sources for said memory cells.

5,556,799

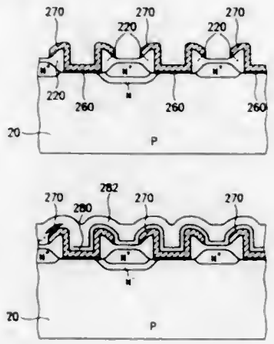
PROCESS FOR FABRICATING A FLASH EEPROM

Gary Hong, Hsinchu, Taiwan, assignor to United Microelectronics Corporation, Hsinchu, Taiwan

Filed Nov. 13, 1995, Ser. No. 558,957

Int. Cl.[6] H01L *21/8247*

U.S. Cl. 437—43 **5 Claims**



1. A process for fabricating a flash EEPROM device on a semiconductor substrate of a first conductivity type, comprising the steps of:

forming a shielding layer with designated patterns over a surface of said semiconductor substrate, said designated patterns extending in a first direction;

forming field oxide layers among said shielding layer, wherein said field oxide layers encroach beneath side edges of said shielding layer;

forming regions of a second conductivity type in said semiconductor substrate underlying said shielding layer, said regions constituting a plurality of bit lines of said flash EEPROM device;

removing a portion of said field oxide layers not covered by said shielding layer to form trenches and provide an exposed semiconductor substrate;

removing said shielding layer;

forming tunnel oxide layers on said exposed semiconductor substrate;

forming floating gates over said tunnel oxide layers and said field oxide layers;

forming an inter-gate dielectric layer over said floating gates; and

forming control gates over said inter-gate dielectric layer, said control gates extending in a second direction and constituting a plurality of word lines for said flash EEPROM device.

5,556,800

METHOD OF MANUFACTURING A MASK READ ONLY MEMORY (ROM) FOR STORING MULTI-VALUE DATA

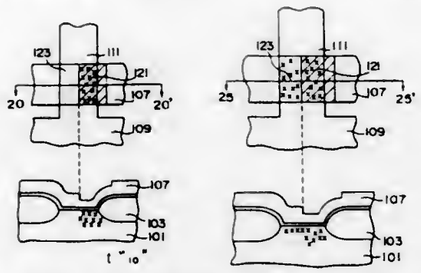
Makoto Takizawa, and Kazunori Kanebako, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 42,676, Apr. 5, 1993, Pat. No. 5,386,381. This application Sep. 30, 1994, Ser. No. 312,906

Claims priority, application Japan, Apr. 3, 1992, 4-81236

Int. Cl.[6] H01L *21/266;21/8246*

U.S. Cl. 437—45 **3 Claims**



1. A method of manufacturing a multi-value mask read-only memory (ROM), comprising the steps of:

forming a second conductivity type source and drain regions in a first conductivity type primary conductive region;

forming a gate insulation layer on a channel region of said primary semiconductor region adjacent to the source and the drain regions;

forming a gate electrode on said gate insulation layer;

etching said gate electrode such that thickness of a first portion of said gate electrode is reduced compared to thickness of a second portion of said gate electrode;

a step of implanting ions through said gate electrode forming a mask member containing openings which are selectively formed corresponding to the data to be written; and

performing a data writing step comprising implanting first energy ions through said gate electrode using said mask member to form a first channel subregion under the first portion of said gate electrode and a second channel subregion under the second portion of said gate electrode,

wherein the concentration and depth of the implanted ions is greater in said first channel subregion than in said second channel subregion.

5,556,801

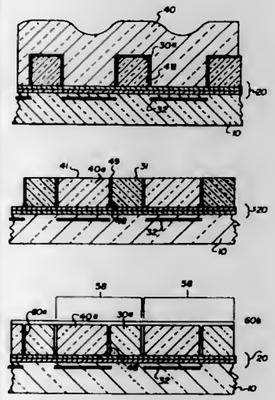
METHOD OF MAKING A PLANAR CHARGE COUPLED DEVICE WITH EDGE ALIGNED IMPLANTS AND INTERCONNECTED ELECTRODES

Gilbert A. Hawkins, Mendon, and Robert L. Nielsen, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 23, 1995, Ser. No. 376,699

Int. Cl.[6] H01L *21/265;21/70;27/00*

U.S. Cl. 437—50 **10 Claims**



1. In a CCD, a method of connecting electrically a first and second set of spaced conductive strips separated by vertical regions of an insulating material, resulting in a planar structure, the method comprising:

(a) planarizing a set of interleaved first and second conductive strips separated by an insulative material to expose the surfaces of the set of interleaved first and second conductive strips and the surface of the insulative material;

(b) etching the insulative material in regions separating alternate pairs of conductive strips, the etched regions contiguous with portions of the sides of the first and second conductive strips;

(c) filling said etched regions with a conductive interconnect material; and

(d) removing portions of the conductive interconnect material so that the conductive interconnect material is removed from regions over the set of interleaved first and second conductive strips.

5,556,802

METHOD OF MAKING CORRUGATED VERTICAL STACK CAPACITOR (CVSTC)

Paul E. Bakeman, Jr., South Burlington, Vt.; Bomy A. Chen, Hopewell Junction, N.Y.; John E. Cronin; Steven J. Holmes, both of Milton, Vt., and Hing Wong, Norwalk, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

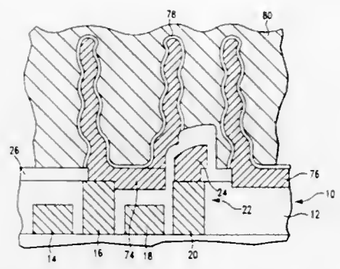
Filed Jun. 7, 1995, Ser. No. 486,630

Int. Cl.[6] H01L *21/8242*

U.S. Cl. 437—52 **9 Claims**

1. A method for forming a capacitive structure on a semiconductor substrate, said substrate having a top layer of a nonconductive material, said substrate including a contact structure below said top layer; the method comprising the steps of:

(a) applying a photoresist material to a top layer of said substrate so as to provide a predetermined array to establish a plurality of prominences of said photoresist material separated by at least one separation area, each respective prominence of said plurality of prominences extending a prominence height from said top layer to a prominence top;



(b) exposing said array to coherent light in a manner establishing a standing wave pattern substantially normal to said top layer within each said at least one separation area;

(c) developing said photoresist material to fix a generally erose face on each said respective prominence, each said face extending from said top layer to said prominence top for each said respective prominence;

(d) depositing a first oxide material intermediate selected pairs of prominences of said plurality of prominences, said depositing effecting accumulation of said first oxide material to an oxide height, said oxide height being at least equal to said prominence height;

(e) etching said first oxide material as required to effect exposure of each said prominence top;

(f) dissolving said photoresist material to uncover a plurality of oxide mandrels; each respective mandrel of said plurality of mandrels extending a mandrel height from said top layer to a mandrel top, each said respective mandrel having a generally erose mandrel face intermediate said top layer and said mandrel top;

(g) etching said top layer sufficiently to at least partially expose said contact structure;

(h) depositing a first silicon material over selected said respective mandrels and over said top layer and said contact structure intermediate said selected mandrels;

(i) depositing a photoresist material over said first silicon material:

(j) etching said photoresist material and said first silicon material to said mandrel height or less to establish a node electrode for said capacitive structure;

(k) stripping substantially all said photoresist material remaining;

(l) stripping said first oxide material to eliminate at least said selected mandrels;

(m) depositing a second oxide material over said node electrode to establish a dielectric layer for said capacitive structure; and

(n) depositing a second silicon material over said dielectric layer to establish a plate electrode for said capacitive structure.

5,556,803

METHOD FOR FABRICATING A CHARGE COUPLED DEVICE

Kyung S. Lee, Seoul, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Chungchungbuk-do, Rep. of Korea

Division of Ser. No. 354,740, Dec. 8, 1994. This application Jun. 7, 1995, Ser. No. 480,720

Int. Cl.[6] H01L *21/70*

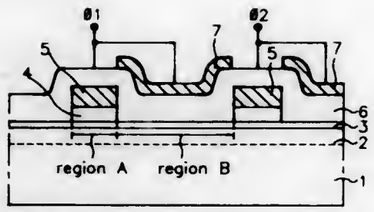
U.S. Cl. 437—53 **3 Claims**

1. A method for fabricating a charged coupled device (CCD) comprising the steps of:

forming a first insulation layer on a semiconductor substrate;

forming a second insulation layer on the first insulation layer, said second insulation layer has a first thickness, a first dielectric constant, and different physical properties than said first insulation layer;

forming a first conductive layer on the second insulation layer;



patterning the first conductive layer and the second insulation layer to form a plurality of spaced first electrodes;

forming a third insulation layer on the entire surface of the substrate, said third insulation layer has a second thickness greater than said first thickness, a second dielectric constant less than said first dielectric constant, and different physical properties than said second insulation layer;

forming a second conductive layer on the third insulation layer; and

forming second electrodes on a portion of the surface of the third insulation layer that overlies an upper side of spaces between the plurality of first electrodes by patterning the second conductive layer.

5,556,804

METHOD OF MANUFACTURING SEMICONDUCTOR LASER

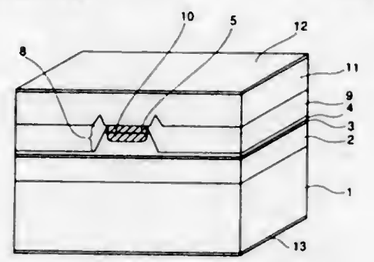
Yutaka Nagai, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1994, Ser. No. 352,496

Claims priority, application Japan, Dec. 10, 1993, 5-309600

Int. Cl.[6] H01L *21/20*

U.S. Cl. 437—129 **57 Claims**



1. A method of manufacturing a buried ridge semiconductor laser comprising:

growing semiconductor layers comprising at least a first conductivity type lower cladding layer, an active layer, and a second conductivity type upper cladding layer on a semiconductor substrate;

forming a stripe-shaped impurity diffusion source film comprising atoms producing the second conductivity type when diffused into the upper cladding layer on the upper cladding layer;

ridge-etching the semiconductor layers using the stripe-shaped impurity diffusion source film as an etching mask so that the second conductivity type upper cladding layer has a stripe-shaped ridge;

growing a first conductivity type current blocking layer on both sides of the ridge, burying the ridge; and

forming a high dopant impurity concentration region comprising a dopant producing the second conductivity type in the second conductivity type upper cladding layer of the ridge by diffusing the atoms producing the second conductivity type from the stripe-shaped impurity diffusion source film into the upper cladding layer throughout the ridge in a heat treatment.

5,556,805

METHOD FOR PRODUCING SEMICONDUCTOR DEVICE HAVING VIA HOLE

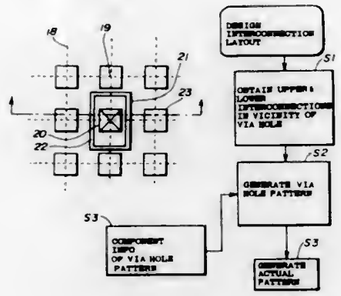
Tetsu Tanizawa, and Hideo Takuda, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 954,467, Sep. 30, 1992, abandoned, which is a continuation of Ser. No. 690,575, Apr. 24, 1991, abandoned. This application Jan. 17, 1995, Ser. No. 372,903

Claims priority, application Japan, Apr. 27, 1990, 2-112923

Int. Cl.[6] H01L *21/283*

U.S. Cl. 437—195 **8 Claims**



1. A method of producing a semiconductor device comprising the steps of:

(a) forming a first interconnection layer and at least one dummy pad on a first layer, the dummy pad being located in the vicinity of and closely adjacent but spaced from the periphery of the first interconnection layer and being of substantially the same thickness as the first interconnection layer;

(b) forming a second layer, of a non-fluid type interlayer insulator material, on the first layer and so as to cover the first interconnection layer and the dummy pad, the portion of the second layer covering the first interconnection layer and extending at least beyond the periphery thereof and toward the dummy pad being of substantially uniform thickness and having an upper surface which is substantially planar and of substantially uniform height relative to the first layer;

(c) forming a via hole in the portion of the second layer having a substantially planar upper surface by use of a mask, the via hole extending transversely from the upper surface and through the second layer thereby to expose a corresponding portion of the surface of the first interconnection layer, said dummy pad being formed substantially only in the vicinity of but displaced from the via hole;

(d) forming a second interconnection layer on the second layer and extending through the via hole into electrical contact with the first interconnection layer, said dummy pad being electrically isolated from the first and second interconnection layers;

(e) generating a dummy pad pattern by a computer aided design (CAD) based on via hole arrangement information and component information of via hole pattern for use in at least said steps (a) and (c), said via hole arrangement information at least including information related to position of the via hole, said component information of via hole pattern including at least a via hole pattern indicative of the shape of the via hole and position of dummy pads with respect to the via hole; and

(f) forming the mask based on the via hole pattern for use in said step (c).

5,556,806

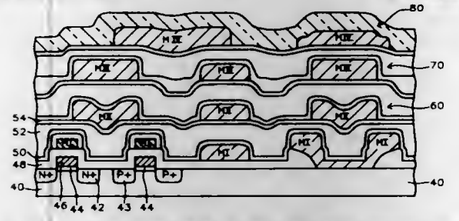
SPIN-ON-GLASS NONETCHBACK PLANARIZATION PROCESS USING OXYGEN PLASMA TREATMENT

Sheg-Liang Pan; Hsien-Wen Chang, both of Hsin-Chu, and Chien-Fong Chen, Taichung, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Hsin-Chu, Taiwan

Filed Jun. 28, 1995, Ser. No. 496,017

Int. Cl.[6] H01L *21/28*

U.S. Cl. 437—195 **21 Claims**



1. A method for planarization of dielectric layers between conductor layers in integrated circuit devices comprising:

providing a semiconductor substrate having devices formed within and on its surface and with at least one patterned conductive layer thereover,

depositing a first silicon oxide layer over said patterned conductive layer,

exposing said first silicon oxide layer to a plasma containing only oxygen (O_2) thereby roughening the surface of said first silicon oxide layer,

covering said first silicon oxide layer with a spin-on-glass layer,

baking and vacuum degassing said spin-on-glass layer,

curing said spin-on-glass layer, and

forming a second silicon oxide layer over said spin-on-glass layer to complete said planarization.

5,556,807

ADVANCE MULTILAYER MOLDED PLASTIC PACKAGE USING MESIC TECHNOLOGY

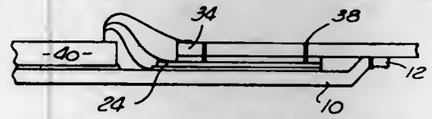
Bidyut K. Bhattacharyya; Debendra Mallik, both of Chandler, Ariz.; Syunsuke Ban, Hyogo, Japan; Takatoshi Takikawa, Hyogo, Japan, and Shosaku Yamanaka, Hyogo, Japan, assignors to Intel Corporation, Santa Clara, Calif.

PCT No. PCT/US93/01481, § 371 Date Jun. 14, 1994, § 102(e) Date Jun. 14, 1994, PCT Pub. No. WO93/16492, PCT Pub. Date Sep. 19, 1993

PCT Filed Feb. 18, 1993, Ser. No. 140,070

Int. Cl.[6] H01L *21/60*

U.S. Cl. 437—209 **29 Claims**



1. A method of constructing an integrated circuit package for an integrated circuit, comprising the steps of:

a) providing a conductive plate having at least one tab;

b) attaching a first layer of insulative material to said conductive plate;

c) attaching a first layer of conductive material to said first layer of insulative material;

d) forming at least one hole in a second layer of insulative material;

e) attaching said second layer of insulative material to a lead frame;

f) filling said hole of said second layer of insulative material with a conductive material;

g) attaching said second layer of insulative material to said first layer of conductive material such that said conductive material within said hole electrically couples said first layer of conductive material to said lead frame; and,

attaching said tab of said conductive plate to said lead frame such that said conductive plate is electrically coupled to said lead frame.

5,556,808

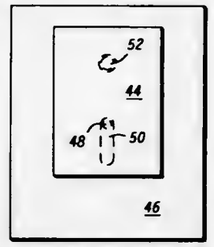
METHOD FOR ALIGNING A SEMICONDUCTOR DEVICE

William M. Williams, Gilbert; Barbara Vasquez; Marlene J. Begay, both of Chandler, and Patrick Thompson, Gilbert, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Jun. 30, 1994, Ser. No. 268,986

Int. Cl.[6] H01L *21/60*

U.S. Cl. 437—209 **41 Claims**



1. A method for aligning a semiconductor device comprising the steps of:

providing a semiconductor device;

providing a first physical alignment feature at a center of thermal expansion of the semiconductor device;

providing a second physical alignment feature at a location away from the center of thermal expansion of the semiconductor device;

providing a substrate having a third physical alignment feature; and

mating the first and second physical alignment features with the third physical alignment feature.

5,556,809

DIRECT-CONTACT TYPE IMAGE SENSOR DEVICE, AN IMAGE SENSOR UNIT, AND METHODS FOR PRODUCING THE SAME

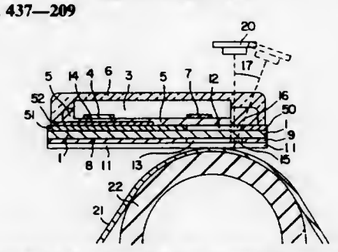
Masahiro Nakagawa, Osaka; Tetsuro Nakamura, Takarazuka; Shinji Fujiwara, Kobe, and Eiichiro Tanaka, Kishiwada, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 141,328, Oct. 21, 1993, Pat. No. 5,477,047. This application Dec. 7, 1994, Ser. No. 351,020

Claims priority, application Japan, Oct. 23, 1992, 4-285759; Dec. 8, 1992, 4-327753; Jun. 10, 1993, 5-138225

Int. Cl.[6] H01L *21/60*

U.S. Cl. 437—209 **7 Claims**



1. A method for producing a direct-contact type image sensor device comprising: a light-transmitting substrate having an upper surface and a lower surface; a first conductor layer formed on the

upper surface of the light-transmitting substrate; a second conductor layer formed on the lower surface of the light-transmitting

5,556,811

METHOD OF OPTIMIZING OPERATING PARAMETERS

c) providing the dielectric material with a lift-off layer, which is a layer made of a material that is soluble in organic solvents;

wherein said electroplating step comprises contacting a needle with the mask-coated under metal layer, and supplying DC

upper surface of the light-transmitting substrate; a second conductor layer formed on the lower surface of the light-transmitting substrate; a transparent electrically conductive layer formed on the second conductor layer; and an image sensor chip mounted face-down on the upper surface of the light-transmitting substrate, with an insulating resin layer being interposed between the image sensor chip and the upper surface of the light-transmitting substrate, the image sensor chip being mounted by a flip-chip-bonding method, the first conductor layer including a circuit portion electrically connected to the image sensor chip and a light-interrupting portion for interrupting a portion of a light beam, the light beam being radiated on an original through the light-transmitting substrate by a light source disposed above the light-transmitting substrate, and the second conductor layer including a second circuit portion and a second light-interrupting portion for interrupting a further portion of the light beam,

the method including:

a step for depositing the first conductor layer on the upper surface of the light-transmitting substrate;

a step for patterning the first conductor layer by a photolithography method so as to form the first circuit portion and the first light-interrupting portion by use of the same mask;

a step for depositing the second conductor layer on the lower surface of the light-transmitting substrate; and

a step for patterning the second conductor layer by photolithography method so as to form the second circuit portion and the second light-interrupting portion by use of the same mask.

5,556,810

METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE WHEREIN A SEMICONDUCTOR CHIP IS CONNECTED TO A LEAD FRAME BY METAL PLATING

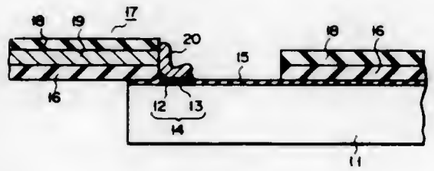
Takao Fujitsu, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 344,605, Nov. 18, 1994, which is a continuation of Ser. No. 77,317, Jun. 15, 1993, abandoned, which is a continuation of Ser. No. 707,763, May 30, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 461,448

Claims priority, application Japan, Jun. 1, 1990, 2-141684

Int. Cl.[6] H01L *21/60*

U.S. Cl. 437—209 **15 Claims**



1. A method of manufacturing a semiconductor device using a lead frame comprising the steps of:

preparing a semiconductor chip having at least one pad on a surface thereof;

preparing a lead frame coated with an insulating film and having at least one electrode pattern, said electrode pattern being formed on the insulating film and having an end face;

adhering said lead frame to said semiconductor chip by use of an adhesive so that the pad on the semiconductor chip and the end face of the electrode pattern are positioned close to each other; and

immersing said lead frame and said semiconductor chip in an electrolytic plating bath, thereby forming a metal layer which electrically connects the pad on the semiconductor chip to the end face of the electrode pattern.

5,556,811

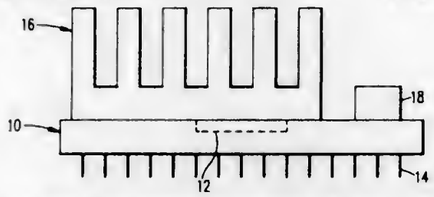
METHOD OF OPTIMIZING OPERATING PARAMETERS OF AN INTEGRATED CIRCUIT PACKAGE HAVING A VOLTAGE REGULATOR MOUNTED THEREON

Willy Agatstein, El Dorado Hills, Calif.; Mostafa Aghazadeh, Chandler; Chia-pin Chiu, Phoenix, both of Ariz.; Amar Ghori, El Dorada Hills; James R. Neal, Cameron Park, both of Calif., and Gregory Turturio, Chandler, Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 172,603, Dec. 21, 1993. This application Jun. 6, 1995, Ser. No. 468,972

Int. Cl.[6] H01L *21/60*

U.S. Cl. 437—209 **6 Claims**



1. A method of assembling an integrated circuit chip package comprising:

A. soldering a chip having an operating voltage input at a center position on a pin grid array (PGA) package;

B. placing a heat sink above said chip on said pin grid array (PGA) package;

C. placing a voltage regulator having an input and an output at an edge of said pin grid array (PGA) package;

D. connecting said output of said voltage regulator to said operating voltage input of said chip;

E. mounting in parallel multi-layer ceramic chip capacitors with an equivalent series resistance (ESR) in the range of between 10 milli Ohms and 100 milli Ohms at 100 khz, and an equivalent series inductance (ESL) in the range of between 0.1 nano henry and 2.0 nano henry; and,

F. connecting said capacitors to said output of said voltage regulator.

5,556,812

CONNECTION AND BUILD-UP TECHNIQUE FOR MULTICHIP MODULES

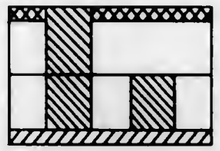
Rainer Leuschner, Erlangen; Helmut Ahne, Roettenbach; Siegfried Birkle, Hoechstadt; Albert Hammerschmidt, Erlangen; Recai Sezi, Roettenbach; Tobias Noll, Aachen, and Ann Dumoulin, Zedelgem, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jun. 27, 1995, Ser. No. 495,246

Claims priority, application Germany, Jun. 27, 1994, 44 22 345.5

Int. Cl.[6] H01L *21/60*

U.S. Cl. 437—209 **20 Claims**



1. A method for manufacturing multichip modules having sequential layers made of a dielectric material with a plurality of conducting tracks embedded therein, comprising the steps of:

a) using a temperature-resistant, base-resistant polymer having a dielectric constant ≦3 as the dielectric material;

b) applying the dielectric material to a non-conductive substrate, which dielectric material serves as an edge boundary for currentless, autocatalytic build-up of the plurality of conducting tracks;

c) providing the dielectric material with a lift-off layer, which is a layer made of a material that is soluble in organic solvents;

d) structuring the dielectric material and the lift-off layer in a single lithographic step, either through direct or an indirect structuring;

e) forming a plurality of grooves having an aspect ratio ≧1 in the dielectric material;

f) applying a metallic seed layer to the dielectric material or to the lift-off layer through vapor deposition in a directed manner;

g) removing the lift-off layer using an organic solvent; and

h) creating the plurality of conducting tracks in the grooves through currentless metal deposition.

5,556,813

Patent Not Issued For This Number

5,556,814

METHOD OF FORMING WIRINGS FOR INTEGRATED CIRCUITS BY ELECTROPLATING

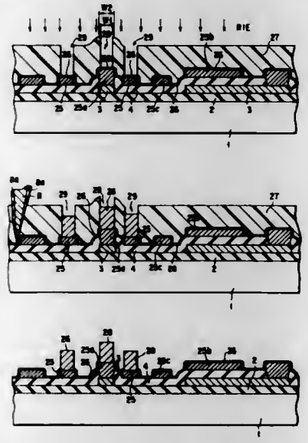
Tomotoshi Inoue, Kawasaki, and Misao Yoshimura, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 27, 1995, Ser. No. 410,744

Claims priority, application Japan, Mar. 28, 1994, 6-056895

Int. Cl.[6] H01L *21/02*

U.S. Cl. 437—230 **18 Claims**



1. A method for forming wirings of an integrated circuit, comprising:

a step of forming wirings on a substrate;

a step of coating the wirings with an under metal layer;

a step of coating the under metal layer with a mask except a part of the under metal layer;

a first etching step of removing the under metal layer which is not coated by the mask to expose upper portions of at least one of the wirings;

an electroplating step of depositing a plating metal layer on the exposed upper portions;

a step of removing the mask; and

a second etching step of removing all of the remaining under metal layer;

wherein said plating metal layer is formed of substantially the same material as that of the exposed upper portions or by a material which can be physically contacted with the exposed upper portions and,

wherein said electroplating step comprises contacting a needle with the mask-coated under metal layer, and supplying DC current to the exposed upper portions in a plating solution through the needles and the under metal layer, thereby permitting a plating metal layer to be deposited on the exposed upper portion.

5,556,815

HIGH TEMPERATURE RESISTANT SILICON NITRIDE CERAMIC

Cornelia Boberski, Liederbach; Hartmut Krüner, Eppstein/Taunus; Günter Riedel, Kelkheim/Taunus, and Rainer Hamminger, Mannheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 170,921, Dec. 21, 1993, abandoned. This application Sep. 26, 1995, Ser. No. 534,059

Claims priority, application Germany, Dec. 23, 1992, 42 43 743.1

Int. Cl.[6] C04B *35/587*

U.S. Cl. 501—97 **15 Claims**

1. A shaped part of sintered silicon nitride ceramic having high mechanical strength consisting essentially of at least 87% by weight Si_3N_4 having crystalline phases of the α- and/or β-form, from 5 to 13% by weight of an additive combination of Al_2O_3 and Y_2O_3, with a Y_2O_3/Al_2O_3 weight ratio being in a range of from 1.1 to 3.4, and additionally from 0 to 1.0% by weight of HfO_2 and/or ZrO_2, wherein the shaped part has a density of greater than 98% of the theoretically possible density and its bending strength is >850 MPa at room temperature and ≧800 MPa at a temperature of 800° C.

5,556,816

METHODS FOR PREPARATION OF TETRAGONAL ZIRCONIA POLYCRYSTAL COMPOSITES

Dae-Joon Kim, Kwangjang Apt. 2-702, Yoido-Dong, Yongdungpo-Ku; Ju-Woong Jang, Shindonga Apt. 4-307, Bon-Dong, Dongjak-Ku, and Hyung-Jin Jung, 208-22, Kungjeon Villa Na-102, Kueui-Dong, Sungdong-Ku, all of Seoul, Rep. of Korea

Filed Mar. 1, 1995, Ser. No. 398,618

Claims priority, application Rep. of Korea, Mar. 15, 1994, 5128/1994

Int. Cl.[6] C04B *35/48*

U.S. Cl. 501—103 **3 Claims**

1. A method for the preparation of tetragonal zirconia polycrystal composite with high toughness and low-temperature degradation resistance, comprising the steps of:

adding 40 to 85 wt % of a non-transformable TZP composition with 15 to 60 wt % of transformable TZP composition to form a mixture; and

sintering the resulting mixture at 1550° C.

5,556,817

CRYOLITE RESISTANT REFRACTORY

Edmund A. Cortellini, North Brookfield, Mass., assignor to Saint Gobain/Norton Industrial Ceramics Corp., Worcester, Mass.

Continuation of Ser. No. 311,810, Sep. 26, 1994, abandoned. This application Nov. 9, 1995, Ser. No. 556,123

Int. Cl.[6] C04B *35/185*

U.S. Cl. 501—128 **3 Claims**

1. A cryolite-resistant refractory for use in a Hall-Heroult aluminum production cell, the refractory consisting essentially of:

a) between about 75 weight percent wt % and about 95 wt % alumina-silica refractory grain,

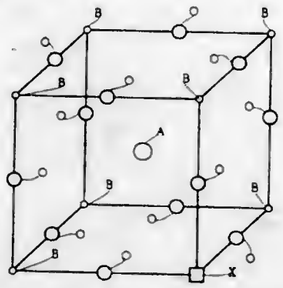
b) between about 2 wt % and about 10 wt % feldspar.

5,556,818

SUBSTITUTED BARIUM-NEODYMIUM-TITANIUM-PEROVSKITE, DIELECTRIC, CERAMIC COMPOSITION, CAPACITOR AND MICROWAVE COMPONENTS

Heinz Kohler, Aachen; Dieter Mateika, Ellerbek, both of Germany, and Sietse Oostra, Roermond, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 30, 1994, Ser. No. 316,273
Int. Cl.[6] C04B *35/46*
U.S. Cl. 501—138 **20 Claims**



1. A substituted barium-neodymium-titanium-perovskite which has a defect structure and which has the following general composition:

$\{A'_{a1}{}^{n1+}\ A''_{a2}{}^{n2+}\ \ldots\ A'''_{an}{}^{n''+}\blacksquare_{an+1}\}\ \{B'_{b1}{}^{m1+}\ B''_{b2}{}^{n2+}\ \ldots\ B'''_{bm}{}^{m''+}\}\ O_3$, wherein the cations $A'_{a1}{}^{a1+}\ A''_{a2}{}^{n2+}\ \ldots\ A'''_{an}{}^{n''+}$ at least comprise Ba^{2+}, Nd^{3+} and, optionally, one or more cations of the group consisting of Cs^{1+}, Rb^{1+}, Tl^{1+}, K^{1+}, Pb^{2+}, Ag^{1+}, Sr^{2+}, Na^{1+}, Bi^{3+}, La^{3+}, Ca^{2+}, Ce^{3+}, Cd^{2+}, Pr^{3+}, Sm^{3+}, Eu^{3+}, Gd^{3+}, Th^{4+}, Tb^{3+}, Mn^{2+}, Li^{1+}, Dy^{3+}, U^{4+}, Y^{3+}, Fe^{2+}, Ho^{3+}, Ce^{4+}, Co^{2+}, Zn^{2+}, Er^{3+}, Tm^{3+}, Yb^{3+}, and/or Lu^{3+},

and the cations $B'_{b1}{}^{m1+}\ B''_{b2}{}^{m2+}\ \ldots\ B'''_{bm}{}^{m''+}$ at least comprise titanium Ti^{4+} and,

optionally, one or more cations of the group consisting of Mn^{2+}, Cr^{2+}, In^{3+}, V^{2+}, Fe^{2+}, Pb^{4+}, Li^{1+}, Zr^{4+}, Co^{2+}, Sc^{3+}, Zn^{2+}, Cu^{2+}, U^{6+}, Mg^{2+}, Hf^{4+}, Mo^{3+}, Sn^{4+}, Ni^{2+}, Nb^{4+}, Ti^{3+}, W^{4+}, Mo^{4+}, Fe^{3+}, Mn^{3+}, V^{3+}, Re^{4+}, Ir^{4+}, Ru^{4+}, W^{5+}, Ta^{5+}, Cr^{3+}, Ga^{3+}, Co^{3+}, Mo^{5+}, Ni^{3+}, Sb^{5+}, W^{6+}, Nb^{5+}, Mo^{6+}, Fe^{4+}, Re^{5+}, V^{4+}, Te^{6+}, V^{5+}, Cu^{3+}, Al^{3+}, Mn^{4+}, Ge^{4+}, and/or Re^{7+}, and

■ are cation vacancies, and

$a_1+a_2+\ \ldots\ +a_{n+1}=1$,

$0.17<a_{n+1}<0.30$,

$b_1+b_2+\ \ldots\ +b_n=1$ and

$a_j{}^*n^1+a_2{}^*n^2+\ \ldots\ +a_n{}^*n^n+b_1{}^*m^1+b_2{}^*m^2+\ \ldots\ +b_m{}^*m^m=6$.

5,556,819

METHOD OF MAKING A FLAME ARRESTING AND CONTAMINANT-ABSORBING FILTER APPARATUS

Amiram Bar-Ilan, Brookline, Mass., assignor to Prototech Company, Needham, Mass.

Division of Ser. No. 885,185, May 19, 1992, Pat. No. 5,431,887. This application Apr. 20, 1995, Ser. No. 425,604
Int. Cl.[6] B01J *38/48;20/10;29/06*
U.S. Cl. 502—22 **4 Claims**

1. A method of producing a flame-arresting filter for use in catalytic broiler smoke abatement assemblies, that comprises surface-oxidizing a stainless steel open pore screen at an elevated temperature; immersing the screen in a substantially electrolyte-free aqueous slurry containing an adsorbent selected from the group consisting of alumina and a zeolite adsorber and containing colloidally dispersed ceria binder; freeing the open pores of the screen from excess slurry; and heating the slurry-coated screen to cause the adsorbent coating to become stabilized and firmly bonded and adhered to the screen by the binder.

4. The method of claim 1 and in which the adsorbed phosphorus compounds are removed by an alkali wash and the adsorbed salts by a water wash.

5,556,820

CATALYST COMPONENT FOR OLEFIN POLYMERIZATION AND PROCESS FOR PRODUCING POLYOLEFINS

Hideo Funabashi; Akinobu Sugahara; Akira Tanaka; Masatoshi Toda; Tsuyoshi Ota; Youichi Matsuo; Tsutomu Akimaru; Sigeo Iwasaki, and Masayuki Tsuruoka, all of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Ichihara, Japan

Continuation-in-part of Ser. No. 743,310, Aug. 27, 1991, abandoned, Ser. No. 972,488, Feb. 17, 1993, abandoned, Ser. No. 971,976, Feb. 24, 1993, abandoned, and Ser. No. 977,392, Mar. 1, 1993, abandoned. This application Mar. 2, 1994, Ser. No. 204,607
Claims priority, application Japan, Dec. 28, 1989, 1-343340; Jun. 17, 1991, 3-171623; Jun. 18, 1991, 3-173024; Jun. 25, 1991, 3-179052; Jun. 28, 1991, 3-183632
Int. Cl.[6] C08F *4/10;4/64*
U.S. Cl. 502—111 **18 Claims**

1. A solid product useful for the preparation of a solid catalyst component for olefin polymerization, which is obtained by the reaction of metallic magnesium, an alcohol, and a halogen in an amount ranging from 0.019 to 0.06 gram-atom for 1 mol of the metallic magnesium.

5,556,821

CATALYST COMPONENT FOR THE POLYMERIZATION OF OLEFINS

Fuyuki Aida, Tokyo; Yoshio Tajima, and Kazuo Matsuura, both of Yokohama, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Jul. 19, 1994, Ser. No. 276,898
Claims priority, application Japan, Jul. 22, 1993, 5-224893
Int. Cl.[6] B01J *31/00*
U.S. Cl. 502—113 **13 Claims**

1. A catalyst component for the polymerization of olefins, comprising:

(1) a compound represented by the general formula R_pMX_{4-p} where M is a transition metal of Group IVa in the Periodic Table, R is a group selected from the group consisting of cyclopentadienyl, substituted cyclopentadienyl, indenyl, substituted indenyl, and an aralkyl group having 7 to 24 carbon atoms, provided R may be bonded together through at least one divalent group selected from the group consisting of alkylene groups having 2 to 8 carbon atoms and silylene groups, X is a halogen atom, a hydrogen atom or a hydrocarbon residue having 1 to 24 carbon atoms, and p is a number satisfying the condition of $1 \leqq p \leqq 4$; and

(2) a compound containing carbon-fluorine bond,

wherein the amount of component (2) is in the range of 0.01 to 100 moles per mole of component (1).

5,556,822

CATALYST SYSTEM FOR POLYERMIZATION OF OLEFIN

Il N. Jung; Joon S. Han; Eun J. Cho, all of Seoul; Young T. Jeong, and Kap K. Kang, both of Kyungsangnam-do, all of Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Filed Jun. 19, 1995, Ser. No. 491,212
Claims priority, application Rep. of Korea, Aug. 12, 1994, 33314/1994
Int. Cl.[6] B01J *21/06*
U.S. Cl. 502—125 **3 Claims**

1. An olefin polymerization catalyst system containing a titanium halide-alkylaluminum Ziegler-Natta catalyst and an electron donor which is an organosilane compound of formula (I):

$$R_1-Si(OR_3)(OR_3)-R_2 \quad (I)$$

wherein R_1 is trimethylsilylmethyl or 2-phenylpropyl; R_2 is cyclopentyl or cyclohexyl; and R_3 is C_1-C_3-alkyl.

5,556,823

CATALYTIC SYSTEM AND PROCESS FOR THE COPOLYMERIZATION OF OLEFINS WITH CARBON MONOXIDE

Anna Sommazi, S. Margherita; Gabriele Lugli, S. Donato Mil.se, and Fabio Garbassi, Novara, all of Italy, assignors to ENICHEM S.p.A., Milan, Italy

Filed Nov. 28, 1994, Ser. No. 348,126
Int. Cl.[6] B01J *31/18*
U.S. Cl. 502—162 **20 Claims**

1. A catalytic system, active in the preparation of alternating copolymers of olefins with carbon monoxide, consisting of:

a) a salt of a metal of Group IB of the Periodic Table of Elements;

b) a bidentate chelating base containing two phosphorus or nitrogen atoms;

c) a Lewis acid; and

d) optionally, an oxidizing agent.

5,556,824

HYDRODEAROMATIZATION OF HYDROCARBONS

Chakka Sudhakar, Wappingers Falls; Frank Dolfinger, Jr., Poughkeepsie; Max R. Cesar, Newburgh, and Jeffrey G. Weissman, Wappingers Falls, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 122,986, Sep. 20, 1993, Pat. No. 5,449,452. This application Jul. 6, 1995, Ser. No. 498,861
Int. Cl.[6] B01J *27/04*
U.S. Cl. 502—202 **4 Claims**

1. A supported, sulfided catalyst characterized by its ability to hydrodearomatize a hydrocarbon feedstock containing aromatics, nitrogen and greater than 0.5 wt % sulfur in the presence of hydrogen which consists essentially of an activated carbon support having a Total Surface Area (Brunaver-Emmett Teller, BET) of between 200^2/g and 2000 m^2/g, a Total Pore Volume (TPV) for nitrogen of about 0.4–1.2 c clg, an Average Pore Diameter by nitrogen physisorption in the range of 16–50 Angstroms, and bearing

(i) 1–50 wt % of at least one Group VIB metal selected from chromium, molybdenum and tungsten;

(ii) 0.1–15 wt % of at least one Group VIII metal; and

(iii) 0.001–10 wt % boron.

5,556,825

AUTOMOTIVE CATALYSTS WITH IMPROVED OXYGEN STORAGE AND METAL DISPERSION

Mordecai Shelef, Bloomfield Village; Rengin K. Usmen, Troy; George W. Graham, Ann Arbor, all of Mich.; William L. H. Watkins, Toledo, Ohio, and Robert W. McCabe, Lathrup Village, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 6, 1995, Ser. No. 369,635
Int. Cl.[6] B01J *23/63*
U.S. Cl. 502—303 **20 Claims**

1. A method for preparing an automotive catalyst system, which comprises the steps of:

providing a substrate;

providing gamma-alumina support material;

depositing lanthana precursor on said alumina support material from an aqueous solution of said precursor in an amount suitable to form a substantially atomic thickness layer of lanthana upon calcination of the precursor;

calcining said lanthana precursor at a temperature of less than about 550° C. to convert said lanthana precursor to a substantially atomic layer of lanthana;

depositing a layer of oxygen storage material precursor selected from the group consisting of ceria precursor, praseodymia precursor, and mixtures thereof on said lanthana layer;

calcining said oxygen storage material precursor at a temperature of less than about 650° C. to convert said oxygen storage precursor to the oxide thereof;

depositing at least a partial layer of catalytic material selected from platinum, palladium, or mixtures thereof on said oxygen storage material; and

calcining said catalytic material at a temperature less than about 550° C. to form said automotive catalytic system.

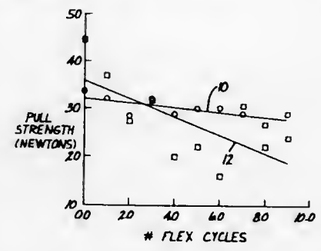
2. The method according to claim 1 wherein said aqueous solution of said lanthana precursor comprises a solution of a soluble lanthanum salt, said deposited lanthana precursor being calcined at a temperature between about 450° C. and about 550° C. forming lanthana.

5,556,826

LASER PERFORATION OF PAPER

Kenneth J. Perrington, Maplewood, and Robert D. Kampfer, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 264,848, Jun. 23, 1994, Pat. No. 5,444,035, which is a continuation of Ser. No. 768,429, Aug. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 570,127, Aug. 17, 1990, abandoned. This application May 18, 1995, Ser. No. 443,472
Int. Cl.[6] B41M *5/20*
U.S. Cl. 503—200 **20 Claims**



1. A form-set of carbonless papers comprising a plurality of perforated sheets, said form-set including at least a first sheet containing a first coating of an encapsulated color-former and a second sheet containing a second coating of a developer, said first and second sheets being positioned such that said first and second coatings are juxtaposed, said form-set made by the process comprising the following steps, in order, of:

(a) providing perforated sheets of carbonless paper by a process including the steps of (i) providing a first carbonless paper having said first coating on at least one surface thereof and a second carbonless paper having said second coating on at least one surface thereof, and (ii) exposing each of said first carbonless paper and second carbonless paper to a laser beam to create a plurality of perforations in each of said first carbonless paper and second carbonless paper, said perforations defining a line between first and second portions of each of said first carbonless paper and second carbonless paper;

(b) processing said perforated sheets by sheet-fed equipment; and

(c) securing said first sheet to said second sheet to form a form-set such that said first and second coatings are juxtaposed.

5,556,827

METHOD FOR PRODUCING REVERSIBLE THERMOSENSITIVE RECORDING MATERIAL

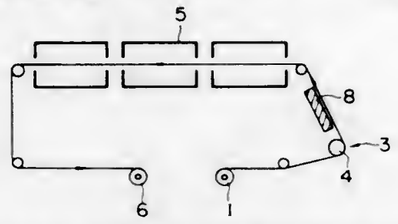
Toru Nogiwa, Numazu; Yukio Konagaya, Shizuoka-ken; Yoshihiko Hotta, Mishima; Kunichika Moroboshi, Numazu; Makoto Kawaguchi, Shizuoka-ken; Akira Suzuki; Fumihito Masubuchi, both of Mishima, and Tsutomu Kagawa, Shizuoka-ken, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 910,509, Jul. 8, 1992, abandoned. This application Feb. 22, 1994, Ser. No. 199,797

Claims priority, application Japan, Jul. 8, 1991, 3-193421; Jul. 3, 1992, 4-200368

Int. Cl.[6] **B41M** *5/36*

U.S. Cl. 503—201 **3 Claims**



1. A method of producing a reversible thermosensitive recording material comprising a support, and a reversible thermosensitive recording layer formed on said support, said reversible thermosensitive recording layer comprising a matrix resin and an organic low-molecular-weight material dispersed in said matrix resin, and capable of reversibly assuming a transparent state and a white opaque state depending upon the temperature thereof, comprising the steps of:

applying a solution or dispersion of said matrix resin and said organic low-molecular-weight material dissolved or dispersed in a solvent to said support, and

drying said applied solution or dispersion with the application of heat thereto in such a manner that when the temperature of said solution or dispersion applied side of said support is t_1, and the temperature of the back side surface of said support, opposite to said solution or dispersion applied side thereof, is t_2, t_1 is lower than t_2, that is, $t_1<t_2$, with the back side surface of said support being heated immediately after the application of said solution or dispersion,

wherein said reversible thermosensitive recording material produced has a length of 50 meters or more.

5,556,828

SAFENED DIMETHENAMID HERBICIDAL COMPOSITIONS

Jutta Glock, Mumpf, Switzerland, and Elmar Kerber, Görwihl, Germany, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 214,738, Mar. 17, 1994, abandoned. This application Dec. 1, 1994, Ser. No. 348,508

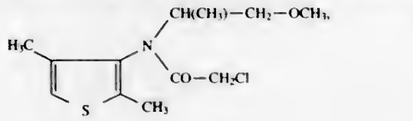
Claims priority, application Switzerland, Mar. 22, 1993, 855/93; Apr. 15, 1993, 1145/93

Int. Cl.[6] **A01N** *25/32*

U.S. Cl. 504—105 **16 Claims**

1. A selective herbicidal composition comprising, in addition to customary inert formulation assistants, a mixture of

a) a herbicidally effective mount of a compound of formula I



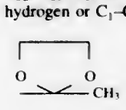
(I)

and

b) to antagonise the herbicide, an antidotally effective amount of a compound of formula II

(II)

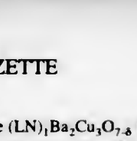
wherein R is a radical of formula



wherein R_{33} and R_{34} are each independently of the other C_1–C_6alkenyl; or R_{33} and R_{34}, taken together, are

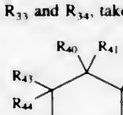
R_{35} and R_{36} are each independently of the other hydrogen or C_1–C_6alkyl;

or R_{33} and R_{34}, taken together, are

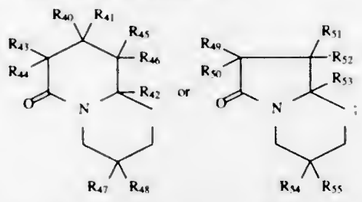


R_{37} and R_{38} are each independently of the other C_1–C_4alkyl, or R_{37} and R_{38}, taken together, are $—(CH_2)_5—$;

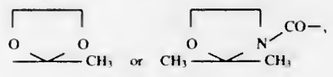
R_{39} is hydrogen, C_1–C_4alkyl or



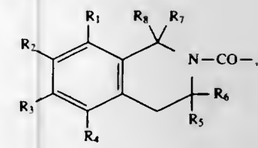
or R_{33} and R_{34}, taken together, are



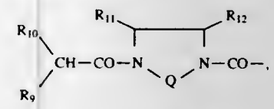
and R_{40}, R_{41}, R_{42}, R_{43}, R_{44}, R_{45}, R_{46}, R_{47}, R_{48}, R_{49}, R_{50}, R_{51}, R_{52}, R_{53}, R_{54} and R_{55} are each independently of one another hydrogen or C_1–C_4alkyl, or R is a radical of formula



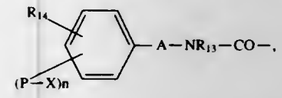
or R is a radial formula



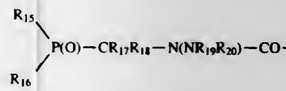
wherein R_1, R_2, R_3 and R_4 are each independently of one another hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy or C_1–C_4haloalkyl, R_5, R_6, R_7 and R_8 are each independently of one another hydrogen, C_1–C_4alkyl or C_1–C_4haloalkyl, or R is a radical of formula



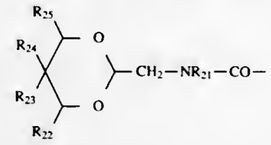
wherein R_9 is C_1–C_4alkyl or halogen, R_{10} is halogen, R_{11} and R_{12} are each independently of the other hydrogen or C_1–C_4alkyl, and Q is C_1–C_4alkylene or alkyl-substituted C_1–C_4alkylene, or R is a radical of formula



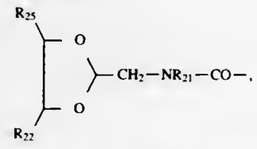
wherein R_{14} is hydrogen, halogen, C_1–C_4alkyl, dioxymethylene, C_1–C_4alkoxy, C_1–C_4alkenyloxy, C_2–C_4alkynyloxy or cyano-C_1–C_4alkyl, P is C_1–C_4alkyl, C_2–C_4 alkenyl, C_2–C_4alkynyl, C_3–C_8cycloalkyl, C_1–C_4alkoxy-C_1–C_4alkyl, C_2–C_4 alkeneoxy-C_1–C_4alkyl, C_2–C_4alkyneoxy-C_1–C_4alkyl, C_1–C_4alkylthio-C_1–C_4 alkyl, C_2–C_4alkenylthio-C_1–C_4alkyl, C_2–C_4alkynylthio-C_1–C_4alkyl, C_1–C_4alkylsulfinyl-C_1–C_4alkyl, C_1–C_4alkylsulfonyl-C_1–C_4alkyl, halo-C_1–C_4alkyl, cyano-C_1–C_4alkyl, 2,2-di-C_1–C_4alkoxy-C_1–C_4alkyl, 1,3-dioxolan-2-yl-C_1–C_4alkyl, 1,3-dioxolan-4-yl-C_1–C_4alkyl, 2,2-di-C_1–C_4alkyl-1,3-dioxolan-4 -yl-C_1–C_4alkyl, 1,3-dioxan-2-yl-C_1–C_4alkyl, 2-benzopyranyl-C_1–C_4alkyl, C_1–C_4 alkoxycarbonyl or C_2–C_4alkenyloxycarbonyl or tetrahydrofurfuryl-C_1–C_4alkyl, the group P-X may also be halogen-C_1–C_4alkyl, X is O, S, SO or SO_2, n is 1, 2 or 3, A is a C_1–C_8hydrocarbon radical or C_1–C_8hydrocarbon radical which is substituted by alkoxy, alkylthio, fluoro, cyano or haloalkyl, and R_{13} is hydrogen, a C_1–C_8hydrocarbon radical, a C_1–C_8hydrocarbon radical which is substituted by alkoxy, polyalkoxy, halogen, cyano or trifluoromethyl, C_3–C_8cycloalkyl, C_1–C_4alkyl-C_3–C_8cycloalkyl, di-C_1–C_4alkoxy-C_1 –C_4alkyl, 1,3-dioxolan-2-yl-C_1–C_4alkyl, 1,3-dioxolan-4-yl-C_1–C_4alkyl, 1,3 -dioxan-2-yl-C_1–C_4alkyl, furyl-C_1–C_4alkyl, tetrahydrofuryl-C_1–C_4alkyl or a radical of formula $—NHCO_2R_{01}$, $—CH_2CO_2R_{01}$, $—CH(CH_3)CO_2R_{01}$ or $—CH(R_{02})—C(R_{03})=NOR_{04}$, wherein R_{01} is methyl, ethyl, propyl, isopropyl or allyl, R_{02} and R_{03} are each hydrogen or C_1–C_4alkyl, and R_{04} is hydrogen, C_1–C_4alkyl, C_2–C_4alkenyl or C_2–C_4alkynyl, or R is a radical of formula $(H_5C_2O)_2P(O)CH_2NHCO—$



wherein R_{15} and R_{16} are each independently of the other hydroxyl, C_1–C_4alkyl, aryl, C_1–C_4alkoxy, C_2–C_4 alkenyloxy, C_2–C_4alkynyloxy, C_2–C_4haloalkoxy, C_2–C_8alkoxyalkoxy, C_1–C_4cyanoalkoxy, C_1–C_4 phenylalkoxy or aryloxy, or aryloxy which is substituted by halogen, cyano, nitro or C_1–C_4alkoxy, R_{17} is hydrogen, C_1–C_4alkyl or phenyl, or phenyl which is substituted by halogen, cyano, nitro or C_1–C_4alkoxy, R_{18} is hydrogen, or C_1–C_4alkyl, R_{19} is hydrogen or a radical of formula $—COCX_1X_2—R_{06}$ or a halogen-substituted alkenoyl radical containing 2 to 4 carbon atoms in the alkenyl moiety, wherein X_1 and X_2 are each independently of the other halogen, or a radical of formula $—COOR_{07}$ or $—COR_{08}$ or a C_1–C_4alkyl, C_2–C_4alkenyl or C_1–C_4phenylalkyl radical which can be substituted at the phenyl ring by halogen, cyano, nitro or C_1–C_4alkoxy, and R_{20} is hydrogen, C_1–C_4alkyl, C_2–C_4 alkenyl or C_2–C_4alkynyl, R_{06} is hydrogen, halogen or C_1–C_6alkyl, R_{07} is C_1–C_4alkyl, C_1–C_4phenylalkyl or C_1–C_4phenylalkyl which is substituted in the phenyl nucleus by halogen, cyano, nitro or C_1–C_4alkoxy, and R_{08} is C_1–C_4alkyl, C_2–C_4alkenyl, C_2–C_4 alkynyl, phenyl, C_1–C_4phenylalkyl or C_1–C_4phenylalkyl which is substituted in the phenyl nucleus by halogen, cyano, nitro or C_1–C_4alkoxy, or R is a radical of formula



or of formula



wherein R_{21} is methyl, ethyl, propyl, 1-methylethyl, 2-propenyl, 2-butenyl, 1,1-dimethyl-2-propenyl, 2-propynyl or 2-methyl-2-propynyl, and R_{22}, R_{23}, R_{24} and R_{25} are each independently of one another hydrogen or methyl, and Y is chloro, or Y is hydrogen if R is a radical of formula $(H_5C_2O)_2P(O)CH_2NHCO—$.

5,556,829

COMPOSITIONS HAVING HERBICIDAL ACTIVITY CONTAINING N-ALKYL-AMIDES AS ACTIVE INGREDIENT

Giovanni Camaggi, Novara; Dario Chiarino, Monza; Mario Fantucci, Milan, and Giovanni Meazza, Saronno, all of Italy, assignors to Zambon Group S.p.A., Vicenza, and Agrimont S.p.A., Milan, both of Italy

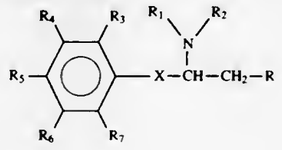
Continuation of Ser. No. 688,828, Apr. 22, 1991, Pat. No. 5,336,664. This application May 27, 1994, Ser. No. 250,619

Claims priority, application Italy, Apr. 24, 1990, 20130/90

Int. Cl.[6] **A01N** *57/06;57/08*

U.S. Cl. 504—199 **13 Claims**

1. A composition for agricultural use containing as active ingredient a compound of formula



(I)

wherein

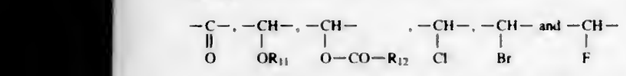
R is a hydrogen atom, alkyl, hydroxy, alkoxy, a fluorine, chlo-

of the $(LN)_1Ba_2Cu_3O_{7-\delta}$ formula, where Ln is chosen from the rare

and at least one soluble salt other than an acid fluoride salt selected

and at least one polymerizable unsaturated group in the mol-

R is a hydrogen atom, alkyl, hydroxy, alkoxy, a fluorine, chlorine or bromine atom, a cyano group, alkylcarbonyloxy, alkylcarbonylthio, mercapto or alkylthio;
wherein one of R_1 and R_2 is a hydrogen atom or a C_1–C_3 alkyl and the other is a group SO_2R_9; R_9 is alkyl, mono or dichloroalkyl, phenyl optionally substituted by from 1 to 3 fluorine, chlorine of bromine atoms of alkyl; the R_{10}s are hydrogen atoms of alkyls;
R_3, R_4, R_5, R_6 and R_7, equal to of different from each other, each are a hydrogen, fluorine, chlorine or bromine atom, trifluoromethyl, alkyl, alkoxy, hydroxy, alkylthio, alkylsulfinyl, alkylsulfonyl, wherein alkyl is optionally substituted by from 1 to 3 fluorine, chlorine of bromine atoms; C_2–C_6 alkenylthio, benzylthio, C_2–C_6 alkenylsulfinyl, C_2–C_6 alkenylsulfonyl; benzylsulfinyl, benzylsulfonyl, benzenesulfonyl; cyano, alkylcarbonyl, alkylcarbonylamino; amino, mono or dialkylamino, trifluoroacetylamino, alkylsulfonylamino, benzoylamino wherein the phenyl may be substituted by from 1 to 3 substituents selected among fluorine, chlorine or bromine atoms or alkyls, or one of R_3, R_4, R_5, R_6 and R_7 is a phenyl, phenoxy, pyridyloxy, such groups being optionally substituted by from 1 to 3 substituents selected among fluorine, chlorine or bromine atoms, alkyl or alkoxy groups;
X is a



wherein R_{11} is a hydrogen atom, alkyl, acyl of a mineral acid selected among nitric, phosphoric and sulfuric acid of an acyl of alkylsulfonic or benzenesulfonic acid; R_{12} is an hydrogen atom, alkyl optionally substituted by from 1 to 3 substituents selected among fluorine, chlorine or bromine atoms, alkoxy or cyano; phenyl optionally substituted by from 1 to 3 substituents selected among fluorine, chlorine or bromine atoms, alkyl, nitro, alkoxy; a C_2–C_6 alkenyl;
and their salts with organic or inorganic acids compatible with agrarian use, and a carrier and optional additives of agricultural use.

5,556,830

TL-DOPED HGBACACU SUPERCONDUCTORS

Guifu Sun; Kai W. Wong, and Ying Xin, all of Lawrence, Kans., assignors to Midwest Superconductivity, Inc., Lawrence, Kans.

Filed May 31, 1994, Ser. No. 251,606
Int. Cl.[6] H01L *39/12;* **C04B** *35/00;35/45;35/057*
U.S. Cl. 505—125 **4 Claims**

1. Superconducting oxides having the general formula $(Hg_{1-x}Tl_x)Ba_2Ca_{n-1}Cu_nO_{2n+2+\alpha}$ where x is from about 0.1 to about 0.3 and n is 2, 3, or 4, and α is an oxygen deficiency factor ranging from about 0 to about 1.

5,556,831

METHOD OF TREATING A PART MADE OF A SUPERCONDUCTIVE CERAMIC OF THE $(LN)_1BA_2CU_3O_{7-\delta}$ TYPE

Alain Wicker, Paris; Jean-Pierre Bonnet, Carignan; Mariano Sanz, Leognan; Patrice Dordor, and Christophe Magro, both of Bordeaux, all of France, assignors to Alactel Alsthom Compagnie Gererale D'Electricite, Paris Cedex, France

Continuation of Ser. No. 988,701, Nov. 24, 1992, abandoned. This application Jun. 21, 1994, Ser. No. 263,411
Claims priority, application France, Nov. 29, 1991, 9114805
Int. Cl.[6] H01L *39/12;* **C04B** *35/45;35/50;35/64*
U.S. Cl. 505—500 **2 Claims**

1. A method of reducing the value of δ during final thermal oxygenation of a superconductor compressed powder ceramic part of the $(LN)_1Ba_2Cu_3O_{7-\delta}$ formula, where Ln is chosen from the rare earth elements other than cerium and terbium, said method comprising:
heat treating said part in an oxidizing atmosphere at a partial pressure of oxygen lying in the range of 0.1 atmospheres to 1 atmosphere, at a temperature lying in the range of 350° C. to 450° C. and for a duration of 12 to 48 hours, and during said heat treating step, in order to activate the oxygen diffusion in said part, causing an electric current to flow through said part with a current density lying in the range of 0.1 A/cm^2 to 2 A/cm^2.

5,556,832

SOLIDS-FREE, ESSENTIALLY ALL-OIL WELLBORE FLUID

Donald C. Van Slyke, Missouri City, Tex., assignor to Union Oil Company of California, El Segundo, Calif.

Filed Sep. 21, 1992, Ser. No. 948,509
Int. Cl.[6] C09K *7/02*
U.S. Cl. 507—203 **16 Claims**

1. A method for the completion or work-over of a well comprising the step of injecting or pumping a wellbore fluid into the well, the method being characterized in that the wellbore fluid is non-aqueous and comprises:
(a) an organic fluid selected from the group consisting of isobutyl isobutyrate, 2 -ethoxyethyl acetate, ethyl caproate, ethylhexyl acetate, 2-(2-ethoxyethoxy) ethyl acetate, 2 -(2-butoxyethoxy) ethyl acetate, diethyl phthalate, and dibutyl phthalate; and
(b) a salt dissolved in the organic fluid, the salt being selected from the group consisting of zinc halides and alkaline earth metal halides.

5,556,833

WHEEL CLEANING COMPOSITION CONTAINING ACID FLUORIDE SALTS

Michael Howe, Mission Viejo, Calif., assignor to Armor All Products Corporation, Aliso Viejo, Calif.

Continuation of Ser. No. 166,185, Dec. 10, 1993, abandoned. This application Mar. 29, 1995, Ser. No. 413,926
Int. Cl.[6] C11D *3/04;3/43;7/04;7/50*
U.S. Cl. 510—189 **11 Claims**

1. An aqueous cleaning composition useful for cleaning wheel soils from surfaces of painted steel, painted aluminum, chrome, stainless steel, clear coated aluminum, untreated aluminum, and plastic, said cleaning composition consisting essentially of at least one acid fluoride salt selected from the group consisting of potassium bifluoride, sodium bifluoride, calcium fluorophosphates, ammonium bifluoride, and sodium fluorosilicates in an amount of about 1 weight percent to about 20 weight percent, at least one organic soil removing agent selected from the group consisting of detergents in an amount of about 0.1 to about 32.5 weight percent and organic solvents in an amount of about 2 to 40 weight percent,

and at least one soluble salt other than an acid fluoride salt selected from the group consisting of ammonium fluoride and ammonium acetate in an amount so that said composition has a molar ratio of soluble anion to hydrogen ion of about 3.5 or greater, said cleaning composition having a pH of about 3 to about 6.5.

5,556,834

PERCARBONATE PARTICLES STABILISED BY COATING WITH AN AQUEOUS SOLUTION CONTAINING A SILICATE AND A BORIC ACID

Alun P. James, Liverpool, and Graham R. Horne, Cheshire, both from, England, assignors to Solvay Interox Limited, Warrington, England

PCT No. PCT/GB93/02551, § 371 Date Jun. 21, 1995, § 102(e) Date Jun. 21, 1995, PCT Pub. No. WO94/14701, PCT Pub. Date Jul. 7, 1994
PCT Filed Dec. 15, 1993, Ser. No. 464,745
Claims priority, application United Kingdom, Dec. 23, 1992, 9226796
Int. Cl.[6] C01B *15/10;* **C11D** *7/04;7/14;7/18*
U.S. Cl. 510—375 **15 Claims**

1. Process for stabilizing alkali metal percarbonate particles by coating the particles with a coating agent, which comprises:
contacting alkali metal percarbonate particles with an aqueous solution of a coating agent prepared by dissolving at least one boric acid selected from the group consisting of meta and ortho boric acid in a solution of an alkali metal silicate having a molar ratio of alkali metal:silicate of from 0.2:1 to 2:1, the amount of boric acid and alkali metal silicate being such that boric acid, calculated as H_3BO_3, constitutes from 25–60% of the total amount of alkali metal silicate and boric acid and such that the total amount of boric acid and alkali metal silicate is at least 15% by weight based on the weight of the aqueous solution; and
removing water to form a coating of the coating agent on the percarbonate particles, the amount of coating agent coated on the particles being about 0.5 to 20% by weight, based on the weight of the coated alkali metal percarbonate particles.

5,556,835

GEL-LIKE FRAGRANCE COMPOSITION

Toru Inaoka, Hyogo; Hideyuki Tahara, Osaka, and Masahiko Shinohara, Chiba, all of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, and Nihon Firmenich Kabushiki Kaisha, Tokyo, both of Japan

Filed Jun. 30, 1994, Ser. No. 269,137
Claims priority, application Japan, Jul. 2, 1993, 5-164653
Int. Cl.[6] A61K *7/46*
U.S. Cl. 512—3 **10 Claims**

1. A gel-like fragrance composition which comprises:
an aqueous gel comprising an aqueous fluid and a gelling agent; and
an oil-absorbent resin having absorbed a fragrant material; wherein said oil-absorbent resin is a cross-linked polymer comprising 90 to 99.999% by weight of a monofunctional monomer component mainly comprising an unsaturated monomer having a solubility parameter of not more than 9 and at least one polymerizable unsaturated group in the molecule, and 0.001 to 10% by weight of a cross-linkable monomer component having at least two polymerizable unsaturated groups or reactive substituents in the molecule; and wherein said oil-absorbent resin is dispersed in said aqueous gel.

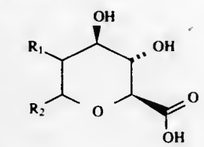
5,556,836

USE OF D-GLUCOPYRANURONIC ACIDS AND THEIR DERIVATIVES FOR INCORPORATION IN PHARMACOLOGICALLY ACTIVE PEPTIDES AND THEIR SALTS

Erich G. Roedern, Bad Soden-Salmunster; Horst Kessler, Schwalbach; Bernhard Kutscher, Maintal; Michael Bernd, Frankfurt, and Thomas Klenner, Hirschberg, all of Germany, assignors to Asta Medica Aktiengesellschaft, Dresden, Germany

Filed Nov. 1, 1994, Ser. No. 332,071
Claims priority, application Germany, Nov. 8, 1993, 43 38 015.8
Int. Cl.[6] A61K *38/09;38/14;* **C07H** *15/04;* **C07K** *9/00*
U.S. Cl. 514—15 **15 Claims**

1. A compound comprising a D-glucopyranuronic acid having the formula:



where
R^1 signifies OH, NH_2, NH-CO-O-CH_2-C_6H_5, NH-CO-O-tert.butyl, or NH-CO-CH_3
R^2 signifies CH_2-NH_2, OH, OCH_3, OCH_2-C_6H_5, CH_2-NH-CO-O-CH_2-C_6H_5, CH_2-NH-CO-O-tert.butyl or CH_2-NH-CO-CH_3, or its enantiomer incorporated into a pharmacologically active peptide or its salt.

5,556,837

METHODS FOR TREATING ADDICTIVE DISORDERS

Eric I. Nestler, Cheshire; Melissa T. Berhow, New Haven, both of Conn.; Dana Beitner-Johnson, Rockville, Md.; David S. Russell, Branford, Conn., and Ronald M. Lindsay, Briarcliff Manor, N.Y., assignors to Regeneron Pharmaceuticals Inc., Tarrytown, N.Y., and Yale University, New Haven, Conn.

Filed Aug. 1, 1994, Ser. No. 283,700
Int. Cl.[6] A61K *38/17*
U.S. Cl. 514—21 **20 Claims**

1. A method for treating or preventing an addictive disease or disorder, comprising administering to a subject suspected of suffering from or at risk for an addictive disease or disorder an amount of brain-derived neurotrophic factor (BDNF) effective to oppose a biochemical or neurophysiological change that is associated with the addictive disease or disorder.

5,556,838

INHIBITING THE DEVELOPMENT OF TOLERANCE TO AND/OR DEPENDENCE ON AN ADDICTIVE SUBSTANCE

David J. Mayer; Donald D. Price; Jianren Mao, all of Richmond, Va., and John W. Lyle, Belmar, N.J., assignors to Virginia Commonwealth University, Richmond, Va.

Continuation of Ser. No. 43,280, Apr. 6, 1993, Pat. No. 5,321,012, which is a continuation-in-part of Ser. No. 10,583, Jan. 28, 1993, abandoned. This application May 19, 1994, Ser. No. 245,970

Int. Cl.[6] A61K *31/70;31/54;31/44;31/445*

U.S. Cl. 514—25 2 Claims

1. A composition comprising an addictive substance and at least one nontoxic substance that blocks the N-methyl-D-aspartate receptor or a major intracellular consequence of N-methyl-D-aspartate receptor activation, the addictive substance being selected from the group consisting of alfentanyl, alphaprodine, anileridine, bezitramide, codeine, dihydrocodeine, diphenoxylate, ethylmorphine, fentanyl, heroin, hydrocodone, hydromorphone, isomethadone, levomethorphan, levorphanol, metazocine, methadone, metopon, morphine, opium extracts, opium fluid extracts, powdered opium, granulated opium, raw opium, tincture of opium, oxycodone, oxymorphone, pethidine, phenazocine, piminodine, racemethorphan, racemorphan and pharmaceutically acceptable salts thereof.

5,556,839

FORM II DIRITHROMYCIN

James M. Greene; Holly M. Hankins, both of Indianapolis; Gregory A. Stephenson, West Lafayette, and David D. Wirth, Lafayette, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 904,781, Jun. 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 692,842, Apr. 29, 1991, abandoned. This application Jan. 9, 1995, Ser. No. 369,980

Int. Cl.[6] C07H *17/08*

U.S. Cl. 514—29 5 Claims

1. A compound selected from purified Form II dirithromycin which has a typical x-ray powder diffraction pattern as follows, using a Nicolet 12V powder diffractometer, wherein d represents the interplanar spacing:

d(Å)	d(Å)
14.17	4.72
11.96	4.50
10.43	4.44
9.65	4.24
8.86	4.20
8.18	4.11
7.07	4.09
6.99	3.92
6.84	3.87
6.59	3.83
6.24	3.73
6.07	3.55
5.97	3.49
5.77	3.46
5.54	3.42
5.50	3.33
5.45	3.17
5.13	3.11
5.11	2.96
4.84	2.83
4.75	2.74
	2.57.

5,556,840

2',5'-PHOSPHOROTHIOATE OLIGOADENYLATES AS ANITIVIRAL AGENTS

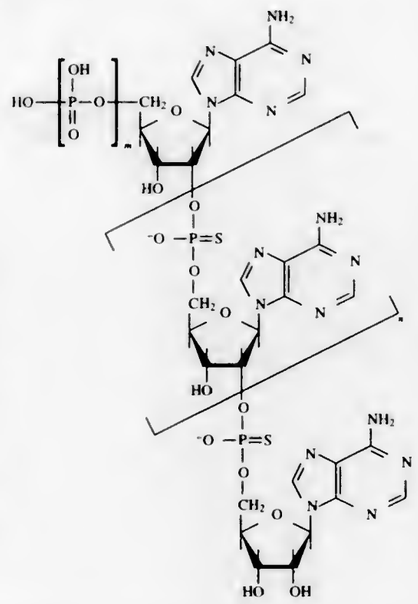
Robert J. Suhadolnik, Roslyn, Pa., and Wolfgang Pfleiderer, Konstanz, Germany, assignors to Temple University - Of The Commonwealth System of Higher Education, Philadelphia, Pa.

Division of Ser. No. 915,771, Jul. 16, 1992, Pat. No. 5,405,939, which is a continuation of Ser. No. 499,118, Mar. 26, 1990, abandoned, which is a continuation of Ser. No. 112,591, Oct. 22, 1987, Pat. No. 4,924,624. This application Dec. 2, 1994, Ser. No. 348,419

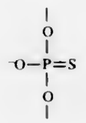
Int. Cl.[6] A61K *31/70;* C07H *21/02*

U.S. Cl. 514—44 12 Claims

1. A method for treating viral infection in mammals comprising administering thereto an antiviral effective amount of a compound which is an optical isomer of the formula:

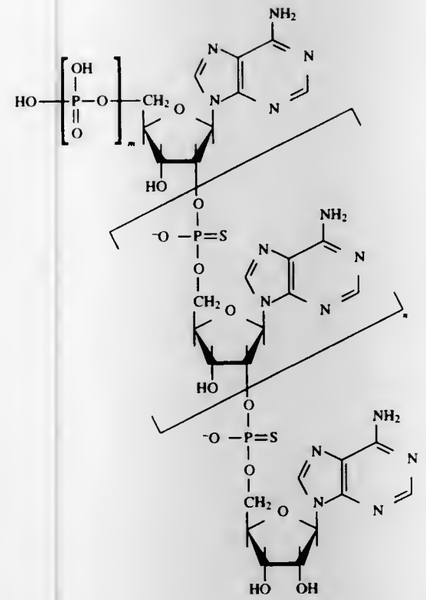


substantially free of contamination by other optical isomers of the same formula, where m is zero, 1, 2, or 3; n is 1 or 2; and at least one of the internucleotide phosphorothioate groups



is of the Sp configuration; or water-soluble salt thereof.

11. A method of inhibiting viral infection in plants comprising administering thereto an antiviral effective amount of a mixture of two or more optical isomers of a compound of the following formula



wherein m is zero, 1, 2, or 3 and n is 1 or 2, and water-soluble salts thereof.

5,556,841

THIAZINE OR THIOMORPHOLINE DERIVATIVES

Yoichi Kawashima, Kyoto; Atsutoshi Ota, and Hiroyuki Mibu, both of Osaka, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

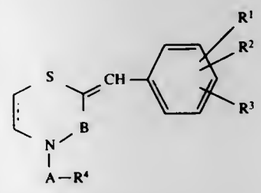
Filed Jan. 26, 1995, Ser. No. 378,502

Claims priority, application Japan, Feb. 4, 1994, 6-12979

Int. Cl.[6] C07D *279/10;179/12;* A61K *31/54;31/425*

U.S. Cl. 514—61 40 Claims

1. A compound having the following formula (I) or a salt thereof,



(I)

wherein

R^1 is hydroxy or protected hydroxy;

R^2 is lower alkyl;

R^3 is hydrogen, lower alkyl, hydroxy, protected hydroxy, or lower alkoxy, and substituted lower alkyl wherein the substituent is hydroxy, or protected hydroxy, amino or lower alkylamino;

R^4 is carboxy or carboxy which is converted into ester or amide; tetrazolyl; phosphono or phosphono which is converted into ester or amide; sulfonyl or sulfonyl which is converted into ester or amide;

A is alkylene;

B is C═O, C═S or CH_2; and

⋯⋯ is a single bond or a double bond.

5,556,842

METHOD FOR VIABLE PRESERVATION OF LUNG GRAFTS

Nobuyoshi Shimizu; Kouzi Uno; Motoi Aoe, all of Okayama, and Kenichi Yoshida, Ibaraki, all of Japan, assignors to Senju Pharmaceutical Co., Ltd., Osaka, Japan

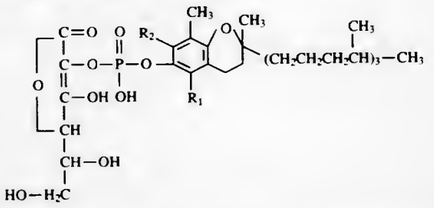
Filed Jan. 23, 1995, Ser. No. 377,055

Claims priority, application Japan, Jan. 28, 1994, 6-008237

Int. Cl.[6] A61K *31/665;31/66;31/355;31/34*

U.S. Cl. 514—100 2 Claims

1. A method for viable preservation of a lung graft which comprises immersing the lung graft after resection in a preservative solution containing a lung graft preserving effective amount of a phosphoric acid diester compound of the following formula or a pharmacologically acceptable salt thereof



wherein R_1 and R_2 are the same or different and each represents a hydrogen atom or a methyl group.

5,556,843

THERAPEUTIC USE OF PHOSPHORYL-L-SERINE-N-ACYL-SPHINGOSINE

Aurelio Romeo, Rome; Gunter Kirschner, Abano Terme, and Gianpaolo Menon, Battaglia Terme, all of Italy, assignors to Fidia, S.p.A., Abano Terme, Italy

PCT No. PCT/EP93/02061, § 371 Date Mar. 9, 1995, § 102(e) Date Mar. 9, 1995, PCT Pub. No. WO94/03178, PCT Pub. Date Feb. 17, 1994

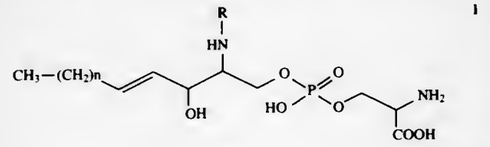
PCT Filed Aug. 2, 1993, Ser. No. 374,624

Claims priority, application Italy, Aug. 3, 1992, PD92A0145

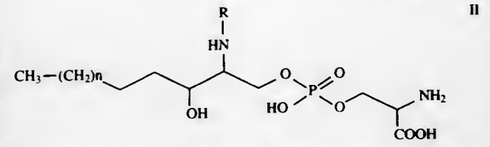
Int. Cl.[6] A61K *31/66*

U.S. Cl. 514—114 8 Claims

1. A pharmaceutical preparation containing a compound of formula I or II



I



II

in which n is 6–16 and R means an acyl residue of a higher aliphatic acid having between 16 and 24 carbon atoms, the distribution of the values for n and R being those of a natural sphingomyelin, or a salt thereof as active ingredient together with a pharmacologically acceptable excipient.

5,556,844

PHARMACEUTICAL OR COSMETIC COMPOSITION CONTAINING A COMBINATION OF A RETINOID AND A STEROL

Uwe Reichert, Le Bar S/Loup; Rainer Schmidt, Mougins, and Braham Shroot, Antibes, all of France, assignors to Centre International De Recherches Dermatologiques Galderma, Valbonne, France

PCT No. PCT/FR91/00526, § 371 Date Mar. 2, 1993, § 102(e) Date Mar. 2, 1993, PCT Pub. No. WO92/00076, PCT Pub. Date Jan. 9, 1992

PCT Filed Jul. 2, 1991, Ser. No. 962,596

Claims priority, application France, Jul. 2, 1990, 90 08344

Int. Cl.[6] A61K *31/07;31/20;31/235;31/575*

U.S. Cl. 514—171 **23 Claims**

1. A pharmaceutical or cosmetic composition comprising in combination

at least one retinoid capable of inhibiting the expression of membranal transglutaminase, said retinoid not having a heterocycle moiety, and

at least one sterol which functions as an inhibitor of the biosynthesis of cholesterol.

5,556,845

11-β SUBSTITUTED-19-NOR STEROIDS

François Nique, Le Perreux Sur Marne; Jean-Georges Teutsch, Pantin, and Patrick Van De Velde, Paris, all of France, assignors to Roussel Uclaf, France

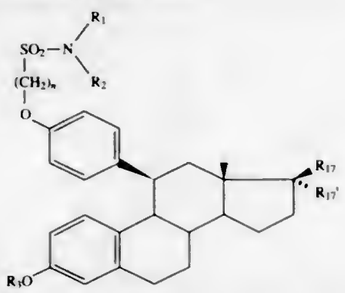
Division of Ser. No. 246,190, May 19, 1994, Pat. No. 5,494,907. This application May 19, 1995, Ser. No. 445,385

Claims priority, application France, Jun. 17, 1993, 93 07310

Int. Cl.[6] A61K *31/58;* **C07J** *43/00*

U.S. Cl. 514—176 **7 Claims**

1. A compound of the formula



wherein

R_{17} and R'_{17} form =O or R_{17} is —OH or acyloxy of an organic carboxylic acid of up to 12 carbon atoms and R'_{17} is selected from the group consisting of hydrogen and alkyl, alkenyl and alkynyl of up to 8 carbon atoms each optionally substituted with at least one member of the group consisting of halogen, $—NH_2$, optionally oxidized mono and di-alkylamino of 1 to 4 alkyl carbon atoms, amino alkyl of 1 to 6 carbon atoms, dialkylamino alkyl, dialkylaminoalkoxy, carboxy, carboxy esterified with lower alkyl, alkyl of 1 to 8 carbon atoms optionally substituted with at least one halogen, acyl of an organic carboxylic acid of up to 6 carbon atoms, acyloxy of an organic carboxylic acid of up to 6 carbon atoms, —OH, =O, —CN, $—NO_2$, formyl, alkoxy of 1 to 8 carbon atoms, alkylthio of 1 to 8 carbon atoms, carbamoyl, alkenyl of up to 8 carbon atoms, alkynyl of up to 8 carbon atoms and phenyl; R_3 is selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms, cycloalkyl of up to 8 carbon atoms and acyl of an organic carboxylic acid of up to 12 carbon atoms; and R_1 and R_2 form a dialkylamino methylene of 1 to 4 alkyl carbon atoms or R_1 and R_2 together with the nitrogen to which they are attached form a saturated heterocycle of 5 to 6 ring members optionally containing a heteroatom of sulfur, nitrogen or oxygen optionally substituted with alkyl of 1 to 4 carbon atoms or =O; and n is an integer of 1 to 18; or a non-toxic, pharmaceutically acceptable addition salt with its base or acid.

5,556,846

17-HETEROCYCLYL-14BETA-5ALPHA-ANDROSTANE, ANDROSTENE AND ANDROSTADIENE DERIVATIVES ACTIVE ON THE CARDIOVASCULAR SYSTEM, AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Piero Melloni, Bresso; Luigi Bernardi, Milan; Mara Ferrandi, Milan; Marco Frigerio, Milan; Marina Mauro, Milan, and Luisa Quadri, Cernusco, all of Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

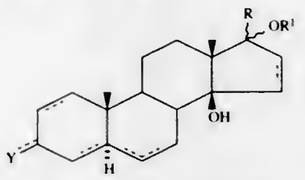
Filed Sep. 29, 1993, Ser. No. 128,116

Claims priority, application Germany, Sep. 29, 1992, 42 32 681.8

Int. Cl.[6] C07J *51/00;* **A61K** *31/58*

U.S. Cl. 514—176 **4 Claims**

1. 17-Heterocyclyl-5α,14β-androstane, androstene and androstadiene derivatives of formula (I):



wherein:

the symbol ~~~ means that the substituents in position 17 have an α or β configuration;

the symbol - - - represents a single or a double bond; when the double bond is not present in the 4 or 5 position, the hydrogen in position 5 has the α configuration;

Y is oxygen or guanidinomino, when - - - in position 3 is a double bond;

Y is hydroxy, OR^2 or SR^2 when - - - in position 3 is a single bond and has an α or β configuration;

R is a saturated or unsaturated mono- or biheterocyclic ring, containing one or more heteroatoms selected from the group consisting of oxygen, sulfur and nitrogen, unsubstituted or substituted by one or more halogen, hydroxymethyl, alkoxy, amino, alkylamino, dialkylamino, cyano, nitro, sulfonamido, C1–C6 lower alkyl group or COR^3;

R^1 is hydrogen; methyl; ethyl or η-propyl substituted by OH or NR^4R^5;

R^2 is hydrogen; methyl; C2–C6 alkyl or C3–C6 alkenyl or C2–C6 acyl, unsubstituted or substituted by a quaternary ammonium group or one or more OR^6, NR^7R^8, CHO, $C(NH)NH_2$, guanidinoimino or by NR^7R^8 and hydroxy;

R^3 is hydrogen, hydroxy, C1–C4 alkoxy or C1–C4 alkyl;

R^4, R^5 are independently hydrogen; methyl; C2–C6 alkyl unsubstituted or substituted by NR^9R^{10}, or R^4 and R^5 taken together with the nitrogen atom form an unsubstituted or substituted, saturated or unsaturated five- or six- membered heterocyclic ring, optionally containing another heteroatom selected from the group consisting of oxygen, sulfur and nitrogen;

R^6 is hydrogen; methyl; C2–C4 alkyl unsubstituted or substituted by one or more NR^9R^{10} groups, or by NR^9R^{10} and hydroxy;

R^7, R^8 are independently hydrogen; methyl; C2–C6 alkyl or C3–C6 alkenyl unsubstituted or substituted by one or more NR^9R^{10}, or NR^9R^{10} and hydroxy, or R^7 and R^8 taken together with the nitrogen atom form an unsubstituted or substituted, saturated or unsaturated five- or six- membered heterocyclic ring, optionally containing another heteroatom selected from the group consisting of oxygen, sulfur and nitrogen, or R^7 is hydrogen and R^8 is $C(NH)NH_2$;

R^9, R^{10} are independently hydrogen, C1–C6 alkyl, or R^9 and R^{10}, taken together with the nitrogen atom they are linked to form a saturated or unsaturated five- or six- membered heterocyclic ring and the stereoisomers, in particular Z and E isomers, optical isomers and their mixtures and the metabolites and the metabolic precursors of the compounds of formula (I).

5,556,847

METHODS OF EFFECTING MEMORY ENHANCEMENT MEDIATED BY STEROID SULFATASE INHIBITORS

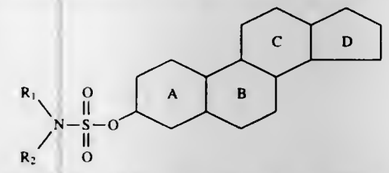
David A. Johnson, Butler; Pui-Kai Li, Library, and Michael E. Rhodes, Latrobe, all of Pa., assignors to Duquesne University of the Holy Ghost, Pittsburgh, Pa.

Filed Oct. 27, 1994, Ser. No. 330,534

Int. Cl.[6] A61K *31/56;31/57*

U.S. Cl. 514—178 **45 Claims**

1. A method for treating a patient to effect memory enhancement comprising providing a compound having the formula (1)



wherein (a) R_1 and R_2 may be the same or different and are selected from the group consisting of hydrogen and a lower alkyl group of 1 to 6 carbon atoms and (b) the ring system ABCD is a steroid nucleus selected from the group consisting of estrone, dehydroepiandrosterone, estradiol, estradiolester, pregnenolone, substituted estrones, substituted dehydroepiandrosterones, substituted estradiols, substituted estradiolesters and substituted pregnenolone,

incorporating said compound in a suitable pharmaceutical carrier;

administering a dosage of said compound in said carrier which is therapeutically effective to enhance said memory of said patient.

5,556,848

OPHTHALMIC SUSPENSION CONTAINING DIFLUPREDONATE

Motoko Kimura, Hiroshima; Yasushi Morita, Toyonaka; Takahiro Ogawa, Nishinomiya, and Tadashi Terai, Kobe, all of Japan, assignors to Senju Pharmaceutical Co., Ltd., Osaka, and Mitsubishi Chemical Corporation, Tokyo, both of Japan

Filed Dec. 20, 1994, Ser. No. 359,654

Claims priority, application Japan, Dec. 27, 1993, 5-332099

Int. Cl.[6] A61K *31/56*

U.S. Cl. 514—179 **12 Claims**

1. An ophthalmic suspension comprising difluprednate as an active ingredient, at least one water soluble polymer selected from the group consisting of hydroxypropylmethylcellulose and polyvinyl alcohol, and at least one buffer selected from the group consisting of sodium acetate and ε-aminocaproic acid.

5,556,849

RUTHENIUM CONTAINING PHTHALOCYANIN PHOTOSENSITIZERS

Michael C. Abrams, Glenmore; Robert C. Brooks, Pottstown; Gerald E. Bossard, King of Prussia, and Jean F. Vollano, Exton, all of Pa., assignors to Johnson Matthey Public Limited Company, London, England

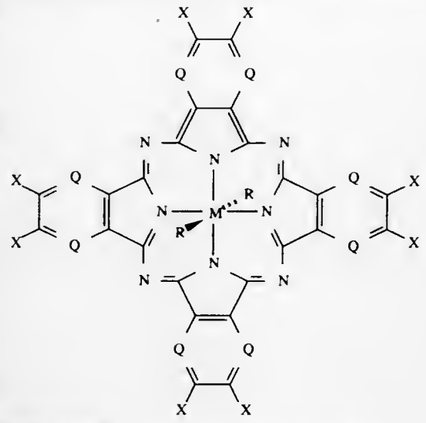
Filed Sep. 12, 1994, Ser. No. 232,146

Claims priority, application Germany, Nov. 8, 1991, 91 23 814.7

Int. Cl.[6] A61K *31/40;487/22*

U.S. Cl. 514—185 **7 Claims**

1. A compound which is a transition metal phthalocyanine or naphthalocyanine derivative of formula I



wherein M is Ru

X is hydrogen, alkyl, alkoxy, halide or adjacent X's may together form $—C_4H—_4$,

each R is a ligand selected from phosphine, arsine, amine, isocyanide, nitrile, thiolate, hydrazine, cyanide, thiocyanate, phenolate, sulphide and aniline groups having a water-solubilizing moiety, and

Q is nitrogen or —CY—, where Y is hydrogen, alkyl, alkoxy or halide, in water-soluble salt or acid form.

5,556,850

CRYSTALLINE ACID ADDITION SALTS OF DIASTEREOMERICALLY PURE 1-(2,2-DIMETHYL-PROPIONYLOXY)-ETHYL-3-CEPHEM-4-CARBOXYLATE

Elisabeth Defossa, Idstein; Gerd Fischer, Limburg; Joachim-Heiner Jendralla, Frankfurt am Main; Rudolf Lattrell, Königstein/Taunus; Theodor Wollmann, Hofheim am Taunus, and Dieter Isert, Eschborn, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 886,143, May 21, 1992, abandoned. This application May 23, 1995, Ser. No. 447,635

Claims priority, application Germany, May 21, 1991, 41 16 937.9

Int. Cl.[6] C07D *501/32;* **A61K** *31/545*

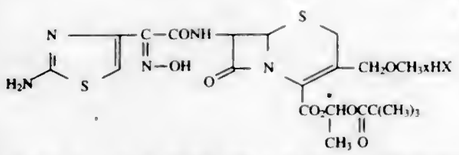
U.S. Cl. 514—202 **4 Claims**

1. A crystalline acid addition salt consisting essentially of a pure crystalline acid addition salt of 1-(2,2-dimethylpropionyloxy)ethyl 3-cephem-4-carboxylate of the formula II

group or C_2–C_{10} acyl group or its pharmaceutically acceptable

the group consisting of nitrogen, oxygen and sulfur hereto-

$R^1—CH=\!=CH—CONH—CH—CON—R^3$



wherein the C atom labelled with * has the 1(S)-configuration, wherein the group =N—OH is in the syn-position, and wherein X is the anion of a physiologically acceptable, monobasic or polybasic, inorganic or organic acid.

5,556,851

CINNOLINE-3-CARBOXYLIC ACID DERIVATIVES

Akira Maruyama, Ibaraki-ken; Shigeru Ogawa, Machida; Satoshi Yamazaki, Sagamihara, and Akihiro Tobe, Yokohama, all of Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

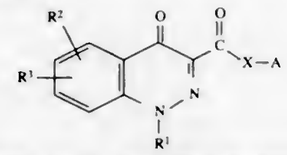
Continuation of Ser. No. 29,431, Mar. 10, 1993, Pat. No. 5,391,549. This application Aug. 5, 1994, Ser. No. 286,220

Claims priority, application Japan, Mar. 12, 1992, 4-53863

Int. Cl.[6] A61K *31/55;31/50*

U.S. Cl. 514—214 **2 Claims**

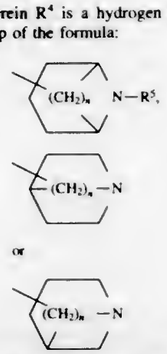
1. A method for preventing or treating a gastroenteric disorder in a patient, which comprises administering to the patient a therapeutically effective amount of a cinnoline compound of the following formula (I):



(I)

wherein X is —O— or a group of the formula:

(wherein R^4 is a hydrogen atom or C_1–C_5 alkyl group); A is a group of the formula:



(II)

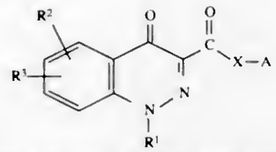
(III)

or

(IV)

(wherein n is an integer selected from 1 to 3; R^5 is a hydrogen atom, C_1–C_5 alkyl group, C_3–C_8 cycloalkyl group or C_7–C_{15} aralkyl group); R^1 is a hydrogen atom, C_1–C_5 alkyl group, C_2–C_5 alkenyl group, C_2–C_4 alkynyl group, C_3–C_8 cycloalkyl group, C_4–C_9 cycloalkylalkyl group, C_2–C_{10} alkoxyalkyl group or C_7–C_{15} aralkyl group; R^2 and R^3 each is independently a hydrogen atom, halogen atom, trifluoromethyl group, hydroxyl group, C_1–C_5 alkoxy group, cyano group, nitro group, amino group, C_1–C_5 alkylamino group, C_2–C_{10} dialkylamino group, C_1–C_5 alkylthio group, C_1–C_5 alkyl group, C_3–C_8 cycloalkyl group, C_7–C_{15} aralkyl group or C_2–C_{10} acyl group or its pharmaceutically acceptable salts, its N-oxide derivatives, or solvates thereof.

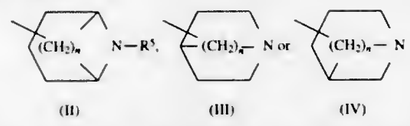
2. A method for preventing or treating nausea and/or emesis in a patient, which comprises administering to the patient a therapeutically effective amount of a cinnoline compound of the following formula (I):



(I)

wherein X is —O— or a group of the formula:

(wherein R^4 is a hydrogen atom or C_1–C_5 alkyl group); A is a group of the formula:



(II) (III) (IV)

(wherein n is an integer selected from 1 to 3; R^5 is a hydrogen atom, C_1–C_5 alkyl group, C_3–C_8 cycloalkyl group or C_7–C_{15} aralkyl group); R^1 is a hydrogen atom, C_1–C_5 alkyl group, C_2–C_5 alkenyl group, C_2–C_4 alkynyl group, C_3–C_8 cycloalkyl group, C_4–C_9 cycloalkylalkyl group, C_2–C_{10} alkoxyalkyl group or C_7–C_{15} aralkyl group; R^2 and R^3 each is independently a hydrogen atom, halogen atom, trifluoromethyl group, hydroxyl group, C_1–C_5 alkoxy group, cyano group, nitro group, amino group, C_1–C_5 alkylamino group, C_2–C_{10} dialkylamino group, C_1–C_5 alkylthio group, C_1–C_5 alkyl group, C_3–C_8 cycloalkyl group, C_7–C_{15} aralkyl group or C_2–C_{10} acyl group or its pharmaceutically acceptable salts, its N-oxide derivatives, or solvates thereof.

5,556,852

N-ACRYLOYLPIPERAZINE COMPOUNDS

Norio Nakamura; Nobuyuki Ohkawa; Takeshi Oshima; Masaaki Miyamoto, and Yasuteru Iijima, all of Tokyo, Japan, assignors to Sanyo Company, Limited, Tokyo, Japan

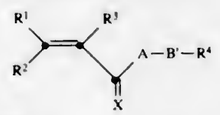
Division of Ser. No. 973,086, Nov. 6, 1992, Pat. No. 5,369,106, which is a division of Ser. No. 751,871, Aug. 28, 1991, Pat. No. 5,192,766, which is a continuation-in-part of Ser. No. 514,523, Apr. 25, 1990, abandoned. This application Oct. 7, 1994, Ser. No. 320,445

Claims priority, application Japan, Apr. 28, 1989, 1-111295

Int. Cl.[6] H01N *43/62;43/60;* **C07D** *741/04*

U.S. Cl. 514—218 **5 Claims**

1. A compound of formula (I):



(I)

wherein:

R^1 and R^2 are the same or different, and each represents a group having the formula $—R^5$, $—CH=CH—R^5$ or $—C\equiv C—R^5$, wherein R^5 represents a C_6–C_{14} carbocyclic aryl group which is unsubstituted or has at least one substituent selected from the group consisting of substituents (a), defined below, or an aromatic heterocyclic group having from 5 to 14 ring atoms, of which from 1 to 5 are hetero-atoms selected from the group consisting of nitrogen, oxygen and sulfur heretoatoms, said heterocyclic group being unsubstituted or having at least one substituent selected from the group consisting of substituents (a), defined below;

R^3 represents a hydrogen atom, a C_1–C_6 alkyl group, a cyano group, or a group having the formula $—R^5$, in which R^5 is as defined above;

X represents an oxygen atom or a sulfur atom;

A represents a 1,4-piperazin-1,4-diyl group or a 1,4-homopiperazin-1,4-diyl group;

B represents a C_1–C_6 alkylene group, a carbonyl group, a thiocarbonyl group, a sulfinyl group or a sulfonyl group;

R^4 represents an unsubstituted phenyl group or a substituted phenyl group having from 1 to 5 substituents selected from the group consisting of substituents (a) and substituents (b), defined below:

substituents (a):

C_1–C_{22} alkyl groups: C_1–C_{22} alkoxy groups;

C_1–C_6 haloalkyl groups; hydroxy groups;

C_{1-4} alkylenedioxy groups; C_1–C_{22} aliphatic carboxylic acyloxy groups; substituted C_1–C_6 aliphatic carboxylic acyloxy groups having at least one substituent selected from the group consisting of substituents (c), defined below; C_7–C_{15} carbocyclic aromatic carboxylic acyloxy groups; substituted C_7–C_{15} carbocyclic aromatic carboxylic acyloxy groups having at least one substituent selected from the group consisting of substituents (d), defined below; C_8–C_{15} aralkyloxycarbonyloxy groups in which the aryl part is unsubstituted or has at least one substituent selected from the group consisting of substituents (d), defined below; C_1–C_6 alkanesulfonyloxy groups in which the alkane part is unsubstituted or has at least one substituent selected from the group consisting of substituents (c), defined below; arylsulfonyloxy groups in which the aryl part is unsubstituted or has at least one substituent selected from the group consisting of substituents (d), defined below; halogen atoms; and nitro groups;

substituents (b):

C_1–C_6 alkylsulfonyl groups; C_1–C_6 alkylsulfinyl groups; and C_1–C_6 alkylthio groups;

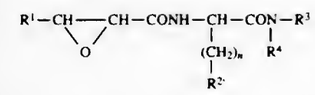
substituents (c):

C_1–C_6 alkyl groups; C_1–C_6 haloalkyl groups; halogen atoms; C_1–C_6 alkoxy groups; and (C_1–C_6 alkanoyloxy)methoxycarbonyl groups;

substituents (d):

C_1–C_6 alkyl groups; C_1–C_6 alkoxy groups; halogen atoms; unsubstituted C_6–C_{10} aryl groups; nitro groups, and (C_1–C_6 alkoxy)carbonyl groups;

and pharmaceutically acceptable salts thereof.



wherein R^1 represents a carboxyl group which may optionally be esterified or amidated; R^2 represents a cyclic group which may optionally be substituted or a polar group; n is an integer of 0 to 6; and R^3 and R^4 are combined with the adjacent nitrogen atom to form a heterocyclic group containing at least two hetero atoms, or a salt thereof.

5,556,854

PYRIDOPYRIMIDINEDIONES, PROCESSES FOR THEIR PREPARATION AND THEIR USE AS DRUGS

Harald Furrer, Hofheim; Dirk Seiffge, Mainz-Kostheim; Ismahan Okyayuz-Baklouti, and John J. Grome, both of Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

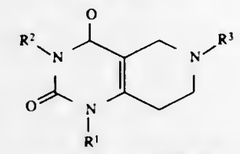
Filed Apr. 21, 1994, Ser. No. 230,811

Claims priority, application Germany, Apr. 23, 1993, 43 13 317.7

Int. Cl.[6] C07D *471/04;211/78;* **A61K** *31/505*

U.S. Cl. 514—234.2 **6 Claims**

1. A compound of the formula I:



(I)

and physiologically acceptable salts of the compound of the formula I, and optionally stereoisomeric forms of the compound of the formula I, in which

R^1 is

a) a hydrogen atom,

b) (C_1–C_4)-alkyl,

c) ω-hydroxy-(C_2–C_4)-alkyl,

d) benzyl,

e) benzyl monosubstituted or polysubstituted on the ring by

1) a halogen atom

2) nitride or

3) methoxy,

f) (ω-1)-(C_3–C_5)-alkenyl or

g) (ω-1)-(C_3–C_5)-alkenyl substituted on the (ω-1) carbon by methyl,

R^2 is

a) a hydrogen atom,

b) (C_1–C_6)-alkyl,

c) benzyl or

d) benzyl monosubstituted or polysubstituted on the ring by

1) a fluorine, chlorine, bromine or iodine atom,

2) nitrile or

3) methoxy and

R^3 is

a) a hydrogen atom,

b) (C_1–C_8)-alkyl.

5,556,853

EPOXYSUCCINIC ACID DERIVATIVES

Shigetoshi Tsubotani, Kawanishi; Takizawa Masayuki, Kobe; Shirasaki Mikio, Nishinomiya, and Yukio Fujisawa, Kobe, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 27, 1994, Ser. No. 330,833

Claims priority, application Japan, Oct. 29, 1993, 5-272806; Oct. 29, 1993, 5-272835; Aug. 8, 1994, 6-186165

Int. Cl.[6] A61K *31/535;* **C07D** *413/12*

U.S. Cl. 514—231.5 **22 Claims**

1. A compound of the formula:

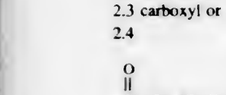
c) cyclohexylmethyl,

selected from the group consisting of Het—NR—SO_2—Ph^1—A—

5,556,858

CIS-2-[(4-HETEROARYL-1-PIPERAZINYL)ALKYL]

c) cyclohexylmethyl,
d) ω-hydroxy-(C_2–C_n)-alkyl,
e) (ω-1)-(C_3–C_5)-alkenyl,
f) (ω-1)-(C_3–C_5)-alkenyl substituted on the (ω-1) carbon by methyl,
g) benzyl,
h) benzyl 1) monosubstituted or polysubstituted on the ring by
1.1 a fluorine, chlorine, bromine or iodine atom,
1.2 nitrile,
1.3 methoxy or
1.4 —CH=CH—$COOR^4$, in which R^4 is a hydrogen atom or (C_1–C_4)-alkyl,
and/or 2) monosubstituted in the α-position of the benzyl radical by
2.1 methyl,
2.2 hydroxymethyl,
2.3 carboxyl or
2.4



—C—O—(C_1–C_4)-alkyl,

i) —$(CH_2)_n$—$COOR^5$, in which
n is an integer from 1 to 8 and
R^5 is a) a hydrogen atom or b) (C_1–C_4)-alkyl,
k) —CH_2—CH=CH—$COOR^6$, in which R^6 is (C_1–C_4)-alkyl,
l) pyridylmethyl,
m) 1-benzyl imidazol-2-ylmethyl,
n) —$CH(COOR^6)_2$, in which R^6 is (C_1–C_4)-alkyl,
o) ω-morpholin-4-yl-(C_2–C_4)-alkyl,
p) 2-methylsulfinylethyl or
q) thienylmethyl,

with the exception of the compound of the formula I in which R^1 and R^2 are hydrogen atoms.

5,556,855

N-HETEROCYCLIC SUBSTITUTED SALICYLIC ACIDS

Hubert Agback, Upsala; Leif Ahrgren, Örbyhus; Thomas Berglindh, Upsala; Martin Haraldsson, Vallentuna; Göran Smedegård, Upsala, and Lars-Inge Olsson, Södertälje, all of Sweden, assignors to Pharmacia AB, Uppsala, Sweden

Continuation of Ser. No. 132,874, Oct. 7, 1993, Pat. No. 5,403,930, which is a continuation of Ser. No. 973,753, Nov. 9, 1992, Pat. No. 5,302,718. This application Dec. 29, 1994, Ser. No. 365,869

Claims priority, application Sweden, Nov. 18, 1991, 9103397

Int. Cl.[6] A61K *31/50;31/44;31/41*

U.S. Cl. 514—247 **16 Claims**

1. A method of treating an autoimmune disease, comprising administering a therapeutically active dosage of a compound to an individual suffering from said disease, said compound being selected from the group consisting of Het—NR—SO_2—Ph^1—A—Ph^2(COOH)(OH) and tautomeric forms, salts, solvates, and C_{1-6}-alkyl esters thereof, wherein Ph^1 and Ph^2 are optionally substituted benzene rings with the condition that carboxy and hydroxy are ortho to one another, A is a bridge and Her— is an optionally substituted heterocyclic ring which has conjugated double bonds and binds to NR, characterized in that A is a bridge which is stable against reduction because it is not azo; and in that R is hydrogen or lower alkyl.

5,556,856

PHTHALAZINONE DERIVATIVES THAT MODULATE MULTI-DRUG RESISTANCE

Jürgen Engel, Alzenau; Bernhard Kutscher, Maintal; Ilona Fleischhauer, Offenbach; Stefan Szelenyi, Schwalg; Peter Metzenauer, Gründau, and Ulrich Werner, Miehlen, all of Germany, assignors to Asta Medica Aktiengesellschaft, Dresden, Germany

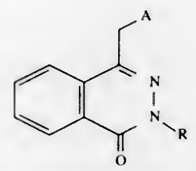
Continuation of Ser. No. 154,091, Nov. 18, 1993, abandoned, which is a continuation of Ser. No. 124,496, Sep. 22, 1993, abandoned. This application Apr. 4, 1995, Ser. No. 416,467

Claims priority, application Germany, Oct. 2, 1992, 42 33 113.7

Int. Cl.[6] A61K *31/495*

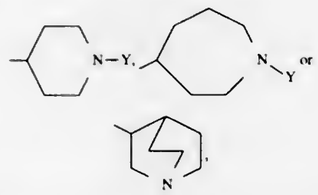
U.S. Cl. 514—248 **5 Claims**

1. A method of treating multi-drug resistance which comprises administering to a patient suffering therefrom an effective amount of a compound selected from the group consisting of compounds of the formula:

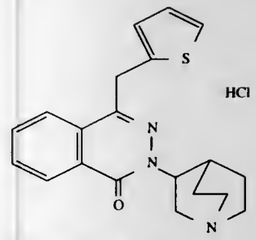


I

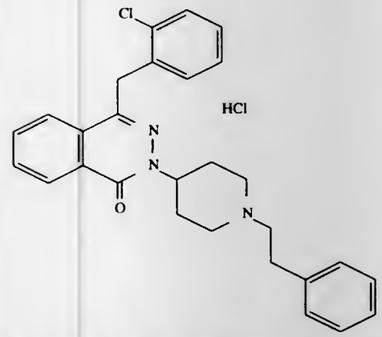
where A=phenyl (unsubstituted, mono- or multi-halogen substituted), H or C_1–C_3-alkyl, 2-furyl or 2-thienyl and R- is



with Y=phenylalkyl or fluorphenyl alkyl as well as all physiological acceptable acid addition salts thereof, the compound of Formula II



a compound of Formula III



and flezelastine and its optical isomers.

5,556,857

DISTURBANCE-OF-CONSCIOUSNESS IMPROVING AGENT

Yasuo Oshiro, Tokushima; Tatsuyoshi Tanaka, Tokushima-ken; Tetsuro Kikuchi, Tokushima, and Katsura Tottori, Itano-gun, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 82,522, Jun. 25, 1993, which is a continuation of Ser. No. 878,515, May 5, 1992, abandoned. This application Jul. 16, 1993, Ser. No. 92,060

Claims priority, application Japan, May 8, 1991, 3-102391; Jul. 17, 1992, 4-189785

Int. Cl.[6] A61K *31/495;31/44;31/155;31/135*

U.S. Cl. 514—253 **19 Claims**

1. A therapeutic method of improving disturbance of consciousness, which comprises administering a pharmacologically effective amount of a sigma receptor agonist compound wherein said amount is from about 0.0001 to 50 mg/kg of body weight per day.

170-920 O.G.-96-16: QL3

5,556,858

II **CIS-2-[(4-HETEROARYL-1-PIPERAZINYL)ALKYL] HEXAHYDRO-1H-ISOINDOLE-1,3 (2H)-DIONES AND RELATED COMPOUNDS AND THEIR THERAPEUTIC UTILITY**

Joseph T. Strupczewski, Flemington; Grover C. Helsley, Stockton; Edward J. Glamkowski, Warren; Yulin Chiang, Covent Station, all of N.J.; Kenneth Bordeau, Kintnersville, Pa.; Peter A. Nemoto, Raritan, and John J. Tegeler, Bridgewater, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

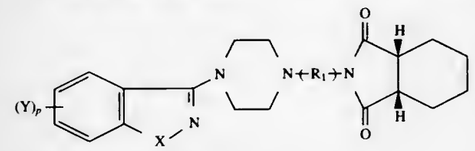
Division of Ser. No. 329,000, Oct. 25, 1994, which is a continuation-in-part of Ser. No. 144,265, Oct. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 969,383, Oct. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 788,269, Nov. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 944,705, Sep. 5, 1991, abandoned, which is a continuation of Ser. No. 619,825, Nov. 29, 1990, abandoned, which is a continuation of Ser. No. 456,790, Dec. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 354,411, May 19, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 467,387

Int. Cl.[6] A61K *31/495;31/445;* **C07D** *413/00;417/00*

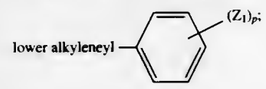
U.S. Cl. 514—254 **16 Claims**

III

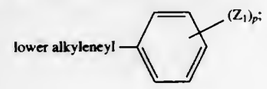
1. A compound of the formula:



X is —O—, —S—, —NH—, or —N(R_2);
R_2 is selected from the group consisting of lower alkyl, aryl lower alkyl, aryl, ($_3$-C_{10}) cycloalkyl, aroyl, (C_2-C_{18}) alkanoyl, (C_1-C_{18}) alkoxycarbonyl, and phenylsulfonyl groups;
aryl is as defined hereinafter;
p is 1 or 2;
Y is hydrogen, lower alkyl, hydroxy, chlorine, fluorine, bromine, iodine, lower alkoxy, trifluoromethyl, nitro, or amino;
R_1 is —$CR_{24}R_{27}$— ($CR_{23}R_{27}$)$_n$—, where n is 0,1,2 or 4; or
—CHR_{24}CH=CH—CHR_{24}—,
—CHR_{24}—C≡C—CHR_{24}—,
—CHR_{24}—CH=CH—$CR_{23}R_{24}$—CHR_{24}—,
—CHR_{24}—$CR_{23}R_{24}$—CH≡CH—CHR_{24}—,
—CHR_{24}—C≡C—$CR_{23}R_{24}$—CHR_{24}—, or
—CHR_{24}—$CR_{23}R_{24}$—C≡C—CHR_{24},
the —CH=CH— bond being cis or trans;
R_{23} is hydrogen, (C_1-C_{18}) linear alkyl, phenyl, hydroxy, (C_1-C_{18})alkoxy, aryloxy, aryl (C_1-C_{18})alkyloxy, (C_1-C_{18})alkanoyloxy, hydroxy (C_1-C_6)alkyl, (C_1-C_{18})alkoxy(C_1-C_6) alkyl, phenyl (C_1-C_6)alkyloxy, aryl (C_1-C_{18}) alkyloxy (C_1-C_6)alkyl or (C_1-C_{18})alkanoyloxy (C_1-C_6) alkyl or



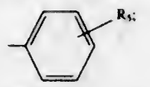
where Z_1 is lower alkyl, —OH, lower alkoxy, —CF_3, —NO_2, —NH_2, or halogen, and p is as previously defined;
R_{24} is hydrogen, (C_1-C_{18}) linear alkyl, phenyl, hydroxy (C_1-C_6)alkyl, (C_1-C_{18})alkoxy(C_1-C_6)alkyl, phenyl (C_1-C_6)alkyloxy, aryl (C_1-C_{18}) alkyoxy(C_1-C_6) alkyl, (C_1-C_{18}) alkanoyloxy (C_1-C_6)alkyl or



where Z_1 and p are as previously defined;

R_{27} is hydrogen or R_{24} and R_{27} taken together with the carbon to which they are attached form C=O or C=S;

and aryl is phenyl or



where R_5 is hydrogen, lower alkyl, lower alkoxy, hydroxy, chlorine, fluorine, bromine, iodine, lower monoalkylamino, lower dialkylamino, nitro, cyano, trifluoromethyl, or trifluoromethoxy; and, any hydroxyl group attached to an aliphatic or aromatic carbon atom, or any primary or secondary nitrogen atom may be acylated with a (C_4-C_{18})carboxylic group, in addition, any nitrogen atom may alternatively be acylated with a (C_4-C_{18})alkoxycarbonyl group;

all geometric, optical, and stereoisomers thereof, or a pharmaceutically acceptable acid addition salt thereof.

5,556,859

N-(4-PYRIMIDINYL)AMIDE PESTICIDES

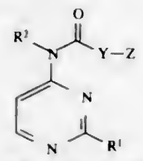
Peter L. Johnson, Indianapolis, Ind., assignor to DowElanco, Indianapolis, Ind.

Filed Dec. 22, 1994, Ser. No. 362,049

Int. Cl.[6] A61K *31/505;* **C07D** *239/42*

U.S. Cl. 514—256 **10 Claims**

1. A compound of the formula



(I)

and N-oxides and salts thereof, wherein

R^1 is H, (C_1–C_4)alkyl, (C_3–C_4) branched alkyl, (C_3–C_7) cycloalkyl, (C_2–C_4) alkenyl, (C_3–C_4) branched alkenyl, halo(C_1–C_4)alkyl, (C_1–C_4)alkoxy, (C_1–C_4)alkoxy(C_1–C_4)alkyl, halo(C_1–C_4)alkoxy, (C_1–C_4)alkylthio, (C_1–C_4)alkylsulfonyl, (C_1–C_4)alkylsulfinyl, halo, or phenyl;

R^2 is H, (C_1–C_4)alkyl, (C_3–C_4) branched alkyl, (C_1–C_4)alkanoyl, halo(C_1–C_4)alkyl, (C_1–C_4)alkoxymethyl, $CH_2SiR^9R^{10}R^{11}$, hydroxymethyl, benzyl, (C_3–C_6) cycloalkylmethyl, or

where R^9, R^{10} and R^{11} are independently (C_1–C_4) alkyl, (C_3–C_4) branched alkyl, phenyl, or substituted phenyl, each T is independently O or S, and R^6 and R^7 are independently (C_1–C_4) alkyl, (C_3–C_4) branched alkyl, phenyl, or substituted phenyl;

Y is $—CH_2—$,

Z is

a phenyl group substituted in the 4-position with:

a)phenoxy,

b) substituted phenoxy,

c) halo (C_2–C_4) alkoxy;

where substituted phenoxy refers to a phenoxy group wherein the phenyl ring is substituted with up to three groups independently selected from halo, (C_1–C_{10}) alkyl, branched (C_3–C_6) alkyl, halo (C_1–C_7) alkyl, hydroxy (C_1–C_7) alkyl, (C_1–C_7) alkoxy, halo (C_1–C_7) alkoxy, phenoxy, substituted phenoxy, phenyl, substituted phenyl, NO_2, OH, CN, (C_1–C_4) alkanoyl, benzoyl, (C_1–C_4) alkanoyloxy, (C_1–C_4)alkoxycarbonyl, phenoxycarbonyl, or benzoyloxy, provided that a substituted phenyl, substituted phenyoxy, substituted phenylthio, or substituted phenylsulfonyl group that is itself substituted with a group from this list shall not, include a total of more than three phenyl rings.

5,556,860

QUINAZOLINONE DERIVATIVES POSSESSING CALCIUM UPTAKE INHIBITING ACTIVITY

Masami Muraoka; Kazuki Matsui; Hirohiko Hasegawa, all of Osaka, and Atsuyuki Kojima, Hyogo, all of Japan, assignors to Sumitomo Pharmaceuticals Co., Ltd., Osaka, Japan

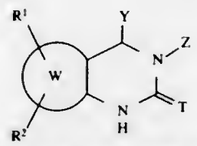
Filed May 26, 1994, Ser. No. 249,212

Claims priority, application Japan, May 26, 1993, 5-148495

Int. Cl.[6] C07D *239/82;239/84;* **A61K** *31/505;31/435*

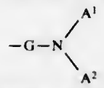
U.S. Cl. 514—258 **8 Claims**

1. A method for preventing or treating a disease caused by influx of calcium ions into cells, which comprises administering a pharmaceutically effective amount of a quinazolinone derivative represented by the formula:



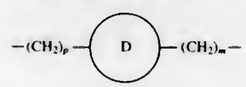
(I)

wherein T represents an oxygen or sulfur atom; Y represents an alkyl, cycloalkyl, cycloalkylalkyl, phenyl, substituted phenyl, aralkyl, substituted aralkyl, heteroaryl or substituted heteroaryl group; ring W represents a benzene, pyridine, thiophene, or 5–10 membered cycloalkene or cycloalkane ring; R^1 and R^2 represent, independently, a hydrogen or halogen atom, or a lower alkyl, cyano trifuloromethyl, nitro, amino, substituted amino, hydroxy, lower alkoxy, lower alkylthio, lower alkyl-sulfinyl or lower alkyl-sulfonyl group; Z represents the following group (1a) or (1b):

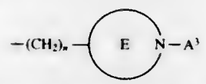


(1a)

in which A^1 and A^2 represent, independently, a hydrogen atom, or an alkyl, substituted alkyl, cycloalkyl, saturated heterocyclic, cycloalkylalkyl, cycloalkenyl-alkyl, aralkyl, substituted aralkyl, heteroarylalkyl, substituted heteroarylalkyl or $—CH_2R^3$ group, R^3 being an alkenyl or alkynyl group, or A^1 and A^2 may be bound to each other to form a hetero ring which is a five to seven membered ring with one or two nitrogen atoms or with one nitrogen atom and one oxygen atom; and G represents a straight chain alkylene group having 1 to 6 carbon atoms, a branched alkylene group having 1 to 6 carbon atoms, or the following group:



p and m stand, independently, an integer from 0 to 2; and D is a cycloalkane ring; or



(1b)

in which n represents an integer of 0 to 2; ring E represents a 4–8 membered saturated heterocyclic ring containing a nitrogen atom; and A^3 represents a hydrogen atom, or an alkyl, substituted alkyl, cycloalkyl, saturated heterocyclic, cycloalkylalkyl, cycloalkenylalkyl, aralkyl, substituted aralkyl, heteroarylalkyl, substituted heteroarylalkyl or $—CH_2R^3$ group, R^3 being an alkenyl or alkynyl group, or may be bound to the ring E to form a quinuclidin-3-yl or guinuclidin-4-yl; or a pharmaceutically acceptable acid-addition salt or quaternary ammonium salt thereof, to a patient.

5,556,861

1,8 BENZONAPHTHYRIDINE DERIVATIVES AND ANTIMICROBAL COMPOSITIONS

Eric Bacque, Morsang-sur-Orge; Michel Barrean, Montgeron; Jean-Francois Desconclois, Paris; Philippe Girard, Arpajon; Michel Kryvenko, Paris; Marc P. Lavergne, Mandres-les-Roses; Jean-Marc Paris, Vaires-sur-Marne, and Guy Picaut, Villejuif, all of France, assignors to Laboratoire Roger Bellon, Neuilly-sur-Seine, France

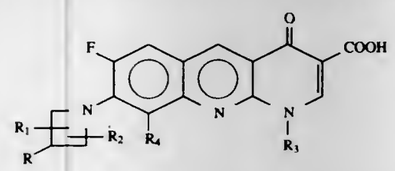
Continuation of Ser. No. 211,317, Apr. 1, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 472,766

Claims priority, application France, Oct. 1, 1991, 91 12058

Int. Cl.[6] A61K *31/435;* **C07D** *471/04*

U.S. Cl. 514—292 **14 Claims**

1. A benzo[b][1,8]naphthyridine compound having the formula:



in which

R represents a hydrogen atom or an amino radical or an alkylamino radical in which the alkyl portion is optionally substituted with an amino or hydroxyl radical, or represents a dialkylamino radical in which the alkyl portions, with the nitrogen atom to which they are attached, optionally form a 5- or 6-membered heterocycle optionally containing another hetero atom selected from nitrogen, oxygen and sulphur, or represents a (3- to 6-membered cycloalkyl)-amino radical, or an alkanoylamino, N-alkyl-N-alkanoyl-amino or aminoalkylphenylamino radical,

R_1 and R_2, which may be identical or different, are located, respectively, at positions 2 and 3 and represent hydrogen atoms, alkyl radicals, alkenyl radicals containing 2 to 4 carbon atoms, phenyl radicals or phenyl radicals substituted with a halogen atom or with an alkyl, alkyloxy, hydroxyl, nitro, amino, alkylamino, dialkylamino or haloalkyl radical, or alternatively R_1 and R_2 are located at position 2 and represent alkyl radicals,

provided R, R_1 and R_2 are not simultaneously a hydrogen atom,

R_3 represents a hydrogen atom or an alkyl, or carboxyalkyl radical, a cycloalkyl radical containing 3 to 6 carbon atoms, and

R_4 represents a hydrogen atom or a fluorine atom,

the alkyl, alkanoylamino, and N-alkyl-N-alkanoyl-amino radicals mentioned above being unbranched or branched and containing 1 to 4 carbon atoms,

in its stereoisomeric forms, a metal salt thereof, an addition salt thereof with a nitrogenous base, an addition salt thereof with an acid or a hydrated form thereof.

5,556,862

PHARMACEUTICAL COMPOSITIONS CONTAINING ISOQUINOLINE DERIVATIVES

Shoichi Imai, Miura-gun; Ken-ichi Mabuchi, Osaka, and Minoru Kawamura, Katoh-gun, all of Japan, assignors to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

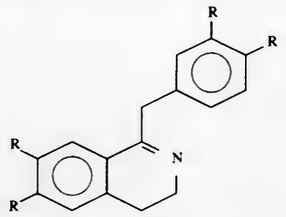
Filed Dec. 21, 1994, Ser. No. 360,630

Claims priority, application Japan, Dec. 28, 1993, 5-351481

Int. Cl.[6] A61K *31/47;31/52*

U.S. Cl. 514—307 **10 Claims**

1. A method for inhibiting phosphodiesterase type IV in a patient in need thereof comprising administering to said patient a therapeutically effective amount of an isoquinoline derivative of the general formula:



wherein R is an ethoxy group, or a pharmaceutically acceptable salt thereof.

5,556,863

COMPOUND FOR GASTRIC ACID SECRETION INHIBITION

Carl I. Starke, Göteborg, Sweden, assignor to Astra Aktiebolag, Sodertalje, Sweden

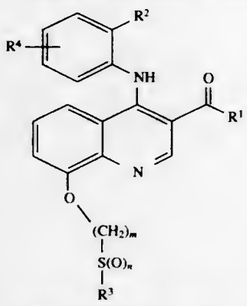
Continuation-in-part of Ser. No. 270,167, Jul. 1, 1994. This application Dec. 8, 1994, Ser. No. 351,852

Claims priority, application Sweden, Jun. 11, 1993, 9302005; Nov. 30, 1993, 9303970

Int. Cl.[6] A61K *31/47;* **C07D** *215/30*

U.S. Cl. 514—313 **14 Claims**

1. A compound of the general formula I



I

or a pharmaceutically acceptable salt of the said compound, wherein

R^1 is

(a) C_1–C_6 alkyl,

(b) C_3–C_6 cykloalkyl, or

(c) C_3–C_6, C_1–C_6 cycloalkylalkyl;

R^2 is

(a) H,

(b) C_1–C_6 alkyl,

(c) C_1–C_6 alkoxy, or

(d) halogen;

R^3 is C_1–C_6 alkyl;

R^4 is

(a) H,
(b) C_1–C_4 alkyl,
(c) halogen, or
(d) OH;
m is an integer 2 or 3; and
n is an integer 0, 1 or 2.

5,556,864

ALPHA-OMEGA-DIARYLALKANE COMPOUNDS SEROTONIN-2 RECEPTOR AGONISTS

Koichi Fujimoto; Naoki Tanaka; Fumitoshi Asai; Tomiyoshi Ito, and Hiroyuki Kotke, all of Tokyo, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

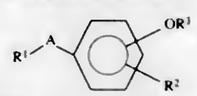
Continuation of Ser. No. 159,744, Nov. 30, 1993, abandoned. This application Jan. 5, 1995, Ser. No. 369,255

Claims priority, application Japan, Nov. 30, 1992, 4-320609; Dec. 18, 1992, 4-338307

Int. Cl.[6] C07C *37/055;39/17;* **A61K** *31/205;31/135*

U.S. Cl. 514—315 **75 Claims**

1. A compound of formula



(I)

wherein:
R^1 represents an aryl group;
R^2 represents a hydrogen atom, a methyl group, an ethyl group, a fluorine atom or a chlorine atom;
R^3 represents a group of formula —B—NR^4R^5,
where R^4 and R^5 are independently selected from the group consisting of hydrogen atoms, alkyl groups and substituted alkyl groups or R^4 and R^5, together with the nitrogen atom to which they are attached, represent a heterocyclic group having from 3 to 6 ring atoms, and B represents an alkylene group having from 2 to 6 carbon atoms or a group of formula —$CH_2CH(OR^6)CH_2$—, where R^6 represents a hydrogen atom, an alkanoyl group, a substituted alkanoyl group or an arylcarbonyl group,
or a group of formula —D—R^7, where D represents a carbon-carbon single bond or an alkylene group having from 1 to 4 carbon atoms and R^7 represents a heterocyclic group having 5 or 6 ring atoms bonded to D via a carbon atom in the heterocyclic group;
A represents an alkylene group having from 2 to 8 carbon atoms;
or a pharmaceutically acceptable salt or an alkyl ester or an aralkyl ester thereof wherein the alkyl ester has 1–6 carbon atoms and the aralkyl ester has 1–4 carbon atoms in the alkyl part and the aryl part has 6 to 10 ring atoms and is unsubstituted or contains a substituent selected from the group consisting of substituent β, defined below;
PROVIDED THAT, where A represents an ethylene group, R^3 represents a group of formula —D—R^7;
said alkyl, substituted alkyl and alkoxy groups have from 1 to 6 carbon atoms;
said substituted alkyl groups are substituted by one of substituents ζ, defined below;
said substituents ζ are selected from the group consisting of hydroxy groups, dialkylamino groups in which the or each alkyl part has from 1 to 6 carbon atoms and aryl groups which have from 6 to 10 ring carbon atoms and which are unsubstituted or are substituted by one, two or three substituents selected from the group consisting of substituents β, defined below;
said alkanoyl and substituted alkanoyl groups have 1 to 6 carbon atoms, and, in the case of the substituted groups are substituted by one carboxy group;
aryl groups have from 6 to 10 ring carbon atoms and are unsubstituted or are substituted by one, two or three substituents selected from the group consisting of substituents α defined below;
the aryl parts of said arylcarbonyl groups have from 6 to 10 ring carbon atoms and are unsubstituted or are substituted by one, two or three substituents selected from the group consisting of substituents β, defined below;
said substituents α are selected from the group consisting of
alkyl groups having from 1 to 6 carbon atoms,
alkenyl groups having from 2 to 6 carbon atoms,
alkynyl groups having from 2 to 6 carbon atoms, hydroxy groups,
alkoxy groups having from 1 to 6 carbon atoms,
haloalkoxy groups having from 1 to 6 carbon atoms,
halogen atoms,
cyano groups,
carbamoyl groups,
mono- and di- alkylcarbamoyl groups in which the or each alkyl part has from 1 to 6 carbon atoms, and aryl groups which have from 6 to 10 ring carbon atoms and which are unsubstituted or are substituted by one, two or three substituents selected from the group consisting of substituents β;
said substituents β are selected from the group consisting of
alkyl groups having from 1 to 6 carbon atoms,
alkoxy groups having from 1 to 6 carbon atoms, and
halogen atoms,
said heterocyclic groups have one to four heterto-atoms selected from the group consisting of nitrogen, oxygen and sulfur heterto-atoms and are unsubstituted or substituted; in the case of substituents on a nitrogen atom, said substituents are selected from the group consisting of substituents γ; in the case of substituents on a carbon atom of the heterocyclic group represented by R^4 and R^5 together, said substituents are selected from the group consisting of substituents δ; in the case of substituents on a carbon atom of the heterocyclic group represented by R^7, said substituents are selected from the group consisting of substituents ϵ;
said substituents γ are selected from the group consisting of alkyl groups having from 1 to 6 carbon atoms and aryl groups which have from 6 to 10 ring carbon atoms and which are unsubstituted or are substituted by one, two or three substituents selected from the group consisting of substituents β;
said substituents δ are selected from the group consisting of:
alkyl groups having from 1 to 6 carbon atoms; hydroxy groups; and
aryl groups which have from 6 to 10 ring carbon atoms and which are unsubstituted or are substituted by one, two or three substituents selected from the group consisting of substituents β;
said substituents β are selected from the group consisting of:
alkyl groups having from 1 to 6 carbon atoms;
alkenyl groups having from 2 to 6 carbon atoms;
alkynyl groups having from 2 to 6 carbon atoms; hydroxy groups;
alkoxy groups having from 1 to 6 carbon atoms;
alkoxycarbonyloxy groups having from 2 to 7 carbon atoms;
alkanoyloxy groups which have from 1 to 20 carbon atoms;
substituted alkanoyloxy groups which have from 2 to 5 carbon atoms and which are substituted by
one carboxy group;
carbamoyloxy groups;
mono- and di- alkylcarbamoyloxy groups in which the or each alkyl part has from 1 co 6 carbon atoms; halogen atoms;
cyano groups; and
aryl groups which have from 6 to 10 ring carbon atoms and which are unsubstituted or are substituted by one, two or three substituents selected from the group consisting of substituents β.

63. A method for the treatment or prophylaxis of circulatory diseases in a mammal, by the administration to said mammal of an effective amount of an active compound, wherein the active compound is at least one compound of formula (I) or a pharmaceutically acceptable salt or ester thereof, as claimed in claim 1.

5,556,865

Patent Not Issued For This Number

5,556,866

HAIR RESTORER AND ITS PREPARATION

Hajime Aga; Takashi Shibuya; Toshiyuki Sugimoto, and Toshio Miyake, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Apr. 28, 1994, Ser. No. 234,384

Claims priority, application Japan, Apr. 28, 1993, 5-123223

Int. Cl.[6] A61K *31/44;31/42;31/19;31/235*

U.S. Cl. 514—332 **12 Claims**

1. A topical hair restorer for alopecia which consists essentially of a carrier and an effective amount in the range of about 0.01–10 w/w % of one or more substantially pure compounds selected from the group consisting of 3-[4-hydroxy-3,5-bis(3-methyl-2-butenyl)phenyl]-2-propenoic acid, benzenepropanoic acid 4-(2-carboxyethenyl)-2-(3-methyl-2butenyl)phenylester, and their salts as an effective ingredient.

5,556,867

OXAZOLINE DERIVATIVE, ITS PRODUCTION AND ITS USE

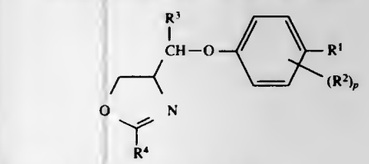
Taro Hirose; Hirosi Kisida; Shigeru Saito, all of Takarazuka, and Hiroaki Fujimoto, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 10,015, Jan. 27, 1993, Pat. No. 5,411,979. This application Dec. 5, 1994, Ser. No. 341,215

Claims priority, application Japan, Jan. 28, 1992, 4-012967

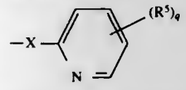
U.S. Cl. 514—340 **6 Claims**

1. An oxazoline derivative having the formula:

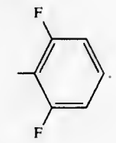


(I)

wherein R^1 is a group of the formula:



(wherein R_5 is, the same or different, a hydrogen atom, a halogen atom, a C_1–C_8 alkyl group, a C_1–C_8 haloalkyl group, an alkoxy-alkyl group having 2 to 8 carbon atoms, a C_1–C_8 alkoxy group, a C_1–C_8 haloalkoxy group, a C_1–C_8 alkylthio group or a C_1–C_8 haloalkylthio group; X is a single bond, an oxygen atom, a sulfur atom, a methylene group or a methyleneoxy group (—CH_2O—, —OCH_2—); q is an integer of 1 to 5);
R^2 is a hydrogen atom, a halogen atom, a C_1–C_3 alkyl group, a C_1–C_3 alkoxy group or a C_1–C_3 alkylthio group;
p is an integer of 1 to 4;
R^3 is a hydrogen atom or a methyl group; and
R^4 is a group of the formula:



5,556,868

ANTIPARASITIC AVERMECTIN AND MILBEMYCIN DERIVATIVES

Bernard J. Banks, Sandwich, United Kingdom, assignor to Pfizer Inc, New York, N.Y.

PCT No. PCT/EP93/00423, § 371 Date Sep. 28, 1994, § 102(e) Date Sep. 28, 1994, PCT Pub. No. WO93/18041, PCT Pub. Date Sep. 16, 1993

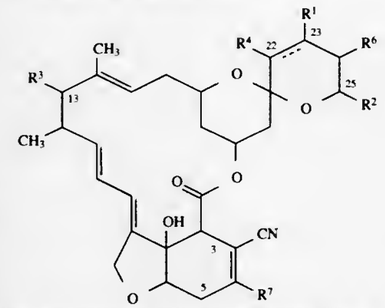
PCT Filed Feb. 23, 1993, Ser. No. 302,655

Claims priority, application United Kingdom, Mar. 7, 1992, 9205007

Int. Cl.[6] A61K *31/335;31/70*

U.S. Cl. 514—450 **30 Claims**

5. A compound of the formula (I):



(I)

wherein the broken line represents an optional bond, R^1 and R^4 being absent when this bond is present, R^1 is H, OH, C_1–C_8 alkoxy optionally substituted by halo or by C_1–C_4 alkoxy, C_2–C_5 alkanoyl, C_2–C_5 alkoxy carbonyl, carboxy, mercapto or by aryl, or R^1 is C_3–C_8 alkenyloxy, C_2–C_9 alkylcarbonyloxy or C_3–C_9 alkenylcarbonyloxy, arylcarbonyl or arylcarbamoyl, said aryl optionally substituted by a C_1–C_9 alkyl group, or R^1 is attached to the remainder of the molecule by a double bond and is oxo or oximino optionally O-substituted by a C_1–C_8 alkyl, C_2–C_8 alkenyl or alkynyl, trialkylsilyl or aralkyl group, or is methylene optionally substituted by a cyano or C_1–C_9 alkyl group;
R^4 is H, OH or C_1–C_8 alkoxy, C_1–C_9 alkanoyloxy; =CH_2; oxo or optionally substituted oximino;
R^2 is
(a) an alpha-branched C_3–C_8 alkyl, alkenyl, alkoxy-alkyl, or alkylthioalkyl group; an alpha-branched C_4–C_8 alkynyl group; a (C_4–C_8)cycloalkyl-alkyl group wherein the alkyl group is an alpha-branched C_2–C_5 alkyl group; a C_3–C_8 cycloalkyl or C_5–C_8 cycloalkenyl group, either of which may optionally by substituted by methylene or one or more C_1–C_4 alkyl groups or halo atoms; or a 3 to 6 membered oxygen or sulphur containing heterocyclic ring which may be saturated, or fully or partially unsaturated and which may optionally be substituted by one or more C_1–C_4 alkyl groups or halo atoms; or
(b) a group of the formula —CH_2R^8 wherein R^8 is H, C_1–C_8 alkyl, C_2–C_8 alkenyl, C_2–C_8 alkynyl, alkoxyalkyl or alkylthioalkyl containing from 1 to 6 carbon atoms in each alkyl or alkoxy group, wherein any of said alkyl, alkoxy, alkenyl or alkynyl groups may be substituted by one or more halo atoms; or a C_3–C_8 cycloalkyl or C_5–C_8 cycloalkenyl group, either of

which may optionally be substituted by methylene or one or

-continued

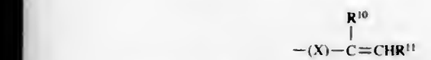
consisting of clotrimazole, ketaconazole, econzole, and micona-

R_7 is hydrogen, halogen or linear or branched-chain C_{1-8} alkyl

which may optionally be substituted by methylene or one or more C_1–C_4 alkyl groups or halo atoms; or a 3 to 6 membered oxygen or sulphur containing heterocyclic ring which may be saturated, or fully unsaturated, or partially unsaturated and which may optionally be substituted by one or more C_1–C_4 alkyl groups or halo atoms; or a group of the formula SR^9 wherein R^9 is C_1–C_8 alkyl, C_2–C_8 alkenyl, C_3–C_8 alkynyl, C_3–C_8 cycloalkyl, C_5–C_8 cycloalkenyl, phenyl or substituted phenyl wherein the substituent is C_1–C_4 alkyl, C_1–C_4 alkoxy or halo; or

(c) a C_1–C_6 alkyl group substituted by one oxo or one or more hydroxy groups or by a single oxygen atom on two adjacent carbon atoms forming an oxirane ring, or R^2 is a C_1–C_5 alkyl group substituted by a (C_1–C_6)alkoxy-carbonyl group, said substituents on R_2 being attached to either or both of a terminal carbon atom and a carbon atom adjacent a terminal carbon atom of R^2; or

(d) $=CH_2$ or a group of the formula:



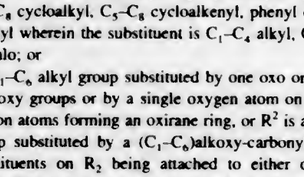
wherein R^{10} and R^{11} are both H; R^{10} is H and R^{11} is C_1–C_3 alkyl, or one of R^{10} and R^{11} is H and the other is phenyl, beteroaryl, C_2–C_6 alkoxycarbonyl or substituted phenyl or heteroaryl wherein said substituent is fluorine, chlorine, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_1–C_4 alkylthio, hydroxy(C_1–C_4)alkyl, cyano, aminosulphonyl, C_2–C_6 alkanoyl, C_2–C_6 alkoxycarbonyl, nitro, trifluoromethyl, trifluoromethoxy, amino or mono or di(C_1–C_4)-alkylamino; and X is a direct bond or is an alkylene group having from 2 to 6 carbon atoms which may be straight or branched-chain; or

(e) phenyl which may optionally be substituted with at least one substituent selected from C_1–C_4 alkyl, C_1–C_4 alkylthio groups, halo atoms, trifluoromethyl, and cyano;

or R^2 may be a group of formula (II):

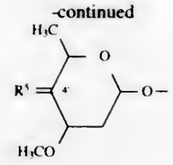
wherein Z is O, S or $—CH_2—$ and a, b, c and d may each independently be 0, 1 or 2; the sum of a, b, c and d not exceeding 5;

R^3 is hydrogen, hydroxy, C_1–C_8 alkoxy or C_2–C_8 alkenoxy, C_1–C_9 alkanoyloxy or C_2–C_9 alkenoyloxy, aroyloxy, (C_1–C_5)alkyloxy-(C_1–C_5)alkoxymethoxy, halogen, oxo, or optionally substituted oximino, hydrazono, carbazido or semicarbazido, N-(C_1–C_4)alkyl semicarbazido, N,N-di(C_1–C_4)alkylsemicarbazido, C_1–C_5 alkanoylhydrazido, benzoylhydrazido or (C_1–C_4)alkyl benzoylhydrazido; or R_3 is



OR

-continued



wherein R^5 is attached to C-4" or C-4' by a single bond and is hydrogen, halo, hydroxy, C_1–C_9 alkanoyloxy or C_2–C_9 alkenoyloxy, aroyloxy, C_1–C_8 alkoxy, amino, N-(C_1–C_8) alkylamino, N,N-di(C_1–C_9)alkylamino; N-(C_1–C_5)alkanoylamino, or N,N-di(C_1–C_9)alkanoylamino;

or R^5 is attached to C-4" or C-4' by a double bond and is oxo, oximino optionally substituted by a C_1–C_8 alkyl, C_2–C_8 alkenyl or alkynyl, trialkylsilyl or aralkyl group; semicarbazido, N-C_1–C_4 alkylsemicarbazido, N,N-di (C_1–C_4)alkylsemicarbazido, C_1–C_5 alkanoylhydrazido, benzoylhydrazido, or (C_1–C_4) alkylbenzoylhydrazido;

R^6 is H or C_1–C_6 alkyl; and

R^7 is methyl, hydroxymethyl, (C_1–C_4 alkoxy) -methyl, (C_2–C_5 alkanoyl)oxymethyl, (C_2–C_5 alkenoyl) oxymethyl, aryloxymethyl, aralkanoyloxymethyl, oxo, oximino optionally substituted by a C_1–C_8 alkyl, alkenyl, alkynyl, trialkylsilyl or aralkyl group, halomethyl, azidomethyl or cyanomethyl.

5,556,869

Patent Not Issued For This Number

5,556,870

USE OF LEFLUNOMIDE FOR INHIBITING INTERLEUKIN 1 BETA

Klaus U. Weithmann, Hofheim, and Robert R. Bartlett, Darmstadt, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 177,960, Jan. 6, 1994, abandoned. This application Mar. 28, 1995, Ser. No. 411,849

Claims priority, application Germany, Jan. 8, 1993, 43 00 277.3

Int. Cl.[6] A61K *31/42*

U.S. Cl. 514—378 **1 Claim**

1. A method for the treatment of a condition characterized by an elevated interleukin 1 beta level in a human or animal suffering from leukemia, hepatitis, increased cartilage absorption, HIV infection, Alzheimer's disease, muscle breakdown, meningitis, microbacterial infections, thromboses, arteriosclerotic depositions, or elevated fat level and joint destruction, wherein the method comprises administering to said human or animal N-(4-trifluoromethylphenyl)-5-methylisoxazole-4-carboxamide in an amount sufficient to inhibit the synthesis and liberation of said interleukin.

5,556,871

METHOD FOR TREATING EPITHELIAL PRECANCEROUS LESIONS WITH TOPICAL INIDAZOLES

Jose Halperin, Brookline; Carlo Brugnara, Newton Highlands, and Harley Haynes, Bedford, all of Mass., assignors to President & Fellows of Harvard College, Cambridge, Mass.

Filed Apr. 24, 1995, Ser. No. 427,485

Int. Cl.[6] A61K *31/415*

U.S. Cl. 514—396 **19 Claims**

1. A method for treating an epithelial precancerous lesion comprising, administering to a human subject in need of such treatment an effective amount of an imidazole selected from the group consisting of clotrimazole, ketaconazole, econzole, and miconazole, wherein the human subject has an epithelial precancerous lesion selected from the group consisting of actinic keratosis, hypertrophic actinic keratosis, Bowenoid actinic keratosis and radiation keratosis.

5,556,872

HISTAMINE DERIVATIVES USEFUL AS IMMUNOMODULATORS

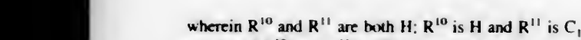
Kenneth L. Melmon, Woodside; Parisa Khosropour, Palo Alto, and Murray Goodman, La Jolla, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation of Ser. No. 146,837, Nov. 12, 1993, abandoned, which is a continuation of Ser. No. 826,578, Jan. 27, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 483,947

Int. Cl.[6] A61K *31/415;* **C07D** *233/64*

U.S. Cl. 514—400 **9 Claims**

1. A compound of the formula:



wherein n=2–10 and phi-CF_3 is para-trifluromethylphenyl, and wherein said compound has H2 receptor activity but not H1 receptor activity.

5,556,873

PESTICIDAL 1-ARYL-5-(SUBSTITUTED ALKYL (THIO) AMIDO)PYRAZOLES

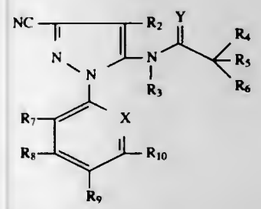
Jamin Huang, Chapel Hill, and Jennifer L. Phillips, Apex, both of N.C., assignors to Rhone-Poulenc Inc., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 21,717, Feb. 24, 1993, abandoned. This application Dec. 20, 1993, Ser. No. 169,944

Int. Cl.[6] A01N *43/56;* **C07D** *231/40;231/44*

U.S. Cl. 514—407 **54 Claims**

1. A compound having the formula:



(I)

or an isomer thereof, wherein:

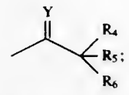
R_2 is halogen; alkyl; haloalkyl; alkoxy; haloalkoxy; nitro; thiocyanato; unsubstituted or mono- or dialkyl substituted sulfamoyl; unsubstituted or mono- or dialkyl substituted aminocarbonyl; alkoxycarbonyl; or unsubstituted or substituted $R_{11}S(O)_n$ in which n is 0, 1 or 2 and R_{11} is alkyl, haloalkyl, cycloalkyl, halocycloalkyl, cycloalkylalkyl or halocycloalkylalkyl; and wherein the alkyl moieties are linear or branched chains of 1 to 4 carbon atoms, the cycloalkyl moiety has 3 to 7 carbon atoms and the halo substitution consists of one or more halogen atoms, which are the same or different, up to full substitution of the alkyl and cycloalkyl moieties;

R_7 is hydrogen, halogen or linear or branched-chain C_{1-8} alkyl or alkoxy;

R_8 and R_{10} are each individually hydrogen or fluorine;

Y is O or S;

R_3 is hydrogen, alkyl, alkoxyalkyl, propargyl, allyl, alkoxycarbonyl, benzyl, alkylcarbonyl, or a radical of the formula:



R_4 is hydrogen, alkyl, haloalkyl, halogen, or phenyl optionally substituted with halogen, alkyl, alkoxy, haloalkoxy, cyano, nitro, or haloalkyl;

R_5 is hydrogen; alkyl; haloalkyl; halogen; haloalkoxyalkyl; alkyl-$S(O)_z$-alkyl wherein z is 0, 1 or 2; alkoxy(alkoxy)$_a$alkyl wherein a is 0 to 4; hydroxy; alkyl-OC(O)-alkyl; or alkoxy;

or R_4 and R_5 together form a 3 to 7 membered cyclic ring system with 0 to 2 heteroatoms selected from the group consisting of O, S, S(O), $S(O)_2$, NH, N-alkyl, N-C(O)-alkyl and N-C(O)-haloalkyl;

R_6 is alkoxy, haloalkoxy, alkoxy(alkoxy)$_b$ wherein b is 1 to 4, haloalkoxy(alkoxy)$_b$ wherein b is 1 to 4, or hydroxy;

R_9 is halogen, alkyl, haloalkyl, alkoxy, haloalkoxy, cyano, nitro, alkylcarbonyl, haloalkylcarbonyl, alkyl-$S(O)_n$ or haloalkyl-$S(O)_n$ in which n is 0, 1 or 2; and wherein the alkyl and alkoxy moieties are linear or branched chains of 1 to 4 carbon atoms and the halo substitution consists of one or more halogen atoms, which are the same or different, up to full substitution of the alkyl and alkoxy moieties; and

X is a nitrogen atom or C—R_{12} in which R_{12} is hydrogen, halogen, cyano, nitro, C_{1-8} alkyl, alkylthio or alkoxy; and the alkyl moieties are linear or branched chains.

5,556,874

2-THIOINDOLES (SELENOINDOLES) AND RELATED DISULFIDES (SELENIDES) WHICH INHIBIT PROTEIN TYROSINE KINASES AND WHICH HAVE ANTITUMOR PROPERTIES

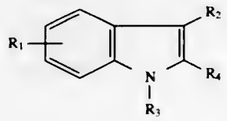
Ellen M. Dobrusin; Howard D. H. Showalter, both of Ann Arbor, Mich.; William A. Denny, Pakuranga, New Zealand; Brian D. Palmer, Glendene, New Zealand; Gordon W. Rewcastle, Manurewa, New Zealand; Moana Tercel, Forrest Hill, New Zealand, and Andrew M. Thompson, Mount Eden, New Zealand, assignors to Warner Lambert Company, Ann Arbor, Mich.

Division of Ser. No. 94,792, Aug. 9, 1993, Pat. No. 5,464,861, which is a continuation-in-part of Ser. No. 926,015, Aug. 6, 1992, abandoned. This application May 10, 1995, Ser. No. 438,616

Int. Cl.[6] A61K *31/40;* **C07D** *209/10*

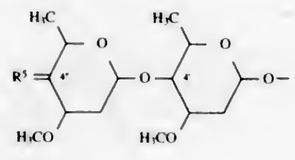
U.S. Cl. 514—414 **34 Claims**

1. 2-Thioindole, 2-indolinethione and polysulfide compounds of the group represented by the general Formulas I and IV



I

-continued



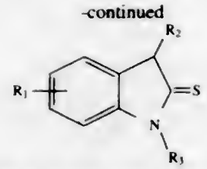
OR

5,556,875

CH_2, or a bond; and

radicals, unsubstituted or substituted by cyano radicals, carboxyl radicals, or alkoxycarbonyl radicals in which the alkyl

-continued



and pharmaceutically acceptable salts thereof, wherein

R_1 is a member selected from H, halogen, R, OH, OCOR, OR, CF_3, NO_2, NH_2, NHR, COOH, CONHR, $(CH_2)_nOH$, $(CH_2)_nOR$, $(CH_2)_nNH_2$, $(CH_2)_nNHR$, and $(CH_2)_nNRR$, and further represents replacement in the ring of 1 or 2 ring methine (—CH=) atoms with aza (—N=) atoms;

R_2 is a member selected from

$(CH_2)_nCOOH$,

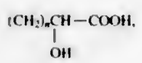
$(CH_2)_nCOR$,

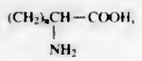
$(CH_2)_nSO_2R$,

$(CH_2)_nSO_2NRR$,

$(CH_2)_nSO_2NHR$,

$CH{=}CHCOOH$,





$(CH_2)_nCONH_2$,

$(CH_2)_nCONHR$,

$(CH_2)_nCONRR$,

$(CH_2)_nCONHCH_2Ph$,

CONHR,

CONRR,

CONHPh,

COY,

COPhCOOH,

COPhCOOR,

$(CH_2)_nCONHPh$,

$(CH_2)_nCONHPhR$,

SO_2Y;

n is an integer from 1 to 4;

R is lower alkyl;

R_3 is a member selected from H, lower alkyl, and benzyl;

Y represents a benzene, pyridine, thiophene, furan, thiazole, or imidazole ring optionally substituted with a lower alkyl, COOH, OH, OCOR, NH_2, CONHR, CONRR, OR, or NHR group; and

R_4 represents SH, S_oX, and S_oQ where o is 1, 2, or 3, X is a member selected from H, lower alkyl, benzyl, and benzene, pyridine, thiophene, furan, thiazole, and imidazole rings, and Q is another 2-thioindolyl moiety of Formula I provided that the group does not comprise compounds having the names

2-(2-thioxo-3-indolinyl)acetic acid,

2-(1-methyl-2-thioxo-3-indolinyl) acetic acid,

methyl 2-(2-thioxo-3-indolinyl) acetate,

ethyl 2-(1-methyl-2-thioxo-3-indolinyl)acetate,

methyl 2-(2-methylthio-3-indolyl) acetate,

bis[methylinodolinyl-3-acetate-(2)]disulfide,

bis[indolyl-3-acetic acid-(2)]disulfide,

bis[methylindolyl-3-acetate-(2)]trisulfide, and

bis[1-methylindolyl-3-acetic acid-(2)]-disulfide.

IV

5,556,875

1,2-DITHIIN ANTIINFECTIVE AGENTS

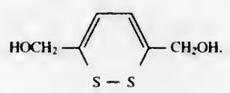
Thien V. Truong, Emeryville; Donald E. Bierer; Jeffrey M. Dener, both of Daly City; Richard Hector; Michale S. Tempesta, both of Moss Beach, all of Calif.; Bernard Loev, Scarsdale, N.Y.; Wu Yang, and Masato Koreeda, both of Ann Arbor, Mich., assignors to Shaman Pharmaceuticals, Inc., South San Francisco, Calif., and The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Aug. 24, 1995, Ser. No. 110,917

Int. Cl.[6] A61K *31/385;* **C07D** *339/08*

U.S. Cl. 514—436 **16 Claims**

1. A dithiin compound having the formula:



5,556,876

METHODS FOR LOWERING SERUM CHOLESTEROL

Henry U. Bryant, and Timothy A. Grese, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

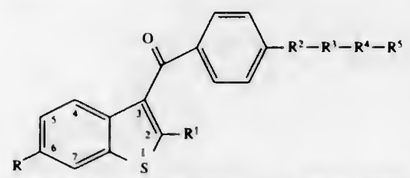
Division of Ser. No. 138,823, Oct. 15, 1993, Pat. No. 5,482,950. This application Aug. 15, 1995, Ser. No. 515,346

Int. Cl.[6] A61K *31/38*

U.S. Cl. 514—443 **9 Claims**

1. A method of lowering serum cholesterol levels comprising administering to a human in need of treatment a serum cholesterol lowering amount of a compound having the formula

(I)



wherein R is hydrogen; hydroxy; C_1–C_6 alkoxy; a group of the formula —O—C(O)—R^a, wherein R^a is hydrogen, C_1–C_6 alkyl optionally substituted with amino, halo, carbonyl, C_1–C_6 alkoxycarbonyl, C_1–C_7 alkanoyloxy, carbamoyl and/or aryl; or R^a is C_1–C_6 alkenyl optionally substituted with aryl; or R^a is a C_3–C_7 cycloalkyl; or R^a is aryl optionally substituted with hydroxy, C_1–C_6 alkyl, C_1–C_6 alkoxy, and/or halo; or R^a is —O-aryl, said aryl optionally substituted with hydroxy C_1–C_6 alkyl, C_1–C_6 alkoxy, and/or halo,

or R is a group of the formula —O—SO_2—R^b wherein R^b may be C_1–C_6 alkyl or aryl optionally substituted with C_1–C_6 alkyl;

or R is carbamoyloxy wherein the nitrogen may be substituted once or twice with C_1–C_6 alkyl;

or R is a group of the formula —O—C(O)R^c—O—(C_1–C_6 alkyl) wherein R^c is a bond or C_1–C_6 alkanediyl;

R^1 is halo, C_1–C_6 alkyl, C_1–C_7 alkyl substituted with C_1–C_6 alkyl, substituted or unsubstituted C_3–C_7 cycloalkyl, or substituted or unsubstituted C_3–C_7 cycloalkenyl;

R^2 is O or CH_2;

R^3 is CH_2 or $(CH_2)_2$;

R^4 is

CH_2, or a bond; and

R^5 is nitrilo; or a pharmaceutically acceptable salt or solvate thereof.

5,556,877

NEW TAXOIDS, THEIR PREPARATION AND THE PHARMACEUTICAL COMPOSITIONS WHICH CONTAIN THEM

Hervé Bouchard, Ivry Sur Seine; Jean-Dominique Bourzat, Vincennes; Alain Commerçon, Vitry-Sur-Seine, and Jean-Pierre Pulicani, Antony, all of France, assignors to Rhone-Poulenc Rorer S.A., Antony, France

Filed Mar. 2, 1994, Ser. No. 204,128

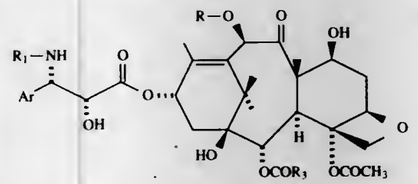
Claims priority, application France, Mar. 2, 1993, 93 02370

Int. Cl.[6] A61K *31/335;* **C07D** *305/14*

U.S. Cl. 514—449 **6 Claims**

1. Taxoids of formula I:

(I)



in which

Ar represents an aryl radical or a heterocylic radical,

R represents a hydrogen atom or an acetyl or alkoxyacetyl radical,

R_1 represents a benzoyl radical or a radical R_2—O—CO— in which R_2 represents:

a straight or branched alkyl radical containing 1 to 8 carbon atoms, an alkenyl radical containing 2 to 8 carbon atoms, an alkynyl radical containing 3 to 8 carbon atoms, a cycloalkyl radical containing 3 to 6 carbon atoms, a cycloalkenyl radical containing 4 to 6 carbon atoms, or a bicycloalkyl radical containing 7 to 11 carbons atoms, these radicals unsubstituted or substituted by at least one substituent selected from halogen atoms and hydroxyl radicals, alkyloxy radicals containing 1 to 4 carbon atoms, dialkylamino radicals in which each alkyl part contains 1 to 4 carbon atoms, piperidino radicals, morpholino radicals, 1-piperazinyl radicals (unsubstituted or substituted in the 4-position by an alkyl radical containing 1 to 4 carbon atoms or by a phenylalkyl radical in which the alkyl part contains 1 to 4 carbon atoms), cycloalkyl radicals containing 3 to 6 carbon atoms, cycloalkenyl radicals containing 4 to 6 carbon atoms, phenyl radicals, cyano radicals, caxboxyl radicals, or alkoxycarbonyl radicals in which the alkyl part contains 1 to 4 carbon atoms;

or by a phenyl radical unsubstituted or substituted by at least one atom or radical selected from halogen atoms, alkyl radicals containing 1 to 4 carbon atoms, or alkyloxy radicals containing 1 to 4 carbon atoms;

or by a saturated or unsaturated heterocyclyl radical containing 4 to 6 members and unsubstituted or substituted by at least one alkyl radical containing 1 to 4 carbon atoms; and

R_3 represents:

a cycloalkyl radical containing 3 to 6 carbon atoms, a cycloalkenyl radical containing 4 to 6 carbon atoms, or a bicycloalkyl radical containing 7 to 11 carbons atoms, these radicals unsubstituted or substituted by at least one substituent selected from halogen atoms and hydroxyl radicals, alkyloxy radicals containing 1 to 4 carbon atoms, dialkylamino radicals in which each alkyl part contains 1 to 4 carbon atoms, piperidino radicals, morpholino radicals, 1-piperazinyl radicals (unsubstituted or substituted in the 4-position by an alkyl radical containing 1 to 4 carbon atoms or by a phenylalkyl radical in which the alkyl part contains 1 to 4 carbon atoms), cycloalkyl radicals containing 3 to 6 carbon atoms, cycloalkenyl radicals containing 4 to 6 carbon atoms, or phenyl radicals, unsubstituted or substituted by cyano radicals, carboxyl radicals, or alkoxycarbonyl radicals in which the alkyl part contains 1 to 4 carbon atoms;

wherein the cycloalkyl, cycloalkenyl, or bicycloalkyl radicals can be unsubstituted or substituted by at least one alkyl radical containing 1 to 4 carbon atoms.

5,556,878

$\Delta^{6,7}$-TAXOLS ANTINEOPLATIC USE AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Robert C. Kelly, Augusta; Roy A. Johnson, Kalamazoo; Harvey I. Skulnick, Kalamazoo, and Eldon G. Nidy, Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

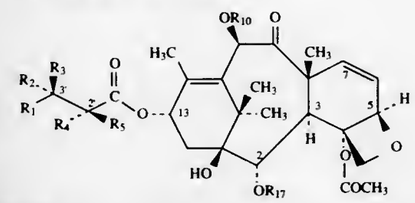
Continuation-in-part of Ser. No. 122,974, Sep. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 76,337, Jun. 11, 1993, abandoned. This application Jun. 10, 1994, Ser. No. 258,019

Int. Cl.[6] C07D *305/14;* **A61K** *31/335*

U.S. Cl. 514—449 **17 Claims**

1. A compound of the Formula I:

I



wherein:

R_1 is selected from the group consisting of —CH_3, —C_6H_5 or phenyl substituted with one, 2 or 3 C_1-C_4 alkyl, C_1-C_3 alkoxy, halo, C_1-C_3 alkylthio, trifluoromethyl, C_2-C_6 dialkylamino, hydroxy or nitro, —2-furyl, 2-thienyl, 1-naphthyl, 2-naphthyl or 3,4-methylenedioxyphenyl;

R_2 is selected from the group consisting of —H, —NHC(O)H,—NHC(O)C_1-C_{10}alkyl —NHC(O)phenyl, —NHC(O)phenyl substituted with one, 2 or 3 C_1-C_4 alkyl, C_1-C_3 alkoxy, halo, C_1-C_3 alkylthio, trifluoromethyl, C_2-C_6 dialkylamino, hydroxy or nitro, —NHC(O)C(CH_3)=CHCH_3, —NHC(O)O$C(CH_3)_3$, —NHC(O)OCH_2phenyl, —NH_2, —$NHSO_2$ -4-methylphenyl, —NHC(O)$(CH_2)_3$COOH, —NHC(O)-4-(SO_3H)phenyl, —OH, —NHC(O)-1-adamantyl, —NHC(O)O-3-tetrahydrofuranyl, —NHC(O)O-4-tetrahydropyranyl, NHC(O)$CH_2C(CH_3)_3$, —NHC(O)$C(CH_3)_3$, —NHC(O)OC_1-C_{10}alkyl, —NHC(O)NHC_1-C_{10}-alkyl, —NHC(O)NHPh, —NHC(O)NHPh substituted with one, 2 or 3 C_1-C_4 alkyl, C_1-C_3 alkoxy, halo, C_1-C_3 alkylthio, trifluoromethyl, C_2-C_6 dialkylamino, or nitro, —NHC(O)C_3-C_8-cycloalkyl, —NHC(O)$C(CH_2CH_3)_2CH_3$, —NHC(O)$C(CH_3)_2CH_2Cl$, —NHC(O)$C(CH_3)_2CH_2CH_3$, phthalimido, —NHC(O)-1-phenyl-1-cyclopentyl, —NHC(O)-1-methyl- 1-cyclohexyl, —NHC(S)$NHC(CH_3)_3$, or —NHC(O)$NHC(CH_3)_3$;

R_3 is selected from the group consisting of —H, —NHC(O)phenyl or —NHC(O)O$C(CH_3)_3$, with the overall proviso that one of R_2 and R_3 is —H but R_2 and R_3 are not both —H;

R_4 is —H or selected from the group consisting of —OH, —OAc(—OC(O)CH_3), —OC(O)O$CH_2C(Cl)_3$, —OCO$CH_2CH_2NH_3^+$ $HCOO^-$, —NHC(O)phenyl, —NHC(O)O$C(CH_3)_3$, —OCO— CH_2CH_2COOH and pharmaceutically acceptable salts thereof, —OCO$(CH_2)_3$COOH and pharmaceutically acceptable salts thereof, and —OC(O)—Z—C(O)—R' [where Z is ethylene (—CH_2CH_2—), propylene (—$CH_2CH_2CH_2$—), —CH=CH—, 1,2-cyclobexane or 1,2-phenylene, R' is —OH, —OH base, —$NR'_2R'_3$, —OR'_3, —SR'_3, —$OCH_2C(O)NR'_4R'_5$ where R'_2

is —H or —CH_3, R'_3 is —$(CH_2)_nNR'_6R'_7$ or —$(CH_2)_nN^+R'_6R'_7R'_8X^-$ where n is 1–3, R'_4 is —H or —C_1-C_4alkyl, R'_5 is —H, —C_1-C_4alkyl, benzyl, hydroxyethyl, —CH_2CO_2H or dimethylaminoethyl, R'_6 and R'_7 are —CH_3, —CH_2— CH_3, benzyl or R'_6 and R'_7 together with the nitrogen of $NR'_6R'_7$ form a pyrrolidino, piperidino, morpholino, or N-methylpiperizino group; R'_8 is —CH_3, —CH_2CH_3 or benzyl, X^- is halide, and base is NH_3, $(HOC_2H_4)_3N$, $N(CH_3)_3$, $CH_3N(C_2H_4)_2NH_2$, $NH_2(CH_2)_6NH_2$, N-methylglucamine, NaOH or KOH], — $OC(O)(CH_2)_nNR^2R^3$ [where n is 1–3, R^2 is —H or —C_1-C_3alkyl and R^3 is —H or —C_1-C_3 alkyl], — $OC(O)CH(R^*)NH_2$ [where R^* is selected from the group consisting of —H, —CH_3, —$CH_2CH(CH_3)_2$, —$CH(CH_3)CH_2CH_3$, —$CH(CH_3)_2$, —CH_2phenyl, —$(CH_2)_4NH_2$, —CH_2 CH_2COOH, —$(CH_2)_3NHC(=NH)NH_2$], the residue of the amino acid proline, —$OC(O)CH=CH_2$, —$C(O)CH_2CH_2C(O)NHCH_2CH_2$ $SO_3^-Y^+$, —$OC(O)CH_2CH_2C(O)NHCH_2CH_2CH_2SO_3^-Y^+$ wherein Y^+ is Na^+ or $N^+(Bu)_4$, —$OC(O)CH_2CH_2C(O)OCH_2$ CH_2OH;

R_5 is —H or —OH, with the overall proviso that when R_5 is —OH, R_4 is —H and with the further proviso that when R_5 is —H, R_4 is other than —H;

R_{10} is —H or —$C(O)CH_3$;

R_{17} is —H, —$C(O)C_6H_5$, —C(O)phenyl substituted with one, 2 or 3 azido, cyano, methoxy, or halo;

with the overall proviso that when R_4 and R_5 are —H and R_{17} is —$C(O)C_6H_5$, either

R_1 is selected from the group consisting of

phenyl substituted with one, 2 or 3 C_1-C_3 alkylthio, C_2-C_6 dialkylamino, hydroxy or nitro, or

3,4-methylenedioxyphenyl; or

R_2 is selected from the group consisting of

—NHC(O)H,

—NHC(O)phenyl substituted with one, 2 or 3 C_1-C_3 alkylthio, C_2-C_6 dialkylamino, hydroxy or nitro,

—NH_2,

—$NHSO_2$-4-methylphenyl,

—NHC(O)$(CH_2)_1$COOH,

—NH C(O)-4-(SO_3H)phenyl,

—OH,

—NHC(O)-1-adamantyl,

—NHC(O)O-3-tetrahydrofuranyl,

—NHC(O)O-4-tetrahydropyranyl,

—NHC(O)NHC_1-C_{10}alkyl,

—NHC(O)NHPh,

—NHC(O)NHPh substituted with one, 2 or 3 C_1-C_4 alkyl, C_1-C_3 alkoxy, halo, C_1-C_3 alkylthio, trifluoromethyl, C_2-C_6 dialkylamino, or nitro,

—$NHC(O)C(CH_3)_2CH_2Cl$,

phthalimido,

—NHC(O)-1-phenyl-1-cyclopentyl,

—NHC(O)-1-methyl-1-cyclohexyl,

—$NHC(S)NHC(CH_3)_3$ or

—$NHC(O)NH$ $C(CH_3)_3$;

and pharmaceutically acceptable salts thereof when the compound contains either an acidic or basic functional group.

5,556,879

AQUEOUS SPECTINOMYCIN BORATE SOLUTIONS

Raymond E. Hopponen, Fort Dodge, Iowa, and Lowell R. Macy, Vermillion, S. Dak., assignors to Rhone Merieux, Inc., Athens, Ga.

Filed Mar. 1, 1995, Ser. No. 369,629

Int. Cl.[6] A01N *43/32*

U.S. Cl. 514—452 **10 Claims**

1. A stable, high potency aqueous spectinomycin composition comprising:

(a) spectinomycin, at a concentration of between about 10% and about 40% by weight, based on the weight of the composition,

(b) boric acid, present in an amount at least equi molar to that of the spectinomycin and forming a boron compound of spectinomycin, and

(c) a base, present in an amount at least equi molar to that of the boric acid and forming the salt of the boron compound,

the composition being in the form of a solution having a pH of about pH 6 to about pH 9.

5,556,880

FUGICIDAL COMBINATIONS BASED ON A PHENYLBENZAMIDE

Marie-Pascale Latorse, Sourcieux Les Mines, France, assignor to Rhone-Poulenc Agrochimie, Lyon Cedex, France

Filed Oct. 14, 1994, Ser. No. 322,504

Claims priority, application France, Oct. 14, 1993, 93 12465

Int. Cl.[6] A01N *37/18;47/10*

U.S. Cl. 514—491 **16 Claims**

1. A fungicidal combination comprising:

(a) a Compound A which is N-methyl-N-ethyl-2-(3,4-dimethoxyphenyl)-4-(trifluoromethyl)benzamide; and

(b) a Compound B which is maneb or mancozeb;

the components A and B of the combination being present in a synergistic fungicidally effective amount, the A/B ratio by weight being between about 0.001 and about 100/1.

5,556,881

INSECT REPELLENT

Margaret R. Grahn Marisi, 45 Red Cedar Dr., Cranston, R.I. 02920

Continuation of Ser. No. 76,107, Jun. 14, 1993, abandoned. This application Feb. 16, 1995, Ser. No. 390,440

Int. Cl.[6] A01N *37/00;* **A61K** *31/00*

U.S. Cl. 514—557 **1 Claim**

1. An insecticidal composition to be used by humans for repelling winged flying insects consisting of by volume

20–30% aqueous solution 4–8% acetic acid

0.2–0.4% oil of anise

2.6–3.6% alcohol

70–80% H_2O.

5,556,882

METHODS OF TREATING WRINKLES USING BENZILIC ACID

Ruey J. Yu, Ambler, and Eugene J. Van Scott, Abington, both of Pa., assignors to Tristrata Technology, Inc., Wilmington, Del.

Continuation of Ser. No. 179,190, Jan. 10, 1994, Pat. No. 5,470,880, which is a continuation of Ser. No. 89,101, Jul. 12, 1993, Pat. No. 5,389,677, which is a division of Ser. No. 8,223, Jan. 22, 1993, abandoned, which is a continuation of Ser. No. 812,858, Dec. 23, 1991, abandoned, which is a continuation of Ser. No. 469,738, Jan. 19, 1990, abandoned, which is a continuation of Ser. No. 945,680, Dec. 23, 1986, abandoned. This application Jun. 6, 1995, Ser. No. 467,530

Int. Cl.[6] A61K *7/48;31/19*

U.S. Cl. 514—570 **10 Claims**

1. Method of visibly reducing a human skin wrinkle comprising topically applying to said wrinkle a composition comprising benzilic acid or a topically effective salt thereof, in an amount and for a period of time sufficient to visibly reduce said wrinkle, wherein said wrinkle is a facial wrinkle.

5,556,883

USE OF HEXAFLUMURON AS A TERMITICIDE

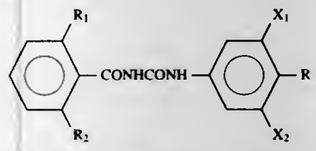
Ellen M. Thomas, Tampa, Fla., and Ronald J. Sbragia, Carmel, Ind., assignors to DowElanco, Indianapolis, Ind.

Continuation of Ser. No. 214,067, Mar. 16, 1994, abandoned, which is a continuation of Ser. No. 891,610, Jun. 1, 1992, abandoned. This application May 11, 1995, Ser. No. 439,389

Int. Cl.[6] A01N *47/28*

U.S. Cl. 514—594 **10 Claims**

1. A method for treating a locus for termites which comprises applying to an infested locus an effective amount of a compound of the formula



wherein R_1 and R_2 are each independently hydrogen, C_1–C_3 alkyl, C_1–C_3 alkoxy, chloro, bromo or fluoro; X_1 and X_2 are each independently chloro, fluoro, bromo, hydrogen or C_1–C_3 alkyl; and R is a fluorine containing C_1–C_4 haloalkoxy group.

5,556,884

SUBSTITUTED OXIME ETHERS, THEIR PREPARATION AND THEIR USE FOR CONTROLLING PESTS AND FUNGI

Klaus Oberdorf, Heidelberg; Hubert Sauter, Mannheim; Wassilios Grammenos, Ludwigshafen; Reinhard Kirstgen, Neustadt; Volker Harries, Frankenthal; Gisela Lorenz, Neustadt; Eberhard Ammermann, Heppenheim; Randall E. Gold, Wachenheim; Wolfgang Siegel, Mannheim, and Albrecht Harreus, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

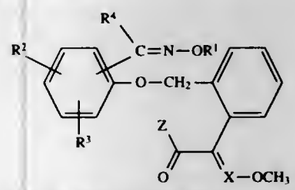
Continuation of Ser. No. 261,975, Jun. 17, 1994, abandoned, which is a division of Ser. No. 91,254, Jul. 15, 1993, Pat. No. 5,358,968. This application May 24, 1995, Ser. No. 449,223

Claims priority, application Germany, Jul. 15, 1992, 42 23 210.4; Sep. 30, 1992, 42 32 816.0; Mar. 31, 1993, 43 10 495.9

Int. Cl.[6] A01N *37/18*

U.S. Cl. 514—620 **5 Claims**

1. A method for controlling pests selected from the group consisting of insects, arachnids and nematodes comprising treating the pests or their infected habitat with an effective amount of a compound of the formula IA:



IA

where R^1 is C_1–C_6-alkyl, C_3–C_6-alkenyl, C_3–C_4-alkynyl, C_1–C_6-haloalkyl, C_3–C_6-haloalkenyl, C_1–C_4-alkoxy-C_1–C_6-alkyl, C_3–C_6-cycloalkyl, C_3–C_6-cycloalkyl-C_1–C_4-alkyl, cyano-C_1–C_6-alkyl, C_1–C_6-alkoxycarbonyl-C_1–C_6-alkyl, aryl-C_3–C_6-alkyl, pyridyl-C_1–C_6-alkyl, thienyl-C_1–C_6-alkyl, aryl-C_1–C_6-alkenyl or aryloxy-C_1–C_6-alkyl, where the aromatic or beteroaromatic ring is unsubstituted or substituted by one or more of the following radicals: C_1–C_4-alkyl, C_1- or C_2-haloalkyl, C_3–C_6-cycloalkyl, C_1–C_4-alkoxy, C_1- or C_2-haloalkoxy, halogen, aryl or aryloxy,

R^2 and R^3 are identical or different and are each hydrogen, C_1–C_4-alkyl, C_1- or C_2-haloalkyl, C_1–C_4-alkoxy, C_1- or C_2-haloalkoxy, halogen, cyano or nitro,

R^4 is hydrogen, C_1–C_6-alkyl or aryl, where the aromatic ring is unsubstituted or substituted by one or more of the following radicals: C_1–C_4-alkyl, C_1- or C_2-haloalkyl, C_1–C_4-alkoxy, C_1- or C_2-haloalkoxy, halogen, cyano or nitro,

X is CH or N, and

Z is a group NR^5R^6, where R^5 and R^6 are identical or different and are each hydrogen or C_1–C_4-alkyl.

5,556,885

N-ARYL-AND N-HETEROARYLHYDRAZONES OF SUBSTITUTED THIOACIDS AND THES-OXIDES THEREOF AS INSECTICIDAL AND ACARICIDAL AGENTS

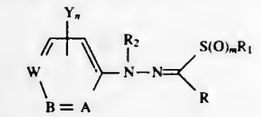
Susan Trotto, Yardley, Pa.; Joseph A. Furch, III, Lawrenceville, N.J.; David G. Kuhn, and David A. Hunt, both of Newtown, Pa., assignors to American Cyanamid Company, Madison, N.J.

Filed Oct. 27, 1994, Ser. No. 330,047

Int. Cl.[6] A01N *33/26;* **C07C** *251/80;245/04;251/72*

U.S. Cl. 514—639 **20 Claims**

1. A method for the control of insect or acarid pests which comprises contacting said pests or their food supply, habitat or breeding grounds with a pesticidally effective amount of a compound having the structure



wherein

A is C-R_3 or N;

B is C-R_4 or N;

W is C-R_5 or N with the proviso that at least one of A, B or W must be other than N;

Y is halogen, CN, NO_2, C_1-C_6alkyl, C_1-C_6haloalkyl, C_1-C_6alkoxy or C_1-C_6 haloalkoxy;

n and m are each independently an integer of 0, 1 or 2;

R is hydrogen; C_1-C_{10}alkyl

unsubstituted or substituted by one or more halogen, C_3-C_6cycloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, $(C_1$-C_4-alkyl)SO_n, $(C_1$-C_4haloalkyl)SO_n,

phenyl unsubstituted or substituted by one to three halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, $(C_1$-C_4alkyl)SO_n, $(C_1$-C_4haloalkyl)SO_n, NO_2 or CN groups, or

phenoxy unsubstituted or substituted by one to three halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, $(C_1$-C_4alkyl)SO_n, $(C_1$-C_4haloalkyl)SO_n, NO_2 or CN groups;

C_3-C_{12}cycloalkyl unsubstituted or substituted by one or more halogens, C_1-C_6alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, $(C_1$-C_4alkyl)SO_n, $(C_1$-C_4haloalkyl)SO_n,

phenyl unsubstituted or substituted by one to three halogen, C_1-C_4alkyl C_1-C_4haloalkyl, C_1-C_4alkoxy. C_1-C_4haloalkoxy, NO_2 or CN groups, or

phenoxy unsubstituted or substituted by one to three halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, NO_2 or CN groups; or

phenyl unsubstituted or substituted by one or more halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, NO_2 or CN groups with the proviso that when R is phenyl, then m must be 1 or 2;

R_1 is hydrogen; C_1-C_{10}alkyl unsubstituted or substituted by one or more halogen, hydroxy, C_1-C_4alkoxy, C_1-C_4haloalkoxy, $(C_1$-C_4alkyl)SO_n, $CONR_6R_7$, CO_2R_8, R_9, R_{10}.

C_3-C_6cycloalkyl unsubstituted or substituted by one to three halogen, C_1-C_4alkyl, C_1C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, NO_2 or CN groups,

phenyl unsubstituted or substituted by one or more halogen,

5,556,886

HIV-INHIBITING BENZENEACETAMIDE DERIVATIVES

5,556,888

RUBBER COMPOUNDS CONTAINING VULCANIZED

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PREPOLYMERS CONTAINING ISOCYANATE GROUPS

phenyl unsubstituted or substituted by one or more halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, NO_2 or CN groups, or

pyridyl unsubstituted or substituted by one or more halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, NO_2 or CN groups;

C_2-C_{10}alkenyl unsubstituted or substituted by one or more halogen, hydroxy, C_1-C_4alkoxy, $(C_1$-C_4alkyl$)SO_x$, $CONR_6R_7$, CO_2R_8, R_9, R_{10}, C_3-C_6cycloalkyl unsubstituted or substituted by one to three halogen, C_1-C_4alkyl, C_1-C_4halo-alkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, NO_2 or CN groups,

phenyl unsubstituted or substituted by one or more halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, NO_2 or CN groups, or

pyridyl unsubstituted or substituted by one or more halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, NO_2 or CN groups;

C_2-C_{10}alkynyl unsubstituted or substituted by one or more halogen, hydroxy, C_1-C_4alkoxy, $(C_1$-C_4alkyl$)SO_x$, $CONR_6R_7$, CO_2R_8, R_9, R_{10}, C_3-C_6cycloalkyl one to three halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, NO_2 or CN groups,

phenyl unsubstituted or substituted by one or more halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, NO_2 or CN groups, or

pyridyl unsubstituted or substituted by one or more halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, NO_2 or CN groups; or

C_3-C_{12}cycloalkyl unsubstituted or substituted by one or more halogen, hydroxy, C_1-C_4alkoxy, $(C_1$-C_4alkyl$)SO_x$, $CONR_6R_7$, CO_2R_8, R_9, R_{10},

C_3-C_6cycloalkyl unsubstituted or substituted by one to three halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, NO_2 or CN groups,

phenyl unsubstituted or substituted by one or more halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, NO_2 or CN groups, or

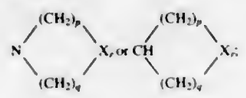
pyridyl unsubstituted or substituted by one or more halogen, C_1-C_4alkyl, C_1-C_4haloalkyl, C_1-C_4alkoxy, C_1-C_4haloalkoxy, NO_2 or CN groups;

R_2 is hydrogen or C_1-C_4alkyl;

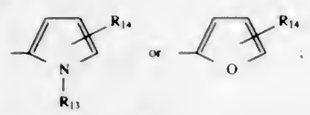
R_3, R_4 and R_5 are each independently hydrogen, halogen, CN, NO_2, $(C_1C_4$alkyl$)SO_x$, $(C_1$-C_4haloalkyl$)SO_x$, C_1-C_6alkyl, C_1-C_6haloalkyl, C_1-C_6alkoxy or C_1-C_6halo-alkoxy;

R_6, R_7 and R_8 are each independently hydrogen or C_1-C_4alkyl;

R_9 is NR_{11} R_{12},



R_{10} is



R_{11}, R_{12}, R_{13} and R_{14} are each independently hydrogen or C_1-C_4alkyl;

X is O, S or NR_{13},

r is an integer of 0 or 1;

p and q are each independently an integer of 0, 1, 2, or 3 with the proviso the sum of p+q+r must be 4, 5 or 6;

x is an integer of 0, 1 or 2; or

the acid addition salts thereof.

5,556,886

HIV-INHIBITING BENZENEACETAMIDE DERIVATIVES

Georges H. Van Daele, Turnhout; Marc G. Verdonck, Gierle; Jean-Paul R. Bosmans, Kortrijk-Marke, and Paul A. Janssen, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

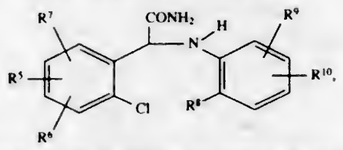
Division of Ser. No. 956,777, Dec. 17, 1992. This application Mar. 27, 1995, Ser. No. 411,039

Claims priority, application European Pat. Off., Jul. 10, 1990, 90201857; Mar. 22, 1991, 91200646

Int. Cl.[6] A61K *31/135*

U.S. Cl. 514—646 **12 Claims**

1. A method of treating subjects suffering from HIV-1 infection which comprises administering to said subjects an effective anti-HIV-1 amount of a compound of the formula:



(1-a)

a pharmaceutically acceptable acid addition salt form or a stereochemically isomeric form thereof, wherein:

R^5 and R^6 each independently are hydrogen, halo, C_{1-6}alkyl, C_{1-6}alkyloxy, nitro, trifluoromethyl, cyano, aminomethyl, carboxyl; C_{1-4}alkyloxycarbonyl, C_{1-4}alkylcarbonyl, aminocarbonyl or hydroxy;

R^7 is hydrogen or halo;

R^8 represents C_{1-6}alkyloxy, nitro, trifluoromethoxy, 2,2,2-trifluoroethoxy, (trifluoromethyl)carbonyl, aminocarbonyl, (cyclopropyl)carbonyl, or a radical of the formula C_{1-6}alkyl-(C=Y)— wherein =Y represents =O, =N—OH, =N—OCH_3, =N—NH_2, or =N—$N(CH_3)_2$;

R^9 and R^{10} each independently are hydrogen, halo, C_{1-6}alkyl, C_{1-6}alkyloxy, nitro, hydroxy, trifluoromethoxy, 2,2,2-trifluoroethoxy, (trifluoromethyl)carbonyl, aminocarbonyl, (cyclopropyl)carbonyl or a radical of the formula C_{1-6}alkyl-(C=Y)— wherein =Y represents =O, =N—OH, =N—OCH_3, =N—NH_2, or =N—$N(CH_3)_2$,

provided that

R^8 is other than 2-methoxy when R^5 is 6-chloro, R^6, R^7 and R^9 are hydrogen and R^{10} is hydrogen or 5-methyl.

5,556,887

IMPROVED A PALMITATE COMPOSITION FOR TOPICAL APPLICATION WHICH ACHIEVES TO THE ENTIRE DERMAL MEMBRANE.

Sheldon Lerner, 3399 First Ave., San Diego, Calif. 92103

Continuation-in-part of Ser. No. 290,160, Aug. 15, 1994, Pat. No. 5,520,919. This application May 1, 1995, Ser. No. 432,529

Int. Cl.[6] A61K *7/48*

U.S. Cl. 514—772.6 **1 Claim**

1. A method for the preparation of a composition for topical application comprising the following procedure:

to 60 grams of deionized water, add 30 grams of carboxyvinyl polymers in a 1.5% solution;

add five grams of polyoxyethylene;

heat to 160 F;

to the above composition add six grams of Vitamin A Palmitate, two grams of sorbitan sesquioleate, 0.5 grams of urea, inositol, sodium lactate, sodium PCA padimate, niacinamide, phenoxyethanol, lactic acid, methylparaben, propylparaben and 0.1 grams of BHT, sodium benzoate and citric acid;

mix the solution while cooling to 100 F and add five grams of Aloe Vera; and

mix the viscosity to 25,000 cPs using a viscometer an add a 10% solution of sodium hydroxide.

5,556,888

RUBBER COMPOUNDS CONTAINING VULCANIZED SCRAP RUBBER, METHODS OF MANUFACTURING SUCH RUBBER COMPOUNDS

Tadashi Koda; Masao Hara, both of Fuchu; Kiyosuke Ueki, and Kei Mori, both of Kurashiki, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, and Kurashiki Kako Co., Ltd., Okayama, both of Japan

Filed Mar. 17, 1995, Ser. No. 407,420

Claims priority, application Japan, Mar. 18, 1994, 6-048640

Int. Cl.[6] C08J *11/04*

U.S. Cl. 521—44.5 **2 Claims**

1. A rubber compound comprising:

a raw rubber;

powdered vulcanized scrap rubber, a surface of said scrap rubber being partially processed via a swelling treatment; and

a vulcanizing agent and vulcanizing accelerator; wherein

said raw rubber, scrap rubber, vulcanizing agent and vulcanizing accelerator are compounded together after said scrap rubber is treated under ordinary temperature without heating and atmosphere conditions by mixing thereto a reclaiming agent which contains petroleum process oil consisting of petroleum process oil and a peptizer selected from the group consisting of a mixture of pentachlorothiophenol and an activating additive, the zinc salt of pentachlorothiophenol, mixed dixylyl disulfides, mixed diaryl disulfides, di-(o-benzamidophenyl) disulfide, the zinc salt of 2-benzamidothiophenol and alkylated phenol sulfide and said partially dissolved product is obtained by using 50–200 parts by weight of petroleum process oil and 1–30 parts by weight of peptizer as said reclaiming agent so as to act on 100 parts by weight of powdered vulcanized scrap rubber.

5,556,889

PREPARATION OF RECYCLATE POLYOLS

Bernhard Naber, and Maritta Lezius, both of Schwarzheide, Germany, assignors to BASF Schwarzheide GmbH, Schwarzheide, Germany

Filed Oct. 6, 1995, Ser. No. 565,207

Int. Cl.[6] C08J *11/04*

U.S. Cl. 521—49.5 **11 Claims**

1. A process for the preparation of recyclate polyols by reacting rigid polyurethane foam with short-chain hydroxyl-containing compounds, which comprises adding at least one epoxidized native fatty oil to the reaction mixture after glycolysis at a temperature from 10° to 80° C. below the glycolysis temperature.

5,556,890

RECLAIMING ε-CAPROLACTAM FROM CARPET WASTE

Antoon H. T. Halderit, Echt; Martin Booij, Sittard; Jan A. J. Hendrix, Born, and Yvonne H. Frentzen, Venlo, all of Netherlands, assignors to DSM N.V., Netherlands

Filed Jun. 2, 1994, Ser. No. 253,010

Claims priority, application Netherlands, Jun. 4, 1993, 9300963

Int. Cl.[6] C07D *201/12;201/16;* **C08J** *11/14*

U.S. Cl. 521—49.8 **14 Claims**

1. A method of purifying ε-caprolactam from carpet waste containing nylon-6, comprising the steps of:

a) separating carpet waste containing nylon-6 to obtain a fraction containing nylon-6;

b) depolymerizing said fraction containing nylon-6 obtained in step a) to obtain contaminated ε-caprolactam; and

c) hydrogenating a mixture of water and said contaminated ε-caprolactam in the presence of hydrogen and hydrogenation catalyst in order to obtain purified ε-caprolactam; and

d) recovering said purified ε-caprolactam from said mixture.

5,556,891

PREPOLYMERS CONTAINING ISOCYANATE GROUPS

Holger Seifert, Freital; Juergen Winkler; Regina Pretzsch, both of Schwarzheide, all of Germany, and Robert O'Meara, Brimington, Great Britain, assignors to BASF Schwarzheide GmbH, Schwarzheide, Germany

Division of Ser. No. 442,739, May 17, 1995. This application Nov. 1, 1995, Ser. No. 551,508

Claims priority, application Germany, May 21, 1994, 44 17 938.3

Int. Cl.[6] C08G *18/22*

U.S. Cl. 521—103 **8 Claims**

1. A prepolymer containing isocyanate groups which can be prepared by reacting

a) organic isocyanates with

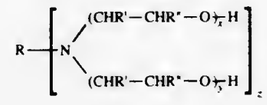
b) polyetherols containing at least 2 hydroxyl groups per molecule and having molecular weights of greater than 400 and/or polyesterols containing at least 2 hydroxyl groups per molecule and having molecular weights of greater than 400,

c) isocyanate-reactive compounds which are at least difunctional and have molecular weights of from 18 to 399, and, optionally,

d) Lewis and/or Brönsted acidic compounds and

e) conventional auxiliaries and additives, such as antioxidants, light stabilizers or fillers,

wherein at least one aromatic aminopolyether alcohol of the formula



where

R is aryl, alkylaryl containing one or more C_1- to C_4-alkyl groups, haloaryl, nitroaryl or cyanoaryl,

R' and R" are identical or different and are, independently of one another, hydrogen, alkyl, aryl, aralkyl, alkoxyalkyl, alkoxyaryl or aroxyaryl,

x and y are independent of one another and

X+y≧10,

Z is from 1 to 4,

is employed as a further component.

5,556,892

ORGANIC AEROGELS FROM THE SOL-GEL POLYMERIZATION OF PHENOLIC-FURFURAL MIXTURES

Richard W. Pekala, Pleasant Hill, Calif., assignor to Regents of the University of California, Oakland, Calif.

Division of Ser. No. 307,219, Sep. 16, 1994, Pat. No. 5,476,878. This application Apr. 25, 1995, Ser. No. 429,276

Int. Cl.[6] C08J *9/28*

U.S. Cl. 521—181 **10 Claims**

1. A composition of matter comprising a low density organic aerogel composed of phenolic-furfural having a pore/cell size of ≦1000 Å and having a density in the range of 0.1 to 1.0 g/cc.

5,556,893

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5,556,893

CATALYST SUPPORT AND CATALYST FOR THE POLYMERIZATION OF ALPHA-OLEFINS; PROCESSES FOR OBTAINING THEM AND POLYMERIZATION OF ALPHA-OLEFINS IN PRESENCE OF THE CATALYST

Jean-Louis Costa, Grimbergen; Vincent Laurent, Houtain-Le-Val; Philippe Francois, Court-Saint-Etienne-Faux, and Dirk Vercammen, Zele, all of Belgium, assignors to Solvay (Société Anonyme), Brussels, Belgium

Filed May 24, 1994, Ser. No. 248,218

Claims priority, application Belgium, May 25, 1993, 09300539

Int. Cl.[6] C08F *4/655*

U.S. Cl. 521—143 **3 Claims**

1. A catalyst support comprising at least one α-olefin polymer which is in a form of particles of mean size from 5 to 350 μm, in which a pore volume generated by pores of radius from 1,000 to 75,000 Å is at least 0.2 cm^3/g, said support being obtained by polymerization of one or more α-olefins by means of a catalytic system (S) containing a catalytic compound (a) which is obtained by heat treatment, in a presence of a halogen-containing agent, of a liquid material resulting from placing titanium tetrachloride ($TiCl_4$) pretreated with an electron-donor compound into contact with a composition (D) corresponding to a general formula of

$$AlR_p(Y)_qX_{3-(p+q)} \quad (II)$$

in which

R denotes a hydrocarbon radical,

Y denotes a group chosen from OR', $—SR'$ and $—NR'R''$ in which each of R' and R'' denotes a hydrocarbon radical or a hydrogen atom;

X denotes a halogen;

p is any number such that $0 \leqq p 2.5$;

q is any number such that $0.5<q<3$, the sum (p+q) being such that $0.5<(p+q) \leqq 3$ and an activator chosen from organoaluminium compounds in such a way that a quantity of catalyst residue, expressed as g of compound (a) per kg of support, is at least approximately 5 and smaller than or equal to 170.

5,556,894

FLAME RESISTANT RIGID POLYURETHANE FOAMS CONTAINING PHOSPHORUS AND A HALOGEN

Thomas L. Fishback, Gibraltar, and Curtis J. Reichel, Southgate, both of Mich., assignors to BASF Corporation, Mt. Olive, N.J.

Division of Ser. No. 334,080, Nov. 4, 1994, Pat. No. 5,420,167. This application Mar. 27, 1995, Ser. No. 411,259

Int. Cl.[6] C08J *9/14;* **C09K** *3/00*

U.S. Cl. 521—168 **27 Claims**

1. A composition of matter comprising:

a) an organo-phosphorus compound containing at least two isocyanate reactive hydrogens; and

b) a secondary or tertiary mono-halogenated aliphatic hydrocarbon having from three to six carbon atoms.

5,556,895

DEGRADABLE POLYDIOXANEONE-BASED MATERIALS

Edward S. Lipinsky, Worthington; Richard G. Sinclair; James D. Browning, both of Columbus, all of Ohio; Alex Cheung, Ft. Collins, Colo.; Kevin H. Schilling, Arvada, Colo., and Dan W. Verser, Golden, Colo., assignors to Ecopol LLC, Golden, Colo.

Continuation of Ser. No. 127,907, Sep. 29, 1993, which is a continuation-in-part of Ser. No. 854,559, Mar. 19, 1992, Pat. No. 5,319,107, and Ser. No. 949,675, Sep. 22, 1992, abandoned, which is a continuation-in-part of Ser. No. 579,000, Sep. 6, 1990, Pat. No. 5,216,050, Ser. No. 579,005, Sep. 6, 1990, Pat. No. 5,180,765, Ser. No. 579,460, Sep. 6, 1990, Pat. No. 5,252,642, and Ser. No. 579,465, Sep. 6, 1990, abandoned, said Ser. No. 579,000Ser. No. 579,005, Ser. No. 579,460, and Ser. No. 579,465, , each is a continuation-in-part of Ser. No. 387,676, Jul. 31, 1989, abandoned, Ser. No. 387,678, Jul. 31, 1989, abandoned, Ser. No. 386,844, Jul. 31, 1989, abandoned, and Ser. No. 387,670, Jul. 31, 1989, abandoned, said Ser. No. 387,676Ser. No. 387,678, Ser. No. 386,844, and Ser. No. 387,670, , each is a continuation-in-part of Ser. No. 229,894, Aug. 8, 1988, abandoned, Ser. No. 229,896, Aug. 8, 1988, abandoned, Ser. No. 317,391, Mar. 1, 1989, abandoned, and Ser. No. 229,939, Aug. 8, 1988, abandoned, said Ser. No. 854,559is a continuation-in-part of Ser. No. 584,126, Sep. 18, 1990, Pat. No. 5,274,127. This application May 31, 1995, Ser. No. 455,990

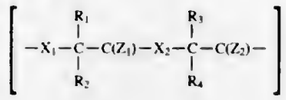
Int. Cl.[6] C08J *9/00*

U.S. Cl. 521—182 **15 Claims**

1. A degradable foam material comprising a hydrolytically degradable polymer in a foam form, said polymer comprising:

(a) a backbone chain;

(b) first repeating units of the formula



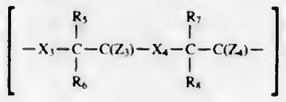
where,

independently for each such first repeating unit:

X and X_2 are independently O or NR' and R' is independently H, hydrocarbyl, substituted hydrocarbyl or a hydrocarbyl derivative; R_1, R_2 and Z_1 combined have at most one carbon atom; R_3, R_4 and Z_2 combined have at most one carbon atom;

Z_1 and Z_2 are each independently one or more constituent group extending from the backbone chain and being covalently bonded to an associated carbon atom in the backbone chain, at least one of Z_1 and Z_2 being oxygen which forms a carbonyl group with the associated carbon atom in the backbone chain; and the molecular weight of such a first repeating unit is less than about 145; and

(c) from about 1 weight percent to about 50 weight percent, based on the total weight of said polymer, of second repeating units of the formula



where,

independently for each such second repeating unit:

X_3 and X_4 are independently O or NR' and R' is independently H, hydrocarbyl, substituted hydrocarbyl or a hydrocarbyl derivative; R_5, R_6, R_7 and R_8 combined have at least four carbon atoms; Z_3 and Z_4 are each independently one or more constituent group extending from the backbone chain and being covalently bonded to an associated carbon atom in the backbone chain, at least one of Z_3 and Z_4 being oxygen which forms a carbonyl group with the associated carbon atom in the backbone chain.

5,556,896

POLYMERIC COMPOSITIONS AND COMPOSITES PREPARED FROM SPIROORTHO-CARBONATES AND EPOXY MONOMERS

Thomas J. Byerley, Mission; J. David Eick, Overland Park, and Cecil C. Chappelow, Leawood, all of Kans., assignors to The Curators of the University of Missouri, Columbia, Mo.

Filed Jul. 1, 1993, Ser. No. 85,981

Int. Cl.[6] A61K *6/087;* **C08K** *3/36;* **C08L** *63/00*

U.S. Cl. 523—116 **3 Claims**

1. A dental composite comprising:

a matrix comprising a cationic initiated reaction product of 2,3,8,9-di(tetramethylene)-1,5,7,11-tetraoxaspiro-[5.5]undecane and an epoxy resin comprising, in a ratio of approximately 5:4:1 by weight, diglycidyl ether of bisphenol A, 3,4-epoxycyclohexanemethyl-3,4-epoxycyclohexane carboxylate, and vinyl cyclohexene dioxide; wherein the amount of said 2,3,8,9-di(tetramethylene)-1,5,7,11-tetraoxaspiro[5.5]undecane is present in at least an amount sufficient to reduce the polymerization shrinkage in comparison to the epoxy resin and itself; and

a filler present in an amount of between approximately 20% and 80% by weight and formed from particles of a quartz silicon dioxide or glass, said particles having sizes from approximately 0.02 micrometers to 100 micrometers.

5,556,897

PRIMER SOLUTION COMPOSITIONS AND METHOD OF FORMING ADHESIVE LAYER ON TOOTH SURFACE

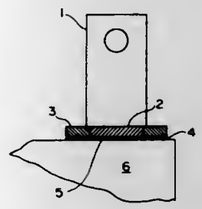
Narimichi Honda, Shiga-ken; Takashi Yamamoto, and Masami Arata, both of Moriyama, all of Japan, assignors to Sun Medical Co., Ltd., Moriyama, Japan

Continuation of Ser. No. 86,992, Jul. 7, 1993, abandoned. This application Dec. 22, 1994, Ser. No. 361,709

Claims priority, application Japan, Jul. 10, 1992, 4-206267

Int. Cl.[6] A61K *6/08*

U.S. Cl. 523—118 **21 Claims**



1. A method for adhesion of a material to a tooth surface which comprises applying a primer solution composition comprising (a) at least one metal compound selected from the group consisting of an iron compound, a copper compound and a cobalt compound, (b) a polymerizable acrylic or meth acrylic monomer having a carboxyl group or a group convertible to a carboxyl group and (c) a polymerizable monomer having no acidic group and having a (meth)acrylate group, said metal compound (a), said polymerizable monomer (b) and said polymerizable monomer (c) being in a concentration of 0.0001 to 1% by weight, 0.1 to 30% by weight and 70 to 99.9% by weight, respectively, base on the amount of the components (a), (b) and (c), to a tooth surface directly, and applying thereto a curing composition containing trialkylboron or its partial oxidate and a polymerizable monomer and having an adhesion strength of at least 11.2 MPa.

5,556,898

RADIATION-SHIELDING POLYMERIC COMPOSITIONS

Leo T. Hutton, Oxford, N.J., and David J. Lavanga, Reading, Pa., assignors to ELF Atochem North America, Inc., Philadelphia, Pa.

Filed Jan. 11, 1995, Ser. No. 371,186

Int. Cl.[6] G21F *1/10*

U.S. Cl. 523—136 **5 Claims**

1. A radiation and chemically resistant composition comprising a blend of a vinylidene fluoride polymer and from about one to about twenty percent by weight of said composition of gadolinium oxide.

5,556,899

FLUORINATED CARBON POLYMER COMPOSITES

Ali Afzali-Ardakani, Yorktown Heights, N.Y.; Juan Ayala-Esquilin, San Jose, Calif.; Bodil E. Braren, Hartsdale; Shahrokh Daijavad, Peekskill, both of N.Y.; Elizabeth Foster, Friendsville, Pa.; James L. Hedrick, Jr., Oakland, Calif.; Jeffrey C. Hedrick, Peekskill, N.Y.; Rodney T. Hodgson, Ossining, N.Y.; Ashit A. Mehta, Vestal, N.Y.; Steven E. Molis, Brewster, N.Y.; Jane M. Shaw, Ridgefield, Conn.; Stephen L. Tisdale, Vestal, N.Y., and Alfred Viehbeck, Fishkill, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 929,313, Aug. 13, 1992, Pat. No. 5,397,863, which is a continuation-in-part of Ser. No. 759,377, Sep. 13, 1991, abandoned, and Ser. No. 759,380, Sep. 13, 1991, abandoned. This application Nov. 30, 1994, Ser. No. 346,766

Int. Cl.[6] C08J *5/18*

U.S. Cl. 523—215 **8 Claims**

1. A process of effecting a change of the physical properties of a polyimide material wherein said properties are dielectric constant and reduced coefficient of thermal expansion, comprising forming a polyimide composite material having a low dielectric constant, said composite based on a dispersion consisting of a fluorinated particulate carbon material and a polyimide or polyimide precursor and optionally one or both of a liquid solvent and a liquid carrier and optionally a coupling agent, said fluroinated carbon material being present in an amount from about 2 to about 60% by weight and heating said dispersion to a temperature of about 400° C. at a rate of from about 65° to about 220° per second.

5,556,900

PROCESS FOR PRODUCING A POLYEPOXY POLYMER-LINKED-ASPHALT THERMOPLASTIC COMPOSITION

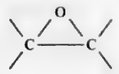
J. L. Goodrich, Lafayette, Calif., and R. J. Statz, Kennett Square, Pa., assignors to Chevron Research and Technology Company, San Francisco, Calif., and E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation of Ser. No. 205,667, Mar. 1, 1994, abandoned, which is a division of Ser. No. 724,552, Jun. 28, 1991, Pat. No. 5,306,750, which is a continuation-in-part of Ser. No. 632,261, Dec. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 459,151, Dec. 29, 1989, abandoned. This application Nov. 10, 1994, Ser. No. 337,658

Int. Cl.[6] C08L *95/00;63/00*

U.S. Cl. 524—59 **7 Claims**

1. A process for producing a polyepoxy polymer-linked-asphalt thermoplastic composition comprising forming a reaction mixture comprising an epoxide-containing reactant polymer and asphalt and heating said reaction mixture to an elevated temperature greater than 100° C. for a time greater than 1 hour, wherein said epoxide-containing reactant polymer comprises 0.05 to 20 weight percent of the reaction mixture and wherein said epoxide-containing reactant polymer contains an epoxide moiety represented by the following formula:



and has a melt flow index of 0.1 to 2000 as determined according to ASTM D1238-65T, Condition E, and contains at least 0.01 weight percent epoxide moieties based on the total weight of the reactant polymer, and wherein said reaction mixture comprises from 0.05 to 20 weight percent epoxide-containing reactant polymer.

5,556,901

POLYSILANE-BASED COMPOSITION

Nathan J. Bryson, Grigny, France, assignor to Flamel Technologies, France

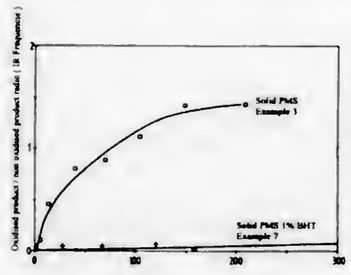
PCT No. PCT/FR93/00040, § 371 Date Nov. 2, 1993, § 102(e) Date Nov. 2, 1993, PCT Pub. No. WO93/14164, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 14, 1993, Ser. No. 117,061

Claims priority, application France, Jan. 15, 1992, 92 00369; Sep. 25, 1992, 92 11724

Int. Cl.[6] C08K *5/34;* **C04B** *35/52*

U.S. Cl. 524—99 **27 Claims**



1. A polysilane-based composition for producing silicon carbide, which comprises:

polysilane chains capable of being degraded by oxidation and the formation of polysiloxane products and/or polysilane chains suitable for being bound together directly by a reaction between Si—H and Si—X radicals, and/or indirectly through the intermediary of a crosslinking additive and by a reaction between A—X and A—H radicals, X being an olefin radical, and A being an organic, organosilicic or silicic radical;

and at least one antioxidant compound selected from the group consisting of phenol antioxidant, amine antioxidant and mixtures thereof; and

said polysilane chains being stabilized in a non-crosslinked state by said antioxidant compound.

5,556,902

SILICONE ANTIFOAMING AGENT COMPOSITION

Hiroaki Shouji, and Koichi Aizawa, both of Kanagawa, Japan, assignors to Dow Corning K.K., Tokyo, Japan

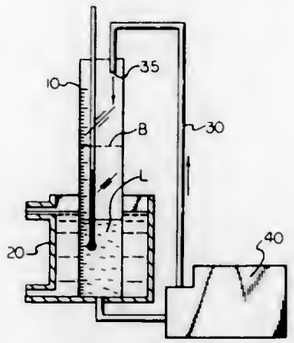
Filed Nov. 6, 1990, Ser. No. 611,223

Claims priority, application Japan, Nov. 8, 1989, 1-28810

Int. Cl.[6] C08K *5/15*

U.S. Cl. 524—114 **5 Claims**

1. A silicone antifoaming agent composition comprising (1) a polydiorganosiloxane, (2) silica and (3) 4 to 2,500 parts by weight per 100 parts by weight of the sum total of the components (1) and (2) of a modified silicone oil having the formula $R^1{}_aG_bR^0{}_{3-a-b}SiOX_kY_mZ_nSiG_pR^1{}_qR^0{}_{3-q-p}$ wherein



X is $R^0{}_2SiO_{2/2}$, Y is $R^0R^1SiO_{2/2}$ and Z is $R^0GSiO_{2/2}$ with the proviso that the order of bonding among the X, Y and Z units is not particularly limited,

R^0 is a saturated or unsaturated monovalent hydrocarbon group,

a and b are each an integer 0, 1 or 2 with the proviso that the sum total of a and b does not exceed 2,

k is a number of 1 to 300, m is a number of 1 to (100-a) and n is a number of 1 to (300-b),

R^1 is an organic group represented by the formula $—R^2A$ wherein

R^2 is a divalent hydrocarbon group having 1 to 18 carbon atoms or a divalent organic group having 1 to 18 carbon atoms in which at least one hydrogen is replaced by a hydroxyl group and

A represents a functional group selected from among epoxy, amino, amide, carboxyl, alkoxy and hydroxyl groups,

and

G is an organic group represented by the formula $—R^3O(R^4O)_pB$ wherein

R^3 and R^4 each represent a divalent hydrocarbon group having 2 to 10 carbon atoms,

p represents an integer of 1 to 100, and

B represents a hydrogen atom or an organic group selected from among monovalent hydrocarbon groups and acyl groups.

5,556,903

POLYBROMINATED PHENYLPHOSPHATE FLAME RETARDENT FOR ENGINEERING THERMOPLASTIC COMPOSITIONS

Joseph Green, East Brunswick, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 123,831, Sep. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 541,571, Jun. 21, 1990, abandoned, which is a continuation-in-part of Ser. No. 360,641, Jun. 11, 1989, abandoned, which is a continuation-in-part of Ser. No. 169,786, Mar. 18, 1988, abandoned. This application Nov. 18, 1994, Ser. No. 341,806

Int. Cl.[6] C08K *5/523*

U.S. Cl. 524—142 **9 Claims**

1. A flame retardant thermoplastic composition comprising a resin selected from the group consisting of polycarbonate, polybutylene terephthalate, polyethylene terephthalate, and blends and alloys of polycarbonate with one or more of polybutylene terephthalate, polyethylene terephthalate and acrylonitrile-butadiene-styrene, and a flame retarding amount of a melt-blendable, solid polybrominated triphenyl phosphate ester selected from a group consisting of tris(dibromophenyl)phosphate and bis(tribromophenyl)phenyl phosphate providing a thermally-stable thermoplastic composition not subject to plateout, having good impact properties, and good processability.

5,556,904

AROMATIC POLYCARBONATE COPOLYMER, A PROCESS FOR PRODUCING THE SAME, AND A PLASTIC OPTICAL WAVEGUIDE USING THE SAME

Masaki Nishiguchi, Chiba, and Toshimasa Tokuda, Iyo, both of Japan, assignors to The Furukawa Electric Co. Ltd, and Teijin Chemicals Ltd., both of Tokyo, Japan

Division of Ser. No. 140,544, Oct. 25, 1993, Pat. No. 5,409,975. This application Jan. 17, 1995, Ser. No. 373,368

Claims priority, application Japan, Nov. 2, 1992, 4-294421; Nov. 2, 1992, 4-294422; Nov. 2, 1992, 4-315595; Nov. 2, 1992, 4-315597; Nov. 2, 1992, 4-315599; Nov. 2, 1992, 4-315601

Int. Cl.[6] C08G *64/10*

U.S. Cl. 524—147 **9 Claims**

1. An aromatic polycarbonate copolymer obtained by reacting a dihydric phenol component, comprising 53 to 99.5 mol % of (A) 2,2-bis(4-hydroxyphenyl)-1,1,1,3,3,3-hexafluoropropane; 47 to 0.5 mol % of (B) 9,9-bis(4-hydroxyphenyl) fluorene; and 10 mol % or less of (C) another dihydric phenol, with a carbonate precursor substance; wherein when 0.7 g of said aromatic polycarbonate copolymer is dissolved in 100 ml of methylene chloride, the specific viscosity of the thus obtained solution measured at 20° C. is in the range of 0.160 to 0.418.

5,556,905

PHYSICALLY-MODIFIED DEGRADABLE THERMOPLASTIC COMPOSITIONS

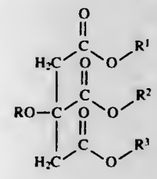
Edward P. Frappier, Kernersville; Ezekiel H. Hull, Greensboro, and L. Muri Jackson, Jamestown, all of N.C., assignors to Reilly Industries, Inc., Indianapolis, Ind.

Filed Mar. 30, 1994, Ser. No. 221,042

Int. Cl.[6] C08K *5/11;5/12*

U.S. Cl. 524—311 **21 Claims**

1. A physically-modified degradable thermoplastic composition which comprises a degradable cellulosic polymer physically modified by a partial ester of citric acid having the formula I:



I

wherein

R=H, R'—CO— or Ph—R'$_n$—CO— wherein R' is a C_1 to C_{18} aliphatic group, n is 0 or 1, and Ph is a phenyl group;

R^1, R^2 and R^3, which may be the same or different from each other, are selected from H, a C_1 to C_{18} aliphatic or alicyclic group, or R'(OR*)$_m$— wherein R' is as defined above, R* is a C_1 to C_8 alkyl group, and m is an integer from 1 to 15; and

wherein about 5% to about 40% of R^1, R^2 and R^3, taken together, are H.

5,556,906

ADHESIVE COMPOSITION

Peter J. Collins, Glen Waverley, and Yoshikazu Yazaki, Moorabbin, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organisation, and Chemplex Australia Limited, both of Melbourne, Australia

PCT No. PCT/AU91/00181, § 371 Date Jan. 4, 1993, § 102(e) Date Jan. 4, 1993, PCT Pub. No. WO91/17224, PCT Pub. Date Nov. 14, 1991

PCT Filed May 3, 1991, Ser. No. 940,875

Claims priority, application Australia, May 3, 1990, PJ 9924/90

Int. Cl.[6] C08K *5/02;* **C09J** *4/00;101/00;201/00*

U.S. Cl. 524—463 **46 Claims**

1. A wood adhesive composition for bonding wood-based materials, said composition comprising an aqueous based thermosettable resin adhesive and a fluorochemical surfactant.

5,556,907

CAOUTCHOUC MIXTURE, TREAD MADE THEREFROM AND TIRE WITH THIS TREAD

Hans-Bernd Fuchs, Alzenau-Hörstein; Dietrich Günter, Frankfurt am Main, and Ulrich Steinbrecht, Ober-Ramstadt, all of Germany, assignors to SP Reifenwerke GmbH, Hanau, Germany

Filed Jan. 17, 1995, Ser. No. 373,391

Claims priority, application Germany, Jan. 24, 1994, 44 01 934.3

Int. Cl.[6] C08K *3/36*

U.S. Cl. 524—493 **12 Claims**

1. Caoutchouc mixture vulcanisable with sulphur and containing at least one elastomer, at least one filler, customary additives and also a vulcanisation system, wherein the caoutchouc mixture contains 30 to 100 parts by weight of isoprene-butadiene-styrene terpolymer with a glass transition temperature range between –90° C. and +20° C., the isoprene of the terpolymer having a 3,4 bond content of 40 to 60% by weight and the butadiene having 1,2 bond content of 20 to 70% by weight; 0 to 70 parts by weight of one or more further elastomers; and 20 to 90 parts by weight of silica as filler, with all parts by weight being respectively related to 100 parts by weight of total elastomers.

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TOUGHENED THERMOPLASTIC MOLDING COMPOSITION

James Y. J. Chung, Wexford, and James P. Mason, McKees Rocks, both of Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

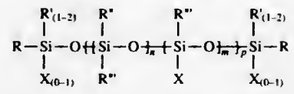
Filed Jul. 6, 1995, Ser. No. 498,935

Int. Cl.[6] C08K *3/34*

U.S. Cl. 524—493 **11 Claims**

1. A thermoplastic molding composition comprising (a) a polycarbonate resin, and (b) a silicone rubber powder, wherein said powder is present in the composition in an amount greater than 1 and lower than 5 percent relative to the weight of the composition, said silicone rubber powder having an average particle size of about 1 to 1000 microns and containing

(i) 100 pbw of a polydiorganosiloxane having a viscosity at 25° C. is about 10^6 to 10^9 centipoise and siloxane structural units represented by the general formula



wherein R', R" and R'" independently denote a hydrogen atom, C_{1-10}-alkyl, alkenyl, cycloalkyl radicals or aryl groups, and where p is about 1000 to 8000 and where the relative weight proportions of n and m is 98.5–100: 0–1.5, and where

X denotes a member selected from the group consisting of

5,556,910

POLYPROPYLENE RESIN COMPOSITION

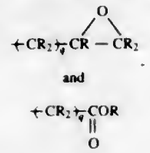
5,556,912

AQUEOUS BINDER DISPERSION FOR PHYSICALLY

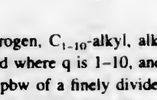
5,556,913

CATIONIC ELECTROCOATING COMPOSITION

X denotes a member selected from the group consisting of



and



where R denotes hydrogen, C_{1-10}-alkyl, alkenyl, cycloalkyl radicals or aryl groups and where q is 1–10, and

(ii) about 10 to 80 pbw of a finely divided silica selected from among fumed silica, precipitated silica and silica gel having a surface area of at least 50 m^2/g,

said composition characterized in that it has a notched Izod impact strength value which is greater than that of the polycarbonate resin alone.

5,556,909

SUBSTITUTED 2-ARYLCARBONYLOXYMETHYL-1,2,5-THIADIAZOLIDIN-3-ONE 1,1-DIOXIDE DERIVATIVES AND COMPOSITIONS AND METHOD OF USE THEREOF

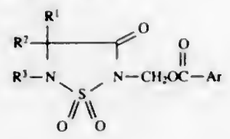
Ranjit C. Desai, Harleysville, Pa., assignor to Sanofi Winthrop Inc., New York, N.Y.

Filed Dec. 2, 1994, Ser. No. 349,341

Int. Cl.[6] C07D 285/10; A61K 31/41

U.S. Cl. 514—362 **20 Claims**

1. A compound of the formula:



wherein:

Ar is phenyl, or phenyl substituted with from one to three, the same or different, members of the group consisting of lower-alkyl, perfluorolower-alkyl, perchlorolower-alkyl, lower-alkoxy, halogen, hydroxy, and -O-(alkylene)-N=B, wherein N=B is amino, lower-alkylamino, dilower-alkylamino, 1-azetidinyl, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, 1-piperazinyl, 4-lower-alkyl-1-piperazinyl, 4-benzyl-1-piperazinyl, or 1-imidazolyl;

R^1 is hydrogen, lower-alkyl, phenyl-lower-alkyl, or halolower-alkyl;

R^2 is hydrogen, lower-alkyl, phenyl-lower-alkyl, or halolower-alkyl; and

R^3 is hydrogen, or lower-alkyl; or R^2 and R^3 together are

1,3-propylene, 1,4-butylene, or either of 1,3-propylene or 1,4-butylene substituted with one or two lower-alkyl groups;

v or pharmaceutically acceptable acid-addition salts of basic members thereof; or where applicable, an enantiomer or a racemic mixture thereof.

5,556,910

POLYPROPYLENE RESIN COMPOSITION

Hiroyuki Harada, Ichihara; Yuji Ikezawa, Nagoya; Susumu Kanzaki, Ichihara; Hideo Shinonaga, Chiba, and Satoru Sogabe, Sodegaura, all of Japan, assignors to Sumitomo Chemical Company Limited., Osaka, Japan

Filed Oct. 18, 1994, Ser. No. 324,603

Claims priority, application Japan, Oct. 19, 1993, 5-261377

Int. Cl.[6] C08K 3/00; C08L 53/00

U.S. Cl. 524—504 **4 Claims**

I. A polypropylene resin composition for coatings to be baked at a temperature of 130° C. or higher comprising 15 to 92% by weight crystalline ethylene propylene block copolymer (A), 5 to 40% by weight ethylene propylene copolymer rubber (B), 1 to 15% by weight polypropylene oligomer containing hydroxyl group (C), and 2 to 30% by weight inorganic filler (D);

wherein said crystalline ethylene propylene block copolymer (A) has a moiety of crystalline polypropylene and another moiety of ethylene-propylene random copolymer in a ratio of ethylene/propylene of 20/80 to 60/40 by weight, said crystalline polypropylene moiety having a limiting viscosity (η)p of 0.8 to 2.0 dl/g and a ratio of molecular weight distribution, Q value=weight average molecular weight Mw/number average molecular weight Mn, of 3.0 to 5.0 as determined by GPC, and a content of solubles in xylene at 20° C. of not higher than 1.5% by weight, and said ethylene-propylene random copolymer being present in an amount of 5–20% by weight of said crystalline ethylene propylene block copolymer (A); and

wherein said ethylene propylene copolymer rubber (B) has a Mooney viscosity ML_{1+4} measured at 100° C. of from 20 to 100 and a propylene content of from 20 to 75% by weight of said ethylene propylene copolymer rubber (B).

5,556,911

FILMS FROM AQUEOUS DISPERSIONS OF BLOCK COPOLYMERS HAVING HYDROGENATED CONJUGATED DIENE BLOCK

Brian W. Walther, and Gary R. Marchand, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 339,862, Nov. 15, 1994. This application Apr. 26, 1995, Ser. No. 427,940

Int. Cl.[6] C08J 3/03; C08K 5/01; C08L 53/00

U.S. Cl. 524—505 **13 Claims**

I. An aqueous dispersion which is capable of forming a coherent, elastomeric, solid film which, after drying and annealing at 90° C. for 30 minutes, demonstrates a tensile strength of 11.0 MPa or greater wherein the dispersion comprises:

I. an organic phase comprising

one or more block copolymer(s) corresponding to the formula:

$$A—B—X_m—(B—A)_n$$

wherein each A is a polymer block derived from monomers comprising one or more monovinylidene aromatic monomers and each B is a polymer block derived from monomers comprising one or more conjugated dienes and, optionally, one or more monovinylidene aromatic monomers, X is the remnant of a multifunctional coupling agent, m is 0 or 1, and n is an integer from 1 to 5, wherein each A polymer block has a weight average molecular weight from 4,000 to 15,000 Daltons, each B polymer block has a weight average molecular weight from 20,000 to 200,000 Daltons wherein the block copolymer(s) are hydrogenated such that 99.0 percent or greater of the residual olefinic unsaturation derived from the conjugated dienes is eliminated and contains sufficient branching such that the block copolymer is elastomeric; and

II. a surfactant in a sufficient amount emulsify the organic phase;

wherein the effective phase volume of the A polymer block in the organic phase is from about 8 to about 20 volume percent.

5,556,912

AQUEOUS BINDER DISPERSION FOR PHYSICALLY DRYING COATING COMPOSITIONS AND USE THEREOF

Thomas Brock, Hurth, and Klaus Wandelmaier, Wuppertal, both of Germany, assignors to Herberts GmbH, Wuppertal, Germany

Filed Dec. 21, 1994, Ser. No. 361,202

Claims priority, application Germany, Dec. 23, 1993, 43 44 063.0

Int. Cl.[6] C08J 3/00; C08K 3/20; C08L 75/00; B05D 1/36

U.S. Cl. 524—507 **5 Claims**

1. Aqueous dispersion of a binder suitable for coating compositions containing a mixture of:

A) 45 to 95 wt. % of one or more polyurethanes, obtained by free-radical initiated polymerisation of polyurethane macromonomers containing carboxyl, phosphonic and/or sulphonic acid groups and lateral vinyl groups, optionally together with terminal vinyl, hydroxy, urethane, thiourethane and/or urea groups in the presence of one or more unsaturated monomers copolymerisable with the polyurethane macromonomer, in the form of an aqueous dispersion and

B) 5 to 55 wt. % of one or more polyurethane resins containing ionic groups containing neither urea nor carbonate groups, which resins have a number average molar mass (M_n) of 10000 to 300000 and an acid value of 5 to 50 in the form of an aqueous dispersion, obtained by preparing a polyurethane prepolymer containing OH groups and having an OH value of 5 to 75 and a number average molar mass (M_n) of 5000 to 50000 by the reaction in an organic medium of

a) one or more isocyanate-reactive compounds with an acid value of 0 to 10 in the form of

a1) 70 to 100 wt. % of one or more polyester polyols and/or polyether polyols, in particular polyester diols, polyether diols with a molecular weight of 500 to 6000, together with

a2) 30 to 0 wt. % of one or more compounds differing from a1) with at least two isocyanate-reactive groups with a molecular weight of 60 to 400 with

b) one or more reaction products containing free isocyanate groups prepared from

b1) at least one compound with two isocyanate-reactive groups and at least one anionic group or group capable of anion formation and

b2) one or more organic diisocyanates

in a quantity ratio such that the molar ratio of the isocyanate-reactive groups of b1) to the isocyanate groups of b2) is 1:1.5 to 1:2.5, wherein the reaction product b) may be produced in the presence of component a), wherein component b) is used in such a quantity that the finished polyurethane resins have the desired acid value and with

c) one or more polyisocyanates with at least two free isocyanate groups per molecule in a quantity such that the molar ratio of the OH groups of component a) to the NCO groups of components b) and c) is 1.01:1 to 3:1,

whereupon, before or after partial or complete neutralisation of groups which may be converted into ionic groups in the organic medium or after conversion into the aqueous phase, the prepolymer obtained from a), b) and c) is subjected to chain extension by reaction with

d) one or more polyfunctional isocyanates with a free NCO group functionality of at least 1.8, in proportions such that the finished polyurethane resins have the desired number average molar mass, wherein the wt. % of the components A) and B) each relate to the resin solids content.

5,556,913

CATIONIC ELECTROCOATING COMPOSITION

Kenshiro Tobinaga, Kawanishi; Hiroyuki Sakamoto, Nishinomiya; Shinsuke Shirakawa, Suita; Satoshi Urano, Tsuzuki-gun, and Yasuyuki Tsuchiya, Hirakata, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka-fu, Japan

Continuation-in-part of Ser. No. 962,049, Oct. 16, 1992, abandoned, which is a continuation of Ser. No. 621,439, Dec. 4, 1990, abandoned. This application Jan. 3, 1994, Ser. No. 176,508

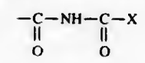
Claims priority, application Japan, Dec. 4, 1989, 1-314584; Aug. 29, 1990, 2-228799

Int. Cl.[6] C08J 3/00; C08K 3/20; C08L 39/00

U.S. Cl. 524—555 **14 Claims**

1. A cationic electrocoating composition comprising a resinous component and an aqueous medium, which is free of blocked isocyanates and curable at a temperature of 100° to 140° C., wherein said resin component comprises:

(P_2) a vinyl polymer resin component having 5 to 1,000 substituted acylamide groups represented by



wherein X is $—OR_1$, $—NR_2R_3$, $—SR_4$ or $-CR_5R_6R_7$, provided that R_1 and R_4 respectively represent an alkyl group, an alkenyl group, an alkynyl group, an aralkyl group, an aryl group, an imino group, an acyl group or an imide group, which may be substituted or cyclized, R_2 and R_3 respectively represent a hydrogen atom, an alkyl group, an alkenyl group, an alkynyl group, an aralkyl group, an aryl group or an acyl group, which may be substituted or cyclized and at least one of R_5, R_6 and R_7 is an acyl group, and the other members of R_5, R_6 and R_7 respectively represent a hydrogen atom, an alkyl group, an alkenyl group an alkynyl group, an aralkyl group, an aryl group or an acyl group, which may be substituted or cyclized, and

(r_2) a resinous component having an active hydrogen containing group and a cationic group as a whole,

wherein said substituted acylamide group is present in an equivalent of at least 1×10^{-5}, said active hydrogen-containing group is selected from the group consisting of an amino group, a hydroxyl group and a mixture thereof and present in an equivalent of at least 1×10^{-5}, and said cationic group is present in an equivalent of 1×10^{-4} to 40×10^{-4}, each of said aforesaid equivalents being based upon 1 gram of all resin components in the composition,

said vinyl polymer (p_2) being either prepared by subjecting monomers to emulsion polymerization and then mixed with the other resinous component (r_2) or prepared by subjecting monomers to solution polymerization and then mixed with the other resinous component (r_2) in the presence of water and acid to form polymer particles, whereby said substituted acylamide groups are protected in the particles.

5,556,914

ROOM TEMPERATURE VULCANIZING COMPOSITIONS

André R. L. Colas, Glashuetten, and Edward A. Joseph, Hofheim, both of Germany, assignors to Dow Corning GmbH, Rheingaustrasse, Germany

Continuation of Ser. No. 125,716, Sep. 24, 1993, abandoned. This application Mar. 23, 1995, Ser. No. 409,914

Claims priority, application United Kingdom, Oct. 27, 1992, 9222593; Dec. 9, 1992, 92225674

Int. Cl.[6] C08K 5/24

U.S. Cl. 524—731 **10 Claims**

1. A room temperature vulcanizable composition formed by mixing components consisting essentially of (1) a diorganopolysiloxane having terminal silicone bonded hydroxyl groups; (2) as the sole crosslinking agent at least one compound selected from the group consisting of trialkoxysilanes and tetraalkyoxysilanes wherein the alkoxy groups of said crosslinking agent contain more

than two carbon atoms and said composition contains from 6 to 50 moles of crosslinking agent per mole of said diorganopolysiloxane, (3) 1 to 8 moles, per mole of said diorganopolysiloxane, of a condensation catalyst and (4) 50 to 200 parts by weight, per 100 parts by weight of said diorganopolysiloxane, of a trialkylsilyl-terminated diorganopolysiloxane.

5,556,915

WATER-BASED ORGANOSILICON COMPOSITION

Takehiro Suzuki; Masashi Koide, and Masahiro Fujii, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 991,408, Dec. 16, 1992, abandoned. This application Oct. 31, 1994, Ser. No. 332,495

Claims priority, application Japan, Dec. 20, 1991, 3-355125

Int. Cl.[6] C08L *83/00;* **B01J** *13/00;* **C04B** *9/02*

U.S. Cl. 524—837 **11 Claims**

1. A barrier penetrant for construction materials, which comprises a water-based organosilicon composition prepared by emulsifying alkylalkoxysilane and/or its condensate in water in the presence of (a) a phosphate anionic emulsifier, (b) at least one water-soluble polymer thickener selected from the group consisting of sodium polyacrylate, polyvinyl alcohol, polyether, casein, mannan, starch, chitosan, carboxymethyl cellulose and methoxymethyl cellulose, and (c) an organic amine alkaline compound, said alkaline compound being present in an amount sufficient to maintain the composition at a pH of 7 to 11.

5,556,916

ANTISTATIC RESIN BLENDS COMPRISING ABS GRAFT COPOLYMERS AND ETHYLENE OXIDE COPOLYMERS

Yasuo Matoba, Amagasaki; Yasumi Shimizu, Kawanishi; Katsuhito Miura, Amagasaki; Sojiro Kitano, Osaka; Takahiro Sakashita, Osaka, and Hidekazu Tanaka, Amagasaki, all of Japan, assignors to Daiso Co. Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 216,437, Mar. 23, 1994, abandoned, which is a continuation of Ser. No. 719, Jan. 5, 1993, abandoned. This application Nov. 4, 1994, Ser. No. 336,200

Int. Cl.[6] C08L *55/02;71/02;71/03*

U.S. Cl. 525—64 **15 Claims**

1. An antistatic resin composition comprising a mixture of:

100 parts by weight of an ABS graft copolymer comprising as component monomers an acrylonitrile compound and a vinyl aromatic compound in a weight ratio of 10:90 to 50:50;

5 to 30 parts by weight of an ethylene oxide copolymer containing at least 50 wt. % of ethylene oxide and additionally 2-phenylphenyl glycidyl ether or 1-naphthylglycidyl ether, said copolymer having a refractive index (n_d^{20}) of at least 1.50 and a reduced viscosity, 0.1 g/dl solution in chlorobenzene at 80° C., of 1 to 5.

5,556,917

TOUGH GLOSSY POLYMER BLENDS

Michael B. Coleila, Plantsville, Conn., and Michael Castriotta, Lancaster, Mass., assignors to Novacor Chemicals (International) SA, Fribourg, Switzerland

Filed Oct. 8, 1993, Ser. No. 134,217

Int. Cl.[6] C08L *51/04*

U.S. Cl. 525—71 **11 Claims**

1. A polymer blend comprising:

(i) from 10 to 50 parts by weight of an impact resistant styrene acrylate polymer alloy; and

(ii) from 90 to 50 parts by weight of a polymer comprising:

(a) from 96 to 85 weight % of one or more C_{8-12} vinyl aromatic monomers a portion of which are grafted to;

(b) from 4 to 15 weight % of one or more polymers selected from the group consisting of polymers of C_{4-6} conjugated diolefins; and copolymers comprising from 40 to 60 weight % of one or more C_{8-12} vinyl aromatic monomers and from 60 to 40 weight % of one or more C_{4-6} conjugated diolefins.

5,556,918

POLYMERIC MATERIALS SUITABLE AS DISPERSING RESINS

Gregor Brodt, Heppenheim; August Lehner, Rödersheim-Gronau; Alfred Lindner, Michelstadt; Hermann Graf, Mutterstadt; Michael Bobrich, Böhl-Iggelheim; Ria Kress, Ludwigshafen; Norbert Schneider, Altrip; Albert Kohl, Laumersheim, and Werner Loch, Appenweier, all of Germany, assignors to BASF Magnetics GmbH, Mannheim, Germany

Filed Jan. 10, 1995, Ser. No. 370,977

Claims priority, application Germany, Jan. 12, 1994, 44 00 594.6; Jan. 12, 1994, 44 00 595.4

Int. Cl.[6] C08F *8/30*

U.S. Cl. 525—131 **5 Claims**

1. A polymeric material (I) suitable as a dispersing resin and obtained by the process of reacting

1) a polymer II comprising

a) from 80 to almost 100 mol % of a C_1–C_{25}-alkyl ester of an α,β-unsaturated carboxylic acid,

b) from 0 to 20 mol % of a further monomer,

c) tetrahydrofuran hydroperoxide as polymerization initiator and, optionally,

d) a further polymerization initiator or regulator by means of which the majority of the polymer chains of the polymer II are terminated at one of their ends by a hydroxyl group,

2) reacting the polymer II with a polyfunctional isocyanate III to give a reaction product IV, the amount of isocyanate groups being from 1.2 to 3.0 mol per mol of hydroxyl groups of II, and

3) reacting the free isocyanate groups of IV with ammonia or with a compound V which has an amino function reactive toward isocyanates.

5,556,919

RUBBER COMPOSITION COMPRISING NITRILE GROUP-CONTAINING HIGHLY SATURATED COPOLYMER RUBBER AND ETHYLENICALLY SATURATED COPOLYMER RUBBER

Motofumi Oyama, Yokosuka, and Kazuyoshi Nakajima, Tokyo, both of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 486,261

Claims priority, application Japan, Sep. 30, 1994, 6-261368

Int. Cl.[6] C08L *9/02;23/16*

U.S. Cl. 525—189 **22 Claims**

1. A rubber composition comprising:

(i) a nitrile group-containing highly saturated copolymer rubber, which is a product obtained by hydrogenating the conjugated diene portion of an unsaturated nitrile-conjugated diene copolymer, and

(ii) an ethylenically saturated copolymer rubber which is comprised of ethylene units, units of an α-olefin having 3 to 14 carbon atoms and non-conjugated diene units;

said nitrile group-containing highly saturated copolymer rubber (i) having an alkylthio group having 12 to 16 carbon atoms, which include at least three tertiary carbon atoms, and having a sulfur atom which is directly bound to at least one of the tertiary carbon atoms; and said highly saturated copolymer rubber (i) further having a Mooney viscosity of 15 to 200 and an iodine value not larger than 80.

5,556,920

STRETCHED POLYPROPYLENE FILM

Shinsuke Tanaka; Manabu Kamisaka; Isao Masada; Junichi Fujii, and Naoki Ueda, all of Tokuyama, Japan, assignors to Tokuyama Corporation, Yamaguchi-ken, Japan

Filed Jul. 7, 1995, Ser. No. 499,195

Claims priority, application Japan, Jul. 8, 1994, 6-157168; Aug. 4, 1994, 6-183629; Mar. 29, 1995, 7-071014

Int. Cl.[6] C08L *45/00;23/10*

U.S. Cl. 525—216 **32 Claims**

1. A stretched polypropylene film comprising a crystalline a polypropylene and a monocyclic olefin polymer, wherein the content of the monocyclic olefin polymer is 0.1–1,000 ppm by weight and which film is stretched at least monoaxially.

5,556,921

AIR DRIED CROSS-LINKABLE POLYMERIC VEHICLES WHICH INCLUDE ACETYLENIC GROUPS

Stoil Dirlikov, and Zhao Chen, both of Ypsilanti, Mich., assignors to Eastern Michigan University, Ypsilanti, Mich.

Filed Feb. 14, 1994, Ser. No. 195,545

Int. Cl.[6] C08K *3/10;* **C08J** *3/24*

U.S. Cl. 525—245 **21 Claims**

1. A polymeric vehicle comprising:

a polymer selected from the group consisting of a homopolymer and copolymer of alpha, beta unsaturated monomers, from about 5 to about 100 molar percent of the monomeric units forming the polymer having at least one pendent propargyl group, the polymer having a number average molecular weight in the range of from about 500 to about 100,000; and a copper (I) catalyst,

the polymer being adapted to be cross-linked through reaction of the propargyl groups, the cross-linking reaction being catalyzed by the copper (I) catalyst to provide the coating binder, the polymer vehicle being effective for providing a coating binder having a hardness of at least about B and an impact resistance of at least about 50 inch-pounds after being applied to a substrate at a thickness of about 1 to about 3 mils wet and air dried for not more than about 24 hours at not less than about −10° C., and not more than about 30° C.

5,556,922

DISPERSIONS FOR PRESSURE SENSITIVE ADHESIVES CONTAINING ALKYL (METH) ACRYLATES

Gunther Mueller, Gernsheim; Herbert Fink, Bickenbach, and Joachim Heyne, Limburgerhof, all of Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Germany

Filed Aug. 25, 1994, Ser. No. 296,244

Claims priority, application Germany, Sep. 21, 1993, 43 32 012.0

Int. Cl.[6] C08L *33/06;* **C08F** *2/24*

U.S. Cl. 525—260 **20 Claims**

1. A method for preparing a dispersion for a pressure sensitive adhesive, containing a copolymer (CP) comprised of units of butyl acrylate and (meth)acrylic acid; said method comprising the steps of:

under semi-continuous polymerization conditions, polymeriztng an aqueous emulsion (EM) containing butyl acrylate, an anionic emulsifier and a non-ionic emulsifier, in the aqueous phase, under heating and in the presence of at least one water-soluble initiator (IN) of formula (I)

$$M\,R_1 \qquad (I)$$

where M represents an alkali metal cation, and

R_1 represents an anion of a peroxyacid or azo-group-containing acid,

wherein said (IN) is present in an amount of 0.5–1.5 wt. % based on weight of the monomers;

emulsifying-in (meth)acrylic acid while maintaining an elevated reaction temperature such that the ratio of butyl acrylate to (meth) acrylic acid ranges from 99.5:0.5 to 90:10 parts by wt.; and

adding a second initiator (RI) to complete the polymerization and wherein said process is carried out under conditions of core and shell polymerization.

5,556,923

CONTINUOUS PROCESS FOR PRODUCING ADDUCTED EPM OR EPDM OIL SOLUTION

Tony L. Caines, and Michael L. Junker, both of Baton Rouge, La., assignors to DSM Copolymer, Inc., Baton Rouge, La.

Continuation of Ser. No. 319,310, Oct. 6, 1994, Pat. No. 5,516,849, which is a division of Ser. No. 42,866, Apr. 5, 1993, Pat. No. 5,384,371, which is a continuation of Ser. No. 949,336, Sep. 22, 1992, abandoned, which is a continuation of Ser. No. 484,378, Feb. 23, 1990, abandoned. This application Aug. 22, 1995, Ser. No. 518,075

Int. Cl.[6] C08F *255/04;255/06;* **C10M** *145/16*

U.S. Cl. 525—285 **11 Claims**

1. An adducted EPR or EPDM solution made by a process comprising continuously reacting (a) a grafted polymer prepared by interpolymerizing ethylene with at least one olefinic hydrocarbon containing 3–16 carbon atoms and optionally a polyene or cyclic polyene containing 5–10 carbon atoms which has been grafted with a graft monomer in the form of an unsaturated dicarboxylic acid, acid ester or anhydride, said grafted polymer being dispersed in an oil solution, with (b) an antioxidant polyamine composition in the presence of (c) an aliphatic or phenolic alcohol ethoxylate to form an imide adduct.

5,556,924

SYNTHESIS OF PHOTOREACTIVE POLYMERIC BINDERS

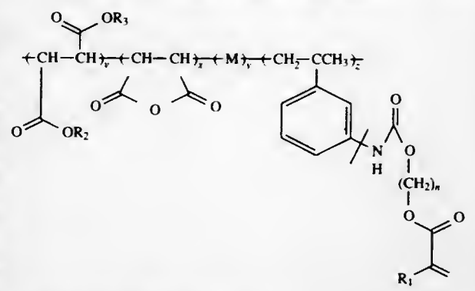
Maurice J. Fitzgerald, Canton; Frederick R. Kearney, Walpole; Rong-Chang Liang, Newton, and William C. Schwarzel, Billerica, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 429,804, Apr. 27, 1995, Pat. No. 5,514,522, which is a continuation-in-part of Ser. No. 146,711, Nov. 1, 1993, abandoned. This application Feb. 15, 1996, Ser. No. 602,046

Int. Cl.[6] C08F *283/00;* **G03F** *7/035*

U.S. Cl. 525—293 **6 Claims**

1. A photoreactive polymeric binder of the formula:



wherein n is an integer from 1 to 18;

—M— is one or more polymerized units of ethylenically unsaturated monomers;

y is approximately 70% to approximately 95% by weight, z is from approximately 5% to approximately 30% by weight, and the sum of v and x are from greater than 0% to approximately 10% by weight;

R_1 is H, or alkyl; and
R_2 and R_3 are each H, alkyl, aryl, or $-(CH_2)_nO_2CCH=CH_2$.

5,556,925

POLYURETHANE RESIN, PROCESS FOR PREPARING THE SAME AND PRINTING INK FOR LAMINATE CONTAINING THE SAME

Katsumi Kousaka; Takahiko Inoue, and Takahito Miyamoto, all of Osaka, Japan, assignors to Sakata Inx Corporation, Japan

Filed Dec. 20, 1993, Ser. No. 169,216

Claims priority, application Japan, Dec. 28, 1992, 4-348068; Dec. 7, 1993, 5-306774

Int. Cl.[6] C08F *20/00;* **C08G** *18/66*

U.S. Cl. 525—440 **7 Claims**

1. A printing ink composition for a laminate comprising a polyurethane resin, a coloring agent and an organic solvent as the essential ingredients, the polyurethane resin being a reaction product of a high molecular weight diol compound having a number average molecular weight of 3,000 to 10,000, a low molecular weight diol compound having a molecular weight of not more than 120, an organic diisocyanate compound, a chain extender, and optionally a reaction terminating agent, wherein the whole of the high molecular weight diol compound and the low molecular weight diol compound has a specific average molecular weight (Msp) of 1,500 to 2,700, the specific average molecular weight (Msp) being calculated according to the formula:

$$Msp=Mw(H)\times Mf(H)+Mw(L)\times Mf(L)$$

wherein the abbreviations means the following:
Mw(H): Number average molecular weight of the high molecular weight diol compound,
Mf(H): Mole fraction of the high molecular weight diol compound,
Mw(L): Molecular weight of the low molecular weight diol compound,
Mf(L): Mole fraction of the low molecular weight diol compound, the isocyanate index (I.I.) of the organic diisocyanate compound to the high molecular weight diol compound wherein the isocyanate index (I.I.) means a ratio of the number of equivalents of isocyanate group/the number of equivalents of hydroxyl group, satisfies the following condition: I.I.>2.0; and the nitrogen content of the polyurethane resin derived from the isocyanate group of the organic diisocyanate compound is from 1.30 to 1.95% by weight.

5,556,926

CONCENTRATE FOR USE IN THE MELT FABRICATION OF POLYESTER

George E. Rotter, Clarendon Hills; Weilong Chiang, Napeville; Boh C. Tsai, Inverness; John L. Melquist, Naperville; Cheryl A. Pauer, Aurora, and Stephen Chen, Wheaton, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

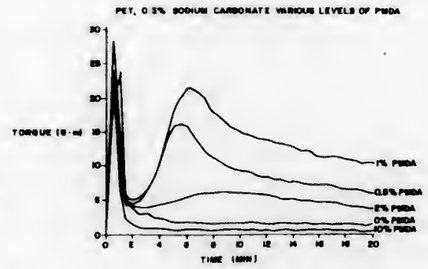
Division of Ser. No. 475,325, Jun. 7, 1995, Pat. No. 5,536,793, which is a continuation-in-part of Ser. No. 241,483, May 12, 1994, Pat. No. 5,446,111, and Ser. No. 241,802, May 12, 1994, abandoned, said Ser. No. 241,483and Ser. No. 241,802, , each is a division of Ser. No. 169,594, Dec. 17, 1993, Pat. No. 5,340,846, which is a division of Ser. No. 10,767, Jan. 29, 1993, Pat. No. 5,288,764. This application Jan. 30, 1996, Ser. No. 593,839

Int. Cl.[6] C08F *20/00*

U.S. Cl. 525—444 **5 Claims**

1. A process for melt processing polyester, said process comprising the steps of:

by melt processing a mixture comprising at least 50 weight percent of a polyester resin carrier and greater than 5 and no more than 20 weight percent of a polyfunctional branching compound to produce a solid concentrate, said concentrate



containing less than 1 weight percent of crosslinked reaction products of the branching compound and the polyester resin carrier; and

melt processing the solid concentrate with a polyester.

5,556,927

CARBONATE GROUP-MODIFIED EPOXY RESIN, A PROCESS FOR THE PREPARATION THEREOF, AND A HEAT-CURABLE RESIN COMPOSITION

Takaaki Fujiwa; Takeharu Tabuchi; Hideki Matsui, all of Hiroshima-ken; Shinji Nakano, Osaka-fu; Shin-ya Yamada, Osaka-fu, and Takao Morimoto, Osaka-fu, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka-fu, and Nippon Paint Co., Ltd., Osaka, both of Japan

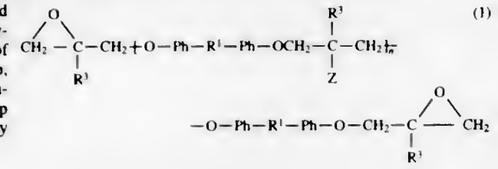
Filed Jun. 7, 1995, Ser. No. 482,561

Claims priority, application Japan, Jun. 16, 1994, 6-157894; Jul. 6, 1994, 6-177634

Int. Cl.[6] C08L *63/00;* **C08F** *283/02*

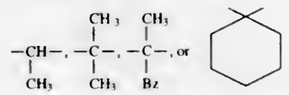
U.S. Cl. 525—533 **5 Claims**

1. A carbonate group-modified epoxy resin represented by general formula (1):

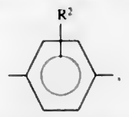


(1)

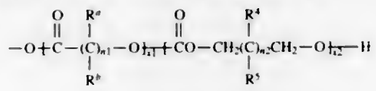
wherein structural unit $-R^1-$ is $-CH_2-$,



Bz is a phenyl group, and n is at least 1, structural unit —Ph— is



the substituted group R2 is a hydrogen atom or a halogen atom, R3 is a hydrogen or a methyl group, structural unit Z is



wherein substituted groups Ra and Rb are independently a hydrogen atom or a methyl group, substituted groups R4 and R5 are independently a hydrogen atom or an alkyl group having carbon number ranging from 1 to 20, n1 is an integer ranging from 1 to 7, n2 is an integer ranging from 0 to 4, x1 is an integer ranging from 0 to 100, and x2 is an integer ranging from 1 to 100.

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TITANIUM (II) OR ZIRCONIUM (II) COMPLEXES AND ADDITION POLYMERIZATION CATALYSTS THEREFROM

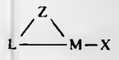
David D. Devore; Francis J. Timmers, both of Midland, Mich.; James C. Stevens, Richmond, Tex.; Robert D. Mussell, Midland, Mich.; Lenore H. Crawford, Midland, Mich., and David R. Wilson, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 241,523, May 12, 1994, Pat. No. 5,470,993, which is a continuation-in-part of Ser. No. 230,051, Apr. 19, 1994, abandoned, which is a continuation-in-part of Ser. No. 82,197, Jun. 24, 1993, abandoned. This application Aug. 15, 1995, Ser. No. 470,858

Int. Cl.[6] C08F *4/643;10/00*

U.S. Cl. 526—127 **19 Claims**

1. A polymerization process comprising contacting an ethylenically and/or acetylenically unsaturated monomer with a catalyst under polymerization conditions characterized in that the catalyst is a composition comprising a metal complex which is catalytically activated by combination with an activating cocatalyst or by use of an activating technique, said complex containing one and only one cyclic delocalized, anionic, π-bonded group, and corresponding to the formula:



wherein:

M is titanium or zirconium in the +2 formal oxidation state;

L is a group containing a cyclic, delocalized, anionic, π-system through which the group is bound to M, and which group is also bound to Z;

Z is a moiety bound to M via a σ-bond, comprising an element selected from the group consisting of boron and the members of Group 14 of the Periodic Table of the Elements, and also comprising an element selected from the group consisting of nitrogen, phosphorus, sulfur and oxygen, said moiety having up to 60 non-hydrogen atoms; and

X is a neutral, conjugated or nonconjugated diene, optionally substituted with one or more groups selected from hydrocarbyl or trimethylsilyl groups, said X having up to 40 carbon atoms and forming a π-complex with M.

5,556,929

OCULAR LENS MATERIAL

Yasuhiro Yokoyama; Yuriko Watanabe; Akinori Okumura, all of Nagoya; Shoji Ichinohe, and Toshio Yamazaki, both of Gunma-ken, all of Japan, assignors to Menicon Co., Ltd., Nagoya, and Shin-Etsu Chemical Co., Ltd., Tokyo, both of Japan

Continuation of Ser. No. 302,404, Sep. 8, 1994, abandoned. This application Jan. 2, 1996, Ser. No. 582,023

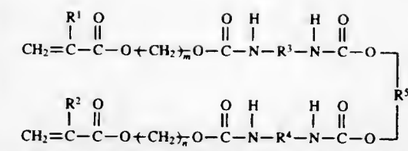
Claims priority, application Japan, Sep. 27, 1993, 5-239967

Int. Cl.[6] C08F *26/00*

U.S. Cl. 526—248 **3 Claims**

1. An ocular lens material made of a copolymer obtained by polymerizing copolymerizable components comprising

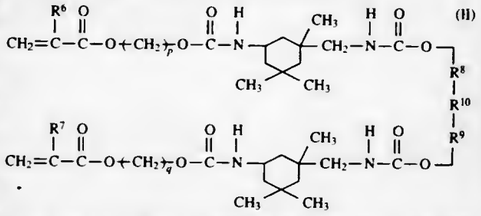
from 10 to 20 wt % of (A) a fluorine-containing di(meth) acrylate having urethane bonds, of formula (I):



(I)

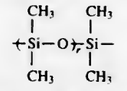
wherein each of R^1 and R^2 independently represents a hydrogen atom or a methyl group, each of R^3 and R^4 independently represents a C_{5-15} alkylene group, R^5 represents a C_{1-20} alkylene group containing from 1 to 20 fluorine atoms, and each of m and n independently represents an integer of from 1 to 5, and

from 10 to 40 wt % of (B) a silicone-containing di(meth)acrylate having urethane bonds, of the formula (II):



(II)

wherein each of R^6 and R^7 independently represents a hydrogen atom or a methyl group, each of R^8 and R^9 independently represents a C_{1-10} alkylene group or a C_{2-10} ether group, R^{10} represents a siloxane structure of the formula (III):



(III)

wherein r is an integer of from 1 to 50, and each of p and q independently represents an integer of from 1 to 5, and

from 40 to 80 wt % of (C) at least one monomer having an unsaturated double bond, copolymerizable with the fluorine-containing di(meth)acrylate (A) and the silicone-containing di(meth)acrylate (B), the monomer (C) containing at least one member selected from the group consisting of (meth)acrylamides and N-vinyl lactams.

5,556,930

COPOLYMERS AND THEIR USE IN THE TREATMENT OF LEATHER

Helmut Brehm, Krefeld; Leonardus Strijbos, Tönisvorst, and Hans-Bernhard Eikmeier, Kempen, all of Germany, assignors to Chemische Fabrik Stockhausen GmbH, Krefeld, Germany

PCT No. PCT/EP93/03350, § 371 Date Jun. 12, 1995, § 102(e) Date Jun. 12, 1995, PCT Pub. No. WO94/12716, PCT Pub. Date Jun. 23, 1994

PCT Filed Nov. 30, 1993, Ser. No. 448,338

Claims priority, application Germany, Dec. 12, 1992, 42 42 039.3

Int. Cl.[6] C08F *220/06;220/28;* **C14C** *3/22*

U.S. Cl. 526—318.5 **14 Claims**

1. A copolymer, comprising:

a) 20–60% by weight of ethylenically unsaturated monomers having acid groups,

b) 40–80% by weight of ethylenically unsaturated glycerol derivatives in which one hydroxyl group of the glycerol is unsubstituted, a second hydroxyl group is etherified with (meth) allyl alcohol, and a third hydroxyl group is etherified with a C_{12-24} alcohol, a C_{12-24} alkylphenol or said third hydroxyl group is esterified with a C_{12-40} monocarboxylic acid, and

c) 0–30% by weight of other ethylenically unsaturated copolymerizable monomers, wherein the sum of said monomers a)

ing conjugated or isolated double bonds and isobutene, whose average molecular weight is from 500 to 5,000 Dalton and which

5,556,935

5,556,937

c) 0–30% by weight of other ethylenically unsaturated copolymerizable monomers, wherein the sum of said monomers a) +b)+c)=100 wt. %.

5,556,931

POLYMERIZABLE COMPOSITION AND ORGANIC GLASS

Satoshi Imura; Hironobu Nagoh, both of Tsukuba, and Kazuhiko Kuramoto, Tokuyama, all of Japan, assignors to Tokuyama Corporation, Yamaguchi-ken, Japan

Filed Jul. 6, 1995, Ser. No. 499,070

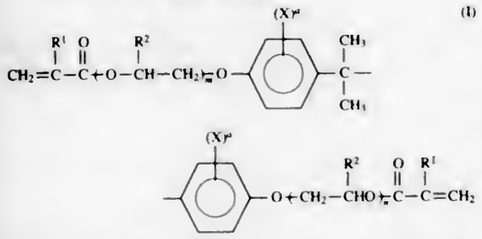
Claims priority, application Japan, Jul. 8, 1994, 6-157007

Int. Cl.[6] C08F *220/20;220/10*

U.S. Cl. 526—323.1 **12 Claims**

1. A polymerizable composition comprising:

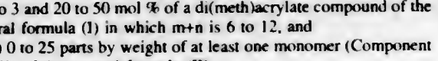
(1) 100 parts by weight of a di(meth) acrylate compound (Component 1) of the general formula (I),



(I)

wherein each of R^1 and R^2 is independently hydrogen or methyl, each of m and n is independently an integer of 1 to 15, X is a halogen excluding fluorine, and a is an integer of to 4, or X is hydrogen when a is 0, provided that, when the amount of Component I is 100 mol %, Component I contains 30 to 80 mol % of a di (meth)acrylate compound of the general formula (I) in which m+n is 2 to 3 and 20 to 50 mol % of a di(meth)acrylate compound of the general formula (I) in which m+n is 6 to 12, and

(2) 0 to 25 parts by weight of at least one monomer (Component II) of the general formula (II),



(II)

wherein each of R^3 and R^4 is independently hydrogen or methyl, R^5 is hydrogen, an alkyl group having 1 to 6 carbon atoms, an aralkyl group having 7 to 12 carbon atoms, an aryl group having 6 to 15 carbon atoms, a cycloalkyl group having 3 to 10 carbon atoms, a glycidyl group, a cyano group, an acryl group or a methacryl group, and k is an integer of 0 to 10.

5,556,932

CHLORINE-FREE, NON-DRYING ISOBUTENE/DIENE COPOLYMERS AND PROCESS FOR THEIR PREPARATION

Hans P. Rath, Gruenstadt; Konrad Knoll, Mannheim, and Helmut Mach, Heidelberg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Aug. 7, 1995, Ser. No. 505,258

Claims priority, application Germany, Mar. 2, 1993, 43 06 384.5

Int. Cl.[6] C08F *4/14;210/12*

U.S. Cl. 526—339 **9 Claims**

1. A chlorine-free, non-drying copolymer of isobutene and a C_4–C_{10}-diene having isolated or conjugated double bonds and containing at least 60 mol % of terminal double bonds and having a molecular weight M_n of from 500 to 5,000 Dalton.

3. A process for the preparation of a chlorine-free, non-drying copolymer from one C_4–C_{10}-diene or different C_4–C_{10}-dienes having conjugated or isolated double bonds and isobutene, whose average molecular weight is from 500 to 5,000 Dalton and which contains at least 60 mol % of terminal double bonds, by cationic polymerization, wherein the isobutene is polymerized with the diene in a molar isobutene/diene ratio of from 50:1 to 0.4:1 with the aid of a boron trifluoride/C_1–C_{15}-alcohol complex whose molar boron trifluoride/alcohol ratio is from 0.25 to 0.9, in the presence or absence of hydrogen fluoride at from −60° to 0° C.

5,556,933

POLYACYLURETHANE AND PROCESS FOR PRODUCING THE SAME

Masami Yabuta, Katano, and Satoshi Urano, Tsuzuki-gun, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

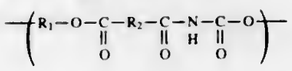
Filed May 2, 1995, Ser. No. 432,705

Claims priority, application Japan, May 6, 1994, 6-094235

Int. Cl.[6] C08G *18/71*

U.S. Cl. 528—26 **15 Claims**

1. Polyacylurethane having a number average molecular weight of 500 to 100,000, wherein the main chain of said polyacylurethane comprises repeating units of the formula:



wherein R_1 represents an alkylene group or an alkenylene group having a molecular weight of 28 to 30,000, which may contain an alicyclic group, an aromatic group and/or an oxygen atom; and R_2 represents an alkylene group, an arylene group or an alkenylene group having 1 to 8 carbon atoms.

5,556,934

ISOCYANURATE EMBEDMENT COMPOUND

James A. E. Hagquist, St. Paul, and Kevin J. Reid, White Bear, both of Minn., assignors to H. B. Fuller Licensing & Financing Inc., Arden Hills, Minn.

Continuation-in-part of Ser. No. 116,346, Sep. 3, 1993, abandoned. This application Sep. 19, 1994, Ser. No. 308,783

Int. Cl.[6] C08G *18/32*

U.S. Cl. 528—85 **19 Claims**

1. A composition curable to a polyurethane/polyisocyanurate comprising:

a polyisocyanate containing at least 18% by weight NCO content;

a polyol having an average of more than 2 hydroxyl groups per molecule; the polyisocyanate and polyol components being present in respective amounts so as to provide a NCO/OH ratio of between 2 and 4; and,

an amount of catalyst effective to catalyze cure of the composition by generation of both urethane and isocyanurate linkages, without substantial gassing, the catalyst being chosen from the group consisting of potassium salts, mixtures of potassium salts, tertiary or quaternary amines, triazine compounds and N,N,N',N',N",N"-hexamethyl-1,3,5-triazine 1,3,5 (2H, 4H, 6H)tripropanamine.

5,556,935

CROSSLINKING AGENTS FOR TEXTILE PRINTING BINDERS

Harro Träubel; Herbert Wigger, both of Leverkusen; Hans-Josef Laas, Koeln, and Helmut Reiff, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 241,926, May 12, 1994, abandoned, which is a continuation of Ser. No. 66,454, May 24, 1993, abandoned. This application May 12, 1995, Ser. No. 440,286

Claims priority, application Germany, May 29, 1992, 42 17 716.2

Int. Cl.[6] C08G *59/00*

U.S. Cl. 528—99 **3 Claims**

1. A textile printing paste comprising a pigment, a binder, and a crosslinking agent, wherein said crosslinking agent consists essentially of

(a) a polyisocyanate mixture prepared by reaction at an NCO:OH equivalent ratio of at least 2:1 of (A) a polyisocyanate component having an (average) NCO functionality of 2.1 to 4.4 in which at least one polyisocyanate of said polyisocyanate component contains only (cyclo)aliphatically bound isocyanate groups with (B) a polyalkylene oxide polyether alcohol containing a statistical average of 5 to 70 ethylene oxide units, wherein said polyisocyanate mixture (a) has

(i) an average NCO functionality of 1.8 to 4.2,

(ii) a content of (cyclo)aliphatically bound isocyanate groups (expressed as NCO, molecular weight 42) in the range from 12.0 to 21.5% by weight, and

(iii) a content of ethylene oxide units (expressed as C_2H_4O, molecular weight 44) arranged within polyether chains of 2 to 20% by weight; or an isocyanate derivative prepared from an organic polyisocyanate having an (average) NCO functionality of 2.0 to 2.5 or a mixture of organic poly- and monoisocyanates having an average NCO functionality of 1.3 to 2.5 and, optionally, compounds containing isocyanate-reactive groups, wherein said isocyanate derivative contains

(i) 2 to 30% by weight of carbodiimide groups —N=C=N—, with the statistical average being 0.8 to 30—N=C=N— groups per molecule,

(ii) 5 to 200 milliequivalents of chemically incorporated sulfonate groups per 100 g of isocyanate derivatives (II), and

(iii) optionally, 0 to 25% by weight, based on isocyanate derivatives (II), of chemically incorporated ethylene oxide units —CH_2—CH_2—O— positioned within polyether chains; or

(b) bisglycidyl-2,2-diphenylpropane or a polyepoxide containing at least three epoxide groups per molecule.

5,556,936

AROMATIC POLYCARBONATES HAVING POLYFUNCTIONAL UV SCREENING UNITS, METHOD FOR MAKING AND USE

Joseph A. King, Jr., Niskayuna; Patrick J. McCloskey, Watervliet; Alice M. Colley, Latham; David M. Dardaris, Ballston Spa, all of N.Y.; Luca P. Fontana, Brasschaat, Belgium, and Josef G. Berndsen, Rilland, Netherlands, assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 17, 1994, Ser. No. 341,240

Int. Cl.[6] C08G *64/00*

U.S. Cl. 528—199 **3 Claims**

1. A method for making a UV stabilized aromatic polycarbonate which comprises melt polymerizing, in the presence of an effective amount of a transesterification catalyst, a mixture comprising (C) about 90–98 molar parts of a dihydric phenol, (D) about 95–105 molar parts of a diaryl carbonate and (E) about 2–12 molar parts of 1,1-bis(4-hydroxyphenyl)-1-[4-hydroxy-3-(N-2-benzotriazole)phenyl] ethane.

5,556,937

SALTS OF PYROMELLITIC ACID, A PROCESS FOR THEIR PREPARATION, AND THEIR USE

Rainer Gras, Bochum, and Elmar Wolf, Recklinghausen; both of Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

Filed Dec. 28, 1994, Ser. No. 365,422

Claims priority, application Germany, Jan. 14, 1994, 44 00 931.3

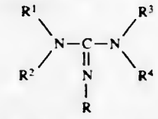
Int. Cl.[6] C08G *69/00;* **C08F** *20/00*

U.S. Cl. 528—288 **4 Claims**

1. A salt of pyromellitic acid comprising:

1 mol of pyromellitic acid; and

0.5–2 mol of a guanidine of the formula (I):



(I)

wherein R, R^1, R^2, R^3 and R^4, identical or different, are each a radical selected from the group consisting of hydrogen, C_{1-8} alkyl, C_{3-8} cycloalkyl and C_{6-8} aromatic hydrocarbon residues, or R^1 and R^2 and R^3 and R^4 may jointly form a ring containing 5 to 7 carbon atoms in which one of the carbon atoms may be substituted with an oxygen atom.

5,556,938

ACID CATALYZED PROCESS FOR PREPARING AMINO ACID POLYMERS

Michael B. Freeman, Harleysville; James M. Lipovsky, Langhorne, both of Pa.; Yi H. Paik, Princeton, N.J.; Jan E. Shulman, Newtown, and Graham Swift, Blue Bell, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 213,648, Mar. 16, 1994, Pat. No. 5,457,176, which is a continuation-in-part of Ser. No. 125,052, Sep. 21, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 466,867

Int. Cl.[6] C08G *69/00*

U.S. Cl. 528—328 **3 Claims**

1. A method of inhibiting scale formation during oil production by adding at least one amino acid polymer at a level of 0.1 to 3000 ppm; wherein the amino acid polymer is prepared by a process comprising:

a) forming a reaction mixture of from about 15 to about 95 percent by weight amino acid, from about 3 to about 85 percent by weight of acid catalyst, and 0 to about 50 percent by weight of a polyfunctional monomer, wherein the weight percentages are based on the total weight of the reaction mixture;

b) heating said reaction mixture from about 110° C. to about 300° C., while maintaining said reaction mixture as an intimate admixture by; i) adding one or more processing aid to the reaction mixture; ii) using mechanical means; or iii) a combination thereof;

c) removing water from said reaction mixture; and

d) recovering amino acid polymer.

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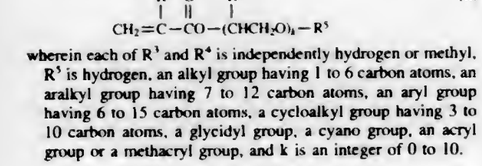
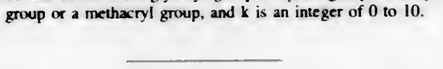


wherein each of R^1 and R^2 is independently hydrogen or methyl, each of m and n is independently an integer of 1 to 15, X is a halogen excluding fluorine, and a is an integer of to 4, or X is hydrogen when a is 0, provided that, when the amount of Component I is 100 mol %, Component I contains 30 to 80 mol % of a di (meth)acrylate compound of the general formula (I) in which m+n is 2 to 3 and 20 to 50 mol % of a di(meth)acrylate compound of the general formula (I) in which m+n is 6 to 12, and

(2) 0 to 25 parts by weight of at least one monomer (Component II) of the general formula (II),



wherein each of R^3 and R^4 is independently hydrogen or methyl, R^5 is hydrogen, an alkyl group having 1 to 6 carbon atoms, an aralkyl group having 7 to 12 carbon atoms, an aryl group having 6 to 15 carbon atoms, a cycloalkyl group having 3 to 10 carbon atoms, a glycidyl group, a cyano group, an acryl group or a methacryl group, and k is an integer of 0 to 10.

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each R of R^1, R^2 and R^3 is independently H or a noninterfering

5,556,939

TC OR RE RADIONUCLIDE LABELLED CHELATE, HEXAPEPTIDE COMPLEXES USEFUL FOR DIAGNOSTIC OR THERAPEUTIC APPLICATIONS

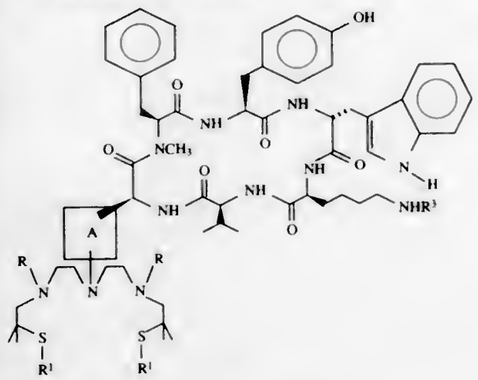
Richard J. Flanagan, St. Lazare; Jean-Marc Dufour, Pierrefonds, and Keith T. Hogan, Dorval, all of Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

Filed Oct. 13, 1994, Ser. No. 322,880

Int. Cl.[6] A61K *38/12;51/08;* **C07F** *13/00;* **C07K** *7/64*

U.S. Cl. 530—311 **7 Claims**

1. A compound of the formula:



wherein:

R is selected from the group consisting of:

hydrogen

loweralkyl of 1–4 carbon atoms, and

loweralkyl carboxyl, wherein loweralkyl is 1–4 carbon atoms;

R^1 is selected from the group consisting of:

hydrogen, a sulfur protecting group, or R^1 and R^1 are linked together to form a bond between the two "S" groups;

m and n are independently an integer from 1–4;

R^3 is hydrogen or a blocking group selected from:

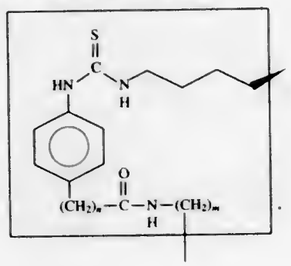
t-butoxycarbonyl (t-boc),

fluorenylmethoxycarbonyl (Fmoc), and

isonicotinyloxycarbonyl(i-Noc); and

the linker

is selected from the group consisting of:



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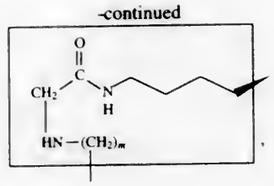
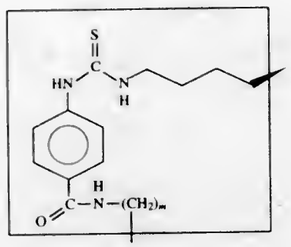


and



5,556,940

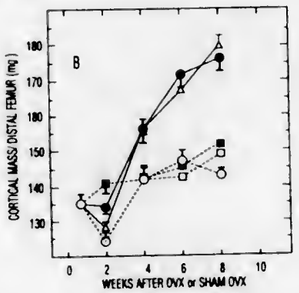
PARATHYROID HORMONE ANALOGUES FOR THE TREATMENT OF OSTEOPOROSIS

Gordon E. Willic, Orleans; James F. Whitfield, Ottawa; Witold Surewicz, Orleans; Wing L. Sung, Gloucester, and Witold Neugebauer, Ottawa, all of Canada, assignors to National Research Council of Canada, Ottawa, Canada

Filed Jun. 20, 1994, Ser. No. 262,495

Int. Cl.[6] A61K *38/29;* **C07K** *14/635*

U.S. Cl. 530—317 **2 Claims**



2. A cyclic analogue of a human parathyroid hormone selected from the group consisting of cyclo(Lys26-Asp^{30}) [Leu^{27}]-hPTH-(1–34)-NH_2 and cyclo (Lys^{27}-Asp^{30})-hPTH-(1–34)-NH_2.

5,556,941

GLYCOPEPTIDE DERIVATIVES, A PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL AGENTS CONTAINING THESE COMPOUNDS

Cenek Kolar, Marburg, and Werner Stüber, Lahntal, both of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Germany

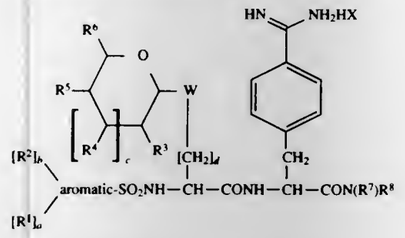
Continuation of Ser. No. 25,798, Mar. 3, 1993, abandoned. This application Aug. 16, 1994, Ser. No. 291,729

Claims priority, application Germany, Mar. 5, 1992, 42 06 858.4

Int. Cl.[6] A61K *38/14;* **C07K** *5/072;9/00*

U.S. Cl. 530—322 **4 Claims**

1. A compound of the formula I



where aromatic is a benzene or naphthalene ring,

a is 0 to 3, b is 0 or 1, c is 0 or 1, d is 1,

R^1 is methyl,

R^2 is methoxy,

R^3 is OH, (C_1-C_3) -alkoxy, C_1-acyloxy, NH_2or C_1-acylamino,

R^4 is OH or C_1-acyloxy,

R^5 is OH or C_1-acyloxy,

R^6 is H, CH_2OH, CH_3, or CH_2O-acetyl,

N (R^7)R^8 are together a piperidine ring,

W is —O— or —CONH—, and

HX is HCl, a (C_1-C_7) -alkanoic acid or another pharmaceutically tolerated inorganic or organic acid.

5,556,942

GLUTATHIONE S-TRANSFERASE-ACTIVATED COMPOUNDS

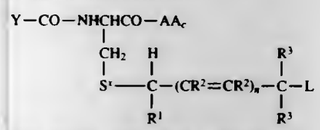
Lawrence M. Kauvar, San Francisco; Matthew H. Lyttle, Point Reyes Station, and Apparao Satyam, Fremont, all of Calif., assignors to Terrapin Technologies, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 130,736, Oct. 1, 1993, which is a continuation-in-part of Ser. No. 126,229, Sep. 24, 1993, which is a continuation-in-part of Ser. No. 863,564, Apr. 3, 1992, abandoned, and a continuation of Ser. No. 253,433, May 31, 1994, said Ser. No. 863,564is a continuation-in-part of Ser. No. 693,245, Apr. 29, 1991, abandoned, and a continuation of Ser. No. 272,488, Jul. 11, 1994, abandoned. This application Sep. 19, 1994, Ser. No. 309,005

Int. Cl.[6] A61K *38/06;* **C07K** *5/083*

U.S. Cl. 530—331 **17 Claims**

1. A compound of the formula:



(1)

or the amides, esters or salts thereof, wherein:

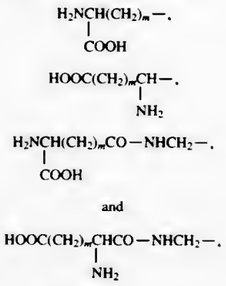
L is an electron withdrawing leaving group;

S^4 is S═O, O═S═O, S═NH, HN═S═O, Se═O, O═Se═O, Se═NH, HN═Se═O, S^+R^4 wherein R^4 is alkyl (1–6C), or O—C═O or HN—C═O;

each R of R^1, R^2 and R^3 is independently H or a noninterfering substituent;

n is 0, 1 or 2;

Y is selected from the group consisting of



wherein m is 1 or 2; and

AA_C is alanine, β-alanine, phenylalanine, glycine or phenylglycine linked through a peptide bond to the remainder of said compound of formula I.

5,556,943

CELL ADHESION PROTEIN, GENE CODING FOR THE SAME, PROCESS FOR PREPARING THE SAME AND CARRIER ONTO WHICH THE SAME IS IMMOBILIZED

Kenji Yamashita; Takaaki Ohara, both of Takasago; Hideo Niwa, Akashi; Fumio Osakada, Himeji; Takeshi Fukuchi; Tadahiro Edamura, both of Akashi, and Tetsu Kakutani, Kakogawa, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 895,202, Jun. 5, 1992, abandoned. This application Oct. 24, 1994, Ser. No. 328,152

Claims priority, application Japan, Jun. 6, 1991, 3-134789; Jun. 24, 1991, 3-151792; Jun. 26, 1991, 3-154486; Jul. 2, 1991, 3-161377; Jul. 15, 1991, 3-173765; Nov. 29, 1991, 3-315709

Int. Cl.[6] C07K *14/47;14/705*

U.S. Cl. 530—350 **8 Claims**

1. A recombinant LFA-3 like protein consisting of the amino acid sequence of SEQ ID NO: 36.

5,556,944

IMMUNOGLOBULIN A BINDING PROTEIN

Vincent A. Fischetti, West Hampstead, N.Y., and Debra E. Bessen, Woodbridge, Conn., assignors to Rockefeller University, New York, N.Y.

Division of Ser. No. 813,584, Dec. 24, 1991, Pat. No. 5,352,588. This application Oct. 3, 1994, Ser. No. 330,515

Int. Cl.[6] C07K *14/315;17/00*

U.S. Cl. 530—350 **6 Claims**

1. A purified polypeptide, wherein said polypeptide comprises residues 42 through 372 of the amino acid sequence shown in SEQ ID NO: 3, and wherein said polypeptide is capable of specifically binding with an IgA antibody.

5,556,945

TUMOR SUPPRESSOR GENE

Yusuke Nakamura, Kanagawa, and Takashi Imai, Chiba, both of Japan, assignors to Cancer Institute, and Eisai Co., Ltd., Tokyo, Japan

Division of Ser. No. 384,850, Feb. 7, 1995. This application May 19, 1995, Ser. No. 444,405

Claims priority, application Japan, Feb. 14, 1994, 6-37649

Int. Cl.[6] C07K *14/47*

U.S. Cl. 530—350 **4 Claims**

1. An isolated polypeptide comprising the polypeptide coded for by the DNA represented by SEQ ID NO:1.

5,556,946

INTERLEUKIN-2/VIRAL ANTIGEN PROTEIN CHIMERS

Yukio Fujisawa, Hyogo; Shuji Hinuma, Osaka, and Aki Aono, Shiga, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 86,429, Jun. 30, 1993, abandoned, which is a continuation of Ser. No. 548,509, Jul. 2, 1990, abandoned. This application Feb. 8, 1995, Ser. No. 386,354

Claims priority, application Japan, Jul. 7, 1989, 1-176036; Mar. 6, 1990, 2-52816; Apr. 11, 1990, 2-93938; May 30, 1990, 2-138180

Int. Cl.[6] A61K *38/20;* **C07K** *14/55;* **C12N** *15/62*

U.S. Cl. 530—351 **20 Claims**

1. A fused protein comprising a viral antigen and interleukin-2.

5,556,947

MONOCLONAL ANTIBODY RECOGNIZING A SURFACE MOLECULE ON A SUBSET OF ANTIGEN-STIMULATED T CELLS AND ON CERTAIN MALIGNANCIES OF T AND B CELL ORIGIN

Glenn H. Bock; David L. Nelson, both of Bethesda; Carole C. Kurman, Potomac, and Thomas A. Fleisher, Bethesda, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 934,106, Aug. 21, 1992, abandoned. This application Aug. 9, 1994, Ser. No. 287,718

Int. Cl.[6] A61K *39/395;* **C07K** *16/18;16/28*

U.S. Cl. 530—391.3 **4 Claims**

1. A purified antibody which specifically binds the same antigen as the monoclonal antibody produced by the hybridoma cell line designated 10D2F6 having ATCC Accession No. HB 11103, wherein the purified antibody binds an antigen which exists on an IL-6 dependent B-cell lymphoma cell line designated DS-1 having ATCC Accession No. CRL 11102 wherein the purified antibody also specifically binds an antigen on antigen-stimulated T cells, but not on non-stimulated T cells.

5,556,948

PHOSPHOLIPID DERIVATIZED WITH PEG BIFUNCTIONAL LINKER AND LIPOSOME CONTAINING IT

Toshiaki Tagawa; Kaoru Awane, both of Yokohama, and Kazuhiro Nagaike, Sagamihara, all of Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

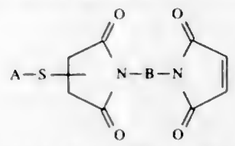
Filed Jan. 19, 1994, Ser. No. 182,832

Claims priority, application Japan, Jan. 22, 1993, 5-027651

Int. Cl.[6] C07K *17/02;16/00;* **C07F** *9/10;* **A61K** *9/127*

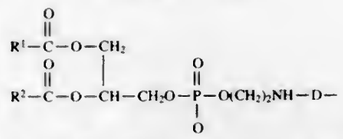
U.S. Cl. 530—391.9 **5 Claims**

1. A phospholipid derivative of formula (I):



(I)

wherein A has the following formula (II):



(II)

wherein each of R^1 and R^2, which are independent of each other, is a C_{11}–C_{19} alkyl group or a C_{11}–C_{19} alkenyl group, and D is a single bond, $—C=(NH_2^+)(CH_2)_{0\text{-}10}—$, $—CO(CH_2)_{0\text{-}10}—$ or $—CH_2(CH_2)_{0\text{-}10}—$, and B is a linking group having the following formula (III):

(III)

wherein each of J and L, which are independent of each other, is a single bond, $—CO(CH_2)_{0\text{-}10}—$, $—(CH_2)_{0\text{-}10}CO—$, $—NHCO(CH_2)_{0\text{-}10}—$, $—(CH_2)_{0\text{-}10}CONH—$ or $—CH_2(CH_2)_{0\text{-}10}—$, and PEG is a polyethylene glycol residue.

5,556,949

CAP-PHENANTHROLINE CONJUGATE FOR DNA CLEAVAGE

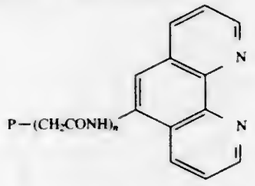
Richard H. Ebright; Y W. Ebright, both of N. Brunswick, and P. Shannon Pendergrast, Mendham, all of N.J., assignors to Rutgers University, Piscataway, N.J.

Continuation of Ser. No. 124,362, Sep. 20, 1993, abandoned, which is a continuation of Ser. No. 747,731, Aug. 20, 1991, abandoned. This application Oct. 11, 1994, Ser. No. 320,568

Int. Cl.[6] C07K *1/107;* **C07D** *471/02;* **C12Q** *1/68*

U.S. Cl. 530—402 **10 Claims**

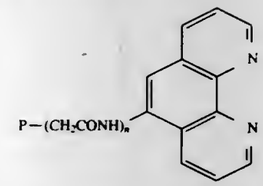
1. A compound having the formula:



wherein P is the full-length catabolite gene activator protein (CAP), and the linker $—(CH_2CONH)_n—$ is attached to the sulfur atom of the cysteine residue at amino acid position 26 of said CAP protein, and n is an integer from 1–3.

6. A composition comprising:

a) A compound having the formula:



wherein P is the full-length catabolite gene activator protein (CAP), and the linker $—(CH_2CONH)_n—$ is attached to the sulfur atom of the cysteine residue at amino acid position 26 of said CAP protein, and n is an integer from 1–3; and

b) Cu(II) ions.

5,556,950

METHOD FOR PREPARING STABILIZED ALKYL GLYCOSIDES

Patrick M. McCurry, Jr., Lansdale, and Janet R. Varvil, Chalfont, both of Pa., assignors to Henkel Corporation, Ambler, Pa.

Filed Apr. 24, 1992, Ser. No. 873,908

The portion of the term of this patent subsequent to Jul. 22, 2012, has been disclaimed.

Int. Cl.[6] C07H *1/06;15/04*

U.S. Cl. 536—4.1 **14 Claims**

1. A method for improving the color of a glycoside product comprising the steps of (1) providing an aqueous solution of a glycoside product; (2) adjusting and maintaining the pH of said solution to a range of from about 3 to about 8 for a time sufficient to substantially eliminate haze; (3) raising the pH of said solution to from about 9 to about 11; (4) contacting the solution from step (3) with a color stabilizing amount of from about 0.01 to about 0.2 weight percent, on a glycoside product dry weight basis, with a Group I or Group II metal borohydride to substantially reduce the propensity of said glycoside product to darken upon exposure to a temperature of at least 35° C. under alkaline conditions and to exhibit a haze at a pH of about 7.

5,556,951

Patent Not Issued For This Number

5,556,952

Patent Not Issued For This Number

5,556,953

ALLERGEN OF CLADOSPORIUM HERBARUM

Lei Zhang, Ottawa; Hari M. Vijay, Gloucester, and Harold Rode, Ottawa, all of Canada, assignors to Minister of Health & Welfare, Ottawa, Canada

Filed Jan. 24, 1994, Ser. No. 185,414

Int. Cl.[6] C12N *15/31;15/11;* **A61K** *39/35*

U.S. Cl. 536—23.74 **2 Claims**

1. An isolated nucleic acid comprising a sequence coding for the allergen Ch 2.1 of *Cladosporium herbarum*, wherein said allergen has the amino acid sequence SEQ ID NO:2.

5,556,954

HEMATOPOIETIC STEM CELL SPECIFIC GENE EXPRESSION

Timothy C. Burn, Bedford; Anne B. Satterthwaite, Brighton, and Daniel G. Tenen, Boston, all of Mass., assignors to Beth Israel Hospital Boston Association, Boston, Mass.

Continuation-in-part of Ser. No. 837,776, Feb. 13, 1992, abandoned. This application Dec. 15, 1992, Ser. No. 990,965

Int. Cl.[6] C07H *21/04;* **C12N** *5/10;15/85*

U.S. Cl. 536—24.1 **12 Claims**

1. A promoter of the CD34 gene comprising all or a functional portion of an isolated or recombinant SEQ ID No: 1 which directs the expression of a gene in hematopoietic stem cells.

5,556,955

PROCESS FOR DETECTION OF NEW POLYMORPHIC LOCI IN A DNA SEQUENCE, NUCLEOTIDE SEQUENCES FORMING HYBRIDIZATION PROBES AND THEIR APPLICATIONS

Gilles Vergnaud, Vert le Petit, France, assignor to Etat Francais represente par le Delegue General pour A'Armement, Paris, France

Continuation of Ser. No. 931,311, Aug. 18, 1992, abandoned. This application Sep. 8, 1994, Ser. No. 303,004

Claims priority, application France, Aug. 22, 1991, 91 10516

Int. Cl.[6] C07H *21/04;* **C12N** *5/10;15/63*

U.S. Cl. 536—24.31 **4 Claims**

1. A polynucleotide according to the following formula: $(ACGGAGCGGACGGA)_n$ (SEQ ID No: 2), wherein n is higher than 20.

2. A polynucleotide according to the following formula: $(AGCTACGGTGTGGACT)_n$ (SEQ ID No: 5), wherein n is higher than 20.

5,556,956

METHODS AND COMPOSITIONS RELATING TO THE ANDROGEN RECEPTOR GENE AND USES THEREOF

Arun K. Roy, and Bandana Chatterjee, both of San Antonio, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Nov. 4, 1993, Ser. No. 149,096

Int. Cl.[6] C07H *21/00;21/02;21/04*

U.S. Cl. 536—24.1 **15 Claims**

1. An oligonucleotide comprising a nucleic acid sequence of a distal activation promoter region upstream of nucleotide position –570 of the sequence at FIG. 1, said position corresponding to position 2087 of SEQ ID NO:1.

5,556,957

Patent Not Issued For This Number

5,556,958

INACTIVATION OF PATHOGENS IN CLINICAL SAMPLES

Peter G. Carroll, Walnut Creek; Stephen T. Isaacs, Orinda, and George D. Cimino, Richmond, all of Calif., assignors to Steritech, Inc., Concord, Calif.

Continuation of Ser. No. 32,490, Mar. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 428,494, Oct. 26, 1989, Pat. No. 5,221,608. This application Jun. 3, 1994, Ser. No. 253,619

Int. Cl.[6] C07H *21/00*

U.S. Cl. 536—25.3 **14 Claims**

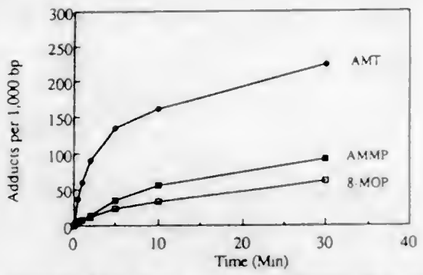
1. A method of treating biological material intended for in vitro clinical testing, comprising:

r is 1, 2, or 3; and

X^- is a negative ion

wherein K is a protective group of the oxo of the formula

(II)



a) providing, in any order, i) a container containing one or more aminopsoralens; ii) a photoactivation device comprising a filter providing wavelength cutoffs at 320 nm, below which no irradiation is transmitted, and at 360 nm, above which no irradiation is transmitted; and iii) material intended for in vitro clinical testing suspected of being contaminated with a nucleic acid-containing pathogen;

b) adding said material to said container;

c) photoactivating said aminopsoralens under conditions such that said aminopsoralens are capable of modifying said nucleic acid of said nucleic acid-containing pathogen, so that said pathogen is inactivated, and;

d) testing said material for the presence of a serum analyte, wherein said photoactivating preserves said serum analyte.

5,556,959

INDOCARBOCYANINE-LINKED PHOSPHORAMIDITES

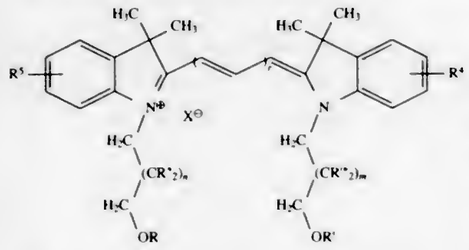
Charles K. Brush, Whitefish Bay, and Eric D. Anderson, Oak Creek, both of Wis., assignors to Pharmacia P-L Biochemicals Inc., Milwaukee, Wis.

Continuation of Ser. No. 7,444, Jan. 22, 1993, abandoned. This application Jun. 24, 1994, Ser. No. 265,569

Int. Cl.[6] C07H *21/00;* **C12Q** *1/68*

U.S. Cl. 536—25.32 **11 Claims**

1. A chemical compound of the following formula:



wherein:

R is selected from the group consisting of H, trityl, 4-O-monomethoxytrityl, 4,4'-O-dimethoxytrityl, and acyl groups, and whereby R can be used as a protecting group or is an H;

R' is a phosphoramidite;

R* is selected from the group consisting of H and lower alkyl groups;

R'' is selected from the group consisting of H and lower alkyl groups;

R^4 is selected from the group consisting of H, lower alkyl, acyl, and $(CH_2)_pCOO(CH_2)_qCH_3$ wherein p is an integer from 0 to 4 and q is an integer from 0 to 4;

R^5 is selected from the group consisting of H, lower alkyl, acyl, and $(CH_2)_pCOO(CH_2)_qCH_3$ wherein p is an integer from 0 to 4 and q is an integer from 0 to 4;

n is an integer from 0 to 10;

m is an integer from 0 to 10;

r is 1, 2, or 3; and

X^- is a negative ion.

5,556,960

Patent Not Issued For This Number

5,556,961

NUCLEOSIDES WITH 5'-O-PHOTOLABILE PROTECTING GROUPS

Robert S. Foote, 105 Elliot Clr., Oak Ridge, Tenn. 37830, and Richard A. Sachleben, 1105 Hickory Trail, Knoxville, Tenn. 37932

Continuation of Ser. No. 117,783, Sep. 7, 1993, abandoned, which is a division of Ser. No. 794,723, Nov. 15, 1991, abandoned. This application Oct. 24, 1994, Ser. No. 328,079

Int. Cl.[6] C07H *19/06;19/067;19/073;19/16*

U.S. Cl. 536—27.1 **6 Claims**

1. A nucleoside consisting of:

a saccharide selected from the group consisting of ribose and deoxyribose;

a basic group selected from the group consisting of purines and pyrimidines attached to the saccharide at the 1'-position of the saccharide; and

a photolabile protecting group protecting the 5'-O-position of the saccharide wherein the photolabile protecting groups contains an ortho-nitrobenzyl moiety and a hydrogen atom on the alpha-carbon atom of the moiety.

5,556,962

PROCESS FOR THE PREPARATION OF HYDROCORTISONE

Francis Brion, Gagny; Jean Buendia, Sur Marne; Christian Diolez, Palaiseau, and Michel Vivat, Sur Marne, all of France, assignors to Roussel Uclaf, France

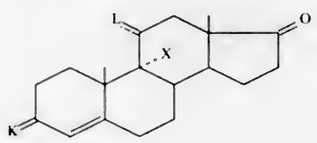
Division of Ser. No. 362,120, Dec. 22, 1994, Pat. No. 5,502,182, which is a division of Ser. No. 105,742, Aug. 12, 1993, Pat. No. 5,401,840, which is a division of Ser. No. 935,535, Aug. 25, 1992, Pat. No. 5,260,463. This application Oct. 2, 1995, Ser. No. 538,027

Claims priority, application France, Sep. 6, 1991, 91 11052

Int. Cl.[6] C07J *21/00*

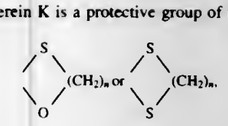
U.S. Cl. 540—30 **1 Claim**

1. A compound of the formula



F

wherein K is a protective group of the oxo of the formula



wherein n is 2 or 3 and L is a 11β-hydroxy, the dotted line in the 11-position is not a bond and X is chlorine, bromine or iodine.

5,556,963

SYNTHESIS OF 4-ALKOXY-N-ACETYLNEURAMINIC ACID

Avraham Liay, Denver, Colo.; Ragen F. Hardgrave, Cleveland, Tex.; Sheri Blystone, Concord, Ohio, and Gregory A. Turner, Independence, Mo., assignors to Oklahoma Medical Research Foundation, Oklahoma City, Okla.

Filed Aug. 5, 1994, Ser. No. 286,573

Int. Cl.[6] C07H *1/00*

U.S. Cl. 536—55.3 **23 Claims**

1. A process for the synthesis of 4-alkoxy-N-acetylneuraminic acid, said process comprising:

(a) protecting the vicinal hydroxyl groups at C-8 and C-9 in a N-acetylneuraminic acid derivative having an alkyl ester at C-1 and an alkyl ketoside at C-2 by forming a ketal in the presence of an acid catalyst;

(b) alkylating the protected derivative from step (a) at C-4 to form an alkoxy group at C-4; and

(c) deprotecting the alkylated, protected derivative from step (b) by removing the ketal at C-8 and C-9 and by removing the alkyl groups at C-1 and C-2 to form the 4-alkoxy-N-acetylneuraminic acid.

5,556,964

PROCESS FOR THE MANUFACTURE OF BUDESONIDE

Robert G. Hofstraat, Nijmegen; Petrus H. Raijmakers, Uden, and Pieter Vrijhof, Berghem, all of Netherlands, assignors to Aktiebolaget Astra, Sodertalje, Sweden

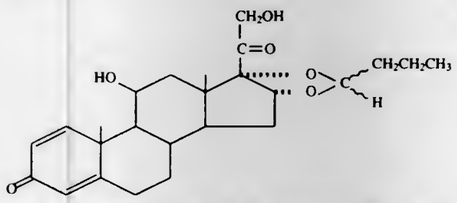
Continuation of Ser. No. 844,574, Mar. 25, 1992, abandoned. This application Dec. 16, 1994, Ser. No. 357,773

Claims priority, application Sweden, Oct. 2, 1989, 89032197

Int. Cl.[6] C07J *73/00*

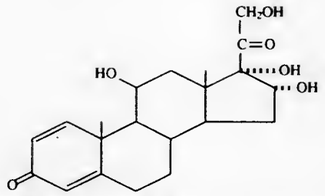
U.S. Cl. 540—63 **3 Claims**

1. A process for preparing the compound (22 R,S)-16α, 17α-butylidene-dioxy-11B,21-dihydroxpregna-1,4-diene 3,20-dione (formula I)



(I)

which compromises reacting the compound 11B, 16α, 17α, 21-tetrahydroxypregna-1,4-diene-3,20-dione (formula II)



(II)

with butanal in acetonitrile in the presence of p-toluenesulfonic acid as a catalyst.

5,556,965

INTERMEDIATES FOR THE PREPARATION OF 6α, 9α-DIFLUORO STEROIDS

Jean-Yves Godard, Le Raincy; Philippe Mackiewicz, Livry Gargan; Denis Prat, Pantin, and Christian Richard, Rosny-Sous-Bois, all of France, assignors to Roussel Uclaf, France

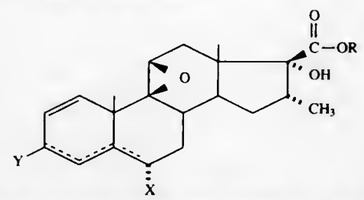
Division of Ser. No. 186,965, Jan. 26, 1994, Pat. No. 5,478,957. This application May 15, 1995, Ser. No. 441,330

Claims priority, application France, Feb. 5, 1993, 93 01275

Int. Cl.[6] C07J *71/00*

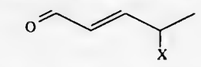
U.S. Cl. 540—87 **1 Claim**

1. A compound of the formula

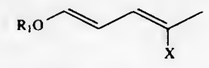


VI

wherein R is hydrogen or an ester remainder, X is hydrogen or fluorine and Y combined with the dotted lines represents



or X is hydrogen and Y combined with the dotted lines is



and R_1 is the remainder of an enol ether or ester.

5,556,966

PROCESS FOR THE PRODUCTION OF ALUMINUM PHTHALOCYANINE COMPOSITION

Shuuichi Kimura; Hikosaka Michichika; Shirao Masami; Mochizuki Akimitsu, and Tsuchida Junichi, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1994, Ser. No. 276,660

Claims priority, application Japan, Jui. 23, 1993, 5-182481

Int. Cl.[6] C09B *67/12*

U.S. Cl. 540—140 **9 Claims**

1. A process for the production of a phthalocyanine composition containing less than 40% by weight of a phthalocyanine compound

having as a central element at least one element selected from H, Li, Be, Na, Mg, Si, K, Ca, Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, As, Y, Zr, Nb, Mo, Pd, Ag, Sn, Pb and Ru and at least 60% by weight of an aluminum phthalocyanine, the process comprising bringing a phthalocyanine compound having as a central element at least one element selected from H, Li, Be, Na, Mg, Si, K, Ca, Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, As, Y, Zr, Nb, Mo, Pd, Ag, Sn, Pb and Ru and a molten salt of aluminum chloride or aluminum bromide into contact with each other at a temperature of at least 220° C. when the phthalocyanine compound has at least one of Cu, Co and Ni as a central element, at a temperature of at least 200° C. when the phthalocyanine compound has Fe as a central element, or at a temperature of at least 120° C. when the phthalocyanine compound has at least one of H, Li, Be, Na, Mg, Si, K, Ca, Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, As, Y, Zr, Nb, Mo, Pd, Ag, Sn, Pb and Ru as a central element, thereby substituting aluminum for the central element.

5,556,967

PROCESS FOR PRODUCING HYDROXYGALLIUM PHTHALOCYANINE

Katsumi Nukada; Katsumi Daimon; Yasuo Sakaguchi, and Masakazu Iijima, all of Minami Ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Division of Ser. No. 108,426, Aug. 19, 1993, Pat. No. 5,393,881. This application Oct. 14, 1994, Ser. No. 321,865

Claims priority, application Japan, Aug. 26, 1992, 4-248934; Sep. 14, 1992, 4-269080

Int. Cl.[6] C09B *47/10*

U.S. Cl. 540—143 **5 Claims**

1. A process for producing a hydroxygallium phthalocyanine crystal comprising:

(a) reacting a gallium trihalide with phthalonitrile or diiminoisoindoline in an aromatic hydrocarbon solvent having a boiling point of 150° C. or higher to form halogenated gallium phthalocyanine, and

(b) hydrolyzing the halogenated gallium phthalocyanine.

5,556,968

POLYAZAMACROCYCLE CHELATING AGENTS WITH AMIDE LINKAGES

Joan F. Carvalho, Mountainview; Shaun P. Crofts, Santa Clara, and John Varadarajan, Sunnyvale, all of Calif., assignors to Nycomed Salutar, Inc., Sunnyvale, Calif.

PCT No. PCT/EP91/02118, § 371 Date Feb. 22, 1994, § 102(e) Date Feb. 22, 1994, PCT Pub. No. WO92/08707, PCT Pub. Date May 29, 1992

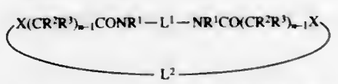
PCT Filed Nov. 6, 1991, Ser. No. 50,249

Claims priority, application United Kingdom, Nov. 7, 1990, 9024286

Int. Cl.[6] C07D *245/02;259/00;* **A61K** *49/00*

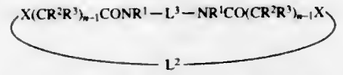
U.S. Cl. 540—460 **9 Claims**

1. A chelating agent of formula I



(I)

wherein L^1 represents a bond or an optionally unsaturated C_{2-14} hydrocarbon chain optionally substituted by groups selected from R^2, R^3 and R^4, optionally having chain backbone methylene moieties which are separated by at least 2 ring carbon atoms from ring heteroatoms replaced by oxygen or sulphur atoms or NA' groups, optionally carrying a fused 5–8 membered saturated or unsaturated carbocyclic or heterocyclic ring itself optionally substituted by groups selected from R^2, R^3 and R^4, and optionally carrying a fused macrocyclic ring of formula Ia

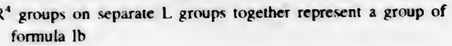


(Ia)

wherein L^1 and L^3 share at least two common ring atoms and optionally an unsaturated ring bond and L^3 is as defined for L^1 but may not itself carry a further fused macrocycle of formula Ia;

L^2 represents a group of formula $[(CR^2R^3)_nX]_m(CR^2R^3)_n$ optionally having a moiety $[(CR^2R^3)_nX]_2(CR^2R^3)_n$ replaced by a moiety $(CR^2R^3)_{n-1}CONR^1\text{-}L^4\text{-}NR^1CO(CR^2R^3)_{n-1}$ where L^4 is a group L^1 but may not carry a fused macrocycle of formula Ia;

R^4 groups on separate L groups together represent a group of formula Ib



Ib

where alk is a group L^1 but may not carry a fused macrocycle of formula Ia or a substituent R^4;

each R^1 independently represents a group R^5 or X^2R^5 where X^2 represents an oxygen or sulphur atom or a group NR^5 and each R^5 independently represents a hydrogen atom or an alkyl or aryl group optionally substituted by a group Y;

each X independently represents an oxygen or sulphur atom or, preferably, a group of formula NA;

each A independently represents a hydrogen atom or an alkyl group optionally substituted by a group Y;

each A' independently represents a group A or a group R^4;

each Y independently represents a group Z, COX, SO_2Z, POZ_2, $CON(OR^6)R^6$ or CSZ;

each Z independently represents a group OR^6, SR^6 or NR_2^6;

each R^6 independently represents a hydrogen atom or an alkyl group optionally carrying at least one substituent selected from

hydroxyl and alkoxy groups, or NR_2^6 together represents a nitrogen-attached 5–7 membered saturated heterocyclic ring optionally containing as a further ring heteroatom a nitrogen, oxygen or sulphur atom and optionally substituted by one or more R^7 groups;

each R^7 independently represents a halogen atom, a hydroxy or sulphonate group or an alkyl or alkoxy group optionally carrying at least one or more hydroxy, alkoxy or hydroxyalkyl groups;

each R^2 and R^3 independently represents a hydrogen atom or an aryl or alkyl group optionally carrying at least one substituent selected from aryl and Y groups,

or two groups A and/or R^3 attached at different positions on a macrocyclic ring may together with the intervening macrocyclic ring atoms form a independently represents 5–8 membered saturated or unsaturated heterocyclic or carbocyclic ring, itself optionally substituted by one or more R^7 group;

m is an integer of 0–8;

n is an integer of 2–5;

p is an integer of 0–8;

with the proviso that at least 2 ionizable Y groups are present or a chelate complex or salt thereof

wherein heterocyclic ring, unless otherwise specified, means a ring containing at least one heteroatom selected from the group consisting of nitrogen, oxygen or sulfur.

5,556,969

BENZODIAZEPINE DERIVATIVES

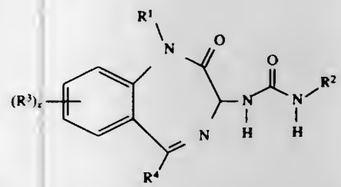
Mark S. Chambers, and Stephen R. Fletcher, both of Hertfordshire, England, assignors to Merck Sharp & Dohme Ltd., Hoddesdon, England

Continuation of Ser. No. 350,759, Dec. 7, 1994, abandoned. This application Jun. 29, 1995, Ser. No. 496,840

Int. Cl.[6] C07D *243/24;413/12;403/12;* **A61K** *31/55*

U.S. Cl. 540—509 **7 Claims**

1. A compound of the Formula (I):



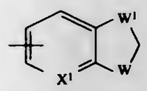
(I)

wherein:

R^1 represents H, C_{1-6}alkyl, C_{3-7}cycloalkyl, cyclopropylmethyl, $CH_2CO_2R^5$ (where R^5 is C_{1-4}alkyl), $CH_2CONR^6R^7$ (where R^6 and R^7 each independently represents H or C_{1-4}alkyl, or R^6 and R^7 together form a chain $(CH_2)_p$ where p is 4 or 5), C_{1-6}alkylNR^8R^9 or C_{-6} alkyl$CONR^8R^9$ where R^8 and R^9 together with the nitrogen atom to which they are attached form a 5 to 8 membered non-aromatic ring system containing a second heteroatom selected from O, S or NR^{10}, where R^{10} is H or C_{1-4}alkyl;

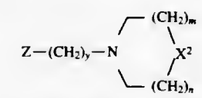
R^2 represents a phenyl or pyridyl group optionally substituted by one or more substituents selected from C_{1-6}alkyl, halo, hydroxy, C_{1-4}alkoxy, $(CH_2)_q$-tetrazolyl optionally substituted in the tetrazole ring by C_{1-4}alkyl, $(CH_2)_q$-imidazoyl, $(CH_2)_q$-triazolyl (where q is 0, 1, 2 or 3), 5-hydroxy-4-pyrone, NR^6R^7, $NR^{10}COR^5$, $NR^{10}CONR^{10}R^5$ (where R^{10} and $R^{10'}$ are each independently H or C_{1-4}alkyl and R^5 is as previously defined), $CONR6R^7$ (where R^6 and R^7 are as previously defined), $SO(C_{1-6}$alkyl), $SO_2(C_{1-6}$alkyl), trifluoromethyl, $CONHSO^2R^{11}$, SO_2NHCOR^{11} (where R^{11} is C_{1-6}alkyl, optionally substituted aryl wherein said substituents are selected from C_{1-4}alkyl, C_{1-4}alkoxy, halo and trifluoromethyl, 2,2-difluorocyclopropane or trifluoromethyl), SO_2NHR^{12} (where R^{12} is a nitrogen containing heterocycle selected from thiazole, thiadiazole, and pyrazine), $B(OH)_2$ or $(CH_2)_qCO_2H$, where q is as previously defined; or

R^2 represents a group



where X^1 represents CH or N; W represents CH_2 or NR^{10}, where R^{10} is as previously defined, and W^1 represents CH^2, or W and W^1 each represent O; or

R^2 represents phenyl substituted by a group



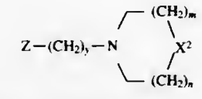
wherein X^2 is O, S or NR^{10}, where R^{10} is as previously defined; Z is a bond, O or S; m is 1, 2 or 3; n is 1, 2 or 3; and y is 0, 1, 2 or 3;

Each R^3 represents C_{1-6}alkyl, balo or NR^6R^7, where R^6 and R^7 are as previously defined;

R^4 represents bridged C_{6-10}bicycloalkyl or C_{3-7}cycloalkyl optionally substituted by one or more C_{1-4}alkyl groups;

x is 0, 1, 2 or 3;

with the proviso that when R^1 is H, C_{1-6}alkyl, C_{3-7}cycloalkyl, cyclopropylmethyl, $CH_2CO_2R^5$ or $CH_2CONR^6R^7$, R^2 represents phenyl substituted by



and pharmaceutically acceptable salts thereof.

5,556,970

LANOLIN FATTY ACIDS, A METHOD FOR THEIR FRACTIONATION, COSMETICS AND DRUGS FOR EXTERNAL USE

Toshiyuki Kawasaki; Isao Kato; Kenji Noda; Masakatsu Osaki; Katsuhiko Miyazaki, all of Kokogawa; Hidekazu Nayeshiro, Daito, and Hideya Ando, Kobe, all of Japan, assignors to Yoshikawa Oil & Fat Co., Ltd., Osaka, Japan

PCT No. PCT/JP93/00540, § 371 Date Dec. 22, 1993, § 102(e) Date Dec. 22, 1993, PCT Pub. No. WO93/22410, PCT Pub. Date Nov. 11, 1993

PCT Filed Apr. 26, 1993, Ser. No. 167,825

Claims priority, application Japan, Apr. 27, 1992, 4-107486; Jul. 23, 1992, 4-239935; Nov. 26, 1992, 4-316845

Int. Cl.[6] C11B *11/00*

U.S. Cl. 554—190 **19 Claims**

1. A process for producing purified hydroxy fatty acids or C_{1-4} lower alcohol esters thereof and purified non-hydroxy fatty acids or C_{1-4} lower alcohol esters thereof from lanolin fatty acids comprising the steps of:

i) reacting in a non-aquous medium lanolin fatty acids, C_{1-4} lower alcohol esters thereof, or mixtures thereof with solid boric acid to convert the hydroxy fatty acids or C_{1-4} lower alcohol esters thereof to boric acid esters thus forming a mixture containing the boric acid esters and unreacted non-hydroxy fatty acids or C_{1-4} lower alcohol esters thereof, and

ii) separating the non-hydroxy fatty acids or C_{1-4} lower alcohol esters thereof from the boric acid esters of hydroxy fatty acids or C_{1-4} lower alcohol esters thereof by vacuum distillation.

5,556,971

PROCESS FOR PREPARING ISOCYANATE AND ISOCYANATE-BASED DERIVATIVES OF CERTAIN AMINO-1,3,5-TRIAZINES BY DIRECT PHOSGENATION

William E. Bay, Ridgefield; William F. Jacobs, II, Bethel; David Gschneidner, Stamford, all of Conn., and Ram B. Gupta, Bronx, N.Y., assignors to Cytec Technology Corp., Wilmington, Del.

Filed May 6, 1994, Ser. No. 239,009
Int. Cl.[6] C07D *251/54*
U.S. Cl. 544—196 **16 Claims**

1. A process for preparing isocyanate functional derivatives of (at least tris-unsubstituted amino)-1,3,5-triazines comprising the steps of:

(a) contacting (i) an (at least tris-unsubstituted amino)-1,3,5-triazine comprising melamine or an oligomer thereof and (ii) phosgene, in a reaction system, at a temperature, a pressure and for a length of time sufficient to produce an isocyanate functional 1,3,5-triazine derivative and hydrogen chloride; and

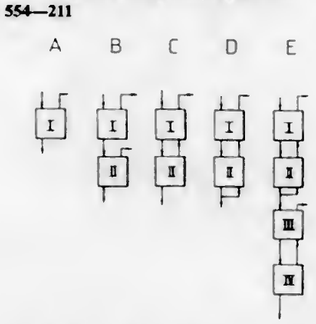
(b) removing hydrogen chloride from the reaction system as such is generated during the course of the reaction of (i) and (ii).

5,556,972

COUNTER CURRENT DRY FRACTIONAL CRYSTALLIZATION

Cornelis N. M. Keulemans, Rozenburg, and Christiaan E. Van den Oever, Bergschenhoek, both of Netherlands, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Continuation of Ser. No. 288,138, Aug. 9, 1994, abandoned, which is a continuation of Ser. No. 971,718, Nov. 4, 1992, abandoned, which is a continuation of Ser. No. 795,243, Nov. 15, 1991, abandoned, which is a continuation of Ser. No. 524,612, May 17, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 470,644
Claims priority, application United Kingdom, May 23, 1989, 8911819
Int. Cl.[6] C11B *7/00;* **C09F** *5/10*
U.S. Cl. 554—211 **6 Claims**



1. A method for dry fractionation of fatty substances by a counter current dry fraction operation, to obtain a stearin fraction and an olefin fraction, the method comprising:

(a) dry fractionating by crystallization the fatty substances into a higher melting first stearin fraction and a lower melting first olefin fraction;

(b) separating the first stearin fraction from the first olefin fraction by membrane filter pressing;

(c) dry fractionating by crystallization the first olefin fraction obtained in step (b) into a higher melting second stearin fraction and a lower melting second olefin fraction;

(d) separating the second stearin fraction from the second olefin fraction by membrane filter processing; and

(e) adding the separated second stearin fraction obtained in step (d) to the fatty substance in step (a);

wherein the second olefin fraction obtained in step (d) is at least partly recycled to step (c) and mixed with the first olefin fractions resulting from step (b); and

wherein the percent recycle for the second olefin fraction is about 10–60% and

wherein the separation efficiency by a membrane filter pressing is higher than 0.4.

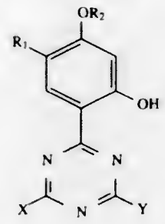
5,556,973

RED-SHIFTED TRIS-ARYL-S-TRIAZINES AND COMPOSITIONS STABILIZED THEREWITH

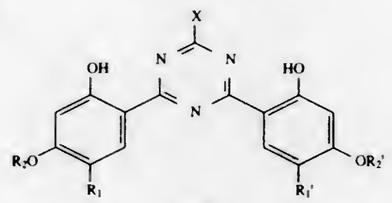
Tyler A. Stevenson, Teaneck, N.J.; Ramanathan Ravichandran, Nanuet, N.Y.; Mark S. Holt, West Nyack, N.Y.; Thuy N. Phan, North Tarrytown, N.Y.; Jean-Luc Birbaum, Fribourg, and Vien V. Toan, Lentigny, both of Switzerland, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Filed Jul. 27, 1994, Ser. No. 281,381
Int. Cl.[6] C07D *251/14*
U.S. Cl. 544—216 **7 Claims**

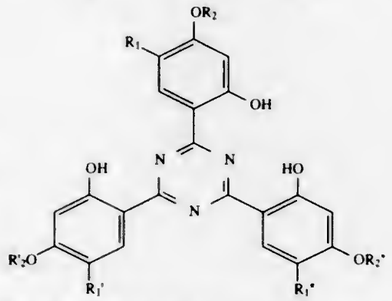
1. A compound of formula I, II or III



I



II



III

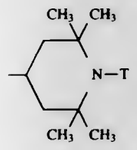
where in the compounds of formula I

X and Y are the same or different and are phenyl or phenyl substituted with one to three lower alkyl, halogen, hydroxy or alkoxy;

R_1 is phenyl alkyl of 7 to 15 carbon atoms;

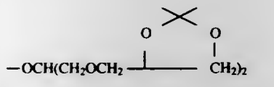
R_4 is aryl of 6 to 10 carbon atoms, or said aryl substituted by one to three halogen, alkyl of 1 to 8 carbon atoms, alkoxy of 1 to 8 carbon atoms or combinations thereof; cycloalkyl of 5 to 12 carbon atoms; or phenylalkyl of 7 to 15 carbon atoms, or said phenylalkyl substituted on the phenyl ring by one to three halogen, alkyl of 1 to 8 carbon atoms, alkoxy of 1 to 8 carbon atoms or combinations thereof; or straight or branched chain alkenyl of 2 to 18 carbon atoms;

R_5 is defined as R_4, or R_5 is also hydrogen or straight or branched chain alkyl of 1 to 24 carbon atoms; or R_5 is a group of the formula



where T is hydrogen, oxyl, hydroxyl, alkyl of 1 to 12 carbon atoms, said alkyl substituted by at least one hydroxyl or lower alkoxy, benzyl or alkanoyl of 2 to 18 carbon atoms;

R_2 is hydrogen, straight or branched chain alkyl of 1 to 24 carbon atoms or cycloalkyl of 5 to 12 carbon atoms; or said alkyl or cycloalkyl substituted by one to eight halogen, epoxy, glycidyloxy, furyloxy, $—R_4$, $—OR_5$, $—N(R_5)_2$, $—CON(R_5)_2$, $—COR_5$, $—COOR_5$, $—OCOR_5$, $—OCOC(R_5)═C(R_5)_2$, $—C(R_5)═CCOOR_5$, —CN, —NCO, or

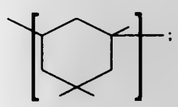


combinations thereof; or said alkyl or cycloalkyl interrupted by one to six epoxy, —O—, $—NR_5—$, $—CONR_5—$, —COO—, —OCO—, —CO—, $—C(R_5)═C(R_5)COO—$, $—OCOC(R_5)═C(R_5)—$, $—(R_5)C═C(R_5)—$, phenylene, or -phenylene-G-phenylene in which G is —O—, —S—, $—SO_2—$, $—CH_2—$, or $—C(CH_3)_2—$, or combinations thereof; or said alkyl or cycloalkyl both substituted and interrupted by combinations of the groups mentioned above; or R_2 is $—SO_2R_3$, or $—COR_6$;

R_6 is straight or branched chain alkyl of 1 to 18 carbon atoms, straight or branched chain alkenyl of 2 to 18 carbon atoms, phenyl, alkoxy of 1 to 12 carbon atoms, phenoxy, alkylamino of 1 to 12 carbon atoms, arylamino of 6 to 12 carbon atoms or a group $—R_7COOH$ or $—NH—R_8—NCO$;

R_7 is alkylene of 2 to 14 carbon atoms or o-phenylene;

R_8 is alkylene of 2 to 10 carbon atoms, phenylene, tolylene, diphenylenemethane or a group



for the compounds of formula II:

X is phenyl or phenyl substituted with one to three lower alkyl, halogen, hydroxy or alkoxy;

R_1 and R_1' are the same or different and are defined as R_1 above;

R_2 and R_2' are the same or different and are defined as R_2 above; and

for the compounds of formula III:

R_1, R_1' and R_1'' are the same or different and are as defined for R_1 above;

R_2, R_2' and R_2'' are the same or different and are as defined for R_2 above.

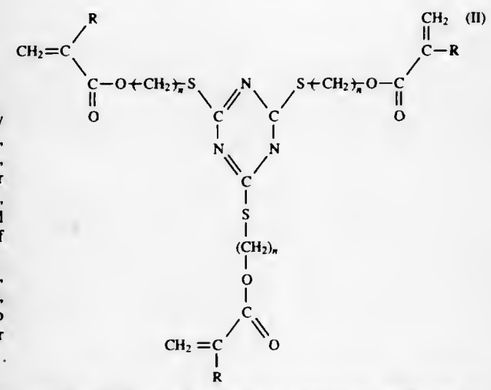
5,556,974

PROCESS FOR THE PREPARATION OF TRIAZINES

Marie-Christine Berthe, Vandoeuvre les Nancy; Paul Caubere, Nancy, and Yves Fort, Vandoeuvre les Nancy, all of France, assignors to Atochem, Paris la Defense, France

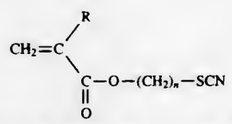
Division of Ser. No. 411,151, Mar. 27, 1995, which is a division of Ser. No. 214,480, Mar. 17, 1994, Pat. No. 5,468,856, which is a division of Ser. No. 725,810, Jul. 9, 1991, Pat. No. 5,332,850. This application Oct. 20, 1995, Ser. No. 546,150
Claims priority, application France, Jul. 9, 1990, 90 08698
Int. Cl.[6] C07D *251/38*
U.S. Cl. 544—219 **3 Claims**

1. A process for the preparation of an acrylic or methacrylic compound of formula (II):



(II)

comprising reacting an acrylic or methacrylic compound of formula (I):



(I)

with at least one alkali metal hydride in the presence of organic solvent,

wherein R is a hydrogen atom, methyl or CHOHR' in which R' is a straight-chain or branched alkyl optionally substituted by hydroxyl, alkoxy or ester substituents; straight-chain, branched or cyclic alkenyl; aryl, optionally substituted by halogen, nitro or alkoxy; unsaturated heterocyclic; alkylaryl; or arylalkyl.

5,556,975

GRISEOLIC ACID DERIVATIVES

phenyl(1–2C)alkylNHCO, phenyl(1–2C)alkyl, pyridyl, phe-

dimethylamino, phenyl, which is optionally substituted by 1

5,556,975

GRISEOLIC ACID DERIVATIVES

Masakatsu Kaneko; Yoshinobu Murofushi; Misako Kimura; Mitsuo Yamazaki, and Yasuteru Iijima, all of Hiromachi, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

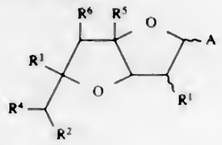
Division of Ser. No. 130,154, Sep. 30, 1993, Pat. No. 5,498,819, which is a continuation of Ser. No. 916,794, Jul. 17, 1992, abandoned, which is a continuation of Ser. No. 742,287, Aug. 8, 1991, abandoned, which is a continuation of Ser. No. 616,763, Nov. 19, 1990, abandoned, which is a continuation of Ser. No. 361,806, May 30, 1989, abandoned, which is a continuation of Ser. No. 157,112, Feb. 10, 1988, abandoned, which is a continuation of Ser. No. 854,418, Apr. 21, 1986, abandoned. This application May 9, 1995, Ser. No. 437,634

Claims priority, application Japan, Apr. 19, 1985, 60-82132; Apr. 27, 1985, 60-91987; Apr. 27, 1985, 60-91989

Int. Cl.[6] C07D *473/34*; A61K *31/52*

U.S. Cl. 544—277 **6 Claims**

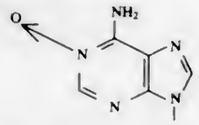
1. A compound of formula (I):



(I)

wherein

A represents a group of formula:



(c)

R^1 and R^2 are independently selected from the group consisting of hydrogen atoms, halogen atoms and groups of formula —OR^9;

R^3 and R^4 are independently selected from the group consisting of carbamoyl groups and carboxy groups;

R^5 and R^6 both represent hydrogen atoms or together they represent an extra carbon-carbon bond between the carbon atoms to which they are attached; and

R^9 represents a hydrogen atom, a C_1-C_6 alkyl group, an alkylsulfonyl group, a haloalkylsulfonyl group, an arylsulfonyl group or a hydroxy-protecting group;

or a pharmaceutically acceptable salt or ester thereof.

5,556,976

REACTIVE CYCLIC N-SULFATOIMIDES AND CELLULOSE CROSSLINKED WITH THE IMIDES

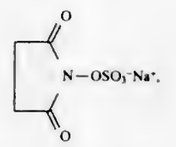
Richard A. Jewell, 5215 146th Ave. S.E., Bellevue, Wash. 98006

Continuation of Ser. No. 828,333, Jan. 13, 1992, Pat. No. 5,366,591, which is a continuation-in-part of Ser. No. 665,761, Mar. 7, 1991, Pat. No. 5,252,275, and a continuation-in-part of Ser. No. 607,268, Oct. 31, 1990, abandoned, which is a continuation-in-part of Ser. No. 395,208, Aug. 17, 1989, Pat. No. 5,225,047, which is a continuation-in-part of Ser. No. 284,885, Dec. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 140,922, Dec. 28, 1987, abandoned, which is a continuation-in-part of Ser. No. 4,729, Jan. 20, 1987, abandoned. This application Apr. 29, 1994, Ser. No. 235,723

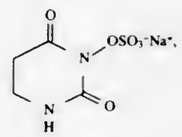
Int. Cl.[6] C07D *403/04*

U.S. Cl. 544—296 **2 Claims**

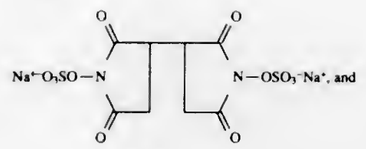
1. A composition of matter selected from the group consisting of (I) the sodium salt of N-sulfatosuccinimide, (II) the sodium salt of 3-sulfato-5,6-dihydrouracil, (III) the disodium salt of 2,2'-bis(N-sulfatosuccinimide), and (IV) the disodium salt of 5,5'-bis(3-sulfato-5,6-dihydrouracil) having the respective structures



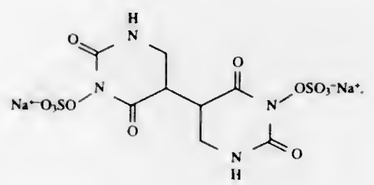
I



II



III



IV

5,556,977

HETEROCYCLIC DERIVATIVES

Michael G. Wayne, Stoke on Trent; Michael J. Smithers, Macclesfield; John W. Rayner, Stockport; Alan W. Faull, Macclesfield; Robert J. Pearce, Wilmslow; Andrew G. Brewster, Macclesfield, all of United Kingdom; Richard E. Shute, Macclesfield; Sturat D. Mills, Macclesfield, and Peter W. R. Caulkett, Macclesfield, all of England, assignors to Zeneca Limited, London, United Kingdom

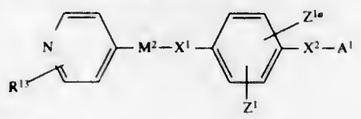
Filed Mar. 28, 1994, Ser. No. 218,171

Claims priority, application United Kingdom, Mar. 29, 1993, 9306453; Dec. 15, 1993, 9325605

Int. Cl.[6] C07D *401/00*

U.S. Cl. 544—360 **8 Claims**

1. A compound of the general formula:



I

wherein:

M^2 is —NR^4—D—TR^5— in which T is N; D is CH_2CO or CH_2CH_2; and R^4 and R^5 together represent CH_2CH_2;

X^1 is a bond;

Z^1 and Z^{1a} each independently represents hydrogen, hydroxy, halogeno, (1–4C)alkyl, (2–4C)alkenyl, (2–4C)alkynyl, (1–4C)alkoxy, (1–4C)alkylthio, (2–4C)alkenyloxy, nitro, amino, (1–4C)alkylamino, (2–4C)alkanoylamino, cyano, (1–4C)alkylsulphonylamino; phenyl(1–2C)alkylsulphonylamino, p-toluenesulphonylamino, or (1–4C)alkoxycarbonyl, or has one of the meanings given for X^2—A^1;

X^2 is an oxy(2–4C)alkylene or oxy(5–6C)alkylene group, which group optionally may be substituted on the alkylene by any of (2–4C)alkenyl, (2–4C)alkynyl, carboxy, (1–4C)alkoxycarbonyl, phenyl(1–4C)alkoxycarbonyl, phenyl(1–2C)alkylNHCO, phenyl(1–2C)alkyl, pyridyl, phenyl, amino or a group of the formula $NR^{12}XR^6$ in which X is SO_2, CO or CO_2, R^{12} is hydrogen or (1–4C)alkyl and R^6 is (1–6C)alkyl, (6–10C)aryl or (6–10C)aryl (1–4C)alkyl;

A^1 is carboxy or a metabolically labile ester or amide thereof; and

R^{13} is hydrogen, (1–4C)alkyl, (1–4C)alkoxy or halogen; or a pharmaceutically acceptable salt thereof.

5,556,978

NEUROMUSCULAR BLOCKING AGENTS

Derek A. Hill, and Geoffrey L. Turner, both of Dartford, England, assignors to Glaxo Wellcome Inc., Research Triangle Park, N.C.

Division of Ser. No. 911,887, Jul. 10, 1992, Pat. No. 5,453,510, which is a continuation of Ser. No. 729,496, Jul. 12, 1991, abandoned. This application Mar. 28, 1995, Ser. No. 413,217

Claims priority, application United Kingdom, Jul. 13, 1990, 9015473

Int. Cl.[6] C07D *217/24*

U.S. Cl. 546—140 **16 Claims**

1. A process for the preparation of 1R-cis, 1'R-cis 2',2'-(3,11-dioxo-4,10-dioxatridecylene)-bis-(1,2,3,4-tetrahydro-6,7-dimethoxy-2-methyl veratrylisoquinolinium) in the form of a salt having a physiologically acceptable anion selected from halide, sulphate, phosphate, acetate, propionate, succinate, maleate, mesylate, besylate, tosylate or napthalenesulphonate; in admixture with less than 8% w/w of other geometrical and optical isomers thereof, which process comprises subjecting a 1R,1'R 2',2'-(3,11-dioxo-4,10-dioxatridecylene)-bis-(1,2,3,4-tetrahydro-6,7-dimethoxy-2-methyl veratrylisoquinolinium salt having the required anion to high performance liquid chromatography using a silica stationary phase and a non-aqueous mobile phase in the presence of a strong acid.

5,556,979

7-ISOINDOLINYL-NAPHTHYRIDONE DERIVATIVES, COMPOSITIONS AND ANTI-BACTERIAL USE THEREOF

Thomas Philipps, Koeln; Stephan Bartel, Bergisch Gladbach; Andreas Krebs, Odenthal; Uwe Petersen, Leverkusen; Thomas Scheuke, Bergisch Gladbach; Klaus-Dieter Bremm, Wuppertal; Rainer Endermann, Wuppertal; Karl G. Metzger, Wuppertal, and Burkhard Mielke, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

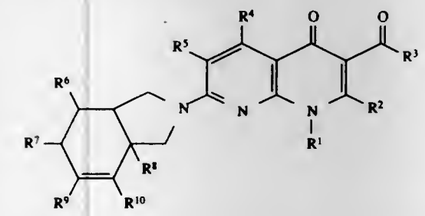
Filed Sep. 10, 1993, Ser. No. 119,369

Claims priority, application Germany, Sep. 15, 1992, 42 30 804.6

Int. Cl.[6] C07D *471/04*; A61K *31/435*

U.S. Cl. 546—123 **10 Claims**

1. A compound of the formula



in which

R^1 represents alkyl having 1 to 4 carbon atoms, which is optionally substituted by 1–3 fluorine atoms, alkenyl having 2 to 4 carbon atoms, cycloalkyl having 3 to 6 carbon atoms, which is optionally substituted by 1 to 2 fluorine atoms, 2-hydroxyethyl, methoxy, amino, methylamino, ethylamino, dimethylamino, phenyl, which is optionally substituted by 1 or 2 fluorine atoms, 3-oxetanyl, bicyclo[1.1.1]pentyl,

R^2 represents hydrogen,

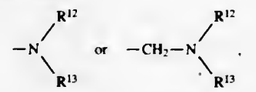
R^3 represents hydroxyl or O—R^{11}, wherein

R^{11} represents alkyl having 1–4 C atoms

R^4 represents hydrogen, amino, alkylamino having 1 to 4 carbon atoms, dialkylamino having 1 to 3 carbon atoms in each alkyl group, hydroxyl, alkoxy having 1 to 4 carbon atoms, mercapto, alkylthio having 1 to 4 carbon atoms, halogen, methyl, ethyl or vinyl,

R^5 represents hydrogen, halogen or methyl,

R^6 represents hydrogen, alkyloxycarbonyl having 1 to 4 carbon atoms, hydroxymethyl,



where

R^{12} denotes hydrogen, alkyl having 1 to 3 carbon atoms, which is optionally substituted by hydroxyl, alkyloxycarbonyl having 1 to 4 carbon atoms in the alkyl moiety, or acyl having 1 to 3 carbon atoms, and

R^{13} denotes hydrogen or methyl,

R^7, R^8, R^9 and R^{10} each represent hydrogen or methyl or its tautomer as well as its pharmaceutically utilisable hydrate and acid addition salt.

5,556,980

PIPERIDINE COMPOUND, A PROCESS FOR PRODUCING THE SAME AND A STABILIZER USING THE SAME

Seiji Sagawa, Chiba; Toshio Kano, Kanagawa; Motohiko Samizo, Osaka; Fumitoshi Kojima, Osaka, and Tetsuo Yamaguchi, Osaka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, and Kyodo Chemical Co., Ltd., Tokyo, both of Japan

Filed Aug. 29, 1994, Ser. No. 294,829

Claims priority, application Japan, Sep. 3, 1993, 5-219796; Dec. 24, 1993, 5-329083

Int. Cl.[6] C07D *211/30*

U.S. Cl. 546—190 **1 Claim**

1. 2-Methyl-3-(2,2,6,6-tetramethyl-4-piperidylamino)-N-(2,2,6,6-tetramethyl-4-piperidyl)-propionamide.

5,556,981

ANGIOTENSIN II ANTAGONIST INTERMEDIATES

Donald B. Boyd, Greenwood; Sherryl L. Lifer, Indianapolis; Winston S. Marshall, Bargerville; Alan D. Palkowitz; William Pfeifer, both of Indianapolis; Jon K. Reel, Carmel; Richard L. Simon, Greenwood; Mitchell I. Steinberg; K. Jeff Thrasher, both of Indianapolis; Venkatraghaven Vasudevan, Indianapolis, and Celia A. Whitesitt, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 49,916, Apr. 20, 1993, which is a continuation-in-part of Ser. No. 892,854, Jun. 3, 1992, abandoned. This application May 30, 1995, Ser. No. 453,532

Int. Cl.[6] C07D *413/10;209/08*

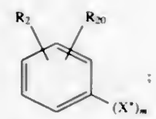
U.S. Cl. 548—238 **2 Claims**

1. A process for preparing compounds of the formula:

R_1'—R_2'

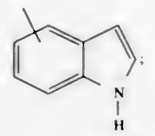
wherein:

R_1' is



;

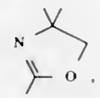
R_2' is



;

R_2 is H, —OH, —$OCOCH_3$, halo, C_1–C_4 alkyl, or C_1–C_4 alkoxy;

R_2 is



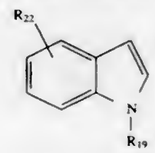
a protected carboxy, cyano, nitro or methoxy, located ortho or para to X*;

X* is —CH_2—;

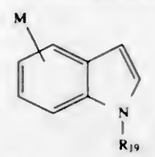
m is independently 0 or 1;

which comprises

a. reacting a compound of the formula



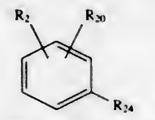
wherein R_{22} is bromo, iodo, —CH_2-bromo, or —CH_2-iodo; and R_{19} is an indole protecting group; with a reagent selected from an alkyl lithium, $MgBr_2$ or Mg, $ZnCl_2$ or Zn, or diisobutylaluminum to prepare a compound of formula IV



IV

M is —Li, —CH_2Li, —MgBr, —MgI, —CH_2MgBr, —CH_2MgI, —ZnBr, —ZnI, —CH_2ZnBr, —CH_2ZnI; or Al(isoButyl)$_2$;

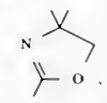
b. reacting the compound of Formula IV in the presence of a Ni (0) or Pd (0) complex catalyst in an aprotic solvent with a compound of the Formula V



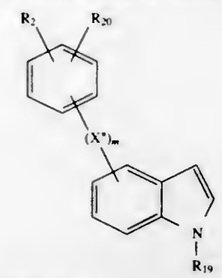
V

wherein R_2 is H, —OH, —$OCOCH_3$, halo, C_1–C_4 alkyl, or C_1–C_4 alkoxy;

R_{20} is



a protected carboxy, cyano, nitro, or methoxy, located in a position ortho or para to R_{24}; and R_{24} is bromo or iodo; to produce an indole of Formula VI



VI

wherein X* is —CH_2—; and m is 0 or 1;

c. isolating the compound of Formula VI; and

d. deprotecting the indole of the compound of Formula VI.

5,556,982

METAL RADIONUCLIDE LABELED PROTEINS FOR DIAGNOSIS AND THERAPY

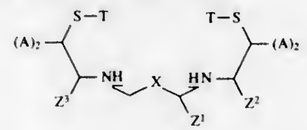
Alan R. Fritzberg, Edmonds; Sudhakar Kasina, Kirkland, and Linda M. Gustavson, Seattle, all of Wash., assignors to NeoRx Corporation, Seattle, Wash.

Continuation-in-part of Ser. No. 576,343, Aug. 31, 1991, Pat. No. 5,242,679, which is a division of Ser. No. 65,017, Jun. 19, 1987, Pat. No. 5,175,343, which is a continuation-in-part of Ser. No. 817,321, Jan. 9, 1986, abandoned, which is a continuation-in-part of Ser. No. 692,000, Jan. 14, 1985, abandoned. This application Jul. 12, 1993, Ser. No. 90,609

Int. Cl.[6] **C07D** *235/02;* **C07C** *69/62;229/14;* **A61K** *49/00;43/00*

U.S. Cl. 548—303.7 **11 Claims**

1. A compound of the formula:



wherein:

one of Z^1, Z^2, Z^3, or Z^4, is $(CH_2)_m$—X'—{CO—NH—$(CH_2)_{m'}$}$_n$—CWY and the others are H_2 or =O, wherein in $(CH_2)_m$ and $(CH_2)_{m'}$, m ranges from 1 to 6 and m' ranges from 1 to 3 and m+m' ranges from 1 to 6;

W is H_2 or =NH or =O;

n is 0 or 1;

T is a removable sulfur protective group, hydrogen, or an alkali metal ion;

Y is biotin, avidin, or strept-avidin;

X is a bond, methylene or CHZ^4;

X' is a bond, oxygen or sulfur; and

the A's are the same or different and are hydrogen or a lower alkyl of from 1 to 3 carbon atoms.

5,556,983

PHENYLIMIDAZOLIDINES

André Claussner, Villemomble; Francois Goubet, Paris, and Jean-Georges Teutsch, Pantin, all of France, assignors to Roussel Uclaf, France

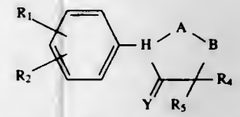
Continuation of Ser. No. 68,736, May 28, 1993, Pat. No. 5,434,176. This application Feb. 13, 1995, Ser. No. 388,131

Claims priority, application France, Jul. 8, 1992, 92-08432

Int. Cl.[6] **C07D** *233/42;233/40*

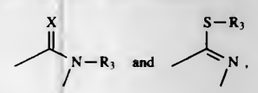
U.S. Cl. 548—300.7 **10 Claims**

1. A compound selected from the group consisting of compounds of the formula



I

wherein one of R_1 and R_2 is selected from the group consisting of —CN, —NO_2, halogen, —CF_3, free carboxy, salified carboxy and carboxy esterified with lower alkyl; and the other is selected from the group consisting of cyano, nitro and carboxy, —A—B— is selected from the group consisting of



and

wherein X is =O or =S, R_3 is selected from the group consisting of hydrogen, alkyl, alkenyl, alkynyl, phenyl and phenylalkyl, each of up to 12 carbon atoms, all optionally substituted with at least one member of the group consisting of —OH, halogen, —SH, —CN and acyl and acyloxy of up to 7 carbon atoms Y is =O, =S, or =NH; R_4 and R_5 taken together with the carbon atom to which they are attached form cycloalkyl of 3 to 7 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

5,556,984

AMMOXIDATION OF SATURATED HYDROCARBONS

Gilbert Blanchard, Le Plessis Belleville; Elisabeth Bordes, Vemars, and Gilbert Ferre, Livry Gargan, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

Continuation of Ser. No. 909,184, Jul. 6, 1992, abandoned. This application Mar. 23, 1994, Ser. No. 216,514

Claims priority, application France, Jul. 4, 1991, 91 08643

Int. Cl.[6] **C07C** *253/24*

U.S. Cl. 558—319 **18 Claims**

1. In a process for the ammoxidation of an alkane into an α,β-ethylenically unsaturated nitrile, by reacting an acyclic alkane having 3 or more carbon atoms per molecule with ammonia and oxygen, the improvement comprising conducting said ammoxidation in vapor phase and in the presence of a solid catalyst, said solid catalyst comprising a catalytically effective amount of an active catalytic phase, said active catalytic phase consisting essentially of a mixed oxide of molybdenum and at least one metal selected from the group consisting of Mg, Ca, Mn, Fe, U, La, and Co.

5,556,985

PYRAZOLONOXONOL COMPOUNDS

Koji Warishi, and Mario Aoki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

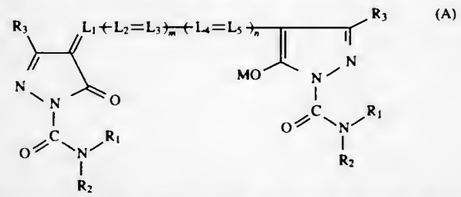
Filed Jan. 27, 1995, Ser. No. 379,209

Claims priority, application Japan, Jan. 31, 1994, 6-009827

Int. Cl.[6] **C07D** *231/20*

U.S. Cl. 548—365.4 **7 Claims**

1. A pyrazolonoxonol compound represented by formula



(A)

wherein R_1 and R_2 each represents a hydrogen atom, an alkyl group or an aryl group, and the alkyl groups represented by R_1 and R_2 may bond to each other to form a saturated 5- or 6-membered ring; R_3 represents a hydrogen atom, an alkyl group, an aryl group, a heterocyclic group, a hydroxyl group, an alkoxy group, a carboxyl group, an ester group, a carbamoyl group, an amino group, an acylamino group, an ureido group, an urethane group or a cyano group; L_1, L_2, L_3, L_4 and L_5 each represents a methine group, and the methine groups which are not adjacent to each other may bond to each other to form a 5- or 6-membered ring; M represents a hydrogen atom or a monovalent cation; and m and n each represent an integer 0 or 1.

5,556,986

PYRAZOLE HYDRAZINE COMPOUNDS

Uwe Hartfiel; Gabriele Dorfmeister; Helga Franke; Jens Geisler; Gerhard Johann, and Richard Rees, all of Berlin, Germany, assignors to Hoechst Schering AgrEvo GmbH, Germany

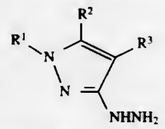
Division of Ser. No. 240,759, Jun. 13, 1994, Pat. No. 5,405,829. This application Dec. 29, 1994, Ser. No. 366,054

Claims priority, application Germany, Nov. 13, 1991, 41 37 872.5; Apr. 15, 1992, 42 12 919.2

Int. Cl.[6] **C07D** *231/38*

U.S. Cl. 548—368.7 **2 Claims**

1. Compounds of general formula II



(II)

in which R^1 is C_1–C_4-alkyl, optionally substituted by one or more halogen atoms;

R^2 is hydrogen, or a C_1–C_4-alkyl, C_1–C_4-alkylthio, C_1–C_4-alkoxy, each of which is optionally substituted by one or more halogen atoms;

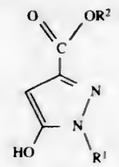
with the exception of compounds where R^1 is methyl or butyl and R^2 is methyl, when R^3 is hydrogen.

5,556,987
PROCESS FOR PRODUCING PYRAZOLECARBOXAMIDE DERIVATIVE

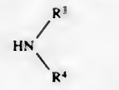
Mario Aoki, and Akira Ogawa, both of Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 25, 1995, Ser. No. 548,266
Claims priority, application Japan, Nov. 10, 1994, 6-276505
Int. Cl.[6] C07D *231/20;231/22*
U.S. Cl. 548—369.7 **11 Claims**

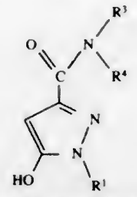
1. A process for producing a pyrazolecarboxamide derivative represented by formula (C) which comprises reacting a pyrazolecarboxylic ester compound represented by formula (A) with an amine compound represented by formula (B) in the presence of a Lewis acid:



(A)



(B)



(C)

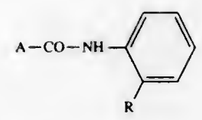
wherein R^1 represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted heterocyclic group; R^2 represents a substituted or unsubstituted alkyl group; and R^3 and R^4 each represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted heterocyclic group, provided that R^3 and R^4 may be bonded to each other to form a ring.

5,556,988
ANILIDE DERIVATIVES AND THEIR USE FOR COMBATING BOTRYTIS

Karl Eicken, Wachenheim; Norbert Goetz, Worms; Albrecht Harreus, Ludwigshafen; Eberhard Ammermann, Heppenheim; Gisela Lorenz, Neustadt, and Harald Rang, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 215,463, Mar. 21, 1994, Pat. No. 5,480,897, which is a division of Ser. No. 973,976, Nov. 9, 1992, Pat. No. 5,330,995. This application Jun. 7, 1995, Ser. No. 472,927
Claims priority, application Germany, Nov. 22, 1991, 41 38 387.7; Feb. 18, 1992, 42 04 764.1; Feb. 18, 1992, 42 04 766.8; Feb. 18, 1992, 42 04 767.6; Feb. 18, 1992, 42 04 768.4
Int. Cl.[6] C07D *231/12;* **A01N** *43/56*
U.S. Cl. 548—374.1 **8 Claims**

1. A method of treating Botrytis infestation comprising applying to a subject in need thereof, an effective amount of an anilide derivative of the formula



wherein A is 1-methylpyrazol-4-yl substituted in the 3-position by methyl, chloro or trifluoromethyl and substituted in the 5-position by chloro;

R is unsubstituted or halogen-substituted C_3–C_{12}-alkyl, unsubstituted or halogen-substituted C_3–C_{12}-alkenyl, C_3–C_6-alkynyl, unsubstituted or halogen-substituted C_2–C_{12}-alkoxy, unsubstituted or halogen-substituted C_3–C_{12}-alkenyloxy, C_3–C_{12}-alkynyloxy, or phenyl which is unsubstituted or substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio or halogen;

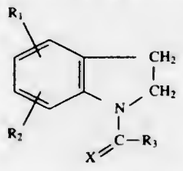
in a suitable carrier.

5,556,989
INDOLINE COMPOUNDS USEFUL FOR DYEING KERATINOUS FIBRES

Alain Lagrange, Coupvray; Jean J. Vandenbossche, Sevran, and HervéAndrean, Paris, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 165,853, Dec. 14, 1993, Pat. No. 5,427,588. This application Mar. 10, 1995, Ser. No. 401,671
Claims priority, application France, Dec. 18, 1992, 92 15675
Int. Cl.[6] C07D *209/08*
U.S. Cl. 548—491 **2 Claims**

1. An indoline compound having the formula



(I)

wherein

R_1 and R_2, each independently, represent hydrogen, C_1–C_4 alkyl, C_1–C_4 monohydroxyalkyl, C_2–C_4 polyhydroxyalkyl, hydroxyl, C_1–C_4 alkoxy or NHR wherein R represents hydrogen, C_1–C_4 alkyl, C_1–C_4 monohydroxyalkyl or C_2–C_4 polyhydroxyalkyl;

X represents an oxygen atom or a sulfur atom;

R_3 represents —OR_4 or NR_5R_6;

R_4 represents a linear or branched C_1–C_{10} alkyl, a linear or branched C_2–C_{10} alkenyl, benzyl, alkoxyalkyl wherein the alkyl and alkoxy moieties have 1–4 carbon atoms or C_1–C_4 haloalkyl;

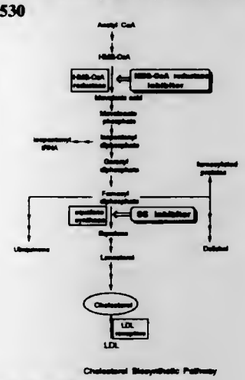
R_5 and R_6, each independently, represent C_1–C_4 alkyl;

with the proviso that R_1 and R_2 do not simultaneously represent hydrogen and when R_1 represents alkyl, alkoxy, mono- or polyhydroxyalkyl, R_2 represents hydroxyl or NHR wherein R has the meaning given above; with the exception of 5-amino-1-(N,N-dimethylcarbamoyl)indoline.

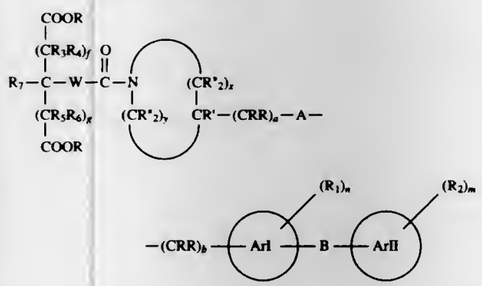
5,556,990
POLYARYLCARBAMOYLAZA-AND-CARBAMOYLALKANEDIOIC ACIDS

Henry W. Pauls, Collegeville; Yong-Mi Choi, Jeffersonville; Robert W. Studt, Reading; Martin P. Maguire, Mont Clare; Alfred P. Spada, Lansdale, and Don D. Cha, Eagleville, all of Pa., assignors to Rhone-Poulenc Rorer Pharmaceuticals Inc., Collegeville, Pa.

Filed Dec. 16, 1994, Ser. No. 357,481
Int. Cl.[6] C07D *207/04;403/08;417/06;211/14;223/02*
U.S. Cl. 548—530 **19 Claims**



1. A compound of the formula:



where:

A is O, S, NR, SO, SO_2 or a bond;

B is $(CRR)_{1-2}$, O, S, NR, SO, SO_2, RC═CR, C≡C, O═C or a bond;

W is a bond, $(CRR)_h$, or NR;

R is hydrogen or C_{1-6} alkyl;

R' and R" are independently hydrogen, C_{1-6} alkyl, C_{1-6} alkoxy, hydroxy, halo, trifluoromethyl or phenyl;

R' and R" together may form a double bond;

R_1 and R_2 are independently hydrogen, C_{1-6} alkyl, C_{1-6} alkoxy, hydroxy, halo, trifluoromethyl or phenyl;

R_3, R_4, R_5 and R_6 are independently hydrogen or C_{1-6}alkyl;

R_7 is H, NRR or OH and when W is $(CRR)_h$ then R_7 is OH;

one of R_3, R_4, R_5, R_6 or R_7 is OH;

Ar I is phenylene;

Ar II is selected from phenyl, pyridyl, naphthyl, benzoxaxolyl, quinolinyl or benzothiazolyl;

a and b are independently 0–3;

a+b is0–4;

f is 0–2;

g is 0–2;

h is 1–2;

m and n are independently 0–2;

x is 1–6;

y is 0–2;

x+y is 3–6; and

its stereoisomers, enantiomers, diastereoisomers and racemic mixtures; or a pharmaceutically acceptable salt thereof.

5,556,991
MALEIMIDE COMPOUNDS HAVING IMPROVED IN STORAGE STABILITY

Yuichi Kita; Koichi Nakagawa, and Kazuo Kishino, all of Hyogo, Japan, assignors to Nippon Shokubai Co., Ltd., Osaka-fu, Japan

PCT No. PCT/JP93/00112, § 371 Date Sep. 22, 1994, § 102(e) Date Sep. 22, 1994, PCT Pub. No. WO93/15048, PCT Pub. Date Aug. 5, 1993
PCT Filed Jan. 29, 1993, Ser. No. 256,829
Claims priority, application Japan, Jan. 30, 1992, 4-015127
Int. Cl.[6] C07D *207/448;207/452*
U.S. Cl. 548—548 **7 Claims**

1. A maleimide composition with reduced vulnerability to discoloration comprising

a) 99.5 % by weight or more of maleimide selected from the group consisting of N-alkyl maleimides, N-benzyl maleimides, N-cycloalkyl maleimides, N-phenyl maleimides, and N-substituted phenyl maleimides;

b) primary amine compounds at a level not exceeding 500 ppm; and

c) chlorine compounds selected from the group consisting of alkyl chlorine compounds, aromatic chlorine compounds, inorganic chlorine compounds, organic phosphate esters having a chlorinated alkyl group and a chlorinated aryl group, and organic acids, said chlorine compounds being present at a level not exceeding 10 ppm as chlorine atoms in said maleimide composition.

5,556,992
NOVEL RHODAMINE DERIVATIVES FOR PHOTODYNAMIC THERAPY OF CANCER AND IN VITRO PURGING OF THE LEUKEMIAS

Louis Gaboury; Luc Villeneuve; Richard Giasson; Tiechao Li, all of Montréal, and Ajay K. Gupta, Pointe-Claire, all of Canada, assignors to Universite de Montreal, Montreal, Canada

Filed Sep. 2, 1994, Ser. No. 300,179
Int. Cl.[6] C07D *311/82*
U.S. Cl. 549—227 **1 Claim**

1. A photoactivable rhodamine derivative with high quantum yield of singlet oxygen generation and differential retention between normal and cancer cells, said derivative being selected from the group consisting of 2-(4,5-dibromo-6-amino-3-imino-3H-xanthen-9-yl)-benzoic acid methyl ester hydrochloride and 2-(4,5-dibromo-6-amino-3-imino-3H-xanthen-9-yl)-benzoic acid butyl ester hydrochloride.

5,556,997

and when A is —O═C(R^4)—, R^3 represents —NH-tert-butyl,

5,556,993

COMPOUNDS FOR THE PHOTODECONTAMINATION OF PATHOGENS IN BLOOD

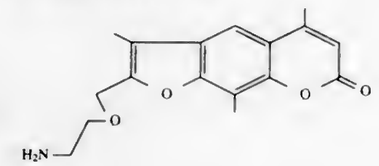
Susan Wollowitz, Walnut Creek; Stephen T. Isaacs, Orinda; Henry Rapoport; Hans P. Spielmann, both of Berkeley, and Aileen Nerio, Santa Clara, all of Calif., assignors to Sterltech, Inc., Concord, Calif.

Division of Ser. No. 212,113, Mar. 11, 1994, which is a continuation-in-part of Ser. No. 83,459, Jun. 28, 1993, Pat. No. 5,399,719. This application Jun. 5, 1995, Ser. No. 465,495

Int. Cl.[6] C07D *493/00*

U.S. Cl. 549—282 **1 Claim**

1. A compound having the formula:



or a salt thereof.

5,556,994

CYCLOPROPANE DERIVATIVES AND METHOD OF PREPARING THE SAME

Tomoyuki Onishi; Takashi Tsuji, and Toshihiro Matsuzawa, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

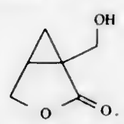
Filed Mar. 30, 1995, Ser. No. 413,226

Claims priority, application Japan, Mar. 30, 1994, 6-061250; Jul. 27, 1994, 6-175495

Int. Cl.[6] C07D *307/77*

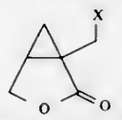
U.S. Cl. 549—302 **3 Claims**

1. (3-Oxa-2-oxobicyclo[3,1,0]hexan-1-yl)methanol represented by formula (II):



(II)

2. A compound of formula:



(2)

wherein X is a leaving group.

5,556,995

PROCESS FOR THE PREPARATION OF POLYHYDRIC PHENOL COMPOUNDS

Naoko Suzuki, Amagasaki; Hirotoshi Nakanishi, Osaka, and Jun Tomioka, Takarazuka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

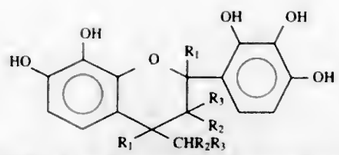
Continuation of Ser. No. 93,620, Jul. 20, 1993, abandoned. This application Jan. 26, 1995, Ser. No. 378,942

Claims priority, application Japan, Aug. 7, 1992, 4-211387

Int. Cl.[6] C07D *311/60*

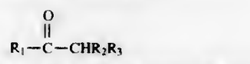
U.S. Cl. 549—406 **13 Claims**

1. A process for preparing a polyhydric phenol compound represented by the formula (1):



(I)

wherein R_1, R_2 and R_3 independently represent hydrogen atom, alkyl, alkenyl, cycloalkyl, aralkyl or aryl group, which comprises carrying out a condensation reaction between a compound represented by the formula (II):



(II)

wherein R_1, R_2 and R_3 are as defined above, and pyrogallol in the presence of ethyl acetate and an organic acid catalyst.

5,556,996

OXIRANYLS DISUBSTITUTED WITH A PHENYL GROUP AND A SUBSTITUTED CHROMANYL OR TETRAHYDROQUINOLINYL GROUP HAVING RETINOID LIKE ACTIVITY

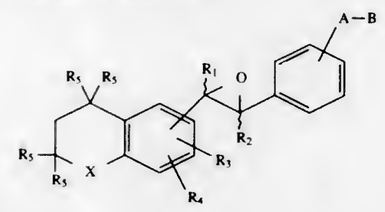
Richard L. Beard, Santa Ana Heights, and Roshantha A. Chandraratna, Missio Viejo, both of Calif., assignors to Allergan, Waco, Tex.

Filed Dec. 29, 1994, Ser. No. 366,174

Int. Cl.[6] C07D *311/04;311/58*

U.S. Cl. 549—407 **13 Claims**

1. A compound of the formula



wherein X is O;

R_1 and R_2 independently are hydrogen, lower alkyl of 1 to 6 carbons, or halogen;

R_3 is hydrogen, lower alkyl of 1 to 6 carbons, halogen, OR_{11}, SR_{11}, $OCOR_{11}$, $SCOR_{11}$, NH_2, NHR_{11}, $N(R_{11})_2$, $NHCOR_{11}$, or NR_{11}—COR_{11}, $Si(R_{11})_3$;

R_4 is hydrogen, lower alkyl of 1 to 6 carbons, halogen, lower alkoxy or lower thioalkoxy of 1 to 6 carbons;

R_5 is independently hydrogen or lower alkyl of 1 to 6 carbons, and the oxiranyl ring is attached to the otherwise unoccupied 6 or 7 position of the chroman nucleus;

A is $(CH_2)_n$ where n is 0–5, lower branched chain alkyl having 3–6 carbons, cycloalkyl having 3–6 carbons, alkenyl having 2–6 carbons and 1 or 2 double bonds, alkynyl having 2–6 carbons and 1 or 2 triple bonds;

B is hydrogen, COOH or a pharmaceutically acceptable salt thereof, $COOR_8$, $CONR_9R_{10}$, $—CH_2OH$, CH_2OR_{11}, CH_2OCOR_{11}, CHO, $CH(OR_{12})_2$, $CHOR_{13}O$, $—COR_7$, $CR_7(OR_{12})_2$, or $CR_7OR_{13}O$, where R_7 is an alkyl having 1 to 5 carbons, a cycloalkyl having 3 to 5 carbons or an alkenyl having 2 to 5 carbons, R_8 is an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5 to 10 carbons, or R_8 is phenyl or lower alkylphenyl, R_9 and R_{10} independently are hydrogen, an alkyl group of 1 to 10 carbons, or a cycloalkyl group of 5–10 carbons, or phenyl or lower alkylphenyl, R_{11} is lower alkyl, phenyl or lower alkylphenyl, R_{12} is lower alkyl, and R_{13} is divalent alkyl radical of 2–5 carbons.

5,556,997

ENHANCED SYNTHESIS OF RACEMIC METALLOCENES

Jamie R. Strickler, and John M. Power, both of Baton Rouge, La., assignors to Albemarle Corporation, Richmond, Va.

Filed Apr. 24, 1995, Ser. No. 427,505

Int. Cl.[6] C07F *17/00;7/00;9/00*

U.S. Cl. 556—11 **14 Claims**

1. A process for preparing a chiral metallocene, said process comprising reacting a salt of an asymmetric bis(cyclopentadienyl) moiety containing ligand with a chelate diamine adduct of a transition, lanthanide or actinide metal halide in an organic solvent medium so as to produce a chiral metallocene.

12. A process for preparing a chiral metallocene, said process comprising reacting an alkali metal salt or a magnesium halide salt of an asymmetric bis(cyclopentadienyl) moiety containing ligand with a chelate diamine adduct of a Group 4 metal halide in a mixed ether-aromatic hydrocarbon solvent medium so as to produce a chiral metallocene.

5,556,998

TRANSITION METAL COMPLEX, PROCESS FOR THE PREPARATION OF THE SAME, AND ASYMMETRIC HYDROGENATION CATALYST COMPRISING THE SAME

Akira Miyashita, Saitama; Takeshi Chiba, Miyagi; Hiroyuki Nohira, Saitama, and Hidemasa Takaya, Shiga, all of Japan, assignors to Takasago International Corporation, Tokyo, Japan

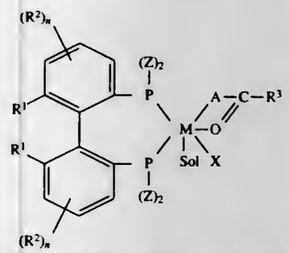
Filed Mar. 13, 1995, Ser. No. 402,692

Claims priority, application Japan, Sep. 14, 1994, 6-247032; Sep. 14, 1994, 6-247033

Int. Cl.[6] C07F *9/02;15/00;* **B01J** *31/00*

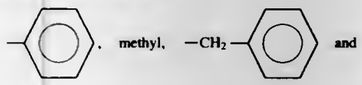
U.S. Cl. 556—21 **20 Claims**

1. A transition metal complex represented by the general formula (I):

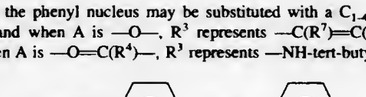


(I)

wherein R^1 and R^2 each represents a halogen atom, a C_{1-3} alkyl group, or a C_{1-3} alkyl group substituted with a halogen atom; n represents 0 or an integer of from 1 to 3; Z represents a cyclohexyl group, a phenyl group, or a substituted phenyl group, wherein said substituted group is a C_{1-4} alkyl group, a C_{1-4} alkoxy group or a halogen atom; X represents a chlorine atom, a bromine atom, or an iodine atom; M represents a ruthenium atom, a rhodium atom, an iridium atom, a palladium atom, or a platinum atom; Sol represents a solvent; A represents —O— or —O═C(R^4)—; R^4 is selected from the group consisting of

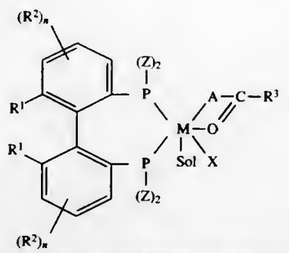


wherein the phenyl nucleus may be substituted with a C_{1-4} alkyl group; and when A is —O—, R^3 represents —C(R^7)═C(R^5)R^6 and when A is —O═C(R^4)—, R^3 represents —NH-tert-butyl,



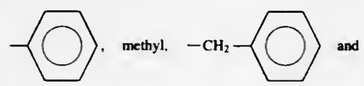
or —OCH_3, wherein R^5, R^6 and R^7 each represents a hydrogen atom, a C_{1-7} alkyl or alkenyl group which may be substituted, or a C_{6-18} aryl or naphthyl group which may be substituted, with the proviso that R^5, R^6 and R^7 are not hydrogen atoms at the same time, that when R^5 and R^6 are hydrogen atoms at the same time, R^7 is not a methyl group, and that when R^7 is a hydrogen atom, R^5 and R^6 are different groups other than a hydrogen atom.

10. A process for the preparation of a transition metal complex represented by the general formula (I):

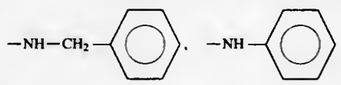


(I)

wherein R^1 and R^2 each represents a halogen atom, a C_{1-3} alkyl group, or a C_{1-3} alkyl group substituted with a halogen atom; n represents 0 or an integer of from 1 to 3; Z represents a cyclohexyl group, a phenyl group, or a substituted phenyl group, wherein said substituted group is a C_{1-4} alkyl group, a C_{1-4} alkoxy group or a halogen atom; X represents a chlorine atom, a bromine atom, or an iodine atom; M represents a ruthenium atom, a rhodium atom, an iridium atom, a palladium atom, or a platinum atom; Sol represents a solvent; A represents —O— or —O═C(R^4)—; R^4 is selected from the group consisting of

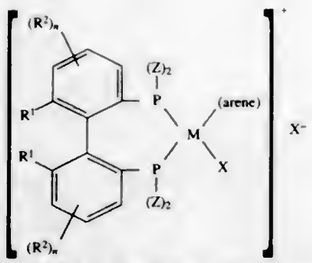


wherein the phenyl nucleus may be substituted with a C_{1-4} alkyl group; and when A is —O—, R^3 represents —C(R^7)═C(R^5)R^6 and when A is —O═C(R^4)—, R^3 represents —NH-tert-butyl,



or —OCH_3, wherein R^5, R^6 and R^7 each represents a hydrogen atom, a C_{1-7} alkyl or alkenyl group which may be substituted, or a C_{6-18} aryl or naphthyl group which may be substituted, with the proviso that R^5, R^6 and R^7 are not hydrogen atoms at the same time, that when R^5 and R^6 are hydrogen atoms at the same time, R^7 is not a methyl group, and that when R^7 is a hydrogen atom, R^5 and R^6 are different groups other than a hydrogen atom,

which comprises reacting a transition metal complex represented by the general formula (II):



(II)

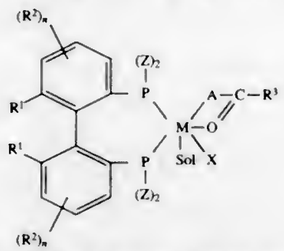
wherein R^1, R^2, n, Z, X and M are as defined above, and (arene) represents benzene or a substituted benzene having one or more substituents selected from C_{1-4} straight-chain or branched alkyl groups,

with a compound represented by the general formula (III) in a solvent:

(III)

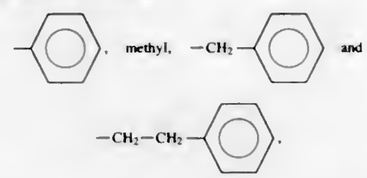
wherein A and R^3 are as defined above.

12. An asymmetric hydrogenation catalyst comprising a transition metal complex represented by the general formula (I):



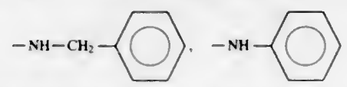
(I)

wherein R^1 and R^2 each represents a halogen atom, a C_{1-3} alkyl group, or a C_{1-3} alkyl group substituted with a halogen atom; n represents 0 or an integer of from 1 to 3; Z represents a cyclohexyl group, a phenyl group, or a substituted phenyl group, wherein said substituted group is a C_{1-4} alkyl group, a C_{1-4} alkoxy group or a halogen atom; X represents a chlorine atom, a bromine atom, or an iodine atom; M represents a ruthenium atom, a rhodium atom, an iridium atom, a palladium atom, or a platinum atom; Sol represents a solvent; A represents —O— or $-O{=}C(R^4)-$; R^4 is selected from the group consisting of



methyl, and ,

wherein the phenyl nucleus may be substituted with a C_{1-4} alkyl group; and when A is —O—, R^3 represents $-C(R^7){=}C(R^5)R^6$ and when A is $-O{=}C(R^4)-$, R^3 represents —NH-tert-butyl,



or $-OCH_3$, wherein R^5, R^6 and R^7 each represents a hydrogen atom, a C_{1-7} alkyl or alkenyl group which may be substituted, or a C_{6-18} aryl or naphthyl group which may be substituted, with the proviso that R^5, R^6 and R^7 are not hydrogen atoms at the same time, that when R^5 and R^6 are hydrogen atoms at the same time, R^7 is not a methyl group, and that when R^7 is a hydrogen atom, R^5 and R^6 are different groups other than a hydrogen atom.

5,556,999

ALKOXYSILANE COMPOSITION INHIBITED FROM DISPROPORTIONATION REACTION

Yoshinori Yamada; Mitsutaka Hasegawa, and Katsuyoshi Harada, all of Nagoya, Japan, assignors to Toagosei Co., Ltd., Tokyo, Japan

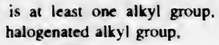
Filed Nov. 13, 1995, Ser. No. 556,003

Claims priority, application Japan, Nov. 14, 1994, 6-304419

Int. Cl.[6] C07F *7/08;7/18*

U.S. Cl. 556—401 **4 Claims**

1. An alkoxysilane composition which comprises (a) an alkoxysilane represented by the formula [1] and substantially free from alcohols:



[1]

wherein m is an integer of 1–3, n is an integer of 0–2, m+n≦3, R is a C_1-C_8 alkyl group, and R' is a C_1-C_4 alkyl group, with a proviso that when there are two or more R or R', R and R' may be the same or different respectively, and (b) at least one compound selected from the group consisting of organic sulfonic acids, sulfuric acid, SO_2, carboxylic acids, carboxylic anhydrides and CO_2.

5,557,000

SILICONE OIL FOR LOW TEMPERATURE USE

Masahiko Minemura, Usuf-gun, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1994, Ser. No. 348,902

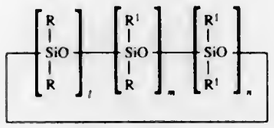
Claims priority, application Japan, Nov. 25, 1993, 5-321022

Int. Cl.[6] C07F *7/08*

U.S. Cl. 556—434 **13 Claims**

1. A silicone oil for low temperature use comprising at least one siloxy alkyl group-containing siloxane of the formula (a) or (2):

(1)



(2)

wherein:

R is at least one alkyl group, aryl group, aralkyl group, or halogenated alkyl group,

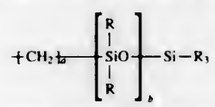
l is 0 to 1999,

m is 0 to 2000,

n is 0 to 2000,

the sum of subscripts l+m+n is 2–2000 and m+n is at least 1, and

R^1 is a monovalent siloxy alkyl group of formula (3):



(3)

wherein a is an integer of at least 2 and b is an integer of at least 0.

5,557,001

SILICONE MONOMER PROCESS

John E. Stauffer, 6 Pecksland Rd., Greenwich, Conn. 06831

Filed May 4, 1995, Ser. No. 434,606

Int. Cl.[6] C07F *7/08;7/18*

U.S. Cl. 556—470 **6 Claims**

1. A process of preparing silicone monomers comprising a reaction between an alkylchloro silane and an aliphatic ether in the presence of a catalyst to form the corresponding alkoxyalkyl silane monomer and alkyl chloride.

5,557,002

PROCESS FOR THE PREPARATION OF BIPHENYL CONTAINING INTERMEDIATES USEFUL IN MAKING ANGIOTENSIN II RECEPTOR ANTAGONISTS

Yoshio Urawa; Ken Furukawa; Toshikazu Shimizu; Yoji Yamagishi, all of Ibaraki; Tomio Tsurugi, Chiba, and Tomio Ichino, Ibaraki, all of Japan, assignors to Eisai Co., Ltd., Tokyo, and Eisai Chemical Co., Ltd., Ibaraki, both of Japan

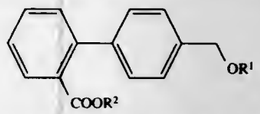
Division of Ser. No. 256,869, Aug. 5, 1994. This application Jun. 6, 1995, Ser. No. 466,128

Claims priority, application Japan, Jun. 17, 1992, 5-169805; Dec. 7, 1992, 4-351139; Dec. 16, 1992, 4-353865; Jun. 17, 1993, 5-169823; Jun. 17, 1993, 5-169824; Jun. 17, 1993, 5-169825

Int. Cl.[6] C07C *309/65;309/73;69/767*

U.S. Cl. 558—44 **19 Claims**

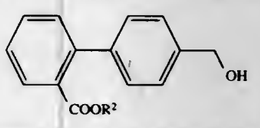
1. A process for the preparation of a sulfonyloxybiphenylcarboxylic ester derivative (I) having the formula:



(I)

wherein R^1 represents a lower alkylsulfonyl group or an arylsulfonyl group; and R^2 represents a lower alkyl group, an aryl group, an aralkyl group, a cycloether group, a triarylsilyl group, a vinyl group, a lower alkoxyalkyl group, an aryloxyalkyl group, an aralkyloxyalkyl group, a thioalkoxyalkyl group or a triphenylmethyl group;

which comprises subjecting a hydroxymethylbipbenylcarboxylic ester derivative (II) having the formula:



(II)

wherein R^2 represents a lower alkyl group, an aryl group, an aralkyl group, a cycloether group, a triarylsilyl group, a vinyl group, a lower alkoxyalkyl group, an aryloxyalkyl group, an aralkyloxyalkyl group, a thioalkoxyalkyl group or a triphenylmethyl group,

to sulfonylation.

5,557,003

ALKYLPHENOXY SUBSTITUTED BIS (THIO PHOSPHORYL) AMINES

John Campbell, Rochdale; Raymond F. Dalton, Cheadle Hulme, and Peter M. Quan, Rochdale, all of Great Britain, assignors to Zeneca Limited, London, England

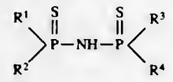
Division of Ser. No. 160,867, Dec. 3, 1993, Pat. No. 5,433,855, which is a continuation-in-part of Ser. No. 70,951, Jun. 4, 1993, Pat. No. 5,393,431. This application Apr. 10, 1995, Ser. No. 419,534

Claims priority, application United Kingdom, Jun. 5, 1992, 9211906; Feb. 5, 1993, 9302332

Int. Cl.[6] C07F *9/24;9/44*

U.S. Cl. 558—155 **17 Claims**

1. A compound of the formula:



wherein R^1 is a 2-alkylphenoxy group in which the phenoxy residue may optionally carry one or more additional substituents, each of R^2, R^3 and R^4, independently, is a phenyl group, an alkyl substituted phenyl group or a 2-alkylphenoxy group in which the phenoxy residue may optionally carry one or more additional alkyl substituents, and at least one 2-alkylphenoxy group contains a tertiary alkyl group.

5,557,004

PROCESS FOR PRODUCTION OF ALIPHATIC ALPHA, OMEGA-AMINONITRILES

Klemens Flick, Herxheim; Klaus Ebel, Lampertheim; Werner Schnurr, Herxheim; Johann-Peter Melder, Mannheim, and Wolfgang Harder, Weinheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

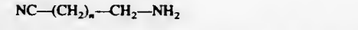
Filed Jan. 10, 1995, Ser. No. 370,607

Claims priority, application Germany, Dec. 27, 1994, 44 46 895.4

Int. Cl.[6] C07C *255/03*

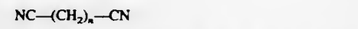
U.S. Cl. 558—459 **5 Claims**

1. In a process for the preparation of aliphatic α,ω-aminonitriles of the formula II



II

where n is an integer of from 1 to 10, by the partial hydrogenation of aliphatic α,ω-dinitriles of the formula I



where n has the above meaning, at an elevated temperature and under superatmospheric pressure, in the presence of a solvent and a catalyst the improvement which comprises; carrying out the partial hydrogenation in the presence of a catalyst which is prepared by the thermal decomposition of cobalt or nickel salts of C_1–C_6-carboxylic acids, C_2–C_6-dicarboxylic acids and cobalt or nickel complexes with 1,2- and 1,3-diketones at a temperature of about 150° to 500° C. and at a pressure from 1 Pa to 10 MPa.

5,557,005

PROCESS FOR PREPARING 3-: CHLOROANTHRANILIC ALKYL ESTERS OF HIGH PURITY FROM 3-CHLOROANTHRANILIC ACID

Günther Semler, Kelkheim, and Michael Meier, Frankfurt, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 230,897, Apr. 21, 1994, abandoned. This application May 24, 1995, Ser. No. 449,251

Claims priority, application Germany, Apr. 22, 1993, 43 13 174.3

Int. Cl.[6] C07C *229/56*

U.S. Cl. 560—47 **20 Claims**

1. A process for preparing a 3-chloroanthranilic alkyl ester, comprising the following steps:

a. reacting 3-chloroanthranilic acid, in an inert solvent, with from 0.8 to 5 parts by weight of phosgene per part by weight of 3-chloroanthranilic acid, wherein said inert solvent comprises an aromatic hydrocarbon, a chlorinated aromatic hydrocarbon, or mixtures thereof

b. reacting the resulting 3-chloroisatoic anhydride intermediate with an alkanol, optionally in the presence of an esterification catalyst, wherein said esterification catalyst is hydroxide, alcoholate, carbonate or hydrogen carbonate of the alkali metals, to obtain the 3-chloroanthranilic alkyl ester.

5,557,006

1-ALKYL-, 1-ALKENYL-, AND 1-ALKYNYLARYL-2-AMINO-1,3-PROPANEDIOLS AND RELATED COMPOUNDS

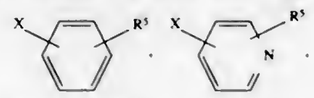
John J. Tegeler, Bridgewater; Barbara S. Rauckman, Flemington; Russell R. L. Hamer, Lebanon; Brian S. Freed, Phillipsburg, all of N.J., and Gregory H. Merriman, Fairfield, Ohio, assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

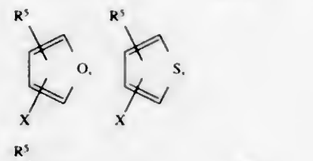
Division of Ser. No. 942,908, Sep. 10, 1992, Pat. No. 5,360,811, which is a continuation-in-part of Ser. No. 840,236, Feb. 24, 1992, abandoned, which is a continuation of Ser. No. 632,910, Dec. 24, 1990, abandoned, which is a continuation-in-part of Ser. No. 596,448, Oct. 12, 1990, abandoned, which is a continuation-in-part of Ser. No. 492,200, Mar. 13, 1990, abandoned. This application Apr. 20, 1995, Ser. No. 425,529

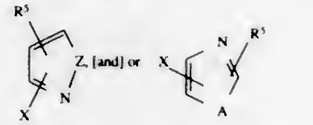
Int. Cl.[6] C07C *69/76;33/28;* **C07D** *211/70*

U.S. Cl. 560—105 **3 Claims**

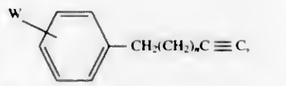
1. A compound of the formula RCH=CHR[4] wherein R is

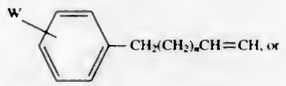


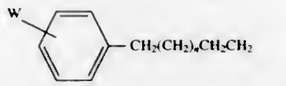




wherein R^5 is $CH_3(CH_2)_m C{\equiv}C$, $CH_3(CH_2)_m CH{=}CH$, $CH_3(CH_2)_m CH_2CH_2$,



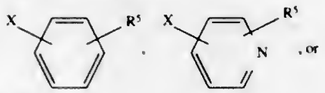




wherein m is 3 to 15, n is 0 to 12, and W and X are independently hydrogen, loweralkyl, loweralkoxy, halogen, or trifluoromethyl, Z is S, O, or C=O; and A is S or O, and R^4 is

wherein R^7 is hydrogen or loweralkyl, or $C(R^{25})_2OR^8$ wherein R^8 is hydrogen, loweralkyl or

wherein R^6 is as above with the proviso that when R^5 is $CH_3(CH_2)_m$ CH_2CH_2, R is not



5,557,007

UNSATURATED POLYLACTONE ACRYLATES AND DERIVATIVES THEREOF

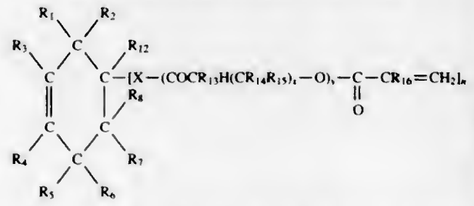
James P. Stanley, Bound Brook, N.J., assignor to Union Carbide Chemicals & Plastics Technology Corporation, Danbury, Conn.

Filed Sep. 28, 1990, Ser. No. 591,445

Int. Cl.[6] C07C *69/757;* **C08F** *32/00*

U.S. Cl. 560—183 **19 Claims**

1. An unsaturated polylactone acrylate of the formula:



wherein R_1 to R_8 are the same or different and are hydrogen, phenyl, or unsubstituted or substituted alkyl groups of 1 to about 8 carbon atoms, n has a value of one or two, R_{12} is hydrogen when

n is one and does not exist when n is two, R_{13}, R_{14}, and R_{15} are the same or different and are hydrogen, phenyl, cyclohexyl, linear or branched alkyl groups of up to about 8 carbon atoms, or halogen with the proviso that not more than three of the R_{13} to R_{15} are alkyl, phenyl, cyclohexyl, or halogen groups, R_{16} is hydrogen, methyl, or ethyl, x is an integer of one to about 6, and y is up to about 50, X is CH_2O when n is equal to two and is CH_2O or $COOCH_2CHR_{17}O$ when n is equal to one, and R_{17} is either hydrogen or methyl.

5,557,008

PROCESS FOR THE INTRODUCTION OF FLUORO SUBSTITUENTS

Craig W. Jones; William R. Sanderson, and John P. Sankey, all of Warrington, United Kingdom, assignors to Solvay Interox Limited, Warrington, England

Filed Sep. 6, 1995, Ser. No. 524,252

Claims priority, application United Kingdom, Sep. 10, 1994, 9418305

Int. Cl.[6] C07C *17/013*

U.S. Cl. 560—145 **15 Claims**

1. In a process for introducing a perfluorinated substituent into an organic substrate susceptible to electrophilic attack, the improvement wherein the process comprises contacting a substrate in a one pot process with a perfluoroalkanoic anhydride in the presence of an inorganic peroxygen compound at a temperature of greater than 10° C., the substrate being free from any heteroatom bonded to a hydrogen atom, and being selected from the group consisting of aromatic compounds comprising a hydrogen atom bonded to an aromatic ring and/or at least two concatenated nucleophilic heteroatoms, and aliphatic compounds comprising at least two concatenated nucleophilic heteroatoms.

5,557,009

PROCESS FOR PREPARING AN AQUEOUS SLURRY OF TEREPHTHALIC ACID

Yoshiaki Izumisawa, Tokyo; Yoshiyuki Sumi, and Takayuki Isogai, both of Kitakyushu, all of Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Oct. 31, 1995, Ser. No. 550,935

Claims priority, application Japan, Nov. 15, 1994, 6-280910; Dec. 19, 1994, 6-315019

Int. Cl.[6] C07C *51/265*

U.S. Cl. 562—412 **26 Claims**

1. A process for preparing an aqueous slurry of terephthalic acid, which comprises oxidizing p-xylene with molecular oxygen in a liquid phase in an acetic acid solvent in the presence of a catalyst, to obtain an acetic acid slurry of terephthalic acid, separating terephthalic acid crystals from the acetic acid slurry, washing the terephthalic acid crystals containing acetic acid, with p-xylene or an acetic acid ester, and then mixing water thereto.

5,557,010

PREPARATION OF A 2,3-DIHALOPERFLUOROCARBONYL HALIDE

Kevin P. Darst, Lake Jackson, Tex.; Bobby R. Ezzell, Midland, Mich., and Nobuyuki Ishibe, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 25, 1992, Ser. No. 904,748

Int. Cl.[6] C07C *51/58*

U.S. Cl. 562—851 **18 Claims**

1. A process for preparing a 2,3-dihaloperfluoropropionyl halide by a nucleophilic addition of a chloride, bromide or iodide ion to a 3-haloperfluoropropene oxide, comprising

(a) contacting an alkali metal chloride, bromide or iodide with a 3-haloperfluoropropene oxide in admixture in an inert liquid reaction medium, and

(b) recovering a 2,3-dihaloperfluoropropionyl halide from said admixture.

5,557,011

PREPARATION OF DIAMINES

Tom Witzel, and Eberhard Fuchs, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

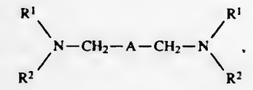
Continuation of Ser. No. 150,364, Nov. 9, 1993, abandoned. This application Nov. 15, 1994, Ser. No. 339,916

Claims priority, application Germany, Nov. 26, 1992, 42 39 782.0

Int. Cl.[6] C07C *209/48*

U.S. Cl. 564—492 **10 Claims**

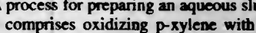
1. A process for the preparation of a tertiary diamine of the formula



I

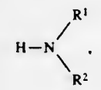
in which A denotes a C_1–C_{20} alkylene chain optionally mono- to penta-substituted by C_1–C_4-alkyl, and R^1 and R^2 each denote C_1–C_{20}-alkyl, C_1–C_{20}-hydroxyalkyl, C_3–C_8-cycloalkyl, C_4–C_{20}-alkylcycloalkyl, C_4–C_{20}-cycloalkylalkyl, phenyl, C_7–C_{20}-phenylalkyl, C_1–C_{20}-alkoxyalkyl, C_7–C_{20}-phenoxyalkyl, or when taken together, R^1 and R^2 denote a saturated or unsaturated C_2–C_6-alkylene chain optionally substituted by C_1–C_4-alkyl and optionally interrupted by oxygen or nitrogen, said process comprising:

reacting a dinitrile of the formula



II,

in which A has the aforementioned meaning, and a secondary amine of the formula



III

in which R^1 and R^2 have the aforementioned meanings, with hydrogen at temperatures ranging from 50° to 200° C. and pressures ranging from 5 to 300 bar in the presence of palladium supported on an oxide selected from the group consisting of γ-AlO_2O_3, SiO_2, TiO_2 or ZrO_2 or on said oxide doped with an alkali metal oxide or alkaline-earth metal oxide, as a hydrogenation catalyst.

5,557,012

FLUORINATION OF ACETALS, KETALS AND ORTHOESTERS

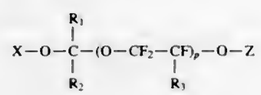
Thomas R. Bierschenk; Timothy J. Juhlke, both of Round Rock; Hajimu Kawa, and Richard J. Lagow, both of Austin, all of Tex., assignors to Exfluor Research Corporation, Round Rock, Tex.

Division of Ser. No. 222,797, Apr. 5, 1994, which is a continuation of Ser. No. 966,681, Oct. 26, 1992, Pat. No. 5,300,683, which is a continuation of Ser. No. 752,703, Aug. 30, 1991, Pat. No. 5,202,488, which is a continuation of Ser. No. 413,785, Sep. 28, 1989, Pat. No. 5,053,536, which is a continuation-in-part of Ser. No. 250,384, Sep. 28, 1988, abandoned. This application Jun. 5, 1995, Ser. No. 461,995

Int. Cl.[6] C07C *59/245;43/30;43/32*

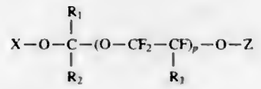
U.S. Cl. 562—582 **5 Claims**

1. A perfluorinated polyether having an average formula:



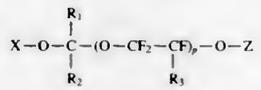
wherein R_1, R_2 and R_3 are the same or different and are selected from the group consisting of —F, —Cl, $—CF_2Cl$, $—CFCl_2$, $—CCl_3$, perfluoroalkyl of one to ten carbon atoms and perfluoroalkoxyalkyl of one to ten carbon atoms wherein one or more of the fluorine atoms can be substituted by a halogen atom other than fluorine; wherein X and Z are the same or different and are selected from the group consisting of $—(CF_2)_rCOF$, $—(CF_2)_rOCF_3$, $—(CF_2)_rCOOH$ and $—C_qF_{2q+1-q}Cl_1$, wherein r is an integer from 1 to 12 and q is an integer from 0 to 25; p is an integer from 1 to 50, provided that the polyether includes at least one halogen atom other than fluorine.

3. A perfluorinated polyether having an average formula:



wherein R_1, R_2 and R_3 are the same or different and are selected from the group consisting of —F, —Cl, $—CF_2Cl$, $—CFCl_2$, $—CCl_3$, perfluoroalkyl of one to ten carbon atoms and perfluoroalkoxyalkyl of one to ten carbon atoms wherein one or more of the fluorine atoms can be substituted by a halogen atom other than fluorine; wherein X and Z are $—(CF_2)_rOCF_3$ wherein r is an integer from 1 to 12 and q is an integer from 0 to 25; p is an integer from 1 to 50, provided that the polyether includes at least one halogen atom other than fluorine.

4. A perhalogenated polyether having an average formula:



wherein R_1, R_2 and R_3 are the same or different and are selected from the group consisting of —F, —Cl, $—CF_2Cl$, $—CFCl_2$, $—CCl_3$, perfluoroalkyl of one to ten carbon atoms and perfluoroalkoxyalkyl of one to ten carbon atoms; wherein X and Z are $—(CF_2)_rCOOH$ wherein r is an integer from 1 to 12 and q is an integer from 0 to 25; p is an integer from 1 to 50, provided that the polyether includes at least one halogen atom other than fluorine.

5,557,013

PREPARATION OF O-SUBSTITUTED HYDROXYLAMMONIUM SALTS

Michael Keil, Freinsheim; Josef Wahl, Schifferstadt; Ulrich Klein, Limburgerhof, and Wolfgang Will, Kirchheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 19, 1995, Ser. No. 545,227

Claims priority, application Germany, Oct. 22, 1994, 44 37 905.6

Int. Cl.[6] C07C *209/00*

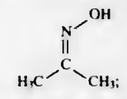
U.S. Cl. 564—301 **7 Claims**

1. A process for preparing O-substituted hydroxylammonium salts of the formula I

$$H_2NOR \times HX \qquad I$$

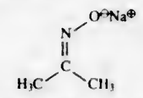
where R is a C_1-C_6-alkyl or C_2-C_6-alkenyl radical, each of which may be halogen-substituted, and X is chlorine or bromine, which comprises reacting in an integrated process, without isolation of intermediates

a) acetone with hydroxylammonium sulfate and sodium hydroxide solution to give the acetone oxime of the formula II



b) treating the solution of acetone oxime thus obtained with sodium hydroxide solution and completely removing water,

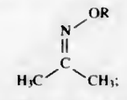
c) reacting the suspension thus obtained of the acetone oxide Na salt III



with alkylating agents of the formula IV

$$RY \qquad IV$$

where R has the meaning mentioned in formula I and Y is a nucleofugic leaving group, at from 0.5 to 15 bar and at up to 140° C., if appropriate with addition of phase-transfer catalysts, to give acetone oxime ethers of the formula V



d) cleaving the acetone oxime ethers with acids HX to give the products I,

a homogeneous, nonpolar aprotic solvent being used in all process steps a) to d).

5,557,014

CATALYTIC SYSTEM FOR OLEFIN OXIDATION TO CARBONYL PRODUCTS

John H. Grate; David R. Hamm, both of Mountain View; Kenneth A. Klingman, San Mateo, all of Calif.; Robert J. Saxton, West Chester, Pa., and Shannan J. Downey, Fremont, Calif., assignors to Catalytica, Inc., Mountain View, Calif.

Continuation of Ser. No. 461,223, Jun. 5, 1995, abandoned, which is a continuation of Ser. No. 689,050, Sep. 4, 1992, abandoned, which is a continuation-in-part of Ser. No. 489,806, Mar. 5, 1990, abandoned. This application Nov. 16, 1995, Ser. No. 558,202

Int. Cl.[6] C07C *45/35*

U.S. Cl. 568—401 **19 Claims**

1. In an aqueous catalyst solution for the oxidation of an olefin to a carbonyl product comprising a palladium catalyst, a polyoxoanion oxidant comprising vanadium, and hydrogen ions, the improvement comprising providing a concentration of said hydrogen ions greater than 0.10 mole per liter of solution when essentially all the oxidant is in its oxidized state, and providing said solution essentially free of sulfuric acid and sulfate ions.

7. In a process for oxidation of an olefin to a carbonyl product comprising

reacting the olefin with an aqueous catalyst solution comprising a palladium catalyst, a polyoxoanion oxidant comprising vanadium, and hydrogen ions, the improvement comprising providing a concentration of said hydrogen ions greater than 0.10 mole per liter of solution when essentially all the oxidant is in its oxidized state, and providing said aqueous catalyst solution essentially free of sulfuric acid and sulfate ions.

5,557,015

METHOD OF PREPARING HYDRAZINE NITROFORM

Fransiscus W. M. Zee, Bodegraven; Johannes M. Mul, Haarlem, and Arie C. Hordijk, Maassluis, all of Netherlands, assignors to Aerospace Propulsion Products B.V., Netherlands

PCT No. PCT/NL93/00230, § 371 Date May 30, 1995, § 102(e) Date May 30, 1995, PCT Pub. No. WO94/10104, PCT Pub. Date May 11, 1994

PCT Filed Nov. 3, 1993, Ser. No. 424,412

Claims priority, application Netherlands, Nov. 3, 1992, 9201916

Int. Cl.[6] C07C *241/02*

U.S. Cl. 564—464 **21 Claims**

1. A method of preparing hydrazine nitroform (HNF) by dissolving nitroform of a purity of more than 98.5 wt. % in a medium that is a solvent for the nitroform and is a nonsolvent for the hydrazine nitroform to be formed, and reacting the nitroform with hydrazine of a purity of more than 99.0 wt. % in the presence of a small amount of proton-transferring medium.

5,557,016

PROCESS FOR PRODUCING ALKADIENOLS

Chihiro Miyazawa, Tokyo; Tomoyuki Mori, Kurashiki; Hiroshi Kameo, Kurashiki, and Shinji Isogai, Kurashiki, all of Japan, assignors to Mitsubishi Kasei Corporation, Tokyo, Japan

PCT No. PCT/JP93/00891, § 371 Date Apr. 6, 1994, § 102(e) Date Apr. 6, 1994, PCT Pub. No. WO94/00410, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 29, 1993, Ser. No. 196,180

Claims priority, application Japan, Jun. 30, 1992, 4-173154

Int. Cl.[6] C07C *33/02*

U.S. Cl. 568—909.5 **6 Claims**

1. A process for producing alkadienols comprising the steps of:

(a) reacting a conjugated alkadiene with water in a reaction solvent in the presence of a palladium catalyst;

(b) distilling the obtained reaction mixture to separate said reaction solvent from said reaction mixture and to collect the alkadienols in the bottom of the distillation column while directly supplying heated water, steam or a mixture thereof as a heating medium to the distillation column, wherein said heating medium is a recycle solution of heated water and steam produced by heating at least a part of the aqueous solution of the aqueous phase obtained by the phase separation of the bottoms and wherein the temperature of the bottom liquid in said distillation column is not higher than 120° C.; and

(c) phase-separating bottoms discharged from said distillation column.

5,557,017

METHOD FOR PRODUCING A HYDROFLUOROCARBON

Kazuya Oharu; Ryuji Seki, and Seisaku Kumai, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Oct. 5, 1994, Ser. No. 318,258

Claims priority, application Japan, Oct. 5, 1993, 5-249312; Oct. 14, 1993, 5-257236; Nov. 5, 1993, 5-276815; Apr. 6, 1994, 6-068541

Int. Cl.[6] C07C *19/08*

U.S. Cl. 570—176 **14 Claims**

1. A method for producing a hydrofluorocarbon of the formula a H_nR_fH wherein n is 0 or 1, and when n is 0, R_f is a $C_{2\text{-}12}$ linear or branched polyfluoroalkyl group, and when n is 1, R_f is a $C_{2\text{-}12}$ linear or branched polyfluoroalkylene group, which comprises reacting an iodofluorocarbon of the formula I_nR_fI wherein n and R_f are as defined above, with an alkali metal hydroxide under action of an alcohol mixture comprising a primary alcohol and a secondary alcohol.

5,557,018

PARTIALLY FLOURINATED POLYMERS AND PROCESS THEREFOR

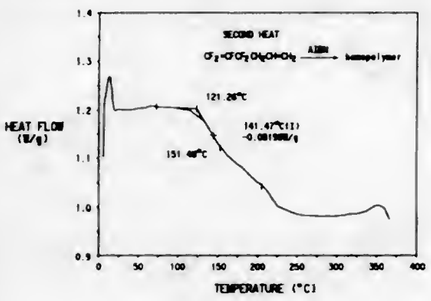
Bruce E. Smart, and Zhen-Yu Yang, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 312,722, Sep. 27, 1994, Pat. No. 5,475,071. This application Sep. 13, 1995, Ser. No. 527,799

Int. Cl.[6] C07C *21/18*

U.S. Cl. 570—135 **1 Claim**

1. A compound of the formula $CF_2{=}CFCF_2CF_2CH_2CH{=}CH_2$.



5,557,019

METHOD FOR PREPARING DICHLORODECAFLUOROPENTANE AND DECAFLUOROPENTANE

Hirokazu Aoyama; Satoru Kohno, and Satoshi Koyama, all of Settsu, Japan, assignors to Daikin Industries Ltd., Osaka, Japan

PCT No. PCT/JP93/00214, § 371 Date Aug. 24, 1994, § 102(e) Date Aug. 24, 1994, PCT Pub. No. WO93/16973, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 22, 1993, Ser. No. 290,776

Claims priority, application Japan, Feb. 28, 1992, 4-043043; May 22, 1992, 4-155748

Int. Cl.[6] C07C *17/093;17/278;19/01;19/08*

U.S. Cl. 570—176 **7 Claims**

1. A method for preparing 3,3-dichloro-1,1,1,2,2,4,4, 5,5,5-decafluoropentane which comprises reacting two moles of tetrafluoroethylene with one mole of difluorodichloromethane in the presence of a Lewis acid catalyst selected from the group consisting of aluminum chloride anhydride, tin tetrachloride anhydride, antimony pentachloride anhydride, zinc chloride anhydride, iron chloride anhydride, boron trifluoride, and chlorofluorides of the formula AlClxFy, ZrClpFq, TiClpFq wherein x+y=3, 0<x<3, 0<y<3, p+q=4, 0<p<4, and 0<q<4.

3. A method for preparing 1,1,1,2,2,4,4,5,5,5-decafluoropentane which comprises reacting two moles of tetrafluoroethylene with one mole of difluorodichloromethane in the presence of a Lewis acid catalyst selected from the group consisting of aluminum chloride anhydride, tin tetrachloride anhydride, antimony pentachloride anhydride, zinc chloride anhydride, iron chloride anhydride, boron trifluoride, and chlorofluorides of the formula AlClxFy, ZrClpFq, or TiClpFq wherein x+y=3, 0<x<3, 0<y<3, p+q=4, 0<p<4, and 0<q<4, to form 3,3-dichloro-1,1,1,2,2,4,4,5,5,5-decafluoropentane; and reducing the 3,3-dichloro-1,1,1,2,2, 4,4,5,5,5-decafluoropentane to 1,1,1,2,2,4,4,5,5,5-decafluoropentane.

5,557,020

HIGH-PURITY PERFLUORO-4-METHYL-2-PENTENE AND ITS PREPARATION AND USE

Konrad Von Werner, Garching, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 166,140, Dec. 10, 1993, abandoned. This application Oct. 12, 1994, Ser. No. 321,982

Claims priority, application Germany, Dec. 12, 1992, 42 41 969.7

Int. Cl.[6] C07C *17/38*

U.S. Cl. 570—177 **7 Claims**

1. A process for preparing a perfluoro-4-methyl-2-pentene having a content of perfluoro-2-methyl-2-pentene of below 1000 ppm, which comprises:

treating a starting material comprising a major amount of perfluoro-4-methyl-2-pentene and a minor amount of perfluoro-2-methyl-2-pentene, said minor amount being greater than 1000 ppm, with a lower alkanol and a catalytic amount of a base, and removing any compound or compounds, higher boiling than perfluoro-2-methyl-2-pentene, formed from said perfluoro-2-methyl-2-pentene as a result of said treatment.

5,557,021

PHILLIPS CATALYST AND ITS USE FOR THE PREPARATION OF ETHYLENE/ALPHA-OLEFIN COPOLYMERS

Hans-Joachim Mueller, Gruenstadt; Kaspar Evertz, Schifferstadt; Siegfried Weber, Weinheim; Guido Funk, Worms 1; Rainer Konrad, Goennheim, and Roland Saive, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Division of Ser. No. 247,479, May 23, 1994, Pat. No. 5,480,852, which is a continuation of Ser. No. 16,529, Feb. 11, 1993, abandoned. This application Aug. 8, 1995, Ser. No. 512,556

Claims priority, application Germany, Feb. 13, 1992, 42 04 260.7

Int. Cl.[6] C07C *2/24*

U.S. Cl. 585—513 **3 Claims**

1. A process for the preparation of a copolymer of ethylene with α-olefins which comprises: copolymerizing ethylene with α-olefins in the presence of a finely divided, aluminum silicate-supported, phosphorous containing chromium Phillips catalyst prepared by

(1) applying at least one organic phosphorus compound selected from the group consisting of phosphates, phosphonates and phosphites and at least one chromium (III) compound which does not react with said phosphorus compounds under the reaction conditions used, in succession in any order or simultaneously, to a finely divided aluminum silicate hydrogel or xerogel to form a catalyst intermediate and

(2) activating the catalyst intermediate by heating the intermediate in an oxidizing atmosphere.

5,557,022

AROMATIZATION PROCESS

Kazuhisa Murata, and Hirobumi Ushijima, both of Tsukuba, Japan, assignors to Director-General Of Agency Of Industrial Science And Technology, Japan

Filed Oct. 17, 1994, Ser. No. 323,810

Claims priority, application Japan, Dec. 7, 1993, 5-340174

Int. Cl.[6] C07C *15/00;5/367*

U.S. Cl. 585—407 **4 Claims**

1. A process for the conversion of a non-aromatic organic compound into aromatics, comprising contacting the non-aromatic organic compound with a catalyst at a temperature of 200°–1,500° C., said catalyst being a carbonaceous material which shows a peak at 2θ of about 25° attributed to C(002) diffraction in a powder X-ray diffraction pattern thereof and which has a C(002) interplanar spacing greater than 0.3440 nm.

5,557,023

OLEFIN OLIGOMERIZATION IN THE PRESENCE OF NOVEL COMPLEXES

Arpad F. Somogyvari, Calgary; Beth Lorraine Creed, Airdrie; Antonio P. Nicola, Calgary; Alan R. Sanger, Edmonton; David J. Law, Edmonton, and Ronald G. Cavell, Edmonton, all of Canada, assignors to The Governors of the University of Alberta, Edmonton, Canada

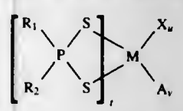
Filed May 23, 1995, Ser. No. 447,887

Int. Cl.[6] C07C *2/24;2/02*

U.S. Cl. 585—513 **40 Claims**

1. A process for the oligomerization of one or more C_{2-4} olefins to one or more higher olefins comprising;

a) forming a solution of a catalyst comprising an activator and a catalyst precursor in a mole ratio from 1:1 to 500:1 in a solvent selected from the group consisting of C_{6-12} cyclic aliphatic and aromatic compounds which are unsubstituted or substituted by a C_{1-4} alkyl radical wherein said catalyst precursor is selected from the group consisting of:



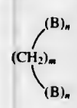
COMPLEX I

wherein:

M is selected from the group consisting of Ni, Cr, Ti, V, Zr, Hf, W; and Mo; t, u, and v are integers, the sum of 2t+u+v is the coordination number of M, t is an integer from 1 to half the coordination number of M, u and v may be 0 or integers and the sum of u+v is from 0 to two less than the coordination number of M;

R_1, and R_2, are independently selected from the group consisting of C_{1-10} straight chained, branched or cyclic alkyl radicals, C_{6-8} monoaromatic aryl radicals which are unsubstituted or substituted by up to three substituents selected from the group consisting of C_{1-8} alkyl radicals, C_{1-6} alkoxy or thioalkyl radicals, C_{6-12} aryloxy radicals, C_{6-12} arylthio radicals, CF_3; and fluorine; or

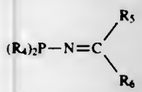
if taken together R_1 and R_2 form a diradical of the formula:



wherein each n is independently 0 or 1; m is an integer from 1 to 10; each B is independently selected from the group consisting of O or S; X is selected from the group consisting of Cl, Br, I, and H, and A is a ligand selected from the group consisting of:

i) ligands of the formula $P(R_3)_3$ wherein R_3 may independently be selected from the group of radicals consisting of C_{1-10} straight chained, branched or cyclic alkyl radicals; C_{6-8} monoaromatic aryl radicals which are unsubstituted or substituted by up to three substituents selected from the group consisting of C_{1-8} alkyl radicals; and

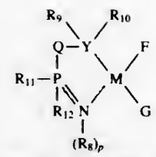
ii) ligands of the formula:



wherein R_4 may be a radical selected from the group of radicals from which R_3 is selected; and

R_5 and R_6 may independently be a hydrogen atom or a radical selected from the group consisting of C_{1-10} straight chained or branched alkyl radicals, C_{5-8} cyclic alkyl radicals, and C_{6-8} monoaromatic aryl radicals which are unsubstituted or substituted by up to three, substituents selected from the group consisting of C_{1-8} alkyl radicals;

(2) complexes of a heterobifunctional ligand having a phosphine center and an imine center of the formula:



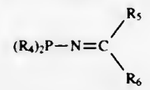
COMPLEX II

wherein: M is as defined above;

R_9, R_{10}, R_{11}, and R_{12} are independently selected from the group consisting of C_{1-10} straight chained, branched or cyclic alkyl radicals, C_{6-8} monoaromatic aryl radicals which are unsubstituted or substituted by up to three substituents selected from the group consisting of C_{1-8} alkyl radicals;

F and G are independently selected from the group consisting of Cl, Br, I, and H, and ligands selected from the group consisting of:

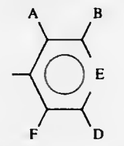
i) ligands of the formula $P(R_3)_3$ where in R_3 is as defined above; and ii) ligands of the formula:



wherein R_4 , R_5 and R_6 are as defined above; Y is P or As;

Q is selected from the group consisting of $(CH_2)_n$ wherein n is 1, 2, or 3, a C_{2-4} alkyl radical, a disubstituted C_6 aryl radical, R_7N wherein R_7 is selected from the group consisting of C_{1-6} straight chained or branched alkyl radicals, C_{6-10} aryl radicals which are unsubstituted or substituted by a C_{1-4} alkyl radical; p is 0 or 1; and if present R_8 is selected from the group consisting of:

i) a radical of the formula:



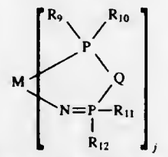
wherein A, B, C, D, are independently selected from the group consisting of F, H, NO_2, a C_{1-6} alkyl radical, and a C_{8-12} aryl radical, and E is an endocyclic nitrogen atom or a C—CN radical or isomers thereof;

ii($SiR^1R^2R^3$ where in R^1, R^2, and R^3 are independently selected from the group consisting of C_{1-4} alkyl radicals; and

iii) a group of the formula:

in which Cp is a cyclopentadienyl radical;

(3) complexes of the formula:



COMPLEX III

wherein M, X, and Q are as defined above;

j is 2 or 3 depending on the coordination number of M; and R_9, R_{10}, R_{11}, and R_{12} are independently selected from the group consisting of C_{1-10} straight chained, branched or cyclic alkyl radicals; and C_{6-8} monoaromatic aryl radicals which are

unsubstituted or substituted by up to three substituents selected from the group consisting of C_{1-8} alkyl radicals; and

present in an amount of between 20 mmol and 500 mmol per g of the chromium compound; and

and polyalkylated product, said alkylation catalyst comprising synthetic porous crystalline MCM-56; and

5,557,029

ISOMERIZATION OF SATURATED HYDROCARBONS

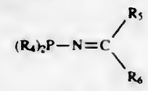
unsubstituted or substituted by up to three substituents selected from the group consisting of C_{1-8} alkyl radicals; and

(4) complexes of the formula:

COMPLEX IV

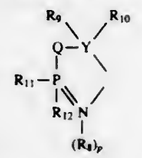
wherein M is as defined above, and L_1, L_2, L_3, and L_4 are independently selected from the group of consisting of:

i) ligands of the formula:



wherein R4, R_5 and R_6 are as defined above

L_1 and L_2, or L_3 and L_4, or both, may be taken together to form a ligand of the formula:



wherein Y, Q, R8, R_9, R_{10}, R_{11}, and R_{12}, and p are as defined above:

iii) ligands of the formula $P(R_3)_3$ where in R_3 is as defined above provided at least one of L_1, L_2, L_3, and L_4 is a ligand of formulas i) or ii) above; and

iv) olefins selected from the group consisting of C_{2-4} olefins, and C_{6-8} cyclic, nonconjugated diolefins provided at least one of L_1, L_2, L_3, and L_4 is a ligand of formulas i) or ii) above;

and said activator selected from the group consisting of aluminum alkyl compounds of the formula $AlR_{(3-n)}X_n$ in which R is a C_{1-8} alkyl radical, X is a halogen atom and n is 0, 1, or 2, alkyl aluminoxane compounds in which the alkyl group has from 1 to 8 carbon atoms, boron trihalide, tetraphenylborate, and tri- or tetra-(penta fluorophenyl) boron compounds or complexes; and

b) contacting said olefin in liquid form with the solution of the catalyst at a temperature from −15° C. to 250° C.; and at a pressure from 15 to 1500 psi.

5,557,024

PROCESS FOR PREPARING SHORT CHAIN ALKYL AROMATIC COMPOUNDS

Jane C. Cheng, Clarksburg, N.J.; Anthony D. Fung, Wilmington, Del.; Donald J. Klocke, Somerdale; Stephen L. Lawton, Pitman, both of N.J.; Daria N. Lissy, Glen Mills, Pa.; Wieslaw J. Roth, Sewell; C. Morris Smith, Princeton, both of N.J., and Dennis E. Walsh, Richboro, Pa., assignors to Mobil Oil Corporation, Fairfax, Va.

Continuation of Ser. No. 249,689, May 26, 1994, Pat. No. 5,453,554, which is a continuation-in-part of Ser. No. 51,952, Apr. 26, 1993, Pat. No. 5,362,697. This application May 30, 1995, Ser. No. 452,919

Int. Cl.[6] C07C *2/66*

U.S. Cl. 585—467 **14 Claims**

1. A process for preparing short chain alkyl aromatic compounds, said process comprising the steps of:

(a) contacting at least one alkylatable aromatic compound with at least one alkylating agent possessing an alkylating aliphatic group having from 1 to 5 carbon atoms under sufficient reaction conditions and in the presence of an alkylation catalyst to provide an alkylated aromatic product possessing at least one alkyl group derived from said alkylating agent, said alkylated aromatic product comprising monoalkylated product and polyalkylated product, said alkylation catalyst comprising synthetic porous crystalline MCM-56; and

(b) contacting said polyalkylated product from step (a) with an aromatic compound of the same formula as the alkylatable aromatic compound of step (a) under sufficient reaction conditions and in the presence of a transalkylation catalyst to provide further monoalkylated product.

5,557,025

HYPERPURE PROPYLENE POLYMER

Luciano Noristi, and Giovanni Baruzzi, both of Ferrara, Italy, assignors to Montell North America Inc. (formerly HIMONT Incorporated, Wilmington, Del.

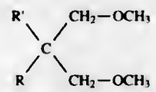
Filed Mar. 26, 1991, Ser. No. 675,229

Claims priority, application Italy, Mar. 30, 1990, 19892/90

Int. Cl.[6] C07C *2/08;2/22*

U.S. Cl. 585—522 **4 Claims**

1. A process for preparing hyperpure propylene polymers or copolymers with CH_2=CHR olefins, where R is hydrogen or an alkyl radical with 2–8 carbon atoms, said polymers containing less than 15 ppm by weight of total ash, less than 5 ppm Al and less than 5 ppm Cl said process comprising polymerizing the monomers in liquid monomer in the presence of a catalyst obtained by reacting an Al-trialkyl compound with a solid catalyst component consisting essentially of magnesium dihalide in active form, having supported thereon a titanium chloride or chloroalcoholate, and an ether having the general formula:



(I)

where R and R' are the same or different and are C_{2-18} alkyl, C_{3-18} cycloalkyl C_{6-18} aryl, C_{7-18} arylalkyl or alkylaryl radicals.

5,557,026

METHOD FOR OLIGOMERIZING AN α-OLEFIN

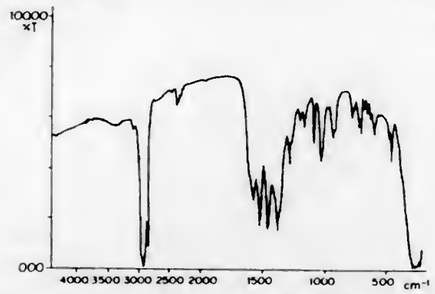
Eiji Tanaka, Kurashiki; Hisao Urata, Machida, and Toshiyuki Oshiki, Yokohama, all of Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Division of Ser. No. 121,864, Sep. 17, 1993, Pat. No. 5,491,272. This application Jul. 31, 1995, Ser. No. 509,140

Claims priority, application Japan, Sep. 17, 1992, 4-247811; Nov. 24, 1992, 4-313646; Nov. 24, 1992, 4-313647; Nov. 25, 1992, 4-315247

Int. Cl.[6] C07C *2/00;2/02*

U.S. Cl. 585—522 **1 Claim**



1. A method for oligomerizing an α-olefin comprising the steps of:

contacting said α-olefin with a catalyst comprising a chromium compound having at least one chromium-pyrrolyl bond and an alkylaluminum compound, wherein said catalyst is not supported on a carrier and the alkylaluminum compound is present in an amount of between 20 mmol and 500 mmol per g of the chromium compound; and

conducting said oligomerization in a solvent selected from the group consisting of a chain saturated hydrocarbon and an alicyclic hydrocarbon, and maintaining a temperature of from 0° C. to 250° C., and a pressure of from atmospheric pressure to 250 kg/cm^2.

5,557,027

OLIGOMERIZATION CATALYST AND PROCESS

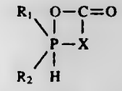
Richard A. Kemp, Stafford, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 140,643, Oct. 21, 1993, Pat. No. 5,439,862. This application Jan. 13, 1995, Ser. No. 372,736

Int. Cl.[6] C07C *2/02;2/08*

U.S. Cl. 585—527 **7 Claims**

1. A process for oligomerizing one or more olefins having from about 2 to about 20 carbon atoms which comprises contacting said olefin in liquid phase at a temperature in the range of from about 0° C. to about 200° C. in the presence of a catalyst prepared by a process which comprises reacting a catalyst precursor ligand having a formula



wherein R_1 and R_2 each independently is an alkyl, alkoxy, aryl, or aryloxy group having from about 1 to about 20 carbon atoms, with the proviso that R_1 and R_2 are not both aryl, or R_1 and R_2 together form a divalent hydrocarbon moiety, and X is 1,2-arylene, O-CH_2, S-CH_2, or Se-CH_2, with a deprotonation source, a transition metal compound selected form the group consisting of nickel salts, chromium salts, cobalt salts, iron salts, copper salts and mixtures thereof, and a catalyst activator, wherein the molar ratio of catalyst activator to transition metal compound is at least about 1:1.

5,557,028

ALKYLATION REACTIONS

Stanely M. Welsh, 2813 E. Fox Chase Cir., Doylestown, Pa. 18901

Filed Mar. 31, 1995, Ser. No. 414,709

Int. Cl.[6] C07C *2/62*

U.S. Cl. 585—724 **24 Claims**

1. A process for producing at least one hydrocarbyl blending component to improve gasoline octane comprising:

near an interface between two phases comprising a first phase and a second phase, generating a free radical on a tertiary carbon atom of a hydrocarbyl reactant containing said tertiary carbon atom; wherein said first phase and said second phases are characterized in that they are at a temperature under 40° C. and substantially insoluble in one another, wherein said first phase comprises a material selected from a group consisting of sulfuric acid and hydrofluoric acid, and wherein said second phase comprises a hydrocarbyl reaction medium comprising one or more materials selected from the group consisting of said hydrocarbyl reactant and a hydrocarbyl solvent for said hydrocarbyl reactant;

encouraging reaction of said free radical with an alkene within said second phase by controlling amount of at least one oxidizing agent to optimize yield of said at least one hydrocarbyl blending component.

5,557,029

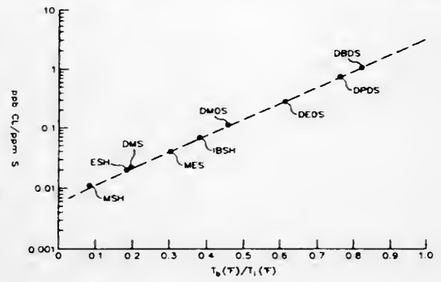
ISOMERIZATION OF SATURATED HYDROCARBONS

Fan-Nan Lin; Nak J. Sung, both of Bartlesville, Okla.; Stephen L. Ege, and Thomas A. Lessard, both of Borger, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 6, 1995, Ser. No. 523,978

Int. Cl.[6] C07C *5/13*

U.S. Cl. 585—739 **37 Claims**



1. In an isomerization process for converting at least one saturated feed hydrocarbon selected from the group consisting of alkanes containing 4–10 carbon atoms per molecule and cycloalkanes containing 5–10 carbon atoms per molecule to at least one saturated product hydrocarbon isomer, wherein a feed stream which comprises (i) said at least one saturated feed hydrocarbon, (ii) hydrogen gas, (iii) about 0–60 parts by weight of water per million parts by weight of said at least one feed hydrocarbon, and (iv) at least one sulfur compound being present as an impurity is contacted in a reaction zone at effective isomerization conditions with a catalyst which consists essentially of platinum and at least one zeolite , and wherein deactivation of said catalyst is caused by said at least one sulfur compound in said reaction zone,

the improvement which comprises eliminating the deactivation of said catalyst caused by said at least one sulfur compound by having at least one added chlorine compound selected from the group consisting of hydrogen chloride and organic chlorides present in said reaction zone.

5,557,030

PROCESS FOR REJECTING HEAVY HYDROCARBONS FROM LIGHT HYDROCARBONS GASES

John Markovs, Yorktown Heights, and Carmen M. Yon, Carmel, N.Y., assignors to UOP, Des Plaines, Ill.

Filed Mar. 23, 1995, Ser. No. 409,114

Int. Cl.[6] C07C *07/12*

U.S. Cl. 585—826 **14 Claims**

1. A process for rejecting heavy hydrocarbons from a light hydrocarbon gas stream comprising methane and ethane, said heavy hydrocarbons including C_{10+} hydrocarbons, water, and carbon dioxide, said process comprising:

a) passing the light hydrocarbon gas stream to an adsorption bed containing a regenerable adsorbent comprising a high silica zeolite having a silica to alumina ratio greater than about 20 and selective for the adsorption of said heavy hydrocarbons, to provide an adsorption effluent stream essentially free of said heavy hydrocarbons;

b) passing said adsorption effluent to a membrane zone to provide a non-permeate stream having a reduced amount of carbon dioxide relative to the light hydrocarbon gas stream; and

c) regenerating said adsorbent.

5,557,031

5,557,035

5,557,039

MATERIALS EVALUATOR

(c) separating the detected light into a first light beam having a horizontal polarization state and a second light beam having a

5,557,031
USE OF ELECTRIC ARC FURNACE BY-PRODUCTS IN CONCRETE
Faisal H. Al-Sugair; Abdulaziz I. Al-Negheimish, and Rajeh Z. Al-Zaid, all of Department of Civil Engineering, King Saud University, P.O. Box 800, Riyadh, Saudi Arabia
Filed Oct. 6, 1994, Ser. No. 319,114
Int. Cl.[6] A62D 3/00; C04B 7/19
U.S. Cl. 588—257 8 Claims

1. In a method for modifying properties when casting cement based concrete or any mortar, the improvement comprising: replacing from about 1% to about 4% by weight of cement in a concrete or mortar precursor mixture with electric arc furnace dust, formulating a cement, electric arc furnace dust, and an aggregate mixture with water to obtain a concrete or mortar precursor mixture, and casting said mixture to obtain concrete or mortar with improved set retardation, and enhanced properties.

5,557,032
KNOCKOUT MICE
Tak W. Mak, Toronto, Canada, assignor to Ontario Cancer Institute, Toronto, Canada, and Craig Bernie Thompson, Chicago, Ill.
Division of Ser. No. 67,767, May 26, 1993, abandoned. This application May 26, 1995, Ser. No. 451,691
Int. Cl.[6] C12N 15/00;5/00; A61K 49/00
U.S. Cl. 800—2 3 Claims

1. A mutant mouse, wherein its endogenous CD28 gene has been disrupted by homologous recombination using a DNA construct comprising intron 1 and exon 2 of the CD28 gene, and wherein a marker sequence is inserted into exon 2, and wherein said disruption prevents expression of CD28 on its T-cells and results in a decreased IgG titer upon viral infection.

5,557,033
METHOD OF INCREASING EGG PRODUCTION IN AVIAN SPECIES BY ACTIVE IMMUNIZATION AGAINST VASOACTIVE INTESTINAL PEPTIDE
Mohamed E. Halawani, Shoreview, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.
Filed Sep. 22, 1992, Ser. No. 949,797
Int. Cl.[6] C12N 15/00; A61K 39/00
U.S. Cl. 800—2 8 Claims

1. A method of increasing egg production in an Avian species, comprising (a) actively immunizing hens of said Avian species with a vasoactive intestinal peptide having SEQ. ID NO: I conjugated or linked to an immunogenic protein, wherein said immunization occurs prior to, or simultaneously with, the onset of a laying season: and (b)boosting said immunized hens during the laying season with the peptide conjugated or linked to the immunogenic protein.

5,557,034
INBRED CORN LINE PHN18
Terrill E. Williams, New Holland, Pa., and Charles T. Cunnyngham, Tipton, Ind., assignors to Pioneer Hi-Bred International, Inc., Des Moines, Iowa
Filed Feb. 3, 1992, Ser. No. 831,034
Int. Cl.[6] A01H 5/00;4/00;1/00; C12N 5/04
U.S. Cl. 800—200 10 Claims

1. Inbred corn seed designated PHN18 and having ATCC Accession No. 97517.

5,557,035
HYBRID CORN PLANT & SEED (3489)
Stephen W. Noble, Jr., Johnston, Iowa, assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa
Filed Jan. 28, 1994, Ser. No. 187,964
Int. Cl.[6] A01H 1/02;4/00;5/00; C12N 5/04
U.S. Cl. 800—200 10 Claims

1. Seed of maize hybrid 3489.
2. A plant produced by the seed of claim 1.

5,557,036
DARK RED KIDNEY BEAN VARIETY AND METHOD OF PRODUCTION
Russell C. Doane, Rte. 3, Box 170, Menomonie; Donald Hagedorn, 927 University Bay Dr., Madison; Karl W. Young, 1400 E. 12th Ave., Menomonie, and Robert E. Rand, 401 Eau Claire Ave. Apt. 119, Madison, all of Wis.
Filed Feb. 8, 1994, Ser. No. 193,560
Int. Cl.[6] A01H 5/00
U.S. Cl. 800—200 6 Claims

1. A dark red kidney bean seed variety 85 having ATCC accession No. 97284.

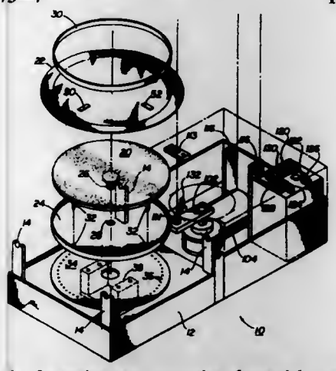
5,557,037
SOYBEANS HAVING ELEVATED CONTENTS OF SATURATED FATTY ACIDS
Walter R. Fehr, and Earl G. Hammond, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa
Continuation of Ser. No. 101,407, Aug. 3, 1993, abandoned, which is a continuation of Ser. No. 643,277, Jan. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 461,341, Jan. 5, 1990, abandoned, which is a continuation-in-part of Ser. No. 445,393, Dec. 5, 1989, abandoned. This application Jan. 19, 1995, Ser. No. 375,340
Int. Cl.[6] A01H 5/00;5/10; C12N 15/01
U.S. Cl. 800—200 24 Claims

1. A soybean plant which produces upon self pollination mature seed containing an endogenous palmitic acid content of from about 14% to about 24% of the total fatty acid composition and an endogenous stearic acid content of from about 20% to about 30% of the total fatty acid composition.

5,557,038
INBRED MAIZE LINE PHTP9
Robert D. Strohbehn, Beadle County, S. Dak., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa
Filed Jan. 31, 1995, Ser. No. 381,241
Int. Cl.[6] A01H 5/00;4/00;1/00; C12N 5/04
U.S. Cl. 800—200 13 Claims

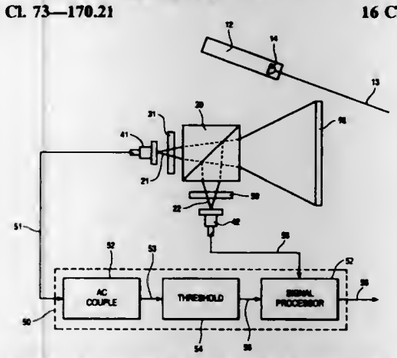
1. Seed of maize inbred line designated PHTP9 and having ATCC Accession No. 97518.

5,557,039
MATERIALS EVALUATOR
Patricia A. Annis, Athens; Ronald C. Davis, Watkinsville, both of Ga., and Randall R. Bresee, Knoxville, Tenn., assignors to University of Georgia Research Foundation, Inc., Athens, Ga.
Filed Jun. 2, 1994, Ser. No. 252,754
Int. Cl.[6] G01N 3/56
U.S. Cl. 73—7 18 Claims



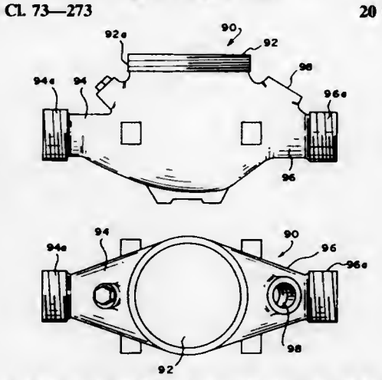
1. A device for testing wear properties of materials, comprising:
(a) a first pad and a second pad, each with a surface for receiving materials and designed to move relative to one another;
(b) a first tensioning means, coupled to the first pad, for uniformly applying tension to received material;
(c) a second tensioning means, coupled to the second pad, for uniformly applying tension to received material; and
(d) drive means, attached to the first pad, for causing the first pad to orbit about the second pad without angulation.

5,557,040
METHOD AND APPARATUS FOR PRECIPITATION DETECTION AND DIFFERENTIATION
Andrew S. Inenaga, Sacramento; William D. Bachalo, Los Altos Hills, and Subramanian V. Sankar, Fremont, all of Calif., assignors to Aerometrics, Inc., Sunnyvale, Calif.
Continuation of Ser. No. 295,996, Aug. 25, 1994, abandoned. This application Feb. 27, 1996, Ser. No. 607,522
Int. Cl.[6] G01W 1/00
U.S. Cl. 73—170.21 16 Claims



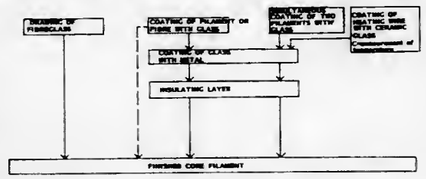
1. A method for detecting precipitation in a volume, comprising the steps of:
(a) projecting a source light having a linear polarization into the volume;
(b) detecting light from the volume, including any of the source light reflected from any precipitation within the volume;
(c) separating the detected light into a first light beam having a horizontal polarization state and a second light beam having a vertical polarization state;
(d) generating a first signal corresponding to an intensity of the first light beam and a second signal corresponding to an intensity of the second light beam;
(e) determining whether precipitation is present in the volume from at least one of the first and second signals; and
(f) determining a type of precipitation in the volume based on at least one of the first and second signals.

5,557,041
MODIFIED WATER METER ARRANGEMENTS
James W. Sanford, Jr., 101 Cusick La., Lenoir City, Tenn. 37772
Filed Mar. 3, 1995, Ser. No. 398,003
Int. Cl.[6] G01F 15/14
U.S. Cl. 73—273 20 Claims



1. A water meter comprising an input side, an output side, a chamber located between said input side and said output side, and an access port located above said chamber;
the improvement comprising an additional port formed in said output side of said meter, said additional port comprising means for receiving an adapter for connecting an additional water line to said meter; and
selective blocking means insertable into said chamber for selectively blocking flow of liquid from said input side to said output side and for selectively allowing flow of liquid from said input side to said output side.

5,557,042
IMPEDANCE DETECTOR, IN PARTICULAR FOR RADIOSONDE OPERATION, AS WELL AS A PROCESS FOR THE MANUFACTURE OF A DETECTOR
Ari Paukkunen, Vantaa, and Jorma Ponkala, Ylönkylä, both of Finland, assignors to Vaisala Oy, Vantaa, Finland
Division of Ser. No. 307,057, Sep. 16, 1994. This application Mar. 28, 1995, Ser. No. 412,142
Claims priority, application Finland, Sep. 29, 1993, 934266
Int. Cl.[6] G01N 27/04; G01W 1/00; G01R 27/26
U.S. Cl. 73—335.03 6 Claims



5,557,044

5,557,046

magnetic circuit portion concentrating said magnetic flux

1. A capacitive humidity detector intended for radiosonde operation, comprising:

a substrate (**10** . . . **10E**) made of an insulating material, onto which substrate are applied electrode and contact layers (**11**, **11a**, **13**) necessary for the formation and connecting of the detector, capacitance;

between the detector capacitance electrodes (**11**, **13**), there is an insulating and active film (**12**), whose electrical permittivity (ϵ) is a function of the amount of water absorbed by the active film;

the substrate of the detector is an elongate solid core filament (**10**; **10B**; **10C**; **10D**; **10E**), onto and around which core filament said electrodes (**11**, **13**) and said active and insulating film (**12**) are applied;

the diameter D_c of said filament (**10**; **10B**; **10C**; **10D**; **10E**) is in the range of D_c=10 μm . . . 2 mm; and

the detector capacitance is in the range of C_M=0.1 pF . . . 1,000 pF.

5,557,043

APPARATUS FOR FIXING AN ADHESIVE BALANCING WEIGHT TO A VEHICLE WHEEL

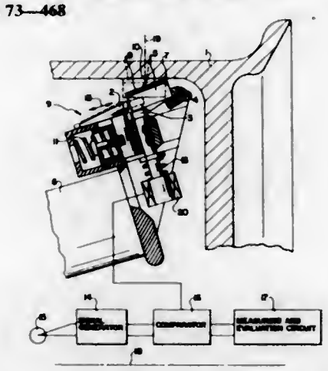
Josef Drechsler, Pfungstadt, Germany, assignor to Hofmann Werkstatt-Technik GmbH, Germany

Filed May 4, 1995, Ser. No. 434,768

Claims priority, application Germany, May 5, 1994, 44 15 930.7

Int. Cl.[6] **B32B** *31/00*

U.S. Cl. 73—468 **13 Claims**



1. Apparatus for fixing a balancing weight having an adhesive layer to a vehicle wheel at a balancing position comprising a balancing weight holder fixed to an end of a movable guide member, said holder having at least first and second holding portions one of which is biased toward the other to hold a balancing weight therebetween so that movement of said guide member moves said balancing weight to the balancing position, said balancing weight having an edge at the adhesive-bearing side of the balancing weight against the wheel at the balancing position, and means for applying pressure to the balancing weight at a position remove from said edge to pivot said balancing weight about said edge towards the balancing position whereby the balancing weight is released from said holder and into adhesive engagement against the wheel at the balancing position.

5,557,044

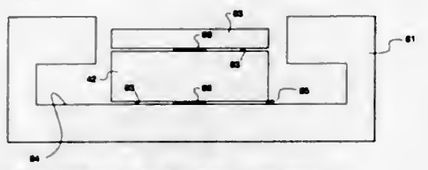
LOW STRESS MAGNET INTERFACE

Steven A. Foote, Issaquah, and Damon R. Stoddard, Seattle, both of Wash., assignors to AlliedSignal, Inc., Morristown, N.J.

Continuation-in-part of Ser. No. 184,527, Jan. 19, 1994. This application Oct. 3, 1994, Ser. No. 317,257

Int. Cl.[6] **G01P** *15/13*

U.S. Cl. 73—497 **6 Claims**



1. A force rebalance accelerometer, comprising:

a proof mass;

a mounting ring;

a pair of flexures for flexibly connecting the proof mass to the mounting ring;

means for returning the proof mass to a null position, said returning means including a permanent magnet having opposing bonding surfaces and one or more excitation rings, one surface of said magnet spaced adjacent to one of said excitation rings;

means for bonding said one of said bonding surfaces of said magnet to one of said excitation rings, said bonding means including means for spacing said bonding surface of said magnet, from said one of said excitation rings forming a pedestal and defining an interface; and

means for compensating for thermal stress at said interface.

5,557,045

VIBRATING GYROSCOPE

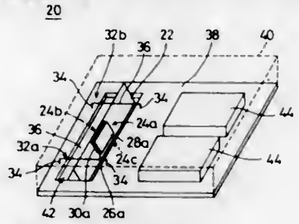
Nobuyuki Ishitoko, and Akira Kumada, both of Nagaokakyo, Japan, assignors to Murata Manufacturing Co. Ltd., Nagaokakyo, Japan

Filed Jan. 17, 1995, Ser. No. 372,914

Claims priority, application Japan, Jan. 21, 1994, 6-005291

Int. Cl.[6] **G01C** *19/00;* **G01P** *3/44;9/00;15/08*

U.S. Cl. 73—504.14 **15 Claims**



1. A vibrating gyroscope comprising:

a rod-like vibrating body,

two supporting members are fixed in the vicinity of nodal points of said vibrating body in order to support said vibrating body thereupon; and

a supporting board for fixing said supporting members, said supporting board having a first side and a second side, and including a holding portion therein for receiving and holding a part of said vibrating body in said supporting board, said vibrating body being supported in said holding portion by said two supporting members wherein said holding portion comprises an opening piercing through said supporting board from the first side of said supporting board to the second side of said supporting board, and wherein a periphery of the holding portion is defined by a periphery of the opening.

5,557,046

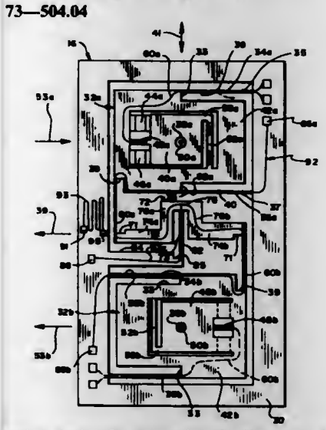
MICROMACHINED RATE AND ACCELERATION SENSOR

Rand H. Hulsing, II, Redmond, Wash., assignor to AlliedSignal Inc., Morris Township, N.J.

Division of Ser. No. 73,318, Jun. 8, 1993, Pat. No. 5,331,854, which is a division of Ser. No. 653,533, Feb. 2, 1991, Pat. No. 5,241,861. This application Mar. 7, 1994, Ser. No. 207,328

Int. Cl.[6] **G01P** *9/04*

U.S. Cl. 73—504.04 **5 Claims**



1. A sensing device for measuring the linear acceleration and rate of rotation of a moving body, comprising:

a monolithic substrate having first and second substantially planar surfaces disposed substantially parallel to each other;

first and second accelerometers formed of said substrate, each of said accelerometers having a force sensing axis for producing an output signal indicative of the acceleration of the moving body along said force sensing axis, each of said accelerometers further having

an accelerometer frame,

a proof mass,

hinge means interconnected between said frame and said proof mass for allowing said proof mass to rotate about a hinge axis when the moving body is subjected to a force along said force sensing axis, said proof mass having a first end interconnected by said hinge means to said frame and a free end permitted to rotate freely about said hinge axis with respect to said frame, said proof mass further having a center of gravity and a pendulous axis aligned to intersect said center of gravity and said hinge axis;

flexible means interconnected between said frame and said free end of said proof mass for flexibly restraining the pivoting of said proof mass about said pendulous axis;

a dither frame;

flexure means for connecting the accelerometer frame of each of said first and second accelerometers to said dither frame, said flexure means being generally compliant to allow dithering of said first and second accelerometers along a dither axis, said dither axis being generally perpendicular to said force sensing axes of said first and second accelerometers;

a conductive dither path disposed along at least said flexure means;

means for directing a magnetic flux to cross the conductive dither path;

signal generator means for producing and applying to said conductive dither path a periodic dither drive signal to dither said first and second accelerometers along said dither axis;

a unitary magnet for emanating flux from first and second surfaces thereof, and magnetic circuit means for establishing a flux path between said second surface of said monolithic substrate and said second surface of said unitary magnet, said magnetic circuit means including a portion disposed adjacent said second planar surface of said monolithic substrate, said magnetic circuit portion concentrating said magnetic flux through said conductive dither path.

5,557,047

METHOD AND APPARATUS FOR ULTRASONIC WAVE MEASUREMENT

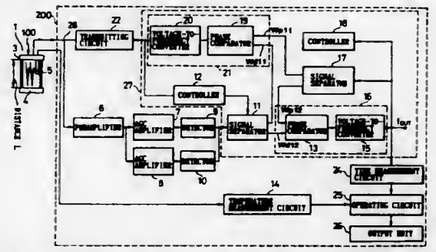
Makoto Koide, Shizuoka, Japan, assignor to Fuji Ultrasonic Engineering Co., Ltd., Hamamatsu, Japan

Filed Feb. 1, 1994, Ser. No. 189,873

Claims priority, application Japan, Feb. 10, 1993, 5-044371

Int. Cl.[6] **G01N** *29/02;29/18*

U.S. Cl. 73—597 **3 Claims**



1. A method of ultrasonic wave measurement, in which multiple echoes generated successively on the basis of waves transmitted from an ultrasonic wave transmitter through a medium under measurement are received in an ultrasonic wave receiver to determine an absolute velocity (V) of sound propagated through the medium on the basis of a propagation time (t_t) determined from the echoes and a propagation distance (L), the method comprising steps of:

selecting at least two of multiple echoes of specific order for each transmitted wave;

outputting a continuous oscillation wave;

controlling a time interval between like order echoes selected with respect to adjacent transmitted waves to be equal to an integral multiple of a period (t_3) of the continuous oscillation wave;

controlling a time interval between echoes adjacent to each other selected with respect to the same transmitted wave to be equal to the period (t_3) of the continuous oscillation wave;

measuring the period (t_3) of the continuous oscillation wave obtainable in the above controlled state; and

using the result of the measurement as the propagation time (t_t) for determining the absolute sound velocity (V).

5,557,048

STRESS EVALUATION METHOD AND APPARATUS THEREFOR

Masahiro Koike, Hitachi; Fuminobu Takahashi, Katsuta; Hideki Inoue, Hitachi; Yosinori Musha, Hitachioota; Shouji Kamimoto, Hitachi; Shinji Naito, Hitachioota, and Tsukasa Sasaki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1994, Ser. No. 313,840

Claims priority, application Japan, Sep. 28, 1993, 5-240936

Int. Cl.[6] **G01N** *29/18*

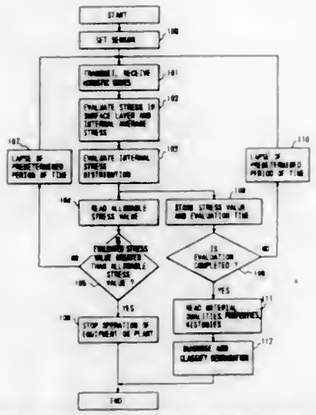
U.S. Cl. 73—597 **9 Claims**

1. A stress evaluation method comprising the steps of:

propagating a longitudinal wave in a thickness direction at a non-loaded portion of a test piece to be tested;

measuring a propagation time of the longitudinal wave in the test piece at the non-loaded portion upon reception of a reflection wave reflected in the thickness direction from a bottom surface of the test piece at the non-loaded portion;

propagating a longitudinal wave and a shear wave in a thickness direction at a loaded portion of the test piece;



measuring a respective propagation time of said longitudinal wave and said shear wave in said test piece at the loaded portion upon reception of a respective reflection wave reflected in the thickness direction from a bottom surface of said test piece at the loaded portion;

calculating a thickness at said loaded portion using a longitudinal wave acoustic velocity at the non-loaded portion which is obtained from a ratio between a thickness at the non-loaded portion and the propagation time of the longitudinal wave at the non-loaded portion;

calculating a shear wave acoustic velocity based on a relationship between said thickness at the loaded portion and said propagation time of said shear wave at said loaded portion; and

evaluating a magnitude of an internal average stress in said thickness direction acting in said loaded portion based on said shear wave acoustic velocity and a predetermined relationship between shear wave acoustic velocities and corresponding stresses.

5,557,049

DISPOSABLE MANOMETER FOR USE WITH A CPR BAG

Jeffrey B. Ratner, Pinellas Park, Fla., assignor to Mercury Enterprises, Inc., Clearwater, Fla.

Filed Nov. 9, 1995, Ser. No. 552,471

Int. Cl.[6] G01L *7/08*

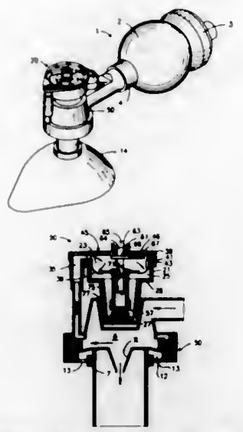
U.S. Cl. 73—715 **15 Claims**

13. A manometer for sensing and displaying air pressure in combination with a CPR bag or a patient breathing tube, the manometer comprising

a) a housing having an upper chamber and a lower chamber separated by a movable wall, said movable wall carrying a stem coupling having an opening with an outwardly extending groove and a bottom surface engaging a compression spring within said lower chamber;

b) said upper chamber being upwardly closed by a cap having pressure indicating indicia thereon, and said cap having a pointer mechanism rotatably mounted thereon and including a pointer alignable with said indicia to indicate pressure in said upper chamber, said pointer mechanism including a downwardly depending actuator stem having a spiral-shaped projection thereon, said actuator stem inserted into said stem coupling opening with said spiral-shaped projection engaged within said groove, whereby reciprocations of said stem coupling translate to rotations of said pointer;

c) said upper chamber being fluidly connected to a source of air from the CPR bag or patient breathing tube via a restricted passageway and said lower chamber being vented to atmosphere;



d) whereby pressure at a sensing port is sensed in said upper chamber causing said movable wall to move downwardly against force of said spring, said pointer thereby rotating into alignment with an indicium representative of pressure in said upper chamber.

5,557,050

SYSTEM FOR METERING GAS SUPPLIED UNDER HIGH PRESSURE

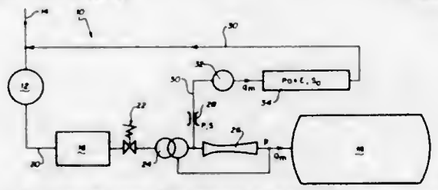
Jean-Pierre Campain, Clamart; Jacques Fournier, Bretigny S/Orge, and Sylvan Janssen, Neuilly s/Seine, all of France, assignors to Schlumberger Industries, Montrouge, France

Filed Jul. 11, 1994, Ser. No. 273,222

Claims priority, application France, Jul. 9, 1993, 93 08591

Int. Cl.[6] G01F *1/86*

U.S. Cl. 73—861.02 **5 Claims**



1. A metering system for metering a volume of compressed gas supplied under high pressure from a first tank to a second tank, said metering system comprising:

a first duct for supplying said compressed gas from said first tank to said second tank, said first duct comprising:

a pressure regulator providing a high driving pressure P, and

a first nozzle having a section with an inner diameters located downstream of said pressure regulator and providing a pressure p downstream therefrom being is less than 0.95 P;

a second duct branching at an inlet end thereof from said first duct between said pressure regulator and said first nozzle, and comprising:

a second nozzle having a section with an inner diameters smaller than the inner diameter of said section S of said first nozzle, an outlet of said second nozzle being maintained at a predetermined low pressure, and

a volume meter connected to said outlet of said second nozzle for metering a volume v_o of gas flowing through said second duct at said low pressure; and

means for calculating a volume V_o at said low pressure of the compressed gas supplied to the second tank by:

$$V_o = v_o\ (S/s).$$

5,557,051

DEVICE FOR MEASURING THE VELOCITY OF A FLUID FLOWING IN A FLOW CHANNEL OF A CONDUIT

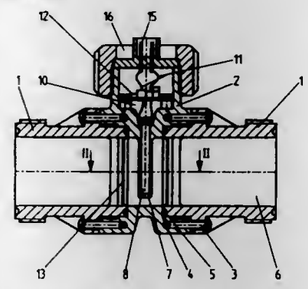
Adelbert Schalk, Wutoschingen-Horheim, Germany, assignor to Georg Fischer Rohrleitungssysteme AG, Schaffhausen, Switzerland

Filed Nov. 18, 1994, Ser. No. 342,243

Claims priority, application Switzerland, Nov. 22, 1993, 03 480/93

Int. Cl.[6] G01F *1/32*

U.S. Cl. 73—861.22 **8 Claims**



1. In a conduit defining a flow channel for transporting a flowing medium in a first direction, a device including a bending sensor for measuring the velocity of the medium flowing through the conduit, the improvement comprising: flow disturbing means located in the flow channel for generating eddies which cause pressure fluctuations having frequencies which are proportioned to the velocity of the medium flowing through the conduit and an arm projecting into the flow channel downstream of the flow disturbing means with respect to said first direction wherein the bending sensor is located within and encapsulated by the arm, is elongated in the direction of the medium flow for sensing the pressure fluctuations on the arm resulting from said eddies to determine the velocity of the medium flowing through the conduit.

5,557,052

KEYBOARD MUSICAL INSTRUMENT HAVING VARIABLE CONTACT POINT BETWEEN JACK AND REGULATION BUTTON

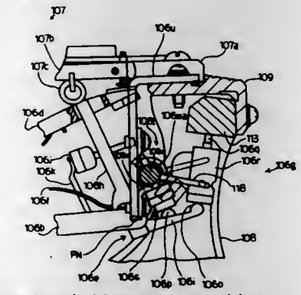
Hajime Hayashida, Shizuoka, and Satoshi Inoue, Shizuoka, both of Japan, assignors to Yamaha Corporation, Japan

Filed Mar. 30, 1995, Ser. No. 413,632

Claims priority, application Japan, Mar. 31, 1994, 6-083726; Jun. 3, 1994, 6-144139

Int. Cl.[6] G10C *3/18*

U.S. Cl. 84—243 **12 Claims**



1. A keyboard musical instrument comprising:

a plurality of keys respectively assigned notes of a scale, and selectively moved by a player;

a plurality of string means associated with said plurality of keys for generating acoustic tones having said notes, respectively;

a plurality of hammer assemblies respectively associated with said plurality of string means for striking the associated string means when said player selectively depresses said plurality of keys,

a plurality of key action mechanisms functionally connected between said plurality of keys and said plurality of hammer assemblies, respectively, and each including

a whippen assembly rotated by the associated key moved by said player,

a regulating button mechanism, and

a jack having a long portion and a short portion merged with said long portion at an intermediate portion rotatably supported by said whippen assembly and brought into contact with said regulating button mechanism for escaping from the associated hammer assembly; and

a change-over means associated with said regulating button mechanism for changing a contact point between said short portion and said regulating button mechanism.

5,557,053

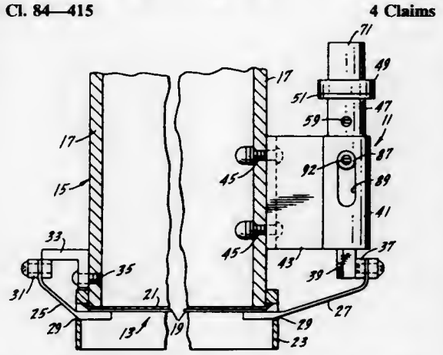
SNARE STRAINER FOR A DRUM

Gregory L. Nickel, 3206 William Avenue, North Vancouver, B.C., Canada

Filed Apr. 19, 1995, Ser. No. 424,805

Int. Cl.[6] G10D *13/02*

U.S. Cl. 84—415 **4 Claims**



1. A snare strainer for a snare drum having snares and a shell, said snare strainer including:

a cylindrical tube,

means to mount said cylindrical tube to the shell of the drum,

a piston installed in said cylindrical tube for slidable movement between a first position and a second position,

a snare tensioning rod affixed to said piston and said snares to locate said snares against said drum when said piston is in said first position and to locate said snares away from said drum when said piston is in said second position,

a quick release mechanism mounted on said cylindrical tube and connected to said piston for moving said piston between said first and second positions,

said quick release mechanism including a handle pivotally mounted on said cylindrical tube, a cross member engaging said piston, and an elongated closed loop link pivotally connected at one end to said cross member and at an opposite end to said handle so that the rotation of said handle will rotate said pivotal connections of said link to an over center position during movement of said piston between said first and second positions.

5,557,054

for indicating which of said player's hands are to be used for

5,557,057

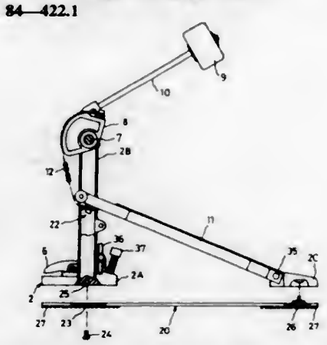
ELECTRONIC KEYBOARD INSTRUMENT

5,557,054

FOOT PEDAL FOR A DRUM

Fumihiro Shigenaga, Hamamatsu, Japan, assignor to Yamaha Corporation, Shizuoka-ken, Japan

Filed Jun. 5, 1995, Ser. No. 461,204
Claims priority, application Japan, Nov. 15, 1994, 6-280383
Int. Cl.[6] G10D *13/02*
U.S. Cl. 84—422.1 **5 Claims**



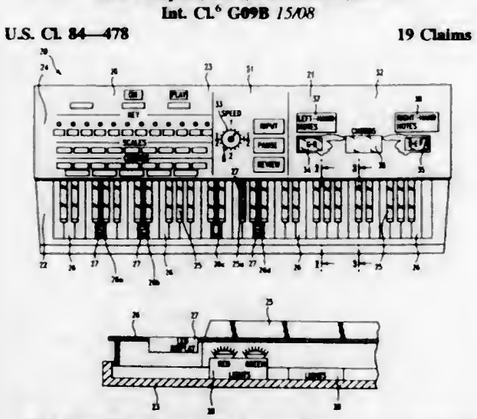
4. A foot pedal for a drum having a beater which is caused to pivot and strike the drum head by the compression of a foot pedal installed in a pedal frame, said foot pedal characterized in that the foot board is installed so as to be rotated in a horizontal direction and one end of a pedal depressing force transmission member which transmits the depressing force of the foot board to the beater is connected to the foot board via an anti-twisting mechanism.

5,557,055

MUSICAL KEYBOARD HAVING AN ELECTRONICALLY CONTROLLED DISPLAY AND A METHOD OF KEYBOARD DISPLAY

Frederick W. Breitweiser, Jr., East Rutherford, N.J., assignor to Breitweiser Music Technology Inc., Wall Township, N.J.

Filed May 17, 1994, Ser. No. 245,218
Int. Cl.[6] G09B *15/08*
U.S. Cl. 84—478 **19 Claims**



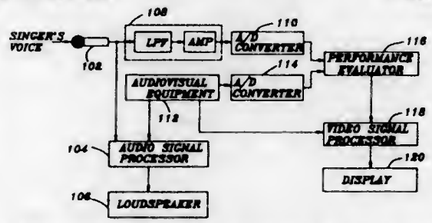
14. A musical instrument system comprising:
a musical keyboard composed of a set of partially transparent playing keys;
plural indicia means each embedded in the upper surface of a different one of said playing keys for indicating which of said player's fingers are to be used for playing said playing key in which it is embedded;
plural two-color illumination means mounted adjacent to and below the lower surface of a different one of said playing keys for directing different colored light through said adjacent key for indicating which of said player's hands are to be used for playing the adjacent one of said keys; and
a control circuit means connected to said indicia means and said two-color illumination means for receiving input signals and for selectively energizing said indicia means and said two-color illumination means in response to said input signals.

5,557,056

PERFORMANCE EVALUATOR FOR USE IN A KARAOKE APPARATUS

Jae-Gyoo Hong, and Ul-Je Kim, both of Seoul, Rep. of Korea, assignors to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Sep. 22, 1994, Ser. No. 310,442
Claims priority, application Rep. of Korea, Sep. 23, 1993, 93-19444
Int. Cl.[6] G09B *15/02;* **G10H** *1/36*
U.S. Cl. 84—610 **5 Claims**



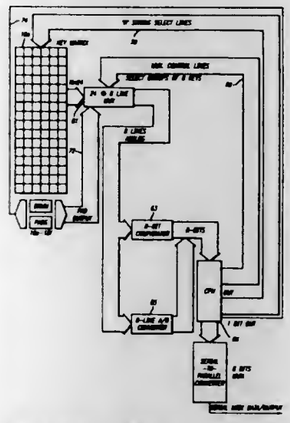
1. A karaoke apparatus capable of evaluating the singing performance of a karaoke singer by measuring the incongruity between an accompanying music and the karaoke singer's rendition to the accompanying music, which comprises:
a microphone for converting the singer's rendition into an electrical voice signal;
a first analog to digital converter (A/D) converter for converting the electrical voice signal into a digitized voice signal;
an audiovisual equipment for producing the accompanying music;
a second A/D converter for digitizing the accompanying music to produce a digitized accompaniment signal;
a performance evaluator for measuring the difference between an energy distribution of the digitized voice signal and that of the digitized accompaniment signal to thereby evaluate the karaoke singer's singing performance, wherein said performance evaluator includes:
means for dividing the digitized voice signal and the digitized accompaniment signal into n groups, respectively, wherein each group contains a predetermined number of digitized subsignals, and calculating an energy for each of the n groups of the digitized voice and the accompaniment subsignals to produce n voice energies and n accompaniment energies, respectively;
means for summing the n voice energies and the n accompaniment energies to produce a voice energy sum and an accompaniment energy sum, respectively;
means for normalizing each of the n voice energies and each of the n accompaniment energies through the use of the voice energy sum and the accompaniment energy sum, respectively;
means for producing an error rate by measuring the difference between each of the normalized n voice energies and each of the normalized n accompaniment energies; and
means for calculating a score of the singer's singing performance on a basis of the error rate.

5,557,057

ELECTRONIC KEYBOARD INSTRUMENT

Harvey W. Starr, 1717 Fifth Ave., San Diego, Calif. 92111

Continuation-in-part of Ser. No. 813,996, Dec. 27, 1991. This application Jan. 14, 1994, Ser. No. 182,767
Int. Cl.[6] G10H *7/00;* **H04J** *3/00*
U.S. Cl. 84—617 **13 Claims**



1. For use with a music synthesizer:
an electronic keyboard instrument comprising:
a fingerboard elongated in a first direction;
a plurality of keys arranged in rows and columns along said fingerboard, wherein the rows extend along the fingerboard in said first direction;
a circuit board within said fingerboard;
means for mounting each said key movable independently of every other one of said keys and movable into contact with said circuit board;
a central processing unit;
said circuit board including means for forming key input signals in response to said keys contacting said circuit board;
multiplexing means connected to receive said key input signals from said circuit board, a voltage comparator circuit connected to receive said key input signals from said multiplexing means, an analog to digital converter connected to said multiplexing means;
said central processing unit including means for sampling said voltage comparator circuit and responding to the presence of said key input signals to cause said key input signals to be converted to digital signals in said analog to digital converter, said digital key input signals representing musical notes, and for outputting said digital signals to said synthesizer.

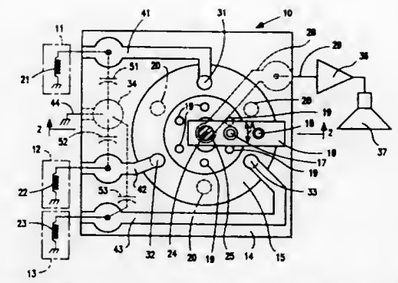
5,557,058

SIGNAL BLENDER FOR THREE OR MORE MUSICAL INSTRUMENT PICKUPS

Melvin A. Lace, Prospect Heights, Ill., assignor to Thomas E. Dorn, Clarendon Hills, Ill.

Filed Oct. 26, 1994, Ser. No. 329,315
Int. Cl.[6] G10H *1/08;3/12;* **H01C** *10/34;10/36*
U.S. Cl. 84—735 **20 Claims**

1. A signal blender for blending the pickup signals generated by at least three musical instrument pickups in a plurality of different combinations and in a multiplicity of different amplitudes to develop a blend signal, the signal blender comprising:
a continuous main blending resistance having at a plurality of main connection taps, at least one for each pickup;



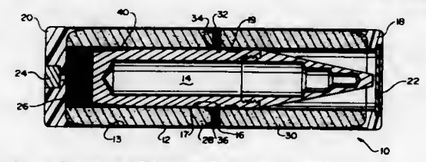
a plurality of main connection means, at least one main connection means for each pickup, connecting each pickup to at least one main resistance connection tap;
a main movable electrically conductive contact, engageable in electrical contact with the main resistance at any point on the main resistance to derive a blend signal therefrom; and
output connection means connecting the main movable contact to an output circuit to apply the blend signal to the output circuit.

5,557,059

TUBELESS CASED TELESCOPED AMMUNITION

John B. Warren, Plymouth, Minn., and James Q. Talley, Burlington, Vt., assignors to Alliant Techsystems Inc., Hopkins, Minn.

Continuation of Ser. No. 203,777, Feb. 28, 1994, abandoned. This application Apr. 13, 1995, Ser. No. 421,297
Int. Cl.[6] F42B *5/045*
U.S. Cl. 102—434 **10 Claims**



1. A cased telescoped ammunition round, comprising:
(a) a case having a front and rear end;
(b) a projectile having aft and forward ends and carried completely within the case such that the aft end of the projectile is proximate the rear end of the case and a space is defined peripheral and aft of the projectile;
(c) a booster charge located in the space aft of the projectile;
(d) a first propellant segment located in the peripheral space between the case and the projectile, the first propellant segment having an inner surface, an aft and forward portion;
(e) a second propellant segment located in the peripheral space between the case and the projectile forward of the first propellant segment;
(f) a seal located between the first propellant and second propellant segments, the seal being generally an annular ring surrounding the projectile and having inner and outer rearwardly facing flanges; and
(g) burnable ignition delay means associated with at least a portion of the inner surface of the first propellant segment and separating the first propellant segment from the booster charge and separating at least the aft portion of the first propellant segment from the projectile, whereby when the booster charge is ignited the ignition of the first propellant segment is delayed until the projectile moves a predetermined distance and the ignition delay means is burned through at least at one point and the ignition of the second propellant segment is delayed at least until the first propellant is ignited and the seal is burned through.

5,557,060

METHOD AND APPARATUS FOR CONTROLLING A MUSICAL PERFORMANCE

Yoshiki Nishimura, Hamamatsu, Japan, assignor to Yamaha Corporation, Shizuoka-ken, Japan

Filed Jun. 5, 1995, Ser. No. 461,205
Claims priority, application Japan, Jun. 6, 1994, 6-123824
Int. Cl.[6] G10H *1/00*
U.S. Cl. 84—626 **20 Claims**

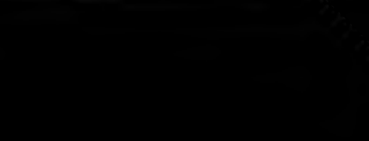
1. A method of controlling a musical performance, comprising the steps of:
(a) storing a plurality of sets of performance data, each set of performance data corresponding to a different musical performance;
(b) selecting one of the sets of performance data;
(c) reproducing the selected set of performance data;
(d) detecting a performance motion of a performer;
(e) changing the selected set of performance data in accordance with the detected performance motion; and
(f) reproducing the changed set of performance data.

5,557,061

APPARATUS AND METHOD FOR CONTROLLING AN ELECTRONICALLY SIMULATED INSTRUMENT

Yoshiki Nishimura, Hamamatsu, Japan, assignor to Yamaha Corporation, Shizuoka-ken, Japan

Filed Jun. 5, 1995, Ser. No. 461,206
Claims priority, application Japan, Jun. 6, 1994, 6-123825
Int. Cl.[6] G10H *1/00*
U.S. Cl. 84—626 **20 Claims**



1. An apparatus for controlling an electronically simulated instrument, comprising:
a storage device for storing a plurality of sets of performance data, each set of performance data corresponding to a different musical performance;
a selector for selecting one of the sets of performance data;
a reproducer for reproducing the selected set of performance data;
a detector for detecting a performance motion of a performer;
a changer for changing the selected set of performance data in accordance with the detected performance motion; and
a reproducer for reproducing the changed set of performance data.

5,557,062

METHOD AND APPARATUS FOR CONTROLLING A MUSICAL PERFORMANCE

Yoshiki Nishimura, Hamamatsu, Japan, assignor to Yamaha Corporation, Shizuoka-ken, Japan

Filed Jun. 5, 1995, Ser. No. 461,207
Claims priority, application Japan, Jun. 6, 1994, 6-123826
Int. Cl.[6] G10H *1/00*
U.S. Cl. 84—626 **20 Claims**

1. A method of controlling a musical performance, comprising the steps of:
(a) storing a plurality of sets of performance data, each set of performance data corresponding to a different musical performance;
(b) selecting one of the sets of performance data;
(c) reproducing the selected set of performance data;
(d) detecting a performance motion of a performer;
(e) changing the selected set of performance data in accordance with the detected performance motion; and
(f) reproducing the changed set of performance data.

5,557,060

DEVELOPING DEVICE

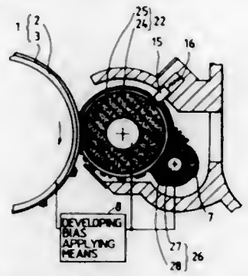
Hideki Okada; Yoshiro Koga; Takashi Suzuki; Yoshihiro Nakashima, and Takehiko Okamura, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Jun. 2, 1993, Ser. No. 70,198

Claims priority, application Japan, Jun. 2, 1992, 4-141424; May 11, 1993, 5-109028

Int. Cl.[6] G03G *15/06*

U.S. Cl. 118—661 6 Claims



1. A developing device comprising:

a toner carrier for developing a latent image formed on a latent image carrier, said toner carrier opposing said latent image carrier;

a supply member for supplying toner to said toner carrier, said supply member being pressingly contacted with said toner carrier while moving relative to said toner carrier; and

a regulation member for thinning toner supplied onto said toner carrier, said regulation member being slidably contacted with said toner carrier,

wherein a hardness of said toner carrier being greater than at least that of said supply member; and

wherein said supply member is formed by a foamed member which is electrically conductive and has a cell density of 1 to 20 in the surface layer portion of said supply member, and is rotatably disposed while contacting with said toner carrier with a contact pressure of 2 to 20.

5,557,061

HIGH TEMPERATURE STABLE, LOW INPUT ENERGY PRIMER/DETONATOR

Coodly P. Ramaswamy, Christiana, Pa., assignor to Breed Automotive Technology, Inc., Lakeland, Fla.

Continuation of Ser. No. 616,578, Nov. 14, 1990, abandoned, which is a division of Ser. No. 326,021, Mar. 20, 1989, abandoned. This application Jun. 6, 1994, Ser. No. 254,484

Int. Cl.[6] C06B *41/08*

U.S. Cl. 149—26 1 Claim

1. A consolidated mixture of a primer initiating composition omitting tetrazene as a sensitizer yet capable of withstanding aging and providing a relatively high degree of sensitivity, reliability, and confidence level within a wide temperature range consisting essentially of:

from 40 to 42 weight percent of basic lead styphnate;

from 20 to 22 weight percent of lead azide;

from 15 to 20 weight of barium nitrate; and

from 1 to 3 weight percent of a sensitizer selected from the group consisting of silicon carbide, fused alumina, ground glass powder, and pure silica sand.

5,557,062

BREATHABLE GAS GENERATORS

Richard O. MacLaren, Sunnyvale, and Donald D. Tzeng, San Jose, both of Calif., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 13, 1994, Ser. No. 355,391

Int. Cl.[6] C06B *31/28*

U.S. Cl. 149—46 8 Claims

1. A gas generating composition comprising about 3 wt % to about 20 wt % of a fuel, about 40 wt % to about 75 wt % of an oxidizer and about 5 wt % to about 25 wt % of a nitrogen producing component wherein the gas generated from the combustion of the composition produces a breathable gas composition having an oxygen content of about 20 to about 40 volume percent oxygen and about 60 to about 80 volume percent nitrogen and wherein the nitrogen producing component is present in sufficient mole percent such that the additional nitrogen gas generated by the nitrogen producing component results in a gas composition having the desired nitrogen/oxygen levels.

5,557,063

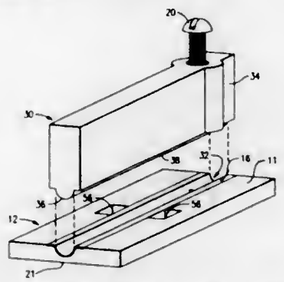
ELECTRONIC COMPONENT ENCLOSURE FOR RF SHIELDING

Behzad D. Mottahed, Upper Montclair, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jan. 3, 1994, Ser. No. 176,637

Int. Cl.[6] H05K *9/00*

U.S. Cl. 174—35 GC 4 Claims



1. An electronic isolation shield including a sealing edge disposed so as to contact an electronic component assembly when the shield is installed on the electronic component assembly, said sealing edge comprising:

a planar surface disposed along the sealing edge so as to rest against a planar surface on the electronic component assembly: and

a longitudinal tongue that extends along the length of the sealing edge and is disposed in relation to said planar surface so as to mate with a grounding material in a surface of a corresponding groove on the electronic component assembly when said planar surface on the sealing edge rests against said planar surface of the electronic component assembly.

5,557,064

CONFORMAL SHIELD AND METHOD FOR FORMING SAME

Ileana Isern-Flecha, Boca Raton; Thomas J. Swirbel, Davie; Robert W. Pennisi, Boca Raton; Danny E. Ross, Plantation; Adolph Naujoks, Coral Springs, and Angelita Alarcon, Sunrise, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 18, 1994, Ser. No. 228,767

Int. Cl.[6] H05U *9/00*

U.S. Cl. 174—35 MS 21 Claims

1. A conformal shield, comprising:

a conformal shield base, comprising:

a first conformable insulating material having a characteristic softening point at a first temperature;

a second conformable insulating material overlaying the first conformable insulating material, the second conformable insulating material having a characteristic softening point at a second temperature higher than the first temperature; and

a first conductive layer disposed on the conformal shield base; and

a second conductive layer disposed on the first conductive layer.

5,557,065

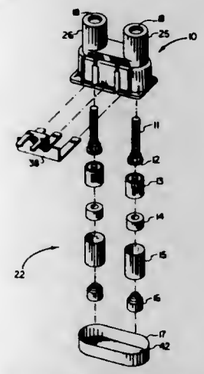
OVERVOLTAGE PROTECTORS SEALED WITH GEL

Boyd G. Brower; Robert A. Crane, both of Keller; John J. Napiorkowski, Irving, and William J. Shannon, North Richland Hills, all of Tex., assignors to Siecor Corporation, Hickory, N.C.

Filed Nov. 21, 1994, Ser. No. 342,986

Int. Cl.[6] H05K *5/06*

U.S. Cl. 174—52.3 4 Claims



1. A protector sealed with gel, comprising:

(a) a housing defining an interior surface, an open base with a perimeter, and a slot about the perimeter of the open base;

(b) an arrestor mounted in the housing;

(c) a first sealing gel applied in the slot; and

(d) a base closing cap having a flange slidably received in the slot and into the gel.

5,557,066

MOLDING COMPOUNDS HAVING A CONTROLLED THERMAL COEFFICIENT OF EXPANSION, AND THEIR USES IN PACKAGING ELECTRONIC DEVICES

Michael D. Rostoker, San Jose; Nicholas F. Pasch, Pacifica, and Joe Zelayeta, Saratoga, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation of Ser. No. 56,344, Apr. 30, 1993, abandoned. This application Jun. 23, 1995, Ser. No. 493,956

Int. Cl.[6] H01J *5/00*

U.S. Cl. 174—52.4 19 Claims

1. A plastic molding compound having a controlled thermal coefficient of expansion, for use in electronic packages, comprising:

a base plastic molding compound having a base thermal coefficient of expansion with a defined temperature range, the base thermal coefficient of expansion being greater than a reference thermal coefficient of expansion;

a loading material combined into the base plastic molding compound, said loading material having a thermal coefficient of expansion less than the base thermal coefficient of expansion within the defined temperature range; and

a wetting agent to promote bonding between a mixture of the base plastic molding compound and the loading material.

5,557,067

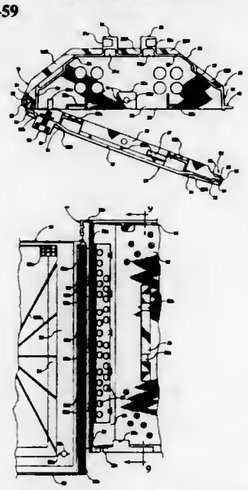
POLE MOUNTED TERMINAL HOUSING

Selim Messelhi, Etobicoke, Canada, assignor to Communications Technology Corporation, Dallas, Tex.

Filed Jul. 22, 1993, Ser. No. 96,051

Int. Cl.[6] H02G *3/18*

U.S. Cl. 174—59 22 Claims



1. A housing having a body portion and a hinged closure portion, the improvements comprising: hinge elements on the body portion and the closure portion, a first hinge element on said body portion being arranged to join with a second hinge element on the closure portion, said first and second hinge elements being configured to permit linear sliding movement of the closure portion longitudinally of an axis to a predetermined position and pivotal movement of the closure portion relative to the body portion when the closure portion is in said predetermined position relative to the body portion; and selector means on said closure portion rotatable to one position for said closure means to pivot open on said hinge elements, and rotatable to another position for said closure means to slide longitudinally relative to said body portion.

side surface and an outwardly facing side surface, the outwardly

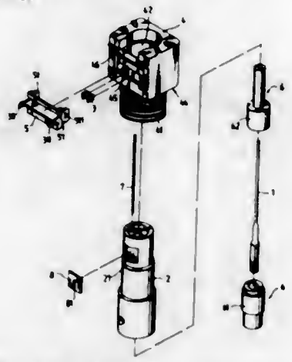
with said non-superconductive metal region being constituted by a

5,557,068

CAPACITIVE COUPLED BNC CONNECTOR

Yu-Ping Chang, Hsin Chu, Taiwan, assignor to D-Link Corporation, Hsin Chu, Taiwan

Filed Nov. 28, 1995, Ser. No. 563,455
Int. Cl.[6] H01R *13/66; 13/46*
U.S. Cl. 174—59 **5 Claims**



1. A BNC connector comprising:

an insulative body having a threaded, cylindrical coupling portion at one end fastened to a conductive panel, a longitudinal center through hole, a plurality of mounting holes and a plurality of side slots at a bottom side thereof;

a metal mounting frame secured to said insulative body, said metal mounting frame comprising a plurality of end strips respectively inserted into the mounting holes of said insulative body, a plurality of hooked portions respectively raised from said end strips and hooked in the mounting holes of said insulative body, and a plurality of mounting legs respectively fastened to a respective mounting hole on a PC board;

a conductive, stepped, cylindrical shell fitted into the longitudinal center through hole to hold a ground terminal and a conductive electric contact, permitting said ground terminal and said conductive electric contact to be respectively welded to said PC board, said cylindrical shell having a metal spring plate fastened to a side opening thereof;

a plurality of capacitor elements respectively fastened to the side slots of said insulative body and stopped between said metal spring plate and said metal mounting frame to filter noises transmitted from said conductive panel; and

an insulative socket mounted within said cylindrical shell to insulate said conductive electric contact from said cylindrical shell.

5,557,069

ELECTRICAL SPRING CONNECTOR HAVING IMPROVED SHELL FOR CONTROLLING SPRING EXPANSION

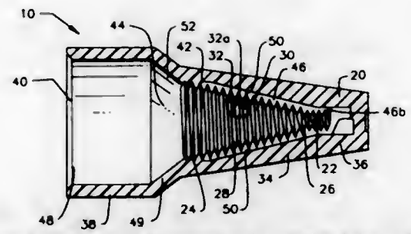
James H. Whitehead, Collierville, and Francis X. Lynch, Memphis, both of Tenn., assignors to Thomas & Betts Corporation, Memphis, Tenn.

Filed Jun. 30, 1994, Ser. No. 268,396
Int. Cl.[6] H01R *4/22*
U.S. Cl. 174—87 **13 Claims**

1. An electrical connector for connecting electrical conductors comprising:

an elongate shell having an open end, a closed end and an elongate axially extending cavity surrounded by an inner shell wall; and

an elongate spring supported within said shell cavity, said spring being frictionally supported to said inner shell wall adjacent said open end and said closed end thereof and having a substantially unsupported longitudinal central portion extending therebetween and defining a passage for receipt of ends of



said conductors, said central spring portion being radially expandable upon insertion of said conductors thereinto;

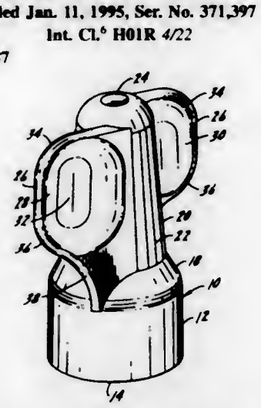
said shell further including a plurality of axially extending deformable ribs, each of said ribs having a transverse rib base along said shell wall and an inwardly tapering radially directed extent having a height which terminates at a rib peak, said inwardly tapering radially directed extent having first and second tapered surfaces extending from said shell wall to said rib peak, the first tapered surface being longer than the second tapered surface such that said rib peak is non-aligned with the line of the radius passing centrally through said transverse rib base, thereby providing a spring engagement surface along one tapering surface thereof to deform said ribs in both a radial direction and a transverse direction toward said second tapered surface.

5,557,070

ERGONOMIC TWIST-ON WIRE CONNECTOR CAP

Carl R. Tamm, Jonesborough, Tenn., assignor to Buchanan Construction Products, Inc., Hacksettstown, N.J.

Filed Jan. 11, 1995, Ser. No. 371,397
Int. Cl.[6] H01R *4/22*
U.S. Cl. 174—87 **12 Claims**



1. A cap for a twist-on electrical connector includes a body formed of a semi-rigid insulating material and having a central bore, open at one end and closed at the other end by an integral end wall, said bore being formed and adapted to contain a wire conductor clamping means therein, said body having a first exterior portion of maximum diameter generally adjacent the open end, substantially the remaining portion of said body having a generally conical exterior surface, said generally conical exterior surface having a pair of generally oppositely positioned laterally extending wings, the wings each being generally tangential to the conical body portion exterior surface, each wing having an inwardly facing

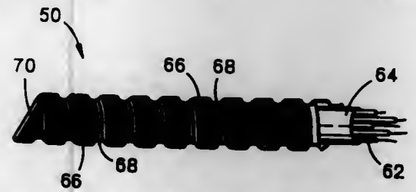
side surface and an outwardly facing side surface, the outwardly facing side surface of each wing having a concave pressure application surface area.

5,557,071

ARMORED CABLE

James W. Falciglia, East Greenwich, R.I., and Anthony J. Mauro, Assonet, Mass., assignors to WPFY, Inc., Wilmington, Del.

Continuation of Ser. No. 139,314, Oct. 19, 1993, Pat. No. 5,468,914, which is a division of Ser. No. 865,334, Apr. 8, 1992, Pat. No. 5,350,885. This application Jun. 2, 1995, Ser. No. 458,642
Int. Cl.[6] H01B *7/36*
U.S. Cl. 174—112 **6 Claims**



1. An armored cable sheath comprising

a continuous metal tubular structure having an internal passage, an outer surface, a first end, and a second end, the internal passage being sized and configured to enclose one or more conductors, said tubular structure being made of a material having a first visual appearance,

the tubular structure having an outer surface with periodic crowns and valleys along its length, and

a stripe of marking material, of different visual appearance from said first visual appearance, applied on said outer surface, along the length of said sheath.

5,557,072

SUPERCONDUCTIVE CONDUCTOR PRESENTING IMPROVED PROTECTION AGAINST PARTIAL TRANSITIONS

Thierry Verhaege, Saulx les Chartreux; Alain Février, Maurepas; Alain Lacaze, Essert, and Yves Laumond, Danjoutin, all of France, assignors to GEC Alsthom SA, Paris, France

Filed Mar. 26, 1992, Ser. No. 858,190
Claims priority, application France, Mar. 28, 1991, 91 03770
Int. Cl.[6] H01B *12/00*
U.S. Cl. 174—125.1 **3 Claims**

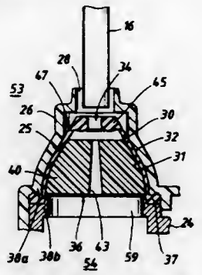
1. A superconductive conductor, made up of a single strand, protected against partial transitions, the conductor comprising a superconductive region made up of superconductive filaments embedded in a non-superconductive metal matrix, and a non-superconductive metal region, wherein the cold resistivity of the non-superconductive metal region is less than half the overall cold resistivity of the superconductive region in a non-superconductive state, the superconductive region and the non-superconductive metal region being merely in mechanical contact, without cohesion with said non-superconductive metal region being constituted by a core situated in the middle of a single superconductive region.

5,557,073

CABLE SEAL

Robert G. Truesdale, Jr., Cary, and John E. Francis, Raleigh, both of N.C., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 693,903, May 1, 1991, Pat. No. 5,360,945. This application Oct. 31, 1994, Ser. No. 332,194
Int. Cl.[6] H02G *15/103*
U.S. Cl. 174—151 **16 Claims**



1. A seal for an elongate object, comprising:

a) an invertible enclosing member having an inside surface, an outside surface, and means defining an opening connecting through said surfaces,

b) means for causing said member to invert when an elongate object is moved through said member, and

c) sealant means on said inside surface for sealing engagement with such an elongate object, said sealant means, in combination with the characteristics of said invertible member, being sufficiently compliant to remain on said inside surface when said member is inverted inside-out, and being configured to form such a sealing engagement with such an elongate object when the object is located in said opening and said member is inside-in, whereby an elongate object inserted through said opening can pass through said member free from substantial contact with said sealant means as said member supports said sealant means outside itself, and said member can then be inverted inside-in to position said sealant means against the elongate object and effect a seal between said member and the object.

5,557,074

COAXIAL LINE ASSEMBLY OF A PACKAGE FOR A HIGH FREQUENCY ELEMENT

Takaharu Miyamoto; Fumio Miyagawa, both of Nagano; Yoji Ohashi, and Tamio Saito, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, and Shinko Electric Industries Co., Ltd., Nagano, both of Japan

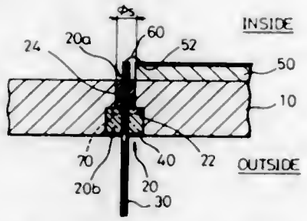
Continuation of Ser. No. 981,417, Nov. 25, 1992, abandoned. This application Dec. 8, 1994, Ser. No. 352,157
Claims priority, application Japan, Nov. 27, 1991, 3-339856; Feb. 5, 1992, 4-019599
Int. Cl.[6] H01B *17/26*
U.S. Cl. 174—152 GM **4 Claims**

1. A coaxial line assembly in a package which houses a high frequency element, the package having an inside and an outside and the assembly comprising:

a metal wall having an inner surface at the inside of the package and an outer surface at the outside of the package, said metal wall having a hole which extends therethrough from the inner surface to the outer surface, said metal wall comprising a step, at substantially an intermediate portion of the hole, defining a smaller diameter, inner hole portion of said metal wall which

5,557,076

CORDLESS POSITION DETECTION APPARATUS



opens to the inner surface and a larger diameter, outer hole portion of said metal wall which opens to the outer surface;

a lead which transmits a high frequency signal, the lead extending through the hole;

glass which is filled in the larger diameter, outer hole portion of said metal wall to hermetically seal said lead in the larger diameter, outer hole portion; and

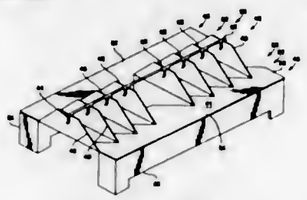
a material existing in the smaller diameter, inner hole portion of said metal wall, said material having a dielectric constant near to that of air, wherein said material is an expanded resin material which is filled in substantially the entire region defined by the smaller diameter, inner hole portion of said metal wall.

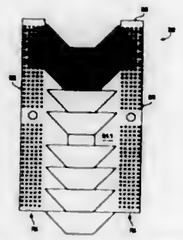
5,557,075

PARALLEL FLEXIBLE TRANSMISSION CABLE

Steven F. Nugent, Portland, Oreg., assignor to Intel Corporation, Sanat Clara, Calif.

Filed Jun. 27, 1994, Ser. No. 266,150
Int. Cl.[6] H05K *1/02*
U.S. Cl. 174—254 **19 Claims**





1. A parallel flexible transmission cable comprising:

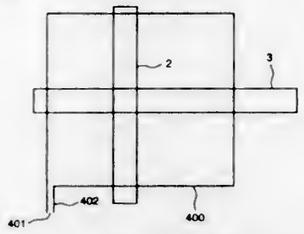
two connectors, each connector having a plurality of contacts; and a flexible cable having two ends, a first vane between the two ends, and a plurality of conductors connected between respective contacts of the two connectors, where a first portion of the flexible cable is within a first plane at a first one of the two connectors, a second portion of the flexible cable is within a second plane at a second one of the two connectors, and where the first vane is within a third plane between the two connectors, where the third plane is orthogonal to the first and second planes.

5,557,076

CORDLESS POSITION DETECTION APPARATUS

Rudi Wieczorek, Münich; Dietrich Hahn, Neufahrn, and Josef Rohrmülle, Fahrenzhausen, all of Germany, assignors to Mikron Gesellschaft Fur, Eching, Germany

Filed Nov. 14, 1994, Ser. No. 339,699
Claims priority, application Germany, Nov. 12, 1993, 43 38 766.7; Jan. 14, 1994, 44 00 946.1
Int. Cl.[6] G08C *21/00*
U.S. Cl. 178—19 **56 Claims**



43. A cordless position detection apparatus comprising a position detection area and a pointer, wherein a coil arranged around the position detection area is provided in order to supply energy to a first resonance circuit in the pointer.

5,557,077

HEARING-PROTECTOR PLUG

Bengt G. Berg, Tyringe, Sweden, assignor to Bilsom AB, Billesholm, Sweden

PCT No. PCT/SE92/00240, § 371 Date Oct. 5, 1993, § 102(e) Date Oct. 5, 1993, PCT Pub. No. WO92/18076, PCT Pub. Date Oct. 29, 1992
PCT Filed Dec. 16, 1993, Ser. No. 129,034
Claims priority, application Sweden, Apr. 19, 1991, 9101181
Int. Cl.[6] A61B *7/02*
U.S. Cl. 181—135 **15 Claims**

1. Hearing-protector plug adapted to be applied in the ear, comprising:

a plug material; and

means for enabling tracing of said plug material with detection equipment operating magnetically, said means for enabling tracing comprising a powder distributed in said plug material, the particle size of the powder being up to about 300 μm.

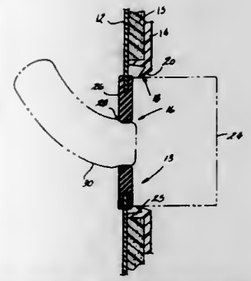
5,557,078

ACOUSTICAL BARRIER

Matthew J. Holwerda, Hudsonville, Mich., assignor to Cascade Engineering, Inc., Grand Rapids, Mich.

Filed Sep. 14, 1994, Ser. No. 306,021
Int. Cl.[6] F16F *15/00*
U.S. Cl. 181—208 **16 Claims**

1. In a wall having an opening therethrough, an article mounted on one side of the wall and having a pass-through component extending from the article and through the opening in the wall to the other side thereof; a moisture seal in the opening in the wall providing a moisture seal around the pass-through component; a mass layer of generally planar configuration positioned adjacent the wall and having an outer planar surface, the mass layer further having a support rib defining an opening in the mass layer in registry with the wall opening and surrounding the article, the support rib extending laterally of the outer planar surface toward the wall; an acoustical foam layer mounted to one side of the wall between the mass layer and the wall and having an opening in which the supporting rib is received and in registry with the wall openly; the improvement which comprises:



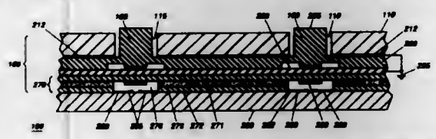
the mass layer further having a flexible seal extending inwardly into the mass layer opening from an edge thereof in contact with the article to provide an acoustical seal around the article.

5,557,079

ELECTRONIC DEVICE WITH SHIELDED KEYPAD INTERFACE

Greg D. Jackson, Plantation; Tyler D. Jensen, Sunrise, and Julio C. Castaneda, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 3, 1995, Ser. No. 497,829
Int. Cl.[6] H01H *9/02*; **H05K** *5/00*
U.S. Cl. 200—5 A **9 Claims**



1. An electronic device having a shielded keypad interface, comprising:

a housing having a keypad interface portion with an opening therein that forms a key hole;

a substrate mounted within the housing, the substrate having circuitry including switch contacts mounted thereon;

a keypad mechanically coupled to the housing, comprising:

an actuator mounted within the key hole, the actuator having an externally accessible key surface; and

a resilient insulative material having first and second opposing surfaces, the first surface being metallized with conductive material, the second surface having a movable contact disposed thereon, the movable contact being aligned with the actuator the conductive material being coupled to electrical ground;

wherein the conductive material provides an electrical shield for the circuitry.

5,557,080

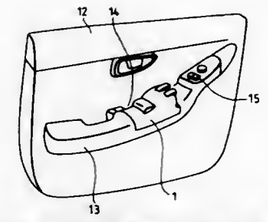
SWITCHING DEVICE

Hiroshi Hayakawa, Furukawa, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1995, Ser. No. 398,705
Claims priority, application Japan, Mar. 8, 1994, 6-065539
Int. Cl.[6] H01H *9/00*
U.S. Cl. 200—5 R **9 Claims**

1. A switching device for selectively controlling one of a first mechanism and a second mechanism, the switching device comprising:

a first switch assembly including a first operation member and a first switch, the first switch generating control signals in response to manipulation of the first operation member; and



a second switch assembly including a second operation member and a second switch, the second switch being actuated by the second operation member to enter a first state when the second operation member is pressed, the second switch being biased into a second state when the second operation member is released;

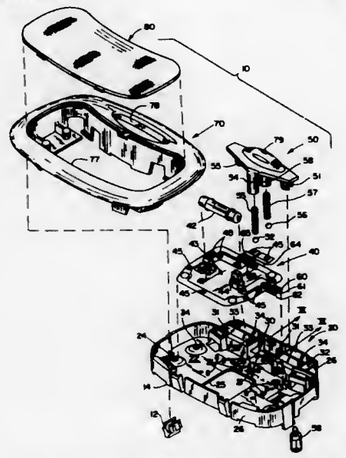
wherein the control signals generated by the first switch assembly control the first mechanism when the second switch is in the first state, and the control signals generated by the first switch assembly control the second mechanism when the second switch is in the second state.

5,557,081

VEHICLE LAMP SLIDE SWITCH INCLUDING DETENT ASSEMBLY

Marc C. Clevenger, Zeeland, and Mathias R. Fox, Holland, both of Mich., assignors to Prince Corporation, Holland, Mich.

Filed Nov. 14, 1994, Ser. No. 338,335
Int. Cl.[6] H01H *15/02*
U.S. Cl. 200—16 C **39 Claims**



1. A switch for a vehicle lamp assembly comprising:

a housing having a lower floor defining a detent structure and a raised floor section defining bearing surfaces above the lower floor section;

at least a pair of conductors positioned on said lower floor and defining a pair of switch contacts, said switch contacts off-set from the detent structure and shaped to define tracks for receiving and supporting a movable contact element in direct contact only with said conductors for movement along said conductors; and

a movable contact element and a control member movably coupled to said raised floor section of said housing along said bearing surfaces, said control member being configured to move said movable contact element along said tracks for selectively electrically coupling said switch contacts together,

and further being configured to operably engage said detent structure to hold said control member in a selected position.

5,557,082

CIRCUIT BREAKER WITH COMMON TRIP MECHANISM

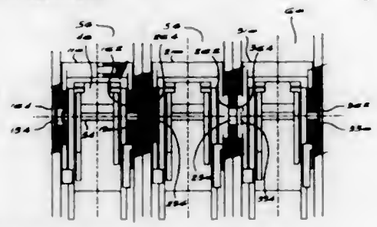
Edward Leet; Manuel F. V. Ribeiro, and Carlos A. Ferreira, all of Transvaal, South Africa, assignors to Circuit Breaker Industries Limited, South Africa

Filed Jul. 5, 1994, Ser. No. 270,491

Claims priority, application South Africa, Jul. 6, 1993, 93/4839

Int. Cl.[6] H01H *73/02*

U.S. Cl. 200—50.35 **3 Claims**



1. A circuit breaker mechanism comprising:

a magnetic frame;

a coil arranged to carry a load current and to induce a magnetic flux in the frame corresponding to the load current;

an armature with associated contacts mounted pivotally on or adjacent to the frame and arranged to be moved under the urging of the magnetic flux between a first, operative position in which the contacts are closed and a second, tripped position in which the contacts are open; and

a tripping lever comprising a substantially U-shaped member having a base and first and second substantially parallel legs, each leg having a first end joined to the base and a second end remote from the base, the tripping lever being disposed about the frame and being mounted on or adjacent to the frame by respective pivot points provided on each leg intermediate the ends thereof, for pivotal movement under the urging of the circuit breaker mechanism when the circuit breaker is tripped, the first leg having a projection formed thereon which extends transversely therefrom between the first and second ends thereof, and the second leg defining a cavity shaped complementally to the projection on the first leg between the first and second ends thereof, the projection on the first leg of the tripping lever being engagable with the cavity defined in the second leg of the tripping lever of an adjacent circuit breaker, so that the tripping of the circuit breaker causes tripping of the adjacent circuit breaker, wherein the tripping lever comprises first and second components joined together at the base of the U-shaped member, and wherein the first component has a portion which forms part of the base of the U-shaped member with a spigot thereon, the second component having a corresponding portion forming another part of the base of the U-shaped member with a socket therein for receiving the spigot, allowing the first and second components to be fitted snugly together end to end to form the tripping lever.

5,557,083

VACUUM CIRCUIT BREAKER AND ELECTRIC CONTACT

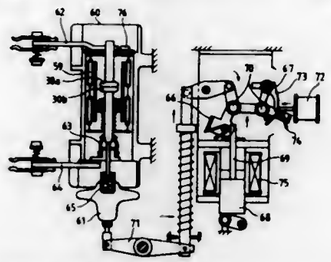
Katsuhiro Komuro; Yoshitaka Kojima; Yukio Kurosawa, all of Hitachi; Yoshio Koguchi, Hitachioota; Toru Tanimizu, Hitachi; Yoshimi Hakamata, Hitachi, and Shunkichi Endo, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 27, 1994, Ser. No. 265,733

Claims priority, application Japan, Jul. 14, 1993, 5-173943

Int. Cl.[6] H01H *33/66;1/00*

U.S. Cl. 218—125 **31 Claims**



1. A vacuum circuit breaker including:

a vacuum switch having a fixed electrode and a movable electrode both within an insulating vessel;

conductor terminals connected outside said vacuum switch to said fixed electrode and said movable electrode, respectively, disposed within the vacuum switch;

opening/closing means for driving said movable electrode through an insulated rod connected to the movable electrode,

said fixed electrode and said movable electrode each having an arc electrode formed by an alloy of a refractory metal and a highly electroconductive metal and also having an arc electrode support member which supports said arc electrode and which is formed of the highly electroconductive metal and an electrode rod or a coil electrode connected to the arc electrode support member; and

said arc electrode and said arc electrode support member and said electrode rod or said arc electrode and said arc electrode support member and said coil electrode being formed integrally with each other by melting of the highly electroconductive metal.

5,557,084

TEMPERATURE COMPENSATING FUEL DISPENSER

Howard M. Myers, Greensboro, and Charles W. VonCannon, Colfax, both of N.C., assignors to Gilbarco Inc., Greensboro, N.C.

Filed Jul. 22, 1994, Ser. No. 279,174

Int. Cl.[6] B67D *5/22*

U.S. Cl. 235—94 A **55 Claims**

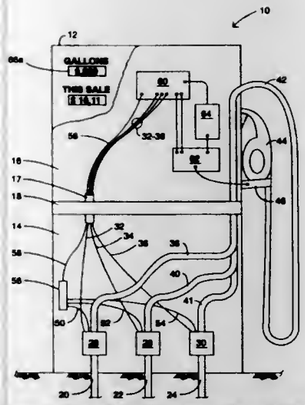
1. An apparatus for dispensing a liquid fuel and measuring the amount dispensed according to a temperature-corrected volumetric measure comprising

a housing having a fuel-handling compartment and an electronics compartment and a barrier between said fuel handling compartment and said electronics compartment,

a plurality of fuel passageways through said fuel-handling compartment, each said passageway having a flow meter to measure the volume of fuel flowing through said passageway and a thermometric probe adapted to read the temperature of fuel flowing through said passageway,

each of said meters being connected by a first electrical circuit to pass an electrical signal representative of the volumetric flow though its respective passageway to said electronics compartment,

each of said probes being connected by a second electric circuit to pass an electrical signal representative of the temperature of the probe onto said second circuit, said second circuit



having one intrinsically safe passage through said barrier to said electronics compartment, and

electronics in said electronics compartment including a computation device connected to said circuits to receive said electric signals and to modify the electrical signal representative of the volumetric flow to account for temperature.

5,557,085

METHOD AND DEVICE FOR ELECTRONIC IDENTIFICATION

Carl Tyren, Antibes, France, and Leif A. Persson, Staffanstorp, Sweden, assignors to RSO Corporation N.V., Netherlands

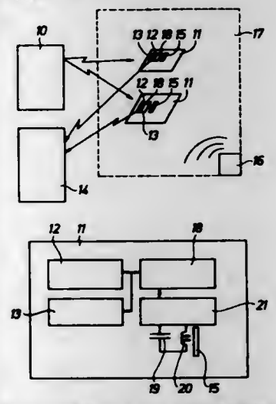
PCT No. PCT/SE93/00038, § 371 Date Sep. 6, 1994, § 102(e) Date Sep. 6, 1994, PCT Pub. No. WO93/14474, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 20, 1993, Ser. No. 256,487

Claims priority, application Sweden, Jan. 20, 1992, 9200145; Nov. 18, 1992, 9203479

Int. Cl.[6] G06K *5/00*

U.S. Cl. 235—380 **8 Claims**



1. An electronic identification device, comprising:

means for generating and transmitting an electromagnetic field;

a plurality of transponder units, each of which including storing means for storing identification data, and transmitter means for transmitting a signal comprising said identification data when each of said transponder units has been exposed to said electromagnetic field;

receiver means for receiving said signal and for decoding said identification data;

at least one element made of a material, having at least one of a magnetic property and electric property being affected by an external magnetic field, being arranged within said transponder unit;

means for generating said magnetic field being provided at an interrogation zone to affect elements located in said interrogation zone; and

processing means being provided in said transponder unit for modifying said signal in dependence of the magnetic field affecting said at least one element.

5,557,086

GAME MACHINE SYSTEM WITH MONEY-PROCESSING STATION

Ullrich Schulze, Wiesbaden; Horst Niederlein, and Hans-Joachim Pickardt, both of Bingen, all of Germany, assignors to NSM Aktiengesellschaft, Bingen, Germany

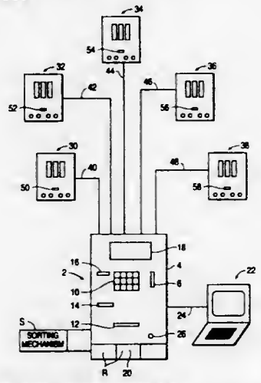
PCT No. PCT/DE93/00178, § 371 Date Aug. 22, 1994, § 102(e) Date Aug. 22, 1994, PCT Pub. No. WO93/17403, PCT Pub. Date Sep. 25, 1993

PCT Filed Feb. 25, 1993, Ser. No. 290,948

Claims priority, application Germany, Feb. 26, 1992, 42 05 791.4

Int. Cl.[6] G06K *5/00*

U.S. Cl. 235—380 **18 Claims**



1. A game machine system comprising:

a plurality of game machines networked with one another and adapted to be used with a single encoded user card, each of the game machines including:

a reading device for reading an encoded user card; and

a display for displaying a credit value read from the encoded user card inserted into a corresponding reading device, the display being adapted to display the credit value in graduated form;

a safe like housing structurally separate from the plurality of game machines; and

a computer-controlled money processing device disposed in the housing and networked with the game machines, the money processing device including:

a money deposit unit adapted to receive money therethrough;

means operatively associated with the money deposit unit for storing a credit value belonging to a user based on the money deposited through the money deposit unit;

a stock of user cards operatively associated with the money deposit unit, the user cards being chip cards each having a non volatile chip memory and being value coded;

an encoding device operatively associated with the stock of user cards for encoding each of the user cards with the credit value belonging to an corresponding user based on the money deposited through the money deposit unit thereby creating an encoded user card;

an acquisition unit operatively associated with the money deposit unit, the means for storing and the encoding device

for acquiring money deposited through the money deposit

5,557,088

for acquiring money deposited through the money deposit unit and allocating the credit value belonging to the corresponding user based on the money deposited through the money deposit unit to both the means for storing and the encoding device for both storage of the credit value by the means for storing and encoding of the credit value onto a user card by the encoding device;

a card dispenser operatively associated with the stock of user cards and adapted to dispense encoded user cards therefrom, the reading device of each of the game machines being adapted to receive an encoded user card dispensed from the card dispenser for reading the encoded user card;

means for releasing, for use by the user, a selected one of the game machines into which an encoded user card has been received, the means for releasing being operatively connected to the reading device of each of the game machines and being responsive to a sufficient credit value read from the encoded user card by the reading device of the selected one of the game machines, the sufficient credit value corresponding to the selected one of the game machines; and

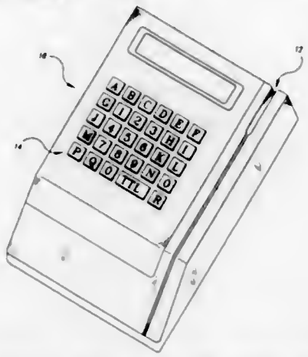
a checking device operatively connected to the means for storing for cyclically updating playing data including game statistics and credit values stored by the means for storing according to playing data transmitted from the selected one of the game machines to the means for storing as a result of use of the selected one of the game machines by the user.

5,557,087

MULTIPLE-MERCHANT CREDIT CARD TERMINAL

Margaret Duyck, 42337 N.W. Greenville Rd., Forest Grove, Oreg. 97116

Filed Apr. 13, 1995, Ser. No. 423,674
Int. Cl.[6] G06F 5/00
U.S. Cl. 235—380 **4 Claims**



1. An improved method of allowing multiple merchants to obtain credit card authorization for customers, comprising:

providing a credit card authorization terminal, the terminal being adapted to obtain data from a credit card and connectable to a credit charge authorizing entity; and

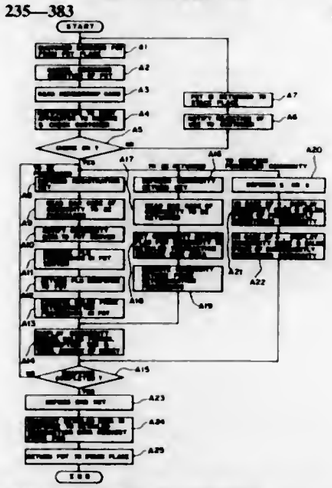
allowing a plurality of merchants to request credit card authorization from the card authorization terminal.

5,557,088

SELF-SCANNING POS SYSTEM, SELF-SCANNING REGISTRATION TERMINAL, CONTROL APPARATUS FOR SELF-SCANNING REGISTRATION TERMINAL AND POS APPARATUS FOR SELF-SCANNING REGISTRATION TERMINAL

Chizu Shimizu; Chizuo Suzuki, and Kyoko Terada, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 29, 1994, Ser. No. 350,984
Claims priority, application Japan, Mar. 14, 1994, 6-042911
Int. Cl.[6] G06K 7/00
U.S. Cl. 235—383 **37 Claims**



1. A self-scanning POS system, comprising:

a POS apparatus including a settlement terminal for effecting final settlement of the accounts for a purchased commodity or commodities;

one or a plurality of self-scanning registration terminals accommodated in said POS apparatus and each including commodity code reading means for reading a commodity code applied to a commodity; and

a control apparatus interposed between said POS apparatus and said self-scanning registration terminal or terminals for communicating commodity purchase information based on commodity code information read by said commodity code reading means of said self-scanning registration terminal or any of said self-scanning registration terminals between the self-scanning registration terminal and said POS apparatus.

5,557,089

CARD READER SYSTEM AND METHOD OF OPERATION

Larry D. Hall, Richardson, and Todd J. Betz, The Colony, both of Tex., assignors to Intellicall, Inc., Carrollton, Tex.

Filed Mar. 3, 1995, Ser. No. 398,579
Int. Cl.[6] G06K 7/06
U.S. Cl. 235—440 **18 Claims**

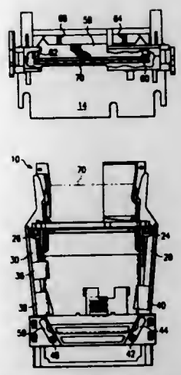
1. A card reader system for use to receive cards as a method of payment, the card reader system comprising:

a frame including a front mounting plate and defining a card path and a card entry point;

a forward gate disposed in the card path and operable to slide out of the card path;

a spring coupled to the frame and to the forward gate and operable to bias the forward gate in a position blocking the card path;

first and second gate skids disposed at opposite ends of the forward gate at the edges of the card path, the first and second



gate skids operable to impact an appropriately sized card simultaneously such that only a card that is sized to impact both the first and second gate skids simultaneously can proceed along the card path past the opened forward gate; and

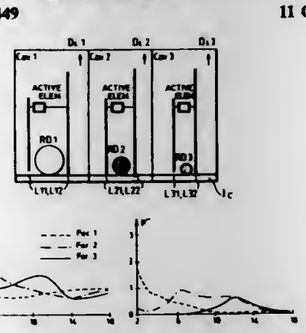
an electric contact board disposed adjacent the card path behind the forward gate, the electric contact board operable to electrically couple to electric contact points on a card having such contact points.

5,557,090

CARD HAVING A FERROMAGNETIC TRACK AND READER THEREFOR

Jean-Pierre Ganne, Orsay; Michèle Labeyrie, Fontenay Aux Roses, and Jean-Claude Dubois, Saint-Remy les Chevreuse, all of France, assignors to THOMSON-CSF, Paris, France

Filed Mar. 9, 1995, Ser. No. 401,251
Claims priority, application France, Mar. 11, 1994, 94 02861
Int. Cl.[6] G06K 7/08
U.S. Cl. 235—449 **11 Claims**



1. A magnetic card comprising a track on which elements are positioned, each comprising a ferromagnetic material M_i resonating at a microwave frequency fo_i and therefore absorbing the microwaves in a band B_i centered on the resonance frequency fo_i.

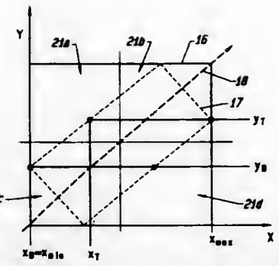
5,557,091

METHOD AND SYSTEM FOR BAR CODE IMAGE PROCESSING

Larry Krummel, 13750 Serracaks, Saratoga, Calif. 95070

Filed Apr. 15, 1994, Ser. No. 228,032
Int. Cl.[6] G06K 7/10
U.S. Cl. 235—462 **13 Claims**

13. An apparatus for establishing the presence, position and skew of at least one bar code on a document, wherein the bar code,



if present, is made up of a series of adjacent but spaced apart dark and light bars which together define a specific outer peripheral configuration, said method comprising the steps of:

(a) means for generating a bit map of the information including a bar code that might be present;

(b) means for acting on said bit map in a way which detects one or more blocks of said information which are present and which corresponds in shape to the specific configuration or configurations of said bar code;

(c) means for analyzing said block or blocks of bit map information, if present, to determine if any one thereof corresponds to a bar code; and

(d) means for each bar code that is found, reading the information therefrom regardless of the orientation of such bar code with respect to the top edge of the document, said means including:

means for determining the magnitude of the skew of said bar code with respect to the top edge of the document; and

means for determining whether the orientation of the skew with respect to the top edge of the document is upward or downward by:

dividing said block into quadrants;

counting the pixels in each of said quadrants; and

applying a set of inequalities to determine if the orientation is upward or downward.

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APPARATUS AND METHOD FOR 16-BIT AND NUMERIC DATA COLLECTION USING BAR CODE SYMBOLOGIES

Sprague Ackley, Seattle, and Stephen Choi, Kirkland, both of Wash., assignors to Intermec Corporation, Everett, Wash.

Continuation-in-part of Ser. No. 147,376, Nov. 5, 1993, abandoned. This application Aug. 24, 1994, Ser. No. 295,382
Int. Cl.[6] G06K 7/10
U.S. Cl. 235—462 **20 Claims**

Step 110	Step 112	Step 114	Step 116		
The Kanji Character in Ideograph	The Character in JISC 6226-1983 code in Hex	JIS code in decimal = 43*(1) + 43(T) + (S)	Code 93 for 1	Code 93 for T	Code 93 for S
情	3270	15,504 = 43*(8) + 43(27) + (39)	"J" value=8	"B" value=27	"Y" value=39
報	4173	19,939 = 43*(10 + 43(18) + (19)	"J" value=1	"S" value=13	"J" value=19
事	3B76	15,222 = 43*(8) + 43(18) + (8)	"J" value=8	"J" value=18	"J" value=8
業	3E40	17,895 = 43*(7) + 43(22) + (7)	"J" value=7	"W" value=22	"J" value=7

1. A method of converting a selected human readable character to machine readable symbols, each symbol having a pattern of dark shapes and light spaces between the shapes, the selected human readable character being represented by a character code having at least 16 bits, the method comprising the steps of:

selecting a single human readable character from a character set of human readable characters, the character set of having more than 6,400 human readable characters;

determining a selected character code having at least 16 bits for the selected human readable character, wherein each human

said intersection of said rotational axis and said central reference axis defining a central reference plane extending along

each scan line in said fifth group of scan lines being substantially parallel to each other scan line in said fifth group of

5,557,095

SYSTEM FOR ENABLING DECODING OF BAR CODE AND OTHER SYMBOLS WITH A DIGITAL

determining a selected character code having at least 16 bits for the selected human readable character, wherein each human readable character in the character set has a corresponding character code;

computing at least first, second and third values from the selected character code;

converting each of the first, second and third values into corresponding first, second and third symbol codes, the first, second and third symbol codes being selected from a symbol set of machine readable symbols, wherein each symbol in the symbol set has a corresponding symbol code, and wherein the character set is substantially larger than the symbol set; and

printing first, second and third symbols corresponding to the first, second and third symbol codes, respectively.

5,557,093

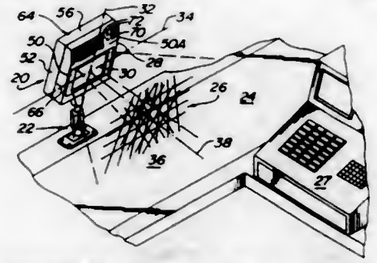
COMPACT PROJECTION LASER SCANNER FOR PRODUCING A NARROWLY CONFINED SCANNING VOLUME FOR OMNI-DIRECTIONAL SCANNING OF CODE SYMBOLS THEREIN, WHILE PREVENTING UNINTENTIONAL SCANNING OF CODE SYMBOLS ON NEARBY OBJECTS

Carl H. Knowles, Moorestown; Charles A. Naylor, Sewell, and David P. Bubnoski, Moorestown, all of N.J., assignors to Metrologic Instruments, Inc., Blackwood, N.J.

Continuation of Ser. No. 36,314, Mar. 24, 1993, abandoned, which is a continuation of Ser. No. 580,738, Sep. 10, 1990, Pat. No. 5,216,232. This application Dec. 28, 1994, Ser. No. 365,193

Int. Cl.[6] G06K *7/10*

U.S. Cl. 235—462 **12 Claims**



1. A projection laser scanner for producing a narrowly confined scanning volume for scanning code symbols presented therein, while preventing unintentional scanning of code symbols on nearby objects located outside thereof, said projection laser scanner comprising:

(a) a compact housing having a light transmission window with a substantially planar extent through which laser light can exit said compact housing and travel towards an object bearing a code symbol, reflects therefrom, travel back through said light transmission window, and enter said compact housing;

(b) an optical bench fixedly mounted in said compact housing and having a central reference axis extending along the longitudinal extent of said optical bench;

(c) a laser beam producing means disposed within said compact housing and fixedly mounted with respect to said optical bench for producing a laser beam;

(d) a laser beam sweeping means disposed within said compact housing and mounted with respect to said optical bench for rotation about a rotational axis intersecting said central reference axis;

said laser beam sweeping means having at least first, second and third rotating light reflective surfaces each being disposed at a different acute angle with respect to said rotational axis, for sweeping the laser beam about said rotational axis along a plurality of different paths, and

said intersection of said rotational axis and said central reference axis defining a central reference plane extending along the longitudinal extent of said optical bench;

(e) a stationary array of at least first, second, third, fourth and fifth stationary light reflective surfaces disposed within said compact housing substantially under said light transmission window and fixedly mounted with respect to said optical bench,

said first stationary light reflective surface having a transverse axis extending substantially perpendicularly with respect to said central reference plane,

said second and third stationary light reflective surfaces being symmetrically disposed on opposite sides of said central reference plane, respectively, and immediately adjacent said first stationary light reflective surface, and

said fourth and fifth stationary light reflective surfaces being symmetrically disposed on opposite sides of said central reference plane, and immediately adjacent said second and third light reflective surfaces, respectively, and adjacent said laser beam sweeping means;

(f) a light collection subsystem disposed within said compact housing and fixedly mounted with respect to said optical bench, said light collection subsystem including

(1) a light collection mirror fixedly mounted along said central reference plane, at a height above and immediately adjacent said first stationary light reflective surface and allowing the laser beam produced from said laser-beam producing means to pass from said light collection mirror, substantially along said central reference plane, directly to said laser beam sweeping means, for sweeping said laser beam about said rotational axis thereof along said plurality of different paths, and

(2) light receiving means for receiving light from said light collection mirror at a height above said laser beam sweeping means and at a point substantially within said central reference plane, and detecting the intensity of said received light and producing an electrical signal indicative of said detected intensity;

(g) signal processing means disposed within said compact housing, for processing said electrical signal;

(h) control means disposed within said compact housing for controlling the operation of said laser beam producing means and said laser beam sweeping means so that, during scanner operation, the laser beam produced from said laser beam producing means passes from said light collection mirror, substantially along said central reference plane, directly to said first, second and third rotating light reflective surfaces of said laser beam sweeping means, and as the laser beam reflects off said first, second and third rotating light reflective surfaces the laser beam is repeatedly swept across said first, second, third, fourth and fifth stationary reflective surfaces thereby producing first, second, third, fourth and fifth groups of plural scan lines, respectively, which are projected out through said light transmission window and intersect about a projection axis extending from said light transmission window, and within a narrowly confined scanning volume extending from adjacent said light transmission window to at least about six inches therefrom so as to produce a highly collimated projected scanning pattern within said narrowly confined scanning volume, by which a code symbol can be scanned omni-directionally while preventing unintentional scanning of code symbols on objects located outside of said narrowly confined scanning volume,

each scan line in said first group of scan lines being substantially parallel to each other scan line in said first group of scan lines,

each scan line in said second group of scan lines being substantially parallel to each other scan line in said second group of scan lines,

each scan line in said third group of scan lines being substantially parallel to each other scan line in said third group of scan lines,

each scan line in said fourth group of scan lines being substantially parallel to each other scan line in said fourth group of scan lines,

each scan line in said fifth group of scan lines being substantially parallel to each other scan line in said fifth group of scan lines,

whereby when the code symbol is presented to the highly collimated projected scanning pattern within said narrowly confined scanning volume, the code symbol is scanned within said highly collimated projected scanning pattern and at least a portion of the laser light reflected from said scanned code symbol is directed through said light transmission window, reflected off said first, second, third, fourth and fifth stationary light reflective surfaces, reflected off said first, second and third rotating light reflective surfaces of said laser beam sweeping means, collected by said light collection mirror, and received by said light receiving means for detection, whereupon said electrical signal is produced for use in decode signal processing; and

(i) said compact housing including a base means for supporting said optical bench with respect to a counter surface so that said highly collimated projected scanning pattern is projected above said counter surface for scanning the code symbol presented to said highly collimated projected scanning pattern.

5,557,094

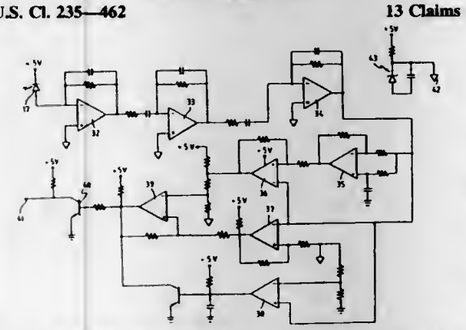
FALSE-TRANSITION INHIBITOR CIRCUIT FOR A BAR CODE READER

Edward Barkan, New York, N.Y., assignor to Symbol Technologies Inc, Holtsville, N.Y.

Division of Ser. No. 56,878, May 5, 1993, Pat. No. 5,410,139, which is a continuation of Ser. No. 47,340, Apr. 19, 1993, Pat. No. 5,268,564, which is a continuation of Ser. No. 772,745, Oct. 7, 1991, abandoned, which is a continuation of Ser. No. 562,130, Aug. 3, 1990, Pat. No. 5,151,580. This application Apr. 20, 1995, Ser. No. 425,808

Int. Cl.[6] G06K *7/10*

U.S. Cl. 235—462 **13 Claims**



1. A false-transition inhibitor circuit for a bar code reader producing a detection signal from a scan of a bar code, a first derivative signal related to the first derivative of the detection signal, and a peak signal indicating peaks of the detection signal, the inhibitor circuit comprising:

an inhibitor comparator, for receiving the first derivative signal at a first input and a feedback signal at a second input, and for setting and outputting an inhibition signal in a blocking state when the first derivative signal is within a threshold range by comparing the first derivative signal and the feedback signal;

a resistor network including a first resistor connected between an output of the inhibitor comparator and the second input of the inhibitor comparator and a second resistor connected between the second input of the inhibitor comparator and ground, for outputting the feedback signal to the second input of the inhibitor comparator; and

a latch comparator for preventing the transmission of the peak signal when the inhibition signal is in the blocking state.

5,557,095

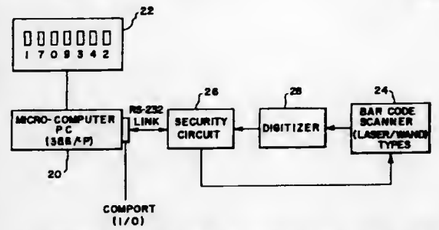
SYSTEM FOR ENABLING DECODING OF BAR CODE AND OTHER SYMBOLS WITH A DIGITAL MICROCOMPUTER CONNECTED VIA THE INPUT/OUTPUT PORT THEREOF TO THE SCANNER

Timothy J. Clark, Orange, and Shoeb Ansari, Garden Grove, both of Calif., assignors to PSC Inc., Webster, N.Y.

Continuation of Ser. No. 283,923, Aug. 1, 1994, abandoned, which is a continuation of Ser. No. 59,796, May 10, 1993, abandoned. This application May 18, 1995, Ser. No. 443,549

Int. Cl.[6] G06K *7/10*

U.S. Cl. 235—462 **3 Claims**



1. A computer system operable as a platform for symbol reading scanners so that the computer controls a scanner and processes data from the scanner representing symbols read by the scanner for decoding the symbols into information corresponding thereto, said system comprising:

a general purpose computer separate from the scanner and having a communications port connectable to the scanner for receiving undecoded data representing the symbols via a communications link between the scanner and the port;

means in said computer responsive to said communications over said link indicating that the scanner is in data communicating relationship with said computer over said link and that said computer is ready to decode the data;

means in said computer for transmitting and receiving commands necessary for controlling the scanner;

means for translating said data into a format for decoding; and

means connected in said link for preventing unauthorized transfer of data into and out of said computer.

5,557,096

MULTIPLE SHEET ELECTRONIC DELIVERY TAG

Atsushi Watanabe, Toyokawa; Hitoshi Kamiya, Hekinan; Eiji Nakada, Kariya; Tomoaki Mizuno, Toyoake; Yoshiyuki Kago, Nishio; Tokutaro Murase, Obu, and Yoshihiko Inukai, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Division of Ser. No. 878,787, May 5, 1992, Pat. No. 5,340,968. This application Mar. 22, 1994, Ser. No. 215,711

Claims priority, application Japan, May 7, 1991, 3-101532; May 10, 1991, 3-105945; May 30, 1991, 3-127635; May 30, 1991, 3-127636; May 21, 1991, 3-116277; May 23, 1991, 3-118718; May 23, 1991, 3-118720; May 24, 1991, 3-120373; May 24, 1991, 3-120374; May 17, 1991, 3-113149; May 29, 1991, 3-126246; Jun. 6, 1991, 3-135004; Jun. 6, 1991, 3-135005; Jun. 14, 1991, 3-143357; Nov. 25, 1991, 3-308921; Dec. 12, 1991, 3-328958

Int. Cl.[6] G06K *19/08*

U.S. Cl. 235—492 **28 Claims**

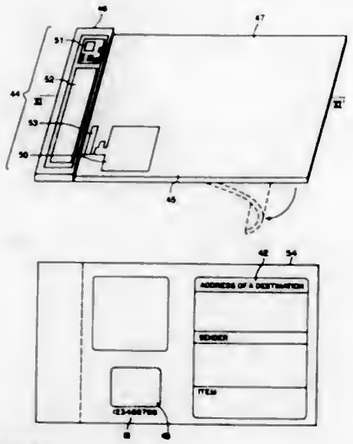
1. An electronic tag apparatus comprising:

a first sheet with at least a portion for filling in codes including written codes;

a second sheet for copying at least part of said written codes when filled in said first sheet;

a third sheet embedding a receiving/transmitting structure responsive to at least one of said codes, said receiving/transmitting structure comprising:

an antenna,



a modulator,

a demodulator, and

a signal processing unit storing therein an information code comprising:

fixed data including ID information, said fixed data being printed on at least one of said first sheet, said second sheet, and said third sheet, and

a variable code including delivery information; and

means for printing said information code on at least one of said first sheet, said second sheet, and said third sheet.

5,557,097

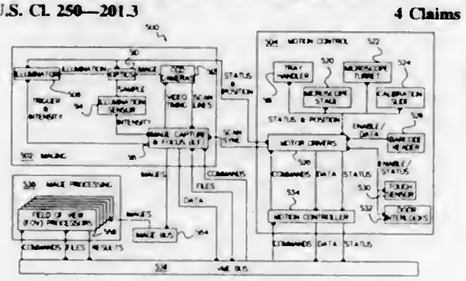
CYTOLOGICAL SYSTEM AUTOFOCUS INTEGRITY CHECKING APPARATUS

William E. Ortyn, Devall; Jon W. Hayenga, and Louis R. Piloco, both of Kent, all of Wash., assignors to NeoPath, Inc., Redmond, Wash.

Filed Sep. 20, 1994, Ser. No. 309,130

Int. Cl.[6] G02B *7/28;* **H04N** *7/18;* **G01M** *11/02*

U.S. Cl. 250—201.3 **4 Claims**



1. An automated method for checking cytological system autofocus integrity, the automated method comprising the steps of:

a) checking autofocus system illumination quality;

b) checking autofocus system frequency response;

c) checking autofocus system component position quality; and

d) checking autofocus system closed loop accuracy.

5,557,098

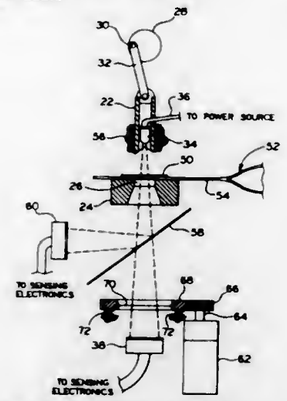
SYSTEM TO IDENTIFY BAGS DISINFECTED BY IRRADIATION WHICH PUNCHES HOLES IN A POLARIZED PORTION OF THE BAG TO INDICATE PROCESSING THEREOF

Edmund D. D'Silva, Vernon Hills, Ill., assignor to Baxter International Inc., Deerfield, Ill.

Filed Dec. 20, 1994, Ser. No. 359,662

Int. Cl.[6] H01J *40/14*

U.S. Cl. 250—222.1 **23 Claims**



1. A system for detecting status of a container having an interior holding a product requiring the product to be subjected to a process, the system comprising:

a housing defining an interior;

a tray on which the container is placed wherein the tray is insertable into the interior of the housing;

a light source positioned to transmit a beam of light through the container in the housing; and

a sensor constructed and arranged to detect the beam of light and its intensity; and

means for punching holes through the container wherein the means for punching holes has an interior capable of receiving the light source to emit the beam of light therefrom.

5,557,099

SIGNAL DEVICE FOR TURBO-ENGINES USING AN OPTICAL PROBE WITH AN ELLIPTICAL SHAPED LIGHT BEAM

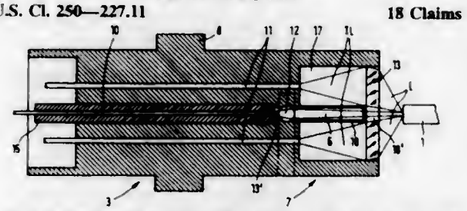
Michael Zielinski, Unterschleissheim, and Gerhard Ziller, Dachau, both of Germany, assignors to MTU Motoren- Und Turbinen-Union Muenchen GmbH, Munich, Germany

Filed Dec. 27, 1994, Ser. No. 364,096

Claims priority, application Germany, Dec. 24, 1993, 43 44 650.7

Int. Cl.[6] G01J *1/04*

U.S. Cl. 250—227.11 **18 Claims**



1. A signal device for use with a turbo-engine having moving blades with free end faces on a rotor which pass through a defined circumferential position relative to a housing, said signal device generating timing signals at exact points in time at which said moving blades pass through said defined circumferential position, the device comprising:

a probe having a head end with a recess formed therein, said head end fixing the probe on the housing radially at a distance with respect to said free end faces, said probe including an axially central transmitting fiber optic waveguide and axially receiving fiber optic waveguides arranged separately and spaced apart from said axially central transmitting fiber optic waveguide so as to end on one side at a bottom of said recess;

wherein the probe further comprises a cylinder lens which is optically connected in front of the axially central transmitting fiber optic waveguide, and a substantially diffusely scattering cover disk including a central optically polished disk section, said substantially diffusely scattering cover disk covering said recess constructed on the head end of said probe;

wherein the cylinder lens focusses a luminous beam from said transmitting fiber optic waveguide into an illuminating beam having an elliptical cross-section, said illuminating beam passing through said recess and said central optically polished disk section such that an elliptical spot is imaged onto each passing free end face of said moving blades, said elliptical spot having its large axis aligned substantially parallel to one of a delivery side and suction side edge of the free end faces;

wherein the probe further comprises a coaxially tube-shaped screen arranged in said recess, the illuminating beam focussed by the cylinder lens passing through said recess within said coaxially tube-shaped screen;

wherein a portion of the illuminating beam reflected off said free end faces is coupled through said diffusely scattering cover disk and the recess into the receiving fiber optic waveguides;

an optical receiver which receives the reflected light coupled in sequences into the receiving fiber optic waveguides; and

a trigger unit coupled to said optical receiver for converting the reflected light sequences into electrical signals.

5,557,100

FLATNESS-MEASURING ROLLER FOR A CONTINUOUSLY MANUFACTURED STRIP BY ANALYZING THE BIREFRINGENCE CAUSED BY THE APPLICATION OF LATERAL FORCE TO AN OPTICAL FIBER WRAPPED AROUND THE ROLLER

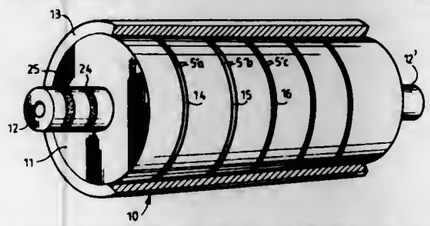
François Jeuniaux, Sancy, and Jean-Luc Mineau, Metz, both of France, assignors to Sollac, Puteaux, France

Continuation of Ser. No. 244,207, Jul. 28, 1994, abandoned. This application Nov. 20, 1995, Ser. No. 561,119

Claims priority, application France, Dec. 2, 1991, 91 14912

Int. Cl.[6] G01J *1/04*

U.S. Cl. 250—227.16 **11 Claims**



1. A roller for measuring the flatness of a continuously produced strip, the roller being rotatably mounted about its axis, the roller comprising:

a hollow cylindrical continuous surface, a jacket and two hollow journals;

a force-measuring device having at least one optical fiber using the birefringence appearing in a monomode optical fiber subjected to a lateral force, said at least one optical fiber forming at least one winding with at least one turn which is continuous about the cylindrical surface, and being placed in contact with the jacket in such a way as to be subjected to a mechanical stress generated by a pressure of the strip on the jacket.

5,557,101

REEL TABLE REVOLUTION DETECTOR FOR USE IN A VIDEO CASSETTE RECORDER

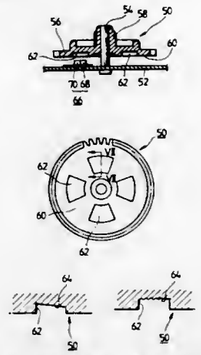
Jae-Kyu Choi, Kyongki-Do, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Sep. 9, 1993, Ser. No. 119,338

Claims priority, application Rep. of Korea, Sep. 9, 1992, 92-17190

Int. Cl.[6] G01D *5/34;* **H01J** *3/14*

U.S. Cl. 250—231.13 **4 Claims**



1. A reel table revolution detector for use in a video cassette recorder, comprising:

a disc-like table adapted to rotatably support a tape reel thereon, said reel table having a reflective underneath surface and an array of concentric spaced-apart cutouts uniformly disposed on the reflective surface along a common imaginary circle whose center coincides with a rotational axis of the tape reel, each of said cutouts having a light scattering surface capable of reducing the intensity of a light beam incident thereupon to an appreciable level, wherein said light scattering surface is axially offset a predetermined distance from the reflective underneath surface of the reel table and wherein said cutouts are disposed in a spacing that accomodates therein alternate light reflection regions of substantially the same width as that of the cutouts;

a light emitter located in an opposing relationship with respect to the reel table for projecting the light beam toward the reflective underneath surface and the light scattering surface of the reel table; and

a light receiver positioned adjacent to the light emitter for receiving the light beam reflected back from the reel table to produce a pulse signal when the intensity of the received light beam fluctuates over time in a pulse pattern.

5,557,102

TESTING APPARATUS FOR THE CALIBRATION OF OVERHEATING AND RAIL BRAKE LOCATING DEVICES

Othmar Saria, Zeltweg, Austria, and Karl H. Schmall, Baden-Baden, Germany, assignors to VAE Aktiengesellschaft, Vienna, Austria

Filed Mar. 2, 1995, Ser. No. 397,692

Claims priority, application Austria, Mar. 2, 1994, A449/94

Int. Cl.[6] G01D *18/00*

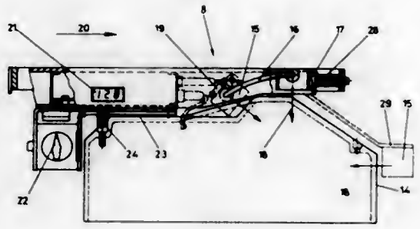
U.S. Cl. 250—252.1 **9 Claims**

1. A testing apparatus for the calibration of overheating and rail brake locating devices, comprising:

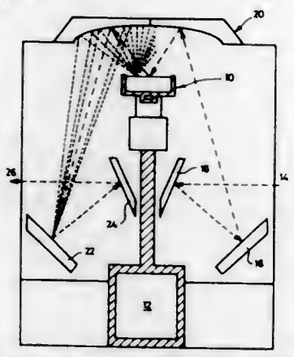
a housing containing a curved track:

means for selectably positioning an IR emitter along said track to adjust the position of said emitter with respect to a device being tested; and

means for fixing said emitter at a selected position on said track.



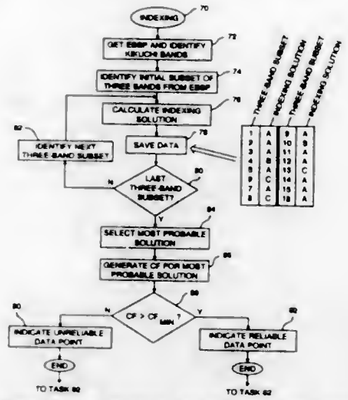
5,557,103
METHOD OF ANALYZING DRILLING FLUIDS
Trevor L. Hughes, Cherry Hinton; Hemant K. J. Ladva, Cambridge, and Peter V. Coveney, Epping, all of United Kingdom, assignors to Dowell, a division of Schlumberger Technology Corp., Houston, Tex.
Filed Dec. 14, 1994, Ser. No. 355,796
Claims priority, application United Kingdom, Dec. 17, 1993, 9325885
Int. Cl.[6] G01N *21/35;33/24*
U.S. Cl. 250—255 **7 Claims**



1. A method of quantitative analysis of free organic components in a drilling fluid containing both solid and liquid components, the method comprising the steps of:
separating solid and liquid components of the drilling fluid using a non-filtering technique;
taking a sample of the liquid components;
mixing said sample with a solution of an inorganic carrier;
analyzing the resulting mixture using infrared spectroscopy so as to determine the amount of organic components in the mixture; and
deriving the amount of free organic components in the drilling fluid from this analysis.

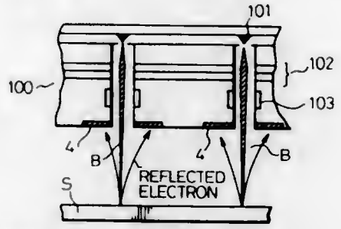
5,557,104
METHOD AND APPARATUS FOR DETERMINING CRYSTALLOGRAPHIC CHARACTERISTICS IN RESPONSE TO CONFIDENCE FACTORS
David P. Field, Pleasant Grove, and David J. Dingley, Provo, both of Utah, assignors to Texsem Laboratories, Inc., Provo, Utah
Filed Oct. 24, 1995, Ser. No. 547,299
Int. Cl.[6] G01N *23/203*
U.S. Cl. 250—307 **23 Claims**

1. A method for determining crystallographic characteristics of a specimen, said method comprising the steps of:
(a) obtaining a plurality of indexing solutions for a crystal within said specimen;



(b) selecting a most probable solution from said plurality of indexing solutions;
(c) generating a confidence factor for said most probable solution, said confidence factor being responsive to at least two of said indexing solutions; and
(d) producing a report associated with said crystal, said report being responsive to said confidence factor.

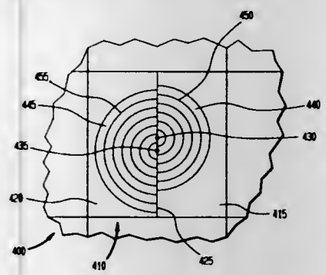
5,557,105
PATTERN INSPECTION APPARATUS AND ELECTRON BEAM APPARATUS
Ichiro Honjo; Kenji Sugishima, and Masaki Yamabe, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Continuation of Ser. No. 190,575, Feb. 2, 1994, which is a continuation of Ser. No. 975,368, Nov. 16, 1992, which is a continuation-in-part of Ser. No. 897,451, Jun. 10, 1992. This application Oct. 11, 1994, Ser. No. 320,377
Claims priority, application Japan, Jun. 10, 1991, 3-137692; Sep. 20, 1991, 3-241549; Nov. 14, 1991, 3-298838; Nov. 29, 1991, 3-316676; Sep. 18, 1992, 4-251233
Int. Cl.[6] H01J *37/06;37/244*
U.S. Cl. 250—310 **7 Claims**



1. A pattern inspection apparatus, comprising:
a plurality of electron emitters, formed on an individual substrate disposed one- or two-dimentionally on a same substrate or in a same plane,
there being provided for each of said electron emitters:
an extraction electrode which extracts from said electron emitter a charge particle beam having a beam current corresponding to an electrode voltage, with respect to each one of said plurality of electron emitters;
a converging electrode for converging said charged particle beam at a convergence ratio corresponding to the electrode voltage or energization current;
a deflection electrode for deflecting said charged particle beam at a deflection angle corresponding to said electrode voltage or energization current;

a beam shaping electrode for correcting the misalignment between the axis of said charged particle beam and the central axis of said converging electrode to shape said charged particle beam; and
a detector operable to detect all of or part of respective secondary or backscattered electrons from the surface of an inspection sample exposed to the converged and deflected charged particle beam or transmitted electrons passing through said inspection sample;
wherein said apparatus is further characterized in that said apparatus being also provided with a means for adjusting said electrode voltage applied to said extraction electrode, converging electrode, deflection electrode and beam shaping electrode.

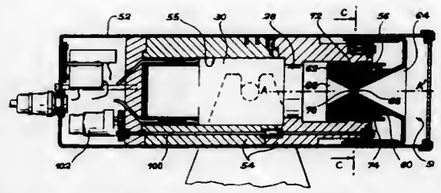
5,557,106
RODENT DISCRIMINATOR LENS
Frank Ioco, Brentwood, N.Y., assignor to Alarm Device Manufacturing Co., Syosset, N.Y.
Filed Aug. 15, 1995, Ser. No. 515,764
Int. Cl.[6] G02B *3/08;* **G01J** *5/08*
U.S. Cl. 250—353 **24 Claims**



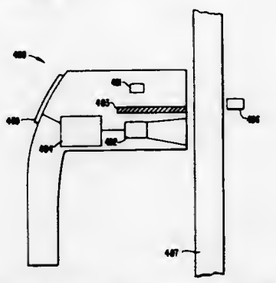
1. A lens for a passive infrared device, comprising:
a first portion having a first optical axis, the first optical axis having an azimuth, and a first elevation, the first portion being configured to monitor a first field of view,
a second portion having a second optical axis and being separated from the first portion by a separation axis, the second optical axis having the azimuth, and a second elevation different from the first elevation, the second portion being configured to monitor a second field of view, and the first and second optical axes being on the separation axis, wherein the second optical axis is offset from the first optical axis, and wherein the first field of view is adjacent to the second field of view at a target distance.

5,557,107
DEVICE FOR THE REAL TIME LOCATION OF RADIATION SOURCES
Hurbert Carcreff, Cressely, and Gilles Theilier, Evry, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France
Filed Mar. 13, 1995, Ser. No. 402,958
Claims priority, application France, Mar. 21, 1994, 94 03279
Int. Cl.[6] G01T *1/29*
U.S. Cl. 250—361 R **16 Claims**

1. Device for the real time location of radiation sources, liable to be located in an area, said device comprising a pinhole camera, whose wall forms a shield with respect to the radiation of the sources, a collimator, means for obturating the pinhole camera, a phosphor screen, transparent in the luminous range and able to convert the radiation of the sources into a light radiation, the obturating means being on the one hand transparent to the radiation of the sources and on the other are able to prevent the light from the area reaching the screen, a camera which is optically coupled to the screen and able to supply, in the form of electrical signals, an image of the sources, as a result of the light radiation which it receives from the screen, and an image of the area, as a result of the light which it receives from the said area through the screen when the obturating means are open, the sensitivity of the camera being adequate for it to obtain an acceptable image of the sources, for a given efficiency of the screen with respect to the detection of the radiation, the images being superimposable and visible due to the means for the processing and display of the electrical signals, characterized in that the collimator comprises two half-collimators rotatable about a common rotation (AA') axis, each half-collimator comprising:
a first aperture having a maximum size (or width) D1, a second aperture having a maximum size (or width) D2, with D2<D1, said apertures being centered on the common rotation axis, the second aperture being located in a planar surface (P, P') perpendicular to said axis,
a circular arc spotfacing of angle α centered on the common rotation axis (AA') and issuing into the surface containing the second aperture,
a pin which can be incorporated into the circular arc spotfacing of the other half collimator,
and in that the obturating means are in the form of a lamella located between the two planar surfaces and extending from one pin to the other, each pin passing through a hole in the lamella, the latter having an adequate width to be able to entirely obturate the two second apertures.



5,557,108
INTEGRATED SUBSTANCE DETECTION AND IDENTIFICATION SYSTEM
Tümay Tümer, 107 Sweetwood Ct., Riverside, Calif. 92507
Continuation-in-part of Ser. No. 143,417, Oct. 25, 1993, Pat. No. 5,446,288. This application Jun. 15, 1995, Ser. No. 490,959
Int. Cl.[6] G01T *3/00;1/00*
U.S. Cl. 250—390.04 **27 Claims**



1. A method for identifying substances disposed behind a barrier having a front, said method comprising the steps of:
positioning a radioactive source on the front side of the barrier, said source providing a flux of gamma rays and fast neutrons;
positioning a detector near said source, said detector capable of measuring a flux of scattered gamma rays and generating a gamma ray output signal corresponding to a magnitude of said scattered gamma rays, and said detector capable of mea-

suring a flux of scattered neutrons and generating a neutron output signal corresponding to a magnitude of said scattered

suring a flux of scattered neutrons and generating a neutron output signal corresponding to a magnitude of said scattered neutrons; and

comparing the magnitude of said detector output signals to determine the identity of substances disposed behind said barrier.

5,557,109

RADIATION STERILIZATION UNIT

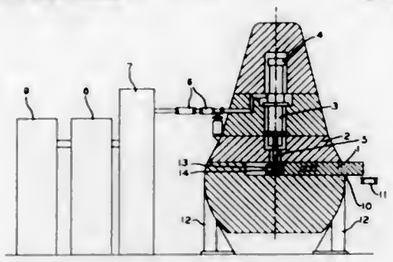
Sergei V. Bidnyy, Moscow; Alexander A. Zavadtsev, Reutov; Emmanuel A. Mirochnik, Moscow; Alexander V. Mishchenko, Moscow; Vitaly M. Pirozhenko, Moscow, and Igor V. Radchenko, Moscow, all of Russian Federation, assignors to International Research and Development, Auburn, Ind.

Filed Oct. 24, 1994, Ser. No. 327,620

Claims priority, application Russian Federation, Nov. 1, 1993, 93049757

Int. Cl.[6] H01J *37/30*

U.S. Cl. 250—455.11 11 Claims



1. A radiation sterilization apparatus comprising:

an electron injector;

an electron accelerator coupled to said injector;

an electron beam deflecting system coupled to said accelerator for directionally deflecting accelerated electrons;

shielding surrounding said injector, accelerator and deflecting system for blocking radiation;

a cavity in said shielding;

a linearly movable manipulator selectively received and movable in and out of said cavity, whereby products to be irradiated are placed in the field of accelerated electrons; and,

wherein said manipulator has a width sufficient to fill said cavity during irradiation of products, whereby said manipulator blocks dangerous levels of radiation from exiting through said cavity.

5,557,110

APERTURE ELECTRON BEAM SYSTEM FOR PATTERN WRITING

Katsuyuki Itoh, Tokyo, Japan, assignor to NEC Corporation, France

Filed Jan. 19, 1995, Ser. No. 375,487

Claims priority, application Japan, Jan. 19, 1994, 6-18995

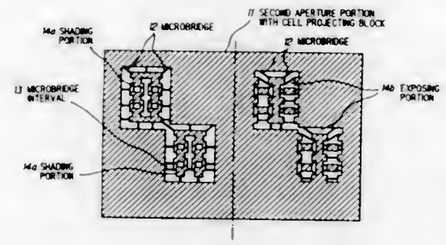
Int. Cl.[6] H01J *37/09*

U.S. Cl. 250—492.23 6 Claims

1. An aperture with a cell projecting block for use in an electron beam system with pattern writing capability comprising:

at least one window-like opening cut through a plate-shaped mask; and

a plurality of isolated patterns supported by microbridges with widths smaller than a limitation of resolution of the electron beam.



5,557,111

Patent Not Issued For This Number

5,557,112

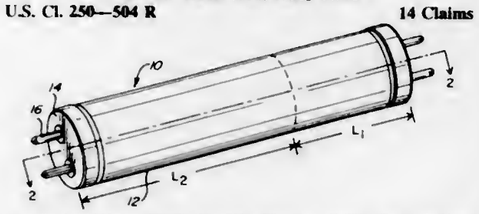
DUAL RADIATION ULTRAVIOLET LAMP

George Csoknyai, Orange, Conn., and Arpad L. Pirovic, Montvale, N.J., assignors to Light Sources, Inc., Milford, Conn.

Filed Jul. 21, 1995, Ser. No. 505,605

Int. Cl.[6] A61N *5/06*; H01J *61/48*

U.S. Cl. 250—504 R 14 Claims



1. A fluorescent lamp having multiple zones with different ultraviolet radiation characteristics along its length comprising:

(a) a tube;

(b) a first fluorescent coating on the interior of said tube adapted to produce ultraviolet radiation of substantially uniform intensity and extending over a first finite length of said tube adjacent one end thereof; and

(c) a second fluorescent coating on the interior of said tube extending over a second finite length of said tube adjacent the other end thereof for producing ultraviolet radiation of a substantially uniform intensity and having radiation characteristics different from those of the radiation produced in said first finite length.

5,557,113

METHOD AND STRUCTURE FOR GENERATING A SURFACE IMAGE OF A TREE DIMENSIONAL TARGET

Abigail A. Moorhouse; Christopher R. Fairley, both of San Jose; Phillip R. Rigg, Saratoga, and Alan Heigesson, Mountain View, all of Calif., assignors to Ultrapointe Corp., Santa Clara County, Calif.

Filed Feb. 18, 1994, Ser. No. 198,751

Int. Cl.[6] G01N *21/00*; G01B *11/24*

U.S. Cl. 250—537.38 7 Claims

1. A method for generating an imaging signal representative of a three dimensional surface of a target comprising the steps of

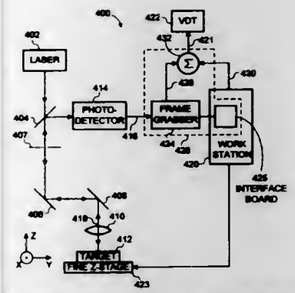
measuring a fixed number of first intensity values, wherein each of said first intensity values corresponds to one of a plurality of positions on the surface of said target, each of said first intensity values being measured at a first height of said target,

storing each of said first intensity values at one of a plurality of addresses within a first memory, each of said plurality of addresses within said first memory corresponding to one of said plurality of positions on the surface of said target,

measuring a fixed number of second intensity values, wherein each of said second intensity values corresponds to one of said plurality of positions on the surface of said target, each of said second intensity values being measured at a second height of said target,

comparing said second intensity values with said first intensity values, such that said second intensity values and said first intensity values which were measured at the same positions on the surface of the target are compared,

overwriting said first intensity values in said first memory with said second intensity values when said second intensity values are greater than said first intensity values.



5,557,114

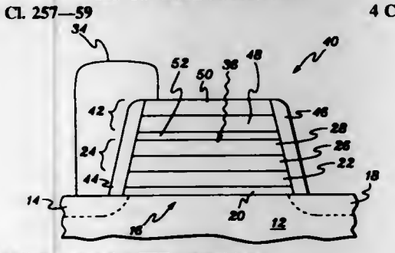
OPTICAL FET

James M. Leas, South Burlington, Vt., and Jack A. Mandelman, Stormville, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 12, 1995, Ser. No. 371,916

Int. Cl.[6] H01L *31/062;31/113*

U.S. Cl. 257—59 4 Claims



4. A light-responsive FET, comprising:

a gate; and

a Schottky diode vertically adjacent said gate, said Schottky diode including a planar junction.

5,557,115

LIGHT EMITTING SEMICONDUCTOR DEVICE WITH SUB-MOUNT

Yukio Shakuda, Kyoto, Japan, assignor to Rohm Co. Ltd., Japan

Filed Aug. 10, 1995, Ser. No. 513,624

Claims priority, application Japan, Aug. 11, 1994, 6-189565; Aug. 18, 1994, 6-194224

Int. Cl.[6] H01L *33/00*

U.S. Cl. 257—81 6 Claims

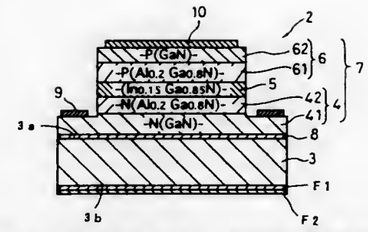
1. A light emitting semiconductor device comprising:

a semiconductor chip; and

a sub-mount assembled with the semiconductor chip;

wherein the semiconductor chip includes: a light-permeable insulating substrate having a support surface and a tail surface opposite to the support surface; a laminate of semiconductor layers formed on the support surface of the insulating substrate, the laminate including at least one N-type layer, a light emitting layer for generating light for emission from the tail surface of the substrate, and at least one P-type layer; at least one anode electrode formed on the P-type layer; and at least one cathode electrode formed on the N-type layer; and

wherein the sub-mount includes an electrically conductive substrate having a mounting surface facing the support surface of the insulating substrate, the mounting surface of the conductive substrate being formed with at least one auxiliary anode electrode which is electrically connected to the conductive substrate and the anode electrode of the semiconductor chip, the mounting surface of the conductive substrate being also formed with at least one auxiliary cathode electrode which is insulated from the conductive substrate but electrically connected to the cathode electrode of the semiconductor chip.



5,557,116

SEMICONDUCTOR LASER DEVICE AND RESIN LAYER

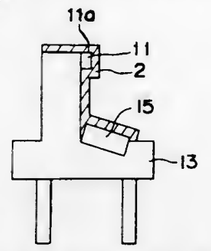
Karsushige Masui; Nobuyuki Miyauchi, both of Nara; Zenpei Tani, Tondabayashi; Hiroshi Chikugawa, Kashihara; Makoto Tsuji, Kitakatsuragi; Masaru Ogawa, Nara, and Takehiro Shiomoto, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 22, 1993, Ser. No. 178,399

Claims priority, application Japan, Dec. 24, 1992, 4-342979; Apr. 30, 1993, 5-104801; May 27, 1993, 5-125751; Jun. 10, 1993, 5-138318

Int. Cl.[6] H01L *33/00*; H01S *3/18*

U.S. Cl. 257—100 14 Claims



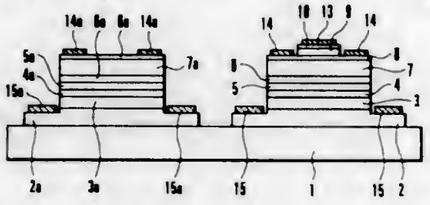
1. A semiconductor laser device including a base, a semiconductor laser chip and a resin layer enclosing the laser chip, said resin layer being made of a single synthetic resin and covering an outwardly oriented beam emitting end face of the laser chip, said resin layer having a thickness not greater than 500 μm and not less than 10 μm and having a surface substantially parallel to the outwardly oriented beam emitting end face of the laser chip.

5,557,117

HETEROJUNCTION BIPOLAR TRANSISTOR AND INTEGRATED CIRCUIT DEVICE USING THE SAME

Yutaka Matsuoka; Eiichi Sano; Kenji Kurishima; Hiroki Nakajima, and Tadao Ishibashi, all of Kanagawa, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed May 11, 1994, Ser. No. 241,189
Claims priority, application Japan, May 12, 1993, 5-132371
Int. Cl.[6] H01L *31/0328*
U.S. Cl. 257—184 **1 Claim**



1. A semiconductor integrated circuit device comprising:
a photoreceiver opto-electro integrated circuit obtained by forming a heterojunction bipolar transistor on a first portion of a semiconductor substrate; and
a pin photodiode formed on a second portion of the semiconductor substrate,
said heterojunction bipolar transistor comprising:
a collector contact having a first semiconductor layer of a first conductivity type and formed on said first portion of the semiconductor substrate;
a collector region stacked on said collector contact,
a base having a second semiconductor layer of a second conductivity type formed on said collector region, and
an emitter having a semiconductor layer of the first conductivity type formed on said base layer,
said collector region including:
a third semiconductor layer,
a fourth semiconductor layer of the second conductivity type having an impurity concentration higher than that of said third semiconductor layer, and
a fifth semiconductor layer of the first conductivity type having a band gap energy higher than that of each of said first and third semiconductor layers and an impurity concentration larger than that of said third semiconductor layer, and lower than that of said first semiconductor layer,
wherein said fifth semiconductor layer, said fourth semiconductor layer, and said third semiconductor layer are sequentially formed on said collector contact, said pin photodiode comprising:
said first semiconductor layer of the first conductivity type formed on said second portion of the semiconductor substrate,
an intermediate layer obtained by sequentially stacking said fifth semiconductor layer, said fourth semiconductor layer, and said third semiconductor layer on said first semiconductor layer, and
said second semiconductor layer of the second conductivity type formed on said intermediate layer.

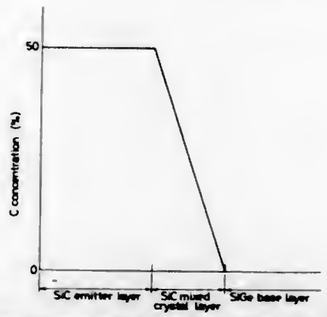
5,557,118

HETERO-JUNCTION TYPE BIPOLAR TRANSISTOR

Takasuke Hashimoto, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 30, 1994, Ser. No. 352,053
Claims priority, application Japan, Dec. 20, 1993, 5-319468
Int. Cl.[6] H01L *31/0328;31/0336;31/0312*
U.S. Cl. 257—197 **3 Claims**

1. A hetero-junction type bipolar transistor having an SiGe base layer and an SiC emitter layer, comprising:
a monocrystalline layer formed between said SiGe base layer and said SiC emitter layer, having a lattice constant between



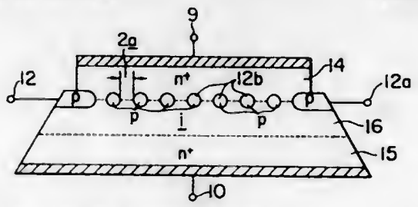
the lattice constant of SiGe and that of SiC, formed within a depletion layer in the emitter-base junction, and being thin enough to be completely depleted, wherein said monocrystalline layer is a mixed SiC crystal layer in which C concentration varies from 0% to 50% from said SiGe base layer toward said SiC emitter layer.

5,557,119

FIELD EFFECT TRANSISTOR HAVING UNSATURATED DRAIN CURRENT CHARACTERISTIC

Jun-ichi Nishizawa, Sendai, Japan, assignor to Handotai Kenkyu Shinkokai, Sendai, Japan

Continuation of Ser. No. 782,789, Oct. 24, 1991, which is a continuation of Ser. No. 303,105, Sep. 17, 1981, abandoned, which is a continuation of Ser. No. 817,052, Jul. 19, 1977, Pat. No. 4,337,473, which is a continuation of Ser. No. 569,741, Apr. 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 413,266, Nov. 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 248,022, Apr. 27, 1972, abandoned. This application May 24, 1995, Ser. No. 449,525
Claims priority, application Japan, Apr. 28, 1971, 46-28405
Int. Cl.[6] H01L *29/808*
U.S. Cl. 257—264 **30 Claims**



1. In a field effect transistor comprising:
a semiconductor region of a first conductivity type,
a source and a drain provided at opposite ends of said semiconductor region, and
gate means of second conductivity type semiconductor material, provided adjacent to said semiconductor region, for defining a channel portion of said semiconductor region and for controlling the flow of drain current between said source and said drain through said channel portion, said channel portion having a length along the direction of flow of said drain current and a width transverse to the direction of flow of said drain current,
said drain and said gate means being adapted to be applied with a drain voltage and a gate bias voltage from external voltage sources, respectively,
the improvement wherein:
said semiconductor region is formed of a semiconductor material having an impurity concentration of less than 10^{15} atoms/cm^3; and
the product of the series resistance and the true transconductance of said field effect transistor is maintained less than one in at

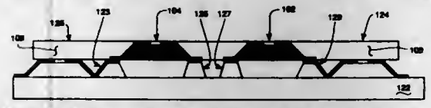
least a portion of the operative state of said transistor in which state a drain current is flowing, to provide substantially throughout said state an unsaturated drain current versus drain voltage characteristic for any operative value of said gate bias voltage,
said series resistance being the sum of the resistance in said source, the resistance from said source to said channel portion and the resistance of said channel portion.

5,557,120

WAFER JOINED OPTOELECTRONIC INTEGRATED CIRCUITS

Eric A. Martin, Medford; Kenneth Vaccaro, Acton; Joseph P. Lorenzo, Stow, and Andrew Davis, Boston, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 274,882, Jul. 14, 1994, Pat. No. 5,472,914.
This application May 17, 1995, Ser. No. 443,915
Int. Cl.[6] H01L *31/062;31/113*
U.S. Cl. 257—291 **17 Claims**



9. Multiple layered integrated circuit apparatus of distinguishable semiconductor material layer compositions comprising:
a first layer substrate of first semiconductor substrate material composition;
a first array of electrical circuit elements received over an upper surface portion of said first layer semiconductor substrate in monolithic relationship therewith and in selected lateral position locations;
said first array of electrical circuit elements including a coplanar plurality of uppermost layer metal film areas laterally dispersed thereon;
a second array of electrical circuit elements, supported in coincident position locations with said selected lateral positions locations and in bonded electrical connection with said coplanar plurality of uppermost layer metal film areas on said first array of electrical circuit elements and said first layer substrate;
said second array of electrical circuit elements including semiconductor devices of a common monolithic, material and epitaxial relationship with each other and of differing monolithic and material relationship with said first array electrical circuit elements; and
said second array of electrical circuit elements also including a semiconductor devices-enclosing layer of transparent epoxy adhesive material disposed in separated parallel physical relationship with said first layer substrate and said first array of electrical circuit elements.

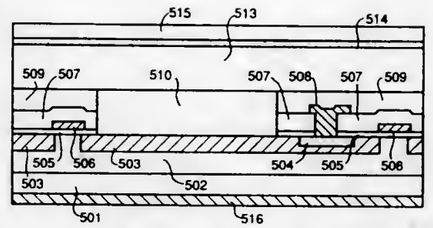
5,557,121

LAMINATED SOLID-STATE IMAGE SENSING APPARATUS AND METHOD OF MANUFACTURING THE SAME

Hiraku Kozuka, Hiratsuka; Shigetoshi Sugawa, Atsugi, and Masato Yamanobe, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 973,953, Nov. 9, 1992, abandoned. This application Feb. 14, 1995, Ser. No. 388,894
Claims priority, application Japan, Nov. 8, 1991, 3-319697; Nov. 6, 1992, 4-321410
Int. Cl.[6] H01L *31/0328;27/148;31/062*
U.S. Cl. 257—292 **16 Claims**

1. A solid-state image sensing apparatus comprising:



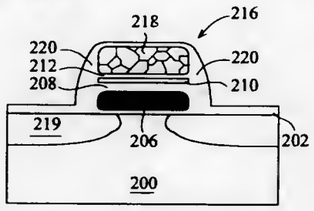
a substrate having a plurality of charge storage portions capable of storing charges and an output circuit for outputting a signal in accordance with the charges stored in said storage portions;
an insulating film formed on the surface of said substrate and having a plurality of openings, each of said openings formed above each respective charge storage portion; and
a columnar embedded region formed within each of said openings and the surface of said insulating film and that of said embedded regions are substantially flattened;
a photosensitive layer of an intrinsic or non-doped semiconductor formed on said insulating film and electrically connected to said charge storage portions via said embedded regions, wherein
each of said embedded regions comprises a P-type or N-type doped semiconductor region provided in direct contact with said photosensitive layer to form pi or ni contact between said photosensitive layer and said embedded region and wherein said opening has a substantially vertical side wall.

5,557,122

SEMICONDUCTOR ELECTRODE HAVING IMPROVED GRAIN STRUCTURE AND OXIDE GROWTH PROPERTIES

Ritu Shrivastava, Fremont, and Chitranjan N. Reddy, Milpitas, both of Calif., assignors to Alliance Semiconductors Corporation, San Jose, Calif.

Filed May 12, 1995, Ser. No. 438,956
Int. Cl.[6] H01L *27/108;29/788*
U.S. Cl. 257—309 **13 Claims**



1. A monolithic semiconductor device having a floating gate that uses electron tunneling to transfer electrons from the floating gate through a tunnel dielectric to an erase electrode, comprising:
a control gate;
an erase electrode;
a floating gate formed of nitrogen doped amorphous silicon;
a tunnel dielectric intermediate said erase electrode and said floating gate; and

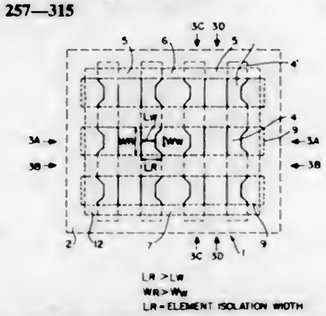
an intergate dielectric intermediate said control gate and said floating gate.

5,557,123

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE WITH SHAPED FLOATING GATE

Noriyuki Ohta, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 7, 1994, Ser. No. 319,605
Claims priority, application Japan, Oct. 8, 1993, 5-253011
Int. Cl.[6] H01L *29/788*
U.S. Cl. 257—315 **14 Claims**



1. A nonvolatile semiconductor memory device comprising:

a plurality of memory cell transistors each comprising

a semiconductor substrate having conductivity,

source and drain regions disposed on a surface of said substrate,

a path disposed between said source and drain regions,

a first gate insulating film covering said path,

a floating gate electrode disposed on said first gate insulating film,

a second gate insulating film covering said floating gate electrode, and

a control gate electrode disposed on said second gate insulating film;

at least two of said memory cell transistors sharing the same source and drain regions;

said path includes an element-isolation region having a uniform isolation length, and a channel region having a first channel length, a second channel length, a first channel width, and a second channel width,

wherein said channel region is directly opposed by said floating gate electrodes,

wherein said element-isolation region is disposed between a pair of said channel regions, and lacks said floating gate electrode,

wherein said floating gate electrode is dimensioned to include a first length, a second length, a first width, and a second width,

wherein said first length is greater than said second length as to create smaller said second width relative to said first width, and

wherein said second length is substantially constant over said second width, and

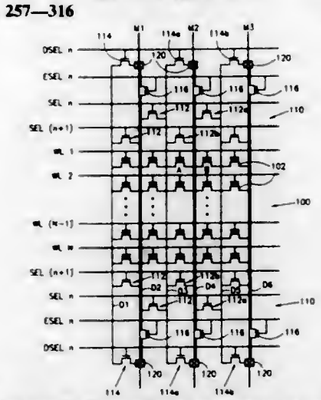
wherein said first and second widths correspond to, and extend in the same direction as, said first and second channel widths, respectively, and said first and second lengths correspond to, and extend in the same direction as, said first and second channel lengths, respectively.

5,557,124

FLASH EEPROM AND EPROM ARRAYS WITH SELECT TRANSISTORS WITHIN THE BIT LINE PITCH

Anirban Roy, Fremont, and Reza Kazerounian, Alameda, both of Calif., assignors to Waferscale Integration, Inc., Fremont, Calif.

Filed Mar. 11, 1994, Ser. No. 212,176
Int. Cl.[6] H01L *29/788*
U.S. Cl. 257—316 **11 Claims**



1. A flash electrically erasable programmable read only memory (EEPROM) array comprising:

EEPROM areas including columns of EEPROM transistors, each EEPROM transistor having a channel of a first length;

at least one control area per EEPROM area, said at least one control area including columns of n-channel select transistors, formed into bit line and column select transistors, each n-channel bit line transistor and column select transistor having a channel length of a second length;

wherein said first and said second lengths are substantially the same.

5,557,125

DIELECTRICALLY ISOLATED SEMICONDUCTOR DEVICES HAVING IMPROVED CHARACTERISTICS

Muhammed A. Shibib, Wyomissing Hills, Pa., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 8, 1993, Ser. No. 163,954
Int. Cl.[6] H01L *29/00*
U.S. Cl. 257—329 **7 Claims**

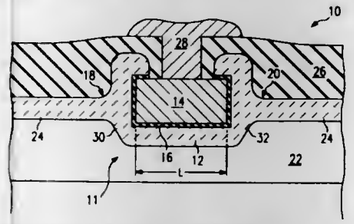
1. An MOS device comprising a substrate having first and second oppositely disposed surfaces, a gate electrode overlying a portion of said first surface and extending continuously between first and second positions on said first surface, a first region disposed within said substrate at said first surface, said first region being disposed within a second region within said substrate, said first and second regions forming therebetween a p-n junction having a first intercept with said first surface and underlying said gate electrode at said first position, said second region and said substrate forming therebetween a p-n junction having a second intercept with said first surface and underlying said gate electrode at a third position spaced from said first and second positions, said substrate including a third region of a first electrical conductivity type underlying and contiguous with said second region and extending to said first surface between said third and second positions, and a fourth region of a second electrical conductivity type contiguous with and underlying said third region said third and fourth regions forming a p-n junction therebetween, the distance between said fourth region and said first surface being less where said fourth region underlies said first surface between said second and third positions than where said fourth region underlies said second region.

5,557,126

THIN-FILM TRANSISTOR AND METHOD FOR FORMING THE SAME

James A. Cunningham, Saratoga, Calif., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Sep. 30, 1994, Ser. No. 316,633
Int. Cl.[6] H01L *29/76*
U.S. Cl. 257—332 **19 Claims**



1. A semiconductor structure, comprising:

a dielectric substrate having a surface and having a recess formed therein, said recess having a sidewall;

a layer of semiconductor material disposed on said surface and in said recess, said layer defining a source region, a drain region, and a channel region that is entirely within said recess, is contiguous with said sidewall, and is between and contiguous with said source and drain regions;

a gate electrode disposed on said surface of said substrate and substantially outside of said recess, said gate electrode having an end portion that extends beyond said sidewall of said recess and that is adjacent to said channel region; and

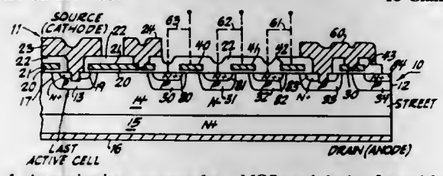
an insulator layer disposed between and contiguous with said end portion of said gate electrode and said channel region.

5,557,127

TERMINATION STRUCTURE FOR MOSGATED DEVICE WITH REDUCED MASK COUNT AND PROCESS FOR ITS MANUFACTURE

Janardhanan S. Ajit, Redondo Beach, and Daniel M. Kinzer, El Segundo, both of Calif., assignors to International Rectifier Corporation, El Segundo, Calif.

Filed Mar. 23, 1995, Ser. No. 409,347
Int. Cl.[6] H01L *29/78;29/40*
U.S. Cl. 257—339 **18 Claims**



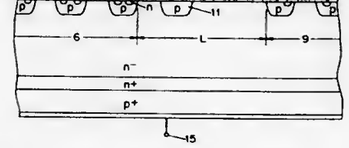
1. A termination structure for a MOSgated device formed in a thin rectangular chip of silicon; said thin chip of silicon having an active area and having at least one main conductive electrode on one surface thereof; said termination structure bounding at least one portion of said active area and comprising a plurality of concentric lateral P-MOS transistor devices extending from a boundary of said active area and toward the edge of said chip; each of said plurality of P-MOS lateral transistors being formed in said one surface and connected in series with one another; each of said P-MOS transistors comprising respective concentric spaced P type diffusions; a gate oxide and an overlying conductive gate electrode spanning the space between each of said P type diffusions to define respective lateral P-MOS devices; said main conductive electrode being disposed adjacent to the one of said P type diffusions which is closest to said active area; each of said P type diffusions having a conductive member connecting it to the gate electrode which spans said last-mentioned P diffusion and the next adjacent P type diffusion which is positioned toward the outer edge of said chip; each of said P-MOS devices turning on when the voltage between said active area and the edge of said chip exceeds a given value; said P-MOS devices being connected in series with one another, whereby the potential between said conductive electrode at the boundary of said active area and the edge of said chip is divided across said series-connected P-MOS devices; said active area of said chip including a plurality of active area MOSgated devices having P type diffusions, gate oxides and conductive gate electrodes; said P diffusions of said active devices and of said P-MOS devices respectively and said gate oxides of said active devices and said P-MOS devices respectively, and said conductive gate electrodes of said active devices and said P-MOS devices respectively being formed in the same respective process steps.

5,557,128

INSULATED-GATE TYPE BIPOLAR TRANSISTOR

Tomoyuki Yamazaki, and Shigeyuki Obinata, both of Nagano, Japan, assignors to Fuji Electric Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1995, Ser. No. 397,417
Claims priority, application Japan, Mar. 4, 1994, 6-033985
Int. Cl.[6] H01L *29/76*
U.S. Cl. 257—341 **4 Claims**



1. An insulated-gate type bipolar transistor comprising:

a plurality of main cells formed integratedly on a semiconductor substrate, the main cells having emitter electrodes; and

a plurality of sensing cells formed on the semiconductor substrate and adjoining at least one of the main cells, the sensing cells having emitter electrodes separated from the emitter electrodes of the main cells and connected to an overcurrent protection circuit;

P-wells connected to the emitter electrodes of the main cells, the P-wells being formed in a region around the sensing cells;

wherein the sensing cells are separated from the adjoining main cells by a distance greater than about 100 μm.

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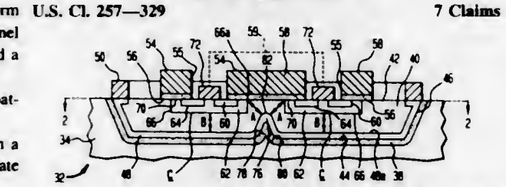
SEMICONDUCTOR MOSFET DEVICE HAVING A

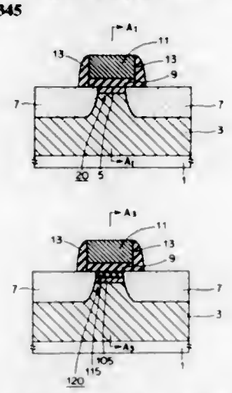


layers forming a second junction diode stack poled opposite said first junction diode stack on said variable photoresistor

5,557,129
SEMICONDUCTOR MOSFET DEVICE HAVING A SHALLOW NITROGEN IMPLANTED CHANNEL REGION

Hidekazu Oda; Shuichi Ueno, and Takehisa Yamaguchi, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1995, Ser. No. 452,611
Claims priority, application Japan, Jun. 22, 1994, 6-140542
Int. Cl.[6] H01L *31/062*
U.S. Cl. 257—345 **10 Claims**



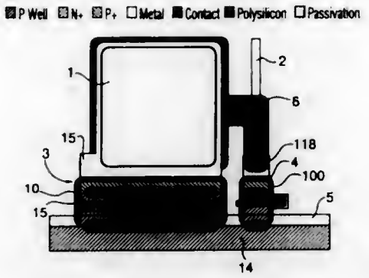
1. A semiconductor device having a field-effect transistor comprising:
a semiconductor substrate of a first conductivity type having a main surface;
a pair of source/drain regions of a second conductivity type formed at the main surface of said semiconductor substrate with a predetermined space between each other;
a gate electrode opposed to a region located between said paired source/drain regions and formed on the main surface of said semiconductor substrate with a gate insulating film therebetween; and
a nitrogen introduced region formed at a region of said semiconductor substrate located between said paired source/drain regions, containing nitrogen and having a peak concentration of said nitrogen, wherein
said peak concentration of said nitrogen is positioned at a depth not exceeding 500 Å from the main surface of said semiconductor substrate.

5,557,130
ESD INPUT PROTECTION ARRANGEMENT

Jonathan H. Orchard-Webb, Kanata, Canada, assignor to Mitel Corporation, Kanata, Canada

Filed Feb. 9, 1995, Ser. No. 385,880
Claims priority, application Canada, Feb. 11, 1994, 2115477
Int. Cl.[6] H01L *23/62*
U.S. Cl. 257—359 **9 Claims**

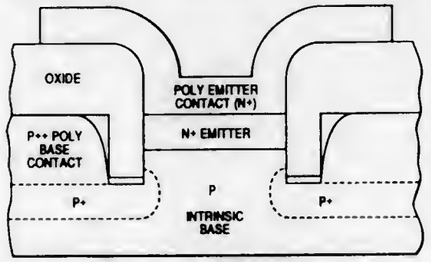
1. An input circuit for protecting a monolithic integrated circuit with a substrate of a first conductivity type against ESD events, comprising a snap-back thick field bipolar transistor arrangement adapted to breakdown under ESD stress to dissipate ESD energy appearing at a contact pad, a snap-back thin field bipolar transistor arrangement adapted to breakdown under ESD stress, and an attenuator resistor connecting said thin field transistor arrangement to said contact pad, said thin field transistor arrangement having a lower breakdown voltage than said thick field transistor arrangement whereby for an ESD event of a given polarity, said thin field transistor arrangement breaks down before said thick field transistor arrangement, thereby shunting the fast edge of an ESD transient that the thick field transistor arrangement is too slow to respond to.



5,557,131
ELEVATED EMITTER FOR DOUBLE POLY BICMOS DEVICES

Steven Lee, Colorado Springs, Colo., assignor to AT&T Global Information Solutions Company, Dayton, Ohio; Hyundai Electronics America, San Jose, Calif., and Symbios Logic Inc., Fort Collins, Colo.

Continuation of Ser. No. 962,543, Oct. 19, 1992, abandoned.
This application Jul. 14, 1994, Ser. No. 275,094
Int. Cl.[6] H01L *29/76;21/265*
U.S. Cl. 257—370 **31 Claims**



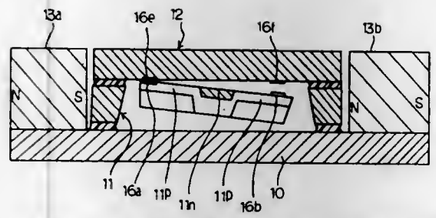
7. A monolithic semiconductor device comprising:
field oxide structures defining a first well region for a bipolar transistor and a second well region for a field effect transistor;
a base in the first well region and having an intrinsic concentration of a first dopant type, the base including an extrinsic region underlying a semiconductor contact, said extrinsic region characterized by a concentration of the first dopant type which is greater than the intrinsic concentration;
an elevation structure attached to the base at a portion of said base separate from said extrinsic region, said elevation structure extending from a plane generally defined by an external surface of said base to a surface above said base;
an emitter of a second dopant type connected to the elevation structure at the surface above the base;
a field effect transistor including a source and a drain in the second well region; and
a metal layer, separate portions of which individually connecting to each of said base, emitter, collector, source and drain.

5,557,132
SEMICONDUCTOR RELAY UNIT

Masazi Takahashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 6, 1994, Ser. No. 354,102
Claims priority, application Japan, Dec. 8, 1993, 5-308238
Int. Cl.[6] H01L *29/82;* **H01H** *51/22*
U.S. Cl. 257—415 **9 Claims**

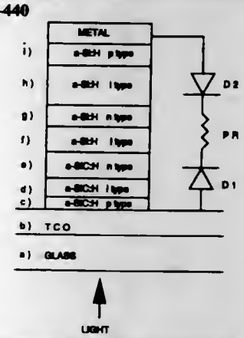
1. A semiconductor relay unit comprising:
a first semiconductor substrate having a stationary portion of a semiconductor material and a movable portion of said semiconductor material movable with respect to said stationary portion, said stationary portion forming a part of a stationary structure stationary with respect to said movable portion;
a coil means at least a part of which is formed on said movable portion;
a moving contact means formed on said movable portion;
a fixed contact portion provided on said stationary structure and associated with said moving contact means;
a magnetic means provided on said stationary structure, and creating a magnetic field around said coil means; and
a current supplying means for supplying a current to said coil means for exerting a magnetic force on said movable portion, thereby causing said movable portion to move with respect to said stationary portion for bringing said moving contact means into contact with said fixed contact portion.



5,557,133
VOLTAGE-CONTROLLED VARIABLE SPECTRUM PHOTODETECTOR FOR 2D COLOUR IMAGE DETECTION AND RECONSTRUCTION APPLICATIONS

Giampiero de Cesare; Fernanda Irrera, and Fabrizio Palma, all of Rome, Italy, assignors to Universita Degli Studi Di Roma "La Sapienza", Rome, Italy

Filed May 9, 1995, Ser. No. 437,498
Claims priority, application Italy, May 12, 1994, RM94A0294
Int. Cl.[6] H01L *31/00;31/075;31/105;31/117*
U.S. Cl. 257—440 **7 Claims**

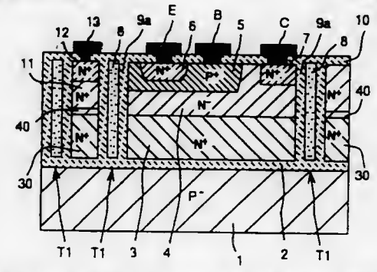


1. A voltage-controlled variable spectrum photodetector comprising:
a translucent conductor forming a first electrode;
a first layer of a doped semiconductor of a first conductivity type, a second layer of an intrinsic semiconductor and a third layer of a doped semiconductor of a second conductivity type forming a first junction diode stack on said conductor and transluminatable by light through said translucent conductor;
a fourth layer of an intrinsic semiconductor on said third layer and a fifth layer of a doped semiconductor of said second conductivity type on said fourth layer, said third, fourth and fifth layers together forming a variable photoresistor stack on said first junction diode stack;
a sixth layer of an intrinsic semiconductor on said fifth layer and a seventh layer of a doped semiconductor of said first conductivity type on said sixth layer, said fifth, sixth and seventh layers forming a second junction diode stack poled opposite said first junction diode stack on said variable photoresistor stack; and
a further electrode on said second junction diode stack whereby a bias voltage varying by a few volts from zero applied across said electrodes selectively renders the photodetector responsive to three principal colors of the visible spectrum.

5,557,134
DIELECTRIC ISOLATED TYPE SEMICONDUCTOR DEVICE

Takayuki Sugisaka, Okazaki; Toshio Sakakibara, Nishio; Shoji Miura, Nukata-gun, and Makio Iida, Ichinomiya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 16, 1994, Ser. No. 341,977
Claims priority, application Japan, Nov. 17, 1993, 5-288309
Int. Cl.[6] H01L *29/00*
U.S. Cl. 257—506 **16 Claims**

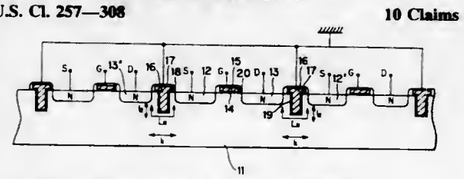


1. A dielectric isolated type semiconductor device comprising:
a semiconductor substrate;
an island semiconductor region disposed on said semiconductor substrate, a bottom of which region is isolated from said semiconductor substrate;
a diffusion region for forming a semiconductor device, formed on a surface portion of said island semiconductor region;
an adjacent semiconductor region disposed proximate to said island semiconductor region; and
an N type region doped at a surface portion of said adjacent semiconductor region, having a doping concentration higher than said surface portion of said adjacent semiconductor region, and having a junction depth deeper than said diffusion region, whereby crystalline defects in said island semiconductor region are suppressed.

5,557,135
SEMICONDUCTOR DEVICE WITH FIELD SHIELD ISOLATION STRUCTURE AND A METHOD OF MANUFACTURING THE SAME

Masayuki Hashimoto, Tateyama, Japan, assignor to Nippon Steel Semiconductor Corporation, Chiba-ken, Japan

Continuation of Ser. No. 956,101, Oct. 2, 1992, abandoned.
This application Jun. 13, 1994, Ser. No. 259,158
Claims priority, application Japan, Oct. 17, 1991, 3-298483
Int. Cl.[6] H01L *29/00*
U.S. Cl. 257—308 **10 Claims**



1. An array of semiconductor devices, comprising:
a semiconductor substrate having a surface;

a first MOSFET of a first conductivity channel type formed in

5,557,137
VOLTAGE PROGRAMMABLE LINK HAVING REDUCED

inductors respectively formed by said two inductor electrodes and the capacitor formed by said pn junction layer along said

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PROCESS TOLERANT, HIGH VOLTAGE, PLANETI

a first MOSFET of a first conductivity channel type formed in the surface of said semiconductor substrate and including a first diffusion layer having a bottom surface of a first predetermined depth level down from the surface of said semiconductor substrate, a source derived from said first diffusion layer, a second diffusion layer having a bottom surface of substantially the same first predetermined depth level, a drain derived from said second diffusion layer, and a gate;

a second MOSFET of the same channel type as said first MOSFET formed adjacent to said first MOSFET in the surface of said semiconductor substrate, including a diffusion layer having a bottom surface of a second predetermined depth level down from the surface of said semiconductor substrate; and

a field shield electrode formed in the surface of said semiconductor substrate for electrically isolating one of the first diffusion layer and the second diffusion layer of said first MOSFET from the diffusion layer of said second MOSFET, wherein said field shield electrode is buried in said semiconductor substrate in a level deeper than the first predetermined depth level and the second predetermined depth level, wherein the field shield electrode is connected to an electrically conductive wiring.

5,557,136

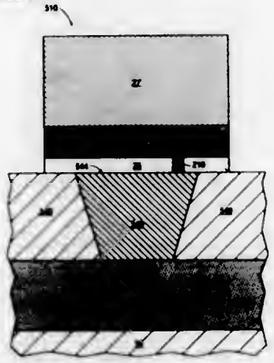
PROGRAMMABLE INTERCONNECT STRUCTURES AND PROGRAMMABLE INTEGRATED CIRCUITS

Kathryn E. Gordon, Mountain View, and Richard J. Wong, Milpitas, both of Calif., assignors to QuickLogic Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 874,983, Apr. 23, 1992, Pat. No. 5,196,724, and Ser. No. 891,675, May 28, 1992, abandoned, which is a continuation of Ser. No. 698,648, May 10, 1991, abandoned, said Ser. No. 874,983is a continuation of Ser. No. 691,950, Apr. 26, 1991, abandoned. This application Jun. 1, 1992, Ser. No. 892,466

Int. Cl.[6] H01L *29/00*

U.S. Cl. 257—530 **1 Claim**



1. A field programmable gate array comprising:

a first metal conductor;

an insulating layer overlaying the first metal conductor, the insulating layer having an opening formed therein;

a plug in the opening, the plug comprising tungsten, the plug contacting the first conductor, a top surface of the insulating layer having a portion adjacent the plug, the portion being substantially coplanar with a top surface of the plug;

amorphous silicon having a substantially planar bottom surface which overlays and contacts the plug and also overlays and contacts the adjacent portion of the insulating layer; and

a second metal conductor overlaying and contacting the amorphous silicon.

5,557,137

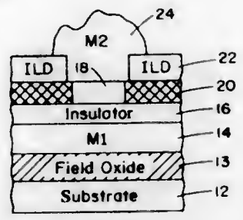
VOLTAGE PROGRAMMABLE LINK HAVING REDUCED CAPACITANCE

Simon S. Cohen, Burlington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 949,891, Sep. 23, 1992, abandoned. This application Mar. 16, 1994, Ser. No. 210,062

Int. Cl.[6] H01L *29/00;* **G11C** *17/00*

U.S. Cl. 257—530 **13 Claims**



1. An electrically programmable link structure comprising:

a first conductive element;

a transformable insulator material over the first conductive element;

a layer of etch stop material over the transformable insulator material, the layer of etch stop material having conductive patches of the etch stop material within nonconductive regions of the etch stop material; and

a second conductive element over the layer of etch stop material, wherein at least one conductive path at a link site is formable through the transformable insulator material by applying a voltage between the first and second conductive elements across the conductive patches of the etch stop material and the transformable insulator material.

5,557,138

LC ELEMENT AND SEMICONDUCTOR DEVICE

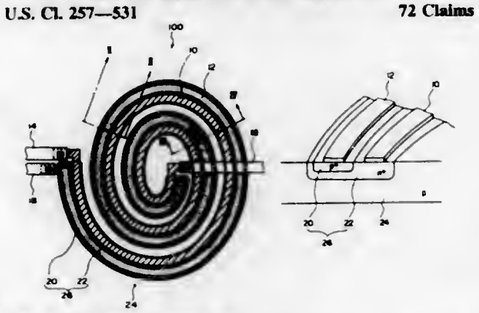
Takeshi Ikeda, 2-5-6-213,Sanno,, Ohta-ku, Tokyo, Japan, and Susumu Okamura, 4-1-12-1305, Hiroo,, Shibuya-ku, Tokyo, Japan

Filed Oct. 26, 1994, Ser. No. 329,520

Claims priority, application Japan, Nov. 1, 1993, 5-296116; Nov. 24, 1993, 5-317307; Dec. 22, 1993, 5-346429

Int. Cl.[6] H01L *27/04;27/02;* **H03H** *7/01*

U.S. Cl. 257—531 **72 Claims**



1. An LC element comprising:

two inductor electrodes formed in a spiral shape respectively having predetermined inductances disposed essentially in parallel, and

a pn junction layer functioning as a capacitor by using in a reverse bias state, formed on a semiconductor substrate along said two inductor electrodes and comprising a p region and an n region electrically connected over their entire length respectively to one and the other of said two inductor electrodes, wherein

inductors respectively formed by said two inductor electrodes and the capacitor formed by said pn junction layer along said two inductor electrodes exist as distributed constants, and

at least one of said two inductor electrodes is used as a signal transmission line.

5,557,139

BURIED BASE VERTICAL BIPOLAR POWER TRANSISTOR WITH IMPROVED CURRENT GAIN AND OPERATION AREA

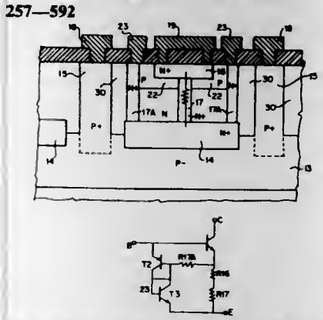
Sergio Palara, Acitrezza, Italy, assignor to Consorzio per la Ricerca Sulla Microelettronica nel Mezzogiorno, Catania, Italy

Filed Jun. 28, 1994, Ser. No. 267,315

Claims priority, application European Pat. Off., Jul. 1, 1993, 93830287

Int. Cl.[6] H01L *29/72;29/90;27/02*

U.S. Cl. 257—592 **15 Claims**



1. A vertical bipolar power transistor formed with an interdigitated geometry on a chip of a semiconductor material of the N type, comprising:

a base region of the P type in a buried layer within the N type material;

an N+ emitter region in a buried layer forming a junction with the base region and having at least one elongate portion;

at least one P+ deep contact base region which extends from a first surface of the chip to the base region;

at least one N+ interconnection region extending from the first surface of the chip to a respective one of the at least one elongate portion of the N+ emitter region, and having resistivity and size selected to form an emitter balancing ballast resistor;

first means for providing electrical contact between the at least one P+ deep contact base region and a base terminal of the transistor;

second means for providing electrical contact between the at least one N+ interconnection region and an emitter terminal of the transistor;

third means for providing electrical contact between a second surface of the chip remotely disposed from the first surface and a collector terminal of the transistor;

at least one P type screening region corresponding to a respective one of the at least one elongate portion and a respective one of the at least one N+ interconnection region, and extending from the first surface towards its respective elongate portion and being adjacent to an upper part of its respective N+ interconnection region;

at least one N+ contact region corresponding to a respective one of the at least one elongate portion and a respective one of the at least one P type screening region, the at least one N+ contact region extending from the first surface towards the respective one of the at least one elongate portion, and being adjacent to the respective one of the at least one P type screening region; and

fourth means for providing electrical contact between each P type screening region and its respective N+ contact region.

5,557,140

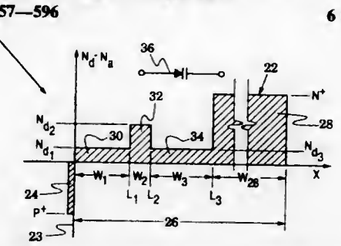
PROCESS TOLERANT, HIGH-VOLTAGE, BI-LEVEL CAPACITANCE VARACTOR DIODE

Chanh M. Nguyen, Newbury Park; Michael G. Case, Thousand Oaks; William W. Hooper, Westlake Village, and Authi A. Narayanan, Thousand Oaks, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 12, 1995, Ser. No. 420,959

Int. Cl.[6] H01L *29/93*

U.S. Cl. 257—596 **6 Claims**



1. A high breakdown voltage, bi-level capacitance varactor diode, comprising:

an anode formed of p-type indium phosphide; and

a cathode formed of n-type indium phosphide and joined to said anode at a junction between them;

wherein one of said cathode and said anode has first, second and third regions in which;

a) said first region adjoins said junction, has an impurity doping concentration N_{d1} and a width W_1;

b) said second region adjoins said first region, has an impurity doping concentration N_{d2} and a width W_2 which is less than 0.2 micron;

c) said third region adjoins said second region, has an impurity doping concentration N_{d3} and a width W_3 which is greater than $1.5W_1$;

d) N_{d2} is less than 3×10^{17} cm^{-3} and greater than N_{d1} and N_{d3}; and

e) N_{d1} and N_{d3} are each less than 1×10^{15} cm^{-3}.

5,557,141

METHOD OF DOPING, SEMICONDUCTOR DEVICE, AND METHOD OF FABRICATING SEMICONDUCTOR DEVICE

Yasoo Harada; Shigeharu Matsushita; Satoshi Terada; Emi Fujii; Takashi Kurose; Takayoshi Higashino; Takashi Yamada; Akihito Nagamatsu; Daijirou Inoue, and Kouji Matsumura, all of Moriguchi, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Division of Ser. No. 75,232, Jun. 10, 1993, Pat. No. 5,350,709. This application Mar. 30, 1994, Ser. No. 220,542

Claims priority, application Japan, Jun. 13, 1992, 4-179421; Jun. 13, 1992, 4-179422; Jun. 13, 1992, 4-179423; Jun. 16, 1992, 4-183260; Jun. 18, 1992, 4-186196; Jun. 19, 1992, 4-186375; Jun. 19, 1992, 4-186376; Oct. 27, 1992, 4-312744; Oct. 30, 1992, 4-316248; Nov. 19, 1992, 4-310559; Nov. 30, 1992, 4-345473; Jan. 12, 1993, 5-3612; Jan. 14, 1993, 5-5307; Jan. 19, 1993, 5-6950; Mar. 15, 1993, 5-54053

Int. Cl.[6] H01L *23/58;29/06;31/0328;29/00*

U.S. Cl. 257—631 **16 Claims**

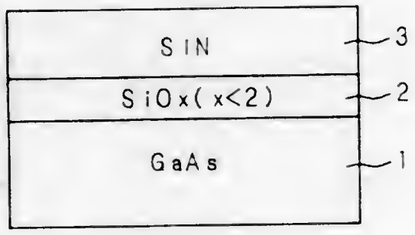
1. A semiconductor device comprising:

a Group III–V compound semiconductor;

an SiOx film laminated on said Group III–V compound semiconductor, with x in the SiOx film being less than 2;

a film formed on said SiOx film, for preventing the external diffusion of Group V atoms that constitute part of said Group III–V compound semiconductor; and

a doped layer, formed in said Group III–V compound semiconductor below said SiOx film, containing silicon as an impurity.

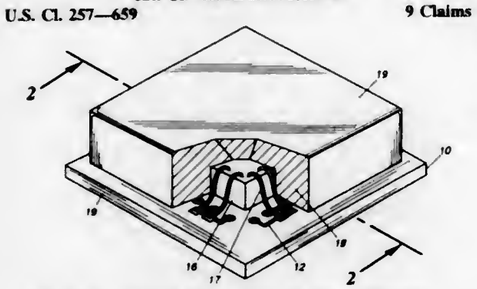


5,557,142

SHIELDED SEMICONDUCTOR DEVICE PACKAGE

Peter B. Gilmore, Plantation, and Kenneth R. Thompson, Sunrise, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 4, 1991, Ser. No. 650,326
Int. Cl.[6] H01L *23/552;23/02*
U.S. Cl. 257—659 **9 Claims**



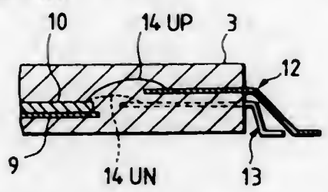
1. A shielded semiconductor device package, comprising:
a semiconductor device;
a substrate having the semiconductor device mechanically attached and electrically interconnected thereto;
an encapsulant material encapsulating the semiconductor device; and
a shield consisting of:
a thin coating of metal deposited directly on the encapsulant material and portions of the substrate, the metal coating precisely conformed to the encapsulant material and the substrate and electrically coupled to the semiconductor device.

5,557,143

SEMICONDUCTOR DEVICE HAVING TWO STAGGERED LEAD FRAME STAGES

Hiroshi Seiji, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Continuation of Ser. No. 122,099, Sep. 16, 1993, abandoned. This application Jul. 25, 1995, Ser. No. 506,823
Int. Cl.[6] H01L *23/495*
U.S. Cl. 257—666 **3 Claims**



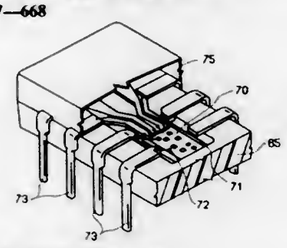
1. A semiconductor device, comprising:
a package containing a semiconductor element on a die pad; and
a plurality of leads extending in a diverging array from an inside of said package to an outside of said package, each of the leads having an inner end portion within the package which is narrower than an outer end portion of the same lead outside the package;
wherein said plurality of leads are arranged in a staggered manner and include upper stage leads and lower stage leads;
wherein an interval between inner end portions of said lower stage leads within said package is narrower than a width of said upper stage leads and an interval between outer end portions of the same lower stage leads outside the package is greater than a width of the upper stage leads; and
wherein an end of said lower stage leads in said package is positioned nearer to said die pad than an end of said upper stage leads.

5,557,144

PLASTIC PACKAGES FOR MICROWAVE FREQUENCY APPLICATIONS

Michael A. Rosenstock, Branchburg; Phillip W. Wallace, Bernardsville; John T. Bayruns, Chatham; Kenneth S. Sanyigo, Fords, and George G. Gilbert, Lebanon, all of N.J., assignors to Anadigics, Inc., Warren, N.J.

Filed Jan. 29, 1993, Ser. No. 10,733
Int. Cl.[6] H01L *23/495*
U.S. Cl. 257—668 **11 Claims**



1. A plastic package comprising:
a plastic platform;
a metallic lead frame having a plurality of leads and a baseplate, the baseplate being embedded in the plastic platform and having an exposed top surface substantially level with a top surface of the platform for mounting at least one semiconductor chip,
at least some of the plurality of leads having a first portion disposed on the platform and a second portion, connected to the first portion, extending outside the platform at substantially the same level as the first portion; and
a plastic cap mounted on the platform and covering at least parts of the first portions of the leads to enclose and seal the chip therein.

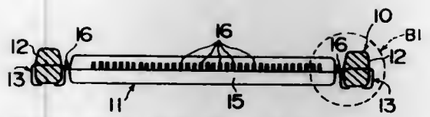
5,557,145

MOUNTING CONSTRUCTION AND METHOD OF A SEMICONDUCTOR DEVICE BY WHICH DEFORMATION OF LEADS IS PREVENTED

Hitoshi Kobayashi; Yuichi Asano; Kenji Kobayashi; Kenichi Sasaki, and Yuji Sakurai, all of Murata-machi, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 9, 1995, Ser. No. 401,441
Claims priority, application Japan, Mar. 11, 1994, 6-041497
Int. Cl.[6] H01L *23/48;23/52*
U.S. Cl. 257—692 **16 Claims**

1. A mounting construction of a semiconductor device having a plurality of outer leads extending from sides of a package thereof, the mounting construction comprising:
a mounting board having a surface on which a plurality of terminals to be electrically connected to said semiconductor device are provided; and



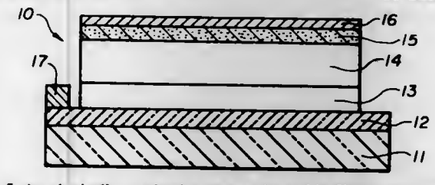
a mounting member being mounted on said mounting board separately from said semiconductor device, said semiconductor device being attached to said mounting member, said mounting member comprising;
a frame member forming a space in which said semiconductor device is placed, said frame member having a bottom surface which faces said surface of said mounting board;
at least one first connecting lead provided to said frame member, said first connecting lead having a first lead connecting portion which makes a contact with a corresponding one of said outer leads of said semiconductor device placed in said space, said first connecting lead having a first external connecting portion to be connected to a corresponding one of said terminals provided on said mounting board, said first external connecting portion extending along said bottom surface of said frame member; and
at least one second connecting lead provided to said frame member, said second connecting lead having a second lead connecting portion which makes a contact with a corresponding one of said outer leads of said semiconductor device placed in said space, said second connecting lead having a second external connecting portion to be connected to a corresponding one of said terminals provided on said mounting board, said second external connecting portion extending along said bottom surface of said frame member,
said first external connecting portion extending from outside said frame member, and said second external connecting portion extending from said space formed by said frame member,
said first external connecting portion and said second external connecting portion being arranged alternately with a predetermined distance apart from each other in a direction along an extending direction of said frame member.

5,557,146

OHMIC CONTACT USING BINDER PASTE WITH SEMICONDUCTOR MATERIAL DISPERSED THEREIN

Jeffrey S. Britt, and Christos S. Ferekides, both of Tampa, Fla., assignors to University of South Florida, Tampa, Fla.

Filed Jul. 14, 1993, Ser. No. 91,648
Int. Cl.[6] H01L *31/0224;29/43*
U.S. Cl. 257—741 **16 Claims**



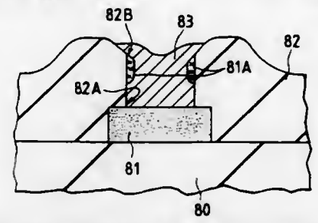
5. An ohmically conductive contact for a thin film p-type semiconductor compound formed of at least one of the metal elements of Class IIB of the Periodic Table of Elements and at least one of the non-metal elements of Class VIA of the Periodic Table of Elements comprising:
(a) a conductive layer of binder paste deposited on the p-type semiconductor compound; and
(b) a semiconductor material in an amount sufficient to form a low resistance electrical contact dispersed in said conductive binder paste comprising mercury telluride and copper telluride.

5,557,147

SEMICONDUCTOR INTEGRATED, CIRCUIT DEVICE, PROCESS FOR FABRICATING THE SAME, AND APPARATUS FOR FABRICATING THE SAME

Jun Sugiura, Musashino; Osamu Tsuchiya, Ohme; Makoto Ogasawara, Ohme; Fumio Ootsuka, Ohme; Kazuyoshi Torii, Kodaira; Isamu Asano; Nobuo Owada, both of Ohme; Mitsuaki Horiuchi, Hachioji; Tsuyoshi Tamaru; Hideo Aoki, both of Ohme; Nobuhiro Otsuka, Kokubunji; Seiichirou Shirai, Hamura-machi; Masakazu Sagawa, Ohme; Yoshihiro Ikeda, Ohme; Masatoshi Tsuneoka, Ohme; Toru Kaga, Urawa; Tomotsugu Shimmyo, Kawagoe; Hidetsugu Ogishi, Hachiojo; Osamu Kasahara, Hinode-machi; Hiromichi Enami, Tachikawa; Atsushi Wakahara, Ohme; Hiroyuki Akimori, Ohme; Sinichi Suzuki, Ohme; Keisuke Funatsu, Ohme; Yoshinao Kawasaki, Kumage-gun; Tunehiko Tubone, Kudamatsu; Takayoshi Kogano, Iruma, and Ken Tsugane, Ohme, all of Japan, assignors to Hitachi, Ltd., and Hitachi ULSI Engineering Corporation, both of Tokyo, Japan

Division of Ser. No. 954,142, Sep. 30, 1992, which is a division of Ser. No. 496,330, Mar. 20, 1990, Pat. No. 5,202,275. This application Apr. 19, 1994, Ser. No. 230,021
Claims priority, application Japan, Mar. 20, 1989, 1-65849
Int. Cl.[6] H01L *29/68;29/34;29/06*
U.S. Cl. 257—763 **18 Claims**



1. A semiconductor integrated circuit device comprising:
a semiconductor substrate having a main surface;
an insulating film formed over said main surface of said semiconductor substrate; and
a wiring line formed on said insulating film, wherein said wiring line comprises a first refractory metal layer formed by a sputtering method and a second refractory metal layer formed by a CVD method in contact with said first refractory metal layer, wherein said first refractory metal layer is formed on said insulating film and said second refractory metal layer is formed on said first refractory metal layer, and wherein said second refractory metal layer includes a same material as that of said first refractory metal layer.

5,557,148

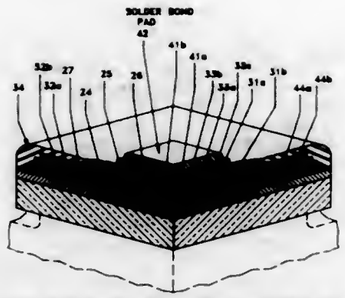
HERMETICALLY SEALED SEMICONDUCTOR DEVICE

Earl S. Cain, Napa County, Calif., assignor to Tribotech, Napa, Calif.

Continuation of Ser. No. 39,625, Mar. 30, 1993, abandoned. This application Dec. 20, 1994, Ser. No. 359,944
Int. Cl.[6] H01L *23/053;23/48*
U.S. Cl. 257—777 **23 Claims**

1. A semiconductor device which includes a semiconductor body having an upper surface, a lower surface and side surfaces extending between said upper and lower surfaces, said semiconductor body having circuit metallization carried by one or more insulating layers for connection to active regions of said device, and an oxide layer having inner edges defining windows overlying said circuit metallization to expose bonding pad areas of said metallization for connection to said active regions, said oxide layer and said insulating layers having outer edges spaced from said bonding pad areas, the improvement comprising
a metal layer of a metal which acts as a barrier against migration of corrosion resistant metal formed on and covering said bonding pad areas,

reducing the size of the dry mixed ingredients to the range



a protective layer extending over said outer edges of said insulating and oxide layers and in contact with said semiconductor body to seal said outer edges of said insulating and oxide layers and environmentally protect said device, said protective layer having inner edges defining windows at said bonding pad areas,

a corrosion resistant metal layer formed on said metal layer for connecting to said bonding pad areas through said metal layer and for sealing said inner edges of said protective layer, and

a bottom protective layer, said protective layer extending over said side surfaces of said semiconductor body to merge with the bottom protective layer to cocoon said device.

5,557,149

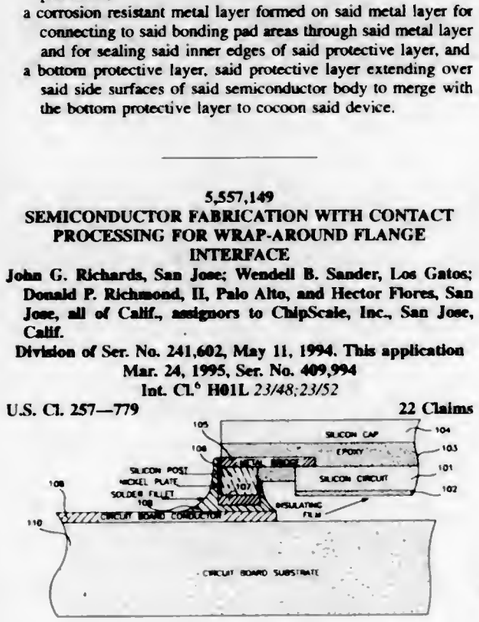
SEMICONDUCTOR FABRICATION WITH CONTACT PROCESSING FOR WRAP-AROUND FLANGE INTERFACE

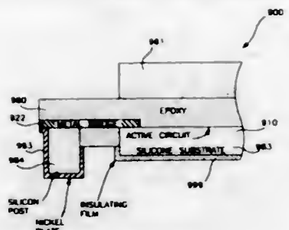
John G. Richards, San Jose; Wendell B. Sander, Los Gatos; Donald P. Richmond, II, Palo Alto, and Hector Flores, San Jose, all of Calif., assignors to ChipScale, Inc., San Jose, Calif.

Division of Ser. No. 241,602, May 11, 1994. This application Mar. 24, 1995, Ser. No. 409,994

Int. Cl.[6] H01L *23/48;23/52*

U.S. Cl. 257—779 **22 Claims**





1. An electrical apparatus, comprising:

(a) a device semiconductor region having a top side;

(b) a semiconductor post region having a top side and a sidewall that have a common edge;

(c) a first layer coupled to a region over the top side of the device semiconductor region and formed over the top side of the semiconductor post region, the first layer extending over the common edge of the semiconductor post region, the first layer including a first conductive material; and

(d) a second layer formed over the sidewall of the semiconductor post region, the second layer including a second conductive material, the second layer bonded with the first layer at the common edge of the semiconductor post region such that a flange interface of the first and second layers is formed at the common edge of the semiconductor post region.

5,557,150

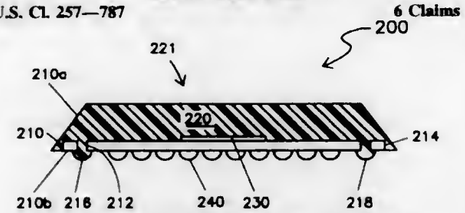
OVERMOLDED SEMICONDUCTOR PACKAGE

Patrick Variot, San Jose, and Chok J. Chia, Campbell, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Division of Ser. No. 331,263, Oct. 28, 1994, which is a continuation of Ser. No. 969,862, Oct. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 917,894, Jul. 21, 1992, abandoned, and a continuation-in-part of Ser. No. 834,182, Feb. 7, 1992, Pat. No. 5,262,927. This application Apr. 27, 1995, Ser. No. 429,605

Int. Cl.[6] H01L *23/28*

U.S. Cl. 257—787 **6 Claims**



1. An overmolded semiconductor package, comprising:

a sandwich structure of a leadframe disposed between an upper substrate and a lower substrate;

a semiconductor die mounted within an opening in the lower substrate and connected to wiring traces disposed on the lower substrate;

means for selectively electrically connecting the wiring traces to leads of the leadframe;

at least one hole extending through the upper and lower substrates; and

a plastic molded structure disposed over the die and partially over the lower substrate, and extending through the at least one hole of the upper and lower substrates.

5,557,151

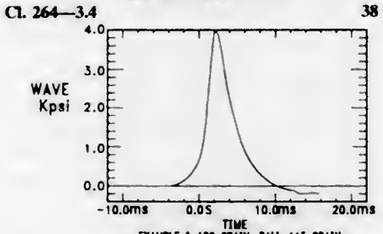
METHOD OF MAKING A GAS GENERATION COMPOSITION

Brett N. Epstein, Las Vegas, Nev.; Mark A. Griesbach, Hortonville, Wis., and Earl F. Kurtz, Las Vegas, Nev., assignors to Legend Products Corporation, Las Vegas, Nev.

Filed Jan. 26, 1994, Ser. No. 187,744

Int. Cl.[6] C06B *21/00*

U.S. Cl. 264—3.4 **38 Claims**



1. Methods of making gas generation compositions, without cooking, including the step of:

dry mixing a nitrate containing oxidizing agent, and an organic acid selected from the group consisting of ascorbic acid and erythorbic acid to form, without cooking, a dry mixture; and then

reducing the size of the dry mixed ingredients to the range between about 30 microns and about 500 microns, with the majority of the dry mixed ingredients in the range between about 100 microns and about 150 microns.

5,557,152

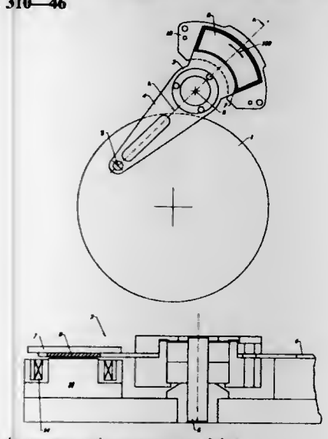
2-POLE SINGLE OR DUAL COIL MOVING MAGNET MOTOR WITH MOVING BACK IRON

Raymond G. Gauthier, Santa Cruz County, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 276,874, Jul. 18, 1994, abandoned, which is a continuation of Ser. No. 541,845, Jun. 21, 1990, abandoned. This application Jun. 2, 1995, Ser. No. 459,635

Int. Cl.[6] H02K *37/00;* **G11B** *5/48*

U.S. Cl. 310—46 **20 Claims**



1. An electromagnetic motor comprising:

a fixed stator structure constructed of high permeability material having at least one pole,

a planar moving magnet member formed with at least one pole having a substantially linear magnetization over its working range,

a moving back iron flux return path portion constructed of high permeability material and supported on said moving magnet member,

at least one energizing coil connected to and operating in conjunction with the fixed stator portion which when energized by a current will establish a magnetic flux that will accelerate said magnet member and said moving back iron flux return path portion in proportion to the applied current.

5,557,153

AIR-COOLED ROTATING ELECTRICAL MACHINE

Hans Zimmermann, Mönchaltorf, Switzerland, assignor to ABB Management AG, Baden, Switzerland

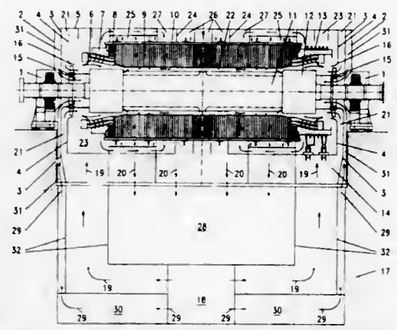
Filed Sep. 15, 1994, Ser. No. 306,622

Claims priority, application Germany, Sep. 15, 1993, 43 31 243.8

Int. Cl.[6] H02K *9/26;9/00;9/06*

U.S. Cl. 310—56 **10 Claims**

3. An air-cooled rotating electrical machine having an open cooling circuit, having a rotor which is provided with cooling ducts, having a laminated stator core which is provided with cooling ducts, having a machine housing, outer casings on two housing ends, fans on each end of a shaft of the rotor, said fans passing cooling air, which is mechanically filtered by a first filter, through chambers on machine ends into a machine interior, said chambers being separated from the machine interior by second inner casings, wherein said chambers are divided by a first inner casing, a first chamber, which is formed essentially by an outer casing and a first inner casing, being capable of supplying a part of said cooling air directly to the rotor bypassing the fan, said part of said cooling air being filtered by a second filter, wherein a second chamber, which is formed essentially by the first inner casing and the second inner casing, can be supplied only with said cooling air, and wherein means are provided for separating an outlet flow space of the fan from a rotor space.



5,557,154

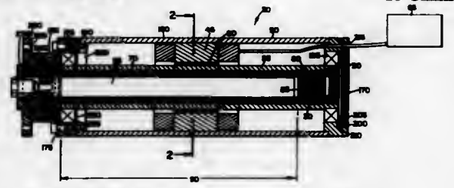
LINEAR ACTUATOR WITH FEEDBACK POSITION SENSOR DEVICE

Timothy A. Erhart, Chanhassen, Minn., assignor to Exlar Corporation, Chanhassen, Minn.

Continuation-in-part of Ser. No. 125,495, Sep. 22, 1993, Pat. No. 5,491,372, which is a continuation of Ser. No. 999,463, Dec. 29, 1992, abandoned, which is a continuation of Ser. No. 775,113, Oct. 11, 1991, abandoned. This application Nov. 19, 1993, Ser. No. 154,953

Int. Cl.[6] H02K *7/06;7/10;11/00;* **F04B** *17/03*

U.S. Cl. 310—80 **16 Claims**



1. An electrically powered linear actuator comprising:

(a) a housing assembly;

(b) an energizable stator supported by the housing assembly;

(c) elongated cylinder means of a magnetic material having means mounted about an outer circumference thereof for forming an armature with the cylinder means, the elongated cylinder means having an internally threaded bore to thereby define an armature drive cylinder;

(d) means for rotatably supporting the cylinder means relative to the housing assembly;

(e) an actuator assembly including an output shaft and a thread engaging portion operably coupled with the threaded bore of the cylinder means, the thread engaging portion being moved along the threaded bore of the cylinder means to provide bidirectional linear movement of the output shaft, the extent of the thread engaging portion being smaller than the extent of the internal threads extending along the cylinder means such that the difference therebetween defines a maximum actuation stroke for the actuator assembly, and the thread engaging portion including a plurality of transmission rollers interposed between and engaging both the output shaft and the threaded bore of the cylinder means; and

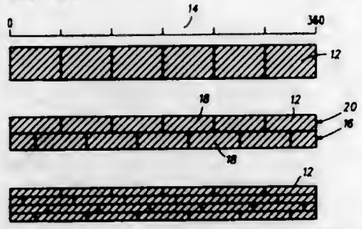
(f) rotational position sensing means for sensing the rotational position of the armature drive cylinder and providing a positional signal representative thereof.

5,557,155

OPTIMIZATION OF SUPERCONDUCTING TILING PATTERN FOR SUPERCONDUCTING BEARINGS

John R. Hull, Hinsdale, Ill., assignor to University of Chicago, Chicago, Ill.

Filed May 23, 1994, Ser. No. 247,349
Int. Cl.[6] H02K *7/09*
U.S. Cl. 310—90.5 **16 Claims**



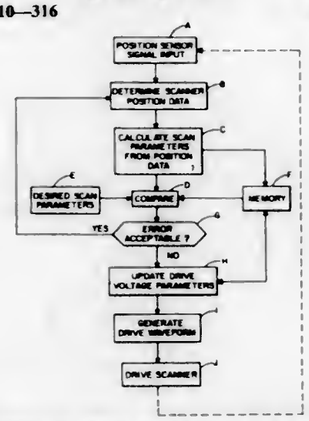
1. A high temperature superconductor bearing, comprising:
a permanent magnet levitated by a plurality of high temperature superconductor structures, said high temperature superconductor structures being arranged in a plurality of tiers, and said high temperature superconductor structures in each tier having their magnetic field maximum locations offset from magnetic field maximum locations of said high temperature superconductor structures in adjacent tiers, thereby smoothing the overall magnetic field of said plurality of HTSC structures.

5,557,156

SCAN CONTROL FOR SCANNING PROBE MICROSCOPES

Virgil Elings, Santa Barbara, Calif., assignor to Digital Instruments, Inc., Santa Barbara, Calif.

Filed Dec. 2, 1994, Ser. No. 353,399
Int. Cl.[6] G01N *23/00*
U.S. Cl. 310—316 **45 Claims**



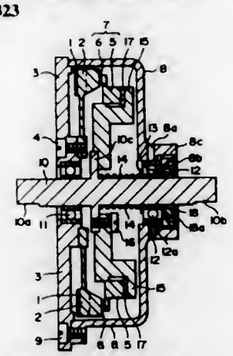
1. In a method of controlling a scanning motion for a scanning probe microscope with a scanner having an attached end and a free end in which positioning of the free end is controlled by application of a scan voltage to the scanner, the improvement comprising the steps of:
a) applying to said scanner a scan voltage which varies as a predetermined parametric function to generate a scanning motion;
b) monitoring said scanning motion with a position sensor by sensing plural position data of said free end along a selected coordinate; and
c) updating parameters of said predetermined parametric function based on the sensed plural position data to produce a linear scan of certain size and offset.

5,557,157

VIBRATION DRIVEN MOTOR

Takayuki Shirasaki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 86,362, Jul. 6, 1993, abandoned, which is a continuation of Ser. No. 619,345, Nov. 29, 1990, abandoned. This application Jan. 30, 1995, Ser. No. 380,333
Claims priority, application Japan, Nov. 30, 1989, 1-312048; Nov. 30, 1989, 1-312049; Nov. 30, 1989, 1-312051
Int. Cl.[6] H01L *41/08*
U.S. Cl. 310—323 **26 Claims**



1. A vibration wave motor, comprising:
a vibration member for generating a vibration wave therein in response to an applied electrical signal; and
a contact member, having a sliding portion which contacts said vibration member, for receiving the vibration wave generated in said vibration member, said sliding portion being formed of a composite resin comprising a base material of thermoplastic resin and a non-fibrous carbon bead material blended therewith, said non-fibrous carbon bead material having an average particle diameter of 10 to 30 μm.

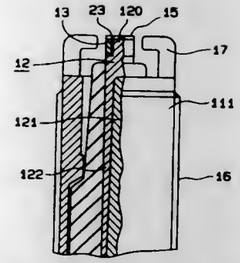
5,557,158

SPARK PLUG AND METHOD OF PRODUCING THE SAME

Keiji Kanao, Okazaki; Kozo Takamura, Nagoya; Nobuo Abe, Yokkaichi, and Akio Katoh, Nishio, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 16, 1994, Ser. No. 260,792
Claims priority, application Japan, Jun. 16, 1993, 5-145064; Jul. 14, 1993, 5-174059; Mar. 22, 1994, 6-050154
Int. Cl.[6] H01T *13/20;13/22;* **H01J** *13/56*
U.S. Cl. 313—141 **6 Claims**

1. A spark plug comprising:
a center electrode electrically insulated from a housing and having a small-diameter portion at a tip portion thereof which has a diameter smaller than that of a main body of said center electrode and composed of similar kinds of material as said center electrode;
a round-shaped material, which is formed into a cylindrical or a ring shape, composed of dissimilar metal material and fitted to said small-diameter portion of said center electrode so as to form a minute clearance between an inner surface of said round-shape material and an outer surface of said small-diameter portion of said center electrode, said round-shape material being composed of noble metal; and
a ground electrode opposing to said center electrode so as to form a spark gap therebetween;
wherein said round-shape material is substantially longitudinally immovably fixed to said center electrode by a large diameter portion which is integrally formed on a tip portion of said center electrode such that said minute clearance is kept between said round-shape material and said center electrode.

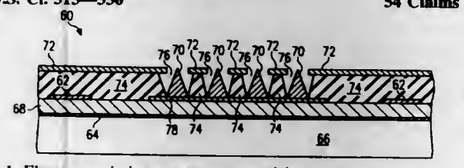


5,557,159

FIELD EMISSION MICROTIP CLUSTERS ADJACENT STRIPE CONDUCTORS

Robert H. Taylor, Richardson; Kenneth G. Vickers, Whitesboro; Bruce E. Gnade, Dallas; Arthur M. Wilson, Richardson, and Charles E. Priman, Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 18, 1994, Ser. No. 341,740
Int. Cl.[6] H01J *1/30;29/04*
U.S. Cl. 313—336 **54 Claims**



1. Electron emission apparatus comprising:
a conductive plate having a plurality of microtip emitters thereon;
a conductive layer overlying said conductive plate and spaced apart from said plate, said conductive layer having apertures formed therein, each of said emitters formed within a corresponding one of said apertures in said conductive layer;
a stripe conductor laterally spaced from said plate; and
a resistive layer electrically coupled to said stripe conductor and said plate.

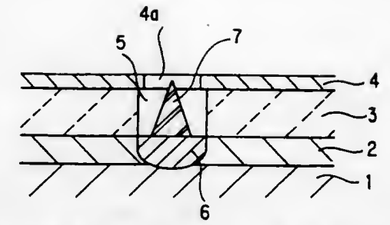
5,557,160

FIELD EMISSION CATHODE INCLUDING CYLINDRICALLY SHAPED RESISTIVE CONNECTOR AND METHOD OF MANUFACTURING

Hideo Makishima, and Akihiko Okamoto, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Dec. 28, 1994, Ser. No. 365,570
Claims priority, application Japan, Dec. 28, 1993, 5-336297
Int. Cl.[6] H01J *1/30;17/06*
U.S. Cl. 313—336 **1 Claim**

1. A field-emission cathode, comprising:
a semiconductor substrate;
a high resistance semiconductor layer formed on said semiconductor substrate;
an electrode for emitting electrons, said emitting electrode being provided on said high resistance semiconductor layer and having a sharpened tip;
an insulating layer formed on said high resistance semiconductor layer, said insulating layer having a cavity surrounding said emitting electrode; and
a control electrode provided on said insulating layer, said control electrode having an aperture surrounding said emitting electrode;
said high resistance semiconductor layer having a cylindrically shaped lower resistivity region located under said emitting electrode, wherein an impurity concentration of said region under said emitting electrode is higher than in a remaining region of said high resistance semiconductor layer;
wherein said high resistance semiconductor layer is one of an epitaxial layer, a polycrystalline layer, and an amorphous layer; and
wherein the impurity concentration of said region under said emitting electrode is higher in an upper surface region thereof than in a remaining region of said lower resistivity region.

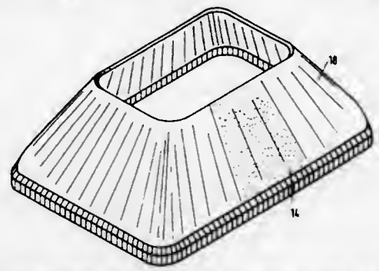


5,557,161

COLOR DISPLAY TUBE HAVING A MAGNETIC SHEILD WITH A REDUCED MAGNETIC PERMEABILITY AREA

Adrianus J. Van Mensvoort, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 19, 1994, Ser. No. 326,611
Claims priority, application Belgium, Oct. 22, 1993, 09301127; European Pat. Off., Feb. 28, 1994, 94200504
Int. Cl.[6] H01J *29/06*
U.S. Cl. 313—402 **11 Claims**



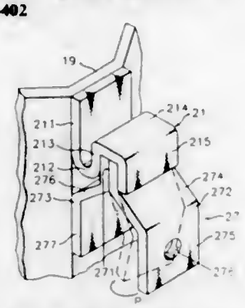
1. A color display tube comprising an envelope with a longitudinal axis, having a neck portion, a funnel portion and a window portion;
an electron gun arranged in the neck portion;
a display screen having a short central axis and a long central axis and a pattern of phosphor elements on the inner surface of the window portion;
a color selection means arranged proximate to the display screen;
a funnel-shaped shield of a magnetically permeable material having two long wall portions parallel to the long axis of the display screen, each of the long wall portions of the shield having at least one apertureless area having a reduced magnetic permeability, and extending in the longitudinal direction of the tube between the edge of the wall portion and the

aperture; and two short wall portions parallel to the short axis

5,557,165

aperture; and two short wall portions parallel to the short axis of the display screen, and an aperture at the gun-sided end, which aperture extends transversely to the longitudinal axis and constitutes an aperture for passing electron beams produced by the gun and scanning the display screen.

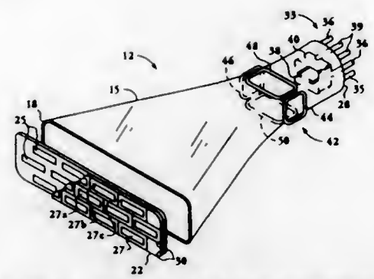
5,557,162
COLOR PICTURE TUBE WITH A SHADOW MASK SUPPORT MEMBER
Jung-chang Han, Kyunggi-do, Rep. of Korea, assignor to Samsung Display Devices Co., Ltd., Kyunggi-do, Rep. of Korea
Filed Jan. 18, 1995, Ser. No. 374,184
Int. Cl.[6] H01J *29/81*
U.S. Cl. 313—402 **2 Claims**



1. A color cathode ray tube comprising:
an evacuated envelope with a tube axis including a face panel having an inside wall with stud pins, a funnel connected to the face panel and a neck extending from the funnel;
a shadow mask assembly including a shadow mask facing the face panel, and a mask frame for supporting the shadow mask;
a plurality of support members for suspending the shadow mask assembly to the stud pins, each of the support members comprising a first arm portion coupled to the stud pin, a second arm portion connected to the mask frame and a folded portion connecting the first and second arm portions with each other; and
a control member for connecting the folded portion of one of the support members to the mask frame, said control member having a fastening section supported and welded to the mask frame above the one support member, and an arcuate elastic section extending from the fastening section, a first corner spring support section upwardly extending from the elastic section and contacting a side wall of the folded portion, a connecting section extending perpendiculenly from the first corner spring support section, and a second corner spring support section downwardly extending from the connecting section and contacting an opposite side wall of the folded portion.

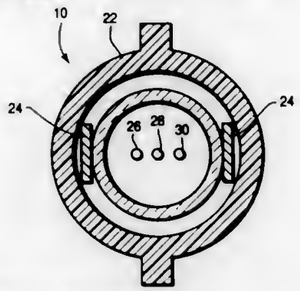
5,557,163
MULTIPLE WINDOW ELECTRON GUN PROVIDING REDUNDANT SCAN PATHS FOR AN ELECTRON BEAM
George Wakalopulos, Pacific Palisades, Calif., assignor to American International Technologies, Inc., Torrance, Calif.
Filed Jul. 22, 1994, Ser. No. 278,804
Int. Cl.[6] H01J *33/04*
U.S. Cl. 313—420 **19 Claims**

1. An electron beam device comprising,
an evacuated gas impermeable envelope having a back end and a front end,
a first and second array each comprising of a plurality of electron permeable, gas impermeable windows disposed at said front end in horizontal rows and vertical columns, with



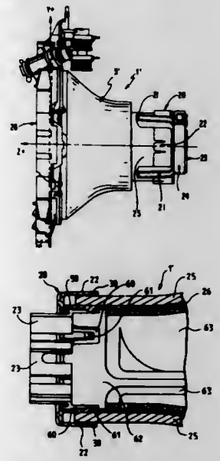
the rows and columns of the first array being staggered with respect to the rows and columns of the second array, with at least one window from the first array extending so as to overlap two adjacent windows of said second array and at least one window from the second array extending so as to overlap two adjacent windows of said first array,
filament means for generating electrons within said envelope,
means for accelerating said electrons along a direction from said back end to said front end,
deflection means for deflecting said electrons transversely to said direction, directing said electrons to impinge primarily upon said plurality of windows, said accelerating means and said deflecting means defining a trajectory means,
means for focusing said electrons upon said plurality of windows, and
timing means for synchronizing said trajectory means and said focusing means such that said electrons traverse at least two of said plurality of windows in a sequence of pulses.

5,557,164
CATHODE RAY TUBE WITH MISCONVERGENCE COMPENSATION
Shiou-Chern Chen, Pan-Chiao, and Chi-Fang Huang, Taipei, both of Taiwan, assignors to Chunghua Picture Tubes, Ltd., Taiwan
Filed Mar. 15, 1995, Ser. No. 404,905
Int. Cl.[6] H01S *29/70;29/50;* **H01F** *7/00*
U.S. Cl. 313—440 **8 Claims**



1. A cathode ray tube comprising:
a tube having a cylindrical neck portion at one end and a funnel portion at its other end;
a gun in the neck portion adapted to generate three electron beams and direct the beams along the tube to the face plate;
purity compensating magnets around the tube adjacent the gun;
a yoke around the tube for causing the beams to move across the face plate; and
means around the neck portion within the purity compensating magnets for compensating the misconvergence of the paths of the beams caused by the effect of the earth's magnetic fields on the beams.

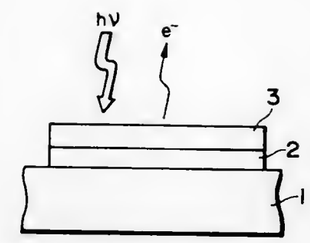
5,557,165
DEFLECTION YOKE ATTACHMENT ARRANGEMENT
Jean-Philippe Descombes, Premiéres, and Alain Vougay, Dijon, both of France, assignors to Thomson Tubes & Displays, S.A., France
Filed Jun. 5, 1995, Ser. No. 465,025
Claims priority, application European Pat. Off., Jan. 7, 1994, 94401502
Int. Cl.[6] H01J *29/70*
U.S. Cl. 313—440 **11 Claims**



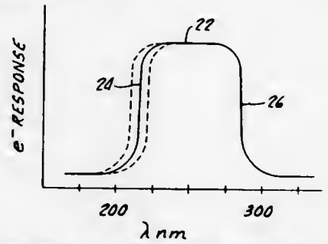
6. A deflection yoke for a cathode ray tube, comprising:
a horizontal deflection coil;
a saddle-shaped vertical deflection coil separated from the horizontal deflection coil;
a truncated cone-shaped core made of magnetic material placed around at least one of said deflection coils; and
a separator for separating said horizontal and vertical deflection coils, said separator including:
a funnel-shaped main body; and
a removable rear ring having a locking attachment arrangement for selectively attaching said main body to said removable ring when said deflection yoke is assembled, said removable rear ring having arms placed on a periphery of said rear ring such that, when said rear ring and said main body of said separator are attached to each other, said arms extend toward a front part of said separator for securing said core.

5,557,166
REFLECTION-TYPE PHOTOELECTRONIC SURFACE AND PHOTOMULTIPLIER
Yasushi Watase; Hiroaki Washiyama, and Toshio Ikuma, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Hamamatsu, Japan
Continuation of Ser. No. 46,958, Apr. 16, 1993, abandoned. This application Jun. 1, 1995, Ser. No. 457,744
Claims priority, application Japan, Apr. 22, 1992, 4-102945
Int. Cl.[6] H01J *40/16*
U.S. Cl. 313—524 **10 Claims**

1. A reflection-type photocathode, comprising:
a substrate made of nickel;
a reflection layer of aluminum formed on an upper surface of the substrate; and
a photosensitive layer formed directly on the reflection layer and formed of antimony activated with at least one kind of alkali metal.



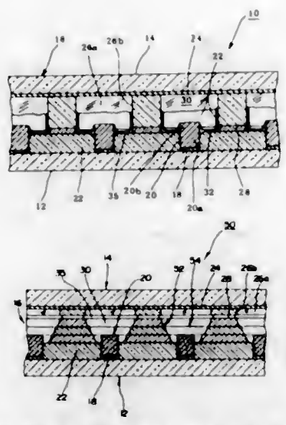
5,557,167
TRANSMISSION MODE PHOTOCATHODE SENSITIVE TO ULTRAVOILET LIGHT
Hyo-Sup Kim, Phoenix; John F. Krueger, Chandler, and Alexander L. Vinson, Apache Junction, all of Ariz., assignors to Litton Systems, Inc., Woodland Hills, Calif.
Filed Jul. 28, 1994, Ser. No. 281,850
Int. Cl.[6] H01J *31/50*
U.S. Cl. 313—542 **18 Claims**



1. A photocathode for receiving photons of ultraviolet light and responsively emitting photoelectrons, said photocathode comprising:
a sapphire window substrate layer;
a single-crystal active layer of AlGaN carried on said substrate layer;
a crystalline interface layer interposing between said substrate window layer and said active layer and including means for providing an interface between said interface layer and said active layer which is substantially free of crystal lattice defects; and
wherein said interface layer includes a super lattice structure with plural sub-layers of AlGaN, and said plural sub-layers of said super lattice structure alternating in their composition of aluminum and gallium constituents.

5,557,168
GAS-DISCHARGING TYPE DISPLAY DEVICE AND A METHOD OF MANUFACTURING
Fumio Nakajima, Kumagaya, and Satoshi Watanabe, Ohsato-gun, both of Japan, assignors to Okaya Electric Industries Co., Ltd., Tokyo, Japan
Filed Mar. 30, 1994, Ser. No. 219,781
Claims priority, application Japan, Apr. 2, 1993, 5-100569; Apr. 2, 1993, 5-100570; Feb. 16, 1994, 6-041895; Feb. 17, 1994, 6-043054; Feb. 21, 1994, 6-046335
Int. Cl.[6] H01J *17/49;17/20*
U.S. Cl. 313—586 **34 Claims**

1. A gas-discharging type display device comprising:
a front substrate formed of a transparent insulating material;
at least one anode on said front substrate, said at least one anode being formed of a transparent conductive material;
a rear substrate formed of an insulating material;
at least one cathode formed of an emitter material on said rear substrate;



at least one junction where said at least one anode and said at least one cathode are in adjacent spaced relation to each other a predetermined distance apart, making at least one discharge cell at said at least one junction;

said front substrate and said rear substrate forming an airtight chamber;

said airtight chamber filled with a discharge gas;

a cathode lead pattern on an inner surface of said rear substrate;

a cathode support layer covering said cathode lead pattern;

said cathode support layer having at least one hole therein; and

said at least one cathode having a cylindrical shape, having a end connected to said cathode lead pattern at said at least one hole in said cathode support layer and a second end protruding from said cathode support layer into said at least one discharge cell.

5,557,169

ELECTRIC LAMP WITH HIGH AND LOW MELTING POINT CURRENT SUPPLY CONDUCTOR

Franciscus H. Van Lierop, and Mathias L. M. Tuinissen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

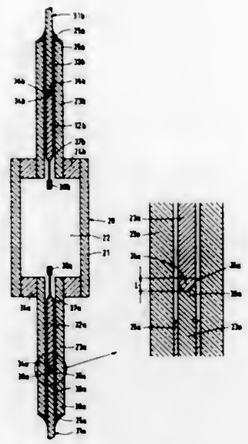
Filed Nov. 4, 1994, Ser. No. 335,512

Claims priority, application Belgium, Nov. 9, 1993, 09301235

Int. Cl.[6] H01J *17/18*

U.S. Cl. 313—623 **4 Claims**

1. An electric lamp comprising a lamp vessel sealed in a gastight manner and having a wall of ceramic material with a lead-through channel, an electric element arranged in the lamp vessel, a current supply conductor connected to the electric element, which current supply conductor issues from the lamp vessel to the exterior via the lead-through channel in the wall and comprises a first part with a melting point and a second part with a melting point lower than the melting point of the first part, which first and second parts form a welded joint with mutually facing ends, characterized in that: the first part merges into a narrowing end, said narrowing end having a circumference O at the transition to the first part and a length L which is at least one tenth of the circumference O, and said narrowing end being at least partly embedded in the end of the second part.



5,557,170

LOW-PRESSURE DISCHARGE LAMP AND METHOD OF MANUFACTURING A LOW-PRESSURE DISCHARGE LAMP

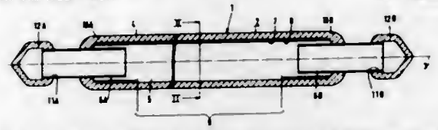
Pieter C. Ooms, Roosendaal, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 22, 1994, Ser. No. 362,038

Claims priority, application Belgium, Dec. 24, 1993, 09301462

Int. Cl.[6] H01J *9/20;61/35*

U.S. Cl. 313—635 **16 Claims**



1. A low-pressure discharge lamp comprising a tubular discharge vessel having an axis and a wall which encloses a discharge space in a gastight manner, an ionizable filling in the discharge space, a pair of electrodes in the discharge vessel, and an optically active layer of a material at an inner surface of the wall of the discharge vessel, which optically active layer is interrupted by an elongate window extending in the direction of the axis, characterized in that the optically active layer adjacent both to the window and to the wall has fused material.

5,557,171

HIGH INTENSITY DISCHARGE LAMP WITH ULTRA VIOLET ABSORBING ENVELOPE

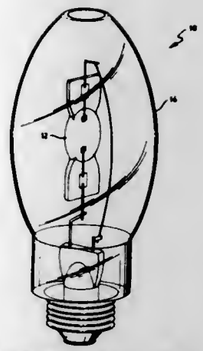
Richard C. Marlor, Beverly, Mass., and R. Bruce Biddulph, Exeter, N.H., assignors to Osram Sylvania Inc., Danvers, Mass.

Filed Jun. 15, 1995, Ser. No. 490,877

Int. Cl.[6] H01J *17/16;61/30*

U.S. Cl. 313—636 **2 Claims**

1. An electric arc discharge lamp having an arc discharge light source which emits both visible light radiation and UV radiation enclosed within a borosilicate glass envelope having a transmission of greater than 90% at a wavelength of 425 nm and a transmission of not more than 40% of said UV radiation at 320 nm; 8% of said UV radiation at 300 nm; and 0.5% of said UV radiation at 290 nm; said borosilicate glass envelope comprising, in weight percent: from about 3.89% Na_2O; about 1.5% K_2O; from 0.0% to about 0.15% Li_2O; about 17% B_2O_3; about 1.4% Al_2O_3; about 0.6% CaO; about 0.35% MgO; about 0.13% Fe_2O_3; and the balance SiO_2.



5,557,172

PLASMA BEAM GENERATING METHOD AND APPARATUS WHICH CAN GENERATE A HIGH-POWER PLASMA BEAM

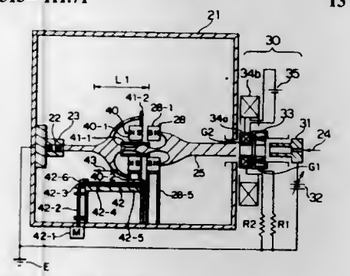
Masaru Tanaka, Ehime, Japan, assignor to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Filed Dec. 20, 1994, Ser. No. 359,543

Claims priority, application Japan, Dec. 21, 1993, 5-322455; Dec. 24, 1993, 5-328698; Dec. 27, 1993, 5-333562

Int. Cl.[6] H01J *7/24*

U.S. Cl. 315—111.71 **13 Claims**



1. A plasma beam generating apparatus comprising:

a chamber for defining a discharge space;

a plasma source mounted on said chamber to generate a plasma beam;

an anode portion arranged within said chamber to receive said plasma beam;

acceleration magnetic field generating means comprising a ring-shaped first permanent magnet arranged so as to surround an orbit of said plasma beam to provide the orbit of said plasma beam with a magnetic field having a magnetic gradient such that space charges are generated, said acceleration magnetic field generating means accelerating electron flow in said plasma beam to supply accelerated electron flow to said anode portion; and

magnetic field controlling means arranged within said chamber for controlling said magnetic gradient by varying strength of the magnetic field generated by said acceleration magnetic field generating means, said magnetic field controlling means comprising a ring-shaped control magnetic field generating means arranged so as to surround the orbit of said plasma beam.

5,557,173

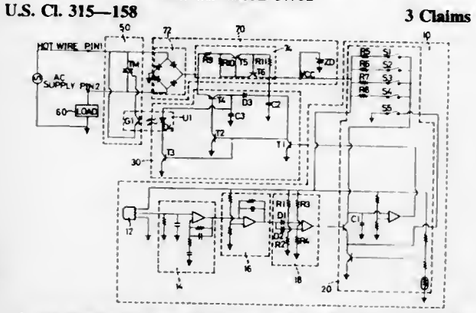
INFRARED DETECTION CIRCUIT

Ping-jung Kuo, Sanchung City, Taiwan, assignor to IR-TEC International Ltd., Taipei Hsien, Taiwan

Filed Aug. 29, 1995, Ser. No. 520,418

Int. Cl.[6] H05B *37/02*

U.S. Cl. 315—158 **3 Claims**



1. An electronic circuit for controlling a load series-connected with the electronic circuit comprising:

a direct current power circuit having a rectifier in series with the load, a high-impedance circuit subtracting an output voltage from the rectifier to a first predetermined voltage, and a zener diode receiving the first predetermined voltage for outputting a power voltage;

detecting means for receiving the power voltage from the direct current power circuit and detecting infrared rays emitted from a human;

triggering means connected with the detecting means for outputting a triggering signal and having the output voltage from the rectifier bypass the high-impedance circuit when the detecting means detects an infrared ray from a human is received as to provide a second predetermined voltage to the zener diode; and

means for activating the load when the triggering signal is received.

5,557,174

ELECTRONIC BALLAST WITH DIMMER AND HARMONICS FILTER FOR SUPPLYING A LOAD, FOR EXAMPLE A LAMP

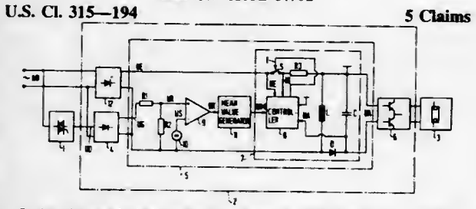
Günter Johler, Bregenz, Austria, assignor to Tridonic Bauelemente GmbH, Dornbirn, Austria

Filed Aug. 3, 1994, Ser. No. 285,091

Claims priority, application Germany, Aug. 25, 1993, 43 28 608.9; Nov. 29, 1993, 43 40 604.1

Int. Cl.[6] H05B *37/02*

U.S. Cl. 315—194 **5 Claims**



1. An electronic ballast for supplying a load with an a.c. voltage whose frequency is higher than an a.c. mains frequency, said ballast comprising:

a first rectifier arranged to be connected to an a.c. mains;

an inverter connected downstream of said first rectifier, which inverter generates, at a frequency which is higher than the frequency of said a.c. mains, an a.c. voltage for the load; and

an electronic harmonics filter which includes a clocked switching controller arranged between the first rectifier and the inverter, the output voltage of which harmonics filter is controlled;

5,557,176

each said row electrode overlaps said base electrode means,

characterised in that,

a dimmer is arranged to be connected to said a.c. mains, said dimmer being connected to control the output voltage of said harmonics filter, whereby a desired value for the control of the output voltage of the harmonics filter is dependent upon voltage changes of said dimmer,

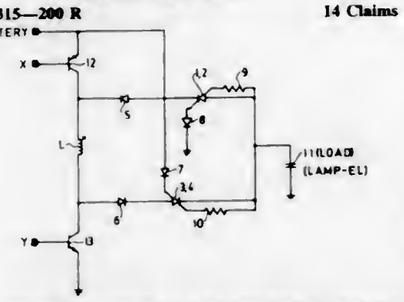
said clocked switching controller being connected to be supplied with a first desired value signal, dependent upon the rectified mains voltage, and a first actual value signal dependent upon the rectified a.c. mains output form, said clocked switching controller also being connected such that the amplitudes of resulting output current pulses from said clocked switching controller are so controlled by comparison of said first desired value signal and said first actual value signal that the pulses form an envelope curve adapted to the sinusoidal half-waves of the rectified a.c. mains voltage.

5,557,175

BATTERY OPERATED INVERTER CIRCUIT FOR CAPACITIVE LOADS SUCH AS ELECTROLUMOINESCENT LAMPS

Grady M. Wood, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Jun. 13, 1995, Ser. No. 490,016
Int. Cl.[6] H05B *37/00*
U.S. Cl. 315—200 R **14 Claims**



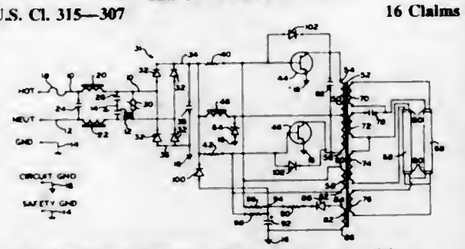
1. An inverter for powering a load presenting a capacitive impedance, which inverter includes an inductor connected to the load, via a plurality of first switching devices each having a terminal for triggering thereof into unidirectional current conduction, said inverter also having a plurality of second switching devices connected in series which said inductor and with a battery providing a voltage between supply and return sides thereof, one of said second switching devices connecting said supply side of said battery to said load via said inductor and one of said plurality of first switching devices to provide the unidirectional current in pulses to said load for charging said load to a voltage higher than the voltage provided by said battery during a first half cycle, and another of said plurality of second switching devices connecting said load to said return side via said inductor and another of said plurality of first switching devices to provide unidirectional current pulses to discharge said load during a second half cycle, and means for automatically triggering said one and said another first switching devices during said first and second half cycles upon occurrence of a transient accompanying said pulses including means presenting a capacitance at the control terminals of said first switching devices and means operated by said transient accompanying said pulses during said first and second half cycles for enabling current to flow with respect to said capacitance to trigger said first switching devices upon occurrence of the transient.

5,557,176

MODULATED ELECTRONIC BALLAST FOR DRIVING GAS DISCHARGE LAMPS

Daniel P. O'Brien, Fort Wayne, Ind., assignor to Diversitec Incorporated, Fort Wayne, Ind.

Filed Jan. 31, 1994, Ser. No. 189,488
Int. Cl.[6] H05B *37/00*
U.S. Cl. 315—307 **16 Claims**



7. A circuit for driving a gas discharge lamp comprising:

full wave rectifier means for connecting to an alternating power source signal and supplying a substantially unfiltered rectified direct current signal at a first frequency;

a transformer having a primary winding with first, second and third tap points, said second tap being intermediate said first and second taps and coupled to said full wave rectifier means, said transformer further having a secondary winding for driving said discharge lamp;

a first transistor having its collector connected to said first tap and a second transistor having its collector connected to said third tap, each of said transistors having an emitter connected to ground and a base coupled to said full wave rectifier means whereby said transistors oscillate in a push/pull relation when said rectified direct current signal is applied thereto; and,

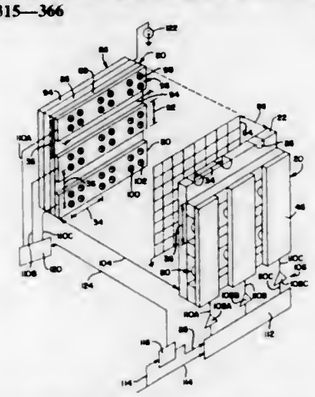
a diode having low instantaneous forward voltage drop connected directly between the base and collector of each of said transistors for directing current from respective base to collectors to prevent excessive saturation of the transistors.

5,557,177

ENHANCED ELECTRON BEAM ADDRESSED STORAGE TARGET

Craig D. Engle, 336 Cline Ave., Griffith, Ind. 46319

Filed Jan. 18, 1994, Ser. No. 183,037
Int. Cl.[6] G09G *1/04*; **H01T** *29/56*; **G02F** *1/03*; **G11C** *13/00*
U.S. Cl. 315—366 **16 Claims**



1. A row addressed field emitter array electronic charge storage target device comprising:

a vacuum environment,

base electrode means,

a plurality of non overlapping row electrodes generally extending along a first direction,

each said row electrode overlaps said base electrode means,

row decoder means to apply a current control voltage between a select one of said row electrodes and said base electrode means,

a respective electron emitting means operatively associated with each said row electrode and said base electrode means for emitting in said vacuum environment a plurality of electrons dependent upon said current control voltage applied between the row electrode and said base electrode means by a field emission phenomena,

target means comprising:

a substrate,

a plurality of reflective conductor means arranged into a matrix of p rows and q columns,

support means to separate each said reflective conductor means from said substrate,

said reflective conductor means in each column q are electrically connected,

electron collector means,

potential control means to apply between each said column q of electrically connected reflective conductor means and said collector means a respective potential difference,

control means to synchronize application of said respective potential differences with application of said current control voltage between each one of said row electrodes and said base electrode means,

acceleration means to enable said electrons emitted from any one of said respective emitting means to be accelerated toward said target means,

focusing means to cause said electrons accelerated by said acceleration means to strike said target means at a respective emitting means image,

equilibrium writing means enabling said respective potential difference applied between any one of said columns q of electrically connected reflective conductor means and said collector means to influence an electronic charge quantity accumulated by a respective pixel element formed where at least one of said reflective conductor means in the column q overlaps said emitting means image of where said focusing means has caused said accelerated electrons to strike said target means,

each column q of electrically connected reflective conductor means overlaps each said respective emitting means image enabling said electronic charge quantity accumulated by said pixel elements formed with each said emitting means image to be collectively accumulated during a respective line period duration thereby providing compensation for variations in the number of said electrons striking said target means at each said emitting means image,

said electronic charge quantity accumulated by each said pixel element influences separation between said substrate and said reflective conductor means forming said pixel element.

5,557,178

CIRCULAR PARTICLE ACCELLERATOR WITH MOBIUS TWIST

Richard M. Talman, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Nov. 1, 1994, Ser. No. 332,038
Int. Cl.[6] H05H *11/00;13/00*
U.S. Cl. 315—501 **12 Claims**

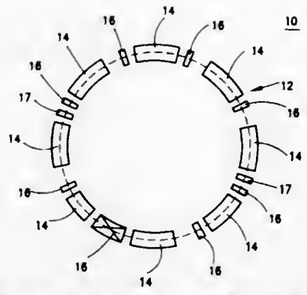
1. A circular accelerator structure for accelerating charged particles comprising:

(a) a ring shaped lattice comprising:

(1) a first plurality of spaced dipole magnets arranged in a ring shape for causing charged particles to bend and thereby travel around said ring shaped lattice; and

(2) a plurality of focusing magnets, each disposed between adjacent ones of said dipole magnets for focusing charged particles as they traverse said ring shaped lattice; and

(b) means to interchange horizontal and vertical betatron oscillation phases of each charged particle only once for every



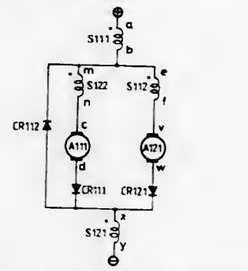
traversal of said ring shaped lattice by each charged particle to cause the horizontal and vertical betatron oscillation phases to alternate during each successive traversal of said ring shaped lattice.

5,557,179

CONTROL CIRCUIT FOR PLURAL PARTIALLY INTERLOCKED COMMUTATOR TYPE MOTORS WITH OSCILLATION DAMPING CHARACTERISTICS

Tai-Her Yang, No. 32 Lane 29, Taipin St., Sl-Hu Town, Dzan-Hwa, Taiwan

Filed Aug. 16, 1994, Ser. No. 291,682
Int. Cl.[6] H02N *4/02*
U.S. Cl. 318—41 **3 Claims**



1. A partially interlocked motor control circuit for plural commutator type motors, comprising:

first and second armatures each having first and second ends;

a first diode connected to the first end of the first armature and a second diode connected to the first end of the second armature; and

a first series field winding arranged to magnetically interact with the first armature to cause the first armature to rotate when a current is present in the first series field winding and a second series field winding arranged to magnetically interact with the second armature to cause the second armature to rotate when a current is present in the second series field winding,

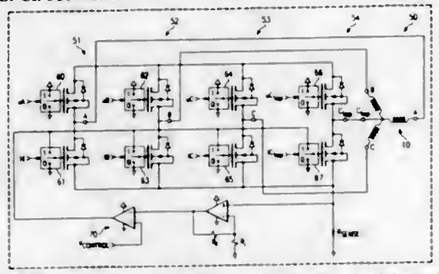
wherein the first series field winding is series connected to the second end of the second armature and wherein the second series field winding is series connected to the second end of the first armature, and

further comprising a third series field winding arranged to magnetically interact with the first armature and connected between a terminal of the power supply and each of the first and second series field windings, and a fourth series field winding arranged to magnetically interact with the second armature and connected between a second terminal of the power supply and each of said diodes.

5,557,180
CIRCUIT AND METHOD FOR OPERATING A 3-PHASE MOTOR WITH A UNI-COIL PHASE COMMUTATION SCHEME

Scott W. Cameron, Milpitas, Calif., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Jun. 30, 1993, Ser. No. 85,507
Int. Cl.[6] H02P *1/18*
U.S. Cl. 318—254 **13 Claims**

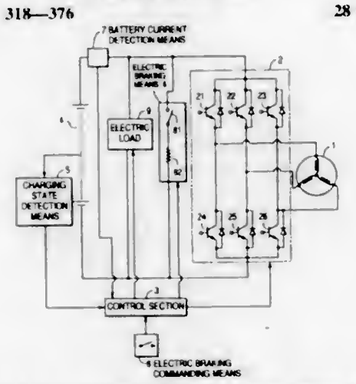


10. The method of claim **9** wherein said plurality of driving coils comprise a "Y" connected set of driving coils.

5,557,181
BRAKE CONTROL APPARATUS FOR ELECTRIC MOTOR VEHICLE

Shotaro Naito, Katsuta; Sanshiro Obara, Naka, and Nobuyoshi Mutoh, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sep. 20, 1993, Ser. No. 123,105
Claims priority, application Japan, Sep. 18, 1992, 4-249140
Int. Cl.[6] H02D *1/00*
U.S. Cl. 318—376 **28 Claims**



26. Method of operating an electric motor system having a motor, a power supply unit coupled to provided electric power to said motor, a control unit which controls said power supply unit and a rechargeable power source coupled to provide electric power to said power supply unit, said power supply unit being operable to output an electric charging current to said rechargeable power source when said power supply unit is driven by said motor, said method comprising the steps of:

detecting a charge state of said rechargeable power source, and providing a charge state signal indicative thereof;

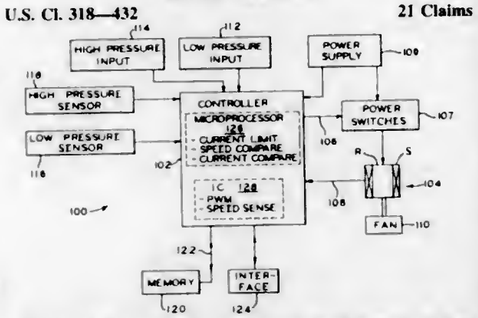
detecting said charging current and providing a current signal indicative of magnitude thereof; and

limiting said charging current flowing to said rechargeable power source by activating a first electric load element to divert at least a portion of said charging current from said rechargeable power source if said charge state signal exceeds a first predetermined value at a time when said charging current exceeds a second predetermined value.

5,557,182
SYSTEM AND METHODS FOR CONTROLLING A DRAFT INDUCER TO PROVIDE A DESIRED OPERATING AREA

Robert K. Hollenbeck, and Mark A. Brattoli, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 25,371, Feb. 26, 1993, Pat. No. 5,418,438. This application Sep. 1, 1994, Ser. No. 299,528
Int. Cl.[6] H02P *7/00*
U.S. Cl. 318—432 **21 Claims**



1. A system for driving a rotatable component in response to an external signal corresponding to a desired motor current, said system having an operating region outside of which excessive heat may be generated by the system, said system comprising:

a motor having a stationary assembly and a rotatable assembly in magnetic coupling relation thereto, the stationary assembly including windings adapted to be energized in at least one preselected sequence, the rotatable assembly in driving relation to the rotatable component;

power switching devices responsive to a motor control signal for selectively connecting a power supply to the windings to provide a motor current to the windings in the preselected sequence to produce an electromagnetic field for rotating the rotatable assembly at a motor operating speed;

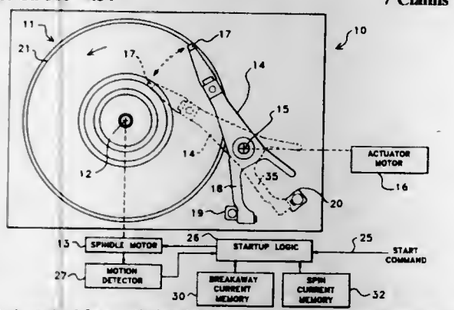
a speed sensing circuit for generating a tachometer signal representative of the motor operating speed; and

a controller comparing the motor operating speed as represented by the tachometer signal to a reference speed and comparing the desired motor current as represented by the external signal to a maximum current which is a function of the motor operating speed and responsive to the external signal and the tachometer signal for generating the motor control signal to control the power switching devices, the controller generating the motor control signal so that a current corresponding to the desired motor current is provided to the windings by the power switching devices when the motor operating speed is greater than or equal to the reference speed, the controller generating the motor control signal so that a current corresponding to the maximum current is provided to the windings by the power switching devices when the motor operating speed is less than the reference speed and the desired motor current is greater than or equal to the maximum current thereby maintaining operation of the motor within a speed/current region defined by the reference speed and the maximum current whereby excessive heat is prevented from being generated by the system.

5,557,183
METHOD AND APPARATUS FOR PREDICTING FAILURE OF A DISK DRIVE

Randall M. Bates, Byron; David F. Glaess, Rochester; Thomas S. Larson, Altura, and Patricia J. Wadkins, Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 99,688, Jul. 29, 1993, abandoned. This application Feb. 17, 1995, Ser. No. 391,313
Int. Cl.[6] H02P *3/00*
U.S. Cl. 318—434 **7 Claims**



1. A method for predicting failure of a disk drive, comprising the steps of;

providing a disk drive having an electrical spin motor, a disk that is rotated by said spin motor, and a head that physically engages said disk when said spin motor is not energized,

monitoring, for a plurality of stop/start events, the electrical energization applied to said spin motor to cause said head to breakaway from said physical engagement with said disk,

predicting the possibility of a future failure of said disk drive as a function of said monitored electrical energization applied to said motor in said plurality of stop/start events,

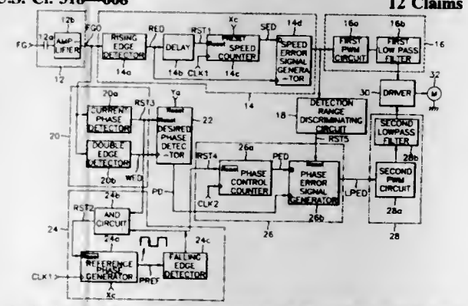
determining a rate of increase of said monitored electrical energization applied to said motor in said plurality of stop/start events, and

predicting the possibility of future failure of said disk drive as a function of said determined rate of increase.

5,557,184
SPINDLE MOTOR CONTROLLING CIRCUIT OF AN OPTICAL DISK SYSTEM

Yong-Ha Hwang, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Aug. 2, 1993, Ser. No. 100,817
Claims priority, application Rep. of Korea, Oct. 1, 1992, 18018/1992
Int. Cl.[6] G05B *1/06*
U.S. Cl. 318—608 **12 Claims**



1. A circuit for controlling a spindle motor of an optical disk system, comprising:

spindle motor rotation sensing means for generating a phase frequency in accordance with an amount of rotation of said spindle motor;

means for setting a variable desired spindle motor speed;

means for setting a variable desired phase value;

speed error signal generating means for generating speed error data indicative of a difference between a period of said phase frequency and data representing said variable desired spindle motor speed;

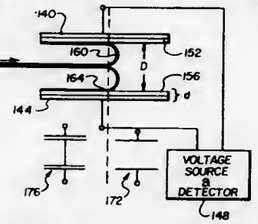
speed driving voltage generating means for generating a speed driving voltage corresponding to said generated speed error data and for driving said spindle motor according to said generated speed driving voltage; and

means for automatically controlling a phase difference between said spindle motor and said variable desired phase value when said speed error data is within a predetermined range and while said speed driving voltage generating means drives said spindle motor according to said speed driving voltage, and disabling control of said phase difference when said speed error data exceeds said predetermined range.

5,557,185
MECHANICAL/ELECTRICAL DISPLACEMENT TRANSDUCER

Stephen C. Jacobsen; Micheal G. Mladejovsky, and John E. Wood, all of Salt Lake City, Utah, assignors to University of Utah Research Foundation, Salt Lake City, Utah

Division of Ser. No. 183,280, Jan. 18, 1994, Pat. No. 5,457,368, which is a division of Ser. No. 28,767, Mar. 9, 1993, Pat. No. 5,302,886, which is a continuation of Ser. No. 417,181, Oct. 4, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 488,068
Int. Cl.[6] G01R *29/12*; H04R *19/00*
U.S. Cl. 318—568.16 **16 Claims**



1. Displacement measuring apparatus comprising

an element whose displacement is to be measured,

sensor means defining two facing, generally parallel conducting surface areas for developing a capacitance therebetween, two dielectric layers, each disposed on a respective surface area, and adapted to produce an electrical output signal whose value varies with variation in proximity of a conductive member to said surface areas,

an elongate, flexible, electrically conductive hand disposed in proximity with said surface areas so that at least a portion of said band is caused to move non-slidably relative to said surface areas when the element is moved to thereby vary the value of the output signal of said sensor means, said apparatus further comprising a second elongate, flexible, electrically conductive band joined at one end to one side of one of the dielectric layers to partially overlie the layer, said first mentioned band being joined at one end to one side of the other dielectric layer adjacent to the one side of said one dielectric layer, to partially overlie the other layer, said bands each extending from a respective one side forwardly toward the opposite side of a respective layer, and then curving outwardly from the respective layer and rearwardly to join and extend along with the other band, said other ends of the bands being caused to move toward and away from between the dielectric layers as the element is moved to thereby cause the bands to respectively cover and uncover corresponding por-

tions of the dielectric layers to thus vary the capacitance

wherein said monitoring comprises monitoring said charge and

3. A method for charging a plurality of cells using a power

tions of the dielectric layers to thus vary the capacitance between the surface areas.

5,557,186

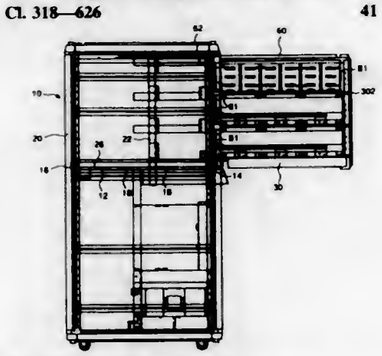
LINEAR ACCELERATED DEVICE

Kevin D. McMurtrey, Sr., Ft. Lauderdale; Arthur M. Rossi, Hollywood; Robert J. Cichon, Jr., Plantation; Karen A. Briggs, Stuart, and Jonathan C. Ely, Pompano Beach, all of Fla., assignors to Encore Computer Corporation, Ft. Lauderdale, Fla.

Continuation of Ser. No. 252,996, Jun. 2, 1994, Pat. No. 5,469,037. This application May 18, 1995, Ser. No. 443,527

Int. Cl.[6] **G11B** *33/02*; **H05K** *5/00*

U.S. Cl. 318—626 **41 Claims**



1. An apparatus comprising:

a housing having a front, a rear and two sides;

an elongated slide mounted front to rear in the housing;

an elongated drawer having at least one open side mounted on the slide for withdrawing the same from the front of the housing and exposing the at least one open side thereof;

means, mounted in the housing, for moving the drawer from a closed position wholly contained in the housing to an open position withdrawn from the housing with the at least one open side exposed;

said means for moving including a motor connected to move the drawer and control means for controlling the motor to moderate starting and stopping of the motor to avoid shocks to the drawer;

mounting means having I/O connections for mounting an array of disc drives in the drawer to be accessible from the at least one open side of the drawer;

cabling means for introducing I/O cables to the mounting means with the cables terminated in connections that mate with the I/O connections of the mounting means; and

ventilation means, disposed on said elongated drawer, for forcing a flow of air into and out of the elongated drawer.

5,557,187

SWITCHED CAPACITOR NETWORK

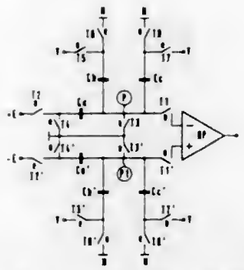
Rudolf Koch, Oberhaching, and Michael Alger-Meunier, Haar, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 29, 1994, Ser. No. 297,618

Claims priority, application Germany, Aug. 27, 1993, 43 28 974.6

Int. Cl.[6] **H03M** *1/66*; **H02M** *3/06*; **G05B** *24/02*; **H02J** *1/00*

U.S. Cl. 320—1 **2 Claims**



1. A switched capacitor network, comprising:

a signal voltage source;

a reference voltage source;

differential amplifiers having input circuits;

two first capacitors having the same capacitance, two second capacitors having the same capacitance, and two third capacitors having the same capacitance as said second capacitors;

a switch device alternatingly charging said two first capacitors from said signal voltage source with polarities being opposite relative to a ground potential and then discharging each of said two first capacitors through said input circuit of a respective one of said differential amplifiers;

said switch device alternatingly charging said two second capacitors in phase opposition with one another from said reference voltage source with the same polarities relative to the ground potential and then discharging each of said two second capacitors through said input circuit of a respective one of said differential amplifiers, in synchronism with the charging and discharging of said two first capacitors; and

said switch device charging each of said two third capacitors in phase opposition with a respective corresponding one of said second capacitors from said reference voltage source with the same polarities relative to the ground potential and then discharging each of said two third capacitors through said input circuit of a respective one of said differential amplifiers.

5,557,188

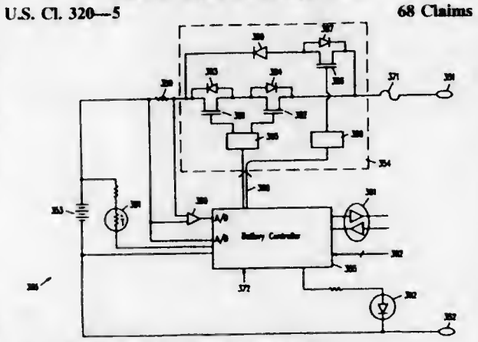
SMART BATTERY SYSTEM AND INTERFACE

Lawrence E. Piercey, San Jose, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Feb. 1, 1994, Ser. No. 190,669

Int. Cl.[6] **G01R** *19/00*; **H02J** *7/04*

U.S. Cl. 320—5 **68 Claims**



1. An intelligent battery system comprising:

a first and a second battery system supply voltage terminal;

a battery having a first and a second supply voltage terminal;

control circuitry coupled between said battery system supply voltage terminals and said battery; and

a battery controller coupled to said control circuitry having input leads for monitoring the state of the battery and in response thereto controlling the charge and discharge current flowing between said battery system supply voltage terminals and said battery by means of said control circuitry;

wherein said monitoring comprises monitoring said charge and discharge current over time to maintain an indication of the charge state of said battery.

5,557,189

METHOD AND APPARATUS INCLUDING A CURRENT DETECTOR AND POWER SOURCE CONTROL CIRCUIT FOR CHARGING A NUMBER OF BATTERIES

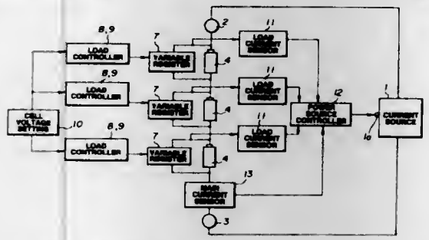
Mamoru Suzuki, Saitama; Minoru Iijima, Tokyo; Yasuyuki Ishihama, Kanagawa, and Nobuhiro Fujiwara, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 9, 1994, Ser. No. 352,618

Claims priority, application Japan, Dec. 24, 1993, 5-328352; Sep. 8, 1994, 6-214917

Int. Cl.[6] **H01M** *10/44*; *10/46*

U.S. Cl. 320—18 **3 Claims**



2. A battery charging apparatus for charging a plurality of cells comprising:

a plurality of charging units each connected to a respective one of a plurality of cells, each charging unit having current changing means connected in parallel with a respective cell for changing the current supplied to the cell, cell voltage detection means for detecting a voltage of the cell, pre-set voltage outputting means for outputting a pre-set voltage indicating a pre-set voltage value of the cell, and comparator-control means for comparing the voltage of the cell detected by said cell voltage detection means to the pre-set voltage from said pre-set voltage outputting means for detecting a present voltage of the cell with respect to said pre-set voltage, said comparator-control means controlling said current changing means so that the current flowing through the current changing means is increased as the present voltage value of the cell approaches the pre-set voltage, wherein said plurality of charging units are connected in series with one another;

a power source circuit having a variable output current connected to the plurality of charging units;

a plurality of first current detection means each associated with the current changing means of each charging unit for detecting the current value flowing through each variable current means;

second current detection means for detecting the output current value of said power source circuit; and

power source circuit control means for detecting the maximum current value among current values of said current changing means based upon each detection output of each first current detection means and for generating a first subtraction current value by subtracting a pre-set maximum load value indicating a maximum current value capable of flowing through said variable current means from said maximum current, said power source circuit control means detecting a polarity of the first subtraction current value and generating a second subtraction current value by subtracting said first substraction current value from an output current value of the power source circuit as detected by said second current detection means, said power source control means also controlling said power source circuit so that an output current value of the power source circuit becomes equal to said second subtraction current value only when the first subtraction current value is of a positive polarity.

3. A method for charging a plurality of cells using a power source circuit comprising the steps of:

controlling a plurality of variable current means connected in parallel to said plurality of cells for varying a current supplied to said cells so that the current flowing through said variable current means is gradually increased as a present voltage value approaches a pre-set voltage value;

detecting the current values of said variable current means and detecting a minimum current value from among said current values and an output current value of said power source circuit;

generating a subtraction current value by subtracting the minimum current value of said variable current means from the output current value of the power source circuit; and

controlling said power source circuit so that the output current value of said power source circuit becomes equal to said subtraction current value.

5,557,190

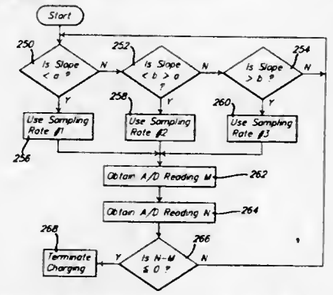
BATTERY RECHARGING SYSTEM WITH SIGNAL-TO-NOISE RESPONSIVE FALLING VOLTAGE SLOPE CHARGE TERMINATION

Daniele C. Brotto, Baltimore, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Feb. 28, 1994, Ser. No. 203,117

Int. Cl.[6] **H01M** *10/44*

U.S. Cl. 320—21 **23 Claims**



1. A method of charging a battery comprising the steps of:

applying a charging current to the battery;

for a first time interval, testing the battery to obtain data of battery voltage as a function of time and evaluating said data to determine if the time rate of change of said voltage is not positive during said first time interval;

terminating the application of charging current to the battery if said time rate of change is not positive during said first time interval;

after the completion of said first time interval, waiting for a second time interval;

after the completion of said second time interval, testing the battery to obtain data of battery voltage as a function of time and evaluating said data to determine if the time rate of change of said voltage is not positive at any time after said second time interval;

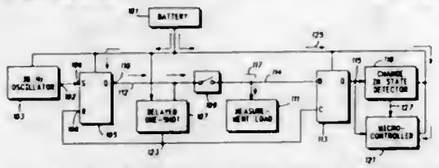
terminating the application of charging current to the battery if said time rate of change is not positive at any time after said second time interval.

5,557,191

APPARATUS FOR MINIMIZING CURRENT DRAIN IN A BATTERY POWERED DATA COLLECTOR

Zbynek A. Capurka, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 29, 1994, Ser. No. 219,599
Int. Cl.° H02J *7/00*
U.S. Cl. 320—48 **13 Claims**



1. An apparatus for minimizing current drain in a battery powered data collector, the apparatus comprising:

stimulus means having a control input, wherein responsive to a first state of a control signal at the control input, the stimulus means provides a periodic stimulus signal, and responsive to a second state of the control signal at the control input the stimulus means ceases the provision of the periodic stimulus signal;

a load; and

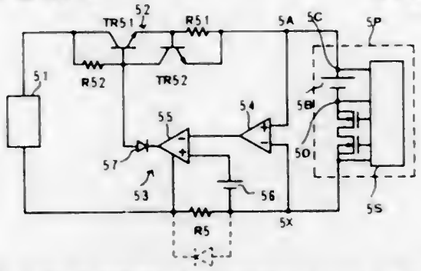
switch means coupled between the stimulus means and the load, the switch means having an on-state and an off-state, wherein responsive to the on-state and the provision of the periodic stimulus signal from the stimulus means, the switch means provides the periodic stimulus signal to the load causing depletion of energy from the battery into the load, and in response to the periodic stimulus signal the switch means provides the second state of the control signal to the control input of the stimulus means, that then ceases the provision of the periodic stimulus signal to the load thus ceasing the depletion of the energy from the battery.

5,557,192

CHARGING APPARATUS WITH A COMPENSATION CIRCUIT

Mikitaka Tamai, Sumoto, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Aug. 12, 1994, Ser. No. 289,568
Claims priority, application Japan, Sep. 21, 1993, 5-234928
Int. Cl.° H02J *7/04*
U.S. Cl. 320—30 **11 Claims**



1. A charging apparatus with a compensation circuit comprising:

(a) a voltage detection circuit for measuring the voltage across terminals of circuitry including a rechargeable battery;

(b) a charging control circuit for controlling charging, based on the voltage measured by the voltage detection circuit, such that the rechargeable battery voltage does not exceed a prescribed voltage; and

(c) a compensation circuit for at least compensating the voltage measured by the voltage detection circuit for a voltage drop due to a resistive component in circuitry other than the rechargeable battery;

wherein the voltage detection circuit is provided with a reference voltage device and an op-amp having a first and a second input terminal;

wherein the terminal voltage of circuit including the rechargeable battery is input to the first input terminal of the op-amp and the reference voltage is input to the second input terminal of the op-amp for comparison;

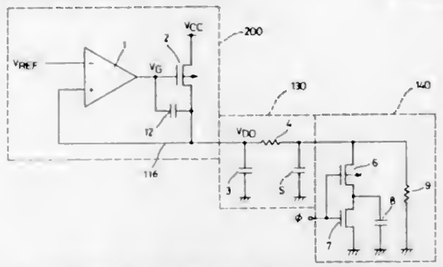
wherein the compensation circuit is provided with a compensation resistor connected in series with the rechargeable battery, and wherein the compensation resistor is connected to the reference voltage device such that the voltage drop across the compensation resistor is added to the voltage of the reference voltage device and input to the second input terminal of the op-amp.

5,557,193

STABILIZED VOLTAGE GENERATING CIRCUIT AND INTERNAL VOLTAGE DOWN CONVERTER AND A METHOD OF GENERATIANG AN INTERNAL OPERATING POWER SUPPLY VOLTAGE FOR A DYNAMICALLY OPERATING CIRCUIT

Takeshi Kajimoto, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 27, 1993, Ser. No. 126,764
Claims priority, application Japan, Oct. 12, 1992, 4-272775
Int. Cl.° G05F *1/40;1/44*
U.S. Cl. 323—282 **9 Claims**



1. A stabilized voltage generating circuit, comprising:

comparator means for comparing a voltage on an output node of the stabilized voltage generating circuit with a first reference voltage;

adjusting means, coupled to the comparator means, for adjusting a current amount flowing from a voltage supplying node to said output node, in response to an output of said comparator means; and

feed back means, coupled between said output node and the output of the comparator means, for feeding back a potential change on said output node to the output of said comparator means by capacitive coupling, wherein a voltage on said output node is applied to a circuit portion driven dynamically as an operating power supply voltage.

5,557,194

REFERENCE CURRENT GENERATOR

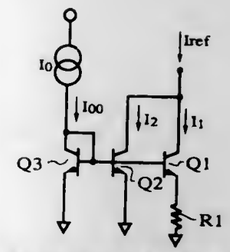
Hatsuhiro Kato, Hakodate, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 20, 1994, Ser. No. 359,460
Claims priority, application Japan, Dec. 27, 1993, 5-329482
Int. Cl.° G05F *3/16*
U.S. Cl. 323—315 **11 Claims**

1. A reference current generator comprising:

(a) a first bipolar transistor (Q1) having an emitter connected to a first power source through a first resistor (R1);

(b) a second bipolar transistor (Q2) having a collector connected to the collector of said first bipolar transistor (Q1), an emitter



connected to the first power source, and a base connected to the base of said first bipolar transistor (Q1);

(c) a constant current source (Io) having a negative temperature coefficient, provided with a terminal connected to a second power source and another terminal serving as an output terminal; and

(d) a third bipolar transistor (Q3) having a base connected to the bases of said first and second bipolar transistors (Q1, Q2), an emitter connected to the first power source, and a collector connected to its own base and to the output terminal of said constant current source,

wherein said second and third bipolar transistors (Q2, Q3) constitute a current mirror circuit, and

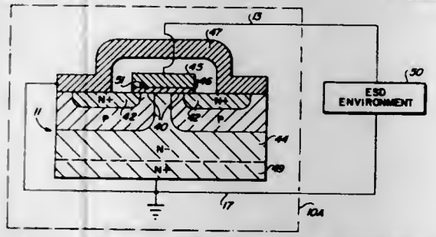
wherein the reference current generator provides a reference current as the sum of a first collector current of said first bipolar transistor and a second collector current of said second bipolar transistor, said first collector current having a positive temperature coefficient and said second collector current having a negative temperature coefficient so that fluctuations in said first and second collector currents due to temperature changes are compensated in order to generate a constant reference current.

5,557,195

METHOD AND APPARATUS FOR EVALUATING ELECTROSTATIC DISCHARGE CONDITIONS

Ronald D. Schrimpf, and Sungchul Lee, both of Tucson, Ariz., assignors to QRP, Inc., Tucson, Ariz.

Continuation of Ser. No. 971,522, Nov. 3, 1992, Pat. No. 5,376,879. This application Nov. 15, 1994, Ser. No. 339,823
Int. Cl.° G01R *31/02;* **G01N** *27/60*
U.S. Cl. 324—72 **5 Claims**



1. An electrostatic discharge sensor adapted for testing an environment for the occurrence of electrostatic discharge in the environment, comprising in combination:

(a) a MOSFET having a gate electrode and a main current-carrying electrode, the MOSFET having the characteristic that an electrostatic discharge of more than a predetermined amount of charge into the gate electrode produces a substantial permanent reduction in the gate electrode impedance of the MOSFET;

(b) an electrically insulative container, the MOSFET being disposed within the insulative container, a first group of conductors, each spaced from the others, extending from the insulative container, and a second group of conductors, each spaced from the others, extending from the insulative container; and

(c) a first conductor within the insulative container electrically connecting the gate electrode to all of the antenna conductors of the first group, and a second conductor within the insulative container electrically connecting the main current-carrying electrode to all of the conductors of the second group,

whereby one of the first and second groups of conductors acts as an antenna for attracting electrostatic discharge and the other of the first and second groups of conductors acts as a relative ground for such electrostatic discharge, and

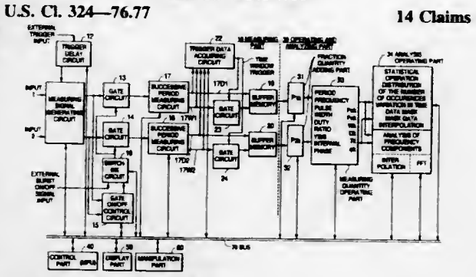
whereby the electrostatic discharge sensor is passed through an environment and subsequently tested to measure the gate electrode impedance and thereby reliably determine if an electrostatic discharge was sensed in the environment by the electrostatic discharge sensor.

5,557,196

JITTER ANALYZER

Hitoshi Ujiie, Sendai, Japan, assignor to Advantest Corporation, Tokyo, Japan

PCT No. PCT/JP94/01389, § 371 Date Apr. 25, 1995, § 102(e) Date Apr. 25, 1995
PCT Filed Aug. 23, 1994, Ser. No. 424,369
Claims priority, application Japan, Aug. 25, 1993, 5-210211; Sep. 16, 1993, 5-230538; Sep. 20, 1993, 5-233365
Int. Cl.° F24F *7/00*
U.S. Cl. 324—76.77 **14 Claims**



1. A jitter analyzer comprising:

a first successive period measuring circuit supplied with one edge of each waveform of a pulse-like signal to be measured including a discontinuous burst signal, for continuously measuring the period between the edges;

a second successive period measuring circuit supplied with one edge of each waveform of a pulse-like signal to be measured including a discontinuous burst signal or the other edge of each waveform of said signal to be measured inputted into said first successive period measuring circuit, for continuously measuring the period between the edges;

first and second memories for storing measured period data therein each time said measured period data are provided thereto from said first and second successive period measuring circuits, respectively;

measuring quantity operating means for calculating various quantities in time/frequency domain of said signal to be measured on the basis of the measured period data stored in said first and second memories, said various quantities in time/frequency including at least a period and a pulse width;

analysis means for performing an analysis of the calculated various quantities in time/frequency of said signal to be measured; and

first and second gate circuits for controlling the passage of the edges therethrough provided to said first and second successive period measuring circuits, respectively;

said first and second gate circuits being controlled so that they are turned on and off in case a discontinuous burst signal is inputted, thereby inhibiting the input of the signal into said successive period measuring circuits during off-time intervals of said burst signal.

5,557,197

constructing a chain of spin-echo signals characteristic of said population of particles;

5,557,197
MULTIMETER WITH AUTOMATIC FUNCTION-SETTING

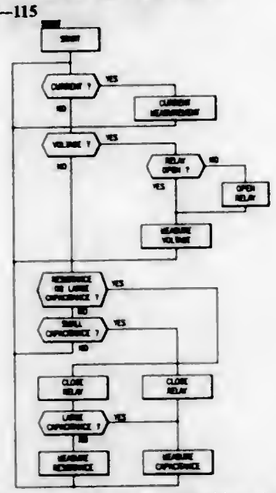
Wolfgang Schulze, Nuremberg; Dieter Feulner, Wendelstein; Burkhard Krien, Roth, and Bernd Meier, Postbauer-Heng, all of Germany, assignors to Gossen-Metrawatt GmbH, Nuremberg, Germany

Filed Sep. 16, 1994, Ser. No. 305,954

Claims priority, application Germany, Sep. 18, 1993, 43 31 796.0

Int. Cl.[6] G01R *15/08*

U.S. Cl. 324—115 **7 Claims**



1. In a method for the automatic recognition of electrical characteristics and measurement of the magnitudes thereof in a multimeter with automatically selected ranges of measurement, the characteristics being recognized by a recognition circuit present at an input to the multimeter, comprising the steps of:

(a) identifying an electrical characteristic whose magnitude is to be measured by applying an input signal to a high input resistance via input terminals;

(b) automatically switching on a low input resistance when the characteristic being measured is recognized as an impedance;

(c) measuring the magnitude of said impedance at low input resistance; and

(d) repeating steps (a)–(c) when the range of measurement is changed, the improvement

wherein the low input resistance is switched only when a voltage applied at the input terminals is zero, and

wherein the high input resistance is switched on again only after a voltage is applied to the input terminals.

5,557,198
ONBOARD DIGITAL LOCOMOTIVE MULTIMETER

Jack W. Matthews, 1131 Wheaton Oaks Ct., Wheaton, Ill. 60187, and William Stevens, Wheaton, Ill., assignors to Jack W. Matthews, Wheaton, Ill.

Filed Nov. 14, 1994, Ser. No. 337,859

Int. Cl.[6] G01R *19/00;1/00;21/00*

U.S. Cl. 324—115 **17 Claims**

1. An onboard digital locomotive multimeter to be installed on a locomotive to test a main generator voltage and a load test shunt millivoltage of a locomotive engine comprising:

a) a switching means for switching both a converter means and a regulator means, the switching means being coupled to a 74 volts power supply source, the switching means also being coupled to a converter means for converting a DC voltage, the converter means being coupled to a regulator means for regulating a voltage to provide power for the digital locomotive multimeter;

b) a first amplifier means for amplifying and coupling the load test shunt millivoltage;

c) the switching means coupled to the first amplifier means;

d) a voltage divider means for dividing a voltage, the voltage divider means being coupled to the main generator voltage;

e) a second amplifier means for amplifying and coupling a voltage, the second amplifier means being coupled to the voltage divider means and the second amplifier means also being coupled to the switching means;

f) a switch position detector means for detecting the position of the switching means, the switch position detector means being coupled to the switching means and the switch position detector means also being coupled to a microcontroller means for microprocessing;

g) an analog to digital converter means for converting an analog signal to a digital signal, the analog to digital converter means being coupled to the switching means and the analog to digital converter means also being coupled to the microcontroller means;

h) a clock reducing means for reducing a clock rate, the clock reducing means being coupled to the microcontroller means and the clock reducing means also being coupled to the analog to digital converter means; and

i) a display means for displaying data, the display means coupled to the microcontroller means.

5,557,199
MAGNETIC RESONANCE MONITOR

Joseph D. Bowman, Cincinnati, and Daniel P. Engel, III, Cheviot, both of Ohio, assignors to The United States of America as represented by the Department of Health and Human Services, Wash.

Filed Apr. 29, 1994, Ser. No. 235,833

Int. Cl.[6] G01V *3/00*

U.S. Cl. 324—301 **16 Claims**

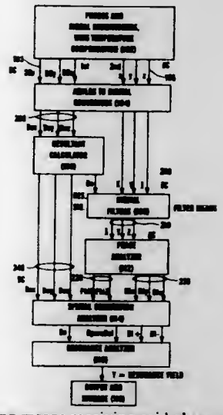
1. Measuring device for measuring magnetic resonance between magnetic moments in an object and a multi-dimensional magnetic field including static and oscillating components, comprising:

probe means for detecting static and oscillating components of a magnetic field and for outputting first and second signals respectively representative thereof;

resultant generating means receiving said first signals for generating and outputting a resultant signal representative of a resultant magnitude of the static component of said magnetic field;

filter means responsive to said resultant signal for establishing a central frequency for filtering said second signals representative of said oscillating component of said magnetic field and for outputting filtered signals representative of the oscillating component of the magnetic field;

phase analyzing means receiving said filtered signals for outputting phase signals and magnitude signals respectively indicative of phases and magnitudes of the oscillating component of the magnetic field; and



yield determining means receiving said phase signals, said magnitude signals, and said first signals for determining a resonance yield of said magnetic field, thereby identifying a change in a rate of chemical reactions involving resonances between the magnetic moments in the object and the multi-dimensional magnetic field.

5,557,200
NUCLEAR MAGNETIC RESONANCE DETERMINATION OF PETROPHYSICAL PROPERTIES OF GEOLOGIC STRUCTURES

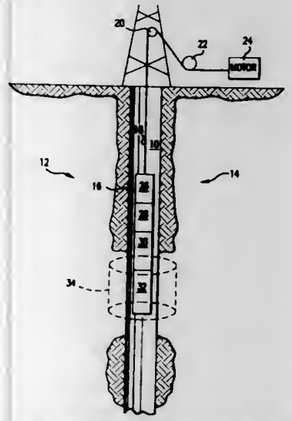
George R. Coates, Austin, Tex., assignor to Numar Corporation, Malvern, Pa.

Continuation-in-part of Ser. No. 898,990, Jun. 15, 1992, Pat. No. 5,412,320, which is a continuation-in-part of Ser. No. 701,516, May 16, 1991, abandoned. This application Jun. 17, 1994, Ser. No. 261,542

The portion of the term of this patent subsequent to Jun. 15, 2012, has been disclaimed.

Int. Cl.[6] G01V *3/00*

U.S. Cl. 324—303 **3 Claims**



1. A method for determining the composition of a geologic structure, comprising the steps of:

imparting a polarizing magnetic field to a geologic structure for a predetermined period of time;

measuring nuclear magnetic resonance signals representing spin-echo relaxation of a population of particles in the geologic structure;

constructing a chain of spin-echo signals characteristic of said population of particles;

determining values for the magnetic resonance log (MRL) porosity (PHI_M) of the geologic structure from said chain of spin-echo signals;

determining values for the total porosity PHI_t; and

deriving additional petrophysical properties of the geologic structure from the total porosity (PHI_t) values and from the MRL porosity (PHI_M) values.

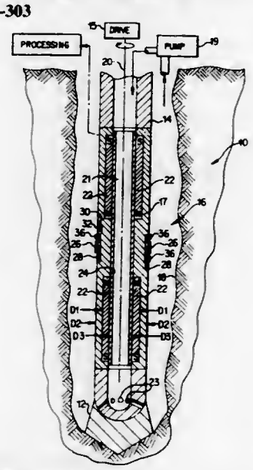
5,557,201
PULSED NUCLEAR MAGNETISM TOOL FOR FORMATION EVALUATION WHILE DRILLING

Robert L. Kleinberg, Ridgefield, and Abdurrahman Sezginer, Brookfield, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 200,815, Feb. 22, 1994, abandoned, which is a continuation of Ser. No. 922,254, Jul. 30, 1992, abandoned. This application Apr. 28, 1995, Ser. No. 430,697

Int. Cl.[6] G01R *33/20*

U.S. Cl. 324—303 **44 Claims**



1. An apparatus comprising:

1) a drilling means having:

a) a drill bit for drilling a borehole in a formation;

b) an exterior surface and a recess in the exterior surface; and

c) a housing means;

2) a pulsed NMR means housed within the housing means for making nuclear magnetic resonance (NMR) measurements of the formation while the borehole is being drilled, the pulsed NMR means having:

a) two tubular magnets, each having magnetic poles, and arranged so one pair of like magnetic poles face one another;

b) an antenna mounted between the two tubular magnets, and in the recess of the exterior surface of the drilling means; and

c) driving circuitry means for driving the antenna, which is mounted in the housing of the drilling means; and

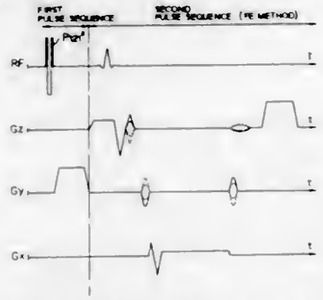
3) means for carrying borehole fluid through the drilling means, which is surrounded by the two tubular magnets and the antenna,

wherein the borehole fluid provides an electromagnetic signal, and the pulsed NMR means comprises a gradient coil means for canceling the signal of the borehole fluid by applying a pulsed magnetic field which is stronger in the borehole fluid and weaker at a stationary point in the formation.

5,557,202
METHOD AND SYSTEM FOR MAGNETIC RESONANCE IMAGING

Mitsue Miyazaki, and Fumitoshi Kojima, both of Otawara, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Apr. 26, 1994, Ser. No. 233,353
Claims priority, application Japan, Apr. 27, 1993, 5-101424
Int. Cl.[6] G01V *3/00*
U.S. Cl. 324—307 **10 Claims**



1. A method of magnetic resonance imaging of an object being examined under an application of a static magnetic field, with a magnetization transfer contrast (MTC) effect concerning protons of water, fat and macromolecules contained in the object being involved in the imaging, the method comprising the steps of:

performing a first sequence including a step for applying a binomial pulse to the object to cause the MTC effect,

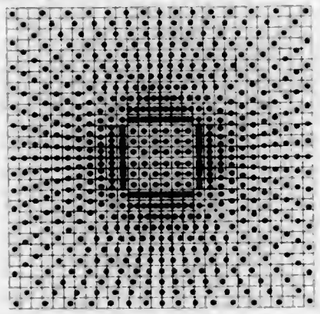
said binomial pulse being an off-resonance pulse to the protons of the water contained in the object and is offset in a central frequency by a predetermined frequency offset amount toward a high frequency side from a central frequency of a spectrum resonance peak made by the protons of the water; and

performing a second sequence for collecting magnetic resonance (MR) image data after the first sequence is performed.

5,557,203
MAGNETIC RESONANCE IMAGING WITH COMBINED BACK PROJECTION AND FOURIER TRANSFORMATION METHOD

Arno Nauerth, Erlenbach, Germany, assignor to Bruker Medizintechnik GmbH, Germany

Filed Dec. 8, 1994, Ser. No. 351,717
Claims priority, application Germany, Dec. 16, 1993, 43 43 023.6
Int. Cl.[6] G01R *33/40*
U.S. Cl. 324—309 **11 Claims**



1. A magnetic resonance method for imaging at object comprising the steps of:

a) locating the object in a homogeneous base magnetic field;

b) applying a gradient magnetic field having a predetermined direction ϕ and strength $G\phi$ for acquiring a single projection;

c) irradiating a high frequency excitation pulse into the object;

d) waiting a time t_w;

e) measuring, at a predetermined sampling rate, j>>1 measuring points Sj which are sequential in time of a nuclear resonance signal from the object, the signal dephasing under the influence of the gradient magnetic field, the measuring points corresponding to i points in k-space lying along a vector extending from a k-space origin in a direction determined by the direction ϕ of the gradient magnetic field, whereby separation of each of the i points in k-space from the k-space origin is given by a product of the Strength of the gradient magnetic field and a time interval between the excitation pulse and the jth measuring point S_j;

f) changing the strength and the direction of the gradient magnetic field;

g) carrying out the steps c) through f) an additional n- times for acquiring n projections with n>>1;

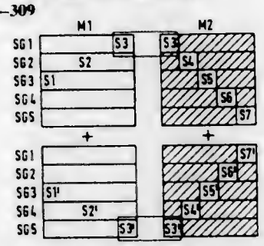
h) assigning new points in k-space from the n*i points in k-space,

i) constructing an image from the new points in k-space using one of a 2d and a 3d Fourier transformation algorithm.

5,557,204
METHOD FOR THE OPERATION OF A NUCLEAR MAGNETIC RESONANCE TOMOGRAPGHY APPARATUS FOR THE ACQUISITION OF AT LEAST TWO DIFFERENTLY WEIGHTED IMAGES

Gerald Lenz, Neunkirchen am Brand, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 2, 1995, Ser. No. 510,145
Claims priority, application Germany, Aug. 3, 1994, 44 27 496.3
Int. Cl.[6] G01R *33/48*
U.S. Cl. 324—309 **7 Claims**



1. A method for operating a nuclear magnetic resonance tomography apparatus for acquiring two differently weighted images, comprising the steps of:

(a) disposing an examination subject in a constant, uniform magnetic field;

(b) in an excitation phase, exciting nuclear spins in said examination subject by emitting a first radio-frequency pulse;

(c) in a read-out phase, emitting a plurality of radio-frequency refocusing pulses in succession, each refocusing pulse being followed by at least one nuclear magnetic resonance signal arising from the excited nuclear spins, each nuclear magnetic resonance signal being spatially-encoded by phase-encoding and read-out gradients;

(d) sampling said nuclear magnetic resonance signals and entering nuclear magnetic resonance signals lying chronologically closer to said excitation phase into rows of a k-space of a first raw data matrix and entering nuclear magnetic resonance signals lying chronologically farther from said excitation phase into rows of k-space of a second raw data matrix, with fewer rows of said first raw data matrix being filled than of said second raw data matrix after each excitation phase;

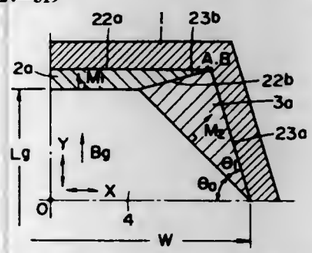
repeating steps (b), (c) and (d) until all rows of both of said first and second raw data matrices are filled; and

producing a first image from said first raw data matrix by Fourier transformation of the nuclear magnetic resonance signals contained therein and producing a second image from said second raw data matrix by Fourier transformation of the nuclear magnetic resonance signals contained therein.

5,557,205
MAGNETIC FIELD GENERATING APPARATUS FOR USE IN MRI

Kimiharu Ohta, Osaka, and Masaaki Aoki, Amagasaki, both of Japan, assignors to Sumitomo Special Metals Co., Ltd., Osaka, Japan

Filed Dec. 8, 1994, Ser. No. 355,163
Claims priority, application Japan, Dec. 27, 1993, 5-350289
Int. Cl.[6] G01V *3/00*
U.S. Cl. 324—319 **18 Claims**



1. A magnetic field generating apparatus for use in MRI, comprising:

yokes;

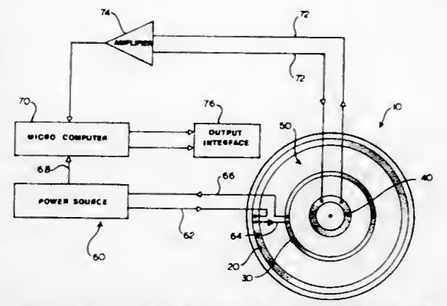
a pair of first permanent magnets each having a trapezoidal cross-section and opposed in parallel with one another in said yokes with a predetermined gap being defined between each of the pole faces of the first permanent magnets;

a pair of second permanent magnets each having a triangular cross-section adjacent each side of said first permanent magnets and in which a magnetic field space having a hexagonal cross-section perpendicular to the longitudinal direction is defined by the pole faces of said first and second permanent magnets;

said first permanent magnets comprise rare earth permanent magnets and the direction of magnetization thereof is substantially identical with the direction of the magnetic field in the magnetic field space;

said second permanent magnets comprise ferrite permanent magnets and the direction of magnetization thereof is at a 90 degree direction relative to the counter face of the magnetic field space; and

an extreme end at a yoke abutting face of the first permanent magnets corresponds with an extreme end at a yoke abutting face of the second permanent magnets.



(b) a second electrical coil, disposed within the first coil, spaced a predetermined radius from the reference point and having a predetermined number of turns of wire;

(c) a sensor coil disposed inwardly of the second coil and having a predetermined radius;

(d) the first and second coils connected to an electrical power source such that the first and second coils respectively produce primary and secondary magnetic fields;

(e) wherein the first and second coils are spaced from the reference point such that the primary and secondary magnetic fields mutually cancel each other in an area inwardly of the two coils so as to create a magnetic cavity in which the amplitudes of the primary and secondary magnetic fields are substantially zero, the sensor coil within the magnetic cavity; and

(f) wherein the radii and the number of turns of wire of the first and second coils and the radius of the sensor coil are calculated according to the following equation:

$$\frac{n_1}{R_1}\left[\frac{1}{2}+\left(\frac{1}{2}\right)^2\frac{3}{4}\left(\frac{r}{R_1}\right)^2+\left(\frac{1\cdot3}{2\cdot4}\right)^2\frac{5}{6}\left(\frac{r}{R_1}\right)^4+\left(\frac{1\cdot3\cdot5}{2\cdot4\cdot6}\right)^2\frac{7}{8}\left(\frac{r}{R_1}\right)^6+\cdots\right]=\frac{n_2}{R_2}\left[\frac{1}{2}+\left(\frac{1}{2}\right)^2\frac{3}{4}\left(\frac{r}{R_2}\right)^2+\left(\frac{1\cdot3}{2\cdot4}\right)^2\frac{5}{6}\left(\frac{r}{R_2}\right)^4+\left(\frac{1\cdot3\cdot5}{2\cdot4\cdot6}\right)^2\frac{7}{8}\left(\frac{r}{R_2}\right)^6+\cdots\right]$$

wherein:

R_1= the radius of the first coil;

n_1= the number of turns of wire of the first coil;

R_2=the radius of the second coil;

n_2=the number of turns of wire of the second coil; and

r= the radius of the sensor coil.

5,557,206
APPARATUS AND METHOD FOR DETECTING A WEAK INDUCED MAGNETIC FIELD BY MEANS OF TWO CONCENTRIC TRANSMITTER LOOPS

I. J. Won, Raleigh, N.C., assignor to Geophex Ltd., Raleigh, N.C.

Filed Feb. 23, 1995, Ser. No. 393,191
Int. Cl.[6] G01V *3/08*; **G01W** *3/10*
U.S. Cl. 324—329 **9 Claims**

1. An apparatus having two electrical coils that generate magnetic fields that mutually cancel each other to create a magnetic cavity, comprising:

(a) a first electrical coil spaced a predetermined radius from a reference point and having a predetermined number of turns of wire;

5,557,207
STREET LIGHT TESTING KIT

George Duve, Washington, N.J., assignor to Area Lighting Research, Inc., Hackettstown, N.J.

Filed Jan. 23, 1995, Ser. No. 376,864
Int. Cl.[6] G01R *31/24*
U.S. Cl. 324—414 **18 Claims**

1. A testing kit for luminaire lamps, comprising:

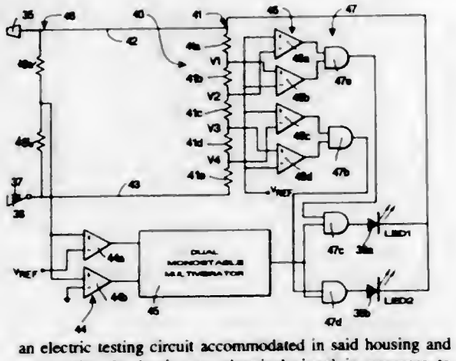
a) a testing device constructed for substitution for a photoelectric sensor interposed between an electric supply network and an individual electric circuit associated with the luminaire lamp to be tested, said testing device including

a housing having at least a portion through which a light emitted in the interior of said housing can be perceived from the exterior of said housing,

means has a constant width for producing a substantially

(d) measuring means, operatively coupled to said conductive

5,557,211



an electric testing circuit accommodated in said housing and operative for issuing an electrical signal in response to detection of incoming voltage at a level above a predetermined level, and

a plurality of light-issuing devices all connected to said testing circuit for substantially simultaneous activation thereof in response to said electrical signal, and distributed within said housing in such a pattern as to enable an observer to perceive the light of at least one of said light-issuing devices at any angle at which the observer can reasonably be expected to view the testing device; and

b) a testing instrument to be used instead of the luminaire lamp in conjunction with said testing device for testing the operation of the luminaire lamp itself, as well as of a starter and a ballast associated with the luminaire lamp.

5,557,208

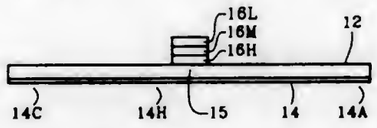
BATTERY TESTER WITH STACKED THERMOCHROMIC ELEMENTS

Robert Parker, Alamo, Calif., assignor to Duracell Inc., Bethel, Conn.

Division of Ser. No. 24,423, Mar. 1, 1993, Pat. No. 5,491,420. This application Jun. 7, 1995, Ser. No. 479,272

Int. Cl.[6] G01R *27/26;* **H01M** *10/48*

U.S. Cl. 324—435 **14 Claims**



1. A battery unit which may be tested by a user to determine the test status thereof, comprising:

an electrical battery for supplying a test current during the testing, having an anode end with an anode terminal means and cathode end with a cathode terminal means;

a dielectric substrate with a single test site thereon, mounted on the electrical battery;

conductive means on the dielectric substrate and having an anode end for electrically engaging the anode terminal means of the electrical battery, and having a cathode end for electrically engaging the cathode terminal means of the electrical battery;

a resistive heater means formed by a segment of the conductive means proximate the single test site for generating heat in response to the test current flowing therethrough, which raises the temperature of the single test site from an initial temperature to a higher temperature determined by the test status of the battery and the resistive heater means, wherein the segment of the conductive means forming the resistive heater means has a constant width for producing a substantially constant temperature (the test temperature) throughout the entire test site;

at least two thermochromic layers stacked on said substrate at said test site, a first thermochormic layer over a second thermochromic layer, said thermochromic layers being stacked at the test site so that the second thermochromic layer is closer to the test site on the substrate than is the first thermochromic layer, whereby during battery testing the first thermochromic layer is closer to the viewer than the second thermochromic layer,

said first thermochromic layer being of a first color which is generally opaque at said initial temperature, and clear at a test temperature (T1) which is greater than the initial temperature thereby revealing the color of the second thermochromic layer to indicate that the battery is at least partially operable;

said second thermochromic layer being of a second color which is generally opaque at said initial temperature and T1, and clear at a test temperature (T2) which is greater than T1 thereby revealing the color of a layer of material therebelow to indicate that the battery is stronger than if only the first thermochromic layer has cleared; and

thermal barrier means between the electrical battery and the dielectric substrate directly under the single test site for minimizing heat flow from the first and second thermochromic layers into the electrical battery during testing.

5,557,209

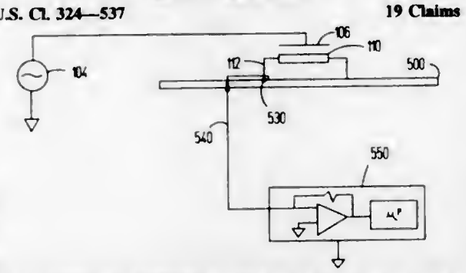
IDENTIFICATION OF PIN-OPEN FAULTS BY CAPACITIVE COUPLING THROUGH THE INTEGRATED CIRCUIT PACKAGE

David T. Crook; Kevin W. Keirn, both of Loveland, Colo., and Ugur Cilingiroglu, Istanbul, Turkey, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 127,400, Sep. 27, 1993, abandoned, which is a continuation of Ser. No. 892,868, Jun. 3, 1992, Pat. No. 5,254,953, which is a continuation-in-part of Ser. No. 631,609, Dec. 20, 1990, Pat. No. 5,124,660. This application Mar. 7, 1995, Ser. No. 400,787

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—537 **19 Claims**



1. A system for measuring the integrity of an electrical contact between a first electrical connection pin of an electrical component and a trace of a circuit assembly, said system comprising:

(a) signal supplying means, comprising an output and a common signal return, for supplying an electrical signal via said output to said trace of the circuit assembly;

(b) an electrical connection between a second connection pin of said electrical component and said common signal return of said signal supplying means;

(c) a conductive electrode comprising a surface adapted to be placed in a fixed position in proximity to a surface of said first pin; and

(d) measuring means, operatively coupled to said conductive electrode, for measuring a parameter indicative of a capacitance associated with connection of said first pin to said circuit assembly, said capacitance being indicative of the integrity of the electrical connection between said first pin and said trace of said circuit assembly.

5,557,210

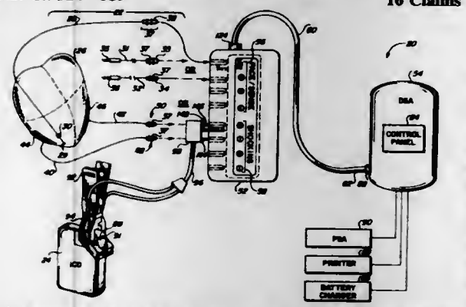
UNIVERSAL CABLE CONNECTOR FOR TEMPORARILY CONNECTING IMPLANTABLE STIMULATION LEADS AND IMPLANTABLE STIMULATION DEVICES WITH A NON-IMPLANTABLE SYSTEM ANALYZER

Armando M. Cappa, Reseda, and Warren R. Heer, La Palma, both of Calif., assignors to Pacesetter, Inc., Sylmar, Calif.

Continuation-in-part of Ser. No. 979,568, Nov. 20, 1992, Pat. No. 5,334,945. This application Apr. 6, 1994, Ser. No. 223,567

Int. Cl.[6] G01R *31/02;* **A61N** *1/372*

U.S. Cl. 324—539 **16 Claims**



1. A system for testing a plurality of implantable stimulation leads adapted for use with an implantable stimulation device, each of the plurality of implantable stimulation leads having a proximal male connector of a prescribed size adapted to be detachably secured to the implantable stimulation device, the system comprising:

a non-implantable system analyzer having a first multi-pin connector, the system analyzer including processing means for applying test signals to and monitoring test signals on specified pins of the first multi-pin connector in accordance with a prescribed test sequence;

a connector block having a plurality of receptacles for varying sizes adapted to receive a corresponding variety of different sized proximal male connectors, the proximal male connector of each of the plurality of implantable stimulation leads being detachably secured to one of the plurality of receptacles, the plurality of receptacles being greater than the plurality of proximal male connectors; and

a multi-conductor cable having a first end for connection with the connector block, and a second end for connection with the first multi-pin connector of the system analyzer, the multi-conductor cable having a multiplicity of electrical conductors therein, each receptacle of the connector block being connected to a respective pin of the first multi-pin connector through at least one of the multiplicity of electrical conductors;

whereby each of the implantable stimulation leads is detachably connected to one of the respective pins of the first multi-pin connector whenever the implantable stimulation lead is detachably secured to a corresponding receptacle of the connector block, thereby allowing the system analyzer to apply a desired test signal to the implantable stimulation leads or to monitor a signal appearing on the implantable stimulation leads in accordance with the prescribed test sequence through the connector block;

whereby a plurality of sizes of implantable stimulation leads may be tested prior to connecting the implantable$_{13}$ stimulation leads to the implantable stimulation device.

5,557,211

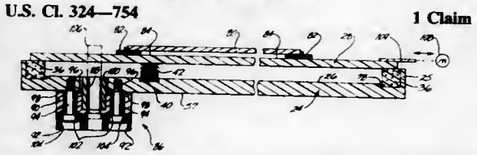
VACUUM TEST FIXTURE FOR PRINTED CIRCUIT BOARDS

Mary E. Ferrer, Hannacroix; Gary F. St. Onge, Ballston Lake, both of N.Y.; Charles J. Johnston, Walnut, and Mark A. Swart, Upland, both of Calif., assignors to Everett Charles Technologies, Inc., Pomona, Calif.

Division of Ser. No. 224,006, Apr. 5, 1994, Pat. No. 5,422,575, which is a division of Ser. No. 84,755, Jun. 30, 1993, Pat. No. 5,300,881, which is a continuation of Ser. No. 896,479, Jun. 9, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 462,229

Int. Cl.[6] G01R *31/02*

U.S. Cl. 324—754 **1 Claim**



1. A vacuum test fixture for testing of printed circuit boards comprising a stationary probe plate, a movable top plate above the probe plate for supporting a board under test, the probe plate supporting an array of test probes extending through the top plate for access to the board, an annular vacuum seal extending around a perimeter of the probe plate for contact with the underside of the top plate, the top plate being movable toward the probe plate under a vacuum applied to a vacuum area between the probe plate and the top plate to draw the top plate toward the probe plate and thereby compress the vacuum seal to retain the vacuum while holding the probes in contact with the board during testing, a plurality of linear bearing assemblies spaced apart around the perimeter of the probe plate and engaged with the top plate for guiding vertical travel of the top plate toward and away from the probe plate and the vacuum seal during vacuum operation of the test fixture, in which the top plate rests on the vacuum seal which is made from a cellular elastomeric material and which is solid in cross-section, in which a majority of the vertical height of the vacuum seal extends above a top face of the probe plate, and in which the undersurface of the moving top plate has a flat surface which rests on a corresponding flat top surface of the vacuum seal the top plate being movable with the linear bearings to shift the top plate, within its own plane, in combinations of lateral and longitudinal movements while resting on the vacuum seal, to align the board with the test probes, and latch means releasably engaged with the linear bearings to hold the top plate in its aligned position.

5,557,212

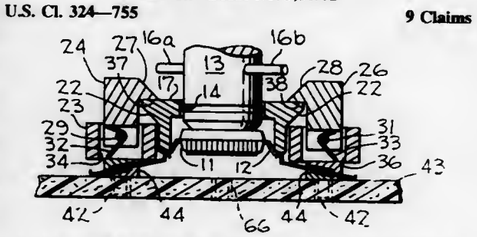
SEMICONDUCTOR TEST SOCKET AND CONTACTS

George L. Isaac, 980 Kiely Blvd. #326, Santa Clara, Calif. 95051; Donald C. Miller, 1139 Blair Ave., Sunnyvale, Calif. 94087, and Rodney S. Ziegenhagen, II, 2905 Kilo Ave., San Jose, Calif. 95124

Filed Nov. 18, 1994, Ser. No. 342,171

Int. Cl.[6] G01R *1/073;31/02*

U.S. Cl. 324—755 **9 Claims**



1. A semiconductor test socket secured to a test board having a pattern of contact pads to communicate with a predetermined pattern of accessible contacts on a semiconductor device under test

wherein the device under test is transported to the test socket by a

5,557,214

5,557,217

HIGH-DENSITY ERASABLE PROGRAMMABLE LOGIC

wherein the device under test is transported to the test socket by a semiconductor holder, comprising

insulator carrier means adapted to be accepted by the semiconductor holder and to contain a semiconductor device therewithin,

means on said insulator carrier means for mechanically supporting the predetermined pattern of accessible contacts on the semiconductor device,

a test socket base for receiving said insulator carrier means,

latching means on said test socket base for holding said insulator carrier means in place within said test socket base during testing and for thereafter releasing said insulator carrier means, and

at least one unitary array of replaceable spring contacts disposed between said test socket base and the test board and having opposed upper and lower contact sides thereon, said lower contact side having a plurality of electrical contacts arranged in registration with the test board pattern of contact pads, and said upper contact side having a plurality of electrical contacts in electrical communication with ones of said lower contact side plurality of contacts and being arranged in registration with the predetermined pattern of accessible contacts on the semiconductor device under test.

5,557,213

SPRING-LOADED ELECTRICAL CONTACT PROBE

Mark S. Reuter, Coventry, and John A. Geranis, Johnston, both of R.I., assignors to Everett Charles Technologies, Inc., Pomona, Calif.

Filed Dec. 1, 1994, Ser. No. 348,565

Int. Cl.[6] G01R *1/06*

U.S. Cl. 324—761 **31 Claims**

23. A spring probe assembly for placement within a probe receptacle for performing electrical tests on an electrical device, the spring probe assembly comprising:

a barrel having an axial opening therethrough, wherein the barrel is adapted to fit axially within the probe receptacle;

a plunger partially disposed within the opening at a first end of the barrel and capable of slidable axial movement therein, wherein the plunger includes a tip at an end outside of the barrel for making contact with an electrical device, and wherein the end of the barrel adjacent the plunger is crimped to limit outward axial movement of the plunger;

a terminal member disposed within the opening at a second end of the barrel opposite from the plunger and fixedly attached therein, and wherein the terminal member comprises:

a head portion disposed within the opening in the barrel, wherein the head portion includes a groove extending circumferentially around an outside surface of the head portion, and wherein the barrel includes a crimped portion engaged with the groove and forming a fixed attachment to inhibit outward axial-movement of the terminal member from the barrel;

a flanged end extending from the head portion to a position outside of the barrel;

four flanges located at equidistant positions around a circumference of the flanged end and each extending radially outward from the flanged end, wherein diametrically opposed flanges have an outside diameter greater than an inside diameter of a terminal portion of a probe receptacle, and wherein each flange includes a shoulder portion that forms a locking abutment against an opening in the terminal portion of the receptacle, thereby locking the probe and receptacle together; and

two axial slots in the flanged end and each extending along an axis of the terminal member and positioned perpendicular to one another, wherein the slots are each positioned between diametrically opposed flange pairs.

5,557,214

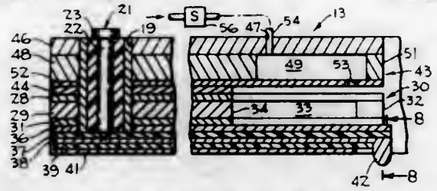
MICRO BEAM PROBE SEMICONDUCTOR TEST INTERFACE

C. Kenneth Barnett, 45640 Parkmeadow Ct., Fremont, Calif. 94539

Filed Feb. 6, 1995, Ser. No. 384,001

Int. Cl.[6] G01R *1/73;* **H01R** *43/00*

U.S. Cl. 324—762 **19 Claims**



1. A micro beam probe for positioning and electrically interfacing between a semiconductor tester and a semiconductor device to be tested, wherein the semiconductor device has a predetermined pattern of test pads thereon, and wherein the semiconductor tester has a plurality of accessible test circuit terminals, comprising

a plurality of cantilevered parallelogram beams having free ends and fixed ends thereon, said free ends being disposed for motion in a direction toward and away from the semiconductor test pads upon bending of the parallelogram beams,

a plurality of test pad contacts attached to said free ends and being arrayed in registration with the predetermined pattern of semiconductor test pads,

a plurality of tester connection contacts for electrical connection to the plurality of accessible test circuit terminals,

a plurality of electrical conductors extending between ones of said plurality of tester connection contacts and ones of said plurality of test pad contacts,

means for shielding said plurality of electrical conductors,

means for providing mechanical support for said plurality of electrical conductors, said means for shielding and said parallelogram beam fixed ends, and

means for sensing a predetermined bending limit in said parallelogram beams in communication with a pressurized gas supply, comprising

a gas plenum having an input orifice in communication with the pressurized gas supply,

said gas plenum having a plurality of output orifices adjacent to and spaced from ones of said parallelogram beam free ends, and

pressure sensing means in communication with said gas plenum input for sensing gas flow restriction indicative of proximity of said parallelogram beam free ends and therefore beam bending.

5,557,215

SELF-BIAS MEASURING METHOD, APPARATUS THEREOF AND ELECTROSTATIC CHUCKING APPARATUS

Hiroaki Saeki, Yamanashi-ken, and Masaki Kondo, Kofu, both of Japan, assignors to Tokyo Electron Limited, Japan

Filed May 9, 1994, Ser. No. 239,982

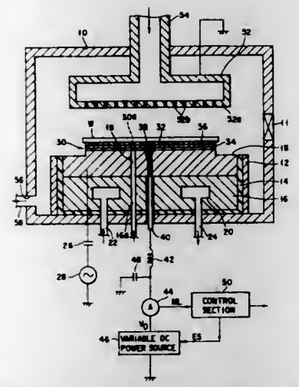
Claims priority, application Japan, May 12, 1993, 5-133856; May 17, 1993, 5-139153

Int. Cl.[6] G01R *31/26*

U.S. Cl. 324—765 **11 Claims**

1. A self-bias measurement method of measuring the self-bias voltage of an object when the object is subjected to a plasma process by using a plasma generated between a pair of electrodes, said object being held, by means of electrostatic chucking means having an electrostatic chucking electrode, on one of the pair of electrodes situated in a processing chamber,

said method comprising the steps of:



detecting a leak current between the object and the electrostatic chucking electrode while varying the DC voltage applied to the electrostatic chucking electrode; and

calculating the self-bias voltage of the object on the basis of the leak current detected.

5,557,216

SYSTEM AND METHOD FOR TESTING ELECTRICAL GENERATORS

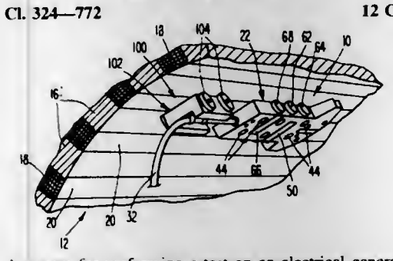
George F. Dailey, Pittsburgh; James A. Bauer, Gibsonia, and Mark W. Fischer, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 15,963, Feb. 8, 1993, Pat. No. 5,365,166.

This application May 25, 1994, Ser. No. 248,907

Int. Cl.[6] G01R *31/34*

U.S. Cl. 324—772 **12 Claims**



1. A system for performing a test on an electrical generator of the type having a rotor and a stator, the stator having an inner periphery defining a space within which the rotor is mounted to rotate, the inner periphery comprising a magnetic material in which a plurality of axial stator slots are defined, comprising:

a first movable carriage which is sized to fit between the rotor and stator and is positionable over a selected stator slot so as to be able to axially traverse the selected stator slot, said first movable carriage being adapted to have testing equipment mounted thereon, and said first movable carriage having a cable connected thereto;

sensing means on said first movable carriage for sensing whether the first movable carriage is centered in an optimum position with respect to the selected stator slot;

centering means on said first movable carriage for centering the first movable carriage with respect to the optimum position if said sensing means indicates said first movable carriage is not so centered, whereby accuracy of any testing by the testing equipment is optimized; and

a second movable carriage for supporting said cable.

5,557,217

HIGH-DENSITY ERASABLE PROGRAMMABLE LOGIC DEVICE ARCHITECTURE USING MULTIPLEXER INTERCONNECTIONS

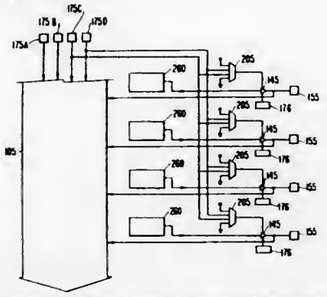
Bruce B. Pedersen, San Jose, Calif., assignor to Altera Corporation, San Jose, Calif.

Continuation of Ser. No. 123,435, Sep. 17, 1993, Pat. No. 5,384,499, which is a continuation-in-part of Ser. No. 43,146, Mar. 31, 1993, Pat. No. 5,268,598, which is a continuation of Ser. No. 957,091, Oct. 6, 1992, abandoned, which is a continuation of Ser. No. 691,640, Apr. 25, 1991, Pat. No. 5,241,224.

This application Oct. 31, 1994, Ser. No. 331,964

Int. Cl.[6] H03K *19/177*

U.S. Cl. 326—39 **7 Claims**



1. A programmable logic array integrated circuit comprising:

a plurality of programmable logic array blocks, each of which receives an associated plurality of first signals and produces an associated plurality of second signals, each second signal associated with each logic array block being a programmable logic function of at least some of the first signals associated with that logic array block;

a plurality of multiplexers, each of which is associated with a respective one of at least some of said first signals, each of said multiplexers having a plurality of input terminals, an output terminal, and controllable circuitry for making an electrical connection from any one of said input terminals to said output terminal, each of said input terminals of each of said multiplexers being connected to a respective one of said second signals, and the output terminal of each multiplexer being connected to the associated first signal, the second signals which are thus connected to the input terminals of each multiplexer being less than all of the second signals which are thus connected to any input terminal of any of said multiplexers; and

programmable circuit elements for controlling the controllable circuitry in each of said multiplexers to select which input terminal of each multiplexer that multiplexer connects to its output terminal.

5,557,218

REPROGRAMMABLE PROGRAMMABLE LOGIC ARRAY

Hyun S. Jang, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyoungki-do, Rep. of Korea

Filed Jul. 13, 1995, Ser. No. 501,819

Claims priority, application Rep. of Korea, Jul. 14, 1994, 94-16969

Int. Cl.[6] H03K *7/38*

U.S. Cl. 326—40 **2 Claims**

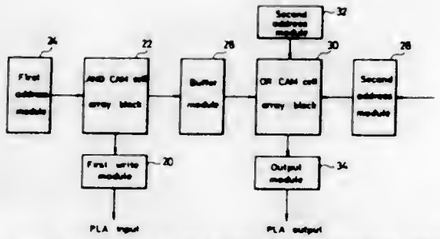
1. A reprogrammable programmable logic array comprising:

a first write module for inputting data to be written and data to be compared;

an AND CAM cell array block for, in a write mode, sequentially storing the write data from said first write module and, in a match mode, comparing the comparison data from said first

dent upon the second data signal when the input signal is in the first state and for producing the second output data signal

hard decision means, coupled to an output of said running average generator means, for converting said running average



write module with its pre-stored data and generating match signals in accordance with the compared result;

a first address module for, in the write mode, generating sequential addresses and supplying the generated sequential addresses to said AND CAM cell array block;

a second write module for inputting data to be written in the write mode;

an OR CAM cell array block for storing sequentially the write data from said second write module in the write mode and detecting its pre-stored data corresponding to the match signals from said AND CAM cell array block in the match mode;

a second address module for, in the write mode, generating sequential addresses and supplying the generated sequential addresses to said OR CAM cell array block; and

an output module for transferring output data from said OR CAM cell array block externally in the match mode.

5,557,219

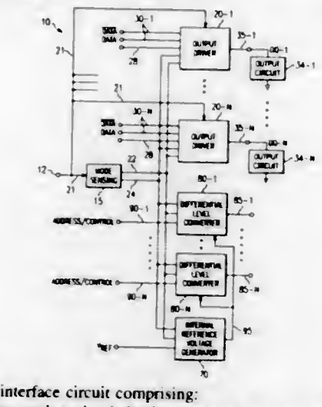
INTERFACE LEVEL PROGRAMMABILITY

Roger D. Norwood, Stafford, and Brian L. Brown, Missouri City, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 189,466, Jan. 31, 1994, abandoned. This application Jun. 1, 1995, Ser. No. 456,436

Int. Cl.[6] H03K *19/173*

U.S. Cl. 326—49 **2 Claims**



1. An interface circuit comprising:

a mode sensing circuit having an input terminal and first and second output terminals for producing control signals in response to an input signal, applied to the input terminal;

a first output circuit, responsive to the control signals, to first data signal and to first and second states of the input signal, for producing a first output data signal dependent upon the first data signal when the input signal is in the first state and for producing the first output data signal dependent upon the first data signal and a circuit connected to the first output circuit when the input signal is in the second state; and

a second output circuit, responsive to the control signals, to a second data signal, and to the first and second states of the input signal, for producing a second output data signal dependent upon the second data signal when the input signal is in the first state and for producing the second output data signal dependent upon the second data signal and a circuit connected to the second output circuit when the input signal is in the second state.

5,557,220

POLARITY DETECTOR

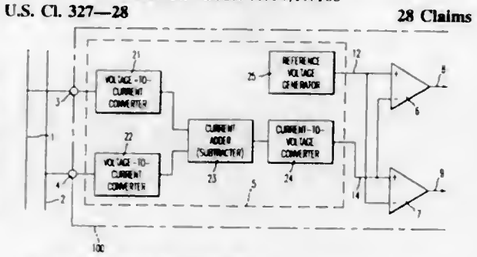
Yukihiro Araya, and Takehiko Umeyama, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 8, 1994, Ser. No. 271,970

Claims priority, application Japan, Aug. 19, 1993, 5-205131

Int. Cl.[6] G01R *19/14;19/165*

U.S. Cl. 327—28 **28 Claims**



1. A polarity detector comprising:

a first input terminal connected to a first transmission path;

a second input terminal connected to a second transmission path;

a first voltage-to-current converter connected to said first input terminal for generating a current based on a first potential at said first input terminal;

a second voltage-to-current converter connected to said second input terminal for generating a current based on a second potential at said second input terminal;

voltage generator means receiving the currents from said first and second voltage-to-current converters for generating a voltage according to a potential difference between said first and second input terminals; and

a discriminating circuit for determining whether the voltage provided by said voltage generator means is within a predetermined range, or less than a lower limit of said predetermined range, or more than an upper limit of said predetermined range to output a discrimination result.

5,557,221

SEMICONDUCTOR INTEGRATED CIRCUIT WITH INPUT/OUTPUT INTERFACE ADAPTED FOR SMALL-AMPLITUDE OPERATION

Masao Taguchi; Satoshi Eto; Yoshihiro Takemae; Hiroshi Yoshioka, and Makoto Koga, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jun. 14, 1993, Ser. No. 76,434

Claims priority, application Japan, Jun. 15, 1992, 4-154986; Jun. 15, 1992, 4-154990; Jul. 6, 1992, 4-178436; Aug. 6, 1992, 4-210383; Aug. 7, 1992, 4-211409; Jan. 20, 1993, 5-7083; May 14, 1993, 5-112793

Int. Cl.[6] H03F *3/45*

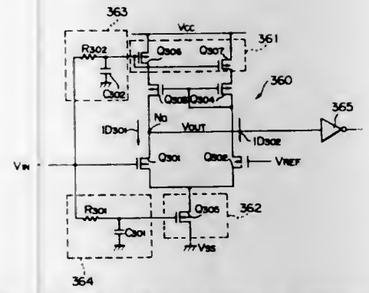
U.S. Cl. 327—53 **4 Claims**

1. A semiconductor integrated circuit comprising:

a signal amplification circuit receiving an input signal;

switch means, connected to said signal amplification circuit and to a power source voltage, for controlling a supply of said power source voltage to said signal amplification circuit, said switch means being a transistor; and

control means, connected to said switch means, for selectively turning ON and OFF said switch means in accordance with one of amplitude and frequency of said input signal wherein



said input signal is applied to a gate of said transistor through a resistance element having a value greater than an impedance matching load resistance value of an external signal bus line connected to said controls means.

5,557,222

DELAYED DETECTION TYPE DEMODULATOR

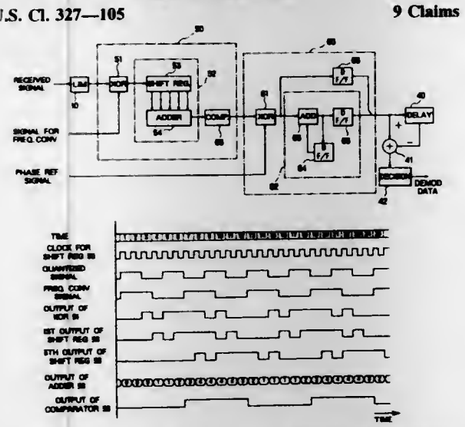
Toshiharu Kojima, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 997,768, Dec. 24, 1992, Pat. No. 5,313,170. This application Mar. 28, 1994, Ser. No. 218,621

Claims priority, application Japan, Dec. 27, 1991, 3-347245

Int. Cl.[6] H03D *7/00*

U.S. Cl. 327—105 **9 Claims**



1. A frequency converter circuit for converting a first frequency of a first 2-level signal using a second 2-level signal having a second frequency distinct from said first frequency of said first 2-level signal, comprising:

an exclusive OR element for receiving the first and second 2-level signals, for obtaining a logical exclusive OR of said first and second 2-level signals, and for outputting an exclusive OR signal;

running average generator means, coupled to an output of said exclusive OR element and which receives a clock signal having a frequency higher than either one of said first and second frequencies, for removing any high frequency components of the exclusive OR signal by generating a signal corresponding to k times a running average of said exclusive OR signal, where k is a positive integer, and for outputting a running average signal; and

hard decision means, coupled to an output of said running average generator means, for converting said running average signal to a 2-level logical signal having a frequency that is an absolute value of the first frequency minus the second frequency.

5,557,223

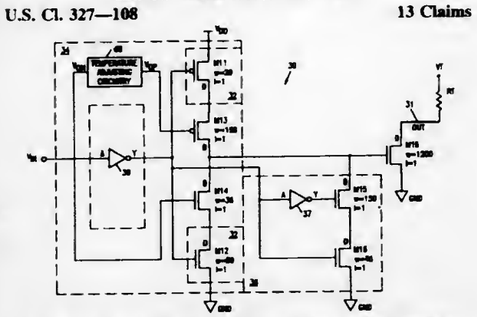
CMOS BUS AND TRANSMISSION LINE DRIVER HAVING COMPENSATED EDGE RATE CONTROL

James R. Kuo, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation of Ser. No. 73,304, Jun. 8, 1993, abandoned. This application Jun. 2, 1995, Ser. No. 459,008

Int. Cl.[6] H03K *3/00;17/16;17/687*

U.S. Cl. 327—108 **13 Claims**



1. A driver for providing binary signals from a data system to a transmission line, the driver comprising:

a first n-channel transistor having its drain coupled to the transmission line and its source coupled to ground, the channel of the first n-channel transistor having a width that is greater than its length;

a first inverter stage for conducting current from a first voltage supply to the gate of the first n-channel transistor in order to switch the first n-channel transistor into a conductive state and for conducting current from the gate of the first n-channel transistor to ground in order to switch the first n-channel transistor into a non-conductive state;

a discharge circuit for providing a discharge path from the gate of the first n-channel transistor to ground during a discharge time period and then removing the discharge path at the end of the discharge time period, the discharge time period beginning when the first inverter stage receives a binary signal commanding it to switch the first n-channel transistor from the conductive state to the non-conductive state, and the discharge time period having a length equal to a period of time necessary to decrease the gate-source voltage of the first n-channel transistor to a level just above its threshold voltage, the discharge circuit including first and second series connected field effect transistors (FET) coupled between the gate of the first n-channel transistor and ground that are switched into simultaneous conducting states for a length of time approximately equal to the discharge time period to provide the discharge path; and

a temperature compensation circuit coupled to the first inverter stage for adjusting the level of current conducted to the gate of the first n-channel transistor and the level of current conducted from the gate of the first n-channel transistor to compensate for variations in temperature, wherein the temperature compensation circuit includes a positive temperature coefficient current generation circuit having a third FET having a gate coupled to a gate of a fourth FET having a larger current conducting channel than a current conducting channel in the third FET in order to generate a current that increases in response to an increase in temperature.

5,557,224

APPARATUS AND METHOD FOR GENERATING A

generating the pulse signal by comparing the trigger signal with an output of the first latch such that the pulse signal is

characteristic and operative to generate a new decay function value, comprising:

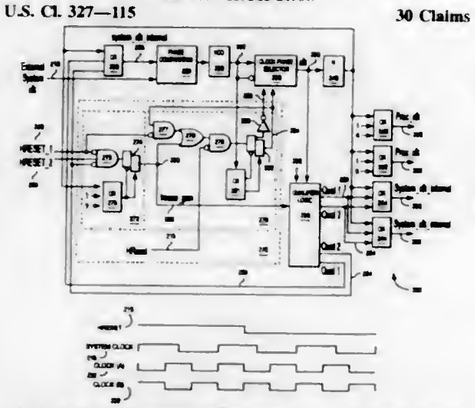
said second intermediate signal and generating a second output current which is proportional to the square of a value

5,557,224

APPARATUS AND METHOD FOR GENERATING A PHASE-CONTROLLED CLOCK SIGNAL

Charles G. Wright, Round Rock, and Jose M. Alvarez, Leander, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y., and Motorola, Inc., Schaumburg, Ill.

Filed Apr. 15, 1994, Ser. No. 228,470
Int. Cl.[6] H03K *21/08*
U.S. Cl. 327—115 **30 Claims**



1. A method of generating a phase-controlled clock signal, comprising the steps of:

inputting a first clock signal having a first frequency and a first transition direction at a time t;

outputting a second clock signal having a second frequency related to said first frequency by a non-integer ratio, said second clock signal having a second transition direction at said time t;

detecting whether said second transition direction is substantially equal to said first transition direction at said t; and

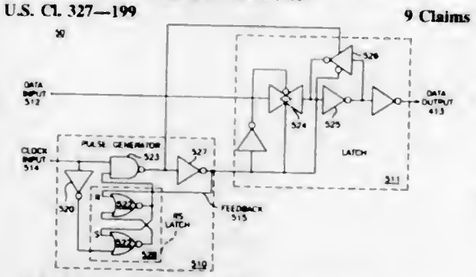
in response to said detecting step, selectively inverting said second clock signal.

5,557,225

PULSED FLIP-FLOP CIRCUIT

Martin S. Denham, Yamhill; Keng L. Wong, Portland; Jeffrey E. Smith, Aloha, and Roshan J. Fernando, Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Dec. 30, 1994, Ser. No. 367,103
Int. Cl.[6] H03K *3/037*
U.S. Cl. 327—199 **9 Claims**



1. A flip-flop circuit comprising:

a trigger signal input for receiving a trigger signal;

a data signal input for receiving a data signal;

a pulse generator coupled to the trigger signal for generating a pulse signal in response to a first edge in the trigger signal, the pulse generator comprising a first latch and a feedback line from an output of the pulse generator, the first latch coupled to the feedback line and the trigger signal, the pulse generator generating the pulse signal by comparing the trigger signal with an output of the first latch such that the pulse signal is generated in response to only the first edge; and

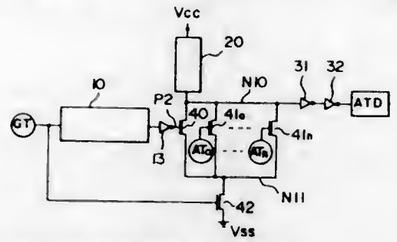
a second latch coupled to said pulse generator and the data signal input for receiving the data signal and storing said data signal in response to said pulse signal.

5,557,226

ADDRESS TRANSITION DETECTOR CIRCUIT AND METHOD OF DRIVING SAME

Takashi Honda, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 246,283, May 19, 1994, Pat. No. 5,461,334. This application Jul. 27, 1995, Ser. No. 508,175
Claims priority, application Japan, May 28, 1993, 5-127197
Int. Cl.[6] H03K *5/153*
U.S. Cl. 327—227 **5 Claims**



1. A transition detector circuit comprising:

an input terminal;

a one-shot pulse generator circuit having an input electrically connected to said input terminal;

a first switching device electrically connected between a first and second nodes and brought into a conducting state in response to a one-shot pulse output from said one-shot pulse generator circuit;

a second switching device electrically connected between a ground potential node and the second node and driven in response to a signal input to said input terminal;

a plurality of switching devices electrically parallel-connected between the first and second nodes and respectively driven in response to a plurality of transition one-shot pulse signals; and

power source potential supplying means for supplying a power source potential to the first node.

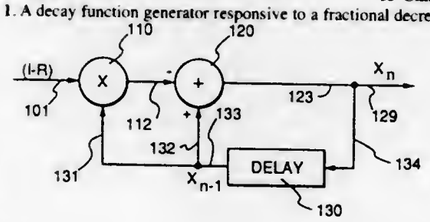
5,557,227

ECONOMICAL GENERATION OF EXPONENTIAL AND PSEUDO-EXPONENTIAL DECAY FUNCTIONS IN DIGITAL HARDWARE

Perry R. Cook, Palo Alto, and Bryan J. Colvin, Sr., San Jose, both of Calif., assignors to Aureal Semiconductor, Fremont, Calif.

Filed Apr. 7, 1994, Ser. No. 224,442
Int. Cl.[6] G06F *7/556*
U.S. Cl. 327—346 **13 Claims**

1. A decay function generator responsive to a fractional decrease



characteristic and operative to generate a new decay function value, comprising:

means for scaling a fractional decrease characteristic of a decay function by an amount depending on a previous decay function value to provide a scaled fractional decrease;

means for decreasing the previous decay function value by the scaled fractional decrease to provide a new decay function value; and

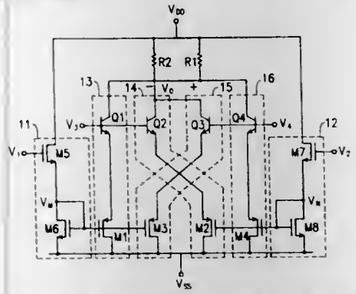
means for storing the previous decay function value, and for providing the previous decay function value to the scaling means and the decreasing means.

5,557,228

FOUR-QUADRANT MULTIPLIER

Shen-Iuan Liu, Keelung, Taiwan, assignor to National Science Council, Taipei, Taiwan

Filed Jul. 26, 1995, Ser. No. 506,914
Int. Cl.[6] H03B *19/00*
U.S. Cl. 327—355 **12 Claims**



1. A four-quadrant multiplier, receiving a first input signal, a second input signal, a third input signal, and a fourth input signal, for calculating the product of the voltage difference between said first input signal and said second input signal as well as that between said third input signal and said fourth input signal, and outputting the result to an output port, said four-quadrant multiplier comprising:

a first terminal to receive a high potential;

a second terminal to receive a low potential;

a first transform means for receiving said first input signal and outputting a first intermediate signal;

a second transform means for receiving said second input signal and outputting a second intermediate signal, the voltage difference between said first input signal and said second input signal being proportional to the voltage difference between said first intermediate signal and said second intermediate signal;

a first squaring means for squaring, coupled between a positive terminal of said output port and said second terminal, said first squaring means receiving said third input signal and said first intermediate signal and generating a first output current which is proportional to the square of a value representing the voltage difference between said third input signal and said first intermediate signal minus a reference voltage, said first squaring means including

a first bipolar transistor operated in the active region, a base of said first bipolar transistor receiving said third input signal and a collector of said first bipolar transistor being coupled to said positive terminal of said output port, and

a first MOS transistor operated in the saturation region, a gate of said first MOS transistor receiving said first intermediate signal, a source of said first MOS transistor being coupled to an emitter of said first bipolar transistor, and a drain of said first MOS transistor being coupled to said second terminal;

a second squaring means for squaring, coupled between a negative terminal of said output port and said second terminal, said second squaring means receiving said third input signal and said second intermediate signal and generating a second output current which is proportional to the square of a value representing the voltage difference between said third input signal and said second intermediate signal minus said reference voltage, said second squaring means including

a second bipolar transistor operated in the active region, a base of said second bipolar transistor receiving said third input signal, and a collector of said second bipolar transistor being coupled to said negative terminal of said output port, and

a second MOS transistor operated in the saturation region, a gate of said second MOS transistor receiving said second intermediate signal, a source of said second MOS transistor being coupled to an emitter of said second bipolar transistor, and a drain of said second MOS transistor being coupled to said second terminal;

a third squaring means for squaring, coupled between said negative terminal of said output port and said second terminal, said third squaring means receiving said fourth input signal and said first intermediate signal and generating a third output current which is proportional to the square of a value representing the voltage difference between said fourth input signal and said first intermediate signal minus said reference voltage, said third squaring means including

a third bipolar transistor operated in the active region, a base of said third bipolar transistor receiving said fourth input signal, and a collector of said third bipolar transistor being coupled to said negative terminal of said output port, and

a third MOS transistor operated in the saturation region, a gate of said third MOS transistor receiving said first intermediate signal, a source of said third MOS transistor being coupled to an emitter of said third bipolar transistor, and a drain of said third MOS transistor being coupled to said second terminal;

a fourth squaring means for squaring, coupled between said positive terminal of said output port and said second terminal, said fourth squaring means receiving said fourth input signal and said second intermediate signal and generating a fourth output current which is proportional to the square of a value representing the voltage difference between said fourth input signal and said second intermediate signal minus said reference voltage, said fourth squaring means including

a fourth bipolar transistor operated in the active region, a base of said fourth bipolar transistor receiving said fourth input signal, and a collector of said fourth bipolar transistor being coupled to said positive terminal of said output port, and

a fourth MOS transistor operated in the saturation region, a gate of said fourth MOS transistor receiving said second intermediate signal, a source of said fourth MOS transistor being coupled to an emitter of said fourth bipolar transistor, and a drain of said fourth MOS transistor being coupled to said second terminal;

a first load means for loading, coupled between said first terminal and said positive terminal of said output port and serving as a load for said first output current and said fourth output current; and

a second load means for loading, coupled between said first terminal and said negative terminal of said output port, serving as a load for said second output current and said third output current, said second load means having a resistance which is equal to that of said first load means.

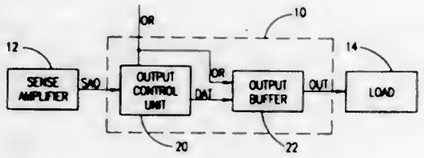
5,557,229

APPARATUS AND METHOD FOR PRODUCING AN OUTPUT SIGNAL FROM A MEMORY ARRAY

Boaz Eitan, Ra'anana, Israel, assignor to Waferscale Integration, Inc., Fremont, Calif.

Filed May 16, 1994, Ser. No. 242,929
Int. Cl.[6] H03K *19/00*
U.S. Cl. 327—374 **7 Claims**

4. An output device comprising:



an output control unit having an input terminal, an output terminal, and a control terminal, said control terminal coupled to an output release line carrying an output release signal, said input terminal coupled to a sense amplifier output line carrying a data signal from a memory cell, said output terminal coupled to a data line carrying an amplified version of said data signal released in response to an input release signal, generated by said output control unit, wherein said input release signal is a delayed version of said output release signal; and

an output buffer controlled by said output release signal, and said amplified version of said data signal, said output buffer outputting an output signal corresponding to said amplified version of said data signal, said output buffer including a plurality of output transistors, said output release signal controls said output buffer to maintain corresponding gate voltages of said plurality of output transistors near corresponding threshold voltages of said plurality of output transistors until said amplified version of said data signal is applied to said output buffer.

5,557,230

Patent Not Issued For This Number

5,557,231

SEMICONDUCTOR DEVICE WITH IMPROVED SUBSTRATE BIAS VOLTAGE GENERATING CIRCUIT

Yasuo Yamaguchi, and Tadashi Nishimura, both of Hyogo-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 38,987, Mar. 29, 1993, abandoned. This application Aug. 15, 1994, Ser. No. 291,057

Claims priority, application Japan, Mar. 30, 1992, 4-074184

Int. Cl.[6] H01L *27/04*

U.S. Cl. 327—534 **12 Claims**

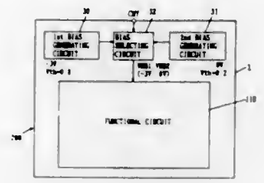
1. A semiconductor device comprising:

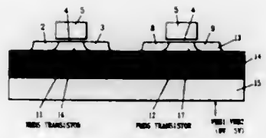
a semiconductor substrate having a substrate terminal;

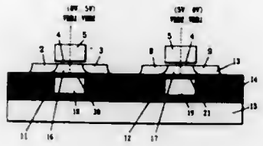
an insulating layer formed on said semiconductor substrate;

a first conductivity channel type MOS transistor formed on said insulating layer and operating selectively in standby and active states, said first conductivity channel type MOS transistor having a gate electrode and a channel forming region which is fully depleted upon application of a threshold voltage thereof;

a second conductivity channel type MOS transistor formed on said insulating layer and operating selectively in the standby and active states, the second conductivity channel type MOS transistor being in the standby state when the first conductivity channel type MOS transistor is in the standby state and the second conductivity channel type MOS transistor being in the active state when the first conductivity channel type MOS







transistor is in the active state, said second conductivity channel type MOS transistor having a gate electrode and a channel forming region which is partially depleted upon application of a threshold voltage thereof; and

substrate bias voltage providing means for selectively providing a first substrate bias voltage in the standby state and a second substrate bias voltage such as to enhance a current supplying drivability of said first conductivity channel type MOS transistor in the active state to said substrate terminal.

5,557,232

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING A CONTROL CIRCUIT FOR SETTING THE TEST MODE

Kenjyu Shimogawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 11, 1994, Ser. No. 288,778

Claims priority, application Japan, Aug. 13, 1993, 5-201340

Int. Cl.[6] G05F *1/10*

U.S. Cl. 327—545 **3 Claims**

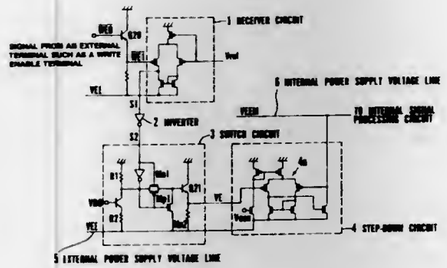
1. A semiconductor integrated circuit device comprising:

an external write enable terminal used for normal signal processing;

a receiver circuit having an input and an output, said receiver circuit being responsive to a signal on said input for producing a switching signal on said output of said receiver circuit;

means for applying an input signal from said external write enable terminal to said input of said receiver circuit;

a switching circuit having an input and an output, said switching circuit being responsive to said switching signal on said input of said switching circuit for being set in a binary state and producing a voltage output signal at said output of said switching circuit, said voltage output signal being set at a first or a second level based on said switching signal;



second circuit means for receiving said voltage output signal and producing a power supply voltage signal, said power supply voltage signal being of a first value or a second value, said second value of said power supply voltage signal being approximately equal to said second level of said voltage output signal; and

third circuit means for applying said power supply voltage signal of said second circuit means to a signal processing circuit.

5,557,233

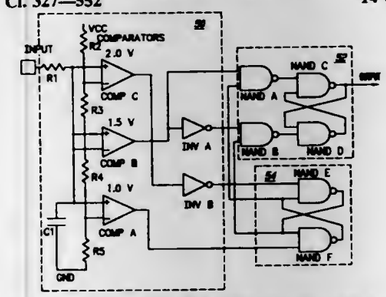
FILTER FOR COMPUTER BUS SIGNALS

Arthur Sobel, Los Altos Hills, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Sep. 30, 1994, Ser. No. 316,280

Int. Cl.[6] H04B *1/10;* **H03K** *5/153*

U.S. Cl. 327—552 **14 Claims**



1. A circuit to process an input signal received from a bus of a computer, said input signal including spurious signal transitions before a peak value is reached, said circuit comprising:

an input node to receive said input signal;

level identification circuitry connected to said input node to characterize the magnitude of said input signal and output a level identification signal, said level identification signal comprising a multiple bit digital signal; and

level hold circuitry connected to said level identification circuitry to process said level identification signal to produce a high digital output signal with a first voltage level that is maintained during said spurious signal transitions and when said peak value of said input signal is reached.

5,557,234

DIFFERENTIAL AMPLIFIER WITH MISMATCH CORRECTION USING FLOATING GATES

Stephen Collins, Worcester, United Kingdom, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

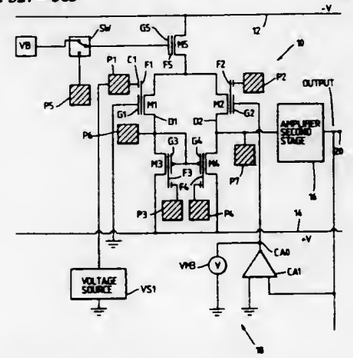
PCT No. PCT/GB93/00311, § 371 Date Mar. 8, 1995, § 102(e) Date Mar. 8, 1995, PCT Pub. No. WO93/17493, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 15, 1993, Ser. No. 347,482

Claims priority, application United Kingdom, Feb. 27, 1992, 9204434

Int. Cl.[6] H03F *3/45*

U.S. Cl. 327—563 **15 Claims**



1. A differential amplifier comprising:

(a) a source-coupled pair of transistors arranged respectively as inverting and non-inverting input transistors of the amplifier,

(b) a pair of subsidiary transistors each connected as a drain load of a respective input transistor,

(c) at least one of the pairs of input and subsidiary transistors comprises a pair of field effect transistors incorporating respective floating gates, and

(d) the amplifier includes correcting means for storing charge upon at least one of said floating gates by charge injection to counteract at least one of:

(i) differing input transistor threshold voltages, and

(ii) discrepancies between actual and design values of input transistor drain voltage.

5,557,235

SEMICONDUCTOR DEVICE COMPRISING A

output terminal to provide the variable output signal to another external circuit that is external to the integrated cir-

5,557,238

DIFFERENTIAL AMPLIFIER WITH COMMON MODE

a second offset compensation device, having an input terminal connected to the audio amplifier output terminal and an output

5,557,235

SEMICONDUCTOR DEVICE COMPRISING A GROUNDING PAD NEAR A REFERENCE SIGNAL PAD AND A CAPACITOR BETWEEN THE PADS

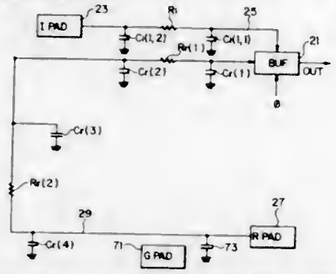
Hiroki Koike, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 14, 1994, Ser. No. 339,729

Claims priority, application Japan, Nov. 24, 1993, 5-317390

Int. Cl.[6] H01L *25/00*

U.S. Cl. 327—564 **8 Claims**



1. A semiconductor device on a semiconductor substrate comprising:

an input buffer for generating an output signal by comparing an input signal with a reference signal;

an input signal pad for receiving said input signal;

a first connection line running from said input signal pad to said input buffer to convey said input signal from said input signal pad to said input buffer; and

a second connection line for receiving said reference signal and connected to said input buffer to convey said reference signal to said input buffer, said second connection line having a first portion which runs along and in parallel to said first connection line.

5,557,236

INTEGRATED CIRCUIT WITH BIDIRECTIONAL PIN

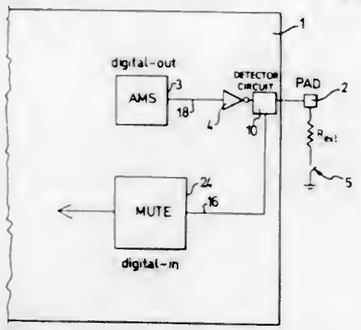
Marco Monti, Milan, Italy, assignor to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

Filed Sep. 19, 1994, Ser. No. 308,708

Claims priority, application European Pat. Off., Oct. 29, 1993, 93830437

Int. Cl.[6] H01L *25/00*

U.S. Cl. 327—565 **27 Claims**



1. An integrated circuit comprising:

a first circuit for performing a first function, the first circuit having an input terminal to receive an input signal from an external circuit that is external to the integrated circuit;

a second circuit for performing a second function and for providing a variable output signal, the second circuit having an output terminal to provide the variable output signal to another external circuit that is external to the integrated circuit;

a single pin: and

a third circuit for detecting a state of the pin and being coupled to the input terminal, to the single pin, and to the output terminal, so that the input signal to the first circuit and the variable output signal from the second circuit are presentable at the pin simultaneously.

5,557,237

METHOD AND DEVICE FOR AUTOMATIC GAIN CONTROL IN AN AMPLIFIER OF AN ELECTROACOUSTIC SYSTEM, PARTICULARLY FOR MOTOR VEHICLES

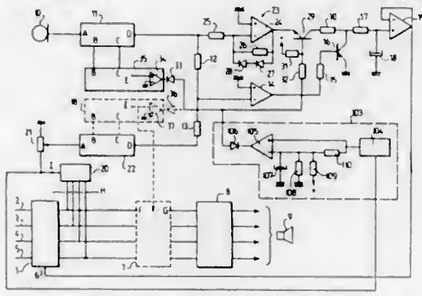
Claude B. Carpentier, Neuilly-sur-Seine, France, assignor to S L X, France

Filed Mar. 22, 1995, Ser. No. 406,850

Claims priority, application France, Sep. 22, 1992, 92 11268

Int. Cl.[6] H03G *3/30*

U.S. Cl. 330—129 **26 Claims**



1. Automatic gain control method for a variable gain amplifier in an electroacoustic system, comprising:

a) effecting a first treatment, including a first filtering sub-treatment, on a complex signal containing a mixture of background noise and sound signals from loudspeakers to obtain a first treated signal,

b) effecting a second treatment, including a second filtering sub-treatment, on a wanted signal sampled at the output of the amplifier to obtain a second treated signal,

each filtering sub-treatment including first high-pass filtering with a low cut-off frequency and second high-pass filtering with a medium cut-off frequency and an attenuation of at least approximately 30 dB at approximately 100 Hz, and

c) controlling the gain of the amplifier as a function of the comparative levels of the two treated signals, such that increase in the gain of the amplifier is prevented

if the level of the signal sampled on the input side of the first high-pass filtering of the first filtering sub-treatment is less than the product of the level of the corresponding signal sampled on the output side of the first high-pass filtering by a predetermined coefficient greater than 1 or

if the level of the signal sampled on the input side of the first high-pass filtering of the second filtering sub-treatment is greater than the product of the level of the corresponding signal sampled on the output side of the first high-pass filtering by a predetermined coefficient greater than 1.

5,557,238

DIFFERENTIAL AMPLIFIER WITH COMMON MODE REGULATION

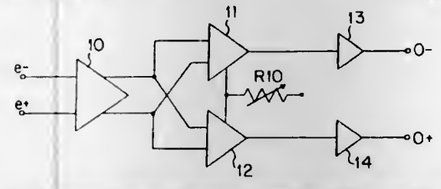
Juliette Weiss, Seyssinet-Pariset, France, assignor to SGS-Thomson Microelectronics S.A., Saint Genis, France

Filed Apr. 21, 1995, Ser. No. 427,090

Claims priority, application France, Apr. 29, 1994, 94/05501

Int. Cl.[6] H03F *3/45*

U.S. Cl. 330—258 **22 Claims**



1. An amplifier having differential inputs and differential outputs that comprises:

an input differential pair having a pair of outputs;

first and second single ended output differential amplifiers, each receiving the pair of outputs of the input differential pair;

buffer stages connected to each of the single ended output differential amplifiers, each buffer stage having an output that constitutes the differential outputs of the amplifier; and

a means for adjusting a quiescent current supplied by the first and second single ended differential amplifiers to the buffer stages that results in the adjustment of a common mode voltage to a required value.

5,557,239

DIRECT CURRENT OFFSET COMPENSATING CIRCUIT OF AN AUDIO SYSTEM

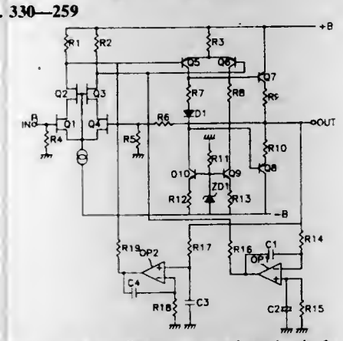
Gibo Masao, Suwon-city, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed May 1, 1995, Ser. No. 432,465

Claims priority, application Rep. of Korea, Aug. 12, 1994, 20367/1994

Int. Cl.[6] H03F *3/45*

U.S. Cl. 330—259 **7 Claims**



7. A direct current offset compensating circuit for an audio system, having an audio amplifier output terminal for outputting an audio signal having a direct current offset value, the direct current offset compensating circuit comprising:

a driving circuit for amplifying an input audio signal;

a buffer circuit for outputting the amplified signal;

a first offset compensation device, having an output connected to the driving circuit, for detecting an offset in the output audio signal while the audio signal is input to said driving circuit, generating and outputting a first compensation signal based on the detected offset signal, wherein the driving circuit compensates for the direct current offset in the output audio signal based on the output of the first offset compensation device;

a second offset compensation device, having an input terminal connected to the audio amplifier output terminal and an output terminal connected to the driving circuit, for detecting the direct current offset in the output audio signal while the audio signal is input to said driving circuit, generating and outputting a second compensation signal based on the detected offset signal, wherein the driving circuit compensates for the direct current offset in the output audio signal based on the output of the second offset compensation device.

5,557,240

POWER SUPPLY FOR A COMPUTER INCLUDING A SOUND SIGNAL AMPLIFYING CIRCUIT

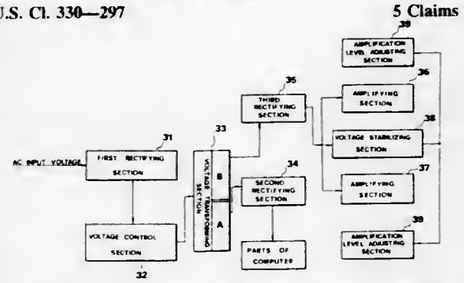
Jang-Bin Lee, Uijongbu, Rep. of Korea, assignor to Korson Co., Ltd., Rep. of Korea

Filed May 19, 1995, Ser. No. 444,433

Claims priority, application Rep. of Korea, Oct. 10, 1994, 94-26398

Int. Cl.[6] H03F *3/04*

U.S. Cl. 330—297 **5 Claims**



1. A power supply for use with a computer and including a sound signal amplifying circuit, said power supply comprising:

a first rectifying means **31** receiving AC power from an AC power source, rectifying said AC power to DC power and outputting DC power;

a voltage control means **32** receiving said DC power and generating a voltage having a high frequency pulse by Switching Mode method and outputting said high frequency pulse voltage;

a voltage transforming means **33** receiving and transforming said voltage having a high frequency pulse to a voltage having a high frequency pulse suitable for operation of computer components and to a voltage having a high frequency pulse suitable for amplification of a sound signal;

a second rectifying means **34** for receiving said high frequency pulse voltage suitable for operation of computer components and rectifying said high frequency pulse voltage thereby providing a stabilized high frequency pulse voltage suitable for powering said computer components;

a third rectifying means **35** receiving said high frequency pulse voltage suitable for amplification of a sound signal and rectifying said high frequency pulse voltage suitable for amplification of a sound signal to a stabilized and noise free voltage for amplification of sound signals, and outputs said stabilized and noise free voltage; and,

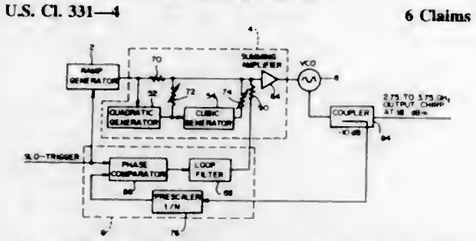
an amplifying means **36.37** receiving said stabilized and noise free voltage from said third rectifying means **35** for amplifying a high power sound signal.

5,557,241

LINEAR CHIRP GENERATION USING VCO TUNING WITH POLYNOMIAL PREDISTORTION

Peter J. Burke, Commack, N.Y., assignor to AIL Systems, Inc., Deer Park, N.Y.

Filed May 24, 1995, Ser. No. 449,202
Int. Cl.[6] H03B *23/00*
U.S. Cl. 331—4 **6 Claims**



1. A linear chirp generator employing a voltage controlled oscillator (VCO) having a tuning characteristic which is naturally nonlinear, which comprises:

a nonlinear voltage controlled oscillator (VCO);

a linear ramp generator, the linear ramp generator generating a linearly ramping output signal having a linear slope characteristic with respect to time;

a polynomial correction waveform generator, the polynomial correction waveform generator generating a polynomial correction signal;

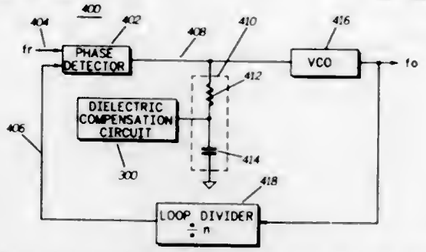
a summer, the summer being responsive to and summing the linearly ramping output signal of the ramp generator and the polynomial correction signal of the polynomial correction waveform generator and generating a VCO tuning signal for tuning the VCO, the tuning signal corresponding to the linearly ramping output signal predistorted with a nonlinearity opposite to the natural nonlinearity of the VCO tuning characteristic, the tuning signal being provided to the VCO, the VCO generating an output signal in the form of a linear frequency versus time chirp.

5,557,242

METHOD AND APPARATUS FOR DIELECTRIC ABSORPTION COMPENSATION

John T. Wetherell, Ft. Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 22, 1995, Ser. No. 445,484
Int. Cl.[6] H03L *7/93*
U.S. Cl. 331—17 **16 Claims**



1. A method for reducing dielectric absorption of a filter capapitor in a phase lock loop circuit, comprising the steps of:

generating a negative impedance; and

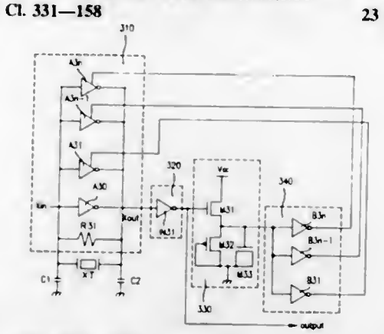
sourcing current to the filter capacitor from the negative impedance when a positive transient at the filter capacitor is detected.

5,557,243

OSCILLATION CIRCUIT WITH POWER LIMITING CONTROLLER

Joon-Cheri Ho, Seoul, Rep. of Korea, assignor to LG Semicon Co., Ltd., Seoul, Rep. of Korea

Filed Apr. 19, 1995, Ser. No. 425,068
Int. Cl.[6] H03B *5/04;5/06;5/36*
U.S. Cl. 331—158 **23 Claims**



1. An oscillation circuit comprising:

first means for producing a first signal in response to an energizing signal being applied as an input signal, and for amplifying said first signal by varying degrees so as to form a second signal; and

second means, responsive to said second signal, for controlling the degree of amplification of said first signal by said first means,

said first means including a plurality of amplifiers arranged in parallel with one of said amplifiers being controlled by said second means,

said second means controlling the degree of amplification by enahling/disabling said one of said amplifiers controlled by said second means,

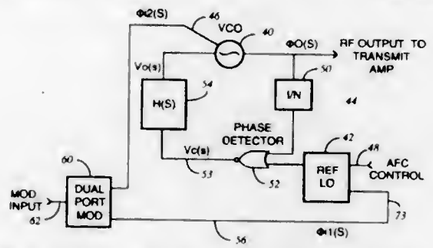
wherein said one of said amplifiers controlled by said second means is a tri-state amplifier which is controlled by a power limiting amplifier having a predetermined threshold value of input required before producing an output sufficient to disable the controlled amplifier.

5,557,244

DUAL PORT PHASE AND MAGNITUDE BALANCED SYNTHESIZER MODULATOR AND METHOD FOR TRANSCEIVER

Raul Salvi, Boca Raton, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 24, 1995, Ser. No. 427,677
Int. Cl.[6] H03L *3/00;7/06;7/099;* **H03D** *3/00*
U.S. Cl. 332—128 **22 Claims**



1. In a transceiver having a voltage controlled oscillator and a reference oscillator coupled in a phase locked loop to the voltage controlled oscillator, a circuit for coupling a modulation input to the voltage controlled oscillator and the reference oscillator comprising:

a magnitude balancing circuit for dividing said modulation input between said voltage controlled oscillator and said reference oscillator for providing a pair of modulation input signals having balanced magnitudes coupled respectively to said oscillators, said magnitude balancing circuit adjusts the balanced magnitude of each of said pair of modulation input signals independent of the phase of said modulation input; and

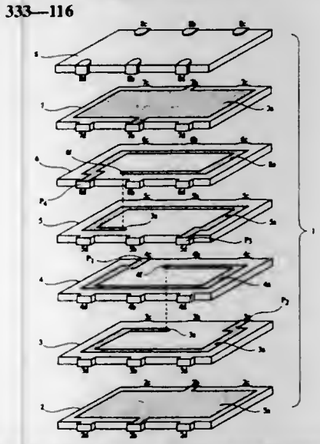
a phase balancing circuit coupled between said modulation input and said voltage controlled oscillator to induce a negative phase shift in the modulation input signal coupled to said voltage controlled oscillator.

5,557,245

STRIP LINE-TYPE HIGH-FREQUENCY ELEMENT

Tsuyoshi Taketa; Toru Ishida, and Yasushi Kishimoto, all of Tottori, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Aug. 30, 1994, Ser. No. 298,341
Claims priority, application Japan, Aug. 31, 1993, 5-240468; Aug. 22, 1994, 6-221126
Int. Cl.[6] H01P *5/18*
U.S. Cl. 333—116 **6 Claims**



1. A strip line-type high-frequency element comprising:

a plurality of vertically spaced, parallel wide ground conductors, including a first wide ground conductor and a second wide ground conductor, each ground conductor having a respective central portion aligned so as to define a central axis, and

a main line and a subline, vertically spaced and in vertical alignment, said main line and said subline each respectively comprising a first strip line and a corresponding second strip line;

each of said first and said corresponding second strip line (1) comprising, in sequence, a first end, a lead portion, an open coil portion, and a second end, and (2) being disposed between said first wide ground conductor and said second wide ground conductor;

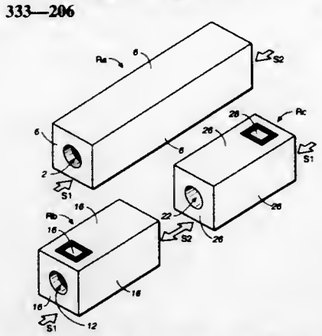
for each of said main line and said subline, said first end of said respective first strip line being vertically spaced from said first end of said corresponding second strip line, and said second end of said respective first strip line being coupled to said second end of said corresponding second strip line to define a respective continuous strip line, said open coil portion of said respective first strip line and said open coil portion of said corresponding second strip line being positioned about said central axis, vertically spaced, and in vertical alignment, said respective continuous strip line thereby defining a vertically extending coil of one or more turns.

5,557,246

HALF WAVELENGH AND QUARTER WAVELENGTH DIELECTRIC RESONATORS COUPLED THROUGH SIDE SURFACES

Jinsei Ishihara, and Shuuichi Sakai, both of Ishikawa-gun, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Feb. 17, 1995, Ser. No. 390,331
Claims priority, application Japan, Feb. 17, 1994, 6-020310
Int. Cl.[6] H01P *1/202*
U.S. Cl. 333—206 **30 Claims**



1. A dielectric resonator apparatus comprising a plurality of dielectric resonators of a first kind and a dielectric resonator of a second kind attached together to form a unistructural apparatus; each of said dielectric resonators comprising:

a dielectric block having a first end surface and a second end surface which are opposite each other and side surfaces extending between said first and second surfaces, a cavity being formed inside said dielectric block;

an axially elongated inner conductor serving as resonant conductor extending inside said cavity between said first and second end surfaces;

outer conductor formed on said side surfaces; and

a coupling area at least on one of said side surfaces, said coupling area comprising a coupling-providing conductor which is insulated from and surrounded by said outer conductor and serves to electrostatically couple with said inner conductor;

the axial length of the inner conductor of each of said dielectric resonators of the first kind being approximately equal to one-quarter wavelength of the resonant frequency of said dielectric resonator of the first kind;

the axial length of the inner conductor of said dielectric resonators of the second kind being approximately equal to one-half wavelength of the resonant frequency of said dielectric resonator of the second kind;

at least one of said dielectric resonators of the first kind, being coupled to at least one of said dielectric resonators of the second kind through side surfaces thereof.

5,557,247

RADIO FREQUENCY VOLUME COILS FOR IMAGING AND SPECTROSCOPY

John T. Vaughn, Jr., Birmingham, Ala., assignor to UAB Research Foundation, Birmingham, Ala.

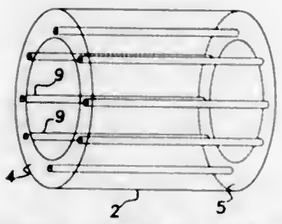
Continuation of Ser. No. 103,940, Aug. 6, 1993, abandoned. This application Sep. 5, 1995, Ser. No. 526,135
Int. Cl.[6] H01D *7/00*
U.S. Cl. 333—219 **31 Claims**

1. An MR RF coil in the form of a tuned TEM resonator, said resonator having a cavity and a set of transmission line segments, and there being circuit means including said set for providing a tunable high frequency magnetic field within said cavity;

said set having n segments, each of said n segments having variable distributed impedance, and said set having an impedance which is due to the individual distributed impedances of

5,557,252

THICK FILM CIRCUIT BOARD AND METHOD OF



said n segments, and is adjustable to different values by adjusting said individual distributed impedances;

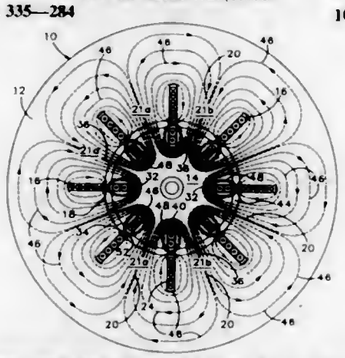
wherein the impedance of each segment is uniformly distributed along the length of each n segment, whereby said coil is capable of resonance greater than 4 Tesla.

5,557,248

MAGNETIZER FOR MAGNETS WITH SHAPED MAGNETIC WAVEFORM

Vaclav Prochazka, Lake Oswego, Oreg., assignor to Synektron Corporation, Portland, Oreg.

Filed Feb. 24, 1994, Ser. No. 201,189
Int. Cl.[6] H01F *7/20;13/00*
U.S. Cl. 335—284 **10 Claims**



1. A magnetizer for magnetizing a body of material having an annular shape comprising:

(a) a primary winding having portions wound about a first core, said primary winding being distributed at spaced-apart locations adjacent an inner periphery of said body of material;

(b) said primary winding carrying current in a first direction so as to create a first field of flux associated therewith;

(c) a secondary winding having portions wound around a second core, said secondary winding being distributed at spaced apart locations adjacent an outer periphery of said body of material;

(d) said secondary winding carrying current in a second direction so as to create a second field of flux associated therewith, said second field being directed so as to oppose said first field;

wherein said first core and said second core are respectively positioned to magnetize a material disposed therebetween.

5,557,249

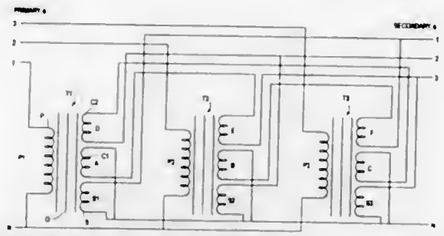
LOAD BALANCING TRANSFORMER

Thomas J. Reynal, 1127 Ivy Wall, Houston, Tex. 77079

Filed Aug. 16, 1994, Ser. No. 292,053
Int. Cl.[6] H01F *30/12*
U.S. Cl. 336—5 **18 Claims**

1. A three phase transformer for connection to a three phase primary and for providing a three phase secondary, the transformer comprising:

first, second and third primary phases;



first, second and third secondary phases;

a first phase transformer core;

a first primary winding wound about said first phase transformer core and connected to said first primary phase;

a first secondary winding wound about said first phase transformer core and connected to said first secondary phase;

a first coupled winding wound about said first phase transformer core;

a second coupled winding wound about said first phase transformer core;

a second primary winding wound about said second phase transformer core and connected to said second primary phase;

a second secondary winding wound about said second phase transformer core and connected to said second secondary phase;

a third coupled winding wound about said second phase transformer core;

a fourth coupled winding wound about said second phase transformer core;

a third primary winding wound about said third phase transformer core and connected to said third primary phase;

a third secondary winding wound about said third phase transformer core and connected to said third secondary phase;

a fifth coupled winding wound about said third phase transformer core; and

a sixth coupled winding wound about said third phase transformer core,

wherein said first coupled winding and said third coupled winding are connected in negative series and in parallel with said third secondary winding, wherein said second coupled winding and said fifth coupled winding are connected in negative series and in parallel with said second secondary winding, and wherein said fourth coupled winding and said sixth coupled winding are connected in negative series and in parallel with said first secondary winding.

5,557,250

TELECOMMUNICATIONS TERMINAL BLOCK

Christian A. M. Debbaut, Cary; William J. Curry, Apex; Kimberley A. Jessup, Raleigh; Kenneth J. Flen, Cary; Julian S. Mullaney, Raleigh; Thomas M. Baum, Apex; Michael E. Grice, Cary; Thomas M. Wilson, Sanford; James A. Pinyan, Apex; Stephen E. Wald, and Roy Thompson, both of Raleigh, all of N.C., assignors to Raychem Corporation, Menlo Park, Calif.

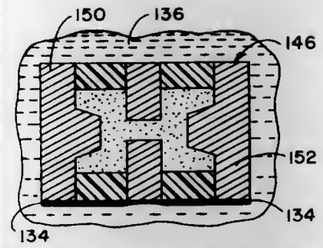
Continuation-in-part of Ser. No. 906,803, Jun. 30, 1992, abandoned, Ser. No. 906,952, Jun. 30, 1992, abandoned, and Ser. No. 954,612, Sep. 30, 1992, abandoned, which is a continuation of Ser. No. 776,501, Oct. 11, 1991, abandoned. This application Apr. 12, 1993, Ser. No. 46,059
Int. Cl.[6] H01C *7/10*
U.S. Cl. 338—21 **35 Claims**

11. A vent-safe apparatus for a telecommunications gas tube protector, comprising:

(a) a first electrode for electrical connection to a terminal on the gas tube protector;

(b) a second electrode for electrical connection to another terminal on the gas tube protector,

(c) a non-gaseous, non-linear resistive, solid, carbon black filled polycarbonate based extrusion grade film having a thickness



from substantially 0.001 to 0.010 inches, said film separating said electrodes and being substantially non-conductive when an electrical potential formed between said electrodes is less than a predetermined breakdown voltage V_B, being conductive when the electrical potential is greater than the breakdown voltage V_B, and said non-linear resistive film forming and supporting a plasma discharge therethrough after becoming conductive to effect a sudden increase in conductivity between said electrodes for discharging high energy potentials with a voltage foldback functionally analogous to a foldback voltage between the terminals of the gas tube protector, said predetermined breakdown voltage V_B being greater than the breakdown voltage of the gas tube protector at least prior to a discharge through said nonlinear resistive film; and

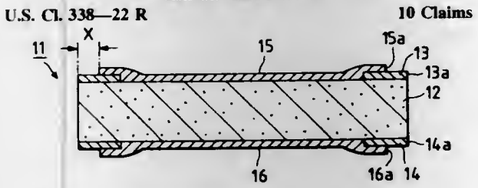
(d) a gel environmentally encapsulating said electrodes and said non-linear resistive film to protect them from environmental contaminants, to exclude oxygen from the plasma discharge, and to act as a heat sink to draw thermal energy away from local hot spots, said gel being chemically inert to said non-linear resistive film.

5,557,251

THERMISTOR WITH ELECTRODES FOR PREVENTING INTER-ELECTRODE MIGRATION

Yuichi Takaoka, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 28, 1994, Ser. No. 218,649
Claims priority, application Japan, Mar. 29, 1993, 5-014843
Int. Cl.[6] H01C *7/10*
U.S. Cl. 338—22 R **10 Claims**



1. A thermistor comprising:

a plate-like thermistor body having main surfaces; and

a pair of first electrodes each formed on one of the main surfaces of said plate-like thermistor body, each said first electrode having an outer periphery which reaches an outer peripheral edge of said thermistor; and

a pair of second electrodes each formed on one of the main surfaces of said plate-like thermistor body, each said second electrode extending from an area encircled by said first electrode onto said first electrode and having an outer periphery which is apart from an outer periphery of said first electrode;

wherein said first and second electrodes are both made of material which can make an ohmic-contact with the main surfaces of said thermistor body; and

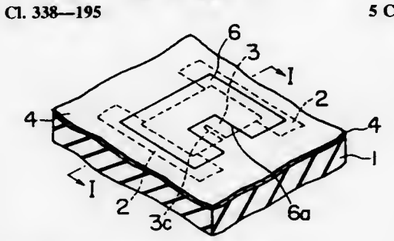
wherein said first electrode consists essentially of a material which is not likely to generate inter-electrode migration and said second electrode consists essentially of a material which is more likely to generate inter-electrode migration as compared with said first electrode.

5,557,252

THICK FILM CIRCUIT BOARD AND METHOD OF MANUFACTURING THE SAME

Shogo Ariyoshi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 9, 1994, Ser. No. 239,968
Claims priority, application Japan, May 13, 1993, 5-111628
Int. Cl.[6] H01C *1/12*
U.S. Cl. 338—195 **5 Claims**



1. A thick film circuit board comprising:

a substrate;

a thick film resistor disposed on said substrate and having a trimming region;

an overcoat covering all of said substrate and said thick film resistor; and

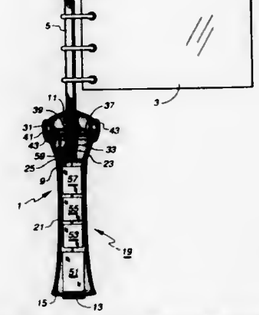
a protective coating disposed on said substrate partially covering and protecting said thick film resistor and having a window through which the trimming region of said thick film resistor is exposed through said overcoat.

5,557,253

OFFICIATING COMMUNICATION DEVICE

Kenneth J. Hegemann, Carlsbad, Calif., and Max M. Stern, 24284 Ontario La., El Toro, Calif. 92630, assignors to Max M. Stern, Lake Forest, Calif.

Filed Sep. 1, 1994, Ser. No. 299,294
Int. Cl.[6] G08B *23/00*
U.S. Cl. 340—321 **12 Claims**



1. In a field sporting event, a device for confirming an event comprising:

a) a flag for waving to visually indicate to others that an event has occurred;

b) a shaft upon which said flag is loosely attached;

c) a handle, for grasping with the hand, to support said shaft integral therewith;

d) means, integral with said handle, for radiating an electronic signal, to confirm said event, said means including an antenna; and,

e) waterproof switch means, interconnected with said means for radiating said electronic signal, for initiating the transmission of the signal.

5,557,254

PROGRAMMABLE VEHICLE MONITORING AND SECURITY SYSTEM HAVING MULTIPLE ACCESS VERIFICATION DEVICES

Sam Johnson, Sugarhill; Cecil W. Ashe, Eatonton, and Jesse B. Yates, Atlanta, all of Ga., assignors to Mobile Security Communications, Inc., Norcross, Ga.

Filed Nov. 16, 1993, Ser. No. 153,140
Int. Cl.[6] B60R *25/10*
U.S. Cl. 340—426 **10 Claims**

1. A security system for protecting a vehicle from theft and from carjacking, comprising:

a central monitoring station;

at least one intrusion detection device operable to detect a violation of a protection zone of said vehicle and operable to output a signal to indicate a violation of said protection zone;

a calling unit on said vehicle operable to establish a communication link to said central monitoring station;

a computerized control and communications unit connected to said at least one intrusion detection device and a said calling unit, wherein said computerized control and communication unit, responsive to said output signal, causes said calling unit to establish a communication link to said central monitoring station;

a position determination device connected to said control and communications unit and operable to determine position information of said vehicle;

an occupant identification device connected to said computerized control and communications unit and operable to determine the identity of an occupant of said vehicle;

wherein said computerized control and communications unit, responsive to said output signal, obtains said position information from said position determination device and causes said calling unit to transmit said position information to said central monitoring station and wherein upon the detection of a violation of said protection zone of said vehicle, said control and communications unit causes said occupant identification device to verify that said occupant is an authorized occupant of said vehicle;

wherein said computerized control and communications unit further connected to a pager receiver for receiving from said central monitoring station a page and commands to control said vehicle and said security system;

a transceiver on said central monitoring station for receiving information transmitted by said calling unit and for communicating control information to said vehicle to control operational units of said vehicle;

circuitry connected to said control and communications unit and operable to accept an allowed range for said vehicle; and

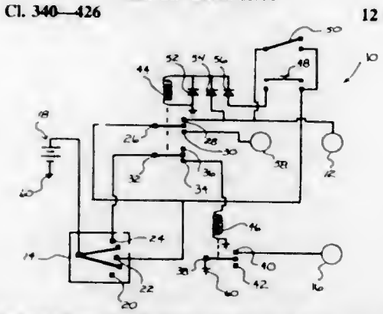
circuitry connected to said control and communications unit and operable to send a signal to said control and communications unit when said vehicle has left said allowed range, whereby, responsive to said sent signal, said control and communications unit is operative to cause said calling unit to signal to said central monitoring station that said vehicle has left its allowed range.

5,557,255

ANTITHEFT DEVICE FOR A VEHICLE AND METHOD OF INSTALLING THE SAME

Steven M. Adams, 4019 E. Holmes Ave., Mesa, Ariz. 85206, and Curtis Paynter, 1142 N. 95th Pl., Mesa, Ariz. 85207

Filed Oct. 6, 1994, Ser. No. 319,079
Int. Cl.[6] B60R *25/10*
U.S. Cl. 340—426 **12 Claims**



1. In a motorized vehicle having an electrical system, a common ground, a horn, a battery, an electronic control module, and a key switch having an off pole, a run pole and a start pole, a concealed anti-theft device comprising:

a first switch connected to the run pole, the first switch having a first pole connected to the vehicle electronic control module;

a concealed momentary switch connected to the run pole, the momentary switch moved between a closed position and an open position by a vehicle operator;

a first relay operatively associated with the momentary switch, the first relay energized when the momentary switch is moved to the closed position after the run pole of the key switch is powered, the first relay is kept energized by a lock loop after the momentary switch is moved to the open position and when the run pole or the start pole of the key switch is powered, the energized first relay energizes the first switch first pole, thereby powering the vehicle electronic control module; and

a valet switch having an open position and a closed position, the valet switch connecting the run pole of the key switch to the vehicle electronic control module when the valet switch is in the closed position, bypassing the momentary switch and powering the electronic control module when the run pole or start pole of the key switch is powered.

5,557,256

TIRE PRESSURE LOSS INDICATING DEVICE

Rainer Achterholt, Weidach, Germany, assignor to Auto-Zubehor-Innovationeo Gaselischaft mbH, Pertlstein, Austria

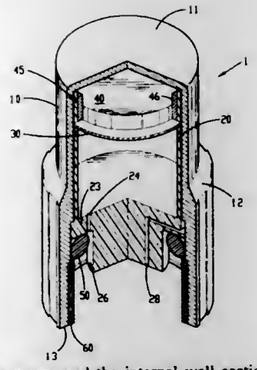
Filed Apr. 29, 1994, Ser. No. 236,508
Claims priority, application Germany, Apr. 30, 1993, 43 14 340.7
Int. Cl.[6] B60C *23/00*
U.S. Cl. 340—442 **18 Claims**

1. A pressure drop-indicating system for a pnumatic tire having a tire valve, said system comprising a valve cap and a display unit, wherein said valve cap comprises

a housing having an interior space defined by a closed end portion, an external wall and an internal wall section provided with a bore, and further having an open end portion defined hy said internal wall section and by an internal thread means adapted for a screw-connection to the tire valve;

an actuator means attached to said internal wall section and extending in an axial direction for opening the tire valve when the open end portion is screwed onto the tire valve;

a deflectable diaphragm means arranged within the interior space and dividing said interior space into a first chamber, arranged between the closed end portion and the diaphragm means, and into a second chamber, arranged between the



diaphragm means and the internal wall section, wherein the first chamber comprises a permanently-open flow connection with the tire valve via at least one non-closable flow channel recessed within the housing, and wherein the second chamber comprises a flow connection with the tire valve via the bore recessed in the internal wall section;

a sealing means sealing the open end portion with respect to the screw-connected tire valve and further hermetically sealing the bore within the internal wall section, such that, during a screw connection action, a given tire pressure is permanently enclosed, sealed and stored within the second chamber to serve as a reference pressure; and

a permanent magnet movably arranged within the first chamber which is shiftable by the diaphragm means, and adapted to assume a first position distantly from the closed end portion when the diaphragm means takes its rest position, and a second position adjacent to the closed end portion when the diaphragm means takes its deflected position,

whereby a pressure drop within the tire causes a similar pressure drop within the first chamber, such that the permanently-stored pressure within the second chamber becomes higher than the pressure within the first chamber and deflects and shifts the diaphragm means toward the closed end portion, and whereby said deflection of the diaphragm means moves the permanent magnet from its first position into its second position; and wherein said display unit comprises

an arrangement section for engaging the valve cap,

a magnetic field sensor means,

at least one display means,

a circuitry means connecting the sensor means with the display means,

an electrical power supply means, and

switching means for enabling the circuitry means and the sensor means;

wherein the display unit is formed as an independently usable hand-held device and is adapted by means of its arrangement section to engage the valve cap in a definite arrangement so that the magnetic field sensor means senses the first or second position of the permanent magnet, and the circuitry means triggers the display means accordingly.

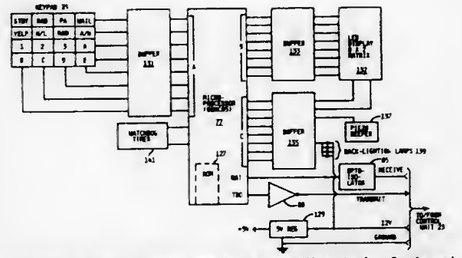
5,557,257

PROGRAMMABLE EMERGENCY SIGNALLING SYSTEM FOR A VEHICLE

Ward J. Gieffers, Oak Lawn, Ill., assignor to Federal Signal Corporation, Oak Brook, Ill.

Continuation of Ser. No. 529,207, May 25, 1990, Pat. No. 5,296,840. This application Dec. 17, 1993, Ser. No. 169,427
Int. Cl.[6] B60Q *1/26;* **G08B** *3/00*
U.S. Cl. 340—474 **14 Claims**

1. An emergency signalling system for a vehicle comprising: a controller for mounting to the vehicle and alternatively operable in



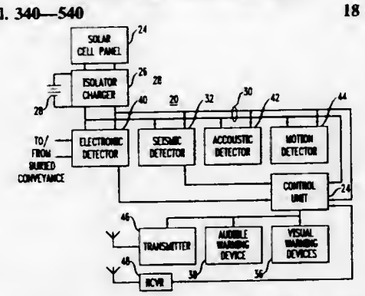
programming and operating modes; a signalling device for broadcasting an emergency warning signal selected by the controller in the operating mode; a first means of the controller responsive to a user interface and a first memory for (1) placing the controller in the programming mode and (2) selecting the emergency warning signal from a group of available emergency warning signals stored in the first memory, a second memory in communication with the first means for storing the selected emergency warning signal; second means of the controller in communication with the second memory and responsive to the user interface when the controller is in the operating mode for delivering the selected emergency warning signal to the signalling device; and, the controller including a control head in serial communication with a control unit, where the control head is responsive to the user interface and the control unit controls the signalling device.

5,557,258

METHOD AND APPARATUS FOR WARNING OF POTENTIAL HARM TO AN UNDERGROUND UTILITY CONVEYANCE

Hossein Eslambolchi, Bedminster, N.J., assignor to AT&T, Holmdel, N.J.

Filed Apr. 28, 1995, Ser. No. 430,652
Int. Cl.[6] G08B *13/00;* **G08G** *1/04*
U.S. Cl. 340—540 **18 Claims**



1. A method of warning of potential harm to a underground utility conveyance, comprising the steps of:

providing at least one sensor for sensing a disturbance attributable to the presence of a piece of excavating equipment in proximity to the utility conveyance;

monitoring the sensor to detect the occurrence of such a disturbance and in response thereto;

generating a warning at the location of the buried underground utility conveyance, the warning directed to an operator of the piece of excavating equipment to warn of potential harm to the buried underground utility conveyance.

5,557,259

PROXIMITY ALERT AND DIRECTION INDICATOR

open areas, in particular for the detection and identification of fires in open areas of greater than one square kilometer, comprising a

signals produced when said polarizer is in an orientation other than said first orientation;

5,557,263

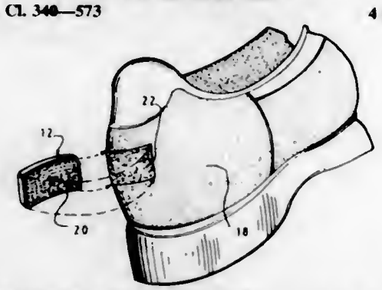
SYSTEM FOR DETECTION OF ELECTRICALLY

5,557,259

PROXIMITY ALERT AND DIRECTION INDICATOR

John S. Musa, 2 Westervelt Ave., Clifton, N.J. 07011

Filed Apr. 10, 1995, Ser. No. 419,427
Int. Cl.[6] G08B 21/00
U.S. Cl. 340—573 **4 Claims**



1. A proximity alert and direction indicator comprising:
a. radio transmitter means worn on the shoe of a subject under surveillance, said transmitter means being attached by hook and pile type fastener material to permit said transmitter means to be removed and located on the back of the shoe adjacent the heel;
b. a bracelet worn on the wrist of an observer, said bracelet carrying direction finding radio receiver means to receive a radio signal issued by said transmitter means;
c. proximity detector means connected to said receiver means to output an alarm signal when the distance between said transmitter means and said receiver means exceeds some preset value, and including means for adjusting said preset value; and
d. transducer means connected to said proximity detector including speaker means to issue an audible alarm to said observer when said alarm signal is received.

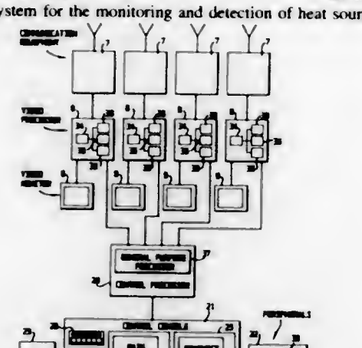
5,557,260

SYSTEM FOR THE MONITORING AND DETECTION OF HEAT SOURCES IN OPEN AREAS

Antonio C. G. Legaz; Francisco J. E. Duran, and Angel J. G. Maraáu, all of Cadiz, Spain, assignors to Empresa Nacional Bazan de Construcciones Naval Militares, S.A., Spain

Filed Feb. 9, 1994, Ser. No. 193,998
Claims priority, application Spain, Feb. 10, 1993, 9300267
Int. Cl.[6] G08B 17/12
U.S. Cl. 340—578 **18 Claims**

1. A system for the monitoring and detection of heat sources in open areas, in particular for the detection and identification of fires in open areas of greater than one square kilometer, comprising a plurality of autonomous transportable vision subsystems and a central station for control and image processing, said vision subsystems including infrared and diurnal remote vision cameras each producing a respective video signal, positioners and complementary means, and which are located in observatories distributed throughout a zone to be monitored, and a communications module, said central station being where processing of images received from the vision subsystems is centralized and where the general operation of the system is monitored and controlled; said central station comprising video processors which digitally process infrared and diurnal images received from the remote vision cameras, said central station displaying said digitally processed images to produce an alarm when a heat source develops; and wherein said central station comprises at least one control processor, plural video processors, and a number of sets of communications equipment equal to the number of vision subsystems, and a control console including a main video monitor which displays a video signal chosen by the operator from one of the vision subsystems or the video recorder, a graphics screen which can display maps and information about the zone being monitored, an alarm panel provided with signalling means for indicating pre-alarm and alarm conditions generated by the video processors, and a control panel which constitutes the man/machine interface for the general control and supervision of the system.

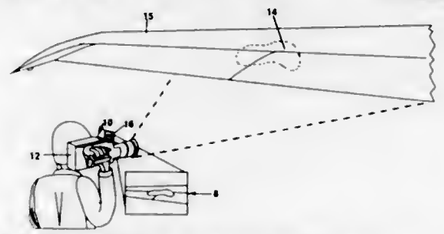


5,557,261

ICE MONITORING AND DETECTION SYSTEM

Blair A. Barbour, Madison, Ala., assignor to Nichols Research Corporation, Huntsville, Ala.

Filed May 6, 1994, Ser. No. 238,886
Int. Cl.[6] G08B 19/02
U.S. Cl. 340—580 **13 Claims**



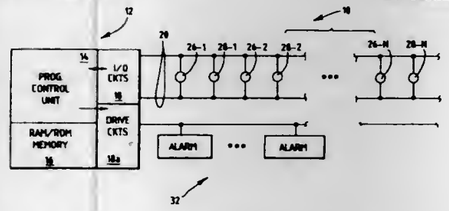
1. A system for detecting the presence and thickness of ice on a surface, said system including video recording means having a framing rate, said video recording means disposed for providing a live image of said surface to a monitor for display thereof, said video recording means including:
a housing having a lens therein for receiving electromagnetic radiation emanating from said surface, said electromagnetic radiation defining an image of said surface;
filter means for filtering the received said radiation, wherein said filter means outputs filtered radiation that is a function of polarization of the received radiation;
means for rotating said filter means at a rate of rotation which is a multiple of said framing rate whereby said filter means outputs radiation that is a function of polarization of the received radiation and said rate of rotation of said filter means;
sensor means for receiving said filtered radiation and converting said filtered radiation into first and second electrical signals which are proportional to a multiple of the framing rate of said video recorder means;
first buffer means for receiving and storing said first electrical signals which are indicative of a frame of signals produced when said polarizer is in a first orientation;
second buffer means for receiving and storing said second electrical signals which are indicative of a succeeding frame of signals produced when said polarizer is in an orientation other than said first orientation;
means for computing the difference between said first and second electrical signals and for providing an output which is a polarization fraction signal representative of ice appearing on said surface;
overlay buffer means for receiving and storing said polarization fraction signal and for providing said polarization fraction signal as an input to said monitor, whereby an overlay image is superimposed over said live image on said monitor to indicate the presence of ice in said image on said monitor.

5,557,262

FIRE ALARM SYSTEM WITH DIFFERENT TYPES OF SENSORS AND DYNAMIC SYSTEM PARAMETERS

Lee D. Tice, Bartlett, Ill., assignor to Pittway Corporation, Chicago, Ill.

Filed Jun. 7, 1995, Ser. No. 479,957
Int. Cl.[6] G08B 17/00;17/06;17/10
U.S. Cl. 340—587 **24 Claims**



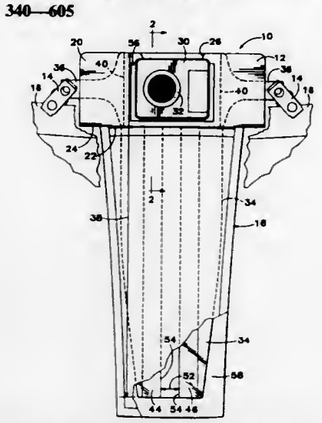
21. A method of minimizing false alarms in a fire detection system having a plurality of ambient condition detectors, the method comprising:
providing a fire detector of a first type;
providing a fire detector of a second type;
providing an alarm output device for generating at least an audible indication of a fire;
locating the detectors in a region to be monitored;
using the detectors to sense first and second fire related ambient conditions in the region;
generating an output from each detector wherein each respective output is indicative of a respective, sensed, ambient condition;
making the outputs available at a selected location;
processing the outputs by combining them in a first fashion so as to produce an alarm delay parameter in response to the sensed ambient conditions;
combining the outputs together in a second fashion to produce a fire condition indicator signal;
comparing the fire condition indicator signal to at least one threshold value to determine the existence of a fire condition; and
energizing the output device in response to the presence of a determined fire condition for a period of time at least as long as the delay parameter.

5,557,263

SYSTEM FOR DETECTION OF ELECTRICALLY CONDUCTIVE FLUIDS

Larry F. Fisher, North Bend, and Oscar E. Johnson, Coos Bay, both of Oreg., assignors to Health Sense International, Inc., Coos Bay, Oreg.

PCT No. PCT/US90/07061, § 371 Date Jul. 20, 1993, § 102(e) Date Jul. 20, 1993, PCT Pub. No. WO94/02918, PCT Pub. Date Feb. 3, 1994
Continuation-in-part of Ser. No. 918,273, Jul. 22, 1992, abandoned. This PCT application Jul. 20, 1993, Ser. No. 104,122
Int. Cl.[6] G08B 21/00
U.S. Cl. 340—605 **39 Claims**



1. A sensing pad for use in detecting the presence of electrically conductive fluids, the sensing pad comprising:
(a) a first layer of a flexible fluid-absorbent sheet material;
(b) a pair of elongate flexible electrodes extending generally parallel with and spaced apart from each other and adhesively attached to said first layer, each of said electrodes having a medial longitudinal margin and a lateral longitudinal margin; and
(c) a second layer of flexible fluid-absorbent sheet material overlying said electrodes and adhered to said first layer along a continuous central strip extending parallel with said electrodes and located between said electrodes, and also adhered to said first layer along a respective strip extending parallel with said electrodes and located alongside said lateral longitudinal margin of each of said electrodes, said first and second layers thereby being interconnected in the form of a pair of separately defined parallel tubes each including one of said electrodes, each of said electrodes having a respective electrically conductive surface exposed within the respective one of said tubes and each said electrode being prevented by said separate parallel tubes from touching said electrically conductive surface of the other flexible electrode of said pair.

5,557,264

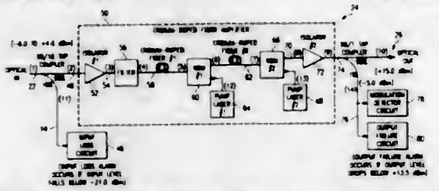
Patent Not Issued For This Number

5,557,265

METHOD AND SYSTEM FOR INDICATING AN OPTICAL TRANSMIT AMPLIFIER FAULT

Michael R. Moothart, Garland, and John M. Dugan, Richardson, both of Tex., assignors to Alcatel Network Systems, Inc., Richardson, Tex.

Filed Dec. 2, 1993, Ser. No. 161,228
Int. Cl.[6] G08B 21/00
U.S. Cl. 340—635 **10 Claims**



1. An optical transmit amplifier fault indicator system for indicating the failure of an optical transmit amplifier, said optical transmit amplifier fault indicator system having an input loss circuit for receiving a portion of an optical input signal to the optical transmit amplifier indicating therefrom that the level of said optical input signal falls below a predetermined optical input signal level for indicating a loss in the optical input signal to the optical transmit amplifier and having an output failure circuit for receiving a portion of an optical output signal from the optical transmit amplifier for determining that the level of said optical output signal falls below a predetermined output signal level for indicating a failure in the optical transmit amplifier output arising from a condition other than a loss in the optical input signal, said optical transmit amplifier fault indicator system comprising:

a modulation detector circuit for receiving a portion of said optical output signal and determining therefrom that a failure in modulation exists in said optical output signal of said optical transmit amplifier modulation;

said modulation detector circuit for converting modulation in said optical output signal into a measurable electrical signal, said measurable electrical signal having a level within a first predetermined range in the presence of modulation in said optical output signal and within a second predetermined range in the absence of modulation within said optical output signal;

said modulation detector circuit further for producing a loss of modulation alarm signal if said measurable electrical signal is within the second predetermined range; and

wherein said modulation detector circuit comprises a photodiode portion and an amplifier portion for generating an amplified AC signal at a predetermined frequency bandwidth in response to modulation in said optical output signal.

5,557,266

SYSTEM FOR CASCADING DATA SWITCHES IN A COMMUNICATION NODE

Jean Calvignac, La Gaude; Pierre Huon, Saint Laurent du Var; Daniel Orsatti, Cagnes-Sur-Mer; Gilles Toubol, Villeneuve Loubet, and Fabrice Verplanken, Cagnes-Sur-Mer, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

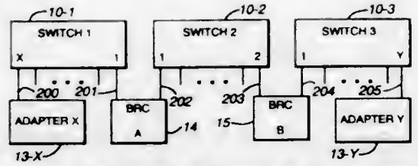
Filed Mar. 7, 1994, Ser. No. 206,363
Claims priority, application European Pat. Off., Apr. 29, 1993, 93480046
Int. Cl.[6] H03K 17/00
U.S. Cl. 340—825.02 **8 Claims**

1. A cascading switching system wherein data bursts of a fixed byte length are transmitted between adapters, comprising:

a first data switch having a first plurality of input/output ports;

a second data switch having a second plurality of input/output ports;

a burst relaying cascader interconnecting one port of said first data switch and one port of said second data switch;



a first plurality of adapters and a second plurality of adapters for exchanging data bursts therebetween;

means connecting each individual one of said first plurality of adapters to an individual port of said first data switch, excluding said one port of said first data switch;

means connecting each individual one of said second plurality of adapters to an individual port of said second data switch, excluding said one port of said second data switch;

a first plurality of data burst buffers within said burst relaying cascader facilitation transmission of data bursts from said first data switch to said second data switch, said first plurality of data burst buffers being equal in number to said second plurality of input/output ports of said second data switch; and

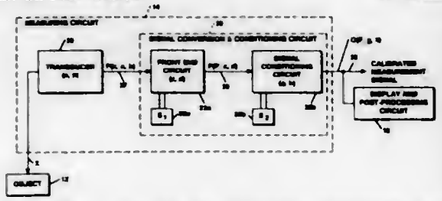
a second plurality of data burst buffers within said burst relaying cascader facilitation transmission of data bursts from said second data switch to said first data switch, said second plurality of data burst buffers being equal in number to said first plurality of input/output ports of said first data switch.

5,557,267

APPARATUS AND METHODS FOR MEASUREMENT SYSTEM CALIBRATION

Noel S. Poduje, Needham Heights; Scott P. Keller, Lincoln, and Roy Mallory, Bedford, all of Mass., assignors to ADE Corporation, Newton, Mass.

Filed Apr. 23, 1993, Ser. No. 52,384
Int. Cl.[6] G08C 15/06;19/22; G01R 35/00
U.S. Cl. 340—870.04 **13 Claims**



1. A measurement system for measuring a characteristic of an object, said system comprising:

a transducer interfacing with said object to provide a transducer output signal, said transducer having at least one transducer parameter associated therewith; and

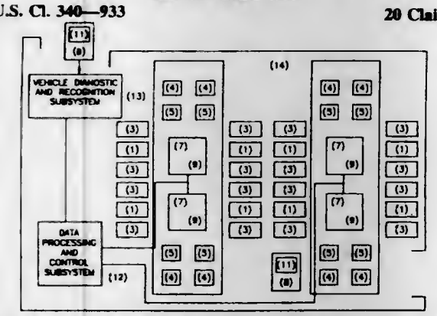
a signal conversion and conditioning circuit, coupled to said transducer, for converting said transducer output signal into an intermediate signal having a voltage amplitude related to said measured object characteristic and providing a calibrated measurement signal indicative of said measured object characteristic, said circuit having at least one parameter associated therewith, wherein said signal conversion and conditioning circuit is adjustable in accordance with adjustments determined by a mathematical combination of at least two parameters selected from the at least one transducer parameter and the at least one signal conversion and conditioning parameter.

5,557,268

AUTOMATIC VEHICLE RECOGNITION AND CUSTOMER AUTOMOBILE DIAGNOSTIC SYSTEM

Gerard J. Hughes, Washington; Leonard J. Duncan, Bridgewater; David P. Gosborn, Flemington, and James P. Stokes, Flemington, all of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 991,814, Dec. 16, 1992, abandoned. This application Feb. 24, 1995, Ser. No. 393,629
Int. Cl.[6] G08G 1/01
U.S. Cl. 340—933 **20 Claims**



1. A service station method for recognizing a vehicle and displaying remotely taken diagnostic information comprising:

(a) recognizing a vehicle that enters said service station;

(b) making a diagnostic measurement of said vehicle;

(c) associating said diagnostic measurement with said recognized vehicle;

(d) re-recognizing said vehicle as it moves to and stops at a service area, which is at a different position from where said diagnostic measurement is made, of said service station;

(e) associating said diagnostic measurement with said re-recognized vehicle; and

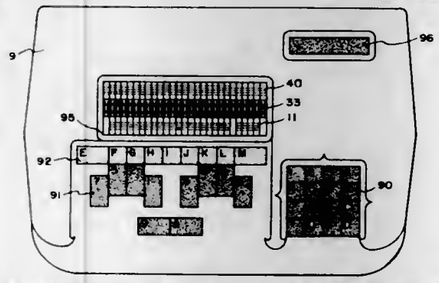
(f) presenting said diagnostic measurement at said service area in view of said vehicle.

5,557,269

INTERACTIVE BRAILLE APPARATUS

Ioan Moutane, 34 rue du Général Brunet, F 75019 Paris, France

Filed Aug. 26, 1994, Ser. No. 296,401
Claims priority, application France, Aug. 27, 1993, 93 10326
Int. Cl.[6] H03K 17/94
U.S. Cl. 341—22 **18 Claims**



14. A device forming an interactive Braille apparatus for the blind, comprising:

a row of tactile modules (**10**) disposed side by side thicknesswise so as together to define a row of modifiable Braille cells (**11**), the emergence of micro-pins into each cell being controlled electrically by a respective one of the tactile modules;

a row of contacts, one for each modifiable Braille cell, disposed opposite said each modifiable Braille cell, wherein the contacts comprise micro-switches (**50**); and

a row of covers (**30**), each of said covers defining a pivoting tab (**32**) controlling a respective one of the micro-switches, each of said covers having a fixed part (**31**) having an area (**40**) for displaying, in Braille, information relating to a respective one of the modifiable Braille cells;

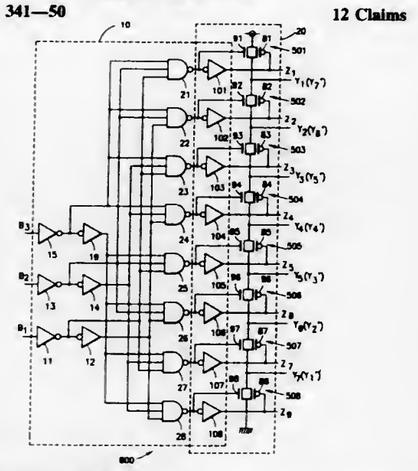
wherein each of said pivoting tabs includes a free end, a bent end being formed at each said free end and defining a stop cooperating with an underside of a respective one of the micro-switches (**50**).

5,557,270

DUAL CONVERSION DECODER

Atushi Miyanishi; Hisashi Matsumoto, and Yoshiki Tsujihashi, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 25, 1994, Ser. No. 295,999
Claims priority, application Japan, Aug. 25, 1993, 5-210379
Int. Cl.[6] H03M 7/14
U.S. Cl. 341—50 **12 Claims**



1. A decoder comprising:

a first decoder circuit responsive to n binary inputs representative of a binary coded decimal value x;

said first decoder having m first outputs Z_1–Z_m supplied through m output drivers where $m= 2^n$, $n \geqq 3$, and Z_1 is the least significant output;

said first decoder circuit including means for setting to a first state an output Z_{x+1}, of said first outputs Z_1–Z_m, and setting remaining ones of said first outputs Z_1–Z_m to a second state;

said first decoder circuit including m at least three-input logic gates driving said m output drivers;

a second decoder circuit having m−1 second outputs Y_1–Y_{m-1} wherein Y_1 is the least significant;

said second decoder circuit having means for setting to said first state x number of said second outputs Y_1–Y_{m-1} in order of significance from the least significant second output Y_1 to a more significant second output Y_x in response to said first outputs Z_1–Z_m, and setting remaining ones of said second outputs Y_{x+1}–Y_{m-1} to said second state; and

said means for setting including m transmission gates having an input gate driven by a respective one of said m output drivers of said first decoder circuit.

5,557,271

a data sink connected to said serial-to-parallel converter for

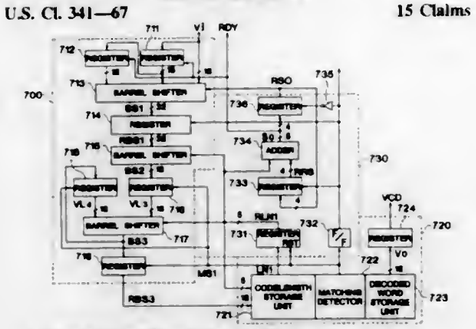
conversion means for electronically converting the three-wire

5,557,275

5,557,271
VARIABLE LENGTH CODER AND VARIABLE LENGTH DECODER

Chai Y. Rim, and Seong W. Hong, both of Seoul, Rep. of Korea, assignors to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Sep. 20, 1994, Ser. No. 309,192
Claims priority, application Rep. of Korea, Sep. 23, 1993, 19512/1993; Sep. 23, 1993, 19513/1993
Int. Cl.[6] H03M 7/40
U.S. Cl. 341—67 **15 Claims**



1. A variable length coder comprising:

a plurality of shifting means, each of said plurality of shifting means inputting a corresponding one of a plurality of codewords and a plurality of codelengths, rotating the corresponding codeword by a desired length for interconnection of the codewords and outputting masking bits designating a position of the corresponding codeword to be rotated;

first ORing means for ORing output codewords from said plurality of shifting means;

second ORing means for ORing output masking bits from said plurality of shifting means;

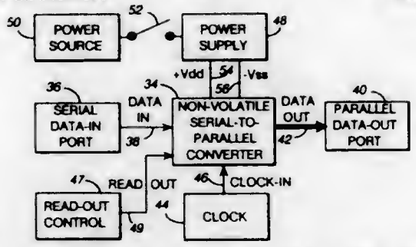
word/mask register means for latching output codeword bits from said first ORing means when corresponding output masking bits from said second ORing means are enabled to "1"; and

memory means for storing an output of said word/mask register means and outputting variable length-coded data.

5,557,272
NON-VOLATILE SERIAL-TO-PARALLEL CONVERTER SYSTEM UTILIZING THIN-FILM, FLOATING-GATE, AMORPHOUS TRANSISTORS

Salvatore R. Riggio, Jr., Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1994, Ser. No. 261,352
Int. Cl.[6] H03M 9/00
U.S. Cl. 341—100 **9 Claims**



1. An electrically operated serial-to-parallel converter system adapted to receive power from a power source, said serial-to-parallel converter system comprising:

a data source for supplying serial data bit signals;

a serial-to-parallel converter connected to said data source for receiving data therefrom;

a data sink connected to said serial-to-parallel converter for receiving parallel data therefrom;

a selectively operated power supply adapted to be connected to the power source, for supplying power to said serial-to-parallel converter when said power supply is turned on;

said serial-to-parallel converter having a plurality of serial-to-parallel converter cells, each of said serial-to-parallel converter cells comprising first and second stages, each stage comprising

a thin-film amorphous floating-gate transistor (FGT) including a control gate, a drain, a source, a channel extending between said drain and said source, an insulator between said control gate and said channel, and a floating gate embedded in said insulator, said channel being conductive when a voltage signal of a first polarity is applied between said control gate and said source and non-conductive when a voltage signal of a polarity opposite to said first polarity is applied between said control gate and said source,

a data-in line,

a data-out line, and

an analog switch (AS) comprising a thin-film amorphous transistor having a gate for turning said analog switch on and off in response to switching signals applied thereto, and a drain and a source connected between said data-in line and said control gate of said FGT for coupling a data bit signal on said data-in line to said control gate when said AS is turned on to thereby capacitively charge said floating gate to represent such data bit;

each serial-to-parallel converter cell having the data-out line of its first stage coupled to the data-in line of its second stage;

said serial-to-parallel converter cells are connected in series with each data-out line from the second stage of a previous cell being connected to the data-in line of the first stage of the next cell whereby said first timing pulse shifts data bits between the serial-to-parallel converter cells

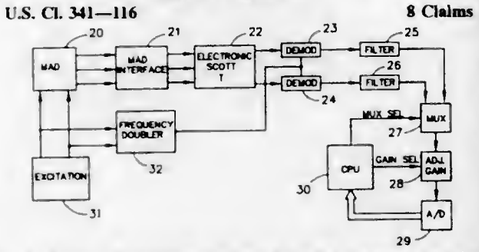
a switching pulse generator connected to said AS of each serial-to-parallel converter cell, for supplying a first switching pulse to said ASs of all of said first stages to write data bits into said first stages and a second switching pulse to said ASs of all of said second stages to transfer the data bits in each of said first stages into each of said second stages; and

said FGTs of said serial-to-parallel converter cells being operative to non-volatilely store data bits when said power supply ceases to supply power to said serial-to-parallel converter.

5,557,273
MAGNETIC AZIMUTH DETECTOR TO DIGITAL (MADD) CONVERTER

Steven J. Catanach, Rio Rancho, N.M., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 25, 1993, Ser. No. 23,026
Int. Cl.[6] H03M 1/48
U.S. Cl. 341—116 **8 Claims**



1. A magnetic azimuth detector to digital converter circuit, comprising:

receive means for receiving a three-wire signal from a magnetic azimuth detector, wherein the three-wire signal is proportional to an angle q which indicates a position of the magnetic azimuth detector relative to magnetic north;

conversion means for electronically converting the three-wire signal into a first analog signal proportional to sin q and a second analog signal proportional to cos q comprising:

a first adder having a non-inverting input coupled to receive a first component of the three-wire signal, an inverting input coupled to receive a second component of the three-wire signal, and means for outputting the first analog signal: and

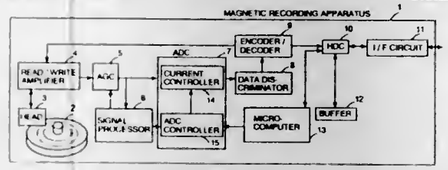
a second adder having a non-inverting input coupled to receive a third component of the three-wire signal, an inverting input coupled to receive the second component of the three-wire signal, and means for outputting the second analog signal; and

digitization means for electronically converting the first analog signal and the second analog signal into corresponding first and second digital signals.

5,557,274
AD CONVERTER AND MAGNETIC RECORDING/REGENERATING APPARATUS USING THE SAME

Tsuguyoshi Hirooka, Fujisawa; Shoichi Miyazawa; Ryutaro Horita, both of Yokohama; Terumi Takashi, Odawara, and Akira Uragami, Sawa-gun, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 3, 1994, Ser. No. 253,551
Claims priority, application Japan, Jun. 7, 1993, 5-136048
Int. Cl.[6] H03M 1/36;1/14
U.S. Cl. 341—155 **7 Claims**



5. A reproducing apparatus for reproducing a signal at different frequencies depending on a reproducing position on a recording medium and for converting an analog signal read from said recording medium to a digital signal, said apparatus comprising:

m (m≧2) AD converters;

a comparison means in each of said AD converters, for comparing an inputted analog signal with a reference voltage, wherein an operating speed of said comparison means is controlled by art operating current supplied thereto;

art instruction means for outputting an instruction for instructing one of a plurality of speeds for converting an analog signal to a digital signal;

a distribution means for distributing said analog signal to n AD converters (n≦m) among said m AD converters in time series according to said instruction;

an output means for receiving digital signals outputted from said n AD converters and outputting said digital signals in time series;

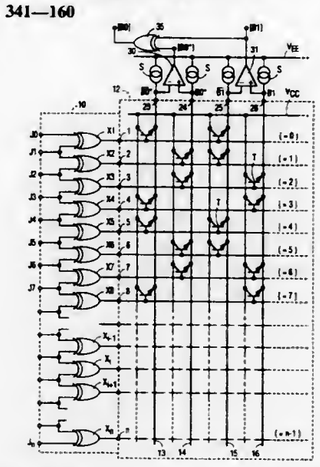
an AD converter control means for suppressing said operating current of (m-n) AD converters excluded from said n AD converters upon receipt of said instruction; and

a signal generation means for generating a digital signal from a comparison result from said comparison means.

5,557,275
ERROR-TOLERANT BINARY ENCODER

Christinus J. van Valburg, Veldhoven, and Rudy J. van de Plassche, Waalre, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 30, 1994, Ser. No. 269,812
Claims priority, application France, Jun. 30, 1993, 93 08005
Int. Cl.[6] H03M 1/36
U.S. Cl. 341—160 **5 Claims**



1. Encoder for the conversion of a digital input signal defined as a code of thermometric or cyclic type, each bit of which is applied to an input of the encoder, so as to obtain a binary-encoded output signal, wherein the encoder comprises: a set of n successive Exclusive OR gates, each with two inputs and one output, each Exclusive OR gate having an input connected to an input of the gate of neighbouring rank as well as to a respective input of the encoder, and includes an encoding matrix with n rows at input and a plurality of pairs of columns at output, each of the n successive rows being connected to an output of a respective one of the successive Exclusive OR gates, each of the columns being coupled to a reference voltage terminal via a respective current source and the columns of one pair delivering a differential output for one bit of the binary output signal, in which encoding matrix active coupling between a specified row and a specified column is effected, when required, by a transistor, the base of which is connected to the said specified row, the emitter of which is connected to the said specified column and the collector of which is connected to a supply voltage terminal, wherein the encoding matrix includes a pair of columns respectively called pseudo-column of order zero and complementary pseudo-column of order zero, the row/column coupling of which is derived respectively through cyclic shifting from the row/column coupling of the pair of columns of order one, namely: for a row of rank i of the pseudo-column of order zero, there is applied a coupling identical to that of the row of rank (i modulo n)+1 of the column of order one, similarly for the row of rank i of the complementary pseudocolumn of order zero, there is applied a coupling identical to that of the row of rank (i modulo n)+1 of the complementary column of order one, and wherein the encoder includes an additional Exclusive OR gate with two inputs, one of which receives a logic signal corresponding to the output from the pair of pseudo-columns of order zero and the other of which receives a logic signal corresponding to the output of the pair of columns of order one, said additional Exclusive OR gate delivering at output the bit of order zero of the binary output signal.

5,557,276

QUANTIZER DESIGNED BY USING HUMAN VISUAL SENSITIVITY

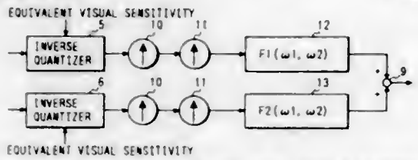
Shigeyuki Sakazawa; Takahiro Hamada, and Shuichi Matsumoto, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Jul. 27, 1994, Ser. No. 281,294

Claims priority, application Japan, Aug. 13, 1993, 220486; Dec. 28, 1993, 350733

Int. Cl.[6] H03M *1/00*

U.S. Cl. 341—200 **5 Claims**



1. In a quantizer used for a picture signal coder in a system, in which postprocessing is carried out in a decoding process,

a quantizer designed by using human visual sensitivity, in which a human visual frequency sensitivity W1(ω) (ω being the angular frequency) equivalent in function to the human visual frequency sensitivity W(ω) with respect to picture after decoding is obtained on the basis of the postprocessing in the decoding process, the obtained human visual frequency sensitivity W1(ω) being used as the visual sensitivity prior to the decoding for quantization.

5,557,277

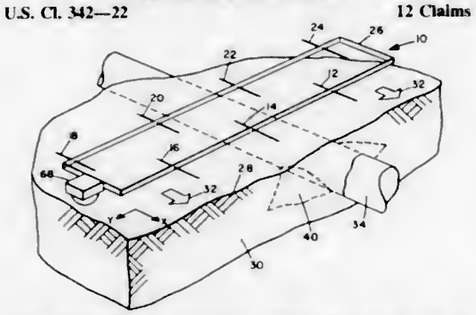
METHOD FOR LOCATING LEAKAGE OF SUBSTANCES FROM SUBTERRANEAN STRUCTURES

Gus P. Tricoles, San Diego, Calif.; Wayne K. Davis, Colorado Springs, Colo., and James T. Nilles, Escondido, Calif., assignors to GDE Systems, Inc., San Diego, Calif.

Filed Sep. 6, 1994, Ser. No. 301,057

Int. Cl.[6] G01S *13/88; 13/89*

U.S. Cl. 342—22 **12 Claims**



11. A method for determining a leakage rate, comprising the steps of:

forming successive calculated images at successive times during a predetermined period in response to continuous-wave signals directed toward the ground, each said calculated image representative of a pattern of leakage of a fluid from a structure buried in the ground, said forming step comprising the steps of:

translating an antenna array over an area of said ground having said structure buried therein;

transmitting and receiving a signal having a discrete frequency selected from a predetermined range of frequencies at each of a plurality of points in said area;

storing complex reflectance values having phase and intensity components in a computer memory, each said reflectance value representative of said signal received at one of said points;

Fourier transforming said stored complex reflectance values to form a received spectrum;

propagating said received spectrum to a predetermined depth; and

inverse Fourier transforming the propagated spectrum to form a calculated image representative of said pattern of leakage of said fluid; and

simultaneously displaying all said calculated images and a predetermined image representative of a pattern of said fluid in said structure, thereby illustrating the progression of leakage during said predetermined period.

5,557,278

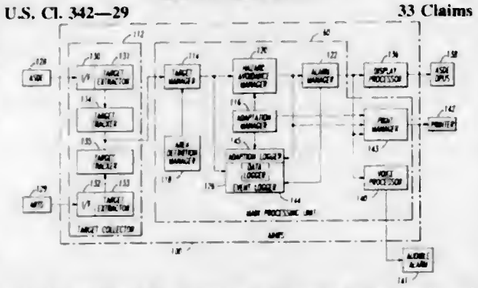
AIRPORT INTEGRATED HAZARD RESPONSE APPARATUS

Bart J. Piccirillo, Mt. Caramel; Marshall Watnick, Trumbull, and Raymond M. Kruczek, Guilford, all of Conn., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Jun. 23, 1995, Ser. No. 494,119

Int. Cl.[6] G01S *13/87*

U.S. Cl. 342—29 **33 Claims**



1. An apparatus for monitoring the position of a plurality of objects in a predefined space comprising:

(a) a target supervisor for characterizing and tracking selected ones of said plurality of objects, said target supervisor receiving target data from at least one sensor, said target supervisor providing a target output having a first plurality of predetermined features respective of said selected ones;

(b) a location supervisor for characterizing and displaying a second plurality of predetermined features respective of said predefined space, said location supervisor providing a location output having said second plurality of predetermined features therein; and

(c) a hazard monitoring supervisor for detecting and responding to at least one predetermined hazard condition and providing a detectable notice thereof, said hazard monitoring supervisor being responsive to said target output and said location output.

5,557,279

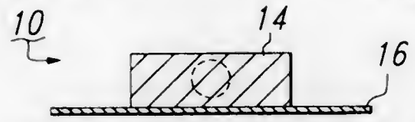
UNITARILY-TUNED TRANSPONDER/SHIELD ASSEMBLY

Loek D'Hont, Almelo, Netherlands, assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 127,910, Sep. 28, 1993, abandoned. This application Jan. 11, 1996, Ser. No. 584,724

Int. Cl.[6] G01S *13/74*

U.S. Cl. 342—42 **9 Claims**



1. A transponder assembly for use with a recognition and identification system suitable for mounting on metal comprising:

a shield member formed of a non-ferrous material for mounting on a metal object;

an insulative support member mounted to said shield member; and

a transponder having an antenna connected to a tank circuit, said transponder mounted on said support member and electrically isolated from said shield member, said shield member interacting with said tank circuit and said antenna such that the combination of said tank circuit, said antenna and said shield is tuned as a single unit to an operating frequency.

5,557,280

SYNCHRONIZED ELECTRONIC IDENTIFICATION SYSTEM

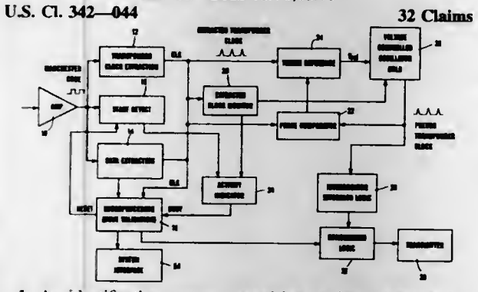
Michael J. C. Marsh, Johannesburg, and Clinton A. Van Zyl, Pretoria, both of South Africa, assignors to British Technology Group Limited, London, United Kingdom

Filed Aug. 25, 1993, Ser. No. 111,430

Claims priority, application South Africa, Aug. 26, 1992, 92/6446

Int. Cl.[6] G01S *13/76; 13/79*

U.S. Cl. 342—044 **32 Claims**



1. An identification system comprising an interrogator and a plurality of transponders, the interrogator including transmitter means for transmitting an interrogation signal to the transponder, receiver means for receiving a response signal from the transponder, and processor means for identifying the transponder from data in the response signal; each transponder comprising receiver means for receiving the interrogation signal, a transponder clock generator, a code generator, transmitter means, and a modulator connected to the code generator, connected so that on receipt of the interrogation signal the transponder transmits a response signal containing data which identifies the transponder, the interrogator including means for detecting successful reception of a response signal from a transponder and for modifying the interrogation signal synchronously with the response signal to indicate successful reception of the response signal, and each transponder including means responsive to a respective modification of the interrogation signal to cease transmission of its response signal.

5,557,281

DEVICE FOR MEASURING THE VELOCITY OF VEHICLES FOR TRAFFIC MONITORING

Joe S. O'Conner, Tulpenstrasse 5, 88630 Aach-Linz, Germany

Filed Jan. 12, 1995, Ser. No. 372,001

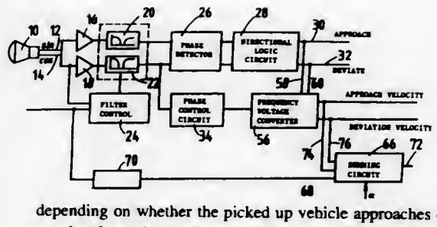
Claims priority, application Germany, Jan. 12, 1994, 44 00 624.1

Int. Cl.[6] G01S *13/91*

U.S. Cl. 342—114 **6 Claims**

1. Device for measuring the velocity of vehicles for traffic monitoring comprising a doppler signal transmitter and receiver characterized in that

(a) the doppler signal transmitter and receiver (**10**) comprises two mixer diodes arranged in such a way that they deliver two doppler signals which are dephased against each other by 90°, the one or the other signal leading the other, depending on whether the picked up vehicle approaches or recedes from the doppler signal transmitter and receiver (**10**),



(b) a signal from the doppler signal transmitter and receiver (**10**) is fed into a frequency measuring device (**34, 56**) for measuring the signal frequency as a quantitative measure for the relative velocity between vehicle and doppler signal transmitter and receiver (**10**).

5,557,282

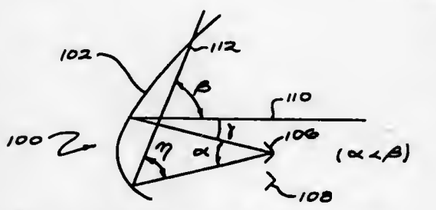
HEIGHT FINDING ANTENNA APPARATUS AND METHOD OF OPERATION

Donald E. Mertens, Thousand Oaks, Calif., assignor to ITT Corporation, New York, N.Y.

Filed Oct. 11, 1988, Ser. No. 255,917

Int. Cl.[6] G01S *13/08*

U.S. Cl. 342—123 **17 Claims**



1. A dual beam radar system comprising, in combination:

means for generating a plurality of signals;

means for feeding said plurality of signals, said feeding means in electronic communication with said signal generating means for providing an antenna pattern dependent upon an elevation angle of a tracked target;

means for reflecting a plurality of radiated energy received from said feeding means, said reflecting means being asymmetrical in shape for focusing and directing said energy to said target and for receiving a plurality of returned signals from said target, said reflecting means providing a cosecant-squared antenna pattern; and

means for measuring an electrical phase angle difference between said plurality of returned signals, said phase angle difference for determining said elevation angle of said target, said asymmeterical reflecting means and said feeding means for providing a greater range of elevation angle coverage of said target by reflecting said radiated energy at larger angles and by restricting said plurality of return signals directed to said feeding mean to smaller angles wherein a large angular region of said return signals is translated into a small angular region of said return signals for eliminating ambiguities in said elevation angle and for providing an increased return signal gain and a unique value of elevation angle for discrete value of said phase angle difference wherein said unique value of said elevation angle permits determining the height of said target.

5,557,283

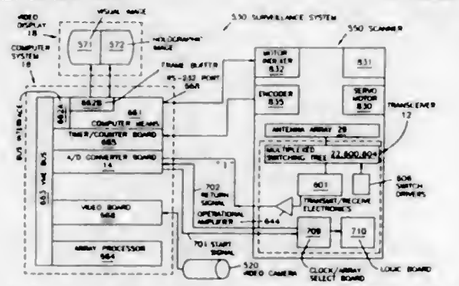
REAL-TIME WIDEBAND HOLOGRAPHIC SURVEILLANCE SYSTEM

David M. Sheen, 1917 Hood, Richland, Wash. 99352; H. Dale Collins, 1751 Duluth, Richland, Wash. 99352; Thomas E. Hall, 8301 W. Entiat Pl., Kennewick, Wash. 99336; Douglas L. McMakin, 2173 Shasta Ave., Richland, Wash. 99352; R. Parks Gribble, 1215 Cottonwood Dr.; Ronald H. Severtsen, 1803 Birch Ave., both of Richland, Wash. 99352; James M. Prince, 3029 W. 2nd Ave., Apt. F95, Kennewick, Wash. 99336, and Larry D. Reid, Rt. 1, Box 1291B, Benton City, Wash. 99320

Continuation-in-part of Ser. No. 212,432, Mar. 14, 1994, Pat. No. 5,455,590, which is a continuation-in-part of Ser. No. 963,204, Nov. 23, 1992, abandoned, which is a continuation-in-part of Ser. No. 752,750, Aug. 30, 1991, abandoned. This application May 12, 1995, Ser. No. 440,279

Int. Cl.[6] **G01S** *13/89*; **G03H** *5/00*

U.S. Cl. 342—179 **24 Claims**



1. A holographic apparatus for near real-time imaging of a target, said apparatus utilizing millimeter wave radiation having a plurality of frequencies from about 1 to about 110 GHz, comprising:

(a) a holographic array having a plurality of antenna units spaced apart from about 0.25 to about 3 wavelength, wherein each unit sends and/or receives millimeter wave radiation, said array spaced apart from said target;

(b) a holographic wideband transceiver for operating said antenna units and providing each unit with millimeter wave radiation source, then receiving high frequency millimeter wave radiation reflection from said target and collected by the unit, then making an output;

(c) an analog to digital converter for converting said output to a corresponding digital signal; and

(d) a computer for applying a three-dimensional reconstruction algorithm to the corresponding digital signal that preserves an unlimited depth of field.

5,557,284

SPOOFING DETECTION SYSTEM FOR A SATELLITE POSITIONING SYSTEM

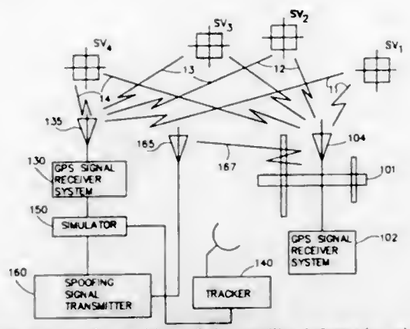
Randolph G. Hartman, Plymouth, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 3, 1995, Ser. No. 383,158

Int. Cl.[6] **G01S** *5/02*

U.S. Cl. 342—357 **10 Claims**

3. A method for detecting a satellite positioning system signal receiver system receiving satellite information signals transmitted from a spoofing signal transmitter and which contain erroneous satellite-specific information therewith, as compared to those satellite information signals transmitted from a transmitter aboard satellite vehicles which form, in part, a satellite based global positioning system, where each of said satellite information signals consists of a carrier signal having coded satellite-specific information, therewith, from which (a) the estimated position of said satellite vehicles may be determined at selected moments in time, (b) the range between a satellite information signal receiver system antenna and selected ones of said satellite vehicles may be estimated, and (c) the position of the satellite information signal receiver system antenna may be estimated, said method comprising the steps of:



separately receiving said satellite information signals through first and second antennae, separated by a known separation distance, and producing first and second electrical signals, respectively, in response to said received satellite information signals;

deriving first transmitter-specific information from said first electrical signal for each received satellite information signal;

deriving second transmitter-specific information from said second electrical for each received satellite information signal;

deriving transmitter-specific discriminant values, where each of said transmitter-specific discriminant values is derived from said first and second transmitter-specific information associated with a single satellite information signal transmitted from a single transmitter, and where each of said transmitter-specific discriminant values is related to a transmitter-specific pointing angle, where said pointing angle is the angle between (i) a vector from said first to said second antenna, and (ii) a vector from said first antenna to one of said transmitters; and

selectively comparing said transmitter-specific discriminant values with a selected norm of operation consistent with satellite information signals transmitted from said satellite vehicles which form, in-part, said satellite positioning system.

5,557,285

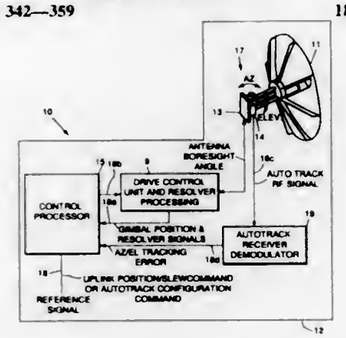
GIMBAL CONTROL SYSTEM

Douglas J. Bender, Redondo Beach; Stuart F. Bockman, Torrance; Bruce N. Eyerly, Torrance, and John J. Anagnost, Torrance, all of Calif., assignors to Hughes Electronics, Los Angeles, Calif.

Filed Jan. 24, 1994, Ser. No. 185,346

Int. Cl.[6] **H01Q** *3/00*

U.S. Cl. 342—359 **18 Claims**



1. Apparatus comprising:

a spacecraft;

a gimbal disposed on the spacecraft;

an antenna disposed on the gimbal;

processing means coupled to the antenna for processing autotrack RF signals received by the antenna and for providing azimuth and elevation tracking error signals in response thereto that are indicative of the absolute line-of-sight of the antenna;

a control processor coupled to the processing means for processing position command signals and the azimuth and elevation tracking error signals, and for generating gimbal control signals for steering the antenna; and

a drive control and angle position measurement processing unit coupled between the control processor and the gimbal for receiving the gimbal control signals from the control processor and for generating antenna boresight angle signals that are applied to the gimbal to steer the antenna, which processing unit comprises a gimbal control system that includes an inner feedback loop that comprises angular position means for providing signals indicative of the relative angular position of the antenna and wherein the inner feedback loop is a control loop that uses the relative gimbal angle measurement to control pointing direction of the antenna along a precommanded profile.

5,557,286

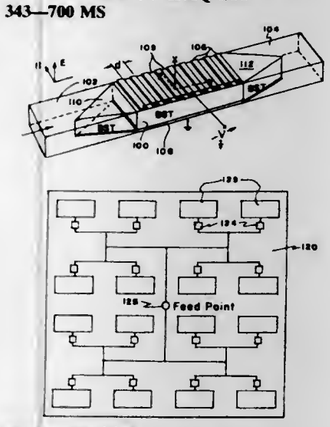
VOLTAGE TUNABLE DIELECTRIC CERAMICS WHICH EXHIBIT LOW DIELECTRIC CONSTANTS AND APPLICATIONS THEREOF TO ANTENNA STRUCTURE

Vijay K. Varadan, State College, Pa.; Fathi Selmi, Tunisia, Tunisia, and Vasundara V. Varadan, State College, Pa., assignors to The Penn State Research Foundation, University Park, Pa.

Filed Jun. 15, 1994, Ser. No. 260,053

Int. Cl.[6] **H01Q** *1/38*

U.S. Cl. 343—700 MS **3 Claims**



1. An antenna comprising:

means for feeding an electromagnetic signal:

a radiating surface;

a dielectric phase shift structure positioned between said means for feeding and said radiating surface, said dielectric phase shift structure comprising a porous ceramic matrix including barium strontium titanate, said barium and strontium present in a percentage to assure a Curie temperature for said porous ceramic matrix below an operating temperature of said antenna, said porous ceramic matrix comprising not more than 50% of a volume of said dielectric phase shift structure; and

bias means positioned in contact with said structure for enabling an alteration of a dielectric constant of said structure by application of a voltage level.

5,557,287

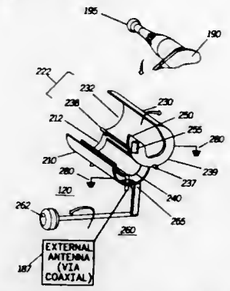
SELF-LATCHING ANTENNA FIELD COUPLER

James V. Pottala, Ft. Lauderdale, and Robert B. Ford, Tamarac, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 6, 1995, Ser. No. 399,271

Int. Cl.[6] **H01Q** *1/24*; *1/50*

U.S. Cl. 343—702 **19 Claims**



1. A self-latching antenna field coupler, comprising:

first and second mechanically coupled housing members, the first housing member being movable, relative to the second housing member, between a first position to define an antenna receiving channel, and a second position to form an antenna chamber defined by the first and second housing members; and

a latch actuator positioned within the antenna receiving channel when the first housing member is in the first position, latch actuator automatically effecting movement of the first housing member from the first position to the second position when an antenna is received in the antenna receiving channel.

5,557,288

ANTENNA HOUSING WITH EXTENDABLE DRAWER FOR A PORTABLE COMPUTER

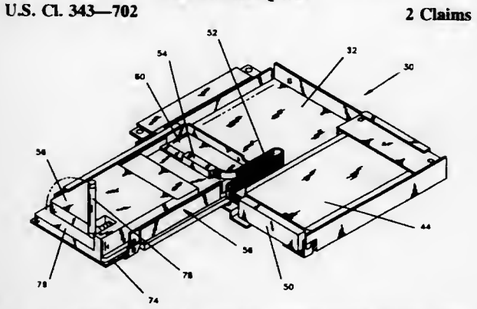
Naotaka Kato, Ayase, and Katsutoshi Katoh, Tokyo, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 7, 1995, Ser. No. 524,977

Claims priority, application Japan, Sep. 7, 1994, 6-213508

Int. Cl.[6] **H01Q** *1/24*

U.S. Cl. 343—702 **2 Claims**



1. A computer having a wireless communication system, said computer comprising in combination:

a computer housing having an opening;

a drawer slidably attached to said computer housing, said drawer having an extended position projecting outwardly from said computer housing, and having a retracted position within said housing, said drawer passing through said opening in said housing when said drawer is moved from said retracted to said extended position; and

an antenna attached to said drawer, said antenna being positioned exterior to said computer housing when said drawer is

in said extended position, and said antenna being positioned

a pair of central electrodes disposed on each side of said dielec-

phase shifters and said middle microwave frequency band phase shifters with said tapered-element radiators;

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MULTI-LOOP ANTENNA

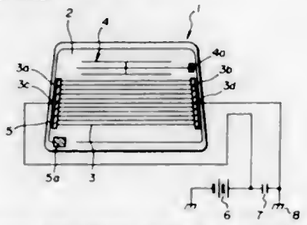
in said extended position, and said antenna being positioned within said computer housing when said drawer is in said retracted position, said antenna being positionable in an operating position when said drawer is in said extended position.

5,557,289

WINDOW GLASS ANTENNA DEVICE FOR AUTOMOBILES

Shobei Ohara, Ibaraki, Japan, assignor to Nippon Sheet Glass Co., Ltd., Japan

Continuation of Ser. No. 160,036, Nov. 30, 1993, abandoned. This application Oct. 17, 1995, Ser. No. 544,147
Claims priority, application Japan, Nov. 30, 1992, 4-343263
Int. Cl.[6] H01Q *1/32*
U.S. Cl. 343—713 **8 Claims**



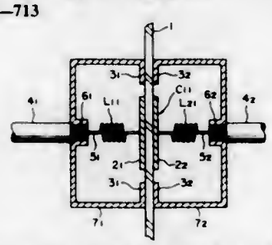
1. A window glass antenna device on an automobile window glass panel of an automobile, comprising:
a defrosting heater disposed on the automobile window glass panel;
a radio signal receiving antenna disposed on the automobile window glass panel; and
a remote control signal receiving antenna disposed on the automobile window glass panel around said defrosting heater and said radio signal receiving antenna, said remote control signal receiving antenna extending from a feeder terminal on the window glass panel along a first outer peripheral edge of the window glass panel and bending to extend along a second outer peripheral edge of the window glass panel and bending to extend along a third outer peripheral edge of the window glass panel and bending to extend along a fourth outer peripheral edge of the window glass panel to a position short of the feeder terminal.

5,557,290

COUPLING APPARATUS BETWEEN COAXIAL CABLES AND ANTENNA SYSTEM USING THE COUPLING APPARATUS

Hironobu Watanabe, Yono, Japan, assignor to Daiichi Denpa Kogyo Kabushiki Kaisha, Tokyo-To, Japan

Continuation of Ser. No. 160,277, Dec. 2, 1993, abandoned. This application Nov. 13, 1995, Ser. No. 557,676
Claims priority, application Japan, Dec. 16, 1992, 4-335802
Int. Cl.[6] H01Q *1/32*
U.S. Cl. 343—713 **16 Claims**



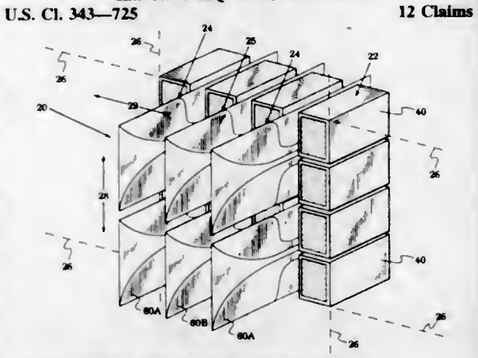
1. An apparatus for coupling a plurality of coaxial cables to each other through a dielectric plate, said apparatus comprising:
a pair of central electrodes disposed on each side of said dielectric plate and disposed opposite each other, each central electrode having a plate shape and a predetermined area, and each of said central electrodes being connected to a respective central conductor of said coaxial cables;
a pair of outer electrodes disposed on each side of said dielectric plate and disposed opposite each other, each of said outer electrodes surrounding a corresponding one of said central electrodes and being connected to a respective outer conductor of each of said coaxial cables; and
a matching circuit provided between said central electrode and said central conductor of the coaxial cable;
wherein the predetermined areas of said central electrodes are sufficient to permit capacitive coupling between said central electrodes.

5,557,291

MULTIBAND, PHASED-ARRAY ANTENNA WITH INTERLEAVED TAPERED-ELEMENT AND WAVEGUIDE RADIATORS

Ruey-Shi Chu, Cerritos; Kuan M. Lee, Brea, and Allen T. S. Wang, Buena Park, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 25, 1995, Ser. No. 451,084
Int. Cl.[6] H01Q *21/00;13/10;13/00*
U.S. Cl. 343—725 **12 Claims**



1. A multiband, phased array antenna, comprising:
a first subarray of tapered-element radiators, each of said tapered-element radiators having a pair of tapered wings which are dimensioned to radiate energy in a lower microwave frequency band and in a middle microwave frequency band;
a second subarray of waveguide radiators, each of said waveguide radiators having a launch end and dimensioned to radiate energy from said launch end in an upper microwave frequency band;
said first subarray and said second subarray arranged in an interleaved relationship with the tapered wings of said tapered-element radiators extending past the launch ends of said waveguide radiators by a distance which establishes a predetermined tapered wing radiation impedance;
a first microwave feed network configured to receive microwave signals in said lower microwave frequency band and in said middle microwave frequency band and to distribute them to said tapered-element radiators;
a plurality of lower microwave frequency band phase shifters positioned in said first microwave feed network to selectively phase shift said microwave signals in said lower microwave frequency band;
a plurality of middle microwave frequency band phase shifters positioned in said first microwave feed network to selectively phase shift said microwave signals in said middle microwave frequency band;
a plurality of diplexers positioned in said first microwave feed network to couple said lower microwave frequency band

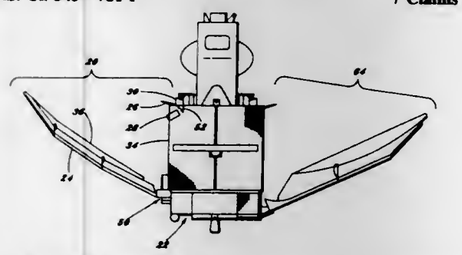
phase shifters and said middle microwave frequency band phase shifters with said tapered-element radiators;
a second microwave feed network configured to receive microwave signals in said upper microwave frequency band and to distribute them to said waveguide radiators; and
a plurality of upper microwave frequency band phase shifters positioned in said second microwave feed network to selectively phase shift said microwave signals in said upper microwave frequency band.

5,557,292

MULTIPLE BAND FOLDING ANTENNA

Evert C. Nygren, Los Altos; Peter W. Lord, Mountainview; Vito J. Jakstys, Penn Valley; Sina Barkeshli, Saratoga, and Levent Ersoy, Cupertino, all of Calif., assignors to Space Systems/Loral, Inc., Palo Alto, Calif.

Filed Jun. 22, 1994, Ser. No. 263,558
Int. Cl.[6] H01Q *19/14*
U.S. Cl. 343—781 P **7 Claims**



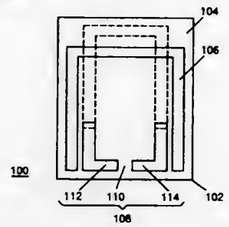
1. An antenna comprising:
a main reflector, a subreflector positioned in front of said main reflector, a first feed operative at a relatively low frequency band of the electromagnetic spectrum and a second feed operative at a relatively high frequency band of the electromagnetic spectrum, said subreflector having a frequency selective surface (FSS) for reflecting radiation at the low band along a folded path between said main reflector and said first feed while permitting radiation at the high band to propagate through the FSS along a straight path between said main reflector and said second feed;
wherein said second feed comprises an array of radiators of sufficient bandwidth to accommodate a first signal channel and a second signal channel operative at a frequency different from a frequency of said first signal channel;
said antenna further comprises a first beamformer connected to said radiators of said second feed for forming a first beam within said low band, and a second beamformer connected to said radiators of said second feed for forming a second beam within said low band; and
said first feed is located behind and to a side of said subreflector, and said second feed is located forward and to said side of said subreflector to provide a configuration to the antenna which is suitable for mounting on a communications satellite, said subreflector having a supporting frame with a hinge to permit a pivoting of said subreflector relative to a housing of the satellite to a stowed position alongside said second feed, and said main reflector having a supporting frame with a hinge to permit a pivoting of said main reflector relative to the housing of the satellite to a stowed position alongside said first feed and said subreflector.

5,557,293

MULTI-LOOP ANTENNA

Danny O. McCoy, Sunrise; Oscar Garay, and Stanton B. McMillan, both of Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 26, 1995, Ser. No. 378,691
Int. Cl.[6] H01Q *1/24;21/00*
U.S. Cl. 343—867 **13 Claims**



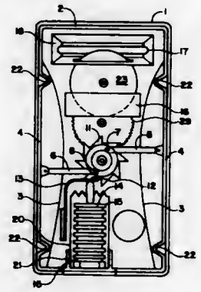
1. A dual loop antenna, comprising:
a substrate having first and second surfaces;
a feed section located on the first surface of the substrate;
a first radiator element located on the first surface of the substrate, said first radiator element capacitively coupled to the feed section, said first radiator element and said feed section providing a first loop antenna; and
a second radiator element located on the second surface of the substrate, said second radiator element parallel plate coupled to the feed section, said second radiator element and said feed section forming a second loop antenna.

5,557,294

EMERGENCY SIGNAL DEVICE

William M. Leslie, 5623 Stresemann St., San Diego, Calif. 92122

Filed Dec. 19, 1991, Ser. No. 810,106
Int. Cl.[6] G09G *3/00*
U.S. Cl. 345—32 **3 Claims**



1. An emergency signal device comprising in combination,
a) a xenon or other gas filled flash tube for emitting bright flashes of light,

signals by converting them to digital data suitable for presentation ... computing a plurality of ray activity measures and a plurality of

b) a reflector and a lens for projecting said bright flashes of light in narrow intense beams such that the distance of visibility is multiplied so as to provide an indication over long distances,

c) a compressible water proof case for housing said device,

d) a segmented multicolor disk between said flash tube and said lens for changing the color of emitted light,

wherein squeezing of said case results in rotation of said segmented multicolor disk and supplies power to said flash tube such that bright flashes of different colors of light are emitted over long distances.

5,557,295

DISPLAY PANEL

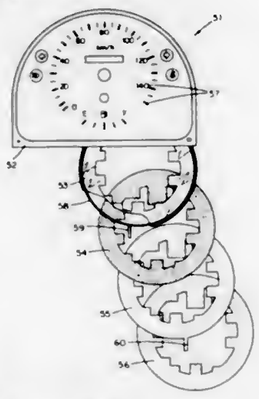
Sadamasa Miyashita, and Laiying Zhang, both of Nagaoka, Japan, assignors to Nippon Seiki K.K., Niigata-ken, Japan

Filed Nov. 6, 1992, Ser. No. 972,681

Claims priority, application Japan, Nov. 28, 1991, 3-339884; Oct. 9, 1992, 4-297716

Int. Cl.[6] G09G *3/12*

U.S. Cl. 345—36 **20 Claims**



8. A display panel comprising:

a light permeable substrate having an indication mark on the surface thereof; and

a light permeable front electrode, a light emission layer, a back electrode and an insulating layer successively formed at the back of the light permeable substrate; wherein:

the light permeable front electrode, the light emission layer, the back electrode and the insulating layer are formed by screen printing;

the back of the light permeable substrate has a first surface portion and a second surface portion, and the light permeable front electrode is formed to be in contact with only the first surface portion; and

the insulating layer insulates said front electrode, said light emission layer and said back electrode from the surrounding atmosphere and is formed so as (i) to entirely cover side surfaces of the light permeable front electrode, the light emission layer, and the back electrode and a back surface of the back electrode, and (ii) to be in contact with only the second surface portion of the back of the light permeable substrate.

5,557,296

FLAT-PANEL TYPE PICTURE DISPLAY DEVICE WITH INSULATING ELECTRON-PROPAGATION DUCTS

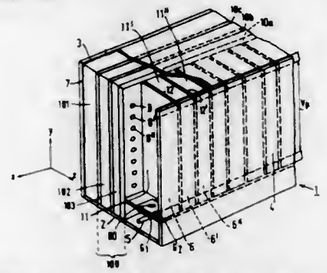
Nicolaas Lambert; Gerardus G. P. Van Gorkom; Petrus H. F. Trompenaars, and Siebe T. De Zwart, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 830,951, Feb. 6, 1992, Pat. No. 5,313,136, Ser. No. 223,962, Jul. 17, 1992, Pat. No. 5,497,046, and Ser. No. 53,980, Apr. 26, 1993, Pat. No. 5,347,199, which is a continuation of Ser. No. 954,949, Sep. 30, 1992, abandoned, which is a continuation of Ser. No. 637,039, Jan. 3, 1991, abandoned, which is a continuation of Ser. No. 528,677, May 24, 1990, abandoned, said Ser. No. 830,951is a continuation of Ser. No. 528,677, said Ser. No. 223,962is a continuation of Ser. No. 715,072, Jun. 13, 1991, abandoned. This application May 11, 1993, Ser. No. 60,330

Claims priority, application Netherlands, Jun. 1, 1989, 8901391; May 7, 1990, 9001528; Jun. 5, 1990, 9001266; Oct. 10, 1990, 9000060; Nov. 26, 1990, 9002566; European Pat. Off., Jun. 12, 1992, 92201720

Int. Cl.[6] G09G *3/22;* **H01J** *31/12*

U.S. Cl. 345—74 **24 Claims**



1. A display device comprising a luminescent screen having a pattern of pixels for luminescing in different colors and means for selectively energizing said pixels, said means comprising at least one electron transport duct having a plurality of exit apertures, means for promoting propagation of electrons within the at least one transport duct by secondary emission, and selection means for selectively extracting electrons from the exit apertures and directing said extracted electrons toward said pixels, said pixels being arranged along adjacent paths extending transversely to the at least one electron transport duct, the pixels in said adjacent paths being staggered with respect to each other.

5,557,297

SYSTEM FOR DISPLAYING CALLIGRAPHIC VIDEO ON RASTER DISPLAYS

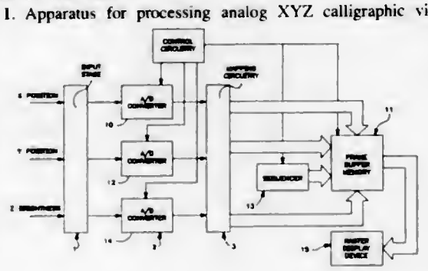
Daniel Sharp, Safety Harbor; Jayanti Patel, St. Petersburg, both of Fla., and Kevin Kelleher, Buford, Ga., assignors to Smiths Industries, Florham Park, N.J.

Filed Jun. 8, 1994, Ser. No. 255,530

Int. Cl.[6] G09G *5/36;3/20;3/36*

U.S. Cl. 345—136 **20 Claims**

1. Apparatus for processing analog XYZ calligraphic video



signals by converting them to digital data suitable for presentation on a raster display, comprising:

frame buffer memory means for storing digital video data to be displayed on a raster display, said memory means having storage locations with row and column addresses corresponding to locations on the surface of the display;

first means for receiving and converting analog signals, indicative of X-deflection locations on said display, to digital signals indicative of corresponding column addresses in said memory means;

second means for receiving and converting analog signals, indicative of Y-deflection locations on said display, to digital signals indicative of corresponding row addresses in said memory means;

third means for receiving and converting analog signals, indicative of the brightness at locations on said display determined by coordinated X-deflection and Y-deflection location indicative signals, to digital signals; and

fourth means for processing and storing said digital brightness signals at column and row address storage locations in said frame buffer memory means corresponding to the addresses determined by said address indicative digital signals of said coordinated X-deflection and Y-deflection location indicative signals, and for including least significant bits from said coordinated X-deflection and Y-deflection address indicative digital signals with said stored digital brightness signals at the corresponding respective column and row address locations in said memory means.

5,557,298

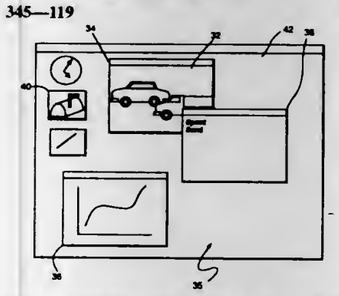
METHOD FOR SPECIFYING A VIDEO WINDOW'S BOUNDARY COORDINATES TO PARTITION A VIDEO SIGNAL AND COMPRESS ITS COMPONENTS

Chao-Kung Yang, Huntington Beach; Jim C. Williams, Anaheim, and Stanley Krutsick, Fullerton, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed May 26, 1994, Ser. No. 249,421

Int. Cl.[6] G09G *5/14*

U.S. Cl. 345—119 **8 Claims**



1. A method of separately determining a set of boundary coordinates for each of a plurality of video windows, each of the windows having either high or low variance components in a high resolution multimedia computer workstation that produces an analog multi-color video signal and displays the video signal, comprising:

converting the analog multi-color video signal into respective color sequences of digital frames;

transforming the color sequences of digital frames into another sequence of digital frames that represent the intensity of the multi-color video signal;

generating difference frames between successive transformed intensity frames;

computing a plurality of row activity measures and a plurality of column activity measures from at least one of the difference frames; and

determining the approximate boundary coordinates from said row and column activity measures.

5,557,299

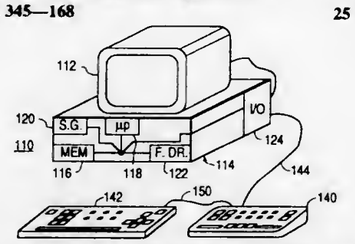
METHOD AND APPARATUS FOR A LEARNING STYLED COMPUTER KEYBOARD

Victor K. Maynard; Kendall C. Maynard; Ruth Smith, and Claire Caiano, all of Niceville, Fla., assignors to KidTech, Inc., Niceville, Fla.

Filed May 4, 1994, Ser. No. 238,216

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—168 **25 Claims**



1. A computer-based method for configuring and operating a computer keyboard to enhance a user's education comprising the steps of:

providing a programmable computer system having electronically coupled together a monitor, a central processing unit, a memory, a sound generator and a keyboard input/output interface;

providing a standard computer keyboard;

providing a learning-styled keyboard with a substantially flat and planar user interface surface having a plurality of discrete keys, each key including a switch and corresponding switch dome and indicia thereat;

providing a mechanically actuated, electrical switch;

electrically connecting either said standard computer keyboard or said learning-styled keyboard to said keyboard input/output interface based exclusively upon the position of said electrical switch;

when said electrical switch electrically connects said learning-styled keyboard to said keyboard input/output interface:

prompting said user, with one of a visual prompt from said monitor and an audible prompt from said sound generator, to actuate a prompted key represented by a respective indicia on a corresponding switch dome on said user interface surface;

in said learning-styled keyboard, generating one digital key strike signal based upon actuation of one of said discrete switch domes and associated switch on said user interface surface and transmitting said key strike signal to said central processor unit via said keyboard input/output interface;

providing at least one of an audible and a visual feedback indicator to said user from said sound generator and said monitor respectively upon receipt of said key strike signal at said central processing unit; and,

solely in said learning-styled keyboard, inhibiting generation of multiple digital key strike signals representing multiple key strikes whether based upon continual actuation of said one discrete switch dome and associated switch or based upon actuation of a plurality of discrete switch domes and associated switches within a predetermined time period;

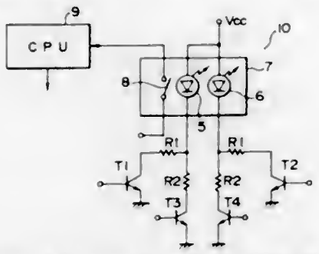
when said electrical switch electrically connects said standard computer keyboard to said keyboard input/output interface:

controlling said programmable computer system exclusively from said standard computer keyboard.

storing said valid pixels of a window in a multi-window system

a switching structure electrically connected with said piezoelec-

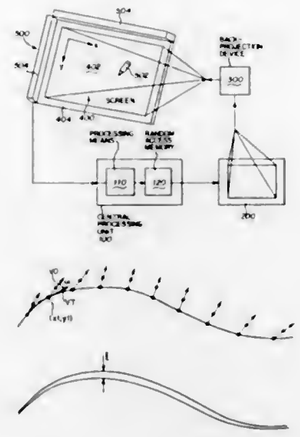
5,557,300
FUNCTIONAL DISPLAY APPARATUS
Kimiyasu Satoh, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan
Continuation of Ser. No. 152,690, Nov. 16, 1993, abandoned. This application Oct. 31, 1995, Ser. No. 550,878
Claims priority, application Japan, Nov. 17, 1992, 4-331084
Int. Cl.[6] G09G *5/00*
U.S. Cl. 345—170 **31 Claims**



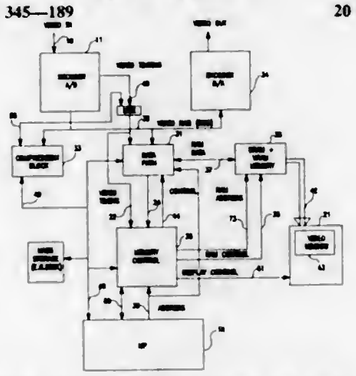
1. A functional display apparatus for a controller, said apparatus comprising:
a panel;
a plurality of selector buttons mounted in said panel, each of said buttons representing a respective function operable by said controller and selectable by manually activating the respective button, each of said buttons being fabricated from a translucent-type material and containing a plurality of luminous elements each adapted to emit light in a respective color so as to distinguish between the functions represented by said buttons and each of said luminous elements further adapted to emit light in a relatively dim state and a relatively bright state;
means for automatically causing one of said luminous elements in each of said buttons to emit light in said dim state upon applying power to said functional display apparatus; and
means responsive to the activation of a button for causing one of said luminous elements contained in the respective button to emit light in said bright state so as to readily identify the activated button.

5,557,301
GRAPHIC DRAWING SYSTEM
Jean-Louis D'Aviau de Piolant, 35 Allée des Trides, 33610 Cestas, France
PCT No. PCT/FR92/00442, § 371 Date Nov. 17, 1993, § 102(e) Date Nov. 17, 1993, PCT Pub. No. WO92/21103, PCT Pub. Date Nov. 26, 1992
PCT Filed May 18, 1992, Ser. No. 150,061
Claims priority, application France, May 17, 1991, 91/06010
Int. Cl.[6] G09G *5/00*
U.S. Cl. 345—179 **24 Claims**

1. A graphics drawing system, comprising:
a drawing surface;
a stylus capable of being moved over the surface in order to simulate plotted lines;
means for determining the coordinates of the stylus in the plane of the surface with respect to a reference;
processing means connected to the coordinate determination means, in order to create or update a digital image by using the coordinates of the stylus; and
means for displaying the image on a screen, which display means are connected to the processing means; and
wherein the means for determining the coordinates of the stylus comprise means to determine the coordinates of a tip of the stylus and means to determine an angle of the stylus with respect to the drawing surface, wherein the means for displaying includes means for displaying the image that includes a line having a width that is determined as a function of the angle of the stylus with respect to the drawing surface.

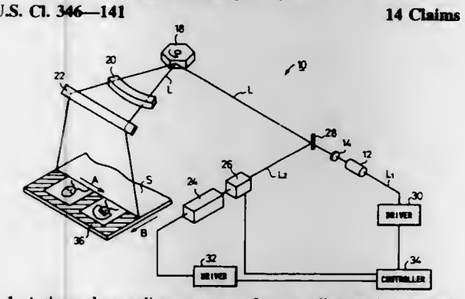


5,557,302
METHOD AND APPARATUS FOR DISPLAYING VIDEO DATA ON A COMPUTER DISPLAY
Adam Levinthal, Redwood City; Ross Werner, Woodside, and J. Lane Molpus, Larkspur, all of Calif., assignors to NeXT, Inc., Redwood City, Calif.
Continuation of Ser. No. 272,908, Jul. 8, 1994, which is a continuation of Ser. No. 4,637, Jan. 12, 1993, which is a continuation of Ser. No. 580,275, Sep. 10, 1990. This application May 4, 1995, Ser. No. 434,654
Int. Cl.[6] G09G *5/36*
U.S. Cl. 345—189 **20 Claims**



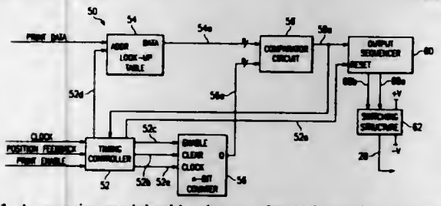
1. A method of displaying analog video data and computer display data comprising text and graphics on a computer display comprising the steps of:
providing analog video data to a converting means and converting said analog video data to a digital pixel stream;
buffering said pixel stream and converting said pixel stream to a plurality of pixel packets;
determining valid pixels of said pixel packets, said step of determining valid pixels accomplished by providing a bit mask having a number of bits, each corresponding to a pixel within a window of a multi-window system in a computer memory, assigning a first bit value for valid pixel display locations and a second bit value for invalid pixel display locations, and conditionally writing each pixel of said pixel packet to a destination location in said computer memory dependent on a corresponding bit location in said bit mask;
storing said valid pixels of a window in a multi-window system in a computer memory at a first rate, said computer memory also storing said computer display data at a second rate; and,
providing said valid pixels from said computer memory for display on said computer display.

5,557,303
THERMAL RECORDING APPARATUS WHICH CAN DRAW BLACK BORDERS
Toshitaka Agano, and Nobuyoshi Nakajima, both of Kanagawa-ken, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 13, 1993, Ser. No. 135,029
Claims priority, application Japan, Oct. 14, 1992, 4-276238
Int. Cl.[6] B41J *2/38;2/45*
U.S. Cl. 346—141 **14 Claims**



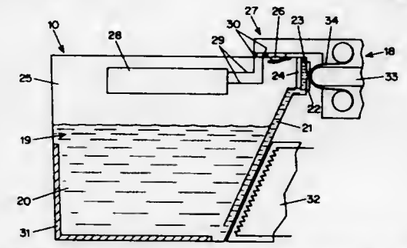
1. A thermal recording apparatus for recording an image on a thermo-sensitive recording medium which develops color whose density varies in response to thermal energy applied thereto, comprising:
main heating means for supplying thermal energy according to a gradation signal of said image to at least an image region of said thermo-sensitive recording medium for a first time interval required to scan said image region; and
auxiliary heating means for supplying said image region with a predetermined thermal energy less than a coloring energy of said thermo-sensitive recording medium for said first time interval, and supplying a region other than said image region with a predetermined thermal energy exceeding said coloring energy for a second time interval required to scan said other region.

5,557,304
SPOT SIZE MODULATABLE INK JET PRINTHEAD
James L. Stortz, Spring, Tex., assignor to Compaq Computer Corporation, Houston, Tex.
Filed May 10, 1993, Ser. No. 60,440
Int. Cl.[6] B41J *2/205*
U.S. Cl. 347—15 **7 Claims**



1. A spot size modulatable, drop-on-demand type ink jet printhead for producing grey-scale images on a substrate, comprising:
a main body portion having an ink-carrying channel extending therethrough;
a piezoelectric actuator acoustically coupled to said ink-carrying channel;
a switching structure electrically connected with said piezoelectric actuator for selectively applying a voltage waveform to said piezoelectric actuator to cause a deflection of said piezoelectric actuator, said deflection of said piezoelectric actuator generating a pressure wave in said ink-carrying channel capable of ejecting a droplet of ink therefrom;
means for selecting a spot size for droplets ejected from said ink-carrying channel to form when striking said substrate;
a look-up table for translating said selected spot size into a time period during which said voltage waveform is to be applied; and
a control circuit for causing said switching circuit to initiate application of said voltage waveform, for determining whether said voltage waveform has been applied to said piezoelectric actuator for said time period and for terminating application of said voltage waveform upon expiration of said time period;
wherein said control circuit further comprises:
sequencer means for selectively asserting or deasserting at least one control signal for output to said switching structure, said selective assertion of said at least one control signal causing said switching structure to apply said voltage waveform to said piezoelectric actuator;
timer means for instructing said sequencer means to initiate application of said voltage waveform and for determining time elapsed since initiating application of said voltage waveform; and
comparator means for comparing said time period produced by said look-up table and said elapsed time determined by said timer means, said comparator means instructing said sequencer means to deassert said at least one asserted control signal when said voltage waveform has been applied for said time period.

5,557,305
INK JET PURGING ARRANGEMENT
Nathan P. Hine, South Strafford, Vt., and David W. Gailus, Merrimack, N.H., assignors to Spectra, Inc., Hanover, N.H.
Filed Feb. 24, 1994, Ser. No. 201,001
Int. Cl.[6] B41J *2/165*
U.S. Cl. 347—17 **12 Claims**



1. An ink jet head comprising a reservoir containing ink and having an airspace, an orifice plate containing an orifice through which ink is ejected during operation of the system, a passage for conducting ink from the reservoir to prevent communication between the airspace and the exterior of the reservoir to the orifice, sealable vent means for sealing the airspace in the reservoir, and heater means within the reservoir and the ink jet head for heating air in the reservoir airspace to force ink from the reservoir through the ink passage and out of the orifice for purging thereof.

5,557,306

5,557,310
INK CONTAINER WITH RING SHAPED INK

5,557,306

INK JET PRINTER WITH A CLEANING APPARATUS FOR REMOVING HARDENED INK FROM A NOZZLE PLATE OF A PRINT HEAD

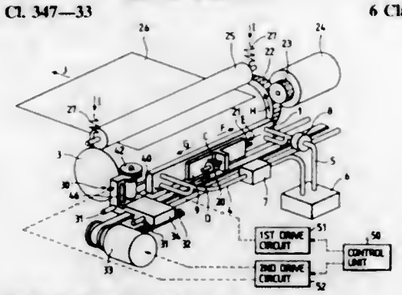
Tohru Fukushima; Kenichi Kanbayashi, and Eiji Kumai, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Dec. 15, 1993, Ser. No. 167,073

Claims priority, application Japan, Dec. 16, 1992, 4-336382; Dec. 16, 1992, 4-336383; May 6, 1993, 5-105580; Nov. 19, 1993, 5-314134

Int. Cl.[6] B41J *2/165*

U.S. Cl. 347—33 **6 Claims**



1. An ink jet printer, comprising:

a print head including a nozzle plate, a plurality of pressure generating chambers respectively communicating with an array of nozzle openings, and a plurality of pressure generating elements each for varying a pressure within a corresponding one of said pressure generating chambers to jet a stream of ink droplets from a respective one of said nozzle openings, wherein said pressure generating chambers and said pressure generating elements are arrayed in a width direction of a print paper;

head drive means for selectively outputting a first signal to said pressure generating elements to cause a stream of ink droplets to be ejected from said nozzle openings at a speed suitable for print and a second signal to cause ink to ooze through said nozzle openings;

cleaning means for cleaning said nozzle plate, wherein said cleaning means is disposed in a nonprinting region during normal printing operations of said printer, is movable in a direction of said array of nozzle openings and with respect to said nozzle plate, and intersects a horizontal plane substantially defined by said stream of ink droplets sprayed during said normal printing operations;

drive means for moving said cleaning means in said longitudinal direction of said print head to wipe ink from said nozzle plate; and

control means for causing said head drive means to output said second signal when said cleaning means is wiping ink from said nozzle plate,

wherein said cleaning means comprises a first cleaning member for performing a rubbing operation and a second cleaning member for performing a wiping operation and wherein said rubbing operation and said wiping operation are simultaneously performed on said nozzle plate.

5,557,307

CONTINUOUS CLEANING THREAD FOR INKJET PRINTING NOZZLE

Paul J. Paroff, East Amherst, N.Y., assignor to Moore Business Forms, Inc., Grand Island, N.Y.

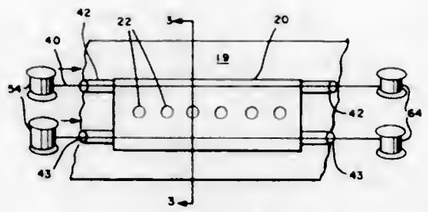
Filed Jul. 19, 1994, Ser. No. 277,075

Int. Cl.[6] B41J *2/165*

U.S. Cl. 347—34 **29 Claims**

1. An ink jet printer head comprising:

a nozzle plate having an array of orifices through which ink droplets are ejected in a controlled fashion;



an ink adsorbent element positioned on said plate in proximity to the array of orifices, wherein said ink adsorbent element slides across said nozzle plate as ink droplets are ejected from the orifices.

5,557,308

INK JET PRINT HEAD PHOTORESIST LAYER HAVING DURABLE ADHESION CHARACTERISTICS

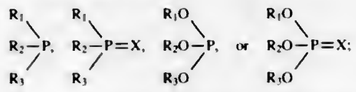
Karuppiah Chandrasekaran, Sayre, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 8, 1994, Ser. No. 272,363

Int. Cl.[6] B41J *2/05;2/03*

U.S. Cl. 347—65 **7 Claims**

1. An ink jet print head having a top plate, an intermediate photoresist layer defining ink passageways, and a bottom plate, the improvement wherein a phosphorus compound is present in the photoresist layer in an amount of approximately 0.01 to 2% by weight, based on total weight of the layer, said phosphorus compound having the formula:



wherein R_1, R_2 and R_3 are substituted or unsubstituted alkyl groups, or substituted or unsubstituted aryl groups having 6 to 10 carbon atoms, and X is oxygen or sulfur.

5,557,309

INK JET PRINTHEAD ASSEMBLY HAVING ALIGNED DUAL INTERNAL CHANNEL

Donald J. Hayes, Plano, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

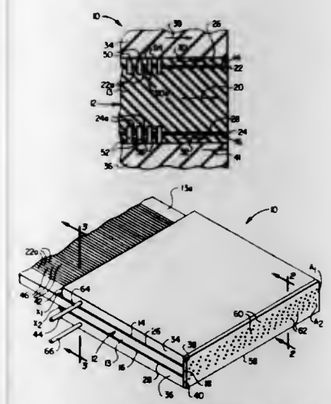
Division of Ser. No. 66,390, May 20, 1993, Pat. No. 5,414,916. This application Feb. 22, 1995, Ser. No. 392,097

Int. Cl.[6] B41J *2/045*

U.S. Cl. 347—71 **6 Claims**

1. A high discharge orifice density ink jet printhead comprising:

a first block structure formed from a piezoelectric material and having a front end, a rear end, and first and second opposite sides extending between said front and rear ends;



first and second layers of metallic material respectively disposed on and covering said first and second opposite sides of said first block structure, each of said first and second layers of metallic material having a front end portion;

first and second sheets of piezoelectric material respectively secured to said front end portions of said first and second layers of metallic material, said first and second sheets of piezoelectric material having front ends aligned with said front end of said first block structure and rear ends positioned forwardly of said rear end of said first block structure;

a first laterally spaced series of elongated, parallel grooves longitudinally extending between said front and rear ends of said first block structure and laterally extending into said first side thereof through said first sheet of piezoelectric material and said first layer of metallic material;

a second laterally spaced series of elongated, parallel grooves longitudinally extending between said front and rear ends of said first block structure and laterally extending into said second side thereof through said second sheet of piezoelectric material and said second layer of metallic material;

a second block structure secured to and covering said first sheet of piezoelectric material, said second block structure extending across said first series of grooves and forming with said first series of grooves a first series of interior ink receiving channels having front and rear ends and being laterally bounded along their lengths, on opposite sides thereof, by piezoelectrically deflectable side wall structures laterally extending transversely to said second block structure;

a third block structure secured to and covering said second sheet of piezoelectric material, said third block structure extending across said second series of grooves and forming with said second series of grooves a second series of interior ink receiving channels having front and rear ends and beiog laterally bounded along their lengths, on opposite sides thereof, by piezoelectrically deflectable side wall structures laterally extending transversely to said third block structure, said second series of interior ink receiving channels being in precise lateral alignment with said first series of interior ink receiving channels;

a plate member extending across and covering the front ends of said first and second series of interior ink receiving channels, said plate member having a first series of ink discharge orifices formed therein and operatively communicated with the front ends of said first series of interior ink receiving channels, and a second series of ink discharge orifices formed therein and operatively communicated with the front ends of said second series of interior ink receiving channels;

means for sealing off the rear ends of said first and second series of interior ink receiving channels; and

means for flowing ink into said first and second series of interior ink receiving channels.

5,557,310

INK CONTAINER WITH RING-SHAPED INK ABSORBING MEMBER

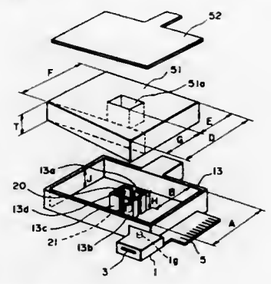
Mitsuru Kurata; Tokihide Ebata, both of Kawasaki; Noribumi Koitabashi, Yokohama; Hiromitsu Hirabayashi, Yokohama; Hitoshi Sugimoto, Yokohama, and Haruo Uchida, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 992,502, Dec. 17, 1992, abandoned, which is a division of Ser. No. 599,978, Oct. 19, 1990. This application Jul. 22, 1994, Ser. No. 279,079

Claims priority, application Japan, Oct. 20, 1989, 1-274640; Oct. 22, 1989, 1-274473; Oct. 22, 1989, 1-274474; Oct. 24, 1989, 1-274839

Int. Cl.[6] B41J *2/175*

U.S. Cl. 347—87 **6 Claims**



1. An ink jet head cartridge comprising:

a recording head for ejecting ink;

an ink container for containing ink to be supplied to said recording head;

an ink supply port for supplying the ink from said ink container to said recording head;

a porous or fibrous ink absorbing material disposed in said ink container for retaining the ink therein, wherein said ink absorbing material has a ring shape with a central opening; and

an engaging portion engaging with said central opening of said ink absorbing material, wherein said ink absorbing material has a higher density proximate to said ink supply port than proximate to said engaging portion.

5,557,311

MULTI-PAGE SIGNATURES MADE USING LASER PERFORATED BOND PAPERS

Kenneth J. Perrington, Maplewood; Thomas H. Hunter, Woodbury, and Keith P. Wilson, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 11, 1993, Ser. No. 76,464

Int. Cl.[6] G03G *21/00;* **B42D** *15/00*

U.S. Cl. 347—111 **23 Claims**

15. A process for producing a folded, bound, laser-perforated, paper-based construction said process comprising the steps of:

(a) creating a line of perforations through a paper substrate by exposure to a laser beam;

(b) generating a latent image on a surface of an imaging element;

(c) developing said latent image with toner;

(d) transferring said developed image to the surface of said laser perforated paper substrate,

(e) collating a plurality of the laser perforated paper substrates prepared in step (d) into sets;

(f) folding said sets on their lines of perforation; and

(g) binding said folded sets on their lines of perforation into a signature.

5,557,312

THERMAL RECORDING AND ERASING APPARATUS

5,557,314

EXPOSURE METHOD AND PATTERN DATA

third diffraction grating for recombining the plurality of indi-

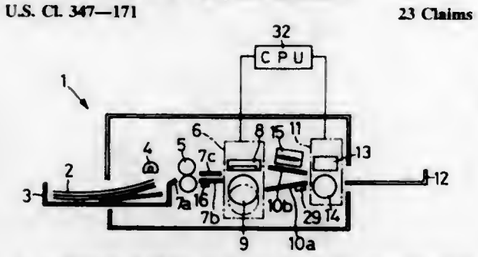
node means, in television communication with the information

5,557,312

THERMAL RECORDING AND ERASING APPARATUS

Akira Sago, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Nov. 19, 1993, Ser. No. 154,524
Claims priority, application Japan, Dec. 3, 1992, 4-324274; Dec. 24, 1992, 4-344353
Int. Cl.[6] B41J 29/36;2/32;2/36
U.S. Cl. 347—171 23 Claims



1. A recording apparatus for recording images on a recyclable heat-sensitive sheet, comprising:

an image-erasing device which thermally erases images recorded on a first recyclable heat-sensitive sheet, thereby recycling said first sheet;

an image-recording device which thermally records images on each of (a) said first sheet which has been recycled by said image-erasing device and (b) a second recyclable heat-sensitive sheet which has not been recycled by said image-erasing device; and

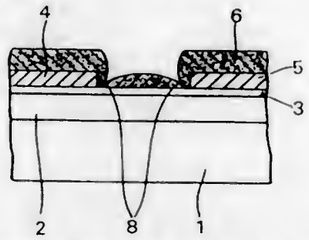
a control device which supplies a first energy to said image-recording device when the image-recording device records images on said first sheet recycled by said image-erasing device, and supplies a second energy different from said first energy to said image-recording device when the image-recording device records images on said second sheet.

5,557,313

WEAR-RESISTANT PROTECTIVE FILM FOR THERMAL HEAD AND METHOD OF PRODUCING THE SAME

Masatoshi Nakayama; Masahiro Nakano, and Tsukimi Endo, all of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Nov. 9, 1993, Ser. No. 149,440
Claims priority, application Japan, Nov. 12, 1992, 4-326202
Int. Cl.[6] B41J 2/335
U.S. Cl. 347—203 3 Claims



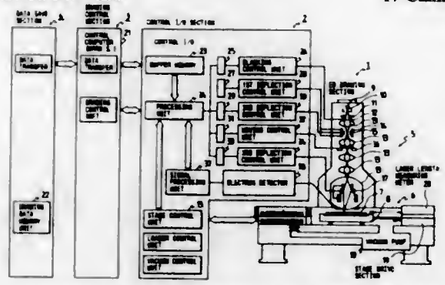
3. A wear-resistant protective film for a thermal head formed by sputtering in a sputtering gas comprising an inert gas, consisting essentially of a wear-resistant material selected from the group consisting of a metal oxide, a metal nitride and mixtures thereof, wherein the wear-resistant protective film has a varying concentration of said inert gas in a direction normal to the protective film and at least one part of said film has a concentration of said inert gas of 0–3 at % and at least another part of said film has a concentration of said inert gas of 2–10 at % and greater than said concentration of said at least one part.

5,557,314

EXPOSURE METHOD AND PATTERN DATA PREPARATION SYSTEM THEREFOR, PATTERN DATA PREPARATION METHOD AND MASK AS WELL AS EXPOSURE APPARATUS

Yoshihiko Okamoto, Ohme; Haruo Yoda, Hinode-machi; Ikuo Takada, Mikanohara-machi; Yukinobu Shibata, Juuou-machi; Akira Hirakawa, Katsuta; Norio Saitou, Tokorozawa; Shinji Okazaki, Urawa, and Fumio Murai, Hinode-machi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 16, 1993, Ser. No. 77,411
Claims priority, application Japan, Jun. 16, 1992, 4-156512
Int. Cl.[6] B41J 2/435
U.S. Cl. 347—230 17 Claims



1. A method of exposing a semiconductor wafer to a charged particle beam comprising:

positioning a first mask having a rectangular opening between a source of the charged particle beam and the semiconductor wafer;

positioning a second mask, having at least one rectangular opening and a plurality of apertures containing a plurality of graphics patterns, between the first mask and the semiconductor wafer; and

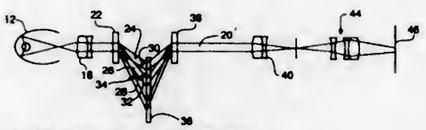
passing the charged particle beam from the source through the rectangular opening of the first mask and through at least one of the at least one rectangular opening and the plurality of apertures of the second mask into incidence with the semiconductor wafer to expose the semiconductor wafer with the charged particle beam while the semiconductor wafer is continuously in motion.

5,557,315

DIGITAL PRINTER USING A MODULATED WHITE LIGHT EXPOSURE SOURCE

Mark M. Meyers, Hamlin, and Raymond E. Wess, Holley, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 18, 1994, Ser. No. 292,451
Int. Cl.[6] B41J 2/47; G01D 15/14; G03B 27/72; G02F 1/11
U.S. Cl. 347—244 21 Claims



1. A photographic printer comprising:

a white light source for producing white light;

a collimating lens for collimating light from said light source so as to form a beam of white light;

a beam modulating assembly for modulating the beam of white light, said modulating assembly comprising a first diffraction grating for splitting the beam of white light into a plurality of individual predetermined beams of light each having an intensity and a different color, a second diffraction grating and a third diffraction grating for recombining the plurality of individual predetermined beams of light, each of said diffraction grating having a pitch, the pitch of the first and third diffraction grating being the same, and the pitch of the second grating being twice that of the pitch of the first diffraction grating, and a modulator for modulating the intensity of each of the colored beams of light individually in accordance with imaging data for each of said colored beams of light; and

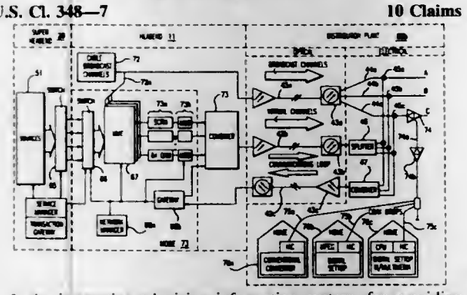
a beam directing assembly for directing the recombined beam of white light onto a photosensitive material, comprising an achromatized cylindrical lens which focuses the combined beam wherein the recombined light beam is passed through an anomorphic, achromatic, F-θ lens for focusing of the recombined beam of light to a small spot for exposure onto the photosensitive material.

5,557,316

SYSTEM FOR DISTRIBUTING BROADCAST TELEVISION SERVICES IDENTICALLY ON A FIRST BANDWIDTH PORTION OF A PLURALITY OF EXPRESS TRUNKS AND INTERACTIVE SERVICES OVER A SECOND BANDWIDTH PORTION OF EACH EXPRESS TRUNK ON A SUBSCRIBER DEMAND BASIS

W. Leo Hoarty, Santa Clara, and Joshua Soske, Sunnyvale, both of Calif., assignors to ICTV, Inc., Santa Clara, Calif.

Division of Ser. No. 56,958, May 3, 1993, which is a continuation-in-part of Ser. No. 877,328, May 1, 1992, Pat. No. 5,365,577, which is a continuation-in-part of Ser. No. 754,932, Sep. 10, 1991, Pat. No. 5,220,420, which is a continuation-in-part of Ser. No. 589,205, Sep. 28, 1990, Pat. No. 5,093,718. This application Sep. 29, 1994, Ser. No. 315,283
Int. Cl.[6] H04N 7/173
U.S. Cl. 348—7 10 Claims



1. An interactive television information system, for providing interactive cable television service over a cable television system distribution network, the interactive television system comprising:

an information source means for supplying a plurality of information services;

a plurality of home interface controller means, each such home interface controller means providing an output in communication with an associated subscriber television and having (i) a signal input for television information signals and input selection means for selecting a given one of the television information signals at the signal input, (ii) channel selection means for permitting a user to select an apparent channel, and (iii) a data transceiver operative over a data communications link;

wherein the cable television distribution network is included in the interactive television information system and includes a plurality of express trunks, each trunk coupled to a group of the home interface controller means and including a first bandwidth portion carrying non-interactive television information services that are substantially identical in nature and bandwidth allocation among all trunks, and a second bandwidth portion carrying the selected television information services on a demand basis established by subscriber usage of the group of the home interface controller means utilizing each trunk for service; and

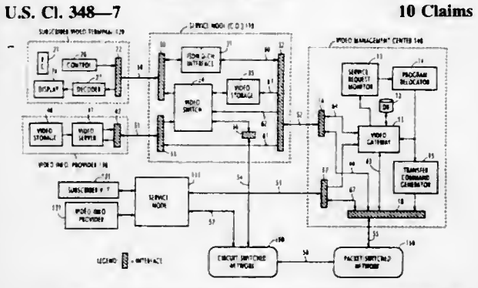
node means, in television communication with the information source means and with the groups of the home interface controller means over the plurality of express trunks, and in data communications with the groups of the home interface controller means over the data communications link, for selecting information services obtained from the information source means based on data obtained over the data communications link from each such home interface controller means and providing each selected information service for delivery by the express trunk coupled to such requesting home interface controller means.

5,557,317

VIDEO-ON-DEMAND SYSTEM WITH PROGRAM RELOCATION CENTER

Makoto Nishio; Sho-ichiro Nakai, and Makiko Yoshida, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 22, 1995, Ser. No. 447,244
Claims priority, application Japan, May 20, 1994, 6-106995
Int. Cl.[6] H04N 7/14
U.S. Cl. 348—7 10 Claims



1. A video-on-demand system for providing video signals from a video information provider to any one of a plurality of subscriber terminals, comprising:

a plurality of video storage devices distributed over a network area for storing one or more video programs supplied from said video information provider;

a database;

a video gateway for receiving subscriber requests from said subscriber terminals.

a service request monitor for analyzing subscriber requests received by the video gateway to produce a list of recorded calls;

a program relocator for analyzing said list to identify a first video storage device and selectively identifying a second video storage device between which said video program is to be transferred;

a transfer command generator responsive to said program relocator for producing a program transfer command signal, said video gateway being responsive to the program transfer command signal for updating said database; and

a switched telecommunication network responsive to said program transfer command signal for transferring said video programs from the first video storage device to the second video storage device.

5,557,318

METHOD AND APPARATUS FOR PERMITTING A

characterized in that the system further comprises:

5,557,321

FUNDUS CAMERA OR OPTHALMIC APPARATUS

5,557,318
METHOD AND APPARATUS FOR PERMITTING A VIEWER TO SCAN THROUGH A PLURALITY OF VIDEO SIGNALS PROVIDED BY A TRANSMITTER

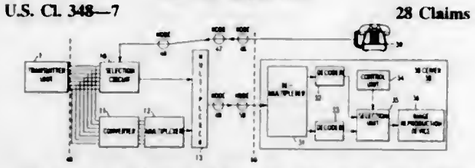
Christiaan M. W. Gabriël, Leiden, Netherlands, assignor to Koninklijke PTT Nederland N.V., Netherlands

Filed Jul. 7, 1995, Ser. No. 499,571

Claims priority, application Netherlands, Jul. 12, 1994, 9401150

Int. Cl.[6] H04N *7/10*

U.S. Cl. 348—7 **28 Claims**



1. A method of offering to a receiver, a first set of video signals originating from a transmitter, each of the first set of video signals including video data, the method comprising the steps of:

transmitting a control signal from the receiver to the transmitter;

in response to the control signal,

selecting at the transmitter a second set of video signals which includes a subset of the first set of video signals, and

transmitting from the transmitter the second set of video signals to the receiver;

transmitting from the transmitter to the receiver a third set of video signals, the third set of video signals including a particular video signal corresponding to one of the first set of video signals not included in the second set of video signals, the particular video signal having a data content that is less than the data content of the corresponding one of the first set of video signals.

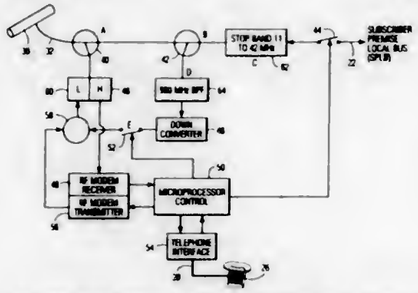
5,557,319
SUBSCRIBER RETURN SYSTEM FOR CATV FULL SERVICE NETWORKS

Aravanan Gurusami, East Syracuse; Mark Chapman, Bridgeport, and John G. Staiger, Clay, all of N.Y., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 28, 1994, Ser. No. 366,341

Int. Cl.[6] H04N *7/173*

U.S. Cl. 348—11 **18 Claims**



1. A system for connecting at least one subscriber device to an off-premises broad band transmission system for two-way communication, comprising:

means for providing service channels from the off-premises broad band transmission system to an entry point over a plurality of carrier frequencies in a first band, and for carrying return transmissions from the entry point over at least one carrier frequency in a second band of frequencies lower than the first band, and

a subscriber premises local bus (SPLB) connected to the entry point for carrying the service channels to the at least one subscriber device over the carrier frequencies in the first band, characterized in that the system further comprises:

means for providing a return transmission signal from the at least one subscriber device to the bus at at least one carrier frequency in a third band of frequencies higher than the first band, and for coupling the signal in the third band to the subscriber premises local bus, and

the entry point comprises means for converting the return signal from the subscriber premises local bus in the third band to a return signal in the second band, the return signal in the second band being one of the return transmissions.

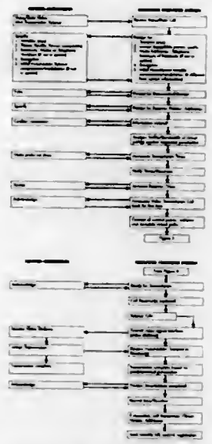
5,557,320
VIDEO MAIL DELIVERY SYSTEM

Mark Kress, 54 Grandview Ave., Toronto, Canada

Filed Jan. 31, 1995, Ser. No. 380,997

Int. Cl.[6] G06F *13/10*

U.S. Cl. 348—12 **6 Claims**



1. A method of transmitting bulk data with a component in the form of still or motion picture images from at least one sender to at least one receiver under the control of a managing network provider, the method comprising executing on a per transmission basis the following steps:

a) each sender identifying intended receivers to the managing network provider and the duration or size of an intended transmission of data,

b) the managing network provider checks data transmission traffic over a virtual transmission path between each sender and each identified receiver to determine appropriate transmission times,

c) the managing network provider provides a scheduled transmission time to each sender,

d) the managing network provider sets up each control point along the virtual transmission path to each identified receiver for the scheduled transmission time, and

e) each sender transmits the bulk data at the scheduled time through the virtual transmission path to each identified receiver.

5,557,321
FUNDUS CAMERA OR OPTHALMIC APPARATUS COMPRISING A FLASH LIGHT SOURCE

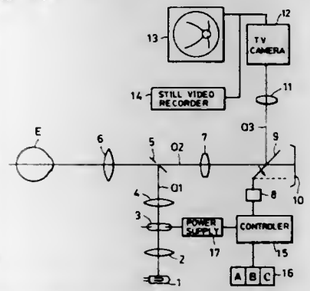
Yoshimi Kohayakawa, Yokohama, and Takeshi Kitamura, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 85,451, Jun. 10, 1993, abandoned, which is a continuation of Ser. No. 762,934, Sep. 19, 1991, abandoned. This application May 5, 1995, Ser. No. 435,533

Claims priority, application Japan, Oct. 2, 1990, 2-264264; Dec. 29, 1990, 2-418432

Int. Cl.[6] H04N *7/18*

U.S. Cl. 348—78 **11 Claims**



1. A fundus camera, comprising:

a first photographing optical system for guiding an image of an eye to be inspected to first imaging means;

a second photographing optical system for guiding the image of the eye to be inspected to second imaging means having a sensitivity different from the sensitivity of the first imaging means;

a flash light source system for providing flash illuminations for photographing adapted to emit a quantity of flash light corresponding to the sensitivity of the first imaging means, and a quantity of flash light corresponding to the sensitivity of the second imaging means; and

select means for selecting one of a plurality of photographing modes, said photographing modes at least comprising a mode for successively alternately performing photographic operations using the first and second imaging means in response to only one manual input operation, wherein each photographic operation is performed with the quantity of flash light of illumination corresponding to the sensitivity of the imaging means used by said flash light source system,

wherein one of the first and second imaging means comprises an electronic camera.

5,557,322
TELECINES WITH SIMULTANEOUS SCANNING OF A PLURALITY OF FRAMES

John D. Millward, Hertfordshire, United Kingdom, assignor to Rank Cintel Limited, United Kingdom

Filed Aug. 15, 1994, Ser. No. 290,352

Claims priority, application United Kingdom, Aug. 16, 1993, 9317046

Int. Cl.[6] H04N *5/253;5/257*

U.S. Cl. 348—100 **21 Claims**

1. Telecine apparatus comprising:

means defining a film path;

moving means for moving a cinematographic film along said film path;

illuminating means for simultaneously illuminating said cinematographic film at at least two spaced locations in said film path;

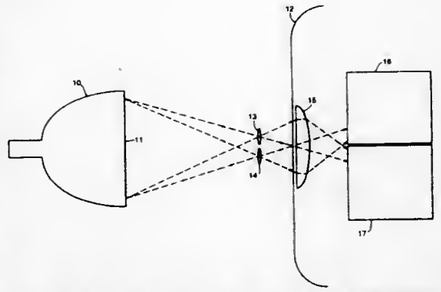
detecting means comprising separate detectors for separately and simultaneously detecting light from said illuminating means that has passed through said cinematographic film at said spaced locations respectively and outputting detected video signals; and

scanning means for causing one of said illuminating means and said detecting means to effect a scan;

storage means coupled to each of said separate detectors for simultaneously storing said detected video signals; and

reading means for reading out from said storage means a single video output signal;

whereby said detected video signals are generated at a reduced scan rate relative to a scan rate of said single video output signal.



5,557,323
DISTANCE MEASURING APPARATUS

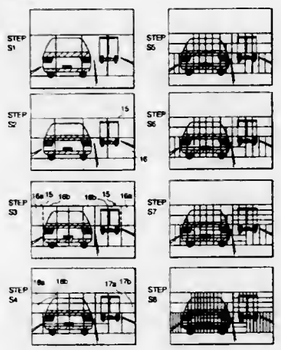
Yasuya Kajiwara, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 12, 1994, Ser. No. 354,483

Claims priority, application Japan, Dec. 14, 1993, 5-313562

Int. Cl.[6] H04N *7/18*

U.S. Cl. 348—140 **4 Claims**



1. A distance measuring apparatus comprising:

image pick-up means for optically picking up an object at two different points to form a first and a second image;

window setting means for forming a window containing said first image and for successively splitting said window into a plurality of sub-windows in a repeated manner so that a contrast of each sub-window last split exceeds a predetermined value but the contrast thereof upon the next splitting becomes less than said predetermined value; and

distance calculation means for calculating a distance to said object through the principle of triangulation based on a deviation of said first and second images.

5,557,324
POLORIZATION VIEWER

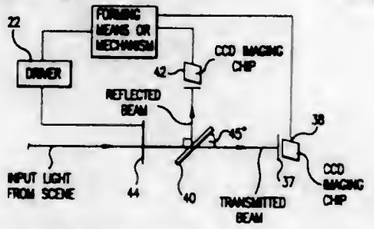
Lawrence B. Wolff, Baltimore, Md., assignor to The Johns

a computer for generating a correction value of said whole image signal according to an output signal of the extracting circuit

5,557,324
POLORIZATION VIEWER

Lawrence B. Wolff, Baltimore, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Oct. 29, 1992, Ser. No. 968,175
Int. Cl.[6] H04N *5/225*
U.S. Cl. 345—207 **11 Claims**

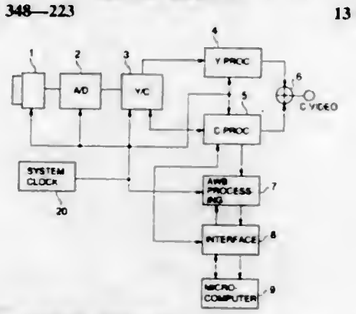


1. A polarization viewer comprising:
a first CCD chip which produces a first signal, said first signal corresponding to a measurement of a first polarization component based on electromagnetic radiation the first CCD chip receives;
a first beamsplitter disposed such that radiation reflected by the first beamsplitter is received by the first CCD chip;
a second CCD chip which produces a second signal corresponding to a measurement of a second polarization component based on electromagnetic radiation the second CCD chip receives which is transmitted by the beamsplitter, said second CCD chip disposed such that the second CCD chip receives radiation transmitted by the beamsplitter;
a mechanism for creating polarization information corresponding to a polarization orientation different than that corresponding with the first or second CCD chip; and
a mechanism for forming a polarization image based on the first and second signals and the creating mechanism, said forming mechanism in communication with the first and second CCD chips and the generating mechanism.

5,557,325
VIDEO CAMERA AND ITS CONTROL METHOD

Osamu Ueda, Kawasaki, and Hirofumi Suda, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 72,915, Jun. 7, 1993, abandoned.
This application Jun. 14, 1995, Ser. No. 489,255
Claims priority, application Japan, Jun. 8, 1992, 4-147722
Int. Cl.[6] H04N *9/73*
U.S. Cl. 348—223 **13 Claims**

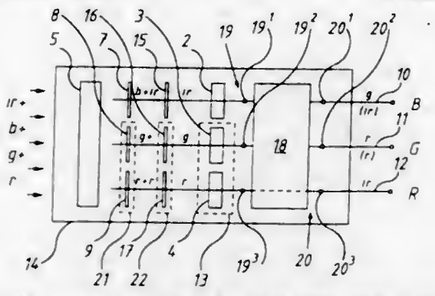


1. A video camera comprising:
an image pickup device for scanning an entire image and generating a whole image signal based on said entire image;
an extracting circuit for extracting a partial image signal corresponding to a predetermined picture plane range from said whole image signal which is generated from said image pickup device; and
a computer for generating a correction value of said whole image signal according to an output signal of the extracting circuit,
wherein said extracting circuit sends an interruption signal to said computer to interrupt other processing being carried out by said computer at a timing when said extracting circuit completes extracting of said partial image signal without waiting a vertical synchronization signal, to make said computer to start operating on said partial image signal.

5,557,326
METHOD AND APPARATUS FOR PRODUCING A FALSE COLOUR IMAGE

Markku Rantasuo, and Tuomas Hänse, both of Espoo, Finland, assignors to Valtion teknillinen tutkimuskeskus, Espoo, Finland

PCT No. PCT/FI92/00325, § 371 Date Jul. 18, 1994, § 102(e) Date Jul. 18, 1994, PCT Pub. No. WO93/11630, PCT Pub. Date Jun. 10, 1993
PCT Filed Nov. 27, 1992, Ser. No. 244,433
Claims priority, application Finland, Nov. 27, 1991, 915597
Int. Cl.[6] H04N *9/04;5/33*
U.S. Cl. 348—272 **6 Claims**



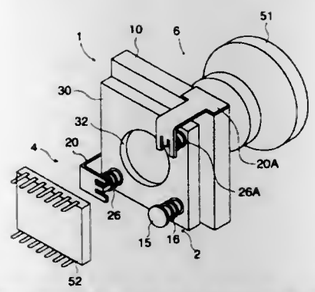
1. A method for producing a false color image, using a video camera provided with first and second arrays of semiconductor detectors, the first and second arrays having a sensitivity range in relation to wavelength extending from visible light to near infrared radiation; and where radiation received in the first and second arrays is filtered, the method comprising:
filtering the radiation received in the first array to provide that only the near infrared radiation (ir) is given access to the first array;
filtering the radiation received in the second array to provide that only the radiation of green (g) and red (r) spectrum ranges are given access to the second array; and
decoding signals (ir, g+r) received from the first and second arrays representing strength of the near infrared radiation (ir) and strength of the radiation of the green (g) and red (r) spectrum ranges, by changing order of the signals to achieve a desired combined false color signal (g+r, ir) in a camera output.

5,557,327
IMAGE INPUT APPARATUS WITH TWO-DIMENSIONAL PIXEL SHIFT

Hiroshi Hasegawa; Takashi Minaki, and Yukinori Koizumi, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 21, 1995, Ser. No. 391,165
Claims priority, application Japan, Feb. 23, 1994, 6-025024
Int. Cl.[6] H04N *5/225*
U.S. Cl. 348—340 **9 Claims**

1. An image input apparatus comprising:
(a) an optical system having an optical path;



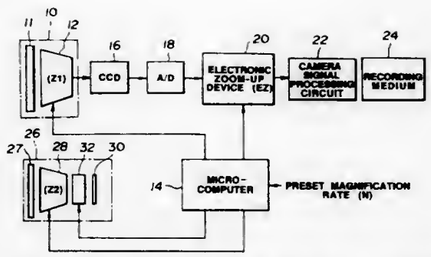
(b) an image reading device having a picture-taking surface, for reading a first image formed onto the picture-taking surface;
(c) a transparent plate member having two flat reflection surfaces which are opposite to and parallel with each other, the plate member being arranged in the optical path of the optical system substantially in parallel with the picture-taking surface of the imaging device so that the image passed through the optical system is transmitted through the transparent plate member;
(d) a tilting means for tilting the plate member with respect to the imaging device so that a second image is formed on the imaging device by moving the first image, the tilting means including,
(1) a support portion for supporting the plate member at a point selected from three points on the plate member which are not aligned on a straight line, the support portion comprising a combination of
a spherical protrusion and
a dent slidably engaged with the spherical protrusion, and
(2) two operating portions for providing a tilting operation at two other points selected from the three points on the plate member,
wherein, when one of the two operating portions is operated, the plate member is tilted around a rotational axis coincident with a straight line connecting the other of the two operating portions with the support portion;
(e) memory means for storing the first and the second images; and
(f) image composing means for synthesizing the first and second images stored in the memory means, thereby an image having a high resolution being obtained.

5,557,328
VIDEO CAMERA HAVING AN IMPROVED ZOOM SYSTEM

Keiko Ishihama, Kanagawa; Tokuya Fukuda, Tokyo; Toshitaka Senuma, Tokyo, and Toru Shiono, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 25,778, Mar. 3, 1993, abandoned.
This application Nov. 23, 1994, Ser. No. 344,520
Claims priority, application Japan, Mar. 11, 1992, 4-052028
Int. Cl.[6] H04N *5/225*
U.S. Cl. 348—358 **19 Claims**

10. A video camera comprising:
input means for inputting a selected magnification rate;
an optical lens unit including focusing means for focusing an image of a scene and first zoom-up means for magnifying the image focused by said focusing means in accordance with the selected magnification rate, said first zoom-up means having a first maximum magnification rate up to which the image is enlargeable;
pickup means for electronically picking up the image magnified by said first zoom-up means and for supplying a digitalized image thereof;
electronic zoom-up means for electronically magnifying the digitalized image supplied by said pickup means when the selected magnification rate exceeds the first maximum magnification rate of said first zoom-up means and for outputting an image to be recorded, the digitalized image being electronically magnified according to an electronic magnification rate of said electronic zoom-up means;



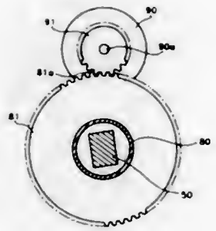
processing means for processing the image to be recorded;
a recording medium on which the processed image is recorded;
a viewfinder disposed optically parallel to said optical means for acquiring a second image of the scene and including second zoom-up means for magnifying the second image and having a second maximum magnification rate not more than a product of the first maximum magnification rate of said first zoom-up means and the electronic magnification rate of said electronic zoom-up means, and a display panel on which the image magnified by said second zoom-up means is displayed;
control means for comparing the selected magnification rate with the first maximum magnification rate of said first zoom-up means and with the second maximum magnification rate of said second zoom-up means, and for setting the electronic magnification rate of said electronic zoom-up means according to the selected magnification and the first maximum magnification rate; and
indicator means for visually indicating a partial area of the image displayed by said display panel which corresponds to the image to be recorded when the selected magnification rate is greater than the second maximum magnification rate of said second zoom-up means, wherein the entire image displayed on said display panel corresponds to the image to be recorded when the second maximum magnification rate of said second zoom-up means is not less than the selected magnification rate.

5,557,329
VIDEO CAMERA HAVING ROTATING MECHANISM FOR ROTATING IMAGE PICKUP WITH RESPECT TO THE CAMERA AND A LENS MOUNT

Tae-hyoung Lim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Dec. 22, 1994, Ser. No. 361,569
Claims priority, application Rep. of Korea, Dec. 24, 1993, 1993-29589
Int. Cl.[6] H04N *5/225*
U.S. Cl. 348—373 **9 Claims**

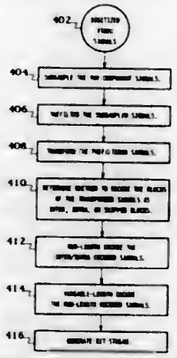
1. A video camera comprising: a group of lenses having an optical axis and forming an optical image from a photographed object, a lens mount for supporting said group of lenses, an image pickup device installed on the optical axis of said group of lenses so as to form said optical image and for converting said optical image into an electric signal, and an image pickup device rotating means for rotating said image pickup device with respect to said lens mount by up to 360° along said optical axis so that said photographed object is displayed on an image medium in a rotated state by a predetermined angle.



5,557,330
ENCODING VIDEO SIGNALS USING SELECTIVE PRE-FILTERING

Brian Astle, Phoenix, Ariz., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 329,524, Oct. 26, 1994, which is a continuation-in-part of Ser. No. 324,923, Oct. 18, 1994. This application Oct. 31, 1994, Ser. No. 332,583
Int. Cl.[6] H04N *7/26*
U.S. Cl. 348—394 **24 Claims**



1. A computer-implemented process for encoding video signals, comprising the steps of:

(a) providing a current video frame;

(b) classifying one or more regions of the current video frame into two or more classes of regions;

(c) applying a first filter to only regions classified as being in a first class to generate first filtered video signals of a filtered image corresponding to the current video frame; and

(d) generating an encoded bit stream for the current video frame using the first filtered video signals, wherein:

the current video frame comprises three component planes;

a first component plane of the three component planes contains more component values than each of a second component plane and a third component plane of the three component planes;

step (b) comprises the step of identifying one or more substantially unchanged regions of the first component plane and one or more substantially changed regions of the first component plane;

step (c) comprises the steps of:

(1) applying the first filter to the one or more substantially unchanged regions of the first component plane to generate first-filtered first-component signals;

(2) applying the first filter to one or more regions of the second component plane corresponding to the one or more substantially unchanged regions of the first component plane to generate first-filtered second-component signals; and

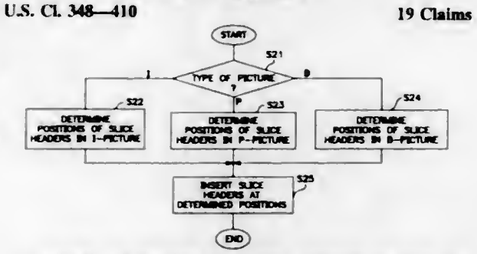
(3) applying the first filter to one or more regions of the third component plane corresponding to the one or more substantially unchanged regions of the first component plane to generate first-filtered third-component signals; and

step (d) comprises the step of generating the encoded bit stream using the first-filtered first-component, second-component, and third-component signals.

5,557,331
IMAGE ENCODING METHOD, AN IMAGE ENCODING CIRCUIT, AN IMAGE ENCODING APPARATUS, AND AN OPTICAL DISK

Masahiro Honjo, Sakai, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 11, 1994, Ser. No. 212,101
Claims priority, application Japan, Mar. 11, 1993, 5-050467
Int. Cl.[6] H04N *7/50*
U.S. Cl. 348—410 **19 Claims**



1. A method for encoding image data comprising the steps of:

specifying a type of a picture in a picture sequence including an I-picture, a P-picture and a B-picture;

determining a position of at least one slice header in the picture in accordance with the type of the picture; and

inserting signals representing at least one slice header within a stream of signals representing the picture at the position determined in the determining step,

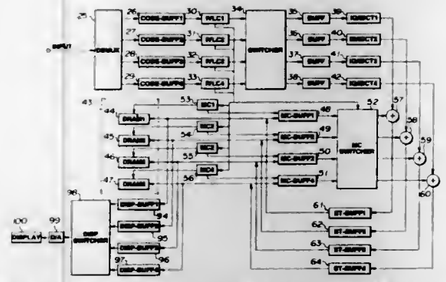
wherein the position of the slice header is determined so that at least one of the relationships $N_i > N_b$ and $N_p > N_b$ is satisfied, where N_i denotes the number of slices in the I-picture, N_p denotes the number of slices in the P-picture and N_b denotes the number of slices in the B-picture.

5,557,332
APPARATUS AND METHOD FOR REPRODUCING A PREDICTION-ENCODED VIDEO SIGNAL

Hideki Koyanagi; Hiroshi Sumihiro, both of Kanagawa; Seiichi Emoto, Tokyo, and Tohsru Wada, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 205,092, Mar. 2, 1994, abandoned. This application May 8, 1995, Ser. No. 437,016
Claims priority, application Japan, Mar. 5, 1993, 5-045112
Int. Cl.[6] H04N *7/12*
U.S. Cl. 398—416 **25 Claims**

1. An apparatus for decoding an input digital video signal which includes groups of blocks of prediction-coded difference data, each of said groups consisting of a predetermined plurality of said blocks and having a respective motion vector associated therewith which is the same for all of said blocks in the respective one of



said groups, each of said blocks of prediction-coded difference data having been formed as a function of the respective motion vector associated with the respective group which includes said block, the apparatus comprising:

a plurality of adding means for adding respective ones of said blocks of prediction-coded difference data contained in one of said groups of blocks and corresponding blocks of distributed reference data to form blocks of decoded data;

supply means for supplying, in parallel, said blocks of prediction—coded difference data contained in said one group thereof to the respective ones of said plurality of adding means; and

reference data means for concurrently supplying said corresponding blocks of distributed reference data to said respective ones of said plurality of adding means, said reference data means including:

a plurality of reference data memories for respectively storing corresponding blocks of reference data from each of a plurality of groups of blocks of reference data so that all the blocks of reference data of each of said plural groups of blocks thereof are stored in respective ones of said plurality of reference data memories, each of said blocks of reference data being formed from previously determined decoded data,

means for reading out portions of said blocks of reference data corresponding to a respective one of said groups of blocks of prediction-coded difference data, said portions being read out in parallel from said plurality of reference data memories as a function of said motion vector associated with said respective one group of blocks of prediction-coded difference data and which is the same for all of said blocks in said one group thereof, said portions being derived from at least one of said groups of reference data without overlap,

a plurality of buffer memories, each corresponding to a respective one of said reference data memories, for temporarily storing respective ones of said portions of the blocks of reference data that are read out from a corresponding respective one of said plurality of reference data memories,

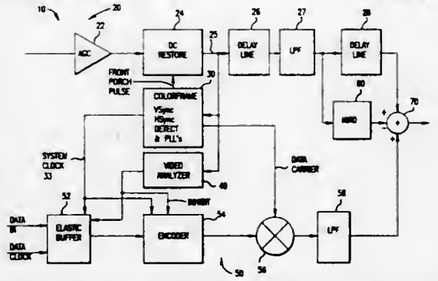
means for reading out, in parallel, from said buffer memories, the temporarily stored portions of said blocks of reference data as a function of said motion vector associated with said respective one group of blocks of prediction-coded difference data and which is the same for all of said blocks in said respective one group thereof, and

distributing means for distributing among said plurality of adding means, as a function of said motion vector associated with said respective one group of blocks of prediction-coded data and which is the same for all of said blocks in said respective one group thereof, said portions of the blocks of reference data being read out from said plurality of buffer memories into blocks of distributed reference data such that respective regions of a video image represented by said blocks of distributed reference data correspond to respective regions of a video image represented by said blocks of prediction-coded difference data without restricting the size of said motion vector associated with said respective one group of blocks of prediction-coded difference data.

5,557,333
SYSTEM FOR TRANSPARENT TRANSMISSION AND RECEPTION OF A SECONDARY DATA SIGNAL WITH A VIDEO SIGNAL IN THE VIDEO BAND

Charles Jungo, Gilbert; Gerald Montgomery, Mesa, and Richard C. Gerdes, Scottsdale, all of Ariz., assignors to WavePhore, Inc., Tempe, Ariz.

Continuation of Ser. No. 715,920, Jun. 14, 1991, Pat. No. 5,327,237. This application Feb. 24, 1994, Ser. No. 201,169
Int. Cl.[6] H04N *7/08*
U.S. Cl. 348—473 **45 Claims**



1. A signal processor for combining data in the same communications channel as a video signal for an image, the video signal having a video bandwidth and having horizontal and vertical blanking interval defined by sync pulses and an active video intervals between blanking intervals, the video signal having luminance and chrominance information frequency interleaved with each other, the data being uncorrelated to the image, the signal processor comprising:

means for receiving a video signal and the data signal;

means for detecting the frequency of at least one of the blanking and active video intervals and the sync pulses; and

means responsive to the detecting means for modulating the data within the video bandwidth with carrier; and

combining the modulated data with the video signal without phase inversion of the data such that the modulated data signal is present during at least some parts of each active video interval but not during the blanking intervals such that the modulated data information is frequency interleaved with both the chrominance and the luminance information such that the phase of the data remains substantially unaltered between successive fields.

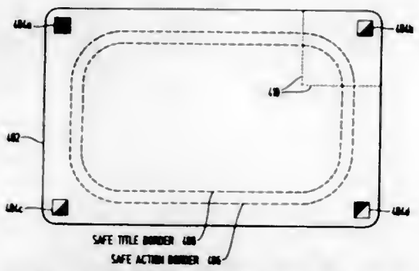
5,557,334
APPARATUS FOR TRACKING THE FLOW OF VIDEO SIGNALS BY INCORPORATING PATTERNS OF MACHINE READABLE SIGNALS WHICH WILL APPEAR AT PREDETERMINED LOCATIONS OF A TELEVISION PICTURE

Kim R. Legate, Valencia, Calif., assignor to Visual Automation Systems, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 3,481, Jan. 12, 1993, Pat. No. 5,450,134. This application Feb. 14, 1995, Ser. No. 388,422
Int. Cl.[6] H04N *5/262*
U.S. Cl. 348—473 **22 Claims**

1. Apparatus for tracking the flow of television programs within a program distribution system, each program including a video signal which contains information to generate a television picture composed of successive television picture frames, the distribution system including a plurality of units through which the television programs flow, said apparatus comprising:

first signal processing means connected within the system for adding signal elements to the video signal of a program in order to add a plurality of patterns of machine readable symbols to a plurality of frames of the television picture such that each of the symbols is disposed substantially at a respective one of a plurality of predetermined locations of a respec-



tive frame of the television picture, wherein the plurality of predetermined locations are composed of a reference location and a plurality of information locations, and symbols at the information locations contain information specific to the program; and

second signal processing means connected within the system for detecting signal elements previously added to a video signal at the information locations of each frame when a given symbol is present at the reference location of that frame and for retrieving, in response to such detection, the information contained in the symbols, wherein

in each frame containing symbols, the information locations have fixed positions relative to the reference location, and said second signal processing means comprise reference position locating means for detecting signal elements previously added to the video signal at the reference location and for determining the present location of those signal elements in each frame.

5,557,335

TIME BASE CORRECTOR FOR VIDEO SIGNAL

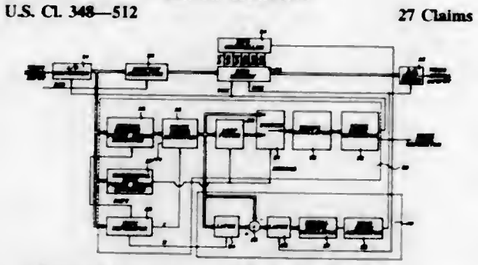
Soon Y. Oh, Kyungki-do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Jan. 20, 1995, Ser. No. 375,828

Claims priority, application Rep. of Korea, Jan. 20, 1994, 1070/1994

Int. Cl.[6] H04N *5/95*

U.S. Cl. 348—512 **27 Claims**



1. A time base corrector for video signal comprising:

an A/D converter for digitally converting an input analog video signal with a sampling clock which is a predetermined number of times the frequency of a chroma carrier signal;

a dropout corrector for correcting the dropout of the digital video signal output from said A/D converter;

a write timing generator for filtering the chroma carrier phase error according to the horizontal sync phase error of the digital video signal output from said A/D converter and generating a write clock which is then output as a sampling clock of said A/D converter;

a FIFO memory for storing the digital video signal output from said dropout corrector according to said write clock output from said write timing generator and outputting the signal according to a read clock;

a FIFO controller for controlling the read/write timing of said FIFO memory; and

a D/A converter for converting the video signal output from said FIFO memory into an analog video signal.

5,557,336

VIDEO RECORDING AND/OR REPRODUCING APPARATUS THAT RECORDS A SIGNAL INDICATING ASPECT RATIO

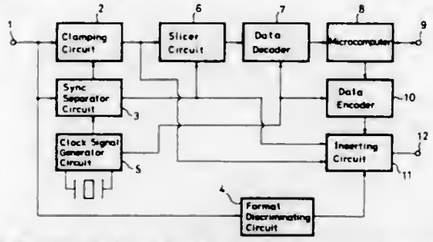
Yasuhisa Nakajima, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 191,763, Feb. 3, 1994, Pat. No. 5,455,631, which is a continuation of Ser. No. 861,029, Mar. 31, 1992, abandoned. This application May 26, 1995, Ser. No. 424,592

Claims priority, application Japan, Apr. 4, 1991, 3-071849

Int. Cl.[6] H04N *5/46*

U.S. Cl. 348—556 **1 Claim**



1. Recording and reproducing apparatus for respectively recording and reproducing on and from a recording medium a video signal having one of two possible aspect ratios, the apparatus comprising:

a clamping circuit, a sync separator circuit, a format discriminating circuit, a clock signal generator circuit, a slicer circuit, a data decoder, a microcomputer, a data encoder, and an inserting circuit, wherein:

a digital composite video signal is supplied to said clamping circuit, said sync separator circuit and said format discriminating circuit,

said clamping circuit produces a clamped video signal output to said slicer circuit and said inserting circuit,

said sync separator circuit produces a sync output signal to said slicer circuit and said inserting circuit,

said format discriminating circuit produces a format discriminating output signal to said inserting circuit,

said clock signal generator circuit produces a clock pulse output signal to said sync separator circuit, said data decoder and said data encoder,

said slicer circuit produces an output to said data decoder,

said data decoder produces an output to said microcomputer,

said microcomputer produces an output to said data encoder, and said data encoder produces an output to said inserting circuit, and wherein:

said inserting circuit modifies said video signal as recorded in response to said format discriminating output signal so as to enable identification of the aspect ratio upon reproduction of said video signal,

said slicer circuit during reproduction supplies an addition data output signal to said data decoder,

said data decoder during reproduction decodes said addition data,

said microcomputer during reproduction determines the aspect ratio of the reproduced signal, and

said data encoder generates an aspect ratio indicating signal during recording.

5,557,337

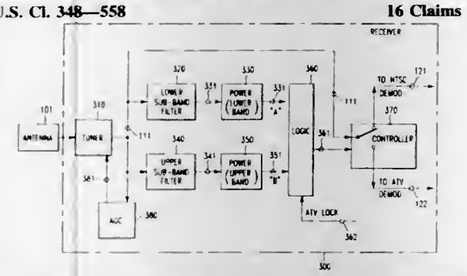
AUTOMATIC TELEVISION SIGNAL DETECTOR TO DIFFERENTIATE NTSC SIGNALS FROM HDJV/AJV SIGNALS

Carl G. Scarpa, Edison, N.J., assignor to Hitachi America, Ltd., Tarrytown, N.Y.

Filed Feb. 18, 1994, Ser. No. 198,992

Int. Cl.[6] H04N *5/46;5/455*

U.S. Cl. 348—558 **16 Claims**



1. A method for automatically switching an incoming intermediate frequency (IF) television signal for processing by either NTSC circuitry or ATV circuitry, the method comprising the steps of

measuring the power in the incoming IF television signal in a sub-band of the NTSC power spectrum having significant spectral energy to produce a first power level,

concurrently measuring the power in the incoming IF television signal in a sub-band of the NTSC power spectrum having minimal spectral energy to produce a second power level, and

switching the incoming IF television signal for processing in response to the relative power between the first power level and the second power level.

5,557,338

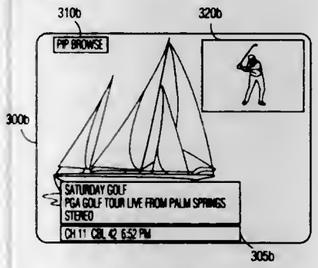
TELEVISION RECEIVER USING RECEIVED CHANNEL GUIDE INFORMATION AND A SECONDARY VIDEO SIGNAL PROCESSOR FOR DISPLAYING SECONDARY CHANNEL INFORMATION

Kenneth W. Maze, and Joseph W. Forler, both of Indianapolis, Ind., assignors to Thomson Consumer Electronics, Inc., Indianapolis, Ind.

Filed Apr. 5, 1995, Ser. No. 419,649

Int. Cl.[6] H04N *5/45;7/173*

U.S. Cl. 348—565 **9 Claims**



1. A television receiver, comprising:

a first tuner and signal processing arrangement for receiving and processing television signals;

a second tuner and signal processing arrangement for receiving and processing television signals;

user-operable data input circuitry adapted to receive user-entered data or commands;

a controller responsive to said user-entered data or commands for generating control signals;

memory circuitry for storing data relating to television shows on a plurality of channels, and storing tuning information for said plurality of channels;

a decoder for receiving and decoding said data relating to television shows on said plurality of channels, said decoder having an output coupled to said controller;

an on-screen display circuit for generating on-screen display signals; and

a secondary image processor for generating signals which when displayed on a display screen cause the display of a secondary image;

said controller, in response to the entering of a BROWSE command by a user maintains a currently-tuned channel on said first tuner for providing a main image, tunes a second channel on said second tuner for providing said secondary image, causes said secondary image processor to display said secondary image and causes said on-screen display circuit to display text relating to a television show currently-running on said second channel.

5,557,339

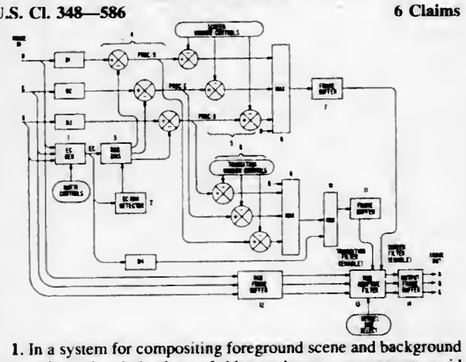
SCREEN FILTERING BOUNDARY DETECTION FOR NOISE FILTERING PRIOR TO IMAGE COMPOSITING

Arpag Dadourian, Northridge, Calif., assignor to Ultimatte Corporation, Chatsworth, Calif.

Continuation-in-part of Ser. No. 48,763, Apr. 15, 1993, abandoned. This application May 9, 1994, Ser. No. 240,881

Int. Cl.[6] H04N *9/74*

U.S. Cl. 348—586 **6 Claims**



1. In a system for compositing foreground scene and background scene video signals having red, blue and green components, said foreground scene video signals corresponding to a foreground scene and said background scene video signals corresponding to a background scene, each of said components having a corresponding video signal level, to obtain a composite video image wherein the foreground scene includes a foreground subject disposed between a colored backing and a camera, said colored backing having a luminance and visibility, said foreground scene video signals defining a portion of the colored backing area which is unobscured, an opaque foreground subject area and a transition area between said unobscured colored backing area and said opaque foreground subject area, wherein filtering is applied to portions of said foreground scene to reduce visual noise in the composite video image, the improvement comprising:

a) means (**101**) for generating a control signal having a level proportional to the luminance and visibility of the colored backing;

b) means (**103**) for adjusting the level of the control signal to match the video signal level of the red, blue and green color components of the video signal for the colored backing;

c) means (**104**) for subtracting the level matched control signal from the foreground scene video signals;

d) means (**105**, **106**, **108**, **109**, **110**) for processing the foreground scene video signals to identify said transition area;

e) means (**113**) for applying a predetermined amount of filtering to said foreground scene video signals corresponding to a

predetermined portion of said transition area prior to process-

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5,557,342

VIDEO DISPLAY APPARATUS FOR DISPLAYING A

5,557,343

OPTICAL SYSTEM INCLUDING A REFLECTING

predetermined portion of said transition area prior to processing of said foreground scene video signals by said processing means.

5,557,340

NOISE REDUCTION IN VIDEO SIGNALS

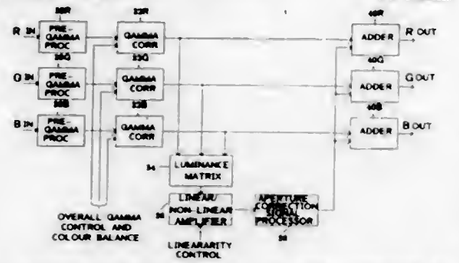
John D. Millward, Hitchin, United Kingdom, assignor to Rank Cintel Limited, United Kingdom

Continuation of Ser. No. 806,665, Dec. 13, 1991, abandoned. This application Nov. 28, 1994, Ser. No. 345,545

Claims priority, applicatioo United Kingdom, Dec. 13, 1990, 9027080

Int. Cl.[6] H04N *9/64*

U.S. Cl. 348—627 **20 Claims**



1. A method of reducing noise in a video signal, comprising the steps of:

a) deriving a luminance signal from said video signal and supplying said luminance signal to a first processing path;

b) supplying said video signal to a second processing path and, in said second processing path, applying gamma correction to at least a portion of the components of said video signal;

c) in said first processing path, applying a controllably variable non-linear adjustment to said luminance signal to obtain an adjusted signal, the characteristic of said variable non-linear adjustment being different from the characteristic of said gamma correction, and then either blocking the low frequency components or enhancing the high frequency components of the adjusted signal to obtain a first processing path processed signal; and

d) combining said non-linearly adjusted luminance signal with said gamma corrected video signal components to create a reduced-noise video signal.

5,557,341

ITERATIVE METHOD FOR ESTIMATING MOTION CONTENT IN VIDEO SIGNALS USING SUCCESSIVELY REDUCED BLOCK SIZE

Peter Weiss, Hagersten, and Björn Christensson, Bandhagen, both of Sweden, assignors to DV Sweden AB, Stockholm, Sweden

PCT No. PCT/SE92/00219, § 371 Date Oct. 8, 1993, § 102(e) Date Oct. 8, 1993, PCT Pub. No. WO92/19068, PCT Pub. Date Oct. 29, 1992

PCT Filed Apr. 3, 1992, Ser. No. 133,089

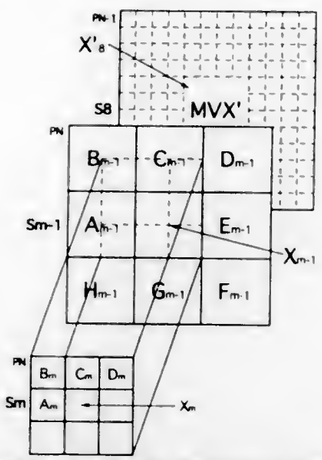
Claims priority, application Sweden, Apr. 12, 1991, 9101113

Int. Cl.[6] H04N *5/14;9/64*

U.S. Cl. 348—699 **24 Claims**

1. An iterative block-matching method for determining a final motion vector for blocks of a predetermined minimum size, the block being within a selected image I_s, the selected image I_s being one in a sequence of digital images, the method using successively reduced block size of the same resolution as blocks of previous sizes, the method comprising the steps of:

a) selecting one of the images in the sequence as the selected image I_s;



b) dividing the selected image I_s into blocks of a predetermined maximum size;

c) selecting at least one reference image I_r from among the remaining images in the sequence for comparison against the selected image I_s;

d) selecting one of the blocks of pixels, within the selected image I_s, upon which to operate;

e) determining a motion vector between the selected block within the selected image I_s and a corresponding area within the reference image I_r;

wherein the step e) includes the steps f)–i) as follows:

f) predicting a motion vector for the selected block as a function of at least one predetermined motion vector value, the predicted motion vector representing predicted movement of the selected block between a position P_0 in the selected image I_s and a position P_p in the reference image I_r;

g) establishing, according to a predetermined search pattern, a plurality of meta blocks in the reference image I_r such that each meta block is located near the position P_p,

the search pattern being a configuration of search points, each meta block having a center located on a search point;

h) determining a degree of similarity between each meta block and the selected block by calculating a matching criterion; and

i) selecting the meta block with the matching criterion that most probably corresponds to actual motion of the selected block between the selected image I_s and the reference image I_r,

thereby selecting a temporary motion vector pointing between the position P0 in the selected block and the search point about which is centered the selected meta block;

j) repeatedly performing, until there is selected a temporary motion vector for each of the blocks of the selected image I_s, the substeps of:

j1) selecting another block of pixels as the selected block from among the remaining block or blocks, within the selected image I_s, upon which to operate; and

j2) performing the step e) for the newly selected block;

k) repeatedly performing, until there is selected a temporary motion vector for each of the blocks of the predetermined minimum size within the selected image I_s, the substeps of:

k1) reducing, if the size of the selected block is greater than the predetermined minimum size, the size of the selected block by dividing the selected image I_s into smaller blocks, while preserving the resolution thereof; and

k2) performing the steps d)–k); and

l) establishing, after the step j), the temporary motion vector as the final motion vector for each of the predetermined minimum size blocks in the selected image I_s, thereby forming a final motion vector field therefor.

5,557,342

VIDEO DISPLAY APPARATUS FOR DISPLAYING A PLURALITY OF VIDEO SIGNALS HAVING DIFFERENT SCANNING FREQUENCIES AND A MULTI-SCREEN DISPLAY SYSTEM USING THE VIDEO DISPLAY APPARATUS

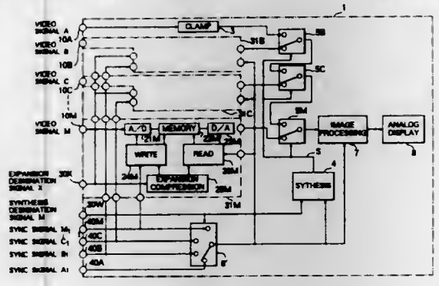
Masahiro Eto, Mobara; Hiroyuki Urata, Yokohama; Fumio Inoue, Yokohama; Masanori Ogino, Yokohama; Atsushi Maruyama, Fujisawa, and Kiyoshi Yamamoto, Yokohama, all of Japan, assignors to Hitachit, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 227,019, Apr. 13, 1994, abandoned. This application Apr. 19, 1995, Ser. No. 425,698

Claims priority, application Japan, Jul. 6, 1993, 5-166611; Nov. 29, 1993, 5-298066

Int. Cl.[6] H04N *5/262*

U.S. Cl. 348—706 **50 Claims**



1. A video display apparatus for displaying on a display a video signal applied thereto from an input terminal for an external video signal, comprising:

a housing;

a plurality of video input means for receiving a plurality of video signals having different scanning frequencies;

expansion/compression signal input means for receiving an expansion/compression designation signal for expanding/compressing selected one of said video signals;

synthesis signal input control means for producing a synthesis control signal for synthesizing selected one of said video signals in response to a synthesis designation signal;

a plurality of sync signal input means for supplying sync signals containing horizontal and vertical sync signals corresponding to said video signals respectively;

a sync switching circuit for selecting one of said sync signals;

a plurality of expansion/compression processing circuits replaceably mounted on said housing for receiving said video signals having different scanning frequencies, expanding/compressing said received video signals in accordance with said expansion/compression designation signal and producing at least one of the video signals expanded/compressed in synchronism with the sync signal selected by said sync switching circuit;

a video signal synthesis circuit for synthesizing at least one of the video signals produced from the expansion/compression processing circuit with another one of the video signals in accordance with said synthesis control signal and producing selected one of a synthesized video signal and said plurality of video signals containing said another video signal; and

an image processing circuit for generating a video display signal from said video signal of said video signal synthesis circuit in synchronism with the sync signal selected by said sync switching circuit and applying the video display signal to a display.

5,557,343

OPTICAL SYSTEM INCLUDING A REFLECTING POLARIZER FOR A REAR PROJECTION PICTURE DISPLAY APPARATUS

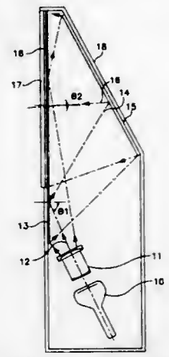
Shigekazu Yamagishi, Takatsuki, Japan, assignor to Matsushita Electric Industrial, Co., Ltd., Osaka, Japan

Filed Jan. 26, 1995, Ser. No. 378,795

Claims priority, application Japan, Jan. 28, 1994, 6-008013

Int. Cl.[6] H04N *5/74*

U.S. Cl. 348—781 **6 Claims**



1. An optical system for a rear projection picture display apparatus comprising:

a picture display unit for generating a picture corresponding to an input video signal;

a projection lens for magnifying and projecting said picture to produce a magnified picture;

a first plane mirror positioned between a second plane mirror and a screen, said first plane mirror having a plane of incidence for receiving and reflecting said magnified picture to produce a reflected magnified picture, wherein said magnified picture is comprised of P-polarized light oscillating in a direction parallel to the plane of incidence and S-polarized light oscillating in a direction perpendicular to the plane of incidence;

said second plane mirror for receiving and reflecting said reflected magnified picture to produce a further reflected magnified picture; and

said screen for displaying said further reflected magnified picture, said screen including a polarizing plate for absorbing light forming said further reflected magnified picture oscillating in a parallel direction relative to said incidence plane;

wherein a first incident angle of light forming said magnified picture relative to said first plane mirror is larger than a second incident angle of light forming said further reflected magnified picture relative to said second plane mirror.

5,557,344

MULTI-BEAM GROUP ELECTRON GUN FOR COLOR CRT

Hsing-Yao Chen, Barrington, Ill., assignor to Chunghwa Picture Tubes, Ltd., Taoyuan, Taiwan

Filed Feb. 7, 1994, Ser. No. 192,819

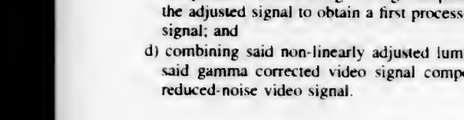
Int. Cl.[6] H04N *3/28*

U.S. Cl. 348—809 **22 Claims**

1. An inline electron gun for a multi-beam color cathode ray tube (CRT) including a display screen whereon a video image is formed by sweeping a plurality of horizontally aligned electron beams over a plurality of vertically spaced, horizontal scan lines in a raster-like manner, wherein each electron beam provides one of the three primary colors of red, green or blue of the video image, said electron gun comprising:

cathode means for providing energetic electrons;

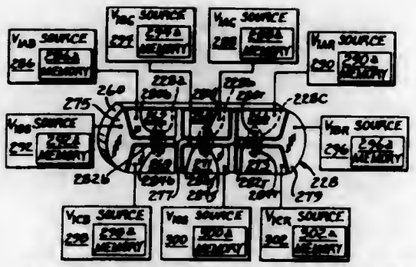
a beam forming region (BFR) disposed adjacent to said cathode means and including first and second spaced charged,



therebetween, each of the lens frames receiving and support-

(6) decrypting in said receiver said encrypted verification string

ground based high energy laser and position of said high



grids respectively having first and second arrays of spaced apertures for forming the energetic electrons into a plurality of beams, wherein each of said first and second arrays of apertures include upper and lower horizontally aligned apertures for passing horizontally aligned electron beams providing the three primary colors of red, green and blue for upper and lower horizontal scan lines, respectively, and wherein the apertures in said first and second arrays are further grouped in vertical alignment so as to form vertically grouped electron beams with the electron beams in each vertical group providing one of the primary colors on a respective horizontal scan line, wherein vertical spacing between adjacent upper and lower apertures is given by S_V and horizontal spacing between vertically aligned groups of apertures is given by S_H, with $\frac{1}{20}$ $S_H \leqq S_V \leqq \frac{1}{2}$ S_H, and wherein said first grid includes a plurality of first and second vertically spaced, horizontally aligned charged portions each including a respective aperture of said first array of apertures and having essentially equal capacitance;

common lens means disposed intermediate said BFR and the CRT's display screen for focusing the electron beams on the display screen; and

convergence means disposed intermediate said common lens means and the display screen for converging the electron beams into an upper and lower spot on the display screen, wherein said upper and lower spots are swept over adjacent upper and lower horizontal scan lines, respectively.

5,557,345

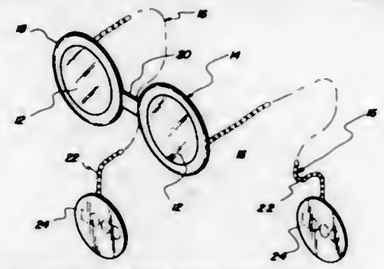
INTERCHANGEABLE TETHERED GLASSES

Betty L. Katzenmeyer, and Kent R. Katzenmeyer, both of 103 Walker St., Evansville, Wis. 53536

Filed Mar. 13, 1995, Ser. No. 402,638

Int. Cl.[6] G02C *1/00;11/02;* **A44C** *13/00*

U.S. Cl. 351—66 **12 Claims**



1. Interchangeable tethered glasses comprising:

a pair of lenses;

a frame means for supporting the lenses over eyes of an individual;

ear engaging means coupled to opposed ends of the frame means for engaging ears of an individual to secure the frame means and lenses relative thereto,

wherein the frame means comprises a pair of lens frames supported in a spaced relationship by a nose bridge extending therebetween, each of the lens frames receiving and supporting an individual one of the lenses,

wherein the ear engaging means comprise a pair of tethers each coupled to an individual one of opposed outboard lateral portions of the frame means, the tethers each extending from the frame means and terminating in a free distal end; a pair of weights; and coupling means for securing each of the weights to the free distal end of an individual one of the tethers,

wherein the coupling means comprises a ring extending through an aperture in the weight, the ring being coupled to the free distal end of the respective tether,

wherein the coupling means further comprises a substantially J-shaped clip coupled to the ring and the free distal end of the tether to permit selective removal of the respective weight, and

wherein the coupling means further comprises a decorative facia coupled to a front face of the J-shaped clip so as to disguise the clip from view.

5,557,346

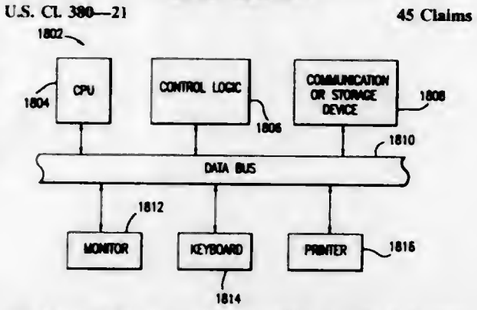
SYSTEM AND METHOD FOR KEY ESCROW ENCRYPTION

Steven B. Lipner, Oakton, Va.; David M. Balenson, Olney, Md.; Carl M. Ellison, Baltimore, Md., and Stephen T. Walker, Glenwood, Md., assignors to Trusted Information Systems, Inc., Glenwood, Md.

Filed Aug. 11, 1994, Ser. No. 289,602

Int. Cl.[6] H04L *9/08*

U.S. Cl. 380—21 **45 Claims**



1. A method for key escrow cryptography for use in a system comprising a sender and a receiver, in which only public escrow keys are stored in said sender and said receiver, a session key being available to said sender and said receiver, comprising the steps of:

(1) encrypting in said sender a message using said session key to form an encrypted message;

(2) generating in said sender a verification string by combining an unique program identifier, a public portion of a program unique key, and a signature representing said unique program identifier and the public portion of said program unique key signed by a private portion of a key escrow programming facility key, and encrypting in said sender said verification string using said session key to generate an encrypted verification string;

(3) encrypting in said sender said session key using the public portion of said program unique key to generate a first encrypted session key;

(4) generating in said sender a first law enforcement access field by encrypting a combination of said first encrypted session key and said unique program identifier with a copy of a public portion of a family key stored in said sender;

(5) transmitting said encrypted message, said encrypted verification string, and said first law enforcement access field from said sender to said receiver, said receiver having stored therein a public portion of said key escrow programming facility key and the public portion of said program unique key;

(6) decrypting in said receiver said encrypted verification string using said session key to recover said verification string, and extracting in said receiver unique program identifier, the public portion of said program unique key, and said signature from said verification string;

(7) verifying in said receiver that said signature corresponds to said extracted unique program identifier and the public portion of said program unique key;

(8) if said signature is verified to correspond to said extracted unique program identifier and the public portion of said program unique key, then encrypting in said receiver said session key using said extracted public portion of said program unique key to generate a second encrypted session key;

(9) generating in said receiver a second law enforcement access field by encrypting a combination of said second encrypted session key and said extracted unique program identifier with a copy of the public portion of said family key stored in said receiver;

(10) comparing in said receiver said first law enforcement access field to said second law enforcement access field; and

(11) if said first law enforcement access field is equal to said second law enforcement access field, then decrypting in said receiver said encrypted message using said session key.

5,557,347

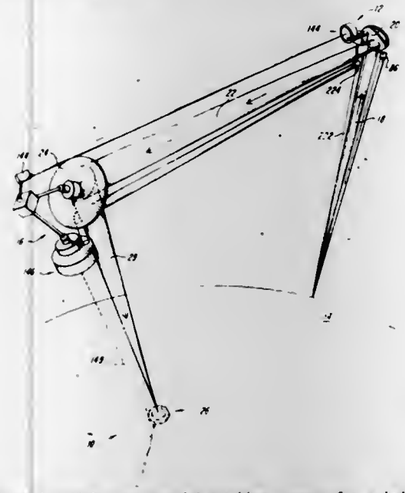
BALLISTIC MISSILE BORESIGHT AND INERTIAL TRACKING SYSTEM AND METHOD

William M. Johnson, Sudbury, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 927,266, Nov. 4, 1986, abandoned. This application May 1, 1990, Ser. No. 517,147

Int. Cl.[6] G01B *11/26;* **G01J** *1/20;* **G01C** *21/02;* **B64D** *1/04*

U.S. Cl. 356—139.08 **54 Claims**



54. A boresight and inertial tracking system for a ballistic missile destruction system including an earth station having a ground based high energy laser providing an outgoing beam, and a high altitude satellite moving with predetermined velocities and distances with respect to said earth station and having a relay mirror and a beacon laser, said high energy laser and said beacon laser being in confronting relation and respectively providing outgoing and incoming energy that are offset with preselected aimpoint lead angles selected such that the source and beacon laser taking into account said propagation velocities and distances traverse substantially the same column of atmosphere, comprising:

atmospheric uplink indirect alignment means including a laser separator having an optical aperture for aligning at said optical aperture common wavelength outgoing and incoming beams representative respectively of pointing direction of said ground based high energy laser and position of said high altitude satellite relay mirror;

atmospheric uplink direct alignment means operative in response to said incoming beam to provide direct boresight blooming autocollimation of the pointing direction of the outgoing beam; and

spacelink alignment transfer means including an inertial tracker having a narrow spectral response sensor tuned to said common wavelength for providing the space-time coordinates of a low altitude target relay mirror associated with a low altitude satellite remote from the inertial tracker and for transferring the energy incident on the high altitude satellite relay mirror from the high energy laser towards and onto the space-time coordinates of the target relay mirror of the low altitude satellite;

said ballistic missile has a photon limited vacuum core spectral line emission having a wavelength, and wherein said common wavelength is selected to be equal to the wavelength of said vacuum core line emission of the ballistic missile.

5,557,348

PROGRESSIVE POWER LENS

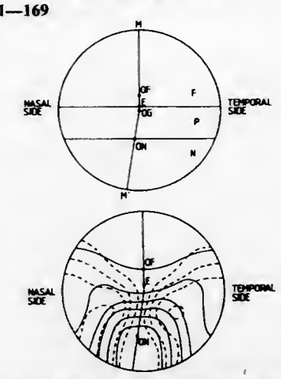
Toshiaki Umeda, Tokyo, and Fumio Takahashi, Ibaraki-ken, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jun. 28, 1994, Ser. No. 266,545

Claims priority, application Japan, Jun. 29, 1993, 5-184412

Int. Cl.[6] G02C *7/06*

U.S. Cl. 351—169 **7 Claims**



1. A progressive power lens comprising, along a principal meridional curve, a portion for distance vision having a refracting power corresponding to a distant view, a portion for near vision having a refracting power corresponding to a near view, and an intermediate portion, located between said portion for distance vision and said portion for near vision, for continuously connecting the refracting powers of said portion for distance vision and said portion for near vision,

wherein, when a mean refracting power, in diopters, of a lens refracting surface at a center for distance vision is S_0, an additional power of said lens refracting surface is A_D, a mean power, in diopters, of each point of said lens refracting surface is S_E, and a difference between the mean power S_E of each point of the lens refracting surface and said mean power S_0 of said center for distance vision is $\Delta S_E = S_E - S_0$, the lens satisfies the following condition from a center for distance vision to lateral side areas of said center for distance vision, as considered in a state in which said lens is worn:

$$-0.50 \leqq \Delta S_E \leqq A_D/3.$$

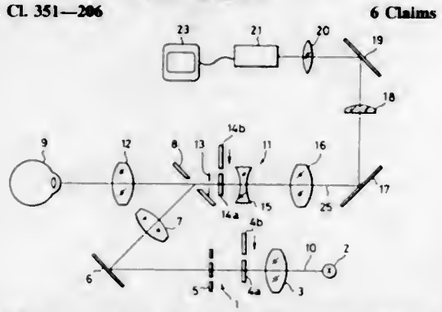
5,557,349

FUNDUS CAMERA FOR INFRARED FLUORSEIN

a position detection optical system for detecting the position of a bright spot of a corneal reflection formed by the alignment

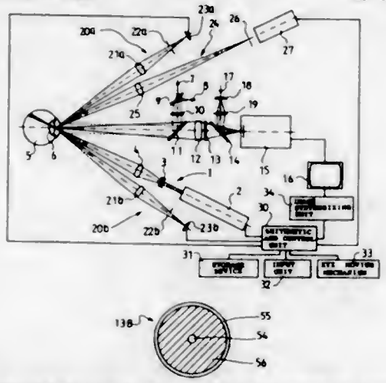
target point and peripheral target points thereof, to one of which the cornea reflected light of the alignment indicator

5,557,349
FUNDUS CAMERA FOR INFRARED FLUORSEIN ANGIOGRAPHY
Shin Yoneya, Maebashi, and Masayuki Takasu, Tokyo-to, both of Japan, assignors to Kabushiki Kaisha TOPCON, Tokyo-to, Japan
Filed Jan. 13, 1995, Ser. No. 372,223
Int. Cl.[6] A61B *3/14*
U.S. Cl. 351—206 **6 Claims**



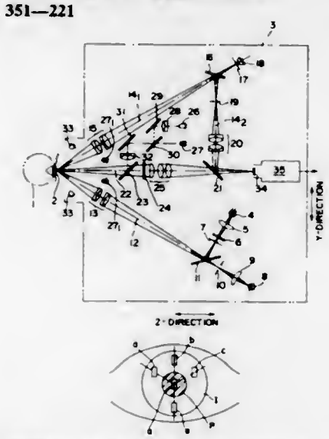
1. A fundus camera, comprising a retina illuminating system for projecting infrared illuminating light beam to the retina to be examined, a first barrier filter having a first transmission wavelength range in the infrared wavelength range and a second barrier filter having a second transmission wavelength range in the infrared wavelength range shifted toward longer wavelength with respect to the first transmission wavelength range, said first and said second barrier filters being interchangeable with each other, and a photographing system for angiography of the retina to be examined through either the first or the second barrier filters, said first and said second barrier filters being arranged in said photographing system.

5,557,350
OPHTHALMOMETRIC APPARATUS WITH ALIGNMENT DEVICE INCLUDING FILTER MEANS
Nobuyuki Yano, Okazaki, Japan, assignor to Nidek Co. Ltd., Japan
Filed Mar. 14, 1995, Ser. No. 403,662
Claims priority, application Japan, Apr. 15, 1994, 6-102169
Int. Cl.[6] A61B *3/14;3/10*
U.S. Cl. 351—208 **13 Claims**



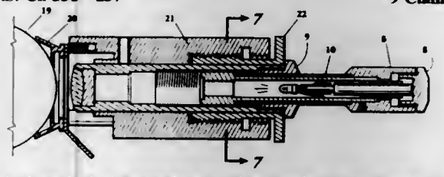
1. An ophthalmometric apparatus having a measuring system to be positioned relative to an objective part in the examinee's eye, said measuring system including a measuring light rays projecting system for protecting measuring light rays into an examinee's eye, comprising:
an alignment light projecting system for projecting alignment light rays on the examinee's eye;
a position detection optical system for detecting the position of a bright spot of a corneal reflection formed by the alignment light projecting system;
a position calculating means for calculating position data representing the position of the examinee's eye relative to the reference position of the ophthalmometric apparatus on the basis of detection data provided by the position detecting optical system; and
an observation optical system for observing the front of the examinee's eye, including an optical element which intercepts a part of the alignment light rays reflected by the cornea, and transmits the observing light rays from the front of the examinee's eye.

5,557,351
APPARATUS FOR OBTAINING VISUAL IMAGES OF CORNEA CELLS AND METHOD FOR DISPLAYING IMAGING-POSITION AROUND CORNEA FOR THE APPARATUS
Tatsuya Kasahara; Yoichi Hamada, and Yoshizo Ikegami, all of Nishinomiya, Japan, assignors to Konan Inc., Hyogo, Japan
Filed Sep. 22, 1994, Ser. No. 310,642
Claims priority, application Japan, Sep. 22, 1993, 5-259445; Oct. 8, 1993, 5-277714
Int. Cl.[6] A61B *3/10;3/14*
U.S. Cl. 351—221 **8 Claims**



1. An apparatus for obtaining visual images of cornea cells comprising:
an illumination optical system for illuminating through a slit an eyeball surface of a subject eye;
a magnification-imaging optical system for forming a magnified image of a subject part on an image receiving surface of a TV camera, based on slit illumination light with which the eyeball surface has been illuminated;
focusing-detection use receiving optics set in such a position as to receive cornea reflected light of the slit light via at least an objective lens;
an eye-front imaging optical system for obtaining a front image of the eye based on eye-front illumination light;
a plurality of view targets including a center view target set as opposed to the subject eye and composed of on-off switchable visible-light sources;
an alignment indicator light projection means for projecting alignment indicator light toward the subject eye;
a cornea-reflected-light receiving means for receiving cornea reflected light of the alignment indicator light;
a plurality of specified target points arranged on a photoreceptor of the reflected-light receiving means including a central target point and peripheral target points thereof, to one of which the cornea reflected light of the alignment indicator light chases; and
a means for moving the imaging system relative to the subject eye depending on output from the light receiving means so that the cornea reflected light of the alignment indicator light is brought to one of the plurality of target points on the photoreceptor of the light receiving means,
wherein each of said view targets corresponds to the respective target point on the photoreceptor and the reflected alignment indicator light chases the one of the plurality of target points when the corresponding view target is turned on.

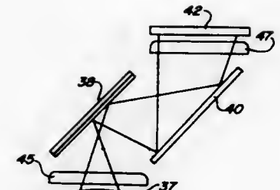
5,557,352
METHOD AND APPARATUS FOR MEASURING THE VISUAL ACUITY OF THE HUMAN EYE DURING AND IMMEDIATELY AFTER OCULAR SURGERY
Robert E. Nordquist, Oklahoma City, Okla., assignor to Wound Healing of Oklahoma, Oklahoma City, Okla.
Filed Jan. 12, 1995, Ser. No. 371,957
Int. Cl.[6] A61B *3/02;3/00*
U.S. Cl. 351—237 **9 Claims**



1. A method of measuring the visual acuity of the human eye during and immediately after ocular surgery, said surgery being of the type wherein a fixation ring is positioned upon the cornea so as to be coaxial with the visual axis of the eye and a support housing is coaxially supported upon said fixation ring, said support housing having a cylindrical bore extending coaxially above the visual axis of the eye, which comprises:
(a) inserting a measuring means into said cylindrical bore of said support housing, said measuring means having a smooth, cylindrical profile complementary to that of said cylindrical bore so as to be laterally stable when inserted therein and a flange for abutting an upper surface of said support housing so as to be stably seated upon said support housing after insertion, said measuring means thus being supported anterior to, and in line with the visual axis of, said eye; and
(b) measuring the visual acuity of said eye using patient responses to visual prompts emanating from a target contained within said measuring means.

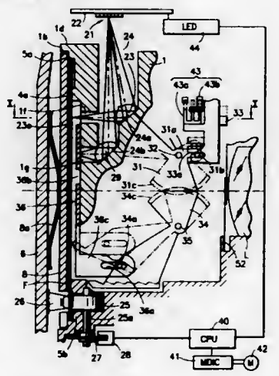
5,557,353
PIXEL COMPENSATED ELECTRO-OPTICAL DISPLAY SYSTEM
Thomas D. Stahl, 2 Acorn St., Portola Valley, Calif. 94028
Filed Apr. 22, 1994, Ser. No. 231,296
Int. Cl.[6] G03B *21/28*
U.S. Cl. 353—69 **20 Claims**

1. A pixel compensated electro-optical display system, said system comprising:
a light source;
at least one reflective image display plane, said plane comprising a plurality of pixels, each of said pixels having a front surface, said front surface of each of said pixels having a length and a width, said length of said front surface being greater than said width of said front surface, said reflective image display plane being disposed at an acute angle with respect to said light source;
a first surface mirror; and
at least one projection surface;



whereby said at least one reflective image display plane substantially compensates for image distortion between said light source and said at least one projection surface.

5,557,354
CAMERA EQUIPPED WITH DATA IMPRINTING DEVICE
Hidenori Miyamoto; Isao Soshi, and Hiroshi Wakabayashi, all of Tokyo, Japan, assignors to Nikon Corporation, Tokyo, Japan
Division of Ser. No. 67,676, May 26, 1993, Pat. No. 5,473,397.
This application Jun. 7, 1995, Ser. No. 478,729
Claims priority, application Japan, May 26, 1992, 4-133490
Int. Cl.[6] G03B *17/24*
U.S. Cl. 354—106 **2 Claims**



1. A camera comprising:
a single light source producing a plurality of light beams, each light beam traveling an independent optical path;
a first part of said device for directing said plurality of light beams emitted from said single light source on desired areas of a screen through a plurality of associated imprinting apertures; and
a second part of said device for selectively blocking said optical path of at least one of said plurality of light beams, thereby preventing said at least one of said plurality of light beams from passing through its associated aperture.

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(d) a condenser lens provided between the second window and

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APPARATUS FOR CONTROLLING AN OPERATION OF A

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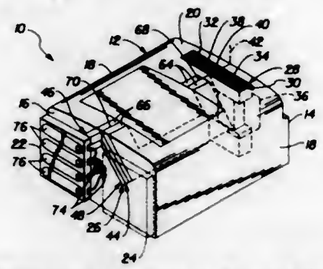
HIGH OUTPUT MAGNETIC HEAD WITH SMALL PHYSICAL DIMENSIONS
Dennis F. Cullum, Leucadia, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 3, 1994, Ser. No. 316,999
Int. Cl.[6] G03B *17/24;* **G11B** *5/235;5/187;5/147*
U.S. Cl. 354—106 **17 Claims**

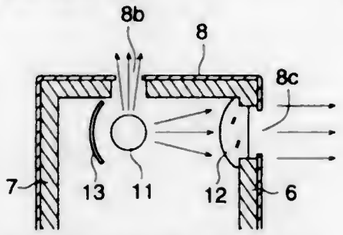


1. A magnetic head for a camera for use with a film having a magnetic memory region wherein said head comprises a first track-forming portion for at least reading information from the magnetic memory region of said film, said track-forming portion including a core forming a magnetic circuit and having spaced areas generally parallel with the film for allowing wire to be wound thereon and a non-magnetic gap between the spaced areas, said core comprising a pair of pole pieces and said head being characterized in that:

each of said pole pieces is generally flat having first and second arms extending to one side from opposite ends of one of said spaced areas and lying generally in a common plane therewith, said arms each having an end; and in which

said pole pieces are disposed at a substantial angle with said ends of their first and second arms, respectively, in closely opposed relation, said ends of said first arms being magnetically spaced to form said non-magnetic gap.

5,557,356
LENS-FITTED PHOTOGRAPHIC FILM UNIT
Ken Ishida, and Yaichi Iijima, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan
Filed Sep. 8, 1995, Ser. No. 525,031
Claims priority, application Japan, Sep. 13, 1994, 6-218946
Int. Cl.[6] G03B *15/05*
U.S. Cl. 354—149.11 **2 Claims**



1. A lens-fitted photographic film unit comprising:

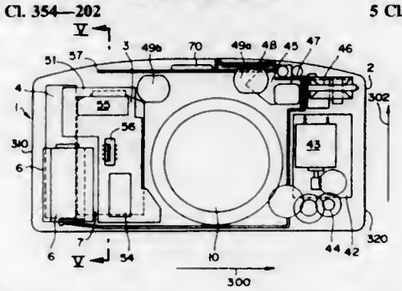
(a) an electronic flash provided inside the film unit;

(b) a neon lamp provided inside the film unit, for lighting or flickering when a charging voltage for the electronic flash reaches a predetermined value;

(c) an external member having a first window provided a part of the external member through which a light emitted from the neon lamp is observed, and a second window provided on a front surface of the external member through which the light emitted from the neon lamp is irradiated toward an object to be photographed; and

(d) a condenser lens provided between the second window and the neon lamp, for converging the light emitted from the neon lamp.

5,557,357
CAMERA HAVING ANTI-VIBRATION FUNCTION WITH IMPROVED CONNECTION AND PLACEMENT OF ANTI-VIBRATION COMPONENTS
Isao Soshi, Tokyo; Hidenori Miyamoto, Urayasu; Minoru Kato; Junichi Omi, both of Kawasaki; Tatsuo Amanuma, Ageo; Jirou Asami, Higashimurayama, and Yoshio Imura, Kawasaki, all of Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Dec. 14, 1994, Ser. No. 356,002
Claims priority, application Japan, Dec. 14, 1993, 5-313712; Dec. 14, 1993, 5-313713; Feb. 4, 1994, 6-032053; Apr. 8, 1994, 6-093947
Int. Cl.[6] G03B *17/02*
U.S. Cl. 354—202 **5 Claims**



1. A camera comprising:

a camera body having first and second ends;

a photographic lens which is positioned on the camera body between the first end and the second end;

a battery compartment positioned in the first end of the camera body;

first and second anti-vibration sensors which detect vibrations affecting the camera and are positioned in the first end of the camera body, the first anti-vibration sensor being positioned approximately between the battery compartment and the photographic lens; and

a main capacitor which generates an electric flash and is positioned in the first end of the camera body.

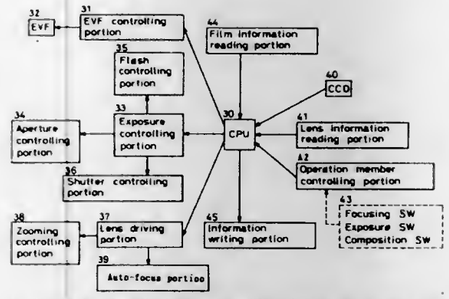
5,557,358
CAMERA HAVING AN ELECTRONIC VIEWFINDER FOR DISPLAYING AN OBJECT IMAGE UNDER DIFFERENT PHOTOGRAPHIC CONDITIONS
Hiromu Mukai; Yasuo Maeda, both of Kawachinagano; Shigeto Ohmori, and Jun Ishihara, both of Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 959,264, Oct. 9, 1992, abandoned. This application Jun. 24, 1994, Ser. No. 265,629
Claims priority, application Japan, Oct. 11, 1991, 3-292318; Dec. 16, 1991, 3-353515; Dec. 16, 1991, 3-353516; Dec. 18, 1991, 3-354780; Dec. 18, 1991, 3-354781
Int. Cl.[6] G03B *13/02*
U.S. Cl. 354—219 **16 Claims**

15. A camera comprising:

an image sensor which receives light incident from an object to be captured and outputs object image data;

means for controlling a reset time of said image sensor to output various object image data for the same object, each of which corresponds to a respective different exposure value;

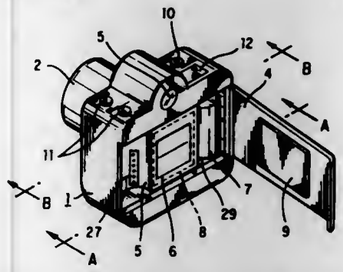
a memory which stores said object image data;



a viewfinder for displaying an object image by means of the object image data; and

a circuit which controls said viewfinder to display simultaneously a plurality of images of the same object.

5,557,359
CAMERA INCLUDING SHUTTER CONTROL AND METHOD
Masanori Hasuda, Kanagawa-ken; Akira Katayama, Tokyo; Yukio Uemura, Tokyo, and Tetsuro Goto, Chiba, all of Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Jun. 13, 1994, Ser. No. 258,727
Claims priority, application Japan, Jun. 17, 1993, 5-171113; Jun. 21, 1993, 5-173795
Int. Cl.[6] G03B *7/00;7/26;9/06*
U.S. Cl. 354—234.1 **47 Claims**



1. A camera including a photographic recording medium exposeable to light to record a photographic image, the camera comprising:

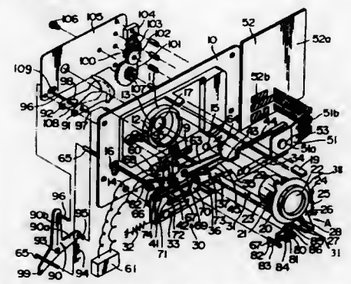
a shutter that regulates an exposure time of the recording medium;

a shutter measuring device coupled to said shutter, said shutter measuring device measuring a time during which the shutter exposes the recording medium;

a determining means that determines a type of recording medium, the type being one of infrared sensitive and non-infrared sensitive; and

a controller coupled to said shutter measuring device, said controller controlling operation of said shutter measuring device in accordance with at least one of the type of said recording medium and a voltage amount supplied to said shutter measuring device.

5,557,360
APPARATUS FOR CONTROLLING AN OPERATION OF A SHUTTER
Takumi Kobayashi, Sakado, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 139,977, Oct. 21, 1993, abandoned, which is a continuation of Ser. No. 824,567, Jan. 23, 1992, abandoned. This application Dec. 13, 1994, Ser. No. 358,579
Claims priority, application Japan, Jan. 23, 1991, 3-024991 U
Int. Cl.[6] G03B *9/08;9/58*
U.S. Cl. 354—230 **21 Claims**



1. An apparatus for controlling an operation of a shutter including at least one shutter sector by which a size of an aperture is defined, said apparatus comprising:

a shutter control member which is linearly moved in one direction upon a shutter opening operation;

a curved sector cam surface formed on the shutter control member and having a varying surface slope, said sector cam surface defining opening areas of a shutter aperture, and said varying surface slope defining varying opening speeds of said shutter aperture,

a linkage for converting said varying surface slope to a corresponding varying opening speed of said shutter sector, said linkage including a cam follower element continuously and directly contacting and following said varying surface slope of said sector cam surface during said shutter opening operation, said opening speed of the aperture being regulated in response to different contacting positions of said element to said varying slope of said curved sector cam surface.

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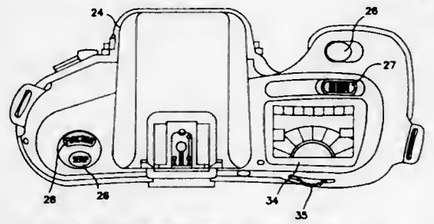
DEVICE FOR SETTING CAMERA INFORMATION USING A REDUCED NUMBER OF OPERATING MEMBERS
Yoshiharu Inoue, and Kimio Uematsu, both of Tokyo, Japan, assignors to Nikon Corporation, Tokyo, Japan
Filed Sep. 7, 1995, Ser. No. 524,690
Claims priority, application Japan, Sep. 7, 1994, 6-214082
Int. Cl.[6] G03B *17/00;17/18;15/03*
U.S. Cl. 354—289.1 **5 Claims**



1. A setting device to set camera data, comprising:

a first operating member;

a first setting input device which is switched ON when the first operating member is operated;

a second operating member;

a second setting input device which is switched ON when the second operating member is operated;
a third operating member;
a third setting input device which outputs a signal according to an operation of the third operating member;
a first memory to store first setting data;
a second memory to store second setting data;
a third memory to store one of a first state which selects the first setting data and a second state which selects the second setting data;
a first display to display one of the first and second setting data according to the state stored by the third memory;
a second display to display one of the first setting data stored in the first memory and the second setting data stored in the second memory according to the content of the third memory;
a first control unit to change a state stored in the third memory according to an output signal of the third setting input device when the first setting input device is ON;
a second control unit to change the content of the first memory, when the third memory stores the first state, according to the output signal of the third setting device when the second setting input device is ON; and
a third control unit to change the content of the second memory, when the third memory stores the second state, according to the output signal of the third setting device when the second setting input device is ON.

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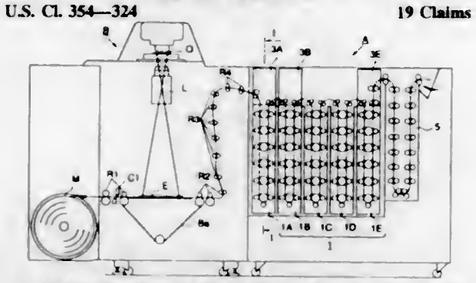
SILVER HALIDE PHOTOSENSITIVE MATERIAL AUTOMATIC DEVELOPING APPARATUS

Yutaka Ueda, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Jun. 12, 1995, Ser. No. 489,381
Claims priority, application Japan, Jun. 16, 1994, 6-13474
Int. Cl.[6] G03D *3/02*
U.S. Cl. 354—324 **19 Claims**



1. An apparatus for processing a silver halide color photographic material with a processing solution, comprising:
a color developing tank in which a color developing solution is stored, wherein a volume of a color developing solution in the color developing tank is B (l), and the photographic material is subjected to color development with the color developing solution;
an agent replenishing device for replenishing a solid agent for color development by a unit amount of A (g) at a time, substantially directly into the color developing tank, wherein a ratio of the unit amount A to the volume B satisfies the following relation: $0.01<A/B<5$;
a processing tank located next to the color developing tank, in the processing tank is stored a processing solution to process the photographic material subjected to the color development; and
a conveyor to convey the photographic material into the color developing tank and into the processing tank, wherein the conveyor conveys the photographic material from starting dipping the photographic material in the color developing solution to starting dipping the photographic material in the processing solution for a time T which satisfies the following relationship: 5 seconds$\leqq T \leqq$18 seconds.

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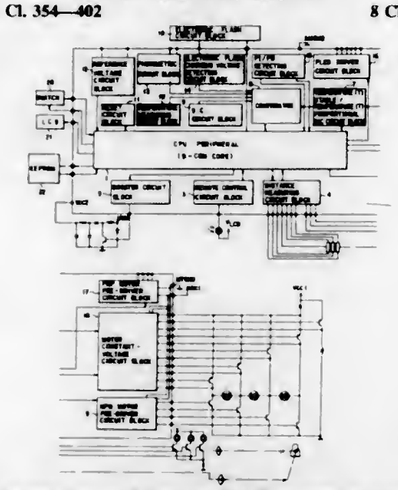
CMOS-ANALOG IC FOR CONTROLLING CAMERA AND CAMERA SYSTEM USING THE SAME

Keiji Kunishige, and Azuma Miyazawa, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1994, Ser. No. 213,960
Claims priority, application Japan, Mar. 16, 1993, 5-080292; Jun. 7, 1993, 5-136149
Int. Cl.[6] G03B *13/36;* **G01J** *1/20*
U.S. Cl. 354—402 **8 Claims**



1. A camera control IC having a CMOS structure, comprising:
an analog signal processing circuit for processing a photoelectric current analog signal obtained from an object to be photographed, said analog signal processing circuit including a circuit for logarithmically compressing the photoelectric current analog signal by transmitting the photoelectric current analog signal to a position between base and emitter electrodes of a parasitic bipolar transistor formed in the CMOS structure; and
a CPU core for controlling a camera sequence in response to an output from said analog signal processing circuit,
wherein said analog signal processing circuit and said CPU core are arranged on one chip with the CMOS structure, without using a Bi-CMOS process.

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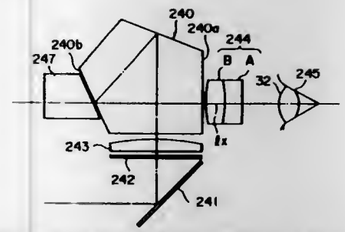
EYE DIRECTION DETECTING APPARATUS

Osamu Shindo, and Shigeo Toji, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 370,367, Jan. 6, 1995, which is a continuation of Ser. No. 167,036, Dec. 16, 1993, abandoned, which is a continuation of Ser. No. 982,427, Nov. 27, 1992, Pat. No. 5,327,191, which is a continuation of Ser. No. 576,191, Aug. 27, 1990, abandoned, which is a continuation of Ser. No. 282,035, Dec. 9, 1988, abandoned, which is a continuation-in-part of Ser. No. 152,359, Feb. 4, 1988, abandoned. This application Jun. 5, 1995, Ser. No. 462,688
Claims priority, application Japan, Dec. 17, 1987, 62-319337; May 20, 1988, 63-123562; Jun. 10, 1988, 63-143259
Int. Cl.[6] G03B *7/00*
U.S. Cl. 354—410 **20 Claims**

1. An eye direction detecting device, comprising:
a light source;
a finder system having an eyepiece element;
means for guiding a beam of light from said light source through said eyepiece element of said finder system so that said beam of light impinges upon an eye of a user positioned proximate said eyepiece element;



a rectangularly shaped sensor for detecting a beam of light reflected from the eye of the user and which passes through said eyepiece element, said sensor producing an output signal; and
means for processing said output signal of said sensor to determine a direction in which the eye gazes.

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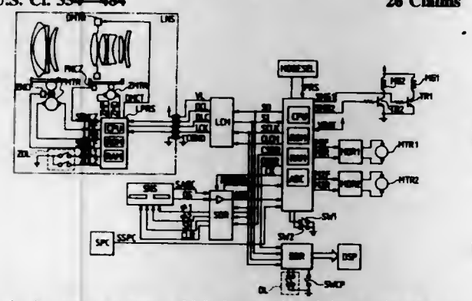
CAMERA ATTACHED WITH AUXILIARY DEVICE

Toshifumi Ohshawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1994, Ser. No. 208,137
Claims priority, application Japan, Mar. 10, 1993, 5-075012
Int. Cl.[6] G03B *7/26*
U.S. Cl. 354—484 **26 Claims**



1. A camera system which is constituted by a plurality of auxiliary devices comprising different loads driven by a power supply of a camera, and a camera which interchangeably mounts said auxiliary devices, comprising:
(a) detection means for detecting a load state of the auxiliary device mounted on said camera;
(b) setting means for setting a battery check level in accordance with the load state detected by said detection means, said setting means setting a different level in accordance with the load state of the mounted auxiliary device if the load is different; and
(c) a check circuit for performing a battery checking operation of a power supply output on the basis of the battery check level.

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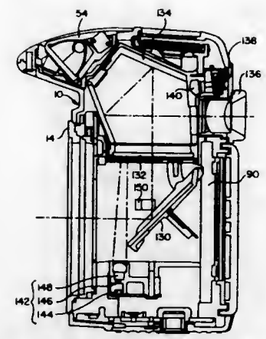
STROBE CONTROL DEVICE FOR CAMERA

Isamu Hirai, and Hideaki Tuji, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1994, Ser. No. 243,831
Claims priority, application Japan, May 17, 1993, 5-139552
Int. Cl.[6] G03B *15/05;7/099*
U.S. Cl. 354—416 **22 Claims**

1. A strobe control device for a camera, comprising:
means for receiving and integrating light transmitted through a photographing lens to be incident on a film surface, said light being reflected by said film surface and made incident on said strobe control device;



means for controlling a strobe to emit light until an integrated light amount reaches a threshold value; and
means for compensating said threshold value so that an effect on said amount of light received by said receiving means as a result of a change in a luminance level of said film surface is canceled when at least one predetermined parameter of a photographing optical path of said camera is changed.

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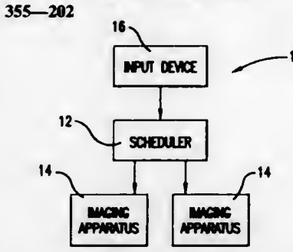
METHOD AND APPARATUS FOR OPTIMIZING SCHEDULING IN IMAGING DEVICES

Ming Yang, Fairport; Injae Choi, Webster, and Tsai C. Soong, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 27, 1995, Ser. No. 411,175
Int. Cl.[6] G03G *21/00*
U.S. Cl. 355—202 **37 Claims**



1. A method of scheduling an image processing job in an imaging system that includes at least one imaging device having associated device-related parameters, said job including a plurality of images to be processed by said imaging system, said images having associated image-related parameters, said method comprising the steps of:
detecting criteria of said job;
determining a set of applicable constraints based upon at least one of said criteria, inputs entered into said system and said at least one imaging device, said set of constraints including device-based constraints that are influenced by said device-related parameters, image-based constraints that are influenced by said image-related parameters, and image sequence constraints which express fundamental recording medium handling rules and which are independent of said device-related parameters;
constructing a mathematic model based on said set of constraints to represent the entire image processing job; and

scheduling said job such that each of the plurality of images in

of the predetermined positions of the electrode surface so that an electrode connecting portion is inserted in each

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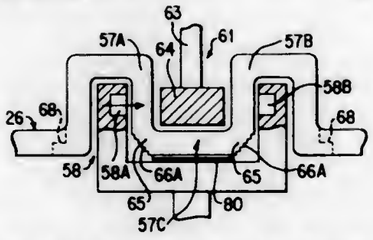
CONTACT CHARGER AND IMAGE FORMING

scheduling said job such that each of the plurality of images in said job can be processed in accordance with said set of constraints and such that all constraints in said model are satisfied substantially simultaneously.

5,557,368
TONER LEVEL DETECTING DEVICE AND METHOD FOR DETECTING TONER LEVEL WITHIN A TONER STORAGE BOX

Yoshinori Endo, Toyota, and Kazuhito Ishida, Nagoya, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Continuation of Ser. No. 434,337, May 2, 1995, Pat. No. 5,499,077. This application Dec. 22, 1995, Ser. No. 577,529
Claims priority, application Japan, May 17, 1994, 6-102769; Jul. 18, 1994, 6-165265
Int. Cl.[6] G03G *15/08*
U.S. Cl. 355—203 **28 Claims**



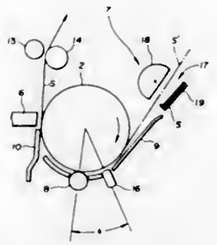
1. A toner level detecting device on a toner storage box, comprising:
first and second toner detecting portions formed of a light transmissive material; and
a connecting portion connecting the first and second toner detecting portions, the connecting portion having a light attenuating surface, wherein the first and second toner detecting portions and the connecting portion are formed such that toner in the toner storage box can fill an aperture between the first and second toner detecting portions.

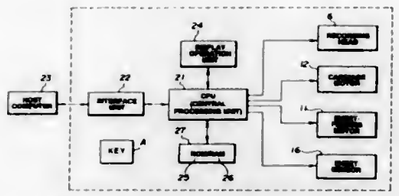
5,557,369
RECORDING APPARATUS WITH DETECTION OF MANUALLY INSERTED RECORDING SHEET

Mikio Shiga, and Tamaki Hashimoto, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1994, Ser. No. 195,191
Claims priority, application Japan, Mar. 2, 1993, 5-066140
Int. Cl.[6] G03G *21/00*
U.S. Cl. 355—204 **12 Claims**

11. A recording apparatus whose recording operation is controlled by being connected to a host computer, said apparatus comprising:
sheet supporting means for supporting a plurality of sheets;
feeding means for feeding a sheet supported by said sheet supporting means;
a manual insertion port for manually inserting a sheet into said apparatus;
conveying means for conveying the sheet fed from said sheet supporting means or the sheet inserted from said manual insertion port;
recording means for performing a recording operation on the sheet fed by said conveying means;
detection means for detecting the sheet fed from said sheet supporting means and the sheet inserted from said manual insertion port; and
control means for discriminating whether the sheet detected by said detection means is a sheet fed from said feeding means or a sheet inserted from said manual insertion port, and for



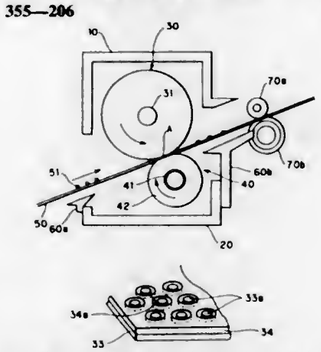


controlling so as to execute a recording operation in a manual mode or in an automatic mode in accordance with the discrimination.

5,557,370
CONTROL DEVICE FOR A FEED ROLLER

Naohisa Kinoshita, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 28, 1994, Ser. No. 330,555
Claims priority, application Japan, Oct. 29, 1993, 5-294541
Int. Cl.[6] G03G *15/20*
U.S. Cl. 355—206 **16 Claims**



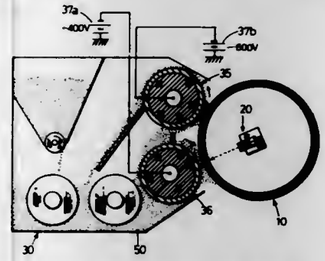
1. A plate-shaped medium transporting device for transporting a plate-shaped medium, the device comprising:
a feed roller rotatable about a feed roller axis, the feed roller including:
a cylindrical first electrode layer provided substantially concentric with the feed roller axis, the first electrode layer having a plurality of electrode connecting portions formed to an electrode surface thereof at predetermined positions on the electrode surface;
a cylindrical second electrode layer provided substantially concentric with the feed roller axis in confrontation with the electrode surface of the first electrode layer; and
a cylindrical and resilient insulation layer provided interposed between the first electrode layer and the second electrode layer, the insulation layer having a plurality of through holes formed therethrough, each through hole being formed at a position in the insulation layer that corresponds to one

of the predetermined positions of the electrode surface so that an electrode connecting portion is inserted in each through hole;
a power source for supplying an electric power between the first and second electrode layers of the feed roller;
drive means for driving the feed roller to rotate about the feed roller axis;
a pressure roller rotatable about a pressure roller axis;
a pressing member for resiliently pressing the pressure roller axis toward the feed roller axis so as to form a nip portion between the pressure roller and the feed roller where the pressure roller abuts the feed roller, the insulation layer of the feed roller becoming resiliently compressed at the nip portion so that several ones of the plurality of electrode connecting portions of the first electrode layer are brought into electrical connection with the second electrode layer at the nip portion, the number of the electrode connecting portions thus brought into electric connection increasing when a plate-shaped medium is sandwiched at the nip portion between the feed roller and the pressure roller; and
detecting means for detecting change in an electrical amount obtained for the first and second electrode layers of the feed roller, to thereby determine feed condition of the plate-shaped medium.

5,557,371
ELECTROPHOTOGRAPHIC APPARATUS

Toshio Tooda, Kanagawa, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 8, 1995, Ser. No. 401,137
Claims priority, application Japan, Jun. 2, 1994, 6-121053
Int. Cl.[6] G03G *5/00;15/04;15/056*
U.S. Cl. 355—211 **10 Claims**

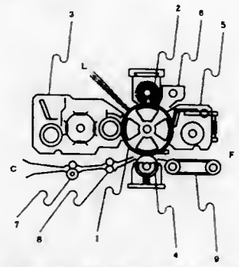


1. An electrophotographic apparatus comprising:
a photosensitive member having a transparent conductive layer which is optically transparent or semitransparent and of high electric conductivity, and a photoconductive layer stacked on a surface of said transparent conductive layer, said photosensitive member being driven to rotate;
a plurality of developing rollers arranged in a row in a direction of rotation of said photosensitive member so as to face a surface of said photosensitive member, said developing rollers each retaining on a surface thereof a developer consisting essentially of an electrically insulating magnetic toner and an electrically conductive magnetic carrier, at least a surface portion of each developing roller being driven to rotate in order to transport said developer to a surface of said photoconductive layer of said photosensitive member;
means for applying a developing bias voltage to each of said developing rollers; and
means for exposing said photosensitive member by applying image light from a reverse side of said photosensitive member toward one of said developing rollers which is disposed most downstream in the direction of rotation of said photosensitive member.

5,557,372
CONTACT CHARGER AND IMAGE FORMING APPARATUS PROVIDED WITH SAME

Seishi Ojima, Takatsuki; Isao Doi, Toyonaka, and Izumi Osawa, Ikeda, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Oct. 25, 1994, Ser. No. 329,092
Claims priority, application Japan, Oct. 27, 1993, 5-269225
Int. Cl.[6] G03G *15/02*
U.S. Cl. 355—219 **21 Claims**

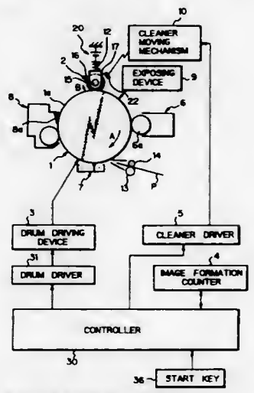


1. A charging member for charging a surface of a charge-receiving member, comprising:
a rotatable support member; and
a plurality of flexible films; one end of each of said films being attached to said support member, and a free end of each of the films being in contact with the surface of the charge-receiving member for charging the surface of the charge-receiving member.

5,557,373
CLEANING SYSTEM FOR CHARGING DRUM OF AN IMAGE FORMING APPARATUS

Yoshiaki Miyashita, Kawasaki; Takeshi Tabuchi, Kawaguchi; Kouichi Yamazaki, Yokohama; Nobuo Kikuchi, Kawagoe; Kentaro Matsumoto, Ichikawa; Sadao Takahashi, and Tadashi Hayakawa, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 4, 1994, Ser. No. 336,208
Claims priority, application Japan, Nov. 5, 1993, 5-277017
Int. Cl.[6] G03G *15/02;21/00*
U.S. Cl. 355—219 **3 Claims**



1. An image forming apparatus comprising:
a rotatable photoconductive element;
a charging member for charging said photoconductive element in contact with said photoconductive element while rotating;
a cleaning member for cleaning a surface of said charging member contacting said photoconductive element;
and

cleaning member moving means for usually holding said cleaning member in a position spaced apart from said surface of

a contact-charging member;
a power source applying a voltage to the contact-charging mem-

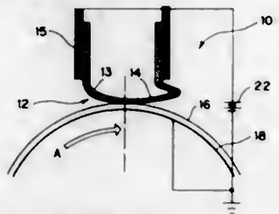
5,557,377
SINGLE PASS. IN-LINE COLOR ELECTROPHOTOGRAPHIC PRINTER WITH

cleaning member moving means for usually holding said cleaning member in a position spaced apart from said surface of said charging member and for causing said cleaning member to contact said surface of said charging member only for a predetermined period of time at a predetermined interval.

5,557,374
CONTACT CHARGER HAVING A SELECTED PERPENDICULAR RESISTIVITY

Ding-Yu Chen, Izumiyama, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 27, 1995, Ser. No. 429,720
Claims priority, application Japan, Apr. 28, 1994, 6-092129
Int. Cl.[6] G03G 15/02
U.S. Cl. 355—219 11 Claims

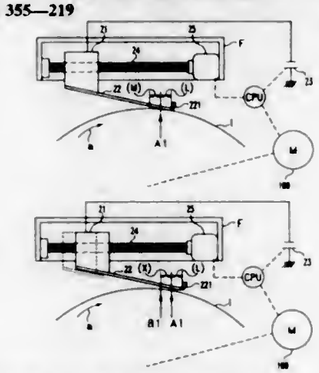


1. A contact charger comprising:
a charging member for applying a voltage to a body to be charged in contact with said charging member, a charging current flowing in said charging member in a direction toward the body to be charged, wherein said charging member being formed as a sheet and having a thickness in the current flowing direction has a perpendicular resistivity whose order is in a range of between 10^3 to $10^8\Omega$, wherein the numerical value of the perpendicular resistivity is given by a product of a surface resistivity of said charging member and a square of the thickness of said charging member.

5,557,375
CONTACT TYPE CHARGING DEVICE AND IMAGE FORMING APPARATUS HAVING THE SAME

Keiko Nagayasu, Ibaraki; Akihito Ikegawa, Sakai; Isao Doi, Toyonaka, and Masashi Yamamoto, Settsu, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Aug. 9, 1995, Ser. No. 513,074
Claims priority, application Japan, Aug. 26, 1994, 6-225854
Int. Cl.[6] G03G 15/02;21/00
U.S. Cl. 355—219 19 Claims

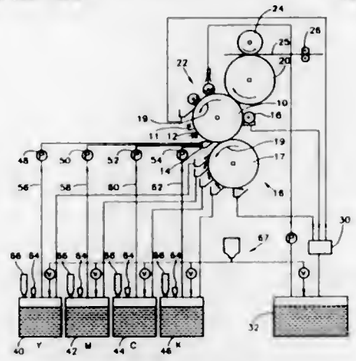


1. An image forming apparatus comprising:
a carrier;
a contact-charging member;
a power source applying a voltage to the contact-charging member in order to charge the carrier;
an image forming device forming an electrostatic latent image by selectively discharging the charged carrier;
positioning means for selectively positioning the contact-charging member at a charging position where the contact-charging member contacts the carrier at a first region of the contact-charging member and at a cleaning position where the contact-charging member contacts the carrier at a second region of the contact-charging member; and
a controller controlling the image forming device and the positioning means so that the image forming device forms the electrostatic latent image when the positioning means positions the contact-charging member at the charging position, and so that the image forming device is inhibited from forming the electrostatic latent image when the positioning means positions the contact-charging member at the cleaning position.

5,557,376
COLOR IMAGING SYSTEM

Benzion Landa, Edmonton, Canada; Ishaiau Lior, Nes Ziona, Israel; Dan Barnea, Neve Monosson, Israel; Paul Fenster, Petach Tikva, Israel, and Uri Levy, Rehovot, Israel, assignors to Indigo N.V., Maastricht, Netherlands

Filed May 15, 1989, Ser. No. 351,546
Int. Cl.[6] G03G 15/10;15/01
U.S. Cl. 355—256 30 Claims

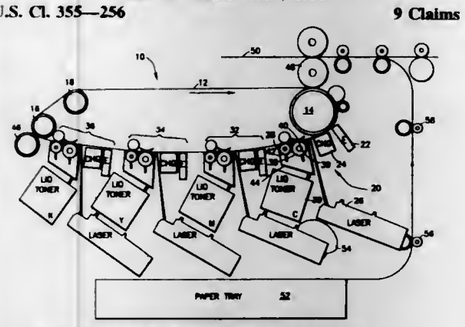


28. An electrostatic imaging system comprising:
a) an electrostatic imaging surface having an electrostatic image formed thereon; and
b) a set of jet outlets for supplying toner of a given color directly onto said imaging surface, wherein each jet outlet supplies a jet of liquid toner having a given cross-sectional extent when it impinges upon said imaging surface and wherein the areas of impingement of adjacent jets of liquid toner of said given color have a center to center spacing which is greater than the given extent.

5,557,377
SINGLE PASS, IN-LINE COLOR ELECTROPHOTOGRAPHIC PRINTER WITH INTERSPERESED ERASE DEVICE

Victor D. Loewen; Thomas Camis, and Kenneth A. Lindblom, all of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 30, 1995, Ser. No. 455,011
Int. Cl.[6] G03G 15/01;15/10
U.S. Cl. 355—256 9 Claims



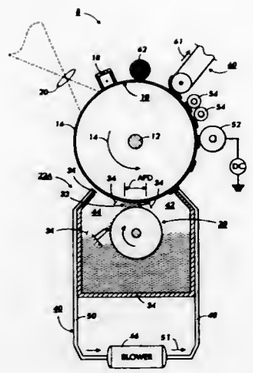
1. An electrophotographic color printer comprising:
a photoreceptor having a toner-receiving surface;
means for moving said photoreceptor in a first direction of movement;
plural exposure means arrayed along said toner-receiving surface of said photoreceptor for charging said photoreceptor in accordance with different color image pixel values;
a developer module associated with each exposure means, each said developer module including a liquid toner reservoir, a developer roll for carrying liquid toner to a transfer point, a squeegee roll for removing excess dispersant from said liquid toner after said liquid toner has been applied to said photoreceptor, said developer module maintaining said developer roll at a constant distance from said photoreceptor at said transfer point to create a fluid interfacial layer thereat between said developer roll and said photoreceptor, said developer module further maintaining said squeegee roll in constant engagement with said photoreceptor;
an erase means positioned upstream from each said exposure means in regards to said first direction of movement of said photoreceptor;
charge means positioned between each said erase means and a downstream exposure means;
a drying roll positioned after a last developer module for fixing a toner image on said photoreceptor; and
means for transferring said toner image to a sheet.

5,557,378
LIQUID IMMERSION DEVELOPMENT MACHINE HAVING A PRESSURE DIFFERENTIAL NIP APPARATUS

Christian O. Abreu, Rochester, and Shyshung S. Hwang, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 25, 1995, Ser. No. 519,868
Int. Cl.[6] G03G 15/11
U.S. Cl. 355—256 9 Claims

1. An excess carrier liquid removing apparatus for use in a LID reproduction machine having a moving liquid toner image carrying surface, the excess carrier liquid removing apparatus comprising:
(a) a housing defining a chamber suitable for containing air, and containing liquid developer including liquid toner and carrier liquid, said chamber including a first air pocket and a second air pocket between the liquid toner and the image carrying surface;
(b) an opening through said housing into said chamber for mounting against the liquid toner image carrying surface;



(c) a roller mounted rotatably to said housing and within said chamber for forming a liquid toner image processing nip with the liquid toner image carrying surface, said image processing nip having an image entrance side and an image exit side, said first and said second air pockets being located to said exit side and said entrance side respectively of said image processing nip; and
(d) air pressure creating means associated with said housing for creating an air pressure differential within said chamber across said image processing nip from one to the other of said entrance and said exit sides of said nip for affecting flow of carrier liquid without carrier liquid vaporization and without liquid toner image disturbance, through said nip, said air pressure creating means moving air out of said second air pocket on said entrance side of said image processing nip, and moving air gently into said first air pocket on said exit side of said image processing nip so as to avoid undesirable evaporation of carrier liquid.

5,557,379
IMAGE FORMING APPARATUS HAVING A TONER CONVEYANCE REGULATOR

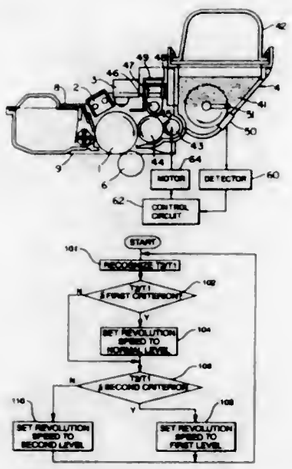
Tetsuya Nakamura, and Hirotaka Fukuyama, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Mar. 4, 1994, Ser. No. 205,541
Claims priority, application Japan, Mar. 5, 1993, 5-044905; Apr. 30, 1993, 5-103974
Int. Cl.[6] G03G 15/08
U.S. Cl. 355—259 20 Claims

1. A developing device for use in an image forming apparatus, comprising:
a toner hopper containing toner;
a developing roller for developing an electrostatic latent image formed on a surface of a photosensitive member using the toner contained in the toner hopper;
a toner feed mechanism for conveying the toner contained in the toner hopper to the developing roller, the toner feed mechanism including a feed roller rotating in contact with the developing roller; and
regulating means for regulating the conveyance of the toner by the feed mechanism from the toner hopper to the developing roller, said regulating means including a toner detector for detecting amount of the toner contained in the toner hopper and a controller for controlling revolution speed of the feed roller in accordance with the amount of toner detected by the toner detector.

a toner storing section accommodating an agitator, and formed

5,557,384



5,557,380

APPARATUS FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE HAVING LIMITING BLADE HOLDING DEVICE

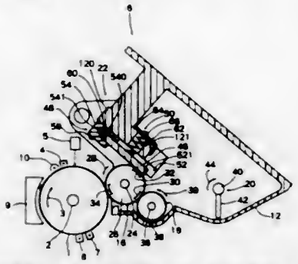
Masahiko Maeda; Shoji Tomita; Masao Uyama; Masayuki Nakashima, and Kenichiro Kitajima, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jun. 20, 1995, Ser. No. 492,511

Claims priority, application Japan, Jul. 7, 1994, 6-155610

Int. Cl.[6] G03G *15/06*

U.S. Cl. 355—259 **25 Claims**



1. An apparatus for developing an electrostatic latent image comprising: a developing housing, a developing agent application means which is disposed in said developing housing, holds the developing agent on a surface thereof in a developing agent-holding zone, and conveys the thus held developing agent into a developing zone to apply it onto the electrostatic latent image, and a limiting means for limiting an amount of the developing agent held on the surface of the developing agent application means in a developing agent limiting zone located between the developing agent-holding zone and the developing zone, wherein said limiting means includes a blade made of a rigid member that is brought into forced contact with the surface of said developing agent application means, a blade support means for supporting said blade in a manner such that a first surface thereof is moved in a direction in which it comes into forced contact with the surface of said developing agent application means, and a first resilient urging means which is disposed on a side of a second surface of said blade to push said blade in a manner such that the first surface thereof is brought into forced contact with the surface of said developing agent application means, wherein said blade support means includes lower support members for supporting a lower end of the blade, an upper support member for supporting an upper edge of the blade, and a second resilient urging means which is disposed between said upper support member and the upper edge of said blade and downwardly pushes said blade.

5,557,381

DEVELOPER SUPPLYING UNIT WITH MULTIPLE CONTAINERS

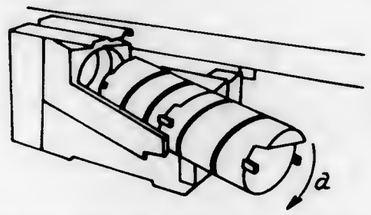
Kazuhiro Sakamoto, Toyokawa, and Kuniya Matsuura, Toyohashi, both of Japan, assignors to Minolta Co., Ltd., Osaki, Japan

Filed Mar. 29, 1995, Ser. No. 412,929

Claims priority, application Japan, Mar. 30, 1994, 6-060890

Int. Cl.[6] G03G *15/08*

U.S. Cl. 355—260 **11 Claims**



1. A developer supplying container which transports developer accommodated therein by its rotation, comprising:
- a first aperture provided on a front side of the container with respect to a direction in which the developer is transported;
- a second aperture provided on a back side of the container with respect to the developer transported direction correspondingly to the posiiton of said first aperture; and
- a connecting member to detachably connect an another container with the present container in a direction of the rotational axis of the container.

5,557,382

TONER REPLENISHING DEVICE FOR A DEVELOPING DEVICE

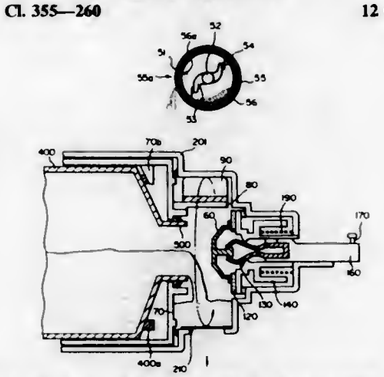
Kenzou Tatsumi, Yokohama; Takeshi Saito, Tokyo; Akio Kutsuwada, Kawasaki; Noboru Kusunose, Yokohama, and Shigeru Yoshiki, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 7, 1995, Ser. No. 554,520

Claims priority, application Japan, Nov. 8, 1994, 6-273440; Apr. 18, 1995, 7-092815; Aug. 25, 1995, 7-217694

Int. Cl.[6] G03G *15/08*

U.S. Cl. 355—260 **12 Claims**



1. A device for replenishing toner to a developing section included in a developing device, and removably mounted to said developing device, said device comprising:
- a toner storing section accommodating an agitator, and formed with an opening at one end portion with respect to a width-wise direction of the developing device;
- an elastic member covering said opening, and formed with a holed portion for replenishing the toner driven by said agitator from said toner storing section to the developing section; and
- a mechanism for closing said holed portion when said device is to be removed from the developing device.

5,557,383

IMAGE FORMING APPARATUS HAVING RECORDING MATERIAL CARRYING MEANS

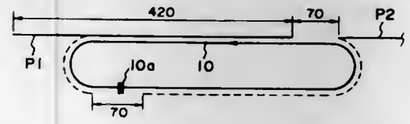
Takashi Hasegawa, Matsudo; Masahiro Inoue, Kawasaki, and Nobuhiko Takekoshi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 458,446, Jun. 2, 1995, abandoned, which is a continuation of Ser. No. 123,283, Sep. 20, 1993, abandoned, which is a continuation of Ser. No. 772,956, Oct. 8, 1991, abandoned. This application Oct. 27, 1995, Ser. No. 549,021

Claims priority, application Japan, Oct. 9, 1990, 2-271637; Oct. 12, 1990, 2-272147

Int. Cl.[6] G03G *15/14*

U.S. Cl. 355—271 **8 Claims**



1. An image forming apparatus, comprising:
- a recording material carrying means for carrying a recording material, said recording material carrying means having a seam and being movable along an endless path;
- image forming means, having a plurality of image forming positions, for sequentially forming a plurality of images on the recording material carried on said recording material carrying means;
- supply means for supplying recording materials to said recording material carrying means;
- control means for controlling supply timing of said supply means such that when a plurality of recording materials are continuously supplied to said recording material carrying means to form superimposed images by said image forming means on the plurality of the recording materials, irrespective of the number of said plurality of recording materials, the recording material supplied by said supply means is not overlapped on the seam, and the recording materials are supplied at substantially regular time intervals so as to satisfy $a=(L/n)-1$,
- where a is a distance between a trailing edge of said recording material and a leading edge of the next recording material, L is a circumferential length of said recording material carrying means, l is a length of said recording material measured in a direction of movement of said recording material carrying means, and n is a maximum number of at least 2 of the recording materials capable of being carried on said recording material carrying means during one full rotation of said recording material carrying means,
- wherein the number n is different depending on the length l.

5,557,384

IMAGE TRANSFERRING DEVICE FOR IMAGE FORMING EQUIPMENT

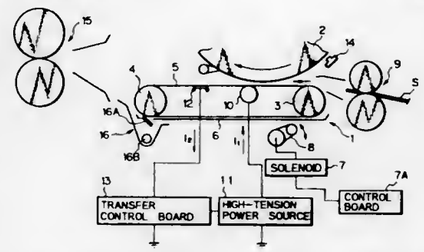
Satoshi Takano, Tokyo; Itaru Matsuda, Yokohama, and Yuko Harasawa, Hayama-machi, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 6,521, Jan. 21, 1993. This application Oct. 19, 1994, Ser. No. 325,078

Claims priority, application Japan, Jan. 22, 1992, 4-9125; Mar. 30, 1992, 4-74366; Nov. 30, 1992, 4-320937; Oct. 22, 1993, 5-265106

Int. Cl.[6] G03G *15/16*

U.S. Cl. 355—274 **7 Claims**



1. A device for transferring an image formed on an image carrier to a sheet and then separating said sheet from said image carrier, said device comprising:
- a transfer belt movable into contact with an outer periphery of the image carrier;
- drive means for causing said transfer belt to rotate;
- a contact electrode held in direct contact with said transfer belt; and
- charge applying means for applying a charge to said transfer belt via said contact electrode;
- wherein a current flow I_{OUT} from said contact electrode to ground via a nip portion between said transfer belt and said image carrier is maintained greater than or equal to a current flow I_2 from said contact electrode to ground via said transfer belt without the intermediary of said nip portion.

5,557,385

METHOD AND DEVICE FOR CONTROLLING THERMAL FIXING MACHINE

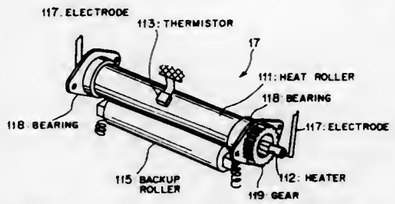
Nobuyuki Tanaka, Kawasaki, and Hironori Kanno, Inagi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 29, 1994, Ser. No. 268,038

Claims priority, application Japan, Oct. 15, 1993, 5-258702

Int. Cl.[6] G03G *15/20*

U.S. Cl. 355—285 **26 Claims**



1. A method for controlling a thermal fixing machine at a temperature wherein a toner image transferred on a recording medium is heated and melted by means of a heater to fix said toner image on said recording medium, comprising the steps of:
- repetitively detecting a temperature of said thermal fixing machine and outputting a digital value representative of the last detected temperature;

repetitively sampling said output digital value to obtain a plurality of temperature detection values; and subjecting said heater to on/off operations, each individual on/off operation based on said plurality of temperature detection values sampled.

5,557,386

TONER RECOVERING DEVICE FOR ELECTROPHOTOGRAPHIC APPARATUS AND TONER RECOVERING FILTER FOR SAID TONER RECOVERING DEVICE

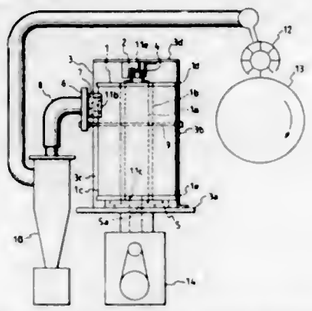
Yuuji Meguro; Shuho Yokokawa; Isao Nakajima; Tsukasa Onose, and Hiroshi Ueno, all of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Nov. 16, 1995, Ser. No. 558,857

Claims priority, application Japan, Nov. 18, 1994, 6-285426; Sep. 29, 1995, 7-252506

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—298 **4 Claims**



1. A toner recovering device for an electrophotographic apparatus, comprising:

means for cleaning untransferred toner remaining on a photosensitive body;

a dust collector connected to said cleaning means, for collecting the untransferred toner through said cleaning means;

a toner recovering filter for filtering an air-toner mixture containing the untransferred toner from said dust collector, said toner recovery filter having an inlet port for introducing the air-toner mixture from said dust collector and an exhaust port for discharging the air from which the toner has been removed;

a filter mounting section for mounting said toner recovering filter;

a joint mechanism having a joint and a hose member, one end of the hose member being connected to said dust collector and an other end of the hose member being connected to said joint, said joint being disposed at the inlet port of said toner recovering filter, said joint mechanism being arranged in the filter mounting section so as to be opened and closed;

detector means for sensing that said toner recovering filter has been mounted or not onto said filter mounting section; and

a pulling member for coupling the inlet port of said toner recovering filter to said joint in cooperation with an operation of mounting said toner recovering filter onto said filter mounting section.

5,557,387

SHEET CONVEYING DEVICE USING SHEET SUCTION AND AIR FORCED SEPARATION

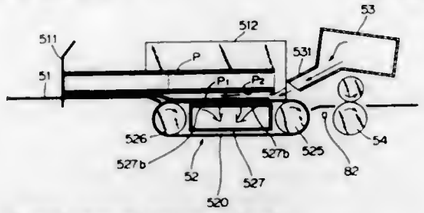
Masaru Hatano, Osaka, Japan, assignor to Mita Industrial Co. Ltd., Osaka, Japan

Filed Jan. 10, 1995, Ser. No. 370,843

Claims priority, application Japan, Jan. 14, 1994, 6-015989

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—312 **16 Claims**



1. A sheet conveying device comprising:

a sheet table on which a plurality of sheets are stacked;

suction conveyer belt means comprising an endless suction conveyer belt having a plurality of small holes for successively conveying a lowermost sheet out of said sheets stacked on said sheet table along a conveying direction;

a suction duct disposed with it crossing said suction conveyer belt in a loop of the suction conveyer belt and having an air suction port in communication with said plurality of small holes formed on its upper surface;

sucking means for sucking air through said suction duct;

an air nozzle for blowing air on a leading end of said lowermost sheet to separate upper sheets from said lowermost sheet;

a guide duct for introducing the air sucked from said suction duct into said air nozzle; and

an auxiliary suction port for ensuring in said suction duct an amount of air blown off from said air nozzle.

5,557,388

PRINTING OR COPYING MACHINE HAVING A COOLING DEVICE FOR THE RECORDING SUBSTRATE

Edmund Creutzmann, Markt Schwaben; Joachim Hoffmann, München, and Walter Kopp, Taufkirchen, all of Germany, assignors to Siemens Nixdorf Informationssysteme Aktiengesellschaft, Paderborn, Germany

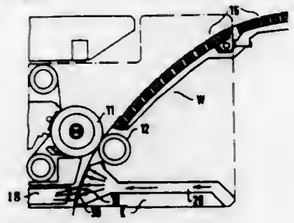
PCT No. PCT/DE93/00976, § 371 Date Apr. 20, 1995, § 102(e) Date Apr. 20, 1995, PCT Pub. No. WO94/09409, PCT Pub. Date Apr. 28, 1994

PCT Filed Oct. 13, 1993, Ser. No. 428,118

Claims priority, application Germany, Oct. 22, 1992, 42 35 667.9

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—312 **13 Claims**



1. An apparatus comprising:

a device for producing a toner image on a recording substrate;

a thermofixing device for fixing the toner image on the recording substrate with heat;

a first cooling device for cooling the heated recording substrate, the cooling device being arranged in a paper run region downstream of the thermofixing device in a direction of transport of the recording substrate and having at least one cooling surface over which the recording substrate is guided, said cooling surface having a multiplicity of air exit openings and an air supply device coupled to the air exit openings for producing an air stream in such a way that an air cushion is formed between the recording substrate and the cooling surface; and

at least one second cooling device arranged in the paper run region on a side of the recording substrate opposite from the first cooling device, for producing at least one second air stream sweeping over the recording substrate.

5,557,389

DEVICE FOR SEPARATING A TRANSFER PAPER UTILIZING A SEPARATION VOLTAGE

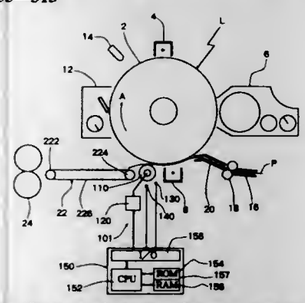
Masaki Sato; Hiroshi Kubota; Kiyoshi Morimoto; Takatoshi Nishimura; Takashi Miyake, and Hisaki Shimosaka, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Oct. 17, 1994, Ser. No. 323,940

Claims priority, application Japan, Oct. 29, 1993, 5-271541; Oct. 29, 1993, 5-271542; Oct. 29, 1993, 5-271543; Nov. 1, 1993, 5-272898; Nov. 16, 1993, 5-286392; Nov. 18, 1993, 5-288973

Int. Cl.[6] G03G *15/14;21/00*

U.S. Cl. 355—315 **12 Claims**



1. A device for separating a transfer paper, onto which a toner image has been electrostatically transferred from the surface of a photosensitive member, from the surface of the photosensitive member, said device comprising:

a separator roller made of an electrically conducting material and adapted to be disposed close to the photosensitive member; and

voltage application means for applying an AC voltage or a pulse voltage to said separator roller at a frequency of 20 KHz or higher.

5,557,390

DIGITAL COPIER SYSTEM

Norifumi Ito, Kawasaki, and Jun Doi, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 247,757, May 23, 1994, Pat. No. 5,440,372. This application Aug. 1, 1995, Ser. No. 509,941

Claims priority, application Japan, Jun. 11, 1993, 5-140605

Int. Cl.[6] G03G *15/00*

U.S. Cl. 355—319 **6 Claims**

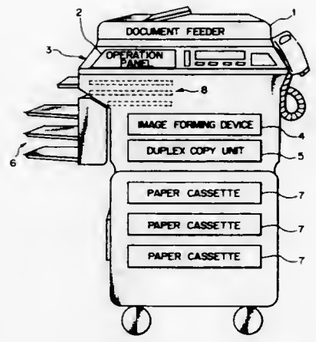
1. A multitask type digital copier system in which a plurality of applications, including copier and printer applications, share and selectively use a plurality of resources, comprising:

an image reading device,

an image forming device, and

a duplex copy unit,

wherein requests for using said duplex copy unit from a plurality of applications are subjected to exclusive control thereby to allow only one of said applications to use said duplex copy unit.



5,557,391

IMAGE FORMING APPARATUS FOR PRODUCING DUPLEX OR COMPOSITE PRINTS WITH IMPROVED EFFICIENCY BY FEEDING SHEETS AT SHORTENED INTERVALS

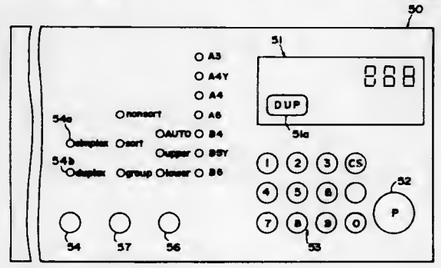
Tomokazu Kato, Toyokawa; Keiichi Nomura, Amagasaki; Kentaro Nagatani, Toyohashi; Syuzi Maruta, Toyokawa; Yoshiaki Takano, Toyohashi; Kazuhiro Araki, and Takashi Noda, both of Okazaki, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 17, 1994, Ser. No. 198,520

Claims priority, application Japan, Feb. 20, 1993, 5-055145

Int. Cl.[6] G03G *15/00*

U.S. Cl. 355—319 **14 Claims**



1. An image forming apparatus comprising:

a mode setting means for setting a duplex copy mode in which images are formed on both sides of a paper;

a feeder which feeds the paper;

an image forming device which forms an image on the paper fed by said feeder;

an intermediate container in which the paper having the image thereon is temporarily accommodated;

a refeeder which refeeds the accommodated paper from said intermediate container to form an image on the paper again;

a detector which detects presence or absence of paper to be fed by said refeeder for image formation and for outputting a signal when said detector detects the absence of paper to be refed; and

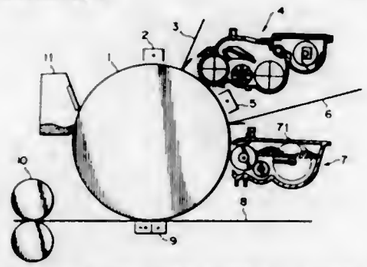
a controller for effecting a change-over from the paper feeding operation by said refeeder to the paper feeding operation by said feeder in response to detection of the signal while maintaining said apparatus in said duplex copy mode when the duplex copy mode is set by said mode setting means.

5,557,392

MULTICOLOR IMAGE FORMING APPARATUS WITH PULSE VOLTAGE AND DC VOLTAGE APPLIED TO A DEVELOPING UNIT

Naoki Iwata, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 20, 1993, Ser. No. 169,078
Claims priority, application Japan, Dec. 22, 1992, 4-356708
Int. Cl.[6] G03G 15/01
U.S. Cl. 355—326 R 13 Claims



11. A multicolor image forming apparatus for forming a multicolor visible image on an image carrier and then transferring said multicolor visible image to a transfer medium at a time, said apparatus comprising:

first developing means for developing a latent image with a developer of first color; and

second developing means for developing a latent image with a developer of second color;

said second developing means comprising:

a developer carrier for depositing said developer of second color thereon, and

bias voltage applying means for applying to said developer carrier a bias voltage for development which changes periodically and has one period made up of a first period of time and a second period of time,

wherein said bias voltage applying means applies, during said first period of time, a first voltage generating an electric field which causes said developer of said second color to fly toward an image area and a non-image area of said image carrier in a gap between said image carrier and said developer carrier and applies, during said second period of time, a second voltage generating, in said gap, an electric field returning said developer of said second color having flied toward said non-image area during said first period of time to said developer carrier, said first period of time being selected such that said developer of said second color does not reach said non-image area.

5,557,393

PROCESS AND APPARATUS FOR ACHIEVING CUSTOMER SELECTABLE COLORS IN AN ELECTROSTATOGRAPHIC IMAGING SYSTEM

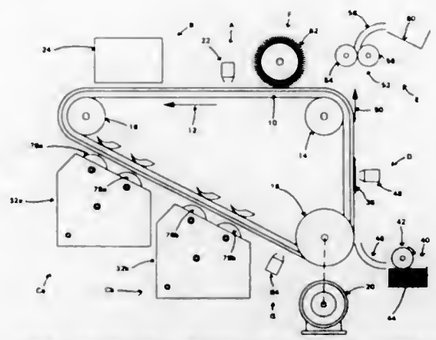
Nancy B. Goodman; Richard P. Germain; Paul C. Julien, all of Webster; Susan J. Kremer, Rochester, and Robert J. Gruber, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 4, 1994, Ser. No. 334,082
Int. Cl.[6] G03G 15/01
U.S. Cl. 355—326 R 32 Claims

1. An electrostatographic imaging process comprising:

forming an electrostatic latent image on an image forming device;

b) developing said electrostatic latent image on said image forming device with at least one first developer, said first developer comprising carrier particles and a blend of two or more toner compositions, said toner compositions being selected from the group consisting of toner compositions having blend compatibility components coated on an external surface of particles of said toner compositions and particulate



toner compositions containing therein blend compatibility components or passivated pigments;

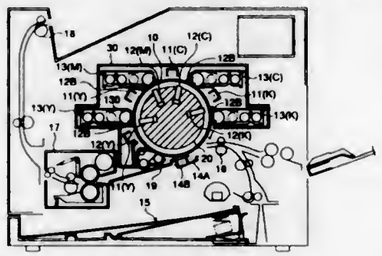
c) transferring said toner image to a receiving substrate and fixing it thereto.

5,557,394

COLOR IMAGE FORMING APPARATUS HAVING A TRANSPARENT PHOTORECEPTOR

Satoshi Haneda; Masakazu Fukuchi; Tadayoshi Ikeda; Hisayoshi Nagase, and Shuta Hamada, all of Hachioji, Japan, assignors to Konica Corporation, Japan

Filed Sep. 29, 1995, Ser. No. 536,447
Claims priority, application Japan, Oct. 3, 1994, 6-239006; Feb. 27, 1995, 7-038591
Int. Cl.[6] G03G 15/01
U.S. Cl. 355—327 26 Claims



1. A color image forming apparatus, comprising:

a photoreceptor for forming a toner image;

a charging means for charging said photoreceptor;

an imagewise exposure means, accommodated inside said photoreceptor, for imagewisely exposing said photoreceptor with exposure light so as to form a latent image on said photoreceptor;

a developing means for developing said latent image with toner so as to form a toner image on said photoreceptor;

wherein a process of forming said toner image is repeated for a plurality of times so that a plurality of toner images are superimposed to from a composite toner image;

a transfer means for transferring said composite toner image onto a recording medium; and

a photodetecting means, accommodated inside said photoreceptor, for detecting light from said photoreceptor.

5,557,395

OPTICAL DEVICE FOR MEASURING SPEED

Tetuya Uno; Junichi Takagi, and Yasunobu Sakai, all of Kyoto, Japan, assignors to Omron Corporation, Japan

Filed Oct. 27, 1993, Ser. No. 141,644
Claims priority, application Japan, Mar. 15, 1993, 5-081478; Oct. 27, 1993, 4-312813
Int. Cl.[6] G01P 3/36; B60T 7/16
U.S. Cl. 356—28 48 Claims

1. A spatial filter-type device to measure speed, comprising:

means for projecting a beam of light on an object whose speed is to be measured;

a lens to receive light reflected by the object;

an optical element having a fixed pitch to split the light reflected by the object alternately into at least two separate light beams along at least two different paths, which have a fixed pitch with respect to an optical axis;

an aperture stop provided between said lens and said optical element, and located at a focal position of said lens so that light reflected by the object that passes through said aperture stop is directed to said optical element;

at least two photodetectors to receive respective light beams; and

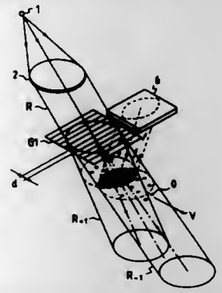
a panel having at least two aperture stops, said aperture stops each positioned in front of each photodetector.

5,557,396

VELOCITY INFORMATION DETECTING APPARATUS

Koh Ishizuka, Okmiya; Satoshi Ishii, and Yasushi Kaneda, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1994, Ser. No. 203,409
Claims priority, application Japan, Mar. 5, 1993, 5-045254
Int. Cl.[6] G01P 3/36; G01B 11/02
U.S. Cl. 356—28.5 19 Claims



1. A velocity information detecting apparatus for detecting velocity information in an object region, comprising:

a light source for emitting a coherent beam;

a beam splitting member for splitting the beam from said light source into a plurality of beams, the object region being irradiated with said plurality of beams in such a state that the object region is located in a region in which the plurality of beams outgoing from said beam splitting member are not yet spatially completely separated from each other; and

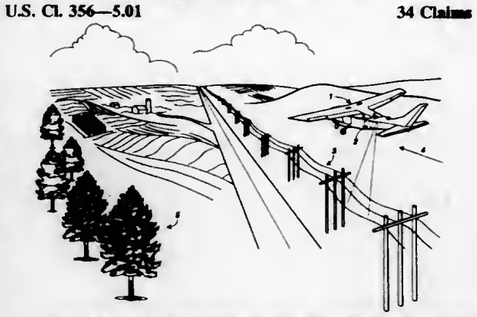
a photodetector for receiving scattered light from said object region, wherein velocity information in the object region is detected, based on a Doppler shift of the scattered light detected by said photodetector.

5,557,397

AIRCRAFT-BASED TOPOGRAPHICAL DATA COLLECTION AND PROCESSING SYSTEM

Russell T. Hyde, Helena; Michael G. Wise; Robert H. Stokes, both of Birmingham, and Edward C. Brasher, Jr., Pelham, all of Ala., assignors to Airborne Remote Mapping, Inc., an Illinois Corp., Bessemer, Ala.

Filed Sep. 21, 1994, Ser. No. 310,164
Int. Cl.[6] G01C 3/08
U.S. Cl. 356—5.01 34 Claims



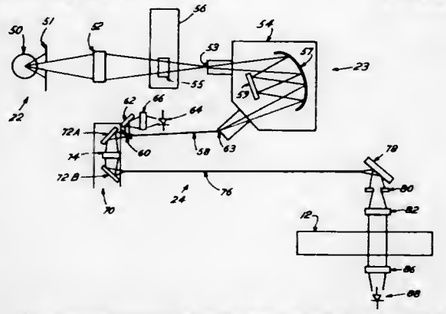
1. An aircraft-based topographical data collection and processing system comprising: (1) a non-ground-based position reference means; (2) a laser beam originating from an aircraft in flight, manipulatable about at least one axis of freedom and directable toward a target; (3) a sensor to register range data from the laser beam reflected back to the aircraft; (4) a means for measuring and time stamping aircraft roll, pitch, and true heading data; and (5) a computer to time stamp, process and collate the aforesaid data to define target position, elevation, and physical and dimensional measurements.

5,557,398

PHOTOMETRIC DEVICE

Mark Wechsler, San Mateo, Calif.; Howard H. Barney, Portland, Oreg.; Roger A. Kaye, Mountain View, Calif.; David G. Ogle, Los Altos, Calif.; Michael M. Lacy, Ben Lomond, Calif.; Calvin Y. Chow, Portola Valley, Calif.; Kimberly L. Crawford, Cupertino, Calif., and Dean G. Hafeman, Hillsborough, Calif., assignors to Molecular Devices Corporation, Sunnyvale, Calif.

Filed Apr. 15, 1994, Ser. No. 228,436
Int. Cl.[6] G01J 3/30
U.S. Cl. 356—318 16 Claims



1. A photometric device for measuring an optical property of a plurality of samples, contained within a plurality of vessels in multi-assay plate, comprising, in combination;

an excitation light source that emits a first light having a first wavelength range on the order of 200 to 1100 nanometers,

a monochromator, responsive to said first light received from said excitation light source, for producing a second light

having a predetermined second wavelength range on the order

ing said distance based upon said relative phase and associ-

an optical coupling assembly connected to said optical pulse generator and to the optical fiber for selectively applying said

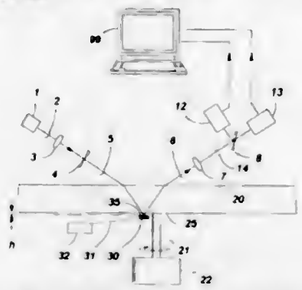
having a predetermined second wavelength range on the order of 250 to 750 nanometers;
an optical fiber, coupled to said monochromator and extending in a first direction therefrom, for receiving said second light and transmitting a test light substantially in said first direction;
a distribution network including a series of distribution optical fibers extending in a second direction;
rotor means for receiving said test light from said optical fiber and for redirecting said test light substantially in said second direction and sequentially into each of said distribution optical fibers;
said rotor means including at least a first mirror operable in a series of mirror positions in correspondence with said series of distribution optical fibers, respectively;
said distribution network transmitting said test light substantially vertically and sequentially through said vessels, said test light being affected by each of said samples to produce a plurality of measurement light flashes;
and photodetector means for receiving said measuring light flashes and responsively providing a plurality of electrical measurement output signals representative of said optical property for each of said optical property for each of said samples, respectively.

5,557,399

OPTICAL GAP MEASURING APPARATUS AND METHOD

Peter de Groot, Middletown, Conn., assignor to Zygo Corporation, Middlefield, Conn.

Filed Mar. 22, 1995, Ser. No. 408,907
Int. Cl.[6] G01B *9/02*
U.S. Cl. 356—357 **29 Claims**



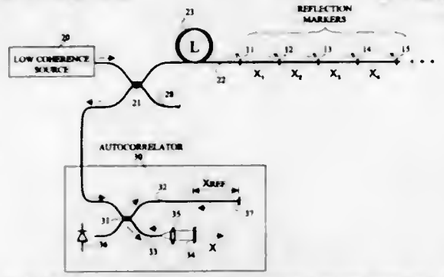
1. A method for measuring the distance of a surface of an object under test with respect to a surface of a substantially transparent element, said object surface being in close proximity to said transparent element surface, said method comprising the steps of:
directing a single polarized light beam toward said transparent element surface at an oblique angle, said single beam having a plane of incidence defining a polarization basis vector p having an associated orthogonal basis vector s, said single beam being incident on said transparent element surface and having a polarization such that both said s and p type polarizations are present;
reflecting said single light beam back through said substantially transparent element from said transparent element surface for providing a reflected beam comprising said s and p polarization components, said reflected beam resulting from a combined reflection from said substantially transparent element surface and said object surface, said reflected s and p polarization components having a relative phase with respect to each other and associated amplitudes;
interfering said reflected s and p polarization components in said reflected beam with each other for providing information about said relative phase and said associated amplitudes of said reflected s and p polarization components; and determining said distance based upon said relative phase and associated amplitude information of said reflected s and p polarization components.

5,557,400

MULTIPLEXED SENSING USING OPTICAL COHERENCE REFLECTROMETRY

Wayne V. Sorin, Mountain View, and Douglas M. Baney, Los Altos, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 15, 1995, Ser. No. 389,222
Int. Cl.[6] G01B *9/02; 11/16*
U.S. Cl. 356—73.1 **11 Claims**



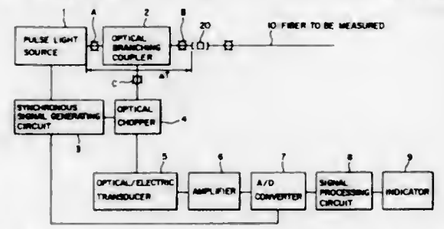
1. An apparatus for measuring the distance between markers on an optical fiber, said apparatus comprising:
a plurality of markers on said optical fiber, each said marker reflecting a portion of a light signal traversing said fiber from a first end thereof, said markers being introduced at predetermined distances from said first end;
means for generating said light signal and for causing said light signal to enter said first end of said optical fiber;
means for collecting light reflected from said markers; and
autocorrelation means for measuring the coherent sum of a first signal comprising said collected light and a second signal comprising said collected light delayed by a variable time delay as a function of said variable time delay, wherein said markers are constructed such that each peak in intensity of said coherent sum can be assigned to reflections generated by a specific pair of said markers.

5,557,401

OPTICAL MASKING APPARATUS

Mikio Maeda, and Masaaki Furuhashi, both of Tokyo, Japan, assignors to Ando Electric Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1994, Ser. No. 318,360
Claims priority, application Japan, Oct. 13, 1993, 5-280049
Int. Cl.[6] G01N *21/88;* **G02B** *26/04*
U.S. Cl. 356—73.1 **10 Claims**



1. An optical masking apparatus for an optical time domain reflectometer used to measure the transmissivity of an optical fiber, said apparatus comprising:
an optical pulse generator for generating a light pulse in response to a trigger signal;

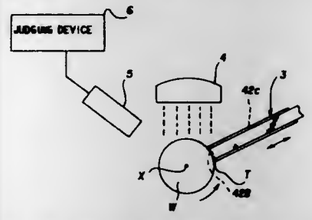
an optical coupling assembly connected to said optical pulse generator and to the optical fiber for selectively applying said light pulse to the optical fiber and to direct light reflected from the optical fiber to an optical coupling assembly output port;
an optical chopper connected to said optical coupling assembly output port for receiving the reflected light from the optical fiber, said optical chopper having an ON state wherein the reflected light is transmitted through said optical chopper and an OFF state wherein said transmission of the reflected light is blocked, and being configured so that said ON/OFF state is controlled in response to an optical chopper ON/OFF synchronizing signal; and
a synchronizing circuit connected to said optical pulse generator and to said optical chopper, said synchronizing circuit configured to generate said optical chopper ON/OFF synchronizing signal and said trigger signal, wherein said trigger signal is generated as a function of said optical chopper ON/OFF synchronizing signal.

5,557,402

SURFACE FLAW DETECTING APPARATUS OF WORKPIECE

Toshihiro Osawa, Ikoma; Shizuki Sasakura, Yao, and Haruhiko Terauchi, Osaka, all of Japan, assignors to Koyo Machine Industries Co., Ltd., Yao, Japan

Filed Apr. 20, 1995, Ser. No. 425,497
Claims priority, application Japan, Sep. 30, 1994, 6-261704
Int. Cl.[6] G01N *21/48*
U.S. Cl. 356—237 **15 Claims**



1. A surface flaw detecting apparatus of workpiece comprising:
work rotating means for rotating a workpiece about its axial line,
cleaning means for removing soiling from the surface of workpiece,
lighting means for illuminating the surface of workpiece,
line sensor means for detecting reflected light from the surface of workpiece,
judging means for judging presence or absence of flaw on the surface of workpiece from the detection result of the line sensor means, and
control means for driving and controlling these constituent means by synchronizing mutually,
wherein the control means is designed to drive and control each constituent means so as to rotate the workpiece about its axial line, and detect the surface flaw optically while removing soiling from the surface of workpiece.

5,557,403

SYSTEM AND METHOD FOR MEASURING CRAZING IN A TRANSPARENCY

Harry L. Task, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 3, 1995, Ser. No. 415,407
Int. Cl.[6] G01N *21/00*
U.S. Cl. 356—239 **8 Claims**

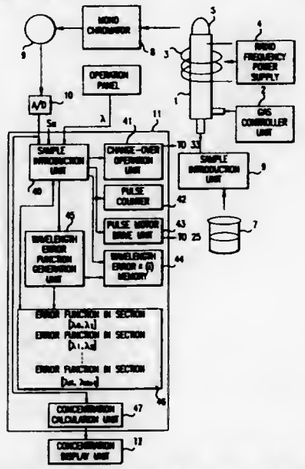
1. A system for measuring crazing in a transparency, comprising:
(a) a first substantially light tight housing having an open end for placement near a first side of a transparency at the portion thereof having a crazed condition;
(b) a light source disposed within said first housing for projecting light through said transparency at said portion thereof baving a crazed condition;
(c) a second substantially light tight housing having an open end for placement in registration with said first housing near the second side of said transparency opposite said first housing;
(d) an optical detector within said second housing and positioned therein to detect only fight from said source reflected from said portion of said transparency having said crazed condition;
(e) baffle means within one or both of said first and second housings for blocking direct; projection of light from said source to said detector; and
(f) a source of power for said source and said optical detector.

5,557,404

SPECTROPHOTOMETER WITH A SYSTEM FOR CALIBRATING A MONOCHROMATOR

Shigeru Matsui, and Akira Owada, both of Hitachinaka, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 17, 1995, Ser. No. 405,652
Claims priority, application Japan, Mar. 22, 1994, 6-050676
Int. Cl.[6] G01J *3/18*
U.S. Cl. 356—319 **11 Claims**



1. A spectrophotometer with a monochromator having a diffraction grating and a grating drive assembly, comprising:
(a) a light source emitting a plurality of emission lines for calibrating the monochromator;
(b) a wavelength error memory storing, with respect to respective calibration wavelengths, values of errors between apparent calibration wavelengths obtained when the diffraction

grating is positioned in theoretical positions corresponding to respective calibration wavelengths, and real wavelengths of

(iv) collecting the scattered light from the diluted flowing sample; and

5,557,407

MEASURING APPARATUS HAVING A DIFFRACTION

producing second interference fringes by projecting a determination light having a second wavelength slightly different

grating is positioned in theoretical positions corresponding to respective calibration wavelengths, and real wavelengths of said emission lines obtained when a light beam from said light source is introduced into said monochromator;

(c) an error function generator dividing a whole measurable spectral range in said monochromator into a plurality of spectral regions by said calibration wavelengths, and generating wavelength error functions in connection with said respective spectral regions on the basis of the arrangement of said errors associated with said respective calibration wavelengths;

(d) an error function storage device storing said generated wavelength error functions in connection with said respective spectral regions;

(e) a controller selecting, of said plurality of spectral regions, a spectral region to which an estimated wavelength for an element to be measured belongs, and for controlling the grating drive assembly so as to obtain a position of said diffraction grating compensated by wavelength error function in said selected spectral region.

5,557,405

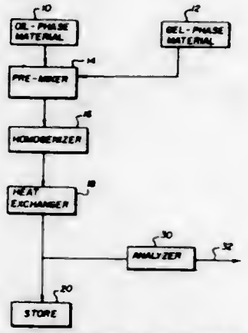
MEASUREMENT OF DROPLET SIZE IN A PHOTOGRAPHIC DISPERSION

David J. Young, Hertfordshire, United Kingdom, assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 284,329, Aug. 2, 1994, abandoned. This application Nov. 13, 1995, Ser. No. 556,347

Int. Cl.[6] G01N *15/02*

U.S. Cl. 356—336 **8 Claims**



1. A method of manufacturing a photographic dispersion in a main flow path for subsequent use in manufacturing a photographic product, the method comprising the steps of:

a) mixing together oil-phase materials and gel-phase materials in a mixing device to form a mixed oil-and gel-phase material;

b) homogenizing the mixed oil- and gel-phase materials in a homogenizing device to form a homogenized photographic dispersion;

c) removing heat from the mixed and homogenized photographic dispersion is a heat exchanging device;

d) monitoring at least one property of the photographic dispersion produced, said at least one property of the photographic dispersion comprising droplet size; and

e) storing the photographic dispersion until ready for use in manufacturing a photographic product;

wherein step d) includes the steps of:

(i) diverting a portion of the photographic dispersion from the main flow path to form a flowing sample;

(ii) diluting the flowing sample with demineralized water to form a diluted flowing sample in accordance with a predetermined water to dispersion ratio;

(iii) illuminating the diluted flowing sample with light from a light source, the diluted flowing sample scattering the illuminating light in accordance with said at least one property of the photographic dispersion;

(iv) collecting the scattered light from the diluted flowing sample; and

(v) analyzing the scattered light to provide an output signal indicative of said at least one property of the photographic dispersion.

5,557,406

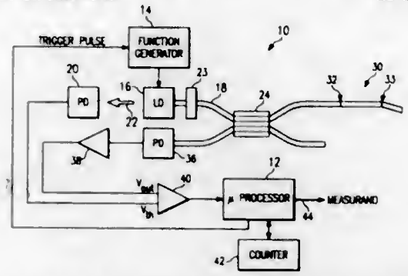
SIGNAL CONDITIONING UNIT FOR FIBER OPTIC SENSORS

Henry F. Taylor, College Station; Roberto Sadkowski, Plano, and Chung E. Lee, College Station, all of Tex., assignors to The Texas A&M University System, College Station, Tex.

Filed Feb. 28, 1995, Ser. No. 395,448

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—345 **28 Claims**



1. Apparatus for determining the value of a measurand measured by a fiber optic interferometer sensor, comprising

a light source emitting a light having a predetermined frequency;

a first photodetector coupled to said light source producing a first electrical signal proportional to said light;

fiber optic means coupled between said light source and said fiber optic interferometer sensor transmitting at least a portion of said light to said interferometer; a second photodetector coupled to said fiber optic interferometer sensor detecting at least a portion of said light transmitted through or reflected from said interferometer, and producing a second electrical signal proportional thereto;

an adjustable amplifier coupled to said second photodetector for amplifying said second electrical signal therefrom;

a comparator coupled to said second photodetector for comparing said second electrical signal with said first electrical signal, producing a first output voltage in response to said first electrical signal exceeding said second electrical signal, and producing a second output voltage in response to said first electrical signal not exceeding said second electrical signal;

a microcontroller coupled to said comparator generating a plurality of trigger signals at a fixed frequency, each initiating a modulation cycle and further generating a control signal in response to detecting a predetermined transition between said first and second output voltages;

a modulator coupled to said light source and said microcontroller for modulating the frequency of said light source in a periodic manner in response to receiving a trigger signal from said microcontroller;

a counter coupled to said microcontroller and beginning counting in response to receiving a trigger signal, ending counting in response to receiving said control signal from said microcontroller, and generating a count value; and

said microcontroller computing a measurand value in response to receiving said count value for each modulation cycle.

5,557,407

MEASURING APPARATUS HAVING A DIFFRACTION GRATING FOR RECEIVING A DIVERGED LIGHT BEAM

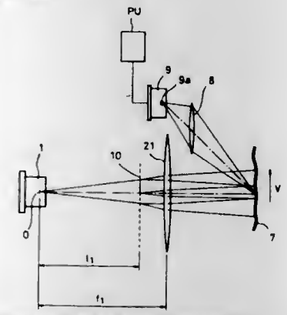
Makoto Takamiya, Tokyo, and Hidejiro Kadowaki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1994, Ser. No. 364,782

Claims priority, application Japan, Dec. 28, 1993, 5-337465

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—356 **21 Claims**



1. A speed measuring apparatus, comprising:

a light source unit for generating a diverged light beam;

a diffraction grating for generating exit light, having at least two exit light beams and including diffracted light, when the diverged light beam from said light source unit enters said diffraction grating;

optical means for converting the exit light into a collimated light; and

optical detecting means for receiving interference light formed by projecting the collimated light on an object to be measured, wherein the speed of the object is measured by using signals obtained by said optical detecting means.

5,557,408

METHOD OF AND SYSTEM FOR MEASUREMENT OF DIRECTION OF SURFACE AND REFRACTIVE INDEX VARIATIONS USING INTERFERENCE FRINGES

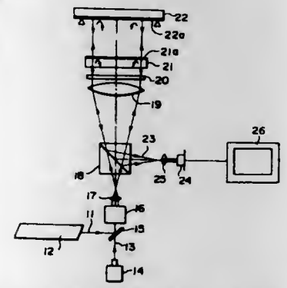
Motonori Kanaya, Ohmiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Saitama-ken, Japan

Filed Mar. 17, 1995, Ser. No. 406,364

Claims priority, application Japan, Jun. 29, 1994, 6-147477

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—359 **6 Claims**



1. A method of measuring the shape of a surface of a work comprising the steps of

producing first interference fringes by projecting a main measuring light having a first wavelength onto a work and a reference surface,

producing second interference fringes by projecting a determination light having a second wavelength slightly different from the first wavelength onto the work and the reference surface, and

determining whether the surface of the work is concave or convex or in which direction the surface inclines on the basis of the relative positions of the first and second interference fringes.

5,557,409

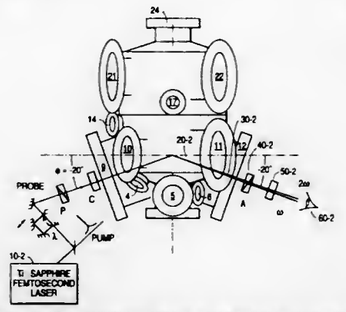
CHARACTERIZATION OF AN EXTERNAL SILICON INTERFACE USING OPTICAL SECOND HARMONIC GENERATION

Michael Downer; Jerry I. Dadap, both of Austin, and John K. Lowell, Round Rock, all of Tex., assignors to Advanced Micro Devices Inc., Sunnyvale, Calif.

Filed Oct. 13, 1994, Ser. No. 322,324

Int. Cl.[6] G01B *11/30*

U.S. Cl. 356—371 **40 Claims**



1. A method of determining physical properties of a surface to be studied, comprising the steps of:

a) applying a plurality of light pulses from a laser light source to said surface, each of said light pulses having a pulsewidth in the femtosecond range;

b) detecting a second harmonic frequency component for each of a plurality of light signals reflected from said surface, wherein said light signals correspond on a one-to-one basis to said plurality of light pulses from aid laser light source; and

c) identifying variations in said surface due to changes in characteristics of said second harmonic frequency component for said each of said light signals,

wherein step c) is performed by an averaging of said second harmonic frequency component for said each of said light signals reflected from said surface within a predetermined time.

5,557,410

METHOD OF CALIBRATING A THREE-DIMENSIONAL OPTICAL MEASUREMENT SYSTEM

Edward D. Huber, Sunnyvale; Rick A. Williams, Orinda; Dean M. Shough, Newark, all of Calif.; Osuk Y. Kwon, Seoul, Rep. of Korea, and Rebecca L. Welling, La Honda, Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

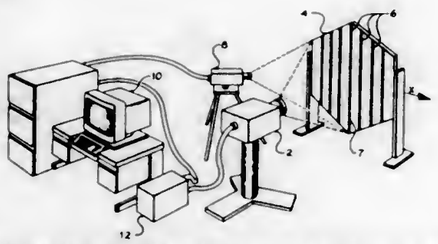
Division of Ser. No. 249,841, May 26, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 479,342

Int. Cl.[6] G01B *11/24*

U.S. Cl. 356—376 **11 Claims**

1. A method for calibrating a three-dimensional optical measurement system, said method comprising the steps of:

mechanically measuring three-dimensional coordinates at each of a plurality of points on a surface of a three-dimensional test calibration fixture;



placing said test calibration fixture into the field of view of said optical measurement system;

optically acquiring a set of data representing the phase at each of a plurality of pixels corresponding to said optical measurement system's view of the surface of said test calibration fixture;

for both the mechanically measuring step and the optically acquiring step, calculating the intersection point of three faces on said surface to uniquely define an accurate correlation between three-dimensional coordinate position and measured phase at that location; and

using an optimization procedure, calculating parameters of said three-dimensional optical measurement system, so as to minimize the difference between intersection point coordinates calculated from the mechanically measuring step and intersection point coordinates calculated from the optically acquiring step; and

fixing said parameters based upon the results of the optimization procedure.

5,557,411

POSITION DETECTION METHOD

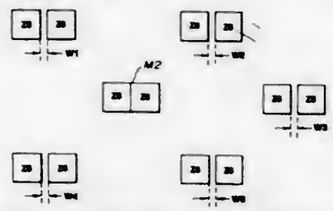
Sakae Hourya, Hachiohji, and Noriyuki Nose, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tkyo, Japan

Continuation of Ser. No. 266,497, Jun. 27, 1994, abandoned. This application Dec. 22, 1995, Ser. No. 577,704

Claims priority, application Japan, Jun. 30, 1993, 5-187476

Int. Cl.[6] G01B *11/00*

U.S. Cl. 356—401 **5 Claims**



1. A method for measuring the interval between a first mark and a second mark on a first object, said method comprising the steps of:

providing a third mark, having the same optical function as the first mark, and a fourth mark, having the same optical function as the second mark, on the first object with a predetermined interval therebetween;

providing a fifth mark, and a sixth mark, on a second object;

projecting light onto the first and second objects;

projecting a first light beam passing through the fifth mark and reflected by the first mark onto a predetermined detection surface, and projecting a second light beam passing through the sixth mark and reflected by the second mark onto the predetermined detection surface;

projecting a third light beam passing through the fifth mark and reflected by the third mark onto the predetermined detection surface, and projecting a fourth light beam passing through the sixth mark and reflected by the fourth mark onto the predetermined detection surface; and

determining the relationship between the actual interval between the first and second marks and information relating to the incident positions of the first and second light beams on the predetermined detection surface, based on the predetermined interval and information relating to the incident positions of the third and fourth light beams on the predetermined detection surface.

5,557,412

IMAGE FORMING METHOD AND APPARATUS FOR COUNTERFEIT PROTECTION USING IMAGE SYNTHESIS ACCOUNTING FOR FORMING CONDITIONS

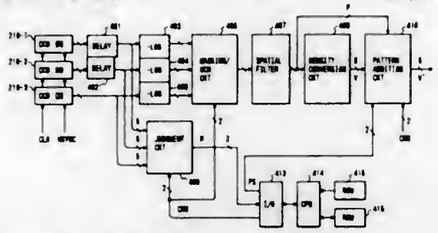
Rie Saito; Nobuatsu Sasanuma, both of Yokohama, and Tetsuya Atsumi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1993, Ser. No. 125,809

Claims priority, application Japan, Sep. 28, 1992, 4-258203; Sep. 28, 1992, 4-258211; Sep. 28, 1992, 4-258698; Sep. 28, 1992, 4-258699

Int. Cl.[6] G03G *21/00;* **H04N** *1/21;1/41*

U.S. Cl. 358—296 **18 Claims**



1. An image forming apparatus comprising:

input means for inputting image data representing an image;

synthesizing means for synthesizing a predetermined information with the image represented by the image data;

forming means for forming an image in accordance with the image synthesized data;

detecting means for detecting a condition relating to an image forming by said forming means; and

controlling means for controlling the synthesis by said synthesizing means based on the detection result of said detecting means.

5,557,413

IMAGE OUTPUT APPARATUS

Norio Ebihara; Noboru Asamizuya, and Nobuchika Momochi, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 25, 1994, Ser. No. 217,743

Claims priority, application Japan, Mar. 29, 1993, 5-069828

Int. Cl.[6] H04N *1/21*

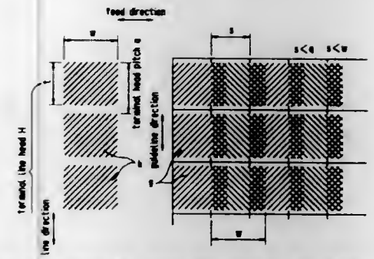
U.S. Cl. 358—296 **4 Claims**

1. An image output apparatus including lenticular lenses, said apparatus printing images by superimposing and printing n images in a first direction on a substrate at a particular pitch p so that one of the n images is displayed through said lenticular lenses when being observed, comprising:

a printer for printing said n images; and

a controller for controlling said printer, wherein a fixed number of pixels m are printed for each of said n images, and pixels m corresponding to the n images are printed within one pitch p wherein a feed s in the first direction for each of said pixels m is given substantially by

$s=p/(n\times m)$



wherein the n images are being superimposed and printed.

5,557,414

METHOD AND APPARATUS FOR CLASSIFYING ARTICLES ACCORDING TO THEIR COLOR

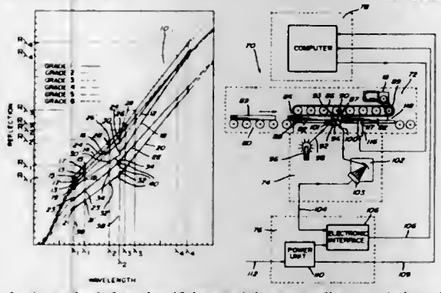
Gilles Allaire, Cap Rouge; Gratien Beauchemin, Sillery; Roger Garceau, Pierrefonds, and Bruno Leclerc, Sainte-Foy, all of Canada, assignors to Centre de Recherche Industrielle du Québec, Ste-Foy, Canada

Filed Jun. 8, 1993, Ser. No. 73,301

Claims priority, application Canada, Apr. 29, 1993, 2095154

Int. Cl.[6] G01N *21/27;21/89*

U.S. Cl. 356—407 **38 Claims**



1. A method for classifying articles according to their color comprising steps of:

selecting a first pair of wavelengths on a plurality of light reflection curves in terms of a reflected light wavelength spectrum;

illuminating with light comprising said first pair of wavelengths an area of one of said articles;

measuring light reflected from said area of one of said articles at said first pair of wavelengths to obtain detected light reflection values corresponding to said first pair of wavelengths;

producing a primary signal representing a resulting difference between said detected light reflection values, said signal being indicative of the color of said one of said articles;

selecting at least one secondary wavelength on said reflected light wavelength spectrum;

illuminating with light comprising said at least one secondary wavelength said area of said one of said articles;

measuring light reflected from said area at said at least one secondary wavelength to produce a secondary signal; said secondary signal being further indicative of the color of said one of said articles;

providing a classification frame comprising a pattern consisting of first and second crossing sets of lines respectively defined by mathematical analysis, said classification frame defining a plurality of color classes;

classifying said one of said articles in a color class of said plurality of color classes defined by said frame, whenever said primary and secondary signals comply with a specific condition; and

rejecting said one of said articles whenever said primary and secondary signals do not comply with said specific condition; and wherein said first and second crossing sets of lines are respectively defined by:

$$R2_i=m_1(R1_i-R1_{0i})+R2_{0i}$$

and

$$R2_j32-m_2(R1_{0j}-R1_{0j})+R2_{0j}$$

wherein

$R1_i$ is a threshold value for said primary signal on a first axis corresponding to a line i of said first set of lines, i=1,n and n>2;

$R1_j$ is a threshold value for said primary signal on a first axis corresponding to a line j of said first set of lines, j=1,m and m>2;

$R1_{0i}$ is the origin threshold value for said primary signal on said first axis corresponding to the line i of said first set of lines;

$R1_{0j}$ is the origin threshold value for said primary signal on said first axis corresponding to the line j of said first set of lines;

$R2_i$ is a threshold value for said secondary signal on a second axis corresponding to a line i of said second set of lines, i=1,n and n>2;

$R2_j$ is a threshold value for said secondary signal on a second axis corresponding to a line j of said second set of lines, j=1,m and m>2;

$R2_{0i}$ is the origin threshold value for said secondary signal on said second axis corresponding to the line i of said second set of lines;

$R2_{0j}$ is the origin threshold value for said secondary signal on said second axis corresponding to the line j of said second set of lines;

m_1 is a slope parameter for the line i of said first set of lines, and being a positive value;

m_2 is a slope parameter for the line j of said second set of lines, and being a positive value, and wherein $R1_{0i=1}$ and $R2_{0i=1}$ are respectively equal to $R1_{0j=1}$ and $R2_{0j=1}$;

and wherein said specific condition is defined by:

$$\left(\frac{r2-R2_{0i}}{m_1}\right)+R1_{0i}<r1<\left(\frac{r2-R2_{0i+1}}{m_1}\right)+R1_{0i+1}$$

and

$$-m_2(r1-R1_{0j})+R2_{0j}<R2<-m_2(r1-R1_{0j+1})+R2_{0j+1}$$

wherein

C_{ij} is the class delimited by the line i and a line i+1 of said first set of lines and the line j and a line j+1 of said second set of lines, and wherein i<n−1, j<m−1;

r1 is said primary signal indicative of the color of said one of said articles; and

r2 is said secondary signal further indicative of the color of said one of said articles.

5,557,415

APPARATUS AND METHOD FOR INDUCING AND DETECTING FLUORESCENCE

Hans O. Nielsen, and Jan Hansen, both of Lyngby, Denmark, assignors to Faxekalk A/S, Copenhagen, Denmark

PCT No. PCT/DK93/00171, § 371 Date Dec. 21, 1994, § 102(e) Date Dec. 21, 1994, PCT Pub. No. WO93/23738, PCT Pub. Date Nov. 25, 1993

PCT Filed May 19, 1993, Ser. No. 343,511

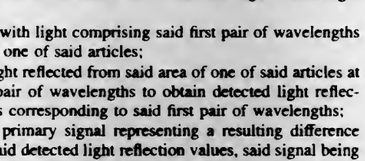
Claims priority, application Denmark, May 21, 1992, 0669/92

Int. Cl.[6] G01N *21/64*

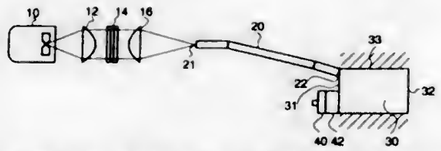
U.S. Cl. 356—417 **26 Claims**

1. An apparatus for inducing and detecting fluorescence in a fluid medium containing at least one fluorophore, the apparatus comprising:

adding step is controlled in accordance with a position of the



wherein said processing means determines start and interruption



a light emitter adapted to emit exciting light of a particular wavelength capable of exciting fluorophores in the fluid medium;

a light detector adapted to detect fluorescence emitted by the fluorophores excited by the exciting light; and

a solid sensor body having internally reflecting wall parts capable of reflecting at least light having a wavelength corresponding to the particular wavelength and having a sensor face adapted to be exposed to the fluid medium, the sensor body being adapted to receive the exciting light from the light emitter, to transmit the received exciting light into the fluid medium through the sensor face, to receive, through the sensor face, fluorescence emitted by excited fluorophores in the fluid medium, and to transmit at least part of the received fluorescence to the light detector, the sensor body being made of a material which is capable of effectively transmitting the exciting light and the fluorescence,

wherein both the light emitter and the detector are positioned at positions at an end of the sensor body a distance from the sensor face, relative positioning of the light emitter, the detector, and the sensor face being such that the detector is able to receive light transmitted from at least a portion of that part of the sensor face which receives light from the light emitter, and

wherein the relative positioning of the light emitter, the sensor face and the optical detector is such that light emitted by the light emitter may directly illuminate the predominant part of the sensor face.

5,557,416

IMAGE PROCESSING APPARATUS AND METHOD THEREOF FOR ADDING A PREDETERMINED PATTERN TO AN IMAGE

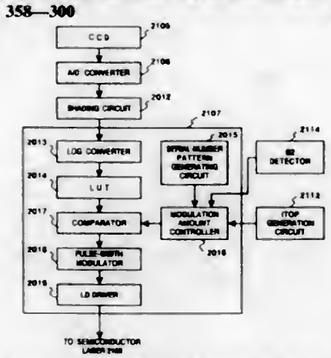
Nobuatsu Sasanuma; Masaaki Sakurai, and Rie Saito, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 24, 1993, Ser. No. 125,831

Claims priority, application Japan, Sep. 25, 1992, 4-256234; Sep. 25, 1992, 4-256235; Sep. 28, 1992, 4-282525

Int. Cl.[6] H04N *1/29;1/00;* **G03G** *21/00;* **G01D** *15/14*

U.S. Cl. 358—300 **15 Claims**



1. An image forming method of forming an image represented by an input image signal comprising:

an adding step of adding a predetermined pattern on the image represented by the input image signal; and

an image forming step of forming the image on which the predetermined pattern is added, wherein the addition by said adding step is controlled in accordance with a position of the image on which the predetermined pattern is added.

5,557,417

MULTI-LOOP TESTING APPARATUS WITH MEANS FOR ADJUSTING A REPRODUCED VIDEO SIGNAL

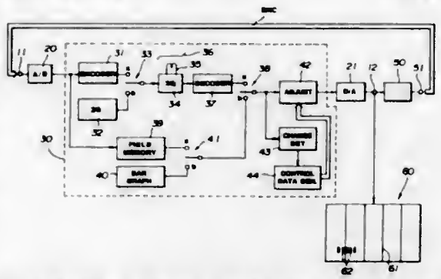
Mikio Ishli, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 865,937, Apr. 9, 1992, abandoned. This application Jan. 24, 1994, Ser. No. 185,754

Claims priority, application Japan, Apr. 11, 1991, 3-163291

Int. Cl.[6] H04N *5/76*

U.S. Cl. 358—310 **33 Claims**



1. Apparatus for adjusting a digital signal reproduced from a record medium, the reproduced digital signal thereafter being subjected to analog processing, comprising:

test input means for providing an input digital test signal;

loop means including digital-to-analog converting means and analog-to-digital converting means for circulating the digital test signal through said loop means a predetermined number of times;

detecting means for detecting changes in said digital test signal after said digital test signal has been recirculated through said loop means said predetermined number of times to produce change indications corresponding to respective detected changes; and

automatic adjustment means including storage means having addresses at which there are stored adjustment values and which are accessed by said change indications, respectively, for reading the corresponding adjustment values from said storage means, and means selectively supplied with said digital signal reproduced from the record medium and being responsive to said adjustment values read from said storage means for adjusting predetermined characteristics of the reproduced digital signal.

5,557,418

VIDEO TAPE FORMAT FOR PROVIDING SPECIAL EFFECTS CAPABILITIES

Louis F. Schaefer, Palo Alto, Calif., assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

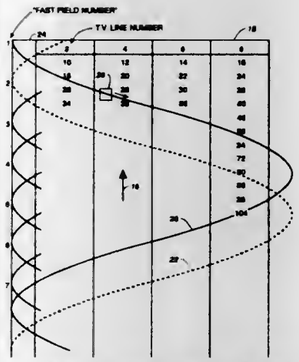
Continuation of Ser. No. 817,622, Jan. 7, 1992, abandoned. This application Dec. 9, 1993, Ser. No. 164,833

Int. Cl.[6] H04N *5/783;5/84*

U.S. Cl. 358—335 **16 Claims**

1. Method of reading digital video information recorded on an optical recording medium moving at a given speed comprising the steps of:

scanning a fraction of a video signal field stored on the recording medium during a scan cycle with an optical sinusoidal trace over the recording medium, said scanning being performed at a speed selected to have a predetermined relationship with said given speed such that a predetermined fraction of the video signal field is scanned;



reading data during the scan cycle, the data including video signal information and video signal identification information; and

storing at least a portion of the read video signal information in a field memory at a location identified by the video signal identification information.

5,557,419

APPARATUS FOR INTERMITTENTLY RECORDING AND/OR REPRODUCING A TIME-VARYING IMAGE

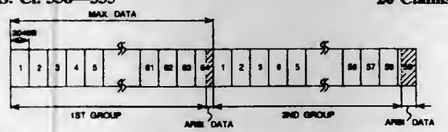
Akira Mato, Sakai, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 23, 1994, Ser. No. 217,201

Claims priority, application Japan, Mar. 25, 1993, 5-066318

Int. Cl.[6] H04N *5/937*

U.S. Cl. 358—335 **20 Claims**



1. A recording apparatus for recording a time-varying image signal on a recording medium comprising:

a compression-coding means for compression-coding a group of a plurality of consecutive image frames, corresponding to a given time (t), to a group of digital image information, at least one of the consecutive image frames being compression-coded by intraframe compression-coding while the remaining consecutive image frames are compression-coded by interframe compression-coding, said compression-coding means operable to limit a total quantity of the group of the compression-coded information to a value not greater than a first fixed value (A);

a storage means for temporarily storing therein a portion of the compression-coded information;

a monitoring means for monitoring the quantity of effective information stored in said storage means;

a processing means for reading out the information from said storage means for each unit of information of a second fixed value smaller than at least half said first fixed value at a predetermined rate greater than A/t, said processing means processing the read information at said predetermined rate; and

a control means for controlling said processing means and outputting an operation start command to said processing means when the quantity of the effective information stored in said storage means is greater than a first given value, said control means also outputting an operation interruption command to said processing means when the quantity of the effective information stored in said storage means is smaller than a second given value,

wherein said processing means determines start and interruption thereof in response to said operation start command and said operation interruption command.

5,557,420

METHOD AND APPARATUS FOR RECORDING VIDEO SIGNALS ON A RECORD MEDIUM

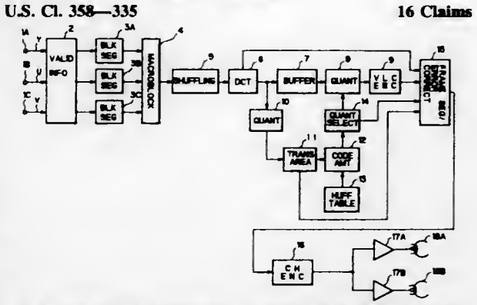
Naofumi Yanagihara, Tokyo; Keiji Kanoto, and Yukio Kubota, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 966,888, Oct. 27, 1992, abandoned. This application Aug. 1, 1994, Ser. No. 283,652

Claims priority, application Japan, Nov. 5, 1991, 3-317497; Jun. 30, 1992, 4-196219

Int. Cl.[6] H04N *5/76*

U.S. Cl. 358—335 **16 Claims**



1. A method of recording video signals of first and second video signal intervals in a plurality of sequentially arranged tracks on a recording medium, comprising the steps of:

respectively dividing said first and second video signal intervals into first and second pluralities of areas of a video screen;

respectively dividing said first and second pluralities of areas into first and second sequences of sub-areas of said video screen;

respectively dividing said first and second sequences of sub-areas into first and second sequences of macroblocks, at least one pair of macroblocks of said first and second sequences of macroblocks representing co-located positions of said video screen and thereby forming at least one pair of first and second common macroblocks;

respectively selecting corresponding macroblocks in corresponding sub-areas from each of said first and second sequences of macroblocks of each of said first and second sequences of sub-areas of each of said first and second pluralities of areas to form first and second sequences of buffering units, each of said corresponding sub-areas representing a portion of said video screen having a respectively different horizontal position and a respectively different vertical position than the other ones of said corresponding sub-areas;

recording the video signals of said first sequence of buffering units in a first predetermined pattern in a first group of a plurality of sequentially arranged tracks; and

recording the video signals of said second sequence of buffering units in a second predetermined pattern in a second group of a plurality of sequentially arranged tracks separate from said first group, said second predetermined pattern being different than said first predetermined pattern such that the first and second common macroblocks are recorded at respective first and second locations within the first and second groups of tracks by different recording heads.

5,557,421

APPARATUS FOR PROGRAMMING A VIDEO TAPE RECORDER

user means for entering an automatic-set-codes command and for entering a VCR+ code corresponding to a broadcast for

outputting the first and second streams of digitized audio/visual data corresponding to the digital reference time base in accor-

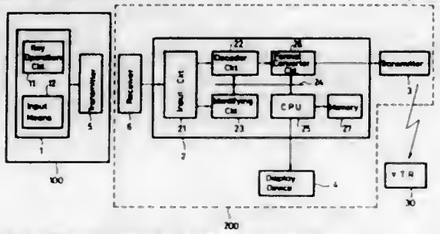
means for receiving said video output signals from said computer means to convert said video output signals having a high

5,557,421

APPARATUS FOR PROGRAMMING A VIDEO TAPE RECORDER

Tohru Kurita, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 65,154, May 21, 1993, abandoned. This application Aug. 1, 1994, Ser. No. 283,740
Claims priority, application Japan, May 29, 1992, 4-139362
Int. Cl.[6] H04N *5/76;5/232*
U.S. Cl. 358—335 **2 Claims**



1. A video programming apparatus comprising:

at least one video tape recorder;

an input unit including a key operation unit for operation by a user to input data information concerning video programming of a television program, wherein said data information is represented as an arbitrary sequence of numerals, and

input means for operation by the user to input a code that designates a selected one of said at least one video tape recorder for effecting said video programming corresponding to said data information; and

a control unit including decoding means for decoding said data information from said key operation unit, identifying means for identifying said selected one of said at least one video tape recorder that corresponds to said code input by said input means to thereby form video programming data suitable for controlling said selected one of said at least one video tape recorder, and

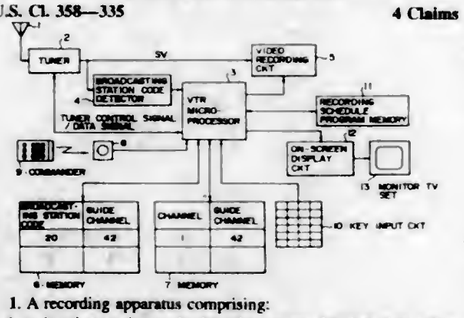
transmitting means for transmitting said video programming data to said at least one video tape recorder.

5,557,422

RECORDING METHOD AND APPARATUS FOR PROGRAMMING A RECORDING SCHEDULE

Tetsuo Nishigaki, Kanagawa; Takamichi Mitsubashi, Saitama, and Takamichi Yoshidaa, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 76,169, Jun. 14, 1993. This application Nov. 4, 1994, Ser. No. 334,427
Claims priority, application Japan, Jun. 30, 1992, 4-173436
Int. Cl.[6] H04N *5/76;* **G11B** *8/00*
U.S. Cl. 358—335 **4 Claims**



1. A recording apparatus comprising:

broadcasting station code detecting means for detecting a first broadcasting station code from a television broadcast signal of a channel selected by a tuner;

user means for entering an automatic-set-codes command and for entering a VCR+ code corresponding to a broadcast for recording, the VCR+ code having an embedded second broadcasting station code;

first memory means for storing first data representing a first corresponding relationship between first broadcasting station codes and respective second broadcasting station codes;

second memory means; and

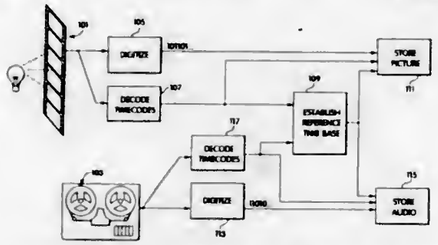
processing means for automatically setting second data representing a second corresponding relationship between channels selectable by the tuner and respective second broadcasting station codes by using respective first broadcasting station codes detected by said broadcasting station code detecting means and the first data stored in said first memory means in response to the automatic-set-codes command entered by a user using said user means for storing the second data in said second memory means and for automatically decoding the VCR+ code having the embedded second broadcasting station code and converting the decoded second broadcasting station code to a channel to be selected by the tuner by using the second data in said second memory means.

5,557,423

SYNCHRONIZATION OF DIGITAL VIDEO WITH DIGITAL AUDIO

Michael Phillips, Brookline; Patrick O'Connor, Billerica, and Eric Peters, Carlisle, all of Mass., assignors to Avid Technology, Inc., Tewksbury, Mass.

Continuation of Ser. No. 48,645, Apr. 16, 1993, abandoned. This application Nov. 23, 1994, Ser. No. 344,409
Int. Cl.[6] H04N *5/76*
U.S. Cl. 358—335 **1 Claim**



1. A method of synchronizing a plurality of streams of digitized audio/visual data including corresponding streams of absolute time indications with each other, comprising the steps of:

creating digital reference time base including periodic timing information and a predetermined start time;

identifying a first relationship between the periodic timing information and a first stream of absolute time indicators that corresponds to a first stream of the plurality of streams of digitized audio/visual data, such that the predetermined start time is coincident with a start time of the first stream of absolute time indicators;.

identifying a second relationship between the periodic timing information and a second stream of absolute time indicators that corresponds to a second stream of the plurality of streams of digitized audio/visual data, such that the predetermined start time is coincident with a start time of the second stream of absolute time indicators; and

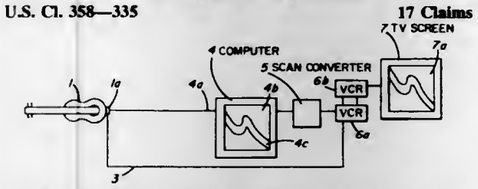
outputting the first and second streams of digitized audio/visual data corresponding to the digital reference time base in accordance with the first relationship and the second relationship, so that the first and second streams of digitized audio/visual data are synchronized.

5,557,424

PROCESS FOR PRODUCING WORKS OF ART ON VIDEOCASSETTE BY COMPUTERIZED SYSTEM OF AUDIOVISUAL CORRELATION

Janis M. Panizza, 446 Kenmont Ave., Pittsburgh, Pa. 15228

Continuation of Ser. No. 121,669, Sep. 15, 1993, abandoned, which is a continuation of Ser. No. 698,855, May 13, 1991, abandoned, which is a continuation-in-part of Ser. No. 236,740, Aug. 26, 1988, abandoned. This application Sep. 15, 1995, Ser. No. 392,194
Int. Cl.[6] H04N *5/76;* **A63J** *17/00*
U.S. Cl. 358—335 **17 Claims**



1. A system for converting audio signals to a visual representation of the audio signals comprising;

a source of audio sound waves,

means for converting said audio sound waves into digitized sound waves or

computer means being programmed to store a plurality of visual images corresponding to a plurality of digitized input signals representative of audio signals,

means for storing in said computer means said digitized input signals and analyzing said digitized input signals into control components to generate visual output signals corresponding to said control components,

said control components forming a communication channel between said digitized input signals and said visual output signals trigger the generation of related visual output signals broken down into control components including frequency and loudness or peak of pulse of the sound,

said computer means includes programmable control means for selectively changing said visual output signals corresponding to said control component,

so that while the responsive output signals remain synchronized with said digitized input signals said visual output signals generated from said control components are edited to change the content of the visual images produced by said output signals including a change of color, size, shape, or movement,

said programmable control means including digitized signal processing means for breaking down said digitized input signal into components and generating performance events therefrom and graphics processor and animation generator means for tying the performance events to said visual output signals,

means for editing said visual output signals in response to the visual images stored in said computer means and said digitized input signals to generate resultant video output signals corresponding to a range of different visual images from said computer means,

said editing means including an event editor to allow selection of the performance events as expressed in graphics or animation, a graphic editor to allow manipulation of the graphics as a representation of the performance events, and an animation editor to allow fade-in and fade-out of a visual display, movement of a visual display and color changes of a visual display,

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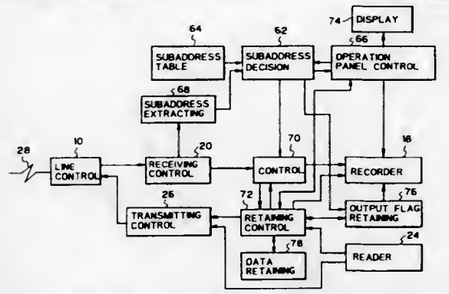
5,557,425

FACSIMILE DEVICE FOR USE IN ISDN AND METHOD OF CONTROLLING SAME

Kenichi Hasegawa, Inagi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 757,345, Sep. 10, 1991, abandoned. This application Dec. 21, 1993, Ser. No. 170,978
Claims priority, application Japan, Sep. 10, 1990, 2-239628
Int. Cl.[6] H04N *1/100*
U.S. Cl. 358—440 **12 Claims**



1. A facsimile device which receives and records messages including image data from a digital network, wherein each of the messages includes a first identifier identifying a receiving facsimile device for receiving the image data, and wherein a second identifier to be compared with the first identifier is stored in the receiving facsimile device, said facsimile device comprising:

receiving means for receiving one of the messages from the digital network;

identifier extracting means for extracting the first identifier from said one of the messages received by the receiving means when said one of the messages includes the first identifier;

storing means for storing the second identifier;

comparison means for comparing the first identifier with the second identifier when the identifier extracting means extracts the first identifier and when the second identifier is stored in the storing means, to determine whether the first identifier coincides with the second identifier;

recording means for recording the image data;

received data retaining means for retaining the image data, to be one of recorded by the recording means and erased according to commands input by a user; and

control means for controlling operations such that the receiving means receives the image data when any of the following conditions occur:

(a) the first identifier coincides with the second identifier,

(b) said one of the messages does not include the first identifier while said storing means does not store the second identifier, and

(c) said one of the messages does not include the first identifier while said storing means stores the second identifier,

said control means recognizing all of conditions (a), (b) and (c) and controlling the operations such that the receiving means ignores said one of the messages when none of (a), (b) and (c) occur, such that the image data is retained in the received data retaining means but not automatically recorded when condi-

tion (c) occurs, and such that when condition (a) or (b) occurs, the image data is recorded by the recording means.

means and to store the other part of said third image data in said second storage means.

generating a signal indicating one of a front or a back surface of

tion (c) occurs, and such that when condition (a) or (b) occurs, the image data is recorded by the recording means.

5,557,426

IMAGE INFORMATION SIGNAL PROCESSING APPARATUS

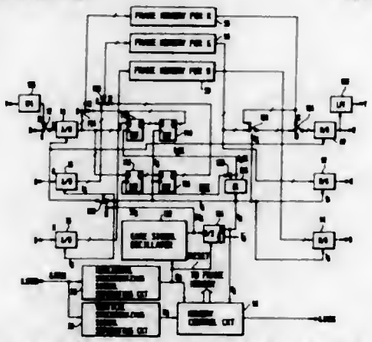
Tsuguhide Sakata, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 201,872, Feb. 24, 1994, abandoned, which is a continuation of Ser. No. 28,768, Mar. 9, 1993, abandoned, which is a continuation of Ser. No. 942,344, Sep. 9, 1992, abandoned, which is a continuation of Ser. No. 460,318, Jan. 2, 1990, abandoned, which is a continuation of Ser. No. 255,110, Oct. 7, 1988, abandoned. This application Sep. 29, 1994, Ser. No. 315,194

Claims priority, application Japan, Oct. 16, 1987, 62-261006

Int. Cl.[6] H04N *1/40;11/04*

U.S. Cl. 358—448 **36 Claims**



1. An image information signal processing apparatus adapted to process a first image information signal having at least a first image signal and a second image signal which is different from said first image signal, and a second image information signal having a third image signal the frequency band of which is wider than that of said first image signal or said second image signal, said image information signal processing apparatus comprising:

(A) image data formation means, arranged to selectively input said first image information signal or said second image information signal, for forming, when said first image information signal is input, first image data corresponding to said first image signal and second image data corresponding to said second image signal by performing sampling of said first image information signal in accordance with a first sampling signal having a first sampling frequency, and for forming, when said second image information signal is input, third image data corresponding to said third image signal by performing sampling of said second image information signal in accordance with a second sampling signal having a second sampling frequency which is higher than said first sampling frequency;

(B) first storage means capable of storing one picture plane portion of said first image data formed by said image data formation means;

(C) second storage means capable of storing one picture plane portion of said second image data formed by said image data formation means; and

(D) image data supply means for supplying, when said first image information signal is input to said image data formation means, said first image data and said second image data formed by said image data formation means to said first storage means and said second storage means, respectively, and, when said second image information signal is input to said image data formation means, said image data supply means being arranged to store a part of said third data formed by said image data formation means in said first storage means and to store the other part of said third image data in said second storage means.

5,557,427

IMAGE FORMING APPARATUS WITH MEANS FOR DETECTING SHEET THICKNESS

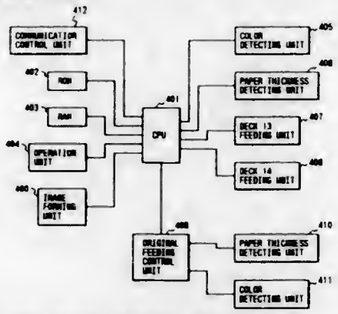
Yuji Kamiya, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 20, 1994, Ser. No. 262,658

Claims priority, application Japan, Jun. 21, 1993, 5-149297

Int. Cl.[6] H04N *1/04;* **G03G** *21/00*

U.S. Cl. 358—496 **8 Claims**



1. An image forming apparatus comprising:

a plurality of accommodation means for accommodating recording sheets;

feed means for feeding recording sheets from said plurality of accommodation means,

image forming means for forming an image on a recording sheet fed by said feed means;

detection means for detecting thicknesses of the sheets accommodated in said plurality of accommodation means;

input means for designating manually a desired thickness of the recording sheet; and

control means for selecting one of said plurality of accommodation means so as to feed the recording sheet of the desired thickness on the basis of a designation from said input means and a detection result of said detection means.

5,557,428

COLOR IMAGE FORMING APPARATUS WHICH CHANGES COLOR IMAGE PROCESSING BASED ON PROPERTIES OF A RECORDING MEDIUM

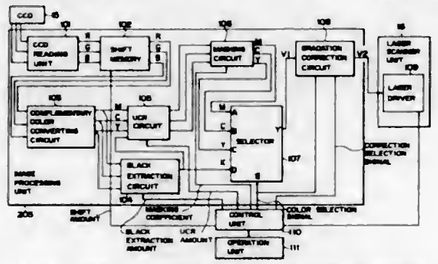
Nobuyuki Watanabe, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1993, Ser. No. 68,098

Claims priority, application Japan, May 29, 1992, 4-138443

Int. Cl.[6] H04N *1/50;1/60*

U.S. Cl. 358—501 **26 Claims**



1. A color image processing method comprising the steps of:

inputting color image data;

generating a signal indicating one of a front or a back surface of a recording medium onto which an image is to be formed;

setting a processing parameter on the basis of the signal generated in said step of generating;

color image processing the color image data input in said step of inputting in accordance with the processing parameter set in said step of setting; and

outputting the color image data processed in said step of color image processing.

5,557,429

IMAGE SIGNAL PROCESSING APPARATUS

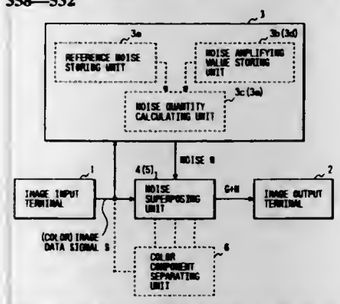
Yoshitsugu Hirose, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 19, 1993, Ser. No. 137,795

Claims priority, application Japan, Oct. 20, 1992, 4-306618

Int. Cl.[6] H04N *1/405;1/409;1/52;1/58*

U.S. Cl. 358—532 **8 Claims**



1. An image signal processing apparatus for converting an image data signal input by an image input terminal into another image data signal suitable for an image output terminal; comprising:

noise generating means for generating a quantity of noise of a spatial frequency characteristic difficult to visually perceive in accordance with a level of the input image data signal, wherein the noise generating means generates noise of a frequency equal to or lower than a fundamental frequency of a screen generated by half-tone generating means in said image output terminal; and

noise superposing means for superposing only the noise generated by said noise generating means on the input image data signal.

5,557,430

IMAGE PROCESSING APPARATUS GENERATING PATTERNS FOR COLORS BASED ON A SET RELATION BETWEEN COLORS AND PATTERNS AND SYNTHESIZING PATTERNS WITH EXTRACTED MONOCHROMATIC INFORMATION

Keizo Isemura, Kokubunji; Kunio Yoshihara, Sagamihara; Hiroyuki Ichikawa, Kawasaki; Masanori Sakai, Yokohama; Masateshi Tanabe, Chigasaki; Mitsuo Nimura, Kawasaki; Yoshihiro Funamizu, Soka, and Hirohiko Kishimoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 265,635, Jun. 24, 1994, abandoned, which is a continuation of Ser. No. 838,311, Feb. 20, 1992, abandoned. This application Sep. 15, 1995, Ser. No. 528,595

Claims priority, application Japan, Feb. 20, 1991, 3-047667; May 29, 1991, 3-153938; May 29, 1991, 3-153939

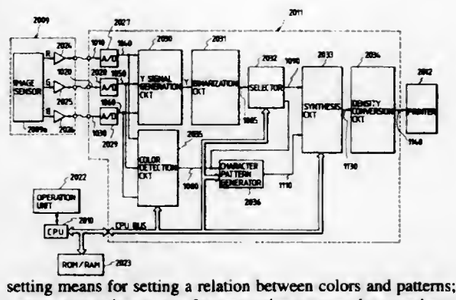
Int. Cl.[6] H04N *1/46*

U.S. Cl. 358—501 **30 Claims**

1. An image processing apparatus, comprising:

image input means for inputting images containing colors;

color recognition means for recognizing the colors of the images input by said image input means;



setting means for setting a relation between colors and patterns;

pattern generation means for generating patterns in accordance with each of the colors recognized by said color recognition means, and the relation between colors and patterns set by said setting means;

visualizing means for visualizing the relation between patterns and colors generated by said pattern generation means;

area recognition means for recognizing areas containing the colors in the images input by said image input means;

extraction means for extracting monochrome information from the images input by said image input means;

synthesis means for synthesizing the patterns originating from said pattern generation means within the area recognized by said area recognition means with the monochrome information extracted by said extraction means; and

output means for outputting the images synthesized by said synthesis means.

5,557,431

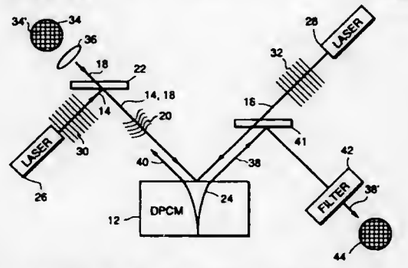
REAL-TIME COMPENSATED IMAGING SYSTEM AND METHOD USING A DOUBLE-PUMPED PHASE-CONJUGATE MIRROR

David M. Pepper, Malibu, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 16, 1993, Ser. No. 169,888

Int. Cl.[6] G03H *1/10*

U.S. Cl. 359—10 **21 Claims**



1. An adaptive optical imaging system, comprising:

a two-beam coupling medium,

a remote reference beam source for directing a remote reference beam through an aberrating medium to said coupling medium, said aberrating medium having a characteristic frequency at which its degree of aberration varies, wherein said remote reference beam source pulses the remote reference beam at a frequency higher than the aberrating medium's characteristic frequency to refresh said hologram at said higher frequency,

a local reference beam source for directing a local reference beam having known phase and intensity characteristics into said beam coupling medium to establish therein a shared hologram with said remote reference beam, and

an object beam source for directing a multi-pixel object beam, that contains image information corresponding to an object, through said aberrating medium to said hologram on a path similar to said remote reference beam, said object beam

diffracting from said two-beam coupling medium into a multi-pixel output beam in the phase conjugate direction of the local reference beam, said output beam retaining said image information, and wherein the pixelized difference in phase and intensity characteristics between the output beam and the local reference beam corresponds to the pixelized difference in phase and intensity characteristics between the object beam and the remote reference beam,

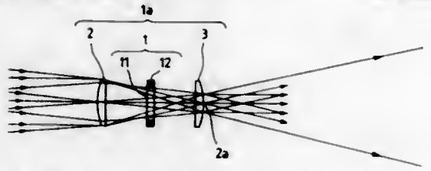
said local reference beam and said remote reference beam establishing said shared hologram independent of said object beam.

5,557,432

DISPLAY DEVICE AND IMAGE FORMATION APPARATUS HAVING FIRST AND SECOND LENS ARRAYS

Hideo Yokota, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1994, Ser. No. 234,956
Claims priority, application Japan, Apr. 30, 1993, 5-128212
Int. Cl.[6] G02F 1/1335
U.S. Cl. 359—41 **14 Claims**



1. A display device comprising:

a plurality of light modulation portions;

a first lens array having lens portions, corresponding to said plurality of light modulation portions, for converging a light by said lens portions; and

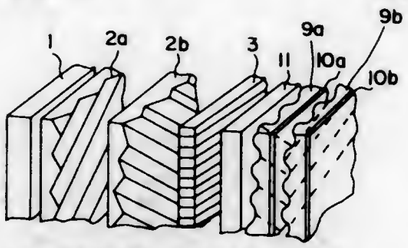
a second lens array having lens portions corresponding to said lens portions of said first lens array, for receiving the light from said light modulation portions, and arranged at a converging point portion of said first lens array.

5,557,433

TRANSMISSIVE LIQUID CRYSTAL DISPLAY HAVING PRISM LENS FILM FOR LIGHT ILLUMINATION AND WAVE LENS FILM FOR LIGHT DIFFUSION

Muneo Maruyama; Toshihiko Ueno; Hiroshi Hada, and Masatake Baba, all of Tokyo, Japan, assignors to NEC Corporation, France

Filed Feb. 13, 1995, Ser. No. 387,606
Claims priority, application Japan, Feb. 28, 1994, 6-030655
Int. Cl.[6] G02F 1/1335
U.S. Cl. 359—41 **12 Claims**



1. A transmissive liquid crystal display comprising:

a surface illuminant including a light-guide plate;

a single prism lens film having an uniform apical angle for receiving light emitted from said surface illuminant so as to be condensed in a direction perpendicular to a surface thereof and transmitting the resultant parallel light therethrough;

a TN liquid crystal panel for receiving the parallel light transmitted through said prism lens film and emitting light for representing an image therefrom; and

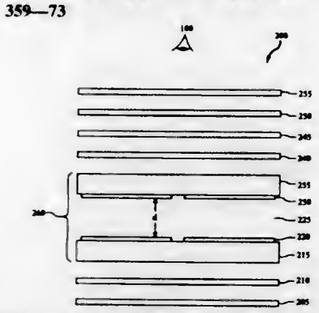
a single wave lens film disposed in front of said TN liquid crystal panel and having a surface facing said TN liquid crystal panel, which is shaped in the form of a wave having parallel ridgelines and a smooth surface on the opposite side, which is coated with a multilayer film, said wave lens film transmitting the light incident from said TN liquid crystal panel to the outside via said multilayer film as diffusion light.

5,557,434

OPTICAL COMPENSATOR INCLUDING AN O-PLATE FOR SUPER-TWIST NEMATIC LIQUID CRYSTAL DISPLAY

Bruce K. Winker, Moorpark; Ragini Saxena, Simi Valley; Donald B. Taber, Thousand Oaks, and Leonard G. Hale, Newbury Park, all of Calif., assignors to Rockwell International, Seal Beach, Calif.

Filed Sep. 30, 1994, Ser. No. 313,477
Int. Cl.[6] G02F 1/1335; C09K 19/02
U.S. Cl. 359—73 **16 Claims**



9. An improved super-twist nematic liquid crystal display comprising:

(a) a polarizer layer;

(b) an analyzer layer;

(c) a liquid crystal cell disposed between said polarizer layer and said analyzer layer, said liquid crystal cell having:

(1) two substrates, and

(2) a liquid crystal layer disposed between said two substrates, said liquid crystal layer comprising a plurality of cholesteric liquid crystal molecules, said molecules having an azimuthal twist angle between said substrates of substantially greater than about 180 degrees; and

(d) a positively-birefringent O-plate compensator layer having an optical axis defined by a tilt angle, said tilt angle measured relative to the plane of the O-plate compensator layer, said O-plate compensator layer disposed between said polarizer layer and said analyzer layer, wherein said tilt angle is a specified value between approximately 30 degrees and approximately 50 degrees.

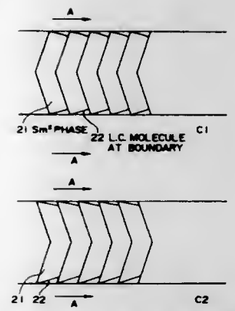
5,557,435

LIQUID CRYSTAL DEVICE AND DISPLAY APPARATUS

Yukio Hanyu, Atsugi; Tadashi Mihara, Isehara; Yasuto Kodera, Fujisawa, and Katsutoshi Nakamura, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1993, Ser. No. 9,062
Claims priority, application Japan, Jan. 28, 1992, 4-013026
Int. Cl.[6] G02F 1/13
U.S. Cl. 359—75 **7 Claims**

1. A chiral smectic liquid crystal device comprising: a chiral smectic liquid crystal, and a pair of substrates sandwiching the liquid crystal, said pair of substrates having opposite surfaces that



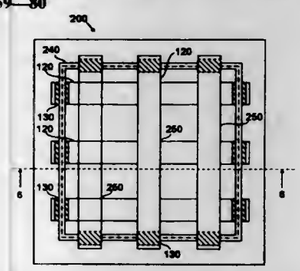
are provided with electrodes for applying a voltage to the liquid crystal and uniaxial alignment axes which cross each other at a crossing angle Θ_c satisfying: $0 < \Theta_c < 15$ degrees, wherein the liquid crystal is placed in the alignment state satisfying $\alpha > (H)$ (wherein α denotes a pretilt angle and (H) denotes a tilt angle, respectively, of the liquid crystal) and providing at least two stable states of optical axes which form an angle $2\Theta a$ therebetween satisfying $(H) > \Theta a > (H)/2$, and wherein a lower substrate of the pair is provided with a uniaxial alignment axis which deviates in a clockwise direction when the liquid crystal has a negative spontaneous polarization and deviates in a counterclockwise direction when the liquid crystal has a positive spontaneous polarization with respect to a uniaxial alignment axis provided to an upper substrate of the pair as viewed from above.

5,557,436

THIN SEAL LIQUID CRYSTAL DISPLAY AND METHOD OF MAKING SAME

Rodney Blose, Gibsonia; Niel Mazurek, Huntingdon Valley, and Theodore J. Zammit, Ambler, all of Pa., assignors to Magnascreen Corporation, Pittsburgh, Pa.

Filed May 12, 1994, Ser. No. 241,489
Int. Cl.[6] C02F 1/1339;1/1345
U.S. Cl. 359—80 **35 Claims**



1. A method for constructing a thin seal display with electrical edge contacts comprising the steps of:

disposing electrically conductive strips on a major surface of first and second oversized substrates to form first and second metalized substrates, wherein at least one end of each of the electrically conductive strips extends over an outline dimension of the thin seal liquid crystal display;

disposing a seal material in a substantially precision manner on a substantial portion of the display outline dimension on the first substrate to create a fill gap opening;

forming a substrate assembly by arranging the first substrate on top of the second substrate wherein the major surfaces containing the electrically conductive strips are facing one another so as to create a cavity in an area bounded by the first and second substrates and the seal material;

transforming the seal material into a seal which joins the substrates;

filing the cavity of the sealed substrate assembly with a display material through the fill gap opening;

sealing the fill gap opening;

forming a reduced substrate assembly by precisely reducing edges of the sealed substrate assembly to the outline dimension of the display, wherein the precision reduction reduces a width of the seal to form the thin seal and exposes edges of the conductive strips; and

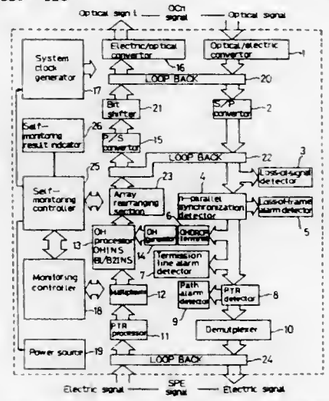
forming electrical edge contacts by depositing an electrically conductive material on the edges of the reduced substrate assembly in the areas of the exposed edges of the electrically conductive strips.

5,557,437

OPTICAL TERMINAL SYSTEM HAVING SELF-MONITORING FUNCTION

Toshiharu Sakai; Yoshinori Nakamura; Takashi Umegaki; Nobuo Iguchi; Miki Hagino; Hiroaki Mori; Toshikazu Ota, all of Osaka; Akihiko Oka, Kanagawa; Kazuo Takatsu, Kanagawa, and Nobuyuki Nemoto, Kanagawa, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Jun. 7, 1995, Ser. No. 487,444
Claims priority, application Japan, Sep. 29, 1994, 6-234913
Int. Cl.[6] H04B 10/08;10/00
U.S. Cl. 359—110 **11 Claims**



1. An optical terminal system having self-monitoring function, comprising:

a receiving device including an optical/electric convertor for receiving an optical signal and converting the optical signal into an electric signal, a S/P convertor for converting the electric signal converted by the optical/electric convertor into a parallel electric signal, and a signal state detector for checking if the parallel electric signal is normal, then separating a low-level signal from the parallel electric signal and outputting the low-level signal;

a transmitting device including a signal generator for switching a clock for the low-level electric signal and multiplexing the low-level electric signal into a high-level signal, a P/S convertor for converting the electric signal generated by the signal generator into a serial electric signal, and an electric/optical convertor for converting the serial electric signal into an optical signal and transmitting the optical signal;

a system clock generator for generating a system clock which actuates the receiving device and transmitting device;

a monitoring controller for controlling the receiving device and transmitting device and monitoring an alarm;

a power source for supplying power to the receiving device, transmitting device, system clock generator and monitoring controller;

a high-level group loopback section for connecting the P/S

an optical path from said radiation source means to said

5,557,440

only one of the selected time interval t during each repeti-

a high-level group loopback section for connecting the P/S convertor of the transmitting device and the S/P convertor of the receiving device to internally loop back the serial electric signal;

a low-level group loopback section for connecting the signal generator of the transmitting device and the signal state detector of the receiving device to internally loop back the parallel electric signal;

a self-loopback section for connecting the signal state detector of the receiving device and the signal generator of the transmitting device to directly loop back the electric signal received by the receiving device to the transmitting device; and

a self-monitoring controller for performing a self-monitoring test on the respective components of the receiving device and transmitting device by using the self-loopback section and either of the high-level group loopback section and low-level group loopback section.

5,557,438

SCANNING AND TRACKING USING ROTATING POLYGONS

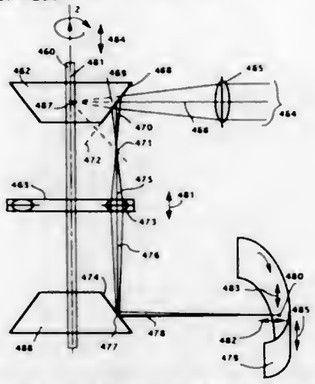
Nira Schwartz, 1314 Wellington Pl., Aberdeen, N.J. 07747, and Arie Shahar, 14 David St., Moshav Magshimim 56910, Israel

Filed Nov. 23, 1993, Ser. No. 155,889

The portion of the term of this patent subsequent to Feb. 2, 2010, has been disclaimed.

Int. Cl.[6] G02B *26/08*

U.S. Cl. 359—204 **72 Claims**



1. A system for scanning, tracking, engraving, printing, plotting, writing, or reading, comprising:

(a) a polygon means rotatable about a rotational axis throughout a range of rotation with a first angular velocity, said polygon means comprising a polygon having at least one side, said side including at least one optical means;

(b) a radiation source means for providing a plurality of radiation beams having a plurality of relative orientations and directing said plurality of radiation beams onto said optical means of said polygon means, such that said plurality of radiation beams travel to said optical means of said polygon means;

(c) a medium support means providing a medium having a region;

(d) said optical means arranged to project said plurality of radiation beams from said optical means onto said region to form, on said region, a corresponding plurality of radiation spots which move on said region at a second angular velocity about said rotational axis of said polygon means, said second angular velocity being linearly proportional to said first angular velocity;

(e) said region being positioned to receive said plurality of radiation beams from said optical means of said polygon means, such that said plurality of radiation beams travel along an optical path from said radiation source means to said optical means, and then to said region;

(f) said radiation source means and said region being positioned so that they are spaced from said rotational axis and are spaced from each other; and

(g) a relative movement means for moving said plurality of radiation beams parallel to said rotational axis.

5,557,439

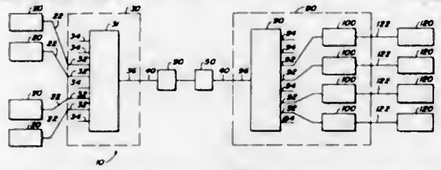
EXPANDABLE WAVELENGTH DIVISION MULTIPLEXED OPTICAL COMMUNICATIONS SYSTEMS

Stephen B. Alexander, Millersville; Steve W. Chaddick, Annapolis, and Victor Mizrahi, Columbia, all of Md., assignors to Ciena Corporation, Columbia, Md.

Filed Jul. 25, 1995, Ser. No. 507,659

Int. Cl.[6] H04J *14/02*

U.S. Cl. 359—130 **7 Claims**



1. An expandable wavelength division multiplexed optical communication system having at least N wavelengths, where N is a whole number greater than or equal to 2, the wavelength division multiplexed optical communication system comprising:

N source lasers for producing N optical channels, each channel having a unique wavelength;

an optical multiplexer module optically communicating with each of the N source lasers for optically combining the N optical channels to form a wavelength division multiplexed optical signal, the multiplexer having N+x inputs, where x is a whole number greater than or equal to 1, the N+x input ports being configured such that the N input ports are optically coupled to the N source lasers and the x input ports are supplemental ports not optically coupled to the N source lasers;

an optical transmission path optically communicating with the multiplexer for carrying the wavelength division multiplexed optical signal comprising the N optical channels;

N separately-packaged optical channel selecting modules, each selecting module including at least one Bragg grating, each Bragg grating configured to select a unique optical channel wavelength;

an optical splitter module optically communicating with the optical transmission path for receiving the wavelength division multiplexed optical signal and outputting portions of the wavelength division multiplexed optical signal onto plural output ports, the optical splitter module and having N+y output ports, where y is a whole number greater than or equal to 1, the N+y output ports being configured such that each of the N output ports are optically coupled to one of the N optical channel selecting modules and the y output ports are supplemental ports not optically coupled to any of the N optical channel selecting modules.

5,557,440

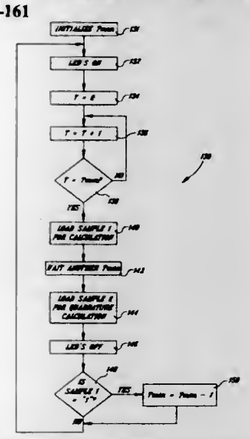
NOISE-INSENSITIVE OPTOENCODING TECHNIQUES WITH COMPENSATION FOR DEVICE VARIATIONS

Mark T. Hanson, Lynnwood, and Glade B. Bacon, Everett, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Jan. 5, 1994, Ser. No. 177,462

Int. Cl.[6] H03K *17/78*; G09G *5/08*

U.S. Cl. 359—161 **31 Claims**



1. A method of providing adjustable input signals for a computer using a computer input device having a memory, at least one light-emitting element and at least one light-detecting element, the method comprising the steps of:

selecting a first value of time Tmin; and

determining whether to adjust the first value of time Tmin by performing the steps

(a) activating the light-emitting element, causing it to emit light;

(b) selectively receiving the emitted light by the light-detecting element;

(c) producing a signal by the light-detecting element in response to the selectively received light;

(d) after the step (c) of producing the signal by the light-detecting element, repeatedly incrementing or decrementing, by a selected time interval t, a count value, and after each change in the count value, but prior to sampling the signal, comparing the count value to the first value of time Tmin to determine if the count value is substantially equal to the first value of time Tmin;

(e) after the step (d) of determining that the count value is substantially equal to the first value of time Tmin, sampling and storing a first sample of the signal in the memory;

(f) sampling and storing a second sample of the signal in the memory, the second sample being stored at a second value of time after the first value of time Tmin, the second value of time having a relationship to the first value of time Tmin, the second sample being used as an input signal for the computer;

(g) after the step (f) of sampling and storing the second sample of the signal, deactivating the light-emitting element;

(h) retrieving the first sample from the memory;

(i) after the step (g) of deactivating the light-emitting element, comparing the retrieved first sample to a selected value;

(j) after the step(g) of deactivating the light-emitting element and after the step (i) of comparing the retrieved first sample to the selected value, changing the first value of time Tmin by the selected time interval t if the first sample has a predetermined relationship to the selected value; and

(k) after the step (j) of changing the first value of time Tmin by the selected time interval t, repeating the steps of (a) through (j) whereby upon repeating the steps (a) through (j), the first value of time Tmin is incrementally changed by only one of the selected time interval t during each repetition of the steps (a) through (j) until the first sample no longer has the predetermined relationship to the selected value.

5,557,441

SOLITON TRANSMISSION SYSTEM HAVING PLURAL SLIDING-FREQUENCY GUIDING FILTER GROUPS

Linn F. Mollenauer, Colts Neck, N.J., assignor to AT&T, Holmdel, N.J.

Filed Oct. 17, 1994, Ser. No. 323,949

Int. Cl.[6] H04B *10/12*

U.S. Cl. 359—173 **7 Claims**

1. A lightwave transmission system supporting soliton propagation in a particular band of frequencies and comprising an optical fiber transmission medium including both a plurality of optical amplifiers spaced apart along the optical fiber transmission medium and a plurality of optical filters spaced apart along the optical fiber transmission medium, the lightwave transmission system CHARACTERIZED IN THAT,

the plurality of optical filters is organized into a plurality of filter groups, each filter group comprising at least N filters where N is an integer and N≧2,

each filter group exhibits a group average center frequency which is different from the group average center frequency of each other filter group,

the plurality of filter groups together exhibit an average frequency sliding rate for moving the frequency of the soliton toward each filter group's group average center frequency, each group average center frequency being in the particular band of frequencies.

5,557,442

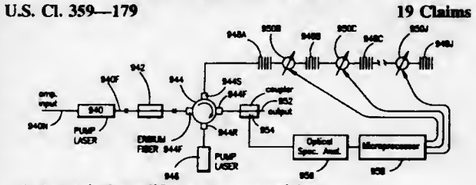
OPTICAL AMPLIFIERS WITH FLATTENED GAIN CURVES

David R. Huber, Warrington, Pa., assignor to Ciena Corporation, Savage, Md.

Division of Ser. No. 71,263, Jun. 4, 1993. This application Dec. 30, 1994, Ser. No. 367,432

Int. Cl.[6] H01S *3/00*; H04B *10/16*

U.S. Cl. 359—179 **19 Claims**



1. An optical amplifier system comprising:

an optical input fiber;

an optical amplifier device connected to receive optical input signals from the optical input fiber;

a directional optical transfer device having at least first, second, and third ports, the first port connected to receive an initial amplified output from said optical amplifier device;

an optical attenuation fiber connected to the second port of said optical transfer device, said second port receiving said initial amplified output applied to said first port, said optical attenuation fiber having a plurality of in-fiber gratings and a plurality of attenuators, each of said attenuators disposed between two of the in-fiber gratings, each of said in-fiber gratings reflecting a different wavelength of optical energy, said optical attenuation fiber supplying an adjusted amplified output to

said second port, the optical attenuation fiber configured such that the adjusted amplified output is a relatively linear ampli-

a current source, coupled to said adder circuit, for controlling a value of the bias current in correspondence to the output of

said second port, the optical attenuation fiber configured such that the adjusted amplified output is a relatively linear amplification of the optical input signals; and

an optical output fiber connected to the third port of said directional optical transfer device to receive said adjusted amplified output.

5,557,443

OPTICAL COMMUNICATION METHOD AND OPTICAL REMOTE CONTROLLER

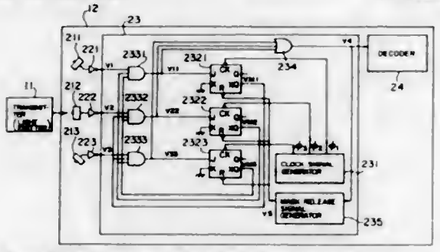
Hiroshi Nakamura, Kasuga; Yasuaki Muranaka, Chikushi-gun; Susumu Ishibashi, Fukuoka, and Toshiyuki Kihara, Tosu, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 5, 1994, Ser. No. 341,217

Claims priority, application Japan, Dec. 9, 1993, 5-309011; Jun. 23, 1994, 6-141699

Int. Cl.[6] H04B *10/00;* **H04N** *5/225;5/232*

U.S. Cl. 359—142 **17 Claims**



1. An optical communication method comprising:

(a) generating a plurality of clock signals having mutually different phases;

(b) receiving light emitted from a light source by using a plurality of light receiving sections and converting the light received by said plurality of light receiving sections into received signals;

(c) determining whether or not each of the received signals is present when each clock pulse included in a respective one of the clock signals is generated;

(d) generating an invalidation signal when a received light signal is determined to be present in step (c);

(e) preventing, when the invalidation signal is present, other received signals from being used to generate said invalidation signal; and

(f) decoding the received signal for which the invalidation signal is generated.

5,557,444

MINIATURE OPTICAL SCANNER FOR A TWO AXIS SCANNING SYSTEM

Charles D. Melville, Issaquah; Thomas A. Furness, III, Seattle; Michael R. Tidwell, Seattle; Joel S. Kollin, Seattle, and Richard S. Johnston, Issaquah, all of Wash., assignors to University of Washington, Seattle, Wash.

Filed Oct. 26, 1994, Ser. No. 329,508

Int. Cl.[6] G02B *26/08*

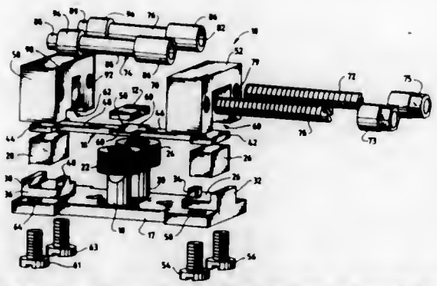
U.S. Cl. 359—199 **37 Claims**

1. A miniature optical scanner comprising:

a ferromagnetic base with a first stator and a second stator formed thereon, said first and second stators being generally parallel to each other,

a first electrical coil wound about said first stator in a first direction;

a second electrical coil wound about said second stator in a second direction opposite said first direction;



first and second magnets disposed on said base on opposite sides of said first and second stators and equidistant to said first and second stators;

a spring plate having first and second support portions mounted respectively on said first and second magnets and having a centrally located mirror mounting portion disposed above said starors with an axis of rotation equidistant to said stators; and

a mirror mounted on said mirror mounting portion of said spring plate, said mirror being oscillated about said axis of rotation when an alternating drive signal is coupled to said first and second electrical coils.

5,557,445

OPTICAL SIGNAL TRANSMITTER HAVING AN APC CIRCUIT WITH AUTOMATIC BIAS CURRENT CONTROL

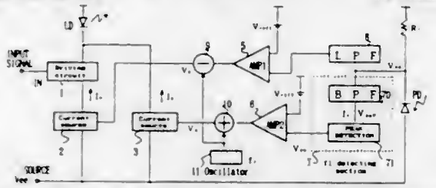
Setsuo Misaizu, Yokohama, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 9, 1994, Ser. No. 303,372

Claims priority, application Japan, Feb. 25, 1994, 6-052958

Int. Cl.[6] H04B *10/04*

U.S. Cl. 359—187 **10 Claims**



1. An optical signal transmitter having an Auto Power Control (APC) circuit with automatic bias current control, comprising:

a laser diode supplied with a bias current signal and an input signal, for outputting a light output according to a level of the input signal;

a photo diode for detecting the light output emitted from the laser diode;

an oscillator for generating and outputting a low frequency signal having a frequency which is lower than that of the input signal;

a circuit for modulating a bias current signal in amplitude with said low frequency signal received from said oscillator; and

a circuit, coupled to said photo diode, for detecting a signal component having said frequency which is lower than that of the input signal and is included in the light output of said laser diode for controlling the bias current so that the detected signal component becomes of a fixed value,

said circuit for detecting said signal component including:

a detecting circuit for detecting said signal component of said frequency, included in the light output of the laser diode;

an amplifier for outputting a difference signal between an output of the detecting circuit and a fixed reference voltage;

an adder circuit, coupled to said amplifier and to said oscillator, for adding an output of said amplifier to the low frequency signal output from said oscillator; and

a current source, coupled to said adder circuit, for controlling a value of the bias current in correspondence to the output of the adder circuit.

5,557,446

OPTICAL SCANNING APPARATUS HAVING TILTED SCANNING LENS SYSTEM

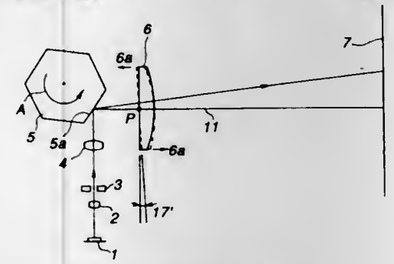
Manabu Kato, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 8, 1993, Ser. No. 44,070

Claims priority, application Japan, Apr. 17, 1992, 4-098058; Feb. 4, 1993, 5-017539

Int. Cl.[6] G02B *26/08*

U.S. Cl. 359—206 **60 Claims**



1. An optical scanning apparatus comprising:

a light source for emitting a light beam;

a first optical system for converting the light beam from said light source to a convergent light beam;

a deflector for deflecting the convergent light beam from said first optical system; and

a second optical system for imaging the convergent light beam deflected by said deflector on a scanned surface as a spot, a symmetrical axis of said second optical system with respect to a main-scanning direction being inclined relative,to a normal to the scanned surface in a main-scan cross section.

5,557,447

OPTICAL SCANNER FOR FINITE CONJUGATE APPLICATIONS

William H. Taylor, South Deerfield, and Thaddeus J. Strzempko, Westfield, both of Mass., assignors to Kollmorgen Corporation, Waltham, Mass.

Continuation-in-part of Ser. No. 320,421, Oct. 5, 1994, abandoned, and a continuation-in-part of Ser. No. 252,925, Jun. 2, 1994, abandoned. This application Jan. 27, 1995, Ser. No. 380,010

Int. Cl.[6] G02B *26/08*

U.S. Cl. 359—208 **11 Claims**

1. An optical system, comprising:

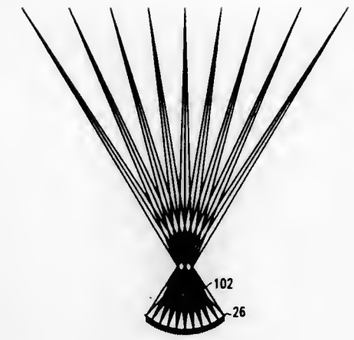
a rotating scan disc including a circular array of concave reflectors on a planar surface thereof;

imaging means adapted to coincide with the scanning sweep of the concave reflectors and separated from said concave reflectors by a distance equal to the focal length of said concave reflectors; and

a light source positioned to emit light toward said circular array of concave reflectors to form an image redirected from said imaging means;

wherein said imaging means includes a non-concentrically positioned strip mirror and objective mirror adapted to correct field curvature of said image.

170–920 O.G.–96–22: QL3



5,557,448

OPTICAL SCANNER

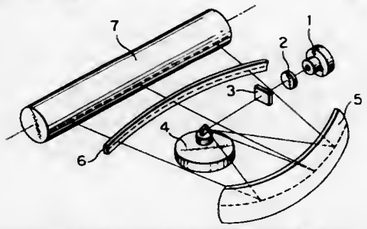
Osamu Endo, and Yoshinori Hayashi, both of Kawasaki, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 3, 1995, Ser. No. 433,025

Claims priority, application Japan, Jun. 28, 1994, 6-146085

Int. Cl.[6] G02B *26/08*

U.S. Cl. 359—208 **4 Claims**



1. An optical scanner in which a light beam deflected by optical deflecting means is reflected on a reflective image forming element and is converged as a light spot onto a scanned face through an elongated lens to perform an optical scanning operation;

the optical scanner being constructed such that said reflective image forming element is formed by a plastic material and has a function for approximately converging the deflected light beam onto the scanned face with respect to a main scan-corresponding direction and also has a function for approximately moving said light spot at an equal speed;

said elongated lens is formed by plastic and has a function for converging the deflected light beam onto the scanned face with respect to a cross scan-corresponding direction in cooperation with said reflective image forming element and also has negative refracting power with respect to the main scan-corresponding direction.

5,557,449

LASER BEAM SCANNING APPARATUS FOR CONTROLLING DIAMETER OF LIGHT SPOT

Fumihiro Miyagawa, Yokohama, and Shuichi Yamazaki, Fujimi, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 26, 1994, Ser. No. 233,801

Claims priority, application Japan, Apr. 27, 1993, 5-101217

Int. Cl.[6] G02B *26/08*

U.S. Cl. 359—212 **15 Claims**

1. A laser beam scanning apparatus comprising:

a light source emitting a collimated laser light beam;

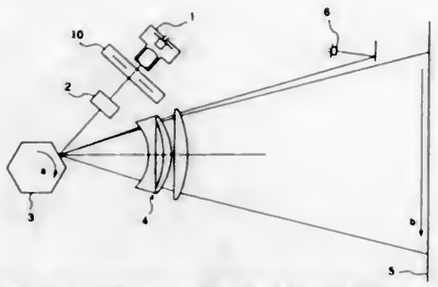
a rotary deflector deflecting a laser light beam arriving from said light source means;

a circular code wheel mounted between said light source and

therefrom; the reflector means being interposed across said beam path and adapted to divert only infra-red energy to said

5,557,453

MICROSCOPE THAT DISPLAYS SUPERIMPOSED DATA



a focusing mechanism converting the deflected light beam into a convergent light beam, and focusing the convergent light beam on a recording medium as a light spot, so that the focused light beam scans the recording medium in a main scanning direction when said rotary deflector is rotated;

a beam shape control mechanism changing the sectional shape of a laser light beam emitted by said light source to a first sectional shape by restricting the laser light beam by using an opening of said beam shape control mechanism, said opening of said beam shape control mechanism having a predetermined sectional shape and predetermined dimensions, so that a diameter of the light spot on the recording medium is changed to a desired diameter;

an apertured part having an opening by which the sectional shape of the collimated laser light beam emitted by the light source means is restricted, the sectional shape of a laser light beam from said aperture part being changed to the first sectional shape by said beam shape control mechanism, wherein the beam shape control mechanism comprises a liquid crystal shutter, said liquid crystal shutter is arranged on an optical path from said light source to said rotary deflector, and said liquid crystal shutter has an opening by which the sectional shape of the laser light beam from said light source is restricted;

the liquid crystal shutter is arranged on said optical path between said apertured part and said rotary deflector; and

both the laser light beam from said apertured part and a laser light beam from said liquid crystal shutter of said beam shaped control mechanism are parallel to the main scanning direction and parallel to a sub-scanning direction perpendicular to the main scanning direction.

5,557,450

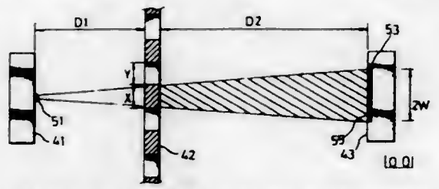
OPTICAL ROTATION ENCODER FOR X-Y DIRECTION INPUT DEVICE

Jack Sun, Taipei, Taiwan, assignor to Primax Electronics Ltd., Taipei, Taiwan

Filed Jan. 4, 1994, Ser. No. 177,161

Int. Cl.[6] G02B *26/02*

U.S. Cl. 359—234 **11 Claims**



1. An input device for a monitor, the input device comprising an optical rotation encoder for sensing X-Y movement of the input device, the encoder comprising:

a point light source for emitting therefrom a light;

a pair of light responsive elements aligned for receiving said light; and

a circular code wheel mounted between said light source and said light responsive elements and having a plurality of equiangularly distributed apertures, every adjacent two of which have a shielding sectorial area therebetween, wherein an X-Y displacement of said input device causes a plurality of pulse signals to be generated as a result of said light passing through said apertures and being intermittently projected on and received by said light responsive elements when said circular code wheel rotates, said circular code wheel being mounted at a first distance from said light source and a second distance from said light responsive elements with one of said apertures and said shielding sectorial areas having a width smaller than a combined width of said pair of light responsive elements, said width of said one of said apertures and said shielding sectorial areas being a function of said first and second distances thereby allowing a relatively high resulting resolution for the monitor to be easily obtained.

5,557,451

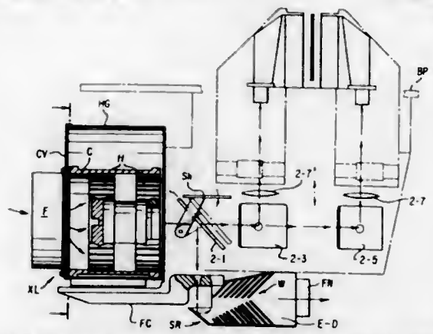
DOCUMENT PROCESSING WITH INFRAD-RED EXTRACTION

Gary Copenhaver, Canton; Johan Bakker, Union Lake, and John Vala, Plymouth, all of Mich., assignors to Unisys Corporation, Blue Bell, Pa.

Division of Ser. No. 151,626, Nov. 15, 1993, Pat. No. 5,426,530, which is a division of Ser. No. 932,523, Aug. 20, 1992, Pat. No. 5,264,961, which is a division of Ser. No. 419,560, Oct. 10, 1989, Pat. No. 5,146,362. This application Jun. 19, 1995, Ser. No. 491,646

Int. Cl.[6] G06K *9/00;8/00;11/00*

U.S. Cl. 359—350 **22 Claims**



1. A method of processing documents in a document processing system, this method involving: transporting the documents at high speed unidirectionally and without pause along a prescribed transport path past at least one image-lift site; scanning the entirety of respective document faces at said sites with illumination from light-source means; providing light-guide means along a path between said light-source means and said sites; providing energy-shaping gate means, disposed at each of said sites, each acting to channel the imaging illumination energy there; and providing heat-dissipation means disposed operatively adjacent said light source means and acting to extract IR energy therefrom and dissipate it so as to shield the said sites; this heat-dissipation means comprising an infra-red extraction means arranged and adapted to remove a substantial part of the infra-red energy projected along a prescribed beam-path from a high-intensity spectral source means;

said extraction means comprising: selective reflector means interrupting said beam path and adapted to divert infra-red energy as an infra-red beam along a second path; and associated infra-red dissipation means including multi-blade surface means disposed within enclosure means, adapted to receive said infra-red beams and to trap them and convert them to surface heat; this surface means being arranged in an infra-red trap configuration to receive infra-red energy beams at an input portion and allow essentially none thereof to re-emerge

therefrom; the reflector means being interposed across said beam path and adapted to divert only infra-red energy to said dissipation means;

said surface means comprising a pair of opposed sets of parallel blades, disposed obliquely to the direction of said infra-red beams, said blades arrayed to converge upon said infra-red beams and block them, to form a convergent, infra-red trap preventing reflection back of any significant portion of an entering infra-red beam.

5,557,452

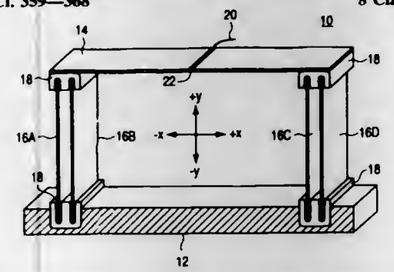
CONFOCAL MICROSCOPE SYSTEM

David W. Harris, Pearl City, Hi., assignor to University of Hawaii, Honolulu, Hi.

Filed Feb. 6, 1995, Ser. No. 384,654

Int. Cl.[6] G02B *26/08;21/00;* **G01B** *5/00;11/02*

U.S. Cl. 359—368 **8 Claims**



4. A portable submersible confocal microscope comprising:

a water tight container having a transparent window;

a microscope objective slidably mounted inside said container next to said window, said microscope objective having an image plane inside said container;

a light source mounted inside said container for generating light used to stimulate fluorescence in a sample to be studied;

a light detector mounted inside said container for detecting said fluorescence stimulated in said sample;

an optical fiber having a first end for emitting and receiving radiation, and a second end optically coupled to said light source and said light detector;

means for coupling said light source and said light detector to said second end of said optical fiber;

a piezoelectric positioner mounted inside said container, said positioner including

a first piezoelectric bimorph cell having a first end, a second end, a first flat side, and a second flat side,

a second piezoelectric bimorph cell having a first end and a second end,

a third piezoelectric bimorph cell having a first and a second end,

means for flexibly mounting said first end of said first piezoelectric bimorph cell perpendicularly to said first end of said second piezoelectric bimorph cell,

means for flexibly mounting said second end of said first piezoelectric bimorph cell perpendicularly to said first end of said third piezoelectric bimorph cell,

a rigid base mounted in said container, and

means for flexibly mounting said second end of said second piezoelectric bimorph cell and said second end of said third piezoelectric bimorph cell to said rigid base,

said optical fiber mounted on said first flat side of said first piezoelectric bimorph cell so that said first end of said optical fiber points in a direction perpendicular to the longitudinal axis of said first piezoelectric bimorph cell, and so that said first end of said optical fiber is in said image plane of said microscope objective.

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MICROSCOPE THAT DISPLAYS SUPERIMPOSED DATA

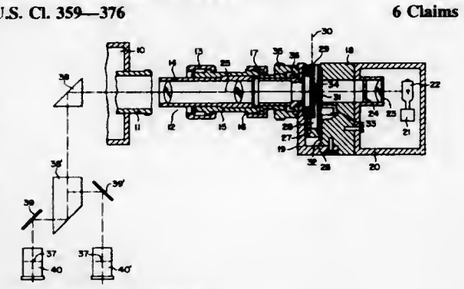
Karl-Josef Schalz, Wellburg, and Norbert Gaul, Solms-Oberbiel, both of Germany, assignors to Leica Mikroskopie und Systeme GmbH, Wetzlar, Germany

Continuation of Ser. No. 76,140, Jun. 14, 1993, abandoned. This application Nov. 17, 1995, Ser. No. 560,513

Claims priority, application Germany, Jun. 12, 1992, 42 19 299.4

Int. Cl.[6] G02B *21/22;21/00*

U.S. Cl. 359—376 **6 Claims**



1. A microscope, comprising:

an eyepiece tube;

a mount attachable to said eyepiece tube to superimpose additional image data upon a microscope image by projecting and reflecting-in said additional image data into an intermediate image plane in said eyepiece tube;

a receiving unit located within said mount to hold said additional image data;

a slide surface, located within said mount parallel to an object plane formed by said additional image data, to permit free and continuous movement of said receiving unit, along two perpendicular axes lying in the object plane, while said receiving unit is bolding said additional image data in the object plane when force is applied to said receiving unit; and

an assembly to maintain said receiving unit in any desired position in the object plane, at a user's option, when said forced is no longer being applied.

5,557,454

STEREOSCOPIC ENDOSCOPE

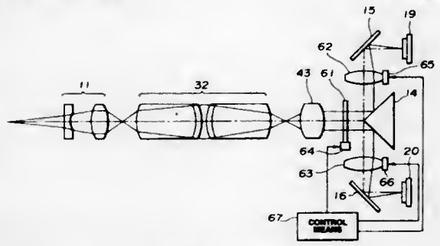
Susumu Takahashi, Iruma, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1993, Ser. No. 139,804

Claims priority, application Japan, Dec. 25, 1992, 4-347023; Dec. 28, 1992, 4-348065

Int. Cl.[6] G02B *21/22;27/22;* **A61B** *1/04*

U.S. Cl. 359—378 **18 Claims**



1. A stereoscopic endoscope, comprising:

an objective lens array having one optical axis;

a relay lens array for transmitting an object image produced by said objective lens array, said relay lens array including an afocal system;

a pupil split means that is located at or near a position of a pupil

tively engaged with said sixth pivotal engagement means for

a controller for receiving the Signals produced by the rotary

5,557,458

a pupil split means that is located at or near a position of a pupil of said relay lens array or a position conjugate to said position, wherein said pupil split means splits said pupil into a plurality of portions;

an image formation optical system that receives a beam emanating from said relay lens array and forms a plurality of object images in cooperation with said pupil split means; and

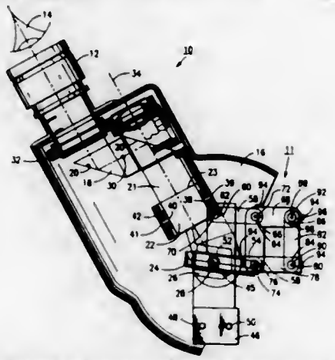
imaging means for receiving said object images.

5,557,455

ANGULAR ADJUSTMENT MECHANISM

Guenter Brueck, Midland Ontario, Canada, assignor to Hughes Electronics, Los Angeles, Calif.

Filed Nov. 30, 1993, Ser. No. 159,392
Int. Cl.[6] G02B *21/18;21/00*
U.S. Cl. 359—384 **12 Claims**



1. A mechanism for precisely adjusting an eyepiece of an optical assembly by allowing said optical assembly and a mirror assembly, disposed within said optical assembly, to rotate about a common axis, said mechanism comprising:

an optical assembly having an eyepiece for viewing an optical image therethrough, a first pivotal engagement means and a second pivotal engagement separated by a first operative length, said first pivotal engagement means having a center defining a first axis, said second pivotal engagement means having a center defining a second axis;

a mirror assembly disposed within said optical assembly for reflecting said viewed image;

a first lever fixedly integrated into said optical assembly have a third pivotal engagement means and a fourth pivotal engagement means separated by a second operative length, said third pivotal engagement means operatively engaged with said first pivotal engagement means for rotating said optical assembly about said first axis, said fourth pivotal engagement means having a center defining a third axis;

a second lever having a fifth pivotal engagement means and sixth pivotal engagement means separated by said second operative length, said fifth pivotal engagement means operatively engaged with said second pivotal engagement means for providing rotation about said second axis, said sixth pivotal engagement means having a center defining a fourth axis;

.

a third lever having a seventh pivotal engagement means, an eighth pivotal engagement means separated from said seventh pivotal engagement means by said first operative length, and a ninth pivotal engagement means separated from said eighth pivotal engagement means by said second operative length, said seventh pivotal engagement means, said eighth pivotal engagement means, and said ninth pivotal engagement means positioned so as to form a right triangle with said eighth pivotal engagement means at a right angle vertex, said seventh pivotal engagement means operatively engaged with said fourth pivotal engagement means for providing rotation about said third axis, said eighth pivotal engagement means operatively engaged with said sixth pivotal engagement means for providing rotation about said fourth axis, said ninth pivotal engagement means having a center defining a fifth axis;

a fourth level fixedly integrated into said mirror assembly having a tenth pivotal engagement means and an eleventh pivotal engagement means separated by a third operative length, said tenth pivotal engagement means operatively engaged with said first pivotal engagement means for rotating said mirror assembly about said first axis, said eleventh pivotal engagement means having a center defining a sixth axis, said third operative length being twice the length of said second operative length; and

a fifth lever having a twelfth pivotal engagement means and a thirteenth pivotal engagement means separated by said first operative length, said twelfth pivotal engagement means operatively engaged with said ninth pivotal engagement means for providing rotation about said fifth axis, said thirteenth pivotal engagement means operatively engaged with said eleventh pivotal engagement means for providing rotation about said sixth axis, such that a rotation of said optical assembly about said first axis at a first angular speed results in a rotation of said mirror assembly about said first axis at a second angular speed without causing significant optical image shifts at said eyepiece, wherein said first angular speed is twice said second angular speed.

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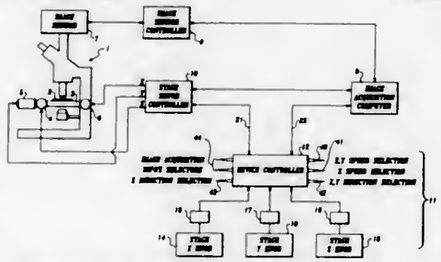
PERSONAL INTERFACE DEVICE FOR POSITIONING OF A MICROSCOPE STAGE

David M. Garner; Chun M. Louie, both of Vancouver; Daniel B. Harrison, Burnaby, and Donald J. Dale, Richmond, all of Canada, assignors to Oncometrics Imaging Corp., Vancouver, Canada

Filed Mar. 4, 1994, Ser. No. 206,735
Int. Cl.[6] G02B *21/26;21/00*
U.S. Cl. 359—393 **9 Claims**



1. Apparatus for interactive manual control of a motorized microscope stage for movement about X, Y and Z axes comprising:

a main housing;

an X and a Y axis control knob actuatably mounted to the housing and a rotary encoder coupled to each of the X and Y axis control knobs, the rotary encoders generating signals in response to the actuation of the X and Y axis control knobs;

a Z axis control unit that is removably secured to the main housing, the Z axis control unit including a Z axis control knob and a rotary encoder coupled to the Z axis control knob that generates signals in response to actuation of the Z axis control knob;

means for communicating the signals generated by the rotary encoder coupled to the Z axis control knob to the main housing when the Z axis control unit is removed from the main housing;

a controller for receiving the Signals produced by the rotary encoders, coupled to the X, Y and Z axis control knobs, the controller producing stage control signals to the motorized microscope stage; and

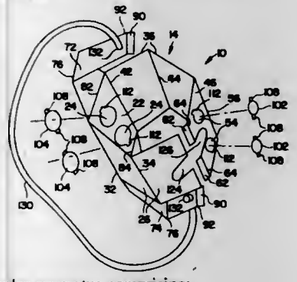
means for connecting the stage control signals produced by the controller to the motorized microscope stage.

5,557,457

FOLDING BINOCULAR APPARATUS AND BINOCULAR BLANK

Anthony Esperti, 9863 SW. 138th Ave., Miami, Fla. 33186

Filed Jul. 25, 1994, Ser. No. 279,534
Int. Cl.[6] G02B *7/02;23/18;23/20*
U.S. Cl. 359—408 **2 Claims**



1. A binocular apparatus comprising:

two objective lenses

two eyepieces;

a body blank of sheet material divided by fold lines comprising a distal wall having a pair of apaced apart objective lens ports and two opposing lateral edges; a bottom wall extending from an edge of said distal wall and having a lateral fold line to permit said apparatus body to collapse and having a remote longitudinal edge; a top wall extending from an opposing edge of said distal wall and having a lateral fold line to permit said apparatus body to collapse; a proximal wall having an outer face and two opposing lateral edge and having a pair of spaced apart eyepiece ports spaced apart from an adjacent said lateral edge a certain distance, and extending from an edge of said top wall opposite said distal wall; a proximal wall bonding flap extending from an edge of said proximal wall opposite said top wall for bonding to said remote longitudinal edge of said bottom wall; a side wall extending from eacb said opposing lateral edge of said distal wall, each said side wall having a remote end and a lateral fold line to permit said side walls to collapse simultaneously with top and bottom walls; a side wall bonding section at each said remote end for bonding to said outer face of said proximal wall at each said opposing lateral edge of said proximal wall, each said side wall bonding flap having a length of at most said certain distance such that said side wall bonding flaps do not obstruct said eyepiece ports and conserve said sheet material;

wherein at least one said objective lens comprises a radial flange along a perimetrical edge of said at least one said objective lens and at least one tab projecting from an opposing perimetrical edge of said at least one said objective lens and spaced apart from said flange;

and wherein said at least one objective lens port comprises a port edge and a tab receiving notch in said port edge;

such that said objective lens may be inserted into said at least one objective lens port and said tab may be simultaneously inserted into said tab receiving notch;

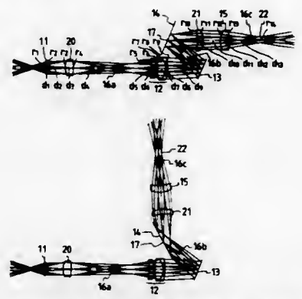
and such that rotation of said objective lens by a user relative to said at least one objective lens port to a position wherein said tab does not register with said notch retains said port edge between said tab and said flange and thus locks said objective lens into said at least one objective lens port.

5,557,458

REAL IMAGE FINDER OPTICAL SYSTEM

Kazumi Itoh, Mitaka, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1994, Ser. No. 253,702
Claims priority, application Japan, Jun. 4, 1993, 5-134239
Int. Cl.[6] G02B *23/00;* **G03B** *13/02*
U.S. Cl. 359—434 **10 Claims**



1. A real image mode finder optical system comprising:

an objective lens for forming an image of an object;

a relay lens for receiving light from said image formed by said objective lens to form a secondary image;

an eyepiece disposed to receive light from said secondary image for observing said image relayed by said relay lens; and

a plurality of reflecting surfaces arranged in an optical path between said objective lens and said eyepiece, at least one of said plurality of reflecting surfaces being movable for changing a direction of light reflected therefrom;

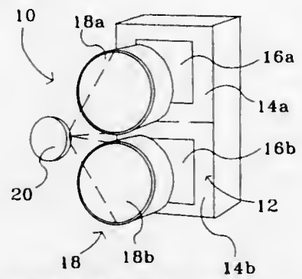
optical components situated on a reflection side of said movable reflecting surface, said optical components being movable to be aligned with a path of an axial ray shifted in accordance with a movement of said movable reflecting surface, said axial ray being defined as a ray incident on said objective lens and travelling in a path coinciding with an optical axis of said objective lens.

5,557,459

OPTICAL CONVERGENCE ACCOMMODATION ASSEMBLY

Peter R. Samson, San Francisco, Calif., assignor to Autodesk, Inc., Sausalito, Calif.

Filed Oct. 27, 1994, Ser. No. 330,208
Int. Cl.[6] G02B *27/22*
U.S. Cl. 359—465 **21 Claims**



1. A video display apparatus, comprising:

a first image projection means having a first display area for producing a first image portion and a second display area for producing a second image portion, wherein the first image portion is a near field image and the second image portion is a far field image;

an optical projection means having a first optical portion and a second optical portion, the first optical portion for projecting the first image portion toward a user's first eye and the second optical portion for projecting the second image portion toward the user's first eye.

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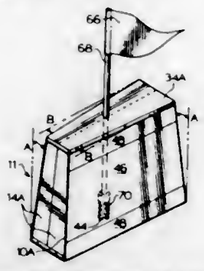
TWO SIDED MARKER

Reginald S. Bennett, Ajax, Canada, assignor to Reginald Bennett International Inc., Ajax, Canada

Continuation-in-part of Ser. No. 6,966, Jan. 21, 1993, Pat. No. 5,416,636, and a continuation-in-part of Ser. No. 775,751, Oct. 15, 1991, Pat. No. 5,223,977, which is a continuation-in-part of Ser. No. 617,766, Nov. 26, 1990, Pat. No. 5,115,343. This application Mar. 13, 1995, Ser. No. 402,499

Int. Cl.[6] G02B *5/122*

U.S. Cl. 359—530 **13 Claims**



1. A marker designed to be mounted on a support surface,

means for mounting said marker on said support surface in a predetermined attitude

said marker, when so mounted, comprising a pair of panels facing approximately away from each other in azimuthal directions, said panels sloping upwardly toward each other at an angle of between 2° and 10° to the vertical, and having retroreflectant material covering a substantial area of said panels,

wherein said marker is shaped so that, when mounted in said attitude, vertical planes through said panels, and perpendicular thereto, intersect at more than 0° and less than 20° to each other.

5,557,461

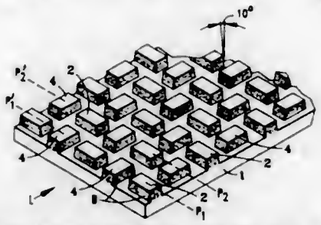
OMNIDIRECTIONAL RETRO-REFLECTIVE ROADWAY MARKER AND THE LIKE

Charles W. Wyckoff, Needham, Mass., assignor to BriteLine Industries, Inc., Denver, Colo.

Filed May 26, 1995, Ser. No. 451,234

Int. Cl.[6] G02B *5/12;5/128*

U.S. Cl. 359—551 **13 Claims**



1. A retro-reflective roadway marker strip having, in combination, a first plurality of transversely extending parallel rows of transversely uniformly spaced transversely oriented blocks protruding upwardly of the strip, and with successive of the parallel rows uniformly longitudinally spaced and transversely staggered with respect to one another; a second plurality of transversely extending parallel rows of transversely uniformly spaced longitudinally oriented blocks similarly protruding upwardly of the strip, and with successive of the parallel rows thereof uniformly longitudinally spaced and transversely staggered with respect to one another; the first and second pluralities of rows being uniformly transversely and longitudinally interleaved, with the longitudinally oriented blocks symmetrically positioned in the transverse spaces between adjacent transversely oriented blocks of each row, and the transversely oriented blocks symmetrically positioned in the longitudinal spaces between adjacent longitudinally oriented blocks, and similar edge faces of the blocks of each of the pluralities of rows being provided with retro-reflective beads.

5,557,462

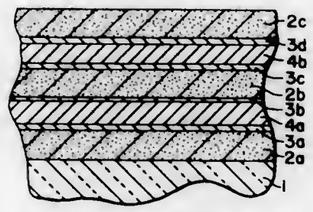
DUAL SILVER LAYER LOW-E GLASS COATING SYSTEM AND INSULATING GLASS UNITS MADE THEREFROM

Klaus W. Hartig, Brighton; Steven L. Larson, Monroe, and Philip J. Lingle, Temperance, all of Mich., assignors to Guardian Industries Corp., Auburn Hills, Mich.

Filed Jan. 17, 1995, Ser. No. 373,085

Int. Cl.[6] G02B *1/10*

U.S. Cl. 359—585 **17 Claims**



1. A sputter-coated glass article comprised of a glass substrate having thereon from the glass outwardly, a layer system including:

a) a layer of Si_3N_4 having a thickness of about 300 Å–500 Å;

b) a layer of nickel or nichrome having a thickness of about 7 Å or less;

c) a layer of silver having a thickness of about 70 Å–130 Å;

d) a layer of nickel or nichrome having a thickness of about 7 Å or less; and

e) a layer of Si_3N_4 having a thickness of about 700 Å–1,100 Å;

f) a layer of nickel or nichrome having a thickness of about 7 Å or less;

g) a layer of silver having a thickness of about 70 Å–190 Å, wherein said layer (g) is thicker than said layer (c);

h) a layer of nickel or nichrome having a thickness of about 7 Å or less; and

i) a layer of Si_3N_4 having a thickness of about 350 Å–700 Å; wherein

when said glass substrate has a thickness of about 2 mm–6 mm, said coated glass substrate has a visible transmittance of about 70% or greater, a normal emissivity (E_n) of about 0.02–0.09, a hemispherical emissivity (E_h) of about 0.03–0.12, a sheet resistance (R_s) of about 2–10 ohms/$_{sq}$ and having the following reflectance and color coordinates wherein the glass side characteristics are:

R_GY, less than about 10

a_h is about −3 to +5

b_h is about 0 to −10

and wherein the film side characteristics are:

R_FY, less than about 10

a_h is about −3 to +5

b_h is about 0 to −10

wherein RY is the reflectance and a_h, b_h are the color coordinates as measured in Hunter units, Ill., C, 10° observer.

5,557,463

EYEPIECE

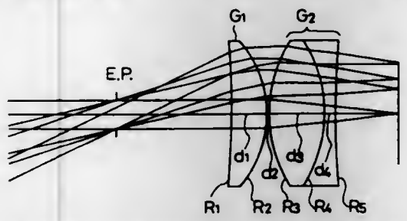
Yasunori Ueno, Kanagawa, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Jul. 18, 1994, Ser. No. 276,713

Claims priority, application Japan, Jul. 19, 1993, 5-198788

Int. Cl.[6] G02B *25/00;13/18*

U.S. Cl. 359—646 **12 Claims**



1. An eyepiece comprising, in the order named, from an eyepoint side:

a first lens group having a positive refractive power; and

a second lens group having a positive refractive power;

said first lens group including a positive lens,

said second lens group consisting of a cemented lens formed by bonding a negative lens and a positive lens to each other,

said cemented lens consisting of said positive lens and said negative lens, in the order named, from said eyepoint side, and

said positive lens of said first lens group having at least one lens surface composed of an aspherical surface.

5,557,464

WIDE-FIELD EYEPIECE LENS SYSTEM

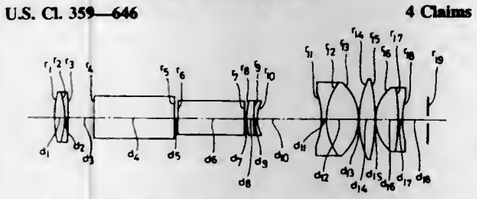
Masaki Imaizumi, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 21, 1995, Ser. No. 505,396

Claims priority, application Japan, Jul. 22, 1994, 6-191289

Int. Cl.[6] G02B *25/00*

U.S. Cl. 359—646 **4 Claims**



1. A wide-field eyepiece lens system comprising, in order from an object side of the lens system, of a first lens unit which is composed of a plurality of lens elements and has a diverging function, and a second lens unit which is composed of a plurality of lens elements and has a converging function, wherein said eyepiece lens system is configured so as to satisfy the following conditions (1) and (2):

$$-8.0<f_1/f<-4.8 \quad (1)$$

$$1.8<D/f<2.6 \quad (2)$$

wherein the reference symbol f represents a focal length of said eyepiece lens system as whole, the reference symbol f_1 designates a focal length of said first lens unit, and the reference symbol D denotes a distance between said first lens unit and said second lens unit.

5,557,465

LASER PLATE MAKING APPARATUS

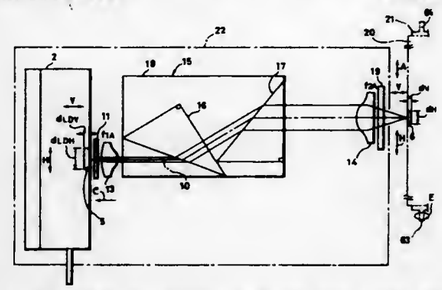
Tatsumi Ito, and Soichi Kuwahara, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 21, 1994, Ser. No. 310,118

Claims priority, application Japan, Sep. 22, 1993, 5-236843

Int. Cl.[6] G02B *13/10;* **G11B** *7/00*

U.S. Cl. 359—669 **8 Claims**



1. An apparatus for forming a press plate from a plate sheet, comprising:

a rotating cylinder rotatably supported around a rotational axis, said plate sheet being wound around said rotating plate cylinder;

a laser light source for providing a laser beam having a beam stripe which is elongated in a predetermined direction;

a collimator lens positioned adjacent to said laser light source for collimating said laser beam to a collimated beam, said collimator lens having focal length f1;

an objective lens for collecting said laser beam and for forming an image on said plate sheet to form recesses thereon, said objective lens having focal length f2, wherein f2/f1 is greater than 1 so that a focal depth of said laser beam is deep;

an anamorphic prism positioned between said collimator lens and said objective lens for expanding said collimated beam m times in said predetermined direction, wherein f2/f1×1/m is less than 1 so that a size of said image is small in said predetermined direction; and

laser beam shifting means for sequentially shifting the position of said laser beam in the direction of said rotational axis so that a two-dimensional pattern of said recesses is formed on said plate sheet.

5,557,466

TWO-WAVELENGTH ANTIREFLECTION FILM

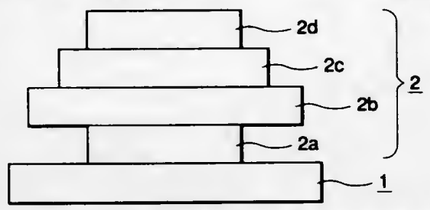
Minoru Otani, and Junri Ishikura, both of Utsunomiya, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 1, 1994, Ser. No. 299,402

Claims priority, application Japan, Sep. 7, 1993, 5-246445

Int. Cl.[6] G02B *1/10;5/28*

U.S. Cl. 359—586 **4 Claims**



1. A two-wavelength antireflection film having antireflective characteristics for a wavelength λ_1 and a wavelength λ_2 different from the wavelength λ_1, comprising:

a multi-layered film provided on a substrate;

wherein each of the materials constituting said multi-layered film has a refractive index not exceeding 1.7 for a central

variable magnification to said image beam passing therethrough, one point of said first plate fixedly mounted to

e3W is an air space between said third and fourth lens groups at said wide angle end; and

wherein each of the materials constituting said multi-layered film has a refractive index not exceeding 1.7 for a central wavelength λ_0, which is defined by the following relation:

$$2/\lambda_0=1/\lambda_1+1/\lambda_2;$$

and

wherein said multi-layered film is a three-layered film consisting, in the order from the surface of said substrate, of films of MgF_2, Al_2O_3 and MgF_2, with respective optical thicknesses of ¼, ½ and ¼ of said central wavelength.

5,557,467

COMBINATION REARVIEW MIRROR

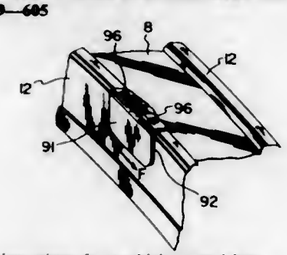
Christopher McColgan, Quebec, and Andrew J. Rolph, Ottawa, both of Canada, assignors to The Lanechanger, Inc., Aylmer, Canada

Continuation of Ser. No. 191,623, Feb. 4, 1994, abandoned, which is a continuation-in-part of Ser. No. 63,357, May 17, 1993, abandoned, which is a continuation of Ser. No. 852,958, Mar. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 685,872, Apr. 16, 1991, Pat. No. Des. 335,857, and a continuation-in-part of Ser. No. 754,678, Sep. 4, 1991, abandoned. This application Jun. 30, 1995, Ser. No. 502,738

Claims priority, application Canada, Sep. 7, 1990, 2024846

Int. Cl.[6] G02B *5/08;7/182;* **B60R** *1/04*

U.S. Cl. 359—605 **10 Claims**



1. A rearview mirror for a vehicle comprising:
- a first planar reflective surface having respective upper and lower edges;
- a second longitudinally convex reflective surface providing a wider field of rearward vision relative to said first reflective surface, said second convex reflective surface additionally curving downwardly at its opposite ends in a direction towards said first reflective surface;
- a frame surrounding said first and second reflective surfaces for maintaining the second reflective surface in a fixed position above said first reflective surface; and
- means for pivoting said first reflective surface to reduce high intensity reflections, said pivoting means comprising:
- first means for pivotally supporting one of said upper and lower edges;
- second means connected to the other of said upper and lower edges; and
- slider means provided on said frame and connected to said second means whereby said second means are moved towards or away from said frame in response to side-to-side movements of said slider means relative to said frame.

5,557,468

CHROMATIC DISPERSION COMPENSATION DEVICE

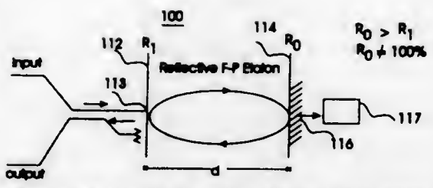
Joseph Ip, Kanata, Canada, assignor to JDS Fitel Inc, Hepean, Canada

Filed May 16, 1995, Ser. No. 442,367

Int. Cl.[6] G02B *5/04*

U.S. Cl. 359—615 **20 Claims**

1. A device for dispersion compensation for providing an output signal that varies in time delay with respect to wavelength, and



which is substantially non-varying in amplitude with respect to wavelength, in a predetermined range of wavelengths, the device comprising:
- an etalon having first and second partially reflective mirrors in a parallel spaced relationship, to form a gap between the mirrors, the first partially reflective mirror being substantially less reflective than the second mirror to allow substantially most of an input signal to pass through the first partially reflective mirror, the first mirror having an input/output port for providing the input signal to the gap between the mirrors, the second mirror having at least a region thereof that al lows a substantially small amount of the input signal to pass therethrough for providing a monitoring port, said monitoring port being substantially optically aligned with said input port, the first mirror having a reflectivity that is less than 90% and the second mirror having a reflectivity that is greater than 97% and less than 100%.

5,557,469

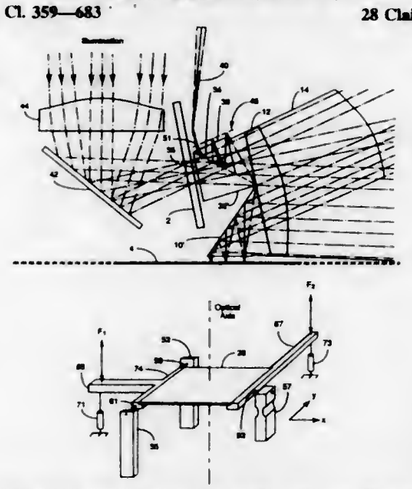
BEAMSPLITTER IN SINGLE FOLD OPTICAL SYSTEM AND OPTICAL VARIABLE MAGNIFICATION METHOD AND SYSTEM

David A. Markle, Saratoga, and Hwan J. Jeong, Los Altos, both of Calif., assignors to Ultratech Stepper, Inc., San Jose, Calif.

Filed Oct. 28, 1994, Ser. No. 331,059

Int. Cl.[6] G02B *15/14;17/00*

U.S. Cl. 359—683 **28 Claims**



1. An optical system to project an image beam from an illuminated object at an object plane to an image plane as a projected image having a selected magnification as compared to said object with said optical system defining an optical path between said object and image planes, said optical system comprising:
- a lens system, having a fixed magnification, mounted in said optical path disposed to receive illumination from said object to produce an image thereof onto said image plane;
- a first plate of a selected thickness and material that is optically compatible with said lens system disposed to apply a first variable magnification to said image beam passing therethrough, one point of said first plate fixedly mounted to constrain said first plate in said optical path; and
- a first actuator coupled to said first plate to selectively bend said first plate and to cause said first variable magnification in proportion to the degree of deformation of said first plate;
- wherein said first variable magnification of said first plate varies said selected magnification positively or negatively in said projected image in a direction normal to an axis around which said first plate is bent, said first projected image is formed with a combination of said lens system and said first plate by applying said selected magnification to said image beam, and the product of said fixed magnification of said lens system and said first variable magnification of said first plate is equal to said selected magnification.

5,557,470

ZOOM LENS SYSTEM

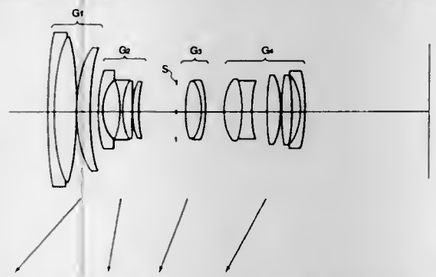
Atsushi Shibayama, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed May 16, 1994, Ser. No. 243,409

Claims priority, application Japan, May 27, 1993, 5-124558

Int. Cl.[6] G02B *15/14*

U.S. Cl. 359—687 **46 Claims**



1. A zoom lens system having a wide angle end, a telephoto end, a zoom range and an effective image plane with a diagonal line and comprising:
- a first lens group having a positive refracting power;
- a second lens group having a negative refracting power;
- a third lens group having a positive refracting power, and consisting of a positive lens and a negative lens cemented thereto;
- a fourth lens group having a positive refracting power;
- said first to fourth lens groups being arranged in this order as viewed from an object;
- a first air space provided between said first and second lens groups and increasing during zooming operation from said wide angle end to said telephoto end;
- a second air space provided between said second and third lens groups and decreasing during said zooming operation; and
- a focal length included in said zooming range and being equal to a length of said diagonal line of said effective image plane;
- said zoom lens system satisfying the following conditions:

$$1.5<F1/FW<2.2;$$

$$0.65<F3/F4<1.50;$$

and

$$0.04<(e3W-e3T)/FW<0.14,$$

where:
- FW is a focal length of said zoom lens system at said wide angle end;
- F1 is a focal length of said first lens group;
- F3 is a focal length of said third lens group;
- F4 is a focal length of said fourth lens group;
- e3W is an air space between said third and fourth lens groups at said wide angle end; and
- e3T is an air space between said third and fourth lens groups at said telephoto end.

5,557,471

LENS FOR DEPOSITING TARGET MATERIAL ON A SUBSTRATE

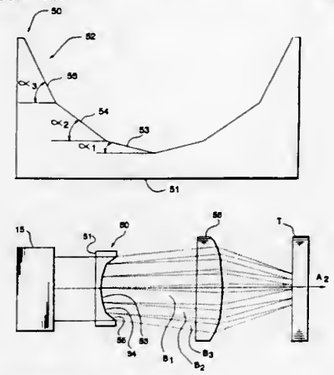
Felix E. Fernandez, Mayaguez, Puerto Rico, assignor to University of Puerto Rico, San Juan, Puerto Rico

Division of Ser. No. 27,191, Mar. 5, 1993, Pat. No. 5,405,659.

This application Feb. 3, 1995, Ser. No. 383,430

Int. Cl.[6] G02B *13/18;3/08*

U.S. Cl. 359—709 **10 Claims**



1. A lens comprising:

(a) a first substantially flat surface; and

(b) a second concave surface opposite said first surface comprising a central conic section and at least one concentric ring, said conic section defining a cone angle relative to said first surface, each of said at least one concentric rings having an inner diameter and defining an angle relative to said first surface, and the angle of each of said at least one concentric rings being greater than the cone angle of said conic section and any rings within its inner diameter each of said conic section and said at least one concentric ring being configured to separate a beam of light passing therethrough into a split beam having a hollow elliptical cross-section.

5,557,472

FAST ASPHERICAL LENS SYSTEM

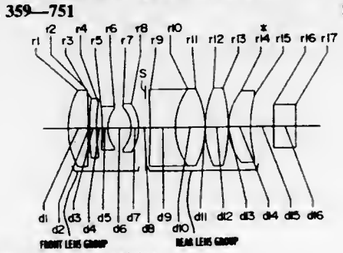
Takayuki Ito, and Yasuyuki Sugano, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, and Asahi Seimitsu Kabushiki Kaisha, both of Tokyo, Japan

Filed Jun. 16, 1994, Ser. No. 260,815

Claims priority, application Japan, Jun. 16, 1993, 5-145131

Int. Cl.[6] G02B *13/04;9/64;3/02*

U.S. Cl. 359—751 **8 Claims**



1. A lens system comprising:

a front lens group having a negative power, a diaphragm, and a

$$1.65\leq(N_1+N_2)/2\leq 1.8$$

small projections integrally formed on a same circumference of an

a front lens group having a negative power, a diaphragm, and a rear lens group having a positive power, arranged in this order from an object side of the lens system, in which the following conditions are satisfied:

$$-0.5<f/f_F<-0.2 \quad (1)$$

$$1.0<\Sigma d_{F+S}/f<3.0 \quad (2)$$

$$1.5<\Sigma d_R/f<3.0 \quad (3)$$

wherein,

f designates a focal length of the entire lens system,

f_F designates a focal length of the front lens group,

Σd_{F+S} represents a sum of the thickness of the front lens group and a distance between the front lens group and the rear lens group; and,

Σd_R represents a thickness of the rear lens group; and

wherein a lens having a diverging aspherical surface is provided in said rear lens group, in which the following conditions are satisfied:

$$-0.9<\Delta I_{ASP}<0 \quad (8)$$

$$I_{SP}/\Delta I_{ASP}<0.2; \quad (9)$$

wherein ΔI_{ASP} represents an aberration factor of the aspherical surface term of a third-order spherical aberration factor of the aspherical lens surface; and

wherein I_{SP} represents an aberration factor of the spherical surface term of the third-order spherical aberration factor of the aspherical lens surface.

5,557,473

WIDE ANGLE LENS

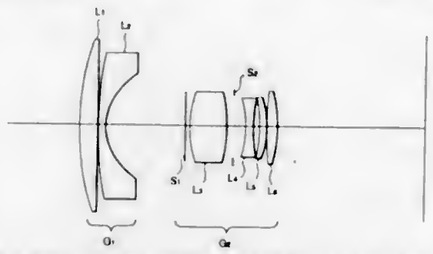
Yoshikazu Sugiyama, Yokohama, and Haruo Sato, Kawasaki, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Apr. 5, 1994, Ser. No. 222,867

Claims priority, application Japan, Apr. 13, 1993, 5-085987

Int. Cl.[6] G02B *9/62*

U.S. Cl. 359—757 **15 Claims**



1. A wide angle lens comprising, in order from an object side:

a first lens group having a negative refracting power, and a second lens group having a positive refracting power,

said first lens group comprising, in order from the object side, a first lens component having a positive refracting power, and a second lens component having a negative refracting power, and

said second lens group comprising, in order from the object side, a third lens component having a positive refracting power, a fourth lens component having a negative refracting power, a fifth lens component having a positive refracting power, and a sixth lens component having a positive refracting power, and

wherein said wide angle lens is constituted to satisfy the following conditions:

$$0.4\leq d_4/f\leq 1$$

$$1.65\leq(N_5+N_6)/2\leq 1.8$$

$$-1.6\leq f_{12}/f\leq -1$$

$$0.43\leq r_4/f\leq 0.6$$

where f: the focal length of the entire system,

d_4: the air space between said second and third lens components,

N_5: the refractive index of said fifth lens component with respect to a d-line,

N_6: the refractive index of said sixth lens component with respect to a d-line,

f_{12}: the synthesized focal length of said first and second lens components, and

r_4: the radius of curvature of an image-side lens surface of said second lens component.

5,557,474

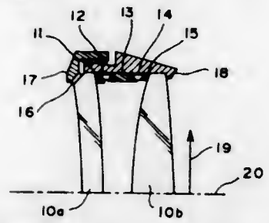
PASSIVE THERMAL COMPENSATION METHOD AND APPARATUS

Donald R. McCrary, Orlando, Fla., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed May 26, 1995, Ser. No. 451,433

Int. Cl.[6] G02B *7/02*

U.S. Cl. 359—820 **12 Claims**



1. A device comprising:

a first member having a plane and a transverse axis orthogonal to said plane, a dimension of said first member along said plane being larger than a width of said first member along said transverse axis, said first member including at least one angled surface forming a first angle with said plane;

a second member including an least one surface forming a second angle with said plane of said first member, said at least one angled surface of said first member abutting said at least one angled surface of said second member; and

biasing means for biasing said angled surfaces of said first and second members together,

wherein during a temperature change said dimension of said first member changes according to a coefficient of thermal expansion of at least said first member such that said angled surfaces of said first and second members are displaced relative to one another thereby displacing said first and second members relative to one another along said transverse axis by operation of said angled surfaces.

5,557,475

OPTICAL SYSTEM FOR IMPROVING THE SYMMETRY OF THE BEAM EMITTED FROM A BROAD AREA LASER DIODE

John L. Nightingale, Portola Valley; John A. Trail, Menlo Park, and John K. Johnson, Sunnyvale, all of Calif., assignors to Coherent, Inc., Santa Clara, Calif.

Filed Jul. 12, 1994, Ser. No. 273,899

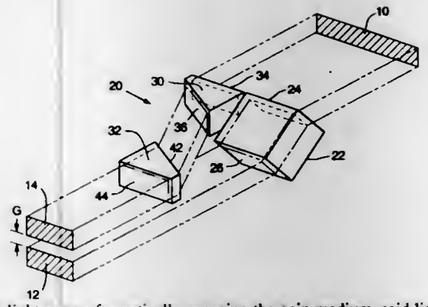
Int. Cl.[6] G02B *5/04;* **H01S** *3/00;3/091;3/22*

U.S. Cl. 359—831 **12 Claims**

1. A laser comprising:

an optical resonator;

a solid state gain medium located within the resonator;



a light source for optically pumping the gain medium, said light source being defined by a laser diode generating a light beam having a cross-section wherein the width is greater than the height;

means for optically coupling the beam from the light source into the gain medium, said coupling means including first optical means aligned with and intercepting one half of the beam in the width dimension, said first optical means functioning to displace said one half of the beam downwardly; and

second optical means aligned with and intercepting the other half of the beam in the width dimension, said second optical means for shifting the other half of the width of the beam over said one half in a manner such that both halves of the beam travel along parallel propagation axes in a stacked configuration thereby improving the brightness symmetry of the beam.

5,557,476

FOLDABLE OUTSIDE REARVIEW MIRROR

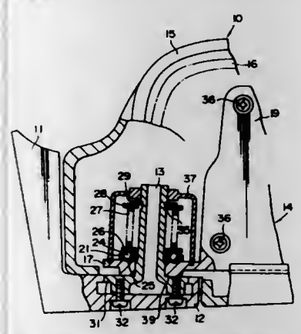
Katsuyoshi Oishi, Shizuoka-ken, Japan, assignor to Eiji Murakami, Shizuoka, Japan

Division of Ser. No. 331,342, Dec. 14, 1994, Pat. No. 5,467,222, which is a division of Ser. No. 736,080, Jul. 26, 1991, Pat. No. 5,384,660. This application Mar. 31, 1995, Ser. No. 414,808

Claims priority, application Japan, Jun. 17, 1991, 3-53564

Int. Cl.[6] G02B *7/182;* **B60R** *1/06*

U.S. Cl. 359—841 **1 Claim**



1. A foldable outside rearview mirror assembly, comprising a mirror body; a base having an extended portion; a shaft arranged on said extending portion of said base and having a root portion; a frame rotatably supported on said root portion of said shaft to attach said mirror body; an end plate rotatably and slidably contacting an upper surface of said extending portion of said base and receiving said root portion of said shaft; a positioning device attached to an upper surface of said end plate; a coil spring arranged around a periphery of said shaft to elastically contact said end plate with said upper surface of said extending portion of said base, said positioning device including a guide plate engaging with said shaft for locking a rotation of said guide plate, a plurality of small projections integrally formed on a same circumference of an under surface of said guide plate, a plurality of concave portions provided on an upper surface of said end plate of said frame to directly said projections, a washer pressed to contact the upper surface of said guide plate by an elastcity of said coil spring, said end plate of said frame retaining a surface contact with said extending portion of said base in case of said mirror body rotating to an erected or folded altitude.

5,557,477

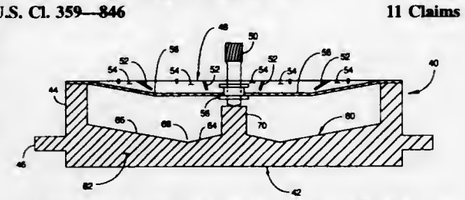
APPARATUS FOR AND METHOD OF CORRECTING FOR ABERRATIONS IN A LIGHT BEAM

Richard H. Sawicki, Pleasanton, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 8, 1993, Ser. No. 133,399

Int. Cl.[6] G02B *5/08*

U.S. Cl. 359—846 **11 Claims**



1. Apparatus for correcting for aberrations in a light beam comprising:

a generally cylindrical, resiliently distortable body having a first end with a light reflecting outer surface and a contoured inner surface having a center portion, a cylindrical side wall extending rearward from the contoured inner surface, and a second open end, said contoured inner surface being disposed opposite said light reflecting outer surface;

an actuator for applying axial force to the center portion of the contoured inner surface; and

means for coupling said actuator to said cylindrical side wall so that actuating said actuator to apply axial force to the center portion of the contoured inner surface also provides inward radial forces between said actuator and said side wall, said means for coupling comprising a circular plate coupled at its center to the actuator and coupled at its periphery to the open end of the generally cylindrical, resiliently distortable body, and said circular plate including a plurality of slots extending radially inward from the side wall forming a plurality of petals.

5,557,478

NONIMAGING RADIANT ENERGY DEVICE

Roland Winston, Chicago, Ill., and Xiaohui Ning, North Providence, R.I., assignors to The University of Chicago Development Corporation The Argonne National Laboratory, Chicago, Ill.

Division of Ser. No. 348,056, May 5, 1989, Pat. No. 5,243,459. This application Sep. 1, 1993, Ser. No. 115,220

Int. Cl.[6] G02B *5/10;23/00*

U.S. Cl. 359—853 **24 Claims**

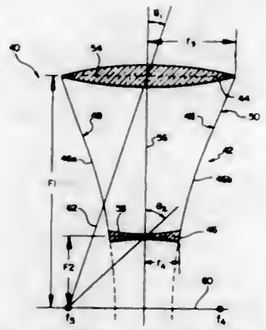
1. A radiant energy transformer for receiving radiant energy impinging upon said transformer within a first acute angle and emitting said radiant energy within a second acute angle, said transformer comprising:

a reflective element having a nonlinear reflective surface;

first lens means operatively coupled to transmit radiant energy to said reflective element;

second lens means operatively coupled to receive radiant energy from said reflective element;

the shape of said reflective element causing radiant energy that impinges upon said nonlinear reflective surface of said reflec-



tive element from within a first acute angle with respect to said radiant energy transformer to be reflected such that said radiant energy emerges from said radiant energy transformer exclusively within a second acute angle with respect to said radiant energy transformer.

5,557,479

APPARATUS AND METHOD FOR RECORDING AND REPRODUCING DIGITAL VIDEO SIGNAL DATA BY DIVIDING THE DATA AND ENCODING IT ON MULTIPLE CODING PATHS

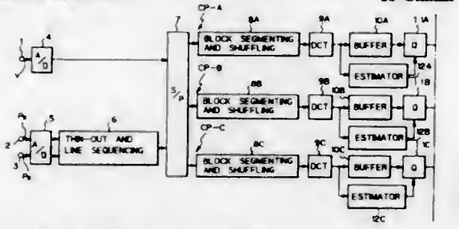
Naofumi Yanagihara, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 245,760, May 18, 1994, abandoned. This application Dec. 15, 1995, Ser. No. 568,403

Claims priority, application Japan, May 24, 1993, 5-144199; Jul. 13, 1993, 5-195532; Aug. 25, 1993, 5-232292

Int. Cl.[6] G11B *5/00*; H04N *5/76*

U.S. Cl. 360—32 **13 Claims**



1. A digital video signal recording apparatus, comprising:

an analog-to-digital converting circuit for converting an analog luminance signal and color difference signals into respective digital signals; and

a dividing circuit for dividing the digital luminance signal and the digital color difference signals into a plurality of coding paths, the coding paths being adapted to perform an encoding process so as to compress and encode the digital luminance signal and the digital color difference signals, each of said coding paths including:

a block segmenting and shuffling circuit for block segmenting and shuffling signals output from said analog-to-digital converting circuit;

a DCT circuit for performing a two-dimensional discrete cosine transform on signals output from said block segmenting and shuffling circuit;

a buffer circuit having a storage capacity for buffering signals output from said DCT circuit;

an estimator for estimating a data amount of a predetermined buffer amount to be output;

a quantizing circuit for setting a quantizing scale corresponding to an output of said estimator and for quantizing signals output from said buffer circuit;

a variable length code encoding circuit for encoding an output of said quantizing circuit into variable length code;

a frame segmenting circuit for framing signals and placing a predetermined sync pattern in signals output from said variable length code encoding circuit so as to perform error correction encoding; and

a deshuffling circuit for deshuffling signals output from said frame segmenting circuit;

a channel converting circuit for converting signals received from said coding paths to signals with a predetermined number of channels; and

a recording circuit for recording signals output from said channel converting circuit on a predetermined recording medium.

5,557,480

RECORDING AND/OR REPRODUCING APPARATUS FOR DISPLAYING DATA DIFFERENTLY IN RECORDING AND REPRODUCTION

Shigeo Yamagata, and Toyokazu Mizogui, both of Kanagawaken, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 97,736, Jul. 27, 1993, abandoned, which is a continuation of Ser. No. 771,792, Oct. 4, 1991, abandoned, which is a continuation of Ser. No. 453,063, Dec. 11, 1989, abandoned, which is a continuation of Ser. No. 7,774, Jan. 28, 1987, abandoned. This application Feb. 15, 1995, Ser. No. 389,725

Claims priority, application Japan, Jan. 31, 1986, 61-017842

Int. Cl.[6] H04N *5/78*

U.S. Cl. 360—33.1 **14 Claims**

1. An image signal recording/reproducing apparatus for recording an image signal on a recording medium and reproducing the image signal recorded on the recording medium, comprising:

a) data setting means for setting the contents of information data to be recorded on the recording medium along with the image signal and outputting the information data indicating the set contents;

b) recording-and-reproducing means having a recording mode in which the image signal is recorded on the recording medium with the information data set by said data setting means added to the image signal, and a reproducing mode in which the image signal and the information data are reproduced from the recording medium and outputting the reproduced image signal and the reproduced information data, said recording-and-reproducing means being arranged to operate either in the recording mode or in the reproducing mode;

c) image signal generating means arranged to receive the information data to generate an image signal indicative of an image which corresponds to the information data received;

d) instructing means for giving an instruction for causing said recording-and-reproducing means either to operate in the recording mode or to operate in the reproducing mode; and

e) control means for controlling said image signal generating means to generate an image signal corresponding to an image whose representations in the recording mode and the reproducing mode are different at least in part to each other in accordance with selection of the recording mode or the reproducing mode instructed by said instruction means.

5,557,481

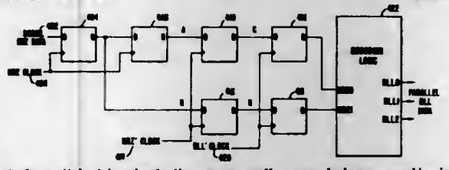
NRZ TO RLL ENCODER CIRCUIT IN DISK DRIVE READ/WRITE CHANNEL

Yihe Huang, Palo Alto, Calif., assignor to Exar Corporation, San Jose, Calif.

Filed May 3, 1995, Ser. No. 433,949

Int. Cl.[6] G11B *5/09*; G06M *3/00*; G11C *19/00*

U.S. Cl. 360—41 **7 Claims**



1. In a disk drive including a controller coupled to a read/write channel and a head/disk assembly, the read/write channel comprising:

a serial nonreturn-to-zero (NRZ) data input;

a first NRZ clock input;

a first memory block coupled to said serial NRZ data input and said first NRZ clock input having a first parallel NRZ data output;

a second NRZ clock input;

a second memory block coupled to said first parallel NRZ data output and said second NRZ clock input having a second parallel NRZ data output;

a run-length limited (RLL) clock input; and

a third memory block coupled to said second parallel NRZ data output and said RLL clock input.

5,557,482

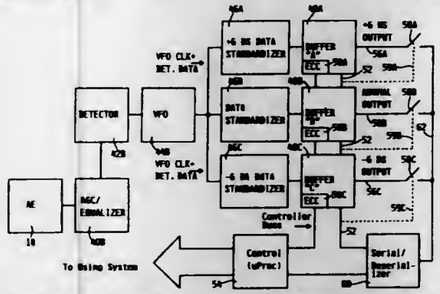
MULTIPATH CHANNEL APPARATUS AND METHOD FOR DATA STORAGE DEVICES AND COMMUNICATIONS SYSTEMS WHEREIN A DATA PATH IS SELECTED BASED ON ERRORS

Thomas C. Christensen, and Earl A. Cunningham, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1994, Ser. No. 359,215

Int. Cl.[6] G11B *5/09*

U.S. Cl. 360—53 **4 Claims**



1. A multipath channel method for a data storage device wherein data is stored on a storage medium and is read from the storage medium by a transducer, said method comprising the steps of:

inputting data read by the transducer into a data channel having a plurality of data paths operatively connected to the transducer;

checking customer and redundancy data from each of said data paths for errors; and

selecting data from one of said data paths based on said checking step;

wherein each of said data paths includes a data standardizer for standardizing data based on a read clock, each of said data paths includes a differing parameter value, said differing parameter value is an offset amount of said read clock, said read clock associated with a first one of said data paths is advanced relative to a reference clock, said offset amount of read clock associated with a second one of said data paths is zero so that said read clock associated with the second data path is equal to said reference clock, and said read clock associated with a third one of said data paths is delayed relative to said reference clock, and wherein said checking step includes the substeps of:

calculating an error correcting code syndrome for said customer and redundancy data from said second data path and comparing said calculated error correcting code syndrome for said customer and redundancy data from said second data path to zero;

if said calculated error correcting code syndrome for customer and redundancy data from said second data path does not equal zero, calculating an error correcting code syndrome for said customer and redundancy data from one of said first and third data paths and comparing said calculated error correcting code syndrome for said customer and redundancy data from said one of said first and third data paths to zero; and

if neither said calculated error correcting code syndrome for customer and redundancy data from said second data path nor said calculated error correcting code syndrome for customer and redundancy data from said one of said first and third data path equals zero, calculating an error correcting code syndrome for said customer and redundancy data from the other of said first and third data paths and comparing said calculated error connecting code syndrome for said customer and redundancy data from said other of said first and third data paths to zero.

5,557,483

TAPE END DETECTION DEVICE

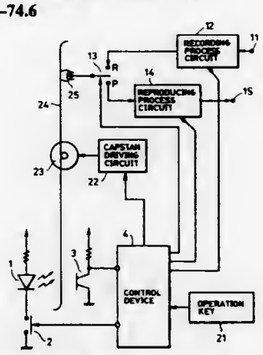
Kazuhiro Takahashi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1991, Ser. No. 794,052

Claims priority, application Japan, Nov. 22, 1990, 2-315964

Int. Cl.[6] G11B *15/48*

U.S. Cl. 360—74.6 **13 Claims**



1. A tape end detection device, comprising:

(a) detection means comprising light emitting means and light receiving means which detect a prescribed portion provided at, least one end of a tape in a preset detecting interval, said light receiving means being opposite to said light emitting means with said tape therebetween; and

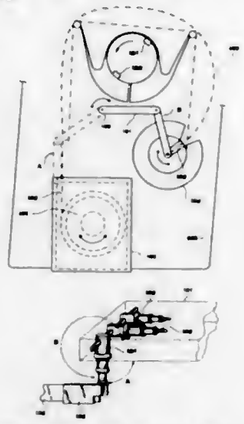
(b) switching means for switching an emission interval of said light emitting means to a different finite duration emission interval in response to a detection of said prescribed portion by the detection means.

5,557,484

DIFFERENTIATION OF MEDIA TYPES VIA LEADER BLOCK CHARACTERISTICS WHICH INCLUDE A PLURALITY OF LEADER BLOCK RETRIEVAL MEMBERS

Michael L. Leonhardt, Longmont, and Charles A. Milligan, Golden, both of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Oct. 11, 1994, Ser. No. 320,857
Int. Cl.[6] G11B *15/67*
U.S. Cl. 360—95 32 Claims



1. A media differentiation and retrieval system for use with a media drive that reads/writes data on a plurality of different media types, each of said media types being individually housed in a data storage element, said data storage element having an opening in one end for securing a leader block, said leader block being attached to the one of said plurality of different media types housed in said data storage element, and a leader block retrieval slot in said leader block that is uniquely keyed to identify the one of said plurality of different media types housed in said data storage element, said media differentiation and retrieval system comprising:

a plurality of leader block retrieval members each being attached at the distal end of a media loading arm and having at least one coaxially aligned retrieval member section, wherein each said at least one retrieval member section corresponds to only one uniquely keyed said leader block retrieval slot;

means, responsive to said data storage element being inserted into said media drive, for inserting successive ones of said at least one retrieval member section from said plurality of leader block retrieval members into said leader block retrieval slot according to an insertion sequence; and

means, responsive to one of said at least one retrieval member section engaging said leader block retrieval slot, for retrieving said leader block from said data storage element;

wherein said plurality of leader block retrieval members are attached to said media loading arm when said leader block is retrieved from said data storage element to travel along a media mounting path within said media drive; and

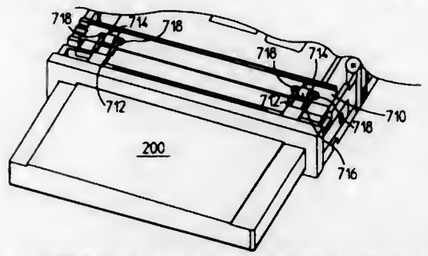
wherein an engaged one of said plurality of leader block retrieval members is in a first position for engaging said leader block retrieval slot while unengaaed ones of said plurality of leader block retrieval member are in a second position proximate to said first position to avoid engaging said leader block retrieval slot and to avoid engaging structure within said media drive proximate to said media mounting path during media mounting.

5,557,485

ALIGNMENT AND LATCHING MECHANISM IN A DRIVE FOR MAGNETIC DATA TAPE MINI-CARTRIDGES

Fred O. Stephens; Devin A. Bloom; Michael P. Eland; Gregory A. Standiford, all of Loveland, and Jon R. Dory, Ft. Collins, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 31, 1995, Ser. No. 414,972
Int. Cl.[6] G11B *5/008*
U.S. Cl. 360—96.5 15 Claims



1. An apparatus in a drive chassis for aligning a magnetic data tape mini-cartridge with the drive chassis, the mini-cartridge having a top cover and a baseplate, the baseplate having a bottom surface, at least one mini-cartridge rear reference point defined on the bottom surface of the baseplate; the baseplate having a top surface, a front surface and a side surface; at least one mini-cartridge front reference point defined on the bottom surface of the baseplate, a notch in the side surface of the baseplate, the notch having a notch front surface, the apparatus comprising:

at least one drive front reference point defined in the drive chassis;

a bracket attached to the drive chassis;

at least one leaf spring, the leaf spring having a first end that is rigidly attached to the bracket and a second end that is flexible;

when the mini-cartridge is fully inserted into the drive chassis, the second end of the leaf spring presses against the top cover, forcing the mini-cartridge rear reference point against the drive front reference point;

at least one drive rear reference point defined in the drive chassis;

a roller, spring loaded to the drive chassis; and

when the mini-cartridge is fully inserted into the drive chassis the roller is forced against the top surface of the baseplate and against the notch front surface, thereby providing force on the baseplate vertical to the baseplate forcing the mini-cartridge front reference point against the drive rear reference point and providing a force on the baseplate parallel to the baseplate in a direction toward the front surface of the baseplate.

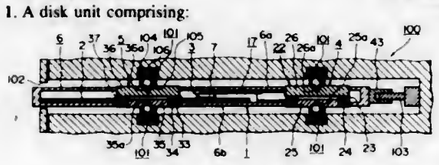
5,557,486

THIN EXTERNAL MEMORY UNIT WITH HARD DISK

Kyo Akagi, Fuchu; Yasuhiro Kato, Tokyo; Masaaki Matsumoto; Akira Iida, both of Odawara, all of Japan, and Yongkweon Kim, Seoul, Rep. of Korea, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 2, 1993, Ser. No. 160,660
Int. Cl.[6] G11B *5/012*
U.S. Cl. 360—97.01 73 Claims

1. A disk unit comprising:



a recording medium disk;

head means for reading and writing information on said disk;

first actuator means for moving said head means relative to said disk;

second actuator means for rotating said disk, said second actuator means including a stator and a moving portion movable with respect to said stator by interaction with said stator, said stator and said moving portion having no bearing structure therebetween; and

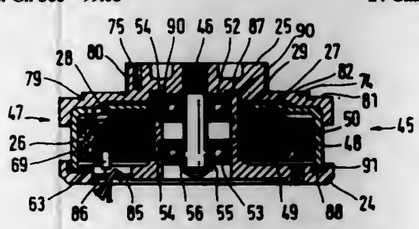
housing means for housing said disk, said head means, and at least a part of said first actuator means and said second actuator means, said stator being fixedly coupled with said housing means.

5,557,487

DISK STORAGE DRIVE HAVING PARTICULAR DIAMETER RELATIONSHIP AND AXIAL COMPACTNESS

Dieter Elsaesser, St. Georgen, and Johann V. D. Heide, Schramberg, both of Germany, assignors to Papst Licensing GmbH, Spaichingen, Germany

Continuation of Ser. No. 227,645, Apr. 14, 1994, Pat. No. 5,422,769, which is a continuation of Ser. No. 47,308, Apr. 19, 1993, Pat. No. 5,446,610, which is a continuation of Ser. No. 883,478, May 15, 1992, Pat. No. 5,216,557, which is a continuation of Ser. No. 682,495, Apr. 9, 1991, Pat. No. 5,128,819, which is a continuation of Ser. No. 259,132, Oct. 18, 1988, Pat. No. 5,006,943, which is a continuation of Ser. No. 32,954, Mar. 31, 1987, Pat. No. 4,779,165, which is a continuation of Ser. No. 733,231, May 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 412,893, Aug. 27, 1982, abandoned. This application May 30, 1995, Ser. No. 453,508
Claims priority, application Germany, Sep. 7, 1981, 31 358.1; Switzerland, Jun. 1, 1984, 2680/84; Mar. 30, 1985, 01374/85
Int. Cl.[6] G11B *17/02*
U.S. Cl. 360—99.08 24 Claims



1. A disk storage device, comprising in combination:

a clean chamber isolated by a partition;

at least one data storage disk provided in said clean chamber and having a central opening with a first diameter;

a motor for rotating said data storage disk about an axis;

a support member connected to the clean chamber partition for supporting said motor within said clean chamber;

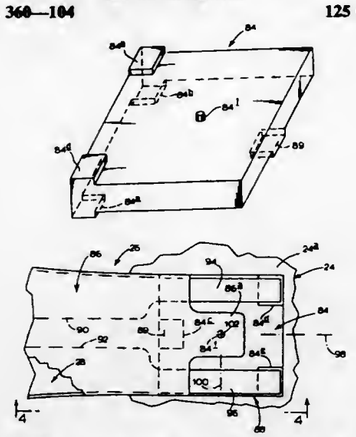
said motor including a stator, having windings, mounted on said support member concentric with said disk rotation axis, a shaft positioned by said support member in alignment with said disk rotation axis, bearings surrounding said shaft, and a rotor rotatable via said bearings about said disk rotation axis, said rotor having a hub member extending through the central opening of said data storage disk with a disk support shoulder extending radially therefrom, said rotor further having a magnetically-conducting member opening toward one axial end of said rotor and housing a motor magnet, said magnetically-conducting member having an outer diameter greater than said first diameter, said rotor having a radially extending inner wall spaced closely adjacent to said stator windings, whereby said disk storage device is compact in a direction along said disk rotation axis while said motor magnet is axially separated from the plane of said storage disk.

5,557,488

GIMBALED MICRO-HEAD/FLEXURE/CONDUCTOR ASSEMBLY AND SYSTEM

Harold J. Hamilton, Santa Clara, and Timothy W. Martin, Los Altos, both of Calif., assignors to Censtor Corp., San Jose, Calif.

Continuation-in-part of Ser. No. 783,619, Oct. 28, 1991. This application Feb. 1, 1993, Ser. No. 11,890
Int. Cl.[6] G11B *5/48*
U.S. Cl. 360—104 125 Claims



1. A head/flexure/conductor assembly for reading and writing information with respect to a rigid magnetic recording medium comprising

a read/write transducer unit having an upper side opposite from a medium-facing side, and first and second laterally spaced bonding areas on the upper side of the transducer unit,

an elongate carrier unit for supporting said transducer unit, said carrier unit having a length spanning from a proximal end to a distal end, and

gimbal structure interconnecting and articulating said units for selected, limited relative movement, including first and second laterally spaced, elongate conductor members, joined to the carrier unit along substantially the entire length of the carrier unit, each of the conductor members having a distal end bonded to one of the bonding areas on the upper side of the transducer unit, so that each of the conductor members forms a cantilever support structure for the transducer unit.

5,557,489

FLEXIBLE CABLE FOR FLOATING TYPE MAGNETIC HEAD DEVICE

Keishi Nakashima, Nagaoka, and Masamitsu Senuma, Tsubame, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1994, Ser. No. 350,866
Claims priority, application Japan, Dec. 9, 1993, 5-340764
Int. Cl.[6] G11B *5/48*
U.S. Cl. 360—104 4 Claims

1. A floating type magnetic head comprising:

a magnetic head main body which faces and floats above a moving recording medium;

a supporting member supporting said magnetic head main body movably;

a flexible cable having a bending portion, connecting said supporting member and said magnetic head main body the bending portion including a cable base material and a conductor layer formed on the cable base material; and

respective parts having dimensions as shown below satisfying equation (1):

$$W/L \leqq -15(A \times DC + Dp) + 0.5,$$

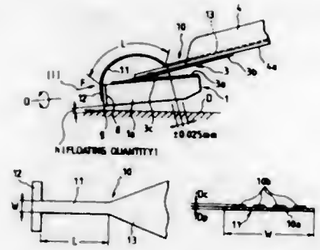
with said steel sleeve, and wherein said step (f) minimizes

a second shield layer;

a second gap layer between the first lead layer and the second

5,557,493

METHOD OF ADJUSTING LINEARITY



wherein the width dimension of at least a part of the bending portion of said flexible cable is W, the length of the bending portion is L, the thickness dimension of the cable base material of the bending portion is Dp, the thickness dimension of the conductor layer is Dc, and the area ratio of said conductor layer to said cable base material is A.

5,557,490

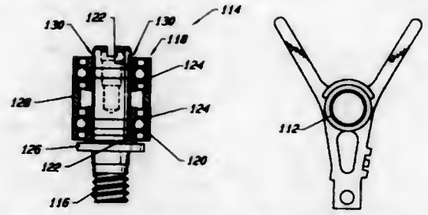
METHOD OF MANUFACTURING AN ACTUATOR ARM WITH A STEEL SLEEVE FOR THERMAL OFF TRACK COMPENSATION

Iraj Jabbari, San Jose, Calif., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 970,769, Nov. 3, 1992, abandoned, which is a continuation of Ser. No. 611,300, Nov. 9, 1990, Pat. No. 5,161,077. This application Jul. 25, 1994, Ser. No. 279,679

Int. Cl.[6] G11B *5/55*; **B22D** *19/00*; **H02K** *23/26*

U.S. Cl. 360—106 **11 Claims**



8. A method of manufacturing and pre-loading an actuator arm formed from a material different from steel and used for pivotal rotation about a steel shaft and a bearing unit, wherein said steel shaft is fixedly attached to a hard disk drive unit frame, and wherein said bearing unit includes upper and lower bearings associated with upper and lower steel inner races fixably attached to said steel shaft, and includes upper and lower steel outer races rotatable about said steel shaft, the method comprising the following steps:

(a) providing a casting die having a desired shape of said actuator arm;

(b) positioning a steel sleeve in said die at a location defining a desired actuator arm pivot bore, said steel sleeve being sized to fit over said outer race and the outer surface of the steel sleeve is textured to facilitate the bonding of the steel sleeve to the actuator arm;

(c) forming said actuator arm such that said sleeve becomes an integral portion of said actuator arm;

(d) adhesively-attaching said lower steel inner race of said bearing unit to said steel shaft;

(e) epoxy-attaching said upper steel inner race of said upper bearing unit to said steel shaft; and

(f) before and while epoxy associated with said step (e) sets, applying a pre-load to said upper bearing unit;

wherein said steps (a), (b) and (c) provide said actuator arm with improved thermal expansion as compared to an actuator arm with said steel sleeve, and wherein said step (f) minimizes actuator arm tilt without requiring permanent application of a pre-load force.

5,557,491

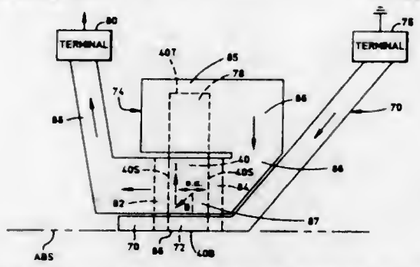
TWO TERMINAL SINGLE STRIPE ORTHOGONAL MR HEAD HAVING BIASING CONDUCTOR INTEGRAL WITH THE LEAD LAYERS

Hardayal S. Gill, Portola Valley, and Douglas J. Werner, Fremont, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 18, 1994, Ser. No. 292,647

Int. Cl.[6] G11B *5/39*

U.S. Cl. 360—113 **35 Claims**



29. A combined head which includes an orthogonal MR read head and an inductive write head which includes a second pole layer, the combined head having a head surface which is coextensive with an air bearing surface, said combined head comprising:

a single orthogonal MR stripe which extends perpendicular to the head surface, the MR stripe being bounded by first and second end edges and a pair of spaced apart side edges, the first end edge forming a portion of said head head surface;

the MR stripe having an easy axis which extends substantially parallel to the head surface;

a first lead layer connected to a first end portion of the MR stripe and a second lead layer connected to a second end portion of the MR stripe, the MR stripe having a middle portion between the first and second end portions;

the first and second lead layers and the MR stripe being connected in series;

the second lead layer extending across the middle portion of the MR stripe for transverse biasing the MR stripe when a sense current is conducted through the first and second lead layers via the MR stripe;

only first and second terminals;

the first lead layer being connected to the first terminal;

the second lead layer having a first portion which extends laterally in a first direction from the connection of the second lead layer to the MR stripe a second portion which extends in a second direction toward the head surface from the first portion, a third portion which extends laterally in a third direction substantially opposite to said first direction;

the third portion extending across the middle portion of the MR stripe;

the second lead layer having a fourth portion which extends from the third portion to the second terminal and is connected thereto;

a first shield layer;

a first gap layer formed on the first shield layer;

the MR stripe being formed on the first gap layer;

a mid-gap insulation layer formed on the MR stripe and the first gap layer;

the first portion of the second lead layer being electrically connected to the MR stripe through a via in said mid-gap insulation layer;

the second, third and fourth portions of the second lead layer being separated from the first shield layer by the first gap layer and the mid-gap insulation layer;

a second shield layer;

a second gap layer between the first lead layer and the second shield layer;

the MR stripe being located between the first and second shield layers;

the first lead layer connected to the first shield layer through a via in the first gap layer and connected to the second shield layer through a via in each of the mid-gap insulation layer and the second gap layer; and

the first terminal being connected to ground.

5,557,492

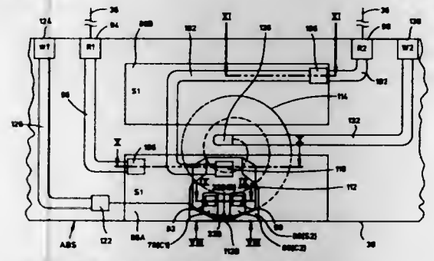
THIN FILM MAGNETORESISTIVE HEAD WITH REDUCED LEAD-SHIELD SHORTING

Hardayal S. Gill, Portola Valley, and David E. Heim, Redwood City, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 103,487, Aug. 6, 1993, abandoned. This application Mar. 8, 1995, Ser. No. 400,689

Int. Cl.[6] G11B *5/39*

U.S. Cl. 360—113 **36 Claims**



1. A thin film magnetoresistive head, comprising:

a magnetoresistive sensing element having first and second oppositely-directed thin film surfaces bounded by top and bottom bounding edges and side bounding edges, the bottom bounding edge forming a portion of an air bearing surface;

first and second sense current thin film connector layers, each connector layer being electrically connected to the magnetoresistive element in a spaced apart relationship;

first and second thin film gap layers and first and second thin film electrically conductive shield layers;

the magnetoresistive sensing element being located between the first and second gap layers;

the magnetoresistive sensing element, the first and second connector layers and the first and second gap layers being located between the first and second shield layers;

the first gap layer having a hole;

the first connector layer being electrically connected to the first shield layer through the hole in the first gap layer and the second connector layer being electrically connected to the second shield layer;

first and second output terminals; and

the first shield layer being electrically connected to the first output terminal and the second shield layer being electrically connected to the second output terminal,

whereby the first and second shield layers serve as leads for the magnetoresistive sensing element thereby eliminating shorting of a sense current to the first and/or second shield layers via the first and/or second gap layers.

5,557,493

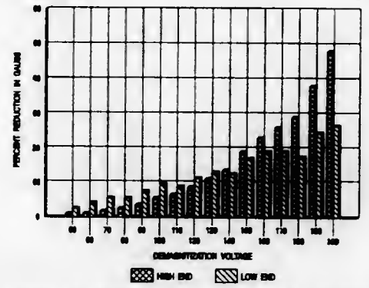
METHOD OF ADJUSTING LINEARITY

Mike Ross, Granger, Ind., assignor to CTS Corporation, Elkhart, Ind.

Filed Apr. 5, 1994, Ser. No. 223,474

Int. Cl.[6] H01F *13/00*

U.S. Cl. 361—149 **3 Claims**



1. A method for demagnetizing a magnetic field position sensor having a first permanent magnet, said first permanent magnet having a thicker magnet portion, said thicker magnet portion having a first air gap associated therewith through which magnetic flux generated by said thicker magnet portion will travel, said first permanent magnet having a thinner magnet portion, said thinner magnet portion having a second air gap associated therewith through which flux generated by said thinner magnet portion will travel, said thicker magnet being thicker than said thinner magnet and thereby generating a stronger magnetic field, said position sensor generating an output corresponding to sensed position, said output non-linear with respect to linear variation in said sensed position, comprising the steps of:

applying a first magnetically saturating field to said first permanent magnet;

applying a first demagnetizing field to first permanent magnet and thereby demagnetizing said thicker magnet portion by a first percentage sufficient to stabilize said thicker magnet portion against irreversible and structural losses; and

demagnetizing said thinner magnet portion by a second percentage sufficient to stabilize said thinner magnet portion against irreversible and structural losses, whereby said first percentage and said second percentage are not equal and said non-linear output is linearized to correspond more closely to said linear variation in said sensed position.

5,557,494

DRIVE CIRCUIT OF AN ELECTROMAGNETIC DEVICE

Minoru Ishikawa, and Kimitada Ishikawa, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Aug. 31, 1994, Ser. No. 297,548

Claims priority, application Japan, Sep. 7, 1993, 5-221505

Int. Cl.[6] H01H *47/04*

U.S. Cl. 361—152 **7 Claims**

1. A drive circuit of an electromagnetic device having a coil, a loop circuit including a DC power supply, a switch, and a first switching device, said drive circuit further comprising:

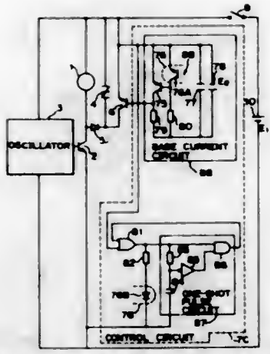
an oscillator having an output terminal connected to a control terminal of said first switching device, said oscillator providing said first switching device with a starting pulse and holding pulses following the starting pulse, said starting pulse being generated when the switch is closed, the width of said starting pulse being greater than the width of said holding pulses;

a series circuit including a surge absorber and a diode, said series circuit being connected in parallel with said coil in such a direction that said series circuit absorbs a counter electromotive force of said coil;

a second switching device connected in parallel with said surge absorber; and

5,557,498

an adapter, a tray, and a bezel,



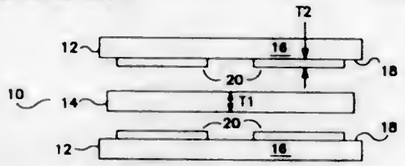
a control circuit, said control circuit (1) rendering said second switching device conductive during a predetermined delay time after the switch is closed, and (2) making said second switching device instantly non-conductive when said switch is opened after said predetermined delay time has elapsed, said predetermined delay time being longer than the width of the starting pulse.

5,557,495

VARIABLE CAPACITOR AND METHOD

Donald K. Belcher, W. Melbourne, and David C. Bailey, Cocoa Beach, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Sep. 29, 1994, Ser. No. 313,596
Int. Cl.[6] H01G *5/01;5/16*
U.S. Cl. 361—298.2 **25 Claims**



1. A variable capacitor comprising:
two circuit boards separated by and in pressural engagement with a polytetrafluoroethylene disk of thickness T1,
each of said two boards comprising a dielectric support having a first surface facing an opposing surface of said disk, and two spaced semicircular patterns of thickness T2 on said first surface, one of said two patterns being electrically connected in said capacitor, and
said two boards being coaxial with said disk and movable relative to each other so that the electrically connected one of said two patterns in one of said two boards can be moved into and out of a position opposing the electrically connected one of said two patterns in the other one of said two boards.

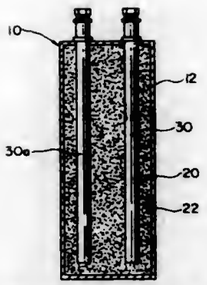
5,557,496

RECHARGEABLE ELECTRIC POWER SUPPLY DEVICE

Yoshihiro Onishi, Hachioji, Japan, assignor to World Enterprise Co., Ltd., Tokyo, Japan

Filed Jul. 19, 1994, Ser. No. 277,172
Claims priority, application Japan, Jul. 30, 1993, 5-227727
Int. Cl.[6] H01G *9/022;9/04;9/042*
U.S. Cl. 361—500 **8 Claims**

1. A rechargeable electric power supply device which comprises a supply unit including a pair of electrodes spaced apart from each other and a mixture of (a) fired fine pellets of an electron absorbing material, (b) fine particles of a mixed electron absorbing material



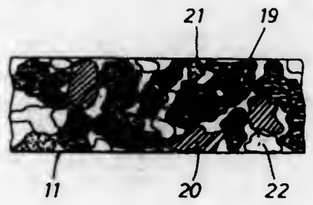
comprising V_3Ga, Bi, CuO, Sr and FeO_2, (c) fine particles of a catalyst, (d) fine particles of C and FeO_2, and (e) a plasticizer, and a casing for accommodating the pair of electrodes and the mixture therein so that the pair of electrodes are individually in intimate contact with the mixture.

5,557,497

CAPACITOR WITH A DOUBLE ELECTRIC LAYER

Alexander M. Ivanov; Isaac Y. Bognitski; Arkadiy F. Gerasimov; Sergei E. Efimov; Vadim G. Savintsev; Andrei V. Fomin, and Sergei V. Chizhevski, all of Moscow, Russian Federation, assignors to Ecosd, Russian Federation

Filed Jul. 2, 1993, Ser. No. 86,910
Claims priority, application Russian Federation, Jul. 3, 1992, 5050652
Int. Cl.[6] H01G *9/155*
U.S. Cl. 361—502 **42 Claims**



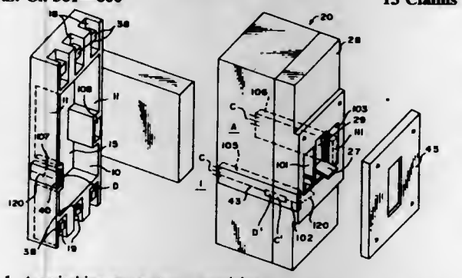
1. An electrical capacitor comprising
a. an electrolyte,
b. at least one pair of electrolyte-impregnated electrodes which are elastically compressible and independently mechanically stable, said electrodes comprising a porous elastic dielectric means and a separate polymer binder,
c. a separator impregnated with said electrolyte between and in contact with both of said at least one pair of electrolyte-impregnated electrodes for ionic conductance and electronically separating said electrodes,
d. at least one pair of electrolyte-impermeable and electrolyte inert current collectors having a first and a second of said pair in contact with a first and a second respectively of the at least one pair of electrolyte-impregnated electrodes, and
e. an uncompressed gasket for separating said at least one pair of electrolyte-impermeable and electrolyte inert current collectors outward of said separator and along the capacitor perimeter.

5,557,498

SWITCHING APPARATUS INCLUDING A DISPLACEABLE DISCONNECTING DEVICE AND AN AUXILIARY CIRCUIT

Renato Dosmo, and Giovanni Mairati, both of Bergamo, Italy, assignors to ABB Sace SpA, Bergamo, Italy

Filed Apr. 21, 1994, Ser. No. 230,919
Claims priority, application Italy, Apr. 21, 1993, MI93A0787; Apr. 21, 1993, MI93A0786
Int. Cl.[6] H02B *1/00;* **H01H** *9/00*
U.S. Cl. 361—600 **13 Claims**



1. A switching apparatus comprising:
a stationary part for mounting in a switch cabinet, the stationary part including power supply terminals, power distribution terminals, and first and second side walls;
a housing body for accommodating a switch mechanism, the housing body including first and second side walls;
wiring which passes from the stationary part to the housing body;
a first additional device with an electrical auxiliary circuit which is supplied with electrical power from said wiring;
means for disconnecting the moving housing body with respect to the stationary part which moves the housing body from an electrically disconnected position to an electrically connected position;
said wiring including a first plug connection having mutually interacting parts positioned in the first and second side walls of the stationary part and in the first and second side walls of the moving housing body, said first plug connection opening during a transition from the electrically connected position to the electrically disconnected position and closing during a transition from the electrically disconnected position to the electrically connected position.

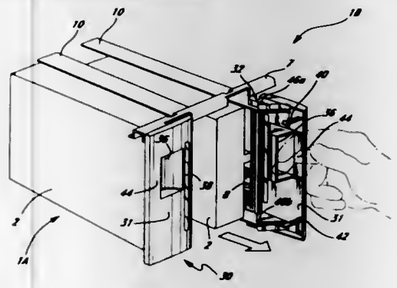
5,557,499

HARD-DISK DRIVE TRAY ASSEMBLY WITH PIVOTALLY ROTATABLE FRONT BEZEL

Victor R. Reiter, Huntington Beach, and Bao G. Le, Orange, both of Calif., assignors to AST Research, Inc., Irvine, Calif.

Filed Jun. 28, 1994, Ser. No. 268,010
Int. Cl.[6] H05K *5/00;7/16*
U.S. Cl. 361—685 **9 Claims**

1. A tray assembly comprising



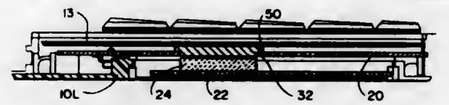
an adapter, a tray, and a bezel,
the adapter and the tray comprising cooperating elements for securing said adapter to said tray by hand,
the bezel attached to the tray to enable pivoting of said bezel around a line lying in a vertical plane, the bezel comprising a pair of inserter/extractor levers for providing a latch and pull action to facilitate even insertion of the tray assembly without the tray assembly twisting, and for providing a release and push action to facilitate even extraction of the tray assembly without the tray assembly twisting.

5,557,500

HEAT DISSIPATING ARRANGEMENT IN A PORTABLE COMPUTER

Allan S. Baucom, Townsend; Mark J. Foster, Acton, and Michele Bovio, Boston, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Dec. 7, 1994, Ser. No. 350,876
Int. Cl.[6] H05K *7/20*
U.S. Cl. 361—687 **21 Claims**



1. Apparatus, comprising:
a first printed circuit board having an opening therein and a layer of thermally-conductive etch adjacent said opening, the sides of said opening being plated with a thermally-conductive material, said layer of etch being in thermally-conductive contact with said thermally-conductive material;
a second printed circuit board having an integrated circuit mounted thereon, said second printed circuit board being disposed relative to said first printed circuit board such that said integrated circuit is substantially aligned with said opening in said first printed circuit board; and
a thermally-conductive slug disposed in said opening of said first printed circuit board in contact with the plated sides thereof, said slug in said first printed circuit board being in physical contact and in a thermally-conductive relationship with said integrated circuit on said second printed circuit board and in a thermally-conductive relationship with said layer of etch in said first printed circuit board to effect heat transfer therebetween.

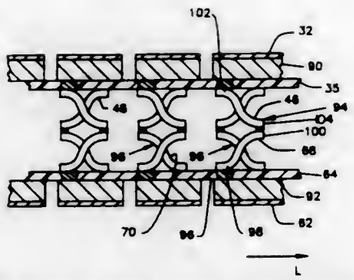
5,557,501

COMPLIANT THERMAL CONNECTORS AND ASSEMBLIES INCORPORATING THE SAME

Thomas H. DiStefano, Monte Sereno, and John W. Smith, Palo Alto, both of Calif., assignors to Tessera, Inc., San Jose, Calif.

Filed Nov. 18, 1994, Ser. No. 342,222
Int. Cl.[6] H05K *7/20*
U.S. Cl. 361—704 **24 Claims**

2. A thermal connector for a microelectronic assembly comprising:
(a) a device-side element and a sink-side element spaced apart from one another in a vertical direction; and
(b) a plurality of conductive paths each including one or more elongated conductors, each said path having a proximal end connected to said device-side element and a distal end connected to said sink-side element, said conductors in said paths sloping in first and second lengthwise horizontal directions opposite to one another, said conductors being arranged in one or more arrays extending in said lengthwise horizontal directions and also extending in widthwise horizontal directions transverse to said lengthwise horizontal directions, each said array including a substantially equal numbers of conductors sloping in said first and second lengthwise directions,



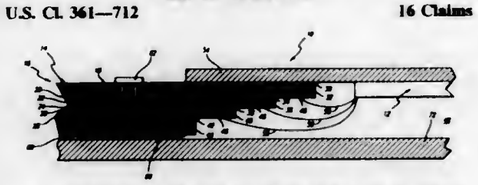
each said path including a plurality of said conductors connected substantially end to end so that the conductors in each said path slope alternately in said first and second lengthwise directions, said paths including a plurality of paths of a first type in which a conductor at the proximal end of the path slopes in said first lengthwise direction and a plurality of paths of a second type in which the conductor at the proximal end of the path slopes in said second direction, the number of paths of said second type being substantially equal to the number of paths of said first type.

5,557,502

STRUCTURE OF A THERMALLY AND ELECTRICALLY ENHANCED PLASTIC BALL GRID ARRAY PACKAGE

Koushik Banerjee; Debendra Mallik, and Ashok Seth, all of Chandler, Ariz., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 2, 1995, Ser. No. 399,162
Int. Cl.[6] H05K *7/20*
U.S. Cl. 361—712 **16 Claims**



1. A ball grid array package for an intergrated circuit comprising:
a circuit board that has an external landing pad and an internal conductive plane that is said internal conductive plane and said shelf being on different levels, electrically coupled to said landing pad, said circuit board further having an internal shelf and a bounding pad thereon, wherein said internal conductive plane is connected to said bounding pad by a conductive strip that extends around an end edge of said shelf;
a heat slug attached to an external surface of said circuit board; and
a solder ball attached to said landing pad of said circuit board.

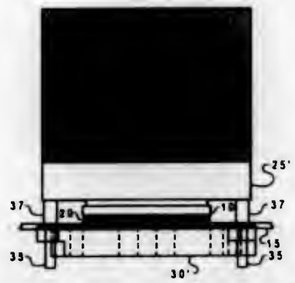
5,557,503

CIRCUIT CARD HAVING A LARGE MODULE-STRAIN RELIEF AND HEAT SINK SUPPORT

Phillip Isaacs, Rochester, and Miles Swain, Hayfield, both of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 12, 1995, Ser. No. 440,182
Int. Cl.[6] H05K *7/70*
U.S. Cl. 361—719 **12 Claims**

1. A circuit card having module strain relief, comprising:
a printed circuit board having a front and a back;
a single module closed on all sides and having a plurality of electrical connections making electrical connection with the printed circuit board and anchoring the module directly to the front of the printed circuit board; and
a stiffening structure to provide rigidity to the printed circuit board that is mounted to, and in contact with a portion of the back of the printed circuit card directly opposite from the module mounted on the front of the circuit card, the stiffening structure being substantially coextensive with the plurality of electrical connections, and being of sufficient thickness and strength to resist flexure of the portion of the printed circuit board in contact with the stiffening structure in response to shock and vibration applied to the module.

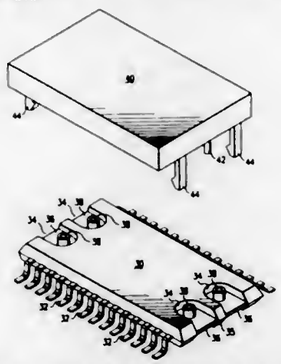


5,557,504

SURFACE MOUNTABLE INTEGRATED CIRCUIT PACKAGE WITH DETACHABLE MODULE

Harry M. Siegel, Hurst; Michael J. Hundt, Double Oak, and Krishnan Kelappan, Carrollton, all of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Continuation of Ser. No. 114,750, Aug. 31, 1993, abandoned. This application Jun. 21, 1995, Ser. No. 492,963
Int. Cl.[6] H01R *9/00*
U.S. Cl. 361—173 **20 Claims**



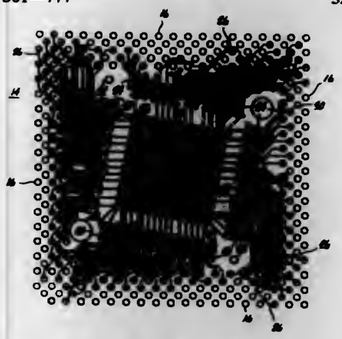
1. A system for packaging integrated circuit components, comprising:
a chip package, comprising:
a body containing a semiconductor device;
a plurality of leads extending from said body, said leads in electrical connection with the semiconductor device, and of the type suitable for surface mounting to a circuit board; and
first and second terminals in electrical connection with the semiconductor device, and extending from said body; and
a component module disposed over said chip package, comprising:
an auxiliary body containing an auxiliary component; and
first and second connectors in electrical connection with the auxiliary component, and extending from said auxiliary body to electrically connect with said first and second terminals, respectively, of said chip package.

5,557,505

DUAL PATTERN MICROPROCESSOR PACKAGE FOOTPRINT

David J. Silva, Trabuco Canyon, Calif., assignor to AST Research, Inc., Irvine, Calif.

Filed Jul. 22, 1994, Ser. No. 278,798
Int. Cl.[6] H05K *1/18*
U.S. Cl. 361—777 **32 Claims**



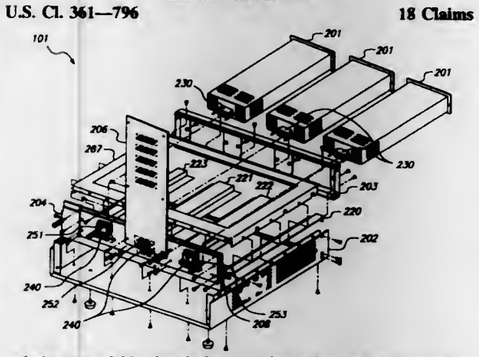
1. A dual footprint for a PC board comprising:
a pin grid array footprint; and
a tape carrier package footprint formed within said pin grid array footprint, wherein said tape carrier package footprint is offset at a selected angle greater than 0° from said pin grid array footprint.

5,557,506

EXPANDABLE DATA PROCESSING CHASSIS AND METHOD OF ASSEMBLY THEREOF

Samuel F. Wood, Los Altos Hills, and John F. Wakerly, Mountain View, both of Calif., assignors to Alantec, San Jose, Calif.

Filed Mar. 31, 1995, Ser. No. 414,771
Int. Cl.[6] H05K *7/14*
U.S. Cl. 361—796 **18 Claims**



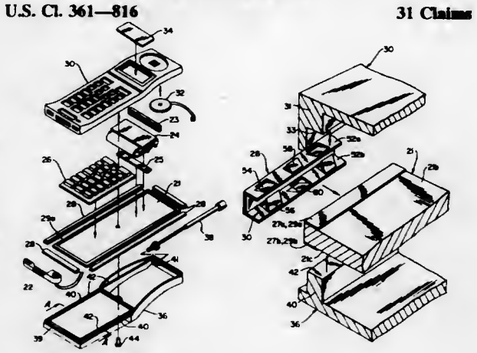
4. An expandable chassis for receiving a first plurality of circuit boards each having an electrical connector on a leading edge of the circuit board and a second plurality of circuit boards each having a first and a second electrical connector on a leading edge of the circuit board, the chassis comprising:
a first removable circuit board housing adapted to receive the first plurality of circuit boards and adapted to planarly align the electrical connectors of the first plurality of circuit boards in a first spatial location;
a second removable circuit board housing mounted adjacent to the first circuit board housing, the second circuit board housing adapted to receive the second plurality of circuit boards and adapted to planarly align the first and second electrical connectors of the second plurality of circuit board in second and third spatial locations;
a first planar backplane mounted to the first housing, the backplane having a plurality of electrical connectors in the first spatial location and a plurality of electrical connector in the second spatial location for electrically interconnecting the first plurality of circuit boards and the second plurality of circuit boards; and
a second planar backplane mounted to the second housing, the backplane having a plurality of electrical connectors in the third spatial location for electrically interconnecting the second plurality of circuit boards.

5,557,507

APPARATUS HAVING SHIELD STRUCTURE

Noboru Koike, and Hirokazu Seraku, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Jun. 24, 1994, Ser. No. 265,027
Claims priority, application Japan, Jul. 28, 1993, 5-186121
Int. Cl.[6] H05K *9/00*
U.S. Cl. 361—816 **31 Claims**



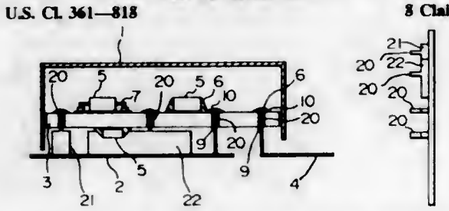
1. An apparatus comprising:
a double-sided circuit board having a first surface and a second surface, a first ground being provided on a first edge portion of the first surface, a second ground being provided on a second edge portion of the second surface, a first circuitry block being mounted on the first surface, and a second circuitry block being mounted on the second surface;
a conductive component having a groove portion engaged with the first edge portion and the second edge portion so that the conductive component contacts the first ground and the second ground;
a first shield case mounted on the first surface so that the first shield case covers the first circuitry block and contacts the conductive component; and
a second shield case mounted on the second surface so that the second shield case covers the second circuitry block and contacts the conductive component.

5,557,508

HIGH-DENSITY CIRCUIT MODULE AND METHOD OF PRODUCING THE SAME

Teruhiro Sato; Tomio Wada, and Yoshiyuki Hirayama, all of Yokohama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 2, 1993, Ser. No. 160,186
Claims priority, application Japan, Jun. 10, 1992, 04-150342
Int. Cl.[6] H05K *9/00*
U.S. Cl. 361—818 **8 Claims**



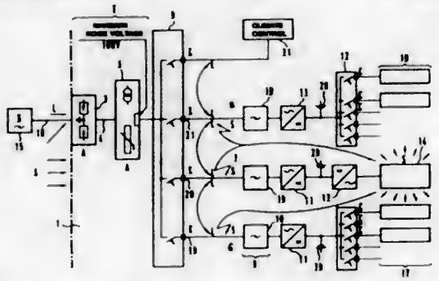
1. A method of producing a high-density circuit module, comprising the steps of:
(a) preparing a single flat metal sheet blank having thin metallic parts which are to form side walls, a shield plate having terminals formed thereon and external leads of said circuit module, said thin metallic parts being connected to the shield plate at connecting portions in positional relationships necessary for assembly of said module;
(b) placing a circuit board on one side of said shield plate of said flat metal sheet blank;
(c) forming holes in said circuit board;
(d) inserting said terminals formed on said shield plate into said holes formed in said circuit board; and
(e) performing operations including severing or bending selected ones of said connecting portions at which said thin metallic parts are connected to the shield plate, and effecting required processing on portions to be jointed, wherein:
at least one of said terminals inserted into said holes in said circuit board and formed on said shield plate is provided with a pedestal which supports said circuit board to provide a clearance between said shield plate and said circuit board to enable a circuit component to be mounted on said circuit board between said circuit board and said shield plate.

5,557,509

POWER SUPPLY FILTER SYSTEM FOR POWER SUPPLY SYSTEM FOR A COMMUNICATIONS SUBSYSTEM OF A WEAPONS SYSTEM

Sobhy Ibrahim, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jul. 22, 1994, Ser. No. 279,112
Claims priority, application Germany, Aug. 9, 1993, 43 26 734.3
Int. Cl.[6] H02M *1/12*
U.S. Cl. 363—44 **4 Claims**



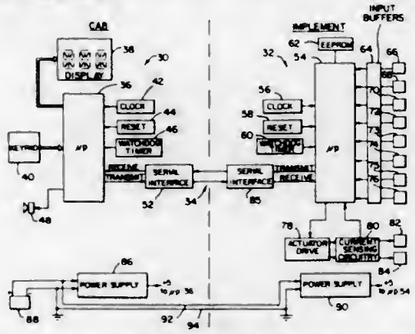
1. A power supply system for a communications subsystem of a weapons system, comprising:
a source of alternating current power external to the subsystem for supplying source power;
a mains connection in the subsystem which is electrically coupled to the external source of power;
a transformer electrically coupled to the mains connection;
a distributor electrically coupled to the transformer and configured to distribute power from the transformer into a plurality of sub-power lines;
a converter in each of the sub-power lines for converting the power supplied thereto into a DC power signal;
devices powered by the DC power signal coupled to the sub-power lines;
a first filter stage provided within the subsystem, the first filter stage having means for removing current surges and voltage surges in the source power and electro-magnetic particle field influences in the mains connection and transformer;
a second filter stage comprising a power line filter positioned in each of the sub-power lines, the second stage filters isolating the various sub-power lines from one another; and
a third filter stage comprising means for filtering noise signals and interfering signals from the various devices so that the devices are isolated from each other.

5,557,510

CONTROL SYSTEM FOR A LARGE ROUND BALER

Thomas J. McIntyre, and Steven B. Inberg, both of Grand Junction, Colo., assignors to Gehl Company, West Bend, Wis.

Filed Nov. 29, 1993, Ser. No. 158,904
Int. Cl.[6] G05B *11/01*; G06F *15/16*
U.S. Cl. 364—146 **7 Claims**



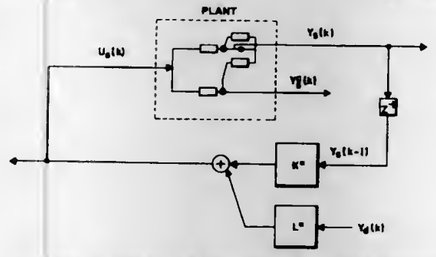
5. A method of forming round bales of crop material, comprising the steps of:
providing a baler having a bale-forming arrangement for forming a cylindrical bale of crop material and having a bale wrapping mechanism;
securing the baler to a towing vehicle;
mounting a processor-based implement control device to the baler;
mounting a processor-based input device in the towing vehicle for receiving input commands from the operator;
interconnecting the implement control device with the bale wrapping mechanism; and
establishing communication between the input device and the implement control device for communicating input signals from the input device to the implement control device to control operation of the bale wrapping mechanism, and for communicating signals indicative of operation of the bale wrapping mechanism from the implement control device to the input device.

5,557,511

EXTENDED HORIZON LIFTINGS FOR PERIODIC GAIN ADJUSTMENTS IN CONTROL SYSTEMS, AND FOR EQUALIZATION OF COMMUNICATION CHANNELS

David S. Bayard, Glendale, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 16, 1994, Ser. No. 222,762
Int. Cl.[6] G05B *13/02*; G06F *19/00*
U.S. Cl. 364—157 **6 Claims**



1. An improved method for providing periodic gain adjustment in a plant of irreducible order, such as for control of electrical, mechanical or chemical systems, or for equalization of communication channels, comprises the choosing of horizon time N>n of liftings in periodic input and output signal windows ρ_u and ρ_y, respectively, of said plant where N is an integer chosen to define the extent of each of said windows ρ_u and ρ_y and n is the order of the irreducible input/output plant model given by an equation of the form

$$A(z^{-1})y_t = B(z^{-1})u_t$$

$$A(z^{-1}) = 1 + \sum_{i=1}^{n} a_i z^{-i};\ B(z^{-1}) = \sum_{i=1}^{n} b_i z^{-i}$$

where polynomials A and B are relatively prime, such that the horizon time for liftings have a total length N=m+l+p+q+2n−1, and in which the number of elements σ_u in the liftings taken from the input signal is greater than the number of elements σ_y in the liftings taken from the output signal for output tracking in control systems, and in which the number σ_u in the liftings taken from the input signal is less than the number of elements σ_y taken from the output signals for input tracking in communication systems, and the following conditions hold for output tracking:
where the superscript t denotes the Moore-Penrose inverse of a submatrix H_s obtained directly from ρ_u and ρ_y by placing said vector ρ_u along the top of a matrix H and ρ_y along the side of said matrix H and taking as said submatrix H_s all of the elements of said matrix H along both borders, and

$$BS_u^T=0$$

$$A(S_y^c)^T=0$$

where $S_u=W(\rho_u)$; $S_y=W(\rho_y)$; $S_y^c=W(\rho_y^c)$ and said liftings have the following representation

$$Y_s(k)=S_yAS_y^TY_s(k-1)+H_sU_s(k), \text{ and}$$

$$Y_s^c(k)=S_y^cAS_y^TY_s(k-1)+S_y^cHS_u^TU_s(k)$$

whereby the transmission of zeros of said liftings from U_s to Y_s are annihilated and the transmission of zeros from V, where $H_s=H_sV$, to Y_s are annihilated and $H_s=S_yHS_u^T$, and the following conditions hold for input tracking:

$$H_s^TH_s=I$$

$$BS_u^T=0$$

$$A(S_y^c)^T=0$$

and said liftings have the following representation:

$$Y_s(k)=S_yAS_y^TY_s(k-1)+S_y^cHS_u^TU_s(k),$$

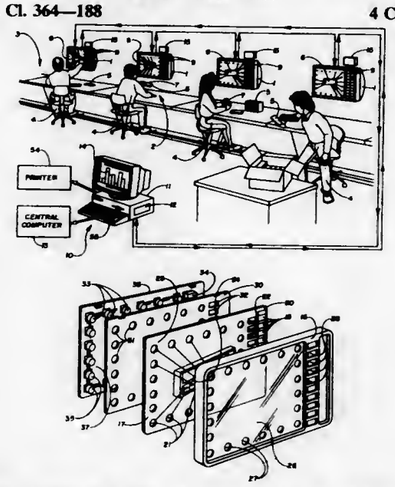
and controlling the performance of said plant in response to said chosen horizon time.

5,557,512

ELECTRONIC DATA ENTRY AND ANALYSIS SYSTEM

John C. Vanko, Timonium; Leo M. Kahl, Baltimore; Jeffrey A. Kaufman, Baltimore, and Mark C. d'Agostino, Baltimore, all of Md., assignors to Fawn Industries, Inc., Hunt Valley, Md.

Division of Ser. No. 268,650, Jun. 30, 1994, Pat. No. 5,508,911.
This application Jun. 23, 1995, Ser. No. 439,976
Int. Cl.[6] G06F *19/00*
U.S. Cl. 364—188 **4 Claims**



1. In combination with a processing means, an apparatus for entering at least one data associated with an object, said apparatus including:
a front screen,
said at least one data to be entered being identified on said front screen,
at least one sensing member disposed on the front screen, said at least one sensing member is associated with said at least one data to be entered,
a key board disposed behind the front screen, and
a controlling means disposed on the key board for controlling said processing means in response to activating said at least one sensing member.

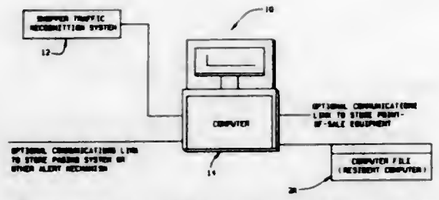
5,557,513

CHECKOUT LANE ALERT SYSTEM AND METHOD FOR STORES HAVING EXPRESS CHECKOUT LANES

Ronald G. Frey, Hackensack, and John D. Nelson, Middletown, both of N.J., assignors to Quadrix Corporation, Bensenville, Ill.

Continuation-in-part of Ser. No. 54,710, Apr. 28, 1993. This application Jun. 17, 1994, Ser. No. 262,131
Int. Cl.[6] G06F *19/00*
U.S. Cl. 364—401 R **11 Claims**

1. A computer-implemented method of forecasting checkout lane traffic in a store including a recognition system having at least one sensor to recognize shoppers as they enter the store, the store including at least one express checkout lane, the method comprising the steps of:



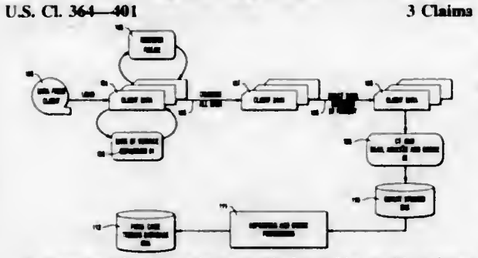
(a) recognizing, via said at least one sensor, shoppers who enter the store during a time period of selected duration, said time period composed of time intervals of selected durations;
(b) generating data, via said recognition system, representing the entry time interval of said shoppers;
(c) transmitting said data representing the entry time interval of each shopper to a computer;
(d) designating, via said computer, a percentage of said shoppers as buyers based on a selected conversion rate;
(e) assigning to each of said buyers, via said computer, a randomly selected number of purchase items in accordance with a frequency distribution curve of items purchased;
(f) calculating, via said computer, from each randomly selected number of purchase items, a shopping time to be assigned to the corresponding buyer;
(g) establishing, via said computer, a checkout lane arrival time for each of said buyers based on the buyers's entry time interval and assigned shopping time; and
(h) determining, via said computer, the eligibility of each of said buyers for express lane checkout in accordance with the corresponding number of purchase items assigned to each of said buyers;
(i) assigning, via said computer, at least a fraction of said buyers eligible for express lane checkout to an express checkout lane.

5,557,514

METHOD AND SYSTEM FOR GENERATING STATISTICALLY-BASED MEDICAL PROVIDER UTILIZATION PROFILES

Jerry G. Seare, Salt Lake City; Patricia A. Smith-Wilson, North Salt Lake; Kurt VanWagoner, Layton; Jean A. Mattey, Midvale; Eileen K. Snyder, Sandy; Candace C. Wahlstrom, Salt Lake City; Michelle Willis, Sandy; Matthew R. Bentley, West Jordan; Steven J. Wenzbauer, Bountiful; Rodney Fredette, Salt Lake City, and Vicki S. Sennett, Sandy, all of Utah, assignors to Medicode, Inc., Salt Lake City, Utah

Filed Jun. 23, 1994, Ser. No. 264,795
Int. Cl.[6] G06F *159/00*
U.S. Cl. 364—401 **3 Claims**



1. A method for generating a medical provider profile using a general purpose computer system wherein said system comprising:
a central processing unit,
dynamic memory,
static memory,
a display device,
an input device,
an output device
a mass storage device which contains
a number of historical medical provider patient billing records identifiable as patient records,
a grouping of diagnosis codes,
a grouping of qualifying circumstance codes,
a grouping of staging indicators,
a grouping of preventive codes,
a grouping of complication codes,
said method comprising the steps of:
(a) selecting a diagnosis code,
(b) reading a plurality of patient records from the mass storage device into the dynamic memory, each of said patient records having said selected diagnosis code and all of said patient records read corresponding to a single patient,
(c) comparing each of said read patient records with each qualifying circumstance code in the grouping of qualifying circumstance codes,
(d) re-sorting each of said patient records having a qualifying circumstance,
(e) reading a staging indicator corresponding to said selected diagnosis code into dynamic memory, and thereby obtaining a clear window time period based on said staging indicator,
(f) creating a grouping of said selected diagnosis code with each code in the grouping of related diagnoses codes which correspond to said selected diagnosis code thereby creating a grouping of related codes,
(g) searching said plurality of read patient records for the record containing the earliest date on which said selected diagnosis code occurs and noting said date as a first occurrence date,
(h) for each read patient record corresponding to a code in said grouping of related codes, rejecting said read patient record if a comparison of each of said read patient records with said staging indicator and said first occurrence date shows that for any read patient record, the date of a read patient record predates said first occurrence date by a period of time that exceeds said clear window,
(i) for each read patient record corresponding to a code in said grouping of related codes, rejecting said read patient record if a comparison of each of said read patient record with said staging indicator and said first occurrence date shows that for any read patient record, the date of a read patient record postdates said first occurrence date by a period of time that exceeds said clear window time period,
(j) for each read patient record not rejected in steps (a) through (i) above, rejecting said record if said selected diagnosis code does not appear on at least two separate dates on said record,
(k) for each read patient record not rejected in steps (a) through (j) above, writing said record into a parameter table to create a profile for said selected diagnosis.

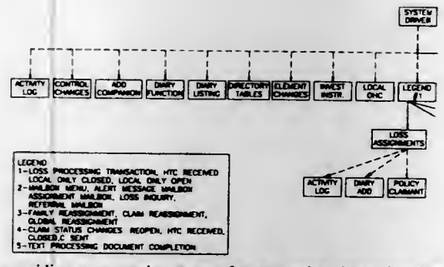
5,557,515

COMPUTERIZED SYSTEM AND METHOD FOR WORK MANAGEMENT

Pamela Abbruzzese, Newington, Conn.; Paul Bailey, Butler, Pa.; Denise L. Fritz, West Simsbury; John Lawler, Columbia, both of Conn.; Rick Manning, Palmer, Mass.; Russ Pollnow, Manchester, Conn.; Anthony Retartha, Burlington, Conn.; Mary J. Round, Windsor, Conn.; Marc Schardt, Bolton, Conn.; Barbara Synodinos, Pawcatuck, Conn., and Robert Tanner, Plainville, Conn., assignors to Hartford Fire Insurance Company, Inc., Hartford, Conn.

Continuation of Ser. No. 791,411, Nov. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 392,842, Aug. 11, 1989, Pat. No. 5,182,705. This application Mar. 17, 1995, Ser. No. 407,499
The portion of the term of this patent subsequent to Jan. 26, 2010, has been disclaimed.
Int. Cl.[6] G06F *17/60*
U.S. Cl. 364—401 R **27 Claims**

1. A computer implemented method of managing work through a system comprising the steps of:



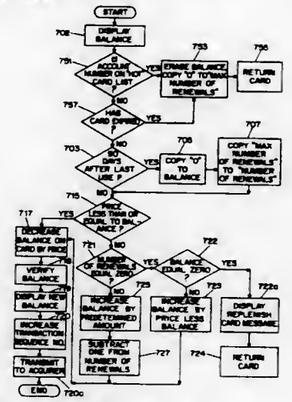
providing a processing means for processing data related to a work matter, including data stored in a storage means electronically interconnected therewith;
providing a plurality of intelligent terminals each having data storage and retrieval equipment, a display screen and at least one input device, wherein said intelligent terminals are electronically linked to and communicate with said processing means and are capable of accessing, displaying and storing data stored in said interconnected storage means;
providing at least one electronic scanner operably connected with a suitable instrumentality for operating on an output of said electronic scanner which instrumentality may include one of said intelligent terminals;
scanning a plurality of documents, with said electronic scanner, to create a plurality of electronic images, each said electronic image corresponding to a page of said plurality of documents;
inputting information through said intelligent terminal connected to said scanner to categorize said documents;
transmitting said electronic images to said processing means for storage on said data storage means;
creating, for each said document, a document summary file, including at least a portion of said characterization information and time, date and location information for said document and
writing said summary file information as at least one record to a database table located in said data storage means;
displaying a list, comprising at least a portion of said extracted information, corresponding to at least a portion of said records, at one of said intelligent terminals, as an indication of the presence of scanned documents;
selecting an image for display from said displayed list;
retrieving said image from its location on said main computer's data storage equipment;
displaying said retrieved image at one of said intelligent terminals;
linking said displayed image with a previously designated work matter;
automatically generating a comment describing said displayed image to an activity log stored in said storage means and linked to said work matter;
permanently associating said displayed image with said comment;
saving said comment, said image association and said work matter association on said main computer's data storage equipment;
providing a database table indicating a person associated with the processing of a work matter;
providing a staff member database table including a plurality of records each having information describing the attributes of a person associated with the processing of work matters;
comparing the person associated with the processing of a work matter with said plurality of records of said staff member database table; and
locating a record of said staff member database table corresponding to said person associated with said work matter.

5,557,516

SYSTEM AND METHOD FOR CONDUCTING CASHLESS TRANSACTIONS

Edward J. Hogan, Bayside, N.Y., assignor to MasterCard International, New York, N.Y.

Filed Feb. 4, 1994, Ser. No. 191,637
Int. Cl.[6] G06F *157/00*
U.S. Cl. 364—406 **54 Claims**



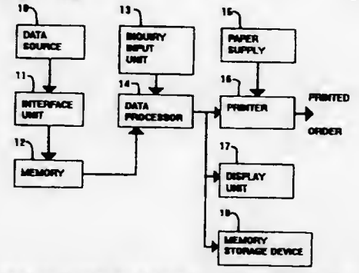
1. Financial card apparatus comprising:
first means for providing first data representing an available fund for cashless transactions;
second means for providing second data in said card apparatus representing a number of renewals, each of which represents an increase of a predetermined amount to said available fund; and
third means for providing third data identifying an account for billing, said account associated with said financial card apparatus;
whereby an increase in said available fund is accompanied by a change in said number of renewals, and whereby upon said change said account is billed for an amount which is a function of said predetermined amount and said change in said number of renewals.

5,557,517

SYSTEM AND METHOD FOR DETERMINING THE PRICE OF AN EXPIRATIONLESS AMERICAN OPTION AND ISSUING A BUY OR SELL TICKET ON THE CURRENT PRICE AND PORTFOLIO

Vergil L. Daughterty, III, 2963 Victoria Cir., Macon, Ga. 31204-1253

Filed Jul. 29, 1994, Ser. No. 282,717
Int. Cl.[6] G06F *157/00*
U.S. Cl. 364—408 **5 Claims**



1. A data processing apparatus for use in transacting an expirationless American option (eAo) order for a security, said data processing apparatus comprising:

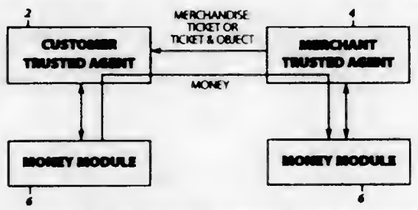
(a) a data source containing a set of data representative of a current market price for the security, an exercise price for the security and a margin requirement for the security;
(b) a memory storage operatively connected to said data source and adapted to store the set of data;
(c) an inquiry input unit for receiving a signal representative of a request to transact an eAo order for the security;
(d) means, responsive to the request signal and to the set of data, for generating data representative of a pure price for the eAo; and
(e) means for outputting the pure price data of the eAo for use in transacting the eAo order.

5,557,518

TRUSTED AGENTS FOR OPEN ELECTRONIC COMMERCE

Sholom S. Rosen, New York, N.Y., assignor to Citibank, N.A., New York, N.Y.

Filed Apr. 28, 1994, Ser. No. 234,461
Int. Cl.[6] G06F 17/60; G06G 7/52; G07D 7/00; G06K 19/02
U.S. Cl. 364—408 **49 Claims**



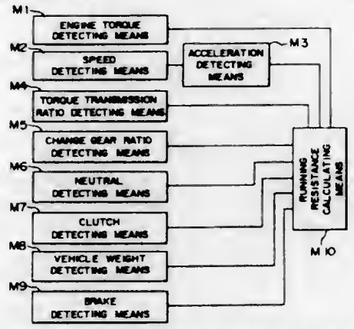
1. A system for open electronic commerce where both customers and merchants can securely transact comprising:
a customer trusted agent;
a first money module associated with said customer trusted agent, and capable of securely communicating with said customer trusted agent;
a merchant trusted agent capable of establishing a first cryptographically secure session with said customer trusted agent;
a second money module associated with said merchant trusted agent and capable of securely communicating with said merchant trusted agent, and capable of establishing a second cryptographically secure session with said first money module;
where said merchant trusted agent transfers electronic merchandise, via said first cryptographically secure session, to said customer trusted agent which provisionally retains said electronic merchandise;
where said customer trusted agent provides first payment information to said first money module and said merchant trusted agent provides second payment information to said second money module;
where said first money module transfers electronic money, in an amount consistent with said first and second payment information, to said second money module via said second cryptographically secure session;
where said first money module informs said customer trusted agent upon successful transfer of said electronic money, whereupon said retention of electronic merchandise is no longer provisional, and where said second money module informs said merchant trusted agent upon successful receipt of said electronic money.

5,557,519

APPARATUS FOR DETECTING THE RUNNING RESISTANCE OF A VEHICLE

Shigeki Morita, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 796,373, Nov. 22, 1991, abandoned. This application Jan. 19, 1995, Ser. No. 375,247
Claims priority, application Japan, Nov. 26, 1990, 2-324257
Int. Cl.[6] B60K 31/04
U.S. Cl. 364—424.01 **9 Claims**



1. A running resistance detecting apparatus for a vehicle having an engine, comprising:
torque detecting means for detecting an output torque of said engine and generating a corresponding output signal;
temperature sensor coupled to said engine;
correcting means for correcting the output torque of said engine based on the temperature of said engine as sensed by said temperature sensor;
acceleration calculating means for calculating an acceleration of said vehicle and generating a corresponding output signal;
vehicle weight detecting means for detecting an overall weight of said vehicle, the overall weight being representative of the weight of the vehicle and rotating weight of the vehicle, said vehicle weight detecting means comprising means for detecting and altering the rotating weight of the vehicle based on the gear ratio of said vehicle; and
running resistance calculating means for calculating a running resistance of said vehicle indicative of a running stage thereof on the basis of the engine torque detected by said torque detecting means and corrected by said correcting means, the vehicle acceleration calculated by said acceleration calculating means, and the overall weight of the vehicle as detected by said vehicle weight detecting means.

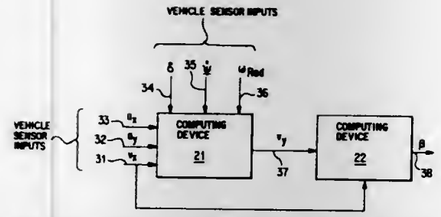
5,557,520

METHOD FOR DETERMINING VARIABLES CHARACTERIZING VEHICLE HANDLING

Avshalom Suissa, Leonberg; Zoltan Zomotor, Waiblingen, and Friedrich Boettiger, Stuttgart, all of Germany, assignors to Daimler-Benz AG, Stuttgart, Germany

Filed Jul. 29, 1994, Ser. No. 283,297
Claims priority, application Germany, Jul. 29, 1993, 43 25 413.6
Int. Cl.[6] G06F 19/00
U.S. Cl. 364—424.01 **10 Claims**

1. A method for determining variables which represent handling characteristics of a vehicle having wheels, said method comprising the steps of:
feeding signals from the vehicle to a computing device, said signals representing measured values of a vehicle longitudinal velocity (v_x), a vehicle longitudinal acceleration (a_x), a vehicle lateral acceleration (a_y), and a vehicle yaw velocity (Ψ);
using state equations of motion in the computing device to determine said variables characterizing vehicle handling;



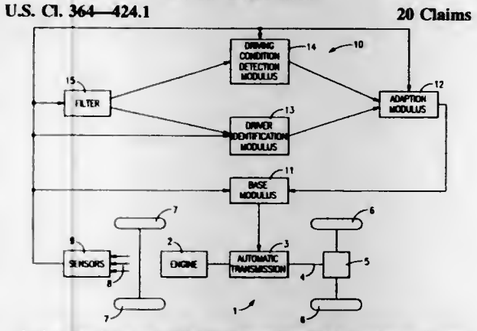
determining a side slip angle (β) in the computing device as one of said variables characterizing vehicle handling;
feeding at least further signals from the vehicle representing the measured variables of a steering angle (δ), and a wheel speed (ω) of individual ones of said wheels to the computing device;
using in the computing device at least one measurement equation based on a vehicle model;
using at least an inclination angle (Φ) of a roadway with respect to a plane as a state variable in said measurement equation; and
outputting signals from the computing device for said variables characterizing vehicle handling, including said side slip angle for the vehicle.

5,557,521

CONTROL SYSTEM FOR CHANGING AUTOMATIC GEARS

Wolfgang Danz, Friedrichshafen; Wolfgang Runge, Ravensburg; Gerhard Eschrich, Tettnang, and Udo Gillich, Meckenbeuren, all of Germany, assignors to ZF Friedrichshafen AG, Friedrichshafen, Germany

PCT No. PCT/EP93/01127, § 371 Date Oct. 24, 1994, § 102(e) Date Oct. 24, 1994, PCT Pub. No. WO93/23689, PCT Pub. Date Nov. 25, 1993
PCT Filed May 7, 1993, Ser. No. 325,329
Claims priority, application Germany, May 11, 1992, 42 15 406.5
Int. Cl.[6] B60K 41/06
U.S. Cl. 364—424.1 **20 Claims**



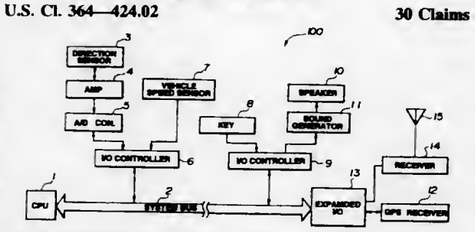
1. A control system (**10**) for determining gear changing points for use in changing gears in an automatic transmission (**3**), said system including detection means (**9**) for detecting input variables derived from a driver-vehicle system, processing means (**11–15**) containing fuzzy-production rules for processing said input variables and producing output variables, and gear change means (**3**) for determining gear changing points for changing gear ratios according to said output variables, wherein the improvement comprises:
said processing means contains the following sets of fuzzy-production rules:
a) a set of basic rules for determining gear-changing points that define a consumption-oriented driving style, in accordance with current input variables detected by said detection means;
b) a set of identification rules for identifying a current driving style of a current driver, ranging from a consumption-oriented to a performance-oriented driving style, in accordance with current input variables detected by said detection means (**9**); and
c) a set of adaption rules for producing a set of modified rules, derived from the basic set of rules, for determining gear-changing points that define a driving style ranging from a consumption-oriented driving style to a performance-oriented driving style, in accordance with the identified current driving style.

5,557,522

APPARATUS AND METHOD FOR GUIDING VEHICLE OCCUPANT TO TRAVEL FROM PRESENT POSITION OF VEHICLE TO SET DESTINATION THROUGH DISPLAY UNIT

Okihiko Nakayama, Yokohama, Japan; Brian R. Grom, Lancaster, N.Y.; Masayasu Iwasaki, Sagamihara, and Hiroshi Tsuda, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 9, 1994, Ser. No. 302,028
Claims priority, application Japan, Sep. 10, 1993, 5-225947; Sep. 10, 1993, 5-225948; Feb. 10, 1994, 6-016371
Int. Cl.[6] G05D 1/00
U.S. Cl. 364—424.02 **30 Claims**



1. An apparatus for guiding a vehicle occupant toward a destination at which the vehicle occupant desires to arrive through a display unit, comprising:
a) road map storing means for storing a road map therein;
b) setting means through which the vehicle occupant sets the destination;
c) first detecting means for detecting a present position of the vehicle and outputting a signal indicative of the present position of the vehicle;
d) display control means for reading the road map from said road map storing means, displaying the road map on the display unit, and simultaneously displaying the detected present position of the vehicle and an optimum route of travel of the vehicle to the set destination from the present position of the vehicle;
e) second detecting means for detecting whether a vehicular ignition key switch is placed at an OFF position or at an ON position to determine whether or not the vehicle is stopped;
f) first route searching means for previously searching the optimum routes of the vehicle to respective intersections from the detected present position of the vehicle when said second detecting means detects that the vehicular ignition key switch is placed at the OFF position with the vehicle stopped before the display control means is effective, said respective intersections falling in a region other than the destination set by the occupant through the setting means and surrounding the detected present position of the vehicle; and
g) second route searching means operating for immediately displaying one of the optimum routes from the present position of the vehicle to the set destination if the set destination set through the setting means corresponds to one of the respective intersections falling in the region and whose optimum route is searched by the first route searching means when the ignition key switch is placed at the ON position and the vehicle occupant sets the destination through the setting

means and otherwise operating for retrieving the result of

a digital-to-analog conversion circuit coupled to the control

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WHEEL ALIGNMENT CONTROL METHOD FOR A

means and otherwise operating for retrieving the result of search by the first route search means and the read road map data so as to derive the optimum route from the set destination toward the present position of the vehicle via one of the optimum routes searched by the first route searching means when the ignition key switch is placed at the ON position when the destination is set, and for immediately displaying the derived optimum route from the set destination through the setting means toward the present position of the vehicle via the searched optimum route by said first route searching means through one of the respective intersections in the region on the display unit through the display control means.

5,557,523

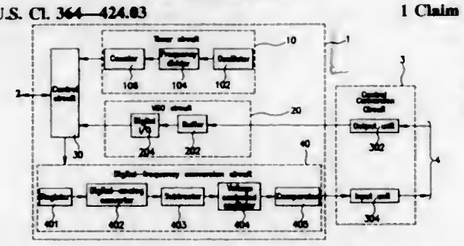
REAL-TIME SIMULATION FOR TESTING AN ABS CONTROLLER

Edge C. Yeh, Hsinchu; J. H. Ton, and G. K. Roan, both of Tao-Yuan, all of Taiwan, assignors to National Science Council, Taiwan

Filed Mar. 21, 1994, Ser. No. 216,934

Int. Cl.[6] G01L *5/28*

U.S. Cl. 364—424.03 **1 Claim**



1. A real-time simulation system for testing an ABS controller, which receives simulated car dynamic data from a computer and transmits the simulated car dynamic data to the ABS controller through a controller conversion circuit, and in return receives control signals from the ABS controller and feeds the control signals back to the computer through the controller conversion circuit, for calculating, analyzing and displaying simulated test results of the ABS controller on a monitor of the computer, comprising:

a timer circuit for outputting time pulses;

a valve signal output circuit coupled to the controller conversion circuit, for outputting control signals coming from the ABS controller;

a control circuit coupled respectively to the computer, the timer circuit, and the valve signal output circuit, for receiving simulated car dynamic data from the computer, transmitting the simulated car dynamic data to the ABS controller, receiving the time pulses coming from the timer circuit and the control signals coming from the ABS controller, and transmitting the time pulses and the control signals to the computer for calculating and analyzing a simulated friction force and slip between a wheel and a road surface based on the time pulses and the control signals and displaying the simulated test results based on the analysis of said simulated friction force and slip on the monitor of the computer; and

a digital-to-analog conversion circuit coupled to the control circuit and the controller conversion circuit, for converting the simulated car dynamic data coming from the control circuit and sending the converted data to the ABS controller.

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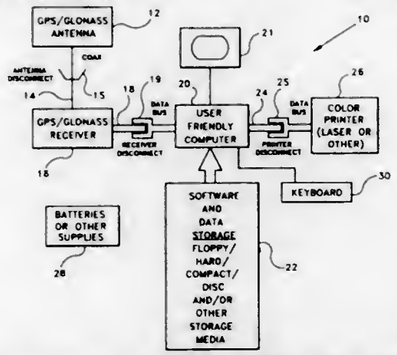
GPS/GLONASS TRAVEL RECORDER

Stanley C. Maki, 4966 "A" Waring Rd., San Diego, Calif. 92120

Continuation-in-part of Ser. No. 780,702, Oct. 18, 1991, abandoned. This application Sep. 30, 1993, Ser. No. 130,013

Int. Cl.[6] G06F *17/40; 157/00*

U.S. Cl. 364—424.04 **14 Claims**



1. Carrier mounted apparatus for providing a precise real time trip record for a carrier by generating and displaying the trip record based on GPS/GLONASS receiver provided periodic precise position, velocity, and time data which comprises:

GPS/GLONASS signal receiving antenna system means;

a GPS/GLONASS signal processing receiver coupled to the antenna system means, for providing signals representative of the carrier's precise latitude and longitude position, precise height above mean sea level, precise time, precise north, east and vertical velocity components;

data storage media:

computer means having a display and coupled to said data storage media and to the receiver for processing the GPS/GLONASS position and velocity representative signals in real time in accordance with algorithm process instructions stored in the data storage media to provide real time travel route plots for viewing on the computer display;

the data storage media also for storing previously obtained signals representative of approximate or precisely known latitude and longitude described local map features of interest to a user in a latitude-longitude associative memory for real-time retrieval and display;

the data storage media also storing symbology generating instructions, and a vector processing program;

the data storage media also for storing spread sheet instructions, to compute accumulated trip mileage and accumulated trip business tax deduction;

the data storage media also providing for real time storage of GPS/GLONASS carrier position and velocity representative signals, and data resulting from processing by said algorithm process instructions, for later retrieval and display, and

printer means coupled to the computer means for providing, upon request, a hard copy of the travel route plots, the accumulated trip mileage and accumulated trip business tax deduction spread sheet from said spread sheet program instructions.

5,557,525

WHEEL ALIGNMENT CONTROL METHOD FOR A MOTOR VEHICLE AND A CONTROL APPARATUS THEREOF

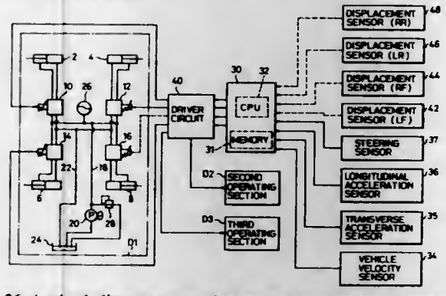
Yoshiki Miichi; Tadao Tanaka, and Mitsuhiko Harara, all of Okazaki, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 134,896, Oct. 13, 1993, abandoned. This application Sep. 27, 1995, Ser. No. 535,319

Claims priority, application Japan, Oct. 13, 1992, 4-274234; Oct. 13, 1992, 4-274235; Oct. 13, 1992, 4-274236

Int. Cl.[6] B60G *17/00*

U.S. Cl. 364—424.05 **28 Claims**



26. A wheel alignment control apparatus for a vehicle, comprising:

actuators respectively provided in suspensions of the vehicle for changing a well alignment of the vehicle;

drive means for driving said actuators;

sensor means for detecting values of a plurality of parameters indicative of a behavior of the vehicle; and

a controller for setting target values of wheel alignment control variables, and for supplying a control signal to said drive means such that the wheel alignment is in conformity with the target values;

wherein said controller estimates a road/traffic condition in which the vehicle runs on the basis of an interrelationship among the detected values of the plurality of parameters, retrieves a first control output in accordance with at least one control rule corresponding to the estimated road/traffic condition, and determines the target values of the wheel alignment control variables respectively associated with a camber angle, caster angle, and toe angle of wheels of the vehicle on the basis of the retrieved first control output.

5,557,526

LOAD MONITORING SYSTEM FOR BOOMS

Thomas M. Anderson, Hugo, Minn., assignor to Schwing America, Inc., White Bear, Minn.

Continuation-in-part of Ser. No. 122,641, Sep. 16, 1993, Pat. No. 5,359,516. This application Sep. 22, 1994, Ser. No. 310,848

Int. Cl.[6] G06F *07/70*

U.S. Cl. 364—424.07 **25 Claims**

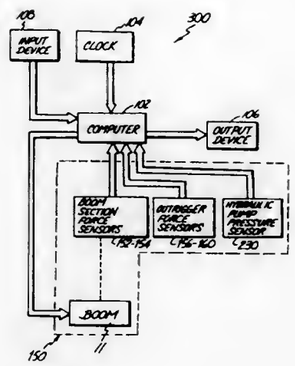
1. A method of monitoring operation of a boom system comprising:

sensing a first parameter indicative of a load on a first boom system component, the load on the first boom system component being a function of one or more forces acting on the boom system component;

determining, from the sensed first parameter, when the load on the first boom system component exceeds a predetermined value;

storing information indicative of an occurrence of a load on the first boom system component which exceeded the predetermined value; and

determining whether a boom warranty is in effect based upon the stored information.



5,557,527

KNIT DESIGN SYSTEM AND A METHOD FOR DESIGNING KNIT FABRICS

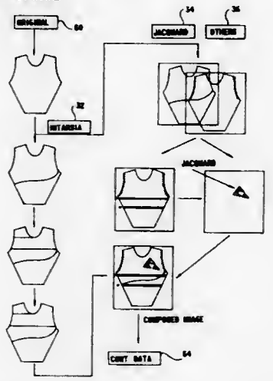
Kenji Kotaki, Kishiwada; Hidekazu Kitada, Naga-gun, and Kiyoshi Minami, Wakayama, all of Japan, assignors to Shima Seiki Manufacturing Ltd., Wakayama, Japan

Filed Aug. 25, 1994, Ser. No. 295,555

Claims priority, application Japan, Aug. 31, 1993, 5-240712; Aug. 31, 1993, 5-240713; Aug. 31, 1993, 5-240714; Aug. 31, 1993, 5-240715

Int. Cl.[6] G09F *19/00;* **D04B** *9/46*

U.S. Cl. 364—470.02 **17 Claims**



1. A knit design system, comprising:

at least a frame memory for storing at least two separate images representing knitting data, said knitting data specifying stitch types of loops of a knit fabric, wherein the at least two separate images form a knit design;

a monitor for independently displaying each separate image of said at least two separate images; and

an external input means for independently modifying said each separate image and for inputting said each separate image into said frame memory.

5,557,528

TASK PRIORITIZATION FOR A TAPE STORAGE

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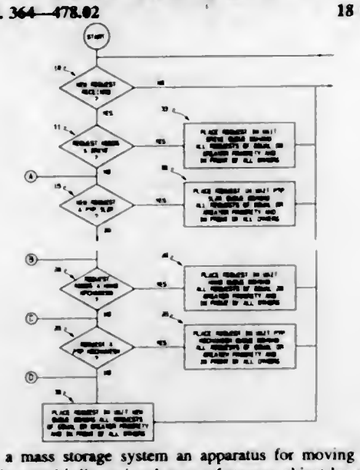
TASK PRIORITIZATION FOR A TAPE STORAGE SYSTEM

Frederick Munro, Broomfield; Aaron Dailey; Scott Allen, both of Boulder, and David Trachy, Louisville, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Nov. 23, 1993, Ser. No. 156,598
Int. Cl.[6] G06F *17/00*; B65G *1/00*
U.S. Cl. 364—478.02 **18 Claims**



1. In a mass storage system an apparatus for moving storage objects in a multi-dimensional array of storage object locations in response to a plurality of requests requiring at least a first and second resource to transfer storage objects between locations, comprising:

first and second resources to transfer a storage object between locations;

means for assigning a priority to the requests;

means operable when the first resource becomes available for allocating the first resource to the highest priority request requiring the first resource;

means operable when the second resource becomes available for allocating the second resource to the highest priority request requiring the second resource; and

means for executing the transfer after the first and second resources have been allocated to the request requiring the allocated first and second resources.

5,557,529
IN-DISPENSER-CARD-READER CONTROL SYSTEM

Walter E. Warn, Knightdale, and Fred K. Carr, Chapel Hill, both of N.C., assignors to Progressive International Electronic, Raleigh, N.C.

Filed Jan. 5, 1995, Ser. No. 368,904
Int. Cl.[6] G06F *17/00*; G06K *5/00*
U.S. Cl. 364—479.02 **4 Claims**

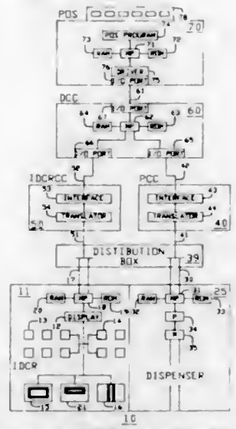
1. A fuel delivery system, comprising:

(a) a fuel dispensing means having a pump means for delivering a variable volumetric flow of fuel into a vehicle tank and an in-dispenser-card-reader means for accepting payment for the fuel dispensed;

(b) a register means, functionally connected to said fuel dispensing means, for initiating commands to said fuel dispensing means and for receiving responses from said fuel dispensing means;

(c) a fuel dispenser control means having a programmable data processor with a read-only-memory device and a read-and-write-memory device, operatively connected between said fuel dispensing means and said register means, for:

(1) reading an input selection key in said in-dispenser-card-reader in said fuel dispensing means for determining when



a customer wants service and how said customer wants to pay for fuel dispensed;

(2) retrieving commands from said read-only-memory device in a predetermined sequence and outputting said commands in a readable format to said pump means in said dispensing means causing fuel to be dispensed;

(3) receiving response data from said pump means and said in-dispenser-card-reader means in said fuel dispensing means during the fueling process and storing said response data in said read-and-write-memory device;

(4) retrieving said response data from said read-and-write memory device and down-loading to said register means on request;

(d) a first configuration means electrically connected between said fuel dispenser control means and said pump means in said fuel dispensing means for configuring said commands and responses into a communication protocol readable by said pump means and a second configuration means connected between said dispenser control means and said in-dispenser-card-reader means in said dispenser means for configuring said commands and responses into a communication protocol readable by said in-dispenser-card-reader means.

5,557,530
SYSTEM FOR SYNTHESIZING MICROWAVE FILTERS IN A RECTANGULAR WAVEGUIDE

Marco Guglielmi, Wassenaar, Netherlands, assignor to Agence Spatiale Europeene, Paris, France

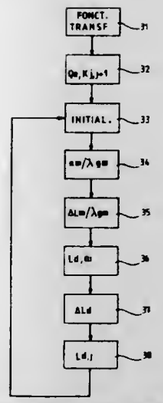
Filed Apr. 20, 1993, Ser. No. 49,930
Claims priority, application France, Apr. 29, 1992, 9205271
Int. Cl.[6] G06F *17/50*
U.S. Cl. 364—488 **12 Claims**

1. A system for synthesizing a microwave filter having a rectangular waveguide with a plurality of tuned resonators coupled by coupling elements having a finite thickness, said coupling elements defining internal cross-sectional restrictions in said waveguide, said system comprising:

memory means for storing signals representing coupling coefficients (Q_e, $k_{j,j+1}$) and a design resonant frequency (f_m) for the resonators, wherein said coupling coefficients are a function of the coupling element geometry;

means responsive to signals indicative of a predetermined thickness for said coupling elements and an initial length (L_m) for said resonators, for controlling a computation unit to determine a variation in a relative width (a_m/λ_{gm}) for the coupling elements as a function of the coupling coefficients and the design resonant frequency stored in said memory means;

means for writing values for the relative width determined by said controlling means into said memory means;



means responsive to said coupling coefficients stored in said memory means for controlling the computation unit to determine a variation in an apparent resonator length (ΔL_m) as a function of said coupling coefficients;

means for determining and displaying a design width for each of a pair of coupling elements operatively associated with each resonator; and

means for determining and displaying a design length (L_d) for each resonator, said design length accounting for the respective contributions of said pair of coupling elements associated with the resonator;

wherein said system tunes said resonators by successively determining design widths for each of said coupling elements and design lengths for each of said resonators until all coupling element design widths and resonator design lengths have been determined.

5,557,531
METHOD AND SYSTEM FOR CREATING AND VALIDATING LOW LEVEL STRUCTURAL DESCRIPTION OF ELECTRONIC DESIGN FROM HIGHER LEVEL, BEHAVIOR-ORIENTED DESCRIPTION, INCLUDING ESTIMATING POWER DISSIPATION OF PHYSICAL IMPLEMENTATION

Michael D. Rostoker, San Jose; Carlos Dangelo, Los Gatos, and Vijay Nagasamy, Union City, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation-in-part of Ser. No. 77,294, Jun. 14, 1993, which is a continuation-in-part of Ser. No. 917,801, Jul. 20, 1992, Pat. No. 5,220,512, and Ser. No. 54,053, Apr. 26, 1993, abandoned, which is a continuation of Ser. No. 507,201, Apr. 6, 1990, Pat. No. 5,222,030, said Ser. No. 917,801is a continuation of Ser. No. 512,129, Apr. 19, 1990, abandoned. This application Jun. 14, 1993, Ser. No. 76,738
Int. Cl.[6] G06F *17/50*
U.S. Cl. 364—489 **35 Claims**

1. A method of estimating circuit area from a system-level description of an electronic design, comprising:

estimating a logic area requirement for the electronic design;

estimation a signal routing area requirement for the electronic design;

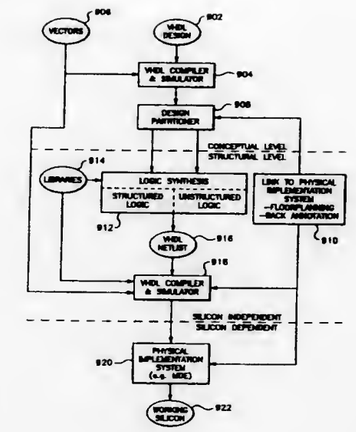
estimating an I/O pin and buffer area requirement for the electronic design;

combining the logic area requirement, the signal routing area requirement, and the I/O pin and buffer area requirement to produce a total area requirement for the electronic design.

5,557,532
PARAMETERIZED GENERIC COMPILER

Henry K. Jun, San Jose; Chun L. Liu, Milpitas; Lin Yang, Fremont, all of Calif., and Kazuyoshi Moriya, Tokyo, Japan, assignors to VLSI Technology, Inc., Calif.

Filed Nov. 12, 1992, Ser. No. 975,014
Int. Cl.[6] G06F *17/50*
U.S. Cl. 364—491 **20 Claims**



1. A method for automatically producing a circuit layout using a compiler which performs the steps of:

receiving established compiler input parameters;

creating a data path netlist with said compiler based on said established input parameters, said step of creating further including the steps of:

(a) recognizing a data format of data path inputs;

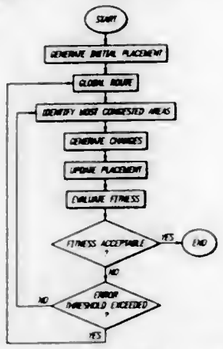
(b) selecting components from a data path library to correlate the data formats of the data path inputs to the data path;

(c) selecting data path components from the data path library for functional processing of said data path inputs based on said established input parameters; and

(d) selecting control path components based on said selected data path components to control the data path components.

ing the average energy of signals in each of several frequency

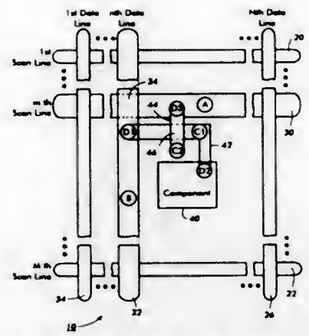
5,557,533
CELL PLACEMENT ALTERATION APPARATUS FOR INTEGRATED CIRCUIT CHIP PHYSICAL DESIGN AUTOMATION SYSTEM
James S. Koford, San Jose; Ranko Scepanovic, Cupertino; Edwin R. Jones, Sunnyvale; Douglas B. Boyle, Palo Alto, and Michael D. Rostoker, Boulder Creek, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.
Filed Apr. 19, 1994, Ser. No. 229,821
Int. Cl.[6] G06F *17/50;15/18*
U.S. Cl. 364—491 **37 Claims**



20. A permutation transposition method, comprising the steps of:
(a) providing a first entity permutation including entity locations, entities allocated to said entity locations and fitnesses of said entities respectively;
(b) selecting entities for transposition such that a probability of each entity being selected is a predetermined function of said fitness of said each entity respectively; and
(c) performing a predetermined entity transposition operation on said first entity placement to produce a second entity placement, in which:
step (b) comprises the substeps of:
(d) sorting and ranking said entities in increasing order of fitness; and
(e) multiplying said fitnesses by weighting factors that increase non-linearly with cell rank to produce weighted fitnesses respectively;
said predetermined function of said fitness is such that said probability of said each entity being selected is substantially linearly proportional to said weighted fitness of said each entity respectively; and
step (b) further comprises the substeps of:
(f) computing a weighted fitness summation for said each entity as being substantially equal to the sum of said weighted fitness of said each entity and said weighted fitnesses of said entities having lower fitnesses than said each entity respectively;
(g) generating a random number having a maximum value that is substantially equal to a maximum weighted fitness summation for said first entity placement; and
(h) selecting a entity for transposition which has a weighted fitness summation that is substantially equal to said random number.

5,557,534
FORMING ARRAY WITH METAL SCAN LINES TO CONTROL SEMICONDUCTOR GATE LINES
I-Wei Wu, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Jan. 3, 1995, Ser. No. 367,983
Int. Cl.[6] H01L *21/72*
U.S. Cl. 364—491 **22 Claims**

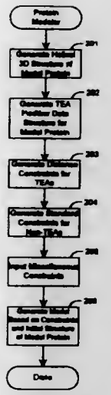
1. A method of forming array circuitry at a surface of a substrate; the method comprising:



forming a first patterned conductive layer that includes M scan lines, where M is greater than 1; each of the scan lines extending approximately in a first direction across the surface of the substrate; the M scan lines being positioned in order from first through Mth; each of the scan lines including metal;
forming a second patterned conductive layer that includes N data lines, where N is greater than 1; each of the data lines extending approximately in a second direction across the surface of the substrate; the second direction being different than the first direction; the N data lines being positioned in order from first through Nth; the array circuitry including, for each value of m from 1 through M and for each value of n from 1 through N, a crossing region in which the mth scan line and the nth data line cross; and
forming cell circuitry for each of a set of at least one of the crossing regions; the cell circuitry of each crossing region in the set being connected to the mth scan line and the nth data line; the cell circuitry of each crossing region in the set including a component having a data lead for receiving signals from or providing signals to the nth data line; the act of forming cell circuitry comprising:
forming a first patterned semiconductor layer; the first patterned semiconductor layer including, for each crossing region in the set, a first line extending between a first connecting point for connecting to the nth data line and a second connecting point for connecting to the data lead; the first line including a channel between the first and second connecting points; and
forming a second patterned semiconductor layer; the second patterned semiconductor layer including, for each crossing region in the set, a second line that extends from a third connecting point for connecting to the mth scan line; the second line crossing the first line at the channel; the second line being conductive;
the acts of forming the first patterned conductive layer, the second patterned conductive layer, and the cell circuitry comprising:
forming electrical connections at the first, second, and third connecting points so that signals on the mth scan line control conductivity of the first line between the nth data line and the data lead.

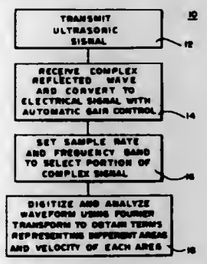
5,557,535
METHOD AND SYSTEM FOR PROTEIN MODELING
Subhashini Srinivasan, Kirkland, and Padmanaban Sudarsanam, Kent, both of Wash., assignors to Immunex Corporation, Seattle, Wash.
Continuation-in-part of Ser. No. 55,050, Apr. 28, 1993, Pat. No. 5,453,397. This application Apr. 28, 1994, Ser. No. 234,812
Int. Cl.[6] G01N *37/00*
U.S. Cl. 364—496 **19 Claims**

1. A method in a computer system for modeling a three-dimensional structure of a variable region of a model protein, the



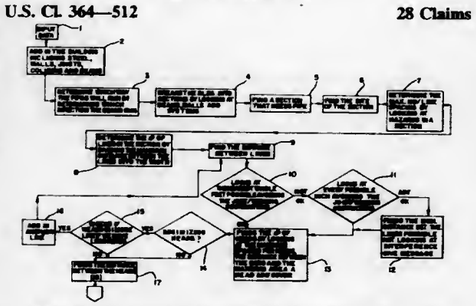
model protein having amino acids, the amino acids having positions within a three-dimensional structure, the method comprising the steps of:
receiving relative positional information between pairs of amino acids;
establishing a position for a first amino acid of the variable region; and
for each amino acid pair in the variable region, generating a model position for the amino acids based on the received relative positional information for the pair of amino acids.

5,557,536
DIRECT MEASUREMENT ULTRASONIC VELOCITY MEASURING SYSTEM
Frederick A. Nabity; Larry L. Fritz, and Douglas T. Carson, all of Lincoln, Nebr., assignors to Isco, Inc., Lincoln, Nebr.
Division of Ser. No. 860,325, Mar. 30, 1992, Pat. No. 5,371,686. This application Nov. 30, 1994, Ser. No. 347,282
Int. Cl.[6] G01F *23/28*
U.S. Cl. 364—510 **10 Claims**



1. A method of determining the approximate average velocity of a fluid stream comprising the steps of:
transmitting an ultrasonic signal into the fluid stream;
receiving reflected ultrasonic signals from at least a representative proportion of cross section of the flow stream;
converting the received reflected ultrasonic signals to electrical signals representing reflection from said at least a representative proportion of the flow stream; and
utilizing substantially all of the electrical signals representing reflection from said at least a representative proportion of the flow stream to calculate an approximate average velocity of the flow stream;
the step of utilizing substantially all of the electrical signals representing reflection from at least a representative proportion of the flow stream to calculate an approximate average velocity of the fluid stream including the substep of determining the average energy of signals in each of several frequency ranges corresponding to different velocity ranges of the flow stream.

5,557,537
METHOD AND APPARATUS FOR DESIGNING AND EDITING A DISTRIBUTION SYSTEM FOR A BUILDING
Linda M. Normann, 664 Leslie La., Glendale Heights, Ill. 60139; Charles, III L. Hines, 345 E. Hickory, Hinsdale, Ill. 60521, and Gene M. Cox, 3954 W. Woodlake Dr., Columbus, Ind. 47201
Continuation of Ser. No. 261,760, Jun. 17, 1994, abandoned, which is a continuation of Ser. No. 876,003, Apr. 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 551,919, Jul. 12, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 466,361
Int. Cl.[6] G06F *17/50*
U.S. Cl. 364—512 **28 Claims**



1. A method for designing a distribution system having delivery components and producing a layout of the system for a building or a portion of a building, the method comprising in combination the steps of:
(a) storing, in digital form in first memory means, generic dimensional and operation requirements of distribution system elements including the delivery components from which the distribution system can be constructed;
(b) storing, in digital form in second memory means, requirements of at least one building standard relating to the operation of the delivery components from which the distribution system can be evaluated;
(c) entering input data into a computer operatively connected to the first and second memory means, the input data including the location and dimensions of building elements and adjuncts;
(d) identifying the requirements of at least one building standard in the second memory means to be used;
(e) electronically designing a layout automatically for the distribution system using the generic dimensional and operation requirements of distribution system elements stored in the first memory means, during which the operation of the delivery components being evaluated and the layout being designed to comply with the requirements of the at least one building standard;
(f) editing one of the building elements, adjuncts and the layout;
(g) electronically checking the edited one of the building elements, adjuncts and the layout for compliance with the requirements of the at least one building standard; and
(h) redesigning the layout to include the edited one of the building elements, adjuncts and the layout if in compliance with the requirements of the at least one building standard.

170-920 O.G.-96-23: QL3

5,557,538
MPEG DECODER

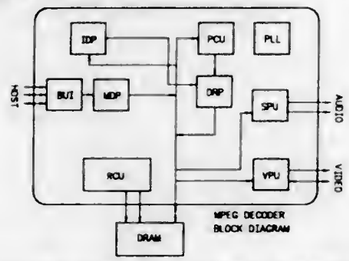
means for adding first time information, indicating a time at which said coded data from said coding means is produced, to

5,557,542
IMAGE STORAGE APPARATUS

5,557,538
MPEG DECODER

Refael Retter, Haifa; Moshe Bublil, Netanya; Gad Shavit, Givat Elia; Aharon Gill, Haifa; Ricardo Jaliff, Nesher; Ram Ofir, Zichron Yaacov; Alon Boner, Hofit; Oded Ilan, Haifa, and Eliezer Haasut, Kiryat Bialik, all of Israel, assignors to Zoran Microelectronics Ltd., Haifa, Israel

Filed May 18, 1994, Ser. No. 245,469
Int. Cl.[6] H04N *11/02;7/12;11/04*
U.S. Cl. 364—514 A **3 Claims**



1. A decoder for multimedia encoded data of multiframe motion pictures comprising

an external memory for storing and transferring data in a repetitive pattern,

a bus interface unit for interfacing with a host system,

a de-multiplexing data processor interconnected with said bus/interface unit for demultiplexing video and audio coded data from said host system and processing said data for transfer to other units of the decoder,

an image data processor interconnected with said de-multiplexing data processor for video signal decoding,

an inverse transform and reconstruction processor interconnected with said image data processor for executing de-scaling, de-quantization, and inverse transformation of decoded video signals,

a prediction calculation unit interconnected with said external memory for calculating prediction blocks from two reference pictures data stored in said external memory and generating a prediction block by interpolation of reference picture data blocks,

a video post-processing unit interconnected with said inverse transform and reconstruction processor and said external memory for generating video display data, and

a serial port unit interconnected with said processors and said external memory for serial output of audio data.

5,557,539
APPARATUS AND METHOD FOR TESTING AN INTERACTIVE VOICE MESSAGING SYSTEM

Todd M. Fitch, Sunnyvale, Calif., assignor to Centigram Communications Corporation, San Jose, Calif.

Filed Jun. 13, 1994, Ser. No. 258,395
Int. Cl.[6] G06F *17/00*
U.S. Cl. 364—514 B **19 Claims**

1. A test case control system for controlling testing of a system under test (SUT), said test case control system comprising:

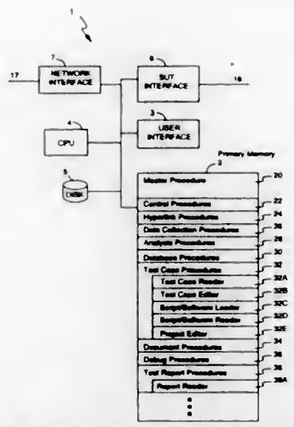
a memory for storing a plurality of procedures;

a plurality of files stored in said memory;

a plurality of test cases stored in said memory, each test case having hyperlinks to a plurality of said procedures as well as to a plurality of said files;

said files including a plurality of human readable documents with text concerning ones of said procedures, test cases and/or SUT:

at least one of said test cases including text concerning a sequence of said procedures and hyperlinks to respective ones of said procedures positioned adjacent to corresponding portions of said text in said one test case, said at least one of said



test cases further including text indicating availability of additional information concerning specified topics and hyperlinks to respective ones of said files positioned adjacent corresponding portions of said text:

a communication path for communicating with said SUT;

a display;

a master procedure for displaying on said display any selected one of said test cases and for displaying user selectable options corresponding to said hyperlinks in said selected test case;

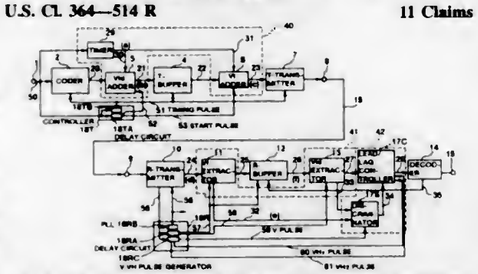
said master procedure enabling hyperlinked launching of each procedure corresponding to user selected options and hyperlinked loading of each file corresponding to user selected options, said master procedure further enabling user modification of selected ones of said stored files and storage of modified files in said memory; and

a processor configured to execute said plurality of procedures and to generate a plurality of signals, said processor including a transmitter that transmits said plurality of signals to said SUT via said communication path, and said processor including a receiver that receives a plurality of signals from said SUT via said communication path.

5,557,540
CODING AND TRANSMITTING SYSTEM

Atsushi Miyashita, Tokorozawa, Japan, assignor to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1994, Ser. No. 251,302
Claims priority, application Japan, May 31, 1993, 5-127673
Int. Cl.[6] G06F *17/00*
U.S. Cl. 364—514 R **11 Claims**



1. A coding and transmitting system comprising a transmitted section and a receiver section connected with said transmitter section through a transmission path, wherein said transmitter section includes:

means for coding an image signal into coded data,

means for adding first time information, indicating a time at which said coded data from said coding means is produced, to said coded data, said adding means being coupled to said coding means,

means for transmitting said coded data to said transmission path, and

means for adding a second time information, indicating a time at which said coded data is transmitted to said transmission path, to said coded data; and

wherein said receiver section includes:

means for detecting said first and second time information included in said coded data transmitted from said transmission path,

means for detecting whether or not a total delay time of said coded data between said transmitter and receiver sections is within a predetermined delay time based on said detected first and second time information,

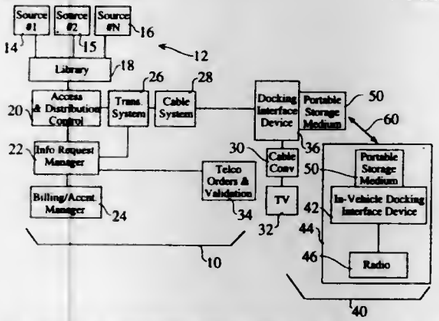
means for controlling a phase of said coded data transmitted on said transmission path in response to a result of the detection by said detecting means of said total delay time, and

means or decoding said coded data from said controlling means to an original image data.

5,557,541
APPARATUS FOR DISTRIBUTING SUBSCRIPTION AND ON-DEMAND AUDIO PROGRAMMING

Nathan Schulhof, Los Gatos, and James M. Janky, Los Altos, both of Calif., assignors to Information Highway Media Corporation, Cupertino, Calif.

Filed Jul. 21, 1994, Ser. No. 279,244
Int. Cl.[6] G11B *20/10*
U.S. Cl. 364—514 R **6 Claims**



1. A system for distributing subscription and on-demand audio programming, comprising:

a high-capacity data storage medium;

a base control interface for identifying and accepting program material;

a mobile control interface for displaying the identity of recorded material for playback selection;

a recording mechanism for accepting very high speed digital data from an external source, at rates faster than real time;

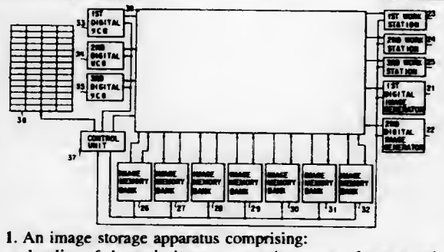
a playback mechanism for retrieving stored data from said storage medium and for converting said data into audio signals for playback and;

means for detecting program material resolution and for reproducing said program material in accordance therewith.

5,557,542
IMAGE STORAGE APPARATUS

Hiroshi Asahina, Tochigi-ken; Kunio Aoki, Yaita; Toyomitsu Kanebako, and Yoshinori Nakatani, both of Tochigi-ken, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 11, 1994, Ser. No. 289,136
Claims priority, application Japan, Aug. 13, 1993, 5-201552; Sep. 2, 1993, 5-218493; Sep. 2, 1993, 5-218502; Sep. 7, 1993, 5-221605
Int. Cl.[6] G06F *17/00*
U.S. Cl. 364—514 R **30 Claims**



1. An image storage apparatus comprising:

a plurality of dynamic image generating means for generating dynamic image data;

a plurality of work stations for displaying dynamic image data as dynamic images;

a plurality of temporary storage means for temporarily storing dynamic image data;

a plurality of video tape recorders each for recording dynamic image data on a video tape and reproducing dynamic image data therefrom;

a matrix switcher, intervening among said plurality of dynamic image generating means, said work stations, said plurality of temporary storage means and said video tape recorders, for switching connections thereamong; and

control means for controlling said matrix switcher in such a manner that one of said plurality of temporary storage means and one of said video tape recorders are assigned to any dynamic image generating means which has generated said dynamic image data and said assigned video tape recorder is connected via said assigned temporary storage means to said dynamic image generating means which has generated dynamic image data, and one of said plurality of temporary storage means and one of said video tape recorders are assigned to any work station which has made a playback request, said assigned video tape recorder is connected via said assigned temporary storage means to said work station which has made said playback request.

5,557,543
TRACKING APPARATUS

Timothy J. Parsons, Bristol, Great Britain, assignor to British Aerospace Public Limited Company, Farnborough, England

Filed Apr. 15, 1994, Ser. No. 228,396
Claims priority, application United Kingdom, Apr. 29, 1993, 9308927
Int. Cl.[6] G06F *17/00*
U.S. Cl. 364—516 **7 Claims**

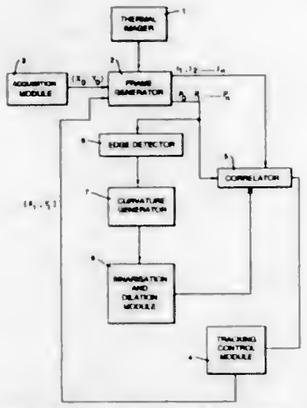
1. Target tracking apparatus including: input means, for receiving from an imager, a first set of data which comprises an image representing a viewed scene containing a target to be tracked, and for generating a second set of data which comprises a reference patch defining an area within said viewed scene containing the target;

template generating means for receiving said second set of data and for generating a third set of data which comprises a binary template representing the target;

and correlator means for receiving said first, second and third sets of data and for performing a multiplicative correlation process on said first, second and third sets of data and for

interface means connected between the read/write means and the central computer for transferring the encoded data to and from

creating a graphical display including plural axes, each axis manifesting a scale which is associated with a parameter



generating a fix point representing the position of the target within said viewed scene.

5,557,544

SPECTROMETER WITH DYNAMICALLY CODED COMPONENTS

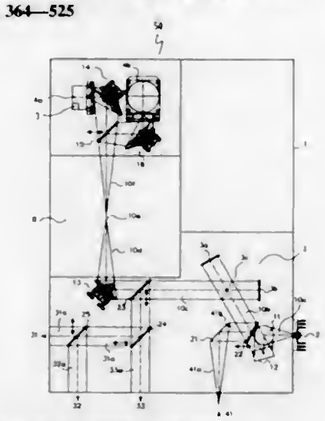
Arno Simon, Karlsruhe; Norbert Rapp, Bühl, both of Germany, and Jean-Michel Weil, Scheibenhard, France, assignors to Bruker Analytische MeBtechnic GmbH, Germany

Filed Dec. 9, 1993, Ser. No. 164,390

Claims priority, application Germany, Dec. 11, 1992, 42 41 905.0

Int. Cl.[6] **H01J** *5/02*; **G02B** *27/00*

U.S. Cl. 364—525 **15 Claims**



15. An FTIR spectrometer comprising:

an interchangeable optical component;

readable data medium means integral with the interchangeable optical component and adapted for storing encoded data concerning at least one of a history and a changeable current property of the interchangeable optical component and adapted for storing non-changeable encoded data;

read/write means connected to the data medium means for reading encoded data from and for writing encoded data to the data medium means;

a central computer adapted to decode the encoded data and to process decisions on the basis of decoded data and adapted to process the encoded data for controlling the read/write means to automatically update changed parameters of the interchangeable optical component;

interface means connected between the read/write means and the central computer for transferring the encoded data to and from the central computer; and

sensor means, communicating with the read/write means, for detecting changes in the encoded data and for generating data signals in response to the detected changes in the encoded data.

5,557,545

AUTOMATIC CONTROL FOR A POWER PLANT

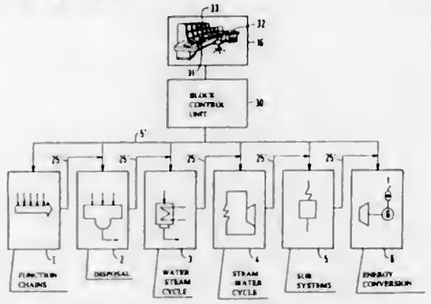
Fritz Löffel, Erlangen, and Claudius Arnoldt, Hessdorf, both of Germany, assignors to Siemens Aktiengesellschaft, Muenchen, Germany

Filed Apr. 14, 1994, Ser. No. 227,597

Claims priority, application Germany, Oct. 14, 1991, 41 33 980.0

Int. Cl.[6] **G05R** *19/418;19/4155*

U.S. Cl. 364—550 **4 Claims**



1. In combination with a power plant having a plurality of mutually interacting controllable power plant components, an automatic power plant control system, comprising:

a master control unit;

a data bus connected to said master control unit; and

function chains including automation devices each having a plurality of subfunction devices, said automation devices being combined into mutually independent functional units corresponding to a technological structure of the power plant, said automation devices executing various functions in an automation system shared by the power plant components, and said automation devices being connected to one another and to said master control unit by said data bus for transmitting data relevant to the power plant;

said function chains each including a common data line linking said subfunction devices and transmitting only data relevant for one functional unit; and

each of said subfunction devices including a plurality of subsystems having the controllable power plant components.

5,557,546

DATA ACQUISITION SYSTEM FOR THE ANALYSIS OF ELEVATOR TROUBLE

Hisanori Fukai; Hiroshi Yamazaki; Kenji Kawano; Shinichiro Kawano, and Hajime Okamoto, all of Tokyo, Japan, assignors to Hitachi Building Systems Engineering & Service Co. Ltd., Japan

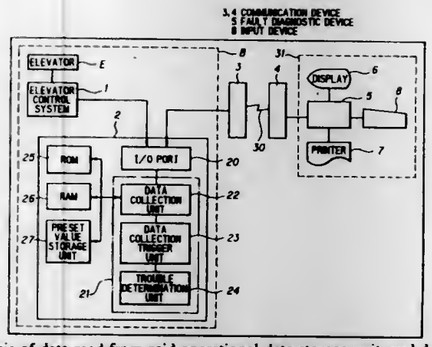
Filed Mar. 10, 1994, Ser. No. 208,307

Claims priority, application Japan, Mar. 26, 1993, 5-068334

Int. Cl.[6] **B66B** *5/02*

U.S. Cl. 364—551.01 **6 Claims**

1. A data acquisition system for analyzing elevator malfunctions, of the type having an operational data storage unit for storing operation data of an elevator, malfunction determination means for determining occurrence of a malfunction of the elevator on the basis of data read from said operational data storage unit, and data collection means for reading data from said operational data storage unit, said data being relevant to said determination of a malfunction by said malfunction determination means; said operational data storage unit, malfunction determination means and data collection means being arranged in a terminal supervisor unit connected to a supervision center for supervising said elevator via a telephone line, said system further comprising:



a preset value storage unit for storing a set of criteria for determining existence of a malfunction-indicating state, in which occurrence of a malfunction of said elevator is likely to be imminent, but has not yet occurred;

means for presetting criteria for determining existence of a malfunction-indicating state in said preset value storage unit from said supervision center via said telephone line; and

data collection trigger means for actuating said data collection means to read predetermined operational data from said operational data storage unit at a time, prior to actual occurrence of a malfunction, when data stored in said operational data storage unit correspond with said criteria preset for the determination of the malfunction-indicating state.

5,557,547

MONITORING SYSTEM STATUS

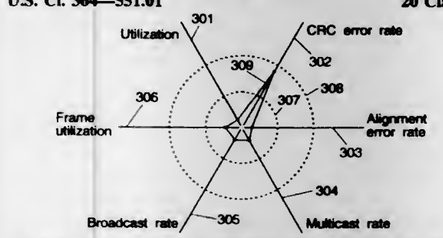
Peter Phaal, Bradley Stoke, United Kingdom, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 135,924, Oct. 13, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 481,196

Claims priority, application United Kingdom, Oct. 22, 1992, 9222282; Apr. 8, 1993, 9307494

Int. Cl.[6] **G01R** *13/00*

U.S. Cl. 364—551.01 **20 Claims**



1. A method of monitoring and displaying measurements of each of multiple different parameters related to an operational status of a system, comprising the computer implemented steps of:

acquiring multiple measurements of each of said parameters by monitoring the operational status of the system;

for each parameter, applying a scaling function to each measurement of that parameter to derive a scaled value thereof as a function of predetermined threshold values for that parameter, said scaled values being within a predetermined range common to all said parameters; for each parameter, selecting a maximum one of said scaled values;

creating a graphical display including plural axes, each axis manifesting a scale which is associated with a parameter being measured, each axis identified as to a respective parameter being measured, said display further indicating at least one threshold value for each axis;

indicating on said display for each said measured parameter, said selected maximum one of said scaled values corresponding thereto on a corresponding axis and thereby indicating if any said selected maximum one of said scaled values exceeds said threshold indicated on said axis; and

altering a graphical component of the display to indicate that a threshold has been exceeded by at least one said maximum one of said scaled values.

5,557,548

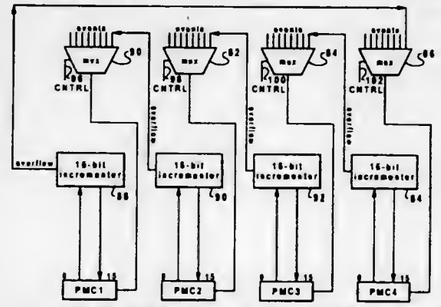
METHOD AND SYSTEM FOR PERFORMANCE MONITORING WITHIN A DATA PROCESSING SYSTEM

Frank C. Gover, Round Rock; Frank E. Levine, and Edward H. Welbon, both of Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1994, Ser. No. 353,006

Int. Cl.[6] **G06F** *13/00*

U.S. Cl. 364—551.01 **8 Claims**



1. A system for monitoring specified events among a plurality of events within a data processing system, comprising:

means for specifying selected events among said plurality of events which are to be monitored;

means for monitoring said specified events;

means for detecting each occurrence of a specified event; and

a plurality of counters which incrementally advance in response to an occurrence of a specified event, wherein responsive to said means for specifying selected events at least one other counter among said plurality of counters is interconnected to a first counter and programmed to incrementally advance in response to an overflow from said first counter.

5,557,549

KNOWLEDGE BASED DIAGNOSTIC ADVISORY SYSTEM AND METHOD FOR AN AIR SEPARATION PLANT

Ching M. Chang, Williamsville, N.Y., assignor to Praxair Technology, Inc., Danbury, Conn.

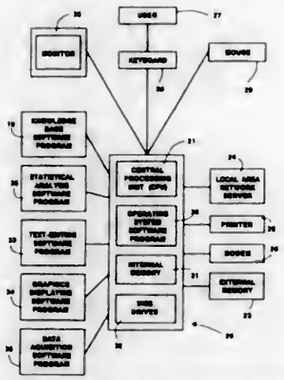
Continuation of Ser. No. 952,819, Sep. 28, 1992. This application Mar. 28, 1995, Ser. No. 411,917

Int. Cl.[6] **G06F** *17/00*

U.S. Cl. 364—551.01 **10 Claims**

1. A diagnostic advisory system for troubleshooting an abnormal condition in the production of at least one gas in an air separation plant identified by one or more alarm or shutdown signals triggered by a different fault condition affecting the normal production of said at least one gas with said diagnostic advisory system comprising:

a programmed computer including memory means for storing a knowledge base of an air separation plant composed of a



hierarchy of knowledge elements containing textual, graphical and/or video material for providing advice and guidance to an operator to enable the operator to monitor and to determine the cause of a fault condition of at least one gas and what action to take to correct such fault with the knowledge elements arranged in a sequence having an ordered priority corresponding to different levels of information with the highest priority knowledge element for the identified fault condition providing a preset number of diagnostic strategies with each strategy incorporating one or more subordinate knowledge elements in ranked order to the higher knowledge elements and to one another in accordance with the priority given to each level of information;

means for interactively linking subordinate knowledge element(s) to their higher priority knowledge element(s);

means responsive to a fault indicating signal for displaying each of said knowledge elements with each subordinate knowledge element displayed in a cascade formation relative to all higher ranking knowledge elements to which it is linked for said fault indicated signal; and

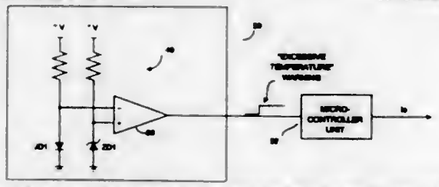
means for successively displaying one or more lower ranking knowledge elements within the linkage chain of knowledge elements to indicate what remedial action should be taken to correct the fault condition; and means for returning to any higher knowledge element from which the displayed lower knowledge element depends.

5,557,550

JUNCTION TEMPERATURE STATUS SENSING AND REDUCTION FOR INTEGRATED POWER DEVICES, SUCH AS A HEAD POSITIONING SYSTEM IN A MAGNETIC DISC DRIVE

Daniel R. Vigil, Agoura Hills, and LeRoy A. Volz, Northridge, both of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Mar. 11, 1994, Ser. No. 212,201
Int. Cl.[6] H02H *9/00;* **G08B** *21/00*
U.S. Cl. 364—557 **13 Claims**



1. A method for temperature protecting an actuator controller integrated circuit that outputs at least one control signal used to position at least one transducer adjacent a rotating disc in a hard disc memory system, the method comprising the following steps:

(a) monitoring temperature of said integrated circuit;

(b) comparing the temperature monitored in step (a) with a reference temperature, and outputting a warning signal while the temperature monitored exceeds the reference temperature by at least a minimum differential; and

(c) while said warning signal is present, introducing a variable time delay in said at least one control output signal to dynamically reduce duty cycle of said integrated circuit including a sequence of steps of

(i) initially imposing a relatively short delay in said duty, cycle of said integrated circuit; and

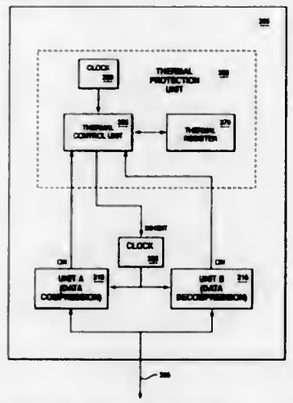
(ii) while said warning signal is present, imposing successively longer delays into said duty cycle until said warning signal is diminished or extinguished.

5,557,551

METHOD AND APPARATUS FOR A THERMAL PROTECTION UNIT

David J. Craft, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 144,451, Oct. 27, 1993. This application Jul. 18, 1995, Ser. No. 504,028
Int. Cl.[6] H03K *17/08;3/72*
U.S. Cl. 364—557 **30 Claims**



1. An apparatus for managing operations of a circuit which executes a sequence of digital instructions, comprising:

means responsive to said sequence of digital instructions to be executed by said circuit for computing predicted cumulative power dissipation to be caused by said sequence of digital instructions by accumulating predetermined thermal load values for said sequence of instructions to be executed;

means for determining whether said cumulative power dissipation exceeds a permissible range of said circuit, and if so, to produce an overload indication; and

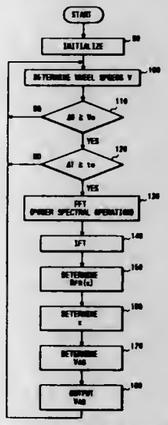
means, responsive to said overload indication from said means for determining, for reducing the cumulative power dissipation of said circuit prior to execution of said sequence of instructions.

5,557,552

SYSTEM FOR PROJECTING VEHICLE SPEED AND TIRE CONDITION MONITORING SYSTEM USING SAME

Kenji Fujiwara, Kariya, Japan, assignor to Nippondenso Co., Ltd., Aichi-pref., Japan

Filed Mar. 23, 1994, Ser. No. 216,536
Claims priority, application Japan, Mar. 24, 1993, 5-065549
Int. Cl.[6] B60Q *1/00;* **E01C** *23/00*
U.S. Cl. 364—565 **17 Claims**



1. A system for projecting the absolute speed of a vehicle comprising:

first detecting means for detecting a wheel speed of a front wheel to provide a front wheel speed indicative signal including at least one of unsprung vertical and longitudinal vibration frequency components caused by vibration inputs acting on the front wheel from a road surface;

second detecting means for detecting a wheel speed of a rear wheel to provide a rear wheel speed indicative signal including at least one of unsprung vertical and longitudinal vibration frequency components caused by vibration inputs acting on the rear wheel from the road surface;

phase difference determining means, responsive to the signals from said first and second detecting means, for determining a phase difference in said at least one of unsprung vertical and longitudinal vibration frequency components between said first and second detecting means to provide a signal indicative thereof; and

vehicle speed projecting means, responsive to the signal from said phase difference determining means, for projecting the absolute speed of the vehicle based on the phase difference and the wheel base of the vehicle.

5,557,553

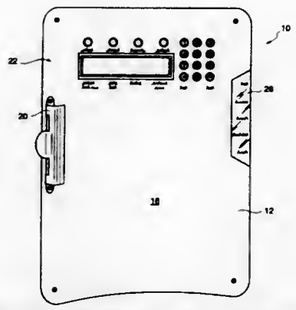
COMPUTER ASSISTED TIME STUDY SYSTEM

Clifford N. Sellie, Sr., 320 Sunset Ct., Northbrook, Ill. 60062-5635

Filed Nov. 12, 1993, Ser. No. 152,212
Int. Cl.[6] G06F *15/22*
U.S. Cl. 364—569 **22 Claims**

1. A computer assisted time study system for establishing standard time values for operators or workers at a company, said system comprising:

a hand holdable data accumulating device including a hand holdable housing, electronic circuitry including a microcomputer in said hand holdable housing, transmitting means coupled to said microcomputer, on-board memory means associated with said microcomputer, and calculating means associated with said microcomputer for calculating output data in one of decimal minutes or decimal hours, a hand holdable clipboard mounted on top of said hand holdable housing and having means for releasably securing a time study sheet or form on said clipboard, a time study sheet or form having information regarding the data to be taken in a particular time study and for use in recording particulars of that time study, said sheet or form being mounted on said clipboard, and input means including switches on said clipboard of said hand holdable housing and switches on a side of said housing under a side margin of said clipboard for inputting, into said on-board memory means, data acquired by a time study analyst;



data acquisition software and initial processing software stored in said memory means of said microcomputer;

a personal or host computer including a memory and receiving means which can be periodically coupled to said transmitting means of said hand holdable data accumulating device for receiving said output data from said hand holdable data accumulating device into said memory of said personal or host computer and for having entered therein from said sheet or form, the particulars of the one or more time studies taken;

data processing software stored in said memory of said personal or host computer for further processing the output data received from said hand holdable data accumulating device; and,

printing means for printing said output data after the output data has been further processed by said data processing software in one of decimal minutes or decimal hours, whichever is provided for by the data processing software.

5,557,554

CALIBRATION METHOD FOR PROTRUSION DETECTING HEAD UNITS AND PROTRUSION INSPECTION METHOD AND PROTRUSION INSPECTION DEVICE USING THE SAME

Hiroshi Kawaguchi, Odawara; Takashi Nakakita, Hadano, and Shinji Homma, Kanagawa-ken, all of Japan, assignors to Hitachi Electronics Engineering Co., Ltd., Tokyo, Japan

Filed Apr. 5, 1994, Ser. No. 222,948
Claims priority, application Japan, Apr. 8, 1993, 5-106233
Int. Cl.[6] G01B *21/08*
U.S. Cl. 364—571.01 **13 Claims**

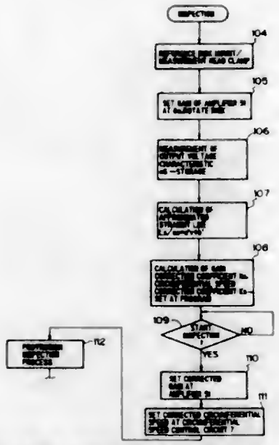
1. A calibration method comprising steps of:

determining a linear equation em=−av+b, wherein a is an inclination and b is an intercept on an output voltage axis, after selecting as a master head unit a protrusion detection head unit of which lifting characteristic is known, determining a reference disk having a predetermined surface roughness, loading a head of the master head unit on the face of the reference disk which is rotated and causing to lift the same, measuring output voltages em of the master head unit while varying the circumferential speed of the track on the reference disk to determine as a function output voltage characteristic using the circumferential speed v and linear-approximating the output voltage characteristic on a rectangular coordinate system of output voltage-circumferential speed;

a corrector that receives a reference temperature magnitude

stored in said engine model, wherein said evaluation provides geometric and performance characteristics required for

micro instruction ROM means for supplying a micro instruction in response to a supplied address, said input means and said



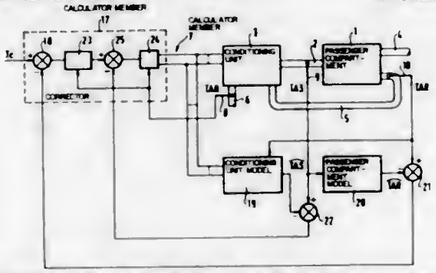
determining a linear equation es=a'v+b', wherein a' is an inclination and b' is an intercept on the output voltage axis, after selecting an arbitrary protrusion detection head unit which is used for the protrusion inspection as a measurement head unit, loading the head of the measurement head unit on the face of the reference disk and causing to lift the same, measuring output voltages es of the measurement head unit while varying the circumferential speed of the track on the reference disk to determine an output voltage characteristic using the circumferential speed v as the function and linear-approximating the output voltage characteristic on the rectangular coordinate system; further determining b/b' and a'b/ab' based on linear equations em=av+b and es=a'v+b', and,

correcting the gain of an amplifier, coupled to the measurement head unit, by multiplying the gain by the value b/b' which amplifies the output signal of the measurement head unit when the measurement head unit is to be used for the protrusion inspection and further correcting the circumferential speed of the track on a rotating disk for an inspection object by multiplying the circumferential speed by the value a'b/ab'.

5,557,555
CIRCUIT FOR REGULATING THE AIR CONDITIONING OF PREMISES

Laurent Friot, Poitiers, and Jean-Claude Trigeassou, Mignaloux-Beauvoir, both of France, assignors to GEC Alsthom Transport SA, Paris, France

Filed Feb. 23, 1994, Ser. No. 200,666
Claims priority, application France, Feb. 24, 1993, 93 02111; Sep. 9, 1993, 93 10730
Int. Cl.[6] G05B *13/04*
U.S. Cl. 364—578 **13 Claims**



1. A circuit for regulating the air conditioning of premises, the premises being air conditioned by a conditioning unit, the circuit comprising:

a corrector that receives a reference temperature magnitude signal and a signal representative of the magnitude of the temperature of the premises and outputs control signals in accordance therewith to control operation of the conditioning unit, said corrector comprising:

a transfer function element which receives said reference temperature magnitude signal and outputs a reference trajectory signal representing a desired operation of said conditioning unit;

a comparator which compares said reference trajectory signal and a signal representing said operation of said conditioning unit and outputs a comparison signal; and

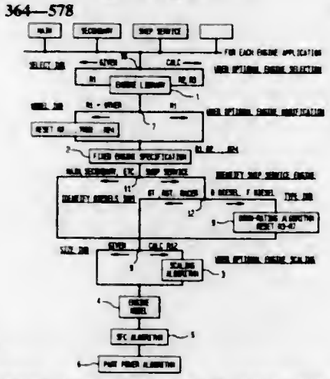
a correction unit which adjusts said control signals in accordance with said comparison signal; and

a simulation member which receives said control signals, adjusted by said correction unit, and performs non-linear and non-stationary simulation of the conditioning unit and the premises.

5,557,556
POWER PLANT SIMULATION FOR WATERBORNE VESSEL COMPUTER-ASSISTED DESIGN AND EVALUATION

Samuel R. Shank, Jr., Arnold, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 30, 1994, Ser. No. 312,952
Int. Cl.[6] B63H *21/00*
U.S. Cl. 364—578 **19 Claims**



1. A method of evaluating impact of engine choice during the computer assisted design of waterborne vessels, the method comprising the steps of:

defining a plurality of generic equations representative of engine specific fuel consumption as a function of at least one engine performance parameter, each of said plurality of generic equations having associated therewith an equation indicator;

providing an engine library containing therein a plurality of engine specifications, each of said plurality of engine specifications defining an engine in terms of a plurality of geometric and performance parameters, said performance parameters including said at least one engine performance parameter and one of said equation indicators;

selecting an engine from said engine library, said selecting having associated therewith a predetermined engine application;

retrieving said engine specification associated with said selected engine from said engine library;

storing said retrieved engine specification in an engine model;

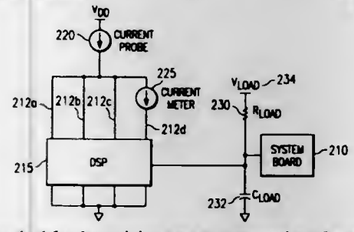
retrieving one of said plurality of generic equations based on said equation indicator stored in said engine model; and

evaluating an engine performance simulation at predetermined operating conditions of the waterborne vessel, said evaluating being performed in accordance with said retrieved equation and said plurality of geometric and performance parameters stored in said engine model, wherein said evaluation provides geometric and performance characteristics required for designing propulsion and ship service power producing machinery for the waterborne vessel.

5,557,557
PROCESSOR POWER PROFILER

Gene A. Frantz, Missouri City, Tex.; Subramaniyan Subuvenkat, Bangalore, Ind.; Jonathan Bradley, Houston, and James A. Larimer, Missouri City, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 4, 1994, Ser. No. 317,957
Int. Cl.[6] G01R *11/00*
U.S. Cl. 364—578 **10 Claims**



1. A method for determining energy consumption of a processor when executing a program, comprising:

selecting a processor,

creating a model of said processor for said processor's energy usage based upon the instruction set of said processor,

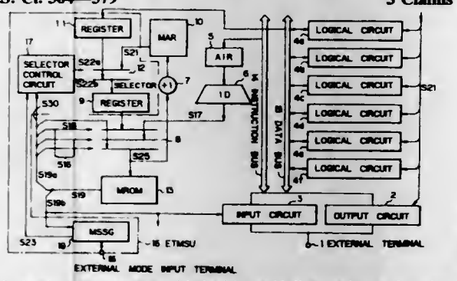
executing said program whose energy consumption is to be measured using said model to determine said energy consumption of said program, and

outputting said determined energy consumption of said program for said processor.

5,557,558
MICROPROCESSOR WITH SELF-DIAGNOSTIC TEST FUNCTION

Masayuki Daito, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 19,912, Feb. 19, 1993, abandoned. This application May 15, 1995, Ser. No. 441,654
Claims priority, application Japan, Feb. 19, 1992, 4-031227
Int. Cl.[6] G05B *19/00*
U.S. Cl. 364—579 **5 Claims**



1. A microprocessor provided with a self-diagnostic test function which operates in a normal mode and in a test mode, comprising:

input means for inputting an encoded normal command which controls the normal mode of operation and for inputting a test command and test data fetched from an external memory for self-diagnostic testing;

decoder means for decoding the encoded normal command supplied from said input means and outputting a decoded normal command as a result thereof; and

micro instruction ROM means for supplying a micro instruction in response to a supplied address, said input means and said decoder means making up a first signal path to supply the decoded normal command to said micro instruction ROM means, wherein said microprocessor further includes:

external test mode setting means for providing a second signal path from said input means to said micro instruction ROM means to supply the test command and the test data to said micro instruction ROM means, and for controlling said second signal path to transmit the test command and the test data through said second signal path as path test information when said microprocessor operates in the test mode, and

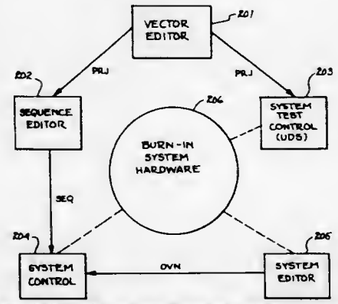
first selector means for selecting, as a selected signal, in accordance with a first code described in the micro instruction delivered from the micro instruction ROM means, either the decoded normal command, the path test information or an address of the micro instruction ROM means described in the micro instruction delivered, and providing the selected signal to the micro instruction ROM means as an output of the first selector means,

said external memory storing normal commands and desired numbers of test commands and test data, each of said test commands designating a test item, said test item being a series of micro steps including a series of a desired number of micro steps to be tested and a micro step to write a test result of said series of said desired number of micro steps to be tested to a destination address of said external memory.

5,557,559
UNIVERSAL BURN-IN DRIVER SYSTEM AND METHOD THEREFOR

James V. Rhodes, Chandler, Ariz., assignor to Motay Electronics, Inc., Chandler, Ariz.

Continuation-in-part of Ser. No. 908,968, Jul. 6, 1992, Pat. No. 5,390,129. This application Dec. 23, 1993, Ser. No. 173,618
Int. Cl.[6] G06F *19/00*
U.S. Cl. 364—580 **60 Claims**



1. In association with a burn-in system of the type comprising test vector storage means for storing data patterns defining the sequence of electrical signals for a burn-in operation to be applied to devices under test; burn-in driver means for controlling the magnitude and frequency content of said electrical signal for burn-in of said devices under test, said burn-in driver means further comprising means for identifying said devices under test; and computer means coupled to said test vector storage means and coupled to said burn-in driver means for changing said sequence, said magnitude and said frequency under program control in response to said means for identifying said devices under test to dynamically modify said sequence of electrical signals for burn-in of said devices under test, a computer system comprising, in combination:

a. first computer editing means for independently setting vector parameters as vector data for testing a said device under test;

arm which contacts said engagement member of said docking device when said portable computer is mechanically fixed to

a. first computer editing means for independently setting vector parameters as vector data for testing a said device under test; and

b. computer data storage means for storing said vector data as an identified project file.

5,557,560

APPARATUS AND METHOD FOR PULSE COMPRESSION AND PULSE GENERATION

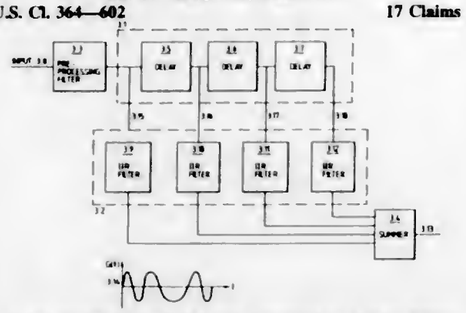
John Dix, Portland, and Roderick A. Smith, Weymouth, both of United Kingdom, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed May 24, 1994, Ser. No. 244,243

Claims priority, application United Kingdom, Oct. 23, 1991, 9122446.9

Int. Cl.[6] G06J *1/00*; G06F *15/31*

U.S. Cl. 364—602 **17 Claims**



1. An electronic circuit for pulse compression or pulse generation comprising a filter which has a pre-selected transfer function and uses infinite impulse response filtering to simulate the response of finite impulse response filtering wherein said filter comprises a filter unit having:

a) a pre-processing filter, and

b) an infinite impulse response (IIR) filter having a predetermined resonant frequency connected to the output of the pre-processing filter;

the arrangement being such that the pre-processing filter has a zero transfer function at the resonant frequency of the IIR filter such that the filter unit simulates one segment of the pre-selected transfer function, said pre-selected transfer function is that of a chirp waveform, made up of discrete segments, each segment being of a single frequency and of integer number of wavelengths of that frequency in duration.

5,557,561

MULTIPLE SIGNAL, DIGITAL DIFFERENTIAL SIGNAL PROCESSOR AND INTERPOLATOR

Stephen L. Daleo, 6204 NW. 50th Ter., Parkville, Mo. 64151, and David D. Boone, 1104 NE. Long Ridge, Lee's Summit, Mo. 64064

Filed Nov. 21, 1994, Ser. No. 342,882

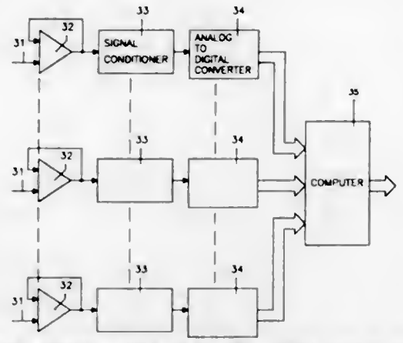
Int. Cl.[6] G06J *1/00*

U.S. Cl. 364—602 **7 Claims**

1. A device for processing a plurality of analog input signals so as to provide at least one digital differential output signal comprising:

a plurality of analog signal conditioners, each analog signal conditioner having an input and an output and having an analog input signal connected to its input and outputting a conditioned analog signal responsive to the analog input signal,

a plurality of analog to digital converters, each converter having an analog input and a digital output,



each conditioned analog signal that is output from an analog signal conditioner being input to the input of an analog to digital converter,

each analog to digital converter sampling the conditioned analog signal at its input at successive instances in time and outputting digital data representing the values of the samples of the conditioned analog signal at the successive instances in time,

a digital computational device, the digital computational device computing for successive instances in time the numerical differences in the digital data representing the values of the samples taken of two of the conditioned analog signals at substantially the same instances of time, and outputting the differences as a digital differential output signal.

5,557,562

PORTABLE COMPUTER AND DOCKING DEVICE FOR PORTABLE COMPUTER

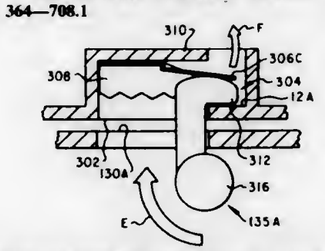
Uchiyama Yoshiharu, Isehara; Asano Takeshi, Atsugi; Fukuda Kaoru, Yokohama; Maeda Kazuhiko, Sagamihara, and Usui Hideyuki, Chigasaki, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 1, 1994, Ser. No. 299,789

Claims priority, application Japan, Sep. 7, 1993, 5-221761

Int. Cl.[6] G06F *1/16*; H05K *1/14*;9/00

U.S. Cl. 364—708.1 **9 Claims**



1. A grounding apparatus within a portable computer for minimizing displacement currents when said portable computer is electrically connected and mechanically fixed to a docking device for a portable computer, said portable computer and said docking device each having a main body which houses a plurality of electrical components, said docking device having an engagement member that is electrically connected to a reference electric potential portion of said main body of said docking device and which mechanically fixes said portable computer to said docking device, said portable computer having an electrical signal connector which transmits electrical signals between said plurality of electrical components within said portable computer and said plurality of electrical components within said docking device, said grounding apparatus comprising:

an electrical contact disposed within a recess in said main body of said portable computer, said electrical contact including a body electrically connected to a reference electrical potential portion of said body of said portable computer and a spring

arm which contacts said engagement member of said docking device when said portable computer is mechanically fixed to said docking device, wherein said electrical contact is spaced apart from said electrical signal connector.

5,557,563

DATA PROCESSING METHOD AND APPARATUS INCLUDING ITERATIVE MULTIPLIER

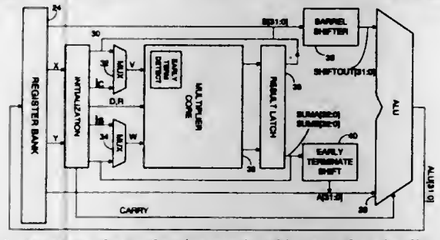
Guy Larri, Cambridge, United Kingdom, assignor to Advanced Risc Machines Limited, Cambridge, United Kingdom

Filed Aug. 26, 1994, Ser. No. 297,694

Claims priority, application United Kingdom, Mar. 11, 1994, 9404767

Int. Cl.[6] G06F *7/52*;*7/38*

U.S. Cl. 364—754 **10 Claims**



1. Apparatus for performing a selectable one of a plurality of different data processing operations upon one or more input operands, which of said plurality of different data processing operation is performed being selected in dependence upon one of a plurality of instruction commands, said plurality of instruction commands including a multiplication command, said apparatus comprising:

(a) an iterative multiplier for performing a multiplication operation to produce a multiplication result in response to a multiplication command, said iterative multiplier comprising:

(i) a multiplier core;

(ii) a feedback circuit for feeding back partial results from an output of said multiplier core to an input of said multiplier core to effect iterative operation; and

(iii) an early terminating circuit connected for early terminating operation of said iterative multiplier when further iterations will not change said multiplication result;

(b) a general purpose shift circuit connected for performing a variable length shift upon one of said input operands in response to one or more of said plurality of instruction commands other than said multiplication command; and

(c) a circuit responsive to early termination of said iterative multiplier for passing one of said partial results output from said multiplier core to said general purpose shift circuit for bit realignment by said general purpose shift circuit as part of generating said multiplication result.

5,557,564

SIGNAL TERMINAL STRUCTURE FOR MACRO CELLS AND AN ASSOCIATED CONNECTION METHOD

Masanori Haraguchi, Yokohama; Yoshinori Okada, Tokyo, and Masato Ito, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

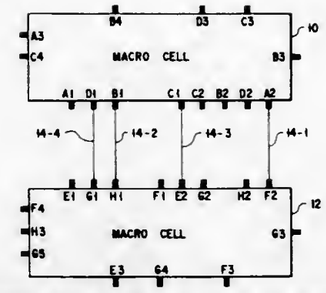
Division of Ser. No. 237,726, May 4, 1994, Pat. No. 5,490,103, which is a continuation of Ser. No. 858,657, Mar. 27, 1992, abandoned. This application Oct. 25, 1995, Ser. No. 548,136

Claims priority, application Japan, Mar. 28, 1991, 3-87221

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—63 **5 Claims**

1. A method for connecting macro cells in a manufacture of a semicustom semiconductor IC device, each of the macro cells having a plurality of signal terminals provided on one side thereof which are electrically connected to a common point, comprising the steps of:



determining common points of the macro cells which are to be electrically connected to each other;

determining distances between different combinations of the signal terminals of the macro cells which will result in the determined common points being electrically connected to each other;

selecting the signal terminals on the macro cells which will have a shortest distance between the signal terminals and result in the determined common points being connected to each other;

storing data representing the selected terminals as shortest distance data in a memory; and

connecting together the selected signal terminals of the macro cells.

5,557,565

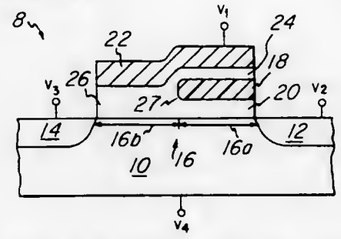
NON-VOLATILE MEMORY CELL STRUCTURE AND PROCESS FOR FORMING SAME

Cetin Kaya, Dallas, and Howard Tigelaar, Allen, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 93,517, Jul. 19, 1993, which is a continuation of Ser. No. 641,952, Jan. 17, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 483,423

Int. Cl.[6] G11C *17/00*;*7/00*

U.S. Cl. 365—185.01 **3 Claims**



1. A method for programming a non-volatile split-gate cell formed on a semiconductor substrate which comprises at least two highly doped regions separated by a channel region, and only one control gate formed over said channel region, and over a floating gate formed beneath said control gate and over a portion of said channel region, comprising:

applying a selected voltage to one of said two highly doped regions;

applying as little as about five volts more than said selected voltage to the second of said two highly doped regions; and

applying a voltage less than said selected voltage to said substrate.

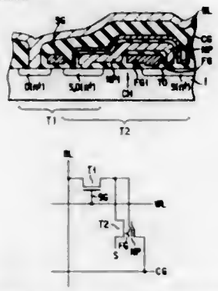
5,557,566

5,557,566

SEMICONDUCTOR NONVOLATILE RAM HAVING E2PROM WITH A FLOATING GATE LOCATED ABOVE THE MIDPORTION OF THE TRANSISTOR CHANNEL

Kiyofumi Ochii, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 858,609, Mar. 27, 1992, abandoned. This application Jan. 20, 1995, Ser. No. 376,644
Claims priority, application Japan, Mar. 30, 1991, 3-093654
Int. Cl.[6] G11C *14/00*
U.S. Cl. 365—185.08 **8 Claims**



1. A semiconductor nonvolatile RAM comprising:

a dynamic RAM cell comprising a first transistor having a current path having one end connected to a bit line, a gate connected to a word line, and a storage region having one end connected to another end of said current path, for storing data; and

an E^2PROM cell comprising a second transistor including a source region, a drain region, a channel region having first and second parts between said source and drain regions, a floating gate above said first part of said channel region and said source region, and a control gate, said drain region of said second transistor being connected to said another end of said current path of said first transistor, and another end of said storage region having first and second parts, said first part of said storage region being above said second part of said channel region and said second part of said storage region being above said floating gate,

wherein said second part of said channel region is rendered conductive when one logic data is stored in said storage region, and said second part of said channel region is rendered nonconductive when other logic data is stored in said storage region.

5,557,567

METHOD FOR PROGRAMMING AN AMG EPROM OR FLASH MEMORY WHEN CELLS OF THE ARRAY ARE FORMED TO STORE MULTIPLE BITS OF DATA

Albert Bergemont, and Min-hwa Chi, both of Palo Alto, Calif., assignors to National Semiconductor Corp., Santa Clara, Calif.

Filed Apr. 6, 1995, Ser. No. 417,938
Int. Cl.[6] G11C *11/34*
U.S. Cl. 365—185.16 **6 Claims**

1. A method for simultaneously programming any combination of memory cells in a column of an alternate-metal virtual-ground (AMG) electrically-programmable read-only-memory (EPROM) or flash memory array to each store one of three or more threshold voltages,

the array having a plurality of metal contacted bit lines, a plurality of non-contacted bit lines formed so that one non-contacted bit line is formed between each adjacent pair of metal contacted bit lines, a plurality of memory cells formed in columns and rows so that each column of memory cells is formed between and contacts adjacent pairs of metal contacted and non-contacted bit lines, a plurality of access transistors formed in a plurality of rows so that an access transistor is formed in each column of memory cells, each row of access transistors being formed so that one access transistor is formed between and contacts every other pair of metal contacted and non-contacted bit lines, a plurality of access lines formed so that each row of access transistors is contacted by a corresponding access line, and a plurality of word lines formed so that each row of memory cells is contacted by a corresponding word line, each cell being formed to produce a punchthrough current during programming, the array being formed in a well,

the method comprising the steps of:

selecting a programming voltage from three or more programming voltages for each of a plurality of cells to be programmed in a column, each cell to be programmed having a corresponding word line, the three or more programming voltages corresponding to said three or more threshold voltages;

applying a first voltage to a first metal contacted bit line, the first metal contacted bit line contacting each memory cell and each access transistor in a first column of a pair of adjacent columns, the first column including the cells to be programmed;

applying a second voltage to a second metal contacted bit line, the second voltage being less than the first voltage, the second metal contacted bit line contacting each memory cell and access transistor in a second column of the pair of adjacent columns;

applying the second voltage to the well;

applying a third voltage to an access line of the plurality of access lines, the access line contacting the access transistor located in the second column of the pair of adjacent columns; and

applying the programming voltages selected for the cells to be programmed to the word lines that correspond to the cells to be programmed.

5,557,568

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE WITH VERIFY MODE FOR VERIFYING DATA WRITTEN TO MEMORY CELLS

Junichi Miyamoto, Yokohama; Yasuo Itoh, Kawasaki, and Yoshihisa Iwata, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 210,434, Mar. 21, 1994, Pat. No. 5,452,249. This application Apr. 24, 1995, Ser. No. 427,265
Claims priority, application Japan, Mar. 31, 1993, 6-074797; Feb. 1, 1994, 6-10209
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—185.22 **35 Claims**

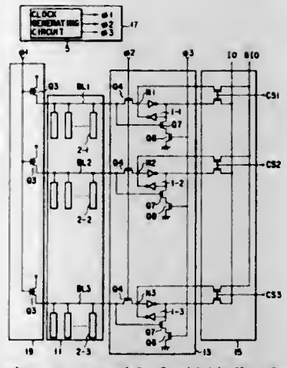
1. A method of operating a non-volatile semiconductor memory device which includes a non-volatile memory cell, a bit line and a word line connected to said non-volatile memory cell, a flip-flop circuit settable in one of a first and a second state, a data setting circuit responsive to a potential of said bit line for setting said flip-flop circuit in the second state, and a data resetting circuit for resetting said flip-flop circuit in a reset state, the method comprising:

a first step of writing data to said non-volatile memory cell during a write operation, wherein said flip-flop circuit is set in one of the first and second states, said

word line and said bit line are driven to select said non-volatile memory cell for writing, and write data, corresponding to the state of said flip-flop circuit, is transmitted to said bit line for supplying the write data to said non-volatile memory cell;

a second step of verifying the writing of the write data to said non-volatile memory cell during a verify operation, wherein, when said flip-flop circuit is set in the first state and when a MOS transistor of said data setting circuit having a gate supplied with a potential of said bit line is turned on, the state of said flip-flop circuit is forcibly inverted from the first state to the second state; and

a third step of reading out data from said non-volatile memory cell during a read-out operation, wherein said flip-flop circuit is reset in the reset state by said data resetting circuit, said word line and said bit line are driven to select said non-volatile memory cell for reading, readout data corresponding to data stored in said non-volatile memory cell is transmitted to said bit line, and the readout data is set in said flip-flop circuit.



5,557,569

LOW VOLTAGE FLASH EEPROM C-CELL USING FOWLER-NORDHEIM TUNNELING

Michael C. Smayling, Missouri City, Tex.; Giulio G. Marotta, Rieti, Italy; Iano D'Arrigo, Cannes, France; Giovanni Santin, Rieti, Italy; Georges Falessi, La Gaude, France, and Mousum Bhat, Austin, Tex., assignors to Texas Instruments Incorporated

Continuation of Ser. No. 135,695, Oct. 12, 1993, abandoned. This application May 25, 1995, Ser. No. 453,474
Int. Cl.[6] G11C *16/04*
U.S. Cl. 365—185.28 **6 Claims**

1. An electrically programmable, non-volatile memory cell arrangement, in a semiconductor substrate, comprising:

a first doped region in said substrate of a first conductivity type, having

a central portion, and

first, second, third and fourth source/drain portions extending outwardly from said central portion;

second, third, fourth and fifth doped regions in said substrate of said first conductivity type, being disposed adjacent to and separated from, by a second conductivity type region forming a channel therebetween, said first, second, third and fourth source/drain portions, respectively;

a first floating gate structure and a second floating gate structure disposed on top of said channels formed between said first source/drain portion and said second doped region, and said second source/drain portion and said third doped region, respectively, and a first control gate structure and a second control gate structure disposed on top of said first and said second floating gate structures, respectively, forming a first storage transistor and a second storage transistor operable to be programmed by Fowler-Nordheim tunneling from only the side of said channels closest to said second doped region and said third doped region, respectively; and

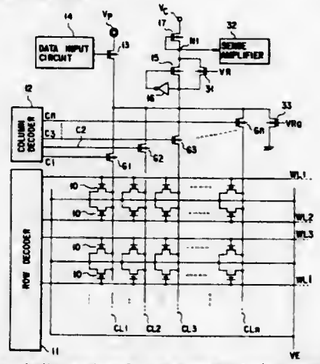
a third and a fourth floating gate structure disposed on top of said channels formed between said third source/drain portion and said fourth doped region, and said fourth source/drain portion and said fifth doped region, respectively, and third and fourth control gate structures disposed on top of said third and said fourth floating gate structures, respectively, forming a third storage transistor and a fourth storage transistor operable to be programmed by Fowler-Nordheim tunneling from only the side of said channels closest to said third source/drain portion and said fourth source/drain portion, respectively.

5,557,570

NONVOLATILE SEMICONDUCTOR MEMORY DEVICE

Hiroshi Iwahashi, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 67,987, May 27, 1993, Pat. No. 5,428,570. This application May 25, 1995, Ser. No. 449,750
Claims priority, application Japan, May 28, 1992, 4-137281
Int. Cl.[6] G11C *7/00*
U.S. Cl. 365—185.29 **6 Claims**



1. A nonvolatile semiconductor memory device comprising:

a memory cell array including memory cells arranged in matrix form of rows and columns, and having row lines and column

lines, each of said memory cells including a MOS transistor having a control gate and a floating gate, the memory cells in each row being commonly connected to a respective one of the row lines, the memory cells in each column being commonly connected to a respective one of the column lines;

a row decoder for selecting at least one of the row lines;

a column decoder for selecting at least one of the column lines;

data detection means, connected to the selected at least one column line, for detecting data stored in at least one memory cell at an intersection of said at least one row line and said at least one column line;

data write means for writing data in said at least one memory cell;

data initializing means for initializing data simultaneously in a plurality of memory cells by applying a high voltage to the control gate of each of said memory cells to inject electrons into the floating gate of each of said plurality of memory cells using a tunnel effect while a plurality of row lines are selected by said row decoder; and

data erase means for erasing data from said memory cells,

wherein, after said data initializing means initializes data simultaneously in said plurality of memory cells using said tunnel effect, said data erase means erases data from said memory cells.

5,557,571

DYNAMIC RANDOM ACCESS MEMORY WITH INTERNAL TESTING SWITCHES

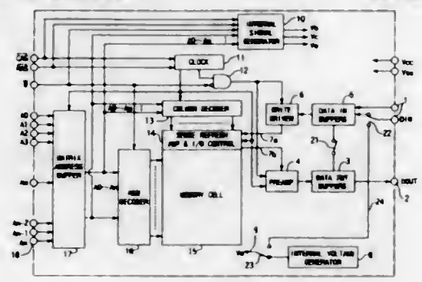
Tetsuo Kato, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

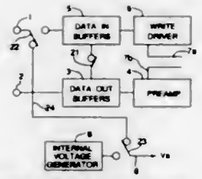
Filed Apr. 14, 1995, Ser. No. 422,411

Claims priority, application Japan, Nov. 29, 1994, 6-294739

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—189.05 **10 Claims**





1. A dynamic random access memory device comprising:

a storage circuit including a memory cell;

an address input circuit for receiving an address for accessing the storage circuit;

a data input circuit connected to said storage circuit, said data input circuit including data input pins for receiving an input data and data buffers for storing the input data;

a data output circuit connected to said storage circuit;

an internal voltage generator for generating a prescribed internal voltage from a power supply voltage;

an internal voltage supply line connected to said internal voltage generator so as to supply the prescribed internal voltage generated by said internal voltage generator;

a first switch to connect one of said data input pins to either one of said data in buffers or an end of a signal line;

a second switch to connect said data in buffers to said data output circuit;

a third switch to connect said internal voltage supply line to either said internal voltage generator or the other end of said signal line; and

a switch signal generator for generating control signals for said switches during a test mode, so as to make said first switch connect said one of said input pins to the end of said signal line, to make said second switch to connect said data in buffer to said data output circuit, and to make said third switch to connect said internal voltage supply line to the other end of said signal line.

5,557,572

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE

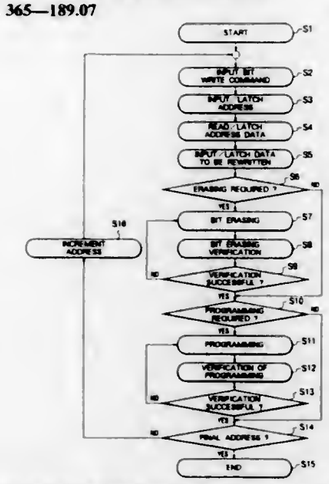
Kikuzo Sawada, and Hiroshi Mawatari, both of Tokyo, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 231,684, Apr. 25, 1994, Pat. No. 5,491,656, which is a continuation-in-part of Ser. No. 50,660, Apr. 22, 1993, Pat. No. 5,408,429. This application Sep. 16, 1994, Ser. No. 307,251

Claims priority, application Japan, Apr. 24, 1992, 4-131491; Apr. 26, 1993, 5-122013

Int. Cl.[6] G11C *7/00;11/34*

U.S. Cl. 365—189.07 **4 Claims**



1. An electrically alterable non-volatile semiconductor memory device comprising:

a plurality of electrically alterable non-volatile semiconductor memory cells arranged in columns and rows;

a decoder circuit for setting at least one of said memory cells to a selected state and other memory cells to a non-selected state;

writing means for performing writing of the memory cell set to said selected state through said decoder circuit;

reading means for performing reading of the memory cell set to said selected state through said decoder circuit;

comparing means for comparing data stored in the memory cell set to said selected state and data to be newly written therein with each other;

judging means for judging whether said data stored in the memory cell set to said selected state is required to be altered or not on the basis of the comparison result of said comparing means; and

alteration control means for performing altering of the data stored in the memory cell only when said judging means judges that said stored data is required to be altered.

5,557,573

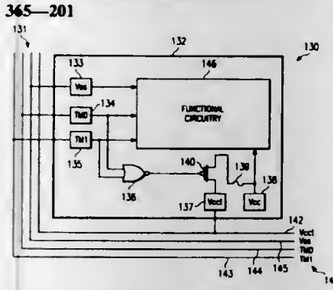
ENTIRE WAFER STRESS TEST METHOD FOR INTEGRATED MEMORY DEVICES AND CIRCUIT THEREFOR

David C. McClure, Carrollton, Tex., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Aug. 21, 1995, Ser. No. 484,609

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—201 **33 Claims**



1. An integrated circuit die having a normal operation mode and at least one special test operation mode comprising:

functional circuitry;

a first test mode control input line extending to the edge of the die, coupled to the functional circuitry, for receiving a first test mode enable signal;

a power supply input pad, coupled to the functional circuitry, for providing a power supply voltage thereto;

a test power supply input line extending to the edge of the die, for receiving a test power supply voltage; and

a switching transistor, having a conduction path connected on one end to the test power supply input and coupled on another end to the functional circuitry, and having a control terminal coupled to the first test mode control input, for applying the test power supply voltage to the functional Circuitry responsive to the first test mode control input receiving the first test mode enable signal.

5,557,574

SEMICONDUCTOR MEMORY DEVICE WITH FUNCTION OF CARRYING OUT LOGIC JUDGEMENT FOR CORRECT RECOGNITION OF MEMORY OPERATION

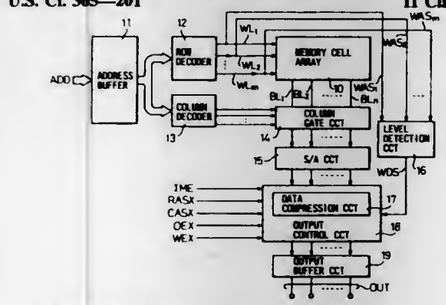
Yukihiro Senoo, Satsuma-gun, and Masao Nakano, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 13, 1995, Ser. No. 489,764

Claims priority, application Japan, Sep. 1, 1994, 6-208711

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—201 **11 Claims**



1. A semiconductor memory device comprising:

a memory cell array having a plurality of word lines;

a decoder circuit for decoding an address signal to thereby generate a word line activation signal for driving a corresponding one of said plurality of word lines;

a data compression circuit for carrying out a comparison between each data bit, read from said memory cell array in a test mode, of a plurality of memory cells connected to a common word line, and compressing a result of the comparison to thereby output a logic judgement result; and

an output control circuit responsive to an external test mode activation signal and the word line activation signal from said decoder circuit, for controlling said data compression circuit,

wherein, in the event the logic judgement result indicates coincidence when said word line activation signal is not output from said decoder circuit, said output control circuit controls the logic judgement result of said data compression circuit to indicate non-coincidence.

5,557,575

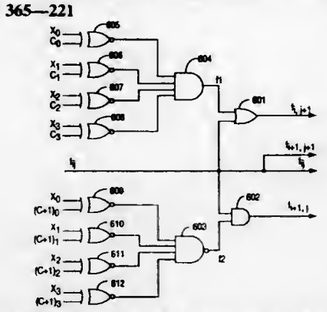
LOOK AHEAD FLAG FOR FIFO

Tsu-Wei F. Lee, Monte Sereno, Calif., assignor to Paradigm Technology, Inc., San Jose, Calif.

Division of Ser. No. 981,158, Nov. 23, 1992, Pat. No. 5,384,744. This application Jan. 24, 1995, Ser. No. 377,890

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—221 **19 Claims**



1. A method for changing a flag signal which a first-in first-out buffer transmits to indicate a status of the first-in first-out buffer, the method comprising:

predetermining possible flag signals corresponding to possible new states of the first-in first-out buffer, such that each possible flag signal indicates the status that the first-in first-out buffer would have in the corresponding possible new state;

selecting one of the possible flag signals to be the flag signal when the state of the first-in first-out buffer changes from an old state to a new state; and

transmitting the selected signal to a device that communicates through the first-in first-out buffer.

5,557,576

METHOD AND APPARATUS FOR MONITORING ILLEGAL CONDITIONS IN A NONVOLATILE MEMORY CIRCUIT

Frankie F. Roohparvar, Cupertino, and Christophe J. Chevallier, Palo Alto, both of Calif., assignors to Micron Quantum Devices, Inc., Santa Clara, Calif.

Filed Jul. 28, 1995, Ser. No. 506,970

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—218 **19 Claims**

3. An integrated memory circuit operable in a selected one of a high voltage mode and a low voltage mode, including:

first means for monitoring status of the memory circuit during an operation of said memory circuit to identify a condition of the memory circuit that requires termination of said operation and asserting a status signal having a first value in response to presence of said condition;

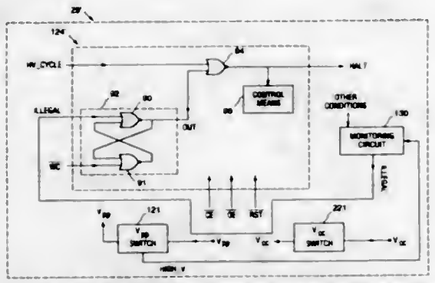
5,557,578

DYNAMIC MEMORY REFRESH CONTROLLER AND

electronic device also enters the initial condition when the supply voltage is less than the threshold voltage.

5,557,581

LOGIC AND MEMORY CIRCUIT WITH REDUCED



second means for terminating said operation in response to a halt signal; and

halt signal means for receiving the status signal from the first means, generating the halt signal in response to the first value of the status signal, and asserting the halt signal to the second means regardless of whether said condition continues to be present but only during the low voltage mode, wherein the halt signal means is a logic circuit, and the logic circuit includes:

a flip-flop circuit having a first input which receives the status signal and an output, wherein the flip-flop circuit enters a first state upon being reset, undergoes a transition from the first state to a second state in response to said first value of the status signal, and asserts an output signal at the output while in the second state; and

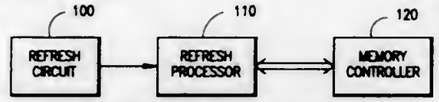
a second circuit having an output, a first input which receives the output signal from the flip-flop circuit, and a second input which receives a second signal, wherein a value of the second signal indicates that the memory circuit is in the low voltage mode, and wherein the second circuit asserts the halt signal at its output only in response to assertion of the output signal at its first input while the second signal having said value is asserted at its second input.

5,557,578

DYNAMIC MEMORY REFRESH CONTROLLER AND METHOD

James D. Kelly, Aptos, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed May 1, 1995, Ser. No. 432,919
Int. Cl.[6] G11C 7/00
U.S. Cl. 365—222 **36 Claims**



1. A refresh controller for a memory comprising:

a refresh circuit for generating refresh requests; and

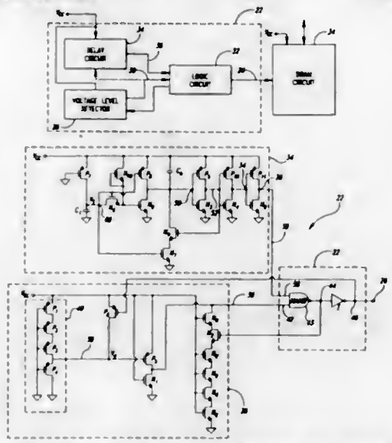
a refresh processor for issuing said refresh requests to the memory as high and low priority requests based on the number of pending refresh requests to the memory.

5,557,579

POWER-UP CIRCUIT RESPONSIVE TO SUPPLY VOLTAGE TRANSIENTS WITH SIGNAL DELAY

George B. Raad, and Stephen L. Casper, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jun. 26, 1995, Ser. No. 494,718
Int. Cl.[6] G11C 5/00
U.S. Cl. 365—226 **17 Claims**



1. A power-up circuit for driving an electronic device to an initial condition by providing a power-up signal to the electronic device, the electronic device being of the type to respond to the power-up signal by entering the initial condition after a time delay, the electronic device also being of the type to operate in an operational state when receiving a supply voltage greater than a threshold voltage, the electronic device further being of the type to be off when receiving a supply voltage equal to a quiescent voltage, the power-up circuit comprising:

a voltage level detector providing a first reset signal in response to detecting that the supply voltage is less than the threshold voltage;

a delay circuit providing a second reset signal in response to detecting that the supply voltage is beginning to rise from the quiescent voltage and at least until the time delay of the electronic device has passed; and

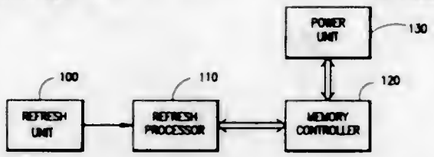
a logic circuit coupled to the voltage level detector and the delay circuit, the logic circuit providing the power-up signal to the electronic device in response to receiving at least one of the first and second reset signals, whereby the electronic device enters the initial condition after its time delay when the supply voltage begins to rise from the quiescent voltage and the electronic device also enters the initial condition when the supply voltage is less than the threshold voltage.

5,557,577

SYSTEM AND METHOD FOR PERFORMING WAKE-UP OPERATIONS TO A MEMORY

James D. Kelly, Aptos, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed May 1, 1995, Ser. No. 432,911
Int. Cl.[6] G11C 7/00
U.S. Cl. 365—222 **32 Claims**



1. A system for powering on a memory comprising:

a resetting unit for initiating a reset interval in response to powering on the memory; and

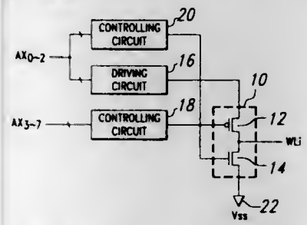
a refresh counter having a refresh count value which is set to an initialized refresh value upon completing said reset interval to ensure that a required number of refreshes is executed as high priority requests by the memory after powering on.

5,557,580

WORD LINE DRIVING CIRCUIT

Shigeki Numaga, Ami-machi; Shunichi Sukegawa, Tsukuba; Takashi Inui, Tshuchiura; Yukihide Suzuki, Akishima, and Kiyoshi Nakai, Ohme, all of Japan, assignors to Texas Instruments Incorporated, Dallas, Tex., and Hitachi, Ltd., Japan

Filed Aug. 18, 1994, Ser. No. 292,452
Claims priority, application Japan, Aug. 18, 1993, 5-225095
Int. Cl.[6] G11C 8/00;7/00
U.S. Cl. 365—230.06 **6 Claims**



1. A word line driving circuit for driving a word line in a memory array of a semiconductor memory device, wherein the word line is associated with a plurality of memory cells arranged in a row and having respective control terminals connected to the word line, said word line driving circuit comprising:

a first output transistor having first, second and control terminals, the first terminal of said first output transistor being connected to the word line;

a second output transistor having first, second and control terminals, the first terminal of said second output transistor being connected to the word line and the second terminal of said second output transistor being connected to a reference potential terminal for leading in electrical current;

an output transistor driving circuit connected to the second terminal of said first output transistor and providing voltage to the second terminal of said first output transistor during the time that said word line is to be driven for driving the word line and decreasing the voltage at the second terminal of said first output transistor to the potential for leading in electrical current after driving of said word line has ended;

a first control circuit connected to the control terminal of said first output transistor for turning on said first output transistor in order to drive said word line and returning said first output transistor to a non-conductive state after a first predetermined time following the ending of driving the word line;

a second control circuit connected to the control terminal of said second output transistor for rendering said second output transistor non-conductive during the time that said word line is being driven and turning on said second output transistor after a second predetermined time following the ending of driving the word line;

each of said output transistor driving circuit and said second control circuit being provided with a plurality of inputs for receiving in common a plurality of address signals as binary bits; and

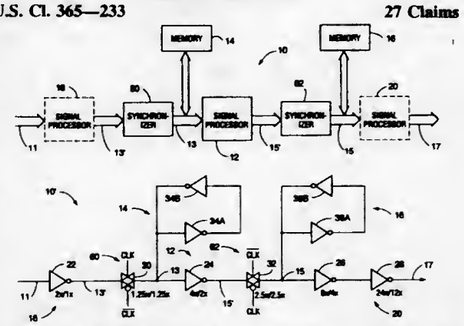
said first control circuit having a plurality of inputs for receiving a plurality of address signals as binary bits, the plurality of address signals received by the inputs of said first control circuit being different from the address signals received by the inputs of said output transistor driving circuit and said second control circuit but included in a common set of address signals therewith.

5,557,581

LOGIC AND MEMORY CIRCUIT WITH REDUCED INPUT-TO-OUTPUT SIGNAL PROPAGATION DELAY

Godfrey P. D'Souza, Santa Clara, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Apr. 10, 1995, Ser. No. 419,377
Int. Cl.[6] G11C 7/00
U.S. Cl. 365—233 **27 Claims**



1. An apparatus including a logic and memory circuit with reduced input-to-input signal propagation delay, said logic and memory circuit comprising:

a synchronizer stage for receiving one or more input logic signals and providing one or more synchronous logic signals corresponding thereto;

a logic stage, coupled to said synchronizer stage, for receiving and asynchronously processing said one or more synchronous logic signals and providing an asnychronous output logic signal in response thereto; and

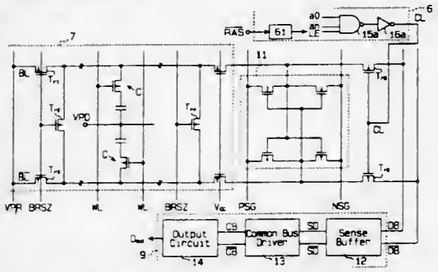
a storage element, coupled to said logic stage, for receiving a and holding said one or more synchronous logic signals simultaneously with said asynchronous processing thereof by said logic stage.

5,557,582

SEMICONDUCTOR MEMORY DEVICE INHIBITING INVALID DATA FROM BEING OUTPUT

Satoru Kawamoto, Kasugai, Japan, assignor to Fujitsu Limited, Kawasaki, and Fujitsu VLSI Limited, Kasugai, both of Japan

Filed Jun. 22, 1994, Ser. No. 264,076
Claims priority, application Japan, Sep. 9, 1993, 5-224546
Int. Cl.[6] G11C 8/00
U.S. Cl. 365—233.5 **4 Claims**



1. A semiconductor memory device which executes the control of data input/output in accordance with a plurality of control signals and address signals, comprising:

a plurality of memory cells storing cell information data;

word lines connected to respective said memory cells, for selecting one of said memory cells;

bit lines connected to respective said memory cells, for receiving cell information data read from the selected memory cell;

data buses connected to respective said bit lines;

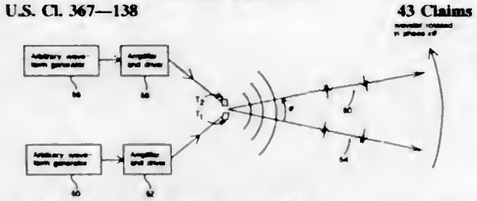
a column gate circuit for regulating supply of said cell information data from said bit lines to said respective data buses;

5,557,586

UNITARY CLOCK AND PICTURE FRAME

a column gate circuit for regulating supply of said cell information data from said bit lines to said respective data buses;
a sense buffer connected to said data buses and latching complementary signals, based on said cell information data;
a bus driver connected to said sense buffer and outputting complementary signals based on said complementary signals latched by, and input thereto from, said sense buffer; and
an output circuit connected to said bus driver and outputting output data, based on said complementary signals output by said bus driver and input thereto and on at least one of a sense amplifier enable signal and an address change detection signal, provided as control signals to said output circuit, said output circuit comprising:
an output terminal for outputting said output data,
a switching circuit which receives said complementary signals from said bus driver,
at least one output transistor, connected between said switching circuit and said output terminal, and
a logical product circuit having an output terminal connected to said switching circuit, a first input terminal for receiving an output control signal as one of said control signals provided to said output circuit, and a second input terminal for receiving one of said sense amplifier enable signal and said address change detection signal, said switching circuit being enabled in response to
an output signal from said logical product circuit, said output circuit maintaining said output terminal at a high-impedance state as long as said sense buffer does not receive cell information data from said memory cell.

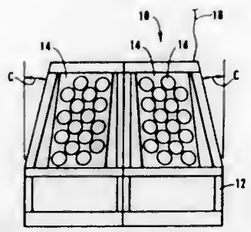
5,557,583
TRANSDUCER TO GENERATE PHASE-ENCODED WAVEFIELDS
Stephen T. Ha, 10855 Meadowglen La. #710, and Norman S. Neidell, 2929 Briarpark, Ste. 125, both of Houston, Tex. 77042
Filed Sep. 2, 1994, Ser. No. 300,643
Int. Cl.[6] G01S *15/00*
U.S. Cl. 367—138 **43 Claims**



1. An echo location system, comprising:
a transducer for generating a phase-encoded wavefield into a propagation medium, said wavefield having monotonically changing phase as a function of direction from the transducer;
means for reversing the phase increments of said wavefield as a function of said direction to form a second phase-encoded wavefield; and
a receiver for receiving reflections from each of the wavefields from an object in the medium.

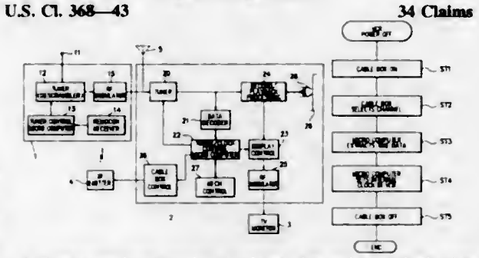
5,557,584
MODERATE DEPTH UNDERWATER SURVEILLANCE SYSTEM
Daniel Suchman, Goleta, Calif., assignor to Sonatech, Inc., Santa Barbara, Calif.
Filed Aug. 8, 1995, Ser. No. 512,529
Int. Cl.[6] H04B *11/00*
U.S. Cl. 367—131 **21 Claims**

1. An active sonar system having a plurality of detection sites selectively positioned on the seafloor for the detection of submerged objects in moderate depth waters, each site comprising:



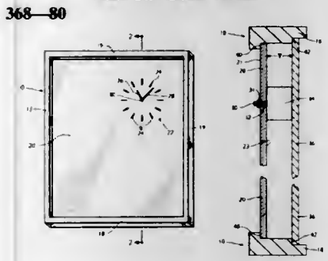
a support platform;
a first sub-array, said first sub-array being mounted on said platform and including a plurality of transducers for transmitting and receiving acoustic signals;
a second sub-array, said second sub-array being mounted on said platform and including a plurality of transducers for transmitting and receiving acoustic signals;
means for activating said first and said second sub-arrays to transmit an acoustic signal along a predetermined path;
means for generating a site report by comparing echos of said transmitted acoustic signal from said submerged object received at said first sub-array with echos of said transmitted acoustic signal from said submerged object received at said second sub-array, said report including a range and a bearing of said submerged object from said site; and
means for verifying said site report with reports from other said sites in said system.

5,557,585
BROADCAST SIGNAL RECEIVER WHICH AUTOMATICALLY SETS AN INTERNAL CLOCK
Tomoyuki Hanai, Kanagawa; Kimio Kakurai, and Kenji Hamamoto, both of Tokyo, all of Japan, assignors to Sony Corp., Tokyo, Japan
Filed Aug. 22, 1994, Ser. No. 293,917
Claims priority, application Japan, Aug. 25, 1993, 5-210605; Sep. 7, 1993, 5-222352
Int. Cl.[6] G04G *9/00*
U.S. Cl. 368—43 **34 Claims**



1. Broadcast signal receiver having an internal clock indicating an internal clock time, comprising:
means for receiving a plurality of broadcast signals;
means for receiving a power-off command;
tuning means coupled to said means for receiving a plurality of broadcast signals and responsive to the reception of said power-off command tunable to a predetermined one of said broadcast signals having time data indicating a local time and supplying said predetermined one of said broadcast signals as a tuned output signal;
means coupled to said tuning means for extracting said time data from said tuned output signal;
clock setting means coupled to said means for extracting and responsive to said extracted time data for automatically setting said internal clock to said local time; and
means for turning said broadcast signal receiver off when said power-off command is received and after said internal clock is automatically set.

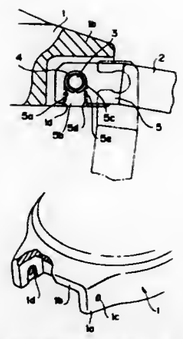
5,557,586
UNITARY CLOCK AND PICTURE FRAME
Velvet J. McCuan, and Gene A. McCuan, both of 8045 N. Hwy. 97, Sp. 13, Terrebonne, Oreg. 97760
Filed Jan. 6, 1995, Ser. No. 369,721
Int. Cl.[6] G04B *19/04*
U.S. Cl. 368—80 **5 Claims**



1. A unitary clock and picture frame assembly wherein said clock and the area of said frame for receiving a picture occupy the same space within the frame and the clock is movable to any one of several predetermined locations within the frame, said frame assembly comprising a frame member or members enclosing said space for said picture and said clock, said frame having a removable transparent front panel located in the front portion of said frame and a removable rear panel located in the rear portion of said frame, said removable transparent front panel having an outer planar face and an inner planar face, said inner planar face of said removable transparent front panel being adapted to receive a picture, said clock comprising a movement housing attached to said transparent front panel, said movement housing being located entirely within said frame and between said removable transparent front panel and said removable rear panel, said movement housing having a drive stem assembly extending outwardly therefrom, said removable transparent front panel having an opening extending therethrough for receiving said drive stem assembly, the outer end of said stem extending through said opening and beyond the outer planar face of said removable transparent front panel, hand members located on the outer portion of said drive stem assembly and beyond the outer planar face of said removable transparent front panel, and non-numeric hour indicia forming a clock face located on said removable transparent front panel in an off-center location and in timekeeping alignment with said hand members, said non-numeric hour indicia being of such a configuration that they continue to constitute a readable clock face when said transparent front panel is either rotated, removed and reversed, or both rotated and reversed, to a position such that one of said non-numeric indicia is located in the twelve o'clock position.

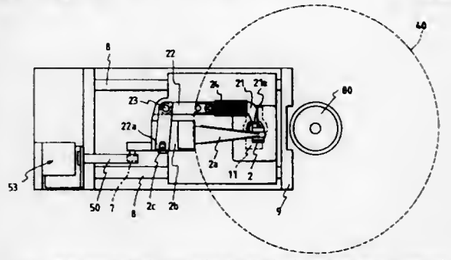
5,557,587
CONNECTING STRUCTURE FOR A WRIST WATCH
Susumu Tosaka, and Junsuke Kashikie, both of Tanashi, Japan, assignors to Citizen Watch Co., Ltd., Japan
Filed Dec. 27, 1994, Ser. No. 363,928
Int. Cl.[6] G04B *37/16*; A44C *5/00*
U.S. Cl. 368—282 **12 Claims**

1. A connecting structure for connecting a member of a wrist watch to another member of the wrist watch, comprising:
a pipe which is compressible in a radial direction thereof and attached to one of the members, positioned in a lateral direction with respect to a longitudinal direction of a band of the wrist watch;
a groove formed in the other member in the lateral direction so as to be engaged with the pipe,



the groove having an opening formed on the underside of the member, an introducing portion communicating with the opening, a groove portion having an approximately circular section and formed at an innermost end of the groove, each of the opening and introducing portion having a width smaller than an outer diameter of the pipe, and larger than an outer diameter of the pipe when compressed, the groove portion having an inner diameter larger than the outer diameter of the pipe, whereby the pipe may be inserted in the groove portion from the opening passing through the introducing portion.

5,557,588
MAGNETOOPTICAL RECORDING/REPRODUCING APPARATUS WITH BIAS MAGNETIC FIELD GENERATION DEVICES FOR MAGNETIC MODULATION RECORDING AND OPTICAL MODULATION RECORDING
Makoto Shiho, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jun. 1, 1994, Ser. No. 251,959
Claims priority, application Japan, Jun. 3, 1993, 5-156406; Jun. 3, 1993, 5-156407
Int. Cl.[6] G11B *13/04; 11/12*
U.S. Cl. 369—13 **4 Claims**



1. A magnetooptical recording/reproducing apparatus comprising:
an optical head for forming a beam spot on a recording medium;
a floating type magnetic head for applying a bias magnetic field to the recording medium to effect magnetic field modulation recording;
a pivotable supporting member for supporting said magnetic head;
retreating means for causing said supporting member to pivot so as to retreat said magnetic head away from the recording medium in a direction substantially perpendicular to a surface of the recording medium;
magnetic field applying means, movable along the surface of the recording medium, for applying a bias magnetic field to the recording medium to effect light modulation recording; and
coupling means for mechanically coupling said supporting member and said magnetic field applying means, said cou-

pling means causing said magnetic field applying means to move in association with movement of said supporting member, wherein said coupling means moves said magnetic field applying means to a position of the beam spot on the recording medium when said retreating means retreats said magnetic head away from the recording medium, and said coupling means retreats said magnetic field applying means away from the position of the beam spot on the recording medium when said magnetic head is not retreated away from the recording medium by said retreating means.

5,557,589

DISC RECORDING AND/OR REPRODUCING APPARATUS THAT POSITIONS THE MAGNETIC HEAD IN RESPONSE TO A TYPE OF DISC

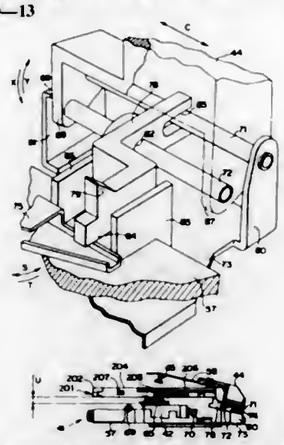
Hiroshi Mukawa, and Hiroshi Eto, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 9,294, Jan. 26, 1993, abandoned. This application Oct. 4, 1994, Ser. No. 317,846

Claims priority, application Japan, Jan. 27, 1992, 4-034049; Jan. 27, 1992, 4-034050; May 26, 1992, 4-157309; May 26, 1992, 4-158820

Int. Cl.[6] **G11B** *33/02;11/00*

U.S. Cl. 369—13 **24 Claims**



14. A disc recording and/or reproducing apparatus for operating on a disc housed within a disc cartridge, the disc cartridge having one of a plurality of disc type recesses, each disc type recess indicating a type of disc and having a bottom side, the disc recording and/or reproducing apparatus comprising:

a pivot shaft;

an optical pickup unit radially movable across the disc that radiates a laser light beam on a recording surface of the disc the optical pickup unit comprising a connecting arm having a pair of upstanding bent portions, wherein the pivot shaft is connected between the pair of upstanding bent portions, and a pair of upstanding tabs that limit the movement of the disc type detection arm along the axis of the pivot shaft one of the upstanding bent portions having a position limiting tab;

a magnetic head that applies an external magnetic field to the disk;

a magnetic head supporting member rotatably connected to the optical pickup unit by the pivot shaft so that the magnetic head can move towards and away from the disc between a first position proximate to the disc and a second position spaced-apart from the disc, and so that the magnetic head moves in unison with the optical pickup unit the magnetic head supporting member having a limiter shaft the limiter shaft contactable with the position limiting tab for limiting rotation of the magnetic head supporting member around the pivot shaft;

biasing means for biasing the magnetic head supporting member in the second position; and

a disc type detection arm engaged to the pivot shaft and rotatably supported by the limiter shaft, that contacts the bottom side of the disc type recess in the disc cartridge when the disc cartridge is loaded into the recording and/or reproducing apparatus, that moves the magnetic head supporting member towards the disc from the second position to the first position in response to the detection arm contacting the bottom side when the disc type recess indicates a first type of disc, and that moves the magnetic head supporting member towards the disc from the second position to a third position intermediate between the first position and the second position in response to the detection arm contacting the bottom side when the disc type recess indicates a second type of disc, the disc type detection arm including a C-shaped cutout that is positioned around the pivot shaft so that the cutout can rotate around the pivot shaft and axially along the pivot shaft,

wherein the disc type detection and the supporting member rotate around the pivot shaft in unison when the detection arm contacts the disc type recess,

wherein the magnetic head supporting member further includes a pair of tabs, and wherein the limiter shaft is connected between the pair of tabs and extends beyond one of the tabs, the limiter shaft being substantially parallel with the pivot shaft.

5,557,590

AUTO CHANGER CAPABLE OF RECORDING/REPRODUCING INFORMATION SIGNALS ON A SELECTIVE DISC-SHAPED RECORDING MEDIUM

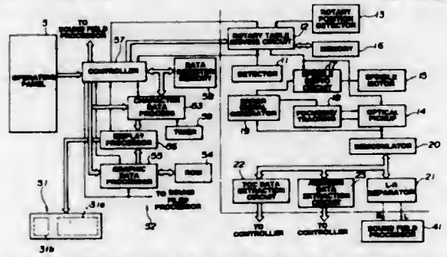
Shuichi Matsumoto; Akira Shinada, both of Kanagawa, and Tetsuya Shiroishi, Chiba, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 31, 1994, Ser. No. 251,131

Claims priority, application Japan, May 31, 1993, 5-152900; May 31, 1993, 5-152902

Int. Cl.[6] **G11B** *17/22*

U.S. Cl. 369—30 **26 Claims**



1. A recording/reproducing apparatus for a disc-shaped recording medium, said recording medium having an information recording region for recording information signals and a table-of-contents region having recorded thereon at least number data and title data of the information signals recorded in said information recording region, comprising

a recording/reproducing unit having loaded therein a plurality of disc-shaped recording media arranged co-planarly in a side-by-side relation, said unit recording the information signals on a selected one of said disc-shaped recording media and reproducing the information signals from the selected disc-shaped recording medium, and

a display unit having a display operation thereof controlled by an output signal from said recording/reproducing unit, said display unit having a first display region for displaying the data recorded in said table-of contents region and a second display region having a display configuration corresponding to an arrangement of said plurality of disc-shaped recording media loaded in said recording/reproducing unit.

5,557,591

TRACK COUNTING SERVO CIRCUIT AND METHOD THEREFOR

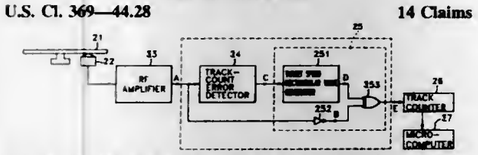
Kim Gee-bong, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed May 26, 1994, Ser. No. 249,907

Claims priority, application Rep. of Korea, May 27, 1993, 93-9360

Int. Cl.[6] **G11B** *7/00*

U.S. Cl. 369—44.28 **14 Claims**



1. In an optical disk driving apparatus track counting servo circuit of the type having a pick up for reading track count signals and other data from a disk, a means for counting the track count signals read from the disk, and a microcomputer for controlling the movement of said pick up relative to said disk in response to a count from said track counting means and target track information, the improvement comprising:

track count signal error detecting means responsive to a first track count signal read by said pick up for detecting errors in an error portion of said first track count signal; and

track count signal compensating means for generating a compensated track count signal according to said errors detected by said track count signal error detecting means and said first track count signal and for applying said compensated track count signal to said track count means so that said track count means counts said compensated track count signal.

5,557,592

REPRODUCING APPARATUS FOR REPRODUCING INFORMATION FROM A RECORDING MEDIUM WITH PIT EDGES SHIFTED IN A STEP-WISE FASHION

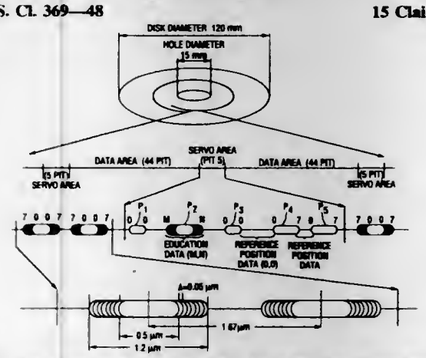
Seiji Kobayashi, Tokyo; Hiroshige Okamura, Kanagawa, and Hisayuki Yamatsu, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 133,124, Dec. 6, 1993. This application May 31, 1995, Ser. No. 445,571

Claims priority, application Japan, Feb. 14, 1992, 4-59710; Jul. 10, 1992, 4-207074

Int. Cl.[6] **G11B** *7/00*

U.S. Cl. 369—48 **15 Claims**



1. An information reproducing apparatus for reproducing recorded information from an information recording medium in which digital information is recorded by shifting in a step-wise fashion edge positions of an information pit from a predetermined reference position within a range corresponding to a predetermined shift period smaller than a transition period of a reproduced signal determined in response to a predetermined transfer characteristic, comprising:

an optical detection system, having the predetermined transfer characteristic used in determining the step-wise shift of the edge positions of the information pits during recording, for scanning said information recording medium along information pit rows with a light beam, detecting, by means of light reflected from the information recording medium, edge transitions of the information pits, and generating a corresponding reproduced signal;

clock generating means for generating a clock synchronized in phase with said reference position on the basis of the reproduced signal obtained from said optical detection system;

level detection means for detecting a reproducing level in said transition period of said reproduced signal at a timing defined by said clock;

judging means for judging recorded information corresponding to the edge positions of said information pit on the basis of said reproducing level; and

bias eliminating means for subtracting a reproducing level detected from the reference pit in which a shift amount of an edge position is set to a minimum value from the reproduced level detected by said level detection means, wherein said bias eliminating means has a defect eliminating function for subtracting an average value of respective value except a maximum value and a minimum value of a plurality of reproducing levels detected from a plurality of reference pits in which an edge position shift amount is set to a minimum value from the reproducing level detected by said level detecting means.

5,557,593

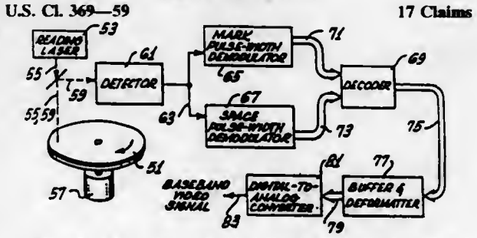
SYSTEM FOR RECORDING DIGITAL INFORMATION IN A PULSE-LENGTH MODULATION FORMAT

Jack H. Bailey, Villa Park, Calif., assignor to DiscoVision Associates, Irvine, Calif.

Division of Ser. No. 119,655, Sep. 13, 1993, which is a continuation of Ser. No. 75,275, Jun. 11, 1993, Pat. No. 5,321,680, which is a continuation of Ser. No. 948,267, Sep. 21, 1992, Pat. No. 5,253,244, which is a continuation of Ser. No. 825,640, Jan. 24, 1992, abandoned, which is a continuation of Ser. No. 645,638, Jan. 25, 1991, Pat. No. 5,084,852, which is a continuation of Ser. No. 499,217, Mar. 16, 1990, Pat. No. 5,003,526, which is a continuation of Ser. No. 782,156, Oct. 2, 1985, abandoned, which is a continuation of Ser. No. 169,238, Jul. 16, 1980, abandoned. This application May 25, 1994, Ser. No. 249,245

Int. Cl.[6] **G11B** *7/00*

U.S. Cl. 369—59 **17 Claims**



1. An optical disc player for optically reading digital information from an information-containing disc, the optical disc player comprising:

a mark and space detector which scans the disc to produce a playback signal that varies in accordance with a pattern of marks and spaces recorded on the disc, said playback signal being indicative of the pattern of marks and spaces on the disc and having marks and spaces with lengths which vary discretely between a minimum length and a maximum length to represent the digital information, said maximum length being greater than double the minimum length;

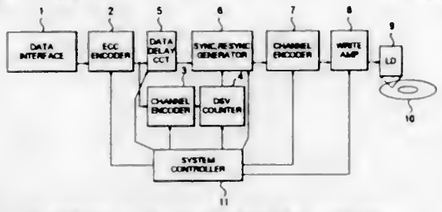
a demodulator, responsive to the playback signal, which detects those lengths of the successive marks and spaces when they are no greater than the maximum length and no less than the minimum length, to produce a succession of: 1) playback

output signals representative of a particular succession of decoded signals to which the marks and spaces correspond, and 2) a signal indicative of a position on the disc where the mark and space detector is scanning.

5,557,594
METHOD AND APPARATUS FOR RECORDING DATA ON RECORDING MEDIUM

Nobuhiro Chiba, and Yasuo Iwasaki, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 21, 1994, Ser. No. 360,349
Claims priority, application Japan, Dec. 21, 1993, 5-322158
Int. Cl.[6] G11B *7/013*
U.S. Cl. 369—59 **14 Claims**

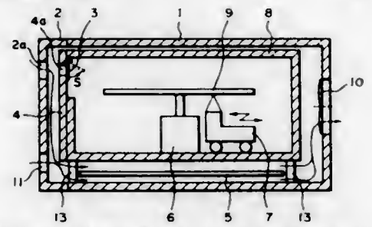


1. An apparatus for processing digital data comprising:
first modulating means for modulating digital data;
DSV computing means for computing a DSV for every predetermined unit of modulated digital data modulated by said first modulating means;
synchronization signal adding means for selectively adding to each predetermined unit of said digital data a first synchronization signal or a second synchronization signal comprised of said first synchronization signal with at least a final bit inverted in accordance with the results of the computation of said DSV computing means; and
second modulating means, connected to said synchronization signal adding means, for performing the same modulation as said first modulating means on said digital data based on said synchronization signal.

5,557,595
DRIVE FOR AN OPTICAL INFORMATION RECORDING MEDIUM

Koichiro Ishii, Yokosuka, Japan, assignor to Nikon Corporation, Tokyo, Japan

Division of Ser. No. 152,920, Nov. 16, 1993, Pat. No. 5,426,628, which is a continuation of Ser. No. 794,866, Nov. 19, 1991, abandoned. This application May 2, 1995, Ser. No. 433,532
Claims priority, application Japan, Nov. 28, 1990, 2-328219
Int. Cl.[6] G11B *33/14*
U.S. Cl. 369—77.1 **3 Claims**

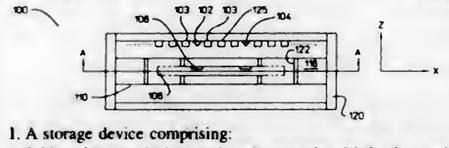


1. A drive apparatus for an optical information recording medium comprising:
a medium holder for holding the optical information recording medium;
a main casing having a medium insertion opening through which the medium is inserted, the main casing containing an optical head inside;
a fan provided on a portion of the main casing for ventilating the interior of the main casing; and
a box having a sealed structure provided in the main casing and having a medium insertion portion with a door which is adapted to be opened/closed;
wherein the medium holder and the optical head are located in the interior of the box, and heat-generating components of the apparatus are located exteriorly of the box; and
wherein said door of said medium insertion portion is kept closed while said medium is located in the interior of the box and is opened during insertion and ejection of said medium through said medium insertion portion.

5,557,596
ULTRA-HIGH DENSITY STORAGE DEVICE

Gary Gibson, 123 Seale Ave., Palo Alto, Calif. 94301; Theodore I. Kamins, 4132 Thain Way, Palo Alto, Calif. 94306; Marvin S. Keshner, 321 Easy St. #2, Mountain View, Calif. 94043; Steven L. Neberhuis, 35923 Blair Pl., Fremont, Calif. 94536; Craig M. Perlov, 1815 Chula Vista Dr., Belmont, Calif. 94002, and Chung C. Yang, 19550 Braemer Ct., Saratoga, Calif. 95070

Continuation-in-part of Ser. No. 406,628, Mar. 20, 1995, abandoned. This application Jul. 12, 1995, Ser. No. 501,432
Int. Cl.[6] G11B *7/00; G11C 11/42*
U.S. Cl. 369—101 **25 Claims**



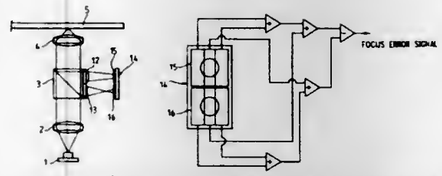
1. A storage device comprising:
a field emitter made by semiconductor microfabrication techniques to generate an electron beam current; and
a storage medium in close proximity to the field emitter, the storage medium having a storage area for storage, the storage area being in one of a plurality of states to represent the information stored in that storage area;
such that:
an effect is generated when the electron beam current bombards the storage area;
the magnitude of the effect depends on the state of the storage area; and
the information stored in the storage area is read by measuring the magnitude of the effect.

5,557,597
FOCUS ERROR DETECTOR

Chul-woo Lee, and Jang-hoon Yoo, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyunki-do, Rep. of Korea

Filed Dec. 13, 1994, Ser. No. 357,240
Claims priority, application Rep. of Korea, Jul. 30, 1994, 94-18932
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—112 **4 Claims**

1. A focus error detector for an objective lens for focusing incident light onto an optical disk, comprising:
a beam splitter for splitting light reflected from the optical disk and passing through the objective lens from incident light incident to the objective lens;
two focusing lenses each having a focal length different from the other and each for receiving light reflected from the optical disk via said beam splitter and focusing the received light,

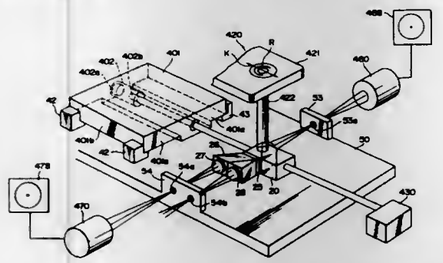


said two focusing lenses being attached on an emitting surface for emitting the received light;
two ternary photo-detectors each for receiving the light respectively focused by said two focusing lenses; and
circuit means for detecting a signal representing the degree of the focus error of said objective lens with respect to said optical disk from said two ternary photo-detectors.

5,557,598
BEAM SPLITTER INSPECTION AND APPARATUS METHOD

Masahiro Oono; Tsuyoshi Itoh; Katsuki Hayashi; Toshiyuki Kase; Masahiko Sasaki; Hiroshi Yamamoto, and Isao Okuda, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 142,047, Oct. 28, 1993, Pat. No. 5,410,532, which is a division of Ser. No. 920,924, Jul. 28, 1992, Pat. No. 5,317,144, which is a division of Ser. No. 574,071, Aug. 29, 1990, Pat. No. 5,157,459. This application Jan. 10, 1995, Ser. No. 370,656
Claims priority, application Japan, Aug. 29, 1989, 1-225625; Aug. 29, 1989, 1-225626; Aug. 29, 1989, 1-225629; Aug. 29, 1989, 1-225630; Oct. 2, 1989, 1-258119
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—112 **30 Claims**

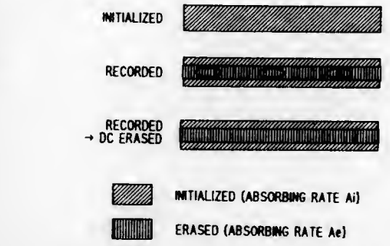


1. A method of inspecting a beam splitter adapted for use in splitting a laser beam reflected by an optical disk, said method comprising:
positioning a beam splitter to be inspected at a predetermined position;
providing a photo detector;
projecting a plurality of images through the beam splitter to be inspected and onto the photo detector; and
detecting locations of the plurality of images on the photo detector to determine an accuracy characteristic of the beam splitter to be inspected.

5,557,599
METHOD FOR INITIALIZING A PHASE-CHANGE TYPE OF OPTICAL DISK UTILIZING EITHER ABSORPTION RATES OR MARK LENGTHS

Shuichi Ohkubo, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Apr. 13, 1995, Ser. No. 421,490
Claims priority, application Japan, Apr. 15, 1994, 6-076786; Dec. 19, 1994, 6-315243
Int. Cl.[6] G11B *7/00;7/24*
U.S. Cl. 369—116 **9 Claims**



1. A method for initializing an optical disk on which information is recorded, erased and reproduced by changing phase conditions of portions of said disk between crystal and non-crystal phase conditions, comprising the steps of:
providing a recording layer;
crystallizing a plurality of record regions of said recording layer with a corresponding plurality of light beams, each of said plurality of light beams having a different strength and irradiating only a respective one of said record regions;
repeatedly recording and erasing data in said record regions using another plurality of light beams irradiating only respective record regions, each of the light beams of said other plurality having a strength that is equal to the strength of the light beam used to crystallize the respective record region being irradiated by the light beam of the other plurality;
measuring second harmonics distortions of said record regions and determining based thereon one record region having uniform second harmonics distortions; and
irradiating initializing light onto the recording layer for initializing the optical disk, the initializing light having a strength that is equal to the strength of the light beams used to irradiate the one record region having uniform second harmonics distortion, whereby to ensure that absorbing rates "Ai" of a given initialized crystal region and "Ae" of a given erased crystal region of said optical disk satisfy the following formula:

$$|Ai-Ae|/Ae<0.05.$$

5,557,600
OPTICAL RECORDING MEDIUM WITH TRAYS LOCATED SO THAT MULTIPLE TRACKS CAN BE SCANNED SIMULTANEOUSLY

Hideyoshi Horimai, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 75,828, Jun. 11, 1993, Pat. No. 5,416,766. This application Sep. 15, 1994, Ser. No. 306,651
Claims priority, application Japan, Jun. 15, 1992, 4-178887
Int. Cl.[6] G11B *7/007*
U.S. Cl. 369—116 **4 Claims**

1. An optical recording medium where tracks are formed on a recording surface, each track being centered respectively about a track center, at such a track pitch that at least two tracks are

scanned simultaneously by a spot of a light beam irradiated onto the recording surface, each track having wobble pits formed at

5,557,604
CELL DELAY ABSORBING CIRCUIT

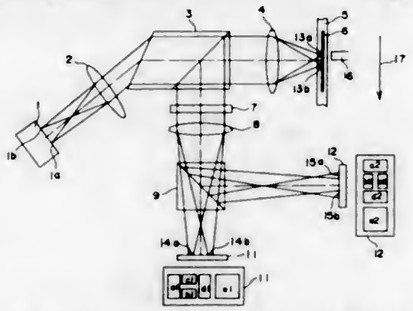
scanned simultaneously by a spot of a light beam irradiated onto the recording surface, each track having wobble pits formed at positions deviated from the track center, a multiplicity of pits formed exactly on the track center, and a first mirror portion with no pits formed between the wobble pits and the multiple pits which are disposed successively; wherein signal-processed data are recorded on each track in such a manner that the data can be detected therefrom on the basis of a push-pull signal and a sum signal obtained by scanning a preceding track and a following adjacent track with the light beam irradiated onto the recording surface.

5,557,601

OPTICAL INFORMATION RECORDING/REPRODUCING METHOD AND APPARATUS IN WHICH A FIEST OPTICAL SPOT PERFORMS FOCUSING, TRACKING, ERASING AND RECORDING AND A SECOND OPTICAL SPOT PERFORMS TWO REPRODUCING MODES

Koichiro Nishikawa, Takasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1994, Ser. No. 228,398
Claims priority, application Japan, Apr. 22, 1993, 5-117660
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—121 **12 Claims**



1. An optical information recording and/or reproducing apparatus comprising:

first light spot forming means for forming a first optical spot on an information recording medium, for performing focusing error detection, tracking error detection, erasing of old information and recording of new information; and

second light spot forming means for forming a second optical spot on the information recording medium, for performing reproduction of newly recorded information and for normal reproduction of recorded information.

5,557,602

OPTICAL RECORDING MEDIUM, RECORDING AND REPRODUCING METHOD AND TRACKING ERROR GENERATING METHOD

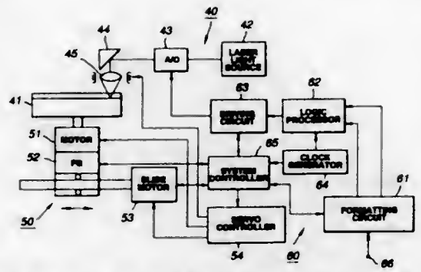
Hideyoshi Horimai, and Goro Fujita, both of Kanagawa, Japan, assignors to Sony Corporation, Japan

Continuation of Ser. No. 133,113, Oct. 12, 1993, abandoned.
This application Jun. 5, 1995, Ser. No. 462,135
Claims priority, application Japan, Feb. 19, 1992, 4-069736; May 25, 1992, 4-157434; Jun. 18, 1992, 4-182847
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—124 **12 Claims**

1. An apparatus for recording onto an optical recording medium, comprising:

storage means for storing data recorded on a preceding recording track of the optical recording medium;

logical processing means for generating data to be recorded on a recording track succeeding the preceding recording track by logical processing of only input data and the stored data; and



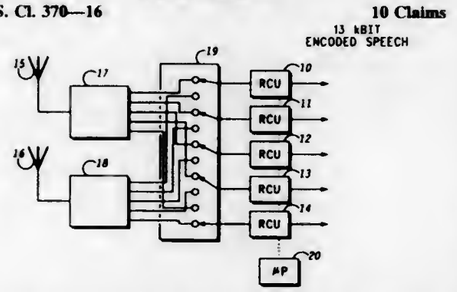
recording means for recording the generated data output from the logical processing means onto the succeeding recording track.

5,557,603

RADIO COMMUNICATIONS APPARATUS WITH DIVERSITY

Ian Barlett, Petersfield, and Peter W. D. Bishop, Swindon, both of Great Britain, assignors to Motorola, Inc., Schaumburg, Ill.

PCT No. PCT/EP92/02630, § 371 Date Oct. 19, 1994, § 102(e) Date Oct. 19, 1994, PCT Pub. No. WO93/13605, PCT Pub. Date Jul. 8, 1993
PCT Filed Nov. 16, 1992, Ser. No. 256,044
Claims priority, application United Kingdom, Dec. 23, 1991, 9127292
Int. Cl.[6] H04B 7/08
U.S. Cl. 370—16 **10 Claims**



1. Radio communications apparatus for receiving a plurality of calls comprising:

a plurality of receivers tunable to a plurality of frequencies,

first and second antennas,

switching means for switching the plurality of receivers to selected ones of the first and second antennas and

control means coupled to the plurality of receivers for tuning the receivers to receive calls, the control means comprising:

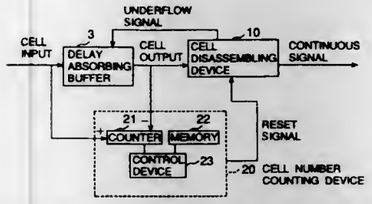
means for identifying a received call of low quality received through the first of the antennas and through a first of the plurality of receivers, means for identifying a spare receiver that is not required for receipt of a call, means for causing the switching means to switch the spare receiver to receive the call through the second antenna, means for tuning the spare receiver to the frequency of the call of low quality and means for diversity combining the calls through the first receiver and the spare receiver.

5,557,604

CELL DELAY ABSORBING CIRCUIT

Motoharu Usumi, and Takaya Yamamoto, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 15, 1994, Ser. No. 290,474
Claims priority, application Japan, Feb. 4, 1994, 6-012416
Int. Cl.[6] H04J 3/14
U.S. Cl. 370—17 **7 Claims**



1. A device for receiving cells with varying time delays and for reconstructing a continuous signal from a sequence of the cells, said device comprising:

delay absorbing means for receiving cells, temporarily storing said cells, and outputting said cells at scheduled equal intervals after absorbing a variation in time delays of said cells;

cell disassembling means for receiving and reconstructing a continuous signal by processing said cells outputted from said delay absorbing means; and

cell counting means for counting a number of cells stored in said delay absorbing means and sending to said cell disassembling means a reset signal when said counted number of the cells exceeds a predetermined number;

said cell disassembling means, upon receiving said reset signal, discarding a cell being processed and sending to said delay absorbing means a request for a new cell so that said delay absorbing means sends to said cell disassembling means one of said cells upon receipt of said request ahead of said scheduled equal intervals and said cell disassembling means starts processing the new cell when said counted number of the cells exceeds said predetermined number, thereby reducing a time delay of said continuous signal.

5,557,605

METHOD FOR PROVIDING CALLER DATA IN A TIME DIVISION MULTIPLEXED WIRELESS COMMUNICATION SYSTEM

Gary W. Grube, Barrington; Brian K. Bunkenburg, Chicago, and Marc C. Naddell, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 3, 1994, Ser. No. 333,919
Int. Cl.[6] H04B 1/56
U.S. Cl. 370—29 **21 Claims**

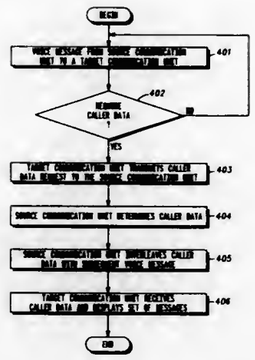
1. In a TDM wireless communication system that includes a plurality of communication units, a plurality of wireless communication resources, and a central controller that allocates the plurality of wireless communication resources among the plurality of communication units, a method for providing caller data, the method comprising the steps of:

at the central controller:

a) during transmission of a voice message from a source communication unit of the plurality of communication units to a target communication unit of the plurality of communication units, receiving, via a wireless communication resource of the plurality of wireless communication resources, a caller data request regarding the source communication unit from the target communication unit;

b) determining caller data of the source communication unit responsive to the caller data request; and

c) interleaving, via a further wireless communication resource of the plurality of wireless communication resources, the caller data with the voice message.

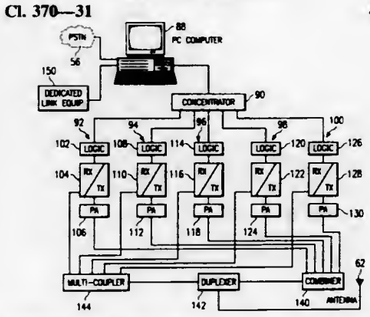


5,557,606

ROUTING OF VOICE COMMUNICATION AT A CELL SITE IN A LAND MOBILE RADIO SYSTEM

Billy G. Moon, Southlake, and Cap V. Nguyen, Dallas, both of Tex., assignors to Uniden America Corporation, Fort Worth, Tex.

Filed Jun. 10, 1994, Ser. No. 258,751
Int. Cl.[6] H04B 7/204
U.S. Cl. 370—31 **4 Claims**



1. A method for routing voice communications at a cell site in a land mobile radio communication system wherein the cell site has a plurality of repeaters each having a transmitter and a receiver, the method comprising the steps of:

producing a receive signal from each of a plurality of said receivers,

digitizing at least a voice component of each said receive signal to produce a plurality of serial digital receive signals corresponding respectively to said receivers,

combining said serial digital receive signals to produce a multiplex serial receive signal which has a plurality of time slots assigned respectively to said receivers,

switching the data between said time slots of said serial digital receive signal to produce a multiplex serial transmit signal which has a plurality of time slots which are assigned respectively to said receivers,

extracting the data from time slots of said multiplex serial transmit signal to produce a plurality of respective serial digital transmit signals corresponding respectively to said transmitters,

converting each of said serial digital transmit signals into a corresponding analog transmit signal, and

providing said analog transmit signals to the corresponding respective ones of said transmitters.

5,557,607

process means for sequentially performing the frame synchronization process and the cell synchronization process with

handle BM sets of said lines where B is the integer part of the result of the division S/N and where each set comprises all corre-

5,557,607

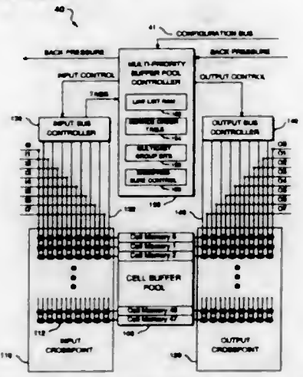
METHODS AND APPARATUS FOR ENQUEUEING AND DEQUEUEING DATA CELLS IN AN ATM SWITCH FABRIC ARCHITECTURE

Brian D. Holden, Sunnyvale, Calif., assignor to Network Synthesis, Inc., and Integrated Telecom Technology, Inc., both of Santa Clara, Calif.

Division of Ser. No. 235,006, Apr. 28, 1994. This application May 11, 1995, Ser. No. 439,147

Int. Cl.[6] H04L *12/64*

U.S. Cl. 370—58.2 **11 Claims**



4. A switching device for transmitting a data cell in a network, the network having a plurality of network destinations coupled thereto, the data cell comprising a first data field, the first data field corresponding to a first group of network destinations to which the data cell is to be transmitted, the switching device comprising:

a plurality of outputs;

a queue for temporarily storing the data cell; and

a memory for storing a plurality of data words, each data word comprising a plurality of first bits, each of said first bits corresponding to a different one of said outputs;

wherein the data cell is placed on selected ones of the outputs for transmission to the first group of network destinations, the selected ones of the outputs corresponding to first bits which have been set in a first data word selected from the plurality of data words, the first data word being selected in response to the first data field in the data cell.

5,557,608

METHOD AND APPARATUS FOR TRANSMISSION OF HIGH PRIORITY TRAFFIC ON LOW SPEED COMMUNICATION LINKS

Jean Calvignac, La Gaude; Claude Galand; Didier Giroir, both of Cagnes sur Mer; Gerald Lebizay, Vence; Daniel Mauduit, Nice, and Victor Spagnol, Cagnes sur Mer, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1995, Ser. No. 446,997

Claims priority, application European Pat. Off., May 25, 1994, 94480047

Int. Cl.[6] H04L *12/56*

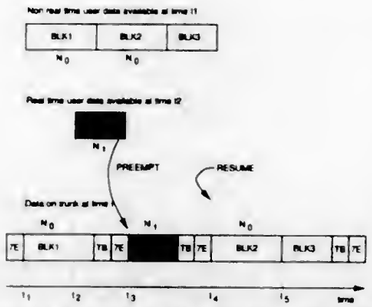
U.S. Cl. 370—60 **9 Claims**

6. For use in a data packet communication system having nodes and links between nodes for transporting low-priority packets in blocks of one or more bytes and high-priority packets, a method of interleaving high-priority data with low-priority data, said method comprising the steps of:

a) determining whether the data currently being transported is a block of low-priority data or a high-priority packet;

b) detecting the presence of a high-priority packet awaiting transport;

c) where the data currently being transported is a block of low-priority data, determining whether the block is part of a



low-priority packet that had previously been preempted to permit at least one high-priority packet to be transported;

d) generating a trailer byte having bit patterns identifying the priority of the data currently being transported and, where the data is part of a low-priority packet, whether it is to be preempted to permit transport of a waiting high-priority packet; and

e) inserting the trailer byte into a predetermined position relative to the data currently being transported.

5,557,609

SWITCHING APPARATUS FOR ATM

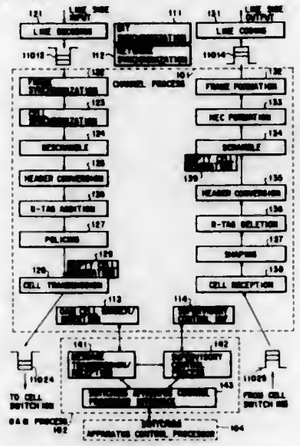
Yasuro Shobatake, Kawasaki; Keiji Tsunoda; Yoshiaki Takabatake, both of Yokohama; Mikio Hashimoto, Ichikawa; Taketoshi Tujita; Junichi Takeda, both of Yokohama, and Narito Kimura, Ichikawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 30, 1994, Ser. No. 351,098

Claims priority, application Japan, Dec. 1, 1993, 5-301489; Jun. 24, 1994, 6-143568; Sep. 16, 1994, 6-246806

Int. Cl.[6] H04L *12/66*

U.S. Cl. 370—60.1 **22 Claims**



1. A switching apparatus comprising:

an input port to which information data associated with an ATM cell is input;

storage means for storing the information data input via said input port;

procedure information means for outputting procedure information indicating a procedure for sequentially performing frame synchronization process for finding each frame of the information data read out from said storage means and ATM cell synchronization process for checking a cell structure;

process means for sequentially performing the frame synchronization process and the cell synchronization process with respect to the information data read out from said storage means in accordance with the procedure information from said procedure information means; and

an output port for outputting information data processed by said process means.

5,557,610

CELL SWITCH FABRIC CHIP

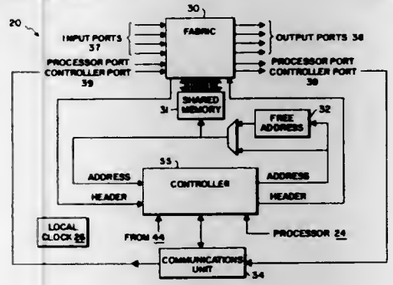
Costas Calamvokis, Bishopston, and David Banks, Redland, both of England, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 14, 1995, Ser. No. 422,141

Claims priority, application European Pat. Off., Apr. 28, 1994, 94303118

Int. Cl.[6] H04L *12/56*

U.S. Cl. 370—60.1 **15 Claims**



1. A chip for use in implementing a cell switch fabric intended to interface a cell body memory to N input ports and N output ports where each port has a plurality of lines over which constituent bits of a cell body can be transferred by a succession of bit shifts; said chip comprising M externally-accessible, separate memory buses each with an associated plurality S of single line-SR blocks, each said block comprising:

— an externally-accessible input contact,

— an input shift register of L elements, the input shift register being connected to said input contact to enable bits to be shifted into the input shift register,

— an externally-accessible output contact, and

— an output shift register of L elements, the elements of the output shift register being connected to the output contact to enable bits to be shifted out of the output shift register through said output contact,

each said memory bus further having associated parallel transfer means operative for each said input shift register to transfer bits in parallel from the input shift register onto the memory bus and for each said output shift register to transfer bits in parallel from the memory bus into the output shift register, the chip further comprising clocking and control means connected to said single line-SR blocks and to said parallel transfer means for clocking and controlling the shifting and the parallel transfer of bits; said chip being usable in a plurality of different switch fabric arrangements to handle BM sets of said lines where B is the integer part of the result of the division S/N and where each set comprises all corresponding lines taken one from each of said N input and N output ports.

5,557,611

ATM CROSS-CONNECT NODE UTILIZING TWO PASSES THROUGH THE CONNECTION NETWORK WITH SHAPING BETWEEN PASSES FOR OPTIMAL RESOURCE ALLOCATION IN A BURSTY ENVIRONMENT

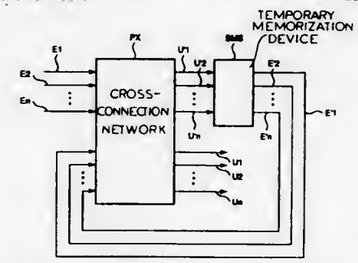
Antonio Cappellari, Beinasco; Paolo Coppo; Matteo D'Ambrosio, both of Turin, and Vinicio Vercellone, Venaria, all of Italy, assignors to CSELT - Centro Studi E Laboratori Telecomunicazioni S.P.A., Turin, Italy

Filed Jul. 19, 1995, Ser. No. 503,968

Claims priority, application Italy, Jul. 26, 1994, TO94A0615

Int. Cl.[6] H04L *21/56;* **H04Q** *11/04*

U.S. Cl. 370—60.1 **13 Claims**



1. A method of cross-connecting variable-bandwidth data flows inside a cross-connect node of an ATM network, in which: data flows are composed of ATM cells transported along the network through virtual channels grouped into virtual paths; a peak bandwidth is assigned to the virtual paths during the set-up of the connection, and in correspondence with each node, traffic is policed at the node input and output, to prevent traffic coming from different virtual paths and directed to the same virtual path outgoing from the node from exceeding the node capacity, and traffic is also shaped, to make the emission of the cells related to a given virtual path as uniform as possible, said method comprising the steps of:

passing the flow of ATM cells in two consecutive passes through a connection network of the node, such that

in a first pass virtual channels of input virtual paths are distributed among intermediate bundles of virtual channels each with an overall peak bandwidth equal to that of the virtual path of origin of the contributing channels,

between the first pass and a second pass, a cross-connection of the virtual channels and a temporary memorization of the related cells are performed, by introducing the cells into service queues associated with the output virtual paths, together with a shaping of the cell flow to be associated with an output virtual path, and

in the second pass the virtual paths are cross-connected, to multiplex output virtual paths on output lines of the node; and

for the temporary memorization, accepting messages only if a threshold for the length of the respective queue has not been exceeded or, if the threshold has been exceeded, only if they are high priority messages, thereby performing a selective discarding process at the message level.

5,557,612

METHOD AND APPARATUS FOR ESTABLISHING

mining which of said data and framing information bits are framing information bits; and

5,557,616

FRAME SYNCHRONIZATION IN A PERFORMANCE

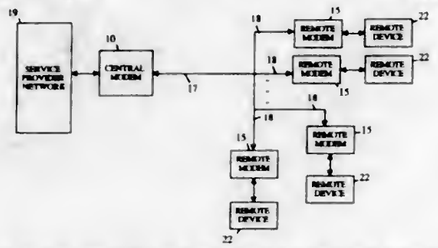
5,557,612
METHOD AND APPARATUS FOR ESTABLISHING COMMUNICATION IN A MULTI-TONE DATA TRANSMISSION SYSTEM

John A. C. Bingham, Palo Alto, Calif., assignor to Amati Communications Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 377,023, Jan. 20, 1995. This application Feb. 28, 1995, Ser. No. 396,132

Int. Cl.[6] H04J *1/02*

U.S. Cl. 370—71 **13 Claims**



1. In a bi-directional data transmission system that facilitates communications between a plurality of remote units and a central unit using a symbol-based discrete multitone transmission scheme that has a multiplicity of discrete sub-channels provided for facilitating upstream communications between the plurality of remote units and the central unit, a method of informing the central unit of the transmission requirements of a remote unit, the method comprising the steps of:

transmitting, using a fast access transmission mode, a communication access request from a selected first remote unit to the central unit, the communication access request comprising a unique remote unit identifier identifying the selected first remote unit and being transmitted from the selected first remote unit on at least one unused sub-channel using a modulation scheme that does not require equalization to decode at the central unit; and

allocating at least one sub-channel to the selected first remote unit in response to the communication access request for facilitating upstream communications between the selected first remote unit and the central unit.

5,557,613
SIMULTANEOUS BROADCASTING METHOD AND APPARATUS FOR INTERRUPTING COMMUNICATION UNITS IN AN EXCLUSIVE MODE

Takeshi Kuwajima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

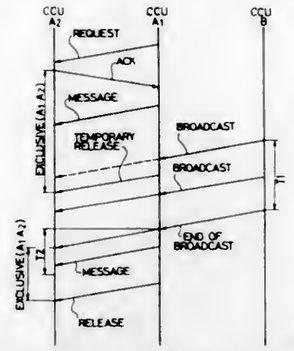
Division of Ser. No. 127,347, Sep. 28, 1993. This application May 10, 1995, Ser. No. 438,306

Claims priority, application Japan, Oct. 2, 1992, 4-264455; Oct. 2, 1992, 4-264464

Int. Cl.[6] H04J *3/02;3/24*

U.S. Cl. 370—85.1 **5 Claims**

1. A method of controlling communications in a communication system including at least three of a first, second, and third communication control apparatus connected to each other by a single transmission line, for maintaining the first and second communication control apparatus as a requesting and a requested communication control apparatus, respectively, in an exclusive communication mode after the second communication control apparatus returns a communication frame of an acknowledgement signal in response to a communication frame for requesting the exclusive communication mode transmitted from the first communication control apparatus, until a communication frame for releasing the exclusive communication mode transmitted from the first communication control apparatus to the second communication control apparatus is received by the second communication control apparatus, the method comprising the steps of:



in response to a communication frame in a simultaneous broadcasting communication mode transmitted from the third communication control apparatus, transmitting from the first communication control apparatus a communication frame for releasing the exclusive communication mode to the second communication control apparatus;

receiving at the second communication control apparatus the communication frame in the simultaneous broadcasting communication mode after the second communication control apparatus has received the communication frame for releasing the exclusive communication mode;

starting to transmit a communication frame of a communication message from the first communication control apparatus to the second communication control apparatus after the first communication control apparatus has detected an ending of the communication frame in the simultaneous broadcasting communication mode; and

receiving at the second communication control apparatus the communication frame of the communication message transmitted from the first communication control apparatus in the exclusive communication mode.

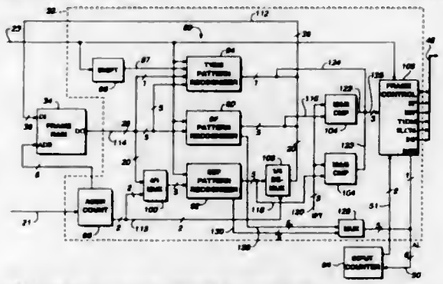
5,557,614
METHOD AND APPARATUS FOR FRAMING DATA IN A DIGITAL TRANSMISSION LINE

Lorin H. Sandler, Northbrook, and Neal T. Wingen, Crystal Lake, both of Ill., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Dec. 22, 1993, Ser. No. 172,458

Int. Cl.[6] H04J *3/06*

U.S. Cl. 370—105 **25 Claims**



19. A digital reception apparatus comprising:

means for receiving data and framing information bits in a digital transmission of information, wherein said data information bits are organized in frames, and wherein said framing information bits designate different frames of said data information bits;

means for determining one of a plurality of possible framing formats from said data and framing information bits by determining which of said data and framing information bits are framing information bits; and

means for outputting said data and framing information bits and a frame synchronization signal, said frame synchronization signal being output when said framing information bits are output which identifies said different frames of said output data information bits.

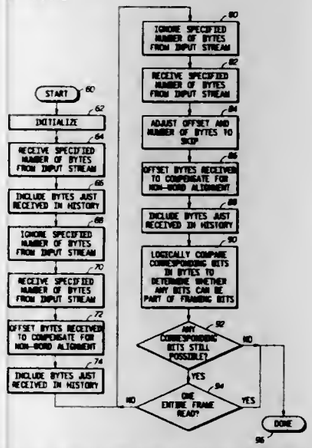
5,557,615
METHOD AND APPARATUS FOR IDENTIFYING EMBEDDED FRAMING BITS

Mark T. Fox, Austin, Tex., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jan. 3, 1995, Ser. No. 368,284

Int. Cl.[6] H04L *7/08*

U.S. Cl. 370—105.1 **21 Claims**



1. A method for identifying framing bits in frames of data bits in a sequential input stream of bits, where the framing bits are embedded among data bits in each of the frames, the method comprising the steps of:

(a) collecting in a storage device a first specified number of bits from the sequential input stream into a first ordered sequential collection of bits;

wherein said first specified number of bits is greater than one,

(b) including the first ordered sequential collection of bits just collected in a history of sequentially collected bits;

(c) ignoring a second specified number of bits in the sequential input stream;

(d) collecting in the storage device said first specified number of bits from the sequential input stream into a second ordered sequential collection of bits;

(e) logically comparing bits in the second ordered sequential collection of bits just collected to predetermined corresponding bits in the history of sequentially collected bits to determine whether any bits in the just collected second ordered collection of bits combined with predetermined corresponding bits in the history of sequentially collected bits is able to constitute a proper framing code sequence;

(f) including the second ordered sequential collection of bits just collected in a history of sequentially collected bits; and

(g) repeating steps (c)–(f) until either:

(1) none of the bits in the just collected ordered sequential collection of bits when logically combined with the predetermined corresponding bits in the history of sequentially collected bits is able to constitute a proper framing code sequence, or

(2) a sum of a total count of collected bits and a total count of ignored bits is greater than or equal to a third specified number of bits.

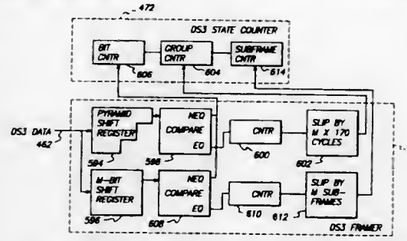
5,557,616
FRAME SYNCHRONIZATION IN A PERFORMANCE MONITORING AND TEST SYSTEM

Kevin Cadieux, and Paul R. Hartmann, both of Escondido, Calif., assignors to Applied Digital Access, Inc., San Diego, Calif.

Division of Ser. No. 118,443, Sep. 7, 1993, which is a continuation-in-part of Ser. No. 862,470, Apr. 2, 1992, abandoned. This application May 26, 1995, Ser. No. 450,494

Int. Cl.[6] H04J *3/06*

U.S. Cl. 370—105.1 **15 Claims**



1. A method of frame synchronization, comprising the steps of:

storing a first n bits of a digital signal into a current frame memory;

shifting n-m of the first n bits into a previous frame memory;

storing a second n bits of the digital signal into the current frame memory;

comparing at least one bit from the current memory with at least one bit from the previous memory;

incrementing a state counter when a condition of the comparison is successful; and

comparing the state counter to a threshold such that the result is indicative of frame synchronization.

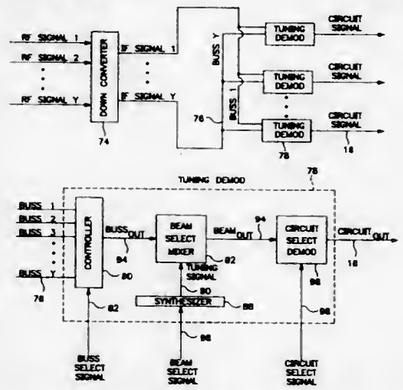
5,557,617
FREQUENCY DIVISION SWITCHING USING RF BUSS

Donald K. Belcher, West Melbourne; Earl B. Knick, Melbourne, and Andrew T. Powshok, Indian Harbour Bch, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Feb. 24, 1995, Ser. No. 393,832

Int. Cl.[6] H04J *1/04;1/06*

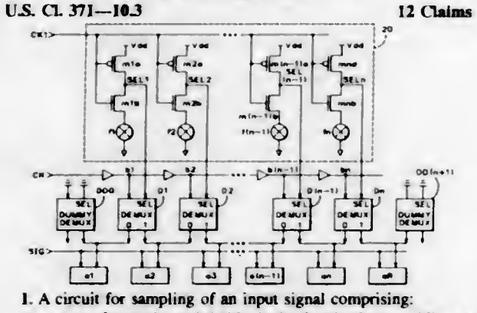
U.S. Cl. 370—120 **23 Claims**



1. A system for isolating an individual baseband circuit signal from plural circuit signals frequency spread modulated onto a beam signal which beam signal is frequency spread modulated onto an IF signal with other similarly composed beam signals, the system comprising:

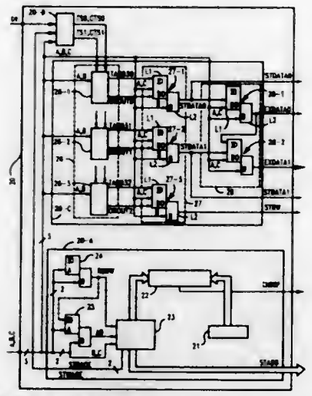
means for providing the IF signal;
plural demodulators, each of said demodulators capable of demodulating any of the beam signals modulated onto the IF signal to a baseband beam signal, and further being capable of demodulating any of the circuit signals modulated onto the baseband beam signal to a baseband circuit signal; and
a buss for providing the IF signal to each of said demodulators.

5,557,618
SIGNAL SAMPLING CIRCUIT WITH REDUNDANCY
Grigory Kogan, Portland, and Boulden G. Griffith, Hillsboro, both of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.
Filed Jan. 19, 1993, Ser. No. 6,284
Int. Cl.[6] G11C *29/00*
U.S. Cl. 371—10.3 **12 Claims**



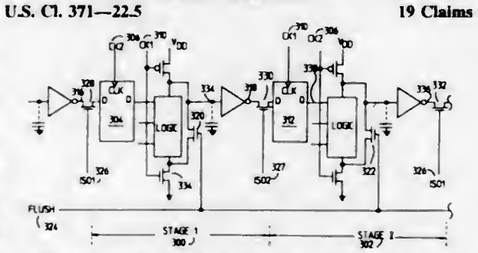
1. A circuit for sampling of an input signal comprising:
a source of sample and hold clock signals for providing a plurality of sample and hold clock signals each occurring at successively delayed times;
a plurality of signal routing means arranged in a row, with each signal routing means having a signal input and a select input and first and second outputs, with the signal inputs of the plurality of signal routing means each receiving one of the successively delayed sample and hold clock signals, and each of the signal routing means producing the sample and hold clock signal on its input as either the first or second output depending on the state of the select input;
a row of signal acquisition cells containing a number of signal acquisition cells greater than the number of signal routing means in the plurality of signal routing means, each such cell having an analog signal input coupled to receive the input signal and a sample and hold clock signal input for determining a time at which a sample of the input signal is acquired by each signal acquisition cell, wherein a first acquisition cell in the row of signal acquisition cells has its sample and hold clock signal input coupled to the first output of a first signal routing means of the plurality of signal routing means arranged in a row, and a last acquisition cell in the row of signal acquisition cells has its sample and hold clock signal input coupled in the second output of a last signal routing means of the plurality of signal routing means arranged in a row, and intermediate acquisition cells in the row of signal acquisition cells each have their sample and hold clock signal input coupled to both the second output of a respective preceding signal routing means of the plurality of signal routing means arranged in a row and to the first output of a respective next signal routing means of the plurality of signal routing means arranged in a row,
whereby in the absence of any defects in the row of signal acquisition cells signals are applied to the select inputs of the signal routing means so as to cause their first outputs to produce the sample and hold clock signals, but when a defect is determined to be present in one of the signal acquisition cells signals may be applied to the selecting signal routing means so as to cause a subset of them to produce the sample and hold clock signals on their second outputs thereby bypassing the signal acquisition cell that was determined to have the defect.

5,557,619
INTEGRATED CIRCUITS WITH A PROCESSOR-BASED ARRAY BUILT-IN SELF TEST CIRCUIT
Stuart Rapoport, Washington, D.C., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 4, 1994, Ser. No. 223,078
Int. Cl.[6] G06F *11/00;11/27*
U.S. Cl. 371—22.5 **7 Claims**



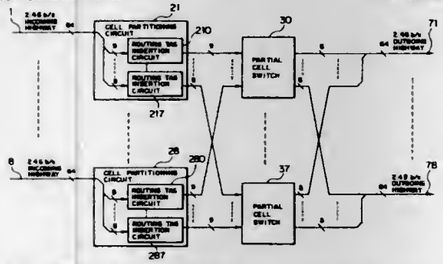
1. An SRAM provided with:
ABIST means for generating self-test data (STDATA), expected data (EXDATA), self-test read/write (STRW) and gating (CNOOP) signals; and
memory means responsive to said self-test data, and self-test read/write signals to generate data-out (DOUT) signals when said ABIST means is in an ABIST mode, said SRAM comprising:
processor-based ABIST circuit means that includes:
address generator means for generating self-test addressing signals;
control logic means responsive to said address generator means for generating control signals for sequencing said processor-based circuit means; and processing means responsive to said control logic means for writing into and for verifying data outputted by said memory means, and for determining whether said memory means is in a READ or a WRITE operating mode.

5,557,620
QUIESCENT CURRENT TESTING OF DYNAMIC LOGIC SYSTEMS
Robert H. Miller, Jr., Loveland, and Craig A. Heikes, Fort Collins, both of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Continuation of Ser. No. 177,826, Jan. 5, 1994, abandoned.
This application Sep. 25, 1995, Ser. No. 533,415
Int. Cl.[6] G06F *11/00*
U.S. Cl. 371—22.5 **19 Claims**



1. In a logic system having a plurality of dynamic logical nodes, first and second power supply potentials, a power supply current flowing between the first and second power supply potentials, the power supply current having a normal value, a precharge phase during which the dynamic logical nodes are driven to the first power supply potential, an evaluation phase, each of the dynamic logical nodes having associated logic circuitry capable of driving the associated logical node to the second power supply potential during the evaluation phase, a method for detecting defects at the dynamic logical nodes, the method comprising the following steps:
a. actively switching a subset of the dynamic logical nodes to the second power supply potential during the evaluation phase, the subset being sufficient to ensure that all the dynamic logical nodes that are not in the subset are driven to the second power supply potential by the associated logic circuitry;
b. measuring the power supply current during step a;
c. comparing the power supply current measured in step b to the normal value of the power supply current; and
d. determining that at least one of the dynamic logical nodes is defective if the power supply current measured in step b is greater than the normal value of the power supply current.

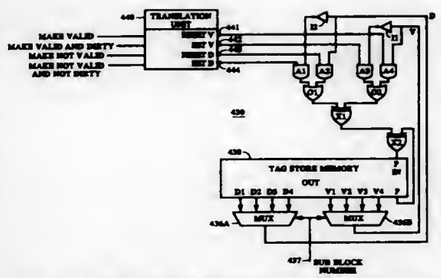
5,557,621
ATM SWITCH AND CONTROL METHOD THEREOF
Yukio Nakano, Hachioji; Takahiko Kozaki, Koganei; Shinobu Gohara, Yokohama, and Yoshihiro Ashi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 19, 1991, Ser. No. 747,143
Claims priority, application Japan, Aug. 17, 1990, 2-215703
Int. Cl.[6] G06F *11/10*
U.S. Cl. 371—37.1 **14 Claims**



1. An ATM switch comprising:
error correcting code (ECC) encoder circuits each for generating, for an ATM cell as an information symbol, an ECC check symbol and for adding the ECC check symbol thereto;
cell partitioning circuits each for subdividing an information field of an ATM cell into N partial cells, for subdividing a check symbol field into M partial cells M is an integer greater than one, and for assigning an identical routing tag to the obtained partial cells;
(N+M) partial cell switches for respectively routing the (N+M) partial cells in an independent fashion based on the routing tag; and
ECC decoder circuits for receiving the (N+M) partial cells thus routed and for achieving an error correction on the received partial cells.

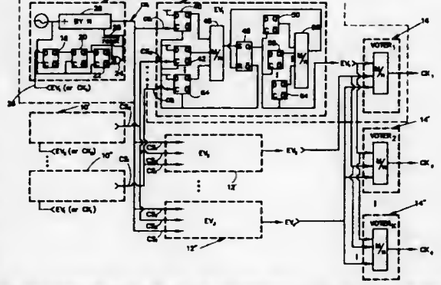
5,557,622
METHOD AND APPARATUS FOR PARITY GENERATION
Soha M. N. Hassoun, Worcester, and Douglas E. Sanders, Framingham, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.
Continuation of Ser. No. 591,195, Oct. 1, 1990, abandoned.
This application Jan. 4, 1993, Ser. No. 518
Int. Cl.[6] G06F *11/10;* **H03M** *13/00*
U.S. Cl. 371—49.1 **4 Claims**

1. An apparatus comprising:
means for storing a plurality of bits;



means for storing a parity bit representative of parity of said plurality of bits;
means, responsive to a plurality of update signals from a processor, for providing a plurality of inversion signals, said plurality of inversion signals corresponding to said stored plurality of bits and indicating an updated state of said bits;
means for comparing each of said plurality of inversion signals to a corresponding one of said stored plurality of bits including means, responsive to a miscompare between said plurality of inversion signals and said plurality of bits, for determining a subset of said plurality of bits to invert;
means, responsive to said means for comparing, for providing a toggle signal if said subset of bits to invert comprises an odd number of bits; and
means, responsive to said toggle signal, for inverting the level of said parity bit.

5,557,623
ACCURATE DIGITAL FAULT TOLERANT CLOCK
Kevin R. Driscoll, Maple Grove, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Aug. 12, 1994, Ser. No. 289,728
Int. Cl.[6] G11B *27/00*
U.S. Cl. 371—61 **6 Claims**



6. An apparatus for producing redundant clock signals comprising:
a plurality of clock sources, each comprising an oscillator means for providing a periodic signal electrically coupled to set an oscillator-driven counter and a synchronizer, wherein the synchronizer in turn is electrically coupled to the oscillator-driven counter as a reset, wherein each clock source has a clock output signal of a preselected frequency responsive to a clock input signal which adjusts only the phase;
a first plurality of sequential edge voters electrically coupled to each clock source and wherein each said sequential edge voter responds to a first change of state of a preselected number of the output signals from the clock sources followed by a second change of state, opposite the first change of state, and wherein each sequential edge voter provides a digital sequential edge voter output signal to at least one of the clock sources and thereby controls the phase of at least one of the clock sources; and

a second plurality of sequential edge voters electrically coupled

5,557,629
LASER DEVICE HAVING AN ELECTRODE WITH

causing a mismatch of the secondary optical cavity relative to

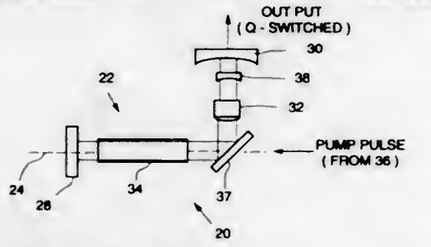
a second plurality of sequential edge voters electrically coupled to each of the first plurality of sequential edge voters in a cross strapped configuration so that at least one Byzantine fault is tolerated by the apparatus.

5,557,624

LASER SYSTEM USING U-DOPED CRYSTAL Q-SWITCH

Robert D. Stultz, Huntington Beach; Milton Birnbaum, Rancho Palos Verdes, both of Calif., and Marly B. Camargo, Sao Paulo, Brazil, assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Jan. 20, 1995, Ser. No. 375,753
Int. Cl.[6] H01S 3/11
U.S. Cl. 372—11 **18 Claims**



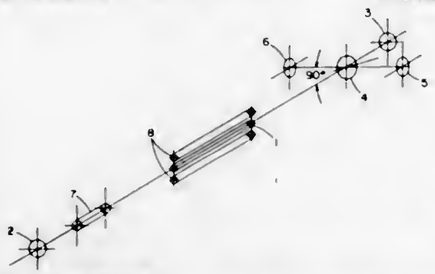
8. A laser system, comprising:
a laser resonator cavity having a resonant axis;
a lasing element within the laser resonator cavity, the lasing element being selected from the group consisting of Er:yttrium-aluminum garnet and Er:glass;
means for optically pumping the lasing element; and
a Q-switch crystal lying along the resonant axis within the laser resonator cavity, the Q-switch crystal comprising a saturable absorber selected from the group consisting of U^{2+}-doped calcium fluoride, U^{2+}-doped strontium fluoride, and U^{2+}-doped barium fluoride.

5,557,625

COUPLED-CAVITY RESONATOR TO IMPROVE THE INTENSITY PROFILE OF A LASER BEAM

Frederic M. Durville, Chelmsford, Mass., assignor to Cynosure, Inc., Bedford, Mass.

Filed Jan. 5, 1995, Ser. No. 368,989
Int. Cl.[6] H01S 3/13
U.S. Cl. 372—29 **41 Claims**



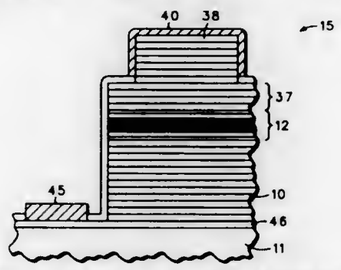
1. A laser comprising:
first and second optical reflecting elements defining an active optical cavity, containing an active laser medium, for amplifying light at resonant modes supported by the cavity to generate a laser beam; and
at least a third optical reflecting element defining a secondary optical cavity, coupled to the active optical cavity, the third optical element determining a geometry of the secondary optical cavity, the geometry of the secondary optical cavity causing a mismatch of the secondary optical cavity relative to the active optical cavity at resonant modes contributing to hot spots in a spatial intensity distribution of the laser beam thereby attenuating energy contained in the resonant modes contributing to the hot spots.

5,557,626

PATTERNED MIRROR VCSEL WITH ADJUSTABLE SELECTIVE ETCH REGION

Piotr Grodzinski, Chandler; Michael S. Lebby, Apache Junction, both of Ariz., and Hsing-Chung Lee, Calabasas, Calif., assignors to Motorola, Schaumburg, Ill.

Filed Jun. 15, 1994, Ser. No. 261,272
Int. Cl.[6] H01S 3/19
U.S. Cl. 372—45 **14 Claims**



1. A method of fabricating patterned mirror VCSELs comprising the steps of:
forming a first mirror stack of a first conductivity type, the first mirror stack being formed of a plurality Of pairs of relatively high and low index of refraction layers:
forming an active region on the first mirror stack;
forming a second mirror stack of a second conductivity type on the active region, the second mirror stack being formed of a first portion including at least one pair of relatively high and low index of refraction layers positioned on the active region and a second portion including at least one pair of relatively high and low index of refraction layers positioned on the first portion to form a complete second mirror stack, the number of pairs of relatively high and low index of refraction layers in the first and second portions, combined, being sufficient to provide a required reflectivity for operation of the VCSEL, and the first and second portions including forming the first portion of alternate layers of InGaP and GaAs and the second portion of alternate layers of AlGaAs and GaAs selected to provide different rates of etching between the first and second portions to allow the second portion to be selectively etched with respect to the first portion; and
selectively etching the second portion of the second mirror stack by utilizing the first portion as an etch stop.

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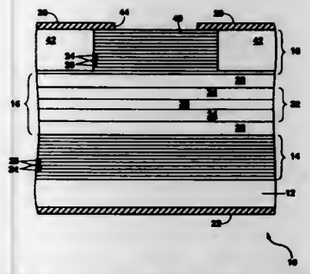
VISIBLE-WAVELENGTH SEMICONDUCTOR LASERS AND ARRAYS

Richard P. Schneider, Jr., and Mary H. Crawford, both of Albuquerque, N.M., assignors to Sandia Corporation, Albuquerque, N.M.

Filed May 19, 1995, Ser. No. 444,462
Int. Cl.[6] H01S 3/19
U.S. Cl. 372—46 **54 Claims**

1. A semiconductor laser for emitting light at a visible wavelength comprising:
(a) a compound semiconductor substrate;
(b) at least one first-grown AlGaAs semiconductor layer formed above the substrate and having a first conductivity type;
(c) an active region comprised of InAlGaP formed above the first-grown AlGaAs layer;



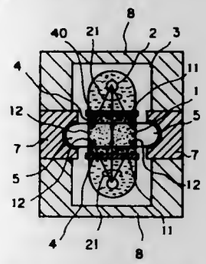
(d) at least one last-grown AlGaAs semiconductor layer formed above the active region and having a second conductivity type opposite the first conductivity type, one of the conductivity types being defined as p-type by carbon, and the other conductivity type being defined as n-type to form a semiconductor junction about the active region;
(e) electrodes above and below the semiconductor junction for electrically activating the laser.

5,557,628

SOLID STATE LASER APPARATUS AND LASER MACHINING APPARATUS

Kazuki Kuba; Masaki Seguchi; Akira Ishimori, and Takashi Yamamoto, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1994, Ser. No. 233,416
Claims priority, application Japan, Sep. 24, 1993, 5-261909
Int. Cl.[6] H01S 3/091;3/092
U.S. Cl. 372—70 **34 Claims**



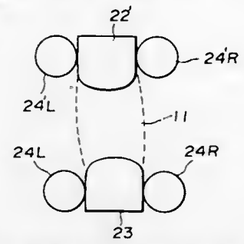
1. A solid state laser apparatus comprising:
a laser medium having a rectangular plate form including upper and lower smooth surfaces extending substantially parallel to each other, right and left side surfaces extending substantially perpendicular to said smooth surfaces, and back and forth end surfaces for entrance/exit of a laser beam;
a pair of supporters disposed on the right and left sides of said laser medium;
a frame integrally containing said supporters;
a light source exciting said laser medium;
a condenser to condense excitation light from said light source for irradiation of said laser medium; and
cooling means for cooling said laser medium by at least one of said smooth surfaces thereof;
wherein an irregularity is formed in said supporter at an inner surface opposed to said side surfaces of said laser medium or at a back surface, and a cooling material is filled into a clearance of said irregularity.

5,557,629

LASER DEVICE HAVING AN ELECTRODE WITH AUXILIARY CONDUCTOR MEMBERS

Hakaru Mizoguchi; Yoshiho Amada, and Noritoshi Ito, all of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 28, 1992, Ser. No. 937,611
Int. Cl.[6] H01S 3/097
U.S. Cl. 372—87 **9 Claims**



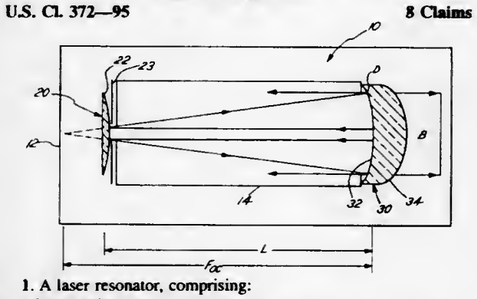
1. A laser device of the type in which electric discharge takes place between a pair of electrodes to excite a laser gas in the laser chamber thereby producing a laser beam, wherein the width of at least one of the pair of electrodes is substantially equal to the width of the electric discharge and wherein there is further provided a pair of conductor members and means for maintaining said pair of conductor members at an electrical potential equal to an electrical potential of one of the pair of electrodes during said discharge, said conductor members being disposed on respective side of said at least one of the electrodes along the longitudinal axis of said one electrode.

5,557,630

UNSTABLE LASER RESONATOR

Michael J. Scaggs, 1019 Valley Rd., Mason, N.H. 03048

Filed Jan. 13, 1995, Ser. No. 372,378
Int. Cl.[6] H01S 3/08
U.S. Cl. 372—95 **8 Claims**



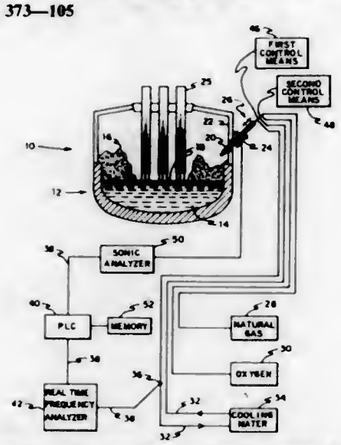
1. A laser resonator, comprising:
a laser cavity;
a gain medium disposed within the laser cavity;
a first mirror disposed adjacent one end of the laser cavity;
a second mirror element disposed adjacent an opposite end of the laser cavity;
wherein the second mirror element includes two surfaces, the first surface substantially facing the laser cavity and the second surface substantially facing away from the laser cavity, the first surface acting as both a regenerative and transmissive interface for the laser cavity and the second surface collimating the transmitted light as it exits the cavity;
the reflecting surface substantially facing the laser cavity, wherein the reflecting surface is a diverging surface; and
wherein the first surface of the second mirror is a positive surface, such that the separation between the reflecting surface of the first mirror and the first surface of the second mirror is $L=(\pi\omega^2_0)\lambda$, where ω_0 is the radius of the laser beam waist and λ is the wavelength of the laser.

5,557,631

SONIC FURNACE MONITORING APPARATUS

Vladimir Bulat, Markham; Bosko Madic, Whitby; David Bowden, Oshawa, and Stan Titan, Whitby, all of Canada, assignors to Dynex Engineering Inc., Whitby, Canada

Filed May 6, 1994, Ser. No. 239,560
Int. Cl.[6] H05B *7/148*
U.S. Cl. 373—105 **7 Claims**



1. A sonic control system, in a metallurgical furnace including a lance, a lance drive, and a liquid cooling circuit, for controlling a lance cooled by a liquid cooling circuit and driven by a lance drive, the lance injecting at least one substance into the melt of the metallurgical furnace for speeding up the melting process, to reduce refining time, to create foamy slag, and to improve the resultant metal composition, said sonic control system comprising:

a hydrophone mounted in sonic communication with said liquid cooling circuit, for obtaining a sonic input from said metallurgical furnace;

a sonic analyzer having data transmission means linking said sonic analyzer to said hydrophone and linking said sonic analyzer to computer means;

said computer means including memory means for storing predetermined sonic signature data;

said computer means for converting the sonic input from said hydrophone to an operating sonic signature data, for comparing the predetermined sonic signature data to the operating sonic signature data and thereby generating first control signals responsive thereto; and

first control means for operating said lance drive responsive to said first control signals.

5,557,632

DEMODULATION AND ROLL-OFF FILTER APPARATUS

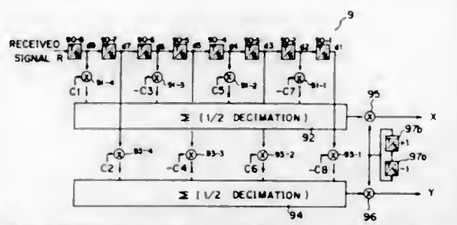
Takashi Kaku, and Hiroyasu Murata, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 10, 1993, Ser. No. 29,238
Claims priority, application Japan, Mar. 10, 1992, 4-051431
Int. Cl.° H03D *1/00;* **H04L** *27/06;* **H04B** *1/10*
U.S. Cl. 375—340 **10 Claims**

1. A demodulation and roll-off filter apparatus for performing a demodulation and roll-off filter process for a received digital signal sampled by an analog/digital converter, comprising:

sampling frequency set means for setting a sampling frequency of said received digital signal to a frequency four times higher than the frequency of a demodulation carrier therefor;

tap means, connected in a cascade shape one after the other, for delaying samples of said received digital signal by a predetermined time, the first tap of said tap means being connected to said sampling frequency means;



first multiplication means for multiplying outputs of a first group of said tap means disposed at intervals of one discrete time apart by first tap coefficients, said first group comprising taps disposed at intervals of one tap apart;

first addition means for adding outputs of said first multiplication means;

first polarity setting means for multiplying one of a first polarity and a second polarity to the result of the addition by said first addition means during cyclically generated timing intervals, and for outputting the result as a real component;

second multiplication means for multiplying outputs of a second group other than said first group of said tap means disposed at intervals of one discrete time apart by second tap coefficients, said second group comprising taps disposed at intervals of one tap apart;

second addition means for adding outputs of said second multiplication means; and

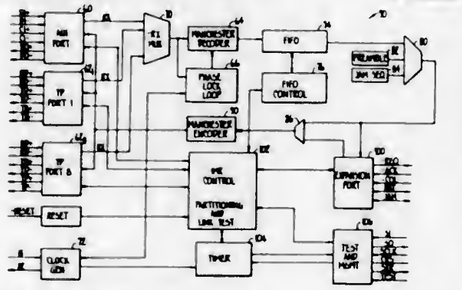
second polarity addition means for multiplying one of the first polarity and the second polarity to the result of the addition by said second addition means, during cyclically generated timing intervals and for outputting the result as an imaginary component.

5,557,633

INTEGRATED MULTI-PORT REPEATER HAVING SHARED RESOURCES

David Staab, San Jose, and Nader Vijeh, Cupertino, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 89,002, Jul. 9, 1993, abandoned, which is a division of Ser. No. 595,061, Oct. 10, 1990, Pat. No. 5,265,124, which is a continuation-in-part of Ser. No. 556,046, Jul. 20, 1990, Pat. No. 5,265,123, which is a continuation-in-part of Ser. No. 480,426, Feb. 15, 1990, Pat. No. 5,164,960. This application Feb. 8, 1995, Ser. No. 385,219
Int. Cl.° H04B *17/02*
U.S. Cl. 375—213 **6 Claims**



2. A repeater, comprising:

an integrated multiport repeater for receiving signals and for retransmitting the received signals, the multiport repeater having a plurality of ports and a control means for receiving data signals and outputting a first control signal;

a link integrity test circuit coupled to a particular one of the plurality of ports for implementing a link integrity test for the particular one port and for disabling the particular port for nonreceipt of a plurality of linktest pulses;

linktest control means, coupled to the link integrity test circuit and responsive to a second control signal, for inhibiting the disablement of the particular port by the link integrity test circuit for nonreceipt of a plurality of linktest pulses; and

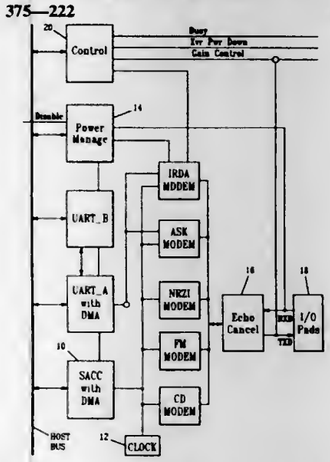
a memory associated with the particular one port and coupled to the control means and responsive to the first control signal for outputting the second control signal in response to the output of the first control signal.

5,557,634

MULTIPROTOCOL DIRECTED INFRARED COMMUNICATION CONTROLLER

Peruvemba S. Balasubramanian, Chappaqua; Nathan J. Lee, New City, and Scott D. Lekuch, New York, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 14, 1994, Ser. No. 323,282
Int. Cl.[6] H04L *27/02*
U.S. Cl. 375—222 **30 Claims**



1. A controller system for use in a communication transceiver having a bus for internally transferring signals, comprising:

a plurality of modem means for selectively modulating and demodulating synchronous and asynchronous signals with respective coding formats, at least one of said modem means encoding asynchronous signals and at least one of said modem means encoding synchronous signals;

a UART connected between said bus and at least one of said asynchronous signal encoding modem means for transferring asynchronous signals therebetween;

a synchronous/asynchronous communication controller (SACC) means, connected between said bus and said plurality of modem means, for transferring asynchronous signals between said bus and said asynchronous signal encoding modem means and transferring synchronous signals between said bus and said synchronous signal encoding modem means, whereby said controller system modulates and demodulates signals with both synchronous and asynchronous coding formats; and further comprising:

checking means for checking a signal for integrity; and

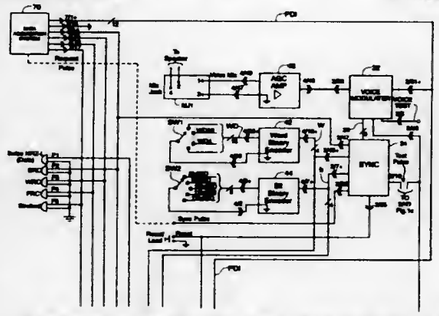
a second UART, connected between said UART and said bus, for intercepting and transmitting an input signal to said checking means for an integrity check.

5,557,635

VOICE ENCODE/DECODE SUBSYSTEM IN A SYSTEM FOR ACQUISITION OF TEST DATA USING PULSE CODE MODULATION

Daniel T. Laird, Victorville, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Wright-Patterson Air Force Base, Ohio

Continuation-in-part of Ser. No. 183,618, Jan. 12, 1994, abandoned. This application Sep. 28, 1994, Ser. No. 313,972
Int. Cl.[6] H03M *7/32*
U.S. Cl. 375—250 **5 Claims**



1. A subsystem to integrate voice into a data acquisition system pulse code modulation (PCM) stream for digital data having bits controlled by a bit rate clock (BRC), with an acquisition format in which the bits are organized into words with a given number of bits per word controlled by a word rate clock (WRC), and the words are organized into frames with a given number of words per frame controlled by a frame rate clock (FRC), words being identified for a type of data by their placement in the frame;

wherein said subsystem uses continuously variable slope delta-modulation (CVSD), comprising a CVSD encoder device operated as an analog-to-digital converter, an analog input of the CVSD encoder device being coupled to a source of voice signals, encoder register means having a data input coupled to a digital output of the CVSD device, and an encoder register clock input for clock pulses to serially shift digital data bits from the digital output of the CVSD encoder device into the encoder register means;

encoder synchronization means comprising an encoder word counter, means for loading the encoder word counter with a selected word value to determine placement of PCM voice words in said frames, the encoder word counter having a clock input coupled to the data acquisition system to receive BRC pulses and controlled to count from said selected word value to a given value and then output a clock pulse at a pulse output, means coupling the pulse output to means for generating encoder clock pulses and supplying them to a clock input of the CVSD encoder device and also to an encoder control gate, the encoder control gate having an enable input coupled to receive request pulses from the data acquisition system, so that when the request pulse is received the CVSD encoder device and the encoder register means are enabled to generate and load a PCM voice word from the CVSD encoder device into the encoder register means, and encoder output control means including means setting the given number of bits per word and means for causing a word which has accumulated said given number of bits to be transferred from the encoder register means to the data acquisition system;

whereby the encoder subsystem uses the bit rate clock (BRC) from said data acquisition system for all timing in said subsystem, with other clocks of the subsystem being divided down from the BRC and a request pulse from said data acquisition system.

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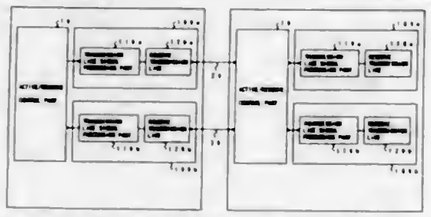
means, having inputs coupled to outputs of said signal quality

5,557,636
METHOD AND SYSTEM OF OPERATING REDUNDANT TRANSMISSION LINE

Kazumi Sato, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 29, 1994, Ser. No. 297,147
Claims priority, application Japan, Mar. 16, 1994, 6-046194
Int. Cl.[6] G06F *11/20;* **H04L** *1/22*
U.S. Cl. 375—260 **15 Claims**



7. A method of operating a redundant transmission line using a transmission control apparatus having a redundant construction, wherein

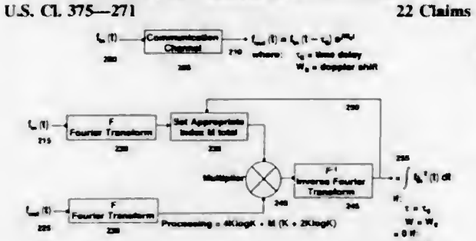
the power is constantly supplied to an active interface board which implements an interface between an active transmission line and a transmission apparatus, and

the power is supplied to a reserve interface board which implements an interface between a reserve transmission line and a transmission apparatus, at a predetermined cycle.

5,557,637
CONVOLUTIONAL AMBIGUITY MULTIPLE ACCESS (CAMA) TRANSMISSION SYSTEM

Thomas W. Glynn, 1806 Severn Grove Rd., Annapolis, Md. 21401

Filed Sep. 24, 1994, Ser. No. 314,254
Int. Cl.[6] H03K *7/06;9/06;* **H04L** *27/10;27/22*
U.S. Cl. 375—271 **22 Claims**



1. A multiple access processing system for processing an input signal for transmission as an output signal, said system comprising:

first means for taking a Fourier transform of a known original signal corresponding to the input signal, using at least one predetermined index, and providing a first result;

second means for taking the Fourier transform of the output signal and providing a second result;

third means for multiplying the first and second results together to provide a product;

fourth means for taking the inverse Fourier transform of the product and providing a further result; and

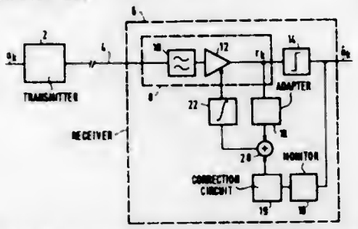
fifth means for reindexing the Fourier transform computed by the first means by shifting the at least one predetermined index to provide a reindexed first result;

wherein said third means multiplies the reindexed first result and the second result, said fifth means providing reindexing a predetermined number of times and said third means operating on each reindexed first result and the second result, so as to generate a decoded input signal at an appropriate time delay and doppler shift.

5,557,638
TRANSMISSION SYSTEM FOR MULTIVALUED DIGITAL SYMBOLS

Kevin D. Fisher, Palo Alto, Calif.; Ho W. Wong-Lam, Eindhoven, Netherlands; Johannes W. M. Bergmans, Eindhoven, Netherlands; Frits A. Steenhof, Eindhoven, Netherlands, and Johannes O. Voorman, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 10, 1994, Ser. No. 212,669
Claims priority, application European Pat. Off., Mar. 11, 1993, 93200712
Int. Cl.[6] H04L *25/34*
U.S. Cl. 375—286 **8 Claims**

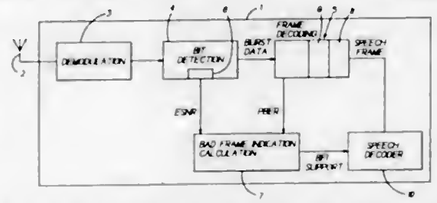


5. Receiver for receiving an input signal representing digital symbols, the receiver comprising deriving means for deriving a detection signal from the input signal, and a detector for determining destination symbols by comparing the detection signal with at least one reference value, the receiver also including adapting means for adapting the ratio between the amplitude of the detection signal and the reference value to minimized a symbol error rate, characterized in that the receiver comprises monitoring means for detecting the absence of at least one of the possible values of the destination symbols and includes correction means for correcting the ratio between the detection signal and the reference value if possible values of the destination symbols are absent.

5,557,639
ENHANCED DECODER FOR A RADIO TELEPHONE

Ilkka Heikkila, Märynummi; Harri Jokinen, Hiisi, and Jukka Ranta, Salo, all of Finland, assignors to Nokia Mobile Phones Ltd., Salo, Finland

Filed Oct. 5, 1994, Ser. No. 322,445
Claims priority, application Finland, Oct. 11, 1993, 934480
Int. Cl.[6] H04B *13/02;17/00*
U.S. Cl. 375—224 **9 Claims**



9. A circuit for a radio telephone for providing speech frames from a modulated RF signal transmitted to the radio telephone as a plurality of digitally encoded bursts, comprising:

an antenna for receiving said modulated RF signal;

a demodulator for demodulating said received RF signal so as to extract digital information representing speech frames from said modulated RF signal;

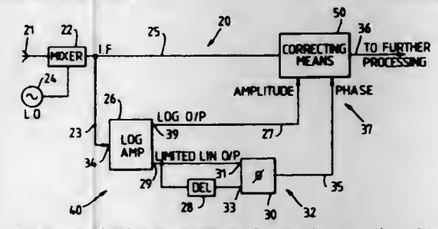
signal qUality determination means having an input coupled to an output of said demodulator for providing, for each received burst, a first burst quality measure and a second burst quality measure, said first burst quality measure being indicative of a signal-to-noise ratio and said second burst quality measure being indicative of a bit error rate; and

means, having inputs coupled to outputs of said signal quality determining means, and responsive to a comparison of said second burst quality measure with a burst quality threshold value, for rejecting the digital information of a burst having a second burst quality measure that fails to meet the burst quality threshold value; wherein said burst quality threshold value is derived at least in part from said first burst quality measure.

5,557,640
PHASE AND AMPLITUDE EQUALIZATION ARRANGEMENT

Peter E. Chadwick, Swindon, United Kingdom, assignor to Plessey Semiconductor Limited, United Kingdom

Filed Jun. 30, 1994, Ser. No. 269,074
Claims priority, application United Kingdom, Jul. 16, 1993, 9314851
Int. Cl.[6] H03H *7/30;* **H03K** *5/159*
U.S. Cl. 375—229 **12 Claims**



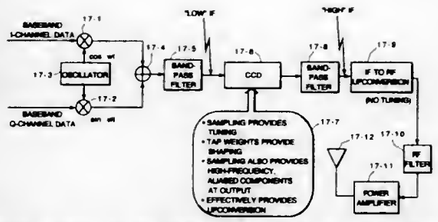
1. An equalization arrangement for use in a receiver for the correction of phase and amplitude distortion effects, comprising: amplifying means for amplifying a signal received along a received signal path by the receiver, said amplifying means having an input fed by the received signal and first and second outputs representative of the amplitude and phase, respectively, of the signal at the input; phase detecting means for detecting a disturbance in the phase of the received signal, said phase detecting means being fed from the second output of the amplifying means; and correcting means for correcting for the phase and amplitude distortion effects, said correcting means having first and second inputs, means connecting said correcting means in the received signal path of the amplifying means, means connecting said first and second inputs of said connecting means to the first output of the amplifying means and to an output of the phase detecting means, respectively, said correcting means being arranged to adjust the amplitude and phase of the received signal in response to disturbances in amplitude and phase detected by the amplifying means and phase detecting means, respectively.

5,557,641
CHARGE-COUPLED-DEVICE BASED TRANSMITTERS AND RECEIVERS

Aaron Weinberg, Potomac, Md., assignor to Stanford Telecommunications, Inc., Reston, Va.

Continuation-in-part of Ser. No. 285,496, Mar. 4, 1994, Pat. No. 5,483,549. This application May 19, 1994, Ser. No. 246,243
Int. Cl.[6] H04L *27/04*
U.S. Cl. 375—295 **4 Claims**

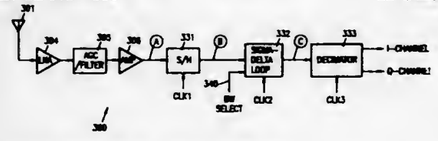
1. A radio transmitter having a source of first signals for radio transmission, means for modulating said first signals on an intermediate carrier frequency second signal to produce a third signal, a charge coupled device (CCD) connected to receive and process said third signal in the absence of digital waveform shaping and digital-to-analog conversion, said CCD having a sampling rate which is a multiple of said intermediate carrier frequency second signal to provide aliased fourth signal components that are spectrally spaced in accordance with said multiple of said intermediate carrier frequency second signal and provide upconversion to a fifth signal, a bandpass filter receiving said fifth signal, said bandpass filter being centered around a selected aliased signal component and a power amplifier/antenna means coupled to receive said selected aliased component for transmission.



5,557,642
DIRECT CONVERSION RECEIVER FOR MULTIPLE PROTOCOLS

Tim A. Williams, Danville, Calif., assignor to Wireless Access, Inc., Santa Clara, Calif.

Continuation of Ser. No. 936,361, Aug. 25, 1992, abandoned. This application Nov. 14, 1994, Ser. No. 337,962
Int. Cl.[6] H03K *9/00*
U.S. Cl. 375—316 **22 Claims**



1. A communications receiver comprising:

an input port configured to receive a radio frequency input signal;

a sample and bold circuit coupled to said input port and configured to receive said input signal and a first clock signal having a first clock frequency, said sample and bold circuit further configured to subsample said input signal at said first clock frequency and to provide a first frequency domain signal centered about a first intermediate frequency corresponding to said first clock frequency, said sample and bold circuit further configured to provide a set of aliased copies of said frequency domain signal, each aliased copy centered at a respective multiple of said first intermediate frequency corresponding to said first clock frequency;

a frequency selective analog to digital converter coupled to said sample and bold circuit and configured to receive a second clock signal which is an integral multiple of said first clock signal, said digital converter including a sigma-delta converter configured to receive said frequency domain signal and said aliased copies of said frequency domain signal and to provide as an output a selected one of said frequency domain signal and said aliased copies of said frequency domain signal as a selected signal, selected as a function of said second clock signal; and

a decimation filter coupled to said frequency selective analog to digital converter and configured to receive said selected signal and to provide a baseband output signal corresponding to said selected signal.

5,557,643
AUTOMATIC FREQUENCY CONTROL SYSTEM FOR

system, the demodulating section demodulating the modulating signal with a carrier frequency to output a demodulation

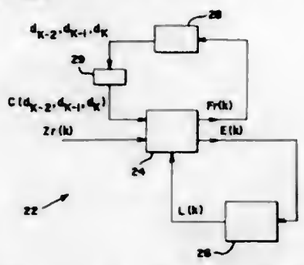
control means for selectively retrieving values from said

5,557,647
BASEBAND SIGNAL DEMODULATOR

5,557,643
AUTOMATIC FREQUENCY CONTROL SYSTEM FOR GMSK-MODULATED SIGNALS

In-Kyung Kim, N. Potomac, Md., and Zhendong Cao, Matawan, N.J., assignors to Hughes Electronics, Los Angeles, Calif.

Filed Apr. 7, 1995, Ser. No. 418,807
Int. Cl.[6] H04L *27/14*
U.S. Cl. 375—324 **25 Claims**



13. An AFC system for detecting and compensating for frequency drift in the carrier frequency of a Gaussian filtered Minimum Shift Keying (GMSK) signal comprising:

an error detector and frequency compensator receiving samples of the GMSK signal and for computing an error signal and frequency compensated samples;

a loop filter receiving the output of the error detector and frequency compensator, the loop filter computing a filter parameter from the error signal and feeding back the filter parameter to the error detector and frequency compensator in a first feedback loop;

a demodulator receiving the output of the error detector and frequency compensator, the demodulator computing demodulated frequency compensated samples; and

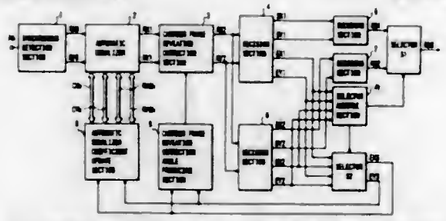
a frequency compensation table receiving the demodulated frequency compensated samples and computing a frequency compensation angle and feeding back the frequency compensation angle to the error detector and frequency compensator in a second feed back loop;

wherein the error detector computes the error signal from the frequency compensated samples and the frequency compensation angle.

5,557,644
SIGNAL DEMODULATING AND DECODING APPARATUS AND SIGNAL DEMODULATING AND DECODING METHOD

Takashi Kuwabara, Kodaira, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 18, 1994, Ser. No. 210,568
Claims priority, application Japan, Apr. 7, 1993, 5-079979; Nov. 2, 1993, 5-274571
Int. Cl.[6] H03H *7/30;* **H03D** *3/00;3/18;* **H04B** *7/10*
U.S. Cl. 375—340 **8 Claims**



1. A signal demodulating and decoding apparatus comprising:

a demodulating section coupled to receive a modulation signal which is modulated by one of a first modulation system and a second modulation system different from the first modulation system, the demodulating section demodulating the modulating signal with a carrier frequency to output a demodulation signal the demodulation section including:

first demodulating means for outputting first demodulation signals obtained by deciding the demodulation signal with the first modulation system and for outputting first error signals obtained by a decision of the first demodulation signals by the first modulation system, wherein the first error signals represent a distance between a signal point regarding the demodulation signal and a signal point of the first demodulation signals, and

second demodulating means for outputting second demodulation signals obtained by deciding the demodulation signal with the second modulation system and for outputting second error signals obtained by a decision of the second demodulation signals by the second modulation system, wherein the second error signals represent a distance between a signal point regarding the demodulation signal and a signal point of the second demodulation signals, and

first decoding means for decoding the first demodulation signals supplied from the first demodulating means to output first decoding signals;

second decoding means for decoding the second demodulation signals supplied from the second demodulating means to output second decoding signals;

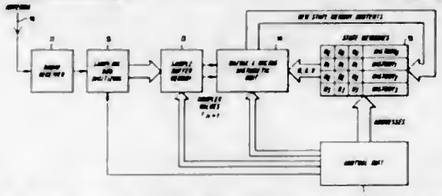
first selection means, coupled to the first and the second decoding signals, for outputting one of the first decoding signals and the second decoding signals in response to a control signal; and

comparing and controlling means, coupled to the first selection means, for comparing respective absolute values of the first error signals and the second error signals, and outputting to the first selection means the control signal so that the first selection means outputs one of the first and the second decoding signals which corresponds to a smaller one of the respective absolute values of the first and the second error signals.

5,557,645
CHANNEL-INDEPENDENT EQUALIZER DEVICE

Paul W. Dent, Stehags, Sweden, assignor to Ericsson-GE Mobile Communications Inc., Research Triangle Park, N.C.

Filed Sep. 14, 1994, Ser. No. 305,727
Int. Cl.[6] H04L *27/06;27/22*
U.S. Cl. 375—340 **17 Claims**



1. An apparatus for demodulating a signal modulated with digital information symbols so as to extract said information symbols, comprising:

receiving means for receiving said signal over a communications channel;

sampling and digitizing means for producing a sequence of numerical sample values representative of said received signal;

memory means for storing said numerical sample values, said memory means having a number of state memories each associated with a hypothesized symbol string and each comprising:

path metric memory,

B-matrix memory,

U-vector memory, and

path history memory;

control means for selectively retrieving values from said memory means and controlling the timing of operations thereupon;

metric computing means for computing candidate metrics using a hypothesis of a next of said information symbols to be demodulated made by said control means, one of said numerical sample values, path metric values, B-matrices, and U-vectors and the candidate metrics associated state number selected by said control means from said memory means;

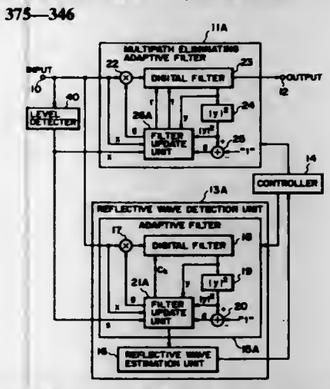
best predecessor computation means for determining the best predecessor of said candidate metrics to be selected to be written back into said memory means along with a successor B-matrix, U-vector and path history; and

updating means for calculating said successor B-matrices, U-vectors and path history using corresponding values associated with said best predecessor and said one of numerical sample values.

5,557,646
MULTIPATH ELIMINATING FILTER

Souichi Hoama, Yokohama, Japan, assignor to Kabushiki Kaisha Kenwood, Tokyo, Japan

Filed May 26, 1995, Ser. No. 451,502
Claims priority, application Japan, Jun. 4, 1994, 6-145615
Int. Cl.[6] H03D *1/04;* **H04B** *7/10;1/10*
U.S. Cl. 375—346 **6 Claims**



1. A multipath eliminating filter, characterized by comprising:

a multipath eliminating adaptive filter comprising: a digital filter having variable filter characteristics to which a frequency modulated or phase modulated digital signal containing a multipath component is inputted and which performs a filter arithmetic process on the input digital signal to eliminate the multipath component therefrom; error detection means for obtaining an error between an amplitude of a digital signal outputted from the digital filter and a reference amplitude value; level adjustment means allowing an amount of adjustment to be varied for adjusting an amplitude level of the input digital signal; and update means which calculates filter characteristics and the amount of level adjustment for minimizing an error detected by the error detection means and which updates filter characteristics for the digital filter and the amount of level adjustment for the level adjustment means;

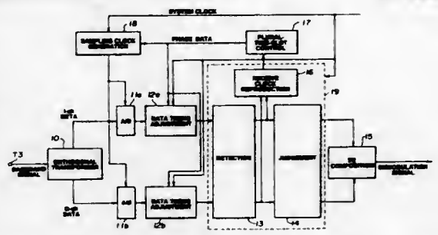
reflective wave detection means for detecting characteristics of a reflected wave from the input digital signal or an output digital signal of said multipath eliminating adaptive filter; and

control means which initializes the digital filter of said multipath eliminating adaptive filter to initial filter characteristics corresponding to characteristics of the reflected wave detected by said reflective wave detection means and which starts an adaptive operation at said multipath eliminating adaptive filter.

5,557,647
BASEBAND SIGNAL DEMODULATOR

Naohide Kushige, Sagamihara; Naritoshi Saito, Hino, and Mutsumu Serizawa, Tokye, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 4, 1994, Ser. No. 177,678
Claims priority, application Japan, Jan. 6, 1993, 5-000794; Jan. 13, 1993, 5-004239
Int. Cl.[6] H04L *7/00*
U.S. Cl. 375—371 **15 Claims**



1. A baseband signal demodulator in a receiver for demodulating a received baseband signal, comprising:

receive clock reproduction means for reproducing a receive clock based on the received baseband signal;

phase error data generation means for generating phase error data indicative of a phase error between a system clock for control of the entire receiver and a receive clock reproduced by the receive clock reproduction means;

sampling clock generation means for changing a phase of the system clock based on the phase error data to generate an optimum sampling clock for the baseband signal;

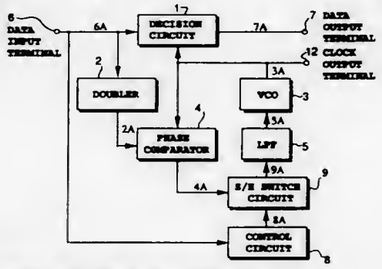
receive data generation means for generating receive data corresponding to a sampled result of the baseband signal based on the optimum sampling clock; and

data timing adjustment means for adjusting the receive data so as to synchronize with the system clock based on the phase error data.

5,557,648
PHASE LOCK LOOP CIRCUIT USING A SAMPLE AND HOLD SWITCH CIRCUIT

Noboru Ishihara, Atsugi, Japan, assignor to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Feb. 14, 1994, Ser. No. 194,668
Claims priority, application Japan, Mar. 1, 1993, 5-062465
Int. Cl.[6] H03D *3/24*
U.S. Cl. 375—376 **37 Claims**



1. A phase lock loop circuit comprising:

a phase comparator for detecting a phase difference between input data and a comparing signal;

a control circuit for detecting a consecutive identical bit state of the input data, and for outputting a control signal;

a sample and hold switch circuit for sampling and holding the output of the phase comparator, and for maintaining a holding

mode in response to the control signal supplied from the

5,557,650

5,557,652
METHOD OF ESTABLISHING COOPERATION WITH A

at the radio frequency, wherein the RF transmitter unit is switched on and off at a frequency less than twenty kilohertz, the wireless

mode in response to the control signal supplied from the control circuit while the consecutive identical bit state is being detected;

a direct current (DC) component detecting means for detecting a direct current (DC) component of the output of the sample and hold switch circuit; and

a variable frequency oscillator for generating a signal whose frequency is controlled in accordance with the output of the direct current (DC) component detecting means, and for supplying the output signal of the variable frequency oscillator to the phase comparator as the comparing signal.

5,557,649

CIRCUIT CONFIGURATION FOR DIVIDING A CLOCK SIGNAL

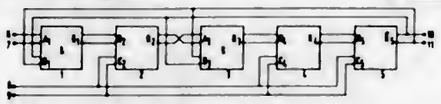
Bruno Scheckel, Ebersberg; Stefan Heinen, Krefeld; Jean Wilwert, and Helmut Herrmann, both of München, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 17, 1995, Ser. No. 442,790

Claims priority, application Germany, May 17, 1994, 44 17 147.1

Int. Cl.[6] H03K *23/66*

U.S. Cl. 377—48 **2 Claims**



1. A circuit configuration being made by differential technology for dividing a clock signal with switchable divider ratios of 4/5 by emitter coupled logic, comprising:

first, second and third series-connected flip-flops each having an output, a data input and a clock input, said output of said second flip-flop being coupled to said data input of said third flip-flop, and said clock inputs of said first, second and third flip-flops being acted upon by a clock signal;

a first AND gate being connected upstream of said first flip-flop and having a first input being acted upon by a control signal for switching over the divider ratio, and a second input being acted upon by an inverted signal from said output of said third flip-flop;

a second AND gate being connected between said first and second flip-flops and having an output connected to said data input of said second flip-flop, a first input receiving an inverted signal from said output of said first flip-flop, and a second input being acted upon by the inverted signal from said output of said third flip-flop; and

n divider stages ($n \leqq 1$) each having a flip-flop and an OR stage including first and last flip-flops and first and last OR stages;

each of said flip-flops of said divider stages except said last flip-flop having an inverted output, each of said flip-flops of said divider stages having a clock input, and each of said OR stages having a first input, a second input and an output;

said flip-flops of said divider stages being connected in series with said output of said third flip-flop, with said inverted outputs of each of said third flip-flop and said flip-flops of said divider stages each being connected to said clock input of a respective one of said flip-flops being connected downstream;

said n series-connected OR gates being connected upstream of said first input of said first AND gate, with said first input of each of said OR gates except for said first OR gate each being acted upon by an output signal from said output of a respective one of said OR gate being connected upstream, said second input of each of said OR gates except for said first OR gate receiving an inverted output signal from said inverted output of a respective one of said flip-flops of said divider stages, said first input of said first OR gate receiving a control signal, and said output of said last OR gate being connected to said first input of said first AND gate.

5,557,650

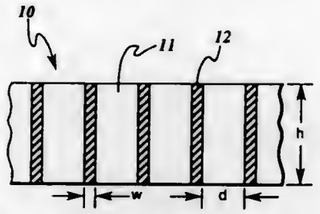
METHOD FOR FABRICATING AN ANTI-SCATTER X-RAY GRID DEVICE FOR MEDICAL DIAGNOSTIC RADIOGRAPHY

Renato Guida, Wynantskill, and Kenneth P. Zarnoch, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 10, 1995, Ser. No. 402,222

Int. Cl.[6] G21K *1/00*

U.S. Cl. 378—154 **17 Claims**



1. A method for fabricating an anti-scatter x-ray grid for medical diagnostic radiography, the method comprising:

providing a substrate having channels therein, the substrate comprising a plastic material that is substantially non-absorbent of x-radiation; and

melting absorbing material that is substantially absorbent of x-radiation and flowing the melted absorbing material into the channels, the substrate comprising material capable of remaining stable at the melting temperature of the absorbing material.

5,557,651

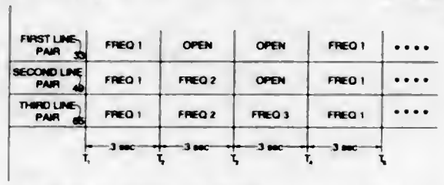
SIGNAL GENERATOR FOR TRACING MULTIPLE TRANSMISSION LINES

Charles H. Wissman, Oceanside, Calif., assignor to Tempo Research Corporation, Vista, Calif.

Filed Jun. 5, 1995, Ser. No. 461,687

Int. Cl.[6] H04M *3/08;3/00;* **G01R** *19/00*

U.S. Cl. 379—6 **19 Claims**



1. A method of tracing a plurality of transmission lines from a first location to a second location, comprising the steps of:

generating a signal;

respectively applying, at the first location, a unique pattern of said signal to each transmission line to be traced, wherein each said transmission line receives a unique pattern of said signal that differs from the pattern of said signal applied to any other of said transmission lines;

detecting, at the second location, said unique pattern of said signal respectively applied to each said transmission line, thereby allowing the identity of each said transmission line to be determined according to the unique pattern respectively applied at the first location and detected at the second location; and

wherein the step of applying said unique pattern of said signal comprises selectively connecting and disconnecting each transmission line to a signal generator.

5,557,652

METHOD OF ESTABLISHING COOPERATION WITH A FUNCTIONALITY

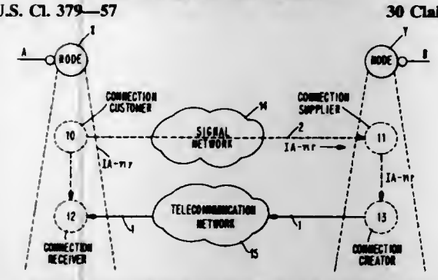
Björn E. R. Jonsson, Järfälla, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation of Ser. No. 18,268, Feb. 16, 1993, abandoned. This application Nov. 20, 1995, Ser. No. 561,113

Claims priority, application Sweden, Feb. 17, 1992, 9200467

Int. Cl.[6] H04G *7/38;* **H04M** *3/42*

U.S. Cl. 379—57 **30 Claims**



1. A method by means of which a first node in a telecommunication network establishes cooperation with hardware equipment which is present in a second node in a second telecommunication network and which can be connected to the first telecommunication network through the intermediary of a third telecommunication network, comprising the steps of:

assigning to the desired cooperation between the first node and said hardware equipment a temporary interaction number which is associated with the desired cooperation;

transmitting the temporary interaction number to the second node;

initiating, by the second node, the establishment of a connection to the first node through said third telecommunication network using the temporary interaction number as a destination address of the first node;

connecting the hardware equipment to said connection; and

releasing said interaction number after the setup of said connection.

5,557,653

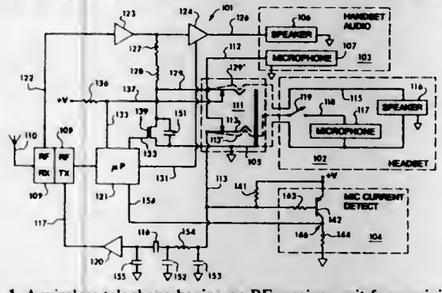
HEADSET FOR HANDS-FREE WIRELESS TELEPHONE

Graeme S. Paterson, Boulder; Gary L. Bliss, Westminster, and Mark R. Boyd, Boulder, all of Colo., assignors to SpectraLink Corporation, Boulder, Colo.

Filed Jul. 27, 1993, Ser. No. 97,881

Int. Cl.[6] H04M *11/00*

U.S. Cl. 379—58 **13 Claims**



1. A wireless telephone having an RF receiver unit for receiving digitized voice information transmitted at a radio frequency and converting the received digitized voice information into a received audio signal on a speaker audio line, the wireless telephone also having an RF transmitter unit for converting a transmit audio signal of a users voice on a microphone audio line into digitized voice information and transmitting the digitized voice information at the radio frequency, wherein the RF transmitter unit is switched on and off at a frequency less than twenty kilohertz, the wireless telephone comprising:

a headset jack for receiving a headset plug, the headset jack having a ground conductor, first and second movable conductors, and first and second stationary conductors, wherein each of the movable conductors are electrically isolated from the stationary conductors when a headset is plugged into the headset jack and the second movable conductor is coupled to the microphone audio line;

a first RF attenuation network coupled to the speaker audio line, the first movable conductor, and ground;

a second RF attenuation network coupled to the microphone audio line and ground; and

an audio amplifier having an input coupled to the second RF attenuation network and having an output coupled to the RF transmitter unit.

5,557,654

SYSTEM AND METHOD FOR AUTHENTICATING SUBSCRIBERS OF A TRANSMISSION NETWORK AND SUBSCRIPTION, HAVING DIFFERING AUTHENTICATION PROCEDURES, USING A COMMON AUTHENTICATION CENTER

Sanna Mäenpää, Espoo, Finland, assignor to Nokia Telecommunications OY, Espoo, Finland

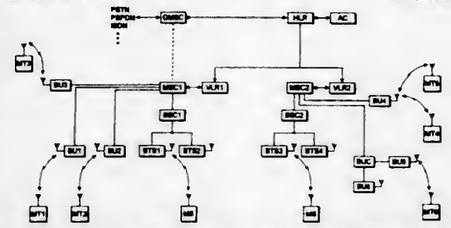
PCT No. PCT/FI93/00063, § 371 Date Oct. 20, 1993, § 102(e) Date Oct. 20, 1993, PCT Pub. No. WO93/17529, PCT Pub. Date Sep. 2, 1993

PCT Filed Feb. 23, 1993, Ser. No. 137,123

Claims priority, application Finland, Feb. 24, 1992, 920792

Int. Cl.[6] H04Q *7/20*

U.S. Cl. 379—58 **5 Claims**



1. A subscriber authentication method in a telecommunication system comprising a transmission network having subscriber identity codes of a first format, a first subscriber authentication procedure and at least one exchange; a subsystem connected to said exchange and having subscriber identity codes of a second format and a second subscriber authentication procedure, the calls of the subscribers of the subsystem being routed through the transmission network and said exchange, said method comprising the steps of:

sending by the transmission network an authentication message containing a first authentication parameter to the subscriber through a said exchange;

generating by the subscriber a second authentication parameter in response to the received first authentication parameter and sending it through said exchange as an authentication response to the transmission network;

comparing by the transmission network the second authentication parameter generated by the subscriber with a corresponding reference parameter and considering the subscriber as correctly authenticated if the second authentication parameter and the reference parameter are equal;

employing by the transmission network for identification of a subscriber of the subsystem a subscriber identity code converted from the second format to the first format and containing a system code indicating that the identity code belongs to a subscriber of the subsystem;

employing by the transmission network for authentication of a subscriber a pair of the first authentication parameter and the reference parameter, generated according to the authentication

procedure of the transmission system, when a subscriber

5,557,659

procedure of the transmission system, when a subscriber identity code belongs to a subscriber of the transmission system; and

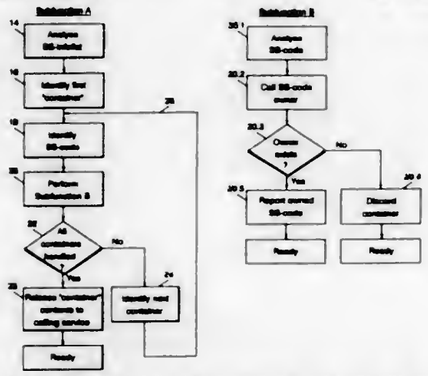
employing by the transmission network for authentication of a subscriber a pair of the first authentication parameter and the reference parameter, generated according to the authentication procedure of the subsystem, when a subscriber identity code belongs to a subscriber of the subsystem.

5,557,655

METHOD FOR ANALYZING SUBSCRIBER DATA RECEIVED FROM AN HLR IN GSM MSC/VLR

Sven J. Lantto, Tullinge, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Oct. 26, 1993, Ser. No. 141,086
Int. Cl.[6] H04Q *7/22*
U.S. Cl. 379—58 **10 Claims**



4. A method of receiving supplementary services data in a mobile switching center/visitor location register (MSC/VLR) from a home location register (HLR) in accordance with a Global System for Mobile (GSM) communications mobile application part (MAP) protocol, the method comprising the steps of:

analyzing a supplementary services code in a designated location in at least one of a plurality of containers contained within the MAP protocol;

granting access to contents of each of said plurality of containers which have a designated supplementary services code; and

copying container data corresponding to said designated supplementary services code into a MSC/VLR.

5,557,656

MOBILE TELECOMMUNICATIONS FOR AIRCRAFT AND LAND BASED VEHICLES

Jimmy C. Ray, Denison; Robert L. George, II, Plano, and Richard C. Levine, Richardson, all of Tex., assignors to AirCell, Inc., Dallas, Tex.

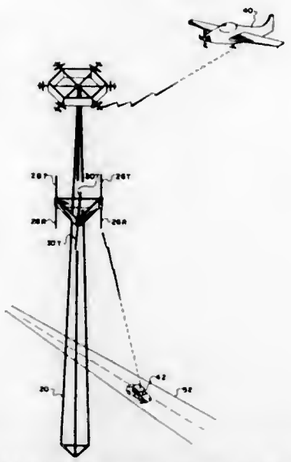
Filed Mar. 6, 1992, Ser. No. 847,920
Int. Cl.[6] H04Q *7/22*
U.S. Cl. 379—59 **5 Claims**

1. A structural cellular telephone system using a designated plurality of radio channels, some of the channels being control channels and some of the channels being voice channels, said system having

a) a plurality of cells, each cell having a base station including a tower located proximate a center thereof,

b) each base station equipped to simultaneously transmit and receive on the plurality of voice channels, and at least one control channel,

c) a plurality of mobile stations operating within the cells,



d) each mobile station being equipped to transmit and receive on some of the channels, and

e) at least one mobile switching center connected to each of said base stations,

f) said mobile switching centers including means for switching any of the mobile stations from one cell to another,

g) each of the mobile stations being equipped to receive instructions from the base stations to determine selections of said channels,

wherein the improvement comprises:

h) some of the mobile stations being on aircraft and some of the mobile stations being on land vehicles,

i) some of said base stations having an air capability to transmit and receive signals on the channels in an aircraft horizontal polarized radiation,

j) all said base stations having capability to transmit and receive signals on the channels in a land vertical polarized radiation,

l) the voice channels to be used for aircraft horizontal polarized radiation selected from all of the voice channels, and the voice channels to be used for land vertical polarized radiation selected from all of the voice channels,

m) each of the cells having a land effective transmission range from the base station,

n) all cells having a base station having said air capability having an air effective transmission range which is greater than the land effective transmission range of all cells.

5,557,657

HANDOFF BETWEEN OVERLAY AND UNDERLAY CELLS

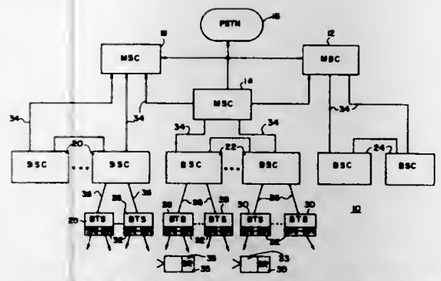
Charles A. Barnett, Sterling, Va., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 9, 1993, Ser. No. 118,548
Int. Cl.[6] H04Q *7/38*
U.S. Cl. 379—60 **11 Claims**

3. A cellular communication system, having a plurality of base station transceivers positioned adjacent one another, one of said plurality of transceivers having a signal strength greater than a signal strength of an adjacent transceiver to define an underlay and an overlay cell, the system comprising

a base station controller coupled to the plurality of base station transceivers for storing at times a current transmit attenuation level of a mobile unit and storing a minimum mobile transmit attenuation level permitted by the underlay cell;

means for establishing a threshold level for a mobile unit comprising a predefined nominal threshold level stored in the base station controller; and means for adjusting the predefined



nominal threshold level in accordance with the current transmit attenuation level of the mobile unit; and

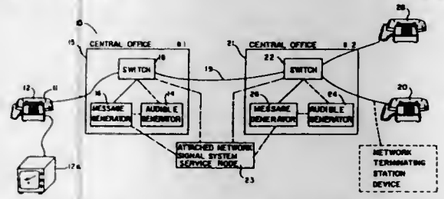
means for handing off the mobile unit to the overlay cell at times when the RF signal strength of the serving cell is equal to or less than the established threshold level, and to the underlay cell at times when the RF signal strength of the serving cell is greater than the established threshold level.

5,557,658

COMMUNICATIONS MARKETING SYSTEM

Mark R. Gregorek, Mahwah, and Jeffrey C. Dillow, Sparta, both of N.J., assignors to Quantum Systems, Inc., Ramsey, N.J.

Continuation-in-part of Ser. No. 245,723, May 18, 1994, Pat. No. 5,428,670, which is a continuation-in-part of Ser. No. 718,080, Jun. 20, 1991, Pat. No. 5,321,740. This application Aug. 11, 1994, Ser. No. 289,472
Int. Cl.[6] H04M *3/22;3/42;11/08*
U.S. Cl. 379—67 **43 Claims**



28. A method for use with an existing communications network for playing one or more generally continuous announcements to a network station which is waiting to reconnect to a call with another network station, wherein a first station at a first network address is connected to a call with a second station at a second network address, a selected one of the first or second stations being temporarily disconnected from the other station and placed on hold within the network and prior to reconnecting the one selected station to the other station, the method comprising:

the first station signalling the network to place the second station on hold within the network;

temporarily disconnecting the first station from the second network address and placing the second station on hold within the network;

playing at least one generally continuous announcement to at least one of the first station and the second station while the second station is on hold within the network;

the first station signalling the network to reconnect to the second station; and

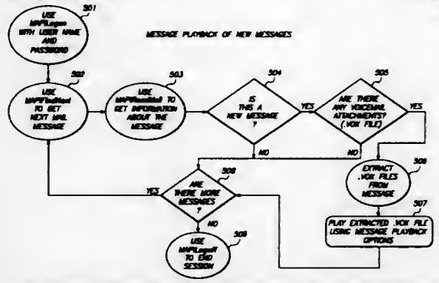
terminating the playing of the announcement and reconnecting the second station to the first station.

5,557,659

ELECTRONIC MAIL SYSTEM HAVING INTEGRATED VOICE MESSAGES

Henry C. A. Hyde-Thomson, 11 North Terrace, London SW3 2BA, England

Continuation of Ser. No. 80,318, Jun. 22, 1993, abandoned. This application Dec. 21, 1994, Ser. No. 361,019
Int. Cl.[6] H04M *3/50*
U.S. Cl. 379—88 **1 Claim**



1. A method of integrating voice messages with text messages in an electronic mailing system comprising the steps of:

generating a single directory which contains a plurality of E-mail addresses, and extension numbers;

receiving a forwarded incoming telephone call; determining a called party's extension number;

recording a voice message from said incoming telephone call as a digital voice file;

attaching said voice file to an E-mail message as part of an E-mail system according to an application program interface of an E-mail system;

determining an E-mail mailbox address from said directory based on said extension number;

sending said E-mail message with its voice file in association with its mailbox address; and

playing back said voice messages over a telephone.

5,557,660

PROGRAM-CONTROLLED COMMUNICATION SYSTEM WHEREBY A CALL REQUEST IS SIMULTANEOUSLY SIGNALED AT A PLURALITY OF COMMUNICATION TERMINAL EQUIPMENT

Luc Crevits, Tielt, and Marc Vanlandeghem, Deinze, both of Belgium, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 954,874, Sep. 30, 1992, abandoned. This application Jan. 11, 1996, Ser. No. 584,912
Claims priority, application Germany, Sep. 30, 1991, 41 32 588.5
Int. Cl.[6] H04M *3/42*
U.S. Cl. 379—215 **17 Claims**

1. A program-controlled communication system having communication terminal equipment, comprising:

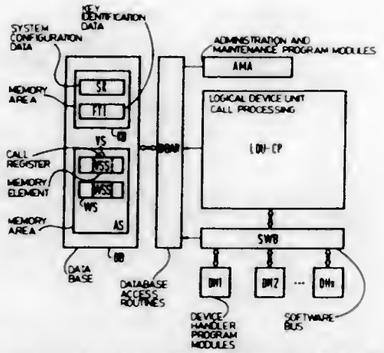
a central control having a main memory containing a database, said central control operatively connected to said communication terminal equipment;

the terminal equipment having keys and/or function keys actuation of which initiate switching-oriented procedures and call setup procedures;

first information for initiating and controlling the procedures;

the database having function key identification information contained in memory areas of the database respectively allocated to said function keys which the central system control accesses, device-related information having at least information about connection configurations, authorizations and services, and second information about physical functions;

at least one group composed of one first communication terminal equipment and one second communication terminal equipment provided as a device configuration;



means for simultaneously signaling an incoming first call, from a third communication terminal and addressed to the first communication terminal equipment, at both the first and second communication terminal equipment;

the central system control having means for call-associated information being written into and read out from memory sections of the main memory dynamically allocated and serving as call register elements and as waiting list memory elements, both during a call setup as well as given an existing call;

in instances wherein the incoming first call signaled at the first and second communication terminal equipment is first accepted by the second terminal equipment and is subsequently transferred into a holding status and wherein a call set up for a second call is effected from the second communication terminal equipment to the first communication terminal equipment using a call register element independent of the first call, the central system control having means for clearing down the second call existing between the first and the second communication terminal equipment as well as, simultaneously, initiating communication of signaling information via a signaling channel to the first communication terminal equipment in response to actuation of a predetermined function key and on the basis of function key identification information allocated to said predetermined function key and communicated to the communication system and on the basis of switching-oriented procedures read out in response thereto from the allocated memory area of the database; and

means for automatically generating in response to said signaling information, a message corresponding to call acceptance and initiating a call set up procedure and effecting a through-connect of the first communication terminal equipment to the third communication terminal equipment transferred into the hold status.

5,557,661

SYSTEM FOR CODING AND DECODING MOVING PICTURES BASED ON THE RESULT OF SPEECH ANALYSIS

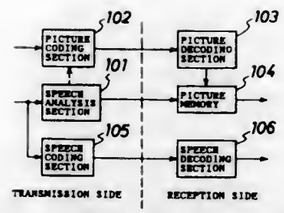
Yutaka Yokoyama, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 26, 1994, Ser. No. 329,331
Claims priority, application Japan, Nov. 2, 1993, 5-274219
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—96 **8 Claims**

1. A system for coding and decoding a moving picture based on a result of a speech analysis, the system comprising:

a transmission side apparatus for coding speech and a picture and transmitting the coded speech and coded picture; and

a reception side apparatus for receiving and decoding the coded speech and the coded picture from said transmission side apparatus;



said transmission side apparatus including speech coding means for coding and outputting input speech into and as coded speech data to said reception side apparatus, speech recognition means for analyzing the input speech to recognize the input speech as a predetermined number of utterance conditions in expressed in units of phonemes and outputting a result of the speech recognition, picture coding means for coding and outputting input pictures corresponding to the predetermined number of utterance conditions into and as coded picture data, history storage means for storing transmission history information of the coded picture data transmitted from said picture coding means to said reception side apparatus, and determination means for referring to said history storage means to determine whether or not the coded picture data corresponding to the result of the speech recognition has been transmitted to said reception side apparatus and controlling said picture coding means in accordance with a result of the determination;

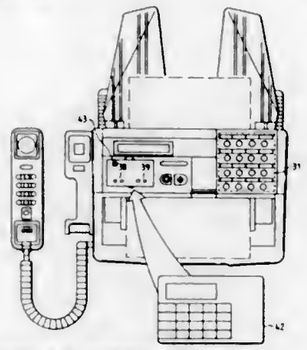
said reception side apparatus including speech decoding means for decoding the coded speech data received from said transmission side apparatus into decoded speech and outputting the decoded speech, picture decoding means for receiving and decoding the coded picture data into a decoded picture and for outputting the decoded picture, and picture storage means for cumulatively storing the decoded picture decoded by said picture decoding means and selectively outputting, when the result of the speech recognition is received, one of the decoded pictures stored therein which corresponds to the result of the speech recognition.

5,557,662

COMMUNICATION APPARATUS CAPABLE OF UTILIZING PORTABLE DEVICE

Toshio Kenmochi, and Masao Kiguchi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 113,317, Aug. 30, 1993, abandoned, which is a division of Ser. No. 633,310, Dec. 24, 1990, abandoned. This application Nov. 7, 1994, Ser. No. 335,307
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—100 **26 Claims**



1. A communication apparatus comprising:

communication means for communicating with a selected one of plural destinations;

connection means for detachably connecting a portable device to said communication means;

first reception means for receiving a code from the portable device, the code indicating a memory capacity of the portable device;

discriminating means for discriminating whether the portable device is capable of storing information regarding the plural destinations stored in said communication apparatus, based on the code sent from the portable device to said first reception means; and

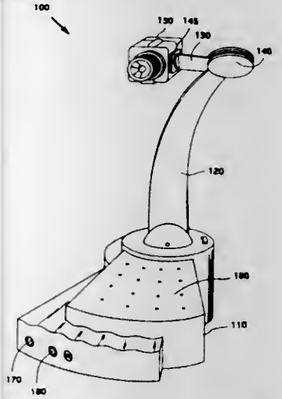
first transmission means for transmitting the information regarding the plural destinations to the portable device according to a discrimination by said discriminating means at a time when said communication apparatus is connected to the portable device via said connection means.

5,557,663

MULTI-MEDIA COMMUNICATION SYSTEM WITH INTEGRATED AND COHERENT AUDIO-VIDEO USER INTERFACE ALLOWING FLEXIBLE IMAGE INPUT

Shu-Chen Huang, Taiwan; Yu-Lin Chao, and Jeng-Yeong Tyan, both of Hsin-Chu, all of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Feb. 15, 1995, Ser. No. 389,151
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—110 **7 Claims**



1. An integrated audio-video user interface for a multi-media communication system comprising:

a base-support means for supporting said integrated audio-video interface thereon wherein said base-support means further including a plurality of audio input and output devices;

a video input means; and

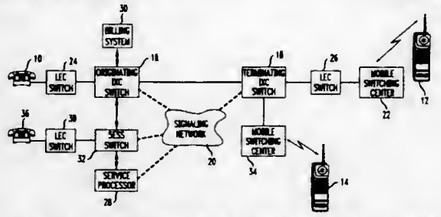
a multi-direction adjustable supporting means for supporting said video input means thereon, said adjustable supporting means being securely attached to said base support means and being flexibly adjustable for directing said video input means for pointing to different directions.

5,557,664

CALLING PARTY-PAID WIRELESS TELEPHONE SERVICE

Elaine G. Burns, Middletown; Esther L. Davenport, Holmdel; Belkacem Manseur, Tinton Falls; Gary A. Munson, Little Silver; Barry S. Seip, New Providence, all of N.J., and Elaine I. Sze, Kirkland, Wash., assignors to AT&T, Holmdel, N.J.

Filed Mar. 31, 1995, Ser. No. 414,555
Int. Cl.[6] H04M *15/00;15/06;17/00*
U.S. Cl. 379—114 **17 Claims**



1. A method for processing a call from a calling party to a called party, the method comprising the steps of:

responsive to a dialed telephone number, querying a database to determine on a call-by-call basis whether to bill the calling party or the called party for communication charges associated with wireless communications service provided to the called party, the dialed number being a number associated with a provider to the called party which provides a service in which the called party can designate that the calling party is to be billed for the communication charges;

delivering to a wireless telecommunications switch a routing telephone number obtained from the database query, the routing telephone number identifying a telephone station to which the call is to be completed and being different from the dialed telephone number; and

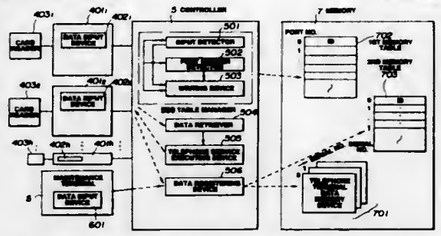
responsive to a determination in the querying step that the calling party is to be billed for the communication charges, inhibiting billing of the called party for the communication charges.

5,557,665

TELEPHONE SYSTEM

Keiji Yamamoto, Hino, Japan, assignor to Toshiba Corporation, Kanagawa-Ken, Japan

Filed Jun. 22, 1994, Ser. No. 263,381
Claims priority, application Japan, Jun. 23, 1993, 5-151793
Int. Cl.[6] H04M *3/38;1/57;1/276*
U.S. Cl. 379—198 **26 Claims**



1. In a telephone system for providing personalized services comprising:

a plurality of telephone terminals;

a plurality of individual identifier input means, each associated with one of said telephone terminals, for entering an individual identifier; and

a PBX for serving said plurality of telephone terminals, said PBX comprising:

telephone terminal data memory means for storing telephone terminal data each associated with at least an individual identifier;

a first memory table storing an identifier of each of said telephone terminals and, if the telephone terminal is in use, the individual identifier which has been entered from the individual identifier input means associated with said telephone terminal;

associating means responsive to an individual identifier entered from one of said individual identifier input means for associating said individual identifier with the identifier of the telephone terminal with which said one of said individual identifier input means is associated to place said telephone terminal in a personalized mode (hereinafter, referred to as "P mode"); and

executing means responsive to a selection of telephone service made from one of the P-mode telephone terminals for executing said selected telephone service for said one of the P-mode telephone terminals on the basis of said telephone terminal data stored in said telephone terminal data memory means and associated with at least said individual identifier,

an improvement wherein:

said telephone terminal data comprises first telephone terminal data associated with said individual identifier and optional second telephone terminal data associated with said individual identifier and telephone terminal identifiers which have been specified by the owner of said individual identifier; and

said executing means comprises means for executing said selected telephone service on the basis of said second telephone terminal data, if any, and on the basis of said first telephone terminal data, otherwise.

5,557,666

METHOD FOR DISPLAYING AN ABSENT-MESSAGE IN A PRIVATE EXCHANGE SYSTEM

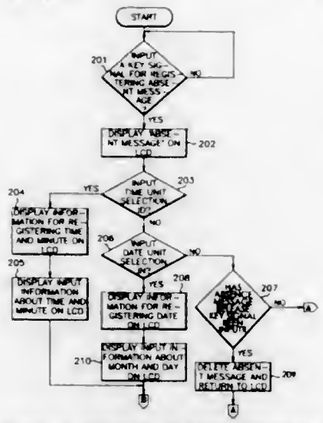
Moon-sik Kim, Ahnyang, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 1, 1994, Ser. No. 221,629

Claims priority, application Rep. of Korea, Nov. 17, 1993, 24486/1993

Int. Cl.[6] H04M *1/64;1/21;3/42*

U.S. Cl. 379—201 **19 Claims**



12. A method for registering an absence-message in a private exchange system, comprising the steps of:

inputting a first key on a telephone within said system to enable a subscriber to register said absence-message, said absence-message being comprised of an absence period message and an absence content message, said absence content message indicating why said subscriber is going to be absent and said absence-period message indicating a beginning point and an ending point of said subscriber's absence;

after inputting said first key, inputting one of a time unit selection key and a date unit selection key on said telephone to indicate a format in which said absence-period message will be expressed;

inputting said ending point of said subscriber's absence, said telephone automatically designating one of a current time and a current date as said beginning point of said subscriber's absence unless an input representative of said beginning point is provided;

displaying said absence-period message on a variable visual display of said telephone;

after displaying said absence-period message, selecting said absence-content message via key input and displaying said absence-content message on said variable visual display of said telephone;

confirming that said absence-period message and said absence-content message being displayed are desired messages; and

storing said absence-period message and said absence-content message as selected messages.

5,557,667

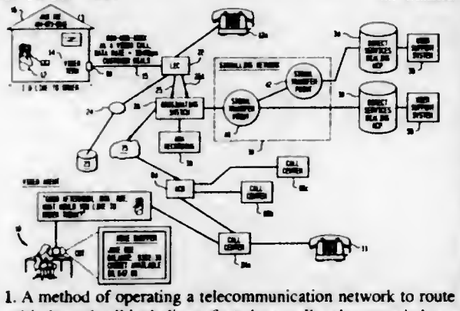
METHOD AND SYSTEM FOR MULTI-CHANNEL DATA AUTOMATIC CALL DISTRIBUTION FOR SEQUENTIALLY LAUNCHED CALLS

Richard F. Bruno, Morristown; Mon-Mei Chen, Marlboro; Rosemary H. Harris, Colts Neck, and Robert E. Markowitz, Glen Rock, all of N.J., assignors to AT&T, Holmdel, N.J.

Continuation-in-part of Ser. No. 215,069, Mar. 18, 1994. This application Mar. 9, 1995, Ser. No. 401,314

Int. Cl.[6] H04M *3/50;* **H04G** *3/64;* **H04J** *3/12*

U.S. Cl. 379—201 **15 Claims**



1. A method of operating a telecommunication network to route a multi-channel call including a first phone call and a second phone call placed at substantialy the same time, from a caller at a calling number to an agent position at a selected destination of a network subscriber based on voice and data transport capability for increased bandwidth communication, wherein the selected destination is one of a plurality of destinations selected by the network subscriber identified by a common telephone number, the method comprising:

associating with each of the first and second phone calls a plurality of discriminators common to both voice and data calls, and an additional data rate discriminator corresponding to a data rate used by the calling party, when the first and second phone calls are data calls,

accessing a first database in response to receiving the common telephone number from the calling party for obtaining a subscriber selected destination number for a voice call based on the common discriminators and a separate subscriber selected destination number for a data call, wherein the separate subscriber selected destination number is based on the common discriminator and the data rate used by the caller,

obtaining the separate subscriber selected destination number for both the first and second phone calls,

providing a second database having a stored plurality of fields each correlating agent positions with calling numbers connected to channels at the agent positions,

querying said second database in response to receipt of one of the first or second calls at the destination, and

responsive to said second database query, completing the first and second phone calls by hunting one of the first or second phone calls to a first channel of an agent position at the destination and connecting the other of the first or second phone calls to a second channel of the agent position.

5,557,668

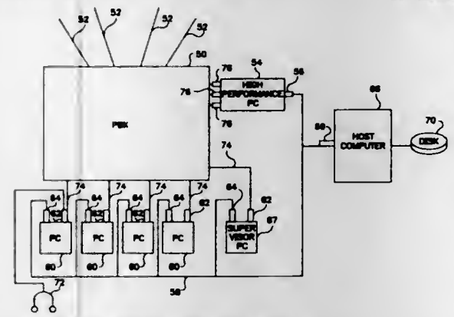
CALL DISTRIBUTION SYSTEM WITH DISTRIBUTED CONTROL OF CALLS AND DATA DISTRIBUTION

Patrick K. Brady, Wheaton, Ill., assignor to Teledata Solutions, Inc., Glen Ellyn, Ill.

Continuation of Ser. No. 904,196, Jun. 25, 1992, abandoned. This application May 25, 1995, Ser. No. 450,268

Int. Cl.[6] H04M *3/58;3/00*

U.S. Cl. 379—212 **15 Claims**



1. A call distribution system comprising:

at least one telephone line;

a first telephony interface device having a telephony connection with said at least one telephone line;

a computer having a data connection to said first telephony interface device;

an interprocess message dispatch system capable of sending messages from one process to another;

a first call control process controlling said first telephony interface device to perform telephony functions, having a message port to said interprocess message dispatch system, and sending messages to a network interface process via said interprocess message dispatch system;

a second telephony interface device having a telephony connection with said at least one telephone line;

a second call control process controlling said second telephony interface device to perform telephony functions;

a communication connection between said second call control process and said network interface process for sending to said second call control process a message received by said network interface process from said first call control process; and

wherein each of said call control processes includes data comprising

a list of calls coming over said at least one telephone line and

a list of all additional computers currently available to receive a transferred telephone call, said lists built from data provided to said call control processes via messages sent over said communication connection.

5,557,669

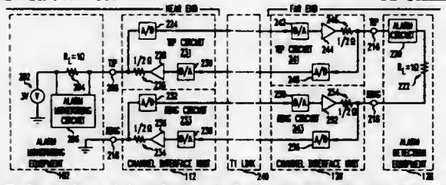
CHANNEL INTERFACE UNIT

Steven B. Perry, Perrineville, N.J., and James P. Hogan, Sterling, Va., assignors to ANTEC Corporation, Rolling Meadows, Ill.

Division of Ser. No. 28,884, Mar. 10, 1993. This application Oct. 12, 1993, Ser. No. 135,023

Int. Cl.[6] H04M *3/22*

U.S. Cl. 379—339 **32 Claims**



7. In a channel interface unit for interconnecting a two-wire transmitting means for propagating analog signals and a digital signal transmitting means for propagating digital signals, wherein said channel interface unit contains a digital interface circuit, connected to said digital signal transmitting means, for producing digital signals based on digital signals received from said digital signal transmitting means; a digital-to-analog converter circuit for converting said digital signals produced by the digital interface circuit into representative analog signals; a driver circuit for amplifying said analog signals and applying said amplified analog signals to said two-wire transmitting means; and a power supply for providing a regulated voltage to said driver circuit, a method of reducing noise in said analog signal produced by said digital-to-analog converter circuit comprising the steps of:

filtering said analog signals produced by said digital-to-analog circuit;

detecting a DC component represented in said digital signals produced by said digital interface circuit;

generating, in response to said DC component, a control signal; and

bypassing, in response to said control signal, said step of filtering such that said analog signals are no longer filtered.

5,557,670

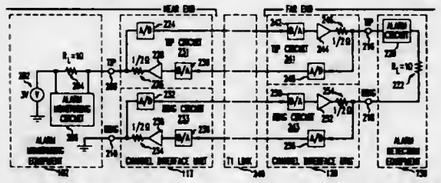
CHANNEL INTERFACE UNIT

Steven B. Perry, Perrineville, N.J., and James P. Hogan, Sterling, Va., assignors to Antec Corporation, Rolling Meadows, Ill.

Division of Ser. No. 28,884, Mar. 10, 1993. This application Oct. 12, 1993, Ser. No. 135,025

Int. Cl.[6] H04M *3/22*

U.S. Cl. 379—339 **21 Claims**



1. In a communications system, a channel interface unit for interconnecting a two-wire transmitting means for propagating analog signals and a digital signal transmitting means for propagating digital signals, said channel interface unit comprising:

digital interface means, connected to said digital signal transmitting means, for producing digital signals based on digital signals received from said digital signal transmitting means;

means, connected to said digital interface means, for converting said digital signals into representative analog signals;

a driver, connected to said means for converting, said driver amplifying said representative analog signals to form amplified analog signals and transmitting said amplified analog signals onto said two-wire transmitting means;

a selector for selecting an operational mode from among a group of candidate operational modes;

a circuit, connected to said driver, the circuit selecting a characteristic for said driver based on said operational mode selected by said selector; and

a power supply, connected to said driver, the power supply providing a regulated voltage to said driver.

5,557,671

DIALING APPARATUS

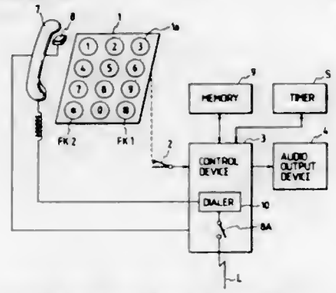
Shozo Endoh, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1993, Ser. No. 174,774

Claims priority, application Japan, Jan. 7, 1993, 5-016952

Int. Cl.[6] H03M *11/10*

U.S. Cl. 379—355 **23 Claims**



17. A dialing method comprising the steps of:

generating a first audio sound according to an operated dial key;

transmitting a dial signal according to the operated dial key; and

generating, according to an off-hook of a handset by a user, a second audio for informing the user that the first audio sound is generated according to the operated dial key.

5,557,672

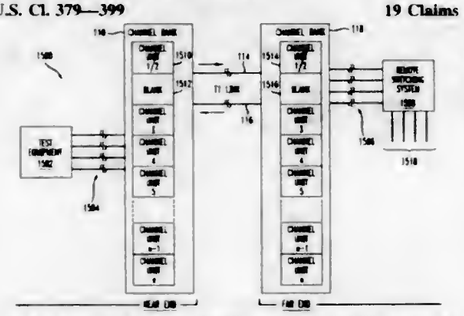
CHANNEL INTERFACE UNIT

Steven B. Perry, Perrineville, N.J., and James P. Hogan, Sterling, Va., assignors to ANTEC Corporation, Rolling Meadows, Ill.

Filed Mar. 10, 1993, Ser. No. 28,884

Int. Cl.[6] H04M *11/04*

U.S. Cl. 379—399 **19 Claims**



1. In a communications system, a channel interface unit for interconnecting a two-wire transmitting means for propagating analog signals and a digital signal transmitting means for propagating digital signals, said channel interface unit comprising:

digital interface means, connected to said digital signal transmitting means, for producing digital signals based on digital signals received from said digital signal transmitting means;

means, connected to said digital interface means, for converting said digital signals into representative analog signals;

driver means, connected to said converting means, for amplifying said analog signals and for transmitting said amplified analog signals onto said two-wire transmitting means; and

power supply means, connected to said driver means and said converting means and operating in response to certain characteristics of said amplified analog signals, for providing, during a tracking mode, regulated voltage to said driver means wherein said regulated voltage is equivalent to a value of said amplified analog signal plus a preset voltage value, and for providing to said driver means, during an idle mode, a voltage equivalent to said preset voltage value.

5,557,673

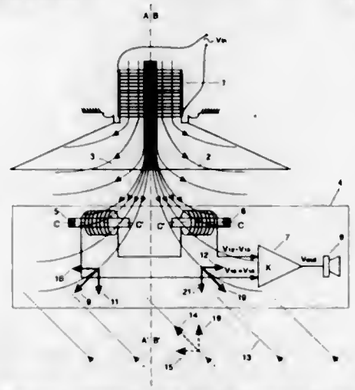
AUDITORY ASSISTANCE APPARATUS AND METHOD

Boris Ginzburg, Migdal Haemek, Israel, assignor to AVR Communications, Ltd., Migdal Haemek, Israel

Filed Oct. 25, 1994, Ser. No. 329,148

Int. Cl.[6] H04M *1/00;* **H04R** *25/00*

U.S. Cl. 379—443 **20 Claims**



1. An auditory assistance apparatus for use with a sound signal source which also produces a magnetic field propagated along a magnetic field axis, said auditory assistance apparatus, comprising:

a pair of magnetic pickup coils of substantially the same electrical and magnetic parameters, but of opposite polarity, to be located close to said sound signal source;

said pair of coils being electrically connected together in series and being mounted on separate cores having parallel axes oriented symmetrically with respect to the geometrical axis of the auditory assistance apparatus with the axes of the cores substantially perpendicular to said magnetic field axis of the sound signal source and said geometrical axis of the auditory assistance apparatus;

an amplifier connected to receive the outputs of said pair of series-connected pickup coils;

and an audio transducer connected to said amplifier for converting its output to sound.

5,557,674

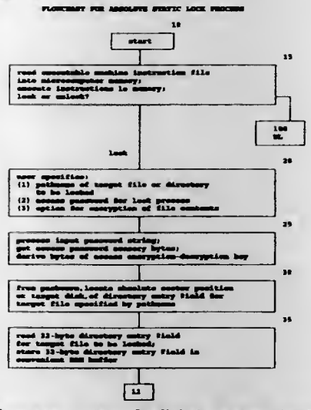
ABSOLUTE STATIC LOCK OF FILES AND DIRECTORIES ON MAGNETIC DISK STORAGE MEDIA IN SINGLE MACHINE PERSONAL MICROCOMPUTERS

Kok-Wah Yeow, 712 Pasadena Avenue, Winnipeg, Manitoba R3T 2T3, Canada, assignor to Kok-Wah Yeow, Winnipeg, Canada

Filed Nov. 18, 1994, Ser. No. 342,169

Int. Cl.[6] G06F *12/14*

U.S. Cl. 380—4 **2 Claims**



1. In a file storage system of a digital computer, implemented in fixed or removable disk storage media by operating system means and BIOS means of said computer, the method of absolute static lock for securing files and removable floppy disks in said storage system, from access by the operating system of the computer, or by that of any other compatible computer, for operations including read, copy, overwrite and erase, comprising the steps of:

(a) modifying directory entry field for the target file into a special null format, including alteration of the directory entry data for filesize, and file starting cluster, to null values, whereby said target file in a locked state will appear to the operating system specifically as a null diskfile possessing null filesize and null starting cluster bytes;

(b) said modification including storage of data in encrypted form at predetermined byte offset positions within the directory entry field, said data storage being completely transparent to the operating system, and said offset or equivalent positions not normally used by, or are functionally transparent to, the operating system of the computer;

(c) said stored data including data on summary bytes for the access password accompanying the user request to lock the target file, and including also data in encrypted form, specifying physical locations in target disk surface wherein is stored the main bulk of decoding data required to unlock the locked target file completely;

(d) protecting the file allocation table entries comprising the file allocation table cluster-chain for the target file, effected by marking said entries as being reserved and physically unusable, thereby rendering the physical disk storage areas occupied by the target file inaccessible to the operating system of said computer;

(e) reserving and protecting, in the disk media containing said target file, suitable storage area with adequate byte capacity in which to store decoding information required to unlock a locked target file completely, said reserved storage area being associated, and uniquely identified, with its own file allocation table cluster-chain data, corresponding to the actual physical cluster locations on the surface of the disk said reserved storage area occupies; p1 (f) in the case where the target disk media is a floppy disk, suitably adjusting the track layout parameters permitting program means of said method in conjunction with BIOS means of said computer to reformat the entire outermost track of the floppy disk into a predetermined, non-standard, encrypted, compressed format, said outermost track containing the boot sector for the disk occupying first sector position in said track;

(g) said track format also including at least a non-standard sector size for the boot sector.

5,557,675

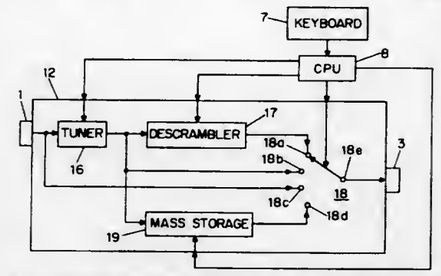
COMPUTER CONTROLLED AUDIO-VISUAL SYSTEM

Donald Schupak, Schupak Group, 730 Fifth Ave., Suite 1901, New York, N.Y. 10019

Filed May 10, 1994, Ser. No. 240,329

Int. Cl.[6] H04N *7/16;7/08;5/268*

U.S. Cl. 380—10 **17 Claims**



1. A computer apparatus receiving an audio/video signal for controlling, in response to user input, an audio/video system including a plurality of audio/video components, comprising:

a central processor receiving said user input;

a plurality of tuners receiving a respective plurality of tuner control signals from said central processor for tuning a plurality of selected channels from among a plurality of channels present in said audio/video signal;

a plurality of descramblers receiving a respective plurality of descrambler control signals from said central processor and a respective plurality of tuned selected channels for descrambling the plurality of tuned selected channels when said plurality of tuned selected channels have been scrambled;

a multiplexer receiving a multiplexer control signal from said central processor and said plurality of tuned selected channels, a plurality of descrambled signals, and said audio/video signal for multiplexing into a multiplexed signal in response to said multiplexer control signal; and

means for providing said multiplexed signal to a plurality of demultiplexers, each of said plurality of demultiplexers outputting a demultiplexed signal to one of said plurality of audio/video components.

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AUTHENTICATION FOR ANALOG COMMUNICATION SYSTEMS

Jonas Nälund, Uppsala; Thomas Johansson, Stockholm, and Johan Dahlström, Sollentuna, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation of Ser. No. 156,696, Nov. 24, 1993, abandoned.

This application Apr. 20, 1995, Ser. No. 422,079

Int. Cl.[6] H04K *1/00*

U.S. Cl. 380—23 **27 Claims**

1. A method for authenticating an identification of a remote station in a radiocommunication system comprising the steps of:

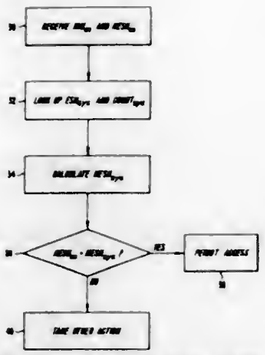
incrementing a first value stored in said remote station in response to each occurrence of at least one predetermined event;

calculating in the remote station a first modified value of an identification code of said remote station known to said remote station and to said system using said first value as an input;

addressing conditions, information content and signal charac-

using said common session encryption key for encrypting and decrypting a first message exchanged during the session

a first speaker driver mounted in a first of the defined cabinets and having an axis directed toward the listening area, the first



incrementing a second value stored in said system in response to said each occurrence of at least one predetermined event;

calculating, in said system, a second modified value of said identification code of said remote station known to said remote station and to said system by using said second value as an input;

transmitting said first modified value from said remote station to said system, and

comparing said first modified value to said second modified value to authenticate identification of said remote station.

5,557,677

METHOD AND ARRANGEMENT FOR COMMUNICATION OF INFORMATION

Sven E. Prytz, Lidingo, Sweden, assignor to Info Development & Patent AB, Sweden

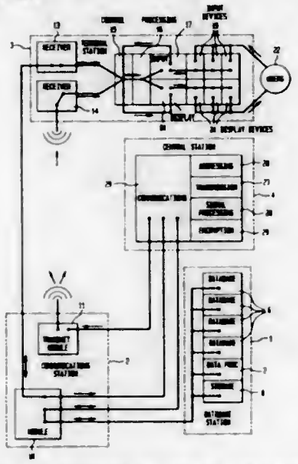
PCT No. PCT/SE94/00133, § 371 Date Dec. 14, 1994, § 102(e) Date Dec. 14, 1994, PCT Pub. No. WO94/19893, PCT Pub. Date Sep. 1, 1994

PCT Filed Feb. 17, 1994, Ser. No. 318,865

Claims priority, application Sweden, Feb. 18, 1993, 9300543

Int. Cl.[6] H04L *29/04*

U.S. Cl. 380—20 **18 Claims**



1. A method for transmitting information from a transmitter to a receiver comprising:

generating a signal carrying said information,

generating signal fragments from said signal by fragmenting said signal into time increments based upon the time priority, addressing conditions, information content and signal character agreed-to between said transmitter and receiver,

assigning an index to each said signal fragment, said index specifying the time position of said fragment within said signal,

providing a coordination chart to said transmitter and receiver, said coordination chart identifying which index corresponds to which time position within said signal,

selecting at least one channel based on the loading, cost structure and transmission capacity of the channel relative to the character of the signal and based on the selective addressing facilities of the channel and the prevailing risk of unauthorized utilization,

transmitting said signal fragments on said selected channel from said transmitter to said receiver,

reassembling, at said receiver, said signal from said signal fragments with the aid of said coordination chart.

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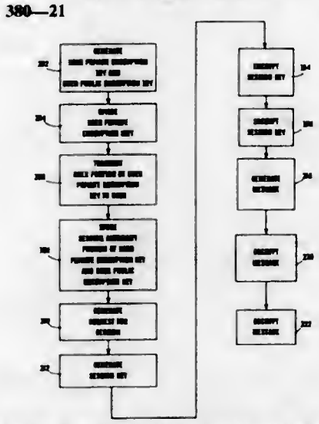
SYSTEM AND METHOD FOR CENTRALIZED SESSION KEY DISTRIBUTION, PRIVACY ENHANCED MESSAGING AND INFORMATION DISTRIBUTION USING A SPLIT PRIVATE KEY PUBLIC CRYPTOSYSTEM

Ravi Ganesan, Arlington, Va., assignor to Bell Atlantic Network Services, Inc., Arlington, Va.

Filed Jul. 18, 1994, Ser. No. 277,376

Int. Cl.[6] H04L *9/16;9/30*

U.S. Cl. 380—21 **25 Claims**



1. In a secured communication encryption system in which users are each associated with a public encryption key and a private encryption key, said private encryption key being divided between a central authority key portion maintained by a central authority and a private user key portion assigned to the user, a method for effecting secure communications during a communications session between users comprising the steps of:

generating a first user session encryption key by encrypting a session key with a combination of the public encryption key and the central authority key portion associated with a first user;

generating a second user session encryption key by encrypting a session key with a combination of the public encryption key and the central authority key portion associated with a second user;

decrypting said first user session encryption key by applying thereto the private user key portion of said first user to obtain a common session encryption key available to said first user;

decrypting said second user session encryption key by applying thereto the private user key portion of said second user to obtain said common session encryption key available to said second user; and

using said common session encryption key for encrypting and decrypting a first message exchanged during the session.

5,557,679

METHOD FOR PERSONALIZATION OF AN ACTIVE CARD

Tomas Julin, Stockholm; Björn Almgren, Bromma, and Leif Sandberg, Saltsjö-Boo, all of Sweden, assignors to Comvik GSM AB, Hagersten, Sweden

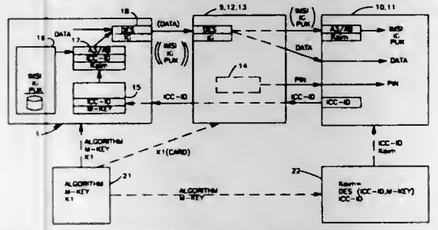
PCT No. PCT/SE92/00656, § 371 Date Mar. 30, 1994, § 102(e) Date Mar. 30, 1994, PCT Pub. No. WO93/07697, PCT Pub. Date Apr. 15, 1993

PCT Filed Sep. 23, 1992, Ser. No. 211,375

Claims priority, application Sweden, Sep. 30, 1991, 9102835

Int. Cl.[6] H04L *9/00;9/32*

U.S. Cl. 380—23 **13 Claims**



1. A method for programming an active card from a remote central computer for use in a mobile telephone system comprising the steps of:

inserting the active card in a card reader associated with a data terminal;

encrypting data representative of a unique identity code and a unique authentication key with the remote central computer;

transferring the encrypted data from said remote central computer through a data communication network to the data terminal;

decrypting the encrypted data into card data at the data terminal; and

transferring the card data to the active card.

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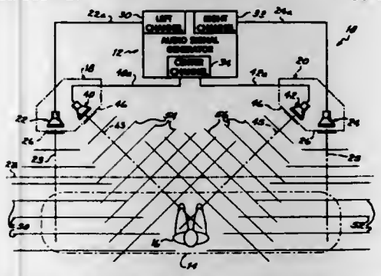
LOUDSPEAKER SYSTEM FOR PRODUCING MULTIPLE SOUND IMAGES WITHIN A LISTENING AREA FROM DUAL SOURCE LOCATIONS

Thomas A. Janes, 3942 N. Cliff La., Cincinnati, Ohio 45220-1009

Filed Apr. 19, 1995, Ser. No. 425,856

Int. Cl.[6] H04R *5/00*

U.S. Cl. 381—27 **30 Claims**



1. A loudspeaker system for producing, in a listening area, realistic sound images from an audio signal generator with a multiplicity of audio signal channels, the system comprising:

two spaced-apart sound cabinets for housing speaker drivers;

a first speaker driver mounted in a first of the defined cabinets and having an axis directed toward the listening area, the first driver configured for being coupled to a first channel signal of said audio signal generator and operable for receiving said first channel signal and creating a first channel sound image forward of the cabinet and into the listening area;

a second speaker driver mounted in a second of the cabinets and having an axis directed toward the listening area, the second driver configured for being coupled to a second channel signal of said audio signal generator and operable for receiving said second channel signal and creating a second channel sound image forward of the cabinet and into the listening area;

a third speaker driver mounted in said first cabinet and physically spaced from said first driver, the third driver having an axis oriented toward the listening area and at an angle to said first driver axis, the third driver configured for being coupled to a signal having frequency components of a third channel from said audio signal generator for receiving said signal and directing sound with third channel components into the listening area at an angle to the first channel sound image;

a fourth speaker driver mounted in said second cabinet and spaced from said second driver, the fourth driver having an axis oriented toward the listening area and at an angle to said second driver axis, the fourth driver configured for being coupled to a signal having components of a third channel for receiving said signal and directing sound with third channel components into the listening area at an angle to the second channel sound image;

when the first and second cabinets are adjacent to one another with the axis of the first and second devices facing forward to the listening area and the axes of the third and fourth drivers directed inwardly to a location in the listening area between the first and second cabinets, the third and fourth drivers being operable for creating, in the listening area location between the first and second channel sound images, a focused sound image having components of a third channel to provide a listener in the listening area with at least three sound images generated from two sound cabinet locations to create a more realistic sound presentation for the listener.

5,557,681

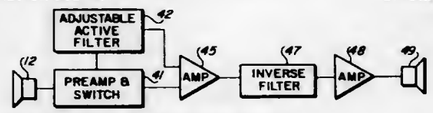
ELECTRONIC STETHOSCOPE

Samuel L. Thomasson, 1038 E. Hearn Way, Gilbert, Ariz. 85234

Filed Sep. 24, 1993, Ser. No. 125,236

Int. Cl.[6] A61B *7/04*

U.S. Cl. 381—67 **17 Claims**



1. An electronic stethoscope comprising:

a microphone;

an active filter coupled to said microphone, said active filter having a center frequency continuously variable within the range of 1 hz to 1500 hz and a bandwidth continuously variable between 1 hz and 3000 hz, wherein said center frequency and said bandwidth are varied indedendently of each other;

an amplifier coupled to said active filter; and

an inverse filter coupled to said amplifier, said inverse filter having a frequency response which is the inverse of the frequency response of the human ear.

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an audio mixer for receiving the first and second audio signals

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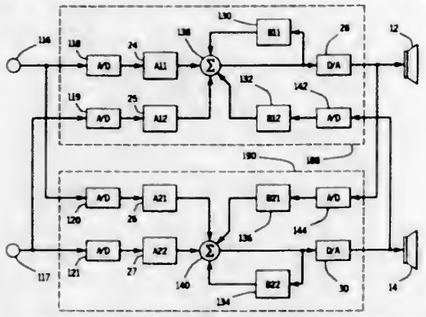
PROCESS AND DEVICE FOR DETERMINING THE

target (C) obtained through this calculated movement (D2) is confirmed, otherwise an estimated location of the target

5,557,682
MULTI-FILTER-SET ACTIVE ADAPTIVE CONTROL SYSTEM

Jay V. Warner, Stoughton; Kent F. Delfosse, and Scott D. Kuha, both of Madison, all of Wis., assignors to Digisonix, Middleton, Wis.

Filed Jul. 12, 1994, Ser. No. 273,919
Int. Cl.[6] A61F *11/06*; H03B *29/00*
U.S. Cl. 381—71 **21 Claims**

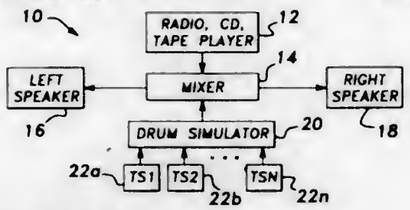


1. A multi-filter-set active adaptive control system comprising:
- a plurality of output transducer arrays introducing control signals to combine with a system input signal to yield a system output signal, each array comprising at least one output transducer;
- a plurality of error transducers sensing said system output signal and providing a plurality of error signals;
- a plurality of sets of adaptive filters, each set residing on a separate digital signal processor and comprising at least one adaptive filter;
- a plurality of sets of D/A converters, one set for each output transducer array, each set comprising at least one D/A converter;
- a plurality of sets of A/D converters, each adaptive filter having a plurality of error inputs, each error input receiving a respective error signal through a respective A/D converter from a respective error transducer,
- wherein at least one error signal from an error transducer is transmitted to at least two A/D converters, each of the two A/D converters being in a separate set of A/D converters.

5,557,683
IN-VEHICLE DRUM SIMULATOR AND MIXER

Terry L. Eubanks, 433 Cambridge, Royal Oak, Mich. 48067

Filed Jul. 20, 1995, Ser. No. 504,901
Int. Cl.[6] H04B *1/00*
U.S. Cl. 381—86 **18 Claims**

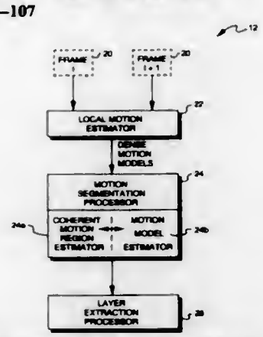


1. An apparatus for overlaying percussive sounds onto a first audio signal output by a signal source in a vehicle, comprising:
- a touch sensor for generating an electrical signal in response to an impact detected by the touch sensor;
- a drum simulator for receiving the electrical signal from the touch sensor and outputting a second audio signal in response to the electrical signal, the second audio signal defining a percussive sound; and
- an audio mixer for receiving the first and second audio signals and mixing the first and second audio signal to output a composite signal including the first and second audio signals, where the signal source, the touch sensor, the drum simulator, and the audio mixer are located in the vehicle.

5,557,684
SYSTEM FOR ENCODING IMAGE DATA INTO MULTIPLE LAYERS REPRESENTING REGIONS OF COHERENT MOTION AND ASSOCIATED MOTION PARAMETERS

John Y. A. Wang, and Edward H. Adelson, both of Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 31,642, Mar. 15, 1993, abandoned. This application Dec. 27, 1994, Ser. No. 464,108
Int. Cl.[6] G06K *9/36*
U.S. Cl. 382—107 **29 Claims**



1. A computer system for encoding digital image data relating to a sequence of image frames to represent the sequence of image frames as digital data organized as a plurality of ordered layers, the layers including information to be used to reproduce and display the same or an associated sequence of image frames, the system including:
- A. a local motion estimator, for producing local motion estimates for pixel neighborhoods in sequential frames and producing from these estimates associated dense motion models, each of the pixel neighborhoods including a selected pixel and the pixels adjacent to the selected pixel;
- B. a motion segmentation processor, for determining, jointly, from the dense motion models
  - i. regions of coherent motion over the entire sequence of frames, and
  - ii. for each region of coherent motion a motion model representing the transformation of the region from frame to frame for the sequence of frames;
- C. a layer extraction processor, for forming for each of the regions of coherent motion a layer by associating with the region data that represents the associated image data, the layer including
  - i. data representing pixel intensity information relating to the sequence of frames for each of the pixels included in the region,
  - ii. data representing an ordering of the layer relative to other layers by depth in the image, the layer extraction processor determining the depth of a layer by determining if pixels in the layer are occluded in any of the frames in the sequence;
  - iii. data representing motion information including parameters relating to the motion model associated with the region by the motion segmentation processor, and
- D. means for outputting the digital data comprising the layers to reproduce the same or an associated sequence of frames.

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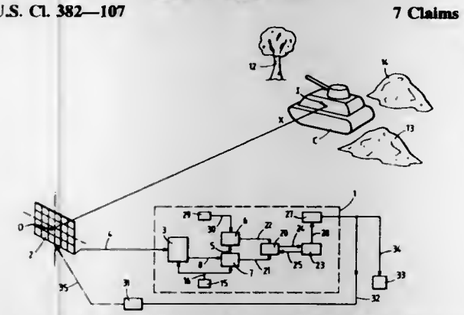
PROCESS AND DEVICE FOR DETERMINING THE LOCATION OF A TARGET

Christophe Schlossers, Chatillon; Stéphane Burzawa, Versailles; François Megel, Chaville, and Anne Le Gouzouguec, Vanves, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Continuation of Ser. No. 257,915, Jun. 10, 1994, abandoned. This application Dec. 8, 1995, Ser. No. 569,556
Claims priority, application France, Jun. 11, 1993, 93 07064
Int. Cl.[6] G06K *9/00*
U.S. Cl. 382—107 **7 Claims**

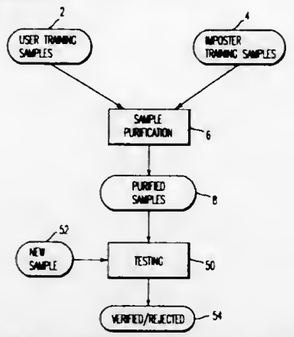


1. A process for determining the location of a target (C) observed in the field of view of an optical detector (2), wherein:
- in a preliminary step, a picture (V0) is taken of the field of view of the optical detector (2) and there are determined a model of the background including at least one partial image (9, 10) of the background and a model of the target including a partial image (11) of the target, said partial images (9, 10, 11) being stored as templates, as well as kinematic characteristics of the latter; and
- throughout the duration of determination of location, the following steps are repeated:
  - a current picture (V1) is taken of the field of view;
  - the movement of the optical detector (2) is calculated in a first main step that includes the following stages:
  - * at least one background search window (19), having the same size within every picture and located at the same position on every picture until the position of said at least one background search window on said current picture is changed, is isolated from said current picture (V1);
  - * the isolated background search window (19) is scanned to match the partial image (9) of the background stored as a template and a subarea of the isolated background search window (19);
  - * the movement (D1) on a picture coordinates plane of the optical detector (2) between point in time a preceding picture is taken and point in time of said current picture is taken is calculated from the position of the partial image (9) of the background in said background search window (19);
  - the movement of the target (C) is calculated in a second main step that includes the following stages:
  - * a target search window (26) having the same size within every picture is isolated from the current picture (V1), the location of this target search window depending on the calculated movement of the optical detector and the position of the target in the preceding picture;
  - * the isolated target search window (26) is scanned to match the partial image (11) of the target stored as a template and a subarea of the isolated target search window (26);
  - * the movement (D2) of the target (C) on the picture coordinates plane that includes the movement of the optical detector is calculated from the position of the partial image (11) of the target in said target search window (26);
  - said calculated movement (D2) of the target (C) is compared with two values, minimum and maximum, of movement which are determined from the kinematic characteristics of the target (C), in such a way that if the calculated movement (D2) is between said two values the location of the target (C) obtained through this calculated movement (D2) is confirmed, otherwise an estimated location of the target is determined from the kinematic characteristics of the latter; and
  - the models of the background and of the target are updated.

5,557,686
METHOD AND APPARATUS FOR VERIFICATION OF A COMPUTER USER'S IDENTIFICATION, BASED ON KEYSTROKE CHARACTERISTICS

Marcus E. Brown, Tuscaloosa, Ala., and Samuel J. Rogers, Breckenridge, Tex., assignors to University of Alabama, Tuscaloosa, Ala.

Filed Jan. 13, 1993, Ser. No. 4,135
Int. Cl.[6] G06K *9/62*
U.S. Cl. 382—115 **51 Claims**



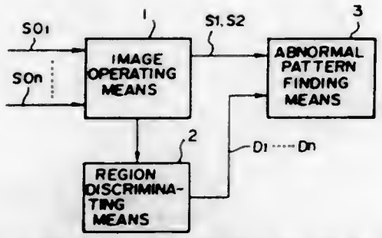
1. A method for verifying whether a user of a system is authorized using keystroke information, comprising the steps:
- creating user training signals from keystroke characteristics of the user, each of said user training signals including a plurality of different portions constructed from keystrokes;
- purifying said user training signals by determining variances of the portions of the user training signals, and discarding a same portion of each of said user training signals when the variance of said same portion is above a predetermined threshold;
- inputting a signal to be tested containing keystroke data;
- determining a similarity between the input signal to be tested and the purified user training signals; and
- allowing access to the system if said input signal to be tested and said purified user training signals are determined to have at least a predetermined threshold of similarity.

5,557,687
ABNORMAL PATTERN DETECTING APPARATUS

Shoji Hara, Kanagawa-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa-ken, Japan

Continuation of Ser. No. 26,099, Mar. 4, 1993, abandoned, which is a continuation of Ser. No. 599,933, Oct. 19, 1990, abandoned. This application Feb. 15, 1995, Ser. No. 389,744
Claims priority, application Japan, Oct. 19, 1989, 1-272212
Int. Cl.[6] G06K *9/00*
U.S. Cl. 382—132 **10 Claims**

1. Apparatus for detecting an abnormal pattern from a plurality of image signals representing a radiation image of an object which is constituted of soft tissues and bones, comprising:
- an image operating circuit for generating from the plurality of image signals at least:
  - a) an original image signal corresponding to an original image representing the soft tissues and the bones of said object, and
  - b) a soft tissue image signal corresponding to a soft tissue image primarily representing soft tissues of said object,



wherein said original image signal and said soft tissue image signal are generated from the plurality of image signals representing a radiation image which has been recorded by exposing said object to at least two kinds of radiation having different energy distributions, wherein the different energy distributions exhibit different transmittances with respect to soft tissues and bones;

a region discriminating circuit which discriminates anatomical regions in the radiation image from at least one of said original image and soft tissue image signals, and provides an output indicative of different anatomical regions of said object; and

an abnormal pattern finding circuit including an abnormal pattern finding filter, responsive to said original image and soft tissue image signals and to the output of said region discriminating circuit, said abnormal pattern finding circuit uniquely processing at least one of said original image signal and said soft tissue image signal and detecting an abnormal pattern, wherein, based on the output of said region discriminating circuit, said abnormal pattern finding circuit adaptively processes said original image signal to detect an abnormal pattern in the different anatomical regions of said object which include primarily soft tissues and processes said soft tissue image signal to detect an abnormal pattern in the different anatomical regions of said object which include primarily bones.

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METHOD OF EXTRACTING CHARACTERISTIC IMAGE DATA AND COLOR DATA CONVERSION DEVICE FOR IMAGE PROCESSING APPARATUS

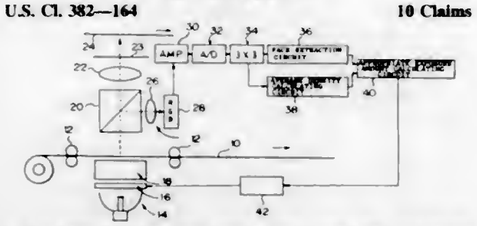
Hiroaki Nakamura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 18, 1993, Ser. No. 154,118

Claims priority, application Japan, Nov. 18, 1992, 4-308963; Nov. 18, 1992, 4-308964

Int. Cl.[6] G06K *9/46*

U.S. Cl. 382—164 **10 Claims**



1. A method of extracting characteristic image data comprising the steps of:

dividing a color original image into a plurality of pixels, breaking down each of the pixels into three colors of red light, green light and blue light, and photometrically measuring the red light, green light and blue light;

dividing on the basis of data obtained by photometry, said color original image into color regions of pixels having similar hue values;

determining which of the divided color regions contact an outer edge of said color original image; said

selecting at least one color region, which is a divided color region and which is a color region other than color regions which contact an outer edge of said color original image, and extracting data of the selected divided region as characteristic image data;

wherein integration processing is executed for each of said pixels using a repeated region expansion method in which data determined from an HLS color space is used as data for determining similarity.

5,557,689

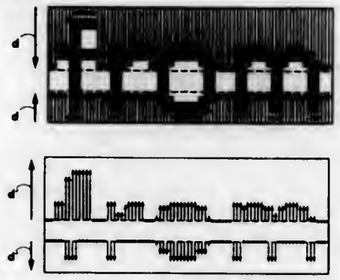
OPTICAL WORD RECOGNITION BY EXAMINATION OF WORD SHAPE

Daniel P. Huttenlocher, and Michael J. Hopcroft, both of Ithaca, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 177,635, Jan. 4, 1994, abandoned, which is a continuation of Ser. No. 796,119, Nov. 19, 1991, abandoned. This application Jun. 1, 1995, Ser. No. 456,413

Int. Cl.[6] G06K *9/34*

U.S. Cl. 382—177 **13 Claims**



1. A method of recognizing a string of symbols in data defining an image, comprising the steps of:

a) detecting in a set of image signals representing an image, a discrete symbol string in an image wherein symbols strings are made up of a plurality of discrete symbols, and image data representing a symbol string in the image data distinguishes symbol-to-symbol spacing from symbol string-to-symbol string spacing;

b) representing the image data of one such symbol string as at least one, one-dimensional signal, said step of representing image data of one such symbol string including the substeps of:

identifying a reference with respect to which a shape signal will be derived for the symbol string;

deriving a set of measurements from the reference with respect to the image data forming the symbol string representing the set of measurements as a curve; and

for a selected portion of the curve, representing that portion as a one dimensional signal f(t) derived with respect to the reference; and

c) comparing said representative signal of the symbol string with a representative signal of a second symbol string.

5,557,690

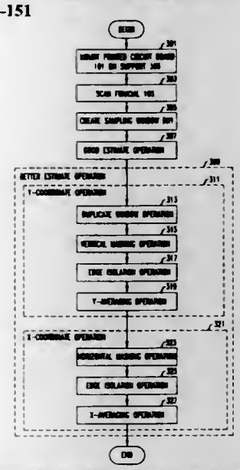
METHOD AND SYSTEM FOR LOCATING OBJECTS WITH SUBPIXEL PRECISION

Lawrence P. O'Gorman, Madison, and Everett F. Simons, Cedar Knolls, both of N.J., assignors to AT&T Corp., Murray Hill, N.J.

Continuation of Ser. No. 996,303, Dec. 23, 1992, abandoned. This application Jun. 23, 1994, Ser. No. 265,979

Int. Cl.[6] G06K *9/00*

U.S. Cl. 382—151 **12 Claims**



1. An apparatus for locating an object on a substrate, the object, from the perspective of an input device, having at least one substantially straight edge, said apparatus comprising:

said input device for capturing an image of at least a portion of said substantially straight edge, and for creating a sampling window comprising an array of image elements which are arranged in a plurality of substantially parallel rows;

a device that orients said substrate with respect to said input device such that an image of said substantially straight edge of said object and at least one of said rows intersect at an angle that is both predetermined and oblique;

a circuit that determines as edge image elements a number of said image elements which define said substantially straight edge for use in determining the precise location of said object on said substrate, said number being determined using a trigonometric function of said angle such that said number is approximately an integral multiple of the number of edge image elements that are in a row of said sampling window; and

a circuit that precisely locates said object on said substrate based on the relative positions of said number of edge elements.

5,557,691

IMAGE PROCESSING SYSTEM

Naoki Izuta, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 84,019, Jun. 3, 1993, abandoned. This application Feb. 9, 1995, Ser. No. 386,192

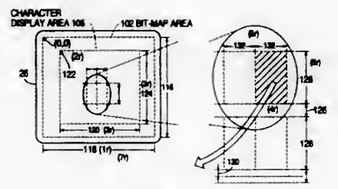
Claims priority, application Japan, Jun. 30, 1992, 4-172105

Int. Cl.[6] G06K *9/42*

U.S. Cl. 382—299 **12 Claims**

1. An image processing system which displays image information on a display device and has multiple resolutions for displaying the image information, wherein the current resolution represents the resolution of image information being displayed and the desired resolution represents the resolution of image information to be displayed, the image processing system comprising:

storage means for storing sets of drawing information, each set corresponding to a respective resolution and the current drawing information representing a set of drawing information corresponding to the current resolution;



buffer means for temporarily storing format codes corresponding to image information to be displayed on the display device, the desired resolution corresponding to the format codes stored in the buffer means;

a host processing unit which:

receives the current drawing information from the storage means,

receives the format codes from the buffer means,

compares the current resolution with the desired resolution,

receives updated drawing information from the storage means when the current resolution is different from the desired resolution, the updated drawing information being a set of drawing information corresponding to the resolution of the image information to be displayed,

converts the format codes into modified format codes in accordance with the updated drawing information when the current resolution is different from the desired resolution, and

converts the format codes into modified format codes in accordance with the current drawing information when the current resolution is not different from the desired resolution; and

memory mapping means, connected to the display device and receiving the modified format codes from the host processing unit, for providing memory-mapping of the modified format codes to enable the image information to be displayed on the display device.

5,557,692

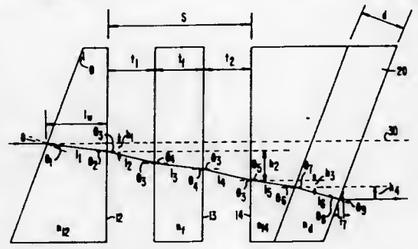
OPTICAL ISOLATOR WITH LOW POLARIZATION MODE DISPERSION

Jing-Jong Pan, and Ming Shih, both of Milpitas, Calif., assignors to E-Tek Dynamics, Inc., San Jose, Calif.

Continuation of Ser. No. 250,323, May 27, 1994, abandoned, which is a continuation of Ser. No. 6,893, Jan. 21, 1993, abandoned. This application Oct. 26, 1995, Ser. No. 548,820

Int. Cl.[6] G02B *6/26;5/30;* **G02F** *1/09*

U.S. Cl. 385—11 **11 Claims**



1. An optical isolator for optical fibers comprising:

a first sleeve for holding a first optical fiber;

a first polarizer of birefringent material disposed in an optical path of an optical signal from the first optical fiber such that

the first polarizer separates the optical signal into rays having

5,557,694

formed therein adjacent an end portion of said waveguide for

(a) fitting a first metal sleeve to a first metal tube to form a fitting

the first polarizer separates the optical signal into rays having differing optical paths;

a Faraday rotator disposed in the paths of the rays from the first polarizer;

a second polarizer of birefringent material disposed in the paths of the rays from the Faraday rotator;

a plate of birefringent material having selected indices of refraction and a thickness which compensates for the difference in optical distance traveled by the rays; and

a GRIN lens and a second sleeve for holding a second optical fiber, wherein the GRIN lens is disposed in the optical path of the rays from the plate to focus the rays on the end of the second optical fiber;

wherein the plate is disposed in the paths of the rays at an oblique angle relative to the rays so as to minimize walk-off.

5,557,693

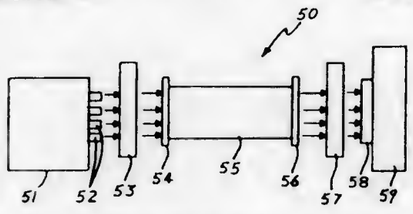
APPARATUS AND METHOD FOR TRANSMITTING OPTICAL DATA

Rick C. Stevens, Apple Valley; Gerald F. Sauter, Eagan, and John A. Krawczak, Minnetonka, all of Minn., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Oct. 21, 1994, Ser. No. 327,406

Int. Cl.[6] G02B *6/28*

U.S. Cl. 385—24 **14 Claims**



1. An apparatus for splitting and parallelly transmitting streams of optical data signals without having to precisely align a source of each of the streams of optical data signals with a single fiber-optic strand comprising:

an emitter array for emitting a plurality of optical data signals over a given area;

a coherent fiber-optic bundle, said coherent fiber-optic bundle having a plurality of fiber-optic strands bundled in a contiguous arrangement, said plurality of fiber-optic strands each having a first end for receiving the streams of optical data signals from the emitter array and each having a second end for emitting the streams of optical data signals from the plurality of fiber-optic strands, said plurality of fiber-optic strands being sufficiently small in relation to a single stream of optical data signals so that the single stream of optical data signals are split into partial signals with each of the partial signals transported in separate and adjacent fiber-optic strands so that when the emitter array directs the streams of optical data signals onto the first end of the plurality of fiber-optic strands each of the streams of optical data signals are transmitted in whole through two or more of said plurality of fiber-optic strands to the second end of the plurality of fiber-optic strands.

5,557,694

METHOD OF DETERMINING THE ZERO DISPERSION WAVELENGTH OF AN OPTICAL WAVEGUIDE

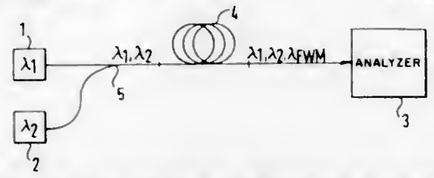
Gustav Veith, Bad Liebenzell, and Henning Bülow, Stuttgart, both of Germany, assignors to Alcatel N.V., Rijswijk, Netherlands

Filed Mar. 24, 1995, Ser. No. 409,758

Claims priority, application Germany, Mar. 30, 1994, 44 11 063.4

Int. Cl.[6] G02B *6/28*

U.S. Cl. 385—27 **6 Claims**



1. A method of determining the zero dispersion wavelength of an optical waveguide (4, 21),

wherein two light signals of different wavelengths (λ_1, λ_2) are coupled into the optical waveguide (4, 21),

wherein a mixing product resulting from a nonlinear interaction of the two light signals in the optical waveguide (4,21) is detected at the output of the optical waveguide,

wherein the wavelength of one of the light signals, which is tunable over a range wherein the zero dispersion wavelength is expected, is selectively varied until the optical output of the mixing product reaches a maximum and the wavelength of this light signal is equal to the zero dispersion wavelength, and

wherein the wavelength of the other light signal is chosen so that it lies outside of the range of the expected zero dispersion wavelength.

5,557,695

WAVEGUIDE-OPTICAL FIBER CONNECTION STRUCTURE AND WAVEGUIDE-OPTICAL FIBER CONNECTION METHOD

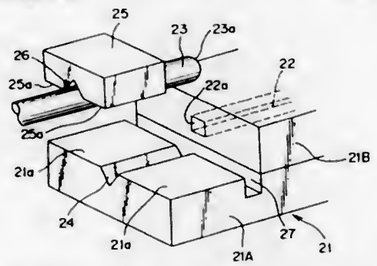
Takashi Yamane; Yasuhiko Omori, both of Kawasaki; Shinya Sawae, Sapporo; Yasutoshi Furukawa, and Hironao Hakogi, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Oct. 31, 1994, Ser. No. 332,578

Claims priority, application Japan, May 12, 1994, 6-098840; Sep. 8, 1994, 6-215075

Int. Cl.[6] G02B *6/30*

U.S. Cl. 385—49 **35 Claims**



1. A waveguide-optical fiber connection structure, comprising:

an optical fiber;

a waveguide substrate having a waveguide integrally formed thereon, said waveguide substrate having a first guide groove formed therein adjacent an end portion of said waveguide for positioning said optical fiber therein; and

a fiber substrate fixed to said optical fiber by metal fixation with a solder material;

each of a face portion of said fiber substrate and a face portion of said waveguide substrate which are opposed to each other in a condition wherein said optical fiber fixed to said fiber substrate by the metal fixation is closely contacted with said first guide groove of said waveguide substrate having a metal film formed thereon, the metal films being fixed to each other by metal fixation to connect said waveguide and said optical fiber to each other using another solder material having a melting point lower than a melting point of the solder material used for the metal fixation between said fiber substrate and said optical fiber.

5,557,696

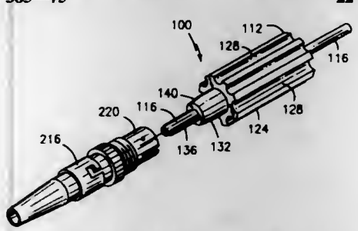
ADAPTORS FOR A DEVICE FOR CLEANING AND POLISHING AN OPTICAL FIBER

Harold M. Stein, 144 Beekman Dr., Agawam, Mass. 01001

Filed Apr. 24, 1995, Ser. No. 449,023

Int. Cl.[6] G02B *6/38;* **B24B** *1/00*

U.S. Cl. 385—75 **22 Claims**



1. A device for interfacing with an optical fiber, comprising:

a. an insert having a throughbore formed therein from a first end of the insert down through the insert to a second end of the insert, the insert throughbore having a center axis that is eccentric to an optical axis of the optical fiber when the insert is positioned in a predetermined spatial relation to the optical fiber; and

b. an adaptor having a throughbore formed therein from a first end of the adaptor down through the adaptor to a second end of the adaptor, the adaptor throughbore having a center axis that is concentric to the optical axis of the optical fiber when the insert is positioned in the predetermined spatial relation to the optical fiber, an inner surface of the adaptor throughbore being adapted to fit over a portion of an outer surface of the insert.

5,557,697

METHOD FOR CONNECTING OPTICAL FIBER CABLES

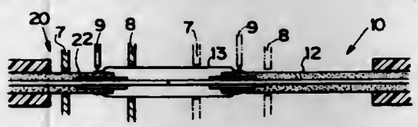
Yasunori Yoshie, Kawasaki, Japan, assignor to NKK Corporation, Tokyo, Japan

Filed Jun. 6, 1995, Ser. No. 467,757

Claims priority, application Japan, Jun. 27, 1994, 6-165805

Int. Cl.[6] G02B *6/38*

U.S. Cl. 385—99 **6 Claims**



1. A method for connecting two optical fiber cables using a metal sleeve, the optical fiber cables each having an optical fiber and metal tube for covering thereof, the method comprising the steps of:

(a) fitting a first metal sleeve to a first metal tube to form a fitting portion, the first metal sleeve being the same as the metal sleeve and the first metal tube being the same as the metal tube;

(b) inserting a sensor for measuring temperatures into the first metal tube at a position corresponding to the fitting portion;

(c) welding the fitting portion, while changing welding conditions, and measuring temperatures to determine an optimum welding condition;

(d) exposing two optical fibers and two metal tubes by specified lengths on the respective end parts of the two optical fiber cables to be connected;

(e) fitting the metal sleeve on the exposed metal tube of one of the two optical fiber cables;

(f) fusing the two optical fibers to each other on the end parts of the two optical fiber cables;

(g) moving the metal sleeve to a position over the exposed metal tubes of the two optical fiber cables;

(h) welding the metal sleeve and the metal tubes on the entire periphery under the optimum welding condition which was determined in the step (c);

(i) fitting a second metal sleeve to a second metal tube to form a fitting portion, the second metal sleeve being the same as the metal sleeve and the second metal tube being the same as the metal tube;

(j) inserting a sensor for measuring temperatures into the second metal tube at a position corresponding to the fitting portion;

(k) welding the fitting portion under the welding condition of the step (h) while measuring temperatures by the sensor; and

(l) confirming that said welding of the step (h) was made under the same condition as said optimum welding condition.

5,557,698

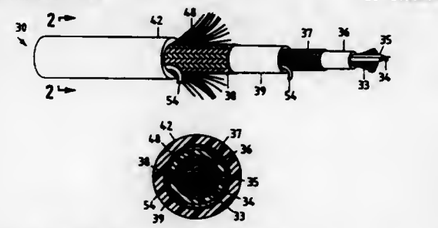
COAXIAL FIBER OPTICAL CABLE

Galen M. Gareis, Richmond, Ind., and Barry Thornton, Auston, Tex., assignors to Belden Wire & Cable Company, Richmond, Ind.

Filed Aug. 19, 1994, Ser. No. 292,314

Int. Cl.[6] G02B *6/44*

U.S. Cl. 385—101 **15 Claims**



3. A coaxial fiber optic cable comprising:

a substantially cylindrical first jacket, said first jacket defining a fiber optic core;

a transmission medium located in said core, said transmission medium including at least one optical fiber

said at least one optical fiber is contained in a buffer tube,

a core strength means positioned between said at least one optical fiber and said first jacket;

said core strength means is a plurality of strengthening fibers that circumferentially surrounds said buffer tube,

a substantially cylindrical inner electrical conductor coaxially surrounding said first jacket;

said first jacket is substantially concentric with said buffer tube

a substantially cylindrical outer electrical conductor coaxially surrounding said inner conductor and radially spaced from said inner conductor;

said inner and outer conductors being metal braid;

a dielectric layer separating said inner and outer conductors; and

an outer jacket surrounding said outer electrical conductor and enclosing said inner and outer conductors.

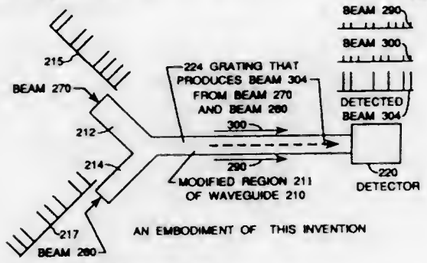
5,557,699

5,557,699

NLO WAVEGUIDE "AND" SWITCH AND METHOD THEREFOR

John J. Kester; Iyad A. Dajani, and Peter M. Ranon, all of Colorado Springs, Colo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 30, 1995, Ser. No. 498,705
Int. Cl.[6] G02F 1/37
U.S. Cl. 385—122 **26 Claims**



AN EMBODIMENT OF THIS INVENTION

1. An NLO switch comprising,

a) a waveguide (wg), the wg having at least two waveguiding modes at a fundamental frequency ω, one waveguiding mode at a second harmonic frequency 2ω and at least one encoded grating for phase-matched SHG,

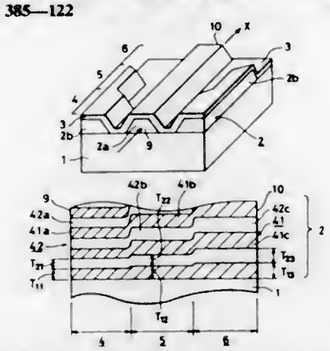
b) means for directing at least two input pulsed laser beams of the same frequency ω into two of said modes to generate an SHG beam when the encoded grating period compensates for the wavevector mismatch between the combined fundamental beams and the generated second harmonic beam.

5,557,700

SEMICONDUCTOR OPTICAL DEVICE UTILIZING NONLINEAR OPTICAL EFFECT

Shigeru Nakamura, and Kazuhito Tajima, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 15, 1995, Ser. No. 441,416
Claims priority, application Japan, Jun. 14, 1994, 6-131512
Int. Cl.[6] G02B 6/10
U.S. Cl. 385—122 **17 Claims**



1. A nonlinear semiconductor optical device comprising:

an optical waveguide layer having an entrance and an exit and comprising nonlinear optical semiconductor material;

said waveguide layer being divided into first to n-th regions arranged along a propagation direction of said signal light, said first region including said entrance and said n-th region including said exit;

said first to n-th regions having first to n-th bandgap wavelengths λ_1 to λ_n that satisfy a relationship of

$$\lambda_1<\lambda_2<\ldots<\lambda_{n-1}<\lambda_n;$$

said waveguide layer generating a nonlinear change of refractive index in said nonlinear optical semiconductor material in response to a control light introduced into said entrance; and

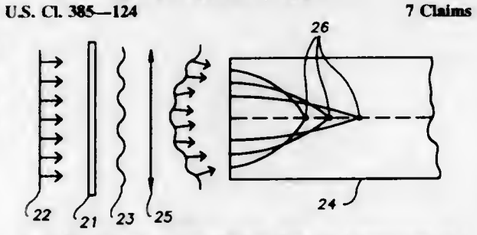
said waveguide layer propagating a signal light introduced into said entrance to said exit without a phase change of said signal light when said nonlinear change of refractive index induced by said control light is not present, and propagating said signal light with said phase change when said nonlinear change of refractive index induced by said control light is present, said phase change being in response to said change of refractive index.

5,557,701

POWER LASER DELIVERY FIBER SYSTEM WITH ENHANCED DAMAGE THRESHOLD

Sergej G. Krivoshlykov, Moscow, Russian Federation, and Wolfgang Neuberger, Monchengladbach, Germany, assignors to Ceram Optec Industries, Inc., East Longmeadow, Mass.

Continuation-in-part of Ser. No. 161,327, Dec. 2, 1993, Pat. No. 5,370,643. This application Nov. 14, 1994, Ser. No. 339,502
Int. Cl.[6] G02B 6/02; G03H 1/00
U.S. Cl. 385—124 **7 Claims**



1. A flexible graded-index optical fiber for transmission of a powerful laser beam, said fiber comprising:

a core having a radius α;

a cladding having a lower refractive index than said core;

a symmetrical axis; and

a refractive index distribution correlating to the function

$$n^2(r)=n_o^2-\omega^2r^2-2\ \beta r^4\ 0\leqq r<a$$

$$n^2(\alpha)=n_o^2-\omega^2\alpha^2-2\ \beta\alpha^4=n_{cl}^2\ r\geqq\alpha$$

where r is the radial distance from said axis, n_o is the refractive index at said axis, n_{cl} is the refractive index of said cladding, ω is the gradient parameter of a standard parabolic index fiber and has the function $\omega=[2n_o(n_o-n_{cl})]^{1/2}/\alpha$, and β is the profile parameter which represents the deviation of the refractive index profile from that of said standard parabolic index fiber, and has the relationship $\beta<<\omega^2/2\alpha^2$.

5,557,702

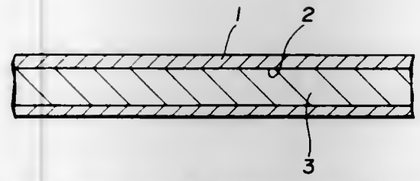
LIGHT GUIDE COMPRISING A METHACRYLIC OR ACRYLIC ACID RESIN CORE AND A FLUOROCARBON RESIN CLAD

Masato Yoshikawa; Minoru Ishiharada, both of Kodaira; Itsuo Tanuma, Sayama; Kazuo Naito, Kawasaki; Masato Sugimachi, Kodaira, and Hideo Sugiyama, Higashimurayama, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 15, 1994, Ser. No. 356,548
Claims priority, application Japan, Dec. 15, 1993, 5-343064; Dec. 15, 1993, 5-343065
Int. Cl.[6] G02B 6/00
U.S. Cl. 385—143 **8 Claims**

1. A light guide comprising

a hollow tubular cladding of a fluorocarbon resin having a methacrylic or acrylic monomer graft polymerized thereto at an inner surface thereof, and



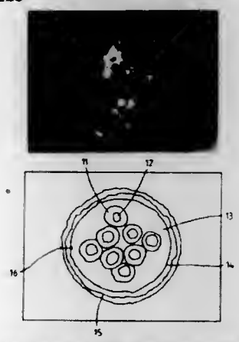
a core of a methacrylic or acrylic resin polymerized to the graft polymerized surface and integrally filled in said cladding.

5,557,703

OPTICAL FIBRES FOR BLOWN INSTALLATION

Philip A. Barker; David J. Stockton; Christopher Fisk, and Peter D. Jenkins, all of Suffolk, England, assignors to British Telecommunications public limited company, London, England

Division of Ser. No. 170,287, Apr. 1, 1994. This application Jun. 5, 1995, Ser. No. 464,092
Claims priority, application United Kingdom, Jul. 1, 1991, 9114196; Jan. 21, 1992, 9201283
Int. Cl.[6] G02B 6/44;6/52
U.S. Cl. 385—128 **9 Claims**



1. An optical fibre package for blow installation comprising:

at least one optical fibre, and

an outer layer of cured flexible resin,

the surface of said resin layer having been modified after the formation of the layer but prior to the cure of said resin,

the resin layer including an inner zone, remote from the surface, which is unaffected by the surface modification process, effects of the surface modification still being detectable.

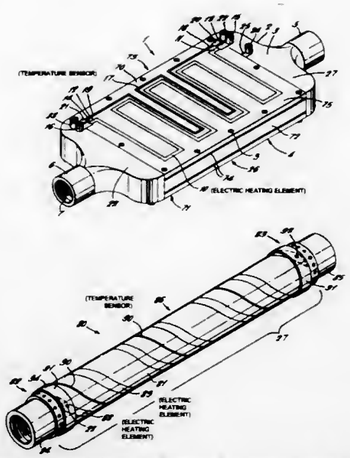
5,557,704

HEATING VESSEL WITH CHROMIUM-ENRICHED STAINLESS STEEL SUBSTRATE PROMOTING ADHERENCE OF THIN FILM HEATER THEREON

Michael E. Dennis, Wiltshire, and David Huddart, Avon, both of United Kingdom, assignors to Pifco Limited, Manchester, United Kingdom

Continuation of Ser. No. 62,159, May 17, 1993, abandoned, which is a continuation of Ser. No. 789,330, Nov. 8, 1991, abandoned. This application Dec. 2, 1994, Ser. No. 352,851
Claims priority, application United Kingdom, Nov. 9, 1990, 9024419
Int. Cl.[6] H05B 3/00; F24H 1/00
U.S. Cl. 392—480 **18 Claims**

1. A heating apparatus comprising a vessel defining a chamber for heating a fluid and having a heater portion, said heater portion comprising:



a chromium containing stainless steel substrate having a coefficient of thermal expansion and an oxidized surface layer comprising chromium oxide, said surface layer having been formed by heating said stainless steel substrate to oxidize chromium present in said substrate;

a dielectric layer applied to and adhered to said surface layer and having a coefficient of thermal expansion which approximately equals that of the stainless steel substrate; and

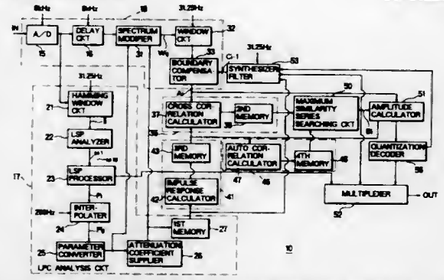
a thick film conductive printed circuit electric heating element formed on said dielectric layer.

5,557,705

LOW BIT RATE SPEECH SIGNAL TRANSMITTING SYSTEM USING AN ANALYZER AND SYNTHESIZER

Tetsu Taguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 3, 1992, Ser. No. 985,138
Claims priority, application Japan, Dec. 3, 1991, 3-319427
Int. Cl.[6] G10L 3/02
U.S. Cl. 395—2.28 **10 Claims**



1. A speech signal analyzer for use in analyzing an input speecb signal to produce a sequence of transmission data signals which appears as a result of an analysis of said input speech signal in said speech signal analyzer, said speech signal analyzer comprising:

preliminary processing means supplied with said input speech signal for preliminarily processing said input speech signal to produce a sequence of processed digital signals which is extracted from said input speech signal and which is arranged within an analysis frame having a predetermined frame time interval;

parameter calculating means for calculating a sequence of preselected parameters at said analysis frame as regards said input speech signal to produce a parameter signal representative of said preselected parameter sequence;

impulse response calculating means supplied with said param-

sample memory means and, when playing of said sample

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impulse response calculating means supplied with said parameter signal for calculating impulse responses with reference to said parameter signal;

cross correlation coefficient calculating means supplied with said impulse responses and said processed digital signal sequence for calculating cross correlation coefficients between said impulse responses and said processed digital signal sequence within said analysis frame to produce cross correlation coefficient signals representative of said cross correlations coefficients;

autocorrelation coefficient calculating means for calculating series of autocorrelation coefficients of said impulse responses;

maximum similarity series extracting means, coupled to said cross correlation coefficient calculating means and said autocorrelation coefficient calculating means, for extracting a series of extracted excitation pulses from said series of autocorrelation coefficients, said series of extracted pulses extending across the predetermined time frame interval, each of the excitation pulses in the series of extracted excitation pulses appearing at a fixed equidistant time interval, and having a polarity, the excitation pulses of said series of excitation pulses being defined by a common phase, the series of extracted excitation pulses being selected from among other such excitation pulse series such that said series of the extracted excitation pulses exhibits a maximum similarity to said cross correlation coefficient signals, said maximum similarity series extracting means functions to produce signals representative of said series of extracted excitation pulses, including a phase signal representative of said phase;

transmitting means responsive to said series of extracted excitation pulses, said phase signal, and said parameter signal for transmitting said transmission data signal sequence in relation to said series of extracted excitation pulses and said phase signal together with said parameter signal.

5,557,706

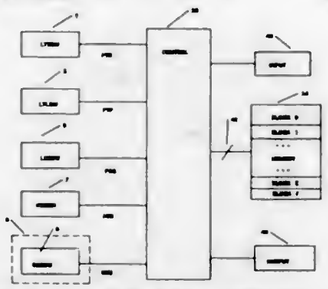
FLEXIBLE PRONUNCIATION-PRACTICE INTERFACE FOR RECORDER/PLAYER

Jon Geist, 4008 Fulford St., Olney, Md. 20832

Filed Jul. 6, 1993, Ser. No. 87,926

Int. Cl.[6] G10L *3/00*

U.S. Cl. 395—2.81 **12 Claims**



1. An audio recorder/player apparatus comprising:

(a) user memory means for storing user sound signals;

(b) sample memory means for storing sample sound signals;

(c) audio input means for recording said user sound signals into said user memory means;

(d) audio output means for playing said user sound signals stored in said user memory means and for playing said sample sound signals stored in said sample memory means;

(e) control means for directing and coordinating the operations of said user memory means, said sample memory means, said audio input means, and said audio output means;

(f) a first user-activatable switch means for triggering, with a single activation, said control means to cause said audio output means to play said sample sound signals stored in said sample memory means and, when playing of said sample sound signals is complete, to cause said audio input means to record said user sound signals into said user memory means;

(g) a second user-activatable switch means for triggering, with a single activation, said control means to cause said audio output means to play said sample sound signals stored in said sample memory means and, when playing of said sample sound signals is complete, to cause said audio output means to play said user sound signals stored in said user memory.

5,557,707

IMAGE FORMING APPARATUS WITH A SCANNER AND METHOD OF CONTROLLING THE SAME

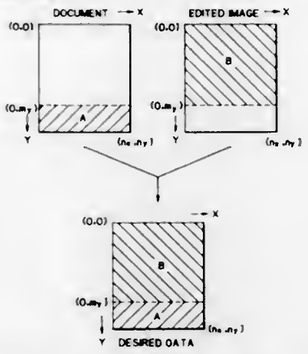
Yoshiya Inoue, Yokohama; Tooru Nagatsuma, Kawasaki; Kazuyuki Shimada, Tokyo; Takamasa Hayashi, Yokohama; Kunio Tomiyasu, Yokohama, and Hirofumi Nishiwaki, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 4,569, Jan. 14, 1993, abandoned. This application Apr. 14, 1995, Ser. No. 421,878

Claims priority, application Japan, Jan. 16, 1992, 4-5604; Mar. 4, 1992, 4-46910; Jun. 17, 1992, 4-158015; Nov. 10, 1992, 4-299808; Dec. 24, 1992, 4-344515

Int. Cl.[6] G06K *15/00*

U.S. Cl. 395—106 **6 Claims**



1. A printer with a scanner for receiving a character code, a control command or similar data from a host and printing said data, comprising:

registering means capable of receiving image data from a scanner built in or connected to said printer and storing said image data in a storage as fill pattern data which will be used to draw graphics;

filling means for filling a figure with said fill pattern data registered by said registering means; and

marking means for specifying a range of the image data from said scanner which is to be recognized as said fill pattern, and wherein said range of the image data can be inserted into any position of the figure.

5,557,708

METHOD AND APPARATUS FOR OUTPUTTING A BINARY BIT DATA MESSAGE FROM BYTES REPRESENTING STRINGS OF CONTIGUOUS BITS OF EQUAL VALUE

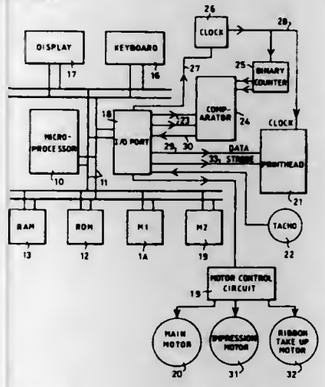
Raymond J. Herbert, Leigh-on-Sea, United Kingdom, assignor to Neopost Ltd., Essex, United Kingdom

Filed Sep. 18, 1991, Ser. No. 761,397

Claims priority, application United Kingdom, Sep. 21, 1990, 9020596

Int. Cl.[6] G06K *15/00*

U.S. Cl. 395—108 **15 Claims**



11. Apparatus for outputting a binary bit data message from bytes representing strings of contiguous bits of equal valve including a microprocessor for generating print data to be output to a printer device;

a print data output line connecting the printer device to the microprocessor;

a memory;

said microprocessor being operable in a printing routine to write a plurality of data bytes to said memory representing a string of print data signals to control the printer device to print dots at selected positions in a line, each byte having a value representing a group of contiguous print data signals to be output on said print data output line having equal binary value;

a counter;

a source of clock signals connected to said counter and to said printer device;

comparison means;

said microprocessor being operable in said printing routine to read said data bytes from said memory and to apply said data bytes serially one at a time to said comparison means and to enable the source of clock signals each time a data byte is applied to the comparison means;

said comparison means being operative in response to a count of clock signals by said counter reaching equality with the value of the data byte applied to the comparison means to disable the source of clock signals and to output to the microprocessor a data line control signal;

said microprocessor being operative to hold the print data line at a first one of first and second levels representing binary one and binary zero respectively and in response to said data line control signal to switch said print data line to a second one of said first and second levels;

said clock signals being effective in combination with said first and second levels of the print data output line to input print data signals to the printer device.

5,557,709

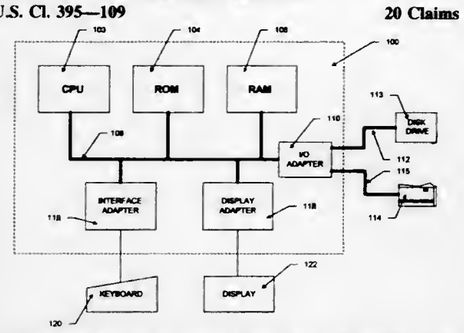
METHOD AND APPARATUS FOR DITHER ARRAY GENERATION TO REDUCE ARTIFACTS IN HALFTONED IMAGES

Joseph S. Shu, San Jose, Calif., assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Jul. 1, 1994, Ser. No. 269,709

Int. Cl.[6] G06K *1/00*

U.S. Cl. 395—109 **20 Claims**



15. An apparatus for generating a dither array for halftone image generation by an output device, the output device for outputting a matrix of dots representing an image, each of the dots being oversized with relation to the outputted matrix, the apparatus comprising:

gray pattern generation means for generating a prototype gray pattern matrix comprising m×n elements, wherein m and n are each positive integers, wherein each of the m×n elements comprise equal predetermined values;

error diffusion means for performing error diffusion processing on the gray pattern matrix to form a starting binary pattern comprising m×n elements, each of the m×n elements comprising one of a first value and a second value;

initial binary pattern generating means for generating an initial binary pattern in response to the starting binary pattern;

oversize adjusting means, responsive the starting binary pattern, for generating a starting gray pattern in accordance the oversized dots;

initial gray pattern generating means for generating an initial gray pattern in response to the starting gray pattern; and

assigning means for generating the dither array in accordance with the initial binary pattern and the initial gray pattern.

5,557,710

COMPUTER AIDED DESIGN SYSTEM

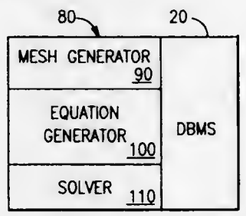
Vardy Amdursky; Ilan Efrat, and Shlomo Shlafman, all of Haifa, Israel, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 2, 1994, Ser. No. 190,423

Claims priority, application United Kingdom, Feb. 8, 1993, 9302450

Int. Cl.[6] G06F *17/50*

U.S. Cl. 395—119 **7 Claims**



1. A computer-aided design system for converting a stored geometrical representation of a structure, the material properties

thereof and the loads imposed thereon into a visualization of a

data values along said ray in said region corresponding to said

d) if a color component of one or more of the neighboring data

thereof and the loads imposed thereon into a visualization of a mechanical quantity of the structure, said system comprising:

means to generate a mesh from said stored geometrical representation of the structure, the material properties thereof and the loads imposed thereon, said mesh describing the structure;

means to generate, by application of the finite element method to the mesh, the elements of a stiffness matrix, a loading vector, and a vector including an associated degree of freedom index for each row and column of the stiffness matrix;

means to generate from the stiffness matrix and the loading vector a matrix A and a right hand-side vector f, wherein any restrained degrees of freedom have been eliminated from the stiffness matrix, and where A and f are related through the relation Ax=f, the vector x representing the mechanical quantity at a plurality of points of the mesh;

a linear solver of the preconditioned conjugate gradient type for generating the elements of the vector x from A and f using a preconditioning matrix K, wherein the linear solver comprises means to generate a principal submatrix from the stiffness matrix by setting to zero those elements therein in positions such that the degree of freedom index associated with their row is not equal to the degree of freedom index associated with their column and means to generate the preconditioning matrix K from the principal submatrix; and

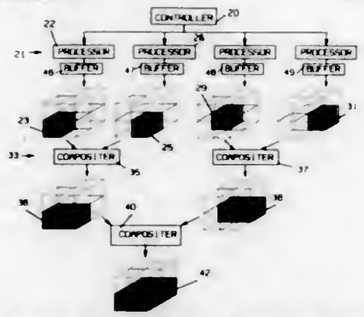
means for visualizing the mechanical quantity of the structure on the computer-aided design system as a function of said vector x.

5,557,711

APPARATUS AND METHOD FOR VOLUME RENDERING

Thomas Malzbender, Mountain View, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 599,326, Oct. 17, 1990, abandoned.
This application Aug. 9, 1995, Ser. No. 512,847
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—122 **12 Claims**



2. An apparatus for generating a pixel luminescence value to be displayed by a two-dimensional pixel-type display as part of a view of a three-dimensional image stored as a three-dimensional data array comprising object data values associated with a plurality of sample points in a three-dimensional object space, said apparatus comprising:

means for defining a ray passing through said object space;

a computer memory for storing the three-dimensional data array, including means for dividing said object space into a plurality of regions, each containing multiple sample points, and assigning a subset of the stored data values corresponding to said multiple sample points to each region in the computer memory;

a plurality of first level processing means for generating intermediate transparency and luminescence values from the stored object data values, one said first processing means corresponding to each said region and operative to process the subset of the stored object data values for said region, each said first level processing means comprising means for generating said transparency value from the subset of stored object data values along said ray in said region corresponding to said first level processing means and means for generating said luminescence value from the subset of stored object data values along said ray in said region corresponding to said first level processing means; and

a plurality of second level compositing processors, each said second level compositing processor comprising:

means for receiving said intermediate transparency and luminescence values generated by first and second said first level processing means for the first and second regions adjoining along said ray;

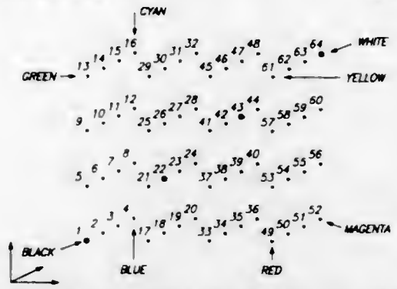
means for generating a composite transparency value and a composite luminescence value from said intermediate transparency and luminescence values generated by each of said first and second first level processing means for the first and second regions adjoining along said ray, said composite luminescence value and composite transparency value being substantially the same as the transparency and luminescence values that would be generated by one of said first or second first level processing means for said ray in a region of said object space encompassing both of said first and second regions corresponding to said first and second first level processing means.

5,557,712

COLOR MAP TABLES SMOOTHING IN A COLOR COMPUTER GRAPHICS SYSTEM AVOIDING OBJECTIONABLE COLOR SHIFTS

Randall G. Guay, Cupertino, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Feb. 16, 1994, Ser. No. 197,055
Int. Cl.[6] H04N *1/46*
U.S. Cl. 395—130 **6 Claims**



1. A computer-implemented method of smoothing data in a preliminary look-up table comprising a three-dimensional data array in which a location of each data point is designated by a unique set of coordinates, a resulting three-dimensional look-up table relating source device colors and destination device colors in a computer graphics system having a color image source device and a color image destination device having non-coincident color gamuts, the method comprising the steps of, beginning at a data point representing one of black and white and concluding at a data point representing the other of black and white:

a) comparing a data point representing a next closest shade of gray to neighboring data points;

b) if a color component of one or more of the neighboring data points differs in value from the same color component of the data point by more than a predetermined amount, adjusting the value of the color component of the one or more neighboring data points such that the color component of the one or more neighboring data points does not differ in value from the color component of the data point by more than the predetermined amount;

c) comparing related data points, having at least one coordinate the same as a coordinate of the data point, to neighboring data points;

d) if a color component of one or more of the neighboring data points differs in value from the same color component of a respective related data point by more than a predetermined amount, adjusting the value of the color component of the one or more neighboring data points such that the color component of the one or more neighboring data points does not differ in value from the color component of the respective related data point by more than the predetermined amount; and

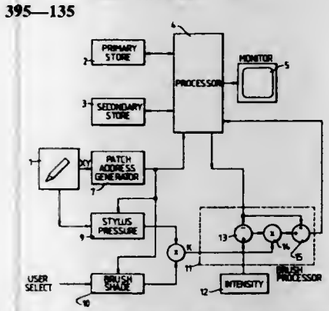
e) repeating steps a) through d).

5,557,713

IMPROVEMENTS IN OR RELATING TO ELECTRONIC GRAPHIC SYSTEMS

Adam Rae-Smith, Newbury, England, assignor to Quantel Limited, Newbury, England

Continuation of Ser. No. 961,291, Oct. 15, 1992, abandoned.
This application May 15, 1995, Ser. No. 440,885
Claims priority, application United Kingdom, Oct. 18, 1991, 9122209
Int. Cl.[6] G06F *15/72*
U.S. Cl. 395—135 **17 Claims**



1. An electronic graphic system for effecting displacement of a boundary of an image feature, the system comprising:

a first store for storing data representing an image;

a second store for storing data representing an image; and

a processor for: deriving, from data in an area of said first store, data representing at least a portion of the image represented by data stored in the first store offset in a predetermined direction by a user determined distance;

storing the derived data in the second store; and

repeatedly combining the data from the second store and the data in said area of the first store to create combined data, storing the combined data in said area of the first store, and offsetting the data in the second store such that the offset data represents the image portion at a position different than that of each offset image portion previously stored in the second store,

whereby the data in said area of the first store is modified so as to represent said portion as having a displaced image feature boundary.

5,557,714

METHOD AND SYSTEM FOR ROTATING A THREE-DIMENSIONAL MODEL ABOUT TWO ORTHOGONAL AXES

Andrew Lines, Los Angeles, Calif.; Matthew C. Bamberger, Bellevue, and Brian H. Yamasaki, Redmond, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Jan. 29, 1993, Ser. No. 10,824
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—137 **21 Claims**

1. A method in a computer system for rotating an object displayed on a display device, wherein the computer system includes a pointer positioning device for positioning a pointer displayed on the display device, the method comprising:

providing a reference sphere having a surface which intersects a reference point on the object, wherein the surface has opposing near and far partial-spheres, wherein the surface includes at least one reachable region and opposing left and right unreachable regions each having a boundary, the regions being defined by constraints on rotation of the object;

selecting the reference point on the object with the pointer positioning device;

detecting movement of the pointer positioning device which moves the pointer and indicates a rotation of the object;

determining an intersection point between the pointer and the surface of the reference sphere;

determining an amount of rotation for the object which corresponds to the indicated rotation of the object, wherein when the intersection point is in the left or right unreachable region the amount of rotation is determined such that the selected reference point coincides with a tracked point which lies along the boundary of the left or right unreachable region, respectively, in the same near or far partial-sphere as the intersection point; and

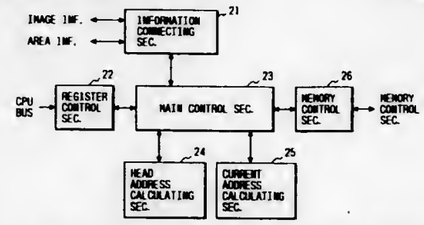
rotating the object by the determined amount of rotation.

5,557,715

IMAGE PROCESSING DEVICE WHICH DESIGNATES MEMORY LOCATIONS BY USING X/Y COORDINATES OF AN IMAGE

Yoshio Ichiyanagi, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 19, 1994, Ser. No. 246,072
Claims priority, application Japan, May 20, 1993, 5-118802
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—137 **13 Claims**



1. An image processing device for processing image information and area information associated therewith to form processed image information, the processed image information being stored into a memory, said device comprising:

means for connecting the image information and the associated area information to produce connected image information;

means for generating memory addresses so as to allow the connected image information to be stored into the memory through coordinates X and Y;

means for rotating the connected image information based on

drawing data conversion means for converting the input infor-

judging whether said nodal points are within said patch with

means for rotating the connected image information based on the memory addresses; and

means for combining the rotated image information with the processed image information in the memory.

5,557,716

GRAPH DRAWING

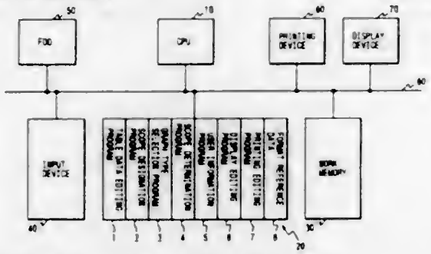
Hirotsugu Oka, Tokyo, and Hiroyuki Watabe, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1993, Ser. No. 84,126

Claims priority, application Japan, Jul. 2, 1992, 4-175557; Jul. 2, 1992, 4-175560; Jul. 2, 1992, 4-175561; Jul. 2, 1992, 40175556; Jul. 6, 1992, 4-178530

Int. Cl.[6] G06T *11/00*

U.S. Cl. 395—140 **10 Claims**



1. A graph drawing apparatus comprising:

first storage means for storing a table containing a plurality of cells;

display control means for displaying the table stored in said first storage means;

designating means for designating a block of cells in the table displayed by said display control means;

count means for counting a number of cells in at least one of a column and a line in the block designated by said designating means;

second storage means for storing an upper limit of the number of cells in at least one of the column and the line suitable for drawing a graph corresponding to numerical data in the cells;

discriminating means for discriminating whether the number of cells in at least one of the column and the line counted by said count means is greater than the upper limit stored in said second storage means;

graph drawing means for drawing a graph based on the numerical data in the block designated by said designating means; and

control means for controlling said graph drawing means to draw a graph when the number of cells counted is discriminated not to be greater than the upper limit by said discriminating means, and inhibiting said graph drawing means from drawing a graph when the number of cells counted is discriminated to be greater than the upper limit by said discriminating means.

5,557,717

METHOD AND DEVICE FOR GRAPHICAL DISPLAY OF A SPORTING CONTEST

Peter C. Wayner, 4129 Roland Ave. #1B, Baltimore, Md. 21211-2038

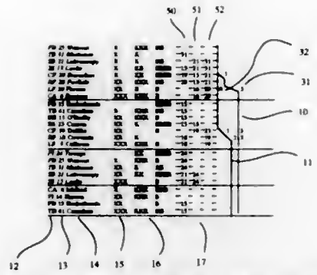
Filed Mar. 28, 1994, Ser. No. 218,734

Int. Cl.[6] G06F *17/00*

U.S. Cl. 395—140 **9 Claims**

1. A method intended for displaying the progress and results of a sporting contest, said method comprising the steps of:

establishing a coordinate reference frame upon a register in which one axis measures the score of the sporting contest and



the other axis measures the progress of the sporting contest, said progress comprising increments of game time;

selecting a set of significant moments comprising a game time dependent series each representing an advance towards conclusion of the sporting contest along said axis measuring said progress of the sporting event in said coordinate reference frame;

recording upon said register a plurality of points in said coordinate reference frame, at least one line connecting two said points in said coordinate reference frame corresponding to the score at each said significant moments in the sporting contest;

graphically representing upon said register each said line corresponding to the score and glyphs proximate to said reference frame indicating a particularity of said advance toward conclusion made by each said significant moment;

graphically representing information indicating significant moments in the game including information from a group consisting of the player's jersey number, the player's personal history, the player's position, the player's name, the player's contribution to the score, the player's contribution to the game's progress, the player's astronomical sign, the player's opinion and the player's physical characteristics thereby generating a graphical summary of the progress and results of a sporting contest in the register.

5,557,718

INFORMATION PROCESSING APPARATUS HAVING A FUNCTION OF DISPLAYING A PLURALITY OF GRAPHS

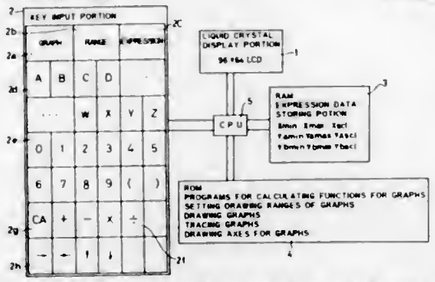
Katsumasa Tsuneyoshi, Higashiosaka, and Akiyoshi Satoh, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 23, 1995, Ser. No. 447,441

Claims priority, application Japan, Jun. 8, 1994, 6-126574

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—140 **6 Claims**



1. An information processing apparatus having a function of displaying a plurality of graphs comprising

display means for displaying graphs;

input means for at least inputting information such as information on mathematical expressions needed for drawing a plurality of graphs and information on graduation of a plurality of axes for respective graphs;

drawing data conversion means for converting the input information on a plurality of mathematical expressions into graph drawing data for drawing a plurality of graphs and for converting the information on graduation of a plurality of axes into axes drawing data to be used for graduating axes for respective graphs;

graph drawing means for drawing a plurality of graphs such that said graphs overlap each other about a common axis based on the graph drawing data and axes drawing data obtained as a result of the conversion and for drawing axes having different scales for respective graphs on the same screen;

and

pointing means for inputting pointing information to point a desired graph from among the plurality of graphs drawn on the same screen and to trace the graph;

said graph drawing means drawing a trace pointer on the relevant graph and drawing an axis pointer on the axis corresponding to the relevant graph in response to the pointing information received from said pointing means.

5,557,719

METHOD AND APPARATUS FOR FORMING OBJECTS BASED ON FREE-FORM CURVES AND FREE-FORM SURFACES FROM PROJECTING NODAL POINTS AND A SERIES OF POINTS ONTO A PATCH

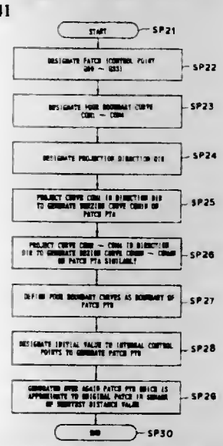
Miwa Ooka, and Tetsuzo Kuragano, both of Tokyo, Japan, assignors to SONY Corp., Tokyo, Japan

Continuation of Ser. No. 966,509, Oct. 23, 1992, abandoned. This application Feb. 15, 1995, Ser. No. 389,562

Claims priority, application Japan, Oct. 30, 1991, 3-313634

Int. Cl.[6] G06T *17/30*

U.S. Cl. 395—141 **5 Claims**



1. A method of forming an object on the basis of data representing a free-form curve projected onto a patch, the method comprising the steps of:

generating control points between two nodal points on a three-dimensional space;

generating said free-form curve which is represented by a vector function, said vector function being capable of representing said free-form curve by designating said nodal points and said control points;

rotating said patch about a nodal point vector to make its projecting direction coincide with a preselected projecting direction, said patch being represented by a predetermined vector function formed on a framing space, and thereafter determining the maximum value and minimum value of y and z coordinate values, x and z coordinate values, or x and y coordinate values with respect to control points of the rotated patch;

judging whether said nodal points are within said patch with respect to said free-form curve by determining whether the coordinate values of said nodal points fall between said determined maximum and minimum values, wherein said nodal points are projected onto said patch when said coordinate values of said nodal points fall between said determined maximum and minimum values;

generating, on the basis of judging whether said nodal points are within said patch, projection nodal points formed by projecting said nodal points from said projecting direction onto said patch with respect to said free-form curve to be projected;

generating a series of points on said free-form curve to be projected;

judging whether each point of said series of points is within said patch from the projecting direction by determining whether said series of points falls between said determined maximum and minimum values wherein said series of points is projected onto said patch when said series of points falls between said determined maximum and minimum values;

forming, on the basis of judging whether each point of said series of points is within said patch, a projection series of points formed by projecting each point of said series of points from said projecting direction onto said patch;

projecting said free-form curve from said projecting direction onto said patch, wherein said projected free-form curve is a function of said projection nodal points and said projection series of points;

transmitting data representing said projected free-form curve to a tool path forming unit;

generating at said tool path forming unit processing data on the basis of said data representing said projected free-form curve; and

using said processing data to mold an object, said object being a physical embodiment of said projected free-form curve, wherein a plurality of free-form curves to be projected comprises boundary curves forming a predetermined framing space; and

said free-form curves being projected from said projecting direction onto said patch are formed on said patch to generate a framing space having said free-form curves as its boundary curves.

5,557,720

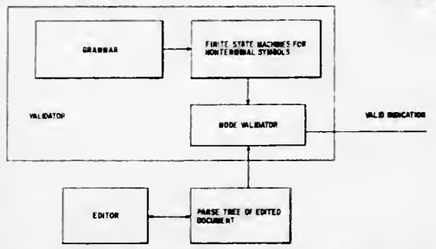
METHOD OF DETERMINING WHETHER A DOCUMENT TREE IS WEAKLY VALID

Allen L. Brown, Jr., San Diego, Calif., and Sidney W. Marshall, Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 44,792, Apr. 12, 1993, abandoned. This application Sep. 8, 1994, Ser. No. 303,286

Int. Cl.[6] G06F *7/28*

U.S. Cl. 395—146 **18 Claims**



1. A method for determining whether an editing step of a document tree results in a weakly valid document structure, the weakly valid document structure being a document structure that is extendable into a valid document structure that satisfies a grammar, the method comprising the steps of:

producing the document tree having a plurality of nodes labelled with symbols of the grammar;

examining selective nodes of the document tree to determine whether the selective nodes are weakly valid to extend into the valid document structure that satisfies the grammar; and

performing the editing step to obtain the weakly valid document structure if the selective nodes are determined to be weakly valid.

5,557,721

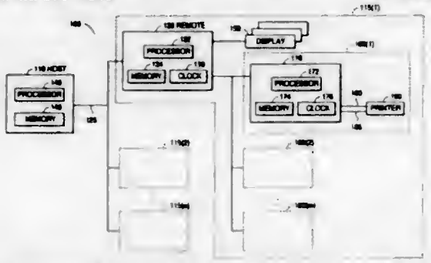
METHOD AND APPARATUS FOR DISPLAY SCREENS AND COUPONS

Kenneth R. Fite, San Diego, Calif., and Bruce R. DeWoolfson, Fairfax, Va., assignors to Environmental Products Corporation, Fairfax, Va.

Continuation-in-part of Ser. No. 517,207, May 1, 1990, abandoned. This application Aug. 18, 1993, Ser. No. 107,599

Int. Cl.[6] G06F *13/00*; **G06T** *1/00*

U.S. Cl. 395—148 **15 Claims**



1. A method of displaying a screen display in a system including an interconnected host processor and remote processor, the method comprising the steps of:

storing in a memory of the remote processor a plurality of sets of data, including a plurality of sets of display data, a plurality of sets of commands, and a plurality of sets of transaction data, each set of display data describing a display screen, each set of commands specifying a set of display data and including a series of commands for controlling display of a display screen, and each set of transaction data corresponding to a transaction to be performed and specifying a set of commands and a scheduled time period to display a display screen, the scheduled time period indicating one or more times of day when a display screen will be displayed;

sending, by the host processor to the remote processor, a set of data that is one of a set of display data, a set of commands, and a set of transaction data;

receiving, by the remote processor, the set of data;

adding, by the remote processor, the received set of data to the plurality of sets of display data, the plurality of sets of commands, or the plurality of sets of transaction data already stored in the memory;

determining whether the received set of data is a set of transaction data;

retrieving from the memory of the remote processor a set of commands from the plurality of sets of commands as specified by the received set of transaction data, when the received set of data is a set of transaction data;

retrieving from the memory of the remote processor a set of display data from the plurality of sets of display data as specified by the retrieved set of commands, when the received set of data is a set of transaction data; and

displaying, by the remote processor when the set of data is a set of transaction data, a display screen described by the retrieved set of display data, only at the one or more times of day indicated by the scheduled time period as specified in the received set of transaction data.

5,557,722

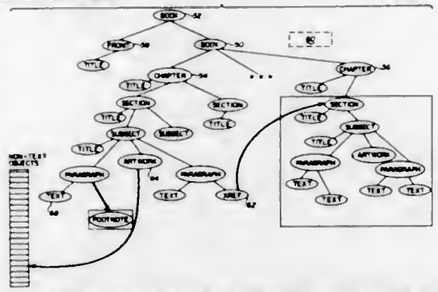
DATA PROCESSING SYSTEM AND METHOD FOR REPRESENTING, GENERATING A REPRESENTATION OF AND RANDOM ACCESS RENDERING OF ELECTRONIC DOCUMENTS

Steven DeRose, East Providence, and Jeffrey Vogel, Providence, both of R.I., assignors to Electronic Book Technologies, Inc., East Providence, R.I.

Continuation of Ser. No. 733,204, Jul. 19, 1991, abandoned. This application Apr. 7, 1995, Ser. No. 419,051

Int. Cl.[6] G06F *17/21*

U.S. Cl. 395—148 **30 Claims**



1. A data processing system for randomly accessing and formatting a portion of an electronically published document having fixed text content and fixed structure defined by descriptive markup defining a plurality of hierarchical elements, wherein each element except a root element has an ancestor element and a type name and at least one element has text content, the data processing system comprising:

means for storing a format specification for each type name utilized for elements in the electronically published document, wherein the format specification for a type name defines appearance of the text content of the elements in the electronically published document having the type name, and wherein the means for storing is separate from the electronically published document;

means for receiving an indication of a starting point within the electronically published document;

means for selecting a starting point element within the electronically published document according to the received indication of the starting point;

means for selecting elements of the electronically published document beginning with the selected starting point element;

means for identifying any ancestor elements of the selected elements; and

means for formatting the text content of each selected element according to a combination of the format specifications for the type names of ancestor elements identified for the selected element and for the type name of the selected element.

5,557,723

METHOD AND SYSTEM FOR CUSTOMIZING FORMS IN AN ELECTRONIC MAIL SYSTEM

Nick Holt, Seattle, and Steve Thomas, Redmond, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 207,231, Mar. 7, 1994, abandoned, which is a continuation of Ser. No. 621,444, Nov. 30, 1990, abandoned. This application Nov. 3, 1994, Ser. No. 334,616

Int. Cl.[6] G06T *1/00*

U.S. Cl. 395—149 **19 Claims**

1. An electronic mail system for displaying and receiving data through user-defined custom forms, the mail system for transporting mail messages from one user of the mail system to another user of the mail system, each form having a plurality of fields, each field representing a form component and having an associated description indicating characteristics of the field for use in displaying the field and in utilizing the field to obtain and transport the data in the electronic mail system and a standard behavior indicating standard operations associated with the field, the electronic mail system comprising:

means for storing a form data structure for each of a plurality of forms, each form data structure having the description of the fields of the form and having a form control procedure customized to control behavior of the form, wherein the behavior of the form indicates operations associated with the form;

a transaction event processor that includes

means for selecting one of the plurality of forms;

means for retrieving the form data structure for the selected form;

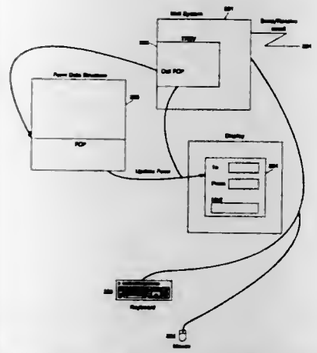
means for receiving input from a user of the computer system;

means for, in response to receiving the user input, invoking the form control procedure of the retrieved form data structure whereby the form control procedure performs a custom behavior for the fields of the form, the custom behavior indicating user-defined operations associated with the fields of the form; and

means for performing the standard behavior for the fields of the form when custom behavior is not performed;

means for packing the user input into a mail message; and

means for transporting the mail message to a designated user of the mail system wherein the designated user can display the user input using a form data structure for displaying the user input.



5,557,724

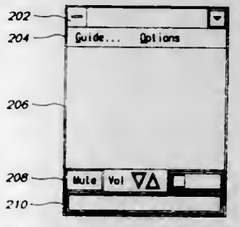
USER INTERFACE, METHOD, AND APPARATUS SELECTING AND PLAYING CHANNELS HAVING VIDEO, AUDIO, AND/OR TEXT STREAMS

Ketan Sampat, Portland, and John Kembel, Lake Oswego, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Oct. 12, 1993, Ser. No. 133,614

Int. Cl.[6] G06F *3/14*

U.S. Cl. 395—157 **30 Claims**



1. A user interface for display on a computer-based multicasting system, comprising:

a multicast window for playing one or more data streams of a multicast channel selected by a user from a plurality of available multicast channels, wherein:

the selected multicast channel comprises any combination of a video stream, an audio stream, and a text stream; and

the multicast window comprises any combination of:

(a) a video subwindow for displaying the video stream;

(b) an audio subwindow for displaying audio control functions for controlling the play of the audio stream; and

(c) a text subwindow for displaying the text stream, wherein:

the computer-based multicasting system automatically determines which data streams are part of the selected multicast channel and generates the multicast window accordingly, such that:

if there is no video stream in the selected multicast channel, then the multicast window does not include the video subwindow;

if there is no audio stream in the selected multicast channel, then the multicast window does not include the audio subwindow; and

if there is no text stream in the selected multicast channel, then the multicast window does not include the text subwindow.

5,557,725

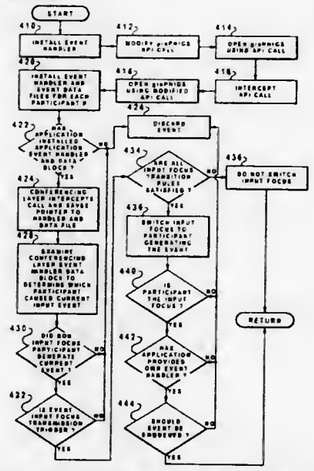
METHOD AND SYSTEM FOR SWITCHING BETWEEN USERS IN A CONFERENCE ENABLED APPLICATION

Catherine M. Ansberry, Redmond; Jay D. Freer, Bellevue; Todd W. Fuqua; Erik P. Mesterton, both of Redmond, all of Wash.; Catherine A. Stillwagon, Saddle River, N.J., and Ching-Yun Yang, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 13, 1995, Ser. No. 387,500

Int. Cl.[6] G06F *15/177*

U.S. Cl. 395—153 **6 Claims**



1. A method of switching input control between conferencing participants operating in a collaborative computer-based system having a plurality of display devices for the display of a public conference view of data object amongst said participants and using an event handler for controlling the input of shared data objects amongst said participants, the method comprising the steps performed by a computer of:

defining a set of participant control transition triggers that indicate when a participant desires input control of said system within said event handler;

defining a set of participant control transition rules that establish which participant has control, which participant can obtain control as an active participant, and which participant cannot gain control as a non-active participant, amongst said conferencing participants;

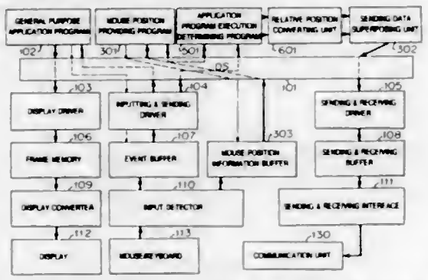
integrating both sets of said participant control transition triggers and rules to form an enhanced conferencing level event handler for switching input control from a first active participant to a second active participant based on an input event from said second active participant while disregarding input events from nonactive participants.

5,557,726

METHOD AND APPARATUS FOR A REMOTE GROUPWARE OPERATING SYSTEM

Kenichi Yoshizawa, Kamakura, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1993, Ser. No. 84,568
Claims priority, application Japan, Jan. 28, 1993, 5-12392
Int. Cl.[6] G06F *3/14*
U.S. Cl. 395—153 **24 Claims**



1. A first device for communicating with a second device in a remote groupware operation, the first device comprising:

sending means for sending data to the second device;

program operating means for operating a program;

inputting means for inputting input data to said program operated by said program operating means, and for inputting coordinate position data from a coordinate inputting device;

interface means disposed between the program operating means and said inputting means for providing the program operated by the program operating means with said input data and for providing said sending means with the input data and the coordinate position data for transmission to the second device;

coordinate position detecting means for detecting said coordinate position data from the coordinate inputting device,

superposing means, disposed between the inputting and sending means, for superposing the coordinate position data on the input data to create superposed information, and for outputting the superposed information to the sending means for transmission to the second device.

5,557,727

DIAGRAM DRAWING APPARATUS

Sachiko Nagai, Fussa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1993, Ser. No. 24,419
Claims priority, application Japan, Mar. 2, 1992, 4-044889
Int. Cl.[6] G06F *3/14*
U.S. Cl. 395—155 **8 Claims**

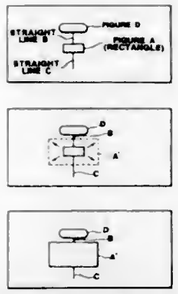
1. A diagram drawing apparatus comprising:

memory means for storing diagram data;

means for displaying the diagram data stored in said memory means;

means for designating a target figure to be enlarged, from the diagram data displayed by said displaying means;

means for automatically retrieving a line whose end is tangent to the target figure designated by said designating means, based on the diagram data stored in said memory means, without requiring any designation of said line by a user;



means for enlarging the target figure as large as a desired magnitude; and

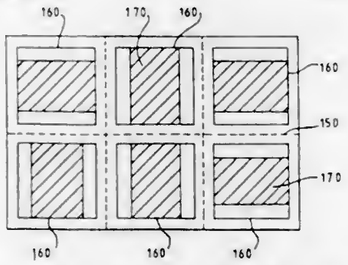
means for automatically shortening the line retrieved by said retrieving means in accordance with the target figure enlarged by said enlarging means to connect the end of the line to the enlarged target figure, without user intervention.

5,557,728

AUTOMATED IMAGE RETRIEVAL AND SCALING INTO WINDOWED DISPLAYS

Michael J. Garrett, Nr. Winchester; Andrew Key, and Kenneth Morse, both of Southampton, all of England, assignors to International Business Machine Corporation, Armonk, N.Y.

Continuation of Ser. No. 929,062, Aug. 12, 1992, abandoned. This application Nov. 22, 1994, Ser. No. 343,617
Claims priority, application United Kingdom, Aug. 15, 1991, 91307559
Int. Cl.[6] G06T *3/40*
U.S. Cl. 395—157 **11 Claims**



1. A system for processing data representing independently stored images so that a set of said independently stored images can be displayed on a computer display having a specified output area, comprising:

means for selecting said set of independently stored images by comparing a user provided keyword with keywords corresponding to each image;

a divider for dividing said output area into a number of regions less than or equal to a number of stored images in said set such that the size of each region is dependent upon the number of stored images, said number of regions being determined according to both a minimum image size that can be observed clearly and aspect ratios of said stored images;

an assignment device for associating each of the stored images in said set with at least one of said regions; and

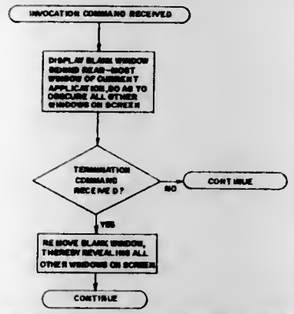
a scaling means for scaling each stored image from said set based on the size of each region such that a plurality of said images are concurrently displayed on said computer display and each image occupies a selected area within the associated region of said output area.

5,557,729

APPLICATION DESIGN INTERFACE ENHANCEMENT

Charles A. Frean, Groton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 428,583, Oct. 30, 1989, abandoned. This application Apr. 27, 1992, Ser. No. 874,750
Int. Cl.[6] G06T *1/00*
U.S. Cl. 395—158 **12 Claims**



1. In a data processing system having a plurality of active applications, and a display, each of said active applications having at least one window, said active applications including one currently running application, a method of controlling display of said windows on said display of said data processing system by selectively changing between obscuring and revealing all of said windows except said at least one window of said one currently running application, comprising the steps of:

displaying, in response to a first command, a non-application program full screen-size blank window that obscures all of said windows at said at least one window of said currently running application, said blank window residing behind a rearmost window of said currently running application, regardless of the size of said at least one window of said currently running application; and

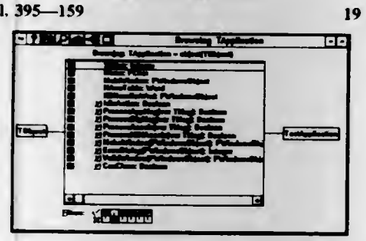
revealing, in response to a second command, all of said previously obscured windows by removing in a single user action said non-application program full screen-size blank window from behind said rearmost window of said currently running application.

5,557,730

SYMBOL BROWSING AND FILTER SWITCHES IN AN OBJECT-ORIENTED DEVELOPMENT SYSTEM

Lars K. Frid-Nielsen, Santa Cruz, Calif., assignor to Borland International, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 233,793, Apr. 26, 1994, Pat. No. 5,432,903, which is a division of Ser. No. 979,575, Nov. 19, 1992, Pat. No. 5,339,433. This application Jun. 6, 1995, Ser. No. 470,881
Int. Cl.[6] G06F *3/00*
U.S. Cl. 395—159 **19 Claims**



1. A method for selectively displaying screen information, said information comprising a list of members, each member having at least one type, the method comprising:

(a) displaying an interface for filtering selected types of information from display, said interface appearing on a screen display as a plurality of switches, each switch corresponding to a respective type and having "on" and "off" states settable by user input;

(b) receiving user input specifying actuation of at least one of said switches so as to result in a desired plurality of said switches being in said "on" state and any remaining switches in said interface being in said "off" state for selectively enabling the display of members having desired types corresponding to said desired plurality of switches; and

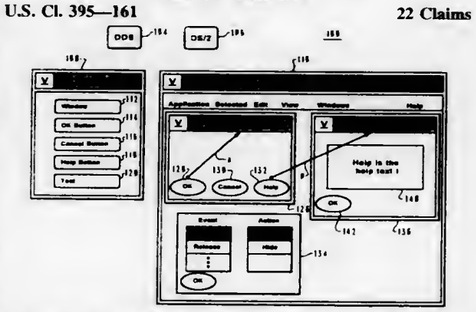
(c) in response to the user input, displaying only members having said desired types while continuing to display said interface.

5,557,731

METHOD AND SYSTEM FOR DETECTING UNDEFINED OBJECTS IN AN APPLICATION

Shih-Gong Li, and John S. Wang, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1993, Ser. No. 174,549
Int. Cl.[6] G06F *3/14*
U.S. Cl. 395—161 **22 Claims**



1. A method in a data processing system for permitting a user to efficiently create an application utilizing a plurality of objects in a graphic user interface, said method comprising:

creating a database, wherein said database is utilized to track objects selected by a user;

registering particular ones of said plurality of objects selected by a user for utilization in said application in said database;

permitting said user to create definitions for said particular ones of said plurality of objects; and

graphically indicating an absence of a definition for one of said particular ones of said plurality of objects within said database, wherein said user may efficiently identify objects requiring a definition.

5,557,732

METHOD AND APPARATUS FOR PROTECTING SOFTWARE EXECUTING ON A DEMONSTRATION COMPUTER

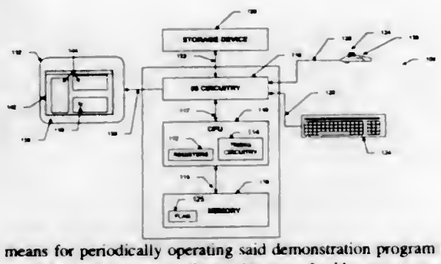
Suzanne M. Thompson, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 11, 1994, Ser. No. 289,150
Int. Cl.[6] G06F *3/14*
U.S. Cl. 395—161 **18 Claims**

1. Apparatus for protecting the integrity of software executing on a computer having a processor for executing system software programs to generate a display on a computer screen and a memory, said computer operating in an environment in which users of various skill levels and motivations are operating said computer, said apparatus comprising:

a demonstration application program located in said memory and having a predetermined run length;

5,557,735



means for periodically operating said demonstration program to exhibit hardware and software features of said computer, said demonstration application program configured to prevent user termination of said demonstration program during execution;

a utility program cooperating with said system software programs to generate a graphical desktop display on said computer screen during a period of time when said demonstration application program is not executing, said graphical desktop display allowing access to said system software programs through manipulation of said graphical desktop display;

means for preventing access to selected ones of said system software programs of said computer through manipulation of said graphical desktop display on said computer screen by said users; and

means for inhibiting user termination of said utility program.

5,557,733

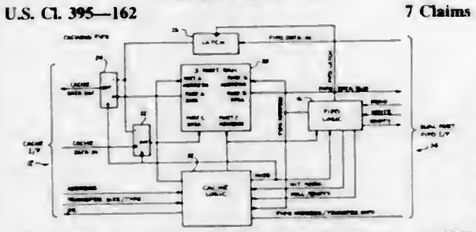
CACHING FIFO AND METHOD THEREFOR

Gary D. Hicok, Mesa, and Judson A. Lehman, Scottsdale, both of Ariz., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Apr. 2, 1993, Ser. No. 42,306

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—162 **7 Claims**



4. A memory subsystem for transferring data between a CPU and a graphics controller in a small computer system comprising, in combination:

Random Access Memory (RAM) means for storing said data, comprising a three port RAM having a first port dedicated to reading said data from said RAM means by said CPU, having a second port dedicated to reading said data from said RAM means by said graphics controller, and having a third port dedicated to writing said data from said CPU and from said graphics controller into said RAM means;

first interface means coupled to said CPU and to said RAM means for providing a cache interface for transferring said data from said CPU to said RAM means and from said RAM means to said CPU; and

second interface means coupled to said graphics controller and to said RAM means for providing a dual port First-In-First-Out (FIFO) interface for transferring said data from said graphics controller to said RAM means and from said RAM means to said graphics controller;

said cache interface and said dual port FIFO interface together comprising:

cache logic means for controlling flow of said data during a CPU read from said RAM means and during a CPU write to said RAM means;

FIFO logic means for controlling flow of said data during a graphics controller read from said RAM means and during a graphics controller write to said RAM means;

latch means for storing said data during said graphics controller write to said RAM means; and

multiplexer means for routing said data appropriately during said graphics controller write to said RAM means, during said CPU write to said RAM means, and during said CPU read from said RAM means.

5,557,734

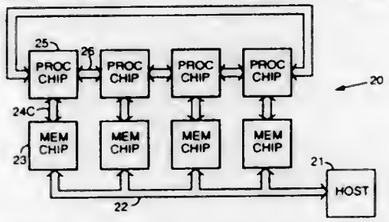
CACHE BURST ARCHITECTURE FOR PARALLEL PROCESSING, SUCH AS FOR IMAGE PROCESSING

Stephen S. Wilson, Ann Arbor, Mich., assignor to Applied Intelligent Systems, Inc., Ann Arbor, Mich.

Filed Jun. 17, 1994, Ser. No. 261,538

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—162 **62 Claims**



10. In a processing system for performing processing operations in parallel upon a data matrix having P columns stored in a first memory means having L rows and M columns, where L, M and P are integers greater than one and P is greater than M, and wherein the data matrix is stored in the first memory means in a plurality of segments, the system including an array of M processing units wherein each of the M processing units is associated with a column of the first memory means, each processing unit has associated therewith a plurality of second memory means, a method of relating column data across segment boundaries, comprising the steps of:

(A) shifting the columns of a first segment at least one column position such that the column of data adjacent a first segment boundary is shifted across the first segment boundary;

(B) storing the column shifted across the first segment boundary in step (A) in a first one of the second memory means of the processing unit to which the shifted column of data is associated;

(C) shifting the columns of a second segment the same number of column positions as the first segment was shifted in step (A) such that the column of data adjacent the first segment boundary is shifted away from the first segment boundary;

(D) transferring the shifted second segment of column data to the M processing units; and

(E) transferring the data stored in the first one of the second memory means in step (B) to the associated processing unit such that column data on both sides of the first segment boundary are accessible to the M processing units.

5,557,735

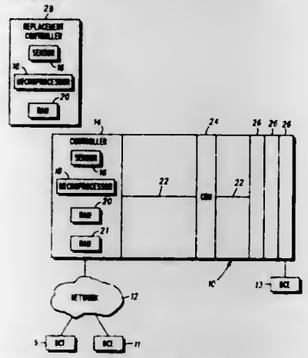
COMMUNICATION SYSTEM FOR A NETWORK AND METHOD FOR CONFIGURING A CONTROLLER IN A COMMUNICATION NETWORK

William J. Pinkston II, Fayetteville, Tenn.; Charles E. Polk, Jr., Athens, and Douglas D. Reed, Meridianville, both of Ala., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 21, 1994, Ser. No. 278,294

Int. Cl.[6] G06F *11/00;11/30*

U.S. Cl. 395—180 **8 Claims**



1. In a network interconnecting DCEs (data communication equipment) a communication system for managing the DCEs access to the network comprising:

a controller coupling the DCEs to the network, the controller connected to the DCEs by way of a communication bus;

the controller having non-volatile memory storing controller configuration information;

a controller backup unit (CBU) coupled to the controller by way of the communciation bus, the CBU having a CBU copy of the controller configuration information, and

a sensor for determining whether the CBU copy of the configuration information is valid.

5,557,736

COMPUTER SYSTEM AND JOB TRANSFER METHOD USING ELECTRONIC MAIL SYSTEM

Toshio Hirosawa, Machida; Tsutomu Itoh, Kanagawa-ken; Motohide Kokunishi, Kokubunji; Atsushi Ueoka, Hachioji; Yoshikazu Ichikawa, Fujisawa; Fujio Fujita; Tadashi Yamagishi, both of Yokohama; Masahiko Ishimaru, Fujisawa; Hideki Namba, Handano; Shigeru Sasaki, Kamakura; Michio Hirano, Chigasaki; Kaoru Kozuma, Yokosuka, and Kazuyuki Nakamura, Tokyo, all of Japan, assignors to Hitachi Electronics Services Co., Ltd., Tokyo; Hitachi, Ltd., Kanagawa, and Hitachi Software Engineering Co., Ltd., Tokyo, all of Japan

Continuation-in-part of Ser. No. 31,729, Mar. 15, 1993, and Ser. No. 149,553, Nov. 9, 1993. This application Jan. 21, 1994, Ser. No. 184,069

Claims priority, application Japan, Mar. 19, 1992, 4-063060; Nov. 11, 1992, 4-300775; Jan. 20, 1993, 5-007071

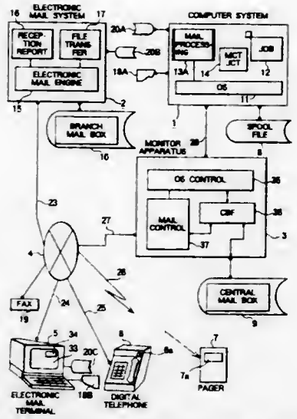
Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—182.02 **44 Claims**

1. A job transfer method in an electronic mail associated type computer system comprising a computer system for executing a job, an electronic mail system for delivering a document, a plurality of output devices connected to said computer system and said electronic mail system, and a monitor apparatus connected between said computer system and said electronic mail system;

said job transfer method comprising the steps of:

requesting an execution of said job by a first mail from the electronic mail system to the computer system by relaying said monitor apparatus;



monitoring said job executed in the computer system by said monitor apparatus;

storing an execution result of said job into a memory device of the computer system when the job execution by the computer system is completed;

reporting an ending condition of said job from said computer system to said electronic mail system which has requested to execute the job;

transmitting and receiving a mail statement about said ending condition of the job and a mail for requesting to output an execution result of the job corresponding to said mail statement between said computer system and said electronic mail system which has requested to execute the job by relaying said monitor apparatus;

instructing a request to output the result of said job execution by a second mail from said electronic mail system which has received the report about the ending condition of the job; and

transferring the result of said job execution stored in the memory device to at least one of said plural output devices based upon said output instruction.

5,557,737

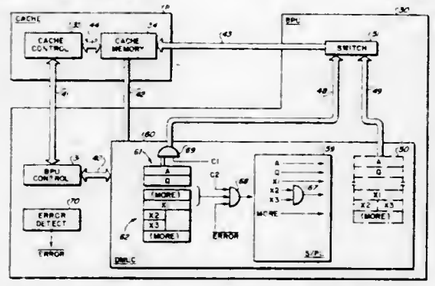
AUTOMATED SAFESTORE STACK GENERATION AND RECOVERY IN A FAULT TOLERANT CENTRAL PROCESSOR

John E. Wilhite, and Ronald E. Lange, both of Glendale, Ariz., assignors to Bull HN Information Systems Inc., Billerica, Mass.

Filed Jun. 13, 1994, Ser. No. 259,021

Int. Cl.[6] G06F *11/34*

U.S. Cl. 395—182.04 **6 Claims**



1. A fault tolerant central processing unit comprising:

A) data manipulation circuitry including a plurality of software visible registers, each said software visible register tempo-

rarily storing information contents as data is manipulated by

5,557,739

5,557,742

rarily storing information contents as data is manipulated by said data manipulation circuitry;

B) a shadow set of said software visible registers;

C) shadowing, packing and validity verification means coupled intermediate said software visible registers and said shadow set for copying the information contents of said plurality of software visible registers, after a data manipulation operation, into said shadow set after the validity of such contents have been verified, said shadowing, packing and validity verification means including combining means for packing information from at least two of said software visible registers, each of which do not exceed half word length, into a single word constituent in said shadow set; and

D) resumption of activity means coupled intermediate said shadow set and said software visible registers for replicating the contents of said shadow set in said software visible registers during recovery from a detected fault by double word transfers.

5,557,738

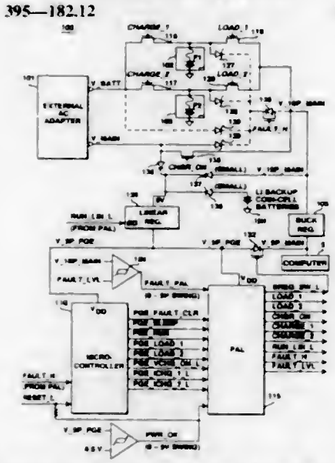
POWER SYSTEM CONFIGURATION AND RECOVERY FROM A POWER FAULT CONDITION IN A COMPUTER SYSTEM HAVING MULTIPLE POWER SUPPLIES

David B. Townsley; Andrew Goag, both of Cupertino, and Eva Henn, Los Altos, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 9, 1994, Ser. No. 239,602

Int. Cl.[6] H02J *7/00;* **G06F** *1/26*

U.S. Cl. 395—182.12 **17 Claims**



1. For use in an electronic device having a plurality of available power supplies, a method of selecting one of the plurality of available power supplies for operating the electronic device comprising the steps of:

bridging all available power supplies simultaneously through a combined power path to provide power to the load of the electronic device;

iterating through a preference hierarchy of the plurality of available power supplies and selecting the first power supply in the hierarchy that is suitable for operating the electronic device; and

switching the power system of the electronic device from the bridged power supply circuit to the first power supply in the hierarchy that is suitable for supplying power to the load of the electronic device.

5,557,739

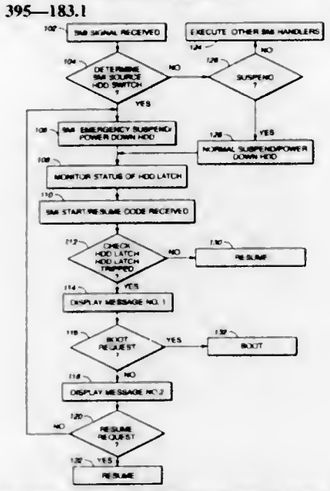
COMPUTER SYSTEM WITH COMPONENT REMOVAL AND REPLACEMENT CONTROL SCHEME

Ajay Gupta, Sioux City, Iowa; Howard K. Fullmer, Pleasanton, Calif.; Michael R. Flannery, Sioux City, Iowa, and Hiroshi Tanaka, Tottori City, Japan, assignors to Gateway 2000, Inc., N. Sioux City, S. Dak.

Filed Nov. 14, 1994, Ser. No. 339,591

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—183.1 **14 Claims**



1. A computer system for use by a user without specialized knowledge in the field of computers, comprising:

a port for receiving a removable component;

a switch for mechanically locking said component to said port and releasing said component from said port, wherein said switch causes the computer system to be suspended and power to the component to be cut off when said component is released from said port, without specific instructions from the user that suspension is necessary;

a release detection system for determining whether said switch has released said component;

a replacement detection system for determining whether said component has been replaced with a different component;

a display for displaying a message if said component has been replaced while the computer system is suspended; and

an input device for receiving commands from the user, wherein the computer system executes a boot procedure if said input device receives a boot request from the user, and wherein the computer system executes a suspend procedure if said input device receives a command indicating that a suspend procedure is to be performed.

5,557,740

METHOD AND SYSTEM FOR PROVIDING DEVICE SUPPORT TESTING FOR A PLURALITY OF OPERATING SYSTEMS

Richard H. Johnson, and Douglas Noddings, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

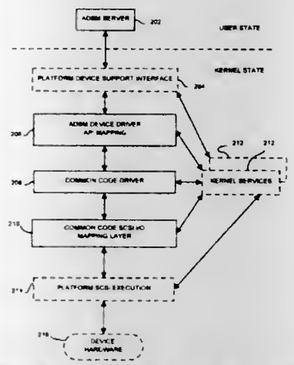
Filed May 30, 1995, Ser. No. 453,407

Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—183.14 **10 Claims**

10. A computer program product for testing a device driver utilized with a data processing system, the computer program product comprising:

(a) a computer readable medium containing program instructions of the computer program product;



(b) an instruction for inputting a script file to a test engine to provide a test to the device driver;

(c) an instruction for compiling the test engine across multiple operating system platforms;

(d) an instruction for sending a command that indicates the test is to be provided to the device driver; and

(e) an instruction for sending results of the test of the device driver back to the test engine.

5,557,741

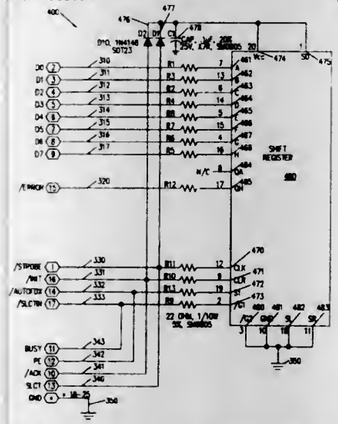
TEST APPARATUS AND METHOD FOR A COMPUTER PARALLEL PORT

Jerry M. Jones, Round Rock, Tex., assignor to Dell USA, L.P., Austin, Tex.

Filed Apr. 28, 1994, Ser. No. 234,447

Int. Cl.[6] G06F *11/34*

U.S. Cl. 395—183.19 **46 Claims**



1. A System for testing a port of a computer, said port having a plurality of output lines and an input line, said system including a test apparatus comprising:

means for coupling said test apparatus to said output lines of said computer port;

means for receiving a datum transmitted in parallel from said computer via said plurality of output lines;

means, coupled to said receiving means, for temporarily storing said datum from said output lines;

means, coupled to said storing means, for serially transmitting said datum via said input line to said computer;

said system further comprising means, within said computer, for comparing said datum transmitted from said computer to said datum received by said computer to verify a proper functioning of said output lines and input line.

5,557,742

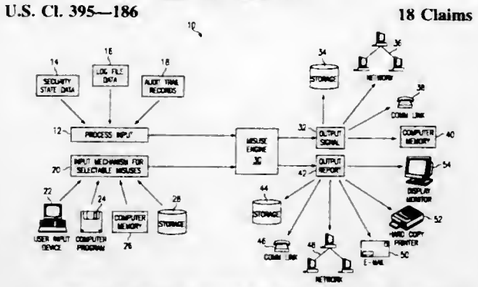
METHOD AND SYSTEM FOR DETECTING INTRUSION INTO AND MISUSE OF A DATA PROCESSING SYSTEM

Stephen E. Smaha, and Steven R. Snapp, both of Austin, Tex., assignors to Haystack Labs, Inc., Austin, Tex.

Filed Mar. 7, 1994, Ser. No. 208,019

Int. Cl.[6] G06F *11/34*

U.S. Cl. 395—186 **18 Claims**



1. A system for detecting intrusion into and misuse of a processing system, comprising:

a process input mechanism for receiving a plurality of process relating inputs to processing system access;

a selectable misuse mechanism connected to said process input mechanism for receiving a plurality of selectable misuses from at least one controllable input source, said at least one controllable input source comprising one or more of a user input device, a processing system program, a processing system memory device, and a processing system storage device;

a misuse engine connected to said selectable misuse mechanism for receiving said plurality of process inputs from said process input mechanism and said plurality of selectable misuses from said selectable misuse mechanism, said misuse engine comprising a signature process mechanism for comparing and matching said process inputs to multiple misuses of said plurality of selectable misuses simultaneously; and

an output mechanism connected to said misuse engine for generating an output when said misuse engine locates a match between at least one of said plurality of process inputs and at least one of said plurality of selectable misuses, said output indicating an intrusion into or misuse of the processing system.

5,557,743

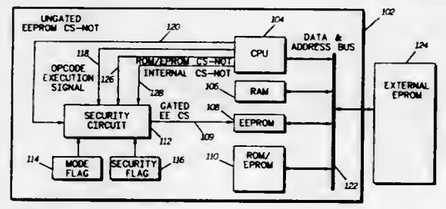
PROTECTION CIRCUIT FOR A MICROPROCESSOR

Raul Pombo, Plantation; Jaime Borras, Hialeah, both of Fla., and Michel Bron, Lausanne, Switzerland, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 5, 1994, Ser. No. 223,484

Int. Cl.[6] G06F *11/34*

U.S. Cl. 395—186 **1 Claim**



1. A method for protecting an internal EEPROM of a microprocessor, the microprocessor having an address bus and a data bus configured for coupling an external memory to the microprocessor, the microprocessor acting upon an instruction originating from either internal memory, or external memory, the method comprising the steps of:

determining if the instruction originates from the external

5,557,745

5,557,746

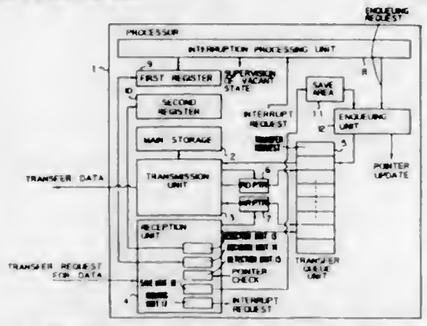
determining if the instruction originates from the external memory or the internal memory;
determining if the instruction originating from internal memory further originates from a read only memory;
allowing access to the internal EEPROM, freezing the address bus to the external memory and floating the data bus to the external memory when the instruction originates from an internal read only memory; and
disallowing access to the EEPROM when the instruction originates from the external memory.

5,557,744

MULTIPROCESSOR SYSTEM INCLUDING A TRANSFER QUEUE AND AN INTERRUPT PROCESSING UNIT FOR CONTROLLING DATA TRANSFER BETWEEN A PLURALITY OF PROCESSORS

Kazuhige Kobayakawa; Shigeru Nagasawa; Masayuki Ikeda; Haruhiko Ueno; Naoki Shinjo; Teruo Utsumi; Masami Dewa, and Kenichi Ishizaka, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jul. 28, 1993, Ser. No. 104,482
Claims priority, application Japan, Dec. 18, 1992, 4-338470
Int. Cl.[6] G06F *13/24; 13/00*
U.S. Cl. 395—200.01 **8 Claims**



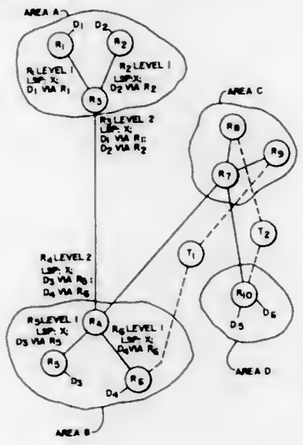
1. A multiprocessor system formed of a plurality of processors connected in parallel with each other through a network for performing communication, each processor comprises:
transfer queue means for temporarily storing a plurality of transfer requests;
a main storage for storing data to be enqueued;
reception means queue means for receiving transfer requests issued by other processors in the multiprocessor system, and sequentially enqueuing the received transfer requests to the transfer queue means;
transmission means connected to the transfer queue means for sending data designated by a transfer request from the main storage to another processor in the multiprocessor system when that transfer request is enqueued in the transfer queue means;
a first register connected to the reception means for indicating whether the transfer queue means has an area available for storing a transfer request;
a second register connected to the reception means for indicating whether a transfer request is a valid transfer request;
save means connected to the reception means for temporarily saving a transfer request;
enqueuing means connected between the save means and the transfer queue means for enqueuing a transfer request saved by the save means to the transfer queue means; and
interruption processing means connected to the reception means and the first register for receiving an interrupt request from the reception means, monitoring whether the transfer queue means has an area available for storing a transfer request and outputting an enqueuing request to the enqueuing means when the transfer queue means has an area available for storing a transfer request.

5,557,745

METHOD FOR SUPPORTING FOREIGN PROTOCOLS ACROSS BACKBONE NETWORK BY COMBINING AND TRANSMITTING LIST OF DESTINATIONS THAT SUPPORT SECOND PROTOCOL IN FIRST AND SECOND AREAS TO THE THIRD AREA

Radia J. Perlman, Acton, Mass.; Ian M. C. Shand, Cobham, United Kingdom, and Christopher W. Gunner, Harvard, Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 882,495, May 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 577,437, Sep. 4, 1990, Pat. No. 5,251,205. This application Mar. 20, 1995, Ser. No. 407,802
Int. Cl.[6] G06F *9/00; 15/00*
U.S. Cl. 395—200.02 **5 Claims**



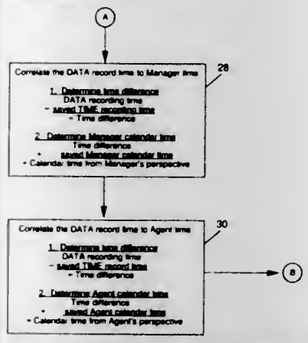
1. A method of transferring information across a computer network that operates according to a first protocol, said computer network being comprised of areas having a plurality of destinations, with each area having at least one destination and each destination having a location within said areas, some of said destinations operating according to a second protocol, and each of said areas having at least one router connected to said destination for supporting both said first protocol and said second protocol located therein, said method of transferring information comprising the steps of:
generating by a first router a first list of the location of each destination in a first area supporting said second protocol, said first router supporting both said first protocol and said second protocol in said first area;
transmitting the first list from said first router to a second router supporting both said first protocol and said second protocol in a second area;
generating, by said second router in said second area, a second list of the location of each destination within said first area and said second area supporting the second protocol;
transmitting the second list from the second router to a third router supporting both said first protocol and said second protocol in a third area;
transferring information identifying destinations in said second area and third area that operate under said second protocol from said router in said second area to said router in said first area.

5,557,746

SYSTEM AND METHOD FOR RECORDING ACCOUNTING TIMES

David D. Chen, Cary; John L. Elsenbies, Raleigh; William F. McKenzie, Jr., Raleigh, and Leo Temoshenko, Raleigh, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 20, 1993, Ser. No. 123,547
Int. Cl.[6] G06F *15/00*
U.S. Cl. 395—200.06 **23 Claims**



1. For use in a Manager of a network comprising at least one Agent for collecting a plurality of records of data, said Manager having a Manager system clock for timekeeping purposes, said at least one Agent having an Agent system clock for time-keeping purposes, each record having Agent recording time data representing the time the record was collected by said Agent and being based upon a reading by said Agent of said Agent system clock, at least one of said records having Manager calendar time data representing the Manager's calendar time, said Manager calendar time being based upon a reading by said Manager of said Manager system clock, a method of correlating Agent recording time data with Manager calendar time data comprising the steps of;
a) retrieving from said Agent a first record having Agent recording time data and Manager calendar time data;
b) retrieving from said Agent a second record having Agent recording time data; and
c) correlating the Agent recording time data of said second record with the Manager calendar time data of said first record using said Agent recording time data and said Manager calendar time data from said retrieved first record and using said Agent recording time data from said retrieved second record, said correlating step comprising the steps of calculating the difference of the Agent recording time data of said first record and the Agent recording time data of said second record and adding said difference to the Manager calendar time data of said first record to obtain the calendar time at the Agent in the Manager's perspective.

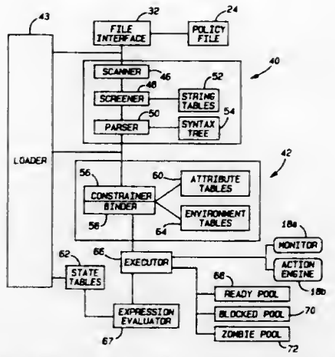
5,557,747

NETWORK POLICY IMPLEMENTATION SYSTEM FOR PERFORMING NETWORK CONTROL OPERATIONS IN RESPONSE TO CHANGES IN NETWORK STATE

Lawrence D. Rogers, 13644 Boquita Dr., Del Mar, Calif. 92014, and Roger Wellington-Oguri, 7931 Nightingale Way, San Diego, Calif. 92123

Filed Jun. 22, 1993, Ser. No. 80,931
Int. Cl.[6] G06F *17/60*
U.S. Cl. 395—200.11 **1 Claim**

1. A computer network policy implementation system for causing network control operations to be performed in response to changes in state of the network comprising:
a policy editor having user interface through which a user may cause a set of policy instructions to be stored to define the network policy, said stored set of policy instructions setting forth operations to be performed in response to changes in state of the network;



network monitoring means for monitoring at least one of a predefined set of changes in the network and for providing system state signals indicative of said changes;
action engine means for selectively causing at least one of a predefined set of network control operations to be performed;
a policy interpreter, receptive of said stored set of policy instructions and communicating with said network monitoring means, for building at least one data structure to represent said stored set of policy instructions in relation to store said system state signals;
said policy interpreter implementing a predefined language having at least a first mechanism to specify that action should be initiated in response to a state signal, and a second mechanism to specify that action should be terminated in response to a state signal whether or not the action has been initiated;
said policy interpreter including an executor means for managing a plurality of threads each representing at least a portion of the policy instructions, the threads executing concurrently and interactively with one another;
said executor means communicating with said action engine means to cause network control operations to be performed in response to changes in state of the network in accordance with said stored set of policy instructions.

5,557,748

DYNAMIC NETWORK CONFIGURATION

David Norris, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

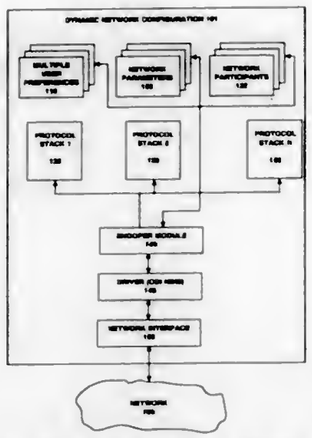
Filed Feb. 3, 1995, Ser. No. 383,254
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—200.10 **20 Claims**

1. A method for dynamically configurating network parameters for a computer device coupled to a network, said method comprising the steps of:
a) storing a plurality of network parameters and a plurality of network participants corresponding to at least one previous network location, said network participants identifying participants observed for said corresponding at least one previous network location;
b) snooping on said network to observe network transactions occurring on said network;
c) evaluating said network transactions to determine at least one network parameter, wherein the step of evaluating said network transactions comprises the step of generating a current network participants list based on said network transactions to identify at least one previous network location; and
d) configurating said computer device with said at least one network parameters so as to dynamically configure said computer device based on said network transactions observed, wherein the step of configurating said computer device com-

provided sender list while establishing connection between

prefetch means for temporarily storing information received

wherein the data controller interrupts the data processing system



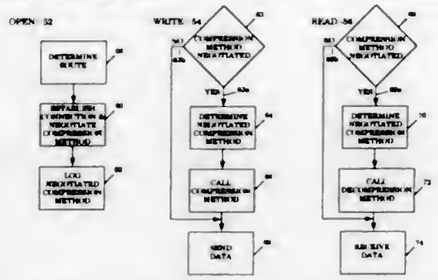
prises the step of configurating said computer device with network parameters corresponding to said at least one previous location when said current network participants compares with said network device on said network participants.

5,557,749

SYSTEM FOR AUTOMATICALLY COMPRESSING AND DECOMPRESSING DATA FOR SENDER AND RECEIVER PROCESSES UPON DETERMINATION OF A COMMON COMPRESSION/DECOMPRESSION METHOD UNDERSTOOD BY BOTH SENDER AND RECEIVER PROCESSES

David Norris, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Oct. 15, 1992, Ser. No. 961,475
Int. Cl.[6] G06F *13/00;13/14,13/36*
U.S. Cl. 395—200.18 **4 Claims**



1. In a network of computer systems comprising a sender computer system having a sender process and a receiver computer system having a receiver process, wherein said sender process provides data to said receiver process, a computer implemented method for transferring said data from said sender process to said receiver process, said method comprising the steps of:

a) providing a sender list of compression/decompression methods understood by said sender computer system by a first system service of said sender computer system to a second system service of said receiver computer system while establishing connection between said sender computer system to said receiver computer system on behalf of said sender process, said sender list being provided in order of sender preference;

providing a receiver list of compression/decompression methods understood by said receiver computer system by said second system service to said first system service in response to said provided sender list while establishing connection between said receiver computer system and said sender computer system, said receiver list being provided in order of receiver preference;

deducing individually a compression/decompression method understood by both said sender and receiver computer systems in accordance to an identical predetermined manner using said sender and receiver lists provided by said first as well as said second system service, based on sender preference dominance, without further communication between said first and said second system services for the purpose of deducing said compression/decompression method understood by both;

b) logging said determined compression/decompression method on said sender and receiver computer systems by said first and second system services respectively;

c) compressing automatically said data to be transferred in accordance to said logged compression/decompression method by a third system service of said sender computer system before transmission, as an integral part of transmitting said data from said sender computer system to said receiver computer system, in response to a data sending request of said sender process to said third system service; and

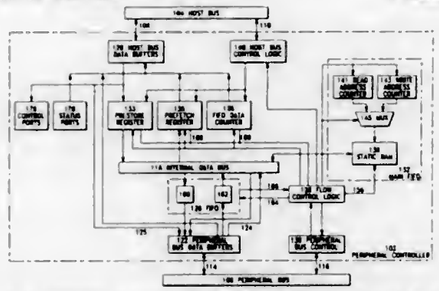
d) decompressing automatically said data in accordance to said logged compression/decompression method by a fourth system service of said receiver computer system after receiving said data from said sender computer system, but before said received data is given to said receiver process, as an integral part of receiving and giving said data to said receiver process, in response to a data reading request of said receiver process.

5,557,750

PREFETCH/PRESTORE MECHANISM FOR PERIPHERAL CONTROLLERS WITH SHARED INTERNAL BUS

Richard S. Moore, Irvine, and Allan F. Pease, Orange, both of Calif., assignors to Future Domain Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 667,754, Mar. 11, 1991, abandoned. This application Oct. 20, 1992, Ser. No. 963,583
Int. Cl.[6] G06F *5/06*
U.S. Cl. 395—250 **5 Claims**



1. A computer system interface for connection between a host computer bus and an input/output peripheral bus or interconnecting a host computer to a peripheral device, comprising:

an internal interface bus;

a single-ported main FIFO buffer operationally coupled to said internal interface bus wherein said single-ported main FIFO buffer includes a circuit for generating a read address and a write address, and further wherein said circuit selects one of said read address and said write address for the location accessed in said single-ported main FIFO buffer;

prestore means for temporarily storing information received from said host computer bus and to be sent said single-ported main FIFO buffer, said prestore means being operationally couple to said internal interface bus;

prefetch means for temporarily storing information received from said single-ported main FIFO buffer and to be sent to said host computer bus, said prefetch means being operationally coupled to said internal interface bus; and

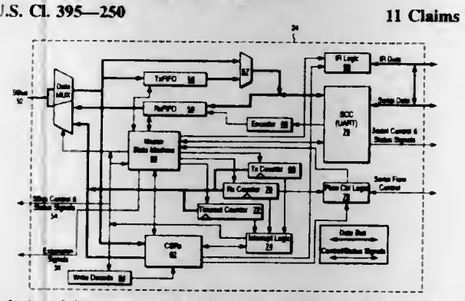
control logic means for causing information to flow from said single-ported main FIFO buffer to said prefetch means, and to further flow from said prefetch means to said host computer bus.

5,557,751

METHOD AND APPARATUS FOR SERIAL DATA COMMUNICATIONS USING FIFO BUFFERS

David A. Banman, Los Altos, and Robert A. Clark, San Jose, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 189,062, Jan. 27, 1994, abandoned. This application Jul. 12, 1995, Ser. No. 501,704
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—250 **11 Claims**



1. A serial communications circuit coupled to a data processing system and a serial port comprising:

a) a first serial receiver and transmitter coupled to the serial port for receiving and transmitting serial data;

b) a transmit buffer coupled to the first serial receiver and transmitter for temporarily storing transmit data from the data processing system, and for providing said transmit data to the first serial receiver and transmitter;

c) a receive buffer coupled to the first serial receiver and transmitter for temporarily storing received data from the serial port and for providing said data to the data processing system;

d) a transmit register associated with the transmit buffer for storing a first pre-determined value, said first pre-determined value indicating the maximum capacity of the transmit buffer;

e) a receive register associated with the receive buffer for storing a second pre-determined value, said second pre-determined value indicating the maximum capacity of the receive buffer;

f) a transmit counter for maintaining a transmit buffer count, said transmit buffer count indicating the current amount of data in the transmit buffer;

g) a receive counter for maintaining a receive buffer count, said receive buffer count indicating a current amount of data in the receive buffer; and

h) a data flow controller coupled to the first serial receiver and transmitter, the transmit buffer, the receive buffer, the transmit register, the receive register, the transmit counter, and the receive counter for allowing data to flow into the transmit and receive buffers when the transmit buffer count is less than the first pre-determined value and the receive buffer count is less than the second pre-determined value, and when the transmit buffer count and the receive buffer count exceeds or is equal to the first pre-determined value and the second pre-determined value, respectively, for stopping data flow into the transmit and receive buffers and for transferring the transmit data and receive data to the serial port and the data processing system, respectively;

wherein the data controller interrupts the data processing system based on the transmit buffer count and the receive buffer count; and

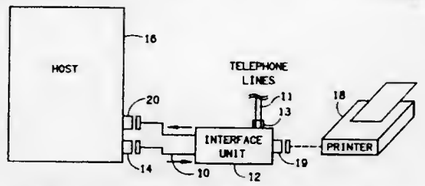
wherein the transmit register and the receive register are programmable by the data processing system such that the data processing system may control the frequency at which the data processing system is interrupted by the data controller by changing the first and second pre-determined values so that the interrupt frequency is based upon a current data transfer rate between the data processing system and the serial port and a current loading of the data processing system.

5,557,752

TELECOMMUNICATIONS INTERFACE APPARATUS AND METHOD

Michel J. Remion, 4001 Westerly Pl., Suite 106, Newport Beach, Calif. 92660

Continuation of Ser. No. 234,537, Apr. 28, 1994, abandoned, which is a continuation of Ser. No. 963,273, Oct. 19, 1992, Pat. No. 5,313,580, which is a continuation of Ser. No. 487,766, Mar. 2, 1990, abandoned. This application Sep. 22, 1995, Ser. No. 532,860
Int. Cl.[6] G06F *13/42;13/14*
U.S. Cl. 395—285 **21 Claims**



1. A method for transmitting data between a printer port of a host computer and a telecommunication network using a printer interface protocol to communicate with an interface module, comprising the steps of:

a. receiving within the interface module print data from the host computer via a printer port of the host computer;

b. identifying from among a first predetermined amount of the received print data a first predetermined command code embedded in the print data, if such command code is present; and

c. transmitting the received print data to the telecommunication network in response to the presence and identification of the first predetermined command code.

5,557,753

INFORMATION PROCESSING UNIT HAVING A MULTIPLEXED BUS AND A BUS CONTROL METHOD THEREFOR

Masashi Suenaga; Nobuo Tomita; Hiroshi Watanabe, and Masayuki Tanji, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 10, 1992, Ser. No. 943,001
Claims priority, application Japan, Sep. 12, 1991, 3-232955
Int. Cl.[6] G06F *13/14*
U.S. Cl. 395—287 **6 Claims**

1. An information processing unit, including;

a plurality of units;

a plurality of buses commonly shared by said plurality of units; and

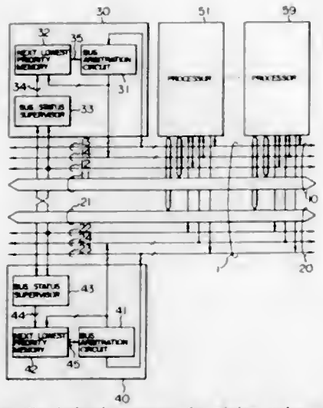
bus arbitration means corresponding independently to each one of said plurality of buses, including:

means for determining whether bus requests are received from particular ones of said plurality of units, through one of said buses to which said bus arbitration means is connected,

priority memory means for storing information indicating respective bus priority of said plurality of units,

1. In a system comprising a bus, a plurality of nodes, each node

5,557,757



priority discriminating means for giving a bus grant to a particular one of said plurality of units having a highest priority among units transmitting a bus request and for writing information indicating updated bus priority into said priority memory means so that the particular unit to which the bus grant is given subsequently bears the lowest priority bus request among said plurality of units and information stored in said priority memory means,

bus status supervising means, connected to each one of said plurality of buses, for supervising status of said plurality of buses, and generating a bus recovery signal indicating, to all of said plurality of units, when a fault occurring in one of said plurality of buses has been eliminated, and

means, connected to said priority memory means and said bus status supervising means to receive said bus recovery signal, for matching the priority information stored in said priority memory means for storing updated priority information based on priority judgement by said priority discriminating means of said bus arbitration means of said bus having the fault occurred therein with said information stored in said priority memory means of said bus arbitration means of the remaining buses;

wherein said bus arbitration means of respective ones of said plurality of buses selects a same particular unit for transferring identical data in a same bus cycle when no fault occurs in any of said plurality of buses, and when a fault does occur in a particular one of said plurality of buses the remaining buses alone are used for transferring the identical data.

5,557,754

COMPUTER SYSTEM AND SYSTEM EXPANSION UNIT

Hironao Sone, Yokohama; Kazuo Sekiya, Tokyo; Hiroshi Ishikawa, Shizuoka, and Yoshihisa Kanada, Itabashi-ku, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 20, 1993, Ser. No. 49,939

Claims priority, application Japan, Jun. 22, 1992, 4-163007

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—287 **19 Claims**

1. A computer system comprising:

a first plurality of bus access requesting resources;

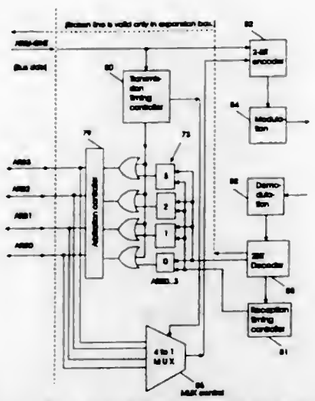
a second plurality of bus access requesting resources;

a first system having a first bus;

a second system having a second bus;

a data line for connecting said first bus to said second bus and transmitting signals in a mode different from those of said buses;

first converting means installed between said first bus and said data line for signal conversion between signals over said first bus and signals over said data line;



second converting means installed between said second bus and said data line for signal conversion between signals over said second bus and signals over said data line;

first arbitration means installed in said first system for arbitrating amongst the first plurality of bus access requesting resources requiring bus access to said first bus;

second arbitration means installed in said second system for arbitrating amongst the second plurality of bus access requesting resources requiring bus access to said second bus;

means installed in said second system for receiving the arbitration level of a bus access requesting resource remaining as a provisional winner in the bus access arbitration of said first system through said data line and letting said resource participate in arbitration by said second arbitration means of said second system; and

means installed in said first system for receiving the arbitration level of a bus access requesting resource remaining as a provisional winner in the bus access arbitration of said second system through said data line and letting said resource participate in arbitration by said first arbitration means of said first system.

5,557,755

METHOD AND SYSTEM FOR IMPROVING BUS UTILIZATION EFFICIENCY

William T. Krein, San Jose; Charles M. Flaig, Cupertino, and James D. Kelly, Aptos, all of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Feb. 24, 1994, Ser. No. 201,461

Int. Cl.[6] G06F *13/36;13/42*

U.S. Cl. 395—293 **10 Claims**

1. In a system comprising a bus, a plurality of nodes, each node receiving a clock signal, the nodes coupled to the bus, and a bus coordinator coupled to the nodes for coordinating access to the bus by the nodes, a method for operating the system, comprising the steps of:

determining which node accesses the bus most frequently;

designating from one of the plurality of nodes a primary node as the node in the system that accesses the bus most frequently, the primary node receiving the clock signal for the primary node,

deriving an operating clock signal from the clock signal received by the primary node;

operating the primary node in response to the operating clock signal; and

applying the operating clock signal to the bus coordinator to operate the bus coordinator at the same clock signal as the primary node, thereby ensuring synchronous operation between the primary node and the bus coordinator, each other node operating in response to the clock signal received by that node.

5,557,756

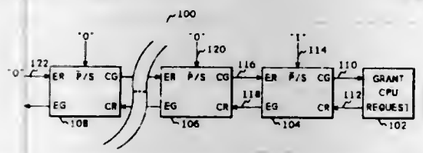
CHAINED ARBITRATION

Thomas V. Spencer, Ft. Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 28, 1994, Ser. No. 331,312

Int. Cl.[6] G06F *13/368*

U.S. Cl. 395—299 **3 Claims**



1. A bus arbitration circuit for determining which device controls a bus within a computer system, said circuit comprising:

a state machine for receiving a processor request signal from a processor device, a request signal from one or more input/output devices, and an external device request signal from an external device, and for sending a processor grant signal to said processor device, a grant signal to each of said one or more input/output devices, and an external device grant signal to said external device as each of said devices receives control of said bus;

a first inverter device connected to a signal line carrying said processor request signal and further connected to a signal line carrying a control signal wherein said first inverter device does not invert said processor request signal when said control signal has a first signal level and wherein said first inverter device inverts said processor request signal when said control signal has a second signal level, wherein said bus arbitration circuit is assigned as a primary circuit when said control signal is at said first signal level and wherein said bus arbitration circuit is assigned as a secondary circuit when said control signal is at said second signal level;

a second inverter device connected to a signal line carrying said processor grant signal and further connected to a signal line carrying said control signal wherein said second inverter device does not invert said processor grant signal when said control signal has said first signal level and wherein said second inverter device inverts said processor grant signal when said control signal has said second signal level.

5,557,757

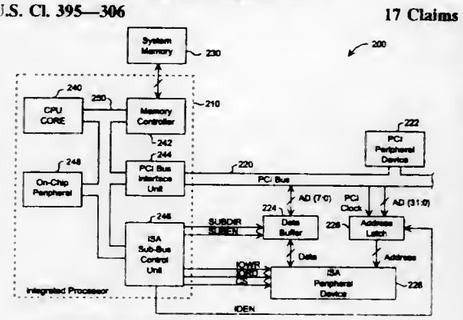
HIGH PERFORMANCE INTEGRATED PROCESSOR ARCHITECTURE INCLUDING A SUB-BUS CONTROL UNIT FOR GENERATING SIGNALS TO CONTROL A SECONDARY, NON-MULTIPLEXED EXTERNAL BUS

Douglas D. Gephardt; Dan S. Mudgett, both of Austin, and James R. MacDonald, Buda, all of Tex., assignors to Advanced Micro Devices, Sunnyvale, Calif.

Filed Feb. 2, 1994, Ser. No. 190,647

Int. Cl.[6] G06F *13/38*

U.S. Cl. 395—306 **17 Claims**



1. A computer system comprising:

a peripheral bus including a plurality of multiplexed address/data lines;

a latch having an input port coupled to said plurality of multiplexed address/data lines;

a data buffer having a first port coupled to said plurality of multiplexed address/data lines;

an integrated processor fabricated on a single integrated circuit and including:

a CPU core;

a local bus coupled to said CPU core;

a bus interface unit configured to interface data, address, and control signals between said local bus and said peripheral bus; and

a sub-bus control unit for generating signals used to control a secondary, non-multiplexed bus external to said integrated processor, wherein said sub-bus control unit is coupled to said bus interface unit and to said latch and is configured to generate a loading signal indicative of the presence of a valid address on said peripheral bus, and wherein said loading signal is provided to said latch for selectively causing said valid address to be latched within said latch; and

a peripheral device compatible with said secondary, non-multiplexed bus, and having a plurality of addressing lines coupled to an output port of said latch, and a plurality of data lines coupled to a second port of said data buffer.

5,557,758

BRIDGE BETWEEN TWO BUSES OF A COMPUTER SYSTEM THAT DETERMINES THE LOCATION OF MEMORY OR ACCESSES FROM BUS MASTERS ON ONE OF THE BUSES

Patrick M. Bland, Austin, Tex.; Richard G. Hofmann, Cary, N.C.; Sagi Katz, Haifa, Israel; Dennis Moeller, and Lance M. Venarchick, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 30, 1994, Ser. No. 351,192

Int. Cl.[6] G06F *13/00*

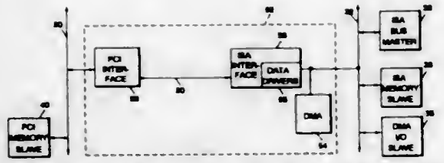
U.S. Cl. 395—308 **18 Claims**

1. A bridge for interfacing a plurality of buses in a system which has a first bus, a first bus master and a first bus slave coupled to the first bus, the first bus master issuing a memory address to perform a memory cycle, a second bus, and a second bus slave coupled to the second bus, the bridge comprising:

instruction cache said program counter is stored in said inter-

a plurality of first output circuits each having a high-impedance

block to said target basic block without violating any data



logic for receiving the memory address from a first bus master and simultaneously generating signals to cause a memory cycle to be performed on the first and second buses concurrently;

logic for detecting whether the second bus slave claims the memory address;

logic for steering data between the first and second buses when the second bus slave claims the address; and

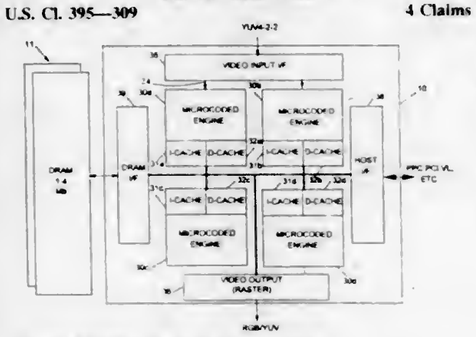
logic for isolating the second bus from the first bus when the second bus slave does not claim the memory address such that data is transferred between the first bus master and the first bus slave.

5,557,759

VIDEO PROCESSOR WITH NON-STALLING INTERRUPT SERVICE

Dwayne T. Crump, Apex, and Steve T. Pancoast, Raleigh, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 7, 1995, Ser. No. 475,667
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—309 **4 Claims**



1. An integrated circuit device comprising:

a substrate,

a plurality of identical processors formed on said substrate, each of said processors having an instruction cache, a data cache, a bus interface unit, and an arithmetic logic unit;

at least one of said processors having a mainline program counter for registering the progress of execution of mainline program code;

an interrupt register formed on said substrate and operatively associated with at least one of said processors for receiving and retaining data after the occurrence of an input/output interrupt, said interrupt register cooperating with said at least one processor for increasing processing efficiency of the integrated circuit device;

an interrupt vector request register formed on said substrate and operatively associated with said at least one of said processors;

wherein upon the occurrence of an input/output (I/O) interrupt, said interrupt vector register receives and retains a vector address for an interrupt routine, said instruction cache fetches interrupt routine code which was not in said instruction cache at the occurrence of said I/O interrupt, said at least one of said processors continuing to execute said mainline code while said interrupt routine code is being fetched by said instruction cache and after said interrupt routine code is present in said instruction cache said program counter is stored in said interrupt register and the vector address is transferred from said vector register to said program counter whereupon said at least one of said processors begins executing said interrupt routine;

a line bus formed on said substrate and interconnecting all of said plurality of processors for transferring data bit streams thereamong;

a video input interface unit formed on said substrate and connected to said line bus for receiving an input signal stream;

a video output interface unit formed on said substrate and connected to said line bus for delivering from the integrated circuit device an output video signal stream determined from processtng by said plurality of processors;

a host interface unit formed on said substrate and connected to said line bus for exchanging with a host processor control signals effective for governing the function of said plurality of processors;

a control bus formed on said substrate and interconnecting said host interface unit and said plurality of processors for exchange of control signals therewith apart from data bit streams transferred over said line bus; and

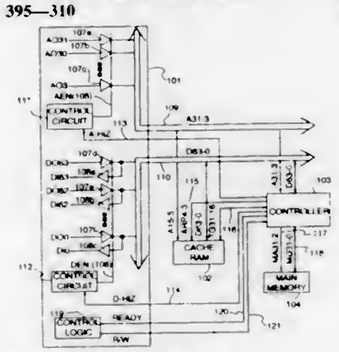
a memory interface unit formed on said substrate and connected to said line bus for exchanging with memory elements data bit streams processed and to be processed by said plurality of processors.

5,557,760

INTEGRATED CIRCUIT DATA PROCESSOR INCLUDING A CONTROL PIN FOR DEACTIVATING THE DRIVING OF A DATA BUS WITHOUT DEACTIVATING THAT OF AN ADDRESS BUS

Osamu Nishii, Kokubunji; Takashi Inagawa, Owari-Asahi; Makoto Hanawa, Niiza, and Hiroshi Takeda, Higashi-Yamato, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 8, 1993, Ser. No. 117,681
Claims priority, application Japan, Sep. 11, 1992, 4-242949
Int. Cl.[6] G06F *13/20*
U.S. Cl. 395—310 **9 Claims**



1. A data processing system including:

an integrated circuit data processor;

a cache memory, coupled with said integrated circuit data processor via a system address bus and a system data bus, being accessed by said integrated circuit data processor;

a controller coupled with said integrated circuit data processor via said system address bus and said system data bus;

a main memory, coupled with said controller via a main memory address bus and a main memory data bus, being accessed by said integrated circuit data processor;

wherein said integrated circuit data processor comprises:

address terminals for outputting addresses to an external device;

data terminals for outputting data to an external device;

a plurality of first output circuits each having a high-impedance state and each outputting an address signal to a corresponding one of said address terminals;

a plurality of second output circuits each having a high-impedance state and each outputting a data signal to a corresponding one of said data terminals;

a first external control terminal for receiving a first external control signal from an external device;

a second external control terminal for receiving a second external control signal from an external device;

a first control circuit connected to said first output circuits and to said first external control terminal for switching a signal outputting state of each of said plurality of first output circuits into the high-impedance state in response to said first external control signal being received at said first external control terminal; and

a second control circuit connected to said second output circuits and to said second external control terminal for switching a signal outputting state of each of said plurality of second output circuits into the high-impedance state in response to said second external control signal being received at said second external control terminal,

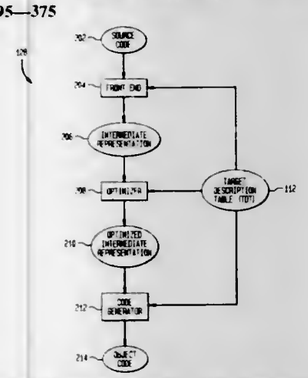
wherein said controller generates said second external control signal at a predetermined level designating deactivation of said plurality of said second output circuits for switching the signal outputting state of said plurality of said second output circuits to said high-impedance state, when a miss that occurs to said cache memory during a write access from said integrated circuit data processor is detected by said control circuit.

5,557,761

SYSTEM AND METHOD OF GENERATING OBJECT CODE USING AGGREGATE INSTRUCTION MOVEMENT

Sun C. Chan, Fremont, and James C. Dehnert, Palo Alto, both of Calif., assignors to Silicon Graphics, Inc., Mountain View, Calif.

Filed Jan. 25, 1994, Ser. No. 186,248
Int. Cl.[6] G06F *9/45*
U.S. Cl. 395—375 **16 Claims**



1. A method of generating object code from an intermediate representation of source code, the object code adapted for execution on a target computer having an instruction set, the intermediate representation comprising a plurality of basic blocks each being represented by a plurality data dependency graphs, each data dependency graph comprising a plurality of nodes each corresponding to an instruction from the target computer instruction set, the method comprising the steps of:

(1) selecting a source basic block being one of the basic blocks of the intermediate representation and a target basic block being another of the basic blocks of the intermediate representation;

(2) identifying a maximal set of instructions contained in said source basic block that are movable from said source basic block to said target basic block without violating any data dependency relationships of the data dependency graphs;

(3) generating an overall cost model of aggregately moving instructions of said maximal set from said source basic block to said target basic block, said cost model specifying an executable cost of moving each of said instructions of said maximal set from said source basic block to said target basic block; and

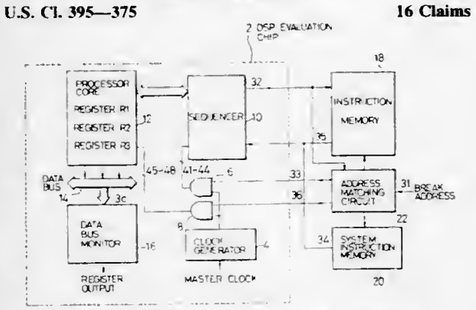
(4) aggregately moving one or more instructions of said maximal set from said source basic block to said target basic block according to said cost model to form the object code.

5,557,762

DIGITAL SIGNAL PROCESSOR EVALUATION CHIP AND DEBUG METHOD

Yasuyuki Okuaki, and Kazushige Yamamoto, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Japan

Continuation of Ser. No. 829,921, Feb. 3, 1992, abandoned.
This application Aug. 29, 1994, Ser. No. 297,684
Claims priority, application Japan, Feb. 13, 1991, 3-020004
Int. Cl.[6] G06F *11/25*
U.S. Cl. 395—375 **16 Claims**



1. A digital signal processor evaluation chip comprising:

a clock generating circuit for generating a multi-phase clock signal;

a first gating circuit coupled to said clock generating circuit, for gating said multi-phase clock signal with a first break signal, thus outputting a first clock signal when said first break signal is in one state in a first period and halting the first clock signal when said first break signal is in another state in a second period after said first period and in a third period after said second period;

a second gating circuit coupled to said clock generating circuit, for gating said multi-phase clock signal with a second break signal, thus outputting a second clock signal when said second break signal is in one state in said first and second periods and halting said second clock signal when said second break signal is in another state in said third period;

a controlling circuit, coupled to said first gating circuit and driven by said first clock signal, for fetching and decoding instructions when said first clock signal is output;

a processing circuit, coupled to said second gating circuit and said controlling circuit, driven by said second clock signal, and having at least one register for performing arithmetic operations and a transfer operation on data in said register responsive to said instructions when said second clock signal is output; and

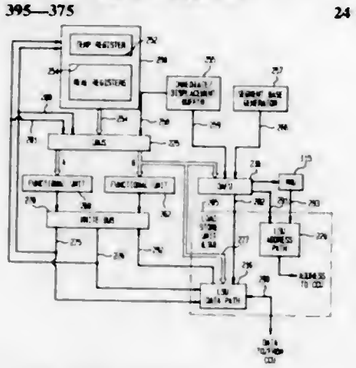
a data bus, coupled to said processing circuit, for receiving data from said register when said transfer operation is performed.

5,557,763

SYSTEM FOR HANDLING LOAD AND/OR STORE OPERATIONS IN A SUPERSCALAR MICROPROCESSOR

Cheryl D. Senter, Sunnyvale, and Johannes Wang, Redwood City, both of Calif., assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 307,042, Sep. 16, 1994, which is a continuation of Ser. No. 954,084, Sep. 29, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 465,238
Int. Cl.[6] G06F 9/38
U.S. Cl. 395—375 24 Claims



1. A computer system, comprising:

(a) a memory system that is configured to store instructions and data;

(b) a processor, connected to said memory system, for executing said instructions, said processor having,

(1) an instruction fetch unit for fetching said instructions from said memory system and for providing a predetermined plurality of said instructions to an instruction window, wherein said instruction window contains a plurality of buckets, each bucket holding four instructions;

(2) an execution unit, coupled to said instruction fetch unit, for executing said instructions from said instruction window in an out-of-order fashion, said execution unit including,

(i) a register file;

(ii) a plurality of fuctional units;

(iii) a first bus, connected to the inputs of said plurality of functional units and further connected to said register file;

(iv) a second bus connected to the outputs of said plurality of functional units and further connected to said register file,

(v) a load store unit adapted to make load request to said memory system out-of-order with respect to all of said instructions in said instruction window and store requests in-order with respect to all of said instructions in said window, said load store unit having,

(A) an address path adapted to manage a plurality of addresses associated with said instructions being executed and to provide addresses to said memory system,

(B) address collision means for detecting and signaling whether address collisions and write pendings exist between each of said instructions being executed, wherein said load store unit performs said load requests if no address collisions and no write pendings are detected,

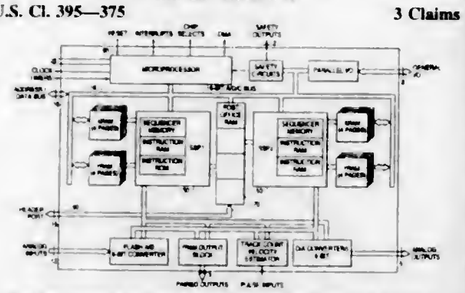
(C) a data path for transfering load and/or store data to and from said memory system and said execution unit, said data path configured to align data returned from said memory system to thereby permit data falling on a word boundary to be returned from said memory system to said execution in correct alignment.

5,557,764

INTERRUPT VECTOR METHOD AND APPARATUS

Brett Stewart, and Ryan Feemster, both of Austin, Tex., assignors to Advanced Micro Devices Inc., Sunnyvale, Calif.

Division of Ser. No. 100,152, Aug. 2, 1993, Pat. No. 5,473,763. This application May 4, 1995, Ser. No. 433,758
Int. Cl.[6] G06F 9/46
U.S. Cl. 395—375 3 Claims



1. An apparatus for co-tasking among a plurality of processors, comprising:

a first processor having means for responding to a first trigger and for executing a first set of routines related to a first task in response to said first trigger;

a mailbox accessible by each of said processors providing unidirectional communication between each of said processors;

a second processor having means for responding to a second trigger and for executing a second set of routines related to a second task in response to said second trigger, said second processor having means to trigger said first processor upon placing results from said second set of routines in said mailbox;

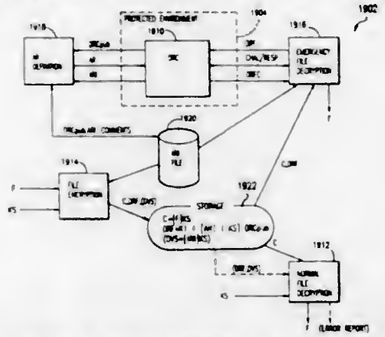
said first processor having means for reading said results from said mailbox and executing a third set of routines related to said second task using said results after completing said first set of routines related to said first task.

5,557,765

SYSTEM AND METHOD FOR DATA RECOVERY

Steven B. Lipner, Oakton, Va.; David M. Balenson, Olney, Md.; Carl M. Ellison, Baltimore, Md., and Stephen T. Walker, Glenwood, Md., assignors to Trusted Information Systems, Inc., Glenwood, Md.

Continuation-in-part of Ser. No. 289,602, Aug. 11, 1994. This application Feb. 21, 1995, Ser. No. 390,959
Int. Cl.[6] H04L 9/08;9/30
U.S. Cl. 380—21 68 Claims



1. A controller for enabling a processor to process a request from an emergency decrypting user to gain access to user secret data in a data recovery field, the data recovery field comprising the user secret data and an access rule index encrypted using a data recovery center public key, wherein emergency decrypting comprises decryption using the data recovery fields, said access rule index allowing the data recovery center to locate an access rule, the access rule defining at least a portion of a procedure for authenticating a party's identity, wherein the access rule includes an authentication test or a compound authorization rule, the controller comprising:

means for enabling said processor to transfer said data recovery field to a data recovery center, wherein said data recovery center decrypts encrypted user secret data and access rule index using a data recovery center private key, and wherein said data recovery center uses said decrypted access rule index to obtain an access rule from a storage device coupled to said data recovery center;

means for enabling said processor to receive from said data recovery center at least one challenge as defined at least partially by said access rule;

means for enabling said processor to communicate to said data recovery center a response to each of said at least one challenge; and

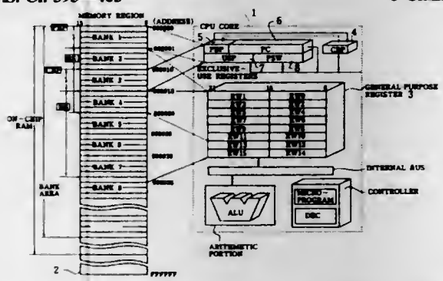
means for enabling said processor to receive from said data recovery center said decrypted user secret data if said at least one challenge was correctly answered as defined at least partially by said access rule.

5,557,766

HIGH-SPEED PROCESSOR FOR HANDLING MULTIPLE INTERRUPTS UTILIZING AN EXCLUSIVE-USE BUS AND CURRENT AND PREVIOUS BANK POINTERS TO SPECIFY A RETURN BANK

Nobuhiro Takiguchi, Ohmiya; Soichi Kawasaki; Yasuo Yamada, both of Tokyo, and Akira Kasuma, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 21, 1992, Ser. No. 964,142
Claims priority, application Japan, Oct. 21, 1991, 3-272750
Int. Cl.[6] G06F 13/24;13/40;9/46
U.S. Cl. 395—405 5 Claims



1. A processor comprising:

a CPU including a plurality of exclusive-use registers, a plurality of general purpose registers, an arithmetic logic unit and a controller for controlling execution of instructions;

a system bus connected to said CPU;

a program memory connected to said system bus for storing a program and for supplying instructions to said CPU through said system bus;

a data memory connected to said system bus for storing data and for exchanging data with said CPU through said system bus during execution of said program;

an exclusive-use bus connected to said CPU and provided separate from said system bus; and

a bank memory providing a plurality of register banks for temporarily saving and restoring the contents of said general purpose registers through said exclusive-use bus,

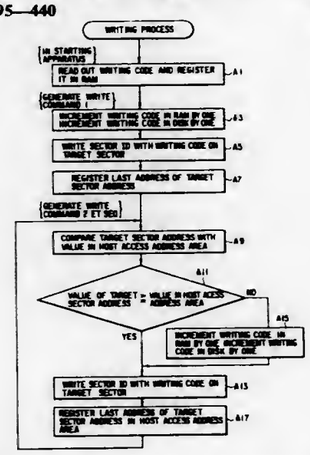
wherein said exclusive-use registers include (a) a current bank pointer register for storing a pointer indicative of current banks of said plurality of register banks for saving the contents of said general purpose registers being used in a current task and (b) a previous bank pointer register for storing a pointer indicative of previous banks of said plurality of register banks for saving the contents of said general purpose registers used in a previous task.

5,557,767

DISK CONTROL SYSTEM USING IDENTIFICATION CODES FOR RETRIEVING RELATED DATA FOR STORAGE IN A READ AHEAD CACHE

Hiroshi Sukegawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 30, 1994, Ser. No. 219,896
Claims priority, application Japan, Mar. 31, 1993, 5-074440
Int. Cl.[6] G06F 13/00
U.S. Cl. 395—440 18 Claims



1. A disk control system connected to a host system, comprising:

memory means used as a secondary memory of said host system;

a read ahead cache for storing a copy of part of sector data stored in said memory means, said read ahead cache being accessible at a higher speed than said memory means;

a first register for storing an identification code;

a second register for storing a sector address;

writing means for, in accordance with a write request with a sector address from said host system, comparing the sector address of the write request with the sector address in said second register, controlling the identification code stored in said first register in accordance with a result of the comparison, and writing data along with the identification code stored in said first register into said memory means after the comparison;

means for, in accordance with a read request with a sector address from said host system, supplying data to said host system when the read request data is stored in said read ahead cache; and

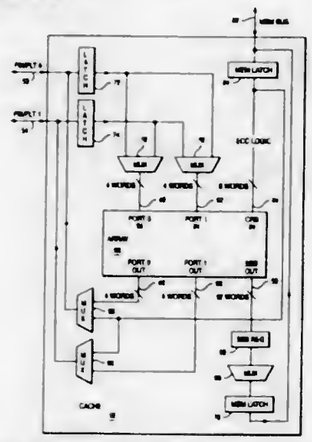
read ahead means for, in accordance with the read request from said host system, reading out the read request data from said memory means to supply the read request data to said host system when the read request data is not stored in said read ahead cache, and reading out additional data having an identification code equal to an identification code stored with the read request data from said memory means in a predetermined direction by changing a sector address from the sector address of the read request data, to store the additional read out data in said read ahead cache, an amount of additional data read out from said memory means corresponding to a predetermined number of sectors.

5,557,768

FUNCTIONAL PIPELINED VIRTUAL MULTIPORT CACHE MEMORY WITH PLURAL ACCESS DURING A SINGLE CYCLE

George M. Braceras, Colchester, Vt., and Lawrence C. Howell, Jr., Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 98,679, Jul. 28, 1993, abandoned.
This application Jul. 27, 1995, Ser. No. 508,212
Int. Cl.[6] G06F *12/08*
U.S. Cl. 395—458 18 Claims



1. A method for operating a cache to interface a memory with a plurality of data processors, said cache providing concurrent operations to said memory and said plurality of processors, said method comprising the steps of:

accessing said cache by a first processor and a second processor during a first portion of a clock cycle wherein said cache is accessed a plurality of times during said first portion of said clock cycle; and

accessing said cache by said memory during a second portion of said clock cycle, wherein said first and second processor and said memory all concurrently access said cache in a single clock cycle.

5,557,769

MECHANISM AND PROTOCOL FOR MAINTAINING CACHE COHERENCY WITHIN AN INTEGRATED PROCESSOR

Joseph A. Bailey, Austin, and Steve L. Belt, Pflugerville, both of Tex., assignors to Advanced Micro Devices, Sunnyvale, Calif.

Filed Jun. 17, 1994, Ser. No. 261,242
Int. Cl.[6] G06F *12/08*
U.S. Cl. 395—473 9 Claims

1. A computer system comprising:

a system bus;

a system memory;

an alternate bus master coupled to said system bus wherein said bus master is configured to execute a memory cycle on said system bus; and

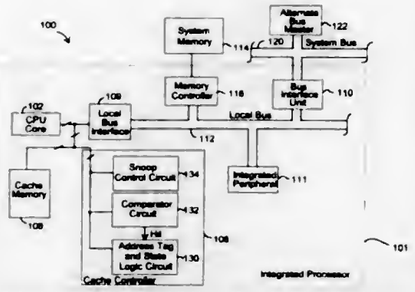
an integrated processor formed on a single semiconductor chip including:

a bus interface unit configured to couple said system bus to a local bus;

a cache memory operatively coupled to said local bus;

a processing unit coupled to said cache memory;

a system memory controller operatively coupled to said local bus and to said system memory and configured to control the storage and retrieval of data within said system memory;



a cache controller operatively coupled to said cache memory and to said local bus configured to control the storage and retrieval of data within said cache memory, wherein said cache controller includes:

a tag logic circuit configured to store a plurality of line addresses indicative of a plurality of lines of data stored within said cache memory and configured to store at least one dirty bit associated with each line;

a comparator circuit coupled to said tag logic circuit configured to determine whether a cache hit has occurred during a designated memory cycle; and

a snoop control circuit coupled to said comparator circuit, wherein said snoop control circuit is configured to inhibit said memory controller during a read cycle which is associated with dirty cached data, wherein said snoop control circuit is configured to cause said dirty cached data to be driven on said local bus in response to said memory cycle; and wherein said snoop control circuit is further configured to latch data to be stored within a corresponding memory location of said cache memory during a write operation of said alternate bus master, and to concurrently latch said data within said memory controller.

5,557,770

DISK STORAGE APPARATUS AND METHOD FOR CONVERTING RANDOM WRITES TO SEQUENTIAL WRITES WHILE RETAINING PHYSICAL CLUSTERING ON DISK

Anupam K. Bhide, Stamford, Conn., and Daniel M. Dias, Mahopac, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 24, 1993, Ser. No. 36,636
Int. Cl.[6] G06F *12/16*
U.S. Cl. 395—488 14 Claims

1. An improved disk system for storing data blocks of digital information for a computer system wherein said disk system provides to said computer system a copy of said data blocks that are requested by said computer system, and said computer system provides to said disk system a modified version of at least some of said data blocks provided by said disk system, said disk system updating stored data blocks corresponding to said modified data blocks provided by said computer system with said provided modified data blocks, comprising:

storage disk means logically partitioned into a data area and a log area, said data area being used for permanent storage of said data blocks, each said data block having a physical home location in said data area;

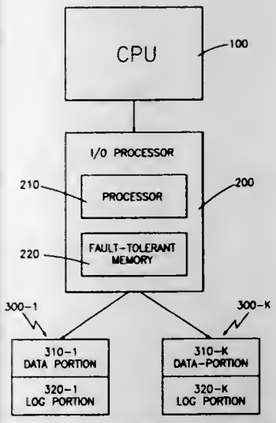
a controller for said storage disk means, said controller having a fault-tolerant memory;

said controller temporarily storing in said fault-tolerant memory said modified data blocks provided by said computer system;

means in said controller for sorting said provided modified data blocks in accordance with said physical home location of said provided modified data blocks to create a sorted run of modified data blocks and for temporarily storing said sorted run in said log area of said storage disk means; and

means in said controller for reading said sorted run temporarily stored in said log area of said storage disk means and for updating said data blocks in said data area of said storage disk means with said sorted run;

whereby said data blocks in said data area are updated by said modified data blocks provided in any order by said computer system in accordance with the physical order of said data blocks in said data area.

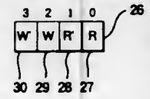


5,557,771

DATA PROCESSING SYSTEM AND STORAGE DEVICE AND AUXILIARY MEMORY BITS FOR CONTROLLING DATA PROTECTION IN THE STORAGE DEVICE

Atsuo Kawaguchi, and Hiroshi Motoda, both of Saitama-ken, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 801,351, Dec. 2, 1991, Pat. No. 5,253,212. This application Mar. 30, 1993, Ser. No. 39,761
Claims priority, application Japan, Dec. 1, 1990, 2-400077; Mar. 30, 1992, 4-073681
Int. Cl.[6] G06F *12/14*
U.S. Cl. 395—490 25 Claims



1. A data processing system comprising a memory unit with auxiliary memory bits and an address decoder for specifying an arbitrary number of data words and an arbitrary number of auxiliary memory bits in said memory unit,

wherein each of said data words is accompanied by a same number of auxiliary memory bits such that when an arbitrary unit in said data processing system is about to perform one of reading and writing a value of a data word in said memory unit, specified by said address decoder, that one of a read and write operation to be performed is interrupted according to the value of one of the auxiliary memory bits, accompanying said data word, corresponding to said operation to be performed, whereupon said arbitrary unit starts a predetermined process, and

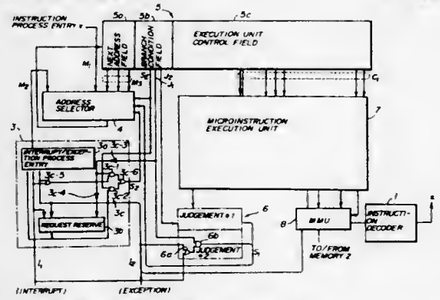
wherein the value of said auxiliary memory bit, corresponding to said operation to be performed, controls selection of a setting for interruption from that including (i) a setting to interrupt the operation being performed prior to completion thereof, and (ii) a setting to interrupt that one of a new read and write operation to be performed before said new operation is started just after a preceding operation is completed.

5,557,772

DATA PROCESSING APPARATUS INCLUDING A REGISTER STORING A PARAMETER AND A MICROINSTRUCTION EXECUTION ARRANGEMENT INCLUDING A CORRECTION ARRANGEMENT FOR CAUSING A FIRST VALUE OF THE PARAMETER TO BE CHANGE TO A SECOND, CORRECT VALUE

Yoshiaki Saka, Chiba, and Toshiharu Ohshima, Kawasaki, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 583,550, Sep. 17, 1990, abandoned.
This application Mar. 29, 1994, Ser. No. 219,753
Claims priority, application Japan, Sep. 19, 1989, 1-242671
Int. Cl.[6] G06F *9/26;9/38*
U.S. Cl. 395—496 19 Claims



1. A data processing apparatus comprising:

memory means for storing microinstructions including a specific microinstruction;

microinstruction executing means, coupled to said memory means, for executing a selected one of said microinstructions by a pipeline process and for outputting an operation result, said executing means including register means for storing a parameter having a first value; and

microinstruction address generating means for generating an address of said specific microinstruction in said memory means when one of the microinstructions executed by said microinstruction executing means indicates that said specific microinstruction should be executed instead of a currently executed microinstruction if a predetermined event occurs: and

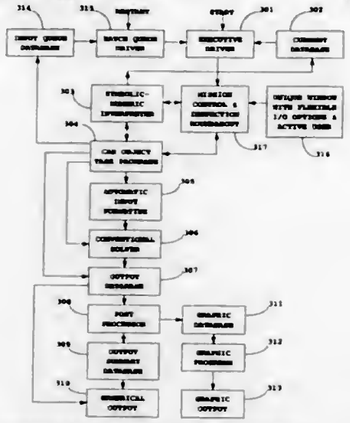
control means for having said microinstruction executing means execute said specific microinstruction read from said memory means in response to the address of the specific microinstruction when said predetermined event occurs so that said first value of said parameter is changed to a second, corrected value which should be replaced by said first value of said parameter used in an immediately previous pipeline process;

wherein said microinstruction executing means executes said currently-executed microinstruction again using said second, corrected value of said parameter after said second, corrected value is obtained by said correction means.

5,557,773
COMPUTATIONAL AUTOMATION FOR GLOBAL OBJECTIVES

Cheh C. Wang, and Esther C. M. Wang, both of 1479 San Marcos Dr., San Jose, Calif. 95132-2262

Continuation-in-part of Ser. No. 714,243, Jun. 12, 1991, abandoned. This application Oct. 19, 1994, Ser. No. 326,655
Int. Cl.[6] G06F *17/18*
U.S. Cl. 395—500 **5 Claims**



1. A computational automation system comprising:

a) an executive driver which is a main program of a computing system that maintains a plurality of files opened to support the mission of computational automation, which allows a very large number of executions of various objective tasks, computational or non-computational, for an entire session until calling for exit by user's menu choice;

b) a symbolic numeric interpreter means that reads in input as character string and decomposes the string into symbols and numeric quantities ready for decoders to process further;

c) a pair of decoding means comprising means for determining the content of the symbolic-numeric input and means for organizing system actions and responses by calling at least one specific objective task subroutine and passing information required by the objective task subroutine to indicated locations;

d) a main menu means for programs of a common class that offers three input options, namely sequential input means using a switching means which comprises means for indicating the end of the sequential input means, computer guided random order symbolic-numeric input means, and free symbolic-numeric input means;

e) a collection of CAE objective task programs stored in the system in the form of building blocks at user's disposal which can be used separately to do one task at time, or combinatively to do one task after another until all are done;

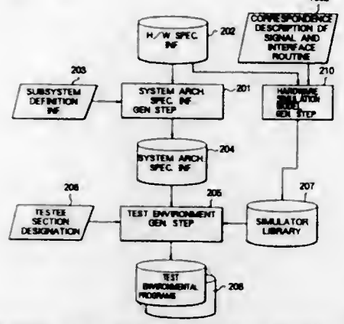
f) means for performing parametric study, also called domain analysis on at least one computational method by performing a plurality of executions of the computational method with input data generated by automation, with ranges, parameters, and goals all under user's control, and sending the output data to a graphical output device wherein for the computational method a determination of parametric/domain's effect caused by algorithm dependent digital computational nature is made and is without uncertainty of possible human errors;

g) means for performing other much simple or more advanced automation in form of added tasks or through users own free experimentation of new communication power and session log file convenience, unlimited new algorithms of automation can be readily generated this way, such that in principle with such tool no one need to duplicate the exactly same manual session twice.

5,557,774
METHOD FOR MAKING TEST ENVIRONMENTAL PROGRAMS

Jun Shimabukuro, Kawasaki; Yuji Nagamatsu, Sagamihara; Yoshimi Ikeuchi, and Kazuyuki Kondo, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Keiyo Engineering Co., Ltd., Chiba-ken, both of Japan

Filed Mar. 17, 1994, Ser. No. 214,688
Claims priority, application Japan, Mar. 22, 1993, 5-061802; Jun. 2, 1993, 5-131842
Int. Cl.[6] G06F *17/60*
U.S. Cl. 395—500 **19 Claims**



1. A method of preparing test environmental programs using a processor including an input device, a display unit and an external storage unit, said method comprising the steps of:

(a) inputting from the external storage unit hardware specification information relating to a system architecture of a system, said system comprising a plurality of subsystems for simulation and supplying a first guidance to said display unit, said first guidance being based on said hardware specification information and being displayed on said display unit for prompting a user to input system table information for generating a specification description of system architecture;

(b) generating the specification description of system architecture for specifying a correspondence between data contained in said hardware specification information based on subsystem definition information designating one of said plurality of said subsystems required for simulation, said subsystem definition information being inputted by the user through the input device;

(c) generating an I/O device program based on interface designation information, said interface designation information representing a correspondence between a signal line and an interface routine for data conversion and said hardware specification information, said interface designation information being input by the user through said input device; and

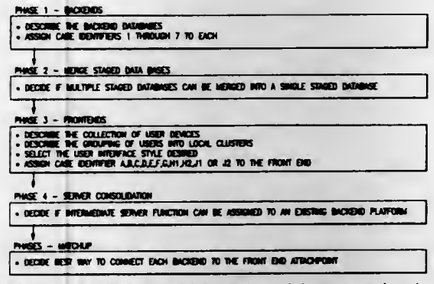
(d) generating a program for test environmental programs by coupling said specification description of system architecture with said I/O device program based on the designation of test software for I/O operation simulation inputted by the user through said input unit in accordance with a second guidance applied to the display unit on the basis of the specification description of system architecture.

5,557,775
EXPERT SYSTEM FOR DESIGNING COMPUTER NETWORKS

John J. Shedletsky, Brewster, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 23, 1994, Ser. No. 200,249
Int. Cl.[6] G06F *9/30;13/10*
U.S. Cl. 395—500 **28 Claims**

1. An expert system for designing a computer network, said system comprising:



means for displaying questions and receiving responsive decisions as to types of back end data bases and whether copies of said back end data bases should be stored in respective fronted data bases;

means for determining if two or more of said fronted data bases can be merged together based on compatibility of their types and notifying an operator of the determination;

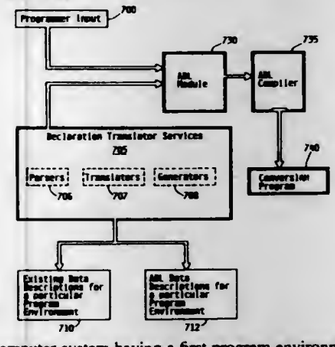
means for receiving a decision from said operator whether said two or more fronted data bases should be merged together, if compatible; and

means for determining a final design of the computer network based in part on the decision whether said two or more fronted databases should be merged together.

5,557,776
APPARATUS WHICH ALLOWS DATA SHARING AMONGST COMPUTER PROGRAM FROM DIFFERENT PROGRAM ENVIRONMENTS

Marsha A. Brown, Manassas, Va.; Richard A. Demers; James A. Diephuis, both of Rochester, Minn.; Lorenzo Falcon, Jr.; Thomas E. Frayne, both of San Jose, Calif.; Sunil S. Gaitonde, Rochester, Minn.; Elaine S. Patry; William A. Remay, both of Warrenton, Va.; Kenneth M. Sissors, Centreville, Va.; Ejuana D. Vasquez, Raleigh, N.C.; David J. Weber, Rochester, Minn., and Koichi Yamaguchi, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 885,086, May 18, 1992, abandoned. This application Aug. 4, 1994, Ser. No. 286,498
Int. Cl.[6] G06F *3/00*
U.S. Cl. 395—500 **3 Claims**



1. A computer system having a first program environment and a second program environment, said system comprising:

a creating mechanism, said creating mechanism comprising means for creating a data description and conversion module, said data description and conversion module comprising first program environment data describing means and second program environment data describing means and means for converting data described by said second program environment data describing means into data described by said first program environment data describing means;

a compiler, said compiler comprising means for compiling said data description and conversion module to create an executable conversion program;

an invoking mechanism, said invoking mechanism comprising means for invoking said executable conversion program, said executable conversion program being invoked by a first program from said first program environment to share data stored by a second program from said second program environment;

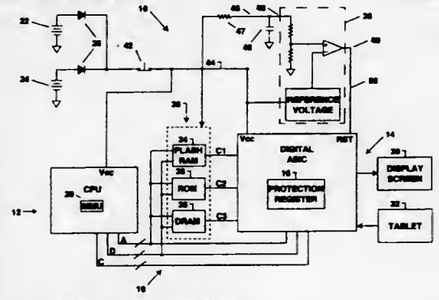
a parsing mechanism for parsing data descriptions from a particular program environment into source ADL (A Data Language) data descriptions; and

a translating mechanism for translating said source ADL data descriptions into target data descriptions, said source data descriptions being ADL data descriptions for a program environment different from said particular program environment.

5,557,777
METHOD AND APPARATUS FOR SYSTEM RECOVERY FROM POWER LOSS

Michael F. Culbert, San Jose, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 30, 1994, Ser. No. 315,951
Int. Cl.[6] G06F *11/34;12/16*
U.S. Cl. 395—500 **37 Claims**



1. A computer system comprising:

a central processing unit (CPU);

a controller including a protection register having a content representing a manner in which said computer system was previously inactivated, said controller being coupled to said CPU for communication therewith; and

activation means operative to read said protection register and to activate said computer system in one of a plurality of ways dependent upon said content of said protection register, wherein each of said plurality of ways includes setting said content of said protection register to reflect that a proper inactivation of said computer system has not been performed, whereby when said computer system inactivates improperly, said protected register will reflect such improper inactivation.

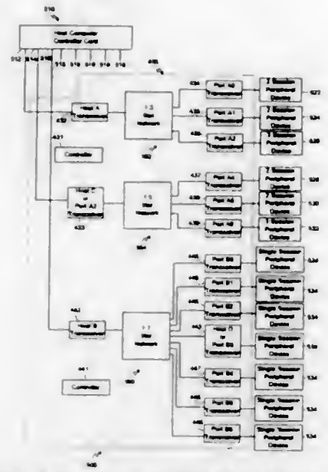
5,557,778
STAR HUB CONNECTION DEVICE FOR AN INFORMATION DISPLAY SYSTEM

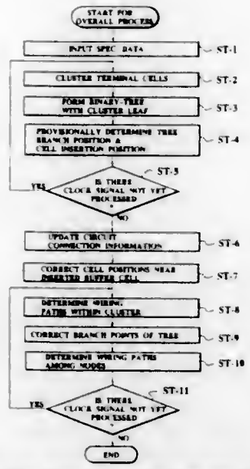
Dennis G. Vaillancourt, South Dartmouth, Mass., assignor to Network Devices, Inc., Pocasset, Mass.

Filed Nov. 7, 1994, Ser. No. 335,034
Int. Cl.[6] H04L *12/403*
U.S. Cl. 395—500 **9 Claims**

1. A star hub connection device for an information display system, comprising:

A. a plurality of ports, wherein each of said ports is a device port, a host port, or a programmable port, each of said programmable ports being selectively operable as a device





port or as a host port, one of said host ports being associated with a first set of ports and a second set of ports, said first set including at least one programmable port, said one programmable port in said first set being associated with a third set of ports;

B. a controller for selectively controlling each of said programmable ports to operate as a host port or as a device port; and

C. programmable coupling means responsive to said controller for selectively configuring said ports as star hub connectors, said programmable coupling means configuring said one host port and said ports in said first set as a first star hub connector when said controller controls said one programmable port in said first set to operate as a device port, and said programmable coupling means configuring said one host port and said ports in said second set as a second star hub connector and configuring said one programmable port in said first set and said ports in said third set as a third star hub connector when said controller controls said one programmable port in said first set to operate as a host port.

5,557,779

METHOD FOR DISTRIBUTING A CLOCK SIGNAL WITHIN A SEMICONDUCTOR INTEGRATED CIRCUIT BY MINIMIZING CLOCK SKEW

Fumihiro Minami, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 896,618, Jun. 10, 1992, Pat. No. 5,410,491. This application Apr. 5, 1995, Ser. No. 417,232

Claims priority, application Japan, Jun. 10, 1991, 3-137851; Nov. 14, 1991, 3-299104

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—500 **15 Claims**

1. A method for distributing a control signal in a wiring-pattern network formed on a semiconductor substrate where said control signal is supplied from a root driver cell via repeating buffer cells to a plurality of terminal cells, the method comprising the steps of:

grouping said plurality of terminal cells into a plurality of clusters containing at least one of said terminal cells;

forming a binary-tree-shaped wiring pattern path where said root driver cell is constituted as a root node and said clusters are constituted as leaf nodes;

inserting said repeating buffer cells as branch nodes into portions of the binary-tree-shaped wiring pattern path at which each of delay times of said control signal propagating therein is minimized and dividing the binary-tree-shaped wiring pattern path into multi-stage hierarchical sub-trees;

calculating delay times of said control signal propagating from each of said branch nodes to each of said leaf nodes, said calculating step being successively repeated from the lowermost ones of said branch nodes to the uppermost one of said branch nodes;

setting physical positions of said branch nodes on the semiconductor substrate where a difference among said delay times becomes minimum;

updating previous entire information about a circuit connection when said repeating buffer cells are inserted;

separating said repeating buffer cells from other cells being overlapped with said repeating buffer cells on said binary-tree-shaped wiring pattern path;

correcting arrangement information about positions of all the cells on the semiconductor substrate so as not to have any of the cells being overlapped; and

determining a final wiring-pattern path among each of said branch nodes.

5,557,780

ELECTRONIC DATA INTERCHANGE SYSTEM FOR MANAGING NON-STANDARD DATA

Allan T. Edwards, Weiser; Rebecca K. Shirrod, Boise, and Robin L. Callahan, Middleton, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 245,887, May 18, 1994, which is a continuation of Ser. No. 876,755, Apr. 30, 1992, abandoned. This application Apr. 20, 1995, Ser. No. 426,469

Int. Cl.[6] G06F *17/28*

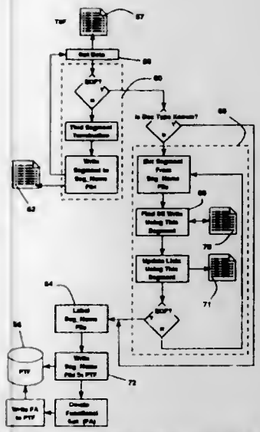
U.S. Cl. 395—500 **15 Claims**

1. A combination software and hardware system, for managing electronic data interchange (EDI) between a sending trading partner and a receiving trading partner, the system comprising:

a) receiving means for receiving data from said sending trading partner, said received data containing, selectively, standard EDI structured data and non-standard EDI data, and said non-standard EDI data having a structure substantially similar to a standard EDI data structure, and said non-standard EDI data or an identifier associated with said non-standard EDI data being corrupted before being received by the receiving means;

b) compare means, coupled to said receiving means, for comparing said structure of said non-standard EDI data received to a library of standard EDI data structures, and identifying a standard EDI data structure in said library most similar to said structure of said received data; and

c) data file creating means, coupled with said compare means, for creating from said received data without interactive intervention a data file having a structure definition the same as said standard EDI data structure in said library compared to be most similar to said structure of said received data.



5,557,781

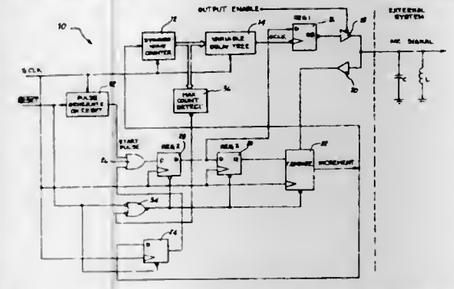
COMBINATION ASYNCHRONOUS CACHE SYSTEM AND AUTOMATIC CLOCK TUNING DEVICE AND METHOD THEREFOR

Mitchell A. Stones, Phoenix, and Nicholas J. Richardson, Tempe, both of Ariz., assignors to VLSI Technology Inc., San Jose, Calif.

Filed Jul. 15, 1993, Ser. No. 92,151

Int. Cl.[6] G06F *1/04*

U.S. Cl. 395—550 **20 Claims**



1. A combination asynchronous cache system and automatic clock tuning device, comprising, in combination:

an asynchronous cache system; and

an automatic clock tuning device coupled to said asynchronous cache system and comprising, in combination:

counter means for counting the number of occurrences that an INCREMENT signal input is sampled in a desired state and for producing an output count signal corresponding to said number of occurrences;

variable delay means coupled to means for providing a System Clock signal (SCLK) and to a portion of said counter means which produces said output count signal for producing a Delayed Clock (DCLK) signal, said SCLK signal being delayed by said variable delay means by an amount proportional to said output count signal to produce said DCLK signal;

output means coupled to a portion of said variable delay means which produces said DCLK signal for delivering a Write Enable (WE) signal to said asynchronous cache system;

comparing means coupled to a portion of said output means which delivers said WE signal and to said means for providing said SCLK signal for outputting said INCREMENT signal when said comparing means samples an occurrence of a rising edge of said WE signal prior to an occurrence of a rising edge of said SCLK signal;

feedback Flip-Flop means having a data input junction coupled to a portion of said comparing means which outputs said INCREMENT signal for providing an output signal;

an OR-Gate having an input junction coupled to a portion of said feedback Flip-Flop means which provides said output signal;

first D-type Flip-Flop means having a data input junction coupled to an output of said OR-Gate and having an output coupled to said output means for providing data input to said output means;

second D-type Flip-Flop means having a data input junction coupled to said output of said first D-type Flip-Flop means for providing said SCLK signal to said comparing means;

pulse generator means coupled to a means for providing a RESET signal input and said means for providing said SCLK signal input for generating an initial START PULSE signal output coupled to an input junction of said OR-Gate;

NOR-Gate means having an active low input junction coupled to said means for providing said RESET signal and an output coupled to said first D-type Flip-Flop means, said second D-type Flip-Flop means, and said comparing means for clearing data content of each of said first D-type Flip-Flop means, said second D-type Flip-Flop means, and said comparing means; and

maximum count detection means coupled to said counter means and to a second active low input junction of said NOR-Gate means for clearing data content of each of said first D-type Flip-Flop means, said second D-type Flip-Flop means, and said comparing means in response to said maximum count detection means reaching a maximum count condition and sending a signal to said second active low input junction of said NOR-Gate to clear said data content of said first D-type Flip-Flop means, said second D-type Flip-Flop means, and said comparing means

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5,557,782

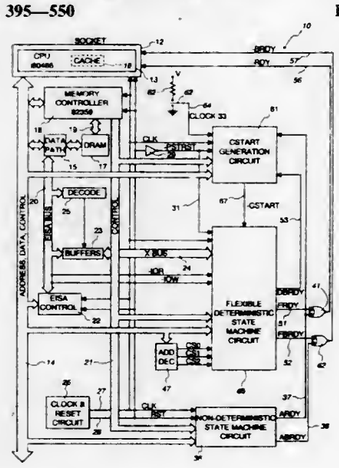
FLEXIBLE DETERMINISTIC STATE MACHINE

Todd R. Witkowski, Bainbridge Township; Vincent J. Messina, Pittsfield Township, both of Mich.; Richard D. Ball, Austin, Tex., and John T. Filion, Lawrenceville, Ga., assignors to Zenith Data Systems Corporation, Buffalo Grove, Ill.

Filed Jul. 12, 1994, Ser. No. 273,763

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—550 **12 Claims**



1. A computer system, comprising: a memory; a processor

a re-synchronizer which re-synchronizes the first access grant

5,557,785

1. A computer system, comprising: a memory; a processor coupled to said memory, said processor including access control means for effecting an access to said memory and for delaying completion of said access to said memory in the absence of and until an occurrence of a control signal; and a deterministic circuit coupled to said processor and said memory and having register means containing control information loaded by said processor, said deterministic circuit having signal generation means for generating said control signal, said signal generation means including delay means for selectively delaying generation of said control signal during an access to said memory by a time interval having a duration which is function of the control information in said register means.

5,557,783

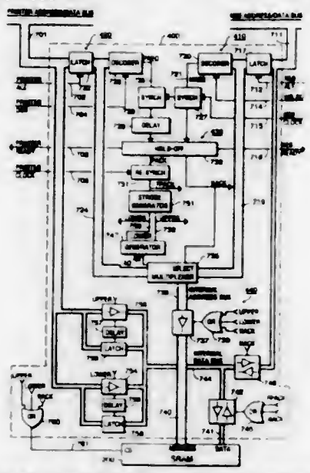
ARBITRATION DEVICE FOR ARBITRATING ACCESS REQUESTS FROM FIRST AND SECOND PROCESSORS HAVING DIFFERENT FIRST AND SECOND CLOCKS

Osman O. Oktay, Irvine; Edward A. Summit, Trabuco Canyon, and Gregory F. Beck, Laguna Hills, all of Calif., assignors to Canon Information Systems, Inc., Costa Mesa, Calif.

Filed Nov. 4, 1994, Ser. No. 336,056

Int. Cl.[6] G06F *1/12;13/16*

U.S. Cl. 395—550 **5 Claims**



1. An arbitration device for shared RAM, the arbitration device arbitrating between first and second access requests from first and second processors having respectively different first and second clocks, said arbitration device comprising:

a synchronizer which synchronizes the first access request to the second clock so as to obtain first and second clock-synchronized access requests;

a delay which delays one of the clock-synchronized requests by a fractional part of the second clock so as to obtain first and second time-offset access requests;

a hold off circuit which outputs first and second access grant signals, exactly one of the first and second access grant signals being activated in correspondence to which of the first and second time-offset access requests is first to arrive at said hold off circuit, wherein the first access grant signal is activated in a case where the first time-offset access request arrives before the second time-offset access request and the second time-offset access request is held off until processing of the first time-offset access request is complete, and wherein the second access grant signal is activated in a case where the second time-offset access request arrives before the first time-offset access request and the first time-offset access request is held off until processing of the second time-offset access request is complete;

a re-synchronizer which re-synchronizes the first access grant signal to the first clock; and

a shared RAM interface, responsive to the first and second access grant signals, so as to give the first processor access to shared RAM in a case where the first access grant signal is output by said hold off circuit, and so as to give the second processor access to the shared RAM in a case where the second access grant signal is output by said hold off circuit.

5,557,784

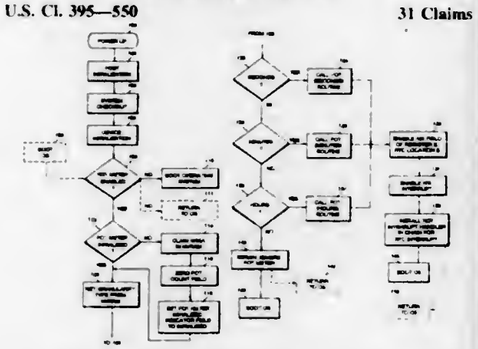
POWER ON TIMER FOR A PERSONAL COMPUTER SYSTEM

Richard A. Dayan, Boca Raton, Fla.; Chris Dombrowski, Apex, N.C., and James F. Mascaro, Lexington, S.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 30, 1995, Ser. No. 413,313

Int. Cl.[6] G06F *1/14,1/34*

U.S. Cl. 395—550 **31 Claims**



1. A personal computer system having a power on timer for recording an amount of time that said system is powered on, said system comprising:

a high speed microprocessor coupled to a high speed data bus;

a first non-volatile memory electrically coupled to a slower speed data bus for storing a pre-selected time unit and a power-on-time (POT) count of pre-selected time units that the system has been powered on;

a bus controller coupled to said high speed data bus and said slower speed data bus for providing communications between the high speed data bus and the slower speed data bus;

a non-volatile real time clock (RTC) coupled to said slower speed data bus having an alarm feature;

means coupled to said slower speed data bus for performing a power-on-time routine at a power on of said system, said power-on-time routine characterized by its ability to set an alarm field of said RTC to be activated after the pre-selected time unit has elapsed and install a POT interrupt handler routine in a chain for RTC interrupts for incrementing the POT count at each passage of said pre-selected time unit while the system is powered on to obtain a POT count of said pre-selected time units that the system has been powered on.

5,557,785

OBJECT ORIENTED MULTIMEDIA INFORMATION SYSTEM USING INFORMATION AND MULTIPLE CLASSES TO MANAGE DATA HAVING VARIOUS STRUCTURE AND DEDICATED DATA MANAGERS

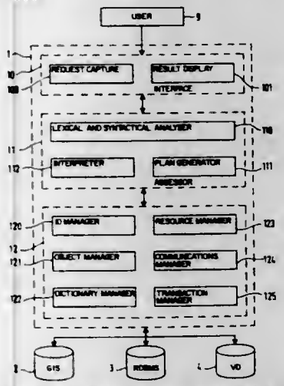
Hubert Lacquit, Maisons Alfort, and Christophe Damier, Savigny sur Orge, both of France, assignors to Alcatel Alsthom Compagnie Generale d'Electricite, Paris Cedex, France

Filed Dec. 2, 1993, Ser. No. 160,203

Claims priority, application France, Dec. 3, 1992, 92 14584

Int. Cl.[6] G06F *15/40*

U.S. Cl. 395—600 **2 Claims**



1. A multimedia information system for managing heterogenous data having various structures and stored in different dedicated data managers, comprising:

processing means programmed to manipulate said heterogenous data as logical objects of an object-oriented data model wherein said object-oriented data model comprises,

a first class (21) describing methods and attribute common to all said logical objects manipulated within said processing means, and

a second class (23) describing first methods for performing transaction operations between said processing means and said data managers and second methods for performing retrieval manipulation and saving operations from said processing means within said data managers,

said first class further describing an attribute which references at least one instance of said second class so as to define a logical link between each logical object within said processing means and one of said data managers.

5,557,786

THREADED, HEIGHT-BALANCED BINARY TREE DATA STRUCTURE

Harold E. Johnson, Jr., Newtown, Pa., assignor to Advanced Computer Applications, Inc., Newtown, Pa.

Filed Jan. 24, 1994, Ser. No. 185,436

Int. Cl.[6] G06F *7/00*

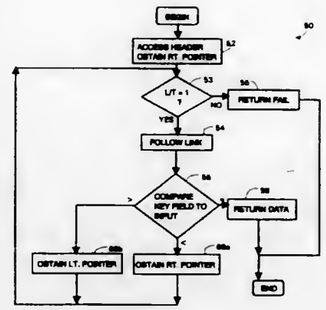
U.S. Cl. 395—600 **15 Claims**

1. A computer implemented method for adding an entry to a balanced binary tree organizational system for storing numeric and alphanumeric data within a memory of a computing machine, comprising computer implemented steps of:

(a) determining whether said entry includes one of an alphanumeric key or a numeric key;

(b) retrieving pointers from the memory of the computing machine to find an insertion location along a search path in a balanced binary tree at which to add the entry and recording a potential rebalancing point in a manner that is dependent upon whether said entry is determined to include an alphanumeric key or a numeric key; and

(c) replacing at least one of said pointers within the memory of the computing machine with a new pointer to the entry.



5,557,787

TABLE GENERATING APPARATUS EMPLOYING HEADING, LAYOUT, AND TABLE SCRIPT DATA

Kil-Ho Shin, and Akira Suzuki, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1994, Ser. No. 197,709

Claims priority, application Japan, Feb. 18, 1993, 5-052936; Feb. 18, 1993, 5-052937

Int. Cl.[6] G06E *17/30*

U.S. Cl. 395—600 **6 Claims**

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(A) DEFINITION OF HEADING ITEM GROUPS
      <ENERGY RESOURCE> = ('GAS' 'COAL' 'OIL' 'ELECTRIC
POWER')
      <FOSSIL FUEL> = ('OIL' 'COAL')
      <CONSUMPTION PLACE> = ('CONSUMPTION IN HOUSEHOLDS'
'CONSUMPTION IN INDUSTRY' 'CONSUMPTION IN AGRICULTURE')
      <YEAR> = ('1982' '1983')

(B) ATTRIBUTE OF GROUP
      <ENERGY RESOURCE>:1:<ORDER IN EXPRESSION>:= (2, 4, 1, 3)

(C) RELATIONSHIP AMONG GROUPS
      ORTHOGONAL RELATION (<ENERGY RESOURCE>, <CONSUMPTION
PLACE>, <YEAR>)
      <ENERGY RESOURCE> = <FOSSIL FUEL>

(D) CORRESPONDENCE BETWEEN HEADING ITEM STRINGS AND TABLE DATA
      'CONSUMPTION IN HOUSEHOLDS' 'OIL' '1982' - '143840'
      'CONSUMPTION IN HOUSEHOLDS' 'GAS' '1982' - '4620'
      'CONSUMPTION IN HOUSEHOLDS' 'ELECTRIC POWER' '1982' -
'35900'
      'CONSUMPTION IN HOUSEHOLDS' 'COAL' '1983' - '3710'
      'CONSUMPTION IN HOUSEHOLDS' 'OIL' '1983' - '158520'
      'CONSUMPTION IN HOUSEHOLDS' 'GAS' '1983' - '17600'
      'CONSUMPTION IN HOUSEHOLDS' 'ELECTRIC POWER' '1983' -
'37630'
      'CONSUMPTION IN INDUSTRY' 'COAL' '1982' - '34513'
      'CONSUMPTION IN INDUSTRY' 'OIL' '1982' - '44760'
      'CONSUMPTION IN INDUSTRY' 'GAS' '1982' - '2876'
      'CONSUMPTION IN INDUSTRY' 'ELECTRIC POWER' '1982' -
'56745'
      'CONSUMPTION IN INDUSTRY' 'COAL' '1983' - '3860'
      'CONSUMPTION IN INDUSTRY' 'OIL' '1983' - '46788'
      'CONSUMPTION IN INDUSTRY' 'GAS' '1983' - '3454'
      'CONSUMPTION IN INDUSTRY' 'ELECTRIC POWER' '1983' -
'34581'
      'CONSUMPTION IN AGRICULTURE' 'COAL' '1982' - '23445'
      'CONSUMPTION IN AGRICULTURE' 'OIL' '1982' - '3652'
      'CONSUMPTION IN AGRICULTURE' 'GAS' '1982' - '3653'
      'CONSUMPTION IN AGRICULTURE' 'ELECTRIC POWER' '1982' -
'23430'
      'CONSUMPTION IN AGRICULTURE' 'COAL' '1983' - '5460'
      'CONSUMPTION IN AGRICULTURE' 'OIL' '1983' - '4454'
      'CONSUMPTION IN AGRICULTURE' 'GAS' '1983' - '434546'
      'CONSUMPTION IN AGRICULTURE' 'ELECTRIC POWER' '1983' -
'45660'
      'CONSUMPTION IN AGRICULTURE' 'COAL' '1983' - '5560'
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1. A table generating apparatus comprising:

logical structure retaining means for retaining a correspondence between heading information which is a set of headings of a table and table data representing a content of the table;

table form retaining means for retaining parameters which determine a layout form of the table, including a heading parameter which specifies a set of headings to be laid out in the table;

table generating means for generating a layout of the table comprising:

heading structure determining means for determining a structure of headings of the table by judging whether any subset of the set of headings specified by the heading parameter corresponds to the table data in accordance with the correspondence retained by said logical structure retaining means and the heading parameter retained by said table form retaining means;

heading layout means for generating a layout of the beadings specified by the heading parameter in accordance with the structure of headings and the parameters retained by said table form retaining means, and

table data allocating means for allocating the table data in accordance with the correspondence retained by the logical

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5,557,790

an inner table and an outer table, each of which tables is composed

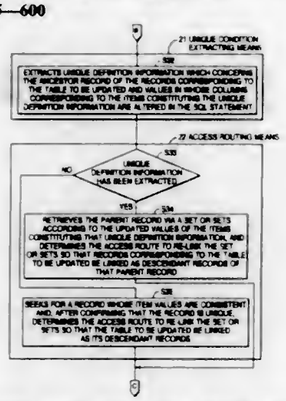
structure retaining means, the parameters retained by said table form retaining means, and the layout of the headings.

5,557,788

RELATIONAL ACCESS SYSTEM FOR NETWORK TYPE DATA BASES WHICH USES A UNIQUE DECLARATIVE STATEMENT

Hiroyumi Inoue, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 28, 1994, Ser. No. 218,631
Claims priority, application Japan, Mar. 27, 1993, 5-092414
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—600 **8 Claims**



5. A relational access method for a network type data base, comprising the steps of:

a) inputting a schema or subschema for the network type data base, said schema or said subschema including record definitions of each record stored in the network type data base, set definitions representing relationships among said each record and ancestor records of said each record, and definitions of key items used to directly access said each record in the network type data base;

b) creating a table definition for said each record by setting each item in the corresponding record definition of said each record as a basic column, supplying matching correspondence information to create an entry for a correspondence table, and obtaining parent record definitions by tracing sets of the corresponding record definition for each ancestor record of said each record;

c) if any of the parent record definitions are obtained in the step b), determining if said any of the parent record definitions contain unique key items;

d) if said any of the parent record definitions contain unique key items, including each unique key item as additional columns to the corresponding record definition of said each record;

e) inputting a unique declarative statement, said unique declarative statement indicating which one of said each record is to be used as an object record of unique declaration;

f) storing contents of said unique declarative statement as unique definition information, said unique definition information being used to uniquely identify said each record; and

g) adding additional columns to the corresponding record definition of said each record based on said unique definition information which is not already included in the corresponding record definition,

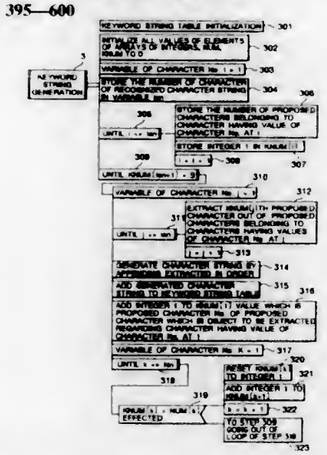
wherein a structured query language (SQL) statement designed for accessing a relational type data base can be used to access said network type data base by using the relational access method.

5,557,789

TEXT RETRIEVAL METHOD AND APPARATUS BASED ON A HANDWRITTEN KEYWORD

Hisao Mase, Hirakata; Yasuharu Namba, Yao; Sachiko Koyama, Okazaki; Tadahiro Kiyama, Ichikawa, and Hiroshi Tsuji, Itami, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 9, 1994, Ser. No. 257,208
Claims priority, application Japan, Jun. 23, 1993, 5-176222
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—600 **8 Claims**



1. A text retrieval method using a text database holding at least one text, character recognizing means for recognizing a handwritten character string, a processing unit and output means for outputting a retrieved result, the method comprising the steps of:

(a) extracting at least one proposed recognized character for each character by a method of extracting a predetermined proposed recognized character from recognized characters of respective characters of a keyword recognized by said character recognizing means;

(b) generating at least one character string by combining proposed recognized characters of said respective characters;

(c) generating a retrieval command for retrieving a text including at least said one character string among said generated character strings out of said text database;

(d) executing said retrieval command;

(e) detecting the number of cases among the texts in said text database in which each of said character strings generated from said proposed recognized characters is included;

(f) holding said number of cases for each of said character strings;

(g) when respective characters forming said character string included in the most texts are different from the first proposed characters of the corresponding characters recognized by said means of recognizing characters, presenting to an end user to that effect through said output means;

(h) presenting to the end user whether the first proposed characters of the characters recognized by said means of recognizing characters are to be corrected to the characters forming said character string or not; and

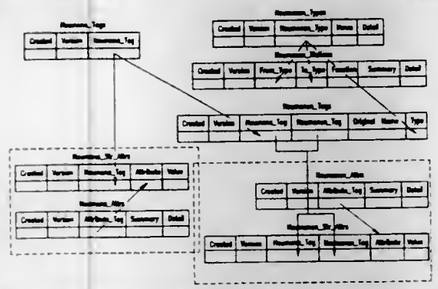
(i) correcting said recognized character string to said character string based on a direction of correction from the end riser.

5,557,790

FACILITY FOR THE GENERIC STORAGE AND MANAGEMENT OF MULTIMEDIA OBJECTS

Ronald E. Bingham, Capitola; Michael J. Dockter, Hollister; Joel F. Farber, San Jose, all of Calif., and Kevin D. Seppi, Austin, Tex., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Jun. 21, 1994, Ser. No. 263,146
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—600 **24 Claims**



1. A computer server for the efficient storage and management of a plurality of heterogeneous formatted data objects comprising:

receiving means for receiving at least a first formatted data object;

a first transforming means for transforming said received data object into a generic format;

storage means for storing said generic format data object into computer storage;

globally unique identifier means for uniquely identifying said transformed data object;

descriptor means for storing a description relating said generic format with said originally received data object;

retrieving means for retrieving said generic format of said data object based on a user request of said first formatted data object based on said unique identifier, and

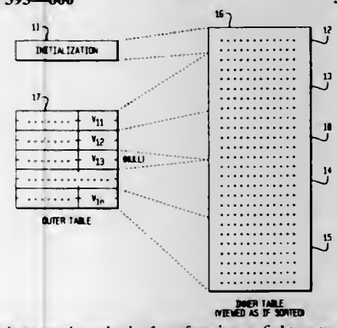
a second transforming means to transform said retrieved generic formatted data object into said requested first format.

5,557,791

OUTER JOIN OPERATIONS USING RESPONSIBILITY REGIONS ASSIGNED TO INNER TABLES IN A RELATIONAL DATABASE

Josephine M. Cheng; Chandrasekaran Mohan, and Mir Hamid Pirahesh, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 749,088, Aug. 23, 1991, abandoned. This application Oct. 19, 1994, Ser. No. 325,942
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—600 **30 Claims**



1. An improved method of performing a fight outer join with specified join predicates in a computerized database system having an inner table and an outer table, each of which tables is composed of a plurality of tuples having multiple columns, the outer table being ordered or indexed in a sorted sequence on a selected set of columns, the improvement comprising the steps of:

(a) determining a plurality of responsibility regions in the inner table using a selected set of columns such that every tuple in the inner table belongs to one and only one responsibility region; and

(b) processing each responsibility region by outputting all tuples of the inner table which belong to the responsibility region, wherein

if an inner tuple and an outer tuple match by satisfying all the specified join predicates, outputting the outer tuple with the inner tuple, and

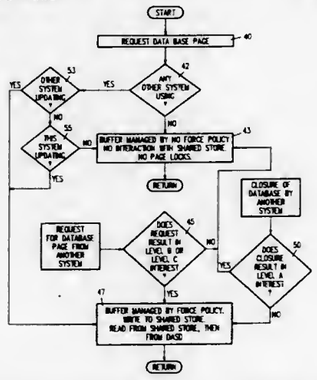
if the inner and outer tuples do not match, outputting null values for the outer tuple with the inner tuple.

5,557,792

EFFICIENT DATA BASE ACCESS USING A SHARED ELECTRONIC STORE IN A MULTI-SYSTEM ENVIROMENT WITH SHARED DISKS

Jeffrey W. Josten, Morgan Hill; Tina L. Masatani; Chandrasekaran Mohan, both of San Jose; Inderpal S. Narang, Saratoga, and James Z. Teng, San Jose, all of Calif., assignors to Intrnational Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 869,267, Apr. 15, 1992, Pat. No. 5,408,653. This application Jan. 3, 1995, Ser. No. 367,631
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—600 **11 Claims**



1. A database management apparatus for maintaining coherency of a database with respect to a plurality of database management systems (DBMS's) of a database system that includes direct access storage connected to the DBMSs for storage of one or more databases and a shared store connected to the DBMS's to temporarily store data for rapid access by the plurality of DBMS's, wherein said. DBMS's provide data from one or more databases to transactions for database processing, said database management apparatus comprising:

database management means for providing access to one or more databases;

first means in the database management means responsive to a

a. reserving a versioned object;

retrieval means for retrieving data on the basis of one or more

5,557,796

first means in the database management means responsive to a request by a first transaction to a first (DBMS for data from a designated database, the request being in the absence of any other transaction requests to any other DBMS for updating the designated database, the first means for: obtaining the data at the first DBMS from the direct access storage without checking for the data in the shared store:

executing the first transaction by conducting a transaction operation on the data at the first (DBMS; and

committing the first transaction: and,

second means in the database management means responsive to a request by a second transaction to the first (DBMS, the request by the second transaction following commitment of the first transaction and being made for data from the designated database, the request being substantially concurrent with a request by a third transaction to a second DBMS for updating the designated database, the second means for:

obtaining the data from the shared store, at the first DBMS, if the data requested by the second transaction is in the shared store, otherwise obtaining the data from the direct access storage.

5,557,793

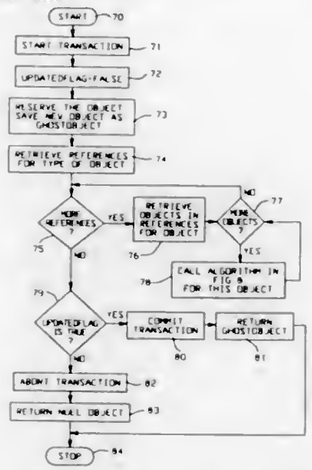
IN AN OBJECT ORIENTED REPOSITORY, A METHOD FOR TREATING A GROUP OF OBJECTS AS A SINGLE OBJECT DURING EXECUTION OF AN OPERATION

Paul D. Koerber, Mission Viejo, Calif., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Jan. 31, 1995, Ser. No. 381,574

Int. Cl.° G06F *13/00*

U.S. Cl. 395—600 **4 Claims**



3. In a computer system having a user interface, a memory and a database, a repository program operation in said computer system for accessing said database, said repository program executing a method for creating a changeable hierarchy of objects comprising the steps of:

a. reserving a versioned object;

b. retrieving a collection of objects that form a path between said version object and a top object in said hierarchy comprising the steps of:

1) comparing said versioned object against said top object and returning true if both objects are the same;

2) setting a boolean flag, returnValue, to false;

3) retrieving a collection of references for type of said object;

4) examining each reference in said collection of references retrieved in the preceding step hereof and selecting those references whose inverse is a composite reference;

5) retrieving objects found in each of said references selected in the preceding step hereof;

6) performing steps of this method for each object retrieved in step 5) hereof;

7) adding said object to a collection of objects in true was returned in step 6) hereof;

8) setting returnFlag to true if true was returned in step 6) hereof;

9) returning returnFlag and collection of objects.

5,557,794

DATA MANAGEMENT SYSTEM FOR A PERSONAL DATA BASE

Yoshifumi Matsunaga; Tadanobu Miyauchi, and Juhei Nakagaki, all of Yokohama, Japan, assignors to Fuji Xerox Co., Ltd., Japan

Continuation of Ser. No. 939,085, Sep. 2, 1992, abandoned. This application Apr. 9, 1995, Ser. No. 425,352

Claims priority, application Japan, Sep. 2, 1991, 3-221850; Sep. 6, 1991, 3-227417

Int. Cl.° G06F *17/30*

U.S. Cl. 395—600 **13 Claims**

1. A data management system comprising:

memory means for storing a plurality of data, each of said data comprising a set of three composing elements of a data body comprising a list of unique records whose data content is not so described that the system is able to handle by hierarchically and logically differentiating it, said composing elements including a data name, data body and keywords, said data name associated with the data body and one or more keywords for retrieval of the data body;

input means for inputting a keyword for retrieval of desired data from the plurality of data stored in the memory means;

retrieval means for retrieving data on the basis of one or more keywords stored in the memory means; and

display means for displaying a retrieval result of the retrieval means.

5,557,795

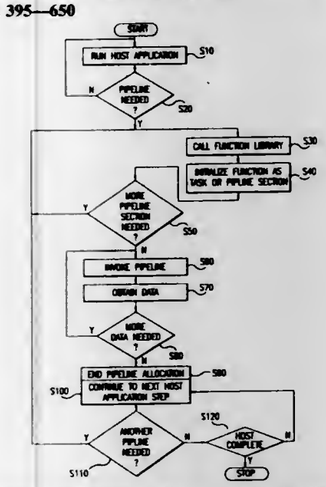
PIPELINED IMAGE PROCESSING SYSTEM FOR A SINGLE APPLICATION ENVIRONMENT

Dennis L. Venable, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 15, 1993, Ser. No. 76,678

Int. Cl.° G06F *9/455*

U.S. Cl. 395—650 **35 Claims**



3. A method for pipelined data processing of a data item in a single tasking environment, the data item comprising a header and at least one data set, the method comprising the steps of:

(a) storing a plurality of data processing functions in a library memory;

(b) storing a host application in a first block of RAM memory;

(c) operating a processor in response to the host application;

(d) instantiating one of the plurality of data processing functions as a task;

(e) storing the instantiated task in at least one additional block of RAM memory, the task comprising:

a first data buffer as a header channel,

at least one second data buffer, each second data buffer being a data processing channel,

at least one third data buffer storing at least one procedure pointer as a link; and

a fourth data buffer storing a current state of the task;

(f) repeating steps (d) and (e) at least one additional time to form a data processing pipeline comprising a plurality of linked tasks, the plurality of linked tasks including an upstream-most task, at least one intermediate task, and a downstream-most task; and

(g) obtaining a processed data item from the pipeline by operating the processor in response to the pipeline and the host application so that the data processing tasks process the at least one data set of the data item based on the header of the data item.

5,557,796

EXTENSIBLE ENTITY MANAGEMENT SYSTEM INCLUDING A DISPATCHING KERNEL AND MODULES WHICH INDEPENDENTLY INTERPRET AND EXECUTE COMMANDS

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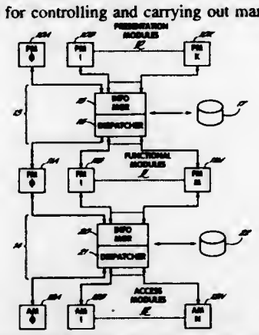
Division of Ser. No. 402,391, Sep. 7, 1989, which is a continuation-in-part of Ser. No. 244,114, Sep. 13, 1988, abandoned, Ser. No. 244,495, Sep. 13, 1988, abandoned, Ser. No. 244,503, Sep. 13, 1988, abandoned, Ser. No. 244,506, Sep. 13, 1988, abandoned, Ser. No. 244,691, Sep. 13, 1988, abandoned, Ser. No. 244,730, Sep. 13, 1988, abandoned, Ser. No. 244,742, Sep. 13, 1988, abandoned, Ser. No. 244,834, Sep. 13, 1988, abandoned, Ser. No. 244,845, Sep. 13, 1988, abandoned, Ser. No. 244,850, Sep. 13, 1988, abandoned, Ser. No. 244,851, Sep. 13, 1988, abandoned, and Ser. No. 244,919, Sep. 13, 1988, abandoned. This application Jan. 21, 1994, Ser. No. 185,186

Int. Cl.° G06F *13/14*

U.S. Cl. 395—650 **49 Claims**

1. A system for controlling and carrying out management functions over an assemblage of entities, said system comprising:



stored management modules interfacing with said entities as part of carrying out said management functions by independently interpreting and executing selected management-related commands, including a first module capable of carrying out a function on a first entity and a second entity, and a second module capable of carrying out a function on said second entity,

a kernel comprising a table of dispatch pointers and a dispatcher, said kernel receiving a command listing at least an entity to be managed, and, based at least on the entity listed by said command, said dispatcher selecting a dispatch pointer and directing said command to a module identified by said selected dispatch pointer, so that said command may be interpreted and executed by said module, said table associating said first and second entities with a first pointer in said table identifying said first module, and

an enroller for enrolling new management modules into said

maximum number of the movable operators executed concur-

application which can supply data on a subject desired by said

5,557,800

an enroller for enrolling new management modules into said system by adding further pointers to said table, said enroller, upon a user command requesting enrollment of said second module, modifying said table to associate said second entity with a second pointer in said table identifying said second module, in a manner such that said dispatcher will direct a command listing said second entity to said second module,

whereby said enroller updates said table in a manner allowing functions of said system to be extended through the addition of new modules.

5,557,797

SCHEDULING METHOD FOR AUTOMATICALLY DEVELOPING HARDWARE PATTERNS FOR INTEGRATED CIRCUITS

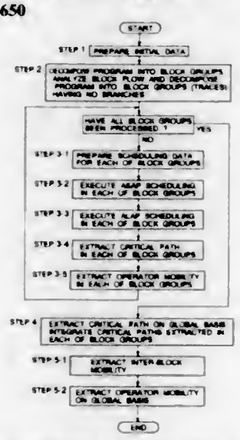
Takanori Yano, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 201,615, Feb. 24, 1994. This application Dec. 12, 1995, Ser. No. 571,277

Claims priority, application Japan, Feb. 25, 1993, 5-061062

Int. Cl.[6] G06F *9/44*

U.S. Cl. 395—650 **6 Claims**



1. A method for obtaining a hardware pattern of a microprocessor based upon a program that is processed by said microprocessor, said microprocessor including a plurality of arithmetic units and a control unit that controls said plurality of arithmetics units independently, said method comprising the steps of:

extracting a plurality of traces from a given program having at least one branching step, each of said plurality of traces being defined at least in part by a plurality of program blocks configured for sequential execution, each of said plurality of program blocks having at least one operator to be executed by said arithmetic units during a control operation having processing steps, and arranged such that, at least one of said plurality of program blocks is separated from another of said plurality of program blocks in an associated trace by the at least one branching step for causing a branching of the control operation to or from a program block associated with another of said plurality of traces;

extracting a critical path represented by the operators in each of said plurality of traces, said critical path being defined by a plurality of reference operators from said one or more operators, the rest of the one or more operators defining movable operators executable concurrently with one or more of the plurality of reference operators during the control operation;

scheduling the processing steps of the movable operators in each of said plurality of traces based upon the at least one branching step, such that upon executing the control operation, the maximum number of the movable operators executed concurrently with a reference operator in a given trace is minimized; and

copying a movable operator in one of said plurality of blocks included in said associated trace to one of a plurality of program blocks included in said another trace.

5,557,798

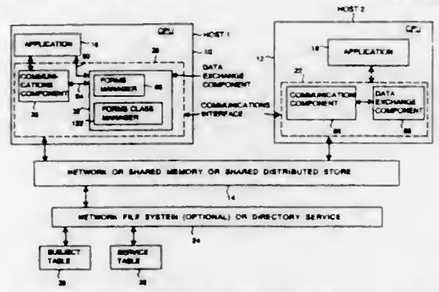
APPARATUS AND METHOD FOR PROVIDING DECOUPLING OF DATA EXCHANGE DETAILS FOR PROVIDING HIGH PERFORMANCE COMMUNICATION BETWEEN SOFTWARE PROCESSES

Marion D. Skeen, Palo Alto, and Mark Bowles, Woodside, both of Calif., assignors to Tibco, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 601,117, Oct. 22, 1990, Pat. No. 5,257,369, which is a continuation-in-part of Ser. No. 386,584, Jul. 27, 1989, Pat. No. 5,187,787. This application Dec. 21, 1990, Ser. No. 632,551

Int. Cl.[6] G06F *15/16;13/00*

U.S. Cl. 395—650 **56 Claims**



1. In a distributed computing environment including one or more computers coupled together by one or more networks, said one or more computers having in execution thereon one or more subscriber applications each of which has the capability of making a subscription request requesting that data on one or more subjects be sent to said subscriber application whenever data on said subject becomes available until said subscription is canceled, and said one or more computers having in execution thereon one or more service applications, each of which is capable of transmitting over said one or more networks data on one or more subjects, an apparatus comprising:

intermediary software controlling said one or more computers and coupled to said one or more networks and said one or more subscriber and service applications, so as to logically decouple said one or more subscriber applications from said service applications in the sense of performing all necessary functions to get data requested by subject by said subscriber applications from one or more service applications that supply data on the requested subject to all computers on which a subscriber application is in execution which has an open subscription to the subject of said data and from each such computer to the subscribing applications themselves and delivering said data only to said computers on which there is in execution a subscriber application having an open subscription to the subject of said data, said logical decoupling also implemented by said intermediary software by eliminating the need to have computer code in any said service application which outputs any data, other than the subject itself, which controls where in said distributed computing environment data published by said service application in execution on one or more of said computers is distributed or which identifies or locates any subscriber application or computer in said distributed computing environment to which data published by any said service application is to be distributed, and by eliminating the need for any subscriber application to include computer code which identifies any particular service application from which data is to be sought or which can find a service

application which can supply data on a subject desired by said subscriber application, said intermediary software for controlling said one or more computers so as to automatically set up a communication path through said network between service applications which publish data on a subject and all and only computers having in execution thereon subscriber applications having an open subscription to the subject of said data.

5,557,799

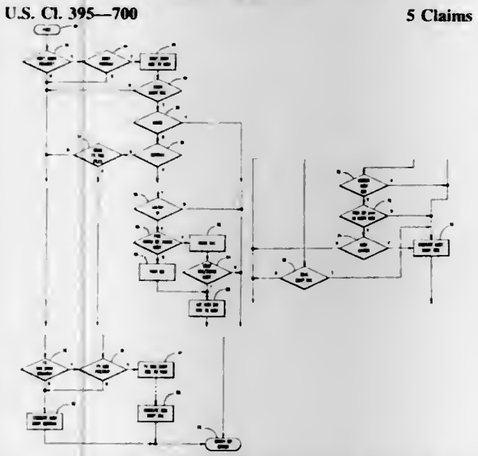
COMPUTER DETERMINATION OF OPERATING SYSTEM OR DATA

Glenn E. Welman, Lexington, Ky., assignor to International Business Machines, Armonk, N.Y.

Continuation of Ser. No. 497,473, Mar. 22, 1990, abandoned. This application Nov. 7, 1990, Ser. No. 609,051

Int. Cl.[6] G06F *9/00*

U.S. Cl. 395—700 **5 Claims**



1. A process for booting a computer system having both an external memory and an internal memory, said internal memory storing an operating system for said computer, comprising the steps of: loading data stored in an external memory into said computer system for operating said computer system, said step of loading comprising reading a boot record of said external memory to determine the presence of consecutive codes for c, o, and m in that order in said boot record, and when said reading of said boot record does not find the presence of said consecutive codes for com, executing said boot record and when said reading said boot record does find the presence of said consecutive codes for com, determining a predefined directory location of said external memory, comparing said consecutive codes for com and a predetermined number of characters in said external memory immediately preceding said consecutive codes for com with contents of said predefined directory location, executing said boot record when said comparison shows the same content, and branching to load an operating system from said internal memory when said comparison does not show the same content.

170-920 O.G.-96-26: QL3

5,557,800

DATA COMPRESSION DEVICE ALLOWING DETECTION OF SIGNALS OF DIVERSE WAVE FORMS

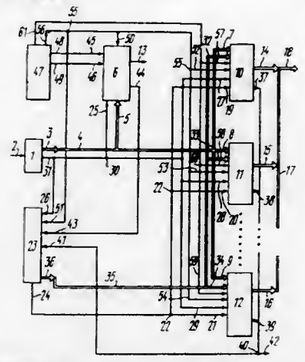
Alibek E. o. Kasimov, ulitsa, Mir-Kasimova, 2, kv. 60; Gusein G. o. Gasanov; Levon G. Gevorkov; Evgeny I. Sidorov, and Ali A. A. o. Abishev, all of Baku, Azerbaijan, assignors to Alibek E. o. Kasimov, Baku, Azerbaijan

PCT No. PCT/SU89/00240, § 371 Date Jun. 20, 1991, § 102(e) Date Jun. 20, 1991, PCT Pub. No. WO91/04552, PCT Pub. Date Apr. 19, 1991

PCT Filed Sep. 4, 1989, Ser. No. 691,046

Int. Cl.[6] G06F *5/00*

U.S. Cl. 395—800 **6 Claims**



1. An information compressor, comprising:

an analog-to-digital converter with an input constituting the input of said compressor, a data output, and a control output;

multiple data processors with first data inputs, address inputs, first control inputs, second control inputs, and first and second outputs; with the first data inputs connected to said data output of said analog-to-digital converter, first control inputs connected to said control output of said analog-to-digital converter, and first and second outputs constituting first and second outputs of the compressor; and

a controller with a control input, a first input, an output, and an address output; with the control input connected to said control output of said analog-to-digital converter, the first input connected to said second outputs of said data processors, the output connected to said second control inputs of said data processors, and the address output connected to said address inputs of said data processors;

wherein each data processor comprises:

an individual working memory;

a comparator with the following elements, inputs, and outputs: a data input and a first input which constitute said data input and said second input of said data processor, a second input, and outputs, wherein said comparator comprises a first adder having first and second inputs constituting said data input and said second input of said comparator, a first output, and a second output constituting one of said outputs of said comparator; a second adder having a first input connected to said first output of said first adder, a second input, and an output constituting one of said outputs of said comparator; and a multiplexer having a first input connected to said second output of said first adder, a second input constituting said first input of said comparator and an output connected to said second input of said second adder;

said working memory having a data input, an address input, a first input, a second input, a first output, and a second output; with said first input constituting said data input, said address input, and said first control input of said data processor, said first output constituting said first output of said data processor and connected to said second input of said comparator;

a control circuit with the following inputs and outputs: first and second inputs connected to said outputs of said comparator, third and fourth inputs constituting said second control input and said first input of said data processor, a fifth input connected to said second output of said working memory, a sixth input constituting said first control input of said data processor, a first output connected to said second input of said working memory, and an output; and

a read only memory having an input connected to said first output of said control circuit and an output constituting said second output of said data processor.

DESIGN PATENTS

GRANTED September 17, 1996

ERRATA

For CLASS	See PATENT NO.
D 06–511	D373796
D 06–569	D373797
D 06–570	D373798
D 06–574	D373799
D 28–078	D373890

DESIGNS

373,671

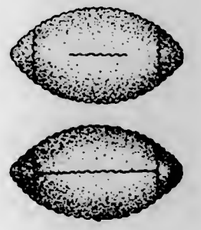
FOOD PRODUCT

Daniel L. Laughlin, White Bear Lake, and James N. Weinstein, Minneapolis, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Oct. 18, 1993, Ser. No. 14,233

Term of patent 14 years

U.S. Cl. D1—106



373,672

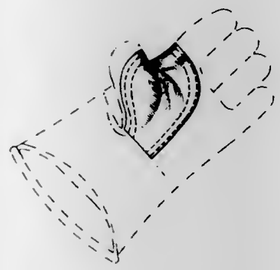
PALM SURFACE OF WORK GLOVE

Yat M. Chan, 113 E. Centre St., Nutley, N.J. 07110

Filed Apr. 5, 1993, Ser. No. 6,652

Term of patent 14 years

U.S. Cl. D2—623



373,673

POCKETED TEE SHIRT

William T. Colling, P.O. Box 7636, Incline Village, Nev. 89452

Filed Jan. 19, 1995, Ser. No. 33,755

Term of patent 14 years

U.S. Cl. D2—717

373,674

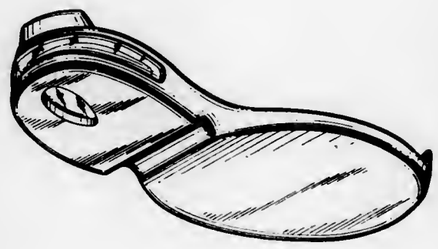
OUTSOLE

Dennis Dolinsky, Morristown, N.J., assignor to E. S. Originals, Inc., New York, N.Y.

Filed Dec. 7, 1994, Ser. No. 34,602

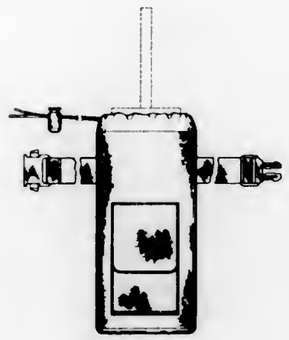
Term of patent 14 years

U.S. Cl. D2—956



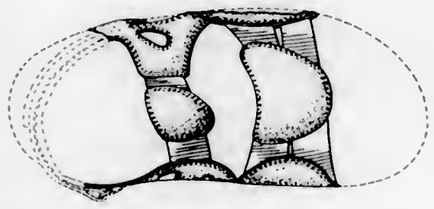
373,675
PYRAMID RIDGE GOLF SHOE SPIKE
Faris W. McMullin, Boise, Id., assignor to Softspikes, Inc., Rockville, Md.
Filed Aug. 31, 1994, Ser. No. 27,882
Term of patent 14 years
U.S. Cl. D2—962

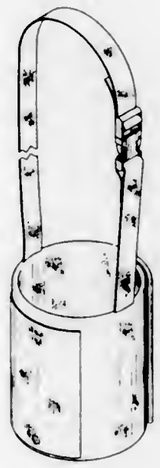
373,677
BOTTLE CARRIER
Michael K. Kelly, 4178 Vermont St., San Diego, Calif. 92103
Filed Oct. 6, 1994, Ser. No. 29,452
Term of patent 14 years
U.S. Cl. D3—229



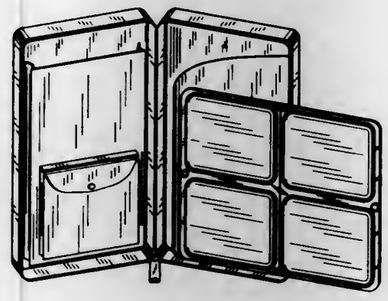
373,678
BOTTLE CARRIER
Maggie Halgis, 61 Barton Heights, Greenfield, Mass. 01301
Filed Sep. 1, 1995, Ser. No. 43,339
Term of patent 14 years
U.S. Cl. D3—229

373,676
SHOE UPPER
Sergio G. Lozano, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jan. 5, 1996, Ser. No. 48,637
Term of patent 14 years
U.S. Cl. D2—969

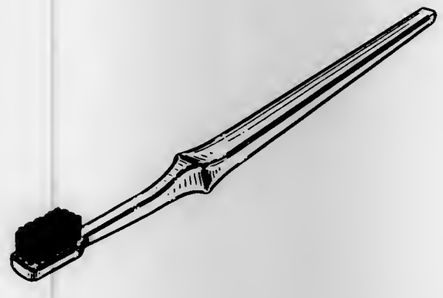




373,679
CARRYING CASE
Gary D. Milby, 1216-B W. Roseburg Ave., Modesto, Calif. 95350
Filed Sep. 7, 1994, Ser. No. 28,110
Term of patent 14 years
U.S. Cl. D3—301



373,680
TOOTHBRUSH
Andrew J. Knox, Milltown, and Kevin G. Yost, Short Hills, both of N.J., assignors to Johnson & Johnson Consumer Products, Inc., Skillman, N.J.
Continuation of Ser. No. 2,524, Dec. 14, 1992, abandoned.
This application Sep. 26, 1994, Ser. No. 28,945
Term of patent 14 years
U.S. Cl. D4—104



373,681
TOOTHBRUSH
Kevin G. Yost, Short Hills; Alan G. Trojanowski, Monmouth Junction, both of N.J.; Thomas M. Dair, Yorktown Heights, N.Y.; Mari H. Ando, New York, N.Y., and Jarrod L. Linton, New York, N.Y., assignors to Johnson & Johnson Consumer Products, Inc., Skillman, N.J.
Filed Mar. 22, 1995, Ser. No. 36,559
The portion of the term of this patent subsequent to Apr. 16, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—104

373,682
BRUSH
Matthew P. Armbruster, 4000 Shillinger Rd. #3, Mobile, Ala. 36619
Filed Sep. 20, 1994, Ser. No. 28,702
Term of patent 14 years
U.S. Cl. D4—132

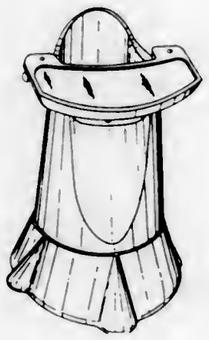
373,683
CHAIR

373,685
CHAIR

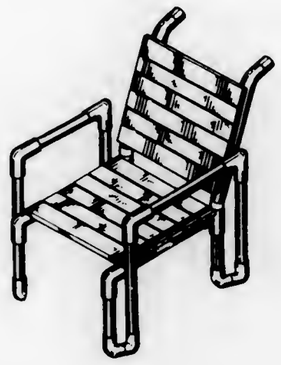
373,687
BED

373,689
DISPLAY CABINET

373,683
CHAIR
David Morgan, Bray, Ireland, assignor to Trumark Limited, Dublin, Ireland
Filed Mar. 13, 1995, Ser. No. 36,065
Claims priority, application Ireland, Sep. 13, 1994, 267/94
Term of patent 14 years
U.S. Cl. D6—339

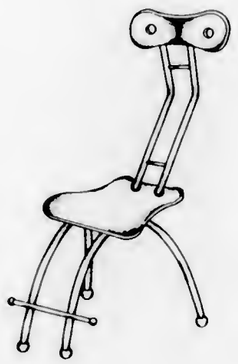


373,685
CHAIR
James H. Yoder, Jr., 1111 Daniels Church Rd., Lincolnton, N.C. 28092
Filed May 16, 1995, Ser. No. 38,972
Term of patent 14 years
U.S. Cl. D6—370

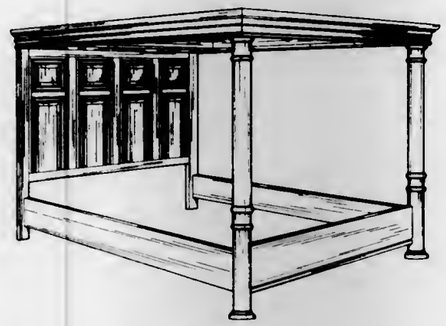


373,684
CHAIR
Charles Desnoyers, Quebec, Canada, assignor to Dutailier Group Inc., Chaput, St Pie, Canada
Filed Jul. 29, 1994, Ser. No. 25,212
Claims priority, application Canada, Apr. 13, 1994, 1994-0744
Term of patent 14 years
U.S. Cl. D6—344

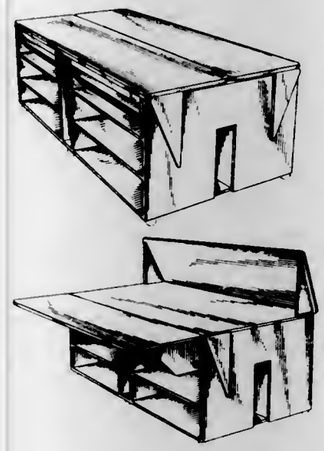
373,686
CHAIR
Rem-Ju Tzeng, No. 4-2, Chung Liao Road, Pei Tou Jenn, Chang Hua Hsien, Taiwan
Filed Aug. 11, 1995, Ser. No. 42,558
Term of patent 14 years
U.S. Cl. D6—374



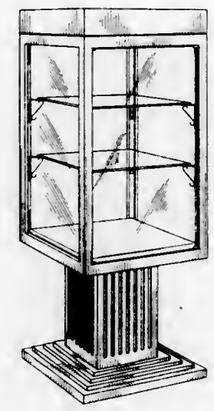
373,687
BED
Guy A. Walters, III, High Point, and Avis E. Tobin, Jr., Thomasville, both of N.C., assignors to Thomasville Furniture Industries, Inc., Thomasville, N.C.
Filed Oct. 20, 1994, Ser. No. 29,977
Term of patent 14 years
U.S. Cl. D6—389



373,688
MULTI-PURPOSE WORK AND STORAGE TABLE
Janet Z. Tulli, 1015 Kreps Rd., Lancaster, Pa. 17603
Filed Mar. 2, 1995, Ser. No. 36,012
Term of patent 14 years
U.S. Cl. D6—397



373,689
DISPLAY CABINET
Juan V. Lladró Roig, and Rafael Tamarit Pitarch, both of Valencia, Spain, assignors to Lladro Comercial, S.A., Valencia, Spain
Division of Ser. No. 25,247, Jun. 28, 1994. This application Sep. 7, 1995, Ser. No. 43,613
Term of patent 14 years
U.S. Cl. D6—436



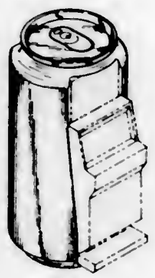
373,690
SUPPORT FOR SLOT MACHINES
Brian Hartmann, Absecon, N.J., assignor to Atlantic City Coin & Slot Service Company, Inc., Pleasantville, N.J.
Filed Aug. 31, 1995, Ser. No. 43,313
Term of patent 14 years
U.S. Cl. D6—450

373,691

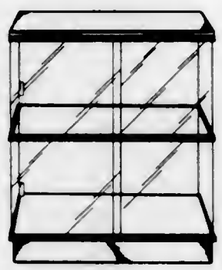
373,695

373,697

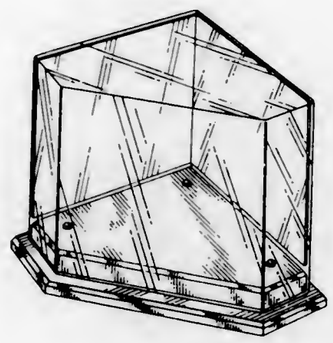
373,691
SUPPORT FOR SLOT MACHINES
Brian Hartmann, Absecon, N.J., assignor to Atlantic City Coin & Slot Service Company, Inc., Pleasantville, N.J.
Filed Aug. 31, 1995, Ser. No. 43,315
Term of patent 14 years
U.S. Cl. D6—450



373,692
GLASS DISPLAY CASE
Hans Staeger, Weil im Schoenbuch, Germany, assignor to Octanorm Vertriebs-GmbH fuer Bauelemente, Filderstadt, Germany
Filed Dec. 9, 1993, Ser. No. 16,191
Claims priority, application Germany, Jun. 9, 1993, M93 04 452.6
Term of patent 14 years
U.S. Cl. D6—470

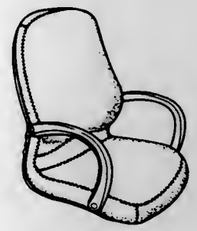


373,693
DISPLAY CASE
Jim Elhage, 80 Speers Rd. #308, Oakville, Ont., Canada
Filed Sep. 27, 1995, Ser. No. 44,588
Claims priority, application Canada, Mar. 27, 1995, 1995-0684
Term of patent 14 years
U.S. Cl. D6—470

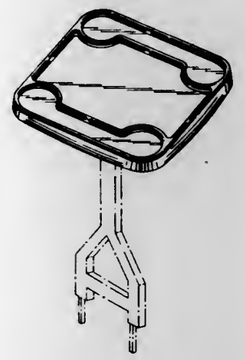


373,694
TABLE WITH STORAGE LEGS
Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex SARL, Oyonnax, France
Filed Dec. 8, 1994, Ser. No. 32,263
Claims priority, application WIPO, Jun. 9, 1994, DMA/002538
The portion of the term of this patent subsequent to Jul. 9, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—480

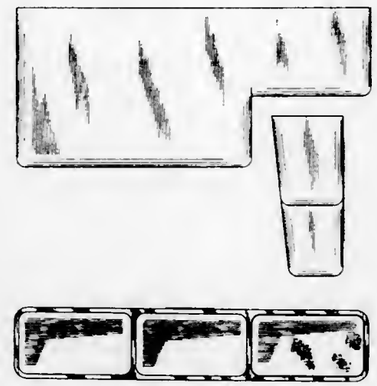
373,695
CHAIR WITH ARMRESTS
Oscar Buffon, Bigolino Di Valdobbiadene, Italy, assignor to Brado S.r.l., Bigolino Di Valdobbiadene (TV), Italy
Filed Jan. 19, 1995, Ser. No. 33,726
Claims priority, application Italy, Jul. 27, 1994, TV9400042
Term of patent 14 years
U.S. Cl. D6—500



373,696
CAMPER COFFEE TABLE
Allen J. Minneman, Union, Ohio, assignor to MTM Molded Products Company, Dayton, Ohio
Filed Nov. 10, 1994, Ser. No. 30,890
Term of patent 14 years
U.S. Cl. D6—51



373,697
NIGHT STAND RACK
Stuart A. Yack, 20 Vanwood Road, Thornhill, Ontario, Canada
Filed Jul. 10, 1995, Ser. No. 42,034
Term of patent 14 years
U.S. Cl. D6—569



373,698
BUSINESS CARD DISPLAY AND DISPENSER
Lorene Farrell, 709-B W. Rusk #323, Rockwall, Tex. 75087
Filed Jun. 8, 1995, Ser. No. 40,028
Term of patent 14 years
U.S. Cl. D6—570

373,699
SHELF

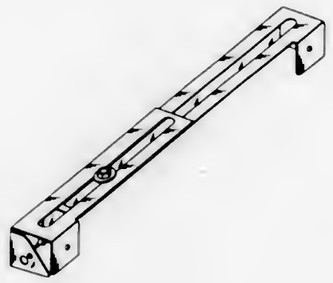
373,701
COMBINED BARBECUE GRILL AND CART

373,703
FOOD PREPARING MACHINE

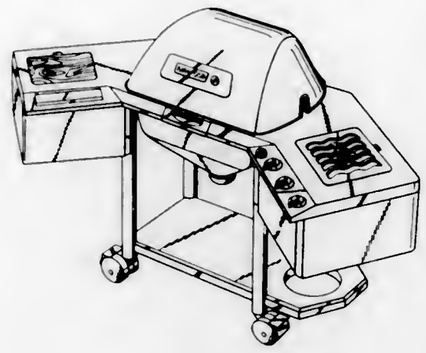
373,705
NON-CHOKE ACCESSORY FOR USE WITH EATING

373,699
SHELF
In-Ho Moon, Seoul, Rep. of Korea, assignor to American Standard Inc., N.J.
Filed Feb. 17, 1994, Ser. No. 18,872
Claims priority, application Rep. of Korea, Aug. 18, 1993, 1993-16714
Term of patent 14 years
U.S. Cl. D6—574

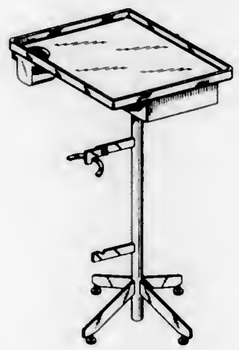
373,700
SHADE HOUSING
Ignatius Z. Theodorou, Alhambra, Calif., assignor to Michaels/Theodorou Partnership, Calabasas, Calif.
Filed May 13, 1994, Ser. No. 22,862
Term of patent 14 years
U.S. Cl. D6—580



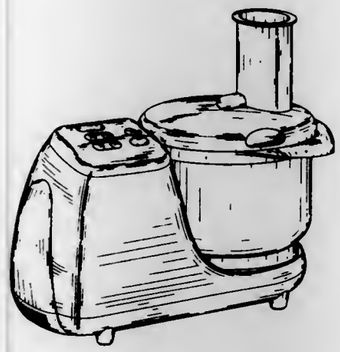
373,701
COMBINED BARBECUE GRILL AND CART
Devin Moore, Decatur, Ga., assignor to W.C. Bradley Company, Columbus, Ga.
Filed Aug. 12, 1994, Ser. No. 27,110
Term of patent 14 years
U.S. Cl. D7—334



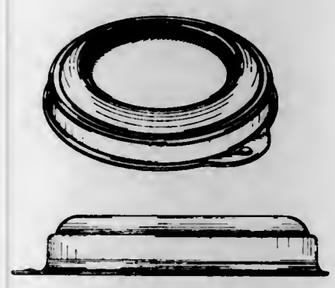
373,702
COOKING GRIDDLE
Brian Perry, 13502-H Whittier Blvd. #360, Whittier, Calif. 90605
Filed Jun. 22, 1995, Ser. No. 40,580
Term of patent 14 years
U.S. Cl. D7—363



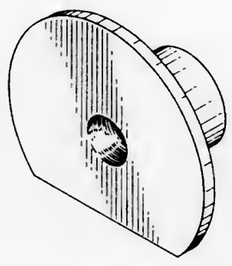
373,703
FOOD PREPARING MACHINE
Carl-Gustaf Frisell, Stockholm, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden
Filed Apr. 26, 1995, Ser. No. 38,009
Claims priority, application Sweden, Nov. 1, 1994, 942196
Term of patent 14 years
U.S. Cl. D7—384



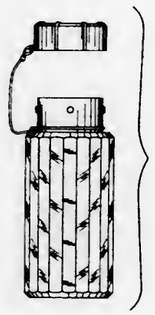
373,704
LID FOR A FOOD STORAGE CONTAINER
Andre Doxey, Shaker Heights, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Division of Ser. No. 10,773, Jul. 19, 1993, Pat. No. Des. 360,105. This application Jul. 11, 1994, Ser. No. 25,745
Term of patent 14 years
U.S. Cl. D7—391



373,705
NON-CHOKE ACCESSORY FOR USE WITH EATING UTENSILS
Holly E. Austin, 56 Main St., P.O. Box 232, East Templeton, Mass. 01438
Filed Apr. 2, 1993, Ser. No. 6,621
Term of patent 14 years
U.S. Cl. D7—401.2



373,706
PORTABLE FLUID CONTAINER
Ron Gregg, 1000 First Ave. South, Seattle, Wash. 98134
Filed Mar. 13, 1995, Ser. No. 36,099
Term of patent 14 years
U.S. Cl. D7—511



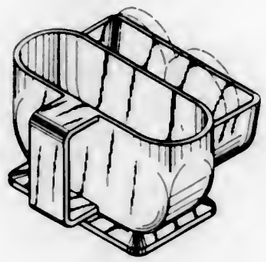
373,707
CUP

373,709
SAUCER

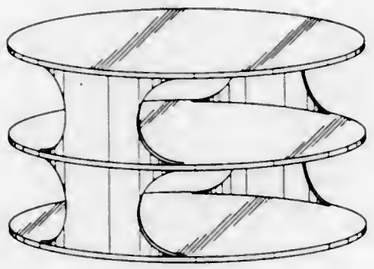
373,711
HANDLE FOR FORKS, SPOONS AND TOOTHBRUSH

373,713
COMBINED FOIL SEAL CUTTER AND COTTON

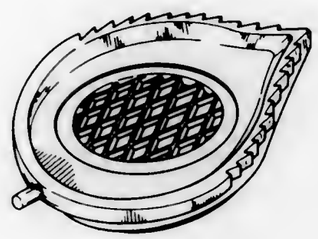
373,707
CUP
Stephen L. Seaburg, 4001 Cedar Run Rd., Traverse City, Mich. 49684
Filed Oct. 23, 1995, Ser. No. 45,542
Term of patent 14 years
U.S. Cl. D7—513



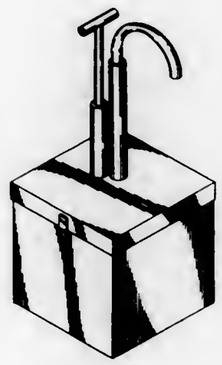
373,708
MICROWAVE STACK TRAY
Craig Hamilton, and Edwin Fernandez, both of 1719 Peperdale Dr., Rowland Heights, Calif. 91748
Filed Jun. 9, 1995, Ser. No. 40,118
Term of patent 14 years
U.S. Cl. D7—550



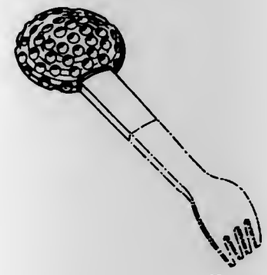
373,709
SAUCER
Shyh-Shyang Leu, No. 13, Lane 623, Sec 1, Jong Iang Rd., Wu-Chi Town, Taichung, Taiwan
Filed Aug. 11, 1995, Ser. No. 42,472
Term of patent 14 years
U.S. Cl. D7—567



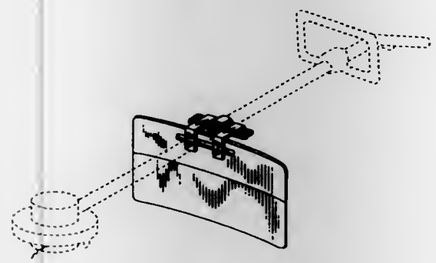
373,710
POSITIVE PRESSURE DISPENSER
Arthur Avon, 1959 Church Rd., Toms River, N.J. 08753
Filed Jun. 9, 1995, Ser. No. 40,086
Term of patent 14 years
U.S. Cl. D7—590



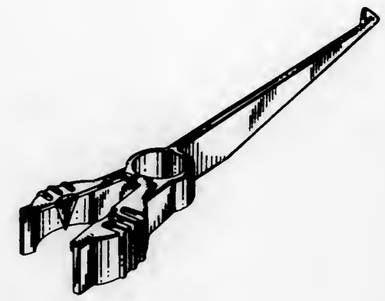
373,711
HANDLE FOR FORKS, SPOONS AND TOOTHBRUSH
Susan Harrison, Wichita Falls, Tex., assignor to Zooth, Inc., Wichita Falls, Tex.
Continuation-in-part of Ser. No. 14,501, Oct. 22, 1993, Pat. No. Des. 366,603, and a continuation-in-part of Ser. No. 14,528, Oct. 22, 1993, Pat. No. Des. 364,877, and a continuation-in-part of Ser. No. 14,496, Oct. 22, 1993, Pat. No. Des. 363,651, and a continuation-in-part of Ser. No. 14,500, Oct. 22, 1993, Pat. No. Des. 365,503, which is a continuation-in-part of Ser. No. 3,463, Jan. 12, 1993, Pat. No. 5,269,420. This application Jun. 27, 1995, Ser. No. 40,824
Term of patent 14 years
U.S. Cl. D7—654



373,712
WEED TRIMMER DEBRIS SHIELD
John C. Bridgers, Rte. 3 Box 154B, Leon, W. Va. 25123
Filed Jun. 22, 1995, Ser. No. 40,578
Term of patent 14 years
U.S. Cl. D8—8

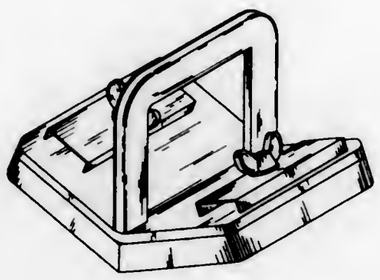


373,713
COMBINED FOIL SEAL CUTTER AND COTTON EXTRACTOR TOOL
Matthew Coe, Cedar Grove, N.J., assignor to PharmaDesign Inc., Warren, N.J.
Filed Mar. 4, 1994, Ser. No. 19,542
Term of patent 14 years
U.S. Cl. D8—14



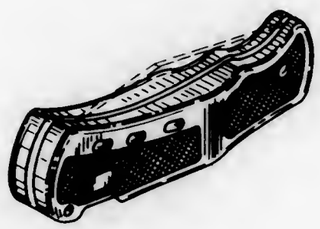
373,714
WIRE CUTTER
Paul W. Hebert, 6450 Lakeshore Dr., San Diego, Calif. 92119
Filed Mar. 17, 1995, Ser. No. 36,310
Term of patent 14 years
U.S. Cl. D8—52

373,715
DRYWALL ANGLE SANDER
Richard D. Fink, N5872 610th St., Ellsworth, Wis. 54011-5131
Filed Jan. 9, 1995, Ser. No. 33,290
Term of patent 14 years
U.S. Cl. D8—90

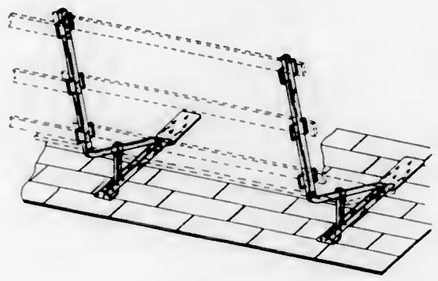


373,717
DOOR JAM
Irvin N. Ferverda, 5930 E. 56th St., Indianapolis, Ind. 46256
Filed May 19, 1995, Ser. No. 39,475
Term of patent 14 years
U.S. Cl. D8—330

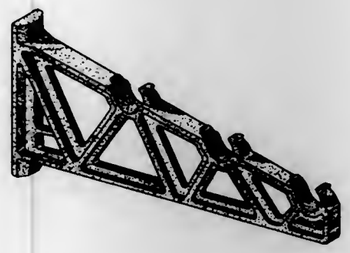
373,716
FOLDING BLADE KNIFE HANDLE
William Keys; Tom Gaboury, both of El Cajon; Jack Koon, San Diego, and Charles T. Buck, El Cajon, all of Calif., assignors to Buck Knives, Inc., El Cajon, Calif.
Filed May 15, 1995, Ser. No. 38,887
Term of patent 14 years
U.S. Cl. D8—107



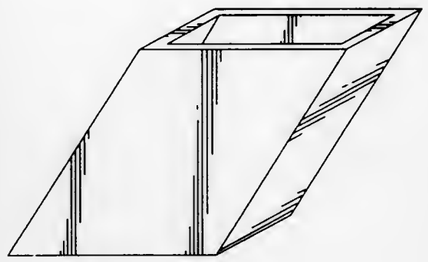
373,718
COMBINED STAGING BRACKET AND DOUBLE SIDED CLAMP BACK RAIL
Donald G. Rondeau, 76 C St., Dracut, Mass. 01826
Filed Mar. 10, 1995, Ser. No. 35,998
Term of patent 14 years
U.S. Cl. D8—349



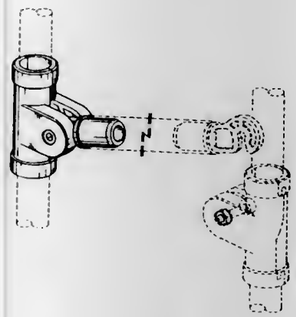
373,719
BRACKET FOR DRYING CLOTHES
Chen Y. Lin, P.O. Box 82-144, Taipei, Taiwan
Filed Jul. 3, 1995, Ser. No. 41,041
Term of patent 14 years
U.S. Cl. D8—373



373,721
TABLE LEG PROTECTOR
Nick Panow, RR 6 1530 Concession #1, Niagara On The Lake, Ontario, Canada
Filed Nov. 4, 1994, Ser. No. 30,688
Term of patent 14 years
U.S. Cl. D8—402

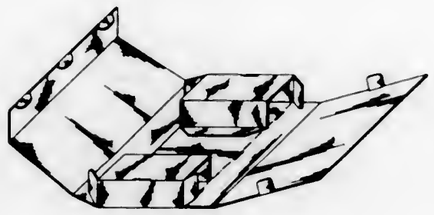


373,720
HINGE JOINT FOR FRAME OF ROLLABLE CART
Seiji Hirano, and Shuji Yoshino, both of Shizuoka, Japan, assignors to Yazaki Industrial Chemical Co., Ltd, Shizuoka, Japan
Filed Aug. 22, 1994, Ser. No. 27,443
Term of patent 14 years
U.S. Cl. D8—382



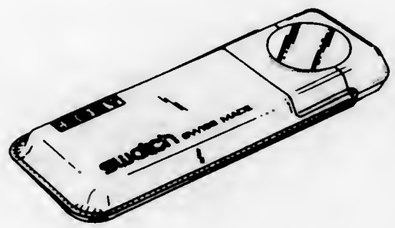
373,722
COMBINED SQUEEZE CONTAINER AND SPREADING KNIFE
David J. Kastberg, 2121 Evans Rd., Flossmoor, Ill. 60422
Filed May 1, 1995, Ser. No. 38,199
Term of patent 14 years
U.S. Cl. D9—337

373,723
PACKAGE
Frederick A. Healey, 618 Kellogg, Plymouth, Mich. 48170
Filed May 4, 1994, Ser. No. 22,362
Term of patent 14 years
U.S. Cl. D9—346

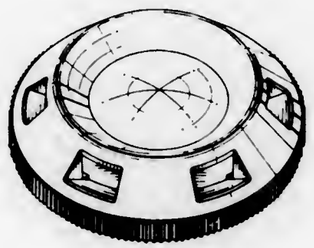


373,724
BOX
Laura Adams, P.O. Box 290112, Nashville, Tenn. 37229
Filed Jan. 11, 1995, Ser. No. 33,384
The portion of the term of this patent subsequent to May 7, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—418

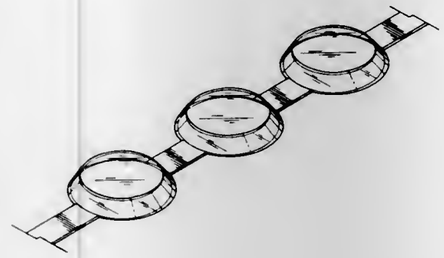
373,725
WATCH BOX
Daniel Weil, London, Great Britain, assignor to Swatch AG (Swatch SA) (Swatch Ltd.), Bienne, Switzerland
Filed Mar. 27, 1995, Ser. No. 36,764
Claims priority, application Switzerland, Sep. 28, 1994, DM/030797
Term of patent 14 years
U.S. Cl. D9—422



373,726
CONTAINER
Ray M. Power, Deeside, Great Britain, assignor to Sanoda Ltd., Clwyd, United Kingdom
Filed Feb. 8, 1995, Ser. No. 34,579
Claims priority, application United Kingdom, Aug. 23, 1994, 2041217
Term of patent 14 years
U.S. Cl. D9—429



373,727
SANITARY SEALS FOR COVERING LIQUID CONTAINING CANS
David W. Lowry, 102 Air Park Dr., Warner Robbins, Ga. 31088
Filed Dec. 1, 1994, Ser. No. 31,915
Term of patent 14 years
U.S. Cl. D9—445

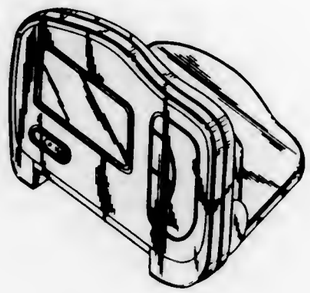


373,728
DISPENSING CONTAINER COVER
Kenneth S. Moore, London, England, assignor to Precise Plastics, Ltd., London, England
Filed Oct. 26, 1994, Ser. No. 30,328
Term of patent 14 years
U.S. Cl. D9—448

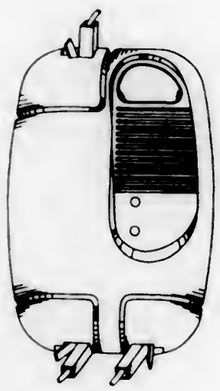
373,729
KETCHUP BOTTLE
Wesley D. Protheroe, Marietta, Ga.; Andrew H. Fagan, Los Angeles, Calif., and H. Burton Fisher, Fishers, Ind., assignors to Marketing Ventures of America, Inc., Atlanta, Ga.
Filed Feb. 25, 1994, Ser. No. 19,219
Term of patent 14 years
U.S. Cl. D9—500

373,730
COMBINED BOTTLE AND CAP
Fabien Baron, New York, N.Y., assignor to Beaute Prestige International, Paris, France
Filed Oct. 24, 1995, Ser. No. 45,563
Term of patent 14 years
U.S. Cl. D9—504

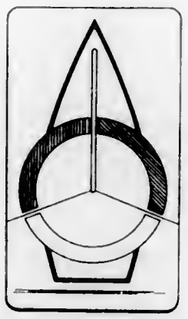
373,731
LCD ALARM CLOCK
Lai L. Wong, Hong Kong, Hong Kong, assignor to Ballanda Limited, Hong Kong, Hong Kong
Filed Sep. 26, 1994, Ser. No. 28,938
Term of patent 14 years
U.S. Cl. D10—15



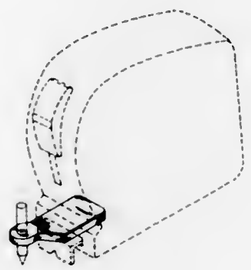
373,732
SURGICAL WARNING DEVICE
Gabor Lederer, 28 Summit Ave., Hackensack, N.J. 07601
Filed Oct. 24, 1994, Ser. No. 30,199
Term of patent 14 years
U.S. Cl. D10—46



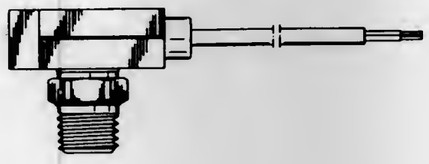
373,733
NAVIGATIONAL INSTRUMENT FOR DETERMINING THE COURSE SECTOR OF WATERCRAFT ILLUMINATED ACCORDING TO REGULATIONS
Ralf Prengel, Schwelmer Strasse 21, D-40235 Dusseldorf, Germany
Filed May 17, 1995, Ser. No. 39,104
Claims priority, application Germany, Nov. 18, 1994, G94 18-437.2 U
Term of patent 14 years
U.S. Cl. D10—65



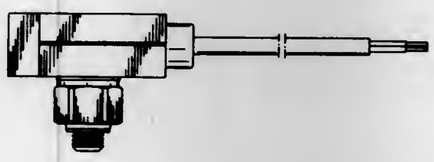
373,734
TAPE MEASURE SCORING ATTACHMENT
Sidney W. Doak, P.O. Box 761, McCook, Red Willow County, Nebr. 69001
Filed Aug. 11, 1995, Ser. No. 42,531
Term of patent 14 years
U.S. Cl. D10—74



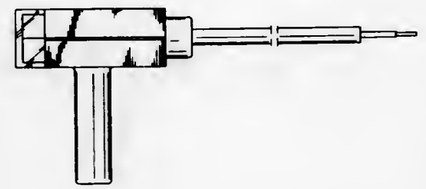
373,735
SOLID STATE PRESSURE DETECTOR
Shogo Kurisaki; Masao Kataoka, and Kuniko Suzuki, all of Ibaraki-ken, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 10, 1995, Ser. No. 35,982
Claims priority, application Japan, Sep. 12, 1994, 6-27687
Term of patent 14 years
U.S. Cl. D10—83



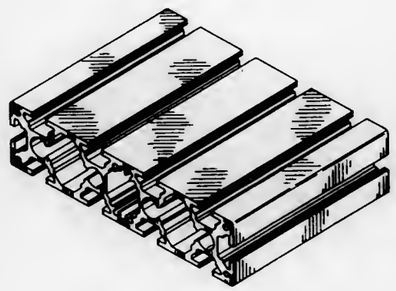
373,736
SOLID STATE PRESSURE DETECTOR
Shogo Kurisaki; Masao Kataoka, and Kuniko Suzuki, all of Ibaraki-ken, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 10, 1995, Ser. No. 35,984
Claims priority, application Japan, Sep. 12, 1994, 6-27688
Term of patent 14 years
U.S. Cl. D10—83



373,737
SOLID STATE PRESSURE DETECTOR
Shogo Kurisaki; Masao Kataoka, and Kuniko Suzuki, all of Ibaraki, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 10, 1995, Ser. No. 35,986
Claims priority, application Japan, Sep. 13, 1994, 6-27788
Term of patent 14 years
U.S. Cl. D10—83



373,738
FRAME FOR PRESSURIZED FLUID-OPERATING DEVICES
Shigekazu Nagai, and Koji Sugano, both of Ibaraki-ken, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 18, 1995, Ser. No. 37,748
Claims priority, application Japan, Oct. 19, 1994, 6-31725
Term of patent 14 years
U.S. Cl. D10—94



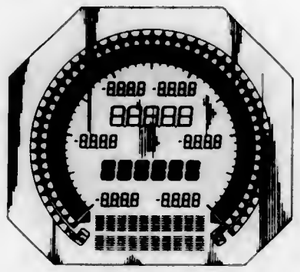
373,739
SCALE PLATE FOR MEASURING INSTRUMENTS

373,741
FINGER RING

373,743
CLOTH FLOWER CONSTRUCTED FROM LINGERIE

373,745
HOLIDAY STOCKING

373,739
SCALE PLATE FOR MEASURING INSTRUMENTS
Manfred Urich, Usingen, Germany, assignor to Barksdale Inc., Los Angeles, Calif.
Filed Aug. 7, 1995, Ser. No. 42,316
Claims priority, application Germany, Feb. 8, 1995, M 95 01 062.9
Term of patent 14 years
U.S. Cl. D10—94



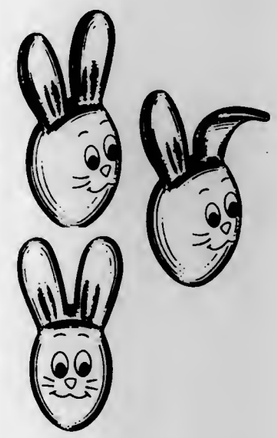
373,740
SIGNALLING INDICATOR POLE FOR OFFICE EQUIPMENT
Hideki Narushima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 15, 1995, Ser. No. 38,889
Claims priority, application Japan, Nov. 14, 1994, 6-34663
Term of patent 14 years
U.S. Cl. D10—114

373,741
FINGER RING
Dilip Mehta, 2018 Antwerpen, Belgium, assignor to Rosy Blue N.V., Antwerpen, Belgium
Filed Jun. 10, 1994, Ser. No. 24,257
Term of patent 14 years
U.S. Cl. D11—26

373,742
BACKLESS PIERCED EARRING
Caryle Janice, 3820 Hickok Clr., Billings, Mont. 59106
Filed Nov. 21, 1994, Ser. No. 31,176
Term of patent 14 years
U.S. Cl. D11—40

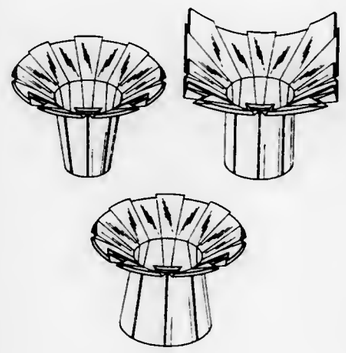
373,743
CLOTH FLOWER CONSTRUCTED FROM LINGERIE
Debra J. Bright, 1558 SE. Cownie St., Port St. Lucie, Fla. 34983
Filed Oct. 27, 1986, Ser. No. 923,801
Term of patent 14 years
U.S. Cl. D11—117

373,744
HANGING EGG SHAPED BUNNY ORNAMENT
Michael C. Wotton, Plantsville, Conn., assignor to Sun Hill Industries, Inc., Stamford, Conn.
Filed Oct. 12, 1995, Ser. No. 45,200
Term of patent 14 years
U.S. Cl. D11—121



373,745
HOIDAY STOCKING
Stanley Lithwick, 226 Sherwood Drive, Ottawa, Ontario, Canada
Filed Aug. 24, 1995, Ser. No. 43,051
Claims priority, application Canada, Mar. 3, 1995, 1995-0501
Term of patent 14 years
U.S. Cl. D11—126

373,746
FLOWER POT COVER
Donald E. Weder, and Joseph G. Straeter, both of Highland, Ill., assignors to The Family Trust U/T/A, and Southpac Trust International, Inc., both of Highland, Ill.
Continuation-in-part of Ser. No. 808,547, Dec. 16, 1991, Pat. No. Des. 360,388, which is a continuation-in-part of Ser. No. 710,272, Jun. 4, 1991, Pat. No. Des. 365,302, which is a continuation-in-part of Ser. No. 617,454, Nov. 21, 1990, abandoned, said Ser. No. 710,272is a continuation-in-part of Ser. No. 411,249, Sep. 22, 1989, Pat. No. Des. 358,113, Ser. No. 411,247, Sep. 22, 1989, abandoned, and Ser. No. 411,245, Sep. 22, 1989, abandoned. This application Jan. 13, 1993, Ser. No. 3,685
The portion of the term of this patent subsequent to Jul. 18, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D11—164



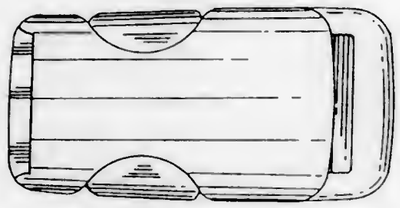
373,747

373,749

373,751

373,753

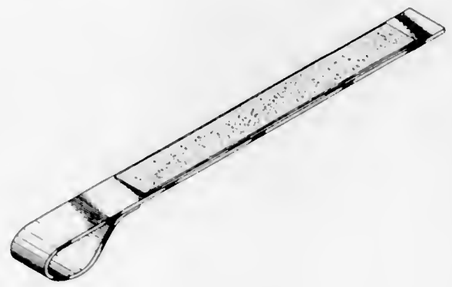
373,747
BUCKLE
Joseph A. Anscher, Port Washington, N.Y., assignor to National Molding Corporation, Farmingdale, N.Y.
Filed May 14, 1993, Ser. No. 8,330
Term of patent 14 years
U.S. Cl. D11—216



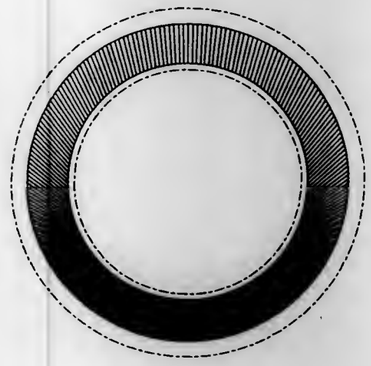
373,749
AUTOMOBILE TIRE
Sonoko Sugimoto, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan
Filed May 2, 1994, Ser. No. 22,225
Claims priority, application Japan, Nov. 1, 1993, 5-33300
The portion of the term of this patent subsequent to Jan. 21, 2006, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—147

373,748
UTILITY CART
John M. Fuller, Winchester, and Scott A. Boothby, Stephens City, both of Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.
Filed Jul. 22, 1994, Ser. No. 26,242
Term of patent 14 years
U.S. Cl. D12—105

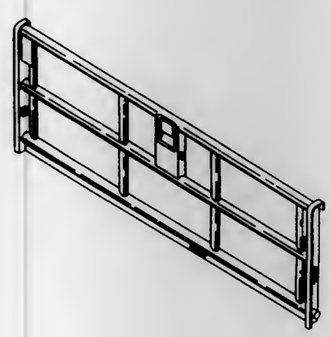
373,750
WHEELCHAIR TRANSPORT SECURITY STRAP
Jerry H. Gunderson, 3851 Rome Dr., Lafayette, Ind. 47905-4442
Filed May 25, 1995, Ser. No. 39,238
Term of patent 14 years
U.S. Cl. D12—133



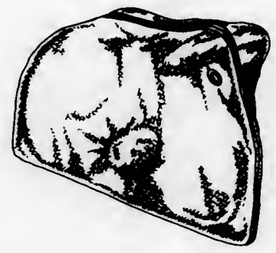
373,751
SEGMENT OF A TIRE SIDEWALL
Antonio Barrese, Milan, Italy, assignor to Pirelli Coordinamento Pneumatici S.p.A., Milan, Italy
Filed Aug. 16, 1993, Ser. No. 11,789
Claims priority, application Italy, Feb. 16, 1993, MI93000098
Term of patent 14 years
U.S. Cl. D12—152



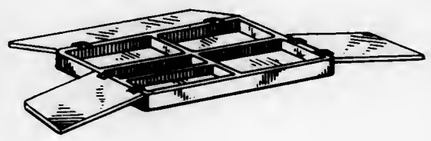
373,752
TAILGATE
John E. McCormack, Newmarket, Canada, assignor to Atoma International Inc., Newmarket
Filed May 1, 1995, Ser. No. 38,285
Term of patent 14 years
U.S. Cl. D12—196



373,753
BICYCLE COVER
Mattie M. Ferguson, 180 Seaview Ct., Apt. 102, Marco Island, Fla. 33937
Filed Dec. 18, 1995, Ser. No. 47,974
Term of patent 14 years
U.S. Cl. D12—402



373,754
VEHICLE STORAGE CONTAINER
Dominick Pinterpe, 4171 Larwin Ave., Cypress, Calif. 90630
Filed May 2, 1994, Ser. No. 22,129
Term of patent 14 years
U.S. Cl. D12—424



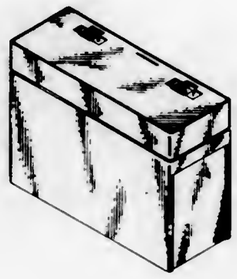
373,755
INTERCHANGEABLE BATTERY WITH BUILT-IN

373,757
TELECOMMUNICATIONS BLOCK TEST ADAPTER

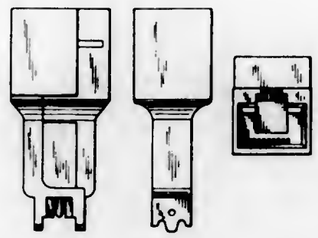
373,759
LIGHT RECEIVING MODULE

373,761
SUPPORT STAND FOR COMPUTER MONITOR AND

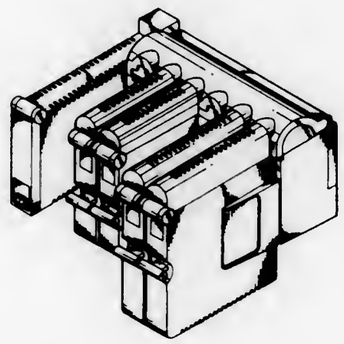
373,755
INTERCHANGEABLE BATTERY WITH BUILT-IN TERMINAL
David Chen, Tainan Hsien, Taiwan, assignor to CSB Battery Co., Ltd., Tainan Hsien, Taiwan
Filed Aug. 9, 1995, Ser. No. 42,735
Term of patent 14 years
U.S. Cl. D13—103



373,757
TELECOMMUNICATIONS BLOCK TEST ADAPTER
Richard T. Abucewicz, New Britain, Conn., assignor to The Siemon Company, Watertown, Conn.
Filed Nov. 4, 1994, Ser. No. 32,374
Term of patent 14 years
U.S. Cl. D13—147

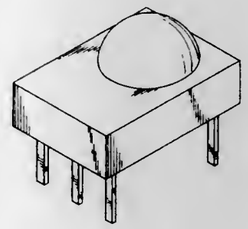


373,758
COMBINED CONNECTION CABINET AND PRINTED CIRCUIT BOARD HOUSINGS
David A. Nogas, Ottawa, Canada, assignor to Mitel Corporation, Kanata, Canada
Continuation of Ser. No. 4,342, Feb. 2, 1993. This application Jun. 26, 1995, Ser. No. 40,916
Claims priority, application Canada, May 8, 1995, 05-08-92-6
Term of patent 14 years
U.S. Cl. D13—162

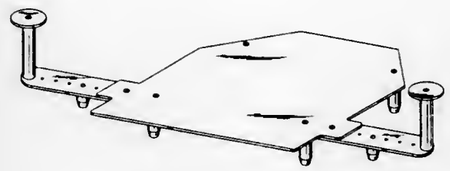


373,756
BATTERY CHARGER FOR A CELLULAR PHONE
Chien-shu Chen, 4th Fl., No. 2-3, Lane 313, Chang An St., Lu Chou Hsiang, Taipei Hsien, Taiwan
Filed Aug. 16, 1995, Ser. No. 42,750
Term of patent 14 years
U.S. Cl. D13—108

373,759
LIGHT RECEIVING MODULE
Masao Tanaka; Susumu Maeta, and Takashi Yamaoka, all of Tottori-ken, Japan, assignors to Sanyo Electric Co., Ltd., Osaka-fu, and Tottori Sanyo Electric Co., Ltd., Tottori-ken, both of Japan
Filed Nov. 21, 1994, Ser. No. 31,295
Claims priority, application Japan, Jun. 20, 1994, 6-18264
The portion of the term of this patent subsequent to Nov. 28, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D13—165

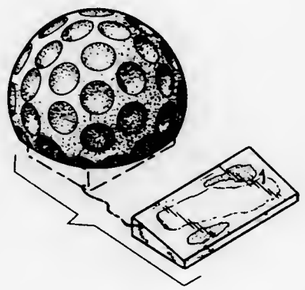


373,761
SUPPORT STAND FOR COMPUTER MONITOR AND SPEAKERS
Chung C. Yu, 87 Townsend St., Walton, N.Y. 13856
Filed Feb. 23, 1995, Ser. No. 35,260
Term of patent 14 years
U.S. Cl. D14—114



373,760
COMPUTER MOUSE
David Willheim, Los Gatos, Calif., assignor to Silicon Graphics, Inc., Mountain View, Calif.
Filed Jul. 22, 1991, Ser. No. 733,232
Term of patent 14 years
U.S. Cl. D14—114

373,762
GOLF MOTIF COMPUTER DUST COVER KIT
Virgil L. Samborsky, 5202 Hahn Ave., Fairborn, Ohio 45324
Filed May 19, 1995, Ser. No. 39,062
Term of patent 14 years
U.S. Cl. D14—114



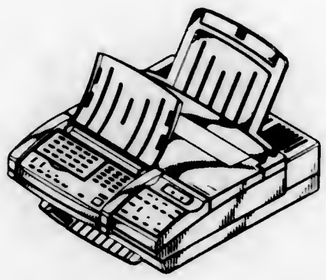
373,763
COMBINED SCANNER, PRINTER AND FACSIMILE

373,765

373,767
PORTABLE DIGITAL TELECOMMUNICATION DEVICE

373,769
ANTENNA BASE

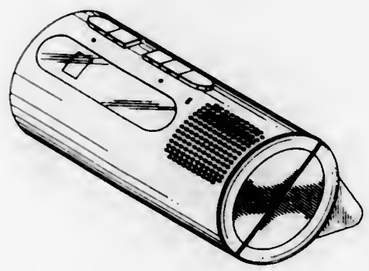
373,763
COMBINED SCANNER, PRINTER AND FACSIMILE
Michael E. Daley, Plano, Tex., assignor to Xerox Corporation, Stamford, Conn.
Filed Mar. 10, 1995, Ser. No. 36,046
Term of patent 14 years
U.S. Cl. D14—118



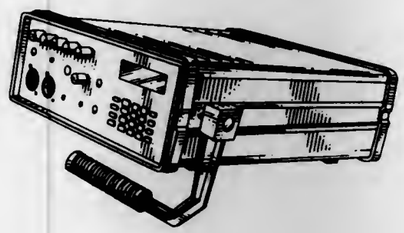
373,764
PORTABLE RADIOTELEPHONE HOUSING
Albert L. Nagele, Wilmette, and Leonid Soren, Lincolnwood, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Apr. 3, 1995, Ser. No. 37,094
Term of patent 14 years
U.S. Cl. D14—138

373,765
CELLULAR TELEPHONE WITH DISPLAY BELOW EARPHONE AND DIAL PAD
Renato Pellicioli, Venice, Italy, assignor to Consuldata S.r.l., Venice, Italy
Filed Jun. 26, 1995, Ser. No. 40,765
Claims priority, application Italy, Feb. 17, 1995, VE95O0003
Term of patent 14 years
U.S. Cl. D14—138

373,766
TELEPHONE ANSWERING MACHINE
Anthony Solomita, Norwalk, Conn., and Rita O'Connor, Mamaroneck, N.Y., assignors to Conair Corporation, Stamford, Conn.
Filed Oct. 10, 1995, Ser. No. 45,106
Term of patent 14 years
U.S. Cl. D14—141



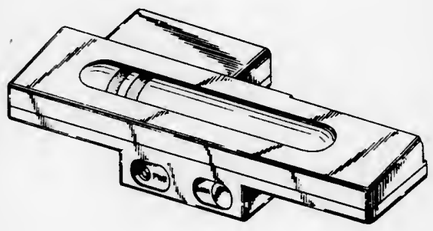
373,767
PORTABLE DIGITAL TELECOMMUNICATION DEVICE
Larry W. Hinderks, 37 Ladwood Dr., Holmdel, N.J. 07733
Filed Apr. 10, 1995, Ser. No. 39,772
Term of patent 14 years
U.S. Cl. D14—150



373,768
TOP MOUNT DISPLAY SELECTIVE CALL RECEIVER
Moo H. Hon, Johor, Malaysia; Lay H. Lim, and Yong C. Toh, both of Singapore, Singapore, assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 3, 1995, Ser. No. 42,203
Term of patent 14 years
U.S. Cl. D14—191

373,769
ANTENNA BASE
Glendon R. Whitehouse, Amherst, N.H., assignor to Cushcraft Corporation, Manchester, N.H.
Filed Aug. 18, 1995, Ser. No. 42,835
Term of patent 14 years
U.S. Cl. D14—238

373,770
ELECTRONIC COMPONENT HOUSING
Larry R. James, Regents Park, and Robert Ashley, Oakhurst, both of Australia, assignors to Alcatel Australia Ltd., Alexandria, Australia
Filed Jun. 9, 1993, Ser. No. 9,357
Claims priority, application Australia, Dec. 17, 1992, 3646/92
Term of patent 14 years
U.S. Cl. D14—240



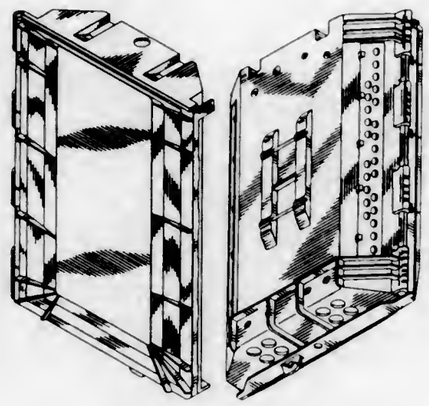
373,771
POLE MOUNTED HOUSING FOR

373,773
COMPRESSED COMBUSTION PISTON

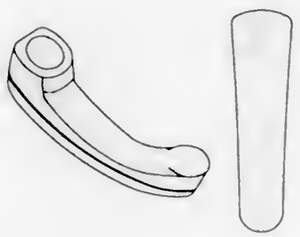
373,775

373,777

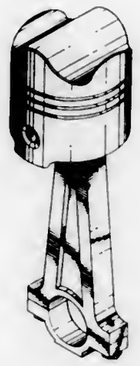
373,771
POLE MOUNTED HOUSING FOR TELECOMMUNICATION TERMINALS
Selim Messelhi, Etobicoke, Canada, assignor to Communications Technology Corporation, Dallas, Tex.
Filed Jul. 22, 1993, Ser. No. 11,002
Term of patent 14 years
U.S. Cl. D14—240



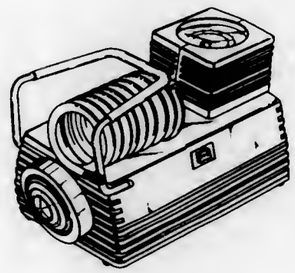
373,772
TELEPHONE HANDSET
Stephen E. Bennett, Succasunna, N.J.; Mark Biasotti, San Jose, Calif.; Reed S. Brown, Indianapolis, Ind.; Michael J. Nuttall, Portola Valley, Calif., and John H. Schaffeld, New Vernon, N.J., assignors to AT&T IPM Corp., Coral Gables, Fla.
Filed Dec. 30, 1994, Ser. No. 32,961
Term of patent 14 years
U.S. Cl. D14—248



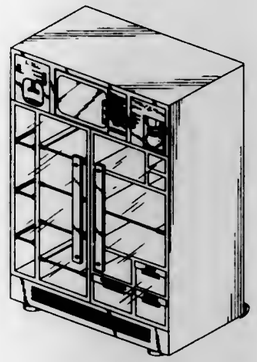
373,773
COMPRESSED COMBUSTION PISTON
Bernie Hund, Jr., 232 Fordham Cir., Pueblo, Colo. 81005
Filed Sep. 12, 1995, Ser. No. 43,791
Term of patent 14 years
U.S. Cl. D15—5



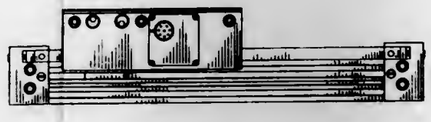
373,774
AIR COMPRESSOR
Chi-Wen Chen, P.O. Box 82-144, Taipei, Taiwan
Filed May 22, 1995, Ser. No. 39,168
Term of patent 14 years
U.S. Cl. D15—9



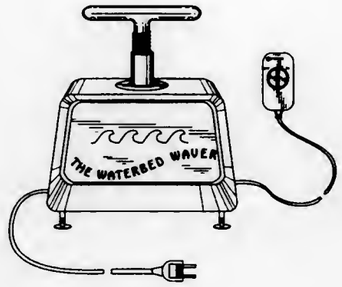
373,775
COMBINATION REFRIGERATOR
Cy K. Andrade, 4324 Kuli Rd., Box 198, Lawai, Hi. 96765
Filed Dec. 30, 1994, Ser. No. 32,972
Term of patent 14 years
U.S. Cl. D15—86



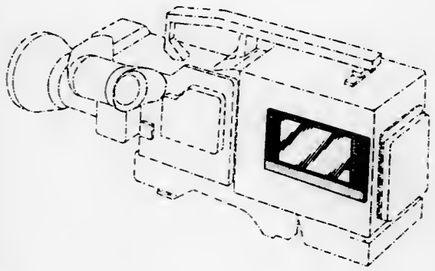
373,776
RODLESS CYLINDER WITH POSITION DETECTOR AND BRAKE
Hitoshi Yamamoto; Fukushima Kenji; Hiroyuki Shimono, and Nobuhiro Fujiwara, all of Yawara-mura, Japan, assignors to SMC Corporation, Tokyo, Japan
Filed Jul. 17, 1995, Ser. No. 41,542
Claims priority, application Japan, Jan. 23, 1995, 7-1016
Term of patent 14 years
U.S. Cl. D15—143



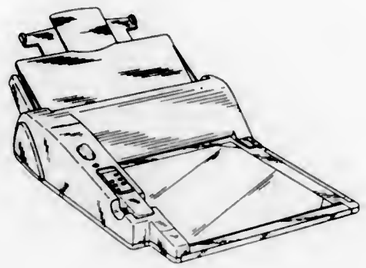
373,777
WATERBED WAVE GENERATOR
Kirk Carey, 513 Front Rd. N., Amherstburg, ONT, Canada
Filed Apr. 20, 1995, Ser. No. 37,775
Term of patent 14 years
U.S. Cl. D15—147



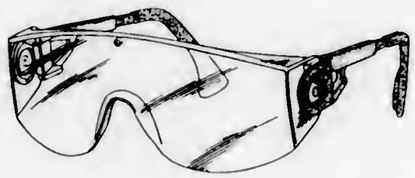
373,778
COMBINED FRONT PANEL DISPLAY AND ASSOCIATED INPUT UNIT FOR A VIDEO CAMERA
Peter Fasciano, Natick, and Jim McKain, Andover, both of Mass., assignors to Avid Technology, Inc., Tewksbury, Mass.
Filed Apr. 7, 1995, Ser. No. 37,244
Term of patent 14 years
U.S. Cl. D16—219



373,779
COMBINED OVERHEAD PROJECTOR AND AUTOMATIC FILM FEEDING UNIT
Yoshihiro Takahashi, Kanagawa-ken; Hiroshi Torikai, Chiba-ken, and Mitsuru Wakabayashi, Tokyo, all of Japan, assignors to Plus Corporation, Tokyo, Japan
Filed May 1, 1995, Ser. No. 38,201
Claims priority, application Japan, Oct. 31, 1994, 6-33210
Term of patent 14 years
U.S. Cl. D16—232

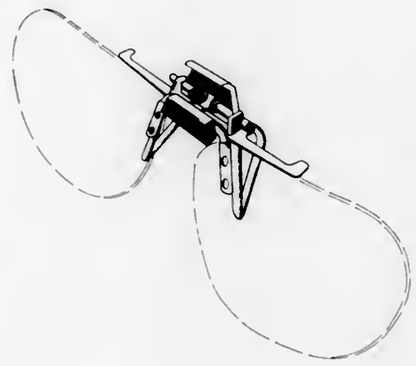


373,780
PROTECTIVE GLASSES
Klaus Wiedner, Fürth, Germany, assignor to Uvex Winter Optik GmbH, Fürth, Germany
Filed Mar. 17, 1995, Ser. No. 36,319
Claims priority, application Hague Agreement, Sep. 23, 1994, DM/030763
Term of patent 14 years
U.S. Cl. D16—314



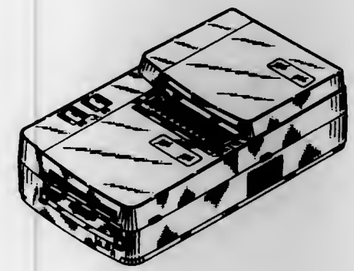
373,781
SUNGLASSES
Luciano Simioni, and Sergio Menegon, both of Montebelluna, Italy, assignors to Killer Loop S.p.A., Pederobba, Italy
Filed Jan. 26, 1995, Ser. No. 34,076
Claims priority, application Italy, Aug. 1, 1994, TV9400045
Term of patent 14 years
U.S. Cl. D16—327

373,782
SUNGLASS CLIP MECHANISM
Robert Shelton, Prinston, Mass., assignor to International Polarizer, Inc., Marlborough, Mass.
Filed May 2, 1994, Ser. No. 22,216
Term of patent 14 years
U.S. Cl. D16—332

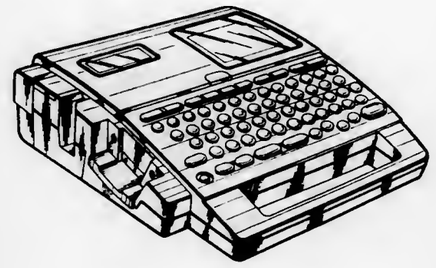


373,783
ELECTRONIC CALCULATOR WITH PRINTER
Haruki Ota, Kanagawa, and Yoshiharo Komuta, Zama, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jul. 24, 1995, Ser. No. 41,859
Term of patent 14 years
U.S. Cl. D18—7

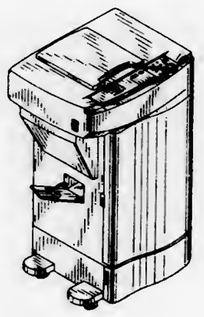
373,784
LABEL PRINTER
Keiichi Washizuka, Yokohama, and Osamu Mimoto, Sagamihara, both of Japan, assignors to Kabushiki Kaisha Tec, Shizuoka, Japan
Filed May 2, 1995, Ser. No. 38,287
Claims priority, application Japan, Nov. 15, 1994, 6-34796
Term of patent 14 years
U.S. Cl. D18—19



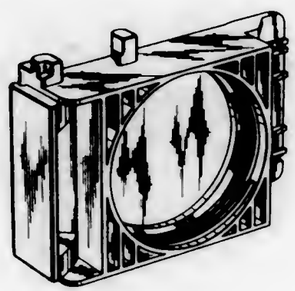
373,785
TAPE PRINTER
Kenji Watanabe; Takanobu Kameda; Chieko Aida, and Tomoyuki Shimmura, all of Tokyo, Japan, assignors to King Jim Co., Ltd., Tokyo, Japan
Filed May 16, 1995, Ser. No. 38,907
Claims priority, application Japan, Nov. 16, 1994, 6-34758
Term of patent 14 years
U.S. Cl. D18—19



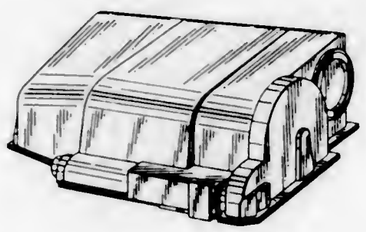
373,786
COPYING MACHINE
Shozo Kondo, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Oct. 19, 1995, Ser. No. 45,445
Claims priority, application Japan, Apr. 20, 1995, 7-11187
Term of patent 14 years
U.S. Cl. D18—39



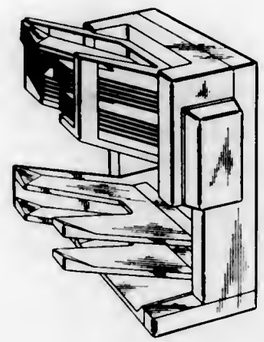
373,787
TONER BOTTLE CAP FOR COPYING MACHINE
Masataka Isomoto, and Toshiaki Nagashima, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 27, 1995, Ser. No. 36,716
Claims priority, application Japan, Sep. 30, 1994, 6-29874
Term of patent 14 years
U.S. Cl. D18—40



373,788
SUPPLY UNIT FOR SUPPLYING A DEVELOPER FOR A COPYING MACHINE
Toshiyuki Kurisu, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed May 18, 1995, Ser. No. 39,008
Claims priority, application Japan, Jan. 20, 1995, 7-899
Term of patent 14 years
U.S. Cl. D18—43

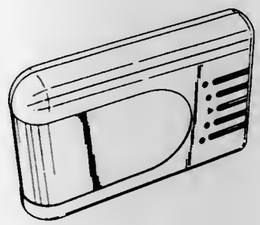


373,789
OUTPUT PAPER DISTRIBUTOR
Hideki Narushima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 12, 1995, Ser. No. 38,727
Claims priority, application Japan, Nov. 14, 1994, 6-34662
Term of patent 14 years
U.S. Cl. D18—48

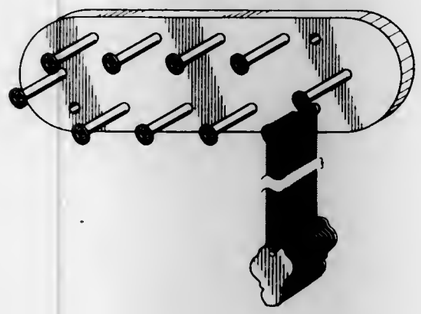


373,790
OFFSET PRINTING MACHINE
Nobuhiko Karafuji, Chiyoda-ku, and Toshiyuki Miyake, Fuchu, both of Japan, assignors to Ryobi Limited, Japan
Filed Sep. 1, 1995, Ser. No. 43,337
Claims priority, application Japan, Mar. 2, 1995, D07-5953
Term of patent 14 years
U.S. Cl. D18—53

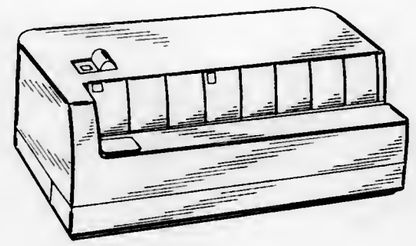
373,791
CARTRIDGE FOR VIDEO PRINTER
Fujio Nobata, Tokyo, Japan, assignor to Sega Enterprises, Ltd., Tokyo, Japan
Filed Nov. 14, 1995, Ser. No. 46,431
Claims priority, application Japan, May 16, 1995, 7-13581
Term of patent 14 years
U.S. Cl. D18—56



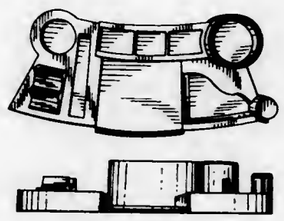
373,792
PRESCHOOL TEACHING AID
Patsy R. Wall, c/o George Oen Dollins 8038 Wood La., Terrell, Tex. 75160
Filed May 30, 1995, Ser. No. 39,489
Term of patent 14 years
U.S. Cl. D19—64



373,793
ELECTRIC PAPER PUNCH
Walter B. Herbst, Evanston, and Ralph Lazar, Skokie, both of Ill., assignors to General Binding Corporation, Northbrook, Ill.
Filed Jun. 27, 1994, Ser. No. 25,110
Term of patent 14 years
U.S. Cl. D19—72



373,794
DESK ORGANIZER
Kwok T. Ming, Chai Wan, Hong Kong, assignor to P.M.P. Industrial Ltd., Hong Kong
Filed Jan. 30, 1995, Ser. No. 34,207
Term of patent 14 years
U.S. Cl. D19—75



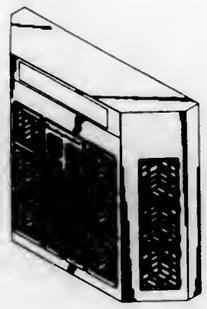
373,795
ELECTRIC MACHINE FOR FLOWERS
Ming-Hsiung Chen, Taipei, Taiwan
Filed Jan. 30, 1995, Ser. No. 34,208
Term of patent 14 years
U.S. Cl. D19—80

373,797
WEATHER DIE
Jeffrey Lee Hall, Lake Oswego, Oreg., assignor to Nike, Inc., Beaverton, Oreg.
Filed Jun. 27, 1995, Ser. No. 41,000
Term of patent 14 years
U.S. Cl. D21—379

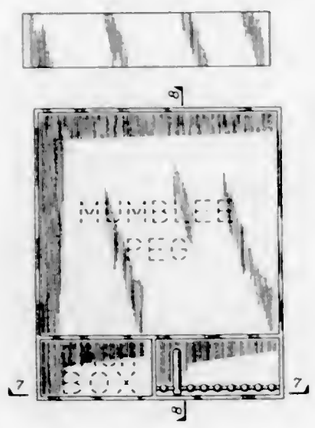
373,799
SPOOL FOR FISHING LINE
Yoshiaki Kawabata, Osaka, Japan, assignor to Shimano, Inc., Osaka, Japan
Filed Jan. 30, 1995, Ser. No. 34,209
Term of patent 14 years
U.S. Cl. D22—111

373,801
FISHING REEL
Yoshiaki Kawabata, Osaka, Japan, assignor to Shimano, Inc., Osaka, Japan
Filed Jan. 30, 1995, Ser. No. 34,210
Term of patent 14 years
U.S. Cl. D22—111

373,795
VENDING MACHINE FOR FLOWERS
Jeffrey L. Bush, 2001 Hamilton St., Philadelphia, Pa. 19130
Filed Jul. 20, 1995, Ser. No. 41,648
Term of patent 14 years
U.S. Cl. D20—4

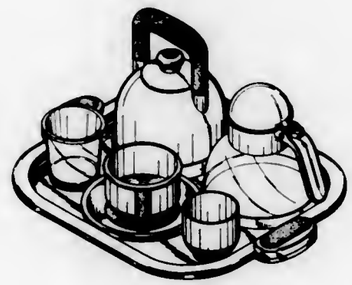


373,796
GAME BOX WITH INDIVIDUAL PIVOTABLE PEGS
George J. Carlson, Box 431, Midale Saskatchewan, Canada
Filed May 12, 1995, Ser. No. 38,740
Term of patent 14 years
U.S. Cl. D21—37

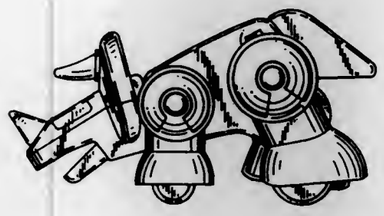


373,797
WEATHER DIE
Richard A. Siegel, 518 Hudson St., 3RF, Hoboken, N.J. 07030
Continuation-in-part of Ser. No. 929,147, Aug. 13, 1992, abandoned. This application Dec. 14, 1993, Ser. No. 16,343
Term of patent 14 years
U.S. Cl. D21—41

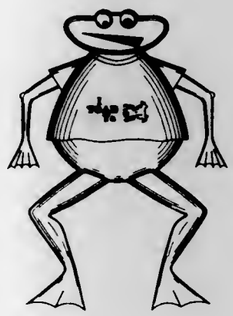
373,798
TOY COFFEE SET
Chin-Long Yang, No. 48, Lane 502, Wen Shyan Rd., Tainan, Taiwan
Filed Dec. 20, 1994, Ser. No. 32,524
Term of patent 14 years
U.S. Cl. D21—121



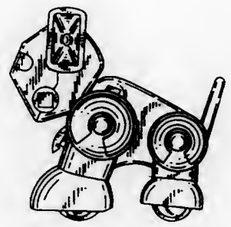
373,799
TOY FIGURINE
Keiko Doi, and Masatsune Sasaki, both of Tokyo, Japan, assignors to Tomy Company, Ltd., Tokyo, Japan
Filed Apr. 28, 1995, Ser. No. 38,094
Claims priority, application Japan, Oct. 28, 1994, 6-33084
Term of patent 14 years
U.S. Cl. D21—148



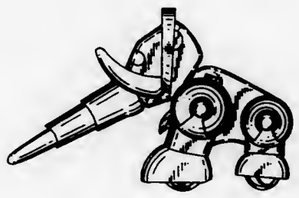
373,800
TOAD FIGURE
Darlene A. Lance, 8730 Centerridge Point, Centerville, Ohio 45458, and Marlene S. Humphrey, 6570 Pine Cone Dr., Dayton, Ohio 45449
Filed Jul. 24, 1995, Ser. No. 42,038
Term of patent 14 years
U.S. Cl. D21—158



373,801
TOY FIGURINE
Keiko Doi, and Masatsune Sasaki, both of Tokyo, Japan, assignors to Tomy Company, Ltd., Tokyo, Japan
Filed Apr. 28, 1995, Ser. No. 38,093
Claims priority, application Japan, Oct. 28, 1994, 6-33082
Term of patent 14 years
U.S. Cl. D21—161

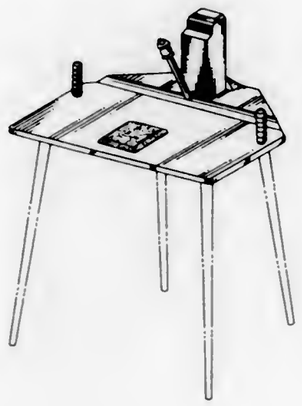


373,802
TOY FIGURINE
Keiko Doi, and Masatsune Sasaki, both of Tokyo, Japan, assignors to Tomy Company, Ltd., Tokyo, Japan
Filed Apr. 28, 1995, Ser. No. 38,092
Claims priority, application Japan, Oct. 28, 1994, 6-33083
Term of patent 14 years
U.S. Cl. D21—162



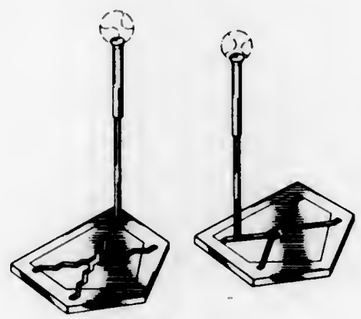
373,803
COMBINED ANKLE AND WRIST STRAP FOR EXERCISE
Louis A. Winans, 4 Hillside Ct. #2, Endicott, N.Y. 13760
Filed Jan. 3, 1995, Ser. No. 33,013
Term of patent 14 years
U.S. Cl. D21—191

373,804
ARM WRESTLING MACHINE
Straughter H. Hurley, 48102 Reservoir Rd., St. Clairsville, Ohio 43950
Filed Feb. 1, 1995, Ser. No. 34,325
Term of patent 14 years
U.S. Cl. D21—195



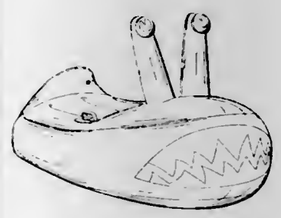
373,805
EXERCISE APPARATUS
R. Lee Rawls, Woodinville; James A. Duncan, Renton, both of Wash.; Kristin Conley, Lynnfield, Mass.; Jerry W. Lee, Kirkland, and Craig L. Johnson, Bothell, both of Wash., assignors to StairMaster Sports/Medical Products, L.P., Kirkland, Wash.
Filed Jul. 24, 1995, Ser. No. 41,783
Term of patent 14 years
U.S. Cl. D21—195

373,806
BATTING TEE
Ronald E. Bunnell, 5054 Loblolly Bay La., Orlando, Fla. 32829
Filed Mar. 28, 1995, Ser. No. 36,824
Term of patent 14 years
U.S. Cl. D21—199

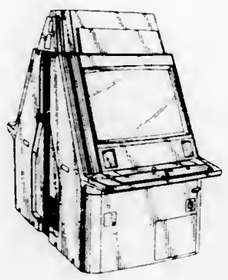


373,807
ICE SKATE BLADE
Jerker E. Swande, Stockholm, Sweden, assignor to Örebroskenan Aktiebolag, Örebro, Sweden
Filed Jan. 18, 1994, Ser. No. 17,763
Claims priority, application Sweden, Jul. 15, 1993, 93-1615
Term of patent 14 years
U.S. Cl. D21—225

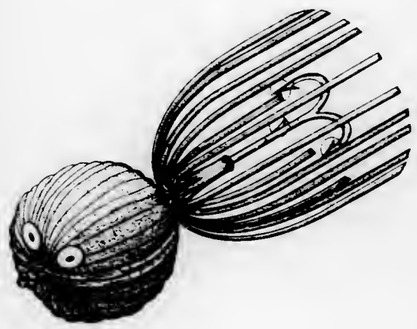
373,808
POOL FLOAT
Lee Nicholson, 1377 Benning Pl., Apartment No. 3, Atlanta, Ga. 30307
Filed Apr. 28, 1995, Ser. No. 38,085
Term of patent 14 years
U.S. Cl. D21—237



373,809
VIDEO GAME MACHINE
Jun Hirato, Tokyo, Japan, assignor to Sega Enterprises, Ltd., Japan
Filed Aug. 15, 1995, Ser. No. 42,622
Claims priority, application Japan, Feb. 20, 1995, 7-4313
Term of patent 14 years
U.S. Cl. D21—240



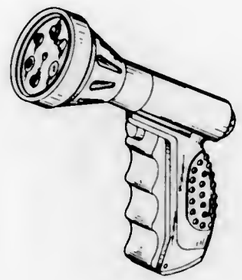
373,810
FISHING LURE
Michael L. Waller, 125 Ridgecrest Dr., Greenville, S.C. 29609
Filed Oct. 5, 1994, Ser. No. 29,421
Term of patent 14 years
U.S. Cl. D22—128



373,811
SPINNING FISH LURE
Daniel G. Haddad, P.O. Box 1912, Highlands, N.C. 28741
Filed Oct. 4, 1995, Ser. No. 44,955
Term of patent 14 years
U.S. Cl. D22—130

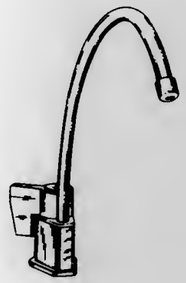
373,812
FISHING REEL SEAT
Shinya Takizawa, Musashino; Shigeru Yamamoto, and Teiji Matsubara, both of Higashikurume, all of Japan, assignors to Daiwa Seiko, Inc., Higashikurume, Japan
Filed Aug. 1, 1995, Ser. No. 42,129
Claims priority, application Japan, Feb. 2, 1995, 7-2455
Term of patent 14 years
U.S. Cl. D22—142

373,813
WATER SPRAY GUN
Wei-Li Guo, No. 10, Fang Tung Road, Wen Chien Tsun, Fang Yuan Hsiang, Changhua Hsien, Taiwan
Filed May 10, 1995, Ser. No. 38,684
Term of patent 14 years
U.S. Cl. D23—223



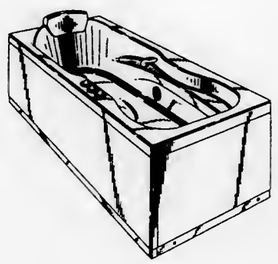
373,814
HOSE NOZZLE
Chin-Yuan Wang, Changhua Hsien, Taiwan, assignor to Yuan Mei corp., Changhua Hsien, Taiwan
Filed Jun. 30, 1995, Ser. No. 40,998
Term of patent 14 years
U.S. Cl. D23—226

373,815
FAUCET
David B. Chaney, Westerville, Ohio, assignor to Amy Controls Inc., Valencia, Calif.
Filed Jul. 31, 1995, Ser. No. 42,818
Term of patent 14 years
U.S. Cl. D23—241



373,816
FAUCET HANDLE
Paul P. Kolada, Columbus, Ohio, assignor to American Standard Inc., Piscataway, N.J.
Filed Jul. 18, 1994, Ser. No. 25,931
Term of patent 14 years
U.S. Cl. D23—250

373,817
BATHTUB
Federico Andronico, Treviso, Italy, assignor to Albatros System S.p.A., Pordenone, Italy
Filed Aug. 16, 1994, Ser. No. 27,200
Claims priority, application Italy, Mar. 10, 1994, PN9400005
Term of patent 14 years
U.S. Cl. D23—277



373,818
TOILET
Richard Sanchez, Bellflower, Calif., and Sun C. Chou, Taipei, Taiwan, assignors to Western Pottery Company, Inc., Paramount, Calif.
Filed Jun. 13, 1995, Ser. No. 42,704
Term of patent 14 years
U.S. Cl. D23—301

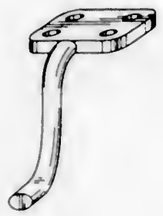
373,819
TOILET SEAT HANDLE

373,821
FRONT PANEL FOR A ROOM AIR CONDITIONER

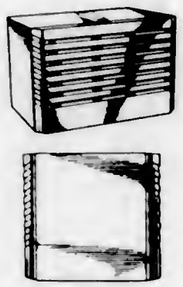
373,823
GASTROINTESTINAL TUBE SYRINGE HOLDER
Donald M. Baldwin, 76 Woodlake Blvd., Millburn, Ohio 43447

373,825
RIBBED AUGMENT FOR A PROSTHETIC IMPLANT

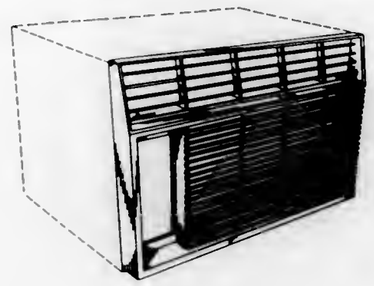
373,819
TOILET SEAT HANDLE
Yehiel Suynov, 142 W. Walnut St., Long Beach, N.Y. 11561
Filed Sep. 7, 1995, Ser. No. 43,600
Term of patent 14 years
U.S. Cl. D23—311



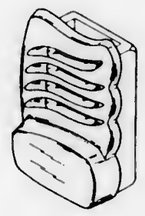
373,820
ROOF HOUSING FOR A REFRIGERATING MACHINE
Norbert Müller, Dietzhölztal; Adam Pawlowski, Dillenburg, and Heinrich Styppa, Giessen, all of Germany, assignors to Rittal-Werk Rudolf Loh GmbH & Co. KG, Germany
Filed Oct. 18, 1994, Ser. No. 29,898
Claims priority, application Germany, Apr. 18, 1994, M 9403157.6
Term of patent 14 years
U.S. Cl. D23—354



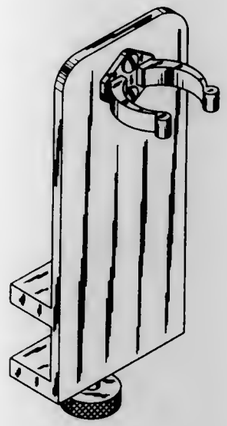
373,821
FRONT PANEL FOR A ROOM AIR CONDITIONER
Christopher M. Thompson, Nashville, and Brian J. Phillips, Smyrna, both of Tenn., assignors to Whirlpool Corporation, Benton Harbor, Mich.
Division of Ser. No. 007,404, Apr. 22, 1993, Pat. No. Des. 366,105. This application Sep. 13, 1995, Ser. No. 43,860
Term of patent 14 years
U.S. Cl. D23—354



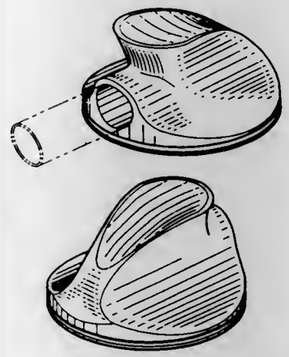
373,822
VAPOR DISPENSER
Stephen B. Leonard, Calidonia, Wis., and Anthony M. Kulusic, Chicago, Ill., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Aug. 18, 1995, Ser. No. 42,841
Term of patent 14 years
U.S. Cl. D23—366



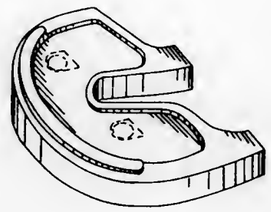
373,823
GASTROINTESTINAL TUBE SYRINGE HOLDER
Donald M. Baldwin, 76 Woodlake Blvd., Millbury, Ohio 43447
Filed Oct. 20, 1994, Ser. No. 29,970
Term of patent 14 years
U.S. Cl. D24—128



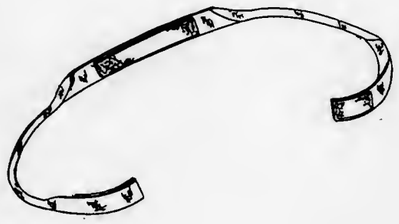
373,824
STETHOSCOPE CHESTPIECE
Joy A. Packard, and Thomas J. Packard, both of Somerset, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Aug. 3, 1994, Ser. No. 25,229
Term of patent 14 years
U.S. Cl. D24—134



373,825
RIBBED AUGMENT FOR A PROSTHETIC IMPLANT
Kevin B. Hayes, Milford, Ind., assignor to Zimmer, Inc., Warsaw, Ind.
Division of Ser. No. 18,301, Jan. 28, 1994, Pat. No. Des. 365,396. This application Sep. 8, 1995, Ser. No. 43,636
Term of patent 14 years
U.S. Cl. D24—155



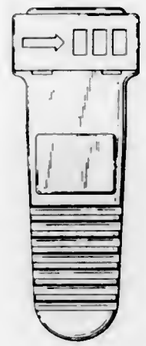
373,826
COMBINED PELVIC SUPPORT BELT AND PAD
Charles Pujals, Jr., 119 Fayette St., Bridgeton, N.J. 08302
Filed Aug. 6, 1992, Ser. No. 925,627
Term of patent 14 years
U.S. Cl. D24—190



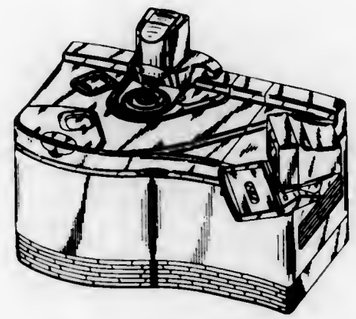
373,827
DISPOSABLE PROBE TIP
James P. Polaniec, No. Ridgeville, Ohio, assignor to Ciba Corning Diagnostics Corp., Medfield, Mass.
Filed Jul. 10, 1995, Ser. No. 41,199
Term of patent 14 years
U.S. Cl. D24—222

373,828
MULTIPLE TIP LIQUID TRANSFER PIPETTE
Don Malinoff, Granada Hills, and Ara Martirosian, Woodland Hills, both of Calif., assignors to DBM Scientific Corporation, Valencia, Calif.
Division of Ser. No. 21,459, Apr. 18, 1994, Pat. No. Des. 368,142. This application Sep. 22, 1995, Ser. No. 44,404
Term of patent 14 years
U.S. Cl. D24—222

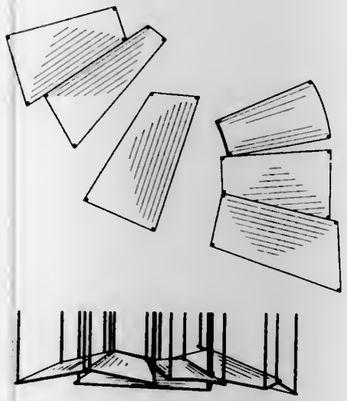
373,829
HOLDER FOR AN ASSAY DEVICE
Christopher C. Pallender, Rise park, United Kingdom, assignor to Applied Research Systems ARS Holding N.V, Netherlands
Filed May 3, 1995, Ser. No. 38,624
Claims priority, application United Kingdom, Nov. 4, 1994, D2043095
Term of patent 14 years
U.S. Cl. D24—224



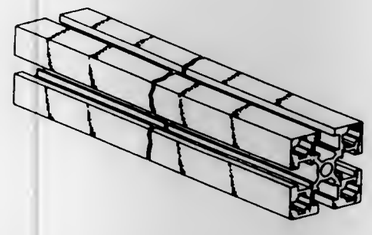
373,830
CHEMICAL ANALYZER
Angelo M. LaBarbera, Honeoye; Michael E. Bausch; Richard S. Perriello, both of Rochester, all of N.Y., and Giorgetto Giugiaro, Torino, Italy, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Jun. 24, 1994, Ser. No. 25,002
Term of patent 14 years
U.S. Cl. D24—232



373,831
CEILING
Paul R. Lechleiter, Powell, and Mark B. Artus, Beechwold, both of Ohio, assignors to Blockbuster Entertainment Inc., Ft. Lauderdale, Fla.
Filed Mar. 16, 1995, Ser. No. 36,260
Term of patent 14 years
U.S. Cl. D25—58

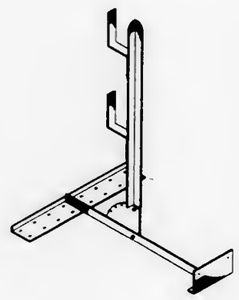


373,832
FRAME BAR FOR CONSTITUTING A FRAME STRUCTURE
Ryoichi Nomura, Toyama, Japan, assignor to NIC Autotec Co., Ltd., Toyama, Japan
Filed Jun. 3, 1994, Ser. No. 23,942
Term of patent 14 years
U.S. Cl. D25—122



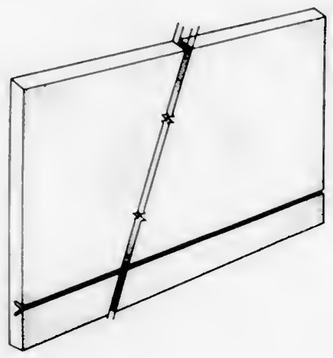
373,833
DECORATIVE SUPPORT POST
John K. Lapp, Jr., 622 N. Shirk Rd., New Holland, Pa. 17557
Filed Feb. 28, 1995, Ser. No. 35,513
Term of patent 14 years
U.S. Cl. D25—126

373,834
ADJUSTABLE HANDRAIL POST
James D. McMillian, 6406 Elkhart, Lubbock, Tex. 79424; Virgil R. Wages, 4910 7th St., Lubbock, Tex. 79416, and Walton J. Austin, 519 40th St., Lubbock, Tex. 79404
Filed Apr. 24, 1995, Ser. No. 37,914
Term of patent 14 years
U.S. Cl. D25—126

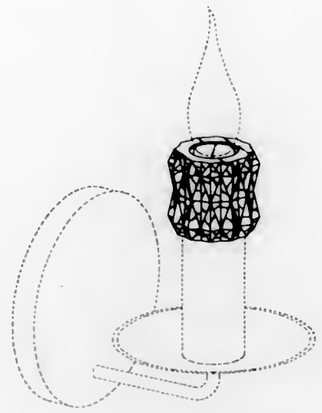


373,835
BASE FOR MARINE POLE LIGHT
Brent A. Reichard, Greenville, Mich., assignor to Attwood Corporation, Grand Rapids, Mich.
Filed Apr. 10, 1995, Ser. No. 37,298
Term of patent 14 years
U.S. Cl. D25—134

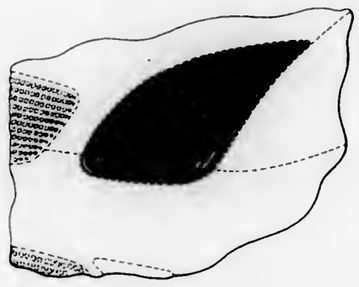
373,836
GROOVED CLADDING BOARD
John Bado, Greenfield Park, and Joseph E. Zarb, Fairfield West, both of Australia, assignors to James Hardie Research Pty Limited, Sydney, Australia
Filed Sep. 23, 1994, Ser. No. 28,865
Claims priority, application Australia, Mar. 29, 1994, 1011/94
Term of patent 14 years
U.S. Cl. D25—138



373,837
FACETED CANDLE FOLLOWER
Libbe A. Milicia, Garfield Heights, Ohio, assignor to The L.D. Kichler Co., Cleveland, Ohio
Filed May 24, 1995, Ser. No. 39,335
Term of patent 14 years
U.S. Cl. D26—23

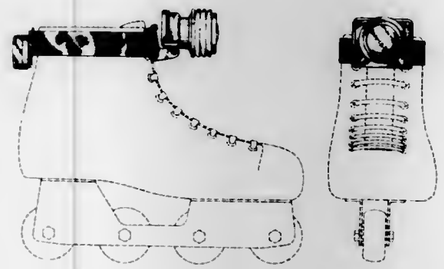


373,838
EXTERIOR FACING SURFACE CONFIGURATION OF A FRONT HEADLIGHT OF AN AUTOMOBILE
Bruno Sacco, Sindelfingen, and Peter Pfeiffer, Boeblingen, both of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany
Filed Oct. 7, 1994, Ser. No. 29,493
Claims priority, application Germany, Apr. 7, 1994, M 94 02 933.4; Apr. 8, 1994, M 94 02 985.9
Term of patent 14 years
U.S. Cl. D26—28

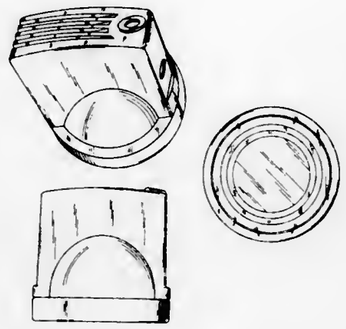


373,839
ILLUMINABLE INDICATOR FOR BICYCLE WHEELS
Mohamed Rasul, 10 James Edward Drive, Markam, Ontarioa, Canada
Filed Jan. 30, 1995, Ser. No. 34,181
Term of patent 14 years
U.S. Cl. D26—28

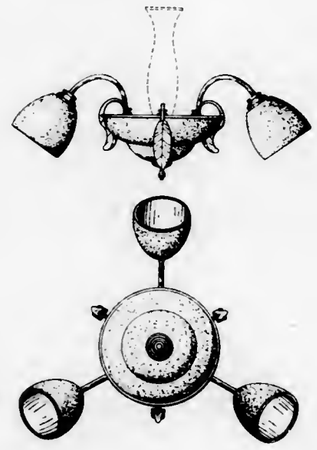
373,840
BOOT-MOUNTABLE LIGHT
Julius Starkman, 50 Cochituate Rd., Newton, Mass. 02161
Filed Jul. 10, 1995, Ser. No. 41,242
Term of patent 14 years
U.S. Cl. D26—39



373,841
LOW-VOLTAGE TRACK LIGHTING FIXTURE
Donald Wandler, Racine, Wis.; Julito A. Bustamante, Waukegan, Ill.; Kent Solberg, Racine, Wis., and Cory Ternberg, Racine, Wis., assignors to Ruud Lighting, Inc., Racine, Wis.
Filed Sep. 19, 1995, Ser. No. 44,173
Term of patent 14 years
U.S. Cl. D26—63



373,842
CHANDELIER
Jean Lupien, Sainte-Adèle, Canada, assignor to Nadair International Ltd., Laval, Canada
Filed Dec. 23, 1994, Ser. No. 32,690
Claims priority, application Canada, Dec. 1, 1994, 1994-2389
Term of patent 14 years
U.S. Cl. D26—84



373,843
DOUBLE STEM TABLE LAMP

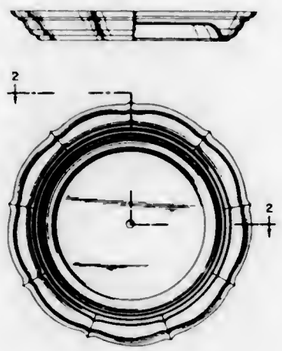
373,845
SET OF BODY MEMBERS AND BOBECHES FOR A

373,847
CIGARETTE TOBACCO CONTAINER
Frank Gottvald, and Robert Capling, both of Toronto, Canada,

373,849
CURLING IRON HOLDER
Joseph M. Passalacqua, 4235 Airway Dr. NE., Moses Lake,

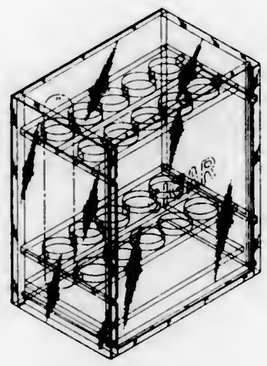
373,843
DOUBLE STEM TABLE LAMP
Robert A. Sonneman, Mamaroneck, N.Y., assignor to Sonneman Design Group, Larchmont, N.Y.
Continuation-in-part of Ser. No. 35,970, Mar. 10, 1995. This application Oct. 2, 1995, Ser. No. 44,865
Term of patent 14 years
U.S. Cl. D26—106

373,844
LIGHTING FIXTURE PAN
Pasquale Miranda, Briarcliff Manor, N.Y., assignor to Murray Feiss Import Corp., Bronx, N.Y.
Filed Mar. 3, 1995, Ser. No. 35,648
Term of patent 14 years
U.S. Cl. D26—149

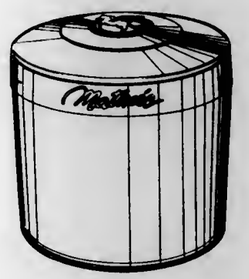


373,845
SET OF BODY MEMBERS AND BOBECHES FOR A CHANDELIER
Patrick S. Dolan, 1901 NW. Upshur St., Portland, Oreg. 97209
Filed Apr. 25, 1995, Ser. No. 38,071
Term of patent 14 years
U.S. Cl. D26—149

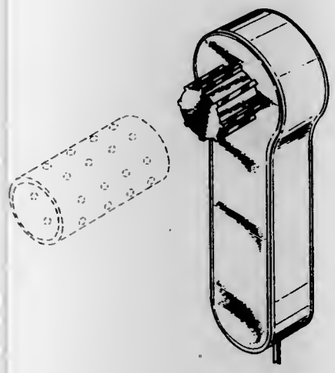
373,846
CIGAR DISPENSER
Lewis Rothman, 20 Normandy Pkwy., Morristown, N.J. 07960
Filed Feb. 21, 1995, Ser. No. 35,144
Term of patent 14 years
U.S. Cl. D27—172



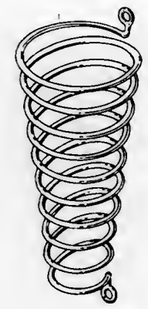
373,847
CIGARETTE TOBACCO CONTAINER
Frank Gottvald, and Robert Capling, both of Toronto, Canada, assignors to Imperial Tobacco Limited, Montreal, Canada
Division of Ser. No. 33,053, Jan. 4, 1995. This application Nov. 17, 1995, Ser. No. 46,513
Claims priority, application Canada, Sep. 27, 1994, 1994-1870
Term of patent 14 years
U.S. Cl. D27—189



373,848
AUTOMATIC HAIR CURLER
Patricia A. Path, 1936 Wood St., Muskegon, Mich. 49442
Filed Jun. 8, 1995, Ser. No. 40,044
Term of patent 14 years
U.S. Cl. D28—35



373,849
CURLING IRON HOLDER
Joseph M. Passalacqua, 4235 Airway Dr. NE., Moses Lake, Wash. 98837
Filed May 24, 1995, Ser. No. 39,320
Term of patent 14 years
U.S. Cl. D28—38



373,850
DECORATIVE FASHION ACCESSORY FOR HAIR
Rommy H. Revson, 225 E. 57th St., Apt. 19H, New York, N.Y. 10022
Filed Jul. 7, 1992, Ser. No. 909,645
Term of patent 14 years
U.S. Cl. D28—41

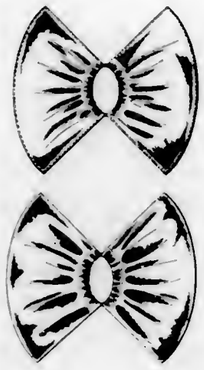
373,851
HAIR BAND
Ann Marie Ferrara, Bronx, N.Y.
Filed Jul. 7, 1995, Ser. No. 41,911
Term of patent 14 years
U.S. Cl. D28—41

373,853
HANDLE FOR A SURGICAL CLIPPPER
Jeffrey Bruce Bindokas, Chicago, Ill., assignor to Ethicon, Inc., Somerville, N.J.
Filed Jul. 7, 1995, Ser. No. 41,910
Term of patent 14 years
U.S. Cl. D28—54

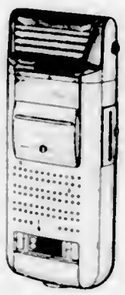
373,855
TRACTABLE TILE
Jeffrey Bruce Bindokas, Chicago, Ill., assignor to Ethicon, Inc., Somerville, N.J.
Filed Jul. 7, 1995, Ser. No. 41,909
Term of patent 14 years
U.S. Cl. D28—54

373,857
HELMET BODY FOR BICYCLIST
Jeffrey Bruce Bindokas, Chicago, Ill., assignor to Ethicon, Inc., Somerville, N.J.
Filed Jul. 7, 1995, Ser. No. 41,908
Term of patent 14 years
U.S. Cl. D29—102

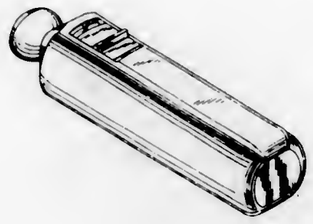
373,851
HAIR BAND
Lynnabeth Martinez, 7349 Via Paseo del Sur, Suite 515-457, Scottsdale, Ariz. 85258
Filed Aug. 26, 1994, Ser. No. 27,689
Term of patent 14 years
U.S. Cl. D28—41



373,852
ELECTRIC DRY SHAVER
Roland Ullmann, Offenbach, Germany, assignor to Braun Aktiengesellschaft, Frankfurt, Germany
Filed Jan. 6, 1994, Ser. No. 17,167
Claims priority, application Hague Agreement, Jul. 9, 1993, DMA/002213
Term of patent 14 years
U.S. Cl. D28—49



373,853
HANDLE FOR A SURGICAL CLIPPPER
Scott Melton, Erie, and Christine M. Wagenknecht, Milledgeville, both of Ill., assignors to Wahl Clipper Corporation, Sterling, Ill.
Filed Oct. 21, 1994, Ser. No. 30,172
Term of patent 14 years
U.S. Cl. D28—54

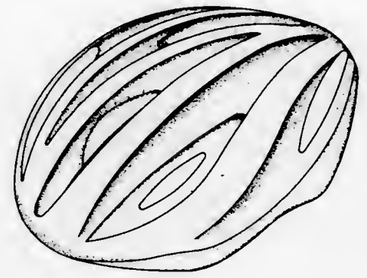


373,854
COMBINED NAIL FILE AND HOLDER
Larry E. Hudson, Grand Rapids, Mich., assignor to ESI Industries, Inc., Grand Rapids, Mich.
Filed Sep. 30, 1994, Ser. No. 29,241
Term of patent 14 years
U.S. Cl. D28—59

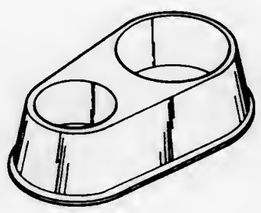
373,855
FINGERNAIL FILE
Marlene M. Jurosek-Bland, 6205 Meriden Ct., Canal Winchester, Ohio 43110
Filed Jun. 19, 1995, Ser. No. 40,436
Term of patent 14 years
U.S. Cl. D28—59

373,856
DENTAL FLOSSING DEVICE
Steven K. Levine, 34 Cross Ridge Rd., Chappaqua, N.Y. 10514
Filed Apr. 17, 1995, Ser. No. 38,778
Term of patent 14 years
U.S. Cl. D28—64

373,857
HELMET BODY FOR BICYCLIST
Tomihiro Fujita, Osaka, Japan, assignor to O.G.K. Hanbai Co., Ltd., Osaka, Japan
Filed May 11, 1995, Ser. No. 38,656
Claims priority, application Japan, Mar. 7, 1995, 7-6285
Term of patent 14 years
U.S. Cl. D29—102



373,858
PET FEEDER
Yin-Tsang Chen, No. 51. Lane 490. Chung Cheng S. Rd., Yung Kang, Tainan, Taiwan
Filed May 17, 1995, Ser. No. 38,956
Term of patent 14 years
U.S. Cl. D30—130



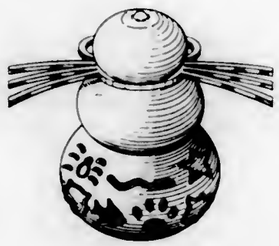
373,859

373,861

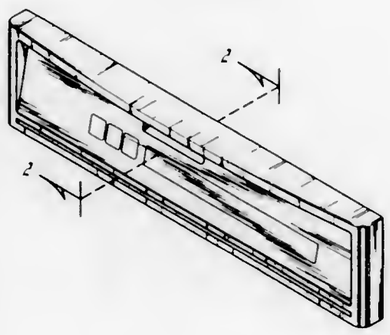
373,863
SNOW AND ICE SCRAPER

373,865
SWIVEL BASE FOR A BUCKET

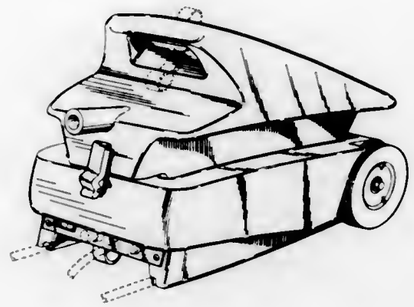
373,859
CAT TOY
Joseph P. Markham, Arvada, and James W. Golden, Littleton, both of Colo., assignors to Bounce, Inc., Lakewood, Colo.
Filed Sep. 27, 1995, Ser. No. 44,631
Term of patent 14 years
U.S. Cl. D30—160



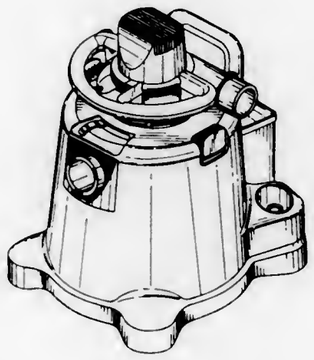
373,860
CONTROL PANEL FOR DISHWASHER
Darrin S. Manke, Des Moines, Iowa, assignor to Maytag Corporation, Newton, Iowa
Filed Nov. 1, 1994, Ser. No. 30,555
Term of patent 14 years
U.S. Cl. D32—3



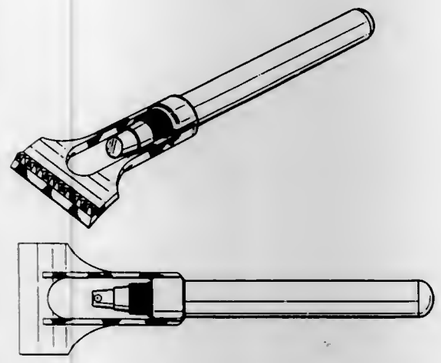
373,861
PORTABLE CARPET CLEANING MACHINE
Thomas S. Block, Muskegon, Mich., assignor to Pacific Steamex Cleaning Systems, Inc., Muskegon, Mich.
Filed Dec. 30, 1994, Ser. No. 32,978
Term of patent 14 years
U.S. Cl. D32—21



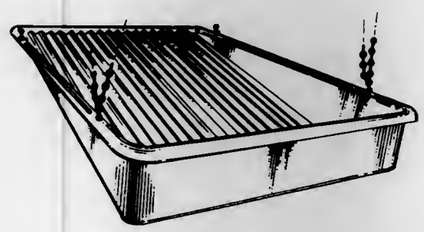
373,862
COMBINED WET/DRY VACUUM CLEANER WITH A DETACHABLE BLOWER
Paul D. Stephens, Cleveland Heights; Craig M. Saunders, Rocky River; Michael F. Wright, Cuyahoga Falls; Richard C. Farone, Wickliffe, and John F. Sovis, Twinsburg, all of Ohio, assignors to Royal Appliance Mfg. Co., Cleveland, Ohio
Filed Jan. 6, 1994, Ser. No. 17,193
Term of patent 14 years
U.S. Cl. D32—23



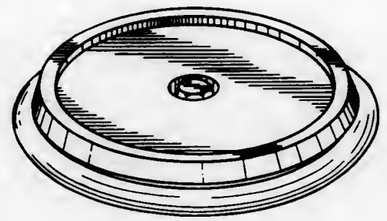
373,863
SNOW AND ICE SCRAPER
Charles G. Shepherd, 1008 Westdale Road, Oakville, Ontario, Canada
Filed Aug. 29, 1995, Ser. No. 43,205
Term of patent 14 years
U.S. Cl. D32—42



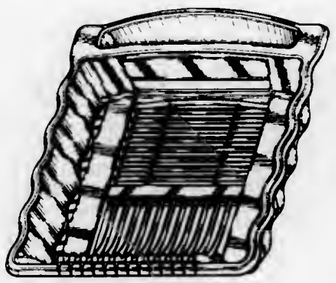
373,864
DROP TRAY FOR INJECTION MOLDED PARTS
Woodrow W. Pearce, 1601 Puebla Dr., Glendale, Calif. 91207
Filed Apr. 11, 1995, Ser. No. 37,374
Term of patent 14 years
U.S. Cl. D32—53.1



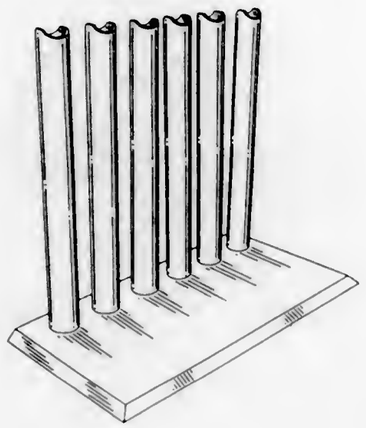
373,865
SWIVEL BASE FOR A BUCKET
Thomas P. Wells, 120 Hemlock St., Broomfield, Colo. 80020
Filed Jan. 30, 1995, Ser. No. 34,182
Term of patent 14 years
U.S. Cl. D32—54



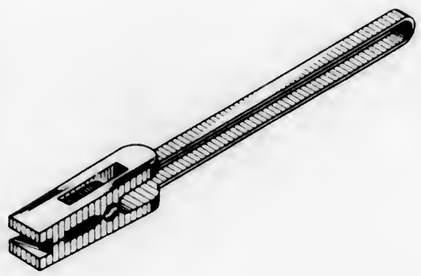
373,866
DRAINER FOR DISHES
Dennis D. Belden, Jr., Akron; Keith E. Brightbill, Wooster; Stephen P. Casteel, Wadsworth; Charles W. Craft, Apple Creek, and Diana W. Juratovac, Columbus, all of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Dec. 14, 1994, Ser. No. 32,173
Term of patent 14 years
U.S. Cl. D32—55



373,867
DEVICE FOR DRYING ARTICLES
Arthur C. Rask, 5334 Old Hwy. 61, Deluth, Minn. 55810
Filed Jan. 25, 1995, Ser. No. 34,031
Term of patent 14 years
U.S. Cl. D32—58



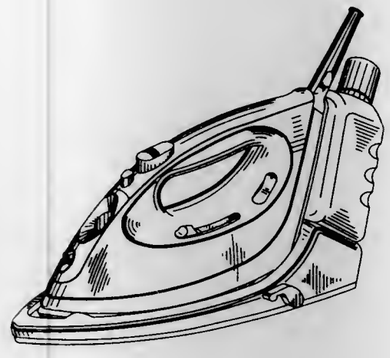
373,868
CLOTHESPIN
Michael E. Olk, and Ramona T. Olk, both of P. O. Box 113, Kimball, Minn. 55353
Filed Feb. 6, 1995, Ser. No. 34,442
Term of patent 14 years
U.S. Cl. D32—61



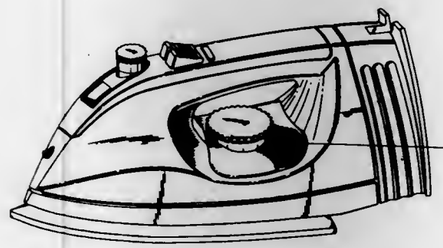
373,869
COMBINED IRONING BOARD AND STEAM IRON
Franz A. Stützer, Offenbach, and Bernd Reibl, Sindelfingen, both of Germany, assignors to Rowenta-Werke GmbH, Offenbach A.M., Germany
Filed Aug. 31, 1995, Ser. No. 43,286
Claims priority, application Germany, Mar. 2, 1995, M 95 01 751.8
Term of patent 14 years
U.S. Cl. D32—66

373,870
ELECTRIC STEAM IRON
Bernd Reibl, Sindelfingen, Germany, assignor to Kowenta-Werke GmbH, Offenbach A.M., Germany
Filed Feb. 16, 1994, Ser. No. 18,861
Claims priority, application Germany, Aug. 21, 1993, M93 06 468.3
Term of patent 14 years
U.S. Cl. D32—70

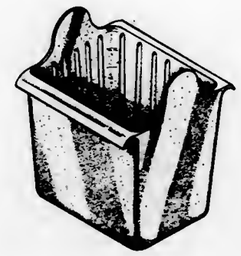
373,871
ELECTRIC IRON AND BASE
Stuart Naft, Fairfield; Bryan de Blois, West Haven, and Gregory K. Hoffman, Danbury, all of Conn., assignors to Black & Decker Inc., Newark, Del.
Filed May 10, 1994, Ser. No. 25,532
Term of patent 14 years
U.S. Cl. D32—70



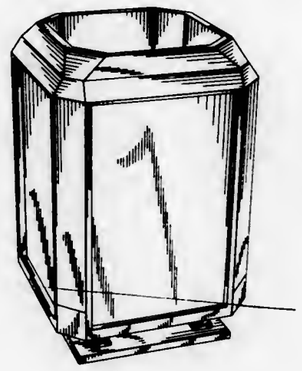
373,872
STEAM IRON
John C. K. Sham, Rm. 1508, Block C, 19 Broadwood Rd., Hong Kong, Hong Kong
Filed Jan. 25, 1995, Ser. No. 34,142
Term of patent 14 years
U.S. Cl. D32—70



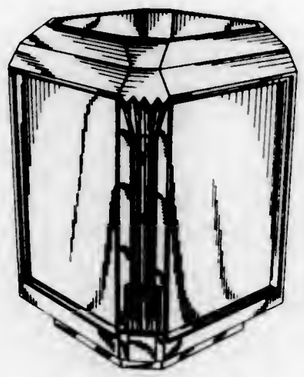
373,873
ENVIRONMENTAL WASTE BASKET
Yen B. Nguyen, 14241 Euclid St., Ste.C-110, Garden Grove, Calif. 92643, and Dennis J. Malone, Orange, Calif., assignors to Yen B. Nguyen, Garden Grove, Calif.
Filed Apr. 3, 1995, Ser. No. 37,038
Term of patent 14 years
U.S. Cl. D34—1



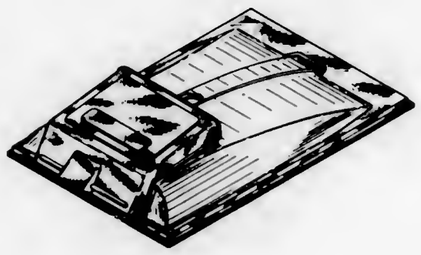
373,874
TRASH RECEPTACLE
Brad Zackson, New York, and Fred S. Rosenberg, Fresh Meadows, both of N.Y., assignors to Beautifying Cities Across America, Corp., New York, N.Y.
Filed Jun. 26, 1995, Ser. No. 40,712
Term of patent 14 years
U.S. Cl. D34—1



373,875
TRASH RECEPTACLE
Brad Zackson, New York, and Fred S. Rosenberg, Fresh Meadows, both of N.Y., assignors to Beautifying Cities Across America Corp., New York, N.Y.
Filed Jun. 26, 1995, Ser. No. 40,713
Term of patent 14 years
U.S. Cl. D34—1



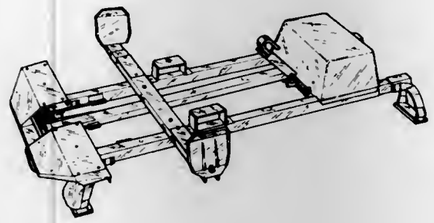
373,876
CONTAINER LID
Donald R. Onken, P.O. Box 72, Easton, Ill. 62633
Filed Jun. 29, 1995, Ser. No. 40,877
Term of patent 14 years
U.S. Cl. D34—11



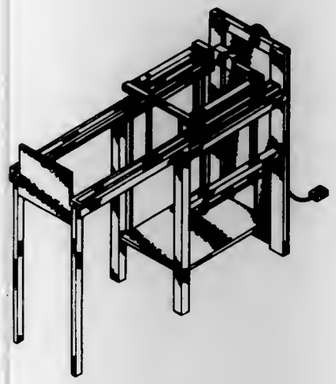
373,877
MULTI-PURPOSE CART
Yih K. Tsai, No. 4-6, Lane 150 Sec. 1, Hsin Sheng S. Rd., Taipei, Taiwan
Filed Sep. 10, 1993, Ser. No. 12,847
Term of patent 14 years
U.S. Cl. D34—12

373,878
FOLDABLE WHEELBARROW
Eric L. Van Der Storm, Zandvoort, Netherlands, assignor to Alu-Light Products B.V., Zandvoort, Netherlands
Filed Jun. 17, 1994, Ser. No. 24,631
Claims priority, application Benelux TM/Des. Off., Dec. 17, 1993, 69316-00
Term of patent 14 years
U.S. Cl. D34—16

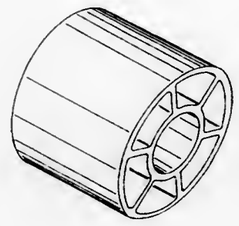
373,879
WHEELCHAIR HOIST
Kenneth G. Wyborn, 26 Peppermint Place, South Grafton, New South Wales, 2460, Australia
Filed May 16, 1995, Ser. No. 38,850
Claims priority, application Australia, Nov. 16, 1994, 3851/94
Term of patent 14 years
U.S. Cl. D34—28



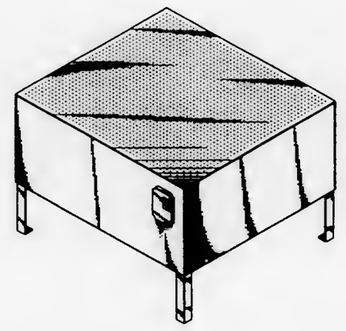
373,880
WHEELCHAIR LIFT
Robert M. Wrobel, 23730 Marine, Eastpointe, Mich. 48021-3422
Filed Jul. 10, 1995, Ser. No. 41,266
Term of patent 14 years
U.S. Cl. D34—28



373,881
ALVEOLATE TUBE
Jean-Jacques Duteil, Chaponost, France, assignor to Societe Roll & Concept SA, France
Filed Sep. 7, 1994, Ser. No. 28,184
Claims priority, application France, Mar. 7, 1994, 941.421
Term of patent 14 years
U.S. Cl. D34—29



373,882
AIR TABLE
Roy Thacker, Watauga, Tex., assignor to Thacker Industrial Service Company, Fort Worth, Tex.
Filed Jan. 6, 1995, Ser. No. 33,183
Term of patent 14 years
U.S. Cl. D34—29



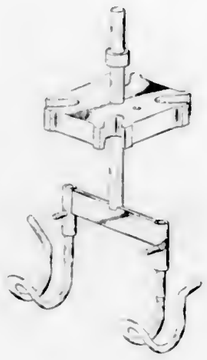
373,883
POULTRY SHACKLE WITH ROTATABLE STIRRUPS

373,885
TELESCOPIC RAMP

373,887
LIFT TRUCK WITH DRIVER'S SEAT

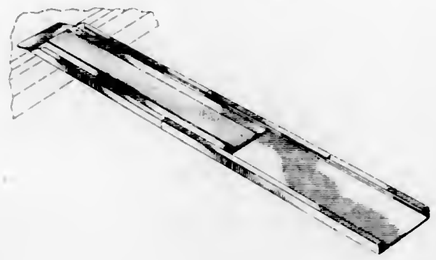
373,889
PALLET

373,883
POULTRY SHACKLE WITH ROTATABLE STIRRUPS
Kenneth D. Dillard, Canton, Ga., assignor to Dapec, Inc., Canton, Ga.
Filed Jun. 15, 1995, Ser. No. 40,326
Term of patent 14 years
U.S. Cl. D34—29

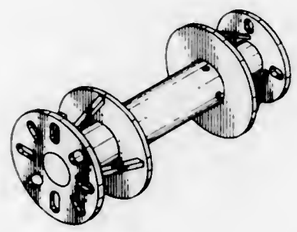


373,884
TREE JACK
John C. Price, Road 1 Box 55 BB, South New Berlin, N.Y. 13843
Filed Apr. 11, 1995, Ser. No. 37,332
Term of patent 14 years
U.S. Cl. D34—31

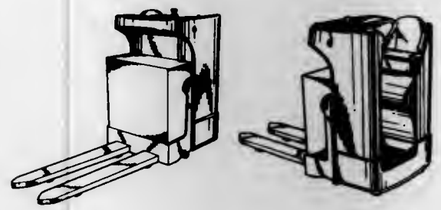
373,885
TELESCOPIC RAMP
Wayne H. Holland, Jr., 12501 Rajah, Sylmar, Calif. 91342
Filed Feb. 2, 1995, Ser. No. 34,350
Term of patent 14 years
U.S. Cl. D34—32



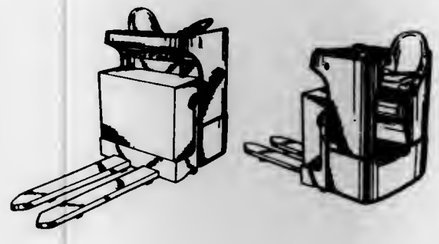
373,886
VEHICLE SELF-PULLING WINCH
Marvin H. McCloud, Jr., P.O. Box 895, Wand Cove, Ak. 99928
Filed Oct. 21, 1994, Ser. No. 30,069
Term of patent 14 years
U.S. Cl. D34—33



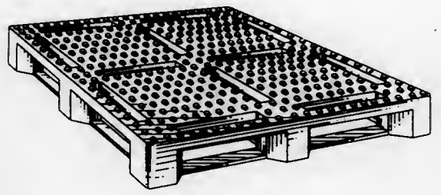
373,887
LIFT TRUCK WITH DRIVER'S SEAT
Richard Soederberg, Muehlacker, Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany
Filed Dec. 22, 1994, Ser. No. 32,638
Claims priority, application Germany, Jun. 22, 1994, M9404823.1
Term of patent 14 years
U.S. Cl. D34—34



373,888
LIFT TRUCK WITH DRIVER'S SEAT
Richard Soederberg, Muehlacker, Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Weissach, Germany
Filed Dec. 22, 1994, Ser. No. 32,640
Claims priority, application Germany, Jun. 22, 1994, M9404822.3
Term of patent 14 years
U.S. Cl. D34—34



373,889
PALLET
Heinz Weber, 64 Gables Court, Beaconsfield, Que, Canada
Filed Dec. 9, 1994, Ser. No. 31,968
Term of patent 14 years
U.S. Cl. D34—38



373,890
COSMETIC COMPACT
Tetsuo Hiro; Tesuo Togasawa, both of Tokyo, and Yotsuda Chieko, Yokohama, all of Japan, assignors to Shiseido Company, Ltd., Tokyo, Japan
Filed May 19, 1995, Ser. No. 39,388
Claims priority, application Japan, Nov. 21, 1994, 6-35103
Term of patent 14 years
U.S. Cl. D28—78

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PATENTS WERE ISSUED ON THE 17th DAY OF SEPTEMBER, 1996

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & D Company Limited: *See*—
Nozoe, Yoshiteru; and Murata, Kazuharu, 5,556,533, Cl. 205-777.500.

A-Bio-Vac Inc.: *See*—
Caufield, James E.; Torborg, Ralph; and Adams, Wilmer L., 5,555,704, Cl. 53-425.000.

A.C.T., Inc.: *See*—
Lund, John F., 5,555,676, Cl. 47-82.000.

A. Nattermann & Cie. GmbH: *See*—
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A. O. Smith Corporation: *See*—
Booles, Harold F., 5,556,679, Cl. 428-36.910.

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Dosmo, Renato; and Mairati, Giovanni, 5,557,498, Cl. 361-600.000.

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Brammer, Norman; McConaughy, Brett R.; and Gariery, James A., 5,555,935, Cl. 166-88.100.

Abbruzzese, Pamela; Bailey, Paul; Fritz, Denise L.; Lawler, John; Manning, Rick; Pollnow, Russ; Retartha, Anthony; Round, Mary J.; Schardt, Marc; Synodinos, Barbara; and Tanner, Robert, to Hartford Fire Insurance Company, Inc. Computerized system and method for work management. 5,557,515, Cl. 364-401.00R.

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Kokubu, Hideki; Abe, Tsutomu; and Machida, Hisashi, 5,556,348, Cl. 476-40.000.

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Komine, Kenji; Ikeda, Wataru; Egawa, Mamoru; Shinosawa, Kastuhiro; Isegawa, Hiroyuki; Honaga, Kazuo; Abe, Yutaka; Kameda, Tsuneji; and Sato, Shinobu, 5,556,270, Cl. 418-179.000.

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Acosta, George M.: *See*—
Cohen, Donald; Daw, Derek J.; Kick, George F.; and Acosta, George M., 5,556,396, Cl. 606-42.000.

AcroMed Corporation: *See*—
McMillin, Carl R., 5,556,687, Cl. 428-113.000.

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Salli, Carl, 5,555,615, Cl. 29-458.000.
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Ujiie, Hitoshi, 5,557,196, Cl. 324-76.770.

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Zee, Fransiscus W. M.; Mul, Johannes M.; and Hordijk, Arie C., 5,557,015, Cl. 564-464.000.

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Abiven, Henri; Colin, Christophe; Bouix, Jean; Macari, Michel; and Viala, Jean-Claude, 5,556,486, Cl. 148-429.000.
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Lockhart, David J.; Vetter, Dirk; and Diggelmann, Martin, 5,556,752, Cl. 435-6.000.

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Kester, John J.; Dajani, Iyad A.; Ranon, Peter M.; and Alley, Thomas G., 5,557,699, Cl. 385-122.000.

Bösch, Peter; Laubacher, Karl-Eugen; Ammon, Dieter; and Steiner, Manfred, 5,556,176, Cl. 303-165.000.

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Aida, Fuyuki; Tajima, Yoshio; and Matsuura, Kazuo, to Nippon Oil Company, Limited. Catalyst component for the polymerization of olefins. 5,556,821, Cl. 502-113.000.
Aigner, Georg. Stop strip for a protective hood on wood shaping machines. 5,555,921, Cl. 144-253.200.
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Funabashi, Hideo; Sugahara, Akinobu; Tanaka, Akira; Toda, Masatoshi; Ota, Tsuyoshi; Matsuo, Youichi; Akimaru, Tsutomu; Iwasaki, Sigeo; and Tsuruoka, Masayuki, 5,556,820, Cl. 502-111.000.
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Sugiura, Jun; Tsuchiya, Osamu; Ogasawara, Makoto; Ootsuka, Fumio; Torii, Kazuyoshi; Asano, Isamu; Owada, Nobuo; Horiuchi, Mitsuaki; Tamaru, Tsuyoshi; Aoki, Hideo; Otsuka, Nobuhiro; Shirai, Seiichirou; Sagawa, Masakazu; Ikeda, Yoshihiro; Tsuneoka, Masatoshi; Kaga, Toru; Shimmyo, Tomotsugu; Ogishi, Hidetsugu; Kasahara, Osamu; Enami, Hiromichi; Wakahara, Atsushi; Akimori, Hiroyuki; Suzuki, Sinichi; Funatsu, Keisuke; Kawasaki, Yoshinao; Tubone, Tunehiko; Kogano, Takayoshi; and Tsugane, Ken, 5,557,147, Cl. 257-763.000.
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Kojima, Yasutaka, 5,555,804, Cl. 101-183.000.
Akiyama, Tatsuhito, to Juki Corporation. Rotary thread take-up lever in a sewing machine. 5,555,830, Cl. 112-248.000.
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Alabama Metal Industries Corporation: *See—*
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Wicker, Alain; Bonnet, Jean-Pierre; Sanz, Mariano; Dordor, Patrice; and Magro, Christophe, 5,556,831, Cl. 505-500.000.
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Wood, Samuel F.; and Wakerly, John F., 5,557,506, Cl. 361-796.000.
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Isern-Flecha, Ileana; Swirbel, Thomas J.; Pennisi, Robert W.; Ross, Danny E.; Naujoks, Adolph; and Alarcon, Angelita, 5,557,064, Cl. 174-35.0MS.
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Strickler, Jamie R.; and Power, John M., 5,556,997, Cl. 556-11.000.
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Sacchettini, James, 5,556,778, Cl. 435-189.000.
Albrecht, Manfred: *See—*
Begemann, Kurt; Rathert, Horst; and Albrecht, Manfred, 5,556,244, Cl. 412-30.000.
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Lacquit, Hubert; and Damier, Christophe, 5,557,785, Cl. 395-600.000.
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Veith, Gustav; and Bülow, Henning, 5,557,694, Cl. 385-27.000.
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Wunderlich, Jens-Christian; Schuster, Otto; Lukas, Helmut; and Schick, Ursula, 5,556,638, Cl. 424-468.000.
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Koch, Rudolf; and Alger-Meunier, Michael, 5,557,187, Cl. 320-1.000.
Allaire, Gilles; Beauchemin, Gratien; Garceau, Roger; and Leclerc, Bruno, to Centre de Recherche Industrielle du Québec. Method and apparatus for classifying articles according to their color. 5,557,414, Cl. 356-407.000.
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Beard, Richard L.; and Chandraratna, Roshantha A., 5,556,996, Cl. 549-407.000.
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Kester, John J.; Dajani, Iyad A.; Ranon, Peter M.; and Alley, Thomas G., 5,557,699, Cl. 385-122.000.
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Alliant Techsystems Inc.: *See—*
Warren, John B.; and Talley, James Q., 5,557,059, Cl. 102-434.000.
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Foote, Steven A.; and Stoddard, Damon R., 5,557,044, Cl. 73-497.000.
Hulsing, Rand H., II, 5,557,046, Cl. 73-504.040.
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Alps Electric Co., Ltd.: *See—*
Hayakawa, Hiroshi, 5,557,080, Cl. 200-5.00R.
Nakashima, Keishi; and Senuma, Masamitsu, 5,557,489, Cl. 360-104.000.
Alstyne, Diane V.; and Sharma, Lawrence R., to Insight Biotek, Inc. Peptides representing epitopic sites for bacterial and viral meningitis causing agents and their CNS carrier and uses thereof. 5,556,757, Cl. 435-7.200.
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Al-Zaid, Rajeh Z.: *See—*
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Amada, Katsumi: *See—*
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Amada Metrecs Company, Limited: *See—*
Takeshita, Kazumori, 5,555,763, Cl. 72-420.000.
Amada, Yoshiho: *See—*
Mizoguchi, Hakaru; Amada, Yoshiho; and Ito, Noritoshi, 5,557,629, Cl. 372-87.000.
Amanuma, Tatsuo: *See—*
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Amati Communications Corporation: *See—*
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Amatruda, Andrew A., Jr.: *See—*
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Amazutsumi, Toru: *See—*
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AMCOL International Corporation: *See—*
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American International Technologies, Inc.: *See—*
Wakalopulos, George, 5,557,163, Cl. 313-420.000.
American Standard Inc.: *See—*
Jensen, Robert M., 5,555,573, Cl. 4-325.000.
American Sterilizer Company: *See—*
Childers, Robert W.; Rickloff, James R.; Mielnik, Thaddeus J.; and Klobusnik, Kenneth J., 5,556,607, Cl. 422-300.000.
Ameropean Corp.: *See—*
Bigwood, Guy M., 5,556,206, Cl. 384-15.000.
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Raybuck, Margaret P.; Kenrick, Michael K.; and Parry, David A., 5,556,598, Cl. 422-10.00D.
Amick, Darryl; McDowell, Gary; Henson, Hershel R.; and Wille, Jerald, to Teledyne Industries, Inc. Non-stick laminating endless belt press. 5,555,799, Cl. 100-930.0RP.
Amirsakis, Charles J.; Vietti, David E.; Heberer, Daniel P.; Dolmon, Louis C.; and Picchiotti, Lawrence, to Morton International, Inc. Magnetic recording medium having a binder containing aminoalkylphosphonate salt functional groups. 5,556,698, Cl. 428-323.000.
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Oberdorf, Klaus; Sauter, Hubert; Grammenos, Wassilios; Kirstgen, Reinhard; Harries, Volker; Lorenz, Gisela; Ammermann, Eberhard; Gold, Randall E.; Siegel, Wolfgang; and Harreus, Albrecht, 5,556,884, Cl. 514-620.000.
Ammon, Dieter: *See—*
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Amoco Corporation: *See—*
Rotter, George E.; Chiang, Weilong; Tsai, Boh C.; Melquist, John L.; Pauer, Cheryl A.; and Chen, Stephen Y., 5,556,926, Cl. 525-444.000.
Stefano, James E., 5,556,751, Cl. 435-6.000.
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Ampel, Stuart, 5,556,150, Cl. 294-118.000.
Ampel, Stuart, to Ampel Probe Corporation. Multipurpose probe. 5,556,150, Cl. 294-118.000.
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Roesenstock, Michael A.; Wallace, Phillip W.; Bayruns, John T.; Sanyigo, Kenneth S.; and Gilbert, George G., 5,557,144, Cl. 257-668.000.
Anagnost, John J.: *See—*
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Andersen Corporation: *See—*
Galowitz, Dennis A.; and Bruchu, Todd W., 5,555,684, Cl. 52-204.500.
Andersen, Erik, to Corpak, Inc. Improved percutaneous access device. 5,556,385, Cl. 604-174.000.
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Brush, Charles K.; and Anderson, Eric D., 5,556,959, Cl. 536-25.320.
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Anderson, Robert E.: *See—*
Contreras, Michael A.; and Anderson, Robert E., 5,556,506, Cl. 156-625.100.
Anderson, R. Rox; Hruza, Luciann; and Kollias, Nikiforos, to General Hospital Corporation, The. Methods for phototherapeutic treatment of proliferative skin diseases. 5,556,612, Cl. 424-59.000.
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Ando Electric Co., Ltd.: *See—*
Maeda, Mikio; and Furuhashi, Masaaki, 5,557,401, Cl. 356-73.100.
Ando, Hideya: *See—*
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Annis, Larry D.: *See—*
Silver, Brian H.; and Annis, Larry D., 5,556,008, Cl. 222-192.000.
Annis, Patricia A.; Davis, Ronald C.; and Bresee, Randall R., to University of Georgia Research Foundation, Inc. Materials evaluator. 5,557,039, Cl. 73-7.000.
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Ansberry, Catherine M.; Freer, Jay D.; Fuqua, Todd W.; Mesterton, Erik P.; Stillwagon, Catherine A.; and Yang, Ching-Yun, to International Business Machines Corporation. Method and system for switching between users in a conference enabled application. 5,557,725, Cl. 395-153.000.
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ANTEC Corporation: *See—*
Perry, Steven B.; and Hogan, James P., 5,557,669, Cl. 379-339.000.
Perry, Steven B.; and Hogan, James P., 5,557,670, Cl. 379-339.000.
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Anzai, Kazuo: *See—*
Aoki, Hidemi; Takeuchi, Yasuhiko; and Anzai, Kazuo, 5,556,581, Cl. 264-40.100.
Anzawa, Teruaki: *See—*
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Shimizu, Nobuyoshi; Uno, Kouzi; Aoe, Motoi; and Yoshida, Kenichi, 5,556,842, Cl. 514-100.000.
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Aoki, Hideo: *See—*

Sugiura, Jun; Tsuchiya, Osamu; Ogasawara, Makoto; Ootsuka, Fumio; Torii, Kazuyoshi; Asano, Isamu; Owada, Nobuo; Horiuchi, Mitsuaki; Kato, Tomokazu; Nomura, Keiichi; Nagatani, Kentaro; Maruta, Syuji; Takano, Yoshiaki; Araki, Kazuhiro; and Noda, Takashi, 5,557,391, Cl. 348-571.000.
Aoki, Hiroshi; Kobayashi, Hitoshi; Asano, Yuichi; Kobayashi, Kenji; Sasaki, Kenichi; and Sakurai, Yuji, 5,557,145, Cl. 257-692.000.

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Sugiura, Jun; Tsuchiya, Osamu; Ogasawara, Makoto; Ootsuka, Fumio; Torii, Kazuyoshi; Asano, Isamu; Owada, Nobuo; Horiuchi, Mitsuaki; Tamaru, Tsuyoshi; Aoki, Hideo; Otsuka, Nobuhiro; Shirai, Seiichirou; Sagawa, Masakazu; Ikeda, Yoshihiro; Tsuneoka, Masatoshi; Kaga, Toru; Shimmyo, Tomotsugu; Ogishi, Hidetsugu; Kasahara, Osamu; Enami, Hiromichi; Wakahara, Atsushi; Akimori, Hiroyuki; Suzuki, Sinichi; Funatsu, Keisuke; Kawasaki, Yoshinao; Tubone, Tunehiko; Kogano, Takayoshi; and Tsugane, Ken, 5,557,147, Cl. 257-763.000.

Aoki, Kunio: *See*—
Asahina, Hiroshi; Aoki, Kunio; Kanebako, Toyomitsu; and Nakatani, Yoshinori, 5,557,542, Cl. 364-514.00R.

Aoki, Makoto: *See*—
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Aoki, Mario: *See*—
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Aoki, Masaaki: *See*—
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Aoki, Takuya: *See*—
Hascho, Seiji; Shimasaki, Yuichi; Aoki, Takuya; Matsumoto, Seiji; Kato, Hiroaki; Komatsuda, Takashi; Saito, Akihisa; and Oketani, Toshikazu, 5,555,724, Cl. 60-276.000.
Shimasaki, Yuichi; Komatsuda, Takashi; Kato, Hiroaki; and Aoki, Takuya, 5,555,725, Cl. 60-277.000.

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Suzuki, Yutaka; Kashiwagi, Hideyuki; Aoki, Teruaki; Koshino, Fumiichi; Picha, George J.; and Szpak, Anthony J., 5,555,898, Cl. 128-898.000.

Aono, Aki: *See*—
Fujisawa, Yukio; Hinuma, Shuji; and Aono, Aki, 5,556,946, Cl. 530-351.000.

Aoyama, Hirokazu; Kohno, Satoru; and Koyama, Satoshi, to Daikin Industries Ltd. Method for preparing dichlorodecafluoropentane and decafluoropentane. 5,557,019, Cl. 570-176.000.

Appel, Jon R., Jr.: *See*—
Pinilla, Clemencia; Appel, Jon R., Jr.; and Houghten, Richard A., 5,556,762, Cl. 435-7.210.

Apple Computer, Inc.: *See*—
Carter, Andrew L., 5,556,107, Cl. 463-35.000.
Culbert, Michael F., 5,557,777, Cl. 395-500.000.
Guay, Randall G., 5,557,712, Cl. 395-130.000.
Kelly, James D., 5,557,577, Cl. 365-222.000.
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Krein, William T.; Flaig, Charles M.; and Kelly, James D., 5,557,755, Cl. 395-293.000.
Townsley, David B.; Gong, Andrew; and Henin, Eva, 5,557,738, Cl. 395-182.120.

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Cadeux, Kevin; and Hartmann, Paul R., 5,557,616, Cl. 370-105.100.

Applied Electroless Concepts, Inc.: *See*—
Krulik, Gerald A.; Mandich, Nenad V.; and Singh, Rajwant, 5,556,553, Cl. 216-93.000.

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Collins, Kenneth S.; Roderick, Craig A.; Trow, John R.; Yang, Chan-Lon; Wong, Jerry Y.; Marks, Jeffrey; Keswick, Peter R.; Groechel, David W.; Pinson, Jay D., II; Ishikawa, Tetsuya; Lei, Lawrence C.; Toshima, Masato M.; and Yin, Gerald Z., 5,556,501, Cl. 156-345.000.
Grunes, Howard E., 5,556,248, Cl. 414-416.000.
Lei, Lawrence C.; and Leung, Cissy, 5,556,476, Cl. 118-728.000.
Somekh, Sasson; Fairbairn, Kevin; Kolstoe, Gary M.; White, Gregory W.; and Faraco, W. George, Jr., 5,556,147, Cl. 294-64.100.

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Suzuki, Yutaka; Kashiwagi, Hideyuki; Aoki, Teruaki; Koshino, Fumiichi; Picha, George J.; and Szpak, Anthony J., 5,555,898, Cl. 128-898.000.

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Besen, Matthew M.; Sevillano, Evelio; and Smith, Donald K., 5,556,475, Cl. 118-723.0MP.

Apps, William P.: *See*—
Lang-Ree, Arne; Apps, William P.; and Ackermann, Jeff, 5,555,996, Cl. 220-403.000.

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Anscombe-Black, William A. B.; and Farthing, Allan J., 5,555,575, Cl. 4-563.100.

ARA, Inc.: *See*—
Mazelsky, Bernard, 5,556,695, Cl. 428-229.000.

Arakawa, Takeshi: *See*—
Fukano, Yoshihiro; Makado, Shoichi; and Arakawa, Takeshi, 5,555,911, Cl. 137-625.690.

Araki, Hiromitsu: *See*—
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Kato, Tomokazu; Nomura, Keiichi; Nagatani, Kentaro; Maruta, Syuji; Takano, Yoshiaki; Araki, Kazuhiro; and Noda, Takashi, 5,557,391, Cl. 355-319.000.

Araki, Seiichi; Suzuki, Mamoru; Fujimoto, Masatoshi; and Ueki, Tadashi, to Eisai Co., Ltd. Method of immunopotentiating and protecting an animal from *E. coli* infections using a combination of *Rosa roxburghii, Artemisiae argyi folium* and *Brassica oleracea var. capitata L.*. 5,556,624, Cl. 424-195.100.

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Honda, Narimichi; Yamamoto, Takashi, and Arata, Masami, 5,556,897, Cl. 523-118.000.

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Arduin, Joël; and Le Masson, Jacques, to Salomon S.A. Device for modifying the force distribution of a ski over its gliding surface and a ski equipped with such a device. 5,556,122, Cl. 280-602.000.

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Duve, George, 5,557,207, Cl. 324-414.000.

Argonne National Laboratory, The University of Chicago Development Corporation, The: *See*—
Winston, Roland; and Ning, Xiaohui, 5,557,478, Cl. 359-853.000.

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Howe, Michael, 5,556,833, Cl. 510-189.000.

Arnaud, Pascal; and Mellul, Myriam, to L'Oreal. Anhydrous cosmetic or dermatological composition containing the combination of a silicone oil and a wax made from an ethylene homopolymer or copolymer. 5,556,613, Cl. 424-64.000.

Arnoldt, Claudius: *See*—
Löffel, Fritz; and Arnoldt, Claudius, 5,557,545, Cl. 364-550.000.

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Smith, Michael J., 5,555,975, Cl. 206-762.000.

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Hirai, Isamu; and Tsuji, Hideaki, 5,557,366, Cl. 354-416.000.
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Kobayashi, Takumi, 5,557,360, Cl. 354-230.000.
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Shindo, Osamu; and Toji, Shigeo, 5,557,364, Cl. 354-410.000.

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Niwa, Shigeki; Hasebe, Etsuhiro; Itoh, Kazuo; Indoh, Toshihiro; and Asai, Masamichi, 5,556,568, Cl. 222-600.000.

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Soshi, Isao; Miyamoto, Hidenori; Kato, Minoru; Omi, Junichi; Amanuma, Tatsuo; Asami, Jirou; and Imura, Yoshio, 5,557,357, Cl. 354-202.000.

Asamizuya, Noboru: *See*—
Ebihara, Norio; Asamizuya, Noboru; and Momochi, Nobuchika, 5,557,413, Cl. 358-296.000.

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Ward, Irl E.; and Michelotti, Francis W., 5,556,482, Cl. 134-38.000.

Ashton, Clint: *See*—
Morrison, William S., III; and Ashton, Clint, 5,555,696, Cl. 52-737.100.

ASK Corporation: *See*—
Irie, Shoichiro; Abe, Motonobu; and Akiyama, Norihito, 5,556,040, Cl. 241-24.290.

ASSA Industries (C.S.) Ltd.: *See*—
Broshi, Yuval, 5,556,246, Cl. 414-278.000.

AST Research, Inc.: *See*—
Reiter, Victor R.; and Le, Bao G., 5,557,499, Cl. 361-685.000.
Silva, David J., 5,557,505, Cl. 361-777.000.

Asta Medica Aktiengesellschaft: *See*—
Engel, Jürgen; Kutscher, Bernhard; Fleischhauer, Ilona; Szelenyi, Stefan; Metzenauer, Peter; and Werner, Ulrich, 5,556,856, Cl. 514-248.000.
Roedern, Erich G.; Kessler, Horst; Kutscher, Bernhard; Bernd, Michael; and Klenner, Thomas, 5,556,836, Cl. 514-15.000.

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Burns, Elaine G.; Davenport, Esther L.; Manseur, Belkacem; Munson, Gary A.; Seip, Barry S.; and Sze, Elaine I., 5,557,664, Cl. 379-114.000.
Eslambolchi, Hossein, 5,557,258, Cl. 340-540.000.
Mollenauer, Linn F., 5,557,441, Cl. 359-173.000.

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O'Gorman, Lawrence P.; and Simons, Everett F., 5,557,690, Cl. 382-151.000.

AT&T Global Information Solutions Company: *See*—
Lee, Steven, 5,557,131, Cl. 257-370.000.

Athapap Trading Company Ltd.: *See*—
Gilmore, Thomas M., 5,555,689, Cl. 52-489.100.

Atochem: *See*—
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Marciandi, Franco; and Bertani, Marco, 5,556,666, Cl. 427-133.000.

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Saito, Rie; Sasanuma, Nobuatsu; and Atsumi, Tetsuya, 5,557,412, Cl. 358-296.000.

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Fox, Paul F., 5,556,344, Cl. 475-235.000.

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Ralph, Peter; Auckerman, Sharon; and Devlin, James, 5,556,620, Cl. 424-85.100.

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Samson, Peter R., 5,557,459, Cl. 359-465.000.

Autoliv Development AB: *See*—
Tolfsen, Ulf; and Dahlen, Magnus, 5,555,609, Cl. 24-641.000.

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Pienta, David J., 5,555,783, Cl. 82-96.000.

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Godolphin, William J.; Specht, Winona C.; Pires, David P.; and Killiam, Geoffrey T., 5,555,920, Cl. 141-329.000.

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Chang, Eng-Pi; Wang, Yao-Feng; Winnik, Mitchell A.; and Ziemelis, Maris, 5,556,663, Cl. 427-8.000.

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Ricks, Merle K.; Sorenson, Janiel; Duran, John A.; and Vargas, Javier, 5,556,125, Cl. 280-728.200.

Avid Technology, Inc.: *See*—
Phillips, Michael; O'Connor, Patrick; and Peters, Eric, 5,557,423, Cl. 358-335.000.

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Ginzburg, Boris, 5,557,673, Cl. 379-443.000.

Awane, Kaoru: *See*—
Tagawa, Toshiaki; Awane, Kaoru; and Nagaike, Kazuhiro, 5,556,948, Cl. 530-391.900.

Axxess Technologies, Inc.: *See*—
Almblad, Robert E., 5,556,240, Cl. 409-81.000.

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Kolton, Chester; and Spater, Stuart S., 5,556,014, Cl. 223-85.000.

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Vandenberg, James P., 5,555,851, Cl. 122-392.000.

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Inenaga, Andrew S.; Bachalo, William D.; and Sankar, Subramanian V., 5,557,040, Cl. 73-170.210.

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von der Heyde, Christian P.; and Backus, Michael E., 5,556,563, Cl. 219-227.000.

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Hanson, Mark T.; and Bacon, Glade B., 5,557,440, Cl. 359-161.000.

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Bae, Sang I.: *See*—
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Brady, Daniel F.; McCall, John E., Jr.; Bailey, Clyde A.; and Copeland, James L., 5,556,478, Cl. 134-18.000.

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Belcher, Donald K.; and Bailey, David C., 5,557,495, Cl. 361-298.200.

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Plachta, Christopher; and Bain, Gregory L., 5,555,561, Cl. 2-2.000.

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Copenhaver, Gary; Bakker, Johan; and Vala, John, 5,557,451, Cl. 359-350.000.

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Lipner, Steven B.; Balenson, David M.; Ellison, Carl M.; and Walker, Stephen T., 5,557,346, Cl. 380-21.000.
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Witkowski, Todd R.; Messina, Vincent J.; Ball, Richard D.; and Filion, John T., 5,557,782, Cl. 395-550.000.

Balonick, Arnold: *See*—
Wyatt, Curtis; and Balonick, Arnold, 5,555,578, Cl. 5-460.000

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Lines, Andrew; Bamberger, Matthew C.; and Yamasaki, Brian H., 5,557,714, Cl. 395-137.000.

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Bhattacharyya, Bidyut K.; Mallik, Debendra; Ban, Syunsuke; Takikawa, Takatoshi; and Yamanaka, Shosaku, 5,556,807, Cl. 437-209.000.

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Shimazu, Hiroto; Bando, Takashi; and Tokuno, Masateru, 5,556,513, Cl. 162-304.000.

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Krivokapic, Zoran; and Bang, David S., 5,556,525, Cl. 204-192.120.

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Barney, Howard H.: *See*—
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Noristi, Luciano; and Baruzzi, Giovanni, 5,557,025, Cl. 585-522.000.

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Keil, Michael; Wahl, Josef; Klein, Ulrich; and Will, Wolfgang, 5,557,013, Cl. 564-301.000.
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Oberdorf, Klaus; Sauter, Hubert; Grammenos, Wassilios; Kirstgen, Reinhard; Harries, Volker; Lorenz, Gisela; Ammermann, Eberhard; Gold, Randall E.; Siegel, Wolfgang; and Harreus, Albrecht, 5,556,884, Cl. 514-620.000.
Rath, Hans P.; Knoll, Konrad; and Mach, Helmut, 5,556,932, Cl. 526-339.000.
Witzel, Tom; and Fuchs, Eberhard, 5,557,011, Cl. 564-492.000.

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Dugan, Jeffrey S., 5,555,716, Cl. 57-224.000.
Fishback, Thomas L.; and Reichel, Curtis J., 5,556,894, Cl. 521-168.000.

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Naber, Bernhard; and Lezius, Maritta, 5,556,889, Cl. 521-49.500.
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Chung, James Y. J.; and Mason, James P., 5,556,908, Cl. 524-493.000.

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Lu, James W. B., 5,555,930, Cl. 165-81.000.

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Bellavia, Anthony S.: *See*—
Amorese, Franklyn J.; and Bellavia, Anthony S., 5,556,113, Cl. 277-233.000.

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Didier, James J., 5,556,514, Cl. 162-358.300.

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Bennett, Reginald S., to Reginald Bennett International Inc. Two sided marker. 5,557,460, Cl. 359-530.000.

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Lusen, Leonard; and Ebersole, Tammy S., 5,555,918, Cl. 139-433.000.

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Martin, Wolfram; Besinger, Hartwig; and Weeber, Heinrich, 5,556,466, Cl. 118-67.000.

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Bethlehem Steel Corporation: *See*—
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Smayling, Michael C.; Marotta, Giulio G.; D'Arrigo, Iano; Santin, Giovanni; Falessi, Georges; and Bhat, Mousumi, 5,557,569, Cl. 365-185.280.

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Bidnyy, Sergei V.; Zavadtsev, Alexander A.; Mirochnik, Emmanuel A.; Mishchenko, Alexander V.; Pirozhenko, Vitaly M.; and Radchenko, Igor V., to International Research and Development. Radiation sterilization unit. 5,557,109, Cl. 250-455.110.

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Seefeldt, Joachim; and Reichle, Horst, 5,555,968, Cl. 198-594.000.

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Bierer, Donald E.: *See*—
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Bierschenk, Thomas R.; Juhlke, Timothy J.; Kawa, Hajimu; and Lagow, Richard J., to Exfluor Research Corporation. Fluorination of acetals, ketals and orthoesters. 5,557,012, Cl. 562-582.000.

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Bigwood, Guy M., to Ameropean Corp. Replacement wiper for linear bearing systems. 5,556,206, Cl. 384-15.000.

Bilsom AB: *See*—
Berg, Bengt G., 5,557,077, Cl. 181-135.000.

Bindomatic AB: *See*—
Tholérus, Jan, 5,556,490, Cl. 156-64.000.

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Bingham, Ronald E.; Dockter, Michael J.; Farber, Joel F.; and Seppi, Kevin D., to International Business Machines Corp. Facility for the generic storage and management of multimedia objects. 5,557,790, Cl. 395-600.000.

Binley, Gary N., to Good Humor-Breyers Ice Cream, Division of Conopco, Inc. Extrusion of materials. 5,556,653, Cl. 426-101.000.

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Russell, Jeremy C.; Yianni, Yiannakis P.; and Charles, Stephen A., 5,556,710, Cl. 428-457.000.

Biometric Imaging, Inc.: *See*—
Sizto, Ning L.; and Dietz, Louis J., 5,556,764, Cl. 435-7.240.

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Biosensor Research Laboratories Co., Ltd.: *See*—
Nakamura, Michihiro; Matsui, Satomi; Oka, Keiko; Tsuruta, Hitoshi; Koori, Yoshihiro; Kato, Takuji; and Ito, Shigeji, 5,556,760, Cl. 435-12.000.

Biotechnology Research & Development Corporation: *See*—
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Birbaum, Jean-Luc: *See*—
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Wehrman, Joseph G.; King, Stephen J.; and Birdi, Kulwant S., 5,555,749, Cl. 62-641.000.

Birkenmaier, Wilhelm: *See*—
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Birkle, Siegfried: *See*—
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Birnbaum, Milton: *See*—
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Bishop, Justin D.: *See*—
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Bishop, Peter W. D.: *See*—
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Bittinger, James H., Jr., to Lake Superior Paper Industries. Angled-rib blocking slab for pulpwood grinder. 5,556,043, Cl. 241-282.000.

Bjorkman, Gerald W., Jr.; Clark, Samuel D.; Craig, Clinton A., deceased (by Glenice P. Craig, executrix), to Lockhead Martin Corporation. Backside shielding assembly for plasma arc welding. 5,556,559, Cl. 219-121.510.

Black & Decker Inc.: *See*—
Brotto, Daniele C., 5,557,190, Cl. 320-21.000.

Black, Wayne J.: *See*—
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Blacklow, Neil R.: *See*—
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Ellett, William A.; and Blalock, James D., 5,556,062, Cl. 248-55.000.

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Johnston, James B.; Tyler, James S.; and Blanchard, Guy C., 5,555,980, Cl. 206-600.000.

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Blank Paper Products Ltd.: *See*—
Blankitny, Efraim, 5,556,026, Cl. 229-123.100.

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Baisch, Eric K.; and Blimegger, Leroy G., 5,556,050, Cl. 242-296.000.

Bliss, Gary L.: *See*—
Paterson, Graeme S.; Bliss, Gary L.; and Boyd, Mark R., 5,557,653, Cl. 379-58.000.

Bliss, Gary S.: *See*—
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Bloom, Devin A.: *See*—
Stephens, Fred O.; Bloom, Devin A.; Eland, Michael P.; Standiford, Gregory A.; and Dory, Jon R., 5,557,485, Cl. 360-96.500.

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Blystone, Sheri: *See*—
Liav, Avraham; Hardgrave, Ragen F.; Blystone, Sheri; and Turner, Gregory A., 5,556,963, Cl. 536-55.300.

Board of Regents, The University of Texas System: *See*—
Roy, Arun K.; and Chatterjee, Bandana, 5,556,956, Cl. 536-24.100.
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Cooper, Richard K.; and Enright, Frederick M., 5,556,782, Cl. 435-240.200.

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Bockman, Stuart F.: *See*—
Bender, Douglas J.; Bockman, Stuart F.; Eyerly, Bruce N.; and Anagnost, John J., 5,557,285, Cl. 342-359.000.

Boehringer Mannheim GmbH: *See*—
Goerlach-Graw, Ada; Baer, Reinhard; and Lerch, Rolf, 5,556,789, Cl. 436-169.000.

Boeing Company, The: *See*—
Baker, Anna L.; and Garrigus, Darryl F., 5,555,914, Cl. 138-115.000.
Kirkwood, Brad L.; Stepan, Michael M.; and Patt, Paul J., 5,556,565, Cl. 219-633.000.

Boettiger, Friedrich: *See*—
Suissa, Avshalom; Zomotor, Zoltan; and Boettiger, Friedrich, 5,557,520, Cl. 364-424.010.

Bogart, Bruce E.: *See*—
Rogers, M. Weldon, III; Bogart, Bruce E.; Gerke, David L.; Eberle, Robert A.; and Thomas, Craig, 5,556,163, Cl. 297-330.000.

Bogdan, Eugene A.: *See*—
Terza, Raymond R.; and Bogdan, Eugene A., 5,556,457, Cl. 106-697.000.

Bognitski, Isaac Y.: *See*—
Ivanov, Alexander M.; Bognitski, Isaac Y.; Gerasimov, Arkadiy F.; Efimov, Sergei E.; Savintsev, Vadim G.; Fomin, Andrei V.; and Chizhevski, Sergei V., 5,557,497, Cl. 361-502.000.

Bohanon, Leo F.; Adams, Robert A.; and Kruszka, Daniel R., to Hydrite Chemical Co. Anticoagulant compositions. 5,556,643, Cl. 424-602.000.

Böhme, Joachim: *See*—
Mayr, Bernold; Müller, Leopold; and Böhme, Joachim, 5,555,861, Cl. 123-90.160.

Bohn, Paul W.; and Lu, Wenyuan, to Biotechnology Research & Development Corporation. Structures with field responsive permeation control. 5,556,528, Cl. 204-600.000.

Bohn, William R.; Short, Shelly; and Garlington, Joseph O., to Walt Disney Company, The. Amusement ride assembly with rotating tube synchronized with an image. 5,556,340, Cl. 472-59.000.

Bolmgren, Mary J.: *See*—
Otters, Timothy P.; and Bolmgren, Mary J., 5,555,778, Cl. 81-3.550.

Bomer, Dennis L.: *See*—
Teder, Rein S.; Bomer, Dennis L.; and Niver, Michael A., 5,556,493, Cl. 156-64.000.

Bone, Ronald N., Jr.: *See*—
Barber, Keith A.; Bone, Ronald N., Jr.; Cogan, Kevin C.; Dickerson, Michael L.; Gien, Peter H.; Griffith, Lezley A.; Nightingale, Gary R.; Ouellette, Edward L.; Petter, Robert R., Jr.; and Semjenow, Gary A., 5,555,787, Cl. 83-698.110.

Boner, Alon: *See*—
Retter, Refael; Bublil, Mosbe; Shavit, Gad; Gill, Aharon; Jaliff, Ricardo; Ofir, Ram; Boner, Alon, Ilan, Oded; and Hassut, Eliezer, 5,557,538, Cl. 364-514.00A.

Böni, Jürg: *See*—
Schüpbach, Jörg; and Böni, Jürg, 5,556,745, Cl. 435-5.000.

Bonn, Russell H., Jr. Billiard ball rack. 5,556,341, Cl. 473-40.000.

Bonner, Kevin B. Double-needle chuck assembly with movable knife for sewing machine. 5,555,834, Cl. 112-129.000.

Bonnet, Jean-Pierre: *See*—
Wicker, Alain; Bonnet, Jean-Pierre; Sanz, Mariano; Dordor, Patrice; and Magro, Christophe, 5,556,831, Cl. 505-500.000.

Bonuscentre Limited: *See*—
Bunker, Roger S. A.; and Goodall, David J., 5,555,947, Cl. 175-62.000.

Booij, Martin: *See*—
Halderit, Antoon H. T.; Booij, Martin; Hendrix, Jan A. J.; and Frentzen, Yvonne H., 5,556,890, Cl. 521-49.800.

Book, Steven C., to Gretson International Ltd. Foldable cover with easel option. 5,555,614, Cl. 29-401.100.

Booles, Harold F., to A. O. Smith Corporation. Flexible dual wall hose or pipe assembly. 5,556,679, Cl. 428-36.910.

Boone, David D.: *See*—
Daleo, Stephen L.; and Boone, David D., 5,557,561, Cl. 364-602.000.

Bordeau, Kenneth J.: *See*—
Strupczewski, Joseph T.; Helsley, Grover C.; Glamkowski, Edward J.; Chiang, Yulin; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., 5,556,858, Cl. 514-254.000.

Bordes, Elisabeth: *See*—
Blanchard, Gilbert; Bordes, Elisabeth; and Ferre, Gilbert, 5,556,984, Cl. 558-319.000.

Borkowski, James T.; and Borkowski, Milton F. Beverage can and pivotal screen guard opener system. 5,555,993, Cl. 220-269.000.

Borkowski, Milton F.: *See*—
Borkowski, James T.; and Borkowski, Milton F., 5,555,993, Cl. 220-269.000.

Borland International, Inc.: *See*—
Frid-Nielsen, Lars K., 5,557,730, Cl. 395-159.000.

Borras, Jaime: *See*—
Pombo, Raul; Borras, Jaime; and Bron, Michel, 5,557,743, Cl. 395-186.000.

Borthick, William R.; and Fujan, Steven J., to Terex Corporation. Cross-stiffened panel structure. 5,555,699, Cl. 52-801.110.

Borucki, Martin T.: *See*—
Kober, Kasimir; and Borucki, Martin T., 5,556,360, Cl. 493-23.000.

Bory, William H., to Chesapeake Corporation. Neck down cutter. 5,556,243, Cl. 409-226.000.

Bösch, Peter; Lauhacher, Karl-Eugen; Ammon, Dieter; and Steiner, Manfred, to Mercedes-Benz AG. Method for controlling vehicle brake pressure as a function of the deviation of the actual slip of wheels relative to a desired slip. 5,556,176, Cl. 303-165.000.

Bose, Frank A.: *See*—
Patrick, Roger; and Bose, Frank A., 5,556,549, Cl. 216-61.000.

Bosmans, Jean-Paul R.: *See*—
Van Daele, Georges H.; Verdonck, Marc G.; Bosmans, Jean-Paul R.; and Janssen, Paul A., 5,556,886, Cl. 514-646.000.

Bossard, Gerald E.: *See*—
Abrams, Michael J.; Brooks, Robert C.; Bossard, Gerald E.; and Vollano, Jean F., 5,556,849, Cl. 514-185.000.

Bossek, Harald: *See*—
Skodell, Birgit; Osberghaus, Rainer; Rogmann, Karl-Heinz; Fauhel, Heiko; and Bossek, Harald, 5,556,450, Cl. 106-10.000.

Bottcher, Axel; Doring, Manfred; and Zehrfeld, Jürgen, to Rutgerswerke Aktiengesellschaft. Neutral metal complex salts. 5,556,705, Cl. 428-413.000.

Bouchard, Hervé; Bourzat, Jean-Dominique; Commerçon, Alain; and Pulicani, Jean-Pierre, to Rhone-Poulenc Rorer S.A. Taxoids, their preparation and the pharmaceutical compositions which contain them. 5,556,877, Cl. 514-449.000.

Bouix, Jean: *See*—
Abiven, Henri; Colin, Christophe; Bouix, Jean; Macari, Michel; and Viala, Jean-Claude, 5,556,486, Cl. 148-429.000.

Boumarafi, Mohamed: *See*—
Hurford, Jonathan P.; and Boumarafi, Mohamed, 5,556,127, Cl. 280-730.200.

Bourneuf, John J.; Lenahan, Dean T.; Demers, Daniel E.; and Plemmons, Larry W., to General Electric Company. Gas turbine engine cooling supply circuit. 5,555,721, Cl. 60-39.750.

Bourzat, Jean-Dominique: *See*—
Bouchard, Hervé; Bourzat, Jean-Dominique; Commerçon, Alain; and Pulicani, Jean-Pierre, 5,556,877, Cl. 514-449.000.

Bovio, Michele: *See*—
Baucom, Allan S.; Foster, Mark J.; and Bovio, Michele, 5,557,500, Cl. 361-687.000.

Bowden, David: *See*—
Bulat, Vladimir; Madic, Bosko; Bowden, David; and Titan, Stan, 5,557,631, Cl. 373-105.000.

Bowen, Douglas M.; Gray, Clint D.; Campbell, Douglas E.; Collier, David; Hickman, Steven L.; Hole, Norman J.; Kessens, Norman J.; Webster, Gary D.; Walker, John H.; and Walters, Daniel L. Lightweight back-pack generator set having a spark-ignited engine operating on middle distillate fuels. 5,555,853, Cl. 123-2.000.

Bowles, Mark: *See*—
Skeen, Marion D.; and Bowles, Mark, 5,557,798, Cl. 395-650.000.

Bowman, Joseph D.; and Engel, Daniel P., III, to United States of America, Health and Human Services. Magnetic resonance monitor. 5,557,199, Cl. 324-301.000.

Boyd, Billy S. Trash bag retaining band. 5,556,063, Cl. 248-99.000.

Boyd, Donald B.; Lifer, Sherryl L.; Marshall, Winston S.; Palkowitz, Alan D.; Pfeifer, William; Reel, Jon K.; Simon, Richard L.; Steinberg, Mitchell I.; Thrasher, K. Jeff; Vasudevan, Venkatraghaven; and Whitesitt, Celia A., to Eli Lilly and Company. Angiotensin II antagonist intermediates. 5,556,981, Cl. 548-238.000.

Boyd, Mark R.: *See*—
Paterson, Graeme S.; Bliss, Gary L.; and Boyd, Mark R., 5,557,653, Cl. 379-58.000.

Boyle, Douglas B.: *See*—
Koford, James S.; Scepanovic, Ranko; Jones, Edwin R.; Boyle, Douglas B.; and Rostoker, Michael D., 5,557,533, Cl. 364-491.000.

BP Chemicals Limited: *See*—
Chinh, Jean-Claude, 5,556,238, Cl. 406-136.000.

Bracco Research S.A.: *See*—
Yan, Feng; Schneider, Michel; and Brochot, Jean, 5,556,610, Cl. 424-9.520.

Braceras, George M.; and Howell, Lawrence C., Jr., to International Business Machines Corporation. Functional pipelined virtual multiport cache memory with plural access during a single cycle. 5,557,768, Cl. 395-458.000.

Bracken Enterprises Limited: *See*—
Leighton, Douglas C., 5,555,629, Cl. 33-17.00R.

Braden, Veronica K.: *See*—
Babaian-Kibala, Elizabeth; Braden, Veronica K.; Poindexter, Michael K.; and Murphy, Christopher J., 5,556,575, Cl. 252-394.000.

Bradley, Jonathan: *See*—
Frantz, Gene A.; Subuvenkat, Subramaniyan; Bradley, Jonathan; and Larimer, James A., 5,557,557, Cl. 364-578.000.

Brady, Daniel F.; McCall, John E., Jr.; Bailey, Clyde A., and Copeland, James L., to Ecolab Inc. Self-optimizing detergent controller for minimizing detergent set-point overshoot. 5,556,478, Cl. 134-18.000.

Brady, Patrick K., to Teledata Solutions, Inc. Call distribution system with distributed control of calls and data distribution. 5,557,668, Cl. 379-212.000.

Braesch, Robert O., Hong, Peter L.; Mefferd, Thomas A.; and Olson, Michael D., to Columbus McKinnon Corporation. Air lifting and balancing unit. 5,556,077, Cl. 254-267.000.

Brammer, Norman; McConaughy, Brett R.; and Gariery, James A., to ABB Vetco Gray Inc. Fluid connector for well. 5,555,935, Cl. 166-88.100.

Bran, Mario E., to Verteq, Inc. Method and apparatus for drying semiconductor wafers. 5,556,479, Cl. 134-1.300.

Brandt, Hans-Jürgen, to Martin Merkel GmbH & Co KG. Shaft sealing ring with flexible hinged sealing lip. 5,556,112, Cl. 277-152.000.

Braren, Bodil E.: *See*—
Afzali-Ardakani, Ali; Ayala-Esquilin, Juan; Braren, Bodil E.; Daijavad, Shahrokh; Foster, Elizabeth; Hedrick, James L., Jr.; Hedrick, Jeffrey C.; Hodgson, Rodney T.; Mehta, Ashit A.; Molis, Steven E.; Shaw, Jane M.; Tisdale, Stephen L.; and Viehbeck, Alfred, 5,556,899, Cl. 523-215.000.

Brasher, Edward C., Jr.: *See*—
Hyde, Russell T.; Wise, Michael G.; Stokes, Robert H.; and Brasher, Edward C., Jr., 5,557,397, Cl. 356-5.010.

Brasseur, Bernard P. Method and device for locating bait at desired depth while fishing. 5,555,668, Cl. 43-43.150.

Brattoli, Mark A.: *See*—
Hollenbeck, Robert K.; and Brattoli, Mark A., 5,557,182, Cl. 318-432.000.

Bravo-Leerabhandh, Marjorie: *See*—
Kwan, Shing F.; and Bravo-Leerabhandh, Marjorie, 5,556,788, Cl. 436-87.000.

Bray, Douglas R.; and Strazhnik, Michael M., to Sea Gull Lighting. Snap-on extension wire socket with electrical conductor insulation piercer. 5,556,297, Cl. 439-405.000.

Bray, Raymond: *See*—
Martin, Terry G.; and Bray, Raymond, 5,555,875, Cl. 124-44.500.

Breed Automotive Technology, Inc.: *See*—
Ramaswamy, Coodly P., 5,557,061, Cl. 149-26.000.

Brehm, Helmut; Strijbos, Leonardus; and Eikmeier, Hans-Bernhard, to Chemische Fabrik Stockhausen GmbH. Copolymers and their use in the treatment of leather. 5,556,930, Cl. 526-318.500.

Breitsprecher, Charles O., to Mattson Spray Equipment, Inc. Proportioner for fluid spray gun with air valve control. 5,556,007, Cl. 222-136.000.

Breitweiser, Frederick W., Jr., to Breitweiser Music Technology Inc. Musical keyboard having an electronically controlled display and a method of keyboard display. 5,557,055, Cl. 84-478.000.

Breitweiser Music Technology Inc.: *See*—
Breitweiser, Frederick W., Jr., 5,557,055, Cl. 84-478.000.

Bremm, Klaus-Dieter: *See*—
Philipps, Thomas; Bartel, Stephan; Krebs, Andreas; Petersen, Uwe; Schenke, Thomas; Bremm, Klaus-Dieter; Endermann, Rainer; Metzger, Karl G.; and Mielke, Burkhard, 5,556,979, Cl. 546-123.000.

Bresee, Randall R.: *See*—
Annis, Patricia A.; Davis, Ronald C.; and Bresee, Randall R., 5,557,039, Cl. 73-7.000.

Brewer, James E.; and Taghizadeh, Ehssanollah. Method for automatic, adaptive, active facilitation to access myocardial electrical instability. 5,555,888, Cl. 128-702.000.

Brewster, Andrew G.: *See*—
Wayne, Michael G.; Smithers, Michael J.; Rayner, John W.; Faull, Alan W.; Pearce, Robert J.; Brewster, Andrew G.; Shute, Richard E.; Mills, Sturat D.; and Caulkett, Peter W. R., 5,556,977, Cl. 544-360.000.

Bridgestone Corporation: *See*—
Nishinaka, Koutaro; and Kawaguchi, Yasuyoshi, 5,556,572, Cl. 510-188.000.
Yoshikawa, Masato; Ishiharada, Minoru; Tanuma, Itsuo; Naito, Kazuo; Sugimachi, Masato; and Sugiyama, Hideo, 5,557,702, Cl. 385-143.000.

Bridgestone Sports Co., Ltd.: *See*—
Higuchi, Hiroshi; Yamagishi, Hisashi; Egashira, Yoshinori; and Yamada, Tadatoshi, 5,556,098, Cl. 473-373.000.

Briggs, Karen A.: *See*—
McMurtrey, Kevin D., Sr.; Rossi, Arthur M.; Cichon, Robert J., Jr.; Briggs, Karen A.; and Ely, Jonathan C., 5,557,186, Cl. 318-626.000.

Brion, Francis; Buendia, Jean; Diolez, Christian; and Vivat, Michel, to Roussel Uclaf. Process for the preparation of hydrocortisone. 5,556,962, Cl. 540-30.000.

BriteLine Industries, Inc.: *See*—
Wyckoff, Charles W., 5,557,461, Cl. 359-551.000.

British Aerospace Public Limited Company: *See*—
Parsons, Timothy J., 5,557,543, Cl. 364-516.000.

British Gas: *See*—
Bunker, Roger S. A.; and Goodall, David J., 5,555,947, Cl. 175-62.000.

British Technology Group Limited: *See*—
Marsh, Michael J. C.; and Van Zyl, Clinton A., 5,557,280, Cl. 342-044.000.

British Telecommunications public limited company: *See*—
Barker, Philip A.; Stockton, David J.; Fisk, Christopher; and Jenkins, Peter D., 5,557,703, Cl. 385-128.000.

Britt, Jeffrey S.; and Ferekides, Christos S., to University of South Florida. Ohmic contact using binder paste with semiconductor material dispersed therein. 5,557,146, Cl. 257-741.000.

Brochot, Jean: *See*—
Yan, Feng; Schneider, Michel; and Brochot, Jean, 5,556,610, Cl. 424-9.520.

Brock, Thomas; and Wandelmaier, Klaus, to Herberts GmbH. Aqueous binder dispersion for physically drying coating compositions and use thereof. 5,556,912, Cl. 524-507.000.

Brodt, Gregor; Lehner, August; Lindner, Alfred; Graf, Hermann; Bobrich, Michael; Kress, Ria; Schneider, Norbert; Kohl, Albert; and Loch, Werner, to BASF Magnetics GmbH. Polymeric materials suitable as dispersing resins. 5,556,918, Cl. 525-131.000.

Bron, Michel: *See*—
Pombo, Raul; Borras, Jaime; and Bron, Michel, 5,557,743, Cl. 395-186.000.

Brook, John W.; Factor, David F.; Kinney, Frederick D.; McCallen, Celeste L.; and Young, Andrea M., to Sandoz Ltd. Cementitious compositions. 5,556,458, Cl. 106-708.000.

Brooks, Robert C.: *See*—
Abrams, Michael J.; Brooks, Robert C.; Bossard, Gerald E.; and Vollano, Jean F., 5,556,849, Cl. 514-185.000.

Broshi, Yuval, to ASSA Industries (C.S.) Ltd. Automated storage system. 5,556,246, Cl. 414-278.000.

Brosmith, Sean B.: *See*—
Oshry, Scott J.; and Brosmith, Sean B., 5,555,977, Cl. 206-308.100.

Brother Kogyo Kabushiki Kaisha: *See*—
Chen, Ding-Yu, 5,557,374, Cl. 355-219.000.
Endo, Yoshinori; and Ishida, Kazuhito, 5,557,368, Cl. 355-203.000.
Kinoshita, Naohisa, 5,557,370, Cl. 355-206.000.
Sago, Akira, 5,557,312, Cl. 347-171.000.
Yamane, Mitsuo; and Kawaguchi, Takashi, 5,556,693, Cl. 428-195.000.

Brotto, Daniele C., to Black & Decker Inc. Battery recharging system with signal-to-noise responsive falling voltage slope charge termination. 5,557,190, Cl. 320-21.000.

Brower, Boyd G.; Crane, Robert A.; Napiorkowski, John J.; and Shannon, William J., to Siecor Corporation. Overvoltage protectors sealed with gel. 5,557,065, Cl. 174-52.300.

Brown, Allen L., Jr.; and Marshall, Sidney W., to Xerox Corporation. Method of determining whether a document tree is weakly valid. 5,557,720, Cl. 395-146.000.

Brown, Brian L.: *See*—
Norwood, Roger D.; and Brown, Brian L., 5,557,219, Cl. 326-49.000.

Brown, Donald C.; Dwarica, N. Steven; and Hickey, Suzanne V., to Heyco Stamped Products, Inc. Blade for printed circuit board to access 120V AC outlet current. 5,556,308, Cl. 439-746.000.

Brown, Glen J.: *See*—
Curlett, John; and Brown, Glen J., 5,556,489, Cl. 152-418.000.

Brown, Marcus E.; and Rogers, Samuel J., to University of Alabama. Method and apparatus for verification of a computer user's identification, based on keystroke characteristics. 5,557,686, Cl. 382-115.000.

Brown, Marsha A.; Demers, Richard A.; Diephuis, James A.; Falcon, Lorenzo, Jr.; Frayne, Thomas E.; Gaitonde, Sunil S.; Patry, Elaine S.; Remay, William A.; Sissors, Kenneth M.; Vasquez, Ejuana D.; Weber, David J.; and Yamaguchi, Koichi, to International Business Machines Corporation. Apparatus which allows data sharing amongst computer program from different program environments. 5,557,776, Cl. 395-500.000.

Brown, Richard D.: *See*—
Wiechard, Robert N.; Banas, John M.; and Brown, Richard D., 5,555,849, Cl. 122-4.00D.

Brown, William: *See*—
Janchitraponvej, Ben; and Brown, William, 5,556,616, Cl. 424-70.122.

Brown, William J.: *See*—
Janchitraponvej, Ben; Brown, William J.; and Lee, Patricia, 5,556,615, Cl. 424-70.110.

Browning, James D.: *See*—
Lipinsky, Edward S.; Sinclair, Richard G.; Browning, James D.; Cheung, Alex; Schilling, Kevin H.; and Verser, Dan W., 5,556,895, Cl. 521-182.000.

Bruce, Walter D.: *See*—
Gehben, Vernon D.; and Bruce, Walter D., 5,556,600, Cl. 422-108.000.

Bruchu, Todd W.: *See*—
Galowitz, Dennis A.; and Bruchu, Todd W., 5,555,684, Cl. 52-204.500.

Brucker, Robert J., to Seal Spout Corporation. Ninety degree pouring spout. 5,556,004, Cl. 222-81.000.

Brueck, Guenter, to Hughes Electronics. Angular adjustment mechanism. 5,557,455, Cl. 359-384.000.

Brugnara, Carlo: *See*—
Halperin, Jose; Brugnara, Carlo; and Haynes, Harley, 5,556,871, Cl. 514-396.000.

Bruker Analytische MeBtechnik GmbH: *See*—
Simon, Arno; Rapp, Norbert; and Weil, Jean-Michel, 5,557,544, Cl. 364-525.000.

Bruker Medizintechnik GmbH: *See*—
Nauerth, Arno, 5,557,203, Cl. 324-309.000.

Brunkhorst, Philip J.: *See*—
Taillon, Armand P.; and Brunkhorst, Philip J., 5,555,817, Cl. 105-198.200.

Brunner, Harald, to Happich Fahrzeng-Dachsysteme GmbH. Fastening device for bars of a roof rack. 5,556,221, Cl. 403-322.000.

Brunner, Larry F. Tire bead breaking tool. 5,555,922, Cl. 157-1.170.

Bruno, Richard F.; Chen, Mon-Mei; Harris, Rosemary H.; and Markowitz, Robert E., to AT&T. Method and system for multi-channel data automatic call distribution for sequentially launched calls. 5,557,667, Cl. 379-201.000.

Brunsting, William J. Magnetic assembly for a closed pressurized flow path of lubricating oil. 5,556,540, Cl. 210-222.000.

Brunswick Biomedical Technologies, Inc.: *See*—
Hewson, Roy; Hewson, J. Richard; and Hewson, Carl E., 5,556,425, Cl. 607-124.000.

Brush, Charles K.; and Anderson, Eric D., to Pharmacia P-L Biochemicals Inc. Indocarbocyanine-linked phosphoramidites. 5,556,959, Cl. 536-25.320.

Brüstle, Klaus; Huber, Edgar; and Röck, Erich, to Julius Blum Gesellschaft m.b.H. Drawer. 5,556,183, Cl. 312-348.100.

Bryant, Henry U.; and Grese, Timothy A., to Eli Lilly and Company. Methods for lowering serum cholesterol. 5,556,876, Cl. 514-443.000.

Bryson, Nathan J., to Flamel Technologies. Polysilane-based composition. 5,556,901, Cl. 524-99.000.

Bublil, Moshe: *See*—
Retter, Refael; Bublil, Moshe; Shavit, Gad; Gill, Aharon; Jaliff, Ricardo; Ohr, Ram; Boner, Alon; Ilan, Oded; and Hassut, Eliezer, 5,557,538, Cl. 364-514.00A.

Bubnoski, David P.: *See*—
Knowles, Carl H.; Naylor, Charles A.; and Bubnoski, David P., 5,557,093, Cl. 235-462.000.

Buchanan Construction Products, Inc.: *See*—
Tanim, Carl R., 5,557,070, Cl. 174-87.000.

Buchanan, Scott J.: *See*—
Lee, Chong S.; and Buchanan, Scott J., 5,556,437, Cl. 51-298.000.

Buchner, Tomasz; and Kelly, David E., to TRW Inc. Control arm for use in a vehicle wheel suspension system. 5,556,119, Cl. 280-96.100.

Budzynski, Danny L.; and Bliss, Gary S., to Dowbrands Inc. Quick bottle production changeover utilizing multi-cavity molds in an extrusion blow molding system. 5,556,648, Cl. 425-150.000.

Buendia, Jean: *See*—
Brion, Francis; Buendia, Jean; Diolez, Christian; and Vivat, Michel, 5,556,962, Cl. 540-30.000.

Bulat, Vladimir; Madic, Bosko; Bowden, David; and Titan, Stan, to Dynex Engineering Inc. Sonic furnace monitoring apparatus. 5,557,631, Cl. 373-105.000.

Bull HN Information Systems Inc.: *See*—
Wilhite, John E.; and Lange, Ronald E., 5,557,737, Cl. 395-182.040.

Bullock, Robert L., to Standard Car Truck Company. Dual face friction wedge. 5,555,818, Cl. 105-198.200.

Bülow, Henning: *See*—
Veith, Gustav; and Bülow, Henning, 5,557,694, Cl. 385-27.000.

Bungo, Keiichiro; Maruyama, Yoshinori; and Kubota, Norimasa, to Minolta Camera Kabushiki Kaisha. Image projecting apparatus provided with cartridge loading device. 5,556,185, Cl. 353-26.00R.

Bunkenburg, Brian K.: *See*—
Grube, Gary W.; Bunkenburg, Brian K.; and Naddell, Marc C., 5,557,605, Cl. 370-29.000.

Bunker, Roger S. A.; and Goodall, David J., to British Gas; and Bonuscentre Limited. Mole launcher and a method of operating a mole launcher. 5,555,947, Cl. 175-62.000.

Buonfigli, Enrico: *See*—
Maoloni, Domenico; Pizi, Adriano; Buonfigli, Enrico; and Tweedie, Alastair R., 5,555,706, Cl. 53-447.000.

Buonocore, Richard L.; *See*—
Gopp, Alexander Y.; Sbaschnig, Richard W.; and Buonocore, Richard L., 5,555,871, Cl. 123-481.000.

Burgeson, John R., to Wildlife Research Center, Inc. Heated animal scent lure dispenser. 5,555,663, Cl. 43-1.000.

Burgess, Alan: *See*—
Ross, Douglas A.; and Burgess, Alan, 5,556,558, Cl. 219-121.500.

Burke, Peter J., to AIL Systems, Inc. Linear chirp generation using VCO tuning with polynomial predistortion. 5,557,241, Cl. 331-4.000.

Burkhalter, Kenneth E.; and Cailey, Ron, to Symorex Inc. Track for sortation handling equipment. 5,555,814, Cl. 104-107.000.

Burn, Timothy C.; Satterthwaite, Anne B.; and Tenen, Daniel G., to Beth Israel Hospital Boston Association. Hematopoietic stem cell specific gene expression. 5,556,954, Cl. 536-24.100.

Burns, Elaine G.; Davenport, Esther L.; Manseur, Belkacem; Munson, Gary A.; Seip, Barry S.; and Sze, Elaine I., to AT&T. Calling party-paid wireless telephone service. 5,557,664, Cl. 379-114.000.

Burzawa, Stéphane: *See*—
Schlossers, Christophe; Burzawa, Stéphane; Megel, François; and Le Gouzouguec, Anne, 5,557,685, Cl. 382-107.000.

Busch, Craig A., to TRW Vehicle Safety Systems Inc. Seat belt bezel assembly. 5,556,171, Cl. 297-483.000.

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Cheesebrough-Pond's USC Co., Division of Conopco, Inc.: *See*—
Ackley, Sprague; and Choi, Stephen, 5,557,092, Cl. 235-462.000.
Choi, Yong-Mi: *See*—

Clark, Robert A.: *See*—
Banman, David A.; and Clark, Robert A., 5,557,751, Cl. 395-250.000.
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Collins, Kenneth S.; Roderick, Craig A.; Trow, John R.; Yang, Chan-Lon; Wong, Jerry Y.; Marks, Jeffrey; Keswick, Peter R.; Groechel, David W.;

Bory, William H., 5,556,243, Cl. 409-226.000.

Chesebrough-Pond's USC Co., Division of Conopco, Inc.: *See*—
Zaaiden, Alexander P.; Wivell, Susan C.; and Kickertz, Virginia R., 5,556,630, Cl. 424-401.000.

Chester, Brian, to Trychest Proprietary Limited. Sliding curtain clip and guide track. 5,555,603, Cl. 16-87.200.

Chetverin, Alexander B.: *See*—
Wu, Ying; Ryabova, Lyubov A.; Kurnasov, Oleg V.; Morosov, Igor Y.; Ugarov, Viktor I.; Volianik, Elena V.; Chetverin, Alexander B.; Zhang, David; Kramer, Fred R.; and Spirin, Alexander S., 5,556,769, Cl. 435-69.100.

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Lipinsky, Edward S.; Sinclair, Richard G.; Browning, James D.; Cheung, Alex; Schilling, Kevin H.; and Verser, Dan W., 5,556,895, Cl. 521-182.000.

Chevallier, Christophe J.: *See*—
Roohparvar, Frankie F.; and Chevallier, Christophe J., 5,557,576, Cl. 365-218.000.

Chevron Research and Technology Company: *See*—
Goodrich, J. L.; and Statz, R. J., 5,556,900, Cl. 524-59.000.

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Bergemont, Albert; and Chi, Min-hwa, 5,557,567, Cl. 365-185.160.

Chi, Tom Y.; Hou, Liping D.; Lee, Kusol; Li, Danny; Naik, Ishver K.; and Quach, Tom, to Hughes Aircraft Company. Method of fabricating a self-aligned double recess gate profile. 5,556,797, Cl. 437-405.000.

Chia, Chok J.: *See*—
Variot, Patrick; and Chia, Chok J., 5,557,150, Cl. 257-787.000.

Chiang, Weilong: *See*—
Rotter, George E.; Chiang, Weilong; Tsai, Boh C.; Melquist, John L.; Pauer, Cheryl A.; and Chen, Stephen Y., 5,556,926, Cl. 525-444.000.

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Strupczewski, Joseph T.; Helsley, Grover C.; Glamkowski, Edward J.; Chiang, Yulin; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., 5,556,858, Cl. 514-254.000.

Chiarino, Dario: *See*—
Camaggi, Giovanni; Chiarino, Dario; Fantucci, Mario; and Meazza, Giovanni, 5,556,829, Cl. 504-199.000.

Chiba, Nobuhiro; and Iwasaki, Yasuo, to Sony Corporation. Method and apparatus for recording data on recording medium. 5,557,594, Cl. 369-59.000.

Chiba, Takeshi: *See*—
Miyashita, Akira; Chiba, Takeshi; Nohira, Hiroyuki; and Takaya, Hidemasa, 5,556,998, Cl. 556-21.000.

Chicago Dryer Company: *See*—
Kober, Kasimir; and Borucki, Martin T., 5,556,360, Cl. 493-23.000.

Chida, Chiaki: *See*—
Maeda, Yuji; Ito, Seiji; and Chida, Chiaki, 5,556,059, Cl. 248-49.000.

Chikugawa, Hiroshi: *See*—
Masui, Katsushige; Miyauchi, Nobuyuki; Tani, Zenpei; Chikugawa, Hiroshi; Tsuji, Makoto; Ogawa, Masaru; and Shiomoto, Takehiro, 5,557,116, Cl. 257-100.000.

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Chin, Albert K.: *See*—
Lathrop, Robert L., Jr.; Emerson, Rick E.; Wiley, James E.; Sklenar, James M.; Chin, Albert K.; Moll, Frederick H.; and Forster, David, 5,555,897, Cl. 128-845.000.

Chinh, Jean-Claude, to BP Chemicals Limited. Process and apparatus for introducing a solid into a reactor. 5,556,238, Cl. 406-136.000.

ChipScale, Inc.: *See*—
Richards, John G.; Sander, Wendell B.; Richmond, Donald P., II; and Flores, Hector, 5,557,149, Cl. 257-779.000.

Chiquita Brands, Inc.: *See*—
Raudales, Gustavo; Fernandez, Raul; Sanabria, Franklin; Barsallo, Rodrigo; Chong, Salomon; Howell, Elmer; Rodriguez, Francisco; Petersen, Randall; and Mullock, Daniel, 5,556,658, Cl. 426-411.000.

Chishima, Masamitsu; and Noro, Yutaka, to Sumitomo Wiring Systems, Ltd. Method and apparatus for connecting a plurality of terminals within a single housing. 5,556,301, Cl. 439-507.000.

Chiu, Chia-pin: *See*—
Agatstein, Willy; Aghazadeh, Mostafa; Chiu, Chia-pin; Ghori, Amar; Neal, James R.; and Turturio, Gregory, 5,556,811, Cl. 437-209.000.

Chizhevski, Sergei V.: *See*—
Ivanov, Alexander M.; Bognitski, Isaac Y.; Gerasimov, Arkadiy F.; Efimov, Sergei E.; Savintsev, Vadim G.; Fomin, Andrei V.; and Chizhevski, Sergei V., 5,557,497, Cl. 361-502.000.

Cho, Eun J.: *See*—
Jung, Il N.; Han, Joon S.; Cho, Eun J.; Jeong, Young T.; and Kang, Kap K., 5,556,822, Cl. 502-125.000.

Cho, Sung K.: *See*—
Grave, Dale L.; and Cho, Sung K., 5,555,598, Cl. 15-322.000.

Chocola, Caryl M.; Momont, Timothy W.; and Bird, Charles R., to KC Equine Systems, Inc. Method and apparatus for feeding horses. 5,555,842, Cl. 119-51.110.

Choi, Injae: *See*—
Yang, Ming; Choi, Injae; and Soong, Tsai C., 5,557,367, Cl. 355-202.000.

Choi, Jae-Kyu, to Daewoo Electronics Co., Ltd. Reel table revolution detector for use in a video cassette recorder. 5,557,101, Cl. 250-231.130.

Choi, Stephen: *See*—
Ackley, Sprague; and Choi, Stephen, 5,557,092, Cl. 235-462.000.

Choi, Yong-Mi: *See*—
Pauls, Henry W.; Choi, Yong-Mi; Studt, Robert W.; Maguire, Martin P.; Spada, Alfred P.; and Cha, Don D., 5,556,990, Cl. 548-530.000.

Chong, Salomon: *See*—
Raudales, Gustavo; Fernandez, Raul; Sanabria, Franklin; Barsallo, Rodrigo; Chong, Salomon; Howell, Elmer; Rodriguez, Francisco; Petersen, Randall; and Mullock, Daniel, 5,556,658, Cl. 426-411.000.

Chow, Alan Y.; and Chow, Vincent, to Chow, Alan Y. Independent photoelectric artificial retina device and method of using same. 5,556,423, Cl. 607-54.000.

Chow, Calvin Y.: *See*—
Wechsler, Mark; Barney, Howard H.; Kaye, Roger A.; Ogle, David G.; Lacy, Michael M.; Chow, Calvin Y.; Crawford, Kimberly L.; and Hafeman, Dean G., 5,557,398, Cl. 356-318.000.

Chow, Che C., to Xerox Corporation. Processes for preparing toners with selectable gloss. 5,556,732, Cl. 430-137.000.

Chow, Vincent: *See*—
Chow, Alan Y.; and Chow, Vincent, 5,556,423, Cl. 607-54.000.

Christensen, Thomas C.; and Cunningham, Earl A., to International Business Machines Corporation. Multipath channel apparatus and method for data storage devices and communications systems wherein a data path is selected based on errors. 5,557,482, Cl. 360-53.000.

Christensson, Björn: *See*—
Weiss, Peter; and Christensson, Björn, 5,557,341, Cl. 348-699.000.

Chrysler Corporation: *See*—
DeRees, Delbert D.; and Kowall, David J., 5,555,677, Cl. 49-502.000.

Chu, Cornel, to Hi-Tech Industries Limited. Paper fastener. 5,555,606, Cl. 24-67.900.

Chu, Ruey-Shi; Lee, Kuan M.; and Wang, Allen T. S., to Hughes Aircraft Company. Multiband, phased-array antenna with interleaved tapered-element and waveguide radiators. 5,557,291, Cl. 343-725.000.

Chun, Jae K., to SamSung Electronics Co., Ltd. Control system and method for a kimchi fermentor. 5,555,797, Cl. 99-468.000.

Chun, Jenny W. Y., to Victory Concept Industries, Ltd. Rubberized paint coating process. 5,556,668, Cl. 427-378.000.

Chung, James Y. J.; and Mason, James P., to Bayer Corporation. Toughened thermoplastic molding composition. 5,556,908, Cl. 524-493.000.

Chung, Yu-Ping, to D-Link Corporation. Capacitive coupled BNC connector. 5,557,068, Cl. 174-59.000.

Chunghwa Picture Tubes, Ltd.: *See*—
Chen, Hsing-Yao, 5,557,344, Cl. 348-809.000.
Chen, Shiou-Chern; and Huang, Chi-Fang, 5,557,164, Cl. 313-440.000.

Church & Dwight Co., Inc.: *See*—
Shank, James D., Jr., 5,556,324, Cl. 451-89.000.
Shank, James D., Jr., 5,556,325, Cl. 451-101.000.

Ciba-Geigy Corporation: *See*—
Glock, Jutta; and Kerber, Elmar, 5,556,828, Cl. 504-105.000.
Stevenson, Tyler A.; Ravichandran, Ramanathan; Holt, Mark S.; Phan, Thuy N.; Birbaum, Jean-Luc; and Toan, Vien V., 5,556,973, Cl. 544-216.000.

Ciccarelli, Roger N.; Bertrand, Jacques C.; Pickering, Thomas R.; and Bayley, Denise R., to Xerox Corporation. Color toner, method and apparatus for use. 5,556,727, Cl. 430-45.000.

Cichon, Robert J., Jr.: *See*—
McMurtrey, Kevin D., Sr.; Rossi, Arthur M.; Cichon, Robert J., Jr.; Briggs, Karen A.; and Ely, Jonathan C., 5,557,186, Cl. 318-626.000.

Ciena Corporation: *See*—
Alexander, Stephen B.; Chaddick, Steve W.; and Mizrahi, Victor, 5,557,439, Cl. 359-130.000.
Huber, David R., 5,557,442, Cl. 359-179.000.

Cilingiroglu, Ugur: *See*—
Crook, David T.; Keirn, Kevin W.; and Cilingiroglu, Ugur, 5,557,209, Cl. 324-537.000.

Cimber, Hugo. Intrauterine contraceptive device. 5,555,896, Cl. 128-830.000.

Cimino, George D.: *See*—
Carroll, Peter G.; Isaacs, Stephen T.; and Cimino, George D., 5,556,958, Cl. 536-25.300.

Cindea, Earl; and Farnsworth, Thomas. Pedestal seat. 5,556,164, Cl. 297-344.220.

Circuit Breaker Industries Limited: *See*—
Leet, Edward; Ribeiro, Manuel F. V.; and Ferreira, Carlos A., 5,557,082, Cl. 200-50.350.

Citibank, N.A.: *See*—
Rosen, Sholom S., 5,557,518, Cl. 364-408.000.

Citizen Watch Co., Ltd.: *See*—
Tosaka, Susumu; and Kashikie, Junsuke, 5,557,587, Cl. 368-282.000.

CLAAS OHG beschraenkt haftende offene: *See*—
Tophinke, Franz; Stovesand, Josef; Heidjann, Franz; and Dammann, Johannes, 5,556,337, Cl. 460-70.000.

Claas oHG Beschrankt haftende offene Handelsgesellschaft: *See*—
Roberg, Alfons, 5,556,042, Cl. 241-101.760.

Clark Equipment Company: *See*—
Deyo, Charles; Watts, Verne C.; and Kaczmarski, Wally L., 5,556,217, Cl. 403-61.000.

Clark, George A.; Heisel, Steven K.; Johnson, Arlen L.; Robinson, Chris; and Dana, Mark K., to Valleylab, Inc. Endoscopic instrument. 5,556,416, Cl. 606-205.000.

Clark, Michael C.: *See*—
Logan, Richard; Clark, Michael C.; and Meyer, Daniel G., 5,555,687, Cl. 52-288.010.

Clark, Robert A.: *See*—
Banman, David A.; and Clark, Robert A., 5,557,751, Cl. 395-250.000.

Clark, Samuel D.: *See*—
Bjorkman, Gerald W., Jr.; Clark, Samuel D.; Craig, Clinton A., deceased, 5,556,559, Cl. 219-121.510.

Clark, Timothy J.; and Ansari, Shoeb, to PSC Inc. System for enabling decoding of bar code and other symbols with a digital microcomputer connected via the input/output port thereof to the scanner. 5,557,095, Cl. 235-462.000.

Clarke, Dana H.: *See*—
Miller, Regis R.; Mellor, George E.; Norman, Theodore W., Sr.; Jamieson, Mary V.; Thompson, Michael J.; Sherrod, Willis, Sr.; Clarke, Dana H.; Webb, Jerome D.; and Wisniewski, Robert D., 5,556,180, Cl. 312-193.000.

Claterbos, John K.; and Fulton, Stephen C. Low-maintenance system for maintaining a cargo in a refrigerated condition over an extended duration. 5,555,733, Cl. 62-62.000.

Claussner, André; Goubet, Francois; and Teutsch, Jean-Georges, to Roussel Uclaf. Phenylimidazolidines. 5,556,983, Cl. 548-300.700.

Clementi, David. Hand grip exercise device. 5,556,359, Cl. 482-49.000.

Clevenger, Marc C.; and Fox, Mathias R., to Prince Corporation. Vehicle lamp slide switch including detent assembly. 5,557,081, Cl. 200-16.00C.

Clopay Building Products Company, Inc.: *See*—
Leist, Alan R.; Lewis, Richard J., Jr.; and Sachs, William J., Jr., 5,555,923, Cl. 160-229.100.

Clough, Arthur H., to Polaroid Corporation. Delaminating method and apparatus, 5,556,499, Cl. 156-344.000.

Coates Brothers PLC: *See*—
Ivory, Nicholas E.; and Thatcher, Wrenford J., 5,556,735, Cl. 430-315.000.

Coates, George R., to Numar Corporation. Nuclear magnetic resonance determination of petrophysical properties of geologic structures. 5,557,200, Cl. 324-303.000.

Coccolo, Enzo, to Danieli & C. Officine Meccaniche SpA; and Danieli Centro Maskin SpA. Device for the quick change of tracks. 5,555,970, Cl. 198-866.000.

Cogan, Kevin C.: *See*—
Barber, Keith A.; Bone, Ronald N., Jr.; Cogan, Kevin C.; Dickerson, Michael L.; Gien, Peter H.; Griffith, Lezley A.; Nightingale, Gary R.; Ouellette, Edward L.; Petter, Robert R., Jr.; and Semjenow, Gary A., 5,555,787, Cl. 83-698.110.

Cohen, Donald; Daw, Derek J.; Kick, George F.; and Acosta, George M., to Endovascular, Inc. Method for tubal electroligation. 5,556,396, Cl. 606-42.000.

Cohen, Justin R. Computer picture toy for infants and very young children. 5,556,339, Cl. 463-1.000.

Cohen, Sidney M.; and Prokesch, Michael E. Method for the reduction of SO_2 emissions as generated by the fluid bed cement process. 5,556,459, Cl. 106-744.000.

Cohen, Simon S., to Massachusetts Institute of Technology. Voltage programmable link having reduced capacitance. 5,557,137, Cl. 257-530.000.

Coherent, Inc.: *See*—
Nightingale, John L.; Trail, John A.; and Johnson, John K., 5,557,475, Cl. 359-831.000.

Coin Concepts, Inc.: *See*—
Lankiewicz, Jeffrey R.; Schneider, Robert C.; and Warner, Gary J., 5,556,093, Cl. 273-126.00A.

Collor: *See*—
Rice, Vic G., 5,555,800, Cl. 101-23.000.

Colas, André R. L.; and Joseph, Edward A., to Dow Corning GmbH. Room temperature vulcanizing compositions. 5,556,914, Cl. 524-731.000.

Colella, Michael B.; and Castriotta, Michael, to Novacor Chemicals (International) SA. Tough glossy polymer blends. 5,556,917, Cl. 525-71.000.

Coleman, Alexander M.: *See*—
Kolasinski, John R.; and Coleman, Alexander M., 5,556,502, Cl. 165-345.000.

Coleman, Jeffrey. Kit for baseball field. 5,556,090, Cl. 273-25.000.

Colgate-Palmolive Co.: *See*—
Gomes, Gilbert S.; Erilli, Rita; and Kern, Ronald, 5,556,577, Cl. 510-383.000.

Colin, Christophe: *See*—
Ahiven, Henri; Colin, Christophe; Bouix, Jean; Macari, Michel; and Viala, Jean-Claude, 5,556,486, Cl. 148-429.000.

Colitto, Domenic, to Royal Extrusions Limited. Vinyl window frame with removable covered accessory groove. 5,555,682, Cl. 52-100.000.

Collard, Bruno, to Soudures et Chaines Pedno Inc. Track device having wheel widening effect. 5,556,487, Cl. 152-228.000.

Colley, Alice M.: *See*—
King, Joseph A., Jr.; McCloskey, Patrick J.; Colley, Alice M.; Dardaris, David M.; Fontana, Luca P.; and Berndsen, Josef G., 5,556,936, Cl. 528-199.000.

Collier, David: *See*—
Bowen, Douglas M.; Gray, Clint D.; Campbell, Douglas E.; Collier, David; Hickman, Steven L.; Hole, Norman J.; Kessens, Norman J.; Webster, Gary D.; Walker, John H.; and Walters, Daniel L., 5,555,853, Cl. 123-2.000.

Collins, H. Dale: *See*—
Sheen, David M.; Collins, H. Dale; Hall, Thomas E.; McMakin, Douglas L.; Gribble, R. Parks; Severtsen, Ronald H.; Prince, James M.; and Reid, Larry D., 5,557,283, Cl. 342-179.000.

Collins, Kenneth S.; Roderick, Craig A.; Trow, John R.; Yang, Chan-Lon; Wong, Jerry Y.; Marks, Jeffrey; Keswick, Peter R.; Groechel, David W.; Pinson, Jay D., II; Ishikawa, Tetsuya; Lei, Lawrence C.; Toshima, Masato M.; and Yin, Gerald Z., to Applied Materials, Inc. Silicon scavenger in an inductively coupled RF plasma reactor. 5,556,501, Cl. 156-345.000.

Collins, Peter J.; and Yazaki, Yoshikazu, to Commonwealth Scientific and Industrial Research Organisation; and Chemplex Australia Limited. Adhesive composition. 5,556,906, Cl. 524-463.000.

Collins, Stephen, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Differential amplifier with mismatch correction using floating gates. 5,557,234, Cl. 327-563.000.

Coltec Industries Inc.: *See*—
Zuercher, Jan A.; Richardson, John Q.; and Legault, Arthur R., 5,556,271, Cl. 418-201.200.

Columbus McKinnon Corporation: *See*—
Braesch, Robert O.; Hong, Peter L.; Mefferd, Thomas A.; and Olson, Michael D., 5,556,077, Cl. 254-267.000.

Colvin, Bryan J., Sr.: *See*—
Cook, Perry R.; and Colvin, Bryan J., Sr., 5,557,227, Cl. 327-346.000.

Coman, Sorin; Wu, Frank; and Demick, Robert L., to Hoover Universal. Vehicle seat back with a head side impact air bag. 5,556,129, Cl. 280-730.200.

Combe, Daniel: *See*—
Legrain, Marc; and Combe, Daniel, 5,556,468, Cl. 118-202.000.

Combustion Engineering, Inc.: *See*—
Anderson, David K.; and Malo, Mark R., 5,555,718, Cl. 60-39.020.
Wiechard, Robert N.; Banas, John M.; and Brown, Richard D., 5,555,849, Cl. 122-4.00D.

Commerçon, Alain: *See*—
Bouchard, Hervé; Bourzat, Jean-Dominique; Commerçon, Alain; and Pulicani, Jean-Pierre, 5,556,877, Cl. 514-449.000.

Commins, Alfred D., to Simpson Strong-Tie Company, Inc. Structural hanger. 5,555,694, Cl. 52-702.000.

Commissariat A L'Energie Atomique: *See*—
Carcreff, Hubert; and Thellier, Gilles, 5,557,107, Cl. 250-361.00R.

Commonwealth Scientific and Industrial Research Organisation: *See*—
Collins, Peter J.; and Yazaki, Yoshikazu, 5,556,906, Cl. 524-463.000.

Communications Technology Corporation: *See*—
Messelhi, Selim, 5,557,067, Cl. 174-59.000.

Compagnie Générale des Etablissements Michelin - Michelin & Cie: *See*—
Gergele, Jean; Le Gall, Armand; Pompier, Jean-Pierre; and Remond, Michel, 5,556,488, Cl. 152-198.000.

Compagnie Generale D'Innovation et de Developpement COGIDEV: *See*—
Giraud, André, 5,556,673, Cl. 428-34.400.

Compaq Computer Corporation: *See*—
Hayes, Donald J., 5,557,309, Cl. 347-71.000.
Stortz, James L., 5,557,304, Cl. 347-15.000.

Composite Development Corporation: *See*—
Quigley, Peter A.; Nolet, Steven C.; and Gallagher, James L., 5,556,677, Cl. 428-36.200.

Compri Technic Pty., Ltd.: *See*—
Fowler, Jeffrey B., 5,555,585, Cl. 15-3.500.

Computer Aided Systems, Inc.: *See*—
Lichti, Robert, Sr.; and Bernard, Clay, II, 5,556,247, Cl. 414-331.000.

Comvik GSM AB: *See*—
Julin, Tomas; Almgren, Björn; and Sandberg, Leif, 5,557,679, Cl. 380-23.000.

Conlon, William M., to Polar Spring Corporation. Control of crystal growth in water purification by directional freeze crystallization. 5,555,747, Cl. 62-532.000.

Consolidated Metal Products, Inc.: *See*—
Madden, Freddie, 5,555,628, Cl. 33-1.0SB.

Consorzio per la Ricerca sulla Microelecttronica Nel Mezzogiorno: *See*—
Zambrano, Raffaele, 5,556,792, Cl. 437-6.000.

Consorzio per la Ricerca Sulla Microelettronica nel Mezzogiorno: *See*—
Palara, Sergio, 5,557,139, Cl. 257-592.000.

Conti, Andrea, to Conti Complett S.p.A. Apparatus for manufacturing hosiery items and knitting and stitching machines. 5,555,832, Cl. 112-470.155.

Conti Complett S.p.A.: *See*—
Conti, Andrea, 5,555,832, Cl. 112-470.155.

Contreras, Michael A.; and Anderson, Robert E., to Motorola, Inc. Method for forming a conductive layer of material on an integrated circuit substrate. 5,556,506, Cl. 156-625.100.

Cook, Milton E.: *See*—
Marsi, Joseph A.; and Cook, Milton E., 5,556,110, Cl. 277-38.000.

Cook, Perry R.; and Colvin, Bryan J., Sr., to Aureal Semiconductor. Economical generation of exponential and pseudo-exponential decay functions in digital hardware. 5,557,227, Cl. 327-346.000.

Cooke, Michael P.; and Felton, George N., to Lucas Industries Public Limited Company. Fuel injection nozzle having a valve and a control element for controlling fuel pressure acting on a surface of the valve. 5,556,031, Cl. 239-124.000.

Coombs, Perry L.: *See*—
Morrison, Ward D.; and Coombs, Perry L., 5,556,235, Cl. 405-303.000.

Cooper, Allan J.: *See*—
Mitsuhashi, Masato; Cooper, Allan J.; Waterman, Michael S.; and Pevzner, Pavel A., 5,556,749, Cl. 435-6.000.

Cooper Cameron Corporation: *See*—
Freen, Paul D., 5,555,867, Cl. 123-260.000.

Cooper, Deani L.: *See*—

Modrich, Paul L.; Su, Shin-San; Au, Karin G.; Lahue, Robert S.; Cooper, Deani L.; and Worth, Leroy, Jr., 5,556,750, Cl. 435-6.000.
Cooper, Richard K.; and Enright, Frederick M., to Board of Supervisors of Louisiana State University and Agricultural & Mechanical College. Transformed mammalian cells capable of expressing cecropin b. 5,556,782, Cl. 435-240.200.
Coors Brewing Company: *See*—
Sedgeley, William A., 5,555,992, Cl. 220-269.000.
Copeland, James L.: *See*—
Brady, Daniel F.; McCall, John E., Jr.; Bailey, Clyde A.; and Copeland, James L., 5,556,478, Cl. 134-18.000.
Copenhaver, Gary; Bakker, Johan; and Vala, John, to Unisys Corporation. Document processing with infra-red extraction. 5,557,451, Cl. 359-350.000.
Coppo, Paolo: *See*—
Cappellari, Antonio; Coppo, Paolo; D'Ambrosio, Matteo; and Vercellone, Vinicio, 5,557,611, Cl. 370-60.100.
Coppola, Daniel D. Gate valve lid. 5,555,998, Cl. 220-484.000.
Cornell Research Foundation, Inc.: *See*—
Talman, Richard M., 5,557,178, Cl. 315-501.000.
Corpak, Inc.: *See*—
Andersen, Erik, 5,556,385, Cl. 604-174.000.
Corpus, Thomas A. Adjustable side attachment strap for helmet and face shield. 5,555,567, Cl. 2-424.000.
Corson, Mary R. Non-tipping wet/dry vacuum. 5,555,600, Cl. 15-327.200.
Cortellini, Edmund A., to Saint Gobain/Norton Industrial Ceramics Corp. Cryolite resistant refractory. 5,556,817, Cl. 501-128.000.
Cosentino, Edward. Tile mounting system. 5,555,690, Cl. 52-506.080.
Cosmec S.R.L.: *See*—
Ackermann, Anton, 5,555,790, Cl. 99-289.00T.
Costa, Jean-Louis; Laurent, Vincent; Francois, Philippe; and Vercammen, Dirk, to Solvay (Société Anonyme). Catalyst support and catalyst for the polymerization of alpha-olefins; processes for obtaining them and polymerization of alpha-olefins in presence of the catalyst. 5,556,893, Cl. 521-143.000.
Costa, Richard G. Lawn rake with spring pivoting head. 5,555,711, Cl. 56-400.200.
Cothran, Dennis W.: *See*—
Young, William O., Jr.; and Cothran, Dennis W., 5,555,610, Cl. 26-96.000.
Courtwright, Robert A.; and Grigsby, Edgar, Jr., to Textron Inc. Air filter for internal combustion engine. 5,556,441, Cl. 055-502.000.
Coveney, Peter V.: *See*—
Hughes, Trevor L.; Ladva, Hemant K. J.; and Coveney, Peter V., 5,557,103, Cl. 250-255.000.
Covington, Michael J., to Case Corporation. Cotton harvester receptacle. 5,556,338, Cl. 460-119.000.
Covington, Wayne L.; and Price, Steven C., to Ore-Ida Foods, Inc. Automatic air heating system for vending machines. 5,556,000, Cl. 221-150.00A.
Cowe, Alexis M. Golf bag and accessory cradle. 5,556,064, Cl. 248-172.000.
Cox, Gene M.: *See*—
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Wechsler, Mark; Barney, Howard H.; Kaye, Roger A.; Ogle, David G.; Lacy, Michael M.; Chow, Calvin Y.; Crawford, Kimberly L.; and Hafeman, Dean G., 5,557,398, Cl. 356-318.000.
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Schneider, Richard P., Jr.; and Crawford, Mary H., 5,557,627, Cl. 372-46.000.
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Gakhar, Ved P.; Pennington, Donald C., Jr.; Byrley, David H.; Grishin, Alexander; Dossett, Richard A.; and Schmidt, Manfred W., 5,555,788, Cl. 83-835.000.
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Carvalho, Joan F.; Crofts, Shaun P.; and Varadarajan, John, 5,556,968, Cl. 540-460.000.
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Crump, Dwayne T.; and Pancoast, Steve T., to International Business Machines Corporation. Video processor with non-stalling interrupt service. 5,557,759, Cl. 395-309.000.
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Cappellari, Antonio; Coppo, Paolo; D'Ambrosio, Matteo; and Vercellone, Vinicio, 5,557,611, Cl. 370-60.100.
Csoknyai, George; and Pirovic, Arpad L., to Light Sources, Inc. Dual radiation ultraviolet lamp. 5,557,112, Cl. 250-504.00R.
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Ross, Mike, 5,557,493, Cl. 361-149.000.
Culbert, Michael F., to Apple Computer, Inc. Method and apparatus for system recovery from power loss. 5,557,777, Cl. 395-500.000.
Cullum, Dennis F., to Eastman Kodak Company. High output magnetic head with small physical dimensions. 5,557,355, Cl. 354-106.000.
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Tozzi, Luigi P., 5,555,862, Cl. 123-143.00B.
Cunningham, Earl A.: *See*—
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Williams, Terrill E.; and Cunnyngham, Charles T., 5,557,034, Cl. 800-200.000.
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Debbaut, Christian A. M.; Curry, William J.; Jessup, Kimberley A.; and Fien, Kenneth J., 5,557,250, Cl. 338-21.000.
Cutco Cutlery Corporation: *See*—
Scheminger, William J., 5,555,625, Cl. 30-319.000.
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Durville, Frederic M., 5,557,625, Cl. 372-29.000.
Cyr, Adelard N. Work holder for eyeglasses. 5,556,085, Cl. 269-75.000.
Cytec Technology Corp.: *See*—
Bay, William E.; Jacobs, William F., III; Gschneidner, David; and Gupta, Ram B., 5,556,971, Cl. 544-196.000.
Cziffer, Endre: *See*—
Bagits, Tibor; Cziffer, Endre; and Szacsky, Mihaly, 5,556,398, Cl. 606-59.000.
D-Link Corporation: *See*—
Chung, Yu-Ping, 5,557,068, Cl. 174-59.000.
Dadap, Jerry I.: *See*—
Downer, Michael; Dadap, Jerry I.; and Lowell, John K., 5,557,409, Cl. 356-371.000.
Dadourian, Arpag, to Ultimatte Corporation. Screen filtering boundary detection for noise filtering prior to image compositing. 5,557,339, Cl. 348-586.000.
da Encarnação, Fernando A. F. Self-destructive hypodermic syringe. 5,556,384, Cl. 604-110.000.
Daewoo Electronics Co., Ltd.: *See*—
Choi, Jae-Kyu, 5,557,101, Cl. 250-231.130.
Hong, Jae-Gyoo; and Kim, Ul-Je, 5,557,056, Cl. 84-610.000.
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Vanko, John C.; Kahl, Leo M.; Kaufman, Jeffrey A.; and d'Agostino, Mark C., 5,557,512, Cl. 364-188.000.
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Tolfsen, Ulf; and Dahlén, Magnus, 5,555,609, Cl. 24-641.000.
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Naslund, Jonas; Johansson, Thomas; and Dahlström, Johan, 5,557,676, Cl. 380-23.000.
Dai Nippon Printing Co., Ltd.: *See*—
Tarumoto, Norihiro; Inomata, Hiroyuki; and Tominaga, Takashi, 5,556,724, Cl. 430-5.000.
Daicel Chemical Industries, Ltd.: *See*—
Fujiwa, Takaaki; Tabuchi, Takeharu; Matsui, Hideki; Nakano, Shinji; Yamada, Shin-ya; and Morimoto, Takao, 5,556,927, Cl. 525-533.000.
Koyama, Hiroshi; and Takemoto, Etsuo, 5,556,516, Cl. 203-91.000.
Daido Hoxan, Inc.: *See*—
Tahara, Masaaki; Senbokuya, Haruo; Kitano, Kenzo; Hayashida, Tadashi; and Minato, Teruo, 5,556,483, Cl. 148-206.000.
Daiichi Denpa Kogyo Kabushiki Kaisha: *See*—
Watanabe, Hironobu, 5,557,290, Cl. 343-713.000.
Daijavad, Shahrokh: *See*—
Afzali-Ardakani, Ali; Ayala-Esquilin, Juan; Braren, Bodil E.; Daijavad, Shahrokh; Foster, Elizabeth; Hedrick, James L., Jr.; Hedrick, Jeffrey C.; Hodgson, Rodney T.; Mehta, Ashit A.; Molis, Steven E.; Shaw, Jane M.; Tisdale, Stephen L.; and Viehbeck, Alfred, 5,556,899, Cl. 523-215.000.
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Aoyama, Hirokazu; Kohno, Satoru; and Koyama, Satoshi, 5,557,019, Cl. 570-176.000.
Dailey, Aaron: *See*—
Munro, Frederick; Dailey, Aaron; Allen, Scott; and Trachy, David, 5,557,528, Cl. 364-478.020.
Dailey, George F.; Bauer, James A.; and Fischer, Mark W., to Westinghouse Electric Corporation. System and method for testing electrical generators, 5,557,216, Cl. 324-772.000.
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Schumacher, Markus, 5,556,332, Cl. 454-76.000.
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Suissa, Avshalom; Zomotor, Zoltan; and Boettiger, Friedrich, 5,557,520, Cl. 364-424.010.
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Nukada, Katsumi; Daimon, Katsumi; Sakaguchi, Yasuo; and Iijima, Masakazu, 5,556,967, Cl. 540-143.000.
Dainippon Ink and Chemicals, Inc.: *See*—
Tashiro, Nansei; and Maruyama, Osamu, 5,556,583, Cl. 264-4.100.
Daiso Co. Ltd.: *See*—
Matoba, Yasuo; Shimizu, Yasumi; Miura, Katsuhito; Kitano, Sojiro; Sakashita, Takahiro, and Tanaka, Hidekazu, 5,556,916, Cl. 525-64.000.
Daito, Masayuki, to NEC Corporation. Microprocessor with self-diagnostic test function. 5,557,558, Cl. 364-579.000.
Daiwa Seiko, Inc.: *See*—
Hashimoto, Hiroshi, 5,556,048, Cl. 242-288.000
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Dajani, Iyad A.: *See*—
Kester, John J.; Dajani, Iyad A.; Ranon, Peter M.; and Alley, Thomas G., 5,557,699, Cl. 385-122.000.
Dale, Donald J.: *See*—
Garner, David M.; Louie, Chun M.; Harrison, Daniel B.; and Dale, Donald J., 5,557,456, Cl. 359-393.000.
Daleo, Stephen L.; and Boone, David D. Multiple signal, digital differential signal processor and interpolator. 5,557,561, Cl. 364-602.000.
D'Alessio, Michael S., to Patent Construction Systems, Harsco Corporation Combination scaffold plank. 5,555,955, Cl. 182-222.000.
Dallaire, Michael P.: *See*—
Berke, Neal S.; Dallaire, Michael P.; Gartner, Ellis M.; Kerkar, Awdhoot V.; and Martin, Timothy J., 5,556,460, Cl. 106-823.000.
Dalton, Raymond F.: *See*—
Campbell, John; Dalton, Raymond F.; and Quan, Peter M., 5,557,003, Cl. 558-155.000.
D'Aluisio, Christopher; and Patterson, Thomas C., to Cannondale Corporation. Bicycle handlebars. 5,555,775, Cl. 74-551.500.
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Cappellari, Antonio; Coppo, Paolo; D'Ambrosio, Matteo; and Vercellone, Vinicio, 5,557,611, Cl. 370-60.100.
Damier, Christophe: *See*—
Lacquit, Hubert; and Damier, Christophe, 5,557,785, Cl. 395-600.000.
Dammann, Johannes: *See*—
Tophinke, Franz; Stovesand, Josef; Heidjann, Franz; and Dammann, Johannes, 5,556,337, Cl. 460-70.000.
Dana, Mark K.: *See*—
Clark, George A.; Heisel, Steven K.; Johnson, Arlen L.; Robinson, Chris; and Dana, Mark K., 5,556,416, Cl. 606-205.000.
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Rostoker, Michael D.; Dangelo, Carlos; and Nagasamy, Vijay, 5,557,531, Cl. 364-489.000.
Daniel, Edward A. Hydrostatic/hydrodynamic flywheel bearing for a press. 5,556,207, Cl. 384-115.000.
Danieli & C. Officine Meccaniche SpA: *See*—
Coccolo, Enzo, 5,555,970, Cl. 198-866.000.
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Coccolo, Enzo, 5,555,970, Cl. 198-866.000.
Daniels, Dean J.: *See*—
Roe, Donald C.; Goulait, David J. K.; Rodriguez, Sheila S.; Carlin, Edward P.; Dreier, Kimberly A.; Jasper, Carolyn M.; and Daniels, Dean J., 5,556,394, Cl. 604-385.200.
Danz, Wolfgang; Runge, Wolfgang; Eschrich, Gerhard; and Gillich, Udo, to ZF Friedrichshafen AG. Control system for changing automatic gears. 5,557,521, Cl. 364-424.100.
Darcy, James A.; and Weeks, Thomas E., to Standard Duplicating Machines Corporation. Paper set feeding. 5,556,254, Cl. 414-798.100.
Dardaris, David M.: *See*—
King, Joseph A., Jr.; McCloskey, Patrick J.; Colley, Alice M.; Dardaris, David M.; Fontana, Luca P.; and Berndsen, Josef G., 5,556,936, Cl. 528-199.000.
Darnez, Charles: *See*—
Istin, Michel; Grognet, Jean-Marc; and Darnez, Charles, 5,556,635, Cl. 424-448.000.
Darragh, Charles T.; Holman, Leonard; Luckett, Thomas M.; and Ward, Michael E., to Solar Turbines Incorporated. Primary surface heat exchanger for use with a high pressure ratio gas turbine engine. 5,555,933, Cl. 165-166.000.
D'Arrigo, Claudio. Antineoplastic drug of plant origin and process for the preparation thereof. 5,556,626, Cl. 424-195.100.
D'Arrigo, Iano: *See*—
Smayling, Michael C.; Marotta, Giulio G.; D'Arrigo, Iano; Santin, Giovanni; Falessi, Georges; and Bhat, Mousumi, 5,557,569, Cl. 365-185.280.
Darst, Kevin P.; Ezzell, Bobby R.; and Ishibe, Nobuyuki, to Dow Chemical Company, The. Preparation of a 2,3-dihaloperfluorocarbonyl halide. 5,557,010, Cl. 562-851.000.
Daub, Dieter, to SMS Schloemann-Siemag Aktiengesellschaft. Arrangement for cooling rolled strips. 5,556,035, Cl. 239-455.000.
Daughterty, Vergil L., III. System and method for determining the price of an expirationless American option and issuing a buy or sell ticket on the current price and portfolio. 5,557,517, Cl. 364-408.000.
Davenport, Esther L.: *See*—
Burns, Elaine G.; Davenport, Esther L.; Manseur, Belkacem; Munson, Gary A.; Seip, Barry S.; and Sze, Elaine I., 5,557,664, Cl. 379-114.000.
Davenport, Ricky W. Method and apparatus for feeding waste material to a dry kiln. 5,555,823, Cl. 110-346.000.
Davey, Charles W.: *See*—
Lange, Robert F.; and Davey, Charles W., 5,556,258, Cl. 417-63.000.
D'Aviau de Piolant, Jean-Louis. Graphic drawing system. 5,557,301, Cl. 345-179.000.
Davidson Textron Inc.: *See*—
Kelman, Josh; and Gridley, Lee E., 5,556,153, Cl. 296-70.000.
Davies, David V Variable geometry kite. 5,556,057, Cl. 244-153.00R.
Davignon, Barry J.: *See*—
Sloss, Christopher W.; Davignon, Barry J.; and Niemeyer, Duane J., 5,556,116, Cl. 280-7.150.
Davis, Andrew: *See*—
Martin, Eric A.; Vaccaro, Kenneth; Lorenzo, Joseph P.; and Davis, Andrew, 5,557,120, Cl. 257-291.000.
Davis, Clark C.: *See*—
Jacobsen, Stephen C.; and Davis, Clark C., 5,556,263, Cl. 417-490.000.
Davis, Daniel W. Amulatory wheelstand-wheelchair interface. 5,556,120, Cl. 280-304.100.
Davis, Ronald C.: *See*—
Annis, Patricia A.; Davis, Ronald C.; and Bresee, Randall R., 5,557,039, Cl. 73-7.000.
Davis, Wayne K.: *See*—
Tricoles, Gus P.; Davis, Wayne K.; and Nilles, James T., 5,557,277, Cl. 342-22.000.
Davis, William M.: *See*—
Shen, Nancy L.; Kacian, Daniel L.; Putnam, James G.; and Davis, William M., 5,556,771, Cl. 435-91.200.
Daw, Derek J.: *See*—
Cohen, Donald; Daw, Derek J.; Kick, George F.; and Acosta, George M., 5,556,396, Cl. 606-42.000.
Dayan, Richard A.; Dombrowski, Chris; and Mascaro, James F., to International Business Machines Corporation. Power on timer for a personal computer system. 5,557,784, Cl. 395-550.000.
DCA Instruments Oy: *See*—
Levola, Tapani, 5,556,465, Cl. 117-202.000.
De La Rue Giori S.A.: *See*—
Lapp, Joachim A. H., 5,555,805, Cl. 101-228.000.
Debbaut, Christian A. M.; Curry, William J.; Jessup, Kimberley A.; and Fien, Kenneth J., to Raychem Corporation. Telecommunications terminal block. 5,557,250, Cl. 338-21.000.
DeBold, Terry A.: *See*—
Frank, Richard B.; DeBold, Terry A.; Widge, Sunil; and Martin, James W., 5,556,594, Cl. 420-448.000.
de Cesare, Giampiero; Irrera, Fernanda; and Palma, Fabrizio, to Universita Degli Studi Di Roma "La Sapienza". Voltage-controlled variable spectrum photodetector for 2D color image detection and reconstruction applications. 5,557,133, Cl. 257-440.000.
Decker, Wolfgang, to Wesumat Fahrzeugwaschanlagen GmbH. Vehicle drying or polishing apparatus. 5,555,593, Cl. 15-302.000.
Dedolph, Richard R. Reactor using tubular spiroids for gas/liquid propulsion. 5,556,765, Cl. 435-41.000.
Defossa, Elisabeth; Fischer, Gerd; Jendralla, Joachim-Heiner; Lattrell, Rudolf; Wollmann, Theodor; and Isert, Dieter, to Hoechst Aktiengesellschaft. Crystalline acid addition salts of diastereomerically pure 1-(2,2-dimethyl-propionyloxy)-ethyl-3-cephem-4-carboxylate. 5,556,850, Cl. 514-202.000.

de Groot, Peter, to Zygo Corporation. Optical gap measuring apparatus and method. 5,557,399, Cl. 356-357.000.
Deguchi, Tetsuya: *See*—
Yagaki, Kazuhito; Okuma, Osamu; Shigehisa, Takuo; and Deguchi, Tetsuya, 5,556,436, Cl. 44-626.000.
Dehnert, James C.: *See*—
Chan, Sun C.; Dehnert, James C.; Lo, Raymond W.; and Towle, Ross A., 5,557,761, Cl. 395-375.000.
de la Chapelle, Albert: *See*—
Kere, Juha; Schlessinger, David; and de la Chapelle, Albert, 5,556,786, Cl. 435-320.100.
DeLaLott Corporation: *See*—
Katz, Marcella M., 5,556,690, Cl. 428-137.000.
Delco Electronics Corporation: *See*—
Troy, Stanton E., 5,556,017, Cl. 224-549.000.
Delfosse, Kent F.: *See*—
Warner, Jay V.; Delfosse, Kent E.; and Kuhn, Scott D., 5,557,682, Cl 381-71.000.
Dell USA, L.P.: *See*—
Jones, Jerry M., 5,557,741, Cl. 395-183.190.
Demers, Daniel E.: *See*—
Bourneuf, John J.; Lenahan, Dean T.; Demers, Daniel E.; and Plemmons, Larry W., 5,555,721, Cl. 60-39.750.
Demers, Richard A.: *See*—
Brown, Marsha A.; Demers, Richard A.; Diephuis, James A.; Falcon, Lorenzo, Jr.; Frayne, Thomas E.; Gaitonde, Sunil S.; Patry, Elaine S.; Remay, William A.; Sissors, Kenneth M.; Vasquez, Ejuana D.; Weber, David J.; and Yamaguchi, Koichi, 5,557,776, Cl. 395-500.000.
Demick, Robert L.: *See*—
Coman, Sorin; Wu, Frank; and Demick, Robert L., 5,556,129, Cl. 280-730.200.
Dener, Jeffrey M.: *See*—
Truong, Thien V.; Bierer, Donald E.; Dener, Jeffrey M.; Hector, Richard; Tempesta, Michael S.; Loev, Bernard; Yang, Wu; and Koreeda, Masato, 5,556,875, Cl. 514-436.000.
Denham, Martin S.; Wong, Keng L.; Smith, Jeffrey E.; and Fernando, Roshan J., to Intel Corporation. Pulsed flip-flop circuit. 5,557,225, Cl. 327-199.000.
Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Kato, Toshiyuki; Ito, Syunzi; and Shimizui, Tsunehiko, 5,556,709, Cl. 428-426.000.
Dennis, Michael E.; and Huddart, David, to Pifco Limited. Heating vessel with chromium-enriched stainless steel substrate promoting adherence of thin film heater thereon. 5,557,704, Cl. 392-480.000.
Denny, William A.: *See*—
Dobrusin, Ellen M.; Showalter, Howard D. H.; Denny, William A.; Palmer, Brian D.; Rewcastle, Gordon W.; Tercel, Moana; and Thompson, Andrew M., 5,556,874, Cl. 514-414.000.
Dent, Paul W., to Ericsson-GE Mobile Communications Inc. Channel-independent equalizer device. 5,557,645, Cl. 375-340.000.
Denton, Grant C.: *See*—
Dinsmoor, John C., III; Van Everen, Barry; Johnson, Michael W.; and Denton, Grant C., 5,556,168, Cl. 297-440.200.
Denton, Timothy A.: *See*—
Karagueuzian, Hrayr S.; Diamond, George A.; Khan, Steven S.; Denton, Timothy A.; and Evans, Steven, 5,555,889, Cl. 128-705.000.
De Pedro, Mayda T.; Estiandan, Fe S.; Talbot, Michael L.; and Traitler, Helmut, to Nestec S.A. Preparation of reduced-calorie coated frozen confectionery. 5,556,659, Cl. 426-302.000.
DeRees, Delbert D.; and Kowall, David J., to Chrysler Corporation. Vehicle door assembly. 5,555,677, Cl. 49-502.000.
Derian, Paul-Joël; and Willemin, Claudie, to Rhone-Poulenc Chimie. Free-flowing pseudoplastic cosmetic compositions/suspensions. 5,556,628, Cl. 424-401.000.
DeRose, Steven; and Vogel, Jeffrey, to Electronic Book Technologies, Inc. Data processing system and method for representing, generating a representation of and random access rendering of electronic documents. 5,557,722, Cl. 395-148.000.
Desai, Ranjit C., to Sanofi Winthrop Inc. Substituted 2-arylcarbonyloxymethyl-1,2,5-thiadiazolidin-3-one 1,1-dioxide derivatives and compositions and method of use thereof. 5,556,909, Cl. 514-362.000.
Descombes, Jean-Philippe; and Vougny, Alain, to Thomson Tubes & Displays, S.A. Deflection yoke attachment arrangement. 5,557,165, Cl. 313-440.000.
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Bacque, Eric; Barreau, Michel; Desconclois, Jean-Francois; Girard, Philippe; Kryvenko, Michel; Lavergne, Marc P.; Paris, Jean-Marc; and Picaut, Guy, 5,556,861, Cl. 514-292.000.
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Synnestvedt, Blake, 5,556,166, Cl. 297-377.000.
De Souza, Etienne N. Compass with safety pivot. 5,555,630, Cl. 33-27.020.
DeVault, Douglas J., to Babcock & Wilcox Company, The. Ammonia absorption refrigeration cycle for combined cycle power plant. 5,555,738, Cl. 62-238.300.
Devlin, James: *See*—
Ralph, Peter; Auckerman, Sharon; and Devlin, James, 5,556,620, Cl. 424-85.100.
Devore, David D.; Timmers, Francis J.; Stevens, James C.; Mussell, Robert D.; Crawford, Lenore H.; and Wilson, David R., to Dow Chemical Company, The. Titanium (II) or Zirconium (II) complexes and addition polymerization catalysts therefrom. 5,556,928, Cl. 526-127.000.
Dewa, Masami: *See*—
Kobayakawa, Kazushige; Nagasawa, Shigeru; Ikeda, Masayuki; Ueno, Haruhiko; Shinjo, Naoki; Utsumi, Teruo; Dewa, Masami; and Ishizaka, Kenichi, 5,557,744, Cl. 395-200.010.
DeWoolfson, Bruce R.: *See*—
Fite, Kenneth R.; and DeWoolfson, Bruce R., 5,557,721, Cl. 395-148.000.
Deyo, Charles; Watts, Verne C.; and Kaczmarski, Wally L., to Clark Equipment Company. Auger mount. 5,556,217, Cl. 403-61.000.
de Zwart, Siebe T.: *See*—
Lambert, Nicolaas; van Gorkom, Gerardus G. P.; Trompenaars, Petrus H. F.; and de Zwart, Siebe T., 5,557,296, Cl. 345-74.000.
D'Hont, Loek, to Texas Instruments Incorporated. Unitarily-tuned transponder/shield assembly. 5,557,279, Cl. 342-42.000.
Diamond, George A.: *See*—
Karagueuzian, Hrayr S.; Diamond, George A.; Khan, Steven S.; Denton, Timothy A.; and Evans, Steven, 5,555,889, Cl. 128-705.000.
Dias, Daniel M.: *See*—
Bhide, Anupam K.; and Dias, Daniel M., 5,557,770, Cl. 395-488.000.
Dickerson, Michael L.: *See*—
Barber, Keith A.; Bone, Ronald N., Jr.; Cogan, Kevin C.; Dickerson, Michael L.; Glen, Peter H.; Griffith, Lezley A.; Nightingale, Gary R.; Ouellette, Edward L.; Petter, Robert R., Jr.; and Semjenow, Gary A., 5,555,787, Cl. 83-698.110.
Dickie, Robert G., to Mousepad Innovations Inc. Mouse pad. 5,556,061, Cl. 248-51.000.
Dickson Product Development, Inc.: *See*—
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Dickson, Thomas D., Jr.; and Mabey, Kent W. Multipurpose food mixing appliance specially adapted for kneading dough. 5,556,198, Cl. 366-97.000.
Didier, Emmanuel R. Concentrator & filter. 5,556,544, Cl. 210-436.000.
Didier, James J., to Beloit Technologies, Inc. Extended nip press apparatus with geared blanket edge clamp. 5,556,514, Cl. 162-358.300.
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Sorbini, Franco, 5,555,657, Cl. 40-518.000.
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O'Brien, Daniel P., 5,557,176, Cl. 315-307.000.
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Colas, André R. L.; and Joseph, Edward A., 5,556,914, Cl. 524-731.000.
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Shouji, Hiroaki; and Aizawa, Koichi, 5,556,902, Cl. 524-114.000.
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Budzynski, Danny L.; and Bliss, Gary S., 5,556,648, Cl. 425-150.000.
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Johnson, Peter L., 5,556,859, Cl. 514-256.000.
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Baker, Bryan C., 5,556,320, Cl. 451-5.000.
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Caines, Tony L.; and Junker, Michael L., 5,556,923, Cl. 525-285.000.
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Halderit, Antoon H. T.; Booij, Martin; Hendrix, Jan A. J.; and Frentzen, Yvonne H., 5,556,890, Cl. 521-49.800.
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Royce, Susan D.; Figuly, Garret D.; Khasat, Nitya P.; and Matos, Jose R., 5,556,619, Cl. 424-78.080.
Dubois, Jean-Claude: *See*—
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 Dunlap, Charles L., deceased; and Dunlap, by Lurlene D., legal representative, 5,556,152, Cl. 296-57.100.
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Eastern Michigan University: *See*—
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Eisai Chemical Co., Ltd.: *See*—
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 Campbell, Roy E.; Wilkinson, John D.; Hudson, Hank M.; and Pierce, Michael C., 5,555,748, Cl. 62-621.000.
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 DeRose, Steven; and Vogel, Jeffrey, 5,557,722, Cl. 395-148.000.
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 Kratel, Günter; Stohr, Günter; Gross, Martin; and Wilde, Eugen, 5,556,689, Cl. 428-137.000.
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 Hutton, Leo T.; and Lavanga, David J., 5,556,898, Cl. 523-136.000.
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 Shaffer, Donald R.; Sanderson, Richard A.; and Savko, John, 5,555,768, Cl. 73-865.800.
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Elliott, Robert H., Jr. Removal of volatile organic pollutants from drinking water. 5,555,735, Cl. 62-100.000.
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 Legaz, Antonio C. G.; Duran, Francisco J. E.; and Maraáu, Augel J. G., 5,557,260, Cl. 340-578.000.
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 Bowman, Joseph D.; and Engel, Daniel P., III, 5,557,199, Cl. 324-301.000.
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 Volchek, Konstantin; Mortazavi, Saviz; and Whittaker, Harry, 5,556,545, Cl. 210-651.000.
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 Fite, Kenneth R.; and DeWoolfson, Bruce R., 5,557,721, Cl. 395-148.000.
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Erhart, Timothy A., to Exlar Corporation. Linear actuator with feedback position sensor device. 5,557,154, Cl. 310-80.000.
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 Kies, Antonius M., 5,555,620, Cl. 29-874.000.
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Erilli, Rita: *See*—
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 VonSick, Hal A., 5,556,329, Cl. 454-4.000.
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Eschrich, Gerhard: *See*—
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Murphy, James C.; Goodge, Kevin; and Hlebovy, Jim, 5,556,497, Cl. 156-172.000.

Essilor International: *See*—
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Mukawa, Hiroshi; and Eto, Hiroshi, 5,557,589, Cl. 369-13.000.

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Eto, Satoshi: *See*—
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Ferrer, Mary E.; St. Onge, Gary F.; Johnston, Charles J.; and Swart, Mark A., 5,557,211, Cl. 324-754.000.
Reuter, Mark S.; and Geranis, John A., 5,557,213, Cl. 324-761.000.

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Ewall, Ralph, to Hercules Incorporated. Wound dressing having a fenestrated base layer. 5,556,375, Cl. 602-58.000.

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Darst, Kevin P.; Ezzell, Bobby R.; and Ishibe, Nobuyuki, 5,557,010, Cl. 562-851.000.

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Brook, John W.; Factor, David F.; Kinney, Frederick D.; McCallen, Celeste L.; and Young, Andrea M., 5,556,458, Cl. 106-708.000.

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Fairley, Christopher R.: *See*—
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Falciglia, James W.; and Mauro, Anthony J., to WPFY, Inc. Armored cable. 5,557,071, Cl. 174-112.000.

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Faraco, W. George, Jr.: *See*—
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Farhat, Lawrence, to Interventional Technologies Inc. Expandable and compressible atherectomy cuter. 5,556,408, Cl. 606-180.000.

Farnsworth, Thomas: *See*—
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Farrell, Jack E., III: *See*—
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Farthing, Allan J.: *See*—
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Skodell, Birgit; Osberghaus, Rainer; Rogmann, Karl-Heinz; Faubel, Heiko; and Bossek, Harald, 5,556,450, Cl. 106-10.000.

Faull, Alan W.: *See*—
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Vanko, John C.; Kahl, Leo M.; Kaufman, Jeffrey A.; and d'Agostino, Mark C., 5,557,512, Cl. 364-188.000.

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Stewart, Brett; and Feemster, Ryan, 5,557,764, Cl. 395-375.000.

Fehr, Walter R., and Hammond, Earl G., to Iowa State University Research Foundation, Inc. Soybeans having elevated contents of saturated fatty acids. 5,557,037, Cl. 800-200.000.

Fehringer, Robert; Hines, William L.; Qutub, Motaz; Emigh, Jonathan D.; Preston, Charles E., Leitner, Robert; and Smart, David. Envelope wetting and sealing apparatus. 5,555,701, Cl. 53-75.000.

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Felix A. Marino Co., Inc.: *See*—
Marino, Frederick W., 5,556,225, Cl. 404-77.000.

Felt, Jeffrey C., to Advanced Bio Surfaces, Inc. Joint resurfacing system. 5,556,429, Cl. 623-16.000.

Felton, George N.: *See*—

Cooke, Michael P.; and Felton, George N., 5,556,031, Cl. 239-124.000.

Fenster, Paul: *See*—
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Ferag AG: *See*—
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Ferekides, Christos S.: *See*—
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Fernandez, Felix E., to University of Puerto Rico. Lens for depositing target material on a substrate. 5,557,471, Cl. 359-709.000.

Fernandez, Librada M. C.: *See*—
Faircloth, Glynn T., Jr.; Millan, Francisco R.; Fernandez, Librada M. C.; and Sarabia, Cristina A., 5,556,777, Cl. 435-118.000.

Fernandez, Raul: *See*—
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Fernandez-Y-Sosa, Raymundo: *See*—
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Fernando, Roshan J.: *See*—
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Ferrandi, Mara: *See*—
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Ferrante, Louis. Steering wheel security device. 5,555,754, Cl. 70-209.000.

Ferre, Gilbert: *See*—
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Ferreira, Carlos A.: *See*—
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Ferrell, Richard M., to ADAC Plastics, Inc. Motor vehicle lamp with improved ventilating means. 5,556,193, Cl. 362-294.000.

Ferrer, Mary E.; St. Onge, Gary F.; Johnston, Charles J.; and Swart, Mark A., to Everett Charles Technologies, Inc. Vacuum test fixture for printed circuit boards. 5,557,211, Cl. 324-754.000.

Ferris, Bruce: *See*—
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Feulner, Dieter: *See*—
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Fichtel & Sachs AG: *See*—
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Dussausse, Jean-Paul; and Prudhon, Daniel, 5,556,296, Cl. 439-404.000.

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Ruschke, Rick R., 5,556,541, Cl. 210-232.000.

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Lane, Abbott A., 5,555,569, Cl. 2-424.000.

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Bryson, Nathan J., 5,556,901, Cl. 524-99.000.

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Hlavenka, Russel L., 5,556,259, Cl. 417-194.000.

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Flenniken, Cindy L., to BICC Cables Corporation. Semiconductive power cable shield. 5,556,697, Cl. 428-323.000.

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Flick, Klemens; Ebel, Klaus; Schnurr, Werner; Melder, Johann-Peter; and Harder, Wolfgang, to BASF Aktiengesellschaft. Process for production of aliphatic-α,ω-aminonitriles. 5,557,004, Cl. 558-459.000.

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Kalberer, Robert C.; Kreutzer, Kevin W.; and Goor, Dan, 5,556,056, Cl. 244-121.000.

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Flynn, Thomas S. Container and method for transporting live crustaceans. 5,555,845, Cl. 119-201.000.
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Green, Joseph, 5,556,903, Cl. 524-142.000.
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Foote, Robert S.; and Sachleben, Richard A. Nucleosides with 5'-O-photolabile protecting groups. 5,556,961, Cl. 536-27.100.
Foote, Steven A.; and Stoddard, Damon R., to AlliedSignal, Inc. Low stress magnet interface. 5,557,044, Cl. 73-497.000.
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Gopp, Alexander Y.; Sbaschnig, Richard W.; and Buonocore, Richard L., 5,555,871, Cl. 123-481.000.
Hill, Robert A., 5,556,505, Cl. 156-570.000.
Lauring, Daniel H.; Smith, Ronald A.; and Gesell, Ralph P., 5,555,774, Cl. 74-512.000.
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Ford, Ronald N., to Sommer & Maca Industries, Inc. Pneumatic mechanism for the application of uniform pressure to a mechanically adjustable spindle. 5,556,322, Cl. 451-21.000.
Fore, John C. Scent-releasing pole for attracting deer. 5,555,665, Cl. 43-1.000.
Foreman, Karen A. Hair liquid applicator. 5,555,899, Cl. 132-114.000.
Forero, Miguel. Manufacturing process for synthetic fiber carpets fixed by fusion at regular intervals with crest or tufts, without using glues or using small amounts of glues, where threads do not loosen and thus obtaining the carpets. 5,556,684, Cl. 428-95.000.
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Fougere, Willard F. Dart game score board. 5,555,840, Cl. 116-223.000.
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Fournier, Louis. Snowboard binding with compensating plate. 5,556,123, Cl. 280-607.000.
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Fowler, Jeffrey B., to Compri Technic Pty., Ltd. Pneumatic gun and projectiles therefor. 5,555,585, Cl. 15-3.500.
Fox, Mark T., to Motorola Inc. Method and apparatus for identifying embedded framing bits. 5,557,615, Cl. 370-105.100.
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Francois, Philippe: *See*—
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Frank, Richard B.; DeBold, Terry A.; Widge, Sunil; and Martin, James W., to CRS Holdings, Inc. Corrosion resistant age hardenable nickel-base alloy. 5,556,594, Cl. 420-448.000.
Franke, Helga: *See*—
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Frappier, Edward P.; Hull, Ezekiel H.; and Jackson, L. Murl, to Reilly Industries, Inc. Physically-modified degradable thermoplastic compositions. 5,556,905, Cl. 524-311.000.
Fraser, John D.; Nguyen, Loc; and Powell, Sherry, to Advanced Technology Laboratories, Inc. Ultrasonic transducer probe with heat dissipating lens. 5,555,887, Cl. 128-663.010.
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Frean, Charles A., to Digital Equipment Corporation. Application design interface enhancement. 5,557,729, Cl. 395-158.000.
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Freeman, Michael B.; Lipovsky, James M.; Paik, Yi H.; Shulman, Jan E.; and Swift, Graham, to Rohm and Haas Company. Acid catalyzed process for preparing amino acid polymers. 5,556,938, Cl. 528-328.000.
Freen, Paul D., to Cooper Cameron Corporation. Swirl flow precombustion chamber. 5,555,867, Cl. 123-260.000.
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Fregeau, Leo J. Magnet beverage treatment. 5,556,654, Cl. 426-234.000.
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Nogami, Sumitaka; Kina, Hideki; and Mantoku, Kaneyuki, 5,556,728, Cl. 430-64.000.
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Hara, Shoji, 5,557,687, Cl. 382-132.000.
Makino, Yoshihiko; Saito, Yoshio; and Seshimoto, Osamu, 5,555,767, Cl. 73-863.000.
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Kawamoto, Satoru, 5,557,582, Cl. 365-233.500.
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Watanabe, Seiichi; and Fujiwara, Morio, 5,556,651, Cl. 425-556.000.
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Ishihama, Keiko; Fukuda, Tokuya; Senuma, Toshitaka; and Shiono, Toru, 5,557,328, Cl. 348-358.000.
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Future Domain Corporation: *See*—
Moore, Richard S.; and Pease, Allan F., 5,557,750, Cl. 395-250.000.

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Nakamura, Tetsuya; and Fukuyama, Hirotaka, 5,557,379, Cl. 355-259.000.
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Fuller, Roy W., to Magnaflex Systems Limited. Rotary press cutters. 5,555,786, Cl. 83-663.000.
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Gupta, Ajay; Fullmer, Howard K.; Flannery, Michael R.; and Tanaka, Hiroshi, 5,557,739, Cl. 395-183.100.
Fulmer, Brian H., to Morton International, Inc. Single side wall air bag inflator. 5,556,130, Cl. 280-741.000.
Fulton, Stephen C.: *See*—
Claterbos, John K.; and Fulton, Stephen C., 5,555,733, Cl. 62-62.000.
Funabashi, Hideo; Sugahara, Akinobu; Tanaka, Akira; Toda, Masatoshi; Ota, Tsuyoshi; Matsuo, Youichi; Akimaru, Tsutomu; Iwasaki, Sigeo; and Tsuruoka, Masayuki, to Idemitsu Petrochemical Co., Ltd. Catalyst component for olefin polymerization and process for producing polyolefins. 5,556,820, Cl. 502-111.000.
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Funatsu, Keisuke: *See*—
Sugiura, Jun; Tsuchiya, Osamu; Ogasawara, Makoto; Ootsuka, Fumio; Torii, Kazuyoshi; Asano, Isamu; Owada, Nobuo; Horiuchi, Mitsuaki; Tamaru, Tsuyoshi; Aoki, Hideo; Otsuka, Nobuhiro; Shirai, Seiichirou; Sagawa, Masakazu; Ikeda, Yoshihiro; Tsuneoka, Masatoshi; Kaga, Toru; Shimmyo, Tomotsugu; Ogishi, Hidetsugu; Kasahara, Osamu; Enami, Hiromichi; Wakahara, Atsushi; Akimori, Hiroyuki; Suzuki, Sinichi; Funatsu, Keisuke; Kawasaki, Yoshinao; Tubone, Tunehiko; Kogano, Takayoshi; and Tsugane, Ken, 5,557,147, Cl. 257-763.000.
Fung, Anthony D.: *See*—
Cheng, Jane C.; Fung, Anthony D.; Klocke, Donald J.; Lawton, Stephen L.; Lissy, Daria N.; Roth, Wieslaw J.; Smith, C. Morris; and Walsh, Dennis E., 5,557,024, Cl. 585-467.000.
Funk, Guido: *See*—
Mueller, Hans-Joachim; Evertz, Kaspar; Weber, Siegfried; Funk, Guido; Konrad, Rainer; and Saive, Roland, 5,557,021, Cl. 585-513.000.
Fuqua, Todd W.: *See*—
Ansberry, Catherine M.; Freer, Jay D.; Fuqua, Todd W.; Mesterton, Erik P.; Stillwagon, Catherine A.; and Yang, Ching-Yun, 5,557,725, Cl. 395-153.000.
Furch, Joseph A., III: *See*—
Trotto, Susan; Furch, Joseph A., III; Kuhn, David G.; and Hunt, David A., 5,556,885, Cl. 514-639.000.
Furcht, Leo T.: *See*—
Kohler, Anja S.; Mooradian, Daniel L.; and Furcht, Leo T., 5,556,632, Cl. 424-423.000.
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Furrer, Harald; Seiffge, Dirk; Okyayuz-Baklouti, Ismahan; and Grome, John J., to Hoechst Aktiengesellschaft. Pyridopyrimidinediones, processes for their preparation and their use as drugs. 5,556,854, Cl. 514-234.200.
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Schuller, Edmund; Greppmeier, Eva-Maria; and Furtmeier, Anton, 5,555,717, Cl. 57-413.000.
Furuhashi, Masaaki: *See*—
Maeda, Mikio; and Furuhashi, Masaaki, 5,557,401, Cl. 356-73.100.
Furukawa Electric Co. Ltd, The: *See*—
Nishiguchi, Masaki; and Tokuda, Toshimasa, 5,556,904, Cl. 524-147.000.
Yamamoto, Kouji; Hashizume, Toshiaki; and Kawaguchi, Hiroshi, 5,555,622, Cl. 29-890.053.
Furukawa, Ken: *See*—
Urawa, Yoshio; Furukawa, Ken; Shimizu, Toshikazu; Yamagishi, Yoji; Tsurugi, Tomio; and Ichino, Tomio, 5,557,002, Cl. 558-44.000.
Furukawa, Yasutoshi: *See*—
Yamane, Takashi; Omori, Yasuhiko, Sawae, Shinya; Furukawa, Yasutoshi; and Hakogi, Hironao, 5,557,695, Cl. 385-49.000.
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Harada, Junichi; Tsuchida, Takuji; Kunikita, Keiji; Hasegawa, Katsuhisa; Fuse, Tadahiko; and Suzuki, Tomoo, 5,555,950, Cl. 180-65.100.
Future Domain Corporation: *See*—
Moore, Richard S.; and Pease, Allan F., 5,557,750, Cl. 395-250.000.
Fyffe, Steve, to Welding Nozzle International. Gas lens collet body. 5,556,550, Cl. 219-75.000.
Gaboury, Louis; Villeneuve, Luc; Giasson, Richard; Li, Tiechao; and Gupta, Ajay K., to Universite de Montreal. Novel rhodamine derivatives for photodynamic therapy of cancer and in vitro purging of the leukemias. 5,556,992, Cl. 549-227.000.
Gabriël, Christiaan M. W., to Koninklijke PTT Nederland N.V. Method and apparatus for permitting a viewer to scan through a plurality of video signals provided by a transmitter. 5,557,318, Cl. 348-7.000.
Gabriel, Stefan M.; and Sheehan, David G., to Johnson & Johnson Professional, Inc. Modular knee prosthesis. 5,556,433, Cl. 623-20.000.
Gadioux, Jacques: *See*—
Pirri, Rosangela; Gadioux, Jacques; and Riveno, Richard, 5,555,936, Cl. 116-295.000.
Gailus, David W.: *See*—
Hine, Nathan P.; and Gailus, David W., 5,557,305, Cl. 347-17.000.
Gaitonde, Sunil S.: *See*—
Brown, Marsha A.; Demers, Richard A.; Diephuis, James A.; Falcon, Lorenzo, Jr.; Frayne, Thomas E.; Gaitonde, Sunil S.; Patry, Elaine S.; Remay, William A.; Sissors, Kenneth M.; Vasquez, Ejuana D.; Weber, David J.; and Yamaguchi, Koichi, 5,557,776, Cl. 395-500.000.
Gakhar, Ved P.; Pennington, Donald C., Jr.; Byrley, David H.; Grishin, Alexander; Dossett, Richard A.; and Schmidt, Manfred W., to Credo Tool Company. Saw blade. 5,555,788, Cl. 83-835.000.
Galand, Claude: *See*—
Calvignac, Jean; Galand, Claude; Giroir, Didier; Lebizay, Gerald; Mauduit, Daniel; and Spagnol, Victor, 5,557,608, Cl. 370-60.000.
Galer, Herbert W. Square container for hazardous powdered materials. 5,555,995, Cl. 220-346.000.
Gallagher, James L.: *See*—
Quigley, Peter A.; Nolet, Steven C.; and Gallagher, James L., 5,556,677, Cl. 428-36.200.
Gallagher, Joseph E., Jr., to Tanner Lynx Corporation. Thick pile sock with heterogeneous body and foot portions, and sock system therewith. 5,555,565, Cl. 2-239.000.
Gallie, Ian G.; and Thorpe, John R., to Nampak Products Limited. Flexible, intermediate bulk container. 5,556,205, Cl. 383-24.000.
Galowitz, Dennis A., and Bruchu, Todd W., to Andersen Corporation. Method and apparatus for securing interior trim to a window frame. 5,555,684, Cl. 52-204.500.
Gandarillas, Michael J. Protective assembly for the steering ram of a marine outboard motor. 5,556,310, Cl. 440-61.000.
Ganesan, Ravi, to Bell Atlantic Network Services, Inc. System and method for centralized session key distribution, privacy enhanced messaging and information distribution using a split private key public cryptosystem. 5,557,678, Cl. 380-21.000.
Ganne, Jean-Pierre; Labeyrie, Michèle; and Dubois, Jean-Claude, to THOMSON-CSF. Card having a ferromagnetic track and reader therefor. 5,557,090, Cl. 235-449.000.
Garay, Oscar: *See*—
McCoy, Danny O.; Garay, Oscar; and McMillan, Stanton B., 5,557,293, Cl. 343-867.000.
Garbassi, Fabio: *See*—
Sommazi, Anna; Lugli, Gabriele; and Garbassi, Fabio, 5,556,823, Cl. 502-162.000.
Garceau, Roger: *See*—
Allaire, Gilles; Beauchemin, Gratien; Garceau, Roger; and Leclerc, Bruno, 5,557,414, Cl. 356-407.000.
Garceveur Corporation: *See*—
Hohmann, Howard E., Jr., 5,556,226, Cl. 404-84.100.
Garcia, Kevin M., to Garcia, Morris F. Method and apparatus for heating liquid. 5,555,850, Cl. 122-248.000.
Garcia, Morris F.: *See*—
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Gareis, Galen M.; and Thornton, Barry, to Belden Wire & Cable Company. Coaxial fiber optical cable. 5,557,698, Cl. 385-101.000.
Garnery, James A.: *See*—
Brammer, Norman; McConaughy, Brett R.; and Garnery, James A., 5,555,935, Cl. 166-88.100.
Garlington, Joseph O.: *See*—
Bohn, William R.; Short, Shelly; and Garlington, Joseph O., 5,556,340, Cl. 472-59.000.
Garner, David M.; Louie, Chun M.; Harrison, Daniel B.; and Dale, Donald J., to Oncometrics Imaging Corp. Personal interface device for positioning of a microscope stage. 5,557,456, Cl. 359-393.000.
Garnett, Martin E.; and Hsing, Michael R., to Micrel, Inc. Self-alignment technique for forming junction isolation and wells. 5,556,796, Cl. 437-31.000.
Garrett, Michael J.; Key, Andrew; and Morse, Kenneth, to International Business Machines Corporation. Automated image retrieval and scaling into windowed displays. 5,557,728, Cl. 395-157.000.
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Baker, Anna L.; and Garrigus, Darryl F., 5,555,914, Cl. 138-115.000.
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Berke, Neal S.; Dallaire, Michael P.; Gartner, Ellis M.; Kerkar, Awdhoot V.; and Martin, Timothy J., 5,556,460, Cl. 106-823.000.
Gasanov, Gusein G. O.: *See*—

Kasimov, Alibek E. O.; Gasanov, Gusein G. O.; Gevorkov, Levon G.; Sidorov, Evgeny I.; and Abishev, Ali A. A. O., 5,557,800, Cl. 395-800.000.
Gassmann, Theodor; and Oberdörster, Franz-Josef, to GKN Automotive AG. Method and device for controlling a coupling. 5,556,343, Cl. 475-87.000.
Gateway 2000, Inc.: *See*—
Gupta, Ajay; Fullmer, Howard K.; Flannery, Michael R.; and Tanaka, Hiroshi, 5,557,739, Cl. 395-183.100.
Gatto, Dom L.: *See*—
Cercone, Ronald J.; Gatto, Dom L.; Gertzman, Arthur A.; and Valentine, Douglas R., 5,556,391, Cl. 604-369.000.
Gaul, Norbert: *See*—
Schalz, Karl-Josef; and Gaul, Norbert, 5,557,453, Cl. 359-376.000.
Gauthier, Raymond G., to Seagate Technology, Inc. 2-Pole single or dual coil moving magnet motor with moving back iron. 5,557,152, Cl. 310-46.000.
Gavin, Patrick M.; Schelhorn, Jean E.; Aschenbeck, David P.; and Strauss, Carl R., to Owens Corning Fiberglas Technology, Inc. Fibrous glass insulation assembly. 5,556,682, Cl. 428-74.000.
Gavin, Robert F.: *See*—
Ensminger, William D.; and Gavin, Robert F., 5,556,381, Cl. 604-93.000.
Gazza, Jack M., to International Business Machines Corporation. Cam integrated with a rotation sensor. 5,555,776, Cl. 74-567.000.
GDE Systems, Inc.: *See*—
Tricoles, Gus P.; Davis, Wayne K.; and Nilles, James T., 5,557,277, Cl. 342-22.000.
Gebben, Vernon D.; and Bruce, Walter D., to Kerr-McGee Chemical Corporation. Method and apparatus for enhancing production of TiO_2. 5,556,600, Cl. 422-108.000.
Gebr. Happich GmbH: *See*—
Vaxelaire, Francis, 5,556,154, Cl. 296-97.100.
Welter, Patrick, 5,556,155, Cl. 296-97.120.
GEC Alsthom SA: *See*—
Verhaege, Thierry; Février, Alain; Lacaze, Alain; and Laumond, Yves, 5,557,072, Cl. 174-125.100.
GEC Alsthom Transport SA: *See*—
Friot, Laurent; and Trigeassou, Jean-Claude, 5,557,555, Cl. 364-578.000.
Geddes, Ian. Direct drill stump jump seeder. 5,555,825, Cl. 111-69.000.
Gehl Company: *See*—
McIntyre, Thomas J.; and Inberg, Steven B., 5,557,510, Cl. 364-146.000.
Geisler, Jens: *See*—
Hartfiel, Uwe; Dorfmeister, Gabriele; Franke, Helga; Geisler, Jens; Johann, Gerhard; and Rees, Richard, 5,556,986, Cl. 548-368.700.
Geist, Jon. Flexible pronunciation-practice interface for recorder/player. 5,557,706, Cl. 395-2.810.
Gemcor Engineering Corporation: *See*—
Michalewski, David; and Krell, Ernest K., 5,555,616, Cl. 29-509.000.
Gen-Probe Incorporated: *See*—
Shen, Nancy L.; Kacian, Daniel L.; Putnam, James G.; and Davis, William M., 5,556,771, Cl. 435-91.200.
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Berkcan, Ertugrul, 5,555,583, Cl. 8-158.000.
Blankenship, Charles P., Jr.; Yoon, Duk N.; Henry, Michael F.; and Benz, Mark G., 5,556,484, Cl. 148-211.000.
Bourneuf, John J.; Lenahan, Dean T.; Demers, Daniel E.; and Plemmons, Larry W., 5,555,721, Cl. 60-39.750.
Guida, Renato; and Zarnoch, Kenneth P., 5,557,650, Cl. 378-154.000.
Hollenbeck, Robert K.; and Brattoli, Mark A., 5,557,182, Cl. 318-432.000.
King, Joseph A., Jr.; McCloskey, Patrick J.; Colley, Alice M.; Dardaris, David M.; Fontana, Luca P.; and Berndsen, Josef G., 5,556,936, Cl. 528-199.000.
Rowen, William I.; and Kure-Jensen, Jens, 5,555,719, Cl. 60-39.030.
Traver, Frank J.; and Merrifield, James H., 5,556,629, Cl. 424-401.000.
General Hospital Corporation, The: *See*—
Anderson, R. Rox; Hruza, Luciann; and Kollias, Nikiforos, 5,556,612, Cl. 424-59.000.
General Metalcraft, Inc.: *See*—
Miller, Regis R.; Mellor, George E.; Norman, Theodore W., Sr.; Jamieson, Mary V.; Thompson, Michael J.; Sherrod, Willis, Sr.; Clarke, Dana H.; Webb, Jerome D.; and Wisniewski, Robert D., 5,556,180, Cl. 312-193.000.
General Motors Corporation: *See*—
Schneider, Douglas M., 5,555,772, Cl. 74-493.000.
GenTec Equipment Company: *See*—
Loesch, Leonard A., 5,556,197, Cl. 366-22.000.
Genzel, Michael; Hettich, Gerhard; and Ramm, Norbert, to Temic Telefunken Microelectronic GmbH. Pretensioning force adjustment of continuously variable transmission. 5,556,346, Cl. 474-28.000.
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Won, I. J., 5,557,206, Cl. 324-329.000.
Georg Fischer Rohrleitungssysteme AG: *See*—
Schalk, Adelbert, 5,557,051, Cl. 73-861.220.
George, Robert L., II: *See*—
Ray, Jimmy C.; George, Robert L., II; and Levine, Richard C., 5,557,656, Cl. 379-59.000.
Georgi, Matthias: *See*—
Blum, Alwin; and Georgi, Matthias, 5,555,590, Cl. 15-167.100.
Gephardt, Douglas D.; Mudgett, Dan S.; and MacDonald, James R., to Advanced Micro Devices. High performance integrated processor architecture including a sub-bus control unit for generating signals to control a secondary, non-multiplexed external bus. 5,557,757, Cl. 395-306.000.
Geranis, John A.: *See*—
Reuter, Mark S.; and Geranis, John A., 5,557,213, Cl. 324-761.000.
Gerardo Pagaza-Melero: *See*—
Pagaza-Melero, Gerardo; Fernandez-Y-Sosa, Raymundo; Bastida-Sanchez, Santiago; Bastida-Sanchez, Agustin; Pagaza-Melero, Victor; and Pagaza-Melero, Jesus F., 5,555,782, Cl. 82-46.000.
Gerasimov, Arkadiy F.: *See*—
Ivanov, Alexander M.; Bognitski, Isaac Y.; Gerasimov, Arkadiy F.; Efimov, Sergei E.; Savintsev, Vadim G.; Fomin, Andrei V.; and Chizhevski, Sergei V., 5,557,497, Cl. 361-502.000.
Gerdes, Richard C.: *See*—
Jungo, Charles; Montgomery, Gerald; and Gerdes, Richard C., 5,557,333, Cl. 348-473.000.
Gergele, Jean; Le Gall, Armand; Pompier, Jean-Pierre; and Remond, Michel, to Compagnie Générale des Etablissements Michelin - Michelin & Cie. Tire having a plurality of independent removable and reinforced sectors. 5,556,488, Cl. 152-198.000.
Gerke, David L.: *See*—
Rogers, M. Weldon, III; Bogart, Bruce E.; Gerke, David L.; Eberle, Robert A.; and Thomas, Craig, 5,556,163, Cl. 297-330.000.
Germain, Richard P.: *See*—
Goodman, Nancy B.; Germain, Richard P.; Julien, Paul C.; Kremer, Susan J.; and Gruber, Robert J., 5,557,393, Cl. 355-326.00R.
Gertzman, Arthur A.: *See*—
Cercone, Ronald J.; Gatto, Dom L.; Gertzman, Arthur A.; and Valentine, Douglas R., 5,556,391, Cl. 604-369.000.
Gesell, Ralph P.: *See*—
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Getz Bros. Co., Ltd.: *See*—
Taoda, Toshimitsu; and Horie, Masao, 5,556,411, Cl. 606-185.000.
Gevorkov, Levon G.: *See*—
Kasimov, Alibek E. O.; Gasanov, Gusein G. O.; Gevorkov, Levon G.; Sidorov, Evgeny I.; and Abishev, Ali A. A. O., 5,557,800, Cl. 395-800.000.
Ghanbari, Ebrahim, to Sony Corporation; and Materials Research Corporation. Sputter etching apparatus with plasma source having a dielectric pocket and contoured plasma source. 5,556,521, Cl. 204-192.320.
Ghori, Amar: *See*—
Agatstein, Willy; Aghazadeh, Mostafa; Chiu, Chia-pin; Ghori, Amar; Neal, James R.; and Turturio, Gregory, 5,556,811, Cl. 437-209.000.
Ghosh, Paritosh: *See*—
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Gassmann, Theodor; and Oberdörster, Franz-Josef, 5,556,343, Cl. 475-87.000.
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Hill, Derek A.; and Turner, Geoffrey L., 5,556,978, Cl. 546-140.000.
Glebe, Harlan, to Suhar Corporation. Motorized electrical apparatus for movement of an electrical fixture with uninterrupted electricity. 5,556,195, Cl. 362-386.000.
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Fujiki, Masaru, 5,555,940, Cl. 169-60.000.
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Oh, Soon Y., 5,557,335, Cl. 348-512.000.
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Lee, Kyung S., 5,556,803, Cl. 437-53.000.
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Schulze, Wolfgang; Feulner, Dieter; Krien, Burkhard; and Meier, Bernd, 5,557,197, Cl. 324-115.000.
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Goubet, Francois: *See*—
Claussner, André; Goubet, Francois; and Teutsch, Jean-Georges, 5,556,983, Cl. 548-300.700.
Gouin, Michael D.: *See*—
Johnson, Larry K.; Reidemeister, Eric P.; Southworth, Robert O.; Gouin, Michael D.; Silva, William; and Amatruda, Andrew A., Jr., 5,555,766, Cl. 73-514.320.
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Elliott, Jeff, 5,555,909, Cl. 137-359.000.
GP Companies, Inc.: *See*—
Simonette, Dallas W., 5,556,264, Cl. 417-307.000.
Grace, Kathleen J., Fonte, Anne M.; and Buser, John P. Patellar alignment device. 5,556,374, Cl. 602-26.000.
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Graf, Hermann: *See*—
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Grahn Marisi, Margaret R. Insect repellent. 5,556,881, Cl. 514-557.000.
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Niskanen, Don L., 5,556,224, Cl. 403-379.000.
Gras, Rainer; and Wolf, Elmar, to Huels Aktiengesellschaft. Salts of pyromellitic acid, a process for their preparation, and their use. 5,556,937, Cl. 528-288.000.
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Gray, Clint D.: *See*—
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Green, Joseph, to FMC Corporation. Polybrominated phenylphosphate flame retardent for engineering thermoplastic compositions. 5,556,903, Cl. 524-142.000.
Green, Thomas S., to ABC TechCorp. Measured liquid dispensing system. 5,556,002, Cl. 222-21.000.
Greene, James M.; Hankins, Holly M.; and Stephenson, Gregory A., to Eli Lilly and Company. Form II Dirithromycin. 5,556,839, Cl. 514-29.000.
Gregerson, Barry, to Empak, Inc. Wafer suspension box. 5,555,981, Cl. 206-711.000.
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Greiff, Paul, to Charles Stark Draper Laboratory, Inc., The. Gimballed vibrating wheel gyroscope. 5,555,765, Cl. 73-504.090.
Grenier, Mario. Method and apparatus for heat treating metal parts. 5,556,593, Cl. 266-257.000.
Greppmeier, Eva-Maria: *See*—
Schuller, Edmund; Greppmeier, Eva-Maria; and Furtmeier, Anton, 5,555,717, Cl. 57-413.000.
Grese, Timothy A.: *See*—
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Gretson International Ltd.: *See*—
Book, Steven C., 5,555,614, Cl. 29-401.100.
Gribble, R. Parks: *See*—
Sheen, David M.; Collins, H. Dale; Hall, Thomas E.; McMakin, Douglas L.; Gribble, R. Parks; Severtsen, Ronald H.; Prince, James M.; and Reid, Larry D., 5,557,283, Cl. 342-179.000.
Gribkov, Vladimir N.: *See*—
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Gridley, Lee E.: *See*—
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Griese, Gary B. Method of hydrometeor dissipation. 5,556,029, Cl. 239-2.100.
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FitzGerald, Mark R.; and Griffin, Craig T., 5,556,281, Cl. 434-16.000.
Griffin, Robert D. Portable device for drying and removing wrinkles from clothing. 5,555,648, Cl. 34-621.000.
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Kogan, Grigory; and Griffith, Boulden G., 5,557,618, Cl. 371-10.300.
Griffith, Henry S. Lattice structure formed from curved elements. 5,555,692, Cl. 52-662.000.
Griffith, Lezley A.: *See*—
Barber, Keith A.; Bone, Ronald N., Jr.; Cogan, Kevin C.; Dickerson, Michael L.; Gien, Peter H.; Griffith, Lezley A.; Nightingale, Gary R.; Ouellette, Edward L.; Petter, Robert R., Jr.; and Semjenow, Gary A., 5,555,787, Cl. 83-698.110.
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McNeill, Robert C.; and Pfeifer, Thomas J., 5,555,791, Cl. 99-295.000.
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Gakhar, Ved P.; Pennington, Donald C., Jr.; Byrley, David H.; Grishin, Alexander; Dossett, Richard A.; and Schmidt, Manfred W., 5,555,788, Cl. 83-835.000.
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Groebly, Walter. Storage receptacle for storing of objects in a plurality of receptacles. 5,556,178, Cl. 312-107.000.
Groechel, David W.: *See*—
Collins, Kenneth S.; Roderick, Craig A.; Trow, John R.; Yang, Chan-Lon; Wong, Jerry Y.; Marks, Jeffrey; Keswick, Peter R.; Groechel, David W.; Pinson, Jay D., II; Ishikawa, Tetsuya; Lei, Lawrence C.; Toshima, Masato M.; and Yin, Gerald Z., 5,556,501, Cl. 156-345.000.
Grognet, Jean-Marc: *See*—
Istin, Michel; Grognet, Jean-Marc; and Darnez, Charles, 5,556,635, Cl. 424-448.000.
Grom, Brian R.: *See*—
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Grome, John J.: *See*—
Furrer, Harald; Seiffge, Dirk; Okyayuz-Baklouti, Ismahan; and Grome, John J., 5,556,854, Cl. 514-234.200.
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Powell, Walter W.; Anderson, Milton N., Jr.; Castaneda, Louis R.; and Martin, Aciel, 5,555,910, Cl. 137-488.000.
Grover, Thomas A.: *See*—
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Grube, Gary W.; Bunkenburg, Brian K.; and Naddell, Marc C., to Motorola, Inc. Method for providing caller data in a time division multiplexed wireless communication system. 5,557,605, Cl. 370-29.000.
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Gruber, Robert J.: *See*—
Goodman, Nancy B.; Germain, Richard P.; Julien, Paul C.; Kremer, Susan J.; and Gruber, Robert J., 5,557,393, Cl. 355-326.00R.
Grunes, Howard E., to Applied Materials, Inc. Semiconductor wafer cassette transfer system. 5,556,248, Cl. 414-416.000.
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Bay, William E.; Jacobs, William F., III; Gschneidner, David; and Gupta, Ram B., 5,556,971, Cl. 544-196.000.
GTY Industries: *See*—
Poppenheimer, Charles B., 5,556,188, Cl. 362-101.000.
Guardian Industries Corp.: *See*—
Hartig, Klaus W.; Larson, Steven L.; and Lingle, Philip J., 5,557,462, Cl. 359-585.000.
Guasch, James A. Method and apparatus for creating air flow in a wall or ceiling for drying purposes through an electrical box. 5,555,643, Cl. 34-443.000.
Guay, Randall G., to Apple Computer, Inc. Color map tables smoothing in a color computer graphics system avoiding objectionable color shifts. 5,557,712, Cl. 395-130.000.
Guenzer, Charles S. Crystallographically oriented growth of silicon over a glassy substrate. 5,556,463, Cl. 117-90.000.
Guertin, Matthew J.: *See*—
Fehskens, Leonard G.; Strutt, Colin; Callander, Jill F.; Nelson, Kathy J.; Guertin, Matthew J.; Sylor, Mark W.; Chapman, Kenneth W.; Schuchard, Robert C.; Goldfarb, Stanley I.; Rogers, Dennis O.; O'Brien, Linsey B.; Chan-Lizardo, Christine C.; England, Benjamin M.; Rosenbaum, Richard L.; Kohls, Ruth E. J.; Aronson, David L.; Moore, Allan B.; Ross, Robert R. N.; Smith, Danny L.; Sankar, Arundahati G.; Koning, G. Paul; Namoglu, Sheryl F.; Seger, Mark J.; Dixon, Timothy M.; and Harrow, Jeffrey R., 5,557,796, Cl. 395-650.000.
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Guha, Dwipendra N., to Scott Fetzer Company, The. Floor mopping machine. 5,555,587, Cl. 15-98.000.
Guida, Renato; and Zarnoch, Kenneth P., to General Electric Company. Method for fabricating an anti-scatter X-ray grid device for medical diagnostic radiography. 5,557,650, Cl. 378-154.000.
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Bockman, Richard; and Guidon, Peter, 5,556,645, Cl. 424-650.000.
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Ulmer, Erik; and Guillemant, Philippe, 5,555,895, Cl. 128-782.000.
Guillen, Jose E., Jr. Soccer practice device. 5,556,104, Cl. 273-396.000.
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Perlman, Radia J.; Shand, Ian M. C.; and Gunner, Christopher W., 5,557,745, Cl. 395-200.020.
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Gupta, Ajay; Fullmer, Howard K.; Flannery, Michael R.; and Tanaka, Hiroshi, to Gateway 2000, Inc. Computer system with component removal and replacement control scheme. 5,557,739, Cl. 395-183.100.
Gupta, Ajay K.: *See*—
Gaboury, Louis; Villeneuve, Luc; Giasson, Richard; Li, Tiechao; and Gupta, Ajay K., 5,556,992, Cl. 549-227.000.
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Gushima, Hiroshi: *See—*
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Gustavson, Linda M.: *See—*
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Rivas, Hercilio; Acevedo, Socrates; and Gutierrez, Xiomara, 5,556,574, Cl. 252-311.500.
Guttman-Carlisle, Deborah L.: *See—*
Barton, Russell L., Guttman-Carlisle, Deborah L.; and Koppel, Gary A., 5,556,623, Cl. 424-179.100.
H. B. Fuller Licensing & Financing Inc.: *See—*
Hagquist, James A. E.; Reid, Kevin J.; Giorgini, Albert; and Hill, Nathanael, 5,556,934, Cl. 528-85.000.
LaBrash, Robert A.; and Willging, Stephen M., 5,556,453, Cl. 106-205.010.
H. Krantz-TKT GmbH: *See—*
Schweikert, Wolfgang, 5,556,330, Cl. 454-289.000.
Ha, Stephen T.; and Neidell, Norman S. Transducer to generate phase-encoded wavefields. 5,557,583, Cl. 367-138.000.
Hach Company: *See—*
Miller, Donald G., 5,556,787, Cl. 436-62.000.
Hackett, Steven S.; Hastings, Roger N.; Thornton, Arnold W.; Thometz, Darlene A.; Larson, Kenneth R.; Thome, Scott P.; and Humphrey, John W., to SciMed Life Systems, Inc. Shaft movement control apparatus. 5,555,893, Cl. 128-772.000.
Hada, Hiroshi: *See—*
Maruyama, Muneo; Ueno, Toshihiko; Hada, Hiroshi; and Baba, Masatake, 5,557,433, Cl. 359-41.000.
Haddad, Heskel M.; and Loucas, Spiro P. Drug delivery ophthalmic insert and method for preparing same. 5,556,633, Cl. 424-427.000.
Hade, Conrad, to Dinaco, Inc. Apparatus for mounting flexible banners. 5,555,659, Cl. 40-604.000.
Hadewe B.V.: *See—*
Gombault, Jacobus F., and Hidding, Gerhard, 5,555,703, Cl. 53-411.000.
Munneke, Christiaan A.; and van der Werff, Jeichienus A., 5,556,086, Cl. 270-46.000.
Haeco Partners, Ltd.: *See—*
Hope, Jack L., 5,555,730, Cl. 60-606.000.
Hafeman, Dean G.: *See—*
Wechsler, Mark; Barney, Howard H., Kaye, Roger A.; Ogle, David G.; Lacy, Michael M.; Chow, Calvin Y.; Crawford, Kimberly L.; and Hafeman, Dean G., 5,557,398, Cl. 356-318.000.
Hagedorn, Donald: *See—*
Doane, Russell C.; Hagedorn, Donald, Young, Karl W.; and Rand, Robert E., 5,557,036, Cl. 800-200.000.
Hager, Jörg; Dürr, Manfred; and Lunebach, Ernst, to A. Nattermann & Cie. GmbH. Water containing liposome system. 5,556,637, Cl. 424-450.000.
Hagino, Miki: *See—*
Sakai, Toshiharu; Nakamura, Yoshinori; Umegaki, Takashi; Iguchi, Nobuo; Hagino, Miki; Mori, Hiroaki; Ota, Toshikazu; Oka, Akihiko; Takatsu, Kazuo; and Nemoto, Nobuyuki, 5,557,437, Cl. 359-110.000.
Hagquist, James A. E.; Reid, Kevin J.; Giorgini, Albert; and Hill, Nathanael, to H. B. Fuller Licensing & Financing Inc. Isocyanurate embedment compound. 5,556,934, Cl. 528-85.000.
Hahn, Dietrich: *See—*
Wieczorek, Rudi; Hahn, Dietrich; and Rohrmülle, Josef, 5,557,076, Cl. 178-19.000.
Haining, Michael L. Disposable scalpel. 5,556,409, Cl. 606-181.000.
Haji, Motohiro: *See—*
Sumioka, Kouichi; Haji, Motohiro; Suzuki, Toshiiku; Sonobe, Masao; and Naitoh, Noriyuki, 5,556,649, Cl. 425-215.000.
Hakamada, Naoki; Inagaki, Mitsuo; Ando, Yoriaki; and Kubo, Kunihiro, to Nippon Soken, Inc. Hydraulic control system for an automatic transmission of a vehicle. 5,556,356, Cl. 477-163.000.
Hakamata, Yoshimi: *See—*
Komuro, Katsuhiro; Kojima, Yoshitaka; Kurosawa, Yukio; Koguchi, Yoshio; Tanimizu, Toru; Hakamata, Yoshimi; and Endo, Shunkichi, 5,557,083, Cl. 218-125.000.
Hakogi, Hironao: *See—*
Yamane, Takashi; Omori, Yasuhiko; Sawae, Shinya, Furukawa, Yasutoshi; and Hakogi, Hironao, 5,557,695, Cl. 385-49.000.
Halawani, Mohamed E., to University of Minnesota, Regents of the. Method of increasing egg production in avian species by active immunization against vasoactive intestinal peptide. 5,557,033, Cl. 800-2.000.
Halderit, Antoon H. T.; Booij, Martin; Hendrix, Jan A. J.; and Frentzen, Yvonne H., to DSM N.V. Reclaiming ε-caprolactam from carpet waste. 5,556,890, Cl. 521-49.800.
Hale, Leonard G.: *See—*
Winker, Bruce K.; Saxena, Ragini; Taber, Donald B.; and Hale, Leonard G., 5,557,434, Cl. 359-73.000.
Hale, Nathan; and Xu, Ming, to Sawgrass Systems, Inc. Permanment heat activated electrographic printing process and composition. 5,555,813, Cl. 101-492.000.
Hall, David E.: *See—*
Wason, Robert P.; and Hall, David E., 5,555,574, Cl. 4-502.000.
Hall, John H.: *See—*
Finkelstein, Walter; and Hall, John H., 5,556,530, Cl. 205-122.000.
Hall, Larry D.; and Betz, Todd J., to Intellicall, Inc. Card reader system and method of operation. 5,557,089, Cl. 235-440.000.
Hall, Roger E. Safety base with anchor, methods of using and making, and associated tool. 5,556,089, Cl. 273-25.000.
Hall, Thomas E.: *See—*
Sheen, David M.; Collins, H. Dale; Hall, Thomas E.; McMakin, Douglas L.; Gribble, R. Parks; Severtsen, Ronald H.; Prince, James M.; and Reid, Larry D., 5,557,283, Cl. 342-179.000.
Haller, Jeff: *See—*
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Halliburton Company: *See—*
Schultz, Roger L.; Beck, H. Kent; Ringgenberg, Paul D.; and Hinkie, Ronald L., 5,555,945, Cl. 175-50.000.
Halm, Hans, to UHU GmbH. Glue stick and method for its production. 5,556,010, Cl. 222-386.000.
Halperin, Jose; Brugnara, Carlo; and Haynes, Harley, to President & Fellows of Harvard College. Method for treating epithelial precancerous lesions with topical inidazoles. 5,556,871, Cl. 514-396.000.
Ham, Young M., to Hyundai Electronics Industries Co., Ltd. Method for fabricating a half-tone type phase shift mask. 5,556,725, Cl. 430-5.000.
Hamada, Shuta: *See—*
Haneda, Satoshi; Fukuchi, Masakazu; Ikeda, Tadayoshi; Nagase, Hisayoshi; and Hamada, Shuta, 5,557,394, Cl. 355-327.000.
Hamada, Takahiro: *See—*
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Hamada, Yoichi: *See—*
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Hamamatsu Photonics K.K.: *See—*
Watase, Yasushi; Washiyama, Hiroaki; and Ikuma, Toshio, 5,557,166, Cl. 313-524.000.
Hamamoto, Kenji: *See—*
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Hamaya, Masahiro: *See—*
Fukaya, Kenji; Hori, Makoto; Hamaya, Masahiro, Ota, Minoru; Nakano, Syuichi; and Fukaya, Tomoji, 5,556,526, Cl. 204-425.000.
Häme, Tuomas: *See—*
Rantasuo, Markku; and Häme, Tuomas, 5,557,326, Cl. 348-272.000.
Hamer, Russell R. L.: *See—*
Tegeler, John J.; Rauckman, Barbara S.; Hamer, Russell R. L.; Freed, Brian S.; and Merriman, Gregory H., 5,557,006, Cl. 560-105.000.
Hamilton, Douglas O.: *See—*
Sidaway, H. John, and Hamilton, Douglas O., 5,556,231, Cl. 405-48.000.
Hamilton, Harold J.; and Martin, Timothy W., to Censtor Corp. Gimbaled micro-head/flexure/conductor assembly and system. 5,557,488, Cl. 360-104.000.
Hamm, David R.: *See—*
Grate, John H.; Hamm, David R.; Klingman, Kenneth A.; Saxton, Robert J.; and Downey, Shannan J., 5,557,014, Cl. 568-401.000.
Hammerschmidt, Albert: *See—*
Leuschner, Rainer; Ahne, Hellmut; Birkle, Siegfried; Hammerschmidt, Albert; Sezi, Recai; Noll, Tobias; and Dumoulin, Ann, 5,556,812, Cl. 437-209.000.
Hamminger, Rainer: *See—*
Boberski, Cornelia; Krüner, Hartmut; Riedel, Günter; and Hamminger, Rainer, 5,556,815, Cl. 501-97.000.
Hammond, Earl G.: *See—*
Fehr, Walter R.; and Hammond, Earl G., 5,557,037, Cl. 800-200.000.
Han, Joon S.: *See—*
Jung, Il N.; Han, Joon S.; Cho, Eun J.; Jeong, Young T.; and Kang, Kap K., 5,556,822, Cl. 502-125.000.
Han, Jung-chang, to Samsung Display Devices Co., Ltd. Color picture tube with a shadow mask support member. 5,557,162, Cl. 313-402.000.
Hanai, Tomoyuki; Kakurai, Kimio; and Hamamoto, Kenji, to Sony Corp. Broadcast signal receiver which automatically sets an internal clock. 5,557,585, Cl. 368-43.000.
Hanawa, Makoto: *See—*
Nishii, Osamu; Inagawa, Takashi; Hanawa, Makoto; and Takeda, Hiroshi, 5,557,760, Cl. 395-310.000.
Hancor, Inc.: *See—*
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Hand, George: *See—*
Kern, Alan R.; LaFleur, John A.; Hand, George; and Ferris, Bruce, 5,556,118, Cl. 280-47.160.
Handa, Makoto: *See—*
Etchu, Masami; Murooka, Hirofumi; Mizutani, Kei; and Handa, Makoto, 5,556,691, Cl. 428-141.000.
Handjani, Rose-Marie: *See—*
Ribier, Alain; Richart, Pascal; and Handjani, Rose-Marie, 5,556,617, Cl. 424-78.020.
Handotai Kenkyu Shinkokai: *See—*
Nishizawa, Jun-ichi, 5,557,119, Cl. 257-264.000.

Haneda, Satoshi; Fukuchi, Masakazu; Ikeda, Tadayoshi; Nagase, Hisayoshi; and Hamada, Shuta, to Konica Corporation. Color image forming apparatus having a transparent photoreceptor. 5,557,394, Cl. 355-327.000.
Hankins, Holly M.: *See—*
Greene, James M.; Hankins, Holly M.; and Stephenson, Gregory A., 5,556,839, Cl. 514-29.000.
Hann, Jerry: *See—*
Giunta, Joseph S.; Hann, Jerry; and McDermott, John F., 5,556,515, Cl. 202-248.000.
Hanna, Beverly I. Face, neck and chin exerciser. 5,556,357, Cl. 482-11.000.
Hans Grohe GmbH & Co. KG: *See—*
Waidele, Armin; and Katzer, Dieter, 5,555,913, Cl. 138-104.000.
Hans Höllmüller Maschinenbau GmbH & Co.: *See—*
Markowski, Joachim, 5,556,532, Cl. 205-705.000.
Hansen, Craig N., to Hansen Engine Corporation. Double acting pump. 5,556,267, Cl. 417-534.000.
Hansen Engine Corporation: *See—*
Hansen, Craig N., 5,556,267, Cl. 417-534.000.
Hansen, Jan: *See—*
Nielsen, Hans O.; and Hansen, Jan, 5,557,415, Cl. 356-417.000.
Hanson, Mark T.; and Bacon, Glade B., to Microsoft Corporation. Noise-insensitive optoencoding techniques with compensation for device variations. 5,557,440, Cl. 359-161.000.
Hanyu, Yukio; Mihara, Tadashi; Kodera, Yasuto; and Nakamura, Katsutoshi, to Canon Kabushiki Kaisha. Liquid crystal device and display apparatus. 5,557,435, Cl. 359-75.000.
Happich Fahrzeng-Dachsysteme GmbH: *See—*
Brunner, Harald, 5,556,221, Cl. 403-322.000.
Hara, Masao: *See—*
Koda, Tadashi; Hara, Masao; Ueki, Kiyosuke; and Mori, Kei, 5,556,888, Cl. 521-44.500.
Hara, Shoji, to Fuji Photo Film Co., Ltd. Abnormal pattern detecting apparatus. 5,557,687, Cl. 382-132.000.
Harada, Hiroyuki; Ikezawa, Yuji; Kanzaki, Susumu; Shinonaga, Hideo; and Sogabe, Satoru, to Sumitomo Chemical Company Limited. Polypropylene resin composition. 5,556,910, Cl. 524-504.000.
Harada, Junichi; Tsuchida, Takuji; Kunikita, Keiji; Hasegawa, Katsuhisa; Fuse, Tadahiko; and Suzuki, Tomoo, to Toyota Jidosha Kabushiki Kaisha; and Kanto Jidosha Kogyo Kabushiki Kaisha. Body structure for electric vehicle. 5,555,950, Cl. 180-65.100.
Harada, Katsuyoshi: *See—*
Yamada, Yoshinori; Hasegawa, Mitsutaka; and Harada, Katsuyoshi, 5,556,999, Cl. 556-401.000.
Harada, Yasoo; Matsushita, Shigeharu; Terada, Satoshi; Fujii, Emi; Kurose, Takashi; Higashino, Takayoshi; Yamada, Takashi; Nagamatsu, Akihito; Inoue, Daijirou; and Matsumura, Kouji, to Sanyo Electric Co., Ltd. Method of doping, semiconductor device, and method of fabricating semiconductor device. 5,557,141, Cl. 257-631.000.
Haraguchi, Masanori; Okada, Yoshinori; and Ito, Masato, to Kabushiki Kaisha Toshiba. Signal terminal structure for macro cells and an associated connection method. 5,557,564, Cl. 365-63.000.
Haraguchi, Tsuyoshi; and Tsuchiya, Ichiro, to Konica Corporation. Method for processing a silver halide color photographic light-sensitive material and producing a color image. 5,556,736, Cl. 430-399.000.
Haraldsson, Martin: *See—*
Agback, Hubert; Ahrgren, Leif; Berglindh, Thomas; Haraldsson, Martin; Smedegård, Göran; and Olsson, Lars-Inge, 5,556,855, Cl. 514-247.000.
Harara, Mitsuhiko: *See—*
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Harasawa, Yuko: *See—*
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Harder, Wolfgang: *See—*
Flick, Klemens; Ebel, Klaus; Schnurr, Werner; Melder, Johann-Peter; and Harder, Wolfgang, 5,557,004, Cl. 558-459.000.
Hardgrave, Ragen F.: *See—*
Liav, Avraham; Hardgrave, Ragen F.; Blystone, Sheri; and Turner, Gregory A., 5,556,963, Cl. 536-55.300.
Hardie, Cal: *See—*
Maggio, Mark; Metzner, Tom; Eckerd, Steven; Skarky, Loren; Midori, Yoshiki; Hardie, Cal; and Yu, Ray, 5,555,619, Cl. 29-860.000.
Harmon, William D. Multi-purpose feeder. 5,555,843, Cl. 119-57.800.
Harreus, Albrecht: *See—*
Eicken, Karl; Goetz, Norbert; Harreus, Albrecht; Ammermann, Eberhard; Lorenz, Gisela; and Rang, Harald, 5,556,988, Cl. 548-374.100.
Oberdorf, Klaus; Sauter, Hubert; Grammenos, Wassilios; Kirstgen, Reinhard; Harries, Volker; Lorenz, Gisela; Ammermann, Eberhard; Gold, Randall E.; Siegel, Wolfgang; and Harreus, Albrecht, 5,556,884, Cl. 514-620.000.
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Harris, Alan L.; Phillips, Mark I.; and Howell, Mark L., to Lucas Industries Public Limited Company. Protecting ABS skid detection against data corruption. 5,556,177, Cl. 303-174.000.
Harris Corporation: *See—*
Belcher, Donald K.; and Bailey, David C., 5,557,495, Cl. 361-298.200.
Belcher, Donald K.; Knick, Earl B.; and Powshok, Andrew T., 5,557,617, Cl. 370-120.000.
Wood, Grady M., 5,557,175, Cl. 315-200.00R.
Harris, David W., to University of Hawaii. Confocal microscope system. 5,557,452, Cl. 359-368.000.
Harris, Ralph E.: *See—*
Winter, Dean C.; Harris, Ralph E.; and Honeyager, Kevin S., 5,555,880, Cl. 128-204.210.
Harris, Rosemary H.: *See—*
Bruno, Richard F.; Chen, Mon-Mei; Harris, Rosemary H.; and Markowitz, Robert E., 5,557,667, Cl. 379-201.000.
Harrison, Daniel B.: *See—*
Garner, David M.; Louie, Chun M.; Harrison, Daniel B.; and Dale, Donald J., 5,557,456, Cl. 359-393.000.
Harrow, Jeffrey R.: *See—*
Fehskens, Leonard G.; Strutt, Colin; Callander, Jill F.; Nelson, Kathy J.; Guertin, Matthew J.; Sylor, Mark W.; Chapman, Kenneth W.; Schuchard, Robert C.; Goldfarb, Stanley I.; Rogers, Dennis O.; O'Brien, Linsey B.; Chan-Lizardo, Christine C.; England, Benjamin M.; Rosenbaum, Richard L.; Kohls, Ruth E. J.; Aronson, David L.; Moore, Allan B.; Ross, Robert R. N.; Smith, Danny L.; Sankar, Arundahati G.; Koning, G. Paul; Namoglu, Sheryl F.; Seger, Mark J.; Dixon, Timothy M.; and Harrow, Jeffrey R., 5,557,796, Cl. 395-650.000.
Hart, Kevin A. Product-supported advertising display and method. 5,555,991, Cl. 211-73.000.
Hartfiel, Uwe; Dorfmeister, Gabriele; Franke, Helga; Geisler, Jens; Johann, Gerhard; and Rees, Richard, to Hoechst Schering AgrEvo GmbH. Pyrazole hydrazine compounds. 5,556,986, Cl. 548-368.700.
Hartford Fire Insurance Company, Inc.: *See—*
Abbruzzese, Pamela; Bailey, Paul; Fritz, Denise L.; Lawler, John; Manning, Rick; Pollnow, Russ; Retartha, Anthony; Round, Mary J.; Schardt, Marc; Synodinos, Barbara; and Tanner, Robert, 5,557,515, Cl. 364-401.00R.
Hartford Hospital: *See—*
Eisenfeld, Leonard I., 5,555,891, Cl. 128-721.000.
Hartig, Klaus W.; Larson, Steven L.; and Lingle, Philip J., to Guardian Industries Corp. Dual silver layer Low-E glass coating system and insulating glass units made therefrom. 5,557,462, Cl. 359-585.000.
Hartman, Randolph G., to Honeywell Inc. Spoofing detection system for a satellite positioning system. 5,557,284, Cl. 342-357.000.
Hartmann, Paul R.: *See—*
Cadieux, Kevin; and Hartmann, Paul R., 5,557,616, Cl. 370-105.100.
Hartwell Corporation: *See—*
Zankich, Frank A., 5,556,142, Cl. 292-101.000.
Hartzell, Mark. D-shaped handle for coping saws. 5,555,627, Cl. 30-509.000.
Harvey, William O.: *See—*
Voss, Mark G.; and Harvey, William O., 5,555,956, Cl. 184-6.160.
Hasan, Syed Riaz-Ul: *See—*
Beach, John R.; Paul, Sigismund G.; Kenny, Daniel J.; Hasan, Syed Riaz-Ul; and Doherty, James E., 5,555,780, Cl. 81-57.370.
Hasebe, Etsuhiro: *See—*
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Hasegawa, Hirohiko: *See—*
Muraoka, Masami; Matsui, Kazuki; Hasegawa, Hirohiko; and Kojima, Atsuyuki, 5,556,860, Cl. 514-258.000.
Hasegawa, Hiroshi; Minaki, Takashi; and Koizumi, Yukinori, to Konica Corporation. Image input apparatus with two-dimensional pixel shift. 5,557,327, Cl. 348-340.000.
Hasegawa, Katsuhisa: *See—*
Harada, Junichi; Tsuchida, Takuji; Kunikita, Keiji; Hasegawa, Katsuhisa; Fuse, Tadahiko; and Suzuki, Tomoo, 5,555,950, Cl. 180-65.100.
Hasegawa, Kenichi, to Fujitsu Limited. Facsimile device for use in ISDN and method of controlling same. 5,557,425, Cl. 358-440.000.
Hasegawa, Makoto; Sakima, Hiromi; Kanbara, Hiromitsu; Ishikawa, Yoshio; Imamura, Yasuo; and Aoki, Makoto, to Tokyo Electron Limited; and Kabushiki Kaisha Toshiba. Plasma etching apparatus. 5,556,500, Cl. 156-345.000.
Hasegawa, Mitsutaka: *See—*
Yamada, Yoshinori; Hasegawa, Mitsutaka; and Harada, Katsuyoshi, 5,556,999, Cl. 556-401.000.
Hasegawa, Takahiko: *See—*
Takeuchi, Shigeru; Sato, Taketoshi; and Hasegawa, Takahiko, 5,555,872, Cl. 123-497.000.
Hasegawa, Takashi; Inoue, Masahiro; and Takekoshi, Nobuhiko, to Canon Kabushiki Kaisha. Image forming apparatus having recording material carrying means. 5,557,383, Cl. 355-271.000.
Hashimoto, Hiroshi, to Daiwa Seiko, Inc. Backlash preventive device for use in a dual bearing type reel for fishing. 5,556,048, Cl. 242-288.000.
Hashimoto, Masayuki, to Nippon Steel Semiconductor Corporation. Semiconductor device with field shield isolation structure and a method of manufacturing the same. 5,557,135, Cl. 257-308.000.
Hashimoto, Mikio: *See—*
Shobatake, Yasuro; Tsunoda, Keiji; Takabatake, Yoshiaki; Hashimoto, Mikio; Tujita, Taketoshi; Takeda, Junichi; and Kimura, Narito, 5,557,609, Cl. 370-60.100.
Hashimoto, Takasuke, to NEC Corporation. Hetero-junction type bipolar transistor. 5,557,118, Cl. 257-197.000.
Hashimoto, Tamaki: *See—*
Shiga, Mikio; and Hashimoto, Tamaki, 5,557,369, Cl. 355-204.000.

Hashimura, Tetsutaro: *See—*
Nakanishi, Kenji; Yajima, Takatoshi; Araki, Hiromitsu; Kobayashi
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Halperin, Jose; Brugnara, Carlo; and Haynes, Harley, 5,556,871, Cl.

Skodell, Birgit; Osberghaus, Rainer; Rogmann, Karl-Heinz; Faubel, Heiko; and Bossek, Harald, 5,556,450, Cl. 106-10.000.
Weuthen, Manfred; Engels, Thomas; Hensen, Herman; Tesmann
Hicok, Gary D.; and Lehman, Judson A., to VLSI Technology, Inc. Caching FIFO and method therefor. 5,557,733, Cl. 395-162.000.
Hidaka, Shigeyuki: *See—*

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Nakanishi, Kenji; Yajima, Takatoshi; Araki, Hiromitsu; Kobayashi, Hideyuki; Ohkubo, Yoshiaki; Hashimura, Tetsutaro; and Naito, Hiroshi, 5,556,739, Cl. 430-533.000.
Hashiuchi, Masachika; Miyazono, Takeshi; Watanabe, Hiroyuki; and Yamanishi, Tadashi, to Mitsui Mining & Smelting Co., Ltd. Magnetite particles and process for preparing the same. 5,556,571, Cl. 252-62.560.
Hashizume, Toshiaki: *See*—
Yamamoto, Kouji; Hashizume, Toshiaki; and Kawaguchi, Hiroshi, 5,555,622, Cl. 29-890.053.
Hashizume, Yukio: *See*—
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Hassoun, Soha M. N.; and Sanders, Douglas E., to Digital Equipment Corporation. Method and apparatus for parity generation. 5,557,622, Cl. 371-49.100.
Hassut, Eliezer: *See*—
Retter, Refael; Bublil, Moshe; Shavit, Gad; Gill, Aharon; Jaliff, Ricardo; Ofir, Ram; Boner, Alon; Ilan, Oded; and Hassut, Eliezer, 5,557,538, Cl. 364-514.00A.
Hastings, Roger N.: *See*—
Hackett, Steven S.; Hastings, Roger N.; Thornton, Arnold W.; Thometz, Darlene A.; Larson, Kenneth R.; Thome, Scott P.; and Humphrey, John W., 5,555,893, Cl. 128-772.000.
Hasuda, Masanori; Katayama, Akira; Uemura, Yukio; and Goto, Tetsuro, to Nikon Corporation. Camera including shutter control and method. 5,557,359, Cl. 354-234.100.
Hatabu, Susumu: *See*—
Yamamoto, Kazuhito; Niimi, Hiroji; Yamamoto, Yoji; and Hatabu, Susumu, 5,556,675, Cl. 428-36.920.
Hatanaka, Hideharu, to Kabushiki Kaisha Toshiba. Apparatus for water supply of automatic ice making apparatus. 5,555,743, Cl. 62-347.000.
Hatano, Masaru, to Mita Industrial Co. Ltd. Sheet conveying device using sheet suction and air forced separation. 5,557,387, Cl. 355-312.000.
Hatcho, Seiji; Shimasaki, Yuichi; Aoki, Takuya; Matsumoto, Seiji; Kato, Hiroaki; Komatsuda, Takashi; Saito, Akihisa; and Oketani, Toshikazu, to Honda Giken Kogyo Kabushiki Kaisha. Capacity determining system in exhaust emission control unit for internal combustion engine. 5,555,724, Cl. 60-276.000.
Hattori, Kazuko: *See*—
Kubota, Michio; Tsusaki, Keiji; Hattori, Kazuko; and Sugimoto, Toshiyuki, 5,556,781, Cl. 435-200.000.
Haufler, Michael D., to R. E. Wright Environmental, Inc. Multiple well jet pump apparatus. 5,555,934, Cl. 166-68.000.
Hauser, Ray; Smothers, Daryl; and Schreier, John, to Hydro-Gear. Auxiliary pumps for axle driving apparatus including hydrostatic transmission. 5,555,727, Cl. 60-488.000.
Hawkins, George W.: *See*—
Adler, Steven J.; Hawkins, George W.; Lesk, Israel A.; Pegler, Peter L.; and Pirastehfar, Hassan, 5,556,793, Cl. 437-11.000.
Hawkins, Gilbert A.; and Nielsen, Robert L., to Eastman Kodak Company. Method of making a planar charge coupled device with edge aligned implants and interconnected electrodes. 5,556,801, Cl. 437-50.000.
Hayakawa, Hideyuki; Kondoh, Masuhiro; Imaeda, Makoto; Imoto, Yuzo; and Takeda, Kenji, to Nippondenso Co., Ltd. Solenoid valve with ball attracted towards seating because of negative pressure. 5,556,175, Cl. 303-119.200.
Hayakawa, Hiroshi, to Alps Electric Co., Ltd. Switching device. 5,557,080, Cl. 200-5.00R.
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Miyashita, Yoshiaki; Tabuchi, Takeshi; Yamazaki, Kouichi; Kikuchi, Nobuo; Matsumoto, Kentaro; Takahashi, Sadao; and Hayakawa, Tadashi, 5,557,373, Cl. 355-219.000.
Hayashi, Makoto; Kanno, Satoshi; and Saito, Naoto, to Hitachi, Ltd. Corrosive environment sensor, corrosive environment measuring apparatus and corrosive environment control system. 5,556,596, Cl. 422-53.000.
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Inoue, Yoshiya; Nagatsuma, Tooru; Shimada, Kazuyuki, Hayashi, Takamasa; Tomiyasu, Kunio, and Nishiwaki, Hirofumi, 5,557,707, Cl. 395-106.000.
Hayashi, Yoshiaki: *See*—
Inoue, Hiroki; Hayashi, Yoshiaki; Senba, Hideki, Ito, Keisuke, and Akita, Makoto, 5,556,456, Cl. 106-494.000.
Hayashi, Yoshinori: *See*—
Endo, Osamu; and Hayashi, Yoshinori, 5,557,448, Cl. 359-208.000.
Hayashida, Hajime; and Inoue, Satoshi, to Yamaha Corporation. Keyboard musical instrument having variable contact point between jack and regulation button. 5,557,052, Cl. 84-243.000.
Hayashida, Tadashi: *See*—
Tahara, Masaaki; Senbokuya, Haruo; Kitano, Kenzo; Hayashida, Tadashi; and Minato, Teruo, 5,556,483, Cl. 148-206.000.
Hayashimoto, Shigeo: *See*—
Suzuki, Toshiyuki; Maeda, Shigeru; Hayashimoto, Shigeo; Ogawa, Mikio; and Yoshida, Norikazu, 5,556,595, Cl. 422-32.000.
Hayenga, Jon W.: *See*—
Ortyn, William E.; Hayenga, Jon W.; and Piloco, Louis R., 5,557,097, Cl. 250-201.300.
Hayes, Donald J., to Compaq Computer Corporation. Ink jet printhead assembly having aligned dual internal channel. 5,557,309, Cl. 347-71.000.
Hayes, Orlan: *See*—
Roman, Patrick; and Hayes, Orlan, 5,556,276, Cl. 433-8.000.
Haynes, Harley: *See*—
Halperin, Jose; Brugnara, Carlo; and Haynes, Harley, 5,556,871, Cl. 514-396.000.
Haystack Labs, Inc.: *See*—
Smaha, Stephen E.; and Snapp, Steven R., 5,557,742, Cl. 395-186.000.
Hazelton, Andrew J.: *See*—
Hipwell, Roger L.; and Hazelton, Andrew J., 5,556,241, Cl. 409-131.000.
Health Sense International, Inc.: *See*—
Fisher, Larry F.; and Johnson, Oscar E., 5,557,263, Cl. 340-605.000.
Healy, Donall B.: *See*—
Whitehouse, Roger; and Healy, Donall B., 5,555,660, Cl. 40-622.000.
Heberer, Daniel P.: *See*—
Amirsakis, Charles J.; Vietti, David E.; Heberer, Daniel P.; Dolmon, Louis C.; and Picchiotti, Lawrence, 5,556,698, Cl. 428-323.000.
Hector, Richard: *See*—
Truong, Thien V.; Bierer, Donald E.; Dener, Jeffrey M.; Hector, Richard; Tempesta, Michael S.; Loev, Bernard; Yang, Wu; and Koreeda, Masato, 5,556,875, Cl. 514-436.000.
Hedrick, James L., Jr.: *See*—
Afzali-Ardakani, Ali; Ayala-Esquilin, Juan; Braren, Bodil E.; Daijavad, Shahrokh; Foster, Elizabeth; Hedrick, James L., Jr.; Hedrick, Jeffrey C.; Hodgson, Rodney T.; Mehta, Ashit A.; Molis, Steven E.; Shaw, Jane M.; Tisdale, Stephen L.; and Viehbeck, Alfred, 5,556,899, Cl. 523-215.000.
Hedrick, Jeffrey C.: *See*—
Afzali-Ardakani, Ali; Ayala-Esquilin, Juan; Braren, Bodil E.; Daijavad, Shahrokh; Foster, Elizabeth; Hedrick, James L., Jr.; Hedrick, Jeffrey C.; Hodgson, Rodney T.; Mehta, Ashit A.; Molis, Steven E.; Shaw, Jane M.; Tisdale, Stephen L.; and Viehbeck, Alfred, 5,556,899, Cl. 523-215.000.
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Cappa, Armando M.; and Heer, Warren R., 5,557,210, Cl. 324-539.000.
Hegemann, Kenneth J.; and Stern, Max M., to Stern, Max M. Officiating communication device. 5,557,253, Cl. 340-321.000.
Heidelberg Harris S.A.: *See*—
Pollet, Alphonse, 5,555,807, Cl. 101-415.100.
Heidelberger Druckmaschinen AG: *See*—
Miltner, Karl-Hermann, 5,555,808, Cl. 101-425.000.
Pollet, Alphonse, 5,555,807, Cl. 101-415.100.
Heidjann, Franz: *See*—
Tophinke, Franz; Stovesand, Josef; Heidjann, Franz, and Dammann, Johannes, 5,556,337, Cl. 460-70.000.
Heikes, Craig A.: *See*—
Miller, Robert H., Jr.; and Heikes, Craig A., 5,557,620, Cl. 371-22.500.
Heikkila, Ilkka; Jokinen, Harri; and Ranta, Jukka, to Nokia Mobile Phones Ltd. Enhanced decoder for a radio telephone. 5,557,639, Cl. 375-224.000.
Heim, David E.: *See*—
Gill, Hardaval S.; and Heim, David E., 5,557,492, Cl. 360-113.000.
Heine, Daniel M. Cargo loading and unloading system for use with utility vehicle having bed. 5,556,249, Cl. 414-500.000.
Heinen, Stefan: *See*—
Scheckel, Bruno; Heinen, Stefan; Wilwert, Jean, and Herrmann, Helmut, 5,557,649, Cl. 377-48.000.
Heinrich Baumgarten KG Spezialfabrik fuer Beschlagteile: *See*—
Baumgarten, Gerd-Diethard, 5,555,604, Cl. 16-114.00A.
Heisel, Steven K.: *See*—
Clark, George A., Heisel, Steven K.; Johnson, Arlen L.; Robinson, Chris; and Dana, Mark K., 5,556,416, Cl. 606-205.000
HEK Manufacturing B.V.: *See*—
van Mol, Johannes C. E.; Ockhuizen, Johannes B. M.; and Smits, Antonius H. J., 5,555,952, Cl. 182-18.000.
Helene Curtis, Inc.: *See*—
Janchitraponvej, Ben; Brown, William J.; and Lee, Patricia, 5,556,615, Cl. 424-70.110.
Janchitraponvej, Ben; and Brown, William, 5,556,616, Cl. 424-70.122.
Helgesson, Alan: *See*—
Moorhouse, Abigail A.; Fairley, Christopher R.; Rigg, Phillip R.; and Helgesson, Alan, 5,557,113, Cl. 250-559.380.
Helin, Arto A.; and Mattila, Teuvo A. Safety mask. 5,555,879, Cl. 128-201.240.
Hellman, Lars, to Ipaco B.V. Cover belt for a duct. 5,556,680, Cl. 428-56.000.
Helsley, Grover C.: *See*—
Sirupcezewski, Joseph T.; Helsley, Grover C.; Glamkowski, Edward J.; Chiang, Yulin; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., 5,556,858, Cl. 514-254.000.
Henderson, Gary R. Portable scaffolding attachment for front end loader or forklift. 5,555,953, Cl. 182-141.000.
Hendrix, Jan A. J.: *See*—
Halderit, Antoon H. T.; Booij, Martin; Hendrix, Jan A. J.; and Frentzen, Yvonne H., 5,556,890, Cl. 521-49.800.
Henin, Eva: *See*—
Townsley, David B.; Gong, Andrew; and Henin, Eva, 5,557,738, Cl. 395-182.120.
Henkel Corporation: *See*—
McCurry, Patrick M., Jr.; and Varvil, Janet R., 5,556,950, Cl. 536-4.100.
O'Brien, William L.; and Kilharger, Alan C., 5,556,557, Cl. 210-787.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Skodell, Birgit; Osberghaus, Rainer; Rogmann, Karl-Heinz; Faubel, Heiko; and Bossek, Harald, 5,556,450, Cl. 106-10.000.
Weuthen, Manfred; Engels, Thomas; Hensen, Herman; Tesmann, Holger; and Nickel, Dieter, 5,556,573, Cl. 510-535.000.
Henny Penny Corporation: *See*—
Landwehr, Tim A.; Mercer, Gary L.; and Miklos, Joseph P., 5,556,567, Cl. 219-779.000.
Henry, Michael F.: *See*—
Blankenship, Charles P., Jr.; Yoon, Duk N.; Henry, Michael F.; and Benz, Mark G., 5,556,484, Cl. 148-211.000.
Henseler, Klaus, to Voith Sulzer Papiermaschinen GmbH. Winder for winding a traveling paper web. 5,556,053, Cl. 242-541.600.
Hensen, Herman: *See*—
Weuthen, Manfred; Engels, Thomas; Hensen, Herman; Tesmann, Holger; and Nickel, Dieter, 5,556,573, Cl. 510-535.000.
Henson, Hershel R.: *See*—
Amick, Darryl; McDowell, Gary; Henson, Hershel R.; and Wille, Jerald, 5,555,799, Cl. 100-930.0RP.
Herbert, Raymond J., to Neopost Ltd. Method and apparatus for outputting a binary bit data message from bytes representing strings of contiguous bits of equal value. 5,557,708, Cl. 395-108.000.
Herberts GmbH: *See*—
Brock, Thomas; and Wandelmaier, Klaus, 5,556,912, Cl. 524-507.000.
Hercules Incorporated: *See*—
Ewall, Ralph, 5,556,375, Cl. 602-58.000.
Sibal, Shiv, 5,556,589, Cl. 264-172.120.
Hermann, George D.: *See*—
Mollensauer, Kenneth H.; Hermann, George D.; Howell, Thomas A.; and Monfort, Michelle Y., 5,556,387, Cl. 604-249.000.
Hermann, Mark D. Frames having lighting to illuminate glass etchings. 5,555,654, Cl. 40-714.000.
Hermes Fabrik pharmazeutischer Praparate: *See*—
Biesalski, Hans K., 5,556,611, Cl. 424-46.000.
Herrmann, Helmut: *See*—
Scheckel, Bruno; Heinen, Stefan; Wilwert, Jean; and Herrmann, Helmut, 5,557,649, Cl. 377-48.000.
Herrmann, John E.; and Blacklow, Neil R., to University of Massachusetts Medical Center. Antibodies specific for the group antigen of astroviruses. 5,556,746, Cl. 435-5.000.
Herron, Norman; and Wang, Ying, to Du Pont de Nemours, E. I., and Company. X-ray photoconductive compositions for x-ray radiography. 5,556,716, Cl. 428-688.000.
Hettich, Gerhard: *See*—
Genzel, Michael; Hettich, Gerhard; and Ramm, Norbert, 5,556,346, Cl. 474-28.000.
Hetzl, Ernst: *See*—
Linnau, Yendra; and Hetzl, Ernst, 5,556,766, Cl. 435-68.100.
Hewlett-Packard Company: *See*—
Calamvokis, Costas; and Banks, David, 5,557,610, Cl. 370-60.100.
Crook, David T.; Keirn, Kevin W.; and Cilingiroglu, Ugur, 5,557,209, Cl. 324-537.000.
Loewen, Victor D.; Camis, Thomas; and Lindblom, Kenneth A., 5,557,377, Cl. 355-256.000.
Malzbender, Thomas, 5,557,711, Cl. 395-122.000.
Miller, Robert H., Jr.; and Heikes, Craig A., 5,557,620, Cl. 371-22.500.
Nguyen, Khe C., 5,556,730, Cl. 430-66.000.
Phaal, Peter, 5,557,547, Cl. 364-551.010.
Sorin, Wayne V.; and Baney, Douglas M., 5,557,400, Cl. 356-73.100.
Spencer, Thomas V., 5,557,756, Cl. 395-299.000.
Stephens, Fred O.; Bloom, Devin A.; Eland, Michael P.; Standiford, Gregory A.; and Dory, Jon R., 5,557,485, Cl. 360-96.500.
Hewson, Carl E.: *See*—
Hewson, Roy; Hewson, J. Richard; and Hewson, Carl E., 5,556,425, Cl. 607-124.000.
Hewson, J. Richard: *See*—
Hewson, Roy; Hewson, J. Richard; and Hewson, Carl E., 5,556,425, Cl. 607-124.000.
Hewson, Roy; Hewson, J. Richard; and Hewson, Carl E., to Brunswick Biomedical Technologies, Inc. Esophageal/stomach placement electrode. 5,556,425, Cl. 607-124.000.
Heyco Stamped Products, Inc.: *See*—
Brown, Donald C.; Dwarica, N. Steven; and Hickey, Suzanne V., 5,556,308, Cl. 439-746.000.
Heyne, Joachim: *See*—
Mueller, Gunther; Fink, Herbert; and Heyne, Joachim, 5,556,922, Cl. 525-260.000.
Heyring, Christopher B., to Kinetic Limited. Vehicle suspension systems. 5,556,115, Cl. 280-6.120.
Hi-Tech Industries Limited: *See*—
Chu, Cornel, 5,555,606, Cl. 24-67.900.
Hickey, Suzanne V.: *See*—
Brown, Donald C.; Dwarica, N. Steven; and Hickey, Suzanne V., 5,556,308, Cl. 439-746.000.
Hickman, Steven L.: *See*—
Bowen, Douglas M.; Gray, Clint D.; Campbell, Douglas E.; Collier, David; Hickman, Steven L.; Hole, Norman J.; Kessens, Norman J.; Webster, Gary D.; Walker, John H.; and Walters, Daniel L., 5,555,853, Cl. 123-2.000.
Hicks, Allen J., to Quinton Instrument Company. Catheter with oval or elliptical lumens. 5,556,390, Cl. 604-280.000.
Hicok, Gary D.; and Lehman, Judson A., to VLSI Technology, Inc. Caching FIFO and method therefor. 5,557,733, Cl. 395-162.000.
Hidaka, Shigeyuki: *See*—
Kimura, Kazuya; Hidaka, Shigeyuki; and Kondo, Yoshitami, 5,556,261, Cl. 417-269.000.
Hidaka, Takayoshi: *See*—
Yano, Yoshiaki; Takeo, Kazuyuki; and Hidaka, Takayoshi, 5,556,636, Cl. 424-448.000.
Hidding, Gerhard: *See*—
Gombault, Jacobus F.; and Hidding, Gerhard, 5,555,703, Cl. 53-411.000.
Hideyuki, Usui: *See*—
Yoshiharu, Uchiyama; Takeshi, Asano; Kaoru, Fukuda; Kazuhiko, Maeda; and Hideyuki, Usui, 5,557,562, Cl. 364-708.100.
Higashi, Taketoshi: *See*—
Fukuda, Yuzuru; Ohta, Tsuyoshi; Ono, Masato; Higashi, Taketoshi; and Yagi, Shigeru, 5,556,729, Cl. 430-65.000.
Higashino, Takayoshi: *See*—
Harada, Yasoo; Matsushita, Shigeharu; Terada, Satoshi; Fujii, Emi; Kurose, Takashi; Higashino, Takayoshi; Yamada, Takashi; Nagamatsu, Akihito; Inoue, Daijirou; and Matsumura, Kouji, 5,557,141, Cl. 257-631.000.
Higuchi, Hiroshi; Yamagishi, Hisashi; Egashira, Yoshinori; and Yamada, Tadatoshi, to Bridgestone Sports Co., Ltd. Three-piece solid golf ball. 5,556,098, Cl. 473-373.000.
Hikosaka, Atsushi: *See*—
Akachi, Keiji; and Hikosaka, Atsushi, 5,556,672, Cl. 428-33.000.
Hikosaka, Michichika: *See*—
Kimura, Shuuichi; Hikosaka, Michichika; Shirao, Masami; Mochizuki, Akimitsu; and Tsuchida, Junichi, 5,556,966, Cl. 540-140.000.
Hilgers, James J.: *See*—
Yawata, Haruyasu (Harry); and Hilgers, James J., 5,556,277, Cl. 433-17.000.
Hill, Calvin G.: *See*—
Drummond, Michael T.; Suski, William C.; Hill, Calvin G.; Lowry, James W.; and Roberts, Rodney W., 5,556,365, Cl. 493-299.000.
Hill, Derek A.; and Turner, Geoffrey L., to Glaxo Wellcome Inc. Neuromuscular blocking agents. 5,556,978, Cl. 546-140.000.
Hill, John D. Blood vessel occlusion trocar. 5,556,412, Cl. 606-194.000.
Hill, Nathanael: *See*—
Hagquist, James A. E.; Reid, Kevin J.; Giorgini, Albert; and Hill, Nathanael, 5,556,934, Cl. 528-85.000.
Hill, Robert A., to Ford Motor Company. Windshield assembly system. 5,556,505, Cl. 156-570.000.
Hill, Ruth B.: *See*—
Sugasawara, Renee J.; and Hill, Ruth B., 5,556,770, Cl. 435-70.100.
Hine, Nathan P.; and Gailus, David W., to Spectra, Inc. Ink jet purging arrangement. 5,557,305, Cl. 347-17.000.
Hines, Charles L., III: *See*—
Normann, Linda M.; Hines, Charles L., III; and Cox, Gene M., 5,557,537, Cl. 364-512.000.
Hines, William L.: *See*—
Fehringer, Robert; Hines, William L.; Qutub, Motaz; Emigh, Jonathan D.; Preston, Charles E.; Leitner, Robert; and Smart, David, 5,555,701, Cl. 53-75.000.
Hinkie, Ronald L.: *See*—
Schultz, Roger L.; Beck, H. Kent; Ringgenberg, Paul D.; and Hinkie, Ronald L., 5,555,945, Cl. 175-50.000.
Hinosawa, Shinji: *See*—
Oku, Yasunori; Anzawa, Teruaki; Ogawa, Tsutomu; and Hinosawa, Shinji, 5,556,133, Cl. 280-781.000.
Hinterlechner, Gerhard, to Micron Technology, Inc. Device for overload protection and braking of a machine part driven by a motor. 5,555,962, Cl. 192-12.00R.
Hinuma, Shuji: *See*—
Fujisawa, Yukio; Hinuma, Shuji; and Aono, Aki, 5,556,946, Cl. 530-351.000.
Hipwell, Roger L.; and Hazelton, Andrew J. Quick stop device. 5,556,241, Cl. 409-131.000.
Hirabayashi, Hiromitsu: *See*—
Kurata, Mitsuru; Ebata, Tokihide; Koitabashi, Noribumi; Hirabayashi, Hiromitsu; Sugimoto, Hitoshi; and Uchida, Haruo, 5,557,310, Cl. 347-87.000.
Hirai, Isamu; and Tsuji, Hideaki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Strobe control device for camera. 5,557,366, Cl. 354-416.000.
Hirai, Takami: *See*—
Yano, Shinsuke; Yamaguchi, Hirofumi; and Hirai, Takami, 5,556,585, Cl. 264-56.000.
Hirai, Yasuo: *See*—
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Hiraishi, Kenji; Saeki, Shingo; Yamazaki, Kazuyuki; and Nakajima, Takao, to Tochigi Fuji Sangyo Kabushiki Kaisha. Differential apparatus. 5,556,351, Cl. 475-160.000.
Hirakawa, Akira: *See*—
Okamoto, Yoshihiko; Yoda, Haruo; Takada, Ikuo; Shibata, Yukinobu; Hirakawa, Akira; Saitou, Norio; Okazaki, Shinji; and Murai, Fumio, 5,557,314, Cl. 347-230.000.
Hiramatsu, Osamu: *See*—
Takenaka, Kenji; Kayukawa, Hiroaki; Ito, Masafumi; Hiramatsu, Osamu; Hirota, Suguru; and Ozeki, Taro, 5,556,260, Cl. 417-269.000.
Hirano, Akihiko, to Hoshizaki Denki Kabushiki Kaisha. Refrigerant circuit for ice making machines etc., 5,555,744, Cl. 62-352.000.

Hirano, Kazuo: *See*—
Miura, Yuichiro; Hirano, Kazuo; Nate, Takayuki; Kambayashi, Taiji; Koike, Masahiro; Takahashi, Fuminobu; Inoue, Hideki; Musha, Yosinori; Kamimoto, Shuuji; Naito, Shinji; and Sasaki, Tsukasa,

Afzali-Ardakani, Ali; Ayala-Esquilin, Juan; Braren, Bodil E.; Daijavad, Shahrokh; Foster, Elizabeth; Hedrick, James L., Jr.; Hedrick, Jeffrey
Holwerda, Matthew J., to Cascade Engineering, Inc. Acoustical barrier. 5,557,078, Cl. 181-208.000.

Hirano, Kazuo: *See*—
Miura, Yuichiro; Hirano, Kazuo; Nate, Takayuki; Kambayashi, Taiji; Ohtsuka, Masahisa; and Nagai, Toshitake, 5,556,671, Cl. 428-15.000.
Hirano, Michio: *See*—
Hirosawa, Toshio; Itoh, Tsutomu; Kokunishi, Motohide; Ueoka, Atsushi; Ichikawa, Yoshikazu; Fujita, Fujio; Yamagishi, Tadashi; Ishimaru, Masahiko; Namba, Hideki; Sasaki, Shigeru; Hirano, Michio; Kozuma, Kaoru; and Nakamura, Kazuyuki, 5,557,736, Cl. 395-182.020.
Hirayama, Yoshiyuki: *See*—
Sato, Teruhiro; Wada, Tomio; and Hirayama, Yoshiyuki, 5,557,508, Cl. 361-818.000.
Hiroi, Masakazu; and Takehara, Yoshifumi, to Canon Kabushiki Kaisha. Sheet finisher. 5,556,251, Cl. 414-790.300.
Hironaka, Kazutoshi: *See*—
Uchimura, Mitsuo; Shinde, Tsukasa; Hironaka, Kazutoshi; Takahashi, Hiroyshi; and Nanba, Akihiko, 5,555,926, Cl. 164-468.000.
Hirooka, Tsuguyoshi; Miyazawa, Shoichi; Horita, Ryutaro; Takashi, Terumi; and Uragami, Akira, to Hitachi, Ltd. Ad converter and magnetic recording/regenerating apparatus using the same. 5,557,274, Cl. 341-155.000.
Hirosawa, Toshio; Itoh, Tsutomu; Kokunishi, Motohide; Ueoka, Atsushi; Ichikawa, Yoshikazu; Fujita, Fujio; Yamagishi, Tadashi; Ishimaru, Masahiko; Namba, Hideki; Sasaki, Shigeru; Hirano, Michio; Kozuma, Kaoru; and Nakamura, Kazuyuki, to Hitachi Electronics Services Co., Ltd.; Hitachi, Ltd.; and Hitachi Software Engineering Co., Ltd. Computer system and job transfer method using electronic mail system. 5,557,736, Cl. 395-182.020.
Hirose, Chisai: *See*—
Kanamori, Hiroo; Urano, Akira; Aikawa, Haruhiko; Ishikawa, Shinji; Hirose, Chisai; and Saito, Masahide, 5,556,442, Cl. 65-17.400.
Hirose, Taro; Kisida, Hirosi; Saito, Shigeru; and Fujimoto, Hiroaki, to Sumitomo Chemical Company, Limited. Oxazoline derivative, its production and its use. 5,556,867, Cl. 514-340.000.
Hirose, Yoshitsugu, to Fuji Xerox Co., Ltd. Image signal processing apparatus. 5,557,429, Cl. 358-532.000.
Hirota, Suguru: *See*—
Takenaka, Kenji; Kayukawa, Hiroaki; Ito, Masafumi; Hiramatsu, Osamu; Hirota, Suguru; and Ozeki, Taro, 5,556,260, Cl. 417-269.000.
Hirschmann, Axel: *See*—
Zahn, Wolfgang; Loose, Gunter; and Hirschmann, Axel, 5,556,604, Cl. 423-213.700.
Hirt, Alfred; Nüssel, Barbara; and Weiss, Robert, to MAN Roland Druckmaschinen AG. Erasable printing form. 5,555,809, Cl. 101-451.000.
Hisadomi, Kenji: *See*—
Miyashita, Akimi; Fujii, Mutsumasa; and Hisadomi, Kenji, 5,555,798, Cl. 100-93.00P.
Hitachi America, Ltd.: *See*—
Scarpa, Carl G., 5,557,337, Cl. 348-558.000.
Hitachi Building Systems Engineering & Service Co, Ltd.: *See*—
Fukai, Hisanori; Yamazaki, Hiroshi; Kawano, Kenji; Kawano, Shinichiro; and Otamoto, Hajime, 5,557,546, Cl. 364-551.010.
Hitachi Chemical Research Center, Inc.: *See*—
Mitsuhashi, Masato; Cooper, Allan J.; Waterman, Michael S.; and Pevzner, Pavel A., 5,556,749, Cl. 435-6.000.
Hitachi Denshi Kabushiki Kaisha: *See*—
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Hitachi Electronics Engineering Co., Ltd.: *See*—
Kawaguchi, Hiroshi; Nakakita, Takashi; and Homma, Shinji, 5,557,554, Cl. 364-571.010.
Nemoto, Ryozi, 5,556,529, Cl. 204-612.000.
Hitachi Electronics Services Co., Ltd.: *See*—
Hirosawa, Toshio; Itoh, Tsutomu; Kokunishi, Motohide; Ueoka, Atsushi; Ichikawa, Yoshikazu; Fujita, Fujio; Yamagishi, Tadashi; Ishimaru, Masahiko; Namba, Hideki; Sasaki, Shigeru; Hirano, Michio; Kozuma, Kaoru; and Nakamura, Kazuyuki, 5,557,736, Cl. 395-182.020.
Hitachi Keiyo Engineering Co., Ltd.: *See*—
Shimabukuro, Jun; Nagamatsu, Yuji; Ikeuchi, Yoshimi; and Kondo, Kazuyuki, 5,557,774, Cl. 395-500.000.
Hitachi Koki Co., Ltd.: *See*—
Meguro, Yuuji; Yokokawa, Shuho; Nakajima, Isao; Onose, Tsukasa; and Ueno, Hiroshi, 5,557,386, Cl. 355-298.000.
Hitachi, Ltd.: *See*—
Akagi, Kyo; Kato, Yasuhiro; Matsumoto, Masaaki; Iida, Akira; and Kim, Yong-kweon, 5,557,486, Cl. 360-97.010.
Asano, Seiji, 5,555,870, Cl. 123-480.000.
Eto, Masahiro; Urata, Hiroyuki; Inoue, Fumio; Ogino, Masanori; Maruyama, Atsushi; and Yamamoto, Kiyoshi, 5,557,342, Cl. 348-706.000.
Fukuyama, Ryooji; Nawata, Makoto; Kakehi, Yutaka; Kawahara, Hironobu; Sato, Yoshiaki; Torii, Yoshimi; Kawaraya, Akira; and Sato, Yoshie, 5,556,714, Cl. 428-620.000.
Hayashi, Makoto; Kanno, Satoshi; and Saito, Naoto, 5,556,596, Cl. 422-53.000.
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Kuwabara, Takashi, 5,557,644, Cl. 375-340.000.
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Matsui, Shigeru; and Owada, Akira, 5,557,404, Cl. 356-319.000.
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Naito, Shotaro; Obara, Sanshiro; and Mutoh, Nobuyoshi, 5,557,181, Cl. 318-376.000.
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Nishii, Osamu; Inagawa, Takashi; Hanawa, Makoto; and Takeda, Hiroshi, 5,557,760, Cl. 395-310.000.
Numaga, Shigeki; Sukegawa, Shunichi; Inui, Takashi; Suzuki, Yukihide; and Nakai, Kiyoshi, 5,557,580, Cl. 365-230.060.
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Boberski, Cornelia; Krüner, Hartmut; Riedel, Günter; and Hamminger, Rainer, 5,556,815, Cl. 501-97.000.
Defossa, Elisabeth; Fischer, Gerd; Jendralla, Joachim-Heiner; Lattrell, Rudolf; Wollmann, Theodor; and Isert, Dieter, 5,556,850, Cl. 514-202.000.
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Koch, Hermann; and Loos, Hans-Joachim, 5,555,988, Cl. 215-249.000.
Semler, Günther; and Meier, Michael, 5,557,005, Cl. 560-47.000.
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Holt, Mark S.: *See*—
Stevenson, Tyler A.; Ravichandran, Ramanathan; Holt, Mark S.; Phan, Thuy N.; Birbaum, Jean-Luc; and Toan, Vien V., 5,556,973, Cl. 544-216.000.
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Igarashi, Kazuo; Takano, Kengo; Morita, Toshiharu; Saito, Hiroaki; Hashizume, Yukio; Suzuki, Tokio; Tashiro, Hirohisa; Muramoto, Mituru; and Sato, Katsunori, 5,556,527, Cl. 204-488.000.
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Oku, Yasunori; Anzawa, Teruaki; Ogawa, Tsutomu; and Hinosawa, Shinji, 5,556,133, Cl. 280-781.000.
Sakakida, Akihiro; Ohara, Hideo; Miyake, Hiroyuki; and Kaneshima, Kazunari, 5,556,034, Cl. 239-417.300.
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Shah, Dipak J., 5,555,927, Cl. 165-239.000.
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Honma, Souichi, to Kabushiki Kaisha Kenwood. Multipath eliminating filter. 5,557,646, Cl. 375-346.000.
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Nugent, Steven F., 5,557,075, Cl. 174-254.000.
Sampat, Ketan; and Kembel, John, 5,557,724, Cl. 395-157.000.

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Hall, Larry D.; and Betz, Todd J., 5,557,089, Cl. 235-440.000.

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Mellen, Craig R., 5,556,548, Cl. 210-806.000.

Intermec Corporation: *See*—
Ackley, Sprague; and Choi, Stephen, 5,557,092, Cl. 235-462.000.

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International Business Machines: *See*—
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Amdursky, Vardy; Efrat, Ilan; and Shlafman, Shlomo, 5,557,710, Cl. 395-119.000.
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Bakeman, Paul E., Jr.; Chen, Bomy A.; Cronin, John E.; Holmes, Steven J.; and Wong, Hing, 5,556,802, Cl. 437-52.000.
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Bates, Randall M.; Glaess, David F.; Larson, Thomas S.; and Wadkins, Patricia J., 5,557,183, Cl. 318-434.000.
Bhide, Anupam K.; and Dias, Daniel M., 5,557,770, Cl. 395-488.000.
Bingham, Ronald E.; Dockter, Michael J.; Farber, Joel F.; and Seppi, Kevin D., 5,557,790, Cl. 395-600.000.
Bland, Patrick M.; Hofmann, Richard G.; Katz, Sagi; Moeller, Dennis; and Venarchick, Lance M., 5,557,758, Cl. 395-308.000.

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Chen, David D.; Eisenbies, John L.; McKenzie, William F., Jr.; and Temoshenko, Leo, 5,557,746, Cl. 395-200.060.

Cheng, Josephine M.; Mohan, Chandrasekaran; and Pirahesh, Mir H., 5,557,791, Cl. 395-600.000.

Christensen, Thomas C.; and Cunningham, Earl A., 5,557,482, Cl. 360-53.000.

Craft, David J., 5,557,551, Cl. 364-557.000.

Crump, Dwayne T.; and Pancoast, Steve T., 5,557,759, Cl. 395-309.000.

Dayan, Richard A.; Dombrowski, Chris; and Mascaro, James F., 5,557,784, Cl. 395-550.000.

Garrett, Michael J.; Key, Andrew; and Morse, Kenneth, 5,557,728, Cl. 395-157.000.

Gazza, Jack M., 5,555,776, Cl. 74-567.000.

Gill, Hardayal S.; and Werner, Douglas J., 5,557,491, Cl. 360-113.000.

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Kato, Naotaka; and Katoh, Katsutoshi, 5,557,288, Cl. 343-702.000.

Leas, James M.; and Mandelman, Jack A., 5,557,114, Cl. 257-59.000.

Li, Shih-Gong; and Wang, John S., 5,557,731, Cl. 395-161.000.

Morrison, Charles B., 5,556,795, Cl. 437-23.000.

Olson, David C.; and Phillips, Robert, III, 5,556,024, Cl. 228-264.000.

Rapoport, Stuart, 5,557,619, Cl. 371-22.500.

Riggio, Salvatore R., Jr., 5,557,272, Cl. 341-100.000.

Shedletsky, John J., 5,557,775, Cl. 395-500.000.

Sone, Hironao; Sekiya, Kazuo; Ishikawa, Hiroshi; and Kanada, Yoshihisa, 5,557,754, Cl. 395-287.000.

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Yuan, Chi-Min, 5,556,726, Cl. 430-30.000.

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Pillot, Bernard, 5,556,121, Cl. 280-304.100.

International Rectifier Corporation: *See*—
Ajit, Janardhanan S.; and Kinzer, Daniel M., 5,557,127, Cl. 257-339.000.

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Bidnyy, Sergei V.; Zavadtsev, Alexander A.; Mirochnik, Emmanuel A.; Mishchenko, Alexander V.; Pirozhenko, Vitaly M.; and Radchenko, Igor V., 5,557,109, Cl. 250-455.110.

Interventional Technologies Inc.: *See*—
Farhat, Lawrence, 5,556,408, Cl. 606-180.000.
Lary, Banning G., 5,556,405, Cl. 606-159.000.

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Rivas, Hercilio; Acevedo, Socrates; and Gutierrez, Xiomara, 5,556,574, Cl. 252-311.500.

Inui, Takashi: *See*—
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Inukai, Yoshihiko: *See*—
Watanabe, Atsushi; Kamiya, Hitoshi; Nakada, Eiji; Mizuno, Tomoaki; Kago, Yoshiyuki; Murase, Tokutaro; and Inukai, Yoshihiko, 5,557,096, Cl. 235-492.000.

Ioco, Frank, to Alarm Device Manufacturing Co. Rodent discriminator lens. 5,557,106, Cl. 250-353.000.

Iowa State University Research Foundation, Inc.: *See*—
Fehr, Walter R.; and Hammond, Earl G., 5,557,037, Cl. 800-200.000.

Ip, Joseph, to JDS Fitel Inc. Chromatic dispersion compensation device. 5,557,468, Cl. 359-615.000.

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Hellman, Lars, 5,556,680, Cl. 428-56.000.

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Kuo, Ping-jung, 5,557,173, Cl. 315-158.000.

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Irmen, Wolfgang; and Kohlen, Helmut, to W. Schlafhorst AG & Co. Apparatus for prepositioning a yarn end on spinning cops for subsequent unwinding in a bobbin winding machine. 5,556,046, Cl. 242-18.00R.

Irrera, Fernanda: *See*—
de Cesare, Giampiero; Irrera, Fernanda; and Palma, Fabrizio, 5,557,133, Cl. 257-440.000.

Isaac, George L.; Miller, Donald C.; and Ziegenhagen, Rodney S., II. Semiconductor test socket and contacts. 5,557,212, Cl. 324-755.000.

Isaacs, Phillip; and Swain, Miles, to International Business Machines Corporation. Circuit card having a large module strain relief and heat sink support. 5,557,503, Cl. 361-719.000.

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Carroll, Peter G.; Isaacs, Stephen T.; and Cimino, George D., 5,556,958, Cl. 536-25.300.
Wollowitz, Susan; Isaacs, Stephen T.; Rapoport, Henry; Spielmann, Hans P.; and Nerio, Aileen, 5,556,993, Cl. 549-282.000.

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Isco, Inc.: *See*—
Nabity, Frederick A.; Fritz, Larry L.; and Carson, Douglas T., 5,557,536, Cl. 364-510.000.

Ise, Michihito: *See*—
Uehara, Yasuo; and Ise, Michihito, 5,556,622, Cl. 424-125.000.

Isegawa, Hiroyuki: *See*—
Komine, Kenji; Ikeda, Wataru; Egawa, Mamoru; Shinosawa, Kastuhiro; Isegawa, Hiroyuki; Honaga, Kazuo; Abe, Yutaka; Kameda, Tsuneji; and Sato, Shinobu, 5,556,270, Cl. 418-179.000.

Isemura, Keizo; Yoshihara, Kunio; Ichikawa, Hiroyuki; Sakai, Masanori; Tanabe, Masatoshi; Nimura, Mitsuo; Funamizu, Yoshihiro; and Kishimoto, Hirohiko, to Canon Kabushiki Kaisha. Image processing apparatus generating patterns for colors based on a set relation between colors and patterns and synthesizing patterns with extracted monochromatic information. 5,557,430, Cl. 358-501.000.

Isern-Flecha, Ileana; Swirbel, Thomas J.; Pennisi, Robert W.; Ross, Danny E.; Naujoks, Adolph; and Alarcon, Angelita, to Motorola, Inc. Conformal shield and method for forming same. 5,557,064, Cl. 174-35.0MS.

Isert, Dieter: *See*—
Defossa, Elisabeth; Fischer, Gerd; Jendralla, Joachim-Heiner; Lattrell, Rudolf; Wollmann, Theodor; and Isert, Dieter, 5,556,850, Cl. 514-202.000.

Ishibashi, Susumu: *See*—
Nakamura, Hiroshi; Muranaka, Yasuaki; Ishibashi, Susumu; and Kihara, Toshiyuki, 5,557,443, Cl. 359-142.000.

Ishibashi, Tadao: *See*—
Matsuoka, Yutaka; Sano, Eiichi; Kurishima, Kenji; Nakajima, Hiroki; and Ishibashi, Tadao, 5,557,117, Cl. 257-184.000.

Ishibe, Nobuyuki: *See*—
Darst, Kevin P.; Ezzell, Bobby R.; and Ishibe, Nobuyuki, 5,557,010, Cl. 562-851.000.

Ishida, Kazuhito: *See*—
Endo, Yoshinori; and Ishida, Kazuhito, 5,557,368, Cl. 355-203.000.

Ishida, Ken; and Iijima, Yaichi, to Konica Corporation. Lens-fitted photographic film unit. 5,557,356, Cl. 354-149.110.

Ishida, Toru: *See*—
Taketa, Tsuyoshi; Ishida, Toru; and Kishimoto, Yasushi, 5,557,245, Cl. 333-116.000.

Ishida, Toshio: *See*—
Usuki, Kazuyuki; Ishida, Toshio; and Yasunaga, Tadashi, 5,556,707, Cl. 428-421.000.

Ishihama, Keiko; Fukuda, Tokuya; Senuma, Toshitaka; and Shiono, Toru, to Sony Corporation. Video camera having an improved zoom system. 5,557,328, Cl. 348-358.000.

Ishihama, Yasuyuki: *See*—
Suzuki, Mamoru; Iijima, Minoru; Ishihama, Yasuyuki; and Fujiwara, Nobuhiro, 5,557,189, Cl. 320-18.000.

Ishihara, Jinsei; and Sakai, Shuuichi, to Murata Manufacturing Co., Ltd. Half wavelengh and quarter wavelength dielectric resonators coupled through side surfaces. 5,557,246, Cl. 333-206.000.

Ishihara, Jun: *See*—
Mukai, Hiromu; Maeda, Yasuo; Ohmori, Shigeto; and Ishihara, Jun, 5,557,358, Cl. 354-219.000.

Ishihara, Noboru, to Nippon Telegraph and Telephone Corporation. Phase lock loop circuit using a sample and hold switch circuit. 5,557,648, Cl. 375-376.000.

Ishiharada, Minoru: *See*—
Yoshikawa, Masato; Ishiharada, Minoru; Tanuma, Itsuo; Naito, Kazuo; Sugimachi, Masato; and Sugiyama, Hideo, 5,557,702, Cl. 385-143.000.

Ishii, Koichiro, to Nikon Corporation. Drive for an optical information recording medium. 5,557,595, Cl. 369-77.100.

Ishii, Mikio, to Sony Corporation. Multi-loop testing apparatus with means for adjusting a reproduced video signal. 5,557,417, Cl. 358-310.000.

Ishii, Satoshi: *See*—
Ishizuka, Koh; Ishii, Satoshi; and Kaneda, Yasushi, 5,557,396, Cl. 356-28.500.

Ishii, Shigeru; Shinso, Yoshihide; Jozaki, Takeki; Shimanaka, Shigeki; Kurokawa, Shuji; and Yamamoto, Hideharu, to Nissan Motor Co., Ltd. Shift control apparatus for automatic transmission. 5,556,349, Cl. 477-76.000.

Ishii, Takashi; and Nagano, Toru, to Yazaki Corporation. Protective cover for connector. 5,556,288, Cl. 439-135.000.

Ishii, Yoshio: *See*—
Suga, Yoichi; Ishii, Yoshio; and Morigaki, Masakazu, 5,556,741, Cl. 430-569.000.

Ishikawa, Hiroshi: *See*—

Sone, Hironao; Sekiya, Kazuo; Ishikawa, Hiroshi; and Kanada, Yoshihisa, 5,557,754, Cl. 395-287.000.

Ishikawa, Kaneyasu; Mitsuura, Fumio; and Masuyama, Fujimitsu, to Mitsubishi Jukogyo Kabushiki Kaisha. Method of forming a weld joint of austenitic stainless steel/ferritic steel. 5,556,561, Cl. 219-137.0WM.

Ishikawa, Kimitada: *See*—
Ishikawa, Minoru; and Ishikawa, Kimitada, 5,557,494, Cl. 361-152.000.

Ishikawa, Makoto: *See*—
Miyakawa, Tsutomu; Nishihara, Hideki; Kuga, Takaaki; Shinohara, Kazunori; and Ishikawa, Makoto, 5,555,864, Cl. 123-179.280.

Ishikawa, Minoru; and Ishikawa, Kimitada, to Fuji Electric Co., Ltd. Drive circuit of an electromagnetic device. 5,557,494, Cl. 361-152.000.

Ishikawa, Morio, to Nippondenso Co., Ltd. Heat exchanger. 5,555,929, Cl. 165-76.000.

Ishikawa, Shinji: *See*—
Kanamori, Hiroo; Urano, Akira; Aikawa, Haruhiko; Ishikawa, Shinji; Hirose, Chisai; and Saito, Masahide, 5,556,442, Cl. 65-17.400.

Ishikawa, Tetsuya: *See*—
Collins, Kenneth S.; Roderick, Craig A.; Trow, John R.; Yang, Chan-Lon; Wong, Jerry Y.; Marks, Jeffrey; Keswick, Peter R.; Groechel, David W.; Pinson, Jay D., II; Ishikawa, Tetsuya; Lei, Lawrence C.; Toshima, Masato M.; and Yin, Gerald Z., 5,556,501, Cl. 156-345.000.

Ishikawa, Yoshio: *See*—
Hasegawa, Makoto; Sakima, Hiromi; Kanbara, Hiromitsu; Ishikawa, Yoshio; Imamura, Yasuo; and Aoki, Makoto, 5,556,500, Cl. 156-345.000.

Ishikura, Junri: *See*—
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Ishimaru, Masahiko: *See*—
Hirosawa, Toshio; Itoh, Tsutomu; Kokunishi, Motohide; Ueoka, Atsushi; Ichikawa, Yoshikazu; Fujita, Fujio; Yamagishi, Tadashi; Ishimaru, Masahiko; Namba, Hideki; Sasaki, Shigeru; Hirano, Michio; Kozuma, Kaoru; and Nakamura, Kazuyuki, 5,557,736, Cl. 395-182.020.

Ishimori, Akira: *See*—
Kuba, Kazuki; Seguchi, Masaki; Ishimori, Akira; and Yamamoto, Takashi, 5,557,628, Cl. 372-70.000.

Ishitoko, Nobuyuki; and Kumada, Akira, to Murata Manufacturing Co. Ltd. Vibrating gyroscope. 5,557,045, Cl. 73-504.140.

Ishizaka, Kenichi: *See*—
Kobayakawa, Kazushige; Nagasawa, Shigeru; Ikeda, Masayuki; Ueno, Haruhiko; Shinjo, Naoki; Utsumi, Teruo, Dewa, Masami; and Ishizaka, Kenichi, 5,557,744, Cl. 395-200.010.

Ishizuka, Koh; Ishii, Satoshi; and Kaneda, Yasushi, to Canon Kabushiki Kaisha. Velocity information detecting apparatus. 5,557,396, Cl. 356-28.500.

Isogai, Shinji: *See*—
Miyazawa, Chihiro; Mori, Tomoyuki; Kameo, Hiroshi; and Isogai, Shinji, 5,557,016, Cl. 568-909.500.

Isogai, Takayuki: *See*—
Izumisawa, Yoshiaki; Sumi, Yoshiyuki, and Isogai, Takayuki, 5,557,009, Cl. 562-412.000.

Istin, Michel; Grognet, Jean-Marc; and Darnez, Charles, to Spi-Bio. Films based on copolymers, their applications in transdermal systems and their processes of preparation. 5,556,635, Cl. 424-448.000.

Isuzu Motors Limited: *See*—
Furihata, Kenichi; and Takahashi, Atsushi, 5,556,083, Cl. 267-277.000.

Ito, Kaoru: *See*—
Kujirai, Toshisada; Ito, Kaoru; Koga, Yoshiaki; Moriyama, Yutaka; Takeshita, Norimitsu; Ohira, Yuji; and Ono, Takahiro, 5,555,739, Cl. 62-244.000.

Ito, Keisuke: *See*—
Inoue, Hiroki; Hayashi, Yoshiaki; Senba, Hideki; Ito, Keisuke; and Akita, Makoto, 5,556,456, Cl. 106-494.000.

Ito, Masafumi: *See*—
Takenaka, Kenji; Kayukawa, Hiroaki; Ito, Masafumi; Hiramatsu, Osamu; Hirota, Suguru; and Ozeki, Taro, 5,556,260, Cl. 417-269.000.

Ito, Masato: *See*—
Haraguchi, Masanori; Okada, Yoshinori, and Ito, Masato, 5,557,564, Cl. 365-63.000.

Ito, Norifumi; and Doi, Jun, to Ricoh Company, Ltd. Digital copier system. 5,557,390, Cl. 355-319.000.

Ito, Noritoshi: *See*—
Mizoguchi, Hakaru; Amada, Yoshiho; and Ito, Noritoshi, 5,557,629, Cl. 372-87.000.

Ito, Osamu, to Sumitomo Wiring Systems, Ltd. Joint connector. 5,556,291, Cl. 439-189.000.

Ito, Seiji: *See*—
Maeda, Yuji; Ito, Seiji; and Chida, Chiaki, 5,556,059, Cl. 248-49.000.

Ito, Shigeji: *See*—
Nakamura, Michihiro; Matsui, Satomi; Oka, Keiko; Tsuruta, Hitoshi; Koori, Yoshihiro; Kato, Takuji; and Ito, Shigeji, 5,556,760, Cl. 435-12.000.

Ito, Syunzi: *See*—
Kato, Toshiyuki; Ito, Syunzi; and Shimizui, Tsunehiko, 5,556,709, Cl. 428-426.000.

Ito, Takayuki; and Sugano, Yasuyuki, to Asahi Kogaku Kogyo Kabushiki Kaisha; and Asahi Seimitsu Kabushiki Kaisha. Fast aspherical lens system. 5,557,472, Cl. 359-751.000.

Ito, Tatsumi; and Kuwahara, Soichi, to Sony Corporation. Laser plate making apparatus. 5,557,465, Cl. 359-669.000.

Ito, Tomiyoshi: *See*—
Fujimoto, Koichi, Tanaka, Naoki; Asai, Fumitoshi; Ito, Tomiyoshi; and Koike, Hiroyuki, 5,556,864, Cl. 514-315.000.

Ito, Yoji; and Hirai, Yasuo, to Showa Yakuhin Kako Co., Ltd. Dry gel composition. 5,556,640, Cl. 424-489.000.

Ito, Yoshiteru: *See*—
Doyama, Yoshiaki; Ozeki, Masataka; Matsui, Keizo; and Ito, Yoshiteru, 5,555,894, Cl. 128-782.000.

Itoh, Hideo: *See*—
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Itoh, Katsuyuki, to NEC Corporation. Aperture for use in electron beam system for pattern writing. 5,557,110, Cl. 250-492.230.

Itoh, Kazumi, to Olympus Optical Co., Ltd. Real image finder optical system. 5,557,458, Cl. 359-434.000.

Itoh, Kazuo: *See*—
Niwa, Shigeki; Hasebe, Etsuhiro; Itoh, Kazuo; Indoh, Toshihiro; and Asai, Masamichi, 5,556,568, Cl. 222-600.000.

Itoh, Tsutomu: *See*—
Hirosawa, Toshio; Itoh, Tsutomu; Kokunishi, Motohide; Ueoka, Atsushi; Ichikawa, Yoshikazu; Fujita, Fujio; Yamagishi, Tadashi; Ishimaru, Masahiko; Namba, Hideki; Sasaki, Shigeru; Hirano, Michio; Kozuma, Kaoru; and Nakamura, Kazuyuki, 5,557,736, Cl. 395-182.020.

Itoh, Tsuyoshi: *See*—
Oono, Masahiro; and Itoh, Tsuyoshi, 5,557,598, Cl. 369-112.000.

Itoh, Yasuo: *See*—
Miyamoto, Junichi; Itoh, Yasuo; and Iwata, Yoshihisa, 5,557,568, Cl. 365-185.220.

Itoi, Shigeru; and Yamamoto, Kenji, to Fujikin Incorporated. Controller. 5,556,072, Cl. 251-58.000.

Itou, Hikaru; Miyazaki, Sho; Tanaka, Tsutomu; Saito, Masashi; Yamada, Shinichi; Wakata, Shigekazu; and Saijo, Eiji, to Sumitomo Wiring Systems, Ltd. Charge coupling for electric vehicle. 5,556,284, Cl. 439-34.000.

Itse, Daniel C.: *See*—
Srinivasachar, Srivats; Morency, Joseph; and Itse, Daniel C., 5,556,447, Cl. 75-670.000.

ITT Automotive, Inc.: *See*—
Ream, Martin, 5,556,137, Cl. 285-26.000.

ITT Corporation: *See*—
Mertens, Donald E., 5,557,282, Cl. 342-123.000.

Ivanov, Alexander M.; Bognitski, Isaac Y.; Gerasimov, Arkadiy F.; Efimov, Sergei E.; Savintsev, Vadim G.; Fomin, Andrei V.; and Chizhevski, Sergei V., to Econd. Capacitor with a double electric layer. 5,557,497, Cl. 361-502.000.

Ivory, Nicholas E.; and Thatcher, Wrenford J., to Coates Brothers PLC. Image-forming process. 5,556,735, Cl. 430-315.000.

Iwahashi, Hiroshi, to Kabushiki Kaisha Toshiba. Nonvolatile semiconductor memory device. 5,557,570, Cl. 365-185.290.

Iwamoto, Norihiro; Takamura, Masayuki; and Matsuda, Tai, to Toshiba Kikai Kabushiki Kaisha. Squeeze pin control method and apparatus for die casting machine. 5,555,924, Cl. 164-4.100.

Iwasaki, Masayasu: *See*—
Nakayama, Okihiko; Grom, Brian R.; Iwasaki, Masayasu; and Tsuda, Hiroshi, 5,557,522, Cl. 364-424.020.

Iwasaki, Sigeo: *See*—
Funabashi, Hideo; Sugahara, Akinobu; Tanaka, Akira; Toda, Masatoshi; Ota, Tsuyoshi; Matsuo, Youichi; Akimaru, Tsutomu; Iwasaki, Sigeo; and Tsuruoka, Masayuki, 5,556,820, Cl. 502-111.000.

Iwasaki, Yasuo: *See*—
Chiba, Nobuhiro; and Iwasaki, Yasuo, 5,557,594, Cl. 369-59.000.

Iwata, Naoki, to Ricoh Company, Ltd. Multicolor image forming apparatus with pulse voltage and DC voltage applied to a developing unit. 5,557,392, Cl. 355-326.00R.

Iwata, Yoshihisa: *See*—
Miyamoto, Junichi; Itoh, Yasuo; and Iwata, Yoshihisa, 5,557,568, Cl. 365-185.220.

Iyer, Radkakrishnan P.; and Agrawal, Sudhir, to Hybridon, Inc. Procedure for the solid phase synthesis of oglionucleotides. 5,556,960, Cl. 536-25.340.

Izumisawa, Yoshiaki; Sumi, Yoshiyuki; and Isogai, Takayuki, to Mitsubishi Chemical Corporation. Process for preparing an aqueous slurry of terephthalic acid. 5,557,009, Cl. 562-412.000.

Izuta, Naoki, to Fujitsu Limited. Image processing system. 5,557,691, Cl. 382-299.000.

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Campolucci, Carlo, 5,555,835, Cl. 112-475.070.

J. W. Harris Co., Inc.: *See*—
Sorenson, John C., 5,556,562, Cl. 219-137.610.

Jabbari, Iraj, to Seagate Technology, Inc. Method of manufacturing an actuator arm with a steel sleeve for thermal off track compensation. 5,557,490, Cl. 360-106.000.

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Kajimoto, Takeshi, to Mitsubishi Denki Kabushiki Kaisha. Stabilized voltage generating circuit and internal voltage down converter and a method of generating an internal operating power supply voltage for a dynamically operating circuit. 5,557,193, Cl. 323-282.000.
Kajita, Laura, to AMCOL International Corporation. Method of improving the contaminant resistance of a smectite clay by rewetting and impregnating the clay with a water-soluble polymer, and redrying the polymer-impregnated clay. 5,556,547, Cl. 210-751.000.
Kajiwara, Yasuya, to Mitsubishi Denki Kabushiki Kaisha. Distance measuring apparatus. 5,557,323, Cl. 348-140.000.
Kakehi, Yutaka: *See*—
Fukuyama, Ryooji; Nawata, Makoto; Kakehi, Yutaka; Kawahara, Hironobu; Saito, Yoshiaki; Torii, Yoshimi; Kawaraya, Akira; and Sato, Yoshie, 5,556,714, Cl. 428-620.000.
Kaku, Nobuyuki: *See*—
Mizutani, Hikaru; Maehara, Yoshimi; Nishijima, Tatsumi; Takeda, Hidekazu; Ogiro, Kenji; and Kaku, Nobuyuki, 5,556,051, Cl. 242-347.100.
Kaku, Takashi; and Murata, Hiroyasu, to Fujitsu Limited. Demodulation and roll-off filter apparatus. 5,557,632, Cl. 375-340.000.
Kakurai, Kimio: *See*—
Hanai, Tomoyuki; Kakurai, Kimio; and Hamamoto, Kenji, 5,557,585, Cl. 368-43.000.
Kakutani, Tetsu: *See*—
Yamashita, Kenji; Ohara, Takaaki; Niwa, Hideo; Osakada, Fumio; Fukuchi, Takeshi; Edamura, Tadahiro; and Kakutani, Tetsu, 5,556,943, Cl. 530-350.000.
Kal Kan Foods, Inc.: *See*—
Balcombe, Roy, 5,555,705, Cl. 53-432.000.
Kalberer, Robert C.; Kreutzer, Kevin W.; and Goor, Dan, to Flight Safety Systems, Inc. Adaptable aircraft airbag protection apparatus and method. 5,556,056, Cl. 244-121.000.
Kalt, Wolfram; Männer, Johann; and Firgo, Heinrich, to Lenzing Aktiengesellschaft. Moulding materials and spinning materials containing cellulose. 5,556,452, Cl. 106-166.010.
Kambayashi, Taiji: *See*—
Miura, Yuichiro; Hirano, Kazuo; Nate, Takayuki; Kambayashi, Taiji; Ohtsuka, Masahisa; and Nagai, Toshitake, 5,556,671, Cl. 428-15.000.
Kameda, Tsuneji: *See*—
Komine, Kenji; Ikeda, Wataru; Egawa, Mamoru; Shinosawa, Kastuhiro; Isegawa, Hiroyuki; Honaga, Kazuo; Abe, Yutaka; Kameda, Tsuneji; and Sato, Shinobu, 5,556,270, Cl. 418-179.000.
Kameo, Hiroshi: *See*—
Miyazawa, Chihiro; Mori, Tomoyuki; Kameo, Hiroshi; and Isogai, Shinji, 5,557,016, Cl. 568-909.500.
Kamimoto, Shuuji: *See*—
Koike, Masahiro; Takahashi, Fuminobu; Inoue, Hideki; Musha, Yosinori; Kamimoto, Shuuji; Naito, Shinji; and Sasaki, Tsukasa, 5,557,048, Cl. 73-597.000.
Kaminaka, Manabu: *See*—
Tanaka, Shinsuke; Kaminaka, Manabu; Masada, Isao; Fujii, Junichi; and Ueda, Naoki, 5,556,920, Cl. 525-216.000.
Kamins, Theodore I.: *See*—
Gibson, Gary; Kamins, Theodore I.; Keshner, Marvin S.; Neberhuis, Steven L.; Perlov, Craig M.; and Yang, Chung C., 5,557,596, Cl. 369-101.000.
Kamiya, Hitoshi: *See*—
Watanabe, Atsushi; Kamiya, Hitoshi; Nakada, Eiji; Mizuno, Tomoaki; Kago, Yoshiyuki; Murase, Tokutaro; and Inukai, Yoshihiko, 5,557,096, Cl. 235-492.000.
Kamiya, Masahiko: *See*—
Naito, Toshiharu; Kamiya, Masahiko; Taguchi, Takeyasu; and Fujiwara, Kenji, 5,557,552, Cl. 364-565.000.
Kamiya, Yuji, to Canon Kabushiki Kaisha. Image forming apparatus with means for detecting sheet thickness. 5,557,427, Cl. 358-496.000.
Kampfer, Robert D.: *See*—
Perrington, Kenneth J.; and Kampfer, Robert D., 5,556,826, Cl. 503-200.000.
Kanada, Yoshihisa: *See*—
Sone, Hironao; Sekiya, Kazuo; Ishikawa, Hiroshi; and Kanada, Yoshihisa, 5,557,754, Cl. 395-287.000.
Kanai, Mitsuji: *See*—
Kuroiwa, Daisuke; Kobayashi, Shigeharu; and Kanai, Mitsuji, 5,555,771, Cl. 74-459.000.
Kanamori, Hiroo; Urano, Akira; Aikawa, Haruhiko; Ishikawa, Shinji; Hirose, Chisai; and Saito, Masahide, to Sumitomo Electric Industries, Ltd. Method for fabricating an optical waveguide. 5,556,442, Cl. 65-17.400.
Kanao, Keiji; and Takamura, Kozo, to Nippondenso Co., Ltd. Spark plug and method of producing the same. 5,557,158, Cl. 313-141.000.
Kanao, Shiro. Cleaner hose. 5,555,915, Cl. 138-133.000.
Kanaya, Motonori, to Fuji Photo Optical Co., Ltd. Method of and system for measurement of direction of surface and refractive index variations using interference fringes. 5,557,408, Cl. 356-359.000.
Kanbara, Hiromitsu: *See*—
Hasegawa, Makoto; Sakima, Hiromi; Kanbara, Hiromitsu; Ishikawa, Yoshio; Imamura, Yasuo; and Aoki, Makoto, 5,556,500, Cl. 156-345.000.
Kanbayashi, Kenichi: *See*—
Fukushima, Tohru; Kanbayashi, Kenichi; and Kumai, Eiji, 5,557,306, Cl. 347-33.000.
Kanebako, Kazunori: *See*—
Takizawa, Makoto; and Kanebako, Kazunori, 5,556,800, Cl. 437-45.000.
Kanebako, Toyomitsu: *See*—
Asahina, Hiroshi; Aoki, Kunio; Kanebako, Toyomitsu; and Nakatani, Yoshinori, 5,557,542, Cl. 364-514.00R.
Kaneda, Yasushi: *See*—
Ishizuka, Koh; Ishii, Satoshi; and Kaneda, Yasushi, 5,557,396, Cl. 356-28.500.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Yamashita, Kenji; Ohara, Takaaki; Niwa, Hideo; Osakada, Fumio; Fukuchi, Takeshi; Edamura, Tadahiro; and Kakutani, Tetsu, 5,556,943, Cl. 530-350.000.
Yano, Yoshiaki; Takeo, Kazuyuki; and Hidaka, Takayoshi, 5,556,636, Cl. 424-448.000.
Kanehira, Kouzi, to Sony Corporation. Method and apparatus for splitting a cathode ray tube. 5,556,018, Cl. 225-2.000.
Kaneko, Masakatsu; Murofushi, Yoshinobu; Kimura, Misako; Yamazaki, Mitsuo; and Iijima, Yasuteru, to Sankyo Company, Limited. Griseolic acid derivatives. 5,556,975, Cl. 544-277.000.
Kaneshima, Kazunari: *See*—
Sakakida, Akihiro; Ohara, Hideo; Miyake, Hiroyuki; and Kaneshima, Kazunari, 5,556,034, Cl. 239-417.300.
Kaneto, Keiichi; Min, Yonggang; and MacDiarmid, Alan G., to University of Pennsylvania, Trustees of the. Conductive polyaniline laminates. 5,556,700, Cl. 428-332.000.
Kang, Kap K.: *See*—
Jung, Il N.; Han, Joon S.; Cho, Eun J.; Jeong, Young T.; and Kang, Kap K., 5,556,822, Cl. 502-125.000.
Kanno, Hironori: *See*—
Tanaka, Nobuyuki; and Kanno, Hironori, 5,557,385, Cl. 355-285.000.
Kanno, Isao, to Sanshin Kogyo Kabushiki Kaisha. Fluid level indicator system. 5,555,857, Cl. 123-73.0AD.
Kanno, Satoshi: *See*—
Hayashi, Makoto; Kanno, Satoshi; and Saito, Naoto, 5,556,596, Cl. 422-53.000.
Kano, Toshio: *See*—
Sagawa, Seiji; Kano, Toshio; Samizo, Motohiko; Kojima, Fumitoshi; and Yamaguchi, Tetsuo, 5,556,980, Cl. 546-190.000.
Kanoto, Keiji: *See*—
Yanagihara, Naofumi; Kanoto, Keiji; and Kubota, Yukio, 5,557,420, Cl. 358-335.000.
Kansai Paint Co., Ltd.: *See*—
Igarashi, Kazuo; Takano, Kengo; Morita, Toshiharu; Saito, Hiroaki; Hashizume, Yukio; Suzuki, Tokio; Tashiro, Hirohisa; Muramoto, Mituru; and Sato, Katsunori, 5,556,527, Cl. 204-488.000.
Kansas State University Research Foundation: *See*—

Vadlamani, Keswara R.; and Seib, Paul A., 5,556,655, Cl. 426-270.000.
Kanto Jidosha Kogyo Kabushiki Kaisha: *See*—
Soshi, Isao; Miyamoto, Hidenori; Kato, Minoru; Omi, Junichi; Amanuma, Tatsuo; Asami, Jirou; and Imura, Yoshio, 5,557,357, Cl.

Kawai, Yuzo: *See*—
Kasahara, Yoshiyuki; Segawa, Hajime; Yamauchi, Mikio; Kuno, Toshihiro; Mizutani, Hiroshige; and Kawai, Yuzo, 5,556,321, Cl. 451-
Poduje, Noel S.; Keller, Scott P.; and Mallory, Roy, 5,557,267, Cl. 340-870.040.
Kelley, Donald W. Water resistant pesticide compositions. 5,556,631, Cl.

Vadlamani, Keswara R.; and Seib, Paul A., 5,556,655, Cl. 426-270.000.
Kanto Jidosha Kogyo Kabushiki Kaisha: *See*—
Harada, Junichi; Tsuchida, Takuji; Kunikita, Keiji; Hasegawa, Katsuhisa; Fuse, Tadahiko; and Suzuki, Tomoo, 5,555,950, Cl. 180-65.100.
Kanuma, Akira: *See*—
Takiguchi, Nobuhiro; Kawasaki, Soichi; Yamada, Yasuo; and Kanuma, Akira, 5,557,766, Cl. 395-405.000.
Kanzaki, Susumu: *See*—
Harada, Hiroyuki; Ikezawa, Yuji; Kanzaki, Susumu; Shinonaga, Hideo; and Sogabe, Satoru, 5,556,910, Cl. 524-504.000.
Kao, Yung-Chung: *See*—
Celii, Francis G.; Kao, Yung-Chung; and Purdes, Andrew J., 5,556,462, Cl. 117-85.000.
Kaoru, Fukuda: *See*—
Yoshiharu, Uchiyama; Takeshi, Asano; Kaoru, Fukuda; Kazuhiko, Maeda; and Hideyuki, Usui, 5,557,562, Cl. 364-708.100.
Kaplan, Jaroslav: *See*—
Mladek, Milos; Tesar, Oldrich; Kaplan, Jaroslav; Pirkl, Ladislav; and Musil, Dobroslav, 5,555,714, Cl. 57-408.000.
Karagueuzian, Hrayr S.; Diamond, George A.; Khan, Steven S.; Denton, Timothy A.; and Evans, Steven, to Cedars-Sinai Medical Center. Methods for detecting propensity fibrillation. 5,555,889, Cl. 128-705.000.
Kardys, Gary J.; and Kelly, Robert G., to Norton Company. Composite abrasive products. 5,556,438, Cl. 51-309.000.
Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Fischer, Joachim; and Mayer, Ingo, 5,555,750, Cl. 66-145.00B.
Karube, Isao; and Yoshida, Nobuyuki, to Akebono Brake Industry Co., Ltd.; and Akebono Research and Development Center, Ltd. Method of producing β-cyclodextrin. 5,556,775, Cl. 435-97.000.
Kasahara, Osamu: *See*—
Sugiura, Jun; Tsuchiya, Osamu; Ogasawara, Makoto; Ootsuka, Fumio; Torii, Kazuyoshi; Asano, Isamu; Owada, Nobuo; Horiuchi, Mitsuaki; Tamaru, Tsuyoshi; Aoki, Hideo; Otsuka, Nobuhiro; Shirai, Seiichirou; Sagawa, Masakazu; Ikeda, Yoshihiro; Tsuneoka, Masatoshi; Kaga, Toru; Shimmyo, Tomotsugu; Ogishi, Hidetsugu; Kasahara, Osamu; Enami, Hiromichi; Wakahara, Atsushi; Akimori, Hiroyuki; Suzuki, Sinichi; Funatsu, Keisuke; Kawasaki, Yoshinao; Tubone, Tunehiko; Kogano, Takayoshi; and Tsugane, Ken, 5,557,147, Cl. 257-763.000.
Kasahara, Tatsuya; Hamada, Yoichi; and Ikegami, Yoshizo, to Konan Inc. Apparatus for obtaining visual images of cornea cells and method for displaying imaging-position around cornea for the apparatus. 5,557,351, Cl. 351-221.000.
Kasahara, Yoshiyuki; Segawa, Hajime; Yamauchi, Mikio; Kuno, Toshihiro; Mizutani, Hiroshige; and Kawai, Yuzo, to Kabushiki Kaisha Taihei Seisakusho. Method and apparatus for grinding elongated knife blade. 5,556,321, Cl. 451-5.000.
Kashikie, Junsuke: *See*—
Tosaka, Susumu; and Kashikie, Junsuke, 5,557,587, Cl. 368-282.000.
Kashiwagi, Hideyuki: *See*—
Suzuki, Yutaka; Kashiwagi, Hideyuki; Aoki, Teruaki; Koshino, Fumiichi; Picha, George J.; and Szpak, Anthony J., 5,555,898, Cl. 128-898.000.
Kasimov, Alibek E. O.; Gasanov, Gusein G. O.; Gevorkov, Levon G.; Sidorov, Evgeny I.; and Abishev, Ali A. A. O., to Kasimov, Alibek E. O. Data compression device allowing detection of signals of diverse wave forms. 5,557,800, Cl. 395-800.000.
Kasina, Sudhakar: *See*—
Fritzberg, Alan R.; Kasina, Sudhakar; and Gustavson, Linda M., 5,556,982, Cl. 548-303.700.
Kasugai, Katsura: *See*—
Funahashi, Yoshio; Kogai, Masao; Kasugai, Katsura; and Kato, Hideki, 5,556,587, Cl. 264-86.000.
Katayama, Akira: *See*—
Hasuda, Masanori; Katayama, Akira; Uemura, Yukio, and Goto, Tetsuro, 5,557,359, Cl. 354-234.100.
Kato, Haruo: *See*—
Sasa, Koichiro; Kuramoto, Shuji; and Kato, Haruo, 5,556,664, Cl. 427-64.000.
Kato, Hatsuhiro, to Kabushiki Kaisha Toshiba. Reference current generator. 5,557,194, Cl. 323-315.000.
Kato, Hideki: *See*—
Funahashi, Yoshio; Kogai, Masao; Kasugai, Katsura; and Kato, Hideki, 5,556,587, Cl. 264-86.000.
Kato, Hiroaki: *See*—
Hatcho, Seiji; Shimasaki, Yuichi; Aoki, Takuya; Matsumoto, Seiji; Kato, Hiroaki, Komatsuda, Takashi; Saito, Akihisa; and Oketani, Toshikazu, 5,555,724, Cl. 60-276.000.
Shimasaki, Yuichi; Komatsuda, Takashi; Kato, Hiroaki; and Aoki, Takuya, 5,555,725, Cl. 60-277.000.
Kato, Isao: *See*—
Kawasaki, Toshiyuki; Kato, Isao; Noda, Kenji; Osaki, Masakatsu; Miyazaki, Katsuhiko; Nayeshiro, Hidekazu; and Ando, Hideya, 5,556,970, Cl. 554-190.000.
Kato, Manabu, to Canon Kabushiki Kaisha. Optical scanning apparatus having tilted scanning lens system. 5,557,446, Cl. 359-206.000.
Kato, Masao: *See*—
Kawauchi, Yasushi; Takemoto, Toshiyuki; Takayama, Makoto; Yokota, Masami; Kato, Masao; Katsuta, Kimio; and Gushima, Hiroshi, 5,556,621, Cl. 424-94.640.
Kato, Minoru: *See*—
Soshi, Isao; Miyamoto, Hidenori; Kato, Minoru; Omi, Junichi; Amanuma, Tatsuo; Asami, Jirou; and Imura, Yoshio, 5,557,357, Cl. 354-202.000.
Kato, Naotaka; and Katoh, Katsutoshi, to International Business Machines Corporation. Antenna housing with extendable drawer for a portable computer. 5,557,288, Cl. 343-702.000.
Kato, Takuji: *See*—
Nakamura, Michihiro; Matsui, Satomi; Oka, Keiko; Tsuruta, Hitoshi; Koori, Yoshihiro; Kato, Takuji; and Ito, Shigeji, 5,556,760, Cl. 435-12.000.
Kato, Tatsuo; Kishi, Katsuhiko; and Matsuda, Takeshi, to SMK Corporation. Cable connector. 5,556,292, Cl. 439-218.000.
Kato, Tetsuo, to Mitsubishi Denki Kabushiki Kaisha. Dynamic random access memory with internal testing switches. 5,557,571, Cl. 365-189.050.
Kato, Tomokazu; Nomura, Keiichi; Nagatani, Kentaro; Maruta, Syuji; Takano, Yoshiaki; Araki, Kazuhiro; and Noda, Takashi, to Minolta Camera Kabushiki Kaisha. Image forming apparatus for producing duplex or composite prints with improved efficiency by feeding sheets at shortened intervals. 5,557,391, Cl. 355-319.000.
Kato, Toshiyuki; Ito, Syunzi; and Shimizui, Tsunehiko, to Denki Kagaku Kogyo Kabushiki Kaisha. Photocurable resin composition for glass lamination, laminated glass product and process for its production. 5,556,709, Cl. 428-426.000.
Kato, Yasuhiro: *See*—
Akagi, Kyo; Kato, Yasuhiro; Matsumoto, Masaaki; Iida, Akira; and Kim, Yong-kweon, 5,557,486, Cl. 360-97.010.
Katoh, Katsutoshi: *See*—
Kato, Naotaka; and Katoh, Katsutoshi, 5,557,288, Cl. 343-702.000.
Katoh, Masahiko, to Sanshin Kogyo Kabushiki Kaisha. Engine management system. 5,555,858, Cl. 123-73.0SC.
Katou, Yutaka, to Aisin Seiki Kabushiki Kaisha. Driving apparatus for a sewing machine. 5,555,829, Cl. 112-220.000.
Katsumata, Makoto; Yamanashi, Hidenori; and Ushijima, Hitoshi, to Yazaki Corporation. Carbon thread and process for producing it. 5,556,608, Cl. 423-447.400.
Katsumata, Makoto; Yamanashi, Hidenori; and Ushijima, Hitoshi, to Yazaki Corporation. Metal plated carbon material and method of producing thereof. 5,556,702, Cl. 428-402.000.
Katsuta, Kimio: *See*—
Kawauchi, Yasushi; Takemoto, Toshiyuki; Takayama, Makoto; Yokota, Masami; Kato, Masao; Katsuta, Kimio; and Gushima, Hiroshi, 5,556,621, Cl. 424-94.640.
Katz, Marcella M., to DeLaLott Corporation. Composite ravel-free needlework fabric and method of producing same. 5,556,690, Cl. 428-137.000.
Katz, Sagi: *See*—
Bland, Patrick M.; Hofmann, Richard G.; Katz, Sagi; Moeller, Dennis; and Venarchick, Lance M., 5,557,758, Cl. 395-308.000.
Katzenmeyer, Betty L.; and Katzenmeyer, Kent R. Interchangeable tethered glasses. 5,557,345, Cl. 351-66.000.
Katzenmeyer, Kent R.: *See*—
Katzenmeyer, Betty L.; and Katzenmeyer, Kent R., 5,557,345, Cl. 351-66.000.
Katzer, Dieter: *See*—
Waidele, Armin; and Katzer, Dieter, 5,555,913, Cl. 138-104.000.
Kaufman, Jeffrey A.: *See*—
Vanko, John C.; Kahl, Leo M.; Kaufman, Jeffrey A.; and d'Agostino, Mark C., 5,557,512, Cl. 364-188.000.
Kauvar, Lawrence M.; Lyttle, Matthew H.; and Satyam, Apparao, to Terrapin Technologies, Inc. Glutathione S-transferase-activated compounds. 5,556,942, Cl. 530-331.000.
Kawa, Hajimu: *See*—
Bierschenk, Thomas R.; Juhlke, Timothy J.; Kawa, Hajimu; and Lagow, Richard J., 5,557,012, Cl. 562-582.000.
Kawaguchi, Atsuo; and Motoda, Hiroshi, to Hitachi, Ltd. Data processing system and storage device and auxiliary memory bits for controlling data protection in the storage device. 5,557,771, Cl. 395-490.000.
Kawaguchi, Hiroshi; Nakakita, Takashi; and Homma, Shinji, to Hitachi Electronics Engineering Co., Ltd. Calibration method for protrusion detecting head units and protrusion inspection method and protrusion inspection device using the same. 5,557,554, Cl. 364-571.010.
Kawaguchi, Hiroshi: *See*—
Yamamoto, Kouji; Hashizume, Toshiaki; and Kawaguchi, Hiroshi, 5,555,622, Cl. 29-890.053.
Kawaguchi, Jun: *See*—
Teranishi, Toyoyuki; Kobayashi, Hiroaki; and Kawaguchi, Jun, 5,556,667, Cl. 427-164.000.
Kawaguchi, Makoto: *See*—
Nogiwa, Toru; Konagaya, Yukio; Hotta, Yoshihiko; Morohoshi, Kunichika; Kawaguchi, Makoto; Suzuki, Akira; Masubuchi, Fumihito; and Kagawa, Tsutomu, 5,556,827, Cl. 503-201.000.
Kawaguchi, Takashi: *See*—
Yamane, Mitsuo; and Kawaguchi, Takashi, 5,556,693, Cl. 428-195.000.
Kawaguchi, Yasuyoshi: *See*—
Nishinaka, Koutaru; and Kawaguchi, Yasuyoshi, 5,556,572, Cl. 510-188.000.
Kawahara, Hironobu: *See*—
Fukuyama, Ryooji; Nawata, Makoto; Kakehi, Yutaka; Kawahara, Hironobu; Sato, Yoshiaki; Torii, Yoshimi; Kawaraya, Akira; and Sato, Yoshie, 5,556,714, Cl. 428-620.000.
Kawahira, Osamu: *See*—
Ogata, Kazumi; and Kawahira, Osamu, 5,556,614, Cl. 424-65.000.

Kawai, Yuzo: *See*—
Kasahara, Yoshiyuki; Segawa, Hajime; Yamauchi, Mikio; Kuno, Toshihiro; Mizutani, Hiroshige; and Kawai, Yuzo, 5,556,321, Cl. 451-5.000.
Kawamoto, Satoru, to Fujitsu Limited; and Fujitsu VLSI Limited. Semiconductor memory device inhibiting invalid data from being output. 5,557,582, Cl. 365-233.500.
Kawamura, Hisato: *See*—
Michiyuki, Hiromi; Ikeda, Hayato; Yokoi, Masanobu; and Kawamura, Hisato, 5,556,265, Cl. 417-312.000.
Kawamura, Minoru: *See*—
Imai, Shoichi; Mabuchi, Ken-ichi; and Kawamura, Minoru, 5,556,862, Cl. 514-307.000.
Kawamura, Yoshiro; Manabe, Isao; and Nakashima, Shingo, to Honda Giken Kogyo Kabushi Kaisha; and Marubishi Yuha Kogyo Kabushiki Kaisha. Method of bending metallic pipe. 5,555,762, Cl. 72-369.000.
Kawano, Isamu: *See*—
Suzuki, Akira; Machida, Shigeru; and Kawano, Isamu, 5,556,269, Cl. 418-55.200.
Kawano, Kenji: *See*—
Fukai, Hisanori; Yamazaki, Hiroshi; Kawano, Kenji; Kawano, Shinichiro; and Okamoto, Hajime, 5,557,546, Cl. 364-551.010.
Kawano, Shinichiro: *See*—
Fukai, Hisanori; Yamazaki, Hiroshi; Kawano, Kenji; Kawano, Shinichiro; and Okamoto, Hajime, 5,557,546, Cl. 364-551.010.
Kawaraya, Akira: *See*—
Fukuyama, Ryooji; Nawata, Makoto; Kakehi, Yutaka; Kawahara, Hironobu; Sato, Yoshiaki; Torii, Yoshimi; Kawaraya, Akira; and Sato, Yoshie, 5,556,714, Cl. 428-620.000.
Kawasaki, Soichi: *See*—
Takiguchi, Nobuhiro; Kawasaki, Soichi; Yamada, Yasuo; and Kanuma, Akira, 5,557,766, Cl. 395-405.000.
Kawasaki, Toshiyuki; Kato, Isao; Noda, Kenji; Osaki, Masakatsu; Miyazaki, Katsuhiko; Nayeshiro, Hidekazu; and Ando, Hideya, to Yoshikawa Oil & Fat Co., Ltd. Lanolin fatty acids, a method for their fractionation, cosmetics and drugs for external use. 5,556,970, Cl. 554-190.000.
Kawasaki, Yoshinao: *See*—
Sugiura, Jun; Tsuchiya, Osamu; Ogasawara, Makoto; Ootsuka, Fumio; Torii, Kazuyoshi; Asano, Isamu; Owada, Nobuo; Horiuchi, Mitsuaki; Tamaru, Tsuyoshi; Aoki, Hideo; Otsuka, Nobuhiro; Shirai, Seiichirou; Sagawa, Masakazu; Ikeda, Yoshihiro; Tsuneoka, Masatoshi; Kaga, Toru; Shimmyo, Tomotsugu; Ogishi, Hidetsugu; Kasahara, Osamu; Enami, Hiromichi; Wakahara, Atsushi; Akimori, Hiroyuki; Suzuki, Sinichi; Funatsu, Keisuke; Kawasaki, Yoshinao; Tubone, Tunehiko; Kogano, Takayoshi; and Tsugane, Ken, 5,557,147, Cl. 257-763.000.
Kawashima, Yoichi; Ota, Atsutoshi; and Mibu, Hiroyuki, to Santen Pharmaceutical Co., Ltd. Thiazine or thiomorpholine derivatives. 5,556,841, Cl. 514-61.000.
Kawauchi, Yasushi; Takemoto, Toshiyuki; Takayama, Makoto; Yokota, Masami; Kato, Masao; Katsuta, Kimio; and Gushima, Hiroshi, to Yamanouchi Pharmaceutical Co., Ltd. Tissue plasminogen activator and method of use. 5,556,621, Cl. 424-94.640.
Kaya, Cetin; and Tigelaar, Howard, to Texas Instruments Incorporated. Non-volatile memory cell structure and process for forming same. 5,557,565, Cl. 365-185.010.
Kaye, Roger A.: *See*—
Wechsler, Mark; Barney, Howard H.; Kaye, Roger A.; Ogle, David G.; Lacy, Michael M.; Chow, Calvin Y.; Crawford, Kimberly L.; and Hafeman, Dean G., 5,557,398, Cl. 356-318.000.
Kaysersberg, S.A.: *See*—
Neveu, Jean-Louis; Schutz, Rudolph W.; and Lipp, George, 5,556,054, Cl. 242-597.600.
Kayukawa, Hiroaki: *See*—
Takenaka, Kenji; Kayukawa, Hiroaki; Ito, Masafumi; Hiramatsu, Osamu; Hirota, Suguru; and Ozeki, Taro, 5,556,260, Cl. 417-269.000.
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Koch, Rudolf; and Alger-Meunier, Michael, to Siemens Aktiengesellschaft. Switched capacitor network. 5,557,187, Cl. 320-1.000.
Koczab, Jean P., to Peaudouce. Composite nonwoven material and application to any absorbent article of hygiene. 5,556,392, Cl. 604-378.000.
Koda, Tadashi; Hara, Masao; Ueki, Kiyosuke; and Mori, Kei, to Mazda Motor Corporation; and Kurashiki Kako Co., Ltd. Rubber compounds containing vulcanized scrap rubber, methods of manufacturing such rubber compounds. 5,556,888, Cl. 521-44.500.
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Nakamura, Masayoshi; Ohki, Teruaki; and Kodama, Shougo, 5,556,038, Cl. 241-17.000.
Kodera, Yasuto: *See*—
Hanyu, Yukio; Mihara, Tadashi; Kodera, Yasuto; and Nakamura, Katsutoshi, 5,557,435, Cl. 359-75.000.
Koenig & Bauer Aktiengesellschaft: *See*—
Holm, Helmut, 5,555,803, Cl. 101-180.000.
Ruckmann, Wolfgang G.; and Wieland, Erich G., 5,555,811, Cl. 101-477.000.
Ruckmann, Wolfgang G.; and Wieland, Erich G., 5,555,812, Cl. 101-477.000.
Stiel, Jürgen A., 5,555,810, Cl. 101-477.000.
Koerber, Paul D., to Unisys Corporation. In an object oriented repository, a method for treating a group of objects as a single object during execution of an operation. 5,557,793, Cl. 395-600.000.
Koford, James S.; Scepanovic, Ranko; Jones, Edwin R.; Boyle, Douglas B.; and Rostoker, Michael D., to LSI Logic Corporation. Cell placement alteration apparatus for integrated circuit chip physical design automation system. 5,557,533, Cl. 364-491.000.
Koga, Makoto: *See*—
Taguchi, Masao; Eto, Satoshi; Takemae, Yoshihiro; Yoshioka, Hiroshi; and Koga, Makoto, 5,557,221, Cl. 327-53.000.
Koga, Yoshiaki: *See*—
Kujirai, Toshisada; Ito, Kaoru; Koga, Yoshiaki; Moriyama, Yutaka; Takeshita, Norimitsu; Ohira, Yuji; and Ono, Takahiro, 5,555,739, Cl. 62-244.000.
Koga, Yoshiro: *See*—
Okada, Hideki; Koga, Yoshiro; Suzuki, Takashi; Nakashima, Yoshihiro; and Okamura, Takehiko, 5,557,060, Cl. 118-661.000.
Kogai, Masao: *See*—
Funahashi, Yoshio; Kogai, Masao; Kasugai, Katsura; and Kato, Hideki, 5,556,587, Cl. 264-86.000.
Kogan, Grigory; and Griffith, Boulden G., to Tektronix, Inc. Signal sampling circuit with redundancy. 5,557,618, Cl. 371-10.300.
Kogano, Takayoshi: *See*—
Sugiura, Jun; Tsuchiya, Osamu; Ogasawara, Makoto; Ootsuka, Fumio; Torii, Kazuyoshi; Asano, Isamu; Owada, Nobuo; Horiuchi, Mitsuaki; Tamaru, Tsuyoshi; Aoki, Hideo; Otsuka, Nobuhiro; Shirai, Seiichirou; Sagawa, Masakazu; Ikeda, Yoshihiro; Tsuneoka, Masatoshi; Kaga, Toru; Shimmyo, Tomotsugu; Ogishi, Hidetsugu; Kasahara, Osamu; Enami, Hiromichi; Wakahara, Atsushi; Akimori, Hiroyuki; Suzuki, Sinichi; Funatsu, Keisuke; Kawasaki, Yoshinao; Tubone, Tunehiko; Kogano, Takayoshi; and Tsugane, Ken, 5,557,147, Cl. 257-763.000.
Koguchi, Yoshio: *See*—
Komuro, Katsuhiro; Kojima, Yoshitaka; Kurosawa, Yukio; Koguchi, Yoshio; Tanimizu, Toru; Hakamata, Yoshimi; and Endo, Shunkichi, 5,557,083, Cl. 218-125.000.
Kohayakawa, Yoshimi; and Kitamura, Takeshi, to Canon Kabushiki Kaisha. Fundus camera or opthalmic apparatus comprising a flash light source system. 5,557,321, Cl. 348-78.000.
Kohl, Albert: *See*—
Brodt, Gregor; Lehner, August; Lindner, Alfred; Graf, Hermann; Bobrich, Michael; Kress, Ria; Schneider, Norbert; Kohl, Albert; and Loch, Werner, 5,556,918, Cl. 525-131.000.
Kohlen, Helmut: *See*—

Irmen, Wolfgang; and Kohlen, Helmut, 5,556,046, Cl. 242-18.00R.
Kohler, Anja S.; Mooradian, Daniel L.; and Furcht, Leo T., to University of Minnesota, Regents of the. Phospholipid modified non-thombogenic sur-
Anderson, R. Rox; Hruza, Luciann; and Kollias, Nikiforos, 5,556,612, Cl. 424-59.000.
Kollin, Joel S.: *See*—

Nakamura, Michihiro; Matsui, Satomi; Oka, Keiko; Tsuruta, Hitoshi; Koori, Yoshihiro; Kato, Takuji; and Ito, Shigeji, 5,556,760, Cl. 435-
Goodman, Nancy B.; Germain, Richard P.; Julien, Paul C.; Kremer, Susan J.; and Gruber, Robert J., 5,557,393, Cl. 355-326.00R.

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Kohler, Anja S.; Mooradian, Daniel L.; and Furcht, Leo T., to University of Minnesota, Regents of the. Phospholipid modified non-thombogenic surface, 5,556,632, Cl. 424-423.000.

Kohler, Heinz; Mateika, Dieter; and Oostra, Sietse, to U.S. Philips Corporation. Substituted barium-neodymium-titanium-perovskite, dielectric, ceramic composition, capacitor and microwave components. 5,556,818, Cl. 501-138.000.

Kohls, Ruth E. J.: *See—*
Fehskens, Leonard G.; Strutt, Colin; Callander, Jill F.; Nelson, Kathy J.; Guertin, Matthew J.; Sylor, Mark W.; Chapman, Kenneth W.; Schuchard, Robert C.; Goldfarb, Stanley I.; Rogers, Dennis O.; O'Brien, Linsey B.; Chan-Lizardo, Christine C.; England, Benjamin M.; Rosenbaum, Richard L.; Kohls, Ruth E. J.; Aronson, David L.; Moore, Allan B.; Ross, Robert R. N.; Smith, Danny L.; Sankar, Arundahati G.; Koning, G. Paul; Namoglu, Sheryl F.; Seger, Mark J.; Dixon, Timothy M.; and Harrow, Jeffrey R., 5,557,796, Cl. 395-650.000.

Kohn, Leonard: *See—*
Singer, Dinah S.; Kohn, Leonard; Mozes, Edna; Saji, Motoyasu; Weissman, Jocelyn; Napolitano, Giorgio; and Ledley, Fred D., 5,556,754, Cl. 435-6.000.

Kohno, Satoru: *See—*
Aoyama, Hirokazu; Kohno, Satoru; and Koyama, Satoshi, 5,557,019, Cl. 570-176.000.

Koide, Makoto, to Fuji Ultrasonic Engineering Co., Ltd. Method and apparatus for ultrasonic wave measurement. 5,557,047, Cl. 73-597.000.

Koide, Masashi: *See—*
Suzuki, Takehiro; Koide, Masashi; and Fujii, Masahiro, 5,556,915, Cl. 524-837.000.

Koike, Hiroki, to NEC Corporation. Semiconductor device comprising a grounding pad near a reference signal pad and a capacitor between the pads. 5,557,235, Cl. 327-564.000.

Koike, Hiroyuki: *See—*
Fujimoto, Koichi; Tanaka, Naoki; Asai, Fumitoshi; Ito, Tomiyoshi; and Koike, Hiroyuki, 5,556,864, Cl. 514-315.000.

Koike, Masahiro; Takahashi, Fuminobu; Inoue, Hideki; Musha, Yosinori; Kamimoto, Shuuji; Naito, Shinji; and Sasaki, Tsukasa, to Hitachi, Ltd. Stress evaluation method and apparatus therefor. 5,557,048, Cl. 73-597.000.

Koike, Noboru; and Seraku, Hirokazu, to Kabushiki Kaisha Toshiba. Apparatus having shield structure. 5,557,507, Cl. 361-816.000.

Koitabashi, Noribumi: *See—*
Kurata, Mitsuru; Ebata, Tokihide; Koitabashi, Noribumi; Hirabayashi, Hiromitsu; Sugimoto, Hitoshi; and Uchida, Haruo, 5,557,310, Cl. 347-87.000.

Koito Manufacturing Co., Ltd.: *See—*
Natsume, Kazunori; and Taki, Nobuhiro, 5,556,194, Cl. 362-299.000.
Saijo, Akira, 5,556,190, Cl. 362-226.000.
Yamazaki, Kazuhiro; Akiyama, Kazuo; and Suzuki, Michihiko, 5,556,584, Cl. 264-46.500.

Koizumi, Yukinori: *See—*
Hasegawa, Hiroshi; Minaki, Takashi; and Koizumi, Yukinori, 5,557,327, Cl. 348-340.000.

Kojima, Atsuyuki: *See—*
Muraoka, Masami; Matsui, Kazuki; Hasegawa, Hirohiko; and Kojima, Atsuyuki, 5,556,860, Cl. 514-258.000.

Kojima, Fumitoshi: *See—*
Miyazaki, Mitsue; and Kojima, Fumitoshi, 5,557,202, Cl. 324-307.000.
Sagawa, Seiji; Kano, Toshio; Samizo, Motohiko; Kojima, Fumitoshi; and Yamaguchi, Tetsuo, 5,556,980, Cl. 546-190.000.

Kojima, Toshiharu, to Mitsubishi Denki Kabushiki Kaisha. Delayed detection type demodulator. 5,557,222, Cl. 327-105.000.

Kojima, Yasutaka, to Akiyama Printing Machine Manufacturing Company Ltd. Perfecting sheet rotary offset press. 5,555,804, Cl. 101-183.000.

Kojima, Yoshitaka: *See—*
Komuro, Katsuhiro; Kojima, Yoshitaka; Kurosawa, Yukio; Koguchi, Yoshio; Tanimizu, Toru; Hakamata, Yoshimi; and Endo, Shunkichi, 5,557,083, Cl. 218-125.000.

Kokubu, Hideki; Abe, Tsutomu; and Machida, Hisashi, to NSK Ltd. Toroidal-type continuously variable transmission. 5,556,348, Cl. 476-40.000.

Kokubu, Sadao, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Automobile engine starter. 5,555,863, Cl. 123-179.300.

Kokunishi, Motohide: *See—*
Hirosawa, Toshio; Itoh, Tsutomu; Kokunishi, Motohide; Ueoka, Atsushi; Ichikawa, Yoshikazu; Fujita, Fujio; Yamagishi, Tadashi; Ishimaru, Masahiko; Namba, Hideki; Sasaki, Shigeru; Hirano, Michio; Kozuma, Kaoru; and Nakamura, Kazuyuki, 5,557,736, Cl. 395-182.020.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Sakazawa, Shigeyuki; Hamada, Takahiro; and Matsumoto, Shuichi, 5,557,276, Cl. 341-200.000.

Kolar, Cenek; and Stüber, Werner, to Behringwerke Aktiengesellschaft. Glycopeptide derivatives, a process for their preparation and pharmaceutical agents containing these compounds. 5,556,941, Cl. 530-322.000.

Kolasinski, John R.; and Coleman, Alexander M., to United States of America, National Aeronautics and Space Administration. Optical fiber cable chemical stripping fixture. 5,556,502, Cl. 165-345.000.

Kolbus GmbH & Co. KG: *See—*
Begemann, Kurt; Rathert, Horst; and Albrecht, Manfred, 5,556,244, Cl. 412-30.000.

Kollias, Nikiforos: *See—*
Anderson, R. Rox; Hruza, Luciann; and Kollias, Nikiforos, 5,556,612, Cl. 424-59.000.

Kollin, Joel S.: *See—*
Melville, Charles D.; Kollin, Joel S.; and Johnston, Richard S., 5,557,444, Cl. 359-199.000.

Kollmorgen Corporation: *See—*
Taylor, William H., 5,557,447, Cl. 359-208.000.

Kolomeyer, Norton. Scatter free litter box. 5,555,844, Cl. 119-165.000.

Kolstoe, Gary M.: *See—*
Somekh, Sasson; Fairbairn, Kevin; Kolstoe, Gary M.; White, Gregory W.; and Faraco, W. George, Jr., 5,556,147, Cl. 294-64.100.

Kolton, Chester; and Spater, Stuart S., to B&G Plastics, Inc. Hanger composite for display of neckties with preformed knots. 5,556,014, Cl. 223-85.000.

Komatsuda, Takashi: *See—*
Hatcho, Seiji; Shimasaki, Yuichi; Aoki, Takuya; Matsumoto, Seiji; Kato, Hiroaki; Komatsuda, Takashi; Saito, Akihisa; and Oketani, Toshikazu, 5,555,724, Cl. 60-276.000.
Shimasaki, Yuichi; Komatsuda, Takashi; Kato, Hiroaki; and Aoki, Takuya, 5,555,725, Cl. 60-277.000.

Komet Praezisionswerkzeuge Robert Breuning GmbH: *See—*
Muendlein, Werner; and Scheer, Gerhard, 5,555,784, Cl. 82-158.000.

Komine, Kenji; Ikeda, Wataru; Egawa, Mamoru; Shinosawa, Kastuhiro; Isegawa, Hiroyuki; Honaga, Kazuo; Abe, Yutaka; Kameda, Tsuneji; and Sato, Shinobu, to Kabushiki Kaisha Toshiba. Blade for a rotary compressor. 5,556,270, Cl. 418-179.000.

Komuro, Katsuhiro; Kojima, Yoshitaka; Kurosawa, Yukio; Koguchi, Yoshio; Tanimizu, Toru; Hakamata, Yoshimi; and Endo, Shunkichi, to Hitachi, Ltd. Vacuum circuit breaker and electric contact. 5,557,083, Cl. 218-125.000.

Konagaya, Yukio: *See—*
Nogiwa, Toru; Konagaya, Yukio; Hotta, Yoshihiko; Morohoshi, Kunichika; Kawaguchi, Makoto; Suzuki, Akira; Masubuchi, Fumihito; and Kagawa, Tsutomu, 5,556,827, Cl. 503-201.000.

Konan Inc.: *See—*
Kasahara, Tatsuya; Hamada, Yoichi; and Ikegami, Yoshizo, 5,557,351, Cl. 351-221.000.

Kondo, Hirofumi, to Sony Corporation. Coating-type magnetic recording medium comprising an ascorbic ester compound in or on a magnetic recording layer. 5,556,717, Cl. 428-694.00B.

Kondo, Kazuyuki: *See—*
Shimabukuro, Jun; Nagamatsu, Yuji; Ikeuchi, Yoshimi; and Kondo, Kazuyuki, 5,557,774, Cl. 395-500.000.

Kondo, Masaki: *See—*
Saeki, Hiroaki; and Kondo, Masaki, 5,557,215, Cl. 324-765.000.

Kondo, Yoshitami: *See—*
Kimura, Kazuya; Hidaka, Shigeyuki; and Kondo, Yoshitami, 5,556,261, Cl. 417-269.000.

Kondoh, Masuhiro: *See—*
Hayakawa, Hideyuki; Kondoh, Masuhiro; Imaeda, Makoto; Imoto, Yuzo; and Takeda, Kenji, 5,556,175, Cl. 303-119.200.

Kondou, Goro: *See—*
Ando, Katsutoshi; Takahashi, Masanori; and Kondou, Goro, 5,556,618, Cl. 424-78.080.

Konica Corporation: *See—*
Haneda, Satoshi; Fukuchi, Masakazu; Ikeda, Tadayoshi; Nagase, Hisayoshi; and Hamada, Shuta, 5,557,394, Cl. 355-327.000.
Haraguchi, Tsuyoshi; and Tsuchiya, Ichiro, 5,556,736, Cl. 430-399.000.
Hasegawa, Hiroshi; Minaki, Takashi; and Koizumi, Yukinori, 5,557,327, Cl. 348-340.000.
Ishida, Ken; and Iijima, Yaichi, 5,557,356, Cl. 354-149.110.
Nakanishi, Kenji; Yajima, Takatoshi; Araki, Hiromitsu; Kobayashi, Hideyuki; Ohkubo, Yoshioki; Hashimura, Tetsutaro; and Naito, Hiroshi, 5,556,739, Cl. 430-533.000.
Suzuki, Takatugu; Tomotake, Atsushi; Ohya, Hidenobu; and Takiyama, Nobuyuki, 5,556,740, Cl. 430-559.000.
Takamuki, Yasuhiko; and Nagami, Ken, 5,556,738, Cl. 430-526.000.
Ueda, Yutaka, 5,557,362, Cl. 354-324.000.

König, Hans; Koch, Kai; and Dietsche, Rainer, to Janke & Kunkel GmbH & Co. KG, IKA-Labortechnik. Laboratory apparatus with receptacle for a stand rod. 5,556,067, Cl. 248-220.210.

Koning, G. Paul: *See—*
Fehskens, Leonard G.; Strutt, Colin; Callander, Jill F.; Nelson, Kathy J.; Guertin, Matthew J.; Sylor, Mark W.; Chapman, Kenneth W.; Schuchard, Robert C.; Goldfarb, Stanley I.; Rogers, Dennis O.; O'Brien, Linsey B.; Chan-Lizardo, Christine C.; England, Benjamin M.; Rosenbaum, Richard L.; Kohls, Ruth E. J.; Aronson, David L.; Moore, Allan B.; Ross, Robert R. N.; Smith, Danny L.; Sankar, Arundahati G.; Koning, G. Paul; Namoglu, Sheryl F.; Seger, Mark J.; Dixon, Timothy M.; and Harrow, Jeffrey R., 5,557,796, Cl. 395-650.000.

Koninklijke PTT Nederland N.V.: *See—*
Gabriël, Christiaan M. W., 5,557,318, Cl. 348-7.000.

Konoya, Hisashi: *See—*
Taniuchi, Osamu; Konoya, Hisashi; and Nankoh, Youichi, 5,556,302, Cl. 439-533.000.

Konrad, Rainer: *See—*
Mueller, Hans-Joachim; Evertz, Kaspar; Weber, Siegfried; Funk, Guido; Konrad, Rainer; and Saive, Roland, 5,557,021, Cl. 585-513.000.

Konzal, Daryl R., to Paper Machinery Corporation. Cup bottom incurl workstation for a cup making machine. 5,556,364, Cl. 493-109.000.

Koori, Yoshihiro: *See—*

Nakamura, Michihiro; Matsui, Satomi; Oka, Keiko; Tsuruta, Hitoshi; Koori, Yoshihiro; Kato, Takuji; and Ito, Shigeji, 5,556,760, Cl. 435-12.000.

Kopp, Walter: *See—*
Creutzmann, Edmund; Hoffmann, Joachim; and Kopp, Walter, 5,557,388, Cl. 355-312.000.

Koppel, Gary A.: *See—*
Barton, Russell L.; Guttman-Carlisle, Deborah L.; and Koppel, Gary A., 5,556,623, Cl. 424-179.100.

Korea Institute of Science and Technology: *See—*
Jung, Il N.; Han, Joon S.; Cho, Eun J.; Jeong, Young T.; and Kang, Kap K., 5,556,822, Cl. 502-125.000.

Koreeda, Masato: *See—*
Truong, Thien V.; Bierer, Donald E.; Dener, Jeffrey M.; Hector, Richard; Tempesta, Michael S.; Loev, Bernard; Yang, Wu; and Koreeda, Masato, 5,556,875, Cl. 514-436.000.

Korson Co., Ltd.: *See—*
Lee, Jang-Bin, 5,557,240, Cl. 330-297.000.

Kortschot, Cornelis; and Knieriem, Lowell D., to Research Applications Inc. Apparatus for heating of bulk materials. 5,555,796, Cl. 99-453.000.

Koshino, Fumiichi: *See—*
Suzuki, Yutaka; Kashiwagi, Hideyuki; Aoki, Teruaki; Koshino, Fumiichi; Picha, George J.; and Szpak, Anthony J., 5,555,898, Cl. 128-898.000.

Koskinen, Jukka; and Mannio, Aaron, to Valmet Corporation. Assembly for loading a doctor blade. 5,556,467, Cl. 118-123.000.

Kotaki, Kenji; Kitada, Hidekazu; and Minami, Kiyoshi, to Shima Seiki Manufacturing Ltd. Knit design system and a method for designing knit fabrics. 5,557,527, Cl. 364-470.020.

Kousaka, Katsumi; Inoue, Takahiko; and Miyamoto, Takahito, to Sakata Inx Corporation. Polyurethane resin, process for preparing the same and printing ink for laminate containing the same. 5,556,925, Cl. 525-440.000.

Kovago, Vilmos, to RSC Mining (Proprietary) Limited. Rock anchor assembly. 5,556,233, Cl. 405-259.400.

Kovey, Stephen R.: *See—*
Saadi, Robert E.; Creager, Brian N.; Becker, Allen R.; and Kovey, Stephen R., 5,555,912, Cl. 137-801.000.

Kowall, David J.: *See—*
DeRees, Delbert D.; and Kowall, David J., 5,555,677, Cl. 49-502.000.

Koyama, Hiroshi; and Takemoto, Etsuo, to Daicel Chemical Industries, Ltd. Method for the purification of 1-aminopropanediol-2,3. 5,556,516, Cl. 203-91.000.

Koyama, Kouhei; Tamai, Shigeru; and Shintani, Masatoshi, to Seed Rubber Company Limited. Coating film transfer tool. 5,556,469, Cl. 118-257.000.

Koyama, Sachiko: *See—*
Mase, Hisao; Namba, Yasuharu; Koyama, Sachiko; Kiyama, Tadahiro; and Tsuji, Hiroshi, 5,557,789, Cl. 395-600.000.

Koyama, Satoshi: *See—*
Aoyama, Hirokazu; Kohno, Satoru; and Koyama, Satoshi, 5,557,019, Cl. 570-176.000.

Koyanagi, Hideki; Sumihiro, Hiroshi; Emoto, Seiichi; and Wada, Tohru, to Sony Corporation. Apparatus and method for reproducing a prediction-encoded video signal. 5,557,332, Cl. 398-416.000.

Koyo Machine Industries Co., Ltd.: *See—*
Osawa, Toshihiro; Sasakura, Shizuki; and Terauchi, Haruhiko, 5,557,402, Cl. 356-237.000.

Kozaki, Takahiko: *See—*
Nakano, Yukio; Kozaki, Takahiko; Gohara, Shinobu; and Ashi, Yoshihiro, 5,557,621, Cl. 371-37.100.

Kozuka, Hiraku; Sugawa, Shigetoshi; and Yamanobe, Masato, to Canon Kabushiki Kaisha. Laminated solid-state image sensing apparatus and method of manufacturing the same. 5,557,121, Cl. 257-292.000.

Kozuma, Kaoru: *See—*
Hirosawa, Toshio; Itoh, Tsutomu; Kokunishi, Motohide; Ueoka, Atsushi; Ichikawa, Yoshikazu; Fujita, Fujio; Yamagishi, Tadashi; Ishimaru, Masahiko; Namba, Hideki; Sasaki, Shigeru; Hirano, Michio; Kozuma, Kaoru; and Nakamura, Kazuyuki, 5,557,736, Cl. 395-182.020.

Kramer, Fred R.: *See—*
Wu, Ying; Ryabova, Lyubov A.; Kurnasov, Oleg V.; Morosov, Igor Y.; Ugarov, Viktor I.; Volianik, Elena V.; Chetverin, Alexander B.; Zhang, David; Kramer, Fred R.; and Spirin, Alexander S., 5,556,769, Cl. 435-69.100.

Kramer, Walter; and Kühnau, Holger, to Motan Holding GmbH. Dryer. 5,555,636, Cl. 34-86.000.

Kratel, Günter; Stohr, Günter; Gross, Martin; and Wilde, Eugen, to Wacker-Chemie GmbH; and Elektro-Gerätebau GmbH. Microporous thermal insulation molding. 5,556,689, Cl. 428-137.000.

Krawczak, John A.: *See—*
Stevens, Rick C.; Sauter, Gerald F.; and Krawczak, John A., 5,557,693, Cl. 385-24.000.

Krebs, Andreas: *See—*
Philipps, Thomas; Bartel, Stephan; Krebs, Andreas; Petersen, Uwe; Schenke, Thomas; Bremm, Klaus-Dieter; Endermann, Rainer; Metzger, Karl G.; and Mielke, Burkhard, 5,556,979, Cl. 546-123.000.

Krebs, Mark. Video mail delivery system. 5,557,320, Cl. 348-12.000.

Krein, William T.; Flaig, Charles M.; and Kelly, James D., to Apple Computer, Inc. Method and system for improving bus utilization efficiency. 5,557,755, Cl. 395-293.000.

Krell, Ernest K.: *See—*
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Kremer, Susan J.: *See—*
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Kress, Ria: *See—*
Brodt, Gregor; Lehner, August; Lindner, Alfred; Graf, Hermann; Bobrich, Michael; Kress, Ria; Schneider, Norbert; Kohl, Albert; and Loch, Werner, 5,556,918, Cl. 525-131.000.

Kreutzer, Kevin W.: *See—*
Kalberer, Robert C.; Kreutzer, Kevin W.; and Goor, Dan, 5,556,056, Cl. 244-121.000.

Krieger, Karl: *See—*
Russ, Werner H.; Hussong, Kurt; Krieger, Karl; and Mrotzeck, Uwe, 5,556,435, Cl. 8-549.000.

Krien, Burkhard: *See—*
Schulze, Wolfgang; Feulner, Dieter; Krien, Burkhard; and Meier, Bernd, 5,557,197, Cl. 324-115.000.

Krivokapic, Zoran; and Bang, David S., to Advanced Micro Devices, Inc. PVD sputter system having nonplanar target configuration and methods for operating same. 5,556,525, Cl. 204-192.120.

Krivoshlykov, Sergej G.; and Neuberger, Wolfgang, to CeramOptec Industries, Inc. Power laser delivery fiber system with enhanced damage threshold. 5,557,701, Cl. 385-124.000.

Kroyer, Karl K. Apparatus and method for manufacturing a double-sided embossing fibrous web and such double-sided web. 5,555,801, Cl. 101-32.000.

Kruczek, Raymond M.: *See—*
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Krueger, John F.: *See—*
Kim, Hyo-Sup; Krueger, John F.; and Vinson, Alexander L., 5,557,167, Cl. 313-542.000.

Krulik, Gerald A.; Mandich, Nenad V.; and Singh, Rajwant, to Applied Electroless Concepts, Inc. Recycle process for regeneration of ammoniacal copper etchant. 5,556,553, Cl. 216-93.000.

Krummel, Larry. Method and system for bar code image processing. 5,557,091, Cl. 235-462.000.

Krüner, Hartmut: *See—*
Boberski, Cornelia; Krüner, Hartmut; Riedel, Günter; and Hamminger, Rainer, 5,556,815, Cl. 501-97.000.

Kruszka, Daniel R.: *See—*
Bohanon, Leo F.; Adams, Robert A.; and Kruszka, Daniel R., 5,556,643, Cl. 424-602.000.

Krutsick, Stanley: *See—*
Yang, Chao-Kung; Williams, Jim C.; and Krutsick, Stanley, 5,557,298, Cl. 345-119.000.

Kryvenko, Michel: *See—*
Bacque, Eric; Barreau, Michel; Desconclois, Jean-Francois; Girard, Philippe; Kryvenko, Michel; Lavergne, Marc P.; Paris, Jean-Marc; and Picaut, Guy, 5,556,861, Cl. 514-292.000.

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Wiecek, Glenn N., 5,556,158, Cl. 297-85.000.

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Lacquit, Hubert; and Damier, Christophe, to Alcatel Alsthom Compagnie Generale d'Electricite. Object oriented multimedia information system using information and multiple classes to manage data having various structure and dedicated data managers. 5,557,785, Cl. 395-600.000.

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Lagrange, Alain; Vandenbosche, Jean J.; and Andrean, Hervé, to L'Oreal. Indoline compounds useful for dyeing keratinous fibres. 5,556,989, Cl. 548-491.000.

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Lam, Sharon, to Advanced Cardiovascular Systems, Inc. Coiled stent with locking ends. 5,556,413, Cl. 606-198.000.

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Lampl, Alfred; Leonhartsberger, Heinz; Urbanek, Otto; Wimbauer, Gerhard; and Naderhirn, Helmut, to Engel Maschinenbau Gesellschaft GmbH. Injection moulding machine. 5,556,656, Cl. 425-589.000.

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Roman, Patrick; and Hayes, Orlan, 5,556,276, Cl. 433-8.000.

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Malmgren, Raymond J., 5,556,232, Cl. 405-129.000.

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Lanechanger, Inc., The: *See*—
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Larson, Steven L.: *See*—
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Cheng, Jane C.; Fung, Anthony D.; Klocke, Donald J.; Lawton, Stephen L.; Lissy, Daria N.; Roth, Wieslaw J.; Smith, C. Morris; and Walsh, Dennis E., 5,557,024, Cl. 585-467.000.

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Ledermann, Donald L.: *See*—
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Leland Stanford Junior University, The Board of Trustees of the: *See*—
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Lee, Jang-Bin, to Korson Co., Ltd. Power supply for a computer including a sound signal amplifying circuit. 5,557,240, Cl. 330-297.000.
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Lee, Kyung S., to Goldstar Electron Co., Ltd. Method for fabricating a charge coupled device. 5,556,803, Cl. 437-53.000.
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Legate, Kim R., to Visual Automation Systems, Inc. Apparatus for tracking the flow of video signals by incorporating patterns of machine readable signals which will appear at predetermined locations of a television picture. 5,557,334, Cl. 348-473.000.
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Legaz, Antonio C. G.; Duran, Francisco J. E.; and Maraáu, Augel J. G., to Empresa Nacional Bazan de Construcciones Naval Militares, S.A. System for the monitoring and detection of heat sources in open areas. 5,557,260, Cl. 340-578.000.
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Ligman, James R., to Better Cleaning System, Inc. Carpet cleaner unit with adjustable power control. 5,555,595, Cl. 15-319.000.
Lim, Tae-hyoung, to Samsung Electronics Co., Ltd. Video camera having rotating mechanism for rotating image pickup with respect to the camera and a lens mount. 5,557,329, Cl. 348-373.000.
Lin, Fan-Nan; Sung, Nak J.; Ege, Stephen L.; and Lessard, Thomas A., to Phillips Petroleum Company. Isomerization of saturated hydrocarbons. 5,557,029, Cl. 585-739.000.
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Lin, Mike. Baseball holder for baseball batting practice. 5,556,091, Cl. 273-26.00R.
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Lipner, Steven B.; Balenson, David M.; Ellison, Carl M.; and Walker, Stephen T., to Trusted Information Systems, Inc. System and method for key escrow encryption. 5,557,346, Cl. 380-21.000.
Lipner, Steven B.; Balenson, David M.; Ellison, Carl M.; and Walker, Stephen T., to Trusted Information Systems, Inc. System and method for data recovery. 5,557,765, Cl. 380-21.000.
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Logan, Richard, to Mid-America Building Products Corporation. Decorative molding strip system. 5,555,688, Cl. 52-288.100.
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Matsui, Hideki: *See—*
Fujiwa, Takaaki; Tabuchi, Takeharu; Matsui, Hideki; Nakano, Shinji; Yamada, Shin-ya; and Morimoto, Takao, 5,556,927, Cl. 525-533.000.
Matsui, Kazuki: *See—*
Muraoka, Masami; Matsui, Kazuki; Hasegawa, Hirohiko; and Kojima, Atsuyuki, 5,556,860, Cl. 514-258.000.
Matsui, Keizo: *See—*
Doyama, Yoshiaki; Ozeki, Masataka; Matsui, Keizo; and Ito, Yoshiteru, 5,555,894, Cl. 128-782.000.
Matsui, Satomi: *See—*
Nakamura, Michihiro; Matsui, Satomi; Oka, Keiko; Tsuruta, Hitoshi; Koori, Yoshihiro; Kato, Takuji; and Ito, Shigeji, 5,556,760, Cl. 435-12.000.
Matsui, Shigeru; and Owada, Akira, to Hitachi, Ltd. Spectrophotometer with a system for calibrating a monochromator. 5,557,404, Cl. 356-319.000.
Matsukawa, Yashuhisa: *See—*
Kobayashi, Masao; Nishioka, Yukiko; Suzuki, Takehiko; and Matsukawa, Yashuhisa, 5,556,642, Cl. 424-502.000.
Matsumoto, Hisashi: *See—*
Miyanishi, Atushi; Matsumoto, Hisashi; and Tsujihashi, Yoshiki, 5,557,270, Cl. 341-50.000.
Matsumoto, Kentaro: *See—*
Miyashita, Yoshiaki; Tabuchi, Takeshi; Yamazaki, Kouichi; Kikuchi, Nobuo; Matsumoto, Kentaro; Takahashi, Sadao; and Hayakawa, Tadashi, 5,557,373, Cl. 355-219.000.
Matsumoto, Masaaki: *See—*
Akagi, Kyo; Kato, Yasuhiro; Matsumoto, Masaaki; Iida, Akira; and Kim, Yong-kweon, 5,557,486, Cl. 360-97.010.
Matsumoto, Seiji: *See—*
Hatcho, Seiji; Shimasaki, Yuichi; Aoki, Takuya; Matsumoto, Seiji; Kato, Hiroaki; Komatsuda, Takashi; Saito, Akihisa; and Oketani, Toshikazu, 5,555,724, Cl. 60-276.000.
Matsumoto, Shuichi; Shimada, Akira; and Shiroishi, Tetsuya, to Sony Corporation. Auto changer capable of recording/reproducing information signals on a selective disc-shaped recording medium. 5,557,590, Cl. 369-30.000.
Matsumoto, Shuichi: *See—*
Sakazawa, Shigeyuki; Hamada, Takahiro; and Matsumoto, Shuichi, 5,557,276, Cl. 341-200.000.
Matsumura, Kouji: *See—*
Harada, Yasoo; Matsushita, Shigeharu; Terada, Satoshi; Fujii, Emi; Kurose, Takashi; Higashino, Takayoshi; Yamada, Takashi; Nagamatsu, Akihito; Inoue, Daijirou; and Matsumura, Kouji, 5,557,141, Cl. 257-631.000.
Matsunaga, Yoshifumi; Miyauchi, Tadanobu; and Nakagaki, Jubei, to Fuji Xerox Co., Ltd. Data management system for a personal data base. 5,557,794, Cl. 395-600.000.
Matsuo, Youichi: *See—*
Funabashi, Hideo; Sugahara, Akinobu; Tanaka, Akira; Toda, Masatoshi; Ota, Tsuyoshi; Matsuo, Youichi; Akimaru, Tsutomu; Iwasaki, Sigeo; and Tsuruoka, Masayuki, 5,556,820, Cl. 502-111.000.
Matsuoka, Yutaka; Sano, Eiichi; Kurishima, Kenji; Nakajima, Hiroki; and Ishibashi, Tadao, to Nippon Telegraph and Telephone Corporation. Heterojunction bipolar transistor and integrated circuit device using the same. 5,557,117, Cl. 257-184.000.
Matsushima, Tsutomu; and Sakakibara, Toshimitsu, to Mitsubishi Denki Kabushiki Kaisha. Wire electric discharge machine. 5,556,551, Cl. 219-69.120.
Matsushita Electric Industrial Co., Ltd.: *See—*
Abe, Mitsuhiro; and Yamada, Mitsuo, 5,556,647, Cl. 425-127.000.
Doyama, Yoshiaki; Ozeki, Masataka; Matsui, Keizo; and Ito, Yoshiteru, 5,555,894, Cl. 128-782.000.
Honjo, Masahiro, 5,557,331, Cl. 348-410.000.
Muto, Akira, 5,557,419, Cl. 358-335.000.
Nakagawa, Masahiro; Nakamura, Tetsuro; Fujiwara, Shinji; and Tanaka, Eiichiro, 5,556,809, Cl. 437-209.000.
Nakamura, Hiroshi; Muranaka, Yasuaki; Ishibashi, Susumu; and Kihara, Toshiyuki, 5,557,443, Cl. 359-142.000.

Sato, Teruhiro; Wada, Tomio; and Hirayama, Yoshiyuki, 5,557,508, Cl. 361-818.000.
Wakita, Katsuya; Hotta, Shu; Sonoda, Nobuo; and Yang, Yang, 5,556,706, Cl. 428-421.000.
Yamagishi, Shigekazu, 5,557,343, Cl. 348-781.000.
Matsushita Electric Works, Ltd.: *See—*
Ono, Hisahiro, 5,556,285, Cl. 439-74.000.
Matsushita, Shigeharu: *See—*
Harada, Yasoo; Matsushita, Shigeharu; Terada, Satoshi; Fujii, Emi; Kurose, Takashi; Higashino, Takayoshi; Yamada, Takashi; Nagamatsu, Akihito; Inoue, Daijirou; and Matsumura, Kouji, 5,557,141, Cl. 257-631.000.
Matsushita, Shigenori; Yamamoto, Shigeru; Zhang, Shu H.; Nishita, Satoru; and Nakata, Kazushi, to Kabushiki Kaisha Komatsu Seisakusho. Blade control system for use in a bulldozer. 5,555,942, Cl. 172-3.000.
Matsuura, Kazuo: *See—*
Aida, Fuyuki; Tajima, Yoshio; and Matsuura, Kazuo, 5,556,821, Cl. 502-113.000.
Matsuura, Kuniya: *See—*
Sakamoto, Kazuhiro; and Matsuura, Kuniya, 5,557,381, Cl. 355-260.000.
Matsuzawa, Toshihiro: *See—*
Onishi, Tomoyuki; Tsuji, Takashi; and Matsuzawa, Toshihiro, 5,556,994, Cl. 549-302.000.
Matsuzawa, Yoko; Tamura, Shin-Ichiro; and Shirai, Katsuya, to Sony Corporation. Optical information recording medium. 5,556,681, Cl. 428-64.100.
Mattey, Jean A.: *See—*
Seare, Jerry G.; Smith-Wilson, Patricia A.; VanWagoner, Kurt; Mattey, Jean A.; Snyder, Eileen K.; Wahlstrom, Candace C.; Willis, Michelle; Bentley, Matthew R.; Wenzbauer, Steven J.; Fredette, Rodney; and Sennett, Vicki S., 5,557,514, Cl. 364-401.000.
Matthews, Jack W.; and Stevens, William, to Matthews, Jack W. Onboard digital locomotive multimeter. 5,557,198, Cl. 324-115.000.
Matthews, Paul E.; and Pelletiers, Thomas W., II, to United States Bronze Powders. Machinable brass compositions. 5,556,446, Cl. 75-255.000.
Mattila, Teuvo A.: *See—*
Helin, Arto A.; and Mattila, Teuvo A., 5,555,879, Cl. 128-201.240.
Mattson Spray Equipment, Inc.: *See—*
Breitsprecher, Charles O., 5,556,007, Cl. 222-136.000.
Mauduit, Daniel: *See—*
Calvignac, Jean; Galand, Claude; Giroir, Didier; Lebizay, Gerald; Mauduit, Daniel; and Spagnol, Victor, 5,557,608, Cl. 370-60.000.
Mauro, Anthony J.: *See—*
Falciglia, James W.; and Mauro, Anthony J., 5,557,071, Cl. 174-112.000.
Mauro, Marina: *See—*
Melloni, Piero; Bernardi, Luigi; Ferrandi, Mara; Frigerio, Marco; Mauro, Marina; and Quadri, Luisa, 5,556,846, Cl. 514-176.000.
Mawatari, Hiroshi: *See—*
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Max Co., Ltd.: *See—*
Kudo, Yasunori; Shibata, Manabu; and Misawa, Takahisa, 5,556,213, Cl. 400-621.000.
Maximicer: *See—*
Welch, Daniel L.; and Love, Jeff L., 5,555,734, Cl. 62-66.000.
May Cheong Toy Products Factory Limited: *See—*
So, Moon-Lam, 5,556,318, Cl. 446-236.000.
Mayer, Bruno Franz P., to Ingenious Design Products. Intimate garment protector. 5,556,013, Cl. 223-84.000.
Mayer, David J.; Price, Donald D.; Mao, Jianren; and Lyle, John W., to Virginia Commonwealth University. Inhibiting the development of tolerance to and/or dependence on an addictive substance. 5,556,838, Cl. 514-25.000.
Mayer, Ingo: *See—*
Fischer, Joachim; and Mayer, Ingo, 5,555,750, Cl. 66-145.00B.
Mayesh, Sol. Scavenging cap applicator. 5,556,216, Cl. 401-127.000.
Maynard, Kendall C.: *See—*
Maynard, Victor K.; Maynard, Kendall C.; Smith, Ruth; and Calano, Claire, 5,557,299, Cl. 345-168.000.
Maynard, Ronald S., to Leland Stanford Junior University, The Board of Trustees of the. Electrically activated multi-jointed manipulator. 5,556,370, Cl. 600-151.000.
Maynard, Victor K.; Maynard, Kendall C.; Smith, Ruth; and Calano, Claire, to Kidtech, Inc. Method and apparatus for a learning styled computer keyboard. 5,557,299, Cl. 345-168.000.
Mayr, Bertold; Müller, Leopold; and Böhme, Joachim, to IAV Motor GmbH. Drive for gas exchange valves, preferably inlet valves for reciprocating internal combustion engines. 5,555,861, Cl. 123-90.160.
Mazda Motor Corporation: *See—*
Koda, Tadashi; Hara, Masao; Ueki, Kiyosuke; and Mori, Kei, 5,556,888, Cl. 521-44.500.
Maze, Kenneth W.; and Forler, Joseph W., to Thomson Consumer Electronics, Inc. Television receiver using received channel guide information and a secondary video signal processor for displaying secondary channel information. 5,557,338, Cl. 348-565.000.
Mazelsky, Bernard, to ARA, Inc. Delaminating armor. 5,556,695, Cl. 428-229.000.
Mazurek, Niel: *See—*
Blose, Rodney; Mazurek, Niel; and Zammit, Theodore J., 5,557,436, Cl. 359-80.000.
McCabe, Robert W.: *See—*
Shelef, Mordecai; Usmen, Rengin K.; Graham, George W.; Watkins, William L. H.; and McCabe, Robert W., 5,556,825, Cl. 502-303.000.
McCaffrey, Scott A. Collapsible diving mask. 5,555,571, Cl. 2-428.000.
McCall, John E., Jr.: *See—*
Brady, Daniel F.; McCall, John E., Jr.; Bailey, Clyde A.; and Copeland, James L., 5,556,478, Cl. 134-18.000.
McCallen, Celeste L.: *See—*
Brook, John W.; Factor, David F.; Kinney, Frederick D.; McCallen, Celeste L.; and Young, Andrea M., 5,556,458, Cl. 106-708.000.
McCloskey, Patrick J.: *See—*
King, Joseph A., Jr.; McCloskey, Patrick J.; Colley, Alice M.; Dardaris, David M.; Fontana, Luca P.; and Berndsen, Josef G., 5,556,936, Cl. 528-199.000.
McClure, David C., to SGS-Thomson Microelectronics, Inc. Entire wafer stress test method for integrated memory devices and circuit therefor. 5,557,573, Cl. 365-201.000.
McColgan, Christopher; and Rolph, Andrew J., to Lanechanger, Inc., The. Combination rearview mirror. 5,557,467, Cl. 359-605.000.
McConaughy, Brett R.: *See—*
Brammer, Norman; McConaughy, Brett R.; and Gariery, James A., 5,555,935, Cl. 166-88.100.
McCoy, Danny O.; Garay, Oscar; and McMillan, Stanton B., to Motorola, Inc. Multi-loop antenna. 5,557,293, Cl. 343-867.000.
McCracken, Brian. Package opener. 5,555,624, Cl. 30-2.000.
McCrary, Donald R., to Martin Marietta Corporation. Passive thermal compensation method and apparatus. 5,557,474, Cl. 359-820.000.
McCuan, Gene A.: *See—*
McCuan, Velvet J.; and McCuan, Gene A., 5,557,586, Cl. 368-80.000.
McCuan, Velvet J.; and McCuan, Gene A. Unitary clock and picture frame. 5,557,586, Cl. 368-80.000.
McCurry, Patrick M., Jr.; and Varvil, Janet R., to Henkel Corporation. Method for preparing stabilized alkyl glycosides. 5,556,950, Cl. 536-4.100.
McDermott, John F.: *See—*
Giunta, Joseph S.; Hann, Jerry; and McDermott, John F., 5,556,515, Cl. 202-248.000.
McDonald, Kenneth P.: *See—*
Shower, Michael F.; McDonald, Kenneth P.; and Lukasiewicz, Anthony J., 5,555,708, Cl. 53-563.000.
McDowell, Gary: *See—*
Amick, Darryl; McDowell, Gary; Henson, Hershel R.; and Wille, Jerald, 5,555,799, Cl. 100-930.0RP.
McEwen, James A.; and Jameson, Michael. Physiologic tourniquet for intravenous regional anesthesia. 5,556,415, Cl. 606-202.000.
McFadden, William C.; and Tout, Stanley D., to Dynametric, Inc. Modular plug locking system. 5,556,295, Cl. 439-301.000.
McIntyre, Thomas J.; and Inberg, Steven B., to Gehl Company. Control system for a large round baler. 5,557,510, Cl. 364-146.000.
McKenzie, William F., Jr.: *See—*
Chen, David D.; Eisenbies, John L.; McKenzie, William F., Jr.; and Temoshenko, Leo, 5,557,746, Cl. 395-200.060.
McMakin, Douglas L.: *See—*
Sheen, David M.; Collins, H. Dale; Hall, Thomas E.; McMakin, Douglas L.; Gribble, R. Parks; Severtsen, Ronald H.; Prince, James M.; and Reid, Larry D., 5,557,283, Cl. 342-179.000.
McMillan, Stanton B.: *See—*
McCoy, Danny O.; Garay, Oscar; and McMillan, Stanton B., 5,557,293, Cl. 343-867.000.
McMillin, Carl R., to AcroMed Corporation. Composite structure suitable for use as a bone plate and method for making said structure. 5,556,687, Cl. 428-113.000.
McMurrey, Kevin D., Sr.; Rossi, Arthur M.; Cichon, Robert J., Jr.; Briggs, Karen A.; and Ely, Jonathan C., to Encore Computer Corporation. Linear accelerated device. 5,557,186, Cl. 318-626.000.
McNeill, Robert C.; and Pfeifer, Thomas J., to Grindmaster Corporation. Beverage dispensing apparatus having articulating basket holding arms for baskets having varying dimensions. 5,555,791, Cl. 99-295.000.
McPherson, Charles D.: *See—*
Mangham, William J.; McPherson, Charles D.; and Mohr, Donald N., 5,556,273, Cl. 432-8.000.
Meadox Medicals, Inc.: *See—*
Popadiuk, Nicholas; Lin, Horng-Ban; and Zdrahala, Richard J., 5,556,426, Cl. 623-1.000.
Meazza, Giovanni: *See—*
Camaggi, Giovanni; Chiarino, Dario; Fantucci, Mario; and Meazza, Giovanni, 5,556,829, Cl. 504-199.000.
Medela, Inc.: *See—*
Silver, Brian H.; and Annis, Larry D., 5,556,008, Cl. 222-192.000.
Medical Analysis Systems, Inc.: *See—*
Kwan, Shing F.; and Bravo-Leerabhandh, Marjorie, 5,556,788, Cl. 436-87.000.
Medicode, Inc.: *See—*
Seare, Jerry G.; Smith-Wilson, Patricia A.; VanWagoner, Kurt; Mattey, Jean A.; Snyder, Eileen K.; Wahlstrom, Candace C.; Willis, Michelle; Bentley, Matthew R.; Wenzbauer, Steven J.; Fredette, Rodney; and Sennett, Vicki S., 5,557,514, Cl. 364-401.000.
Medjet Inc.: *See—*
Gordon, Eugene I.; Feder, Peretz; and Khan, M. Ekramul H., 5,556,406, Cl. 606-166.000.
Medtronic, Inc.: *See—*
Powell, Jack H., III; Seaman, Joseph J.; Foley, Russell A.; and Leahy, JoAnn, 5,556,422, Cl. 607-48.000.

Mefferd, Thomas A.: *See—*
Braesch, Robert O.; Hong, Peter L.; Mefferd, Thomas A.; and Olson, Michael D., 5,556,077, Cl. 254-267.000.
Megel, François: *See—*
Schlossers, Christophe; Burzawa, Stéphane; Megel, François; and Le Gouzouguec, Anne, 5,557,685, Cl. 382-107.000.
Meguro, Yuuji; Yokokawa, Shuho; Nakajima, Isao; Onose, Tsukasa; and Ueno, Hiroshi, to Hitachi Koki Co., Ltd. Toner recovering device for electrophotographic apparatus and toner recovering filter for said toner recovering device. 5,557,386, Cl. 355-298.000.
Mehr-Ayin, Kourosh; Bialas, W. J.; and Smith, James A., to Sundstrand Corporation. Integrated APU. 5,555,722, Cl. 60-39.142.
Mehta, Ashit A.: *See—*
Afzali-Ardakani, Ali; Ayala-Esquilin, Juan; Braren, Bodil E.; Daijavad, Shahrokh; Foster, Elizabeth; Hedrick, James L., Jr.; Hedrick, Jeffrey C.; Hodgson, Rodney T.; Mehta, Ashit A.; Molis, Steven E.; Shaw, Jane M.; Tisdale, Stephen L.; and Viehbeck, Alfred, 5,556,899, Cl. 523-215.000.
Meier, Bernd: *See—*
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Meier, Michael: *See—*
Semler, Günther; and Meier, Michael, 5,557,005, Cl. 560-47.000.
Meier-Burkamp, Gerhard, to Fichtel & Sachs AG. Shifting arrangement for a change gear drive in multispeed hubs for bicycles. 5,556,354, Cl. 475-275.000.
Meilhon, Daniel, to Sodap. Ready-tear packaging. 5,556,674, Cl. 428-34.900.
Meitner, Sean W. Method for making and using a template for a dental implant osteotomy and components relating thereto. 5,556,278, Cl. 433-75.000.
Melby, Jeffrey A.: *See—*
Turk, George F.; and Melby, Jeffrey A., 5,556,230, Cl. 405-29.000.
Melchior, Jean F.; and Andre, Thierry, to S.N.C. Melchior Technologie. Internal combustion engines. 5,555,859, Cl. 123-79.00C.
Melder, Johann-Peter: *See—*
Flick, Klemens; Ebel, Klaus; Schnurr, Werner; Melder, Johann-Peter; and Harder, Wolfgang, 5,557,004, Cl. 558-459.000.
Melea Limited: *See—*
Ladney, Michael, 5,556,650, Cl. 425-546.000.
Mellen, Craig R., to Interline Hydrocarbon Inc. Process for contaminated oil reclamation. 5,556,548, Cl. 210-806.000.
Melloni, Piero; Bernardi, Luigi; Ferrandi, Mara; Frigerio, Marco; Mauro, Marina; and Quadri, Luisa, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. 17-heterocyclyl-14beta-Salpha-androstane, androstene and androstadiene derivatives active on the cardiovascular system, and pharmaceutical compositions containing same. 5,556,846, Cl. 514-176.000.
Mellor, George E.: *See—*
Miller, Regis R.; Mellor, George E.; Norman, Theodore W., Sr.; Jamieson, Mary V.; Thompson, Michael J.; Sherrod, Willis, Sr.; Clarke, Dana H.; Webb, Jerome D.; and Wisniewski, Robert D., 5,556,180, Cl. 312-193.000.
Mellul, Myriam: *See—*
Arnaud, Pascal; and Mellul, Myriam, 5,556,613, Cl. 424-64.000.
Melmon, Kenneth L.; Khosropour, Parisa; and Goodman, Murray, to Leland Stanford Junior University, The Board of Trustees of the. Histamine derivatives useful as immunomodulators. 5,556,872, Cl. 514-400.000.
Melquist, John L.: *See—*
Rotter, George E.; Chiang, Weilong; Tsai, Bob C.; Melquist, John L., Pauer, Cheryl A.; and Chen, Stephen Y., 5,556,926, Cl. 525-444.000.
Melville, Andreas T.: *See—*
Blumenthal, Robert N.; and Melville, Andreas T., 5,556,556, Cl. 205-784.500.
Melville, Charles D.; Kollin, Joel S.; and Johnston, Richard S., to University of Washington. Miniature optical scanner for a two axis scanning system. 5,557,444, Cl. 359-199.000.
Membrane Technology and Research, Inc.: *See—*
Baker, Richard W.; and Lokhandwala, Kaaeid A., 5,556,449, Cl. 95-49.000.
Menicon Co., Ltd.: *See—*
Yokoyama, Yasuhiro; Watanabe, Yuriko; Okumura, Akinori; Ichinohe, Shoji; and Yamazaki, Toshio, 5,556,929, Cl. 526-248.000.
Menon, Gianpaolo: *See—*
Romeo, Aurelio; Kirschner, Gunter; and Menon, Gianpaolo, 5,556,843, Cl. 514-114.000.
Menon, Venugopal B., to Sematech, Inc. Submicron particle removal using liquid nitrogen. 5,555,902, Cl. 134-199.000.
Mense, Martin: *See—*
Wussmann, Holger; Kaak, Hartmut; and Mense, Martin, 5,555,713, Cl. 57-281.000.
MEPLA-Werke Lautenschläger GmbH & Co. KG: *See—*
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Mercedes-Benz AG: *See—*
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Cecotti, Gerhard; Cecotti, Josef; and Röhm, Rolf, 5,556,334, Cl. 454-155.000.
Sigmund, Günther, 5,556,333, Cl. 454-143.000.
Steiner, Manfred; and Steffi, Christoph, 5,556,173, Cl. 303-3.000.
Zahn, Wolfgang; Loose, Gunter; and Hirschmann, Axel, 5,556,604, Cl. 423-213.700.
Mercer, Gary L.: *See—*
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Merck Frosst Canada, Inc.: *See—*
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Merck Sharp & Dohme Ltd.: *See—*
Chambers, Mark S.; and Fletcher, Stephen R., 5,556,969, Cl. 540-509.000.
Mercury Enterprises, Inc.: *See—*
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Merocel Corporation: *See—*
Cercone, Ronald J.; Gatto, Dom L.; Gertzman, Arthur A.; and Valentine, Douglas R., 5,556,391, Cl. 604-369.000.
Merrifield, James H.: *See—*
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Merriman, Gregory H.: *See—*
Tegeler, John J.; Rauckman, Barbara S.; Hamer, Russell R. L.; Freed, Brian S.; and Merriman, Gregory H., 5,557,006, Cl. 560-105.000.
Mertens, Donald E., to ITT Corporation. Height finding antenna apparatus and method of operation. 5,557,282, Cl. 342-123.000.
Mesmer, Ethan J.: *See—*
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Messelhi, Selim, to Communications Technology Corporation. Pole mounted terminal housing. 5,557,067, Cl. 174-59.000.
Messina, Vincent J.: *See—*
Witkowski, Todd R.; Messina, Vincent J.; Ball, Richard D.; and Filion, John T., 5,557,782, Cl. 395-550.000.
Mesterton, Erik P.: *See—*
Ansberry, Catherine M.; Freer, Jay D.; Fuqua, Todd W.; Mesterton, Erik P.; Stillwagon, Catherine A.; and Yang, Ching-Yun, 5,557,725, Cl. 395-153.000.
Metamorphosis Design & Development: *See—*
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Metrologic Instruments, Inc.: *See—*
Knowles, Carl H.; Naylor, Charles A.; and Bubnoski, David P., 5,557,093, Cl. 235-462.000.
Metzenauer, Peter: *See—*
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Metzger, Karl G.: *See—*
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Metzner, Tom: *See—*
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Meyer, Daniel G.: *See—*
Logan, Richard; Clark, Michael C.; and Meyer, Daniel G., 5,555,687, Cl. 52-288.010.
Meyers, Mark M.; and Wess, Raymond E., to Eastman Kodak Company. Digital printer using a modulated white light exposure source. 5,557,315, Cl. 347-244.000.
Mibu, Hiroyuki: *See—*
Kawashima, Yoichi; Ota, Atsutoshi; and Mibu, Hiroyuki, 5,556,841, Cl. 514-61.000.
Michalewski, David; and Krell, Ernest K., to Gemcor Engineering Corporation. Method and apparatus for positioning of tooling efficiently. 5,555,616, Cl. 29-509.000.
Michalos, Peter. Surgical needle holder for securing a needle at a selected position. 5,556,403, Cl. 606-148.000.
Michelotti, Francis W.: *See—*
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Michigan TransTech Corporation, The: *See—*
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Michiyuki, Hiromi; Ikeda, Hayato; Yokoi, Masanobu; and Kawamura, Hisato, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Multi-piston type refrigerant compressor with means for damping suction and discharge gas pulsation. 5,556,265, Cl. 417-312.000.
Micrel, Inc.: *See—*
Garnett, Martin E.; and Hsing, Michael R., 5,556,796, Cl. 437-31.000.
Micro Tec B.V.: *See—*
Van Der Est, N., 5,556,535, Cl. 210-140.000.
Micron Quantum Devices, Inc.: *See—*
Roohparvar, Frankie F.; and Chevallier, Christophe J., 5,557,576, Cl. 365-218.000.
Micron Technology, Inc.: *See—*
Edwards, Allan T.; Shirrod, Rebecca K.; and Callahan, Robin L., 5,557,780, Cl. 395-500.000.
Hinterlechner, Gerhard, 5,555,962, Cl. 192-12.00R.
Raad, George B.; and Casper, Stephen L., 5,557,579, Cl. 365-226.000.
Microsoft Corporation: *See—*
Hanson, Mark T.; and Bacon, Glade B., 5,557,440, Cl. 359-161.000.
Holt, Nick; and Thomas, Steve, 5,557,723, Cl. 395-149.000.
Lines, Andrew; Bamberger, Matthew C.; and Yamasaki, Brian H., 5,557,714, Cl. 395-137.000.
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Veltrop, Loren; and Friedl, Joel G., 5,556,201, Cl. 366-203.000.
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Maggio, Mark; Metzner, Tom; Eckerd, Steven; Skarky, Loren; Midori, Yoshiki; Hardie, Cal; and Yu, Ray, 5,555,619, Cl. 29-860.000.
Midwest Superconductivity, Inc.: *See—*
Sun, Guifu; Wong, Kai W.; and Xin, Ying, 5,556,830, Cl. 505-125.000.
Mielke, Burkhard: *See—*
Philipps, Thomas; Bartel, Stephan; Krebs, Andreas; Petersen, Uwe; Schenke, Thomas; Bremm, Klaus-Dieter; Endermann, Rainer; Metzger, Karl G.; and Mielke, Burkhard, 5,556,979, Cl. 546-123.000.
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Childers, Robert W.; Rickloff, James R.; Mielnik, Thaddeus J.; and Klobusnik, Kenneth J., 5,556,607, Cl. 422-300.000.
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Miklos, Joseph P.: *See—*
Landwehr, Tim A.; Mercer, Gary L.; and Miklos, Joseph P., 5,556,567, Cl. 219-779.000.
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Wieczorek, Rudi; Hahn, Dietrich; and Rohrmülle, Josef, 5,557,076, Cl. 178-19.000.
Miler, Daniel F.: *See—*
Wernberg, Donald E.; Molenaar, Gregory A.; and Miler, Daniel F., 5,555,720, Cl. 60-39.030.
Millan, Francisco R.: *See—*
Faircloth, Glynn T., Jr.; Millan, Francisco R.; Fernandez, Librada M. C.; and Sarabia, Cristina A., 5,556,777, Cl. 435-118.000.
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Miller, Donald G., to Hach Company. Manganese III method for chemical oxygen demand analysis. 5,556,787, Cl. 436-62.000.
Miller, Regis R.; Mellor, George E.; Norman, Theodore W., Sr.; Jamieson, Mary V.; Thompson, Michael J.; Sherrod, Willis, Sr.; Clarke, Dana H.; Webb, Jerome D.; and Wisniewski, Robert D., to General Metalcraft, Inc. Filing cabinet drawer. 5,556,180, Cl. 312-193.000.
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Leonhardt, Michael L.; and Milligan, Charles A., 5,557,484, Cl. 360-95.000.
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Jallerat, Eric; and Lemonnier, Jean, 5,556,591, Cl. 264-516.000.
Mills, Sturat D.: *See—*
Wayne, Michael G.; Smithers, Michael J.; Rayner, John W.; Faull, Alan W.; Pearce, Robert J.; Brewster, Andrew G.; Shute, Richard E.; Mills, Sturat D.; and Caulkett, Peter W. R., 5,556,977, Cl. 544-360.000.
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Kaneto, Keiichi; Min, Yonggang; and MacDiarmid, Alan G., 5,556,700, Cl. 428-332.000.
Minaki, Takashi: *See—*
Hasegawa, Hiroshi; Minaki, Takashi; and Koizumi, Yukinori, 5,557,327, Cl. 348-340.000.
Minami, Fumihiro, to Kabushiki Kaisha Toshiba. Method for distributing a clock signal within a semiconductor integrated circuit by minimizing clock skew. 5,557,779, Cl. 395-500.000.
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Kotaki, Kenji; Kitada, Hidekazu; and Minami, Kiyoshi, 5,557,527, Cl. 364-470.020.
Minamimura, Masaaki; Okada, Haruo; and Sakurada, Kikuo, to Nissei Plastic Industrial Co., Ltd. Crushing machine apparatus and a method for cleaning the crushing machine apparatus. 5,556,039, Cl. 241-18.000.
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Tahara, Masaaki; Senbokuya, Haruo; Kitano, Kenzo; Hayashida, Tadashi; and Minato, Teruo, 5,556,483, Cl. 148-206.000.
Mineau, Jean-Luc: *See—*
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Minebea Kabushiki-Kaisha: *See—*
Obara, Rikuro; and Tatsuno, Katashi, 5,556,209, Cl. 384-504.000.
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Zhang, Lei; Vijay, Hari M.; and Rode, Harold, 5,556,953, Cl. 536-23.740.
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Barlow, Charles G.; Johns, Peter R.; and Sills, Peter D., 5,556,742, Cl. 430-601.000.
Lee, Chong S.; and Buchanan, Scott J., 5,556,437, Cl. 51-298.000.
Perrington, Kenneth J.; and Kampfer, Robert D., 5,556,826, Cl. 503-200.000.
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Minolta Camera Kabushiki Kaisha: *See—*
Bungo, Keiichiro; Maruyama, Yoshinori; and Kubota, Norimasa, 5,556,185, Cl. 353-26.00R.
Kato, Tomokazu; Nomura, Keiichi; Nagatani, Kentaro; Maruta, Syuji; Takano, Yoshiaki; Araki, Kazuhiro; and Noda, Takashi, 5,557,391, Cl. 355-319.000.
Mukai, Hiromu; Maeda, Yasuo; Ohmori, Shigeto; and Ishihara, Jun, 5,557,358, Cl. 354-219.000.
Minolta Co., Ltd.: *See—*
Nagayasu, Keiko; Ikegawa, Akihito; Doi, Isao; and Yamamoto, Masashi, 5,557,375, Cl. 355-219.000.
Ojima, Seishi; Doi, Isao; and Osawa, Izumi, 5,557,372, Cl. 355-219.000.
Sakamoto, Kazuhiro; and Matsuura, Kuniya, 5,557,381, Cl. 355-260.000.
Mirochnik, Emmanuel A.: *See—*
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Misaizu, Setsuo, to Fujitsu Limited. Optical signal transmitter having an apc circuit with automatic bias current control. 5,557,445, Cl. 359-187.000.
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Kudo, Yasunori; Shibata, Manabu; and Misawa, Takahisa, 5,556,213, Cl. 400-621.000.
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Bidnyy, Sergei V.; Zavadtsev, Alexander A.; Mirochnik, Emmanuel A.; Mishchenko, Alexander V.; Pirozhenko, Vitaly M.; and Radchenko, Igor V., 5,557,109, Cl. 250-455.110.
Mishina, Koji. Battery operated vending machine for dispensing cylindrical and tetrahedron-shaped objects. 5,555,965, Cl. 194-217.000.
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Watanabe, Koji; Sugita, Toru; Kobayashi, Yasutomo; Shibao, Masaharu; and Mita, Akimitsu, 5,555,685, Cl. 52-204.597.
Mita Industrial Co. Ltd.: *See—*
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Maeda, Masahiko; Tomita, Shoji; Uyama, Masao; Nakashima, Masayuki; and Kitajima, Kenichiro, 5,557,380, Cl. 355-259.000.
Sato, Masaki; Kubota, Hiroshi; Morimoto, Kiyoshi; Nishimura, Takatoshi; Miyake, Takashi; and Shimosaka, Hisaki, 5,557,389, Cl. 355-315.000.
Mita, Juniti: *See—*
Momose, Yutaka; Fujiwara, Koji; and Mita, Juniti, 5,555,729, Cl. 60-517.000.
Mita, Masaaki; Sugimoto, Kenji; Sudoh, Seiji; Shioda, Katashi; and Kudoh, Moriyoshi, to Mitsubishi Chemical Corporation; and Mitsubishi Kasei Engineering Corporation. Apparatus for separating a liquid mixture by pervaporation. 5,556,539, Cl. 210-195.200.
Mitchell, William H.: *See—*
Molnar, Charles J.; Molnar, Judith R.; and Mitchell, William H., 5,555,674, Cl. 47-56.000.
Mitel Corporation: *See—*
Orchard-Webb, Jonathan H., 5,557,130, Cl. 257-359.000.
Mitrano, Richard: *See—*
Jenkins, Gary; Mitrano, Richard; and Vock, Curtis A., 5,556,327, Cl. 451-278.000.
Mitsubishi Chemical Corporation: *See—*
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Kimura, Motoko; Morita, Yasushi; Ogawa, Takahiro; and Terai, Tadashi, 5,556,848, Cl. 514-179.000.
Maruyama, Akira; Ogawa, Shigeru; Yamazaki, Satoshi; and Tobe, Akihiro, 5,556,851, Cl. 514-214.000.
Mita, Masaaki; Sugimoto, Kenji; Sudoh, Seiji; Shioda, Katashi; and Kudoh, Moriyoshi, 5,556,539, Cl. 210-195.200.
Tagawa, Toshiaki; Awane, Kaoru; and Nagaike, Kazuhiro, 5,556,948, Cl. 530-391.900.
Tanaka, Eiji; Urata, Hisao; and Oshiki, Toshiyuki, 5,557,026, Cl. 585-522.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Araya, Yukihiro; and Umeyama, Takehiko, 5,557,220, Cl. 327-28.000.
Ariyoshi, Shogo, 5,557,252, Cl. 338-195.000.
Kajimoto, Takeshi, 5,557,193, Cl. 323-282.000.
Kajiwara, Yasuya, 5,557,323, Cl. 348-140.000.

Kato, Tetsuo, 5,557,571, Cl. 365-189.050.
Kojima, Toshiharu, 5,557,222, Cl. 327-105.000.
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Kasahara, Yoshiyuki; Segawa, Hajime; Yamauchi, Mikio; Kuno, Toshihiro; Mizutani, Hiroshige; and Kawai, Yuzo, 5,556,321, Cl. 451-
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Kuba, Kazuki; Seguchi, Masaki; Ishimori, Akira; and Yamamoto, Takashi, 5,557,628, Cl. 372-70.000.
Matsushima, Tsutomu; and Sakakibara, Toshimitsu, 5,556,551, Cl. 219-69.120.
Miyanishi, Atushi; Matsumoto, Hisashi; and Tsujihashi, Yoshiki, 5,557,270, Cl. 341-50.000.
Morishita, Hiroaki, 5,556,554, Cl. 219-69.120.
Morita, Shigeki, 5,557,519, Cl. 364-424.010.
Nagai, Yutaka, 5,556,804, Cl. 437-129.000.
Oda, Hidekazu; Ueno, Shuichi; and Yamaguchi, Takehisa, 5,557,129, Cl. 257-345.000.
Yamaguchi, Yasuo; and Nishimura, Tadashi, 5,557,231, Cl. 327-534.000.
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Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Miichi, Yoshiki; Tanaka, Tadao; and Harara, Mitsuhiko, 5,557,525, Cl. 364-424.050.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Ishikawa, Kaneyasu; Mitsuura, Fumio; and Masuyama, Fujimitsu, 5,556,561, Cl. 219-137.0WM.
Shimazu, Hiroto; Bando, Takashi; and Tokuno, Masateru, 5,556,513, Cl. 162-304.000.

Mitsubishi Kasei Corporation: *See*—
Miyazawa, Chihiro; Mori, Tomoyuki; Kameo, Hiroshi; and Isogai, Shinji, 5,557,016, Cl. 568-909.500.

Mitsubishi Kasei Engineering Company: *See*—
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Mita, Masaaki; Sugimoto, Kenji; Sudoh, Seiji; Shioda, Katashi; and Kudoh, Moriyoshi, 5,556,539, Cl. 210-195.200.

Mitsuhashi, Masato; Cooper, Allan J.; Waterman, Michael S.; and Pevzner, Pavel A., to Hitachi Chemical Research Center, Inc. Ohgoprobe design-station: a computerized method for designing optimal DNA probes. 5,556,749, Cl. 435-6.000.

Mitsuhashi, Takamichi: *See*—
Nishigaki, Tetsuo; Mitsuhashi, Takamichi; and Yoshidaa, Takamichi, 5,557,422, Cl. 358-335.000.

Mitsui Mining & Smelting Co., Ltd.: *See*—
Hashiuchi, Masachika; Miyazono, Takeshi; Watanabe, Hiroyuki; and Yamanishi, Tadashi, 5,556,571, Cl. 252-62.560.

Mitsui Petrochemical Industries Ltd.: *See*—
Yamamoto, Kazuhito; Niimi, Hiroji; Yamamoto, Yoji; and Hatabu, Susumu, 5,556,675, Cl. 428-36.920.

Mitsui Toatsu Chemicals, Inc.: *See*—
Ajioka, Masanobu; Enomoto, Katashi; Yamaguchi, Akihiro; and Suzuki, Kazuhiko, 5,556,711, Cl. 428-460.000.

Mitsuura, Fumio: *See*—
Ishikawa, Kaneyasu; Mitsuura, Fumio; and Masuyama, Fujimitsu, 5,556,561, Cl. 219-137.0WM.

Mittermeir, Werner; and Black, Wayne J., to M3 Systems, Inc. Surgical needle with stress-relocation means. 5,556,410, Cl. 606-185.000.

Miura Dolphins Co., Ltd.: *See*—
Miura, Yuichiro; Hirano, Kazuo; Nate, Takayuki; Kambayashi, Taiji; Ohtsuka, Masahisa; and Nagai, Toshitake, 5,556,671, Cl. 428-15.000.

Miura, Katsuhito: *See*—
Matoba, Yasuo; Shimizu, Yasumi; Miura, Katsuhito; Kitano, Sojiro; Sakashita, Takahiro; and Tanaka, Hidekazu, 5,556,916, Cl. 525-64.000.

Miura, Morimichi; and Oota, Tadao, to Toyota Jidosha Kabushiki Kaisha. Suspension arm made of fiber reinforced plastic and manufacturing method thereof. 5,556,081, Cl. 267-47.000.

Miura, Shoji: *See*—
Sugisaka, Takayuki; Sakakibara, Toshio; Miura, Shoji; and Iida, Makio, 5,557,134, Cl. 257-506.000.

Miura, Yuichiro; Hirano, Kazuo; Nate, Takayuki; Kambayashi, Taiji; Ohtsuka, Masahisa; and Nagai, Toshitake, to Miura Dolphins Co., Ltd.; Tonen Corporation; Osaka Organic Chemical Industry Co., Ltd.; Tonen Chemical Corporation; Sanyo Electric Co., Ltd.; and Ohtsuka, Masahisa. Artificial snow in an aggregate form of snow granules. 5,556,671, Cl. 428-15.000.

Miwa, Kiyoshi: *See*—
Tsuchiya, Makoto; and Miwa, Kiyoshi, 5,556,776, Cl. 435-106.000.

Miyagawa, Fumihiro; and Yamazaki, Shuichi, to Ricoh Company, Ltd. Laser beam scanning apparatus for controlling diameter of light spot. 5,557,449, Cl. 359-212.000.

Miyagawa, Fumio: *See*—
Miyamoto, Takaharu; Miyagawa, Fumio; Ohashi, Yoji; and Saito, Tamio, 5,557,074, Cl. 174-152.0GM.

Miyakawa, Tsutomu; Nishihara, Hideki; Kuga, Takaaki; Shinohara, Kazunori; and Ishikawa, Makoto, to Hukuto Manufacturing Co., Ltd. Electric source control device of internal combustion engine drive vehicle. 5,555,864, Cl. 123-179.280.

Miyake, Hiroyuki: *See*—
Sakakida, Akihiro; Ohara, Hideo; Miyake, Hiroyuki; and Kaneshima, Kazunari, 5,556,034, Cl. 239-417.300.

Miyake, Takashi: *See*—
Sato, Masaki; Kubota, Hiroshi; Morimoto, Kiyoshi; Nishimura, Takatoshi; Miyake, Takashi; and Shimosaka, Hisaki, 5,557,389, Cl. 355-315.000.

Miyake, Toshio: *See*—
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Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, to Nikon Corporation. Camera equipped with data imprinting device. 5,557,354, Cl. 354-106.000.

Miyamoto, Hidenori: *See*—
Soshi, Isao; Miyamoto, Hidenori; Kato, Minoru; Omi, Junichi; Amanuma, Tatsuo; Asami, Jirou; and Imura, Yoshio, 5,557,357, Cl. 354-202.000.

Miyamoto, Junichi; Itoh, Yasuo; and Iwata, Yoshihisa, to Kabushiki Kaisha Toshiba. Non-volatile semiconductor memory device with verify mode for verifying data written to memory cells. 5,557,568, Cl. 365-185.220.

Miyamoto, Masaaki: *See*—
Nakamura, Norio; Ohkawa, Nobuyuki; Oshima, Takeshi; Miyamoto, Masaaki; and Iijima, Yasuteru, 5,556,852, Cl. 514-218.000.

Miyamoto, Takaharu; Miyagawa, Fumio; Ohashi, Yoji; and Saito, Tamio, to Fujitsu Limited; and Shinko Electric Industries Co., Ltd. Coaxial line assembly of a package for a high frequency element. 5,557,074, Cl. 174-152.0GM.

Miyamoto, Takahito: *See*—
Kousaka, Katsumi; Inoue, Takahiko; and Miyamoto, Takahito, 5,556,925, Cl. 525-440.000.

Miyanishi, Atushi; Matsumoto, Hisashi; and Tsujihashi, Yoshiki, to Mitsubishi Denki Kabushiki Kaisha. Dual conversion decoder. 5,557,270, Cl. 341-50.000.

Miyashita, Akimi; Fujii, Mutsumasa; and Hisadomi, Kenji, to Hitachi Techno Engineering Co., Ltd. Hot press for producing a multilayered substrate. 5,555,798, Cl. 100-93.00P.

Miyashita, Akira; Chiba, Takeshi; Nohira, Hiroyuki; and Takaya, Hidemasa, to Takasago International Corporation. Transition metal complex, process for the preparation of the same, and asymmetric hydrogenation catalyst comprising the same. 5,556,998, Cl. 556-21.000.

Miyashita, Atsushi, to Hitachi Denshi Kabushiki Kaisha. Coding and transmitting system. 5,557,540, Cl. 364-514.00R.

Miyashita, Sadamasa; and Zhang, Laiying, to Nippon Seiki K.K. Display panel. 5,557,295, Cl. 345-36.000.

Miyashita, Yoshiaki; Tabuchi, Takeshi; Yamazaki, Kouichi; Kikuchi, Nobuo; Matsumoto, Kentaro; Takahashi, Sadao; and Hayakawa, Tadashi, to Ricoh Company, Ltd. Cleaning system for charging drum of an image forming apparatus. 5,557,373, Cl. 355-219.000.

Miyauchi, Nobuyuki: *See*—
Masui, Katsushige; Miyauchi, Nobuyuki; Tani, Zenpei; Chikugawa, Hiroshi; Tsuji, Makoto; Ogawa, Masaru; and Shiomoto, Takehiro, 5,557,116, Cl. 257-100.000.

Miyauchi, Tadanobu: *See*—
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Miyazaki, Katsuhiko: *See*—
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Miyazaki, Mitsue; and Kojima, Fumitoshi, to Kabushiki Kaisha Toshiba. Method and system for magnetic resonance imaging. 5,557,202, Cl. 324-307.000.

Miyazaki, Sho: *See*—
Itou, Hikaru; Miyazaki, Sho; Tanaka, Tsutomu; Saito, Masashi; Yamada, Shinichi; Wakata, Shigekazu; and Saijo, Eiji, 5,556,284, Cl. 439-34.000.

Miyazawa, Azuma: *See*—
Kumishige, Keiji; and Miyazawa, Azuma, 5,557,363, Cl. 354-402.000.

Miyazawa, Chihiro; Mori, Tomoyuki; Kameo, Hiroshi; and Isogai, Shinji, to Mitsubishi Kasei Corporation. Process for producing alkadienols. 5,557,016, Cl. 568-909.500.

Miyazawa, Junichi: *See*—
Ikesugi, Hiroshi; and Miyazawa, Junichi, 5,556,286, Cl. 439-74.000.

Miyazawa, Shoichi: *See*—
Hirooka, Tsuguyoshi; Miyazawa, Shoichi; Horita, Ryutaro; Takashi, Terumi; and Uragami, Akira, 5,557,274, Cl. 341-155.000.

Miyazono, Takeshi: *See*—
Hashiuchi, Masachika; Miyazono, Takeshi; Watanabe, Hiroyuki; and Yamanishi, Tadashi, 5,556,571, Cl. 252-62.560.

Mizoguchi, Hakaru; Amada, Yoshiho; and Ito, Noritoshi, to Kabushiki Kaisha Komatsu Seisakusho. Laser device having an electrode with auxiliary conductor members. 5,557,629, Cl. 372-87.000.

Mizogui, Toyokazu: *See*—
Yamagata, Shigeo; and Mizogui, Toyokazu, 5,557,480, Cl. 360-33.100.

Mizrahi, Victor. *See*—
Alexander, Stephen B.; Chaddick, Steve W.; and Mizrahi, Victor, 5,557,439, Cl. 359-130.000.

Mizukami, Mitsuo: *See*—
Sakata, Kazunari; Tago, Kenji; and Mizukami, Mitsuo, 5,556,275, Cl. 432-241.000.

Mizuno, Tomoaki: *See*—
Watanabe, Atsushi; Kamiya, Hitoshi; Nakada, Eiji; Mizuno, Tomoaki; Kago, Yoshiyuki; Murase, Tokutaro; and Inukai, Yoshihiko, 5,557,096, Cl. 235-492.000.

Mizutani, Hikaru; Maehara, Yoshimi; Nishijima, Tatsumi; Takeda, Hidekazu; Ogiro, Kenji; and Kaku, Nobuyuki, to Hitachi Maxell, Ltd.; and Hitachi, Ltd. Tape cartridge having a front lid with a covering wall. 5,556,051, Cl. 242-347.100.

Mizutani, Hiroshige: *See*—

Kasahara, Yoshiyuki; Segawa, Hajime; Yamauchi, Mikio; Kuno, Toshihiro; Mizutani, Hiroshige; and Kawai, Yuzo, 5,556,321, Cl. 451-5.000.

Mizutani, Kei: *See*—
Etchu, Masami; Murooka, Hirofumi; Mizutani, Kei; and Handa, Makoto, 5,556,691, Cl. 428-141.000.

Mizyurina, Galina T.: *See*—
Shchetanov, Boris V.; Mizyurina, Galina T.; Gribkov, Vladimir N.; Shalin, Radii E.; and Kachanov, Evgueni B., 5,556,586, Cl. 264-62.000.

Mladejovsky, Michael G.: *See*—
Jacobsen, Stephen C.; Mladejovsky, Michael G.; and Wood, John E., 5,557,185, Cl. 318-568.160.

Mladek, Milos; Tesar, Oldrich; Kaplan, Jaroslav; Pirkl, Ladislav; and Musil, Dobroslav, to Rieter Elitex. Combing roller. 5,555,714, Cl. 57-408.000.

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Johnson, Sam; Ashe, Cecil W.; and Yates, Jesse B., 5,557,254, Cl. 340-426.000.

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Johnson, Timothy; Moireau, Patrick; and Mager, Gunther, 5,556,045, Cl. 242-18.00G.

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Wechsler, Mark; Barney, Howard H.; Kaye, Roger A.; Ogle, David G.; Lacy, Michael M.; Chow, Calvin Y.; Crawford, Kimberly L.; and Hafeman, Dean G., 5,557,398, Cl. 356-318.000.

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Wernberg, Donald E.; Molenaar, Gregory A.; and Miler, Daniel F., 5,555,720, Cl. 60-39.030.

Molex Incorporated: *See*—
Ikesugi, Hiroshi; and Miyazawa, Junichi, 5,556,286, Cl. 439-74.000.

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Seim, Albert D., II; Steinbuchel, Herman J.; and Willing, Charles R., 5,556,236, Cl. 406-3.000.

Molis, Steven E.: *See*—
Afzali-Ardakani, Ali; Ayala-Esquilin, Juan; Braren, Bodil E.; Daijavad, Shahrokh; Foster, Elizabeth; Hedrick, James L., Jr.; Hedrick, Jeffrey C.; Hodgson, Rodney T.; Mehta, Ashit A.; Molis, Steven E.; Shaw, Jane M.; Tisdale, Stephen L.; and Viehbeck, Alfred, 5,556,899, Cl. 523-215.000.

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Rönnberg, Peter, 5,556,393, Cl. 604-385.200.

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Foster, Derek J.; Gillbanks, Peter J.; and Moloney, Keith C., 5,556,257, Cl. 416-241.00R.

Moloney, Rodger T.: *See*—
Ingalls, Rex K.; Casey, Harold H.; and Moloney, Rodger T., 5,556,522, Cl. 204-269.000.

Molpus, J. Lane: *See*—
Levinthal, Adam; Werner, Ross; and Molpus, J. Lane, 5,557,302, Cl. 345-189.000.

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Loewen, Eric P.; and White, Arthur W., 5,555,822, Cl. 110-237.000.

Momochi, Nobuchika: *See*—
Ebihara, Norio; Asamizuya, Noboru; and Momochi, Nobuchika, 5,557,413, Cl. 358-296.000.

Momont, Timothy W.: *See*—
Chocola, Caryl M.; Momont, Timothy W.; and Bird, Charles R., 5,555,842, Cl. 119-51.110.

Momose, Yutaka; Fujiwara, Koji; and Mita, Juniti, to Aisin Seiki Kabushiki Kaisha. Stirling engine. 5,555,729, Cl. 60-517.000.

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Noristi, Luciano; and Baruzzi, Giovanni, 5,557,025, Cl. 585-522.000.

Montgomery, Gerald: *See*—
Jungo, Charles; Montgomery, Gerald; and Gerdes, Richard C., 5,557,333, Cl. 348-473.000.

Monti, Marco, to SGS-Thomson Microelectronics S.r.l. Integrated circuit with bidirectional pin. 5,557,236, Cl. 327-565.000.

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Kohler, Anja S.; Mooradian, Daniel L.; and Furcht, Leo T., 5,556,632, Cl. 424-423.000.

Moore, Allan B.: *See*—
Fehskens, Leonard G.; Strutt, Colin; Callander, Jill F.; Nelson, Kathy J.; Guertin, Matthew J.; Sylor, Mark W.; Chapman, Kenneth W.; Schuchard, Robert C.; Goldfarb, Stanley I.; Rogers, Dennis O.; O'Brien, Linsey B.; Chan-Lizardo, Christine C.; England, Benjamin M.; Rosenbaum, Richard L.; Kohls, Ruth E. J.; Aronson, David L.; Moore, Allan B.; Ross, Robert R. N.; Smith, Danny L.; Sankar, Arundahati G.; Koning, G. Paul; Namoglu, Sheryl F.; Seger, Mark J.; Dixon, Timothy M.; and Harrow, Jeffrey R., 5,557,796, Cl. 395-650.000.

Moore Business Forms, Inc.: *See*—
Paroff, Paul J., 5,557,307, Cl. 347-34.000.

Moore, Dan T., III; James, Deborah L.; Wheeler, Maurice E.; Weber, William H.; and Hoover, James W., to Polymer Innovations, Inc. Method of producing custom-fitting articles and composition for the use therewith. 5,555,584, Cl. 12-142.00N.

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Moore, William P., to Vigoro Corporation, The. Preparation of near-neutral anionic salt feed minerals. 5,556,634, Cl. 424-438.000.

Moorhouse, Abigail A.; Fairley, Christopher R.; Rigg, Phillip R.; and Helgesson, Alan, to Ultrapointe Corp. Method and structure for generating a surface image of a three dimensional target. 5,557,113, Cl. 250-559.380.

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Morehead, John H.: *See*—
Rosene, Ronald G.; Morehead, John H.; and Timp, Richard L., 5,555,759, Cl. 72-179.000.

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Morgan, Robert E. Craft hoop assembly. 5,555,653, Cl. 38-102.200.

Mori, Atsushi: *See*—
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Mori, Hiroaki: *See*—
Sakai, Toshiharu; Nakamura, Yoshinori; Umegaki, Takashi; Iguchi, Nobuo; Hagino, Miki; Mori, Hiroaki; Ota, Toshikazu; Oka, Akihiko; Takatsu, Kazuo; and Nemoto, Nobuyuki, 5,557,437, Cl. 359-110.000.

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Koda, Tadashi; Hara, Masao; Ueki, Kiyosuke; and Mori, Kei, 5,556,888, Cl. 521-44.500.

Mori, Tomoyuki: *See*—
Miyazawa, Chihiro; Mori, Tomoyuki; Kameo, Hiroshi; and Isogai, Shinji, 5,557,016, Cl. 568-909.500.

Morigaki, Masakazu: *See*—
Suga, Yoichi; Ishii, Yoshio; and Morigaki, Masakazu, 5,556,741, Cl. 430-569.000.

Morimoto, Kiyoshi: *See*—
Sato, Masaki; Kubota, Hiroshi; Morimoto, Kiyoshi; Nishimura, Takatoshi; Miyake, Takashi; and Shimosaka, Hisaki, 5,557,389, Cl. 355-315.000.

Morimoto, Takao: *See*—
Fujiwa, Takaaki; Tabuchi, Takeharu; Matsui, Hideki; Nakano, Shinji; Yamada, Shin-ya; and Morimoto, Takao, 5,556,927, Cl. 525-533.000.

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Igarashi, Kazuo; Takano, Kengo; Morita, Toshiharu; Saito, Hiroaki; Hashizume, Yukio; Suzuki, Tokio; Tashiro, Hirohisa; Muramoto, Mituru; and Sato, Katsunori, 5,556,527, Cl. 204-488.000.
Morita, Yasushi: *See*—
Kimura, Motoko; Morita, Yasushi; Ogawa, Takahiro; and Terai, Tadashi, 5,556,848, Cl. 514-179.000.
Moriya, Kazuyoshi: *See*—
Jun, Henry K.; Liu, Chun L.; Yang, Lin; and Moriya, Kazuyoshi, 5,557,532, Cl. 364-491.000.
Moriyama, Yutaka: *See*—
Kujirai, Toshisada; Ito, Kaoru; Koga, Yoshiaki; Moriyama, Yutaka; Takeshita, Norimitsu; Ohira, Yuji; and Ono, Takahiro, 5,555,739, Cl. 62-244.000.
Moroboshi, Kunichika: *See*—
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Morosov, Igor Y.: *See*—
Wu, Ying; Ryabova, Lyubov A.; Kurnasov, Oleg V.; Morosov, Igor Y.; Ugarov, Viktor I.; Volianik, Elena V.; Chetverin, Alexander B.; Zhang, David; Kramer, Fred R.; and Spirin, Alexander S., 5,556,769, Cl. 435-69.100.
Morris, Joseph W., to Sealed Air Corporation. Bag separator and dispenser. 5,556,019, Cl. 225-96.000.
Morrison, Charles B., to International Business Machines Corporation. Quantum well superluminescent diode. 5,556,795, Cl. 437-23.000.
Morrison, Ward D.; and Coombs, Perry L., to Cannon Industries, Inc. Rock bolter. 5,556,235, Cl. 405-303.000.
Morrison, William S., III; and Ashton, Clint, to Morrison, III, William S. Filament wound architectural column. 5,555,696, Cl. 52-737.100.
Morse, Kenneth: *See*—
Garrett, Michael J.; Key, Andrew; and Morse, Kenneth, 5,557,728, Cl. 395-157.000.
Mortazavi, Said; and Vogel, Alan, to Pacesetter, Inc. Input protection circuit for pacemaker activity sensor processing circuitry. 5,556,420, Cl. 607-9.000.
Mortazavi, Saviz: *See*—
Volchek, Konstantin; Mortazavi, Saviz; and Whittaker, Harry, 5,556,545, Cl. 210-651.000.
Mortimer, Richard A.: *See*—
Blasko, Richard G.; and Mortimer, Richard A., 5,556,272, Cl. 431-75.000.
Morton International, Inc.: *See*—
Amirsakis, Charles J.; Vietti, David E.; Heberer, Daniel P.; Dolmon, Louis C.; and Picchiotti, Lawrence, 5,556,698, Cl. 428-323.000.
Fulmer, Brian H., 5,556,130, Cl. 280-741.000.
Ricks, Merle K.; Sorenson, Janiel; Duran, John A.; and Vargas, Javier, 5,556,125, Cl. 280-728.200.
Rink, Linda M.; and Hock, Christopher, 5,556,439, Cl. 55-487.000.
Mosher, Gary M. Door hinge alignment apparatus. 5,555,605, Cl. 16-247.000.
Moss, Billy. Tractor mounted lifting apparatus. 5,556,245, Cl. 414-24.500.
Motan Holding GmbH: *See*—
Kramer, Walter; and Kühnau, Holger, 5,555,636, Cl. 34-86.000.
Motay Electronics, Inc.: *See*—
Rhodes, James V., 5,557,559, Cl. 364-580.000.
Motloch, Wallace M. Body-worn orthopedic device that includes individual connected modules, and a method of manufacturing and designing such an orthopedic device. 5,556,373, Cl. 602-6.000.
Motoda, Hiroshi: *See*—
Kawaguchi, Atsuo; and Motoda, Hiroshi, 5,557,771, Cl. 395-490.000.
Motomura, Yoshihiro; and Tetsuhiro, Suzuki, to NEC Corporation. Magnetoresistive head. 5,556,718, Cl. 428-694.00R.
Motorola: *See*—
Grodzinski, Piotr; Lebby, Michael S.; and Lee, Hsing-Chung, 5,557,626, Cl. 372-45.000.
Motorola, Inc.: *See*—
Adler, Steven J.; Hawkins, George W.; Lesk, Israel A.; Pegler, Peter L.; and Pirastehfar, Hassan, 5,556,793, Cl. 437-11.000.
Barlett, Ian; and Bishop, Peter W. D., 5,557,603, Cl. 370-16.000.
Capurka, Zbynek A., 5,557,191, Cl. 320-48.000.
Contreras, Michael A.; and Anderson, Robert E., 5,556,506, Cl. 156-625.100.
FitzGerald, Mark R.; and Griffin, Craig T., 5,556,281, Cl. 434-16.000.
Fox, Mark T., 5,557,615, Cl. 370-105.100.
Gilmore, Peter B.; and Thompson, Kenneth R., 5,557,142, Cl. 257-659.000.
Grube, Gary W.; Bunkenburg, Brian K.; and Naddell, Marc C., 5,557,605, Cl. 370-29.000.
Isern-Flecha, Ileana; Swirbel, Thomas J.; Pennisi, Robert W.; Ross, Danny E.; Naujoks, Adolph; and Alarcon, Angelita, 5,557,064, Cl. 174-35.0MS.
Jackson, Greg D.; Jensen, Tyler D.; and Castaneda, Julio C., 5,557,079, Cl. 200-5.00A.
McCoy, Danny O.; Garay, Oscar; and McMillan, Stanton B., 5,557,293, Cl. 343-867.000.
Pinkston, William J., II; Polk, Charles E., Jr.; and Reed, Douglas D., 5,557,735, Cl. 395-180.000.
Pombo, Raul; Borras, Jaime; and Bron, Michel, 5,557,743, Cl. 395-186.000.
Pottala, James V.; and Ford, Robert B., 5,557,287, Cl. 343-702.000.
Salvi, Raul, 5,557,244, Cl. 332-128.000.
Wetherell, John T., 5,557,242, Cl. 331-17.000.
Williams, William M.; Vasquez, Barbara; Begay, Marlene J.; and Thompson, Patrick, 5,556,808, Cl. 437-209.000.
Wright, Charles G.; and Alvarez, Jose M., 5,557,224, Cl. 327-115.000.
Mottahed, Behzad D., to Lucent Technologies Inc. Electronic component enclosure for RF shielding. 5,557,063, Cl. 174-35.0GC.
Motzko, Andrew R., to Wagner Spray Tech Corporation. Adjustable constant pressure caulk gun. 5,556,009, Cl. 222-326.000.
Moultrie, Daniel L. Golf club and golf shoe cleaning device. 5,555,589, Cl. 15-105.000.
Mousepad Innovations Inc.: *See*—
Dickie, Robert G., 5,556,061, Cl. 248-51.000.
Mower, Barry D.; and Matherne, Lonny R., to Lifetime Products, Inc. Apparatus and method for packaging a basketball goal system with weight-fillable base. 5,556,088, Cl. 273-1.50R.
Mozes, Edna: *See*—
Singer, Dinah S.; Kohn, Leonard; Mozes, Edna; Saji, Motoyasu; Weissman, Jocelyn; Napolitano, Giorgio; and Ledley, Fred D., 5,556,754, Cl. 435-6.000.
Mrotzeck, Uwe: *See*—
Russ, Werner H.; Hussong, Kurt; Krieger, Karl; and Mrotzeck, Uwe, 5,556,435, Cl. 8-549.000.
MTU Motoren- Und Turbinen-Union Muenchen GmbH: *See*—
Zielinski, Michael; and Ziller, Gerhard, 5,557,099, Cl. 250-227.110.
Muderlak, Kenneth J.: *See*—
Sheih, Rocky; and Muderlak, Kenneth J., 5,555,906, Cl. 137-240.000.
Mudgett, Dan S.: *See*—
Gephardt, Douglas D.; Mudgett, Dan S.; and MacDonald, James R., 5,557,757, Cl. 395-306.000.
Mueller, Gunther; Fink, Herbert; and Heyne, Joachim, to Roehm GmbH Chemische Fabrik. Dispersions for pressure sensitive adhesives containing alkyl (meth) acrylates. 5,556,922, Cl. 525-260.000.
Mueller, Hans-Joachim; Evertz, Kaspar; Weber, Siegfried; Funk, Guido; Konrad, Rainer; and Saive, Roland, to BASF Aktiengesellschaft. Phillips catalyst and its use for the preparation of ethylene/α-olefin copolymers. 5,557,021, Cl. 585-513.000.
Muendlein, Werner; and Scheer, Gerhard, to Komet Praezisionswerkzeuge Robert Breuning GmbH. Lathe tool. 5,555,784, Cl. 82-158.000.
Mukai, Hiromu; Maeda, Yasuo; Ohmori, Shigeto; and Ishihara, Jun, to Minolta Camera Kabushiki Kaisha. Camera having an electronic viewfinder for displaying an object image under different photographic conditions. 5,557,358, Cl. 354-219.000.
Mukawa, Hiroshi; and Eto, Hiroshi, to Sony Corporation. Disc recording and/or reproducing apparatus that positions the magnetic head in response to a type of disc. 5,557,589, Cl. 369-13.000.
Mukoyama, Masahi: *See*—
Dzau, Victor; and Mukoyama, Masahi, 5,556,780, Cl. 435-240.200.
Mul, Johannes M.: *See*—
Zee, Fransiscus W. M.; Mul, Johannes M.; and Hordijk, Arie C., 5,557,015, Cl. 564-464.000.
Mulderer, Jürgen: *See*—
Nähring, Herbert; Wolf, Hans; and Mulderer, Jürgen, 5,556,477, Cl. 118-728.000.
Müller, Helmut E.: *See*—
Sinnhuber, Ruprecht; and Müller, Helmut E., 5,556,128, Cl. 280-730.200.
Müller, Leopold: *See*—
Mayr, Bertold; Müller, Leopold; and Böhme, Joachim, 5,555,861, Cl. 123-90.160.
Mullinax, Rebecca L.: *See*—
Sorge, Joseph A.; and Mullinax, Rebecca L., 5,556,772, Cl. 435-91.200.
Mullins, Gene; Jiang, Zemin; and Piccirilli, Art P., to Fleetguard, Inc. Pressure-actuated radial air filter seal. 5,556,440, Cl. 55-498.000.
Mullock, Daniel: *See*—
Raudales, Gustavo; Fernandez, Raul; Sanabria, Franklin; Barsallo, Rodrigo; Chong, Salomon; Howell, Elmer; Rodriguez, Francisco; Petersen, Randall; and Mullock, Daniel, 5,556,658, Cl. 426-411.000.
Munneke, Christiaan A.; and van der Werff, Jeichienus A., to Hadewe B.V. Method for assembling a postal item as well as a system and an aligning station for carrying out this method. 5,556,086, Cl. 270-46.000.
Munnerlyn, Charles R.: *See*—
Shimmick, John K.; Telfair, William B.; Munnerlyn, Charles R.; and Glockler, Herrmann J., 5,556,395, Cl. 606-4.000.
Munro, Frederick; Dailey, Aaron; Allen, Scott; and Trachy, David, to Storage Technology Corporation. Task priontization for a tape storage system. 5,557,528, Cl. 364-478.020.
Munson, Gary A.: *See*—
Burns, Elaine G.; Davenport, Esther L.; Manseur, Belkacem; Munson, Gary A.; Seip, Barry S.; and Sze, Elaine I., 5,557,664, Cl. 379-114.000.
Münzebrock, Anton: *See*—
Dreher, Herbert; Hülsmann, Michael; Münzebrock, Anton; and Persico, Guiliano, 5,555,957, Cl. 187-233.000.
Murai, Fumio: *See*—
Okamoto, Yoshihiko; Yoda, Haruo; Takada, Ikuo; Shibata, Yukinobu; Hirakawa, Akira; Saitou, Norio; Okazaki, Shinji; and Murai, Fumio, 5,557,314, Cl. 347-230.000.
Murakami, Eiji: *See*—
Oishi, Katsuyoshi, 5,557,476, Cl. 359-841.000.
Murakami, Hiroshi: *See*—

Otani, Satoshi; Kirimura, Hiroya; Kuwahara, Hajime; Tabata, Takao; Nakahigashi, Takahiro; and Murakami, Hiroshi, 5,556,474, Cl. 118-723.00E.
Muramoto, Mituru: *See*—
Igarashi, Kazuo; Takano, Kengo; Morita, Toshiharu; Saito, Hiroaki; Hashizume, Yukio; Suzuki, Tokio; Tashiro, Hirohisa; Muramoto, Mituru; and Sato, Katsunori, 5,556,527, Cl. 204-488.000.
Muranaka, Yasuaki: *See*—
Nakamura, Hiroshi; Muranaka, Yasuaki; Ishibashi, Susumu; and Kihara, Toshiyuki, 5,557,443, Cl. 359-142.000.
Muraoka, Masami; Matsui, Kazuki; Hasegawa, Hirohiko; and Kojima, Atsuyuki, to Sumitomo Pharmaceuticals Co., Ltd. Quinazolinone derivatives possessing calcium uptake inhibiting activity. 5,556,860, Cl. 514-258.000.
Murase, Tokutaro: *See*—
Watanabe, Atsushi; Kamiya, Hitoshi; Nakada, Eiji; Mizuno, Tomoaki; Kago, Yoshiyuki; Murase, Tokutaro; and Inukai, Yoshihiko, 5,557,096, Cl. 235-492.000.
Murata, Hiroyasu: *See*—
Kaku, Takashi; and Murata, Hiroyasu, 5,557,632, Cl. 375-340.000.
Murata, Kazuharu: *See*—
Nozoe, Yoshiteru; and Murata, Kazuharu, 5,556,533, Cl. 205-777.500.
Murata, Kazuhisa; and Ushijima, Hirobumi, to Agency of Industrial Science And Technology. Aromatization process. 5,557,022, Cl. 585-407.000.
Murata Kikai Kabushiki Kaisha: *See*—
Nakade, Kazuhiko, 5,555,712, Cl. 57-264.000.
Murata Manufacturing Co., Ltd.: *See*—
Ishihara, Jinsei; and Sakai, Shuuichi, 5,557,246, Cl. 333-206.000.
Ishitoko, Nobuyuki; and Kumada, Akira, 5,557,045, Cl. 73-504.140.
Takaoka, Yuichi, 5,557,251, Cl. 338-22.00R.
Murofushi, Yoshinobu: *See*—
Kaneko, Masakatsu; Murofushi, Yoshinobu; Kimura, Misako; Yamazaki, Mitsuo; and Iijima, Yasuteru, 5,556,975, Cl. 544-277.000.
Murooka, Hirofumi: *See*—
Etchu, Masami; Murooka, Hirofumi; Mizutani, Kei; and Handa, Makoto, 5,556,691, Cl. 428-141.000.
Murphy, Christopher J.: *See*—
Babaian-Kibala, Elizabeth; Braden, Veronica K.; Poindexter, Michael K.; and Murphy, Christopher J., 5,556,575, Cl. 252-394.000.
Murphy, James C.; Goodge, Kevin; and Hlebovy, Jim, to Essef Corporation. Fitting installation process. 5,556,497, Cl. 156-172.000.
Murphy, Timothy F., to Research Foundation of State University of New York, The. Method for detecting *Branhamella catarrhalis*. *5,556,755, Cl. 435-6.000.*
Musa, John S. Proximity alert and direction indicator. 5,557,259, Cl. 340-573.000.
Musha, Yosinori: *See*—
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Musil, Dobroslav: *See*—
Mladek, Milos; Tesar, Oldrich; Kaplan, Jaroslav; Pirkl, Ladislav; and Musil, Dobroslav, 5,555,714, Cl. 57-408.000.
Mussell, Robert D.: *See*—
Devore, David D.; Timmers, Francis J.; Stevens, James C.; Mussell, Robert D.; Crawford, Lenore H.; and Wilson, David R., 5,556,928, Cl. 526-127.000.
Muto, Akira, to Matsushita Electric Industrial Co., Ltd. Apparatus for intermittently recording and/or reproducing a time-varying image. 5,557,419, Cl. 358-335.000.
Muto, Robert A.: *See*—
Pool, James L.; Muto, Robert A.; and Perkins, Ronald J., 5,555,781, Cl. 81-436.000.
Mutoh, Nobuyoshi: *See*—
Naito, Shotaro; Obara, Sanshiro; and Mutoh, Nobuyoshi, 5,557,181, Cl. 318-376.000.
Mutou, Shigeo: *See*—
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Imura, Satoshi; Nagoh, Hironobu; and Kuramoto, Kazuhiko, 5,556,931, Cl. 526-323.100.
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Chi, Tom Y.; Hou, Liping D.; Lee, Kusol; Li, Danny; Naik, Ishver K.; and Quach, Tom, 5,556,797, Cl. 437-405.000.
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Nakagawa, Masahiro; Nakamura, Tetsuro; Fujiwara, Shinji; and Tanaka, Eiichiro, to Matsushita Electric Industrial Co., Ltd. Direct-contact type
Nakanishi, Kenji; Yajima, Takatoshi; Araki, Hiromitsu; Kobayashi, Hideyuki; Ohkubo, Yoshioki; Hashimura, Tetsutaro; and Naito, Hiroshi, to Konica

Voss, Mark G.; and Harvey, William O., 5,555,956, Cl. 184-6.160.
Narukawa, Satoshi; Amazutsumi, Toru; Tamaki, Hiyoshi; and Yamauchi, Yasuhiro, to Sanyo Electric Co., Ltd. Tightly sealed prismatic battery.
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Bock, Glenn H.; Nelson, David L.; Kurman, Carole C.; and Fleisher, Thomas A., 5,556,947, Cl. 530-391.300.

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Otani, Satoshi; Kirimura, Hiroya; Kuwahara, Hajime; Tabata, Takao; Nakahigashi, Takahiro; and Murakami, Hiroshi, 5,556,474, Cl. 118-723.00E.
Nakai, Kiyoshi: *See*—
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Nakajima, Fumio; and Watanabe, Satoshi, to Okaya Electric Industries Co., Ltd. Gas-discharging type display device and a method of manufacturing. 5,557,168, Cl. 313-586.000.
Nakajima, Hiroki: *See*—
Matsuoka, Yutaka; Sano, Eiichi; Kurishima, Kenji; Nakajima, Hiroki; and Ishibashi, Tadao, 5,557,117, Cl. 257-184.000.
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Nakajima, Isao: *See*—
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Nakajima, Yasuhisa, to Sony Corporation. Video recording and/or reproducing apparatus that records a signal indicating aspect ratio. 5,557,336, Cl. 348-556.000.
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Nakamura, Hiroaki, to Fuji Photo Film Co., Ltd. Method of extracting characteristic image data and color data conversion device for image processing apparatus. 5,557,688, Cl. 382-164.000.
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Nakamura, Katsutoshi: *See*—
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Nakamura, Kazuyuki: *See*—
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Nakamura, Norio; Ohkawa, Nobuyuki; Oshima, Takeshi; Miyamoto, Masaaki; and Iijima, Yasuteru, to Sankyo Company, Limited. N-acryloylpiperazine compounds. 5,556,852, Cl. 514-218.000.
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Nakamura, Tetsuya; and Fukuyama, Hirotaka, to Kabushiki Kaisha Toshiba. Image forming apparatus having a toner conveyance regulator. 5,557,379, Cl. 355-259.000.
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Nakamura, Yoshinori: *See*—
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Nakanishi, Kenji; Yajima, Takatoshi; Araki, Hiromitsu; Kohayashi, Hideyuki; Ohkubo, Yoshioki; Hashimura, Tetsutaro; and Naito, Hiroshi, to Konica Corporation. Photographic support. 5,556,739, Cl. 430-533.000.
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Nakano, Masao: *See*—
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Nakano, Shinji: *See*—
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Nakano, Yukio; Kozaki, Takahiko; Gohara, Shinobu; and Ashi, Yoshihiro, to Hitachi, Ltd. ATM switch and control method thereof. 5,557,621, Cl. 371-37.100.
Nakashima, Keishi; and Senuma, Masamitsu, to Alps Electric Co., Ltd. Flexible cable for floating type magnetic head device. 5,557,489, Cl. 360-104.000.
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Nakashima, Yoshihiro: *See*—
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Nakatani, Yoshinori: *See*—
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Nakayama, Masatoshi; Nakano, Masahiro; and Endo, Tsukimi, to TDK Corporation. Wear-resistant protective film for thermal head and method of producing the same. 5,557,313, Cl. 347-203.000.
Nakayama, Okihiko; Grom, Brian R.; Iwasaki, Masayasu; and Tsuda, Hiroshi, to Nissan Motor Co., Ltd. Apparatus and method for guiding vehicle occupant to travel from present position of vehicle to set destination through display unit. 5,557,522, Cl. 364-424.020.
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Namba, Hideki: *See*—
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Nampak Products Limited: *See*—
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Nanno, Kunio; Mori, Atsushi; and Sugimoto, Akinori, to Honda Giken Kogyo Kabushiki Kaisha. Parking brake system. 5,555,773, Cl. 74-512.000.
Napiorkowski, John J.: *See*—
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Nartron Corporation: *See*—

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Narukawa, Satoshi; Amazutsumi, Toru; Tamaki, Hiyoshi; and Yamauchi, Yasuhiro, to Sanyo Electric Co., Ltd. Tightly sealed prismatic battery. 5,556,722, Cl. 429-163.000.
Näslund, Jonas; Johansson, Thomas; and Dahlström, Johan, to Telefonaktiebolaget LM Ericsson. Authentication for analog communication systems. 5,557,676, Cl. 380-23.000.
Nate, Takayuki: *See*—
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National Machinery Company, The: *See*—
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National Recovery Technologies, Inc.: *See*—
Sommer, Edward J., Jr.; Kittel, Michael A.; and Quarles, Ronald A., 5,555,984, Cl. 209-580.000.
National Research Council of Canada: *See*—
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National Semiconductor Corp.: *See*—
Bergemont, Albert; and Chi, Min-hwa, 5,557,567, Cl. 365-185.160.
Kuo, James R., 5,557,223, Cl. 327-108.000.
Natsume, Kazunori; and Taki, Nobuhiro, to Koito Manufacturing Co., Ltd. Vehicular lamp having glittering appearance. 5,556,194, Cl. 362-299.000.
Nauerth, Arno, to Bruker Medizintechnik GmbH. Magnetic resonance imaging with combined back projection and fourier transformation method. 5,557,203, Cl. 324-309.000.
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Naumann, Hans J.; Robotta, Reinhard; Schröter, Gunter; and Oesterreich, Rolf, to Niles-Simmons Industrieanlagen GmbH. Apparatus for measuring the contours of a wheel. 5,555,632, Cl. 33-203.000.
Nawata, Makoto: *See*—
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Nawrath, Nikolaus, to Man Roland Druckmaschinen AG. Roller assembly in an inking unit or a damping unit of a rotary printing machine. 5,555,806, Cl. 101-148.000.
Nayeshiro, Hidekazu: *See*—
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Maruyama, Muneo; Ueno, Toshihiko; Hada, Hiroshi; and Baba, Masatake, 5,557,433, Cl. 359-41.000.
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Richardson, Charles A.; Bernstein, Michael; Okikawa, Jerry K.; and Bennett, Terrence R., 5,555,882, Cl. 128-633.000.
Nelson, David L.: *See*—
Bock, Glenn H.; Nelson, David L.; Kurman, Carole C.; and Fleisher, Thomas A., 5,556,947, Cl. 530-391.300.
Nelson, John D.: *See*—
Frey, Ronald G.; and Nelson, John D., 5,557,513, Cl. 364-401.00R.
Nelson, Kathy J.: *See*—
Fehskens, Leonard G.; Strutt, Colin; Callander, Jill F.; Nelson, Kathy J.; Guertin, Matthew J.; Sylor, Mark W.; Chapman, Kenneth W.; Schuchard, Robert C.; Goldfarb, Stanley I.; Rogers, Dennis O.; O'Brien, Linsey B.; Chan-Lizardo, Christine C.; England, Benjamin M.; Rosenbaum, Richard L.; Kohls, Ruth E. J.; Aronson, David L.; Moore, Allan B.; Ross, Robert R. N.; Smith, Danny L.; Sankar, Arundahati G.; Koning, G. Paul; Namoglu, Sheryl F.; Seger, Mark J.; Dixon, Timothy M.; and Harrow, Jeffrey R., 5,557,796, Cl. 395-650.000.
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Sakai, Toshiharu; Nakamura, Yoshinori; Umegaki, Takashi; Iguchi, Nobuo; Hagino, Miki; Mori, Hiroaki; Ota, Toshikazu; Oka, Akihiko; Takatsu, Kazuo; and Nemoto, Nobuyuki, 5,557,437, Cl. 359-110.000.
Nemoto, Peter A.: *See*—
Strupczewski, Joseph T.; Helsley, Grover C.; Glamkowski, Edward J.; Chiang, Yulin; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., 5,556,858, Cl. 514-254.000.
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NeoPath, Inc.: *See*—
Ortyn, William E.; Hayenga, Jon W.; and Piloco, Louis R., 5,557,097, Cl. 250-201.300.
Neopost Ltd.: *See*—
Herbert, Raymond J., 5,557,708, Cl. 395-108.000.
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Fritzberg, Alan R.; Kasina, Sudhakar; and Gustavson, Linda M., 5,556,982, Cl. 548-303.700.
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Wollowitz, Susan; Isaacs, Stephen T.; Rapoport, Henry; Spielmann, Hans P.; and Nerio, Aileen, 5,556,993, Cl. 549-282.000.
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Cheong, Sung Hee, 5,556,662, Cl. 426-646.000.
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Network Devices, Inc.: *See*—
Vaillancourt, Dennis G., 5,557,778, Cl. 395-500.000.
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Holden, Brian D., 5,557,607, Cl. 370-58.200.
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Krivoshlykov, Sergej G.; and Neuberger, Wolfgang, 5,557,701, Cl. 385-124.000.
Neugebauer, Witold: *See*—
Willick, Gordon E.; Whitfield, James F.; Surewicz, Witold; Sung, Wing L.; and Neugebauer, Witold, 5,556,940, Cl. 530-317.000.
Neumann, Barry R., to Transcom Gas Technologies Pty. Ltd. Gas delivery system. 5,555,868, Cl. 123-275.000.
Neveu, Jean-Louis; Schutz, Rudolph W.; and Lipp, George, to Kaysersberg, S.A. Anti-theft distribution for roll materials. 5,556,054, Cl. 242-597.600.
New, Daniel D.; and New, William G. Tailgate ruler and fixturing device. 5,556,151, Cl. 296-39.200.
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Nachtman, Thomas J., 5,556,033, Cl. 239-343.000.
New, William G.: *See*—
New, Daniel D.; and New, William G., 5,556,151, Cl. 296-39.200.
New York Univ.: *See*—
Lavker, Robert M.; Sun, Tung-Tien; and Yang, Jing-Shan, 5,556,783, Cl. 435-240.210.
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Coyne, Mike S.; Crisp, Stanley A.; and Newman, Jim E., 5,556,588, Cl. 264-130.000.
Newman, Mark R. Tobacco jar cover having humidity control and method of use. 5,556,579, Cl. 261-99.000.
NeXT, Inc.: *See*—
Levinthal, Adam; Werner, Ross; and Molpus, J. Lane, 5,557,302, Cl. 345-189.000.
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Funahashi, Yoshio; Kogai, Masao; Kasugai, Katsura; and Kato, Hideki, 5,556,587, Cl. 264-86.000.
Yano, Shinsuke; Yamaguchi, Hirofumi; and Hirai, Takami, 5,556,585, Cl. 264-56.000.
NGK Spark Plug Co., Ltd.: *See*—
Kagawa, Junichi, 5,556,315, Cl. 445-7.000.
Nguyen, Cap V.: *See*—
Moon, Billy G.; and Nguyen, Cap V., 5,557,606, Cl. 370-31.000.
Nguyen, Chanh M.; Case, Michael G.; Hooper, William W.; and Narayanan, Authi A., to Hughes Aircraft Company. Process tolerant, high-voltage, bi-level capacitance varactor diode. 5,557,140, Cl. 257-596.000.
Nguyen, Khe C., to Hewlett-Packard Company. Charge injection barrier for positive charging organic photoconductor. 5,556,730, Cl. 430-66.000.
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Fraser, John D.; Nguyen, Loc; and Powell, Sherry, 5,555,887, Cl. 128-663.010.

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Nichols Research Corporation: *See*—
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Sasaki, Shigeyuki; Takagi, Takeshi; and Okude, Yoshitaka, 5,556,669, Cl. 427-410.000.
Tobinaga, Kenshiro; Sakamoto, Hiroyuki; Shirakawa, Shinsuke; Urano,

Nishinaka, Koutaro; and Kawaguchi, Yasuyoshi, to Bridgestone Corporation. Rubber composition for cleaning molds and exhibiting reduced amino-alcohol volatilization and ammonia odor, and method for use thereof.
Mäenpää, Sanna, 5,557,654, Cl. 379-58.000.
Nolen, Jay A. Fuel tank switching apparatus. 5,555,873, Cl. 123-575.000.
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Nguyen, Thanh T. Drywall repair system. 5,555,691, Cl. 52-514.000.
Nichols Research Corporation: *See—*
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Weuthen, Manfred; Engels, Thomas; Hensen, Herman; Tesmann, Holger; and Nickel, Dieter, 5,556,573, Cl. 510-535.000.
Nickel, Gregory L. Snare strainer for a drum. 5,557,053, Cl. 84-415.000.
Nicola, Antonio P.: *See—*
Somogyvari, Arpad F.; Creed, Beth L.; Nicola, Antonio P.; Sanger, Alan R.; Law, David J.; and Cavell, Ronald G., 5,557,023, Cl. 585-513.000.
Nidek Co. Ltd.: *See—*
Yano, Nobuyuki, 5,557,350, Cl. 351-208.000.
Nidy, Eldon G.: *See—*
Kelly, Robert C.; Johnson, Roy A.; Skulnick, Harvey I.; and Nidy, Eldon G., 5,556,878, Cl. 514-449.000.
Niederlein, Horst: *See—*
Schulze, Ullrich; Niederlein, Horst; and Pickardt, Hans-Joachim, 5,557,086, Cl. 235-380.000.
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Hawkins, Gilbert A.; and Nielsen, Robert L., 5,556,801, Cl. 437-50.000.
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Sloss, Christopher W.; Davignon, Barry J.; and Niemeyer, Duane J., 5,556,116, Cl. 280-7.150.
Niemi, Paul M.: *See—*
Rajala, Gregory J.; Niemi, Paul M.; and Oshefsky, Daniel J., 5,556,504, Cl. 156-519.000.
NIFCO, Inc.: *See—*
Watanabe, Koji; Sugita, Toru; Kobayashi, Yasutomo; Shibao, Masaharu; and Mita, Akimitsu, 5,555,685, Cl. 52-204.597.
Nightingale, Gary R.: *See—*
Barber, Keith A.; Bone, Ronald N., Jr.; Cogan, Kevin C.; Dickerson, Michael L.; Gien, Peter H.; Griffith, Lezley A.; Nightingale, Gary R.; Ouellette, Edward L.; Petter, Robert R., Jr.; and Semjenow, Gary A., 5,555,787, Cl. 83-698.110.
Nightingale, John L.; Trail, John A.; and Johnson, John K., to Coherent, Inc. Optical system for improving the symmetry of the beam emitted from a broad area laser diode. 5,557,475, Cl. 359-831.000.
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Inaoka, Toru; Tahara, Hideyuki; and Shinohara, Masahiko, 5,556,835, Cl. 512-3.000.
Niimi, Hiroji: *See—*
Yamamoto, Kazuhito; Niimi, Hiroji; Yamamoto, Yoji; and Hatabu, Susumu, 5,556,675, Cl. 428-36.920.
Niira, Reiji, deceased (by Yuriko Niira, Kiyotaka Niira, Hideaki Niira, legal heirs); Yamamoto, Tatuo; and Uchida, Masashi, to Shingawa Fuel Co. Ltd.; and Shinanen New Ceramic Corporation. Antibiotic zeolite-containing film. 5,556,699, Cl. 428-323.000.
Niira, Yuriko, Kiyotaka Niira, Hideaki Niira, legal heirs: *See—*
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Hasuda, Masanori; Katayama, Akira; Uemura, Yukio; and Goto, Tetsuro, 5,557,359, Cl. 354-234.100.
Inoue, Yoshiharu; and Uematsu, Kimio, 5,557,361, Cl. 354-289.100.
Ishii, Koichiro, 5,557,595, Cl. 369-77.100.
Miyamoto, Hidenori; Soshi, Isao; and Wakabayashi, Hiroshi, 5,557,354, Cl. 354-106.000.
Shibayama, Atsushi, 5,557,470, Cl. 359-687.000.
Soshi, Isao; Miyamoto, Hidenori; Kato, Minoru; Omi, Junichi; Amanuma, Tatsuo; Asami, Jirou; and Imura, Yoshio, 5,557,357, Cl. 354-202.000.
Sugiyama, Yoshikazu; and Sato, Haruo, 5,557,473, Cl. 359-757.000.
Ueno, Yasunori, 5,557,463, Cl. 359-646.000.
Umeda, Toshiaki; and Takahashi, Fumio, 5,557,348, Cl. 351-169.000.
Niles-Simmons Industrieanlagen GmbH: *See—*
Naumann, Hans J.; Robotta, Reinhard; Schröter, Gunter; and Oesterreich, Rolf, 5,555,632, Cl. 33-203.000.
Nilles, James T.: *See—*
Tricoles, Gus P.; Davis, Wayne K.; and Nilles, James T., 5,557,277, Cl. 342-22.000.
Nilsson, Bengt, to Chemrec Aktiebolag. Device in a reactor for gasifying spent liquor. 5,556,602, Cl. 422-185.000.
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Isemura, Keizo; Yoshihara, Kunio; Ichikawa, Hiroyuki; Sakai, Masanori; Tanabe, Masatoshi; Nimura, Mitsuo; Funamizu, Yoshihiro; and Kishimoto, Hirohiko, 5,557,430, Cl. 358-501.000.
Ning, Xiaohui: *See—*
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Nintendo Co., Ltd.: *See—*
Nagano, Masakazu; and Takano, Mitsuhiro, 5,556,108, Cl. 463-45.000.
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Suzuki, Toshiyuki; Maeda, Shigeru; Hayashimoto, Shigeo; Ogawa, Mikio; and Yoshida, Norikazu, 5,556,595, Cl. 422-32.000.
Nippon Oil Company, Limited: *See—*
Aida, Fuyuki; Tajima, Yoshio; and Matsuura, Kazuo, 5,556,821, Cl. 502-113.000.
Nippon Paint Co., Ltd.: *See—*
Fujiwa, Takaaki; Tabuchi, Takeharu; Matsui, Hideki; Nakano, Shinji; Yamada, Shin-ya; and Morimoto, Takao, 5,556,927, Cl. 525-533.000.
Sasaki, Shigeyuki; Takagi, Takeshi; and Okude, Yoshitaka, 5,556,669, Cl. 427-410.000.
Tobinaga, Kenshiro; Sakamoto, Hiroyuki; Shirakawa, Shinsuke; Urano, Satoshi; and Tsuchiya, Yasuyuki, 5,556,913, Cl. 524-555.000.
Yabuta, Masami; and Urano, Satoshi, 5,556,933, Cl. 528-26.000.
Nippon Seiki K.K.: *See—*
Miyashita, Sadamasa; and Zhang, Laiying, 5,557,295, Cl. 345-36.000.
Nippon Sheet Glass Co., Ltd.: *See—*
Ohara, Shohei, 5,557,289, Cl. 343-713.000.
Teranishi, Toyoyuki; Kobayashi, Hiroaki; and Kawaguchi, Jun, 5,556,667, Cl. 427-164.000.
Nippon Shokubai Co., Ltd.: *See—*
Inaoka, Toru; Tahara, Hideyuki; and Shinohara, Masahiko, 5,556,835, Cl. 512-3.000.
Kita, Yuichi; Nakagawa, Koichi; and Kishino, Kazuo, 5,556,991, Cl. 548-548.000.
Nippon Soken, Inc.: *See—*
Hakamada, Naoki; Inagaki, Mitsuo; Ando, Yoriaki; and Kubo, Kunihiro, 5,556,356, Cl. 477-163.000.
Nippon Steel Corporation: *See—*
Sawada, Kikuzo; and Mawatari, Hiroshi, 5,557,572, Cl. 365-189.070.
Nippon Steel Semiconductor Corporation: *See—*
Hashimoto, Masayuki, 5,557,135, Cl. 257-308.000.
Nippon Telegraph and Telephone Corporation: *See—*
Ishihara, Noboru, 5,557,648, Cl. 375-376.000.
Matsuoka, Yutaka; Sano, Eiichi; Kurishima, Kenji; Nakajima, Hiroki; and Ishibashi, Tadao, 5,557,117, Cl. 257-184.000.
Nippon Zeon Co., Ltd.: *See—*
Oyama, Motofumi; and Nakajima, Kazuyoshi, 5,556,919, Cl. 525-189.000.
Nippon Zoki Pharmaceutical Co., Ltd.: *See—*
Imai, Shoichi; Mabuchi, Ken-ichi; and Kawamura, Minoru, 5,556,862, Cl. 514-307.000.
Nippondenso Co., Ltd.: *See—*
Fukaya, Kenji; Hori, Makoto; Hamaya, Masahiro; Ota, Minoru; Nakano, Syuichi; and Fukaya, Tomoji, 5,556,526, Cl. 204-425.000.
Hayakawa, Hideyuki; Kondoh, Masuhiro; Imaeda, Makoto; Imoto, Yuzo; and Takeda, Kenji, 5,556,175, Cl. 303-119.200.
Ishikawa, Morio, 5,555,929, Cl. 165-76.000.
Kanao, Keiji; and Takamura, Kozo, 5,557,158, Cl. 313-141.000.
Naito, Toshiharu; Kamiya, Masahiko; Taguchi, Takeyasu; and Fujiwara, Kenji, 5,557,552, Cl. 364-565.000.
Nakajima, Hiroshi; and Tsuboko, Toshio, 5,556,138, Cl. 285-137.100.
Sugisaka, Takayuki; Sakakibara, Toshio; Miura, Shoji; and Iida, Makio, 5,557,134, Cl. 257-506.000.
Takeo, Yuji; Isaji, Akira; Nagata, Toshihiro; Tanaka, Masaya; and Iritani, Kunio, 5,555,737, Cl. 62-230.000.
Takeuchi, Shigeru; Sato, Taketoshi; and Hasegawa, Takahiko, 5,555,872, Cl. 123-497.000.
Watanabe, Atsushi; Kamiya, Hitoshi; Nakada, Eiji; Mizuno, Tomoaki; Kago, Yoshiyuki; Murase, Tokutaro; and Inukai, Yoshihiko, 5,557,096, Cl. 235-492.000.
Nique, François; Teutsch, Jean-Georges; and Van De Velde, Patrick, to Roussel Uclaf. 11-β substituted-19-nor steroids. 5,556,845, Cl. 514-176.000.
Nishi, Yoshio: *See—*
Kubota, Haruo; Nishi, Yoshio; Ueno, Yoshio; Wada, Yasuo; and Honda, Munenobu, 5,556,078, Cl. 254-368.000.
Nishigaki, Tetsuo; Mitsuhashi, Takamichi; and Yoshidaa, Takamichi, to Sony Corporation. Recording method and apparatus for programming a recording schedule. 5,557,422, Cl. 358-335.000.
Nishiguchi, Masaki; and Tokuda, Toshimasa, to Furukawa Electric Co. Ltd, The; and Teijin Chemicals Ltd. Aromatic polycarbonate copolymer, a process for producing the same, and a plastic optical waveguide using the same. 5,556,904, Cl. 524-147.000.
Nishihara, Hideki: *See—*
Miyakawa, Tsutomu; Nishihara, Hideki; Kuga, Takaaki; Shinohara, Kazunori; and Ishikawa, Makoto, 5,555,864, Cl. 123-179.280.
Nishii, Osamu; Inagawa, Takashi; Hanawa, Makoto; and Takeda, Hiroshi, to Hitachi, Ltd. Integrated circuit data processor including a control pin for deactivating the driving of a data bus without deactivating that of an address bus. 5,557,760, Cl. 395-310.000.
Nishijima, Tatsumi: *See—*
Mizutani, Hikaru; Maehara, Yoshimi; Nishijima, Tatsumi; Takeda, Hidekazu; Ogiro, Kenji; and Kaku, Nobuyuki, 5,556,051, Cl. 242-347.100.
Nishikawa, Koichiro, to Canon Kabushiki Kaisha. Optical information recording/reproducing method and apparatus in which a first optical spot performs focusing, tracking, erasing and recording and a second optical spot performs two reproducing modes. 5,557,601, Cl. 369-121.000.
Nishimura, Tadashi: *See—*
Yamaguchi, Yasuo; and Nishimura, Tadashi, 5,557,231, Cl. 327-534.000.
Nishimura, Takatoshi: *See—*
Sato, Masaki; Kubota, Hiroshi; Morimoto, Kiyoshi; Nishimura, Takatoshi; Miyake, Takashi; and Shimosaka, Hisaki, 5,557,389, Cl. 355-315.000.
Nishimura, Yoshiyuki: *See—*
Ohsaki, Takahisa; Takami, Norio; Nishimura, Yoshiyuki; and Tamaki, Toshio, 5,556,723, Cl. 429-218.000.

Nishinaka, Koutaro; and Kawaguchi, Yasuyoshi, to Bridgestone Corporation. Rubber composition for cleaning molds and exhibiting reduced amino-alcohol volatilization and ammonia odor, and method for use thereof. 5,556,572, Cl. 510-188.000.
Nishino, Hiroshi: *See—*
Kim, Yong C.; and Nishino, Hiroshi, 5,556,576, Cl. 252-511.000.
Nishio, Makoto; Nakai, Sho-ichiro; and Yoshida, Makiko, to NEC Corporation. Video-on-demand system with program relocation center. 5,557,317, Cl. 348-7.000.
Nishioka, Yukiko: *See—*
Kobayashi, Masao; Nishioka, Yukiko; Suzuki, Takehiko; and Matsukawa, Yashuhisa, 5,556,642, Cl. 424-502.000.
Nishita, Satoru: *See—*
Matsushita, Shigenori; Yamamoto, Shigeru; Zhang, Shu H.; Nishita, Satoru; and Nakata, Kazushi, 5,555,942, Cl. 172-3.000.
Nishiwaki, Hirofumi: *See—*
Inoue, Yoshiya; Nagatsuma, Tooru; Shimada, Kazuyuki; Hayashi, Takamasa; Tomiyasu, Kunio; and Nishiwaki, Hirofumi, 5,557,707, Cl. 395-106.000.
Nishizawa, Jun-ichi, to Handotai Kenkyu Shinkokai. Field effect transistor having unsaturated drain current characteristic. 5,557,119, Cl. 257-264.000.
Niskanen, Don L., to Grand Haven Stamped Products. Shifter handle assembly. 5,556,224, Cl. 403-379.000.
Nissan Motor Co., Ltd.: *See—*
Ishii, Shigeru; Shinso, Yoshihide; Jozaki, Takeki; Shimanaka, Shigeki; Kurokawa, Shuji; and Yamamoto, Hideharu, 5,556,349, Cl. 477-76.000.
Nakayama, Okihiko; Grom, Brian R.; Iwasaki, Masayasu; and Tsuda, Hiroshi, 5,557,522, Cl. 364-424.020.
Nissei Plastic Industrial Co., Ltd.: *See—*
Aoki, Hidemi; Takeuchi, Yasuhiko; and Anzai, Kazuo, 5,556,581, Cl. 264-40.100.
Minamimura, Masaaki; Okada, Haruo; and Sakurada, Kikuo, 5,556,039, Cl. 241-18.000.
Nisshin Chemical Industry Co. Ltd.: *See—*
Fukumoto, Masafumi, 5,556,676, Cl. 428-36.100.
Nissho Corporation: *See—*
Taoda, Toshimitsu; and Horie, Masao, 5,556,411, Cl. 606-185.000.
Nissin Electric Co., Ltd.: *See—*
Otani, Satoshi; Kirimura, Hiroya; Kuwahara, Hajime; Tabata, Takao; Nakahigashi, Takahiro; and Murakami, Hiroshi, 5,556,474, Cl. 118-723.00E.
Nitto Pharmaceutical Industries Ltd.: *See—*
Kishida, Tsunataro, 5,556,785, Cl. 435-252.900.
Niver, Michael A.: *See—*
Teder, Rein S.; Borner, Dennis L.; and Niver, Michael A., 5,556,493, Cl. 156-64.000.
Niwa, Hideo: *See—*
Yamashita, Kenji; Ohara, Takaaki; Niwa, Hideo; Osakada, Fumio; Fukuchi, Takeshi; Edamura, Tadahiro; and Kakutani, Tetsu, 5,556,943, Cl. 530-350.000.
Niwa, Shigeki; Hasebe, Etsuhiro; Itoh, Kazuo; Indoh, Toshihiro; and Asai, Masamichi, to Toshiba Ceramics Co., Ltd. Slide gate plate. 5,556,568, Cl. 222-600.000.
NKK Corporation: *See—*
Yoshie, Yasunori, 5,557,697, Cl. 385-99.000.
Yoshimi, Naoto; Watanabe, Toyofumi; and Yamashita, Masaaki, 5,556,715, Cl. 428-623.000.
Noble, Stephen W., Jr., to Pioneer Hi-Bred International, Inc. Hybrid corn plant & seed (3489). 5,557,035, Cl. 800-200.000.
Noda, Kenji: *See—*
Kawasaki, Toshiyuki; Kato, Isao; Noda, Kenji; Osaki, Masakatsu; Miyazaki, Katsuhiko; Nayeshiro, Hidekazu; and Ando, Hideya, 5,556,970, Cl. 554-190.000.
Noda, Satoshi: *See—*
Kuramoto, Takeo; Watabe, Masataka; Noda, Satoshi; Shoji, Takashi; and Sakai, Takekazu, 5,556,023, Cl. 228-248.100.
Noda, Takashi: *See—*
Kato, Tomokazu; Nomura, Keiichi; Nagatani, Kentaro; Maruta, Syuji; Takano, Yoshiaki; Araki, Kazuhiro; and Noda, Takashi, 5,557,391, Cl. 355-319.000.
Noddings, Douglas: *See—*
Johnson, Richard H.; and Noddings, Douglas, 5,557,740, Cl. 395-183.140.
Nogami, Sumitaka; Kina, Hideki; and Mantoku, Kaneyuki, to Fuji Electric Co., Ltd. Photoconductor element of an electrophotographic device. 5,556,728, Cl. 430-64.000.
Nogiwa, Toru; Konagaya, Yukio; Hotta, Yoshihiko; Moroboshi, Kunichika; Kawaguchi, Makoto; Suzuki, Akira; Masubuchi, Fumihito; and Kagawa, Tsutomu, to Ricoh Company, Ltd. Method for producing reversible thermosensitive recording material. 5,556,827, Cl. 503-201.000.
Nogles, Thomas G., to Southcorp Water Heaters USA, Inc. Pressure compensating water heater. 5,555,997, Cl. 220-404.000.
Nohira, Hiroyuki: *See—*
Miyashita, Akira; Chiba, Takeshi; Nohira, Hiroyuki; and Takaya, Hidemasa, 5,556,998, Cl. 556-21.000.
Nokia Mobile Phones Ltd.: *See—*
Heikkila, Ilkka; Jokinen, Harri; and Ranta, Jukka, 5,557,639, Cl. 375-224.000.
Nokia Telecommunications Oy: *See—*
Mäenpää, Sanna, 5,557,654, Cl. 379-58.000.
Nolen, Jay A. Fuel tank switching apparatus. 5,555,873, Cl. 123-575.000.
Nolet, Steven C.: *See—*
Quigley, Peter A.; Nolet, Steven C.; and Gallagher, James L., 5,556,677, Cl. 428-36.200.
Noll, Tobias: *See—*
Leuschner, Rainer; Ahne, Hellmut; Birkle, Siegfried; Hammerschmidt, Albert; Sezi, Recai; Noll, Tobias; and Dumoulin, Ann, 5,556,812, Cl. 437-209.000.
Nomura, Keiichi: *See—*
Kato, Tomokazu; Nomura, Keiichi; Nagatani, Kentaro; Maruta, Syuji; Takano, Yoshiaki; Araki, Kazuhiro; and Noda, Takashi, 5,557,391, Cl. 355-319.000.
Non-Invasive Technology, Inc.: *See—*
Chance, Britton, 5,555,885, Cl. 128-654.000.
Nonomura, Yuusuke, to Kabushiki Kaisha Egawa. Measuring method by using resonance of a resonance medium. 5,555,884, Cl. 128-653.200.
Norbeck, Dean K.: *See—*
Wills, Frank E.; and Norbeck, Dean K., 5,555,736, Cl. 62-187.000.
Nordica S.p.A.: *See—*
Sartor, Claudio; and Gorza, Roberto, 5,555,651, Cl. 36-117.700.
Nordquist, Robert E., to Wound Healing of Oklahoma. Method and apparatus for measuring the visual acuity of the human eye during and immediately after ocular surgery. 5,557,352, Cl. 351-237.000.
Nordson Corporation: *See—*
Boccagno, George E.; Saidman, Lawrence B.; and Wacker, Robert L., 5,556,471, Cl. 118-300.000.
Noren, Kjell: *See—*
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Noristi, Luciano; and Baruzzi, Giovanni, to Montell North America Inc. Hyperpure propylene polymer. 5,557,025, Cl. 585-522.000.
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Ohara, Shohei, to Nippon Sheet Glass Co., Ltd. Window glass antenna device for automobiles. 5,557,289, Cl. 343-713.000.

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Ohkawa, Nobuyuki: *See*—
Nakamura, Norio; Ohkawa, Nobuyuki; Oshima, Takeshi; Miyamoto, Masaaki; and Iijima, Yasuteru, 5,556,852, Cl. 514-218.000.

Ohki, Teruaki: *See*—
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Ohkubo, Shuichi, to NEC Corporation. Method for initializing a phase-change type of optical disk utilizing either absorption rates or mark lengths. 5,557,599, Cl. 369-116.000.

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Nakamura, Michihiro; Matsui, Satomi; Oka, Keiko; Tsuruta, Hitoshi; Koori, Yoshihiro; Kato, Takuji; and Ito, Shigeji, 5,556,760, Cl. 435-12.000.

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Okada, Hideki; Koga, Yoshiro; Suzuki, Takashi; Nakashima, Yoshihiro; and Okamura, Takehiko, to Seiko Epson Corporation. Developing device. 5,557,060, Cl. 118-661.000.

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Okamura, Hiroshige: *See*—
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Okaya Electric Industries Co., Ltd.: *See*—
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Oki Electric Industry Co., Ltd.: *See*—
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Okuaki, Yasuyuki; and Yamamoto, Kazushige, 5,557,762, Cl. 395-375.000.

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Liav, Avraham; Hardgrave, Ragen F.; Blystone, Sheri; and Turner, Gregory A., 5,556,963, Cl. 536-55.300.

Oktay, Osman O.; Summit, Edward A.; and Beck, Gregory F., to Canon Information Systems, Inc. Arbitration device for arbitrating access requests from first and second processors having different first and second clocks. 5,557,783, Cl. 395-550.000.

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Sasaki, Shigeyuki; Takagi, Takeshi; and Okude, Yoshitaka, 5,556,669, Cl. 427-410.000.

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Oldsen, John G.; and Stankus, John C., to Jennmar Corporation. Mine roof bolt assembly. 5,556,234, Cl. 405-259.100.

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Schramayr, Ernst; and Olewicz, Tadeusz A., 5,555,833, Cl. 112-470.310.

Olmr, Jaroslav J. On the go gear shifter. 5,555,961, Cl. 192-3.620.

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Braesch, Robert O.; Hong, Peter L.; Mefferd, Thomas A.; and Olson, Michael D., 5,556,077, Cl. 254-267.000.

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Itoh, Kazumi, 5,557,458, Cl. 359-434.000.
Kunishige, Keiji; and Miyazawa, Azuma, 5,557,363, Cl. 354-402.000.
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Yabe, Hisao; Tashiro, Yoshio; Ilda, Yoshihiro; Suzuki, Akira; Itoh, Hideo; Yamazaki, Minoru; Tamada, Osamu; and Kura, Yasuhito, 5,556,367, Cl. 600-124.000.

O'Meara, Robert: *See*—
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Omi, Junichi: *See*—
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Omori, Yasuhiko: *See*—
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Omron Corporation: *See*—
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Garner, David M.; Louie, Chun M.; Harrison, Daniel B.; and Dale, Donald J., 5,557,456, Cl. 359-393.000.

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Orcutt, John W.; and Lin, Galle, to Texas Instruments Incorporated. Polar bond head. 5,556,022, Cl. 228-1.100.
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Ortyn, William E.; Hayenga, Jon W.; and Piloco, Louis R., to NeoPath, Inc. Cytological system autofocus integrity checking apparatus. 5,557,097, Cl. 250-201.300.
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Yamashita, Nobuhiko, 5,556,768, Cl. 435-69.100.
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Miura, Yuichiro; Hirano, Kazuo; Nate, Takayuki; Kambayashi, Taiji; Ohtsuka, Masahisa; and Nagai, Toshitake, 5,556,671, Cl. 428-15.000.
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Osaki, Masakatsu: *See—*
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Osawa, Izumi: *See—*
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Oshry, Scott J.; and Brosmith, Sean B., to Roundhouse Products, Inc. Sleeve and storage device for planar articles. 5,555,977, Cl. 206-308.100.
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Ostrowski, Stanislaw, to Humming Bird Inc. Transmission with planetary multi-gear members. 5,556,355, Cl. 475-332.000.
Oswald, Fred. Vibrator with covering and related method. 5,556,199, Cl. 366-120.000.
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Ota, Tsuyoshi: *See—*
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Otani, Minoru; and Ishikura, Junri, to Canon Kabushiki Kaisha. Two-wavelength antireflection film. 5,557,466, Cl. 359-586.000.
Otani, Satoshi; Kirimura, Hiroya; Kuwahara, Hajime; Tabata, Takao; Nakahigashi, Takahiro; and Murakami, Hiroshi, to Nissin Electric Co., Ltd. Plasma processing apparatus. 5,556,474, Cl. 118-723.00E.
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Otters, Timothy P.; and Bolmgren, Mary J. Can opener for pull top cans. 5,555,778, Cl. 81-3.550.
Ou, Chan C. Household drying center. 5,555,640, Cl. 34-202.000.
Ouellette, Edward L.: *See—*
Barber, Keith A.; Bone, Ronald N., Jr.; Cogan, Kevin C.; Dickerson, Michael L.; Gien, Peter H.; Griffith, Lezley A.; Nightingale, Gary R.; Ouellette, Edward L.; Petter, Robert R., Jr.; and Semjenow, Gary A., 5,555,787, Cl. 83-698.110.
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Ozawa, Shigeyuki: *See—*
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Pacesetter, Inc.: *See—*
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Mortazavi, Said; and Vogel, Alan, 5,556,420, Cl. 607-9.000.
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Curlett, John; and Brown, Glen J., 5,556,489, Cl. 152-418.000.
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O'Brien, Fred R.; and Martin, Jerry E., 5,556,074, Cl. 251-329.000.
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Rontome, Carlos P.; and Padilla, Santiago N., 5,556,480, Cl. 134-26.000.
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Panizza, Janis M. Process for producing works of art on videocassette by computerized system of audiovisual correlation. 5,557,424, Cl. 358-335.000.
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Konzal, Daryl R., 5,556,364, Cl. 493-109.000.
Pappas, Panagiotis T. Method and apparatus for pulsed magnetic induction. 5,556,418, Cl. 607-1.000.
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Paradigm Technology, Inc.: *See—*
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Parker, Robert, to Duracell Inc. Battery tester with stacked thermochromic elements. 5,557,208, Cl. 324-435.000.
Parker, Stephen M., to Whitaker Corporation, The. End connection for a flexible shielded cable conductor. 5,556,300, Cl. 439-497.000.
Paroff, Paul J., to Moore Business Forms, Inc. Continuous cleaning thread for inkjet printing nozzle. 5,557,307, Cl. 347-34.000.
Parrish, Milton E.; and Mesmer, Ethan J. Multi-layer conformable support system. 5,556,169, Cl. 297-452.280.
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Parsons, Timothy J., to British Aerospace Public Limited Company. Tracking apparatus. 5,557,543, Cl. 364-516.000.
Parveris, John I. Retaining device. 5,555,607, Cl. 24-129.00R.
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Patry, Elaine S.: *See—*
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Paul, Leonard. Air freshener and/or deodorizer dispensing system. 5,556,030, Cl. 239-56.000.
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Paweletz, Anton; and Birkenmaier, Wilhelm, to SKF Textilmaschinen-Komponenten GmbH. Shaftless spinning rotor of an open-end spinning machine. 5,555,715, Cl. 57-414.000.
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Pelak, Mark S. Method and apparatus for appliance mounting. 5,556,280, Cl. 433-172.000.
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Pernot, Pascal C. R., to Ethicon, Inc. Packaging for a surgical suture. 5,555,976, Cl. 206-63.300.
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Perry, Steven B.; and Hogan, James P., to ANTEC Corporation. Channel interface unit. 5,557,669. Cl. 379-339.000.
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Salli, Carl, to Advanced Micro Devices Inc. Modular wire frame table and method of assembly. 5,555,615, Cl. 29-458.000.

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Kim, Moon-Sik, 5,557,666, Cl. 379-201.000.
Kwon, Tai-Eun, 5,556,211, Cl. 400-124.110.
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Sanford, James W., Jr. Modified water meter arrangements. 5,557,041, Cl. 73-273.000.

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Inenaga, Andrew S.; Bachalo, William D.; and Sankar, Subramanian V., 5,557,040, Cl. 73-170.210.

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Fujimoto, Koichi; Tanaka, Naoki; Asai, Fumitoshi; Ito, Tomiyoshi; and Koike, Hiroyuki, 5,556,864, Cl. 514-315.000.
Kaneko, Masakatsu; Murofushi, Yoshinobu; Kimura, Misako; Yamazaki, Mitsuo; and Iijima, Yasuteru, 5,556,975, Cl. 544-277.000.
Nakamura, Norio; Ohkawa, Nobuyuki; Oshima, Takeshi; Miyamoto, Masaaki; and Iijima, Yasuteru, 5,556,852, Cl. 514-218.000.

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Sano, Shigeki, to Fuji Electric Co., Ltd. Drink supply apparatus. 5,556,006, Cl. 222-129.100.

Sanofi Winthrop Inc.: *See*—
Desai, Ranjit C., 5,556,909, Cl. 514-362.000.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Fujimoto, Hiroaki, 5,556,311, Cl. 440-89.000.
Kanno, Isao, 5,555,857, Cl. 123-73.0AD.
Katoh, Masahiko, 5,555,858, Cl. 123-73.0SC.
Ogino, Hiroshi, 5,556,312, Cl. 440-75.000.
Ogino, Hiroshi, 5,556,313, Cl. 440-75.000.
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Fukuda, Yoshihide; and Ozawa, Shigeyuki, 5,556,314, Cl. 440-89.000.

Sanshin Thermal Insulation Co., Ltd.: *See*—
Irie, Shoichiro; Abe, Motonobu; and Akiyama, Norihito, 5,556,040, Cl. 241-24.290.

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Kawashima, Yoichi; Ota, Atsutoshi; and Mibu, Hiroyuki, 5,556,841, Cl. 514-61.000.

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Smayling, Michael C.; Marotta, Giulio G.; D'Arrigo, Iano; Santin, Giovanni; Falessi, Georges; and Bhat, Mousumi, 5,557,569, Cl. 365-185.280.

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Rosenstock, Michael A.; Wallace, Phillip W.; Bayruns, John T.; Sanyigo, Kenneth S.; and Gilbert, George G., 5,557,144, Cl. 257-668.000.

Sanyo Electric Co., Ltd.: *See*—
Harada, Yasoo; Matsushita, Shigeharu; Terada, Satoshi; Fujii, Emi; Kurose, Takashi; Higashino, Takayoshi; Yamada, Takashi; Nagamatsu, Akihito; Inoue, Daijirou; and Matsumura, Kouji, 5,557,141, Cl. 257-631.000.
Miura, Yuichiro; Hirano, Kazuo; Nate, Takayuki; Kambayashi, Taiji; Ohtsuka, Masahisa; and Nagai, Toshitake, 5,556,671, Cl. 428-15.000.
Narukawa, Satoshi; Amazutsumi, Toru; Tamaki, Hiyoshi; and Yamauchi, Yasuhiro, 5,556,722, Cl. 429-163.000.
Tamai, Mikitaka, 5,557,192, Cl. 320-30.000.

Sanz, Mariano: *See*—
Wicker, Alain; Bonnet, Jean-Pierre; Sanz, Mariano; Dordor, Patrice; and Magro, Christophe, 5,556,831, Cl. 505-500.000.

Sarabia, Cristina A.: *See*—
Faircloth, Glynn T., Jr.; Millan, Francisco R.; Fernandez, Librada M. C.; and Sarabia, Cristina A., 5,556,777, Cl. 435-118.000.

Sarcos Group: *See*—
Jacobsen, Stephen C.; and Davis, Clark C., 5,556,263, Cl. 417-490.000.

Saria, Othmar; and Schmall, Karl H., to VAE Aktiengesellschaft. Testing apparatus for the calibration of overheating and rail brake locating devices. 5,557,102, Cl. 250-252.100.

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Hörl, Hans-Heinrich; Nussbaumer, Dietmar; and Wünn, Eberhard, 5,556,708, Cl. 428-424.200.

Sasa, Koichiro; Kuramoto, Shuji; and Kato, Haruo, to Sony Corporation. Method of forming a phosphor screen. 5,556,664, Cl. 427-64.000.

Sasaki, Kenichi: *See*—
Kobayashi, Hitoshi; Asano, Yuichi; Kobayashi, Kenji; Sasaki, Kenichi; and Sakurai, Yuji, 5,557,145, Cl. 257-692.000.

Sasaki, Shigeru: *See*—
Hirosawa, Toshio; Itoh, Tsutomu; Kokunishi, Motohide; Ueoka, Atsushi; Ichikawa, Yoshikazu; Fujita, Pujio; Yamagishi, Tadashi; Ishimaru, Masahiko; Namba, Hideki; Sasaki, Shigeru; Hirano, Michio; Kozuma, Kaoru; and Nakamura, Kazuyuki, 5,557,736, Cl. 395-182.020.

Sasaki, Shigeyuki; Takagi, Takeshi; and Okude, Yoshitaka, to Nippon Paint Co., Ltd. Coating with carboxyl and carboxylate-containing polymer and hydroxyl and epoxy-containing polymer. 5,556,669, Cl. 427-410.000.

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Sasaki, Tsukasa: *See*—
Koike, Masahiro; Takahashi, Fuminobu; Inoue, Hideki; Musha, Yosinori; Kamimoto, Shuuji; Naito, Shinji; and Sasaki, Tsukasa, 5,557,048, Cl. 73-597.000.

Sasakura, Shizuki: *See*—
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Sasanuma, Nobuatsu; Sakurai, Masaaki; and Saito, Rie, to Canon Kabushiki Kaisha. Image processing apparatus and method thereof for adding a predetermined pattern to an image. 5,557,416, Cl. 358-300.000.

Sasanuma, Nobuatsu: *See*—
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Sato, Haruo: *See*—
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Igarashi, Kazuo; Takano, Kengo; Morita, Toshiharu; Saito, Hiroaki; Hashizume, Yukio; Suzuki, Tokio; Tashiro, Hirohisa; Muramoto, Mituru; and Sato, Katsunori, 5,556,527, Cl. 204-488.000.

Sato, Kazumi, to Fujitsu Limited. Method and system of operating redundant transmission line. 5,557,636, Cl. 375-260.000.

Sato, Masaki; Kubota, Hiroshi; Morimoto, Kiyoshi; Nishimura, Takatoshi; Miyake, Takashi; and Shimosaka, Hisaki, to Mita Industrial Co., Ltd. Device for separating a transfer paper utilizing a separation voltage. 5,557,389, Cl. 355-315.000.

Sato, Mituyoshi; Uozumi, Minoru; and Nakayama, Masao, to Toyota Jidosha Kabushiki Kaisha. Vacuum casting apparatus using flange-free stalk. 5,555,925, Cl. 164-255.000.

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Komine, Kenji; Ikeda, Wataru; Egawa, Mamoru; Shinosawa, Kastuhiro; Isegawa, Hiroyuki; Honaga, Kazuo; Abe, Yutaka; Kameda, Tsuneji; and Sato, Shinobu, 5,556,270, Cl. 418-179.000.

Sato, Taketoshi: *See*—
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Sato, Teruhiro; Wada, Tomio; and Hirayama, Yoshiyuki, to Matsushita Electric Industrial Co., Ltd. High-density circuit module and method of producing the same. 5,557,508, Cl. 361-818.000.

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Fukuyama, Ryooji; Nawata, Makoto; Kakehi, Yutaka; Kawahara, Hironobu; Sato, Yoshiaki; Torii, Yoshimi; Kawaraya, Akira; and Sato, Yoshie, 5,556,714, Cl. 428-620.000.

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Fukuyama, Ryooji; Nawata, Makoto; Kakehi, Yutaka; Kawahara, Hironobu; Sato, Yoshiaki; Torii, Yoshimi; Kawaraya, Akira; and Sato, Yoshie, 5,556,714, Cl. 428-620.000.

Satoh, Akiyoshi: *See*—
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Satoh, Kimiyasu, to Sony Corporation. Functional display apparatus. 5,557,300, Cl. 345-170.000.

Satoh, Motoharu; and Watanabe, Kazushige, to Sanden Corporation. Apparatus for electrolyzing water. 5,556,523, Cl. 204-272.000.

Satterfield, William H., to Spencer Wright Industries, Inc. Shifting needle carpet mender. 5,555,826, Cl. 112-80.040.

Satterthwaite, Anne B.: *See*—
Burn, Timothy C.; Satterthwaite, Anne B.; and Tenen, Daniel G., 5,556,954, Cl. 536-24.100.

Satyam, Apparao: *See*—
Kauvar, Lawrence M.; Lyttle, Matthew H.; and Satyam, Apparao, 5,556,942, Cl. 530-331.000.

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Fretwell, Percy; Saucier, Stanton D.; and Doucet, Bernard G., 5,556,250, Cl. 414-558.000.

Sauter, Gerald F.: *See*—
Stevens, Rick C.; Sauter, Gerald F.; and Krawczak, John A., 5,557,693, Cl. 385-24.000.

Sauter, Hubert: *See*—
Oberdorf, Klaus; Sauter, Hubert; Grammenos, Wassilios; Kirstgen, Reinhard; Harries, Volker; Lorenz, Gisela; Ammermann, Eberhard; Gold, Randall E.; Siegel, Wolfgang; and Harreus, Albrecht, 5,556,884, Cl. 514-620.000.

Savage, Huey P., to Savage Systems, Inc. Waist supported bow string steadying device for archer. 5,555,874, Cl. 124-1.000.

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Savintsev, Vadim G.: *See*—
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Shaffer, Donald R.; Sanderson, Richard A.; and Savko, John, 5,555,768, Cl. 73-865.800.

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Yamane, Takashi; Omori, Yasuhiko; Sawae, Shinya; Furukawa, Yasutoshi; and Hakogi, Hironao, 5,557,695, Cl. 385-49.000.

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Hale, Nathan; and Xu, Ming, 5,555,813, Cl. 101-492.000.

Sawicki, Richard H., to United States of America, Energy. Apparatus for and method of correcting for aberrations in a light beam. 5,557,477, Cl. 359-846.000.

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Winker, Bruce K.; Saxena, Ragini; Taber, Donald B.; and Hale, Leonard G., 5,557,434, Cl. 359-73.000.

Saxton, Robert J.: *See*—
Grate, John H.; Hamm, David R.; Klingman, Kenneth A.; Saxton, Robert J.; and Downey, Shannan J., 5,557,014, Cl. 568-401.000.

Sbaschnig, Richard W.: *See*—
Gopp, Alexander Y.; Sbaschnig, Richard W.; and Buonocore, Richard L., 5,555,871, Cl. 123-481.000.

Sbragia, Ronald J.: *See*—
Thoms, Ellen M.; and Sbragia, Ronald J., 5,556,883, Cl. 514-594.000.

Scaggs, Michael J. Unstable laser resonator. 5,557,630, Cl. 372-95.000.

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Scatterday, Mark A. Deformable grip. 5,556,358, Cl. 482-49.000.

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Schaefer, Louis F., to Samsung Electronics Co., Ltd. Video tape format for providing special effects capabilities. 5,557,418, Cl. 358-335.000.

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Schaller, Douglas A., to University of Southern California. Pharyngeal end-tidal carbon dioxide measuring catheter. 5,555,890, Cl. 128-719.000.

Schalz, Karl-Josef; and Gaul, Norbert, to Leica Mikroskopie und Systeme GmbH. Microscope that displays superimposed data. 5,557,453, Cl. 359-376.000.

Schardt, Marc: *See*—
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Scheckel, Bruno; Heinen, Stefan; Wilwert, Jean; and Herrmann, Helmut, to Siemens Aktiengesellschaft. Circuit configuration for dividing a clock signal. 5,557,649, Cl. 377-48.000.

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Scheider, Alfred F.; and Warner, R. Brown. Abrasive filament honing tool and method of making and using same. 5,556,328, Cl. 451-463.000.

Schelhorn, Jean E.: *See*—
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Scherba, Robert. Inflatable device. 5,555,679, Cl. 52-2.180.

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Schilling, Kevin H.: *See*—
Lipinsky, Edward S.; Sinclair, Richard G.; Browning, James D.; Cheung, Alex; Schilling, Kevin H.; and Verser, Dan W., 5,556,895, Cl. 521-182.000.

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Schmitt, Steven M.: *See*—
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Schneider, Michel: *See*—
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Schoo, Raul A. I. Tubular column of high resistance to buckling. 5,555,678, Cl. 52-2.130.

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Schroeder, Arthur G. Apparatus and method for opening and closing skylights. 5,555,683, Cl. 52-200.000.

Schröter, Gunter: *See*—
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Schuller, Edmund; Greppmeier, Eva-Maria; and Furtmeier, Anton, to Rieter Ingolstadt Spinnereimaschinenbau AG. Open-end spinning device having an improved fiber feeding channel. 5,555,717, Cl. 57-413.000.

Schultz, Perry D., to Wilson Greatbatch Ltd. Ergonomic and easily serviceable vacuum probe. 5,555,601, Cl. 15-339.000.

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Schulze, Ullrich; Niederlein, Horst; and Pickardt, Hans-Joachim, to NSM Aktiengesellschaft. Game machine system with money-processing station. 5,557,086, Cl. 235-380.000.

Schulze, Wolfgang; Feulner, Dieter; Krien, Burkhard; and Meier, Bernd, to Gossen-Metrawatt GmbH. Multimeter with automatic function-setting. 5,557,197, Cl. 324-115.000.

Schulzinger, Solomon. Method and apparatus for filtering using filter mounted on tank partition wall. 5,556,555, Cl. 210-767.000.

Schumacher, Markus, to Daimler-Benz Aerospace Airbus GmbH. Air duct for a position adjustable service panel. 5,556,332, Cl. 454-76.000.

Schupak, Donald. Computer controlled audio-visual system. 5,557,675, Cl. 380-10.000.

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Schupp, Hans: *See*—
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Schutz, Rudolph W.: *See*—
Neveu, Jean-Louis; Schutz, Rudolph W.; and Lipp, George, 5,556,054, Cl. 242-597.600.

Schutz, Udo. Process for manufacturing and reconditioning a reusable barrel of synthetic resin. 5,556,494, Cl. 156-69.000.

Schwab, Pierre P. Self-stressing snap spring assembly for electrical contacts. 5,555,972, Cl. 200-451.000.

Schwartz, Nira; and Shahar, Arie. Scanning and tracking using rotating polygons. 5,557,438, Cl. 359-204.000.

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Adams, Daniel O., 5,556,382, Cl. 604-96.000.
Hackett, Steven S.; Hastings, Roger N.; Thornton, Arnold W.; Thometz, Darlene A.; Larson, Kenneth R.; Thome, Scott P.; and Humphrey, John W., 5,555,893, Cl. 128-772.000.

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Scott Fetzer Company, The: *See*—
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Jabbari, Iraj, 5,557,490, Cl. 360-106.000.
Maggio, Mark; Metzner, Tom; Eckerd, Steven; Skarky, Loren; Midori, Yoshiki; Hardie, Cal; and Yu, Ray, 5,555,619, Cl. 29-860.000.
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Morris, Joseph W., 5,556,019, Cl. 225-96.000.

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SEB S.A.: *See*—
Legrain, Marc; and Combe, Daniel, 5,556,468, Cl. 118-202.000.

Sedgeley, William A., to Coors Brewing Company. Double hinged opening for container end members. 5,555,992, Cl. 220-269.000.

Sedy, Josef, to Durametallic Corporation. Face seal with angled grooves and shallow annular groove. 5,556,111, Cl. 277-96.100.

Seed Rubber Company Limited: *See*—
Koyama, Koubei; Tamai, Shigeru; and Shintani, Masatoshi, 5,556,469, Cl. 118-257.000.

Seefeldt, Joachim; and Reichle, Horst, to bielomatik Leuze GmbH + . Conveying system for sheet layers. 5,555,968, Cl. 198-594.000.

Segawa, Hajime: *See*—
Kasahara, Yoshiyuki; Segawa, Hajime; Yamauchi, Mikio; Kuno, Toshihiro; Mizutani, Hiroshige; and Kawai, Yuzo, 5,556,321, Cl. 451-5.000.

Seger, Mark J.: *See*—
Fehskens, Leonard G.; Strutt, Colin; Callander, Jill F.; Nelson, Kathy J.; Guertin, Matthew J.; Sylor, Mark W.; Chapman, Kenneth W.; Schuchard, Robert C.; Goldfarb, Stanley I.; Rogers, Dennis O.; O'Brien, Linsey B.; Chan-Lizardo, Christine C.; England, Benjamin M.; Rosenbaum, Richard L.; Kohls, Ruth E. J.; Aronson, David L.; Moore, Allan B.; Ross, Robert R. N.; Smith, Danny L.; Sankar, Arundahati G.; Koning, G. Paul; Namoglu, Sheryl F.; Seger, Mark J.; Dixon, Timothy M.; and Harrow, Jeffrey R., 5,557,796, Cl. 395-650.000.

Seguchi, Masaki: *See*—
Kuba, Kazuki; Seguchi, Masaki; Ishimori, Akira; and Yamamoto, Takashi, 5,557,628, Cl. 372-70.000.

Seib, Paul A.: *See*—
Vadlamani, Keswara R.; and Seib, Paul A., 5,556,655, Cl. 426-270.000.

Seidl, Paul G., to W. R. Grace & Co.-Conn. Control and arrangement of a continuous process for an industrial dryer. 5,555,635, Cl. 34-79.000.

Seifert, Holger; Winkler, Juergen; Pretzsch, Regina; and O'Meara, Robert, to BASF Schwarzheide GmbH. Prepolymers containing isocyanate groups. 5,556,891, Cl. 521-103.000.

Seiffge, Dirk: *See*—
Furrer, Harald; Seiffge, Dirk; Okyayuz-Baklouti, Ismahan; and Grome, John J., 5,556,854, Cl. 514-234.200.

Seiji, Hiroshi, to Rohm Co., Ltd. Semiconductor device having two staggered lead frame stages. 5,557,143, Cl. 257-666.000.

Seiko Electronic Components Ltd.: *See*—
Sasaki, Tomio; Sakai, Tsugio; and Tahara, Kensuke, 5,556,721, Cl. 429-218.000.

Seiko Epson Corporation: *See*—
Fukushima, Tohru; Kanbayashi, Kenichi; and Kumai, Eiji, 5,557,306, Cl. 347-33.000.
Okada, Hideki; Koga, Yoshiro; Suzuki, Takashi; Nakashima, Yoshihiro; and Okamura, Takehiko, 5,557,060, Cl. 118-661.000.
Senter, Cheryl D.; and Wang, Johannes, 5,557,763, Cl. 395-375.000.
Shu, Joseph S., 5,557,709, Cl. 395-109.000.

Seiko Instruments Inc.: *See*—
Sasaki, Tomio; Sakai, Tsugio; and Tahara, Kensuke, 5,556,721, Cl. 429-218.000.

Seim, Albert D., II; Steinbuchel, Herman J.; and Willing, Charles R., to Molins PLC. Conveyor system for rod-like articles. 5,556,236, Cl. 406-3.000.

Seip, Barry S.: *See*—
Burns, Elaine G.; Davenport, Esther L.; Manseur, Belkacem; Munson, Gary A.; Seip, Barry S.; and Sze, Elaine I., 5,557,664, Cl. 379-114.000.

Seki, Ryuji: *See*—
Oharu, Kazuya; Seki, Ryuji; and Kumai, Seisaku, 5,557,017, Cl. 570-176.000.

Sekiya, Kazuo: *See*—
Sone, Hironao; Sekiya, Kazuo; Ishikawa, Hiroshi; and Kanada, Yoshihisa, 5,557,754, Cl. 395-287.000.

Sellers, Victor L.: *See*—
Cheney, William A.; Grady, John T., Jr.; Sellers, Victor L.; Lefler, Kevin; and Wilks, Robert S., 5,556,448, Cl. 95-6.000.

Sellie, Clifford N., Sr. Computer assisted time study system. 5,557,553, Cl. 364-569.000.

Selmi, Fathi: *See*—
Varadan, Vijay K.; Selmi, Fathi; and Varadan, Vasundara V., 5,557,286, Cl. 343-700.0MS.

Sematech, Inc.: *See*—
Menon, Venugopal B., 5,555,902, Cl. 134-199.000.

Semiconductor Energy Laboratory Co., Ltd.: *See*—
Yamazaki, Shunpei, 5,556,794, Cl. 437-13.000.

Semjenow, Gary A.: *See*—
Barber, Keith A.; Bone, Ronald N., Jr.; Cogan, Kevin C.; Dickerson, Michael L.; Gien, Peter H.; Griffith, Lezley A.; Nightingale, Gary R.; Ouellette, Edward L.; Petter, Robert R., Jr.; and Semjenow, Gary A., 5,555,787, Cl. 83-698.110.

Semler, Günther; and Meier, Michael, to Hoechst Aktiengesellschaft. Process for preparing 3-chloroanthranilic alkyl esters of high purity from 3-chloroanthranilic acid. 5,557,005, Cl. 560-47.000.

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Inoue, Hiroki; Hayashi, Yoshiaki; Senba, Hideki; Ito, Keisuke; and Akita, Makoto, 5,556,456, Cl. 106-494.000.

Senbokuya, Haruo: *See*—
Tahara, Masaaki; Senbokuya, Haruo; Kitano, Kenzo; Hayashida, Tadashi; and Minato, Teruo, 5,556,483, Cl. 148-206.000.

Senju Pharmaceutical Co., Ltd.: *See*—
Kimura, Motoko; Morita, Yasushi; Ogawa, Takahiro; and Terai, Tadashi, 5,556,848, Cl. 514-179.000.
Ogata, Kazumi; and Kawahira, Osamu, 5,556,614, Cl. 424-65.000.
Shimizu, Nobuyoshi; Uno, Kouzi; Aoe, Motoi; and Yoshida, Kenichi, 5,556,842, Cl. 514-100.000.

Sennett, Vicki S.: *See*—
Seare, Jerry G.; Smith-Wilson, Patricia A.; VanWagoner, Kurt; Mattey, Jean A.; Snyder, Eileen K.; Wahlstrom, Candace C.; Willis, Michelle; Bentley, Matthew R.; Wenzbauer, Steven J.; Fredette, Rodney; and Sennett, Vicki S., 5,557,514, Cl. 364-401.000.

Senoo, Yukihiro; and Nakano, Masao, to Fujitsu Limited. Semiconductor memory device with function of carrying out logic judgement for correct recognition of memory operation. 5,557,574, Cl. 365-201.000.

Senter, Cheryl D.; and Wang, Johannes, to Seiko Epson Corporation. System for handling load and/or store operations in a superscalar microprocessor. 5,557,763, Cl. 395-375.000.

Senuma, Masamitsu: *See*—
Nakashima, Keishi; and Senuma, Masamitsu, 5,557,489, Cl. 360-104.000.

Senuma, Toshitaka: *See*—
Ishihama, Keiko; Fukuda, Tokuya; Senuma, Toshitaka; and Shiono, Toru, 5,557,328, Cl. 348-358.000.

Seppi, Kevin D.: *See*—
Bingham, Ronald E.; Dockter, Michael J.; Farber, Joel F.; and Seppi, Kevin D., 5,557,790, Cl. 395-600.000.

Seraku, Hirokazu: *See*—
Koike, Noboru; and Seraku, Hirokazu, 5,557,507, Cl. 361-816.000.

Serizawa, Mutsumu: *See*—
Kushige, Naohide; Saito, Naritoshi; and Serizawa, Mutsumu, 5,557,647, Cl. 375-371.000.

Servanty, Guy; and Obry, Philippe, to C.A.S.O. Conception Aéronautique du Sud-Ouest; and Aerospatiale. Method and device for manufacturing adhesive elements to be applied to a three-dimensional surface for the purpose of decorating it. 5,556,491, Cl. 156-64.000.

Seshimoto, Osamu: *See*—
Makino, Yoshihiko; Saito, Yoshio; and Seshimoto, Osamu, 5,555,767, Cl. 73-863.000.

Seth, Ashok: *See*—
Banerjee, Koushik; Mallik, Debendra; and Seth, Ashok, 5,557,502, Cl. 361-712.000.

Severtsen, Ronald H.: *See*—
Sheen, David M.; Collins, H. Dale; Hall, Thomas E.; McMakin, Douglas L.; Gribble, R. Parks; Severtsen, Ronald H.; Prince, James M.; and Reid, Larry D., 5,557,283, Cl. 342-179.000.

Sevillano, Evelio: *See*—
Besen, Matthew M.; Sevillano, Evelio; and Smith, Donald K., 5,556,475, Cl. 118-723.0MP.

Sezginer, Abdurrahman: *See*—
Kleinberg, Robert L.; and Sezginer, Abdurrahman, 5,557,201, Cl. 324-303.000.

Sezi, Recai: *See*—
Leuschner, Rainer; Ahne, Hellmut; Birkle, Siegfried; Hammerschmidt, Albert; Sezi, Recai; Noll, Tobias; and Dumoulin, Ann, 5,556,812, Cl. 437-209.000.

SGS-Thomson Microelectronics, Inc.: *See*—
Cameron, Scott W., 5,557,180, Cl. 318-254.000.
Cunningham, James A., 5,557,126, Cl. 257-332.000.
McClure, David C., 5,557,573, Cl. 365-201.000.
Siegel, Harry M.; Hundt, Michael J.; and Kelappan, Krishnan, 5,557,504, Cl. 361-173.000.

SGS-Thomson Microelectronics S.A.: *See*—
Weiss, Juliette, 5,557,238, Cl. 330-258.000.

SGS-Thomson Microelectronics S.r.l.: *See*—
Monti, Marco, 5,557,236, Cl. 327-565.000.

Shaffer, Donald R.; Sanderson, Richard A.; and Savko, John, to Elizabeth-Hata International, Inc. Method and apparatus for testing a medicinal tablet. 5,555,768, Cl. 73-865.800.

Shah, Dipak J., to Honeywell Inc. Thermostat system having an optimized temperature recovery ramp rate. 5,555,927, Cl. 165-239.000.

Shah, Mrugesh K. Apparatus and method for promoting growth and repair of soft tissue. 5,556,428, Cl. 623-13.000.

Shahar, Aric: *See*—

Schwartz, Nira; and Shahar, Arie, 5,557,438, Cl. 359-204.000.

Shakuda, Yukio, to Rohm Co. Ltd. Light emitting semiconductor device with sub-mount. 5,557,115, Cl. 257-81.000.

Shalin, Radii E.: *See*—
Shchetanov, Boris V.; Mizyurina, Galina T.; Gribkov, Vladimir N.; Shalin, Radii E.; and Kachanov, Evgueni B., 5,556,586, Cl. 264-62.000.

Shaman Pharmaceuticals, Inc.: *See*—
Truong, Thien V.; Bierer, Donald E.; Dener, Jeffrey M.; Hector, Richard; Tempesta, Michael S.; Loev, Bernard; Yang, Wu; and Koreeda, Masato, 5,556,875, Cl. 514-436.000.

Shand, Ian M. C.: *See*—
Perlman, Radia J.; Shand, Ian M. C.; and Gunner, Christopher W., 5,557,745, Cl. 395-200.020.

Shank, James D., Jr., to Church & Dwight Co., Inc. Blasting cabinet. 5,556,324, Cl. 451-89.000.

Shank, James D., Jr., to Church & Dwight Co., Inc. Pressurization system for abrasive supply pot. 5,556,325, Cl. 451-101.000.

Shank, Samuel R., Jr., to United States of America, Navy. Power plant simulation for waterborne vessel computer-assisted design and evaluation. 5,557,556, Cl. 364-578.000.

Shannon, William J.: *See*—
Brower, Boyd G.; Crane, Robert A.; Napiorkowski, John J.; and Shannon, William J., 5,557,065, Cl. 174-52.300.

Shao, Steve. Swivel mechanism for an electrical fan. 5,556,256, Cl. 416-100.000.

Sharkey, Hugh R.: *See*—
Rosen, Arye; Edwards, Stuart D.; Lax, Ronald G.; Sharkey, Hugh R.; and Lundquist, Ingemar H., 5,556,377, Cl. 604-22.000.

Sharma, Lawrence R.: *See*—
Alstyne, Diane V.; and Sharma, Lawrence R., 5,556,757, Cl. 435-7.200.

Sharp, Daniel; Patel, Jayanti; and Kelleher, Kevin, to Smiths Industries. System for displaying calligraphic video on raster displays. 5,557,297, Cl. 345-136.000.

Sharp Kabushiki Kaisha: *See*—
Masui, Katsushige; Miyauchi, Nobuyuki; Tani, Zenpei; Chikugawa, Hiroshi; Tsuji, Makoto; Ogawa, Masaru; and Shiomoto, Takehiro, 5,557,116, Cl. 257-100.000.
Tsuneyoshi, Katsumasa; and Satoh, Akiyoshi, 5,557,718, Cl. 395-140.000.

Sharpe, Barry L.; and Mathieson, Eian D., to Matson Automotive Industries Pty Ltd. Battery terminal connector. 5,556,309, Cl. 439-759.000.

Shavit, Gad: *See*—
Retter, Refael; Bublil, Moshe; Shavit, Gad; Gill, Aharon; Jaliff, Ricardo; Ofir, Ram; Boner, Alon; Ilan, Oded; and Hassut, Eliezer, 5,557,538, Cl. 364-514.00A.

Shaw, Jane M.: *See*—
Afzali-Ardakani, Ali; Ayala-Esquilin, Juan; Braren, Bodil E.; Daijavad, Shahrokh; Foster, Elizabeth; Hedrick, James L., Jr.; Hedrick, Jeffrey C.; Hodgson, Rodney T.; Mehta, Ashit A.; Molis, Steven E.; Shaw, Jane M.; Tisdale, Stephen L.; and Viehbeck, Alfred, 5,556,899, Cl. 523-215.000.

Shaw, Robert L.: *See*—
Bird, James F.; Huesdash, Douglas E.; Pierce, Lawrencw E.; and Shaw, Robert L., 5,555,686, Cl. 52-220.100.

Shchetanov, Boris V.; Mizyurina, Galina T.; Gribkov, Vladimir N.; Shalin, Radii E.; and Kachanov, Evgueni B., to Aerospatiale Societe Nationale Industrielle; and VIAM-All Russian Institut of Aviation Materials. Process for manufacturing a heat insulating material. 5,556,586, Cl. 264-62.000.

Shedletsky, John J., to International Business Machines Corporation. Expert system for designing computer networks. 5,557,775, Cl. 395-500.000.

Sheehan, David G.: *See*—
Gabriel, Stefan M.; and Sheehan, David G., 5,556,433, Cl. 623-20.000.

Sheen, David M.; Collins, H. Dale; Hall, Thomas E.; McMakin, Douglas L.; Gribble, R. Parks; Severtsen, Ronald H.; Prince, James M.; and Reid, Larry D. Real-time wideband holographic surveillance system. 5,557,283, Cl. 342-179.000.

Sheih, Rocky; and Muderlak, Kenneth J. Automatic flush valve actuation apparatus for replacing manual flush handles. 5,555,906, Cl. 137-240.000.

Sheldon, Paul C.; and Kirkham, Edward E., to Giddings & Lewis, Inc. Space frame for a machine tool. 5,556,242, Cl. 409-132.000.

Shelef, Mordecai; Usmen, Rengin K.; Graham, George W.; Watkins, William L. H.; and McCabe, Robert W., to Ford Motor Company. Automotive catalysts with improved oxygen storage and metal dispersion. 5,556,825, Cl. 502-303.000.

Shell Oil Company: *See*—
Kemp, Richard A., 5,557,027, Cl. 585-527.000.
Rem, Peter C.; van der Poel, Hans; and Ruyter, Herman P., 5,555,642, Cl. 34-423.000.

Shen, Nancy L.; Kacian, Daniel L.; Putnam, James G.; and Davis, William M., to Gen-Probe Incorporated. Stabilized compositions of reverse transcriptase and RNA polymerase for nucleic acid amplification. 5,556,771, Cl. 435-91.200.

Sher, Neal A., to EyeFix, Inc. Luminescent eye fixation device. 5,556,417, Cl. 600-236.000.

Sherrod, Willis, Sr.: *See*—
Miller, Regis R.; Mellor, George E.; Norman, Theodore W., Sr.; Jamieson, Mary V.; Thompson, Michael J.; Sherrod, Willis, Sr.; Clarke, Dana H.; Webb, Jerome D.; and Wisniewski, Robert D., 5,556,180, Cl. 312-193.000.

Shibao, Masaharu: *See*—
Watanabe, Koji; Sugita, Toru; Kobayashi, Yasutomo; Shibao, Masaharu; and Mita, Akimitsu, 5,555,685, Cl. 52-204.597.

Shibata, Manabu: *See*—
Kudo, Yasunori; Shibata, Manabu; and Misawa, Takahisa, 5,556,213, Cl. 400-621.000.

Shibata, Yukinobu: *See*—
Okamoto, Yoshihiko; Yoda, Haruo; Takada, Ikuo; Shibata, Yukinobu; Hirakawa, Akira; Saitou, Norio; Okazaki, Shinji; and Murai, Fumio, 5,557,314, Cl. 347-230.000.

Shibayama, Atsushi, to Nikon Corporation. Zoom lens system. 5,557,470, Cl. 359-687.000.

Shibib, Muhammed A., to Lucent Technologies Inc. Dielectrically isolated semiconductor devices having improved characteristics. 5,557,125, Cl. 257-329.000.

Shibuya, Takashi: *See*—
Aga, Hajime; Shibuya, Takashi; Sugimoto, Toshiyuki; and Miyake, Toshio, 5,556,866, Cl. 514-332.000.

Shiga, Mikio; and Hashimoto, Tamaki, to Canon Kabushiki Kaisha. Recording apparatus with detection of manually inserted recording sheet. 5,557,369, Cl. 355-204.000.

Shigehisa, Takuo: *See*—
Yagaki, Kazuhito; Okuma, Osamu; Shigehisa, Takuo; and Deguchi, Tetsuya, 5,556,436, Cl. 44-626.000.

Shigenaga, Fumihiro, to Yamaha Corporation. Foot pedal for a drum. 5,557,054, Cl. 84-422.100.

Shih, Ming: *See*—
Pan, Jing-Jong; and Shih, Ming, 5,557,692, Cl. 385-11.000.

Shiho, Makoto, to Canon Kabushiki Kaisha. Magnetooptical recording/reproducing apparatus with bias magnetic field generation devices for magnetic modulation recording and optical modulation recording. 5,557,588, Cl. 369-13.000.

Shiledar Baxi, Hari R. Hockey-type game. 5,556,094, Cl. 273-108.500.

Shima Seiki Manufacturing Ltd.: *See*—
Kotaki, Kenji; Kitada, Hidekazu; and Minami, Kiyoshi, 5,557,527, Cl. 364-470.020.

Shimabukuro, Jun; Nagamatsu, Yuji; Ikeuchi, Yoshimi; and Kondo, Kazuyuki, to Hitachi, Ltd.; and Hitachi Keiyo Engineering Co., Ltd. Method for making test environmental programs. 5,557,774, Cl. 395-500.000.

Shimada, Kazuyuki: *See*—
Inoue, Yoshiya; Nagatsuma, Tooru; Shimada, Kazuyuki; Hayashi, Takamasa; Tomiyasu, Kunio; and Nishiwaki, Hirofumi, 5,557,707, Cl. 395-106.000.

Shimada, Yuji: *See*—
Tanabe, Hiroshi; Imamura, Tsutomu; Amada, Katsumi; and Shimada, Yuji, 5,555,621, Cl. 29-890.000.

Shimanaka, Shigeki: *See*—
Ishii, Shigeru; Shinso, Yoshihide; Jozaki, Takeki; Shimanaka, Shigeki; Kurokawa, Shuji; and Yamamoto, Hideharu, 5,556,349, Cl. 477-76.000.

Shimasaki, Yuichi; Komatsuda, Takashi; Kato, Hiroaki; and Aoki, Takuya, to Honda Giken Kogyo Kabushiki Kaisha. Control system for electrically heated catalyst of internal combustion engine. 5,555,725, Cl. 60-277.000.

Shimasaki, Yuichi: *See*—
Hatcho, Seiji; Shimasaki, Yuichi; Aoki, Takuya; Matsumoto, Seiji; Kato, Hiroaki; Komatsuda, Takashi; Saito, Akihisa; and Oketani, Toshikazu, 5,555,724, Cl. 60-276.000.

Shimazu, Hiroto; Bando, Takashi; and Tokuno, Masateru, to Mitsubishi Jukogyo Kabushiki Kaisha; and SK Engineering, Ltd. Multi-layer paper sheet forming system. 5,556,513, Cl. 162-304.000.

Shimizu, Chizu; Suzuki, Chizuo; and Terada, Kyoko, to Fujitsu Limited. Self-scanning POS system, self-scanning registration terminal, control apparatus for self-scanning registration terminal and POS apparatus for self-scanning registration terminal. 5,557,088, Cl. 235-383.000.

Shimizu, Nobuyoshi; Uno, Kouzi; Aoe, Motoi; and Yoshida, Kenichi, to Senju Pharmaceutical Co., Ltd. Method for viable preservation of lung grafts. 5,556,842, Cl. 514-100.000.

Shimizu, Toshikazu: *See*—
Urawa, Yoshio; Furukawa, Ken; Shimizu, Toshikazu; Yamagishi, Yoji; Tsurugi, Tomio; and Ichino, Tomio, 5,557,002, Cl. 558-44.000.

Shimizu, Yasumi: *See*—
Matoba, Yasuo; Shimizu, Yasumi; Miura, Katsuhito; Kitano, Sojiro; Sakashita, Takahiro; and Tanaka, Hidekazu, 5,556,916, Cl. 525-64.000.

Shimizu, Yasuo: *See*—
Sugino, Mitsutaka; and Shimizu, Yasuo, 5,555,951, Cl. 180-444.000.

Shimizui, Tsunehiko: *See*—
Kato, Toshiyuki; Ito, Syunzi; and Shimizui, Tsunehiko, 5,556,709, Cl. 428-426.000.

Shimmick, John K.; Telfair, William B.; Munnerlyn, Charles R.; and Glockler, Herrmann J., to VISX Incorporated. Method and system for laser treatment of refractive error using an offset image of a rotatable mask. 5,556,395, Cl. 606-4.000.

Shimmyo, Tomotsugu: *See*—

Sugiura, Jun; Tsuchiya, Osamu; Ogasawara, Makoto; Ootsuka, Fumio; Torii, Kazuyoshi; Asano, Isamu; Owada, Nobuo; Horiuchi, Mitsuaki; Tamaru, Tsuyoshi; Aoki, Hideo; Otsuka, Nobuhiro; Shirai, Seiichirou; Sagawa, Masakazu; Ikeda, Yoshihiro; Tsuneoka, Masatoshi; Kaga, Toru; Shimmyo, Tomotsugu; Ogishi, Hidetsugu; Kasahara, Osamu; Enami, Hiromichi; Wakahara, Atsushi; Akimori, Hiroyuki; Suzuki, Sinichi; Funatsu, Keisuke; Kawasaki, Yoshinao; Tubone, Tunehiko; Kogano, Takayoshi; and Tsugane, Ken, 5,557,147, Cl. 257-763.000.

Shimogawa, Kenjyu, to NEC Corporation. Semiconductor integrated circuit device having a control circuit for setting the test mode. 5,557,232, Cl. 327-545.000.

Shimosaka, Hisaki: *See*—
Sato, Masaki; Kubota, Hiroshi; Morimoto, Kiyoshi; Nishimura, Takatoshi; Miyake, Takashi; and Shimosaka, Hisaki, 5,557,389, Cl. 355-315.000.

Shin-Etsu Chemical Co., Ltd.: *See*—
Minemura, Masahiko, 5,557,000, Cl. 556-434.000.
Yokoyama, Yasuhiro; Watanabe, Yuriko; Okumura, Akinori; Ichinohe, Shoji; and Yamazaki, Toshio, 5,556,929, Cl. 526-248.000.

Shin-Etsu Handotai Co., Ltd.: *See*—
Kimura, Masanori; and Yamagishi, Hirotoshi, 5,556,461, Cl. 117-52.000.
Uchiyama, Isao; and Kudo, Hideo, 5,555,634, Cl. 34-78.000.

Shin, Kil-Ho; and Suzuki, Akira, to Fuji Xerox Co., Ltd. Table generating apparatus employing heading, layout, and table script data. 5,557,787, Cl. 395-600.000.

Shinada, Akira: *See*—
Matsumoto, Shuichi; Shinada, Akira; and Shiroishi, Tetsuya, 5,557,590, Cl. 369-30.000.

Shinanen New Ceramic Corporation: *See*—
Niira, Reiji, deceased; Yamamoto, Tatuo; and Uchida, Masashi, 5,556,699, Cl. 428-323.000.

Shinde, Tsukasa: *See*—
Uchimura, Mitsuo; Shinde, Tsukasa; Hironaka, Kazutoshi; Takahashi, Hiroyshi; and Nanba, Akihiko, 5,555,926, Cl. 164-468.000.

Shindo, Isao; Mutou, Shigeo; Kai, Susumu; and Omori, Tokio, to Hitachi, Ltd. Test strip supply apparatus. 5,556,597, Cl. 422-63.000.

Shindo, Osamu; and Toji, Shigeo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Eye direction detecting apparatus. 5,557,364, Cl. 354-410.000.

Shingawa Fuel Co. Ltd.: *See*—
Niira, Reiji, deceased; Yamamoto, Tatuo; and Uchida, Masashi, 5,556,699, Cl. 428-323.000.

Shinjo, Naoki: *See*—
Kobayakawa, Kazushige; Nagasawa, Shigeru; Ikeda, Masayuki; Ueno, Haruhiko; Shinjo, Naoki; Utsumi, Teruo; Dewa, Masami; and Ishizaka, Kenichi, 5,557,744, Cl. 395-200.010.

Shinko Electric Industries Co., Ltd.: *See*—
Miyamoto, Takaharu; Miyagawa, Fumio; Ohashi, Yoji; and Saito, Tamio, 5,557,074, Cl. 174-152.0GM.

Shinohara, Kazunori: *See*—
Miyakawa, Tsutomu; Nishihara, Hideki; Kuga, Takaaki; Shinohara, Kazunori; and Ishikawa, Makoto, 5,555,864, Cl. 123-179.280.

Shinohara, Masahiko: *See*—
Inaoka, Toru; Tahara, Hideyuki; and Shinohara, Masahiko, 5,556,835, Cl. 512-3.000.

Shinonaga, Hideo: *See*—
Harada, Hiroyuki; Ikezawa, Yuji; Kanzaki, Susumu; Shinonaga, Hideo; and Sogabe, Satoru, 5,556,910, Cl. 524-504.000.

Shinosawa, Kastuhiro: *See*—
Komine, Kenji; Ikeda, Wataru; Egawa, Mamoru; Shinosawa, Kastuhiro; Isegawa, Hiroyuki; Honaga, Kazuo; Abe, Yutaka; Kameda, Tsuneji; and Sato, Shinobu, 5,556,270, Cl. 418-179.000.

Shinso, Yoshihide: *See*—
Ishii, Shigeru; Shinso, Yoshihide; Jozaki, Takeki; Shimanaka, Shigeki; Kurokawa, Shuji; and Yamamoto, Hideharu, 5,556,349, Cl. 477-76.000.

Shintani, Masatoshi: *See*—
Koyama, Kouhei; Tamai, Shigeru; and Shintani, Masatoshi, 5,556,469, Cl. 118-257.000.

Shinwa Pharmaceutical Co., Ltd.: *See*—
Kishida, Tsunataro, 5,556,785, Cl. 435-252.900.

Shioda, Katashi: *See*—
Mita, Masaaki; Sugimoto, Kenji; Sudoh, Seiji; Shioda, Katashi; and Kudoh, Moriyoshi, 5,556,539, Cl. 210-195.200.

Shiomoto, Takehiro: *See*—
Masui, Katsushige; Miyauchi, Nobuyuki; Tani, Zenpei; Chikugawa, Hiroshi; Tsuji, Makoto; Ogawa, Masaru; and Shiomoto, Takehiro, 5,557,116, Cl. 257-100.000.

Shiono, Toru: *See*—
Ishihama, Keiko; Fukuda, Tokuya; Senuma, Toshitaka; and Shiono, Toru, 5,557,328, Cl. 348-358.000.

Shirai, Katsuya: *See*—
Matsuzawa, Yoko; Tamura, Shin-Ichiro; and Shirai, Katsuya, 5,556,681, Cl. 428-64.100.

Shirai, Seiichirou: *See*—
Sugiura, Jun; Tsuchiya, Osamu; Ogasawara, Makoto; Ootsuka, Fumio; Torii, Kazuyoshi; Asano, Isamu; Owada, Nobuo; Horiuchi, Mitsuaki; Tamaru, Tsuyoshi; Aoki, Hideo; Otsuka, Nobuhiro; Shirai, Seiichirou; Sagawa, Masakazu; Ikeda, Yoshihiro; Tsuneoka, Masatoshi; Kaga, Toru; Shimmyo, Tomotsugu; Ogishi, Hidetsugu; Kasahara, Osamu; Enami, Hiromichi; Wakahara, Atsushi; Akimori, Hiroyuki; Suzuki, Sinichi; Funatsu, Keisuke; Kawasaki, Yoshinao; Tubone, Tunehiko; Kogano, Takayoshi; and Tsugane, Ken, 5,557,147, Cl. 257-763.000.

Shirakawa, Shinsuke: *See*—
Tobinaga, Kenshiro; Sakamoto, Hiroyuki; Shirakawa, Shinsuke; Urano, Satoshi; and Tsuchiya, Yasuyuki, 5,556,913, Cl. 524-555.000.

Shirao, Masami: *See*—
Kimura, Shuuichi; Hikosaka, Michichika; Shirao, Masami; Mochizuki, Akimitsu; and Tsuchida, Junichi, 5,556,966, Cl. 540-140.000.

Shirasaki, Takayuki, to Canon Kabushiki Kaisha. Vibration driven motor. 5,557,157, Cl. 310-323.000.

Shiroishi, Tetsuya: *See*—
Matsumoto, Shuichi; Shinada, Akira; and Shiroishi, Tetsuya, 5,557,590, Cl. 369-30.000.

Shirrod, Rebecca K.: *See*—
Edwards, Allan T.; Shirrod, Rebecca K.; and Callahan, Robin L., 5,557,780, Cl. 395-500.000.

Shlafman, Shlomo: *See*—
Amdursky, Vardy; Efrat, Ilan; and Shlafman, Shlomo, 5,557,710, Cl. 395-119.000.

Shobatake, Yasuro; Tsunoda, Keiji; Takabatake, Yoshiaki; Hashimoto, Mikio; Tujita, Taketoshi; Takeda, Junichi; and Kimura, Narito, to Kabushiki Kaisha Toshiba. Switching apparatus for ATM. 5,557,609, Cl. 370-60.100.

Shockley, Robert S. Device for attracting animals. 5,555,664, Cl. 43-1.000.

Shoji, Takashi: *See*—
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Shop Vac Corporation: *See*—
Berfield, Robert C., 5,555,597, Cl. 15-321.000.

Short, Shelly: *See*—
Bohn, William R.; Short, Shelly; and Garlington, Joseph O., 5,556,340, Cl. 472-59.000.

Shough, Dean M.: *See*—
Huber, Edward D.; Williams, Rick A.; Shough, Dean M.; Kwon, Osuk Y.; and Welling, Rebecca L., 5,557,410, Cl. 356-376.000.

Shouji, Hiroaki; and Aizawa, Koichi, to Dow Corning K.K. Silicone antifoaming agent composition. 5,556,902, Cl. 524-114.000.

Showa Corporation: *See*—
Takasaki, Hideki, 5,556,082, Cl. 267-218.000.

Showa Denko K.K.: *See*—
Kuramoto, Takeo; Watabe, Masataka; Noda, Satoshi; Shoji, Takashi; and Sakai, Takekazu, 5,556,023, Cl. 228-248.100.

Showa Shell Sekiyu K.K.: *See*—
Nakamura, Masayoshi; Ohki, Teruaki; and Kodama, Shougo, 5,556,038, Cl. 241-17.000.

Showa Yakuhin Kako Co., Ltd.: *See*—
Ito, Yoji; and Hirai, Yasuo, 5,556,640, Cl. 424-489.000.

Showalter, Howard D. H.: *See*—
Dobrusin, Ellen M.; Showalter, Howard D. H.; Denny, William A.; Palmer, Brian D.; Rewcastle, Gordon W.; Tercel, Moana; and Thompson, Andrew M., 5,556,874, Cl. 514-414.000.

Shower, Michael F.; McDonald, Kenneth P.; and Lukasiewicz, Anthony J., to Elopak Systems A.G. Pressure closing mechanism. 5,555,708, Cl. 53-563.000.

Shrivastava, Ritu; and Reddy, Chitranjan N., to Alliance Semiconductors Corporation. Semiconductor electrode having improved grain structure and oxide growth properties. 5,557,122, Cl. 257-309.000.

Shroot, Braham: *See*—
Reichert, Uwe; Schmidt, Rainer; and Shroot, Braham, 5,556,844, Cl. 514-171.000.

Shu, Joseph S., to Seiko Epson Corporation. Method and apparatus for dither array generation to reduce artifacts in halftoned images. 5,557,709, Cl. 395-109.000.

Shuert, Lyle H. Pallet with plastic legs. 5,555,820, Cl. 108-51.100.

Shulman, Jan E.: *See*—
Freeman, Michael B.; Lipovsky, James M.; Paik, Yi H.; Shulman, Jan E.; and Swift, Graham, 5,556,938, Cl. 528-328.000.

Shute, Richard E.: *See*—
Wayne, Michael G.; Smithers, Michael J.; Rayner, John W.; Faull, Alan W.; Pearce, Robert J.; Brewster, Andrew G.; Shute, Richard E.; Mills, Sturat D.; and Caulkett, Peter W. R., 5,556,977, Cl. 544-360.000.

Sibal, Shiv, to Hercules Incorporated. Process of using a spin pack for multicomponent fibers. 5,556,589, Cl. 264-172.120.

Sidaway, H. John; and Hamilton, Douglas O., to Hancor, Inc. Severable leaching chamber with end cap. 5,556,231, Cl. 405-48.000.

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Kasimov, Alibek E. O.; Gasanov, Gusein G. O.; Gevorkov, Levon G.; Sidorov, Evgeny I.; and Abishev, Ali A. A. O., 5,557,800, Cl. 395-800.000.

Siecor Corporation: *See*—
Brower, Boyd G.; Crane, Robert A.; Napiorkowski, John J.; and Shannon, William J., 5,557,065, Cl. 174-52.300.
Luther, James P.; Knecht, Dennis M.; Reinhardt, Sherrh C.; and Petzold, Karen, 5,556,323, Cl. 451-28.000.

Siegel, Harry M.; Hundt, Michael J.; and Kelappan, Krishnan, to SGS-Thomson Microelectronics, Inc. Surface mountable integrated circuit pack-

Smithers, Michael J.: *See*—
Ebihara, Norio; Asamizuya, Noboru; and Momochi, Nobuchika,

Siegel, Harry M.; Hundt, Michael J.; and Kelappan, Krishnan, to SGS-Thomson Microelectronics, Inc. Surface mountable integrated circuit package with detachable module. 5,557,504, Cl. 361-173.000.
Siegel, Wolfgang: *See—*
Oberdorf, Klaus; Sauter, Hubert; Grammenos, Wassilios; Kirstgen, Reinhard; Harries, Volker; Lorenz, Gisela; Ammermann, Eberhard; Gold, Randall E.; Siegel, Wolfgang; and Harreus, Albrecht, 5,556,884, Cl. 514-620.000.
Siemens Aktiengesellschaft: *See—*
Crevits, Luc; and Vanlandeghem, Marc, 5,557,660, Cl. 379-215.000.
Ibrahim, Sobhy, 5,557,509, Cl. 363-44.000.
Koch, Rudolf; and Alger-Meunier, Michael, 5,557,187, Cl. 320-1.000.
Löffel, Fritz; and Arnoldt, Claudius, 5,557,545, Cl. 364-550.000.
Lenz, Gerald, 5,557,204, Cl. 324-309.000.
Leuschner, Rainer; Ahne, Hellmut; Birkle, Siegfried; Hammerschmidt, Albert; Sezi, Recai; Noll, Tobias; and Dumoulin, Ann, 5,556,812, Cl. 437-209.000.
Scheckel, Bruno; Heinen, Stefan; Wilwert, Jean; and Herrmann, Helmut, 5,557,649, Cl. 377-48.000.
Siemens Medical Systems, Inc.: *See—*
Weng, Lee; and Phillips, William H., 5,555,886, Cl. 128-661.100.
Siemens Nixdorf Informationssysteme Aktiengesellschaft: *See—*
Creutzmann, Edmund; Hoffmann, Joachim; and Kopp, Walter, 5,557,388, Cl. 355-312.000.
Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See—*
Melloni, Piero; Bernardi, Luigi; Ferrandi, Mara; Frigerio, Marco; Mauro, Marina; and Quadri, Luisa, 5,556,846, Cl. 514-176.000.
Sigmund, Günther, to Mercedes-Benz AG. Air-distributor box. 5,556,333, Cl. 454-143.000.
Silicon Graphics, Inc.: *See—*
Chan, Sun C.; Dehnert, James C.; Lo, Raymond W.; and Towle, Ross A., 5,557,761, Cl. 395-375.000.
Silicon Systems, Inc.: *See—*
Parekh, Nitin; and Massetti, Dominic, 5,556,507, Cl. 156-656.100.
Sills, Peter D.: *See—*
Barlow, Charles G.; Johns, Peter R.; and Sills, Peter D., 5,556,742, Cl. 430-601.000.
Silva, David J., to AST Research, Inc. Dual pattern microprocessor package footprint. 5,557,505, Cl. 361-777.000.
Silva, William: *See—*
Johnson, Larry K.; Reidemeister, Eric P.; Southworth, Robert O.; Gouin, Michael D.; Silva, William; and Amatruda, Andrew A., Jr., 5,555,766, Cl. 73-514.320.
Silver, Brian H.; and Annis, Larry D., to Medela, Inc. Soft-cup feeder. 5,556,008, Cl. 222-192.000.
Simon, Arno; Rapp, Norbert; and Weil, Jean-Michel, to Bruker Analytische MeBtechnik GmbH. Spectrometer with dynamically coded components. 5,557,544, Cl. 364-525.000.
Simon, Richard L.: *See—*
Boyd, Donald B.; Lifer, Sherryl L.; Marshall, Winston S.; Palkowitz, Alan D.; Pfeifer, William; Reel, Jon K.; Simon, Richard L.; Steinberg, Mitchell I.; Thrasher, K. Jeff; Vasudevan, Venkatraghaven; and Whitesitt, Celia A., 5,556,981, Cl. 548-238.000.
Simonette, Dallas W., to GP Companies, Inc. Low profile positive displacement pump system. 5,556,264, Cl. 417-307.000.
Simons, Everett F.: *See—*
O'Gorman, Lawrence P.; and Simons, Everett F., 5,557,690, Cl. 382-151.000.
Simpson Strong-Tie Company, Inc.: *See—*
Commins, Alfred D., 5,555,694, Cl. 52-702.000.
Sinclair, Richard G.: *See—*
Lipinsky, Edward S.; Sinclair, Richard G.; Browning, James D.; Cheung, Alex; Schilling, Kevin H.; and Verser, Dan W., 5,556,895, Cl. 521-182.000.
Singer, Dinah S.; Kohn, Leonard; Mozes, Edna; Saji, Motoyasu; Weissman, Jocelyn; Napolitano, Giorgio; and Ledley, Fred D., to United States of America, Health and Human Services. Methods for assessing the ability of a candidate drug to suppress MHC class I expression. 5,556,754, Cl. 435-6.000.
Singh, Ajay K.: *See—*
Fischer, Harold L.; Singh, Ajay K.; and Stadnik, John M., Jr., 5,555,756, Cl. 72-41.000.
Singh, Rajwant: *See—*
Krulik, Gerald A.; Mandich, Nenad V.; and Singh, Rajwant, 5,556,553, Cl. 216-93.000.
Sinnhuber, Ruprecht; and Müller, Helmut E., to Volkswagen AG. Safety arrangement for a vehicle occupant. 5,556,128, Cl. 280-730.200.
Sissors, Kenneth M.: *See—*
Brown, Marsha A.; Demers, Richard A.; Diephuis, James A.; Falcon, Lorenzo, Jr.; Frayne, Thomas E.; Gaitonde, Sunil S.; Patry, Elaine S.; Remay, William A.; Sissors, Kenneth M.; Vasquez, Ejuana D.; Weber, David J.; and Yamaguchi, Koichi, 5,557,776, Cl. 395-500.000.
Six Corners Development Company: *See—*
Stein, Andrew M.; and Jinks, Andrew, 5,555,792, Cl. 99-323.900.
Sizer, Charles E., to Tetra Laval Holdings & Finance S.A. Process and apparatus for packaging liquid food products. 5,555,702, Cl. 53-127.000.
Sizto, Ning L.; and Dietz, Louis J., to Biometric Imaging, Inc. Method and apparatus for cell counting and cell classification. 5,556,764, Cl. 435-7.240.
SK Engineering, Ltd.: *See—*
Shimazu, Hiroto; Bando, Takashi; and Tokuno, Masateru, 5,556,513, Cl. 162-304.000.
Skarky, Loren: *See—*
Maggio, Mark; Metzner, Tom; Eckerd, Steven; Skarky, Loren; Midori, Yoshiki; Hardie, Cal; and Yu, Ray, 5,555,619, Cl. 29-860.000.
Skeen, Marion D.; and Bowles, Mark, to Tibco, Inc. Apparatus and method for providing decoupling of data exchange details for providing high performance communication between software processes. 5,557,798, Cl. 395-650.000.
SKF Textilmaschinen-Komponenten GmbH: *See—*
Paweletz, Anton; and Birkenmaier, Wilhelm, 5,555,715, Cl. 57-414.000.
Skinner, Richard L. Attachment device for motor cranes. 5,556,148, Cl. 294-67.100.
Sklenar, James M.: *See—*
Lathrop, Robert L., Jr.; Emerson, Rick E.; Wiley, James E.; Sklenar, James M.; Chin, Albert K.; Moll, Frederick H.; and Forster, David, 5,555,897, Cl. 128-845.000.
Skodell, Birgit; Osberghaus, Rainer; Rogmann, Karl-Heinz; Faubel, Heiko; and Bossek, Harald, to Henkel Kommanditgesellschaft auf Aktien. Neutral self-shine emulsion for the care of floors (III). 5,556,450, Cl. 106-10.000.
Skulnick, Harvey I.: *See—*
Kelly, Robert C.; Johnson, Roy A.; Skulnick, Harvey I.; and Nidy, Eldon G., 5,556,878, Cl. 514-449.000.
Sloan, Alan B. Gift wrapping sleeve. 5,556,025, Cl. 229-87.190.
Sloss, Christopher W.; Davignon, Barry J.; and Niemeyer, Duane J., to Roadmaster Corporation. Adjustable riding toy with interchangeable back ends. 5,556,116, Cl. 280-7.150.
Smaha, Stephen E.; and Snapp, Steven R., to Haystack Labs, Inc. Method and system for detecting intrusion into and misuse of a data processing system. 5,557,742, Cl. 395-186.000.
Smalley, Richard E., to William Marsh Rice University. Solar process for making fullerenes. 5,556,517, Cl. 204-157.470.
Smart, Bruce E.; and Yang, Zhen-Yu, to Du Pont de Nemours, E. I., and Company. Partially flourinated polymers and process therefor. 5,557,018, Cl. 570-135.000.
Smart, David: *See—*
Fehringer, Robert; Hines, William L.; Qutub, Motaz; Emigh, Jonathan D.; Preston, Charles E.; Leitner, Robert; and Smart, David, 5,555,701, Cl. 53-75.000.
Smayling, Michael C.; Maronta, Giulio G.; D'Arrigo, Iano; Santin, Giovanni; Falessi, Georges; and Bhat, Mousumi, to Texas Instruments Incorporated. Low voltage flash EEPROM C-cell using fowler-nordheim tunneling. 5,557,569, Cl. 365-185.280.
SMC Kabushiki Kaisha: *See—*
Fukano, Yoshihiro; Makado, Shoichi; and Arakawa, Takeshi, 5,555,911, Cl. 137-625.690.
Smedegård, Göran: *See—*
Agback, Hubert; Ahrgren, Leif; Berglindh, Thomas; Haraldsson, Martin; Smedegård, Göran; and Olsson, Lars-Inge, 5,556,855, Cl. 514-247.000.
Smith, C. Morris: *See—*
Cheng, Jane C.; Fung, Anthony D.; Klocke, Donald J.; Lawton, Stephen L.; Lissy, Daria N.; Roth, Wieslaw J.; Smith, C. Morris; and Walsh, Dennis E., 5,557,024, Cl. 585-467.000.
Smith, Danny L.: *See—*
Fehskens, Leonard G.; Strutt, Colin; Callander, Jill F.; Nelson, Kathy J.; Guertin, Matthew J.; Sylor, Mark W.; Chapman, Kenneth W.; Schuchard, Robert C.; Goldfarb, Stanley I.; Rogers, Dennis O.; O'Brien, Linsey B.; Chan-Lizardo, Christine C.; England, Benjamin M.; Rosenbaum, Richard L.; Kohls, Ruth E. J.; Aronson, David L.; Moore, Allan B.; Ross, Robert R. N.; Smith, Danny L.; Sankar, Arundahati G.; Koning, G. Paul; Namoglu, Sheryl F.; Seger, Mark J.; Dixon, Timothy M.; and Harrow, Jeffrey R., 5,557,796, Cl. 395-650.000.
Smith, Donald K.: *See—*
Besen, Matthew M.; Sevillano, Evelio; and Smith, Donald K., 5,556,475, Cl. 118-723.0MP.
Smith, Gregory A.; Foltz, Dale E.; Wisebaker, Robert E.; and Loy, Robert E., to National Machinery Company, The. Flat die thread roller. 5,555,757, Cl. 72-88.000.
Smith, James A.: *See—*
Mehr-Ayin, Kourosh; Bialas, W. J.; and Smith, James A., 5,555,722, Cl. 60-39.142.
Smith, Jeffrey E.: *See—*
Denham, Martin S.; Wong, Keng L.; Smith, Jeffrey E.; and Fernando, Roshan J., 5,557,225, Cl. 327-199.000.
Smith, John W.: *See—*
DiStefano, Thomas H.; and Smith, John W., 5,557,501, Cl. 361-704.000.
Smith, Lee A. Block for controlling soil erosion. 5,556,228, Cl. 405-16.000.
Smith, Michael J., to Arrow Art Finishers, Inc. Shipping container convertible into display stand. 5,555,975, Cl. 206-762.000.
Smith, Roderick A.: *See—*
Dix, John; and Smith, Roderick A., 5,557,560, Cl. 364-602.000.
Smith, Ronald A.: *See—*
Lauring, Daniel H.; Smith, Ronald A.; and Gesell, Ralph P., 5,555,774, Cl. 74-512.000.
Smith, Ruth: *See—*
Maynard, Victor K.; Maynard, Kendall C.; Smith, Ruth; and Calano, Claire, 5,557,299, Cl. 345-168.000.
Smith, Scott C. Inflatable saddle support apparatus. 5,555,710, Cl. 54-66.000.
Smith, Wayne H. Method and apparatus for applying liquid. 5,555,673, Cl. 47-1.500.

Smithers, Michael J.: *See—*
Wayne, Michael G.; Smithers, Michael J.; Rayner, John W.; Faull, Alan W.; Pearce, Robert J.; Brewster, Andrew G.; Shute, Richard E.; Mills, Sturat D.; and Caulkett, Peter W. R., 5,556,977, Cl. 544-360.000.
Smiths Industries: *See—*
Sharp, Daniel; Patel, Jayanti; and Kelleher, Kevin, 5,557,297, Cl. 345-136.000.
Smith-Wilson, Patricia A.: *See—*
Seare, Jerry G.; Smith-Wilson, Patricia A.; VanWagoner, Kurt; Mattey, Jean A.; Snyder, Eileen K.; Wahlstrom, Candace C.; Willis, Michelle; Bentley, Matthew R.; Wenzbauer, Steven J.; Fredette, Rodney; and Sennett, Vicki S., 5,557,514, Cl. 364-401.000.
Smits, Antonius H. J.: *See—*
van Mol, Johannes C. F.; Ockhuizen, Johannes B. M.; and Smits, Antonius H. J., 5,555,952, Cl. 182-18.000.
SMK Corporation: *See—*
Kato, Tatsuo; Kishi, Katsuhiko; and Matsuda, Takeshi, 5,556,292, Cl. 439-218.000.
Takada, Yasuo, 5,555,971, Cl. 200-345.000.
Smothers, Daryl: *See—*
Hauser, Ray; Smothers, Daryl; and Schreier, John, 5,555,727, Cl. 60-488.000.
SMS Schloemann-Siemag Aktiengesellschaft: *See—*
Daub, Dieter, 5,556,035, Cl. 239-455.000.
Snap-Tite, Inc.: *See—*
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Snapp, Steven R.: *See—*
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Snyder, Eileen K.: *See—*
Seare, Jerry G.; Smith-Wilson, Patricia A.; VanWagoner, Kurt; Mattey, Jean A.; Snyder, Eileen K.; Wahlstrom, Candace C.; Willis, Michelle; Bentley, Matthew R.; Wenzbauer, Steven J.; Fredette, Rodney; and Sennett, Vicki S., 5,557,514, Cl. 364-401.000.
So, Moon-Lam, to May Cheong Toy Products Factory Limited. Toy carrousel. 5,556,318, Cl. 446-236.000.
Sobel, Arthur, to VLSI Technology, Inc. Filter for computer bus signals. 5,557,233, Cl. 327-552.000.
Societe Nationale Elf Aquitaine: *See—*
Pirri, Rosangela; Gadioux, Jacques; and Riveno, Richard, 5,555,936, Cl. 116-295.000.
Sodap: *See—*
Meilhon, Daniel, 5,556,674, Cl. 428-34.900.
Sogabe, Satoru: *See—*
Harada, Hiroyuki; Ikezawa, Yuji; Kanzaki, Susumu; Shinonaga, Hideo; and Sogabe, Satoru, 5,556,910, Cl. 524-504.000.
Solar Turbines Incorporated: *See—*
Darragh, Charles T.; Holman, Leonard; Luckett, Thomas M.; and Ward, Michael E., 5,555,933, Cl. 165-166.000.
Sollac: *See—*
Jeuniaux, François; and Mineau, Jean-Luc, 5,557,100, Cl. 250-227.160.
Solvay (Société Anonyme): *See—*
Costa, Jean-Louis; Laurent, Vincent; Francois, Philippe; and Vercammen, Dirk, 5,556,893, Cl. 521-143.000.
Solvay Interox Limited: *See—*
James, Alun P.; and Horne, Graham R., 5,556,834, Cl. 510-375.000.
Jones, Craig W.; Sanderson, William R.; and Sankey, John P., 5,557,008, Cl. 560-145.000.
Somekh, Sasson; Fairbairn, Kevin; Kolstoe, Gary M.; White, Gregory W.; and Faraco, W. George, Jr., to Applied Materials, Inc. Wafer tray and ceramic blade for semiconductor processing apparatus. 5,556,147, Cl. 294-64.100.
Sommazi, Anna; Lugli, Gabriele; and Garbassi, Fabio, to Enichem S.p.A. Catalytic system and process for the copolymerization of olefins with carbon monoxide. 5,556,823, Cl. 502-162.000.
Sommer & Maca Industries, Inc.: *See—*
Ford, Ronald N., 5,556,322, Cl. 451-21.000.
Sommer, Edward J., Jr.; Kittel, Michael A.; and Quarles, Ronald A., to National Recovery Technologies, Inc. Automated glass and plastic refuse sorter. 5,555,984, Cl. 209-580.000.
Somogyvari, Arpad F.; Creed, Beth L.; Nicola, Antonio P.; Sanger, Alan R.; Law, David J.; and Cavell, Ronald G., to University of Alberta, The Governors of the. Olefin oligomerization in the presence of novel complexes. 5,557,023, Cl. 585-513.000.
Sonatech, Inc.: *See—*
Suchman, Daniel, 5,557,584, Cl. 367-131.000.
Sone, Hironao; Sekiya, Kazuo; Ishikawa, Hiroshi; and Kanada, Yoshihisa, to International Business Machines Corporation. Computer system and system expansion unit. 5,557,754, Cl. 395-287.000.
Sonobe, Masao: *See—*
Sumioka, Kouichi; Haji, Motohiro; Suzuki, Toshiiku; Sonobe, Masao; and Naitoh, Noriyuki, 5,556,649, Cl. 425-215.000.
Sonoco Products Company: *See—*
Drummond, Michael T.; Suski, William C.; Hill, Calvin G.; Lowry, James W.; and Roberts, Rodney W., 5,556,365, Cl. 493-299.000.
Sonoda, Nobuo: *See—*
Wakita, Katsuya; Hotta, Shu; Sonoda, Nobuo; and Yang, Yang, 5,556,706, Cl. 428-421.000.
Sony Chemicals Corporation: *See—*
Abe, Kenji; and Sugita, Satoru, 5,556,701, Cl. 428-336.000.
Sony Corporation: *See—*
Chiba, Nobuhiro; and Iwasaki, Yasuo, 5,557,594, Cl. 369-59.000.
Ebihara, Norio; Asamizuya, Noboru; and Momochi, Nobuchika, 5,557,413, Cl. 358-296.000.
Ghanbari, Ebrahim, 5,556,521, Cl. 204-192.320.
Goda, Yoshimasa, 5,555,623, Cl. 29-896.900.
Hanai, Tomoyuki; Kakurai, Kimio; and Hamamoto, Kenji, 5,557,585, Cl. 368-43.000.
Horimai, Hideyoshi, 5,557,600, Cl. 369-116.000.
Horimai, Hideyoshi; and Fujita, Goro, 5,557,602, Cl. 369-124.000.
Ishihama, Keiko; Fukuda, Tokuya; Senuma, Toshitaka; and Shiono, Toru, 5,557,328, Cl. 348-358.000.
Ishii, Mikio, 5,557,417, Cl. 358-310.000.
Ito, Tatsumi; and Kuwahara, Soichi, 5,557,465, Cl. 359-669.000.
Kanehira, Kouzi, 5,556,018, Cl. 225-2.000.
Kobayashi, Selji; Okamura, Hiroshige; and Yamatsu, Hisayuki, 5,557,592, Cl. 369-48.000.
Kondo, Hirofumi, 5,556,717, Cl. 428-694.00B.
Koyanagi, Hideki; Sumihiro, Hiroshi; Emoto, Seiichi; and Wada, Tohru, 5,557,332, Cl. 398-416.000.
Kurita, Tohru, 5,557,421, Cl. 358-335.000.
Matsumoto, Shuichi; Shinada, Akira; and Shiroishi, Tetsuya, 5,557,590, Cl. 369-30.000.
Matsuzawa, Yoko; Tamura, Shin-Ichiro; and Shirai, Katsuya, 5,556,681, Cl. 428-64.100.
Mukawa, Hiroshi; and Eto, Hiroshi, 5,557,589, Cl. 369-13.000.
Nakajima, Yasuhisa, 5,557,336, Cl. 348-556.000.
Nishigaki, Tetsuo; Mitsuhashi, Takamichi; and Yoshidaa, Takamichi, 5,557,422, Cl. 358-335.000.
Ooka, Miwa; and Kuragano, Tetsuzo, 5,557,719, Cl. 395-141.000.
Sasa, Koichiro; Kuramoto, Shuji; and Kato, Haruo, 5,556,664, Cl. 427-64.000.
Satoh, Kimiyasu, 5,557,300, Cl. 345-170.000.
Suzuki, Mamoru; Iijima, Minoru; Ishihama, Yasuyuki; and Fujiwara, Nobuhiro, 5,557,189, Cl. 320-18.000.
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Sorbini, Franco, to Dima S.r.l. System for fastening interchangeable advertisements to a supporting strip. 5,555,657, Cl. 40-518.000.
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Ricks, Merle K.; Sorenson, Janiel; Duran, John A.; and Vargas, Javier, 5,556,125, Cl. 280-728.200.
Sorenson, John C., to J. W. Harris Co., Inc. Welding assembly. 5,556,562, Cl. 219-137.610.
Sorge, Joseph A.; and Mullinax, Rebecca L., to Stratagene. Polymerase compositions and uses thereof. 5,556,772, Cl. 435-91.200.
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Sorkin, Felix L. Chair for use in construction. 5,555,693, Cl. 52-689.000.
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Soske, Joshua W.: *See—*
Hoarty, W. Leo; and Soske, Joshua W., 5,557,316, Cl. 348-7.000.
Soudures et Chaines Pedno Inc.: *See—*
Collard, Bruno, 5,556,487, Cl. 152-228.000.
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Nogles, Thomas G., 5,555,997, Cl. 220-404.000.
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Leverant, Gerald R., 5,556,713, Cl. 428-610.000.
Winter, Dean C.; Harris, Ralph E.; and Honeyager, Kevin S., 5,555,880, Cl. 128-204.210.
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Johnson, Larry K.; Reidemeister, Eric P.; Southworth, Robert O.; Gouin, Michael D.; Silva, William; and Amatruda, Andrew A., Jr., 5,555,766, Cl. 73-514.320.
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Fuchs, Hans-Bernd; Günter, Dietrich; and Steinbrecht, Ulrich, 5,556,907, Cl. 524-493.000.
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Nygren, Evert C.; Lord, Peter W.; Jakstys, Vito J.; Barkeshli, Sina; and Ersoy, Levent, 5,557,292, Cl. 343-781.00P.
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Calvignac, Jean; Galand, Claude; Giroir, Didier; Lebizay, Gerald; Mauduit, Daniel; and Spagnol, Victor, 5,557,608, Cl. 370-60.000.
Sparkman, Scott. Solar energy collector. 5,555,878, Cl. 126-657.000.
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Kolton, Chester; and Spater, Stuart S., 5,556,014, Cl. 223-85.000.
Specht, Winona C.: *See—*
Godolphin, William J.; Specht, Winona C.; Pires, David P.; and Killiam, Geoffrey T., 5,555,920, Cl. 141-329.000.

Specialty Coating Systems, Inc.: *See*—
Olson, Roger A.; Wary, John; and Beach, William F., 5,556,473, Cl. 118-719.000.
Spectra, Inc.: *See*—
Hine, Nathan P.; and Gailus, David W., 5,557,305, Cl. 347-17.000.
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Paterson, Graeme S.; Bliss, Gary L.; and Boyd, Mark R., 5,557,653, Cl. 379-58.000.
Speer, John G.: *See*—
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Cheesman, Donald C.; and Spencer, Mark W., 5,556,041, Cl. 241-24.140.
Spencer, Thomas V., to Hewlett-Packard Company. Chained arbitration. 5,557,756, Cl. 395-299.000.
Spencer Wright Industries, Inc.: *See*—
Satterfield, William H., 5,555,826, Cl. 112-80.040.
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Istin, Michel; Grognet, Jean-Marc; and Darnez, Charles, 5,556,635, Cl. 424-448.000.
Spielmann, Hans P.: *See*—
Wollowitz, Susan; Isaacs, Stephen T.; Rapoport, Henry; Spielmann, Hans P.; and Nerio, Aileen, 5,556,993, Cl. 549-282.000.
Spirin, Alexander S.: *See*—
Wu, Ying; Ryabova, Lyubov A.; Kurnasov, Oleg V.; Morosov, Igor Y.; Ugarov, Viktor I.; Volianik, Elena V.; Chetverin, Alexander B.; Zhang, David; Kramer, Fred R.; and Spirin, Alexander S., 5,556,769, Cl. 435-69.100.
Sprintvest Corporation NV: *See*—
Banks, Stewart, 5,556,005, Cl. 222-96.000.
Srinivasachar, Srivats; Morency, Joseph; and Itse, Daniel C., to Physical Sciences, Inc. Process for treating metal-contaminated materials. 5,556,447, Cl. 75-670.000.
Srinivasan, Subhashini; and Sudarsanam, Padmanaban, to Immunex Corporation. Method and system for protein modeling. 5,557,535, Cl. 364-496.000.
Staab, David; and Vijeh, Nader, to Advanced Micro Devices, Inc. Integrated multi-port repeater having shared resources. 5,557,633, Cl. 375-213.000.
Stadnik, John M., Jr.: *See*—
Fischer, Harold L.; Singh, Ajay K.; and Stadnik, John M., Jr., 5,555,756, Cl. 72-41.000.
Staehle, Charles M.: *See*—
Staten, Dwight M.; and Staehle, Charles M., 5,555,839, Cl. 116-210.000.
Staggl, Roland; and Oser, Jörg, to Mannesmann Aktiengesellschaft. Supporting and guiding arrangement, in particular a post for shelf storage and retrieval devices. 5,555,958, Cl. 187-406.000.
Stahl, Thomas D. Pixel compensated electro-optical display system. 5,557,353, Cl. 353-69.000.
Staiger, John G.: *See*—
Gurusami, Aravanan; Chapman, Mark; and Staiger, John G., 5,557,319, Cl. 348-11.000.
Stallard, Caskel A.; and Scholl, Susan O., to Cerebral Palsy Research Foundation of Kansas. Electricaly operable wheelchair having a controller responsive to different types of inputs. 5,555,949, Cl. 180-6.500.
Standard Car Truck Company: *See*—
Bullock, Robert L., 5,555,818, Cl. 105-198.200.
Taillon, Armand P.; and Brunkhorst, Philip J., 5,555,817, Cl. 105-198.200.
Standard Duplicating Machines Corporation: *See*—
Darcy, James A.; and Weeks, Thomas E., 5,556,254, Cl. 414-798.100.
Standiford, Gregory A.: *See*—
Stephens, Fred O.; Bloom, Devin A., Eland, Michael P.; Standiford, Gregory A.; and Dory, Jon R., 5,557,485, Cl. 360-96.500.
Stanford Telecommunications, Inc.: *See*—
Weinberg, Aaron, 5,557,641, Cl. 375-295.000.
Stanford University: *See*—
Kazmer, David O., 5,556,582, Cl. 264-40.100.
Stankus, John C.: *See*—
Oldsen, John G.; and Stankus, John C., 5,556,234, Cl. 405-259.100.
Stanley, James P., to Union Carbide Chemicals & Plastics Technology Corporation. Unsaturated polylactone acrylates and derivatives thereof. 5,557,007, Cl. 560-183.000.
Starke, Carl I., to Astra Aktiebolag. Compound for gastric acid secretion inhibition. 5,556,863, Cl. 514-313.000.
Starr, Harvey W. Electronic keyboard instrument. 5,557,057, Cl. 84-617.000.
Staten, Dwight M.; and Staehle, Charles M., to Distress Signals, Inc. Inflatable balloon signal device. 5,555,839, Cl. 116-210.000.
Statz, R. J.: *See*—
Goodrich, J. L.; and Statz, R. J., 5,556,900, Cl. 524-59.000.
Stauffer, John E. Silicone monomer process. 5,557,001, Cl. 556-470.000.
Steenhof, Frits A.: *See*—
Fisher, Kevin D.; Wong-Lam, Ho W.; Bergmans, Johannes W. M.; Steenhof, Frits A.; and Voorman, Johannes O., 5,557,638, Cl. 375-286.000.
Stefano, James E., to Amoco Corporation. Selective amplification system using Q-β replicase. 5,556,751, Cl. 435-6.000.
Steffi, Christoph: *See*—
Steiner, Manfred; and Steffi, Christoph, 5,556,173, Cl. 303-3.000.
Stein, Andrew M.; and Jinks, Andrew, to Six Corners Development Company. Corn popping kettle assembly 5,555,792, Cl. 99-323.900.
Stein, Harold M. Adaptors for a device for cleaning and polishing an optical fiber. 5,557,696, Cl. 385-75.000.
Steinberg, Mathew: *See*—
Bingham, Gail J.; Haller, Jeff; and Steinberg, Mathew, 5,556,060, Cl. 248-49.000.
Steinberg, Mitchell I.: *See*—
Boyd, Donald B.; Lifer, Sherryl L.; Marshall, Winston S.; Palkowitz, Alan D.; Pfeifer, William; Reel, Jon K.; Simon, Richard L.; Steinberg, Mitchell I.; Thrasher, K. Jeff; Vasudevan, Venkatraghaven; and Whitesitt, Celia A., 5,556,981, Cl. 548-238.000.
Steinbrecht, Ulrich: *See*—
Fuchs, Hans-Bernd; Günter, Dietrich; and Steinbrecht, Ulrich, 5,556,907, Cl. 524-493.000.
Steinbuchel, Herman J.: *See*—
Seim, Albert D., II; Steinbuchel, Herman J.; and Willing, Charles R., 5,556,236, Cl. 406-3.000.
Steiner, Manfred; and Steffi, Christoph, to Mercedes-Benz AG. Device and method for termination an automatic braking process in motor vehicles. 5,556,173, Cl. 303-3.000.
Steiner, Manfred: *See*—
Bösch, Peter; Laubacher, Karl-Eugen; Ammon, Dieter; and Steiner, Manfred, 5,556,176, Cl. 303-165.000.
Stendardo, William; and Weisman, David. Card type of electronic learning aid/teaching apparatus. 5,556,283, Cl. 434-188.000.
Stepan, Michael M.: *See*—
Kirkwood, Brad L.; Stepan, Michael M.; and Patt, Paul J., 5,556,565, Cl. 219-633.000.
Stephens, Fred O.; Bloom, Devin A.; Eland, Michael P.; Standiford, Gregory A.; and Dory, Jon R., to Hewlett-Packard Company. Alignment and latching mechanism in a drive for magnetic data tape mini-cartridges. 5,557,485, Cl. 360-96.500.
Stephenson, Gregory A.: *See*—
Greene, James M.; Hankins, Holly M.; and Stephenson, Gregory A., 5,556,839, Cl. 514-29.000.
Steritech, Inc.: *See*—
Carroll, Peter G.; Isaacs, Stephen T.; and Cimino, George D., 5,556,958, Cl. 536-25.300.
Wollowitz, Susan; Isaacs, Stephen T.; Rapoport, Henry; Spielmann, Hans P.; and Nerio, Aileen, 5,556,993, Cl. 549-282.000.
Stern, Max M.: *See*—
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Stevens, Gary D.; and Padovani, Francois A., to Texas Instruments Incorporated. Method of making optically fused semiconductor powder for solar cells. 5,556,791, Cl. 437-4.000.
Stevens, James C.: *See*—
Devore, David D.; Timmers, Francis J.; Stevens, James C.; Mussell, Robert D.; Crawford, Lenore H.; and Wilson, David R., 5,556,928, Cl. 526-127.000.
Stevens, Rick C.; Sauter, Gerald F.; and Krawczak, John A., to Unisys Corporation. Apparatus and method for transmitting optical data. 5,557,693, Cl. 385-24.000.
Stevens, William: *See*—
Matthews, Jack W.; and Stevens, William, 5,557,198, Cl. 324-115.000.
Stevenson, Robert L. Manual refrigeration apparatus. 5,555,740, Cl. 62-293.000.
Stevenson, Tyler A.; Ravichandran, Ramanathan; Holt, Mark S.; Phan, Thuy N.; Birbaum, Jean-Luc; and Toan, Vien V., to Ciba-Geigy Corporation. Red-shifted tris-aryl-s-triazines and compositions stabilized therewith. 5,556,973, Cl. 544-216.000.
Stewart, Brett; and Feemster, Ryan, to Advanced Micro Devices Inc. Interrupt vector method and apparatus. 5,557,764, Cl. 395-375.000.
Stiel, Jürgen A., to Koenig & Bauer Aktiengesellschaft. Device for supplying printing plates to a plate cylinder and for carrying away the same from the plate cylinder. 5,555,810, Cl. 101-477.000.
Sugsson, Lars, to Chemrec Aktiebolag. Method of seperating sulphur compounds. 5,556,605, Cl. 423-220.000.
Stillwagon, Catherine A.: *See*—
Ansberry, Catherine M.; Freer, Jay D.; Fuqua, Todd W.; Mesterton, Erik P.; Stillwagon, Catherine A.; and Yang, Ching-Yun, 5,557,725, Cl. 395-153.000.
Stites, Kelye. Shuffleboard game board with a handicap scoring system. 5,556,095, Cl. 273-126.00R.
Stockton, David J.: *See*—
Barker, Philip A.; Stockton, David J.; Fisk, Christopher; and Jenkins, Peter D., 5,557,703, Cl. 385-128.000.
Stuckwell, Walter E. Forearm crutch. 5,555,904, Cl. 135-68.000.
Stoddard, Damon R.: *See*—
Foote, Steven A.; and Stoddard, Damon R., 5,557,044, Cl. 73-497.000.
Stohr, Günter: *See*—
Kratel, Günter; Stohr, Günter; Gross, Martin; and Wilde, Eugen, 5,556,689, Cl. 428-137.000.
Stokes, James P.: *See*—
Hughes, Gerard J.; Duncan, Leonard J.; Goshorn, David P.; and Stokes, James P., 5,557,268, Cl. 340-933.000.
Stokes, Robert H.: *See*—
Hyde, Russell T.; Wise, Michael G.; Stokes, Robert H.; and Brasher, Edward C., Jr., 5,557,397, Cl. 356-5.010.
Stone Container Corporation: *See*—

Kuhn, Wayne H.; and Leftwich, Robert B., 5,555,982, Cl. 206-746.000.
Stones, Mitchell A.; and Richardson, Nicholas J., to VLSI Technology Inc. Combination asynchronous cache system and automatic clock tuning device and method therefor. 5,557,781, Cl. 395-550.000.
St. Onge, Gary F.: *See*—
Ferrer, Mary E.; St. Onge, Gary F.; Johnston, Charles J.; and Swart, Mark A., 5,557,211, Cl. 324-754.000.
Storage Technology Corporation: *See*—
Leonhardt, Michael L.; and Milligan, Charles A., 5,557,484, Cl. 360-95.000.
Munro, Frederick; Dailey, Aaron; Allen, Scott; and Trachy, David, 5,557,528, Cl. 364-478.020.
Stortz, James L., to Compaq Computer Corporation. Spot size modulatable ink jet printhead. 5,557,304, Cl. 347-15.000.
Storz, Karl; and Novak, Pavel. Device for irrigation of body cavities. 5,556,378, Cl. 604-31.000.
Stott, Christopher, to LK Limited. Scale assembly. 5,555,633, Cl. 33-704.000.
Stovesand, Josef: *See*—
Tophinke, Franz; Stovesand, Josef; Heidjann, Franz; and Dammann, Johannes, 5,556,337, Cl. 460-70.000.
Stratagene: *See*—
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Strauss, Carl R.: *See*—
Gavin, Patrick M.; Schelhorn, Jean E.; Aschenbeck, David P.; and Strauss, Carl R., 5,556,682, Cl. 428-74.000.
Strazhnik, Michael M.: *See*—
Bray, Douglas R.; and Strazhnik, Michael M., 5,556,297, Cl. 439-405.000.
Strickland, Frederick W.; and Bastarache, Joseph L. Semiautomatic operated handcuffs with pivotal arcuate blades. 5,555,751, Cl. 70-16.000.
Strickler, Jamie R.; and Power, John M., to Albemarle Corporation. Enhanced synthesis of racemic metallocenes. 5,556,997, Cl. 556-11.000.
Strijbos, Leonardus: *See*—
Brehm, Helmut; Strijbos, Leonardus; and Eikmeier, Hans-Bernhard, 5,556,930, Cl. 526-318.500.
Strohbehn, Robert D., to Pioneer Hi-Bred International, Inc. Inbred maize line PHTP9. 5,557,038, Cl. 800-200.000.
Strupczewski, Joseph T.; Helsley, Grover C.; Glamkowski, Edward J.; Chiang, Yulin; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., to Hoechst-Roussel Pharmaceuticals, Inc. Cis-2-[(4-heteroaryl-1-piperazinyl)alkyl] hexahydro-1H-isoindole-1,3 (2H)-diones and related compounds and their therapeutic utility. 5,556,858, Cl. 514-254.000.
Strusch, Wolfgang: *See*—
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Strutt, Colin: *See*—
Fehskens, Leonard G.; Strutt, Colin; Callander, Jill F.; Nelson, Kathy J.; Guertin, Matthew J.; Sylor, Mark W.; Chapman, Kenneth W.; Schuchard, Robert C.; Goldfarb, Stanley I.; Rogers, Dennis O.; O'Brien, Linsey B.; Chan-Lizardo, Christine C.; England, Benjamin M.; Rosenbaum, Richard L.; Kohls, Ruth E. J.; Aronson, David L.; Moore, Allan B.; Ross, Robert R. N.; Smith, Danny L.; Sankar, Arundahati G.; Koning, G. Paul; Namoglu, Sheryl F.; Seger, Mark J.; Dixon, Timothy M.; and Harrow, Jeffrey R., 5,557,796, Cl. 395-650.000.
Stüber, Werner: *See*—
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Studebaker, Charles E. Finger-protecting paper creaser. 5,556,366, Cl. 493-405.000.
Studt, Robert W.: *See*—
Pauls, Henry W.; Choi, Yong-Mi; Studt, Robert W.; Maguire, Martin P.; Spada, Alfred P.; and Cha, Don D., 5,556,990, Cl. 548-530.000.
Stufflebeam, John F.; and Ledermann, Donald L., to Case Corporation. Operator controlled pressure applicator for the furrow forming mechanism of a seed planter. 5,555,824, Cl. 111-62.000.
Stultz, Robert D.; Birnbaum, Milton; and Camargo, Marly B., to Hughes Aircraft Company. Laser system using U-doped crystal Q-switch. 5,557,624, Cl. 372-11.000.
Su, Shin-San: *See*—
Modrich, Paul L.; Su, Shin-San; Au, Karin G.; Lahue, Robert S.; Cooper, Deani L.; and Worth, Leroy, Jr., 5,556,750, Cl. 435-6.000.
Subuvenkat, Subramaniyan: *See*—
Frantz, Gene A.; Subuvenkat, Subramaniyan; Bradley, Jonathan; and Larimer, James A., 5,557,557, Cl. 364-578.000.
Succi, Marco; and Lorimer, D'Arcy, to Saes Getters S.p.A. Process for the purification of hydrogen and a purifier therefor. 5,556,603, Cl. 422-213.000.
Suchman, Daniel, to Sonatech, Inc. Moderate depth underwater surveillance system. 5,557,584, Cl. 367-131.000.
Suda, Hirofumi: *See*—
Ueda, Osamu; and Suda, Hirofumi, 5,557,325, Cl. 348-223.000.
Sudarsanam, Padmanaban: *See*—
Srinivasan, Subhashini; and Sudarsanam, Padmanaban, 5,557,535, Cl. 364-496.000.
Suddith, Robert L., to Liposome Company, Inc., The. Liposome continuous size reduction method and apparatus. 5,556,580, Cl. 264-4.300.
Sudhakar, Chakka; Dolfinger, Frank, Jr.; Cesar, Max R.; and Weissman, Jeffrey G., to Texaco Inc. Hydrodearomatization of hydrocarbons. 5,556,824, Cl. 502-202.000.
Sudhaus Schloss-Und Beschlagtechnik GmbH & Co.: *See*—
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Sudoh, Seiji: *See*—
Mita, Masaaki; Sugimoto, Kenji; Sudoh, Seiji; Shioda, Katashi; and Kudoh, Moriyoshi, 5,556,539, Cl. 210-195.200.
Suenaga, Masashi; Tomita, Nobuo; Watanabe, Hiroshi; and Tanji, Masayuki, to Hitachi, Ltd. Information processing unit having a multiplexed bus and a bus control method therefor. 5,557,753, Cl. 395-287.000.
Suga, Yoichi; Ishii, Yoshio; and Morigaki, Masakazu, to Fuji Photo Film Co., Ltd. Silver halide emulsion, method of manufacturing the same, and photosensitive material using this emulsion. 5,556,741, Cl. 430-569.000.
Sugahara, Akinobu: *See*—
Funabashi, Hideo; Sugahara, Akinobu; Tanaka, Akira; Toda, Masatoshi; Ota, Tsuyoshi; Matsuo, Youichi; Akimaru, Tsutomu; Iwasaki, Sigeo; and Tsuruoka, Masayuki, 5,556,820, Cl. 502-111.000.
Sugano, Yasuyuki: *See*—
Ito, Takayuki; and Sugano, Yasuyuki, 5,557,472, Cl. 359-751.000.
Sugasawara, Renee J.; and Hill, Ruth B., to Igen, Inc. Method of preparing a composition that enhances. 5,556,770, Cl. 435-70.100.
Sugawa, Shigetoshi: *See*—
Kozuka, Hiraku; Sugawa, Shigetoshi; and Yamanobe, Masato, 5,557,121, Cl. 257-292.000.
Sugimachi, Masato: *See*—
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Sugimoto, Akinori: *See*—
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Sugimoto, Hitoshi: *See*—
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Sugimoto, Kenji: *See*—
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Sugimoto, Toshiyuki: *See*—
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Kubota, Michio; Tsusaki, Keiji; Hattori, Kazuko; and Sugimoto, Toshiyuki, 5,556,781, Cl. 435-200.000.
Sugino, Mitsutaka; and Shimizu, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Electrically operated power steering apparatus with improved housing assembly. 5,555,951, Cl. 180-444.000.
Sugisaka, Takayuki; Sakakibara, Toshio; Miura, Shoji; and Iida, Makio, to Nippondenso Co., Ltd. Dielectric isolated type semiconductor device. 5,557,134, Cl. 257-506.000.
Sugishima, Kenji: *See*—
Honjo, Ichiro; Sugishima, Kenji; and Yamabe, Masaki, 5,557,105, Cl. 250-310.000.
Sugita, Satoru: *See*—
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Sugita, Toru: *See*—
Watanabe, Koji; Sugita, Toru; Kobayashi, Yasutomo; Shibao, Masaharu; and Mita, Akimitsu, 5,555,685, Cl. 52-204.597.
Sugiura, Jun; Tsuchiya, Osamu; Ogasawara, Makoto; Ootsuka, Fumio; Torii, Kazuyoshi; Asano, Isamu; Owada, Nobuo; Horiuchi, Mitsuaki; Tamaru, Tsuyoshi; Aoki, Hideo; Otsuka, Nobuhiro; Shirai, Seiichirou; Sagawa, Masakazu; Ikeda, Yoshihiro; Tsuneoka, Masatoshi; Kaga, Toru; Shimmyo, Tomotsugu; Ogishi, Hidetsugu; Kasahara, Osamu; Enami, Hiromichi; Wakahara, Atsushi; Akimori, Hiroyuki; Suzuki, Sinichi; Funatsu, Keisuke; Kawasaki, Yoshinao; Tubone, Tunehiko; Kogano, Takayoshi; and Tsugane, Ken, to Hitachi, Ltd.; and Hitachi ULSI Engineering Corporation. Semiconductor integrated circuit device, process for fabricating the same, and apparatus for fabricating the same. 5,557,147, Cl. 257-763.000.
Sugiyama, Hideo: *See*—
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Sugiyama, Yoshikazu; and Sato, Haruo, to Nikon Corporation. Wide angle lens. 5,557,473, Cl. 359-757.000.
Suhadolnik, Robert J.; and Pfleiderer, Wolfgang, to Temple University - Of The Commonwealth System of Higher Education. 2',5'-phosphorothioate oligoadenylates as anitiviral agents. 5,556,840, Cl. 514-44.000.
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Glebe, Harlan, 5,556,195, Cl. 362-386.000.
Suhocki, Paul V.: *See*—
Ridinger, Mark T.; and Suhocki, Paul V., 5,556,380, Cl. 604-52.000.
Suissa, Avshalom; Zomotor, Zoltan; and Boettiger, Friedrich, to Daimler-Benz AG. Method for determining variables characterizing vehicle handling. 5,557,520, Cl. 364-424.010.
Sukegawa, Hiroshi, to Kabushiki Kaisha Toshiba. Disk control system using identification codes for retrieving related data for storage in a read ahead cache. 5,557,767, Cl. 395-440.000.
Sukegawa, Shunichi: *See*—
Numaga, Shigeki; Sukegawa, Shunichi; Inui, Takashi; Suzuki, Yukihide; and Nakai, Kiyoshi, 5,557,580, Cl. 365-230.060.
Sulzer-Escher Wyss GmbH: *See*—
Bluhm, Reinhard; and Gotz, Thomas, 5,556,511, Cl. 162-206.000.
Sumerak, Joseph E. Pultrusion method for making variable cross-section thermoset articles. 5,556,496, Cl. 156-166.000.
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Koyanagi, Hideki; Sumihiro, Hiroshi; Emoto, Seiichi; and Wada, Tohru, 5,557,332, Cl. 398-416.000.
Suzuki, Mamoru; Iijima, Minoru; Ishihama, Yasuyuki; and Fujiwara, Nobuhiro, to Sony Corporation. Method and apparatus including a current detector and a power source control circuit for charging a number of

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Prochazka, Vaclav, 5,557,248, Cl. 335-284.000.
Takagi, Junichi: *See*—
Uno, Tetuya; Takagi, Junichi; and Sakai, Yasunobu, 5,557,395, Cl. 356-28.000.
Takagi, Takeshi: *See*—

Sumihiro, Hiroshi: *See—*
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Harada, Hiroyuki; Ikezawa, Yuji; Kanzaki, Susumu; Shinonaga, Hideo; and Sogabe, Satoru, 5,556,910, Cl. 524-504.000.
Hirose, Taro; Kisida, Hiroshi; Saito, Shigeru; and Fujimoto, Hiroaki, 5,556,867, Cl. 514-340.000.
Inoue, Hiroki; Hayashi, Yoshiaki; Senba, Hideki; Ito, Keisuke; and Akita, Makoto, 5,556,456, Cl. 106-494.000.
Sagawa, Seiji; Kano, Toshio; Samizo, Motohiko; Kojima, Fumitoshi; and Yamaguchi, Tetsuo, 5,556,980, Cl. 546-190.000.
Suzuki, Naoko; Nakanishi, Hirotoshi; and Tomioka, Jun, 5,556,995, Cl. 549-406.000.
Sumitomo Electric Industries, Ltd.: *See—*
Kanamori, Hiroo; Urano, Akira; Aikawa, Haruhiko; Ishikawa, Shinji; Hirose, Chisai; and Saito, Masahide, 5,556,442, Cl. 65-17.400.
Nakamura, Takao; and Iiyama, Michitoma, 5,556,472, Cl. 118-719.000.
Tanabe, Keiichiro; and Fujimori, Naoji, 5,556,464, Cl. 117-106.000.
Sumitomo Heavy Industries, Ltd.: *See—*
Tanaka, Masaru, 5,557,172, Cl. 315-111.710.
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Kushida, Takahiro, 5,555,916, Cl. 138-177.000.
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Muraoka, Masami; Matsui, Kazuki; Hasegawa, Hirohiko; and Kojima, Atsuyuki, 5,556,860, Cl. 514-258.000.
Sumitomo Special Metals Co., Ltd.: *See—*
Ohta, Kimiharu; and Aoki, Masaaki, 5,557,205, Cl. 324-319.000.
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Chishima, Masamitsu; and Noro, Yutaka, 5,556,301, Cl. 439-507.000.
Ito, Osamu, 5,556,291, Cl. 439-189.000.
Itou, Hikaru; Miyazaki, Sho; Tanaka, Tsutomu; Saito, Masashi; Yamada, Shinichi; Wakata, Shigekazu; and Saijo, Eiji, 5,556,284, Cl. 439-34.000.
Taniuchi, Osamu; Konoya, Hisashi; and Nankoh, Youichi, 5,556,302, Cl. 439-533.000.
Summit, Edward A.: *See—*
Oktay, Osman O.; Summit, Edward A.; and Beck, Gregory F., 5,557,783, Cl. 395-550.000.
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Sun, Jack, to Primax Electronics Ltd. Optical rotation encoder for X-Y direction input device. 5,557,450, Cl. 359-234.000.
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Banman, David A.; and Clark, Robert A., 5,557,751, Cl. 395-250.000.
D'Souza, Godfrey P., 5,557,581, Cl. 365-233.000.
Piercey, Lawrence E., 5,557,188, Cl. 320-5.000.
Sun, Tung-Tien: *See—*
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Sundstrand Corporation: *See—*
Mehr-Ayin, Kourosh; Bialas, W. J.; and Smith, James A., 5,555,722, Cl. 60-39.142.
Sundy, Harold W.: *See—*
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Sung, Nak J.: *See—*
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Sung, Wing L.: *See—*
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Shin, Kil-Ho; and Suzuki, Akira, 5,557,787, Cl. 395-600.000.
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Suzuki, Mamoru; Iijima, Minoru; Ishihama, Yasuyuki; and Fujiwara, Nobuhiro, to Sony Corporation. Method and apparatus including a current detector and a power source control circuit for charging a number of batteries. 5,557,189, Cl. 320-18.000.
Suzuki, Mamoru: *See—*
Araki, Seiichi; Suzuki, Mamoru; Fujimoto, Masatoshi; and Ueki, Tadashi, 5,556,624, Cl. 424-195.100.
Araki, Seiichi; Suzuki, Mamoru; Fujimoto, Masatoshi; and Ueki, Tadashi, 5,556,625, Cl. 424-195.100.
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Sugiura, Jun; Tsuchiya, Osamu; Ogasawara, Makoto; Ootsuka, Fumio; Torii, Kazuyoshi; Asano, Isamu; Owada, Nobuo; Horiuchi, Mitsuaki; Tamaru, Tsuyoshi; Aoki, Hideo; Otsuka, Nobuhiro; Shirai, Seiichirou; Sagawa, Masakazu; Ikeda, Yoshihiro; Tsuneoka, Masatoshi; Kaga, Toru; Shimmyo, Tomotsugu; Ogishi, Hidetsugu; Kasahara, Osamu; Enami, Hiromichi; Wakahara, Atsushi; Akimori, Hiroyuki; Suzuki, Sinichi; Funatsu, Keisuke; Kawasaki, Yoshinao; Tubone, Tunehiko; Kogano, Takayoshi; and Tsugane, Ken, 5,557,147, Cl. 257-763.000.
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Suzuki, Takatugu; Tomotake, Atsushi; Ohya, Hidenobu; and Takiyama, Nobuyuki, to Konica Corporation. Heat-developable photosensitive material. 5,556,740, Cl. 430-559.000.
Suzuki, Takehiko: *See—*
Kobayashi, Masao; Nishioka, Yukiko; Suzuki, Takehiko; and Matsukawa, Yashuhisa, 5,556,642, Cl. 424-502.000.
Suzuki, Takehiro, Koide, Masashi; and Fujii, Masahiro, to Toyo Ink Manufacturing Co., Ltd. Water-based organosilicon composition. 5,556,915, Cl. 524-837.000.
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Igarashi, Kazuo; Takano, Kengo; Morita, Toshiharu; Saito, Hiroaki; Hashizume, Yukio; Suzuki, Tokio; Tashiro, Hirohisa; Muramoto, Mituru; and Sato, Katsunori, 5,556,527, Cl. 204-488.000.
Suzuki, Tomoo: *See—*
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Suzuki, Toshiiku: *See—*
Sumioka, Kouichi; Haji, Motohiro; Suzuki, Toshiiku; Sonobe, Masao; and Naitoh, Noriyuki, 5,556,649, Cl. 425-215.000.
Suzuki, Toshiyuki; Maeda, Shigeru; Hayashimoto, Shigeo; Ogawa, Mikio; and Yoshida, Norikazu, to Nippon Kayaku Kabushiki Kaisha. Sheet material for eliminating methyl bromide, a material therefor obtained by working the sheet into a hilter form, and a method for eliminating methyl bromide with the same. 5,556,595, Cl. 422-32.000.
Suzuki, Yukihide: *See—*
Numaga, Shigeki; Sukegawa, Shunichi; Inui, Takashi; Suzuki, Yukihide; and Nakai, Kiyoshi, 5,557,580, Cl. 365-230.060.
Suzuki, Yutaka; Kashiwagi, Hideyuki; Aoki, Teruaki; Koshino, Fumiichi; Picha, George J.; and Szpak, Anthony J., to Applied Medical Research, Inc. Gastric access device. 5,555,898, Cl. 128-898.000.
Swain, Miles: *See—*
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Swart, Mark A.: *See—*
Ferrer, Mary E.; St. Onge, Gary F.; Johnston, Charles J.; and Swart, Mark A., 5,557,211, Cl. 324-754.000.
Sweers, Ronald L. Guard screen for a rain gutter having flanges for gripping the front lip of a gutter. 5,555,680, Cl. 52-12.000.
Swicegood, Glenn M., Jr. Shoe wiping mat assembly. 5,556,685, Cl. 428-95.000.
Swiderski, Paul R., to Emerson Electric Co. Collapsible-expansible support assembly. 5,555,954, Cl. 182-152.000.
Swift, Graham: *See—*
Freeman, Michael B.; Lipovsky, James M.; Paik, Yi H.; Shulman, Jan E.; and Swift, Graham, 5,556,938, Cl. 528-328.000.
Swirbel, Thomas J.: *See—*
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Sylor, Mark W.: *See—*
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Symbios Logic Inc.: *See—*
Lee, Steven, 5,557,131, Cl. 257-370.000.
Symbol Technologies Inc: *See—*
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Symorex Inc.: *See—*
Burkhalter, Kenneth E.; and Cailey, Ron, 5,555,814, Cl. 104-107.000.
Synaptic Pharmaceutical Corporation: *See—*
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Synektron Corporation: *See—*
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Synnestvedt, Blake, to Desert Craft Casual Furniture Co. Reclining bracket lounge chair. 5,556,166, Cl. 297-377.000.
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Abbruzzese, Pamela; Bailey, Paul; Fritz, Denise L.; Lawler, John; Manning, Rick; Pollnow, Russ; Retartha, Anthony; Round, Mary J.; Schardt, Marc; Synodinos, Barbara; and Tanner, Robert, 5,557,515, Cl. 364-401.00R.
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Szeremeta, George R. Rugged terrain cart. 5,556,117, Cl. 280-47.110.
Szpak, Anthony J.: *See—*
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Taber, Donald B.: *See—*
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Tabuchi, Takeharu: *See—*
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Tabuchi, Takeshi: *See—*
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Tagawa, Toshiaki; Awane, Kaoru; and Nagaike, Kazuhiro, to Mitsubishi Chemical Corporation. Phospholipid derivatized with PEG bifunctional linker and liposome containing it. 5,556,948, Cl. 530-391.900.
Taghizadeh, Ehssanollah: *See—*
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Tago, Kenji: *See—*
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Taguchi, Masao; Eto, Satoshi; Takemae, Yoshihiro; Yoshioka, Hiroshi; and Koga, Makoto, to Fujitsu Limited. Semiconductor integrated circuit with input/output interface adapted for small-amplitude operation. 5,557,221, Cl. 327-53.000.
Taguchi, Takeyasu: *See—*
Naito, Toshiharu; Kamiya, Masahiko; Taguchi, Takeyasu; and Fujiwara, Kenji, 5,557,552, Cl. 364-565.000.
Taguchi, Tetsu, to NEC Corporation. Low bit rate speech signal transmitting system using an analyzer and synthesizer. 5,557,705, Cl. 395-2.280.
Tahara, Hideyuki: *See—*
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Tahara, Kensuke: *See—*
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Tahara, Masaaki; Senbokuya, Haruo; Kitano, Kenzo; Hayashida, Tadashi; and Minato, Teruo, to Daido Hoxan, Inc. Method of carburizing austenitic metal. 5,556,483, Cl. 148-206.000.
Taillon, Armand P.; and Brunkhorst, Philip J., to Standard Car Truck Company. Pad of substantially rigid synthetic resin for a friction wedge in a bolster pocket. 5,555,817, Cl. 105-198.200.
Taiwan Fu Hsing Industrial Co., Ltd.: *See—*
Lin, Jui-Chang, 5,556,144, Cl. 292-336.300.
Taiwan Semiconductor Manufacturing Company: *See—*
Pan, Sheng-Liang; Chang, Hsien-Wen; and Chen, Chien-Fong, 5,556,806, Cl. 437-195.000.
Tajima, Kazuhito: *See—*
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Tajima, Yoshio: *See—*
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Takabatake, Yoshiaki: *See—*
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Takada, Ikuo: *See—*
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Takada, Yasuo, to SMK Corporation. Key switch. 5,555,971, Cl. 200-345.000.
Takagi, Junichi: *See—*
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Takagi, Takeshi: *See—*
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Takahashi, Fumio: *See—*
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Takahashi, Hiroyshi: *See—*
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Takahashi, Kazue: *See—*
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Takahashi, Kazuhiro, to Canon Kabushiki Kaisha. Tape end detection device. 5,557,483, Cl. 360-74.600.
Takahashi, Masanori, to Sanshin Kogyo Kabushiki Kaisha. Water circulation system for marine engine. 5,555,855, Cl. 123-41.080.
Takahashi, Masanori: *See—*
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Takahashi, Masazi, to NEC Corporation. Semiconductor relay unit. 5,557,132, Cl. 257-415.000.
Takahashi, Sadao: *See—*
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Takahashi, Susumu, to Olympus Optical Co., Ltd. Stereoscopic endoscope. 5,557,454, Cl. 359-378.000.
Takami, Norio: *See—*
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Takamiya, Makoto; and Kadowaki, Hidejiro, to Canon Kabushiki Kaisha. Measuring apparatus having a diffraction grating for receiving a diverged light beam. 5,557,407, Cl. 356-356.000.
Takamuki, Yasuhiko; and Nagami, Ken, to Konica Corporation. Silver halide photographic element and processing method thereof. 5,556,738, Cl. 430-526.000.
Takamura, Kozo: *See—*
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Takamura, Masayuki: *See—*
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Takano, Kengo: *See—*
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Takano, Mitsuhiro: *See—*
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Takano, Satoshi; Matsuda, Itaru; and Harasawa, Yuko, to Ricoh Company, Ltd. Image transferring device for image forming equipment. 5,557,384, Cl. 355-274.000.
Takano, Yoshiaki: *See—*
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Takaoka, Yuichi, to Murata Manufacturing Co., Ltd. Thermistor with electrodes for preventing inter-electrode migration. 5,557,251, Cl. 338-22.00R.
Takasago International Corporation: *See—*
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Takasago Netsugaku Kogyo Kabushiki Kaisha: *See—*
Inaba, Hitoshi; and Ohmi, Tadahiro, 5,555,928, Cl. 165-47.000.
Takasaki, Hideki, to Showa Corporation. Cushion unit. 5,556,082, Cl. 267-218.000.
Takasaki, Kunihiko, to Takigen Manufacturing Co. Ltd. Push button-operated flush type handle assembly. 5,556,145, Cl. 292-336.300.
Takashi, Terumi: *See—*
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Takasu, Masayuki: *See—*
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Takatsu, Kazuo: *See—*
Sakai, Toshiharu; Nakamura, Yoshinori; Umegaki, Takashi; Iguchi, Nobuo; Hagino, Miki; Mori, Hiroaki; Ota, Toshikazu; Oka, Akihiko; Takatsu, Kazuo; and Nemoto, Nobuyuki, 5,557,437, Cl. 359-110.000.
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Takeda Chemical Industries, Ltd.: *See—*
Fujisawa, Yukio; Hinuma, Shuji; and Aono, Aki, 5,556,946, Cl. 530-351.000.
Tsubotani, Shigetoshi; Masayuki, Takizawa; Mikio, Shirasaki; and Fujisawa, Yukio, 5,556,853, Cl. 514-231.500.

Takeda, Hidekazu: *See—*
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Takeda, Hiroshi: *See—*
Nishii, Osamu; Inagawa, Takashi; Hanawa, Makoto; and Takeda, Hiroshi, 5,557,760, Cl. 395-310.000.

Takeda, Junichi: *See—*
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Takeda, Kenji: *See—*
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Takehara, Yoshifumi: *See—*
Hiroi, Masakazu; and Takehara, Yoshifumi, 5,556,251, Cl. 414-790.300.

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Hasegawa, Takashi; Inoue, Masahiro; and Takekoshi, Nobuhiko, 5,557,383, Cl. 355-271.000.

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Taguchi, Masao; Eto, Satoshi; Takemae, Yoshihiro; Yoshioka, Hiroshi; and Koga, Makoto, 5,557,221, Cl. 327-53.000.

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Sakagami, Kouichi, 5,556,140, Cl. 292-92.000.
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Ohinata, Yoshiharu; Takita, Nagon; and Negishi, Hideo, 5,555,802, Cl. 101-116.000.

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De Pedro, Mayda T.; Estiandan, Fe S.; Talbot, Michael L.; and Traitler, Helmut, 5,556,659, Cl. 426-302.000.

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Koyama, Kouhei; Tamai, Shigeru; and Shintani, Masatoshi, 5,556,469, Cl. 118-257.000.

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Narukawa, Satoshi; Amazutsumi, Toru; Tamaki, Hiyoshi; and Yamauchi, Yasuhiro, 5,556,722, Cl. 429-163.000.

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Tamura, Masao: *See—*
Tarimura, Masatake; and Tamura, Masao, 5,556,546, Cl. 210-659.000.

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Tanabe Seiyaku Co., Ltd.: *See—*
Kobayashi, Masao; Nishioka, Yukiko; Suzuki, Takehiko; and Matsukawa, Yashuhisa, 5,556,642, Cl. 424-502.000.

Tanabe, Tokuyoshi, to Kabushiki Kaisha Tanabe Shishu. Sewing machine including a laser cutting system, a sewing method, and an embroidering method. 5,555,827, Cl. 112-102.500.

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Fujimoto, Koichi; Tanaka, Naoki; Asai, Fumitoshi; Ito, Tomiyoshi; and Koike, Hiroyuki, 5,556,864, Cl. 514-315.000.

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Tanimizu, Toru: *See—*
Komuro, Katsuhiro; Kojima, Yoshitaka; Kurosawa, Yukio; Koguchi, Yoshio; Tanimizu, Toru; Hakamata, Yoshimi; and Endo, Shunkichi, 5,557,083, Cl. 218-125.000.

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Abbruzzese, Pamela; Bailey, Paul; Fritz, Denise L.; Lawler, John; Manning, Rick; Pollnow, Russ; Retartha, Anthony; Round, Mary J.; Schardt, Marc; Synodinos, Barbara; and Tanner, Robert, 5,557,515, Cl. 364-401.00R.

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Wittner, Lupu, 5,556,564, Cl. 219-494.000.

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Amick, Darryl; McDowell, Gary; Henson, Hershel R.; and Wille, Jerald, 5,555,799, Cl. 100-930.0RP.

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Telefonaktiebolaget LM Ericsson: *See—*
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Näslund, Jonas; Johansson, Thomas; and Dahlström, Johan, 5,557,676, Cl. 380-23.000.

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Bender, Richard; and Maier, Lothar, 5,556,131, Cl. 280-741.000.

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Teng, James Z.: *See—*
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Terada, Kyoko: *See—*
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Kauvar, Lawrence M.; Lyttle, Matthew H.; and Satyam, Apparao, 5,556,942, Cl. 530-331.000.

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Hackett, Steven S.; Hastings, Roger N.; Thornton, Arnold W.; Thometz,

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Sugiura, Jun; Tsuchiya, Osamu; Ogasawara, Makoto; Ootsuka, Fumio;

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Tetra Laval Holdings & Finance S.A.: *See*—
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Johnson, Larry K.; Reidemeister, Eric P.; Southworth, Robert O.; Gouin, Michael D.; Silva, William; and Amatruda, Andrew A., Jr., 5,555,766, Cl. 73-514.320.
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Orcutt, John W.; and Lin, Galle, 5,556,022, Cl. 228-1.100.
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Theken, Randall R. Ergonomic handle. 5,556,092, Cl. 273-75.000.

Thellier, Gilles: *See*—
Carcreff, Hubert; and Thellier, Gilles, 5,557,107, Cl. 250-361.00R.

Then, Terry T.: *See*—
Berger, Martin T.; and Then, Terry T., 5,555,939, Cl. 169-54.000.

Theurer, Josef; and Wörgötter, Herbert, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Machine for working with a suction snout on the ballast of a track bed. 5,555,941, Cl. 171-16.000.

Theusner, Joachim: *See*—
Kubein-Meesenburg, Dietmar; and Nagerl, Hans, 5,556,432, Cl. 623-20.000.

Thibodeau, Joe: *See*—
Young, Neil P.; Thibodeau, Joe; Trubitt, David; and Fowler, Dennis, 5,555,815, Cl. 104-296.000.

Tholérus, Jan, to Bindomatic AB. Indicating binding times. 5,556,490, Cl. 156-64.000.

Thomas & Betts Corporation: *See*—
Blasko, Richard G.; and Mortimer, Richard A., 5,556,272, Cl. 431-75.000.
Whitehead, James H.; and Lynch, Francis X., 5,557,069, Cl. 174-87.000.

Thomas, Craig: *See*—
Rogers, M. Weldon, III; Bogart, Bruce E.; Gerke, David L.; Eberle, Robert A.; and Thomas, Craig, 5,556,163, Cl. 297-330.000.

Thomas, Steve: *See*—
Holt, Nick; and Thomas, Steve, 5,557,723, Cl. 395-149.000.

Thomasson, Samuel L. Electronic stethoscope. 5,557,681, Cl. 381-67.000.

Thorne, Scott P.: *See*—
Hackett, Steven S.; Hastings, Roger N.; Thornton, Arnold W.; Thometz, Darlene A.; Larson, Kenneth R.; Thorne, Scott P.; and Humphrey, John W., 5,555,893, Cl. 128-772.000.

Thometz, Darlene A.: *See*—
Hackett, Steven S.; Hastings, Roger N.; Thornton, Arnold W.; Thometz, Darlene A.; Larson, Kenneth R.; Thorne, Scott P.; and Humphrey, John W., 5,555,893, Cl. 128-772.000.

Thompson, Andrew M.: *See*—
Dobrusin, Ellen M.; Showalter, Howard D. H.; Denny, William A.; Palmer, Brian D.; Rewcastle, Gordon W.; Tercel, Moana; and Thompson, Andrew M., 5,556,874, Cl. 514-414.000.

Thompson, Craig Bernie: *See*—
Mak, Tak W., 5,557,032, Cl. 800-2.000.

Thompson, Kenneth R.: *See*—
Gilmore, Peter B.; and Thompson, Kenneth R., 5,557,142, Cl. 257-659.000.

Thompson, Michael J.: *See*—
Miller, Regis R.; Mellor, George E.; Norman, Theodore W., Sr.; Jamieson, Mary V.; Thompson, Michael J.; Sherrod, Willis, Sr.; Clarke, Dana H.; Webb, Jerome D.; and Wisniewski, Robert D., 5,556,180, Cl. 312-193.000.

Thompson, Patrick. Two liter insulated cooler containers. 5,555,746, Cl. 62-457.400.

Thompson, Patrick: *See*—
Williams, William M.; Vasquez, Barbara; Begay, Marlene J.; and Thompson, Patrick, 5,556,808, Cl. 437-209.000.

Thompson, Suzanne M., to International Business Machines Corporation. Method and apparatus for protecting software executing on a demonstration computer. 5,557,732, Cl. 395-161.000.

Thoms, Ellen M.; and Sbragia, Ronald J., to DowElanco. Use of hexaflumuron as a termiticide. 5,556,883, Cl. 514-594.000.

Thomson Consumer Electronics, Inc.: *See*—
Maze, Kenneth W.; and Forler, Joseph W., 5,557,338, Cl. 348-565.000.

THOMSON-CSF: *See*—
Ganne, Jean-Pierre; Labeyrie, Michèle; and Dubois, Jean-Claude, 5,557,090, Cl. 235-449.000.

Thomson Saginaw Ball Screw Company, Inc.: *See*—
Dolata, Randy W.; and Houlihan, Lisa A., 5,555,770, Cl. 74-459.000.

Thomson Tubes & Displays, S.A.: *See*—
Descombes, Jean-Philippe; and Vougny, Alain, 5,557,165, Cl. 313-440.000.

Thorne, Barbara L.; and Traniello, James F. A. System for termite detection and control. 5,555,672, Cl. 43-124.000.

Thornton, Arnold W.: *See*—
Hackett, Steven S.; Hastings, Roger N.; Thornton, Arnold W.; Thometz, Darlene A.; Larson, Kenneth R.; Thorne, Scott P.; and Humphrey, John W., 5,555,893, Cl. 128-772.000.

Thornton, Barry: *See*—
Gareis, Galen M.; and Thornton, Barry, 5,557,698, Cl. 385-101.000.

Thorpe, John R.: *See*—
Gallie, Ian G.; and Thorpe, John R., 5,556,205, Cl. 383-24.000.

Thrasher, K. Jeff: *See*—
Boyd, Donald B.; Lifer, Sherryl L.; Marshall, Winston S.; Palkowitz, Alan D.; Pfeifer, William; Reel, Jon K.; Simon, Richard L.; Steinberg, Mitchell I.; Thrasher, K. Jeff; Vasudevan, Venkatraghaven; and Whitesitt, Celia A., 5,556,981, Cl. 548-238.000.

Tibco, Inc.: *See*—
Skeen, Marion D.; and Bowles, Mark, 5,557,798, Cl. 395-650.000.

Tice, Lee D., to Pittway Corporation. Fire alarm system with different types of sensors and dynamic system parameters. 5,557,262, Cl. 340-587.000.

Tigelaar, Howard: *See*—
Kaya, Cetin; and Tigelaar, Howard, 5,557,565, Cl. 365-185.010.

Timmers, Francis J.: *See*—
Devore, David D.; Timmers, Francis J.; Stevens, James C.; Mussell, Robert D.; Crawford, Lenore H.; and Wilson, David R., 5,556,928, Cl. 526-127.000.

Timp, Richard L.: *See*—
Rosene, Ronald G.; Morehead, John H.; and Timp, Richard L., 5,555,759, Cl. 72-179.000.

Tipton, Clyde C. Biopsy shaver. 5,555,892, Cl. 128-757.000.

Tisdale, Stephen L.: *See*—
Afzali-Ardakani, Ali; Ayala-Esquilin, Juan; Braren, Bodil E.; Daijavad, Shahrokh; Foster, Elizabeth; Hedrick, James L., Jr.; Hedrick, Jeffrey C.; Hodgson, Rodney T.; Mehta, Ashit A.; Molis, Steven E.; Shaw, Jane M.; Tisdale, Stephen L.; and Viehbeck, Alfred, 5,556,899, Cl. 523-215.000.

Titan, Stan: *See*—
Bulat, Vladimir; Madic, Bosko; Bowden, David; and Titan, Stan, 5,557,631, Cl. 373-105.000.

Toagosei Co., Ltd.: *See*—
Yamada, Yoshinori; Hasegawa, Mitsutaka; and Harada, Katsuyoshi, 5,556,999, Cl. 556-401.000.

Toan, Vien V.: *See*—
Stevenson, Tyler A.; Ravichandran, Ramanathan; Holt, Mark S.; Phan, Thuy N.; Birbaum, Jean-Luc; and Toan, Vien V., 5,556,973, Cl. 544-216.000.

Tobe, Akihiro: *See*—
Maruyama, Akira; Ogawa, Shigeru; Yamazaki, Satoshi; and Tobe, Akihiro, 5,556,851, Cl. 514-214.000.

Tobinaga, Kenshiro; Sakamoto, Hiroyuki; Shirakawa, Shinsuke; Urano, Satoshi; and Tsuchiya, Yasuyuki, to Nippon Paint Co., Ltd. Cationic electrocoating composition. 5,556,913, Cl. 524-555.000.

Tocchet, Ivan; and Scarpis, Edoardo. Food vending machine particularly warm food such as toasts, sandwiches, pizzas and brioches. 5,555,793, Cl. 99-326.000.

Tochigi Fuji Sangyo Kabushiki Kaisha: *See*—
Hiraishi, Kenji; Saeki, Shingo; Yamazaki, Kazuyuki; and Nakajima, Takao, 5,556,351, Cl. 475-160.000.

Tod, Tim, to Dynamics Chinatec Systemtechnik GmbH. Device for the receiving of coins at a coin-operated automatic machine. 5,555,966, Cl. 194-343.000.

Toda, Masatoshi: *See*—
Funabashi, Hideo; Sugahara, Akinobu; Tanaka, Akira; Toda, Masatoshi; Ota, Tsuyoshi; Matsuo, Youichi; Akimaru, Tsutomu; Iwasaki, Sigeo; and Tsuruoka, Masayuki, 5,556,820, Cl. 502-111.000.

Todd, Robert J., to Research Medical, Inc. Medical pressure relief valve. 5,556,386, Cl. 604-247.000.

Toji, Shigeo: *See*—
Shindo, Osamu; and Toji, Shigeo, 5,557,364, Cl. 354-410.000.

Tokai Corporation: *See*—
Mifune, Hideo; and Nakamura, Yasuaki, 5,555,905, Cl. 137-15.000.

Tokuda, Toshimasa: *See*—
Nishiguchi, Masaki; and Tokuda, Toshimasa, 5,556,904, Cl. 524-147.000.

Tokuno, Masateru: *See*—
Shimazu, Hiroto; Bando, Takashi; and Tokuno, Masateru, 5,556,513, Cl. 162-304.000.

Tokuyama Corporation: *See*—
Imura, Satoshi; Nagoh, Hironobu; and Kuramoto, Kazuhiko, 5,556,931, Cl. 526-323.100.
Tanaka, Shinsuke; Kaminaka, Manabu; Masada, Isao; Fujii, Junichi; and Ueda, Naoki, 5,556,920, Cl. 525-216.000.

Tokyo Electron Limited: *See*—
Hasegawa, Makoto; Sakima, Hiromi; Kanbara, Hiromitsu; Ishikawa, Yoshio; Imamura, Yasuo; and Aoki, Makoto, 5,556,500, Cl. 156-345.000.
Saeki, Hiroaki; and Kondo, Masaki, 5,557,215, Cl. 324-765.000.
Sakata, Kazunari; Tago, Kenji; and Mizukami, Mitsuo, 5,556,275, Cl. 432-241.000.

Tokyo Electron Tohoku Limited: *See*—
Sakata, Kazunari; Tago, Kenji; and Mizukami, Mitsuo, 5,556,275, Cl. 432-241.000.

Tol-O-Matic, Inc.: *See*—
Rosengren, Gary W.; and Poeschl, Philip M., 5,555,789, Cl. 92-165.00R.

Tolfsen, Ulf; and Dahlen, Magnus, to Autoliv Development AB. Safety belt buckle. 5,555,609, Cl. 24-641.000.

Tominaga, Takashi: *See*—
Tarumoto, Norihiro; Inomata, Hiroyuki; and Tominaga, Takashi, 5,556,724, Cl. 430-5.000.

Tomioka, Jun: *See*—
Suzuki, Naoko; Nakanishi, Hirotoshi; and Tomioka, Jun, 5,556,995, Cl. 549-406.000.

Tomita, Nobuo: *See*—
Suenaga, Masashi; Tomita, Nobuo; Watanabe, Hiroshi; and Tanji, Masayuki, 5,557,753, Cl. 395-287.000.

Tomita, Shoji: *See*—
Maeda, Masahiko; Tomita, Shoji; Uyama, Masao; Nakashima, Masayuki; and Kitajima, Kenichiro, 5,557,380, Cl. 355-259.000.

Tomiyasu, Kunio: *See*—
Inoue, Yoshiya; Nagatsuma, Tooru; Shimada, Kazuyuki; Hayashi, Takamasa; Tomiyasu, Kunio; and Nishiwaki, Hirofumi, 5,557,707, Cl. 395-106.000.

Tomotake, Atsushi: *See*—
Suzuki, Takatugu; Tomotake, Atsushi; Ohya, Hidenobu; and Takiyama, Nobuyuki, 5,556,740, Cl. 430-559.000.

Ton, J. H.: *See*—
Yeh, Edge C.; Ton, J. H.; and Roan, G. K., 5,557,523, Cl. 364-424.030.

Tonen Chemical Corporation: *See*—
Miura, Yuichiro; Hirano, Kazuo; Nate, Takayuki; Kambayashi, Taiji; Ohtsuka, Masahisa; and Nagai, Toshitake, 5,556,671, Cl. 428-15.000.

Tonen Corporation: *See*—
Miura, Yuichiro; Hirano, Kazuo; Nate, Takayuki; Kambayashi, Taiji; Ohtsuka, Masahisa; and Nagai, Toshitake, 5,556,671, Cl. 428-15.000.

Tong, Hua-Sou: *See*—
Norris, Roland W.; and Tong, Hua-Sou, 5,556,665, Cl. 427-64.000.

Tooda, Toshio, to Fujitsu Limited. Electrophotographic apparatus. 5,557,371, Cl. 355-211.000.

Tophinke, Franz; Stovesand, Josef; Heidjann, Franz; and Dammann, Johannes, to CLAAS OHG beschraebkt haftende offene. Self-propelling harvester thresher. 5,556,337, Cl. 460-70.000.

Topper, Robert T.; Gilliom, John W.; and Tucker, James M., to White Consolidated Industries, Inc. Reciprocating pump with cooperating piston shearing portions. 5,556,268, Cl. 417-553.000.

Toray Industries, Inc.: *See*—
Ando, Katsutoshi; Takahashi, Masanori; and Kondou, Goro, 5,556,618, Cl. 424-78.080.

Torborg, Kevin; and Jelinek, Victor E., to White Consolidated Industries, Inc. Motor mounted to blower housing. 5,555,647, Cl. 34-601.000.

Torborg, Ralph: *See*—
Caufield, James E.; Torborg, Ralph; and Adams, Wilmer L., 5,555,704, Cl. 53-425.000.

Torii, Kazuyoshi: *See*—
Sugiura, Jun; Tsuchiya, Osamu; Ogasawara, Makoto; Ootsuka, Fumio; Torii, Kazuyoshi; Asano, Isamu; Owada, Nobuo; Horiuchi, Mitsuaki; Tamaru, Tsuyoshi; Aoki, Hideo; Otsuka, Nobuhiro; Shirai, Seiichirou; Sagawa, Masakazu; Ikeda, Yoshihiro; Tsuneoka, Masatoshi; Kaga, Toru; Shimmyo, Tomotsugu; Ogishi, Hidetsugu; Kasahara, Osamu; Enami, Hiromichi; Wakahara, Atsushi; Akimori, Hiroyuki; Suzuki, Sinichi; Funatsu, Keisuke; Kawasaki, Yoshinao; Tubone, Tunehiko; Kogano, Takayoshi; and Tsugane, Ken, 5,557,147, Cl. 257-763.000.

Torii, Yoshimi: *See*—
Fukuyama, Ryooji; Nawata, Makoto; Kakehi, Yutaka; Kawahara, Hironobu; Sato, Yoshiaki; Torii, Yoshimi; Kawaraya, Akira; and Sato, Yoshie, 5,556,714, Cl. 428-620.000.

Tosaka, Susumu; and Kashikie, Junsuke, to Citizen Watch Co., Ltd. Connecting structure for a wrist watch. 5,557,587, Cl. 368-282.000.

Toshiba Ceramics Co., Ltd.: *See*—
Niwa, Shigeki; Hasebe, Etsuhiro; Itoh, Kazuo; Indoh, Toshihiro; and Asai, Masamichi, 5,556,568, Cl. 222-600.000.

Toshiba Corporation: *See*—
Yamamoto, Keiji, 5,557,665, Cl. 379-198.000.

Toshiba Kikai Kabushiki Kaisha: *See*—
Iwamoto, Norihiro; Takamura, Masayuki; and Matsuda, Tai, 5,555,924, Cl. 164-4.100.

Toshima, Masato M.: *See*—
Collins, Kenneth S.; Roderick, Craig A.; Trow, John R.; Yang, Chan-Lon; Wong, Jerry Y.; Marks, Jeffrey; Keswick, Peter R.; Groechel, David W.; Pinson, Jay D., II; Ishikawa, Tetsuya; Lei, Lawrence C.; Toshima, Masato M.; and Yin, Gerald Z., 5,556,501, Cl. 156-345.000.

Tottori, Katsura: *See*—
Oshiro, Yasuo; Tanaka, Tatsuyoshi; Kikuchi, Tetsuro; and Tottori, Katsura, 5,556,857, Cl. 514-253.000.

Toubol, Gilles: *See*—
Calvignac, Jean; Huon, Pierre; Orsatti, Daniel; Toubol, Gilles; and Verplanken, Fabrice, 5,557,266, Cl. 340-825.020.

Tout, Stanley D.: *See*—
McFadden, William C.; and Tout, Stanley D., 5,556,295, Cl. 439-301.000.

Towle, Ross A.: *See*—
Chan, Sun C.; Dehnert, James C.; Lo, Raymond W.; and Towle, Ross A., 5,557,761, Cl. 395-375.000.

Townsley, David B.; Gong, Andrew; and Henin, Eva, to Apple Computer, Inc. Power system configuration and recovery from a power fault condition in a computer system having multiple power supplies. 5,557,738, Cl. 395-182.120.

Toyo Ink Manufacturing Co., Ltd.: *See*—
Kimura, Shuuichi; Hikosaka, Michichika; Shirao, Masami; Mochizuki, Akimitsu; and Tsuchida, Junichi, 5,556,966, Cl. 540-140.000.
Suzuki, Takehiro; Koide, Masashi; and Fujii, Masahiro, 5,556,915, Cl. 524-837.000.

Toyoda Gosei Co., Ltd.: *See*—
Akachi, Keiji; and Hikosaka, Atsushi, 5,556,672, Cl. 428-33.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Harada, Junichi; Tsuchida, Takuji; Kunikita, Keiji; Hasegawa, Katsuhisa; Fuse, Tadahiko; and Suzuki, Tomoo, 5,555,950, Cl. 180-65.100.
Miura, Morimichi; and Oota, Tadao, 5,556,081, Cl. 267-47.000.
Sato, Mituyoshi; Uozumi, Minoru; and Nakayama, Masao, 5,555,925, Cl. 164-255.000.

Tozzi, Luigi P., to Cummins Engine Company, Inc. Spark plug including magnetic field producing means for generating a variable length arc. 5,555,862, Cl. 123-143.00B.

Traak, Inc.: *See*—
Plachta, Christopher; and Bain, Gregory L., 5,555,561, Cl. 2-2.000.

Trabold, Hermann. Filter for filtering gaseous and liquid media. 5,556,543, Cl. 210-435.000.

Trachy, David: *See*—
Munro, Frederick; Dailey, Aaron; Allen, Scott; and Trachy, David, 5,557,528, Cl. 364-478.020.

Trail, John A.: *See*—
Nightingale, John L.; Trail, John A.; and Johnson, John K., 5,557,475, Cl. 359-831.000.

Traitler, Helmut: *See*—
De Pedro, Mayda T.; Estiandan, Fe S.; Talbot, Michael L.; and Traitler, Helmut, 5,556,659, Cl. 426-302.000.

Traniello, James F. A.: *See*—
Thorne, Barbara L.; and Traniello, James F. A., 5,555,672, Cl. 43-124.000.

Transcom Gas Technologies Pty. Ltd.: *See*—
Neumann, Barry R., 5,555,868, Cl. 123-275.000.

Träubel, Harro; Wigger, Herbert; Laas, Hans-Josef; and Reiff, Helmut, to Bayer Aktiengesellschaft. Crosslinking agents for textile printing binders. 5,556,935, Cl. 528-99.000.

Trauner, Alfred; and Lettmayr, Gernot, to Voest-Alpine Industrieanlagenbau GmbH. Method of sealing and seal for a starter bar head to be used in a continuous caster. 5,556,109, Cl. 277-1.000.

Traver, Frank J.; and Merrifield, James H., to General Electric Company. Method of preparing microemulsions. 5,556,629, Cl. 424-401.000.

Tribotech: *See*—
Cain, Earl S., 5,557,148, Cl. 257-777.000.

Tricoles, Gus P.; Davis, Wayne K.; and Nilles, James T., to GDE Systems, Inc. Method for locating leakage of substances from subterranean structures. 5,557,277, Cl. 342-22.000.

Tridonic Bauelemente GmbH: *See*—

Johler, Günter, 5,557,174, Cl. 315-194.000.

Trigeassou, Jean-Claude: *See*—

Tsugane, Ken: *See*—
Sugiura, Jun; Tsuchiya, Osamu; Ogasawara, Makoto; Ootsuka, Fumio;

Turner, Geoffrey L.: *See*—
Hill, Derek A.; and Turner, Geoffrey L., 5,556,978, Cl. 546-140.000.

Wu, Ying; Ryabova, Lyubov A.; Kurnasov, Oleg V.; Morosov, Igor Y.; Ugarov, Viktor I.; Volianik, Elena V.; Chetverin, Alexander B.; Zhang

Johler, Günter, 5,557,174, Cl. 315-194.000.
Trigeassou, Jean-Claude: *See*—
Friot, Laurent; and Trigeassou, Jean-Claude, 5,557,555, Cl. 364-578.000.
Tristrata Technology, Inc.: *See*—
Yu, Huey J.; and Van Scott, Eugene J., 5,556,882, Cl. 514-570.000.
Trolchan, Paul D.; and Phan, Dean V., to Procter & Gamble Company, The. Paper structures having at least three regions including a transition region interconnecting relatively thinner regions disposed at different elevations, and apparatus and process for making the same. 5,556,509, Cl. 162-111.000.
Trompenaars, Petrus H. F.: *See*—
Lambert, Nicolaas; van Gorkom, Gerardus G. P.; Trompenaars, Petrus H. F.; and de Zwart, Siebe T., 5,557,296, Cl. 345-74.000.
Trotto, Susan; Furch, Joseph A., III; Kuhn, David G.; and Hunt, David A., to American Cyanamid Company. N-aryl- and N-heteroarylhydrazones of substituted thioacids and the s-oxides thereof as insecticidal and acaricidal agents. 5,556,885, Cl. 514-639.000.
Troutman, Richard V., Jr. Submersible object with bait compartment for a attracting fish. 5,555,670, Cl. 43-44.990.
Trow, John R.: *See*—
Collins, Kenneth S.; Roderick, Craig A.; Trow, John R.; Yang, Chan-Lon; Wong, Jerry Y.; Marks, Jeffrey; Keswick, Peter R.; Groechel, David W.; Pinson, Jay D., II; Ishikawa, Tetsuya; Lei, Lawrence C.; Toshima, Masato M.; and Yin, Gerald Z., 5,556,501, Cl. 156-345.000.
Troy, Stanton E., to Delco Electronics Corporation. Hinged phone bracket for vehicle. 5,556,017, Cl. 224-549.000.
Trubitt, David: *See*—
Young, Neil P.; Thibodeau, Joe; Trubitt, David; and Fowler, Dennis, 5,555,815, Cl. 104-296.000.
Truesdale, Robert G., Jr.; and Francis, John E., to Raychem Corporation. Cable seal. 5,557,073, Cl. 174-151.000.
Trujillo, Richard S.: *See*—
Trujillo, Wendy J.; and Trujillo, Richard S., 5,555,848, Cl. 119-654.000.
Trujillo, Wendy J.; and Trujillo, Richard S. Pet/flea collar. 5,555,848, Cl. 119-654.000.
Truong, Thien V.; Bierer, Donald E.; Dener, Jeffrey M.; Hector, Richard; Tempesta, Michael S.; Loev, Bernard; Yang, Wu; and Koreeda, Masato, to Shaman Pharmaceuticals, Inc.; and University of Michigan, The Regents of the. 1,2-dithiin antiinfective agents. 5,556,875, Cl. 514-436.000.
Trusted Information Systems, Inc.: *See*—
Lipner, Steven B.; Balenson, David M.; Ellison, Carl M.; and Walker, Stephen T., 5,557,346, Cl. 380-21.000.
Lipner, Steven B.; Balenson, David M.; Ellison, Carl M.; and Walker, Stephen T., 5,557,765, Cl. 380-21.000.
Trustees of Univ. of Penna: *See*—
Lavker, Robert M.; Sun, Tung-Tien; and Yang, Jing-Shan, 5,556,783, Cl. 435-240.210.
TRW Inc.: *See*—
Buchner, Tomasz; and Kelly, David E., 5,556,119, Cl. 280-96.100.
Sampson, William P., 5,556,132, Cl. 280-741.000.
TRW Vehicle Safety Systems Inc.: *See*—
Busch, Craig A., 5,556,171, Cl. 297-483.000.
Lee, Chienhom, 5,556,126, Cl. 280-728.300.
Olson, Mark O., 5,556,124, Cl. 280-728.200.
Trychest Proprietary Limited: *See*—
Chester, Brian, 5,555,603, Cl. 16-87.200.
Tsai, Bob C.: *See*—
Rotter, George E.; Chiang, Weilong; Tsai, Bob C.; Mekquist, John L.; Pauer, Cheryl A.; and Chen, Stephen Y., 5,556,926, Cl. 525-444.000.
Tsai, Shu-Yen. Baking pot. 5,555,795, Cl. 99-446.000.
Tsuboko, Toshio: *See*—
Nakajima, Hiroshi; and Tsuboko, Toshio, 5,556,138, Cl. 285-137.100.
Tsubotani, Shigetoshi; Masayuki, Takizawa; Mikio, Shirasaki; and Fujisawa, Yukio, to Takeda Chemical Industries, Ltd. Epoxysuccinic acid derivatives. 5,556,853, Cl. 514-231.500.
Tsuchida, Junichi: *See*—
Kimura, Shuuichi; Hikosaka, Michichika; Shirao, Masami; Mochizuki, Akimitsu; and Tsuchida, Junichi, 5,556,966, Cl. 540-140.000.
Tsuchida, Takuji: *See*—
Harada, Junichi; Tsuchida, Takuji; Kunikita, Keiji; Hasegawa, Katsuhisa; Fuse, Tadahiko; and Suzuki, Tomoo, 5,555,950, Cl. 180-65.100.
Tsuchiya, Ichiro: *See*—
Haraguchi, Tsuyoshi; and Tsuchiya, Ichiro, 5,556,736, Cl. 430-399.000.
Tsuchiya, Makoto; and Miwa, Kiyoshi, to Ajinomoto Co., Inc. Sucrase gene derived from coryneform bacteria. 5,556,776, Cl. 435-106.000.
Tsuchiya, Osamu: *See*—
Sugiura, Jun; Tsuchiya, Osamu; Ogasawara, Makoto; Ootsuka, Fumio; Torii, Kazuyoshi; Asano, Isamu; Owada, Nobuo; Horiuchi, Mitsuaki; Tamaru, Tsuyoshi; Aoki, Hideo; Otsuka, Nobuhiro; Shirai, Seiichirou; Sagawa, Masakazu; Ikeda, Yoshihiro; Tsuneoka, Masatoshi; Kaga, Toru; Shimmyo, Tomotsugu; Ogishi, Hidetsugu; Kasahara, Osamu; Enami, Hiromichi; Wakahara, Atsushi; Akimori, Hiroyuki; Suzuki, Sinichi; Funatsu, Keisuke; Kawasaki, Yoshinao; Tubone, Tunehiko; Kogano, Takayoshi; and Tsugane, Ken, 5,557,147, Cl. 257-763.000.
Tsuchiya, Yasuyuki: *See*—
Tobinaga, Kenshiro; Sakamoto, Hiroyuki; Shirakawa, Shinsuke; Urano, Satoshi; and Tsuchiya, Yasuyuki, 5,556,913, Cl. 524-555.000.
Tsuda, Hiroshi: *See*—
Nakayama, Okihiko; Grom, Brian R.; Iwasaki, Masayasu; and Tsuda, Hiroshi, 5,557,522, Cl. 364-424.020.
Tsugane, Ken: *See*—
Sugiura, Jun; Tsuchiya, Osamu; Ogasawara, Makoto; Ootsuka, Fumio; Torii, Kazuyoshi; Asano, Isamu; Owada, Nobuo; Horiuchi, Mitsuaki; Tamaru, Tsuyoshi; Aoki, Hideo; Otsuka, Nobuhiro; Shirai, Seiichirou; Sagawa, Masakazu; Ikeda, Yoshihiro; Tsuneoka, Masatoshi; Kaga, Toru; Shimmyo, Tomotsugu; Ogishi, Hidetsugu; Kasahara, Osamu; Enami, Hiromichi; Wakahara, Atsushi; Akimori, Hiroyuki; Suzuki, Sinichi; Funatsu, Keisuke; Kawasaki, Yoshinao; Tubone, Tunehiko; Kogano, Takayoshi; and Tsugane, Ken, 5,557,147, Cl. 257-763.000.
Tsuji, Akira: *See*—
Yamachika, Mikio; Kobayashi, Eiichi; Ota, Toshiyuki; and Tsuji, Akira, 5,556,734, Cl. 430-270.100.
Tsuji, Hideaki: *See*—
Hirai, Isamu; and Tsuji, Hideaki, 5,557,366, Cl. 354-416.000.
Tsuji, Hiroshi: *See*—
Mase, Hisao; Namba, Yasuharu; Koyama, Sachiko; Kiyama, Tadahiro; and Tsuji, Hiroshi, 5,557,789, Cl. 395-600.000.
Tsuji, Makoto: *See*—
Masui, Katsushige; Miyauchi, Nobuyuki; Tani, Zenpei; Chikugawa, Hiroshi; Tsuji, Makoto; Ogawa, Masaru; and Shiomoto, Takehiro, 5,557,116, Cl. 257-100.000.
Tsuji, Takashi: *See*—
Onishi, Tomoyuki; Tsuji, Takashi; and Matsuzawa, Toshihiro, 5,556,994, Cl. 549-302.000.
Tsujihashi, Yoshiki: *See*—
Miyanishi, Atushi; Matsumoto, Hisashi; and Tsujihashi, Yoshiki, 5,557,270, Cl. 341-50.000.
Tsuneoka, Masatoshi: *See*—
Sugiura, Jun; Tsuchiya, Osamu; Ogasawara, Makoto; Ootsuka, Fumio; Torii, Kazuyoshi; Asano, Isamu; Owada, Nobuo; Horiuchi, Mitsuaki; Tamaru, Tsuyoshi; Aoki, Hideo; Otsuka, Nobuhiro; Shirai, Seiichirou; Sagawa, Masakazu; Ikeda, Yoshihiro; Tsuneoka, Masatoshi; Kaga, Toru; Shimmyo, Tomotsugu; Ogishi, Hidetsugu; Kasahara, Osamu; Enami, Hiromichi; Wakahara, Atsushi; Akimori, Hiroyuki; Suzuki, Sinichi; Funatsu, Keisuke; Kawasaki, Yoshinao; Tubone, Tunehiko; Kogano, Takayoshi; and Tsugane, Ken, 5,557,147, Cl. 257-763.000.
Tsuneyoshi, Katsumasa; and Satoh, Akiyoshi, to Sharp Kabushiki Kaisha. Information processing apparatus having a function of displaying a plurality of graphs. 5,557,718, Cl. 395-140.000.
Tsunoda, Keiji: *See*—
Shobatake, Yasuro; Tsunoda, Keiji; Takabatake, Yoshiaki; Hashimoto, Mikio; Tujita, Taketoshi; Takeda, Junichi; and Kimura, Narito, 5,557,609, Cl. 370-60.100.
Tsurugi, Tomio: *See*—
Urawa, Yoshio; Furukawa, Ken; Shimizu, Toshikazu; Yamagishi, Yoji; Tsurugi, Tomio; and Ichino, Tomio, 5,557,002, Cl. 558-44.000.
Tsuruoka, Masayuki: *See*—
Funabashi, Hideo; Sugahara, Akinobu; Tanaka, Akira; Toda, Masatoshi; Ota, Tsuyoshi; Matsuo, Youichi; Akimaru, Tsutomu; Iwasaki, Sigeo; and Tsuruoka, Masayuki, 5,556,820, Cl. 502-111.000.
Tsuruta, Hitoshi: *See*—
Nakamura, Michihiro; Matsui, Satomi; Oka, Keiko; Tsuruta, Hitoshi; Koori, Yoshihiro; Kato, Takuji; and Ito, Shigeji, 5,556,760, Cl. 435-12.000.
Tsusaki, Keiji: *See*—
Kubota, Michio; Tsusaki, Keiji; Hattori, Kazuko; and Sugimoto, Toshiyuki, 5,556,781, Cl. 435-200.000.
Tubone, Tunehiko: *See*—
Sugiura, Jun; Tsuchiya, Osamu; Ogasawara, Makoto; Ootsuka, Fumio; Torii, Kazuyoshi; Asano, Isamu; Owada, Nobuo; Horiuchi, Mitsuaki; Tamaru, Tsuyoshi; Aoki, Hideo; Otsuka, Nobuhiro; Shirai, Seiichirou; Sagawa, Masakazu; Ikeda, Yoshihiro; Tsuneoka, Masatoshi; Kaga, Toru; Shimmyo, Tomotsugu; Ogishi, Hidetsugu; Kasahara, Osamu; Enami, Hiromichi; Wakahara, Atsushi; Akimori, Hiroyuki; Suzuki, Sinichi; Funatsu, Keisuke; Kawasaki, Yoshinao; Tubone, Tunehiko; Kogano, Takayoshi; and Tsugane, Ken, 5,557,147, Cl. 257-763.000.
Tucker, James M.: *See*—
Topper, Robert T.; Gilliom, John W.; and Tucker, James M., 5,556,268, Cl. 417-553.000.
Tujita, Taketoshi: *See*—
Shobatake, Yasuro; Tsunoda, Keiji; Takabatake, Yoshiaki; Hashimoto, Mikio; Tujita, Taketoshi; Takeda, Junichi; and Kimura, Narito, 5,557,609, Cl. 370-60.100.
Tümer, Tümay O. Integrated substance detection and identification system. 5,557,108, Cl. 250-390.040.
Tunis, Scott W. Methods of preparing and inserting flexible intraocular lenses and a configuration for flexible intraocular lenses. 5,556,400, Cl. 606-107.000.
Tunissen, Mathias L. M.: *See*—
Van Lierop, Franciscus H.; and Tunissen, Mathias L. M., 5,557,169, Cl. 313-623.000.
Turi, Zoltan G., to Wayne State University. Composite intraluminal graft. 5,556,414, Cl. 606-198.000.
Turk, George F.; and Melby, Jeffrey A., to United States of America, Army. Concrete armor unit for the protection of coastal, shore lines and hydraulic structures. 5,556,230, Cl. 405-29.000.
Turk, Philip E., to Board of Regents, The University of Texas System. Bacterial bed. 5,556,536, Cl. 210-150.000.
Turn-Act, Inc.: *See*—
Eicher, Fred C.; Evans, Charles F., Jr.; and Evans, Charles F., III, 5,556,149, Cl. 294-104.000.

Turner, Geoffrey L.: *See*—
Hill, Derek A.; and Turner, Geoffrey L., 5,556,978, Cl. 546-140.000.
Turner, Gregory A.: *See*—
Liav, Avraham; Hardgrave, Ragen F.; Blystone, Sheri; and Turner, Gregory A., 5,556,963, Cl. 536-55.300.
Turturio, Gregory: *See*—
Agatstein, Willy; Aghazadeh, Mostafa; Chiu, Chia-pin; Ghori, Amar; Neal, James R.; and Turturio, Gregory, 5,556,811, Cl. 437-209.000.
Tuscaloosa Steel Corporation: *See*—
Mangham, William J.; McPherson, Charles D.; and Mohr, Donald N., 5,556,273, Cl. 432-8.000.
Tweedie, Alastair R.: *See*—
Maoloni, Domenico; Pizi, Adriano; Buonfigli, Enrico; and Tweedie, Alastair R., 5,555,706, Cl. 53-447.000.
Tyan, Jeng-Yeong: *See*—
Huang, Shu-Chen; Chao, Yu-Lin; and Tyan, Jeng-Yeong, 5,557,663, Cl. 379-110.000.
Tyler, James S.: *See*—
Johnston, James B.; Tyler, James S.; and Blanchard, Guy C., 5,555,980, Cl. 206-600.000.
Tyren, Carl; and Persson, Leif A., to RSO Corporation N.V. Method and device for electronic identification. 5,557,085, Cl. 235-380.000.
Tzeng, Bae C. Picture-combined fire extinguisher. 5,555,938, Cl. 169-36.000.
Tzeng, Donald D.: *See*—
MacLaren, Richard O.; and Tzeng, Donald D., 5,557,062, Cl. 149-46.000.
UAB Research Foundation: *See*—
Vaughn, John T., Jr., 5,557,247, Cl. 333-219.000.
Uchida, Haruo: *See*—
Kurata, Mitsuru; Ebata, Tokihide; Koitabashi, Noribumi; Hirabayashi, Hiromitsu; Sugimoto, Hitoshi; and Uchida, Haruo, 5,557,310, Cl. 347-87.000.
Uchida, Masahiro, to Yamaha Hatsudoki Kabushiki Kaisha. Multi-valve engine. 5,555,869, Cl. 123-308.000.
Uchida, Masashi: *See*—
Niira, Reiji, deceased; Yamamoto, Tatuo; and Uchida, Masashi, 5,556,699, Cl. 428-323.000.
Uchimura, Mitsuo; Shinde, Tsukasa; Hironaka, Kazutoshi; Takahashi, Hiroyshi; and Nanba, Akihiko, to Rheo-Technology, Ltd. Process for the production of semi-solidified metal composition. 5,555,926, Cl. 164-468.000.
Uchiyama, Isao; and Kudo, Hideo, to Shin-Etsu Handotai Co., Ltd. Wafer holder. 5,555,634, Cl. 34-78.000.
Ueda, Hisashi, to Japan as represented by Director General of Agency of Industrial Science and Technology. Carbonaceous ferromagnetics and method for the preparation thereof. 5,556,570, Cl. 252-62.51R.
Ueda, Naoki: *See*—
Tanaka, Shinsuke; Kaminaka, Manabu; Masada, Isao; Fujii, Junichi; and Ueda, Naoki, 5,556,920, Cl. 525-216.000.
Ueda, Osamu; and Suda, Hirofumi, to Canon Kabushiki Kaisha. Video camera and its control method. 5,557,325, Cl. 348-223.000.
Ueda, Yutaka, to Konica Corporation. Silver halide photosensitive material automatic developing apparatus. 5,557,362, Cl. 354-324.000.
Uehara, Yasuo; and Ise, Michihito, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method of treatment for stoma-peripheral inflammation diseases. 5,556,622, Cl. 424-125.000.
Ueki, Kiyosuke: *See*—
Koda, Tadashi; Hara, Masao; Ueki, Kiyosuke; and Mori, Kei, 5,556,888, Cl. 521-44.500.
Ueki, Tadashi: *See*—
Araki, Seiichi; Suzuki, Mamoru; Fujimoto, Masatoshi; and Ueki, Tadashi, 5,556,624, Cl. 424-195.100.
Araki, Seiichi; Suzuki, Mamoru; Fujimoto, Masatoshi; and Ueki, Tadashi, 5,556,625, Cl. 424-195.100.
Uematsu, Kimio: *See*—
Inoue, Yoshiharu; and Uematsu, Kimio, 5,557,361, Cl. 354-289.100.
Uemura, Yukio: *See*—
Hasuda, Masanori; Katayama, Akira; Uemura, Yukio; and Goto, Tetsuro, 5,557,359, Cl. 354-234.100.
Ueno, Haruhiko: *See*—
Kobayakawa, Kazushige; Nagasawa, Shigeru; Ikeda, Masayuki; Ueno, Haruhiko; Shinjo, Naoki; Utsumi, Teruo; Dewa, Masami; and Ishizaka, Kenichi, 5,557,744, Cl. 395-200.010.
Ueno, Hiroshi: *See*—
Meguro, Yuuji; Yokokawa, Shuho; Nakajima, Isao; Onose, Tsukasa; and Ueno, Hiroshi, 5,557,386, Cl. 355-298.000.
Ueno, Shuichi: *See*—
Oda, Hidekazu; Ueno, Shuichi; and Yamaguchi, Takehisa, 5,557,129, Cl. 257-345.000.
Ueno, Toshihiko: *See*—
Maruyama, Muneo; Ueno, Toshihiko; Hada, Hiroshi; and Baba, Masatake, 5,557,433, Cl. 359-41.000.
Ueno, Yasunori, to Nikon Corporation. Eyepiece. 5,557,463, Cl. 359-646.000.
Ueno, Yoshio: *See*—
Kubota, Haruo; Nishi, Yoshio; Ueno, Yoshio; Wada, Yasuo; and Honda, Munenobu, 5,556,078, Cl. 254-368.000.
Ueoka, Atsushi: *See*—
Hirosawa, Toshio; Itoh, Tsutomu; Kokunishi, Motohide; Ueoka, Atsushi; Ichikawa, Yoshikazu; Fujita, Fujio; Yamagishi, Tadashi; Ishimaru, Masahiko; Namba, Hideki; Sasaki, Shigeru; Hirano, Michio; Kozuma, Kaoru; and Nakamura, Kazuyuki, 5,557,736, Cl. 395-182.020.
Ugarov, Viktor I.: *See*—
Wu, Ying; Ryabova, Lyubov A.; Kurnasov, Oleg V.; Morosov, Igor Y.; Ugarov, Viktor I.; Volianik, Elena V.; Chetverin, Alexander B.; Zhang, David; Kramer, Fred R.; and Spirin, Alexander S., 5,556,769, Cl. 435-69.100.
Ugen, Kenneth E.: *See*—
Weiner, David B.; Ugen, Kenneth E.; and Williams, William V., 5,556,744, Cl. 435-5.000.
UHU GmbH: *See*—
Halm, Hans, 5,556,010, Cl. 222-386.000.
Ujiie, Hitoshi, to Advantest Corporation. Jitter analyzer. 5,557,196, Cl. 324-76.770.
Ulmer, Erik; and Guillemant, Philippe, to Centre National De La Recherche Scientifique. Process and device for eye movement analysis. 5,555,895, Cl. 128-782.000.
Ulrich, Alfred, to Joseph Vögele AG. Road finisher. 5,556,227, Cl. 404-101.000.
Ultimatte Corporation: *See*—
Dadourian, Arpag, 5,557,339, Cl. 348-586.000.
Ultrapointe Corp.: *See*—
Moorhouse, Abigail A.; Fairley, Christopher R.; Rigg, Phillip R.; and Helgesson, Alan, 5,557,113, Cl. 250-559.380.
Ultratech Stepper, Inc.: *See*—
Markle, David A.; and Jeong, Hwan J., 5,557,469, Cl. 359-683.000.
Ulvator AB: *See*—
Lindstrand, Ulf, 5,556,055, Cl. 242-608.200.
Umeda, Toshiaki; and Takahashi, Fumio, to Nikon Corporation. Progressive power lens. 5,557,348, Cl. 351-169.000.
Umegaki, Takashi: *See*—
Sakai, Toshiharu; Nakamura, Yoshinori; Umegaki, Takashi; Iguchi, Nobuo; Hagino, Miki; Mori, Hiroaki; Ota, Toshikazu; Oka, Akihiko; Takatsu, Kazuo; and Nemoto, Nobuyuki, 5,557,437, Cl. 359-110.000.
Umeyama, Takehiko: *See*—
Araya, Yukihiro; and Umeyama, Takehiko, 5,557,220, Cl. 327-28.000.
Unangst, Bruce E.: *See*—
Quinn, Mark K.; and Unangst, Bruce E., 5,556,445, Cl. 71-11.000.
Uniden America Corporation: *See*—
Moon, Billy G.; and Nguyen, Cap V., 5,557,606, Cl. 370-31.000.
Union Carbide Chemicals & Plastics Technology Corporation: *See*—
Stanley, James P., 5,557,007, Cl. 560-183.000.
Union Oil Company of California: *See*—
Van Slyke, Donald C., 5,556,832, Cl. 507-203.000.
Unisys Corporation: *See*—
Copenhaver, Gary; Bakker, Johan; and Vala, John, 5,557,451, Cl. 359-350.000.
Koerber, Paul D., 5,557,793, Cl. 395-600.000.
Stevens, Rick C.; Sauter, Gerald F.; and Krawczak, John A., 5,557,693, Cl. 385-24.000.
United Air Specialists, Inc.: *See*—
Cheney, William A.; Grady, John T., Jr.; Sellers, Victor L.; Lefler, Kevio; and Wilks, Robert S., 5,556,448, Cl. 95-6.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Collins, Stephen, 5,557,234, Cl. 327-563.000.
Dix, John; and Smith, Roderick A., 5,557,560, Cl. 364-602.000.
United Microelectronics Corp.: *See*—
Hong, Gary, 5,556,798, Cl. 437-43.000.
Hong, Gary, 5,556,799, Cl. 437-43.000.
United States Bronze Powders: *See*—
Matthews, Paul E.; and Pelletiers, Thomas W., II, 5,556,446, Cl. 75-255.000.
United States of America
Air Force: *See*—
Kester, John J.; Dajani, Iyad A.; Ranon, Peter M.; and Alley, Thomas G., 5,557,699, Cl. 385-122.000.
Laird, Daniel T., 5,557,635, Cl. 375-250.000.
Martin, Eric A.; Vaccaro, Kenneth; Lorenzo, Joseph P.; and Davis, Andrew, 5,557,120, Cl. 257-291.000.
Task, Harry L., 5,557,403, Cl. 356-239.000.
Army: *See*—
Turk, George F.; and Melby, Jeffrey A., 5,556,230, Cl. 405-29.000.
Energy: *See*—
Sawicki, Richard H., 5,557,477, Cl. 359-846.000.
Health and Human Services: *See*—
Bock, Glenn H.; Nelson, David L.; Kurman, Carole C.; and Fleisher, Thomas A., 5,556,947, Cl. 530-391.300.
Bowman, Joseph D.; and Engel, Daniel P., III, 5,557,199, Cl. 324-301.000.
Ochoa, Augusto C.; Longo, Dan L.; Ghosh, Paritosh; and Young, Howard A., 5,556,763, Cl. 435-7.230.
Singer, Dinah S.; Kohn, Leonard; Mozes, Edna; Saji, Motoyasu; Weissman, Jocelyn; Napolitano, Giorgio; and Ledley, Fred D., 5,556,754, Cl. 435-6.000.
National Aeronautics and Space Administration: *See*—
Bayard, David S., 5,557,511, Cl. 364-157.000.
Kolasinski, John R.; and Coleman, Alexander M., 5,556,502, Cl. 165-345.000.
Navy: *See*—
Shank, Samuel R., Jr., 5,557,556, Cl. 364-578.000.
U.S. Philips Corporation: *See*—
Baas, Frank J.; and Vos, Peter G. J., 5,555,979, Cl. 206-419.000.

Fisher, Kevin D.; Wong-Lam, Ho W.; Bergmans, Johannes W. M.; Steenhof, Frits A.; and Voorman, Johannes O., 5,557,638, Cl. 375-286.000.
Gurusami, Aravanan; Chapman, Mark; and Staiger, John G., 5,557,319, Cl. 348-11.000.
Kohler, Heinz; Mateika, Dieter; and Oostra, Sietse, 5,556,818, Cl. 501-138.000.
Lambert, Nicolaas; van Gorkom, Gerardus G. P.; Trompenaars, Petrus H. F.; and de Zwart, Siebe T., 5,557,296, Cl. 345-74.000.
Maassen, Egbertus J. P., 5,556,191, Cl. 362-256.000.
Ooms, Pieter C., 5,557,170, Cl. 313-635.000.
Van Lierop, Franciscus H.; and Tunissen, Mathias L. M., 5,557,169, Cl. 313-623.000.
Van Mensvoort, Adrianus J., 5,557,161, Cl. 313-402.000.
van Valburg, Christinus J.; and van de Plassche, Rudy J., 5,557,275, Cl. 341-160.000.

United Technologies Automotive, Inc.: *See*—
Kuhn, Brent A.; and Yi, Chong H., 5,556,287, Cl. 439-89.000.

United Technologies Corporation: *See*—
MacLaren, Richard O.; and Tzeng, Donald D., 5,557,062, Cl. 149-46.000.

Universita Degli Studi Di Roma "La Sapienza": *See*—
de Cesare, Giampiero; Irrera, Fernanda; and Palma, Fabrizio, 5,557,133, Cl. 257-440.000.

Universite de Montreal: *See*—
Gaboury, Louis; Villeneuve, Luc; Glasson, Richard; Li, Tiechao; and Gupta, Ajay K., 5,556,992, Cl. 549-227.000.

University of Alabama: *See*—
Brown, Marcus E.; and Rogers, Samuel J., 5,557,686, Cl. 382-115.000.

University of Alberta, The Governors of the: *See*—
Somogyvari, Arpad F.; Creed, Beth L.; Nicola, Antonio P.; Sanger, Alan R.; Law, David J.; and Cavell, Ronald G., 5,557,023, Cl. 585-513.000.

University of British Columbia, The: *See*—
Ross, Douglas A.; and Burgess, Alan, 5,556,558, Cl. 219-121.500.

University of California, Regents of the: *See*—
Pekala, Richard W., 5,556,892, Cl. 521-181.000.

University of Chicago: *See*—
Hull, John R., 5,557,155, Cl. 310-90.500.

University of Georgia Research Foundation, Inc.: *See*—
Annis, Patricia A.; Davis, Ronald C.; and Bresee, Randall R., 5,557,039, Cl. 73-7.000.

University of Hawaii: *See*—
Harris, David W., 5,557,452, Cl. 359-368.000.

University of Massachusetts Medical Center: *See*—
Herrmann, John E.; and Blacklow, Neil R., 5,556,746, Cl. 435-5.000

University of Michigan, The Regents of the: *See*—
Truong, Thien V.; Bierer, Donald E.; Dener, Jeffrey M.; Hector, Richard; Tempesta, Michael S.; Loev, Bernard; Yang, Wu; and Koreeda, Masato, 5,556,875, Cl. 514-436.000.

University of Minnesota, Regents of the: *See*—
Halawani, Mohamed E., 5,557,033, Cl. 800-2.000.
Kohler, Anja S.; Mooradian, Daniel L.; and Furcht, Leo T., 5,556,632, Cl. 424-423.000.

University of Missouri, The Curators of the: *See*—
Byerley, Thomas J.; Eick, J. David; and Chappelow, Cecil C., 5,556,896, Cl. 523-116.000.

University of Notre Dame, The: *See*—
Alcock, Charles B.; and Bakshi, Nikesh, 5,556,534, Cl. 205-787.500.

University of Pennsylvania, Trustees of the: *See*—
Kaneto, Keiichi; Min, Yonggang; and MacDiarmid, Alan G., 5,556,700, Cl. 428-332.000.
Weiner, David B.; Ugen, Kenneth E.; and Williams, William V., 5,556,744, Cl. 435-5.000.

University of Puerto Rico: *See*—
Fernandez, Felix E., 5,557,471, Cl. 359-709.000.

University of South Florida: *See*—
Britt, Jeffrey S.; and Ferekides, Christos S., 5,557,146, Cl. 257-741.000.

University of Southern California: *See*—
Schaller, Douglas A., 5,555,890, Cl. 128-719.000.

University of Utah Research Foundation: *See*—
Jacobsen, Stephen C.; Mladejovsky, Michael G.; and Wood, John E., 5,557,185, Cl. 318-568.160.

University of Washington: *See*—
Melville, Charles D.; Kollin, Joel S.; and Johnston, Richard S., 5,557,444, Cl. 359-199.000.

Uno, Kouzi: *See*—
Shimizu, Nobuyoshi; Uno, Kouzi; Aoe, Motoi; and Yoshida, Kenichi, 5,556,842, Cl. 514-100.000.

Uno, Tetuya; Takagi, Junichi; and Sakai, Yasunobu, to Omron Corporation. Optical device for measuring speed. 5,557,395, Cl. 356-28.000.

UOP: *See*—
Markovs, John; and Yon, Carmen M., 5,557,030, Cl. 585-826.000.

Uozumi, Minoru: *See*—
Sato, Mituyoshi; Uozumi, Minoru; and Nakayama, Masao, 5,555,925, Cl. 164-255.000.

Upjohn Company, The: *See*—
Kelly, Robert C.; Johnson, Roy A.; Skulnick, Harvey I.; and Nidy, Eldon G., 5,556,878, Cl. 514-449.000.

Uragami, Akira: *See*—
Hirooka, Tsuguyoshi; Miyazawa, Shoichi; Horita, Ryutaro; Takashi, Terumi; and Uragami, Akira, 5,557,274, Cl. 341-155.000.

Urano, Akira: *See*—
Kanamori, Hiroo; Urano, Akira; Aikawa, Haruhiko; Ishikawa, Shinji; Hirose, Chisai; and Saito, Masahide, 5,556,442, Cl. 65-17.400.

Urano, Satoshi: *See*—
Tobinaga, Kenshiro; Sakamoto, Hiroyuki; Shirakawa, Shinsuke; Urano, Satoshi; and Tsuchiya, Yasuyuki, 5,556,913, Cl. 524-555.000.
Yabuta, Masami; and Urano, Satoshi, 5,556,933, Cl. 528-26.000.

Urata, Hiroyuki: *See*—
Eto, Masahiro; Urata, Hiroyuki; Inoue, Fumio; Ogino, Masanori; Maruyama, Atsushi; and Yamamoto, Kiyoshi, 5,557,342, Cl. 348-706.000.

Urata, Hisao: *See*—
Tanaka, Eiji; Urata, Hisao; and Oshiki, Toshiyuki, 5,557,026, Cl. 585-522.000.

Urawa, Yoshio; Furukawa, Ken; Shimizu, Toshikazu; Yamagishi, Yoji; Tsurugi, Tomio; and Ichino, Tomio, to Eisai Co., Ltd.; and Eisai Chemical Co., Ltd. Process for the preparation of biphenyl containing intermediates useful in making angiotensin II receptor antagonists. 5,557,002, Cl. 558-44.000.

Urbanek, Otto: *See*—
Lampl, Alfred; Leonhartsberger, Heinz; Urbanek, Otto; Wimbauer, Gerhard; and Naderhirn, Helmut, 5,556,656, Cl. 425-589.000

Urgovitch, Kenneth J.: *See*—
Talish, Roger J.; Ryaby, John P.; Scowen, Kenneth J.; and Urgovitch, Kenneth J., 5,556,372, Cl. 601-2.000.

Ushijima, Hirobumi: *See*—
Murata, Kazuhisa; and Ushijima, Hirobumi, 5,557,022, Cl. 585-407.000.

Ushijima, Hitoshi: *See*—
Katsumata, Makoto; Yamanashi, Hidenori; and Ushijima, Hitoshi, 5,556,608, Cl. 423-447.400.
Katsumata, Makoto; Yamanashi, Hidenori; and Ushijima, Hitoshi, 5,556,702, Cl. 428-402.000.

Usmen, Rengin K.: *See*—
Shelef, Mordecai; Usmen, Rengin K.; Graham, George W.; Watkins, William L. H.; and McCabe, Robert W., 5,556,825, Cl. 502-303.000.

Usuki, Kazuyuki; Ishida, Toshio; and Yasunaga, Tadashi, to Fuji Photo Film Co., Ltd. Magnetic recording medium having a lubricant comprising a phosphoric acid monoester and a fluorocarboxylic acid ester. 5,556,707, Cl. 428-421.000.

Usumi, Motoharu; and Yamamoto, Takaya, to Fujitsu Limited. Cell delay absorbing circuit. 5,557,604, Cl. 370-17.000.

USX Corporation: *See*—
Giunta, Joseph S.; Hann, Jerry; and McDermott, John F., 5,556,515, Cl. 202-248.000.
Terza, Raymond R.; and Bogdan, Eugene A., 5,556,457, Cl. 106-697.000.

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Jun, Henry K.; Liu, Chun L.; Yang, Lin; and Moriya, Kazuyoshi, 5,557,532, Cl. 364-491.000.
Sandler, Lorin H.; and Wingen, Neal T., 5,557,614, Cl. 370-105.000.
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Vogel, Alan: *See—*
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Vogel, Jeffrey: *See—*
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Wu, Ying; Ryabova, Lyubov A.; Kurnasov, Oleg V.; Morosov, Igor Y.; Ugarov, Viktor I.; Volianik, Elena V.; Chetverin, Alexander B.; Zhang, David; Kramer, Fred R.; and Spirin, Alexander S., 5,556,769, Cl. 435-69.100.
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Vollano, Jean F.: *See—*
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Von Berg, Peter. Connector for flexible medical tubing. 5,556,136, Cl. 285-23.000.
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Roy, Anirban; and Kazerounian, Reza, 5,557,124, Cl. 257-316.000.
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Walchhutter, Ulrico, to S.I.T.I. Societa Impianti Termoelecttrici Industriali. Device for feeding pressurized liquid to a hydraulic circuit. 5,556,266, Cl. 417-362.000.
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Brown, Allen L., Jr.; and Marshall, Sidney W., 5,557,720, Cl. 395-146.000.
Chow, Che C., 5,556,732, Cl. 430-137.000.
Ciccarelli, Roger N.; Bertrand, Jacques C.; Pickering, Thomas R.; and Bayley, Denise R., 5,556,727, Cl. 430-45.000.
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Fujiwa, Takaaki; Tabuchi, Takeharu; Matsui, Hideki; Nakano, Shinji, Yamada, Shin-ya; and Morimoto, Takao, 5,556,927, Cl. 525-533.000.

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Higuchi, Hiroshi; Yamagishi, Hisashi; Egashira, Yoshinori; and Yamada, Tadatoshi, 5,556,098, Cl. 473-373.000.

Yamada, Takashi: *See*—
Harada, Yasoo; Matsushita, Shigeharu; Terada, Satoshi; Fujii, Emi; Kurose, Takashi, Higashino, Takayoshi; Yamada, Takashi; Nagamatsu, Akihito; Inoue, Daijirou; and Matsumura, Kouji, 5,557,141, Cl. 257-631.000.

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Yamaguchi, Tetsuo: *See*—

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Hayashida, Hajime; and Inoue, Satoshi, 5,557,052, Cl. 84-243.000.
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Uchida, Masahiro, 5,555,869, Cl. 123-308.000.

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Sumioka, Kouichi; Haji, Motohiro; Suzuki, Toshiiku; Sonobe, Masao; and Naitoh, Noriyuki, 5,556,649, Cl. 425-215.000.

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Yamamoto, Hiroshi: *See*—
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Yamamoto, Kazuhito; Niimi, Hiroji; Yamamoto, Yoji; and Hatabu, Susumu, to Mitsui Petrochemical Industries Ltd. Blow molded articles. 5,556,675, Cl. 428-36.920.

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Kozuka, Hiraku; Sugawa, Shigetoshi; and Yamanobe, Masato, 5,557,121, Cl. 257-292.000.

Yamanouchi Pharmaceutical Co., Ltd.: *See*—
Kawauchi, Yasushi; Takemoto, Toshiyuki; Takayama, Makoto; Yokota, Masami; Kato, Masao; Katsuta, Kimio; and Gushima, Hiroshi, 5,556,621, Cl. 424-94.640.

Yamasaki, Brian H.: *See*—
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Yamashita, Kenji; Ohara, Takaaki; Niwa, Hideo; Osakada, Fumio; Fukuchi, Takeshi; Edamura, Tadahiro; and Kakutani, Tetsu, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Cell adhesion protein, gene coding for the same, process for preparing the same and carrier onto which the same is immobilized. 5,556,943, Cl. 530-350.000.

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Yoshimi, Naoto; Watanabe, Toyofumi; and Yamashita, Masaaki, 5,556,715, Cl. 428-623.000.

Yamashita, Nobuhiko, to Osaka Gas Company Limited. Method for preparing peptides and proteins utilizing ribosome. 5,556,768, Cl. 435-69.100.

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Kobayashi, Seiji; Okamura, Hiroshige; and Yamatsu, Hisayuki, 5,557,592, Cl. 369-48.000.

Yamauchi, Mikio: *See*—
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Narukawa, Satoshi; Amazutsumi, Toru; Tamaki, Hiyoshi; and Yamauchi, Yasuhiro, 5,556,722, Cl. 429-163.000.

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Hiraishi, Kenji; Saeki, Shingo; Yamazaki, Kazuyuki; and Nakajima, Takao, 5,556,351, Cl. 475-160.000.

Yamazaki, Kouichi: *See*—
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Yamazaki, Toshio: *See*—
Yokoyama, Yasuhiro; Watanabe, Yuriko; Okumura, Akinori; Ichinohe, Shoji; and Yamazaki, Toshio, 5,556,929, Cl. 526-248.000.

Yan, Feng; Schneider, Michel; and Brochot, Jean, to Bracco Research S.A. Gas mixtures useful as ultrasound contrast media, contrast agents containing the media and method. 5,556,610, Cl. 424-9.520.

Yanagihara, Naofumi; Kanoto, Keiji; and Kubota, Yukio, to Sony Corporation. Method and apparatus for recording video signals on a record medium. 5,557,420, Cl. 358-335.000.

Yanagihara, Naofumi, to Sony Corporation. Apparatus and method for recording and reproducing digital video signal data by dividing the data and encoding it on multiple coding paths. 5,557,479, Cl. 360-32.000.

Yang, Chan-Lon: *See*—
Collins, Kenneth S.; Roderick, Craig A.; Trow, John R.; Yang, Chan-Lon; Wong, Jerry Y.; Marks, Jeffrey; Keswick, Peter R.; Groechel, David W.; Pinson, Jay D., II; Ishikawa, Tetsuya; Lei, Lawrence C.; Toshima, Masato M.; and Yin, Gerald Z., 5,556,501, Cl. 156-345.000.

Yang, Chao-Kung; Williams, Jim C.; and Krutsick, Stanley, to Hughes Aircraft Company. Method for specifying a video window's boundary coordinates to partition a video signal and compress its components. 5,557,298, Cl. 345-119.000.

Yang, Ching-Yun: *See*—
Ansberry, Catherine M.; Freer, Jay D.; Fuqua, Todd W.; Mesterton, Erik P.; Stillwagon, Catherine A.; and Yang, Ching-Yun, 5,557,725, Cl. 395-153.000.

Yang, Chung C.: *See*—
Gibson, Gary; Kamins, Theodore I.; Keshner, Marvin S.; Neberhuis, Steven L.; Perlov, Craig M.; and Yang, Chung C., 5,557,596, Cl. 369-101.000.

Yang, Jing-Shan: *See*—
Lavker, Robert M.; Sun, Tung-Tien; and Yang, Jing-Shan, 5,556,783, Cl. 435-240.210.

Yang, Lin: *See*—
Jun, Henry K.; Liu, Chun L.; Yang, Lin; and Moriya, Kazuyoshi, 5,557,532, Cl. 364-491.000.

Yang, Ming; Choi, Injae; and Soong, Tsai C., to Xerox Corporation. Method and apparatus for optimizing scheduling in imaging devices. 5,557,367, Cl. 355-202.000.

Yang, Tai-Her. Control circuit for plural partially interlocked commutator type motors with oscillation damping characteristics. 5,557,179, Cl. 318-41.000.

Yang, Wu: *See*—
Truong, Thien V.; Bierer, Donald E.; Dener, Jeffrey M.; Hector, Richard; Tempesta, Michael S.; Loev, Bernard; Yang, Wu; and Koreeda, Masato, 5,556,875, Cl. 514-436.000.

Yang, Yang: *See*—
Wakita, Katsuya; Hotta, Shu; Sonoda, Nobuo; and Yang, Yang, 5,556,706, Cl. 428-421.000.

Zambrano, Raffaele, to Consorzio per la Ricerca sulla Microelecttronica Nel

Zhang, David: *See*—

Yang, Zhen-Yu: *See*—
Smart, Bruce E.; and Yang, Zhen-Yu, 5,557,018, Cl. 570-135.000.
Yano, Nobuyuki, to Nidek Co. Ltd. Ophthalmometric apparatus with alignment device including filter means. 5,557,350, Cl. 351-208.000.
Yano, Shinsuke; Yamaguchi, Hirofumi; and Hirai, Takami, to NGK Insulators, Ltd. Dielectric ceramic body including TIO2 dispersion in crystallized cordierite matrix phase, method of producing the same, and circuit board using the same. 5,556,585, Cl. 264-56.000.
Yano, Takanori, to Ricoh Company, Ltd. Scheduling method for automatically developing hardware patterns for integrated circuits. 5,557,797, Cl. 395-650.000.
Yano, Yoshiaki; Takeo, Kazuyuki; and Hidaka, Takayoshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Adhesive composition for medical use. 5,556,636, Cl. 424-448.000.
Yap, Edwin. Pistol grip magazine adaptor. 5,555,661, Cl. 42-49.020.
Yasunaga, Tadashi: *See*—
Usuki, Kazuyuki; Ishida, Toshio; and Yasunaga, Tadashi, 5,556,707, Cl. 428-421.000.
Yates, Jesse B.: *See*—
Johnson, Sam; Ashe, Cecil W.; and Yates, Jesse B., 5,557,254, Cl. 340-426.000.
Yawata, Haruyasu (Harry); and Hilgers, James J., to Ormco Corporation. Flared buccal tube having an internally tapered mesial section. 5,556,277, Cl. 433-17.000.
Yazaki Corporation: *See*—
Furuya, Yoshiyuki; and Masuda, Michihisa, 5,556,187, Cl. 362-27.000.
Ishii, Takashi; and Nagano, Toru, 5,556,288, Cl. 439-135.000.
Jinno, Keishi, 5,556,304, Cl. 439-595.000.
Katsumata, Makoto; Yamanashi, Hidenori; and Ushijima, Hitoshi, 5,556,608, Cl. 423-447.400.
Katsumata, Makoto; Yamanashi, Hidenori; and Ushijima, Hitoshi, 5,556,702, Cl. 428-402.000.
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Yeh, Edge C.; Ton, J. H.; and Roan, G. K., to National Science Council. Real-time simulation for testing an ABS controller. 5,557,523, Cl. 364-424.030.
Yeow, Kok-Wah, to Yeow, Kok-Wah. Absolute static lock of files and directories on magnetic disk storage media in single machine personal microcomputers. 5,557,674, Cl. 380-4.000.
Yerly, Marcel, to Bobst SA. Device for fastening a gripper bar on a chain train in a machine that processes plate-like workpieces. 5,555,969, Cl. 198-803.300.
Yeti Shine Co., Ltd.: *See*—
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Yokota, Hideo, to Canon Kabushiki Kaisha. Display device and image formation apparatus having first and second lens arrays. 5,557,432, Cl. 359-41.000.
Yokota, Masami: *See*—
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Yokoyama, Yasuhiro; Watanabe, Yuriko; Okumura, Akinori; Ichinohe, Shoji; and Yamazaki, Toshio, to Menicon Co., Ltd.; and Shin-Etsu Chemical Co., Ltd. Ocular lens material. 5,556,929, Cl. 526-248.000.
Yokoyama, Yutaka, to NEC Corporation. System for coding and decoding moving pictures based on the result of speech analysis. 5,557,661, Cl. 379-96.000.
Yon, Carmen M.: *See*—
Markovs, John; and Yon, Carmen M., 5,557,030, Cl. 585-826.000.
Yon, In K. Underpants for men having extendable sanitary portion. 5,555,568, Cl. 2-403.000.
Yoneya, Shin; and Takasu, Masayuki, to Kabushiki Kaisha TOPCON. Fundus camera for infrared fluorsein angiography. 5,557,349, Cl. 351-206.000.
Yoo, Jang-hoon: *See*—
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Yoon, InBae. Multifunctional devices having loop configured portions and collection systems for endoscopic surgical procedures and methods thereof. 5,556,376, Cl. 604-15.000.
York International Corporation: *See*—
Wills, Frank E.; and Norbeck, Dean K., 5,555,736, Cl. 62-187.000.
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Yoshida, Makiko: *See*—
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Yoshida, Nobuyuki: *See*—
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Yoshida, Norikazu: *See*—
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Yoshidaa, Takamichi: *See*—
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Yoshie, Yasunori, to NKK Corporation. Method for connecting optical fiber cables. 5,557,697, Cl. 385-99.000.
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Yoshiharu, Uchiyama; Takeshi, Asano; Kaoru, Fukuda; Kazuhiko, Maeda; and Hideyuki, Usui, to International Business Machines Corporation. Portable computer and docking device for portable computer. 5,557,562, Cl. 364-708.100.
Yoshikawa, Masato; Ishiharada, Minoru; Tanuma, Itsuo; Naito, Kazuo; Sugimachi, Masato; and Sugiyama, Hideo, to Bridgestone Corporation. Light guide comprising a methacrylic or acrylic acid resin core and a fluorocarbon resin clad. 5,557,702, Cl. 385-143.000.
Yoshikawa Oil & Fat Co., Ltd.: *See*—
Kawasaki, Toshiyuki; Kato, Isao; Noda, Kenji; Osaki, Masakatsu; Miyazaki, Katsuhiko; Nayeshiro, Hidekazu; and Ando, Hideya, 5,556,970, Cl. 554-190.000.
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Yoshioka, Hiroshi: *See*—
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Yoshizawa, Kenichi, to Mitsuhishi Denki Kabushiki Kaisha. Method and apparatus for a remote groupware operating system. 5,557,726, Cl. 395-153.000.
Young, Andrea M.: *See*—
Brook, John W.; Factor, David F.; Kinney, Frederick D.; McCallen, Celeste L.; and Young, Andrea M., 5,556,458, Cl. 106-708.000.
Young, David J., to Eastman Kodak Company. Measurement of droplet size in a photographic dispersion. 5,557,405, Cl. 356-336.000.
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Young, Neil P.; Thibodeau, Joe; Trubitt, David; and Fowler, Dennis, to Young, Neil P. Model train born control system. 5,555,815, Cl. 104-296.000.
Young, William O., Jr.; and Cothran, Dennis W., to Young Engineering, Inc. Tenter frame, apparatus for use with tenter frame and methods of use. 5,555,610, Cl. 26-96.000.
Yourno, Joseph. Method and apparatus for nested polymerase chain reaction (PCR) with single closed reaction tubes. 5,556,773, Cl. 435-91.200.
Yu, Chai-Chi. Decorative lamp assembly adapted to provide silhouetting effects. 5,555,658, Cl. 40-554.000.
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Maggio, Mark; Metzner, Tom; Eckerd, Steven; Skarky, Loren; Midori, Yoshiki; Hardie, Cal; and Yu, Ray, 5,555,619, Cl. 29-860.000.
Yu, Ruey J.; and Van Scott, Eugene J., to Tristrata Technology, Inc. Methods of treating wrinkles using benzilic acid. 5,556,882, Cl. 514-570.000.
Yuan, Chi-Min, to International Business Machines Corporation. Photolithographic dose determination by diffraction of latent image grating. 5,556,726, Cl. 430-30.000.
Yun, Jeom-Yul: *See*—
Lee, Dong-Jin; and Yun, Jeom-Yul, 5,555,931, Cl. 165-122.000.
Zahn, Wolfgang; Loose, Gunter; and Hirschmann, Axel, to Mercedes-Benz AG. Method and apparatus for purifying exhaust gases from internal combustion engines. 5,556,604, Cl. 423-213.700.
Zambon Group S.p.A.: *See*—
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Zambrano, Raffaele, to Consorzio per la Ricerca sulla Microelecttronica Nel Mezzogiorno. Process for manufacturing a power integrated circuit ("PIC") structure with a vertical IGBT. 5,556,792, Cl. 437-6.000.
Zammit, Theodore J.: *See*—
Blose, Rodney; Mazurek, Niel; and Zammit, Theodore J., 5,557,436, Cl. 359-80.000.
Zamora, Paul O., to RhoMed Incorporated. YIGSR peptide radiopharmaceutical applications. 5,556,609, Cl. 424-1.690.
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Cherukuri, Subraman R.; Battist, Gerald E.; and Zamudio-Tena, Jose F., 5,556,652, Cl. 426-5.000.
Zankich, Frank A., to Hartwell Corporation. Rotary hook tension-shear latch. 5,556,142, Cl. 292-101.000.
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Zeneca Limited: *See*—
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Wayne, Michael G.; Smithers, Michael J.; Rayner, John W.; Faull, Alan W.; Pearce, Robert J.; Brewster, Andrew G.; Shute, Richard E.; Mills, Sturat D.; and Caulkett, Peter W. R., 5,556,977, Cl. 544-360.000.
Zenith Data Systems Corporation: *See*—
Witkowski, Todd R.; Messina, Vincent J.; Ball, Richard D.; and Filion, John T., 5,557,782, Cl. 395-550.000.
Zenith Electronics Corporation: *See*—
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Zhang, David: *See*—
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Miyashita, Sadamasa; and Zhang, Laiying, 5,557,295, Cl. 345-36.000.
Zhang, Lei; Vijay, Hari M.; and Rode, Harold, to Minister of Health & Welfare Canada. Allergen of *dosporium herbarum*. 5,556,953, *Cl. 536-23.740*.
Zhang, Shu H.: *See*—
Matsushita, Shigenori; Yamamoto, Shigeru; Zhang, Shu H.; Nishita, Satoru; and Nakata, Kazushi, 5,555,942, Cl. 172-3.000.
Zheng, Joe. Dual purpose parking pad. 5,556,692, Cl. 428-156.000.
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Zielinski, Michael; and Ziller, Gerhard, to MTU Motoren- Und Turbinen-Union Muenchen GmbH. Signal device for turbo-engines using an optical probe with an elliptical shaped light beam. 5,557,099, Cl. 250-227.110.
Ziemelis, Maris: *See*—
Chang, Eng-Pi; Wang, Yao-Feng; Winnik, Mitchell A.; and Ziemelis, Maris, 5,556,663, Cl. 427-8.000.
Ziller, Gerhard: *See*—
Zielinski, Michael; and Ziller, Gerhard, 5,557,099, Cl. 250-227.110.
Zimmermann, Hans, to ABB Management AG. Air-cooled rotating electrical machine. 5,557,153, Cl. 310-56.000.
Zinser Textilmaschinen GmbH: *See*—
Wussmann, Holger; Kaak, Hartmut; and Mense, Martin, 5,555,713, Cl. 57-281.000.
Znaiden, Alexander P.; Wivell, Susan C.; and Kickertz, Virginia R., to Chesebrough-Pond's USC Co., Division of Conopco, Inc. Cold creams containing acyl lactylates. 5,556,630, Cl. 424-401.000.
Zomotor, Zoltan: *See*—
Suissa, Avshalom; Zomotor, Zoltan; and Boettiger, Friedrich, 5,557,520, Cl. 364-424.010.
Zoran Microelectronics Ltd.: *See*—
Retter, Refael; Bublil, Moshe; Shavit, Gad; Gill, Aharon; Jaliff, Ricardo; Ofir, Ram; Boner, Alon; Ilan, Oded; and Hassut, Eliezer, 5,557,538, Cl. 364-514.00A.
Zuercher, Jan A.; Richardson, John Q.; and Legault, Arthur R., to Coltec Industries Inc. Valve system for capacity control of a screw compressor and method of manufacturing such valves. 5,556,271, Cl. 418-201.200.
Zurn Industries, Inc.: *See*—
Saadi, Robert E.; Creager, Brian N.; Becker, Allen R.; and Kovey, Stephen R., 5,555,912, Cl. 137-801.000.
Zygo Corporation: *See*—
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3D Systems, Inc.: *See*—
Hull, Charles W., 5,556,590, Cl. 264-401.000.

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TO WHOM

Bausch, Michael E.: *See*—
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17th DAY OF SEPTEMBER, 1996

NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aoki, Kazuo: *See—*
Murakami, Azuma; Aoki, Kazuo; Yamanami, Tsuguya; Tomofuji, Yoshiaki; Tanaka, Takeshi; Inashima, Satoshi; Funahashi, Takahiko; Chikami, Toshihide; and Senda, Toshiaki, Re. 35,329, Cl. 178-19.000.
Chikami, Toshihide: *See—*
Murakami, Azuma; Aoki, Kazuo; Yamanami, Tsuguya; Tomofuji, Yoshiaki; Tanaka, Takeshi; Inashima, Satoshi; Funahashi, Takahiko; Chikami, Toshihide; and Senda, Toshiaki, Re. 35,329, Cl. 178-19.000.
Funahashi, Takahiko: *See—*
Murakami, Azuma; Aoki, Kazuo; Yamanami, Tsuguya; Tomofuji, Yoshiaki; Tanaka, Takeshi; Inashima, Satoshi; Funahashi, Takahiko; Chikami, Toshihide; and Senda, Toshiaki, Re. 35,329, Cl. 178-19.000.
Inashima, Satoshi: *See—*
Murakami, Azuma; Aoki, Kazuo; Yamanami, Tsuguya; Tomofuji, Yoshiaki; Tanaka, Takeshi; Inashima, Satoshi; Funahashi, Takahiko; Chikami, Toshihide; and Senda, Toshiaki, Re. 35,329, Cl. 178-19.000.
Malone, David G.; Vacek, James L.; and Smith, G. Scott, to University of Kansas Medical Center. Hot tip catheter assembly. Re. 35,330, Cl. 606-28.000.
Murakami, Azuma; Aoki, Kazuo; Yamanami, Tsuguya, Tomofuji, Yoshiaki; Tanaka, Takeshi; Inashima, Satoshi; Funahashi, Takahiko; Chikami, Toshihide; and Senda, Toshiaki, to Wacom Co., Ltd. Electronic blackboard and accessories such as writing tools. Re. 35,329, Cl. 178-19.000.
Senda, Toshiaki: *See—*
Murakami, Azuma; Aoki, Kazuo; Yamanami, Tsuguya; Tomofuji, Yoshiaki; Tanaka, Takeshi; Inashima, Satoshi; Funahashi, Takahiko; Chikami, Toshihide; and Senda, Toshiaki, Re. 35,329, Cl. 178-19.000.
Smith, G. Scott: *See—*
Malone, David G.; Vacek, James L.; and Smith, G. Scott, Re. 35,330, Cl. 606-28.000.
Tanaka, Takeshi: *See—*
Murakami, Azuma; Aoki, Kazuo; Yamanami, Tsuguya; Tomofuji, Yoshiaki; Tanaka, Takeshi; Inashima, Satoshi; Funahashi, Takahiko; Chikami, Toshihide; and Senda, Toshiaki, Re. 35,329, Cl. 178-19.000.
Tomofuji, Yoshiaki: *See—*
Murakami, Azuma; Aoki, Kazuo; Yamanami, Tsuguya; Tomofuji, Yoshiaki; Tanaka, Takeshi; Inashima, Satoshi; Funahashi, Takahiko; Chikami, Toshihide; and Senda, Toshiaki, Re. 35,329, Cl. 178-19.000.
University of Kansas Medical Center: *See—*
Malone, David G.; Vacek, James L.; and Smith, G. Scott, Re. 35,330, Cl. 606-28.000.
Vacek, James L.: *See—*
Malone, David G.; Vacek, James L.; and Smith, G. Scott, Re. 35,330, Cl. 606-28.000.
Wacom Co., Ltd.: *See—*
Murakami, Azuma; Aoki, Kazuo; Yamanami, Tsuguya; Tomofuji, Yoshiaki; Tanaka, Takeshi; Inashima, Satoshi; Funahashi, Takahiko; Chikami, Toshihide; and Senda, Toshiaki, Re. 35,329, Cl. 178-19.000.
Yamanami, Tsuguya: *See—*
Murakami, Azuma; Aoki, Kazuo; Yamanami, Tsuguya; Tomofuji, Yoshiaki; Tanaka, Takeshi; Inashima, Satoshi; Funahashi, Takahiko; Chikami, Toshihide; and Senda, Toshiaki, Re. 35,329, Cl. 178-19.000.

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TO WHOM

CERTIFICATES WERE ISSUED

American Hoechst Corp.: *See—*
Hilton, Charles B., B1 4,615,806, Cl. 210-690.000.
Hilton, Charles B., to American Hoechst Corp. Removal of iodide compounds from non-aqueous organic media. B1 4,615,806, Cl. 210-690.000.

LIST OF DESIGN PATENTEES

Abucewicz, Richard T., to Siemon Company, The. Telecommunications block test adapter. 373,757, Cl. D13-147.000.
Adams, Laura. Box. 373,724, Cl. D9-418.000.
Aida, Chieko: *See—*
Watanabe, Kenji; Kameda, Takanobu; Aida, Chieko; and Shimmura, Tomoyuki, 373,785, Cl. D18-19.000.
Aktiebolaget Electrolux: *See—*
Frisell, Carl-Gustaf, 373,703, Cl. D7-384.000.
Albatros System S.p.A.: *See—*
Andronico, Federico, 373,817, Cl. D23-277.000.
Alcatel Australia Ltd.: *See—*
James, Larry R.; and Ashley, Robert, 373,770, Cl. D14-240.000.
Alu-Light Products B.V.: *See—*
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Wall, Patsy R. Preschool teaching aid. 373,792, Cl. D19-64.000.
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Walters, Guy A., III; and Tobin, Avis E., Jr., to Thomasville Furniture Industries, Inc. Bed. 373,687, Cl. D6-389.000.
Wandler, Donald; Bustamante, Julito A.; Solberg, Kent; and Ternberg, Cory, to Ruud Lighting, Inc. Low-voltage track lighting fixture. 373,841, Cl. D26-63.000.
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Washizuka, Keiichi; and Mimoto, Osamu, to Kabushiki Kaisha Tec. Label printer. 373,784, Cl. D18-19.000.
Watanabe, Kenji; Kameda, Takanobu; Aida, Chieko; and Shimmura, Tomoyuki, to King Jim Co., Ltd. Tape printer. 373,785, Cl. D18-19.000.
Weber, Heinz. Pallet. 373,889, Cl. D34-38.000.
Weder, Donald E.; and Straeter, Joseph G., to Family Trust U/T/A, The; and Southpac Trust International, Inc. Flower pot cover. 373,746, Cl. D11-164.000.
Weil, Daniel, to Swatch AG (Swatch SA) (Swatch Ltd.). Watch box. 373,725, Cl. D9-422.000.
Weinstein, James N.: *See—*
Laughlin, Daniel L.; and Weinstein, James N., 373,671, Cl. D1-106.000.
Wells, Thomas P. Swivel base for a bucket. 373,865, Cl. D32-54.000.
Western Pottery Company, Inc.: *See—*
Sanchez, Richard; and Chou, Sun C., 373,818, Cl. D23-301.000.
Whirlpool Corporation: *See—*
Thompson, Christopher M.; and Phillips, Brian J., 373,821, Cl. D23-354.000.
Whitehouse, Glendon R., to Cushcraft Corporation. Antenna base. 373,769, Cl. D14-238.000.
Wiedner, Klaus, to Uvex Winter Optik GmbH. Protective glasses. 373,780, Cl. D16-314.000.
Willheim, David, to Silicon Graphics, Inc. Computer mouse. 373,760, Cl. D14-114.000.
Winans, Louis A. Combined ankle and wrist strap for exercise. 373,803, Cl. D21-191.000.
Wong, Lai L., to Ballanda Limited. LCD alarm clock. 373,731, Cl. D10-15.000.
Wotton, Michael C., to Sun Hill Industries, Inc. Hanging egg shaped bunny ornament. 373,744, Cl. D11-121.000.
Wright, Michael F.: *See—*
Stephens, Paul D.; Saunders, Craig M.; Wright, Michael F.; Farone, Richard C.; and Sovis, John F., 373,862, Cl. D32-23.000.
Wrobel, Robert M. Wheelchair lift. 373,880, Cl. D34-28.000.
Wyborn, Kenneth G. Wheelchair hoist. 373,879, Cl. D34-28.000.
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Daley, Michael E., 373,763, Cl. D14-118.000.
Yack, Stuart A. Night stand rack. 373,697, Cl. D6-569.000.
Yamamoto, Hitoshi; Fukushima, Kenji; Shimono, Hiroyuki; and Fujiwara, Nobuhiro, to SMC Corporation. Rodless cylinder with position detector and brake. 373,776, Cl. D15-143.000.
Yamamoto, Shigeru: *See—*
Takizawa, Shinya; Yamamoto, Shigeru; and Matsubara, Teiji, 373,812, Cl. D22-142.000.
Yamaoka, Takashi: *See—*
Tanaka, Masao; Maeta, Susumu; and Yamaoka, Takashi, 373,759, Cl. D13-165.000.
Yang, Chin-Long. Toy coffee set. 373,798, Cl. D21-121.000.
Yazaki Industrial Chemical Co., Ltd: *See—*
Hirano, Seiji; and Yoshino, Shuji, 373,720, Cl. D8-382.000.
Yoder, James H., Jr. Chair. 373,685, Cl. D6-370.000.
Yoshino, Shuji: *See—*
Hirano, Seiji; and Yoshino, Shuji, 373,720, Cl. D8-382.000.
Yost, Kevin G.; Trojanowski, Alan G.; Dair, Thomas M.; Ando, Mari H.; and Linton, Jarrod L., to Johnson & Johnson Consumer Products, Inc. Toothbrush. 373,681, Cl. D4-104.000.
Yost, Kevin G.: *See—*
Knox, Andrew J.; and Yost, Kevin G., 373,680, Cl. D4-104.000.
Yu, Chung C. Support stand for computer monitor and speakers. 373,761, Cl. D14-114.000.
Yuan Mei Corp.: *See—*
Wang, Chin-Yuan, 373,814, Cl. D23-226.000.
Zackson, Brad; and Rosenberg, Fred S., to Beautifying Cities Across America, Corp. Trash receptacle. 373,874, Cl. D34-1.000.
Zackson, Brad; and Rosenberg, Fred S., to Beautifying Cities Across America Corp. Trash receptacle. 373,875, Cl. D34-1.000.
Zarb, Joseph E.: *See—*
Bado, John; and Zarb, Joseph E., 373,836, Cl. D25-138.000.
Zimmer, Inc.: *See—*
Hayes, Kevin B., 373,825, Cl. D24-155.000.
Zooth, Inc.: *See—*
Harrison, Susan, 373,711, Cl. D7-654.000.

LIST OF PLANT PATENTEES

Escarpe, Jean L. Nectarine tree 'Crystal Belle'. 9,643, Cl. Pl-40.100.

Pieper, Wilhelm K. H. *Aechmea fasciata* Variegated Fria 'Aribo'. 9,644, Cl.

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ISSUED SEPTEMBER 17, 1996

LIST OF PLANT PATENTEES

Escande, Jean L. Nectarine tree 'Crystal Belle'. 9,643. Cl. Plt.-40.100. Pieper, Wilhelm K. H. *Aechmea fascini* Variegated Friederike'. 9,644. Cl. Plt.-88.800.

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NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2

2 5,555,561
69 5,555,562
148 5,555,563
239 5,555,564
5,555,565
247 5,555,566
403 5,555,568
424 5,555,567
5,555,569
5,555,570
428 5,555,571

CLASS 4

213 5,555,572
325 5,555,573
502 5,555,574
563.1 5,555,575

CLASS 5

93.1 5,555,577
114 5,555,576
421 5,555,579
460 5,555,578
502 5,555,581
600 5,555,582
665 5,555,580

CLASS 8

158 5,555,583
549 5,556,435

CLASS 12

142 N 5,555,584

CLASS 15

3.5 5,555,585
21.2 5,555,586
98 5,555,587
104.16 5,555,588
105 5,555,589
167.1 5,555,590
210.1 5,555,591
236.07 5,555,592
302 5,555,593
313 5,555,594
319 5,555,595
320 5,555,596
321 5,555,597
322 5,555,598
5,555,599
327.2 5,555,600
339 5,555,601
428 5,555,602

CLASS 16

87.2 5,555,603
114 A 5,555,604
247 5,555,605

CLASS 24

67.9 5,555,606
129 R 5,555,607
442 5,555,608
641 5,555,609

CLASS 26

96 5,555,610
102 5,555,611

CLASS 27

2 5,555,612

CLASS 29

263 5,555,613
401.1 5,555,614
458 5,555,615
509 5,555,616
772 5,555,617
825 5,555,618
860 5,555,619
874 5,555,620
890 5,555,621
890.053 5,555,622
896.9 5,555,623

CLASS 30

2 5,555,624
319 5,555,625
393 5,555,626
509 5,555,627

CLASS 33

1 SB 5,555,628
17 R 5,555,629
27.02 5,555,630
31 5,555,631
203 5,555,632
704 5,555,633

CLASS 34

78 5,555,634
79 5,555,635
86 5,555,636
97 5,555,637
117 5,555,638
135 5,555,639
202 5,555,640
261 5,555,641
423 5,555,642
443 5,555,643
444 5,555,644
499 5,555,645
585 5,555,646
601 5,555,647
621 5,555,648
666 5,555,649

CLASS 36

114 5,555,650
117.7 5,555,651

CLASS 37

189 5,555,652

CLASS 38

102.2 5,555,653

CLASS 40

306 5,555,655
411 5,555,656
518 5,555,657
554 5,555,658
604 5,555,659
622 5,555,660
714 5,555,654

CLASS 42

49.02 5,555,661
103 5,555,662

CLASS 43

1 5,555,663
5,555,664
5,555,665
17 5,555,666
5,555,667
43.15 5,555,668
44.96 5,555,669
44.99 5,555,670
57.1 5,555,671
124 5,555,672

CLASS 44

626 5,556,436

CLASS 47

1.5 5,555,673
56 5,555,674
79 5,555,675
82 5,555,676

CLASS 49

502 5,555,677

CLASS 51

298 5,556,437
309 5,556,438

CLASS 52

2.13 5,555,678
2.18 5,555,679
12 5,555,680
63 5,555,681
100 5,555,682
200 5,555,683
204.5 5,555,684
204.597 5,555,685
220.1 5,555,686
288.01 5,555,687
288.1 5,555,688
489.1 5,555,689
506.08 5,555,690
514 5,555,691
662 5,555,692
689 5,555,693
702 5,555,694
730.4 5,555,695
737.1 5,555,696
741.1 5,555,697
745.17 5,555,698
801.11 5,555,699

CLASS 53

48.1 5,555,700
75 5,555,701
127 5,555,702
411 5,555,703
425 5,555,704
432 5,555,705
447 5,555,706
493 5,555,707
563 5,555,708
570 5,555,709

CLASS 54

66 5,555,710

CLASS 55

487 5,556,439
498 5,556,440
502 5,556,441

CLASS 56

400.2 5,555,711

CLASS 57

224 5,555,716
264 5,555,712
281 5,555,713
408 5,555,714
413 5,555,717
414 5,555,715

CLASS 60

39.02 5,555,718
39.03 5,555,719
5,555,720
39.142 5,555,722
39.182 5,555,723
39.75 5,555,721
276 5,555,724
277 5,555,725
469 5,555,726
488 5,555,727
496 5,555,728
517 5,555,729
606 5,555,730
671 5,555,731

CLASS 62

3.4 5,555,732
62 5,555,733
66 5,555,734
100 5,555,735
187 5,555,736
230 5,555,737
238.3 5,555,738
244 5,555,739
293 5,555,740
294 5,555,741
311 5,555,742
347 5,555,743
352 5,555,744
401 5,555,745
457.4 5,555,746
532 5,555,747
621 5,555,748
641 5,555,749

CLASS 65

17.4 5,556,442
27 5,556,443
106 5,556,444

CLASS 66

145 B 5,555,750

CLASS 70

16 5,555,751
159 5,555,752
209 5,555,753
5,555,754
247 5,555,755

CLASS 71

11 5,556,445

CLASS 72

41 5,555,756
88 5,555,757
132 5,555,758
179 5,555,759
334 5,555,760
349 5,555,761
369 5,555,762
420 5,555,763

CLASS 73

7 5,557,039
170.21 5,557,040
273 5,557,041
296 5,555,764
335.03 5,557,042
468 5,557,043
497 5,557,044
504.04 5,557,046
504.09 5,555,765
504.14 5,557,045
514.32 5,555,766
597 5,557,047
5,557,048
715 5,557,049
861.02 5,557,050
861.22 5,557,051
863 5,555,767
865.8 5,555,768

CLASS 74

89.22 5,555,769
459 5,555,770
5,555,771
493 5,555,772
512 5,555,773
5,555,774
551.5 5,555,775
567 5,555,776
595 5,555,777

CLASS 75

255 5,556,446
670 5,556,447

CLASS 81

3.55 5,555,778
15.9 5,555,779
57.37 5,555,780
436 5,555,781

CLASS 82

46 5,555,782
96 5,555,783
158 5,555,784

CLASS 83

589 5,555,785
663 5,555,786
698.11 5,555,787
835 5,555,788

CLASS 84

243 5,557,052
415 5,557,053
422.1 5,557,054
478 5,557,055
610 5,557,056
617 5,557,057
735 5,557,058

CLASS 92

165 R 5,555,789

CLASS 95

6 5,556,448
49 5,556,449

CLASS 99

289 T 5,555,790
295 5,555,791
323.9 5,555,792
326 5,555,793
349 5,555,794
446 5,555,795
453 5,555,796
468 5,555,797

CLASS 100

93 P 5,555,798
930 RP 5,555,799

CLASS 101

23 5,555,800
32 5,555,801
116 5,555,802
148 5,555,806
180 5,555,803
183 5,555,804
228 5,555,805
415.1 5,555,807
425 5,555,808
451 5,555,809
477 5,555,810
5,555,811
5,555,812
492 5,555,813

CLASS 102

434 5,557,059

CLASS 104

107 5,555,814
296 5,555,815

CLASS 105

168 5,555,816
198.2 5,555,817
5,555,818

CLASS 106

10 5,556,450
14.13 5,556,451
166.01 5,556,452
205.01 5,556,453
218 5,556,454
494 5,556,456
697 5,556,457
708 5,556,458
744 5,556,459
823 5,556,460

CLASS 108

9 5,555,819
51.1 5,555,820

CLASS 110

191 5,555,821
237 5,555,822
346 5,555,823

CLASS 111

62 5,555,824
69 5,555,825

CLASS 112

80.04 5,555,826
102.5 5,555,827
103 5,555,828
129 5,555,834
220 5,555,829
248 5,555,830
470.06 5,555,831
470.155 5,555,832
470.31 5,555,833
475.07 5,555,835

CLASS 114

89 5,555,836
153 5,555,837
265 5,555,838

CLASS 116

210 5,555,839
223 5,555,840
295 5,555,936

CLASS 117

52 5,556,461
85 5,556,462
90 5,556,463
106 5,556,464
202 5,556,465

CLASS 118

67 5,556,466
123 5,556,467
202 5,556,468
257 5,556,469
264 5,556,470
300 5,556,471
661 5,557,060
719 5,556,472
5,556,473
723 E 5,556,474
723 MP 5,556,475
728 5,556,476
5,556,477

CLASS 119

51.11 5,555,842
57.8 5,555,843
165 5,555,844
201 5,555,845
654 5,555,848
708 5,555,846
850 5,555,847

CLASS 122

4 D 5,555,849
248 5,555,850
392 5,555,851

CLASS 123

1 A 5,555,852
2 5,555,853
41.08 5,555,855
41.1 5,555,854
41.42 5,555,856
73 AD 5,555,857
73 SC 5,555,858
79 C 5,555,859
90.16 5,555,860
5,555,861
143 B 5,555,862
179.28 5,555,864
179.3 5,555,863
184.56 5,555,865
240 5,555,866
260 5,555,867
275 5,555,868
308 5,555,869
480 5,555,870
481 5,555,871
497 5,555,872
575 5,555,873

CLASS 124

1 5,555,874
44.5 5,555,875

CLASS 126

504 5,555,876
565 5,555,877
657 5,555,878

CLASS 128

201.24 5,555,879
204.21 5,555,880
207.17 5,555,881
633 5,555,882
642 5,555,883
653.2 5,555,884
654 5,555,885
661.10 5,555,886
663.01 5,555,887
702 5,555,888
705 5,555,889
719 5,555,890
721 5,555,891
757 5,555,892
772 5,555,893
782 5,555,894
5,555,895
830 5,555,896
845 5,555,897
898 5,555,898

CLASS 132

114 5,555,899
200 5,555,900
273 5,555,901

CLASS 134

1.3 5,556,479
18 5,556,478
26 5,556,480
5,556,481
38 5,556,482
199 5,555,902

CLASS 135

16 5,555,903
68 5,555,904

CLASS 137

15 5,555,905
240 5,555,906

312 5,555,907
329.1 5,555,908
359 5,555,909
488 5,555,910
625.69 5,555,911
801 5,555,912

CLASS 138

104 5,555,913
115 5,555,914
133 5,555,915
177 5,555,916

CLASS 139

383 A 5,555,917
433 5,555,918

CLASS 141

59 5,555,919
329 5,555,920

CLASS 144

253.2 5,555,921

CLASS 148

206 5,556,483
211 5,556,484
320 5,556,485
429 5,556,486

CLASS 149

26 5,557,061
46 5,557,062

CLASS 152

198 5,556,488
228 5,556,487
418 5,556,489

CLASS 156

64 5,556,490
5,556,491
5,556,492
5,556,493
69 5,556,494
148 5,556,495
166 5,556,496
172 5,556,497
5,556,601
245 5,556,498
344 5,556,499
345 5,556,500
5,556,501
5,556,503
519 5,556,504
570 5,556,505
625.1 5,556,506
656.1 5,556,507

CLASS 157

1.17 5,555,922

CLASS 160

229.1 5,555,923

CLASS 162

60 5,556,508
111 5,556,509
158 5,556,510
206 5,556,511
272 5,556,512
304 5,556,513
358.3 5,556,514

CLASS 164

4.1 5,555,924
255 5,555,925
468 5,555,926

CLASS 165

47 5,555,928
76 5,555,929
81 5,555,930
122 5,555,931
135 5,555,932
166 5,555,933
239 5,555,927
345 5,556,502

CLASS 166

68 5,555,934
88.1 5,555,935
301 5,555,937

CLASS 169

36 5,555,938
54 5,555,939
60 5,555,940

CLASS 171

16 5,555,941

CLASS 172

3 5,555,942
22 5,555,943
787 5,555,944

CLASS 174

35 GC 5,557,063
35 MS 5,557,064
52.3 5,557,065
52.4 5,557,066
59 5,557,067
5,557,068
87 5,557,069
5,557,070
112 5,557,071
125.1 5,557,072
151 5,557,073
152 GM 5,557,074
254 5,557,075

CLASS 175

50 5,555,945
61 5,555,946
62 5,555,947

CLASS 178

19 Re 35,329
5,557,076

CLASS 180

6.5 5,555,949
65.1 5,555,950
444 5,555,951

CLASS 181

135 5,557,077
208 5,557,078

CLASS 182

18 5,555,952
141 5,555,953
152 5,555,954
222 5,555,955

CLASS 184

6.16 5,555,956

CLASS 187

233 5,555,957
406 5,555,958

CLASS 188

73.1 5,555,959

CLASS 190

115 5,555,960

CLASS 192

3.62 5,555,961
12 R 5,555,962
58.61 5,555,963
145 5,555,964

CLASS 194

217 5,555,965
343 5,555,966

CLASS 198

359 5,555,967
594 5,555,968
803.3 5,555,969
866 5,555,970

CLASS 200

5 A 5,557,079
5 R 5,557,080
16 C 5,557,081
90.35 5,557,082
345 5,555,971
451 5,555,972
561 5,555,973

CLASS 202

248 5,556,515

CLASS 203

91 5,556,516

CLASS 204

157.47 5,556,517
192.12 5,556,519
5,556,525
192.13 5,556,520
192.32 5,556,521
269 5,556,522
272 5,556,523
296 5,556,524
425 5,556,526
484 5,556,518
488 5,556,527
600 5,556,528
612 5,556,529

CLASS 205

122 5,556,530
153 5,556,531
705 5,556,532
777.5 5,556,533
784.5 5,556,556
787.5 5,556,534

CLASS 206

1.7 5,555,974
63.3 5,555,976
308.1 5,555,977
410 5,555,978
419 5,555,979
600 5,555,980
711 5,555,981
746 5,555,982
762 5,555,975

CLASS 209

534 5,555,983
580 5,555,984
667 5,555,985

CLASS 210

140 5,556,535
150 5,556,536
151 5,556,537
194 5,556,538
195.2 5,556,539
222 5,556,540
232 5,556,541
5,556,542
435 5,556,543
436 5,556,544
651 5,556,545
659 5,556,546
690 B2 4,615,806
751 5,556,547
767 5,556,555
787 5,556,557
806 5,556,548

CLASS 211

40 5,555,986
59.3 5,555,990
73 5,555,991
153 5,555,987

CLASS 215

249 5,555,988

CLASS 216

61 5,556,549
93 5,556,553

CLASS 218

125 5,557,083

CLASS 219

69.12 5,556,551
5,556,554
75 5,556,550
86.32 5,556,552
121.45 5,556,560
121.5 5,556,558
121.51 5,556,559
137 WM 5,556,561
137.61 5,556,562
227 5,556,563
494 5,556,564
633 5,556,565
683 5,556,566
779 5,556,567

CLASS 220

62 5,555,989
269 5,555,992
5,555,993
287 5,555,994
346 5,555,995
403 5,555,996
404 5,555,997
484 5,555,998
565 5,555,999

CLASS 221

150 A 5,556,000

CLASS 222

1 5,556,001
21 5,556,002
39 5,556,003
81 5,556,004
96 5,556,005
129.1 5,556,006
136 5,556,007
192 5,556,008
326 5,556,009
386 5,556,010
455 5,556,011
600 5,556,568
608 5,556,012

CLASS 223

84 5,556,013
85 5,556,014

CLASS 224

328 5,556,015
329 5,556,016
549 5,556,017

CLASS 225

2 5,556,018
96 5,556,019

CLASS 227

109 5,556,020

CLASS 228

1.1 5,556,022
248.1 5,556,023
264 5,556,024

CLASS 229

87.19 5,556,025
123.1 5,556,026

CLASS 235

94 A 5,557,084
380 5,557,085
5,557,086
5,557,087
383 5,557,088
440 5,557,089
449 5,557,090
462 5,557,091
5,557,092
5,557,093
5,557,094
5,557,095
492 5,557,096

CLASS 237

8 C 5,556,027
12.3 A 5,556,028

CLASS 239

2.1 5,556,029
56 5,556,030
124 5,556,031
279 5,556,032
343 5,556,033
417.3 5,556,034
455 5,556,035
457 5,556,036
458 5,556,037

CLASS 241

17 5,556,038
18 5,556,039
24.14 5,556,041
24.29 5,556,040
101.76 5,556,042
282 5,556,043
296 5,556,044

CLASS 242

18 G 5,556,045
18 R 5,556,046
250 5,556,047
288 5,556,048
295 5,556,049
296 5,556,050
347.1 5,556,051
412.3 5,556,052
541.6 5,556,053
597.6 5,556,054
608.2 5,556,055

CLASS 244

121 5,556,056
153 R 5,556,057
171 5,556,058

CLASS 248

49 5,556,059
5,556,060
51 5,556,061
55 5,556,062
99 5,556,063
129 5,556,065
172 5,556,064
218.4 5,556,066
220.21 5,556,067
220.41 5,556,068
291.1 5,556,069
469 5,556,070
634 5,556,071

CLASS 250

201.3 5,557,097
222.1 5,557,098
227.11 5,557,099
227.16 5,557,100
231.13 5,557,101
252.1 5,557,102
255 5,557,103
307 5,557,104
310 5,557,105
353 5,557,106
361 R 5,557,107
390.04 5,557,108
455.11 5,557,109
492.23 5,557,110
504 R 5,557,112
559.38 5,557,113

CLASS 251

58 5,556,072
129.11 5,556,073
329 5,556,074
368 5,556,075

CLASS 252

62.51 R 5,556,570
62.56 5,556,571
311.5 5,556,574
394 5,556,575
511 5,556,576
604 5,556,578

CLASS 254

8 R 5,556,076
267 5,556,077
368 5,556,078

CLASS 256

22 5,556,079
24 5,556,080

CLASS 257

59 5,557,114
81 5,557,115
100 5,557,116
184 5,557,117
197 5,557,118
264 5,557,119
291 5,557,120
292 5,557,121
308 5,557,135
309 5,557,122
315 5,557,123
316 5,557,124
329 5,557,125
332 5,557,126
339 5,557,127
341 5,557,128
345 5,557,129
359 5,557,130
370 5,557,131
415 5,557,132
440 5,557,133
506 5,557,134
530 5,557,136
5,557,137
531 5,557,138
592 5,557,139
596 5,557,140
631 5,557,141
659 5,557,142
666 5,557,143
668 5,557,144
692 5,557,145
741 5,557,146
763 5,557,147
777 5,557,148
779 5,557,149
787 5,557,150

CLASS 261

99 5,556,579

CLASS 264

3.4 5,557,151
4.1 5,556,583
4.3 5,556,580
40.1 5,556,581
5,556,582
46.5 5,556,584
56 5,556,585
62 5,556,586
86 5,556,587
130 5,556,588
172.12 5,556,589
401 5,556,590
516 5,556,591

CLASS 266

227 5,556,592
257 5,556,593

CLASS 267

47 5,556,081
218 5,556,082
277 5,556,083

CLASS 269

60 5,556,084
75 5,556,085

CLASS 270

46 5,556,086
58.18 5,556,087

CLASS 273

1.5 R 5,556,088
25 5,556,089
5,556,090
26 R 5,556,091
75 5,556,092
108.5 5,556,094
126 A 5,556,093
126 R 5,556,095
146 5,556,096
241 5,556,099
249 5,556,100
274 5,556,101
299 5,556,102
371 5,556,103
396 5,556,104
411 5,556,106

CLASS 277

1 5,556,109
38 5,556,110
96.1 5,556,111
152 5,556,112
233 5,556,113

CLASS 279

2.08 5,556,114

CLASS 280

6.12 5,556,115
7.15 5,556,116
47.11 5,556,117
47.16 5,556,118
96.1 5,556,119
304.1 5,556,120
5,556,121
602 5,556,122
607 5,556,123
728.2 5,556,124
5,556,125
728.3 5,556,126
730.2 5,556,127
5,556,128
5,556,129
741 5,556,130
5,556,131
5,556,132
781 5,556,133

CLASS 281

29 5,556,134

CLASS 283

48.1 5,556,135

CLASS 285

23 5,556,136
26 5,556,137
111 5,556,139
137.1 5,556,138

CLASS 292

92 5,556,140
99 5,556,141
101 5,556,142
302 5,556,143
336.3 5,556,144
5,556,145

CLASS 294

31.1 5,556,146
64.1 5,556,147
67.1 5,556,148
104 5,556,149
118 5,556,150

CLASS 296

39.2 5,556,151
57.1 5,556,152
70 5,556,153
97.1 5,556,154
97.12 5,556,155
100 5,556,156

CLASS 297

68 5,556,157
85 5,556,158
216.1 5,556,159
5,556,160
217.3 5,556,161
256.15 5,556,162
330 5,556,163
344.22 5,556,164
362.14 5,556,165
377 5,556,166
423.15 5,556,167
440.2 5,556,168

452.28 5,556,169
463.1 5,556,170
483 5,556,171

CLASS 300

21 5,556,172

CLASS 303

3 5,556,173
119.2 5,556,175
165 5,556,176
174 5,556,177
191 5,556,174

CLASS 310

46 5,557,152
56 5,557,153
80 5,557,154
90.5 5,557,155
316 5,557,156
323 5,557,157

CLASS 312

107 5,556,178
190 5,556,179
193 5,556,180
313 5,556,181
334.19 5,556,182
348.1 5,556,183

CLASS 313

141 5,557,158
336 5,557,159
5,557,160
402 5,557,161
5,557,162
420 5,557,163
440 5,557,164
5,557,165
524 5,557,166
542 5,557,167
586 5,557,168
623 5,557,169
635 5,557,170
636 5,557,171

CLASS 315

111.71 5,557,172
158 5,557,173
194 5,557,174
200 R 5,557,175
307 5,557,176
366 5,557,177
501 5,557,178

CLASS 318

41 5,557,179
254 5,557,180
376 5,557,181
432 5,557,182
434 5,557,183
568.16 5,557,185
608 5,557,184
626 5,557,186

CLASS 320

1 5,557,187
5 5,557,188
18 5,557,189
21 5,557,190
30 5,557,192
48 5,557,191

CLASS 323

282 5,557,193
315 5,557,194

CLASS 324

72 5,557,195
76.77 5,557,196
115 5,557,197
5,557,198
301 5,557,199
303 5,557,200
5,557,201
307 5,557,202
309 5,557,203
5,557,204
319 5,557,205
329 5,557,206
414 5,557,207
435 5,557,208
537 5,557,209
539 5,557,210
754 5,557,211
755 5,557,212
761 5,557,213
762 5,557,214
765 5,557,215
772 5,557,216

CLASS 326

39 5,557,217
40 5,557,218
49 5,557,219

CLASS 327

28 5,557,220
53 5,557,221
105 5,557,222
108 5,557,223
115 5,557,224
199 5,557,225
227 5,557,226
346 5,557,227
355 5,557,228
374 5,557,229
534 5,557,231
545 5,557,232
552 5,557,233
563 5,557,234
564 5,557,235
565 5,557,236

CLASS 330

129 5,557,237
258 5,557,238
259 5,557,239
297 5,557,240

CLASS 331

4 5,557,241
17 5,557,242
158 5,557,243

CLASS 332

128 5,557,244

CLASS 333

116 5,557,245
206 5,557,246
219 5,557,247

CLASS 335

284 5,557,248

CLASS 336

5 5,557,249

CLASS 338

21 5,557,250
22 R 5,557,251
195 5,557,252

CLASS 340

321 5,557,253
426 5,557,254
5,557,255
442 5,557,256
474 5,557,257
540 5,557,258
573 5,557,259
578 5,557,260
580 5,557,261
587 5,557,262
605 5,557,263
635 5,557,265
825.02 5,557,266
870.04 5,557,267
933 5,557,268

CLASS 341

22 5,557,269
50 5,557,270
67 5,557,271
100 5,557,272
116 5,557,273
155 5,557,274
160 5,557,275
200 5,557,276

CLASS 342

22 5,557,277
29 5,557,278
42 5,557,279
044 5,557,280
114 5,557,281
123 5,557,282
179 5,557,283
357 5,557,284
359 5,557,285

CLASS 343

700 MS 5,557,286
702 5,557,287
5,557,288
713 5,557,289
5,557,290
725 5,557,291
781 P 5,557,292
867 5,557,293

CLASS 345

32 5,557,294
36 5,557,295
74 5,557,296
119 5,557,298
136 5,557,297
168 5,557,299
170 5,557,300
179 5,557,301
189 5,557,302
207 5,557,324

CLASS 346

141 5,557,303

CLASS 347

15 5,557,304
17 5,557,305
33 5,557,306
34 5,557,307
65 5,557,308
71 5,557,309
87 5,557,310
111 5,557,311
171 5,557,312
203 5,557,313
230 5,557,314
244 5,557,315

CLASS 348

7 5,557,316
5,557,317
5,557,318
11 5,557,319
12 5,557,320
78 5,557,321
100 5,557,322
140 5,557,323
223 5,557,325
272 5,557,326
340 5,557,327
358 5,557,328
373 5,557,329
394 5,557,330
410 5,557,331
473 5,557,333
5,557,334
512 5,557,335
556 5,557,336
558 5,557,337
565 5,557,338
586 5,557,339
627 5,557,340
699 5,557,341
706 5,557,342
781 5,557,343
809 5,557,344

CLASS 351

66 5,557,345
169 5,557,348
206 5,557,349
208 5,557,350
221 5,557,351
237 5,557,352

CLASS 353

10 5,556,184
26 R 5,556,185
69 5,557,353

CLASS 354

106 5,557,354
5,557,355
149.11 5,557,356
202 5,557,357
219 5,557,358
230 5,557,360
234.1 5,557,359
289.1 5,557,361
324 5,557,362
402 5,557,363
410 5,557,364
416 5,557,366
484 5,557,365

CLASS 355

202 5,557,367
203 5,557,368
204 5,557,369
206 5,557,370
211 5,557,371
219 5,557,372
5,557,373
5,557,374
5,557,375
256 5,557,376
5,557,377
5,557,378
259 5,557,379
5,557,380
260 5,557,381
5,557,382
271 5,557,383
274 5,557,384
285 5,557,385
298 5,557,386
312 5,557,387
5,557,388
315 5,557,389
319 5,557,390
5,557,391
326 R 5,557,392
5,557,393
327 5,557,394

CLASS 356

5.01 5,557,397
28 5,557,395
28.5 5,557,396
73.1 5,557,400
5,557,401
139.08 5,557,347
237 5,557,402
239 5,557,403
318 5,557,398
319 5,557,404
336 5,557,405
345 5,557,406
356 5,557,407
357 5,557,399
359 5,557,408
371 5,557,409
376 5,557,410
401 5,557,411
407 5,557,414
417 5,557,415

CLASS 358

296 5,557,412
5,557,413
300 5,557,416
310 5,557,417
335 5,557,418
5,557,419
5,557,420
5,557,421
5,557,422
5,557,423
5,557,424
440 5,557,425
448 5,557,426
496 5,557,427
501 5,557,428
5,557,430
532 5,557,429

CLASS 359

10 5,557,431
41 5,557,432
5,557,433
73 5,557,434
75 5,557,435
80 5,557,436
110 5,557,437
130 5,557,439
142 5,557,443
161 5,557,440
173 5,557,441
179 5,557,442
187 5,557,445
199 5,557,444
204 5,557,438
206 5,557,446
208 5,557,447
5,557,448
212 5,557,449
234 5,557,450
350 5,557,451
368 5,557,452
376 5,557,453
378 5,557,454
384 5,557,455
393 5,557,456
408 5,557,457
434 5,557,458
465 5,557,459
530 5,557,460
551 5,557,461
585 5,557,462
586 5,557,466
605 5,557,467
615 5,557,468
646 5,557,463
5,557,464
669 5,557,465
683 5,557,469
687 5,557,470
709 5,557,471
751 5,557,472
757 5,557,473
820 5,557,474
831 5,557,475
841 5,557,476
846 5,557,477
853 5,557,478

CLASS 360

32 5,557,479
33.1 5,557,480
41 5,557,481
53 5,557,482
74.6 5,557,483
95 5,557,484
96.5 5,557,485
97.01 5,557,486
99.08 5,557,487
104 5,557,488
5,557,489
106 5,557,490
113 5,557,491
5,557,492

CLASS 361

149 5,557,493
152 5,557,494
173 5,557,504
298.2 5,557,495
500 5,557,496
502 5,557,497
600 5,557,498
685 5,557,499
687 5,557,500
704 5,557,501
712 5,557,502
719 5,557,503
777 5,557,505
796 5,557,506
816 5,557,507
818 5,557,508

CLASS 362

16 5,556,186
27 5,556,187
101 5,556,188
153.1 5,556,189
226 5,556,190
256 5,556,191
276 5,556,192
294 5,556,193
299 5,556,194
386 5,556,195

CLASS 363

44 5,557,509

CLASS 364

146 5,557,510
157 5,557,511
188 5,557,512
401 5,557,514
401 R 5,557,513
5,557,515
406 5,557,516
408 5,557,517
5,557,518
424.01 5,557,519
5,557,520
488 5,557,530
489 5,557,531
491 5,557,532
5,557,533
5,557,534
496 5,557,535
510 5,557,536
512 5,557,537
514 A 5,557,538
514 B 5,557,539
514 R 5,557,540
5,557,541
5,557,542
516 5,557,543
525 5,557,544
550 5,557,545
551.01 5,557,546
5,557,547
5,557,548
5,557,549
557 5,557,550
5,557,551
565 5,557,552
569 5,557,553
571.01 5,557,554
578 5,557,555
5,557,556
5,557,557
5,557,558
580 5,557,559
602 5,557,560
5,557,561
708.1 5,557,562
754 5,557,563

CLASS 365

63 5,557,564
185.01 5,557,565
185.08 5,557,566
185.16 5,557,567
185.22 5,557,568
185.28 5,557,569
185.29 5,557,570
189.05 5,557,571
189.07 5,557,572
201 5,557,573
5,557,574
218 5,557,576
221 5,557,575
222 5,557,577
5,557,578
226 5,557,579
230.06 5,557,580
233 5,557,581
233.5 5,557,582

CLASS 366

18 5,556,196
22 5,556,197
97 5,556,198
120 5,556,199
175.2 5,556,200
203 5,556,201
213 5,556,202
347 5,556,203

CLASS 367

131 5,557,584
138 5,557,583

CLASS 368

43 5,557,585
80 5,557,586
282 5,557,587

CLASS 369

13 5,557,588
5,557,589
30 5,557,590
44.28 5,557,591
48 5,557,592
59 5,557,593
5,557,594
77.1 5,557,595
101 5,557,596
112 5,557,597
5,557,598
116 5,557,599
5,557,600
121 5,557,601
124 5,557,602

CLASS 370

16 5,557,603
17 5,557,604
29 5,557,605
31 5,557,606
58.2 5,557,607
60 5,557,608
60.1 5,557,609
5,557,610
5,557,611
71 5,557,612
85.1 5,557,613
105 5,557,614
105.1 5,557,615
5,557,616
120 5,557,617

CLASS 371

10.3 5,557,618
22.5 5,557,619
5,557,620
37.1 5,557,621
49.1 5,557,622
61 5,557,623

CLASS 372

11 5,557,624
29 5,557,625
45 5,557,626
46 5,557,627
70 5,557,628
87 5,557,629
95 5,557,630

CLASS 373

105 5,557,631

CLASS 374

161 5,556,204

CLASS 375

213 5,557,633
222 5,557,634
224 5,557,639
229 5,557,640
250 5,557,635

260 5,557,636
271 5,557,637
286 5,557,638
295 5,557,641
316 5,557,642
324 5,557,643
340 5,557,632
5,557,644
5,557,645
346 5,557,646
371 5,557,647
376 5,557,648

CLASS 377
48 5,557,649

CLASS 378
154 5,557,650

CLASS 379
6 5,557,651
57 5,557,652
58 5,557,653
5,557,654
5,557,655
59 5,557,656
60 5,557,657
67 5,557,658
88 5,557,659
96 5,557,661
100 5,557,662
110 5,557,663
114 5,557,664
198 5,557,665
201 5,557,666
5,557,667
212 5,557,668
215 5,557,660
339 5,557,669
5,557,670
355 5,557,671
399 5,557,672
443 5,557,673

CLASS 380
4 5,557,674
10 5,557,675
20 5,557,677
21 5,557,346
5,557,678
5,557,765
23 5,557,676
5,557,679

CLASS 381
27 5,557,680
67 5,557,681
71 5,557,682
86 5,557,683

CLASS 382
107 5,557,684
5,557,685
115 5,557,686
132 5,557,687
151 5,557,690
164 5,557,688
177 5,557,689
299 5,557,691

CLASS 383
24 5,556,205

CLASS 384
15 5,556,206
115 5,556,207
117 5,556,208
504 5,556,209
517 5,556,210

CLASS 385
11 5,557,692
24 5,557,693
27 5,557,694
49 5,557,695
75 5,557,696
99 5,557,697
101 5,557,698
122 5,557,699
5,557,700
124 5,557,701
128 5,557,703
143 5,557,702

CLASS 392
480 5,557,704

CLASS 395
2.28 5,557,705
2.81 5,557,706
106 5,557,707
108 5,557,708
109 5,557,709
119 5,557,710
122 5,557,711
130 5,557,712
135 5,557,713
137 5,557,714
5,557,715
140 5,557,716
5,557,717
5,557,718
141 5,557,719
146 5,557,720
148 5,557,721
5,557,722
149 5,557,723
153 5,557,725
5,557,726
155 5,557,727
157 5,557,724
5,557,728
158 5,557,729
159 5,557,730
161 5,557,731
5,557,732
162 5,557,733
5,557,734
180 5,557,735
182.02 5,557,736
182.04 5,557,737
182.12 5,557,738
183.1 5,557,739
183.14 5,557,740
183.19 5,557,741
186 5,557,742
5,557,743
200.01 5,557,744
200.02 5,557,745
200.06 5,557,746
200.10 5,557,748
200.11 5,557,747
200.18 5,557,749
250 5,557,750
5,557,751
285 5,557,752
287 5,557,753
5,557,754
293 5,557,755
299 5,557,756
306 5,557,757
308 5,557,758
309 5,557,759
310 5,557,760
375 5,557,761
5,557,762
5,557,763
5,557,764
405 5,557,766
440 5,557,767
458 5,557,768
473 5,557,769
488 5,557,770
490 5,557,771
496 5,557,772
500 5,557,773
5,557,774
5,557,775
5,557,776
5,557,777
5,557,778
5,557,779
5,557,780
550 5,557,781
5,557,782
5,557,783
5,557,784
600 5,557,785
5,557,786
5,557,787
5,557,788
5,557,789
5,557,790
5,557,791
5,557,792
5,557,793
5,557,794
650 5,557,795
5,557,796
5,557,797
5,557,798
700 5,557,799
800 5,557,800

CLASS 398
416 5,557,332

CLASS 400
124.11 5,556,211
621 5,556,213

CLASS 401
126 5,556,214
127 5,556,216
199 5,556,215

CLASS 403
61 5,556,217
170 5,556,218
176 5,556,219
298 5,556,220
322 5,556,221
5,556,222
323 5,556,223
362 5,556,224
379 5,556,224

CLASS 404
77 5,556,225
84.1 5,556,226
101 5,556,227

CLASS 405
16 5,556,228
27 5,556,229
29 5,556,230
48 5,556,231
129 5,556,232
259.1 5,556,234
259.4 5,556,233
303 5,556,235

CLASS 406
3 5,556,236
32 5,556,237
136 5,556,238

CLASS 407
113 5,556,239

CLASS 409
81 5,556,240
131 5,556,241
132 5,556,242
226 5,556,243

CLASS 412
30 5,556,244

CLASS 414
24.5 5,556,245
278 5,556,246
331 5,556,247
416 5,556,248
500 5,556,249
558 5,556,250
790.3 5,556,251
796.7 5,556,252
797.7 5,556,253
798.1 5,556,254

CLASS 415
212.1 5,556,255

CLASS 416
100 5,556,256
241 R 5,556,257

CLASS 417
63 5,556,258
194 5,556,259
269 5,556,260
5,556,261
307 5,556,264
312 5,556,265
362 5,556,266
364 5,556,262
490 5,556,263
534 5,556,267
553 5,556,268

CLASS 418
55.2 5,556,269
179 5,556,270
201.2 5,556,271

CLASS 420
448 5,556,594

CLASS 422
10 D 5,556,598
32 5,556,595
53 5,556,596
63 5,556,597
102 5,556,599
108 5,556,600
185 5,556,602
213 5,556,603
300 5,556,607

CLASS 423
213.7 5,556,604
220 5,556,605
228 5,556,606
447.4 5,556,608

CLASS 424
1.69 5,556,609
9.52 5,556,610
46 5,556,611
59 5,556,612
64 5,556,613
65 5,556,614
70.11 5,556,615
70.122 5,556,616
78.02 5,556,617
78.08 5,556,618
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94.64 5,556,621
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179.1 5,556,623
195.1 5,556,624
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401 5,556,628
5,556,629
5,556,630
410 5,556,631
423 5,556,632
427 5,556,633
438 5,556,634
448 5,556,635
5,556,636
450 5,556,637
468 5,556,638
480 5,556,639
489 5,556,640
490 5,556,641
502 5,556,642
602 5,556,643
630 5,556,644
650 5,556,645

CLASS 425
127 5,556,647
150 5,556,648
215 5,556,649
546 5,556,650
556 5,556,651
589 5,556,656

CLASS 426
5 5,556,652
101 5,556,653
234 5,556,654
241 5,556,657
270 5,556,655
302 5,556,659
411 5,556,658
499 5,556,660
549 5,556,661
646 5,556,662

CLASS 427
8 5,556,663
64 5,556,664
5,556,665
133 5,556,666
164 5,556,667
378 5,556,668
410 5,556,669

CLASS 428
1 5,556,670
15 5,556,671
33 5,556,672
34.4 5,556,673
34.9 5,556,674
36.1 5,556,676
36.2 5,556,677
36.6 5,556,678
36.91 5,556,679
36.92 5,556,675
56 5,556,680
64.1 5,556,681
74 5,556,682
76 5,556,683
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122 5,556,688
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141 5,556,691
156 5,556,692
195 5,556,693
212 5,556,694
229 5,556,695
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323 5,556,697
5,556,698
5,556,699
332 5,556,700
336 5,556,701
402 5,556,702
5,556,703
408 5,556,704
413 5,556,705
421 5,556,706
5,556,707
424.2 5,556,708
426 5,556,709
457 5,556,710
460 5,556,711
480 5,556,712
610 5,556,713
620 5,556,714
623 5,556,715
688 5,556,716
694 B 5,556,717
694 R 5,556,718

CLASS 429
59 5,556,720
163 5,556,722
210 5,556,627
218 5,556,719
5,556,721
5,556,723

CLASS 430
5 5,556,724
5,556,725
30 5,556,726
45 5,556,727
64 5,556,728
65 5,556,729
66 5,556,730
137 5,556,732
162 5,556,733
270.1 5,556,734
315 5,556,735
399 5,556,736
400 5,556,737
526 5,556,738
533 5,556,739
559 5,556,740
569 5,556,741
601 5,556,742

CLASS 431
75 5,556,272

CLASS 432
8 5,556,273
159 5,556,274
241 5,556,275

CLASS 433
8 5,556,276
17 5,556,277
75 5,556,278
82 5,556,279
172 5,556,280

CLASS 434
16 5,556,281
178 5,556,282
188 5,556,283

CLASS 435
4 5,556,743
5 5,556,744
5,556,745
5,556,746
6 5,556,747
5,556,748
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5,556,754
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7.2 5,556,757
7.21 5,556,762
7.23 5,556,763
7.24 5,556,764
7.9 5,556,758
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69.1 5,556,767
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70.1 5,556,770
91.2 5,556,771
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97 5,556,775
106 5,556,776
118 5,556,777
189 5,556,778
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240.2 5,556,780
5,556,782
240.21 5,556,783
252.5 5,556,784
252.9 5,556,785
320.1 5,556,786

CLASS 436
62 5,556,787
87 5,556,788
169 5,556,789
172 5,556,790

CLASS 437
4 5,556,791
6 5,556,792
11 5,556,793
13 5,556,794
23 5,556,795
31 5,556,796
43 5,556,798
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53 5,556,803
129 5,556,804
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209 5,556,807
5,556,808
5,556,809
5,556,810
5,556,811
5,556,812
230 5,556,814
405 5,556,797

CLASS 439
34 5,556,284
74 5,556,285
5,556,286
89 5,556,287
135 5,556,288
5,556,289
188 5,556,290
189 5,556,291
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266 5,556,293
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301 5,556,295
404 5,556,296
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595 5,556,304
622 5,556,305
637 5,556,306
676 5,556,307
746 5,556,308
759 5,556,309

CLASS 440
61 5,556,310
75 5,556,312
5,556,313
89 5,556,311
5,556,314

CLASS 445
7 5,556,315
50 5,556,316

CLASS 446
236 5,556,318
268 5,556,317
475 5,556,319

CLASS 451
5 5,556,320
5,556,321
21 5,556,322
28 5,556,323
89 5,556,324
101 5,556,325
246 5,556,326
278 5,556,327
463 5,556,328

CLASS 454
4 5,556,329
56 5,556,331
76 5,556,332
143 5,556,333
155 5,556,334
258 5,556,335
289 5,556,330

CLASS 460
70 5,556,337
119 5,556,338

CLASS 463
1 5,556,339
35 5,556,107
45 5,556,108

CLASS 504
105 5,556,828
199 5,556,829

CLASS 505
125 5,556,830
500 5,556,831

CLASS 507
203 5,556,832

CLASS 508
545 5,556,569

CLASS 510
188 5,556,572
189 5,556,833
375 5,556,834
383 5,556,577
535 5,556,573

CLASS 512
3 5,556,835

CLASS 514
15 5,556,836
21 5,556,837
25 5,556,838
29 5,556,839
44 5,556,840
61 5,556,841
100 5,556,842
114 5,556,843
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570 5,556,882
594 5,556,883
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639 5,556,885
646 5,556,886
772.6 5,556,887

CLASS 521
44.5 5,556,888
49.5 5,556,889
49.8 5,556,890
103 5,556,891
143 5,556,893
168 5,556,894
181 5,556,892
182 5,556,895

CLASS 523
116 5,556,896
118 5,556,897
136 5,556,898
215 5,556,899

CLASS 524
59 5,556,900
99 5,556,901
114 5,556,902
142 5,556,903
147 5,556,904
311 5,556,905
463 5,556,906
493 5,556,907
5,556,908
504 5,556,910
505 5,556,911
507 5,556,912
555 5,556,913
731 5,556,914
837 5,556,915

CLASS 525
64 5,556,916
71 5,556,917
131 5,556,918
189 5,556,919
216 5,556,920
245 5,556,921
260 5,556,922
285 5,556,923
293 5,556,924
440 5,556,925
444 5,556,926
533 5,556,927

CLASS 526
127 5,556,928
248 5,556,929
318.5 5,556,930
323.1 5,556,931
339 5,556,932

CLASS 528
26 5,556,933
85 5,556,934
99 5,556,935
199 5,556,936
288 5,556,937
328 5,556,938

CLASS 530
311 5,556,939
317 5,556,940
322 5,556,941
331 5,556,942
350 5,556,943
5,556,944
5,556,945
351 5,556,946
391.3 5,556,947
391.9 5,556,948
402 5,556,949

CLASS 536
4.1 5,556,950
23.74 5,556,953
24.1 5,556,954
5,556,956
24.31 5,556,955
25.3 5,556,958
25.32 5,556,959
25.34 5,556,960
27.1 5,556,961
55.3 5,556,963

CLASS 540
30 5,556,962
63 5,556,964
87 5,556,965
140 5,556,966
143 5,556,967
460 5,556,968
509 5,556,969

CLASS 544
196 5,556,971
216 5,556,973
219 5,556,974
277 5,556,975
296 5,556,976
360 5,556,977

CLASS 546
123 5,556,979
140 5,556,978
190 5,556,980

CLASS 548
238 5,556,981
300.7 5,556,983
303.7 5,556,982
365.4 5,556,985
368.7 5,556,986
369.7 5,556,987
374.1 5,556,988
491 5,556,989
530 5,556,990
548 5,556,991

CLASS 549
227 5,556,992
282 5,556,993
302 5,556,994
406 5,556,995
407 5,556,996

CLASS 554
190 5,556,970
211 5,556,972

CLASS 556
11 5,556,997
21 5,556,998
401 5,556,999
434 5,557,000
470 5,557,001

CLASS 558
44 5,557,002
155 5,557,003
319 5,556,984
459 5,557,004

CLASS 560
47 5,557,005
105 5,557,006
145 5,557,008
183 5,557,007

CLASS 562
412 5,557,009
582 5,557,012
851 5,557,010

CLASS 564
301 5,557,013
464 5,557,015
492 5,557,011

CLASS 568
401 5,557,014
909.5 5,557,016

CLASS 570
135 5,557,018
176 5,557,017
5,557,019
177 5,557,020

CLASS 585
407 5,557,022
467 5,557,024
513 5,557,021
5,557,023
522 5,557,025
5,557,026
527 5,557,027
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826 5,557,030

CLASS 588
257 5,557,031

CLASS 600
124 5,556,367
151 5,556,370
201 5,556,371
236 5,556,417

CLASS 601
2 5,556,372

CLASS 602
6 5,556,373
26 5,556,374
58 5,556,375

CLASS 604
15 5,556,376
22 5,556,377
31 5,556,378
49 5,556,379
52 5,556,380
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110 5,556,384
174 5,556,385
247 5,556,386
249 5,556,387
263 5,556,388
264 5,556,389
280 5,556,390
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378 5,556,392
385.2 5,556,393
5,556,394

CLASS 606
4 5,556,395
28 Re.35,330
42 5,556,396
48 5,556,397
59 5,556,398
80 5,556,399
107 5,556,400
119 5,556,401
147 5,556,402
148 5,556,403
151 5,556,404
159 5,556,405
166 5,556,406
174 5,556,407
180 5,556,408
181 5,556,409
185 5,556,410
5,556,411
194 5,556,412
198 5,556,413
5,556,414
202 5,556,415
205 5,556,416

CLASS 607
1 5,556,418
9 5,556,419
5,556,420
36 5,556,421
48 5,556,422
54 5,556,423
116 5,556,424
124 5,556,425

CLASS 623
1 5,556,426
4 5,556,427
13 5,556,428
16 5,556,429
5,556,430
17 5,556,431
20 5,556,432
5,556,433
22 5,556,434

CLASS 800
2 5,557,032
5,557,033
200 5,557,034
5,557,035
5,557,036
5,557,037
5,557,038

CLASSIFICATION OF DESIGNS

D1— 106 373,671
D2— 623 373,672
717 373,673
956 373,674
962 373,675
969 373,676
D3— 229 373,677
373,678
301 373,679
D4— 104 373,680
373,681
132 373,682
D6— 339 373,683
344 373,684
370 373,685
374 373,686
389 373,687
397 373,688
436 373,689
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470 373,692
373,693
480 373,694
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569 373,697
570 373,698
574 373,699
D7— 334 373,701
363 373,702
384 373,703
391 373,704
401.2 373,705
511 373,706
513 373,707
550 373,708
567 373,709
590 373,710'
654 373,711
D8— 8 373,712
14 373,713
52 373,714
90 373,715
107 373,716
330 373,717
349 373,718
D9— 337 373,722
346 373,723
418 373,724
422 373,725
429 373,726
445 373,727
448 373,728
500 373,729
504 373,730
517 373,731
D10— 15 373,731
46 373,732
65 373,733
74 373,734
83 373,735
373,736
373,737
94 373,738
373,739
114 373,740
D11— 26 373,741
40 373,742
117 373,743
121 373,744
126 373,745
164 373,746
216 373,747
D12— 105 373,748

133 373,750
147 373,749
152 373,751
9 373,774
86 373,775
143 373,776
148 373,799
158 373,800
161 373,801
134 373,824
155 373,825
190 373,826
38 373,849
41 373,850
373,851
D34— 1 373,873
373,874
373,875

	133	373,750		9	373,774		148	373,799		134	373,824		38	373,849	D34—	1	373,873
	147	373,749		86	373,775		158	373,800		155	373,825		41	373,850			373,874
	152	373,751		143	373,776		161	373,801		190	373,826			373,851			373,875
	196	373,752		147	373,777		162	373,802		222	373,827		49	373,852		11	373,876
	402	373,753	D16—	219	373,778		191	373,803			373,828		54	373,853		12	373,877
	424	373,754		232	373,779		195	373,804		224	373,829		59	373,854		16	373,878
D13—	103	373,755		314	373,780			373,805		232	373,830			373,855		28	373,879
	108	373,756		327	373,781		199	373,806	D25—	58	373,831		64	373,856			373,880
	147	373,757		332	373,782		225	373,807		122	373,832		78	373,890		29	373,881
	162	373,758	D18—	7	373,783		237	373,808		126	373,833	D29—	102	373,857			373,882
	165	373,759		19	373,784		240	373,809			373,834	D30—	130	373,858			373,883
D14—	114	373,760			373,785	D22—	128	373,810		134	373,835		160	373,859		31	373,884
		373,761		39	373,786		130	373,811		138	373,836	D32—	3	373,860		32	373,885
		373,762		40	373,787		142	373,812	D26—	23	373,837		21	373,861		33	373,886
	118	373,763		43	373,788	D23—	223	373,813		28	373,838		23	373,862		34	373,887
	138	373,764		48	373,789		226	373,814			373,839		42	373,863			373,888
		373,765		53	373,790		241	373,815		39	373,840		53.1	373,864		38	373,889
	141	373,766		56	373,791		250	373,816		63	373,841		54	373,865			
	150	373,767	D19—	64	373,792		277	373,817		84	373,842		55	373,866			
	191	373,768		72	373,793		301	373,818		106	373,843		58	373,867			
	238	373,769		75	373,794		311	373,819		149	373,844		61	373,868			
	240	373,770	D20—	4	373,795		354	373,820			373,845		66	373,869			
		373,771	D21—	37	373,796			373,821	D27—	172	373,846		70	373,870			
	248	373,772		41	373,797		366	373,822		189	373,847			373,871			
D15—	5	373,773		121	373,798	D24—	128	373,823	D28—	35	373,848			373,872			

CLASSIFICATION OF PLANTS

P—	40.1	9,643		88.8	9,644												

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Kansas	20	Oklahoma	40			

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 :	5,555,562	5,555,643	5,556,247	5,556,764	5,557,223	5,557,578
	5,555,617	5,555,654	5,556,248	5,556,769	5,557,227	5,557,581
	5,555,834	5,555,661	5,556,250	5,556,771	5,557,233	5,557,584
	5,556,080	5,555,683	5,556,258	5,556,772	5,557,253	5,557,593
	5,556,271	5,555,692	5,556,276	5,556,780	5,557,277	5,557,596
	5,556,273	5,555,694	5,556,277	5,556,784	5,557,282	5,557,607
	5,556,559	5,555,701	5,556,295	5,556,788	5,557,285	5,557,612
	5,557,247	5,555,705	5,556,306	5,556,796	5,557,291	5,557,616
	5,557,261	5,555,722	5,556,340	5,556,797	5,557,292	5,557,624
	5,557,397	5,555,745	5,556,370	5,556,811	5,557,294	5,557,633
	5,557,686	5,555,747	5,556,373	5,556,833	5,557,298	5,557,635
04 :	5,555,572	5,555,778	5,556,374	5,556,872	5,557,302	5,557,638
	5,555,742	5,555,800	5,556,387	5,556,875	5,557,316	5,557,642
	5,555,776	5,555,815	5,556,395	5,556,887	5,557,334	5,557,651
	5,555,828	5,555,838	5,556,396	5,556,892	5,557,339	5,557,692
	5,556,064	5,555,839	5,556,401	5,556,900	5,557,353	5,557,709
	5,556,132	5,555,844	5,556,408	5,556,942	5,557,355	5,557,711
	5,556,166	5,555,848	5,556,412	5,556,958	5,557,398	5,557,712
	5,556,281	5,555,850	5,556,413	5,556,968	5,557,400	5,557,714
	5,556,358	5,555,874	5,556,418	5,556,993	5,557,410	5,557,720
	5,556,540	5,555,877	5,556,420	5,556,996	5,557,418	5,557,721
	5,556,579	5,555,882	5,556,430	5,557,014	5,557,431	5,557,730
	5,556,793	5,555,889	5,556,449	5,557,040	5,557,434	5,557,738
	5,556,807	5,555,890	5,556,463	5,557,057	5,557,459	5,557,740
	5,556,808	5,555,897	5,556,476	5,557,062	5,557,469	5,557,747
	5,557,167	5,555,933	5,556,479	5,557,066	5,557,475	5,557,750
	5,557,195	5,555,977	5,556,489	5,557,091	5,557,477	5,557,751
	5,557,255	5,555,980	5,556,501	5,557,095	5,557,481	5,557,752
	5,557,330	5,555,996	5,556,507	5,557,108	5,557,488	5,557,755
	5,557,333	5,556,001	5,556,525	5,557,113	5,557,490	5,557,761
	5,557,502	5,556,012	5,556,544	5,557,122	5,557,491	5,557,763
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48 : 373,711
373,763
373,792
373,834
373,882
373,748
51 : 373,706
53 : 373,805
373,849
54 : 373,712
55 : 373,715
373,822
373,824
373,841

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September 24, 199

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UNITED STATES PATENT AND TRADEMARK OFFICE
September 24, 1996 Volume 1190 Number 4

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Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1187 O.G. 49, on June 18, 1996.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed, effective July 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the German mark, and was announced in the *Official Gazette* at 1187 O.G. 73, on June 25, 1996.

International fees were changed, effective on January 1, 1996, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1181 O.G. 49, on December 19, 1995.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1995, and were announced in the *Official Gazette* at 1177 O.G. 171, on August 29, 1995.

The schedule of PCT fees (in U.S. dollars), effective July 1, 1996, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee	220.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed	660.00
— Corresponding prior U.S. national application filed	430.00
— Supplemental search fee, per additional invention (payable only upon invitation)	190.00
European Patent Office as ISA	1585.00
International fees	
Basic fee	677.00
Basic supplemental fee (for each page over 30)	13.00
Designation fee per country or region	
— For the first 11 national or regional offices designated	164.00
— For each designation in excess of 11 offices	No Charge
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee	164.00
— Confirmation fee	82.00
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee	207.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I	470.00
— Additional examination fee, per additional invention (payable only upon invitation)	140.00
— USPTO was not ISA in PCT Chapter I	710.00
— Additional examination fee, per additional invention (payable only upon invitation)	250.00

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4)	47.00	94.00
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4)	340.00	680.00
USPTO was ISA but not IPEA	375.00	750.00
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office	505.00	1010.00
— Search report has been prepared by the European Patent Office or the Japanese Patent Office	440.00	880.00
Other National fees		
— For each independent claim in excess of 3	39.00	78.00
— For each claim in excess of 20	11.00	22.00
— For each application containing a multiple dependent claim	125.00	250.00
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	65.00	130.00
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	130.00	130.00

June 4, 1996

BRUCE A. LEHMAN
Assistant Secretary of Commerce and Commissioner of Patents and Trademarks

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Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on September 21, 1993 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,245,706 through 5,247,705
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on September 19, 1989 for which maintenance fees due at 7 years

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

Patent Number	Serial Number	Issue Date
4,459,916	06/360,985	07/17/84
4,460,310	06/392,981	07/17/84
4,460,311	06/265,849	07/17/84
4,460,312	06/381,244	07/17/84

Attention is drawn to the patents which were issued on September 19, 1989 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,866,789 through 4,868,924
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on September 17, 1985 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,541,125 through 4,542,536
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1994, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) $495.00
By other than a small entity $990.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) $995.00
By other than a small entity $1,990.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) $1,495.00
By other than a small entity $2,990.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) $65.00
By other than a small entity $130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable $660.00
(2) unintentional $1,550.00

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED July 17, 1996
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 32,274	06/675,598	11/04/86
(4,459,933)	(06/315,603)	(07/17/84)
Re. 32,492	06/878,631	09/01/87
(4,460,919)	(06/380,145)	(07/17/84)
Re. 32,850	06/839,045	01/31/89
(4,460,256)	(06/323,686)	(07/17/84)
Re. 33,269	07/267,548	07/17/90
(4,460,750)	(06/392,021)	(07/17/84)
4,459,707	06/410,726	07/17/84
4,459,718	06/384,941	07/17/84
4,459,723	06/375,455	07/17/84
4,459,729	06/514,874	07/17/84
4,459,730	06/379,277	07/17/84
4,459,731	06/431,871	07/17/84
4,459,734	06/356,201	07/17/84
4,459,736	06/371,563	07/17/84
4,459,740	06/406,717	07/17/84
4,459,746	06/354,181	07/17/84
4,459,752	06/425,010	07/17/84
4,459,753	06/292,938	07/17/84
4,459,756	06/394,366	07/17/84
4,459,762	06/442,559	07/17/84
4,459,766	06/405,389	07/17/84
4,459,771	06/330,322	07/17/84
4,459,786	06/315,308	07/17/84
4,459,793	06/385,242	07/17/84
4,459,795	06/463,114	07/17/84
4,459,800	06/376,032	07/17/84
4,459,801	06/392,596	07/17/84
4,459,810	06/381,750	07/17/84
4,459,812	06/474,164	07/17/84
4,459,815	06/366,416	07/17/84
4,459,820	06/393,888	07/17/84
4,459,821	06/404,604	07/17/84
4,459,823	06/480,522	07/17/84
4,459,826	06/336,406	07/17/84
4,459,829	06/445,059	07/17/84
4,459,834	06/341,791	07/17/84
4,459,835	06/359,847	07/17/84
4,459,842	06/319,721	07/17/84
4,459,843	06/395,683	07/17/84
4,459,845	06/391,908	07/17/84
4,459,851	06/380,731	07/17/84
4,459,853	06/363,852	07/17/84
4,459,854	06/399,954	07/17/84
4,459,856	06/440,575	07/17/84
4,459,859	06/397,599	07/17/84
4,459,862	06/409,242	07/17/84
4,459,864	06/430,759	07/17/84
4,459,866	06/306,740	07/17/84
4,459,871	06/296,172	07/17/84
4,459,872	06/335,134	07/17/84
4,459,882	06/379,831	07/17/84
4,459,884	06/448,209	07/17/84
4,459,898	06/328,912	07/17/84
4,459,899	06/363,067	07/17/84
4,459,903	06/375,443	07/17/84
4,459,907	06/412,768	07/17/84
4,459,914	06/379,239	07/17/84

Patent Number	Serial Number	Issue Date
4,459,916	06/360,985	07/17/84
4,459,922	06/460,222	07/17/84
4,459,928	06/393,360	07/17/84
4,459,929	06/447,962	07/17/84
4,459,930	06/393,105	07/17/84
4,459,931	06/293,812	07/17/84
4,459,934	06/360,695	07/17/84
4,459,940	06/374,518	07/17/84
4,459,944	06/397,204	07/17/84
4,459,954	06/407,826	07/17/84
4,459,964	06/388,329	07/17/84
4,459,969	06/339,267	07/17/84
4,459,972	06/309,053	07/17/84
4,459,973	06/377,147	07/17/84
4,459,979	06/419,060	07/17/84
4,459,994	06/391,142	07/17/84
4,460,011	06/510,932	07/17/84
4,460,018	06/275,528	07/17/84
4,460,020	06/373,123	07/17/84
4,460,024	06/396,614	07/17/84
4,460,029	06/445,804	07/17/84
4,460,030	06/428,328	07/17/84
4,460,037	06/226,688	07/17/84
4,460,039	06/439,082	07/17/84
4,460,043	06/405,371	07/17/84
4,460,044	06/413,324	07/17/84
4,460,045	06/395,201	07/17/84
4,460,047	06/422,092	07/17/84
4,460,052	06/291,261	07/17/84
4,460,057	06/400,469	07/17/84
4,460,060	06/480,476	07/17/84
4,460,066	06/462,703	07/17/84
4,460,071	06/339,716	07/17/84
4,460,076	06/376,497	07/17/84
4,460,083	06/347,932	07/17/84
4,460,099	06/474,488	07/17/84
4,460,109	06/485,799	07/17/84
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4,460,259	06/449,330	07/17/84
4,460,266	06/369,833	07/17/84
4,460,268	06/499,048	07/17/84
4,460,272	06/377,605	07/17/84
4,460,274	06/310,140	07/17/84
4,460,275	06/394,149	07/17/84
4,460,288	06/231,356	07/17/84
4,460,289	06/283,486	07/17/84
4,460,310	06/392,981	07/17/84
4,460,311	06/265,849	07/17/84
4,460,312	06/381,244	07/17/84
4,460,330	06/483,109	07/17/84
4,460,331	06/493,858	07/17/84
4,460,336	06/402,307	07/17/84
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4,460,338	06/400,975	07/17/84
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4,460,351	06/391,700	07/17/84
4,460,367	06/397,462	07/17/84
4,460,375	06/551,271	07/17/84
4,460,378	06/514,546	07/17/84
4,460,385	06/444,856	07/17/84
4,460,393	06/471,815	07/17/84
4,460,405	06/342,265	07/17/84
4,460,407	06/450,947	07/17/84
4,460,408	06/405,651	07/17/84
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4,460,413	06/331,612	07/17/84
4,460,417	06/436,035	07/17/84
4,460,427	06/511,014	07/17/84
4,460,429	06/411,718	07/17/84
4,460,439	06/547,352	07/17/84
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4,460,443	06/416,351	07/17/84
4,460,446	06/477,953	07/17/84
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4,460,453	06/426,710	07/17/84
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4,460,470	06/468,835	07/17/84
4,460,472	06/467,867	07/17/84
4,460,481	06/318,549	07/17/84
4,460,483	06/310,166	07/17/84
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4,460,493	06/370,713	07/17/84
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4,460,502	06/316,653	07/17/84
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4,460,512	06/482,570	07/17/84
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5,129,112	07/714,256	07/14/92
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5,130,317	07/584,655	07/14/92
5,130,329	07/591,283	07/14/92
5,130,341	07/796,606	07/14/92
5,130,346	07/599,480	07/14/92
5,130,349	07/788,905	07/14/92
5,130,356	07/473,453	07/14/92
5,130,358	07/326,947	07/14/92
5,130,370	07/795,574	07/14/92
5,130,371	07/490,814	07/14/92
5,130,375	07/429,975	07/14/92
5,130,376	07/512,720	07/14/92
5,130,382	07/501,815	07/14/92
5,130,384	07/326,818	07/14/92
5,130,387	07/780,579	07/14/92
5,130,400	07/526,088	07/14/92
5,130,403	07/793,913	07/14/92
5,130,404	07/710,114	07/14/92
5,130,412	07/598,365	07/14/92
5,130,415	07/384,411	07/14/92
5,130,432	07/633,636	07/14/92
5,130,433	07/546,703	07/14/92
5,130,436	07/404,930	07/14/92
5,130,442	07/606,410	07/14/92
5,130,447	07/706,325	07/14/92
5,130,450	07/688,903	07/14/92
5,130,451	07/677,639	07/14/92
5,130,457	07/025,910	07/14/92
5,130,466	07/463,713	07/14/92
5,130,468	07/698,019	07/14/92
5,130,469	07/566,401	07/14/92
5,130,483	07/460,335	07/14/92
5,130,484	07/670,287	07/14/92
5,130,490	07/797,582	07/14/92
5,130,494	07/463,337	07/14/92
5,130,496	07/785,051	07/14/92
5,130,502	07/602,428	07/14/92
5,130,509	07/615,034	07/14/92

Patent Number	Serial Number	Issue Date
5,130,539	07/685,299	07/14/92
5,130,542	07/439,972	07/14/92
5,130,546	07/599,158	07/14/92
5,130,598	07/629,063	07/14/92
5,130,602	07/713,533	07/14/92
5,130,609	07/598,659	07/14/92
5,130,610	07/647,016	07/14/92
5,130,622	07/686,163	07/14/92
5,130,652	07/438,119	07/14/92
5,130,653	07/569,187	07/14/92
5,130,654	07/367,435	07/14/92
5,130,656	07/513,855	07/14/92
5,130,662	07/667,871	07/14/92
5,130,664	07/665,820	07/14/92
5,130,668	07/590,221	07/14/92
5,130,679	07/653,751	07/14/92
5,130,685	07/648,505	07/14/92
5,130,689	07/641,774	07/14/92
5,130,694	07/708,287	07/14/92
5,130,695	07/611,166	07/14/92
5,130,696	07/660,538	07/14/92
5,130,708	07/667,217	07/14/92
5,130,721	07/294,347	07/14/92
5,130,764	07/376,963	07/14/92
5,130,770	07/715,426	07/14/92
5,130,771	07/609,249	07/14/92
5,130,775	07/539,830	07/14/92
5,130,786	07/406,088	07/14/92
5,130,790	07/629,320	07/14/92
5,130,792	07/475,137	07/14/92
5,130,814	07/450,978	07/14/92
5,130,825	07/223,061	07/14/92
5,130,829	07/712,218	07/14/92
5,130,839	07/682,897	07/14/92
5,130,868	07/642,061	07/14/92
5,130,879	07/716,559	07/14/92
5,130,881	07/142,094	07/14/92
5,130,886	07/758,196	07/14/92
5,130,887	07/631,178	07/14/92
5,130,890	07/758,918	07/14/92
5,130,893	07/630,647	07/14/92
5,130,899	07/729,181	07/14/92
5,130,937	07/490,157	07/14/92
5,130,956	07/694,100	07/14/92
5,130,964	07/485,972	07/14/92
5,130,967	07/513,478	07/14/92
5,130,973	07/262,860	07/14/92
5,130,990	07/480,449	07/14/92
5,130,999	07/623,094	07/14/92
5,131,000	07/559,644	07/14/92
5,131,009	07/551,373	07/14/92
5,131,029	07/571,509	07/14/92
5,131,030	07/731,613	07/14/92
5,131,036	07/724,586	07/14/92
5,131,048	07/639,507	07/14/92
5,131,052	07/294,364	07/14/92
5,131,057	07/478,607	07/14/92
5,131,062	07/657,833	07/14/92
5,131,086	07/539,381	07/14/92

Patents Reinstated Due To The Acceptance of a Late Maintenance Fee From 7/19/96

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,601,885	06/385,500	06/07/82	07/22/86	07/25/96
4,624,897	06/618,784	06/08/84	11/25/86	07/23/96
4,667,593	06/904,605	09/08/86	05/26/87	07/23/96
4,674,289	06/748,866	06/26/85	06/23/87	07/26/96
4,952,012	07/222,571	11/17/88	08/28/90	07/23/96
5,051,813	07/619,108	11/27/90	09/24/91	07/24/96
5,073,280	07/535,473	06/08/90	12/17/91	07/23/96
5,106,508	07/588,535	09/26/90	04/21/92	07/23/96
5,107,823	07/676,599	03/28/91	04/28/92	07/25/96

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

Re. 34,834, Re. S.N. 08/436,863, May 8, 1995, Cl. 379/59, CELLULAR TELEPHONE DATA COMMUNICATIONS SYSTEM AND METHOD, Harry M. O'Sullivan, Owner of Record: *Spectrum Information Technologies Inc., Dallas, Tex.*, Attorney or Agent: Charles M. Leedom, Jr., Ex. Gp.: 2608

4,807,187, Re. S.N. 08/638,722, May 9, 1996, Cl. 364/419.01, APPARATUS AND METHOD FOR COMPARING DATA GROUPS, Cary L. Queen, Owner of Record: *Advanced Software, Inc., Stanford, Calif.*, Attorney or Agent: Robert A. Saltzberg, Ex. Gp.: 2411

4,883,527, Re. S.N. 08/655,853, May 30, 1996, Cl. 65/273, GLASS SHEET BENDING AND TEMPERING APPARATUS, Harold A. McMaster, et. al., Owner of Record: *First National Bank of Boston, Canton, Mass.*, Attorney or Agent: Earl J. Lafontaine, Ex. Gp.: 1303

5,208,876, Re. S.N. 08/355,138, Dec. 13, 1994, Cl. 385/11, OPTICAL ISOLATER, Jing-Joang Pan, Owner of Record: *E-Tek Dynamics, Inc., San Jose, Calif.*, Attorney or Agent: Henry K. Woodward, Ex. Gp.: 2501

5,263,132, Re. S.N. 08/558,529, Nov. 6, 1995, Cl. 395/146, METHOD OF FORMATTING DOCUMENTS USING FLEXIBLE DESIGN MODELS PROVIDING CONTROLLED COPY FIT AND TYPEFACE SELECTION, Michael R. Parker, et. al., Owner of Record: *Michael R. Parker, et. al., San Diego, Calif.*, Attorney or Agent: Michael D. Stolowitz, Ex. Gp.: 2412

5,281,842, Re. S.N. 08/496,569, June 29, 1995, Cl. 257/371, DYNAMIC RANDOM ACCESS MEMORY WITH ISOLATED WELL STRUCTURE, Kenichi Yasuda, et. al., Owner of Record: *Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan*, Attorney or Agent: Jeffrey A. Wyand, Ex. Gp.: 2508

5,278,091, Re. S.N. 08/585,402, Jan. 11, 1996, Cl. 437/52, PROCESS TO MANUFACTURE CROWN STACKED CAPACITOR STRUCTURES WITH HSG-RUGGED POLYSILICON ON ALL SIDES OF THE STORAGE NODE, Pierre Fazan, et. al., Owner of Record: *Micron Semiconductor, Inc., Boise, Id.*, Attorney or Agent: Michael L. Lynch, Ex. Gp.: 1104

5,328,543, Re. S.N. 08/679,252, July 12, 1996, Cl. 156/574, BORDER GUIDE, Thomas G. Campagna, Owner of Record: *Inventor*, Attorney or Agent: Andrew Calderon, Ex. Gp.: 1304

5,363,440, Re. S.N. 08/683,935, July 19, 1996, Cl. 379/399, MULTILAYERED TYPE NETWORK INTERFACE UNIT, Bassel H. Daoud, Owner of Record: *American Telephone And*

Telegraph Company, New York, N.Y., Attorney or Agent: Lester H. Birnbaum, Ex. Gp.: 2601

Reg. Number	Serial Number	Reg. Date
	609,778	71/673,097	08/02/1955
	609,788	71/668,825	08/02/1955
	609,791	71/659,693	08/02/1955

Reg. Number	Serial Number	Reg. Date
1,016,673	73/022,420	07/29/1975
1,016,901	73/022,633	07/29/1975
1,016,909	73/004,175	07/29/1975
1,016,910	73/012,117	07/29/1975

Telegraph Company, New York, N.Y., Attorney or Agent: Lester H. Birnbaum, Ex. Gp.: 2601

5,488,297, Re. S.N. 08/677,870, July 10, 1996, Cl. 355/104, IMAGE TRANSFER APPARATUS, Masaaki Matsuo, et. al., Owner of Record: *Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan*, Attorney or Agent: Nils E. Pedersen, Ex. Gp.: 2104

5,411,062, Re. S.N. 08/674,798, July 3, 1996, Cl. PAPER-MAKERS FABRIC WITH ORTHOGONAL MACHINE DIRECTION YARN SEAMING LOOPS, Henry J. Lee, Owner of Record: *Asten, Inc., Charleston, S.C.*, Attorney or Agent: Davida Federman, Ex. Gp.: 3408

5,422,500, Re. S.N. 08/690,462, July 29, 1996, Cl. 307/443, SWITCHABLE ACTIVE TERMINATION FOR SCSI PERIPHERAL DEVICES, Paul G. Mandel, Owner of Record: *Hitachi Ltd., Tokyo, Japan*, Attorney or Agent: Michael A. O'Neil, Ex. Gp.: 2509

Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

5,509,826, Reexam. No. 90/004,337, Aug. 22, 1996, Cl. 439/637, VERY LOW PROFILE CARD EDGE CONNECTOR, Robert C. White, Burndy Corp., Norwalk, Conn., Attorney or Agent: Kenyon & Kenyon, New York, N.Y., Ex. Gp.: 3202, Requester: Owner

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Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED
MAY 06, 1996
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
12,442	70/012,442	07/28/1885
105,521	71/085,267	08/03/1915
105,535	71/085,965	08/03/1915
326,577	71/362,834	07/30/1935
326,588	71/359,176	07/30/1935
326,611	71/363,327	07/30/1935
326,656	71/362,132	07/30/1935
326,676	71/362,378	07/30/1935
326,688	71/362,573	07/30/1935
326,707	71/360,552	07/30/1935
326,719	71/361,428	07/30/1935
609,758	71/666,840	08/02/1955
609,766	71/671,010	08/02/1955
609,767	71/671,018	08/02/1955
609,769	71/671,859	08/02/1955
609,776	71/654,199	08/02/1955
609,778	71/673,097	08/02/1955
609,788	71/668,825	08/02/1955
609,791	71/659,693	08/02/1955
609,797	71/657,951	08/02/1955
609,799	71/671,042	08/02/1955
609,817	71/672,727	08/02/1955
609,856	71/672,562	08/02/1955
609,868	71/664,662	08/02/1955
609,870	71/665,520	08/02/1955
609,888	71/603,278	08/02/1955
609,890	71/652,198	08/02/1955
609,891	71/667,108	08/02/1955
609,901	71/671,615	08/02/1955
609,905	71/667,532	08/02/1955
609,909	71/665,385	08/02/1955
609,925	71/660,932	08/02/1955
609,927	71/661,604	08/02/1955
609,959	71/673,568	08/02/1955
609,965	71/673,737	08/02/1955
609,970	71/664,978	08/02/1955
609,971	71/670,436	08/02/1955
609,973	71/670,965	08/02/1955
609,974	71/670,966	08/02/1955
609,978	71/671,368	08/02/1955
609,980	71/641,519	08/02/1955
609,988	71/654,173	08/02/1955
609,990	71/656,445	08/02/1955
609,991	71/656,727	08/02/1955
609,996	71/659,585	08/02/1955
609,998	71/661,842	08/02/1955
610,001	71/662,703	08/02/1955
610,005	71/663,206	08/02/1955
610,007	71/668,572	08/02/1955
610,010	71/669,762	08/02/1955
610,011	71/669,889	08/02/1955
610,014	71/670,816	08/02/1955
610,016	71/670,991	08/02/1955
610,024	71/672,967	08/02/1955
610,025	71/673,076	08/02/1955
610,026	71/673,332	08/02/1955
610,039	71/674,284	08/02/1955
610,040	71/674,285	08/02/1955
610,059	71/630,330	08/02/1955
610,063	71/671,790	08/02/1955
610,069	71/642,890	08/02/1955
610,070	71/657,035	08/02/1955
610,074	71/626,677	08/02/1955
610,085	71/651,933	08/02/1955
610,100	71/638,346	08/02/1955
610,106	71/661,526	08/02/1955
610,128	71/653,271	08/02/1955
610,135	71/678,782	08/02/1955
610,142	71/655,127	08/02/1955
610,149	71/597,588	08/02/1955
610,151	71/679,959	08/02/1955
610,152	71/679,960	08/02/1955
610,153	71/679,961	08/02/1955
610,155	71/653,534	08/02/1955
610,157	71/666,252	08/02/1955
1,011,717	73/006,508	05/27/1975
1,013,615	73/021,601	06/17/1975
1,016,622	73/003,052	07/29/1975
1,016,624	73/010,816	07/29/1975
1,016,625	73/014,284	07/29/1975
1,016,626	73/015,190	07/29/1975
1,016,628	73/026,062	07/29/1975
1,016,633	73/031,027	07/29/1975
1,016,635	73/001,322	07/29/1975
1,016,639	73/012,724	07/29/1975
1,016,642	73/016,842	07/29/1975
1,016,643	73/018,124	07/29/1975
1,016,652	73/024,035	07/29/1975
1,016,654	73/027,094	07/29/1975
1,016,656	73/030,102	07/29/1975
1,016,662	73/035,345	07/29/1975
1,016,668	73/037,934	07/29/1975
1,016,669	73/008,909	07/29/1975
1,016,670	73/013,894	07/29/1975
1,016,671	73/017,283	07/29/1975

Reg. Number	Serial Number	Reg. Date
1,016,673	73/022,420	07/29/1975
1,016,677	73/028,613	07/29/1975
1,016,678	73/029,313	07/29/1975
1,016,684	73/036,646	07/29/1975
1,016,691	73/019,460	07/29/1975
1,016,694	73/031,997	07/29/1975
1,016,697	73/035,513	07/29/1975
1,016,698	73/000,169	07/29/1975
1,016,699	73/006,313	07/29/1975
1,016,704	73/012,338	07/29/1975
1,016,706	73/013,177	07/29/1975
1,016,707	73/017,130	07/29/1975
1,016,708	73/019,283	07/29/1975
1,016,709	73/022,188	07/29/1975
1,016,710	73/022,189	07/29/1975
1,016,714	73/026,757	07/29/1975
1,016,715	73/027,047	07/29/1975
1,016,716	73/028,506	07/29/1975
1,016,727	73/036,952	07/29/1975
1,016,728	73/037,013	07/29/1975
1,016,729	73/020,216	07/29/1975
1,016,732	73/035,955	07/29/1975
1,016,734	73/004,458	07/29/1975
1,016,740	73/010,824	07/29/1975
1,016,741	73/011,216	07/29/1975
1,016,743	73/012,631	07/29/1975
1,016,744	73/014,956	07/29/1975
1,016,746	73/016,600	07/29/1975
1,016,748	73/018,854	07/29/1975
1,016,752	73/020,313	07/29/1975
1,016,753	73/020,712	07/29/1975
1,016,756	73/024,072	07/29/1975
1,016,759	73/025,080	07/29/1975
1,016,761	73/026,871	07/29/1975
1,016,762	73/027,763	07/29/1975
1,016,765	73/027,977	07/29/1975
1,016,766	73/028,084	07/29/1975
1,016,768	73/029,154	07/29/1975
1,016,770	73/030,127	07/29/1975
1,016,771	73/030,589	07/29/1975
1,016,777	73/033,327	07/29/1975
1,016,778	73/033,655	07/29/1975
1,016,779	73/033,678	07/29/1975
1,016,781	73/035,840	07/29/1975
1,016,782	73/038,451	07/29/1975
1,016,783	73/038,596	07/29/1975
1,016,790	73/011,090	07/29/1975
1,016,792	73/020,448	07/29/1975
1,016,793	73/029,075	07/29/1975
1,016,794	73/029,727	07/29/1975
1,016,795	73/030,711	07/29/1975
1,016,796	73/030,712	07/29/1975
1,016,797	73/035,021	07/29/1975
1,016,799	73/037,193	07/29/1975
1,016,805	73/024,628	07/29/1975
1,016,808	73/028,278	07/29/1975
1,016,819	73/014,904	07/29/1975
1,016,821	73/019,120	07/29/1975
1,016,826	73/033,735	07/29/1975
1,016,828	73/034,476	07/29/1975
1,016,839	73/000,532	07/29/1975
1,016,842	73/009,816	07/29/1975
1,016,847	73/014,637	07/29/1975
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1,016,852	73/022,900	07/29/1975
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1,016,861	73/026,444	07/29/1975
1,016,866	73/029,296	07/29/1975
1,016,869	73/030,168	07/29/1975
1,016,873	73/004,396	07/29/1975
1,016,878	73/025,673	07/29/1975
1,016,886	73/035,082	07/29/1975
1,016,893	73/000,625	07/29/1975
1,016,896	73/008,952	07/29/1975
1,016,899	73/016,548	07/29/1975
1,016,900	73/018,580	07/29/1975
1,016,901	73/022,633	07/29/1975
1,016,909	73/004,175	07/29/1975
1,016,910	73/012,117	07/29/1975
1,016,917	73/025,880	07/29/1975
1,016,918	73/025,982	07/29/1975
1,016,924	73/037,734	07/29/1975
1,016,928	73/039,052	07/29/1975
1,016,929	73/007,168	07/29/1975
1,016,932	73/017,318	07/29/1975
1,016,933	73/028,077	07/29/1975
1,016,934	73/028,111	07/29/1975
1,016,946	73/036,043	07/29/1975
1,016,950	73/039,161	07/29/1975
1,016,953	73/009,728	07/29/1975
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1,016,963	73/018,447	07/29/1975
1,016,964	73/018,806	07/29/1975
1,016,965	73/019,035	07/29/1975
1,016,978	73/033,971	07/29/1975
1,016,985	73/036,233	07/29/1975
1,016,990	73/037,448	07/29/1975
1,017,001	73/027,405	07/29/1975
1,017,002	73/028,830	07/29/1975
1,017,008	73/010,903	07/29/1975
1,017,021	73/020,633	07/29/1975
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1,017,027	73/024,930	07/29/1975
1,017,032	73/028,562	07/29/1975
1,017,033	73/030,345	07/29/1975
1,017,034	73/030,439	07/29/1975
1,017,035	73/030,440	07/29/1975
1,017,037	73/031,502	07/29/1975
1,017,038	73/031,503	07/29/1975
1,017,039	73/031,526	07/29/1975
1,017,040	73/031,698	07/29/1975
1,017,045	73/033,429	07/29/1975
1,017,047	73/033,433	07/29/1975
1,017,051	73/006,575	07/29/1975
1,017,054	73/014,969	07/29/1975
1,017,055	73/018,222	07/29/1975
1,017,058	73/020,517	07/29/1975
1,017,064	73/026,977	07/29/1975
1,017,065	73/027,900	07/29/1975
1,017,068	73/029,254	07/29/1975
1,017,073	73/033,515	07/29/1975
1,017,078	73/001,352	07/29/1975
1,017,082	73/024,342	07/29/1975
1,017,083	73/026,862	07/29/1975
1,017,087	73/016,513	07/29/1975
1,017,092	73/021,307	07/29/1975
1,017,096	73/032,615	07/29/1975
1,017,099	73/000,686	07/29/1975
1,017,106	73/024,126	07/29/1975
1,017,107	73/024,154	07/29/1975
1,017,112	73/031,212	07/29/1975
1,017,113	73/031,941	07/29/1975
1,017,122	73/041,986	07/29/1975
1,017,123	73/041,987	07/29/1975
1,017,124	73/041,988	07/29/1975
1,017,126	73/007,742	07/29/1975
1,017,130	73/039,253	07/29/1975
1,017,139	73/029,887	07/29/1975
1,017,141	73/031,129	07/29/1975
1,017,146	73/005,270	07/29/1975
1,017,147	73/005,272	07/29/1975
1,017,151	73/017,872	07/29/1975
1,017,153	73/024,510	07/29/1975
1,017,154	73/026,180	07/29/1975
1,017,155	73/027,304	07/29/1975
1,017,160	73/002,619	07/29/1975
1,017,162	73/004,561	07/29/1975
1,017,163	73/005,880	07/29/1975
1,017,164	73/005,882	07/29/1975
1,017,166	73/010,388	07/29/1975
1,017,168	73/022,310	07/29/1975
1,017,169	73/023,087	07/29/1975
1,017,172	73/024,473	07/29/1975
1,017,173	73/027,033	07/29/1975

Reg. Number	Serial Number	Reg. Date
1,017,174	73/027,489	07/29/1975

5,486,251	5,507,387	5,518,529	5,527,060
5,486,638	5,507,625	5,518,668	5,527,387
5,487,002	5,507,949	5,518,975	5,527,521

Reg. Number	Serial Number	Reg. Date
1,017,174	73/027,489	07/29/1975
1,017,176	73/029,503	07/29/1975
1,017,177	73/029,656	07/29/1975
1,017,178	73/032,307	07/29/1975
1,017,180	73/034,983	07/29/1975
1,017,182	73/036,556	07/29/1975
1,017,186	73/038,198	07/29/1975
1,017,187	73/038,370	07/29/1975
1,017,192	73/008,618	07/29/1975
1,017,194	72/463,464	07/29/1975
1,017,201	73/023,625	07/29/1975
1,017,207	73/036,705	07/29/1975
1,017,209	73/015,298	07/29/1975
1,017,210	73/031,849	07/29/1975
1,017,212	72/442,402	07/29/1975
1,024,896	73/023,243	11/11/1975

Errata

In the list of patents which expired on March 13, 1996, due to failure to pay maintenance fees, in the O.G. of May 21, 1996, the following patent should not have appeared:

Patent Number	Serial Number	Issue Date	Filing Date
Re. 32,471 (4,435,854)	06/693,879 (06/247,776)	08/11/87 (03/13/84)	01/23/85 (03/26/81)

Errata

In the list of patents which expired on March 21, 1993, due to failure to pay maintenance fees, in the O.G. of June 08, 1993, the following patent should not have appeared:

Patent Number	Serial Number	Issue Date	Filing Date
4,813,924	06/710,018	03/21/89	03/08/85

Certificates of Correction For Week of September 24, 1996

B1 4,944,030	5,347,351	5,432,224	5,466,824
D. 342,560	5,348,437	5,433,059	5,468,476
4,578,076	5,365,927	5,434,263	5,468,646
4,841,985	5,373,179	5,435,631	5,468,697
5,001,119	5,373,995	5,436,715	5,468,894
5,042,486	5,378,616	5,437,282	5,469,356
5,082,476	5,383,494	5,440,434	5,470,176
5,084,616	5,385,593	5,441,549	5,470,815
5,091,512	5,387,257	5,441,945	5,471,413
5,151,998	5,391,335	5,442,468	5,471,587
5,152,110	5,392,383	5,443,664	5,472,198
5,160,197	5,393,926	5,443,851	5,473,010
5,166,788	5,394,778	5,444,699	5,473,439
5,170,438	5,394,929	5,444,857	5,475,593
5,177,843	5,394,936	5,445,439	5,475,919
5,180,674	5,396,085	5,446,130	5,475,938
5,205,545	5,401,508	5,449,415	5,477,358
5,221,998	5,402,050	5,449,613	5,477,825
5,247,374	5,404,053	5,451,700	5,477,836
5,257,612	5,408,419	5,453,989	5,478,535
5,261,301	5,408,619	5,454,283	5,478,818
5,264,278	5,411,615	5,459,067	5,478,840
5,280,315	5,418,234	5,460,299	5,479,254
5,286,634	5,423,969	5,463,495	5,479,698
5,292,746	5,425,808	5,463,998	5,480,437
5,298,792	5,427,623	5,464,302	5,480,458
5,299,654	5,427,880	5,465,841	5,480,475
5,300,480	5,427,925	5,466,541	5,481,005
5,309,383	5,430,160	5,466,648	5,481,687
5,312,843	5,431,619	5,466,651	5,482,884
5,333,077	5,432,068	5,466,666	5,483,094
5,344,785	5,432,216	5,466,749	5,484,810
5,486,251	5,507,387	5,518,529	5,527,060
5,486,638	5,507,625	5,518,668	5,527,387
5,487,002	5,507,949	5,518,975	5,527,521
5,487,724	5,508,732	5,519,004	5,527,568
5,487,896	5,508,746	5,519,216	5,527,576
5,488,057	5,508,811	5,519,234	5,527,767
5,488,263	5,508,830	5,519,267	5,528,121
5,489,456	5,509,853	5,519,448	5,528,161
5,490,352	5,510,064	5,519,501	5,528,497
5,491,206	5,510,225	5,519,508	5,528,599
5,491,647	5,510,245	5,519,725	5,528,709
5,491,956	5,511,186	5,519,847	5,528,765
5,495,246	5,511,528	5,520,533	5,528,920
5,495,327	5,512,222	5,520,641	5,529,294
5,496,487	5,512,234	5,520,910	5,529,364
5,496,510	5,512,240	5,521,520	5,529,460
5,496,753	5,512,352	5,521,542	5,529,513
5,496,836	5,512,635	5,521,708	5,529,610
5,496,901	5,512,729	5,521,720	5,529,646
5,496,907	5,512,758	5,521,727	5,529,693
5,497,011	5,512,877	5,521,735	5,529,861
5,498,454	5,513,208	5,521,857	5,529,886
5,499,325	5,513,347	5,521,898	5,530,031
5,499,706	5,513,468	5,522,023	5,530,386
5,499,877	5,513,975	5,522,085	5,530,560
5,500,096	5,514,031	5,522,614	5,530,716
5,500,117	5,514,294	5,522,816	5,530,836
5,500,485	5,514,375	5,522,854	5,530,846
5,501,708	5,514,577	5,522,880	5,530,930
5,501,953	5,514,594	5,522,883	5,531,261
5,502,409	5,514,655	5,522,972	5,531,310
5,502,460	5,514,819	5,523,000	5,531,327
5,502,539	5,515,022	5,523,168	5,531,373
5,504,209	5,515,133	5,523,389	5,531,592
5,504,406	5,515,499	5,523,423	5,532,058
5,504,722	5,515,581	5,523,465	5,532,301
5,504,847	5,515,612	5,523,799	5,533,248
5,505,538	5,516,565	5,524,048	5,533,343
5,505,876	5,516,626	5,524,176	5,533,654
5,506,254	5,517,100	5,524,443	5,533,826
5,506,289	5,517,553	5,524,575	5,534,186
5,506,602	5,517,575	5,524,661	5,534,302
5,506,714	5,518,030	5,525,841	5,535,282
5,506,722	5,518,282	5,525,998	5,536,727
5,506,938	5,518,357	5,526,383	5,538,263
5,507,013	5,518,499	5,526,516	5,539,344
5,507,032			

Summary of Final Decisions

Issued by the

Trademark Trial and Appeal Board

July 15-19, 1996

Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	Applicant's/ Respondent's Mark and Goods/Services	Opposer's/ Petitioner's Mark and Goods/Services	TTAB Decision	Mark and Goods Cited by Examining Attorney	Recommended for Publication
7-16	EX	74/243,193	Canadian Agra Corp.	2(e)(1)	"MACHINERY RING" [brokering of farm services between farmers and farm laborers and owners and operators of farming equipment]		Refusal Affirmed		No
7-16	EX	74/362,907	Custom Towels, Inc.	2(e)(1); whether mark has acquired distinctiveness and is, therefore, registrable under Sec. 2(f)	"CUSTOM TOWELS" [beach towels, bath towels and sport towels]		Refusal Affirmed (on both issues)		No
7-16	OPP	89,309	Hard Rock Cafe Licensing Corp. v. Rock Hard Sportswear, Inc.	2(d)	"ROCK HARD" [clothing, particularly clothing made of leather and/or denim fabrics, namely, jeans, T-shirts, hats, jackets, sweatshirts and sweatpants]	"HARD ROCK CAFE" and "HARD ROCK CAFE" (and design) [restaurant services, t-shirts, sweatshirts, polo shirts, sport shirts, jackets, hats, etc.]; "HARD ROCK TIMES" (and design) [t-shirts]	Opposition Sustained		No
7-16	OPP	91,340 91,457	Morton International, Inc. v. Asahi Denka Kogyo Kabushiki Kaisha	2(d)	"ADEKA STAB" and "ADK STAB" [chemicals, namely, stabilizers and additives for plastics]	"ADVASTAB" [stabilizers for vinyl resins]	Opposition Sustained		No
7-17	EX	74/449,910	Tomco Auto Products, Inc.	2(d)	"TOMCO CARBURETORS" (and design) [automotive carburetors]		Refusal Affirmed	"TOMCO TT" (and design) [vehicle parts, namely, carburetor floats; carburetor couplings; carburetor dashpots; carburetor choke pull-offs; carburetor valves; etc.]; "TOMCO TT INC." (and design) [replacement emission reduction parts for land vehicles]	No

(1)EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SJ)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION

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Date Issued	Type of Case[1]	Proceeding or App'n No.	Party/Parties	Issue	Applicant's/ Respondent's Mark and Goods/Services	Opposer's/ Petitioner's Mark and Goods/Services	TTAB Decision	Mark and Goods Cited by Examining Attorney	Recommended for Publication
7-18	EX	74/392,047	Carolyn C. Weissberg and Steven Weissberg	2(e)(1)	"VIRTUAL PAPER" [computer services, namely, configuring and designing software and hardware to facilitate the flow of information among disparate users]		Refusal Affirmed		No
7-18	OPP	92,996	Miguel Torres, S.A. v. Cantine Mezzacorona S.C.A.R.L.	2(d)	"MEZZACORONA" (and design) [wines and sparkling wines]	"GRAN CORONAS" (in stylized form) and "CORONAS" (and design) [wine]	Opposition Sustained		No
7-19	EX	74/319,605	TJC, Inc.	2(e)(3)	"BOGOTA BAGS" [garment bags for travel, carry-on bags, backpacks and travel kits sold empty]		Refusal Affirmed		No
7-19	EX	74/458,353	Krueger GmbH & Co. KG	2(d)	"CHOCOCINO" [preparations for making flavored drinks, namely, a drink having the flavor of cocoa and coffee]		Refusal Affirmed	"CHOCK O'CCINO" [iced coffee with milk and sugar and iced tea]	No
7-19	EX	74/528,198	The Jolt Company, Inc.	2(e)(1)	"BLU BOTOL" [water, namely, sparkling water, spring water, and mineral water]		Refusal Reversed		No

(1)EX = EX PARTE APPEAL; OPP = OPPOSITION; CANC = CANCELLATION; CU = CONCURRENT USE; (SJ) = SUMMARY JUDGMENT; (R) = REQ. FOR RECONSIDERATION

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Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
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Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
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SPECIAL BOXES APPLICABLE TO *BOTH* PATENT AND TRADEMARK MAIL

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Box 6	Mail for the Office of Procurement.
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Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
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In addition, each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials. Facilities for making paper copies of patent and trademark information are generally provided for a fee.

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New Jersey	Newark Public Library	(201) 733-7782
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	Cleveland Public Library	(216) 623-2870
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Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents
EDWARD R. KAZENSKE, Deputy Assistant Commissioner for Patents
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—JOHN R. KITTLE, Director	308-0661	10/27/94
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200—RICHARD V. FISHER, Director	308-1235	07/24/94
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—BARRY S. RICHMAN, Director	308-0651	09/20/94
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—THEODORE MORRIS, Director	308-2351	01/19/95
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	08/05/94
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	09/27/94
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	01/31/95
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—BOBBY R. GRAY, Director	305-9600	10/28/93
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3800	08/15/94
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director	308-0956	02/03/95
TELECOMMUNICATIONS, GROUP 2600—NICHOLAS P. GODICI, Director	305-4700	12/27/94
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	308-0661	01/30/95
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—F.R. SCHMIDT, Director	308-1113	06/03/94
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—CARLTON R. CROYLE, Director	308-1148	10/20/94
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	06/05/95
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD O. KELLY, Director	308-0861	05/05/95
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-1021	10/25/94

*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:
(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
(3) All design patents are granted for a term of 14 years from the date of the grant.
However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner

REEXAMINATIONS

SEPTEMBER 24, 1996

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner
Philip G. Hampton, II, Assistant Commissioner
Robert M. Anderson, Deputy Assistant Commissioner
David E. Buchar, Director, Trademark Examining Office

Condition of Trademark Applications as of August 1, 1996

Law Office	Oldest Date New*	Oldest Date Amendment Filed
Law Office 101—Ron Williams, Managing Attorney, (703) 308–9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	12/14/95	04/10/96
Law Office 102—Myra Kurzbard, Managing Attorney, (703) 308–9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/22/96	02/12/96
Law Office 103—Kathryn Erskine, Managing Attorney, (703) 308–9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/05/96	06/26/96
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308–9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/22/96	04/01/96
Law Office 105—Thomas Howell, Managing Attorney, (703) 308–9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/27/96	05/01/96
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308–9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	02/06/96	02/08/96
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308–9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	01/17/96	01/30/96
Law Office 108—David Shallant, Managing Attorney, (703) 308–9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/14/96	03/18/96
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308–9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	03/15/96	05/15/96
**Collective Marks—Class 200		
**Certification Marks—Classes A & B		
Office of Trademark Services—Vacant (703) 308-9100		
Trademark Assistance Center—(703) 308-9000		
Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188		
Intent-To-Use—(ITU)—(703) 308-9500		
Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126		
Affidavits Under Sections 8 & 15 (All Classes)	01/26/96	—0—
Renewals (All Classes)	05/02/96	—0—
Section 12(c) Publications (All Classes)	02/29/96	—0—

1. ** Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305–8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. * These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

REEXAMINATIONS

SEPTEMBER 24, 1996

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,491,834 (2999th)

DISPLAY CONTROLLING APPARATUS

Tetsuji Oguchi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

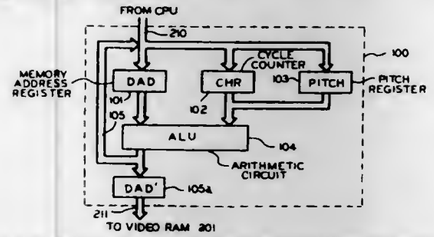
Reexamination Request No. 90/003,611, Oct. 21, 1994.

Reexamination Certificate for Patent 4,491,834, issued Jan. 1, 1985, Ser. No. 598,360, Apr. 12, 1984.

Claims priority, application Japan, Sep. 22, 1980, 55-132009

Int. Cl.[6] G09G *5/34*

U.S. Cl. 345—123



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–3 is confirmed.

Claim 4 is determined to be patentable as amended.

4. A display system comprising display means for displaying information on a screen, processor means for producing said display information, video RAM means for storing the produced display information, input means for inputting said produced display information into said video RAM means, address generator means for generating a plurality of continuous and discontinuous addresses, reading means for reading out said video RAM means, said read out being display information designated by said plurality of continuous and discontinuous addresses generated by said address generator means, and transferring means for sequentially transferring the read out display information to said display means, said address generator including first means for supplying said video RAM means with a start scrolling address indicating a leading display information which is first to be displayed on one horizontal scanning line on said screen upon a scroll operation, second means for sequentially producing said continuous addresses to designate display information which is to be displayed on said one horizontal scanning line subsequently to said leading display information, said continuous addresses being produced by sequentially adding predetermined incremental data to said start scrolling address during one horizontal scanning period, third means for producing said discontinuous address to designate a leading display information which is first to be displayed on a next horizontal scanning line, said discontinuous address being produced by adding data which is larger than said predetermined increment of data to said start scrolling address during a period between said one horizontal scanning period and said next horizontal scanning period, *said discontinuous address being supplied to said first means as said start scrolling address*, and fourth means for producing continuous addresses to designate display information which is to be displayed subsequently to said leading display information on the next horizontal scanning line by sequentially adding said predetermined increment data to said discontinuous address during the next horizontal scanning period, whereby a display pattern consisting of a plurality of lines assigned to said video RAM means is shifted to arbitrary locations on said screen of said display means at a high speed.

B1 4,826,712 (3000th)

DECORATIVE RIBBONS

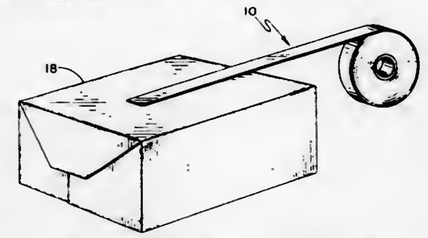
Mark H. Theno, 6833 Woodland Dr., Eden Prairie, Minn. 55344

Reexamination Request No. 90/002,819, Aug. 24, 1992.

Reexamination Certificate for Patent 4,826,712, issued May 2, 1989, Ser. No. 39,700, Apr. 20, 1987.

Int. Cl.[6] D04D *7/10*

U.S. Cl. 428—4



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–7 are cancelled.

[1. A ribbon for gift wrapping a package to prevent accidental displacement of the ribbon during handling of the package comprising:

a decorative ribbon comprising a strip of flexible material for wrapping around a portion of a package to enhance the appearance of the package, said strip of flexible material having a bottom surface, said strip of flexible material having a visually decorative appearance, said bottom surface having a layer of repositionable pressure-sensitive adhesive located thereon for attaching said strip of flexible material to the package to prevent the displacement of said strip of flexible material, said adhesive layer having an effective holding strength sufficiently strong to prevent accidental displacement of the ribbon on the package, said holding strength being sufficiently weak so as to permit repositioning of the ribbon on the package without damaging the package.]

B1 4,869,942 (3001st)

TRILMINATED ROOFING SHINGLE

Robert E. Jennus, Brandon, Fla., and Dale P. Major, Camden, Ark., assignors to The Celotex Corporation, Tampa, Fla.

Reexamination Request Nos. 90/003,774, Apr. 3, 1995 and 90/003,780, Apr. 6, 1995.

Reexamination Certificate for Patent 4,869,942, issued Sep. 26, 1989, Ser. No. 135,967, Dec. 21, 1987.

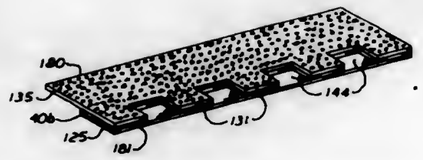
Division of Ser. No. 895,988, Aug. 14, 1986, Pat. No. 4,729,814.

Int. Cl.[6] E04D *1/26*

U.S. Cl. 428—77

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended.



Claims 2 and 3, dependent on an amended claim, are determined to be patentable.

New claims 4–19 are added and determined to be patentable.

1. A roofing shingle coprising a top asphalt coated sheet, a second asphalt coated sheet, adhesive means between said sheets to secure said sheets together to form a two-layered, laminated sheet, said second sheet being substantially narrower than said top sheet and having one edge of said second sheet in alignment with one edge of said top sheet, said laminated sheet having alternating tabs and cut-out portions along one edge thereof, and a strip adhered along the underside of said tabs, [and] coincident with the outer edges of said tabs *and covering the cut-out portions* to form a unitary roofing shingle.

B1 5,025,855 (3002nd)

CONDENSER FOR USE IN A CAR COOLING SYSTEM

Ryoichi Hoshino; Hironaka Sasaki, and Takayuki Yasutake, all of Oyamashi, Japan, assignors to Showa Aluminum Corporation, Osaka, Japan

Reexamination Request No. 90/003,822, May 8, 1995.

Reexamination Certificate for Patent 5,025,855, issued Jun. 25, 1991, Ser. No. 509,901, Apr. 16, 1990.

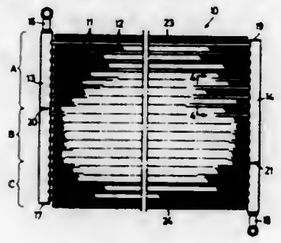
Division of Ser. No. 328,896, Mar. 27, 1989, Pat. No. 4,936,379, which is a division of Ser. No. 77,815, Jul. 27, 1987, Pat. No. 4,825,941.

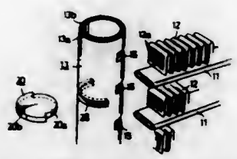
Claims priority, application Japan, Jul. 29, 1986, 61-179263; Nov. 2, 1986, 61-263138

The portion of the term of this patent subsequent to May 2, 2006, has been disclaimed.

Int. Cl.[6] F28D *1/00*

U.S. Cl. 165—150





AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended.

1. A condensing apparatus comprising:

a pair of headers provided in parallel with each other;

a plurality of tubular elements whose opposite ends are connected to the headers;

fins provided in air paths present between one tubes and the next;

wherein each header is made of an aluminum pipe having a circular cross-section;

wherein each of the tubular elements is made of a flat hollow aluminum tube; and

wherein the opposite ends of the tubular elements are inserted in slits produced to the headers, and liquid-tightly secured therein;

wherein at least one of the headers is internally divided by a partition into at least two groups of coolant passageways, thereby enabling the flow of coolant to make at least one U-turn in the header; and

wherein the partition is inserted in the header through a slit produced in the header and secured therein, *the portion of the partition disposed in the header being without any perforations.*

B1 5,126,932 (3003rd)

METHOD AND APPARATUS FOR EXECUTING A PROGRAM IN A HETEROGENEOUS MULTIPLE COMPUTER SYSTEM

C. Daniel Wolfson, Langhorne, Pa.; Frederic W. Brehm, Mercerville, N.J.; Maura M. Flatley, South Brunswick, Township, N.J., and Ellen M. Voorhees, Plainsboro, N.J., assignors to Siemens Corporate Research, Inc., Princeton, N.J.

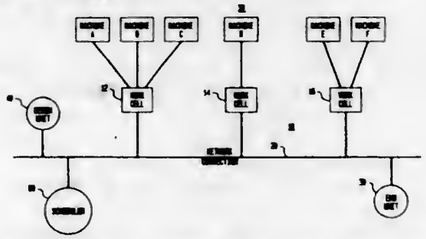
Reexamination Request No. 90/003,647, Nov. 30, 1994.

Reexamination Certificate for Patent 5,126,932, issued Jun. 30, 1992, Ser. No. 506,503, Apr. 5, 1990.

Continuation-in-part of Ser. No. 208,318, Jun. 17, 1988, abandoned.

Int. Cl.[6] G06F *19/00;15/163*

U.S. Cl. 395—200.03



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 8 and 15 are determined to be patentable as amended.

Claims 2–7 and 9–14 dependent on an amended claim, are determined to be patentable.

New claims 16–31 are added and determined to be patentable.

1. In a distributed heterogeneous multiple computer system having a plurality of autonomous nodes, a method of executing a work sequence program, comprising data associated with a work unit and specifications for performing a plurality of successive work operations in sequence on said work unit utilizing said data, said method comprising the steps of:

writing said work sequence program in a standard language, and using said standard language to define a structure of the data used in said work sequence program and to specify a sequence of work operations to be performed on said work unit using said associated data at each one of a selected sequence of autonomous nodes;

providing a processor at each of the autonomous nodes for executing a work operation program for performing a work operation on a work unit at the respective node, said processor being operated [in] *with* a given processor operating [environment] *language* which [may differ] *differs* from [the] *at least one other* processor operating [environment] *language* of

another processor at another node and using [an] *a non-state retaining* interpreter for interpreting the standard language of the work sequence program into the given opeating [environment] *language* of the processor at the respective node;

initiating execution of said work sequence program on the processor at a first autonomous [mode] *node* in said multiple computer system by using the processor interpreter to interpret said work sequence program into the processor operating [environment] *language* of said processor and thereupon executing the work operation program of said processor on the work unit in accordance with the associated data and specifications for the work operations of said work sequence program; and

transferring execution of said work sequence program to another processor at a second autonomous node in said multiple computer system in response to a next one of said successive work operations in the sequence specified in said work sequence program.

B1 5,196,759 (3004th)

HIGH TEMPERATURE LAMPS HAVING UV ABSORBING QUARTZ ENVELOPE

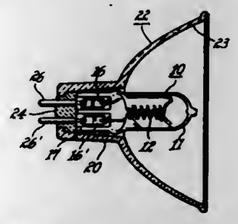
Thomas G. Parham, Gates Mills, Ohio; Robert L. Bateman, Jr., Kitty Hawk, N.C.; Gary R. Allen, and Paul G. Mathews, both of Chesterland, Ohio, assignors to General Electric Company, Cleveland, Ohio

Reexamination Request No. 90/003,445, May 26, 1994.

Reexamination Certificate for Patent 5,196,759, issued Mar. 23, 1993, Ser. No. 843,660, Feb. 28, 1992.

Int. Cl.[6] H01K *1/32;* **H01J** *61/30*

U.S. Cl. 313—112



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 6, 12, and 15 are determined to be patentable as amended.

Claims 2–5, 7–11, 13 and 14, dependent on an amended claim, are determined to be patentable.

New claims 16–36 are added and determined to be patentable.

1. A lamp comprising a light source with emits both UV and visible light radiation surrounded by a UV-absorbing and visible light transmissive fused quartz envelopo codoped with both titanium dioxide and cerium oxide to absorb at least [a portion] *80%* of said UV radiation *between 220 and 340 nm,* with said envelop being at a temperature above 500° C. during operation of said lamp.

B1 5,324,483 (3005th)

APPARATUS FOR MULTIPLE SIMULTANEOUS SYNTHESIS

Donna R. Cody, Saline; Sheila H. H. DeWitt, Dexter; John C. Hodges; John S. Kiely, both of Ann Arbor, all of Mich.; Walter H. Moos, Oakland, Calif.; Michael R. Pavia, Newton, Mass.; Bruce D. Roth, Ann Arbor, Mich.; Mel C. Schroeder, Dexter, Mich., and Charles J. Stankovic, Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

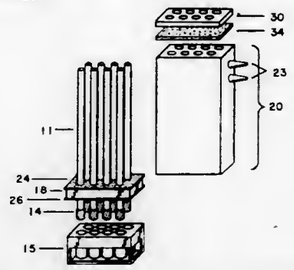
Reexamination Request No. 90/003,932, Aug. 28, 1995.

Reexamination Certificate for Patent 5,324,483, issued Jun. 28, 1994, Ser. No. 12,557, Feb. 2, 1993.

Continuation-in-part of Ser. No. 958,383, Oct. 8, 1992, abandoned.

Int. Cl.[6] C08F *283/00*

U.S. Cl. 422—131



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–54 is confirmed.

1. An apparatus for multiple, simultaneous synthesis of compounds comprising:

a plurality of reaction tubes, each reaction tube having an upper end and a lower end, said lower end of each reaction tube comprising a filter, said upper end and said filter each having an inside diameter and an outside diameter;

a reservoir block having at least one reaction well for receiving said lower end of each reaction tube comprising the filter;

a holder block with a plurality of apertures, said apertures having a diameter at least equal to the outside diameter of at least one of said plurality of reaction tubes;

a manifold located adjacent to said holder block, said manifold enclosing the upper ends of said plurality of reaction tubes;

a means for providing a seal between said holder block and said reservoir block;

a means for providing a seal between said holder block and said manifold; and

a means for fastening together independently said reservoir block to said holder block and said holder block to said manifold.

REISSUES

SEPTEMBER 24, 1996

REISSUES

SEPTEMBER 24, 1996

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,331

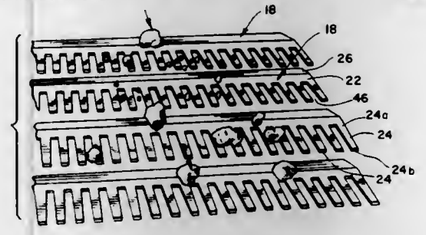
MATERIAL SEPARATING APPARATUS

Raymond W. Sherman, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Original No. 5,108,589, dated Apr. 28, 1992, Ser. No. 702,145, May 13, 1991. Application for reissue Aug. 24, 1994, Ser. No. 294,961

Int. Cl.[6] **B07B** *1/12;1/46*

U.S. Cl. 209—393 **21 Claims**



1. A material separating apparatus, comprising:

a trough having a material input end longitudinally spaced from a material discharge end and including means for separating particles up to a preselected size from a material having particles of different sizes therein; and

means for resiliently supporting said trough relative to a supporting surface to permit vibratory movement of said trough and means for vibrating said trough for agitating and moving said material from said input end toward said discharge end:

said separating means including a plurality of longitudinally spaced finger screen means disposed between said input end and said discharge end and along the longitudinal axis of said trough, each of said finger screen means including a backbone extending from side to side across the width of said trough, each of said finger screen means also including forwardly extending fingers connected at one end to said backbone, said fingers being spaced side by side from each other by a preselected amount at forward ends thereof sufficient to allow particles up to said preselected size to pass through said fingers, said fingers of each of said finger screen means extending forwardly and slightly upwardly relative to said backbone of said finger screen means immediately forward thereof, each of said finger screen means also including a rearwardly depending leg connected at one end to said backbone, each of said finger screen means having said forward ends of said fingers overlapping said finger screen means immediately forward thereof, said forward ends of said fingers being vertically spaced above said finger screen means adjacent to and immediately forward thereof by a spacing [sufficient to permit particles up] *equal* to said preselected [size to pass through the] *amount of* spacing between adjacent ones of said finger screen means;

whereby said material having particles of different sizes will be conveyed along said trough and over successive ones of said finger screen means with particles up to said preselected size falling through said finger screen means as said material moves from said input end to said discharge end of said trough.

Re. 35,332

OPTICAL PICKUP DEVICE WITH DIFFRACTION DEVICE

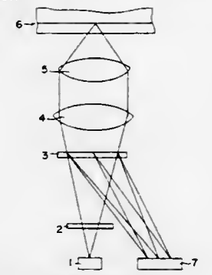
Toshiya Nagahama, Nara; Yoshio Yoshida, Tenri; Yasuo Nakata, Tenri, and Yukio Kurata, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Original No. 5,049,732, dated Sep. 17, 1991, Ser. No. 424,373, Oct. 19, 1989. Application for reissue Sep. 17, 1993, Ser. No. 123,459

Claims priority, application Japan, Oct. 21, 1988, 63-266425; Apr. 13, 1989, 1-95646

Int. Cl.[6] **G01J** *1/20;* **G11B** *7/00*

U.S. Cl. 250—201.5 **14 Claims**



10. An optical pickup device comprising:

a light source for emitting light beams;

an optical system for focusing said light beams emitted from said light source onto a recording medium, said optical system allowing said light beams reflected from said recording medium to pass therethrough;

a light receiving means which receives said light beams reflected from said recording medium;

a diffraction means, disposed between said light source and said optical system across an optical axis of dividing said light beams emitted from said light source into at least a zero-order diffracted beam and first-order diffracted beams and for introducing said light beams reflected from said recording medium into said light receiving means;

wherein said diffraction means has a diffraction area where a diffraction grating is formed, said optical axis of said light beams emitted from said light source passing through a position of said diffraction area, said position being separated from an end portion of said diffraction area by a predetermined distance, said end portion being closer to said light receiving means than any other end portion of said diffraction area; and wherein said predetermined distance is set so that said first-order diffracted beams from the diffraction means are not incident on said optical system.

Re. 35,333

INFRARED DETECTOR

Naoko Iwasaki, and Katsuhiro Ohno, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

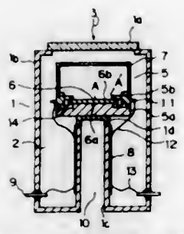
Original No. 5,260,575, dated Nov. 9, 1993, Ser. No. 29,033, Mar. 10, 1993. Application for reissue Jun. 17, 1994, Ser. No. 261,815

Claims priority, application Japan, May 19, 1992, 4-152658

Int. Cl.[6] **G01J** *5/06*

U.S. Cl. 250—352 **10 Claims**

1. An infrared detector including:



a dewar having an outer cylinder with a window for transmitting incident infrared radiation, and an inner cylinder united with said outer cylinder so as to form a space for inserting cooling means, an

an infrared detecting device accommodated in said dewar and driven while being cooled to a cryogenic temperature by said cooling means from the outside of said dewar,

wherein the improvement comprises a container for accommodating said infrared detecting device, said container including a bottom plate having a projection projecting inwardly of said container from an inner surface thereof, so that said infrared detecting device is secured to said projection of said bottom plate, said bottom plate being secured to an end portion of said inner cylinder which is disposed in said dewar, thereby disposing said container in said dewar.

2. An infrared detector according to claim 1, wherein said bottom plate of said container for said infrared detecting device is made of [an Invar] *a nickel-iron alloy.*

6. An infrared detector according to claim 1, wherein said end portion of said inner cylinder of said dewar is made of [Kovar] *a nickel-cobalt-iron alloy.*

Re. 35,334

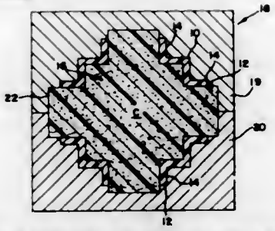
PROCESS FOR CORE REMOVAL FROM MOLDED PRODUCTS

Timothy M. Moore, Silvi, and Gerbrig W. Van Der Woude, Rock Island, both of Ill., assignors to Advanced Plastics Partnership, Moline, Ill.

Original No. 5,089,186, dated Feb. 18, 1992, Ser. No. 551,769, Jul. 11, 1990. Application for reissue Feb. 17, 1994, Ser. No. 198,141

Int. Cl.[6] **B22C** *9/02;33/38;33/52;33/54*

U.S. Cl. 264—489 **19 Claims**



1. A method of removing a molding core from a molded product wherein said core comprises a particulate inert material which is formed into a discrete configuration conforming to the configuration of at least a portion of the molded product and the particulate inert material is bound in said configuration by a *heat* cured binder comprising *a silicate salt and* a water soluble carbohydrate, said method comprising exposing said bound core with said [water soluble carbohydrate] *binder* therein and said molded product to water after the product has been molded to disintegrate and remove the core from the molded product.

Re. 35,335

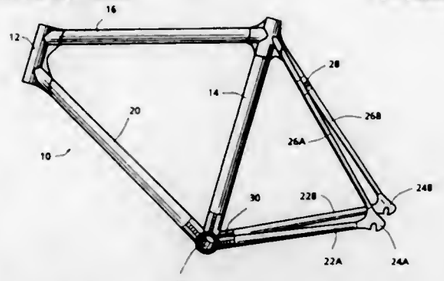
COMPOSITE BICYCLE FRAME

Craig D. Calfee, 115 Post St., Santa Cruz, Calif. 95060

Original No. 5,116,071, dated May 26, 1992, Ser. No. 321,510, Mar. 9, 1989. Application for reissue Oct. 25, 1993, Ser. No. 143,284

Int. Cl.[6] **B62K** *3/02;19/02*

U.S. Cl. 280—281.1 **14 Claims**



8. A bicycle frame of the type including a plurality of tubes of the type which are joined to a bottom bracket shell, the tubes having longitudinal axes, and the frame extending in a plane defined by the longitudinal axes of the tubes, comprising:

continuous fiber composite material with hardening agents impregnated therein, substantially surrounding, and in laminated contact with, a junction between said tubes and said bottom bracket shell to form at least one integrated structural joint and gusset between said tubes and said bottom bracket shell, said at least one gusset extending in a plane transverse to the plane of the frame.

Re. 35,336

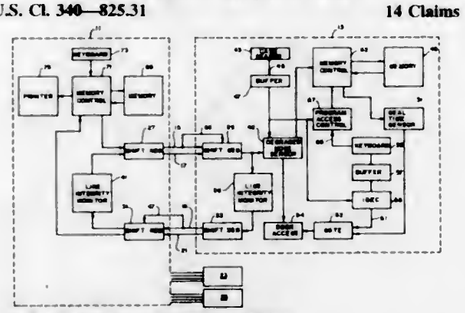
SELF-CONTAINED PROGRAMMABLE TERMINAL FOR SECURITY SYSTEMS

Bryan D. Ulch, Valencia; Donald P. Sturgis, Claremont, and Robert J. Fox, Los Angeles, all of Calif., assignors to Casi-Rusco, Inc.

Original No. 4,218,690, dated Aug. 19, 1980, Ser. No. 874,283, Feb. 1, 1978. Application for reissue Aug. 14, 1992, Ser. No. 930,855

Int. Cl.[6] **G06K** *5/00;* **H04Q** *9/00;* **G05B** *23/00*

U.S. Cl. 340—825.31 **14 Claims**



1. A security access system, comprising:

a central processor, comprising:

a programmable memory storing data specifying personnel access at plural remote terminals; and

means for communicating with said plural remote terminals; and

plural remote terminals connected by said communicating means with said central processor, each comprising:

a programmable memory within said terminal storing data specifying personnel access for said remote terminal; and

means within said terminal for providing selective, programmable access at n remote location in response to either said central processor memory data or said remote terminal memory data.

9. A security access system, as defined in claim 1, wherein at least one of said remote terminals is a unit comprising said programmable memory and said means for providing selective, programmable access.

Re. 35,337

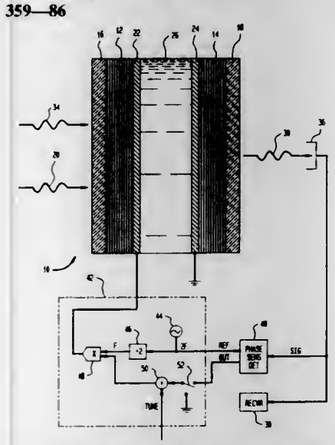
TEMPERATURE COMPENSATION OF LIQUID-CRYSTAL ETALON FILTERS

Jayantilal S. Patel, Red Bank, and John R. Wullert, II, Colonia, both of N.J., assignors to Bell Communications Research, Inc., Morristown, N.J.

Original No. 5,113,275, dated May 12, 1992, Ser. No. 725,340, Jul. 3, 1991. Application for reissue Dec. 14, 1994, Ser. No. 355,928

Int. Cl.[6] **G02F** *1/133;1/137*

U.S. Cl. 359—86 **5 Claims**



9. A method of [compensating a] *using the internal modulating refractive index variations within a liquid-crystal filter from an applied oscillatory signal to provide temperature compensation to the* liquid-crystal filter *when* irradiated with a beam of light, comprising the steps of:

applying [a first] *said* oscillatory signal at a frequency f across electrodes of said liquid-crystal filter;

detecting a component of said beam of light filtered by said filter and having a frequency proportionally related to said frequency f; and

a first step of adjusting said oscillatory signal in response to said detected component *as modulated by the internal variations within said liquid-crystal filter.*

Re. 35,338

SUSTAINED RELEASE DELIVERY OF WATER SOLUBLE BIO-MOLECULES AND DRUGS USING PHOSPHOKIPID-COATED MICROCRYSTALS, MICRODROPLETS AND HIGH-CONCENTRATION LIPSOMES

Duncan H. Haynes, Miami, Fla., assignor to Pharma-Logic, Inc., Miami, Fla.

Original No. 5,246,707, dated Sep. 21, 1993, Ser. No. 800,520, Dec. 3, 1991. Continuation of Ser. No. 514,012, Apr. 26, 1990, Pat. No. 5,091,188. Application for reissue Sep. 12, 1994, Ser. No. 304,225

Int. Cl.[6] **A61K** *9/127;37/22*

U.S. Cl. 424—450 **18 Claims**

12. An orally administrable pharmaceutical composition consisting essentially of a free-flowing aqueous suspension of solid particles of a pharmacologically active water-insoluble drug substance in solid form, the solid particles having diameters of about 0.05 μm to about 10 μm, coated with a 0.3 nm to 3.0 μm thick layer of a membrane-forming amphipathic lipid which stabilizes the drug substance from coalescence.

PLANT PATENTS

GRANTED SEPTEMBER 24, 1996

PLANT PATENTS

GRANTED SEPTEMBER 24, 1996

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

9,645

APPLE TREE NAMED 'MYRA'

Myles Van Leuven, Kennewick, Wash., assignor to Columbia & Okanagan Nursery, Wenatchee, Wash.

Filed Jul. 6, 1995, Ser. No. 514,457

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—34.1 **1 Claim**

1. A new and distinct variety of Fuji apple tree substantially as herein shown and described.

9,646

RASPBERRY (RUBUS) NAMED 'PSI-1014'

Stephen M. Ackerman, Salinas, Calif., assignor to Plant Sciences, Inc., and Berry R & D, Inc., both of Watsonville, Calif.

Filed Jul. 5, 1995, Ser. No. 498,403

Int. Cl.[6] A01H *5/00*

U.S. Cl. Plt.—46.2 **1 Claim**

1. A new and distinct red raspberry varietey named 'PSI-10142 as herein described and illustrated.

PATENTS

GRANTED September 24, 1996

ERRATA

For CLASS	See PATENT NO.
034–379	5,557,873
054–007	5,557,905
062–050	5,557,924
062–050	5,557,925
062–648	5,557,951
128–642	5,558,073
166–373	5,558,153
220–575	5,558,253
220–527	5,558,254
227–178	5,558,266
237–002	5,558,273
236–003	5,558,274
242–560	5,558,302
473–341	5,558,332
473–131	5,558,333
473–279	5,558,334
463–042	5,558,339
273–119	5,558,373
285–023	5,558,375
285–091	5,558,376
297–153	5,558,391
267–162	5,558,393
374–208	5,558,436
446–026	5,558,550
445–007	5,558,575
208–059	5,558,766
208–105	5,558,767
208–187	5,558,768
508–391	5,558,802
248–634	5,558,804
508–243	5,558,805
508–251	5,558,807
508–556	5,558,808
510–321	5,558,812
423–230	5,558,844
424–059	5,558,914

PATENTS

GRANTED SEPTEMBER 24, 1996

ERRATA–CONTINUED

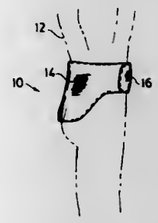
For CLASS	See PATENT NO.
428–102	5,558,951
425–006	5,558,989
428–447	5,559,074
507–273	5,559,082
524–041	5,559,171
524–155	5,559,172
200–061	5,559,309
257–666	5,559,316
313–496	5,559,397
313–477	5,559,398
313–506	5,559,399
313–506	5,559,400
326–093	5,559,459
335–151	5,559,482
340–447	5,559,484

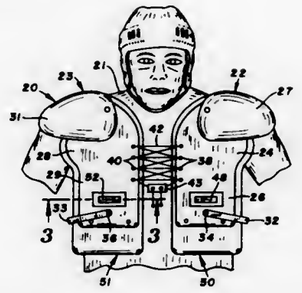
PATENTS

GRANTED SEPTEMBER 24, 1996

GENERAL AND MECHANICAL

5,557,801
DEVICE FOR RETAINING BODY HEAT
Stephen A. Jakus, 85 Lux St., Rochester, N.Y. 14621
Filed Mar. 29, 1995, Ser. No. 412,767
Int. Cl.[6] A41D *13/00*
U.S. Cl. 2—2 **15 Claims**





1. A body warmer comprised of a fabric shell and an interior chamber, wherein said shell is comprised of a central body, a right flap joined to said central body, and a left flap joined to said central body, and wherein:

(a) said shell is comprised of a front section and a back section joined to said front section, wherein said chamber is formed between said front section and said back section;

(b) said central body of said shell is comprised of a top portion integrally connected to a bottom portion, wherein:

1. said top portion has a substantially rectangular shape with a width of from about 6 to about 8 inches and a length of from about 23 to about 29 inches,

2. said bottom portion is integrally joined to said top portion and has a length which decreases from its top to its bottom, wherein the bottom of said bottom portion has a length which is from about 70 to about 90 percent of the length of said top portion,

3. the combined width of said top portion and said bottom portion is from about 1.5 to about 2.5 times as great as the width of said top portion, and

4. at least about 80 volume percent of said chamber formed between said front section and said back section which is disposed in said central body of said shell is comprised of a laminated insulating structure comprised of a first fabric layer, an intermediate fibrous insulating layer joined to said first fabric layer, and a second fabric layer joined to said intermediate fibrous insulating layer; and

(c) each of said right flap and said left flap is comprised of releasable attachment means and has a substantially rectangular shape, a width of from about 5 to about 8 inches, and a length of from about 8 to about 16 inches.

5,557,802
PAD ASSEMBLY WITH RELEASABLE CUSHION
Neal C. Wickert, 5621 Overlook Dr., Bloomington, Minn. 55437
Filed Apr. 22, 1994, Ser. No. 231,497
Int. Cl.[6] A41D *13/00*
U.S. Cl. 2—2 **19 Claims**

1. A protective pad assembly for protection of a chest and shoulder of a person's body from injury comprising: a first shield of relatively rigid material having a longitudinal curved shape in conformance with and larger than the chest to be protected, a second shield of relatively rigid material pivotally connected to the first shield, the second shield having a longitudinal curved shape in conformance with and larger than the shoulder to be protected, said first and second shields having interior surfaces and slots, a cushion having an outer periphery shaped to conform to said interior surfaces of the first and second shields and positioned to contact the chest and shoulder to be protected, the cushion comprising inner and outer flexible sheet means having a plurality of separate chambers and slots aligned with the slots in the first and second shields, said sheet means including inner and outer layers of air impervious plastic material having adjacent outer peripheral edges, said adjacent outer peripheral edges being joined together, said layers having intermediate sections joined together to separate said chambers from each other and prevent air from flowing between the chambers, said intermediate sections comprising reduced thickness portions of the cushion to facilitate the conformance of the cushion to the interior surfaces of the first and second shields and the chest and shoulder of the person to be protected, each chamber accommodating a continuous pad of springy compressible air entrained open cellular material that completely fills the chamber, the sheet means holding the pads under less than complete compression thereof, and at least one opening in one of the sheet means in communication with each of said chambers for permitting air flow through the sheet means and out of each of the pads upon further compression of the pads from impact of an external force on the shields and through the sheet means and into the pads upon expansion of the pads, and releasable strap means releasably connecting the cushion to the first shield and second shield, the releasable strap means extending through the slots in the first and second shields and cushion and having a first end and a second end opposite from the first end, the first and second ends having releasable cooperating means for holding said first and second ends together.

5,557,803
SHOCK ABSORBENT PROTECTIVE GLOVE
Timothy E. Granich, and Marilyn Granich, both of 4871 Sevilla Way, Carlsbad, Calif. 92008
Continuation of Ser. No. 279,090, Jul. 22, 1994, abandoned, which is a continuation of Ser. No. 981,604, Nov. 25, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 461,758
Int. Cl.[6] A41D *13/10*
U.S. Cl. 2—16 **3 Claims**

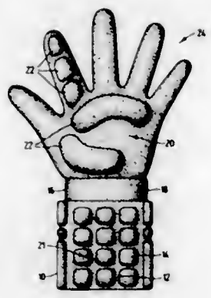
1. A protective sports glove for use underneath a conventional baseball glove by a baseball player, including:

(a) an inner glove so dimensioned as to be insertable within a conventional baseball glove when the inner glove is worn on a user's hand, the inner glove having a heal, fingers, knuckles, a palm having a base, and an inner forearm portion;

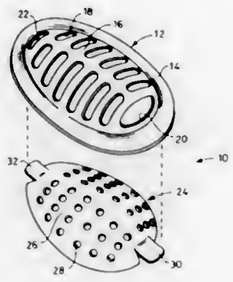
(b) first shock absorbing means for protecting a palm of a user, the first shock absorbing means being disposed generally at the base;

(c) second shock absorbing means for protecting fingers of a user, the second shock absorbing means being disposed generally across the inside of at least one knuckle; and

(d) a separate shock absorbent wristguard, flexibly coupled to the base along the inner forearm.

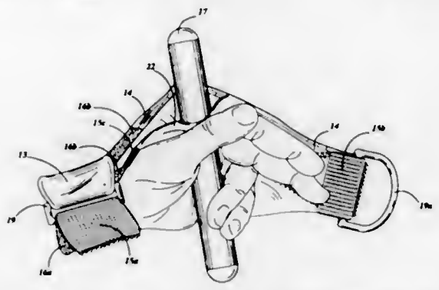


5,557,804
PROTECTIVE APPLIANCE
Klaus Ovortrup, Hellerup, and Henrik Jeppesen, Holte, both of Denmark, assignors to Ovortrup ApS, Lyngby, Denmark
Filed Nov. 16, 1994, Ser. No. 340,745
Claims priority, application Denmark, Nov. 16, 1993, 1293/93
Int. Cl.[6] A41D *13/00*; A61F *13/00*
U.S. Cl. 2—23 17 Claims



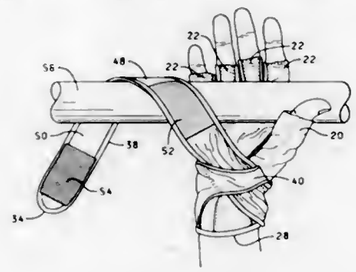
1. A protective appliance to be worn by an individual for protecting a body part of said individual, which body part is covered by a piece of clothing, comprising:
an inner shell part of a convex configuration to be arranged such that one side of the inner shell part is covered by .said piece of clothing at said body part of said individual, said inner shell part including opposite first and second fixation flanges and a central curved inner shell integrally connected to said fixation flange, said fixation flanges having configurations allowing said fixation flanges to be arranged in contact with respective body surface parts adjacent to said body part of said individual, and said central curved inner shell bridging said fixation flanges so as to cover said body part of said individual without contacting said body part, as said fixation flanges are arranged in contact with said body surface parts;
an outer shell part to be arranged opposite to said inner shell part relative to said piece of clothing so as to sandwich said piece of clothing between said inner shell part and said outer shell part, the outer shell part having opposite first and second fixation apertures; and
fixation means for fixating said inner shell part and said outer shell part relative to one another, sandwiching said piece of clothing therebetween, said fixation means being comprised by cooperating the first and second fixation flanges and the first and second fixation apertures provided at said inner shell part and said outer shell part, respectively.

5,557,805
GRIPPING AID
Samuel J. Emerson, 2209-2nd St., White Bear Lake, Minn. 55110
Continuation-in-part of Ser. No. 312,560, Dec. 1, 1993, Pat. No. 5,553,324, which is a continuation-in-part of Ser. No. 136,706, Oct. 15, 1993, abandoned. This application Jul. 20, 1995, Ser. No. 504,593
Int. Cl.[6] A41D *19/00*
U.S. Cl. 2—158 10 Claims



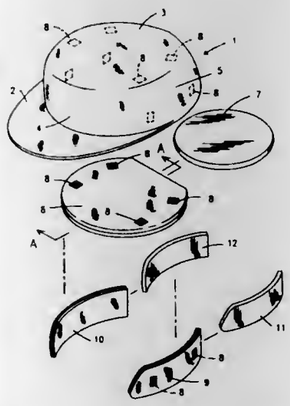
9. A gripping aid for supporting a wearer's hand and wrist, comprising:
(a) an elongated elastic wrist band having a width sufficient to support the wearer's wrist when worn, wherein said wrist band has a first end and a second end, the first end having a first securing means and the second end having a second securing means, said first and second securing means can be joined together for selectively securing the first and second ends of the wrist band together;
(b) an elastic gripping band coupled to a mid-section of said wrist band and extending therefrom to a free end, said free end including third securing means for selectively securing said free end back to fourth securing means located adjacent a lateral edge of said gripping band adjacent said wrist band;
(c) a first and a second rigid member attached to said wrist band, wherein the wearer's wrist is sandwiched between the first and second rigid member when worn;
(d) a stiffening strap extending from at least one of a first and second end of said wrist band; and
(e) a thumb strap coupled to a mid-section of said wrist band and extending therefrom to a free end.

5,557,806
WEIGHT-LIFTING GLOVE HAVING A SECURING STRAP AND SLEEVE
Charles A. Caswell, and Richard K. Davis, both of Altus, Okla., assignors to OK-1 Manufacturing Company, Altus, Okla.
Filed Mar. 17, 1995, Ser. No. 406,353
Int. Cl.[6] A41D *19/00*
U.S. Cl. 2—161.1 8 Claims
1. A glove adapted to be disposed over an individual's hand and



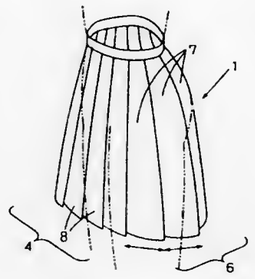
wrist for supporting the wrist when gripping an object, the glove comprising:
a glove member having a palm side, a back side, and an opening for receiving the hand of the individual;
sleeve means for defining a sleeve opening on the palm side of the glove member; and
a strap having one end connected to the glove member, a free end, a back-of-the-wrist portion and a running portion, the back-of-the-wrist portion being wrappable about the back of the wrist and the running portion being disposed through the sleeve opening of the sleeve means so as to be disposed adjacent the palm side of the glove member and extend angularly across the heel of the hand whereby the disposition of the back-of-the wrist portion and the running portion of the strap cooperate to provide support to the wrist of the individual, the running portion of the strap member having a length sufficient to permit the running portion of the strap to be disposed about and secured to the object whereby the glove member is connected to the object so as to enhance the individual's grip on the object.

5,557,807
HEADWEAR INCLUDING COOLANT MEANS
Jerry Hujar, 1009 Melrose St., Seffner, Fla. 33584, and Duelda Hujar, 1511 Broker Rd., Brandon, Fla. 33511
Filed Oct. 25, 1994, Ser. No. 328,372
Int. Cl.[6] A42B *1/02;1/18*
U.S. Cl. 2—171.2 17 Claims



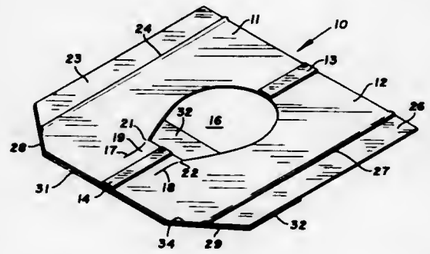
1. An article of headwear having coolant means removably supported therein, comprising:
headwear having at least a crown section designed to cover the top of a head of a wearer, said crown section including at least a dome, front, and left and right sides;
at least one pouch secured inside said crown,
said coolant means comprising a pliable closure means containing a liquid adapted to be refreezable, said coolant means shaped to be received and stored in said pouch;
wherein said pouch is constructed of a first layer of a first material and a second layer of second material, said second material different from said first material, said first layer of material provided on the outside of said pouch and being a thin material having good thermal transmissive properties, and said second material provided interior of said first material and having thermal insulative properties.

5,557,808
SKIRT WITH VARIABLE SIZED PLEATS
Masateru Kawai, Kurashiki, Japan, assignor to Akashi Hifuku Kogyo Co., Ltd., Okayama, Japan
Filed Sep. 13, 1995, Ser. No. 527,767
Int. Cl.[6] A41D *1/14*
U.S. Cl. 2—211 2 Claims



1. A pleated skirt in which a plurality of linear pleats are formed in fabric material, wherein a width of each of said plurality of pleats in contact with right and left side portions of the body of a wearer is larger than a width of each of said plurality of pleats in contact with front and back portions of the body of the wearer.

5,557,809
TOILET SEAT COVER
James L. Adams, 37 Fremont Dr., Fargo, N. Dak. 58103
Continuation-in-part of Ser. No. 148,296, Nov. 8, 1993, Pat. No. 5,392,469, and a continuation-in-part of Ser. No. 15,141, Nov. 9, 1993, Pat. No. Des. 356,634. This application Feb. 27, 1995, Ser. No. 394,773
Int. Cl.[6] A47K *13/14;13/18*
U.S. Cl. 4—245.3 18 Claims



1. A cover for a toilet seat having a front portion, side members joined to a back section and a generally central opening between the side members to accommodate the lower body and legs of a human comprising: sheet means for covering the toilet seat to protect the person using the toilet seat, said sheet means having a first section for covering one side member of the toilet seat, a second section-for covering the other side member of the toilet seat, said first and second sections comprising sheet material being water-soluble only at temperatures above 100 degrees F, strip means securing the first and second sections together with an opening between said first and second sections, said strip means comprising material being water-soluble only at temperatures above 34 degrees F, a first side sheet member secured to the first section, a second side sheet member secured to the second section, and an apron secured to the first and second sections and the first and second side sheet members and adapted to extend downwardly from the front portion of the toilet seat, said first and second side

sheet members and apron comprising material being water-soluble

5,557,813
KNOCK DOWN MATTRESS SYSTEM

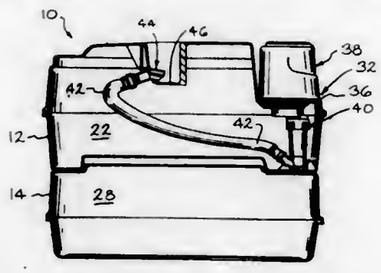
a fitted lower sheet and an attachable upper covering for placement on said mattress;

sheet members and apron comprising material being water-soluble only at temperatures above 34 degrees F.

5,557,810
PORTABLE TOILET WITH BATTERY OPERATED FLUSH ASSEMBLY

John M. Antos, Ann Arbor; John R. Selina, Brighton, and James M. Byrne, Ann Arbor, all of Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

Filed Aug. 24, 1994, Ser. No. 295,245
Int. Cl.[6] E03D *1/24;5/10*
U.S. Cl. 4—321 **5 Claims**



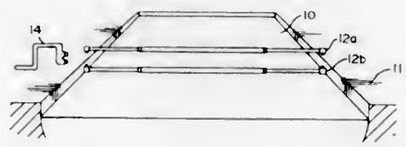
1. A flush assembly for a portable toilet having a bowl with a bottom discharge opening, the toilet also including a flush water chamber adapted to contain flush water for rinsing the bowl and flushing the contents thereof through the discharge opening, said flush assembly comprising: an electric pump operable to pump flush water from the flush water chamber into the bowl, said pump having a pump inlet located in the flush water chamber and a pump outlet communicating with the bowl, a flush assembly housing mounted to the toilet, a battery pack for supplying electrical power to said pump to operate said pump, said battery pack being removably received within a portion defining a recess in said flush assembly housing, said battery pack also including a battery pack housing, said battery pack housing having a battery holding portion and supporting an actuating member both being removable with said battery pack, said battery pack holding portion adapted to secure at least one battery therein, said actuating member being electrically connected to said battery pack and said pump for selectively actuating said pump in response to actuation of said actuating member, said battery pack adapted to permit removal of batteries from said battery holding portion without requiring removal of said actuating member from said battery pack housing, valve means connected to said pump for preventing inadvertent flow of flush water into the bowl, conduit means for connecting said valve means to said pump outlet, said conduit means providing unrestricted communication between said pump outlet and said valve means, said valve means operating to permit flow of flush water into the bowl in response to pumping of flush water by said pump out of said pump outlet.

5,557,811
FREE-FLOATING MEANS AND METHOD FOR ROLLING POOL COVERS

David D. Hoff, 7184 Gibson Canyon Rd., Vacaville, Calif. 95688

Continuation-in-part of Ser. No. 631,019, Dec. 17, 1990, abandoned, which is a continuation-in-part of Ser. No. 396,911, Aug. 18, 1989, abandoned. This application Sep. 16, 1991, Ser. No. 760,578
Int. Cl.[6] E04H *4/10;* **B65H** *75/10;75/40*
U.S. Cl. 4—502 **11 Claims**

1. A free-floating apparatus for rolling buoyant flexible pool covers, said apparatus comprising:



(a) a tubular spindle-core element free-floating upon a buoyant flexible pool cover at a midpoint of said cover and within the perimeter of the pool, wherein said apparatus utilizes the buoyancy of said cover, is therein solely supported by the buoyancy of said cover, and is adapted to have said buoyant flexible pool cover wrapped therearound to roll said cover directly upon the surface water of the pool;

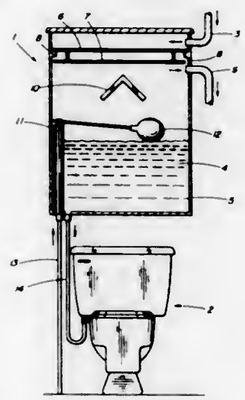
(b) a means for securing said tubular spindle-core to said buoyant flexible pool cover thereby enabling said cover to fold back upon itself about said spindle-core to be wrapped therearound;

(c) a means for producing rotation to said spindle-core to fold said cover back upon itself about said spindle-core to be wrapped therearound into a roll upon the surface water of the pool.

5,557,812
WASTE WATER REUSE SYSTEM

Eric H. Sayant, P.O. Box 344, Sharbot Lake, Ontario, Canada

Filed Aug. 8, 1994, Ser. No. 287,364
Int. Cl.[6] A47K *4/00*
U.S. Cl. 4—665 **5 Claims**

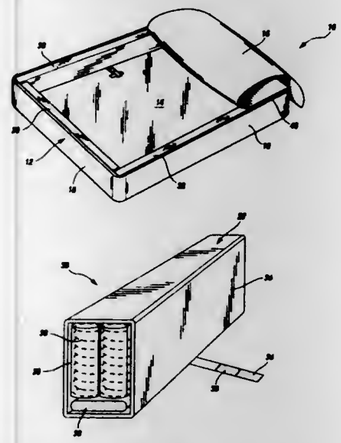


1. A waste water reuse system comprising a first holding tank for disposition above the toilet tank of a conventional toilet, the holding tank having a waste water inlet located adjacent a top thereof, an overflow outlet located below the waste water inlet, a removable filter disposed within the holding tank between the inlet and outlet in a position to filter water incoming from the inlet, a gravity fed outlet at the bottom of the tank for connection to a water inlet of the conventional toilet, a water supply inlet at or adjacent the bottom of the tank for connection to a fresh water supply, and a float valve connected to the water supply inlet for controlling inflow of fresh water to the holding tank, the float valve having a float ball for causing shut-off of the supply of fresh water at a level substantially below the overflow outlet, and means connecting the waste water inlet to a bathtub water outlet, the holding tank further including a water deflector disposed below the filter, the deflector being attached to opposite walls of the holding tank for simultaneously deflecting water incoming from the waste water inlet and structurally supporting said opposite walls.

5,557,813
KNOCK DOWN MATTRESS SYSTEM

C. Edward Steed, Alpharetta, and Ricky F. Gladney, Fairburn, both of Ga., assignors to Simmons Company, Atlanta, Ga.

Filed Mar. 3, 1995, Ser. No. 398,227
Int. Cl.[6] A47C *27/00*
U.S. Cl. 5—239 **9 Claims**



1. A mattress system comprising:

a shell having a bottom panel, a top panel and side panels interposed therebetween;

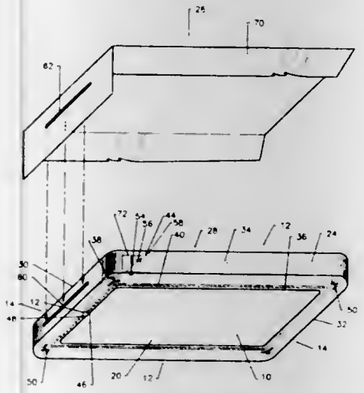
a plurality of bolsters dimensioned and configured to be positioned within said shell in abutment with the side panels thereof;

said bolsters each being secured to the bottom panel of said shell by a strap fixed to the underside of said bolster and a cooperative loop member formed on said bottom panel.

5,557,814
BED SHEETING ARRANGEMENT

Stephen Cybulski, 784 Paul La., Plentywood, Mont. 59254

Filed Jul. 24, 1995, Ser. No. 436,606
Int. Cl.[6] A47G *9/02*
U.S. Cl. 5—496 **9 Claims**



1. A bed sheeting arrangement for placement on a mattress, said bed sheeting arrangement comprising:

a fitted lower sheet and an attachable upper covering for placement on said mattress;

said fitted lower sheet having a substantially rectangular central area, said substantially rectangular area having a foot end, a head end and a sidewall extending around said central area;

said sidewall having an edge remote from said central area, said edge having a channel containing a continuous inelastic drawstring which continuous inelastic drawstring is constrained to lie in said channel the entire length of said edge;

said channel having a first opening therefrom;

said inelastic drawstring having a first end exiting said channel through said first opening, said first end being constrained outside said channel along said sidewall edge;

said channel having a second opening therefrom;

said inelastic drawstring having a second end exiting said channel through said second opening, said second end being manually accessible outside said channel;

said fitted lower sheet having a third opening;

said second end of said inelastic drawstring exiting said third opening in said fitted lower sheet;

said second end of said inelastic drawstring having a stopper, said stopper being attached to said second end outside said third opening in said fitted lower sheet;

said second end of said inelastic drawstring having a handle;

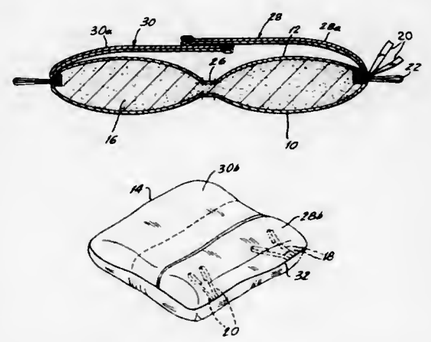
said fitted lower sheet having an enclosable pocket, said enclosable pocket providing for securing of said second end of said inelastic drawstring; and,

said fitted lower sheet having a first part of a two part releasable fastener attached to said foot end thereof, said first part interengaging said upper covering.

5,557,815
CONVERTIBLE PILLOW/CHAIR PAD

Jacob Mintz, Fall River, and Cidalisa Andrade, Swansea, both of Mass., assignors to Klear-Vu Corp., Fall River, Mass.

Filed Apr. 10, 1995, Ser. No. 419,191
Int. Cl.[6] A47G *9/00;* **A47C** *27/00*
U.S. Cl. 5—636 **15 Claims**



1. A convertible cushion comprising first and second sides having edges joined along a seam to form an enclosure, a flap of flexible material having four edges, said flap extending from one end of said enclosure and being joined to said enclosure seam along three of said edges, a second flap extending from the end of said enclosure opposite to said one end, said first flap and said second flap being adapted to partially overlap when situated adjacent the same side of said enclosure and tie strings extending from said seam along said one end of said enclosure.

5,557,816
PILLOW HAVING MULTIPLE INTERIOR VOLUMES

side rails of a hospital bed comprising,

a) a flexible core which is slightly longer than it is wide and

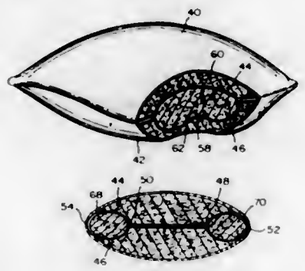
said lid includes a lid first end spaced from a lid second end, the housing first end having a first end recess, with the lid first

5,557,816

PILLOW HAVING MULTIPLE INTERIOR VOLUMES

Samuel B. Pedersen, and Nicolas J. Hanauer, both of Seattle, Wash., assignors to Pacific Coast Feather Company, Seattle, Wash.

Division of Ser. No. 959,880, Oct. 9, 1992, Pat. No. 5,299,333. This application Oct. 29, 1993, Ser. No. 145,332
Int. Cl.[6] A47G *9/00*
U.S. Cl. 5—645 **11 Claims**



1. A pillow, comprising:

upper and lower casing members, each having longitudinal and end edges;

upper and lower baffle members positioned interiorly of the upper and lower casing members, the baffle members and casing members having longitudinal and end edges, wherein the longitudinal and end edge, respectively, of the casing members and the baffle members are secured together, thereby defining upper and lower volumes, respectively, between the upper baffle member and the upper casing member and the lower baffle member and the lower casing member, the upper and lower baffle members being secured together along a least one line of longitudinal stitching between the longitudinal edges thereof, creating at least two interior volumes between the upper and lower volumes; and

pillow filling positioned in at least one of the interior volumes and the upper and lower volumes.

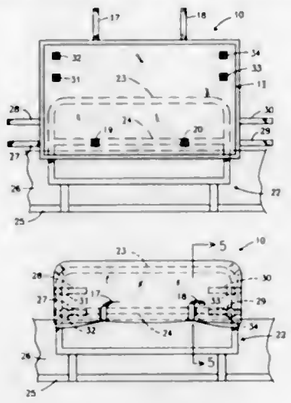
5,557,817

PROTECTIVE COVER FOR HOSPITAL BED RAILS

Henry J. Haddock, 866 Eldorado Ave., Clearwater Beach, Fla. 34630

Filed Jul. 14, 1995, Ser. No. 502,488
Int. Cl.[6] A47C *21/08*
U.S. Cl. 5—663 **2 Claims**

1. A protective cover adapted for removable placement on the side rails of a hospital bed comprising,



a) a flexible core which is slightly longer than it is wide and which is made of a cushioning plastic foam material,

b) an outer layer of soft cloth material overlying the entirety of said core,

c) a first pair of side hook and eye means secured to the elongated sides of the outer layer and, at such time as said cover is placed over the top of a side rail and bent downwardly, said first hook and eye means being securable together,

d) a first and a second pair of hook means secured to the ends of said outer layer, with said first pair of end hook means being opposed to said second pair of end hook means, and,

e) a first and second pair of end eye means secured to the ends of said outer layer, with said first pair of end eye means being opposed to said second pair of end eye means;

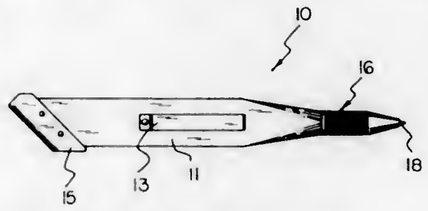
f) said first end eye means being secured to the same end of said cover as said end first hook means and said second end eye means being secured to the same end of said cover as said second hook means, whereby when said cover is placed over a side rail said first end hook and eye means can be secured to each other around a first end of the side rail and said second end hook and eye means can be secured to each other around the end of the side rail opposite the first end.

5,557,818

UTILITY PEN-KNIFE

Michael Leon, 1209 NE. 3rd St., Moore, Okla. 73160

Filed Nov. 14, 1994, Ser. No. 337,756
Int. Cl.[6] B26B *11/00*
U.S. Cl. 7—160 **5 Claims**



1. A utility pen-knife, comprising,

an elongate housing, said housing having a housing first end spaced from a housing second end, the housing longitudinally aligned to maintain ease of grasping and compactness relative to the housing, and wherein the housing first end includes a first end opening,

and

the housing having a bottom wall spaced from a top wall, with a housing lid selectively securable to the housing, with the housing lid arranged in a coplanar orientation relative to the top wall, and the housing lid is secured to the housing,

and

the housing having a partition wall within the housing, with a pen assembly terminating in a pen tip extending beyond the housing second end extending from the partition wall through the housing second end,

and

a knife assembly extending from the housing partition wall to the housing first end opening between the housing lid and the housing bottom wall,

and

the knife assembly having a carriage reciprocally mounted within the housing, with the carriage having a primary knife blade, wherein the carriage is reciprocable within the housing from a first position when the primary knife blade projects through the housing first end opening to a second position wherein the primary knife blade is retracted within the housing,

and

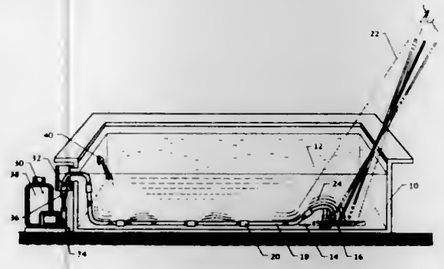
said lid includes a lid first end spaced from a lid second end, the housing first end having a first end recess, with the lid first end further having a first end rib, wherein the first end rib is arranged in a parallel relationship relative to the housing first end opening, and the rib is received within said first end recess.

5,557,819

POOL CLEANER WITH WEIGHTED HOSE

Anthony E. Krolikowski, Royal Oak, Mich., assignor to Innovating Corporation, Royal Oak, Mich.

Filed Jun. 20, 1995, Ser. No. 492,470
Int. Cl.[6] E04H *3/20*
U.S. Cl. 15—1.7 **5 Claims**



1. A manually operated pool cleaner assembly comprising:

a pool cleaner suction nozzle and an elongated handle connected to said cleaner nozzle adapted to enable a person to maneuver said nozzle over debris on a submerged floor of a swimming pool:

an elongated flexible buoyant sealed hose connected at one end to said cleaner nozzle;

a pool filtration system connected to the other end of said hose to draw water under negative pressure into said cleaner nozzle;

and means for stabilizing a submerged length of said hose to rest on said pool floor during manipulation of said cleaner nozzle to minimize surface ripples and thereby maintain visibility of the pool bottom to a person maneuvering said cleaner nozzle with said elongated handle, said means generally comprising a plurality of weights mounted to and spaced apart along the length of said hose; said weights of sufficient mass to provide a gravitational force greater than the buoyancy force of an intervening length of said hose between said spaced apart weights.

5,557,820

APPARATUS FOR PRODUCING AN ION-RICH DIRECTABLE AIR STREAM

Michael J. Belanger, Wolverine Lake, and Robert J. Wentworth, Farmington Hills, both of Mich., assignors to Belanger, Inc., Northville, Mich.

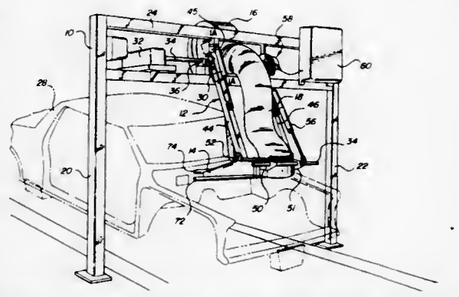
Filed Dec. 29, 1994, Ser. No. 365,834
Int. Cl.[6] B60S *3/06*
U.S. Cl. 15—1.51 **12 Claims**

1. Apparatus for producing a high flow-rate air stream comprising:

support means;

a pivot arm assembly mounted on the support means for controlled pivotal movement throughout a predetermined angular range;

an air nozzle having an air outlet and being pivotally mounted on the free end of the pivot arm assembly for movement therewith as well as pivotal movement relative thereto;



actuator means for selectively angularly orienting the nozzle relative to the pivot arm assembly; and

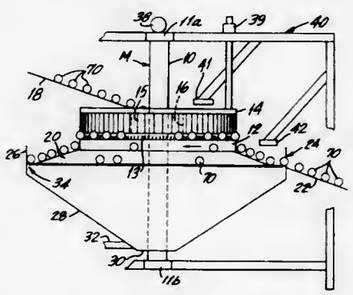
programmable means for activating said actuator means for selectively angularly orienting said nozzle in each of at least first and second orientations relative to the pivot arm assembly when said pivot arm assembly is in first and second respective angular positions, each of said first and second angular orientations being selectable in each of the pivot arm assembly positions.

5,557,821

CENTRIFUGAL PACKINGLINE MACHINE

John T. Washnock, and Harold L. Thomas, both of Dunedin, Fla., assignors to OMT Engineering Inc., Dunedin, Fla.

Filed Mar. 27, 1995, Ser. No. 410,985
Int. Cl.[6] A23N *12/00*
U.S. Cl. 15—3.13 **7 Claims**



1. Apparatus for treating produce, such as fruit and vegetables, comprising:

a rotatable shaft;

a first generally disc-shaped member disposed about said shaft and having a first bristled surface and an interior opening for passing produce between said shaft and said first member;

a second generally disc-shaped member, disposed opposite said first member and mounted on said shaft for rotation therewith, and having a second bristled surface cooperating with said first bristled surface for passing produce therebetween;

means for introducing produce into said opening onto said second member and between said first and second bristled surfaces;

means for driving said shaft to rotate said second member to impose a centrifugal force on produce between said first and second bristled surfaces forcing said produce outwardly to the periphery of said first and second members;

means for receiving said produce upon a 360° discharge from the periphery of said first and second members and for guiding said produce to a single discharge path; and

means for providing a treating medium through said first bristled surface for treating said produce while passing outwardly to the periphery of said first and second members.

5,557,822

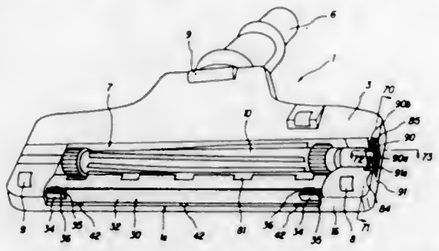
NOZZLE FOR A SPRAY GUN

Jeffrey A. Hall, Lake Orion, Mich., assignor to Binks Manufacturing Company, Franklin Park, Ill.

Filed Jan. 31, 1995, Ser. No. 381,139
Int. Cl.[6] B05B *1/34*
U.S. Cl. 239—600 **10 Claims**

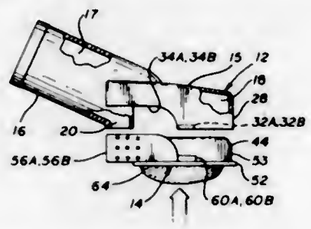
a nozzle body having a hollow tubular member for connecting to

5,557,822
ELECTRIC VACUUM CLEANER
Mikio Yagi, Osaka; Hiroshi Mikami, Sakai, and Taichi Tamura, Yao, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Oct. 14, 1994, Ser. No. 321,873
Claims priority, application Japan, Oct. 22, 1993, 5-264662; Aug. 2, 1994, 6-181570
Int. Cl.[6] A47L 9/06
U.S. Cl. 15—369 17 Claims



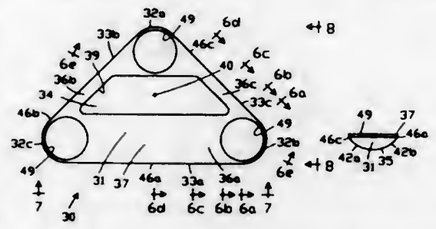
1. An electric vacuum cleaner having a suction nozzle comprising:
a nozzle body with a bottom surface, a front wall, and at least two side surfaces for housing the suction nozzle;
a dust inlet formed in the bottom surface of the nozzle body; and
a rotary brush rotatably mounted in the nozzle body along said dust inlet, said nozzle body including,
a flexible member, contacting a floor on which the nozzle body is moving and covering a lower portion of said front wall, the flexible member being mounted to the front wall of the nozzle body so as to pivot forward and backward in response to respective backward and forward movement of the nozzle body on the floor, the backward pivoting of the flexible member opening the lower portion of said front wall to enable suction of particles relatively large in size off the floor, and
a sliding piece slidably mounted on at least one of the side surfaces of the nozzle body, the sliding piece including a portion contacting the floor,
sliding backward and exposing a side opening in response to the respective forward movement of the nozzle body, to enable suction of particles relatively large in size, and
sliding forward and closing the side opening in response to respective backward movement of the nozzle body, to maintain maximum suction pressure through the dust inlet.

5,557,823
VACUUM CLEANER ATTACHMENT
Dawn V. Rouda, Lancaster, Pa., assignor to JMA & Associates, Indian Wells, Calif.
Filed May 26, 1995, Ser. No. 452,393
Int. Cl.[6] A47L 9/06
U.S. Cl. 15—400 5 Claims



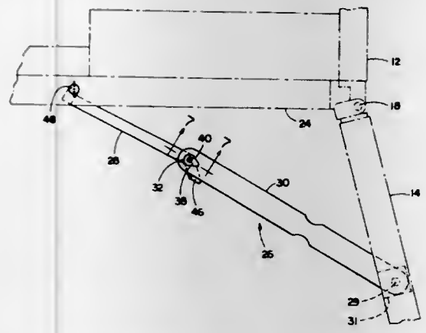
1. A vacuum cleaner attachment comprising:
a nozzle body having a hollow tubular member for connecting to the vacuum pipe of a vacuum cleaner, the side of the body turned away from the member having front and rear openings said rear opening having front, rear and side walls and in communication with said member, said front opening having a semi-flexible front wall, side walls and said front wall of said rear opening as the rear wall thereof, each of said side walls of said front opening having one half of a detent thereon; and
a cleaning pad support having upstanding front, side and rear walls, a top surface and a pad of plush-like slanted filaments mounted on the bottom surface, each of said side walls of said support having a second half of said detent thereon, said support adapted to fit within said front opening of said body such that said front wall of said pad support is in engagement with said front wall of said front opening and first and second halves of said detent are in releasable engagement.

5,557,824
FURNITURE FLOOR GLIDE
Richard D. Busbey, 3521 16th Ave., Kenosha, Wis. 53140
Filed Jun. 26, 1995, Ser. No. 494,696
Int. Cl.[6] A47B 91/06
U.S. Cl. 16—42 R 18 Claims



1. A glide for supporting furniture on a substantially horizontal floor surface comprising:
a monobloc having a bottom wall and at least one structural web extending from said bottom wall, said bottom wall having a floor-contacting lower surface under said web defined in part by a series of arcs blended together to define a relatively smooth convex surface;
said web extending along the periphery of the monobloc and having an upper surface at the end distal from said bottom wall adapted to support furniture thereon, said distal end defining at least one recess; and,
adhesive coated resilient material fixed within said recess, said adhesive material having an exposed upper side adapted to secure the monobloc to the bottom of furniture, whereby furniture on said monobloc rests on the upper surface thereof with the adhesive material holding the monobloc to the furniture pressed into said recess.

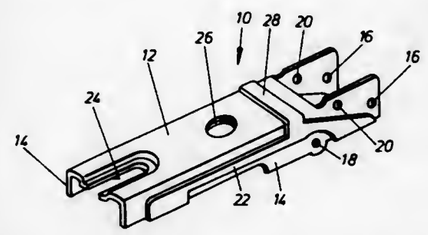
5,557,825
DOOR RETAINER MECHANISM FOR AUTOMATICALLY RETAINING ACCESS DOOR ON CABINET IN OPENED POSITION
Deborah L. Harr, Columbia, Mo., assignor to Hubbell Incorporated, Orange, Conn.
Filed Oct. 17, 1994, Ser. No. 323,744
Int. Cl.[6] E05C 17/04
U.S. Cl. 16—82 8 Claims
1. A door retainer mechanism for retaining an access door on a cabinet in an opened position, comprising:
(a) a first link pivotally coupled at a first end to a housing of the cabinet pivotally mounting an access door for movement between opened and closed positions;



(b) a second link pivotally coupled at a first end to the access door and pivotally coupled at a second end to a second end of said first link such that said first and second links undergo pivotal movement about said respective first ends relative to the cabinet housing and access door and about said respective second ends relative to each other between retracted and extended conditions with respect to one another as the access door is moved between the closed and opened positions relative to the cabinet housing; and
(c) first and second latching elements respectively defined on said second ends of said first and second links and being operable automatically to latch said first and second links to one another in said extended condition upon the access door reaching the opened position and said first and second links reaching said extended condition and thereby to retain the first and second links in said extended condition and the access door in the opened position and prevent said first and second links from pivotal movement relative to one another about said respective second ends and returning to said retracted condition and the access door from returning to the closed position, said first and second latching elements also being operable manually to unlatch said first and second links from one another and thereby release the access door from the opened position such that said first and second latching elements can be pivoted about said respective second ends and returned to said retracted condition as the access door is returned to the closed position, one of said first and second latching elements having a symmetrical configuration and an asymmetrical configuration and the other of said first and second latching elements having a complementary asymmetrical configuration permitting one of said latching elements to fit within the other of said latching elements in only one orientation upon registry of said asymmetrical configurations when said first and second links are latched in said extended condition so as to prevent pivotal movement of said links relative to one another.

5,557,826
HEAT INSULATING HANDLE FOR METALLIC COOKING POTS AND THE LIKE
Gerd Kloppsteck, Arnsberg, Germany, assignor to Heinrich Berndes Produktionsgesellschaft mbH, Germany
PCT No. PCT/EP95/01034, § 371 Date Nov. 8, 1995, § 102(e) Date Nov. 8, 1995, PCT Pub. No. WO95/25458, PCT Pub. Date Sep. 28, 1995
PCT Filed Mar. 20, 1995, Ser. No. 545,831
Claims priority, application Germany, Mar. 24, 1994, 9405011 U
Int. Cl.[6] A47J 45/08
U.S. Cl. 16—166 R 9 Claims
1. Handle apparatus of heat-insulating material for attachment to a cooking vessel having a fastening projection with a threaded bore therein located on an external wall of the cooking vessel,
the handle apparatus comprising a handle portion and an integrally attached fastening portion,
the fastening portion having an engagement surface shaped complementarily to the outer wall of a cooking vessel, and a lateral surface which remains exposed when the handle apparatus is secured to a cooking vessel, the fastening portion having a recess for receiving the fastening projection of a cooking vessel, and a handle portion bore for receiving a fastening screw therethrough for securing the handle apparatus to the fastening projection of a cooking vessel by way of a threaded bore located in the fastening projection, the handle portion bore leading out to a countersunk recess formed in the handle portion for receiving the head of a fastening screw,
said handle apparatus further comprising a horizontal groove of relatively small depth, the groove being defined by a base and perpendicular side walls, which groove extends over the mouth of the countersunk recess and over the breadth of the lateral surface of the fastening portion for receiving a cover, which cover is fashioned as a strip shape to correspondingly reside within the groove and which thereby closes the mouth of the countersink recess.

5,557,827
CABINET-WALL RELATED MEMBER FOR CABINET HINGES
Horst Lautenschläger, and Reinhard Lautenschläger, both of Reinheim, Germany, assignors to MEPLA-Werke Lautenschläger GmbH & Co.KG, Germany
Filed May 12, 1995, Ser. No. 439,623
Claims priority, application Germany, Sep. 7, 1994, 44 31 827.8
Int. Cl.[6] E05D 7/04;5/00
U.S. Cl. 16—237 9 Claims



1. An elongated hinge arm member of a furniture hinge (10, 10', 10") for attachment to a mounting plate affixed to a cabinet wall, the hinge arm having a lengthwise direction, comprising:
a web having a surface (12) and a pair of oppositely lying lateral longitudinal margins;
lateral flanges (14), having both an inner and an outer flat side, turned down at substantially right angles from each of the lateral longitudinal margins so that the hinge arm has a generally inverse U-shaped cross-sectional configuration; and
reinforcement means over at least a portion of the length of each lateral flange, wherein the reinforcement means comprises at

least one bead (22) embossed into each lateral flange in the lengthwise direction of the flange,

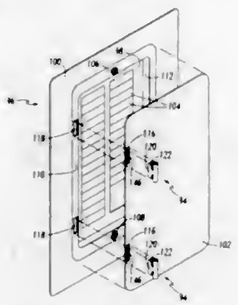
side structures which together define a compartment having a top

5,557,831
PROCESS FOR PRODUCING A WOVEN CARBON

body portion including means for engaging the fastener member to effect removal thereof, said removal means enabling a pulling

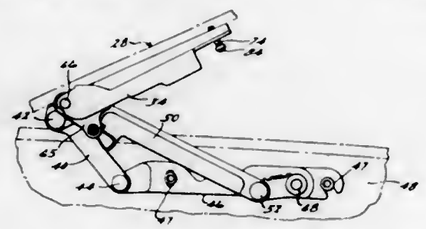
least one bead (22) embossed into each lateral flange in the lengthwise direction of the flange.

5,557,828
LOAD CENTER DOOR HINGE ELEMENT
Richard A. Reiner, Hanover Township, and John E. Swedowski, Parks Township, both of Pa., assignors to Eaton Corporation, Cleveland, Ohio
Filed Jul. 6, 1995, Ser. No. 500,809
Int. Cl.[6] E05D *7/00*
U.S. Cl. 16—257 **5 Claims**



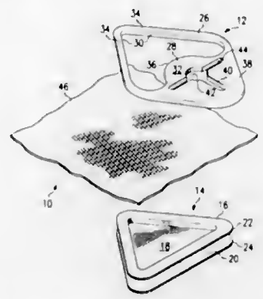
1. In a hinge assembly for pivotally mounting a door to a dead front cover of an enclosure for circuit breaker handles of a load center, said hinge assembly, comprising:
a hinge element formed by spaced-apart wall members,
a first of said wall members having a projection formed out of the surface of said first of said wall members, and
a second of said wall members having laterally opposed, bendable tab means,
said projection providing a positive partial retention of said first of said wall members in said cover dead front upon insertion of said hinge element into said cover dead front, and
said bendable tab means of said second of said wall members being bent after said hinge element is inserted into said cover dead front for said mounting of said door to said cover dead front.

5,557,829
VEHICLE MULTI-LINK HINGE FLUSH POSITIONING ARRANGEMENT
Robert M. Schoen, West Bloomfield, Mich., and Gregory E. Thurk, Roscoe, Ill., assignors to Chrysler Corporation, Highland Park, Mich.
Filed Mar. 28, 1995, Ser. No. 412,493
Int. Cl.[6] E05D *11/00*
U.S. Cl. 16—375 **7 Claims**



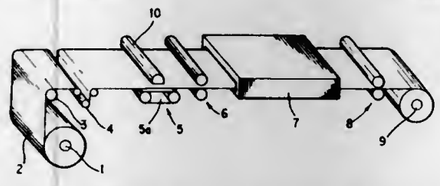
1. A multi-link hinge assembly for use as hinge means in an automotive vehicle having laterally spaced body side structures and longitudinally spaced supports extending transversely to the side structures which together define a compartment having a top opening, a closure having longitudinally extending side edges and an exterior surface, a laterally spaced pair of such hinge means swingably supporting one hinged end of the closure for movement between an upwardly extending open position to permit access to the compartment and a substantially horizontally disposed longitudinally extending closed position in which the closure covers the compartment, said multi-link hinge assembly comprising:
a longitudinally extending closure-half bracket having first and second ends, said bracket secured to an underside of the closure with said bracket first end adjacent the closure one hinged end;
a longitudinally extending body-half arm having first and second ends, said arm secured to an associated side structure of the compartment with said arm first end adjacent the closure one hinged end;
first and second links each pivotally connected at opposite ends to said bracket and said arm respectively, for movement in the plane of opening and closing movements of the closure;
wherein said bracket second end has an outboard extending tab portion that, when said closure is in said closed position, overlies an inboard extending stop portion of said arm, wherein said portions are in vertically spaced parallel relationship to each other;
said bracket outboard tab portion providing a threaded bore and an adjustable screw shank threadedly engaged with said bore, said shank terminating at its lower end in a head portion that, in said closure closed position, contacts an opposed surface of said arm stop portion to provide for vertical adjustment of an associated one longitudinal side edge of the closure for alignment of said side edge with said compartment opening, thereby minimizing adjustment of the hinge assembly body-half arm relative to its associated side structure.

5,557,830
FASTENER
William B. Davis, Arlington, Tex., assignor to Olympic General Corporation, Reno, Nev.
Filed Jan. 11, 1995, Ser. No. 371,412
Int. Cl.[6] A44B *21/00; 1/04*
U.S. Cl. 24—459 **16 Claims**



1. A fastener, comprising:
a) a retainer having a substantially triangular frame and a groove disposed about the outer circumference of said frame; and
b) a collar having a substantially triangular frame, said collar frame having first, second and third legs, each said leg having an inner sidewall adapted to be received within said groove of said retainer, wherein said collar frame and said retainer frame are equiangular.

5,557,831
PROCESS FOR PRODUCING A WOVEN CARBON REINFORCING FABRIC WITH A HIGH COVER FACTOR
Hajime Kishi; Nobuyuki Odagiri; Tokuo Tazaki; Hideo Nagata; Takeshi Terashita; Akira Nishimura, all of Ehime, and Hiroyasu Kato, Otsu, all of Japan, assignors to Toray Industries Inc., Tokyo, Japan
Division of Ser. No. 88,635, Jul. 9, 1993, Pat. No. 5,447,785, which is a continuation-in-part of Ser. No. 24,957, Mar. 2, 1993, abandoned. This application Jan. 4, 1995, Ser. No. 368,674
Claims priority, application Japan, Mar. 2, 1992, 4-80522
Int. Cl.[6] C08G *79/02*
U.S. Cl. 28—167 **3 Claims**

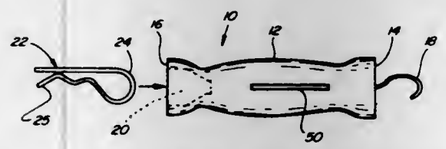


1. A process for producing a woven reinforcing fabric comprising the following steps:
a) providing a woven fabric having warps and woofs made of multi-filament yarns of carbon fiber wherein said warps and woofs are twisted to no more than 5 turns/meter and wherein the width of the mesh opening formed by the warps and woofs is at least ⅓ the width of the warps;
b) continuously feeding the woven fabric in the warp direction while treating the fabric with a plurality of water jets arranged in the weft direction, the spacing between adjacent water jets being no more than ⅓ of the spacing of the warps, the punching force of each of said water jets at the surface of said fabric being 0.1 to 3 grams-force, wherein said water jets originate from nozzles having an inner diameter of 0.05 to 0.5 mm;
wherein said reinforcing fabric has a cover factor of 90.0 to 99.8 percent and wherein the warps and woofs of said reinforcing fabric satisfy the following equation:

$$W=k\cdot(D/\rho)^{5/9}$$

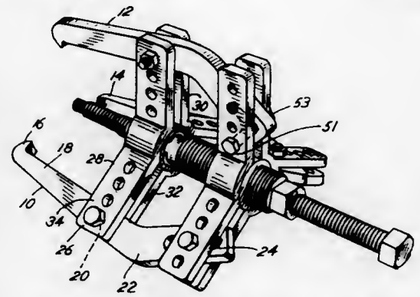
wherein k is a constant in the range of 3.5×10^{-2} to 10.0×10^{-2}; ρ is the specific gravity of the carbon fibers; and W and D are the width and denier respectively of the warp or woof.

5,557,832
TOOL FOR ATTACHING AND REMOVING CLIP TYPE FASTENER MEMBERS AND THE LIKE
Gerald A. Vanden Brook, 1401 Koerber, Cape Girardeau, Mo. 63701
Filed Sep. 15, 1994, Ser. No. 306,664
Int. Cl.[6] B23F *19/04*
U.S. Cl. 29—243.56 **9 Claims**



1. A tool for attaching and removing various fastener members from a wide variety of different mechanical assemblies comprising a body portion having first and second end portions associated therewith, said body portion being sized and shaped so as to be comfortably grasped by a user's hand, the first end portion of said body portion including means for engaging the fastener member to effect removal thereof, said removal means enabling a pulling force to be exerted against the fastener member during the removal process, the second end portion of said body portion including means for holding the fastener member in an operatively stable position to effect attachment thereof, said attachment means enabling a pushing force to be exerted against the fastener member during the attachment process, and means for fastening the tool member to the particular mechanical assembly associated with the fastener member to be attached or removed therefrom.

5,557,833
PULLER DEVICE
James L. Pool, Clarinda, Iowa, assignor to Lisle Corporation, Clarinda, Iowa
Filed Feb. 22, 1995, Ser. No. 392,144
Int. Cl.[6] B23P *19/04*
U.S. Cl. 29—261 **11 Claims**



1. Apparatus for effecting either an inside pull of an item from a housing or an outside pull of an item from a shaft, said apparatus being reversible between a configuration to effect an inside pull and an outside pull, said apparatus comprising, in combination:
at least first and second reversible, integral pulling jaw members, said jaw members each having a gripping end, a first link extending from the gripping end to a pivot and a second integral link extending from the pivot away from the gripping end;
a jaw support yoke having a centerline axial bore with a centerline axis and a plurality of radially extending arms, each of said arms including a pivot connection for pivotally connecting with one of the jaw members, said jaw members having aligned gripping ends;
a pressure screw extending through the axial bore of the yoke toward the gripping ends, and threadably attached to the jaw support yoke;
a cam member carriage having a centerline axial bore concentric with the yoke bore and including a plurality of radially extending arms;
an annular spacing screw in the cam member carriage bore, said spacing screw axially movable with respect to the cam member carriage bore, said spacing screw threadably attached to the cam member carriage, said pressure screw concentric with the spacing screw, said annular spacing screw rotatably attached to the jaw support yoke whereby the axial spacing of the yoke and carriage is adjustable by threadably adjusting the annular spacing screw;
said second link defining inside and outside cam surfaces, said carriage arms defining inside and outside cam followers coacting with the cam surfaces whereby when the axial spacing of the yoke and carriage is adjusted, the second link cam surfaces coact with the carriage followers to effect pivoting of the jaw members toward or away from each other for inside or outside gripping of the item and;
said pressure screw being rotatable to engage a surface and thereby simultaneously transport the yoke, carriage and jaws to effect a pull.

5,557,834
METHOD OF AND APPARATUS FOR ASSEMBLING COMPONENT PARTS

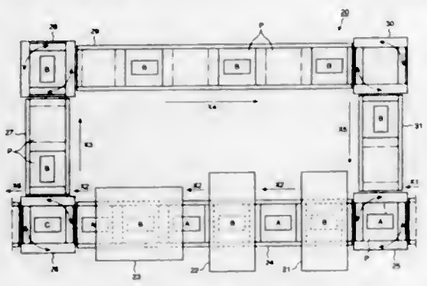
b) cleaning the bar end in the region where the new connecting device is intended to be mounted;
c) material-cutting machining the end surface of the bar end;

5,557,834

METHOD OF AND APPARATUS FOR ASSEMBLING COMPONENT PARTS

Hiroshi Miyanaka; Hideharu Sakimori, and Yuzo Uotani, all of Hiroshima-ken, Japan, assignors to Mazda Motor Corporation, Hiroshima-ken, Japan

Filed Dec. 21, 1994, Ser. No. 360,932
Int. Cl.[6] B23P *13/00;21/00*
U.S. Cl. 29—407.05 **11 Claims**



1. A method of assembling individual units in which an incomplete unit is moved forward along an assembly line in progression to successive disassembling and assembling stations for addition of component parts to the unit until the unit is complete, said method comprising the steps of:

disassembling, at the disassembling station, component parts from said incomplete unit, said component parts having been machined as an integral part of said incomplete unit;

adding and provisionally assembling, at the assembling station, components including a specific component part and the integrally machined component parts to said incomplete unit so as to provide a provisionally complete unit;

performing an inspection of a positional relationship of said component parts relative to one another;

disassembling, at said disassembling station, said component parts from said provisionally complete unit; and

replacing said specific component part with another specific component part according to a result of said inspection and completely assembling said component parts again to the unit at said assembling station so as to provide an enduringly complete unit with a predetermined positional relationship among said component parts.

5,557,835

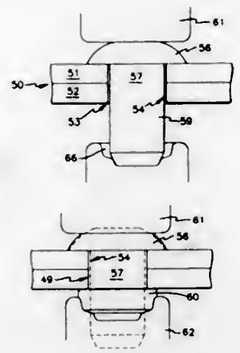
METHOD, RIVET-PUNCH, FOR JOINING SEVERAL METAL SHEETS BY USING NON-HEAT-TREATED RIVETS MADE FROM AN ALUMINIUM ALLOY

Michiel P. Brandts, Godelindeweg 5, NL-1217 HP Hilversum, Netherlands

PCT No. PCT/NL92/00034, § 371 Date Oct. 12, 1993, § 102(e) Date Oct. 12, 1993, PCT Pub. No. WO92/14566, PCT Pub. Date Sep. 3, 1992
PCT Filed Feb. 18, 1992, Ser. No. 107,705
Claims priority, application Netherlands, Feb. 19, 1991, 9100286
Int. Cl.[6] B21J *15/02*
U.S. Cl. 29—524.1 **11 Claims**

1. A method of joining together metal sheets (**51**, **52**) of a stack (**50**) by a rivet (**55**) having a shank (**57**), of which a shank end (**59**) with a beginning diameter (d) is deformed by radial expansion into a disc-shaped rivet head (**60**) with an ending diameter (D), said method comprising the steps of:

providing a first rivet punch (**62**) preliminarily with a die recess (**66**) having a stepped contour in a central part of the first rivet punch (**62**), said stepped contour comprising a bottom (**60**) of said die recess (**66**) bordered by an annular wall (**68**) disposed at a relatively small angle to an axis of said die recess (**66**)



bordered in turn by an annular step (**70**) disposed at a relatively large angle to said axis and bordered by an annular wall (**67**) disposed at a relatively small angle to said axis;

positioning the first rivet punch (**62**) having, in the centra part (**67**), the profile (**69**) complementary to a profile of the shank end (**59**) so that the first rivet punch (**62**) stops expansion of the disc-shaped rivet head (**60**) before a ratio of the ending diameter (D) to the beginning diameter (d) exceeds a critical value, above which crack formation occurs;

providing initially a gap (**53**) between a wall (**54**) of the shank (**57**) and a wall (**49**) of the metal sheets (**51**, **52**);

surrounding the shank end (**59**) partially with the first rivet punch (**62**) having an inner diameter initially spaced from the shank end (**59**) so that the expansion of the shank end (**59**) is accommodated by a hollow space in the first rivet punch (**62**), and also so that the ratio of the ending diameter (D) to the beginning diameter (d) remains below the critical value above which crack formation occurs; and

using a second rivet punch (**61**) to strike a cap (**56**) of the rivet (**55**) with a force so that the shank end (**59**) with the beginning diameter (d) is radially deformed into the head (**60**) with the ending diameter (D) which matches the inner diameter of the hollow space in the first rivet punch (**62**);

whereby, due to expansion of the shank (**57**), the gap (**53**) disappears and a diameter of a hole, of which the gap (**53**) forms a part and in which the rivet (**55**) extends through the metal sheets (**51**, **52**), is widened out.

5,557,836

METHOD OF MANUFACTURING A CUBE CORNER ARTICLE

Kenneth L. Smith, White Bear Lake, and Gerald M. Benson, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 140,638, Oct. 20, 1993, abandoned. This application Oct. 20, 1994, Ser. No. 326,690
Int. Cl.[6] B23P *17/00*
U.S. Cl. 29—527.4 **10 Claims**

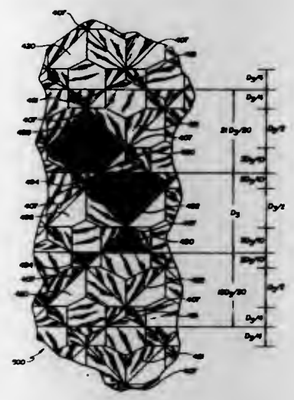
1. A method of manufacturing a cube corner article, comprising the steps of:

providing a machinable substrate;

machining in the substrate a first groove set comprising a plurality of parallel grooves such that at least two adjacent grooves in the first groove set are displaced by a first distance d_1;

machining in the substrate a second groove set comprising a plurality of parallel grooves such that at least two adjacent grooves in the second groove set are displaced by a second distance d_2, the second groove set intersecting the first groove set at a plurality of intersection locations; and

machining in the substrate a third groove set comprising a plurality of parallel grooves such that at least two adjacent



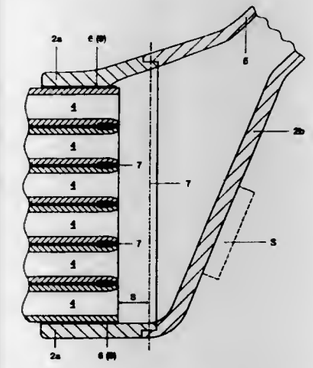
grooves in the third groove set are displaced by a third distance d_3, different from d_1 and d_2, at least one of the grooves in the third groove set intersecting the first groove set and the second groove set at a point displaced from the intersection locations, thereby forming a structured surface comprising an array of cube corner elements including at least two non-congruently shaped cube corner elements.

5,557,837

METHOD FOR REPAIRING STATER WINDING BARS

Alfred Thiard-Laforet, Midlothian, Va., and Wilibald Zerlik, Birr, Switzerland, assignors to ABB Management AG, Baden, Switzerland

Filed Apr. 3, 1995, Ser. No. 415,362
Claims priority, application Germany, Jan. 26, 1995, 195 02 308.0
Int. Cl.[6] H02K *15/14*
U.S. Cl. 29—596 **4 Claims**



1. A method for repairing a connecting device for the electrical connection and for supplying and carrying away the coolant to and from the conductor elements of the stator winding bars of electrical machines, at least some of said conductor elements being hollow, all the conductor elements being surrounded by a metallic component and being soldered thereto and to one another, which component overhangs the conductor elements forming a water chamber and ends in a connecting fitting for coolant supply and carrying the coolant away, comprising the following method steps:

a) inductive heating and removal of the existing connecting device from the bar end;

b) cleaning the bar end in the region where the new connecting device is intended to be mounted;

c) material-cutting machining the end surface of the bar end;

d) introducing narrow slots between adjacent conductor elements into the end of the bar in the transverse direction and vertical direction;

e) pushing on a first connecting part which is made of copper and completely surrounds the bar end;

f) filling remaining gaps between the first connecting part and the outer surfaces of the bar end with copper foil and/or solder foil;

g) filling the narrow slots, which have been introduced into the end of the bar, with copper foil and/or solder foil or a combination of both;

h) inductive heating of the first connecting part and of the bar end and soldering with the addition of solder;

i) at least visual inspection of the solder joint thus created;

j) fitting a second connecting part made of copper to the free end surface of the first connecting part by soldering;

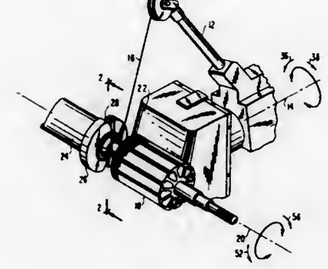
k) testing the sealing of the resulting connecting device.

5,557,838

METHODS FOR WINDING ARMATURES HAVING SLOT COMMUTATORS

Massimo Lombardi; Sabatino Luciani; Massimo Ponzio, and Graziano Quirini, all of Florence, Italy, assignors to Axis USA, Inc., Marlborough, Mass.

Division of Ser. No. 909,577, Jul. 6, 1992, Pat. No. 5,369,877.
This application Aug. 5, 1994, Ser. No. 286,516
Int. Cl.[6] H02K *15/09*
U.S. Cl. 29—597 **14 Claims**



1. A method for winding wire around an electric motor armature, the armature having portions defining core slots and portions defining commutator slots, the method comprising the steps of:

winding the wire into first and second core slots with a rotating flyer;

positioning a guide ring having a notch so that the notch intersects and captures the wire;

positioning the armature so that the notch is aligned with a selected one of the commutator slots;

rotating the flyer in a first direction after the notch is positioned to intersect and capture the wire and after the notch is aligned with the selected commutator slot, the rotation of the flyer drawing the wire into the notch directly towards the selected commutator slot;

securing the wire in the selected commutator slot; and

forming a loop in the wire.

5,557,839

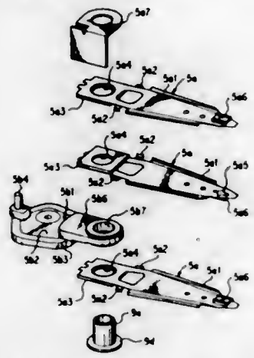
METHOD OF FABRICATING AN IMPROVED

a) a cylinder having a diameter smaller than the diameter of said tubes, whereby said cylinder may be freely moved axially into

5,557,842

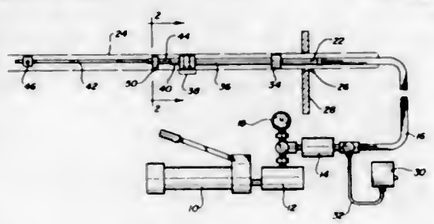
METHOD OF MANUFACTURING A SEMICONDUCTOR LEADFRAME STRUCTURE

5,557,839
METHOD OF FABRICATING AN IMPROVED TRANSDUCER SUSPENSION ASSEMBLY
Mark Mastache, and Peter A. Capano, both of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Division of Ser. No. 865,013, Apr. 8, 1992, abandoned. This application Mar. 16, 1995, Ser. No. 405,314
Int. Cl.[6] G11B *5/42*
U.S. Cl. 29—603.03 **3 Claims**



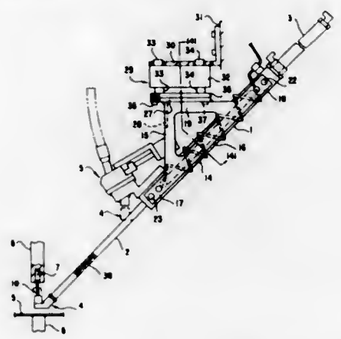
1. A method of fabricating an actuator assembly for a disk drive, comprising:
providing a tubular member having a flange;
providing at least one load beam having a hole therethrough sized to slide over said tubular member;
providing a motor coil housing;
providing a motor coil on said motor coil housing, said motor coil housing having a bole therethrough that is sized to slide over said tubular member;
stacking said at least one load beam and said motor coil housing on said tubular member in a predetermined sequence forming a stack seated upon said flange;
compressing said stack of load beam and motor coil housing against said flange; and
expanding said tubular member, while maintaining said stack in compression, to compressively engage said tubular member in each said hole to frictionally secure said at least one load beam and said motor coil housing to said tubular member;
rotatably mounting said tubular member for rotation about a longitudinal axis of said tubular member.

5,557,840
TUBE SHEET LOCATOR AND TUBE EXPANDER
John P. Terpening, Syracuse, N.Y., assignor to J. E. Miller Inc., E. Syracuse, N.Y.
Filed Feb. 19, 1995, Ser. No. 387,080
Int. Cl.[6] B23P *15/26*
U.S. Cl. 29—727 **21 Claims**



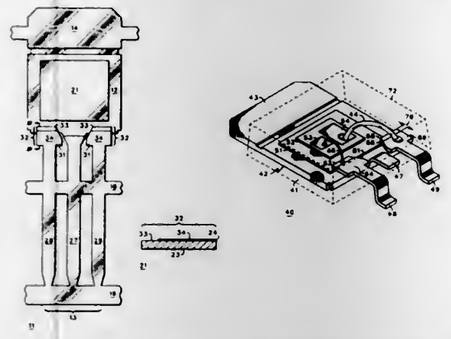
1. Apparatus for effecting localized, radial expansion of ductile metal tubes of a heat exchange device into tight engagement with a tube support sheet, said apparatus comprising:
a) a cylinder having a diameter smaller than the diameter of said tubes, whereby said cylinder may be freely moved axially into and out of said tubes;
b) a plurality of pistons arranged in axially spaced relation to one another within said cylinder in hydraulically sealed relation thereto, each of said pistons having a surface to which a predetermined fluid pressure is applied to effect movement of said pistons in a first direction axially of said cylinder;
c) a plurality of connecting rods, each extending between and fixedly connected at opposite ends to a successive pair of said pistons, whereby all of said pistons are rigidly connected in series and are moved in said first direction with a total force equal to said predetermined pressure multiplied by the total area of said piston surfaces;
d) a deformable member positioned within said tube, outside said cylinder, said member being radially expandable in response to axial compression, and returning to its original configuration upon removal of said axial compression; and
e) means for translating said total force from said pistons to said axial compression, the magnitude of said total force being sufficient to radially expand said deformable member by an amount effecting said radial expansion of said tube.

5,557,841
PARTS FEEDING DEVICE
Yoshitaka Aoyama, and Shoji Aoyama, both of 20-11, Makitsukadai 2-cho, Sakai-shi, Osaka 590-01, Japan
PCT No. PCT/JP94/01419, § 371 Date Jan. 25, 1995, § 102(e) Date Jan. 25, 1995
PCT Filed Aug. 26, 1994, Ser. No. 290,782
Claims priority, application Japan, Apr. 2, 1994, 6-099070
Int. Cl.[6] B23P *19/04*; B23Q *3/15*
U.S. Cl. 29—743 **7 Claims**



1. A parts feeding device having a feed rod received in a guide tube such that the feed rod can be advanced and retracted and whereby parts held in the feed rod are fed to a predetermined position for insertion into a receiving hole in a mating member, wherein the guide tube is joined to an air cylinder supported by a stationary member, wherein a stroke of said air cylinder inserts a part from the feed rod into said receiving hole, said parts feeding device further comprising
a holding member for magnetically attracting and holding parts, said holding member being joined to one end of the feed rod, with an air spout port formed in said holding member,
wherein said air spout port communicates with a compressed air supply, and a part magnetically held by the holding member is urged by air from the air spout port toward the receiving hole, thereby effecting transfer of the part to the receiving hole.

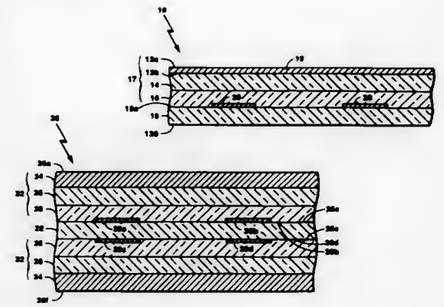
5,557,842
METHOD OF MANUFACTURING A SEMICONDUCTOR LEADFRAME STRUCTURE
Keith W. Bailey, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Division of Ser. No. 398,830, Mar. 6, 1995. This application May 30, 1995, Ser. No. 452,754
Int. Cl.[6] H01R *43/00*
U.S. Cl. 29—827 **15 Claims**



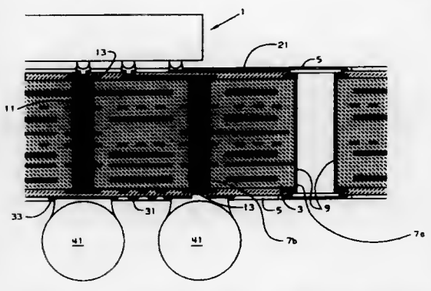
15. A process for forming a semiconductor device including the steps of:
attaching a semiconductor chip to a leadframe structure, wherein the leadframe structure comprises a die bond portion, a first lead, and a second lead, and wherein the first lead includes a first bond post having a first major surface for forming a wire bond, and wherein the first major surface has a first portion comprising a first metal and a second portion comprising a second metal different than the first metal so that the first bond post can accommodate connecting wires that comprise different materials, and wherein the second lead includes a second bond post having a second major surface for forming a wire bond, and wherein the second major surface has a first portion comprising the first metal and a second portion comprising the second metal so the second bond post can accommodate connecting wires that comprise different materials;
coupling a first connecting wire to the semiconductor chip and to one of the first and second portions of the first bond post;
coupling a second connecting wire to the semiconductor chip and to one of the first and second portions of the second bond post; and
placing a protective material over portions of the semiconductor chip, the first and second connective wires, and the first and second bond posts.

5,557,843
METHOD OF MAKING A CIRCUIT BOARD OR LAYER THEREOF INCLUDING SEMI-CURING A SECOND ADHESIVE COATED ON A CURED FIRST ADHESIVE
Darryl J. McKenney, Milford, and Robert D. Cyr, Manchester, both of N.H., assignors to Parlex Corporation, Methuen, Mass.
Division of Ser. No. 110,437, Aug. 23, 1993, Pat. No. 5,362,534. This application Aug. 30, 1994, Ser. No. 297,792
Int. Cl.[6] H05K *3/28;3/38;3/46*
U.S. Cl. 29—851 **6 Claims**

1. A method of manufacturing a printed circuit board comprising the steps of:
coating a first surface of a first conductive foil with a first adhesive;
curing the first adhesive on the first surface of the first conductive foil;
coating a first surface of the cured first adhesive with a second adhesive;
semi-curing the second adhesive on the first surface of the cured first adhesive; and
applying the semi-cured second adhesive against a first surface of a substrate, so as to form a printed circuit board.



5,557,844
METHOD OF PREPARING A PRINTED CIRCUIT BOARD
Anilkumar C. Bhatt, Johnson City; Roy H. Magnuson, Endicott; Voya R. Markovich, Endwell; Konstantinos I. Papathomas, and Douglas O. Powell, both of Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 342,533, Nov. 21, 1994. This application Jun. 5, 1995, Ser. No. 463,344
Int. Cl.[6] H01K *3/10*
U.S. Cl. 29—852 **1 Claim**



1. A method of preparing a printed circuit board having a film redistribution layer and selective filled plated through holes comprising the steps of:
a. laminating a printed circuit board subcomposite with 0.5 ounce/square foot Cu foil on both sides thereof;
b. thinning the copper foil to about 0.00025 inch;
c. drilling a pattern of holes through the subcomposite for plated through holes, and drilling a sheet of polyimide with the same plated through hole pattern;
d. seeding the drilled subcomposite with a palladium/tin colloidal suspension whereby to make the exposed surfaces catalytic for electroless Cu plating; ,
e. electrolessly plating copper over the exposed surfaces of the subcomposite and in the plated through hole barrels to a thickness of about 0.001 to 0.0012 inch;
f. positioning the drilled polyimide sheet on the subcomposite aligned with the plated through holes;
g. placing a sheet of foil coated with plated through hole filler composition atop the sub-composite to form a stack;
h. laminating the stack to cause the coating composition to soften and flow through the holes in the drilled polyimide into the plated through holes and thereafter cure;

i. abrading the surface thereof to remove nubs of the fill material from the tops of the filled plated through holes, and remove

providing said housing with a locking ramp having a circumferentially sloping ramp surface facing in one axial direction,

5,557,847
METHOD OF PRODUCING A METAL HONEYCOMB CARRIER

peripheral frustoconical wall inclined outwardly from the central region, the wall having an inner surface and an innermost free

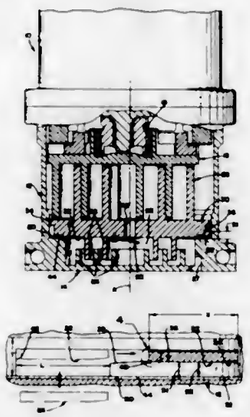
i. abrading the surface thereof to remove nubs of the fill material from the tops of the filled plated through holes, and remove fill residues on the surface of the copper foil from bleed between the mask and the sub-composite;
j. drilling the subcomposite with the pattern of plated through holes that are to remain unfilled, deburring, and chemical hole cleaning the unfilled plated through hole barrels for plating;
k. seeding the subcomposite with a palladium/tin colloidal suspension, and electrolessly copper plating the seeded subcomposite with an additional 0.0002 to 0.0003 inch of copper;
l. applying a layer of photoresist to the subcomposite, and exposing and developing the layer of photoresist to define a desired pattern of surface circuitization;
m. etching the exposed surface of the subcomposite to form a desired circuit pattern;
n. stripping the photoresist;
o. applying a dry film photoimagable, dielectric polymer, to one or both surfaces of the subcomposite;
p. exposing the photoimagable dielectric with the pattern of the desired vias between the subcomposite circuitry and the circuitry to be formed on the top surface of the dielectric;
q. developing the pattern of via openings, and thereafter processing the dielectric to further cure the dielectric;
r. seeding the dielectric with a colloidal palladium/tin suspension;
s. laminating a subsequent dry film photoresist layer thereto, over the palladium/tin seed layer; imaging the photoresist with the image of the circuitization to be formed, and developing the imaged photoresist;
t. plating the subcomposite with copper to form a film redistribution layer thereon;
u. stripping the photomask from the circuitized composite.

5,557,845

METHOD FOR INSTALLING A STATIONARY SCROLL

Michael J. Burkett, Lockport, and Nikolaos A. Adonakis, Grand Island, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 20, 1995, Ser. No. 407,127
Int. Cl.[6] B23P *15/00*
U.S. Cl. 29—888.022 **3 Claims**



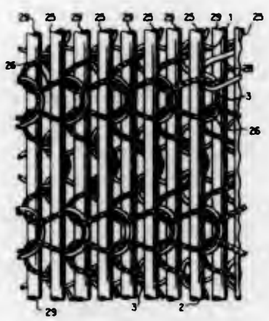
1. In a scroll compressor having a generally cylindrical housing and a stationary scroll with a disk shaped end plate having an axially inwardly facing lower surface and an outer edge surrounded by said housing, a method for installing said scroll to said housing, comprising the steps of,
providing said housing with a generally annular, axially outwardly facing annular shelf having an area of radial overlap with said scroll end plate lower surface,
providing said housing with a locking ramp having a circumferentially sloping ramp surface facing in one axial direction, radially overlapped with said shelf, and having a predetermined least axial separation from said shelf,
providing said scroll end plate outer edge with a locking ramp with an oppositely circumferentially sloping ramp surface facing in the opposite axial direction from said housing locking ramp surface and radially coextensive therewith, said end plate locking ramp surface having a least axial separation from said end plate lower surface substantially equal to said predetermined least axial separation,
inserting said scroll end plate outer edge axially inside of said housing at an angular position in which said respective ramps are angularly misaligned, and,
turning said housing and scroll relative to one another until said respective ramp surfaces align with one another, thereby wedging said respective ramp surfaces past one another and forcing said scroll end plate lower surface and housing shelf into tight axial engagement.

5,557,846

BLANK FOR THE MANUFACTURING OF FIBER REINFORCED COATINGS OR METAL COMPONENTS

William Wei, München, and Thomas Stoll, Reutlingen, both of Germany, assignors to MTU Motoren- und Turbinen-Union Muenchen GmbH, Germany

Division of Ser. No. 257,537, Jun. 9, 1994, Pat. No. 5,440,806, which is a division of Ser. No. 29,667, Mar. 11, 1993, Pat. No. 5,356,701. This application Jun. 7, 1995, Ser. No. 474,959
Claims priority, application Germany, Mar. 13, 1992, 42 08 100.9
Int. Cl.[6] B23P *15/02*
U.S. Cl. 29—889.2 **5 Claims**



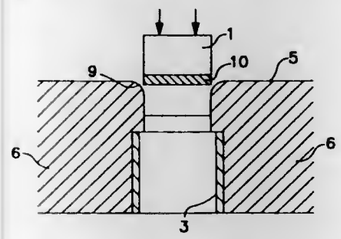
1. A process for manufacturing fiber-reinforced titanium components, comprising the steps of using a blank material having
a plurality of fibers made from a material which has a high tensile strength and is stable at high temperatures, and
a knitted metal wire material comprising a plurality of metal wire mesh,
knitting and holding said fibers in said metal wire material in an orientation in which said fibers are separated from each other and are parallel to an axis of said blank material;
guiding reinforcing fibers as woof yarns in a knitting machine in parallel to an axis of said blank material;
knitting metal wire meshes around said reinforcing fibers,
placing at least one layer of said blank material onto a desired form; and
compressing said at least one layer of said blank material by means of high-temperature isostatic pressing to form said fiber-reinforced titanium components.

5,557,847

METHOD OF PRODUCING A METAL HONEYCOMB CARRIER

Yoshikazu Koshiba; Yukio Aoki; Tsuyoshi Minakata; Michio Inamura; Tomohiro Yasunaga, all of Tokyo; Fujiya Imoto, Yawata, and Junichi Nakagawa, Takatsuki, all of Japan, assignors to Nippon Yakin Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 182,192, Apr. 12, 1994, abandoned. This application Apr. 21, 1995, Ser. No. 427,625
Claims priority, application Japan, May 29, 1992, 4-139314; Jun. 23, 1992, 4-165010; Jun. 23, 1992, 4-165020
Int. Cl.[6] B01J *35/04*; F01N *3/28*
U.S. Cl. 29—890 **6 Claims**



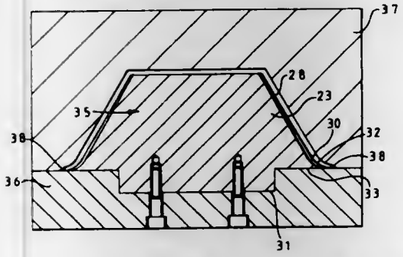
1. In a method for producing a metal honeycomb carrier for carrying an exhaust gas cleaning catalyst, wherein the carrier is in the form of a core part having a honeycomb structure formed by winding a plurality of alternating corrugated metal plates and flat metal plates, by inserting the core part into an outer cylindrical casing having an inner diameter substantially the same as the outer diameter of the core part, the improvement comprising
contracting the core part to an outer diameter which is smaller than the inner diameter of the cylindrical casing,
inserting the contracted core part into the cylindrical casing, and,
allowing the inserted contracted core part to expand to its original outer diameter to thereby engage with the cylindrical casing,
said step of contracting the core part thereby facilitating the step of inserting the core part into the cylindrical casing.

5,557,848

ROTARY ATOMISERS

Graham S. Povey, Bromyard, United Kingdom, assignor to Micron Sprayers Limited, Bromyard, United Kingdom

PCT No. PCT/GB93/00053, § 371 Date Jul. 21, 1994, § 102(e) Date Jul. 21, 1994, PCT Pub. No. WO93/13867, PCT Pub. Date Jul. 22, 1993
PCT Filed Jan. 12, 1993, Ser. No. 256,705
Claims priority, application United Kingdom, Jan. 21, 1992, 9201190
Int. Cl.[6] B05B *3/10*
U.S. Cl. 29—890.143 **15 Claims**



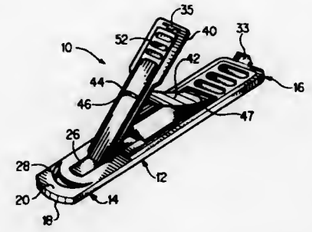
1. A method of producing a rotary dispersion member in the form of a hollow truncated cone having a central region and a peripheral frustoconical wall inclined outwardly from the central region, the wall having an inner surface and an innermost free edge, grooves formed in said inner surface of the wall, each groove having a required width, having opposite faces defining a groove angle therebetween, being symmetrical and extending radially outwardly from the central region to the innermost free edge of the wall, the grooves having respective end parts at said innermost free edge of the wall, the respective end parts of the grooves being arcuate and the grooves having respective straight parts extending from said central region to the respective end parts, the method comprising the steps of providing a form having at least in part an external shape in the form of a truncated cone having a frustoconical side surface, providing a cutter having a cutting face corresponding to the groove angle of each of said grooves of the rotary dispersion member, cutting a first groove in the form using the cutter, said cutting including a step of moving said cutter along a line parallel to said frustoconical side surface, to cut at least a part of a straight part of the first groove in the form, repeating said cutting to provide a further groove in the form angularly spaced from said first groove around the frustoconical side surface of the form by a distance corresponding to a required groove spacing in the rotary dispersion member, removing material from a wider end of said form around the whole of its periphery until an end of an outer generated surface of the arcuate end part of each groove is at a required angle to a surface normal to a central axis of rotation of the form, said form then constituting one part of a mould tool, providing another part of said mould tool in the form of a cavity part, placing said mould tool parts together and moulding said rotary dispersion member therebetween, with said respective end parts of the grooves thereof being arcuate at said innermost free edge of the frustoconical wall.

5,557,849

NAIL CLIPPER

Young S. Lee, and Jong C. Kim, both of Seoul, Rep. of Korea, assignors to Y.S. Creation Co., Ltd., Rep. of Korea, and Meepo USA Co., Calif.

Filed Dec. 11, 1995, Ser. No. 570,662
Int. Cl.[6] A45D *29/02*
U.S. Cl. 30—29 **9 Claims**



1. A nail clipper, comprising:
a clipper body comprising a front section and a rear section, the front section comprising a top plate and a base plate defining a passageway therebetween, the top plate and the base plate each comprising an aperture substantially aligned with each other and adapted to receive a finger nail therewithin, the rear section comprising a first handle;
a blade slidably positioned in the passageway, the blade comprising a cutting edge;
a second handle having a front end connected to the blade; and
a flexible plate having a first end and an opposing second end, the first end of the flexible plate attached to the second handle and the second end of the flexible plate attached to the first handle, the flexible plate adapted to normally bias the second handle and the blade in a retracted position rearward from the apertures;
wherein second handle is adapted to be gripped against the first handle to overcome the bias of the flexible plate to advance

the blade from the retracted position to a forward position in which the cutting edge of the blade passes the apertures.

5,557,851

DYNAMIC FLEXIBLE RAZOR HEAD

a motor connected to said knife, said motor being adapted to operate said knife,

the blade from the retracted position to a forward position in which the cutting edge of the blade passes the apertures.

5,557,850

RECIPROCAL ELECTRIC SHAVER

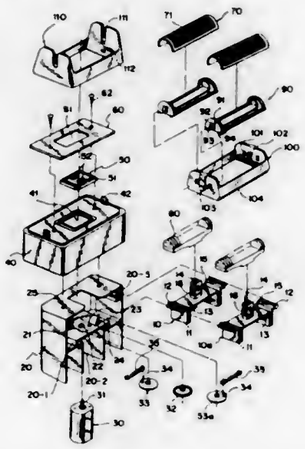
Mun K. Hyoun, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 29, 1994, Ser. No. 365,955

Claims priority, application Rep. of Korea, Dec. 29, 1993, 1993-30420

Int. Cl.[6] B26B *19/02*

U.S. Cl. 30—43.92 **6 Claims**



1. A reciprocal electric shaver, comprising a housing;

first and second cutters mounted in said housing for linear reciprocation along parallel paths;

an electric motor mounted in said housing and including a drive shaft rotatable about a main axis; a drive gear affixed to said shaft for rotation therewith;

first and second driven gears mounted for rotation about first and second secondary axes, respectively, oriented parallel to and spaced equidistantly from said main axis, said secondary axes being intersected by a common reference line which also intersects said main axis, both of said driven gears being connected to said drive gear to be driven thereby; and

first and second connecting links each interconnecting a respective one of said driven gears and a respective cutter, one end of each of said first and second connecting links being pivotably connected to a respective one of said driven gears for pivotal movement about an eccentric axis oriented parallel to and spaced from

said secondary axis of the respective driven gear, said eccentric axes being spaced equidistantly from their respective secondary axes and from said main axis, the other end of said connecting link being pivotally connected to said respective cutter for reciprocating said cutters in mutually opposite directions in response to rotation of said drive gear.

5,557,851

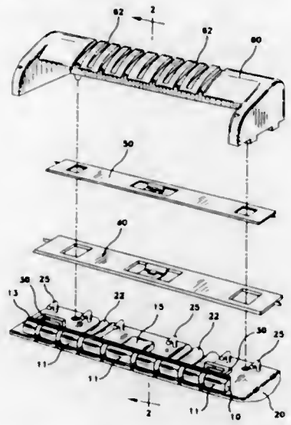
DYNAMIC FLEXIBLE RAZOR HEAD

Ernest A. Ortiz, Cheshire, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 234,740, Apr. 28, 1994, abandoned. This application Feb. 2, 1996, Ser. No. 597,534

Int. Cl.[6] B26B *21/40*

U.S. Cl. 30—50 **14 Claims**



1. A flexible razor head comprising:

a base member;

a movable guard bar comprising a face-engaging portion and a rearwardly-extending tongue, said guard bar having a home position;

means for resiliently connecting said guard bar to said base member whereby said connecting means biases said guard bar toward said home position;

at least one blade pivotally connected to said base member along a pivotal axis, said blade having a home position, whereby said tongue is operatively connected to said blade such that movement of said guard bar causes saod blade to rotate about said pivotal axis; and

whereby said base member and said at least one blade are adapted to flex in response to forces encountered during shaving.

5,557,852

HAND TOOL WITH FIVE CUTTING EDGES

Giacomo Frisina, P.O. Box 655, Newman Lake, Wash. 99025

Filed May 31, 1995, Ser. No. 454,688

Int. Cl.[6] B25D *3/00*

U.S. Cl. 30—167 **1 Claim**

1. A hand tool for use in woodworking, comprising:

(I) a blade, comprising:

(a) a front cutting edge;

(b) a left cutting edge, adjacent to the front cutting edge;

(c) a right cutting edge, adjacent to the front cutting edge;

(d) a left rear cutting edge, adjacent to the left cutting edge; and

(e) a right rear cutting edge, adjacent to the right cutting edge;

(II) a shaft, attached to the blade, comprising:

(a) a body portion having a forward end attached to the blade and having a rearward end;

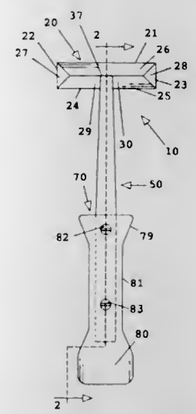
(b) a lower curved portion;

(c) a transition portion, attached to the lower curved portion;

(d) an upper curved portion, attached to the transition portion;

(e) a middle portion, attached to the upper curved portion; and

(f) a rear end portion, attached to the middle portion, having a forward bolt hole and a rearward bolt hole; and



(III) a handle, attached to the rearward end of the shaft by a forward bolt and a rearward bolt, comprising:

(a) an upper piece, having a forward bolt hole and a rearward bolt hole, and also having a flared front portion and a bulbous rear portion and a central grip portion;

(b) a lower piece, having a forward bolt hole and a rearward bolt hole, and also having a flared front portion and a bulbous rear portion and a central grip portion, attached to the upper piece;

(c) an axial cavity surrounding the rearward end of the body portion of the shaft; and

(d) a front opening in the axial cavity through which the shaft passes.

5,557,853

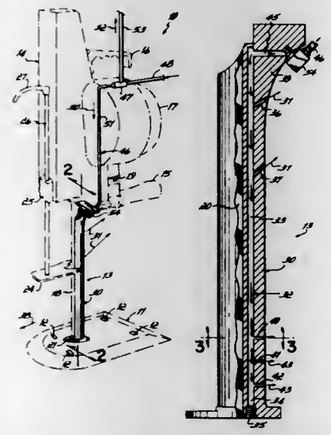
AIR COOLED CLOTH CUTTING MACHINE

L. George Andre, and Scott E. Andre, both of Cincinnati, Ohio, assignors to The Wolf Machine Company, Cincinnati, Ohio

Filed Mar. 6, 1995, Ser. No. 399,194

Int. Cl.[6] B26B *7/00*

U.S. Cl. 30—275 **11 Claims**



1. A cloth cutting machine, said machine being movable through a cloth stack in a cutting direction, said machine comprising

a knife connected to a standard, said knife being supported by said standard,

a motor connected to said knife, said motor being adapted to operate said knife,

a handle connected to said machine, said handle being manually gripped by an operator to guide said machine during use of said machine, and

an air handler device connected to said machine, said air handler device being structured to direct at least one of cooling air and warming air in a predetermined intentional air flow direction against that hand of an operator which manually grips said handle so that said hand is continuously exposed to said air flow when said hand grips said handle and said air handler device is operational both when said machine is stationary and not in operational relation with said cloth stack and when said machine is moving in said cutting direction through said cloth stack during use of said machine.

5,557,854

METHOD FOR MEASURING PRELOAD CLEARANCE IN DOUBLE ROW ROLLING BEARING AND APPARATUS THEREFORE

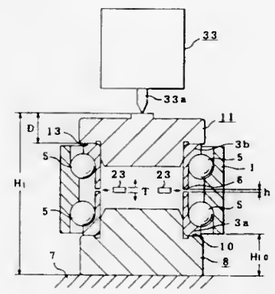
Hakaru Fujioka, Koga-gun, Japan, assignor to NSK Ltd., Shinagawa-ku, Japan

Filed Feb. 3, 1995, Ser. No. 383,503

Claims priority, application Japan, Feb. 4, 1994, 6-012553

Int. Cl.[6] G01B *5/14*

U.S. Cl. 33—517 **2 Claims**



1. An apparatus for measuring preload clearance in a double row rolling bearing having an outer ring having outer raceways in double rows on an inner peripheral surface, first and second inner rings each having an inner raceway on an outer peripheral surface and each provided concentric with the outer ring, and a plurality of rolling members provided between the inner raceways and the outer raceways in double rows, respectively, the rolling members being preloaded so that the first and second inner rings are abutted to each other at inner end edges, the apparatus comprising a receiving block having an upper face to which the outer end face of the first inner ring is abutted, a retaining block having a lower face provided with a retaining face to which the outer end face of the second inner ring is abutted to apply a downward light weight to the second inner ring, an insert portion projected downwards from a lower face of the retaining block, which is provided radially inside the retaining face, so as to be received within the inner rings, a plurality of spacers having a thickness T and supported below the insert portion at a position lower than the retaining face by an axial length of the first inner ring so as to be displaced in a radial direction of the insert portion, a driving device for driving the spacers so that tip portions of the spacers move in and out across a circumferential face of the insert portion, and a measurement device for measuring the vertical position of the retaining block.

5,557,855

RETICLE

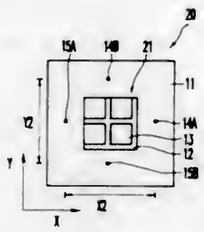
Joon Hwang, Chungcheongbuk-Do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyungiki-do, Rep. of Korea

Filed Mar. 22, 1995, Ser. No. 408,277

Claims priority, application Rep. of Korea, Mar. 22, 1994, 94-5692; Mar. 22, 1994, 94-5693

Int. Cl.[6] G01B *21/00; 5/00*

U.S. Cl. 33—613 **10 Claims**



1. A reticle having a unit field which is formed with a scribe lane zone and a plurality of pattern areas comprising;

a first main vernier formed at outer side of right end of said unit field;

a first sub vernier formed at outer side of left end of said unit field;

a second main vernier formed at outer side of upper end of said unit field;

a second sub vernier formed at outer side of lower end of said the unit field.

5,557,856

ARRANGEMENT FOR THE SPACE UNDERNEATH A DRYER SECTION OF A PAPER MACHINE

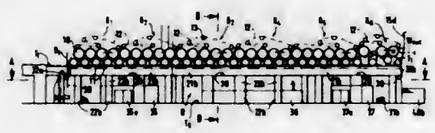
Reima Kerttula, Muurame, Finland, assignor to Valmet Corporation, Helsinki, Finland

Filed Apr. 20, 1994, Ser. No. 230,059

Claims priority, application Finland, Nov. 30, 1993, 935339

Int. Cl.[6] D06F *58/00*

U.S. Cl. 34—117 **15 Claims**



1. Arrangement in a paper machine dryer section, said dryer section having a frame supported by structural members over a space in a paper machine hall, comprising

a hood situated above a level of a floor in said paper machine hall, said hood surrounding the dryer section and confining moist spaces of the dryer section in an interior thereof,

partition means arranged underneath the dryer section for separating the moist dryer section spaces confined in said hood interior from dry spaces situated underneath the dryer section, said dry spaces constituting at least one of storage spaces in which accessory devices of the paper machine are stored and installation spaces in which accessory devices of the paper machine are installed, and

conveyor means for disposing of paper broke from a web passing through the dryer section, said conveyor means being arranged above said partition means.

5,557,857

APPARATUS FOR THE AFTERTREATMENT OF PHOTOPOLYMERIZABLE PRINTING PLATES

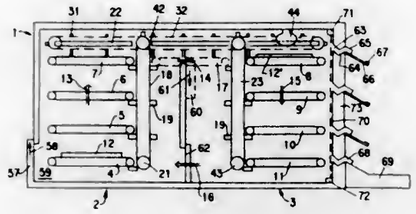
Herbert Konermann, and Reinhard Helmer, both of Lengerich, Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 7, 1993, Ser. No. 117,849

Claims priority, application Germany, Sep. 17, 1992, 42 31 104.7

Int. Cl.[6] F26B *11/18*

U.S. Cl. 34—189 **39 Claims**



28. Apparatus for the aftertreatment of photopolymerizable printing plates comprising means for generating an environment with at least one predetermined condition and a transport device to support plates during transport and to transport the plates through the apparatus, characterized in that

the transport device has more than one pallet (4–11, 17; 4'–11'; 4"–11") for printing plates (12, 12") that are conveyed in an orbit at least sectionwise through the environment, and

the generating means comprises a postexposure unit (3) having, in a storage chamber, a light source for a predetermined spectrum that can be varied with respect to time.

5,557,858

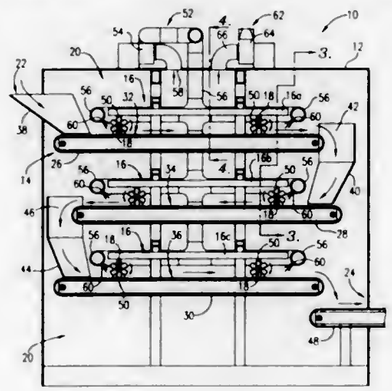
INFRARED WOOD PRODUCT DRYER

Virgil Macaluso, Independence, Kans., assignor to Catalytic Industrial Group Inc., Independence, Kans.

Filed Aug. 25, 1995, Ser. No. 519,845

Int. Cl.[6] F26B *3/34*

U.S. Cl. 34—273 **17 Claims**



1. A method of drying a particulate moisture-bearing material comprising the steps of:

conveying a particulate material along a material flow path;

exposing the material to infrared radiant energy from a flameless catalytic gas-fired heater during said conveyance along said path, said heater operating at a temperature of from about 700°–900° F., said infrared radiant energy having a wavelength similar to the absorption spectrum of said material and the moisture therein to enhance drying of the material; and

agitating the material during said conveyance along said path.

5,557,859

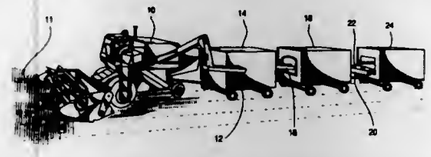
CONTINUOUS PROCESS FOR HARVESTING, SOLAR DRYING AND ACCUMULATING HAY OR OTHER CROPS

Stanley C. Baron, Box 368 Lamington Rd., Whitehouse, N.J. 08888

Continuation-in-part of Ser. No. 214,980, Mar. 17, 1994, abandoned. This application Oct. 19, 1995, Ser. No. 545,391

Int. Cl.[6] F26B *7/00*

U.S. Cl. 34—378 **20 Claims**



1. A method for processing hay or other crops growing in a field which comprises continuously forming a layer of a crop on a moving conveyor; subjecting the crop layer on the moving conveyor to a drying treatment which substantially reduces the moisture content of the crop layer; and removing the dried crop from the moving conveyor; wherein the crop layer on the moving conveyor is subjected to a solar drying treatment in an enclosed, drying chamber surrounding the moving conveyor, the drying chamber having a plurality of first side walls, a first floor and a transparent or translucent roof, at least one of the first floor and first side walls being enclosed within at least one of a second floor and second side walls parallel with the first floor and first side walls with a space therebetween; at least one air passageway through at least one of the first side walls and first floor; and a desiccant in the space; wherein solar drying is conducted by passing sunlight through the transparent or translucent roof; said drying chamber being conveyed by means to convey said drying chamber to facilitate collection and drying of said crops.

5,557,860

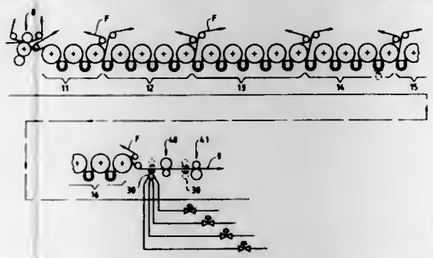
DRYER SECTION WITH MOISTENING DEVICES AT LATTER ENDS

Gerhard Kotitschke, Steinheim; Hans-Peter Sollinger, Heidenheim; Markus Oechsle, Bartholomae, and Karlheinz Straub, Heidenheim, all of Germany, assignors to Voith Sulzer Papermaschinen GmbH, Germany

Filed Nov. 23, 1994, Ser. No. 344,736

Int. Cl.[6] D21F *5/04;* **F26B** *3/04*

U.S. Cl. 34—455 **21 Claims**



17. Method for drying a paper web in a paper making machine, the method including the steps of:

first guiding the paper web over a plurality of heatable drying cylinders arranged as a plurality of successively located drying groups of a drying section, the drying cylinders being located at an initial region of the drying section, the initial region including at least two-thirds of all heatable drying cylinders of said drying section;

guiding the paper web over a plurality of vacuum guide rolls interposed between the heatable drying cylinders;

guiding the paper web over drying cylinders located at an end region following said initial region of said drying section; and

moistening the paper web solely at said end region for reducing the tendency of the paper web to curl.

5,557,861

DEVICE FOR DRYING A MATERIAL IN STRIP FORM, IN PARTICULAR PAPER IN STRIP FORM

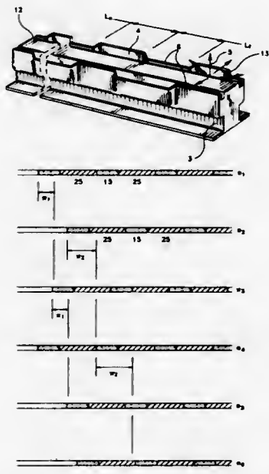
Jean-Rene Argouarch, Courcouronnes; Dominique X. Brasse, Clamart, and Alain J. Grandjean, Evry, all of France, assignors to Materiels Equipements Graphiques, S.A., Lisses-Evry, France

Filed Jun. 20, 1994, Ser. No. 262,992

Claims priority, application France, Jun. 30, 1993, 93 07987

Int. Cl.[6] F26B *3/00*

U.S. Cl. 34—461 **10 Claims**

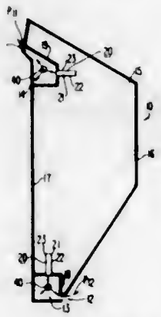


3. Device for drying a material in strip form (1), including, on a frame (2), two series (S_1, S_2) of drying nozzles (3) delimiting, in one plane (P), a corridor for passage of the material in strip form over a path (T), each of the series of drying nozzles being located in a plane (P_1, P_2) substantially parallel to the plane (P), the drying nozzles being perpendicular to the path of the material, each nozzle comprising at least one narrow longitudinal slit (4) suitable for allowing a drying gas to flow therethrough, the said longitudinal slit being delimited by a space contained between two substantially parallel longitudinal metal plates, an inner one (12) and an outer one (11) fixed to a nozzle frame, a blocking means being provided to selectively neutralize a plurality of areas (6) of at least one slit, characterized in that the said neutralized areas are areas of the outer plate pressed against the inner plate forming a longitudinal window (13) between the neutralized areas out of which the drying gas flows, characterized in that the offsetting pitch (π) of the successive neutralized areas of the slits in the nozzles is equal to $(L_n+L_f)/n$, where L_n is the width of the neutralized areas, where L_f is the width of the windows and where n assumes a value between 2 and 5.

5,557,862
PROCESS AND APPARATUS FOR THE CONTINUOUS HEAT SETTING OF YARN LAID DOWN IN LOOPS
Gerhard Vetter, Süssen, and Ludwig Resch, Töging, both of Germany, assignors to M.H. Maschinenfabrik GmbH & Co., KG, Donzdorf, Germany
Filed Apr. 19, 1995, Ser. No. 429,157
Claims priority, application Germany, Apr. 30, 1994, 44 15 229.9
Int. Cl.[6] F26B *13/00*
U.S. Cl. 34—618 **16 Claims**

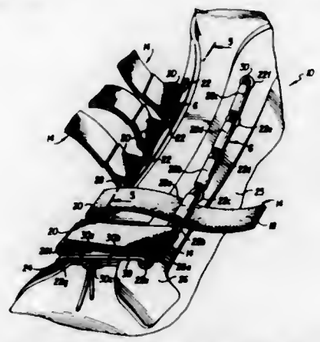
1. A process for treating yarn comprising:
providing a heat setting chamber having a predetermined chamber length,
heating said heat setting chamber with superheated steam,
continuously supplying yarn in loops to a yarn conveyor,
operating said yarn conveyor to continuously transport said yarn along a transport length through said heat setting chamber,
controlling said heating to assure a constant yarn heat setting temperature along a part of said transport length in said heat setting chamber, said controlling heating including heating said heat setting chamber along said transport length to a predetermined temperature slightly higher than a predetermined required yarn heat setting temperature,
and controlling the transport speed of the conveyor such that, after said yarn reaches the required yarn heat setting temperature along said transport path, said yarn is subjected to at least said required yarn heat setting temperature along said part of said transport length to thereby effect heat setting of said yarn.

5,557,863
BLOW DEVICE FOR A DRYER SECTION OF A PAPER MACHINE
Hannu Kokkala, Turku, Finland, assignor to Valmet Corporation, Helsinki, Finland
Filed Apr. 12, 1995, Ser. No. 420,751
Int. Cl.[6] F26B *9/00*
U.S. Cl. 34—629 **13 Claims**



1. A blow device for a dryer section of a paper machine from which air is blown to support a paper web, comprising
a frame including an air space, a first air chamber, a second air chamber and nozzle openings communicating with said first and second air chambers and through which air is blown to support the paper web, said air space, said first and second air chambers being separate from one another,
means for passing air into said air space, and
sets of equalizing plates associated with said air space and through which air from said air space is passed into said first and second air chambers.

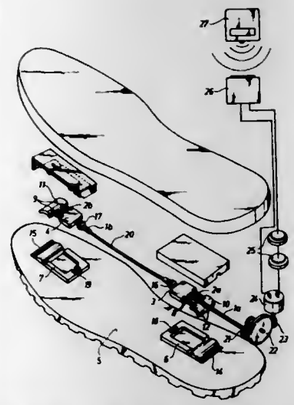
5,557,864
FOOTWEAR FASTENING SYSTEM AND METHOD OF USING THE SAME
Lloyd A. Marks, 727 Great Springs Rd., Bryn Mawr, Pa. 19010
Filed Feb. 6, 1995, Ser. No. 383,842
Int. Cl.[6] A43C *11/00*; **A44B** *18/00*
U.S. Cl. 36—50.1 **22 Claims**



1. A footwear fastener system for securing footwear having opposed upper sides and a plurality of lace eyelets in said upper sides, said fastener system comprising at least one hook-and-loop fastener strip, first lace means for lacing said fastener strip to the eyelets of one of said upper sides and second lace means for lacing between the eyelets of the other upper side, said fastener strip including a loop at one end thereof, a first tubular post disposed in said loop, said first lace means passing through said loop and said first tubular post, a second tubular post disposed between a pair of eyelets of the other upper side, said second lace means passing through said second tubular post.

5,557,865
ANTI-SKID DEVICE FOR FOOTWEAR
Bertil Sjösvärd, Västra Frölunda, Sweden, assignor to Monica Sjosvard, Vastra Frolunda, Sweden
PCT No. PCT/SE93/00049, § 371 Date Mar. 8, 1995, § 102(e) Date Mar. 8, 1995, PCT Pub. No. WO93/14664, PCT Pub. Date Aug. 5, 1993
PCT Filed Jan. 25, 1993, Ser. No. 256,917
Claims priority, application Sweden, Jan. 30, 1992, 9200257
Int. Cl.[6] A43C *15/00*; **A43B** *5/00*
U.S. Cl. 36—61 **4 Claims**

1. An anti-skid device for footwear, comprising:
a footwear undersole which is longer in a longitudinal direction than wide in a transverse direction; said undersole having a lower face; at least two openings formed in said undersole so as to open downwardly through said lower face, said at least two openings being spaced from one another in said longitudinal direction;
a respective spike member associated with each said opening; each spike member having at least one spike and being arranged to be displaced between a retracted, inactive position wherein the at least one spike is located above said lower face, and an extended, active position wherein the at least one spike protrudes downwardly from the respective opening, below said lower face;
each spike member comprising a slide, a downwardly concavely curved spike carrier plate on a transversely extending edge of

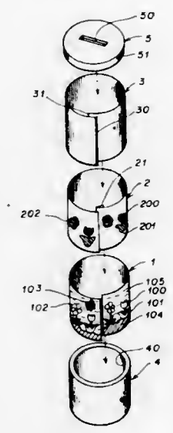


which the respective said at least one spike is based, and a hinge connecting the slide and the spike carrier;
means for moving said spike members between said retracted and extended positions comprising
for each spike member, a housing operatively associated with said undersole in juxtaposition with a respective said opening; each housing receiving the slide of a respective spike member for longitudinal sliding movement, guided therein, between two positions corresponding to said two positions of said spike members;
an upwardly convex surface provided on each said housing in juxtaposition with a respective said opening, and disposed to be in sliding engagement with a respective spike carrier plate, for pivoting the spike carrier plate on the respective said hinge, relative to the respective said slide, between a more horizontal disposition of the respective at least one spike corresponding to said retracted position, and a more vertical disposition of the respective at least one spike corresponding to said extended position;
for each housing, a respective longitudinally extending rotary rod disposed in threaded engagement with the respective said slide and supported relative to said undersole such that rotation in one direction slides the respective slide forwardly, and rotation in an opposite direction slides the respective slide rearwardly; and
means for rotating said rods in said directions, for extending and retracting said spikes.

5,557,866
ATHLETIC FOOTWEAR WITH HINGED ENTRY AND FASTENING SYSTEM
Randall Prengler, 4025 Desert Mountain Dr., Plano, Tex. 75093
Filed Sep. 7, 1993, Ser. No. 116,735
Int. Cl.[6] A43B *11/00*; **A43C** *11/00*
U.S. Cl. 36—138 **13 Claims**

1. A pivot-entry shoe comprising:
a flexible base member including a forward portion and a heel portion for providing flexibility of movement to a wearer's foot;
a flexible forward encasement attached to and above said forward portion of said flexible base member;
a pair of flexible complementary generally frustoconical members for providing support to a wearer's ankle and lower leg;
means for pivotally securing said pair of complementary generally frustoconical members to said forward encasement;
wherein each of said frustoconical members includes a lower edge wherein a rigid member is embedded in each lower edge for providing increased rigidity to said lower edges; and
means for securing said frustoconical members to a wearer's ankle and lower leg.

5,557,867
VARIABLE-DISPLAY DEVICE FOR AMUSEMENT
Shigeru Sugawara, Tokyo, Japan, assignor to Tenyo Co., Ltd., Tokyo, Japan
Filed Apr. 11, 1995, Ser. No. 420,731
Claims priority, application Japan, Apr. 14, 1994, 6-076012
Int. Cl.[6] G09F *11/02*
U.S. Cl. 40—493 **9 Claims**



1. A variable-display device, comprising:
an outer hollow cylinder made of a transparent material, carrying a first display such as a picture, characters, figure or other pattern;
an inner hollow cylinder carrying a second display different from said first one and disposed inside and substantially coaxially with said outer cylinder, said inner cylinder having a passage formed therein in a direction substantially parallel to the axis thereof and communicating to outside from the inside thereof;
a shading sheet-like member made of a soft opaque material, disposed as curled and having one end thereof located inside said inner cylinder and the other end located outside said passage formed in said inner cylinder; and
an operating member coupled to said shading sheet member and disposed rotatably in relation to said outer cylinder;

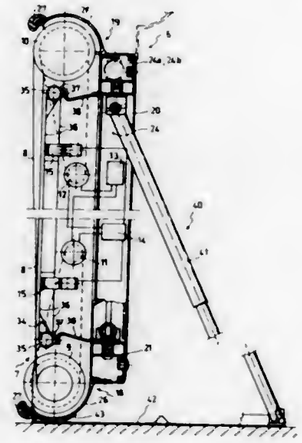
said shading sheet member being movable along the outer surface of said inner cylinder through said passage, upon

5,557,869
DEVICES FOR ALTERATION AND DISPLAY OF

said magazine being designed for insertion into said hollow handgrip frame, said power supply including in combination:

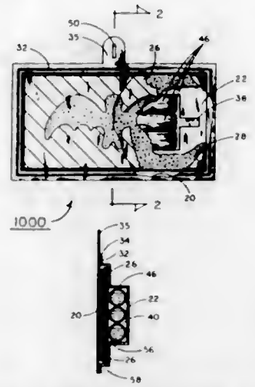
said shading sheet member being movable along the outer surface of said inner cylinder through said passage, upon rotation of said operating member in a direction or in an opposite direction, to sequentially conceal said second display or reveal it through said first display.

5,557,868
MODULES FOR DISPLAYING ADVERTISING IMAGES, AND A DISPLAY ASSEMBLY
Guy A. Tabary, Luynes, and Alain A. R. Tabary, Louans, both of France, assignors to Societe Civile D'Innovation, Luynes, France
Filed Jul. 6, 1994, Ser. No. 271,156
Int. Cl.[6] G09F *11/18*
U.S. Cl. 40—471 **10 Claims**



1. A module for displaying advertising images, the module comprising a housing having a back face and a front face and a display opening in the front face, moving means for moving an image support strip past said display opening, drive means for driving the moving means detectors for detecting the position of the image-support strip, an electronic control unit connected to the drive means and to said detectors to control the rate at which images are displayed, and a power supply, wherein:
- in the vicinity of the back face, the housing includes a rigid framework having sides, and rigid framework comprising an assembly of section bars, a sideplate fixed to each side of said framework and extending toward the display opening, a bottom cap, and a top cap;
- the moving means for moving a strip comprising a first horizontal cylinder and a second horizontal cylinder on which the strip is wound, the cylinders comprising drive shafts, the cylinders being carried by said sideplates, the first cylinder being disposed and the second cylinder being disposed in the immediate vicinity of the bottom cap between the display opening and the framework,
- and wherein each of the top and bottom caps has a front portion that overlies a portion of the adjacent horizontal cylinder;
- the drive means comprising a first electric motor and a second electric motor mounted on one of said sideplates, and disposed between said cylinders, the first motor being connected to the drive shaft of said first cylinder and the second motor being connected to the drive shaft of said second cylinder.

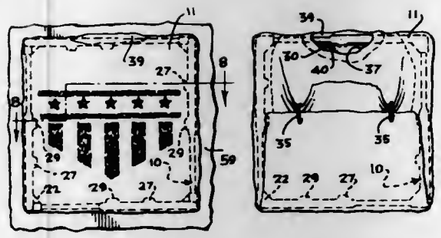
5,557,869
DEVICES FOR ALTERATION AND DISPLAY OF CHEMILUMINESCENT LIGHT
Andre J. T. Douglas, 1046 Brookview Ave., Westlake Village, Calif. 91361
Continuation-in-part of Ser. No. 239834, May 9, 1994, abandoned, which is a continuation of Ser. No. 975009, Nov. 12, 1992, abandoned, which is a continuation-in-part of Ser. No. 663365, Feb. 27, 1991, abandoned. This application Feb. 2, 1995, Ser. No. 382,525
Int. Cl.[6] G09F *13/20*
U.S. Cl. 40—542 **11 Claims**



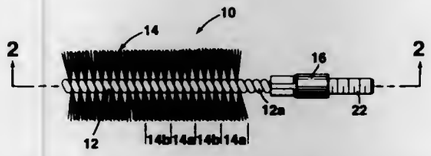
7. In an artistic display device including a shell having a transparent front wall through which an optical image is to be transmitted, a rear wall forming in cooperation with the front wall a compartment, a set of frangible vials in the compartment having separate chemiluminescent liquids therein and which may be broken to mix the liquids and thereby provide a light-generating mixture for generating light, and a body of liquid-absorbing material for retaining the liquid mixture after the vials have been broken, the improvement comprising:
- the front and rear walls having perimetrical portions between which a perimetrical portion of the body of liquid-absorbing material is grasped, for maintaining the shape of said body of liquid-absorbing material after the vials have been broken;
- the size of the compartment being restricted to closely conform to the size of the vials so that the body of liquid-absorbing material has limited opportunity to migrate into the compartment; and
- wherein said compartment has a lateral expanse that is substantially less than the lateral expanse of said body of liquid-absorbing material, said rear wall being also recessed to provide a plurality of ducts radiating laterally outwardly from said compartment to aid in distributing the mixed liquid to all portions of said body of liquid-absorbing material.

5,557,870
T-SHIRT MOUNTING FRAME
Gerald H. Bergman, 36 Rolling Meadow, East Amherst, N.Y. 14051
Filed Jul. 5, 1991, Ser. No. 270,463
Int. Cl.[6] G09F *17/00;* **D06C** *3/08*
U.S. Cl. 40—603 **17 Claims**

1. In combination, a T-shirt and a frame for displaying a design on said T-shirt comprising a T-shirt having a first portion with a design thereon and a second portion attached to said first portion, a frame having first and second sides with said first portion of said T-shirt containing said design being located on said first side of said frame and said second portion of said T-shirt being located on said second side of said frame, and a sheet of cardboard between said first and second portions of said T-shirt for preventing said second portion of said T-shirt from moving into substantial engagement with said first portion.

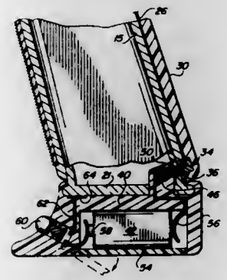


5,557,871
BRUSH FOR CLEANING THE BORE OF A GUN BARREL
Anthony F. LaLonde, P.O. Box H, San Jose, Calif. 95151
Filed May 2, 1995, Ser. No. 431,664
Int. Cl.[6] F41A *29/02*
U.S. Cl. 42—95 **13 Claims**



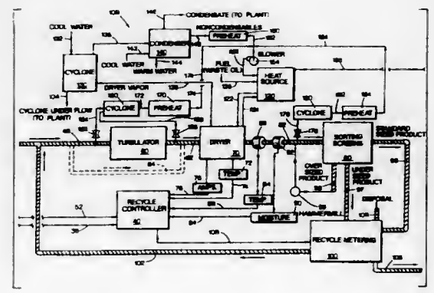
1. A brush for cleaning the bore of a gun barrel comprising:
(a) wire means having a first segment for the securement of brush bristles and a second segment free of brush bristles;
(b) a plurality of groups of metal bristles and a plurality of groups of nylon bristles being successively and alternately secured to said first segment of said wire means in annular orientation for said nylon bristles to provide elasticity and reboundability to said metal bristles for flexibility and for inhibiting permanent deformation of said metal bristles; and
(c) handle support means attached to said second segment.

5,557,872
POWER SUPPLY FOR FIREARM ACCESSORIES
F. Richard Langner, 9856 E. Aster Dr., Scottsdale, Ariz. 85260
Filed May 25, 1995, Ser. No. 450,864
Int. Cl.[6] F41G *1/35*
U.S. Cl. 42—103 **18 Claims**



1. A power supply for providing power to accessories carried by a firearm having a barrel and a hollow handgrip frame with a cartridge magazine having upper and lower ends, the upper end of said magazine being designed for insertion into said hollow handgrip frame, said power supply including in combination:
- a housing located within the lower end of said cartridge magazine and having a hollow battery compartment therein for receiving a battery;
- first and second contact members in said housing compartment for mating corresponding contacts on said battery placed in said battery compartment;
- an electrical connection between said first contact member and said cartridge magazine;
- an electrical connector through said housing, and insulated from said cartridge magazine, to said second contact member; and
- an electrical conductor carried by said handgrip frame and terminating in a handgrip contact and wherein said electrical connector is spring-loaded for extending a predetermined distance out of said housing for contacting said handgrip contact with said cartridge magazine inserted into said hollow handgrip frame.

5,557,873
METHOD OF TREATING SLUDGE CONTAINING FIBROUS MATERIAL
Bart T. Lynam, Edmonds, and Ronald V. Peterson, Seattle, both of Wash., assignors to PCL/SMI, A Joint Venture, Edmonton, Canada
Continuation-in-part of Ser. No. 177,439, Jan. 5, 1994, Pat. No. 5,428,906, which is a division of Ser. No. 601,906, Oct. 23, 1990, Pat. No. 5,279,637. This application Feb. 10, 1995, Ser. No. 387,104
Int. Cl.[6] F26B *7/00*
U.S. Cl. 34—379 **2 Claims**

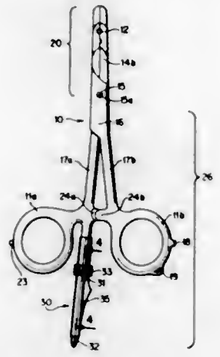


1. A method of making a granular fertilizer product having an enhanced shelf life produced from dewatered sludge solids containing fibrous material derived from paper products, comprising the steps of:
- mixing and sizing dewatered sludge cake solids with a recycled portion of sorted product to produce a solids mixture;
- drying the solids mixture in a dryer to produce dried solids;
- sorting the dried solids into a sorted product comprising oversized product containing the fibrous material, undersized product, and standard sized product;
- grinding the oversized product, including the fibrous material, to reduce the oversized product including the fibrous material to standard size;
- returning the reduced oversized product, including the fibrous material, for sorting again into a sorted product comprising undersized product and standard sized product;
- recycling the undersized product to serve as the recycled portion of sorted product in the mixing and sizing step; and
- adding lime to the standard sized product to produce the granular fertilizer from the standard sized product.

5,557,874
MULTI-PURPOSE FISHING TOOL

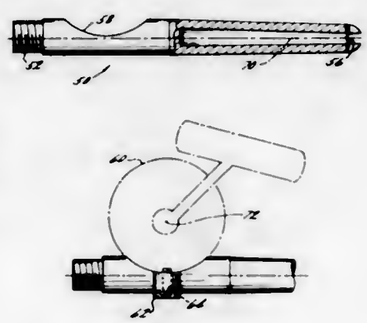
10. A fishing pole assembly comprising:
a fishing rod:

5,557,874
MULTI-PURPOSE FISHING TOOL
Samuel J. Pietrandrea, 396 Beechwood Rd., and Albert A. Saviano, 278 McKinley Pl., both of Ridgewood, N.J. 07450
Filed Jun. 9, 1994, Ser. No. 257,174
Int. Cl.[6] A01K *97/00*
U.S. Cl. 43—4 **12 Claims**



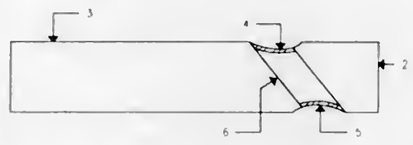
1. A multi-purpose fishing tool including:
a hemostat having at least two handles, said handles inching finger loop means, a pivot point around which the handles move, wherein the handles each have a forward section and a rearward section relative to said pivot point, gripping means including opposed surfaces included along the forward section of the handles, and inter-locking toothed means, each of said forward section of said handles having a cutting member whereby said cutting members are aligned for cooperative action;
each of said forward section of said handles further comprising a semi-circular cylindrical bore adapted to compress split-shot and one of said handles further comprising at least one wedge and another of said handles comprises at least one corresponding semi-circular cylindrical bore for opening split-shot; and
a knot-maker fixedly attached to .one of the handles, said knot-maker including a retractable sleeve having a pair of walls extending upward to form a ramp, said ramp defining a channel therein.

5,557,875
BUTT ASSEMBLY FOR A FISHING POLE
Thomas Testa, 36 Sunnyfield Dr., Windsor, Conn. 06095
Filed Nov. 30, 1994, Ser. No. 347,577
Int. Cl.[6] A01K *87/06*
U.S. Cl. 43—20 **17 Claims**



10. A fishing pole assembly comprising:
a fishing rod;
a reel housing;
a butt comprising (1) a generally cylindrical elongated member having opposing upper and lower ends, said fishing rod connected to said upper end and (2) a generally arcuate segment formed in said member, said reel housing disposed in said segment;
a reel block disposed on said member opposite said segment; and
means for connecting said reel block to said reel housing, wherein said reel housing is secured in said segment.

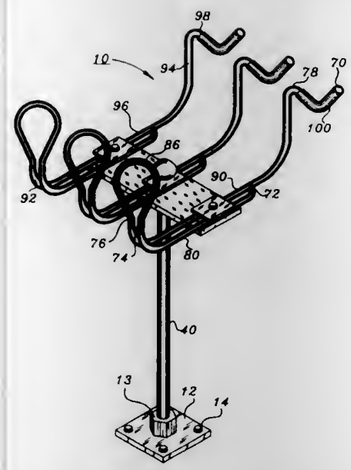
5,557,876
FISHING ROD HOLDER
Michael D. Parker, 15088 Holleyside Dr., Montclair, Va. 22026
Filed Mar. 7, 1995, Ser. No. 399,647
Int. Cl.[6] A01K *97/10*
U.S. Cl. 43—21.2 **15 Claims**



1. A tubular fishing rod holder comprising:
a single cylindrical tube comprising:
a rearward end;
a holding portion for receiving and holding a handle portion of a fishing rod; and
a mounting portion, formed between said rearward end and said holding portion, for mounting said fishing rod holder on a support, said mounting portion comprising:
a top receiving hole formed in a top portion of said cylindrical tube at a first distance away from said rearward end;
a bottom receiving hole being formed in a bottom portion of said cylindrical tube at a second distance from said rearward end, wherein said first distance is greater than said second distance; and
a side cut out portion connecting said top receiving hole to said bottom receiving hole.

5,557,877
UNIVERSAL MOUNT FISHING ROD HOLDER
Kennie R. Colson, RT8, Box 825, Murray, Ky. 42071
Filed Sep. 20, 1995, Ser. No. 531,318
Int. Cl.[6] A01K *97/10*
U.S. Cl. 43—21.2 **5 Claims**

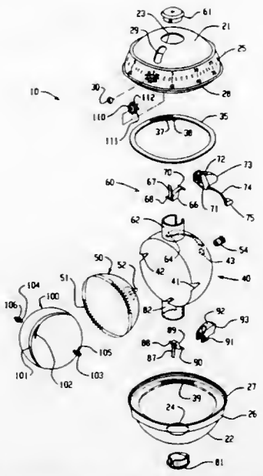
1. A universal mount fishing rod holder for holding a plurality of fishing rods in a position for use when fishing comprising, in combination:
a rigid planar square base with an inwardly threaded tubular receptacle coupled thereto at a central location and extended upwards therefrom;
coupling means for securing the base to an external recipient object;
a rectangular rigid planar bar positioned directly above the base and with the bar having an upper surface, and a lower surface;
an elongated support rod having one end threadedly coupled to the receptacle of the base and another end pivotally coupled to the lower surface of the bar; and
three spaced and rotatable rod holders with each rod holder formed of an elongated rigid piece of wire having an anterior section, a posterior section, and a central section extended therebetween and coupled to the upper surface of the bar, each



piece of wire further having an upper end, a curved lower end a first intermediate location, a second intermediate location, and a third intermediate location, a generally L-shaped first segment having a horizontal lower leg connected with the lower end and a vertical upper leg connected with the first intermediate location, a curved second segment positioned in a vertical plane and connected between the first intermediate location and the second intermediate location to define a loop sized for receiving a free end of a fishing rod therein, a generally u-shaped third segment having a vertical short upper leg connected with the second intermediate location, a vertical long upper leg connected with the third intermediate location, and a horizontal cross leg extended therebetween, and a generally v-shaped sheathed fourth segment positioned in coplanar alignment with the loop and connected between the third intermediate location and the upper end to define a seat for holding a portion of a fishing rod therein.

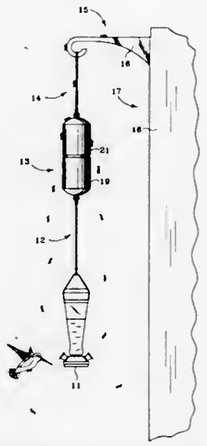
5,557,878
FISHING LINE FLOAT WITH DEPTH METERING FUNCTION
Charles A. Ross, Baltimore, Md., assignor to American Sport Lure, Inc., Kingsville, Md.
Filed Nov. 7, 1994, Ser. No. 335,545
Int. Cl.[6] A01K *91/00*
U.S. Cl. 43—43.11 **8 Claims**

1. A depth metering fishing line float for metering a preselected length of fishing line therethrough comprising:
a shell assembly having a central axis and upper and lower shell sections rotatable relative to one another about said central axis, said assembly defining a pair of axially spaced openings, one at each axial end thereof,
a carriage assembly located within said shell assembly and having an upper spindle and a lower spindle extending from opposite ends thereof through said respective openings, said carriage assembly being adapted for rotation about said central axis relative to said shell assembly,
means for passing a fishing line through said spindles and through the interior of said float,
brake means responsive to rotation of said carriage assembly for selectively gripping said fishing line to halt passage thereof through said float,
a buoyant drum member journaled in said carriage assembly for rotation about a drum axis perpendicular to said central axis, said drum being operatively engaged by said fishing line to turn said drum member as said fishing line passes through said float.



gear train means connecting said drum member to said carriage assembly whereby said carriage assembly turns relative to said shell assembly in response to rotation of said drum member; and
trigger means responsive to a predetermined rotation of said carriage for actuating said brake means.

5,557,879
ANT SHOCKING APPARATUS
Russell J. Ott, 9050 Briarclift Rd., Indianapolis, Ind. 46256
Filed Feb. 21, 1995, Ser. No. 391,056
Int. Cl.[6] A01M *1/22*
U.S. Cl. 43—112 **6 Claims**



1. Ant control apparatus comprising:
first and second cylinders longitudinally spaced along an axis, establishing a circumferential gap between the cylinders, the cylinders having electrically conductive marginal portions at the gap;
an electric battery having a positive terminal electrically connected to the marginal portion of one of the cylinders and a negative terminal electrically connected to the marginal portion of the other cylinder and establishing a voltage differential across the gap;

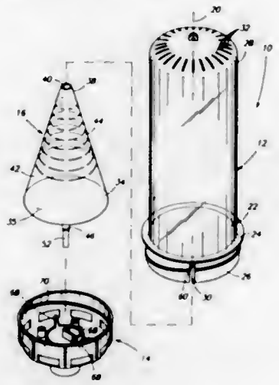
an electrical insulator secured to the cylinders, and holding them in the longitudinally spaced relationship; and wherein:

1. A plant package, comprising:
a floral grouping comprising a bloom portion;

5,557,884
SPRAYING AND LEVEL CONTROL FOR AERO-

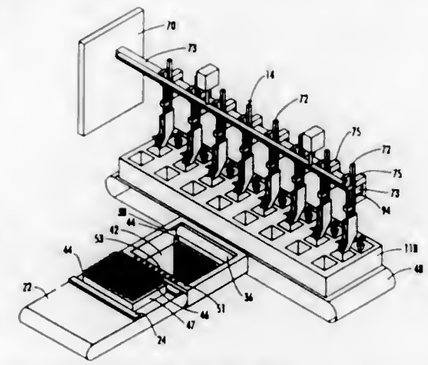
an electrical insulator secured to the cylinders, and holding them in the longitudinally spaced relationship; and wherein:
the first cylinder has a closed top forming a downwardly opening cup;
the second cylinder has a closed bottom forming an upwardly opening cup.

5,557,880
YELLOW JACKET TRAP
Rodney G. Schneidmiller, Veradale, Wash., assignor to Sterling International, Inc., Veradale, Wash.
Filed Feb. 27, 1995, Ser. No. 394,842
Int. Cl.[6] A01M *1/02*
U.S. Cl. 43—122 **15 Claims**



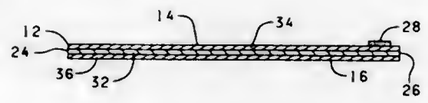
1. A yellow jacket trap comprising:
a cylindrical upper member defining a hollow entrapment chamber, the upper member having a bottom open end and a top end;
an inverted cone removably inserted within the cylindrical upper member, the inverted cone having a first open end coincident with the bottom open end of the upper member, the inverted cone extending into the entrapment chamber and tapering to a second open end having a diameter less than a diameter of the first open end; and
an orientation coupling to align the inverted cone relative to the upper member and to guide the inverted cone during insertion into the upper member and removal therefrom, the orientation coupling having at least one slot formed in the upper member and at least one guide peg projecting from the inverted cone which matingly slides within the slot to orient and guide the inverted cone relative to the upper member.

5,557,881
SEEDLING TRANSPLANTER
Floyd Bouldin, 2803 Standing Bear Way, Murfreesburo, Ind. 37130, and Dwight Bouldin, 999 Mieser Ln., McMinnville, Tenn. 37110
Filed Feb. 21, 1995, Ser. No. 391,501
Int. Cl.[6] A01C *11/02*; **B65G** *47/90*
U.S. Cl. 47—1.01 **30 Claims**



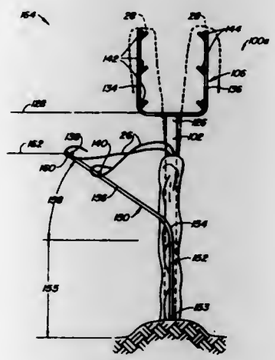
1. An automated apparatus for transplanting seedlings having a soil caked root plug from a first seedling tray to a second tray, comprising
a frame having a front, a back, and spaced apart side members;
a first conveyor system;
a second conveyor system substantially perpendicular to the first conveyor system;
a gantry moveable between the side members of the frame;
positioning means for moving the gantry;
means for operably driving the first conveyor system and the second conveyor system;
a gripper assembly partially comprised of:
a plurality of grippers wherein each gripper is configured to laterally grasp and take possession of a seedling removed from the first seedling tray and plant it into the soil of a second seedling tray;
each gripper further includes:
at least two spaced apart finger elements pivotally connected to an upright support member and operable between an opened and closed position; and
each finger element has a proximal portion and an angled soil penetrating portion for insertion into the soil of a second seedling tray at a downward angle to plant a seedling therein without the need for pre-dibbling the soil thereof, and further capable of being removed at an upward angle to minimize the possibility of extracting the previously transplanted seedling therefrom.

5,557,882
PLANT PACKAGE HAVING A WAXY WRAPPER
Donald E. Weber, Highland, Ill., assignor to Southpac Trust International, Inc., Highland, Ill.
Continuation-in-part of Ser. No. 923,202, Oct. 13, 1992, and a continuation-in-part of Ser. No. 313,675, Sep. 27, 1994, which is a continuation of Ser. No. 188,183, Jan. 28, 1994, Pat. No. 5,388,386, which is a continuation of Ser. No. 968,798, Oct. 30, 1992, Pat. No. 5,369,934, which is a continuation of Ser. No. 865,563, Apr. 9, 1992, Pat. No. 5,245,814, which is a continuation of Ser. No. 649,379, Jan. 31, 1991, Pat. No. 5,111,638, which is a continuation of Ser. No. 249,761, Sep. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 219,083, Jul. 13, 1988, Pat. No. 4,897,031, which is a continuation of Ser. No. 4,275, Jan. 5, 1987, Pat. No. 4,773,182, which is a continuation of Ser. No. 613,000, May 22, 1984, abandoned, and a continuation-in-part of Ser. No. 264,866, Jun. 23, 1994, which is a continuation of Ser. No. 965,585, Oct. 23, 1992, abandoned, which is a continuation of Ser. No. 893,586, Jun. 2, 1992, Pat. No. 5,181,364, which is a continuation of Ser. No. 707,419, May 28, 1991, abandoned, which is a continuation of Ser. No. 502,358, Mar. 29, 1990, abandoned.
This application May 11, 1995, Ser. No. 438,818
Int. Cl.[6] A01G *5/00*
U.S. Cl. 47—44.01 **29 Claims**



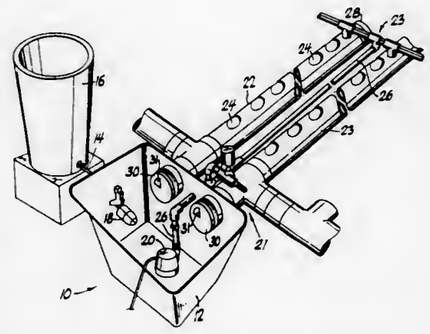
1. A plant package, comprising:
a floral grouping comprising a bloom portion;
a flexible wrapper constructed from a material comprising a waxy layer and a support layer, the waxy layer constructed from a sheet of waxed material and superposed upon a first surface of the support layer and connected thereto, and wherein the wrapper, when wrapped about the floral grouping, is less compressible about the floral grouping than a wrapper formed from the sheet of waxed material alone; and
wherein the wrapper is placed about the floral grouping such that the waxy layer is positioned adjacent the bloom portion forming a wrapper which substantially encompasses the bloom portion, the wrapper having an upper end and a lower end.

5,557,883
TRELLISING SYSTEM FOR PRODUCING DRIED-ON-THE-VINE RAISINS
David L. Walker, Caruthers, Calif., assignor to Sun-Maid Crowers of California, Kingsburg, Calif.
Filed Feb. 1, 1995, Ser. No. 384,282
Int. Cl.[6] A01G *17/06;17/14*
U.S. Cl. 47—46 **15 Claims**



1. A trellis system for producing dried-on-the-vine raisins in a row of vines of the type growing in the ground and having a split canopy of fruiting canes and replacement canes, the system comprising:
a plurality of first support arms each having outer and inner ends;
a plurality of second support arms each having first and second ends;
a plurality of substantially vertical first support members each having an upper end and a lower end, said upper ends secured to the first support arms supporting each said first support arm along the row of vines with the outer end having an upper elevation and the inner end having a lower elevation, the upper elevation being substantially greater than the lower elevation;
a plurality of substantially vertical second support members secured to the second support arms supporting each said second support arm along the row of vines with the first and second ends both having elevations higher than the upper elevation;
a first wire supported by the plurality of first support arms for supporting fruiting canes so that, after the fruiting canes are severed, the grapes can dry from the heat of the sun to create raisins; and
a second wire supported by the plurality of second support arms for supporting replacement canes so that the replacement canes are separated from the fruiting canes.

5,557,884
SPRAYING AND LEVEL CONTROL FOR AERO-HYDROPONIC SYSTEM
Gregory Deppe, 284 Morgan Ave., Old Bridge, N.J. 08857
Filed Jul. 27, 1994, Ser. No. 281,295
Int. Cl.[6] A01G *31/00*
U.S. Cl. 47—62 **3 Claims**



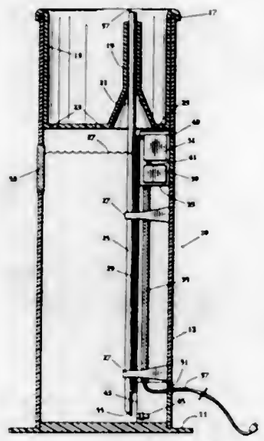
1. An aero-hydroponic plant growing system comprising;
a) a nutrient reserve reservoir containing a supply of liquid nutrients;
b) a main reservoir connected to the nutrient reserve reservoir and supplied with liquid nutrients from the nutrient reserve reservoir;
c) a pump with an inlet and an outlet whereby the inlet is connected to the main reservoir for removing the liquid nutrients from the main reservoir;
d) a plurality of plant tubes in which a plurality of plants will be supported;
e) a piping system connected to the outlet of the pump and the interior of the plant tubes;
f) a spray head connected to the piping system for oxygenating and dispersing the liquid nutrients into the interior of the plurality of plant tubes; and
g) means for controlling the level of liquid nutrients in the interior of the plurality of plant tubes.

5,557,885
HYDROPONIC PLANTER
Harry M. Sledge, 5822 S. 67th Ave., Tulsa, Okla. 74145
Continuation of Ser. No. 34,741, Mar. 19, 1993, Pat. No. 5,385,590. This application Jan. 27, 1995, Ser. No. 378,965
Int. Cl.[6] A01G *31/00*
U.S. Cl. 47—66 **2 Claims**

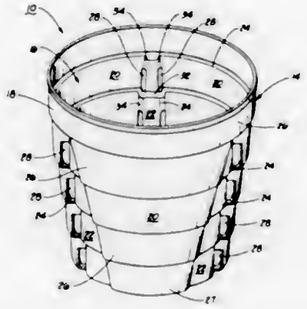
1. A hydroponic planter comprising:
a tank for storing a solution of plant nutrients up to a selected level therein;
a pot for containing a growing medium and plants rooted therein, said pot having at least one hole through a bottom thereof aligned for draining into said tank;
means for supporting said pot with said drain hole above said selected level;
a riser pipe mounted within said tank defining a path directing flow of said solution from said tank;
means for causing said solution to flow through said riser pipe;
a stand pipe extending upwardly from said pot bottom and aligned with said riser pipe for extending said flow path through said pot bottom for discharge of said solution into said pot; and
said riser pipe extending through said stand pipe, said stand pipe having a lower portion tapered to a greater bottom diameter for facilitating insertion of said riser pipe therein.

5,557,887

distal vertical member at said bore, the latch member further

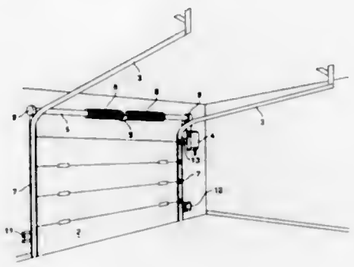


5,557,886
PLANT GROWING CONTAINER FOR AIR-PRUNING ROOTS
Carl E. Whitcomb, Rte. 5, Box 174, Stillwater, Okla. 74074
Filed Sep. 20, 1995, Ser. No. 530,606
Int. Cl.[6] A01G *23/02*
U.S. Cl. 47—73 18 Claims



1. An improved container for growing a plant intended to be transplanted, comprising:
a bottom wall; and
an upwardly extending sidewall connected to the perimeter of the bottom wall forming a container having an open top, the upwardly extending sidewall having an internal surface and an external surface, the sidewall comprising:
an outer, first sidewall portion having a plurality of upwardly facing primary internal ledges positioned in spaced relationship one above the other, each primary internal ledge serving to direct laterally growing roots to grow along the primary internal ledge; and
an inset, second sidewall portion connected to and displaced inwardly from the outer, first sidewall portion, the inset, second sidewall portion defining a plurality of root-pruning openings between the inset, second sidewall portion and the outer, first sidewall portion, each root-pruning opening aligned with a primary internal ledge so that roots growing along the primary internal ledges are directed to the root-pruning openings for air-root pruning.

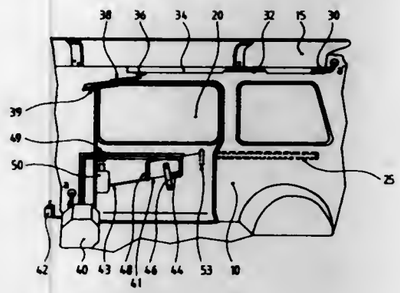
5,557,887
YIELDABLE GEARING AND SAFETY MECHANISMS FOR GARAGE DOOR OPERATORS
Jerry W. Fellows, 4950 John Muir Rd., Martinez; Thomas M. Sherlock, Los Altos Hills, and Richard S. Davis, Palo Alto, all of Calif., assignors to Jerry W. Fellows, Martinez, Calif.
Continuation-in-part of Ser. No. 268,767, Jun. 29, 1994, abandoned. This application Oct. 28, 1994, Ser. No. 330,479
Int. Cl.[6] E05F *15/20*
U.S. Cl. 49—28 36 Claims



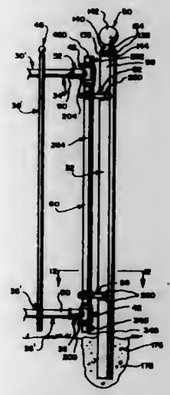
1. An actuator for operating a garage door, said actuator coupled to a door opening and closing mechanism, said actuator comprising:
a motor;
a transmission, coupled to said motor and said garage door opening and closing mechanism, that transmits force from said motor to said door opening and closing mechanism to close said garage door; and
means, coupled to said transmission, for disengaging a portion of said transmission when the torsional force to close said garage door reaches a predetermined limit;
whereby said disengaged transmission no longer transmits force from said motor to said door opening and closing mechanism and said motor offers no resistance to manually lifting said garage door.

5,557,888
OPEN AND CLOSE CONTROL DEVICE FOR A HORIZONTALLY SLIDABLE VEHICLE DOOR
Rene Ruchat, 26a, Chemin de Pont-Ceard, CH-1290 Versoix, Switzerland; Bernard Planche, Chemin de la Chesnaie, CH-1219 Chateleine, Switzerland, and Jean Roch, 721, route de Vésegnin, F-01280 Prevessin Moens, France
PCT No. PCT/FR93/00178, § 371 Date Oct. 7, 1994, § 102(e) Date Oct. 7, 1994, PCT Pub. No. WO93/17211, PCT Pub. Date Sep. 2, 1993
PCT Filed Feb. 24, 1993, Ser. No. 284,609
Claims priority, application France, Feb. 28, 1992, 92 02622
Int. Cl.[6] E05F *11/34*
U.S. Cl. 49—362 20 Claims

1. An open-and-close control device for a horizontally slidable vehicle door fitted with a lock, said control device comprising a horizontal endless screw rotatably movably held within a rail fixed to a vehicle body adjacent said vehicle door, and adapted to be rotated a rotary electric motor, wherein said horizontal endless screw engages a threaded aperture in a slide translationally movable in said rail, wherein said slide is connected by a single connecting rod to an inner arm positioned on said vehicle door, said arm being oriented towards an inside of said vehicle body, wherein said single connecting rod is at an angle of less than about 25° to said horizontal endless screw, and opening said vehicle door is initiated by a substantially outward transverse translation of at least part of said vehicle door.

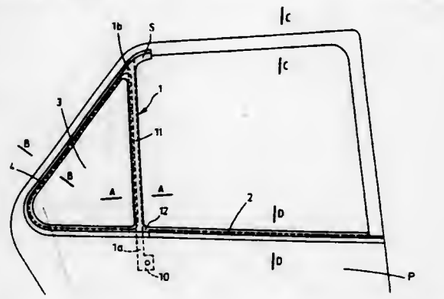


5,557,889
PREFABRICATED SIMULATED WROUGHT IRON AND LIKE FENCING SYSTEMS AND METHODS
Ivan Sharp, 5413 N. 3100 West, Amalga, Utah 84335
Division of Ser. No. 138,177, Oct. 15, 1993, Pat. No. 5,415,380, which is a division of Ser. No. 926,734, Aug. 7, 1992, Pat. No. 5,301,926, which is a division of Ser. No. 645,164, Jan. 24, 1991, Pat. No. 5,192,054. This application Jan. 20, 1995, Ser. No. 375,746
Int. Cl.[6] E05F *1/10*
U.S. Cl. 49—386 10 Claims



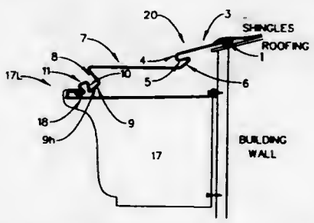
1. Simulated wrought iron fence gate structure comprising:
a gate frame comprising a simulated wrought iron open lattice comprising an array of interconnected horizontal rails and vertical members, the vertical members comprising a proximal vertical member and a distal vertical member;
vertically-erect wrought iron simulating post structure anchored in place at a lower end thereof;
at least two spaced exposed hinge mechanisms comprising two arms connected by an exposed pivot pin interposed between the post structure on the proximal vertical member of the gate frame to support the gate in cantilevered relation;
at least one gate return mechanism substantially concealed and operable within the proximal vertical member biased between the proximal vertical member and one of said arms to urge the gate toward its closed position;
a latch mechanism comprising a rectilinearly reciprocable plunger spring biased toward an extended position comprising a distal portion and a proximal portion, the distal portion extending beyond the distal vertical member through an alignment maintaining sleeve carried in a bore in the distal vertical member, the proximal portion extending transversely to and beyond the distal vertical member being concealed within a housing connected to and transversely extending from the distal vertical member at said bore, the latch member further comprising a rotatable handle exterior of the housing and plunger retraction structure connecting the handle and the proximal portion of the plunger.

5,557,890
DOOR TRIM ASSEMBLY
Claude Levy, Houilles; Jean-Claude Smadja, and Pierre Opman, both of Neuilly Sur Seine, all of France, assignors to Technistan, Courbevoie, France
Filed Sep. 7, 1993, Ser. No. 116,498
Int. Cl.[6] B60J *5/04*
U.S. Cl. 49—502 5 Claims



1. An automobile vehicle door trim assembly comprising a unitary body of one-piece construction, obtained by moulding around and with both an upright and a fixed panel, a peripheral seal for connection to at least one of the elements chosen from the group constituted by at least one lower sealing band forming a mobile window scraper, a mobile window run channel, a finishing coating for said upright, and covers for connections with elements added upon assembly, and wherein said lower sealing band is connected to said fixed panel seal by an elastic articulation.

5,557,891
GUTTER PROTECTION SYSTEM
Gregory P. Albracht, 9623 Burdette, Omaha, Nebr. 68134
Filed Mar. 31, 1995, Ser. No. 414,271
Int. Cl.[6] E04D *13/076*
U.S. Cl. 52—12 22 Claims



1. A gutter protection system which serves to direct rain water into an underlying gutter system to which it is affixed while preventing the entry of debris into said underlying gutter system, said underlying gutter system being affixed to a lower edge of a sloped building roof and being oriented so as to assume a generally vertically downward slope between said downward sloped building roof and a point of attachment of said gutter protection system to said underlying gutter system, said gutter protection system comprising: a primary body element in which is present a water flow slowing means which serves to essentially reverse the direction of

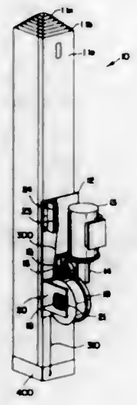
flow of rain water at least twice between the entry of said rain water onto an upper surface of said gutter protection system, and the flow of said rain water into said underlying gutter system, which gutter protection system utilizes capillary action to direct said rain water flow through said water flow slowing means during use, said capillary action being unevaded through at least said first of said at least two flow direction reversals, said gutter protection system providing, via unevaded capillary action, said rain water exiting said first of said at least two flow direction reversals in said water flow slowing means at a vertically lower position than that at which said rain water entered said water flow slowing means.

5,557,892

POWER MAST

Kevin R. Lavin, Princeton, Mass., assignor to Wolf Coach, Inc., Auburn, Mass.

Filed Mar. 8, 1994, Ser. No. 207,926
Int. Cl.[6] B66C *23/06*
U.S. Cl. 52—121 **6 Claims**



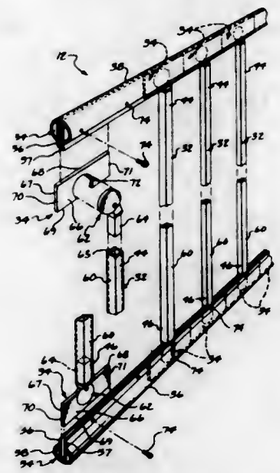
1. A power mast assembly, comprising:
an outer stationary mast section having an inner and outer surface;
an innermost mast section having an inner and outer surface, said innermost mast section having spring means secured therein;
at least one inner telescoping intermediate mast section between said innermost mast section and said outer stationary mast section, said at least one inner telescoping intermediate mast section having an inner and outer surface;
a base supporting said outer stationary mast section, said innermost mast section and said inner telescoping intermediate mast section;
a plurality of up pulleys, one being secured to said inner surface of said outer stationary mast section, and each of the remaining plurality of up pulleys being secured to said inner surface of one of said inner telescoping intermediate mast sections;
a plurality of transition pulleys, one being secured to said base, and each of the remaining plurality of transition pulleys being secured to one of said inner telescoping intermediate mast sections, each transition pulley being vertically spaced from said up pulleys;
an up cable having a first end and a second end, said first end being secured to said innermost mast section, said up cable being sequentially threaded from said innermost mast section through said transition and up pulleys and out said outer stationary mast section, said up cable second end being secured to means for driving said up cable, said means for driving said up cable comprising a spiral grooved cable drum; and
a down cable having a first end and a second end, said down cable first end being secured to said spring means, said down cable being threaded from said spring means, out said innermost mast section and through transition means aligning it with said spiral grooved cable drum, said down cable second end being secured to said spiral grooved cable drum; said spiral grooved cable drum being suitably dimensioned such that only a single wrap of up cable or down cable lay on said drum at any given time.

5,557,893

ADJUSTABLE PITCH SPIRAL STAIRWAY KIT

George A. Bowls, 12315 Mukilteo Speedway, Lynnwood, Wash. 98037

Filed Jul. 27, 1995, Ser. No. 508,235
Int. Cl.[6] E04F *11/00*
U.S. Cl. 52—187 **19 Claims**



7. An adjustable railing assembly, comprising:
(a) a first railing defining a longitudinal channel;
(b) a plurality of pickets, each having an end portion;
(c) a plurality of elongate inserts, each insert having a length equal to a predetermined distance between pickets, the end portion of each picket being engageable with a corresponding insert, the picket end portions and engaged inserts being receivable within the first railing channel with the inserts arranged end to end to locate the end portions of the pickets at the predetermined distance; and
(d) means for securing the inserts and engaged picket ends within the first railing channel.

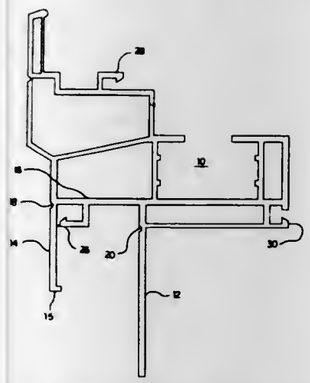
5,557,894

WINDOW ASSEMBLY FRAME

Geoffrey C. Card, Roscoe, Ill., assignor to Stectus Systems-Midwest, Winnebago, Ill.

Filed Feb. 13, 1995, Ser. No. 387,076
Int. Cl.[6] E06B *3/00*
U.S. Cl. 52—204.595 **13 Claims**

1. An integral framing member comprising:
an integral nail fin having a notch therein, whereby said integral nail fin may be removed from said integral framing member;
an integral J-shaped member having a notch therein, whereby said integral J-shaped member may be removed from said integral framing member, said integral J-shaped member dimensioned and configured to overlie a gap between said framing member and a building structure;
a frame member having a first end and a second end, said frame member connecting said integral nail fin and said J-shaped member;
said frame member, said integral nail fin, and said J-shaped member defining a first channel therebetween; p1 a first retention clip connected to said first end of said frame member and disposed within said first channel; and
said framing member including means defining a second channel therein.

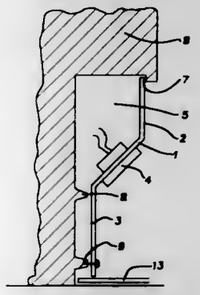


5,557,895

DETACHABLE BRACKET FORMING A WALL BOTTOM SKIRTING FOR FIXING CONNECTIONS

Jean-Claude Bendrell, 263 Cours de la Somme, 33800 Bordeaux, France

PCT No. PCT/FR93/00345, § 371 Date Dec. 21, 1994, § 102(e) Date Dec. 21, 1994, PCT Pub. No. WO93/20607, PCT Pub. Date Oct. 14, 1993
PCT Filed Apr. 6, 1993, Ser. No. 313,228
Claims priority, application France, Apr. 7, 1992, 92 04471
Int. Cl.[6] E04B *2/00*
U.S. Cl. 52—220.7 **8 Claims**



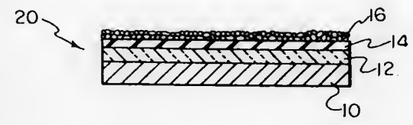
1. Wall bottom skirting for fixing electrical and/or fluid connections facilitating the incorporation and concealment of cables and ducts, comprising:
a cavity in a lower part of a wall and having an upper part, a median part, and a lower part;
an abutment point at said upper part of said cavity;
a support point at said median part of said cavity;
a fixing point at said lower part of said cavity;
a detachable bracket having a median flange, an upper flange, and a lower flange, said upper, median, and lower flanges forming a shape like a stretched Z, said median flange serving as a support for connections, said upper flange contacting said abutment point, and said lower flange contacting said support point and being fixed to the wall through said fixing point.

5,557,896

METHOD OF EMPLOYING AN EXTRUDED OPEN-CELL ALKENYL AROMATIC FOAM IN ROOFING SYSTEMS

Daniel D. Imeokparia, Pickerington; Creston D. Shmidt, Nashport; Kyung W. Suh, Granville, and Michael J. Ennis, Reynoldsburg, all of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 264,677, Jun. 23, 1994, abandoned. This application Aug. 29, 1994, Ser. No. 297,356
Int. Cl.[6] E04D *1/10*
U.S. Cl. 52—408 **21 Claims**



1. A roofing system for a structure, comprising:
a) a roof deck;
b) a protective layer of a plurality of panels of an extruded alkenyl aromatic polymer foam situated above and adjacent the deck, the foam comprising an alkenyl aromatic polymer material having greater than 50 percent by weight alkenyl aromatic monomeric units, the foam having from about 30 to about 80 percent open cell content; and
c) a substantially waterproof membrane situated above and adjacent to the foam panels.

5,557,897

FASTENING DEVICE FOR A ROOF SEALING STRIP OR THE LIKE

Klaus Kranz, Weisbaden, and Reinhard Schubert, Hemsbach, both of Germany, assignors to BRAAS GmbH, Frankfurter, Germany

PCT No. PCT/DE93/00132, § 371 Date Nov. 21, 1994, § 102(e) Date Nov. 21, 1994, PCT Pub. No. WO93/17200, PCT Pub. Date Sep. 2, 1993
PCT Filed Feb. 11, 1993, Ser. No. 284,536
Claims priority, application Germany, Feb. 20, 1992, 42 05 140.1
Int. Cl.[6] E04D *5/14*
U.S. Cl. 52—410 **8 Claims**

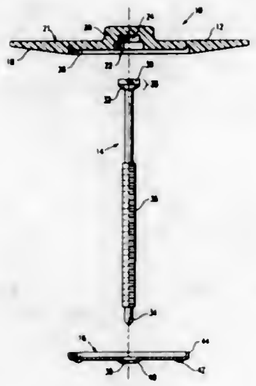
1. A fastening device arrangement for anchoring a member on a roof structure comprising:
a holder having a central opening therein;
an elongated fastener for disposition within the central opening in the holder and having a lower end for penetrating a member and a roof structure and an opposite upper end having a head for engagement with the holder at the central opening thereof to press and anchor the member on the roof structure; and
a cover having an underside thereof configured to receive the holder and having a central opening therein configured interlockingly to engage the head of the fastener, whereby rotation of the cover rotatably drives the fastener when the central opening therein engages the head of the fastener.

5,557,899

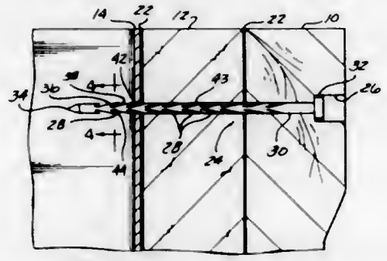
MODULAR ANTI-WARPING DOOR STRUCTURE

bination, a rigid elongated metal tube having an upper end, a lower end, an axis and an outer surface, an envelope formed of recycled synthetic plastic material encasing said tube throughout its length

standoff welded to a bumper plate which is also welded to the tie bar and moves in the space between the pads, and a third extended standoff having its upper and lower ends received



5,557,898
PNEUMATICALLY DRIVEN FINISH NAIL FOR SECURING A PLANAR MEMBER TO A METAL SHEET SUPPORT
Timothy J. Dixon, 215 E. Vine St., Milwaukee, Wis. 53212
Continuation of Ser. No. 199,474, Feb. 22, 1994, abandoned. This application Jun. 20, 1995, Ser. No. 492,734
Int. Cl.[6] E04B *5/00*; **F16B** *15/06*
U.S. Cl. 52—410 **7 Claims**

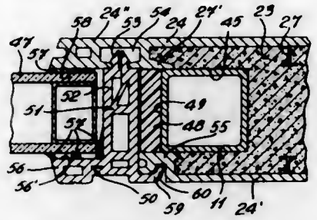


1. A pneumatically driven finish nail, a planar finish member and metal sheet support combination in which the finish nail secures the planar member to a planar portion of the metal sheet support, wherein said planar portion of said metal sheet support has a predetermined thickness, the combination comprising:

the finish nail including a solid, one piece single shank with a small low profile head secured to one end of said shank and said shank having an axial length extending perpendicularly and longitudinally from said head and terminating at a pointed end opposite said head;

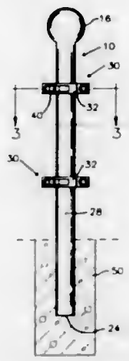
said shank having a plurality of flexible barbs extending angularly from said shank, the barbs spaced longitudinally on the shank and having a smooth surface portion of said shank disposed therebetween, said smooth surface portion of said shank disposed between two adjacent longitudinally spaced barbs having a length slightly greater than the thickness of said metal support such that one barb at least engages the planar portion of the metal sheet support and said planar portion of the metal sheet support being disposed in said smooth surface portion, said barbs having a flexibility to retract toward said shank for forming an essentially smooth surface as said barbs penetrate through the planar wood member and the planar portion of the metal sheet support, and said barbs having a flexibility to expand outwardly from a retracted position for non-retractable engagement with the planar portion of the metal sheet support to resist removal of the finish nail from the metal sheet support.

5,557,899
MODULAR ANTI-WARPING DOOR STRUCTURE
Pierre Dubé, St-Romuald; Barry Yane, Hampstead, and Yvon Boudreau, Beaconsfield, all of Canada, assignors to Materiaux de Construction 2 Plus 2 Inc., Lachine, Canada
Filed Jan. 20, 1995, Ser. No. 375,773
Int. Cl.[6] E06B *3/70*
U.S. Cl. 52—455 **20 Claims**



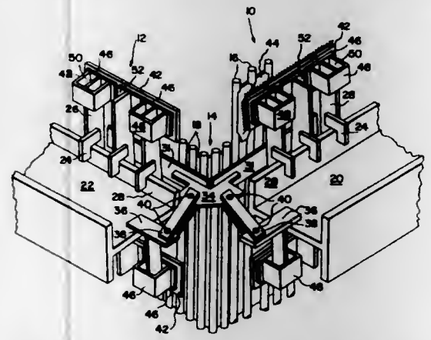
1. A modular anti-warping door panel for use in the construction of a door or door panels, said panel comprising a rigid reinforcing frame constructed of material resistant to warping, said reinforcing frame being defined by two spaced apart elongated rigid members and one or more transverse members, said reinforcing frame being secured between an elongated butte stile and a lock stile and a top and bottom rail, said stiles and rails being formed as hollow members of rectangular cross-section forming a peripheral panel frame, said two elongated rigid members being retained along an inner peripheral channel of said butte stile and lock stile, panel means retained in an opening defined by said inner peripheral channel, a rigid post secured in said butte and lock stiles along an outer edge portion thereof and concealed within said bollow stiles, a connecting element disposed along an outer edge of said top and bottom rails and interconnected at opposed ends thereof with a top portion of said rigid post of said butte and lock stiles, said two elongated rigid members being received captive at opposed free ends thereof in said connecting element, and an insulating material disposed in inner spaces of said butte and lock stiles and said top and bottom rails.

5,557,900
PLAYGROUND STRUCTURAL MEMBER USING RECYCLED PLASTIC
Dwight C. Shaneour, Hillsdale, Mich., assignor to The Shane Group, Inc., Hillsdale, Mich.
Filed Sep. 15, 1995, Ser. No. 528,983
Int. Cl.[6] E04C *3/30*
U.S. Cl. 52—736.3 **9 Claims**



1. A playground structural member characterized by its economy of manufacture, durability and color fastness comprising, in combination, a rigid elongated metal tube having an upper end, a lower end, an axis and an outer surface, an envelope formed of recycled synthetic plastic material encasing said tube throughout its length and outer surface, said envelope having an upper end, a lower end and an outer surface, said envelope upper end comprising an enlarged head adjacent said tube upper end, the envelope wall thickness as defined by said tube outer surface and said envelope outer surface between said head and said envelope lower end being substantially uniform and said envelope outer surface between said head and envelope lower end being cylindrical, a bracket circumscribing said envelope cylindrical outer surface, said bracket including a circumferentially contractible clamp, operating means selectively contracting said clamp for firmly mounting said bracket upon said envelope, and an attachment tab mounted upon said bracket.

5,557,901
BOILER BUCKSTAY SYSTEM
Thomas P. Hoosic, Clinton, and Edward F. Radke, Wadsworth, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.
Filed Nov. 15, 1994, Ser. No. 339,852
Int. Cl.[6] E04B *2/28*; **F22B** *37/24*
U.S. Cl. 52—506.03 **6 Claims**



1. A buckstay system for a membraned-tube wall of a steam generator having a first wall section which meets a second wall section at an angle to form a corner, the system comprising:

at least one buckstay extending across at least part of each wall section;

a pair of tie bars welded to each other at the corner;

an end connection corner tie welded at the corner to the pair of tie bars;

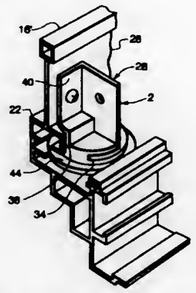
a pair of end connection buckstay brackets, one end of each welded to each end of the buckstays near the corner;

a pair of end connection links connected by pins at one end of the end connection corner tie and at the other end to the end connection buckstay bracket, so that forces from one buckstay are transmitted through the links to the tie bars;

engagement means, engaged with each buckstay, for transmitting bending forces which tend to bend each wall section to each respective buckstay which resists such bending forces, and for transmitting the weight of each buckstay to a respective wall section supporting each buckstay; and

for each buckstay, at least one anchor assembly having upper and lower support plates welded to the outside surface of the tubes, engaged with each buckstay by the engagement means and including two pads welded to and spaced from each other on top of each support plate, a U-shaped plate welded on top of each pad to form an aperture, a first extended standoff located nearest the corner having an inner edge welded directly to one tie bar and having its upper and lower ends received within the apertures formed by one U-shaped plate on each upper and lower support plate, a second extended standoff welded to a bumper plate which is also welded to the tie bar and moves in the space between the pads, and a third extended standoff having its upper and lower ends received within the apertures formed by the other U-shaped plates on the upper and lower support plates and engaged by the engagement means to its associated buckstay.

5,557,902
MICRO CORNICE UNIVERSAL ATTACHMENT CLIP
Brian E. Witmyer, Lititz, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.
Filed Mar. 13, 1995, Ser. No. 402,623
Int. Cl.[6] E04B *5/52*
U.S. Cl. 52—506.07 **3 Claims**



1. A connector for ceiling suspension members comprising:

a) a ceiling suspension system comprising at least a first inverted T-runner and a second element fastened to the first inverted T-runner;

b) said first inverted T-runner having a vertical web member and, at the lower end thereof, horizontal flanges extending either side of the vertical web, said flanges being capable of being formed of different sizes and shapes; and

c) a means connecting together the first inverted T-runner and the second element, said means comprising:

1) an upper member connected to the first inverted T-runner,

2) a lower member connected to the second element, and

3) a middle member connecting together the upper and lower members, said members being rotated as a unit to different positions, said middle member having groove means to receive one of the flanges, and said upper member engaging one side of said vertical web depending upon the different positions of the member rotated relative to the flanges.

5,557,903
MOUNTING CLIP FOR PANELED ROOF
Robert M. M. Haddock, 8655 Table Butte Rd., Colorado Springs, Colo. 80908
Filed Aug. 1, 1994, Ser. No. 285,280
Int. Cl.[6] E04B *1/36*
U.S. Cl. 52—508 **45 Claims**

1. A building assembly comprising:

an underlying building support structure;

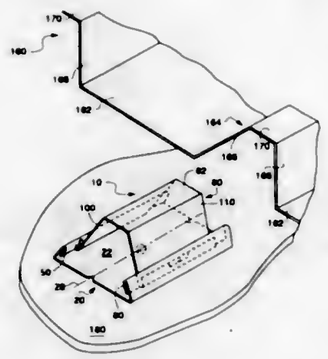
a first building panel;

a first member comprising a base and first and second laterally displaced channel members, said first and second channel members each being interconnected with said base, said first member being attached to one of said first panel said and underlying support structure;

a second member comprising a platform and first and second laterally displaced leg members, said first and second leg members each being interconnected with and extending away from said platform, wherein a portion of said first and second leg members are slidably interconnected with said first and

5,557,905
BIT FOR ADMINISTERING ANIMAL MEDICATION

knife secured to support arm means mounted for movement between a stand-by position disposing said cutting knife away



second channel members, respectively, said second member being attached to the other of said first panel and said underlying support structure; and

means for allowing said first member to move relative to said second member in a direction which is generally parallel with said first and second channel members.

5,557,904

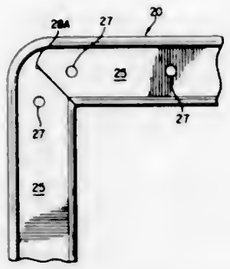
THERMOFORMABLE PLASTIC FRAMIN/CONNECTING STRIP

Donald E. Dabowski, York, Pa., assignor to Quaker Plastic Corporation, Mountville, Pa.

Continuation-in-part of Ser. No. 969,132, Oct. 30, 1992, abandoned. This application May 25, 1995, Ser. No. 452,571

Int. Cl.[6] H04C *2/00*

U.S. Cl. 52—631 **4 Claims**



1. A method of forming a corner in a thermoformable longitudinal facing member having a contoured cross-section while maintaining the continuity of the member as the member is being formed comprising:

making a pair of converging cuts partially through and at predetermined space locations in said longitudinal member and at an angle transverse to the axis of the member and removing the essentially wedge-shape portion defined by said cuts, said angle corresponding to one half the angle of the bent angle of the member;

drilling an enlarged circular opening in the strip at the apex of the converting cuts;

heating the longitudinal member; and

bending the said member along its longitudinal axis and in the plane of the longitudinal member thereby closing the opening and butting the edges of said converging cuts to define the desired corner.

5,557,905

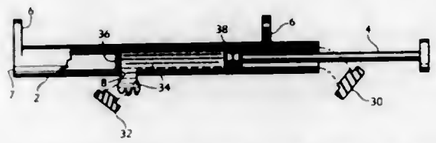
BIT FOR ADMINISTERING ANIMAL MEDICATION

Kay J. Harding, 6154 Bellfountain Rd., Corvallis, Oreg. 97333

Filed Jan. 31, 1995, Ser. No. 382,061

Int. Cl.[6] B68B *1/06*

U.S. Cl. 54—7 **12 Claims**



1. A device for dispensing paste-like medication onto the tongue of a horse, comprising:

(a) hollow cylindrical tubular means, usable as a bar bit, having an oval orifice on the bottom surface thereof for dispensing said paste-like medication downward onto the tongue of said horse;

(b) rod-shaped plunging means slidably inserted into said tubular means thereby forcing said paste-like medication through said oval orifice onto said horse's tongue; and

(c) attachment means for attaching said tubular means to said horse.

5,557,906

PIVOTABLE GUIDE PAN FOR ROUND BALE WRAPPING MATERIAL

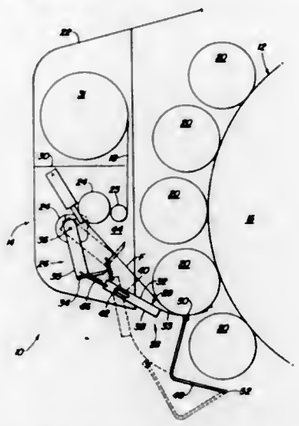
Jean Viaud, Sarreguemines, France, assignor to Deere & Company, Moline, Ill.

Filed Jul. 19, 1995, Ser. No. 504,206

Claims priority, application Germany, Jul. 22, 1994, 44 26 034.2

Int. Cl.[6] B65B *27/12*

U.S. Cl. 53—118 **5 Claims**



1. In a round baler having a baling chamber for forming large cylindrical bales and including a gap serving as a wrap material inlet, a wrapping mechanism mounted exteriorly of said chamber adjacent said gap and including a wrap material feed mechanism, a wrap material guide assembly, and a wrap material cutting mechanism, said feed mechanism including a pair of feed rolls for feeding wrap material along a feed path extending towards said gap, and said guide assembly including a guide pan disposed in an upwardly facing orientation below said feed path for intercepting wrapping material discharged from the feed rolls and directing it towards said gap, and said cutting mechanism including a cutting

knife secured to support arm means mounted for movement between a stand-by position disposing said cutting knife away from said feed path and a cutting position diposing said cutting knife across said feed path, the improvement comprising: mounting means supporting said guide pan for movement between an operative position diposing said guide surface in said upwardly facing orientation and an inoperative position wherein said guide surface is nearly vertical; and a spring means coupled between said guide pan and said support arm means for moving said guide pan to said inoperative position in response to said cutting blade being moved to said cutting position, and for moving said guide pan to said operative position in response to said cutting blade being moved to said stand-by position.

5,557,907

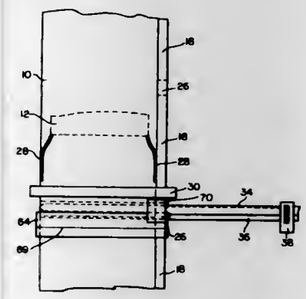
TRANSVERSE ZIPPER SYSTEM

Art Malin, Northbrook; Donald Van Erden, Wildwood, and Michael McMahon, Palatine, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Feb. 24, 1995, Ser. No. 393,864

Int. Cl.[6] B65B *51/04*

U.S. Cl. 53—139.2 **5 Claims**



1. A method for manufacturing plastic bags or packages on a form, fill and seal machine comprising the steps of:

a) directing a sheet of plastic sheet material having lateral edges toward and about a longitudinally extending filling tube of said form, fill and seal machine to form a plastic tube thereabout having a longitudinally extending fin comprising said lateral edges;

b) sealing said fin;

c) providing a transverse gap in said tube;

d) opening said gap; and

e) disposing a zipper having a web through said gap transversely into said plastic tube.

5,557,908

COIN PROCESSING MACHINE

Masamichi Ozeki, Ashikaga; Mamoru Takasaki, Kazo; Katsuyuki Miyamoto, Kawaguchi, and Mitsumasa Tsuruda, Oomiya, all of Japan, assignors to Laural Bank Machine Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1994, Ser. No. 223,684

Claims priority, application Japan, Apr. 15, 1993, 5-088701

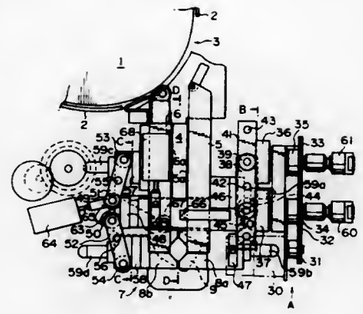
Int. Cl.[6] B65B *11/04*

U.S. Cl. 53—212 **11 Claims**

1. A coin processing machine comprising:

a rotatable disk for receiving deposited coins and feeding out said received coins to a coin sorting passage by a centrifugal force produced by rotation thereof, said coin sorting passage including a pair of guide members;

denomination setting means for selecting a denomination of coins to be processed;



coin processing means for processing coins which are fed out to said coin sorting passage in accordance with said denomination selected by said denomination setting means;

data storing means for storing coin data concerning said denomination of coins to be processed, said coin data including a diameter and a thickness of said coins to be processed, said data storing means including:

first data storing means for storing permanent coin data, said permanent coin data being read only from said first data storing means, and

second data storing means for storing coin data newly stored by said data input means, said newly stored coin data being written into and read from said second data storing means;

data input means for inputting said coin data into said data storing means;

control means for reading out said coin data from said data storing means in accordance with said denomination selected by said denomination setting means so as to control said coin processing means;

passage width adjusting means for adjusting a spacing between said pair of guide members;

transporting belt means for holding coins in said coin sorting passage between a lower surface of said transporting belt means and an upper surface of said coin sorting passage, and for transporting coins;

transporting belt position adjusting means for adjusting a vertical position of said transporting belt means;

coin stacking means for stacking coins to be wrapped after passing through said coin sorting passage;

coin support post means for receiving and supporting on an upper surface thereof coins stacked in said coin stacking means at a post waiting position immediately below said coin stacking means;

coin wrapping means including a plurality of wrapping rollers, said coin wrapping means for winding a wrapping film around said stacked coins supported by said coin support post means, thereby wrapping said stacked coins and producing a wrapped coin roll;

support post moving means for moving said coin support post means between said post waiting position immediately below said coin stacking means, a post wrapping position where said stacked coins supported by said coin support post means can be wrapped by said coin wrapping means, and a post retracted position where said coin support post means is retracted from between said plurality of wrapping rollers; and

first wrapping roller moving means for moving said plurality of wrapping rollers between respective wrapping roller wrapping positions where said coins are wrapped, and respective wrapping roller waiting positions where said plurality of wrapping rollers are slightly more apart from each other than in said respective wrapping roller wrapping positions;

said control means reading out from said data storing means said coin diameter data and said coin thickness data of said denomination of coins to be processed in accordance with said denomination selected by said denomination setting means, and said control means outputting said coin diameter data and said coin thickness data so as to adjust said spacing

between said pair of guide members and so as to adjust said vertical position of said transporting belt means;

upright picker drum with rows of spindles and an upright doffer

an auger conveyor rotatably journaled on the right side sheet and

between said pair of guide members and so as to adjust said vertical position of said transporting belt means;

said coin data includes coin thickness data; and

said support post moving means lowering said coin support post means by a distance corresponding substantially to a thickness of one coin based on said coin thickness data of coins to be wrapped read out from said data storing means by said control means each time said coin support post means receives one coin during a time period between a first time when said coin stacking means has stacked a first predetermined number of coins smaller than a second predetermined number of coins corresponding to a total number of coins to be wrapped in each said wrapped coin roll, and a second time when said coin support post means supports said coins in said second predetermined number corresponding to said total number of coins to be wrapped.

5,557,909

APPARATUS AND PROCESS FOR PACKAGING ARTICLES

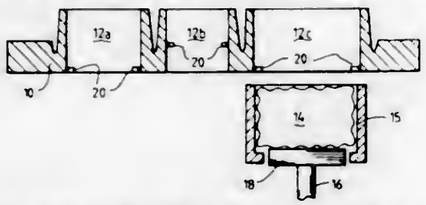
Laurence A. Boyhan, Lower Templestowe, Australia, assignor to Gradual Pty, Ltd., Melbourne, Australia

PCT No. PCT/AU93/00244, § 371 Date Jan. 23, 1995, § 102(e) Date Jan. 23, 1995, PCT Pub. No. WO93/24372, PCT Pub. Date Dec. 9, 1993

PCT Filed May 26, 1993, Ser. No. 343,493

Int. Cl.[6] B65B *5/08;35/32*

U.S. Cl. 53—474 **13 Claims**



11. A method of packaging articles comprising loading, at a first workstation, one or more articles into one or more apertures in a plate member having a plurality of apertures therein, each aperture having at least two openings and being capable of receiving an article or group of articles through the first opening thereof; said aperture having non-return stop means provided therein to releasably retain an article or group of articles positioned therein; said plate member also having means to register one or more packages thereagainst; the loading of said one or more articles being through said first opening in said one or more apertures; positioning one or more packages against said plate member, in registration therewith; moving said plate member while in registration with said one or more packages to a position that enables articles within said aperture or apertures to move therefrom through a second opening therein to positions in said one or more packages predetermined by the position of said aperture or apertures in said plate member, and removing said package or packages and articles from registration with said plate member.

5,557,910

DISCHARGE DOOR STRUCTURE FOR A NARROW ROW COTTON PICKER

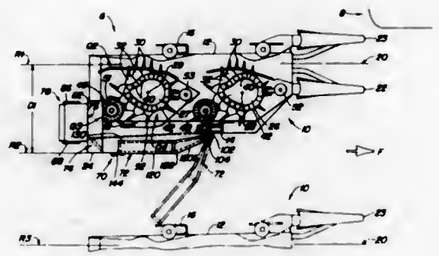
Roberto N. Del Rosario, Des Moines, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jun. 30, 1995, Ser. No. 497,062

Int. Cl.[6] A01D *46/08*

U.S. Cl. 56—30 **24 Claims**

7. In a cotton harvester for harvesting cotton planted in rows in a field, a fore-and-aft extending row unit adapted for forward movement through the field, the row unit comprising:



a fore-and-aft extending row unit housing having a top and a bottom and defining a row receiving area;

a cotton conveying duct supported adjacent the housing;

a harvesting drum supported by the housing for rotation about an upright axis beside the row receiving area, the drum including a plurality of spindles for picking cotton from a first row of cotton plants in the row receiving area;

door structure connected to the housing and extending rearwardly from a forward location outwardly adjacent the drum toward the aft end of the row unit, the door structure including a discharge area opening into the cotton conveying duct;

a doffer column located near the harvesting drum for removing picked cotton from the spindles and directing the cotton outwardly to the door structure; and

wherein the door structure includes an access door pivotally connected to the housing, the access door swingable from a closed harvesting position to an open access position and providing an inwardly opening area to facilitate access to the harvesting drum when in the access position, said access door having a rigidifying section comprising an inwardly offset area.

5,557,911

ADJUSTABLE DOFFER COLUMN FOR A COTTON HARVESTER ROW UNIT

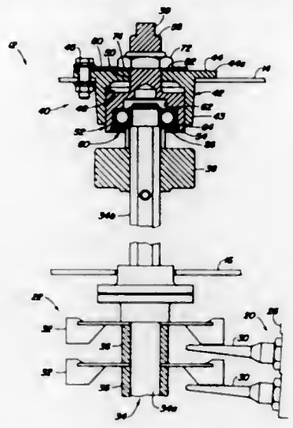
Leon F. Sanderson, Des Moines, and Joel M. Schreiner, Ankeny, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Nov. 1, 1995, Ser. No. 551,500

Int. Cl.[6] A01B *46/16*

U.S. Cl. 56—41 **11 Claims**

1. In a cotton harvester row unit having panel structure, an upright picker drum with rows of spindles and an upright doffer column with doffer pads adapted for doffing cotton from the spindles, doffer column height adjustment structure comprising:



a doffer adjusting housing connected to the panel structure;

a bearing support movably mounted within the doffer adjusting housing and retaining the doffer column at a preselected vertical location dependent on the location of the bearing support;

an adjusting member connected to the bearing support and having a shaft portion threaded vertically through the doffer adjusting housing and rotatable relative to the housing for moving the bearing support vertically upon relative rotation of the shaft portion and housing;

a torque retaining member supported on the shaft portion;

a single locking nut threaded onto the shaft portion and sandwiching the torque retaining member between the locking nut and the doffer adjusting housing, the nut and torque retaining member maintaining a preselected locking torque between the shaft portion and the housing for normally maintaining the preselected vertical location of the doffer column; and

wherein the shaft portion includes a wrench receiving portion for rotating the shaft portion relative to the housing while the preselected locking torque is maintained so that loosening of the locking nut to move the bearing support and change the preselected vertical location of the doffer column is obviated.

5,557,912

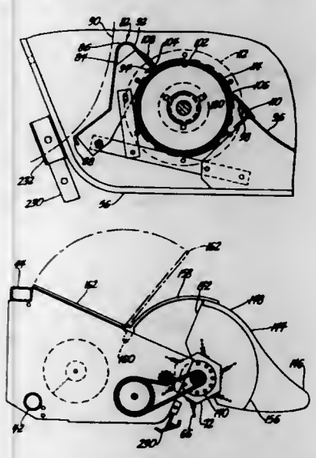
STRIPPER HEADER ATTACHMENT

Douglas A. Voss, Brantford; David G. Link, Cayuga; David S. Rea, Slave Lake, and Murray W. Mills, Brantford, all of Canada, assignors to Western Combine Corporation, Guelph, Canada

Filed Jun. 13, 1995, Ser. No. 489,963

Int. Cl.[6] A01D *41/06;* **A01F** *12/10*

U.S. Cl. 56—130 **11 Claims**



1. A stripper header attachment, adapted to be attached to a combine harvester, having an elongated frame with a back wall, a right side sheet and a left side sheet;

a stripping rotor rotatably journaled on the forward portion of the right side sheet and the forward portion of the left side sheet for rotation about a generally horizontal transverse axis;

stripping elements attached to the outer surface of the stripping rotor;

a front hood mounted on the right side sheet and the left side sheet and covering a part of an upper and forward portion of the stripping rotor;

an auger trough mounted on the frame and extending from the right side sheet to the left side sheet;

an auger conveyor rotatably journaled on the right side sheet and the left side sheet positioned in the auger trough and extending from the right side sheet to the left side sheet;

a feed plate mounted on the frame and extending from a position adjacent to the stripping rotor to the auger trough and from the right side sheet to the left side sheet;

a slot in the feed plate extending substantially from the right side sheet to the left side sheet and having a predetermined width;

a smooth roller conveyor rotatably journaled on the right side sheet and the left side sheet, that has a diameter which exceeds the predetermined width of the slot and an upper portion that extends into the slot a sufficient distance to substantially prevent the passage of grain through the slot; and

a drive system that rotates the stripping rotor in a direction to move stripped heads and grain over the top of the stripping rotor, that rotates the smooth roller conveyor in the same direction as the stripping rotor to convey stripped heads and grain toward the auger trough, and that rotates the auger conveyor in the opposite direction from the stripping rotor.

5,557,913

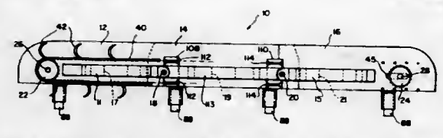
BELT MOWER

Donald L. Metz, 6311 Fly Rd., Suite A, East Syracuse, N.Y. 13057

Filed Feb. 24, 1995, Ser. No. 393,489

Int. Cl.[6] A01D *34/83*

U.S. Cl. 56—244 **4 Claims**



1. A mower comprising elongated, downwardly open housing means, a pair of pulleys mounted in said housing means at opposite ends thereof for rotation about a pair of horizontally disposed axes, respectively, an endless belt entrained about said pulleys, a plurality of cutting elements mounted on an outer surface of said belt, drive means connected to at least one of said pulleys for driving said belt and adjustable rotatable means connected to said housing means for supporting said housing means on the ground for movement along the ground in spaced relation thereto, wherein said housing means is comprised of a plurality of sections and horizontally disposed pivot means pivotally interconnecting said sections whereby said sections may pivot relative to each other in response to uneven ground.

5,557,914

TWISTING MACHINE WITH EXTERNAL AND INTERNAL CONTROL PANELS

Angelo Maccaferri, Bologna, Italy, assignor to S.A.M.P. S.p.A. Meccanica di Precisione, Bologna, Italy

Filed Feb. 6, 1995, Ser. No. 383,858

Claims priority, application Italy, Feb. 7, 1994, BO94A0047

Int. Cl.[6] D01H *1/10;7/46*

U.S. Cl. 57—58.65 **3 Claims**

1. A twisting machine for producing a twisted product comprising:

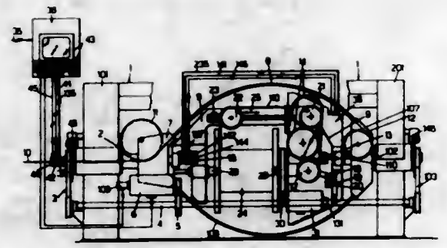
a supporting frame;

a pair of opposed spindles attached to said supporting frame;

a flyer structure rotatably mounted on said pair of opposed spindles;

a cradle frame supported by said spindles inside of said flyer structure, said cradle frame including a take-up reel for the twisted product;

external components located outside of said flyer structure, each said external component having an external power supply line and an external control line associated therewith;



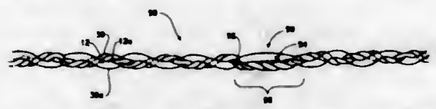
an external control panel arranged exteriorly of said flyer structure and including
(a) a three-phase current power feed line,
(b) a supply means for supplying a three-phase current power from said feed line to said supply lines of said external control components, and
(c) an external electronic computer having a two-wire serial line and being connected to said external control lines for controlling of said external components;
internal components located inside of said flyer structure, each said internal component having an internal power supply line and an internal control line associated therewith;
an internal control panel mounted on said cradle and including an internal electronic computer having a two-wire serial line and being connected to said internal control lines for controlling of said internal components; and
a slip ring system arranged on one of said spindles comprising
(a) a first pair of three rings for connecting said feed line with said supply lines of said internal components, and
(b) a second pair of two rings for connecting said two wire serial lines of said internal and said external electronic computers together to enable a mutual communication and dialogue between said internal and said external electronic computers to ensure that the operation of said external components takes place in phase and in correct sequence with the operation of said internal components.

5,557,915

METHOD AND APPARATUS FOR MAKING ALTERNATE TWIST PLIED YARN AND PRODUCT

Warren F. Knoff, Richmond, Va.; Robert W. McAllister; Peter Popper, both of Wilmington, Del.; Steven K. Shibata, Salisbury, Md.; Robert E. Taylor, Columbia, and Paul W. Yngve, Chapin, both of S.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 14, 1994, Ser. No. 339,103
Int. Cl.[6] D01H *3/26*; D02G *3/02*
U.S. Cl. 57—204 **9 Claims**



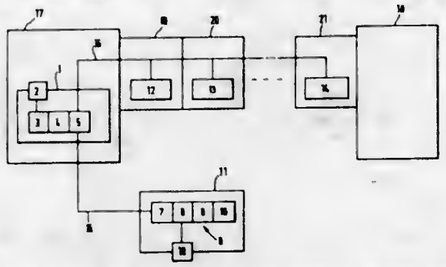
1. An alternate twist plied yarn formed from a plurality of strands of singles yarns twisted in alternating directions in lengthwise intervals of first half-cycles of twist at a predetermined twist level followed by second half-cycles of twist at the same twist level with reversal nodes therebetween, the singles twisted yarns being ply-twisted together in alternating directions in lengthwise intervals of first half-cycles of ply-twist followed by second half-cycles of ply-twist with a reversal node therebetween, there being a bond formed adjacent each node wherein the first half-cycle of ply-twist is located within the bond and the second half-cycle of ply-twist originates at one end of the bond after the adjacent node, the twist level in the singles twisted yarns is between 25% in the same direction and 60% in the opposite direction of the twist applied to the singles yarns before plying.

5,557,916

DEVICE FOR ADJUSTMENT OF THE PARAMETERS FOR OPTIMAL PIECING OPERATIONS ON A ROTOR SPINNING MACHINE

Susanne Messmer, and Josef Müller, both of Ingolstadt, Germany, assignors to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany

Filed May 25, 1995, Ser. No. 450,526
Claims priority, application Germany, Sep. 7, 1994, 44 31 810.3
Int. Cl.[6] D01H *11/00;13/04*
U.S. Cl. 57—261 **4 Claims**



1. A process for piecing in a textile spinning machine with optimal piecing parameters when batches of material processed by the spinning machine are changed, comprising:
changing batches of material processed by the spinning machine;
inputting machine data which changes as a result of changing batches of material into a memory of a central machine control;
transmitting the machine data from the central machine control to a travelling piecing device for a piecing operation, the piecing device having a microcomputer configured for executing a piecing program and having a data base of functional piecing parameters;
computing with the piecing device microcomputer a basic set of optimal piecing parameters corresponding to the transmitted machine data, the basic set of parameters having a minimal number of piecing parameters required for a piecing operation;
displaying the set of optimal piecing parameters at an operator control station in operable communication with the piecing device before the piecing operation;
manually changing any combination of the displayed optimal piecing parameters by an operator at the operator control station within preset limits; and
piecing with the piecing device as a function of the manually adjusted optimal piecing parameters.

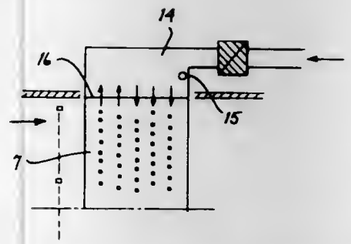
5,557,917

ENGINE STALL AND DISTORTION SUPPRESSION SYSTEM

Link C. Jaw, Tempe, Artz., assignor to Scientific Monitoring, Inc., Tempe, Artz.

Filed Sep. 13, 1994, Ser. No. 305,019
Int. Cl.[6] F02C *7/04*
U.S. Cl. 60—39.02 **18 Claims**

1. A method of equalizing the air pressure in a turbine engine air inlet, said method comprised of:
providing a modulating plenum adjacent to and surrounding said turbine engine air inlet, said plenum filled with air;
providing a means for regulating pressure of the air in said modulating plenum;
providing a means for monitoring the air pressure in said modulating plenum;
separating said modulating plenum from said turbine engine air inlet with a means for permitting air flow between said modulating plenum and said turbine engine air inlet; and



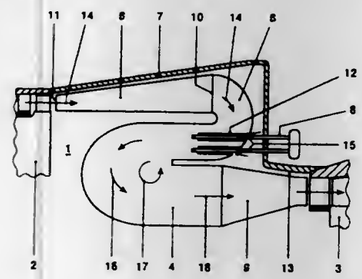
maintaining the air pressure in said modulating plenum at a determined pressure.

5,557,918

GAS TURBINE AND METHOD OF OPERATING IT

Yau-Pin Chyou, Taipei, Taiwan; Thomas Sattelmayer, Mandach, Switzerland, and Peter Senior, Sheffield, Great Britain, assignors to ABB Research Ltd., Zurich, Switzerland

Filed Mar. 31, 1995, Ser. No. 414,810
Claims priority, application Germany, Jun. 3, 1994, 44 19 338.6
Int. Cl.[6] F02C *3/14*
U.S. Cl. 60—39.04 **7 Claims**



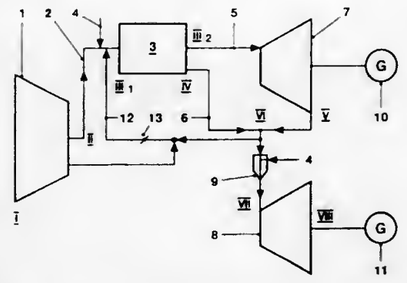
6. A method of operating a gas turbine having a high-pressure compressor, a high-pressure turbine, a low-pressure turbine, and a first combustion chamber connected to the high-pressure turbine and a second combustion chamber connected via a nozzle to the low-pressure turbine, comprising the steps of:
directing exhaust gases from the first combustion chamber into the high pressure turbine;
directing the exhaust gases from the high-pressure turbine into a diffuser where a velocity of the high-pressure turbine exhaust gases is reduced;
changing by 180° the direction of flow of the gases after exiting the diffuser;
injecting a fuel into the exhaust gases by an injection device for form a combustion mixture after the direction of flow of the gases is changed,
directing the combustion mixture into the second combustion chamber,
changing by 180° the direction of flow of the combustion mixture in the second combustion chamber, wherein a ring vortex is formed,
igniting the combustion mixture in the second combustion chamber, and
directing the combusting gases into the low-pressure turbine.

5,557,919

METHOD OF OPERATING A GAS TURBINE INSTALLATION

Rolf Althaus, Flawil, Switzerland, assignor to ABB Management AG, Baden, Switzerland

Filed Aug. 26, 1994, Ser. No. 295,061
Claims priority, application Germany, Sep. 13, 1993, 43 31 081.8
Int. Cl.[6] F02C *3/02*
U.S. Cl. 60—39.06 **4 Claims**



1. A method of operating a gas turbine installation, comprising the steps of:
compressing air in a low-pressure compressor;
introducing a fuel into the compressed air downstream of the compressor;
directing the compressed air and fuel to a pressure-wave machine;
combusting the compressed air and fuel in the pressure-wave machine;
directing a high-pressure working gas produced in the pressure-wave machine via a high-pressure driving-gas conduit to a high-pressure turbine;
directing a low-pressure working gas produced in the pressure-wave machine to a low-pressure driving-gas conduit;
introducing partially expanded and cooled gas from an exhaust of the high-pressure turbine into the low-pressure working gas before entry into the low-pressure turbine;
introducing fuel into the low-pressure working gas and high-pressure turbine exhaust gas mixture and combusting the mixture in a combustion chamber; and,
directing the combustion gas to the low-pressure turbine.

5,557,920

COMBUSTOR BYPASS SYSTEM FOR A GAS TURBINE

Jeffrey A. Kain, Chuluota, Fla., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 168,489, Dec. 22, 1993, abandoned. This application Mar. 30, 1995, Ser. No. 414,144
Int. Cl.[6] F02C *9/18*
U.S. Cl. 60—39.23 **14 Claims**

1. A gas turbine, comprising:
a compressor for producing compressed air;
a combustion zone in which a fuel is burned in a first portion of said compressed air, thereby producing a hot gas;
a turbine for expanding said hot gas;
a flow path for directing said hot gas produced in said combustion zone to said turbine comprising a liner enclosing said combustion zone and a duct disposed between said liner and said turbine, said liner and said duct each having an upstream and a downstream end; and
a collar, encircling said downstream end of said liner and said upstream end of said duct, including a first ring having a first port and a sliding ring encircling said first ring, said first ring and said sliding ring cooperable for causing a second portion of said compressed air to bypass said combustion zone and

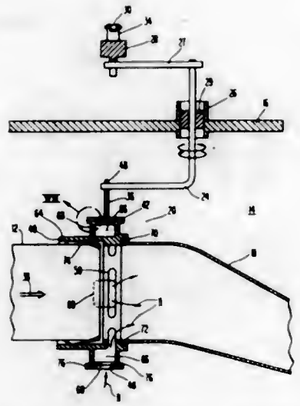
5,557,922

TURBINE

particles to form agglomerates and trapping the particles and particle agglomerates by at least one filter, said method comprising the steps of:

5,557,925

PIPING INSTALLATION FOR LOW TEMPERATURE FLUID

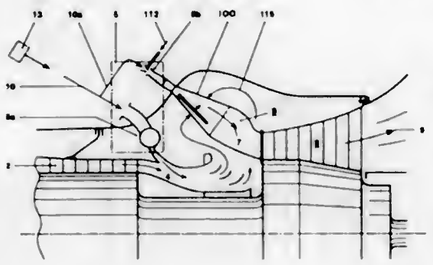


enter said flow path downstream of said combustion zone through said first port.

5,557,921
POWER PLANT

Hans U. Frutschi, Riniken, and Hans Wettstein, Fislisbach, both of Switzerland, assignors to ABB Management AG, Baden, Switzerland

Filed Mar. 31, 1995, Ser. No. 414,740
Claims priority, application Germany, May 2, 1994, 44 15 315.5
Int. Cl.[6] F02C 3/30
U.S. Cl. 60—39.53 8 Claims

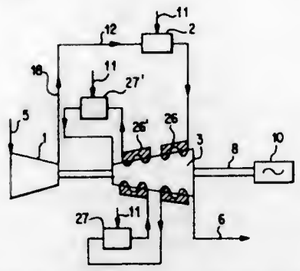


1. A power plant, comprising:
at least one compressor,
at least one combustion chamber having at least one burner,
at least one turbine acting downstream of the combustion chamber,
a steam generator connected to received exhaust gas from the at least one turbine,
a first injector system mounted on an outlet diffusor of the compressor to further compress air from the compressor, a driving nozzle of the first injector system being connected to receive steam from the steam generator, and
a second injector system disposed upstream of the burner of the combustion chamber to inject fuel into the burner, a driving nozzle of the second injector system being connected to receive steam from the generator.

5,557,922
TURBINE

Kenzo Hoshino, and Simoes Raposo Bruges de Oliveira Manueljose, both of 16-21 Daikan-cho, Hiratsuka-shi, Kanagawa-ken, Japan

Filed Jan. 25, 1995, Ser. No. 377,738
Claims priority, application Japan, Jan. 25, 1994, 6-038998
Int. Cl.[6] F02C 7/00
U.S. Cl. 60—39.75 1 Claim

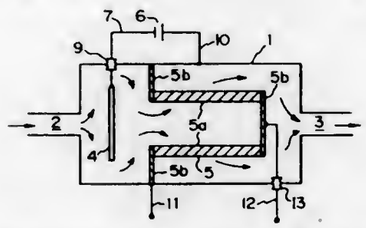


1. A turbine having an entrance; a combustion chamber; and static blades and dynamic blades, and interspaces defined between adjacent ones of the static blades; said static blades having passages formed inside the blades, an inlet to said passages, and an outlet from said passages; a recombustion chamber; means for conducting working gas from said combustion chamber to said inlet; means for conducting said working gas from said outlet to said recombustion chamber; whereby the gas passes serially into each blade through its inlet, through the passages thereof, and flows out through the outlet into and through said recombustion chamber, and then enters the turbine through its entrance; and means for feeding said gas entering through said entrance into said interspaces to thereby act on the dynamic blades of the turbine to rotate the dynamic blades.

5,557,923
METHOD AND DEVICE FOR REMOVING PARTICLES FROM EXHAUST GASES FROM INTERNAL COMBUSTION ENGINES

Heinz Bolt, Wolfratshausen; Franz Walser, Murnau, and Axel Schoneborn, Rodenbach, all of Germany, assignors to Linde Aktiengesellschaft and GST Systeme, and Gesellschaft Fur Abscheide-Und Steuertechnik mbH, Germany

PCT No. PCT/EP93/01851, § 371 Date Mar. 9, 1995, § 102(e) Date Mar. 9, 1995, PCT Pub. No. WO94/02719, PCT Pub. Date Feb. 3, 1994
PCT Filed Jul. 14, 1993, Ser. No. 367,357
Claims priority, application Germany, Jul. 15, 1992, 42 23 277.5
Int. Cl.[6] F01N 3/18
U.S. Cl. 60—274 20 Claims

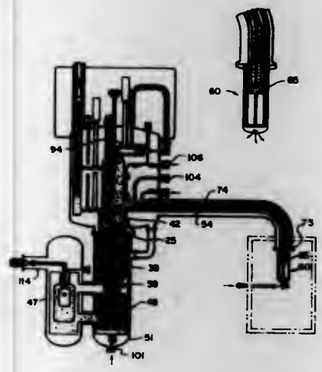


1. A method for the removal of particles from the exhaust gases produced by internal combustion engines by electrostatically charging the particles by at least one electrode, causing some of the particles to form agglomerates and trapping the particles and particle agglomerates by at least one filter, said method comprising the steps of:
a. continuously passing the exhaust gases through a sintered metal fine-mesh filter having at least one precipitation electrode even during regeneration of the filter; and
b. conducting an electrical current periodically through the sintered metal fine-mesh filter to regenerate the filter and heat the filter above the ignition temperature of the particles.

5,557,924
CONTROLLED DELIVERY OF FILTERED CRYOGENIC LIQUID

Russell Blanton, Acton; David Tucker, Quincy, and Thornton Stearns, Winchester, all of Mass., assignors to Vacuum Barrier Corporation, Woburn, Mass.

Filed Sep. 20, 1994, Ser. No. 309,531
Int. Cl.[6] F17C 7/02
U.S. Cl. 62—50.1 24 Claims

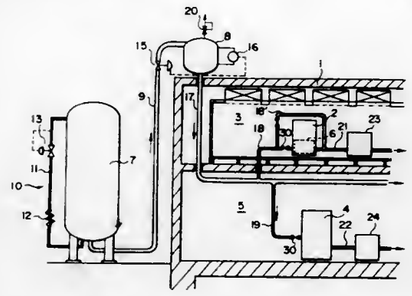


1. A system for delivering a controlled stream of sterile liquid cryogen from an outlet, comprising
a cryogen delivery flow path including a delivery conduit connecting a source of liquid cryogen to the outlet,
a cryogen sterilizer capable of sterilizing cryogen flowing therethrough, said cryogen sterilizer being positioned in the delivery conduit, the delivery conduit comprising a sterile delivery conduit section downstream of the cryogen sterilizer,
an on/off valve positioned between the cryogen sterilizer and the liquid cryogen source,
a sterilizing flow path for sterilizing the cryogen sterilizer and the sterile delivery conduit section, the sterilizing flow path comprising a sterilizing conduit communicating between a source of sterilizing medium and a connection to the cryogen delivery flow path, said on/off valve being positioned between said connection and said cryogen source, whereby the cryogen sterilizer and the sterile delivery conduit section can be isolated from the liquid cryogen source during sterilization such that sterilization occurs without subjecting the liquid cryogen source to the sterilizing medium.

5,557,925
PIPING INSTALLATION FOR LOW TEMPERATURE FLUID

Hideki Kawamura; Shinji Tomita; Shuichi Murayama, all of Kako-gun, and Yukinobu Nishikawa, Koto-ku, all of Japan, assignors to Teisan K.K., Japan

PCT No. PCT/JP94/01494, § 371 Date May 8, 1995, § 102(e) Date May 8, 1995, PCT Pub. No. WO95/07434, PCT Pub. Date Mar. 16, 1995
PCT Filed Sep. 9, 1994, Ser. No. 432,167
Claims priority, application Japan, Sep. 10, 1993, 5-226238
Int. Cl.[6] F17C 9/02
U.S. Cl. 62—50.5 1 Claim



1. An installation for supplying liquid nitrogen to a plurality of equipment units, comprising:
a storage tank for storing the liquid nitrogen;
means for raising an internal pressure of and keeping the internal pressure thereof at said storage tank to a predetermined level;
a first pipe for transporting the liquid nitrogen out of said storage tank;
a gas-liquid separator installed at a position which is higher than positions where said equipment units are installed, for receiving the liquid nitrogen from said first pipe;
means for discharging a part of the nitrogen gas from said gas-liquid separator to keep an internal pressure of said gas-liquid separator at a predetermined level;
a second pipe for transporting the liquid nitrogen out of a bottom of said gas-liquid separator; and
a plurality of third pipes diverging from said second pipe, for supplying the liquid nitrogen from said second pipe to said equipment units, respectively, each of said third pipes being a thermally insulated pipe whose outer diameter is smaller than that of said second pipe.

5,557,926
PULSE DETONATION APPARATUS WITH INNER AND OUTER SPHERICAL VALVES

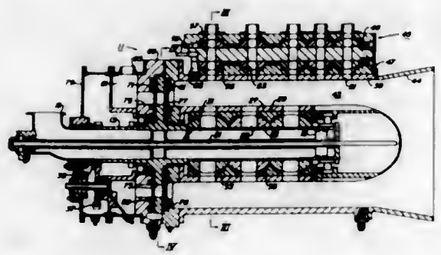
Louis G. Hunter, Jr., Fort Worth, and Don D. Winfree, Keller, both of Tex., assignors to Lockheed-Martin, Fort Worth, Tex.

Continuation-in-part of Ser. No. 410,334, Mar. 24, 1995, which is a continuation-in-part of Ser. No. 265,661, Jun. 24, 1994, Pat. No. 5,473,885. This application May 12, 1995, Ser. No. 439,865
Int. Cl.[6] F02K 7/02; F02C 5/02
U.S. Cl. 60—247 19 Claims

1. A pulse detonation apparatus, comprising in combination:
a cylinder which has a longitudinal axis, an inner passage extending along the longitudinal axis, and a closed downstream end;
a sleeve which closely receives the cylinder;
a jacket which is spaced outward from the sleeve, providing an annulus between the jacket and the sleeve which has an upstream end wall and an open downstream end;
the cylinder and the sleeve being rotatable relative to each other;

5,557,928
TUBE ROCKET THRUST CHAMBER CONSTRUCTION

5,557,931
CHARGE PUMP FOR AXLE DRIVING APPARATUS



the sleeve and the cylinder each having at least one inner port which cyclically align with each other to communicate the inner passage with the annulus;

at least one outer port in the jacket and at least one outer valve means mounted to the outer port for opening and closing the outer port;

cylinder drive means for causing relative rotation between the cylinder and sleeve to open and close the inner ports;

outer valve drive means for actuating the outer valve means to open and close the outer port;

means for introducing a first component of a fuel mixture into the inner passage and a second component of a fuel mixture into the outer port, so that when the inner ports and outer port are open, the two components are injected into the annulus, where they mix to become a combustible fuel mixture; and

igniter means in the annulus for detonating the combustible fuel mixture when the inner ports and outer port are closed to create a detonation wave for passing out the open downstream end of the annulus.

5,557,927

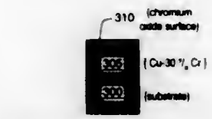
BLANCHING RESISTANT COATING FOR COPPER ALLOY ROCKET ENGINE MAIN CHAMBER LINING

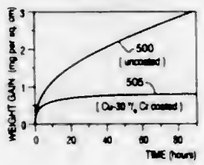
Kuang-Tsan K. Chiang, Agoura Hills, and Sherwin Yang, Chatsworth, both of Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Continuation of Ser. No. 192,528, Feb. 7, 1994, abandoned. This application Nov. 8, 1995, Ser. No. 554,665

Int. Cl.[6] F02K *9/00*

U.S. Cl. 60—257 **6 Claims**





1. A method of protecting a copper-based alloy rocket engine combustion chamber from blanching, comprising the steps of:

(a) placing a copper-chromium mixture comprising 30±10 volume percent chromium in said combustion chamber;

(b) evacuating said combustion chamber to a specified degree of vacuum; and

(c) vapor-depositing said copper-chromium mixture on a surface of said combustion chamber.

5,557,928

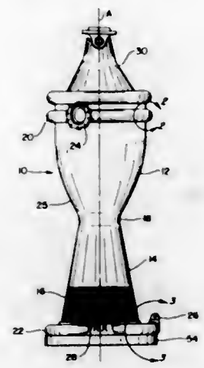
TUBE ROCKET THRUST CHAMBER CONSTRUCTION AND METHOD

Jaoquin H. Castro, West Palm Beach; Samuel S. Owen, Palm Beach Gardens, both of Fla., and Salvatore Santangelo, So. Windsor, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 16, 1994, Ser. No. 291,385

Int. Cl.[6] F02K *11/00*

U.S. Cl. 60—260 **12 Claims**



1. A rocket engine having a thrust chamber comprising a combustion chamber having an inlet and being generally conical or bell shaped and a nozzle having an exit and being generally conical or bell shaped and defining a throat section, said thrust chamber being formed from a plurality of tubes having passages extending from adjacent to the inlet of said combustion chamber to adjacent to the exit of said nozzle comprising a first annular manifold circumscribing said thrust chamber in proximity to said thrust chamber and adjacent to said exit, each of said tubes having a first end and a second end remotely spaced from said first end, said first end fitting into and complementing a plurality of apertures formed in said first annular manifold, a second annular manifold circumscribing said nozzle and axially spaced from said first annular manifold, said second end of each of said plurality of tubes fitting into and complementing a plurality of additional apertures formed in said second annular manifold, each of said plurality of tubes having and end portion adjacent to said second end being bent in a U-shaped configuration defining a pair of legs where one of said pair of legs is in a direction spaced laterally from said nozzle and facing said first annular manifold whereby fluid first flows into said second manifold then through said tubes and into said first manifold.

5,557,929

CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE EQUIPPED WITH EXHAUST GAS PURIFYING CATALYST

Ritsuo Sato, Atsuqi City, and Kimiyoshi Nishizawa, Yokohama City, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Dec. 23, 1994, Ser. No. 363,068

Claims priority, application Japan, Dec. 28, 1993, 5-333908

Int. Cl.[6] F01N *3/28*

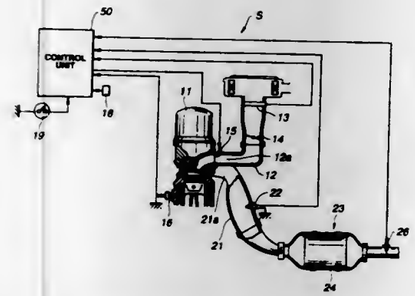
U.S. Cl. 60—276 **16 Claims**

1. A control system for an internal combustion engine provided with an exhaust gas purifying catalyst in an exhaust gas passageway of the engine, said control system comprising:

means for diagnosing a deterioration of the catalyst;

means for detecting a predetermined engine operation condition at which a temperature of the catalyst becomes high;

means for calculating a first period at which a control for stopping fuel to be supplied to the engine is made;



means for calculating a second period at which a control for increasing an amount of fuel to be supplied to the engine is made; and

means for avoiding an operation of said diagnosing means when a deviation between said first and second periods is not less than a predetermined value under said predetermined engine operating condition.

5,557,930

DRIVE UNIT HAVING AN ELECTRIC MOTOR

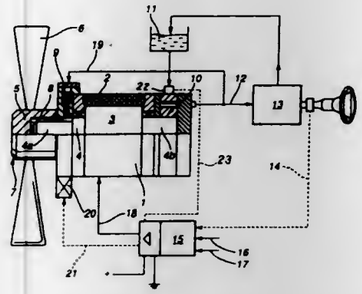
Aydogan Cakmaz, Stuttgart, and Arno Röhringer, Ditzingen, both of Germany, assignors to Mercedes-Benz A.G., Stuttgart, Germany

Filed May 18, 1995, Ser. No. 445,212

Claims priority, application Germany, May 24, 1994, 44 18 071.3

Int. Cl.[6] F16D *31/02*

U.S. Cl. 60—433 **4 Claims**



1. Drive unit including an electric motor for driving a cooling fan and for driving a hydraulic pump of a motor vehicle adapted to supply pressurized fluid to a power steering unit, said electric motor having a clutch for engaging and disengaging said cooling fan, and a control circuit for operating said clutch in such a manner that the operation of the power steering unit has preference over the operation of the cooling fan and said cooling fan is disengaged from said motor when said power steering unit requires pressurized fluid for steering assistance.

5,557,931

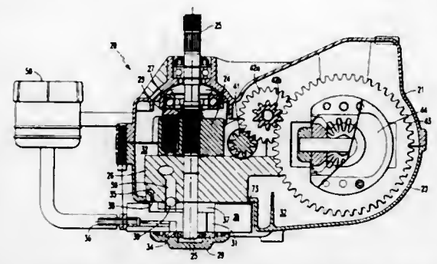
CHARGE PUMP FOR AXLE DRIVING APPARATUS INCLUDING HYDROSTATIC TRANSMISSION

Ray Hauser, Decatur; Daryl Smothers, Sullivan, and John Schreier, Grove, all of Ill., assignors to Hydro-Gear Limited, Sullivan, Ill.

Continuation of Ser. No. 394,144, Feb. 24, 1995. This application May 26, 1995, Ser. No. 451,162

Int. Cl.[6] F16D *31/02;39/00*

U.S. Cl. 60—455 **15 Claims**



1. An apparatus for transmitting power from a vehicle engine to an output axle, comprising:

a housing having an opening formed therein;

a hydrostatic transmission disposed substantially within said housing, said hydrostatic transmission comprising a center section, extending from within said housing and into communication with said opening, having hydraulic porting formed therein; a pump mounted on said center section and drivingly linked to said vehicle engine; and a motor mounted on said center section and hydraulically connected through said hydraulic porting to said pump, said motor being drivingly connected to an output shaft;

a sump containing hydraulic fluid in flow communication with said hydrostatic transmission for supplying hydraulic fluid thereto;

gearing means disposed substantially within said housing for transmitting power from said output shaft to said output axle;

a charge pump disposed adjacent to the external surface of said housing; and

means for hydraulically connecting said charge pump and said hydrostatic transmission.

5,557,932

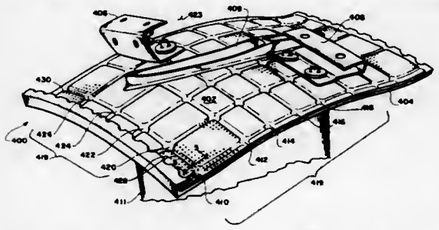
LOW THERMAL STRESS IMPINGEMENT COOLING APPARATUS

Dudley O. Nash, Cincinnati, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Wright-Patterson Air Force Base, Ohio

Filed Jun. 6, 1986, Ser. No. 874,207

Int. Cl.[6] F02K *1/82*

U.S. Cl. 60—266 **23 Claims**



1. Limited thermal stress fracture-resistant impingement cooling apparatus for distributing cooling fluid over a heated member comprising:

a cooling baffle member disposed substantially parallel of said heated member on the heat source opposite side thereof and at

5,557,934

EFFICIENT ENERGY CONVERSION APPARATUS AND METHOD ESPECIALLY ARRANGED TO EMPLOY A

axis (A), the stepped piston bore including a main bore proximate the closed end and a fast-fill bore proximate the open end, the fast-fill bore having a larger diameter than the

a cooling baffle member disposed substantially parallel of said heated member on the heat source opposite side thereof and at predetermined separation distance therefrom, said cooling baffle member having adjacent first and remote second sides with respect to said heated member;

means for rigidly joining said cooling baffle member to said heated member at lateral peripheral portions thereof;

a pattern of furrow depressions interrupting the lateral extent of said cooling baffle member surface central of said rigidly joined peripheral portions, said furrow depressions at the adjacent side apex portion thereof contacting said heated member and supporting the said baffle and heated members in said predetermined separation;

an array of impingement cooling fluid transmission apertures disposed in a predetermined pattern over the surface of said cooling baffle member; and

a source of pressurized cooling fluid communicating with said cooling baffle member remote side.

5,557,933

MALFUNCTION DIAGNOSIS APPARATUS FOR INTERNAL COMBUSTION ENGINE

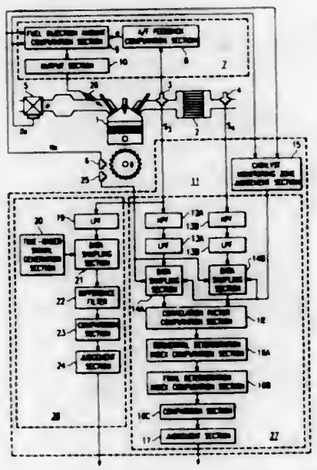
Akihito Numata, Ibaraki; Takashi Mukaihira, Katsuta; Toshio Ishii, Mito; Yutaka Takaku, and Kazuya Kawano, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 8, 1994, Ser. No. 302,409

Claims priority, application Japan, Sep. 8, 1993, 5-223613

Int. Cl.[6] F01N *3/20*

U.S. Cl. 60—274 **23 Claims**



1. A malfunction diagnosis apparatus for an internal combustion engine comprising:

a fluctuation factor state measurement sensor;

an angular-based data sampler which samples data of an output signal from said fluctuation factor state measurement sensor at a rate dependent on engine speed;

a malfunction judgment means for judging a malfunction of a function of said internal combustion engine on the basis of data sampled by said angular-based data sampler;

a time-based data sampler which samples an output signal from said fluctuation state measurement sensor at every lapse of a predetermined constant time and supplies said output signal from said time-based data sampler to a filter.

5,557,934

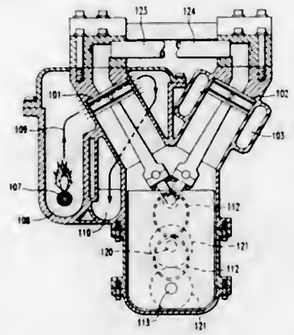
EFFICIENT ENERGY CONVERSION APPARATUS AND METHOD ESPECIALLY ARRANGED TO EMPLOY A STIRLING ENGINE OR ALTERNATELY ARRANGED TO EMPLOY AN INTERNAL COMBUSTION ENGINE

Eugene H. Beach, Silver Spring, Md., assignor to Epoch Engineering, Inc., Gaithersburg, Md.

Filed Dec. 20, 1994, Ser. No. 360,053

Int. Cl.[6] F01B *9/00*

U.S. Cl. 60—517 **31 Claims**



1. A drive apparatus comprising:

an engine having one or more cylinders, each cylinder having a moveable piston contained therein;

a system for generating heat and for converting the heat into linear motion of the piston within each cylinder;

a load;

a drive system having a mechanical drive path through which the piston of each cylinder is coupled to the load to apply driving force thereto;

the drive system including a drive shaft in the drive path; and

gear mechanism means connected between the piston of each cylinder and the drive shaft and having at least a set of Class 1 elliptical gears of the first type to increase efficiency of the engine and overall efficiency of the apparatus.

5,557,935

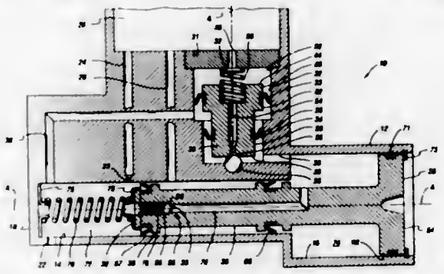
APPLY-RATE-INDEPENDENT FAST-FILL MASTER CYLINDER

Blaise J. Ganzel, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Livonia, Mich.

Filed May 23, 1995, Ser. No. 447,360

Int. Cl.[6] F15B *7/04*

U.S. Cl. 60—578 **9 Claims**



1. An apply-rate-independent fast-fill master cylinder, comprising:

an elongate housing having a main axis (A) and a valve axis (B), a closed end and an open end, the housing further having a stepped piston bore concentrically disposed along the main axis (A), the stepped piston bore including a main bore proximate the closed end and a fast-fill bore proximate the open end, the fast-fill bore having a larger diameter than the main bore,

the housing also having a main inlet port and a compensation port, which are connectable to a brake fluid reservoir, and a main outlet port extending therethrough into the main bore,

the housing also having a staged inverse proportioning valve bore, also stepped and concentrically disposed along the valve axis and including a first valve bore portion and a second valve bore portion, the first valve bore portion having a larger diameter than the second valve bore portion, and

the housing also having a valve bore inlet port extending between the valve bore and the fast-fill bore, a valve bore outlet port extending between the valve bore and the main bore, and a reservoir return port extending between the valve bore and the reservoir;

a staged inverse proportioning valve body slidably disposed within the staged inverse proportioning valve bore, the valve body having a leading valve body portion disposed within the first valve bore portion, and a trailing valve body portion disposed within the second valve bore portion, the valve body also having an internal valve port extending concentrically therethrough along the valve axis, a valve body valve seat being formed at the location where the internal valve port exits the trailing valve body portion;

a staged inverse proportioning valve ball fixedly mounted in the housing proximate the valve body valve seat, the valve body being resiliently biased to urge the valve seat against the valve ball for isolating the valve bore inlet port from the reservoir return port;

a leading valve seal disposed circumferentially on the leading valve body portion for isolating the valve bore outlet port from the reservoir return port;

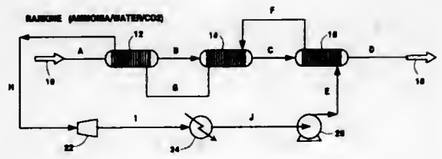
a trailing valve seal disposed circumferentially on the trailing valve body portion for isolating the valve bore inlet port from the valve bore outlet port;

a stepped piston slidably disposed within the stepped piston bore and having a leading piston portion disposed within the main bore, defining a main pressurizing chamber between the leading piston portion and the closed end of the housing, and a trailing piston portion disposed within the fast-fill bore, and defining a fast-fill pressurizing chamber between the trailing piston portion and the leading piston portion, the stepped piston **60** being resiliently biased toward the open end of the housing;

a first leading piston seal disposed circumferentially on the leading piston portion for isolating the main pressurizing chamber from the main inlet port and from the compensation port when the stepped piston **60** is displaced;

a second leading piston seal disposed circumferentially on the leading piston portion for isolating the fast-fill pressurizing chamber from the main inlet port; and

a trailing piston seal disposed circumferentially on the trailing piston portion for isolating the fast-fill pressurizing chamber from the open end.



5,557,937

VAPOUR COMPRESSION SYSTEMS

Geoffrey G. Haselden, Leeds, England, assignor to The University of Leeds, Leeds, England

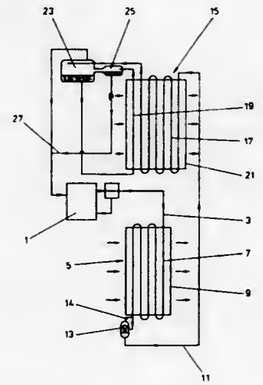
Division of Ser. No. 50,303, Apr. 2, 1993, Pat. No. 5,385,034.

This application Nov. 22, 1994, Ser. No. 343,765

Claims priority, application United Kingdom, Oct. 4, 1990, 9021611

Int. Cl.[6] F25B *41/04;43/00*

U.S. Cl. 62—114 **27 Claims**



1. A vapor compression system comprising:

(a) a compressor for increasing the pressure of refrigerant vapour;

(b) a condenser for high pressure refrigerant vapour received from the compressor;

(c) an evaporator for liquid refrigerant received from the condenser, from which low pressure refrigerant vapour is supplied to the compressor;

(d) a reservoir into which liquid refrigerant discharged from the evaporator collects, so as to minimize the supply of liquid refrigerant to the compressor;

(e) a conduit for supply of liquid refrigerant from the reservoir for admixture with refrigerant that has been vaporized in the evaporator so that, under steady state operating conditions, refrigerant is discharged into the reservoir from the evaporator in both liquid and vapour phases; and

(f) an expansion device which controls the supply of liquid refrigerant from the condenser to the evaporator the expansion device being arranged to open when the quantity of condensed liquid refrigerant within or behind it reaches a predetermined level, the force required to open the expansion device being substantially independent of the pressure drop across it.

5,557,936

THERMODYNAMIC POWER GENERATION SYSTEM EMPLOYING A THREE COMPONENT WORKING FLUID

Raymond Francis Drnevich, Clarence Center, N.Y., assignor to Praxair Technology, Inc., Danbury, Conn.

Filed Jul. 27, 1995, Ser. No. 508,568

Int. Cl.[6] F01K *25/06*

U.S. Cl. 60—649 **8 Claims**

1. A method for generating power comprising the steps of

providing a pressurized working fluid comprising water, ammonia, and carbon dioxide, and

expanding the pressurized working fluid in a turbine to generate useful power.

5,557,938

TRANSPORT REFRIGERATION UNIT AND METHOD OF

1. A control system for an absorption chiller having pump means for recycling an absorbent through a generator and an absorber, the

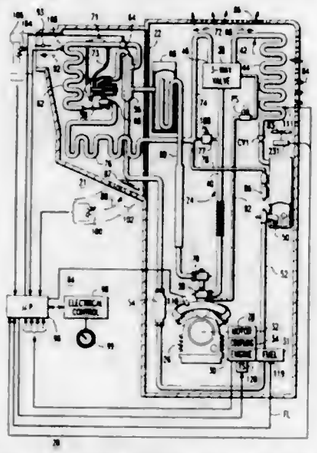
opened from a closed state to communicate ambient air pressure with said compartment in response to a suctioning-back of water in said conduit during said second pressure condi-

5,557,938

TRANSPORT REFRIGERATION UNIT AND METHOD OF OPERATING SAME

Jay L. Hanson, Bloomington, and Doyle G. Herrig, Elko, both of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Filed Feb. 27, 1995, Ser. No. 395,014
Int. Cl.[6] F25B *49/02*
U.S. Cl. 62—126 **32 Claims**



1. A method of operating a transport refrigeration unit associated with a conditioned space to be temperature controlled, with the transport refrigeration unit including a refrigerant compressor driven by an internal combustion engine having fuel in a fuel supply tank, comprising the steps of:

providing a fuel level signal responsive to the amount of fuel in the fuel supply tank,

and modifying the operation of the transport refrigeration unit in response to a predetermined value of the fuel level signal,

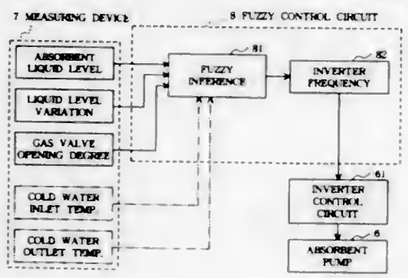
said modifying step increasing the length of time the transport refrigeration unit will function to control the temperature of the conditioned space without exhausting the fuel in the fuel supply tank.

5,557,939

CONTROL SYSTEM FOR ABSORPTION CHILLERS

Kazuaki Mizukami, Hirakata; Atsushi Ogawa, Kyoto; Masashi Yasuda, Neyagawa; Masahiro Furukawa; Hidetoshi Arima, both of Gunma, and Yoshio Ozawa, Hirakata, all of Japan, assignors to Sanyo Electric Co. Ltd., Osaka, Japan

Filed May 10, 1995, Ser. No. 438,363
Claims priority, application Japan, May 19, 1994, 6-131403
Int. Cl.[6] F25B *15/00*; G05D *15/00*
U.S. Cl. 62—148 **2 Claims**



1. A control system for an absorption chiller having pump means for recycling an absorbent through a generator and an absorber, the control system being operable for controlling the output of the pump means to maintain the absorbent in the generator at an approximately constant liquid level, the control system comprising:

data detecting means for detecting an item of or different items of operating state data at least including the liquid level of the absorbent in the generator,

main control means for carrying out a specified control rule based on the detected operating state data to calculate a control input for the pump means,

emergency detecting means for detecting a variation of the liquid level in the generator departing from a predetermined reference range or the liquid level departing from a predetermined reference range as indicating occurrence of an emergency, and

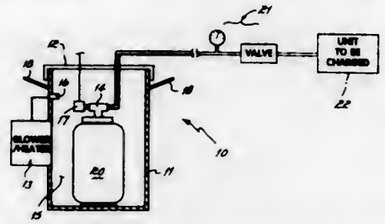
emergency control means for stopping the control operation of the main control means upon detection of the emergency and altering the control input for the pump means to the greatest possible extent to make the liquid level approximate to a target value.

5,557,940

PORTABLE HEATING UNIT FOR ON-SITE CHARGING OF A COOLING UNIT

Roger G. Hendricks, R.D.#1, Box 73,, Mingo Junction, Ohio 43938

Filed Oct. 27, 1995, Ser. No. 549,172
Int. Cl.[6] F25B *45/00*
U.S. Cl. 62—149 **6 Claims**



1. A portable refrigerant system charging apparatus comprising:

an enclosure for holding a refrigerant supply cylinder, a heater and a blower for raising the temperature within said enclosure, a power supply for said heater and blower, a high temperature sensor for interrupting the power to said heater and blower when a predetermined temperature is reached, a high pressure sensor for interrupting the power to said heater and blower when a predetermined pressure is reached, and a tee fitting for connecting said refrigerant supply cylinder to a charging outlet and to said high pressure sensor.

5,557,941

REFRIGERATION UNIT AND METHOD OF OPERATING SAME

Jay L. Hanson, Bloomington; James E. Nixon, Woodbury; Doyle G. Herrig, Elko, and Gerald J. Ladendorf, Bloomington, all of Minn., assignors to Thermo King Corporation, Minneapolis, Minn.

Division of Ser. No. 152,649, Nov. 12, 1993, Pat. No. 5,456,088. This application Jun. 30, 1995, Ser. No. 431,807
Int. Cl.[6] F25B *13/00*
U.S. Cl. 62—160 **16 Claims**

1. A method of operating a refrigeration unit having a compressor driven by a prime mover in one of first and second selectable operating modes, with the first operating mode being a continuous mode which includes cooling and heating cycles, and with the second operating mode being a cycle mode which includes cooling and null cycles, to control the temperature of a conditioned space relative to a predetermined set point temperature, comprising the steps of:

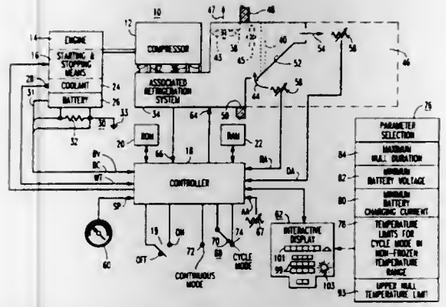
selecting an operating mode from the continuous and cycle operating modes,

selecting a temperature range in which the cycle mode is authorized,

selecting the set point temperature for the conditioned space,

comparing the selected set point temperature with the selected authorized temperature range,

and running the unit in the continuous mode when the comparison step finds that the selected set point temperature is not within the authorized temperature range, without regard to the operating mode selected.

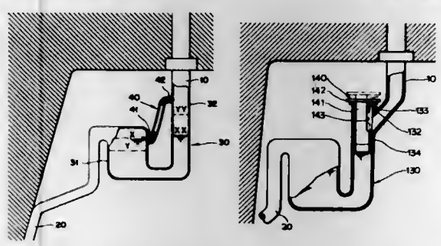


5,557,942

METHODS AND APPARATUS FOR EQUALIZING PRESSURE BETWEEN A REFRIGERATING COMPARTMENT AND AMBIENT AIR

Sang U. Kim, Suwon, and Suk Bang, Youngin, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 4, 1994, Ser. No. 334,078
Claims priority, application Rep. of Korea, Nov. 30, 1993, 1993-25777 U; Feb. 4, 1994, 1994-2167 U
Int. Cl.[6] F25D *21/14*
U.S. Cl. 62—288 **10 Claims**



1. A refrigerator comprising:

a refrigerating food storage compartment having a door;

a water conduit for conducting defrost water out of said compartment and including a water trapping portion disposed intermediate the ends thereof for preventing an air transfer between said compartment and the ambient air disposed outside of said compartment during a first pressure condition wherein a pressure in said compartment is equal to that of said ambient air; and

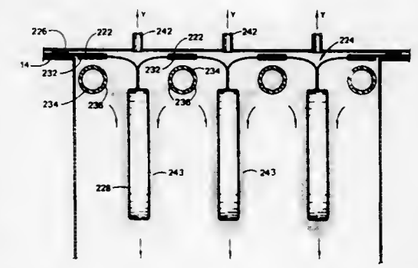
a pressure equalizing means for equalizing pressure between said compartment and said ambient air in response to a second pressure condition, wherein a pressure within said compartment is lower than that of said ambient air, said pressure equalizing means comprising air passage means for being opened from a closed state to communicate ambient air pressure with said compartment in response to a suctioning-back of water in said conduit during said second pressure condition.

5,557,943

RAPID COOLING THROUGH A THIN FLEXIBLE MEMBRANE

Philip H. Coelho, and Terry Wolf, both of Rancho Cordova, Calif., assignors to ThermoGenesis Corporation, Rancho Cordova, Calif.

Division of Ser. No. 495,765, Mar. 19, 1990, Pat. No. 5,168,712. This application Dec. 7, 1992, Ser. No. 986,525
Int. Cl.[6] H25D *17/02*
U.S. Cl. 62—376 **7 Claims**



1. A device for fast freezing perishables, comprising, in combination:

a container having an open top;

a liquid refrigerant disposed in said container which is provided with means for maintaining the refrigerant at a temperature to enable the fast freezing of the perishables;

a removable cover plate having top and bottom surfaces and a plurality of slotted openings;

said cover plate being hermetically secured to said container top;

each said slotted opening having a pouch formed of thin-walled flexible plastic material with the pouch opening hermetically sealed to the bottom perimetric edge of said slotted opening to depend therefrom into the container interior;

a plurality of tubular spray heads mounted in said container below said cover plate to direct liquid refrigerant against said pouches;

an insulated closure member moveable from an open position exposing said slots for inserting perishables into said pouches to a closed position hermetically sealing said closure to said cover plate top surface; and

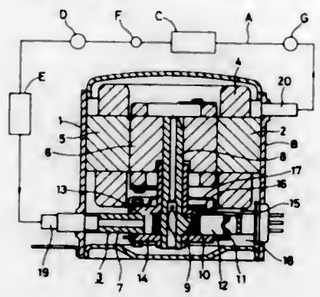
vacuum means acting between said cover plate top surface and said insulated closure to collapse said pouches around said perishables whereby fast freezing is achieved by said liquid refrigerant spray aided by improved heat transfer resulting from the vacuum created close contact between the pouches and perishables.

5,557,944

REFRIGERATING UNIT

Yutaka Hirano, Ohta; Takeo Komatubara, Kiryu; Takashi Sunaga, Ohra-gun; Yasuki Takahashi, Sawa-gun; Kiyoshi Tanaka, Ohra-gun; Kiyoshi Akazawa, Ohra-gun; Masato Watanabe, Ohra-gun, and Seiki Jikuhara, Akoh, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka-fu, Japan

Filed Feb. 14, 1994, Ser. No. 195,278
Claims priority, application Japan, Feb. 12, 1993, 5-024169
Int. Cl.[6] C10M *107/00*
U.S. Cl. 62—469 **1 Claim**



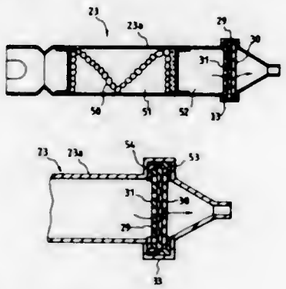
1. A refrigerating unit comprising the component parts of a compressor, a condenser, a pressure reducing unit and an evaporator connected to perform a refrigeration cycle, which components are machined and assembled using an alkylbenzene hard oil (HAB) or an ester system oil as the oil used in the machining and assembling processes of said component parts, and the volume of HAB used being less than 10% of the sealed volume of the refrigerating machine oil in the refrigerating unit, said refrigerating unit using a hydrofluorocarbon system refrigerant in the refrigeration cycle and having at least one refrigerating machine oil with a polyol ester oil as its base oil, the hydrofluorocarbon system refrigerant having its purity higher than 99.95 wt % and the amount of chlorine impurity in the system refrigerant is lower than 80 ppm.

5,557,945

REFRIGERANT COMPRESSOR AND REFRIGERATION SYSTEM INCORPORATING SAME

Manso Mangyo, Fujisawa; Sinya Ito, Yokohama, and Seishi Nakaoka, Chigasaki, both of Japan, assignors to Matsushita Refrigeration Company, Osaka, Japan

Filed Oct. 11, 1994, Ser. No. 320,717
Claims priority, application Japan, Oct. 12, 1993, 5-254191
Int. Cl.[6] F25B *43/00*
U.S. Cl. 62—474 **18 Claims**



1. A refrigeration system comprising:

a series of a refrigerant flow passage including therein a refrigerant compressor, a condenser, a drier, an expansion mechanism and an evaporator;

a refrigerant containing, as a main component, a chlorine-free carbon fluoride compound;

a lubricating oil containing ester as a main component, said lubricating oil having solubility with said refrigerant; and

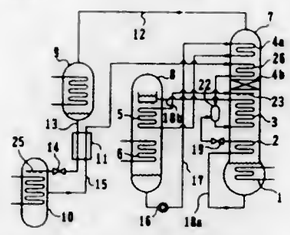
a filter provided in said refrigerant flow passage, said filter formed of a film material being one of fluororesin, cellulose ester and silica fiber.

5,557,946

ABSORPTION TYPE HEAT PUMP

Takahide Sugiyama; Hisashi Takahashi, and Nakahiro Inagaki, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Mar. 29, 1995, Ser. No. 412,453
Claims priority, application Japan, Mar. 29, 1994, 6-058782
Int. Cl.[6] F25B *15/00;37/00*
U.S. Cl. 62—476 **26 Claims**



1. An absorption type heat pump comprising:

a regeneration unit including:

a rectifying section for enhancing the concentration of a generated cooling medium,

a regeneration heat input device for heating and boiling a solution that has flowed from the rectifying section, the regeneration heat input device being arranged under the rectifying section,

an absorption regeneration heat exchanging section arranged between the regeneration heat input device and the rectifying section, the absorption regeneration heat exchanging section having a heat exchanging passage composed of heat transfer walls, and

a strong solution scattering device arranged between the absorption regeneration heat exchanging section and the rectifying section;

a condenser into which steam of cooling medium generated in the regeneration unit is introduced for cooling, condensing and liquidizing the cooling medium steam;

an evaporator into which the condensed and liquidized cooling medium liquid is introduced from the condenser through an expansion valve so as to evaporate the cooling medium liquid by heat exchange with a heating medium;

a vapor-liquid mixer for mixing the supplied cooling medium steam with a portion of the weak solution that has flowed out from the regeneration unit;

a first conduit for introducing the mixed liquid that has flowed out from the vapor-liquid mixer into a lower inlet of an absorption regeneration heat exchanging section of the regeneration unit;

an absorption unit including:

a first solution scattering device for introducing and scattering a mixed fluid that has flowed out from an upper outlet of the absorption regeneration heat exchanging section of the regeneration unit

a strong solution heat exchanging section having a heat exchange passage composed of heat transfer walls, the strong solution heat exchanging section being arranged under the solution scattering device; and

an absorption radiating section having a heat exchanging passage in which a cooling fluid flows, the absorption radiating section being provided under the strong solution heat exchanging section and composed of heat transfer walls;

a solution pump for drawing a strong solution stored in a bottom portion of the absorption unit;

a second conduit for introducing the strong solutioo drawn out by the solution pump into a lower inlet of the strong solution heat exchanging section of the absorption unit;

a third conduit for supplying a strong solution flowing out from an upper outlet of the strong solution heat exchanging section of the absorption unit to the strong solution scattering device of the regeneration unit;

an invert rectifier for introducing cooling medium steam flowing out from the evaporator to a lower portion of the container and also for introducing a residual portion of the weak solution that has flowed out from the regeneration unit and is introduced into the vapor-liquid mixer, so that the cooling medium steam and the weak solution are subjected to vapor-liquid contact;

a forth conduit for supplying cooling medium steam generated at the top of this invert rectifier to the vapor-liquid mixer; and

a fifth conduit for supplying an intermediate weak solution generated at the bottom portion of the invert rectifier to the solution scattering device of the absorption unit.

5,557,947

Patent Not Issued For This Number

5,557,948

YARN GUIDING METHOD AND APPARATUS FOR FLAT KNITTING MACHINE

Masahiro Shima, and Minoru Senoomura, both of Wakayama, Japan, assignors to Shima Seiki Mfg. Ltd., Wakayama-ken, Japan

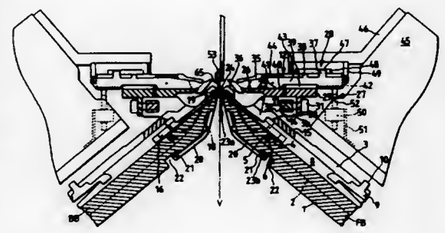
Filed Apr. 28, 1995, Ser. No. 425,915
Claims priority, application Japan, Apr. 28, 1994, 6-113892; Apr. 6, 1995, 7-107911
Int. Cl.[6] D04B *7/04*
U.S. Cl. 66—64 **11 Claims**

3. A yarn guiding apparatus for a flat knitting machine, the flat knitting machine comprising a yarn feeder and a pair of opposed needle beds defining a knock over edge area and a center line therebetween, at least one of the needle beds having mounted thereon a plurality of needles and a plurality of sinkers arranged between the needles, the yarn guiding apparatus comprising:

at least one yarn holding member arranged between at least one of the plurality of needles and at least one of the plurality of sinkers, the yarn holding member being advanceable toward and retractable from the knock over edge area and having an operating face for pushing down a yarn fed from the yarn feeder to the knock over edge area, the operating face being configured for contacting the yarn and for pushing the yarn down toward at least one of the needles when the yarn holding member is advanced toward the knock over edge area,

yarn holding member operating means for operating the yarn holding member, the yarn holding member operating means comprising a butt formed on the yarn holding member, and

a cam provided in a cam box for controlling at least one of advancement of the yarn holding member toward and retraction of the yarn holding member from the knock over edge area, the cam being operable for engaging the butt of the yarn holding member and for advancing the yarn holding member



to a position wherein at least a portion of the yarn holding member extends beyond the center line defined by the opposing needle beds.

5,557,949

DUST COLLECTING AND REMOVING DEVICE IN A CIRCULAR KNITTING MACHINE AND A KNIT FABRIC MANUFACTURING APPARATUS

Masakazu Mori, Aichi-gun, and Toyotoshi Yoshioka, Toyota, both of Japan, assignors to Luwa Japan Ltd., Yokkaichi, and Kabushiki Kaisha Fukuharaseiki Seisakusho, Kobe, both of Japan

Filed Nov. 4, 1994, Ser. No. 334,530
Claims priority, application Japan, Nov. 9, 1993, 5-304632
Int. Cl.[6] D04B *35/32*
U.S. Cl. 66—168 **10 Claims**

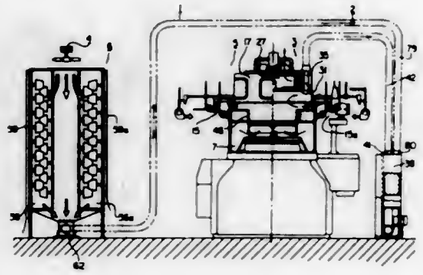
1. A dust collecting and removing device of a circular knitting machine for collecting dust from a knitting portion thereof, comprising:

a first outer casing having wall means defining a first interior chamber and a suction opening in communication with said hitting portion to collect dust therefrom;

a first dust collecting body having means for securing said first

dust collecting body within said hollow interior of said outer casing, said first dust collecting body having a plate member and a rotatable cylindrical first filter which has an annular shape, said first filter having an interior surface which defines a hollow filter interior having a first end and a second end that is covered by said plate member, and an exterior surface which is spaced from said wall means so as to define a first suction passage therebetween;

means for rotating said first filter;



a first suction device in communication with said filter interior downstream of said first end which effects a flow of air from said first suction passage, through said first filter and into said filter interior so that filtered dust collects on said first filter;

a blowing nozzle fixed on said knitting machine within said filter interior, said blowing nozzle directed toward said interior filter surface for blowing said filtered dust outwardly from said filter;

a collecting nozzle fixed on said knitting machine in communication with said first suction passage, said collecting nozzle being directed toward said exterior filter surface and aligned with said blowing nozzle for receiving said filtered dust blown thereby; and

a collecting container in communication with said collecting nozzle.

5,557,950

WARP KNITTED PLUSH FABRIC RESISTANT TO PILE PULL-THROUGH

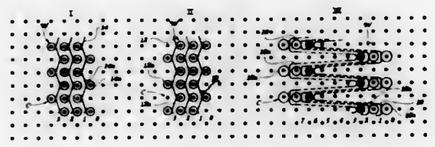
David T. Richards, Greensboro; Phillip D. McCartney, Oak Ridge, and Billy J. Casper, Greensboro, all of N.C., assignors to Guilford Mills, Inc., Greensboro, N.C.

Filed Jun. 2, 1995, Ser. No. 460,134

Int. Cl.[6] D04B *21/04;11/08;23/08*

U.S. Cl. 66—194 **12 Claims**

1. A textile fabric of a knitted construction characterized by a raised pile at one side of the fabric forming an upstanding plush surface which resists tendency of the pile to be pulled from the fabric, the fabric comprising a plurality of yarns interknitted with one another including yarns forming a ground structure for the fabric and yarns interknitted with the ground yarns and extending outwardly therefrom forming the raised pile, the ground yarns being multifilament synthetic yarns wherein each filament of the ground yarns is no greater than approximately 1.5 denier, the pile



yarns being microdenier multifilament synthetic yarns wherein each filament of the pile yarns is less than about one denier, and wherein the total denier of each ground yarn is greater than about fifty percent (50%) of the total denier of each pile yarn.

5,557,951

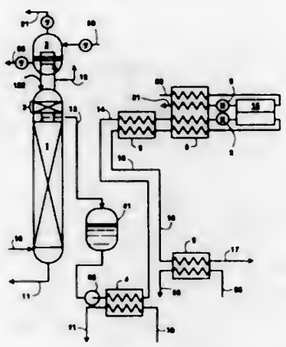
PROCESS AND APPARATUS FOR RECOVERY AND PURIFICATION OF ARGON FROM A CRYOGENIC AIR SEPARATION UNIT

Ravi Prasad, East Amherst, and Dante P. Bonaquist, Grand Island, both of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Mar. 24, 1995, Ser. No. 409,242

Int. Cl.[6] F25J *3/04*

U.S. Cl. 62—648 **16 Claims**



1. A method for purifying and recovering product grade argon from an argon-containing stream, said method comprising the steps of:

(a) introducing an argon-containing stream to a packed argon column having a reflux means and from 78 to 140 equilibrium stages;

(b) withdrawing a purge stream from the argon column, withdrawing an argon-enriched liquid from the argon column below where the purge stream is withdrawn from the argon column, vaporizing the argon-enriched liquid to produce argon-enriched vapor and contacting the argon-enriched vapor with a solid electrolyte ionic or mixed conductor membrane; and

(c) recovering product grade argon from step (b) having an oxygen concentration below about 10 ppm.

5,557,952

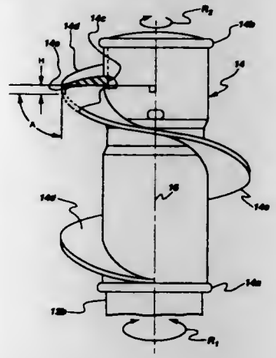
WASHING MACHINE AUGER SCREW WITH LIP

Robert E. Sundell, Clifton Park, and Harold J. Jenkins, Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 10, 1995, Ser. No. 513,241

Int. Cl.[6] D06F *17/10*

U.S. Cl. 68—134 **13 Claims**



1. An auger for moving clothes downwardly in a washing machine comprising:

a tubular housing;

an auger screw extending radially outwardly from said housing and spiralling therearound, and including a proximal edge integrally joined to said housing, and an opposite distal edge; and

an auger lip disposed along said distal edge of said auger screw, and being inclined relative to said auger screw for impeding radially outward movement of said clothes.

5,557,953

MACHINE FOR DYEING TEXTILE YARNS

Philippe Massotte, and Hubert Liebmann, both of Wittelsheim, France, assignors to Superba, Mulhouse, France

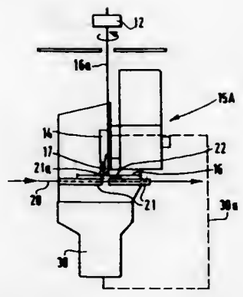
Filed Apr. 24, 1995, Ser. No. 426,952

Claims priority, application France, Apr. 22, 1994, 94 04877

Int. Cl.[6] D06B *1/02*

U.S. Cl. 68—205 R **6 Claims**

1. A machine for dyeing textile yarns (**20**) comprising at least one dye application station (**15A**, **15B**, **15C**) in front of which a plurality of textile yarns (**20**) moves continuously, said dye application station (**15A**, **15B**, **15C**) comprising dye-spraying means (**14**) configured to send out a jet of dye (**17**) which is tranverse with respect to the direction of movement of said yarns (**20**) in a region in which said yarns pass, wherein said dye application station (**15A**, **15B**, **15C**) comprises means forming a protective sheath (**21**) in which the textile yarns (**20**) extend, said protective sheath-forming means (**21**) having an open portion (**21***a*) situated in line with the dye-spraying means (**14**) and in which the textile yarns (**20**) are opposite dye-spraying means (**14**), and wherein said dye application station (**15A**, **15B**, **15C**) is equipped with shutter-forming means (**16**) arranged between the textile yarns (**20**) and the dye-spraying means (**14**) and configured alternately to intercept or to let through the jet (**17**) of dye sprayed towards the textile yarns



(**20**), said shutter-forming means comprising a rotating disc (**16**) including at least one aperture (**18***a*, **18***b*) extending substantially in the direction of a radius of the disc (**16**), the dye-spraying means (**14**) extending substantially in the direction of a radius of the disc (**16**).

5,557,954

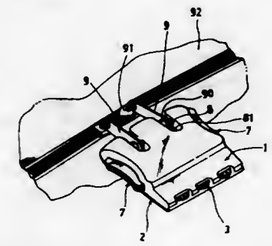
COMBINATION LOCK WITH DUALLY DEPRESSIBLE PUSH BUTTONS

Chong-Kuan Ling, c/o Sinox Co., Ltd. P. O. Box 96-156, Taipei, Taiwan

Filed Jun. 5, 1995, Ser. No. 463,715

Int. Cl.[6] E05B *67/38*

U.S. Cl. 70—68 **7 Claims**



1. A combination lock comprising:

a lock body combinable with a cover thereon;

a plurality of dials and sleeves rotatably mounted in said lock body;

a control slide slidably held in a first portion of said lock body and operatively driven by said sleeves and dials to a locking position and normally restored to an unlocking position when the dials and sleeves are set in an unlocking combination;

a retarding means pivotally mounted in a central portion in said lock body and engageable with said control slide;

a pair of push-button members resiliently held in two opposite end portions in a second portion of said lock body opposite to said control slide; and

a pair of locking tongue members each said locking tongue member integrally connected with each said push-button member and normally protruding into an insertion opening notched in the second portion of said lock body for locking a latch member of an article to be locked;

said control slide operatively biasing said retarding means for retarding depression of said push-button members for a locking;

and upon dialing of a correct combination of the dials to restore said control slide to retract said retarding means, said push-button members will not be retarded and will be depressed for an unlocking.

5,557,955

HOT WATER FAUCET LOCKING DEVICE

Daniel E. Kinsella, P.O. Box 2035, Nantucket, Mass. 02584

Filed Jun. 5, 1995, Ser. No. 463,716

Int. Cl.[6] E03C *1/05*

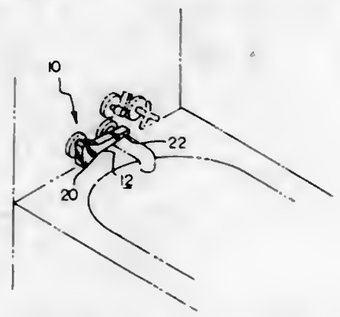
U.S. Cl. 70—177 **5 Claims**

outboard outer portion, the insert adapted to be positioned over a hot water faucet handle in the operative orientation, a lock pin being formed in a cylindrical configuration with a

which switch is opened and closed by turning of a key in the ignition key assembly for connection or not connecting said source of electrical power to an output, the improvement comprising:

a steering wheel having a transverse member that is movable

5,557,955
HOT WATER FAUCET LOCKING DEVICE
Daniel E. Khuzella, P.O. Box 2035, Nantucket, Mass. 02584
Filed Dec. 20, 1994, Ser. No. 360,162
Int. Cl.[6] F16K *35/00*
U.S. Cl. 70—177 **1 Claim**



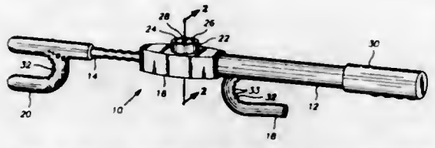
1. A new and improved hot water faucet locking device comprising, in combination:

an outer shell being fabricated of recycled plastic and including an inboard region and an outboard region, the inboard region formed in a planar configuration with an inner surface and an outer surface, the inboard region having two side edges formed contiguously with the outboard region and angled outwardly therefrom, the inboard region having a linear side edge positioned between the angled side edges and inboardly with respect thereto, a short side edge being positioned between each end of the linear side edge and the outboard end of each angled side edge, the inboard region adapted to be large enough to contain a water faucet handle therein, the inner surface of the shell including a generally cylindrical shaped bore with a central portion and three generally semi cylindrical shaped outer portions, a first and second outer portion having its rounded end positioned adjacent to each short side edge of the inboard region, a third outer portion having its rounded end positioned adjacent to the outboard region of the shell, the central and outer portions of the bore being adapted to be positioned over a hot water faucet handle in an operative orientation, an angled side edge of the inboard region including a cylindrical hole extending therein to a point adjacent to the opposite angled side edge;

an outboard region of the outer shell being formed contiguously with the inboard region and having an inner surface and an outer surface, the cutboard region being formed in a generally V-shaped orientation with a linear edge at its apex, the apex defining the outboard extent of the outboard region and having a smaller width than the remainder thereof, the inboard extent of the outboard region having a large width and formed contiguously with the inboard region, the outboard region having a gradually decreasing width between its inboard and outboard extents, the inner surface including a generally rectangular shaped bore extending through the majority of its length, in an operative orientation the outboard region is adapted to be positioned between a shower control and faucet; and

an insert fabricated of metal and including an inboard region and an outboard region, the insert being welded into the plastic shell to prevent slippage when utilizing the apparatus, the insert having an upper surface and a lower surface, the upper surface following the contour of the bore in the shell and adapted to be affixed therein, the lower surface of the insert also following the contour of the bore in the shell, the outboard region of the insert being formed as a generally planar handle, the inboard region of the insert including a generally cylindrical shaped hollow projection extending downwardly therefrom, the projection having a central portion and three generally semi cylindrical shaped outer portions, the insert including generally axially positioned apertures adjacent to its outboard outer portion, the insert adapted to be positioned over a hot water faucet handle in the operative orientation, a lock pin being formed in a cylindrical configuration with a planar circular head at one extent, the pin adapted to be positioned through the bore in the angled side edge of the shell.

5,557,956
VISUAL AUTOMOTIVE THEFT DETERRENT DEVICE
Carl F. Merz, 725 Miller Ave., Freeport, N.Y. 11520
Filed Feb. 24, 1995, Ser. No. 394,286
Int. Cl.[6] B60R *25/02*
U.S. Cl. 70—209 **7 Claims**



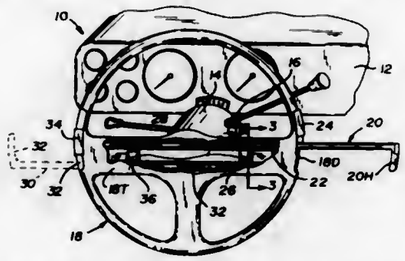
1. An automobile visual theft deterrent device to simulate a locking device for use on an automobile having a steering wheel, comprising:

a tubular member, having a first wheel rim hook;

a middle housing, the middle housing attached to the tubular member, the middle housing having a central bore extending through the middle housing, the middle housing having an insert disk cavity, and an insert disk mounted in the insert disk cavity, the insert disk having a slot that resembles a key hole, the insert disk is silver colored to resemble a lock; and

an elongated rod member, having a second wheel rim hook and a flat end, the second wheel rim hook is opposite the first wheel rim hook, the flat end extends into the central bore to adjust the relative distance between the first wheel rim hook and second wheel rim hook, the first wheel rim hook and second wheel rim hook are opposed to one another so that they may engage opposed portions of the steering wheel from the inside thereof, wherein the tubular member and the elongated rod member are constructed of lightweight plastic, the slot and insert disk defining a means which is not capable of receiving a key to unlock the rod member relative to the middle housing through actuation of the key.

5,557,957
AUTOMATIC STEERING WHEEL ANTI-THEFT SYSTEM
Victor D. Wyman, 1314 Highway 30, Griffith, Ind. 46319
Filed May 15, 1995, Ser. No. 441,402
Int. Cl.[6] B60R *25/02*
U.S. Cl. 70—209 **9 Claims**

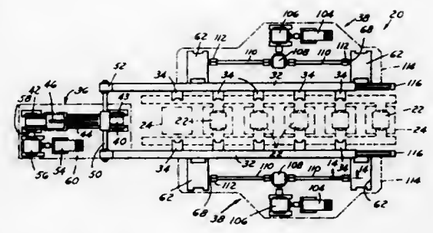


9. In an automobile having a steering wheel column, source of electrical power, an ignition key assembly mounted to the steering wheel column, said key assembly including an electric switch which switch is opened and closed by turning of a key in the ignition key assembly for connection or not connecting said source of electrical power to an output, the improvement comprising:

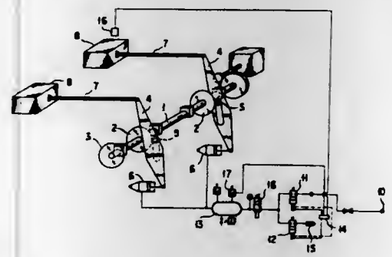
a steering wheel having a transverse member that is movable between a position wherein said member extends radially outward from the steering wheel and obstructs normal use of the steering wheel;

an electronically operated latch for securing said member in an outward extended position; and

means coupling said output of said electric switch to said latch whereby said latch may secure said member in the extended position when said electric switch is opened or allow it to be retracted when said electric switch is closed.



5,557,958
DYNAMIC BALANCER CIRCUIT OF TRANSFER FEEDER
Kenji Nishida, and Kazuhiko Shiroza, both of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
PCT No. PCT/JP93/00591, § 371 Date Oct. 28, 1994, § 102(e) Date Oct. 28, 1994, PCT Pub. No. WO93/22080, PCT Pub. Date Nov. 11, 1993
PCT Filed Apr. 30, 1993, Ser. No. 331,479
Claims priority, application Japan, May 7, 1992, 4-114826
Int. Cl.[6] B21D *43/05*
U.S. Cl. 72—20.1 **15 Claims**



1. In a transfer feeder used in a transfer press, which transfer feeder includes a transfer bar, a feed lever which drives the transfer bar in a feeding direction by swinging movement of the feed lever, a cam follower connected with the feed lever, a camshaft rotated by power taken out of a transfer press, operable at a production speed, and a feed cam mounted to the camshaft to be in contact with the cam follower for controlling swinging movement of the feed lever, a dynamic balancer circuit comprising:

a rear cushion cylinder coupled to the feed lever to produce a force on the feed lever for urging the cam follower into contact with the feed cam; and

a control circuit operatively connected to the rear cushion cylinder for controlling pressure in said rear cushion cylinder to set the force on the feed lever in response to the production speed of the transfer press.

5,557,959
MODULAR DIE TRANSFER SYSTEM
Bernard J. Wallis, Dearborn, and Sabatino A. Bianchi, Bloomfield Hills, both of Mich., assignors to Livernois Research & Development Company, Dearborn, Mich.
Filed Jul. 25, 1994, Ser. No. 280,089
Int. Cl.[6] B21D *43/05*
U.S. Cl. 72—20.2 **29 Claims**

1. In a die transfer system for transferring workpieces between successive die stations in a stamping press, and including an elongated finger bar having spaced fingers for engaging workpieces at successive die stations, first means for reciprocating said finger bar longitudinally for transferring workpieces between successive die stations, and second means for reciprocating said finger bar laterally into and out of engagement with the workpieces at the die stations, the improvement wherein said second means comprises:

at least two finger bar drive modules coupled to said finger bar and spaced from each other lengthwise of said finger bar, drive shaft means extending between and interconnecting said drive modules, and means coupled to said drive shaft means for operating said drive shaft means and said finger bar drive modules in synchronism with operation of the stamping press, each of said finger bar drive modules comprising:

crank arm means, means operatively coupling said crank arm means to said drive shaft means for rotating said crank arm means about an axis parallel to said finger bar, cam plate means coupled to said finger bar and mounted for movement lateral to said axis and said finger bar, said cam plate means having cam slot means extending in a direction lateral to said axis, and cam follower means disposed in said slot means and coupled to said crank arm means such that rotation of said drive shaft means rotates said crank arm means and propels said cam follower means along said slot means while simultaneously driving said cam plate means and said finger bar laterally into and out of engagement with workpieces at the die stations,

said drive shaft means comprising a plurality of shaft segments each extending between an adjacent pair of said modules, each of said modules including means for interconnecting successive drive shaft segments such that all of said drive shaft segments and all of said finger bar drive modules operate in unison, said means for interconnecting successive drive shaft segments comprising stub shaft ends rotatably carried by and projecting from said module, means within said module operatively interconnecting said stub shaft ends, and means for connecting said stub shaft ends to said successive drive shaft segments, said means operatively coupling said crank arm means to said drive shaft means comprising first gear means coupled to one of said stub shaft ends, and second gear means rotatably carried by said module and coupling said first gear means to said crank arm means.

5,557,960
DEVICE FOR PRODUCING A TUBE, IN PARTICULAR A TUBE-SHAPED PRINTING FORM, WITH A CONTINUOUS CIRCUMFERENTIAL SURFACE
Eduard Hoffmann, Bobingen; Johann Winterholler, Friedberg, and Wolfgang Prem, Ustersbach, all of Germany, assignors to MAN Roland Druckmaschinen AG, Offenbach, Germany
Filed Apr. 4, 1994, Ser. No. 222,695
Claims priority, application Germany, Apr. 3, 1993, 43 11 078.9
Int. Cl.[6] B21D *39/02;51/28;11/02*
U.S. Cl. 72—51 **11 Claims**

1. A device for producing a tube-shaped printing form with a continuous circumferential surface from a plate having a register hole system and a first edge and a second edge which are to be connected together, comprising: a first clamping strip which can be

extruding a generally cylindrical tubular blank in which the wall thickness of a cross section taken at any point substantially

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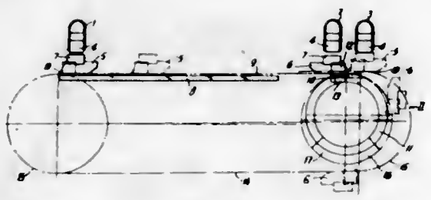
5,557,963
METHOD AND APPARATUS FOR NECKING A METAL

strip to produce an arcuate shape along the length of a deformable material which comprises:



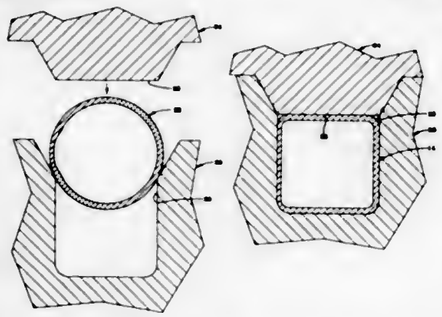
supported in an initial position and fastened longitudinally to the first plate edge; a second clamping strip which can be supported in an initial position and fastened longitudinally to the second plate edge, the clamping strips have a pin register with pins arranged to cooperate with the register hole system of the plate; means assigned to at least one of the clamping strips for effecting rotation around an axle parallel to a longitudinal axis of the tube, whereby the clamping strips are positionable opposite one another so that the plate edges contact one another in a correct register and can be connected together to form the tube; and a rotatably supported cylinder, a plurality of holders adapted to be positionable corresponding to plate size for holding the clamping strips at a distance from one another in the initial position approximately in one plane; a sliding table provided under the holders so as to support the plate; and lifting elements provided at the holders for lowering the two clamping strips on the plates whereby the plate edges to be connected can be fixed at the clamping strips by the pin register and the register hole system in exact register while simultaneously detaching from the holders, the second clamping strip being displaceable transversely along the sliding table at least along the length of the plate, while the first clamping strip, including the first plate edge fixed thereto, is positionable on the rotatably supported cylinder so that the plate is wrapped around the cylinder after a complete revolution of the cylinder, and so that the clamping strips are located opposite one another to facilitate connection of the plate edges, the plurality of holders including a holder arranged to position the second clamping strip, including the second plate edge fixed thereto, on the cylinder in a displaced position.

5,557,961

HYDROFORMED STRUCTURAL MEMBER WIH VARIED WALL THICKNESS

Chi-Mou Ni, Troy; Charles J. Bruggemann, Rochester; Tasnim Hassan, Flint, and Wallace T. Hall, Fenton, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1995, Ser. No. 557,664
Int. Cl.[6] B21D *39/20*
U.S. Cl. 72—61 **2 Claims**



1. A method for hydroforming a generally tubular structural member in which the wall thickness of a cross section of said member taken at any point is circumferentially variant but longitudinally constant, comprising the steps of,

extruding a generally cylindrical tubular blank in which the wall thickness of a cross section taken at any point substantially corresponds to the wall thickness desired in said structural member,

placing said blank between a pair of hydroforming dies forming an interior space that matches the desired exterior cross sectional shape of said structural member and with said blank oriented relative to said dies such that its wall thickness corresponds to the wall thickness desired in said structural member, and,

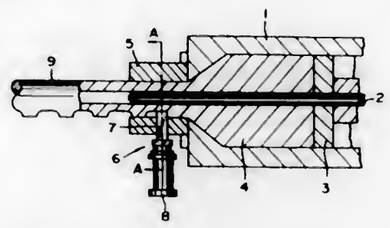
pressurizing the interior of said blank so as to force it out into the interior space of said dies.

5,557,962

LONG DEFORMED EXTRUDED METALLIC SHAPE AND METHOD FOR MANUFACTURING SAID SHAPE

Kazunori Takikawa, Numazu, Japan, assignor to USUI Kokusai Sangyo Kaisha Ltd., Japan

Continuation of Ser. No. 982,732, Jun. 21, 1993, abandoned. This application Jul. 5, 1995, Ser. No. 498,107
Claims priority, application Japan, Jun. 28, 1991, 3-183363; WIPO, Jun. 21, 1993, PCT/JP92/00820
Int. Cl.[6] B21C *25/08*
U.S. Cl. 72—260 **3 Claims**



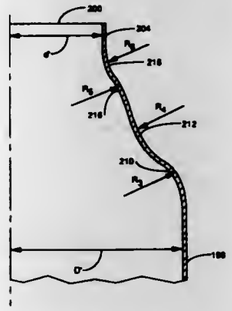
1. A method of producing an elongate high pressure fuel duct with spaced apart regions of enlarged thickness on one longitudinal side, characterized by: providing a container for a flowable metal having an elongate die defining a horizontal passage for receiving the flowable metal from the container, said passage being of uniform cross-sectional shape along its length, said cross-sectional shape comprising a cylindrically generated top surface and a rectilinearly generated bottom surface extending from said cylindrically generated surface; inserting a cylindrical mandrel through said container and through said elongate die, said cylindrical mandrel being concentrically disposed relative to said cylindrically generated top surface of said elongate die to define a nominal radial thickness, and said mandrel being spaced from said bottom surface of said die a distance equal to the enlarged thickness, said enlarged thickness being greater than said radial thickness; urging the flowable metal from the container and through the passage of the die in surrounding relationship to said mandrel for producing the high pressure fuel duct supported and defined by said die and said mandrel, such that portions of said fuel duct between said mandrel and said bottom surface of said die define said enlarged thickness; intermittently moving a forming device vertically Upwardly from the bottom surface into the passage of said die intermediate the length of the die and orthogonally to said mandrel for intermittently producing regions of reduced cross-sectional area and a reduced thickness along portions of the fuel duct between mandrel and the bottom surface of the die, said moving of the forming device being carried out to form a concave curved transition between the regions of reduced thickness and the regions of enlarged thickness for achieving a smooth uninterrupted metal flow through said transitions with an enhanced strength, whereby portions of the die adjacent the forming device resist forces on the forming device by the flowable metal and support the flowable metal in proximity to the forming device.

5,557,963

METHOD AND APPARATUS FOR NECKING A METAL CONTAINER AND RESULTANT CONTAINER

Hans H. Diekhoff, Avonmore, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 922,913, Jul. 19, 1992, Pat. No. 5,355,710. This application Jun. 14, 1994, Ser. No. 260,285
Int. Cl.[6] B21D *19/10*
U.S. Cl. 72—379.4 **17 Claims**



1. A method of necking an end portion of a metal container comprising

effecting a generally radially inward deformation of an axial portion of said container adjacent to an open end of said container to establish a generally cylindrical reduced diameter portion adjacent to said open end of said container and an outwardly generally convex curved transition portion disposed between said reduced diameter portion and the remainder of said container, and

sequentially by additional generally radially inward deformation steps axially enlarging said transition portion and reforming at least a part of said generally cylindrical portion into a generally outwardly concave curved configuration which terminates immediately adjacent to said generally convexly outwardly curved portion,

creating said outwardly concave curved portion such that it merges into said convexly outwardly curved portion, and

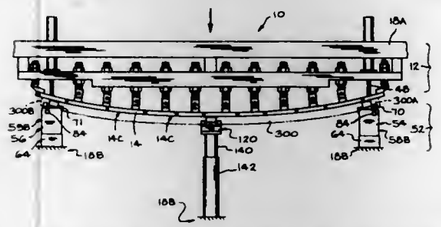
creating said generally outwardly convex curved portion and said adjacent generally outwardly concave portion to meet at the point of tangency of each said curved portion.

5,557,964

DOUBLE PLANE BEND FORMER

Richard E. Jessop, DeWitt, and John E. Demmer, Lansing, both of Mich., assignors to Demmer Corporation, Lansing, Mich.

Division of Ser. No. 183,675, Jan. 19, 1994, Pat. No. 5,481,897. This application Oct. 23, 1995, Ser. No. 547,019
Int. Cl.[6] B21D *5/01*
U.S. Cl. 72—389.1 **12 Claims**



1. A method for bending of an elongate strip having opposed ends and a length between the opposed ends defining an axis of the strip to produce an arcuate shape along the length of a deformable material which comprises:

(a) providing in a driving means a pair of spaced apart bending members which are moved together to bend the strip and then are moved apart, a first one of the bending members having an arcuate surface for bending the strip to form a bend in the strip when the bending members are moved together; and a second one of the bending members comprising at least two tool members mounted along the axis defined by the strip when the bending members are apart and wherein each of the tool members has holders which mount the strip, wherein at least one of the holders is pivotable around a holder axis parallel to the axis of the strip and is biased such that the strip mounted in the holder is urged towards the arcuate surface of the first one of the bending members, wherein the holder also rotates around the holder axis parallel to the axis of the strip prior to or during bending, wherein the bending members rotate the strip on the one of the holders which is pivotable and move against the bias of the one of the holders to deform the strip as the bending members are moved together;

(b) providing the strip between the bending members mounted on the holders;

(c) moving the bending members together to bend the strip, wherein the arcuate surface has a bend which is greater than the arcuate shape to be produced in the strip; and

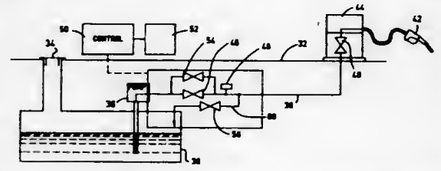
(d) moving the bending members apart, wherein the strip straightens to a curve which is less than the arcuate shape.

5,557,965

PIPELINE LEAK DETECTOR

Bradley T. Fiechtner, San Diego, Calif., assignor to Dover Corporation, New York, N.Y.

Filed Oct. 20, 1994, Ser. No. 325,964
Int. Cl.[6] G01M *3/04*
U.S. Cl. 73—49.2 **17 Claims**



1. An apparatus for detecting leaks in a pipeline in a liquid dispensing system, comprising:

a tank containing a liquid;

dispensing valve means disposed remote from said tank:

a pipeline connected between said storage tank and said dispenser valve means:

a pump coupled to said pipeline for supplying liquid to said pipeline at an elevated pressure, the elevated pressure being a pressure at which the pressure/volume relationship in said pipeline is substantially linear:

an isolation valve in said pipeline between said pump and said dispenser valve for selectively isolating the segment of said pipeline between said isolation valve and said dispenser valve at the elevated pressure:

pressure sensing means in said pipeline segment for detecting pressure changes in the elevated pressure of the liquid in said pipeline segment: and

control means having calculation and timing functions, the internal volume of said pipeline segment being known and being stored in memory in said control means, said isolation valve and said pressure sensing means being coupled to said control means, said control means being configured to compute a volume of liquid leaking from said pipeline segment from a predetermined incremental pressure change sensed by said pressure sensing means and the known internal volume in said pipeline segment.

5,557,966

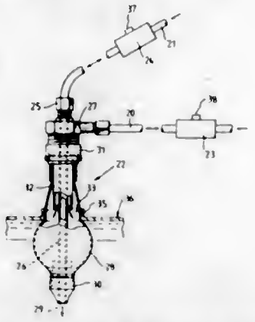
COLDING SYSTEM PRESSURE TESTING DEVICE FOR LEAK DETECTION

sets of junctions, said first set of junctions spatially separated from said second set of junctions in a direction of flow to be

5,557,971

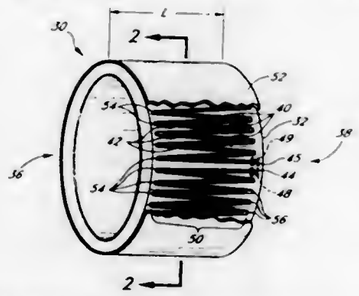
PRESSURE SENSOR

5,557,966
COLDING SYSTEM PRESSURE TESTING DEVICE FOR LEAK DETECTION
Kevin A. Corry, 74 Lamington Ave., Lutwyche, Queensland 4030, Australia
Filed Jul. 6, 1994, Ser. No. 271,326
Claims priority, application Australia, Jul. 6, 1993, PL9794
Int. Cl.[6] G01M *3/04;3/32*
U.S. Cl. 73—49.7 **13 Claims**



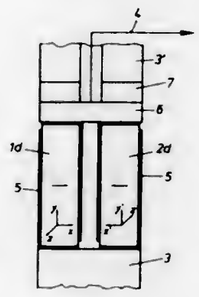
1. A cooling system pressure testing device for attachment in an inlet opening of a component of the cooling system to be pressure tested, the cooling system pressure testing device including a body having an inlet and an inlet valve communicating with the body inlet, a sealing head positionable in the opening and having a support and a bladder having an inlet secured to and extending about the support, a passage extending through the bladder and having an inlet and an outlet, the body inlet and the valve allowing fluid from a single source to be selectively directed to either the passage inlet or the bladder inlet to either pressurize the component to be pressure tested or to inflate the bladder, and a pressure relief valve in communication with the passage for limiting the pressure to which the test is conducted and which is operable to vent the pressure within the component without deflating the bladder whereby the bladder may be inflated to close off the inlet opening and the passage enabling the system to be pressurized up to a pressure determined by the pressure relief valve while the bladder closes off the inlet opening.

5,557,967
THERMOPILE FLOW SENSOR
Herman L. Renger, Calabasas, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.
Filed Feb. 24, 1995, Ser. No. 393,955
Int. Cl.[6] G01F *1/68*
U.S. Cl. 73—204.24 **9 Claims**



1. A flow sensor, comprising:
a series of interconnected thermocouples which form a series of junctions, said series of junctions comprising first and second sets of junctions, said first set of junctions spatially separated from said second set of junctions in a direction of flow to be sensed, wherein said series of interconnected thermocouples comprises means for heating said flow sensor when an alternating heating current is passed through said series of interconnected thermocouples, wherein said series of thermocouples is formed on a substrate, wherein junctions of said first set are proximate to a first end of said substrate and junctions of said second set are proximate to a second end of said substrate, and wherein said series of thermocouples is arranged on said substrate such that a polarity of a voltage generated by said series of thermocouples indicates a polarity of a temperature difference between said first and second ends.

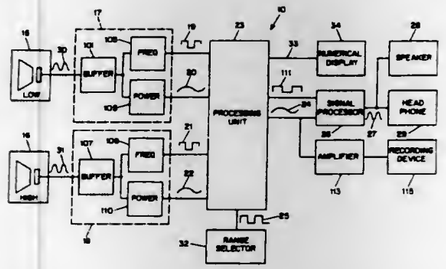
5,557,968
PIEZOELECTRIC MEASURING ELEMENT FOR MEASURING MECHANICAL VARIABLES
Peter W. Krempl, Graz/Ragnitz, and Roland Selic, Graz, both of Austria, assignors to AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik M.B.H., Graz, Austria
Filed Feb. 23, 1995, Ser. No. 393,390
Claims priority, application Austria, Mar. 3, 1994, A461/94
Int. Cl.[6] H01L *41/08*
U.S. Cl. 73—497 **5 Claims**



1. Piezoelectric measuring element for measuring mechanical variables such as pressure, force, and acceleration, comprising at least two piezoelectric crystal elements, wherein said crystal elements differ chemically, at least one of said crystal elements having a piezo-coefficient with a negative temperature coefficient, and at least one of said crystal elements having a piezo-coefficient with a positive temperature coefficient, the cutting angles and the number of crystal elements being chosen so as to result in an essentially constant overall sensitivity within a given temperature interval.

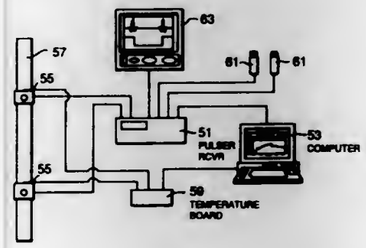
5,557,969
APPARATUS AND METHOD FOR DETECTION ULTRASONIC WAVES PROPAGATED FROM WITHIN A SELECTED DISTANCE
John Jordan, Oldsmar, Fla., assignor to Energy and Environmental Technologies Corporation, Santa Rosa, Calif.
Continuation-in-part of Ser. No. 213,129, Mar. 15, 1994, abandoned. This application Jun. 27, 1995, Ser. No. 495,099
Int. Cl.[6] G01N *29/20*
U.S. Cl. 73—592 **19 Claims**

19. A method of identifying ultrasonic waves originating within a variably selected predetermined distance, comprising the steps of:
sensing ultrasonic waves having a high frequency component and a low frequency component;
separately determining an intensity of the high frequency component and an intensity of the low frequency component;



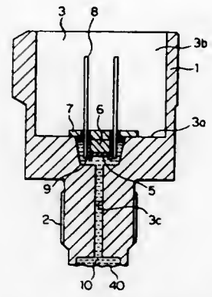
generating a first ratio of the intensity of said high frequency component to the intensity of said low frequency component;
generating a second ratio indicative of the expected intensity ratio at said variably selected predetermined distance; and
comparing continuously said first and second ratios and producing an output signal indicative of the detection of ultrasonic waves within said variably selected predetermined distance when a predetermined relationship between said first and second ratios exists.

5,557,970
AUTOMATED THICKNESS MEASUREMENT SYSTEM
Agostino Abbate, Clifton Park; Julius Frankel, Rensselaer, and Mark Doxbeck, Troy, all of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Continuation of Ser. No. 179,178, Jan. 10, 1994, abandoned. This application Jul. 3, 1995, Ser. No. 498,710
Int. Cl.[6] G01H *5/00*
U.S. Cl. 73—597 **11 Claims**



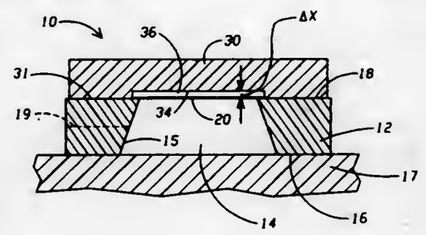
1. A method of measuring the change in thickness of a component dimension of a sample material to which sound waves are coupled, comprising;
providing said sample material having said component dimension to which said sound waves are coupled;
providing first and second reference standards, each of said standards including a material of predetermined thickness to provide first and second reference thicknesses respectively;
transmitting a sound wave signal over a period of time through said sample material and each of said reference standards;
repeatedly measuring the time for said sound wave signal to traverse said sample thickness and each of said first and second reference thicknesses over said period of time; and
calculating the change in thickness of said sample thickness with respect to time by calculating the velocity of said signal from the measured times for said first and second reference thicknesses and the measured time for said thicknesses on a computer using the equation $\partial t^{(i)}=[l_2^{(i)}-l_1^{(i)}]/[t_2^{(i)}-t_1^{(i)}]\cdot\{[t^{(i)}-t^{(o)}]+\frac{1}{2}\cdot[t_2^{(i)}-t_2^{(o)}+t_1^{(i)}-t_1^{(o)}]-[t^{(i)}\beta\,[T^{(i)}-T^{(s)}]\}$.

5,557,971
PRESSURE SENSOR
Fumito Uemura; Seiki Kodama, and Hiroshi Nakamura, all of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 14, 1994, Ser. No. 355,683
Claims priority, application Japan, Dec. 17, 1993, 5-318543
Int. Cl.[6] G01L *11/00*
U.S. Cl. 73—702 **3 Claims**



1. A pressure sensor for sensing pressure vibrations in a combustion chamber of an internal combustion engine, comprising:
a) a case (1) having a detection cavity (3c) which has an open end;
b) a pressure sensing means (5) disposed in said detection cavity of said case;
c) a diaphragm (40) disposed to seal said open end of said detection cavity; and
d) a pressure transmitting medium (10) filled within said detection cavity,
e) wherein said diaphragm is substantially disc-shaped, and a diameter d (mm) and plate thickness t (μm) of said diaphragm satisfy a formula $t=Kd^2$, where $K=3.3\times10^{-4}\sim5.3\times10^{-4}$, such that a resonant frequency of said diaphragm lies within a range of abnormal pressure vibration frequencies in the combustion chamber and outside of a range of normal pressure vibration frequencies therein, and an output amplitude of the pressure sensing means is thereby substantially greater for an abnormal pressure vibration than for a normal pressure vibration.

5,557,972
MINIATURE SILICON BASED THERMAL VACUUM SENSOR AND METHOD OF MEASURING VACUUM PRESSURES
David C. Jacobs, Hampton, and William J. Alvesteffer, Newport News, both of Va., assignors to Teledyne Industries, Inc., Los Angeles, Calif.
Filed Sep. 13, 1994, Ser. No. 305,059
Int. Cl.[6] G01L *7/00;21/12*
U.S. Cl. 73—756 **37 Claims**



37. A gas pressure sensing structure for sensing vacuum pressures, the pressure sensing structure comprising:

a base having a gas chamber cavity which extends from a top of the base to a bottom of the base,
a membrane covering a top opening to the gas chamber cavity,

5,557,974
TORQUE SENSOR USING MAGNETOSTRICTIVE ALLOY AND METHOD OF MANUFACTURING THE SAME

flexible strip brush means passing partially around and tensioned against the slipring means in electrical brushing contact therewith for transmitting the signal to associated electrical circuit

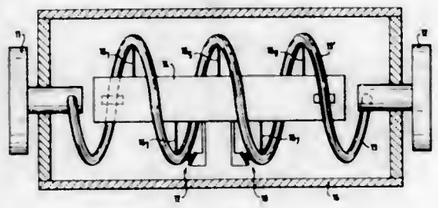
a base having a gas chamber cavity which extends from a top of the base to a bottom of the base,
a membrane covering a top opening to the gas chamber cavity,
a cover attached to the base and covering the membrane, a bottom surface of the cover spaced from a top surface of the membrane a distance not grater than 10 microns, and
a first resistive element disposed at least partially on the membrane,
a second resistive element disposed at least partially on the base,
a voltage source connected to the first and second resistive elements, and
a measuring circuit for measuring voltages and currents applied to the first and second resistive elements, the measuring circuit comprising a bridge circuit having four resistors, the bridge circuit connected to an amplifier, a capacitor and a transistor.

5,557,973

CORIOLIS-TYPE MASS FLOW SENSOR WITH A HELICAL MEASURING TUBE

Ole Koudal, Reinach, and Alfred Wenger, Neftenbach, both of Switzerland, assignors to Endress + Hauser Flowtec AG, Switzerland

Filed Sep. 9, 1994, Ser. No. 303,706
Claims priority, application European Pat. Off., Sep. 11, 1993, 93114632
Int. Cl.[6] G01F *1/84*
U.S. Cl. 73—861.355 **18 Claims**



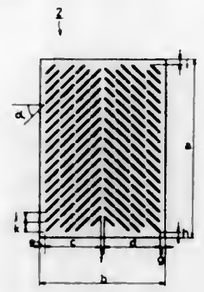
1. A mass flow sensor configured to be installed in a conduit through which a fluid flows, said mass flow sensor comprising
flanges for mounting to said conduit,
a single measuring tube fixed at its ends to said flanges and having a vibrating portion, said vibrating portion of said measuring tube having the shape of a circular cylindrical constant-pitch helix with at least one turn,
an external support tube having external support tube ends fixed to at least one of said measuring tube and said flanges,
an internal support element having internal support element ends fixed to said measuring tube adjacent said flanges,
connecting elements being distributed along said vibrating portion of said measuring tube, interconnecting said vibrating portion of said measuring tube and said internal support element, and permitting only those modes of said vibrating portion of said measuring tube in which the centerline of said vibrating portion remains, as far as possible, substantially on a rest-position cylindrical enveloping surface of said modes, and
means for exciting said vibrating portion of said measuring tube into resonance vibrations perpendicular to its centerline.

5,557,974

TORQUE SENSOR USING MAGNETOSTRICTIVE ALLOY AND METHOD OF MANUFACTURING THE SAME

Hiroyuki Hase, Kyoto, and Rihito Shoji, Yawata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 24, 1994, Ser. No. 294,027
Claims priority, application Japan, Aug. 26, 1993, 5-211234
Int. Cl.[6] G01L *3/00*
U.S. Cl. 73—862.335 **12 Claims**



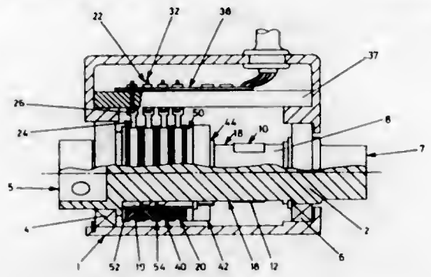
1. A torque sensor comprising a magnetostrictive alloy ribbon fixed on a surface of a shaft having a longitudinal axis and means for detecting magnetic change arranged outside said magnetostrictive alloy ribbon, wherein said magnetostrictive alloy ribbon has three or more adjacent rows of elliptical or rectilinear holes formed in said magnetostrictive alloy ribbon, said rows of holes being arranged along the longitudinal axis of said shaft so that major axes of the holes in each of said rows are parallel to each other and so that said major axes are disposed in oblique directions substantially at angles of +45° and −45° to the longitudinal axis of said shaft.

5,557,975

TORQUE TRANSDUCERS

David O. Crane, Lutterworth; Ian B. Golding, Rugby, and Andrew C. Lester, Ratby, all of United Kingdom, assignors to Crane Electronics Limited, United Kingdom

PCT No. PCT/GB93/01943, § 371 Date Mar. 15, 1995, § 102(e) Date Mar. 15, 1995, PCT Pub. No. WO94/07119, PCT Pub. Date Mar. 31, 1994
PCT Filed Sep. 14, 1993, Ser. No. 397,273
Int. Cl.[6] G01L *1/00*
U.S. Cl. 73—862.338 **14 Claims**



1. A torque transducer comprising:
a torque deformable shaft
strain sensing means on the shaft for generating a torque related electrical signal,
slipring means mounted for conjoint rotation with the shaft for receiving the signal, and

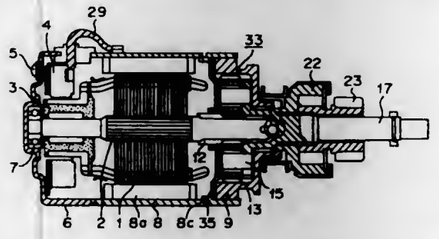
flexible strip brush means passing partially around and tensioned against the slipring means in electrical brushing contact therewith for transmitting the signal to associated electrical circuit means;
wherein the slipring means comprise a plurality of discs of carbon material arranged coaxially with the shaft but electrically isolated from one another, electrical connections from the strain sensing means to the individual carbon discs being via annular or substantially annular printed circuit boards in axial compression between the carbon discs of the slipring means: and
the flexible strip brush means comprise a plurality of metal strips, one per carbon slipring disc.

5,557,976

PLANETARY GEAR REDUCTION STARTER

Satoshi Moribayashi; Shuzo Isozumi, and Akira Morishita, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1995, Ser. No. 377,410
Claims priority, application Japan, Apr. 27, 1994, 6-114616
Int. Cl.[6] F02N *15/06*
U.S. Cl. 74—7 E **3 Claims**



1. A planetary gear reduction starter sub-assembly, comprising:
a) a motor,
b) a planetary gear reduction device connected to a front end portion of the motor, and
c) an overrunning clutch slidably engaged with a helical spline formed in a rotary output shaft for the planetary gear reduction device,
d) wherein the sub-assembly is adapted to be completed by the addition of a front bracket disposed in front of the motor to surround the planetary gear reduction device and the overrunning clutch, wherein the motor, the planetary gear reduction device, the rotary output shaft and the overrunning clutch are assembled in one piece in the absence of the front bracket, wherein a projection (8c) is formed in an inner circumferential surface and near the front end of a yoke of the motor, wherein a center plate (35) is disposed in contact with a front side of the projection, and wherein an internal gear wheel (9) of the planetary gear reduction device is forcibly fitted and secured to the inner circumferential surface of the yoke at the side of the center plate with respect to the projection.

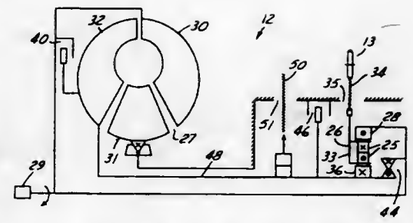
5,557,977

SYSTEM FOR POWERING ROTATING VEHICLE ACCESSORIES USING TRANSMISSON

Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 6, 1995, Ser. No. 554,017
Int. Cl.[6] F16H *47/08*
U.S. Cl. 74—15.84 **20 Claims**

1. A system for powering rotating accessories of a vehicle, the system comprising:
an automatic transmission powered by an engine, said transmission comprising: a housing, and a torque converter at least partially housed in said housing, said torque converter having an impeller driveably connected to said engine and a turbine being driven by said impeller and driving an output shaft of said transmission to drive said vehicle;
a converter lock-up clutch connected to said impeller and said turbine;
a planetary gear set comprising a sun gear coupled to said output shaft, a plurality of pinions rotatably coupled to said sun gear, a carrier rotatably coupled to said pinions and a ring gear rotatably coupled to said pinions and said engine; and,
wherein said accessories are rotatably coupled to said carrier of said planetary gear set such that said accessories are operable between at least two speed ratios.

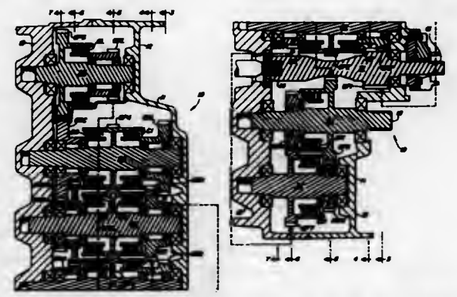


5,557,978

COUNTERSHAFT POWER TRANSMISSION

John P. McAskill, Coffeyville, Kans., assignor to Deere & Company, Moline, Ill.

Filed Mar. 7, 1995, Ser. No. 399,782
Int. Cl.[6] F16H *3/08*
U.S. Cl. 74—331 **22 Claims**



1. In a transmission including a housing, an input shaft rotatably mounted in the housing and having an input end for receiving input, an input gear fixed to the input shaft, an output shaft rotatably mounted in the housing and having an output end for providing output, and a plurality of countershafts rotatably mounted in the housing, the output shaft and each of the countershafts having a fixed gear fixed thereto and at least one rotatable gear rotatably mounted thereon and selectively fixed thereto by a respective clutch, the rotatable gears including an input set meshed with the input gear; the shafts, gears, and clutches being arranged to fix any selected one of the input set of the rotatable gears to its shaft by its respective clutch and drivingly connect thereto any selected one of a set of gear ratio combinations that are formed using a plurality of the gears to provide a plurality of speeds at the output end of the output shaft for the output, the improvement comprising:
a plurality of the gears being drivingly connected to form a gear ratio sequence that is included in at least one of the gear ratio combinations in order to provide a decrease in speed transmitted thereto and in at least one other of the gear ratio combinations in order to provide an increase in speed transmitted thereto.

5,557,979

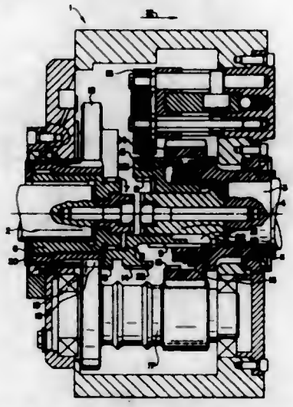
GEAR BOX

a synchronizer for coupling said at least one driven gear to said input shaft;

5,557,984

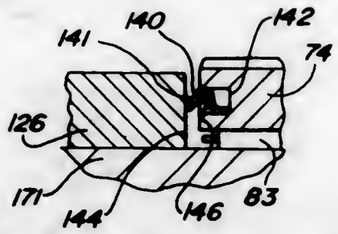
TWIN MASS FLYWHEEL

5,557,979
GEAR BOX
Otto Krassnitzer; Alfred Zitz, and Robert Felber, all of Zeltweg, Austria, assignors to VOEST-ALPINE Bergtechnik Gesellschaft mbH, Zeltweg, Austria
Filed Apr. 11, 1995, Ser. No. 420,836
Claims priority, application Austria, Apr. 11, 1994, 736/94
Int. Cl.[6] F16H *3/02*
U.S. Cl. 74—377 **10 Claims**



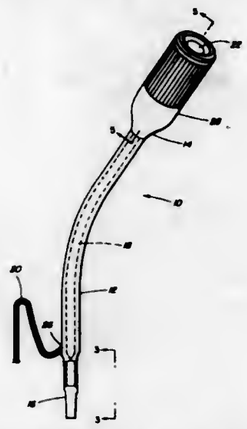
1. A gearbox having coaxial drive and driven shafts, said gearbox comprising a clutch sleeve movable in the axial direction of the shafts between a first position, in which the drive and driven shafts are directly coupled, and a second position in which the shafts are connected by at least one gear stage, said clutch sleeve including an internal gear and an external gear arranged on substantially the same diameter, said gears being positioned on the sleeve such that when the clutch sleeve is in the first position, the internal gear couples the sleeve to one of said shafts and the external gear couples the sleeve to the other of the shafts.

5,557,980
ONE-PIECE GEAR RATTLE PREVENTION FOR COUNTERSHAFT TRANSMISSION
Cesare G. Mastroianni, Denver, N.C., and Timothy E. Mick, Rochester Hills, Mich., assignors to Getrag Gears of North America, Inc., Sterling Heights, Mich.
Continuation-in-part of Ser. No. 988,292, Dec. 8, 1992, Pat. No. 5,335,562. This application Aug. 8, 1994, Ser. No. 287,086
Int. Cl.[6] F16D *1/08;* **F16H** *55/14*
U.S. Cl. 74—443 **3 Claims**



1. A transmission for use in a vehicle, said transmission comprising:
a housing having an input shaft and a countershaft;
at least one drive gear mounted for rotation about said input shaft;
at least one driven gear mounted to said countershaft;
a synchronizer for coupling said at least one driven gear to said input shaft;
a ring having an annular portion mounted to said at least one driven gear and a resilient arm extending at an angle axially outwardly and radially inwardly from said annular portion to contact synchronizer to hold said driven gear from rattling when said driven gear is not coupled to said input shaft.

5,557,981
ONE-PIECE GEARSHIFT LEVER WITH COLD FORMED END
Leonard Neal, Windsor, and Robert Elliott, Tecumseh, both of Canada, assignors to Tamco Limited, Ontario, Canada
Filed May 25, 1993, Ser. No. 66,972
Int. Cl.[6] F16H *59/10;* **B21C** *1/24*
U.S. Cl. 74—523 **5 Claims**

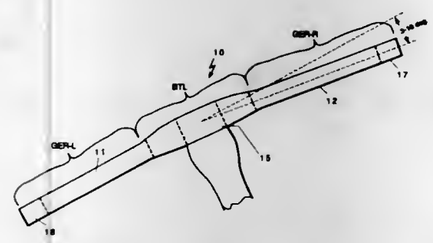


1. A one-piece gearshift lever comprising a mandrel drawn metal tube having a tubular outer operative end and a cold formed solid inner functional end, said inner end having a contour for mechanical cooperation with components auxiliary to the lever.

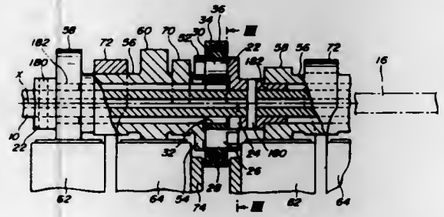
4. A method of manufacturing a one-piece gearshift lever having a mandrel drawn metal tube with an outer operative end and a cold formed inner functional end for mechanical cooperation with components auxiliary to the lever; said method comprising the steps of:
a) drawing a small diameter, thick-walled steel tubing over a mandrel to define a conduit having opposite ends;
b) cold forming one of said ends to provide a flat functional end; and
c) machining a portion of said functional end to a contour for mechanical cooperation with components auxiliary to the lever.

5,557,982
COMPOSITE BICYCLE HANDLEBAR
Darrell W. Voss; Gary G. Klein, and Richard Randall, all of Chehalis, Wash., assignors to Klein Bicycle Corporation, Chehalis, Wash.
Continuation of Ser. No. 947,817, Sep. 21, 1992, abandoned. This application Mar. 30, 1995, Ser. No. 415,022
Int. Cl.[6] B62K *21/12*
U.S. Cl. 74—551.1 **18 Claims**

1. Composite hollow tubular bicycle handlebar having lateral ends of the same diameter, said composite hollow tubular bicycle handlebar including three fiber layers in a resin matrix, including unidirectional axial fiber and hoop fiber layers, and wherein said handlebar has bend, taper and clamp center sections and a pair of grip end regions, each region having a crossectional area, and the cross-sectional area and linear fiber weight of unidirectional axial fiber are greater in the bend, taper and clamp center sections than in the grip lateral end regions, and a metal sleeve in said clamp center section.

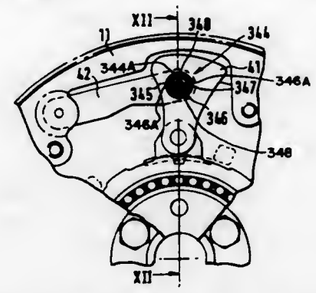


5,557,983
DEVICE FOR MOVING CAM RELATIVE TO ITS DRIVING SHAFT
Seinosuke Hara, and Yoshiko Yamada, both of Atsugi, Japan, assignors to Unisia Jecs Corporation, Atsugi, Japan
Filed Jun. 17, 1993, Ser. No. 77,509
Claims priority, application Japan, Jun. 17, 1992, 4-157911
Int. Cl.[6] F01L *1/34*
U.S. Cl. 74—568 R **14 Claims**



1. A device for moving a cam relative to its driving shaft, the device comprising:
a driving shaft rotatable about a shaft axis;
a hollow cam rotatable, about said shaft axis, relative to said driving shaft;
a support;
an intermediate member supported in said support for rotation so as to rotate eccentrically with respect to said shaft axis;
a drive collar mounted coaxially with said driving shaft for rotation therewith and having a first radial slot;
a driven collar rotatable with said hollow cam and having a second radial slot;
a first pin having one end rotatably supported by said intermediate member and an other end slidably engaged in said first radial slot;
a second pin having one end rotatably supported by said intermediate member and an other end slidably engaged in said second radial slot;
means for holding said support for movement within a plane perpendicular to said shaft axis; and
means for driving said support to take different positions continuously to produce different values in the eccentricity of said intermediate member,
said driving means including a control rod rotatable about a control rod axis and means for converting an angular position which said control rod is positioned to one of said different positions which said support takes.

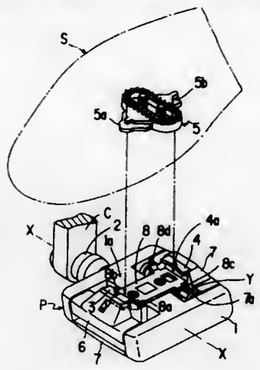
5,557,984
TWIN MASS FLYWHEEL
Richard D. M. Cooke, Warwick, and Anthony J. Curtis, Leamington Spa, both of Great Britain, assignors to Automotive Products, plc, Leamington Spa, England
PCT No. PCT/GB91/02259, § 371 Date May 23, 1994, § 102(e) Date May 23, 1994, PCT Pub. No. WO92/14076, PCT Pub. Date Aug. 20, 1992
PCT Filed Dec. 18, 1991, Ser. No. 94,111
Claims priority, application United Kingdom, Jan. 30, 1991, 9102029
Int. Cl.[6] F16F *15/10*
U.S. Cl. 74—574 **17 Claims**



1. A twin mass flywheel comprising two co-axially arranged flywheel masses which are mounted for limited angular rotation relative to each other and a plurality of pivotal linkages interconnecting the two flywheel masses each linkage comprising a first link pivotally connected to one of the flywheel masses, as second link pivotally connected to the other of the flywheel masses and a common pivot for pivotally connecting the first and second links, each linkage having a concentration of mass ajacent its common pivot so that centrifugal force moves the common pivot radially outwardly, and resilient torque means in each common pivot operable after a predetermined relative roatation between the flywheel masses to resist said relative rotation.

5,557,985
BICYCLE CLEAT COUPLING STRUCTURE
Masashi Nagano, Izumi, Japan, assignor to Shimano Inc., Osaka, Japan
Continuation of Ser. No. 973,883, Nov. 10, 1992, abandoned. This application Jan. 23, 1995, Ser. No. 376,308
Claims priority, application Japan, Nov. 13, 1991, 3-296159
Int. Cl.[6] G05G *1/14*
U.S. Cl. 74—594.6 **9 Claims**

1. An apparatus for coupling a shoe having a cleat to a bicycle



pedal with a pedal shaft for rotatably supporting said pedal, comprising:

a shoe bottom opposing surface that faces a bottom of said shoe;

a first pivotal axis provided on said pedal;

a first cleat clamp supported by said first pivotal axis, and including cleat engaging means for engaging one end of said cleat until a force exceeding a predetermined value is applied thereto;

a second cleat clamp opposed to said first cleat clamp across said pedal shaft, said second cleat clamp being cooperative with said first cleat clamp to hold said cleat to said pedal; and

a pair of resistor projections disposed between said second cleat clamp and said pedal shaft, a position of each restrictor projection being such that said cleat can contact said each restrictor projection when said cleat is engaged by said first and second cleat clamps, said pair of restrictor projections being provided for restricting displacement of said cleat by contact therewith;

wherein said restrictor projections project with respect to said shoe bottom opposing surface and are spaced apart in a direction substantially parallel to said first pivotal axis by a distance greater than a width along a pedal shaft of a portion of said cleat for contacting said restrictor projections, thereby allowing said cleat to oscillate freely on said shoe bottom opposing surface through said distance between said restrictor projections and about said cleat engaging means.

5,557,986

DIFFERENTIAL MECHANISM

Alastair J. Young; John Spooner, both of Kenilworth, and John P. Chippendale, Solihull, all of United Kingdom, assignors to Automotive Products, plc, Leamington Spa, Warwickshire, England

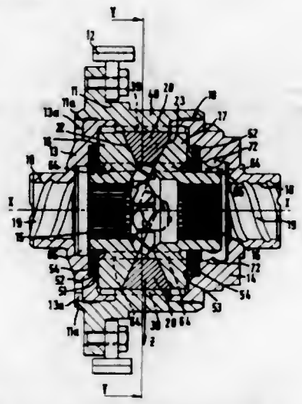
PCT No. PCT/GB94/01329, § 371 Date Jun. 14, 1995, § 102(e) Date Jun. 14, 1995, PCT Pub. No. WO95/00777, PCT Pub. Date Jan. 5, 1995

PCT Filed Jun. 20, 1994, Ser. No. 381,986

Claims priority, application United Kingdom, Jun. 22, 1993, 9312856

Int. Cl.[6] F16H *35/04*

U.S. Cl. 74—650 **31 Claims**



1. A differential mechanism (**10**) comprising two output cam members (**16**, **17**) rotatable about an axis (X—X) each said member having a single annular cam surface (**22**, **23**) thereon of undulating wave form comprising pairs of mutually inclined surfaces (**24**, **25**:**26**, **27**), a plurality of cam followers (**28**) having end surfaces (**29**, **30**:**32**, **33**) engaging the cam surfaces of the output cam members, the arrangement being such that relative contra rotation of said output cam members (**22**, **23**) causes the cam followers (**28**) to slide axially, and an input member (**11**) which slidably supports the followers and moves the followers circumferentially relative to the output cam members, characterised in that the cam members (**16**, **17**) have equal numbers of pairs of inclined surfaces (**24**, **25**:**26**, **27**) thereon and there are at least two different types of cam followers (**28**) and the number of followers is a multiple of the number of pairs of inclined surfaces, where the multiple is an integer greater than one.

5,557,987

SHIFTING DEVICE FOR A TURNING GEAR TRANSMISSION WITH AUTOMATIC TRANSMISSION-RATIO CHANGE FOR A CHANGE IN DIRECTION OF A DRIVING SHAFT

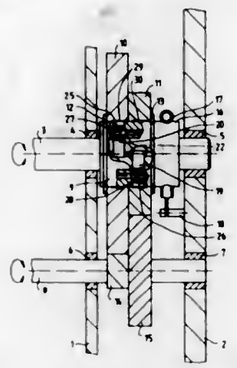
Kurt Lötsch, Wiesental, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Jul. 11, 1994, Ser. No. 273,410

Claims priority, application Germany, Jul. 10, 1993, 43 23 114.4

Int. Cl.[6] F16H *3/08*; **F16D** *13/10*

U.S. Cl. 74—810.1 **3 Claims**



1. Shifting device for a turning gear transmission having an automatic change of transmission ratio when a change in direction of a driving shaft occurs, including two driving gearwheels disposed coaxially with respect to the driving shaft, the driving gearwheels being of different diameters and, respectively, being disconnectable from the driving shaft, and a driven shaft having two driven gearwheels firmly connected thereto and being in continuous pair-wise engagement with the driving gearwheels, comprising a pawl holder rotatably mounted on the driving shaft, the driving gearwheels being rotatably mounted on said pawl holder, at least one pair of pawls held by said pawl holder, and means for causing said pair of pawls, contingent upon the respective direction of rotation of the driving shaft, to effect an entrainment of one of the driving gearwheels in a different direction of rotation, wherein said pawl holder is connected to a two way-acting friction-type restraining mechanism, and said friction-type restraining mechanism comprises a locally anchored spring, said spring being tautly laid in a partial region about an outside diameter of a shoulder formed on said pawl holder.

5,557,988

CENTRIPETALLY IMPELLED VEHICLE

John C. Claxton, 7852 Feather Oaks Dr., Jacksonville, Fla. 32277

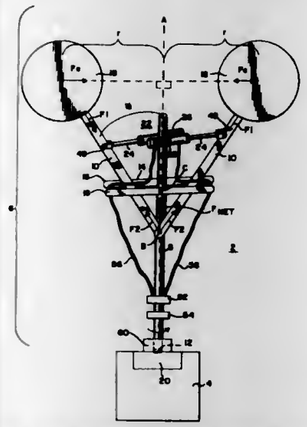
Filed Nov. 29, 1994, Ser. No. 346,136

Int. Cl.[6] B64G *1/24*

U.S. Cl. 74—845 **44 Claims**

1. A centripetally impelled vehicle, comprising:

a housing;



a centripetal impeller attached to said housing so as to impart a force on said housing that causes said housing and centripetal impeller to move, said centripetal impeller comprising:

an attachment piece attached to said housing and defining an axis of revolution;

a movable arm pivotable relative to said attachment piece so that said movable arm is a distance r from said axis of revolution;

a rotation device coupled to said attachment piece so as to cause said attachment piece to rotate about said axis of revolution and produce a centripetal force toward said axis of revolution;

a variable force device attached to said movable arm and producing a force on said movable arm toward said axis of revolution so as to cause a net force along said attachment piece and causing said housing to move.

5,557,989

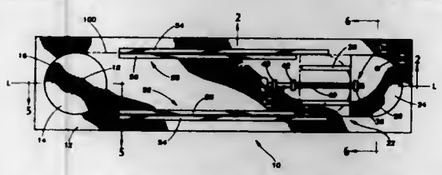
BAND SAW BLADE TENSIONING DEVICE

John C. Smith, Jr., 210 Michigan Ave., Gaffney, S.C. 29341

Filed Feb. 17, 1995, Ser. No. 390,140

Int. Cl.[6] B23D *63/02*

U.S. Cl. 76—74 **6 Claims**



1. A device for securing and tensioning a band saw blade, comprising:

a rectangular base member having a longitudinal axis;

a disk member fixedly attached at an end of the base member, said disk member for holding a first section of the band saw blade in place;

a first pair of parallel blade guides which are disposed parallel to the longitudinal axis of the base member, said first pair of blade guides capable of supporting a second section of the band saw blade therebetween;

retractable tensioning means for producing an outwardly directed force on the band saw blade, said tensioning means disposed at another end of the base member;

a second pair of parallel blade guides which are disposed parallel to the longitudinal axis of the base member, said second pair of blade guides supporting a third section of the band saw blade therebetween;

the tensioning means comprising:

a block member, rounded at one end, slidingly engaged with the top surface of the base member;

a flange, having a threaded aperture and fastened to the top surface of the block member; and

an elongated bolt, horizontally disposed with respect to the base member, and threadingly engaged at its distal end with the threaded aperture;

said elongated bolt producing an outwardly directed force on the block member whenever the bolt is rotated in a first direction, and producing an inwardly directed force on the block member whenever the bolt is rotated in a second direction;

said attaching means further comprising:

a pair of attaching pegs, passing through the block member; and

a pair of slots located in the base member, said slots for receiving the pair of pegs therein.

5,557,990

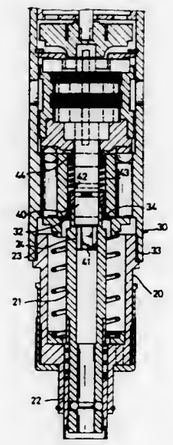
ACTUATING DEVICE FOR USE IN POWERED SCREWDRIVER

Fu-zong Shin, No. 6, Lane 84, Chinhua Rd., Taichung, Taiwan

Filed Jul. 27, 1995, Ser. No. 507,823

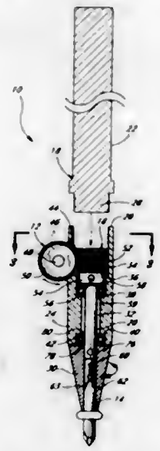
Int. Cl.[6] B25B *21/00*

U.S. Cl. 81—54 **2 Claims**



1. A powered screwdriver comprising a tool head (**10**), a lower cylinder (**20**), a hollow shaft (**21**) insertable through the lower cylinder (**20**), an upper cylinder (**30**) engageable with the lower cylinder (**20**), a passage (**32**) defined in the upper cylinder (**30**), a motor-driven axle (**40**) insertable through the passage (**32**) and engageable with the hollow shaft (**21**) so that the motor-driver axle and the hollow shaft are slidable but not rotatable with respect to each other and an actuating device including a lower ring (**34**) securely received in the passage (**32**), an actuator (**42**) with a collar slidably mounted on the motor-driven axle (**40**) and a tab radially extending from the collar and projecting through a slot (**35**) defined in the upper cylinder (**30**), a spring (**43**) mounted on the motor-driven axle (**40**), an upper ring (**44**) securely received in the passage (**32**) and-a push-button switch (**50**) mounted on the upper cylinder (**30**), wherein as the powered screwdriver is pushed against a screw, the motor-driven axle (**40**) is further inserted into the hollow shaft (**21**) so that the collar of the actuator (**42**) is pushed by means of the hollow shaft (**21**) so that the push-button switch (**50**) is pressed by means of the tab of the actuator (**42**).

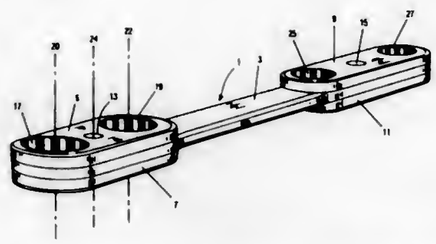
5,557,991
CALIBRATION HAND TOOL
James L. Brodbeck, 225 S. Ashford Pl., Fullerton, Calif. 92631
Filed Mar. 24, 1995, Ser. No. 410,080
Int. Cl.[6] B25B *17/00*
U.S. Cl. 81—57.29 **27 Claims**



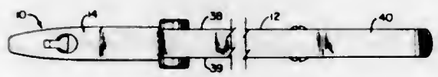
1. A hand tool for making precise rotational adjustments of electrical or mechanical devices, said hand tool comprising:
a driven shaft which rotates about a first axis;
a handle in which at least a portion of said driven shaft is journaled;
a driving tumbler which rotates about a second axis which extends in a nonparallel direction relative to said first axis, said tumbler supported by said handle in a position where at least a portion of said tumbler is exposed generally at a point of intersection between said second axis and a line which extends between said first and second axes, said line being substantially perpendicular to both said first and second axes; and
a gear train which couples together said driving tumbler and said driven shaft, said gear train configured to transmit rotational motion of said tumbler about said second axis into rotation of said shaft about said first axis and to reduce the rotational speed of said driven shaft relative to said driving tumbler.

5,557,992
MULTI-SOCKET WRENCH CONTAINING DUAL SOCKET WRENCH UNITS
Richard J. Macor, Greenwich Township, Warren County, N.J., assignor to Proprietary Technologies, Inc., Stewartsville, N.J.
Continuation-in-part of Ser. No. 96,383, Jul. 23, 1994, abandoned, which is a continuation-in-part of Ser. No. 864,972, Apr. 7, 1992, Pat. No. Des. 342,653. This application Dec. 28, 1994, Ser. No. 364,697
Int. Cl.[6] B25B *13/06*
U.S. Cl. 81—124.5 **20 Claims**

1. A multi-socket wrench, which comprises:
(a) an elongated main member having an elongated dimension, with an upper area, lower area, a first end and a second end;
(b) at least two wrench units, each wrench unit having an elongated dimension and having opposing elongated ends, and each wrench unit having only two sockets, said two sockets being positioned side by side thereon, one of said at least two wrench units being rotatably attached at said upper area and another of said at least two wrench units being rotatably attached at said lower area of said first end of said elongated main member, said two sockets on each wrench unit being substantially opposite one another, each of said two sockets on each wrench unit being located at different opposing elongated ends of said wrench unit; and,
(c) attachment means for attaching said wrench units to said elongated main member.

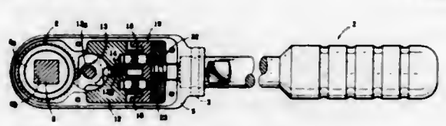


5,557,993
SLIDE ACTUATING MECHANISM FOR OPEN-END ADJUSTABLE WRENCH
Kelly P. Austin, 3712 Cragmont Ave., Dallas, Tex. 75205
Filed Aug. 2, 1995, Ser. No. 510,544
Int. Cl.[6] B25B *13/16*
U.S. Cl. 81—165 **11 Claims**



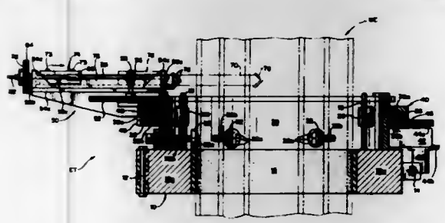
1. In an open-ended, adjustable jaw wrench wherein an elongated handle has a fixed jaw at one end and a movable jaw at said one end with an adjusting worm gear for advancing said movable jaw toward and away from said fixed jaw, the improvement comprising:
an elongated cavity in said handle;
a shaft having at least one helical groove rotatably supported within said cavity including a drive gear at one end engageable with said worm gear and a bearing member at an opposite end thereof;
said handle including elongated slots extending along opposite sides of said cavity; and
actuator means insertable into each of said slots into engagement with said helical groove whereby movement of one or both said actuating means along said slots imparts rotation to said drive shaft and drive gear to rotate said worm gear.

5,557,994
RATCHET HANDLE WITH TORQUE ADJUSTMENT
Tatsuo Nakayama, 16818 Dallas Pkwy., Dallas, Dallas County, Tex. 75248
Filed Jul. 17, 1995, Ser. No. 503,436
Int. Cl.[6] B25B *23/142*
U.S. Cl. 81—478 **13 Claims**



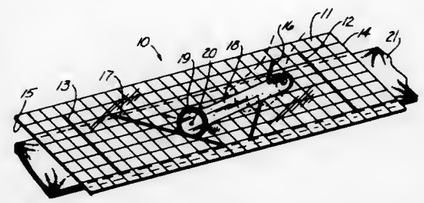
1. A torque ratchet handle comprising:
a handle;
a body connected to the handle;
a ratchet gear rotatably mounted in the body;
a shaft affixed to the ratchet gear that rotates in response to the rotation of the handle and the ratchet gear;
a ratchet pawl adjacent the ratchet gear for meshing with the ratchet gear and restraining rotation of the ratchet gear as the handle is rotated;
ratchet pawl support means affixed to the ratchet pawl wherein the support means is moveable within the body in a direction perpendicular to the shaft;
spring means adjacent the support means for elastically urging the support means and the ratchet pawl to contact the ratchet gear in opposition to rotational torque received from the ratchet gear and the ratchet pawl; and
adjustment means abutting the spring means for adjusting the elastic spring force of the spring means as applied to the support means.

5,557,995
RADIAL CUTTING TOOLS FOR CUTTING THICK-WALLED TUBULAR MEMBERS
Jerry H. Robinson, Mobile, Ala., assignor to Wellcutter, Inc., Brewton, Ala.
Continuation-in-part of Ser. No. 361,826, Dec. 22. 1994, which is a continuation-in-part of Ser. No. 45,411, Apr. 13, 1993, Pat. No. 5,394,776. This application Feb. 2, 1995, Ser. No. 383,502
Int. Cl.[6] B23B *5/14*
U.S. Cl. 82—113 **42 Claims**



1. A cutting tool for cutting tubular members comprising:
an annular frame assembly which is concentrically positionable relative to the tubular member to be cut such that said cutting tool is disposed in a cutting plane which is normal to the tubular member's longitudinal axis; and
a radial cutting assembly coupled to said annular frame assembly for orbital movement within said cutting plane so as to cut said tubular member, wherein
said radial cutting assembly includes a bit subassembly having
(i) a bit support block which has opposed planar surfaces parallel to said cutting plane so as to establish therebetween a thickness dimension of said bit support block, and
(ii) a bit carried rigidly at a forward end of said bit support block so as to be in a mounting plane which is substantially transverse to said opposed parallel planar surfaces and thereby oriented substantially parallel to the tubular member's longitudinal axis, and wherein
(iii) said bit has a cutting edge with lateral portions which extend past said opposed parallel planar surfaces of said bit support block such that said bit cuts a channel in the tubular member having a dimension measured parallel to the tubular member's longitudinal axis which is greater than the thickness dimension of said bit support block.

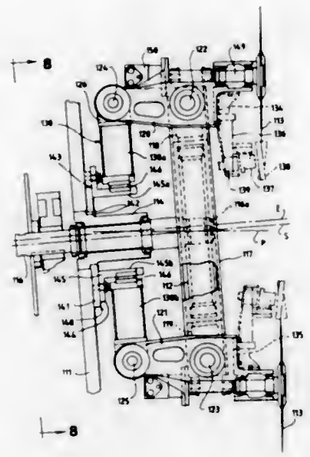
5,557,996
METHOD AND APPARATUS FOR CUTTING PIECES OF CLOTH FOR USE IN QUILTS OR THE LIKE
James K. Reber, and Jill A. Reber, both of 10481 NW. 107th Ave., Granger, Iowa 50109
Continuation of Ser. No. 57,509, May 6, 1993, abandoned. This application Mar. 9, 1994, Ser. No. 208,490
Int. Cl.[6] B26D *3/00*
U.S. Cl. 83—56 **21 Claims**



3. A method for cutting cloth into shapes for use in quilts using an apparatus comprising a sheet of transparent material; a first linear slot disposed through said sheet at a first location on said sheet, whereby a cutter can extend therethrough to cut several layers of cloth; a second linear slot disposed through said sheet at a second position thereof, said second slot being oriented at an angle of less than 90° with respect to said first linear slot, whereby a cutter can extend therethrough to cut several layers of cloth;
a third linear slot disposed in said sheet, said third linear slot being both non-parallel and non-perpendicular to both of said first and second linear slots; and
wherein more than half the length of said second linear slot is disposed directly between a path or trajectory extending from a first end of the first slot to a first end of the third slot and a path or trajectory extending from a second end of the first slot to a second end of the third slot whereby said sheet can be shifted along the same general linear path to move from using one of the slots to any other one of the slots; said method comprising:
placing said sheet over a piece of cloth to be cut into pieces;
using a cutter to cut said cloth through said first slot;
shifting said sheet in one direction along said same general linear path;
using said cutter to cut said cloth through said third slot;
shifting said sheet in an opposite direction to said one direction along said same general linear path;
using said cutter to cut said cloth through said second slot;
shifting said sheet in said one direction again along said same general linear path; and
using said cutter to cut said cloth again through said third slot.

5,557,997
APPARATUS FOR TRANSVERSE CUTTING
Gary R. Wunderlich, and Larry D. Wierschke, both of Green Bay, Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.
Filed Apr. 6, 1994, Ser. No. 223,543
Int. Cl.[6] B26D *1/58*
U.S. Cl. 83—174 **17 Claims**

1. A continuous motion saw for elongated web plies, comprising: frame means providing a linear path for said elongated plies, conveyor means operatively associated with said frame means for advancing said elongated web plies along said linear path, a relatively elongated drive arm rotatably mounted on said frame means, a blade mounted on said drive arm, means on said frame means for rotatably said drive arm about an axis skewed with respect to said linear path,
bracket means mounted adjacent an end of said drive arm to provide two degrees of pivotal freedom and carrying said blade, means on said bracket means for rotating said blade,



rotation of said drive arm orbiting said blade and the blade orbit intersecting said linear path, and

control means rotatably mounted on said frame means for rotation about an axis eccentric to said drive arm axis, said control means comprising a control arm connected to said bracket means for compensating for the skew of said drive arm to orient said blade perpendicular to said web plies in said linear path when engaging the same,

said two degrees of pivotal freedom of said bracket means including means providing first for rotation about a first axis generally parallel to the length of each of said drive arm and said control arm and second for rotation about a second axis perpendicular to said first axis and generally perpendicular to said skewed axis, said rotation-providing means including clutch means to maintain a constant forward index motion.

5,557,998

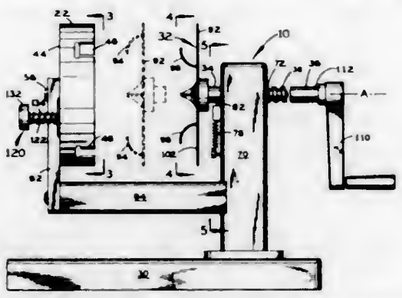
BAGEL CORING APPARATUS

Eli H. Schwartz, and Jerilyn H. Schwartz, both of 17056 Huntington Pkwy., Boca Raton, Fla. 33496

Filed Dec. 19, 1994, Ser. No. 358,718

Int. Cl.[6] B26D *3/06*

U.S. Cl. 83—875 **14 Claims**



1. A coring apparatus for coring a single annular channel in a substantially annular food item, comprising:

a base member,

a post member extending from said base member, said post member including drive shaft guide means,

a drive shaft having a longitudinal axis and being rotatably fitted through said guide means, said drive shaft having shaft external threads,

means for engaging said shaft external threads, such that rotating said drive shaft relative to said post member causes said drive shaft to advance along said longitudinal axis relative to said post member,

a food item cutting element mounted on said drive shaft including a first blade means and a second blade means, the first blade means and the second blade means are radially spaced from said drive shaft longitudinal axis for cutting along a singular circular channel path, the first blade means has a pair of exterior arched blades arcuately extending in a radial direction away from said longitudinal axis for cutting an interior wall of a single annular channel, the second blade means has a pair of interior arched blades arcuately extending in a radial direction towards said longitudinal axis for cutting an exterior wall of the single annular channel, each of the exterior arched blades and each of the interior arched blades are angularly spaced from each other in alternating order about the longitudinal axis;

an annular food item holding means connected to said base member and located along said longitudinal axis of said drive shaft and adjacent said cutting element for securing a substantially annular food item against rotation relative to said post member such that said cutting element is advanced toward said holding means and into contact with said food item by rotating said drive shaft in one direction, and wherein the first blade means and the second blue means cut a single annular core in the annular food item, the single annular core being concentric to the perimeter of the annular food item.

5,557,999

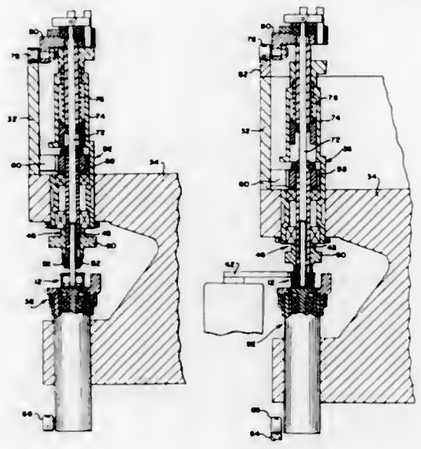
METHOD FOR MANUFACTURING A TAMPER-INDICATING PLASTIC CLOSURE

David W. Smith, Waynetown, and Ramesh Kamath, Brownsburg, both of Ind., assignors to H-C Industries, Inc., Crawfordsville, Ind.

Filed Jan. 14, 1994, Ser. No. 182,627

Int. Cl.[6] B65D *41/34*

U.S. Cl. 83—880 **10 Claims**



1. A method of handling a plastic closure, comprising the steps of:

providing a plastic closure having a top wall portion and a depending annular skirt portion;

providing an orientation mandrel including stop means for engaging said closure to stop rotation of said closure relative to said orientation mandrel, said stop means being engageable with said closure by movement of said stop means generally radially of said mandrel;

positioning said closure in operative association with said mandrel and relatively rotating said mandrel and said closure with respect to each other until said closure is positioned in a predetermined orientation with respect to said mandrel whereupon said stop means engage said closure by the movement of said stop means generally radially of said mandrel to stop relative rotation of said mandrel and said closure with respect to each other.

5,558,000

HIGH SPEED AND HIGH LOAD CYLINDER DEVICE

Hitoshi Sawamura, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

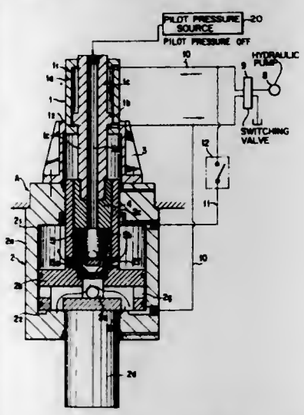
PCT No. PCT/JP93/01497, § 371 Date Apr. 26, 1995, § 102(e) Date Apr. 26, 1995, PCT Pub. No. WO94/11639, PCT Pub. Date May 26, 1994

PCT Filed Oct. 18, 1993, Ser. No. 424,417

Claims priority, application Japan, Nov. 19, 1992, 4-309843

Int. Cl.[6] F01B *1/00*; F15B *11/00*

U.S. Cl. 91—164 **5 Claims**



1. A high speed and high load cylinder device comprising:

a high speed cylinder including a first piston disposed therein and having an effective area, and first and second fluid chambers defined in an interior space of said high speed cylinder by said first piston;

a high pressure cylinder including a second piston disposed therein and cooperating with said first piston of said high speed cylinder, said second piston having an effective area which is larger than said effective area of said first piston, and third and fourth fluid chambers defined in an interior space of said high pressure cylinder by said second piston, said second piston defining a communication passage for selectively communicating said third and fourth fluid chambers with each other;

a hydraulic circuit connected to said high speed cylinder and to said high pressure cylinder for supplying hydraulic pressure thereto, said hydraulic circuit including a fluid path communicating with one of said third and fourth fluid chambers for supplying the hydraulic pressure thereto;

first valve means disposed in said communication passage for selectively establishing and blocking communication between said third and fourth fluid chambers;

first valve control means for controlling a position of said first valve means for selectively establishing and blocking communication between said third and fourth fluid chambers, said first valve control means operating said first valve means at an open position in a high speed mode operation and at a closed position in a high load mode operation; and

second valve means disposed in said fluid path for selectively establishing and blocking communication between said hydraulic circuit and said one of said third and fourth fluid chambers, said second valve means establishing communication between said hydraulic circuit and said one of said third and fourth fluid chambers during said high load mode operation.

5,558,001

PNEUMATIC BOOSTER

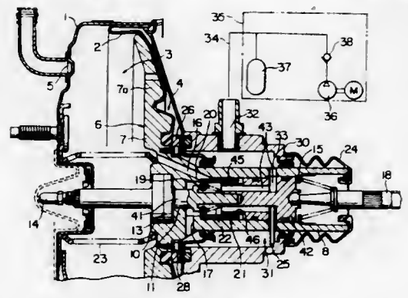
Nobumaro Osaka; Yasuhiko Amari, and Takanobu Enomoto, all of Yamanashi-ken, Japan, assignors to Tokico Ltd., Kanagawa-ken, Japan

Filed Jun. 15, 1994, Ser. No. 260,985

Claims priority, application Japan, Jun. 17, 1993, 5-171192

Int. Cl.[6] F15B *9/10*

U.S. Cl. 91—376 R **6 Claims**



1. A pneumatic booster, comprising:

a housing defining a space therein;

a diaphragm dividing said space inside said housing into a constant-pressure chamber and a variable-pressure chamber;

a valve body hermetically attached to said diaphragm and having a first passage communicating said constant-pressure chamber with said variable-pressure chamber;

a plunger slidably fitted in said valve body so as to be movable in response to movement of an input shaft, said plunger comprising a first sliding member that is connectable to an output shaft, a second sliding member that is connected to said first sliding member at a junction and connectable to the input shaft and an axial direction;

a second passage having a portion that extends in said second sliding member of said plunger and a portion that extends in said valve body and around said first sliding member and communicates the inside of said variable-pressure chamber with the outside of said valve body; and

valve means operative in response to movement of said plunger for opening said second passage while closing said first passage and for closing said second passage while opening said first passage, said valve means comprising a valve member that can open and close at least said second passage;

wherein said first sliding member comprises a valve seat in said second passage;

said valve member comprises a valve portion and a cylindrical portion, said cylindrical portion comprising a rigid integral reinforcing member;

said cylindrical portion of said valve member is fitted on a portion of said second sliding member of said plunger so as to cover said junction between said first sliding member and said second sliding member and so as to be movable in the axial direction of said plunger relative to said plunger and said valve body;

said valve portion of said valve member extends radially inwardly from one end of said cylindrical portion so that said valve portion can rest on and separate from said valve seat for selectively establishing and interrupting communication between said portion of said second passage in said second sliding member and said portion of said second passage that extends around said first sliding member; and

wherein said valve member further comprises a seal member

5,558,003

with the main outlet enclosure via the internal fluid distribu-

5,558,005

wherein said valve member further comprises a seal member coated on said valve portion thereof at least at a surface portion of said valve portion engageable with said valve seat.

5,558,002

HYDRAULIC BOOSTERS FOR VEHICLE HYDRAULIC SYSTEMS

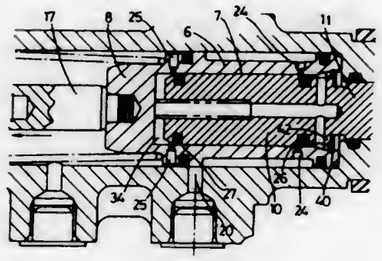
Keith J. Robbins, West Yorkshire, England; Michael Williamson, Caerleon, United Kingdom, and Andrew R. Broadwell, Humberside, England, assignors to Lucas Industries, Public Limited Company, Solihull, England

Filed Feb. 23, 1995, Ser. No. 393,270

Claims priority, application United Kingdom, Feb. 26, 1994, 9403764

Int. Cl.[6] F15B *9/10*

U.S. Cl. 91—378 **12 Claims**



1. An hydraulic booster for a vehicle hydraulic systems comprising:

a body including a bore;

a boost piston located in the bore, the boost piston comprising a bore and a wall in which a radial high pressure supply inlet port and a radial return outlet port are (is) provided;

an output member in communication with the boost piston;

a power chamber located in the bore of the boost piston, and

a control valve in communication with the power chamber, wherein

the boost piston is operable to apply an output force to the output member in response to a pressure applied to the power chamber under (the) control of the control valve, in turn responsive to an input force, and

the control valve comprises a spool in working communication with the bore of the boost piston, and a pair of longitudinally spaced radial seals carried by the spool, a (the) first one of the seals being disposed so as to prevent fluid from the radial high pressure supply port from entering the power chamber through the spool at least when the booster is in an inoperative position, movement of the spool in a forward operating direction causing the first one of the seals to uncover the supply port so that fluid enters the power chamber through the spool, in turn to advance the boost piston in its bore, and a second one of the seals is disposed so as to prevent fluid from leaving the power chamber at least when the booster is in the operative condition, and uncovers the radial return port when the input force is relieved.

5,558,003

HYDRAULIC MOTOR PROVIDED WITH A DEVICE FOR SELECTING ITS ACTIVE CUBIC CAPACITY

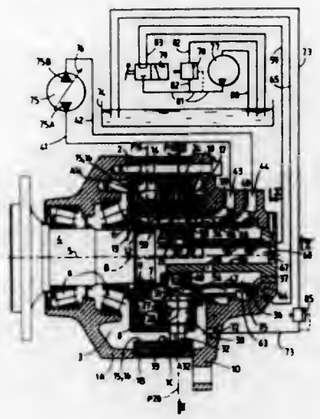
Philippe P. Bauzou, Compiegne, and Jean-Claude F. Case, Bonneuil-en-Valois, both of France, assignors to Poclain Hydraulics, France

Filed Sep. 8, 1994, Ser. No. 302,549

Claims priority, application France, Sep. 15, 1993, 93 10972

Int. Cl.[6] F01B *13/06*

U.S. Cl. 91—492 **9 Claims**



1. A hydraulic motor having radial pistons and a device for selecting its active cubic capacity, the motor comprising:

a cam having a plurality of undulations, each undulation comprising a crest placed between two troughs;

a cylinder block mounted to rotate about an axis of rotation relative to the cam;

a plurality of cylinders provided in the cylinder block, and disposed radially relative to said axis of rotation;

a plurality of pistons slidably mounted inside the cylinders, each piston delimiting a fluid working chamber inside the cylinder in which it is mounted, and being urged against said cam under drive from the pressure of a fluid under pressure contained in said working chamber;

a main inlet fluid enclosure for the fluid under pressure and a main outlet fluid enclosure;

an internal fluid distributor co-operating with the cylinder block, while the cylinder block rotates relative to the cam, to put each working chamber into communication alternately with the main inlet enclosure and with the main outlet enclosure;

a plurality of individual feed selectors disposed in the cylinder block, each individual selector being associated with a cylinder belonging to a specific group of said cylinders, and being interposed between the working chamber delimited inside said cylinder and the internal fluid distributor; and

means for returning the pistons slidably mounted in the cylinders of said specific group of cylinders towards the configuration in which the pistons are retracted inside their respective cylinders;

the motor being organized in such manner that firstly each individual feed selector can be placed in two specific configurations, said feed selector being coupled to a return member for returning said feed selector to one of said specific configurations, and to a control member for putting said feed selector in place in the other of said two specific configurations, said control member being connected to a control device, and having the opposite effect to that of the return member; secondly, when said individual feed selector is in said one specific configuration, the working chamber delimited inside the cylinder associated with the individual selector can, while the cylinder block is rotating relative to the cam, be put into communication alternately with the main inlet enclosure and with the main outlet enclosure via the internal fluid distributor; and thirdly, when said individual feed selector is in the other of said two specific configurations, said working chamber is isolated at least from the main inlet enclosure;

wherein the control member coupled to each of said individual feed selectors can work only in a range of positions of the cylinder associated with said individual feed selector which corresponds to the axis of said cylinder being in alignment with the crest of one of said undulations of the cam, and to positions that are angularly adjacent to the position in which said alignment is obtained.

5,558,004

CONTROL ARRANGEMENT FOR AT LEAST ONE HYDRAULIC CONSUMER

Armin Stellwagen, Lohr/Main, Germany, assignor to Mannesmann Rexroth GmbH, Lohr/Main, Germany

PCT No. PCT/EP93/01688, § 371 Date Jan. 13, 1995, § 102(e) Date Jan. 13, 1995, PCT Pub. No. WO94/02743, PCT Pub. Date Feb. 3, 1994

PCT Filed Jun. 30, 1993, Ser. No. 373,315

Claims priority, application Germany, Jul. 16, 1992, 42 23 389.5

Int. Cl.[6] F15B *11/05*

U.S. Cl. 91—517 **32 Claims**

1. A control arrangement for at least one hydraulic consumer in which a consumer can be controlled with respect to direction and speed via a directional control valve device, in which two consumer lines lead from the directional control valve device to the consumer, each of which consumer lines can be connected via a directional control valve piston and a metering restrictor to a pump and via a directional control valve piston and preferably a metering restrictor to a tank respectively and each has, associated therewith, a throttle valve having a servo-piston, wherein the servo-piston of the throttle valve is arranged in the consumer line downstream of the directional control valve piston and the metering restrictor; a valve seat can be acted on by the servo-piston; the servo-piston has at its front a first pressure surface which, for opening of the throttle valve, can be acted on by pressure prevailing downstream of the directional control valve device and the metering restrictor, at its rear a second pressure surface which, for closing of the throttle valve, can be acted on by a control pressure produced in a position of rest of the directional control valve piston alone by a load, and at its front, a third pressure surface which, for the opening of the throttle valve, can be acted on by load pressure prevailing in the corresponding consumer line between the throttle valve and consumer; and upon a discharg of the corresponding consumer line to the tank, the pressure acting on the second pressure surface can be reduced.

5,558,005

MULTI-SECTION ACTUATOR

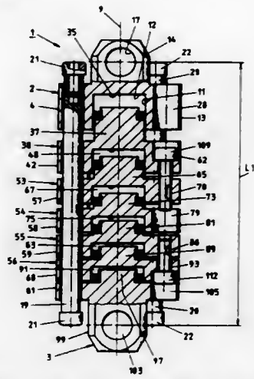
Christoph Heckner, Bielefeld, Germany, assignor to Dürkopp Adler Aktiengesellschaft, Germany

Continuation of Ser. No. 167,421, Dec. 15, 1993. This application Oct. 10, 1995, Ser. No. 541,498

Claims priority, application Germany, Dec. 22, 1992, 42 43 497.1

Int. Cl.[6] F01B *15/00*

U.S. Cl. 92—66 **24 Claims**



1. An actuator adapted to be actuated by pressurized fluid, comprising:

a plurality of piston-cylinder units;

each piston-cylinder unit comprising a piston and a cylinder, the piston being arranged for movement within the cylinder along a longitudinal axis of said actuator;

said piston-cylinder units being arranged adjacent to each other and interconnected so that an overall stroke length of said actuator corresponds to a sum of respective stroke lengths of said pistons within said cylinders;

each piston-cylinder unit having an arrangement for setting a respective stroke length of the corresponding piston within the corresponding cylinder;

said actuator comprising a connecting part, said connecting part comprising a single unitary component which includes the piston of one of the piston-cylinder units and the cylinder of another, adjacent piston-cylinder unit, the piston of the connecting part being arranged for movement in an adjacent cylinder to form one of the piston-cylinder units and the cylinder of the connecting part being arranged to receive an adjacent piston to form another of the piston-cylinder units;

said connecting part having a channel for receiving and guiding said pressurized fluid into said connecting part; wherein each of said piston cylinder units include a pressure application area upon which said pressurized fluid is applied, each pressure application area of each of said piston cylinder units being independent of pressure application areas of other of said piston cylinder units.

5,558,006

HEALTH BEVERAGE PLANT EXTRACTION APPARATUS

Nobuyoshi Kuboyama, 96 Litchfield Dr., Carlisle, Mass. 01741

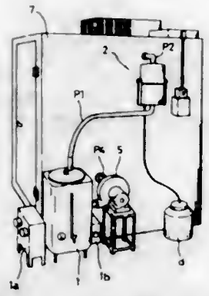
Filed Aug. 4, 1994, Ser. No. 286,001

Int. Cl.[6] A47J *31/00*

U.S. Cl. 99—275 **22 Claims**

1. A health beverage manufacturing apparatus for extracting an ingredient from a substance, comprising:

a water atomizer including a water reservoir, a heater for heating water in said water reservoir, and an associated ultrasonic wave generating device for assisting in atomizing the water in said water reservoir;



an extracting device having an inlet communicating with an outlet of said atomizer and including holding means for holding the substance with the ingredient to be extracted in a crushed state;

said inlet of said extracting device receiving atomized water from said atomizer so that a mixture of the atomized water and the ingredient to be extracted is formed within said extracting device;

a condenser having an inlet communicating with an outlet of said extracting device for receiving a mixture of atomized water and the extracted ingredient and liquefying at least a portion of the mixture;

a first reservoir having an inlet communicating with an outlet of said condenser for receiving at least a portion of the liquefied mixture, wherein said first reservoir is a substantially airtight pressure vessel; and

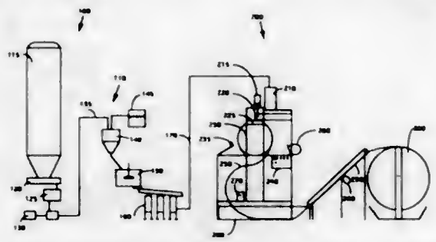
a blower operatively associated with said apparatus for providing the atomized water entering said extracting device through said extracting device inlet at a higher pressure than the pressure of the mixture of atomized water and the extracted ingredient exiting said extracting device at said extracting device outlet, thereby producing a decompressed state in said extracting device and enhancing the extraction of the ingredient in the substance to be extracted.

5,558,007

APPARATUS FOR MAKING THIN AND CONTINUOUS WRAPPING SHEETS

Yoke K. Mo, deceased, late of Palo Alto, Calif., and by Ngoc U. Mo, legal heir, 175 Demeter St., East Palo Alto, Calif. 94303

Filed Nov. 20, 1995, Ser. No. 560,656
Int. Cl.[6] A21B *1/46;* A21C *9/06;11/00;* A23P *1/00*
U.S. Cl. 99—326 **7 Claims**



1. An apparatus for making a thin and continuous food wrapping sheet from a batter comprising:

a first rotating drum includes a heating surface;

a batter storing and spreading means disposed right above said first rotating drum for spreading said batter on said heating surface on said first rotating drum for forming a food wrapping sheet on said heating surface wherein said wrapping sheet hanging downwardly along a tangential direction from said heating surface;

a second rotating drum;

a rotation control means for controlling a rotation speed of said first rotating drum and a rotation speed of said second rotating drum;

a conveying guide tube for receiving said wrapping sheet from said first rotating drum and for guiding said wrapping sheet to second rotating drum for wrapping around a sheet collecting surface on said second rotating drum; and

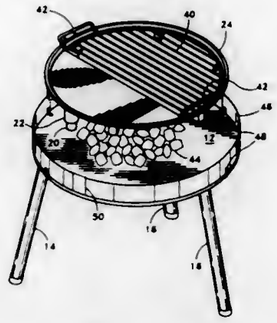
a blowing and stretching means disposed below said first rotating drum for generating an air flow to blow on said wrapping sheet hanging downwardly from said first rotating drum and to blow said wrapping sheet away from said conveying guide tube for generating a tension on said wrapping sheet for drying and stretching said wrapping sheet.

5,558,008

COMBINATION GRILL-WOK BARBECUE

Borden Jenkins, P.O. Box 2996, Corpus Christi, Tex. 78403

Filed May 30, 1995, Ser. No. 455,225
Int. Cl.[6] A47J *33/00*
U.S. Cl. 99—340 **3 Claims**



1. A combination grill-wok and heat source support device, capable of resting on a permanent surface such as a floor, comprising:

a steel plate;

a surface on the plate;

a circumference on the plate;

a plurality of removable legs for supporting the plate connected to the steel plate above the permanent surface;

the removable legs are threadedly connected to the steel plate;

post means removably extending from the surface on the steel plate;

the post means is threadedly connected to the steel plate;

tube means telescopingly engaging the post means;

an end on the tube means;

the tube means, sealed at the end, engaging the post means in a loose friction fit;

a circumference on the tube means;

a point on the circumference;

a steel ring attached at the point on the circumference on the tube means;

the ring comprising a plurality of tabs extending into the ring for supporting the wok-grill; and

the steel ring being in a spaced co-planar relation with the plate, whereby the heat source placed on the steel plate will warm the grill-wok and placed within the steel ring;

a removable wind shield means, attachable to the circumference of the plate for protecting the heat source from a wind;

the wind shield means comprising:

a rectangular member;

a first end on the member;

a second end on the member; and

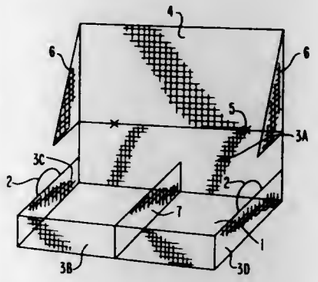
a fastener attached to the member to releasably connect the first end to the second end.

5,558,009

DEVICE FOR COOKING OR GRILLING SMALL PIECES OF FOOD AND METHOD OF USE

Marvin Fabrikant, and Patricia Fabrikant, both of 5149 Tilden St., N.W., Wash., D.C. 20016

Continuation-in-part of Ser. No. 442,931, May 17, 1995. This application Aug. 8, 1995, Ser. No. 512,416
Int. Cl.[6] A47J *37/07*
U.S. Cl. 99—450 **15 Claims**



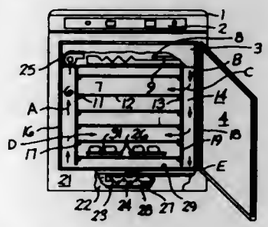
1. A device for cooking or grilling small pieces of food comprising two halves of a basket which fit together to form a fully enclosed basket, each half including a mesh made of a material suitable for cooking or grilling small pieces of food having openings throughout the mesh, said mesh comprising a bottom, a rear wall, a front wall, and two side walls, wherein the two side walls are joined to the front and rear walls and the rear wall is higher than the front wall such that the entire device fits completely within conventional covered outdoor barbecue grills and such that the higher rear wall facilitates turning over the small pieces of food when the device is shaken.

5,558,010

FOOD STORAGE CHAMBER DOOR OPEN COMPENSATION

Winston L. Shelton, Louisville, Ky., assignor to Properties Leasing, Louisville, Ky.

Filed Jan. 13, 1995, Ser. No. 372,352
Int. Cl.[6] A23L *1/00;* A21C *13/00*
U.S. Cl. 99—468 **2 Claims**



1. A hot food storage oven, comprising:

a food receiving chamber;

a reservoir for water in communication with said food receiving chamber;

a first heater to heat the water in said reservoir;

a first sensor to sense the temperature of water in said reservoir;

a second heater to heat the air in said chamber;

a second sensor to sense the temperature of the air in said chamber; and

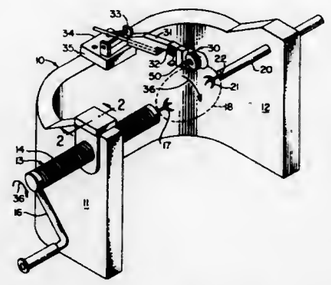
a control system, which operates said second heater so as to maintain the air in said chamber at a selected level above the temperature of water in the reservoir in order to maintain a selected water vapor content in the air, and which operates said second heater by utilizing input from said second sensor to determine a standard air temperature, and, upon detecting a drop in said air temperature below the standard, turns on said first heater and integrates the deviation of said air temperature from the standard air temperature until it returns to the standard temperature, and continues heating said water reservoir so that said air temperature exceeds said standard temperature for a long enough period of time that the integral of the deviation above the standard temperature is substantially equal to the integral of the deviation below the standard temperature.

5,558,011

FRUIT PARING AND CUTTING APPARATUS

Stephen J. Heim, 21906 Pacific Coast Highway, Malibu, Calif. 90265

Filed Sep. 5, 1995, Ser. No. 523,390
Int. Cl.[6] A23N *7/00*
U.S. Cl. 99—595 **7 Claims**



1. An apparatus for paring and cutting fruit comprising:

(a) a base including first and second opposed vertical supports, aligned apertures being disposed through each of said first and second supports;

(b) a screwthreaded spindle coupled within the aperture in said first support;

(c) a cylindrical drive shaft having first and second ends and having a screwthreaded segment thereon rotatably journeled through said first support, said screwthreaded segment in engagement with said spindle;

(d) first fruit holding means for releasably holding the fruit secured to the first end of said drive shaft;

(e) rotation means for rotating said drive shaft and the first fruit holding means secured to the second end of said drive shaft;

(f) a slidable shaft axially aligned with said drive shaft, said slidable shaft being rotatably journeled and slidably coupled within the aperture in said second support;

(g) second fruit holding means for releasably holding the fruit secured to said slidable shaft in opposition to said first fruit holding means;

(h) a cutting assembly resiliently secured to said base and positioned intermediate said first and second fruit holding means, said cutting assembly comprising first, second and third paring blades each having paring edges directed in opposition to the direction of rotation of the fruit, said first and second blades being in parallel spaced relation to each other and perpendicular to the axis of said drive shaft and slidable shaft, said third blade being coupled between said first and second blades at one end thereof and being perpendicular thereto, and a cutting guide in parallel spaced relation

to the third paring blade whereby the thickness of the pared fruit is determined; and

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5,558,013

DEVICE AND METHOD FOR ELECTRONICALLY

pressure vessels provided respectively on said upper and lower heat plates, for respectively pressing stacked substrate blanks,

to the third paring blade whereby the thickness of the pared fruit is determined; and

(i) cutting means for cutting that portion of the fruit in paring engagement with the paring blades into uniform segments.

5,558,012

AUTOMATIC BUNDLING MACHINE

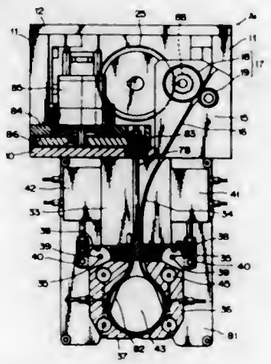
Osamu Yamashima; Toshihiro Inoue, and Hiroshi Hasegawa, all of Hofbara-gun, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Mar. 23, 1995, Ser. No. 409,093

Claims priority, application Japan, Mar. 24, 1994, 6-053593

Int. Cl.[6] B65B *13/28*

U.S. Cl. 100—26 **8 Claims**



1. An automatic bundling machine comprising:

a case, a band-supply portion having

a band passage in said case,

a drive roller and a free roller positioned at opposite sides of said band passage,

a band-feeding rotary actuator for rotating said drive roller, and

a one-way clutch and a friction clutch mounted between said band-feeding rotary actuator and said drive roller;

a bundle converging portion having a pair of hooks at one end of said case, and a hook driving actuator for opening and closing said pair of hooks,

said pair of hooks, when closed, forming a bundling-object receiving space, a band receiving groove having one end formed in a circumferential surface of said receiving space, opposed to said band passage; and

a band clamping and cutting portion having a rotor rotated by a band-twisting rotary actuator in said case, a band channel at a flange-shaped portion on the periphery of a forward end of said rotor, said band channel connecting said band passage and one end of said band receiving groove,

a pair of clamps, one end of each of said clamps being axially supported by a supporting axis in said band channel, the other end of said clamps being engaged with said hook so as to travel forward and backward to the circumferential surface of said rotor according to the opening and closing motion of said hooks, and

a cutter traveling forward and backward to said rotor according to the opening and closing motion of one of said hooks.

5,558,013

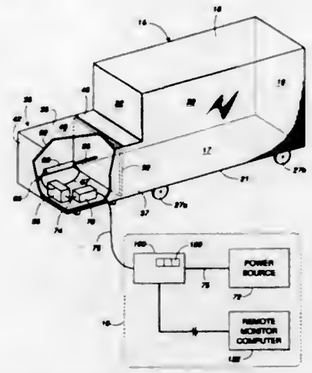
DEVICE AND METHOD FOR ELECTRONICALLY MEASURING THE FULLNESS OF A TRASH RECEPTACLE

James O. Blackstone, Jr., 85 Hickory La., LaGrange, Ga. 30240

Continuation-in-part of Ser. No. 879,487, May 7, 1992, abandoned. This application Dec. 30, 1992, Ser. No. 998,525

Int. Cl.[6] B30B *15/18*

U.S. Cl. 100—35 **9 Claims**



7. A method of monitoring the amount of trash in a trash receptacle and comparator unit, said comparator unit having an electrical motor, comprising the steps of:

measuring a first current drawn by said electric motor when compacting said trash and a second current when repositioning after compacting said trash; and

determining said amount of trash in said trash receptacle by comparing a derivative of said current drawn to a derivative threshold.

5,558,014

METHOD AND APPARATUS FOR BALING LOOSE MATERIALS

Lonnie R. Robinson, Matthews, N.C., assignor to Lindemann Recycling Equipment, Inc., Charlotte, N.C.

Filed Apr. 5, 1995, Ser. No. 417,996

Int. Cl.[6] B30B *9/30*

U.S. Cl. 100—35 **23 Claims**

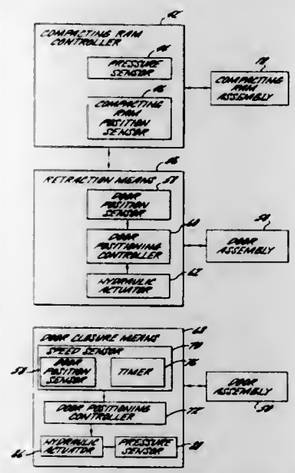
16. A method of baling loose materials with a baling apparatus having a controllably positioned door, the method comprising the steps of:

receiving loose materials in a charging passage defined within the baling apparatus;

moving a compacting ram platen within the charging passage between a retracted position and an extended position, said step of moving the compacting ram platen comprising the steps of urging the loose materials which are received within the charging passage into an adjacent compaction chamber, and compacting the loose materials within the compaction chamber into a bale as the compacting ram platen is moved from the retracted position to the extended position;

halting the movement of the compacting ram platen once a bale is formed;

moving a leading edge portion of the door from an initial position to a final position, wherein said moving step comprises the step of determining the position of the door relative to the position of the halted compacting ram platen such that the final position is in general alignment with the compacting ram platen to thereby define an opening from the compaction chamber which has a size that corresponds to the position of the compacting ram platen; and



ejecting the compacted bale through the opening from the compaction chamber defined by the door.

5,558,015

HOT PRESS WITH PRESSURE VESSELS TO UNIFORMLY DISTRIBUTE PRESSURE TO THE WORK PIECE

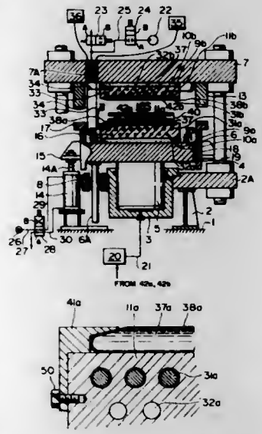
Akimi Miyashita, Toride; Mutsumasa Fujii, Ibaraki-ken, and Haruo Mishina, Ushiku, all of Japan, assignors to Hitachi Techno Engineering Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1994, Ser. No. 360,087

Claims priority, application Japan, Dec. 28, 1993, 5-335428

Int. Cl.[6] B30B *15/34;5/02*

U.S. Cl. 100—50 **10 Claims**



6. A hot press for producing a multilayered substrate, said hot press comprising:

upper and lower bolsters arranged in vertically opposed relation to each other;

upper and lower heat insulating plates;

upper and lower heat plates provided respectively on said upper and lower bolsters through said upper and lower heat insulating plates, respectively, said upper and lower heat plates adapted to be connected to a heat source;

pressure vessels provided respectively on said upper and lower heat plates, for respectively pressing stacked substrate blanks, and adapted to be filled with a fluid heating medium;

means for detecting pressure in each of said pressure vessels; and

means for controlling the pressure of fluid heating medium in said pressure vessel in accordance with detection results of said pressure detection means.

5,558,016

ARRANGEMENT FOR APPLYING A SURFACE PRESSURE TO WORKPIECES DRIVEN BY A PRESSING BAND

Raoul De Brock, Kortrijk, Belgium, assignor to Firma Theodor Hymmen, Bielefeld, Germany

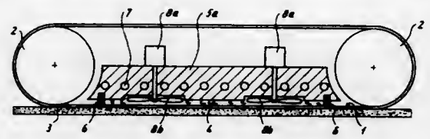
Filed Jun. 10, 1988, Ser. No. 206,337

Claims priority, application Germany, Jun. 15, 1987, 37 19 976.5

The portion of the term of this patent subsequent to Dec. 10, 2002, has been disclaimed.

Int. Cl.[6] B30B *15/34*

U.S. Cl. 100—93 P **3 Claims**



1. An arrangement for applying a surface pressure and temperature to workpiece which are driven by a pressing band, comprising means forming an action zone for accommodating a fluid pressure medium, said action zone forming means including the pressing band and a plate with a seal located between said pressing band and said plate; means for supplying a fluid pressure medium into said action zone so that the fluid pressure medium is accommodated in said action zone under operational pressure; means for generating a temperature in said plate; and means for producing an extensive forced movement of fluid pressure medium in said action zone for producing an extensive forced movement including a fan integrated in said plate.

5,558,017

ROLL STAND

Bernd Berger, Kaarst; Peter Reinthal, Hemer, and Manfred Benfer, Iserlohn, all of Germany, assignors to Sundwiger Eisenhutte Maschinenfabrik GmbH & Co., Hemer-Sundwig, Germany

Filed Jan. 30, 1995, Ser. No. 380,750

Claims priority, application Germany, Feb. 28, 1994, 44 06 454.3

Int. Cl.[6] B30B *3/04*

U.S. Cl. 100—93 RP **10 Claims**

1. A roll stand, comprising:

a vertically adjustable upper member,

a lower member,

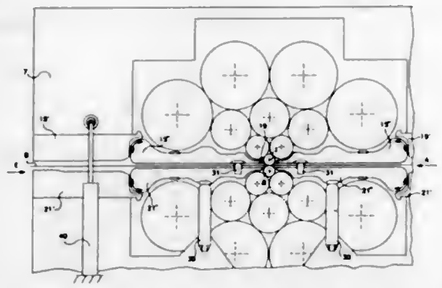
at least one upper working roll,

at least one lower working roll,

a plurality of upper and lower supporting rolls, supporting said upper and lower working rolls, respectively,

a plurality of upper and lower guard plates disposed opposite one another in pairs, above and below a strip which is rolled in said roll stand,

said upper and lower guard plates extending into said roll stand to said upper and lower working rolls, respectively, wherein each of said upper guard plates is pivotably connected to said vertically adjustable upper member, around a pivot disposed



axially parallel to said upper working roll, and wherein each of said lower guard plates is pivotably connected to said lower member, around a pivot disposed axially parallel to said lower working roll, and

wherein each of said upper guard plates includes a supporting element associated with said upper working roll, such that said supporting element engages said working roll when said upper guard plate is pivoted in the direction of said upper member of said roll stand.

5,558,018

SUPPORT FRAME FOR NIP ROLLERS

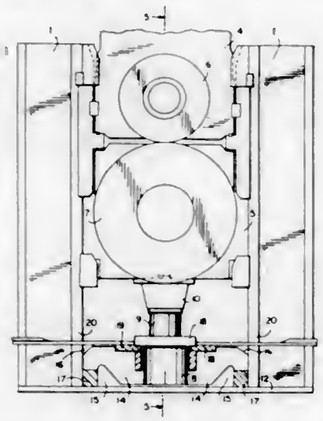
Erkki Leinonen, Järvenpää, Finland, assignor to Valmet Corporation, Helsinki, Finland

Filed Jun. 7, 1995, Ser. No. 477,793

Claims priority, application Finland, Jun. 15, 1994, 942858

Int. Cl.[6] B30B *3/04*

U.S. Cl. 100—170 **8 Claims**



1. A frame structure for supporting a first roller and a second roller in a roll nip comprising:

two vertical legs, the rollers being rotatably supported on axes of the rollers between said legs so that the first roller is positioned above the second roller to form a roll nip, the first roller being fixed vertically between said legs, the second roller being capable of sliding vertically between said legs;

an actuator positioned between said legs and capable of vertically moving said second roller to control pressure in the roll nip; and

a horizontal beam structure fixedly attached proximate to bottom ends of each of said legs, said actuator being mounted on said beam structure, said horizontal beam structure comprising:

a support plate upon which said actuator is mounted, said support plate having ends, the ends of said support plate being connected to each of said legs proximate to the bottom ends of each of said legs, portions of said support plate proximate to the ends thereof being sufficiently flexible so that, upon activation of said actuator to cause said second roller to move vertically, said support plate yields.

5,558,019

ROTARY PRINTING MACHINE

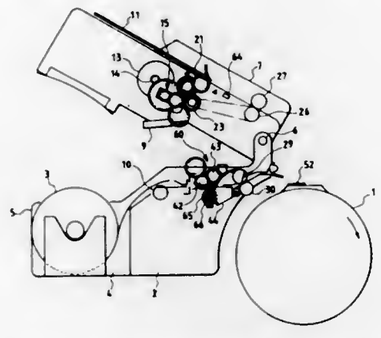
Muneaki Kawai, and Koichi Oyama, both of Tokyo, Japan, assignors to Riso Kagaku Corporation, Tokyo, Japan

Filed Nov. 20, 1995, Ser. No. 560,957

Claims priority, application Japan, Nov. 21, 1994, 6-286737; Feb. 17, 1995, 7-029640

Int. Cl.[6] B41F *15/00;15/34*

U.S. Cl. 101—116 **8 Claims**



1. A rotary stencil printing machine in which a printing stencil is obtained from a stencil sheet, said rotary stencil printing machine comprising:

stencil making means for processing the stencil sheet to obtain the printing stencil;

a printing drum having an outer cylindrical surface and clamping means which clamps the front end portion of the stencil sheet thus processed by said stencil making means, said printing drum being turned with the front end portion of the stencil sheet clamped with said clamping means to wind the stencil sheet on said outer cylindrical surface thereof;

conveying means for conveying the stencil sheet, which has been processed by said stencil making means, towards said printing drum;

movable guide means which is movable between a standby position and a holding position which are spaced away from each other in a direction perpendicular to the surface of the stencil sheet located between said stencil making means and said printing drum, said movable guide means moving from said standby position to said holding position, for lengthening a stencil conveying path between said stencil making means and said clamping means;

urging means for urging said movable guide means towards said holding position; and

holding means for holding said movable guide means at said standby position against said urging means, and for, after the stencil sheet is held on the side of said printing drum rather than on the side of said movable guide means, releasing said movable guide means.

5,558,020

FLEXOGRAPHIC PRINTING SYSTEM

John Marozzi, 634 Dogwood La., Boonton Township, Morris County, N.J. 07950; Greg Rochon, Boonton; Urmil Patel, Somerville, both of N.J., and Ben Dambly, York, Pa., assignors to John Marozzi, Boonton Township; Theresa Pugh, Parsippany, and Barbara Batesko, Montville, all of N.J.

Continuation of Ser. No. 322,545, Oct. 13, 1994, Pat. No. 5,429,049, which is a continuation of Ser. No. 85,193, Jul. 2, 1993, abandoned, which is a continuation of Ser. No. 852,531, Mar. 17, 1992, Pat. No. 5,224,422. This application May 12, 1995, Ser. No. 440,139

Int. Cl.[6] B41F *5/04;5/24*

U.S. Cl. 101—228 **1 Claim**

1. A printing system for printing on a continuous web that is intermittently advanced through the printing system, the system comprising:

printing means for imprinting upon said continuous web during at least a portion of the web advancement, said printing means including a rotary print cylinder and a printing plate mounted thereon, said printing plate engaging said continuous web to print thereon during a printing cycle;

inking means for inking said printing means, said inking means providing ink to said printing plate during an inking cycle;

means for engaging said printing plate of said print cylinder with the web during a printing cycle and avoiding engagement of said printing plate of said print cylinder during a non-printing cycle when the web is stopped;

means for intermittently driving the web between stopped and moving conditions and for rotating said print cylinder by transference of the moving condition of the web to rotation of the print cylinder by friction from the web only during the printing cycle, said intermittent driving means transferring and converting intermittent advancement only of said web to rotation of said print cylinder; and

motor driving means for rotating said print cylinder during the inking cycle and while the web is in the stopped condition, said motor driving means comprising a motor and means for coupling said motor to said print cylinder to rotate said print cylinder during the inking cycle,

said motor driving means including means for rotating said print cylinder during all segments of print cylinder rotation other than during said printing cycle.

5,558,021

PRINTING DEVICE FOR PRINTING PLASTIC CARDS

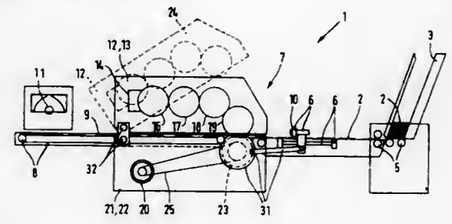
Helmut Erhard, Volkach, and Georg Schneider, Würzburg, both of Germany, assignors to Metronic-Geratebau GmbH & Co., Veitshochheim, Germany

Filed Aug. 30, 1995, Ser. No. 521,580

Claims priority, application Germany, Aug. 30, 1994, 44 30 801.9

Int. Cl.[6] B41F *13/24*

U.S. Cl. 101—232 **11 Claims**



1. A printing device for printing individual plastic cards of a check card format comprising:

a counter-pressure cylinder having a rubber blanket and supported for rotation between spaced first and second lower side frames;

an upper pivot frame supported for pivotal movement about a first end on said first and second lower side frames;

a printing and inking unit including an ink duct, a screen cylinder receiving ink from said ink duct, an ink transfer cylinder in contact with said screen cylinder, a printing forme support cylinder in contact with said ink transfer cylinder, and a rubber blanket support cylinder in engagement with said printing forme support cylinder, said printing and inking unit being supported by said upper pivot frame with said rubber blanket support cylinder being engageable with said counter-pressure cylinder to form a printing gap for printing said plastic cards; and

means for driving said counter-pressure cylinder and said cylinders in said inking and printing unit in a synchronous manner with respect to each other.

5,558,022

TRANSFER MEANS FOR BATHING INVALID

James R. Mason, Mandurah, and Philip J. Mason, Wanneroo, both of Australia, assignors to Raceside Holdings Pty Ltd., Western Australia, Australia

PCT No. PCT/AU93/00019, § 371 Date Sep. 21, 1994, § 102(e) Date Sep. 21, 1994, PCT Pub. No. WO93/14731, PCT Pub. Date Aug. 5, 1993

PCT Filed Jan. 18, 1993, Ser. No. 302,922

Claims priority, application Australia, Jan. 17, 1992, PL0477

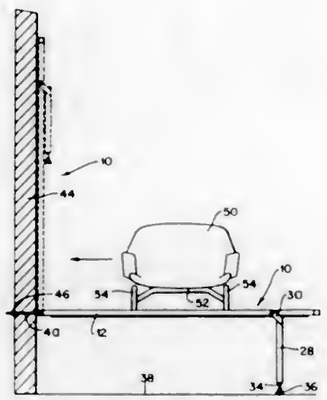
Int. Cl.[6] E01B *23/00;* **A47K** *3/02*

U.S. Cl. 104—126 **13 Claims**

1. A transfer means for moving an object between two spaced apart locations, the transfer means comprising:

a platform means for carrying the object, the platform means having a roller means for allowing the platform means to roll between the said two locations;

at least two elongate members disposable substantially horizontally, each elongate member having a guide rail extending substantially along its length, the guide rail defining a track within which the roller means can roll, the guide rail being shaped so that the roller means is confined within the guide rail so as to limit movement of the roller means to movement along the guide rail and so that the roller means is inhibited from movement out of the guide rail either vertically or horizontally along substantially the entire length of the guide rail, the roller means allowing movement of the platform means between the two spaced apart locations, the guide rail



having a cut-out located in an upper portion of the guide rail for allowing entry and exit of the roller means from the guide rail by movement of the roller means in an upward direction out of the guide rail through the cut-out so that the platform means can be attached to the guide rail and removed from the guide rail respectively, and the guide rail having means to inhibit removal of the platform means from the ends of the guide rail; and

a pivot means for pivotably attaching one end of each of the elongate members to a structural member, the pivot means allowing pivoting of the elongate members between a substantially horizontal in-use position and a substantially vertical storage positions;

wherein, the platform means can be removed from the elongate members to allow pivoting of the elongate members between the in-use and storage positions.

5,558,023

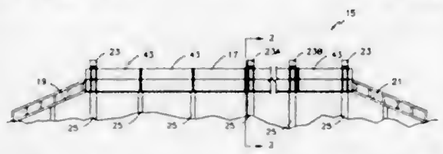
ENCLOSED TRANSPORTATION SYSTEM FOR RIDER PROPELLED VEHICLES WITH PNEUMATIC PROPULSION ASSISTANCE

Milnor H. Senior, III, 3377 S. Willow Ct., Denver, Colo. 80231

Continuation of Ser. No. 174,253, Dec. 28, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 462,134

Int. Cl.[6] B61B *13/10*

U.S. Cl. 104—138.1 **20 Claims**



1. For use in a transportation network including at least one of streets and paths, a transportation system for aiding movement of a rider propelled vehicle also movable by the rider over the transportation network, said system comprising:

an open sided passage structure defined by first and second spaced wall sections and a covering section opposite an open side of said passage structure between said wall sections, said wall and covering sections formed of non-cementitious plastic material, said passage structure defining at least a first entryway and at least a first way of egress at opposite ends thereof for vehicle entrance into said system from the transportation network and vehicle exit from said system to the transportation network, respectively;

a surface having a width sufficient to span said space between said wall sections and extending from one node in the transportation network to another node in the transportation network, said surface for movement thereover of the vehicle;

means for securing said open sided passage structure over said surface with said surface at said open side; and

air moving means supported adjacent to but not supported by said passage structure and connected with said passage structure for moving air through said passage structure in a direction and at a velocity sufficient to aid movement of the vehicle through said passage structure while retaining a substantially constant overall air pressure in said passage structure between said entryway and said way of egress.

5,558,024

BODY ROLL CONTROL SYSTEM FOR A RAILWAY VEHICLE WITH VARIABLE TRIM BODY

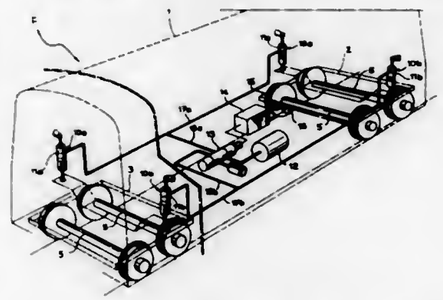
Solera Leonardo, Seregno; Magnani Alberto, and Pier L. Bernabo' Silorata, both of Torino, Italy, assignors to Fiat Ferroviaria Spa, Italy

Filed Aug. 24, 1995, Ser. No. 519,145

Claims priority, application Italy, Apr. 7, 1995, TO95A0275

Int. Cl.[6] B61F *5/00*

U.S. Cl. 105—199.2 **2 Claims**



1. A body roll control system for a railway vehicle having a variable trim body, wherein the vehicle includes first and Second bogies having respective opposite left and right sides and resilient suspension means between said body and said bogies, said control system comprising two pairs of respectively left and right fluid pressure linear actuators interposed substantially vertically between said body and said left and, respectively, right sides of said first and second bogies, a source of fluid under pressure, valve means controlling connection between said actuators and said source of fluid under pressure through respective fluid lines, a regulation electronic unit operatively associated to said valve means, and transducer means for detecting the non-compensated centrifugal acceleration acting on said body and for transmitting corresponding output signals to said regulation electronic unit to pilot said valve means so as to perform, while the vehicle is travelling along a curve, rotations of said body about a longitudinal axis tending to compensate said centrifugal acceleration, each said left and right actuator comprising a single-acting cylinder having a single thrust chamber, the thrust chamber of each left single-acting cylinder being in communication solely with the thrust chamber of the other left single-acting cylinder and the thrust chamber of each right single-acting cylinder being in communication solely with the thrust chamber of the other right single-acting cylinder, and wherein said valve means comprise a single valve unit connected to said single thrust chambers of both said left and said right single-acting cylinders.

5,558,025

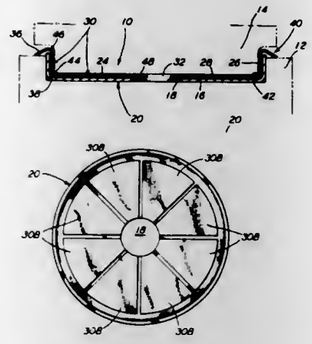
COMBINATION WEAR AND LUBRICATING LINER ASSEMBLY FOR RAILWAY CAR TRUCK BOLSTER BOWL

Wajih Kanjo, Lockport, Ill., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Continuation-in-part of Ser. No. 154,189, Nov. 18, 1993, Pat. No. 5,423,275. This application Jan. 13, 1995, Ser. No. 372,779

Int. Cl.[6] B61F *5/00*

U.S. Cl. 105—199.4 **20 Claims**



1. An improved combination wear and lubricating liner assembly for a bolster bowl disposed on an upper surface of a railway car truck, said combination wear and lubricating liner assembly comprising:

(a) a generally round cup-shaped wear liner assembly having a first predetermined outer diameter and a first predetermined inner diameter, said wear liner assembly including,

(i) a first generally round bottom plate portion having a first predetermined thickness,

(ii) a first centrally disposed aperture, having a first predetermined diameter, formed through said first bottom plate portion, and

(iii) a first upstanding generally round wall portion, having said first predetermined thickness and a first predetermined height, connected at a bottom portion thereof to an outer perimeter of said first bottom plate portion;

(b) a lubricating liner assembly, said lubricating liner assembly including,

(i) a plurality of substantially flat solid lubricating materials each having a bottom surface disposed adjacent and in contact with an upper surface of said bottom plate portion of said wear liner assembly, and

(ii) a vertically disposed ring-like substantially solid lubricating material, having a second predetermined height, an outer surface of said ring-like lubricating material disposed adjacent and in contact with an inner surface of said upstanding wall portion of said wear liner assembly;

(c) a protective cover member having a second predetermined outer diameter and a second predetermined inner diameter, said protective cover member including,

(i) a second generally round bottom plate portion, having a second predetermined thickness, a bottom surface of said second bottom plate portion being disposed adjacent and in contact with an upper surface of each of said plurality of said substantially flat solid lubricating material pieces,

(ii) a second centrally disposed aperture, having a second predetermined diameter, formed through said second bottom plate portion,

(iii) a second upstanding generally round wall portion, having said second predetermined thickness and a third predetermined height, connected at a bottom portion thereof to an outer perimeter of said second bottom plate portion, and

(iv) an annular lip-like portion connected adjacent an inner edge thereof to an upper edge of said second upstanding wall portion, said lip-like portion extending outwardly from said upper edge of said second upstanding wall portion and downwardly toward a top surface of such bolster bowl; and

(d) an annular space disposed between an inner surface of said ring-like lubricating material and an outer surface of said second upstanding wall portion, a width of said annular space being predetermined.

5,558,026

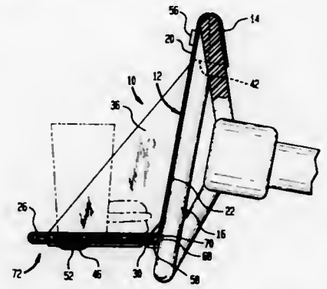
MOTOR VEHICLE TRAY

David S. Seibert, 481 Cushing St., Hingham, Mass. 02043

Continuation-in-part of Ser. No. 127,042, Sep. 26, 1993, abandoned. This application Sep. 12, 1994, Ser. No. 304,258

Int. Cl.[6] A47B *37/00*

U.S. Cl. 108—44 **5 Claims**



1. A tray adapted for mounting on a steering wheel of a motor vehicle, comprising supporting means for supporting an article thereon; suspending means, which includes a first panel, for suspending said supporting means outwardly from the steering wheel at an angle relative thereto, said supporting means including a second panel connected to a first end of said first panel; mounting means for mounting said suspending means from the steering wheel, said mounting means including a third panel, which is connected to a second end of said first panel, said second end being positioned opposite said first end of said first panel, and a fourth panel, which is connected said third panel, said third panel and said fourth panel forming a first pocket therebetween, said first pocket being inverted and being shaped and sized so as to receive an upper portion of the steering wheel; and adjusting means for adjusting the angle between said supporting means and the steering wheel to one of a plurality of positions, said adjusting means including a pair of side panels, said side panels being connected to said first panel and extending outwardly from opposite sides of said first panel, and attaching means for removably attaching said side panels to said second panel such that the angle between said second panel and the steering wheel is adjustable to one of said plurality of positions, said attaching means including a first set of fasteners positioned on said side panels and a second set of fasteners positioned on said second panel, said first set of fasteners including a first fastener, which is positioned on a free end of one of said side panels, and a second fastener, which is positioned on a free end of the other of said side panels, said second set of fasteners including a third fastener, which is positioned adjacent to a first edge of said second panel, and a fourth fastener, which is positioned adjacent to a second edge of said second panel, said first panel, said second panel, said third panel and said side panels forming a body which is made from an unitary blank of a flexible material and which is foldable into a compact folded state for storage, said second panel being divided into a first subpanel, which is connected to said first panel and which has a pair of opposing edges, and a second subpanel, which is connected to said first subpanel and which has a pair of opposing edges, said second subpanel being folded onto said first subpanel along a first fold line

extending between said first subpanel and said second subpanel,

said plurality of caster assemblies operably secured beneath said

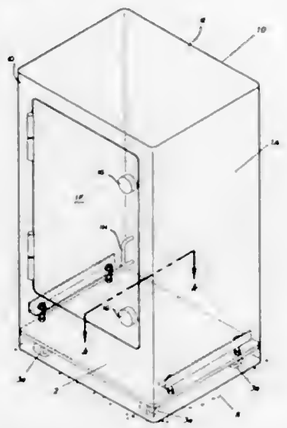
a fourth blower having an outlet coupled in tangential relationship with said outer wall adjacent said furnace shell lower end

5,558,030

PLANT FEEDER APPARATUS

extending between said first subpanel and said second subpanel, and said opposing edges of said first subpanel being connected to said opposing edges of said second subpanel to form a second pocket.

5,558,027
SELF CONTAINED SAFE CASTER SYSTEM
B. Arvell Williams, and J. Chad Williams, both of P.O. Box 5249, Amarillo, Tex. 79119-5249
Filed Feb. 23, 1995, Ser. No. 392,487
Int. Cl.[6] E05G *1/00*
U.S. Cl. 109—45 **12 Claims**



1. The combination of retractable caster assemblies and a large portable enclosure;

said large portable enclosure including a plurality of oppositely disposed parallel side walls;

an upper top surface interconnected with said plurality of side walls forming an enclosure;

access means provided in one of said plurality of oppositely disposed side walls for controlling access to said enclosure;

a planar enclosure floor positioned within said enclosure walls;

height adjusting means comprising a pair of angle iron support members secured to a pair of said oppositely disposed side walls;

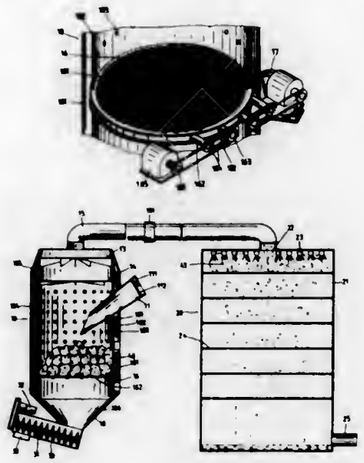
each of said pair of angle iron support members including a pair of spaced bolts, each of said bolts having a first end extending through unthreaded bores in each of said angle iron support members and a second opposite end extending through a pair of unthreaded bores in said floor;

said first end of each of said bolts having a pair of nuts fixedly secured thereto with one nut located above and the other nut located below said ankle iron support member thereby capturing said angle iron support member therebetween;

a third nut fixedly secured to the upper surface of said floor in coaxial alignment with each of said pair of spaced bores in said enclosure floor with said second end of said bolt threaded through said third fixed nut and rotation of the uppermost nut secured to said bolt causes said enclosure floor and a plurality of caster assemblies to be lowered or raised depending upon the direction of rotation;

said plurality of caster assemblies operably secured beneath said enclosure floor whereby said caster assemblies can be lowered onto a supporting surface to permit said enclosure to be rolled thereover without the need for any specialized moving equipment such as a floorjack or forklift.

5,558,028
INCINERATOR FRAME
Wen-Chiang H. Lin, No. 1, Liu Tsuoh, Liu Tsuoh Li, Chia-Yih City, Taiwan
Filed Jul. 11, 1995, Ser. No. 500,772
Int. Cl.[6] F23G *5/00*
U.S. Cl. 110—243 **3 Claims**



1. An incinerator frame, comprising:

a furnace shell formed by a longitudinally extended tubular furnace chamber wall extending between upper and lower ends of said furnace shell to define a furnace chamber and a longitudinally extended outer wall disposed in spaced concentric relationship with respect to said furnace chamber wall to define an air passage therebetween, said furnace chamber wall having a plurality of spaced air inlet openings formed therethrough to provide open fluid communication between said air passage and said furnace chamber, said furnace shell including a charging funnel extending outwardly therefrom and in open communication with said furnace chamber, said charging funnel having an air valve and a block board disposed at a distal end thereof, said furnace shell having a diversion space disposed adjacent a lower end of said furnace chamber, said upper end of said furnace shell having an exhaust outlet formed through said upper end thereof for passage of exhaust gases therethrough;

a set of three blowers disposed in radially spaced relationship around said furnace shell, each of said blowers having an air outlet pipe sealingly coupled to said outer wall of said furnace shell and disposed in tangential relationship therewith for providing a flow of air through said air passage and plurality of air inlet openings to form a whirling air circulation about a perimeter portion of said furnace chamber;

an upper and a lower guide plate disposed within said furnace chamber in longitudinally spaced relationship adjacent an upper end thereof for dividing said furnace chamber into first and second burning spaces, said upper and lower guide plate each having an opening formed therethrough to form said second burning space therebetween;

a rotatable grate disposed within said furnace shell between said furnace chamber and said diversion space;

a fourth blower having an outlet coupled in tangential relationship with said outer wall adjacent said furnace shell lower end in fluid communication with said diversion space for providing a flow of air into said diversion space and through openings in said grate into said furnace chamber;

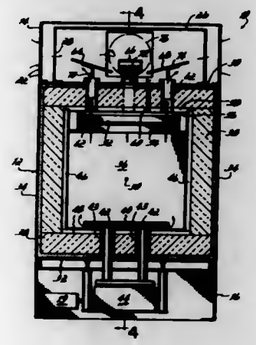
a funnel-shaped ash collector coupled to said lower end of said furnace shell in open communication with said diversion space for receiving ashes displaced by rotation of said grate;

an exhaust pipe coupled in fluid communication with said exhaust outlet;

filter means coupled in fluid communication to said exhaust pipe for filtering said exhaust gases flowing from said exhaust pipe, said filter means including means for spraying water through said exhaust gases and a plurality of layers of filter material to trap particulates therein; and,

ash ejection means coupled to a lower end of said funnel-shaped ash collector, said ash ejection means including (1) an auger extending between said ash collector and an ash outlet, and (2) a motor for rotatively driving said auger to displace ash from said ash collector to said ash outlet.

5,558,029
ASHING FURNACE AND METHOD
Steven C. Peake, Dubuque, Iowa, assignor to Barnstead/Thermolyne Corporation, Dubuque, Iowa
Filed Dec. 14, 1994, Ser. No. 355,914
Int. Cl.[6] F23J *11/00;15/00*; F23N *5/00*
U.S. Cl. 110—345 **31 Claims**



31. A method of more completely combusting a combustible material portion of a sample including combustible and uncombustible material in a furnace for use in analyzing materials comprising the steps of:

providing an enclosure with first and second heater elements and a filter;

placing a sample including combustible and uncombustible material in the enclosure;

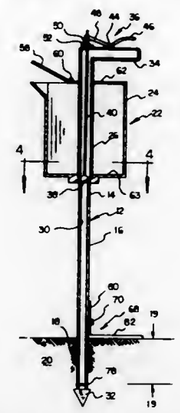
initially combusting the combustible material of the sample with the first heater element;

filtering the uncombusted products of combustion of the combustible material of the sample with the filter so as to prevent the uncombusted products from passing out of the furnace;

secondarily combusting the filtered uncombusted products with the second heater element; and

said furnace being operable for use in analyzing material samples placed therein.

5,558,030
PLANT FEEDER APPARATUS
L. H. Ward, 6103 Indian Springs, Livingston, Tex. 77351
Filed Jul. 11, 1994, Ser. No. 272,814
Int. Cl.[6] A01C *23/00*
U.S. Cl. 111—7.2 **6 Claims**



1. A plant feeder apparatus, comprising:

a rigid support assembly which includes a top end portion, a mid-portion, and a bottom end portion, wherein said bottom end portion includes a point assembly which is adapted to penetrate soil to a sufficient depth such that the soil is capable of retaining said support assembly in an upstanding orientation, and wherein said top end portion is adapted to support a chemical dispenser assembly, wherein said point assembly penetrates the soil when a downward force is exerted on said support assembly toward said point assembly when said point assembly is in contact with the soil,

a chemical dispenser assembly connected to said top end portion of said support assembly, wherein said chemical dispenser assembly includes a container for containing a quantity of a dissolved chemical, a conduit connected to said container for conveying a portion of the dissolved chemical out of said container, a manually-operated valve assembly supported by said container for controlling outflow of dissolved chemical from said container,

a flow conduit assembly supported by said support assembly and connected to said conduit for conveying dissolved chemical from said container to the soil, wherein said flow conduit assembly includes a top end portion in fluid communication with said conduit, a mid-portion in fluid communication with said top end portion, and a bottom end portion in fluid communication with said mid-portion, wherein said bottom end portion of said flow conduit assembly is adapted to be positioned in the soil and includes an outlet aperture from which dissolved chemical can exit into the soil,

a transverse strut assembly connected to said support assembly and projecting transversely from said support assembly, wherein said transverse strut assembly is L-shaped and includes a vertical portion and a transverse portion, wherein a slot is provided in said vertical portion of said transverse strut assembly for enabling adjustment of a depth of penetration of said support assembly into the soil, and

a fastener for attaching said vertical portion of said transverse strut assembly to a selected position on said mid-portion of said support assembly, such that said transverse strut assembly is selectively adjustable along said mid-portion of said support assembly for controlling a depth with which said bottom end portion of said support assembly penetrates into the soil,

wherein said manually-operated valve assembly includes:

a handle assembly connected to said container,

a trigger assembly connected to said handle assembly,

a pull rod connected to said trigger assembly, and

a ball-shaped valve element connected to said pull rod, and wherein said top end portion of said flow conduit assembly

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5,558,032
EMBROIDERY DATA PREPARING DEVICE

5,558,035
SPINNAKER POLE AND DIP POLE JIBING SYSTEM

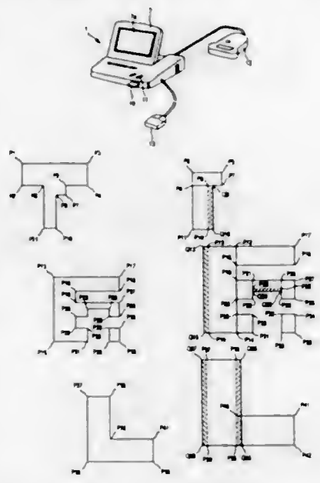
a ball-shaped valve element connected to said pull rod, and wherein said top end portion of said flow conduit assembly includes a valve surface adapted to engage said ball-shaped valve element of said manually-operated valve assembly for providing a valving action for said conduit.

5,558,031

APPARATUS FOR PROCESSING EMBROIDERY DATA SO AS TO ENLARGE LOCAL BLOCKS OF ADJACENT EMBROIDERY PATTERNS

Yukiyoshi Muto; Masao Futamura, and Masahiro Mizuno, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed May 30, 1995, Ser. No. 452,496
Claims priority, application Japan, Jun. 1, 1994, 6-119943
Int. Cl.[6] D05B *21/00*; D05C *9/06*
U.S. Cl. 112—102.5 **28 Claims**



1. An apparatus for processing embroidery data including stitch-position data representative of stitch positions defining an embroidery to be formed on a workpiece by a sewing machine, the apparatus comprising:

image reading means for reading an original embroidery image corresponding to said embroidery to be formed on the workpiece, and generating original embroidery image data representative of said original embroidery image, said original embroidery image including a plurality of image patterns having respective outlines, said image reading means reading said plurality of image patterns such that said image patterns are distinguished from each other;

outline generating means for generating said outlines of said plurality of image patterns of said original embroidery image an the basis of said original embroidery data;

determining means for determining whether the outline of each one of said image patterns should be changed so as to enlarge, in at least one direction, an area which is partially defined by said outline of said each one of said image patterns;

outline changing means for changing said outline of said each one of said image patterns, said determining means determines that said outline of said each one of said image patterns should be moved; and

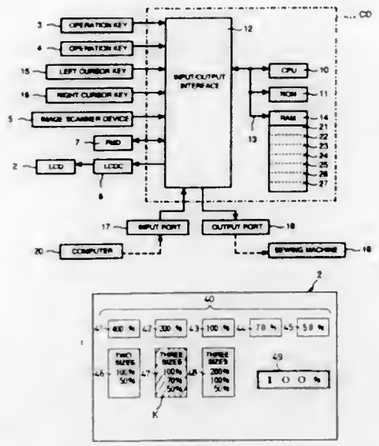
stitch-position data generating means for generating stitch-position data representative of stitch positions defining said embroidery to be formed within the outlines of said image patterns which include said outline changed by said outline changing means.

5,558,032

EMBROIDERY DATA PREPARING DEVICE

Yukiyoshi Muto; Masao Futamura, and Masahiro Mizuno, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jun. 21, 1995, Ser. No. 493,315
Claims priority, application Japan, Jul. 29, 1994, 6-197927
Int. Cl.[6] D05B *21/00*; D05C *9/06*
U.S. Cl. 112—102.5 **20 Claims**



9. An embroidery data preparing device for preparing embroidery data of an original pattern for use by an embroidery machine, comprising:

means for inputting an original pattern;

dividing means for dividing the input original pattern into a plurality of closed embroidery areas;

size setting means for setting at least one pattern size;

stitch data preparing means for preparing a set of stitch data for each of the plurality of closed embroidery areas for each size pattern defined by said size setting means; and

stitch data storing means for storing the set of stitch data for each size pattern as prepared by said stitch data preparing means.

5,558,033

IMAGE FIGURE PROCESSING METHOD AND DEVICE

Masao Futamura; Yukiyoshi Muto, and Masahiro Mizuno, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jun. 21, 1995, Ser. No. 468,126
Claims priority, application Japan, Jul. 29, 1994, 6-197926
Int. Cl.[6] D05C *5/02*
U.S. Cl. 112—475.19 **23 Claims**

12. An image figure processing method for creating sewing data, comprising the steps of:

reading out an original picture pattern;

converting the original picture pattern to pattern image data;

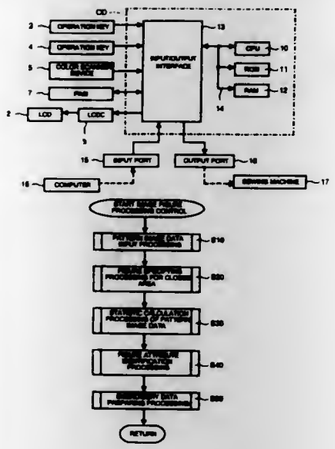
processing the pattern image data to identify each closed area in the pattern image;

specifying a discriminator of the pattern image data of each closed area;

identifying an attribute of each closed area in the pattern image on the basis of the discriminator;

creating embroidery stitch data for each closed area on the basis of and incorporating the attribute for that closed area; and

storing the embroidery stitch data in a memory device for subsequently sewing by an embroidery-sewing machine.

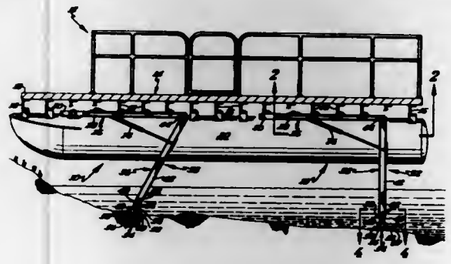


5,558,034

LIFT TRANSPORTABLE WITH PONTOON BOATS OR THE LIKE

Gary Hodapp, R.R. #4, Box 212, Mankato, Minn. 56001

Filed Jul. 6, 1994, Ser. No. 271,032
Int. Cl.[6] B63B *17/00*
U.S. Cl. 114—44 **23 Claims**



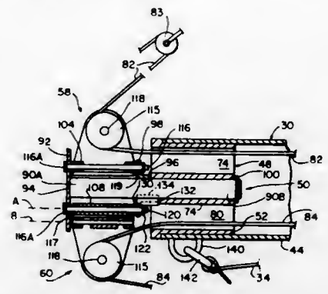
1. Lift for a watercraft having an attachment surface comprising, in combination: first and second mounts securable to the attachment surface of the watercraft in a spaced relation; a lift module of a generally U-shape and including first and second legs extending from a central spindle and having free ends, with the free end of the first leg being pivotally mounted to the first mount and the free end of the second leg being pivotally mounted to the second mount about a lift axis; means for pivoting the lift module relative to the mounts between a retracted position and a lift position, with the central spindle being adjacent the attachment surface in the retracted position and being spaced from the attachment surface in the lift position; and a pad pivotally mounted to the central spindle about a pad axis and including a first linear plate extending between the first and second legs for providing a support surface with the bottom of the water body.

5,558,035

SPINNAKER POLE AND DIP POLE JIBING SYSTEM USING SAME

Jeffrey F. Klein, Baltimore, Md., assignor to Chesapeake Advanced Sail Hardware, Inc., Baltimore, Md.

Filed Jul. 10, 1995, Ser. No. 500,131
Int. Cl.[6] B63H *9/10*
U.S. Cl. 114—89 **13 Claims**



1. A dip jibe spinnaker pole for a sailing yacht having opposite port and starboard sides and a main mast, a spinnaker sail supported on said mast and including port and starboard clews at opposite corners along a foot thereof, a topping lift extending upwardly along said main mast and respective control spinnaker lines acting alternatively as a guy and a sheet connected at one end to each of said clews and led along respective port and starboard sides to a cockpit, aft said mast, said spinnaker pole comprising:

an elongated spinnaker pole tubular body having a longitudinal axis and inboard and outboard ends, an inboard end fitting coupled to said tubular body at said inboard end for detachably pivotably mounting said spinnaker pole to said mast, an outboard fitting fixed to the outboard end of said tubular body, the improvement comprising:

at least two sheaves including port and starboard snatch guy sheaves, means for mounting said snatch guy sheaves to opposite sides of said spinnaker pole outboard fitting for pivoting about axes parallel to said longitudinal axis of said pole, with said sheaves extending outwardly from said fitting such that the sheaves articulate through an arc of approximately 180°,

at least two snatch guys including port and starboard snatch guys led through said pole, said outboard end fitting and said port and starboard snatch guy sheaves, respectively, from said inboard end and terminating in snap shackles loosely coupled to respective ones of said port and starboard control spinnaker lines proximate to said spinnaker sail clews, whereby said sheaves pivot to accommodate rise and fall and fore and aft movement of said snatch guys during dip jibing of the spinnaker pole from a starboard tack upon hauling in of one snatch guy and letting out of the other snatch guy, thereby minimizing friction between the snatch guys and the snatch guy sheaves and reducing wear on said snatch guys.

5,558,036

INTEGRATED TUG/BARGE SYSTEM WITH RIDING PUSHER BOAT

James H. Hara, Ridgefield, Conn., assignor to Skarhar, Inc., Greenwich, Calif.

Filed Jan. 17, 1995, Ser. No. 373,578
Int. Cl.[6] B63B *21/58*
U.S. Cl. 114—249 **24 Claims**

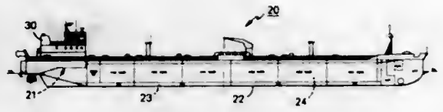
1. An integrated tug/barge for carrying cargo, comprising:

(a) a cargo carrying barge, said barge having no means of propulsion; and

(b) a tug boat mounted on top of a portion of said barge such that said tug boat and said barge will experience identical

5,558,038

a feed drop tube holder means fabricated from a resilient mate-



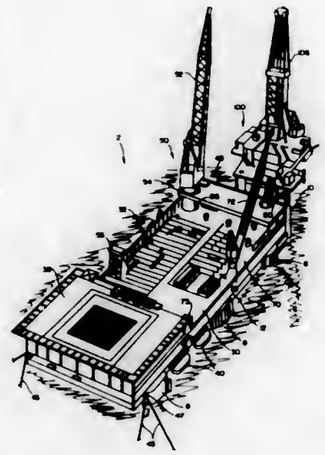
motion when said integrated tug/barge is operated, said tug boat including means for propulsion and maneuvering of said integrated tug/barge, with a portion of said means for propulsion and maneuvering being disposed below the surface of the water in which said integrated tug/barge is floating, the hull portion of said tug boat when so mounted being vertically disposed substantially no lower than said surface of said water, except for said portion of said means for propulsion and maneuvering.

5,558,037

SEMISUBMERSIBLE VESSEL WITH FORWARD-MOUNTED CRANE

Foster T. Manning, 193A Goldhill Centre, Newton/Thomson Roads, Singapore 1130, Singapore

Filed Mar. 15, 1995, Ser. No. 404,590
Int. Cl.[6] B62B *27/00*
U.S. Cl. 114—264 **16 Claims**



1. A semisubmersible floating vessel having a pair of substantially parallel, laterally spaced buoyant hulls with ballast chambers to permit said hulls to be moved between a submerged condition and a surface floating condition, a row of columns supported by and extending upwardly from each said hull, and a working platform supported by the upper ends of said columns, wherein the improvement comprises:

a crane mounted on said platform adjacent to an end of said platform, said crane having sufficient capacity to lift loads off said end of said platform and at least one side of said platform and from a portion of said platform extending from said end of said platform to at least about halfway to an opposite end of said platform; and

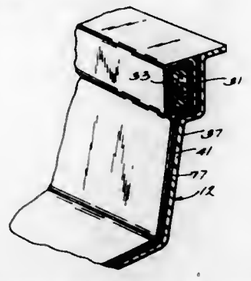
a support structure for said crane; said structure extending downwardly from said crane, through said platform to one of said columns, and down into said one of said columns; and said structure interfacing with sidewall portions of said one of said columns to transmit forces created by operation of said crane to said one of said columns.

5,558,038

BOAT HULL GUNWALE CONSTRUCTION AND PROCESS THEREFOR

Don B. McNamara, Menomonee Falls, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 8, 1995, Ser. No. 436,586
Int. Cl.[6] B63B *3/00*
U.S. Cl. 114—355 **9 Claims**



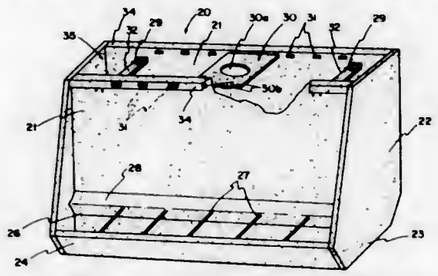
1. A resin transfer molding method for molding a boat hull including a screw strip, said method comprising the steps of wrapping the screw strip with reinforcement, fabricating a rigid mold having a boat-defining surface including a screw strip receiving recess, applying gel coat to the boat-defining surface in a layer including a gel coated recess, positioning reinforcement having interstices along the gel coat layer and with an upper part of the reinforcement extending into the gel coated recess, locating the reinforcement wrapped screw strip in the gel coated recess to capture the upper part of the reinforcement between the mold and the reinforcement wrapped screw strip, and burying the reinforcement and filling the interstices thereof with a resinous layer to produce said boat hull.

5,558,039

HOG FEEDER

Leon S. Zimmerman, Lititz, Pa., assignor to Staco, Inc., Schaefferstown, Pa.

Filed Dec. 11, 1995, Ser. No. 570,301
Int. Cl.[6] A01K *5/00*
U.S. Cl. 119—52.1 **8 Claims**



1. An improved livestock feeder for use with an automatic feed delivery system having a feed drop tube operatively connected thereto for dispensing feed into said feeder, said improvements comprising:

an open-topped feed bin defined by a pair of opposed, downwardly converging side walls and a pair of opposed end walls fixedly attached thereto;

a plurality of horizontally opposed slots formed in the upper edges of said side walls and being arranged linearly at predetermined intervals, each of said slots being disposed in substantial alignment with an opposing slot formed in each respective opposed side wall; and

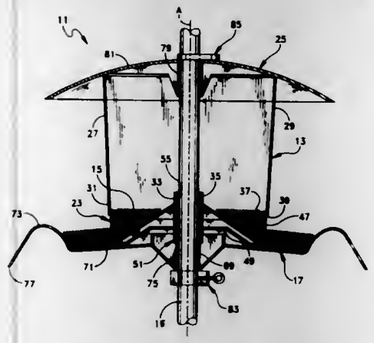
a feed drop tube holder means fabricated from a resilient material and being sized to an overall dimension that is slightly larger than the distance between said opposed side walls, said holder means being capable of compression into a curved bow shape by hand pressure to a reduced overall dimension to permit a plurality of tabs formed on the ends thereof to engage said slots in said side walls whereby when said holder is released from a compressed condition, it springs back to its original shape and is captured between said side walls.

5,558,040

BIRD FEEDER

Betsy P. Colwell; Wendy A. Wagner, both of Foster, R.I.; Paul Graham, Worcester, and John Kline, Brimfield, both of Mass., assignors to Droll Yankees, Inc., Foster, R.I.

Filed Apr. 19, 1995, Ser. No. 424,118
Int. Cl.[6] A01K *39/00*
U.S. Cl. 119—52.2 **20 Claims**



1. A bird feeder capable of storing bird feed therein and delivering the bird feed to a feed tray located below the bird feeder, said bird feeder comprising:

a housing comprising a vertically disposed cylindrical wall having an upper end and a lower end, and a bottom wall attached to the lower end of the cylindrical wall, said bottom wall having a plurality of downwardly sloping channels formed therein which extend radially outwardly, said cylindrical wall having a plurality of feed apertures formed at its lower end which are circumferentially spaced and aligned with said channels of the bottom wall wherein bird feed stored within the housing flows down the channels through the feed apertures and into the feed tray; and

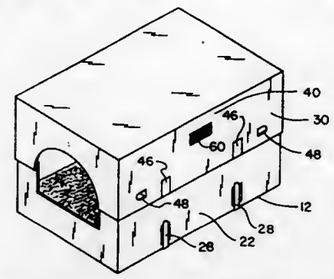
an annular door rotatably secured to the housing, said door comprising an outer peripheral wall, a bottom, and means associated with the door and housing for rotatably securing the door to the housing for rotational movement relative to the housing, said outer wall being positioned radially outwardly with respect to the cylindrical wall of the housing and having a plurality of openings formed therein which register with the feed apertures of the housing for allowing bird feed to pass through the feed apertures, said door being rotatably movable between an open position in which the openings of the door are fully aligned with the feed apertures of the housing for allowing bird feed to flow into the feed tray, and a closed position in which the wall of the door blocks the feed apertures for preventing the bird feed from flowing into the feed tray.

5,558,041

DISPOSABLE TELESCOPIC CAT LITTER BOX

James Fairall, Jr., and Delores Fairall, both of 310 First Ave., N., Lake Wales, Fla. 33853

Filed Mar. 2, 1995, Ser. No. 397,625
Int. Cl.[6] A01K *1/035*
U.S. Cl. 119—165 **6 Claims**



2. A disposable telescopic cat litter box comprising, in combination:

a rectangular bottom portion having a bottom surface and an open top, a front wall, a rear wall, a right wall, and a left wall, a u-shaped rectangular opening in the front wall of the bottom portion, a first set of adhesive tabs positioned along the right wall, a second set of adhesive tabs positioned along the left wall; and

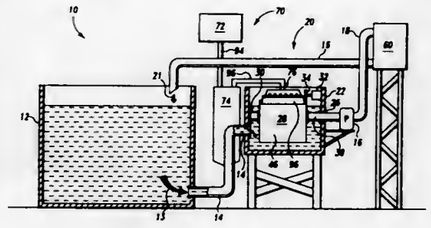
a top portion having an open bottom and a top surface, a front wall, a rear wall, a right wall, and a left wall, a perforated portion formed in the front wall, a first set of plastic strips positioned along the right wall adapted for engagement with the adhesive tabs of the right wall of the bottom portion, a second set of plastic strips positioned along the left wall adapted for engagement with the adhesive tabs of the left wall of the bottom portion, the top portion telescopically mated with the bottom portion with the perforated portion of the front wall of the top portion aligning with the opening of the front wall of the bottom portion.

5,558,042

AQUACULTURE FILTRATION SYSTEM EMPLOYING A ROTATING DRUM FILTER

James E. Bradley, R.R. 2, Box 342, Ladoga, Ind. 47954, and Duane C. Leach, 820 Palmetto Ct., Indianapolis, Ind. 46217

Filed Jun. 1, 1994, Ser. No. 252,257
Int. Cl.[6] A01K *63/04*
U.S. Cl. 119—226 **15 Claims**



1. A substantially closed aquaculture system for farming fish in combination with a system for filtering water to be recirculated through said aquaculture system, comprising:

a container having an inlet for receiving water from the aquaculture system to be filtered and an outlet for recirculating filtered water to the aquaculture system;

a cylindrically shaped filter horizontally mounted in said container by a tubular member having an elongated opening

formed therein for receiving a flow of filtered water, said

5,558,046

formed therein for receiving a flow of filtered water, said elongated opening having a length of at least half an axial length of said cylindrically shaped filter, said filtered water flowing through said tubular member and flowing out of said tubular member from at least one end of said tubular member, said filter having a porous resilient filter screen forming an outer layer of said filter for removing aquaculture system particulate from said water received through said inlet, said elongated opening opposing said filter screen;

cleaning means positioned in direct contact with said resilient filter screen for removing said aquaculture system particulate collected at an outer surface of said resilient filter screen; and

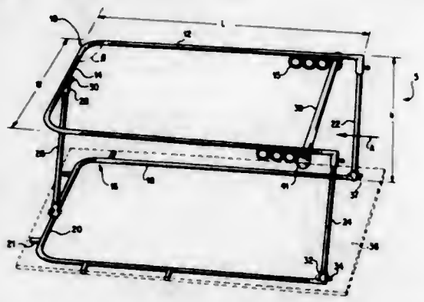
rotating means for rotating said filter.

5,558,043

LIGHTWEIGHT, PORTABLE ANIMAL GROOMING STALL

Donovan J. Givens, 21420 County Rd. 10, Corcoran, Minn. 55340

Filed Oct. 6, 1994, Ser. No. 319,074
Int. Cl.[6] A01K *1/00*
U.S. Cl. 119—519 **12 Claims**



1. A lightweight, portable grooming stall for an animal, comprising:

a substantially U-shaped bar having a front portion and two legs;

a three point support system coupling with said U-shaped bar so as to maintain said U-shaped bar in a horizontal attitude;

a base system coupled to said three point support system, said base system underlying said U-shaped bar;

wherein said three point support system engages with said base system at only three distinct points adjacent a floor level; and

a restraint system variably positioned across said two legs of said U-shaped bar.

5,558,044

ILLUMINATED DOG LEASH HANDLE

Joseph E. Nasser, Jr., and Nancy M. Nasser, both of 2 Greenway Rd., Windham, N.H. 03087

Filed Jun. 6, 1995, Ser. No. 468,809
Int. Cl.[6] A01K *27/00*
U.S. Cl. 119—796 **18 Claims**

1. An illuminated animal leash assembly comprising:

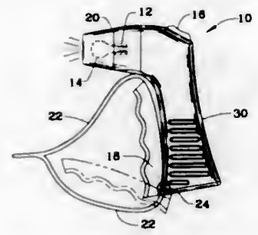
an elongated leash having a first end and a second end, the second end including a connecting means for connecting the leash to an animal;

a handle having a grip portion;

a light source in the handle for illuminating an area by manipulating the handle to direct the light source to the area;

a battery connected to the light source for energizing the light source; and

means for connecting the first end of the leash to the handle, said means for connecting including a movable member which is movable between an open position and a closed position, the



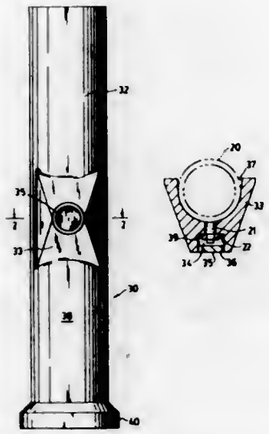
movable member forming a means for trapping a portion of the elongated leash between the movable member and the handle when in the closed position.

5,558,045

REFRACTORY TILE FOR OPEN-SPACED BOILER TUBES

Arthur W. Cole, Rowley, Mass., and John M. Heffernan, Langhorne, Pa., assignors to Wheelabrator Environmental Systems, Inc., Hampton, N.H., and The Carborundum Company, Niagara Falls, N.Y.

Filed Sep. 14, 1994, Ser. No. 305,638
Int. Cl.[6] F22B *37/00*
U.S. Cl. 122—6 A **9 Claims**



1. A refractory tile adapted for protecting an individual boiler tube against corrosion/erosion from a gas stream comprising

(a) a unitary semi-cylindrical ceramic body, elongated along the tube and having a front face directed toward the gas stream and a back face contoured in a single smooth curve to contact no more than about one-half of that individual boiler tube surface;

(b) a ceramic shield projecting toward the gas stream from the front face of that tile; and

(c) a cavity extending from an entrance on the back face of the ceramic body through the front face of said shield, said cavity being enlarged stepwise toward the front face of said shield, producing a shoulder;

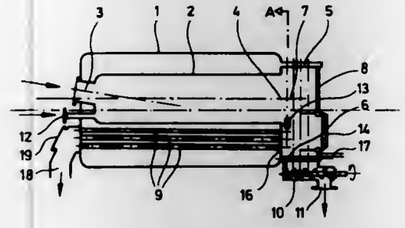
whereby the tile can be affixed to the tube by means of a threaded stud anchored to that individual boiler tube by fitting the tile to the tube, passing the stud into the cavity, and threading a nut onto the stud to press against the shoulder, thereby urging the tile against the boiler tube.

5,558,046

FIRE-TUBE BOILER

Fritz Schoppe, and Josef Prüstler, both of Geretsried, Germany, assignors to Dr.-Ing. Fritz Schoppe, Geretsried, Germany

PCT No. PCT/DE92/00190, § 371 Date Aug. 30, 1994, § 102(e) Date Aug. 30, 1994, PCT Pub. No. WO93/18339, PCT Pub. Date Sep. 16, 1993
PCT Filed Mar. 5, 1992, Ser. No. 295,693
Int. Cl.[6] F22B *7/12;37/06*
U.S. Cl. 122—367.1 **13 Claims**



1. A fire-tube boiler operated with ash-containing flue gases and containing, in a boiler drum, at least one horizontally arranged fire tube which is provided at one end with an extension for the connecting of the burner, a reversing chamber at one end of the boiler drum into which an outlet of the fire tube debouches at the other end thereof, and a plurality of flue tubes which have ann inside diameter 2R and extend, starting from the reversing chamber, below the fire tube through the boiler drum, wherein

each of the flue tubes has an inlet opening which widens from the inside diameter (2) in the direction towards the reversing chamber into which it debouches, in trumpet-like manner with a radium of curvature r over an axial distance of approximately r, r/R being >0.3,

the dimensions of the fire tube, with due consideration of the boiler capacity and the desired temperature of the boiler water, are so selected that, in operation, the temperature of the flue gases at the outlet end of the fire tube lies a safety margin below the ash-softening temperature of the corresponding fuel, and

the number and inside diameter (2) of the flue tubes are so dimensioned that the dynamic pressure in the flue tubes at a point directly behind the trumpet-shaped widening is greater than 40 Pa.

5,558,047

LOW NO_x INTEGRATED BOILER-BURNER COGENERATION APPARATUS

Richard C. Vetterick, Akron, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Nov. 30, 1994, Ser. No. 347,024
Int. Cl.[6] F22B *37/10*
U.S. Cl. 122—367.1 **38 Claims**

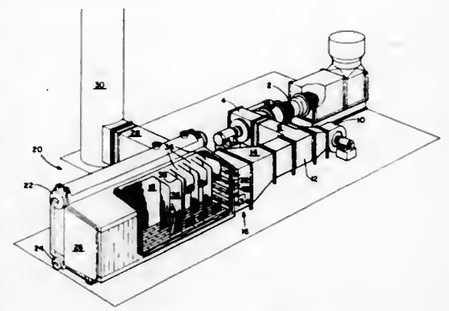
1. A low NO_x, integrated boiler-burner cogeneration apparatus, comprising:

a horizontally fired, factory assembled package boiler having an inlet plenum and a furnace space;

a gas turbine-generator having an outlet for providing turbine exhaust gas to the furnace space;

a multi-nozzle burner (MNB) array including a plurality of vertically and horizontally spaced burner nozzles located at an entrance to the furnace space for supplying fuel for combustion into the furnace space;

one or more vertically extending, horizontally spaced chill tube assemblies located within the furnace space downstream of the MNB array so as to quickly absorb heat from combustion exhaust gases within the furnace space to lower a temperature of the combustion exhaust gases to minimize NO_x formation;



forced draft fan means for providing combustion air to the furnace space; and

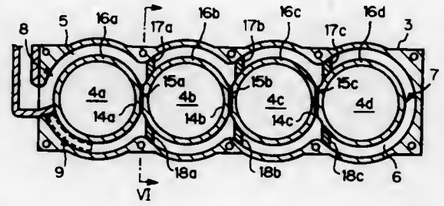
means for supplying fuel to the MNB array.

5,558,048

CYLINDER BLOCK COOLING ARRANGEMENT

Makoto Suzuki; Shizuo Abe, and Masato Kawauchi, all of Mishima, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 13, 1995, Ser. No. 402,818
Claims priority, application Japan, Mar. 18, 1994, 6-048388
Int. Cl.[6] F02B *75/18*
U.S. Cl. 123—41.24 **27 Claims**



1. A cooling system for an engine having a plurality of cylinder bores which are arranged along a longitudinal axis of the engine, an intermediate wall being provided between every two adjacent bores, the system comprising:

a first coolant passage continuously extending, on one side of the axis, from the bore arranged in one end of the engine to the bore arranged in another end of the engine along the periphery of the bores;

a second coolant passage continuously extending, on another side of the axis, from the bore arranged in the one end of the engine to the bore arranged in the other end of the engine along the periphery of the bores;

a connector for connecting ends of the first and second coolant passages located at the one end of the engine;

a coolant inlet formed at the end of the first coolant passage located at the other end of the engine;

a coolant outlet formed at the end of the second coolant passage located at the other end of the engine; and

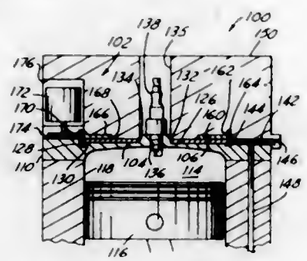
a connecting passage formed in at least one intermediate wall for connecting the first and the second coolant passages to each other, wherein a coolant flows from the coolant inlet through, in turn, the first coolant passage, the connector, and the second coolant passage, and flows out from the coolant outlet, wherein the coolant flows through the connecting passage, and wherein an amount of coolant flowing through the first coolant passage, the connector, and the second coolant passage is substantially constant over these passages.

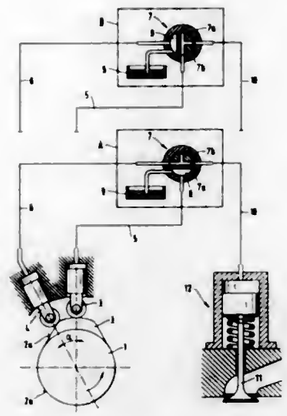
5,558,049

VARIABLE ORBITAL APERTURE VALVE SYSTEM FOR FLUID PROCESSING MACHINES

G. Douglas Dubose, 2712 56th St., Lubbock, Tex. 79413

Filed Jun. 5, 1995, Ser. No. 462,489
Int. Cl.[6] F01L *7/00*
U.S. Cl. 123—80 D **32 Claims**





1. A variable orbital aperture valve system for a fluid processing machine, wherein the machine has at least one fluid processing chamber, each chamber having at least one port through which fluid passes into and out of the chamber, said variable orbital aperture valve system comprising:

an orbiter having at least one primary aperture therein;

means for mounting said orbiter adjacent a chamber of a fluid processing machine, wherein the chamber has at least one port, to thereby mount said orbiter rotatably with respect to the chamber in sealingly interfaced relation with respect to the at least one port;

means for rotating said orbiter with respect to the chamber to thereby provide periodic alignment of said at least one primary aperture with respect to the at least one port;

at least one floater having a secondary aperture therein;

means for mounting said at least one floater adjacent said orbiter to thereby mount said at least one floater movably in sealingly interfaced relation with respect to said orbiter and the at least one port; and

means for selectively moving said at least one floater with respect to the at least one port so that said secondary aperture is selectively aligned with respect thereto wherein said secondary aperture remains substantially near said at least one port;

wherein fluid passes through the at least one port when the at least one primary aperture of said orbiter aligns therewith, and wherein said alignment of said at least one primary aperture with respect to the at least one port is selectively modified by the selective movement of said at least one floater due to repositioning of said at least one secondary aperture with respect to the at least one port.

5,558,050

ARRANGEMENT FOR THE CONTROL OF VALVE TIMING IN A COMBUSTION ENGINE

Daniel Paro, Kvevlax, Finland, assignor to Wartsila Diesel International Ltd Oy, Helsinki, Finland

Filed May 31, 1995, Ser. No. 455,294
Claims priority, application Finland, Jul. 1, 1994, 943159
Int. Cl.[6] F01L *1/34;9/02*
U.S. Cl. 123—90.13 **7 Claims**

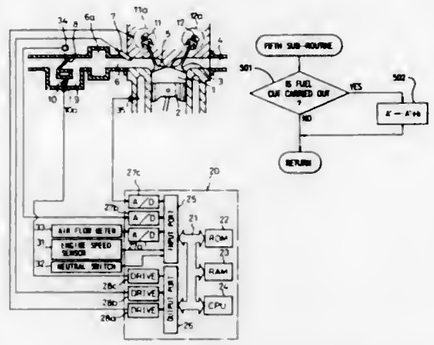
1. An arrangement for controlling valve timing in a combustion engine having at least one engine valve associated with a cylinder of the engine and a rotary shaft having an outer cam surface extending therearound, said arrangement comprising at least first and second follower members that are functionally independent of each other and cooperate with the outer cam surface, and selectively operable coupling means effective between said follower members and said valve, the coupling means having at least a first state in which the first follower member controls the valve and a second state in which the second follower member controls the valve.

5,558,051

VALVE TIMING CONTROL DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Mamoru Yoshioka, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Division of Ser. No. 312,585, Sep. 27, 1994, Pat. No. 5,529,037.
This application Jun. 7, 1995, Ser. No. 477,250
Claims priority, application Japan, Sep. 28, 1993, 5-241435
Int. Cl.[6] F01L *13/00*
U.S. Cl. 123—90.15 **4 Claims**



1. A valve timing control device for an internal combustion engine comprising:

a variable valve timing mechanism capable of varying the valve overlap period continuously or in stages;

stop means for stopping fuel injection in at least one predetermined engine operating condition;

determination means for determining an optimal value of the valve overlap period in a current engine operating condition, on the basis of current engine speed, load, and temperature;

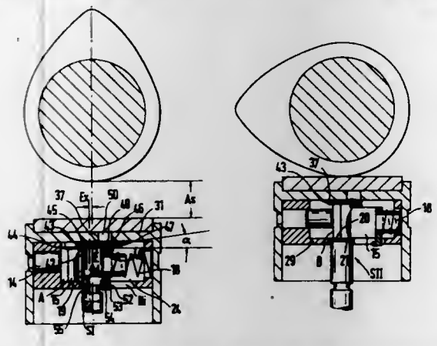
control means for controlling said variable valve timing mechanism such that the valve overlap period becomes larger than said optimal value when fuel injection is stopped by said stop means.

5,558,052

INTERNAL-COMBUSTION ENGINE SWITCHABLE VALVE TAPPET

Dietmar Schwarzenthal, Ditzingen, and Joachim Gruenberger, Sachsenheim, both of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Germany

Filed Feb. 21, 1995, Ser. No. 390,998
Claims priority, application Germany, Feb. 18, 1994, 44 05 190.5; Dec. 15, 1994, 44 44 698.5
Int. Cl.[6] F01L *1/12;13/00;* **F02D** *13/06*
U.S. Cl. 123—90.16 **37 Claims**



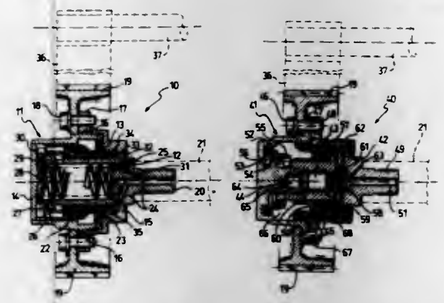
34. A tappet for a switchable valve of an internal-combustion engine and interacting with a camshaft cam, comprising a hydraulically actuated piston and a clutch member having a bore and arranged to be actuated by the piston for switching the valve between a first switching position and a second switching position for charge cycle control, and a locking element operatively associated with said clutch member such that, in a defined cam path range, when the valve stem is dipped into the bore of the clutch member, the locking element is unlocked by said stem.

5,558,053

TIMING VARIATOR BETWEEN THE CRANKSHAFT AND THE CAMSHAFT OF AN INTERNAL COMBUSTION ENGINE

Renzo Tortul, S. Pier D'Isonzo, Italy, assignor to Carraro S.p.A., Campodarsego, Italy

Filed Oct. 6, 1994, Ser. No. 321,830
Int. Cl.[6] F01L *1/344*
U.S. Cl. 123—90.17 **16 Claims**



1. A timing variator (**10;40**) between a crankshaft (**37**) and a camshaft (**21**) of an internal combustion engine, comprising a first element (**11;41**) drivingly connected to the crankshaft (**37**), a second element (**12;42**) drivingly connected to the camshaft (**21**), a piston member (**13;43**) interposed between the first (**11;41**) and the second (**12;42**) elements and coupled to one (**11;41**) of said elements by a helical gear arrangement (**22;68**) and to the other (**12;42**) of the two elements either by a spur gear or helical gear arrangement (**23;50**), said piston member (**13;43**) being displaced relative to said elements (**11,12; 41,42**) to change the angular setting of the two elements (**11,12' 41,42**) through the gear arrangements (**22,23; 58,60**), thereby changing the camshaft (**21**) to crankshaft (**37**) timing relationship, wherein said timing variator further comprises torque means (**28;52**) associated with said elements (**11,12; 41,42**) to generate a torque between said elements (**11;41** and **12;42**) and braking means (**33,34; 59–62**) between said elements (**11,12; 41,42**) for braking the movement of one element (**11;41**) relative to the other (**12;42**) wherein said torque means comprises a torsionally preloaded spring connected at one end to said first element and at the other end to said second element.

14. A timing variator (**10;40**) between a crankshaft (**37**) and a camshaft (**21**) of an internal combustion engine, comprising a first element (**11;41**) drivingly connected to the crankshaft (**37**), a second element (**12;42**) drivingly connected to the camshaft (**21**), a piston member (**13;43**) interposed between the first (**11;41**) and the second (**12;42**) elements and coupled to one (**11;41**) of said elements by a helical gear arrangement (**22;68**) and to the other (**12;42**) of the two elements either by a spur gear or helical gear arrangement (**23;50**), said piston member (**13;43**) being displaced relative to said elements (**11,12; 41,42**) to change the angular setting of the two elements (**11,12; 41,42**) through the gear arrangements (**22,23; 58,60**), thereby changing the camshaft (**21**) to crankshaft (**37**) timing relationship, wherein said timing variator further comprises braking means (**33,34; 59–62**) between said elements (**11,12; 41,42**) for braking the movement of one element (**11;41**) relative to the other (**12;42**)

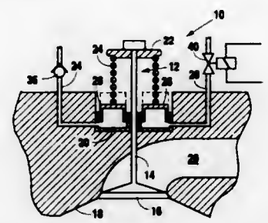
wherein said braking means is a mechanical friction braking means and comprises a thrust member (**58**) received inside the second element (**42**) for movement along an axis of said second element and having surfaces inclined relative to said axis, friction members (**62**) for frictional engagement with the first element (**41**) received transversely inside the second element (**42**) and engaging said thrust member (**58**), an elastic member (**59**) biasing the thrust member (**58**) such that the thrust member (**58**) pushes by means of the inclined surfaces the friction members (**62**) against the first element (**41**).

5,558,054

VARIABLE PRELOAD SYSTEM FOR VALVE SPRINGS

Susumu Ariga, and Jongmin Lee, both of San Antonio, Tex., assignors to Southwest Research Institute, San Antonio, Tex.

Filed Jun. 7, 1995, Ser. No. 487,036
Int. Cl.[6] F01L *3/10;1/02*
U.S. Cl. 123—90.65 **3 Claims**



1. A variable valve spring preload system for an internal combustion engine having a plurality of valves movably disposed in said engine, each of said valves having a stem extending between spaced ends, a spring retainer removably attached to the stem at one of said ends, and a spring compressibly interposed said spring retainer and a seating surface concentrically positioned about said valve stem, said seating surface being selectively movable along said stem between a retracted position at which said spring is compressed to a first maximum length and an extended position at which said spring is compressed to a length less than said first maximum compressed length, said variable spring preload system comprising:

a hydraulic lifer having interior walls defining a portion of an

5,558,058

FOUR STROKE ENGINE WITH COMBINED OIL PUMP

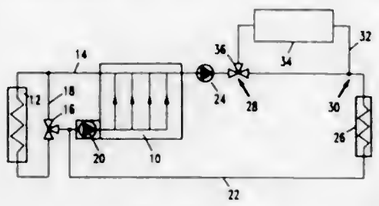
a hydraulic lifer having interior walls defining a portion of an expandable chamber and an exterior surface portion defining said spring seating surface;
an inlet port communicating said expandable chamber with a source of pressurized fluid;
an outlet port spaced from said inlet port and communicating said expandable chamber with a drain reservoir; and
a means for controlling the flow of fluid through said chamber from said inlet port to said outlet port, said fluid flow being substantially unrestricted in response to the speed of said engine being less than a predetermined value and restricted in response to the speed of said engine being equal to or greater than said predetermined value, said means comprising a fluid flow control valve interposed said outlet port and said drain reservoir, said fluid flow control valve having a variable orifice that is moved to a closed position in response to the speed of said engine being equal to or greater than a predetermined value, and moved to an open position in response to said engine speed being less than said predetermined value.

5,558,055

METHOD AND AN ASSEMBLY FOR OPERATING SENSIBLE HEAT STORAGES

Oskar Schatz, Gauting, Germany, assignor to Schatz Thermo System Gmbh, Gauting, Germany

Filed Apr. 26, 1995, Ser. No. 429,332
Claims priority, application Germany, Apr. 27, 1994, 44 14 791.0; Apr. 5, 1995, 195 12 821.4
Int. Cl.[6] F02N *17/02*
U.S. Cl. 123—142.5 R **15 Claims**



1. A method for operating sensible heating storages in automotive vehicles, in particular for heating an engine at cold start, comprising the steps of:
using a heat carrier for sensible heat, with the heat carrier circulating between the engine, which is a heat source when hot and a heat sink when cold, and a heat storage the heat carrier being adapted to be circulated independently of engine operation;
initiating circulation of the heat carrier to the heat storage at the latest when the engine is started;
continuing circulation of the heat carrier until the total contents of the heat storage has been replaced;
resuming circulation of the heat carrier to the heat storage at the latest when an ignition of the engine is switched off; and
continuing circulation of the heat carrier until the contents of the heat storage has been completely replaced.

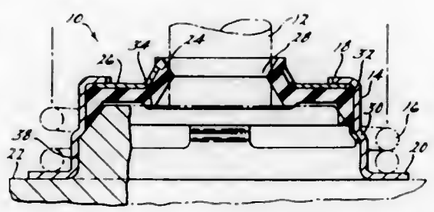
5,558,056

TWO-PIECE VALVE STEM SEAL

David Sakata, Livonia, Mich., assignor to Freudenberg-NOK General Partnership, Plymouth, Mich.

Filed Nov. 14, 1995, Ser. No. 557,459
Int. Cl.[6] F01L *3/08*
U.S. Cl. 123—188.6 **21 Claims**

1. A valve stem seal assembly for use in an internal combustion engine, said assembly including:



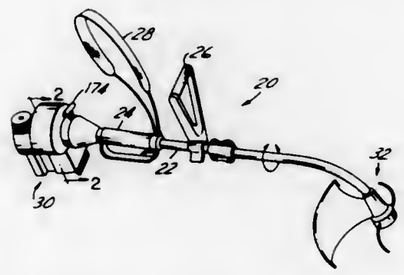
a rigid shell having a radially outwardly extending flange at a bottom end of said shell and a radially inwardly extending end wall at a top end of said shell, said flange contacting a valve spring;
a resilient body placed and secured within said rigid shell, said body being press fitted within said rigid shell; and
a finger spring molded in a top portion of said resilient body.

5,558,057

OPERATOR CARRIED POWER TOOL HAVING A FOUR-CYCLE ENGINE

Robert G. Everts, Chandler, Ariz., assignor to Ryobi Outdoor Products, Chandler, Ariz.

Continuation of Ser. No. 801,026, Dec. 2, 1991, Pat. No. 5,241,932. This application May 2, 1993, Ser. No. 65,576
The portion of the term of this patent subsequent to Sep. 7, 2010, has been disclaimed.
Int. Cl.[6] F02F *7/00*
U.S. Cl. 123—195 R **2 Claims**



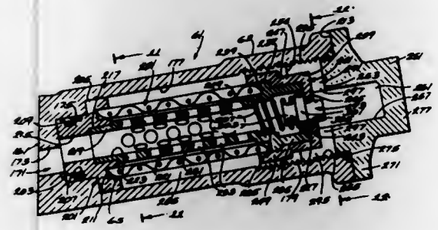
1. A power tool comprising:
a frame to be carried by an operator;
an implement cooperating with the frame and having a rotary driven input member; and
a lightweight four-cycle internal combustion engine attached to the frame, said engine having:
an engine block having a cylindrical bore and an enclosed oil reservoir located below the cylindrical bore;
a piston reciprocally cooperating within the bore;
a crankshaft rotatably cooperating with the block and aligned along a crank axis perpendicular to the cylindrical bore, said crankshaft operably connected to the implement input member;
a connecting rod operatively connected between the piston and the crankshaft such that reciprocation of the piston is transformed into rotation of the crankshaft,
a cylinder head assembly cooperating with the block, the cylinder head assembly having an intake and an exhaust valve respectively disposed in an intake and an exhaust port, wherein said ports are generally in line and oriented opposed to one another in a cross flow manner, and
a valve train for opening and closing the intake and exhaust valves in timed sequence at one half crankshaft speed.

5,558,058

FOUR STROKE ENGINE WITH COMBINED OIL PUMP AND FILTER ASSEMBLY

Lam H. Ming, Tsing Yi Island, and Chu K. Ying, Yuen Long, both of Hong Kong, assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Jun. 3, 1994, Ser. No. 253,362
Int. Cl.[6] F01M *11/03*
U.S. Cl. 123—196 A **19 Claims**



1. An oil pump assembly comprising a housing member including a first mounting surface adapted to engage a first other mounting surface, a cover member mounting surface spaced from said first mounting surface, a bore extending from said cover member mounting surface and including, adjacent said cover member mounting surface, a counter bore, an oil supply passage extending between said first mounting surface and said cover member mounting surface for communication with an oil supply port in the first other mounting surface, and an oil delivery passage extending between said first mounting surface and said cover member mounting surface for communication with an oil delivery port in the first other mounting surface, a cover member including a housing member mounting surface engaging said cover member mounting surface of said housing member, a second other mounting surface, an oil supply recess located in said housing member mounting surface and communicating with said counter bore in said housing member, an internal oil supply conduit communicating between said oil supply recess and said housing member mounting surface and communicating with said oil supply passage in said housing member, an oil discharge recess located in said housing member mounting surface and communicating with said counter bore in said housing member, an internal oil discharge passage communicating between said oil discharge recess and said second other mounting surface, and an internal oil delivery passage extending between said housing member mounting surface and said second other mounting surface and communicating with said oil delivery passage in said housing member, and fasteners releasably connecting said cover member to said housing member to form a pump assembly.

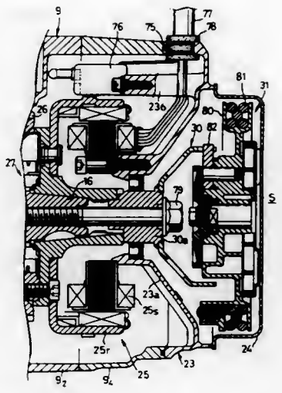
5,558,059

POWER UNIT FOR A SITTING-TYPE VEHICLE

Kei Yoshinaga; Katsuhiko Ito; Katsumi Ebara; Hitoshi Furuhashi; Takashi Shichinohe, and Masaharu Omagari, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 12, 1995, Ser. No. 501,652
Claims priority, application Japan, Jul. 12, 1994, 6-160429
Int. Cl.[6] F02B *77/00*
U.S. Cl. 123—198 E **8 Claims**

1. A casing for an engine having a crank shaft, said engine and crank shaft being mounted in a longitudinal direction of the vehicle body comprising:
an output shaft operatively connected to driving wheels and projecting from said casing in the longitudinal direction of the vehicle body;
a cover detachably connected to said casing at a position displaced from the output shaft on the front surface of the casing, said cover enclosing electric devices and harnesses extending from the electric devices being taken outside of the casing through a joining surface between the casing and the cover.

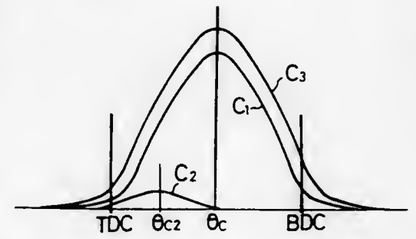


5,558,060

INTERNAL COMBUSTION ENGINE

Kaoru Horie; Hitoshi Takahashi, and Atsushi Umemoto, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1994, Ser. No. 314,429
Claims priority, application Japan, Sep. 28, 1993, 5-241723
Int. Cl.[6] F02B *31/00*
U.S. Cl. 123—308 **13 Claims**



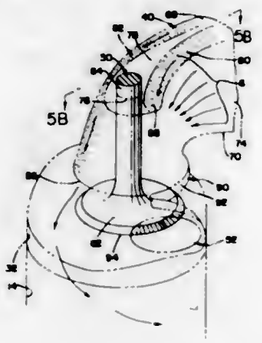
1. An internal combustion engine comprising: a valve operating device operatively connected to a pair of intake valves and capable of opening and closing one of said intake valves in accordance with an operating condition of the engine and capable of opening and closing the other said intake valve in a small lift amount, thereby producing a deflection of an intake air drawn into a combustion chamber; and a fuel injection valve for injecting a fuel toward a pair of intake valve bores independently opened and closed by said pair of intake valves, respectively; wherein the timing of opening and closing of said other intake valve which is opened and closed in the small lift amount is set at a time point when the lift amount is maximized in the first half of an intake stroke of a piston for said combustion chamber.

5,558,061

pressure region, a flat control pressure region in which the

5,558,065

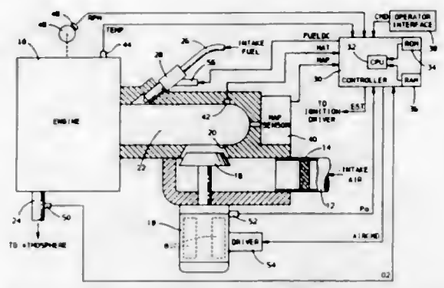
5,558,061
ENGINE CYLINDER INTAKE PORT
David W. Susnjnski, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 22, 1995, Ser. No. 578,002
Int. Cl.[6] F02B *31/00*
U.S. Cl. 123—306 **4 Claims**



1. In an internal combustion engine including a combustion chamber defined by a cylinder having a piston, an intake valve for regulating charge flow through an opening and into said combustion chamber and an exhaust valve for regulating exhaust gas out of said combustion chamber, a first apparatus for inducing charge swirl within said combustion chamber comprising a chamber shroud disposed in said combustion chamber including a circumferentially extending wall having an axially terminal end disposed in said combustion chamber and disposed about a portion of said valve opening, said wall effective to block ingress of said charge flow through a portion of said opening when said intake valve is in a first, low lift-low flow range of valve operation to thereby direct charge flow into said combustion chamber through one side of said opening to induce charge flow swirl in said chamber, and an intake system comprising an intake port extending from an inlet to said opening, said intake port defining first and second flow paths, said first flow path including a second apparatus for inducing charge swirl within said combustion chamber comprising a charge flow guide wing operable under conditions of high valve opening and high volumetric inlet charge flow to induce a directional change in charge flow traversing said first flow path resulting in an increase in charge flow through said second flow path to thereby direct charge flow into said combustion chamber through one side of said opening, inducing charge flow swirl in said chamber when said intake valve is in a second, high lift-high flow range of valve operation.

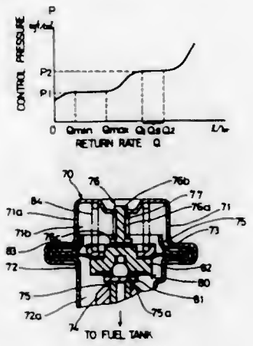
5,558,062
INTEGRATED SMALL ENGINE CONTROL
Daniel B. O'Connell, Rochester, and Michael T. Faville, Geneseo, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.
Filed Sep. 30, 1994, Ser. No. 316,427
Int. Cl.[6] F02D *41/14;43/04*
U.S. Cl. 123—361 **7 Claims**

1. A control system for a small engine having an inlet air passage, comprising:
- a movable engine operating level selector;
- a sensor for sensing the selector position;
- an engine command schedule consisting of sets of engine control commands, wherein each set corresponds to at least one selector position;
- an ignition timing controller for timing engine ignition events in accord with the set of engine control commands corresponding to the sensed selector position;



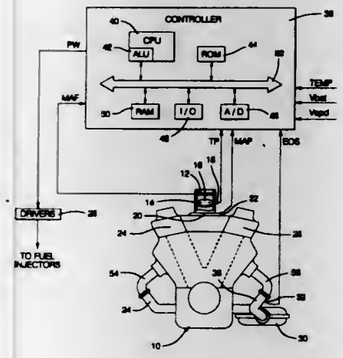
- an engine air control valve for controlling a degree of restriction of the inlet air passage in accord with the set of engine control commands corresponding to a sensed selector position; and
- at least one fuel injector for metering a quantity of fuel to the engine in accord with the set of engine control commands corresponding to the sensed selector position.

5,558,063
FUEL SUPPLY SYSTEM WITH TWO-STAGE CONTROL PRESSURE REGIONS
Kazuji Minagawa, Tokoname; Kiyotoshi Oi, Toyohashi, and Takashi Akiba, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Sep. 28, 1995, Ser. No. 535,632
Claims priority, application Japan, Oct. 11, 1994, 6-245530
Int. Cl.[6] F02M *41/00;37/04*
U.S. Cl. 123—457 **14 Claims**



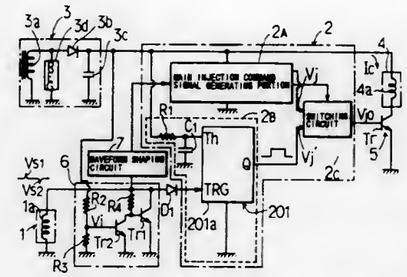
1. A fuel supply system for engine comprising:
- a fuel injector for injecting a predetermined rate of fuel to the engine;
- a fuel pump for supplying fuel to the injector;
- a pump controller capable of adjusting a fuel delivery flow rate of the fuel pump and increasing the fuel delivery flow rate from the fuel pump during hot restarting of the engine;
- a fuel supply passage disposed between the fuel pump and the injector; and
- a pressure regulator disposed in the fuel supply passage and capable of adjusting a fuel supply pressure to the injector,
- wherein the pressure regulator is capable of adjusting the fuel supply pressure, according to an excess fuel return flow rate which is a subtraction of the the predetermined rate from the fuel delivery flow rate, to a low-pressure side control pressure region over a first excess fuel flow rate range and to a high-pressure side control pressure region over a second excess fuel flow rate range, and
- wherein the pressure regulator has, in each of the high-pressure side control pressure region and the low-pressure side control pressure region, a flat control pressure region in which the control pressure varies at less than 0.1 kgf/cm^2 per 10 liters/hr.

5,558,064
ADAPTIVE ENGINE CONTROL
Kenneth J. Buslepp, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 19, 1995, Ser. No. 545,125
Int. Cl.[6] F02M *51/00*
U.S. Cl. 123—480 **9 Claims**



1. An engine control method for generating a control signal applied to control an actuator to drive a value of an automotive internal combustion engine air/fuel ratio control parameter to a target air/fuel ratio parameter value, comprising the steps of:
- storing, in a memory device, a block learn array comprising a plurality of adjacent cells corresponding to a plurality of adjacent engine operating condition ranges, each of the plurality of cells having a cell value;
- repeatedly, (a) sensing a current engine condition, (b) determining whether a learn state is present in which the current engine condition is within any of the operating condition ranges of the block learn array, (c) if a learn state is present, then (i) identifying an active cell of the array as the block learn array cell having an engine operating condition range including the current engine condition and (ii) determining an active cell value by adjusting the cell value of the active cell in direction to drive the control parameter value toward the target parameter value, (d) if a learn state is not present, then (i) identifying an active cell of the array as the block learn array cell having an engine operating condition range closest to the current engine condition and (ii) determining an active cell value as the cell value of the active cell, (e) generating the control signal as a function of the determined active cell value, and (f) applying the control signal to control the engine air/fuel ratio control parameter;
- determining a value indicating a degree of deviation of the control parameter value away from the target parameter value;
- comparing the determined value to a predetermined threshold value over a predetermined monitoring period;
- adding a cell to the block learn array when the determined value exceeds the threshold value over the predetermined monitoring period;
- comparing cell values of at least one pair of neighboring cells in the block learn array over a predetermined comparing period; and
- reducing the number of cells of the block learn array when the cell values of the at least one pair are substantially the same over the predetermined comparing period.

5,558,065
METHOD FOR DRIVING INJECTOR FOR INTERNAL COMBUSTION ENGINE
Yoshinobu Arakawa, Numazu, Japan, assignor to Kokusan Denki Co., Ltd., Shizuoka-Ken, Japan
Filed Sep. 5, 1995, Ser. No. 523,695
Int. Cl.[6] F02D *41/30*
U.S. Cl. 123—490 **6 Claims**



1. A method for driving an injector for an internal combustion engine comprising the steps of:
- providing a power circuit including a magneto driven by the internal combustion engine, a rectifying circuit for rectifying an output of said magneto and a power capacitor charged by means of an output of said rectifying circuit;
- applying a voltage induced across said power capacitor to a driving coil of the injector by means of said power circuit;
- obtaining information on an angle of rotation of the internal combustion engine and information on an engine speed based on a pulse signal obtained from a signal generator driven by the internal combustion engine, to thereby generate an injection command signal of a predetermined signal width;
- feeding a driving current from said power circuit to said driving coil while said injection command signal is generated, to thereby drive the injector;
- prohibiting driving of the injector during an injector drive prohibition period which is a predetermined period of time defined after start of starting operation of the internal combustion engine; and
- permitting driving of the injector after a lapse of said injector drive prohibition period.

5,558,066
FUEL SYSTEM VIBRATION DAMPER
Alan H. Zhao, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.
Filed Feb. 2, 1995, Ser. No. 382,883
Int. Cl.[6] F02M *37/04*
U.S. Cl. 123—495 **23 Claims**

1. An engine, comprising:
- a crankshaft having a nonzero rotational energy when said engine is operating;
- a fuel system drive gear;
- a drive mechanism coupled to the crankshaft and to the fuel system drive gear for transmitting at least a portion of the rotational energy to the fuel system drive gear;
- a fuel system coupled to the fuel system drive gear; and
- a damper coupled to the fuel system drive gear and operable to dampen torsional excitation produced by the fuel system during a fuel injection event.

said control means inhibits the passage of fuel into said timing chamber near the end of the retraction stroke thereby forc-

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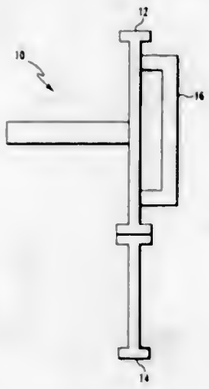
5,558,069
METHOD AND APPARATUS FOR FLUID

downstream of an exhaust port of the engine to a crankcase of the engine to be delivered from the crankcase to a combustion cham-



said control means inhibits the passage of fuel into said timing chamber near the end of the retraction stroke thereby forcing a predetermined quantity of fuel into said metering chamber and causing said metering piston to move toward said timing plunger,

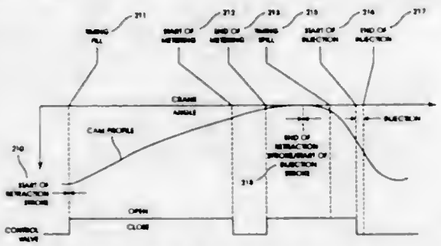
whereby a predetermined quantity of fuel is metered into said metering chamber after said force of said biasing means has decreased, said predetermined quantity of fuel being thereafter injected into the engine during the subsequent injection stroke.

5,558,067

DOUBLE PULSING ELECTRONIC UNIT INJECTOR SOLENOID VALVE TO FILL TIMING CHAMBER BEFORE METERING CHAMBER

Norman C. Blizard, and Paul D. Free, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Aug. 24, 1995, Ser. No. 518,987
Int. Cl.[6] F02M *37/04*
U.S. Cl. 123—501 **10 Claims**



1. A fuel injector having an injection stroke and a retraction stroke for use in an internal combustion engine, said injector comprising:

an injector body having a bore formed therein;

a timing plunger disposed at a first location within said bore, said timing plunger being freely slidable within said bore during the retraction stroke;

a metering piston slidably disposed at a second location within said bore;

a timing chamber defined in said bore between said timing plunger and said metering piston;

means for biasing said metering piston away from said timing plunger with a variable force;

a metering chamber defined in said bore below said metering piston, said metering chamber and said timing chamber having minimum volumes at the beginning of the retraction stroke, said volumes being increasable as said injector travels through the retraction stroke;

a passage formed in said injector body for providing continuous fuel communication to said metering chamber; and

control means for permitting and inhibiting the passage of fuel into said timing chamber,

wherein

said control means permits the passage of fuel into said timing chamber at the beginning of the retraction stroke thereby forcing said timing plunger away from said metering piston and decreasing said biasing force of said biasing means,

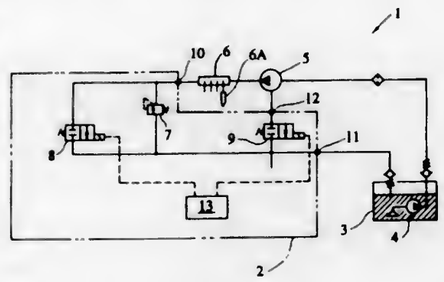
and further wherein

5,558,068

SOLENOID VALVE UNIT FOR FUEL INJECTION APPARATUS

Akira Kunishima; Tomiaki Hasebe; Hideya Kikuchi; Etsuro Hozumi, and Takeo Kushida, all of Saitama, Japan, assignors to Zexel Corporation, Japan

Filed May 26, 1995, Ser. No. 452,133
Claims priority, application Japan, May 31, 1994, 6-139729; Jan. 9, 1995, 7-016351
Int. Cl.[6] F02M *37/04; F02N 17/00*
U.S. Cl. 123—516 **24 Claims**



1. A fuel injection apparatus comprising:

a low-pressure pump that supplies fuel at low pressure from a fuel tank,

an injector, a high-pressure pump that is connected with and that receives the low-pressure fuel from the low-pressure pump and that supplies the fuel at high pressure to the injector that injects the fuel at high pressure into an engine,

a solenoid valve unit comprising:

a unit housing provided with a high-pressure lead-in port from the injector, a low-pressure lead-out port to the fuel tank, a return port from the high-pressure pump, a high-pressure passage in communication with the lead-in port, a low-pressure passage in communication with the lead-out port, and a return port passage in communication with the return port,

a pressure control valve that opens and closes the high-pressure and low-pressure passage in accordance with pressure at the lead-in port, and

solenoid valves able to communicate with the lead-in port and lead-out port via the pressure control valve and able to open and close communication between the high-pressure passage and the low-pressure passage, and between the low-pressure passage and the return port passage,

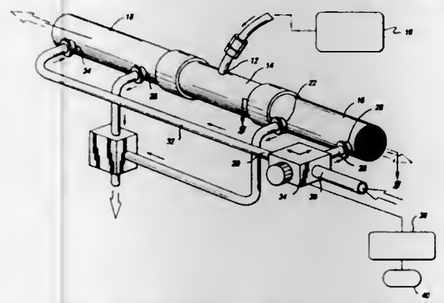
wherein the solenoid valves are controlled to open communication between the high-pressure passage and the low-pressure passage and close communication between the low-pressure passage and the return port passage during engine startup, and to close communication between the high-pressure passage and the low-pressure passage, and open communication between the low-pressure passage and the return port passage during normal engine operation.

5,558,069

METHOD AND APPARATUS FOR FLUID TEMPERATURE CONTROL

Kevin E. Stay, Brighton, Mich., assignor to Livernois Research & Development Company, Dearborn, Mich.

Filed Nov. 9, 1995, Ser. No. 555,616
Int. Cl.[6] F02M *31/00*
U.S. Cl. 123—541 **23 Claims**



1. A method for heat transfer in the fuel of a fuel system, comprising:

connecting a supply of compressed gas to a gas inlet port of a vortex tube so that the gas rapidly expands and cools, thereby cooling a first end of the vortex tube in relation to a warmer second end of the vortex tube;

attaching a first heat exchanger to the first end of the vortex tube;

providing a first fuel inlet port in the first heat exchanger so that fuel flowing into the first fuel inlet port is cooled by thermal contact with the first end of the vortex tube; and

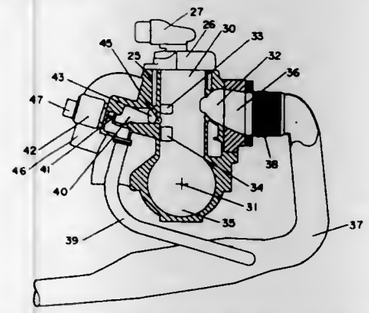
providing a cooled fuel outlet port in the heat exchanger so that cooled fuel may leave the first heat exchanger.

5,558,070

EXHAUST GAS RECIRCULATION IN A TWO STROKE ENGINE

Gregory B. Bell, Woodlands, and David R. Worth, Shenton Park, both of Australia, assignors to Orbital Engine Company (Australia) Pty. Limited, Australia

PCT No. PCT/AU94/00009, § 371 Date Jun. 6, 1995, § 102(e) Date Jun. 6, 1995, PCT Pub. No. WO94/16207, PCT Pub. Date Jul. 21, 1994
PCT Filed Jan. 4, 1994, Ser. No. 446,737
Claims priority, application Australia, Jan. 4, 1993, PL6639
Int. Cl.[6] F02M *25/07*
U.S. Cl. 123—568 **27 Claims**



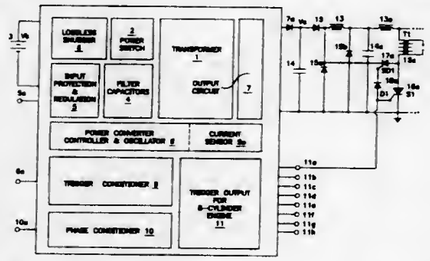
2. A method of controlling the generation NO_x in a fuel injected two stroke cycle crankcase scavenged internal combustion engine comprising selectively delivering exhaust gas from a location downstream of an exhaust port of the engine to a crankcase of the engine to be delivered from the crankcase to a combustion chamber of the engine, controlling, by an electronic control unit, a quantity of exhaust gas delivered to the crankcase during each cycle of the engine in accordance with engine operating conditions, and timing the exhaust gas delivery to the crankcase with respect to engine cycle.

5,558,071

IGNITION SYSTEM POWER CONVERTER AND CONTROLLER

Michael Ward; Winfield Hill, Stoneham, and Arthur J. Pennell, Lexington, all of Mass., assignors to Combustion Electromagnetics, Inc., Arlington, Mass.

Continuation-in-part of Ser. No. 206,632, Mar. 7, 1994, abandoned. This application Feb. 24, 1995, Ser. No. 396,194
Int. Cl.[6] F02P *3/09;* **H02M** *3/315*
U.S. Cl. 123—598 **40 Claims**



10. A DC to DC voltage step-up power converter including energy storage and voltage step-up inductive means and a main power switch means SE for controlling current in said inductive means to raise a low input voltage power supply means to a high output voltage Vc, the power converter including a converter controller comprising controlled oscillator means for turning said switch SE on and off for durations Ton and Toff respectively, the oscillator means including a timing capacitor Ct which is charged up to a high threshold voltage Vhth and discharged through a discharge point to a low thresbold voltage Vlth to define the two periods Toff and Ton, capacitor Ct being charged through a resistor Rc connected at one end to said discharge point and at the other end to said high output voltage load at voltage Vc to define the off-time Toff which decreases with increased voltage Vc, and timing capacitor Ct discharging through a resistor Rb connected between capacitor Ct and the discharge point to define the on-time Ton, and wherein a diode is placed across resistor Rb for by-passing resistor Rb during charging of timing capacitor Ct through resistor Rc.

5,558,072

APPARATUS FOR DISPOSING OF FUEL-VAPOR

Kenji Harima, Susono; Toshinari Nagai, Sunto-gun; Hiroshi Kanai; Akinori Osanai, both of Susono; Kazuhiro Iwano, Aichi-gun, and Shuji Yuda, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Mar. 30, 1995, Ser. No. 413,526
Claims priority, application Japan, Apr. 13, 1994, 6-074914
Int. Cl.[6] F02D *41/04;41/34*
U.S. Cl. 123—677 **10 Claims**

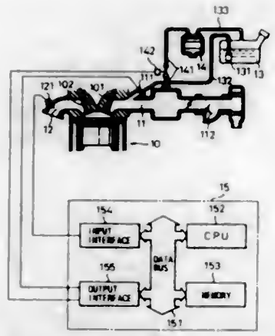
1. The method of disposing of fuel-vapor comprising the steps of:

detecting a driving condition of an engine;

calculating a standard opening of a purge valve, that is, an opening of a purge valve at standard atmospheric pressure in accordance with the driving condition detected at said detecting step;

expandable means and coupled to the distal extremity of the

(KLAF(KSTRL)), whose control response is inferior to that



calculating the basic fuel amount in order to control the air-fuel ratio of exhaust gas of the engine at a target air-fuel ratio determined in accordance with the driving condition detected at said detecting step;

calculating a correction factor for the basic fuel amount calculated at said basic fuel amount calculating step in accordance with the standard opening of the purge valve calculated at said standard opening of a purge valve calculating step;

detecting the atmospheric pressure;

correcting the standard opening of the purge valve calculated at said standard opening of a purge valve calculating step in accordance with the atmospheric pressure detected at said atmospheric pressure detecting step;

injecting fuel in an amount determined by the basic fuel amount calculated at said basic fuel amount calculating step; and

driving the purge valve in accordance with the corrected standard opening of the purge valve corrected at said correcting step.

5,558,073

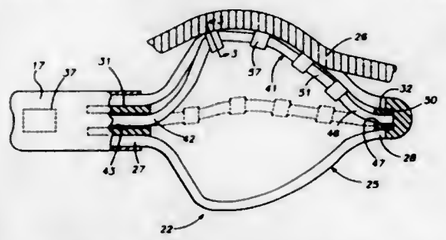
ENDOCARDIAL MAPPING APPARATUS WITH ROTATABLE ARM AND METHOD

Mark L. Pomeranz, Los Gatos, Calif.; Patsy A. Gingell, Pascoag, R.I., and Mir A. Imran, Palo Alto, Calif., assignors to Cardiac Pathways Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 135,848, Oct. 12, 1993, Pat. No. 5,400,783. This application Mar. 27, 1995, Ser. No. 410,716

Int. Cl.[6] A61B *5/0408*; A61N *1/05*

U.S. Cl. 128—642 **9 Claims**



1. An apparatus for mapping and/or ablating the wall of a chamber of a heart having blood therein comprising a flexible elongate tubular member having proximal and distal extremities and at least one lumen extending therethrough, expandable means carried by the distal extremity of the flexible elongate tubular member for moving between contracted and expanded positions, the expandable means having a distal extremity and a plurality of spaced-apart electrodes for engaging the wall of the heart, the expandable means being provided with spaces between electrodes when the expandable means is in an expanded position, an elongate flexible element having a distal extremity disposed within the expandable means and coupled to the distal extremity of the expandable means, at least one electrode carried by the distal extremity of the elongate flexible element for engaging the wall of the heart and means coupled to the elongate flexible element for moving a portion of the distal extremity of said element into a space between electrodes so as to engage the wall of the heart for mapping and/or ablating.

5,558,074

IGNITION DEVICE FOR INTERNAL-COMBUSTION ENGINE

Katsuaki Fukatsu, Urizura-machi; Noboru Sugiura, Mito; Hayato Koguchi, Takahagi, and Yoichi Anzo, Hitachinaka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 28, 1995, Ser. No. 508,703

Claims priority, application Japan, Jul. 28, 1994, 6-177277

Int. Cl.[6] F02P *3/00*

U.S. Cl. 123—647 **7 Claims**

1. An ignition device for an internal-combustion engine in which an ignition module provided with an IC section for interrupting the primary current of an ignition coil is assembled integrally with said ignition coil;

said ignition module having a heat sink for dissipating heat produced at said IC section, a relay member secured on said heat sink, a connecting terminal fitted on said relay member and electrically connected with an internal terminal of said ignition coil, and a wire for electrical connection between said connecting terminal and said IC section.

5,558,075

FUEL METERING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Hidetaka Maki; Yusuke Hasegawa, and Shusuke Akazaki, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1995, Ser. No. 514,785

Claims priority, application Japan, Aug. 12, 1994, 6-212163; Aug. 12, 1994, 6-212164

Int. Cl.[6] F02D *41/14*

U.S. Cl. 123—680 **29 Claims**

1. A system for controlling fuel metering for an internal combustion engine, comprising:

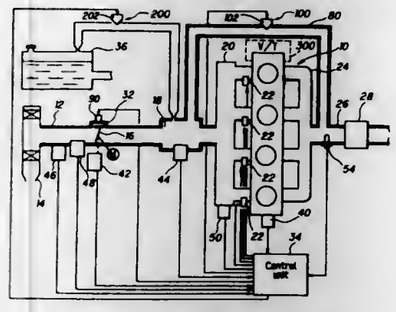
air/fuel ratio detecting means for detecting an air/fuel ratio (KACT) of an exhaust gas of the engine;

engine operating condition detecting means for detecting an operating condition of the engine;

fuel injection quantity determining means for determining a quantity of fuel injection (Tim) to be supplied to the engine;

first feedback correction coefficient calculation means for calculating variables to determine a first feedback correction coefficient (KSTR) using a first control law having an algorithm expressed in a recursion formula;

second feedback correction coefficient calculation means for calculating variables to determine a second feedback correction coefficient (KLAF(KSTRL)), whose control response is inferior to that of the first feedback correction coefficient, using a second control law;



switching means for switching the first feedback correction coefficient (KSTR) and the second feedback correction coefficient (KLAF(KSTRL)) therebetween; and

feedback control means for correcting a manipulated variable by the switched one of the feedback correction coefficients (KSTR, KLAF(KSTRL)) to bring at least one of the detected air/fuel ratio (KACT) and the quantity of fuel injection (Tim) to a desired value (KCMD);

wherein

said switching means replacing at least one of the variables of one of the feedback correction coefficients (KSTR, KLAF(KSTRL)) with a value to be used in a calculation of the other of the feedback correction coefficients (KLAF(KSTRL), KSTR).

5,558,076

FUEL METERING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

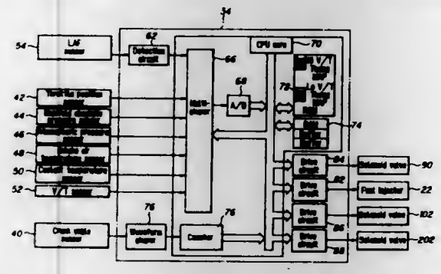
Hidetaka Maki; Shusuke Akazaki; Yusuke Hasegawa, and Yoichi Nishimura, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1995, Ser. No. 514,857

Claims priority, application Japan, Feb. 25, 1995, 7-061660

Int. Cl.[6] F02D *41/14;43/00*

U.S. Cl. 123—687 **26 Claims**



1. A system for controlling fuel metering for an internal combustion engine, comprising:

air/fuel ratio detecting means for detecting an air/fuel ratio (KACT) of an exhaust gas of the engine;

engine operating condition detecting means for detecting an operating condition of the engine;

fuel injection quantity determining means for determining a quantity of fuel injection (Tim) to be supplied to the engine;

first feedback correction coefficient calculation means for calculating a first feedback correction coefficient (KSTR) using a first control law having an algorithm expressed in a recursion formula;

second feedback correction coefficient calculation means for calculating a second feedback correction coefficient (KLAF(KSTRL)), whose control response is inferior to that of the first feedback correction coefficient, using a second control law;

switching means for switching the first feedback correction coefficient (KSTR) and the second feedback correction coefficient (KLAF(KSTRL)) therebetween; and

feedback control means for correcting a manipulated variable by the switched one of the feedback correction coefficients (KSTR, KLAF(KSTRL)) to bring at least one of the detected air/fuel ratio (KACT) and the quantity of fuel injection (Tim) to a desired value (KCMD);

wherein the improvement comprising:

said engine being provided with a mechanism having an actuator which switches an operating condition of an engine valve;

engine valve operation switching means being provided for switching the operating condition of the engine valve through the actuator between a first characteristic (LoV/T) for a low engine speed and a second characteristic (HiV/T) for a high engine speed; and

said feedback control means correcting the manipulated variable by the second feedback correction coefficient (KLAF(KSTRL)) when said engine valve operation switching means switches the operating condition of the engine valve to the second characteristic (HiV/T).

5,558,077

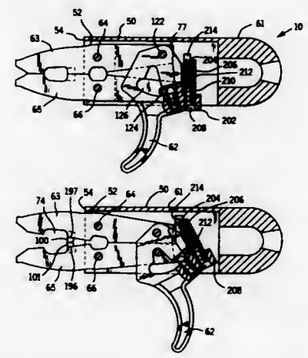
BOW STRING RELEASE WITH BEARD GUARD

Louis R. Linsmeyer, Hutisford, Wis., assignor to Tru-Fire Corporation, Fond du Lac, Wis.

Continuation-in-part of Ser. No. 979,106, Nov. 20, 1992, Pat. No. 5,357,939. This application Aug. 4, 1994, Ser. No. 285,800

Int. Cl.[6] F41B *5/18*

U.S. Cl. 124—35.2 **3 Claims**



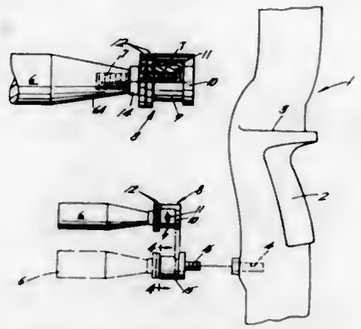
1. A bow string release having a body, a movable jaw mechanism within the body, the jaw mechanism including means for engaging a bow string when in a first position and for releasing the bow string when in a second position, and a trigger for controlling the jaw mechanism, the release further comprising a guard adjacent the jaw mechanism for minimizing the entry of hair into the jaw mechanism, the guard positioned for defining a gap between the guard and the jaw mechanism, regardless of the position of the movable jaw mechanism.

5,558,078

member; wherein said stack member has four side walls; and

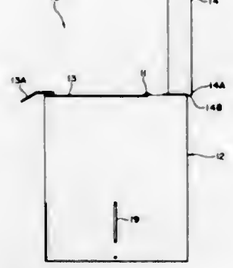
repeating step (c) and said at least partial withdrawal and reinsertion as often as necessary until the carbon dioxide

5,558,078
ARCHERY BOW STABILIZER
Patrick J. Dunlap, 13290 Table Rock Rd., Central Point, Oreg. 97502
Filed Nov. 4, 1994, Ser. No. 334,148
Int. Cl.[6] F41B *5/20*
U.S. Cl. 124—8.9 **5 Claims**



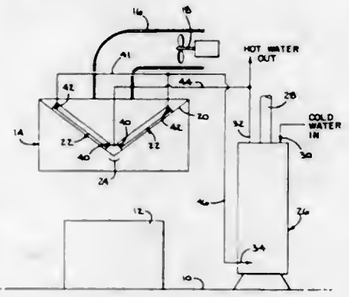
3. An archery bow stabilizer comprising,
a weight member including a threaded stem,
a clamp carried by said threaded stem,
a retainer having screw threads for screwed attachment to the bow and having spaced apart surfaces for clamped engagement with said clamp, and
said weight member in threaded engagement with said clamp and attachable to said retainer by manual rotation of the weight member.

5,558,079
TRASH INCINERATOR
James W. Goetz, Wheatland, Wyo., assignor to Diamond G Progressive Enterprises, Inc., Wheatland, Wyo.
Filed Jul. 7, 1995, Ser. No. 499,780
Int. Cl.[6] F23G *5/00*
U.S. Cl. 126—224 **8 Claims**



1. A trash incinerator comprising:
(a) a body including a burn chamber;
(b) a vertical tubular stack member extending upwardly from said body member; wherein said stack member communicates with said burn chamber to enable combustion gases to exit said burn chamber into said stack member; wherein said stack member includes an opening for fresh air to enter said stack member; wherein said stack member has four side walls; and wherein opposing side walls are parallel to each other; and
(c) spark arrestor means in said stack member for preventing sparks from escaping out of said stack member; wherein said spark arrestor comprises an elongated unitary screen having openings therethrough; and wherein said screen is folded to provide a plurality of sections which extend between opposing side walls.

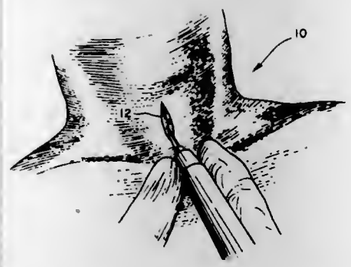
5,558,080
GREASE COLLECTING BAFFLE AND HEAT EXCHANGER ASSEMBLY FOR A WATER HEATING SYSTEM
Craig C. Grohman, Oak Creek; Edward Robinson, Caledonia, both of Wis., and Bob L. Barton, Camdenton, Mo., assignors to Modine Manufacturing Company, Racine, Wis.
Division of Ser. No. 320,949, Oct. 11, 1994, Pat. No. 5,524,607. This application Apr. 27, 1995, Ser. No. 430,756
Int. Cl.[6] F24C *15/20*
U.S. Cl. 126—299 D **15 Claims**



1. A water heating system comprising:
a heat generating range for cooking food;
a hood overlying said range for capturing fumes rising from the range or food thereon;
an exhaust duct connected to said hood whereby said fumes may be exhausted therefrom;
an exhaust fan connected to said exhaust duct for causing said fumes to be exhausted;
a water heater having an upper, hot water outlet, a cold water inlet and a recirculating water port; and
a baffle and heat exchanger assembly interposed between said hood and said exhaust duct, said assembly having a grease collecting baffle facing said hood and a heat exchanger backing said baffle, said heat exchanger having a first flow path for said fumes and a second flow path for water to be heater and in heat exchange relation with said first flow path, said second flow path having opposed ends, one of said ends being connected to said hot water outlet, the other of said ends being connected to said recirculating water port.

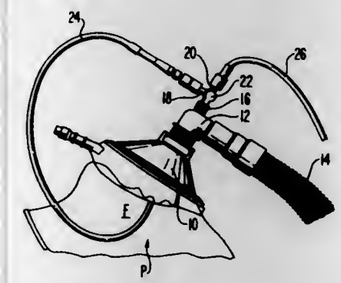
5,558,081
SURGICAL METHOD FOR INSERTING A TRANSTRACHEAL CATHETER
Alan Lipkin, 5410 E. Nassau Cir., Englewood, Colo. 80110
Continuation-in-part of Ser. No. 521,025, Aug. 29, 1995, abandoned. This application Feb. 5, 1996, Ser. No. 596,719
Int. Cl.[6] A61M *15/00*
U.S. Cl. 128—200.24 **15 Claims**

1. A method for inserting a transtracheal catheter into a patient's trachea said method comprising:
making an incision through the patient's skin and subcutaneous tissue at a midline of the patient's neck overlying the trachea;



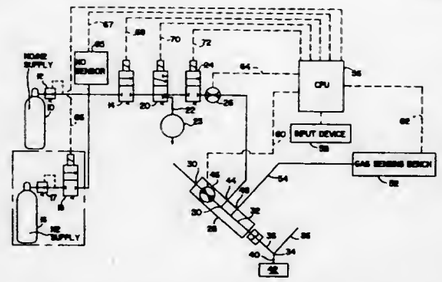
dissecting the patient's sternothyroid muscle apart within the incision to expose said trachea;
creating local advancement flaps on either side of the incision;
removing subcutaneous fat from beneath the flaps;
suturing the flaps to the sternothyroid muscle within the incision;
creating an opening through the trachea within the area exposed by the incision; and
inserting a transtracheal catheter through the opening into the trachea.

5,558,082
METHOD OF INTUBATING A PATIENT AND INTRODUCER FOR USE WITH SUCH METHOD
Robert F. Spencer, 22 Mountain View Dr., Waterbury, Vt. 05676
Filed Jan. 9, 1995, Ser. No. 369,819
Int. Cl.[6] A61M *16/00*
U.S. Cl. 128—200.26 **13 Claims**



1. A method of intubating and ventilating a patient to be anesthetized, comprising the steps of:
(a) inserting a tubular introducer into the airway of the patient and continuing such insertion in anticipation that the insertion will continue until the introducer is inserted into the trachea of the patient;
(b) ventilating the patient by face mask;
(c) sampling gaseous medium flowing out of the introducer during masked ventilation of the patient for measuring the carbon dioxide content of the gaseous medium thereby to obtain a determination of whether or not the end of the introducer has actually been inserted into the trachea of the patient; and
(d) if the carbon dioxide measurement indicates that the end of the introducer has actually been inserted into the trachea, passing an endotracheal tube over the introducer into the trachea of the patient, withdrawing the introducer and continuing ventilation through the endotracheal tube, or
(e) if the carbon dioxide measurement indicates that the end of the introducer has not been inserted into the trachea, at least partially withdrawing the introducer and reinserting it into what is again anticipated to be the trachea and thereafter repeating step (c) and said at least partial withdrawal and reinsertion, as often as necessary, until the carbon dioxide measurement does indicate that the end of the introducer has in fact been inserted into the trachea and then proceeding with step (d).

5,558,083
NITRIC OXIDE DELIVERY SYSTEM
Duncan P. L. Bathe, Madison; Thomas S. Kohlmann, McFarland; John R. Pinkert, Madison, and Robert Q. Tham, Middleton, all of Wis., assignors to Ohmeda Inc., Liberty Corner, N.J.
Filed Nov. 22, 1993, Ser. No. 156,175
Int. Cl.[6] A61M *15/00*
U.S. Cl. 128—203.12 **27 Claims**



1. A nitric oxide delivery system for providing a predetermined concentration of nitric oxide to a patient, said nitric oxide delivery system having a connection means adapted to be fluidly connected to a supply of nitric oxide having a known concentration of nitric oxide, said nitric oxide delivery system further comprising a patient circuit having an inspiratory limb adapted to receive a breathing gas from a gas delivery system and communicate the breathing gas to a patient, a flow transducer located in said inspiratory limb of said patient breathing circuit for sensing the total flow of gas delivered by a gas delivery system to the patient and providing a signal indicative of such flow, input means for providing a signal indicative of the predetermined concentration of nitric oxide to be delivered to said inspirator limb of said breathing circuit, a flow control valve controlling the flow of nitric oxide from a supply of nitric oxide, conduit means in said inspiratory limb of said patient breathing circuit receiving the flow of nitric oxide from said flow control valve and combining the flow into the flow of gas from a gas delivery system, and a signal processor responsive to the signal from said flow transducer and to the signal indicative of the predetermined concentration to provide a signal to said flow control valve to establisb a flow of nitric oxide through said flow control valve to said conduit means in an amount to establish a nitric oxide concentration delivered to a patient in the predetermined concentration.

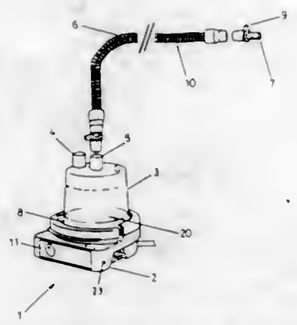
5,558,084
HUMIDIFIER WITH DELIVERY TUBE CONDENSATION PREVENTING STRUCTURE AND CONTROL
Michael G. Daniell, and Andrew B. Clark, both of Auckland, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand
Filed Oct. 2, 1992, Ser. No. 955,503
Claims priority, application New Zealand, Oct. 4, 1991, 240102
Int. Cl.[6] A61M *16/16;* **H05B** *3/00;* **F24F** *6/02*
U.S. Cl. 128—203.17 **7 Claims**

1. A respiratory humidifier comprising:
a humidifying chamber having a gases outlet;

(c) providing a disposable container having a formulation

corresponding commencement, duration and termination information to a microcontroller;

5,558,088
SINGLE PATIENT USE DISPOSABLE CARBON DIOXIDE



a delivery conduit extending between said gases outlet of said humidifying chamber and a user, said delivery conduit being exposed to ambient temperature;

heating means energizable to heat water in said humidifying chamber to humidify gases supplied to said humidifying chamber;

control means which, on occasion, energize said heating means;

ambient temperature sensing means to sense the ambient temperature of the surrounding atmosphere; and

differential temperature selection means to allow a user to select a value representative of a desired temperature difference between the temperature of humidified gases supplied by the humidifier chamber and ambient temperature;

said ambient temperature sensing means and said differential temperature selection means respectively providing an indication of the ambient temperature and said value representative of a desired difference temperature to said control means;

said control means calculating a desired gases outlet temperature as the sum of the sensed ambient temperature and said value representative of a desired difference temperature such that said gases outlet temperature tracks said ambient temperature;

said control means selectively energizing said heating means to control the temperature of said humidified gases supplied by said humidifier at said gases outlet to said calculated temperature to thereby minimize condensation of said humidified gases passing through said delivery conduit.

5,558,085

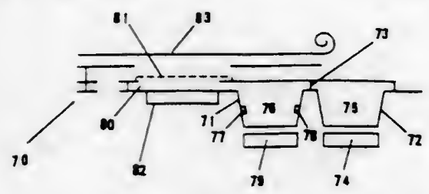
INTRAPULMONARY DELIVERY OF PEPTIDE DRUGS

Reid M. Rubsamen, Berkeley, and Lester J. Lloyd, Orinda, both of Calif., assignors to Aradigm Corporation, Hayward, Calif.

Continuation-in-part of Ser. No. 279,720, Jul. 25, 1994, Pat. No. 5,419,315, which is a continuation of Ser. No. 10,989, Jan. 29, 1993, abandoned. This application Oct. 28, 1994, Ser. No. 330,971

Int. Cl.[6] A61M *11/00*

U.S. Cl. 128—200.14 **31 Claims**



1. A method of administering a peptide drug for inhalation by a patient, comprising:

(a) providing a hand-held, self contained device;

(b) determining a drug release point based upon real time values of both a patient's inspiratory rate and inspiratory volume;

(c) providing a disposable container having a formulation therein comprising a carrier and peptide drug;

(d) providing an open channel which includes an abutment therein and placing said open channel in fluid communication with said disposable container;

(e) providing a porous membrane having pores with a diameter of 0.25 to 6 microns in fluid communication with said open channel;

(f) moving said formulation from said disposable container through said abutment and into said open channel, the abutment being broken upon application of force thereon by said formulation;

(g) aerosolizing said formulation by moving said formulation through said open channel and through said porous membrane;

(h) providing said aerosolized formulation for inhalation by a patient;

(i) repeating steps (a–h) at substantially the same inspiratory flow rate and inspiratory flow volume and providing a new disposable porous membrane for each aerosolizing step (g).

5,558,086

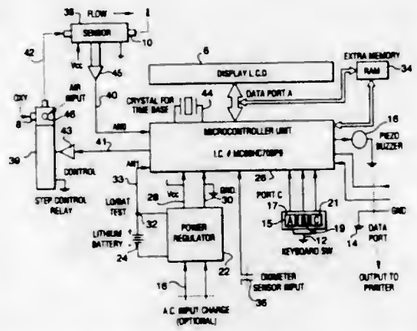
METHOD AND APPARATUS FOR THE INTERMITTENT DELIVERY OF OXYGEN THERAPY TO A PERSON

Donald M. Smith, Vancouver, and Roderick M. Townley, Abbotsford, both of Canada, assignors to Freedom Air Services, Vancouver, Canada

Continuation-in-part of Ser. No. 991,824, Dec. 16, 1992, abandoned. This application Nov. 23, 1994, Ser. No. 347,237

Int. Cl.[6] A61M *16/00;* **A62B** *7/00;9/00;* **F16K** *31/26*

U.S. Cl. 128—204.26 **19 Claims**



1. A portable apparatus for carrying by a person and supplying dosages of an oxygen-containing gas in synchronization with the inhalation phase of the respiratory cycle of a person, comprising:

(a) a low voltage step control relay having a gas inlet port on the apparatus adapted for connection to a source of oxygen-containing gas; means for reciprocally moving said step control relay from a closed non-gas flow position to an open gas flow position responsive to an electrical signal from a microcontroller of sufficient length of time to open said step control relay, for maintaining said step control relay, after being opened, in an open gas flow position without drawing further electrical current, and for moving said step control relay from an open gas flow position to a closed non-gas flow position responsive to a subsequent electrical signal from a microcontroller of sufficient length of time to close said step control relay;

(b) a low voltage microbridge mass gas flow sensor connected to a gas outlet port on the apparatus, said gas flow sensor sensing the commencement of inhalation, the duration of oxygen containing gas flow, and the termination of inhalation during each inhalation phase of the respiratory cycle and transmitting

corresponding commencement, duration and termination information to a microcontroller;

(c) a programmed low voltage microcontroller for receiving a first electrical signal from the gas flow sensor upon detection by the gas flow sensor of the commencement of inhalation, and for transmitting said first electric signal to the step control relay of sufficient duration to cause the step control relay to move to said open gas flow position; and for receiving a second electrical signal from the gas flow sensor upon detection by the gas flow sensor of the termination of inhalation, and for transmitting said second electric signal to the step control relay of sufficient duration to cause the step control relay to move to said closed non-gas flow position;

(d) a portable low voltage electrical power supply for operating the low voltage step control relay, the low voltage gas flow sensor and the low voltage microcontroller;

(e) a display on the apparatus connected to the microcontroller and the gas flow sensor for displaying programmed data from said microcontroller, and data received from said gas flow sensor;

(f) a keyboard on the apparatus connected to said microcontroller for enabling manual control commands to be conveyed to said microcontroller; and

(g) said apparatus having a total mass capable of being carried by a single person.

5,558,087

DEVICE FOR REDUCING THE RELATIVE HUMIDITY OF A FLOWING GAS

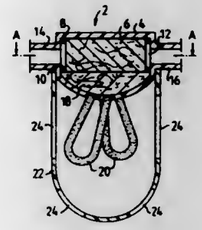
Georgios Psaros, Tullinge, and Marie Johansson, Kista, both of Sweden, assignors to Siemens Elema AB, Solna, Sweden

Filed Feb. 28, 1995, Ser. No. 395,476

Claims priority, application Sweden, Mar. 24, 1994, 9400991

Int. Cl.[6] A62B *7/00*

U.S. Cl. 128—205.12 **10 Claims**



1. In a ventilator for supplying breathing gas to a patient a device for reducing the relative humidity of a flowing gas which is warmer than ambient air, comprising:

a container having an inlet and an outlet for flowing gas from which moisture is to be removed;

a flow channel disposed in said container and placing said inlet and said outlet in fluid communication and through which said flowing gas flows in said container;

hydrophilic material disposed in said container and being at least partially surrounded by at least one moisture permeable element directly connected to said hydrophilic material and providing a communication path between said hydrophilic material and ambient atmosphere for permitting evaporative discharge of moisture, adsorbed from said flowing gas into said hydrophilic material, from said hydrophilic material through said moisture permeable element directly into ambient air.

5,558,088

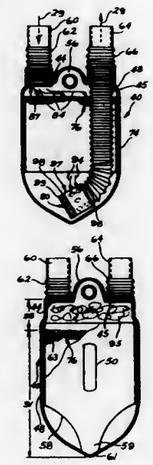
SINGLE PATIENT USE DISPOSABLE CARBON DIOXIDE ABSORBER WHICH IS PATIENT TIDAL VOLUME DEPENDENT AND SELF-REGULATING

Charles A. Smith, 811 Starlite Dr., Louisville, Ky. 40207

Continuation-in-part of Ser. No. 818,658, Oct. 28, 1991, Pat. No. 5,360,002, which is a continuation-in-part of Ser. No. 699,485, May 13, 1991, Pat. No. 5,228,435. This application Oct. 28, 1994, Ser. No. 330,444

Int. Cl.[6] A62B *7/10;23/02;19/00*

U.S. Cl. 128—205.28 **11 Claims**



1. A carbon dioxide absorber having an inlet and an outlet conduit, said absorber having self-regulating means for providing patient tidal volume dependent heated and humidified air to a patient, said self-regulating means comprising: a container having an inlet opening and an outlet opening connected respectively to the inlet and outlet conduits, a predetermined amount of carbon dioxide absorbent material disposed between such inlet and outlet openings, the container having a total volume of free air space when said scrubber material is disposed therein of in the range of between 470 to 1000 cc's, said outlet conduit being adapted to be connected to a patient and said outlet conduit having a total volume equal to about twice the volume of free air space of said container and wherein the volume of said container is approximately equal to the tidal volume of a patient.

5,558,089

RESPIRATOR NOSE CLIP

David M. Castiglione, South St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 322,576, Oct. 13, 1994. This application Dec. 27, 1995, Ser. No. 578,073

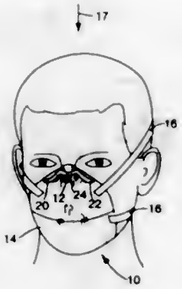
Int. Cl.[6] A62B *7/10*

U.S. Cl. 128—206.24 **20 Claims**

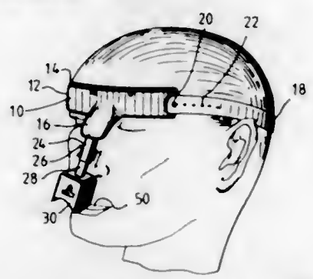
1. A nose-clip sized and shaped for securement to a respirator to assist in fitting the respirator over a person's nose, the nose-clip comprising:

a non-linear strip that when projected on an XY plane and viewed from the front has first, second, and third inflections, first and second wings, and a midsection, the midsection being disposed between the first and second wings and having first and second frame members that are joined together and offset from each other at an angle α of 45 to 179 degrees, the first, second, and third inflections being disposed on the non-linear strip between the first wing and the midsection, centrally in the midsection, and between the midsection and the second wing, respectively.

a plurality of therapeutic transducer elements for generating therapeutic ultrasonic waves;



5,558,090
MULTI-PURPOSE HEAD-MOUNTED ADJUSTABLE MEDICAL TUBE HOLDER
Lonnie A. James, 63 E. 2nd St., Huntington Station, N.Y. 11746
Filed Oct. 30, 1995, Ser. No. 549,872
Int. Cl.[6] A61M *25/02; 16/04*
U.S. Cl. 128—207.18 **10 Claims**

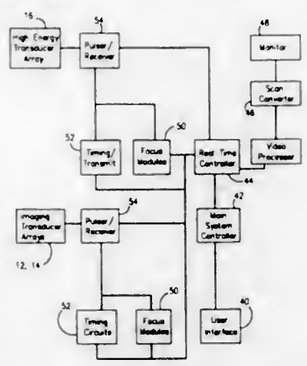


1. An endotracheal holder apparatus for securing an endotracheal tube in the operative position thereof in the airway of a patient, comprising:
a) a head band including an adjustable strap connected directly to a brow band having a brow band extension projecting outwardly;
b) an adjustable rigid support sleeve downwardly extending from said brow band extension capable of positioning an endotracheal tube in the proper position within a patient's airway; and
c) tube holding means affixed to the bottom of said support sleeve to facilitate positioning of an endotracheal tube and prevent collapse due to patient's biting of endotracheal tube, said tube holding means having slot means for receiving and holding an endotracheal tube entering the mouth of a patient and means for permitting a bite block to be attached, said tube holding means being shaped to facilitate entry of material, medication and additional apparatus into the mouth of a patient while an endotracheal tube is in place.

5,558,091
MAGNETIC DETERMINATION OF POSITION AND ORIENTATION
David E. Acker, Setauket, N.Y.; Ian McNulty, Naperville, Ill.; Robert C. Pacheco, New York, and Wayne Grandner, Port Jefferson Station, both of N.Y., assignors to Biosense, Inc., Orangeburg, N.Y.
Filed Oct. 6, 1993, Ser. No. 132,479
Int. Cl.[6] A61B *5/05*
U.S. Cl. 128—653.1 **45 Claims**

1. Apparatus for determining position of an object comprising:
(a) magnet means for generating a plurality of different magnetic fields in a sensing volume, each said field having at least one component having a magnitude which is quasilinear with respect to distance in a reference direction within said sensing volume, said magnitude being non-zero in at least some locations within said sensing volume;
(b) control means for actuating said magnet means to generate said fields in a predetermined sequence;
(c) a sensor connected to the object and movable within said sensing volume, and adapted to detect magnetic field components in at least two different local directions relative to the sensor and provide separate data representing each said component; and
(d) calculation means for determining the position of said sensor from said data representing said magnetic field components detected during generation of said fields.

5,558,092
METHODS AND APPARATUS FOR PERFORMING DIAGNOSTIC AND THERAPEUTIC ULTRASOUND SIMULTANEOUSLY
Evan C. Unger, and David W. Yellowhair, both of Tucson, Ariz., assignors to ImaRx Pharmaceutical Corp., Tucson, Ariz.
Filed Jun. 6, 1995, Ser. No. 468,052
Int. Cl.[6] A61B *8/00;* **A61F** *7/00;* **A61H** *1/00*
U.S. Cl. 128—660.03 **27 Claims**



1. An ultrasonic transducer assembly for simultaneous application of diagnostic and therapeutic ultrasonic waves comprising:

a plurality of therapeutic transducer elements for generating therapeutic ultrasonic waves;
a plurality of diagnostic transducer elements for generating and receiving diagnostic ultrasonic waves; and
a platform having a substantially planar upper surface on which said pluralities of therapeutic and diagnostic transducer elements are arranged, said plurality of therapeutic transducer elements being disposed on said planar surface centrally of said plurality of diagnostic transducer elements.

5,558,093
GUIDEWIRE WITH IMAGING CAPABILITY
Mark L. Pomeranz, Los Gatos, Calif., assignor to Cardiovascular Imaging Systems, Inc., Sunnyvale, Calif.
Continuation of Ser. No. 320,105, Oct. 5, 1994, abandoned, which is a continuation-in-part of Ser. No. 113,972, Aug. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 846,304, Mar. 5, 1992, abandoned, which is a continuation-in-part of Ser. No. 525,948, May 18, 1990, Pat. No. 5,095,911.
This application Mar. 2, 1995, Ser. No. 400,418
Int. Cl.[6] A61B *8/12*
U.S. Cl. 128—660.03 **13 Claims**

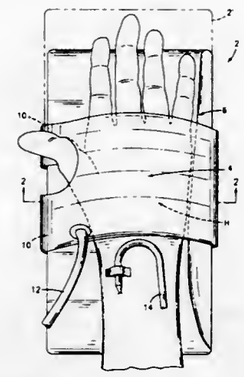
1. An improved vascular imaging and interventional method wherein a stenosed region in a blood vessel is treated with an interventional catheter, said improvement comprising imaging the stenosed region using an imaging guidewire which is movably disposed within the interventional catheter, wherein the interventional catheter is used for treating the stenosed region.

5,558,094
METHODS FOR USING PERSISTENT GASES AS ULTRASOUND CONTRAST MEDIA
Steven M. Quay, Pacific Palisades, Calif., assignor to Sonus Pharmaceuticals, Inc., Bothell, Wash.
Division of Ser. No. 893,657, Jun. 5, 1992, Pat. No. 5,409,688, which is a continuation-in-part of Ser. No. 761,311, Sep. 17, 1991, abandoned. This application Feb. 1, 1995, Ser. No. 382,253
Int. Cl.[6] A61K *49/02*
U.S. Cl. 128—662.02 **17 Claims**

17. A method of ultrasound imaging comprising the steps of:
(1) providing a biocompatible ultrasound contrast agent comprising a member of the group consisting of hexafluoropropylene, octafluoropropane, octofluoro-2-butene, hexafluoro-2-butyne, hexafluorobuta-1,3-diene, octafluorocyclobutane and decafluorobutane to an animal; and
(2) performing an ultrasound scan on said animal.

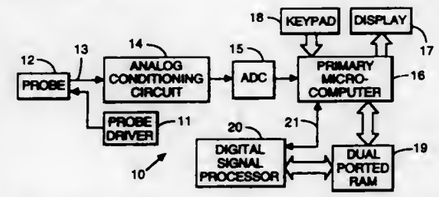
5,558,095
METHOD AND DEVICE FOR INCREASING HAND VASCULAR RESISTANCE DURING BLOOD PRESSURE MEASUREMENT
James M. Hynson, San Francisco, and Jeffrey A. Katz, Millbrae, both of Calif.
Continuation of Ser. No. 297,301, Aug. 29, 1994. This application Aug. 25, 1995, Ser. No. 520,140
Int. Cl.[6] A61B *5/00*
U.S. Cl. 128—668 **3 Claims**

1. A method for obtaining accurate blood pressure readings from a patient's radial artery during periods of vasodilation of blood vessels in the hand, said method comprising the steps of:



a) applying uniform pressure to the patient's hand so as to uniformly restrict blood flow in the patient's hand to a degree necessary to elevate blood pressure in a distal portion of the patient's arm to a level which is comparable to aortic blood pressure; and
b) invasively measuring the patient's blood pressure in the radial artery in said distal portion of the patient's arm while continuing to restrict blood flow in the patient's hand.

5,558,096
BLOOD PULSE DETECTION METHOD USING AUTOCORRELATION
Eugene S. Palatnik, Pewaukee, Wis., assignor to Biochem International, Inc., Waukesha, Wis.
Filed Jul. 21, 1995, Ser. No. 505,502
Int. Cl.[6] A61B *5/02*
U.S. Cl. 128—687 **18 Claims**



1. A method performed by a medical monitor in order to determine a period of a physiological function of a patient, wherein the method comprises steps of:
operating a probe to produce an electrical signal which represents the physiological function;
periodically sampling the electrical signal at a given sampling rate to acquire a plurality of signal samples X(i), where i is an integer that designates a particular signal sample;
storing the plurality of signal samples in a memory;
applying serial autocorrelation to the plurality of signal samples to produce a sequence of summation values S(n), where n is a positive integer which designates a particular summation value and an order of the summation values in the sequence;
storing the sequence of summation values in the memory;
locating a peak summation value S(max), where max is a positive integer, by:
(a) deriving a threshold value,
(b) locating a first summation value S(ind1) which has a magnitude that is less than the threshold value and where ind1 is a positive integer,
(c) locating a second summation value S(ind2) having a magnitude greater than the threshold value and where ind2is a positive integer greater than ind1,

(d) locating a third summation value S(ind3) having a magnitude less than the threshold value and where ind3is a positive integer greater than ind2, and

(e) then locating the peak summation value S(max) as a summation value of greatest magnitude that is between the second and third summation values;

determining a count of summation values in the sequence of summation values from an initial summation value to the peak summation value S(max); and

deriving the period from the count of summation values and the given sampling rate.

5,558,097

METHOD FOR TACHYARRHYTHMIA DETECTION

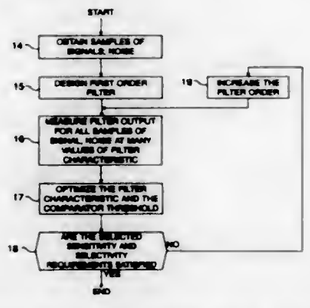
Peter Jacobson, Hagueneau, and Daniel Krolss, Schweighouse-Moder, both of France, assignors to ELA Medical S.A., Montrouge, France

Filed Aug. 9, 1994, Ser. No. 287,843

Claims priority, application France, Aug. 13, 1993, 93-09950

Int. Cl.[6] A61B *5/0464*

U.S. Cl. 128—705 **29 Claims**



1. A method for optimizing a sensing circuit for a tachyarrhythmia detector, having at least one filter having an input for signals, a filter characteristic and an output, and at least one comparator having an input connected to the filter output and a threshold value input, comprising the steps of:

a) obtaining samples of desired and undesired signals;

b) determining a peak filter output amplitude for said samples of desired and undesired signals as a function of variations in a filter characteristic value;

c) determining a set of combinations of said filter characteristic values, and the threshold value of said comparator, which provide a preselected selectivity and sensitivity; and

d) selecting a single combination of said filter characteristic value and comparator threshold value resulting in a minimum gain*bandwidth product.

5,558,098

METHOD AND APPARATUS FOR DETECTING LEAD SENSING ARTIFACTS IN CARDIAC ELECTROGRAMS

Eric S. Fain, Menlo Park, Calif., assignor to Ventritex, Inc., Sunnyvale, Calif.

Filed Nov. 2, 1995, Ser. No. 556,790

Int. Cl.[6] A61B *5/0402*

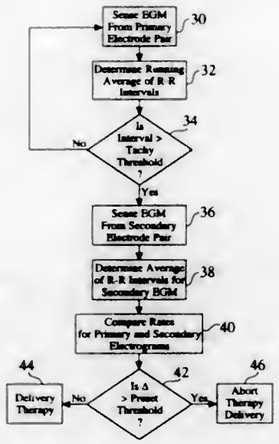
U.S. Cl. 128—706 **15 Claims**

1. A method for detecting the presence of sensing artifacts in a sensed cardiac electrogram comprising the steps of:

sensing a first electrogram signal from a first pair of electrodes;

sensing a second electrogram signal from a second pair of electrodes;

analyzing each of said first and second electrogram signals for cardiac event interval information; and



comparing said event interval information for said first electrogram signal with said event interval information for said second electrogram signal to determine if sensing artifacts are present in one of said electrogram signals.

5,558,099

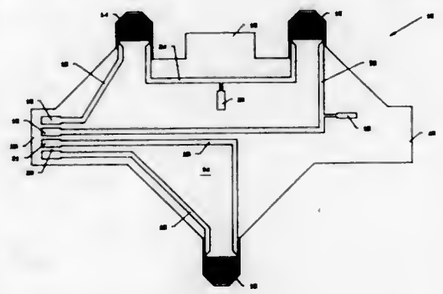
FLOW SENSOR SYSTEM

Bruce Bowman, Eden Prairie, and Peter Stasz, St. Paul, both of Minn., assignors to EdenTec, Inc., Eden Prairie, Minn.

Continuation of Ser. No. 182,424, Jan. 18, 1994, abandoned, which is a continuation of Ser. No. 934,725, Aug. 24, 1992, abandoned, which is a division of Ser. No. 665,552, Mar. 5, 1991, Pat. No. 5,161,541. This application Jul. 6, 1995, Ser. No. 498,580

Int. Cl.[6] A61B *5/08*

U.S. Cl. 128—724 **9 Claims**



1. An apparatus comprising:

a flexible substrate;

at least one heat sensor attached to the flexible substrate;

a connector, wherein the connector comprises a region of conductive ink attached to the flexible substrate; and a conductive path of conductive ink attached to the flexible substrate electrically coupling the at least one heat sensor to the connector.

5,558,100

BIOPSY FORCEPS FOR OBTAINING TISSUE SPECIMEN AND OPTIONALLY FOR COAGULATION

Dennis Cox, Saugus, Calif., assignor to Ballard Medical Products, Draper, Utah

Filed Dec. 19, 1994, Ser. No. 358,899

Int. Cl.[6] A61B *10/00*

U.S. Cl. 128—751 **4 Claims**

1. A biopsy forceps apparatus comprising: a flexible hollow support cable with a proximal end, having a distal end and a central passage from end to end, said support cable having an insulating layer surrounding an outer surface of the support cable from end to end;

a single electrically conductive control wire slidably fitted in and extending through said central passage, said electrically conductive control wire having an insulating layer surrounding that portion of the control wire which is inside said support cable and being connected to an electrically conductive mount at a distal end of the control wire;

an electrically conductive mount connected to said support cable at the distal end thereof, and comprising means for pivotally supporting a pair of electrically conductive metal jaws at the distal end of said support cable, said jaws having curved walls with sharp cutting edges which together form an enclosure when closed to trap an excised tissue specimen;

an electrically conductive spear means for stabilizing and holding tissue to be excised by said jaw, said spear means connected to said mount at the distal end of said support cable, and having a shaft with a pointed end extending into the enclosure formed by said jaws as they are closed to excise tissue; and

means for connection of said electrically conductive control wire to a source of electrical current so as to permit selective energizing of said control wire or mechanical closing of said jaws to excise tissue, and thereby simultaneous energizing of the mount, jaws and spear means;

whereby tissue can be either excised or cauterized by said apparatus, as selected by a user.

5,558,101

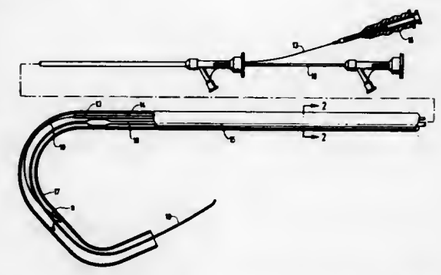
METHOD AND SYSTEM FOR HOLDING THE POSITION OF A GUIDING MEMBER

Dennis L. Brooks, Santa Clara; Alfredo G. Bayot, Newark; Mina W. B. Chow, San Jose, and Paul F. Muller, San Carlos, all of Calif., assignors to Advanced Cardiovascular System, Inc., Santa Clara, Calif.

Filed Oct. 14, 1994, Ser. No. 324,010

Int. Cl.[6] A61B *5/00*

U.S. Cl. 728—772 **19 Claims**



1. A system for maintaining an elongated intravascular member in a longitudinal position within a patient's artery while moving a catheter over the elongated intravascular member, comprising:

a) an elongated guiding sheath having proximal and distal ends, a port in the distal end and an inner lumen extending therein to the port in the distal end;

b) an elongated torqueable engaging device which is configured to be slidably disposed within the inner lumen of the guiding sheath and which has a flexible distal portion configured to extend out the port in the distal end of the guiding sheath and wrap around and engage an intravascular member adjacent thereto when the torqueable engaging device is rotated so as to hold the intravascular member in position; and

c) torquing means on a proximal extremity of the torqueable engaging device to rotate the latter within the elongated guiding sheath.

5,558,102

UNIVERSAL TIE-LESS PATIENT LIMB RESTRAINT DEVICE

Andrew D. McCarthy, 5507 Albia Rd., Bethesda, Md. 20816

Continuation-in-part of Ser. No. 723,049, Jun. 28, 1991, Pat. No. 5,161,545, and a continuation-in-part of Ser. No. 973,974, Nov. 9, 1993, abandoned. This application Jun. 9, 1994, Ser. No. 257,279

Int. Cl.[6] A61F *5/37*

U.S. Cl. 128—878 **5 Claims**

1. A restraint device adapted for interruptable contact with a to be restrained limb and for concurrent remote anchoring to limit exaggerated limb flexing, comprising:

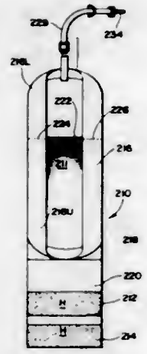
(a) a flexible fabric member being of a generally rectangular configuration with first and second planar surfaces having substantially parallel, opposing linear margins defining the longitudinal dimension of each of said surfaces;

(b) a flexible cloth, ribbon-like element normally describing a closed circle when not in use, said flexible cloth being partly fastened across its length at two diametrically opposite points which are transversely disposed to the parallel opposing linear margins and located on the first surface of said fabric member along one lateral transverse dimension of said cloth, and proximal to a first longitudinal end thereof, such ribbon-like element thus presenting two substantially symmetrical, hemispherical loops adapted for interruptable, looping engagement with an elongate anchoring strap;

(c) at least one first adhering segment of a pile type mounted transversely on the first planar surface of said fabric member

5,558,105

HAIR BRADING TOOL



and being located proximal to a second longitudinal end of said fabric member which is distal from the ribbon-like element;

(d) at least one second adhering segment of a hook-locking type mounted on the second planar surface of said fabric member and being located proximal to the first longitudinal end of said fabric member;

(e) the adhering segments on the first and second longitudinal ends being aligned complementally so that when the first longitudinal end of the fabric member is folded about a patient limb, and serves to overlap the second longitudinal end thereof, then the first adhering segment on the first fabric surface will contact with the second adhering segment on the second fabric surface; and

(f) a separable elongate anchoring strap which cooperates with at least one of the two hemispherical loops of said ribbon-like element by being in sliding engagement at one longitudinal end to one of the hemispherical loops, and said anchoring strap adapted for being passed through the second of said hemispherical loops, while the device is disposed in the limb restraining mode, with the other longitudinal end of said anchoring strap itself terminating in an engageable element which forms an anchor strap attachment and release means, with the strap itself being of an intermediate length sufficient for such hemispherical-loop engaged strap to also extend and be strung around a support post which is spaced apart from the limb restraint device, whereby the overall flexing movement of the restrained limb is controlled by the associated anchoring strap.

5,558,103
ALIGNMENT OF FILTER AND CIGARETTE COMPONENTS

Martin T. Garthaffner, Chesterfield, and Ronald D. Honaker, Powhatan, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Mar. 29, 1995, Ser. No. 413,062
Int. Cl.[6] H24C *5/52*
U.S. Cl. 131—94 **17 Claims**

1. A method of manufacturing smoking articles comprising at least two components, the method comprising the steps of:

supplying spaced apart first and second components of a first type and first and second components of a second type to respective component holding channels on a drum with the first and second components of the second type located between adjacent ends of spaced apart first and second components of the first type, with respective first gaps between the respective ends of said components of the second type and the adjacent ends of said components of the first type and a second gap between the first and second components of the second type;

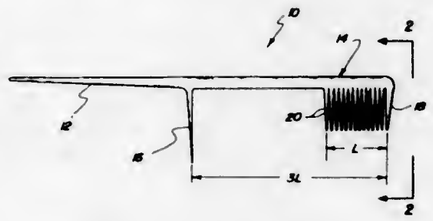
spreading apart the component holding channels at the second gap to open the second gap between the first and second components of the second type; and

restricting the outward axial movement of the components of the first type in the channels during said spreading apart of the channels such that said respective first gaps narrow while the second gap opens.

5,558,104
BRAIDING COMB

Deborah D. Clouser, 1246 Mulberry St., Reading, Pa. 19604

Filed May 8, 1995, Ser. No. 438,084
Int. Cl.[6] A45D *24/38*
U.S. Cl. 132—144 **3 Claims**



1. A braiding comb comprising:

an elongated handle member, the elongated handle member including a first end proximal to which an individual can grasp and manipulate the handle member and a second end spaced from the first end;

a comb assembly having an end tine and a plurality of intermediate tine fixedly secured orthogonally to the elongated handle member proximal to the second end thereof the plurality of intermediate tines extend a first distance from the end tine, with the elongated uniformly tapered pick member being spaced a second distance from the end tine equal to approximately three times the first distance;

a single elongated pick member having a base end fixedly secured to the elongated handle member and tapering uniformly therefrom to a smaller outer end, said pick member projecting substantially orthogonally from the elongated handle member and oriented substantially medially between the first and second end thereof.

5,558,105
HAIR BEADING TOOL

Donald Rosenwinkel, Oak Park, Ill., and Mark Reyner, Oelwein, Iowa, assignors to Breslow, Morrison, Terzian & Associates, Inc., Chicago, Ill.

Filed Feb. 10, 1995, Ser. No. 386,453
Int. Cl.[6] A45D *7/02*
U.S. Cl. 132—212 **6 Claims**

1. A hair beading tool comprising:

a handle;

a spindle having a first end joined to the handle and a second, free end;

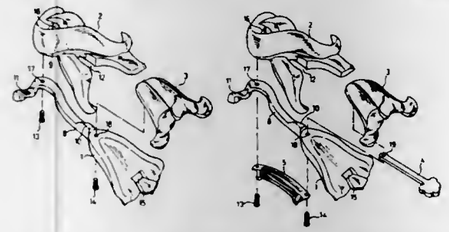
a string having a first end joined to the free end of the spindle and a second, free end; and

a hook joined to the handle and defining a slot therewith for receiving the string.

5,558,106
HAIR CLIP COMBINATION DEVICE

Ou Y. M. Der, P.O. Box 82-144, Taipei, Taiwan

Filed Aug. 16, 1995, Ser. No. 515,898
Int. Cl.[6] A45D *8/12*
U.S. Cl. 132—275 **4 Claims**



1. A hair clip kit device comprising a base, a holder member shaped like the receptacle of a flower and fastened to said base at one side, a petal-like cover covered on said base and abutted against said holder member, a petal-like extension rod for mounting between said base and said petal-like cover, a metal clip fastened to a bottom side of said base, a pin for securing said base to hair, and a clamping rod for securing said base to the hair, wherein said base comprises a retainer rod at one end, a first through hole adjacent to said retainer rod, a coupling block at one end of said retainer rod, a clamping tip at an opposite end of said retainer rod, and a second through hole on said retainer rod adjacent to said clamping tip; said holder member is fastened to the second through hole of said base by a screw, has a bottom coupling groove, which receives said retainer rod, and a bevel opening at one end of said bottom coupling groove which receives the coupling block of said base; said petal-like cover is fastened to the first through hole of said base by a screw.

5,558,107
HAIR CURLER ESPECIALLY FOR COLD WAVING

Hyeong S. Kim, Kowloon, Hong Kong, assignor to Georg Wiegner, Kowloon, Hong Kong

Filed Jun. 17, 1994, Ser. No. 261,258
Claims priority, application Germany, Jun. 24, 1993, 43 20 972.6
Int. Cl.[6] A45D *6/06*
U.S. Cl. 132—228 **12 Claims**

1. A hair curler comprising:

a curler body formed with an intermediate region in the form of a liquid-permeable elongated cylindrical mesh grid having circular stabilizing rings connected by axially-extending ribs forming a tube, a first end member at one end of said body closing said tube at said one end, and a second end member at an opposite end of said body in one piece with said tube and being provided with an axial opening communicating with an inner diameter of said tube and a multiplicity of notches along the outer periphery defining fingers between them to form a crown defining a connector to engage an adaptor for the supply of hair treatment fluids to be fed to said tube and to form clamping means for selectively engaging a clamp member; and a clamping band or clamping stirrup forming said clamp member engageable across a lock of hair wound on said grid and attached to said body.

5,558,108
PROCESS FOR REMOVING ZEBRA MUSSELS FROM RIGID STRUCTURES

Ted B. Croswell, Sr., 11555 Foster Rd., Baton Rouge, La. 70811-1218

Filed Jan. 6, 1995, Ser. No. 369,423
Int. Cl.[6] B08B *9/02;9/06*
U.S. Cl. 134—22.12 **9 Claims**

1. A process for removing mussels from a rigid structure through which water flows from a body of water containing zebra mussels comprising:

a. stopping the flow of water from said body of water through said rigid structure,

b. directing steam through said rigid structure in a direction opposite to the direction in whicb water flows through said rigid structure, said steam having a temperature and pressure sufficient to remove said mussels from said pipes and heat exchangers, for a period of time sufficient to remove said mussels from said structure,

c. conveying said steam and zebra mussels removed said structure to said body of water, and

d. discharging said steam and zebra mussels removed from said structure into said body of water.

5,558,109

AQUEOUS CLEANING METHOD AND COMPOSITION WITH NONIONIC SURFACTANTS FOR REMOVING WATER SOLUBLE FLUX

Francis R. Cala, Highland Park, and Richard A. Reynolds, Plainsboro, both of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Filed Feb. 21, 1995, Ser. No. 391,015
Int. Cl.[6] B08B *3/02;3/08;* **C11D** *1/825;1/83*
U.S. Cl. 134—42 **50 Claims**

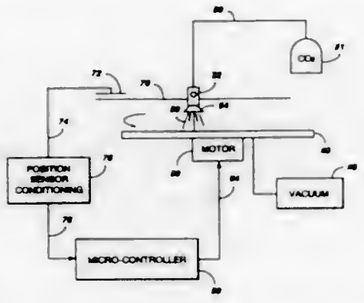
21. A method of removing water soluble flux residues from circuit assemblies comprises contacting said circuit assemblies with an aqueous solution containing at least three nonionic surfactants, said surfactants having cloud points of at least 95° F. in said aqueous solution and which cloud points are at least 5° F. different from each other.

5,558,110

APPARATUS FOR REMOVING PARTICULATE MATTER

John F. Williford, Jr., 7155 N.E. 126th St., Kirkland, Wash. 98034

Division of Ser. No. 97,172, Jul. 23, 1993, Pat. No. 5,364,474. This application Sep. 2, 1994, Ser. No. 300,415
Int. Cl.[6] B08B *3/02*
U.S. Cl. 134—56 R **16 Claims**



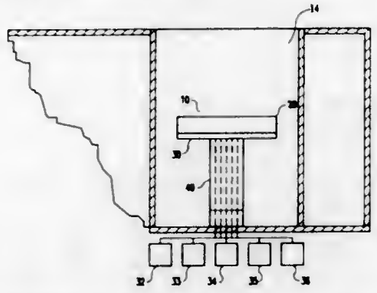
1. Apparatus for removing contaminants from a workpiece, comprising:
- a supply of cleaning material;
- a sprayhead for directing a stream of the cleaning material towards the workpiece;
- a support plate on which the workpiece is mounted, the support plate being disposed in front of the stream of the cleaning material;
- an accelerator for accelerating the stream of cleaning material in a first direction onto a region of the support plate radially displaced from a center of the support plate and an edge of the workpiece;
- a motor for rotating the support plate in a second direction that is substantially opposite the first direction of the stream of cleaning material in order to increase an effective velocity at which the cleaning material impacts the workpiece;
- means for moving the sprayhead across a face of the support plate;
- a sensor for detecting a position of the sprayhead in relation to the face of the support plate, the sensor producing a position signal that is proportional to the position of the sprayhead; and
- a control circuit that is connected to receive the position signal produced by the sensor, wherein the control circuit produces a motor drive signal that varies the speed of the motor in response to the position signal.

5,558,111

APPARATUS AND METHOD FOR CARRIER BACKING FILM RECONDITIONING

Michael F. Lofaro, Milton, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 2, 1995, Ser. No. 382,724
Int. Cl.[6] B08B *3/02*
U.S. Cl. 134—95.2 **12 Claims**



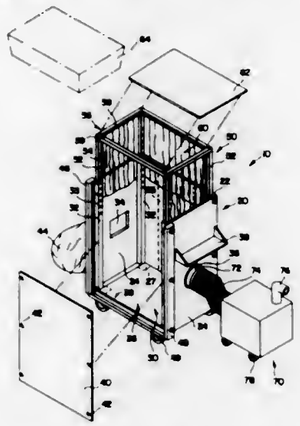
1. An apparatus for reconditioning a carrier backing film on a wafer carrier used in chemical-mechanical polishing of semiconductor wafers, comprising:
- a surface plate having perforations extending throughout its width;
- a flat perforated material on a first surface of the surface plate;
- a backing plate connected to a second surface of the surface plate and having connections to a cleaning solution supply and a vacuum supply; and
- a contacting means being extendable so that the perforated material on the surface plate contacts the carrier backing film prior to initiating a vacuum condition, said contacting means being retractable to break said vacuum condition.

5,558,112

PORTABLE ISOLATION ENCLOSURE AND PROCESS FOR CLEANING ENVIRONMENTS

Jerome F. Strieter, Silver Spring, Md., assignor to Southern Concepts, Inc., Hyattsville, Md.

Filed Mar. 27, 1995, Ser. No. 410,747
Int. Cl.[6] B08B *7/04*
U.S. Cl. 134—103.2 **16 Claims**



1. A portable isolation enclosure apparatus for cleaning areas located on wall structures, the apparatus comprising:

a booth including an open top and a plurality of side walls extending away from the open top to form a partially closed-wall structure with an interior sufficiently large to accommodate a worker, the booth having an open side extending from one of said plurality of side walls to another of said plurality of side walls which faces the one side wall, the open side providing a worker located in the interior of the booth access to an area on a wall located adjacent to the booth;

a frame member adjustably connected to the booth and spaced above the booth a longitudinal distance which is adjustable to permit the frame member to be moved vertically toward or away from the open top of the booth;

a plurality of adjustable length connectors, each connector being attached to the frame member and to the booth, the plurality of adjustable length connectors securing the frame member to the booth to permit adjustment of the vertical position of the frame member relative the open top of the booth; and

vacuum and filter means for drawing air from the exterior of the booth into the interior of the booth, and filtering the air drawn into the interior of the booth along with any airborne contaminants and discharging clean air to the exterior of the booth;

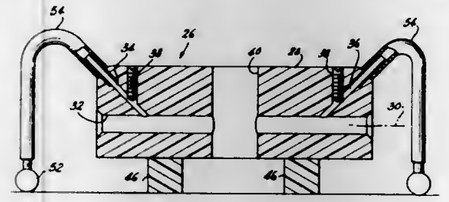
whereby the portable isolation enclosure apparatus can be positioned against a wall with the open side of the booth isolating an area on the wall which is located on the exterior of the booth, and a worker can access the area from inside the booth.

5,558,113

WIRE STRAND CLEANER

Ronald G. Casteel, Russell; Dennis E. Davis, Warren, and Robert R. Johnson, Sheffield, all of Pa., assignors to Osram Sylvania Inc., Danvers, Mass.

Filed Mar. 1, 1994, Ser. No. 203,977
Int. Cl.[6] B08B *3/08*
U.S. Cl. 134—122 R **4 Claims**



1. An agitator component for use with a wire strand cleaner comprising; a body having a longitudinal axis; a wire strand receiving bore coaxial with said longitudinal axis; a first fluid receiving passage connecting with said bore at an angle less than 90° and greater than 0° ; a fluid volume control adjustably mounted with said first fluid receiving passage; and a fluid releasing path having upper and lower ends formed in said body, normal to said bore and in communication therewith, said fluid releasing path being open to the environment at both its upper and lower ends.

5,558,114

ECCENTRIC SCORED RUPTURE DISK ASSEMBLY

John L. Strelow, Broken Arrow, Okla., assignor to Oklahoma Safety Equipment Co., Broken Arrow, Okla.

Filed Apr. 7, 1995, Ser. No. 418,564
Int. Cl.[6] F16K *17/16*
U.S. Cl. 137—68.27 **15 Claims**

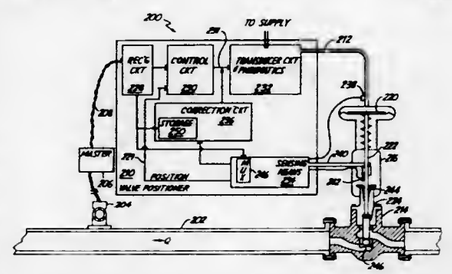
1. In a safety pressure relief device for placement between flange holders in a pressure system and including a buckling disk assembly having a retaining flange portion with an inside diameter and an outside diameter and a central bulged dome portion connected to the inside diameter by a transition portion, said bulged dome portion having a convex side and a concave side and said disk having a rated pressure on one side thereof at which said disk buckles in the direction of pressure, the improvement comprising:
- an arcuate score line formed on the flange portion of said disk eccentric with said bulged portion;
- said eccentric score line creating a line of weakness such that, when mounted between said flange holders, rated pressure applied to said bulged portion causes said disk to rupture along said eccentric score line; and
- said eccentric score line having an increasing resistance to tearing said flange portion from between said flange bolders as the rupture moves along the arcuate score line tires assuring that the ruptured portion is retained with the device.

5,558,115

VALVE POSITIONER WITH PRESSURE FEEDBACK, DYNAMIC CORRECTION AND DIAGNOSTICS

Gary A. Lenz, Eden Prairie; Gregory C. Brown, Minnetonka, and Jogesh Warrior, Chanhassen, all of Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Division of Ser. No. 112,694, Aug. 25, 1993. This application Jun. 7, 1995, Ser. No. 481,085
Int. Cl.[6] F16K *37/00*
U.S. Cl. 137—86 **7 Claims**



1. A valve positioner for providing a control pressure to a valve actuator mechanically coupled to a valve, the positioner communicating with a master over a communications loop, comprising:
- receiving means coupled to the communication loop for receiving an input representative of a desired valve position;
- sensing means for sensing a set of physical parameters affecting the valve, the set of sensed physical parameters including a position of the valve;
- control means coupled to the sensing means and the receiving means for providing a command output as a function of the desired valve position and the sensed valve position;
- transducer means receiving a source of pressurized air and the command output, for providing the control pressure as a function of the command output; and
- correction means for storing a valve attribute of the valve which is affected by one of the physical parameters, the correction means compensating the command output as a function of the sensed physical parameter and the stored valve attribute.

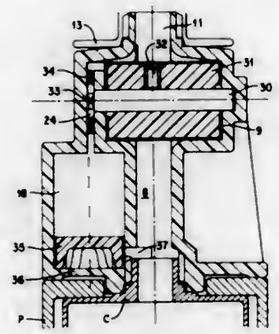
5,558,116

METERING CAP

therebetween from said inner central cavity in response to said application of pressure on said outer end of said valve

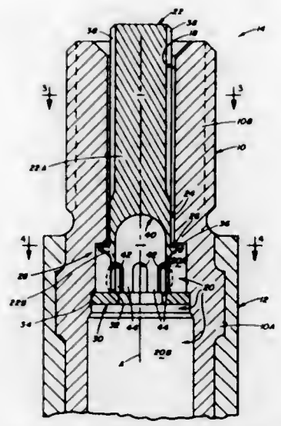
reel out said hose or reel in said hose, b) transmit fluid from said source of fluid through said high pressure line to its front

5,558,116
METERING CAP
Werner F. Dubach, Maur, Switzerland, assignor to Createchnic AG, Switzerland
Filed Feb. 22, 1995, Ser. No. 394,025
Claims priority, application Switzerland, Mar. 7, 1994, 665/94
Int. Cl.[6] G05D *11/03*
U.S. Cl. 137—101.11 **11 Claims**



1. In a metering cap for the metered combination of at least two flowable components comprising a first feed line (**8**) and an outlet line (**11**), at least two meshing metering rotors (**31**) disposed in a metering cap housing (**1**), said meshing metering rotors (**31**) actuable by a pressurized main component and driving a gear pump (**24**) for at least one admixing component which is conducted from at least a first distal container (**18, 20**) through a second feed line (**23**) into the pressurized main component, the improvement comprising: said first feed line (**8**) and the outlet line (**11**) substantially aligned in the metering cap housing (**1**), a mixing chamber (**10**) disposed between the meshing metering rotors (**31**) and the outlet line (**11**), the at least one admixing component introducible into the main component through said second feed line (**23**) extending onto said main component, and said mixing chamber (**10**) in communication with the metering chamber (**8**) in which the meshing metering rotors (**31**) turn, whereby the meshing metering rotors (**31**) aid the blending of said main component and said at least one admixing component in the mixing chamber (**10**); at least one gear wheel (**34**) of the .gear pump (**24**) disposed, fixed against relative rotation, on at least one rotor shaft of the at least two meshing metering rotors (**31**), said at least one gear wheel (**34**) meshing with a second gear wheel (**34**) of the gear pump (**24**); and said second feed line (**23**) for the at least one admixing component in the form of a tube extending through said mixing chamber (**10**) and having at least one outlet opening (**26**) on a side remote from a flow.

5,558,117
PNEUMATIC VALVE ASSEMBLY WITH DYNAMIC ANNULAR SEAL FLANGE
Frank J. McGuinness, 7519 Ponce Ave., West Hills, Calif. 91307
Filed Jan. 11, 1995, Ser. No. 371,125
Int. Cl.[6] B60C *29/04;* **F16K** *7/20;15/20;21/00*
U.S. Cl. 137—223 **18 Claims**



1. An pneumatic valve assembly for use to deliver and exhaust flow of pressurized air to and from an inflatable body, said pneumatic valve assembly comprising:

(a) an elongated valve body having an interior outer central passageway and an interior inner central cavity formed in said body and extending in coaxial relationship with one another, said cavity being larger in diameter than said passageway, said cavity at an outer end thereof communicating with said passageway at an inner end of said passageway, said valve body having an interior annular seal surface defined thereon at said outer end of said cavity and surrounding said inner end of said passageway;

(b) an elongated valve stem having an outer axial portion disposed through said passageway of said valve body and movable axially relative to said valve body, said valve stem having an inner axial portion connected at an outer end thereof to said outer axial portion at an inner end thereof, said inner axial portion extending past said annular seal surface defined on said valve body and into said cavity of said valve body, said valve stem being smaller in diameter than said outer central passageway of said valve body so as to define an annular channel therebetween;

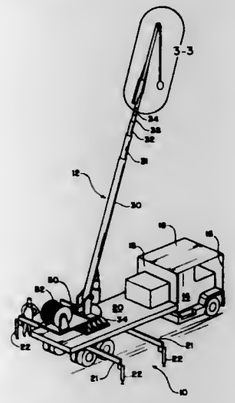
(c) a retainer member disposed in said inner central cavity of said valve body and displaced from said annular seal surface on said valve body, said retainer member being engaged with an inner end of said inner axial portion of said valve stem so as to support said valve stem within said outer central passageway and inner central cavity of said valve body;

(d) an annular seal flange attached to and extending about and radially outward from an outer end of said inner axial portion of said valve stem, said annular seal flange, in response to said support of said valve stem by said retainer member, being normally disposed in an engaged position against and sealed relationship with said annular seal surface in said valve body and having an outer side facing towards said annular channel between said valve body and valve stem, said annular seal flange, in response to delivery of a flow of pressurized air through said channel and against said outer side of said annular seal flange, being bendable to a displaced position away from and unsealed relationship with said annular seal surface so as to permit said flow of pressurized air to pass between said annular seal surface and said annular seal flange and into said outer end of said inner central cavity of said valve body, said annular seal flange being movable away from said annular seal surface upon application of pressure on an outward end of said valve stem so as to move said valve stem relative to said valve body toward said retainer member and permit flow of pressurized air between said annular seal surface and said annular seal flange from said outer chamber of said inner central cavity and into said annular channel between said valve body and valve stem; and

(e) means defining at least one aperture in at least one of said retainer member and said inner axial portion of said valve stem to permit said flow of pressurized air to pass through said aperture means through said cavity;

(f) said inner end of said inner axial portion of said valve stem including a plurality of legs being circumferentially spaced apart and deformable so as to permit said axial movement of said valve stem relative to said valve body and displacement of said annular seal flange away from said annular seal surface and thereby permit outward flow of pressurized air therebetween from said inner central cavity in response to said application of pressure on said outer end of said valve stem.

5,558,118
SYSTEM FOR REMOTELY CONTROLLING THE UNREELING AND TAKE-UP OF A HOSE ONA REEL
Jonathon E. Mooring, 9944 Bon Vue Dr., El Cajon, Calif. 92021
Filed May 30, 1995, Ser. No. 453,784
Int. Cl.[6] B66F *9/06;* **A62C** *5/00*
U.S. Cl. 137—342 **24 Claims**



1. A system for remotely controlling the un-reeling and take-up of a hose on a reel comprising:

a reel having a pair of laterally spaced side walls rigidly connected together by a tubular drum, said side walls having a diameter D1 and said tubular drum having an inside diameter D2; said reel being rigidly mounted on a tubular axle having an outer diameter D3, said tubular axle having at least one aperture in its side wall to provide communication with its interior; said axle extending from the side walls of said reel;

support means for the opposite end of said axle, said opposite ends of said axle being journaled in said support means so that it can rotate;

a primary power source and means connecting it to said axle to provide rotational motion;

an elongated hose having a length L1, a rear end, an outer diameter D4 and an inner diameter D5; at least part of said hose being coiled on said reel with the rear end of said hose being connected to the interior of the tubular drum of said reel;

an elongated tubular high pressure line having an outside diameter D6 and it is located in said hose and extends at least the length of said hose, said high pressure line having a front end and a rear end; D6 is less than D5 by a predetermined amount to form an annular chamber that extends the length of said hose between the outer surface of said high pressure line and the inner diameter of said hose;

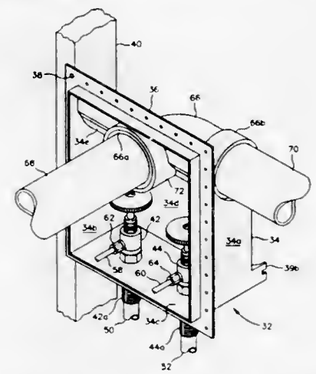
a plurality of secondary lines extending at least the length of said hose, said secondary lines passing through the annular chamber of said hose and they each have a front end and a rear end;

two of said secondary lines being fiber optic lines, the rear ends of said fiber optic lines being connected to a base modem, a source of electrical power is connected to said base modem, the front ends of said fiber optic lines being connected to a satellite modem;

a source of fluid and means for connecting it to the bottom end of said high pressure line; and

a control console connected to said satellite modem; said control console having means for a) directing said primary source to reel out said hose or reel in said hose, b) transmit fluid from said source of fluid through said high pressure line to its front end, and c) means for controlling the speed of a) and b).

5,558,119
WALL MOUNTED BOX FOR CONNECTING A P-TRAP TO A TRAP ARM
Duane R. Condon, 2330 Raymond Ave., Ramona, Calif. 92065, and Richard G. Davis, 9610 Green Spruce Rd., Lakeland, Tenn. 38002
Continuation of Ser. No. 252,406, Jun. 1, 1994, Pat. No. 5,423,345. This application May 1, 1995, Ser. No. 432,592
Int. Cl.[6] F16L *5/00*
U.S. Cl. 137—360 **13 Claims**

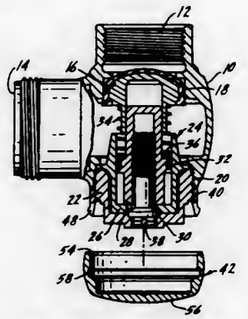


1. A wall mounted box for connecting a P-trap arm, comprising:

a housing for recessed installation in a surrounding wall panel; and

a drain fitting receptacle formed in the housing for connecting a P-trap on a forward side of the wall panel to a drain pipe on a rearward side of the wall panel, including a cylindrical sleeve for receiving the downstream end of a horizontally positioned arm having an upstream end connected to the P-trap.

5,558,120
VANDALPROOF CONTROL STOP CAP
John R. Wilson, Naperville, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.
Filed Apr. 26, 1995, Ser. No. 429,084
Int. Cl.[6] F16K *27/12*
U.S. Cl. 137—382 **14 Claims**



1. A control stop for use in a plumbing supply line including a body, an inlet and outlet in said body, a valve seat in said body and

a valve member movable toward and away from said valve seat to

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5,558,122
ELECTRIC SIGNALS SUPPLYING DEVICE IN

first ball valve means disposed in said first passage between said

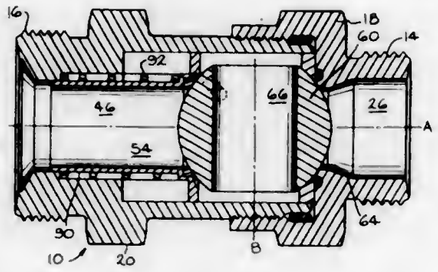
a valve member movable toward and away from said valve seat to control flow from said inlet to said outlet, an opening in said body providing exterior access to said valve member for adjustment thereof, the improvement comprising a vandalproof cap assembly for said opening, said cap assembly including a non-metallic sleeve attached to said body about said opening, and a cap mounted on said sleeve, said sleeve and cap having interengagement means thereon which permit free rotation of said cap relative to said sleeve and prevent removal of said cap from said sleeve except by a prying tool insertable between the cap and body to pry the cap away from the body and sleeve.

5,558,121

FLUID ACTUATED BALL CHECK VALVE ASSEMBLY

Alexander P. Webster, Concord, and Gary M. Jenski, Jr., Jackson, both of Mich., assignors to Aeroquip Corporation, Maumee, Ohio

Filed Jun. 7, 1995, Ser. No. 478,100
Int. Cl.[6] F16K *15/04*
U.S. Cl. 137—511 **9 Claims**



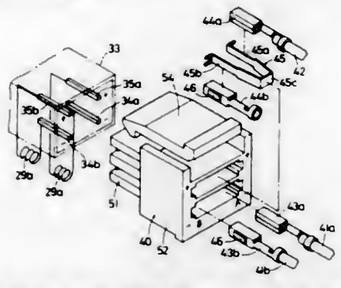
1. A fluid actuated ball check valve assembly comprising:
an annular housing have a first end and a second end, said annular housing defining a fluid passageway having a passageway axis extending therethrough;
a ball valve guide positioned in said fluid passageway including a ball valve stop ring having a first side and a second side, two opposed ball valve support walls extending from said second side of said stop ring, said support walls each having one inwardly extending ball valve pin, said pins being opposed to one another;
a fluid actuated ball valve defining two opposed pin slots, said slots being adapted to receive said ball valve pins to allow said ball valve to pivot in said fluid passageway, said ball valve defining a bore having a bore axis extending therethrough; and
resilient means engaging said ball valve to maintain said ball valve in said fluid passageway, whereby pressurized fluid in said fluid passageway at said first end of said annular housing causes said ball valve to pivot from a closed position wherein said fluid passageway axis is substantially perpendicular to said bore axis to an open position wherein said passageway axis is substantially parallel to said bore axis, said open position allowing fluid flow through said fluid passageway from said first end to said second end of said annular housing, and said closed position preventing fluid flow through said fluid passageway from said second end to said first end of said annular housing.

5,558,122

ELECTRIC SIGNALS SUPPLYING DEVICE IN SOLENOID VALVE

Takahide Kawamura, Mizuhomachi, and Kazuo Kotsuji, Kiyose, both of Japan, assignors to Koganei Corporation, Tokyo, Japan

Filed Jul. 24, 1995, Ser. No. 505,871
Claims priority, application Japan, Jul. 26, 1994, 6-174032
Int. Cl.[6] F15B *13/043*
U.S. Cl. 137—596.17 **3 Claims**



1. An electric signals supplying device in a solenoid valve, which supplies electric signals to respective solenoid coils in said solenoid valve having two solenoid coils which control operations of respective valve members, said device comprising:
a socket having two conducting pins constituting a first pair, which are respectively connected to a terminal on one of the polarities of said two solenoid coils, and further having two conducting pins constituting a second pair, which are respectively connected to a terminal on the other of the polarities of said two solenoid coils;
a connector detachably mounted on said socket;
a short circuit member detachably installed in said connector, which electrically connects the two conducting pins to each other of one of the pairs out of said first pair and said second pair;
a first contact and a second contact, which are detachably installed in said connector, contacting said two conducting pins of the other of the pairs out of said first pair and the second pair, and connected thereto with signal cables respectively; and
a third contact detachably installed in said connector, said third contact contacting one of the two conducting pins of said one of the pairs out of said first and second pairs, and being connected thereto with a common signal cable.

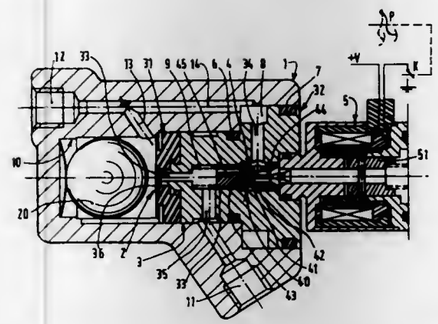
5,558,123

ELECTRICALLY CONTROLLED PRESSURE-HOLDING VALVE

Philippe Castel, Paris; Olivier Castello, Bondy, and Guy Meynier, Aulnay-Sous-Bois, all of France, assignors to AlliedSignal Europe Services Techniques, Drancy, France

Filed Aug. 9, 1995, Ser. No. 513,059
Claims priority, application France, Sep. 8, 1994, 94 10734
Int. Cl.[6] B60T *15/36;* **B60K** *41/24*
U.S. Cl. 137—598 **3 Claims**

1. A pressure-holding valve, comprising a body having a blind bore therein with a variable-pressure inlet port and with a pressure outlet port, a non-return valve housed within the body and interposed within said bore between said inlet port and outlet port, a first passageway for establishing a first communication path between said inlet port and outlet port, said communication path pointing in a direction going from said inlet port towards said outlet port, and a controlled valve located in said body on a bypass path bypassing the non-return valve in order to allow, selectively, a second communication to be established or broken between the inlet port and the outlet port, said controlled valve being closed in response to actuation of an electromagnet integral with the body



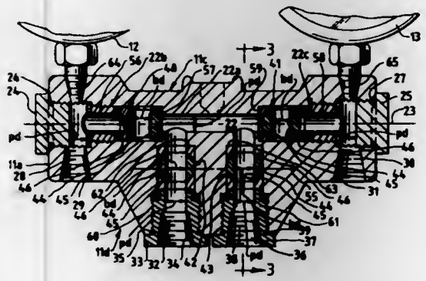
and opened by a return spring acting on said electromagnet, characterised in that said body is formed as a single unit and pierced to form said blind bore, said blind bore being is closed by two annular seals carried by a plug, said plug having a first end of which engages said blind bore, said non-return valve being located between the closed end of the blind bore and said first end of the plug and said electromagnet is rendered integral with a second end of the plug and located outside of said blind bore, said outlet port communicating with an annular volume defined between said two annular seals and said plug being pierced with a first passage permitting said inlet port of said valve to communicate with said non-return valve and with a second passage causing the inlet port to communicate with said annular volume, said controlled valve being installed in said second passage.

5,558,124

REFRIGERATION MANIFOLD

Scott R. Randall, Aurora, Ill., assignor to J/B Industries, Inc., Aurora, Ill.

Filed May 26, 1995, Ser. No. 453,167
Int. Cl.[6] G01L *7/00*
U.S. Cl. 137—597 **20 Claims**



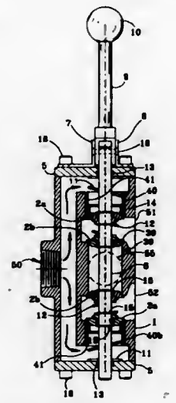
1. A refrigeration manifold comprising:
a manifold body having first and second opposite ends and a top and a bottom;
a first passage extending horizontally through said body along a first horizontal axis from said first end to said second end;
a second passage extending vertically through said body from said top to said bottom and passing through and being in communication with said first passage;
a third passage extending vertically through said body from said top to said bottom and passing through and being in communication with said first passage;
a fourth passage means extending vertically through said body from said first passage to said bottom of said body;
a fifth passage extending vertically through said body from said first passage to said bottom of said body;
first ball valve means disposed in said first passage between said second passage and said fourth passage for selectively opening and closing said first passage;
second ball valve means disposed in said first passage between said third passage and said fifth passage for selectively opening and closing said first passage;
third ball valve means disposed in said fourth passage for selectively opening and closing said fourth passage;
fourth ball valve means disposed in said fifth passage for selectively opening and closing said fifth passage;
plug means disposed on said first and second ends of said body for sealing opposite ends of said first passage.

5,558,125

AIR WINCH CONTROL VALVE

Leslie J. Sell, Bothell, Wash., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Sep. 6, 1994, Ser. No. 301,082
Int. Cl.[6] F16K *11/16*
U.S. Cl. 137—625.27 **2 Claims**



1. A directional air valve comprising:
a valve body having a valve bore formed longitudinally therethrough;
a pressurized air supply chamber within said valve body and accessing each longitudinal end;
an exhaust port accessing said bore intermediate said each longitudinal end;
a reciprocating longitudinal shaft disposed within said valve bore having a diameter less than said valve bore;
an opposed pair of poppet valve members disposed at each longitudinal end of said valve bore intermediate said pressurized air supply chamber and said exhaust port;
each of said poppet valve members cooperating with a valve seat formed in said bore to effect control of supply of pressurized air and exhaust to and from an air motor;
a work supply port accessing said valve bore intermediate one of said opposed pair of poppet valve members;
a return port accessing said valve bore intermediate a second of said opposed pair of poppet valve members;
the function of said work supply port and said return port being interchangeable;
said poppet valve members being disposed for selective longitudinal reciprocation along said longitudinal shaft;
an outermost poppet valve member of each of said opposed pair of poppet valve members being substantially fixed in longitudinal location on said longitudinal shaft and an innermost poppet valve member of each of said opposed pair of poppet valve members being restricted in longitudinal movement in one direction away from its pair member and free to reciprocate towards its pair member against a bias force;

said outermost poppet valve member being further provided with a longitudinally reciprocating sliding sleeve forming a valve seat between said pressurized air supply chamber and said bore and said reciprocating valve seat being biased towards and with limited travel towards said outermost poppet valve member;

said poppet valve members being independently displaceable relative to cooperation with said bore and its pair member to effect selective passage of pressurized air received in said pressurized air supply chamber alternatively between said work supply port and said return port and oppositely from one of said supply port or return port to said exhaust port.

5,558,126

DOUBLE SOLENOID TYPE ELECTROMAGNETIC VALVE

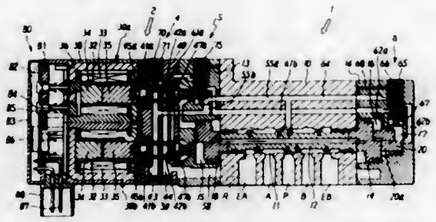
Bunya Hayashi, and Makoto Ishikawa, both of Yawara-mura, Japan, assignors to SMC Corporation, Tokyo, Japan

Filed Aug. 18, 1995, Ser. No. 516,763

Claims priority, application Japan, Nov. 22, 1994, 6-312775

Int. Cl.[6] F15B *13/043*

U.S. Cl. 137—625.64 **4 Claims**



1. A double solenoid type electromagnetic valve including:

a main valve portion having a main valve member for changing over a main fluid from one flowing direction to another, said main valve member being disposed slidably within a valve hole, also having a first piston disposed at one axial end of said main valve member, and further having second and third pistons which are disposed in series at the opposite end of said main valve member, said first and second pistons having the same diameter, said third piston being smaller in diameter than the first and second pistons, said main valve member being changed over from one change-over position to another by means of said pistons which are driven with a pilot fluid;

a pilot valve portion having two, first and second solenoid mechanisms, with the pilot fluid being allowed to operate separately on said first piston and said second and third pistons by operation of said solenoid mechanisms; and

a change-over device capable of effecting change-over between a first change-over position in which the pilot fluid fed to said second and third pistons operates on both second and third pistons and a second change-over position in which the pilot fluid operates on only the third piston of a smaller diameter.

5,558,127

HYDRAULIC PILOT VALVE

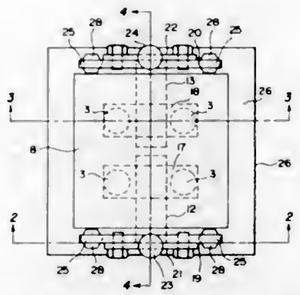
Jun Maruyama, Yokohama; Seita Hayashi; Suji Hori, both of Oyama, and Tadao Karakama, Tokyo, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP92/01318, § 371 Date Apr. 10, 1995, § 102(e) Date Apr. 10, 1995, PCT Pub. No. WO94/09278, PCT Pub. Date Apr. 28, 1994

PCT Filed Oct. 9, 1992, Ser. No. 416,699

Int. Cl.[6] F15B *13/08*

U.S. Cl. 137—636.1 **16 Claims**



1. A construction comprising:

first and second hydraulic pilot valves, each of said first and second hydraulic pilot valves comprising:

a valve body;

a swing shaft rotatably mounted in said valve body for pivotal motion about a longitudinal axis of said swing shaft between a first direction and a second direction, the second direction being opposite the first direction;

an actuating arm fixed to said swing shaft for rotation therewith, said actuating arm extending in each of said first and second directions from said swing shaft;

first and second pressure-reducing valves formed in said valve body, said first pressure-reducing valve being located in said first direction from said swing shaft while said second pressure-reducing valve is located in said second direction from said swing shaft;

each of said first and second pressure-reducing valves having an input port and an output port, each of said first and second pressure-reducing valves having a pressure-reducing element between the input and output ports thereof, each said pressure-reducing element including an associated spool biased by a spring so as to establish a normally shut-off state between the input and output ports of the respective pressure-reducing valve, each said pressure-reducing element further comprising a piston, an end of which comes into contact with said actuating arm to press a respective associated spool in accordance with a magnitude of rotation of said swing shaft in a respective one of said first and second directions;

a limit arm fixed to said swing shaft for rotation therewith, said limit arm having a first limit arm end portion extending in said first direction from said shaft, said limit arm having a second limit arm end portion extending in said second direction from said swing shaft;

an operating lever connected to said limit arm and to said swing shaft so that said operating lever can be pivoted in either of said first direction with respect to said swing shaft and said second direction with respect to said swing shaft;

a first adjustable stopper mounted on one of said first limit arm end portion and said valve body to provide an adjustable maximum limit for pivotal motion of said operating lever in said first direction; and

a second adjustable stopper mounted on one of said second limit arm end portion and said valve body to provide an adjustable maximum limit for pivotal motion of said operating lever in said second direction;

said first and second hydraulic pilot valves being arranged together With the swing shafts of the two hydraulic pilot valves being coaxial, whereby the maximum limit for pivotal motion in the first direction of the operating lever of said first hydraulic pilot valve, the maximum limit for pivotal motion in the second direction of the operating lever of said first hydraulic pilot valve, the maximum limit for pivotal motion in the first direction of the operating lever of said second hydraulic pilot valve, and the maximum limit for pivotal motion in the second direction of the operating lever of said second hydraulic pilot valve can be adjusted to desired values despite errors in the manufacture of either of said first and second hydraulic valves and errors in the assembling of said first and second hydraulic pilot valves in said construction.

5,558,128

ONE-HOLE MOUNT MIXING FAUCET

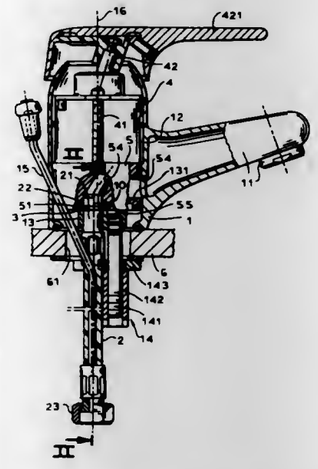
Manfred Paweizik, Soest; Max Derr, and Dieter Kahle, both of Iserlohn, all of Germany, assignors to Friedrich Grohe Aktiengesellschaft, Hemer, Germany

Filed Apr. 24, 1995, Ser. No. 427,212

Claims priority, application Germany, May 5, 1994, 44 15 797.5

Int. Cl.[6] E03C *1/04*; **F16K** *27/04*

U.S. Cl. 137—801 **11 Claims**



1. A plumbing fixture comprising:

a housing defining a chamber and having a bottom wall forming an upper surface and formed with at least one inlet port opening at the upper surface;

a cartridge assembly in the chamber having a bottom surface directly confronting the bottom-wall upper surface and formed with an inlet port opening on the bottom surface in line with the bottom-wall inlet port;

an inlet conduit having an end fitting extending through the bottom-wall inlet port and into the cartridge-assembly inlet port and formed with an outwardly open circumferential groove generally level with the surfaces;

a split and spreadable snap ring fitted to the groove and bearing on the floor, one of the ports closely surrounding the snap ring and preventing same from spreading; and

a seal ring engaged around the end fitting in the cartridge-assembly inlet port.

5,558,129

STREAM SELECTOR FOR PROCESS ANALYZER

Donald P. Mayeux, Prairieville, La., assignor to Whitey Co., Highland Heights, Ohio

Continuation of Ser. No. 195,368, Feb. 14, 1994, Pat. No. 5,361,805, which is a continuation of Ser. No. 928,780, Aug. 13, 1992, Pat. No. 5,305,788. This application Nov. 7, 1994, Ser. No. 335,173

Int. Cl.[6] F16K *31/12*

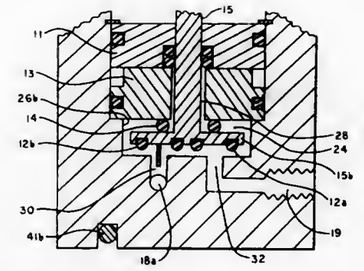
U.S. Cl. 137—885 **9 Claims**

1. A valve module for use with other similar modules to form a variety of different valve manifold assemblies comprising:

a) a valve body including a first pair of spaced lateral exterior side walls;

b) a valve chamber in the body;

c) a first flow passageway extending through the body between the first pair of lateral exterior side walls;



d) a second flow passageway extending between the first pair of lateral exterior side walls in parallel flow relationship with said first flow passageway;

e) separate connecting flow passages joining the first flow passageway and the second flow passageway to respective first and second valve seats in the valve chamber;

f) a valve means in the valve chamber movable between a first position wherein the first valve seat is closed to a second position wherein the first valve seat is opened and the second valve seat is closed; and,

g) actuating means for moving the valve means between the first and second positions.

5,558,130

PIPE STOPPER HAVING A GUIDE MEMBER TO ASSIST IN GUIDING THE STOPPER AROUND A BEND IN A PIPE

Martin B. McCabe, Bromley, and Anthony C. Saunders, Newdigate, both of United Kingdom, assignors to Synthotech Marine Limited, Thronton Heath, United Kingdom

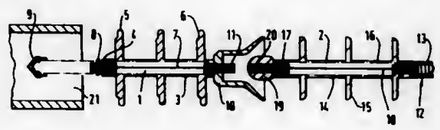
PCT No. PCT/GB92/02097, § 371 Date Jun. 16, 1994, § 102(e) Date Jun. 16, 1994, PCT Pub. No. WO93/12368, PCT Pub. Date Jun. 24, 1993

PCT Filed Nov. 12, 1992, Ser. No. 244,854

Claims priority, application United Kingdom, Dec. 18, 1991, 9126879; Feb. 12, 1992, 9202918

Int. Cl.[6] F16L *55/12*

U.S. Cl. 138—89 **17 Claims**



1. A pipe stopper, comprising:

an elongate resilient body member;

at least one sealing member for sealing the pipe stopper to a pipe, the at least one sealing member positioned around a circumference of the body member; and

a guide member extending from a leading end of the pipe stopper for guiding the pipe stopper around a bend in the pipe;

wherein each sealing member comprises a circumferential flange and a sealing washer, the sealing washer having a flexible circumferential edge region that provides a relatively low resistance to insertion of the stopper in the pipe, but which, when the pipe stopper is pulled back a short distance, deforms and folds into engagement with the flange and an internal wall of the pipe forming a seal.

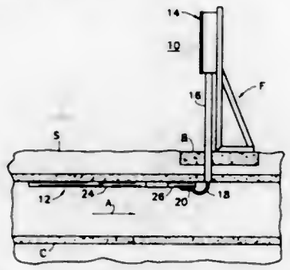
5,558,131

APPARATUS FOR BLOCKING FLUID FLOW THROUGH A CONDUIT RESPONSIVE TO AN EMERGENCY

5,558,134

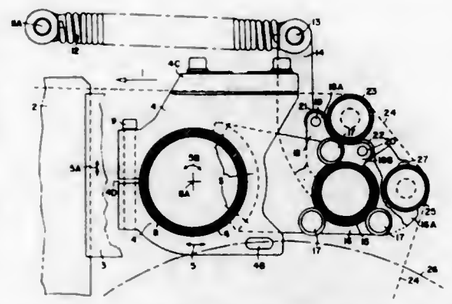
BINDING WIRE GUIDE MECHANISM FOR A BINDING

5,558,131
APPARATUS FOR BLOCKING FLUID FLOW THROUGH A CONDUIT RESPONSIVE TO AN EMERGENCY CONDITION
Donald R. Cahee, Felton; Charles Sandy; Pete Martz, both of Camden; M. James Clougherty, Felton, and Robert Pauly, Bear, all of Del., assignors to ILC Dover Incorporated, Frederica, Del.
Filed Dec. 3, 1993, Ser. No. 162,336
Int. Cl.[6] F16L *55/12*
U.S. Cl. 138—93 **34 Claims**



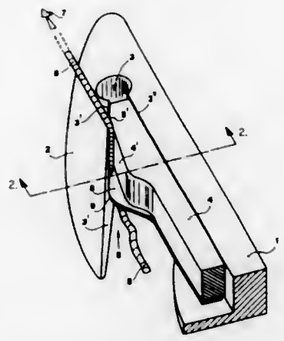
1. Apparatus for selectively blocking fluid flow in a conduit, comprising:
- an inflatable enclosure arranged in said conduit and being normally deflated to minimize restriction of fluid flow through said conduit;
- means for fixedly securing said inflatable enclosure adjacent to said conduit and retaining said inflatable enclosure in a deployed position ready for use;
- means adjacent to said conduit for rapidly inflating said inflatable enclosure responsive to an inflation request;
- said inflatable enclosure being folded to maintain a small profile when deflated to further minimize restriction of fluid flow through said conduit; and
- a protective enclosure formed of a material for normally retaining said inflatable enclosure in the folded condition when said inflatable enclosure is deflated, said protective enclosure comprising breakaway means for breaking apart said material protecting said inflatable enclosure to thereby enable the inflatable enclosure to inflate to an inflated condition;
- a normal inflation pressure of said means for inflating being sufficient to provide a force to cause said inflatable enclosure to break apart said protective enclosure, thereby enabling the inflatable enclosure to inflate to an inflated condition sufficient to block fluid flow through said conduit.

5,558,132
ADJUSTABLE WARP TENSION ROLL SUPPORT
Horst Haeussler, and Wilhelm Herrlein, both of Lindau/B, Germany, assignors to Lindauer Dornier Gesellschaft mbH, Lindau, Germany
Filed Jul. 24, 1995, Ser. No. 506,219
Claims priority, application Germany, Jul. 30, 1994, 44 27 126.3
Int. Cl.[6] D03D *49/12*
U.S. Cl. 139—115 **13 Claims**



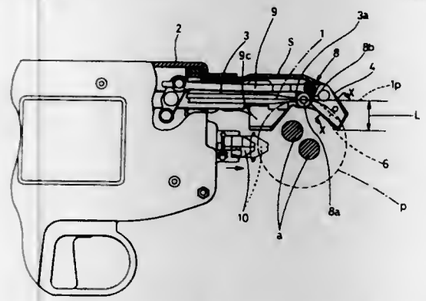
1. A warp tensioning mechanism for a weaving loom having a weaving width, comprising a loom frame, a lateral upright frame member (**2**) on each side of said loom frame, a warp tensioning roller (**23**), a warp guide roller (**25**), and a carrier beam (**15**) extending across said weaving width, a first mounting member (**3**) operatively connected to a respective upright frame member (**2**) on each side of said loom frame for a vertical up and down adjustment (**5A**), a second mounting member (**4**) operatively connected to said first mounting member (**3**) for a horizontal back and forth adjustment (**5**), said second mounting member (**4**) comprising a clamp seat (**6**), a crossbar (**8**) extending across said weaving width and having each end mounted in said clamp seat (**6**) on each side of said loom frame for an angular adjustment (**5B**) around a longitudinal axis (**8A**) of said crossbar (**8**) when said clamp seat (**6**) is loosened, a first set of carrier brackets (**16**) each having a mounted end (**16'**) rigidly secured to said crossbar (**8**) and a first free end including a first bearing (**17**) for rotatably holding said carrier beam (**15**), a bearing bracket (**18**) secured to said carrier beam (**15**), said bearing bracket (**18**) comprising a second bearing (**21**, **22**) for rotatably supporting said warp tensioning roller (**23**), a biasing device (**12**, **14**) connected to said carrier beam (**15**) for biasing said warp tensioning roller (**23**) into a warp tensioning position, a second set of carrier brackets (**16A**) each having a mounted end (**16"**) rigidly secured to said crossbar (**8**) and a second free end including a third bearing (**27**) for rotatably holding said warp guide roller (**25**).

5,558,133
FILL END CATCHING/CLAMPING SYSTEM IN THE DRIVE CLAMP OF A LOOM
Giulio Bortoli, Schio, and Luciano Corain, Vicenza, both of Italy, assignors to Nuovo Pignone S.p.A., Florence, Italy
Filed Aug. 1, 1995, Ser. No. 509,939
Claims priority, application Italy, Aug. 5, 1994, MI94A1709
Int. Cl.[6] D03D *47/20*
U.S. Cl. 139—448 **7 Claims**



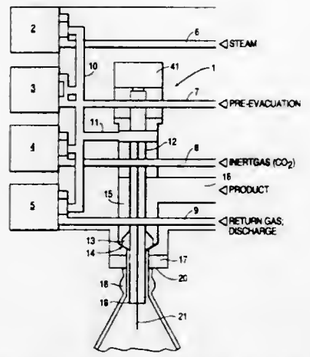
1. Fill end catching/clamping system in the fill drive clamp body of a loom, provided at one end with a hook, an axially movable wedge elastically urged inside said hook of the clamp body, said wedge positioned between a wall of said clamp body and a wall of said hook, said wall of said hook facing a wall of said wedge and forming a narrow "V"-shaped hollow for lock-clamping the fill end to be driven, characterized in that at least one elastic blade is positioned below said wedge and a side wall of said at least one elastic blade cooperates with said wall of said hook for retaining the fill end in said narrow "V"-shaped hollow.

5,558,134
BINDING WIRE GUIDE MECHANISM FOR A BINDING MACHINE
Atsushi Miyazaki, Tokyo, Japan, assignor to Max Co., Ltd., Japan
Filed Nov. 7, 1994, Ser. No. 337,027
Claims priority, application Japan, Nov. 8, 1993, 5-302284
Int. Cl.[6] B21F *15/04*
U.S. Cl. 140—57 **6 Claims**



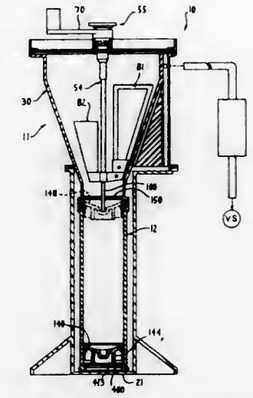
1. A bind guide mechanism for a binding machine in which a wire of metal is looped around articles to be bound with the wire and in which a part of the wire thus looped is twisted to bind the articles together, said binding wire guide mechanism comprising:
- a wire feeding mechanism for feeding the wire;
- a straight guide member for straightly guiding the wire fed by said wire feeding mechanism;
- a bend guide member provided at the outlet of said straight guide member, said bend guide member having a wire receiving surface to receive the wire fed out of said straight guide member in such a manner that the wire abuts obliquely against said wire receiving surface;
- an angle varying means for varying an angle of abutment which said wire forms with said wire receiving surface; and
- connecting means operatively connecting the straight guide member with the bend guide member,
- wherein positions of said straight guide member and said bend guide member are adjustable according to the angle of abutment of the wire with respect to said wire receiving surface.

5,558,135
PROCESS AND DEVICE FOR THE STERILE FILLING OF BEVERAGE LIQUIDS
Hermann Kronseder, Woerth, and Wilhelm Weiss, Lappersdorf, both of Germany, assignors to Krones AG Hermann Kronseder Maschinenfabrik, Germany
Continuation of Ser. No. 938,168, May 3, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 487,863
Claims priority, application Germany, Jun. 6, 1990, 40 18 122.7; Nov. 14, 1990, 40 36 290.6
Int. Cl.[5] B67C *3/10*
U.S. Cl. 141—6 **13 Claims**



1. A process for the sterile filling of beverage liquids into bottles comprising the steps of:
- a) lifting a bottle vertically upwardly from below toward filling element having a feed pipe affixed thereto in a positioning phase so that an outlet opening of the feed pipe at an end thereof and opening essentially in the axial direction of the pipe lies within the bottle in the area of the head of the bottle and below the bottle's opening, a space being provided between an outer casing of the feed pipe and the inner wall of the head of the bottle;
- b) introducing steam into the bottle through said feed pipe and out of said outlet opening thereof in the axial direction of the pipe toward the bottom of the bottle in a relatively powerful and bundled jet in a sterilization phase to sterilize the interior of the bottle;
- c) introducing an inert counter-pressure gas into the bottle through said feed pipe in a counter-pressurizing phase to generate a counter-pressure in the bottle;
- d) filling a beverage liquid into the bottle in a filling phase by flowing the liquid down and around the outer casing of the feed pipe and through said space, the counter-pressure gas simultaneously being forced out by the liquid through said feed pipe; and
- e) lowering the bottle vertically downwardly away from the element in a withdrawal phase after the desired level of liquid in the bottle has been reached.

5,558,136
BONE CEMENT CARTRIDGE WITH SECONDARY PISTON
Michael R. Orrico, Kalamazoo, Mich., assignor to Stryker Corporation, Kalamazoo, Mich.
Filed Jan. 31, 1994, Ser. No. 189,328
Int. Cl.[6] A61B *17/56*
U.S. Cl. 141—23 **16 Claims**



1. A surgical cement cartridge for loading with surgical cement and for ejecting surgical cement at a surgical site, the cartridge comprising:
- a substantially tubular casing comprising a peripheral wall surrounding a longitudinal passage, the passage having an open front end and a remote rear end;
- a first piston means located in said passage for free sliding movement from said front end towards said rear end in response to input of surgical cement into said front end of said casing;

a second piston means located in said passage adjacent said rear end for forcible driving forward along said passage to cause said first piston means to eject cement from said open front end of said casing toward a surgical site, said second piston means having seal means for positively blocking flow of surgical cement axially therepast, said seal means comprising an elastomeric annular seal which bears forcibly and sealingly and slidingly against said casing peripheral wall.

5,558,137

CONTAINER BAG FOR A CLOSED FILL SYSTEM

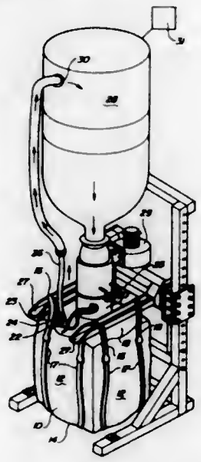
Charles S. Futerman, Stoke-On-Trent, England, assignor to Mulox IBC Limited, London, England

Continuation-in-part of Ser. No. 117,732, Sep. 7, 1993, abandoned. This application Jan. 25, 1995, Ser. No. 377,944

Claims priority, application United Kingdom, Sep. 8, 1992, 9218970

Int. Cl.[6] **B65B** *31/00*

U.S. Cl. 141—44.000 **9 Claims**



1. A flexible intermediate container apparatus assembly adapted to contain a pulverulent material, said container apparatus assembly comprising:

a bag formed of a plurality of side walls, a base wall, and a top wall defining an interior space closed off from an exterior space of ambient atmosphere;

a pressure means for producing pressure within said bag above said ambient atmosphere;

a spout mounted on said top wall constructed to receive said pulverulent material housed in a filling apparatus that is closed from said exterior space of ambient atmosphere;

a pressure relief valve mounted on a wall of said bag and adapted to release gas and said pulverulent at a pressure lower than that which would cause the walls of said bag to rupture; and

duct means being provided having one end thereof connected to said pressure relief valve to collect said pulverulent material which may escape from said pressure relief valve, and the other end sealingly positioned to deposit the escaped pulverulent material into a suitable receiver that is closed from ambient atmosphere such that said container system can fill said bag with no leakage of pulverulent material into said ambient atmosphere.

5,558,138

PROCESS AND APPARATUS FOR CLEANING CONTAINER HANDLING MACHINES SUCH AS BEVERAGE CAN FILLING MACHINES

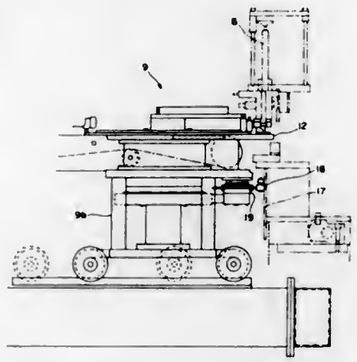
Klaus-Friedrich Stock, Dortmund, and Siegmar Sindermann, Kamen-Heeren, both of Germany, assignors to KHS Maschinen- und Anlagenbau AG, Dortmund, Germany

Filed Sep. 21, 1994, Ser. No. 310,239

Claims priority, application Germany, Sep. 22, 1993, 43 32 202.6

Int. Cl.[6] **B67C** *3/22;* **B67B** *3/00;* **B65G** *47/84*

U.S. Cl. 141—90 **20 Claims**



17. Apparatus for cleaning beverage container handling units of a liquid container filling and handling machine, the beverage container handling units comprising means for admitting a liquid into beverage containers positioned adjacent the beverage container handling units, the liquid container filling and handling machine having a substantially cylindrical shape and defining a peripbery and an axis of rotation about which the liquid container filling and handling machine rotates, the beverage container handling units comprising a plurality of beverage container handling units being disposed about the periphery and being moved by the liquid container filling and handling machine in a substantially circular path;

said cleaning apparatus being a unitary apparatus distinct and separate from the liquid container filling and handling machine, said cleaning apparatus comprising:

a washing container supply station, said washing container supply station comprising:

a plurality of washing container means for containing a cleaning substance therein for cleaning at least the means for admitting a substance into beverage containers positioned adjacent the beverage container handling units;

each of said plurality of washing container means comprising connecting means for being connected with a corresponding beverage container handling unit;

washing container feed means for feeding the washing container means to the beverage container handling units from the washing container supply station; washing container means from the beverage container handling units to the washing container supply station; means for moving the entire apparatus for cleaning with the washing container supply station towards, and away from and out of contact with the liquid container filling and handling machine, and for positioning the washing container feed means adjacent the substantially circular path at least during cleaning of the beverage container handling units, and for positioning the washing container feed means away from and out of contact with the substantially circular path to provide an unobstructed path about the liquid container filling and handling machine.

5,558,139

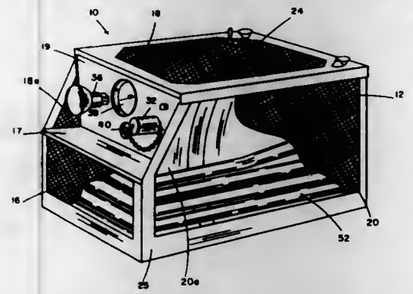
LIQUID OXYGEN SYSTEM

Fred P. Snyder, St. Louis, Mo., assignor to Essex Cryogenics of Missouri, St. Louis, Mo.

Filed Feb. 13, 1995, Ser. No. 388,342

Int. Cl.[6] **B65B** *1/30;31/00*

U.S. Cl. 141—95 **22 Claims**



1. A system for compactly and safely storing and delivering oxygen, the system having a plurality of elements interconnected by fluid lines and comprising:

a. a reinforced, metal, orbitally-shaped tank which receives and contains oxygen to be stored as a liquid and delivered by the system to an end user,

b. a fill valve in communication with the tank for providing oxygen from a main source thereof to the system,

c. a vent valve connected to the liquid oxygen tank for selectively releasing oxygen from the system,

d. a differential pressure gauge located between and in communication with the fill valve and the vent valve to permit an operator of-the system to thereby monitor the pressure differential in the system so that selective adjustments can be made in a timely and controlled manner to maintain the pressure within the system during filling at an optimum level,

e. at least one pressure relief valve between and in communication with the oxygen tank and the vent valve thereby release pressure from the system as necessary to maintain the desired temperature and pressure conditions within the system,

f. a heat exchanger in communication with and between the liquid oxygen tank and a fluid pressure regulator,

g. a fluid pressure regulator in communication with and between the heat exchanger and an oxygen flow control outlet,

h. a flow control outlet by which flow of oxygen from the system to an end user can be controlled, and

i. a phase selector valve disposed between and in communication with the liquid oxygen tank and the heat exchanger to thereby permit the system to select as a function of pressure whether oxygen supplied from the liquid oxygen tank to the heat exchanger will be supplied as either a liquid or a gas,

the tank, fill valve, vent valve, differential pressure gauge, at least one pressure relief valve, supply heat exchanger, pressure regulator and phase selector valve all being sized and arranged in relation to one another so as to provide a lightweight, compact system for safely storing and delivering oxygen, which system is suitable for use by a home-bound patient as well as in a movable vehicle, and otherwise where safety, weight and size are of concern.

5,558,140

DEVICE FOR DRAINING FLUID FROM A CONTAINER

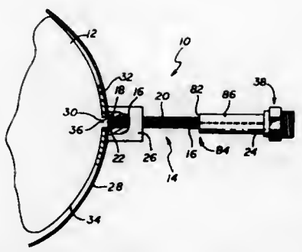
James E. Clark, II, Ojai, Calif., assignor to Clark Technology Systems, Inc., Santa Paula, Calif.

Filed Sep. 2, 1994, Ser. No. 300,402

Int. Cl.[6] **B65B** *1/04;3/04*

U.S. Cl. 141—98 **12 Claims**

1. A fluid container draining device which allows fluid to be removed from a fluid container in a controlled manner, said fluid container having walls defining a fluid filled interior region therebetween, said fluid container draining device comprising:



a threaded screw means having a sharpened tip at its forward region, which screw means when turned will screw into and penetrate the wall of the fluid container and enter the fluid containing cavity of the fluid container, said screw means having an internal channel communicating between an opening at the forward end of the screw means and a rear region of the threaded screw means, said rear region being externally threaded;

a means to provide fluid tight sealing between the screw means and the fluid container wall to prevent fluid leakage from between the threaded screw means and the walls of the fluid container;

a turning surface adapted for engagement with a drill to permit said fluid container draining device to be turned to drill and screw said threaded screw means into the wall of the fluid container to sealably engage the fluid container draining device therewith, independent of other means to retain the device in contact with the fluid container; and

a fluid valve means positioned at the rear region of the screw means in fluid connection with the channel, said fluid valve means providing fluid flow control between the interior of the fluid container and the outside of the fluid container.

5,558,141

APPARATUS FOR PRODUCING NITROGEN UNDER HIGH PRESSURE

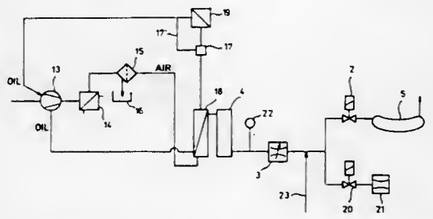
Peter F. Dannöhl, Bottrop, Germany, assignor to Druckluft-Dannohl GmbH, Germany

Filed Jan. 26, 1995, Ser. No. 378,535

Claims priority, application Germany, Feb. 9, 1994, 44 04 072.5

Int. Cl.[6] **B65B** *1/30;3/28;57/06;57/14*

U.S. Cl. 141—197 **9 Claims**



1. Apparatus for producing nitrogen under high pressure for at least one consumer, particularly for at least one injection moulding machine, including

an inflatable reservoir (5) which is connected via a first magnetic valve (2) to a nitrogen source,

a high pressure storage container (8), which is connectable to the consumer,

a high pressure compressor (7), which is connected on the suction side to the reservoir and on the pressure side to the storage container,

a control device for the first magnetic valve and the high pressure compressor, the control device including a filling state sensor (6) actuated by the reservoir and a pressure switch (10) connected to the storage container, and

including a recycling line (11), which is connected to the inflatable reservoir (5) and is connectable to the consumer, for the nitrogen expanded in the consumer,,

whereby the filling state sensor (6) has an upper switching point, at which it starts the high pressure compressor (7) anti closes the first magnetic valve (2), and a lower switching point at which, in dependence on the pressure in the storage container (8), it either opens the first magnetic valve (2) or switches the high pressure compressor (7) off,

characterised in that

associated with the first magnetic valve (2) there is a second magnetic valve (20) which is actuated in alternation with it and is connected on the outlet side to the atmosphere via a throttle (21),

that the magnetic valves (2,20) are connected on the inlet side via an adjustable throttle (3) to at least one nitrogen separator (4) which is supplied by an air compressor (13), and

that associated with the outlet of the separator (4) there is a nitrogen purity sensor (22) which actuates the magnetic valves (2,20) in addition to the control device.

5,558,142

WOODWORKING MILLING CUTTER PARTICULARLY FOR GROOVING AND PROFILING

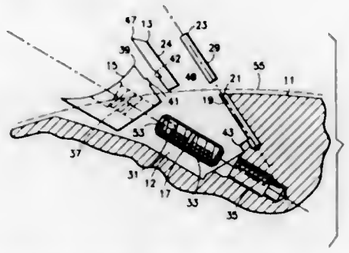
Bruno Ehrle, Neuhausen; Rolf Herzog, Winterthur, both of Switzerland; Andreas Mosmann, Wutöschingen-Horheim, Germany; Reto Riedberger, Hochfelden, and Alfred Weber, Uhwiesen, both of Switzerland, assignors to Oertli Werkzeuge AG, Hõri bei Bülach, Switzerland

Filed May 24, 1995, Ser. No. 449,483

Claims priority, application Switzerland, Jun. 20, 1994, 1941/94

Int. Cl.[6] B27G *13/00*

U.S. Cl. 144—230 **7 Claims**



1. Woodworking milling cutter, particularly for grooving and profiling, having

a tool body (11) forming a body of rotation;

at least one cutting blade (13);

at least one circumferential recess (12) formed in the tool body defining one wall (19), the at least one cutting blade being positioned against said wall;

at least one holding element (15) located in the at least one recess, and engaging the at least one cutter blade (13) for retaining the cutter blade in the recess;

clamping means (17) securing the holding element in the recess; and

means for resiliently engaging the at least one cutter blade against said wall (19) of the respective recess,

said engagement means comprising at least one bore (21) formed in the body (11) extending parallel to said wall (19) of the recess, a portion of which bore intersects the wall of the recess to leave said portion exposed in the recess (12);

a roll pin (23) located in the bore (21) and having a portion of its surface exposed in the recess (12); and

a groove formed in the cutter blade at the side facing said wall (19) of the recess (12) and in resilient engagement with a portion of the roll pin (23), which portion of the roll pin (23) is exposed in the surface of the wall (19) of the recess.

5,558,143

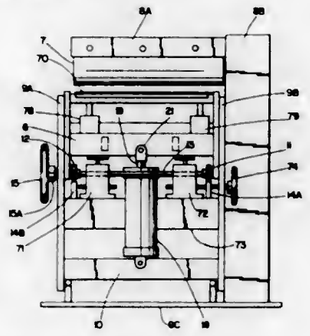
VARIABLE RADIUS BOWING PRESS

Chauncey Hofacker, St. Louisville, Ohio, assignor to The Longaberger Company, Dresden, Ohio

Continuation-in-part of Ser. No. 322,915, Oct. 13, 1994. This application Jan. 3, 1995, Ser. No. 368,160

Int. Cl.[6] B27H *1/00*

U.S. Cl. 144—381 **31 Claims**



1. A variable radius bowing press, comprising:

a mandrel support;

a mandrel removably connected to said mandrel support; and

a subassembly including a housing, a substantially planar wiper plate connected to said housing and capable of pivoting with respect to said mandrel, and an actuator capable of exerting a force against said wiper plate to cause said wiper plate to pivot.

5,558,144

PNEUMATIC RADIAL TIRE WITH HYBRID BAND CORD

Ritsuo Nakayasu, Osaka, and Shinichi Miyazaki, Kobe, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan

Filed Dec. 28, 1994, Ser. No. 365,114

Claims priority, application Japan, Dec. 28, 1993, 5-338099

Int. Cl.[6] B60C *9/18;9/20*

U.S. Cl. 152—527 **8 Claims**

1. A pneumatic radial tire comprising

a toroidal carcass ply,

a breaker belt disposed radially outside the carcass ply, and

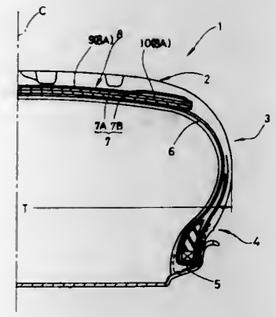
a band belt disposed radially outside the breaker belt,

the breaker belt comprising at least one ply of parallel, non-metallic cords,

the band belt comprising a ply of at least one hybrid cord wound spirally and continuously in the circumferential direction of the tire at an angle of 0 to 3 degrees with respect to the tire equator,

the at least one hybrid cord each comprising a low elastic modulus thread and a high elastic modulus thread which are finally-twisted together,

the low elastic modulus thread comprising at least one low elastic modulus fiber first-twisted and having an elastic modulus of not more than 2000 kgf/sq.mm, and



the high elastic modulus thread comprising at least one high elastic modulus fiber first-twisted and having an elastic modulus of not less than 3000 kgf/sq.mm, wherein,

in the band belt ply, the count E of the at least one hybrid cord per 5 cm width, the stress F1 in kgf of each at least one hybrid cord at 2% elongation, and the stress F2 in kgf of each at least one hybrid cord at 6% elongation satisfies the following relationships:

$F1 \times E < 60$; and

$F2 \times E > 150$.

5,558,145

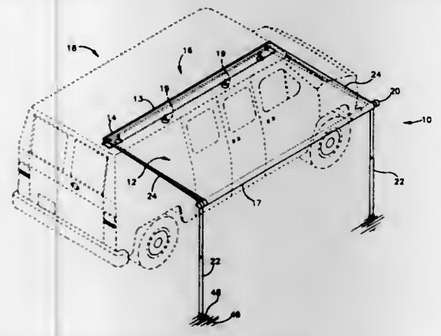
PORTABLE AWNING ASSEMBLY

Gregory J. Baka, Kendallville, Ind., assignor to The Dometic Corporation, LaGrange, Ind.

Filed Jun. 7, 1994, Ser. No. 255,187

Int. Cl.[6] E04F *10/06*

U.S. Cl. 160—67 **22 Claims**



1. A portable awning assembly, comprising:

a roller;

a header rail removably mounted on a mounting surface and having at least one slide channel;

an awning having one of a leading edge and a trailing edge fastened to the roller so as to be rollable around the roller, and said trailing edge being fastened at the header rail;

suction cups slidingly disposed in said slide channel of the header rail for attachment of the header rail to the mounting surface;

a pair of support poles removably disposable between the leading edge of the awning and a ground surface so as to support the awning; and

a rafter removably disposable between the leading and trailing edges of the awning so as to maintain the awning in an extended position.

5,558,146

BLIND

Makio Abe, 2-1-82-204, Sakurazutsumi, Musashino-shi, Japan

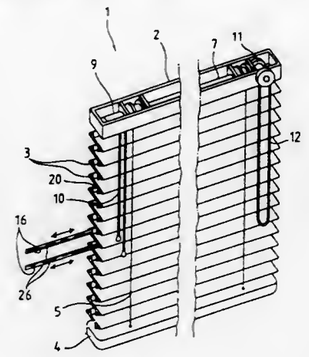
PCT No. PCT/JP93/01728, § 371 Date Jul. 26, 1994, § 102(e) Date Jul. 26, 1994, PCT Pub. No. WO94/12755, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 25, 1993, Ser. No. 256,852

Claims priority, application Japan, Nov. 26, 1992, 4-337792

Int. Cl.[6] E06B *9/26*

U.S. Cl. 160—176.1 **22 Claims**



1. A blind having parallel slats angularly movable simultaneously about their respective longitudinal axes, wherein each slat has a graphic pattern forming region on a base board of transparent material, said base board having, in a cross-section transverse to a longitudinal axis thereof, a central surface, a first bent surface bent obliquely upward from one edge of the central surface, and a second bent surface bent obliquely downward from the other edge, said graphic pattern forming regions of the respective slats are arranged to be combined with each other to produce a significant graphic pattern on the entire blind when the slats are angularly moved and tilted to a predetermined angle which is siqnificant for an observer, each of said graphic pattern forming regions comprising a diffused-reflection surface composed of fine irregularities on at least a portion of at least one of the first and second bent surfaces of the base board.

5,558,147

DOOR COUNTERWEIGHT ASSEMBLY

Edward L. Nofziger, Wauseon, Ohio, assignor to Nofziger Doors International, Inc., Archbold, Ohio

Filed Jun. 8, 1995, Ser. No. 488,632

Int. Cl.[6] E05F *11/04*

U.S. Cl. 160—190 **10 Claims**

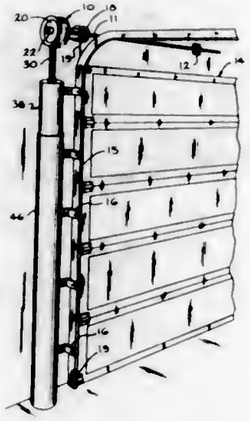
1. A door counterweight assembly for mounting on a shaft, comprising a pair of spaced disks having aligned openings for receiving said shaft, a tape drive member extending inwardly from at least one of said spaced disks, said tape drive member being spaced from and parallel to said shaft and a continuous flexible tape having a portion positioned around said shaft between said spaced disks and another portion attached to a counterweight, said continuous flexible tape being positioned between said shaft and said tape drive member, whereby rotation of said shaft folds said continuous tape around said shaft to increase the counterweight torque applied to said shaft.

5,558,150

METHOD OF PRODUCING A CAST MULTILAYERED

5,558,153

METHOD & APPARATUS FOR ACTUATING A

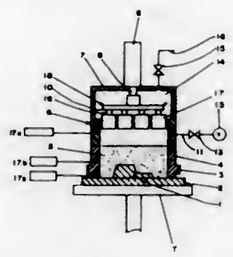


5,558,148

METHOD OF PRODUCING MOLDS

Nagato Uzaki, Toyohashi; Ukichi Oishi, Toyokawa; Ryoji Kanayama, Toyohashi; Hironobu Amano, and Tokiya Terabe, both of Toyokawa, all of Japan, assignors to Sintokogio, Ltd., Achi, Japan

Filed May 5, 1995, Ser. No. 435,476
Claims priority, application Japan, May 12, 1994, 6-124586
Int. Cl.[6] B22C *15/264;15/276;15/28*
U.S. Cl. 164—7.1 6 Claims



1. In a method of producing a mold that includes the steps of feeding molding sand into a space defined by a pattern plate and a flask mounted on the pattern plate; covering the upper part of the flask by a closing cover; and then pressing the molding sand by using an air flow, wherein the pressing step includes the steps of:

evacuating air from the space enclosed by the pattern plate, the flask, and the closing cover, to make the space a vacuum so that the pressure of the air between the grains of the molding sand in the space is between 1 Tort and 150 Torr; and

causing an air flow into the space from an upper part of the space such that the pressure in the space increases to the ambient pressure at a pressure gradient of at least 15 arm/s, thereby compressing the molding sand.

5,558,149

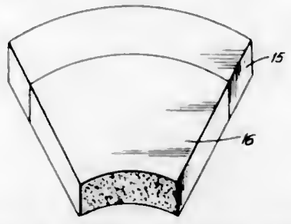
Patent Not Issued For This Number

5,558,150

METHOD OF PRODUCING A CAST MULTILAYERED ALLOY TUBE AND THE PRODUCT THEREOF

David L. Sponseller, Ann Arbor, Mich., assignor to ERIM, Ann Arbor, Mich.

Filed May 26, 1995, Ser. No. 451,412
Int. Cl.[6] B22D *13/02;19/08*
U.S. Cl. 164—95 20 Claims



1. A method for producing by centrifugal casting an alloy tubular article of manufacture in the form of a composite tubular product comprised of an outer alloy layer of one composition and at least one inner alloy layer of another composition while substantially inhibiting the formation of a metallurgical bond between layers in the as-cast condition which comprises:

providing a rotatable centrifugal casting mold having a first open end and a second open end and a cylindrical inner surface adapted to receive a molten metal alloy,

pouring into said first open end of said rotatable mold a first alloy composition of melting point of at least about 1300° C. and centrifugally casting said alloy as a tubular outer layer during rotation of said mold,

allowing said outer layer to solidify and cool so that the temperature of its inner face does not exceed about 92% of its absolute melting point in degrees Kelvin,

pouring into said tubular outer layer at least one second layer of an alloy of melting point of at least about 1300° C. at a pouring temperature sufficient to form said second layer within said tubular layer interior during rotation of said mold,

and cooling said centrifugally cast composite tubular metal product to ambient temperature,

said composite tubular product in the as-cast condition being characterized by an interface between said layers in which the formation of a metallurgical bond across said interface has been substantially inhibited.

5,558,151

DIE CASTING MOLD HAVING LOCK RINGS FOR MOUNTING AN INSERT TO A MANDREL

Michael V. Gilbert, Oolitic, and Bradley C. Menaugh, Mitchell, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 18, 1995, Ser. No. 574,173
Int. Cl.[6] B22D *17/24*
U.S. Cl. 164—312 4 Claims

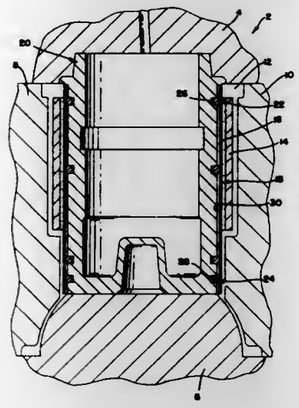
1. In a die casting mold for casting a block for an internal combustion engine, said block having at least one combustion chamber defined by a discrete cylindrical liner having an inside diameter and inner cylindrical surface said liner being embedded in a mass of metal cast thereabout in a cavity of said mold, wherein said mold includes a reusable, cylindrical, detachable mandrel for positioning said liner in said cavity during casting and removable with said block after casting, the improvement comprising

at least two spaced apart annular grooves in the outside surface of said mandrel;

a split-ring radially compressible and expansible spring in each of said grooves, said spring having (1) a leading edge, (2) a pair of ends proximate each other and moveable to and fro relative to each other during placement and displacement of said liner on and off said mandrel respectively, and (3) an outside diameter which is greater than said inside diameter of said liner when said spring is in an uncompressed state; and

a chamfer on the leading edge of said spring for engaging an edge of said liner and camming said spring radially inwardly to a compressed state when said liner is slipped over said mandrel;

whereby, after said liner is positioned on said mandrel, said spring radially expands against the inner cylindrical surface of said liner and holds said liner in position on said mandrel.

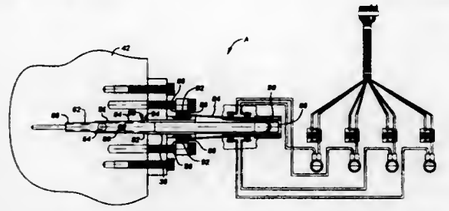


5,558,153

METHOD & APPARATUS FOR ACTUATING A DOWNHOLE TOOL

Michael W. Holcombe, Katy; David E. Rothers, Houston; Steve C. Owens, Katy; William D. Henderson, League City, and James C. Doane, Friendswood, all of Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Oct. 20, 1994, Ser. No. 326,824
Int. Cl.[6] E21B *23/04*
U.S. Cl. 166—373 38 Claims



1. A method of actuating a downhole tool, comprising the steps of:

retaining a member on the tool with a frangible element;

lowering the tool to the desired downhole depth;

sending at least one nonelectrical signal from the surface to the tool downhole;

receiving said nonelectrical signal at a control system mounted on the tool;

using an output generated by said control system to weaken said frangible element;

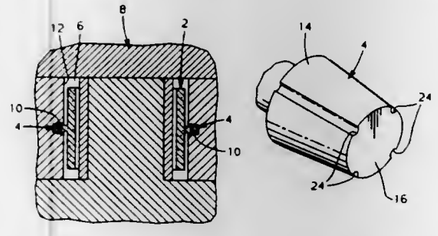
operating the tool due to movement of said member.

5,558,152

SELF-CLEANING CORE PRINT

Stuart W. Anderson, Bedford, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 10, 1995, Ser. No. 419,564
Int. Cl.[6] B22C *21/14*
U.S. Cl. 164—340 6 Claims



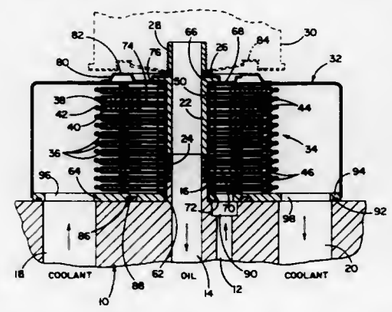
1. In a pressure casting system comprising a die having an internal surface defining a cavity for forming a metal casting, at least one pocket in said die at said surface, said pocket being defined by a side wall and a bottom wall, an expendable core positioned in said cavity to define an internal feature of said casting, at least one core print extending from said core and nesting in said pocket to hold said core in position in said cavity, said core print being defined by an end surface at the distal end of said core prin. and an external surface surrounding said core print and engaging said side wall at an interface therebetween, the improvement comprising: said end surface being spaced from said bottom wall so as to provide a gap therebetween, and at least one flow channel extending along said interface communicating said cavity with said gap to admit molten metal into said gap during casting, whereby said molten metal solidifies in said gap and said channel and facilitates complete removal of said core print from said pocket after the die is opened and the casting removed therefrom.

5,558,154

CAPTIVE FLOW DONUT OIL COOLER

Thomas E. Lefeber, Racine, Wis., assignor to Modine Manufacturing Company, Racine, Wis.

Filed Dec. 1, 1992, Ser. No. 983,731
Int. Cl.[6] F28F *3/08*
U.S. Cl. 165—51 11 Claims



1. In a heat exchanger, the combination of:

a stack of heat exchange units, each unit including a pair of spaced plates joined at their peripheral edges, the units in said stack further being spaced from one another;

means defining a first passage through said stack, said first passage being sealed from said heat exchange units;

means defining a second passage in fluid communication with the interior of said heat exchange units and having an opening to one end of said stack;

means defining a third passage in fluid communication with the interior of said heat exchange units in spaced relation to said second passage having an opening to the other end of said stack;

a housing containing said stack, said housing including a base adapted to be abutted to a source of two heat exchange fluids,

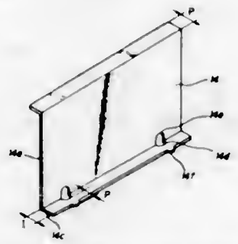
5,558,158

HYGIENIC AIR HANDLER

ment with each other, at least one recess is formed by said inclined surfaces to pull in a brazing material thereby provid-

a housing containing said stack, said housing including a base adapted to be abutted to a source of two heat exchange fluids, and an opposite side;
a pair of first ports, one in said base and the other in said opposite side and defining opposite ends of said first passage;
a second port in said base and in fluid communication with said second passage opening;
a third port in said opposite side and in fluid communication with said third passage; and
fourth and fifth ports in said base and spaced from one another on generally opposite sides of said stack.

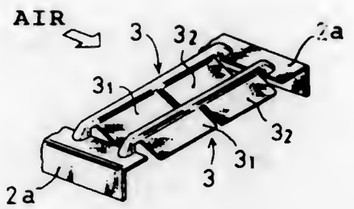
5,558,155
COOLING APPARATUS AND ASSEMBLING METHOD THEREOF
Eiji Ito, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 4, 1994, Ser. No. 285,692
Claims priority, application Japan, Aug. 6, 1993, 5-196403
Int. Cl.[6] F28F *7/00*
U.S. Cl. 165—80.3 **20 Claims**



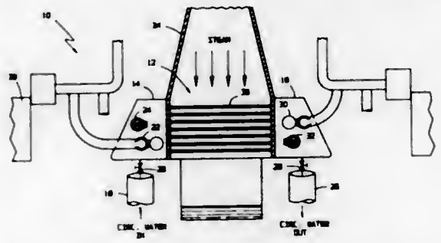
1. A cooling apparatus having a cooling structure, comprising:
a metal plate having a flat surface;
a plurality of fins arranged in parallel on and fixed to the flat surface of said metal plate, wherein each of said fins comprises: an upper edge section lying substantially in a first plane; a first middle section; and a lower edge section lying substantially in a second plane, said upper and lower edge sections being bent at a predetermined angle with respect to said first middle section along bending axes, at least one of said upper and lower edge sections having a plurality of notches and projections, said notches and projections extending along lines which are perpendicular to said bending axes and which are parallel to said first and second planes, wherein said notches of one fin engage with the projections of an adjacent fin when said fins are arranged in parallel on the flat surface of said metal plate.

5,558,156
HEAT EXCHANGER
Toshihiro Tsutsui, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki, Tokyo, Japan
Filed Dec. 21, 1994, Ser. No. 360,926
Claims priority, application Japan, Jan. 21, 1994, 6-005282
Int. Cl.[6] F28D *1/06*
U.S. Cl. 165—84 **5 Claims**

1. A heat exchanger having heat exchange members for exchanging heat with a fluid flowing along surfaces of said heat exchange members, comprising:
plurality of fins with each fin having a rigid portion which includes a plate member integrally attached to a flexible portion which includes at least one metallic layer and at least one piezoelectric material layer, said rigid portion having ends which extend outwardly from sides of said flexible portion and which are fixed to respective side edge portions of said heat exchange members so that said flexible portion is supported in a cantilevered manner; and
means for vibrating said flexible portion of each fin of said plurality of fins such that said rigid portion of each fin of said plurality of fins operates as a fulcrum.

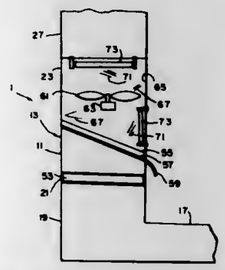


5,558,157
APPARATUS AND METHOD OF REMOVING MICROFOULING FROM THE WATERSIDE OF A HEAT EXCHANGER
James Makowski, 729 Chateaugay Ave., Naperville, Ill. 60540; Sunish Shah, 11934 S. Lawler; Tony Lostroscio, 3424 W. 125th St., both of Alsip, Ill. 60658; Ronald D. Wine, 2550 Fishing Creek Rd., Harrisburg, Pa. 17112, and Arne A. Lindberg, 2902 Hawkshead, New Lenox, Ill. 60451
Filed Dec. 19, 1994, Ser. No. 358,410
Int. Cl.[6] F28G *13/00*
U.S. Cl. 165—95 **10 Claims**



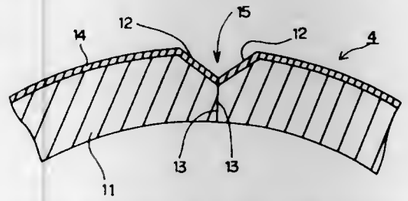
1. A method for removing microfouling from the tube side of a shell-and-tube heating exchanger, comprising the steps of:
isolating and draining completely of surface water from the tube side of said heat exchanger while it is still on-line;
passing of steam over the shell side of said heat exchanger to produce a heat load on the shell side of said heat exchanger and to add heat on the tube side of said heat exchanger so as to dry microfouling on the inside surfaces of the tubes;
providing a source of low relative humidity air which is dry;
passing said low relative humidity air through the tube side of said heat exchanger while there is still a heat load on the shell side of said heat exchanger so as to remove moisture from the microfouling and to further assist in drying the microfouling;
lowering further the relative humidity of the air due to the passing of the steam over the shell side of said heat exchanger by the added heat on the tube side of said heat exchanger so as to assist in drying of the microfouling; and
re-introducing the surface water to the heat exchanger after the tube side of said heat exchanger has been dried so as to wash away and remove the dried out microfouling from the tube side of said heat exchanger.

5,558,158
HYGIENIC AIR HANDLER
Robert L. Elmore, 900 NW. 8th Ave., Fort Lauderdale, Fla. 33311
Continuation of Ser. No. 246,093, May 19, 1994, abandoned. This application Feb. 8, 1995, Ser. No. 385,577
Int. Cl.[6] F28F *13/12;19/02*
U.S. Cl. 165—122 **4 Claims**



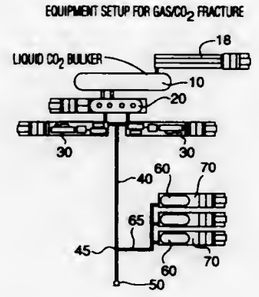
1. The method of supplying hygienic air, comprising providing an indoor commercial and residential air handler having a coating substantially on all of an interior of the indoor commercial and residential air handler of a high density, non-porous, highly reflective material, drawing the air through a return duct and through a filter into the interiorly coated air handler, drawing air through a heat exchanger evaporator coil where relative humidity of the air is increased by chilling the air, which provides a damp interior providing appropriate conditions for the culture of mold, algae, bacteria and the proliferation of spores, bacteria and viruses, and into a blower, delivering the air from the blower through an outlet chamber within the air handler and through air delivery distribution ducts, and bathing the air with light within the air handler downstream of the heat exchanger, and preventing growth of microorganisms, mold, algae, bacteria and viruses and preventing surface accumulation of allergens.

5,558,159
HEADER TANK STRUCTURE FOR HEAT EXCHANGER
Soichi Kato, Osato-gun, Japan, assignor to Zexel Corporation, Tokyo, Japan
Filed Nov. 17, 1994, Ser. No. 343,864
Claims priority, application Japan, Nov. 24, 1993, 5-062834 U; Nov. 8, 1994, 6-273505
Int. Cl.[6] F28F *9/00*
U.S. Cl. 165—153 **6 Claims**



1. A header tank structure for a heat exchanger, comprising:
a header tank material having opposite ends and major surfaces;
a brazing material coated over at least one of said major surfaces of said header tank material;
said opposite ends provided with inclined end surfaces inclined with respect to a direction of wall thickness and truncated to form perpendicular end surfaces perpendicular with respect to said major surfaces, and
said inclined end surfaces being directly extended from said major surface so that when said ends are brought into abutment with each other, at least one recess is formed by said inclined surfaces to pull in a brazing material thereby providing a firm joint between the ends.

5,558,160
NITROGEN/CARBON DIOXIDE COMBINATION FRACTURE TREATMENT
Robin Tudor, High River, Canada, assignor to Canadian Fracmaster Ltd., Canada
Filed Jan. 13, 1995, Ser. No. 372,354
Claims priority, application Canada, Nov. 14, 1994, 2135719
Int. Cl.[6] E21B *43/267*
U.S. Cl. 166—280 **32 Claims**



22. Apparatus for hydraulically fracturing an underground formation penetrated by a well bore comprising:
high pressure pump means for injecting a first stream of liquified gas down said well bore;
first storage means to store said liquified gas under pressure;
conduit means to provide fluid communication between said pump means and said first storage means;
second storage means to store proppants at a temperature and pressure substantially equal to the storage pressure and temperature of said liquified gas;
blender means to blend said proppants from said second storage means into said first stream prior to injection thereof down said well bore;
second high pressure pump means for injecting a second stream of gas down said well bore;
third storage means to store said gas; and
high pressure supply lines to provide fluid communication between said first and second pump means and said well bore, said supply lines from said first and second pump means intersecting one another prior to said well bore for admixing of said first and second streams flowing therein before injection thereof down said well bore.

23. A method of fracturing an underground formation penetrated by a well bore comprising the steps of:
forming a first pressurized stream of liquified gas;
forming a second pressurized stream of gas; and
admixing said first and second streams to form a fracturing fluid consisting essentially of said first and second pressurized streams and injecting said fracturing fluid into said formation at a rate and pressure to cause the fracturing thereof.

5,558,161

an actuating piston slidably disposed in said housing;

securing location wherein the sweep is secured on the sweep attaching portion in a field-working condition; and

5,558,161
METHOD FOR CONTROLLING FLUID-LOSS AND FRACTURING HIGH PERMEABILITY SUBTERRANEAN FORMATIONS

Sanjay M. Vitthal, Duncan, Okla.; Mary A. Hardy, Leiderdorp, Netherlands; David E. McMechan, Duncan, Okla.; William E. Martch, Shekou, China, and Ronald G. Dusterhoft, Calgary, Canada, assignors to Halliburton Company, Duncan, Okla.

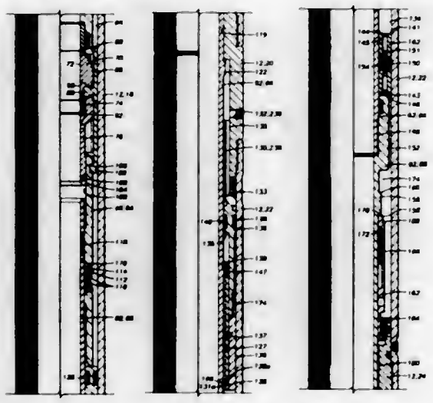
Filed Feb. 2, 1995, Ser. No. 397,468
Int. Cl.[6] E21B *43/267*
U.S. Cl. 166—280 **18 Claims**

1. A method of fracturing a subterranean formation having a permeability in excess of about 10 md comprising:
preparing a first aqueous gel by admixing a first gelling agent with an aqueous liquid;
combining a crosslinking agent with said first aqueous gel in an amount sufficient to result in crosslinking of said first aqueous gel;
introducing said first crosslinker containing aqueous gel into said subterranean formation at a rate and pressure sufficient to create at least one fracture in said formation having a permeability in excess of about 10 md and to produce a filter cake on at least a portion of the face of said fracture
preparing a second aqueous gel by admixing a second gelling agent with an aqueous fluid whereby a linear gel is formed;
admixing a proppant with at least a portion of said aqueous linear gel;
introducing said proppant containing aqueous linear gel into said subterranean formation behind said first crosslinker containing aqueous gel to increase the rate of fluid leak-off to said formation by disruption of the filter cake on the face of said fracture while extending said created fracture in said formation; and
packing proppant into at least a portion of said created fracture by dehydration of the proppant containing gel through increased fluid leak-off over that of the undisrupted filter cake.

5,558,162
MECHANICAL LOCKOUT FOR PRESSURE RESPONSIVE DOWNHOLE TOOL

Kevin R. Manke, Flower Mound, and Paul Ringgenberg, Carrollton, both of Tex., assignors to Halliburton Company, Houston, Tex.

Filed May 5, 1994, Ser. No. 238,417
Int. Cl.[6] E21B *34/10*
U.S. Cl. 166—319 **8 Claims**

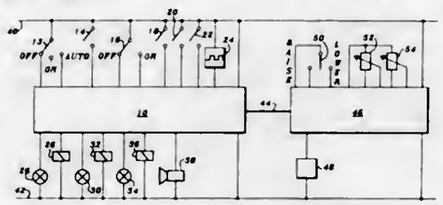


1. An annulus pressure responsive tool apparatus, comprising:
a tool housing;
a power piston slidably disposed in said housing;
an actuating piston slidably disposed in said housing;
a first pressure conducting passage for communicating a well annulus with said power piston to effect movement of the power piston within said housing;
a second pressure conducting passage for communicating said well annulus with said actuating piston to effect movement of said actuating piston within said housing; and
an operating element operably associated with said tool for movement with said actuating piston to a first position of said operating element and with said power piston to a second position of said operating element, wherein said actuating piston is associated with said operating element by a selectively actuatable load transfer assembly.

5,558,163
CONTROL SYSTEM FOR UTILITY VEHICLE

Jürgen Hollstein, Mannheim, Germany, assignor to Deere & Company, Moline, Ill.

Filed Jul. 25, 1995, Ser. No. 506,673
Claims priority, application Germany, Aug. 16, 1994, 44 28 824.7
Int. Cl.[6] A01B *41/06*
U.S. Cl. 172—2 **14 Claims**



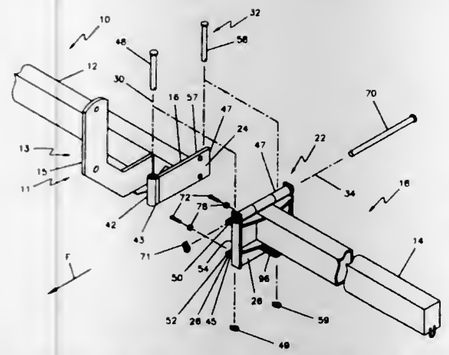
1. A control system for controlling a plurality of control devices of a work vehicle having an implement hitch coupled to a hitch actuator which is controlled by a hitch control unit, the control system having an electronic control unit which is electrically connected to the control devices, a plurality of operating elements for adjusting the operation modes of the control devices and the hitch actuator, the electronic control unit also having means for enabling and disabling an automatic mode for the control devices in response to manipulation of a first one of the operating element and means for activating the enabled automatic mode upon a manual operation signal delivered to the hitch control unit to change the operation modes of the functions associated with the control devices, characterized by:
the first operating element comprising an automatic switch which is electrically connected to the electronic control unit and which is manipulatable independent from other of the plurality of operating elements; and
a hitch position sensor electrically connected to the hitch control unit, the electronic control unit controlling the control devices as a function of sensed hitch position and according to a predetermined program when the automatic mode is activated.

5,558,164
COLLAPSIBLE TOOL BAR FOR AGRICULTURAL IMPLEMENTS

Larry R. Clymer, 214 N. Broadway, Columbus Grove, Ohio 45830

Filed Jan. 25, 1995, Ser. No. 377,972
Int. Cl.[6] A01B *49/00*
U.S. Cl. 172—311 **20 Claims**

17. A collapsible tool bar hinge for connecting a normally horizontal main tool bar section and an outer wing section carrying agricultural earth-working tools including:
a) a first hinge plate secured to one of said sections and
b) a second hinge plate secured to the other of said sections

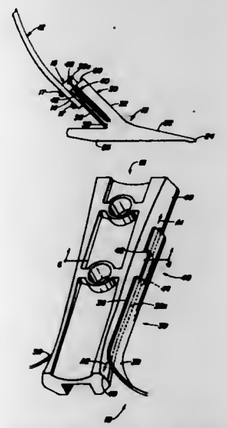


c) said first hinge plate pivotally attached to said second hinge plate about a substantially horizontal axis, and
d) means for urging said outer wing section in a downward direction including a spring mounting member adjustably secured to said first hinge plate and positioned through an aperture in said second hinge plate, said spring mounting member having an enlarged portion, a spring positioned between said enlarged portion and said second hinge plate having one end in contact with said second hinge plate and another end in contact with said enlarged portion of said spring mounting member.

5,558,165
AGRICULTURAL SWEEP AND MOUNTING

David H. Bucher, Des Moines, and David C. Winter, Johnston, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 15, 1995, Ser. No. 537,160
Int. Cl.[6] A01B *15/00*
U.S. Cl. 172—721 **22 Claims**

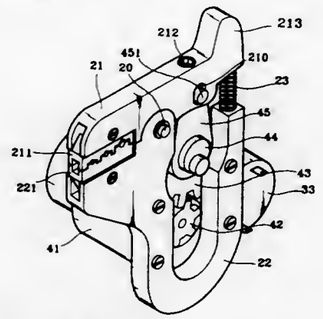


1. In a tillage implement having an upright shank, knock-on sweep structure comprising:
a sweep having an upper connecting portion;
an elongated sweep attaching portion located at a lower end of the shank;
the connecting portion and sweep attaching portion including indexing structure facilitating mounting of the connecting portion on the sweep attaching portion at a preselected location along the sweep attaching portion; and
wherein the sweep is movable a first direction from the preselected location along the sweep attaching portion to a first securing location wherein the sweep is secured on the sweep attaching portion in a field-working condition; and
wherein the sweep is movable a second direction opposite the first direction to a secondary securing location offset from the first securing location in a loss prevention condition.

5,558,166
POWER TOOL

Ching-Jen Chen, No. 71, Mei-Ning St., Tai-Shan Shieng, Taipei Hsien, Taiwan

Filed Apr. 28, 1995, Ser. No. 430,239
Int. Cl.[6] H02G *1/12*
U.S. Cl. 173—49 **2 Claims**



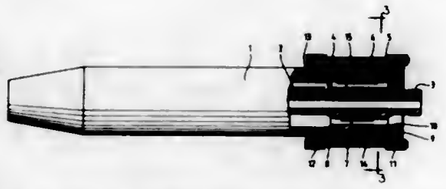
1. A power tool comprising:
a machine base;
a fixed jaw fixedly secured to said machine base, said fixed jaw having a pivot in a middle portion and a working plate at a front end thereof;
a movable jaw turned about the pivot on said fixed jaw and drive to act with said fixed jaw in processing a workpiece between, said movable jaw having a working plate disposed at a front end thereof and moved to act against the working plate on said fixed jaw in processing the workpiece, an oblong hole vertically disposed near a rear end thereof;
a motor mounted inside said machine base;
a power supply unit to provide electric power supply to said motor;
a transmission mechanism driven by said motor to turn said movable jaw about said pivot relative to said fixed jaw in processing the workpiece, said transmission mechanism comprising a speed reducer, a drive gear turned by said speed reducer, an eccentric shaft, a driven gear fixedly mounted around said eccentric shaft and meshed with said drive gear, a link having one end coupled to said eccentric shaft by a loose coupling and an opposite end fixedly made with a round pin inserted in the oblong hole on said movable jaw, the round pin of said link being reciprocated in the oblong hole on said movable jaw to turn said movable jaw about said pivot when said eccentric shaft is turned by said motor through said speed reducer and said drive gear via said driven gear.

5,558,167
PERCUSSION BORING MACHINE

Alfons Hesse, Lennestadt, Germany, assignor to Tracto-Technik Paul Schmidt Spezialmaschinen KG, Lennestadt, Germany

Filed Sep. 17, 1993, Ser. No. 123,301
Claims priority, application Germany, Sep. 19, 1992, 42 31 400.3
Int. Cl.[6] B25D *17/24*
U.S. Cl. 173—91 **8 Claims**

1. A percussion boring machine comprising:
a housing for receiving an axially movable impact piston,



a control pipe for controlling the movement of an impact piston in said housing and being adapted for connection to a compressed air hose, and

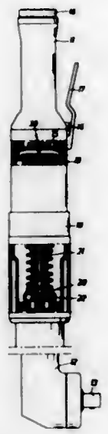
an elastic separator fitted between said housing and said control pipe and held at least on said housing under axial compression by retaining elements.

5,558,168

PHENMATIC POWER NUTRUNNER

Erik R. Rahm, Vasby, both of Sweden, assignor to Atlas Copco Tools AB, Nacka, Sweden

Filed Feb. 17, 1995, Ser. No. 390,652
Int. Cl.[6] B25B *23/145*
U.S. Cl. 173—178 **8 Claims**



1. A pneumatic power nutrunner, comprising:

a rotation motor (**19**),

a pressure air inlet passage (**15**),

an air shut-off valve (**30**) in said inlet passage (**15**),

an output shaft (**13**),

a torque limiting release clutch (**20**) located between said motor (**19**) and said output shaft (**13**) and including a driving clutch half (**21**), torque transferring rolling elements (**24**), and a driven clutch half (**22**) formed with cam surfaces (**25**) engaging said rolling elements (**24**),

a release torque determining thrust sleeve (**26**) which is spring biassed into engagement with said rolling elements (**24**) and which is movably guided on said driving clutch half (**21**) for axial displacement at release of said clutch, said thrust sleeve (**26**) having an internal recess (**42**), an activating rod (**32, 36**) connected to said shut-off valve (**30**) and extending through an axial bore (**45**) in said driving clutch half (**21**), and a latch means (**40**) radially movable relative to said driving clutch half (**21**) from an activating rod (**32, 36**) locking position to an activating rod (**32, 36**) releasing position at release of said clutch (**20**), thereby entering partly said recess (**42**),

wherein:

said driving clutch half (**21**) has a tubular portion (**14**) with radial apertures (**23**) in which said rolling elements (**24**) are movably supported,

said driven clutch half (**22**) is partly received in said tubular portion (**14**),

said cam surfaces (**25**) on said driven clutch half (**21**) are radially acting and are located within said tubular portion (**14**),

said shut-off valve (**30**) comprises an actuating means (**31, 34**) activated at part closure of said shut-off valve (**30**) for generating an axial actuating force on said activating rod (**32, 36**) and,

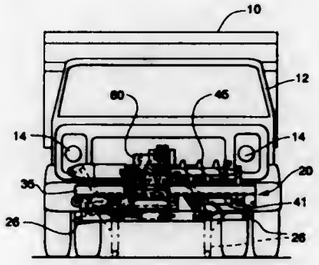
said activating rod (**32, 36**) and said thrust sleeve (**26**) are provided with cam means (**39, 43**) for interacting with said latch means (**40**) to transmit the actuating force of said actuating means (**31, 34**) to said thrust sleeve (**26**), thereby extending said thrust sleeve displacement to a complete disengagement with said rolling elements (**24**) at release of said clutch (**20**) and closure of said shut-off valve (**30**).

5,558,169

TRUCK MOUNTED WORK IMPLEMENT

Kenneth B. Madgwick, 2709 N. 7th St., Garden City, Kans. 67846, and Randall M. Friesen, Garden City, Kans., assignors to Kenneth B. Madgwick, Garden City, Kans.

Filed Feb. 13, 1995, Ser. No. 388,155
Int. Cl.[6] E21B *7/02*
U.S. Cl. 173—185 **9 Claims**



4. In the combination of a vehicle and a work implement mounted thereon, the vehicle being movable in a forward direction of travel corresponding to a line of sight of an operator, said vehicle including an implement mounting mechanism positioned at a forward extremity of said vehicle, the improvement comprising:

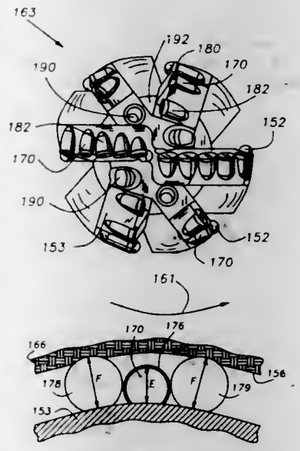
said work implement having a supporting frame detachably mountable to said mounting mechanism, said supporting frame including a boom means that is selectively pivotally extendible transversely and longitudinally of said mounting mechanism in operative positions, said boom means being further positionable in a nested transport position in which said boom means is compactly collapsed forwardly of said vehicle below said line of sight, said boom means being positionable generally perpendicularly of said forward direction of travel and fully within a transverse profile of said vehicle when said boom means is in said transport position.

5,558,170

METHOD AND APPARATUS FOR IMPROVING DRILL BIT STABILITY

Gary M. Thigpen, Houston; William H. Sherwood, Jr., Spring, and Coy M. Fielder, Cypress, all of Tex., assignors to Baroid Technology, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 996,151, Dec. 23, 1992, abandoned, and a continuation-in-part of Ser. No. 312,260, Sep. 26, 1994, Pat. No. 5,449,048. This application Dec. 6, 1994, Ser. No. 350,362
Int. Cl.[6] E21B *10/46*
U.S. Cl. 175—57 **8 Claims**



6. A drill bit for drilling a borehole through a formation, said borehole having a borehole gauge diameter and a borehole wall, said drill bit having a drilling rotation direction, said drill bit comprising:

a hard metal body having an end face;

a plurality of PDC cutter assemblies disposed on said end face for engaging said formation, said plurality of PDC cutter assemblies including at least one final PDC cutter assembly axially and radially spaced from a central region point of said end face;

a first metal body disposed adjacent said at least one final PDC cutter and having a first substantially smooth surface profiled to extend outwardly for substantially continuous sliding contact said borehole wall;

a second metal body disposed laterally outwardly with respect to said center point of said end face, said second metal body having a second substantially smooth surface profiled to extend outwardly a distance less than a neighboring PDC cutter and being operable to engage said formation when said neighboring PDC cutter cuts too deeply into said formation; and

a PDC member secured to said second metal body, said PDC member having a cutting edge and a frustoconical surface on said PDC member, said frustoconical surface having an angle greater than a rake angle of said second metal body.

5,558,171

WELL DRILLING PROCESS AND CLAY STABILIZING AGENT

Raymond E. McGlothlin, and Frank B. Woodworth, both of Houston, Tex., assignors to M-I Drilling Fluids L.L.C., Houston, Tex.

Filed Apr. 25, 1994, Ser. No. 232,386
Int. Cl.[6] C09K *7/02*; **E21B** *21/00*
U.S. Cl. 175—64 **14 Claims**

1. In a method for the drilling of a well penetrating a subterranean formation, the steps comprising:

a) circulating a water-based drilling fluid through said well by introducing said drilling fluid into said well and into contact with said formation and withdrawing said drilling fluid from said well to remove cuttings therefrom; and

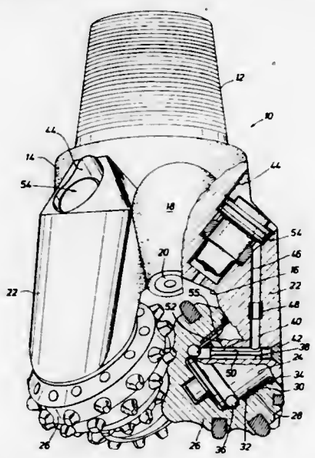
b) entraining in said drilling fluid, a clay stabilizing agent comprising the reaction product of polyamine base reactant selected from the group consisting of an aliphatic polyamine, a heterocyclic polyamine and an alkylalkanol polyamine and mixtures thereof with a functional reactant selected from the group consisting of a carbamide, a dialkylcarbonate, and mixtures thereof.

5,558,172

EARTH BORING BIT AND LUBRICATOR COMPENSATION THEREFOR

Stuart C. Millsapps, Jr., Austin, Tex., assignor to Briscoe Tool Company, Houston, Tex.

Filed Dec. 1, 1994, Ser. No. 347,705
Int. Cl.[6] E21B *10/22*
U.S. Cl. 175—228 **35 Claims**



1. A well drilling bit comprising:

a bit body including a centralized portion and a plurality of radially and circumferentially spaced legs depending longitudinally from the centralized portion;

a respective cutter body rotatably mounted on the free end of each leg with beating means cooperative between each leg and the respective cutter body;

wherein the bit body has a respective lubricant passage therethrough communicating with each bearing and with an upwardly opening lubricant reservoir recess distal the respective bearing, the lubricant reservoir recess also communicating with a respective vent port opening downwardly through the bit body radially inwardly of the respective leg;

a respective lubricating mechanism in each lubricant reservoir recess, each lubricating mechanism comprising

an elastomeric pressure compensating diaphragm extending across the lubricant reservoir recess and sealed with respect

said internal combustion engine adapted selectively to provide torque to said power transmission through said carrier for said

gear, a third gear drivingly engaging the drive wheel gear and means drivingly interconnecting the second gear and the third gear.

an elastomeric pressure compensating diaphragm extending across the lubricant reservoir recess and sealed with respect thereto, dividing the recess into a lower portion communicating with the vent port and an upper portion communicating with the lubricant passage, said diaphragm having a major, laterally outer, flexible portion;

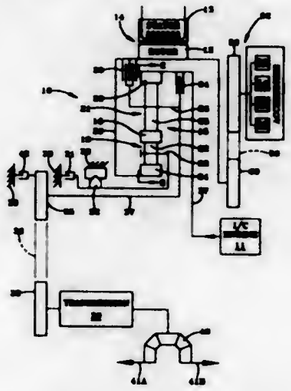
an integral diaphragm protector located above the diaphragm in the upper portion of the lubricant reservoir recess, having a primary, downwardly opening cavity for receipt of lubricant and receiving at least a portion of the diaphragm, including said major portion when the diaphragm is contracted, and having a flow path communicating the interior of the primary cavity with the upper portion of the lubricant reservoir recess externally of the protector, the protector further comprising a cap portion sealed with respect to the lubricant reservoir recess above the point of communication between the lubricant passage and the flow path and connected to the bit body by connector means so as to retain the diaphragm in the lubricant reservoir recess, the external surface of the protector having a relieved zone defining an exterior, annular lubricant groove communicating with the lubricant passage and the flow path, and at least one lateral lubricant port interconnecting the external annular lubricant groove directly with the primary cavity to form at least part of the flow path, the inner diameter of the protector in the primary cavity being relieved in the vicinity of the lateral lubrication port.

5,558,173

INTEGRATED HYBRID TRANSMISSION WITH MECHANICAL ACCESSORY DRIVE

James F. Sherman, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 23, 1993, Ser. No. 125,901
Int. Cl.[6] B60K *25/06*
U.S. Cl. 180—53.8 **14 Claims**



1. A power train for a vehicle, said power train comprising:

an internal combustion engine to provide a source of torque;

a motor/generator to provide a second source of torque;

a drive ratio selection transmission;

a power transmission;

said power transmission having compounded first and second planetary gear sets;

each planetary gear set having first gear means, second gear means and a plurality of planetary gears mounted on a carrier operatively to connect said first and second gear means of the respective first and second planetary gear sets;

a common gear member serving not only as said second gear means for said first planetary gear set but also as said first gear means for said second planetary gear set;

said internal combustion engine adapted selectively to provide torque to said power transmission through said carrier for said second planetary gear set;

means selectively to transfer torque between said motor/generator and said power transmission through said carrier for said second planetary gear set;

means selectively to transfer torque to and from the drive ratio selection transmission and said internal combustion engine, said means also transferring torque from said internal combustion engine to said power transmission;

said carrier for said first planetary gear set being selectively connected to ground;

means selectively connecting said drive ratio selection transmission to ground;

an accessory drive; and,

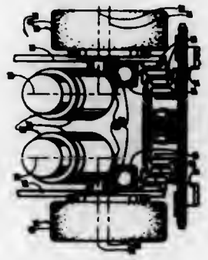
said accessory drive being operatively connected to said motor/generator and said power transmission.

5,558,174

DRIVE TRAIN ASSEMBLY

Isaac Avitan, and Robert C. Wolke, both of Sioux City, Iowa, assignors to Schaeff, Incorporated, Sioux City, Iowa

Division of Ser. No. 188,535, Jan. 26, 1994, abandoned. This application May 8, 1995, Ser. No. 437,450
Int. Cl.[6] B60K *1/02*; **B60L** *11/18*
U.S. Cl. 180—60 **15 Claims**



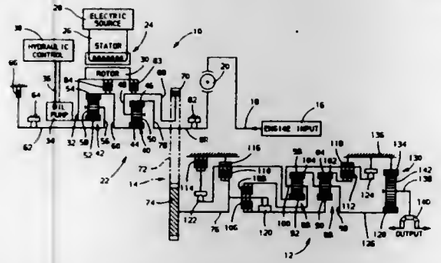
1. A lift truck including a chassis and a pair of masts at a forward end of the chassis, the chassis including a pair of substantially parallel spaced frame members, a pair of drive wheels, a pair of drive wheel spindles, each drive wheel being mounted for rotation about a spindle, each drive wheel including a gear, a motor associated with each drive wheel and drive means interconnecting each motor to the gear of an associated wheel, means rigidly securing each spindle to a frame member adjacent a forward end of the lift truck along an axis perpendicular to the frame members, the drive means including a drive train assembly, the drive train assembly comprising a drive train housing, each motor including an output shaft and a drive train interconnecting the output shaft of each motor with the gear of each drive wheel, the drive train being carried in the housing, means rigidly securing each drive train housing to one of the frame members, the housing extending laterally from the frame member in a direction parallel to the spindle axis, means for mounting the motor to the housing at a location laterally spaced from the frame member, each motor being rigidly cantilever supported from a respective frame member through a respective drive train housing, each motor having an axis tilted from vertical inwardly relative to the forward end of the lift truck, the drive train comprising a first gear rotating unitarily with the motor output shaft, a second gear drivingly engaging the first gear, a third gear drivingly engaging the drive wheel gear and means drivingly interconnecting the second gear and the third gear.

5,558,175

HYBRID POWER TRANSMISSION

James F. Sherman, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 13, 1994, Ser. No. 355,359
Int. Cl.[6] B60K *6/00*
U.S. Cl. 180—65.2 **2 Claims**



1. A power transmission and power source comprising:

an electric power source;

an internal combustion power source including a shaft having a first direction of operation;

a multi-range planetary gear arrangement;

a combining planetary gear arrangement operatively connected between said electrical power source, said internal combustion power source and said multi-range planetary gear arrangement, said combining planetary gear arrangement having a plurality of members;

a first one-way torque transmitting means for selectively grounding a first member of the combining planetary gear arrangement and said internal combustion power source connected therewith for preventing operation of the shaft opposite to said first direction of operation;

a first friction clutch means for selectively connecting the electrical power source with a second member of the combining planetary gear arrangement and with an input member of the multi-range planetary gear arrangement;

a second friction clutch means for selectively connecting the electrical power source with a third member of the combining planetary gear arrangement and for cooperating with said first friction clutch means and said electrical power source to initiate operation of said internal combustion power source and for cooperating with the first one-way torque transmitting means to establish a drive path in the combining planetary gear arrangement between the electrical power source and the multi-range planetary gear arrangement when the internal combustion power source is inoperative.

5,558,176

AUTOMOTIVE AIR INTAKE SYSTEM

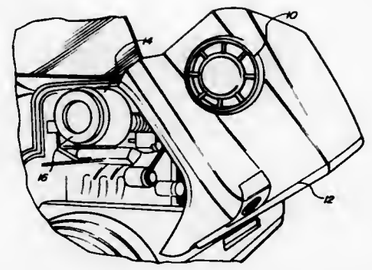
James R. Petersen, Grosse Ile, and Raymond T. Champagne, Taylor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 31, 1994, Ser. No. 332,232
Int. Cl.[6] B60K *13/02*
U.S. Cl. 180—68.3 **7 Claims**

1. An automotive air intake system comprising:

a moveable and pivotally mounted hood having a shear closing movement;

a striker assembly vertically mounted to said hood and having a rigid striker plate and a flexible conduit, said conduit having a conduit opening and securing said striker plate to said hood; and



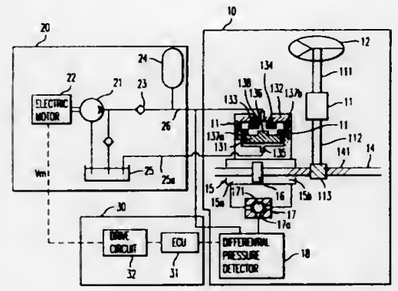
a stationary air cleaner plate having a planar sealing surface surrounding an air cleaner opening, the shear movement is between said striker assembly and said stationary air cleaner plate when said hood is moved to one of a closed and an open position, said striker plate striking said air cleaner plate and compressing said conduit when said hood is moved to a partially closed position and said conduit opening mating with said air cleaner opening when said hood is moved said closed position.

5,558,177

POWER STEERING APPARATUS

Yoshiharu Inaguma, Nagoya; Yutaka Mori, Toyohashi; Keiji Suzuki, Okazaki, and Takuya Ohkubo, Chiryu, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 29, 1994, Ser. No. 314,622
Claims priority, application Japan, Sep. 30, 1993, 5-245167
Int. Cl.[6] B62D *5/09*
U.S. Cl. 180—422 **8 Claims**



1. A power steering apparatus comprising:

a hydraulic actuator having a pair of cylinder chambers and operable to generate assisting power;

a hydraulic pump for supplying pressurized fluid;

an electric motor for operating said hydraulic pump;

a directional control valve mechanism of center-closed type operable by a steering wheel for delivering the pressurized fluid supplied by said hydraulic pump selectively to said pair of cylinder chambers of said hydraulic actuator through a supply passage;

detection means for detecting differential pressure between a pressure at said supply passage and a higher one of pressures in said pair of cylinder chambers; and

motor control means for controlling said electric motor to drive said electric motor intermittently while the steering wheel is at its neutral position at such a speed as to return the differential pressure to a predetermined first value, comprising,

a drive voltage control circuit for outputting a drive voltage depending on the detected differential pressure to said electric motor,

wherein while the steering wheel is at the neutral position, said

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5,558,179

an oil reservoir placed below a bearing chamber in which said bearing is disposed, and an oil pick-up member mounted on an end

ing said plurality of pinions, each of said crown gears engaging one of said screw shafts, and a plurality of gear boxes

wherein while the steering wheel is at the neutral position, said drive voltage control circuit outputs no drive voltage to stop said electric motor until the differential pressure decreases from said first predetermined value to a second predetermined value, but thereafter outputs a drive voltage to drive said electric motor at said speed so as to return the differential pressure to said first predetermined value.

5,558,178

METHOD AND ARRANGEMENT FOR CONTROLLING A MOTOR VEHICLE

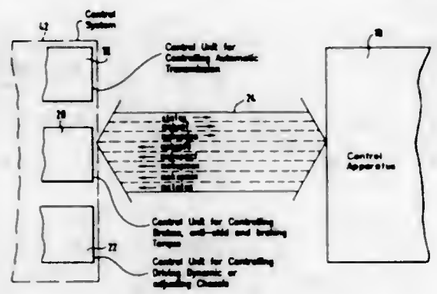
Werner Hess, Stuttgart, and Hong Zhang, Bietigheim-Bissingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 26, 1993, Ser. No. 157,993

Claims priority, application Germany, Nov. 26, 1992, 42 39 711.1

Int. Cl.[6] B61C *15/12*

U.S. Cl. 180—197 **13 Claims**



1. A method for controlling a motor vehicle having at least two component systems interconnected via a communication system for facilitating an exchange of data between the component systems, the motor vehicle further having a drive unit generating torque and a first one of said component systems being a first control unit for controlling the torque of said drive unit, a second one of said component systems being a second control unit for operating on said torque in at least one operating state, the method comprising the steps of:

generating a desired torque value (mokupdes) in said second control unit indicative of the magnitude of the torque to be outputted by said drive unit;

transmitting said desired torque value (mokupdes) from said second control unit via said communication system to said first control unit;

forming an electrical output signal in said first control unit based on said desired torque value (mokupdes) to adjust said torque of said drive unit to correspond to said desired torque value (mokupdes);

determining values (tlHFM, n) in said first control unit which correspond to at least one operating variable of said drive unit and said vehicle and computing from said values (tlHFM, n) an actual torque (mokupact) outputted by said drive unit; and,

transmitting said computed actual value (mokupact) from said first control unit to said second control unit via said communication system.

5,558,179

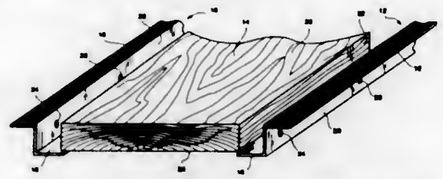
PLANK SUPPORT JACKET

LeRoy Matthews, 5 Copperfield Dr., Hawthorn Woods, Ill. 60047

Division of Ser. No. 170,416, Dec. 20, 1993, Pat. No. 5,409,082, which is a continuation of Ser. No. 972,389, Nov. 5, 1992, abandoned. This application Feb. 3, 1995, Ser. No. 383,354

Int. Cl.[6] E04G *1/15*

U.S. Cl. 182—222 **6 Claims**



1. A support jacket in combination with a plank, said support jacket comprising an upper horizontal ledge and a lower horizontal ledge joined at opposite ends of a vertical wall member, each ledge extending from said vertical wall member in a direction opposite each other, and means for connecting and orientating said vertical wall member to a longitudinal side surface of said plank to be supported so as to dispose said lower horizontal ledge in supporting contact with the underside surface of said plank and to dispose said upper horizontal ledge to extend laterally outward from said longitudinal side surface of said plank in substantially axial alignment with the upper surface of said plank without contacting said plank, said vertical wall member being both vertically dimensioned and horizontally dimensioned to correspond to the vertical and horizontal dimensions of said longitudinal side surface of said plank and said vertical wall member being substantially planar so as to be adapted to form a border to said longitudinal side surface of said plank.

5,558,180

BEARING LUBRICATING APPARATUS FOR ROTARY MACHINE

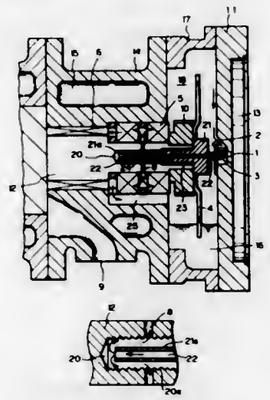
Kiyoshi Yanagisawa, Kanagawa-ken, Japan, assignor to Ebara Corporation, Tokyo, Japan

Filed Apr. 10, 1995, Ser. No. 421,152

Claims priority, application Japan, Apr. 12, 1994, 6-073054

Int. Cl.[6] F01M *9/06*

U.S. Cl. 184—11.2 **5 Claims**



1. A bearing lubricating apparatus for a rotary machine comprising a rotary shaft rotatably supported within a casing via a bearing,

an oil reservoir placed below a bearing chamber in which said bearing is disposed, and an oil pick-up member mounted on an end portion of said rotary shaft and partially immersed into a lubricating oil in said oil reservoir, said oil pick-up member picking up the lubricating oil which is thereafter supplied to said bearing, said apparatus characterized by:

an oil receiving portion formed at an inner surface of said casing near said end portion of said rotary shaft and adapted to receive the lubricating oil picked up by said oil pick-up member;

a suction nozzle for sucking the lubricating oil received in said oil receiving portion;

a first passage for directing the lubricating oil sucked by said suction nozzle to an inner side of said rotary shaft opposite to a suction side through the interior of said rotary shaft;

a second passage for directing the lubricating oil from said first passage toward the suction side and for supplying the lubricating oil to said bearing, wherein a screw thread is formed on the surface of said second passageway and extends axially along the length of said second passageway; and

at least one oil supply nozzle adapted to effect a pumping action as said rotary shaft is rotated to supply the lubricating oil to the bearing.

5,558,181

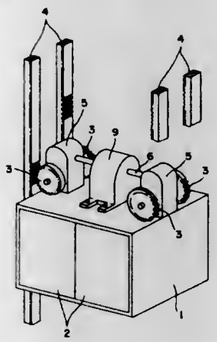
ELEVATOR

Mutsuro Bundo, 6-11, Funai-cho 1-chome, Oita-shi, Oita-ken, Japan

Filed Jan. 4, 1995, Ser. No. 368,632

Int. Cl.[6] B66B *9/02*

U.S. Cl. 187—270 **3 Claims**



1. An elevator, comprising:

a vertical elevator passage having sidewalls;

an elevator cage disposed in said vertical elevator passage, said elevator cage comprising a top, a bottom and edges of said top and bottom;

a plurality of vertical racks secured to said sidewalls of said vertical elevator passage;

a plurality of pinions carried on a pair of substantially horizontal rotary shafts that are supported along said edges of one of said top and bottom of said elevator cage and that extend parallel to said sidewalls of said vertical passage having said plurality of vertical racks thereon, said plurality of vertical racks each having at least one of said plurality of pinions engaged therewith; and

a means for irreversibly driving said pinions in opposite rotary directions so as to raise and lower said elevator cage along said plurality of vertical racks, said means comprising an irreversible motor mounted on said cage, a plurality of screw shafts that have threaded end portions and that are symmetrically connected to said irreversible motor so as to extend in opposite directions from said irreversible motor, a plurality of crown gears secured to midpoints of said rotary shafts carrying said plurality of pinions, each of said crown gears engaging one of said screw shafts, and a plurality of gear boxes covering said crown gears and said threaded end portions of said screw shafts.

5,558,182

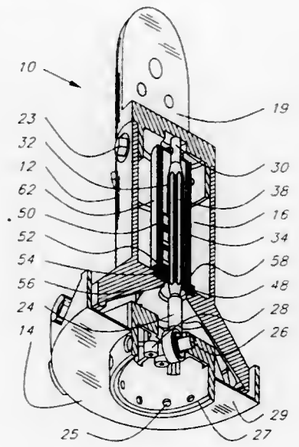
BENDING AND TORSION LOAD ALLEVIATOR WITH AUTOMATIC RESET

Horacio M. de la Fuente, Friendswood, Tex.; Michael C. Eubanks, Tulsa, Okla., and Anthony X. Dao, Friendswood, Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 25, 1995, Ser. No. 428,743

Int. Cl.[6] F16D *63/00*

U.S. Cl. 188—67 **22 Claims**



1. A load alleviator, comprising:

a crown assembly having a plurality of cam surfaces circumferentially spaced about a portion thereof,

a center housing having an end portion thereof engageable with said crown assembly, said end portion having thereon a plurality of cam followers for engaging respective ones of said plurality of cam surfaces;

an energy dissipator having a dissipator body and an elongate member, said elongate member being axially moveable within said dissipator body member, said energy dissipator being operable to dissipate energy as a result of relative axial movement between said dissipator body and said elongate member;

first and second connectors for securing said crown assembly to said center housing, said first connector mounting said energy dissipator with respect to said crown housing, said second connector mounting said energy dissipator with respect to said center housing, said first and second connectors being operative to allow a range of angular deflection of said crown assembly relative to said center housing; and

a biasing member for biasing said crown assembly relative to said center housing.

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0 degrees but less than 90 degrees, and a second range greater

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FRICTION DISK WITH RENEWABLE WEAR FACES

engaged at respective engagement sites with the shaft rotational engagement means and situated in juxtaposition with

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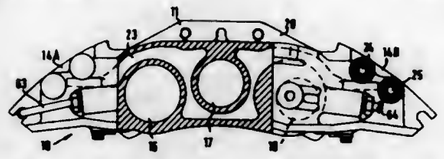
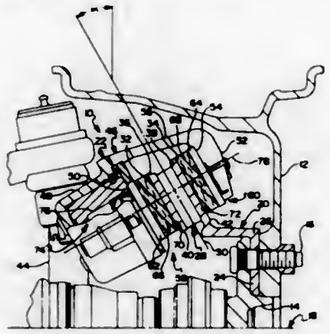
DISK BRAKE
Ashley Way, Leamington, Great Britain, assignor to Automotive Products, plc, Warwickshire, United Kingdom
PCT No. PCT/GB94/00565, § 371 Date Nov. 17, 1994, § 102(e) Date Nov. 17, 1994, PCT Pub. No. WO94/21937, PCT Pub. Date Sep. 29, 1994
PCT Filed Mar. 18, 1994, Ser. No. 343,523
Claims priority, application United Kingdom, Mar. 19, 1993, 9305795
Int. Cl.[6] F16D 55/02
U.S. Cl. 188—71.6 4 Claims



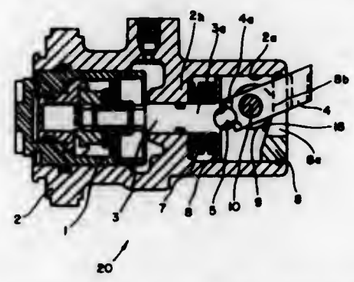
1. A disc brake caliper having two limbs which in use straddle a brake disc to support friction pads on each side of the brake disc for engagement with opposed sides of the disc, two or more hydraulic piston and cylinder assemblies in each limb of the caliper for operation of the caliper via a brake applying circuit, a cooling circuit separate from the brake applying circuit for the circulation of coolant within the caliper, the cooling circuit including an internal gallery in each limb of the caliper which at least partially encircles a cylinder of each assembly in the limb and the gallery in one limb being interconnected with the gallery in the other limb, and pumping means for circulating coolant around the separate cooling circuit which includes both galleries.

5,558,184
SLANTED BRAKE ROTOR
Bernhard W. Kullmann, Rochester Hills; Joerg L. Scheibel, and Werner Gottschalk, both of Auburn Hills, all of Mich., assignors to ITT Automotive, Auburn Hills, Mich.
Filed Jun. 7, 1995, Ser. No. 481,979
Int. Cl.[6] F16D 65/20
U.S. Cl. 188—72.4 4 Claims



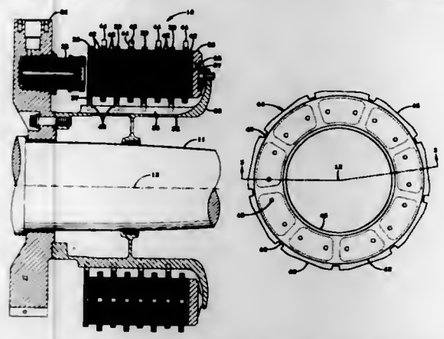
1. A disc brake assembly for use in a vehicle having a rotatable hub, comprising:
a rotor mounted to the hub of the vehicle for rotation therewith about an axis of rotation, said rotor including a mounting flange portion for mounting a wheel thereagainst, said rotor further including an annular member coupled to said flange and having a central axis and two opposing friction faces for contacting a respective friction element during braking, said annular member being disposed such that said central axis and a line perpendicular to said axis of rotation form an angle having a value selected from one of a first range greater than 0 degrees but less than 90 degrees, and a second range greater than 90 degrees but less than 180 degrees, each face being substantially parallel to said central axis; and,
a caliper assembly mounted to the vehicle and having a housing, said housing including an inboard portion and an outboard portion on opposite sides of said rotor for receiving the friction elements wherein said inboard and outboard portions are connected by a bridge portion,
said caliper assembly further including fluid motor means for urging said friction elements into contact with said opposing friction faces of said annular member during braking, said fluid motor means including a fluid actuated piston slidably disposed in said housing to move along a longitudinal axis for urging opposing contacting surfaces of said friction elements against said opposing friction faces of said annular member, said longitudinal axis being substantially perpendicular to said opposing friction faces wherein a line of force as applied by said contacting surfaces is perpendicular to said opposing friction faces, said longitudinal axis and said line of force being coincident.

5,558,185
INPUT LEVER FOR ACTUATING A PUSH ROD FOR A BRAKE MOTOR
Pasquale Tribuzio, Bitonto, and Angelantonio Errico, Giovinazzo, both of Italy, assignors to AlliedSignal Freni SPA, Modungo, Italy
PCT No. PCT/EP94/00997, § 371 Date Apr. 19, 1994, § 102(e) Date Apr. 19, 1994, PCT Pub. No. WO94/25774, PCT Pub. Date Nov. 10, 1994
PCT Filed Mar. 30, 1994, Ser. No. 211,843
Claims priority, application Italy, Apr. 30, 1993, TO93A0299
Int. Cl.[6] F16D 55/26
U.S. Cl. 188—72.6 4 Claims



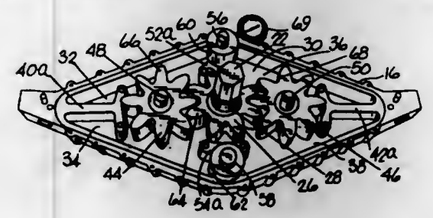
1. A mechanical device for actuating a piston located in a cylinder housing of a disk brake, said device comprising: a push rod translationally secured to said piston, a lever connected to said push rod for axially moving said piston within said cylinder, a ball located in a first semi-spherical indentation on an end of said push rod and in a second semi-spherical indentation on an end of said lever to form a joint for connecting said lever to said push rod, said ball allowing relative rotation of said lever with respect to said push rod, means for translationally guiding said push rod in said cylinder, an end member secured to said cylinder and having a vertical inclined plane thereon adjacent an elongated opening, said lever extending through said elongated opening, and roller means secured to said lever and engaging said inclined plane characterized in that said roller means comprises a roller mounted to rotate on said lever in response to an input force applied to said lever which causes said roller means to roll on said inclined plane and impart translation movement of said push rod within said cylinder which is axially communicated said piston, said rolling means engaging said inclined plane at a single point while said joint formed by said ball communicates the input force as modified by the vertical inclined plane into said push rod such that substantially only axial translation force is applied to said push rod.

5,558,186
FRICTION DISK WITH RENEWABLE WEAR FACES
Robert W. Hyde, Beavercreek; William T. Holzworth, Springfield, and Bradley J. Baden, Troy, all of Ohio, assignors to The BFGoodrich Company, Akron, Ohio
Filed May 24, 1995, Ser. No. 449,437
Int. Cl.[6] F16D 65/10
U.S. Cl. 188—218 XL 25 Claims



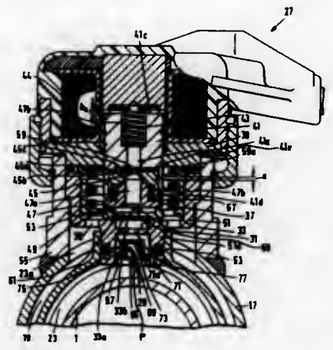
1. A friction disk comprising an annular carrier including a plurality of recessed regions and torque drive notches spaced around its circumferential direction, and a friction lining mounted on the carrier, the friction lining having a flat wear face and an obverse face including raised areas corresponding to and matingly engaging the walls of the recessed regions of the carrier to provide torque transfer capability between the lining and the carrier, the depth of the recessed regions being slightly less than the height of the raised areas.

5,558,187
BRAKE APPARATUS FOR A ROTATING SHAFT
David H. Aberle, 5916 Braun Way, Arvada, Colo. 80004
Filed Jun. 7, 1995, Ser. No. 486,896
Int. Cl.[6] F16D 57/06
U.S. Cl. 188—292 7 Claims



1. A brake apparatus for a rotating rotatable shaft, the apparatus comprising:
a) a fluid-tight housing;
b) a shaft rotational engagement means disposed within the housing and having an exteriorly-accessible opening therethrough for rotatable engagement with a rotatable shaft;
c) a plurality of walls within the housing forming a plurality of compartments within the housing, with said compartments in fluid communication with each other through openable and closable valve means;
d) a liquid permanently within the housing present in an amount to substantially fill the housing and flowable through the valve means in direct relation to the openness of said valve means; and
e) a plurality of compartment-divider rotational engagement means disposed inside the housing, said compartment-divider rotational engagement means rotatably restriction-sealingly engaged at respective engagement sites with the shaft rotational engagement means and situated in juxtaposition with the walls forming the compartments to produce respective restriction seals therewith.

5,558,188
VIBRATION DAMPER FOR A MOTOR VEHICLE SUSPENSION
Otto Samonil, Niederwerrn, and Steffen Kraus, Schweinfurt, both of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany
Filed Jul. 10, 1995, Ser. No. 500,179
Claims priority, application Germany, Jul. 12, 1994, 44 24 436.3
Int. Cl.[6] F16F 9/46; F16K 31/02; B60G 17/08
U.S. Cl. 188—299 16 Claims



1. A vibration damper for a suspension of a motor vehicle for damping vibrations between a wheel and a frame of a motor vehicle, said vibration damper having an exterior, the exterior defining a side of said vibration damper, and said vibration damper comprising:
a cylinder;
said cylinder defining a chamber therewithin;
said cylinder having a first end and a second end, and said cylinder defining a longitudinal dimension between the first end and the second end;
means for connecting said cylinder to one of: a wheel and a frame of a motor vehicle;
a piston rod;
said piston rod extending along the longitudinal dimension and extending through the first end of said cylinder;
said piston rod having a first end within said cylinder and a second end outside of said cylinder;
means for connecting said piston rod to the other of a wheel and a frame of a motor vehicle;
a piston disposed at said first end of said piston rod;
said piston dividing said chamber into a first chamber portion and a second chamber portion;
damping fluid disposed within said first chamber portion and said second chamber portion;
fluid passage means connecting said first chamber portion and said second chamber portion for bypassing fluid around said piston;
valve means for regulating flow of damping fluid through said fluid passage means; and
an electromagnet for controlling operation of said valve means;
said valve means being attached to the side of said vibration damper, and said valve means comprising:
a valve seat;
a valve closure member disposes adjacent said valve seat for closing against said valve seat;

means for closing said valve closure member with respect to said valve seat to substantially close said fluid passage

said second end portion of said first part being disposed adjacent said pilot control element;
said pilot control element being disposed to rest against and

they communicate with said vents in the bottom side of said second tube, a spring being fitted at a rear end of said regulating rod behind one of said pair of valve elements;

means for closing said valve closure member with respect to said valve seat to substantially close said fluid passage means;

means for permitting opening of said valve closure member with respect to said valve seat to open said fluid passage means;

said electromagnet comprising means for operating at least one of said means for permitting opening and said means far closing;

at least one fluid passage portion disposed adjacent said valve seat, said at least one fluid passage portion defining a longitudinal direction extending away from said valve seat and a longitudinal axis oriented parallel with respect to said longitudinal direction;

said cylinder having a higher-pressure channel, disposed generally along the longitudinal dimension of said cylinder, for conducting fluid under higher pressure;

said cylinder having a lower-pressure channel, disposed generally along the longitudinal dimension of said cylinder and concentrically with respect to said high-pressure channel, for conducting fluid under lower pressure;

said valve means comprising means for providing fluid communication between said higher-pressure channel and said lower-pressure channel;

said higher-pressure channel being concentrically nested radially inwardly of said lower-pressure channel, with respect to said longitudinal axis of said cylinder;

said at least one fluid passage portion having an inlet portion opening into said higher-pressure channel of said cylinder;

said at least one fluid passage portion extending from said inlet portion to said valve seat, to generally promote the flow of fluid, along an axis of flow that is generally parallel to the longitudinal axis of said at least one fluid passage portion, from said inlet portion to said valve seat, to open said valve closure member from said valve seat in a direction away from said at least one fluid passage portion; and

insert means having been inserted in said at least one fluid passage portion, for locally diverting fluid flow within said at least one fluid passage portion through at least one substantial angle with respect to said longitudinal direction of said at least one fluid passage portion, to locally displace the axis along which fluid flows through said at least one passage portion to a substantial degree with respect to said longitudinal axis of said at least one fluid passage portion.

5,558,189

ADJUSTABLE HYDRAULIC VIBRATION DAMPER

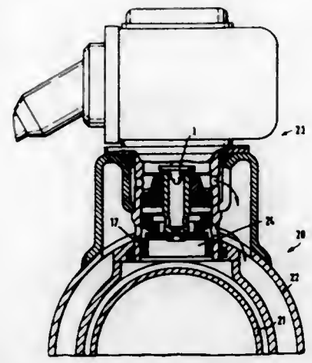
Hubert Beck, Eltorf-Kreuzhof, Germany, assignor to Fichtel & Sachs AG, Eltorf, Germany

Filed Jul. 26, 1995, Ser. No. 507,701

Claims priority, application Germany, Jul. 26, 1994, 44 26 385.6

Int. Cl.[6] F16F *9/46*; B60G *17/08*

U.S. Cl. 188—299 **20 Claims**



1. A vibration damper comprising:

a cylinder defining a chamber therein, said cylinder containing a damping fluid;

said cylinder having a longitudinal axis;

a piston rod sealingly projecting into said cylinder and being axially displaceable with respect to said cylinder;

a piston being attached to said piston rod, said piston being slidably disposed within said cylinder to sealingly divide said chamber into first and second chambers;

an outer tube disposed about said chamber, said piston and said piston rod;

means for permitting fluid communication between said first and second chambers;

said means for permitting fluid communication comprising electromagnetic damping valve means mounted at said outer tube;

said electromagnetic damping valve means comprising:

a valve arrangement, said valve arrangement having means for adjusting fluid communication between said first and second chambers;

a damping valve for adjusting the flow of the damping fluid between said first working chamber and said second working chamber;

said valve having a longitudinal axis about which said valve extends, said longitudinal axis of said valve extending essentially radially away from said longitudinal axis of said shock absorber cylinder;

said valve comprising:

a pilot valve;

said pilot valve comprising a pilot control element;

a valve body;

a valve seat;

said valve seat comprising a valving surface;

said valve body being disposed to rest against and close against said valve seat and open away from said valve seat, and thus permitting flow of said damping fluid across said valve seat;

said valving surface defining a planar area in which said valving surface is disposed;

said planar area being disposed substantially transverse to said longitudinal axis of said valve;

said valve seat being disposed to control a major flow of fluid through said valve;

said valve body comprising a first part and a second part;

said first part being movable with respect to said second part;

said first part having a first end portion and a second end portion;

said second end portion being opposite said first end portion;

said first end portion and said second end portion being disposed along said longitudinal axis of said valve;

said first end portion extending at least to said planar area defined by said valving surface;

said first end portion having a portion extending towards said valve seat;

said first end portion and said second end portion being rigidly connected to one another to prevent separation of said first end portion away from said second end portion;

said first valve body part being mounted in a first axial guide;

said second part being operatively connected to said first part such that said second part can be displaced radially within said valve with respect to the longitudinal axis of said valve;

said second part having a first extreme end and a second extreme end;

said second extreme end being opposite said first extreme end;

said first extreme end and said second extreme end being disposed along said longitudinal axis of said valve;

said first end portion of said first part extending beyond said first extreme end of said second part;

said second end portion of said first part extending beyond said second extreme end of said second part;

said second end portion of said first part being disposed adjacent said pilot control element;

said pilot control element being disposed to rest against and close against said second end portion of said first part and to open away from said second end portion of said first part, thus permitting flow of said damping fluid through said pilot valve;

said pilot control element being disposed to control a minor flow of fluid through said valve; and

said minor flow of fluid being substantially smaller than said major flow of fluid.

5,558,190

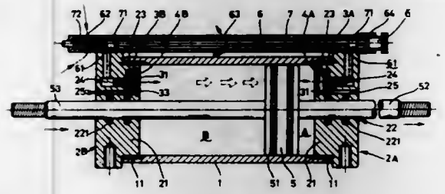
DAMPING DEVICE ADAPTED FOR USE IN EXERCISE APPARATUS

John Chang, No. 1-2, Lane 975, Chun-Jih Road, Tao-Yuan City, Taiwan

Filed Oct. 6, 1995, Ser. No. 540,018

Int. Cl.[6] F16F *9/50*

U.S. Cl. 188—312 **3 Claims**



1. A damping device adapted for use in exercise apparatus, comprising:

a cylinder, having an internally threaded front end and an internally threaded rear end;

a front cylinder cover and a rear cylinder cover, each of which has a threaded raised portion provided on an inner side thereof for engaging said threaded front end or said threaded rear end of said cylinder and is provided with an axial through hole formed in a central portion thereof, said axial through hole having a plurality of oil seals disposed therein, said front cylinder cover and said rear cylinder cover each having a valve hole formed near its corresponding axial through hole, said valve hole in both of said front cylinder cover and said rear cylinder cover communicating with a first vent which opens in an upper side of said cylinder cover and a second vent which opens in an outer side of said cylinder cover;

a first valve disposed in said valve hole of said front cylinder cover and a second valve disposed in said valve hole of said rear cylinder cover, each of said valves having an axial through hole connected to a first tube of a smaller diameter on an outer side thereof, said first tube being fitted into said first vent and being provided with a longitudinally oriented through hole in an upper rear side thereof;

a first C-clip and a second C-clip for positioning said first valve and said second valve within their corresponding valve holes;

a piston disposed within said cylinder and having an outer periphery insertably provided with a plurality of oil seals, both ends of said piston extending to form a first action bar and a second action bar, which respectively pass through said axial through holes in said front cylinder cover and said rear cylinder cover;

a second tube having a front end and rear end fixedly secured at respective upper sides of said front cylinder cover and said rear cylinder cover, said second tube being provided with a plurality of vents formed in its bottom side for communicating with said first vents in said front cylinder cover and said rear cylinder cover, said second tube further having through holes formed near its upper rear portion and upper middle portion;

a regulating rod disposed within said second tube and having a pair of valve elements located at suitable positions such that they communicate with said vents in the bottom side of said second tube, a spring being fitted at a rear end of said regulating rod behind one of said pair of valve elements;

a stop element fitted on a front end portion of said regulating rod for positioning said regulating rod in said second tube and controlling displacement of the regulating rod therein.

5,558,191

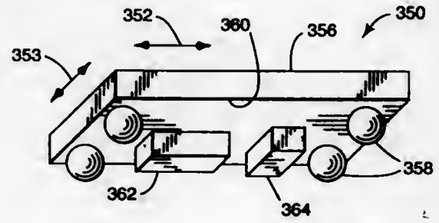
TUNED MASS DAMPER

Ming-Lai Lai, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Continuation-in-part of Ser. No. 228,645, Apr. 18, 1994. This application Mar. 9, 1995, Ser. No. 401,973

Int. Cl.[6] F16F *7/10*

U.S. Cl. 188—379 **11 Claims**



1. A damping apparatus for controlling a dynamic response in a primary structure, the primary structure having a natural vibrational frequency, said damping apparatus comprising:

a secondary mass;

a support means for the secondary mass, the support means operably connecting the secondary mass and the primary structure and providing for two dimensional movement of the secondary mass relative to the primary structure;

at least one spring interposed between the primary structure and the secondary mass; and

at least one viscoelastic element interposed between the primary structure and the secondary mass;

wherein said at least one spring and said at least one viscoelastic element are tuned to a frequency to provide said damping apparatus with a vibrational frequency of approximately said natural vibrational frequency of said primary structure; and

whereby when said dynamic response is initiated in the primary structure, the dynamic response is damped by the movement of the secondary mass.

5,558,192

FLUID COUPLING AND EXTERNAL CONTROL THEREFOR

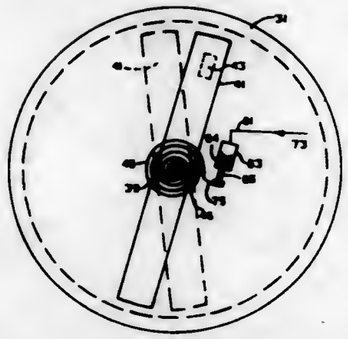
Günther Mühlbach, Heidelberg, and Heinz Wollmann, Bermatingen, both of Germany, assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 27, 1995, Ser. No. 411,123

Int. Cl.[6] F16D *35/02;43/25*

U.S. Cl. 192—58.61 **9 Claims**

1. A fluid coupling device of the type including a first rotatable coupling member defining an axis of rotation, enclosure means associated with said first coupling member to define a fluid chamber therebetween; valve means associated with said first coupling member and disposed to separate said fluid chamber into a fluid operating chamber and a fluid reservoir chamber; a second rotatable coupling member disposed in said fluid operating chamber and being rotatable relative to said first coupling member; one of said first coupling member and said enclosure means cooperating with said second coupling member to define a viscous shear space therebetween, said valve means being operable to control the flow of fluid between said reservoir chamber and said operating cham-



ber, and including means defining a fluid inlet port and a valve member movable between an open position permitting fluid flow through said inlet port, and a closed position (FIG. 3) substantially blocking fluid flow through said inlet port; a valve shaft operably associated with said valve member for movement therewith, and a bimetal element operably associated with said enclosure means and in operable engagement with said valve shaft to move said valve member between said open and closed positions in response to variations in ambient air temperature, said bimetal element including a movable portion in operable engagement with said valve shaft, and a portion normally fixed relative to said enclosure means; characterized by:

(a) actuator means operably associated with said enclosure means for rotation therewith;

(b) said actuator means including an actuator member in operable engagement with said normally fixed portion of said bimetal element, and operable in response to variations in a predetermined condition, to move said normally fixed portion between a normal position (FIG. 3) and an actuated position.

5,558,193

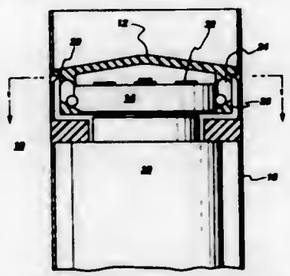
BALL-TYPE AUGER RATCHET MECHANISM FOR AGITATOR/AUGER SYSTEMS

Harold J. Jenkins, Amsterdam; Robert E. Sundell, Clifton Park, and Sudhir D. Savkar, Niskayuna, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1994, Ser. No. 283,380

Int. Cl.[6] D06F *17/08;37/40;* F16D *41/061*

U.S. Cl. 192—45 **7 Claims**



1. A ratchet mechanism for converting oscillatory motion of a vertical agitator in first and second opposite rotary directions into unitary motion of an auger in said first direction comprising:

a cylindrical top cap for being joined to said auger and having a top closed end, a bottom open end, and a plurality of pocket cavities extending at least in part vertically;

means for connecting said top cap to said auger comprising a spin weld;

a cam positioned horizontally within said top cap for being joined to said agitator, said cam having a plurality of outwardly extending teeth; and

a plurality of balls positioned within said pocket cavities respectively, wherein said balls are displaced upwardly within said pocket cavities at a first position by rotation of said cam in said second direction and said balls fall by gravity to interlock between said cam and said top cap at a second position by rotation of said cam in said first direction.

5,558,194

NEUTRAL POSITION DETENT FOR SYNCHRONIZER

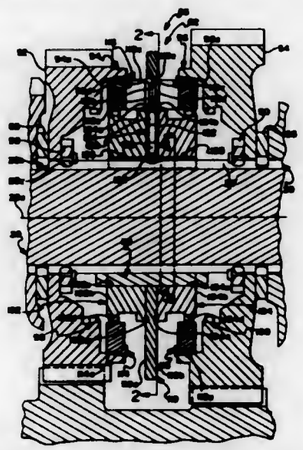
David L. Cox, Wigan, England, assignor to Eaton Corporation, Cleveland, Ohio

Filed Oct. 24, 1994, Ser. No. 328,195

Claims priority, application England, Oct. 29, 1993, 9322319.6

Int. Cl.[6] F16D *23/06*

U.S. Cl. 192—53.31 **5 Claims**



1. A pin-type synchronizer mechanism for first and second axially spaced apart gears mounted for rotation and secured against axial movement on shaft means having an axis about which the gears and the shaft means rotate, the mechanism comprising:

gear friction and gear jaw means affixed to each gear, the gear friction means engagable with first and second axially spaced apart and axially movable friction means for respectively synchronizing the first and second gears with the shaft means, the gear jaw means engagable with axially movable jaw means of an assembly including a flange extending radially between the first and second friction means and means axially connecting the flange to the axially movable jaw means, the flange for axially moving the axially movable friction and jaw means from disengaged positions there of into said engagement in response to an axially bi-directional shift force (F_s) moving the flange from a neutral position thereof, toward one of said gears; the axially movable jaw means including axially extending internal spline teeth having flank surfaces disposed continuously in spaces between pairs of commonly facing axially extending flank surfaces of external spline teeth affixed to the shaft means

blocker means operative when engaged for preventing engagement of the jaw means prior to the synchronizing, the blocker means including a plurality of circumferentially spaced pins rigidly extending axially from the first and second friction means and into pin openings of the flange, each of the pins having axially spaced apart blocker shoulders engagable with blocker shoulders defined on opposite sides of the flange and about the associated opening;

pre-energizer means for engaging either one of the first and second friction means in response to initial axial movement of the flange by the shift force (F_s) from the neutral position toward one of the gears for engaging the blocker means in response to engagement of the friction means producing a synchronizing torque (T_s) transmitted to the flange via the pins and for transmitting the shift force (F_s) to the engaged friction means via the engaged blocker means to increase the engaging force of the engaged friction means, the pre-energizer means including resilient means for positioning the friction means in the disengaged position thereof when the flange is in the neutral position thereof; characterized by:

detent means resiliently reacting between the assembly and the shaft means for positioning the assembly in the neutral position relative to the shaft means the detent means including a recess defining the neutral position and formed in an outer circumferential surface of the shaft means for receiving a radially movable neutral position plunger disposed in an elongated slot extending radially outward from a central opening in the flange and biased radially inward by a spring disposed in the slot.

5,558,195

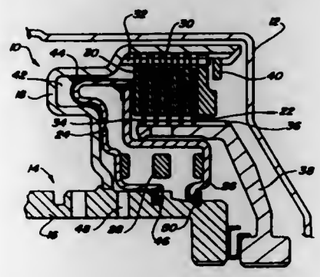
SUBSTANTIALLY RECTANGULAR CROSS SECTION TRANSMISSION SPRING

Henry R. Bucciero, Harper Woods, Mich., assignor to Kuhlman Corporation, Lexington, Ky.

Filed Jul. 28, 1994, Ser. No. 282,054

Int. Cl.[6] F16D *25/0638*

U.S. Cl. 192—85 AA **6 Claims**



1. A fluid actuated clutch assembly selectively movable between an applied condition and a released condition, said clutch assembly comprising:

an input member rotatably supported by said clutch assembly;

an output member rotatably supported by said clutch assembly;

a selectively operable clutch device for locking said input device to said output device;

a piston device slidably disposed within said clutch assembly, said piston device operable to move said clutch assembly between said applied condition and said released condition;

a pressure chamber defined by said clutch assembly for moving said piston device into one of said applied and released conditions;

an annular spring cavity defined by said clutch assembly adjacent to said pressure chamber and separated from said pressure chamber by said piston device; and

a coil spring defining an outside diameter and being disposed within said annular spring cavity radially inward of said clutch device for urging said piston device into the other of said applied and said released conditions, said coil spring having a solid height substantially less than said outside diameter and comprising a substantially rectangular cross section wire such that said coil spring utilizes substantially the entire volume of said spring cavity.

5,558,196

DEVICE FOR DETECTING LIMITS OF ROTATIONAL MOTION IN A ROBOT

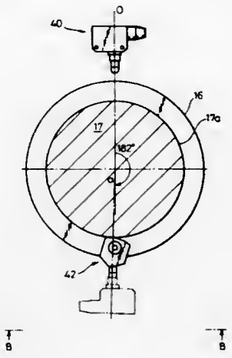
Ryo Nihei; Akihiro Terada, both of Fujiyoshida; Kyozi Iwasaki, Hachioji, and Masatoshi Ito, Yamanashi, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

Filed Oct. 6, 1994, Ser. No. 319,103

Claims priority, application Japan, Oct. 7, 1993, 5-251682

Int. Cl.[6] B25J *13/00*

U.S. Cl. 192—142 R **6 Claims**



1. A device for detecting the limits of the rotational motion of a rotating member in an industrial robot, which said rotating member rotates relative to a fixed member in a first and a second rotational direction about an axis, said device comprising;

a limit switch provided on one of said rotating member and said fixed member; and

a contact piece for activating said limit switch, said contact piece being disposed on another of said rotating member and said fixed member, said contact piece being rotatable between first and second angular positions about an axis parallel to said axis of said members, wherein said rotating member can rotate relative to said fixed member a total of at least 360 degrees.

5,558,197

COIN ESCALATOR FOR GAMING DEVICES

Wayne H. Rothschild, Wheeling; Edward J. Soyka, Rolling Meadows; Herbert H. Hausman, Lincolnshire, and Joe Pirzadeh, Schaumburg, all of Ill., assignors to WMS Gaming, Inc., Chicago, Ill.

Filed Jul. 29, 1994, Ser. No. 283,384

Int. Cl.[6] G07F *1/04*

U.S. Cl. 194—344 **2 Claims**

1. A coin escalator for conveying coins from a coin hopper to a discharge point comprising:

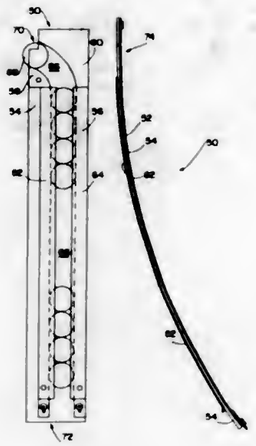
a) an arcuate back plate having a smooth, continuous coin-guiding surface on its outer circumference for guiding the coins, the coin-guiding surface extending without interruption along the entire length of the back plate and having a width at least equal to the diameter of the coins;

b) a pair of spacer plates disposed on the back plate, each spacer plate including an edge plate, the edge plates extending substantially parallel to the coin-guiding surface and being spaced therefrom a distance at least equal to the thickness of the coins to define a coin transport channel with the coin-guiding surface, the coin-guiding surface extending continuously between the spacer plates;

whereby the coins travel along the outer circumference of the back plate.

5,558,199

5,558,202



5,558,198

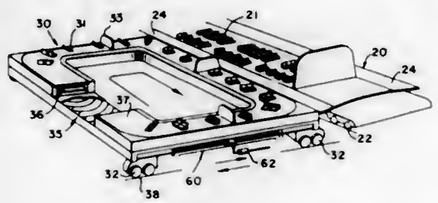
BAND TRANSPORTATION SYSTEM

Ramiro O. Juarez, Espana 282, Cochabamba, Bolivia

Filed Sep. 18, 1995, Ser. No. 529,885

Int. Cl.[6] B66B *29/08*

U.S. Cl. 198—324 **20 Claims**



1. A band transportation system, comprising:

a) first transporting band means extending along a closed path and including mounted on said first band means, and said first band means further including first propelling means for accelerating said first band means to a predetermined speed, and said first band means having at least one straight portion;

b) second transporting band means extending along a closed path and including a plurality of seat assemblies for passengers mounted on said second band means, and said second band means further including second propelling means for accelerating said second band means to at least said predetermined speed of said first band means, and said second band means having at least one straight portion; and

c) means for moving said second transporting band means towards and away from said first band means so that said straight portion of said first and second band means are brought sufficiently close to each other when the speed of said first and second band means is substantially the same to permit passengers to move to and from said first and second band means.

5,558,199

APPARATUS FOR FORMING A LAYER OF TOBACCO PARTICLES

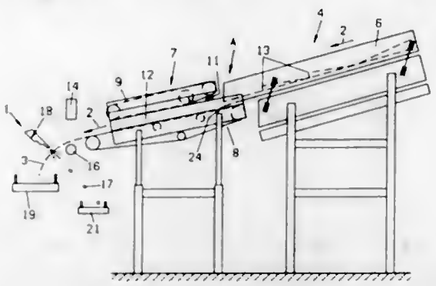
Friedemann Roether, Aumühle; Heiko Niehues, Hamburg; Uwe Leckband, Hamburg; Harry Drewes, Hamburg; Horst-Udo Christ, Hamburg, and Hans Dierken, Amelinghausen, all of Germany, assignors to Hauni Maschinenbau Aktiengesellschaft, Hamburg, Germany

Filed Jul. 20, 1994, Ser. No. 278,056

Claims priority, application Germany, Jul. 31, 1993, 43 25 838.7; Oct. 16, 1993, 43 35 385.1

Int. Cl.[6] B65G *47/31*

U.S. Cl. 198—461.2 **23 Claims**



1. Apparatus for transforming a multilayer stream of tobacco particles into a single layer during advancement of the particles in a predetermined direction along an elongated path, comprising a first transporting unit including at least one vibratory first conveyor having means for advancing the particles at a first speed along a first portion of said path; and a second transporting unit located downstream of said at least one first conveyor and included two second conveyors having means for advancing the particles at a second speed higher than said first speed along a second portion of said path, said second conveyors being disposed one above the other and defining an air-confining channel for the advancement of particles along said second portion of said path, said second conveyors including endless flexible elements one of which includes an upper reach below and the other of which includes a lower reach above said channel.

5,558,200

CONTAINER TRANSFER SYSTEM FOR COATING LINE WITH ROTARY LOADER, PLUNGER CHUCK AND KNOCK-OFF MECHANISMS

Thomas G. Whitby, Seven Hills; Kenneth A. Krismanth, Strongsville; Joseph R. Lawn, Brecksville, and David W. Black, Richfield, all of Ohio, assignors to FECO Engineered Systems, Inc., Cleveland, Ohio

Filed Apr. 28, 1994, Ser. No. 234,299

Int. Cl.[6] B65G *25/00*

U.S. Cl. 198—470.1 **24 Claims**

1. An article conveying device comprising

a conveyor,

at least one article holder attached to said conveyor for movement therewith along a conveyor path,

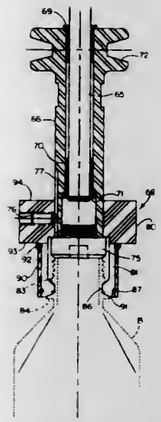
said article holder including

a support member having an axis extending generally perpendicular to said conveyor path, and

a chuck carried on said support member for telescoping axial movement between first and second axially displaced positions,

said chuck being radially expandable and contractible and having an interior socket for receiving therein an end of an article to be gripped by the chuck when said chuck is in said first position,

said support member having a plunger portion movable axially into said socket when said chuck moves from said first position on said support member to said second position for engaging and axially ejecting the article out of said socket.



5,558,201

CONVEYOR APPARATUS FOR FURTHER CONDUCTING INDIVIDUALLY SUPPLIED, FLAT PRODUCTS

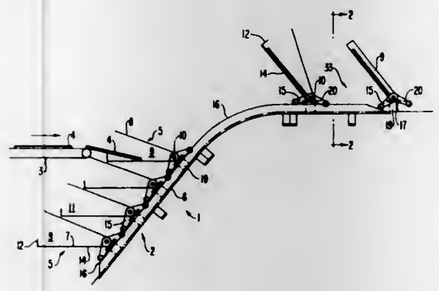
Jean-Claude Oppliger, Niederhasli; Robert Grünenfelder, Oberembrach, and Willy Maier, Kloten, all of Switzerland, assignors to Grapha-Holding AG, Hergiswil, Switzerland

Filed Aug. 9, 1994, Ser. No. 288,245

Claims priority, application Switzerland, Aug. 10, 1993, 02378/93; Jun. 21, 1994, 01962/94

Int. Cl.[6] B65G *47/04*

U.S. Cl. 198—476.1 **10 Claims**



1. A conveyor apparatus for conveying and distributing individually fed flat products, comprising:

a rotatingly driven pulling element defining a conveying path; and

a plurality of receiving apparatuses spaced apart from one another and each having one end secured to the pulling element for being moved in a conveying direction along the conveying path, each said receiving apparatus having two side walls which are respectively spaced in the conveying direction and which form a flat receiving chamber transversely to the conveying direction having a receiving and discharge end opposite the one end presenting a closable opening, wherein the side walls of each receiving chamber have a position of incline which remains oriented backwardly with respect to the conveying direction along the entire conveying path.

5,558,202

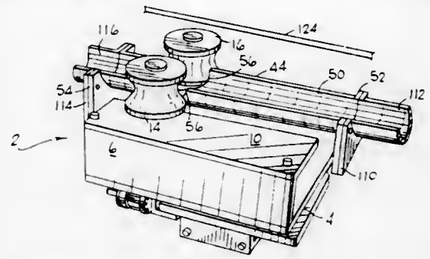
APPARATUS FOR MOVING CIRCULAR CONTAINER ENDS

David R. Miller, Golden, and Gregory J. Fischer, Wheat Ridge, both of Colo., assignors to Coors Brewing Company, Golden, Colo.

Filed Sep. 5, 1995, Ser. No. 523,228

Int. Cl.[6] B65G *29/00*

U.S. Cl. 198—624 **14 Claims**



1. Apparatus for moving circular container ends comprising:

a tray over which said circular container ends are moved;

said tray having a longitudinally extending surface having an arcuate transverse cross-sectional configuration having a radius that is slightly greater than the radius of each of said circular container ends;

an open ended housing comprising a base plate, opposite sidewalls and a partial top wall mounted on each of said opposite sidewalls;

said tray having opposite cut out portions;

a roller formed from an elastic material and having a longitudinal axis mounted on each of said partial top walls and having a portion thereof extending through one of said cut out portions;

each of said rollers having an outer surface extending in the direction of said longitudinal axis;

at least a portion of said outer surface having a contour extending in the longitudinal direction comprising a central arcuate section and a linearly extending section extending from each end of said central arcuate section;

said central arcuate section having a radius that is smaller than the radius of each of said circular container ends;

each of said linearly extending sections extending in a direction that is inclined relative to said longitudinal axis;

said linearly extending sections being located to be contacted and deformed outwardly by portions of each of said circular container ends; and

drive means for rotating said rollers to apply a pushing force on each of said circular container ends.

5,558,203

TRANSPORTING DEVICE

Hartmut Herm, Dreieich; Karl May, Bad Vilbel; Karlheinz Unverzagt, Offenbach am Main, and Helmut Werdinig, Nürnberg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 28, 1995, Ser. No. 411,458

Claims priority, application Germany, Sep. 29, 1992, 42 32 684.2

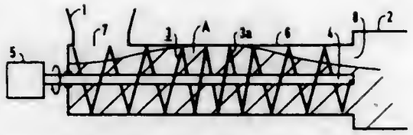
Int. Cl.[6] B65G *33/26*

U.S. Cl. 198—661 **11 Claims**

1. A transporting device, comprising:

a housing having a feed opening and a discharge opening defining a transporting direction, said housing having a partial section and a remaining section;

a conveyor worm being disposed in said housing, being rotatable about a longitudinal axis and having a smaller pitch in said partial section than in said remaining section, said smaller



pitch of said conveyor worm being disposed at a distance from said feed opening, as seen in the transporting direction; and

said conveyor worm having a partial element with said smaller pitch and two partial elements with a larger pitch, said partial element with said smaller pitch being disposed between said two partial elements with said larger pitch.

5,558,204

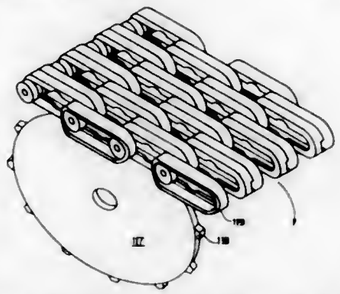
MODULAR COMPONENTS AND WELD-FREE BELTING ASSEMBLY

Ronald G. Daringer, Cambridge, Md., assignor to Maryland Wire Belts, Inc., Church Creek, Md.

Continuation-in-part of Ser. No. 56,875, May 5, 1993, Pat. No. 5,375,695, and a continuation-in-part of Ser. No. 217,565, Mar. 25, 1994. This application Aug. 23, 1994, Ser. No. 294,395

Int. Cl.[6] B65G *21/18*

U.S. Cl. 198—778 **25 Claims**



1. A combination of modular components for use in weld-free assembly of belting to extend lengthwise in the direction of intended travel and widthwise in transverse relationship to such direction, comprising

(A) an elongated link, having:

(i) a longitudinal axis extending in the direction of intended travel,

(ii) external surfaces which, at least in part, define an upper conveying surface, an oppositely disposed lower surface, and a side wall surface on each side of such link, with such side wall surface extending so as to join upper and lower surfaces and so as to join longitudinal distal ends of the elongated link,

(iii) an elongated internal cavity means encased within such external surfaces and extending in the direction of the longitudinal axis of the elongated link,

(iv) opening means defined along each side wall surface providing side wall access from each side wall into the internal cavity means, each such side wall surface defining:

(a) an entry portion, which is located intermediate longitudinal distal ends, presenting an access opening into the elongated internal cavity means of each such link, and

(b) elongated slot means, which extend longitudinally in such side wall surface from such access opening toward each longitudinal distal end of the elongated internal cavity within the elongated link,

such access opening having at least one cross-sectional dimension which is larger than a corresponding dimension of the slot means; and

(B) unitary coupler means, in which each coupler includes:

(i) a central axis which, during belt assembly, is oriented in transverse relationship to the direction of intended travel,

(ii) a pair of flanges, one each on each longitudinal distal end of the coupler, for coupling a pair of links in widthwise side-by-side relationship,

such pair of links enabling widthwise side-by-side coupling with respective longitudinal axes of such links extending in such direction of intended travel during assembly,

(iii) a circumferential groove means located intermediate such flanges, such groove means presenting a recessed surface of smaller diameter than either such flange,

such groove means being disposed substantially perpendicularly transverse to the central axis of such coupler,

(iv) each such coupler flange having cross-sectional dimensional and configurational characteristics to permit entry through the entry portion of the side wall of an elongated link into its elongated internal cavity means, and to be retained by such slot means, with

such coupler groove means

permitting lengthwise-directed movement of the coupler along such link by coacting with the link sidewall structure defining slot means along the side wall of the link, and

enabling pivotal rotational movement of an elongated link about the central axis of such coupler as the flange for such coupler is retained within the elongated cavity means; with

a plurality of such couplers being provided for widthwise side-by-side assembly of a plurality of link components in lengthwise staggered relationship, to establish a width dimension for such belting.

5,558,205

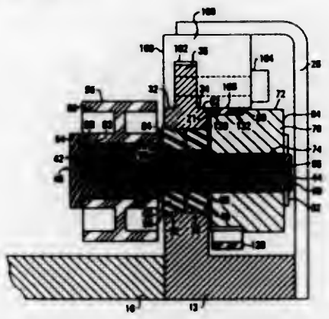
CONVEYORS

David E. Helgerson, Plymouth, and Brian R. Lee, Prior Lake, both of Minn., assignors to Quickdraw Design and Drafting, Inc., Burnsville, Minn.

Filed Sep. 26, 1994, Ser. No. 312,300

Int. Cl.[6] B65G *13/06*

U.S. Cl. 198—781.04 **15 Claims**



1. A roller conveyor for moving articles along a pathway, said conveyor comprising:

A) a pair of laterally spaced parallel side walls extending in the lengthwise direction of said conveyor pathway, each said side wall having an inside surface facing said pathway and an outside surface facing away from said pathway,

B) each said side wall having mounted therein a plurality of driven roller assemblies in spaced relationship along a straight line in the lengthwise direction of said pathway, said assemblies being for supporting the lateral portions of articles moved along said pathway, each said driven roller assembly comprising:

i) a rotatable shaft rotatably mounted in the side wall so that an inner stub shaft section projects inside the side wall and an outer stub shaft section projects outside the side wall.

ii) a roller carried on said inner stub shaft section of said rotatable shaft for rotation therewith to move articles resting on said roller along said pathway,

iii) a driven pulley having axially extending teeth and grooves in its circumferential outer periphery, said outer periphery having a lateral inside edge essentially free of any annular ridge and a lateral outside edge equipped with an annular ridge of a radius at least as great as the radius of said axially extending teeth, said pulley being mounted on said outer stub shaft section of said rotatable shaft in a manner that causes rotation of said shaft with said pulley, said pulley having its lateral inside peripheral edge adjacent the outside surface of the side wall,

C) an endless positive drive belt having a positive drive surface formed of transverse teeth and grooves for meshing with the axially extending teeth and grooves of said driven pulleys along a straight drive run free of guide rollers for said drive belt along said straight drive run, and a backing surface of substantially smooth character such that said backing surface provides a substantially flat plane along the length of said straight drive run, said drive run of said drive belt being laterally guided by said conveyor side wall along its inside edge and by the annular ridges of said pulleys along its outside edge, and

D) a guide strip having an anti-camming surface extending in proximate relationship lengthwise over said drive belt backing surface along the length of said drive run, said anti-camming surface being such that it serves as an abutment obstructing said drive belt along said drive run from being cammed out of its meshed relationship with said pulleys along said drive run.

5,558,206

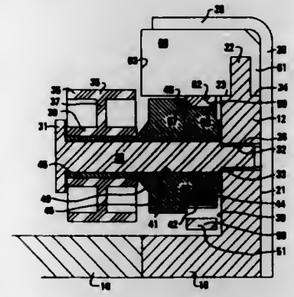
CONVEYOR TECHNOLOGY

David E. Helgerson, Plymouth, and Brian R. Lee, Prior Lake, both of Minn., assignors to Quickdraw Design and Drafting, Inc., Burnsville, Minn.

Filed Sep. 26, 1994, Ser. No. 312,452

Int. Cl.[6] B65G *13/06*

U.S. Cl. 198—781.04 **20 Claims**



1. A roller conveyor of compact structure for moving articles along a pathway having a lengthwise direction, said conveyor comprising:

A) a pair of laterally spaced side walls extending in the lengthwise direction of said conveyor pathway, each said side wall having an inside surface facing said pathway and an outside surface facing away from said pathway,

B) each said side wall having mounted therein a plurality of driven roller assemblies in spaced relationship and at uniform height along the lengthwise direction of said pathway, said assemblies being for supporting the lateral portions of articles moved along said pathway, each said driven roller assembly comprising:

i) a stub shaft mounted in the side wall so that said stub shaft is fixed against rotation and projects perpendicularly inward from the inside surface of the side wall, said stub shaft being characterized by having an abutting shoulder which rests in abutting condition against said side wall as said shaft projects perpendicularly from said side wall and by having a radially expanded integral head at its inwardmost end,

ii) a driven rotatable pulley having an outer circumferential periphery, an inner axial bore of a size permitting said pulley to slide axially over said shoulder onto said stub shaft from said shoulder end of said stub shaft, a lateral outside face, a lateral inside face, and a sleeve section extending axially out from said lateral inside face, said pulley being mounted on said shaft in a manner that allows rotation of said pulley including its sleeve, said pulley having its lateral outside face adjacent to the inside surface of the side wall and having its sleeve section adjacent to and in a rotatable relationship with respect to the radially expanded integral head of said stub shaft,

iii) a roller carried on said sleeve section of said pulley for rotation therewith to move articles resting on said roller down said pathway,

iv) said radially expanded integral head of said shaft being sufficiently extensive in the radial direction to retain said roller and said sleeved pulley on said stub shaft and to require mounting of said roller and said sleeved pulley on said stub shaft from said shoulder end of said stub shaft before mounting said stub shaft in said side wall, and

C) a drive system including an endless drive belt engaged with said pulleys to effect rotation thereof.

5,558,207

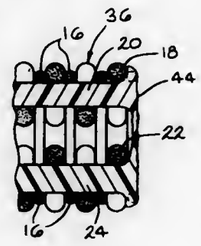
BELTING HAVING SEALED EDGE AND METHOD OF MANUFACTURE

Florian S. Zabron, Orchard Park; Miles S. Rothman, Williamsville, and Walter M. Kazial, Amherst, all of N.Y., assignors to Globe International, Inc., Buffalo, N.Y.

Filed Apr. 12, 1995, Ser. No. 420,690

Int. Cl.[6] B65G *15/34*

U.S. Cl. 198—847 **22 Claims**



1. A conveyor belting, which comprises:

a) a multiplicity of substantially parallel warp yarns extending longitudinally of the conveyor belting, the warp yarns comprising natural fiber yarns extending across a majority of a width of the belting and meltable material yarns extending across at least one cutting band of the remaining width of the belting; and

b) a plurality of meltable weft yarns extending transversely of the width; and

c) a lateral edge of the cutting band characterized by fusing of the meltable warp and weft yarns.

5,558,208

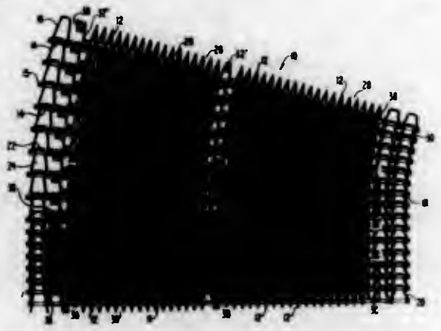
CONVEYOR BELTS WITH SPIRAL OVERLAY

actuator projects through an opening in an associated switch face plate and is pivotable along a path between an on position and an

said switching mechanism having an operating position in which a switching stroke of said actuating element is transferred

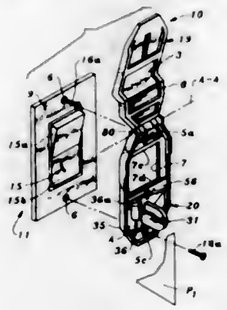
switch cap being interchangeable, said selected housing cover and said selected actuation attachment being matched

5,558,208
CONVEYOR BELTS WITH SPIRAL OVERLAY
John G. Kucharski, Winchester, Va., assignor to Ashworth Brothers, Inc., Winchester, Va.
Division of Ser. No. 115,735, Sep. 3, 1993, Pat. No. 5,423,416. This application May 4, 1995, Ser. No. 434,993
Int. Cl.[6] B65G *15/54*
U.S. Cl. 198—848 **20 Claims**



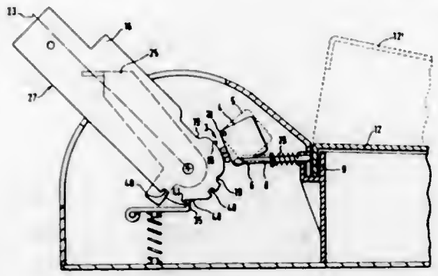
1. A conveyor belt having an upper conveying surface, a lower surface and side edges, said belt comprising:
- a plurality of connecting rods extending laterally across said belt;
- a spiral overlay comprising a plurality of wire spirals each forming a helix extending across said belt, each of said spirals comprising opposed arcuate linking bends at locations across each said spiral, said spirals arranged relative to one another such that said linking bends are intermeshed with linking bends of an immediately adjacent one of said spirals and said intermeshed linking bends of adjacent spirals receive one of said rods to operatively connect said spirals; and
- a plurality of connective links arranged at the ends of said spirals for operatively connecting said rods, said links being attached to said rods by welds adjacent the ends of said spirals and the ends of said spirals being formed so as to provide a clearance between said welds and the ends of said spirals.

5,558,209
LOCKOUT FOR CONVENTIONAL WALL-TYPE TOGGLE OR ROCKER ELECTRICAL SWITCH ASSEMBLIES
Jafar Mohsen, 409 Honker La., Suisun City, Calif. 94585
Continuation-in-part of Ser. No. 231,023, Apr. 21, 1994, Pat. No. 5,468,925. This application Mar. 2, 1995, Ser. No. 397,586
Int. Cl.[6] H01H *9/28*
U.S. Cl. 200—43.22 **20 Claims**



1. A switch lockout selectively useable on one of a plurality of conventional wall-type electrical actuators wherein said selected actuator projects through an opening in an associated switch face plate and is pivotable along a path between an on position and an off position wherein a first of said selected actuators being movable in a first predetermined path and a second of said selected actuators being movable in a second predetermined path, comprising
- an integrally formed, mounting frame adapted to be attached in parallel relationship to said switch face plate and including a side wall of octagonal shape and an end wall having a continuous edge integrally attached to said side wall to form a box-like cavity, said end wall also including a trio of orthogonally extending openings therethrough wherein only two of said openings are used for mounting said mounting frame to said switch face plate, a centrally disposed aperture defined by a series of transverse and longitudinal edges, and a counterbore segment contiguous with said aperture including a receiving cavity of rectangular cross section and a roof surface, said aperture adapted to be alignable with said selected actuator when said mounting frame is attached to said switch face plate, and
- an integrally formed cover frame pivotally attached to said mounting frame to permit said cover frame to undergo rotation into one of a closed and open position relative to said mounting frame, said cover frame including a side wall of octagonal shape and an end wall integrally attached to said side wall to form a box-like structure, said side wall of said cover being shaped to have a majority portion thereof nesting within said cavity in said mounting frame when said cover is in said closed position, said end wall of said cover frame including first and second end segments and an up-sloping segment located relative to said aperture of said mounting frame whereby pivoting of said selected actuator is prevented by said counterbore segment of said mounting frame intersecting said first predetermined path of said first selected actuator and said up-sloping segment of said cover frame intersecting said second predetermined path of said second selected actuator.

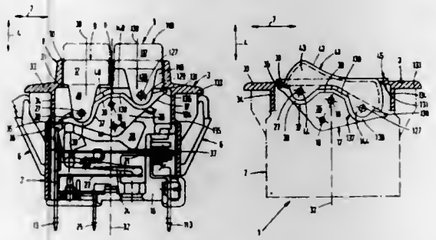
5,558,210
MICROSWITCH
Jürgen Jonischus, Romanshorn, Switzerland, assignor to Firma Fedag, Romanshorn, Switzerland
Filed Jul. 12, 1995, Ser. No. 501,540
Claims priority, application Germany, Jul. 12, 1994, 44 24 427.4
Int. Cl.[6] H01H *1/52*
U.S. Cl. 200—321 **22 Claims**



1. A switching device for actuating an electrical drive motor of a working tool, said switching device comprising:
- a housing;
- a microswitch, comprising a switching pin for switching on and off said microswitch, positioned in said housing;
- an actuating element projecting from said housing for actuating said switching pin positioned in said housing;
- a switching mechanism comprising a plurality of members including said switching pin and said actuating element:

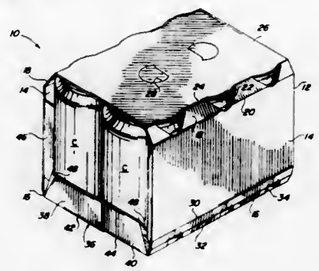
said switching mechanism having an operating position in which a switching stroke of said actuating element is transferred onto said switching pin to move said switching pin from a deactivation position in which said microswitch is switched off into an activation position in which said microswitch is switched on;
said switching mechanism having a switched-off position in which the stroke of said actuating element is not transferred onto said switching pin and in which said microswitch is switched off;
wherein said switching mechanism is returned from said operating position into said switched-off position by moving one of said members from an enabling position within said switching mechanism into a disabling position within said switching mechanism;
a locking element for arresting said moveable member in said enabling position;
a releasable safety stop releasably connected to said housing;
said locking element resting on said releasable safety stop; and
wherein, when said releasable safety stop is released, said moveable member is moved from said enabling position into said disabling position.

5,558,211
PUSH-BUTTON ACTUATED SAFETY SWITCH
Konrad Heydner, and Oswald Onderka, both of Altdorf, Germany, assignors to Ellenberger & Poensgen GmbH, Altdorf, Germany
Filed Mar. 15, 1995, Ser. No. 397,256
Claims priority, application Germany, Sep. 19, 1992, 9212645 U; Oct. 13, 1992, 9213787 U
Int. Cl.[6] H01H *21/00*
U.S. Cl. 200—553 **22 Claims**



1. A protective switch having an actuation side, comprising:
- a base having walls;
- a pivot shaft connected to the walls of said base;
- a switching rocker pivotal on said pivot shaft to be pivotally seated on said base, and including two lever arms for switching the protective switch on and off;
- a housing placed on said base and protectively surrounding said switching rocker;
- a selected housing cover chosen from a kit comprising at least two differently configured housing covers, said selected housing cover being located on the actuation side of the protective switch and protectively covering the switching rocker, said selected housing cover including an opening therethrough;
- a plurality of hinges each disposed on a respective lever arm of said switching rocker;
- a selected actuation attachment extending through the opening of said selected housing cover and being modularly connected to said switching rocker by said hinges for pivoting said switching rocker, and selected from a kit comprising at least one switch button longitudinally displaceable in said selected housing cover and pivotally connected with one of said lever arms, and a switch cap rotatably movable relative to said pivot shaft and rigidly connected with the two lever arms of said switching rocker, said at least one switch button and said switch cap being interchangeable, said selected housing cover and said selected actuation attachment being matched together.

5,558,212
WRAP-AROUND CARRIER WITH BAR CODE BLOCKER
Robert L. Sutherland, Kennesaw, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.
Filed Nov. 8, 1994, Ser. No. 335,930
Int. Cl.[6] B65D *75/00*
U.S. Cl. 206—147 **7 Claims**



1. A package comprised of a wrap-around carrier containing two rows of adjacent articles, comprising:
- opposite side panels connected to top and bottom panels, the bottom panels being comprised of overlapping bottom panel flaps and the side panels and bottom panel flaps including end edges;
- an end panel flap connected to each end edge of the bottom panel flaps along a first fold line, associated end panel flaps being in overlapping relationship to each other and extending at substantially right angles to the bottom panel flaps;
- a side panel locking flap connected to each end edge of the side panels along a second fold line;
- an angle panel located between each end panel flap and an associated side panel locking flap, the angle panel being connected along a third fold line to the end panel flap and along a fourth fold line to the side panel locking flap, the fourth fold line being relatively short compared to the third fold line;
- each angle panel being adjacent an article and contacting an outer bottom portion thereof;
- each side panel locking flap being in substantial face-to-face engagement with an adjacent portion of the associated side panel; and
- a portion of each side panel locking flap extending a substantial distance beyond the fourth fold line, said portion being in contact with an associated article, whereby the locking panels are held in place by said contact.

5,558,213
WRAP-AROUND CARRIER WITH BAR CODE BLOCKER
Robert L. Sutherland, Kennesaw, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.
Continuation-in-part of Ser. No. 335,930, Nov. 8, 1994. This application Jun. 14, 1995, Ser. No. 490,479
Int. Cl.[6] B65D *75/00*
U.S. Cl. 206—147 **13 Claims**

1. A package comprised of a wrap-around carrier containing two rows of adjacent articles having curved lower portions, comprising:
- opposite side panels connected to top and bottom panels, the bottom panel being comprised of a first bottom panel flap partially overlapping a second bottom panel flap, each flap having opposite end edges;

5,558,215
ARRANGEMENT FOR MIXING TWO COMPONENTS

c) in an upper region of the pack part (10) is arranged a collar (38) which is provided with at least one collar from wall (39) having a lower edge and collar side tabs (40, 41);
wherein the chamber front wall (34) is flush with the collar front wall (29),
wherein an upright first front edge (38), formed by the chamber

a first end panel flap connected by a fold line to each of the end edges of the first bottom panel flap and a second end panel flap connected by a fold line to each of the end edges of the second bottom panel flap;

the first end panel flap at each end of the bottom panel partially overlapping the associated second end panel flap;

means in the overlapping portions of associated first and second end panel flaps for mechanically locking the associated first and second end panel flaps together; and

each end panel flap including at least one fold line extending upwardly from the associated bottom panel fold line;

the end panel flaps contacting and substantially following the contour of the curved lower portion of adjacent articles.

5,558,214

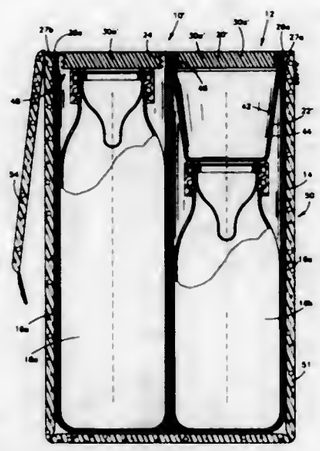
BABY BOTTLE CARRIER

Jackie L. Brundidge, 19414 Ridgewood, Warrensville Heights, Ohio 44122

Filed May 3, 1995, Ser. No. 433,094

Int. Cl.[6] B65D *71/00*

U.S. Cl. 206—162 **17 Claims**



1. A baby bottle carrier, comprising:

a container provided with a plurality of interconnected compartments each adapted to receive baby bottles of various sizes;

a lid detachably mounted to said container to close each of said compartments and having a plurality of protrusions; and

a plurality of spacers each detachably secured to an underside of said lid by one of said plurality of protrusions of said lid to project into said compartments and abut against said baby bottles of various sizes.

5,558,215

ARRANGEMENT FOR MIXING TWO COMPONENTS

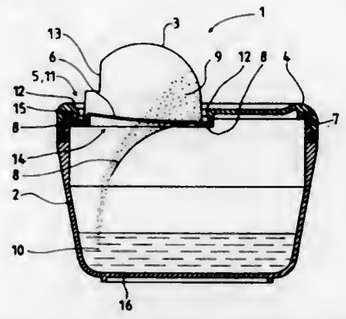
Franz Steigerwald, Griesheim; Martina Schmitt, Gernsheim, and Gabriele Bock, Darmstadt, all of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Germany

Filed Nov. 1, 1995, Ser. No. 551,650

Claims priority, application Germany, Nov. 11, 1994, 44 40 264.3

Int. Cl.[6] B65D *25/08;81/32*

U.S. Cl. 206—222 **9 Claims**



1. An arrangement for mixing two components, comprising a vessel provided with connecting means; a cover element placed on said vessel and having an upper region, said cover element being provided in said upper region with a recess having an edge; at least one cutting mandrel provided on said edge of said recess; a releasable depot vessel inserted in said recess of said cover element and having a foil at a side of said vessel, said depot vessel having a lower inner diameter which is greater than a double distance between a central axis of said depot vessel and said cutting mandrel.

5,558,216

HINGE-LID PACK FOR STICK-SHAPED ARTICLES, SUCH AS CIGARETTES, AND PROCESS FOR PRODUCING IT

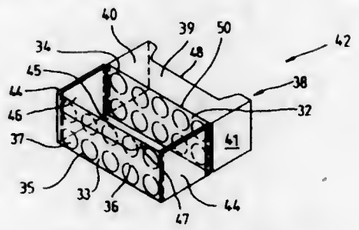
Heinz Focke, and Harald Gosebruch, both of Verden, Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Germany

Filed Mar. 8, 1994, Ser. No. 207,175

Claims priority, application Germany, Mar. 9, 1993, 43 07 386.7

Int. Cl.[6] B65D *85/10;85/12*

U.S. Cl. 206—256 **1 Claim**



1. A hinge lid pack for stick-shaped articles, wherein:

a) in a region of a pack rear wall (**15**), a lid (**11**) bears against a pack part (**10**) which has a pack front wall (**13**), the pack rear wall (**15**), a pack bottom wall (**14**) and pack side walls (**16**, **17**);

b) corresponding to the pack part (**10**), the lid (**11**) has a lid front wall (**22**), lid rear wall (**20**), lid top wall (**21**), and lid side walls (**24**, **25**);

c) in an upper region of the pack part (**10**) is arranged a collar (**38**) which is provided with at least one collar from wall (**39**) having a lower edge and collar side tabs (**40**, **41**);

d) the collar (**38**) is fixed in the pack part (**10**) at least by regions of the collar front wall (**39**) which bear against the pack front wall (**13**);

(e) at a lower edge which forms a folding line (**50**), the collar front wall (**39**) is adjoined by a first supporting wall (**32**) which is angled relative to said collar front wall;

(f) the first supporting wall (**32**) is provided with a plurality of first recesses (**34**) arranged at a distance from one another, each for passage of one of said articles (**29**), and at a distance from the pack bottom wall (**14**);

(g) the collar (**38**) and the first supporting wall (**32**) are made from a common blank which, by three-dimensional folding, forms a supporting insert (**42**) for the pack part (**10**);

(h) wherein, at a distance from the first supporting wall (**32**) and also from the pack bottom wall (**14**), there is a second supporting wall (**33**) which is angled with respect to the pack front wall (**13**) or the pack rear wall (**15**), and which has second recesses (**35**) each for passage of one article, and wherein the first and second recesses (**34**, **35**) are arranged in alignment relative to one another, such that each article (**29**) is held by both supporting walls; and

(i) wherein the supporting insert (**42**) has, in a lower region thereof adjoining one edge of said second supporting wall (**33**), a spacer tab (**47**) which bears against the pack front wall (**13**) or pack rear wall (**15**) and which reaches as far as the pack bottom wall (**14**) and has the contour of a recess (**48**) formed in a region of the collar front wall (**39**).

5,558,217

HINGE-LID PACK FOR CIGARETTES

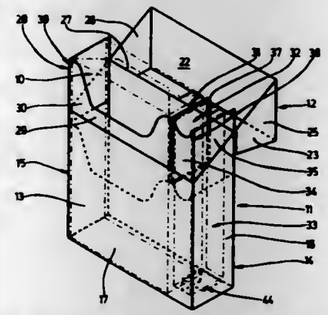
Heinz Focke, and Heido Spiring, both of Verden, Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Germany

Filed Dec. 12, 1994, Ser. No. 355,343

Claims priority, application Germany, Dec. 14, 1993, 43 42 523.2

Int. Cl.[6] B65D *85/10*

U.S. Cl. 206—268 **8 Claims**



1. A hinge-lid pack for cigarettes for the accommodation of a cigarette block (**10**), said pack comprising:

a box part (**11**);

a lid part (**12**) which is hingedly connected to a rear wall (**14**) of the box part (**11**);

a collar (**28**) fixed in the box part (**11**) and having a collar front wall (**29**) and two collar side tabs (**30**, **31**); and

a chamber (**32**) for the accommodation of a lighter (**33**) and arranged next to the cigarette block (**10**);

wherein the chamber (**32**) is delimited against the cigarette block (**10**) by one (**31**) of the collar side tabs which is adjacent the chamber;

wherein in a region of the collar, the chamber (**32**) is delimited by a chamber front wall (**34**), a chamber outer side wall (**35**) and said one collar side tab (**31**),

wherein the chamber front wall (**34**) is flush with the collar front wall (**29**),

wherein an upright first front edge (**36**), formed by the chamber front wall (**34**) and a chamber side wall (**35**), corresponds to an opposite upright front edge (**39**) which is formed by the collar front wall (**29**) and the other collar side tab (**30**) which is located opposite the chamber (**32**), and

wherein the chamber (**32**) has a depth which corresponds to that of the box part (**11**).

5,558,218

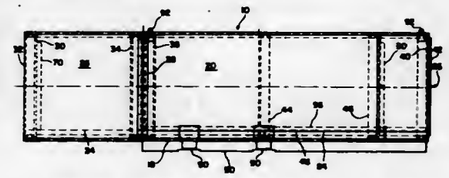
SHIPPING CONTAINER FOR LARGE CYLINDRICAL SLEEVES

William A. James, Long Branch; Stephen H. Breitkopf, North Brunswick; Robert G. Provell, Spotswood, all of N.J., and Ralph A. Moody, III, Fuquay-Varina, N.C., assignors to McNeil-PPC, Inc., Skillman, N.J.

Filed Aug. 2, 1994, Ser. No. 284,869

Int. Cl.[6] B65G *65/30;* **B65D** *85/02;* **B65B** *19/00*

U.S. Cl. 206—303 **41 Claims**



1. A shipping container for transporting a large cylindrical sleeve, comprising:

a. an elongated outer housing having first and second spaced opposite ends;

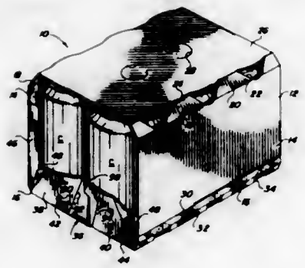
b. at least one door positioned at said first end of the outer housing to provide access to the interior of the outer housing to place a cylindrical sleeve in the outer housing or to remove a cylindrical sleeve from the outer housing; and

c. a support tube, on which the large cylindrical sleeve is supported in the shipping container, said support tube being mounted within the shipping container by a cantilever mounting at the second end of the outer housing, with the support tube extending interiorly, and substantially to the first end, of the outer housing.

20. A method of handling a cylindrical backing sleeve comprising, forming a three-dimensional topographical pattern on a blank cylindrical backing sleeve while holding the sleeve on a mandrel, transferring the cylindrical backing sleeve into a shipping container by placing the cylindrical backing sleeve on a support tube which is mounted within the shipping container by a cantilever mounting at one end of the shipping container while aligning the cylindrical backing sleeve with the support tube by using alignment guides on the support tube, transferring the cylindrical backing sleeve from the shipping container to a drum of a fabric forming machine while aligning the cylindrical backing sleeve with the drum by using the alignment guides on the support tube, and utilizing the cylindrical backing sleeve to produce a nonwoven fabric by positioning a layer of fibrous material on the cylindrical backing sleeve and projecting fluid against the fibrous material and cylindrical backing sleeve to form a nonwoven fabric.

28. A method of handling a cylindrical backing sleeve comprising, utilizing a shipping container to transport a blank cylindrical support sleeve to a mandrel by placing the cylindrical backing sleeve on a support tube which is mounted within the shipping container by a cantilever mounting at one end of the shipping container and transferring the cylindrical backing sleeve from the shipping container onto the mandrel by using alignment guides on the shipping container, and forming a three-dimensional topographical pattern onto the blank cylindrical backing sleeve while holding the sleeve on the mandrel.

36. A method of handling a cylindrical backing sleeve comprising, transporting a cylindrical backing sleeve having a three-



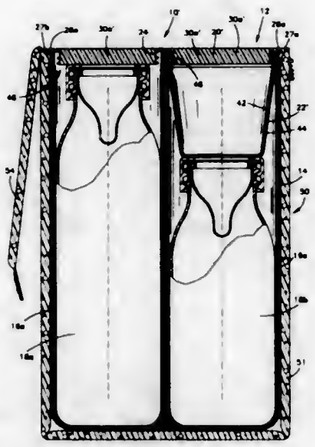
a first end panel flap connected by a fold line to each of the end edges of the first bottom panel flap and a second end panel flap connected by a fold line to each of the end edges of the second bottom panel flap;
the first end panel flap at each end of the bottom panel partially overlapping the associated second end panel flap;
means in the overlapping portions of associated first and second end panel flaps for mechanically locking the associated first and second end panel flaps together; and
each end panel flap including at least one fold line extending upwardly from the associated bottom panel fold line;
the end panel flaps contacting and substantially following the contour of the curved lower portion of adjacent articles.

5,558,214

BABY BOTTLE CARRIER

Jackie L. Brundidge, 19414 Ridgewood, Warrensville Heights, Ohio 44122

Filed May 3, 1995, Ser. No. 433,094
Int. Cl.[6] B65D *71/00*
U.S. Cl. 206—162 **17 Claims**



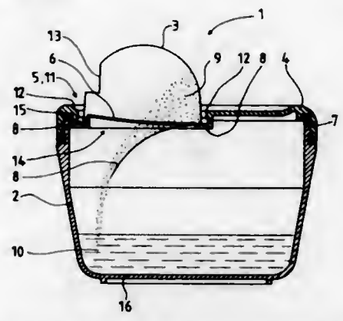
1. A baby bottle carrier, comprising:
a container provided with a plurality of interconnected compartments each adapted to receive baby bottles of various sizes;
a lid detachably mounted to said container to close each of said compartments and having a plurality of protrusions; and
a plurality of spacers each detachably secured to an underside of said lid by one of said plurality of protrusions of said lid to project into said compartments and abut against said baby bottles of various sizes.

5,558,215

ARRANGEMENT FOR MIXING TWO COMPONENTS

Franz Steigerwald, Griesheim; Martina Schmitt, Gernsheim, and Gabriele Bock, Darmstadt, all of Germany, assignors to Wella Aktiengesellschaft, Darmstadt, Germany

Filed Nov. 1, 1995, Ser. No. 551,650
Claims priority, application Germany, Nov. 11, 1994, 44 40 264.3
Int. Cl.[6] B65D *25/08;81/32*
U.S. Cl. 206—222 **9 Claims**



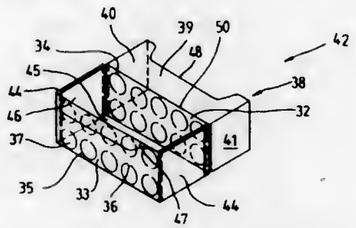
1. An arrangement for mixing two components, comprising a vessel provided with connecting means; a cover element placed on said vessel and having an upper region, said cover element being provided in said upper region with a recess having an edge; at least one cutting mandrel provided on said edge of said recess; a releasable depot vessel inserted in said recess of said cover element and having a foil at a side of said vessel, said depot vessel having a lower inner diameter which is greater than a double distance between a central axis of said depot vessel and said cutting mandrel.

5,558,216

HINGE-LID PACK FOR STICK-SHAPED ARTICLES, SUCH AS CIGARETTES, AND PROCESS FOR PRODUCING IT

Heinz Focke, and Harald Gosebruch, both of Verden, Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Germany

Filed Mar. 8, 1994, Ser. No. 207,175
Claims priority, application Germany, Mar. 9, 1993, 43 07 386.7
Int. Cl.[6] B65D *85/10;85/12*
U.S. Cl. 206—256 **1 Claim**



1. A hinge lid pack for stick-shaped articles, wherein:
a) in a region of a pack rear wall (**15**), a lid (**11**) bears against a pack part (**10**) which has a pack front wall (**13**), the pack rear wall (**15**), a pack bottom wall (**14**) and pack side walls (**16**, **17**);
b) corresponding to the pack part (**10**), the lid (**11**) has a lid front wall (**22**), lid rear wall (**20**), lid top wall (**21**), and lid side walls (**24**, **25**);

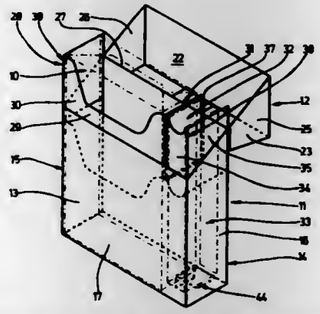
c) in an upper region of the pack part (**10**) is arranged a collar (**38**) which is provided with at least one collar from wall (**39**) having a lower edge and collar side tabs (**40**, **41**);
d) the collar (**38**) is fixed in the pack part (**10**) at least by regions of the collar front wall (**39**) which bear against the pack front wall (**13**);
(e) at a lower edge which forms a folding line (**50**), the collar front wall (**39**) is adjoined by a first supporting wall (**32**) which is angled relative to said collar front wall;
(f) the first supporting wall (**32**) is provided with a plurality of first recesses (**34**) arranged at a distance from one another, each for passage of one of said articles (**29**), and at a distance from the pack bottom wall (**14**);
(g) the collar (**38**) and the first supporting wall (**32**) are made from a common blank which, by three-dimensional folding, forms a supporting insert (**42**) for the pack part (**10**);
(h) wherein, at a distance from the first supporting wall (**32**) and also from the pack bottom wall (**14**), there is a second supporting wall (**33**) which is angled with respect to the pack front wall (**13**) or the pack rear wall (**15**), and which has second recesses (**35**) each for passage of one article, and wherein the first and second recesses (**34**, **35**) are arranged in alignment relative to one another, such that each article (**29**) is held by both supporting walls; and
(i) wherein the supporting insert (**42**) has, in a lower region thereof adjoining one edge of said second supporting wall (**33**), a spacer tab (**47**) which bears against the pack front wall (**13**) or pack rear wall (**15**) and which reaches as far as the pack bottom wall (**14**) and has the contour of a recess (**48**) formed in a region of the collar front wall (**39**).

5,558,217

HINGE-LID PACK FOR CIGARETTES

Heinz Focke, and Heido Spiering, both of Verden, Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Germany

Filed Dec. 12, 1994, Ser. No. 355,343
Claims priority, application Germany, Dec. 14, 1993, 43 42 523.2
Int. Cl.[6] B65D *85/10*
U.S. Cl. 206—268 **8 Claims**



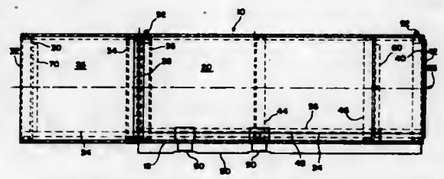
1. A hinge-lid pack for cigarettes for the accommodation of a cigarette block (**10**), said pack comprising:
a box part (**11**);
a lid part (**12**) which is hingedly connected to a rear wall (**14**) of the box part (**11**);
a collar (**28**) fixed in the box part (**11**) and having a collar front wall (**29**) and two collar side tabs (**30**, **31**); and
a chamber (**32**) for the accommodation of a lighter (**33**) and arranged next to the cigarette block (**10**);
wherein the chamber (**32**) is delimited against the cigarette block (**10**) by one (**31**) of the collar side tabs which is adjacent the chamber;
wherein in a region of the collar, the chamber (**32**) is delimited by a chamber front wall (**34**), a chamber outer side wall (**35**) and said one collar side tab (**31**),
wherein the chamber front wall (**34**) is flush with the collar front wall (**29**),
wherein an upright first front edge (**36**), formed by the chamber front wall (**34**) and a chamber side wall (**35**), corresponds to an opposite upright front edge (**39**) which is formed by the collar front wall (**29**) and the other collar side tab (**30**) which is located opposite the chamber (**32**), and
wherein the chamber (**32**) has a depth which corresponds to that of the box part (**11**).

5,558,218

SHIPPING CONTAINER FOR LARGE CYLINDRICAL SLEEVES

William A. James, Long Branch; Stephen H. Breitkopf, North Brunswick; Robert G. Provell, Spotswood, all of N.J., and Ralph A. Moody, III, Fuquay-Varina, N.C., assignors to McNeil-PPC, Inc., Skillman, N.J.

Filed Aug. 2, 1994, Ser. No. 284,869
Int. Cl.[6] B65G *65/30;* **B65D** *85/02;* **B65B** *19/00*
U.S. Cl. 206—303 **41 Claims**



1. A shipping container for transporting a large cylindrical sleeve, comprising:
a. an elongated outer housing having first and second spaced opposite ends;
b. at least one door positioned at said first end of the outer housing to provide access to the interior of the outer housing to place a cylindrical sleeve in the outer housing or to remove a cylindrical sleeve from the outer housing; and
c. a support tube, on which the large cylindrical sleeve is supported in the shipping container, said support tube being mounted within the shipping container by a cantilever mounting at the second end of the outer housing, with the support tube extending interiorly, and substantially to the first end, of the outer housing.

20. A method of handling a cylindrical backing sleeve comprising, forming a three-dimensional topographical pattern on a blank cylindrical backing sleeve while holding the sleeve on a mandrel, transferring the cylindrical backing sleeve into a shipping container by placing the cylindrical backing sleeve on a support tube which is mounted within the shipping container by a cantilever mounting at one end of the shipping container while aligning the cylindrical backing sleeve with the support tube by using alignment guides on the support tube, transferring the cylindrical backing sleeve from the shipping container to a drum of a fabric forming machine while aligning the cylindrical backing sleeve with the drum by using the alignment guides on the support tube, and utilizing the cylindrical backing sleeve to produce a nonwoven fabric by positioning a layer of fibrous material on the cylindrical backing sleeve and projecting fluid against the fibrous material and cylindrical backing sleeve to form a nonwoven fabric.

28. A method of handling a cylindrical backing sleeve comprising, utilizing a shipping container to transport a blank cylindrical support sleeve to a mandrel by placing the cylindrical backing sleeve on a support tube which is mounted within the shipping container by a cantilever mounting at one end of the shipping container and transferring the cylindrical backing sleeve from the shipping container onto the mandrel by using alignment guides on the shipping container, and forming a three-dimensional topographical pattern onto the blank cylindrical backing sleeve while holding the sleeve on the mandrel.

36. A method of handling a cylindrical backing sleeve comprising, transporting a cylindrical backing sleeve having a three-

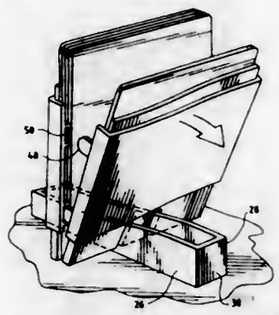
dimensional topographical pattern formed thereon into a shipping container by placing the cylindrical backing sleeve on a support tube which is mounted within the shipping container by a cantilever mounting at one end of the shipping container while aligning the cylindrical backing sleeve with the support tube by using alignment guides on the support tube, transferring the cylindrical backing sleeve from the shipping container to a drum of a fabric forming machine while aligning the cylindrical backing sleeve with the drum by using the alignment guides on the support tube, and utilizing the cylindrical backing sleeve to produce a nonwoven fabric by positioning a layer of fibrous material on the cylindrical backing sleeve and projecting fluid against the fibrous material and cylindrical backing sleeve to form a nonwoven fabric.

5,558,219

DISKETTE TRANSPORTER WITH SIDE CAP SURFACE STEPS

Robert Staubitz, Collinsville, and Timothy Repp, New Hartford, both of Conn., assignors to Tenex Corporation, Elk Grove Village, Ill.

Filed Jan. 23, 1995, Ser. No. 376,357
Int. Cl.[6] B65D *85/57;43/08*
U.S. Cl. 206—308.1 **3 Claims**



1. A transporter for the portable storage and display of multiple computer media devices, said transporter comprising:

a. a bottom container having a front surface, a back surface, two side surfaces and a bottom surface, said front, back and side surfaces forming a top aperture, said bottom surface defining a plurality of slits extending between said front surface and said back surface, and;

b. a top cap having a front cap surface, a back cap surface, two cap side surfaces, said front cap, back cap and side cap surfaces forming an aperture adapted to frictionally engage the bottom container surfaces forming said top aperture, said top cap having side cap surfaces which can operatively disengage said top aperture of said bottom container in order to operatively engage said plurality of slits to form a transverse axis of support for said bottom container, said operative engagement thereby displacing at least a portion of any computer media devices located in said bottom container above said top aperture of said bottom container, said side cap surfaces further defining a plurality of steps relative to the bottom of said bottom container such that the operative engagement of said top cap with said slits creates distinctly differentiated bases of support for said multiple computer media devices.

2. A transporter for the portable storage and display of multiple computer media devices for facilitating the easier review of said devices within said transporter, said transporter comprising:

a. a bottom container having a front surface, a back surface, two side surfaces, and a bottom surface, said front, back and side surfaces forming a top aperture, said bottom surface defining a plurality of slits extending between said front surface and said back surface;

b. a living hinge operatively connecting said front surface of said bottom container with said side surfaces and said bottom surface, said living hinge comprising a strip of flexible material between said bottom surface and said front surface, and;

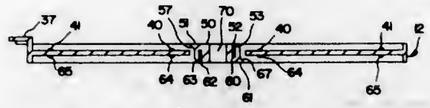
c. a top cap having a front cap surface, a back cap surface, two side cap surfaces and a top, said front cap, back cap and side cap surfaces forming an aperture which can frictionally engage the bottom container surfaces forming said top aperture of said bottom container, said top cap side surfaces being capable of operatively disengaging said top aperture of said bottom container in order create an operatively engagement with said plurality of slits to form a transverse axis of support for said bottom container, said operative engagement thereby displacing at least a portion of any computer media devices located in said bottom container above said top aperture of said bottom container, said side cap surfaces further defining a plurality of steps such that the operative engagement of said top cap side surfaces with said slits creates distinctly differentiated horizontal bases of support for computer media devices placed in said bottom container.

5,558,220

CASE AND TRAY FOR HOLDING HIGH DENSITY DISCS

Kaj Gartz, Orange, Conn., assignor to Owen J. Meegan, Salem, Mass.

Filed Jun. 21, 1995, Ser. No. 492,737
Int. Cl.[6] B65D *85/57*
U.S. Cl. 206—308.1 **26 Claims**



1. A case for holding at least one high recording density disc, said disc having an outer edge and a central hole defined by an internal edge, said case comprising:

a base having a flat bottom and sidewalls disposed around the perimeter thereof;

a tray for carrying at least one disc, said tray being adapted to fit in said base;

a hub integrally formed and centrally located on said tray, said hub extending from said tray and having a generally cylindrical shape and a diameter not greater than the diameter of said central hole;

locking means on a locking side of said hub to detachably retain on said hub a portion of said central edge of said disc, said locking means being inflexibly disposed on said locking side of said hub;

spring means to urge said portion of said central edge against said locking means and said hub whereby said disc is detachably secured on said tray by said locking means.

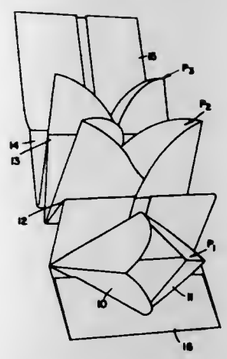
5,558,221

DISKETTE HOLDER

Susan Scior, 54 State St., Brooklyn Heights, N.Y. 11201

Filed Jan. 19, 1995, Ser. No. 375,474
Int. Cl.[6] B65D *85/57;37/00*
U.S. Cl. 206—308.3 **8 Claims**

1. A holder for packing a plurality of diskettes, each having an identifying side label, said holder comprising a plurality of interhinged like pockets for receiving the diskettes, each pocket being defined by a pair of opposed gussets forming a V-shaped inlet to expose the label, said holder being fabricated from a single rectangular blank of flexible sheeting scored and die cut to create said interhinged pockets, said blank being divided by longitudinal score lines into a relatively broad central panel flanked by side panels, each side panel having a series of equi-spaced lobes projecting



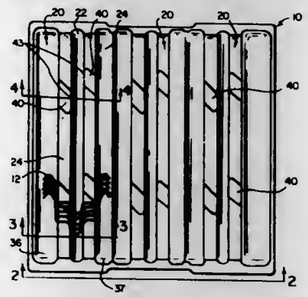
outwardly therefrom, the central and side panels being divided by a series of transverse score lines into like sections each including a pair of said opposed lobes, each section being divided in half by a transverse fold line running through the center of the lobes, with diagonal score lines extending from the ends of each lobe through the related side panel to a common point on the adjacent longitudinal score line to create a triangular gusset zone which when the side panels are folded over the central panel and the blank is then accordian folded on the transverse score lines, the sections are folded in half on said fold line to form in each section said opposing pair of gussets to define said pocket.

5,558,222

TRAY FOR POULTRY TRUSSES

Donald J. Volk, and Steve Martin, both of c/o Volk Enterprises, Inc. 1232 South Ave., Turlock, Calif. 95380

Continuation of Ser. No. 263,460, Jun. 22, 1994, abandoned. This application Jul. 13, 1995, Ser. No. 502,365
Int. Cl.[6] B65D *83/00*
U.S. Cl. 206—338 **18 Claims**



1. In combination, a tray for retaining poultry trusses and a plurality of said trusses,

said trusses having a U-shaped central portion, first and second shoulders extending outwardly from said central portion and a pair of legs depending from said shoulders,

said tray comprising at least one longitudinally extending truss support having first support means for supporting said central portion of said trusses, first and second outward extending surfaces extending outwardly from said first support means, and second support means extending outwardly from said first and second outward extending surfaces for supporting said legs of said trusses,

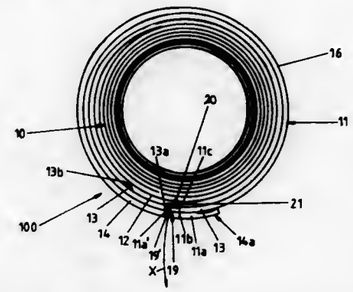
said first support means and said second support means supporting said trusses with said shoulders spaced above said outward extending surfaces.

5,558,223

PACKING FOR PAPER ROLLS

Michael Stefanescu, Berlin, Germany, assignor to Herlitz Aktiengesellschaft, Berlin, Germany

PCT No. PCT/EP93/00946, § 371 Date Mar. 15, 1995, § 102(e) Date Mar. 15, 1995, PCT Pub. No. WO94/07762, PCT Pub. Date Apr. 14, 1994
PCT Filed Apr. 20, 1993, Ser. No. 397,272
Claims priority, application Germany, Oct. 6, 1992, 92 13 430 U
Int. Cl.[6] B65D *85/66;85/675;* **B65H** *18/28*
U.S. Cl. 206—389 **12 Claims**



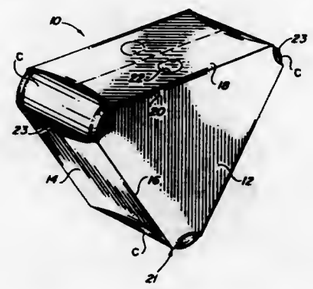
1. A combined packing a paper roll, wherein the paper roll comprises an outermost paper layer having a free end, a subjacent paper layer underneath the outermost paper layer, an adhesive connection between the free end of the outermost paper layer and the subjacent paper layer, an opening aid provided at a radially inwardly facing surface of the subjacent paper layer, the opening aid being adapted for tearing through the outermost paper layer and the subjacent paper layer, wherein the outermost paper layer and the subjacent paper layer extending between the opening aid and the free end of the outermost paper layer form a paper strip leader serving as the packing for the paper roll.

5,558,224

TRIANGULAR ARTICLE CARRIER

James C. Fogle, Marietta, Ga., assignor to Riverwood International Corporation, Atlanta, Ga.

Filed May 8, 1995, Ser. No. 436,536
Int. Cl.[6] B65D *65/06;5/42*
U.S. Cl. 206—427 **10 Claims**



1. A package comprised of an article carrier of generally triangular shape containing a plurality of articles, comprising:

opposite side panels, each side panel having opposite inwardly tapered end edges and an upper edge;

a top panel connected to the upper edges of the side panels, the top panel including handle openings;

end panels connected to associated end edges of the side panels, the end panels tapering toward, and terminating in a bottom

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5,558,226

AMUSEMENT DEVICE HAVING A SECRET

dates, said continuous portion of a calendar includes at least one of said predetermined dates and said at least one of said predeter-

b) a container of water-soluble polymer film, said first chemical being encapsulated in said film and said second chemical

end panels connected to associated end edges of the side panels, the end panels tapering toward, and terminating in a bottom carrier portion;

the plurality of articles extending between the side panels; and

the articles being arranged in a plurality of rows, including an upper most row adjacent the top panel and a bottom row in the bottom carrier portion, each succeeding relatively higher row in the carrier containing a greater number of articles than the next lower row.

7. A blank for forming an article carrier of generally triangular shape, comprising:

a centrally located top panel section having opposite side edges, the top panel section including handle openings;

a side panel section connected to each of the side edges of the top panel section by a fold line;

each side panel section being of generally triangular shape, each side panel section having opposite end edges converging away from the top panel section; and

an end panel flap connected by fold line to at least one of the end edges of each side panel section;

a carrier formed from the blank being capable of holding a plurality of rows of articles, including an upper most row adjacent a panel of the carrier formed from the top panel section of the blank, wherein each succeeding relatively higher row in the carrier formed from the blank contains a greater number of articles than the next lower row and the articles extend between the side panels of the carrier.

5,558,225

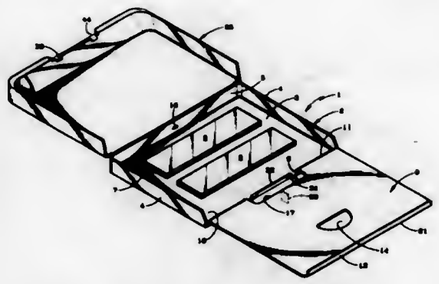
PHOTOGRAPH AND NEGATIVE STORAGE CONTAINER AND METHOD

James T. Weisburn, Massillon; Larry K. Mundorf, North Canton; Roger H. Ramsey, Akron, and William E. Brazis, Medina, all of Ohio, assignors to Alpha Enterprises, Inc., North Canton, Ohio

Filed Jun. 24, 1994, Ser. No. 264,964

Int. Cl.[6] B65D *95/48;85/62;* **B65B** *25/14*

U.S. Cl. 206—455 **15 Claims**



1. A storage container for objects including

a base having first and second spaced end walls;

panel means pivotally mounted on the second end wall of the base and movable into spaced juxtaposition with said base and extending to adjacent said first end wall for forming a first storage compartment between said base and panel means and extending between said first and second end walls; and

lid means pivotally mounted on the first end wall of the base and movable into a closed position on the base and extending to adjacent said second end wall in spaced juxtaposition with the panel means for forming a second storage compartment between said panel means and lid means, said second storage compartment being substantially equal in length and width to the first storage compartment.

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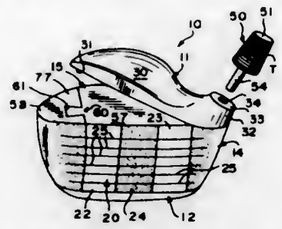
AMUSEMENT DEVICE HAVING A SECRET COMPARTMENT

Gerald W. Fritz, 658 Mallard Ct., Arnold, Md. 21012

Filed Mar. 29, 1995, Ser. No. 413,009

Int. Cl.[6] A45C *13/10;* **B65D** *85/00*

U.S. Cl. 206—457 **24 Claims**



1. An article having a secret compartment comprising a base plate, a top plate and a plurality of intermediate plates between said base plate and said top plate, said plates being disposed in substantially parallel planes, means for pivotally mounting said top plate about a substantially vertical axis for pivoting said top plate in its plane and substantially parallel to the planes of said intermediate plates, means between one of said intermediate plates and said pivotally mounting means for selectively holding said plates assembled and effecting the separation thereof, means for selectively preventing and permitting pivoting of said top plate by said pivotally mounting means, and a secret chamber defined at least in part by a recess formed in an intermediate plate which can be exposed by effecting pivoting of said top plate and separation of said intermediate plates.

5,558,227

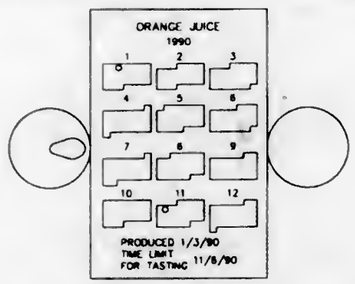
SEALED CONTAINER HAVING A CALENDAR FUNCTION

Ikuhiro Hakamada, Yushima 3-29-3-502 Bunkyo-ku, Tokyo Prefecture, Japan

Continuation of Ser. No. 117,115, Apr. 8, 1994, abandoned. This application Aug. 21, 1995, Ser. No. 524,102

Int. Cl.[6] B65D *85/72*

U.S. Cl. 206—459.5 **10 Claims**



1. A sealed container having a seal which is incapable of being reused when broken, and a consumable product sealed therein, all of the consumable product in the sealed container having a single predetermined production date on which the product was made, and a single predetermined expiration date after which the properties of the consumable product will have changed to an extent such that the product is no longer suitable for consumption, in which a continuous portion of a calendar is printed on an exterior surface of said container along with the year or years of said continuous portion of a calendar, and in which said continuous portion of a calendar overlaps the time interval between said predetermined dates, said continuous portion of a calendar includes at least one of said predetermined dates and said at least one of said predetermined dates is indicated on the exterior surface of the container.

5. A sealed container having a seal which is incapable of being reused when broken, and a consumable product sealed therein, the consumable product having a predetermined production date and a predetermined expiration date, in which a continuous portion of a calendar is printed on an exterior surface of the container and in which said continuous portion of a calendar includes both said predetermined dates and both of said predetermined dates are indicated on the exterior surface of the container along with the year or years of said continuous portion of a calendar.

9. A sealed container having a consumable product sealed therein, the consumable product having a predetermined expiration date after which the properties of the consumable product will have changed to an extent such that the product is no longer suitable for consumption, in which a continuous portion of a calendar is printed on an exterior surface of the container, said continuous portion of the calendar including said expiration date and at least a portion of said useful life immediately preceding said expiration date, and in which said expiration date and said portion of said predetermined useful life, as they appear on said continuous portion of a calendar, are distinguished from dates in said continuous portion of the calendar outside said useful life.

5,558,228

WATER-SOLUBLE POLYMER PACKAGING FOR DELIVERY OF INCOMPATIBLE CROP PROTECTION CHEMICALS

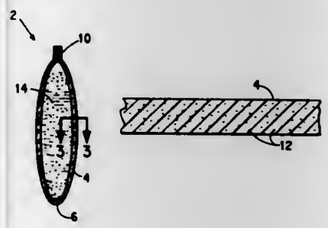
David A. Jackisch, Wilmington, Del., and David A. Styles, West Grove, Pa., assignors to E.I. Du Pont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US93/04612, § 371 Date Nov. 28, 1994, § 102(e) Date Nov. 28, 1994, PCT Pub. No. WO93/23991, PCT Pub. Date Dec. 9, 1993

PCT Filed May 20, 1993, Ser. No. 338,514

Int. Cl.[6] B65D *85/84*

U.S. Cl. 206—524.7 **2 Claims**



1. Packaging for storing and releasing incompatible crop protection chemicals, comprising:

a) first and second crop protection chemical, said first and second chemicals being incompatible with respect to each other; and

b) a container of water-soluble polymer film, said first chemical being encapsulated in said film and said second chemical being contained in said container, wherein said first chemical is not in contact with said second chemical; whereby upon solution of said film in water, said film and said container releases said first and second chemicals, respectively.

5,558,229

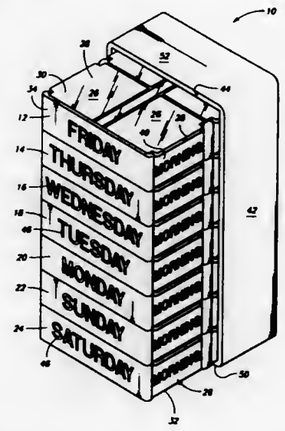
DISPENSER ASSEMBLY AND METHOD OF ADMINISTERING MEDICATION

Frank Halbich, 4960 Frazier Dr., Post Falls, Id. 83854

Filed Mar. 20, 1995, Ser. No. 406,398

Int. Cl.[6] B65D *83/04*

U.S. Cl. 206—534 **6 Claims**



1. An assembly for dispensing objects of interest, comprising:

a rectangular shaped tray having sidewalls, a bottom surface, and opposite ends, and wherein the sidewalls and bottom surface define a cavity having given length, width and depth dimensions, and wherein the cavity has a longitudinal line of reference;

a restraining portion borne by the sidewall of the tray and disposed between the opposite ends of the tray; and

a plurality of nestable dispensing containers matingly received in the cavity of the tray, each dispensing container having top and bottom surfaces, and a substantially continuous sidewall, and wherein the dispensing containers each have a given length dimension which is greater than the depth dimension of the cavity, and a width dimension which is less than the width dimension of the cavity, and wherein the restraining portion frictionally engages each of the dispensing containers disposed intermediate the opposite ends of the tray and guides the individual dispensing containers along a given path of travel which lies in the same plane as the longitudinal line of reference, and wherein individual dispensing containers moved to the opposite ends of the tray are disengaged from the restraining portion and are substantially freely moveable along a course of travel which is substantially transverse to the longitudinal line of reference, and wherein dispensing containers disposed intermediate the opposite ends of the tray are moveable along a course of travel transverse to the longitudinal line of reference following the application of force of a given magnitude which is effective to overcome the frictional force provided by the restraining portion, the force being of a magnitude which does not substantially deform the tray, and wherein containers removed from the tray may be inserted back into the cavity in an inverted position.

5,558,230

DENTAL IMPLANT CONTAINER WITH CAP FOR

comprising a circumferential sidewall with an opening for holding the healing screw in a fixed position therein; and

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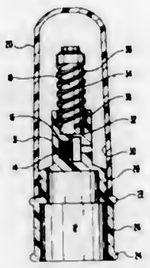
PRODUCT SIZE GRADING SYSTEM

5,558,230

DENTAL IMPLANT CONTAINER WITH CAP FOR HOLDING A DENTAL IMPLANT AND HEALING SCREW

David V. Fischer, West Jordan, Utah, and Riccardo Ilic, Milan, Italy, assignors to Ultradent Products, South Jordan, Utah

Filed Jun. 7, 1995, Ser. No. 474,475
Int. Cl.[6] B65D *85/20*
U.S. Cl. 226—570 **21 Claims**



1. A container for a dental implant having a first longitudinal axis and a healing screw having a head and a shaft with a second longitudinal axis that extends centrally of the shaft comprising:

a carrier having means for holding the dental implant in a fixed position and having means for holding the healing screw in a fixed position with the second longitudinal axis of the healing screw making a transverse angle with the first longitudinal axis of the dental implant; and

a hood in contact with the carrier having means to seal the dental implant and the healing screw from the ambient.

10. A container for a dental implant having a first longitudinal axis and a healing screw having a head and a shaft with a second longitudinal axis that extends centrally of the shaft, comprising:

a carrier having a proximal end and an opposite distal end, the distal end comprising means for holding the dental implant in a fixed position, and means for holding the healing screw in a fixed position with the second longitudinal axis of the healing screw perpendicular to the first longitudinal axis of the dental implant; and

a hood in contact with the carrier and having means to seal the dental implant and the healing screw from the ambient.

17. A container for a dental implant having a first longitudinal axis and a healing screw having a head and a shaft with a second longitudinal axis that extends centrally of the shaft, comprising:

a carrier having a cylindrical proximate end opposite a cylindrical distal end and a cylindrical portion therebetween, the proximal end having a larger cross-sectional diameter than that of said portion, and said portion having a larger cross-sectional diameter than that of the distal end, the distal end having a first cavity for receiving an end of the dental implant, and a second cavity therein for substantially enclosing and retaining the healing screw with the second longitudinal axis of the healing screw perpendicular to the first longitudinal axis of the implant, said distal end having a tool passage extending from an outside surface thereof to the second cavity, the tool passage having a longitudinal axis in common with to the second longitudinal axis of the healing screw, and said portion between the distal and proximal ends having a plurality of ribs radially encircling and extending therefrom and having a first flange extending therefrom distal of the plurality of ribs, a second distal flange extending from the distal end of the carrier; and

a hood in contact with the first flange and circumscribing the plurality of ribs, whereby the hood seals both cavities from the ambient.

21. A container for a dental implant and a healing screw comprising:

a carrier means comprising a projecting portion with an opening in an end of the projecting portion for holding the dental implant in a fixed position, and said projecting portion further comprising a circumferential sidewall with an opening for holding the healing screw in a fixed position therein; and

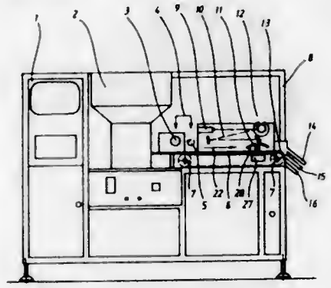
a hood adapted to contact the carrier means so as to seal the dental implant and the healing screw from the ambient.

5,558,231

AUTOMATIC SORTING MACHINE FOR SORTING AND CLASSIFYING SMALL PRODUCTS OF THE PHARMACEUTICAL AND CONFECTIONERY INDUSTRIES ACCORDING TO FORM AND COLOR

Detlef Weier, Heiligenberg, Germany, assignor to Maschimpex GmbH, Friedrichshafen, Germany

Filed May 15, 1995, Ser. No. 440,974
Claims priority, application Germany, May 14, 1994, 44 17 015.7
Int. Cl.[6] B07C *5/342*
U.S. Cl. 209—580 **23 Claims**



1. An automatic sorting machine for sorting and classifying small products, by means of optoelectronic specimen recognition, the machine comprising:

a vibratory inlet device wherein the products to be sorted are separated;

a camera having a beam/light path;

a delivery device for conveying the separated products, through the beam/light path;

the camera being utilized for optically comprehending each product and for obtaining electronic signals;

means for evaluating the electronic signals for specimen recognition for deviations of the product, for producing an elimination signal, for eliminating defective products and unrecognized products, wherein the camera is a color-line camera, whose beam/light path is so movably arranged that a beam/light path thereof, in a feeding direction of the product, pans the beam/light path over a predetermined conveying track, wherein the product, during the throughput thereof through the panned beam/light path, is rotated about an axis parallel to a scanning line.

5,558,232

APPARATUS FOR SORTING DOCUMENTS

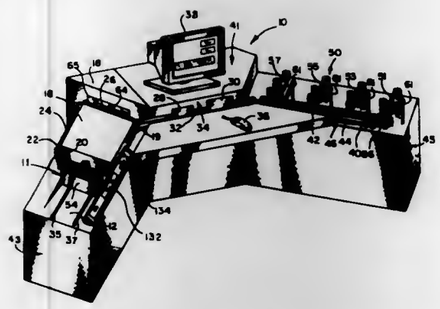
Albert F. Stevens, Moorestown; Jeffrey L. Chodack, Mullica Hill; Russell M. Lange, Palmyra; Robert R. Dewitt, Marlton, all of N.J.; John D. Coleman, Philadelphia, Pa.; Peter W. Bressler, Philadelphia, Pa., and Keith W. Forsyth, Philadelphia, Pa., assignors to Opex Corporation, Moorestown, N.J.

Filed Jan. 5, 1994, Ser. No. 177,846
Int. Cl.[6] B07C *5/00*; **G06K** *9/00*
U.S. Cl. 209—584 **28 Claims**

1. An apparatus for sorting documents comprising:

(a) a document transport for conveying the documents along a selected path of movement;

(b) a viewing area positioned along the selected path for presenting each of the documents to an operator for visual detection of documents having a desired characteristic;



(c) a group selector for activation by the operator upon visual detection of documents having the desired characteristic while the documents are on the selected path;

(d) an override selector for activation by the operator for overriding the activation of the group selector while the documents are on the selected path; and

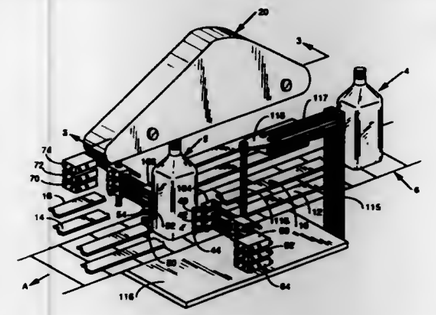
(e) a gate along the selected path responsive to the activation of the group selector by the operator for directing documents having the desired characteristic to a selected output area.

5,558,233

CONTAINER INSPECTION APPARATUS FOR DETERMINING THE WALL THICKNESS OF NON-ROUND CONTAINERS AND ASSOCIATED METHOD

Henry M. Dimmick, Butler; Jerreld K. Shetter, Cabot, and Joseph L. Kisiel, Butler, all of Pa., assignors to AGR International, Inc., Butler, Pa.

Filed Oct. 27, 1994, Ser. No. 330,311
Int. Cl.[6] B07C *5/00*
U.S. Cl. 209—522 **45 Claims**



1. Apparatus for inspecting the wall thickness of a non-round container comprising

capacitive sensor means for providing thickness information,

oscillator means operatively associated with said sensor means for receiving said thickness information from said sensor means and generating corresponding voltage signals,

electronic processor means for receiving said voltage signals and comparing them with desired thickness values in determining whether the desired thickness is present,

means for translating said non-round containers sequentially into contact with said sensor means while rotation of said non-round containers while they are in contact with said sensor means, and

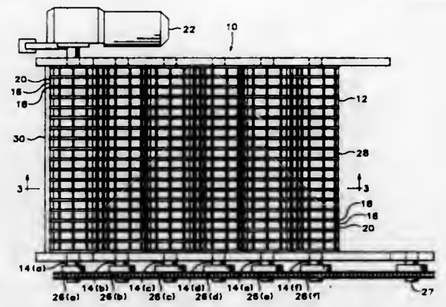
said sensor means having at least one sensor with capacitive sensing portions not in the same plane as other capacitive sensing portions of said sensor.

5,558,234

PRODUCT SIZE GRADING SYSTEM

John E. Mobley, 20571 Empire Ave., Bend, Oreg. 97701

Filed Jul. 22, 1994, Ser. No. 278,716
Int. Cl.[6] B07B *13/075*
U.S. Cl. 209—671 **6 Claims**



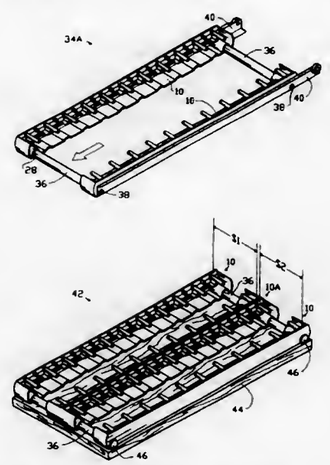
1. A product size grading system comprising a roller bed having a plurality of rotary shafts, each shaft having a uniform direction of rotation and supporting a plurality of alternating conveyor disks and nubbin rollers, the nubbin rollers each having a substantially polygonal cross section and having flexible nubbins projecting therefrom, wherein said nubbins are inclined at a slight angle lagging the direction of rotation of said rotary shafts and wherein the combination of said nubbin rollers and said conveyor disks form product sizing pockets.

5,558,235

ORGANIZER SUPPORT STRUCTURE FOR AUDIO/VIDEO MEDIA

Thomas A. Hunt, Encinitas, Calif., assignor to Spectrum Concepts, Inc., Encinitas, Calif.

Filed Sep. 6, 1994, Ser. No. 301,068
Int. Cl.[6] A47G *29/00*
U.S. Cl. 211—40 **43 Claims**



1. A package support construction, comprising:

a pair of spaced apart parallel side rail members for helping to support thereinbetween thin package members each having a wide transverse dimension, and thick package members each having a narrow transverse dimension;

means for securing said side rail members in a substantially

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ADAPTABLE BAKING SYSTEM

(c) each of said first pair of said rear draft stop members and said first pair of said front draft stop members having a

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SNAP-ON, PLASTIC HINGED CLOSURE IN A SINGLE PIECE

means for securing said side rail members in a substantially parallel relation relative to one another to form a support frame for the package members;

a pair of spaced apart thin package member support shelves extending from corresponding ones of said side rail members toward one another for supporting from below said thin package members only, said side rail members being dimensioned to permit the thick package members to fit therebetween;

a series of spaced apart long stop members disposed generally in a common plane on said side rail members and extending in a pair of spaced apart rows transversely from corresponding ones of said side rail members in a confronting relationship for helping to define thick package receiving slots between opposed pairs of long stop members for helping to support said thick package members therebetween in either a backwardly or forwardly inclined upright manner between said shelves, said rows of long stop members being disposed above said shelves;

a series of spaced apart short stop members disposed generally in said common plane interleaved alternatingly with said long stop members on said side rail members and extending transversely in a pair of spaced apart rows from corresponding ones of said side rail members in a confronting relationship above said shelves and cooperating with said long stop members to define thin package receiving slots between opposed pairs of said short stop members for helping to support said thin package members therebetween either in a backwardly or forwardly inclined upright manner supported from below on said shelves at inclinations generally parallel to the thick package members, said pairs of long stop members and said pairs of short stop members having substantially different horizontal lengths relative to each other to permit the thin package members to fit between oppositely disposed pairs of said short stop members; and

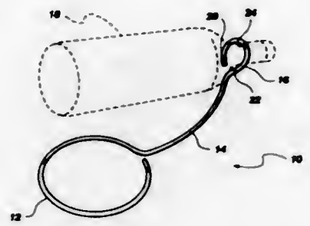
said pairs of long stop members and said short stop members being interleaved in said common plane and spaced apart from one another by a sufficient distance to permit the thin package members and the thick package members to be shifted in unison between forwardly inclined parallel positions and backwardly inclined parallel positions to maintain the forwardly inclined package members and the backwardly inclined package members in generally parallel dispositions.

5,558,236

REFRESHMENT RACK

Robert N. Williams, 438 Woodbridge, San Luis Obispo, Calif. 93401, and Brian N. Williams, 3396 E. Antler Way, Salt Lake City, Utah 84121

Filed Mar. 17, 1994, Ser. No. 210,146
Int. Cl.[6] A47F 7/00
U.S. Cl. 211—74 **19 Claims**



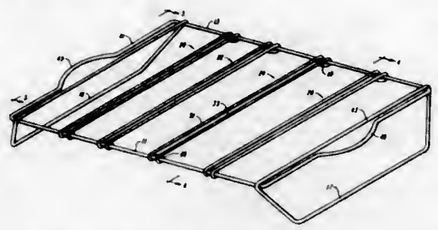
1. A refreshment rack comprising a rod support base and a rod bottle supporting element formed with said base, said bottle supporting element consisting of a single, round, and essentially complete loop adapted to receive the neck only of a bottle therein and to support the bottle by its neck in cantilever fashion.

5,558,237

ADAPTABLE BAKING SYSTEM

Bruce Ancona, New York, N.Y., assignor to B. Vla International Housewares, Inc., Englewood Cliffs, N.J.

Filed Jan. 13, 1995, Ser. No. 370,757
Int. Cl.[6] A47F 7/00
U.S. Cl. 211—133 **7 Claims**



1. An apparatus for baking comprising:

a pair of horizontal, parallel, first bars;

leg means for supporting said parallel first bars at substantially equal heights above a supporting surface;

a plurality of second bars extending between said first bars transversely thereto, the ends of said second bars being slidingly engaged with said first bars thereby to permit the spacing between said second bars to be manually adjusted; and

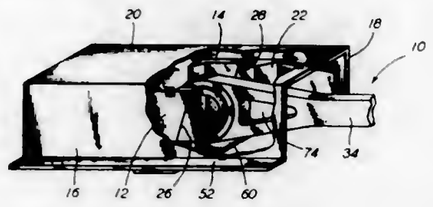
a plurality of each of several differently sized pans, each of said pans being provided, on opposed sides thereof, with hook means adapted to engage a respective one of said second bars whereby a freely selectable group of said pans can be supported between said second bars for baking by appropriately spacing said second bars.

5,558,238

FREIGHT RAILWAY CAR SLACKLESS DRAWBAR ASSEMBLY

David W. Daugherty, Jr., Plainfield, Ill., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Sep. 11, 1995, Ser. No. 526,436
Int. Cl.[6] B61G 7/00
U.S. Cl. 213—50.5 **20 Claims**



15. A slackless type drawbar assembly for connecting adjacently disposed ends of a pair of railway type freight cars together in a substantially semipermanent manner, said slackless drawbar assembly comprising:

(a) a first pair of vertically disposable rear draft stop members engageable with and securable to respective ones of a pair of vertically disposed side wall portions of a center sill member disposed along a longitudinal centerline of a first railway freight car;

(b) a first pair of substantially radially opposed and vertically disposable front draft stop members engageable with and securable to such respective ones of such pair of such vertically disposed side wall portions of such center sill member disposed along such longitudinal centerline of such first railway freight car;

(c) each of said first pair of said rear draft stop members and said first pair of said front draft stop members having a substantially flat and respectively facing surface portion formed thereon;

(d) each said substantially flat surface portion disposed on at least one of said first pair of said rear draft stop members and said first pair of said front draft stop members having a predetermined taper;

(e) an elongated drawbar member having a predetermined length;

(f) a first aperture, having a predetermined configuration, formed through said elongated drawbar member adjacent a first end thereof;

(g) a first ball member having at least a portion thereof disposed in said first aperture, said first ball member having a predetermined diameter;

(h) a first race assembly secured to said elongated drawbar member adjacent said first aperture and having an inner surface thereof surrounding said at least a portion of said first ball member disposed in said first aperture;

(i) a first pair of elongated shaft members extending outwardly from radially opposed sides of said first ball member for a predetermined distance, each of said first pair of shaft members including substantially radially opposed flat surface portions which are wedge shaped and which engage respective said substantially flat and respectively facing surfaced end portions disposed on each of said pair of rear draft stop members and said pair of said front draft stop members;

(j) a first securing means engageable with such center sill portion of such first freight car and a bottom surface of each of said pair of said elongated shaft members for securing said slackless drawbar assembly within such center sill member in a vertical direction;

(k) a second pair of vertically disposable rear draft stop members engageable with and securable to said respective ones of such pair of vertically disposed side wall portions of such center sill member disposed along a longitudinal centerline of an adjacently disposed second railway freight car;

(l) a second pair of substantially radially opposed and vertically disposable front draft stop members engageable with and securable to such respective ones of such pair of vertically disposed side wall portions of such center sill member disposed along such longitudinal centerline of such second railway freight car;

(m) each of said second pair of rear draft stop members and said second pair of front draft stop members having a substantially flat and respectively facing surface portion;

(n) a second aperture, having a predetermined configuration, formed through said elongated drawbar member adjacent a second end thereof;

(o) a second ball member having at least a portion thereof disposed in said second aperture, said second ball member having a predetermined diameter;

(p) a second race assembly secured to said elongated drawbar member adjacent said second aperture and having an inner surface thereof surrounding said at least a portion of said second ball member disposed in said second aperture;

(q) a second pair of elongated shaft members extending outwardly from radially opposed sides of said second ball member for a predetermined distance, each of said second pair of shaft members including substantially radially opposed flat surface portions which are wedge shaped and which engage respective said substantially flat and respectively facing surfaced end portions disposed on each of said pair of rear draft stop members and said pair of said front draft stop members; and

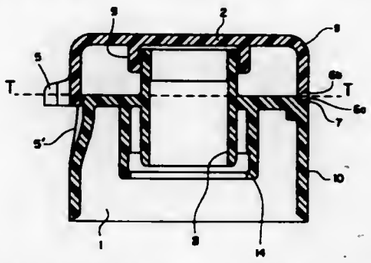
(r) a second securing means engageable with such center sill portion of such second freight car and a bottom surface of each of said second pair of said elongated shaft members for securing said slackless drawbar assembly within such center sill member in a vertical direction.

5,558,239

SNAP-ON, PLASTIC HINGED CLOSURE IN A SINGLE PIECE

Werner F. Dubach, Maur, Switzerland, assignor to Alfatechnic Patent AG, Switzerland

PCT No. PCT/CH94/00049, § 371 Date Jun. 26, 1995, § 102(e) Date Jun. 26, 1995, PCT Pub. No. WO94/20713, PCT Pub. Date Sep. 15, 1994
PCT Filed Mar. 8, 1994, Ser. No. 335,705
Claims priority, application Switzerland, Mar. 9, 1993, 0705/93
Int. Cl.[6] B65D 47/08
U.S. Cl. 215—235 **11 Claims**



1. An integral plastic hinged snap closure having a lower part (1) and an upper part (2) connected with respect to each other with an improved integral joint, the improved integral joint comprising:

said lower part (1) having a lower jacket wall (10), said lower jacket wall (10) having a lower thinned area (12*a*) of reduced wall thickness, a lower pivot axis (6*a*) oriented longitudinally along said lower thinned area (12*a*);

said upper part (2) having an upper jacket wall (11), said upper jacket wall (11) having an upper thinned area (12*b*) of reduced wall thickness, an upper pivot axis (6*b*) oriented longitudinally along said upper thinned area (12*b*);

the closure having a compression-resistant flip element (7) positioned between said lower pivot axis (6*a*) and said upper pivot axis (6*b*); and

two snap elements (3), one of said snap elements (3) positioned on one side of said compression-resistant flip element (7) and another of said snap elements (3) positioned on an opposite side of said compression-resistant flip element (7), each said snap element (3) comprising said lower thinned area (12*a*) continuing within said lower jacket wall (10) away from said lower pivot axis (6*a*) and said upper thinned area (12*b*) continuing within said upper jacket wall (11) away from said upper pivot axis (6*b*), and in a direction away from said lower pivot axis (6*a*) and said upper pivot axis (6*b*) such that said continued lower thinned area (12*a*) and said continued upper thinned area (12*b*) are diverging with respect to each other.

5,558,240

CUP HANDLE

Merry Karp, 1295 Tower Grove Rd., Beverly Hills, Calif. 90210

Filed May 12, 1995, Ser. No. 440,218
Int. Cl.[6] B65D 23/10
U.S. Cl. 215—398 **16 Claims**

1. In a cup having a mouth, a body and a base, a cup handle fastened to the cup comprising:

a. an elongated curved outer section having an exterior surface adapted to fit adjacent a user's palm and an elongated, oppositely curved inner section adapted to be grasped by a user's fingers;

b. said outer section including

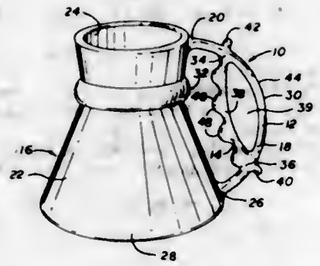
a first end fastened to the cup body and extending therefrom, said first end being fastened to the cup proximate the mouth of the cup;

edgelok coupling assemblies including a first edgelok and a second edgelok, said first and second edgeloks designed to be

a plurality of transverse panels respectively fastened to said mounting blocks between each pair of supports to close the

5,558,244

OIL RESERVOIR HAVING A CAP WITH CYLINDRICAL



a second end fastened to the cup body and extending therefrom spaced apart from said first end, said second end being fastened to the cup at a point between the mouth and the base of the cup, and

an arcuate mid portion between said first and second ends, said mid portion being spaced apart from the side of the cup;

the distance between said points of attachment when measured in a straight line between said first and second ends being from about 1" to about 4"; and

c. said inner section including a third-end,

said third end fastened to said mid portion proximate to said first end;

a fourth end spaced apart from said third end, said fourth end being attached to said mid portion proximate to said second end;

and an arcuate inner portion, curved oppositely from said mid portion and spaced between the body of the cup and said outer section's mid portion;

the distance between said points of attachment of said third and fourth ends when measured in a straight line being less than the distance between said first and second ends.

5,558,241

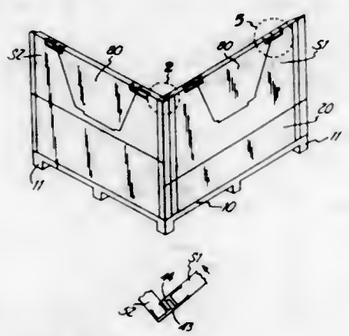
CRYOTRANSPORT CHAMBER

M. Conrad Hoffstutler, Jr., Burnsville; Patrick E. Meacham, Lakeville; Mark W. Wallace, Minneapolis, and Carl R. Nyberg, Bloomington, all of Minn., assignors to Temp Top Container Systems, Inc., Edina, Minn.

Filed Jan. 6, 1994, Ser. No. 178,189

Int. Cl.[6] B65D *6/16*

U.S. Cl. 220—1.5 **19 Claims**



1. A transport container comprising:

a base;

a plurality of sidewalls, said sidewalls extending essentially perpendicularly from the base to form a container having an inner cavity;

a plurality of edgelok coupling assemblies for selectively connecting adjacent sidewalls along a detachable extent, said edgelok coupling assemblies including a first edgelok and a second edgelok, said first and second edgeloks designed to be detachably connected to selectively connect adjacent sidewalls, said first edgelok including:

means for securing the first edgelok relative to a side of the sidewall;

a latch member having a latch projection and a latch channel extending along the entire detachable extent; and

said second edgelok including:

means for securing the second edgelok relative to a side of an adjacent sidewall; and

a latch member having a latch projection and a latch channel extending along the entire detachable extent, the latch projection of the first edgelok being similarly sized and aligned relative to the latch channel of the second edgelok and the latch projection of the second edgelok being similarly sized and aligned relative to the latch channel of the first edgelok so that when the first and second edgeloks are connected, the latch projections of the first and second edgeloks closely fit into said latch channels of second and first edgeloks, respectively,.

wherein the latch projection of the first edgelok includes a posilatch extension and the latch projection of the second edgelok includes a posilatch groove and the posilatch extension of connected edgeloks fits into the posilatch groove to securely connect the first and second edgeloks of the edgelok coupling assemblies.

5,558,242

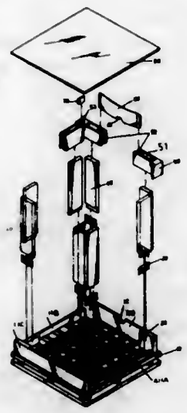
STRUCTURE OF OUTER CASE

Hung Kuan, P.O. Box 82-144, Taipei, Taiwan

Filed Nov. 29, 1995, Ser. No. 580,496

Int. Cl.[6] B65D *6/22*

U.S. Cl. 220—4.31 **1 Claim**



1. An outer case comprising:

a rectangular base having four upright side walls of different heights, one upright side wall having a half-round notch in the middle at at top side;

a metal frame mounted within said base;

pairs of supports respectively hinged to two opposite ends of each of the four upright side walls of said base by hinges;

a plurality of mounting blocks respectively fastened to said supports and arranged in stack on each support, each mounting block having a center through hole for the insertion of one support, a mounting groove at one end, and a sliding groove at an opposite end;

a plurality of wedges respectively fitted into the mounting grooves of said mounting blocks to fastened said mounting blocks together;

a plurality of transverse panels respectively fastened to said mounting blocks between each pair of supports to close the four sides of the outer case, each transverse panel having two opposite ends respectively fitted into the sliding grooves of said mounting blocks, one of said transverse panels having a half-round notch in the middle at a bottom side matched with the half-round notch on the upright side walls of said base to provide a circular outlet; and a top cover covered on said supports, said mounting blocks, and said transverse panels at a top side opposite to said base.

5,558,243

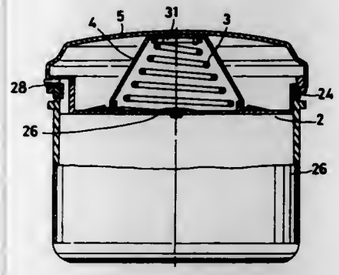
SEALING CAP FOR VACUUM CONTAINERS

Hui-Ying Chu, Tainan Hsien, Taiwan, assignor to Chiun Pao Enterprise Co., Ltd., Tainan Hsien, Taiwan

Filed Nov. 7, 1994, Ser. No. 336,739

Int. Cl.[6] B65D *31/04*

U.S. Cl. 220—212 **3 Claims**



1. A sealing cap for vacuum containers, comprising:

a base disc having an outer circumferential edge portion with a first annular groove formed in a lower surface thereof for coupling to a container and a second annular groove formed in an outer perimeter surface of said outer circumferential edge portion, said base disc including (1) a centrally disposed stop valve, (2) a raised ring formed on a bottom surface of said base disc and circumscribing said stop valve, and (3) a leak valve secured to said outer circumferential edge portion;

a spring having opposing first and second ends, said first end of said spring being disposed on said bottom surface of said base disc within said raised ring;

a plate member disposed on said second end of said spring;

a sucking plate formed of a rubber material and having a central conically shaped portion overlaying said spring and plate member, said central conically shaped portion extending from a circumferential annular flat portion disposed on said bottom surface of said base disc circumscribing said raised ring;

a soft cap body coupled to said base disc and overlaying said sucking plate, said cap body being formed of a rubber-like material and having an inner annular ridge adapted to engage said second annular groove of said base disc, wherein positioning said sealing cap on an upper edge of a container and repeatedly displacing a portion of said cap body against said spring pumps air from the container to form a partial vacuum therein.

5,558,244

OIL RESERVOIR HAVING A CAP WITH CYLINDRICAL BAFFLES DEFINING LABYRINTH PASSAGE

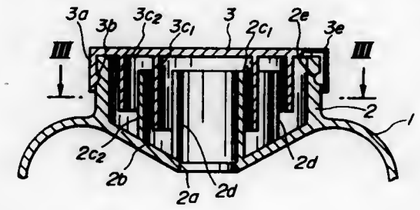
Seiji Akaike, and Shinichi Komatsu, both of Atsugi, Japan, assignors to Unisia Jecs Corporation, Atsugi, Japan

Filed Feb. 3, 1995, Ser. No. 383,584

Claims priority, application Japan, Feb. 24, 1994, 6-049974

Int. Cl.[6] B65D *51/16*

U.S. Cl. 220—374 **7 Claims**



1. A reservoir for an automotive vehicle, the reservoir having a filler port, comprising:

a cap detachably mounted to the filler port of the reservoir;

a plurality of first baffles concentrically arranged inside said cap, said plurality of first baffles extending substantially in an axial direction of the filler port, said plurality of first baffles having different diameters;

a plurality of second baffles concentrically arranged inside the filler port of the reservoir and having different diameters, said plurality of second baffles being concentric with said plurality of first baffles, wherein said plurality of second baffles are unitarily formed in one piece with said filler port,

said plurality of first baffles and said plurality of second baffles being disposed alternately; and

at least one communication port formed through each of said second baffles, for allowing fluid communication with the reservoir.

5,558,245

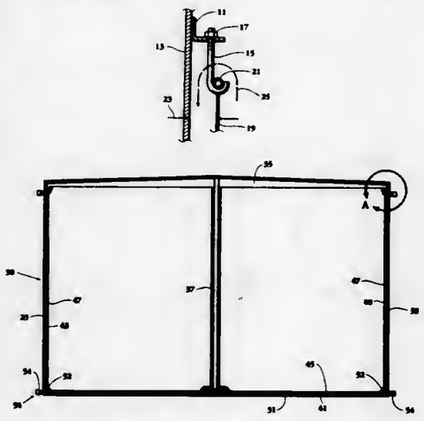
STORAGE TANK BLADDER SEAL

Steven P. White, 200 Center Plz., Ste. 1423, Tulsa, Okla. 74119

Filed Sep. 20, 1994, Ser. No. 309,402

Int. Cl.[6] B65D *8/00*

U.S. Cl. 220—403 **18 Claims**



1. A bladder mounting for a storage tank comprising:

a liner;

a circumferential band of adhesive material between an inner wall of said tank and said liner forming a seal of said liner to

(e) an injection valve having three ports, wherein a first port

a circumferential band of adhesive material between an inner wall of said tank and said liner forming a seal of said liner to said tank wall along a continuous path;

means for clamping said liner against said inner surface of said wall with said band of adhesive therebetween; and

at least one pneumatically operated automatic relief valve through said wall proximate and below said seal for pneumatic communication from a cavity between said wall and said liner to atmosphere external to said tank whereby, as said tank is filled with material to be stored, gases trapped between said wall and said liner and below said seal are automatically released to atmosphere through said at least one relief valve.

5,558,246

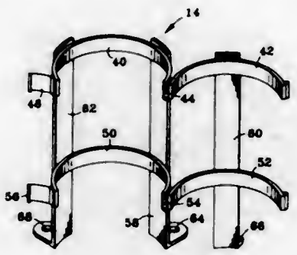
BOTTLED GAS TANK HOLDER

George S. Ross, Jr., 12 Mirra Ave., Derry, N.H. 03038

Filed Jun. 12, 1995, Ser. No. 489,588

Int. Cl.[6] B65D *25/20*

U.S. Cl. 220—737 **1 Claim**



1. A holder for securing and holding in a stable position a tank of the type which, when in use, contains a compressed gas such as carbon dioxide used for carbonating soft drinks, said holder comprising:

at least two circular rings each said circular ring having a substantially same width and a substantially same diameter said width of each said circular ring being less than each said diameter and said diameter being sufficient to permit said tank to be inserted within each said circular rings;

at least three leg members each leg member tangentially affixed to each said circular rings in such a manner as to be substantially perpendicular to a plane formed by each said circular ring and parallel to a centerline defined by a center of each said circular ring when all said leg members and all said circular rings are affixed;

means for attaching said holder to a frame means thereby preventing the movement of said holder when said tank is positioned therein and wherein each said circular ring is comprised of two pieces, a stationary part and a hinged part, said stationary part and said hinged part of each said circular ring joined together at a hingeable end by a hinge and at a lockable end by a lockable latch.

5,558,247

EXTENSION TUBE CLIP HOLDER

Frank J. Cass, 11 Victor Ave., Eatontown, N.J. 07724

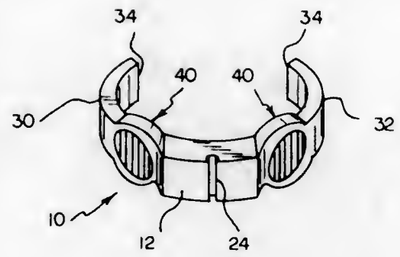
Filed Aug. 19, 1994, Ser. No. 292,210

Int. Cl.[6] A47G *29/00*

U.S. Cl. 220—735 **1 Claim**

1. An extension tube clip holder comprising:

a center member having an arcuate inner wall and an outer wall with a circular aperture extending through said center member and parallel to said outer wall, said center member further having an opening which extends through said outer wall and



is coextensive with said circular aperture to permit communication with said circular aperture through said outer wall, said circular aperture and said opening being so constructed and arranged that an extension tube can be inserted into said circular aperture for secure storage and can be easily removed therefrom for use;

a first arcuate arm extending from a first side of said center member;

a second arcuate arm extending from a second side of said center member, said arms terminating in a pair of spaced distal ends, said arcuate arms cooperating with said inner wall to define a substantially circular area within which a container is positionable such that said arms extend at least partially around a cylindrical side wall of a container to secure said center member to a container; and

a first gripping member interposed between said first side of said center member and said first arcuate arms, and a second gripping member interposed between said second side of said center member and said second arcuate arms, each of said gripping members including arcuate extensions extending vertically therefrom and a gripping surface extending along said outer exterior surface of said gripping member, said gripping surface comprising a plurality of gripping serrations integrally molded into said gripping member, whereby an individual can grasp said holder by positioning a left index finger onto said distal end of said first arcuate arm and a left thumb onto said first gripping member and by positioning a right index finger into engagement with said distal end of said second arcuate arm and a right thumb onto said second gripping member, whereby said distal ends of said first and second arcuate arms can be resiliently biased apart during installation procedure of the holder.

5,558,248

HEADED ROD MEMBER ALIGNING AND SUPPLY APPARATUS

Kanji Sakoda, Aichi-ken, Japan, assignor to Embart Inc., Newark, Del.

Filed Sep. 9, 1994, Ser. No. 304,104

Claims priority, application Japan, Sep. 10, 1993, 5-049338

Int. Cl.[6] B23Q *7/12*

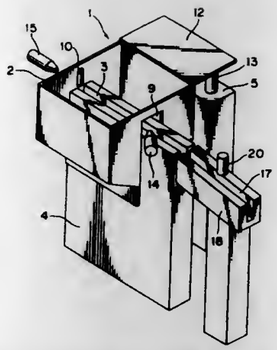
U.S. Cl. 221—164 **1 Claim**

1. A headed rod member aligning and supply apparatus comprising,

a container for receiving a plurality of headed rod members,

an elongated chute having a portion thereof inserted into said container, said chute having a top surface formed with a groove having a width smaller than the diameter of the head of said headed rod member but larger than the diameter of the shank of said headed rod member to thereby receive the shank of said headed rod member therein,

moving means for effecting relative movement between said container and said chute to thereby move both said container and said chute between a first position in which the bottom surface of said container and the top surface of said chute meet and a second position in which the top surface of said



chute rises to a predetermined height above the bottom surface of said container

a number of said plurality of headed rod members being received in said groove of said chute when said chute and said container are in said first position, and

an air nozzle directed towards the top surface of said chute for blowing off therefrom excess headed rod members note positioned in said groove of said chute when said chute and said container are in said second position;

said apparatus further including a feed member connected to said chute, an escapement means which separates and feeds the aligned headed rod members one by one, and a second air nozzle for blowing air onto the top surface of said chute so as to move the headed rod members aligned in a row in said groove to said feed member.

5,558,249

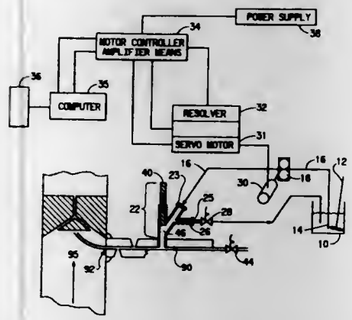
PRECISION LIQUID ADDITION DEVICE

Allan F. Falcoff, Chadds Ford, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 57,034, May 5, 1993, abandoned. This application Sep. 19, 1994, Ser. No. 306,426

Int. Cl.[6] B67D *5/08*

U.S. Cl. 222—63 **8 Claims**



6. An apparatus for delivering a controlled volume of fluid from a supply vessel to a high pressure stream which comprises:

(a) at least one liquid supply vessel;

(b) a positive displacement means capable of pumping a variable volume of fluid from said supply vessel;

(c) controlling means coupled to said positive displacement means which drives said positive displacement means;

(d) a computer capable of storing programs electrically connected to said controlling means;

(e) an injection valve having three ports, wherein a first port receives fluid from said supply vessel, a second port attached to said first port allows said fluid to flow out of said injection valve into a process line and a third port which allows fluid to flow to a recirculation line;

(f) a plunger in said injection valve being positioned within said injection valve such that fluid may enter the space within said injection valve, said plunger acting as a syringe to perform air-free and complete addition of materials at the completion of the pumping cycle;

(g) a solenoid controlled by the computer to allow circulation of fluids from said supply vessel through said injection valve back to said supply vessel to prevent settling of suspended solids within said fluids;

(h) a conduit which carries fluids to flush a supply line connected to said process stream whose flow is controlled by a second solenoid controlled by said computer;

wherein said computer through the controlling means drives the positive displacement means to pump a volume of fluid from said supply vessel into said injection valve as the plunger is in the open position such that pumped fluids enter said process stream, said plunger returns to said closed position, said second solenoid opening to allow fluids from said conduit to enter.

5,558,250

HAND HELD DEVICE

Paulus Manders, 632 Barbadoes Street, Christchurch 8001, New Zealand

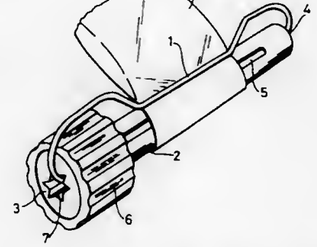
PCT No. PCT/NZ93/00054, § 371 Date Dec. 14, 1994, § 102(e) Date Dec. 14, 1994, PCT Pub. No. WO94/01336, PCT Pub. Date Jan. 20, 1994

PCT Filed Jul. 5, 1993, Ser. No. 204,174

Claims priority, application New Zealand, Jul. 3, 1992, 243445

Int. Cl.[6] B65D *35/32*

U.S. Cl. 222—99 **11 Claims**



1. A device for use in dispensing the contents of a collapsable tube, the device comprising a shaped spring clip the ends of which are inserted into the ends of a slotted member, in use, a folded tail of a collapsable tube is inserted into the slot in the slotted member so that when the slotted member is rotated the spring clip contacts the exterior of the tube forcing it to wrap around the slotted member and if the cap of the tube is removed, material is dispensed from the tube, and wherein at least one end of the slotted member has internally projecting teeth which act as a ratchet when the slotted member is rotated to inhibit movement of the spring clip relative to the slotted member to prevent the collapsable tube from unwrapping.

170–921 O.G.–96–7: QL3

5,558,251

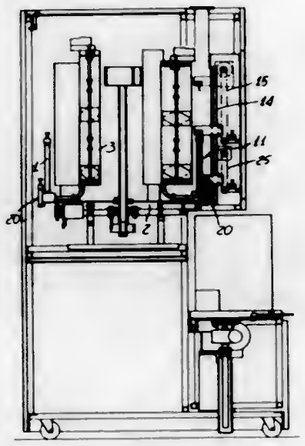
ing completely across the half of said base opposite said one-half, said non-recyclable waste comprising garbage or trash is placed

5,558,251

APPARATUS FOR METERING PIGMENTS FOR PAINTS AND THE LIKE

Giuseppe Neri, Via dei Lavoratori, 128/130, 20092 - Cinisello Balsamo (Milano), Italy

Filed Oct. 18, 1994, Ser. No. 324,743
Int. Cl.[6] B67D 5/52
U.S. Cl. 222—135 1 Claim



1. An apparatus for metering pigments for paints comprising a bearing framework supporting a rotary carousel supporting in turn a plurality of pigment vessels each provided with a pigment delivery vessel, wherein each said pigment delivery assembly comprises a pigment delivery nozzle and a suction piston having a piston rod connected at a top portion thereof to a driving block slidably supported by an upright and connected to a first ball circulation assembly allowing said driving block and said piston rod to be precisely displaced; near said suction piston, valve means being provided, said valve means including a valve means stem including a head connected to a movable block also slidably supported on said upright and being connected to a second ball circulation assembly driving said movable block, said valve means stem sliding within a chamber and being provided with a middle neck portion providing, in said chamber, first duct means communicating second duct means of a said pigment delivery vessel with third connecting duct means of said suction piston, said valve means stem being driven from a first pigment delivery nozzle closing operation position in which said stem will close said pigment delivery nozzle and said neck portion of said stem will cause said second duct means of said pigment delivery vessel to communicate with said third connecting duct means of said suction piston, to a second pigment delivery nozzle opening operating position so as to allow said suction piston to draw a pigment from said pigment delivery vessel, and then to a third residue pigment removing operating position in which said stem is caused to project from said pigment delivery nozzle.

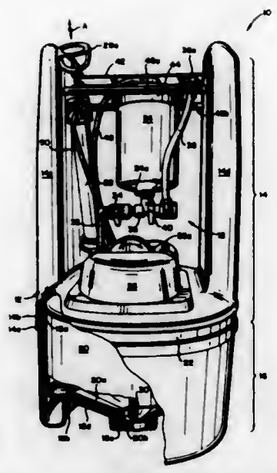
5,558,252

PORTABLE CHEMCIAL TANK WITH INTEGRAL TRANSFER SYSTEM

Neil P. Stapensea, Raleigh; Kevin K. Gaskins, Apex; Dan J. Pronka, Chapel Hill, all of N.C., and Gil Rollison, Memphis, Tenn., assignors to BASF Corporation, Mt. Olive, N.J.

Filed Mar. 31, 1995, Ser. No. 412,337
Int. Cl.[6] B67D 5/06
U.S. Cl. 222—181.2 17 Claims

1. A portable, self-contained liquid chemical storage and transfer unit comprising:



(i) a support shell having upper and lower support shell sections concentrically joined to one another, said upper support shell having a diametrically opposed pair of upright support arms so as to define therebetween a generally U-shaped space;

(ii) a liquid chemical storage tank contained within said lower support shell section; and

(iii) a transfer system positioned in said U-shaped space, said transfer system including;

(a) a metering canister fluid-connected to said liquid chemical storage tank; and

(b) a pump fluid-connected to said metering canister; wherein

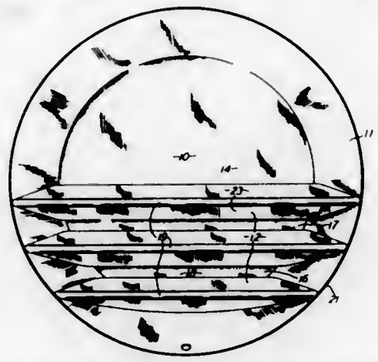
(c) operation of said pump creates a vacuum within said metering canister to draw liquid chemical from said storage tank and into said metering canister.

5,558,253

LIGHTWEIGHT AND STRENGTH-REINFORCED TACO PLATE

William A. Malvasio, 608 Brown's Lake Dr., Burlington, Wis. 53105

Filed Dec. 11, 1995, Ser. No. 570,587
Int. Cl.[6] B65D 5/4805
U.S. Cl. 220—575 4 Claims



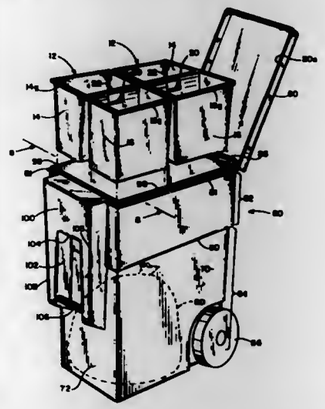
1. A lightweight and strength-reinforced taco plate with two holders, comprising a plate made in one sheet having a uniform thickness throughout and including a circular base with one-half thereof being planar, a plurality of parallel chord-like walls extending completely across the half of said base opposite said one-half, said walls each being shaped in inverted V-shape and spaced apart, an upstanding completely annular rim integral with said base and extending completely therearound, said base and said walls and said rim all being integral and all being formed of only plastic and moldable material, and the height of said walls and said rim being the same, one of said walls extends diametrically across said base and thereby divides, said base into two semi-circular halves which present the aforesaid halves, and with said walls being liquid tight with said base and said rim up to the full height of said walls, for preventing liquid flow between said base halves.

5,558,254

CONTAINER FOR STORING AND TRANSPORTING RECYCLABLE AND NON-RECYCLABLE WASTE

Dennis C. Anderson, Northfield, and Harold T. Hjermstad, II, Eden Prairie, both of Minn., assignors to National Polymers Inc., Lakeville, Minn.

Continuation-in-part of Ser. No. 128,989, Sep. 29, 1993, Pat. No. 5,390,813. This application Feb. 2, 1995, Ser. No. 382,644
Int. Cl.[6] A47G 19/00
U.S. Cl. 220—527 3 Claims



1. A wheeled service bin assembly for holding and transporting recyclable waste and non-recyclable waste comprising,

a unitary bin body formed from a rigid material with connected side walls, a horizontal bottom wall, and an upper open wide mouth and having an upper portion and a lower portion that are integral with one another,

the upper portion of the bin body defines a compartment for holding a plurality of recycling receptacles in side-by-side relationship which completely fill the upper compartment when inserted therein,

the lower portion of the bin body defines a lower compartment for holding non-recyclable garbage and waste below the recycling receptacles,

the bin includes a support for holding the recycling receptacles next to each other in the upper portion of the bin,

the recycling receptacles are removably supported for holding recyclable waste in the upper portion of the bin,

each of the recycling receptacles includes a receptacle body having a bottom wall, connected side walls terminating in an upper open wide mouth, a centrally located upright, hollow, downwardly opening partition dividing the receptacle into a pair of side-by-side upwardly opening wide-mouthed compartments each bounded upwardly by an upper edge, and a handle located between the compartments proximate the upper edges thereof,

supporting wheel means rotatably mounted at the bottom of the bin body for supporting the bin from the ground,

said non-recyclable waste comprising garbage or trash is placed in the lower compartment by inserting the non-recyclable waste into the bin body when the recycling receptacles are removed from the upper compartment and the garbage and trash is covered by the receptacles when the receptacles are in place in the bin,

said recycling receptacle thereby providing at least four compartments for holding at least four kinds of recyclable waste in the upper compartment of the bin body,

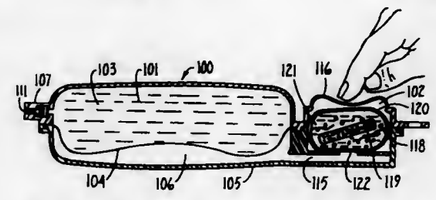
whereby the bin containing both the recyclable and non-recyclable trash or garbage can then be transported to the street or other pickup point with the receptacles covering the trash or garbage.

5,558,255

LIQUID DELIVERY DEVICE

Gregory E. Sancoff, Rancho Santa Fe; Mark C. Doyle, San Diego, and Frederic P. Field, Solana Beach, all of Calif., assignors to River Medical, Inc., San Diego, Calif.

Division of Ser. No. 105,327, Aug. 6, 1993, Pat. No. 5,398,851. This application Jun. 5, 1995, Ser. No. 464,331
Int. Cl.[6] B65D 83/14
U.S. Cl. 222—189.06 14 Claims



1. An apparatus for the generation of a gas for use in a gas driven pump, comprising:

a first container that is adapted to be situated in fluid communication with the pump, said first container containing a first and a second chemical, said first and second chemicals being initially separated from one another by an openable barrier, and reactive upon contact to generate a gas, the apparatus further comprising a separator interposed between the first container and the pump for allowing the gas to be communicated from the first container to the pump while said first and second chemicals remain in said container.

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BOTTLED WATER SUPPLY SYSTEM

Edward J. Miller, 3919 Pixie Ave., Lakewood, Calif. 90712, and Michelle R. Irvine, 81820 Shadow Palm St., Apt. #9, Indio, Calif. 92201

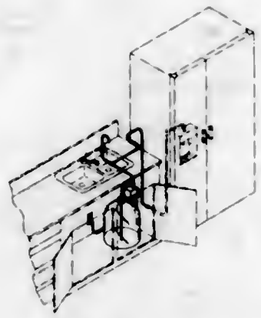
Filed Mar. 2, 1995, Ser. No. 398,966
Int. Cl.[6] B67D 5/58
U.S. Cl. 222—189.09 1 Claim

1. A bottled water supply system comprising:

a water bottle for receiving and storing a quantity of fresh water, the water bottle being shaped so as to define a generally cylindrical body tapering to a neck of a reduced diameter;

a filter cap secured to the neck of the water bottle and including a sump conduit extending through an interior of the water bottle to terminate proximal to a lower end thereof, wherein the filter cap further comprises a closed cylindrical cap having a seal engaging the neck of the water bottle, a connector extending through the closed cylindrical cap and coupling the sump conduit to an intake conduit, an air filter means positioned into fluid communication with an interior of the water bottle for filtering air vented into the interior of the water bottle during removal of water therefrom;

a demand pump;



the intake conduit extending from the cap and in communication with the sump conduit to couple and fluidly communicate with the demand pump;

a faucet;

a faucet conduit in fluid communication with the faucet;

an output conduit extending from the demand pump and into fluid communication with the faucet conduit, wherein the demand pump operates to pump fluid from the water bottle and maintain a predetermined fluid pressure within the output conduit such that a pressure drop will effect automatic operation of the demand pump to supply water from the water bottle to the output conduit and the faucet conduit;

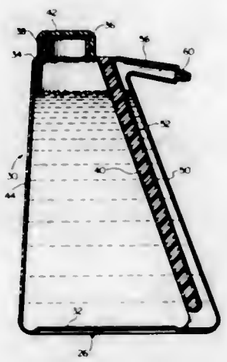
an auxiliary conduit means positioned into fluid communication with the output conduit for coupling the output conduit to a refrigerator including an ice-maker wherein the auxiliary conduit means is coupled to the ice-maker intake line of the refrigerator.

5,558,257

OVAL INTEGRAL SLANT PUMP

Morris Braun, Chicago, Ill., assignor to W. Braun Company, Chicago, Ill.

Filed Oct. 3, 1994, Ser. No. 316,845
Int. Cl.[6] B65D *37/00*
U.S. Cl. 222—212 **10 Claims**



1. A manually-compressible, resilient container for storing and for positively dispelling and delivering fluid compositions contained therein,

said container comprising a body defining a fluid reservoir, said body including a floor-like base,

wall means projecting upwardly of said base and being formed, as an extension thereof, at upper limits of said wall means, with a neck defining a port through which said container is filled,

cap-like closure means for sealing said port after introducing a fluid composition into said reservoir,

tubular conduit means including dispenser tube means integrally formed with and supported exteriorly of and radially-outwardly of a diametric limit of said container for establishing fluid flow communication with said reservoir at a locale adjacent said base of said container,

said conduit means projecting upwardly of said base and extending within limits defined by lower and upper bounds of said body of said container,

said conduit means having a terminal discharge end,

said base being generally ellipsoid, and said wall means extending upwardly of said base and being smooth and uninterrupted circumferentially, and said base being planar,

said wall means being angled generally inwardly of said base, and defining a continuous and smooth annular configuration,

a nozzle integrally formed with said dispenser tube means at said terminal discharge end thereof,

web means projecting outwardly of and extending along said wall means for connecting said wall means with said tubular conduit means for supporting and for stabilizing said conduit means;

said web means being integrally formed with said wall means and with said conduit means, and extending along an upward reach of said conduit means, and

orifice means at said terminal discharge end of said conduit means for delivery of a fluid composition positively dispelled from said reservoir upon application of compression forces to said wall means of said container.

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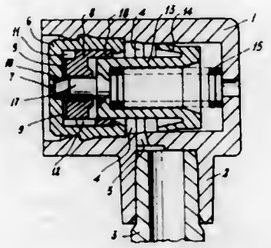
DISPENSER FOR DISPENSING ATOMIZED FLUIDS UNDER PRESSURE, PROVIDED WITH A SHUT-OFF ELEMENT OPERATED BY THE PRESSURIZED FLUID

Giovanni Albini; Tommaso Ruscitti, both of Milan, and Franco Cariappi, Pianello Valtidone, all of Italy, assignors to TER S.r.l., Milan, Italy

Filed Mar. 10, 1995, Ser. No. 401,902
Claims priority, application Italy, May 25, 1994, MI94A1061
Int. Cl.[6] B05B *1/30*
U.S. Cl. 222—496 **4 Claims**



1. A dispenser dispensing atomized fluids under pressure, provided with a shut-off element operated by the action of the pressurized fluid, comprising:

a hollow head provided with a seat connected onto a free end of a stem of a pump and in which is provided an elongate compression chamber in communication with said seat wherein said chamber is delimited at a first end thereof by a body positioned in the head and traversed by a hole through which fluid is discharged into the atmosphere,

a piston moveable housed in said chamber and provided with a seal lip which delimits a second end of the compression chamber,

an appendix projecting from said piston

a spring housed in said hollow head and acting on the piston, said appendix having a free end which is biased by said spring and closes said discharge hole and said appendix being withdrawable from said hole into a dispensing position by the action of the pressurized fluid when fed into said chamber and acting on the piston against the action of said spring to allow the pressurized fluid to emerge in an atomized state from said chamber through said discharge hole,

said head having a cavity which houses a bush traversed by a hole into which said piston appendix is inserted and through which said appendix extends,

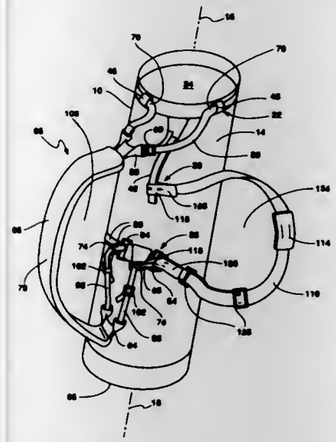
a tubular wall extending from said bush and defining a cavity in which a portion of the piston in proximity with said appendix is insertable in a slidable, sealed manner, a length dimension of said tubular wall and of said piston being such that a portion of the piston emerges from the cavity delimited by the tubular wall of the bush only after undergoing an extent of travel sufficient to enable said appendix to withdraw from said discharge hole so as to allow free emergence of pressurized liquid originating from said compression chamber through at least one channel provided within said bush and which is closable by the piston.

5,558,259

GOLF BAG WITH DUAL CARRYING STRAPS

Theodore-James Izzo, Evergreen, Colo., assignor to Izzo Systems, Inc., Wheatridge, Colo.

Filed Sep. 27, 1994, Ser. No. 313,377
Int. Cl.[6] A45F *3/04*
U.S. Cl. 224—627 **18 Claims**



1. A golf bag, comprising:

a generally longitudinally extending enclosure having an open end and a closed end;

a first strap having first and second end portions which interface with said elongated enclosure at first and second longitudinally displaced locations on said enclosure, respectively, said first location being generally proximate said open end; and

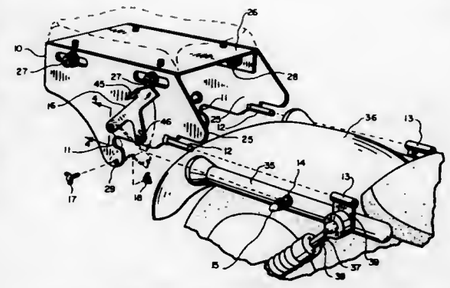
a second strap having first and second end portions which interface with said elongated enclosure at said second location and at a third location, respectively, said third location being longitudinally displaced from said closed end a distance at least as great as a distance that said second location is longitudinally displaced from said closed end and less than said first location is longitudinally displaced from said closed end.

5,558,260

DETACHABLE MOTORCYCLE PASSENGER SEAT AND/OR LUGGAGE RACK

Cory A. Reichert, 1315 S. Wasatch Dr., Salt Lake City, Utah 84108

Filed Apr. 18, 1995, Ser. No. 423,772
Int. Cl.[6] B62J *7/04;1/28*
U.S. Cl. 224—413 **13 Claims**



1. A method of attaching a base for an auxiliary passenger seat, luggage rack, or combination thereof to a motorcycle, comprising the steps of:

adding spacers to a plurality of fender attachment bolts of the motorcycle;

providing a base having a plurality of hooks and a plurality of latches;

engaging the hooks of the base to the spacers of the fender attachment bolts; and

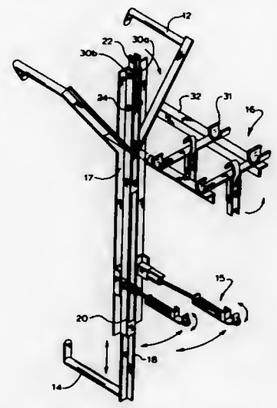
engaging the latches with the spacers to prevent the hooks from slipping off the spacers.

5,558,261

BICYCLE CARRIER

Nils E. Hedeen, 2741 N. Campbell Ave., Chicago, Ill. 60647-1922

Filed Dec. 9, 1994, Ser. No. 353,093
Int. Cl.[6] B60R *9/10*
U.S. Cl. 224—511 **14 Claims**



1. A bicycle carrier comprising:

a base member exhibiting a channel thereon;

first clamping hook means and second clamping hook means mounted to said base member for clamping onto an object positioned therebetween,

wherein said second clamping hook means comprises a slide

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APPARATUS AND METHOD FOR NON-CONTACT

an actuator operatively engaged with said drive means comprising:

wherein said second clamping hook means comprises a slide member slidably engaged with said base member within said channel of said base member, and a hook member attached to said slide member;

locking means selectively disposed and operable within said channel of said base member comprising a lockable lever pivotally connected to said slide member and to said base member for selectively extending and locking said slide member, said locking means being positioned within said channel such that said locking means is inaccessible when locked; and

bicycle supporting means projecting from said first clamping hook means for supporting a bicycle.

5,558,262

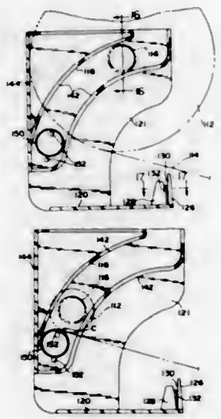
PLASTIC BAG DISPENSER

Ebrahim Simhaee, 112 N. Maple Dr., Beverly Hills, Calif. 90210

Continuation-in-part of Ser. No. 124,952, Sep. 21, 1993, which is a continuation of Ser. No. 821,192, Jan. 21, 1992, Pat. No. 5,261,585, which is a continuation-in-part of Ser. No. 764,137, Sep. 20, 1991, Pat. No. 5,219,424, and a continuation-in-part of Ser. No. 652,031, Feb. 7, 1991, Pat. No. 5,135,146. This application Mar. 21, 1994, Ser. No. 215,197

Int. Cl.[6] B26F *3/02*

U.S. Cl. 225—106 **7 Claims**



1. A dispenser for dispensing and separating an article from a roll of articles having perforations between said articles, comprising:

a container for holding said roll, said container including a surface which frictionally engages said roll;

a tongue attached to said container for engaging said perforations between said articles during dispensing and separation;

a finger attached to said container and positioned adjacent said tongue, such that a gap is formed between said tongue and said finger, said gap positioned to receive a portion of a second article adjacent said article to be separated and retain said portion, said gap preventing said portion from departing from said gap in the same direction it entered said gap;

means for mounting said roll connected to said container, said means constructed such that the component of force exerted by said roll against said surface due to the weight of the roll increases as the size of the roll decreases, and

means for applying an additional frictional force to the roll when its diameter has decreased to a predetermined size.

5,558,263

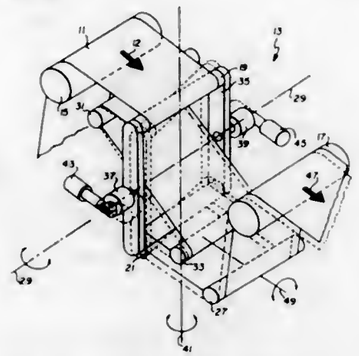
APPARATUS AND METHOD FOR NON-CONTACT ACTIVE TENSIONING AND STEERING OF MOVING WEBS

Michael Long, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 26, 1994, Ser. No. 280,693

Int. Cl.[6] B65H *23/035*

U.S. Cl. 226—114 **32 Claims**



1. Apparatus for conveying a web, comprising:

a) a machine frame;

b) a source of web material having first and second sides, said web material passing along said machine frame;

c) a first air bar having a first substantially cylindrical surface and a first axis, and being pivotably disposed on said machine frame, said first web side being wrapped at least partially along said first cylindrical surface through a first wrap angle;

d) a second air bar having a second substantially cylindrical surface and a second axis, said second air bar being spaced apart from said first air bar and said second axis being parallel to said first axis, and being pivotably disposed on said machine frame, said second web side being wrapped at least partially along said second cylindrical surface through a second wrap angle;

e) means for pivoting said first and second air bars in fixed relative relationship about a third axis orthogonal to said first and second axes, said third axis being in or parallel to a plane through said first and second axes and substantially orthogonal to said first and second axes, to steer said web through said apparatus; and

f) means for drawing said web through said apparatus.

5,558,264

COMBUSTION-POWERED, FASTENER-DRIVING TOOL WITH GAS-ACTUATED, FASTENER-FEEDING MECHANISM

Valery G. Weinstein, Morton Grove, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Feb. 13, 1995, Ser. No. 388,215

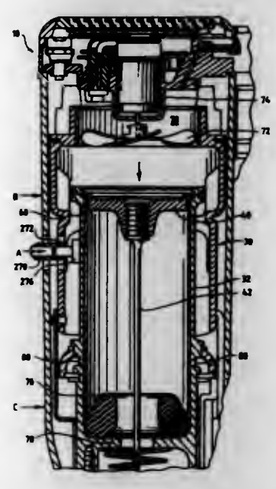
Int. Cl.[6] B25C *1/04*

U.S. Cl. 227—10 **4 Claims**

1. A combustion-powered, fastener-driving tool of a type employing a combustible fuel, the fastener-driving tool comprising

(a) a structure defining a combustion chamber and defining a driving piston cylinder, the driving piston cylinder having a wall and defining an axis, and a nosepiece mounted to said structure, the nosepiece communicating with the driving piston cylinder,

(b) a driving piston mounting a driving member, the driving piston being arranged to be axially driven within the wall of the driving piston cylinder upon combustion of a fuel in the combustion chamber, so as to drive the driving member from



an uppermost position wherein the driving member is retracted from the nosepiece into a lowermost position wherein the driving member is extended into the nosepiece,

(c) means including a bumper for arresting the driving piston when the driving piston is driven into the lowermost position,

(d) gas-actuated means for feeding fasteners from a collated strip of fasteners individually and successively into the nosepiece,

(e) means for exhausting combusted gases from the driving piston cylinder after the driving piston has been driven from the uppermost position toward the lowermost position, and

(f) means for diverting combusted gases from the driving piston cylinder so as to actuate the feeding means when the driving piston is driven, the diverting means being arranged to take in combusted gases through the wall of the driving piston cylinder, at a location between the uppermost position of the driving piston and the exhausting means.

5,558,265

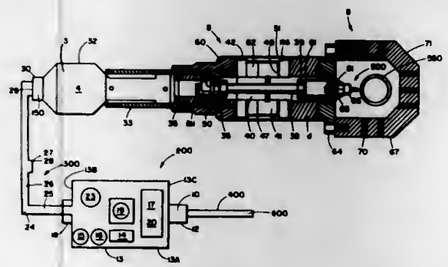
FRICTION WELDING APPARATUS

John W. Fix, Jr., Palm City, Fla., assignor to The Safe Seal Company, Inc., La Porte, Tex.

Filed Feb. 4, 1994, Ser. No. 191,618

Int. Cl.[6] B23K *20/12*

U.S. Cl. 228—2.3 **23 Claims**



22. A portable welding apparatus for fusion welding a given workpiece to a stationary member where the fusion weld process includes a burn-off phase, an upset phase and a fusion period, comprising:

a drive means adapted to produce a selected rotational speed in an axially disposed shaft;

an actuator operatively engaged with said drive means comprising:

a housing;

means to translate the rotational motion of said shaft to the workpiece;

movement means to urge the workpiece in an axial direction relative to the stationary member at a selected pressure for the burn-off phase and the fusion period;

a support removably engageable to said actuator housing and adapted to hold the stationary member in a fixed axial relationship relative to said workpiece; and

control means to selectively regulate the duration of the burn-off and upset phases and the fusion period including a means to gradually increase a forging pressure connected to said movement means.

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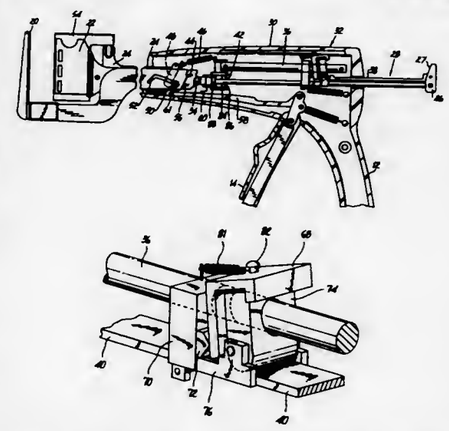
APPARATUS FOR APPLYING SURGICAL FASTENERS

David T. Green, Westport; Henry Bolanos, East Norwalk; Keith Ratcliff, Sandy Hook; Lisa M. Heaton, Norwalk, and John C. Robertson, Bloomfield, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 779,505, Oct. 18, 1991, abandoned. This application Apr. 28, 1994, Ser. No. 234,712

Int. Cl.[6] A61B *17/072*

U.S. Cl. 227—178.1 **66 Claims**



1. An apparatus for applying surgical fasteners to body tissue comprising:

tissue gripping means for holding tissue therebetween including a first jaw member and a second jaw member, said first jaw member including a plurality of fasteners positioned on said first jaw member;

means for advancing said first jaw member towards said second jaw member to grip tissue therebetween prior to driving said fasteners into said tissue;

means for retaining said advancing means along a linear path of travel to selectively position said first jaw member in a plurality of positions in relation to said second jaw member;

means for releasing said retaining means from engagement with said advancing means, said releasing means being movable from a first position which permits said retaining means to engage said advancing means to a second position in which said releasing means engages said retaining means to move said retaining means out of engagement with said advancing means to permit said advancing means to return to a rest position; and

means for driving said fasteners into said tissue subsequent to positioning said jaw members in relation to each other by said advancing means.

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a lead screw mounted for rotation relative to, and disposed in

5,558,270

5,558,272

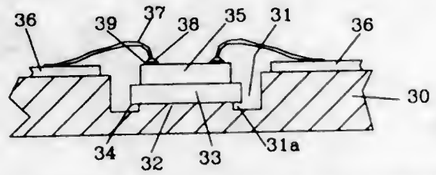
OCTAGONAL CONTAINER WITH NOVEL CLOSURE

5,558,267

MOAT FOR DIE PAD CAVITY IN BOND STATION HEATER BLOCK

Henry L. Humphrey, Richardson; Richard L. Mahle, Dallas, and Randall V. Tekavec, Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 31, 1995, Ser. No. 414,704
Int. Cl.[6] H01L *21/60;* **B23K** *37/04*
U.S. Cl. 228—4.5 **10 Claims**



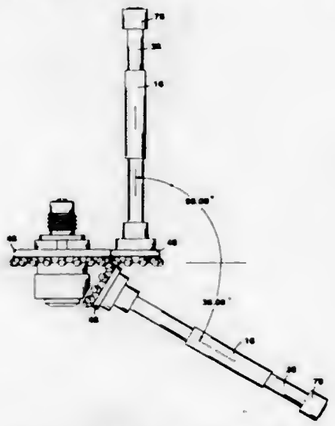
1. An improved wire bond station for accommodating irregularities on the edges of the lead frame die mount pad, comprising:
a wire bond station including a heater block;
a lead frame die mount pad cavity, having a bottom surface, in said heater block; and
a platform, having a top surface, in the die mount pad cavity for supporting a lead frame die mount pad, during bonding, such that the edges of the lead frame die mount pad, and irregularities thereon, extend beyond the top surface of the platform and are spaced above the bottom surface of said die mount pad cavity.

5,558,268

TORCH ASSEMBLY FOR A CONICAL SURFACE

Rees Acheson, Alstead, N.H., assignor to Bortech Corporation, Alstead, N.H.

Filed Apr. 26, 1995, Ser. No. 427,886
Int. Cl.[6] B23K *9/12;37/02*
U.S. Cl. 228—29 **16 Claims**



1. A mechanism for applying a weld bead for build up of a conical surface, said mechanism comprising:
a base assembly with base gear means fixedly mounted thereto,
a slide rail assembly mounted for rotation relative to said base assembly, about a base axis, said slide rail assembly comprising:
at least one slide rail adapted to be positioned generally parallel to the conical surface,
a slide carriage mounted for movement along said at least one slide rail, carrying a welding torch,
a lead screw mounted for rotation relative to, and disposed in threaded engagement with, said slide carriage, and
slide carriage gear means mounted for rotation with said lead screw and in engagement with said base gear means, and
means for rotating said slide rail assembly relative to said base axis,
whereby, rotation of said slide rail assembly relative to said base axis moves the torch carried by said slide carriage along the conical surface with a circumferential component of motion relative to the base axis, and, simultaneously, rotation of said slide carriage assembly, by inter-engagement of said slide carriage gear means with said base gear means, causes said slide carriage to move along said at least one slide rail with the torch carried by said slide carriage moving along the conical surface with a radial component of motion relative to the base axis, the torch being moved in a spiral path, about said base axis, along the conical surface.

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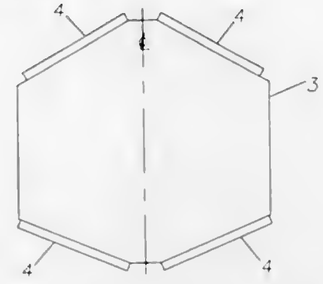
ANGULAR POSITIONING DEVICES FOR STAINED GLASS CRAFT ITEMS

Mark P. Wallace, 1655 Sharon Way, Clearwater, Fla. 34624

Filed Feb. 13, 1995, Ser. No. 387,255
Int. Cl.[6] B23K *3/00*
U.S. Cl. 228—49.1 **11 Claims**



1. A plurality of distinctly coded sets of angular alignment guides, each set being designed to hold the sides of a stained glass lampshade in assembly position for soldering and being color coded or being otherwise marked thereon according to the angle corresponding to the internal angle of the assembled sides of a specific lampshade, each set of guides comprising twice the number of angular brackets as the number of sides of said lampshade, each bracket being composed of two sides joined together and forming the same internal angle as that corresponding to the internal angle formed between two adjacent sides of an assembled lampshade.

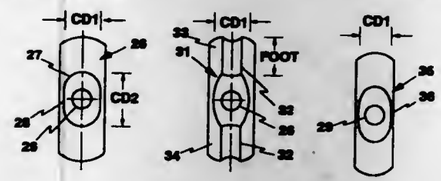
8. An alignment fixture for the proper positioning and assembly of the side members of stained glass box and box like items comprising a base having at least 4 edges A, B, C, and D arranged consecutively; edges B and C having respectively planar sides mounted orthogonally to the base and forming there between an angle equal to the internal angle of a regular polygon; the edges A and D being longer than said upstanding sides; said edges A and D and the area between the edges A, B, C, and D being substantially free of upstanding structure; wherein the sides of the fixture are cut away at the theoretical juncture of said planar sides so that the seam formed between two side members when positioned against the sides and pushed together is exposed for an assembly operation.

5,558,270

FINE PITCH CAPILLARY/WEDGE BONDING TOOL

Beni Nachon, Qiriat-Ata, Israel; Ehud Efrat, Horsham, Pa.; Eli Razon, Maple Glen, Pa., and Gil Periberg, Elkins Park, Pa., assignors to Kulicke and Soffa Investments, Inc, Wilmington, Del.

Filed Jan. 6, 1995, Ser. No. 369,729
Int. Cl.[6] H01L *21/603*
U.S. Cl. 228—180.5 **11 Claims**



1. A fine pitch capillary bonding tool for use in a rotary head automatic gold wire bonder, said bonding tool comprising:
a cylindrical shaped body portion having a wire hole through the center of the body portion,
a working tip on one end of said body portion,
said working tip having two distinct cone angles, a tapered working face and a tapered chamfer recess,
said tapered working face having a pair of bonding wedges spaced apart from said wire hole,
said bonding wedges on said working tip having a first cone angle of substantially zero degrees in a first or front direction and a tapered cone angle in a second or side direction, and
said tapered chamfer recess in said working tip being tapered sufficient to constrain the radial extrusion of a ball being bonded to an object.

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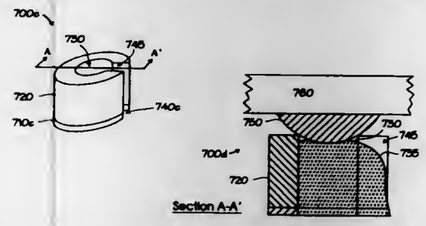
SHAPED, SELF-ALIGNING MICRO-BUMP STRUCTURES

Michael D. Rostoker, San Jose, and Nicholas F. Pasch, Pacifica, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Division of Ser. No. 55,429, Apr. 30, 1993, Pat. No. 5,477,086.
This application May 17, 1995, Ser. No. 443,059
Int. Cl.[6] B23K *1/20;* **H01L** *21/58*
U.S. Cl. 228—180.22 **24 Claims**



1. A method of forming a conductive bump contact, comprising:
providing a conductive material extending from a surface of a substrate, one end of the conductive material supported on the surface of the substrate and an other end of the conductive material being elevated above the surface of the substrate;
forming a concave depression in the other end of the conductive material, said concave depression being perpendicular to the surface of the substrate and extending completely through the conductive material and sized and shaped to receive and align with a corresponding conductive bump contact having a convex end; and
forming a vent opening through the conductive material between the concave depression and an external surface of the conductive material.

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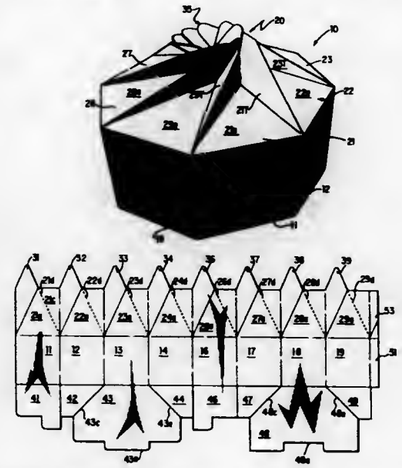
OCTAGONAL CONTAINER WITH NOVEL CLOSURE

Francis M. Magister, Murrysville, Pa., assignor to Victorian Gift Box, Inc.

Filed Nov. 22, 1995, Ser. No. 562,029
Int. Cl.[6] B65D *5/64*
U.S. Cl. 229—109 **5 Claims**



1. An octagonal container comprising:
a. eight rectilinear side members, each of said side members being attached to at least one other side member;
b. eight top members each attached to at least one other top member and associated with one of said side members; each of said top members comprising a triangular top element, the base of which is attached to said associated side member, each of said triangular top elements including at least a tetrahedrahedral element on one of its other sides and a triangular support element on its remaining side; and
c. eight closure members, each of said closure members being associated with a side member and having complimentary shapes with at least one other closure member to interleaf together to define a bottom closure for said container wherein said container is formed from a planar sheet of foldable material.

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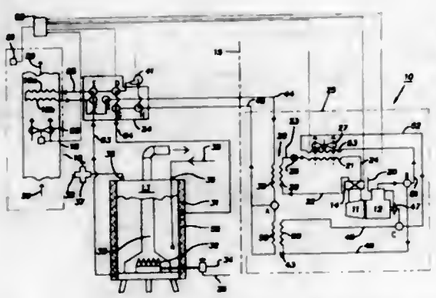
TWO-PIPE SYSTEM FOR REFRIGERANT ISOLATION

Paul F. Swenson, Shaker Hts., Ohio; Edwin E. Jordan, Parkersburg, W. Va., and Joseph Gerstmann, Framingham, Mass., assignors to Advanced Mechanical Technology, Inc., Watertown, Mass.

Filed Nov. 10, 1994, Ser. No. 336,985
Int. Cl.[6] F25B *27/00*
U.S. Cl. 237—2 B **11 Claims**

1. A space conditioning system for a building comprising a refrigeration circuit external of the building, the refrigeration circuit including a refrigerant vapor compressor, a heat engine for driving the compressor, a pair of refrigerant heat exchangers for evaporating and condensing the refrigerant, one of said refrigerant heat exchangers being arranged to transfer heat with the environment external of the building, a heat storage unit, a heat transfer circuit for transferring heat between the interior and exterior of the building, the heat transfer circuit including a first heat exchanger in thermal communication with the other refrigerant heat exchanger, a second heat exchanger for absorbing rejected heat from the heat engine, and a third heat exchanger for thermal communication with air in an interior space of the building, the heat transfer circuit including lines for conducting heat transfer fluid between its asso-



ciated heat exchangers and said heat storage unit for heat transfer therebetween, and means for circulating heat transfer fluid in said lines, said fluid circulating means being operable independently of said refrigerant compressor to circulate heat transfer in said lines between said heat transfer circuit heat exchangers and said heat storage unit, said heat transfer circuit being selectively operable to circulate heat transfer fluid serially through its first heat exchanger and then through its second heat exchanger and then through its third heat exchanger in a heating mode.

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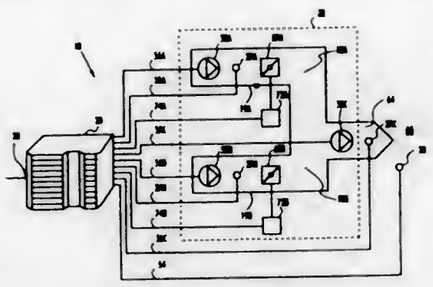
DUAL DUCT CONTROL SYSTEM

M. Nebil Ben-Aissa, Tunisia, South Africa; Jerry J. Doran, Greendale, Wis.; Howard A. Jensen, Mequon, Wis., and Dick Monroe, West Milwaukee, Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Mar. 24, 1995, Ser. No. 409,704
Int. Cl.[6] G05D *23/00*
U.S. Cl. 236—13 **18 Claims**



10. In an environment control system including a first duct for providing a hot air flow and a second duct for providing a cold air flow, a flow sensor circuit configured to determine a combined flow of the hot air flow and the cold air flow and to provide a mixed flow signal representative of the combined flow, and a temperature sensor configured to measure a temperature of the combined flow and to provide a temperature signal representative of the temperature, a method of controlling an environmental zone comprising:

providing a zone command responsive to a zone temperature set point and a zone temperature value;

determining a mixed temperature error responsive to the zone command and the temperature signal;

determining a mixed flow error responsive to the zone command and the mixed flow signal;

adjusting the cold flow responsive to the mixed temperature error signal and the mixed flow error signal; and

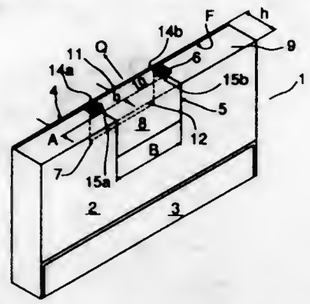
adjusting the hot flow responsive to the mixed temperature error signal and the mixed flow error signal.

5,558,275

PROTECTIVE COVERING FOR ARTICLES, IN PARTICULAR OF RECTANGULAR PARALLELEPIPED FORM

Klaus Schoettle, Strasbourg, France; Gerald-Wolfgang Borck, Ludwigshafen, and Heinrich Wollensack, Kehl, both of Germany, assignors to BASF Magnetics GmbH, Mannheim, Germany

Filed Oct. 29, 1993, Ser. No. 143,021
Claims priority, application Germany, Oct. 31, 1992, 9214815 U
Int. Cl.[6] B65D *43/22*
U.S. Cl. 229—125.37 **7 Claims**



1. A container of substantially cuboid form comprising base and lid parts hingedly connected to one another, said base part having a narrow side, a dividing line located between and separating said narrow side and said lid part, where the lid part can be opened for removal or insertion of a magnetic tape cassette, said narrow side being traversed by a three-part closure strip, said closure strip having separating lines between said three parts, said three-part closure strip consisting of two side parts and a central part therebetween and is of a bonding or adhesive material wherein said separating lines are arranged adjacent and parallel to said dividing line and the width of said three-part closure strip is a fraction of the length of the narrow side of said base part, and wherein the container has on the narrow side a depressed grip for opening the container, and wherein the width of the central part is at least equal to the width of the depressed grip.

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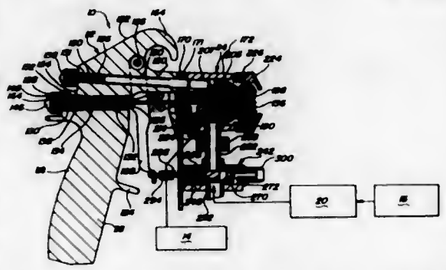
AIR GUN FOR SPRAYING AND DRYING AIR-DRYABLE LIQUID MATERIALS

Mark C. Barrett, New Hudson, and Coy Barrett, Canton, both of Mich., assignors to Tram-7 Precision, Inc., Redford, Mich.

Filed Dec. 14, 1994, Ser. No. 355,838
Int. Cl.[6] B05B *1/24;7/02*
U.S. Cl. 239—135 **20 Claims**



1. A spray gun for attachment to a source of hot pressurized air and a source of liquid material for spraying air-dryable liquid materials as an air-liquid spray, said spray gun comprising:

a liquid material gun body having a liquid material channel for carrying liquid material and a hot pressurized air channel for carrying pressurized air, said gun further including a liquid material inlet port for attachment to a source of liquid material, said liquid material inlet port being continuous with said liquid material channel, said gun body further including a pressurized air inlet port for attachment to a source of pressurized air, said pressurized air inlet port being continuous with said pressurized air channel, said gun body further including a nozzle, said nozzle having an air-liquid material mixing area where said pressurized air combines with said liquid material to form an air-liquid spray, said liquid material channel being continuous with said air-liquid material mixing area of said nozzle, said hot pressurized air channel being continuous with said air-liquid material mixing area of said nozzle;

an air diverter including a body having a diverter valve-receiving bore, said body having a pressurized air channel outlet and a diverted air outlet, said pressurized air channel outlet being continuous with said pressurized air channel of said gun body, said body having a pressurized air inlet and a diverted air inlet, said diverter further including a diverter valve movable within said valve-receiving bore of said body, said diverter valve including an air channel bore and a diverted air bore, said diverter valve being movable between an air-passing position wherein said air channel bore is in alignment with said pressurized air channel outlet and said pressurized air channel inlet and said diverted air bore is in alignment with said diverted air outlet and said diverted air inlet and an air-blocking position wherein said air channel bore is out of alignment with said pressurized air channel outlet and said pressurized air channel inlet and said diverted air bore is out of alignment with said diverted air outlet and said diverted air inlet; and

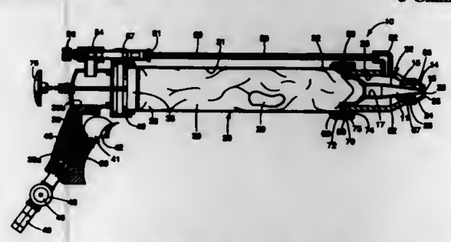
means for moving said diverter valve between said air-passing position and said air-blocking position.

5,558,277

APPLICATOR FOR SHEAR THINNING VISCOUS COATING MATERIALS

Ian R. Owen, River Falls, Wis., and Alan G. McKown, Oakdale, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 280,377, Jul. 26, 1994. This application Oct. 30, 1995, Ser. No. 545,882
Int. Cl.[6] B05B *9/04*
U.S. Cl. 239—322 **8 Claims**



1. A pneumatic applicator for applying shear thinning viscous coating materials having a predetermined range of properties including a low shear rate viscosity in the range of 100,000 to 800,000 centipoise as measured with a Brookfield viscometer at 2 revolutions per minute using a number 7 spindle; a high shear viscosity in the range of 40,000 to 100,000 centipoise as measured with a Brookfield viscometer at 20 revolutions per minute using a number 7 spindle; and a thixotropy index, defined as the ratio of the low shear rate viscosity to the high shear rate viscosity, that is greater than 4, said applicator comprising:

a nozzle having a central axis, inlet and outlet ends, an outer surface, a distal end surface at said outlet end, and a through material opening from said inlet end to said outlet end;

means for dispensing viscous material through the material opening of said nozzle from said inlet to said outlet end;

an air directing housing having an inner surface defining, with said outer surface of said nozzle, an air chamber around said nozzle, said air directing housing including a front end having a distal surface and defining an air outlet opening for the air chamber between the inner and the distal surfaces of said air directing housing, which air outlet opening is adapted to be positioned around the outer surface of said nozzle adjacent said front end of said nozzle, the distal surface of said nozzle being in a position between an outer position with a portion of the nozzle within the air outlet opening and the distal surface of the nozzle projecting past the outer distal surface of the air directing housing by about 1 millimeter, and an inner position with the nozzle out of the air outlet opening and the distal surface of the nozzle spaced from the inner surface of the air directing housing by about 2 millimeters, and so that when the nozzle is within the air outlet opening, there is a portion of the air outlet opening around the nozzle that has an area measured in a plane at a right angle to the axis of the nozzle in the range of about 5 to 15 square millimeters; and

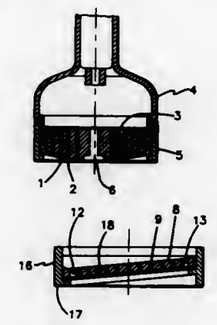
manually adjustable means for directing air under pressure into said air chamber so that when the viscous material is dispensed through said nozzle at a generally uniform rate, air can be directed into said chamber and will escape through the annular opening around said nozzle and the amount of air being directed into said chamber can be adjusted to cause different amounts of atomization of the viscous material being dispensed from the nozzle so that it can be applied to a surface adjacent the nozzle in coatings of various widths and thicknesses.

5,558,278

SHOWER NOZZLE

Massimo Gallorini, Arezzo, Italy, assignor to A.B.G. S.r.l., Arezzo, Italy

Filed Oct. 3, 1994, Ser. No. 321,812
Claims priority, application Italy, Oct. 6, 1993, AR930027 U
Int. Cl.[6] B05B *1/14*
U.S. Cl. 239—553.3 **5 Claims**



1. Shower nozzle comprising:

a shower head extending in the direction of a longitudinal axis from a fluid inlet to a fluid outlet; a disc-shaped plate having a surface facing said fluid inlet; means for securing the disc-shaped plate to the shower head; said surface extending in the direction of a horizontal axis which extends at an angle relative to said longitudinal axis from a first portion nearer said fluid inlet to a second portion near said fluid outlet; said disc-shaped plate having a first vent aperture extending therethrough at said first portion, and a second drainage aperture extending therethrough at said second portion; a plurality of spray perforations between said vent aperture and said drainage aperture; and said drainage aperture having a diameter greater than that of said spray perforations.

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transferring said renovated first portion to a re-use location,

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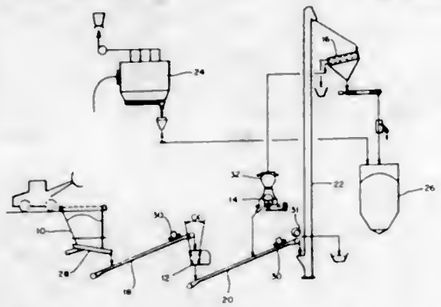
CROP DISCHARGE MEANS FOR A FORAGE

5,558,279
PROCESS AND PLANT FOR GRINDING SPENT POTLININGS AND SIMILAR MATERIALS

Francis Desrumaux, St. Romain En Gal, France, assignor to FCB, Montreuil, France

PCT No. PCT/FR94/01121, § 371 Date May 22, 1995, § 102(e) Date May 22, 1995, PCT Pub. No. WO95/09052, PCT Pub. Date Apr. 6, 1995
PCT Filed Sep. 27, 1994, Ser. No. 446,588
Claims priority, application France, Sep. 28, 1993, 93/11492
Int. Cl.[6] B02C *9/04;23/08*
U.S. Cl. 241—24.25 **15 Claims**

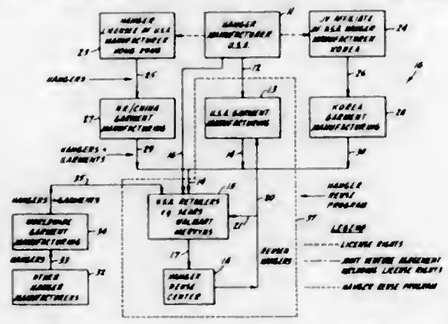


1. A method for comminuting spent potlinings comprising the steps of:
(a) crushing the spent potlinings to reduce them into pieces the majority of which are smaller in size than 50 mm,
(b) screening the crushed pieces to separate grains smaller in size than 2.5–3 mm, and
(c) grinding the screened pieces larger in size than 2.5–3 mm in a vibrating cone mill, so as to reduce them to grains most of which are smaller in size than 2.5–3 mm.

5,558,280
METHOD AND SYSTEM FOR RECYCLING AND REUSING GARMENT HANGERS

Donald F. Morgan, Zeeland, Mich., assignor to Batts, Inc., Zeeland, Mich.

Filed Jun. 7, 1995, Ser. No. 472,912
Int. Cl.[6] B02C *19/12*
U.S. Cl. 241—24.28 **15 Claims**

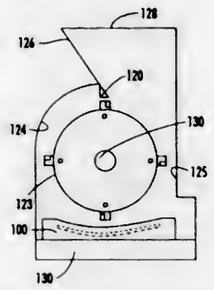


1. In a method of re-using and recycling garment hangers the steps of
collecting a batch of garment hangers at a collecting location,
transferring said collected batch of garment hangers to a hanger re-use and recycling facility,
sorting said collected batch of garment hangers into a first portion potentially suitable for re-use and a second portion,
renovating said first portion,
transferring said renovated first portion to a re-use location,
conditioning at least a first part of said second portion for recycling, and
transferring said conditioned first part of said second portion to a recycling location.

5,558,281
RECYCLING AND SOLID MATERIAL CONVERSION APPARATUS

Floyd E. Bouldin, 70 Easy St., Box 7177, McMinnville, Tenn. 37110-7177, and Thomas E. Cantrell, McMinnville, Tenn., assignors to Floyd E. Bouldin, McMinnville, Tenn.

Filed Dec. 12, 1994, Ser. No. 353,723
Int. Cl.[6] B02C *13/04;13/284;23/24*
U.S. Cl. 241—51 **14 Claims**

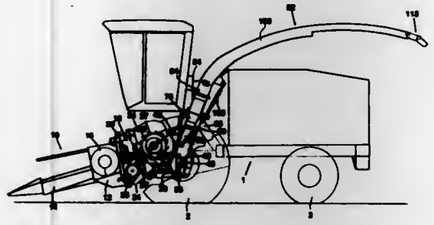


1. A grinding apparatus for reducing the size of waste material, comprising:
a housing having an interior, an exterior, an inlet for introducing material into the interior, and an exit for expelling material from the interior, further comprising:
a front wall having a substantially vertical portion in communication with an arcuate portion,
a back wall,
a pair of spaced apart side walls, and
a bottom grate positioned adjacent to the exit of the housing;
substantially cylindrical drum means for reducing the size of waste material, comprising:
a central section having spaced apart ends and an axis of rotation,
shaft means extending from the spaced apart ends for rotating the drum means about the axis,
a plurality of cutting blocks, and
ring means rigidly attached to the central section for pivotally supporting the plurality of cutting blocks;
drive means engageable with the shaft means for rotating the shaft means;
airfoil means attached to the arcuate portion of the front wall in the interior of the housing and vertically aligned above and positioned substantially parallel to the axis of rotation, whereby a static air curtain is established within the interior of the housing enabling air to be drawn into the housing through the inlet and expelled from the exit when the drum means rotates.

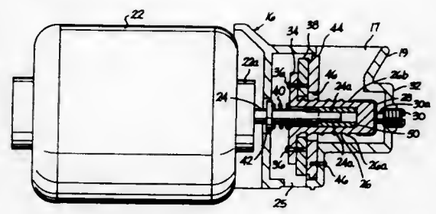
5,558,282
CROP DISCHARGE MEANS FOR A FORAGE HARVESTER

Danny R. Ameye, Zonnebeke; Dirk J. Desmijder, Wondelgem, and Adrianus Naaktgeboren, Varsenare, all of Belgium, assignors to New Holland North America, Inc., New Holland, Pa.

Filed Mar. 10, 1995, Ser. No. 402,258
Int. Cl.[6] B02C *18/22*
U.S. Cl. 241—60 **20 Claims**



1. A forage harvester, comprising
a main frame (1);
a cutterhead assembly (34), comprising a cutterhead (36), operable to comminute crop material;
means for mounting said cutterhead assembly on said main frame;
blower means (48, 49) including a blower outlet (73),
means for mounting said blower means on said main frame adjacent said cutterhead assembly;
said blower means disposed to receive the comminuted crop material from said cutterhead assembly (34), and operable to propel said comminuted crop material to said blower outlet (73);
duct means (52), disposed in operative communication with said blower outlet (73) for discharging said comminuted crop material from the forage harvester; the improvement comprising:
mounting means for supportably mounting said duct means (52) to said main frame (1),
said mounting means independently mounting said duct means in a manner such that there is no direct, physical connection between said duct means (52) and said blower means (48,49), and
said means for mounting said blower means (48, 49) includes means for detaching said blower means from the forage harvester while said duct means (52) remain connected to said main frame (1).



(c) a coffee bean feed mechanism mounted on said shaft for feeding beans received from said storage container to said grinding burrs;
(d) a biasing element biasing said second grinding burr toward said first grinding burr; and
(e) a second passageway providing egress from said grinder housing for ground coffee ground by said grinding burrs, said second passageway located closer to said motor than said first passageway.

5,558,283
COFFEE GRINDER DEVICE WITH FEED WORM AND REVERSED GRINDING BURR POSITIONING

Charles M. Fisher, Louisville, Ky., and Robert C. McNeill, Jeffersonville, Ind., assignors to Grindmaster Corporation, Louisville, Ky.

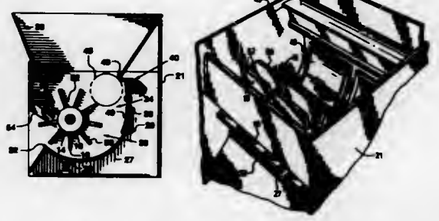
Filed May 9, 1995, Ser. No. 437,596
Int. Cl.[6] A47J *42/18*
U.S. Cl. 241—100 **10 Claims**

1. In a coffee grinder apparatus having a coffee bean storage container,
(a) a grinder housing having a first passageway communicating with said storage container, said housing enclosing first and second grinding burrs, said first grinding burr being stationary with respect to said housing;
(b) a grinder motor having a shaft extending into said housing and mounting for rotation said second grinding burr, said second grinding burr being located closer to said motor than said first grinding burr and being axially movable with respect to said first grinding burr;

5,558,284
CRUSHING APPARATUS

Ralph F. Baumung, and Gary L. Everett, both of Cambridge, Canada, assignors to R. Baumung Industries Limited, Cambridge, Canada

PCT No. PCT/CA94/00090, § 371 Date Oct. 20, 1994, § 102(e) Date Oct. 20, 1994, PCT Pub. No. WO94/19106, PCT Pub. Date Sep. 1, 1994
PCT Filed Feb. 23, 1994, Ser. No. 331,560
Claims priority, application United Kingdom, Feb. 24, 1993, 9303749
Int. Cl.[6] B02C *13/00;21/02*
U.S. Cl. 241—101.741 **24 Claims**



1. Crushing apparatus, which is suitable for crushing metal and plastic containers in domestic garbage, wherein:
the apparatus includes a crush rotor, which is mounted in bearings for rotation with respect to a frame of the apparatus;
the apparatus includes a cooperating crush plate;
the crush rotor and the crush plate are so arranged as to define a pinch-throat;
the pinch-throat is a progressively narrowing space between the crush rotor and the crush plate, commencing at an open mouth of the pinch-throat, and the pinch-throat width is the distance between a point on the overall diameter of the crush rotor and the corresponding closest point thereto on the crush plate;
the arrangement of the apparatus is such that items entering the open mouth and then passing through the pinch-throat are crushed between the crush plate and the crush rotor;
at the mouth of the pinch-throat the pinch-throat tapers gently, in that a tangent to the overall diameter of the crush rotor at the mouth, and a tangent to the crush plate at the corresponding point, subtend a small angle;
the apparatus includes a means for receiving items to be crushed, which is so arranged in the apparatus that items therein fall under gravity onto the rotor, and the direction of

rotation of the rotor is such as to carry the items towards the

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YARN WINDER

and second core ends with a running end portion of the wound roving or slubbing hanging past the second core end; and a

rotation of the rotor is such as to carry the items towards the open mouth of the pinch-throat;

the apparatus includes a crammer, which includes a beak;

the apparatus includes a crammer driver, which is effective to reciprocate the crammer in such a manner that the beak of the crammer moves cyclically towards and away from a point on the crush rotor, being a point located between the hopper and the pinch-throat.

5,558,285

APPARATUS FOR LIFTING AND DROPPING A DROP HAMMER

Pentti Räsänen, Savonlinna, Finland, assignor to Oy Aura-Machine Ltd., Aura, and Savonlinnan PR-Urakointi OY, Savonlinna, both of Finland

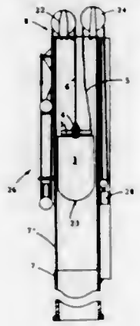
PCT No. PCT/FI93/00549, § 371 Date May 17, 1995, § 102(e) Date May 17, 1995, PCT Pub. No. WO94/14539, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 21, 1993, Ser. No. 436,231

Claims priority, application Finland, Dec. 21, 1992, 925798

Int. Cl.° B02C *1/14*

U.S. Cl. 241—273 **19 Claims**



1. Apparatus for lifting and dropping a drop hammer in a crushing or compaction process, comprising:

a hollow cylinder having an interior substantially vertical surface;

a drop hammer movable vertically, up and down, within said hollow cylinder, said drop hammer having an upper portion including a latch-engaging head;

an anchoring device disposed within said cylinder distinct from said drop hammer and hollow cylinder and comprising: first and second latches with portions thereof which engage said latch-engaging head; and an actuator for movement between a first position in which one or both of said latches are moved with respect to said latch-engaging head to engage said head and effectively attach said anchoring device to said drop hammer so that said drop hammer and anchoring device move together up and down vertically within said cylinder, and a second position in which one or both of said latches are moved away from said latch-engaging head so that said drop hammer is completely detached from said anchoring device and may drop freely within said cylinder under the force of gravity; and

at least one cable attached to said anchoring device for movement of said anchoring device vertically up and down within said cylinder.

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YARN WINDER

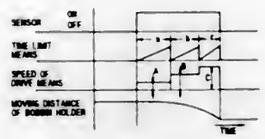
Takami Sugioka; Toshihiro Yudate, and Yuji Seike, all of Matsuyama, Japan, assignors to Teijin Seiki Co., Ltd., Osaku-Fu, Japan

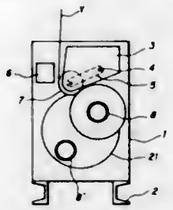
Filed Jan. 12, 1994, Ser. No. 180,417

Claims priority, application Japan, Jan. 14, 1993, 5-022119

Int. Cl.° B65H *67/044;54/28*

U.S. Cl. 242—18 A **4 Claims**





1. A yarn winder composing:

a bobbin holder for supporting a bobbin thereon, the bobbin having an outer surface adapted to receive yarn wound thereabout;

a contact roller capable of being pressed against the outer surface of the bobbin inserted onto said bobbin holder, wherein the contact roller presses against a yarn layer as yarn is wound on the outer surface of the bobbin;

a transverse apparatus for traversing a yarn along the bobbin;

a sensor for detecting and generating a signal in response to a predetermined amount of movement of the contact roller due to an increase of the yarn wound on the bobbin;

supporting means for supporting the bobbin holder; and

drive means coupled to the supporting means for moving said bobbin holder in a direction away from said contact roller, said drive means including time limit means actuated in response to said signal from said sensor for measuring the time said sensor has generated said signal, and speed varying means for increasing the speed a which said drive means moves said bobbin holder away from said contact roller in response to the amount of time measured by said time limit means.

5,558,287

APPARATUS AND METHOD TO PREVENT FLAILING DAMAGE TO A STRAND WOUND ON A SPOOL

Ralph J. Darsey, Lawrenceville, and Gregory D. Horne, Stone Mountain, both of Ga., assignors to Lucent Technologies Inc., Murray Hill, N.J.

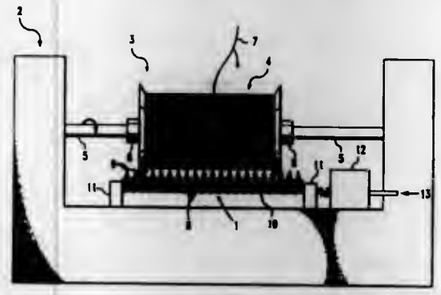
Filed Feb. 2, 1995, Ser. No. 382,745

Int. Cl.° B65H *54/00;57/00*

U.S. Cl. 242—18 R **14 Claims**

1. For use with a machine for rotating a spool to wind a filamentary strand onto the spool, wherein the strand has a loose end occurring during or at the end of the winding that rotating with the rotating spool and tends to flail against the strand wound on the spool an apparatus comprising:

means for capturing the loose end of the strand during rotation of the spool, said means comprising at least a first and a second brush member adjacent each other and spaced from the spool when the spool is mounted in the machine, each brush member comprising an elongated bristle mounting



member and a plurality of bristles mounted therein and extending outwardly from said bristle mounting member;

adjacent brush members being sufficiently close to each other that at least some of said outwardly extending bristles of said first brush member overlap and mesh with said outwardly extending bristles of said second brush member to define a slot for capturing the loose end of the strand, said intermeshing bristles being oriented transversely relative to the direction of movement of the loose end of the strand during rotation of the spool.

10. A method of winding a filamentary strand on a spool comprising the steps of:

(a) mounting the spool onto a winding means;

(b) arranging a plurality of brushes having bristles thereon in a longitudinal array wherein bristles of adjacent brushes intermesh to define strand capture slots between the adjacent brushes;

(c) positioning the array of brushes in spaced proximity to the spool and substantially parallel thereto;

(d) attaching a first end of the strand to the spool;

(e) rotating the spool to wind the strand thereon until a second, loose end of the strand rotates with the spool; and

(f) capturing the loose end of the strand in one of the slots defined between adjacent brushes to prevent the loose end of the strand from flailing that portion of the strand wound on the spool while the spool continues to rotate.

5,558,288

YARN BOBBIN CORE TUBES

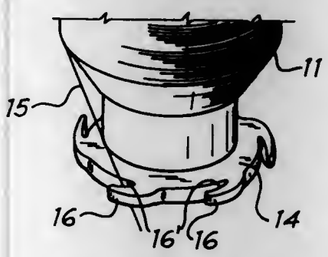
Loredana Brovelli, Via Monte Rosa 21, Milan, Italy

Filed Jul. 20, 1994, Ser. No. 272,395

Claims priority, application Italy, Jul. 20, 1993, MI930592 U

Int. Cl.° B65H *55/00*

U.S. Cl. 242—172 **7 Claims**



1. A wound package combination comprising:

a tubular bobbin core formed about an axis and having a first and second end, around which roving or slubbing is wound to form a wound package, wherein the tubular bobbin core is transported normal to the core axis while being suspended at the first core end with the axis oriented vertically and the wound package having a cylindrical central portion and frustoconical first and second end portions spaced from the first and second core ends with a running end portion of the wound roving or slubbing hanging past the second core end; and a means for retaining the running end portion of the roving or slubbing disposed on the second core end and including at least one lateral projection on the second core end extending radially with respect to the axis of the bobbin core, the at least one projection having a surface oriented at an oblique angle with respect to a radius of the bobbin core to define a notch for receiving the running end portion of the roving or slubbing hanging from the wound package and retaining the running end portion at only one location proximate the outer surface of the cylindrical portion of the wound package.

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SPINNING REEL

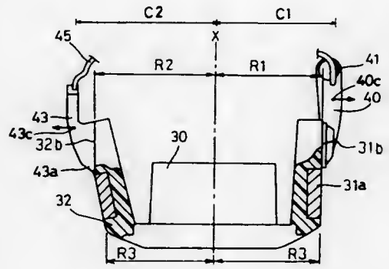
Hirokazu Hirayama, Takaishi, and Seiichi Aratake, Izumi, both of Japan, assignors to Shimano Inc., Osaka, Japan

Filed Mar. 2, 1995, Ser. No. 397,337

Claims priority, application Japan, Mar. 8, 1994, 6-037022

Int. Cl.° A01K *89/01*

U.S. Cl. 242—231 **12 Claims**



1. A spinning reel for a fishing rod, the spinning reel comprising:

a reel body having a handle and means for fitting to a fishing rod,

a rotor having a cylindrical portion which is supported for rotation about a rotational axis on a front side of said reel body, a first arm portion and a second arm portion which are formed integrally with said cylindrical portion and which are located facing each other at opposite sides of said cylindrical portion with said rotational axis between them wherein said rotor is rotatable in response to movement of said handle,

a first bail support member which is fitted to said first arm portion for rotational movement with respect thereto, said first bail support member having a line guiding portion attached thereto, said first bail support member and said line guiding portion defining a first center of gravity,

a second bail support member which is fitted to said second arm portion for rotational movement with respect thereto, said second bail support member defining a second center of gravity,

a bail extending between said first bail support member and said second bail support member such that said bail, said first bail support member and said second bail support member rotate together with respect to said first and second arm portions,

and a spool which is located between said first arm portion and second arm portion,

wherein the distance from the rotational axis of said rotor to said second center of gravity of said second bail support member is longer than the distance from the rotational axis of said rotor to said first center of gravity of the first bail support member such that said second bail member distance from said rotational axis at least partially balances weight of said line guiding portion on said first bail member in response to rotational dynamic forces.

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(ii) positioning a magnetic tape during winding onto the tape

portion of the energizing force of said first winding spring so that a reduced energizing force in said webbing winding

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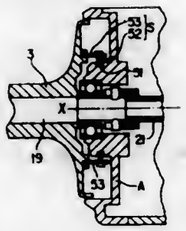
BAITCASTING REEL HAVING A REMOVABLE SPOOL

Jun Sato, Sakai, Japan, assignor to Shimano Inc., Osaka, Japan

Division of Ser. No. 8,706, Jan. 25, 1993, Pat. No. 5,386,948.
This application Sep. 14, 1994, Ser. No. 305,564
Claims priority, application Japan, Jan. 28, 1992, 4-2489
Int. Cl.[6] A01K *89/0155*
U.S. Cl. 242—313 **8 Claims**



1. A baitcasting reel comprising:
a frame;
first and second side bodies disposed on right and left sides, respectively, of said frame;
a spool rotatably supported within said frame and between said first and second side bodies for taking up a fishing line, said spool including a flange;
a spool shaft for rotatably supporting said spool to said first and second side bodies;
a handle supported by one of said first and second side bodies for rotating said spool in a direction to take up said fishing line;
an opening formed in at least one side face of said frame for allowing insertion and withdrawal of said spool from said frame, said opening being exposed by displacing an entire one of said first and second side bodies; and
engaging means including,
a tubular portion projecting from one of said side bodies, said tubular portion having an annular groove formed peripherally therein;
a pin, wherein said pin engages with said annular groove; and
a support member for connecting said pin to said flange of said spool;
wherein said engaging means prevents said spool from being inadvertently withdrawn from said frame through said opening, and by a manual operation, said engaging means allows said spool to be withdrawn from said frame through said opening through elastic deformation of said support member.

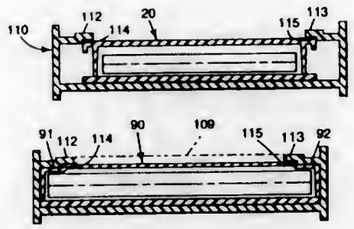
5,558,291

DRIVE FOR HANDLING MULTIPLE SIZE INFORMATION STORAGE MEDIA CARTRIDGES AND CARTRIDGES THEREFOR

James S. Anderson, Chanhassen; Sten R. Gerfast, Mendota Heights; Warren W. Opheim, Prior Lake; Robert W. Tapani, Oakdale, and Hung T. Tran, Woodbury, all of Minn., assignors to Imation Corp., Oakdale, Minn.

Filed May 16, 1994, Ser. No. 243,504
Int. Cl.[6] G11B *23/087*
U.S. Cl. 242—336 **62 Claims**

1. An information storage media container having a plurality of reference points for accurate positioning of the container, a housing of a first size containing information storage media and a drive/control mechanism for moving the media, the drive/control mechanism including a driven part, and the housing having a media access opening providing outside access to the media and a drive, opening providing outside access to the driven part, characterized in that



a. the relative positions of the media access opening and the driven part are the same as for a second information storage media container having a second size;
b. the portion of the housing having at least one of the media access opening and the drive opening is a different width than the analogous portion of the second information storage media container;
c. the reference points are in the same relative positions to the media access opening and the driven part as the analogous reference points in the second container; and

the container has a guide structure at at least one of the top and bottom thereof, the relative position of a side of the guide structure to the media access opening and the driven part being the same as the relative position of one side the second container to its media access opening and driven part.

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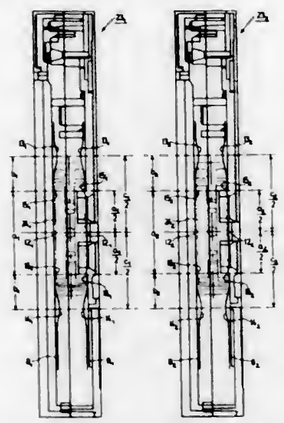
MAGNETIC-TAPE CASSETTE HAVING AT LEAST ONE ANTIFRICTION FOIL SEPARATED FROM AN ANTIFRICTION-FOIL STACK

Anton Stöger, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 4, 1994, Ser. No. 335,513
Claims priority, application European Pat. Off., Dec. 24, 1993, 93203682
Int. Cl.[6] G11B *23/087*
U.S. Cl. 242—345.3 **6 Claims**



1. A system of magnetic tape cassettes, comprising:
a first cassette variant and a second cassette variant,
said cassette variants including a housing and a tape hub rotatable in said housing onto which a magnetic tape is windable, said housing and tape hub being substantially identical for said first and second cassette variants, and an anti-friction foil having at least two raised portions spaced from each other for one of (i) positioning said tape hub within said housing and

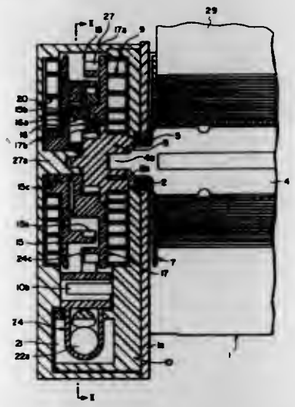
(ii) positioning a magnetic tape during winding onto the tape hub relative to said housing,
said first cassette variant having a said antifriction foil according to a first variant in which said two raised portions are spaced by a first distance and said second cassette variant having a said antifriction foil according to a second variant in which said two raised portions are separated by a second distance; and
said first and second cassette variants are assembled by successively separating the respective first and second anti-friction foils from the top of an antifriction foil stack comprising a plurality of contiguous anti-friction foils, with the antifriction foils of the first type interleaved between those of the second type, the distance between the raised portions of the first and second anti-friction foils being selected such that the antifriction foil on the top of the stack, after removal of each successive anti-friction foil, is slightly lifted relative to the anti-friction foil underneath the top foil by spring action due to the difference in spacing of the at least two raised portions between each successive anti-friction foil.

5,558,293

RETRACTOR FOR SEAT BELT

Satoshi Hirase, and Masao Matsuki, all of Kanagawa, Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Apr. 20, 1995, Ser. No. 425,495
Claims priority, application Japan, Apr. 21, 1994, 6-106117; Feb. 27, 1995, 7-061524
Int. Cl.[6] B60R *22/44*
U.S. Cl. 242—372 **16 Claims**



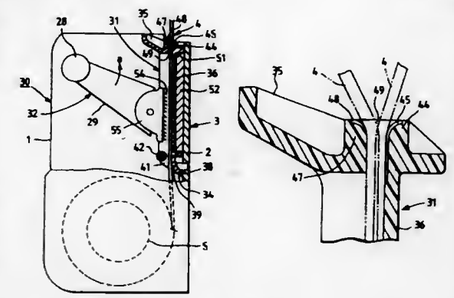
1. A retractor for a seat belt including a winding force reducing mechanism for reducing a webbing winding force when an occupant wears the seat belt, said retractor comprising:
a base;
a winding shaft supported rotatably on said base for winding a webbing;
a first winding spring for energizing said winding shaft in a webbing winding direction;
a second winding spring disposed on said winding shaft in parallel with said first winding spring; and
gear means interposed between said winding shaft and said second winding spring for applying the energizing force of said second winding spring to said winding shaft in the same direction as the energizing force of said first winding spring and for tightening said second winding spring in an elastic energy storing direction by means of the energizing force of said first winding spring;
wherein said gear means is structured such that, when the seat belt is worn by an occupant, the elastic energy of said second winding spring stored therein serves to cancel at least a portion of the energizing force of said first winding spring so that a reduced energizing force in said webbing winding direction is applied to said winding shaft.

5,558,294

RETRACTOR FOR SEAT BELT

Takanobu Sasaki, and Kazumi Hirata, both of Kanagawa, Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Oct. 26, 1994, Ser. No. 329,255
Claims priority, application Japan, Oct. 26, 1993, 5-062079 U
Int. Cl.[6] B65H *75/48*
U.S. Cl. 242—377 **12 Claims**



1. A retractor for a seat belt, comprising:
a retractor base;
a bobbin fixed to a winding shaft rotatably supported to said retractor base; a webbing, at least a portion of the webbing being wound on the bobbin; and
a webbing guide fixed to said retractor base for regulating a webbing moving path so that the webbing wound around said bobbin is drawn out from a predetermined position on said retractor base, said webbing guide including a stationary first positioning portion located on an end of the webbing guide that is closest to said bobbin in a longitudinal direction along a length of the webbing and a second positioning portion located on an end of the webbing guide that is opposite to said first positioning portion in the longitudinal direction,
wherein each of said first and second positioning portions include a plurality of protrusions which are formed at intervals in a width direction of the webbing and each of said protrusions having a linear portion which extends in the longitudinal direction,
each of the protrusions of said first positioning portion including a first end that is closest to said bobbin and which extends from said linear portion each of the protrusions of said second positioning portion including a second end that is opposite to the first end and which extends from said linear portion in the longitudinal direction, the first and second ends being bent in a direction away from the webbing with respect to a thickness direction of the webbing.

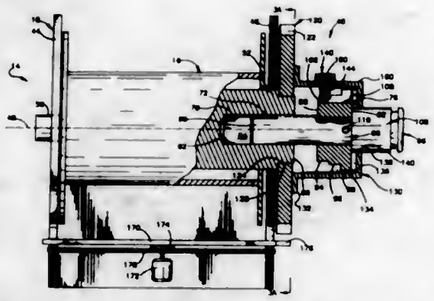
5,558,295

SEAT BELT RETRACTOR WITH AUTOMATIC LOCKING MECHANISM

Barney J. Bauer, Fenton, Mich., assignor to TRW Vehicle Safety Systems Inc., Lyndhurst, Ohio

Filed Dec. 20, 1994, Ser. No. 360,241
Int. Cl.[6] B60R *22/28*
U.S. Cl. 242—379.1 **15 Claims**

1. Apparatus comprising:
a spool upon which vehicle seat belt webbing is wound, said spool being supported for unwinding rotation under the influence of tension in said webbing;



dissipator means for dissipating an amount of energy by resisting said unwinding rotation of said spool, while permitting a limited amount of said unwinding rotation, when the level of said tension is greater than a predetermined elevated level;

sensor means for sensing at least one characteristic selected from a vehicle occupant characteristic and a vehicle collision characteristic and for providing at least one signal indicative of said at least one characteristic; and

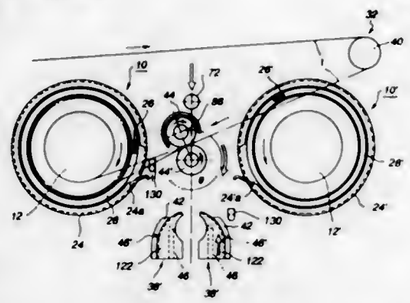
controller means for controlling said dissipator means to vary said amount of dissipated energy in response to said at least one signal.

5,558,296

METHOD OF SUCCESSIVELY WINDING AN ELONGATED MEMBER AND AN APPARATUS THEREFOR

Kouji Sasaki, and Kazuji Kaneda, both of Ichihara, Japan, assignors to Furukawa Electric Co., Ltd., The, Tokyo, Japan

Filed Jun. 28, 1994, Ser. No. 267,447
Claims priority, application Japan, Jun. 30, 1993, 5-187584
Int. Cl.[6] B65H *54/00;67/044*
U.S. Cl. 242—18 A **12 Claims**



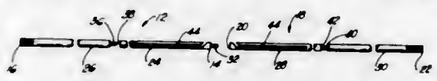
1. A method of successively winding an elongated member using an apparatus including at least first and second spoolers having associated first and second spools and controlled drive means for operating the elements of the apparatus comprising the steps of shifting said elongated member for transfer from said first spool when it is fully wound to said second spool, drawing said elongated member toward a catching member on said second spool on said second spooler to catch a wind-beginning end of said elongated member whereby said elongated member is transferred from said first spooler to said second spooler and stopping said first spooler after said elongated member is caught and cut by said catching member on said second spool on said second spooler and a wind-terminating portion of said elongated member is wound on said first spool on said first spooler, said method further comprising the steps of pinching said elongated member at a pinch location between said spoolers so that a tension applied to said elongated member when said elongated member is caught and cut at said second spooler is prevented from being applied to said elongated member on said first spool on said first spooler, pulling out said elongated member at a speed higher than a winding speed of said first spooler while said elongated member is pinched so that the elongated member is slackened on the downstream side of said pinch location and absorbing slack of said elongated member so that an appropriate tension is applied to said elongated member on said downstream side thereof.

5,558,297

NECKERCHIEF ROLLING DEVICE

Donna B. Elmore, 101 Pecanwood Dr., Long Beach, Miss. 39560

Filed Feb. 7, 1995, Ser. No. 384,951
Int. Cl.[6] B65H *75/10*
U.S. Cl. 242—532.6 **12 Claims**



1. A neckerchief rolling device for symmetrically and uniformly rolling a neckerchief, comprising:

first and second rods, each having opposite interior and exterior ends;

co-acting fastening means on said first and second rods for joining the interior ends thereof in end to end aligned relation;

neckerchief engagement means adjacent the interior end of at least said first rod, wherein said neckerchief engagement means comprises a slot extended axially through said first rod and

having an open end adjacent the interior end of said first rod and having an opposite closed end; said slot being open through opposite sides of the rod to enable passage of a portion of the neckerchief therethrough, whereby, upon engagement of a neckerchief by said engagement means and rolling said joined rods across the neckerchief, the neckerchief is rolled onto the joined rods;

said neckerchief engagement means positioned interior to said first rod, such that said first rod is of uniform external diameter throughout its length; and

said co-acting fastening means being releasable to enable axial withdrawal of said first and said second rods from opposite ends of a rolled up neckerchief.

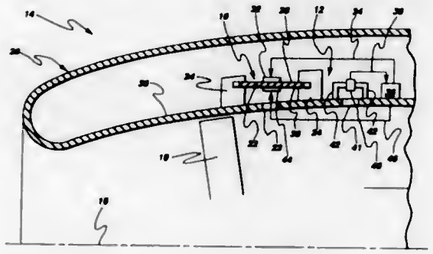
5,558,298

ACTIVE NOISE CONTROL OF AIRCRAFT ENGINE DISCRETE TONAL NOISE

Frederic G. Pla, and Harindra Rajiyah, both of Clifton Park, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 5, 1994, Ser. No. 349,285
Int. Cl.[6] B64D *29/00;* **F02C** *7/045*
U.S. Cl. 244—1 N **10 Claims**

1. An active noise control subassembly for an aircraft engine,



said engine producing discrete tonal noise, and said subassembly comprising:

a) an aircraft engine noise radiating panel bendably vibratable to generate a canceling noise generally opposite in phase to at least a portion of said discrete tonal noise of said aircraft engine, said panel having first and second generally opposing sides; and

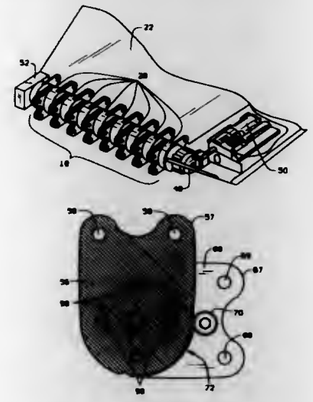
b) a first piezoceramic actuator plate vibratable by a first applied electric AC signal, said first plate connected to said first side of said panel such that vibrations in said first plate cause bending vibrations in said panel and such that said first plate is compressively prestressed along said panel when said panel is free of said bending vibrations.

5,558,299

WING FOLD PUSH-PIN LOCKING ASSEMBLY

Joseph R. Velle, St. Louis, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Apr. 19, 1994, Ser. No. 229,637
Int. Cl.[6] F16H *59/00;* **G05G** *05/00*
U.S. Cl. 244—49 **22 Claims**



1. In a wing fold assembly for use in aircraft which provides relative rotational movement of a first wing tip about a second fixed wing and includes a plurality of wing tip flanges, a plurality of fixed wing flanges and all of said flanges being rotatably mounted to a central shaft, the improvement comprising:

means for selectively interlocking said wing tip flanges in relation to said fixed wing flanges to thereby lock said wing tip in position with respect to said fixed wing in either of a folded or faired position, said interlocking means including an alternating pin and ball bearing arrangement which slidably inserts into and out of alignable bores within respective body components integral with said flanges, said body components disposed to operatively receive said central shaft.

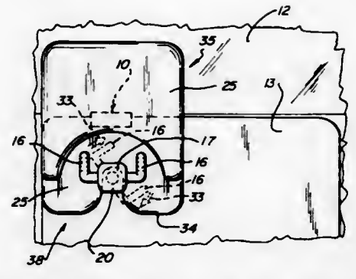
5,558,300

ADAPTABLE AIRCRAFT AIRBAG PROTECTION APPARATUS AND METHOD

Robert C. Kalberer, Boulder, and Dan Goor, Colorado Springs, both of Colo., assignors to Flight Safety Systems, Inc., Boulder, Colo.

Filed Feb. 2, 1995, Ser. No. 383,424
Int. Cl.[6] B64D *25/00*
U.S. Cl. 244—121 **28 Claims**

1. An aircraft construction affording protection in the event of excessive aircraft acceleration/deceleration, comprising;



an elongated aircraft control yoke having a generally horizontally extending post, one end of said post movable penetrating an instrument panel, and an opposite end of said post containing generally vertically extending control handle means for operation by a pilot, said post being manually rotatable to enable control of aircraft roll, and said post being manually movable in a generally linear direction relative to said instrument panel to enable control of aircraft pitch,

an aircraft windshield mounted relative to said instrument panel,

an airbag assembly mounted on said instrument panel and generally vertically above said post and generally vertically below said windshield,

an aircraft acceleration/deceleration sensor mounted on said aircraft,

a source of compressed gas connected to be controlled by said sensor and connected to inflate said airbag assembly with said compressed gas, and

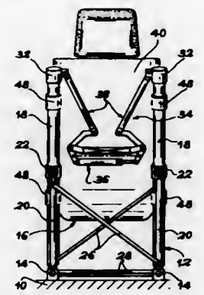
said airbag assembly including an airbag which when inflated occupies a generally vertically flat and rectangular space between said control handle means, said windshield and said instrument panel, and above said post, without physically engaging said control handle means and said post, thus enabling said roll and pitch control of said aircraft in the presence of an inflated airbag.

5,558,301

AIRCRAFT AND IN PARTICULAR ROTARY-WING AIRCRAFT SEAT HAVING AN ENERGY ABSORPTION DEVICE AUTOMATICALLY ADJUSTABLE AS A FUNCTION OF THE SIZE OF THE OCCUPANT

Ronan Kerdoncuff, Nieul Imer, and Gabriel Martin, Echillais, both of France, assignors to Societe Nationale Industrielle et Aerospatiale, France

Filed Dec. 21, 1994, Ser. No. 360,564
Claims priority, application France, Dec. 22, 1993, 93 15467
Int. Cl.[6] B64D *11/06*
U.S. Cl. 244—122 R **9 Claims**



1. Aircraft seat, comprising a pan for receiving an occupant, a frame fixable to an aircraft floor, and a connecting structure between the pan and the frame, said connecting structure compris-

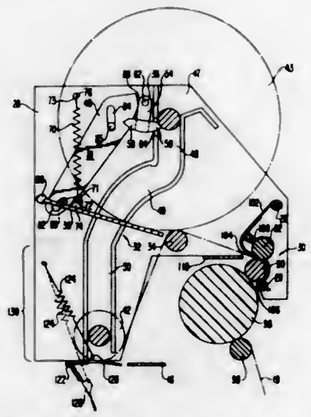
ing pan height regulating means and energy absorption means, wherein the energy absorption means has a variable inclination and exerts on the pan a retaining force having a vertical component which varies with said inclination, and wherein an actuation of the pan height regulating means results in a modification of the inclination of the energy absorption means, whereby the vertical component of the retaining force varies inversely with respect to the pan height.

5,558,302

FLEXIBLE SHEET MATERIAL DISPENSER WITH AUTOMATIC ROLL TRANSFERRING MECHANISM

Paul W. Jespersen, Salt Lake City, Utah, assignor to Georgia-Pacific Corporation, Atlanta, Ga.

Filed Feb. 7, 1995, Ser. No. 384,923
Int. Cl.[6] B65H *19/10*
U.S. Cl. 242—560 **40 Claims**



1. A dispenser for rolls of flexible sheet material wound on cores, the cores having ends extending beyond the sides of the rolls, the dispenser comprising:

a housing having opposite side walls, each side wall having a guide track for receiving and guiding the core ends;

a first support means in said housing for contacting and supporting a roll of flexible sheet material during a first portion of the dispensing of the sheet material from the dispenser;

a second support means for contacting and supporting a roll of flexible sheet material during a second portion of the dispensing of the sheet material from the dispenser, said second support means being located in said housing below said first support means;

a dispensing mechanism supported in said housing laterally of said first support means for dispensing sheet material from a dispensing roll out of said dispenser;

a reserve roll support pivotally attached to a side wall adjacent an upper portion of at least one of said guide tracks, said reserve roll support exhibiting first and second states; in said first state, said reserve roll support permitting a reserve roll of flexible sheet material at an upper reserve position to freely travel downward along said guide tracks and onto said first support means; and in said second state, at least a portion of said reserve roll support is located in said one guide track for retaining a reserve roll of flexible sheet material at an upper reserve position and preventing the reserve roll from travelling downward along said guide tracks and onto said first support means;

a sensing mechanism mounted in said housing and between said side walls for sensing the diameter of the dispensing roll as sheet material is dispensed from the dispensing roll during the support of the dispensing roll by both said first and second support means, said sensing mechanism being movable between at least one retaining position and at least one releasing position, said sensing mechanism being in a releasing position when the dispensing roll is supported by said first support means and has a diameter greater than a predetermined diameter, said sensing mechanism being in a retaining position when the dispensing roll is supported by said second support means and has a diameter less than the predetermined diameter; and

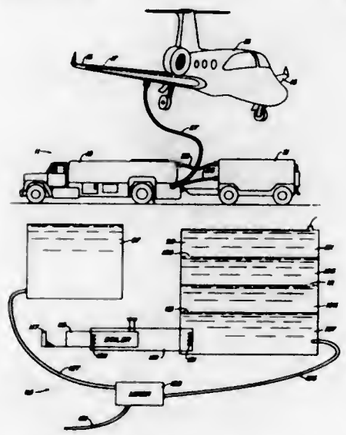
a coupling device coupled to said sensing mechanism and to said reserve roll support, said coupling device placing said reserve roll support into said first state when said sensing mechanism is in a releasing position, and said coupling device placing said reserve roll support into said second state when said sensing mechanism is in a retaining position.

5,558,303

METHOD AND APPARATUS FOR USING HOT FUELS TO DE-ICE AIRCRAFT

Terence L. Koethe, 1021 Oakwood Dr., Keller, Tex. 76248; Richard M. Wilson, Rte. 6, Box 918, Burleson, Tex. 76028, and Gary L. Reid, 6213 Greenlee, Fort Worth, Tex. 76112

Filed Dec. 27, 1994, Ser. No. 364,301
Int. Cl.[6] B64D *15/02*
U.S. Cl. 244—134 R **20 Claims**



1. A method for de-icing an aircraft of the type having wings and fuel storage in the wings, the method comprising in combination the steps of:

providing fuel for fueling the aircraft;

providing a primary heat source, exterior of the aircraft;

operating the primary heat source to heat the fuel to elevated temperatures, exterior of the aircraft, with the elevated temperatures being above ambient fuel temperatures of the type encountered on the ground and in in-ground fuel storage tanks;

fueling the aircraft with the fuel at the elevated temperatures; and

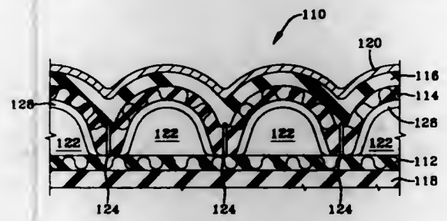
wherein the elevated temperatures are sufficiently higher than the temperatures of outer portions of the wings such that heat transfers from the fuel within the wings to the outer portions of the wings for de-icing the wings.

5,558,304

DEICER ASSEMBLY UTILIZING SHAPED MEMORY METALS

Lowell J. Adams, Dayton, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 14, 1994, Ser. No. 213,395
Int. Cl.[6] B64D *15/00*
U.S. Cl. 244—134 A **38 Claims**



1. A deicing apparatus comprising:

a top shell upon which ice accumulates; and,

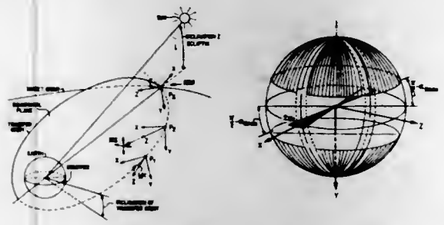
element means comprised of shaped memory metal for changing shape into a predetermined transformation shape for deflecting said top shell when the temperature of said element means is raised to a predetermined transformation temperature.

5,558,305

MEASURING ARRANGEMENT USEFUL FOR CONTROLLING THE ATTITUDE OF A THREE-AXIS STABILIZED SATELLITE, CORRESPONDING EVALUATION PROCESS, REGULATING SYSTEM AND PROCESS

Michael Surauer, Chieming; Helmut Bittner; Walter Fichter, both of Munich, and Horst-Dieter Fischer, Unterhaching, all of Germany, assignors to Deutsche Aerospace AG, Germany

PCT No. PCT/EP92/02851, § 371 Date Jul. 27, 1994, § 102(e) Date Jul. 27, 1994, PCT Pub. No. WO93/04923, PCT Pub. Date Mar. 18, 1993
PCT Filed Sep. 4, 1992, Ser. No. 204,324
Claims priority, application Germany, Sep. 6, 1991, 41 29 630.3
Int. Cl.[6] B64G *1/36*
U.S. Cl. 244—171 **9 Claims**



1. A measurement arrangement for use in controlling attitude of a three-axis stabilized satellite, said arrangement comprising:

sun sensor that determine a sun vector indicating a direction of the sun with respect to a satellite-fixed system of coordinates XYZ, said sun sensors having a measuring range which comprises full all-around view in a preselected plane and a limited angle range of $|\alpha_2| \leq \alpha_{2max}$, with $\alpha_{2max} < \pi/2$, perpendicularly to said preselected plane on both sides thereof; and

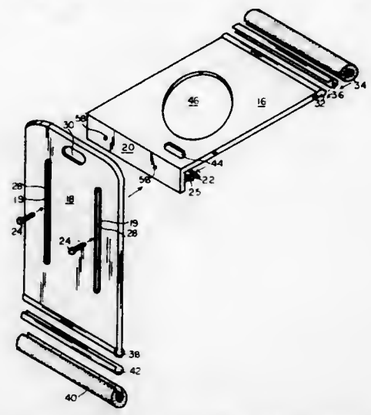
an integrating speed gyroscope which measures in a single measuring axis $\underline{G}=(G_X, G_Y, G_Z)^T$, said measuring axis enclosing an angle β relative to the preselectable plane, wherein $|\beta| \geq (\pi/2)-\alpha_{2max}$.

5,558,306

INCLINED SURFACE SUPPORT PLATFORM

Robert S. Binford, 451 Cotuit Bay Dr., and Gregg A. Binford, 923 Main St., both of Cotuit, Mass. 02635

Filed Jan. 3, 1995, Ser. No. 367,579
Int. Cl.[6] A47G *23/02*
U.S. Cl. 248—148 **19 Claims**



1. An adjustable support platform for a pail or tools for use on an inclined surface such as a roof or ladder, which support platform comprises:

a) a vertical planar member having a first lower end and a second upper end;

b) a horizontal planar member having a first extended end and a second secured end, said horizontal planar member adapted to be secured to an extend horizontally at a right angle from said vertical planar member in a height-adjusting relationship; and said horizontal planar member characterized by at least on opening in said horizontal planar member to receive and hold a pail or a tool;

c) wherein said first lower end of said vertical planar member and said first extended end of said horizontal planar member are arcuate ends;

d) a non-slip surface, friction-engaging foam means at said first lower end of said vertical planar member and at said first extended end of said horizontal planar member to retain the support platform in position on an inclined surface, said foam means comprising a friction-engaging, deformable, arcuate-formed, plastic foam material; and

e) adjusting means to secure said second secured end of said horizontal planar member to said vertical planar member, and to adjust and secure the desired height of said horizontal planar member to said vertical planar member based on the incline of the surface on which the support platform is to be used, to provide said horizontal, adjustably secured planar member at a right angle to said vertical planar member.

5,558,307

GARMENT/TOWEL HOOK

Richard B. Klein, Overland Park; Chris Serslev, Leawood, both of Kans., and Ristomatti Ratia, Chicago, Ill., assignors to Lynk, Inc., Shawnee Mission, Kans.

Filed Aug. 11, 1994, Ser. No. 289,006
Int. Cl.[6] A47F *5/00*
U.S. Cl. 248—309.1 **6 Claims**

1. A garment/towel hook, comprising:

a base for abutment against a vertical surface;

a cantilevered rod extending from said base and having a free end;

a knob mounted upon said rod adjacent said free end, said knob including a tubular sheath, having an opening extending

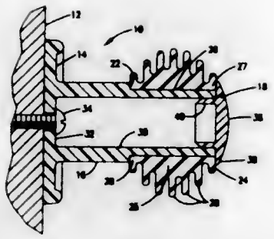
an arm pivotally mounted to the extension arm in juxtaposition below the extension arm for holding picnic utensils; and

5,558,310

RADIATOR SUPPORT BRACKET

5,558,312

ADJUSTABLE SAFETY BRACKET FOR ROOFING



therethrough along a longitudinal axis of said sheath, said opening slidably received on said free end of said rod, said sheath being integrally formed with a plurality of ribs extending thereabout, and projecting radially outward from the longitudinal axis of said sheath and from a longitudinal axis of said rod, said ribs being spaced along said sheath, said ribs being formed of a resilient material having a relatively high coefficient of friction.

5,558,308

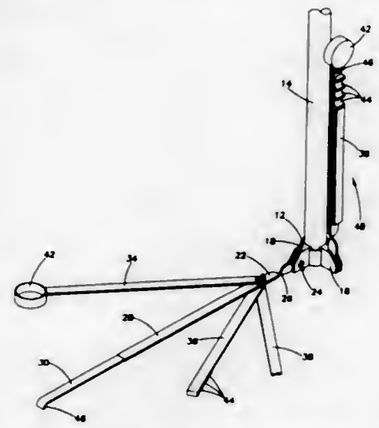
PICNIC UTENSIL HOLD DOWN APPARATUS

Warren P. Edris, 2308 Bryant Dr., Carlsbad, Calif. 92008

Filed Jun. 9, 1995, Ser. No. 489,126

Int. Cl.[6] A47B *97/00*

U.S. Cl. 248—507 **7 Claims**



1. A picnic utensil hold down apparatus comprising:

a ring adapted to surround a post or tube extending vertically from a table, said ring adapted to have a diameter larger than the post or tube;

an adapter means including a hook on one side thereof for engaging the ring on one side;

an opposed side of the adapter including a pair of parallel arms and a bifurcation space where a threaded bolt means is disposed for connecting the arms;

a bifurcation on the opposed side of the adapter;

an extension arm having a vertical planar surface attached to the adapter in the bifurcation space and secured therein by the threaded bolt means and being rotatable thereabout;

a recess in the extension arm;

an arm telescopically mounted within the extension arm for holding picnic plates;

an arm pivotally mounted to the extension arm in juxtaposition above the extension arm for holding a cup and drinking glass a;

an arm pivotally mounted to the extension arm in juxtaposition below the extension arm for holding picnic utensils; and

an arm for holding napkins pivotally mounted to the extension arm below the arm for holding picnic utensils.

5,558,309

CONVERTIBLE STRUCTURE COMPRISING A PLURALITY OF ADJACENT SEATS AND OF VARIABLE SIZE ALONG A SLIDING AXIS

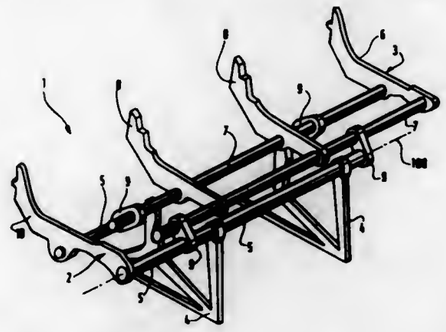
Robert R. L. Marechal, Paris, France, assignor to Societe Industrielle et Commerciale de Materiel Aeronautique, Issoudun, France

Filed Dec. 16, 1994, Ser. No. 358,004

Claims priority, application France, Dec. 17, 1993, 93 15256

Int. Cl.[6] F16M *13/00*

U.S. Cl. 248—424 **18 Claims**



1. A structure comprising a plurality of adjacent seats for a public passenger vehicle, in particular an airliner, the structure being convertible and of variable size along a sliding axis (**100**), and comprising:

a fixed portion (**2**) comprising at least two transverse underframes (**4**) that are spaced apart from each other, fixed to the floor of the passenger cabin, and rigidly connected to one another by longitudinal underframe elements (**5**) having an axis that is generally parallel to the sliding axis;

at least one moving portion (**3**) that is movable relative to the fixed portion between two extreme positions, namely a maximum-size first position and a minimum-size second position, said moving portion (**3**) including an end transverse seat side member (**6**) rigidly associated with longitudinal support elements (**7**), and intermediate transverse seat side members (**8**) parallel to the end transverse seat side member (**6**) and associated with the longitudinal support elements (**6**), and serving to mount seat backs and arms; and

locking means for locking the moving portion (**3**) to the fixed portion (**2**) in each of the two extreme positions;

wherein each longitudinal underframe element (**5**) includes at least two sliding supports (**9**) secured to the longitudinal underframe element (**5**) for sliding along an axis that is parallel to and distinct from the general axis of the associated longitudinal underframe element (**5**), with a longitudinal support element (**7**) of the moving portion (**3**) being slidably received therein and guided in translation along the sliding axis (**100**).

5,558,310

RADIATOR SUPPORT BRACKET

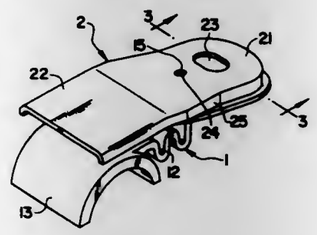
Tsuneichi Furuie; Masato Ueno; Takashi Maeno; Yutaka Ogasawara; Masaki Inoue, and Naoki Mori, all of Inazawa, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai-gun, Japan

Filed Sep. 2, 1994, Ser. No. 299,108

Claims priority, application Japan, Sep. 6, 1993, 5-245899; Mar. 18, 1994, 6-074429

Int. Cl.[6] B60K *11/00*

U.S. Cl. 248—573 **14 Claims**



1. A radiator support bracket holding an upper side of a radiator comprising:

a bracket body uniformly made of resin, said bracket body including a base portion adapted to be fixed to a vehicle body, a transformable arm portion extending from said base portion, and a support portion provided at an edge of an end of said arm portion and holding the upper side of the radiator, and

a stopper member for restricting transformation of said base portion,

wherein said transformable arm portion has a wave-shape.

5,558,311

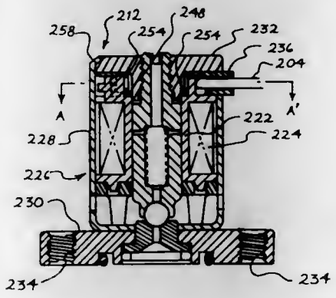
SOLENOID VALVE HARNESS

John R. Connelly, Rock Falls, Ill., assignor to Borg-Warner Automotive, Inc., Sterling Heights, Mich.

Filed Dec. 8, 1994, Ser. No. 352,279

Int. Cl.[6] F16K *31/06*

U.S. Cl. 251—129.15 **11 Claims**



1. A solenoid valve for use with a harness in a vehicle transmission, said solenoid valve comprising:

an exterior housing; and

a solenoid coil located inside said housing, said solenoid coil including at least one coil wire;

wherein one end of said coil wire is grounded to said exterior housing.

5,558,312

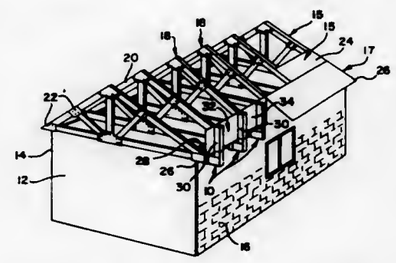
ADJUSTABLE SAFETY BRACKET FOR ROOFING

Daniel Brennan, Chana, Ill., assignor to Safety Brackets, Inc., Chicago, Ill.

Filed Jan. 30, 1995, Ser. No. 380,624

Int. Cl.[6] E04H *17/14*; **E04G** *3/00*; **A47B** *96/06*; **A47L** *3/02*

U.S. Cl. 256—65 **20 Claims**



1. An adjustable safety bracket assembly for forming a support for a safety barricade erected along the edge of a roof of a structure, the roof having a plurality of roof support members spaced along the structure which provide a support for sheathing applied to the roof support members, said roof support member defining a working surface of said roof, at least one of said roof support members having a free end, the safety bracket assembly comprising:

an elongated attachment member for attaching said safety bracket assembly to the roof support member free end, the attachment member having first and second opposing ends and two sidewalls extending between the opposing ends, said sidewalls cooperating with a basewall to define a channel portion of said attachment member at said first end thereof, said sidewalls being spaced apart from each other at said attachment member second end to define a yoke portion;

a barricade support member pivotally connected to said attachment member second end at a pivot point, the barrier support member including a hollow portion which defines a receptacle which receives a support post therein and holds the support post in an upright position with respect to the working surface of said roof;

means for fixing a position of and for restraining movement of said barrier support member with respect to said attachment member, the position fixing and movement restraining means including first openings in said attachment member sidewalls proximate said second end thereof, second openings in said barrier support member and a retention pin adapted for insertion through a set of aligned first and second openings, which when inserted through said aligned set of first and second openings, fixes said barrier support member relative to said attachment member and restrains movement of said barrier support member relative to said attachment member,

said barrier support member including a second, redundant means for restraining movement of said barrier support member relative to said attachment member, the redundant movement restraining means including a stop surface disposed thereon aligned with said attachment member channel portion and opposing said roof support member endface when said safety bracket assembly is installed upon said roof support member, whereby if said retention pin fails to restrain movement of said barrier support member relative to said attachment member, pivotal movement of said barrier support member about said pivot point is restrained by interference between said barrier support member stop surface and said roof support member endface.

5,558,313

TRENCH FIELD EFFECT TRANSISTOR WITH

a first angled section extending from a lower end of the first vertical section and angled down and inward toward the

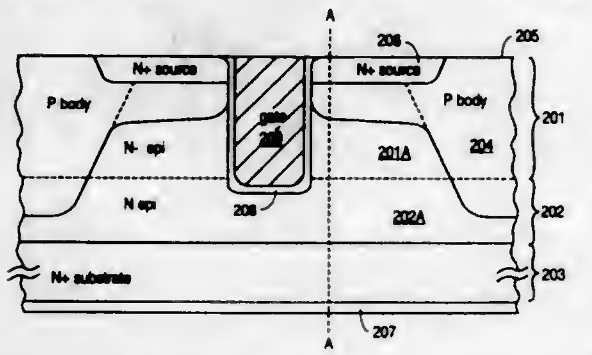
5,558,317

VOLUTE SPRINGS ADAPTED FOR TORSIONAL

5,558,313
TRENCH FIELD EFFECT TRANSISTOR WITH REDUCED PUNCH-THROUGH SUSCEPTIBILITY AND LOW R_{DSON}

Fwu-Iuan Hshieh, Saratoga, and Mike F. Chang, Cupertino, both of Calif., assignors to Siliconix incorporated, Santa Clara, Calif.

Continuation of Ser. No. 386,895, Feb. 10, 1995, and a continuation-in-part of Ser. No. 918,954, Jul. 24, 1992, and Ser. No. 131,114, Oct. 1, 1993, which is a continuation of Ser. No. 925,336, Aug. 4, 1992, abandoned. This application Feb. 10, 1995, Ser. No. 386,895
Int. Cl.⁶ H01L *29/76; 29/94*
U.S. Cl. 257—342 **6 Claims**



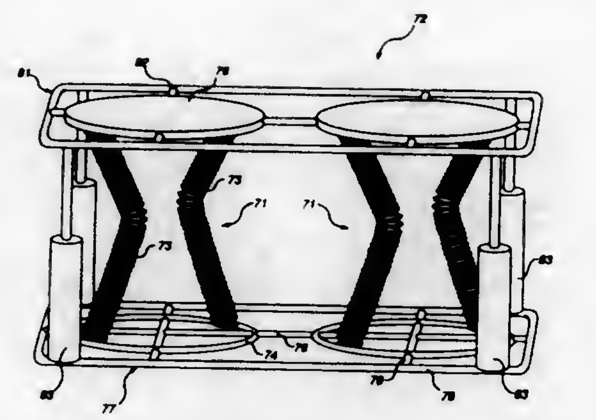
1. A field effect transistor comprising:
a substrate of a first conductivity type being a drain region;
a lower layer of the first conductivity type formed on the substrate and having a doping level less than that of the substrate;
an upper layer of the first conductivity type formed entirely overlying the lower layer and having a doping level less than that of the lower layer;
a trench defined in the upper layer and lower layer and extending to within a predetermined distance of the drain region, the trench being at least partially filled with a conductive gate electrode;
a source region of the first conductivity type formed in the upper layer and extending to a principal-surface of the upper layer and lying adjacent to sidewalls of the trench; and
a body region of a second conductivity type extending from the principal surface of the upper layer down to and into at least an upper portion of the lower layer and being spaced apart from a lower portion of the trench, wherein two spaced apart portions of the body region lying respectively on two sides of the trench define a lateral extent of the upper layer, whereby an accumulation region extends from the body region to the lower layer when the transistor is on.

5,558,314
FLUID-LIKE SUPPORT DEVICE

James D. Weinstein, 1109 Woodland Dr., Bridgeport, W. Va. 26330

Filed Jan. 17, 1995, Ser. No. 373,567
Int. Cl.⁶ F16F *3/04*
U.S. Cl. 267—91 **14 Claims**

1. A support unit having a vertical center and comprising:
a. a base member;
b. a support platform; and
c. a plurality of support columns, each said support column having a top and bottom, with the bottoms of said support columns attached at equidistant intervals to said base member and the tops of said support columns attached at equidistant intervals to said support platform, each said support column comprised of a coiled, curved spring flexible along the entire: length of said column, and said support columns further being positioned and operable to flex, in response to application of a compressive force against said support platform, in a uniform

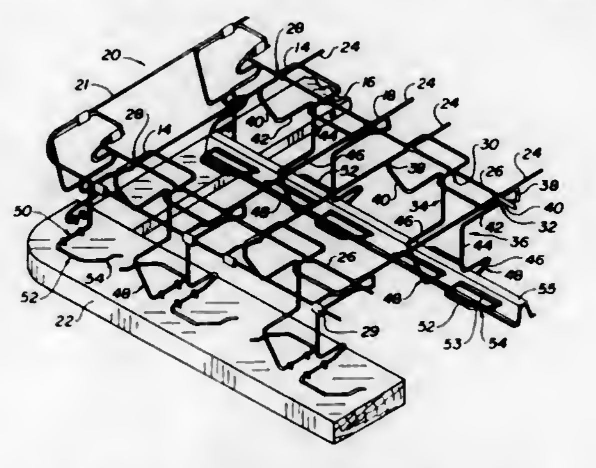


symmetric manner, with reference to each other and the vertical center of said support unit and also to provide a substantially uniform counter-force through a range of flexion of said support columns and corresponding compression of said support unit.

5,558,315
MULTI-FOLD INTERLOCKABLE SPRING FOR USE IN MATTRESS FOUNDATION ASSEMBLIES

Eugen Constantinescu, Westlake, and Robert F. Wagner, Medina, both of Ohio, assignors to Ohio Mattress Licensing and Components Group, Cleveland, Ohio

Filed Aug. 25, 1994, Ser. No. 295,931
Int. Cl.⁶ F16F *3/00*
U.S. Cl. 267—103 **22 Claims**



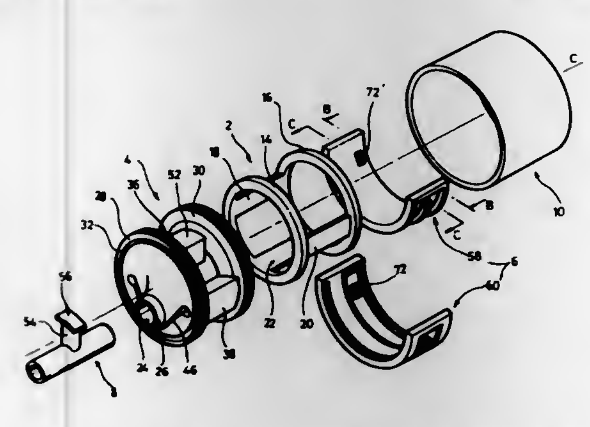
1. A spring element formed from a single piece of wire having a plurality of bends to form a plurality of generally linear sections and members, adapted for assembly in plural numbers in a mattress foundation structure having a frame and a wire grid mattress supporting deck, the spring element comprising:
(i) a generally horizontal top portion attachable to a horizontal mattress supporting deck,
the horizontal top portion having a central member positionable to overlappingly traverse a piece of the wire grid mattress supporting deck, and two first torsional end members parallel to the central member and positionable to traverse and underlap pieces of the mattress supporting deck, the central and end members connected by two generally parallel cross members,
(ii) a deflectable leg extending downward from each of the first torsional end members of the top portion, each of the legs having,
a first vertical section extending generally vertically downward from an end of the first torsional end member,

a first angled section extending from a lower end of the first vertical section and angled down and inward toward the other leg,
a generally horizontal second torsional member extending from a lower inward end of the first angled section and generally horizontal and parallel to the first torsional end member,
a second vertical section extending generally vertically downward from an end of the second torsional member,
a third torsional member connected to a lower end of the second vertical section, the third torsional member connected to a second angled section angled inward and down toward the other spring, the second angled section terminating at a fourth generally horizontal torsional member, and
(iii) a base section attached to the fourth torsional member and configured for attachment to an element of a frame of a mattress foundation structure.

5,558,316
HYDRO-MOUNT FOR POWER PLANT

Hyosang Lee, Kyungsangnam, and Youngkun Yoon, Kyungsangbuk, both of Rep. of Korea, assignors to Hyundai Motor Company, Rep. of Korea

Filed Oct. 3, 1995, Ser. No. 538,205
Claims priority, application Rep. of Korea, Oct. 4, 1994, 94-25304
Int. Cl.⁶ F16M *5/00*
U.S. Cl. 267—140.12 **8 Claims**

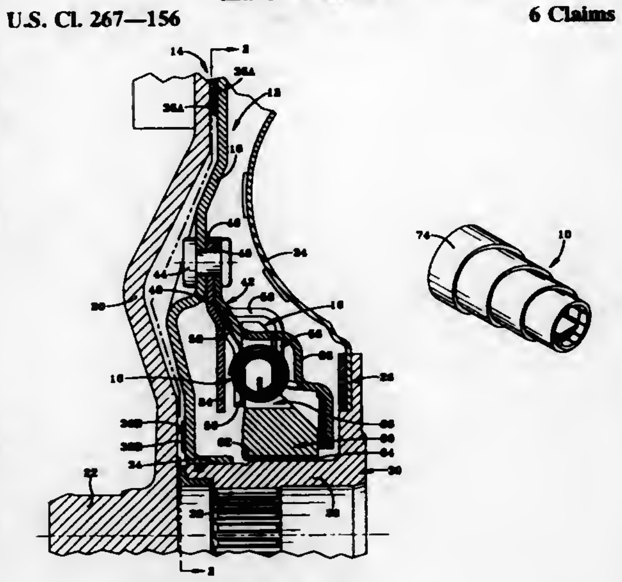


1. A hydro mount for a power plant having an engine, a clutch, and a transmission all of which are integrally formed with each other, comprising:
an outer pipe having a central axis;
a frame member inserted into the outer pipe and including a pair of ring-shaped rim members arranged along the central axis, and first, second and third connecting members connecting the rim members with each other at a predetermined interval, the first and second rim connecting members being disposed opposite each other on a plane where the central axis is laid and the third connecting member being disposed at 90° with respect to each first and second connecting member;
an elastic member supportably inserted in the frame member and including a boss having a penetrating hole, a pair of circular-shaped side plates attached respectively on opposite ends of the boss, and first, second, and third projections extending in a radial direction from an outer surface of the boss and contacting respectively the first, second and third connecting members of the frame member to define a main chamber and a sub-chamber with the outer pipe and the pair of plates;
orifice means disposed around the connecting members of the frame to communicate the main chamber and the sub-chamber with each other; and
an inner pipe inserted and attached by vulcanization to the penetrating hole of the boss of the elastic member.

5,558,317
VOLUTE SPRINGS ADAPTED FOR TORSIONAL DAMPER ASSEMBLIES AND METHOD OF MANUFACTURING SAME

Terry E. Nels, Beavercreek, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 26, 1994, Ser. No. 187,430
Int. Cl.⁶ F16F *1/10*
U.S. Cl. 267—156 **6 Claims**

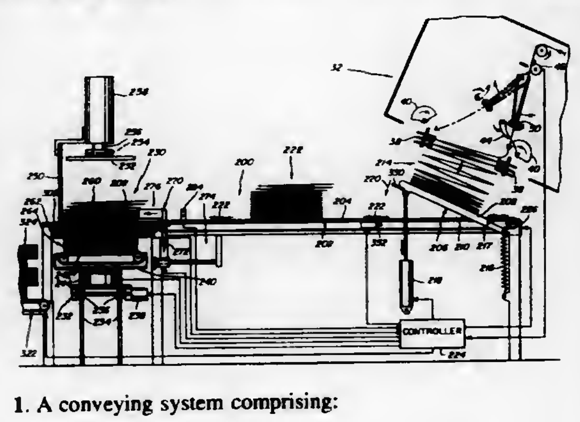


3. A volute spring comprising:
a plurality of telescopically adjacent coils;
each said coil having oppositely directed surfaces which present opposed surfaces on said telescopically adjacent coils;
at least one of said opposed engaging surfaces having a structural configuration in the nature of a plurality of intersecting grooves which define a plurality of polygonal plateaus;
said plateaus providing the engaging surface on at least one of said adjacent coils that obviates the formation of a hydrodynamic oil film from degrading the hysteresis frictional engagement between said adjacent coils.

5,558,318
SEPARATOR FOR FORMING DISCRETE STACKS OF FOLDED WEB

H. W. Crowley, Newton; Stephen E. Silva, Acton; Peter E. Bianchetto, Foxboro; John W. Clifford, Ashland, all of Mass., and Bruce J. Taylor, Manchester, N.H., assignors to Roll Systems, Inc., Burlington, Mass.

Continuation-in-part of Ser. No. 943,446, Sep. 10, 1992, Pat. No. 5,360,213, which is a continuation of Ser. No. 641,472, Jan. 15, 1991, Pat. No. 5,149,075. This application Mar. 29, 1994, Ser. No. 219,503
Int. Cl.⁶ B65B *35/50;* **B65G** *57/00;* **B65H** *29/00*
U.S. Cl. 270—39.05 **51 Claims**



1. A conveying system comprising:

a conveyor for receiving a stack of output folded web, the conveyor driving the web from an upstream end to a down-

the frictional surface toward the selected of the sheets to maintain the frictional surface in frictional engagement with

5,558,321
DEVICE FOR FACILITATING SHEET SEPARATION OR

a pair of transfer rollers each having a predetermined diameter opposed to each other for transferring a sheet of paper along a

a conveyor for receiving a stack of output folded web, the conveyor driving the web from an upstream end to a downstream end;

a supporting surface that moves between a position aligned with the conveyor for movement of the web downstream by the conveyor, to a position remote from the conveyor wherein folded web is deposited on the supporting surface free of downstream conveyance; and

a means for sensing when a desired volume of web, based upon a predetermined compression of the web, is deposited on the supporting surface to move the supporting surface from the position remote from the conveyor to the position aligned with the conveyor for movement of the folded web to the downstream location by the conveyor.

41. A method for conveying a folded web comprising:

outputting web from a folder;

conveying the outputted web to a downstream location;

supporting the folded web, adjacent the folder, so that the web is free of conveying at selected times;

locating the folded web output by the folder so that the folded web is conveyed to the downstream location; and

forming the web into discrete stacks at the downstream location including locating successive stacks of folded web at the downstream location and further including lowering a supporting surface so that a top of each of the successive stacks is located to receive an additional stack of folded web thereon.

5,558,319

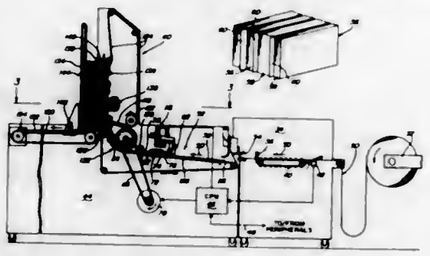
WEB STACKER AND SEPARATOR WITH SHEET OFFSETTING KICKER

H. W. Crowley, Newton; John W. Clifford, Ashland, both of Mass.; Thomas Connolly, Nashua, N.H.; John R. Fairhurst, Lawrence, Mass., and Bruce Taylor, Manchester, N.H., assignors to Roll Systems, Inc., Burlington, Mass.

Continuation of Ser. No. 874,846, Apr. 27, 1992, Pat. No. 5,366,212. This application Nov. 15, 1994, Ser. No. 340,164

Int. Cl.[6] B65H *33/04*

U.S. Cl. 270—58.31 **33 Claims**



1. An apparatus for stacking and separating sheets of web material comprising:

a conveyor for transporting sheets from a source in a stream aligned in a downstream direction in a first orientation to a stacking location;

a kicker located along the conveyor for offsetting selected of the sheets in a direction substantially transverse to the downstream direction, the kicker comprising a frictional surface constructed and arranged to move between a position free of engagement with the sheets, located above the sheets and facing a side of the sheets opposite a side of the sheets that is supported by the conveyor and the kicker surface being constructed and arranged to move from a position that is free of engagement with the face of the sheets to a position that engages the sheets and wherein the frictional surface, in engagement with the sheets moves to direct the sheets in the direction that is substantially transverse to the downstream direction, wherein the kicker comprises a reciprocating foot having a frictional surface that includes a spring that biases the frictional surface toward the selected of the sheets to maintain the frictional surface in frictional engagement with the selected of the sheets as the foot moves to offset the selected of the sheets in the direction substantially transverse to the downstream direction; and

a stacker positioned at the stacking location for receiving each of the sheets from the first orientation in the conveyor and overlaying each of the sheets in a stack extending downstream in a second orientation.

5,558,320

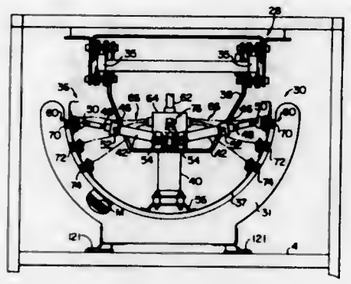
LIFTING SHOE FOR MEDIA HANDLING AND RELATED CASSETTE MEDIA HOLDER

Alan W. Menard; Larwence S. Wolfson, both of Bolton, and Joseph Conlan, Rocky Hill, all of Conn., assignors to Gerber Systems Corporation, South Windsor, Conn.

Filed Nov. 8, 1993, Ser. No. 148,584

Int. Cl.[6] B65H *5/22*

U.S. Cl. 271—4.01 **7 Claims**



1. A system for offering light-tight handling of a supply media from a supply station to a work station and to a collecting station, said system comprising:

a media handling apparatus having a frame and a housing enclosing an internal confine defining a supply station and a collecting station disposed at opposite ends of said frame;

said handling apparatus also having a positioning drive means disposed above said supply, work and collecting stations to move media between said supply station, said collecting station, and said work station;

a supply cassette having a generally cylindrical upwardly convex supporting surface for supporting flexible media in a stack of such media in a curved form, said supply cassette having a covering means for selectively covering and uncovering media which is contained therein;

a first opening formed in said housing of said unit for receiving said supply cassette therein, said first opening including a closure means for closing said first opening to light;

first drive means associated with said first opening and supported by said frame for engaging with said supply cassette and operable to cause said covering means to uncover the media in said supply cassette after said first opening is closed by said closure means;

a collecting module for receiving media transferred from said work station to said collecting station by said handling apparatus, said collecting module including drivable means,

a second opening formed in said housing and associated with said collecting station for receiving said collecting module,

said second opening including a closure means for closing said second opening to light; and

second drive means associated with said second opening and disposed on said frame for engaging with and driving said drivable means of said collecting module when said collecting module is positioned at said collecting station.

5,558,321

DEVICE FOR FACILITATING SHEET SEPARATION OR SINGLING

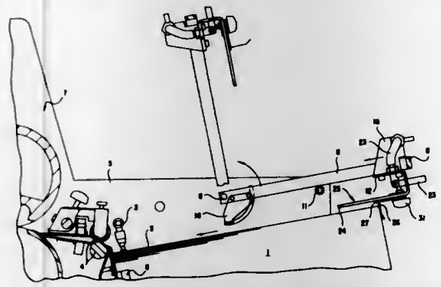
Martin Greive, Heidelberg, and Bernd Ruf, Weiterstadt, both of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Germany

Filed Dec. 27, 1994, Ser. No. 364,536

Claims priority, application Germany, Dec. 24, 1993, 43 44 453.9

Int. Cl.[6] B65H *3/14*

U.S. Cl. 271—98 **2 Claims**



1. Device for facilitating sheet separation or singling in an upper region of a feeder pile, wherein the feeder pile has a top surface, an edge facing away from a processing machine, and an edge surface extending substantially perpendicularly to the top surface, comprising a supporting structure disposed above a feeder pile and extending beyond dimensions of a maximally processable format of a printing material and being swivellable out of a plane extending parallel to a top surface of the feeder pile, elements for facilitating sheet separation carried by said supporting structure, said elements being adjustably movable against an edge surface of the feeder pile when said supporting structure is swivelled into the plane extending parallel to the top surface of the feeder pile, a traverse movable slide-like on said supporting structure in a direction parallel to sheet-separation direction, and locking means for fixing said traverse in an arbitrary position said traverse being formed with a guiding surface, and including stops for acting upon the trailing edge of the feeder pile, said stops being received in recesses formed in said guiding surface.

5,558,322

PAPER DISCHARGE UNIT FOR USE IN IMAGE FORMING APPARATUS

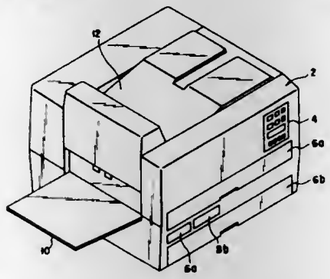
Yoshitsugu Nakatomi, Yokosuka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 17, 1994, Ser. No. 259,974

Claims priority, application Japan, Jun. 21, 1993, 5-148984

Int. Cl.[6] B65H *31/00*

U.S. Cl. 271—209 **16 Claims**



1. A paper sheet transfer apparatus comprising:

a pair of transfer rollers each having a predetermined diameter opposed to each other for transferring a sheet of paper along a paper sheet transfer plane extending between the pair of transfer rollers by holding the sheet of paper therebetween;

a rotary shaft located coaxial with one of the transfer rollers; and

a corrugation roller rotatably mounted on the rotary shaft for corrugating the sheet of paper transferred by the transfer rollers, in a direction perpendicular to the direction of the transfer of the sheet of paper,

the corrugation roller having:

a roller main body with a diameter larger than the diameter of each of said transfer rollers, for corrugating the sheet of paper, the roller main body projecting from the paper sheet transfer plane toward the other one of the transfer rollers;

a holding portion mounted on the rotary shaft for bolding the roller main body on that portion of the rotary shaft which is not opposed to the other one of the transfer rollers; and

a support portion extending between the holding portion and the roller main body, the support portion being able to be warped in accordance with the thickness of the sheet of paper transferred by the transfer rollers, for deformably supporting the roller main body, and restraining the amount of projection of the roller main body from the paper sheet transfer plane of the one of the transfer rollers and the amount of the corrugation,

the roller main body, the holding portion and the support portion being resin-molded integral as one body.

5,558,323

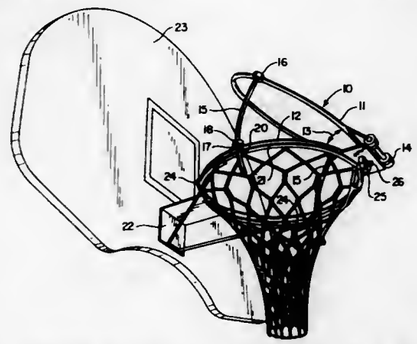
BASKETBALL PRACTICE DEVICE

Samuel J. LoFaso, Sr., 242 Linda Visa Rd., Sewickley, Pa. 15143

Filed Nov. 13, 1995, Ser. No. 556,405

Int. Cl.[6] A63B *69/00*

U.S. Cl. 237—1.5 A **10 Claims**



1. A basketball practice device comprising: an auxiliary ring and means supporting said auxiliary ring in general above a basketball supporting ring in a plane disposed at an acute angle from the plane of said supporting ring, and adjustment means for selectively adjusting and maintaining said acute angle.

5,558,324

BALL DELIVERY DEVICE

Larry Jourdan, Rte. 1, Box 8, Brooksville, Miss. 39739

Continuation-in-part of Ser. No. 819,063, Jan. 10, 1992, abandoned. This application Jul. 1, 1993, Ser. No. 154,910

Int. Cl.[6] A63B *69/00*

U.S. Cl. 273—260 **5 Claims**

1. A ball delivery device for delivering a ball to a player comprising:

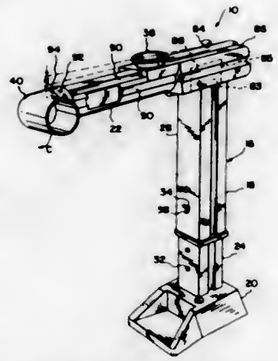
a substantially vertical support structure;

5,558,326

HOCKEY STICK BLADE COVER AND METHOD

5,558,328

RELATIVE FREQUENCY-BASED WORD GAME

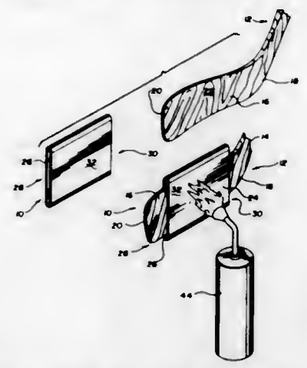


an elongate enclosed delivery conduit extending outwardly from said support structure, said delivery conduit including a ball discharging means positioned at one end of said delivery conduit for singularly discharging a ball from said delivery conduit into an unguided delivery path and a ball receiving means spaced from said discharging means including an inlet aperture extending upwardly from said enclosed delivery conduit for permitting a ball to be positioned in said delivery conduit, said delivery conduit being sufficiently nontransparent to prevent a player from viewing a ball traveling through said delivery conduit until the ball is discharged from said discharging means into the unguided delivery path wherein said enclosed conduit extends outwardly from said support structure at a sufficient delivery angle to cause a ball positioned therein to move by gravity away from said support structure, said ball discharging means including a curved discharge section terminating in a discharge opening of sufficient size to permit passage of a ball therethrough wherein said curved discharge section is connected to said delivery conduit to permit rotation of said curved discharge section, said delivery conduit including hesitation members positioned directly below said inlet aperture on the bottom portion of said delivery conduit to engage a portion of a ball placed therein to vary discharge time of the ball.

5,558,325
PLAY BALLS OR PRESSURELESS TENNIS BALLS
I. Glen Hargis, Talmadge; Richard A. Miranda, Berlin Center; John A. Wilson, Akron, and Oon H. Yeoh, Hudson, all of Ohio, assignors to GenCorp Inc., Fairlawn, Ohio
Filed Aug. 5, 1993, Ser. No. 102,686
Int. Cl.[6] B32B *1/08*; A63B *39/00*
U.S. Cl. 273—61 C **19 Claims**

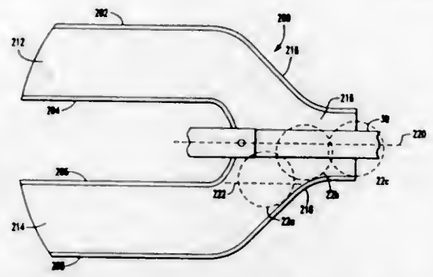
1. A play ball comprising: a blend of at least
a) one or more crosslinked rubbers,
b) one or more reinforcing particulate fillers comprising silica or carbon black or combinations thereof, and
c) a polymeric filler being an ethylene-vinyl acetate copolymer with from about 1 to 10 weight percent vinyl acetate and/or the reaction product of cellulose grafted with a low density polyethylene in the presence of a free-radical source,
wherein said polymeric filler is blended into said one or more rubbers before they are crosslinked, and
wherein said ball is in the form of a hollow sphere.

5,558,326
HOCKEY STICK BLADE COVER AND METHOD
Tamara J. Adamson, and James G. Berg, both of Lino Lakes, Minn., assignors to T3 Innovations, Inc., Lino Lakes, Minn.
Filed May 9, 1995, Ser. No. 438,166
Int. Cl.[6] A63B *59/14*
U.S. Cl. 273—67 A **19 Claims**



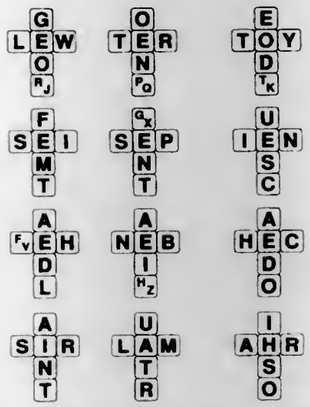
1. A method for improving a blade of a hockey stick comprising the steps of:
applying a heat shrinkable member to the blade;
exposing said heat shrinkable member to a source of heat sufficient to shrink said heat shrinkable member, whereby said heat shrinkable member conforms to the blade.

5,558,327
PINBALL WAND
Bryan P. Hansen, Des Plaines, and Roberto Hurtado, Elmwood Park, both of Ill., assignors to Capcom Coin-Op, Inc., Arlington Heights, Ill.
Continuation of Ser. No. 382,373, Feb. 1, 1995, abandoned, which is a continuation-in-part of Ser. No. 255,657, Jun. 8, 1994, Pat. No. 5,452,894. This application Mar. 24, 1995, Ser. No. 409,598
Int. Cl.[6] A63F *7/30*
U.S. Cl. 273—121 A **8 Claims**



1. In a pinball game utilizing a pinball rolling on a game surface, an apparatus for maneuvering said pinball comprising:
an electromagnet for carrying said pinball below said electromagnet wherein said electromagnet defines a path lying in a plane that intersects a horizontal plane so that said pinball is urged by gravity to move along said electromagnet while being carried by said electromagnet; and
a platform positioned adjacent said electromagnet for directing said pinball from a first contact position with respect to said electromagnet to a second contact position with respect to said electromagnet.

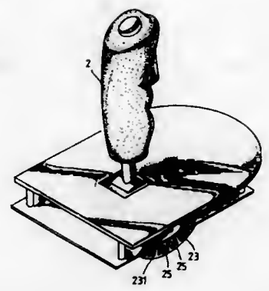
5,558,328
RELATIVE FREQUENCY-BASED WORD GAME
Tomas Krantz, Björklinge, Sweden, assignor to Turn it, Inc., Chicago, Ill.
Filed Feb. 2, 1995, Ser. No. 382,888
Int. Cl.[6] A63F *9/04*
U.S. Cl. 273—146 **22 Claims**



1. A game apparatus for forming words from letters appearing on word game dice comprising:
twelve word game dice having seventy-two faces, six faces on each die of said dice;
sixty-six of said faces displaying one letter of an alphabet having the letters A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, and Z,
the remaining six of said faces each displaying two of said letters of said alphabet appearing together; and
nine of said faces displaying said letter E, seven of said faces displaying said letter T, six of said faces displaying said letter A, five of said faces displaying said letter O, five of said faces displaying said letter N, five of said faces displaying said letter I, five of said faces displaying said letter S, five of said faces displaying said letter R, four of said faces displaying said letter H, three of said faces displaying said letter L, three of said faces displaying said letter D, two of said faces displaying said letter C, two of said faces displaying said letter M, two of said faces displaying said letter U, two of said faces displaying said letter F, two of said faces displaying said letter P, two of said faces displaying said letter G, one of said faces displaying said letter W, one of said faces displaying said letter Y, one of said faces displaying said letter B, one of said faces displaying said letter V, one of said faces displaying said letter K, one of said faces displaying said letter J, one of said faces displaying said letter X, one of said faces displaying said letter Q, and one of said faces displaying said letter Z,
said letters being arranged on said dice so that no two letters appear more than once on a die and to maximize the possible number of words which may be formed.

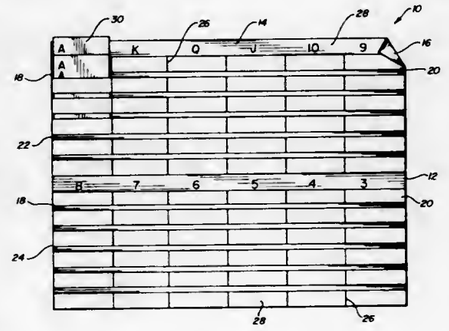
5,558,329
PHOTOELECTRIC DIGITIZED JOYSTICK
William S. Y. Liu, 3f, No. 19, Lane 190, Tun-Hwa S. Rd., Sec. 1, Taipei, Taiwan
Filed Mar. 1, 1995, Ser. No. 396,592
Int. Cl.[6] A63F *9/00*
U.S. Cl. 273—148 B **6 Claims**

1. A joystick comprising: an operating stick, light gratings fixedly mounted on an X-axle and a Y-axle, said X-axle and Y-axle are substantially arranged at right angles to each other and are movable by said operating stick, each light grating including a series of apertures spaced along a periphery thereof, and light



emitter and receiver assemblies, each assembly disposed relative a light grating to cooperate with the apertures of said light grating, and a control circuit adapted for receiving a signal from said light emitter and receiver assemblies to provide a variable delay output corresponding to the movement of the light gratings and thereby said operating stick.

5,558,330
PLAYING CARD ORGANIZER
Eve N. McCune, 1219 Inca La., Henderson, Nev. 89015
Filed Jul. 18, 1995, Ser. No. 503,552
Int. Cl.[6] A63F *1/10*
U.S. Cl. 273—150 **1 Claim**

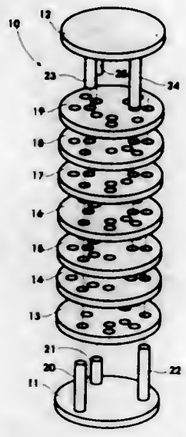


1. A playing card organizer comprising:
a flexible mat having twelve flexible strap member affixed to a front playing surface of said flexible mat in a manner to define twelve columns, each of said twelve columns including six card slots, each of said twelve strap members being of a different color than any one of said twelve strap members adjacent thereto;
adapted for holding playing cards and a water impermeable sheet disposed on a back surface thereof, a first six column set of said twelve columns being positioned on a top section of said playing surface in a manner to leave a portion of said playing surface along an upper portion of said top section visible, a second six column set of said twelve columns being positioned on a bottom section of said playing surface in a manner to leave a portion of said playing surface between said first six column set and said second six column set visible, each column of said first six column set having a rank of a playing card embossed thereabove on said portion of said playing surface along an upper portion of said top section, each column of said second six column set having a rank of a playing card embossed thereabove on said portion of said playing surface between said first six column set and said second six column set.

5,558,331
STACKING PUZZLE

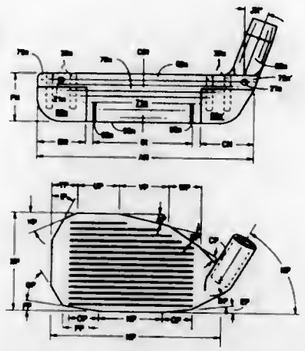
ter of said green, said computer containing means for showing a golf shot placement by a human physical act using a

5,558,331
STACKING PUZZLE
Dmitry Zlotsky, 59 W. Cedar St., Livingston, N.J. 07039
Filed Apr. 10, 1995, Ser. No. 420,285
Int. Cl.[6] A63F 9/12
U.S. Cl. 273—156 **15 Claims**



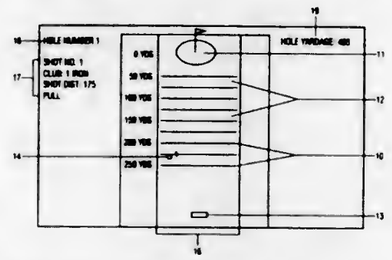
1. A puzzle comprising:
a base element having
a plurality of pegs of varied lengths extending upwardly from said base element;
a top element, having
a plurality of pegs of varied length extending downwardly from said top element;
a plurality of game elements, each of said game element having a plurality of apertures dimensioned to receive said pegs therethrough;
the object of said puzzle being to stack said game elements and said top element in a unique order atop said base element and to position said game elements in unique rotational positions so as to align said apertures and allow thereby the passage of said pegs therethrough in order to form a substantially solid structure.

5,558,332
GOLF CLUB HEAD
Raymon W. Cook, San Antonio, Tex., assignor to Kliker Golf Company, Inc., San Antonio, Tex.
Continuation-in-part of Ser. No. 2,598, Jan. 11, 1993, Pat. No. 5,308,067. This application May 2, 1994, Ser. No. 236,345
Int. Cl.[6] A63B 53/04
U.S. Cl. 473—341 **21 Claims**



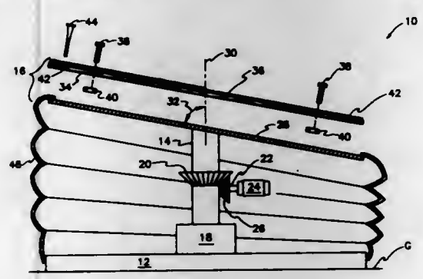
11. A three-piece golf club head for use with a golf club having a shaft, said head having a heel and a toe end comprising:
a heel weight and a toe weight, said heel weight and said toe weight being of the same composition, similarly shaped and having substantially the same mass;
an L-shaped frame for maintaining fixed, spatial relationship between said heel weight and said toe weight, said frame having a T-shaped faceplate portion of uniform thickness and a base member portion, said T-shaped faceplate portion and said base member portion being generally tabular and disposed one to the other, integrally joined along adjacent edges thereof at an included angle, said T-shaped faceplate portion having outwardly extending horizontal crossarms and being generally bilaterally symmetrical;
means to mount said weights on removed ends of said frame; and
means to mount said shaft to one of said crossarms;
wherein said weights are mounted with first faces thereof substantially flush with a front surface of said faceplate portion and second surfaces thereof abuttingly mounted with bottom surfaces of said crossarms, and third surfaces abuttingly contacting said base member portion and wherein more than 90% of the total weight of said club head is located within one inch of said heel end and said toe end of said club head.

5,558,333
GOLF GAME DATA RECORDER, ANALYZER, AND GAME IMPROVER USING DISPLAY SIMULATIONS WITH PLURAL RESOLUTIONS
Steven M. Kelson, 5412 Ranger Dr., Rockwall, Tex. 75087, and Robert E. Kelson, 2409 Knights Bridge Dr., Grand Prairie, Tex. 75050
Filed Nov. 30, 1993, Ser. No. 158,759
Int. Cl.[6] A63B 69/36; G06F 161/00
U.S. Cl. 473—131 **9 Claims**



1. A system for analyzing, calculating, and displaying results from a person's actual, physical play of any selected hole of a plurality of golf course, regardless of the length and shape of said golf hole, comprising:
a computer having a display, a memory, a data entry means, and means for providing display simulations with plural resolutions for entering data recorded from said person's actual play into said memory for enabling an accurate replication of said actual play of said golf course hole,
said computer being arranged to show a simulation of a fairway of a golf course hole, said simulation of said fairway including a simulation of a green and a plurality of equidistant markers on said fairway that display measurements from the center of said green, a simulation of a tee box, and a simulation of the distance from said center of said green to said tee box, and display means in said computer for displaying said golf course hole in the following three sequential views:
a first view displaying the total length of said golf course hole, measured in predetermined measurement unit from said center of said green, said computer containing means for showing a golf shot placement by a human physical act using a pointing device within a golf course hole placement resolution that is relatively small compared to the length of said golf course hole as displayed on said display means in said first view, thereby providing a visible measurement of said golf shot after said placement, and
a second view displaying a magnified simulation of that part of said golf course hold from said center of said green measured down a center line of said fairway to simulate a relatively long fairway distance to accommodate a bend to dogleg in said fairway, said computer containing means for enabling said person to show a golf shot placement within a fairway placement resolution that is relatively small compared to the length of said fairway as displayed on said display means in said second view, and
a third view displaying a magnified simulation of said green to enable said person to show a putt placement on said green within a green placement resolution that is relatively small compared to the size of said green as displayed on said display means in said third view.

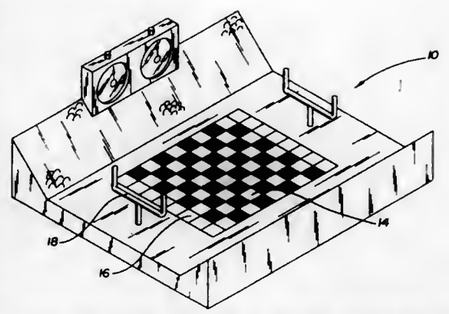
5,558,334
GOLF TEE PLATFORM
Mortimer P. Roche, 8516 Blounts La., Fulton, Md. 20759
Filed Aug. 16, 1995, Ser. No. 515,914
Int. Cl.[6] A63B 69/36
U.S. Cl. 473—279 **10 Claims**



1. A golf driving practice platform, comprising:
a base;
a vertical rotatable mast supported on said base, said mast having a gear circumferentially oriented thereon;
a motor for revolving said mast, said motor having an output shaft terminating in a second gear, said second gear engaging said gear of said mast; and
a playing surface member supported on and rotatable with said mast, said playing surface member comprising
a support plate fixed to said mast, and
a playing surface liner having means for removable securement to said support plate, said playing surface liner having disposed thereon a plurality of sections simulating different ground conditions normally found on a golf course, said plurality of sections being generally coplanar and constantly upwardly exposed, whereby all sections are simultaneously accessible from above said practice platform.

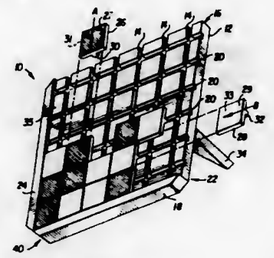
5,558,335
CHESS FOOTBALL GAME
Dennis Wise, 222 County Park Rd., Pottstown, Pa. 19465
Filed Sep. 18, 1995, Ser. No. 529,329
Int. Cl.[6] A63F 3/00
U.S. Cl. 273—237 **5 Claims**

1. A chess football game for playing chess with points scored for the capturing of an opponents playing pieces comprising, in combination:



a game board having a generally rectangular configuration, the game board having a hollow interior, the game board having an illuminated playing surface disposed thereon, the illuminated playing surface comprising a chess board with the addition of an end row of squares at opposing ends thereof, the game board having goal posts positioned beyond the end lines of the illuminated playing surface, the game board having upwardly extending side portions, the game board having an activation button disposed thereon;
a speaker secured within one of the upwardly extending side portions of the game board;
a scoring system secured within one of the upwardly extending side portions of the game board opposed from the speaker;
a control means secured within the hollow interior of the game board, the control means having an electrical plug extending outwardly of the game board, the electrical plug adapted for coupling with an electrical outlet, the control means cooperating with the activation button of the game board, the power means being electrically coupled collectively with the illuminated playing surface, the speaker, and the scoring system.

5,558,336
BOARD GAME AND METHOD OF PLAYING
Donald Sapello, 207 Coari Ave., Minotola, N.J. 08341
Filed Mar. 27, 1995, Ser. No. 411,283
Int. Cl.[6] A63F 3/00
U.S. Cl. 273—281 **9 Claims**



1. A board game, comprising:
a game board having a top surface and a bottom surface;
a first wall member extending above said top surface at one side thereof;
a second wall member extending above said top surface at an adjacent side thereof;
a first plurality of spaced grooves provided in the top surface, and a second plurality of spaced grooves intersecting with the first plurality of grooves, wherein said first plurality of grooves extends in a first direction from said first wall member to a first open side of said game board, and said second plurality of grooves extends in a second direction from said second wall member perpendicular to the first direction to a second open side of said game board; and

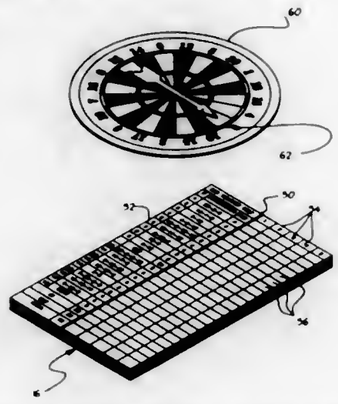
a set of playing pieces, adapted to slide along the grooves from

scores of up to five players, a first column including the

5,558,339
NETWORK ARCHITECTURE TO SUPPORT

a set of playing pieces, adapted to slide along the grooves from the first or second open sides, each of which includes a protrusion having a depth, a width no wider than a width of any of said grooves, and a length greater than the width of any of said grooves.

5,558,337
DART BOARD GOLF GAME
Louis C. Frank, III, 3405 Andover Dr., Fairfax, Va. 22030
Filed Sep. 18, 1995, Ser. No. 529,331
Int. Cl.[6] F41J *3/00*
U.S. Cl. 273—408 **1 Claim**



1. A new and improved dart board golf game comprising, in combination:

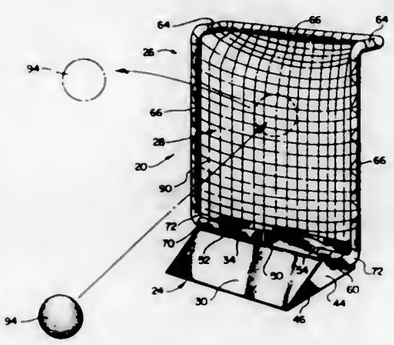
a regulation dart board formed in a planar generally circular configuration and adapted to be hung vertically from a mounting surface, the board having a circular cork center, the board having an outer ring positioned adjacent to the outer perimeter of the board, the board including three inner rings having a smaller width than the outer ring, a first inner ring being positioned around the cork center, a second inner ring being positioned adjacent to the outer ring, a third inner ring being positioned between the inner and outer rings, the outer ring including the numerals 1 through **20**, in the operative orientation the numeral **20** being positioned at the top of the board with the remaining numerals being positioned around the outer ring in a clockwise sequence as follows: **1**, **18**, **13**, **4**, **9**, **10**, **15**, **2**, **17**, **3**, **19**, **7**, **16**, **8**, **11**, **14**, **6**, **12** and **5**, twenty generally triangular shaped sectional areas being positioned between the first and second inner rings of the dart board, each triangular shaped sectional area having an apex abutting the first inner ring of the dart board, the sections being formed of two different colors and arranged in an alternating color sequence, each individual numeral being positioned adjacent to a corresponding individual sectional area;

a plurality of darts, each dart including a main body section formed in a generally cylindrical configuration with a front end and a rear end, the front end of each dart including a needle extending therefrom, the rear end of each dart including a plurality of feathers extending therefrom, the main section of each dart including a rough surface to enhance gripping by users, during play of the game the darts being thrown at the dart board so that the needle becomes lodged in a desired sectional area of the board;

a plurality of score cards formed in a planar generally rectangular configuration with a right side, a left side, a horizontal top edge and a vertical left edge, each scorecard including a plurality of horizontal and vertical lines forming a plurality of columns and rows, the right side top edge including horizontally positioned numerals 1 through **5** to permit recording of scores of up to five players, a first column including the numerals **1** through **9** and **10** through **18** positioned vertically in ascending order, the vertically positioned numerals representing the front 9 holes and back 9 holes of a golf course, a second combination column including sets of between two and four numerals separated by dashes, the numeral sets representing the order in which players must score dart hits on the corresponding sectional areas of the dart board in order to move on to the next numeral in the first column, a third par column being positioned adjacent to the combination column, the par column including the numerals 3, 4 or 5 to represent the par number of throws expected to achieve the hits required in the combination column, each player recording their respective scores with each combination being achieved; and

a set of playing rules informing players how to play the game, each player being required to stand a predetermined distance from the dart board when throwing the darts, each player being required to score dart hits in the sectional areas of the dart board corresponding to the numerals in the combination column on the playing card, the combination **20**–**3**–**6** indicating that players must score hits in the following sequence: section **20**, section **3** and section **6**, the players continuing to throw darts until attaining the required combination or reaching a maximum score of 12 throws, the player achieving the lowest score at the completion of the game being deemed the winner.

5,558,338
GAME ASSEMBLY FOR MULTIPLE SPORTS USAGE
Ronald H. Taub, 980 N. Michigan Ave., Chicago, Ill. 60611
Continuation-in-part of Ser. No. 195,294, Feb. 14, 1994, abandoned. This application Oct. 26, 1994, Ser. No. 329,432
Int. Cl.[6] A63B *67/00*
U.S. Cl. 273—411 **9 Claims**



1. A game assembly for use in playing different and distinct ball games comprising

multi-functional base means for accommodating a plurality of standards adapted for use, selectively, in a plurality of different ball games,

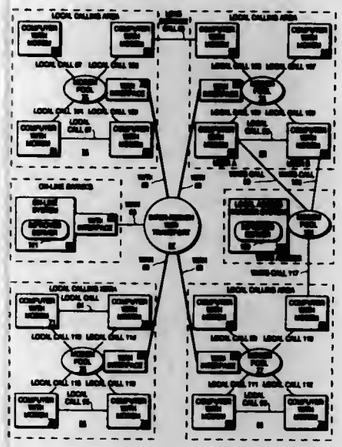
said base means including a stable pedestal having a plurality of horizontally spaced, vertically extending sockets for matingly receiving therewithin posts for supporting structures including nets,

support post means for seating in said sockets and for supporting a net means

net means defining target zones toward which balls associated with each of said plurality of games may be impelled,

said games including basketball, football, and soccer games.

5,558,339
NETWORK ARCHITECTURE TO SUPPORT RECORDING AND PLAYBACK OF REAL-TIME VIDEO GAMES
Stephen G. Perlman, 721 Tiana La., Mountain View, Calif. 94041
Filed May 5, 1994, Ser. No. 238,383
Int. Cl.[6] A63F *9/24*
U.S. Cl. 463—42 **22 Claims**



1. A first computer for directly linking said first computer with a second computer, said first computer also for recording the video game interaction between a first player on said first computer and a second player on said second computer, said first computer comprising:

a network interface coupled to a network;

client application software executing in said first computer, said client application software including:

processing logic for connecting said first computer to a server on said network via said network interface;

processing logic for requesting said server to match said first computer with a second computer using matching criteria;

processing logic for receiving a network address of said second computer from said server;

processing logic for disconnecting said first computer from said server before establishing a direct communication link with said second computer using said network address;

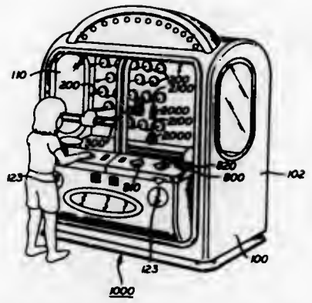
processing logic for saving game information on said first computer, indicative of the interaction between said first player on said first computer and said second player on said second computer;

processing logic for reconnecting said first computer to a server coupled to said network; and

processing logic for uploading said game information from said first computer to a server memory coupled to said server.

5,558,340
GAME MACHINE
Takaya Ibe; Kazuyoshi Tanaka; Kaname Ota; Goujun Yamamoto, and Toshihiro Okabe, all of Tokyo, Japan, assignors to Kabushiki Kaisha Bonpresto, Japan
Filed Aug. 11, 1995, Ser. No. 514,269
Claims priority, application Japan, Aug. 21, 1994, 6-219480; Jun. 30, 1995, 7-187774
Int. Cl.[6] A63F *9/00*
U.S. Cl. 273—448 **20 Claims**

1. A game machine containing a plurality of articles disposed therein, comprising:



(a) a machine body having a vertical first side and a vertical deep side opposite the first side, the plurality of articles being disposed between the first side and the deep side;

(b) grip means disposed within said machine body for gripping at least one of said a plurality of articles;

(c) drive means for moving said grip means, said drive means including:

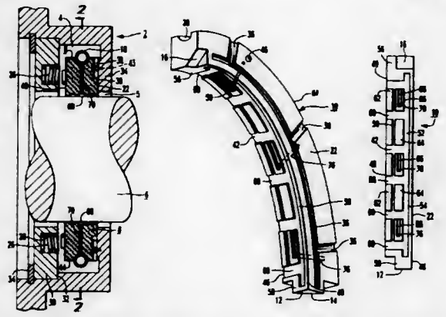
vertical drive means for moving said grip means in a vertical direction; and depthwise drive means for moving said grip means in a depthwise direction from a position adjacent said first side towards said deep side;

(d) control means disposed in said machine body for controlling the starting and stopping of said drive means; and

(e) input means actuatable by a game player for sending start and stop signals, as indicated by the actuation of said input means by said game player, to said control means to respectively start and stop said vertical drive means,

(f) wherein said control means actuates said depthwise drive means, after said vertical drive means is stopped, to move said grip means toward said article.

5,558,341
SEAL FOR SEALING AN INCOMPRESSIBLE FLUID BETWEEN A RELATIVELY STATIONARY SEAL AND A MOVABLE MEMBER
Alan D. McNickle, Sellersville; Mingfong Hwang, Lansdale, both of Pa., and Adam N. Pope, Cincinnati, Ohio, assignors to Stein Seal Company, Kulpsville, Pa.
Filed Jan. 11, 1995, Ser. No. 371,283
Int. Cl.[6] F16J *15/34*
U.S. Cl. 277—3 **10 Claims**



1. A stationary seal member adapted to control and minimize the leakage of an incompressible fluid along a path between a sealing surface on said seal member and a complementary surface on a movable member adjacent to which said seal member is adapted to be mounted, said sealing surface terminating at two spaced edges, one of said edges adapted to be exposed to an incompressible fluid in a first region at relatively higher ambient pressure, the second of

said edges being essentially continuous and being adapted to be exposed to a second region at a relatively lower ambient pressure, said sealing member being formed when in its operating position to isolate said first and second regions except along the aforementioned path, whereby the incompressible fluid is adapted to pass between said sealing surface and the complementary movable surface from said one edge toward said second edge, said stationary seal member being adapted to be resiliently mounted such that said sealing surface is movable under resilient force toward said complementary surface and into engagement therewith and against such resilient force away from said complementary surface to vary the gap between said sealing and said complementary surfaces, said stationary seal member having:

i. a sealing dam formed on such sealing surface adjacent said second edge and an elongated groove in said sealing surface positioned adjacent to and parallel with said sealing dam;

ii. said seal member having a plurality of spaced transverse grooves formed in said sealing surface and extending from said first edge thereof transversely across said sealing surface and terminating in said elongated groove forming a plurality of relatively short pads on said sealing surface between said groove, said first edge and the adjacent transverse grooves respectively;

iii. at least some of said pads each having a pocket formed therein and extending from one of said transverse grooves into the respective pad and terminating in said pad short of the adjacent transverse groove, each of said pockets being exposed to said complementary surface and being formed such that, when said movable surface moves relative to said sealing surface, incompressible fluid is moved into said pockets by the velocity shearing gradient between said movable and stationary members to generate an increased pressure in said pockets to urge said seal member away from said movable surface, said pocket being a depth sufficient in size such that upon moderate wear of the pad due to rubbing against said complementary surface, said pocket depth continues to be of sufficient size to maintain a velocity gradient induced pressure increase therein, said seal member being formed such that in the event of wear of said seal member pads to reduce the depth of said pocket, the velocity gradient in said pocket is increased to increase the pressure in said pocket, whereby said gap is increased and thus causing said gap to be self-regulating in size; and

iv. said seal member having a bleed opening provided in the interior of said pocket passing through a portion of said seal member and communicating with a surface on said seal member that during operation is exposed to the level of pressure in said first region.

5,558,342

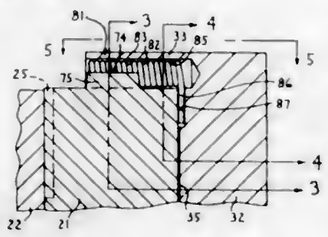
MECHANICAL SEAL WITH SPRING DRIVE

Josef Sedy, Mount Prospect, Ill., assignor to Duratmetallic Corporation, Kalamazoo, Mich.

Filed Aug. 5, 1994, Ser. No. 286,665

Int. Cl.[6] F16J *15/34*

U.S. Cl. 277—81 R **20 Claims**



1. In a mechanical seal assembly for creating a sealing relationship between a housing and a shaft rotatable relative thereto, said seal assembly including first and second coaxially aligned seal rings disposed in axially adjacent and surrounding relationship to the shaft, said first and second seal rings having opposed flat seal faces thereon which are normally maintained in directly opposed and close association with one another to define an annular sealing region therebetween to effectively separate high and low pressure zones which are defined at opposite radial edges of said annular sealing region, said first seal ring being nonrotatably coupled to the housing, said second seal ring being nonrotatably coupled by a resilient drive connector to a drive member which is nonrotatably coupled to the shaft for rotation therewith, the improvement wherein said resilient drive connector comprises first and second axially-elongate grooves formed respectively in said drive member and said second seal ring, said first and second grooves being disposed closely adjacent and opening radially in opposed relation to one another, and an axially-elongate coil spring member disposed within and confined between said first and second grooves for transmitting rotational driving force from said drive member through said coil spring member to said second seal ring in response to rotation of said shaft.

5,558,343

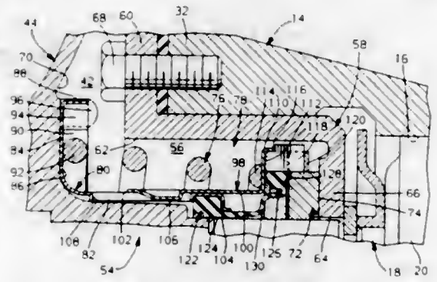
WATER PUMP SEAL ASSEMBLY

J. Oscar Aparicio, Aurora, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 26, 1995, Ser. No. 578,291

Int. Cl.[6] F16J *15/36*

U.S. Cl. 277—88 **3 Claims**



1. A water pump seal assembly for use between a rotatable pump shaft and a fixed housing comprising a base carrier member having a cylindrical body extending coaxially with said pump shaft and fixed longitudinally and rotationally with respect to said shaft to thereby rotate with said shaft, said base carrier member including a compression spring member disposed coaxially about said cylindrical body, said seal assembly further comprising a sliding carrier member having a cylindrical body extending coaxially with said pump shaft and having a first end in longitudinally slidable, rotationally fixed, coaxial disposition with an end of said cylindrical body of said base carrier member, said compression spring member operable to move said sliding carrier member longitudinally along said water pump shaft relative to said fixed base carrier, and a hydrodynamic sealing disc disposed between a second end of said sliding carrier member and said fixed housing said sealing disc rotationally fixed relative to said sliding carrier member, said base carrier member and said pump shaft to thereby rotate against said fixed housing and define a seal therebetween, and an elastomeric sealing member disposed between said sealing disc and said pump shaft to define a seal therebetween wherein said sliding carrier is operable to locate said hydrodynamic sealing disc longitudinally against said fixed housing under the bias of said compression spring.

5,558,344

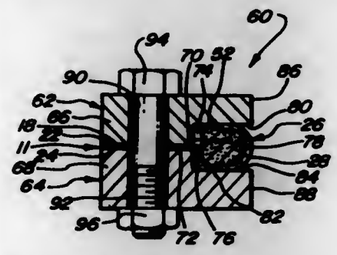
EXHAUST PIPE FLANGE GASKET

Michael J. Kastly, Bolingbrook, Ill., and Rob Lehmann, Fort Wayne, Ind., assignors to Dana Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 156,162, Nov. 23, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 474,590

Int. Cl.[6] F16J *9/00;* **F16L** *17/00*

U.S. Cl. 277—167.5 **18 Claims**



14. A gasket, said gasket including:

a single metallic body with a planar portion extending laterally inwardly from an outer edge of said body and including an upper surface and a lower surface, said planar portion having at least one bolt hole, a shielding grommet formed from said body at an inner edge of said planar portion, said shielding grommet defining an outer periphery of an aperture extending about a longitudinal axis of said body;

a sealing element retained within said shielding grommet;

two metallic pipe-like members, each of said members having a flange with a longitudinally extending aperture and a laterally extending planar clamping face, wherein said flanges include equally spaced recesses having a common depth adjacent said clamping face; and

a fastener passing through said bolt hole and said apertures, said bolt hole and apertures sized such that said shielding grommet is correctly positioned in said recesses when said fastener secures said gasket and said members together.

5,558,345

STEPPED BOOT ATTACHMENT STRUCTURE

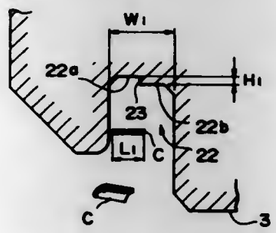
Kinzo Kobayashi; Shinji Suzuki, and Takahiro Takenaga, all of Yamanashi-ken, Japan, assignors to Tokico, Ltd., Kanagawa-ken, Japan

Filed Dec. 22, 1994, Ser. No. 361,558

Claims priority, application Japan, Dec. 25, 1993, 5-348103

Int. Cl.[6] F16J *15/52;9/00*

U.S. Cl. 277—168 **3 Claims**



1. A boot attachment structure in which a boot has a cylindrical elastic body that has an outer surface and a circumferential engagement portion on the outer surface, a bore has an inner circumferential groove formed therein, the inner circumferential groove has a bottom, the bottom has a step formed therein in the circumferential direction, the step has a height of 0.5 mm or less, and the engagement portion is fitted into the inner circumferential groove.

5,558,346

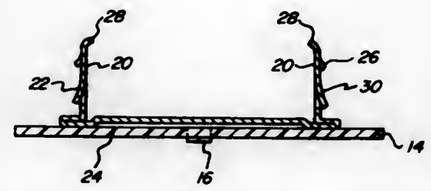
PUSH PLUG SEAL WITH SEALING PATCH SECURED BY TABS

William Hartery, Watertown, Conn., assignor to Illinois Tool Works, Inc., Glenview, Ill.

Filed Jan. 26, 1995, Ser. No. 378,518

Int. Cl.[6] F16J *15/00;* **B65D** *39/00*

U.S. Cl. 277—189 **8 Claims**



1. A push plug, comprising:

a metal one-piece plug for sealing an aperture extending through a vehicle body panel, said plug having a plug body having at least two gripping legs extending generally perpendicularly away from said plug body, said legs each having two sets of gripping tabs for gripping said aperture, one set of tabs being located intermediate said plug body and free ends of said legs thereby providing second mounted position and a second set of tabs located adjacent said free ends of said legs thereby providing a first mounted position, said plug body having a plurality of substantially triangular sharp-pointed tabs located intermediate said legs around a perimeter of said plug body and extending perpendicularly away from said plug body oppositely from said legs;

an elastomeric sealing patch located against said plug body on a side of said plug body said sharp-pointed tabs penetrating the patch and retaining the patch to said plug body.

5,558,347

SEAL

Terence P. Nicholson, Hexham, Great Britain, assignor to Specialist Sealing Limited, Jersey, Channel Islands

Continuation of Ser. No. 81,266, Jun. 23, 1993, abandoned. This application Apr. 26, 1995, Ser. No. 427,881

Claims priority, application United Kingdom, Dec. 31, 1990, 9028219; Jan. 21, 1991, 9101301

Int. Cl.[6] F16J *15/00*

U.S. Cl. 277—229 **7 Claims**

1. A flexible seal comprising a flexible impervious protective and sealing envelope having substantially parallel spaced-apart portions, said envelope being formed of a chemically resistant plastic material, and a resiliently deformable packing within the envelope, the packing comprising a resilient cellular structure consisting of two superposed layers of resilient sheet metal generally parallel to and between said portion, of which at least one said layer is deformed and sealed to the other said layer in such a way that at least one closed cell is formed between said sealed layers; whereby said closed cell is capable of retaining a fluid or gas therein.

5,558,348

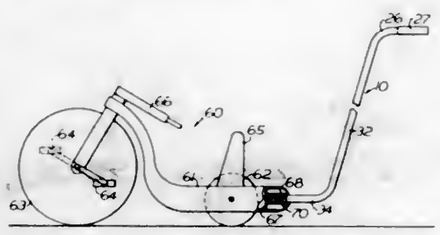
CHILD RIDING VEHICLE AND CONTROL HANDLE

George T. Becka, 119 E. Sprague Rd., Seven Hills, Ohio 44131

Continuation of Ser. No. 227,611, Apr. 14, 1994, abandoned, which is a division of Ser. No. 969,987, Nov. 2, 1992, Pat. No. 5,306,030. This application Oct. 31, 1995, Ser. No. 551,002

Int. Cl.[6] B62K 5/04

U.S. Cl. 280—282 **10 Claims**



1. In combination a child's riding vehicle and a rearwardly and upwardly projecting control handle, the vehicle including at least one steerable front wheel, a hollow plastic frame, a pair of laterally spaced rear wheels having a common axis, a socket means for receiving a lower end of said control handle positioned rearwardly of said axis, the socket means formed integrally with and internally of said plastic frame, and a means for rigidly fastening the lower end of the control handle to the socket means, whereby an adult can control the speed of the vehicle through the use of the handle and can elevate the front wheel of the vehicle so as to control the direction of the vehicle through the use of the handle.

5,558,349

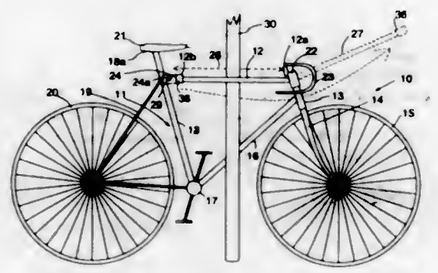
SELF-LOCKING BICYCLE

David M. Rubin, 1102 Emerson St., Palo Alto, Calif. 94301

Filed Jan. 5, 1995, Ser. No. 368,925

Int. Cl.[6] B62K 19/00; B62H 5/00

U.S. Cl. 280—287 **11 Claims**



1. A self-locking bicycle comprising:
   a head tube rotatively mounting a wheel-containing front fork;
   a down tube rigidly connected to and extending from said head tube to a fixed crank housing;
   a seat tube rigidly extending from a bicycle seat assembly to said crank housing and rigidly connected thereto, said seat tube rigidly mounting a wheel-containing rear fork;
   a connection piece connected to said head tube;
   a top tube affixedly mounted between and extending from said connection piece to said seat tube; said top tube including a part of at least one anti-theft lock mechanism for locking said top tube between said head tube and said seat tube, said top tube being demountable from at least one of said head tube and said seat tube;
   wherein said lock mechanism is a key-operated lock or a combination lock; and
   wherein in an unlocked opened demounted condition of the top tube, a resultant opening between said head tube and second seat tube can be leaned past an immobile post structure, and in that position, the top tube is remounted and relocked to lock the bicycle to the post structure; and
   wherein a first end of said top tube is demountable from and lockable by said lock mechanism to one of said head tube and said seat tube and a second end of said top tube is pivotable with respect to the other one of said head tube and said seat tube.

5,558,350

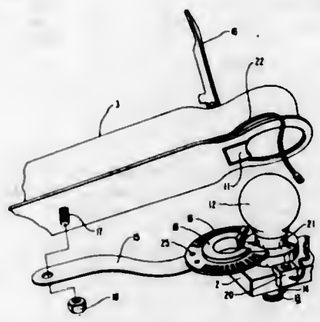
STEERING CONTROL SYSTEM FOR TRAILERS

Scott S. Kimbrough, and R. Scott Vincent, both of Salt Lake City, Utah, assignors to University of Utah Research Foundation, Salt Lake City, Utah

Continuation of Ser. No. 703,612, May 21, 1991, abandoned. This application Feb. 15, 1994, Ser. No. 197,010

Int. Cl.[6] B62D 13/04

U.S. Cl. 280—426 **3 Claims**



1. A hitch angle sensor assembly for measuring a hitch angle θ between a tow vehicle having a joint and a trailer rotatably joined to the tow vehicle at the joint, said tow vehicle having an XYZ coordinate system and said trailer having an xyz coordinate system, said hitch angle sensor assembly comprising:
   (a) a hitch ball having a shaft at its first end, a ball at its second end, and a channeled area located between said first and second ends, said channeled area comprising antifriction material, and said hitch ball being installable on a receiver,
   (b) an angle indicator having an outer angle indicator disk and an inner receptacle, said outer angle indicator disk having an opening to permit said inner receptacle to be placed adjacent said channeled area, said inner receptacle comprising antifriction material and being configured so that said inner receptacle can rotate about said channeled area and about the Z axis during a change in hitch angle θ, said outer angle indicator disk being configured to indicate a hitch angle θ,

   (c) an elongate strap having a first end and a second end, said elongate strap first end being connected to said angle indicator and said elongate strap second end being connectable to a trailer tongue, said strap being rigid in the xy plane in order to facilitate accurate measurement of a hitch angle θ, and said strap being more rigid in the xy plane than in either the xz or yz planes, and
   (d) a sensor adapted to read a hitch angle θ from said outer angle indicator ring;
   wherein said strap and angle indicator are constructed so that they are capable of only rotating about the Z-axis;
   wherein said strap is flexible in bending about the y-axis, thereby allowing pitching movements to occur between the tow vehicle and the trailer without binding and without causing rotation of said angle indicator about the Z-axis;
   wherein said strap is flexible in twisting about the x-axis thereby allowing rolling movements between the tow vehicle and the trailer to occur without binding and without causing rotation of said indicator disk about the Z-axis;
   wherein said strap is rigid about the z-axis; and
   wherein said strap causes said indicator disk to return to a θ=0 position whenever the x-axis lies in the XZ plane.

5,558,351

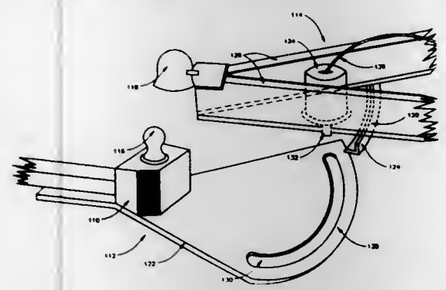
ANTI-JACK-KNIFE ASSEMBLY

David Hunter, HCR 66, Box 75, Yellville, Ark. 72687

Division of Ser. No. 453,301, Dec. 20, 1989, abandoned, . This application Oct. 11, 1994, Ser. No. 321,146

Int. Cl.[6] B60D 1/06

U.S. Cl. 280—432 **12 Claims**



1. A stabilizing assembly for preventing trailing member jack-knifing, the assembly comprising:
   a pick-up truck adapted by the addition of a hitch assembly for pulling a trailing vehicle;
   the truck hitch assembly including a support plate, a radial groove defined by the support plate, and a hitch ball, the radius of the groove centered on the hitch ball;
   a trailer adapted for hitching to the pick-up truck, the adaptation comprising a hitch member and a retractable pin assembly;
   the retractable pin assembly has a pin mounted for operative engagement with the radial groove defined by the support plate, thereby restricting trailing vehicle jack-knife with respect to the vehicle;
   means for activating the retractable pin assembly for selective engagement of the retractable pin assembly with the radial groove; and
   stabilizing means operatively associated with the hitch means for stabilizing the support plate relative to the trailer hitch member and providing support during arcuate movement of the stabilizing assembly and the relative movement between the pick-up portion and the trailer portion of the hitch assembly during both normal and jack-knife restricting operation as the weight of portion of the trailer hitch member bears down on the truck hitch assembly and the stabilizing means acts to maintain the pin in operative engagement with the radial groove.

5,558,352

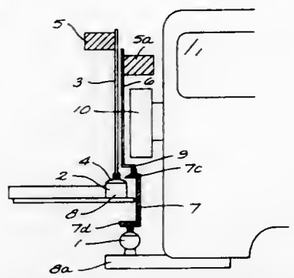
TRAILER HITCH ALIGNMENT DEVICE

Malcolm L. Mills, 1890 Camino de la Cienega, Tucson, Ariz. 85715

Filed Mar. 1, 1995, Ser. No. 396,565

Int. Cl.[6] B60D 1/40

U.S. Cl. 280—477 **18 Claims**



1. A trailer hitch alignment/coupling device comprising:
a) a first mast assembly for attachment to a trailer hitch of a towed vehicle comprising:
   1) a first mast having a first and second end,
   2) a securing means for securing said first mast to the hitch of a trailer, said securing means comprising:
      A) a base portion being substantially domed in shape and having at least one magnet fixably attached to a concave side of said base portion such that, when secured to said hitch, said at least one magnet contacts said hitch, thereby securing said base portion to said hitch, said first end of said mast removably attached to a convex side of said base portion, and,
      B) a hook and loop strap attached to said base portion, said strap extending from said base portion to said trailer hitch, said hook and loop strap for further securing said base portion to said trailer hitch, and,
   3) at least one rigid flag fixably attached proximate to said second end of said mast;
b) a second mast assembly for attachment to a trailer hitch of a towing vehicle comprising:
   1) a second mast having a first and second end,
   2) a securing means for securing said second mast to the trailer hitch of a towing vehicle, said securing means comprising:
      A) a base portion comprised of a first and a second part, said first part comprised of a substantially domed member and at least one magnet fixably attached to a concave side of said domed member such that, when secured to said hitch, said at least one magnet contacts said hitch, thereby securing said base portion to said hitch, said second part comprised of a substantially C-shaped member, said first end of said second mast being removably attached to an upper portion of said substantially C-shaped member, said substantially C-shaped member fixably attached to a convex portion of said first part, and,
      B) a hook and loop strap attached to said base portion, said strap extendable from said base portion to said trailer hitch when in use, said hook and loop strap for further securing said base portion to said trailer hitch, and,
   3) at least one rigid flag fixably attached proximate to said second end of said mast;
c) at least one speaker means for generating an audible signal; and,
d) at least one sensor means in operative communication with said at least one speaker means and further in operative communication with at least one of said first and second mast assemblies, said at least one sensor means for activating said at least one speaker means when alignment of said first and second mast assembly is achieved.

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position relative to the base, the pivotal arm mechanism

predeterminate resistance force to be overcome by the boot

5,558,353

DEVICE FOR MODIFYING THE FORCE DISTRIBUTION OF A SKI OVER ITS GLIDING SURFACE AND A SKI EQUIPPED WITH SUCH A DEVICE

Joël Arduin, Metz-Tessy, and Jacques Le Masson, Cran-Gevrier, both of France, assignors to Salomon S.A., Metz-tessy, France

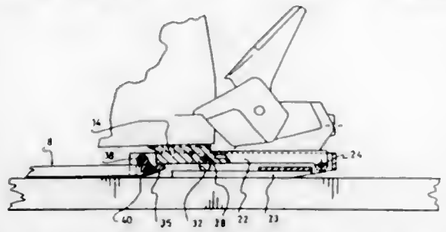
PCT No. PCT/FR92/01101, § 371 Date Oct. 27, 1994, § 102(e) Date Oct. 27, 1994, PCT Pub. No. WO93/14836, PCT Pub. Date May 8, 1993

PCT Filed Nov. 26, 1992, Ser. No. 256,630

Claims priority, application France, Jan. 31, 1992, 92 01249

Int. Cl.[6] A63C *5/07*

U.S. Cl. 280—602 **23 Claims**



1. A device for modifying force distribution of a ski over a gliding surface of the ski, the ski extending in a longitudinal direction, the ski furthermore having a central zone with at least one binding element for retaining a boot and at least one support element for supporting a sole of the boot, said device comprising:

a stiffening blade having a front end and a rear end, the front end of the stiffening blade being adapted to be affixed to a forward portion of the ski, the forward portion of the ski being forward of the central zone, the stiffening blade having a predeterminate length so that the rear end of the stiffening blade is adapted to be located in the central zone;

a sensor element for supporting only a portion of the sole of the boot and for capturing a vertical thrust force of the boot; and

a connection between the sensor element and the stiffening blade for transmitting to the stiffening blade, in the form of a unidirectional force oriented generally horizontally and in said longitudinal direction toward only the front end of the stiffening blade, at least a portion of the vertical thrust force of the boot.

5,558,354

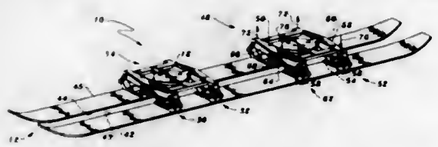
COMBINATION SKIS AND MOUNTING PLATE ASSEMBLY

Ronald K. Lion, 375 Summit Rd., Watsonville, Calif. 95076

Filed Feb. 23, 1995, Ser. No. 392,133

Int. Cl.[6] A63C *5/00*

U.S. Cl. 280—607 **17 Claims**



1. A combination ski and mounting plate assembly, comprising:

a pair of skis;

a first mounting plate assembly for supporting a mounting plate for a boot binding; said first mounting plate assembly being pivotally secured to both of said pair of skis so that said pair of skis are operably linked together by said first mounting plate assembly; said mounting plate assembly includes a four bar linkage assembly comprising a front linkage assembly including a first inner bar and a first outer bar operably secured to said mounting plate; said first inner bar being pivotally secured to said first outer bar; a rear linkage assembly including a rear inner bar and a rear outer bar are operably secured to said mounting plate, said rear inner bar being pivotally secured to said rear outer bar; said front linkage assembly and said rear linkage assembly being operably secured to both skis allowing the skis to pivot and move about a central pivot point allowing a downward pressure on either side of said mounting plate to be translated into an upward force on an opposite side of said plate, thereby providing an upward lifting force on a ski edge beneath said opposite side of said plate; and

a second mounting plate assembly for supporting a mounting plate for a boot binding; said second mounting plate assembly being operably mounted to both skis of said pair of skis and spaced from said first mounting plate assembly so that said pair of skis are operably linked together by said second mounting plate assembly; said second mounting plate assembly includes a four bar linkage assembly comprising a front linkage assembly including a first inner bar and a first outer bar operably secured to said mounting plate, said first inner bar being pivotally secured to said first outer bar; a rear linkage assembly including a rear inner bar and a mar outer bar are operably secured to said mounting plate; said rear inner bar being pivotally secured to said rear outer bar; said front linkage assembly and said rear linkage assembly operably connecting both skis together allowing for the skis to pivot and move about a central pivot point allowing a downward pressure on either side of said mounting plate to be translated into an upward force on an opposite side of said plate, thereby providing an upward lifting force to a ski edge beneath said opposite side of said plate resulting in a parallel synchronized motion with outside and inside edges of the skis always maintaining the same position relative to each other.

5,558,355

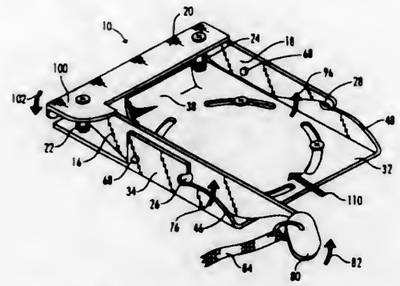
SNOWSPORT BINDINGS

Howarth P. Henry, 1760 Pomona Ave. #65, Costa Mesa, Calif. 92627

Continuation of Ser. No. 951,233, Sep. 25, 1992, abandoned. This application Mar. 14, 1994, Ser. No. 213,467

Int. Cl.[6] A63C *9/10*; B62B *13/00*

U.S. Cl. 280—624 **9 Claims**



1. A binding for use with a snowsport boot having two pin ends extending therefrom and a piece of snowsport equipment, each pin end defining a circumference, the binding comprising:

a base adapted to be fixed to the piece of snowsport equipment, the base having a pair of side members, each side member having a first edge defining an indentation configured to receive at least a portion of one of the pin ends, each side member having a side member portion extending above the indentation for restricting upward movement of the pin ends upon the pin ends being received within the indentations;

a pivotal arm mechanism pivotally mounted to the base for pivotal movement between a first position and a second position relative to the base, the pivotal arm mechanism having a second edge associated with each side member and cooperating with the indentation in the associated side member to define a closed pin receptacle upon the arm mechanism being in the first position relative to the base and an open pin receptacle upon the arm mechanism being in the second position relative to the base, the pin receptacles being adapted to receive the pin ends extending from the boot; and

at least one spring coupled to the pivotal arm mechanism for biasing the pivotal arm mechanism toward the first position relative to the base; wherein upon the pivotal arm being in the first position the second edge is disposed adjacent the first edge of the indentation in the associated side member auch that the combination of the adjacent first and second edges forms a pin receptacle having a substantially closed loop shape to substantially surround the circumference of a pin end when received in the pin receptacle.

5,558,356

BINDING ELEMENT FOR ALPINE SKIS

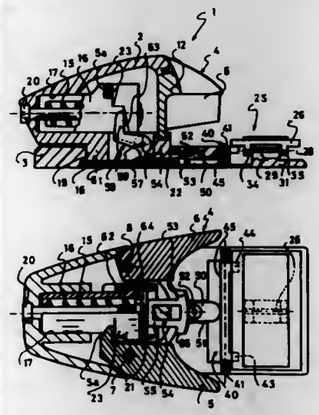
Christian Challande, Cruseilles; Pascal Thomas, Chambery, and Pierre Desarmaux, Evires, all of France, assignors to Salomon S.A., Metz-Tessy, France

Filed Aug. 11, 1994, Ser. No. 288,753

Claims priority, application France, Aug. 18, 1993, 93 10190

Int. Cl.[6] A63C *9/085*

U.S. Cl. 280—625 **12 Claims**



1. A binding for retaining a boot on an alpine ski, said binding comprising:

a base for attachment to a ski;

a body mounted on said base;

means for mounting said body for free rotation about an upward exteading axis with respect to said base;

a latch movable between a latched position and an unlatched position, said body being retained against said free rotation in said latched position of said latch;

a retention jaw borne by said body, said retention jaw comprising two laterally opposed retention wings which laterally retains the boot and a sole clamp which vertically retains the boot;

a spring housed in said body which elastically opposes release movements of said jaw in response to forces transmitted by the boot;

a support plate for supporting a sole of the boot;

means for defining a rocking motion of said support plate about a predetermined longitudinal axis fixed relative to the ski said longitudinal axis being parallel to a longitudinal direction of the ski; and

a linking device operatively connecting said support plate to said spring, said linking device comprises means for reducing a predeterminate resistance force to be overcome by the boot for release of the boot from the retention jaw in response to a force exerted on said support plate for generating said rocking motion of said support plate about said longitudinal axis, said reducing means further comprising means for moving said latch from said latched position to said unlatched position.

5,558,357

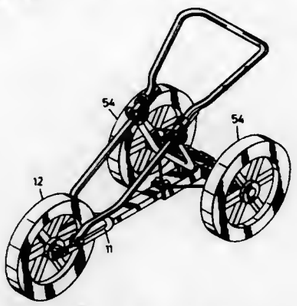
TROLLEY FRAME FOLDABLE IN ONE-STEP OPERATION

Teresa Wang, Taichung, Taiwan, assignor to Sci-Tw International Inc., Taichung, Taiwan

Filed Aug. 24, 1995, Ser. No. 518,754

Int. Cl.[6] B62B *7/08*

U.S. Cl. 280—647 **4 Claims**



1. A foldable frame for a trolley, comprising:

an elongated straight main body having a front end portion and a rear end portion;

a slide member sleeved movably on said main body and being movable frontwardly to a storage position on said main body;

two axle units located on two sides of said main body and each of which consisting of a parallelogram linkage including an inner link member secured to said rear end portion of said main body in such a manner that said parallelogram linkages has a common inner link member, each of said axle units further including two parallel transverse links having inner ends connected pivotally to said inner link member, and an outer link member connected pivotally to outer ends of said transverse links and having a transverse hole formed therethrough so as to be adapted to mount an axle of a wheel rotatably within said transverse hole, said transverse links being located in parallel with said main body when said slide member is moved to the storage position in such a manner that said transverse holes of said outer link members are transverse to said main body;

a pair of connecting rods, each of said connecting rods having a first end connected pivotally to said slide member, and a second end connected pivotally to a corresponding one of said outer link members so as to position said parallel links on said main body;

a pair of inclined lengthwise extending support rods having front end portions pivoted to said front end portion of said main body in such a manner that said support rods can rotate about a horizontal axis;

a U-shaped support having two inclined arms pivoted to rear end portions of said support rodslat upper ends thereof in such a manner that each of said arms is rotatable about an upper horizontal axis which is located near the upper end of said arm, and a horizontal section interconnecting lower ends of said arms and connected pivotally to said slide member, in such a manner that said arms extends forwardly and upwardly from said horizontal section and that said horizontal section can rotate about a lower horizontal axis which is located near said horizontal section below said upper horizontal axis; and

a push member having a front end portion connected pivotally to the rear end portions of said support rods and rotatable about

a horizontal axis to overlap on said support rods so as to reduce total length of said frame;

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COLLAPSIBLE LUGGAGE CARRIER

a pair of control arms, each control arm having a vertical portion directly connected to said at least one shock absorber, a

a horizontal axis to overlap on said support rods so as to reduce total length of said frame;

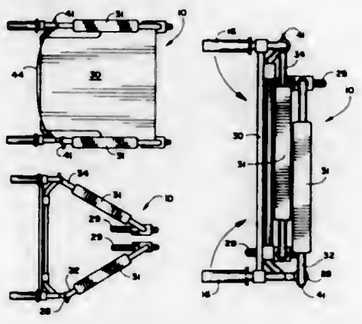
whereby, said trolley frame can be folded in a one-step operation by moving said slide member to said storage position so that said parallel links and said support rods are adjacent to and generally parallel with said main body, thus reducing total height and width of said trolley frame.

5,558,358

COMBINATION WHEELCHAIR AND WALKER

Candace L. Johnson, 10466 Moselle St., San Diego, Calif. 92131

Filed Jun. 19, 1995, Ser. No. 492,216
Int. Cl.[6] B62M 1/14
U.S. Cl. 280—648 **2 Claims**



1. A convertible wheelchair/walker device which is convertible between a wheelchair, a walker, and a transport or storage configuration, comprising:

a back frame formed by a pair of uprights interconnected by at least one cross-member, one of said uprights having an extension member extending forwardly therefrom and each of said uprights having a surface support wheel with a fixed direction of rotation mounted at a lower end thereof;

a substantially planar rigid seat pivotably connected to said cross-member;

a pair of side frame members, each having a surface support wheel mounted at a lower forward end thereof for pivotable movement about a vertical axis, one of said side frame members being pivotally connected at a rearward end directly to one of said pair of uprights by means of a first pivotal connection and the other side frame member being connected at a rearward end to said extension member of said one upright by means of a second pivotal connection, the wheelchair/walker device being in a wheelchair mode with a substantially rectangular configuration in plan form when the side frame members are extending forwardly from the uprights and substantially parallel to each other and the seat has been pivoted to a substantially horizontal position between the side frame members, a walker mode with a triangular configuration in plan form when the seat has been pivoted to a substantially vertical position extending between the uprights and the side frame members have been pivoted to bring their forward ends into close proximity, and a transport/storage mode with the side frame members extending parallel to the back frame when the seat has been pivoted to a substantially vertical position extending between the uprights, the one side frame member has been pivoted against an under surface of the seat, and the other side frame member has been pivoted against the one side frame member; and

locking means located within said first and second pivotal connections for selectively locking said pair of side frame members in selected pivotal positions relative to the uprights to define the wheelchair, walker, and transport/storage modes.

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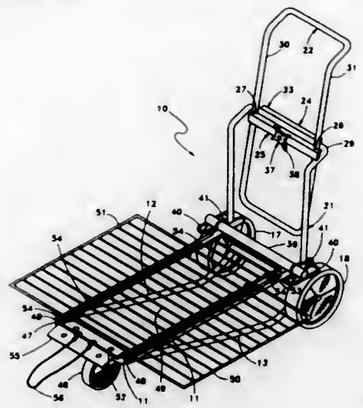
COLLAPSIBLE LUGGAGE CARRIER

William D. Phears, 1781 Freedom Dr., Melbourne, Fla. 32940

Filed Jun. 5, 1995, Ser. No. 462,187
Int. Cl.[6] B62B 3/02
U.S. Cl. 280—654 **3 Claims**



1. A collapsible luggage carrier comprising:

(a) a support frame;

(b) at least one support arm attached to the support frame;

(c) a tubular axle sleeve member attached to the support arm;

(d) a rear axle in and extending beyond opposing ends of the axle sleeve member;

(e) a rear wheel rotatively attached to each end of the rear axle;

(f) a lower handle member pivotally connected to the rear axle and adjacent the opposing ends of the axle sleeve member;

(g) an upper handle member slidingly and lockingly connected to the lower handle member;

(h) a releasable lower handle member upright locking brace adjacent the support frame;

(i) a pair of opposing locking brace supports abutting the locking brace;

(j) a front wheel rotatingly connected to the support frame at an end of the support frame distal the rear axle;

(k) a support grille adjustment bar attached to an upper side of the support frame;

(l) a support grille slidingly connected to the support grille adjustment bar; and

(m) a support grille wing hingedly attached to opposing ends of the support grille.

5,558,360

VEHICLE SUSPENSION SYSTEM FOR A STEERABLE DRIVE WHEEL

Unkoo Lee, Kyungki, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Dec. 28, 1993, Ser. No. 174,017
Claims priority, application Rep. of Korea, Dec. 30, 1992, 92-26741; Dec. 30, 1992, 92-26742
Int. Cl.[6] B60G 3/00
U.S. Cl. 280—675 **3 Claims**

1. A vehicle suspension system for a steerable wheel comprising:

a wheel carrier for rotatably supporting a wheel, said wheel carrier including a projection portion at a rear part thereof connected with a tie rod by a ball joint, said wheel carrier being steered by said tie rod;

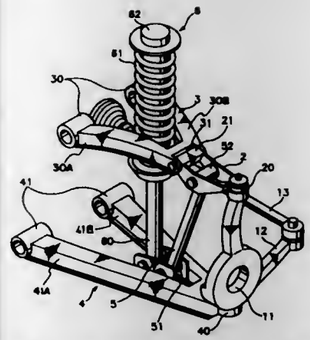
a connecting arm including a wheel side end connection part pivotally connected to an upper part of said wheel carrier and a vehicle side end connection part;

an upper control arm including diverging vehicle body side end connection parts diverged into a front branch and a rear branch and a wheel side end connection part, said diverging vehicle body side end connection parts of said upper control arm connecting said wheel carrier to a vehicle body, and said wheel side end connection part connected to the vehicle side end connection part of said connecting arm;

a lower control arm including diverging vehicle body side end connection parts diverged into a front branch and a rear branch and a wheel side end connection part, said diverging vehicle body side end connection parts of said lower control arm connecting the lower part of said wheel carrier to said vehicle body, and said wheel side end connection part connected to a lower end of said wheel carrier;

a connecting link including an upper connection part and a lower connection part, said upper connection part being connected to a point of said connecting arm substantially the same distance from said wheel side end connection part and said vehicle side end connection part and said lower connection part being connected to said lower control arm closer to said wheel carrier than to the vehicle body side of the lower control arm; and

a strut assembly including a shock absorber and a spring, said strut assembly including an upper part connected to said vehicle body by an insulator connection part, and a lower part pivotally connected to a neighboring point of said lower connection part of said connecting link.

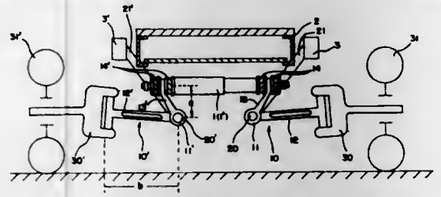


5,558,361

SUSPENSION SYSTEM FOR FRONT WHEELS OF A LOW-BODY BUS

Dong W. Shin, Ulsan-si, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Oct. 5, 1994, Ser. No. 318,437
Int. Cl.[6] B60G 3/06
U.S. Cl. 280—697 **11 Claims**



1. A suspension system for a low-body bus comprising:

a pair of frame members positioned parallel to a longitudinal axis of and coplanar with a lower portion of a vehicle body;

a pair of wheel carriers, each wheel carrier rotatably connected to a respective one of a pair of front wheels and positioned below the vehicle body;

at least one shock absorber disposed horizontally below the vehicle body and transversely positioned with respect to the longitudinal axis of the vehicle body;

a pair of control arms, each control arm having a vertical portion directly connected to said at least one shock absorber, a horizontal portion directly connected to a respective one of said pair of wheel carriers, and a middle portion where the horizontal portion and the vertical portion pivotally connect, said pair of control arms being entirely positioned below said vehicle body; and

a pair of torsion bars, each torsion bar having one end connected to the middle portion of a respective one of said pair of control arms and the other end connected to a respective one of said frame members wherein said pair of torsion bars are entirely positioned below the vehicle body.

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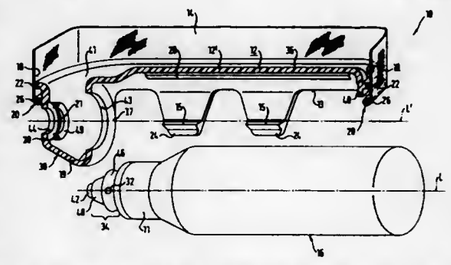
GAS BAG MODULE

Dominique Acker, Alfdorf, and Adolf M. Kuhn, Welzheim, both of Germany, assignors to TRW Repa GmbH, Alfdorf, Germany

Filed Apr. 28, 1995, Ser. No. 431,102
Claims priority, application Germany, May 2, 1994, 44 15 374.0
Int. Cl.[6] B60R 21/20;21/26
U.S. Cl. 280—728.2 **6 Claims**



1. A gas bag module for a passenger-side vehicular restraint system, comprising an elongate mounting wall, an elongate gas generator having a generally cylindrical container, and an inflatable gas bag with a gas bag wall and an inflation opening defined in said gas bag wall by a bead, said mounting wall comprising an outer peripheral edge with a first, outwardly extending wall portion and a second wall portion extending transversely to said first wall portion, said first and second wall portions defining a peripheral seat, and said bead being engaged in said seat with a tight fit, said bead being located on a first side of said mounting wall and said gas bag wall extending on a second side of said mounting wall opposite said first side, and said mounting wall further comprising a plurality of resiliently deflectable arms extending away from said mounting wall on the first side thereof, said arms, upon pushing said gas generator towards said mounting wall, being initially resiliently deflected by said container and thereafter snapping behind said container.

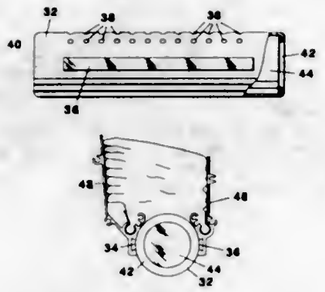
5,558,363

SLIDE-ON COMBUSTION CHAMBER FOR AUTOMOTIVE AIRBAG MODULE

Kim V. Dahl, Clinton, Utah, assignor to Morton International, Inc., Chicago, Ill.

Filed Sep. 7, 1995, Ser. No. 524,871
Int. Cl.[6] B60R 21/20;21/26
U.S. Cl. 280—728.2 **12 Claims**

1. In an automotive airbag module including first and second side walls for housing a deflated airbag therebetween and an elongated tubular combustion chamber extruded with an outer wall having integral first and second side rails extending longitudinally therealong and connected to both of said side walls for inflating said airbag, the improvement which comprises:



said combustion chamber having first and second ends and wherein said first and second side rails terminate short of the first end of said chamber;

an end base member housed within the first end of said combustion chamber; and

said outer wall at the first end of said combustion chamber being radially formed to seal said base member within the first end of said combustion chamber.

5,558,364

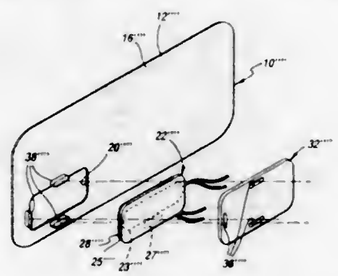
PLASTIC AIR BAG COVER HAVING AN INTEGRATED LIGHT SOURCE

David J. Davis, Troy, Mich., assignor to Larry J. Winget, Leonard, Mich.

Filed Jun. 7, 1995, Ser. No. 477,873

Int. Cl.[6] B60R *21/20*; B60Q *3/04*

U.S. Cl. 280—728.3 **18 Claims**



1. A plastic air bag cover having an integrated light source and adapted for use within a passenger compartment of a vehicle, the cover comprising:

a front panel adapted to overlie an undeployed air bag, the front panel having a front outer surface and rear inner surface, wherein the front panel has a window associated therewith capable of transmitting light therethrough;

a light source module including a base plate and a light source mounted on the base plate; and

a back plate secured to the rear inner surface of the front panel in containing relationship to the light source module to form a hollow compartment for the light source module wherein light from the light source is transmitted through the window to provide an information-bearing image within the passenger compartment whereby information is provided to a passenger of the vehicle.

5,558,365

TETHERED AIR BAG

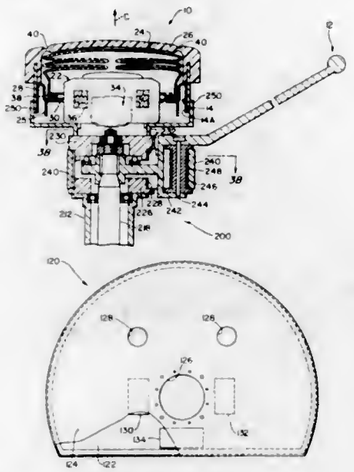
Naoki Oe; Koki Sato, and Keiichi Tamura, all of Aichi-ken, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki Seisakusho, Aichi-ken, Japan

Continuation-in-part of Ser. No. 123,168, Sep. 20, 1993, abandoned. This application Nov. 7, 1994, Ser. No. 337,009

Claims priority, application Japan, Dec. 18, 1992, 4-087032 U

Int. Cl.[6] B60R *21/22*

U.S. Cl. 280—731 **4 Claims**



3. An air bag apparatus disposed in a vehicle in an immovable state, wherein a bag is inflated in a state of sudden deceleration of said vehicle to protect an occupant by being interposed between a vehicle body and said occupant, said air bag apparatus comprising:

a stationary pad;

means for holding said stationary pad immovable during turning of a steering wheel, said means comprising a planetary gear structure including a fixed gear having a training portion formed continuously over an outer peripheral surface of said fixed gear,

a sun gear having a training portion formed continuously over an outer peripheral surface of said sun gear and wherein said sun gear is rotatable relative to a steering shaft and said stationary pad is mounted on said sun gear,

a plurality of planetary gears coupled with said steering wheel, wherein said planetary gears include a training portion formed continuously over an outer peripheral surface of said planetary gears, and

a timing belt cooperating with said training portion of said sun gear, said fixed gear and said planetary gears respectively; and

a heteromorphic bag accommodated in a folded state in said stationary pad, said bag including, in its inflated state, a portion corresponding to the head of said occupant and a portion corresponding to a portion other than said head of said occupant, wherein said bag in said inflated state is formed so that said portion corresponding to a portion other than the head of said occupant is made smaller as compared with said portion corresponding to the head of said occupant, wherein

said portion corresponding to a portion other than the head of said occupant is bounded by a lower portion of said bag formed into a substantially straight line.

5,558,366

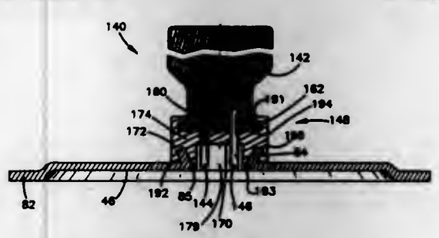
INITIATOR ASSEMBLY FOR AIR BAG INFLATOR

Homer W. Fogle, Jr.; Todd Bailey; Brian R. Plistick, all of Mesa, and Eric Streff, Higley, all of Ariz., assignors to TRW Inc., Lyndhurst, Ohio

Filed Aug. 22, 1995, Ser. No. 517,740

Int. Cl.[6] B60R *21/26*

U.S. Cl. 280—736 **24 Claims**



2. An initiator assembly comprising:

(a) a retainer comprising an opening;

(b) an igniter having a longitudinal axis and comprising a pyrotechnic material on said axis which on ignition exerts an axial force; and

(c) a preformed plastic coupler plug received within said retainer opening, said plug comprising

(i) locking surfaces engaging said igniter and said retainer and holding said igniter in a spaced relationship with respect to said retainer;

(ii) a sealing portion integral with said locking surfaces providing a seal in the space between said retainer and said igniter, said sealing portion increasing in seal tightness when exposed to said axial force;

said igniter longitudinal axis being aligned with said retainer opening and said axial force being exerted in the direction of said opening;

said igniter and said retainer comprising opposed spaced-apart surfaces and said coupler plug sealing portion being a compressible annular continuous web between said opposed spaced-apart surfaces;

said compressible web having a shore A hardness in the range of about 20 to about 100 in a temperature range between about −40° C. to about 150° C.

5,558,367

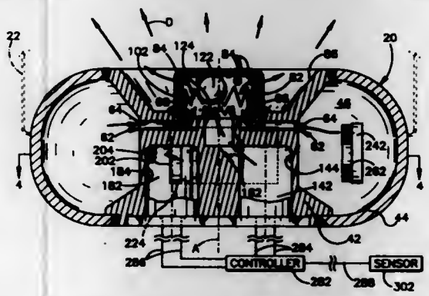
DUAL STAGE AUGMENTED INFLATOR FOR AN AIR BAG

Jess A. Cuevas, Scottsdale, Ariz., assignor to TRW Inc., Lyndhurst, Ohio

Filed Mar. 14, 1995, Ser. No. 403,386

Int. Cl.[6] B60R *21/26*

U.S. Cl. 280—737 **25 Claims**



1. An apparatus for use in inflating an air bag, said apparatus comprising:

a first housing;

a second housing fixed to and surrounded by said first housing to define a chamber for an inflation fluid;

a flow passage extending through one of said first and second housings for conducting inflation fluid from the chamber to an air bag;

a rupturable closure member fixed to one of said first and second housings for blocking fluid communication through said flow passage when the closure member is in an unruptured condition;

first actuatable initiator means located in said second housing for effecting the rupture of said closure member, upon actuation, to enable fluid flow through said flow passage;

a second actuatable initiator located in said second housing; and

an ignitable material for effecting an increase in the temperature and pressure of the inflation fluid in the chamber in response to actuation of said second initiator, said ignitable material located in a passage in said second housing and extending between said second initiator and the chamber.

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CHASSIS STRUCTURE

John R. Cerny; Mohamad S. El-Zein, both of Bettendorf, Iowa; Richard A. Curry; Maurice A. Popelier, both of Moline, Ill., and Harold E. Krause, Milan, Ill., assignors to Deere & Company, Moline, Ill.

Filed Nov. 3, 1994, Ser. No. 333,923

Int. Cl.[6] B62D *21/00*

U.S. Cl. 280—781 **103 Claims**

99. A vehicle chassis that is adapted to carry a power means, steering and drive wheels and a steering means, said chassis comprised of reinforced plastic composite material and including first and second elongated side members, said side members including two generally rigid members joined with two flexible panels adapted to accommodate torsional or bending loads encountered by the chassis.

5,558,369

TAPPING PLATE AND RETENTION BRACKET ASSEMBLY

Joel T. Cornea, Ortonville, and Andrew J. Tomlin, Harrison Township, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

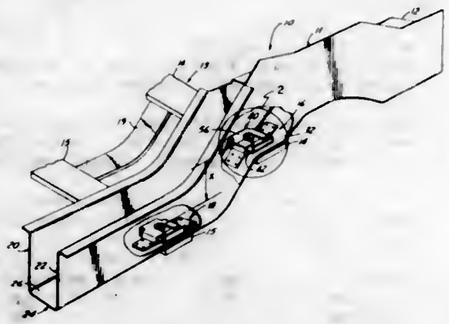
Filed Jun. 20, 1995, Ser. No. 492,882

Int. Cl.[6] B62D *21/02*; F16B *37/00*;*37/06*

U.S. Cl. 280—800 **9 Claims**

1. A tapping plate and retention bracket assembly for a vehicle frame web comprising:

a sheet metal retention bracket for mounting a tapping plate, said bracket having a rectangular central section, inboard and outboard side walls upstanding at right angle bends from opposite longitudinal side edges of said section, an apertured



top flange extending outboard at right angles from the upper end of said inboard side wall, said top flange having fore and aft end walls downstanding from opposite transverse edges thereof and a longitudinal free edge adjacent an upper free edge of said outboard side wall;

said central section having an oversize hole aligned with said top flange aperture on a vertical axis, and forward and aft attachment tongues each extending at an obtuse angle bend from associated opposite forward and aft transverse end edges of said section; and

a tapping plate adapted to overlie said bracket central section for controlled movement relative thereto, said plate having a central threaded bore therethrough adapted for alignment on said axis for receiving a fastener, said tapping plate positioned between said fore and aft end walls and below said top flange; whereby

with said bracket central section adapted for flush contact with a frame horizontal web pedestal, said forward and aft tongues are adapted for flush welding attachment with associated forward and aft sloped web portions with said tongues providing reinforcement of the pedestal.

5,558,370

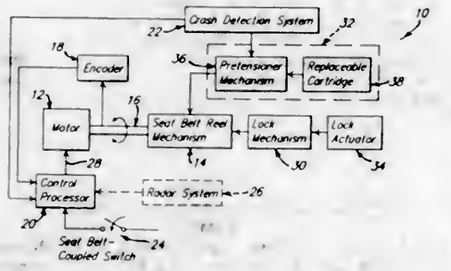
ELECTRONIC SEAT BELT TENSIONING SYSTEM

Leonard W. Behr, White Lake, Mich., assignor to Automotive Systems Laboratory, Inc., Farmington Hills, Mich.

Filed Mar. 30, 1995, Ser. No. 413,601

Int. Cl.[6] B60R *22/44;22/46;22/48*

U.S. Cl. 280—806 **9 Claims**



9. A vehicle seat belt tension control system comprising:

a control means coupled to a seat belt tensioning mechanism, said control means comprising:

a processor means for monitoring a predetermined condition of the vehicle;

an electric motor coupled to said seat belt tensioning mechanism for adjusting the tension of said seat belt based on the monitored vehicle condition;

means for detecting seat belt payout;

means responsive to said pay out detecting means for detecting an unsafe occupant seating condition; and

a tactile warning means coupled to said seating condition detection means and said control means for alerting the occupant to a detected unsafe seating condition by causing said electric motor to momentarily increase the seat belt tension to tug on the occupant; and

a pretensioner means connected to the seat belt tensioning mechanism for tensioning the seat belt in response to a detected emergency vehicle condition, said pretensioner means comprising a replaceable pyrotechnic cartridge.

5,558,371

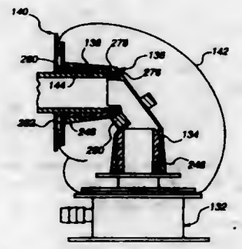
RESUSCITATOR

Richard J. Lordo, West Deer Township, Pa., assignor to Respironics, Inc., Murrysville, Pa.

Filed Sep. 26, 1994, Ser. No. 312,238

Int. Cl.[6] A62B *7/10;* **F16L** *27/107*

U.S. Cl. 285—114 **21 Claims**



8. A flexible tubular hinge member for fluidly coupling first and second tubular fluid carrying conduits, said flexible tubular hinge member comprising:

a first socket at a first end of said flexible tubular hinge member for sealingly receiving said first tubular conduit;

a second socket at a second end of said flexible tubular hinge member for sealingly receiving said second tubular conduit;

a deflection-resistant intermediate region possessing a first moment of inertia disposed between said first and second sockets; and

deflection sites possessing lower moments of inertia than said first moment of inertia arranged between said first socket and said intermediate region and between said second socket and said intermediate region,

wherein said intermediate region comprises a crush-resistant abutment means for abutting at least one of said first and second sockets for limiting flexure of said tubular member about said deflection sites, said crush-resistant abutment means comprising at least one substantially annular, radially outwardly projecting flange.

5,558,372

INSIDE DOOR HANDLE TOGGLE RELEASE MECHANISM

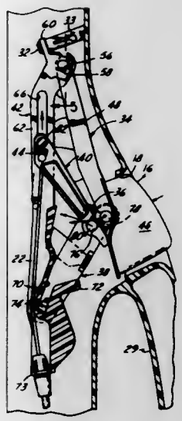
Richard C. Kapes, Shelby Twp, and Dennis M. Feher, Washington, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jan. 3, 1995, Ser. No. 368,282

Int. Cl.[6] L05B *63/20*

U.S. Cl. 292—336.3 **10 Claims**

1. A toggle release mechanism for a vehicle door latch control assembly, the toggle release mechanism comprising a base member, a first lever having two opposite ends pivotally connected at one end thereof to said base member, a second lever having two opposite ends pivotally connected at one end thereof to the other end of said first lever and slidably connected at the other end



thereof along said base member, an actuating member pivotally connected at one end thereof to said base member and rollingly connected to said one end of said second lever, and means formed on said other end of said second lever for connecting a cable thereto adapted to being pulled upon depression of said actuating member.

5,558,373

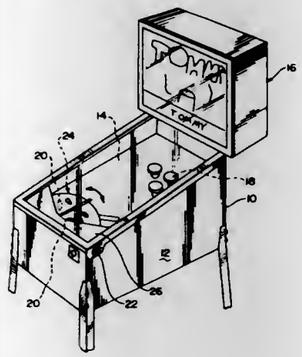
PINBALL MACHINE WITH MOVING FEATURE

Paul M. Lesley, and Michael D. Toler, both of Chicago, Ill., assignors to Sega Pinball, Inc., Melrose Park, Ill.

Filed Nov. 14, 1994, Ser. No. 337,736

Int. Cl.[6] A63F *7/02;7/30*

U.S. Cl. 273—119 R **9 Claims**



1. A pinball machine which comprises;

a housing which carries a playfield;

a plurality of targets and play features on said playfield;

at least one manually operated ball flipper on said playfield;

a flipper obscurer; and

means for deploying and retracting said flipper obscurer such that said flipper is not visible to the player when said flipper obscurer is deployed and is visible to the player when said flipper obscurer is retracted.

5,558,374

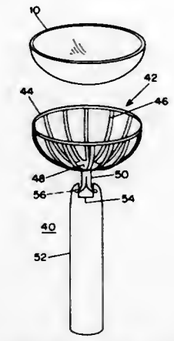
CONTACT LENS APPLICATOR

Kenneth Harrison, 813 Sussex Rd., Franklin Lakes, N.J. 07417

Continuation-in-part of Ser. No. 279,253, Jul. 21, 1994, Pat. No. 5,407,241. This application Feb. 13, 1995, Ser. No. 388,554

Int. Cl.[6] A61F *9/00*

U.S. Cl. 294—1.2 **7 Claims**



1. Apparatus for retaining and applying a contact lens, comprising:

a base member having a concave upper chamber, said chamber being larger in diameter than said lens;

an applicator wand having a cup-shaped upper receptacle having radially extending fingers connected to a peripheral ring, said peripheral ring being smaller in diameter than said lens, said receptacle being receivable in said concave chamber and a handle portion connected to the center of said receptacle and removably extending through an opening in said base member; and

a fluid permeable retaining member having a convex lower surface for insertion into said concave upper chamber and being arranged to releasably connect to said base member to hold a lens in said concave chamber against said upper receptacle.

5,558,375

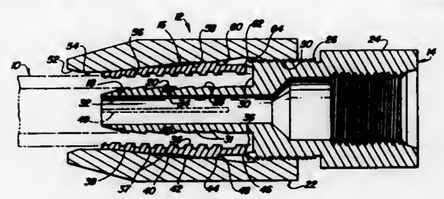
QUICK ATTACH, REUSABLE HOSE FITTINGS

Kenneth L. Newman, Moline, Ill., assignor to Deere & Company, Moline, Ill.

Filed Jul. 10, 1995, Ser. No. 500,074

Int. Cl.[6] F16L *55/00*

U.S. Cl. 285—23 **7 Claims**



1. In a hose fitting including a fitting body, a compressible collet and a compression nut, with said fitting body having an exteriorly threaded section to which is joined a nipple having an outside diameter somewhat less than a diameter of said threaded section so as to define an annular stop surface facing axially in a first direction, with said compression nut being disposed in concentric relationship to said nipple and having a threaded bore at one end screwed onto said threaded section of said fitting body and with said collet being received within said compression nut and having a frusto-conical exterior surface section located for cooperating

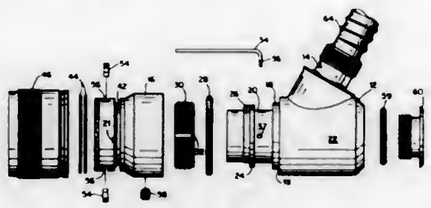
with a frusto-conical interior surface section of said compression nut to effect a first force in a first zone for deflecting the collet inwardly as the compression nut moves axially in a second direction relative to said collet when being screwed onto said threaded section, the improvement comprising: said collet having a second frusto-conical exterior surface section spaced axially from said first-named frusto-conical exterior surface; section and said compression nut having a second frusto-conical interior surface section spaced axially from said first-named frusto-conical exterior surface section, with said second exterior and interior frusto-conical surface sections being disposed for cooperating with each other to effect a second force in a second zone for deflecting the collet inwardly as the compression nut moves axially in said second direction relative to said collet; and said collet having an annular surface joined to said second frusto-conical surface and facing axially in said second direction; and said compression nut including an annular retaining surface located radially outwardly of said threaded bore and disposed in confronting relationship to said shoulder, whereby said collet may be preassembled by inserting it through said threaded bore of said compression nut while the collet is in an inwardly compressed state, the collet then returning to its uncompressed state where the annular shoulder thereof confronts the retaining surface of said compression nut and thus is prevented from being dislodged from the interior of said compression nut.

5,558,376

LOW PROFILE SWIVEL ADAPTERS

Roger Woehl, Rohnert Park, Calif., assignor to Engineered Transitions Co., Inc., Healdsburg, Calif.

Filed Mar. 2, 1995, Ser. No. 397,874
Int. Cl.[6] F16L *55/00*
U.S. Cl. 285—91 **7 Claims**



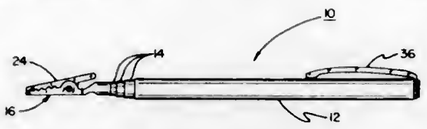
1. A swivel joint comprising
a hollow main body member having a central axis,
a hollow internally threaded second body member having a central axis coaxial with said main body,
an externally threaded annular bearing,
said main body member having a cylindrical bearing surface defined between two walls and extending toward said second body member,
said annular bearing being seated on said cylindrical bearing surface bar rotation relative thereto,
said second body member threaded onto said annular bearing, and
means for substantially reducing the effects of side and end thrust on said second body member,
said means comprising
said annular bearing having dimensions substantially precisely equal to the dimensions of said bearing surface between said walls.

5,558,377

TELESCOPING CLIP IMPLEMENT

Robert Blum, and George McKeon, both of 4690 Bradley Ct., both of Doylestown, Pa. 18901

Filed May 8, 1995, Ser. No. 438,085
Int. Cl.[6] B25J *1/02*
U.S. Cl. 294—19.1 **5 Claims**



1. A telescoping clip implement comprising:
an elongated handle tube symmetrically oriented about a longitudinal axis directed therethrough, wherein the handle tube is shaped so as to define a closed storage cavity extending into a first end thereof, the storage cavity being shaped so as to define a plurality of handle tube interior threads; and an end cap having an end cap threaded plug threadably engaged to the handle tube interior threads;
a plurality of extension tubes telescopingly received within the handle tube which can be selectively extended therefrom into an extended position, said handle tube being of a first diameter with the extension tubes each being of a diameter substantially less than the first diameter of the handle tube and wherein the plurality of extension tubes includes a first extension tube slidably received within the handle tube and extendable therefrom, a second extension tube slidably received within the first extension tube and slidable therefrom, and a third extension tube slidably received within the second extension tube and slidably extendable therefrom, a free distal end of the third extension tube being shaped so as to define an extension tube threaded projection; and
an engaging means mounted to the free distal end of the third extension tube for engaging an object so as to permit manual manipulation of the object by an individual when holding the handle tube, said engaging means comprising a spring clip including a mounting boss secured to the free distal end of the third extension tube; a first mounting jaw extending from the mounting boss; and a second jaw pivotally mounted relative to the first jaw wherein the mounting boss includes a threaded bore with the extension tube threaded protection being threadably received within the bore of the mounting boss.

5,558,378

GRAPPLING-TYPE SHOVEL

Edward Byrd, Stubbins East Ogwell, Devon England, England

Filed Nov. 15, 1995, Ser. No. 558,801
Int. Cl.[6] A01B *1/18*
U.S. Cl. 294—50.8 **5 Claims**

1. A grappling-type shovel, comprising:
a pair of semicircular blades each having a concave inner surface and a convex outer surface, each of said blades also having a first, planar cutting surface which, when said blades are pivoted by the outward movement of the upper ends of a pair of handles, may be brought into cooperative engagement with one another to retain excavated material between said blades, each of said blades further having, at the bottom thereof, a second cutting surface diverging from said first cutting surface;
a hinge pivotally securing said blades together, said hinge including a pair of pivot plates extending from said concave inner surfaces of said blades and a pivot pin joining said plates
a pair of elongated handles having upper and lower ends, said elongated handles being secured at their lower ends to said blades and,
a foot pedal pivotally secured to the lower end of one of said handles.

5,558,379

IMPLEMENT HAVING AN ERGONOMIC STEP

Herbert U. Wehner, Columbus, Ohio, assignor to UnionTools, Columbus, Ohio

Filed Aug. 12, 1994, Ser. No. 288,706
Int. Cl.[6] A01B *1/02*
U.S. Cl. 294—60 **12 Claims**

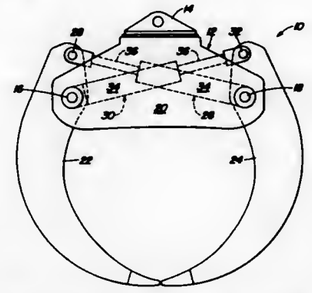
1. An implement comprising:
a handle having a gripping portion and a centerline extending through the gripping portion;
a work engaging portion;
a first step having a substantially flat, foot engaging surface lying in a first plane;
a second step having a substantially flat, foot engaging surface lying in a second plane, the first and second planes defining a line of intersection where the first and second planes cross, said line of intersection being below the first and second foot engaging surfaces;
wherein the centerline of the gripping portion is substantially perpendicular to the line of intersection formed by the first and second planes and the line of intersection formed by the first and second planes forms an acute angle with the work engaging portion.

5,558,380

LOGGING GRAPPLE

Douglas G. Meyer, and Stanley L. Irwin, both of Dubuque, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Sep. 19, 1994, Ser. No. 308,778
Int. Cl.[6] B66C *1/42*
U.S. Cl. 294—88 **7 Claims**



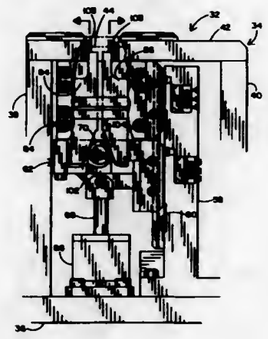
1. A logging grapple for use with a logging skidder, the grapple comprising:
a rigid grapple head having a grapple mounting assembly for mounting the grapple head to a logging skidder and left and right tong mounting assemblies for pivotally mounting tongs to the grapple head, the left and right tong mounting assemblies are fixed relative to one another;
a left tong is pivotally mounted to the left tong mounting assembly, the left tong having a first hydraulic cylinder mounting assembly;
a right tong is pivotally mounted to the right tong mounting assembly, the right tong having a second hydraulic cylinder mounting assembly;
a first double acting hydraulic cylinder is mounted between the first hydraulic cylinder mounting assembly and the right tong mounting assembly;
a second double acting hydraulic cylinder is mounted between the second hydraulic cylinder mounting assembly and the left tong mounting assembly.

5,558,381

CARRIER OPENER SYSTEM

Joon Park, Glendale, Calif., assignor to Hughes Aircraft Co., Los Angeles, Calif.

Filed Oct. 14, 1994, Ser. No. 323,408
Int. Cl.[6] H05K *13/00*
U.S. Cl. 294—88 **16 Claims**



1. A carrier opener system comprising:
a frame;

walls in said frame defining a channel into which an electronic

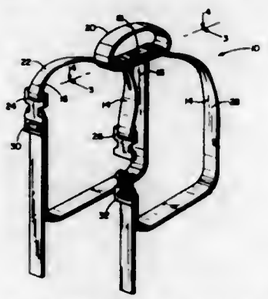
loops at the top thereof adjacent to the member, and the loops

able platform of modular design is mounted, the platform including

5,558,386

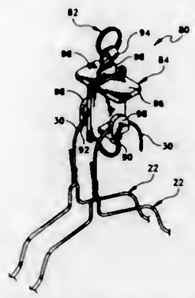
walls in said frame defining a channel into which an electronic component retaining carrier can be inserted;
a carriage mounted in said frame, said carriage carrying guide pins thereon, said carriage being movable with respect to said frame toward said channel so that said guide pins enter said channel to position a carrier in said channel;
fingers on said carriage, said fingers being positioned to move into said channel when said guide pins move into said channel;
means to more said fingers with respect to each other to act upon a carrier in said channel to uncaptivate a component beld by said carrier;
a driver movably mounted in said frame to move in the same direction as said carriage in said frame, said driver being connected to said carriage to move said carriage so that guide pins enter said channel, wherein said carriage is mounted on said driver to be resiliently moved by said driver so that said driver and said carriage move together from a first position wherein said guide pins are out of said channel to a second position wherein said guide pins are in said channel;
a stop for limiting motion of said carriage with respect to said frame when said driver moves said carriage to said second position wherein said guide pins are in said channel; and
drive means for said driver to move said driver from a second position to a third position and said means to move said fingers includes cam faces actuated by movement of said driver from said second to said third position.

5,558,382
STRAP-STYLE ARTICLE CARRIER
James J. Wengler, Minneapolis, Minn., assignor to Robert Davidson, Southport, Conn.
Filed Sep. 28, 1994, Ser. No. 314,223
Int. Cl.[6] A45F *5/10;* **B65D** *63/18*
U.S. Cl. 294—157 **12 Claims**



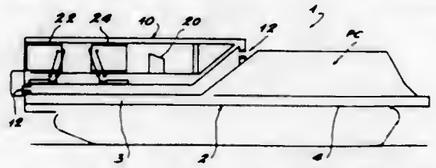
1. A carrier for a heavy article having a top portion, sides, a front, a rear, and a fore and aft axis such as an outboard motor comprising,
a pair of downwardly extending article-encircling loops of flexible strap material including a rear strap loop for encircling the rear of the article and a front strap loop encircling the front of the article,
a member for providing a comfortable gripping surface, said member is a piece of fabric proximate the article-encircling loops of strap material at a top portion of the article during use to provide a hand grip for the carrier,
each of said article-encircling loops of strap material is positioned during use in an inclined plane wherein the rear strap loop projects rearwardly from the member at an oblique angle and the front strap loop projects forwardly at an oblique angle whereby the strap loops lie in inclined planes and encircle the article obliquely when in place on the article such that the strap loops join one another at the top portion of the article and are spread apart at a bottom portion thereof,
the carrier having a tension-absorbing connecting portion aligned a) with the member and b) aligned with said strap loops at the top thereof adjacent to the member, and the loops of strap material include the connecting portion at a point where the strap loops join one another adjacent to the member,
the tension-absorbing connection portion and said member both lie across the top portion of said article and extend from one side thereof to the other side at right angles to the fore and aft axis thereof, and
releasable fastener means secured to each of the strap loops for holding the strap loops in place on the article during use.

5,558,383
CARRYING DEVICE
William E. Lancellotti, 10 Brookwood Dr., Johnston, R.I. 02919
Division of Ser. No. 415,736, Apr. 3, 1995, abandoned. This application Feb. 5, 1996, Ser. No. 595,418
Int. Cl.[6] A47G *25/06*
U.S. Cl. 294—143 **5 Claims**



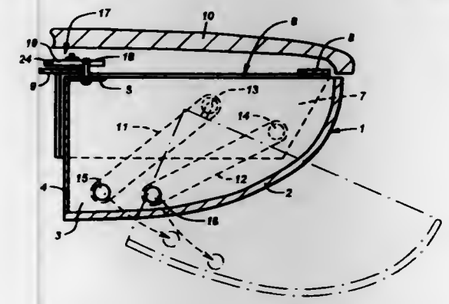
1. A carrying device for carrying articles on hangers, said carrying device comprising:
a top attaching element having a key ring and a flexible piece attached to the key ring;
a body portion having a top end portion secured to the flexible piece;
carrying means having a pair of oppositely extending carrying portions which are attached to and extend from the body portion, said carrying portions enabling a person to carry the device between their fingers; and
hook means having a pair of oppositely extending hooks which are attached to and extend from the body portion below said carrying portions, said hooks enabling a person to hang and support articles therefrom.

5,558,384
MOTORIZED BREAKDOWN VEHICLE
Renaud Mouterde, Versailles; Jacky Jacquemout, Clamart, and Michel Lamarche, Ver-les-Chartres, all of France, assignors to Giat Industries, Versailles, France
Filed Aug. 1, 1994, Ser. No. 284,036
Claims priority, application France, Aug. 4, 1993, 93 09603
Int. Cl.[6] B60R *5/00;* **F41H** *7/02*
U.S. Cl. 296—37.1 **11 Claims**



1. A motorized breakdown vehicle for maintenance and repair of a tank, said vehicle comprising a tank chassis on which a removable platform of modular design is mounted, the platform including supports receiving equipment required for performing maintenance, repair, and/or supply operations, a rear portion of said chassis containing an engine and receiving said platform, and at least some of the supports being displaceable on the platform so as to provide access to different portions of the engine of the vehicle.

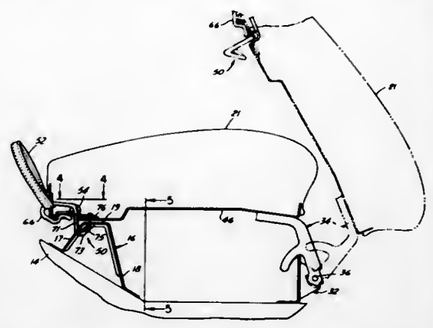
5,558,385
MOVABLE GLOVE COMPARTMENT HAVING A REAR MOUNTED, REMOTELY ACTUATED LOCK
Helmut Gross, Winnenden; Martin Leilich, and Hans Zuschanko, both of Neckarsulm, all of Germany, assignors to Audi AG, Germany
PCT No. PCT/EP92/02781, § 371 Date Jun. 2, 1994, § 102(e) Date Jun. 2, 1994, PCT Pub. No. WO93/11968, PCT Pub. Date Jun. 24, 1993
PCT Filed Dec. 2, 1992, Ser. No. 244,443
Claims priority, application Germany, Dec. 14, 1991, 41 41 239.7
Int. Cl.[6] B60R *7/06*
U.S. Cl. 296—37.12 **19 Claims**



1. A movable glove compartment assembly for use in a motor vehicle comprising:
a glove compartment movably engaged with a dashboard in said motor vehicle;
a latching device positioned at a rear portion of said glove compartment; and
a locking device mechanically engaged with said dashboard adjacent to said rear portion of said glove compartment, said locking device adapted for mechanical engagement with said latching device and remotely actuatable to release said latching device.

15. A dashboard-mounted glove compartment and lock mechanism combination comprising:
a glove compartment having open and closed positions;
a latch mounted to the glove compartment; and
a locking member selectively engaging said latch for opening and keeping said glove compartment closed with respect to a dashboard;
said glove compartment having an exposed face from the dashboard when in its said closed position;
said latch and said locking member having none of their components mounted in or adjacent said exposed face.

5,558,386
ASYMMETRICAL WIRE HOOK LATCH ARRANGEMENT
Lynn K. Tilly, Oxford; Donald L. Silsbe, Woodhaven, and Michael T. Twomley, Linden, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.
Filed Apr. 20, 1995, Ser. No. 425,545
Int. Cl.[6] B60N *2/02*
U.S. Cl. 296—65.1 **6 Claims**



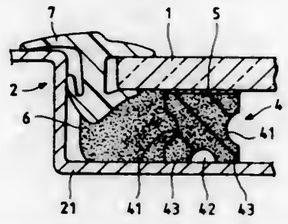
1. A one-piece latch wire retainer having first and second wire lengths defining a common axis of rotation and terminating in opposed spaced apart first and second bend portions interconnected by a wire-hook, said wire-hook adapted for latching and unlatching a hinged member pivotable about a transverse hinge axis with a fixed anchor member wire-hook engaging slot, an improved wire-hook comprising:
a long finger having one upper end connected to the first one bend portion and sloped downwardly at a predetermined obtuse-angle relative to the retainer first wire-length, a short finger having one upper end connected to the second bend portion and extending downwardly at a right-angle relative to the second wire-length, wherein said long and short fingers defining with said wire lengths a substantially common plane;
said long finger other lower end terminating in a first acute-angle bend juncture connected to a proximate end of a lead-in wire segment upwardly sloped at a relatively steep incline defining a first acute-angle relative to said long finger, said short finger other lower end terminating in a second acute angle bend juncture connected to a proximate end of a lead-out wire segment upwardly sloped at a relatively flat incline defining a second acute-angle relative to said short finger;
said lead-in and lead-out segments having distal ends interconnected by substantially right-angle bends to associated ends of a bight segment disposed parallel to the retainer axis of rotation;
whereby upon the hinged member being moved downward for engagement of said hook with the anchor member slot, a bottom portion of said lead-in segment smoothly sliding on the fixed member causing said hook to rotate about the axis of rotation away from the anchor member until said bight segment has cleared an upper free edge of the anchor member slot, wherein torsion spring means biasing said hook through the slot such that said bight segment is urged by said spring means into contact with the anchor member; and
whereby upon means connected to the retainer rotating said hook and moving the hinged member upward for unlatching said hook, wherein an upper portion of said lead-out segment cams said bight segment past the slot free edge obviating hang up therewith.

5,558,387
FIXING STRUCTURE FOR A WINDOW GLASS

roof part while attached thereto, after moving of the roof cover part into a completely open position, for reducing the length of said

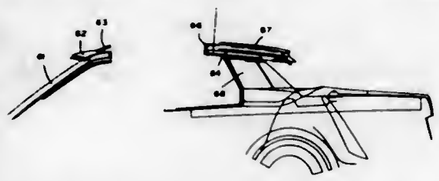
1. The combination comprising a folding convertible top for a vehicle, said folding convertible top having an opening defined by

5,558,387
FIXING STRUCTURE FOR A WINDOW GLASS
Atsushi Sumida, Nagoya, and Yoshihiko Kanamori, Toyota, both of Japan, assignors to Toyoda Gosei Co., Ltd., Japan
Filed May 26, 1995, Ser. No. 452,176
Int. Cl.[6] B60J *10/02*
U.S. Cl. 296—93 **1 Claim**



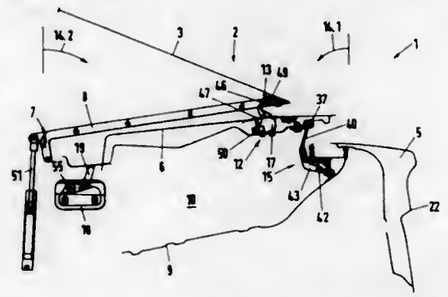
1. A structure for fixing a window glass to a window opening edge of a vehicle body, comprising:
adhesive material positioned to provide a bond between an outer periphery of the window glass and a glass receiving surface in said window opening edge of a vehicle body;
a dam mounted on said window glass about an inner surface thereof to control adhesive movement, said dam including:
a first recess formed at a first part of a side surface of said dam, to make said first part thinner than an upper surface of said dam;
a second recess formed at a second part of a bottom surface of said dam where said dam contacts said glass receiving surface; and
a pair of legs formed on both sides of said second recess.

5,558,388
VEHICLE ROOF
Arpad Fürst, Germering; Martin Danzl, München; Johann Mayer, Petershausen, and Stefan Mikloni, München, all of Germany, assignors to Webasto Karosseriesysteme GmbH, Germany
Continuation-in-part of Ser. No. 14,991, Feb. 5, 1993, abandoned. This application Aug. 5, 1994, Ser. No. 286,467
Claims priority, application Germany, Feb. 5, 1992, 42 03 229.6; Aug. 5, 1993, 43 26 329.1
Int. Cl.[6] B60J *7/00*
U.S. Cl. 296—107 **32 Claims**



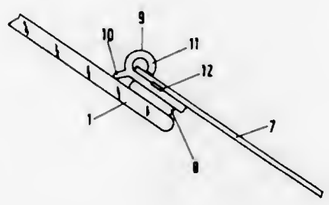
23. A vehicle roof with at least one rigid roof cover part that can be opened during driving in a sunroof mode by being moved into at least one open position, in a lengthwise direction of the vehicle and relative to rigid roof parts lying laterally and to the rear with respect to said at least one roof cover part, said rigid roof parts including a rear roof part that is attached to lateral roof parts, said lateral roof parts and said rear roof part being fixed relative to a body portion of the vehicle at least in said sunroof mode, and means for fury opening the roof to provide a convertible-type roof opening by moving of all of the rigid roof parts and the at least one roof cover part into a storage space in a rear part of the vehicle; wherein the lateral roof parts are attached to the rear roof part by means for displacing the lateral roof parts with respect to the rear roof part while attached thereto, after moving of the roof cover part into a completely open position, for reducing the length of said roof prior to moving thereof into said storage space.

5,558,389
RETRACTABLE FOLDING TOP FOR A CONVERTIBLE
Karl Rothe, Bramsche; Frank Lehnig, and Heiko Klemme, both of Osnabrueck, all of Germany, assignors to Wilhelm Karmann GmbH, Osnabrueck, Germany
Filed Aug. 8, 1994, Ser. No. 287,443
Claims priority, application Germany, Aug. 7, 1993, 9311798 U
Int. Cl.[6] B60J *7/12*
U.S. Cl. 296—107 **23 Claims**



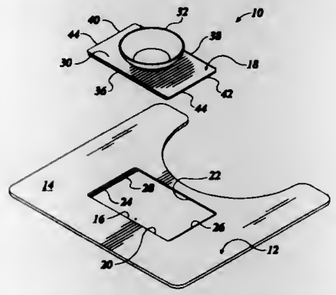
1. A convertible top for a vehicle comprising a folding top frame having an unfolded position, a storage well in said vehicle, a cover, actuating means operably connected between said cover and said vehicle for moving said cover between a closed position and an open position, said cover when in said closed position covering said storage well, said cover when in said open position uncovering said storage well, and engageable means on said cover and said folding top frame operable to effect engagement between said cover and said folding top frame, said actuating means being operable to move said cover to said closed position as said engagement is effected between said cover and said folding top frame by said engageable means such that moving of said cover to said closed position by said actuating means effects tensioning of said folding top frame.

5,558,390
REAR-WINDOW PANE FOR CONVERTILES
Ludger Hemmis; Matthias Overberg, both of Osnabrück, and Burkhard Schröder, Sassenberg, all of Germany, assignors to Wilhelm Karmann GmbH, Osnabrueck, Germany
Division of Ser. No. 227,808, Apr. 14, 1994, Pat. No. 5,464,265. This application Jun. 14, 1995, Ser. No. 490,260
Claims priority, application Germany, Apr. 29, 1993, 9306462 U
Int. Cl.[6] B60J *7/12*
U.S. Cl. 296—146.14 **16 Claims**



1. The combination comprising a folding convertible top for a vehicle, said folding convertible top having an opening defined by a marginal edge portion, a window pane of solid glass disposed in said opening, said glass having an outer edge section, a plastic extruded profile element extending between said marginal edge portion of said convertible top and said outer edge section of said glass, securing means securing said plastic extruded profile element to said marginal edge portion of said convertible top, and affixing means affixing said plastic extruded profile element to said outer edge section of said glass, whereby said glass is thereby sealingly secured to said convertible top.

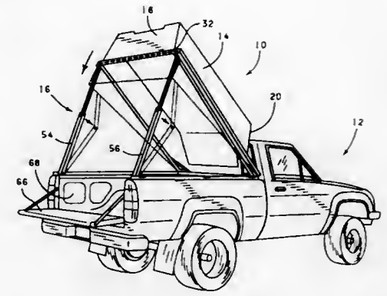
5,558,391
TRAY WITH REMOVABLE OBJECT SUPPORTING INSERT
Robert O. Chavous, 9 Orlando Dr., Chattanooga, Tenn. 37415
Filed Dec. 1, 1994, Ser. No. 348,534
Int. Cl.[6] A47B *83/02*
U.S. Cl. 297—153 **24 Claims**



20. A tray for removably supporting a useful object, said tray comprising:
a tray body defining an upper work surface and a lower surface, and defining at least one opening therethrough defined by a closed perimeter;
at least one object supporting insert for being removably received and supported in said opening of said tray body, said object supporting insert defining an upper surface on which the useful object is secured, whereby the useful object is maintained in a stationary position to facilitate its use as said object supporting insert is positioned in said opening of said tray body, and whereby the useful object is removable from said tray body through the removal of said object supporting insert;
a locking mechanism for releasably locking said object supporting insert in said opening of said tray body; and
a plurality of clamp members for releasably engaging a wheel chair, whereby said tray is supported by said wheel chair and the useful object secured to said object supporting insert is disposed for use by an occupant of such wheel chair.

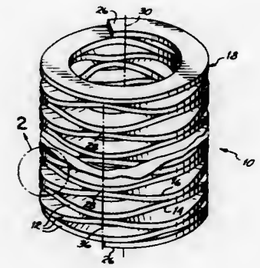
5,558,392
COMBINATION BOAT/CAMPER SHELL/POP-UP TENT
Jeffery N. Young, 1116 N. St. Clair Ave., Oklahoma City, Okla. 73107
Filed Feb. 17, 1994, Ser. No. 197,926
Int. Cl.[6] B60P *3/367*
U.S. Cl. 296—157 **11 Claims**

1. A combination boat/camper/tent apparatus for use with a vehicle having pickup bed walls, including a frame assembly which comprises:
a lower frame shaped generally to conform with the pickup bed walls, wherein the lower frame includes a lower front rail, a lower left rail and a lower right rail;



an upper frame wherein the upper frame includes means for receiving a camper/boat and wherein the upper frame comprises: an upper front rail; an upper left side rail; an upper right side rail; and an upper rear rail, and wherein the upper rear rail includes a brace member and a gate wherein the gate is hingedly attached to the brace member and wherein the gate moves from an open position to a closed position; and
a hinge attached to the lower front rail and the upper frame for hingedly connecting the lower front rail to the upper frame.

5,558,393
COMPOSITE MULTI-WAVE COMPRESSION SPRING
James T. Hawkins, Cincinnati, Ohio, and Michael Hawkins, Placentia, Calif., assignors to Proteus Engineering, Inc., Cincinnati, Ohio
Filed Jan. 24, 1995, Ser. No. 377,168
Int. Cl.[6] F16F *1/06*
U.S. Cl. 267—162 **16 Claims**



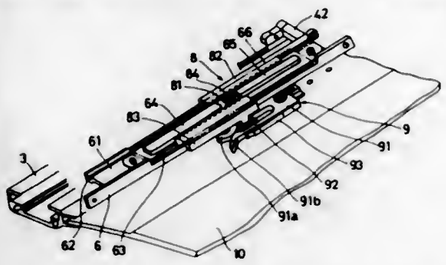
1. A composite multi-wave compression spring comprising:
a ribbon of graphite fibers in a resin matrix, said ribbon having a plurality of turns around a longitudinal spring axis, each said turn having a plurality of waves including successive crests and troughs, each said crest and each said trough being aligned with a trough and a crest, respectively, in an adjacent said turn of the spring;
first and second wave regions within the spring, said first wave region being disposed generally within the middle turn of the spring and each said crest and troughs within said first Wave region having a constant amplitude, said second wave region being disposed adjacent to said first wave region and amplitudes of said troughs and of said crests in said second wave region decreasing the farther away it is from said first wave region; and
a flat region adjacent to said second wave region, said flat region including at least one turn of the spring and an end turn of the spring.

5,558,394
VEHICLE SUNROOF

so as to adjust the spacing between the cushion and a second end of the tube wherein the cushion is shaped to fit a bicycle saddle.

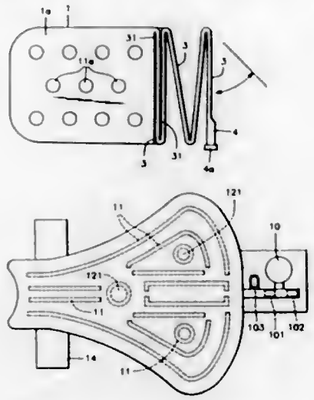
seat back having a spinal support system which adjusts automatically to the spinal curvature of an occupant, said seating system

5,558,394
VEHICLE SUNROOF
Keiji Mori, Kariya; Katsutoshi Kato, Ama-gun; Naofumi Fujie, Nagoya, and Akitoshi Sometani, Okazaki, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan
Filed Aug. 26, 1994, Ser. No. 294,846
Claims priority, application Japan, Aug. 27, 1993, 5-212723
Int. Cl.[6] B60J *7/00;7/05*
U.S. Cl. 296—214 **9 Claims**



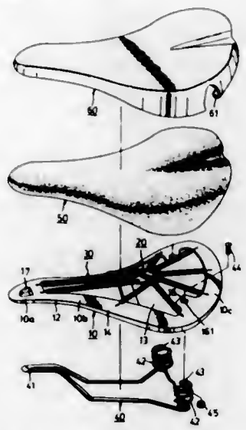
1. A sunroof for opening and closing a roof opening in a vehicle, comprising:
a guide rail for mounting in the vehicle along the roof opening;
a movable panel for opening and closing the roof opening;
a link mechanism, including a driving shoe guided on the guide rail and a driven shoe, connected to the movable panel;
a sunshade panel slidably supported by the guide rail;
a connecting rod connected to the driven shoe; and
an interlock mechanism slidably mounted on the connecting rod and engaging the sunshade panel during tilting-up movement of the movable panel and during sliding-open movement of the movable panel, thereby to open the sunshade panel.

5,558,395
INFLATABLE CUSHION DEVICES FOR BICYCLE SEATS AND OTHER SPORTING GOODS
Yin-jun Huang, 15, ZerHo YI Street, Kaohsiung City, Taiwan
Division of Ser. No. 998,173, Nov. 23, 1992, Pat. No. 5,335,382. This application Jul. 29, 1994, Ser. No. 281,984
Int. Cl.[6] A47C *27/08;* **B62J** *1/26;* **A43B** *13/20*
U.S. Cl. 297—199 **10 Claims**



1. An air cushion having at least one extension tube with one end communicating with the interior of the cushion, said tube being integrally formed with said cushion and having a zig-zag form with adjacent limbs which can be moved apart and together so as to adjust the spacing between the cushion and a second end of the tube wherein the cushion is shaped to fit a bicycle saddle.

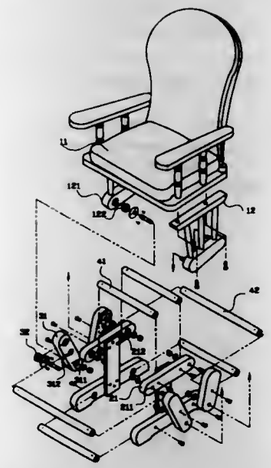
5,558,396
BICYCLE SADDLE ASSEMBLY WITH A BICYCLE SADDLE CAPABLE OF ABSORBING SHOCK IN A PLURALITY OF DIRECTIONS.
Tsai-Yun Yu, Taichung Hsien, Taiwan, assignor to Selle Tech Industrial Co., Ltd., Taichung Hsien, Taiwan
Filed Sep. 16, 1994, Ser. No. 306,996
Int. Cl.[6] B62J *1/02*
U.S. Cl. 297—208 **20 Claims**



11. A bicycle saddle, comprising:
a rigid saddle body formed as a looped member and having a front portion with a nose, an intermediate portion defining a pair of diverging branches, and an arcuate rear portion having a first end and a second end spaced apart from each other, said saddle body having a width which increases from said nose to said rear portion where the branches connect the front portion with the first and second ends of the rear portion,
said saddle body having a periphery defining an opening, wherein the saddle body further defines a plurality of first spring retaining holes one of said spring retaining holes being formed medially in each of said branches medially on each of said branches and located forwardly of a rigid spring retaining plate, between the front portion and rear portion of the saddle body;
said rigid spring retaining plate has a periphery which defines a plurality of second spring retaining holes; and
a plurality of elongated coil springs, each of which having a first end secured to one of said first spring retaining holes in said saddle body and a second end secured to one of said second spring retaining holes in said retaining plate, said coil springs extending radially in different directions from said retaining plate to said front portion, said intermediate portion and said rear portion of said saddle body, so as to enable said bicycle saddle to absorb shock in a plurality of directions.

5,558,397
ROCKING CHAIR
Chang Chih-Huang, Taipei, Taiwan, assignor to Collins Co., Ltd., Taipei, Taiwan
Filed Jun. 6, 1995, Ser. No. 467,636
Int. Cl.[6] A47D *13/10*
U.S. Cl. 297—281 **1 Claim**

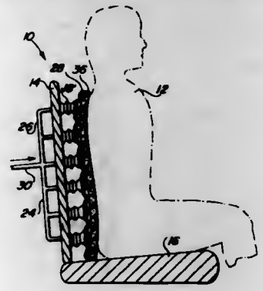
1. A rocking chair comprising:



a chair body having two parallel stands and a seat supported on said stands, each stand having a horizontal bar and two bearings at two opposite ends of said horizontal bar;
a base, said base comprising two substantially I-shaped upright frames, and four stretchers connected between said upright frames, each upright frame having two pivot holes horizontally spaced at a top side thereof; and
a linking mechanism connected between said stands of said chair body and said base for permitting said chair body to rock on said base, said linking mechanism comprising two symmetrical pairs of links and two stretchers respectively connected between said links, each link having a pivot hole at one end pivotably connected to one bearing on the horizontal bar of one stand by a respective pivot means, a bearing at an opposite end pivotably connected to one pivot hole on one upright frame of said base by a pivot means;
wherein each of the stretchers of said linking mechanism and said base each comprises two metal female screws embedded at two opposite ends and fixed in place by a respective locating pin and connected to a respective through hole on said upright frames of said base or on said links by a respective screw bolt so that said base and said linking mechanism are detachable.

5,558,398
SELF-ADJUSTING SEATING SYSTEM
James P. Santos, 1229 Notch Brook Rd., Stowe, Vt. 05672
Filed Nov. 8, 1993, Ser. No. 148,450
Int. Cl.[6] A47C *3/025*
U.S. Cl. 297—284.3 **24 Claims**

10. A self-adjusting seating system including a seat pan and a seat back having a spinal support system which adjusts automatically to the spinal curvature of an occupant, said seating system comprising:



said seat pan having front and rear edges and adapted to be supported substantially horizontally;
a rigid seat back support member connected to the rear edge of said seat pan and oriented substantially vertically;
a multiplicity of elongate air-filled cylindrical plenum chambers all having an extended length and opposed first and second ends, each having an orifice formed in said first end and said second end of each being closed, said first end of said plenum chambers being supported on said seat back support member with said closed second end facing forwardly and together defining a plane substantially parallel to said back support member, said plenum chambers being arranged in at least one array of at least one horizontally spaced pair of plenum chambers disposed on respective opposite sides of a vertical center line of said back support member, each array for supporting a respective zone of a seated occupant's spinal column, each plenum chamber being compressible from said extended length and adapted to resist load applied to said second closed end along an axis passing centrally through said opposed ends, means including a system of tubing directly interconnecting through respective orifices the interiors of all of said plenum chambers for automatically distributing air among the plenum chambers of an array in delayed response to changes in degree of their compression caused by differences in loading on said second closed end of the plenum chambers of an array due to the weight and movement of a seated occupant, and thereby vary the extent to which each plenum chamber is compressed from its extended length and configure the closed ends of the arrayed plenum chambers to substantially correspond to the contour of the spinal zone of occupant supported by an array, and means for supplying air to said interconnecting means and the interiors of said plenum chambers at a pressure sufficient to maintain said plenum chambers at said extended length when the seating system is unoccupied;
a support member overlying the forwardly facing closed ends of said arrayed plenum chambers providing flexible support between a seated occupant's back and the spaced closed ends of said plenum chambers and distributing the load of a seated occupant over more than one plenum chamber, the contour of said support member being adapted to change in response to changes in the extent of compression of individual plenum chambers to correspond substantially to the contour of the closed ends of the arrayed plenum chambers, and
cushion means overlying and adapted to follow the contour of said support member for separating a seated occupants' back from said support member.

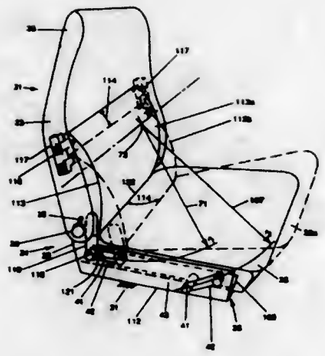
5,558,399
SEAT AND LUMBAR MOTION CHAIR, ASSEMBLY AND METHOD
Hector Serber, 6 W. Harbor Dr., Sausalito, Calif. 94965
Filed Sep. 13, 1994, Ser. No. 305,026
Int. Cl.[6] A47C *3/025;7/46*
U.S. Cl. 297—284.4 **14 Claims**

1. A seat and lumbar motion chair assembly comprising: a back support; back support mounting assembly coupled to said back support and mounting said back support in a stationary position in a generally vertical orientation relative to a support surface; a seat; seat mounting assembly coupled to said seat and mounting said seat to said mounting assembly proximate said back support in a generally horizontal orientation relative to said support surface for guided fore and aft movement of said seat along a continuous arcuate path; and a lumbar support coupled proximate its lower end to said seat for movement of said lower end of said lumbar support in said fore and aft movement with said seat, said lumbar support being pivotally coupled proximate its top end to said back support said back support remaining in its stationary position during movement of said lumbar support, whereby a buttocks and lumbar

5,558,401

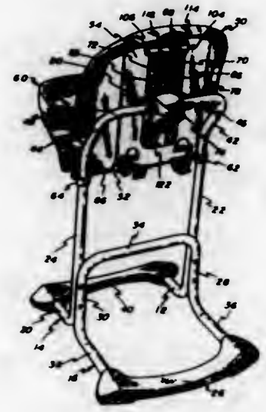
5,558,402

a seat back having a pair of rigid members extending outwardly



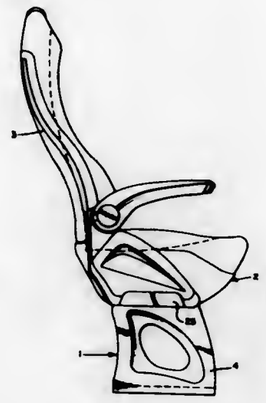
region of a user seated in said chair assembly will remain supported in substantial contact with both said seat and said lumber support during rapid fore and aft motion of said seat.

5,558,400
ADJUSTABLE HEIGHT HIGH CHAIR
Keith Poulson, Westminster, and Patrick M. Bertsch, Thornton, both of Colo., assignors to Gerry Baby Products Company, Thornton, Colo.
Filed Oct. 11, 1994, Ser. No. 320,906
Int. Cl.[6] A47C 3/40
U.S. Cl. 297—344.18 **22 Claims**



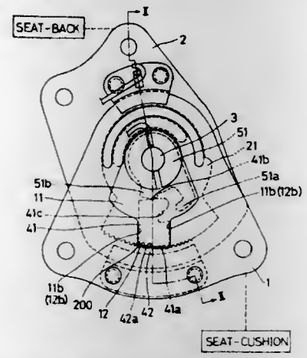
1. A high chair comprising:
a frame;
a seat shell supported on said frame, said seat shell including a seat portion and a back portion;
first guide means connecting a lower portion of said seat shell to said frame;
second guide means connecting an upper portion of said seat shell to said frame, said second guide means comprising at least one elongated slot extending vertically along said back portion and at least one guide finger supported on said frame and extending into said slot; and
wherein said first and second guide means guide said seat shell in vertical movement relative to said frame, and said second guide means includes a latch for selectively positioning said seat shell at a plurality of vertical locations.

5,558,401
SEATS FOR BUSES AND THE LIKE
Juan Singla Casanayas, Martorelles, Spain, assignor to Fabricacion Asientos Vehiculos Industriales, S.A. (Faisan), Martorelles, Spain
Filed May 13, 1994, Ser. No. 242,724
Claims priority, application Spain, May 14, 1993, 9301049
Int. Cl.[6] B60N 2/24
U.S. Cl. 297—232 **8 Claims**



1. An improved seat structure for buses and the like, said seat structure comprising:
at least one frame including at least two feet, two seats and two backs;
at least two crossbars which are disposed substantially horizontal and parallel with respect to each other, each crossbar having two end sections, said crossbars being anchored to the frame by means of said end sections being rigidly fixed to said feet;
at least two cross members which are disposed substantially orthogonal to said crossbars and which interconnect said crossbars, each cross member having two end sections, said cross members having said end sections welded to the crossbars, each of said cross members being provided with a plurality of orifices disposed between said end sections;
at least two bars disposed substantially parallel with respect to said crossbars, said bars passing through respective ones of said orifices in said cross members;
four vertical side plates, each side plate having an essentially triangular contour, two first ones of said side plates being fixed to said crossbars, two second ones of said side plates being fixed to said bars, said two first ones of said side plates each having two lower vertices corresponding to a lower end substantially horizontal edge in the vicinity of which the side plates are fixed to said crossbars, said two second ones of said side plates each having two lower vertices corresponding to a lower and substantially horizontal edge in the vicinity of which the side plates are fixed to said bars, each of said four side plates having a third upper vertex in the vicinity of which there are means for connecting the back pivotably to said side plates;
coupling means for coupling the seat to the side plates; and
means for fastening said bars such that a lateral movement of said bars with respect to said cross members is selectively inhibited.

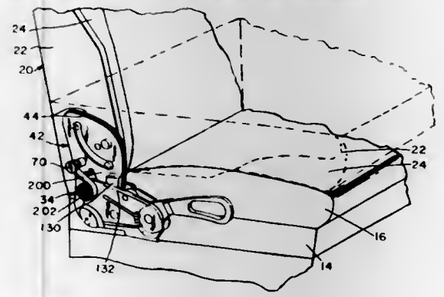
5,558,402
SEAT RECLINING APPARATUS
Yukifumi Yamada, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed Dec. 21, 1994, Ser. No. 360,886
Claims priority, application Japan, Dec. 22, 1993, 5-324796
Int. Cl.[6] B60N 2/20;2/22
U.S. Cl. 297—363 **3 Claims**



1. A seat reclining apparatus comprising:
a lower arm for attaching a seat-cushion;
an upper arm for attaching a seat-back;
a shaft rotatably disposed in the lower arm and fixed to the upper arm for unitary rotation with the upper arm;
a releasable locking mechanism for releasably restraining relative rotation between the lower and upper arms, said locking mechanism including a pawl slidably supported in a slot formed in one of the lower and upper arms and constrained for movement radially of the shaft into and out of meshing engagement with a a ratchet provided on one of the lower and upper arms, the meshing engagement receiving a force from the upper arm and the resultant force being transmitted to the lower arm via the pawl and a wall of the slot; and
a regulating gear set formed on the other of the lower and upper arms and having a pitch circle larger than that of the ratchet so as to be engagable with the pawl while the pawl is in meshing engagement with the ratchet.

5,558,403
SEAT RECLINER
Majid Hammoud, Northville; Fred C. Kresky, Rochester Hills, and Jay P. McCarthy, Livonia, all of Mich., assignors to Atoma International, Inc., Ontario, Canada
Filed Jan. 23, 1995, Ser. No. 377,007
Int. Cl.[6] B60N 2/02
U.S. Cl. 297—378.12 **18 Claims**

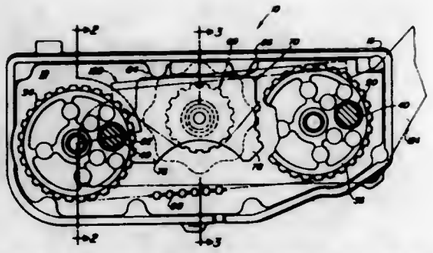
15. A seat assembly for an automobile comprising:



a seat;
a seat back having a pair of rigid members extending outwardly from lower portions of opposite sides of said seat back; and
a pair of connector structures each disposed at opposite sides of said seat assembly constructed and arranged to connect the lower portions of said seat back with a rearward portion of said seat, said connector structures enabling said seat back to be reclined at varying angles with respect to the automobile seat by being pivoted about a first pivot point and further enabling said seat back to be positioned in a manner which permits a back surface thereof to provide horizontal cargo support by being pivoted about a second pivot point, a first of said connector structures disposed at a first side of said seat assembly and including
1) a seat member adapted to be fixed to the seat at said first side of the seat assembly;
2) an arm adapted to interconnect with one of said rigid members of said seat back at said first side of the seat assembly, said arm being mounted on said seat member for movement along a plurality of incremental positions about said first pivot point to enable said seat back to be reclined at varying angles with respect to said seat,
said arm having a releasable locking assembly constructed and arranged to lock said rigid member against movement relative to said arm to thereby rigidly maintain said seat back in one of (1) a dress-up position wherein said seat back is inclined at a predetermined angle with respect to said seat and (2) a dump position wherein said seat back is substantially parallel in overlying relation with respect to said seat and horizontally presents its back surface to provide a horizontal cargo support, said releasable locking assembly being releasable to permit movement of said rigid member of said seat back disposed at the first side of the seat assembly with respect to said arm about said second pivot point so as to enable said seat back to be pivotally movable between said dress-up and dump positions;
3) a latch assembly constructed and arranged to lock said arm selectively into one of said incremental positions so as to set the angle at which said seat back is reclined with respect to said seat at an angle greater than said predetermined angle; and
4) a lever mechanism manually movable to (1) disable said latch assembly and thereby permit said arm to be movable along said incremental positions about said first pivot point so that said seat back can be reclined at varying angles with respect to said seat and (2) release said releasable locking assembly to permit movement of said rigid member of said seat back with respect to said arm about said second pivot point and thereby enable said seat back to be pivotally movable between said dress-up and dump positions;
said lever mechanism being manually releasable to selectively (1) enable said latch assembly to lock said arm into a selected one of said incremental positions so as to set the angle at which said seat back is reclined with respect to said seat and (2) enable said releasable locking assembly to lock said rigid member against movement relative to said arm and rigidly maintain seat back in one of said dress-up and dump positions.

5,558,404
ADJUSTABLE ARMREST
Norman E. Muzzy; Corwin L. Klages, both of Cedar Falls, and Eric P. Hansotia, Independence, all of Iowa, assignors to Deere & Company, Moline, Ill.
Filed Jul. 25, 1994, Ser. No. 280,262
Int. Cl.[6] A47C 7/54
U.S. Cl. 297—411.38 **16 Claims**

1. An adjustable armrest for use with an operator's seat on a vehicle, the armrest comprising:
a frame;
a driven member mounted for rotation on the frame and having a central axis about which it rotates, and having a bore which extends parallel to its central axis and which is spaced apart



from said central axis, said bore for rotatably receiving a pin which is adapted to be fixed with respect to the operator's seat and projecting generally horizontally therefrom; and

an operator controlled actuator rotatably mounted on the frame and coupled to the driven member to cause the driven member to rotate with respect to the frame, the rotating driven member cooperating with the pin for causing movement of the driven member and frame with respect to the fixed pin.

5,558,405

PROTECTIVE FRAME FOR STROLLER

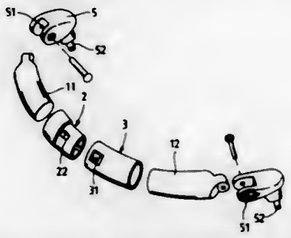
Takashi Ishikura, and Hayato Takahashi, both Tokyo, Japan, assignors to Combi Corporation, Tokyo, Japan

Filed Sep. 19, 1994, Ser. No. 308,433

Claims priority, application Japan, Sep. 30, 1993, 5-857341

Int. Cl.[6] A47D *15/00*

U.S. Cl. 297—487 **8 Claims**



1. A protective frame for a stroller including a seat portion and a pair of armrest poles disposed on opposite sides of the seat portion, respectively, the protective frame comprising:

a pair of retaining bodies adapted to be releasably attached to the armrest poles respectively;

a pair of rigid pole bodies rotatably coupled at a first end thereof to said retaining bodies, respectively; and

a joint mechanism for joining second, opposite ends of said pole bodies together, said joint mechanism being detachable into two separate joint portions.

5,558,406

METHOD OF MAKING AND WHEEL ASSEMBLY FOR INFLATABLE TIRE

Donald Meilinger, Placentia, Calif., and Richard Clement, La Grange, Ill., assignors to Midwest Rim & Wheel Co., Inc., Chicago, Ill.

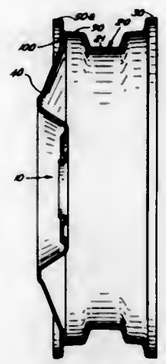
Filed Aug. 27, 1993, Ser. No. 113,217

Int. Cl.[6] B60B *21/00*; **B21B** *13/02*; **B21K** *1/38*

U.S. Cl. 301—65 **23 Claims**

1. A method for manufacturing a wheel of desired circumference, comprising the steps of:

extruding a wheel rim section from a light metal alloy, the rim section having a first tire-retaining flange at a first side and having a second side opposite the first side along the width of the rim section;



cutting the rim section to a length longer than the desired wheel circumference so that the rim section has two ends;

joining the ends of the rim section to make a rim hoop;

circumpressing the rim hoop to the desired circumference;

providing a wheel center from a light metal, the center including a second tire-retaining flange; and,

joining the rim hoop and the wheel center along the second side of the rim to form the wheel.

5,558,407

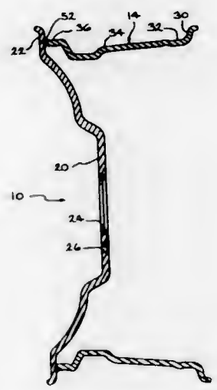
ALUMINUM FULL FACE VEHICLE WHEEL

Dennis Jaskiery, Milford, Mich., assignor to Hayes Wheels International, Inc., Romulus, Mich.

Continuation of Ser. No. 176,587, Jan. 3, 1994, Pat. No. 5,435,633. This application Jul. 21, 1995, Ser. No. 505,141

Int. Cl.[6] B60B *3/04*

U.S. Cl. 301—63.1 **5 Claims**



1. A full face vehicle wheel comprising:

a generally annular disc constructed of aluminum and including a body having a centrally located wheel mounting surface and an outer annular portion, said outer annular portion defining an outboard tire bead seat retaining flange of the full face wheel, said outboard tire bead seat retaining flange defining a radially extending inner surface;

a generally circular rim constructed of aluminum and defining an axis and including an inboard tire bead seat retaining flange, an inboard tire bead seat, an axially extending well, and an outboard tire bead seat;

said outboard tire bead seat being of a substantially uniform thickness and defining generally parallel outer and inner axially extending cylindrical surfaces which terminate at an axial endmost surface, said axial endmost surface including a radially extending first end surface and a non-radially extending chamfered second end surface;

wherein when said axial endmost surface of said rim is positioned adjacent said outboard tire bead seat retaining flange of said disc, said radially extending first end surface of said rim abuts said radially extending inner surface of said outboard tire bead seat retaining flange of said disc, and said non-radially extending chamfered second end surface of said rim is spaced from and cooperates with said radially extending inner surface of said outboard tire bead seat retaining flange of said disc to form a generally annular groove for receiving a weld to join said rim and said disc together and produce the finish full face wheel.

5,558,408

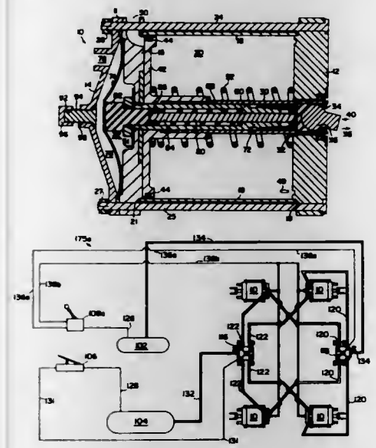
VEHICLE BRAKE SYSTEM

Mark H. Naedler, Houston, Tex., and Nathan L. Goldfein, Tucson, Ariz., assignors to International Transquip Industries, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 2,174, Jan. 8, 1993, Pat. No. 5,402,866. This application Apr. 4, 1995, Ser. No. 416,216

Int. Cl.[6] F16D *69/00*

U.S. Cl. 303—7 **26 Claims**



1. A fluid brake system for a vehicle, comprising:

a fluid-applied, mechanically held brake assembly including

a housing;

a first rod connectable to a brake;

a first pressure-responsive member within the housing fixed to the first rod to move the first rod in a first direction to apply the brake responsive to the supply of fluid pressure thereto;

first means biasing the first rod in the opposite direction to release the brake responsive to the exhaust of fluid pressure from the first pressure-responsive member;

a second rod fixed to the housing concentrically to the first rod;

a third rod within the housing and arranged concentrically with respect to the first and second rods for reciprocation with respect thereto;

a second pressure-responsive member within the housing and arranged to move the third rod in the first direction responsive to the supply of fluid pressure to the second pressure responsive member;

second means biasing the third rod in the opposite direction responsive to the exhaust of fluid pressure from the second pressure-responsive member;

means for locking the first rod to the second rod when the first rod has been moved in the first direction and the third rod is moved in the opposite direction and for unlocking the first rod from the second rod when the third rod is moved in the first direction;

means in the housing through which fluid under pressure may be supplied to the first pressure-responsive member to move the first rod in the one direction to apply the brake and exhausted from the first pressure-responsive member to permit the first rod to be moved by the first biasing means in the opposite direction to release the brake; and

means through which fluid under pressure may be exhausted from the second pressure-responsive member to permit the second biasing means to move the third rod in the opposite direction to lock the brake;

a source of fluid under pressure for supplying fluid under pressure to the first and second pressure responsive members;

first means actuatable to generate and transmit a park signal controlling the delivery and exhaust of fluid under pressure to and from the second pressure responsive member; and

second means actuatable to generate and transmit a service signal controlling the delivery and exhaust of fluid under pressure to and from the first pressure responsive member.

5,558,409

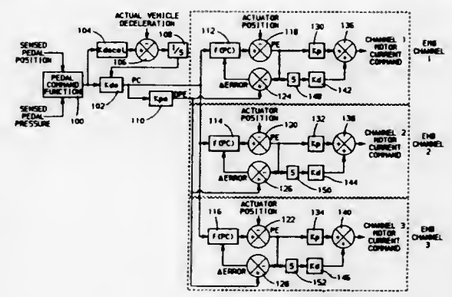
ELECTROHYDRAULIC BRAKING SYSTEM

Allen J. Walenty, Macomb; Kevin G. Leppek, Rochester Hills, and Alexander Kade, Grosse Pointe Woods, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 14, 1994, Ser. No. 355,468

Int. Cl.[6] B60T *13/16*

U.S. Cl. 303—10 **9 Claims**



1. A brake control method for controlling the position of an actuator driven electrohydraulic brake pressure modulator for applying pressure to a brake of a vehicle wheel traveling over a road surface, comprising the steps of:

sensing a vehicle braking input;

providing a schedule of modulator position commands as a function of vehicle braking commands;

establishing a vehicle braking command in accord with the sensed vehicle braking input;

referencing a position command from the provided schedule corresponding to the established vehicle braking command;

estimating actual modulator position;

calculating position error as a difference between the referenced position command and estimated actual modulator position;

generating a drive signal as a predetermined function of the position error; and

applying the drive signal to the actuator driven electrohydraulic brake pressure modulator.

5,558,410

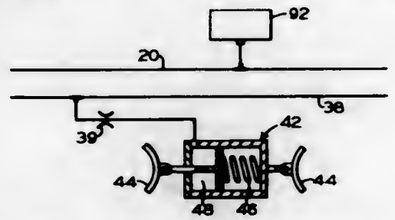
5,558,413

(f) low pressure inputs of the two recirculation pumps operatively connected to a return line of the respective brake circuit

5,558,410
RAILWAY BRAKING APPARATUS

Wajih Kaujo, Lockport, Ill.; Eric Smith, Burlington, Canada; Thomas J. Demoise, Export, Pa.; Michael Girotti, Thorold; Thomas McCabe, Dorval, both of Canada; Charles B. Fessler, Lancaster, Pa., and Scott Natschke, Kankakee, Ill., assignors to Westinghouse Air Brake Co., Wilmerding, Pa.

Division of Ser. No. 278,937, Jul. 22, 1994. This application Jun. 7, 1995, Ser. No. 473,287
Int. Cl.[6] B60T *13/22*
U.S. Cl. 303—71 **5 Claims**



1. A railway parking brake system for a railway train having at least one car equipped with fluid pressure operated service brakes, including at least one brake shoe movable between a brake applied position and a brake released position, and operated from a first source of fluid pressure for application and release of said service brakes, said parking brake system comprising:
(a) mechanical means for biasing and maintaining said brake shoe to said brake applied position;
(b) a second source of fluid pressure;
(c) means responsive to an adequate fluid pressure from said second source of fluid pressure for counteracting said mechanical means and moving said brake shoe to said brake release position, such that as long as said adequate fluid pressure is maintained at said second source of fluid pressure, said mechanical means will be unable to bias said brake shoe to said brake applied position; and
(d) a flow restricting means disposed on a transmission line interconnecting said second source of fluid pressure and said means responsive to an adequate fluid pressure from said second source of fluid pressure, and adapted to control a loss of fluid pressure from said means responsive to an adequate fluid pressure, in an event in which said adequate fluid pressure from said second source of fluid pressure ceases to be maintained.

5,558,411
RAILWAY BRAKING APPARATUS

Wajih Kaujo, Lockport, Ill.; Eric Smith, Burlington, Canada; Thomas J. Demoise, Export, Pa.; Michael Girotti, Thorold, Canada; Thomas McCabe, Monroeville; Charles B. Fessler, Lancaster, both of Pa., and Scott Natschke, Kankakee, Ill., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

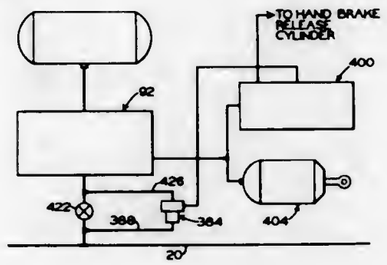
Division of Ser. No. 278,937, Jul. 22, 1994. This application Jun. 7, 1995, Ser. No. 475,853
Int. Cl.[6] B60T *13/22*
U.S. Cl. 303—71 **15 Claims**

1. A railway parking brake system for a railway train having at least one car equipped with fluid pressure operated service brakes, operated from a source of fluid pressure for application of said service brakes, said parking brake system comprising:
a) at least one brake contact element movable between a brake applied position and a brake released position;
b) mechanical means for biasing and maintaining said brake contact element to said brake applied position;
c) brake release means responsive to an adequate fluid pressure within said source of fluid pressure for counteracting said mechanical means and moving said brake contact element to said brake released position, such that as long as said adequate fluid pressure is maintained within said source of fluid pressure, said mechanical means will not be able to bias said brake contact element to said brake applied position; and
d) a flow restricting means adapted to control a loss of fluid pressure from said brake release means in an event in which said adequate fluid pressure ceases to be maintained.

5,558,412
RAILWAY BRAKING APPARATUS

Wajih Kaujo, Lockport, Ill.; Eric Smith, Burlington, Canada; Thomas J. Demoise, Export, Pa.; Michael Girotti, Thorold; Thomas McCabe, Dorval, both of Canada; Charles B. Fessler, Lancaster, Pa., and Scott Natschke, Kankakee, Ill., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Division of Ser. No. 278,937, Jul. 22, 1994. This application Jun. 7, 1995, Ser. No. 482,387
Int. Cl.[6] B60T *15/54*
U.S. Cl. 303—74 **5 Claims**

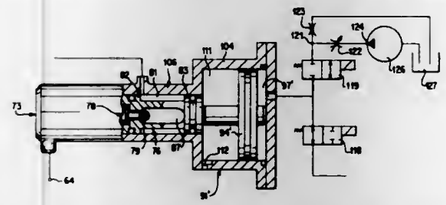


1. A brake release system for an auxiliary parking brake on a railway train having at least one car equipped with fluid pressure operated service brakes, said brake release system comprising:
(a) a manually operable auxiliary parking brake apparatus;
(b) a source of fluid pressure;
(c) a first means for connecting said source of fluid pressure to said auxiliary parking brake apparatus;
(d) a second means for manually operating said auxiliary parking brake apparatus to a braking position;
(e) a third means responsive to a predetermined level of fluid pressure at said source of fluid pressure for releasing said auxiliary parking brake apparatus; and
(f) a parking brake release control means for controlling application of fluid pressure to said third means to thereby control release of said auxiliary parking brake apparatus.

5,558,413
BRAKE-PRESSURE CONTROL DEVICE HAVING REAR-AXLE BRAKE CIRCUIT SELF-PRIMING RECIRCULATION PUMP

Reinhard Resch, Stuttgart, Germany, assignor to Mercedes-Benz AG, Germany

Filed May 4, 1995, Ser. No. 434,800
Claims priority, application Germany, May 4, 1994, 44 15 651.0
Int. Cl.[6] B60T *8/32*
U.S. Cl. 303—115.3 **18 Claims**

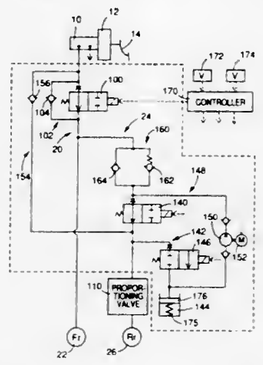


1. A brake-pressure control device for a vehicle with hydraulic brake system having two brake circuits and equipped with an anti-lock brake system (ABS) which operates according to a recirculation principle, and with a device for dynamic movement control (FDR) mode operating according to a principle of keeping longitudinal slip and lateral slip of vehicle wheels within limits which are compatible overall with dynamic stability of the vehicle by electronically controlled, automatic activation of at least one wheel brake, comprising
(a) a brake-pressure control device including a brake circuit distribution with a front-axle brake circuit and a rear-axle brake circuit, and a static main cylinder with pressure outputs individually assigned to the brake circuits;
(b) ABS recirculation pumps configured to operate as at least one pressure source from which the at least one wheel brake utilized for the dynamic movement control is suppliable with brake pressure, with a recirculation pump assigned to the brake circuit of the front axle requiring minimum input pressure level for feed mode;
(c) a low pressure input of the recirculation pump of the front-axle brake circuit configured for connection by a precharging control valve to an output pressure space of a precharging cylinder configured as a single-circuit main cylinder which has a piston forming an axially movable boundary of the drive pressure space and being arranged to be displaceable by applying pressure to a drive pressure space to increase pressure in the output pressure space, and has axially spaced flanges between which an overrun space is defined and kept in constant communication with a front-axle pressure output of the main cylinder, the piston being provided with a valve arranged to be activated mechanically to function as a non-return valve which blocks a through-flow channel of the piston connecting the overrun space to the output pressure space when pressure in the output pressure space of the precharging cylinder is larger than a pressure in the overrun space and opens the through-flow channel when the output pressure of the main cylinder is larger than a pressure in the output pressure space of the precharging cylinder;
(d) change-over valves individually assigned to each of the brake circuits and operatively connected between the main cylinder pressure outputs and main brake lines of the brake circuits, the change-over valves having an open, basic position assigned to a normal braking mode and a blocking, switched position assigned to the dynamic movement control (FDR) mode;
(e) an inflow control valve operatively arranged to have a basic, blocking position in which a supply path from the rear-axle pressure output of the main cylinder to the low pressure side of the recirculation pump of the brake circuit of the rear axle is blocked and a switched position assigned to the dynamic movement control (FDR) mode in which a through-flow position opens the supply path; and
(f) low pressure inputs of the two recirculation pumps operatively connected to a return line of the respective brake circuit via a non-return valve arranged to be acted on in an opening direction by relatively higher pressure in the return line than at the respective low pressure input and is otherwise in a blocking state; wherein
(g) the recirculation pump of the rear-axle brake circuit is configured as a self-priming pump; and
(h) the precharging cylinder is configured selectively to increase pressure in the output pressure space by one of (i) valve-controlled application to a drive pressure space of the precharging cylinder of output pressure of a built-in vehicle hydraulic pressure source, wherein the output pressure is generated by one of a hydraulic power steering system and a permanently driven hydraulic ride leveller pump and (ii) valve-controlled venting of a drive chamber constituting the drive pressure space previously connected to a built-in vacuum source of a pneumatic driving cylinder and output pressure of a built-in, pneumatic pressure source to the pneumatic driving cylinder.

5,558,414
VEHICLE BRAKING SYSTEM CAPABLE OF CONTROLLING PUMP FOR OPTIMUM RATE OF CHANGE OF BRAKE CYLINDER PRESSURE

Kazuhiko Kubota, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 2, 1995, Ser. No. 556,791
Claims priority, application Japan, Nov. 24, 1994, 6-289729
Int. Cl.[6] B60T *8/32*
U.S. Cl. 303—122.08 **17 Claims**



1. A braking system for a motor vehicle, comprising:
an operator-controlled brake operating member;
a master cylinder for generating a fluid pressure according to an amount of operation of said brake operating member;
a wheel brake cylinder for operating a wheel brake to brake a wheel of the motor vehicle according to a fluid pressure applied to said wheel brake cylinder;
a reservoir for storing a working fluid;
a pump for pressurizing the fluid sucked up from said reservoir, and delivering the pressurized fluid toward at least one of said master cylinder and said wheel brake cylinder;
a DC power source;
a pump actuator driven by said DC power source to operate said pump;
an electrically operated pressure control device having a plurality of operating states which are selectively established to electrically control the fluid pressure in the wheel brake cylinder and which include a pressure-increase state for substantial fluid communication of the wheel brake cylinder with at least one of the master cylinder and a deliver side of the

pump, and a pressure-decrease state for substantial fluid com-

5,558,416
CABINET FOR DISPLAYING OBJECTS

a support surface extending between said first and second side walls, said support surface having a top surface and a bottom

pump, and a pressure-decrease state for substantial fluid communication of the wheel brake cylinder with the reservoir;

a pump actuator control device having a power supply portion for intermittently supplying electric power from said DC power source to said pump actuator such that a duty ratio of the pump actuator is controlled in response to a duty ratio signal, and a signal generating portion for generating said duty ratio signal; and

said signal generating portion of said pump actuator control device comprising monitoring means for detecting at least one of a physical value which influences an amount of delivery of said pressurized fluid from said pump, and a selected one of said operating states of said electrically operated pressure control device, and optimizing means responsive to said monitoring means, for optimizing a rate of change of the fluid pressure in said wheel brake cylinder during an operation of said electrically operated pressure control device.

5,558,415

METHOD OF ENHANCING THE RELIABLITY IN OPERATION OF A BRAKE SYSTEM WITH ELECTRONIC CONTROL OF THE BRAKE FORCE DISTRIBUTION

Gunther Buschmann, Idstein, and Jürgen Woywod, Hattersheim, both of Germany, assignors to ITT Automotive Europe GmbH, Frankfurt, Germany

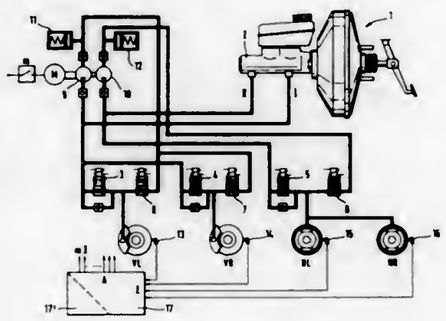
PCT No. PCT/EP93/01942, § 371 Date Jan. 27, 1995, § 102(e) Date Jan. 27, 1995, PCT Pub. No. WO94/03351, PCT Pub. Date Feb. 17, 1994

PCT Filed Jul. 22, 1993, Ser. No. 374,768

Claims priority, application Germany, Jul. 29, 1992, 42 24 971.6

Int. Cl.[6] **B60T** *8/32;8/60;8/26*

U.S. Cl. 303—186 **11 Claims**



1. A method for enhancing the reliability of a brake system with electronic brake force distribution control for an automotive vehicle having front wheels and rear wheels and front wheel brakes and rear wheel brakes, respectively associated with said front wheels and said rear wheels, said method comprising the steps of:

generating a front wheel slip and a rear wheel slip;

determining a difference between said front wheel slip and said rear wheel slip;

limiting brake pressure rise in said rear wheel brakes when said difference exceeds a slip difference threshold;

varying the pressure introduced into said front wheel brakes;

sensing the wheel rotational behavior of said front wheels in response to the step of varying the pressure introduced into said front wheel brakes and identifying an error; and

at least minimizing, upon identification of an error, the effect of the step of limiting brake pressure rise in said rear wheel brakes.

5,558,416

CABINET FOR DISPLAYING OBJECTS

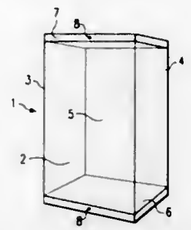
Florea Dumitru, Nidderau, Germany, assignor to Glasbau Hahn GmbH & Co. KG, Germany

Filed Feb. 16, 1995, Ser. No. 389,901

Claims priority, application European Pat. Off., Feb. 18, 1994, 94102459

Int. Cl.[6] **A47F** *3/00;* **E06B** *3/00*

U.S. Cl. 312—139 **20 Claims**



1. A cabinet for displaying objects, said cabinet comprising:

an underpart;

a plurality of side walls extending upwardly from said underpart, said upwardly extending side walls having upper ends;

an upper part for receiving the upper ends of said side walls;

a door having a lower portion and an upper portion, said door being positioned to extend upwardly from the underpart to the upper part;

upper and lower hinge assemblies, said upper hinge assembly including an upper hinge pin, a first portion connected to said upper part, and a second portion connected to the upper portion of said door, said lower hinge assembly including a lower hinge pin, a first portion connected to said underpart, and a second portion connected to the lower portion of said door, each of said first and second hinge portions defining holes therein for extending said respective upper and lower hinge pins therethrough and rotatably connecting said first and second hinge portions together so that said door can be rotated on said hinge assemblies, said door thereby having an inner surface defined as that surface facing toward said cabinet when said door is closed;

upper and lower rods connected to said first hinge portion of said upper and lower hinge assemblies, respectively;

upper and lower bearing bodies mounted in said upper part and said underpart, respectively, for receiving said upper and lower rods, respectively, said rods being therein axially slidable perpendicular to said inner surface when said door is closed; and

means having a first end rotatably mounted to said underpart and having a second end rotatably mounted to the lower portion of said door for exerting a predetermined horizontal force against the weight of said door so that when said upper and lower rods are axially extended out from said respective upper and lower bearing bodies and said door is open, the weight of said door does not cause said lower rod to retract into said lower bearing body.

5,558,417

CAROUSEL CABINET

Clara M. Termotto, 22 Wood Creek Dr., Pittsford, N.Y. 14534

Filed Dec. 13, 1994, Ser. No. 354,655

Int. Cl.[6] **A47B** *88/00;49/00*

U.S. Cl. 312—249.9 **20 Claims**

1. A carousel cabinet, comprising:

an elongate body comprising a first section including a plurality of compartments adjacent a periphery of the body, rotatable about a longitudinal axis of the body, and a stationary second section having a flat top surface, located immediately adjacent and above the first section, wherein the first section is rotatable with respect to the stationary second section, the body further having a central longitudinal bore;

a base connected to the first section of the body and located adjacent and below the first section;

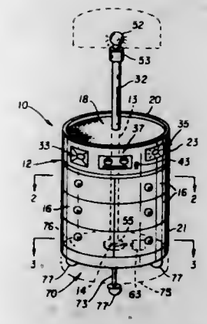
a tubular shaft passing through the central bore in the body and having one end terminating in the base and another end terminating between about six to twenty four inches above the flat top surface of the stationary second section of the body, the shaft connecting the base with the stationary second section, the first section being rotatable with respect to the base and stationary second section,

illumination means connected with the other end of the shaft for providing light in an area of the cabinet;

a switch connected with the end above the flat top surface of the stationary second section;

electrical connection means for providing electrical power delivery to the second section; and

communication device means located in the stationary second section of the body for sending and/or receiving a communication signal.



5,558,418

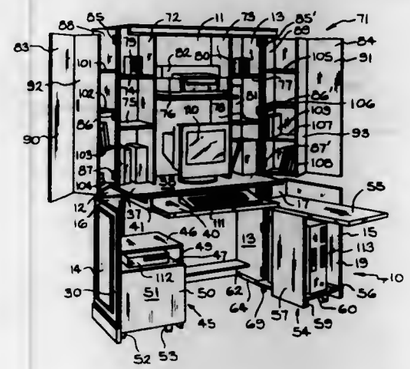
FURNITURE ASSEMBLY FOR A COMPACT DESK

Michael D. Lambright, and Douglas P. Krieger, both of Archbold, Ohio, assignors to Sauder Woodworking Co., Archbold, Ohio

Filed Sep. 13, 1995, Ser. No. 527,832

Int. Cl.[6] **E06B** *1/00*

U.S. Cl. 312—321.5 **22 Claims**



1. A furniture assembly for a compact desk comprising:

first and second side walls extending outwardly from a back wall in spaced relationship, said first and second side walls including first and second base portions, respectively;

a support surface extending between said first and second side walls, said support surface having a top surface and a bottom surface;

first and second desk doors each having an edge wall and a front wall, each of said edge walls being directly mounted on said first and second side walls by hinge means to allow said first and second doors to be movable between open and closed positions, each of said first and second desk doors including integral first and second cart units, respectively; and

first and second base brackets mounted on said first and second base portions, respectively, said brackets including bodies extending outwardly from said back wall along said base portions to predetermined points beyond said side walls adjacent said edge walls of said desk doors.

5,558,419

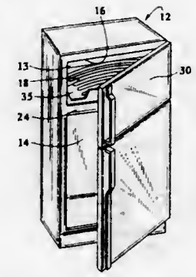
PULL-OUT FREEZER FLOOR FOR REFRIGERATOR AND FREEZERS

James F. Dasher, Vanderburgh County, and Michael A. Fiori, Evansville, both of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 30, 1995, Ser. No. 380,279

Int. Cl.[6] **A47B** *90/04*

U.S. Cl. 312—404 **17 Claims**



1. A slidable tray assembly for a refrigerated compartment having a floor structure and an evaporator compartment at a rear of said compartment, comprising:

a base supported on said floor structure and held stationary with respect thereto;

a platform slidably supported on said base, said platform providing platform air holes therethrough, said air holes located at a front of said platform;

said base having an elevated surface providing an air passage therebelow and base air holes at a front of said base for receiving air from said platform air holes, said base air holes communicating air into said air passage, said air passage having an end open into said evaporator compartment.

5,558,420

FLAT LIGHTING DEVICE

Yoji Oki; Koichi Hanaoki, both of Yokohama, and Shigeo Fujisawa, Tokyo, all of Japan, assignors to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Nov. 9, 1994, Ser. No. 337,152

Claims priority, application Japan, Nov. 12, 1993, 5-306022

Int. Cl.[6] **F21V** *5/00*

U.S. Cl. 362—31 **2 Claims**

1. A flat lighting device comprising a panel-shaped transparent substrate, a light source holding unit fitted to an end face of said substrate and a tubular luminous body fitted to said light source holding unit, wherein said light source holding unit is made of a conductive material and has a substantially U-shaped cross section with an open side such that said light source holding unit engages said end face at said open side, and wherein a leading-in wire of

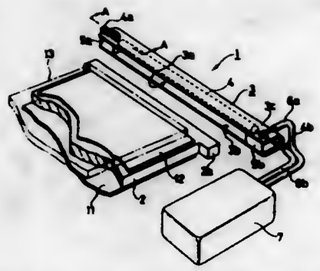
surface of said translucent lamp shade to create large circles of light on said outer surface of said translucent lamp shade.

5,558,423

HEADLIGHTS FOR MOTOR VEHICLES

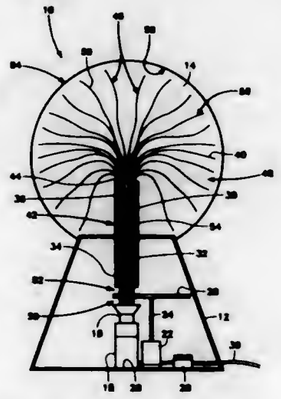
Wilhelm Schatke; Rolf Seiser, both of Ludwigsfelde, and Josef

means for reciprocably operating said connecting means to raise and lower said second frame in relation to said first frame.



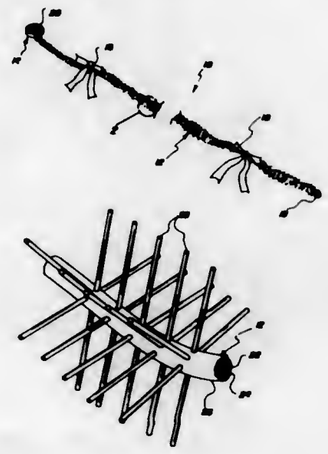
said luminous body is connected to said light source holding unit to form thereon a power feed section for said luminous body.

5,558,421
DECORATIVE FIBER OPTIC LAMP
Michael V. Gaustella, 1212 Quail Ct., Fillmore, Calif. 93015
Filed May 16, 1995, Ser. No. 442,351
Int. Cl.[6] F21V *8/00*
U.S. Cl. 362—32 15 Claims



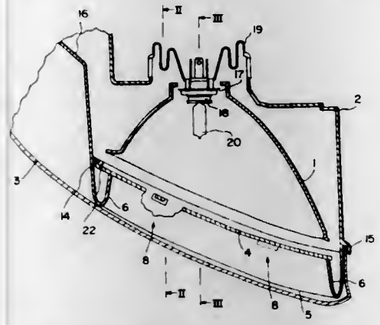
1. A decorative fiber optic lamp, comprising:
an enclosed base;
a translucent lamp shade removably connected to said enclosed base;
a pedestal located within said enclosed base;
a light source attached to said pedestal and for illuminating light;
an elongated hollow fiber plug having a bottom end extending from said light source to a top end within said lamp shade;
a plurality fiber optic strands bundled together within said fiber plug and having an entrance tip and an exit tip, wherein each of said fiber optic strand extends through said top end of said elongated fiber plug into said lamp shade;
special effects means located between said light source and said fiber plug for intermittently modifying said illuminated light and projecting said modified illuminated light through said fiber plug, whereby said modified illuminated light travels through each fiber strand from said entrance tip of said fiber strand to said exit tip near said lamp shade; and
means for rotating said special effects means so that varying effects of modified light are projected from the special effects means through said fiber strands;
wherein some of said exit tips of said fiber strands are located in close proximity to an inner surface of said translucent lamp shade to create small circles of light on said outer surface of said translucent lamp shade and wherein some of said exit tips of said fiber strands are located in far proximity to said inner surface of said translucent lamp shade to create large circles of light on said outer surface of said translucent lamp shade.

5,558,422
DECORATIVE FIBER OPTIC LIGHT
Jeffrey M. Sanford, 320 W. Kendall Dr., Yorkville, Ill. 60560
Filed Jul. 17, 1995, Ser. No. 503,281
Int. Cl.[6] F21P *1/02*
U.S. Cl. 362—32 6 Claims



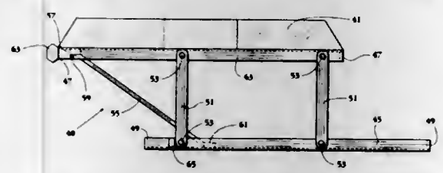
1. A decorative fiber optic light comprising:
a light means for generating illumination;
a fiber optic light string extending from the light means;
wherein the fiber optic light string comprises a fiber optic cable including a transparent core encapsulated by a reflective casing; and a plurality of elongated optical radiators extending from the fiber optic cable and directed through the reflective casing into optical communication with the transparent core such that illumination directed through the transparent core of the fiber optic cable will radiate through the elongated optical radiators;
wherein the elongated optical radiators each comprise a substantially transparent material formed into an elongated linear rod;
wherein the elongated optical radiators are oriented in spaced pluralities, with each plurality of optical radiators being radially spaced about the fiber optic cable and residing within a common plane;
wherein the spaced pluralities of the elongated optical radiators are positioned in a substantially spaced and parallel orientation relative to one another along the length of the fiber optic cable;
wherein the light means is mounted to a first end of the fiber optic light string;
and further comprising a mounting ring secured to a second end of the fiber optic light string so as to permit securement of the second end relative to a supporting structure.

5,558,423
HEADLIGHTS FOR MOTOR VEHICLES
Wilhelm Schatka; Ralf Seiger, both of Lippstadt, and Josef Wieneke, Bad Westernkotten, all of Germany, assignors to Hella KG Hueck & Co., Lippstadt, Germany
Filed Aug. 7, 1995, Ser. No. 511,869
Claims priority, application Germany, Dec. 17, 1994, 44 45 187.3
Int. Cl.[6] B60Q *1/00*
U.S. Cl. 362—61 10 Claims



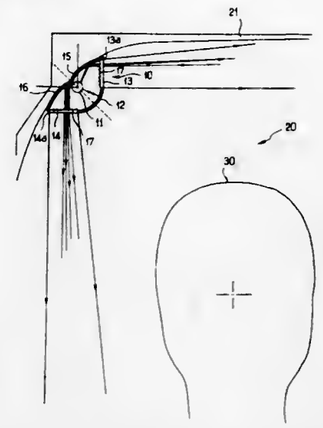
1. A headlight for a vehicle including a reflector, a housing for receiving the reflector, a light-transmissive shield for closing a front side of the housing, a light-transmissive screen arranged between the reflector and the light-transmissive shield, and an opaque-baffle frame surrounding the light-transmissive screen with an outer edge area thereof being mounted on the housing and an inner edge area thereof extending toward an outer edge of the reflector;
wherein the light-transmissive screen has a front surface which borders on the inner edge area of the opaque-baffle frame that is directed toward the reflector in an interior of the headlight, the light-transmissive screen being positioned behind a rear side of the outer edge area of the opaque-baffle frame, and being held on the rear side of the opaque-baffle frame, against movement in all directions, by a shaped interlocking connection between its outer edge and the opaque-baffle frame.

5,558,424
EMERGENCY VEHICLE LIGHT BAR ASSEMBLY
Stephen J. Zeligson, 1815 E. 31st Pl., Tulsa, Okla. 74105
Filed Jan. 26, 1995, Ser. No. 378,736
Int. Cl.[6] B60Q *1/00*
U.S. Cl. 362—66 13 Claims



1. A light bar assembly for an emergency vehicle comprising:
a first substantially horizontal elongated frame mountable transversely across an upper surface of the emergency vehicle;
a second substantially horizontal elongated frame substantially aligned with said first frame;
means connecting said first and second frames for substantially continuously parallel vertical displacement of said second frame above said first frame;
an arrangement of emergency indicating equipment fixed atop said second frame; and
means for reciprocably operating said connecting means to raise and lower said second frame in relation to said first frame.

5,558,425
FLUORESCENT TUBE CABIN LIGHTING
Sylvain Pons, and Daniel Segaud, both of Paris, France, assignors to Valeo Electronique, Creteil, France
Filed Nov. 9, 1994, Ser. No. 336,522
Claims priority, application France, Nov. 9, 1993, 93 13358
Int. Cl.[6] B60Q *3/02*
U.S. Cl. 362—74 31 Claims



1. A lighting device for lighting the cabin of a motor vehicle, the device comprising an elongate light source disposed inside a housing, wherein the housing comprises:
two windows transparent to the light flux emitted by the source, the windows being spaced apart from each other and comprising a top window through which light radiation is emitted in a generally horizontally direction, and a bottom window through which light radiation is emitted generally downwards;
first directional light flux recovery means disposed between two respective first edges of said windows; and
second directional light flux recovery means disposed between the two respective other edges of said windows;
said directional light flux recovery means having shapes that combine to guide the light flux emitted by the source towards said transparent windows; and
a support fixed to a portion of the vehicle for pivotally supporting said housing.

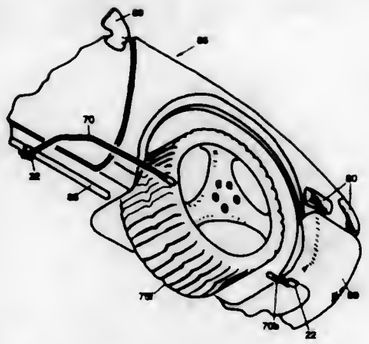
5,558,426
AERODYNAMIC WHEEL LIGHTS FOR AUTOMOTIVE VEHICLE
Dennis C. Cabanatan, and Henry C. Cabanatan, both of Belleview Ct., Belleville, N.J. 07109
Filed Dec. 5, 1994, Ser. No. 350,404
Int. Cl.[6] B60Q *1/32*
U.S. Cl. 362—78 17 Claims

1. A wheel light assembly comprising in combination:
an automobile having a major axis and a frame on an underside thereof, four of more wheels mounted for rotation, a switching control for headlights, and an electrical power source;
one or more wheel light uniform in design but adapted for use with any of said wheels, with no more than one said light per wheel, said wheel light comprising:
a light source connected to,
a tubular arm through which electrical power is conducted,

a supporting seat in an elongate form for supporting the three-section type third braking light, a bottom of said supporting

5,558,429
PORTABLE LIGHTING DEVICE

a user of said dual beam flashlight can illuminate darkened areas from the lamps of the dual beam flashlight selected from the



means for attaching said light source at a lighting end of said arm, cover means comprising a lens fitted over said light source, and

attachment means for connecting said arm to said frame;

said arm being substantially curved and aerodynamic such that said arm is distance outwardly from, and parallel to, the major axis of said automobile, said wheel light being attached to said frame at a location proximate to each said wheel; said lighting end thereof, comprising said light source and said cover means, being aerodynamic being directed toward said wheel;

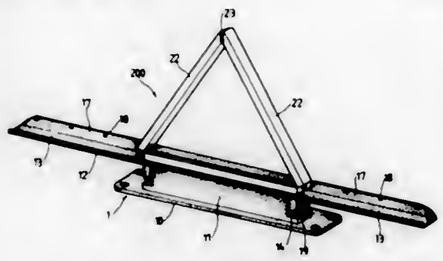
said light source being electrically connected to said electrical power source through said switching control whereby said wheel light operates simultaneously with said headlights to provide uniform illumination for said wheel sufficient to enhance safety of said automobile, mechanical activities involving said wheel, and appearance of said wheel and said automobile during operation thereof at night.

5,558,427

BASE STRUCTURE FOR A THREE SECTION TYPE THIRD BRAKING LIGHT WHICH CAN BE CONVERTED INTO A TRIANGULAR FAILURE WARNING LIGHT

Chang A. Yang, No. 9, Alley 100, Lane 21, Wei-Hu Road, Nei-Hu, Taipei, Taiwan

Filed May 25, 1994, Ser. No. 249,129
Int. Cl.[6] B60Q *1/26*
U.S. Cl. 362—80.1 **3 Claims**



1. A base structure for a three-section type third braking light which can be converted into a triangular failure warning light, said base structure being mounted inside a rear windscreen glass of an automobile at an appropriate position, characterized by:

a base seat, having a fixing plate such that said base seat can be mounted on at least one of a horizontal and a vertical surface of the automobile; said fixing plate being provided with a pivot seat having a left and right side surface and projecting pins respectively provided on a center of the left and right side surfaces of said pivot seat; and

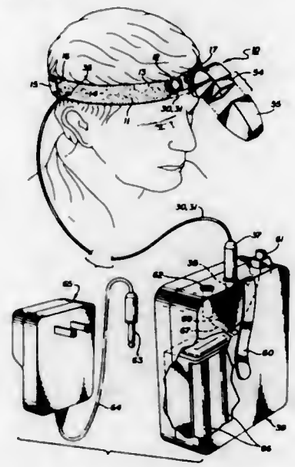
a supporting seat in an elongate form for supporting the three-section type third braking light, a bottom of said supporting seat being provided with two lugs for being pivotally connected to said projecting pins of said pivot seat; said supporting seat including three portions in which a middle portion is a clamping section for fixing a middle section of said three-section type third braking light and the left and right portions are resiliently engaged with the left and right sections of said three-section type third braking light.

5,558,428

PORTABLE READING LIGHT DEVICE

Robert A. Lehrer, 7413 McCool Ave., Los Angeles, Calif. 90045-1233, and Kenneth A. Tarlow, 94 Birch Ave., Corte Madera, Calif. 94925

Filed Sep. 7, 1994, Ser. No. 301,670
Int. Cl.[6] F21L *15/14*
U.S. Cl. 362—105 **20 Claims**



1. A portable light weight bed lamp comprising:

an adjustable head band adapted to be worn about a head of a user;

a light housing mounted on said headband, said light housing being adjustable with respect to said headband so that a light beam emitting from a bulb disposed in said light housing out of an opening leading from said housing can be adjusted to fall on a particular location in front of the user; and

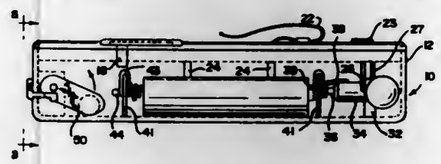
said light housing including a high intensity light bulb mounted therein coupled to a power source for selectively lighting said bulb, a clear light diffusing lens being substantially flat and planar forming a plane having light beam diffusing means thereon for diffusing a beam of light passing therethrough mounted in said housing between said bulb and an opening leading out of said housing, and a combination heat shield and light reflector mounted in said housing on one side of said bulb, said bulb being disposed between said combination and said diffusing lens, said combination being curved in a direction toward said bulb and being adapted to both dissipate heat emitted from said bulb and reflect light emitted from said bulb into a light beam emanating through said lens and out of said opening, said bulb being mounted in a bulb socket spaced from said combination between said combination and said lens, said bulb being an elongated halogen bulb extending generally vertically having its longitudinal axis lying in a plane generally parallel to said plane of said lens whereby said combination creates a diffusion of light emitted from said bulb and focuses said light into a light beam passing through said lens while diffusing the same.

5,558,429

PORTABLE LIGHTING DEVICE

Scott Cain, 157 Peter Ct., Unit C, Bartlett, Ill. 60103

Filed Jun. 13, 1994, Ser. No. 258,866
Int. Cl.[6] F21V *33/00*
U.S. Cl. 362—155 **35 Claims**



1. A lighting device adaptable for mounting on a device such as a container having a lid movable between an open or vertical position and a closed or horizontal position, the improvement comprising:

a light bulb for providing illumination and having light control switch means in an electrical circuit with a battery and with the light bulb to turn said light bulb on and off;

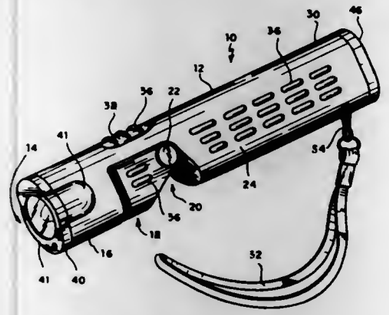
said switch means having magnetic gravity responsive means operable to actuate said electrical circuit to automatically turn on said light bulb when in an on position and turn off the light bulb in an off position.

5,558,430

DUAL BEAM FLASHLIGHT

Donald J. Booty, Jr., Chicago, Ill., assignor to Phorm Concept and Design, Inc., Chicago, Ill.

Filed Dec. 9, 1994, Ser. No. 355,252
Int. Cl.[6] F21L *1/00*
U.S. Cl. 362—184 **20 Claims**



1. A dual beam flashlight comprising:

a flashlight body comprising a primary headlamp, a rotatable secondary lamp in a housing, a recess for the rotatable secondary lamp and housing, a first light switch, a second light switch, a first energizing source, and a second energizing source;

the primary headlamp being located at a front end of the flashlight body and fixed in said flashlight body, said flashlight body having a top region and a bottom region;

the rotatable secondary lamp being encased in the housing which is rotatable, said housing being positioned completely in the recess in said bottom region and proximate to the front end of said flashlight body;

the first light switch positioned in the top region of the flashlight body, energizing only the primary headlamp from the first energizing source; and

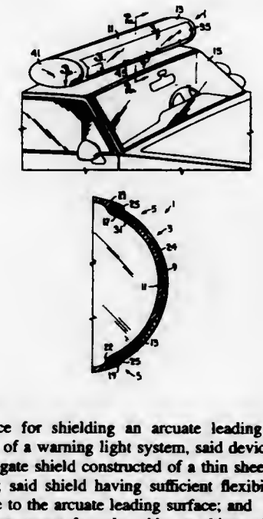
the second light switch energizing the secondary lamp only by the second energizing source when said secondary lamp in said housing is rotated out from the recess; whereby a user of said dual beam flashlight can illuminate darkened areas from the lamps of the dual beam flashlight selected from the fixed primary headlamp, the rotatable secondary lamp, and both the fixed primary headlamp and the rotatable secondary lamp.

5,558,431

REPLACEABLE WARNING LIGHT LENS PROTECTOR

Andrew V. Wilson, Floral City, Fla., assignor to Novation Research, Inc., Homosassa, Fla.

Division of Ser. No. 101395, Aug. 2, 1993, Pat. No. 5420774.
This application May 25, 1995, Ser. No. 450,895
Int. Cl.[6] T21V *15/00*
U.S. Cl. 362—376 **12 Claims**



1. A device for shielding an arcuate leading surface of an elongate lens of a warning light system, said device comprising:

(a) an elongate shield constructed of a thin sheet of transparent material; said shield having sufficient flexibility to be conformable to the arcuate leading surface; and

(b) attaching means for releasably attaching said shield to the lens such that said shield is conformed to the arcuate leading surface and exposed to the abusive environment normally encountered by the lens of a warning light system, said attaching means including an opposing pair of grooves formed in the lens.

5,558,432

DRUM MIXER HAVING A COMBINED HEATING/MIXING ZONE WITH AGGREGATE ENTRY AT BOTH ENDS

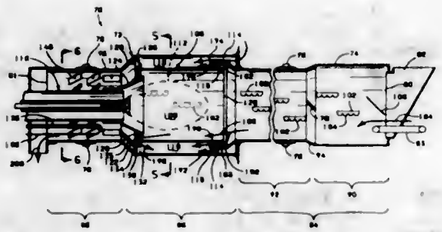
George W. Swisher, Jr., 1500 Dorchester Dr., Oklahoma City, Okla. 73120

Filed Jun. 14, 1994, Ser. No. 260,128
Int. Cl.[6] B28C *5/46*
U.S. Cl. 366—25 **14 Claims**

1. An apparatus for heating and mixing asphalt-aggregate compositions, the apparatus comprising:

a rotatable drum having a first drum section and a second drum section, the first drum section defining a drying zone, the second drum section defining a mixing zone, and an end portion of the second drum section circumscribing an end portion of the first drum section to define a combustion zone between the drying zone and the mixing zone;

a combustion housing mounted within the combustion zone of the drum, the combustion housing having an end portion circumscribed by the end portion of the first drum section to define an inner annulus therebetween, the combustion housing



and the second drum section defining a heating-mixing zone therebetween, the combustion housing defining a combustion chamber having a first end communicating with the drying zone and a second end communicating with the heating-mixing zone;

a burner assembly producing a flame having a stream of hot gases flowing from the combustion chamber toward the drying zone of said drum;

means for introducing aggregate into the drying zone of said drum;

means for urging a first portion of aggregate from the drying zone into the heating-mixing zone through the inner annulus and means for urging a second portion of aggregate from the drying zone into the heating-mixing zone through the combustion chamber;

means for introducing liquid asphalt into the mixing zone of said drum to form an asphaltic composition from aggregate and liquid asphalt in the mixing zone if said drum; and

means for removing the asphaltic composition from the mixing zone of said drum; and

a diverting plate secured within said drum between the second end of the combustion chamber and the mixing zone, said diverting plate being sized and shaped to direct the second portion of the aggregate from the combustion chamber into the heating-mixing zone before the aggregate is urged around said diverting plate to the mixing zone.

5,558,433

CONICAL TILTABLE AUGER APPARATUS FOR CONTINUOUSLY FEEDING EXTRUSION AND/OR ROLLING MACHINES WITH VISCOUS MATERIAL.

Victor Gheorghita, Castellanza, Italy, assignor to Pomini S.P.A., Castellanza, Italy

Filed Sep. 28, 1995, Ser. No. 534,956

Claims priority, application Italy, Oct. 27, 1994, MI94A2204

Int. Cl.[6] B28C *7/10*

U.S. Cl. 366—76.4 **8 Claims**

1. An apparatus for continuously feeding a machine with a batch of material, comprising:

a support;

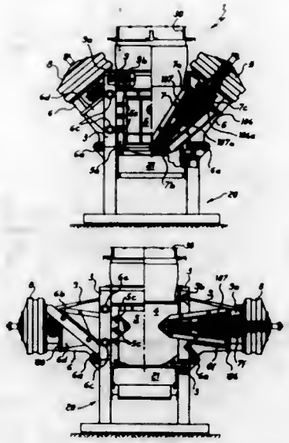
means forming a vertical hopper on said support, said hopper having an upper opening for receiving said batch and a lower outlet for discharging said material;

a pair of conical augers on opposite sides of said hopper rotatable to feed said material to said outlet;

a respective drive connected with each of said augers for driving said augers independently of one another;

means for cooling said augers and at least one wall of said hopper; and

respective mounting means on said support for each of said augers for retaining said augers in operating positions wherein said augers are inclined to a vertical and converge downwardly in said hopper in a V-pattern, and for tilting said augers from said operating positions into inoperative positions wherein said augers are substantially horizontal in a standstill state of said apparatus.



5,558,434

METHOD FOR PREVENTING ACCUMULATION OF SLUDGE IN A COAL WATER MIXTURE STORAGE TANK

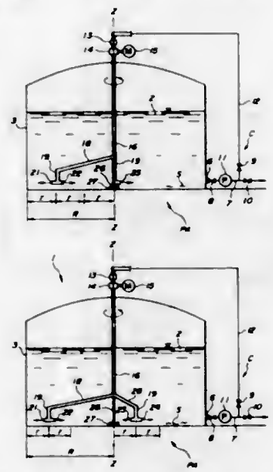
Kenjiro Hamada, and Akira Matsubuchi, both of Kawasaki-ku, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed May 15, 1995, Ser. No. 440,761

Claims priority, application Japan, Oct. 12, 1994, 6-245958

Int. Cl.[6] B01F *5/04;15/02;* **B65D** *90/00*

U.S. Cl. 366—137 **10 Claims**



1. A method for preventing accumulation of sludge in a coal water mixture storage tank, comprising the steps of:

preparing a coal water mixture storage tank having a circulation pump for taking a stored liquid out of sad storage tank, a liquid conducting pipe vertically standing inside of said storage tank for conducting said stored liquid discharged from said circulation pump to a bottom of said storage tank, a nozzle for jetting the stored liquid out of said liquid conducting pipe toward a radial direction of said storage tank and a rotary means for rotating the liquid conducting pipe having an axis at a center of said storage tank;

determining a zone width r(m) of a stirring zone of said nozzle, using a formula of:

$$r \leqq QA(140 \times A^{0.5})$$

where, A is a sectional area of a nozzle opening (m^2) and Q is a flow amount of said stored liquid per one nozzle (m^3/h);

determing a location of said nozzle dependent on said zone width; and

jetting said stored liquid from said nozzle in said radial direction of said storage tank while rotating said liquid conducting pipe.

5,558,435

SYSTEM FOR MIXING LIQUIDS

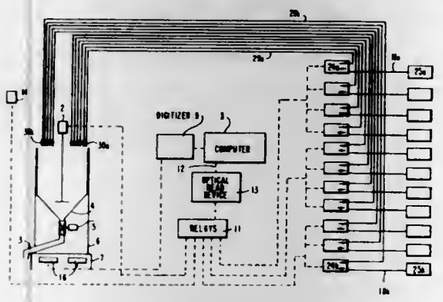
Erik Marjo, Manly, Australia, assignor to Pacific Inks (Australia) Pty Ltd., Beaconsfield, Australia

Filed Nov. 8, 1994, Ser. No. 336,002

Claims priority, application Australia, Jun. 21, 1994, PM6347

Int. Cl.[6] G05D *11/02;* **B01F** *15/04*

U.S. Cl. 366—141 **10 Claims**



1. A liquid mixing system comprising a mixing vessel provided with agitation means, a load cell capable of determining the weight of material in the mixing vessel, a plurality of liquid supply conduits each conduit dedicated to transfer one of a plurality of constituent liquids from corresponding separate supply vessels to the mixing vessel, each liquid having a corresponding liquid weight; a positive displacement pump dedicated to each supply conduit; a computer system for controlling the pumps for controlling the supply of the plurality of constituent liquids to the mixing vessel, the amount of each constituent liquid added to the mixing vessel being metered by the computer on the basis of the corresponding constituent liquid weight monitored by the load cell at the mixing vessel, the computer being programmed to activate said positive displacement pumps for a predetermined length of time according to a predetermined weight of each constituent liquid required in the mixing vessel, the accuracy of the metering of each constituent liquid into the mixing vessel being enhanced by said computer being programmed to introduce substantially all of a predetermined quantity of each of said constituent liquids into the mixing vessel one at a time according to a predetermined sequence and, before a next constituent liquid is introduced, measuring the weight of the already-introduced constituent liquid to determine if an additional amount of said already-introduced liquid is required and, if so, reactivating said pump corresponding to said already-introduced liquid for an additional predetermined period of time until said predetermined weight is achieved.

5,558,436

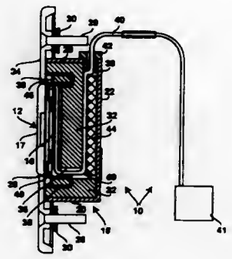
THERMALLY ISOLATED ROOM TEMPERATURE SENSING APPARATUS

Michael F. Richards, Carol Stream, Ill., assignor to Landis & Gyr, Inc., Buffalo Grove, Ill.

Filed Jul. 14, 1994, Ser. No. 275,043

Int. Cl.[6] G01K *1/00;7/00*

U.S. Cl. 374—208 **15 Claims**



1. A thermally isolated room temperature sensing apparatus of the type which is adapted to be wall mounted, comprising:

enclosure means having a generally flat from plate with at least one opening for positioning the outer portion of a sensor assembly, said enclosure means including a box structure having sides, a top and a bottom, said box structure being generally closed on its sides and bottom, said front plate covering the top thereof;

said sensor assembly adapted to sense the temperature of the immediate area in which it is located and generates a value representative of the sensed temperature, said sensor assembly being adjacent said opening and having an exposed thermally conductive surface generally coplanar with said front plate and positioned to sense the temperature of the air;

thermal isolating means located in said enclosure means adapted to minimize the thermal effects of air that is present outside of said box structure, said thermal isolating means including insulating means located in said box structure generally between said sensor assembly and said box structure sides and bottom and a mounting means attached to said insulating means and said sensor assembly for holding said sensor assembly in said enclosure means; and

conducting means connected to said sensor assembly and being adapted to conduct electrical signals exteriorly of said enclosure means;

said insulating means comprising at least one block of solid insulating material having a first recess for retaining said sensor assembly, and a second recess for carrying said conducting means from said sensor assembly to a second opening in one of said bottom and one of said sides, said first recess being larger than said sensor assembly, said mounting means holding said sensor assembly spaced away from said insulating material;

said mounting means comprises a pair of spring retainer clips, each of which have a pair of end portions and a bridging portion, said bridging portion being adjacent to said front plate and said end portions being connected to said sensor assembly, each of said end portions having an extended loop for providing an elongated path between the bridging portion and said sensor assembly for providing a thermal barrier between said bridging portion and said sensor assembly.

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DYNAMICALLY BALANCED ORBITAL SHAKER

along an internal surface of said second wall, said male and female profiles being extruded from a first polymeric material, portions with the heat-sealable face of one portion opposed to the

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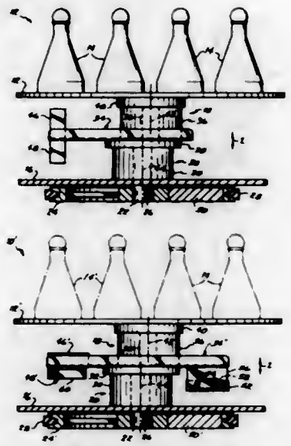
DYNAMICALLY BALANCED ORBITAL SHAKER

Donald W. Rode, Marietta, Ohio, assignor to Forma Scientific, Inc., Marietta, Ohio

Filed May 19, 1995, Ser. No. 444,658
Int. Cl.[6] B01F *11/00*
U.S. Cl. 366—208 **7 Claims**



1. An orbital shaker mechanism comprising:
a first shaft rotatable about a first axis and including a mounting portion;
a first bearing assembly receiving said first shaft;
a second shaft rotatable about a second axis offset from said first axis;
a second bearing assembly receiving said second shaft and having a bearing housing affixed to the mounting portion of said first shaft;
a counterweight mounting bracket mounted between the mounting portion of said first shaft and the bearing housing of said second bearing assembly, said counterweight mounting bracket extending both in a direction of the offset and in a direction opposite to the offset;
a platform connected to said second shaft at the offset such that rotation of said platform occurs in an orbital manner about said first axis;
a first counterweight fixed to said counterweight mounting bracket at a location disposed in a direction opposite to the offset; and,
a second counterweight located farther from said platform than said first counterweight and mounted for rotation with said first shaft, said second counterweight being fixed to said counterweight mounting bracket at a location disposed in the direction of the offset.

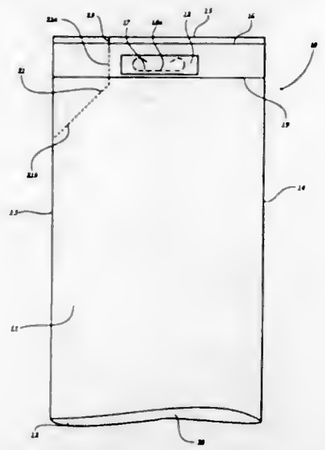
5,558,438

BAG WITH REENFORCED HANDLE AND RESEALABLE POUR SPOUT OPENING

Charles J. Warr, High Point, N.C., assignor to Rex-Rosenlew International Incorporated, Thomasville, N.C.

Continuation-in-part of Ser. No. 500,173, Jul. 10, 1995. This application Aug. 1, 1995, Ser. No. 509,831
Int. Cl.[6] B65D *33/08;33/02;33/18;33/38*
U.S. Cl. 383—10 **8 Claims**

1. In a bag including first and second walls having joined first and second opposed side edges, an end edge, at least one seal line spaced from the end edge and extending laterally from one side to the other for sealing closed the end of the bag, a die cut opening defining a handle in the first and second walls adjacent the end edge for receiving a hand therethrough, and a plurality of spaced-



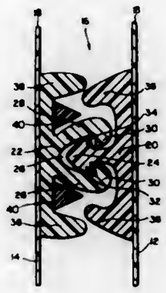
apart perforations in both side walls extending in a line from the end edge diagonally to one of the first or second side edges and forming a tear line for permitting a corner portion of the first and second walls, including a portion of the end edge of the bag, to be torn away from the bag in a progressive tearing motion to form a opening in the bag from which the contents of the bag can be poured, the improvement comprising handle reenforcement and resealing means, and comprising; a strip of sheet material secured by a pressure sensitive adhesive to at least one of the first or second walls of the bag and positioned in reenforcing relation to the die cut handle for providing reinforcement to the handle when the bag is being carried by the handle, said strip being removable from its reenforcing position on the handle and repositioned over the pour spout opening in the bag and secured in place by the pressure sensitive adhesive for sealing the opening in the bag to retain remaining contents therein.

5,558,439

WEDGE ZIPPER

Paul A. Tilman, New City, N.Y., assignor to Minigroup Inc., Orangeburg, N.Y.

Filed Jun. 8, 1995, Ser. No. 488,692
Int. Cl.[6] B65D *33/24*
U.S. Cl. 383—63 **24 Claims**



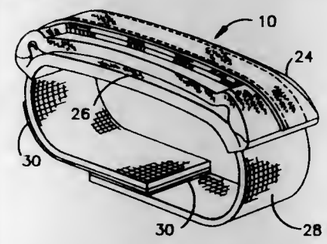
1. A reclosable bag comprising;
a first wall and a second wall joined to form an enclosure with a mouth defined by wall edges; and
a closure for selectively opening and sealing said mouth, said closure comprising a male profile extending along an internal surface of said first wall and a female profile and extending along an internal surface of said second wall, said male and female profiles being extruded from a first polymeric material, wherein at least one of said male profile and said female profile includes at least one rib of a second polymeric material coextruded therewith having a free end directed toward the other of said male profile and said female profile, and extending longitudinally therealong, said second polymeric material having a lower melting point than said first polymeric material.

5,558,440

ARTICLE FOR RETAINING OBJECTS

E. Lynn Miller, 1002 Locust St., Columbia, Mo. 65205

PCT No. PCT/US91/04157, § 371 Date Dec. 13, 1993, § 102(e) Date Dec. 13, 1993, PCT Pub. No. WO92/22463, PCT Pub. Date Dec. 23, 1992
PCT Filed Jun. 13, 1991, Ser. No. 167,843
Int. Cl.[6] B65D *30/20*
U.S. Cl. 383—87 **13 Claims**



1. A pouch which may be secured to the body of a user, said pouch comprising a top layer and a bottom layer of fabric which together form a closed cavity for retaining articles, said top and bottom layers each having a center section extending parallel to and between side sections, the side sections being releasably folded inward of the closed cavity into overlapping relationship with one another and between the center sections of the top and bottom layers, the center section of the top layer including an access opening into said closed cavity and the center section of the bottom layer including a means for releasably attaching said pouch to the body of the user.

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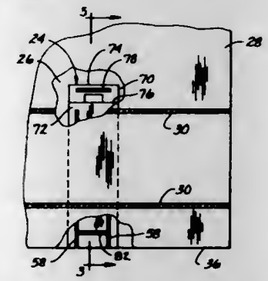
RECEPTACLE

Kenneth V. Morrison; Rick L. Felton, both of 40 N. Kingshighway, St. Louis, Mo. 63108, and Vernon S. Eckert, 8024 Pembroke Dr., St. Louis, Mo. 63123

Filed Dec. 12, 1994, Ser. No. 353,823
Int. Cl.[6] B65D *33/01*
U.S. Cl. 383—100 **13 Claims**



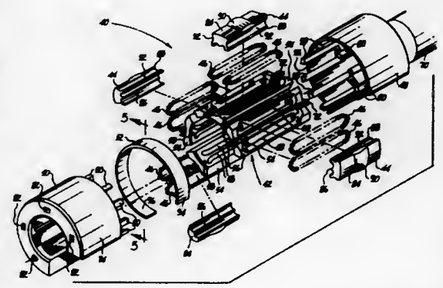
1. A receptacle made of air-impervious sheet material which is heat-sealable at least on one face thereof, said receptacle having portions with the heat-sealable face of one portion opposed to the heat-sealable face of another, said portions being heat-sealed together forming a seal for the receptacle, said receptacle having a check valve for venting air therefrom for deflation of the receptacle while checking ingress of outside air, said check valve comprising an elongate flat tube of heat-sealable sheet material extending between said portions of the receptacle through the seal from the inside to the outside of the receptacle, said tube having opposed walls, an inlet end, a discharge end, an elongate longitudinal passage between the opposed walls and extending from the inlet end of the tube to the discharge end, said opposed portions of the receptacle being heat-sealed to the outside of the tube in line with said seal, and said tube having means therein for inhibiting sealing together of its walls allowing simultaneous formation of said seal and heat sealing of said portions of the receptacle to the outside of the tube, the inlet end of the tube being inside the receptacle and the outlet end of the tube being outside the receptacle, said opposed portions of the receptacle being bonded to the walls of the tube at the inlet end of the tube for maintaining the inlet end of the tube in an open position.

5,558,442

LINEAR MOTION BEARING ASSEMBLY

Alison Ng, Jamaica, N.Y., assignor to Thomson Industries, Inc., Port Washington, N.Y.

Continuation of Ser. No. 239,996, May 9, 1994, abandoned, which is a continuation-in-part of Ser. No. 94,514, Jul. 20, 1993, Pat. No. 5,346,313. This application Jan. 2, 1996, Ser. No. 582,043
Int. Cl.[6] F16C *29/06*
U.S. Cl. 384—43 **23 Claims**



1. A linear motion bearing assembly for movement along a shaft comprising:
ball retainer structure having at least a portion of a plurality of open axial ball tracks formed therein, said ball tracks including an open load bearing portion, an open return portion and turnarounds interconnecting said load bearing and return portions;
a plurality of bearing balls disposed in said ball tracks;
a plurality of load bearing plates axially positioned adjacent said ball retainer structure for receiving load from said balls disposed in said load bearing portion of the ball tracks; and
an extended plate retainer structure enclosing substantially all of an exposed exterior surface of said ball retainer structure and having a uniform substantially cylindrical inner surface in direct contact with said load bearing plates, said extended plate retainer structure being configured and dimensioned to maintain said plurality of load bearing plates in position and for receiving load directly from said load bearing plates.

5,558,443

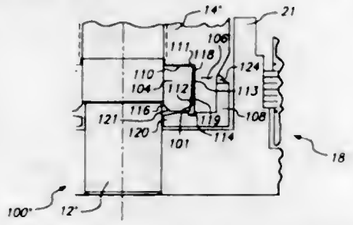
SHAFT SEAL FOR HYDRODYNAMIC BEARING UNIT

Yan Zang, Milpitas, Calif., assignor to Quantum Corporation, Milpitas, Calif.

Continuation-in-part of Ser. No. 363,566, Dec. 22, 1994, which is a continuation-in-part of Ser. No. 278,803, Jul. 22, 1994, abandoned. This application Jul. 18, 1995, Ser. No. 503,794

Int. Cl.[6] F16C *33/72*

U.S. Cl. 384—112 **11 Claims**



1. An improved seal for a hydrodynamic bearing unit including a shaft, a sleeve rotatably disposed over the shaft and defining a pair of spaced-apart hydrodynamic journal bearings in cooperation with the shaft, an annular axial thrust plate secured to the shaft to form a first hydrodynamic thrust bearing with the sleeve, and a second hydrodynamic thrust bearing with a top plate secured to the sleeve, the bearing unit being filled with a hydrodynamic bearing lubricant, the improved seal for containing the hydrodynamic bearing lubricant and including:

a seal ring secured to the shaft and extending radially outwardly of the pair of spaced-apart hydrodynamic journal bearings being defined between the seal ring and the thrust plate, the seal ring adjacently facing adjacent radial and axial portions of the sleeve,

an annular taper capillary seal defined between a diverging outer wall surface of the seal ring and the adjacent axial portion of the sleeve, and

a containment ring means extending from the sleeve to surround a radial wall portion of the seal ring adjacent to an opening of the taper capillary seal and forming a secondary containment sealing means opening toward the shaft for preventing escape of the hydrodynamic bearing lubricant,

the hydrodynamic lubricant emplaced within the annular taper capillary seal and being retained in place by capillary force in the absence of rotation, and being retained in place by capillary force and by centrifugal force in the presence of relative rotation between the shaft and the sleeve.

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BEARINGS HAVING SPACED PADS AND METHODS OF MAKING THE SAME

Russell D. Ide, 122 Ridge Dr., Exeter, R.I. 02822

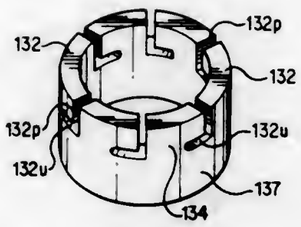
Division of Ser. No. 956,838, Oct. 2, 1992, Pat. No. 5,284,392, which is a continuation-in-part of Ser. No. 685,148, Apr. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 389,881, Feb. 8, 1989, Pat. No. 5,137,373, which is a continuation-in-part of Ser. No. 283,529, Oct. 25, 1988, Pat. No. 5,112,143, which is a continuation-in-part of Ser. No. 55,340, May 29, 1987, abandoned. This application Dec. 3, 1993, Ser. No. 161,169

Int. Cl.[6] F16C *17/06*

U.S. Cl. 384—122 **15 Claims**

1. A unitary thrust bearing comprising:

a one-piece substantially cylindrical body having an axis and a cylindrical radially inner surface, a cylindrical radially outer surface spaced radially outward from the cylindrical inner surface, and two axially spaced edge surfaces at least one of which is substantially planar; the cylindrical body being formed with a plurality of circumferentially spaced axially extending grooves extending between the inner and outer surfaces from the planar edge surface so as to define a plurality of circumferentially spaced bearing pads each bearing pad having a planar pad surface and axially extending grooves extending at a right angle to the plane of the bearing pad surfaces; a plurality of circumferentially extending grooves, each circumferentially extending groove extending between the inner and outer radial surfaces in continuance of and at a right angle to an axially extending groove so as to undercut a portion of the bearing pad defined by the axially extending groove.



5,558,445

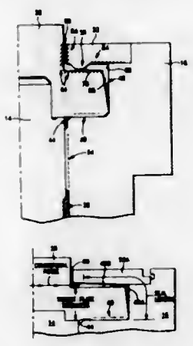
SELF-CONTAINED HYDRODYNAMIC BEARING UNIT AND SEALS

Shuo-Hao Chen, Fremont; Yan Zang, Milpitas, and Michael R. Hatch, Mountain View, all of Calif., assignors to Quantum Corporation, Milpitas, Calif.

Continuation-in-part of Ser. No. 278,803, Jul. 22, 1994, abandoned. This application Dec. 22, 1994, Ser. No. 363,566

Int. Cl.[6] F16C *33/74;32/06*

U.S. Cl. 384—132 **26 Claims**



1. A self-contained hydrodynamic bearing unit comprising a shaft and a shaft housing defining an opening for receiving the shaft for relative rotation, at least one radial hydrodynamic bearing defined between the shaft and the shaft housing, the shaft defining an annular thrust bearing disk portion extending radially outward of a main cylindrical surface of the shaft and cooperating with an adjacent annular face of the shaft housing to define a hydrodynamic thrust bearing, a gap being formed between an outer cylindrical wall of the thrust bearing disk portion and an adjacently facing cylindrical surface of the shaft housing for defining a primary annular surface tension capillary seal, and an annular bushing ring extending from the housing radially inwardly to enclose the thrust bearing disk, at least one of the annular bushing ring and an adjacent outer face of the thrust bearing disk forming a secondary containment capillary seal, there normally being lubricating liquid in the bearing unit at the radial hydrodynamic bearing, at the hydrodynamic thrust bearing and in the primary annular capillary seal, the secondary containment capillary seal for containing overflow of lubricating liquid from the primary annular capillary seal, the trapped lubricating liquid being urged toward the primary annular capillary seal by centrifugal force generated by the relative rotation between the shaft and the shaft housing.

19. A self-contained hydrodynamic bearing unit having a first surface tension capillary seal, the bearing unit comprising:

a shaft and a sleeve defining an opening for receiving the shaft and being dimensioned relative to the shaft to enable relative rotation about an axis,

a first hydrodynamic journal bearing defined between a main cylindrical surface of the shaft and the sleeve,

the shaft including a first annular thrust bearing disk portion extending radially outwardly from the main cylindrical surface and cooperating with an adjacent annular face of the sleeve to define a first hydrodynamic thrust bearing,

a first gap defined between an outer wall of the first thrust bearing disk portion and an adjacently facing surface of the sleeve comprising an axial segment of the capillary seal,

a first annular bushing ring extending from the sleeve radially inwardly toward the shaft to enclose the first annular thrust bearing disk portion and defining in combination with the shaft a radially inward axial opening to ambient,

a second gap defined between the bushing ring and an adjacent face of the thrust bearing disk portion comprising a radial segment of the first surface tension capillary seal,

the axial segment of the first surface tension capillary seal being contiguous with the radial segment of the capillary seal,

hydrodynamic lubricating liquid in the bearing unit at the first hydrodynamic journal bearing, at the first hydrodynamic thrust bearing and in at least the axial segment of the first surface tension capillary seal,

the radial segment for receiving and holding lubricating liquid otherwise flowing out of the axial segment of the seal capillary seal,

the lubricating liquid in the radial segment being forced toward the axial segment of the capillary seal by centrifugal force resulting from relative rotation between the shaft and the sleeve.

5,558,446

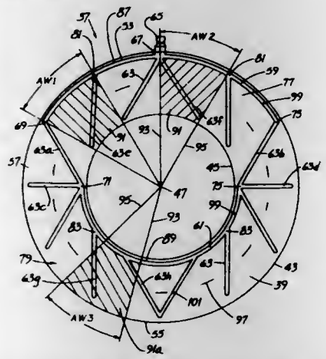
BEARING ARRANGEMENT WITH GRAVITY-FED LUBRICATION

Harvey J. Kallenberger, Wind Lake, Wis., assignor to Harnischfeger Corporation, Brookfield, Wis.

Filed Jun. 2, 1995, Ser. No. 459,709

Int. Cl.[6] F16C *33/10*

U.S. Cl. 384—368 **16 Claims**



1. In the combination including (a) a generally planar thrust bearing angular to a horizontal plane and having a bearing center and a region of highest elevation above such plane, and (b) a load-support structure oscillating on the bearing, and wherein the bearing includes a plurality of lubrication grooves, the improvement wherein:

the bearing includes a lubricant feed aperture at the region;

the grooves are connected to the aperture; and

at least one of the grooves intersects a circle concentric with the bearing center,

whereby grooves are gravity-fed with lubricant.

5,558,447

ROLLER BEARING

Hans Hardtke, Zeven, Germany, assignor to LISEGA GmbH, Germany

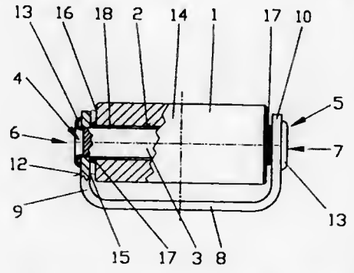
PCT No. PCT/DE93/00396, § 371 Date Dec. 8, 1994, § 102(e) Date Dec. 8, 1994, PCT Pub. No. WO93/22572, PCT Pub. Date Nov. 11, 1993

PCT Filed Apr. 30, 1993, Ser. No. 331,608

Claims priority, application Germany, May 4, 1992, 9206032 U

Int. Cl.[6] F16C *13/00;19/00*

U.S. Cl. 384—418 **9 Claims**



1. A rotatable roller bearing comprising a cylindrical roller mounted centrally on a shaft, said shaft having end portions which extend beyond the roller on opposite sides thereof, said shaft end portions being fitted in a mounting having remote outer surfaces and more adjacent inner surfaces, at least said shaft end portions each including a wall defining a substantially hollow cavity, the wall of each cavity being secured in position against an adjacent outer surface of the mounting by bending each end wall of the shaft concentrically outward against the adjacent outer surface of the mounting in the form of a concentric bead.

5,558,448

ROLLING BEARING

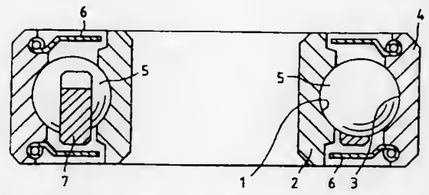
Toshikazu Yabe; Hiromitsu Asai, and Magozo Hamamoto, all of Kanagawa, Japan, assignors to NSK Ltd., Tokyo, Japan

Filed Jul. 7, 1995, Ser. No. 499,216

Claims priority, application Japan, Jul. 7, 1994, 6-177713

Int. Cl.[6] F16C *33/66*

U.S. Cl. 384—470 **6 Claims**



1. A rolling bearing comprising an outer race having one track, an inner race having another track, a plurality of rolling elements arranged between both tracks, and a cage for retaining the plurality of rolling elements in such a way that the rolling elements can roll freely,

wherein the cage is a lubricating oil-containing polymer member

5,558,450

a supporting member for supporting said guide means to be

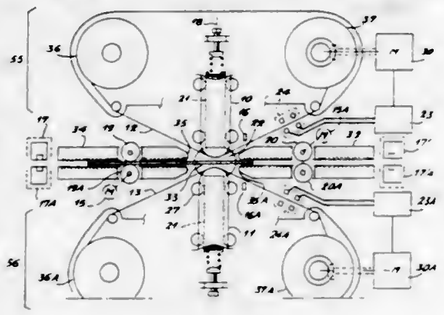
wherein the cage is a lubricating oil-containing polymer member obtained by injection molding a composition which comprises a polyolefin resin and a lubricating oil and contains the lubricating oil in an amount of 10 to 80% by weight.

5,558,449

SIMULTANEOUS TWO-FACE PRINTING MACHINE

Paul Morgavi, La Ciotat, France, assignor to Gemplus Card International, Gemenos, France

Filed Apr. 10, 1995, Ser. No. 419,453
Claims priority, application France, Apr. 15, 1994, 94 04829
Int. Cl.[6] B41J *2/315*
U.S. Cl. 400—188 **18 Claims**



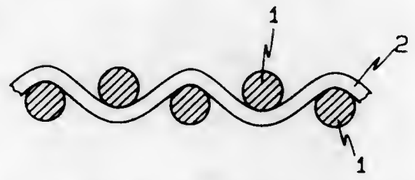
1. A printing machine for simultaneously printing on two faces of a card, the printing machine comprising:
a guide, the guide defining a pathway along which the card is conveyed through the printing machine;
a plurality of rollers disposed along the pathway along which the card is conveyed through the printing machine;
a first card-drive motor, the first card-drive motor being coupled to a first one of the plurality of rollers, the first card-drive motor cooperating with the plurality of rollers so as to convey the card along the pathway;
a first printing machine, the first printing machine being disposed on a first side of the guide, the first printing machine further comprising
a first thermal print head, the first print head being movable along an axis which is perpendicular to the two faces of the card,
a first ribbon carrying inks and substances to be deposited on the card by the first thermal print head;
a second printing machine, the second printing machine being identical to the first printing machine, the second printing machine being disposed on a second side of the guide, and the second printing machine further comprising
a second thermal print head, the second print head being movable along the axis which is perpendicular to the two faces of the card, the axis thereby forming a common axis of movement of the first and second print heads, and the second print head cooperating with the first print head so as to simultaneously print on the two faces of the card, and
a second ribbon carrying inks and substances to be deposited on the card by the second thermal print head;
a print head motor, the print head motor being coupled to the first and second print heads and being adapted for moving the first and second print heads along the common axis; and
an electronic control circuit, the electronic control circuit being coupled to the first card-drive motor and to the print head motor, the electronic control circuit causing the first card-drive motor and the print head motor to cooperate so as to bring the first and second thermal print heads into contact with the card during the passage of the card in the guide when the card is at the position of the first and second thermal print heads.

5,558,450

INK RIBBON FABRIC FOUNDATION

Seiji Tsuboi, and Zheng l. Cai, both of Osaka, Japan, assignors to Fujicopian Co., Ltd., Osaka, Japan

Filed Apr. 6, 1995, Ser. No. 418,070
Claims priority, application Japan, Apr. 7, 1994, 6-069660
Int. Cl.[6] B41J *31/02*
U.S. Cl. 400—241.3 **3 Claims**



1. An ink ribbon fabric foundation comprising a plain weave fabric comprising warp yarns and weft yarns, said plain weave fabric satisfying the following equation:

$$K=1.5 \text{ to } 6$$

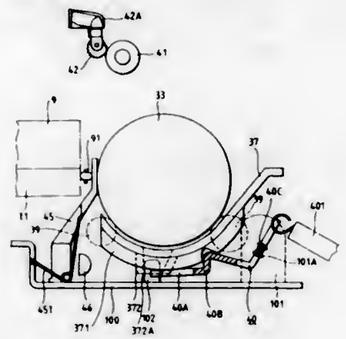
wherein K is the ratio of C_1/C_2; C_1 is a warp crimp rate; and C_2 is a weft crimp rate.

5,558,451

SHIFTABLE GUIDE MEMBER WITH ROLLERS IN A SHEET FEEDING APPARATUS

Tadashi Hanabusa; Masanori Kaneko, both of Kawasaki, and Koh Hasegawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 956,475, Oct. 2, 1992, abandoned, which is a continuation of Ser. No. 634,735, Dec. 27, 1990, abandoned. This application Mar. 1, 1994, Ser. No. 203,746
Claims priority, application Japan, Dec. 29, 1989, 1-344905
Int. Cl.[6] B41J *13/054*
U.S. Cl. 400—637 **7 Claims**



1. An image forming apparatus comprising:
a main body;
a conveying rotary member for conveying a sheet in a sheet conveying direction;
guide means for guiding a sheet being conveyed along said conveying rotary member;
a second rotary member supported by said guide means and arranged to form a nip between said second rotary member and said conveying rotary member, for nipping a sheet being conveyed therethrough;
biasing means for biasing said guide means to urge said second rotary member against said conveying rotary member;

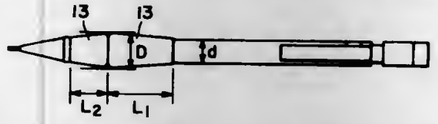
a supporting member for supporting said guide means to be shiftable between a first position and a second position located upstream of the first position in the sheet conveying direction, such that said guide means is located in the first position when a sheet is nipped and conveyed by said conveying rotary member and said second rotary member, and said guide means is shifted along an outer periphery of said conveying rotary member in a direction reverse to the sheet conveying direction to the second position as a result of a reaction force received from a trailing end of a sheet conveyed by said conveying rotary member when the trailing end passes through the nip; and
image forming means for forming an image on the sheet being conveyed by said conveying rotary member,
wherein said supporting member includes movement regulating means for limiting movement of said guide means in the sheet conveying direction and the direction reverse to the sheet conveying, and
wherein said movement regulating means includes first and second contact portions provided on said guide member, and third and fourth contact portions provided on the main body of the apparatus for limiting movement of said guide means to a predetermined range, said first and third contact portions being arranged for abutting so as to selectively inhibit said guide means from moving beyond the predetermined range in the sheet conveying direction, and said second and fourth contact portions being arranged so as to selectively inhibit said guide means from moving beyond the predetermined range in the direction reverse to the sheet conveying direction.

5,558,452

HOLDER TUBE FOR WRITING INSTRUMENT

Shigeo Oka, Tokyo, and Takayuki Hoshi, Funabashi, both of Japan, assignors to Pentel Kabushiki Kaisha, Japan

PCT No. PCT/JP93/01475, § 371 Date Jun. 28, 1994, § 102(e) Date Jun. 28, 1994, PCT Pub. No. WO94/09996, PCT Pub. Date May 11, 1994
PCT Filed Oct. 14, 1993, Ser. No. 244,914
Claims priority, application Japan, Oct. 29, 1992, 4-080980; Jul. 15, 1993, 5-043690
Int. Cl.[6] B43K *23/00*
U.S. Cl. 401—6 **31 Claims**



1. A grip for a writing instrument, comprising: a first frusto-conical ring and a second frusto-conical ring each disposed around and on a barrel of a writing instrument, the first frusto-conical ring having a substantially longer axial length than the second frusto-conical ring, and the first and second frusto-conical rings being in abutting end-to-end contact with each other at a front portion of the writing instrument barrel to define a grip.

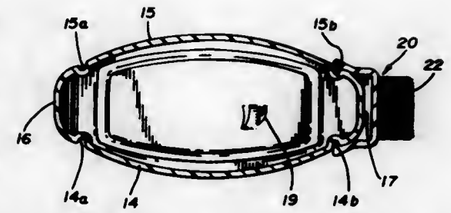
5,558,453

CONTAINER AND APPLICATOR COMBINATION

Ronald F. Bell, Uniontown, Ohio; Charles W. Botsford, Highland Village, Tex.; Thomas Kearnes, Richfield, and Detlev F. Smith, Akron, both of Ohio, assignors to GOJO Industries, Inc., Cuyahoga Falls, Ohio

Filed May 18, 1995, Ser. No. 443,426
Int. Cl.[6] A46B *11/00*
U.S. Cl. 401—137 **7 Claims**

1. A container and applicator combination comprising:
(a) a container having front and rear walls and integral, opposed sidewalls interconnecting said front and rear walls;



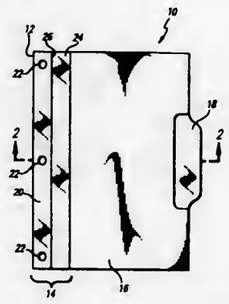
(b) at least one applicator including an elongate handle; and
(c) means, carried by said front and rear walls of said container and said elongate handle of said applicator for releasably attaching said applicator to said container.

5,558,454

ONE-PIECE LASER/INK JET PRINTABLE DIVIDER WHICH IS FOLDED OVER AT THE BINDING EDGE

Sonia Owen, Covina, Calif., assignor to Avery Dennison Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 116,058, Sep. 2, 1993, abandoned. This application Dec. 1, 1994, Ser. No. 348,370
Int. Cl.[6] B42F *13/00*
U.S. Cl. 402—79 **22 Claims**



1. A one-piece divider assembly which is folded over along one edge for feeding into a laser printer, ink jet printer, or photocopier, the divider comprising:
a divider sheet having a binding edge, a binding edge region of reduced thickness extending inwardly from said binding edge, and a main body having an integral, outwardly-extending tab;
said divider sheet having a longitudinal folding line which is inset from and which runs substantially parallel to said binding edge;
said binding edge region having a folding portion defined on one side by said binding edge and on the opposite side by said folding line, and a non-folding portion; and
a binding edge reinforcement film which is adhered to at least a portion of said binding edge region;
wherein said folding portion of said binding edge region is folded over at said folding line and said folding portion is releasably tacked with a single-use adhesive to said non-folding portion of said divider sheet.

5,558,455

BREAK-AWAY BANNER ROD FITTER

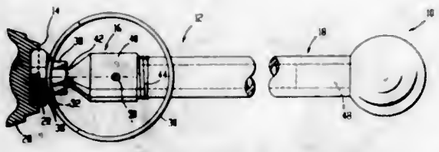
Nelson J. Emery, Emporia, Kans., assignor to Emery Fixtures Inc., Emporia, Kans.

Filed May 30, 1995, Ser. No. 453,341
Int. Cl.[6] F16D *9/06*
U.S. Cl. 403—2 **9 Claims**

1. A break-away banner rod assembly comprising:

said planar surface along said proximal edge of said tab,

5,558,460



a fixture comprising a mounting plate adapted for engaging and coupling to an upright support surface and including a laterally extending, tubular body having a slot in the sidewall thereof;

a banner rod coupler supported by said fixture and including a laterally extending segment having a zone of weakness; and

an elongated banner rod having one end thereof operatively coupled with said coupler and extending through said slot of said tubular body for supporting a banner therefrom,

said tubular body captively retaining said one end of said banner rod in the event of load-induced breakage of said coupler adjacent said zone of weakness.

5,558,456

DRIVE BEARING ARRANGEMENTS FOR WATERCRAFT

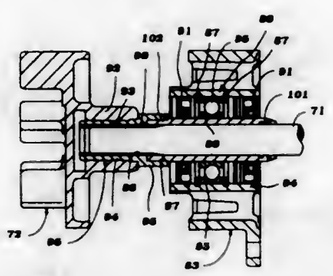
Ryoichi Nakase, and Noboru Suganuma, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 19, 1994, Ser. No. 325,702

Claims priority, application Japan, Oct. 19, 1993, 5-261187

Int. Cl.[6] B63H *23/00*; F16D *1/06*

U.S. Cl. 403—359 **10 Claims**



1. A coupling between a shaft extending through a supporting wall and a drive coupling element disposed on only one side of said supporting wall, said shaft passing with a clearance through the inner race of an anti-friction bearing the outer house of which is fixed to said supporting wall, said shaft having a splined portion extending on said one side of said supporting wall beyond said inner race, said coupling element having an inner hub formed with a splined opening receiving and forming a driving connection to said shaft splined portion, and a corrosion-resistant sleeve extending in the area between said inner race and said shaft and in inter-fitting relationship with said inner hub.

5,558,457

CHUCKING DEVICE FOR FIXING A HOLLOW SHAFT TO A SHAFT

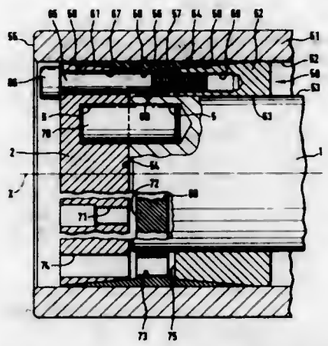
Ralph Mullenberg, Im Wiesengrund 6, D-41516 Grevenbroich, Germany

Filed Feb. 21, 1995, Ser. No. 391,103

Claims priority, application Germany, Mar. 2, 1994, 9403482 U

Int. Cl.[6] F16D *1/09*

U.S. Cl. 403—370 **12 Claims**



9. A chucking device for the torque-transferring fixation of a hollow shaft to a shaft having an axis by means of a cone chucking device which clamps the hollow shaft and the shaft together in a frictionally connected manner and can be operated by means of axial clamping screws, said shaft having a front face, the improvement comprising: a disk element of said cone chucking device extending in front of said front face of said shaft and extending transversely to said axis and means for interlockingly fixing said front face of said shaft to said disk to secure against relative rotation, said front face of said shaft including a bore having a side face and a bottom face, said disk element having a shaft face adjacent said shaft and an outer face, said shaft face including a bore having a side face and a bottom face and aligned in substantial registry with said shaft bore, said means for interlockingly fixing including cotter means for fixing relative rotation located within said aligned bores.

5,558,458

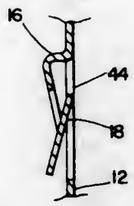
CONNECTOR

Gary Silvis; Thomas E. Howland, both of Georgetown, and Steven R. Saoke, Batavia, all of Ohio, assignors to Stanley Mechanics Tools, Georgetown, Ohio

Filed Feb. 21, 1995, Ser. No. 391,644

Int. Cl.[6] F16B *5/07*

U.S. Cl. 403—393 **11 Claims**



1. A connection assembly, comprising:

a first member with a substantially planar surface;

a tab having a proximal edge and a distal end formed from a section of said planar surface, wherein said tab is integral with said planar surface along said proximal edge of said tab, wherein said tab is offset from said planar surface and disposed substantially parallel to said planar surface, and wherein said distal end of said tab does not extend beyond an edge of said first member;

a catch formed from said tab, wherein said catch is integral with said tab along a proximal edge of said catch, said proximal edge of said catch located at a point intermediate between said proximal edge of said tab and said distal end of said tab, said catch extending from said proximal edge of said catch to a distal end of said catch, said distal end of said catch located between said proximal edge of said catch and said proximal edge of said tab, wherein said distal end of said catch is biased towards said planar surface;

a second member with a substantially planar surface; and

an opening formed in said planar surface of said second member, wherein said opening is configured to receive said distal end of said catch when said second member is positioned in a space between said tab and said planar surface of said first member.

5,558,459

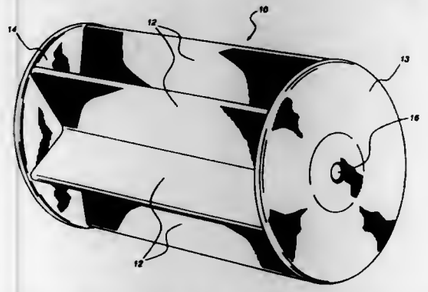
WAVE SUPPRESSION MEANS FOR LARGE WAVES

Peter W. Odenbach, P.O. Box 1355, Monument, Colo. 80132, and Dale Kieffer, Faocagrtg, Via delle Terme di Caracalla, Rome, Italy

Filed Feb. 13, 1995, Ser. No. 387,447

Int. Cl.[6] E02B *3/04*; *3/06*

U.S. Cl. 405—21 **5 Claims**



1. A wave suppressor for use in suppressing large waves formed by ships, tides and wind comprised of

a. a cylindrical hollow core member having an inner and outer surface, said outer surface having an opening located therein, said opening permitting filling material to enter said hollow of said core member in order to provide a desirable buoyancy to said wave suppressor, and said inner surface defining a central axial opening;

b. a removable plug which interacts with the opening located within said outer surface of said core member to form a water-fight seal;

c. a plurality of hollow fins radially extending outward from such core member and positioned substantially coextensively along the length of said core member, with the hollow interior regions of said fins extending into the hollow region of said core member;

d. two hollow discs circumferentially positioned about and connected to each end of said core member and also to said fins, with the hollow interior regions of said discs extending into the hollow region of said core member so as to form a single hollow interior area within said wave suppressor which is coextensive with said core member, said fins and said discs; and

e. a tube located within and positioned coextensively along the length of said central axial opening, said tube having a central axial opening for receiving a means for stringing a plurality of wave suppressors together.

5,558,460

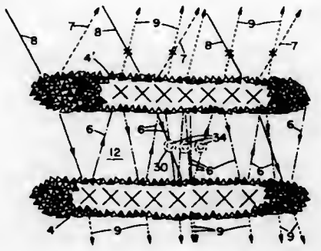
APPARATUS FOR ENHANCING WAVE HEIGHT IN OCEAN WAVES

Scott A. Jenkins, 14765 Kalapana St., Poway, Calif. 92064; Joseph Wasyl, 4529 Mount Henry Pl., San Diego, Calif. 92117, and Charles Robins, 2110 Avenida de La Playa, La Jolla, Calif. 92037

Filed Mar. 3, 1994, Ser. No. 206,501

Int. Cl.[6] E02B *3/06*

U.S. Cl. 405—29 **9 Claims**



1. An artificial reef structure for altering at least one of a wavelength, wave frequency, wave number and wave direction of incoming ocean waves for generating constructive interference between said incoming ocean waves to generate a wave having an enhanced height greater than a height of said incoming ocean waves, the artificial reef comprising:

a plurality of structural units disposed in at least one talus pile, said at least one talus pile having a reef height and a reef slope, each structural unit comprising a sandbag having a tetrahedron-shape with four corners wherein said plurality of structural units are randomly distributed within said at least one talus pile with respect to each other to form a plurality of irregular surfaces each having a plurality of raised corners and recessed spaces therebetween for receiving at least one of said corners therein so that at least a portion of said corners of each said structural unit fits within the recessed spaces defined by other structural units of said plurality of structural units so that said plurality of structural units is substantially interlocked and wherein said reef height is less than said incoming wave height and is adapted to induce drag on said incoming ocean waves to diffract the incoming ocean waves to a pre-selected location to cause the incoming ocean waves to constructively interfere at the pre-selected location.

5,558,461

TUBULAR GUTTER SYSTEM

Arie Van Dorp, Hazerswoude Dorp, Netherlands, assignor to Arvado Patent B.V., Hazerswoude, Netherlands

PCT No. PCT/NL92/00046, § 371 Date Nov. 14, 1994, § 102(e) Date Nov. 14, 1994, PCT Pub. No. WO93/18239, PCT Pub. Date Sep. 16, 1993

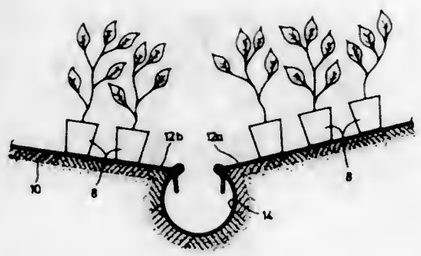
PCT Filed Mar. 10, 1992, Ser. No. 295,906

Int. Cl.[6] E02B *13/00*

U.S. Cl. 405—43 **22 Claims**

1. In a system for collecting water from a surface which is covered by a waterproof membrane, whereby tubular gutters are installed in trenches in the surface adjacent to the margins of the waterproof membrane and whereby the surface is slightly sloped such that water on the membrane will flow in a natural manner in the direction of a gutter, each tubular gutter comprising apertures through which water may enter the gutter, the improvement wherein the apertures in each tubular gutter of the system are present in an upwardly directed wall of the tubular gutter and have an elongated shape with a largest dimension in length direction of the tubular gutter, whereby a marginal section of the membrane adjacent to said apertures is attached to the wall of the tubular

therethrough and a secondary conduit means mainly of polymeric material for containing at least part of said primary conduit means therein with each said conduit means having an inner peripheral



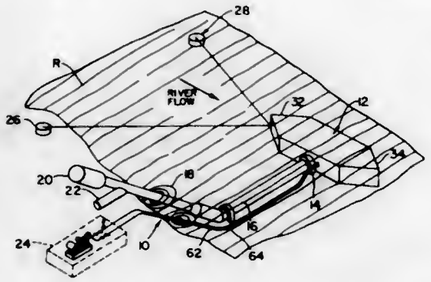
gutter at or directly adjacent to an edge of each aperture such that water flowing along the membrane will be received in said gutter.

5,558,462

FLAT PLATE FISH SCREEN SYSTEM

George G. O'Haver, Redding, Calif., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 2, 1994, Ser. No. 352,753
Int. Cl.[6] E02B *8/08*
U.S. Cl. 405—81 **19 Claims**



1. A fish screen device adapted to be lowered into a body of water such as a lake, river or the like and to be raised therefrom, said device comprising:

a housing unit including a flat fish screen through which water passes and a discharge outlet for water passing through the fish screen for connection to external discharge piping; and

controllable buoyancy means, disposed within said housing unit, for enabling the housing unit including the fish screen to be lowered to the bottom of a body of water and to be raised therefrom.

5,558,463

SOIL REMEDIATION APPARATUS AND METHOD

Donald J. Geisel, 6 Jordan Court, Clifton Park, N.Y. 12065

Filed Mar. 21, 1995, Ser. No. 407,763
Int. Cl.[6] B09C *1/06*; **E21B** *36/00*
U.S. Cl. 405—128 **38 Claims**

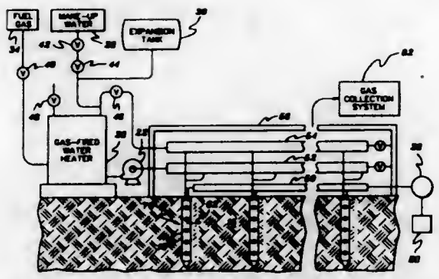
1. An apparatus for assisting soil remediation comprising:

transfer means for transferring thermal energy to soil; and

means for introducing a supplemental fluid into soil surrounding said transfer means, wherein said thermal energy and said fluid assist said soil remediation.

9. A method of facilitating soil remediation with a probe including heat transfer apparatus and supplemental fluid introduction apparatus, the method comprising steps of:

probing soil with said probe, wherein said heat transfer apparatus heats the soil surrounding said probe; and



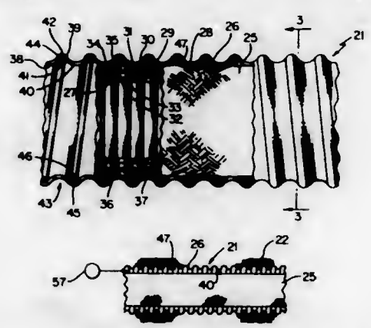
injecting supplemental fluid into the soil surrounding said probe via said supplemental fluid introduction apparatus for enhancing remediation thereof, wherein said supplemental fluid introduction apparatus operates independent from said heat transfer apparatus.

5,558,464

SYSTEM FOR CONVEYING A FLUID THROUGH AN UNDER-THE-GROUND LOCATION AND METHOD OF MAKING THE SAME

Joseph V. Tassone, Kettering, Ohio; Richard L. Marsh, Springfield, Mo., and James T. Candor, Washington Township, Ohio, assignors to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 284,029, Aug. 1, 1994, which is a division of Ser. No. 18,687, Feb. 17, 1993, Pat. No. 5,358,358. This application May 19, 1995, Ser. No. 445,445
Int. Cl.[6] F16L *11/11*
U.S. Cl. 405—154 **16 Claims**



1. In a system for conveying a fluid through an under-the-ground location, said system comprising a primary flexible conduit means for conveying said fluid therethrough and having an inner peripheral surface and an outer substantially smooth surface, and an outer secondary conduit formed mainly of polymeric material having at least a portion of said primary conduit means removably disposed therein and having an inner peripheral surface and an outer peripheral surface that engages said ground in said under-the-ground location thereof; the improvement wherein said secondary conduit has a part of said inner peripheral surface thereof comprising inwardly directed wire reinforced projections thereof engaging the entire extent of said substantially smooth outer peripheral surface of said primary conduit means, said inwardly directed projections defining recesses to define a passage between said primary and said secondary conduit that extends therebetween throughout substantially the entire engagement area thereof so as to facilitate removal of said primary conduit means while said secondary conduit remains in said under-the-ground location thereof.

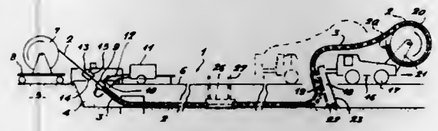
9. In a method of making a system for conveying a fluid through an under-the-ground location, said method comprising the steps of forming a primary flexible conduit means for conveying said fluid

therethrough and a secondary conduit means mainly of polymeric material for containing at least part of said primary conduit means therein with each said conduit means having an inner peripheral surface and an outer peripheral surface, forming said outer peripheral surface of said primary conduit means to have a substantially smooth surface, and disposing said system in said ground at said under-the ground location so that said ground engages said outer peripheral surface of said secondary conduit means and said at least part of said primary conduit means is removably disposed within said secondary conduit means; the improvement comprising the steps of forming said inner peripheral surface of said secondary conduit means to have a part thereof that comprises inwardly directed projections thereof engaging the entire extent of said substantially smooth outer peripheral surface of said primary conduit means said inwardly directed projections defining recesses to define a passage between said primary and said secondary conduits that extends therebetween through substantially the entire engagement area thereof so as to facilitate removal of said primary conduit means from said secondary conduit means while said secondary conduit means remain in said under-the-ground location thereof.

5,558,465

METHOD AND DEVICE FOR LAYING AN UNDERGROUND TELECOMMUNICATIONS CABLE

Alain Pecot, Lannion, and Philippe Lesueur, Tregastel, both of France, assignors to France Telecom, Paris, France

Filed Jun. 1, 1995, Ser. No. 457,218
Claims priority, application France, Jun. 6, 1994, 94.06904
Int. Cl.[6] E02F *5/10*
U.S. Cl. 405—178 **9 Claims**

1. A system for laying underground cable comprising:

a first drum fixed in position and supplying the cable to a trench dug in the ground;

a hauling pig formed at a leading end of the cable;

a second drum mounted to a moveable tractor for supplying a cable protecting tube into the trench as the tractor moves;

a plowshare mounted to the tractor for forming the trench as the tractor moves; and

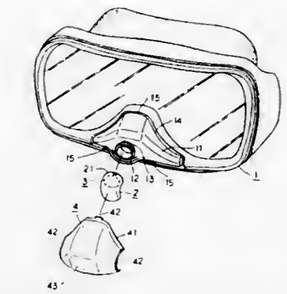
a compressor communicating with a tube section, rearwardly of the pig, for propelling the cable further into the tube.

5,558,466

DIVING MASK WITH A STRUCTURE FOR DRAIN AND FLOW GUIDE

Tzong-Fu Kuo, No35, Cheng long Lane, Sec. 2, San Ming Rd., Pan Chiao city, Taipei Hsien, and Le-Jang Feng, 1 Fl., No. 22-10, Lane 50, Tien Mu E. Rd., Taipei, both of Taiwan

Filed May 9, 1995, Ser. No. 437,590
Int. Cl.[6] A61F *9/02*
U.S. Cl. 405—186 **5 Claims**



1. A diving mask with a structure for a drain and flow guide comprising:

a frame body with a nose,

a drain port on a lower front portion of said nose,

a flow guide tube connected at a first end to said drain port and extending outward from said drain port, and an outlet end of said flow guide tube bent toward a lower edge of said nose, and

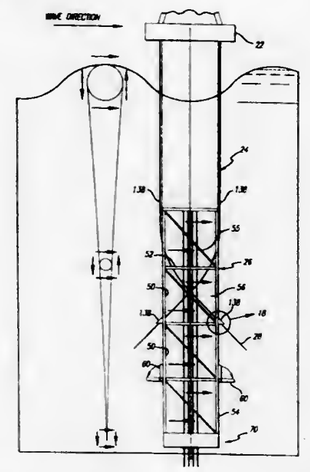
a check drain valve; such that a control and flow guide action of said flow guide tube restricts diffusion of water and air blown out by a diver so that said water and air drains smoothly from said diving mask.

5,558,467

DEEP WATER OFFSHORE APPARATUS

Edward E. Horton, Rancho Palos Verdes, Calif., assignor to Deep Oil Technology, Inc., Irvine, Calif.

Filed Nov. 8, 1994, Ser. No. 336,377
Int. Cl.[6] E02B *17/00*
U.S. Cl. 405—195.1 **30 Claims**



1. In a deep water offshore apparatus for us in oil drilling and production, the combination of:

an upper hull means having an upper end portion adapted to provide buoyancy to the apparatus and to extend above the water surface and support an equipment deck and a lower end portion adapted to extend downward to a selected water depth;

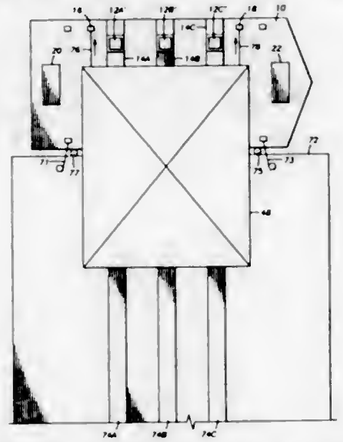
means connected to the lower end of the hull means and extending downwardly therefrom for minimizing heave, pitch, and roll motion of the apparatus;

said downwardly extending means comprising:

frame means including columns and vertically spaced entrapment plates carried thereby and providing open bays, said plates being spaced a vertical distance corresponding to a horizontal dimension of said bay to permit horizontal flow of water transversely between said plates and to limit movement of water vertically between said plates; said frame means being at a depth below significant wave action for inhibiting heave motion by entrapping water between

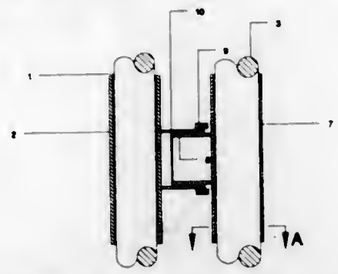
said plates and for increasing the natural period of the apparatus to an amount greater than the peak period of the wave spectrum;
a keel assembly at the lower end of the frame mean including ballast means and buoyancy compartments;
and anchor means connected to said apparatus at a depth of water where horizontal movement of the frame means is minimal.

5,558,468
METHOD AND APPARATUS FOR ERECTING A MARINE STRUCTURE
Andrew C. Barnett, Jr., 1013 River Bend Dr., Houston, Tex. 77063-1503; Larry R. Russell, and Barbara L. Thompson, both of Houston, Tex., assignors to Andrew C. Barnett, Jr., Houston, Tex.
Filed Jul. 15, 1994, Ser. No. 276,107
Int. Cl.[6] E02D *25/00*; **B63B** *35/44*
U.S. Cl. 405—204 **12 Claims**



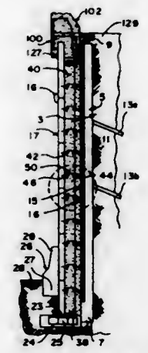
1. A method for installing a superstructure onto a substructure jacket located offshore to form an offshore platform, with the superstructure initially at a wharf and the substructure jacket supported offshore on a sea bottom at a location remote from the superstructure initially and the substructure jacket having a plurality of leg extensions extending above the sea surface, the method comprising the steps of:
erecting a plurality of parallel-disposed shore-mounted skid tracks on the wharf;
providing a variable-draft cargo vessel having a deck and a plurality of parallel-disposed deck-mounted skidways, each said skidway having a top surface;
nesting a plurality of normally retracted lifting means within each of said skidways and below said skidway top surface;
docking said cargo vessel at the wharf so that said deck-mounted skidways are in alignment with said shore-mounted skid tracks;
skidding the superstructure along said shore-mounted skid tracks and thence on to said deck-mounted skidways;
fastening the superstructure to said cargo vessel;
transporting said cargo vessel with the superstructure thereon to a location offshore in proximity to the substructure jacket supported on the sea bottom;
unfastening the superstructure from said cargo vessel;
extending said plurality of lifting means nested in each said skidway upwardly to elevate the superstructure to a preselected height above the jacket leg extensions;
depositing the superstructure in mating relationship upon the jacket while rapidly retracting said lifting means away from the superstructure with a coordinated movement of the lifting means to provide a rapid breakaway of the cargo vessel from the superstructure.

5,558,469
ROTATING PILE GUIDE
Lance W. Hellerman, 3905 Marlowe, Houston, Tex. 77005
Filed May 12, 1994, Ser. No. 241,567
Int. Cl.[6] E02D *13/04*
U.S. Cl. 405—232 **3 Claims**



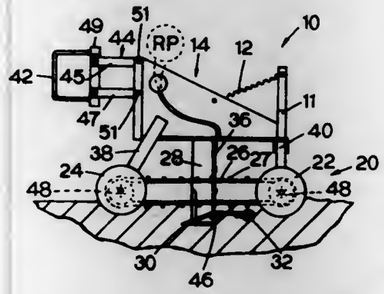
1. A rotating pile guide consisting of a bolted clamp shell being attached at one end to an offshore structure through a joint capable of rotation around an axis perpendicular to longitudinal axis of the clamp shell and fastened by a retaining ring to a standoff from the structure.

5,558,470
SYSTEM AND METHOD FOR ADJUSTABLY ANCHORING TRAFFIC BARRIERS AND WALL FACING PANELS TO THE SOLDIER BEAMS OF A WALL
J. Thomas Elmore; Alan Veatch, both of Washington, D.C.; William C. Clements, Reston, Va.; Victor Elias, Bethesda, Mass., and Longine J. Wojciechowski, Gaithersburg, Md., assignors to JTE, Inc., Lorton, Va.
Continuation-in-part of Ser. No. 958,260, Oct. 9, 1992, Pat. No. 5,356,242. This application Oct. 17, 1994, Ser. No. 323,732
Int. Cl.[6] E02D *29/00*
U.S. Cl. 405—262 **18 Claims**



1. A system for anchoring a traffic barrier along the top edge of a wall structure of the type including at least one wall panel spaced apart from and connected to a soldier beam, comprising:
a connecting structure means cast-in-place between said soldier beam and a top portion of said wall panel for structurally interconnecting a traffic barrier to said soldier beam, said connecting structure including an array of internal reinforcing members for both strengthening said connecting structure means and for interlinking said traffic barrier thereto, the reinforcing members being adjustable in depth prior to the casting in place of said connecting structure means to accommodate variations in the distance between said soldier beam and said panel, said array of internal reinforcing members including at least one vertically oriented bar member, and a second anchor member connected to and extending from said wall panel.

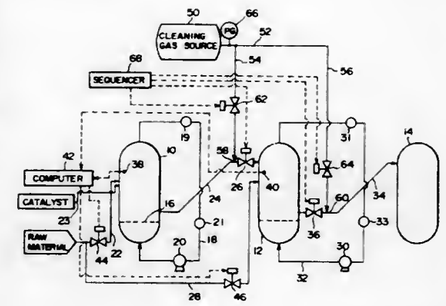
5,558,471
DEVICE FOR INJECTING CHEMICALS INTO THE SOIL
Gary L. Payne, HC 02, Box 36, McGee, Mo. 63763
Filed Mar. 23, 1995, Ser. No. 409,344
Int. Cl.[6] A01C *13/00*
U.S. Cl. 405—269 **29 Claims**



1. A device for injecting chemicals into the soil comprising:
at least one pair of drums, a front drum and a back drum, each drum having a side surface;
at least one belt encircling each pair of drums;
at least one disc mounted on at least one side surface of at least one drum;
means to support the device connected to the drums;
at least one brace connected to the means to support the device;
a knife extending from each brace;
at least one tube having a first end and a second end; and
at least one nozzle connected to the first end of each tube.

5,558,472
METHOD AND APPARATUS FOR TRANSPORTING PARTICLES
Hiroyuki Ogawa; Seiji Hirata, and Yoshizumi Sasaki, all of Ichihara, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
Filed Oct. 6, 1994, Ser. No. 319,020
Claims priority, application Japan, Oct. 7, 1993, 5-251632
Int. Cl.[6] B65G *53/66*
U.S. Cl. 106—12 **32 Claims**

1. A method for transporting particles, which comprises:
providing a first container containing particles and a second container;
providing a transportation pipe that connects said first container to said second container;
providing a first valve in said transportation pipe;
providing a supply source of cleaning gas to be supplied into said transportation pipe to clean inside of said transportation pipe;
making a pressure of said first container higher than a pressure of said second container;
making a pressure of cleaning gas supplied from said cleaning gas source higher than a pressure of said first container;



closing and opening said first valve to transport the particles from said first container to said second container intermittently;
supplying cleaning gas from said cleaning gas source into said transportation pipe while first valve is closed; and
stopping supply of cleaning gas from said cleaning gas source while said first valve is opened.

5,558,473
LABYRINTH SEAL COAL INJECTOR
Philip D. Lindahl, Arvada, Colo., assignor to Philip D. Lindahl, Herndon, Va.
Filed Aug. 15, 1994, Ser. No. 290,572
Int. Cl.[6] B65G *53/48*
U.S. Cl. 406—61 **10 Claims**

1. Apparatus for injecting dry particles into a pipeline containing a slurry of particles suspended in a pressurized fluid comprising:
a base,
a pipe-shaped housing attached to said base, said housing having an upstream end and a downstream end, said housing having an inlet for dry particles on the side of the housing near the upstream end and an outlet for particles at the downstream end,
said housing having one or more fluid injection inlets near the downstream end for mixing lubricating fluid with dry particles for the formation of lubricated particles,
a powered screw rotor inserted within the housing and extending from the upstream end to the downstream end,
a pipe-shaped reducer,
said reducer having an inlet end the same diameter as that of the downstream end of said housing,
said reducer attached by the inlet end to the downstream end of said housing,
said reducer having one or more fluid injection inlets near the inlet end for addition of lubricating fluid to provide further lubrication of lubricated particles,
said reducer attached to an isolation valve,
a mixing chamber attached to the isolation valve,
said mixing chamber having a laterally attached fluid inlet pipe for transport fluid,
said mixing chamber attached to a pipeline for transport of a slurry of particles suspended in a pressurized fluid.

5,558,474

subsequently rotating said drilling motor at a second rotation speed faster than the first rotation speed until an end of

wherein the total impedance of the combined negative capactiance circuit and said piezoelectric material is substantially

5,558,474

APPARATUS FOR DISCHARGING PARTICULATE MATERIAL

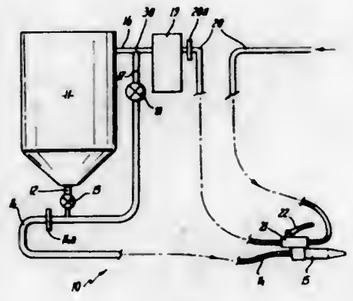
Kevin Wildon, 31 Hall Lane, Hindley, Wigan WN2 2SA, England

Continuation of Ser. No. 938,674, Sep. 1, 1992, abandoned, which is a continuation of Ser. No. 555,802, Jul. 23, 1990, abandoned, which is a continuation of Ser. No. 259,398, Oct. 18, 1988, abandoned, which is a continuation of Ser. No. 856,349, Apr. 28, 1986, abandoned. This application Mar. 28, 1994, Ser. No. 218,890

Claims priority, application United Kingdom, May 1, 1985, 8511122; May 14, 1985, 8512166; Dec. 19, 1985, 85312499

Int. Cl.[6] B65G *53/42*

U.S. Cl. 406—127 **18 Claims**



1. Apparatus for discharging particulate material comprising a container for particulate material, an outlet from the container for particulate material, first valve means for controlling flow of particulate material through the outlet, inlet conduit means for supplying gas under pressure to the container for pressurizing the container and for supplying gas under pressure to the container outlet downstream of the first valve means, a discharge conduit connecting the container outlet to a discharge outlet for gas and particulate material, said discharge conduit comprising a flexible elongate member, and second valve means in the inlet conduit for controlling flow of pressure gas, said second valve means having open, closed and intermediate control positions and being operable by means remote from the container without loss of pressure gas from the second valve means in any control position.

5,558,475

BALL NOSE END MILLS

Bjorn Hakansson; Peder Von Holst, both of Sandviken, and Rolf Oskarsson, Ronninge, all of Sweden, assignors to Sandvik AB, Sandviken, Sweden

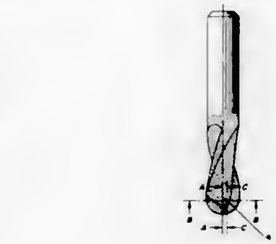
Filed Sep. 30, 1993, Ser. No. 129,330

Claims priority, application Sweden, Sep. 30, 1992, 9202838

Int. Cl.[6] B23C *5/10;5/14*

U.S. Cl. 407—54 **6 Claims**

1. A solid ball nose tool comprising a hard material with 30–70 volume % submicron hard TiN constituents in a metallic matrix of high speed steel, the tool having a cutting edge at an axial end thereof, the cutting edge extending along an end radius away from a center of the tool, the cutting edge having a constant positive rake angle along the end radius of +8±2° and a continuously decreasing clearance angle towards the center, the clearance angle being 10±2° at the center, the clearance and rake angles being measured in a plane perpendicular to the cutting edge, the cutting edge including edge rounding, the edge rounding decreasing continuously from 10–30 μm at an outer periphery of the cutting edge to <10 μm at the center, the clearance angle at the outer periphery ranging from 17±2° to 12±2°.



5,558,476

DUAL-MOTOR-DRIVEN DRILLING MACHINE AND METHOD OF CONTROLLING CURRENTS FLOWING IN MOTORS

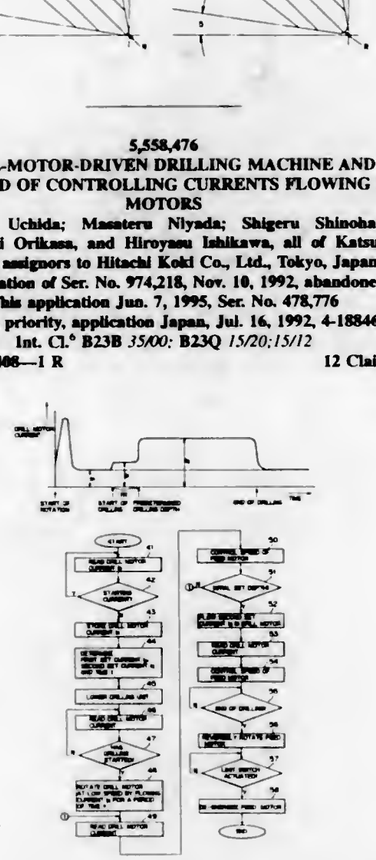
Toshiaki Uchida; Masateru Niyada; Shigeru Shinohara; Hiroaki Orikasa, and Hiroyasu Ishikawa, all of Katsuta, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 974,218, Nov. 10, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 478,776

Claims priority, application Japan, Jul. 16, 1992, 4-188462

Int. Cl.[6] B23B *35/00;* **B23Q** *15/20;15/12*

U.S. Cl. 408—1 R **12 Claims**



1. A method of controlling a drilling machine including a drilling unit which has a drill motor, said drill motor rotating a cylindrical cutter mounted on said drilling unit when supplied with a driving current, and a feed motor operatively coupled to said cylindrical cutter for linearly moving said cylindrical cutter for drilling into a material, the method comprising the steps of:

rotating said drilling motor at a first rotation speed during a predetermined period of time from a start of drilling by controlling a rotation speed of said feed motor; and

subsequently rotating said drilling motor at a second rotation speed faster than the first rotation speed until an end of drilling by controlling the rotation speed of said feed motor,

further comprising the steps of:

before rotating said drilling motor at the first rotation speed, detecting a no-load current flowing through said drill motor;

identifying said cylindrical cutter being used based on the no-load current; and

determining the first and second rotation speeds based on information obtained in said identifying step.

5,558,477

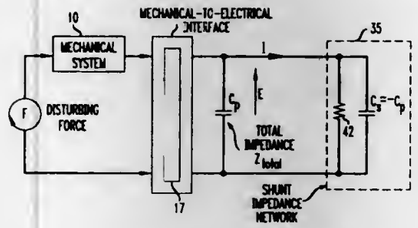
VIBRATION DAMPING SYSTEM USING ACTIVE NEGATIVE CAPACITANCE SHUNT CIRCUIT WITH PIEZOELECTRIC REACTION MASS ACTUATOR

Douglas R. Browning, Randolph, and Woodson D. Wynn, Basking Ridge, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 2, 1994, Ser. No. 348,527

Int. Cl.[6] B23B *47/00;* **G01B** *7/16*

U.S. Cl. 408—143 **8 Claims**



1. A vibration-reducing device for damping broadband vibrations of a structure, comprising:

an actuator connected to said structure and comprising piezoelectric material, said material having a broadband capacitive reactance;

a negative capacitance circuit connected in shunt relation to said material, wherein said circuit continuously simulates a negative capacitance of equivalent magnitude but opposite in phase to said capacitive reactance of said piezoelectric material said circuit comprising:

an amplifier having positive and negative feedback loops;

an input/output circuit connecting said amplifier in shunt across said piezoelectric material;

a tuning resistor coupled across said input/output circuit for tuning said negative capacitance circuit;

a resistive voltage divider having a first series connected resistor and a second series connected resistor for determining the negative feedback non-inverting gain of said amplifier said second series connected resistor coupled across said amplifier;

a load capacitor coupled across said amplifier forming a capacitive voltage divider with said capacitive reactance of said piezoelectric material;

wherein the total impedance of the combined negative capactiance circuit and said piezoelectric material is substantially larger than that of said piezoelectric material alone.

5,558,478

DEVICE FOR TRANSFERRING A TORQUE TO A TOOL IN A HAND TOOL APPARATUS

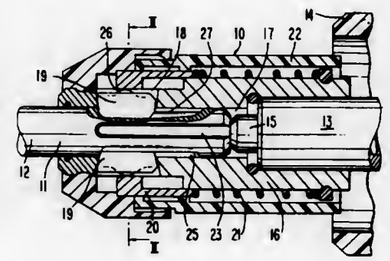
Alfred Odendahl, Waldenbuch; Horst Sigg, Stuttart; Heinz Neubert, Ebersbach, and Hans-Peter Meyen, Filderstadt, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 27, 1994, Ser. No. 331,344

Claims priority, application Germany, Nov. 30, 1993, 43 40 728.5

Int. Cl.[6] B23B *51/02;31/107*

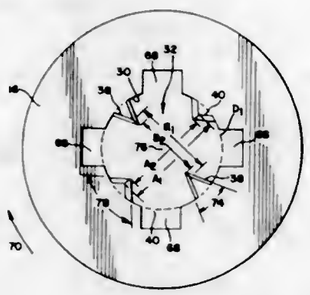
U.S. Cl. 408—226 **16 Claims**



1. A device for transferring torque to a tool in a hand tool apparatus, said device comprising a tool member (**12**) having a tool shaft (**11**) provided with a plurality of catch grooves (**23**) and provided with at least one elongated locking groove (**25**) circumferentially displaced from the catch grooves (**23**) in the tool shaft (**11**), said catch grooves (**23**) being open at a tool shaft end received in the hand tool apparatus; a tool holder (**10**) having a tool receptacle (**16**) provided with a receptacle cavity (**17**) in which the tool member (**12**) is held in operation, wherein the tool receptacle (**16**) has at least two axially extending catch elements (**24**) projecting inwardly into the receptacle cavity (**17**) so as to be engageable with the catch grooves (**25**) in the tool shaft (**11**) and at least one lock element (**19**) in a radial recess (**18**) provided in the tool receptacle (**16**) in a circumferential region of the receptacle cavity (**17**) spaced circumferentially from the catch elements (**24**) so as to be movable radially outward against a spring force, said at least one lock element (**19**) being engageable in the at least one locking groove (**25**), the at least one locking groove (**25**) being shaped to limit axial motion of the tool member (**12**) when the at least one lock element (**19**) is engaged in the at least one locking groove (**25**); and means (**20,26**) for engaging and retaining the at least one lock element in the at least one locking groove (**25**),

wherein the at least one locking groove (**25**) in the tool shaft (**11**) includes a front portion (**34**) and a rear portion (**33**), said rear portion (**33**) being closer to the tool shaft end held in the tool holder (**10**) than the front portion (**34**), and the front portion of the at least one locking groove (**25**) extends deeper into the tool shaft (**11**) than the rear portion of the at least one locking groove (**25**) so that in a working position of the tool member (**12**) the at least one lock element (**19**) engages in the front portion of the at least one locking groove (**25**) and extends deeper into the tool shaft (**11**) than in an idle position of the tool member (**12**) in which the at least one lock element (**19**) is located in the rear portion of the at least one locking groove (**25**).

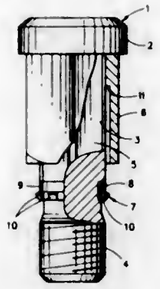
5,558,479
WALL ANCHOR ACCOMMODATING FASTENERS OF VARYING THREAD DIAMETERS
James W. McElderry, Schaumburg, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.
Filed May 19, 1995, Ser. No. 445,274
Int. Cl.[6] F16B *25/00;37/12*
U.S. Cl. 411—178 **18 Claims**



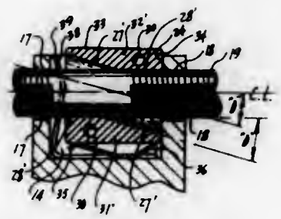
1. An anchor for use in mounting articles upon a friable material by means of fasteners having threads of specified diameters, comprising:
a flange for preventing the anchor from completely entering the friable material; and
a generally cylindrical body having a flange end and a generally cylindrical interior surface, said body coupled to said flange at said flange end, said interior surface of said body defined by a bore having a predetermined diameter and a center, said interior surface having a spline configuration disposed thereon, said spline configuration configured to accommodate at least two diameter-specific fastener sizes, said spline configuration including a first type of spline and a second type of spline, both said types of splines having a height measured from said generally cylindrical interior surface and extending radially towards said center, said second type of spline having a height which is greater than said height of said first type of spline.

5,558,480
BOLT FOR TRUSS, WHEREIN THE BOLT HAS SHAFT PORTIONS SEPARATED BY A GROOVE AND A STOPPER HAVING PROTRUSIONS ENGAGED IN THE GROOVE
Hiroshi Kazino; Masaaki Ide; Shinichi Kondo, and Tomiyasu Kakeno, all of Aichi-ken, Japan, assignors to Aoyama Seisakusho Co., Ltd., Aichi-ken, Japan
Filed Jan. 9, 1995, Ser. No. 369,904
Claims priority, application Japan, Jan. 20, 1994, 6-4483
Int. Cl.[6] F16B *35/02*
U.S. Cl. 411—368 **1 Claim**

1. A bolt for a truss, the bolt comprising:
a main body including:
a head portion, and
a shaft portion which extends from the head portion,
the shaft portion having:
a base portion with a polygonal cross-section at a head portion side of said shaft portion,
a threaded portion extending from the base portion, and
an annular external groove arranged between the base portion and the threaded portion;
a polygonal tube having a polygonal cross-section, said polygonal tube being engaged with the shaft portion of the main body such that said polygonal tube is slideable and non-rotatable on said base portion; and
a stopper for preventing release of the polygonal tube from the shaft portion, said stopper including a ring having a peripheral surface on which plural engaging protrusions are formed, the plural engaging protrusions being integratedly embedded in the annular groove.

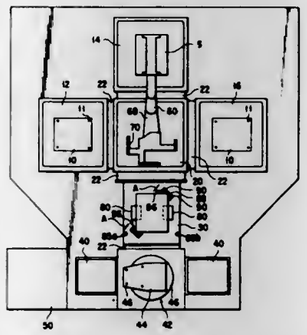


5,558,481
SELF-LOCKING QUICK DISENGAGEMENT NUT FOR CLAMPS AND THE LIKE
Joon Park, 1320 Virginia Ave., Glendale, Calif. 91202
Continuation-in-part of Ser. No. 187,739, Jan. 28, 1994, abandoned. This application May 30, 1995, Ser. No. 452,840
Int. Cl.[6] F16B *37/08;37/16*
U.S. Cl. 411—433 **21 Claims**



1. An assembly comprising:
first and second members;
a thrust screw having first and second ends, said thrust screw having threads intermediate said ends;
means for rotatably connecting said second end of said thrust screw to said second member;
a nut block having a threaded portion, the major diameter of said threaded portion lying substantially on a cylinder having a threaded portion axis, and a non-threaded portion, said non-threaded portion being a portion of a cylindrical surface having a diameter larger than the major diameter of said thrust screw and having a clearance axis, said axes intersecting each other, said nut block being movably connected to said first member for engaging said thrust screw to permit said first and second members to be moved with respect to each other by rotation of said thrust screw, said nut block being configured to be movable from an engaged position where it is engaged on said thrust screw and a disengaged position where it is disengaged from said thrust screw; and
a spring connected between said first member and said nut block to thrust said nut block toward its engaged position so that manual release deflects said spring and permits said nut block to disengage from said thrust screw to permit the free movement of said thrust screw with respect to said first member.

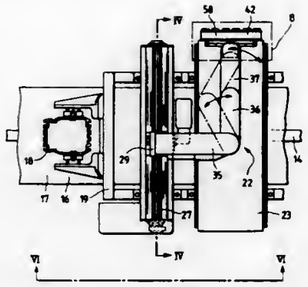
5,558,482
MULTI-CHAMBER SYSTEM
Tutomu Hiroki, Yamanashi-ken; Shoichi Abe, and Kiyotaka Akiyama, both of Kofu, all of Japan, assignors to Tokyo Electron Limited, Tokyo, and Tokyo Electron Yamanashi Limited, Nirasaki, both of Japan
Continuation-in-part of Ser. No. 102,987, Jul. 28, 1993. This application Feb. 25, 1994, Ser. No. 202,100
Claims priority, application Japan, Jul. 29, 1992, 4-222128; Feb. 26, 1993, 5-061253; Feb. 26, 1993, 5-061295; Feb. 26, 1993, 5-061400
Int. Cl.[6] B65G *65/00;49/07*
U.S. Cl. 414—217 **14 Claims**



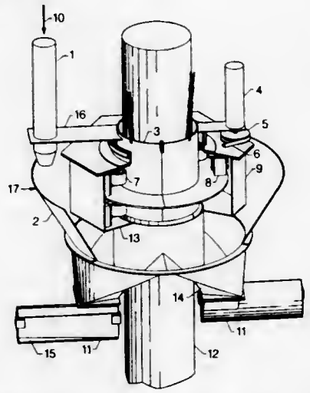
1. A multi-chamber system for processing substrates comprising:
plural vacuum-process chambers in which substrates are processed in a decompressed atmosphere;
a first load lock chamber communicated with each of the vacuum-process chambers and exhausted to substantially the same decompressed atmosphere as the vacuum-process chambers;
a second load lock chamber communicated with the first load lock chamber and exhaustible to substantially the same atmosphere as the first load lock chamber;
first carrier means arranged in the first load lock chamber to carry a substrate between the first load lock chamber and the second load lock chamber;
first buffer means arranged in the first load lock chamber to temporarily hold plural substrates thereon;
second buffer means arranged in the second load lock chamber to temporarily hold plural substrates thereon;
positioning means arranged in the second load lock chamber to position single or plural substrates; and
second carrier means arranged in a non-decompressed atmosphere to carry plural substrates into and out of the second load lock chamber.

5,558,483
ARTICLE TRANSFER APPARATUS WITH VACUUM OPERATED WORK HOLDER AND ARTICULATED WORK HOLDER MOVER
Junichi Masuda, Kounan, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan
Filed May 15, 1995, Ser. No. 440,655
Claims priority, application Japan, May 17, 1994, 6-128121
Int. Cl.[6] B65G *1/04*
U.S. Cl. 414—278 **4 Claims**

1. An article transfer apparatus movable along a row of article storage racks, comprising:
an article carrier provided with a conveyor and means for moving said conveyor substantially perpendicular to the row of the article storage racks;
an article holder disposed adjacent said article carrier and being movable between said row of article storage racks and said article carrier, said article holder including a base frame carrying a suction cup case containing a plurality of suction cups and means for connecting said suction cup case with respect to said base frame for horizontal pivotal movement with respect thereto; and
means for moving said article holder between said article storage racks and said article carrier including:
support means,
means for moving said support means between said article storage racks and said article carrier,
a plurality of articulated swing arms connecting said article holder to said support means, and
means for controllably, driving said swing arms for selectively moving said article bolder with respect to said article carrier.



5,558,484
APPARATUS FOR DISPENSING PARTICULATE MATERIAL
Michael Z. Mikulicz, Inverness, and Serge Gurevich, Chicago, both of Ill., assignors to UOP, Des Plaines, Ill.
Continuation-in-part of Ser. No. 168,494, Dec. 22, 1993, abandoned. This application Apr. 28, 1995, Ser. No. 430,645
Int. Cl.[6] B65G *69/04*
U.S. Cl. 414—301 **15 Claims**



1. An apparatus for dispensing particulate material onto a particle bed within a vessel having a vertical longitudinally extended central member, said apparatus comprising:
(a) a bearing ring encircling and supported by said central member and defining a bearing surface;
(b) particulate material dispensing means supported by said bearing ring, said dispensing means comprising an annular particle container adapted to surround said central member and defining an annular opening at one end for receiving

particulate material into an upwardly directed end and an outlet at an opposite end for discharging particulate material

belt, to receive the articles when said dumper unit goes into the tipped over position.

the width of each of the panels being less than one half of the length of the rear edge and the second mounting means

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APPARATUS FOR STACKING BOOKS

particulate material into an upwardly directed end and an outlet at an opposite end for discharging particulate material below said annular opening;

(c) means for rotatably supporting said particulate material dispensing means from said bearing surface and restraining radial and longitudinal movement of said particulate material dispensing means relative to said bearing ring;

(d) particulate material feed means fixed to said central member and offset radially from the longitudinal axis thereof and adapted to feed particulate material to said annular opening of said annular particle container; and

(e) means for rotating said particulate material dispensing means relative to said bearing ring.

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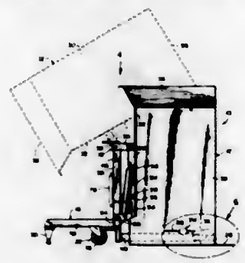
LIFT AND DUMP APPARATUS

Terry Haynes, P.O. Box 20776, Beaumont, Tex. 77720-0776

Filed Feb. 22, 1995, Ser. No. 392,140

Int. Cl.[6] B65G *65/23*

U.S. Cl. 414—421 **8 Claims**



1. A lift and dump apparatus comprising:

a) a dumper unit for holding articles therein, said dumper unit including a platform, a pair of side walls extending upwardly from said platform, a rear wall extending upwardly from said platform, a removable grid holder extending between said side walls opposite from said rear wall, and a pair of angle guide walls, each said angle guide wall extending from a top edge of one said side wall to direct the articles from said dumper unit onto the conveyor belt, when in the tipped over position;

b) a stable frame unit, said stable frame unit including a pair of spaced apart parallel vertical supports, a pair of spaced apart parallel front horizontal base legs extending from said vertical supports, a pair of spaced apart parallel rear horizontal base legs extending from said vertical supports, a lower beam member extending horizontally between said vertical supports, an upper beam member extending horizontally between said vertical supports, and a pair of struts, each said strut angularly affixed between one said vertical support and one said front horizontal base leg;

c) means for pivotally connecting said dumper unit to said stable frame unit;

d) means for lifting said dumper unit, so that said dumper unit can go from an upright position to a tipped over position on said stable frame unit, to discharge all the articles therefrom; and

e) means on said stable frame unit for transporting said dumper unit along a horizontal floor surface to and from a conveyor belt, to receive the articles when said dumper unit goes into the tipped over position.

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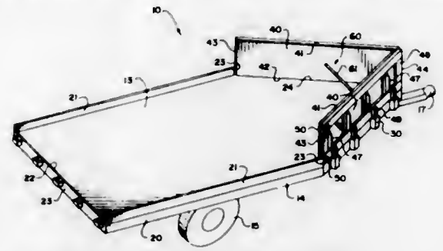
SNOWMOBILE TRAILER WITH FRONT GRAVEL GUARDS

Vern Paproski, 801-45th Street West, Saskatoon, Saskatchewan, Canada

Filed Feb. 8, 1995, Ser. No. 385,693

Int. Cl.[6] B65G *67/02*

U.S. Cl. 414—537 **11 Claims**



1. A trailer for transporting vehicles comprising:

a trailer frame;

ground wheels for supporting the frame for transportation across the ground;

a hitch at a forward end of the frame for connection to a towing vehicle for pulling the trailer frame in a direction along a center line of the trailer frame;

a flat bed mounted on the frame for receiving at least one vehicle thereon, the flat bed having two parallel sides, a rear edge generally transverse to the center line and a front edge which includes two front edge portions converging inwardly and forwardly from the sides to an apex at the center line;

two planar guard panels, each panel being substantially rectangular having two sides, two ends, a length between the ends and a width between the sides;

first mounting means for mounting each of the panels on a respective one of the front edge portions with one side of the panel lying along the respective front edge portion and the panel standing upwardly from the front edge portion so that the panels provide guard surfaces across the front edge of the flat bed;

the first mounting means comprising a plurality of tubular pockets arranged at spaced positions along each of the front edge portions and a plurality of projecting stake members mounted on one side of the each of the panels so as to project outwardly from the side of the panel generally in a plane parallel to a plane of the panel for readily releasable engagement into the pockets whereby the panels can be readily removed from the respective front edge portion;

the length of each panels being substantially equal to the length of the respective front edge portion and the panels being arranged such that when mounted by the first mounting means on the front edge portions, the adjacent ends of the panels are substantially in engagement at the apex and lie on a substantially vertical line at the apex;

and second mounting means including first mounting elements on one end of each panel and second mounting elements at the rear edge and at each of the front edge portions, the first and second mounting elements being arranged for readily removably and replaceably receiving said one end of each of the panels such that said one ends of the panels can selectively be located at one of the rear edge and the front edge portions for loading or unloading a vehicle;

the width of each of the panels being less than one half of the length of the front edge portions such that both panels can be mounted by said second mounting means side by side selectively on each of the front edge portions;

the width of each of the panels being less than one half of the length of the rear edge and the second mounting means including a first set of second mounting elements at one side of the rear edge and a second set of second mounting elements at an opposed side of the rear edge so as to receive the two panels side by side selectively at positions either at said one side of the rear edge or at said opposed side of the rear edge for loading or unloading vehicles for standing on the flatbed side by side.

5,558,487

TRANSPORTING SYSTEM FOR AN ARTICLE

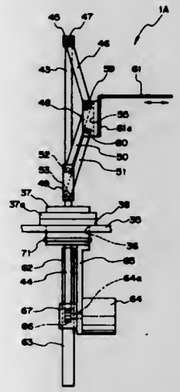
Kiyoshi Nakagawa, Kanagawa, Japan, assignor to Sony Corporation, Japan

Filed Jan. 11, 1995, Ser. No. 371,202

Claims priority, application Japan, Jan. 25, 1994, 6-023104

Int. Cl.[6] B65G *65/00*

U.S. Cl. 414—744.6 **11 Claims**



1. A transporting apparatus comprising:

a first linear moving arm and a second linear moving arm which are juxtaposed so as to move linearly with center axes of said first and second linear moving arms remaining in a substantially parallel relationship with each other;

an article transporting unit for moving an article;

a first link pivotally mounted at one end on a first end portion of said first linear moving arm and at the other end on said article transporting unit;

a second link pivotally mounted at one end on a first end portion of said second linear moving means and at the other end with said article transporting unit;

a linear drive means for moving said first and second linear moving arms synchronously with each other and opposite to each other so as to move said article transporting unit in a direction perpendicular to center axes of said first and second linear moving arms through a link mechanism composed of the first and second links;

a posture maintaining means interposed between said first and second linear moving arms for preventing a change in posture of said article transporting unit during the movement of said article transporting unit; and

a rotary drive means for rotating a mechanism which includes said first and second linear moving arms and said linear drive means, about an axis that is parallel with said first and second linear moving arms.

5,558,488

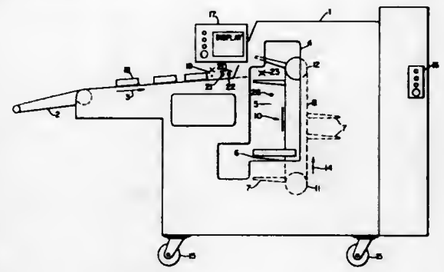
APPARATUS FOR STACKING BOOKS

Glenn M. Gentry, Harrisonburg, Va., assignor to R.R. Donnelley & Sons Company, Inc., Chicago, Ill.

Filed Jun. 24, 1994, Ser. No. 264,959

Int. Cl.[6] B65G *57/11*

U.S. Cl. 414—790.4 **37 Claims**



1. A real time sensor-based apparatus for stacking books delivered to said apparatus in a stream, each said book having a thickness, said apparatus comprising:

a stacking region;

first and second fork means for intercepting a predetermined number of said books to form a stack;

first and second carrier means for separately moving respective said first and second fork means cyclically to and from said stacking region in accordance with real time control signals;

real time control means for providing said control signals, said control signals including sequential signals in a cycle:

(i) controlling said first carrier means to locate said first fork means within said stacking region to form a first said stack, said formation occurring by said real time sensors signaling each time that each said book has been delivered to said stacking region and that said first fork means be moved down the thickness of said book each time until said predetermined number of books forming said first said stack has been formed, and

controlling said second carrier means to locate said second fork means away from said stacking region while said first fork means is within said stacking region;

(ii) controlling said first carrier means to move said first fork means away from said stacking region after said first stack is formed;

(iii) controlling said second carrier means to locate said second fork means within said stacking region to form a second said stack, said formation occurring by said real time sensors signaling each time that each said book has been delivered to said stacking region and that said second fork means be moved down the thickness of said book until said predetermined number of books forming said second said stack has been formed, and

controlling said first carrier means to locate said first fork means away from said stacking region while said second fork means is within said stacking region, and

(iv) controlling said second carrier means to move said second fork means away from said stacking region after said second stack is formed;

wherein said first and second fork means are in substantially the same dimensions of vertical attitude and horizontal plane within said stacking region when each said stack is being formed, and said first and second fork means could theoretically overtake each other during a cycle since they (i) operate parallel to each other, and (ii) each said first and second fork means is not able to contact the other.

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suction cover and said intermediate casing which face said pump

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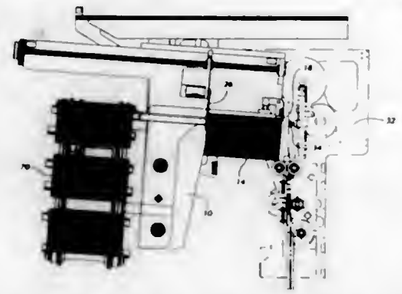
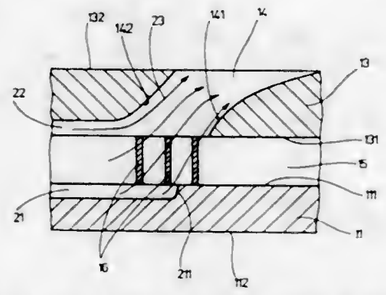
enters the casing in a predetermined direction, at least one wall, a

5,558,489
MASS FEEDER FOR PRODUCT DELIVERY SYSTEM
Frank Moncrief, Acworth; David R. Bacco, Canton, both of Ga., and Charles McNamara, Tucson, Ariz., assignors to Riverwood International Corporation, Atlanta, Ga.
Filed Apr. 6, 1995, Ser. No. 418,100
Int. Cl.[6] B65H *29/36*
U.S. Cl. 414—793.7 **31 Claims**



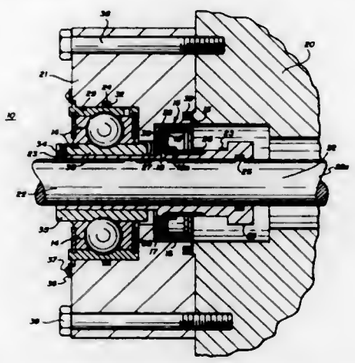
14. A partition feeder for use with partitions having notched sides, comprising:
first and second spaced apart guide rails for respectively receiving said notched sides of said partitions and for forming a main stack of said partitions between said guide rails and along a longitudinal axis of said guide rails;
at least one tab at one end of said guide rails for contacting one end of said stack, said partitions being removed from said one end of said guide rails by a selecting apparatus; and
means for biasing said partitions toward said one end of said guide rails;
wherein said guide rails suspend said partitions and allow said partitions to freely advance toward said one end of said guide rails.

5,558,490
LIQUID PUMP
Klaus Dobler, Gerlingen; Thanh-Hung Nguyen-Schaefer, Asperg, and Michael Huebel, Gerlingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
Filed Oct. 13, 1995, Ser. No. 543,119
Claims priority, application Germany, Dec. 24, 1994, 44 46 537.8
Int. Cl.[6] F04D *5/00*
U.S. Cl. 415—55.1 **13 Claims**



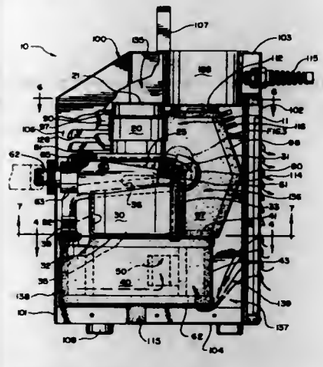
1. An electric fuel pump, comprising a suction cover having an inlet aperture; an intermediate casing having an outlet aperture; a rotationally driven pump impeller located between said suction power and said intermediate casing and having a plurality of blades for displacement of liquid; means forming a pump chamber and including two side channels arranged in plane surfaces of said suction cover and said intermediate casing which face said pump impeller, said side channels being formed by grooves which are concentric to a pump axis and extend from said inlet aperture to said outlet aperture, said inlet aperture leading into a beginning of said side channel arranged in said suction cover and said outlet aperture leading into an end of said side channel arranged in said intermediate casing, said outlet aperture extending with a continuously widening aperture cross-section from said side channel arranged in said intermediate casing to an outer surface of said intermediate casing on a side remote from said pump impeller, a wall of said outlet aperture which bounds an end of said side channel arranged in said intermediate casing having a concave curvature at least in a side channel region from an inner surface of said intermediate casing facing said pump impeller onward, said side channel arranged in said suction cover having a blind end in said suction cover and being provided with an end flank which rises steeply from a bottom of said side channel arranged in said suction cover to an inner surface of said suction cover on a side facing said pump impeller.

5,558,491
UNITIZED PRODUCT SEAL FOR PUMPS
Darrell G. Andrews, 1627 E. Everglade, Odessa, Tex. 79762
Continuation-in-part of Ser. No. 123,080, Sep. 17, 1993, abandoned. This application Mar. 31, 1995, Ser. No. 414,028
Int. Cl.[6] F04D *29/12*
U.S. Cl. 415—111 **6 Claims**



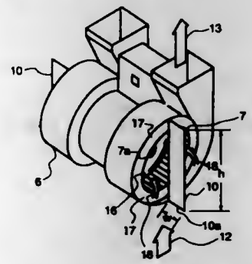
1. In a centrifugal pump having a pump shaft and a packing gland, a unitized roller-seal for sealing the pump shaft to the packing gland of the centrifugal pump comprising:
the packing gland having a bore therethrough and an inner radial flange within said bore;
a sealed roller bearing positioned in said packing gland on one side of said radial flange, having an outer race secured to and stationary with said packing gland and an inner race secured to the pump shaft for rotation therewith;
a sleeve having a hard surface secured to the pump shaft positioned in said packing gland with the hard surface on the side of said radial flange opposite said sealed roller bearing; and
a seal member fitted within said packing gland on the side of said radial flange opposite said sealed roller bearing, said seal member including a sealing face for engagement with the hard surface of the sleeve juxtaposed said roller bearing.

5,558,492
PAINT SPRAYER WITH INLET SILENCER
Joseph W. Kieffer, Maple Grove, Minn., assignor to Wagner Spray Tech Corporation, Minneapolis, Minn.
Division of Ser. No. 36,539, Mar. 22, 1993, Pat. No. 5,423,395. This application Apr. 11, 1995, Ser. No. 420,150
Int. Cl.[6] F04D *29/66*
U.S. Cl. 415—119 **6 Claims**



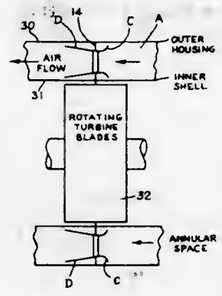
1. An assembly comprising:
(a) an air compressor retained within a pressurizing enclosure; the air compressor having a primary air intake port, and
(b) a silencer in direct fluid communication with the primary air intake port which comprises at least:
(1) a housing defining a silencing chamber and including a sound absorbent material,
(2) an inlet orifice through the housing,
(3) an outlet orifice through the housing, and
(4) a baffle positioned within the silencing chamber forming a circuitous path within the silencing chamber from the inlet orifice to the outlet orifice; the baffle including a sound absorbent material.

5,558,493
FORCED AIR COOLING APPARATUS HAVING BLOWER AND AIR CURRENT REGULATING PLATE THAT REDUCES EDDY AIR CURRENT AT INLET OF BLOWER
Yutaka Hayashi; Mitsuo Miyamoto; Michihito Watarai, all of Hadano; Takayuki Atarashi, Tsuchiura; Tetsuya Tanaka, Nihari-gun; Toshio Hotada, Tsuchiura; Yoshihiro Takada, Nihari-gun, and Takahiro Daikoku, Ushiku, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Jun. 7, 1995, Ser. No. 477,653
Claims priority, application Japan, Jul. 18, 1994, 6-165047
Int. Cl.[6] F04D *29/66*
U.S. Cl. 415—208.1 **10 Claims**



1. A forced air cooling apparatus for a casing having a frame, a rack mounted on the frame, a floor punching through which air enters the casing in a predetermined direction, at least one wall, a ceiling punching through which air exits the casing, a blower having an impeller, and a device onto which air entering the casing through said floor punching is blown by said blower, comprising:
the blower having an inlet through which intake air enters at a side of the impeller and an outlet through which air exits the blower perpendicular to an axis of said impeller;
an air current regulating plate mounted to one of said blower and said casing adjacent said inlet of said blower for reducing eddy air current adjacent said inlet of the blower;
wherein said plate has a planar body portion that extends parallel with said predetermined direction of air flow into the casing;
wherein said impeller has an inside diameter D and wherein a beight of said plate is at least (D/2); and
wherein a distance l between an intake surface of the blower and an inside surface of the wall of the casing is less than (D/2).

5,558,494
FLOW CONTROL APPARATUS AND METHOD
John E. Chambers, P.O. Box 6747, Greenville, S.C. 29606, and David C. Brenner, 702 Edwards Rd., Greenville, S.C. 29615
Continuation-in-part of Ser. No. 232,342, Apr. 22, 1994, Pat. No. 5,393,327, which is a continuation of Ser. No. 53,718, Apr. 27, 1993, abandoned. This application Feb. 8, 1995, Ser. No. 385,691
The portion of the term of this patent subsequent to Feb. 28, 2012, has been disclaimed.
Int. Cl.[6] F01D *9/02*
U.S. Cl. 415—208.1 **18 Claims**



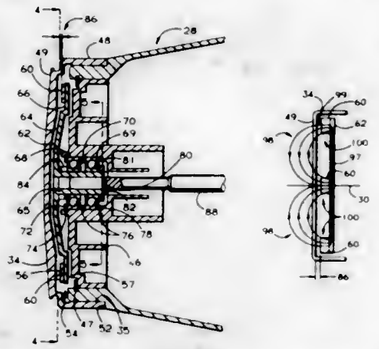
1. An air flow control apparatus positioned opposite an opening in a wall comprising:
an orifice plate extending across said exit opening for air in said wall;
a bellmouth air entrance member carried on one side of said orifice plate having walls tapering inwardly to an exit end connected adjacent said exit opening in said orifice plate in alignment therewith;
an evase positioned on the other side of said orifice plate having walls tapering outwardly from an entrance end connected adjacent said orifice plate in alignment with said exit opening and with said exit end of said bellmouth; and
said exit end of said bellmouth and said entrance end of said evase being aligned and in juxtaposition on respective opposite sides of said orifice plate providing an open and unrestricted passageway for substantially unrestricted and undisturbed air flow so that said evase receives air collected by said bellmouth directly from the exit end and discharges same through said erase;
whereby an air pressure drop across said exit opening is minimized.

5,558,495
ELECTROMAGNETIC HEATING DEVICES.

nication with said channel and said coolant outlet being in fluid communication with said coolant return passage.

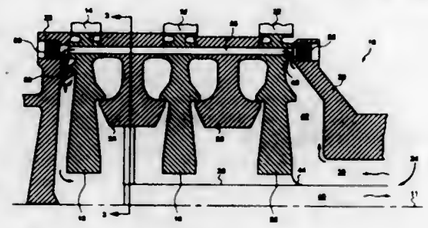
5,558,500
ELASTOMERIC SEAL FOR AXIAL DOVETAIL ROTOR

5,558,495
ELECTROMAGNETIC HEATING DEVICES, PARTICULARLY FOR RAM AIR TURBINES
Barry J. Parker; Alexander Krisiekas; John D. Stilwell, all of Rockford, and Neil L. Brown, Stillman Valley, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.
Filed Dec. 2, 1993, Ser. No. 161,765
Int. Cl.[6] F01D *5/08*
U.S. Cl. 416—95 **24 Claims**



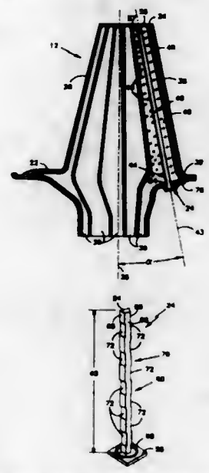
1. In a device having a longitudinal axis and being rotatable about the axis and having a nose cone attached at one axial end thereof, an apparatus for heating said nose cone comprising:
an armature of electrically conductive material integrally formed with said nose cone; and
magnetic field producing means disposed within said device in a manner so as to produce a flow of electric currents in said armature by electro-magnetic induction when said nose cone and said magnetic field producing means are caused to rotate relative to each other about said axis.

5,558,496
REMOVING PARTICLES FROM GAS TURBINE COOLANT
Donald E. Woodmansee, and Diether E. Carreno, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.
Filed Aug. 21, 1995, Ser. No. 517,310
Int. Cl.[6] F01D *5/08;5/18*
U.S. Cl. 416—95 **10 Claims**



1. A gas turbine apparatus comprising:
a rotor having a longitudinal axis, a coolant supply passage and a coolant return passage;
a channel formed axially in said rotor parallel to and radially spaced from said longitudinal axis, one end of said channel being in fluid communication with said coolant supply passage; and
a turbine blade attached to said rotor and having a coolant inlet and a coolant outlet, said coolant inlet being in fluid communication with said channel and said coolant outlet being in fluid communication with said coolant return passage.
8. A gas turbine apparatus comprising:
a rotor having a longitudinal axis and a coolant supply passage;
an axially oriented channel formed in said rotor and radially spaced from said longitudinal axis, said channel being in fluid communication with said coolant supply passage; and
a removable liner disposed in said channel.

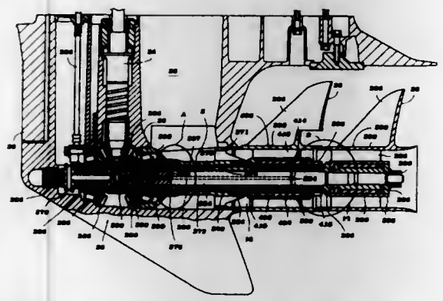
5,558,497
AIRFOIL VIBRATION DAMPING DEVICE
Robert J. Kraft, and Robert J. McClelland, both of Palm City, Fla., assignors to United Technologies Corporation, Hartford, Conn.
Filed Jul. 31, 1995, Ser. No. 509,276
Int. Cl.[6] F01D *5/26*
U.S. Cl. 416—96 A **12 Claims**



1. A rotor blade for a rotor assembly, comprising:
a root;
an airfoil, having a base, a tip, a first cavity, a second cavity, and a passage, said passage including a pair of walls converging from said first cavity to said second cavity, connecting said first and second cavities; and
a damper, received within said passage;
wherein friction between said damper and said converging walls damps vibration of said blade; and
wherein the rotor assembly has an axis of rotation and said rotor blade has a radial centerline; and
wherein said passage is skewed from said radial centerline; and
wherein rotating said rotor assembly about said axis of rotation centrifugally forces said damper bearing surfaces radially outward and into contact with said converging passage walls.

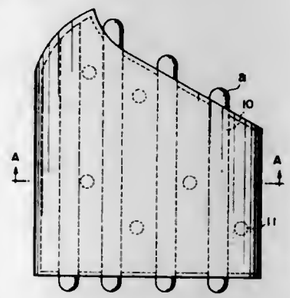
5,558,498
PROPELLER SHAFT ASSEMBLY FOR MARINE PROPULSION SYSTEM
Hiroshi Ogino, Hamamtsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha dba Sanshin Industries Co., Ltd., Hamamtsu, Japan
Filed May 31, 1995, Ser. No. 455,084
Claims priority, application Japan, May 31, 1994, 6-118710
Int. Cl.[6] B63H *20/00*
U.S. Cl. 416—129 **26 Claims**

1. A propulsion shaft assembly for a marine propulsion system comprising a hollow outer shaft and a coaxial inner shaft which



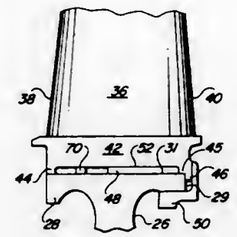
extends beyond a rear end of the outer shaft, said inner and outer shafts arranged to define a space between an inner diameter of said hollow outer shaft and an outer diameter of said inner shaft, a thrust washer carried by said inner shaft at a position proximate to said rear end of said outer shaft, and a hollow end cap carried by the outer shaft at its rear end, a portion of said end cap covering a portion of said thrust washer so as to form a generally labyrinth path into the space defined between said inner and outer shafts.

5,558,499
CENTRIFUGAL BLOWER WHEEL WITH BACKWARD CURVED BLADES
Takao Kobayashi, No. 15-16, Momohamacho, Hiratsuka, Kanagawa-ken, Japan
Filed Oct. 3, 1994, Ser. No. 317,625
Int. Cl.[6] F04D *29/30*
U.S. Cl. 416—186 R **6 Claims**



1. A centrifugal blower wheel with backward curved blades comprising:
a disk, a shroud and airfoil shaped blades, wherein each of said airfoil shaped blades comprises a vane member made of non-metallic material and a vane attachmeot member made of sheet metal, said vane attachment member being directly fixed to said disk and said shroud so as to form a rotor, and said vane member covering said vane attachment member.

5,558,500
ELASTOMERIC SEAL FOR AXIAL DOVETAIL ROTOR BLADES
Bob Elliott, Phoenix; Devinder N. Katariya, Chandler; Robert G. Minnick, Chandler; Rita A. Peralta, Chandler; Ronald J. Rich, Phoenix; Daniel M. Voron, Tempe, all of Ariz., and Michael J. Cave, Oceanside, Calif., assignors to AlliedSignal Inc., Morris Township, N.J.
Continuation of Ser. No. 253,439, Jun. 7, 1994, abandoned.
This application Feb. 29, 1996, Ser. No. 609,095
Int. Cl.[6] F04D *29/34*
U.S. Cl. 416—220 R **4 Claims**



1. A rotor assembly for a gas turbine engine, comprising:
a disc having along its periphery circumferentially spaced dovetail grooves,
a blade having an airfoil portion and a root portion, said root portion contoured to be received within said dovetail groove and having an inner surface that extends axially from a leading edge to a trailing edge, said leading and trailing edges each having a tab member extending inward therefrom to define a gap between said inner surface and a base of said groove; and
an elastomeric member disposed in said gap and having a bottom surface with a portion inclined at an angle and a surface portion extending therefrom for sealingly contacting said base.

5,558,501
PORTABLE CEILING FAN
Jui-Shang Wang, Taipei, Taiwan; Rodney Jane, Westboro; John Longan, Natick, both of Mass.; Stanley Gresens, Homewood; Gregory Holderfield, Oak Park, both of Ill.; Donald Hootstein, Cambridge, Mass., and Steven R. Valentor, Wesmont, Ill., assignors to Duracraft Corporation, Southborough, Mass.
Filed Mar. 3, 1995, Ser. No. 398,224
Int. Cl.[6] F04D *29/64*
U.S. Cl. 416—244 R **22 Claims**

1. A portable electric fan comprising:
a plurality of posts adapted for interconnection to form an elongated pole means having first and second ends, each of said posts having threaded portions accommodating said interconnection of said posts;
a pedestal attached to said first end of said pole means and adapted to provide support thereof on a base surface;
clamp means attached to said second end of said pole means and adapted for clamping engagement with an upper surface spaced from said base surface;
an adjustment mechanism for adjusting the length of said pole means; and
blower means retained by said pole means.

being fixed to said boss shroud to be smoothly continuous from a surface of said boss shroud to the upstream side and

a valve device connected to at least one of said channel and said pumping chamber, the valve device being arranged to block,

5,558,502

TURBO PUMP AND SUPPLY SYSTEM WITH THE PUMP

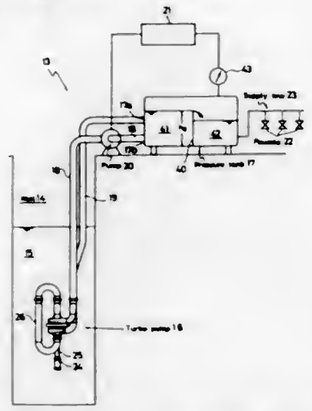
Tetsuo Fukazawa, and Chugen Chin, both of Narashino, Japan, assignors to Pacific Machinery & Engineering Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1994, Ser. No. 359,907

Claims priority, application Japan, Dec. 24, 1993, 5-328130; Nov. 8, 1994, 6-273244

Int. Cl.[6] F04D *29/22;* **F04B** *9/10;49/00*

U.S. Cl. 417—36 **7 Claims**



1. A turbo pump comprising a pump impeller rotatably disposed in the pump casing for rotation, to carry carried fluid which is any one of liquid, gas, and an intermediate comprising a two-phase fluid mixture of liquid and gas, a turbine wheel rotatably disposed in a turbine casing coaxially with said pump impeller and being rotated by working fluid which is any one of liquid, gas, and an intermediate comprising a two-phase fluid mixture of liquid and gas, said pump impeller being rotated by the rotating the turbine wheel, wherein

said pump impeller comprises a shroud continuously formed with a boss into which a rotor shaft fits and blades each having a blade inlet, said shroud having a concave arcing rotatable surface formed in a meridian plane configuration and a boss shroud formed in a cylindrical configuration substantially parallel to said rotor shaft, an edge of said blade inlet being fixed to said boss shroud to be smoothly continuous from a surface of said boss shroud to the upstream side and largely projecting upstream, said edge of said blade inlet having a portion attached to said cylindrical boss shroud and a portion near said pump casing, said portion near said pump casing extending substantially perpendicular to said rotor shaft, said portion attached to said boss shroud and said portion near said pump casing being connected therebetween by a smooth arc-like curve projecting convexly upstream to thereby form the edge of said blade inlet, and angle of said blade inlet being set to an angle of substantially 0° to the direction of its tangent at said portion of said edge near said boss shroud and increasing continuously from said portion of said edge near said boss shroud to said portion of said edge near the casing, said angle of the blade inlet being varied smoothly between said portion near said boss shroud and said portion near said casing to thereby form said blade inlet, and said blade inlet being connected to the end of the blade outlet with a smooth curved surface to thereby form each of said blades; and

said turbine wheel comprises a shroud continuously formed with a boss into which said rotor shaft fits and blades each having a blade outlet, said shroud having a concave arcing rotatable surface formed in a meridian plane configuration and a boss shroud formed in a cylindrical configuration substantially parallel to said rotor shaft, an edge of said blade outlet being fixed to said boss shroud to be smoothly continuous from a surface of said boss shroud to the downstream side and largely projecting downstream, said edge of said blade outlet having a portion attached to said cylindrical boss shroud and a portion near said turbine casing, said portion near said turbine casing extending substantially perpendicular to said rotor shaft, said portion attached to said boss shroud and said portion near said turbine casing being connected therebetween by a smooth arc-like curve projecting convexly downstream to thereby form the edge of said blade outlet, an angle of said blade outlet being set to an angle of substantially 0° to the direction of its tangent at said portion of said edge near said boss shroud and increasing continuously from said portion of said edge near said boss shroud to said portion of said edge near the casing, said angle of the blade outlet being varied between said portion near said boss shroud and said portion near said casing to thereby form said blade outlet, and said blade outlet being connected to the end of the blade inlet with a smooth curved surface to thereby form each of said blades.

5,558,503

HIGH-PRESSURE CLEANING DEVICE WITH BYPASS MECHANISM AND PULSATION DAMPEMING

Matthias Weller, Winnenden, and Wilhelm Eisenmann, Althütte, both of Germany, assignors to Alfred Karcher GmbH & Co., Winnenden, Germany

PCT No. PCT/EP93/00958, § 371 Date Dec. 21, 1994, § 102(e) Date Dec. 21, 1994, PCT Pub. No. WO94/00690, PCT Pub. Date Jan. 6, 1994

PCT Filed Apr. 20, 1993, Ser. No. 356,192

Claims priority, application Germany, Jun. 27, 1992, 42 21 192.1

Int. Cl.[6] F04B *49/00*

U.S. Cl. 417—307 **16 Claims**

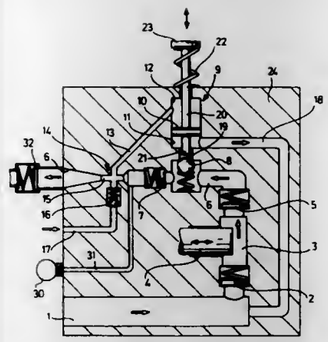
1. A high-pressure cleaning device comprising:

a high-pressure pump for pumping cleaning liquid out of a suction line into a pressure line leading to a discharge device;

a bypass line for communicating liquid from the pressure line to the suction line;

a valve body closing an outlet opening between the pressure line and the bypass line;

an actuating element for the valve body, said element being movable against the valve body contrary to the action of a spring into a position displacing said valve body into an open position; and



an operating cylinder divided into a first and a second chamber by a piston sealingly displaceable in said cylinder and coupled to the actuating element, said first chamber being arranged between the outlet opening and the bypass line and said second chamber communicating with the pressure line via a control line;

said valve body positioned between said first chamber and the pressure line to preclude communication therebetween when said outlet opening is closed;

wherein the control line exits from the pressure line in a region of a cross-sectional constriction thereof.

5,558,504

MAGNETOSTRICTIVE PUMP FOR APPLYING PASTES AND ADHESIVES

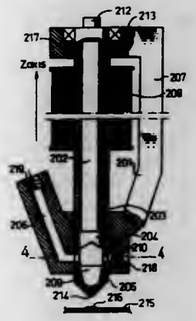
Lennart Stridsberg, Enskede, Sweden, assignor to Mydata Automation AB, Sweden

Continuation of Ser. No. 934,522, Nov. 23, 1992, abandoned. This application Nov. 14, 1994, Ser. No. 338,364

Claims priority, application Sweden, Feb. 12, 1990, 9000502

Int. Cl.[6] F04B *7/04;19/02*

U.S. Cl. 417—322 **13 Claims**



1. A device for applying a relatively viscous material in discrete points to a point board, comprising:

a pump house comprising:

a pumping chamber having an outlet;

a piston contained within the pump house; and

a magnetostrictive rod arranged to displace the piston by a change in a length of the rod;

a channel configured to feed a material to the pump house;

a nozzle comprising a restriction, the nozzle being rigidly attached to the pump house and configured to discharge the material from the pumping chamber;

a coil positioned around the rod;

an opening extending into the pumping chamber; and

a valve device connected to at least one of said channel and said pumping chamber, the valve device being arranged to block, at predetermined times, a material flow between the channel and the pumping chamber, the valve device having means for displacing the pump house between a first position, in which the material flow is permitted from the channel into the pumping chamber and through the opening, and a second position, in which the opening is not fluidly coupled to the channel and the material flow between the channel and the pumping chamber is blocked.

5,558,505

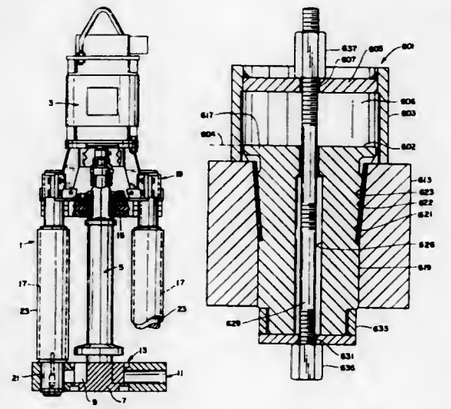
MOLTEN METAL PUMP SUPPORT POST AND APPARATUS FOR REMOVING IT FROM A BASE

George S. Mordue, Ravenna; Richard S. Henderson, Solon; Ronald E. Gilbert, Chardon, and David M. Masarin, Hinckley, all of Ohio, assignors to Metaullics Systems Co., L.P., Solon, Ohio

Filed Aug. 9, 1994, Ser. No. 287,914

Int. Cl.[6] F04B *35/00*

U.S. Cl. 417—360 **19 Claims**



1. An apparatus for removing a molten metal pump post comprising a cup-like member sized to fit over a section of a molten metal pump post and a base member, a rod mating said cup-like member with said base member wherein at least one of a first or second end of said rod is coupled with at least one of said members in a manner which allows urging said members together.

5,558,506

PNEUMATICALLY SHIFTED RECIPROCATING PUMP

John M. Simmons, 605 Slayton, and Tom M. Simmons, 504 Slayton, both of Saginaw, Mich. 48603

Continuation-in-part of Ser. No. 205,702, Mar. 3, 1994, abandoned. This application Oct. 26, 1995, Ser. No. 548,847

Int. Cl.[6] F04B *17/00*

U.S. Cl. 417—393 **14 Claims**

1. A pneumatically shifted reciprocating fluid pump comprising:

a body defining a plurality of pumped fluid pumping chambers;

driving means defining a pneumatically driven driving chamber associated with each of the respective pumped fluid pumping chambers;

connecting means connecting the respective driving means;

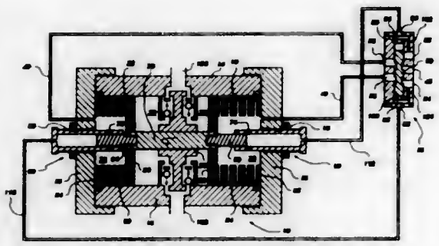
a pneumatically actuated control valve for supplying a drive fluid sequentially to each pneumatically actuated driving chamber for effecting reciprocal pumping of the respective driving means; and

axis (x—x) extending in the predetermined direction and abutting the pushers (2), the edges (3) of which act in rhythmic alternation

5,558,509

SLIDING-BLADE WATER JET PROPULSION

ally with their outer ends following the inner periphery of said oval-shaped side wall of said chamber and the inner periphery



pneumatically actuated pneumatic switching means associated with each of the respective driving means for permitting drive fluid to selectively exhaust from respective pneumatically actuated driving chambers at a predetermined location on each respective driving means relative to its respective fluid pumping chamber, means the control valve for sequentially supplying the drive fluid to respective pneumatically actuated driving chambers for reciprocally actuating respective pumping means, pneumatic actuated means comprising a piston and cylinder connected to the respective pumping means, wherein the piston is attached to the pumping means, and the cylinder including means defining a drive fluid relief passageway therein for selectively relieving pressurized drive fluid from its associated pneumatically actuated driving chamber.

5,558,507

HOSE PUMP USING ANGULARLY STAGGERED ECCENTRIC DISKS WITH PROJECTING STUB SHAFTS

Eberhard Magnus, Remscheid, Germany, assignor to Mastermark Corporation, Louisville, Ky.

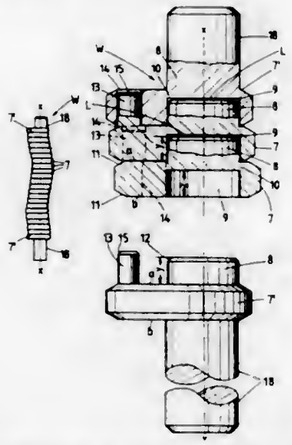
PCT No. PCT/EP93/00187, § 371 Date Oct. 28, 1994, § 102(e) Date Oct. 28, 1994, PCT Pub. No. WO93/22558, PCT Pub. Date Nov. 11, 1993

PCT Filed Jan. 28, 1993, Ser. No. 331,499

Claims priority, application Germany, Apr. 29, 1992, 92 05 733 U

Int. Cl.° F04B *43/08*

U.S. Cl. 417—474 **17 Claims**



1. A hose pump having (a) a tubular hose member (4) extending in a predetermined direction, (b) a plurality of pushers (2) having edges (3) thereof positioned adjacent said hose member (4), the pushers (2) being arranged one behind the other in the predetermined direction of the hose member (4), and (c) a plurality of angularly staggered eccentric disks (7) rotating about a common axis (x—x) extending in the predetermined direction and abutting the pushers (2), the edges (3) of which act in rhythmic alternation on the hose member(4), each of the disks (7) having a stub shaft (8) that projects out from one side of the disk (7) and a recess (9) defined by the other side of disk (7), each stub shaft (8) engaging a corresponding recess (9) on the adjacent disk (7), the common axis (x—x) being defined by a center line of the stub shafts (8).

5,558,508

REED-TYPE DISCHARGE VALVE ARRANGEMENT FOR A HERMETIC COMPRESSOR

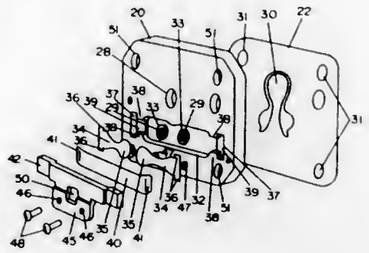
Hiroshi Sasano; Koshi Hamada, and Akihiko Kubota, all of Fujisawa, Japan, assignors to Matsushita Refrigeration Company, Osaka, Japan

PCT No. PCT/JP92/00248, § 371 Date Oct. 26, 1993, § 102(e) Date Oct. 26, 1993, PCT Pub. No. WO93/18304, PCT Pub. Date Sep. 16, 1993

PCT Filed Mar. 3, 1992, Ser. No. 137,205

Int. Cl.° F04B *53/10*

U.S. Cl. 417—569 **7 Claims**



1. A hermetic compressor comprising:

a hermetic case;

a cylinder block fitted within said case, said cylinder block including a cylinder having an open end;

a piston disposed within said cylinder;

a motor fitted on said cylinder block for reciprocating said piston within said cylinder;

a valve plate secured to said cylinder block at said open end;

an elongated recess formed on a surface of said valve plate opposite to a side of said valve plate on which said piston is disposed;

a pair of discharge holes provided through said valve plate, said discharge holes having an end portion opening to an inside region of said recess;

a pair of discharge reeds disposed within said recess for sealing said discharge holes;

a spring reed for pressing against a first side of said discharge reeds, said discharge reeds having a second side which is opposite to said first side, said discharge holes being located adjacent to said second side;

a stopper secured to said valve plate which fixes a position of said spring reed; and

a cylinder head including a discharge plenum covering said stopper, said spring reed, said discharge reeds and said recess;

said discharge holes each including a discharge valve seat on said end portion opening to said inside region of said recess, wherein:

said valve plate has a pair of steps formed on respective ends of said recess such that said discharge holes are interposed between said pair of steps, and

said discharge reeds abut against respective ones of said discharge valve seats and said steps to seal said discharge holes.

5,558,509

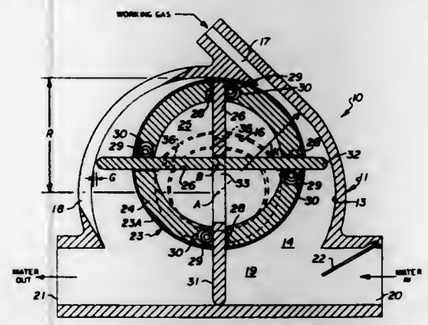
SLIDING-BLADE WATER JET PROPULSION APPARATUS FOR WATERCRAFT

Olga Jirnov, and Alexei Jirnov, both of 5490 Braesvalley, Apt. 420, Houston, Tex. 77096

Continuation-in-part of Ser. No. 400,764, Mar. 8, 1995, Pat. No. 5,511,525. This application Apr. 6, 1995, Ser. No. 418,596

Int. Cl.° F01C *1/344;* **B63H** *11/08;11/10*

U.S. Cl. 418—15 **9 Claims**



1. A sliding-blade water jet propulsion apparatus for watercraft comprising:

an oval-shaped chamber having a peripheral side wall which is oval-shaped in cross section, parallel opposed facing flat end walls, and a continuous guide groove formed in each said end wall;

the inner periphery of said oval-shaped side wall of said chamber in the plane of rotor rotation is configured according to the equation:

$$X = \sqrt{R^2 + (L \times \sin \beta)^2}$$

where

X=a variable distance between the inner periphery of said chamber in a plane extending through the center of symmetry of said oval-shaped side wall,

R=one-half of the minor axis of the oval,

L=eccentricity of the center of rotor rotation relative to the central axis of said chamber, and

β=rotor swing angle from the contiguity point of the circular surface of said rotor and the inner surface of said oval-shaped chamber side wall;

a water channel extending through said chamber generally tangential thereto and having a water inlet and a water outlet;

a cylindrical rotor having a circular side wall, parallel opposed flat end walls, at least two mutually perpendicular slots extending radially through said rotor with a radial extending portion of each said slot extending through said rotor end walls, a concentric shaft extending outwardly from each said end wall, said rotor rotatably mounted by said shafts eccentrically in said chamber relative to the major axis of said chamber;

at least two elongate rectangular blades slidably mounted one in each of said slots extending through said rotor in mutually perpendicular relation, each independently movable relative to the other in a radial direction and each said blade having a guide element extending from opposed sides and through said radial extending portion of each said slot outwardly from said rotor end walls which are slidably received in said guide groove in said chamber end walls; and

means for rotating said rotor to cause said blades to draw water through said water inlet into said water channel generally tangential to the axis of rotation and discharge said water through said water outlet in a jet stream;

upon rotation of said rotor, said guide elements traveling in said guide grooves causing said blades to extend and retract radially with their outer ends following the inner periphery of said oval-shaped side wall of said chamber and the inner periphery of a portion of said water channel with a constant clearance between the outer tip ends of said blades and said inner peripheries.

5,558,510

SCROLL COMPRESSOR HAVING WRAP ELEMENTS WITH RIGIDIFIED INNER ENDS

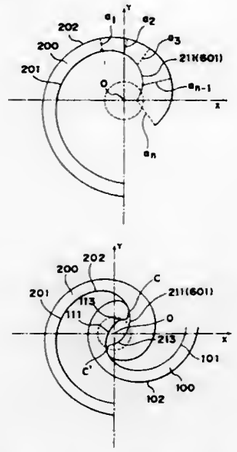
Masahiko Makino, Yawata; Michio Yamamura; Masafumi Fukushima, both of Kusatsu, and Kunio Iwanami, Moriyama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed May 24, 1995, Ser. No. 449,372

Claims priority, application Japan, Apr. 17, 1995, 7-090700

Int. Cl.° F01C *1/04*

U.S. Cl. 418—55.2 **4 Claims**



1. In a scroll compressor having first and second wrap elements in engagement with each other, each of said first and second wrap elements having an internal wall and an external wall opposite to each other and also having an inner end portion and an outer end portion opposite to each other, wherein the improvement comprises:

the internal wall of said first wrap element having a principal portion that extends spirally outwardly from the inner end portion thereof and is shaped with a curve given by r=aϕ on a polar coordinate (r, ϕ), said (a) being a constant;

the external wall of said first wrap element having a principal portion that extends spirally outwardly from the inner end portion thereof and is shaped with a curve given by r=aϕ+b, said (b) being a constant;

the internal wall of said second wrap element having a principal portion that extends spirally outwardly from the inner end portion thereof and is shaped with an envelope curve obtained as a result of circular translation of the external wall of said first wrap element relative to said second wrap element;

the external wall of said second wrap element having a principal portion that extends spirally outwardly from the inner end portion thereof and is shaped with an envelope curve obtained as a result of circular translation of the internal wall of said first wrap element relative to said second wrap element;

the inner end portion of the internal wall of said second wrap element being partially shaped to represent a first curve approximate to an envelope curve that is obtained by circulating a first circular arc of a given radius connected with the inner end portion of the external wall of said first wrap element at a first given point, said first circular arc having a

common tangent with the external wall of said first wrap, where

a piston including:

common tangent with the external wall of said first wrap element at said first given point, a shortest distance from each point on said first curve to the external wall of said second wrap element increasing towards an inner end of said second wrap element; and

the inner end portion of the internal wall of said first wrap element being partially shaped to represent a second curve approximate to an envelope curve that is obtained by circulating a second circular arc of a given radius connected with the inner end portion of the external wall of said second wrap element at a second given point, said second circular arc having a common tangent with the external wall of said second wrap element at said second given point, a shortest distance from each point on said second curve to the external wall of said first wrap element increasing towards an inner end of said first wrap element.

5,558,511

SLIDING VANE MACHINE HAVING VANE GUIDES AND INLET OPENING REGULATION

Lars G. Hedelin, Djursholm, Sweden, assignor to Fanja Ltd., St. Helier, N.J.

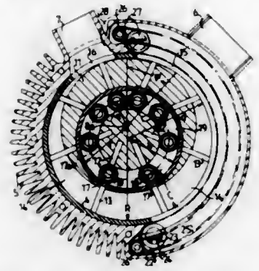
PCT No. PCT/SE93/00841, § 371 Date Mar. 30, 1995, § 102(e) Date Mar. 30, 1995, PCT Pub. No. WO94/09260, PCT Pub. Date Apr. 28, 1994

PCT Filed Oct. 14, 1993, Ser. No. 411,758

Claims priority, application Sweden, Oct. 15, 1992, 9203034

Int. Cl.[6] F01C *1/344;21/12*

U.S. Cl. 418—150 **8 Claims**



1. In a sliding vane machine with a cylindrical rotor (11), eccentrically placed in a housing (1), said rotor being rotatably mounted in the housing by means of a drive shaft (8) the periphery of the rotor touching the interior of the housing at one point, as seen in a plane perpendicular to the rotational axis (8*a*) of the rotor (11), which is provided with a number of vanes (13), which are guided in grooves (12) in the rotor (11) for essentially radial movement relative thereto, said vanes (13) delimiting, together with the rotor (11) and the housing (1), chambers (14) for transferring a medium from an inlet opening (15) in the housing (1) to a delivery opening (16) in the housing, the movement of each of the vanes (13) relative to the rotor (11) being guided by means of at least one guide means (17, 18), which runs along a guide race (19) in the housing (1), said guide race (19) and/or the interior of the housing (1), as seen in a plane perpendicular to the rotational axis (8*a*) of the rotor (11), having such shape that the radially distal end of each vane (13) follows the contour Of the interior of the housing (1); the improvement wherein the inlet opening (15) in the housing (1) is provided with a device for regulating the length of the inlet opening, as seen in the rotational direction of the vanes (13), said device comprising a flexible membrane (21), the end of which is fixed to a roller (23), which can be moved along the inlet opening (15) during rotation for winding up or unwinding the membrane (21) onto or from the roller (23).

5,558,512

FLUID COMPRESSOR WITH VERTICAL LONGITUDINAL AXIS

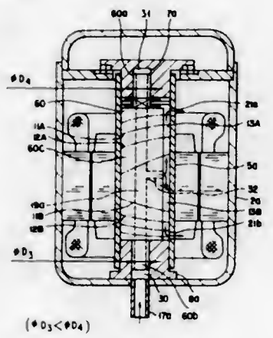
Takayoshi Fujiwara, Tokyo; Masayuki Okuda, and Yoshinori Sone, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Division of Ser. No. 175,243, Dec. 29, 1993, Pat. No. 5,388,969. This application Oct. 12, 1994, Ser. No. 321,778

Claims priority, application Japan, Jan. 12, 1993, 5-003314

Int. Cl.[6] F04C *18/22*

U.S. Cl. 418—188 **1 Claim**



1. A fluid compressor comprising:

a sealed casing;

upper and lower bearings provided at upper and lower parts of the sealed casing, respectively;

a cylinder provided in the sealed casing, the cylinder having upper and lower end opening portions which are rotatably supported by the upper and lower bearings, respectively;

a piston including:

a piston body disposed eccentrically within the cylinder, the piston body having a pair of helical grooves formed in an outer peripheral surface thereof, one of the helical grooves of the pair having a pitch which decreases gradually upwardly from an axial center portion of the piston, the other helical groove of the pair having a pitch which decreases gradually downwardly from the center portion of the piston;

an upper shaft portion which is integrally formed with an upper end portion of the piston body and eccentrically supported by the upper bearing; and

a lower shaft portion which is integrally formed with a lower end portion of the piston body and eccentrically supported by the lower bearing, the upper shaft portion of the piston and the lower shaft portion of piston having a diameter $\phi D4$ and a diameter $\phi D3$, respectively, which are set so as to apply an upward thrust force to the piston in accordance with rotation of the cylinder and the piston;

blades fitted in the helical grooves such that the blades project from and retract in the grooves in accordance with rotation of the cylinder and piston;

a plurality of working chambers provided in the cylinder and constituted by upper working chambers and lower working chambers which are separated from each other by the center portion of the piston, the upper working chambers being partitioned by one of the blades so as to have capacities decreasing gradually from a lowermost one of the upper working chambers, the lower working chambers being partitioned by another blade so as to have capacities decreasing gradually from an uppermost one of the lower working chambers; and

a torque transmission mechanism for rotating the cylinder and the piston synchronously at a relative circumferential speed, and for compressing a fluid which is sucked into the lowermost one of the upper working chambers, while conveying the fluid gradually towards an uppermost one of the upper working chambers, and for compressing a fluid which is sucked into the uppermost one of the lower working chambers, while conveying the fluid gradually towards a lowermost one of the lower working chambers,

wherein the diameter $\phi D3$ of the lower shaft portion of the piston is less than the diameter $\phi D4$ of the upper shaft portion of the piston such that said upward thrust force produced in accordance with the rotation of the piston is substantially equal to or slightly greater than the total weight of rotational parts.

5,558,513

VAPOR CATALYST SYSTEM FOR COMBUSTION

Fred A. Wentworth, Jr., Stratham, N.H., assignor to Ionic Fuel Technology, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 515,527, Oct. 17, 1994, Pat. No. 4,016,837, which is a continuation-in-part of Ser. No. 430,252, Jan. 2, 1974, Pat. No. 3,862,819. This application Aug. 31, 1976, Ser. No. 719,343

Int. Cl.[6] F23J *7/00*

U.S. Cl. 431—4 **14 Claims**

1. A vapor catalyst system for fossil fuel combustion apparatus comprising:

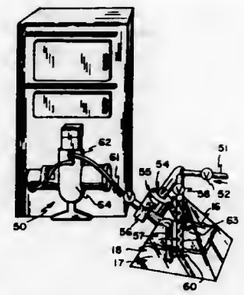
(a) a closed container of liquid constituted at least partially of water;

(b) an air pump having a pressure side and a suction side;

(c) a first connection from the pressure side of said pump to below the liquid surface in said container;

(d) a second connection from the suction side of said pump directly to said container at a location above the liquid surface in said container to produce continuously circulating air flow between said pump and said container passing through said liquid;

(e) a third connection to the suction side of said pump from ambient air; and,



(f) means to exhaust recirculating air to said combustion apparatus while replacing said recirculating air with ambient air;

and wherein, said air pump and means to exhaust are adapted to permit a substantially fixed volume of said recirculating air to be maintained at said location above the liquid surface and also to permit the amount of air exhausted to said combustion device to be small relative to air recirculated between said pump and said container.

5,558,514

SAFETY LATCH FOR A LIGHTER

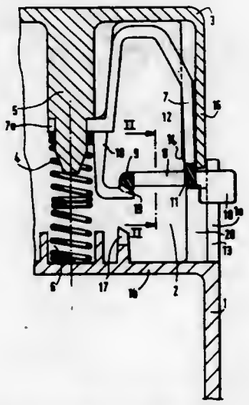
Henri Ansquer, Quimper, France, assignor to Hameur Et Cie, Paris, France

Filed May 25, 1995, Ser. No. 450,026

Claims priority, application France, May 27, 1994, 94 06452

Int. Cl.[6] F23D *11/36*

U.S. Cl. 431—153 **10 Claims**



1. A safety latch for a lighter, comprising

a lighter body having a lower reservoir section and an upper end forming a body cavity, said upper end including a reservoir valve for discharging gas from said lower reservoir section and a burner for igniting discharged gas,

a pushbutton mounted at the upper end of the lighter body and vertically movable in the body cavity and operative with the reservoir valve and burner upon depression of said pushbutton for igniting discharged gas, said pushbutton having a split skirt forming a split opening, and a spring for applying an outward biasing force to said pushbutton, and

a resilient latch received wit'in said body cavity including a resilient latch piece mounted substantially in a plane of symmetry of the lighter body, and affixed to the pushbutton, said resilient latch piece having an inverted U-shape having a first branch and a second branch, each branch having an end wherein the end of the first branch includes a movable arm

having opposing ends, and the end of the second branch is

iii) a photoinitiator system,

a weight;

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INTERACTIVE BOOK ASSEMBLY

having opposing ends, and the end of the second branch is secured to said pushbutton, said movable arm having at one end a safety catch horizontally moveable through the split opening of the split skirt between a first position in which the catch projects outside to the lighter body when the lighter is in a locked position and a second position in which the catch moves into the body and the split skirt when the lighter is in an unlocked position, and wherein said arm includes stops for cooperating with the lighter body and engaging the split skirt and preventing depression of the pushbutton when the lighter is in its locked position.

5,558,515

PREMIXING BURNER

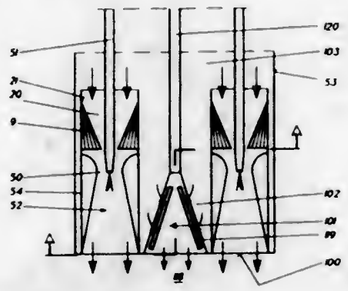
Rolf Althaus, Kobe, Japan, and Jakob Keller, Redmond, Wash., assignors to ABB Management AG, Baden, Switzerland

Filed Mar. 6, 1995, Ser. No. 399,143

Claims priority, application Germany, Apr. 2, 1994, 44 11 622.5

Int. Cl.[6] F23Q *9/00*

U.S. Cl. 431—284 **11 Claims**



1. A premixing burner, comprising:
a premixing pilot burner;
a plurality of premixing main burners arranged around the pilot burner, each of the main burners having a circular flow duct for a main flow;
means for injecting at least one of a gaseous and a liquid fuel into each main burner as a secondary flow into the main flow,
a plurality of vortex generators disposed in each main burner around a circumference in the duct for generating a plurality of vortices in the main flow; and
a venturi nozzle arranged in the circular flow duct of each main burner downstream of the vortex generators;
wherein the secondary flow is injected into the duct of each main burner in a region of maximum constriction of the venturi nozzle.

5,558,516

PRETREATED PLASTIC DENTAL APPLIANCES AND METHODS

Jerold S. Horn, Los Angeles, and James F. Forbes, Monrovia, both of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 14, 1994, Ser. No. 323,041

Int. Cl.[6] A61C *7/16*

U.S. Cl. 433—9 **21 Claims**

1. A method for pretreating a plastic dental appliance having a surface to be bonded to a tooth comprising
a) applying a pretreatment composition comprising
i) a polymerizable component,
ii) a solvent capable of at least partially solubilizing the plastic dental appliance, and
iii) a photoinitiator system,
wherein i) and ii) may be the same or different materials, to the surface of the dental appliance; and
b) before application of an orthodontic adhesive to said surface, exposing said applied pretreatment composition to actinic radiation in an amount sufficient to polymerize said polymerizable component.

5,558,517

POLYMERIC PROSTHESIS HAVING A PHOSPHONYLATED SURFACE

Shalaby W. Shalaby, Anderson, and Karen R. Rogers, West Columbia, both of S.C., assignors to Clemson University, Clemson, S.C.

Division of Ser. No. 68,297, May 27, 1993, abandoned, which is a continuation of Ser. No. 840,828, Feb. 24, 1992, abandoned. This application Jul. 15, 1994, Ser. No. 275,634

Int. Cl.[6] A61C *8/00*; **C08F** *8/40*

U.S. Cl. 433—201.1 **13 Claims**

1. An improved polymeric prosthesis adapted to be implanted into the body and to undergo osteointegration with an adjoining bone, said prothesis comprising a bone implant made from a preformed organic polymer, said implant including a portion shaped to be received within a bone cavity, said implant being configured to replace a missing part of a bone, said improvement comprising:
a preformed organic polymer having a surface phosphonylated with phosphorous groups capable of being converted to a calcium salt and undergoing osteointegration with adjacent bone tissues, said phosphonylated surface being characterized such that said preformed polymer has said phosphorous groups appended to a selective amount of its original reactive carbon sites, said amount being greater than zero and less than about 30 percent of said carbon sites, a majority of said phosphorous groups being located at the surface of said polymer, said phospborous groups having the general formula

$$X-\underset{\underset{O}{\|}}{P}-X$$

wherein X is an OH group.

5,558,518

ORAL HYGIENE IRRIGATOR SYRINGE BULB

Itai Bab, Karmei Yossef, and Gadi Porat, Jerusalem, both of Israel, assignors to Novadent Ltd., Jerusalem, Israel

Filed Aug. 10, 1993, Ser. No. 104,998

Claims priority, application Israel, Aug. 10, 1992, 102776

Int. Cl.[6] A61G *17/02*; **A61C** *15/00*

U.S. Cl. 433—80 **27 Claims**

1. An oral irrigator fluid dispensing apparatus comprising:
an elastic compressible bulb having an opening and an internal cavity for holding an irrigation fluid therein and wherein the irrigation fluid always settles to a low region of the internal cavity within the bulb in any spatial orientation the bulb;

a weight;
a rigid nozzle having a base portion to which the bulb opening is attached, a lumen having a fluid outlet at an upper portion thereof, and a flexible, non-kinking tube, one end of said tube being coupled to a lower portion of said lumen and another fluid inlet end being attached to said weight and extending into said cavity of said bulb to provide for means for constantly maintaining said fluid inlet end of said tube in the irrigation fluid regardless of the spatial orientation of the bulb, with the tube being of a sufficient length and flexibility such that with the cooperation of the weight, the fluid of the tube is contained in said low area so as to enable the irrigation fluid to flow through the flexible tube to the nozzle regardless of the spatial orientation of said bulb;
irrigation means coupled to said fluid outlet of said lumen for dispensing said irrigation fluid therefrom by compressing said bulb;
a first one-way valve accommodated within said lumen in close proximity to said fluid outlet for enabling said irrigation fluid to flow from said bulb through said flexible tube, said nozzle and said irrigation means so as to be dispensed therefrom upon compression of said bulb and for preventing contaminated oral fluids from flowing into said cavity of said bulb by way of said irrigation means, said nozzle, and said flexible tube upon decompression of the bulb; and
a second one-way valve for preventing flow of air and/or any additional irrigation fluid from said bulb through said flexible tube, said nozzle and said irrigation means when the bulb is compressed and permitting flow of air into the bulb during decompression.

5,558,519

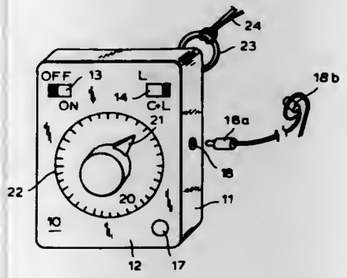
METHOD FOR INSTRUCTION OF GOLF AND THE LIKE

Stuart Sabowitz, 293 Riverside Dr., New York, N.Y. 10025-5282

Filed Jul. 29, 1994, Ser. No. 282,626

Int. Cl.[6] A63B *69/36*

U.S. Cl. 434—247 **5 Claims**



1. A method of training a golfer to have a smoother, more constant golf swing with a golf club, whicb comprises
(a) providing a source of uniformly spaced-apart beat signals discernible by the golfer,
(b) guiding the golfer to perform the golf swing, from the moment of take-away to the end of the backswing and into the foreswing, in synchronism with first, second and third uniformly spaced beat signals derived from said source, with take-away being initiated at the first beat and the end of the backswing and initiation of foreswing occurring approximately at the time of said third beat, and
(c) guiding the golfer to complete the foreswing portion of said golf stroke, with the moment of impact of club head with a ball occurring substantially in synchronism with a fourth uniformly spaced beat signal derived from said source.

5,558,520

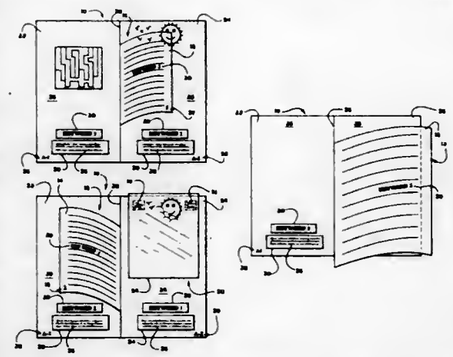
INTERACTIVE BOOK ASSEMBLY

Bernice F. Werzberger, 1252 Mayfair Dr., NE., Atlanta, Ga. 30324

Filed Aug. 23, 1994, Ser. No. 294,442

Int. Cl.[6] G09B *5/00*

U.S. Cl. 434—317 **50 Claims**



1. An interactive coordinated book assembly useful for teaching in a parent/child, teacher/student or self study environment, comprising:
a plurality of left and right main pages, each containing textual material and at least one key word;
a plurality of left and fight activity pages, each of said activity pages containing an activity area and a direction text area;
said main pages and said activity pages being alternately interleaved and bound along one edge to form a book;
said direction text areas on said activity pages containing at least one activity to be read, said direction text area on said fight activity page being reverse coordinated with said key word appearing on said left main page and said direction text area on said left activity page being reverse coordinated with said key word appearing on said right main page;
wherein at least one of said activities is coordinated with said key word appearing on said fight main page; and
wherein said left activity page contains said key word present in said adjacent fight main page, and said right activity page contains said key word present in said adjacent left main page.

5,558,521

SYSTEM FOR PREVENTING BIAS IN TEST ANSWER SCORING

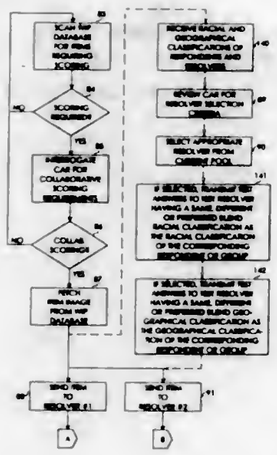
Jay V. Clark, West Liberty; William L. Bramlett, Jr., Swisher, and Judith Moyer, Iowa City, all of Iowa, assignors to National Computer Systems, Inc., Eden Prairie, Minn.

Division of Ser. No. 14,176, Feb. 5, 1993, Pat. No. 5,437,554. This application Aug. 12, 1994, Ser. No. 290,014

Int. Cl.[6] G09B *7/00*

U.S. Cl. 434—322 **14 Claims**

1. A system for preventing bias in the scoring of answers to tests taken by persons in particular classifications, the system comprising:
a) receive means for electronically receiving a plurality of answers to test questions, the test answers corresponding to tests taken by a plurality of respondents from particular definable classifications and comprising electronic representations of at least a portion of test answer sheets, wherein the test answers are to be scored by a plurality of test resolvers;
b) classification means for receiving a particular classification of each of the respondents and for electronically associating each of the particular classifications with the test answers for the corresponding respondent; and



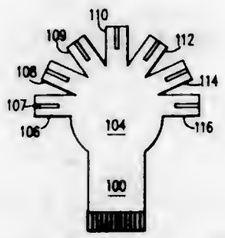
c) routing means for electronically selecting a test resolver within the plurality of test resolvers for scoring each of the answers based upon the particular classification of the corresponding respondent and for transmitting the answers to a test resolver terminal for the selected test resolver.

5,558,522

SLOT MANIFOLD FOR MOTHERBOARD THAT PROVIDES SPACE-SAVING ACCESS TO AN EXPANSION BUS OF A PERSONAL COMPUTER

David Dent, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jan. 30, 1995, Ser. No. 380,846
Int. Cl.[6] H01R 9/09
U.S. Cl. 439—65 **38 Claims**



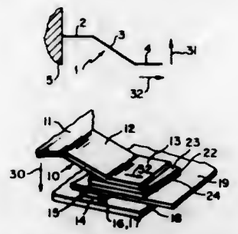
1. A computer expansion connector comprising:
a base;
a number of male pins in said base;
said male pins being arranged in a horizontal plane;
an upper portion;
said upper portion comprising a number of sockets having connectors therein that are connected to said male pins;
a first socket of said number of sockets, said first socket being oriented in a first plane parallel to said horizontal plane;
a second socket of said number of sockets, said second socket being oriented in a second plane vertical to said horizontal plane; and,
a third socket of said number of sockets, said third socket being oriented in a third plane, said third plane being at an angle to said horizontal plane.

5,558,523

PAD ON PAD TYPE CONTACT INTERCONNECTION TECHNOLOGY FOR ELECTRONIC APPARATUS

Paul W. Coteus, Yorktown Heights, and Alphonso P. Lanzetta, Marlboro, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 15, 1994, Ser. No. 275,897
Int. Cl.[6] H01R 23/66
U.S. Cl. 439—67 **7 Claims**



1. In a pad on pad type of electrical connection in electronic apparatus wherein the surfaces or an array of electrical contact pads on one substrate are brought into contact with the mating surfaces of a mating array of electrical contact pads on another substrate, an electrical connector comprising:
a base and upper rigid parallel support member assembly having compression means for urging and retaining said members toward each other, and having registration dowels extending from said base into said upper support member,
a first substrate opening in a first side of said assembly for accommodating an end of a first conductor supporting substrate having an array of contact pads on one side thereof with the opposite side thereof on said base support member with said dowels passing through registration holes therein,
a second substrate opening in a second and opposing side to said first side of said assembly, for accommodating an end of a second conductor supporting substrate having an array of contact pads on one side thereof in mating contact with the array of contact pads on said first substrate and positioned with said dowels passing through registration holes therein,
a spring array component, said component having an array of spring elements, each spring element location in said array corresponding to the location of a pad in said array on one of said substrates,
each said spring element having,
an elongated spring portion with one end angularly attached to a common supporting portion of said array of spring elements and,
a pad sized compression portion attached to the remaining end of said spring portion, and,
said array of spring elements being positioned with said dowels through registration holes therein and with said spring members in contact with said second substrate.

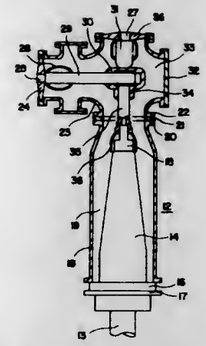
5,558,524

CABLE CONNECTION FOR A METAL-ENCAPSULATED, GAS-INSULATED, HIGH-VOLTAGE SWITCHING INSTALLATION

John Å. Classon, Ludvika, Sweden, and Herbert Schifko, Glattbrugg, Switzerland, assignors to ABB Management AG, Baden, Switzerland

Filed Mar. 28, 1995, Ser. No. 411,561
Claims priority, application Switzerland, Apr. 19, 1994, 1217/94
Int. Cl.[6] H01R 4/66
U.S. Cl. 439—92 **10 Claims**

1. A cable connection for a single-phase metal-encapsulated, gas-insulated, high-voltage switching installation having a connection enclosure (23) which surrounds connecting parts which are connected to the active parts of the gas-insulated, high-voltage switching installation, having cable connection encapsulation (18) which is connected to the connection enclosure (23) and surrounds a cable termination (14) with an end bolt (15), having an electrically conductive connecting piece which is inserted between the end bolt (15) and the connecting parts, wherein
the electrically conductive connecting piece is constructed such that it can easily be removed
after removal of the connecting piece, a separation, which is designed as an isolating gap, is produced between the end bolt (15) and the connecting parts, and
a grounding device (67), which can easily be installed, is provided in this isolating gap for reliable grounding of the end bolt (15).

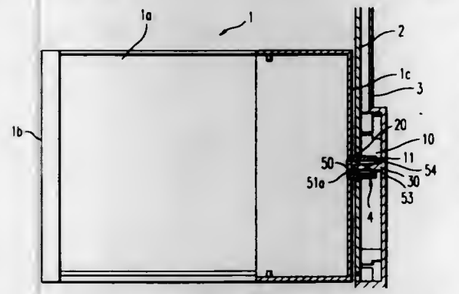


5,558,525

FRAME GROUND CONNECTION DEVICE FOR AUTOMATION EQUIPMENT

Pascal Malgouires, Cannes La Bocca, France, assignor to AEG Schneider Automation, Valbonne, France

Filed Apr. 4, 1995, Ser. No. 416,249
Claims priority, application France, Apr. 6, 1994, 94 04134
Int. Cl.[6] H01R 13/652
U.S. Cl. 439—101 **5 Claims**



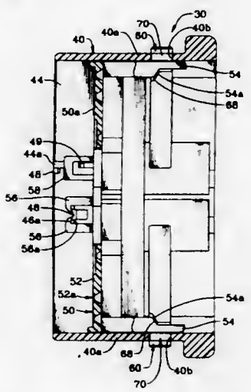
1. A combination of a frame ground connection device and automation equipment which includes at least one removable interface module containing processor electronics on at least one printed circuit adapted to be electrically connected to an interconnect printed circuit carried by a support via respective connectors, said at least one printed circuit being accommodated in a casing of the module and adapted to be fixed to said support and connected electrically to a conductive part of the support by the frame ground connection device which has connecting members fastened to said support and to said module, whereby mutual electrical contact is established between said module and said support, in which device:
said connection members include a male member and a female member adapted to cooperate plug-and-socket fashion, and said interconnect printed circuit includes an opening through which at least one of said connecting members passes when said module is mounted on said support, said member being insulated from said interconnect printed circuit where it passes through said opening.

5,558,526

CONNECTOR WITH A CONTACT-ALIGNING DEVICE

Akira Nagamine, Kawasaki, Japan, assignor to The Whitaker Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 219,597, Mar. 29, 1994, Pat. No. 5,501,606. This application Feb. 17, 1995, Ser. No. 390,597
Claims priority, application Japan, Apr. 13, 1994, 6-074660
The portion of the term of this patent subsequent to Mar. 29, 2014, has been disclaimed.
Int. Cl.[6] H01R 13/44
U.S. Cl. 439—140 **12 Claims**



1. A connector comprising a first connector including a first housing for receiving male contacts that extend in a mating direction of said first connector, said first connector adapted to receive a second connector including a second housing to mate with said first housing, and a contact-aligning device in said first housing having a contact-aligning plate with a number of through-holes through which contact sections of male contacts pass and is movable toward rear ends of the contact sections when pushed by the second housing as the first and second connectors are mated together, characterized by:
a locking device used to prevent movement of said contact-aligning device;
said first housing having a pair of side walls with an opening in one of the sidewalls for the insertion of the locking device;
said contact-aligning device having a set of arms extending from said contact-aligning plate that engages said locking device;
said first housing having a protrusion formed on an inner wall thereof at a position in front of the male contact sections;
said contact-aligning device having a pair of legs in a form of resilient spring members extending in the mating direction and including a pair of hook members engaging said protrusion to prevent movement of said contact-aligning device towards the rear of male contact sections; and
said pair of legs being engagable with a pushing protrusion of the second housing by pushing said hook members free of said first housing protrusion during mating between the first and second housings thereby permitting said contact-aligning device to move towards the rear of the male contact sections.

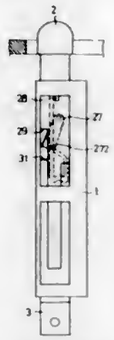
5,558,527

TWO-STAGE EJECTING DEVICE FOR EXPANSION

5,558,530

ELECTRICAL CONNECTOR ASSEMBLY HAVING A

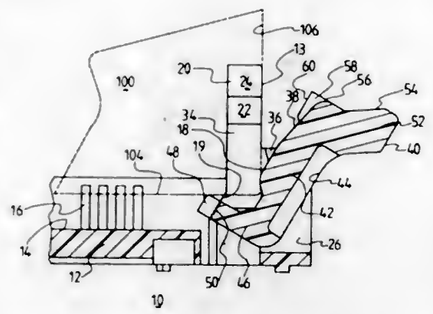
5,558,527
TWO-STAGE EJECTING DEVICE FOR EXPANSION SLOTS
Carol S. M. Lin, No. 3, Houng-Shi Rd., Chung-Li City, Tao-Yuan Hsien, Taiwan
Filed Dec. 6, 1994, Ser. No. 354,149
Int. Cl.[6] H01R *13/62*
U.S. Cl. 439—155 **10 Claims**



1. A two-stage ejecting device for the expansion slot of a computer, comprising a main setting, a push rod having a lower surface, and a drive link; said device further comprising:
- a cut-off section disposed approximately in the middle of the bottom side of said push rod;
- a pivot bolt formed at one end of said cut-off section; and
- a pivot arm, having a lower surface and including a base end and a free end, connected to said cut-off section at said pivot bolt through a hole at the base end of said pivot arm, allowing the to free end of said pivot arm to undergo a swing movement; and
- a guide bolt formed on the lower surface of said pivot arm at said free end; the swing movement of the free end of said pivot arm including a slight movement in a longitudinal direction; and with the lower surface of said pivot arm and the lower surface of said push rod in alignment in a plane, said guide bolt extends outwardly from said plane; and
- a ring guidance formed on a contact surface between a slide channel of said main setting and the lower surface of said pivot arm and defining a path; and
- a holding formed in the middle of a bottom side of said ring guidance by an inwardly tilting of the path of said guidance, said guide bolt passing said holding to one side when being driven; and a top side of the path defined by said ring guidance providing movement of said guide bolt to a side opposite to said one side.

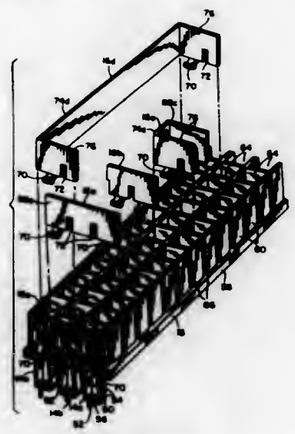
5,558,528
CONNECTOR WITH EJECTOR
Lee-Ming Cheng, Cupertino, and Edmond Choy, Union City, both of Calif., assignors to Hon Hai Precision Ind. Co., Ltd., Taipei Hsien, Taiwan
Filed Nov. 13, 1995, Ser. No. 558,967
Int. Cl.[6] H01R *13/62*
U.S. Cl. 439—160 **14 Claims**

1. A card edge connector with a rotatable ejector for receiving a module therein, comprising:
- an insulative elongated housing having a central slot for receiving said module therein;
- a plurality of passageways disposed by at least one side of the slot for receiving a corresponding number of contacts therein;
- first guidance/retention means integrally extending upward from the housing for laterally retaining and aligning the inserted module in the housing; and



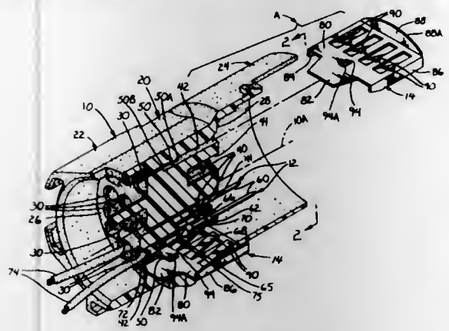
said ejector including second guidance/retention means having a guiding surface in an interior surface for retaining and aligning the inserted module lengthwise in the housing; wherein said guiding surface includes a lower arc section, a middle vertical section and an upper oblique section.

5,558,529
ELECTRICAL CONNECTOR WITH SHUNT SYSTEM
David H. Romatzick, Jr., Milford, Conn., assignor to Burndy Corporation, Norwalk, Conn.
Filed Aug. 2, 1994, Ser. No. 284,795
Int. Cl.[6] H01R *29/00*
U.S. Cl. 439—188 **17 Claims**



1. An electrical connector comprising:
- a plurality of first electrical contacts;
- a housing having the first contacts fixedly connected thereto;
- a shuttle movably located inside the housing and having at least one cam surface extending out of an aperture of the housing; and
- a plurality of second electrical shunt contacts stationarily connected to the shuttle, wherein the cam surface is moved by a mating electrical connector to move the second shunt contacts into and out of electrical contact with the first contacts dependent upon location of the mating electrical connector relative to the housing.

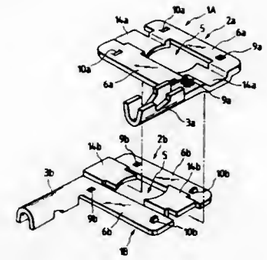
5,558,530
ELECTRICAL CONNECTOR ASSEMBLY HAVING A TERMINAL LOCKING BUSSING PLATE
John R. Morello, Lake Milton, and Daniel H. Huff, Austintown, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Jul. 5, 1994, Ser. No. 270,945
Int. Cl.[6] H01R *29/00*
U.S. Cl. 439—189 **6 Claims**



1. An electrical connector assembly comprising:
- a connector housing made from an electrically insulating material, said housing having a plurality of spaced terminal receiving cavities extending therethrough, an axially extending elongated slot extending substantially coextensive with said plurality of spaced terminal receiving cavities and spaced substantially equidistantly from each of said plurality of cavities and being in communication with said cavities via axially extending transverse passages,
- a plurality of metal terminals connected to conductor wires, each of said metal terminals having first and second ends, each of said terminals being received in one of said terminal receiving cavities in said housing and having a forward portion and an abutment extending transversely outwardly of said forward portion intermediate said ends,
- and a metal bus plate comprising a base shaped complementary with said elongated slot in said housing and having a plurality of laterally spaced upstruck tangs, said bus plate being insertable into said slot and with the tangs being received through said transverse passages and extending into said terminal receiving cavities in said housing,
- cooperable abutments on said housing and said bus plate to position said bus plate in said housing upon being inserted into said slot,
- said tangs on said bus plate being sequentially engageable with said forward portion of said terminals, deflectable by said transversely, extending abutments on said terminals and adapted to be snapped behind the transversely extending abutments to again engage the forward portions of said terminals when either the terminals or bus plate are inserted into the housing with the other already in the housing whereby the tangs serve the dual function of electrically connecting the terminals to the bus plate and providing a lock to prevent reverse movement of the terminals.

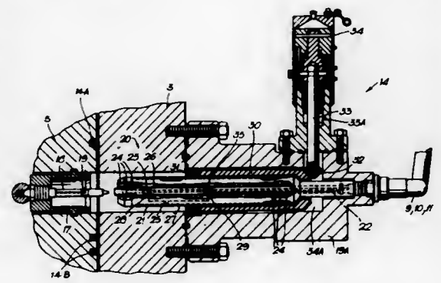
5,558,531
COMBINATION TERMINAL
Tomohiro Ikeda, and Kenji Tsuchiya, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Jan. 30, 1995, Ser. No. 380,577
Claims priority, application Japan, Feb. 9, 1994, 6-015492
Int. Cl.[6] H01R *13/28*
U.S. Cl. 439—287 **8 Claims**

1. A combination terminal having two plate terminals joined together, each of said plate terminals comprising:



- a joint to which electric wires are pressure-weldable;
- a securing member, integrally formed with said joint, having a centrally disposed securing hole for receiving a clamp bolt and having base planes, one of said base planes being adjacent to said joint;
- retaining planes, extending obliquely from said base planes of said securing member, disposed on opposite sides of said securing hole;
- at least one lock pawl disposed on a first corner portion of one of said base planes; and
- at least one stepped fitting portion disposed on a second corner portion of one of said base planes,
- wherein said retaining planes of a first of said two plate terminals are mated with said retaining planes of a second of said two plate terminals, and said lock pawl of said first of said two plate terminals is subsequently mated with said stepped fitting portion of said second of said two plate terminals, thereby joining said two plate terminals together.

5,558,532
ELECTRICAL CONNECTION
Hans P. Hopper, Hillhouse, United Kingdom, assignor to Cooper Cameron Corporation, Houston, Tex.
Filed May 12, 1994, Ser. No. 241,537
Claims priority, application European Pat. Off., Aug. 4, 1993, 93306162
Int. Cl.[6] H01R *13/629*
U.S. Cl. 439—310 **9 Claims**



1. An assembly providing an electrical connection across an interface between a radially inner member and a surrounding radially outer member, the assembly comprising a sealed enclosure defined between the inner and outer members; a cable which leads to the enclosure, and which has at least one conducting core; an electrical coupling element within the inner member; and a shuttle filled with a dielectric gel contained within a flexible bladder

exposed to surrounding pressure, said shuttle being reciprocatable

5,558,534
SELF SACRIFICING LATCHING SYSTEM

5,558,537
CEILING FIXTURE MOUNTING STRUCTURE

exposed to surrounding pressure, said shuttle being reciprocatable radially inwardly from a disconnected position wholly within the outer member to a connected position in which the shuttle makes an electrical connection between the conducting core and the electrical coupling element.

5,558,533

ELECTRICAL CONNECTOR

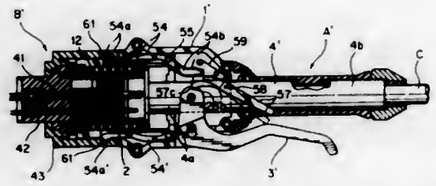
Shigemi Hashizawa; Shigemitsu Inaba, and Toshiaki Hasegawa, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Continuation of Ser. No. 165,827, Dec. 14, 1993. This application Apr. 11, 1995, Ser. No. 419,936

Claims priority, application Japan, Dec. 18, 1992, 4-338738; May 12, 1993, 5-110186

Int. Cl.[6] H01R *13/62*

U.S. Cl. 439—310 **3 Claims**



1. An electrical connector comprising a feeding connector half and a receiving connector half, wherein said feeding connector half comprises:

a case having a front half portion and a rear half portion;

a connector main body slidably mounted within said front half portion of said case, said connector main body having terminal accommodating cavities for housing a plurality of terminals;

a handle including a main body portion and a slider, wherein said slider is slidably mounted in a drilled hole in a partition wall within said case for causing said connector main body to slide;

a rotatable lever having a working portion, an intermediate portion and an operating portion, said intermediate portion being between said working portion and said operating portion, said working portion being rotatably attached to one end of said handle within said case and said operating portion projecting out of said case;

a preliminary locking means comprising a pair of locking arms rotatably attached in said case, said locking arms each having a hook-shaped locking claw at a front end of said locking arms, said hook-shaped locking claws outwardly projecting so as to engage locking channels of said receiving connector half and wire springs adjacent to each of said locking arms for urging said hook-shaped locking claws outwardly into engagement with said locking channels of said receiving connector half; and

a secondary locking means attached to said handle and adjacent to said rotatable lever for locking and unlocking said rotatable lever wherein said rotatable lever is locked after said feeding connector half and said receiving connector half are preliminarily locked to each other and then said rotatable lever is rotated to a position where said operating portion of said rotatable lever is rotated towards and near said handle so that said feeding connector half is completely locked to said receiving connector half.

5,558,534

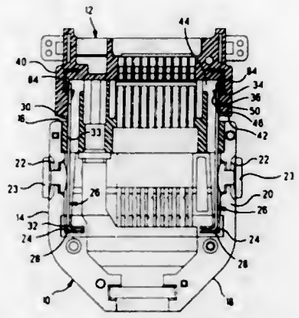
SELF SACRIFICING LATCHING SYSTEM

Michael D. Sarkady, Crystal Lake, Ill.; Jason M. Reisinger, Carlisle, Pa.; William V. Pauza, Palmyra, Pa.; James R. Fetterolf, Sr., Mechanicsburg, Pa., and James E. Connell, Jr., Hershey, Pa., assignors to The Whitaker Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 269,423, Jun. 30, 1994, Pat. No. 5,449,298. This application Nov. 22, 1994, Ser. No. 344,038

Int. Cl.[6] H01R *13/627*

U.S. Cl. 439—352 **17 Claims**



1. An electrical connector having a latching system to maintain a latched relationship with a complementary electrical connector where said connectors are in latching relationship during periods of operability, and may be unlatched by exerting a maximum predetermined separating force on the respective connectors, said latching system comprising a pair of flexible metal arms disposed along opposite sides of the electrical connector, where free ends of said metal arms each includes an opening of a size to be received on one of complementary members of the complementary connector, each of said free ends further characterized by a small slot extending from said opening to an outer edge of the respective arm defines a pair of complementary fingers, said complementary electrical connector including a forward ramp surface against which said flexible arms initially ride to effect mating of said connectors, and a rear, laterally disposed surface, so that in the mated condition said complementary member engages said opening, whereby applying the maximum predetermined separating force between the electrical connectors causes a localized force on said fingers, to spread said fingers and free said openings from said complementary members, thereby releasing the connectors from each other.

5,558,535

LOCKING CONSTRUCTION

Yuuji Saka, Yokkaichi; Kouichi Shirouzu, Toyota, and Kazuyuki Shiraki, Toyota, all of Japan, assignors to Sumitomo Wiring Systems, Ltd, Yokkaichi City, Japan

Filed Jun. 7, 1994, Ser. No. 255,736

Claims priority, application Japan, Jun. 25, 1993, 5-034576 U

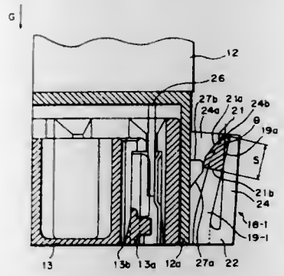
Int. Cl.[6] H01R *13/627*

U.S. Cl. 439—357 **5 Claims**

1. A locking construction for holding first and second electrical components into electrical connection with each other, the locking construction comprising:

a locking projection being provided on the first electrical component;

a locking portion being provided on the second electrical component, the locking portion including an elastically deflectable flexible portion and a hook portion formed at a distal end of the flexible portion and engageable with the locking projection; and



a spring portion being provided on the second electrical component so as to be spaced a predetermined distance from the locking portion;

wherein when deflection of the flexible portion by the locking projection has reached at least a predetermined amount, the spring portion is depressed by the locking portion so as to be elastically deflected, the predetermined amount being before the first and second electrical components are held in electrical connection with each other, the flexible portion being returned to an undeflected position and the hook portion contacting the first electrical component when the first and second electrical components are in electrical connection with each other.

5,558,536

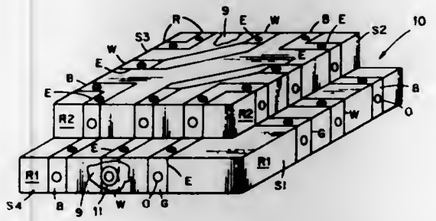
CIRCUIT CONNECTOR BLOCK

Robert F. Horton, Cullman, Ala., assignor to Charles A. Phillips, Ardmore, Tenn.

Filed Dec. 5, 1994, Ser. No. 349,204

Int. Cl.[6] H01R *13/60;9/22*

U.S. Cl. 439—535 **17 Claims**



1. A switch-power circuit connector positionable within a power circuit junction box having a plurality of angularly displaced side openings and sized to generally linearly receive conductor power cables introduced through said openings and comprising:

angularly displaced first, second, third, and fourth sets of electrical receptacles, each set having three side-by-side receptacles, and each set being positionable on a side to generally linearly receive, in a said receptacle, one of three conductors of a cable introduced through a said side opening;

end receptacles of each set of said side-by-side receptacles being electrically common with an adjacent receptacle of another said set of electrical receptacles;

electrically common receptacles of said first and second sets of receptacles and of said third and fourth sets of receptacles being power transmission receptacles;

a first conductive member being connected between the center receptacle of said first and fourth sets of receptacles; and

a second conductive member connected between the center receptacles of said sets of second and third receptacles.

5,558,537

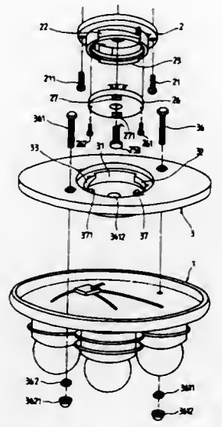
CEILING FIXTURE MOUNTING STRUCTURE

Hsiu-Ling Su, 4/F., No. 11, Alley 9, Lane 105, Tien-Mu E. Rd., Taipei City, Taiwan

Filed Feb. 24, 1995, Ser. No. 393,672

Int. Cl.[6] H01R *13/625*

U.S. Cl. 439—537 **1 Claim**



1. A ceiling fixture mounting structure comprising:

a ceiling fixture holder securely fixed to the ceiling around a wire hole on the ceiling by screws, said ceiling fixture bolder comprising a plurality of retainer ribs raised from the periphery;

a bottom plate fixedly secured to said ceiling fixture bolder by screws, said bottom plate having two opposite contact metal plates at two opposite sides respectively connected a power supply, and a ground rod at the center;

a circular mounting plate fastened to said ceiling fixture holder, said circular mounting plate comprising a top chamber, which receives said ceiling fixture holder, a plurality of retainer flanges disposed in said top chamber and being respectively engaged with said retainer ribs of said ceiling fixture holder when said circular mounting plate is rotated clockwise after the insertion of said ceiling fixture holder into said top chamber, a ground rod, which is disposed in contact with the ground rod on said bottom plate when said circular mounting plate is fixed to said ceiling fixture holder, and two contact metal plates, which are disposed in contact with the contact metal plates on said bottom plate when said circular mounting plate is fixed to said ceiling fixture holder; and

a ceiling fixture body fastened to said circular mounting plate by screws and nuts.

5,558,538

TERMINATION DEVICE AND METHOD

Jacques Delalle, Triel-Sur-Seine, France, assignor to Raychem S.A., France

PCT No. PCT/GB93/01865, § 371 Date Mar. 13, 1995, § 102(e) Date Mar. 13, 1995, PCT Pub. No. WO94/07282, PCT Pub. Date Mar. 31, 1994

PCT Filed Sep. 3, 1993, Ser. No. 397,143

Claims priority, application United Kingdom, Sep. 14, 1992, 9219448

Int. Cl.[6] H01R *9/05*

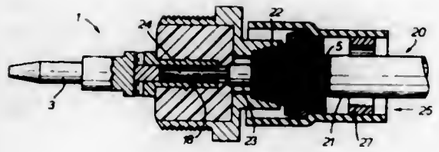
U.S. Cl. 439—583 **16 Claims**

1. A device for terminating a cable having a screen and at least one inner conductor, which comprises:

(i) a hollow electrically conductive outer body for terminating the screen of the cable, which body has two open ends and

5,558,540

MULTI CONNECTOR ASSEMBLY



which is provided with an internal screw thread that tapers from one of its open ends;

(ii) a metallic coil, at least part of which is screwed into the tapering screw thread of the outer body and tapers towards a constriction at least when screwed into the tapering screw thread; and

(iii) a conformable metallic foil in tubular form, at least part of which is located within the constriction of the metallic coil;

the device being arranged so that the screen of the cable may be terminated by inserting an exposed portion of it into the tube of metallic foil and screwing the metallic coil further into the outer body by means of the tapering screw thread, thereby constricting the coil further and causing the metallic foil to tighten about the cable screen.

5,558,539

METHOD AND DEVICE FOR PROVIDING ELECTRICAL CONTINUITY OF CABLE SHIELDING

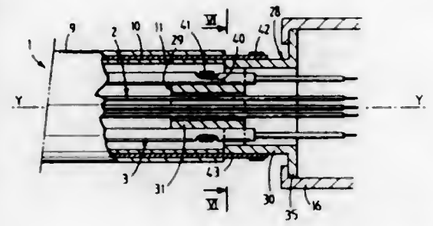
Jacky Lignelet, Coudoux, France, assignor to Eurocopter France, Marignane Cedex, France

Filed Oct. 21, 1994, Ser. No. 327,433

Claims priority, application France, Oct. 22, 1993, 93 12616

Int. Cl.[6] H01R *13/648*

U.S. Cl. 439—610 **8 Claims**



I. An electrical connection element intended for the electrical connection of shielded bundles of electrical cables, at least some of said electrical cables being shielded, said connection element comprising:

an outer tube having a hollow interior space and a diameter, said outer tube having a first portion adapted to be joined to a bundle of electrical cables having a shield, said electrical cables passing through said hollow internal space of said outer tube, said outer tube having a second portion adapted to be joined to a connector associated with said bundle of electrical cables and intended to make electrical connection with an interacting connector associated with at least one other bundle of electrical cables, said shield of said bundle of electrical cables surrounding said outer tube and being in contact with an external face of said outer tube, and

an inner tube having a diameter smaller than said diameter of said outer tube, said inner tube being fixed coaxially to said outer tube to establish electrical linkage between said inner and outer tubes.

5,558,540

MULTI-CONNECTOR ASSEMBLY

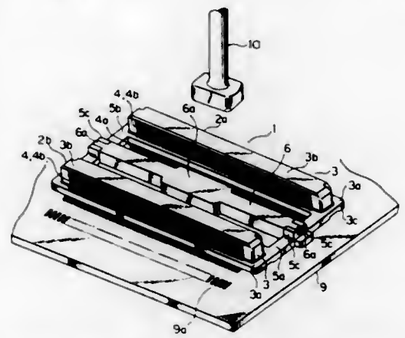
Nobukazu Kato, and Mamoru Suzuki, both of Tokyo, Japan, assignors to Japan Aviation Electronics Industry, Limited, Japan

Filed Dec. 23, 1994, Ser. No. 363,371

Claims priority, application Japan, Dec. 29, 1993, 5-351540

Int. Cl.[6] H01R *23/70*

U.S. Cl. 439—637 **5 Claims**



1. A multi-connector assembly for use with a printed circuit board having a conductive pattern formed thereon, which comprises:

a plurality of electrical connectors to be mounted on said printed circuit board in a predetermined positional relationship with one another, each of said connectors comprising an insulator block having a fitting member to be fitted in a mating connector, and a plurality of electrical contacts fixedly supported in said insulator block, each of said contacts having a contacting portion to be brought into contact with a mating contact of said mating connector and a terminal portion to be mechanically and electrically connected to said conductive pattern on said printed circuit board;

a plurality of connecting bar means each of which is made of an insulation material, said connecting bar means mechanically connecting a plurality of the connectors adjacent to one another in said predetermined positional relationship to thereby maintain said connectors in said predetermined positional relationship;

and

common holding means removably connected in common to a plurality of said connecting bar means, said common holding means having a handle portion to be chucked by chucking means of a conveying machine for conveying said assembly.

5,558,541

BLIND MATE CONNECTOR FOR AN ELECTRONIC CIRCUIT TESTER

Julius K. Botka, and David R. Veteran, both of Santa Rosa, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 3, 1994, Ser. No. 316,970

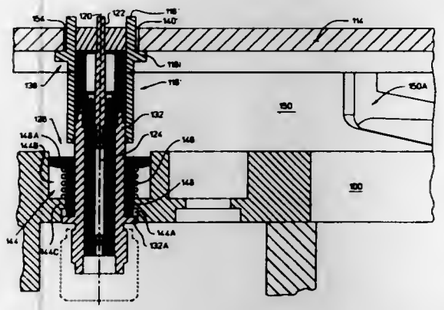
Int. Cl.[6] H01R *9/07*

U.S. Cl. 439—675 **6 Claims**

1. A blind mate connector comprising:

an electrically conductive approximately cylindrical body portion having a central axis and a first inner diameter, the body portion having an interior surface adapted to internally receive an outer conductor of one of a male and female connector at a first end of the body portion and a relieved region at a second end of the body portion, the body portion having a second inner diameter at the relieved region;

an electrically conductive approximately cylindrical-solid center conductor having an axis corresponding to the central axis,



the center conductor having one of a female and male end juxtaposed with the first end of the body portion and adapted to contact a center conductor of the one of the male and female connector inserted into the first end of the body portion and a male end juxtaposed with the second end of the body portion and adapted to contact a center conductor of a female connector inserted into the second end of the body portion, the center conductor of the blind mate connector having an exterior surface opposite the interior surface of the body portion, the center conductor having a diameter less than the first inner diameter of the body portion to provide an interstitial region between the body portion and the center conductor of the blind mate connector;

dielectric material disposed in the interstitial region for supporting the center conductor of the blind mate connector within the body portion;

an electrically conductive approximately cylindrical sleeve having an axis corresponding to the central axis, the sleeve having an internal surface and an external surface the sleeve being disposed in the relieved region at the second end of the body portion in electrical contact with the body portion, the sleave having a solid cylindrical portion having an outer diameter approximately corresponding to the inner diameter of the relieved region at the second end of the body portion and a slotted portion having an outer diameter smaller than the outer diameter of the solid cylindrical portion of the sleeve and an increased diameter portion for contacting an outer conductor of the female connector inserted into the second end of the body portion; and

means for retaining the sleeve in the body portion when the sleeve is mounted within the body portion, the means for retaining the sleeve comprising a retaining ring having an outer diameter corresponding substantially to the inner diameter of the relieved region of the body portion and disposed within the second end of the body portion at approximately the intersection of the solid cylindrical portion and the slotted portion of the sleeve.

5,558,542

ELECTRICAL CONNECTOR WITH IMPROVED TERMINAL-RECEIVING PASSAGE MEANS

Michael O'Sullivan, Willowbrook, and James A. Wetter, Hoffman Estates, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed Sep. 8, 1995, Ser. No. 525,324

Int. Cl.[6] H01R *13/10*

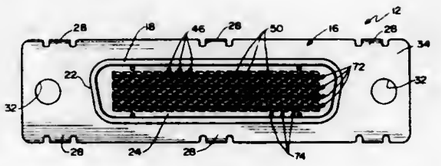
U.S. Cl. 439—682 **3 Claims**

1. An electrical connector, comprising:

a dielectric housing having means for mounting a plurality of terminals;

a plurality of terminals mounted in the housing, each terminal including a blade portion terminating in a distal contact end formed by dual spaced-apart cantilevered spring arms with mutually opposing contact portions defining a conductor-receiving mouth therebetween, the spring arms being cantilevered at opposite edges of the blade portion and offset on opposite sides of the blade portion; and

a plurality of generally rectangular passages in the housing into which the blade portions project, each passage including opposing side walls generally parallel to the blade portion of the respective terminal in the passage, and each side wall including a laterally outwardly offset portion to accommodate one of the offset spring arms at the distal contact end of the terminal, said laterally outwardly offset portions of the side walls of each passage being located adjacent one pair of diagonally opposite corners of the passage, and the other pair of diagonally opposite corners of each passage are angled inwardly toward the blade portion of the terminal.



5,558,543

CONNECTOR ATTACHMENT COMPONENT

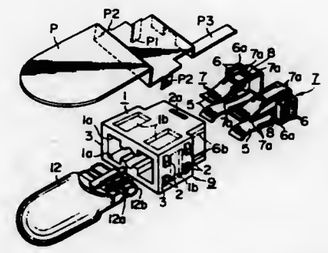
Tsunesuke Takano, and Koukichi Sinzawa, both of Tokyo, Japan, assignors to Daiichi, Denso Buhin Co., Ltd., Japan

Filed Feb. 9, 1995, Ser. No. 386,357

Claims priority, application Japan, Mar. 2, 1994, 6-056765

Int. Cl.[6] H01R *17/00*

U.S. Cl. 439—699.2 **4 Claims**



1. A connector attachment component for a lamp comprising:

a bulb holder which includes an electrically insulative base member defining a central interior rectangular space for receiving a lamp base therewithin;

a pair of electrically conductive bulb connectors each having a resilient generally U-shaped clamp element for resiliently holding the lamp base, and a connection piece for connection to an electrical circuit, said pair of connectors being positioned parallel to one another within said central interior rectangular space such that each said clamp element forwardly extends to receive the lamp base of a lamp when inserted thereinto; and

an electrically conductive reflecting plate forwardly extending from an upper surface of said bulb holder so as to be in covering relationship to the lamp when the lamp base thereof is resiliently held by said clamp elements of said connectors, wherein

said reflecting plate includes an electrically conductive projecting piece which is inserted into a connection piece of one of said connectors to allow electrical current to flow through the reflecting plate to the connector and illuminate the lamp held thereby.

5,558,544

BATTERY TERMINAL

a sleeve;

a wedge; and

5,558,548

PROPELLER DRIVE FOR BOATS

5,558,544
BATTERY TERMINAL

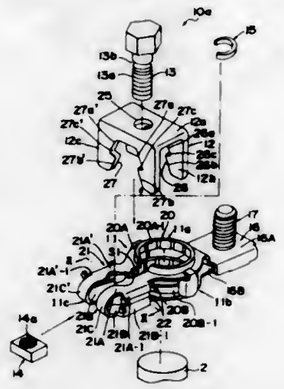
Hajime Okada, and Masaaki Tabata, both of Yokkaichi City, Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi City, Japan

Filed Dec. 6, 1993, Ser. No. 161,574

Claims priority, application Japan, Dec. 7, 1992, 4-084121; Dec. 7, 1992, 4-084122; Dec. 7, 1992, 4-084131

Int. Cl.[6] H01R *13/631*

U.S. Cl. 439—762 **2 Claims**



1. A battery terminal for a terminal post of a battery comprising:

a terminal formed by a single plate having a top part and a bottom part for holding said terminal post comprising:

a first fitting member integrally formed with said top part for holding said terminal post and provided with a first sliding member having a tapered outer surface; and

a second fitting member integrally formed with said bottom part for holding said terminal post and provided with a second sliding member having a second tapered outer surface, said second sliding member being received in said first sliding member; and

a tightening tool having a first tapered inner surface engageable to said first tapered outer surface and a second tapered inner surface engageable to said second tapered outer surface, said first tapered inner surface being stagger and spaced from said second tapered inner surface, whereby when said tightening tool is forced to move toward said terminal, said first and second tapered inner surfaces press said first and second tapered outer surfaces to compress said terminal to hold said terminal post.

5,558,545
BATTERY TERMINAL CONNECTOR HAVING PAD CONTACTS

Jeanne E. Staab, Warren; Edward M. Bango, Cortland, and Robert J. Stang, Courtland, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

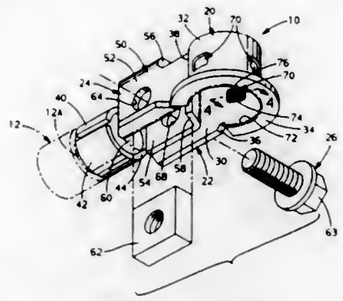
Filed May 1, 1995, Ser. No. 431,944

Int. Cl.[6] H01R *4/42*

U.S. Cl. 439—762 **5 Claims**

1. A battery terminal connector for connecting an electrical cable to a battery terminal post, said connector comprising:

a gripping portion formed of elastically deformable and electrically conductive metal material in the shape of a hollow shell having adjacent ends which define and axially extending slot to enable the shell to open and close,



a pair of extension arms integral with said ends of said shell and extending generally parallel to one another,

first of said arms being connectable to an electrical cable,

radially inwardly extending indentations on said gripping portion for engaging said battery post at spaced locations, and

fastener means carried by said extension arms for moving said extension arms toward each other to close said gripping portion around said battery post to clamp said indentations and gripping portion onto said battery post,

the improvement being that said indentations comprise three radially inwardly extending pads at three equidistantly spaced circumferential locations on said gripping portion, said pads having an inner end face which is knurled so that said pads bite into the battery post to provide both a good mechanical and a good electrical connection with the battery post.

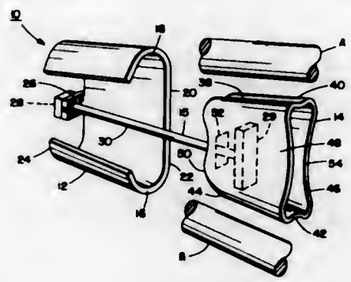
5,558,546
ELECTRICAL WEDGE CONNECTOR WITH PREINSTALLMENT INTERCONNECTOR

Richard Chadbourne, Merrimack; William J. Lasko, Libson, and Gennaro L. Pecora, Manchester, all of N.H., assignors to Burndy Corporation, Norwalk, Conn.

Filed Dec. 9, 1994, Ser. No. 353,459

Int. Cl.[6] H01R *4/50*

U.S. Cl. 439—783 **10 Claims**



1. An electrical connector comprising:

a sleeve;

a wedge; and

an interconnector that connects the wedge to the sleeve when the wedge is not directly connected to the sleeve, the interconnector comprising a flexible cord.

5,558,547
CONTACT SPRING HAVING A DETENT SLEEVE CONSTRUCTED AS AN OVERSPRING

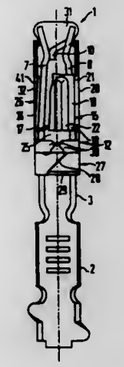
Josef Breitschaft, Prien, Germany; Jacques De Pauw, Dammes-Swaele, Belgium, and Artur Wohlfart, Bad Dürkheim, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 22, 1994, Ser. No. 293,827

Claims priority, application Germany, Feb. 24, 1992, 9202366 U

Int. Cl.[6] H01R *13/187*

U.S. Cl. 439—843 **12 Claims**



1. A contact spring assembly, comprising:

a contact spring having a connection part for an electrical conductor and a contact part with a spring leg base and spring legs originating from said spring leg base for contacting a plug contact; and

a detent sleeve being retained at said spring leg base, being produced from sheet metal as a stamped and bent part, surrounding said contact part like a box, being constructed as an overspring and having a longitudinal direction and a longitudinal edge region, said detent sleeve having a bottom wall, two side walls each having an overspring arm being cut out of said side wall, bent inward and resting on a respective one of said spring legs, a transition to said bottom wall, a top wall being divided by a production-dictated longitudinal slit formed therein, and a detent spring arm being cut out of one of said walls, extending in said longitudinal direction of said detent sleeve and being bent outward;

said overspring arms being formed solely by dividing cuts extending substantially crosswise to said longitudinal direction of said detent sleeve; said dividing cuts converging from said side walls toward said longitudinal edge region at said transition to said bottom wall and ending there with said respective overspring arm remaining connected to said detent sleeve at a connection location in said longitudinal edge region; and said respective overspring arm extending from said connection location crosswise to said longitudinal direction of said detent sleeve, being bent inward about a bending line located in said longitudinal edge region and extending parallel to said longitudinal direction and in the direction of said longitudinal direction of said detent sleeve.

5,558,548
PROPELLER DRIVE FOR BOATS

Niclas Olofsson, Vise; Anders Rydberg, Arboga, and Oddbjörn Hallenstvedt, Valskog, all of Sweden, assignors to AB Volvo Penta, Gothenburg, Sweden

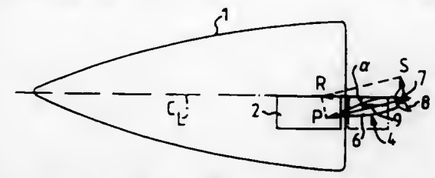
PCT No. PCT/SE93/00434, § 371 Date Jan. 24, 1995, § 102(e) Date Jan. 24, 1995, PCT Pub. No. WO93/24361, PCT Pub. Date Dec. 9, 1993

PCT Filed May 17, 1993, Ser. No. 341,581

Claims priority, application Sweden, May 22, 1992, 9201625

Int. Cl.[6] B63H *1/28;5/12*

U.S. Cl. 440—66 **12 Claims**



1. Propulsion unit for a marine vessel, the unit comprising a housing connected to a hull of the vessel, a propeller shaft rotatably journalled and connected to transmission means enclosed in the housing, and a surface-breaking propeller mounted on the propeller shaft and located outside an outer end of the housing, wherein in the horizontal plane, the propeller shaft (**7**; **7***a*, **7***b*, **7***c*, **7***d*) forms a first angle (α) to a vertical plane of symmetry of a water flow-control body (**9**) directly connected to said housing (**6**; **26**; **46**), said flow-control body (**9**) controlling water flow and being intended to be aligned with a longitudinal extension (C_L) of the vessel when the vessel is travelling in a straight line.

5,558,549
FOUR CYCLE ENGINE FOR WATERCRAFT

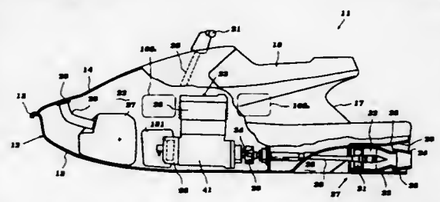
Ryoichi Nakase, and Masayoshi Nanami, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 27, 1995, Ser. No. 394,457

Claims priority, application Japan, Feb. 28, 1994, 6-030490

Int. Cl.[6] B63H *21/32*

U.S. Cl. 440—88 **33 Claims**

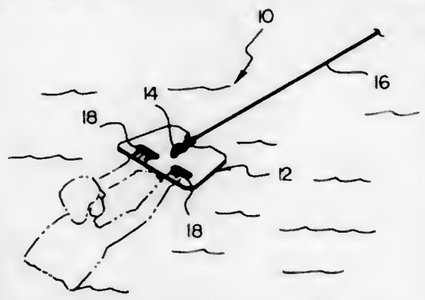


1. A watercraft having a hull, an engine compartment in said hull, a propulsion unit carried by said hull for propelling said watercraft through a body of water, a four-cycle, internal combustion engine positioned within said engine compartment and comprising a cylinder block having at least one cylinder bore receiving a piston, a cylinder head affixed to said cylinder block and defining with said cylinder bore and said piston a combustion chamber, a crankcase affixed to said cylinder block and defining at least in part a crankcase chamber in which a crankshaft driven by said piston is journaled, said crankshaft rotating about a generally horizontal axis extending longitudinally in said hull a lubricating system for said engine comprising a lubricant tank fixed within said engine compartment in proximity to but spaced from said crankcase chamber and lubricant pump means for circulating lubricant from said lubricant tank to said engine and for returning lubricant from said engine to said lubricant tank, and transmission means for driving said propulsion unit from said crankshaft.

5,558,550
SIMULATED FINGER DEVICE
Mark Settebucati, 218 E. 17 St., New York City, N.Y. 10003
Filed Feb. 14, 1994, Ser. No. 195,588
Int. Cl.[6] A63H *37/00*
U.S. Cl. 446—26 **14 Claims**

1. A simulated finger amusement device comprising a simulated finger having an appearance that closely resembles a free end portion of a human finger; means for releasably mounting the simulated finger on a portion of a finger of a person's hand at a location spaced from a free end and concealing one side of the portion which is at the location spaced from the free end so that the simulated finger may be aligned with a visible portion of the person's finger, appearing to a casual observer to be a natural continuation thereof; and, means attaching the simulated finger to the mounting means for rotational movement about a longitudinal axis of the simulated finger providing an illusion to a casual observer that the person's natural finger is rotating unnaturally.

5,558,551
STEERABLE SWIMMER TOWING DEVICE
David W. Irby, 10750 S.W. Fox Brown Rd., Indian Town, Fla. 34956
Filed Sep. 15, 1995, Ser. No. 528,992
Int. Cl.[6] B63B *35/79*
U.S. Cl. 441—65 **1 Claim**



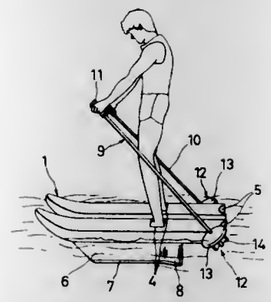
1. A steerable swimmer towing device comprising:
a planar member having a line anchor coupled thereto for permitting securement of a tow line to the planar member, the planar member being shaped so as to define a plurality of handle apertures directed thereto such that an individual can grasp the planar member to be towed behind a boat by the tow line, the planar member being shaped so as to define a planar top surface oriented in a substantially spaced and parallel orientation relative to a planar bottom surface with the line anchor extending from the planar top surface. The line anchor being positioned centrally within the top surface of the planar member, the planar member being further shaped so as to define a linear rear edge having linear lateral edges projecting from opposed ends of the linear rear edge, and a forward edge extending between the linear lateral edges, the forward edge being substantially arcuate in shape and including a line clearance aperture directed inwardly of the forward edge so as to separate the forward edge into spaced portions thereof, the line clearance aperture projecting towards the line anchor and being centrally aligned between the linear lateral edges to permit a tow line when coupled to the line anchor to project below the planar member, the handle apertures being comprised of elongated slots directed through the planar member oriented in a substantially spaced and parallel orientation relative to the linear edge thereof, a steering fin coupled to the bottom surface of the planar member, the steering fin comprising a mounting plate secured to the bottom surface and a vertical plate coupled to the mounting plate and projecting substantially orthogonally from the bottom surface of the planar member, the vertical plate being shaped so as to taper from a first vertical height proximal to a forward edge of the mounting plate to a second vertical height proximal to a rearward edge of the mounting plate, wherein the second vertical height is substantially greater than the first vertical height.

5,558,552
FASTENING FOR THE FOOT-LOOP STRAPS OF SURFBOARDS
Marc Namur, Welterstadt, Germany, assignor to Fanatic Sports GmbH, Ransbach-Baumbach, Germany
Filed Aug. 31, 1995, Ser. No. 521,844
Claims priority, application Germany, Aug. 31, 1994, 9413936 U
Int. Cl.[6] A63C *15/06*
U.S. Cl. 441—75 **6 Claims**

1. Fastening for surfboard foot-loop straps, comprising fastening bars (6–8) on an upper side (5) of a board body (1), which bars each contain location holes (36) at equal intervals with an insertion slot (37), an undercut (38), and an upper side positioning slot (39) for the insertion of locking bars (40) with a swivel handle (41) that are positioned so they can turn in fastening plates (42), (43) on the end of the foot-loop straps (2–4) and have a locking bar nose (44) matching the insertion slot (37) of the holes (36) in the fastenings bars (6–8), whereby upon turning a locking bar (40), which is placed in a location hole (36) of the fastening bars (6–8) corresponding to the desired position chosen for a foot-loop strap (2–4), the locking bar (40) interfits with a bayonet connection with the undercut (38) of the location hole (36) .

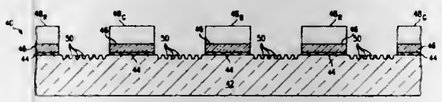
5,558,553
WATER WALKING DEVICE, HULL AND STOCK THEREOF
Kiyoshige Okano, 187-5 Kawajiri, Siroyama-cho, Tsukui-gun, Kanagawa-Ken, Japan
Filed Oct. 2, 1995, Ser. No. 537,456
Int. Cl.[6] B63B *35/83*
U.S. Cl. 441—76 **5 Claims**

1. A water walking device comprising:
(a) a pair of hulls,
(b) a pair of stocks used with said hulls when walking on water,



(c) each of said hulls having a footwell formed in a concave hole shape for mounting the feet of a user,
(d) a vertical stabilizer fin on the lower surface of each hull formed to extend in the longitudinal direction,
(e) a weight along the lower edge of each vertical stabilizer fin,
(f) a water surface propulsion blade at the rear of the hull formed in a concave shape pointing towards the front of the hull,
(g) an underwater propulsion blade at the rear of the vertical stabilizer fin formed in a fan shape divergent towards the rear of the vertical stabilizer fin to define a rear surface, and the rear surface of said underwater blade formed in a concave shape pointing to the forward part of the vertical stabilizer fin,
(h) each stock including a shaft provided on the lower part with a plurality of vanes mounted in a blade body formed in a rim shape,
(i) said vanes forming a radial pattern, at fixed intervals, centering around the shaft of the stock.

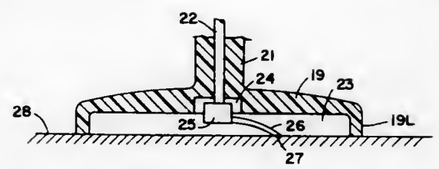
5,558,554
METHOD FOR FABRICATING A FIELD EMISSION DEVICE ANODE PLATE HAVING MULTIPLE GROOVES BETWEEN ANODE CONDUCTORS
John E. Finklea, Garland; Chi-Cheong Shen, Richardson; Kenneth G. Vickers, Whitesboro, and Mark A. Kressley, Richardson, all of Tex., assignors to Texas Instruments Inc., Dallas, Tex.
Filed May 31, 1995, Ser. No. 455,312
Int. Cl.[6] H01J *9/20*
U.S. Cl. 445—52 **30 Claims**



1. A method of fabricating an anode plate for use in a field emission display device, said method comprising the steps of:
providing a substantially transparent substrate having spaced-apart, electrically conductive regions on a surface thereof;
etching a plurality of grooves in said surface in the spaces between said electrically conductive regions; and
applying luminescent material on said conductive regions.

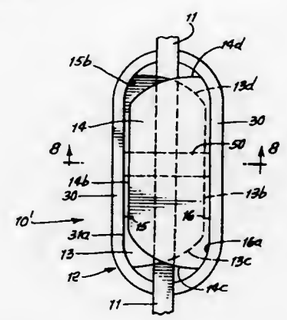
5,558,555
SKATING DOLL PLATFORM
Melvin Kennedy, 825 Marbella La., Lantana, Fla. 33462
Filed Sep. 14, 1995, Ser. No. 528,477
Int. Cl.[6] A63H *3/20;11/00*
U.S. Cl. 446—359 **9 Claims**

1. A platform acting as a stage to animate a doll having a given weight mounted thereon, said doll having a pair of legs terminating in feet, said platform comprising:



A. a base functioning as a stage and an underside well recessed therein;
B. an upright tubular bearing mounted on the platform;
C. a spindle extending through the tubular bearing loosely thereby being slidable and rotatable therein; said spindle having an upper end projecting above the bearing and a lower end projecting into the well;
D. an actuator joined to the lower end of the spindle, and provided with an eccentric projecting tip which when the platform is placed on a horizontal play surface then frictionally engages this surface; and
E. means to clamp one leg of the doll to the upper end of the spindle to support said doll above the platform, the weight of the doll applying a downward pressure on the slidable spindle to urge said tip against said play surface whereby when the platform is manually pushed along said surface, the tip then sweeps in a circular path in said well and turns said spindle to rotate said doll.

5,558,556
SUPPORT DEVICE FOR A BRASSIERE STRAP
Harry W. Froehlich, 1344 Marinette Rd., Pacific Palisades, Calif. 90272
Filed Apr. 3, 1995, Ser. No. 415,431
Int. Cl.[6] A41D *27/26*
U.S. Cl. 450—86 **15 Claims**



1. In apparatus attachable to a strip of material associated with a garment, the combination comprising
a) a flexible support base, and
b) two foldable flaps carried by said base at spaced apart fold locations, and characterized in that the flaps are separately foldable from open positions allowing placement of said strip past at least one open position flap and toward the base, to closed position in which portions of the flaps directly overlie one another and the strip is retained to the base by the flaps; the flaps consisting of mutually face-to-face adherent material to adhere when the portions are pressed together in the closed position of the flaps,
c) said flaps being retained to the base to project freely from said fold locations,
d) said fold locations being linear and substantially parallel, but each with fold end curvature, toward an extended line defined by the other flap linear fold location,

e) each flap projecting throughout its major length from its associated linear fold location toward and into proximity to

tion of the steel strip, one rotary brush on a side face of the steel strip being set to rotate downwardly thereon and the other adjacent rotary brush on the same side as the one rotary

5,558,561
METHOD AND MACHINING APPARATUS FOR USE ESPECIALLY IN THE SANDING OF ITEMS OF WOOD

e) each flap projecting throughout its major length from its associated linear fold location toward and into proximity to the other flap associated linear fold location in said flap closed positions.

f) said flaps consisting of vinyl material, and being transparent, flexible and mutually adherent.

5,558,557

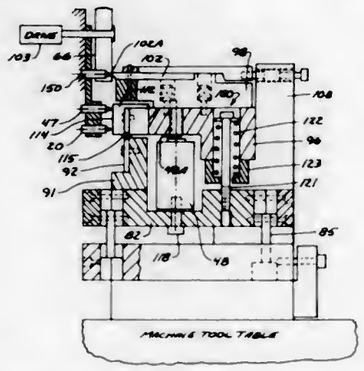
THREE AXIS CONTROL FOR MACHINE TOOL

Leon G. Dashevsky, Plymouth, Minn., assignor to Innovex Inc., Hopkins, Minn.

Filed Dec. 13, 1994, Ser. No. 354,540

Int. Cl.[6] B24B *49/10*

U.S. Cl. 451—10 **17 Claims**



1. Position control apparatus for a moving machining table comprising:

a first plate adapted to be supported in a desired position relative to a rotating machine tool;

a second plate spaced from said first plate, and flexure members coupling said second plate relative to said first plate for movement in a desired plane;

a pair of actuators coupled to the second plate and controlling movement in the plane, said actuators being spaced apart along a first line in said plane;

a reference surface mounted relative to said second plate such that movement of the second plate in the plane including the first line causes corresponding movement of the reference surface;

at least two sensors mounted for sensing movement of a second line on the reference surface in direction perpendicular to the reference surface; and

control means coupled between said sensors and said actuators for maintaining the second line on the reference surface in a desired position under control of the actuators as the reference surface moves relative to the sensor.

5,558,558

APPARATUS FOR RETRACTING A TOOL SLIDE OF AN ULTRASONIC CUTTING MACHINE

Michael Bory, and Hans Bauer, both of Wattwil, Switzerland, assignors to Erosonic AG, Wattwil, Switzerland

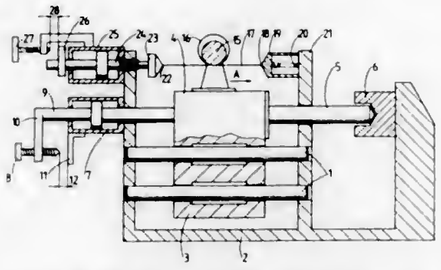
Filed Jan. 24, 1994, Ser. No. 185,029

Claims priority, application Switzerland, Jan. 25, 1993, 203/93

Int. Cl.[6] B24B *49/00*

U.S. Cl. 451—11 **8 Claims**

1. An apparatus for retracting a tool carriage (3) of an ultrasonic cutting machine, comprising:



a) a tool carriage slideably mounted on guideways (1) fixed to a frame (2),

b) first drive means (7, 9) mounted on the frame and coupled directly to the carriage for feeding said carriage, and a cutting tool (5) carried thereby, in a first direction (A) to advance the tool against a workpiece (6),

c) clamping means (15, 16) mounted to the carriage, and

d) second drive means (24, 25) coupled to the clamping means for, in succession:

1) actuating the clamping means to engage the carriage, and

2) retracting the carriage, and the cutting tool, in a second, opposite direction against a force exerted on the carriage by the first drive means,

e) wherein the clamping means comprises a driver (15) surrounded by a loop (16) formed by a flexible pull element (17) having a first end (18) preloaded against a stop (21) attached to the frame by a prestressed pull element (20), and a second end (22) attached to the second drive means.

5,558,559

POLISHING SYSTEM FOR OPPOSITE EDGE FACES OF PLATED STEEL STRIP

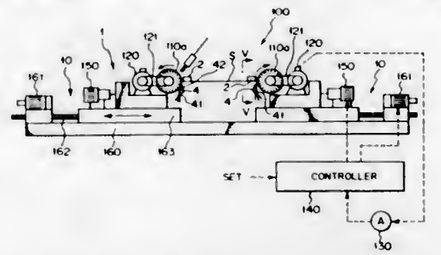
Yukihiko Noguchi; Keitoshi Haruta; Isamu Sakamoto; Mituo Yamanaka, all of Ibaraki-ken; Makoto Uchinono, and Takashi Shiohara, both of Yamaguchi-ken, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Aug. 12, 1994, Ser. No. 289,540

Claims priority, application Japan, Aug. 13, 1993, 5-044412 U; Aug. 13, 1993, 5-201717; Aug. 13, 1993, 5-201718; Apr. 5, 1994, 6-067356

Int. Cl.[6] B24B *49/00*

U.S. Cl. 451—14 **8 Claims**



1. A polishing system for opposite edge faces of a plated steel strip wherein a plating layer on opposite edge faces of the plated steel strip is removed, comprising:

at least a pair of side face polishing devices disposed along a traveling direction of the steel strip for polishing opposite side faces of the steel strip by a pair of rotary brushes which engage with said opposite side faces in a widthwise direction, said rotary brushes having a substantially hourglass configuration, rotary axes of said rotary brushes of said devices opposed in the widthwise direction of the steel strip being inclined in the same direction relative to the traveling direction of the steel strip, one rotary brush on a side face of the steel strip being set to rotate downwardly thereon and the other adjacent rotary brush on the same side as the one rotary brush being set to rotate upwardly thereon in the case of providing more than two pairs of said side face polishing devices;

a warp adjusting mechanism for adjusting warps of edge portions of the steel strip, said warp adjusting mechanism being designed to form an upward ramp path and a downward ramp path in a pass line of a steel strip passing between the opposite rotary brushes by at least three path rolls provided in a given spaced distance in said pass line, to insulate tension caused in said upward and downward ramp paths from other paths by wringer rolls provided on inlet and outlet sides of said upward and downward ramp paths, and to rotate the rotary brushes downwardly or upwardly relative to the side face on said upward or downward ramp path;

a detector for detecting a change of a driving load in a motor which drives said rotary brush; and

a controller for adjusting the position of said rotary brush by applying a control signal to a motor which moves said rotary brush in the widthwise direction of the steel strip response to the detected signal from said detector.

5,558,560

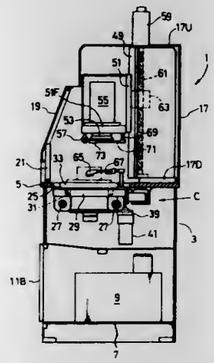
TOOL GRINDING MACHINE

Kazuyuki Uchida, Ebina, Japan, assignor to Amada Metrecs Company, Limited, Kanagawa, Japan

Filed Mar. 7, 1994, Ser. No. 206,613

Int. Cl.[6] B24B *49/00*

U.S. Cl. 451—24 **12 Claims**



1. A tool grinding machine for grinding a punch cutting edge of a punch body provided in a punch assembly, the punch assembly including a punch guide, the punch body inserted in the punch guide, and an elastic means provided between the punch guide and the punch body for urging the punch body relative to the punch guide so that the cutting edge of the punch body is retracted into the punch guide, the tool grinding machine comprising:

a base;

a rotary table disposed on the base;

a punch supporting device disposed on said rotary table, for supporting the punch assembly;

a push device provided on the rotary table, for moving the punch body relative to the punch guide against an elastic force of the elastic means so that the punch cutting edge of the punch body projects from the punch guide; and

a grinding tool disposed away from said rotary table in an axial direction of the rotary table, the grinding tool being rotatable and movable toward the rotary table, for grinding the cutting edge of the punch body projected from the punch guide.

5,558,561

METHOD AND MACHINING APPARATUS FOR USE ESPECIALLY IN THE SANDING OF ITEMS OF WOOD IN A SANDING MACHINE

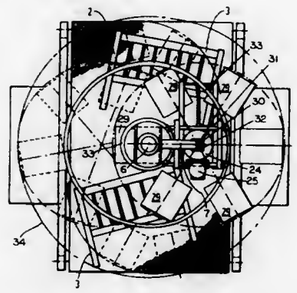
Keld O. Hundebol, Ansager, Denmark, assignor to HH Patent A/S, Ansager, Denmark

Continuation of Ser. No. 284,901, Aug. 2, 1994, Pat. No. 5,441,440, which is a continuation-in-part of Ser. No. 154,921, Nov. 18, 1993, abandoned, which is a division of Ser. No. 950,416, Sep. 23, 1992, Pat. No. 5,291,689, which is a division of Ser. No. 699,181, May 13, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 484,678

The portion of the term of this patent subsequent to Mar. 8, 2011, has been disclaimed.

Int. Cl.[6] B24B *7/00*

U.S. Cl. 451—28 **2 Claims**



1. A method of sanding comprising:

providing a plurality of sanding rollers each located on a respective spindle having a longitudinal axis extending radially outward from a spindle drive;

rotating said spindle drive with said spindle drive thereon;

driving each of said spindles independently of said spindle drive and rotating the sanding roller thereon as the spindle drive is rotated;

convey articles to be sanded along a path in a first direction beneath said driven sanding rollers to be contacted thereby; and

moving said rotating spindle drive carrying the driven spindles with the rotating sanding roller thereon in a circular direction over said path as the articles are moving in the first direction therebeneath;

uniformly and gently sanding the articles by contacting the articles with the driven sanding rollers which attack the articles from many different sanding directions as the articles pass beneath the moving rotating spindle drive carrying the rotating spindles.

5,558,562

METHOD FOR MICRO-CLEANING A SUPPORT AND APPARATUS FOR IMPLEMENTING SAME

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PCT No. PCT/FR92/01177, § 371 Date Jun. 9, 1994, § 102(e) Date Jun. 9, 1994, PCT Pub. No. WO93/11908, PCT Pub. Date Jun. 24, 1993

PCT Filed Dec. 11, 1992, Ser. No. 244,787

Claims priority, application France, Dec. 11, 1991, 91 15567; Dec. 11, 1991, 91 15568

Int. Cl.[6] B24B *1/00*

U.S. Cl. 451—38 **17 Claims**

1. A method of micro-cleaning and of micro-blasting a support comprising the steps of: spraying towards the support a multitude of jets of compressed air charged with fine abrasive particles having grain sizes which lie mainly in the range 80 micrometers to 120 micrometers, the spraying step including the emitting of the

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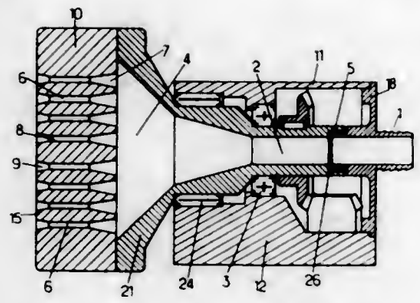
5,558,564

FACETTING MACHINE

and a grinding unit pattern follower adapted to abut against the pattern held by said workpiece holder during grinding of



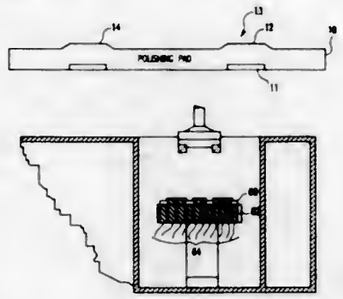
jets via nozzles, and the displacing at high speeds of the jets to sweep the support with the jets, wherein the multitude of jets is at least ten, and wherein, at each nozzle, the respective jet has a cross-section lying in the range 400 micrometers to 4 millimeters, thereby imparting very low kinetic energy to each jet.

5,558,563

METHOD AND APPARATUS FOR UNIFORM POLISHING OF A SUBSTRATE

William J. Cote, Poughquag, and Michael F. Lofaro, Milton, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 23, 1995, Ser. No. 392,591
Int. Cl.[6] B24B *1/00*
U.S. Cl. 451—41 **7 Claims**



1. A method for polishing a substrate, comprising the steps of:
contacting a surface of a substrate with a polishing pad while at least one of said substrate and said polishing pad moved so as to polish said surface of said substrate with said polishing pad;
placing a plurality of pistons adjacent a non-polishing surface of said polishing pad, said plurality of pistons being positionable in an up position and a down position; and
simultaneously applying a first amount of pressure on a first portion of said surface of said substrate with said polishing pad during said contacting step and a second amount of pressure which is different from said first amount of pressure on a second portion of said surface of said substrate with said polishing pad during said contacting step by adjusting positions of pistons in said plurality of pistons up or down to produce a polishing surface for said polishing pad which has at least one comparatively raised first portion and at least one comparatively lower second portion.

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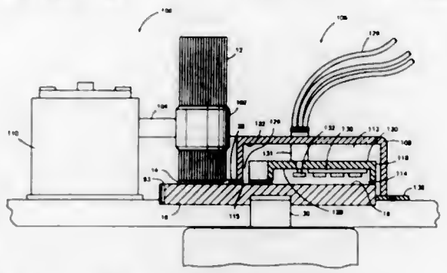
FACETING MACHINE

Adir Ascalon, 35 E. 35th St. Apt. 8H, New York, N.Y. 10016
Continuation-in-part of Ser. No. 142,506, Oct. 22, 1993, Pat. No. 5,454,747. This application Jan. 4, 1995, Ser. No. 368,423
Int. Cl.[6] B24B *7/00*
U.S. Cl. 451—066 **32 Claims**

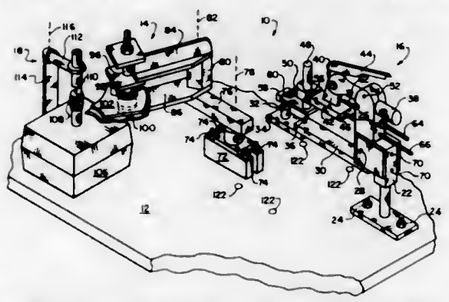


1. A faceting machine comprising:
means for abrading objects to be faceted;
said abrading means having a surface with abrasive grit compounds for abrading said objects;
means for replenishing and refurbishing said abrasive grit compounds on said surface during operation of said abrading means; and
means for affixing and freezing said abrasive grit compounds on said surface, said affixing and freezing means comprising means for applying a coolant material to said surface.

5,558,565

GLASS PATTERN CUTTING DEVICE

Victor Dedonato, 2833 Locust Dr., Pittsburg, Pa. 15241
Filed Jul. 31, 1995, Ser. No. 509,125
Int. Cl.[6] B24B *7/00*
U.S. Cl. 451—70 **16 Claims**

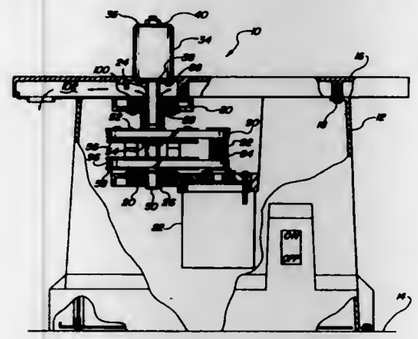


9. A glass cutting apparatus for cutting glass into preset patterns, said apparatus comprising:
a workpiece holder adapted to simultaneously hold a glass workpiece and a pattern thereon, wherein said workpiece holder includes a pair of opposed clamping members for clamping the glass workpiece and pattern therebetween, a base member, a support arm rotatably attached to said base member at a first end thereof, a C-shaped frame rotatably attached to a second end of said support arm, and wherein said clamping members are attached to said C-shaped frame;
a cutting unit including at least one cutter blade for scoring the glass workpiece which is held by said workpiece holder, and a pattern follower adapted to abut against the pattern held by said workpiece holder during scoring of the glass workpiece by said cutter; and
a grinding unit having a rotatable grinder for grinding an edge of the glass workpiece which is held by said workpiece holder, and a grinding unit pattern follower adapted to abut against the pattern held by said workpiece holder during grinding of the edge of the glass workpiece by said grinder.

5,558,566

OSCILLATING SPINDLE SANDER

Toshimitsu Hashii, Clemson, S.C., and Robert G. Everts, Chandler, Ariz., assignors to Ryobi Motor Products, Easley, S.C.
Division of Ser. No. 48,326, Mar. 17, 1993, Pat. No. 5,402,604. This application Dec. 30, 1994, Ser. No. 366,977
Int. Cl.[6] B24B *55/06*
U.S. Cl. 451—157 **13 Claims**



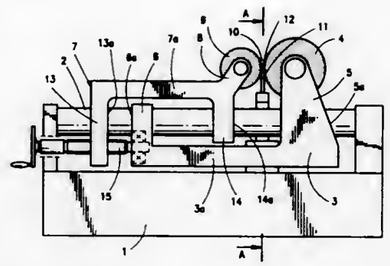
1. An oscillating spindle sander comprising;
a cabinet having a work table with a substantially horizontal upper surface and an opening extending therethrough;
an upper and a lower bearing affixed to the cabinet and defining a vertical axis aligned with the cabinet opening;
a rotary spindle pivotably supported by the upper and lower bearings and oscillatable in a vertical direction relative to the cabinet;
a drive motor operatively connected to the rotary spindle for rotating and simultaneously axially oscillating the spindle relative to the cabinet; and
a cylindrical sanding drum attached to said rotary spindle between an upper and a lower washer, said lower washer having a plurality of radial fins which function as a centrifugal fan producing an air flow away from said spindle to expel sanding dust from the region of spindle located between the upper bearing and the lower washer.

5,558,567

CENTERLESS MACHINE

Olle Hedberg, Nonnens, Sweden, assignor to Lidköping Machine Tools AB, Likdöping, Sweden
Filed Feb. 14, 1995, Ser. No. 388,448
Int. Cl.[6] B24B *5/00*
U.S. Cl. 451—242 **6 Claims**

1. A centreless grinding machine comprising:
a frame,
guides on said frame,
a regulating wheel carriage displaceably supported on the guides,
a regulating wheel supported by said regulating wheel carriage,
a grinding wheel carriage displaceably supported on the guides,
a grinding wheel supported by said grinding wheel carriage,
said regulating and grinding wheels defining a grinding gap between them of adjustable size,
a work support provided in the grinding gap,
each of said grinding and regulating wheel carriages having at least two spaced apart supporting points relative to the guides,

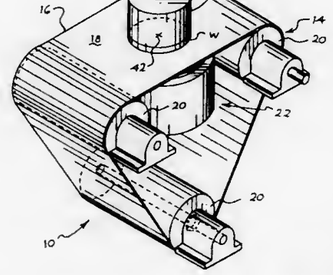


said carriages arranged in an overlapping relation such that one supporting point of one of said carriages is situated between the two supporting points of the other carriage for compensating thermally dependent length variations at said carriages.

5,558,568

WAFER POLISHING MACHINE WITH FLUID BEARINGS

Homayoun Talieh, San Jose; David E. Weldon, Los Gatos, and Boguslaw A. Nagorski, San Jose, all of Calif., assignors to Ontrak Systems, Inc., Milpitas, Calif.
Continuation-in-part of Ser. No. 321,085, Oct. 11, 1994. This application Nov. 2, 1994, Ser. No. 333,463
Int. Cl.[6] B24B *21/00*
U.S. Cl. 451—303 **17 Claims**



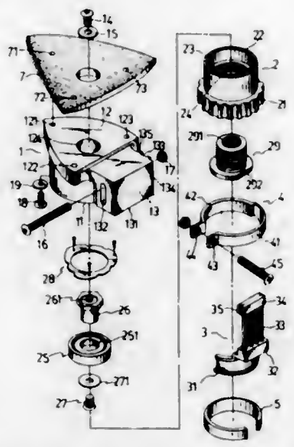
1. In a semiconductor wafer polishing machine of the type comprising at least one polishing pad assembly and at least one wafer holder positioned to hold a semiconductor wafer against the polishing pad assembly, the improvement comprising:
a support positioned adjacent the polishing pad assembly, said support comprising a plurality of fluid bearings that support the polishing pad assembly on the support, each of said fluid bearings comprising:
a respective fluid supply conduit connectable to a separate respective source of fluid at a separate respective pressure;
a respective set of fluid pads, each in fluid communication with the respective fluid supply conduit, said fluid pads configured to direct fluid from the respective fluid supply conduit to support in part the polishing pad assembly on the support.

5,558,569

GRINDING HEAD MOUNTING STRUCTURE FOR PORTABLE GRINDING MACHINES

Tai-Wang Lee, 7-4 Fl., No. 187, Chung Hsiao Rd., Taichung, Taiwan

Filed Apr. 12, 1995, Ser. No. 420,806
Int. Cl.[6] B24B *23/00*
U.S. Cl. 451—356 **1 Claim**



1. A grinding head mounting structure for a motor-driven grinding machine having a threaded driving shaft and a circular block raised from a machine base thereof around said motor-driven driving shaft, the grinding head mounting structure comprising:

an abrasive plate holder base, said abrasive plate holder base comprising a tubular coupling portion, a triangular platform horizontally disposed above said tubular coupling portion, a center countersunk hole at the center of said triangular platform, three border countersunk holes at the three angles of said triangular platform for mounting an abrasive plate by screws, a rectangular block extended from said triangular platform and said tubular coupling portion at one side, a chamber on a bottom side of said rectangular block, a first oblong slot and a second oblong slot vertically disposed on said rectangular block at two opposite lateral sides and communicated with each other, and two vertical ribs raised along two opposite lateral sides of said second oblong slot;

a tubular eccentric base shaft coupled to said tubular coupling portion of said abrasive plate holder base, said tubular eccentric base shaft comprising a vertically grooved outward bottom flange, a plurality of top screw holes equiangularly spaced on the topmost edge thereof, an inside annular flange, and a bottom screw hole;

a bearing mounted within said tubular eccentric base shaft and supported above said inside annular flange of said tubular eccentric base shaft, having a center through hole;

a headed mandrel inserted through the center through hole on said bearing and secured to said bearing by a screw and a washer, said headed mandrel having a center screw hole, into which the respective screw is threaded from one end;

a trefoil ring plate fastened to the top screw holes on the topmost edge of said tubular eccentric base shaft;

a screw member having an outer thread threaded into the bottom screw hole on said tubular eccentric base shaft, and an inner thread threaded onto the threaded driving shaft of said motor-driven grinding machine;

a split ring mounted around the circular block of said motor-driven grinding machine;

a clamp mounted around said split ring, said clamp comprising a first half-round strip and a second half-round strip longitudinally connected and terminating in a respective eyed end respectively connected together by a screw bolt, the diameter of said first half-round strip being longer than that of said second half-round strip; and

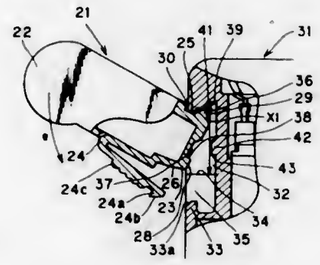
a swinging member having an arched base retained between said first half-round strip of said clamp and said split ring, a stepped horizontal block raised from said arched base, a rectangular coupling portion spaced above said stepped horizontal block and coupled to said rectangular block of said abrasive plate holder base, and a plurality of vertical rods connected between said stepped horizontal block and said rectangular coupling portion, said rectangular coupling portion having a longitudinal center through hole connected between said first oblong slot and said second oblong slot by a screw and a nut.

5,558,570

POWER TOOL HAVING DETACHABLE AUXILIARY HANDLE

Nobuhisa Nakamura; Kazuhide Ohzeki, and Hiroshi Takano, all of Hitachinaka, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1995, Ser. No. 397,642
Claims priority, application Japan, Apr. 8, 1994, 6-070977
Int. Cl.[6] B24B *23/00*
U.S. Cl. 451—357 **4 Claims**



1. A power tool including

a main body formed with an auxiliary handle receiving portion which comprises an insertion hole;

a main handle provided integrally with the main body;

an auxiliary handle having a grip portion and an insertion portion extending from the grip portion and detachably engageable with the handle receiving portion, the insertion portion having a resilient latch portion; and, the improvement comprising:

the insertion portion (**23**) having an upper surface (**25**) and a lower arcuate surface (**26**) configured to have a vertical length at a base end of the insertion portion greater than a vertical length at a tip end portion thereof; and

the insertion hole (**32**) having an upper surface operative to engage with the upper surface (**25**) of the insertion portion and a lower surface (**34**) operative to engage with the base end of the lower arcuate surface (**26**), the upper surface (**25**) of the insertion portion (**23**) being provided with an upper protrusion (**29**) extending in a widthwise direction of the insertion portion, and the upper surface of the insertion hole (**32**) having an upper indentation (**39**) operative to engage with the upper protrusion (**29**),

wherein an outer perimeter of the grip portion (**22**) is larger than that of the insertion portion (**23**) for providing a stepped portion (**50**) and upper corner (**30**) therebetween, the lower arcuate surface of the insertion portion being defined by a radius defined between the upper corner and base end of the lower arcuate surface, so that a vertical height of the base portion of the insertion portion is a maximum and a vertical height of the tip end portion thereof is a minimum; and

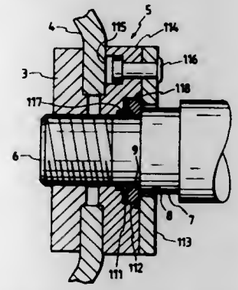
further wherein a distance (X1) between a top surface of the upper indentation (**39**) and a lower surface (**34**) of the insertion hole is equal to a vertical distance (X2) between a top of the upper protrusion (**29**) and the base end of the lower arcuate surface (**26**).

5,558,571

PORTABLE GRINDER

Takeshi Toyoshima, Ibaraki-ken; Yo Kawakami, Mito; Hiroyasu Ishikawa, Katsuta; Takao Abe, Hitachi; Satsuo Sato, Katsuta; Nobuhiro Noto, Katsuta; Tadahiro Kaneko, Katsuta; Takayoshi Kaneta, Ibaraki-ken; Jnurou Kobayahsi, Katsuta, and Osamu Kawanobe, Katsuta, all of Japan, assignors to Hitachi Koki Company Limited, Tokyo, Japan

Filed Jun. 17, 1994, Ser. No. 262,334
Claims priority, application Japan, Sep. 3, 1993, 5-220278
Int. Cl.[6] B24B *23/00*
U.S. Cl. 451—358 **11 Claims**



6. A grinder having a grinding member, comprising:

a rotatable spindle having an engagement portion;

a first flange engaging the engagement portion of the spindle,through a plastic ring play, wherein the first flange and the engagement portion of the spindle define a given play therebetween in a direction of rotation;

a second flange; and

means for enabling the grinding member to be held between the first flange and the second flange;

wherein the first flange comprises a main body, a sub member, and means for bonding the sub member and the main body together, the sub member engaging the engagement portion of the spindle.

5,558,572

PACKAGE/PEDESTAL FOR SHARPENING STONE

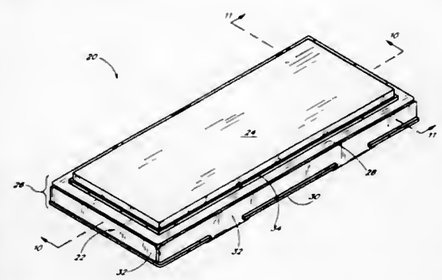
William J. Fletcher, Reno, Nev., assignor to Eze-Lap Diamond Products, Inc., Carson City, Nev.

Filed Jul. 26, 1994, Ser. No. 280,361
Int. Cl.[6] B23F *21/03*
U.S. Cl. 451—552 **22 Claims**

1. A system for packaging a sharpening stone and for supporting said stone on a base surface, comprising:

a sheet having a first main panel and a second main panel joined along adjacent edges by first and second hinges to an intermediate panel, said first panel having at least a first latch member formed on an edge opposite said intermediate panel;

a closure flap joined to an edge of said second panel opposite said intermediate panel with a third hinge, said closure flap including at least a second latch member for mating with said first latch member, said first, second and third hinges capable of allowing rotational movement of the respective elements connected at the hinges in either direction out of the plane of the sheet so that two box-shaped configurations can be formed by said sheet with said first and second panels forming top and bottom walls and said intermediate panel and said closure flap forming sidewalls; and



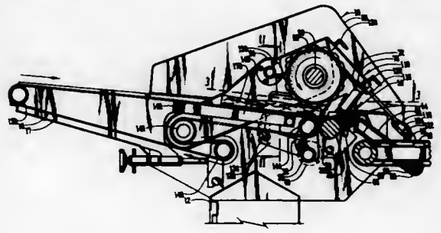
a sharpening stone mounted on a surface of one of said first and second panels so that in a first box-shaped configuration the stone is enclosed while in a second box-shaped configuration the stone is exposed, the other of said first and second panels on which the sharpening stone is not mounted having a first surface which is configured to rest on a support in said second box-shaped configuration, said first surface facing said sharpening stone in said first box-shaped configuration and facing away from said stone in said second box-shaped configuration.

5,558,573

METHOD AND MEANS OF SKINNING MEAT PRODUCTS

Vincent L. Basile, II., West Des Moines; Brent M. Veldkamp, Des Moines; Douglas N. McCloskey, Altoona, and David S. Hamblin, Clive, all of Iowa, assignors to Townsend Engineering Company, Des Moines, Iowa

Filed May 17, 1995, Ser. No. 443,125
Int. Cl.[6] A22B *5/16*
U.S. Cl. 452—127 **28 Claims**



1. A meat skinning machine, comprising,

a frame,

a gripping roll rotatably mounted on said frame,

a pair of control arms having upper and lower ends pivotally secured to said frame at their lower ends, with their upper ends normally extending above said gripping roll,

a skinning blade assembly having opposite ends secured to the upper ends of said control arms so that pivotal movement of said control arms will move said skinning blade assembly towards or away from gripping roll,

an air cylinder means connected to said control arms to selectively pivot said arms with respect to said frame,

power means on said frame operatively connected to said gripping roll to grip a meat product and move said meat product into an operative skinning position with respect to said skinning blade assembly; and

an adjustable cam means being mounted within said machine and bearing against said control arms to limit the pivotal movement of said skinning blade assembly with respect to said gripping roll.

5,558,574

VENTILATOR

Richard A. Peak, Colchester, England, assignor to Titon Hardware Limited, Colchester, United Kingdom

Filed Feb. 9, 1994, Ser. No. 193,957
Claims priority, application United Kingdom, Feb. 10, 1993, 9302562
Int. Cl.[6] E06B 7/02
U.S. Cl. 454—213 18 Claims

12. A slot ventilator comprising first and second base portions adapted to be secured to a facia, one at each end of an elongate opening therein, and an elongate body portion secured to the base portions by respective first and second pivoting parallel motion links, whereby when the base portions are so secured, the body portion is movable from an open position to a closed position in which sealing portions on the body portion press against the facia, on either side of the opening, thereby sealing the opening; and

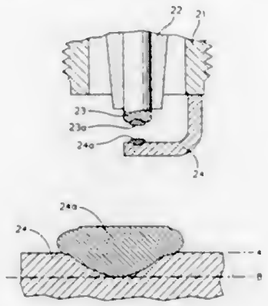
the body portion including an extruded central body section and first and second end caps which are pressfit into the extruded central body section.

5,558,575

SPARK PLUG WITH PLATINUM TIP PARTIALLY EMBEDDED IN AN ELECTRODE

Randolph K. Chiu, Davison, and Mark J. Harris, Flushing, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 15, 1995, Ser. No. 441,095
Int. Cl.[6] H01T 21/02
U.S. Cl. 445—7 10 Claims



1. A method of attaching a platinum tip to a spark plug electrode comprising:

heating a portion of the electrode to soften the electrode material;

pushing a portion of a platinum spark plug tip into the softened portion of the electrode; so that the platinum tip is embedded a distance of at least 0.2 mm in the electrode; and

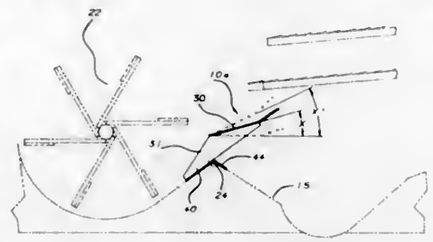
subsequently resistance welding the platinum tip to the electrode.

5,558,576

AIR DEFLECTOR PANEL INSERT FOR USE IN AXIAL FLOW TYPE COMBINES

Philip E. Meyers, P.O. box 65, Fronteer, Saskatchewan, Canada

Filed Jun. 5, 1995, Ser. No. 462,112
Int. Cl.[6] A01F 12/44
U.S. Cl. 460—99 14 Claims



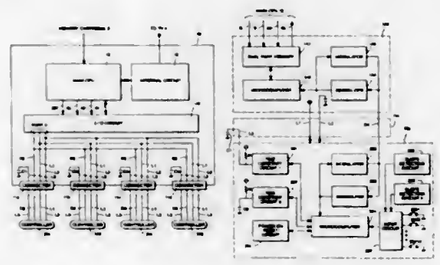
1. An air deflector panel for insertion into existing combines of the axial flow type having sieve elements extending rearwardly from a front portion thereof located behind and slightly above an outlet of a throat of a cleaning fan, a lower edge of said outlet being defined by a raised ridge extending transversely across a separation chamber defined between side walls of said combine; said air deflector panel including an air directing plate member and mounting members having means for attachment of said air deflector panel to existing structure of the combine, said mounting means including an attachment member for bolting on said ridge and spacer plates disposed in vertical planes extending in the direction of flow of air from said outlet, said vertical plates being affixed between said plate and said attachment members for supporting said plate above said ridge and projecting rearwardly thereof whereby said plate deflects a portion of air being expelled from the outlet of said throat under said plate and in a less upward direction so that said portion of expelled air passes rearwardly of said front portion before flowing upwardly through said sieve elements.

5,558,577

ELECTRONIC GAME MACHINE AND MAIN BODY APPARATUS AND CONTROLLERS USED THEREIN

Shuhei Kato, Kyoto, Japan, assignor to Nintendo Company, Ltd., Kyoto-fu, Japan

Filed May 25, 1995, Ser. No. 450,843
Claims priority, application Japan, May 25, 1994, 6-110692
Int. Cl.[6] G09G 5/08; A63F 9/22
U.S. Cl. 463—36 11 Claims



1. An electronic game machine comprising a main console having a plurality of connectors, and a plurality of controllers detachably connected to corresponding ones of the plurality of connectors, wherein said main console comprises:

a central processing unit,

an I/O circuit relaying signals between said central processing unit and said connectors, and having a port to which the connectors are connected in parallel relative to each other, and

a plurality of channel number specifying means corresponding to said connectors, for defining different parameters corresponding to different channel numbers associated with said connectors;

and wherein each controller comprises:

channel number detecting means for detecting the channel number associated with said controller, said detection based upon said channel number specifying means corresponding to said corresponding one of the connectors;

and wherein said I/O circuit comprises:

read command sending means for sending a read command including one of said channel numbers to each controller through the port; and

each of said controllers further comprises:

coincidence detecting means for detecting whether said one channel number included in the read command coincides with the channel number associated with said controller as detected by said channel number detecting means, and

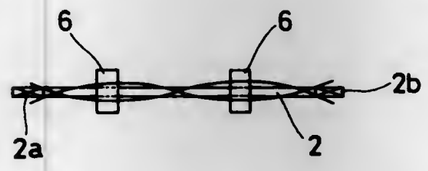
operation status signal transmitting means for transmitting an operation status signal to the I/O circuit when said coincidence detecting means detects the coincidence of channel numbers.

5,558,578

DRIVING FORCE TRANSMITTING DEVICE

Naoyuki Uryu, Anjo; Hiroshi Watanabe, Chita-gun, and Hiroyuki Kato, Okazaki, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi-pref, Japan

Filed May 20, 1994, Ser. No. 246,663
Claims priority, application Japan, May 20, 1993, 5-118337
Int. Cl.[6] F16C 1/06
U.S. Cl. 464—52 7 Claims



1. A driving force transmitting device for transmitting driving force from a driving member to a driven member, comprising:

a wired cable operatively connected with each of the driving member and the driven member, wherein the wired cable rotated by the driving member drives the driven member;

an outer tube through which the wired cable is fitted; and

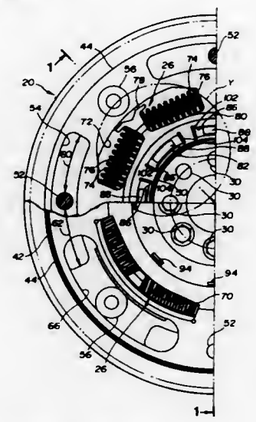
supporting tubes fitted in the outer tube and in frictional engagement with the wired Cable, wherein the supporting tubes support the wired cable when the wired cable is rotated.

5,558,579

TORSIONAL DAMPER HAVING A RESILIENTLY COUPLED DAMPER ELEMENT AND A FRICTION GENERATING DEVICE MOUNTED WITHIN A PADDED WINDOW OF THE DAMPER ELEMENT

Shouichi Tsuchiya; Tatsuya Morishita; Masanori Koda, all of Atsugi; Atsuhiro Mori, Yokosuka, and Takashi Murasugi, Ebina, all of Japan, assignors to Unisia Jecs Corporation, Atsugi, and Nissan Motor Co., Ltd., Yokohama, both of Japan

Filed Sep. 7, 1994, Ser. No. 301,568
Claims priority, application Japan, Sep. 7, 1993, 5-222358
Int. Cl.[6] F16D 3/12;3/14
U.S. Cl. 464—64 11 Claims



1. A torsional damper comprising:

first and second damper elements which are resiliently coupled by a spring arrangement, said first damper element having a radially extending wall and, said second damper element having a plurality of windows;

a plurality of friction blocks received respectively in said plurality of windows;

a spring element biasing said plurality of friction blocks against said radially extending wall of said first damper element; and

a cushion attached to an edge of one of said plurality of windows, said cushion contacting said plurality of friction blocks when said first damper element is rotated relative to said second damper element by a predetermined angle;

wherein said cushion includes a plurality of pairs of first pads, each pair being attached to a corresponding one of said plurality of windows, and a plurality of pairs of second pads, each pair being attached to a corresponding one of said plurality of windows.

5,558,580

BOOT

Koshi Okuyama, Shizuoka-ken, Japan, assignor to NOK Corporation, Tokyo, Japan

Filed Dec. 13, 1994, Ser. No. 357,248
Claims priority, application Japan, Dec. 15, 1993, 5-066858 U
Int. Cl.[6] F16D 3/84
U.S. Cl. 464—175 7 Claims

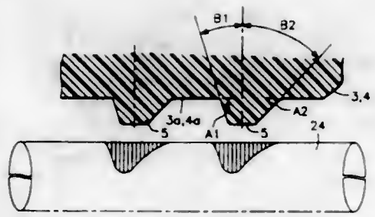
1. A boot comprising an interior and an exterior and including two end portions each having a respective boot opening, at least one of the two end portions having an inner surface adapted to contact a shaft or an outer ring surrounding the shaft on which two lip portions are provided so as to form a closed space between said two lip portions each of the two lip portions having a first slant defining a first surface facing toward the boot interior and a second

5,558,584

POOL CUE WITH SIGHT

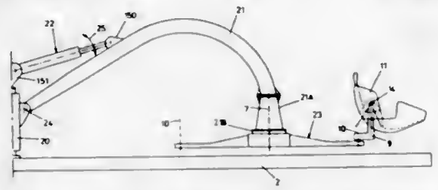
5,558,586

GOLF PUTTER HEAD AND CLUB



slant defining a second surface facing toward the boot exterior, a first rising angle of each slant in an axial section of the boot being larger than a second rising angle of each second slant.

5,558,581
FAIRGROUND DEVICE
Hette Kuijpstra, EC Terband, Netherlands, assignor to Kuijpstra Konstruktie B.V., Terband, Netherlands
Division of Ser. No. 50,580, Aug. 23, 1993, Pat. No. 5,395,290.
This application Jan. 25, 1995, Ser. No. 378,364
Claims priority, application Netherlands, Nov. 2, 1990, 9002399
Int. Cl.[6] A63G *1/08*
U.S. Cl. 472—31 **26 Claims**



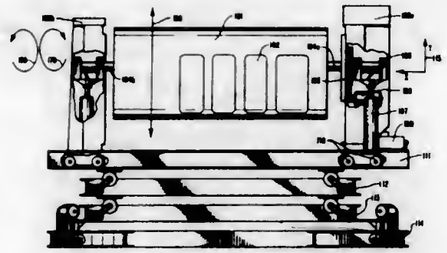
1. In a fairground device having a plurality of seats comprising a base disc driven for rotation about a central axis and at least one seat support(s) carried by the base disc in a spaced relation relative to the central axis for rotation of the seat support(s) about a second axis, the seat support(s) carrying at least one seat mounted eccentrically relative to a corresponding second axis, the improvement comprising:

the seats mounted on at least one seat support(s) for rotation about a third axis extending substantially transversely to the second axis, the base disc having a plurality of longitudinally extending radial arms pivotally connected to a central hub for pivoting the radial arms about an axis extending transversely to the longitudinally extending radial arms and for carrying the seat support(s) and positioning means for setting the pivotable position of the radial arms.

5,558,582
ROTATING MOTION SIMULATOR
Loran L. Swensen, and Jonathan E. Neville, both of South Jordan, Utah, assignors to Enhanced Simulation, Inc., Salt Lake City, Utah
Filed Oct. 14, 1994, Ser. No. 323,366
Int. Cl.[6] A63G *31/08*
U.S. Cl. 472—43 **23 Claims**

1. A motion simulator apparatus for providing motion cues to passengers, comprising:

(a) a passenger-holding capsule having a first end and a second end and a center point between said first end and said second end, and having a means for permitting passenger entrance into said capsule and a means for permitting passenger exit from said capsule;



(b) a vertical movement means for imparting vertical movement to said first end of passenger-holding capsule;

(c) a horizontal movement means for imparting front-to-back movement to said passenger-holding capsule;

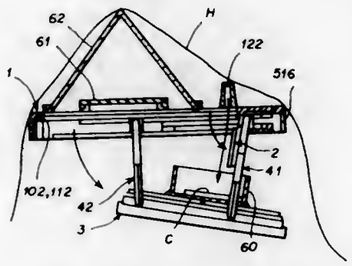
(d) a lateral movement means for imparting side-to-side movement to said first end of passenger-holding capsule;

(e) a pivot movement means for imparting pivot movement about said center point of passenger-holding capsule;

(f) a rotation movement means for imparting rotational movement about an axis defined as the line from said first end of passenger-holding capsule to said second end of passenger-holding capsule, and running essentially through the center of said passenger holding capsule; and

(g) a control means for providing directional and velocity controls to said passenger-holding capsule.

5,558,583
COIN TRANSFER APPARATUS FOR JUGGLERY USE
Tomoyuki Shimomura, Higashikurume, Japan, assignor to Tenyo Co., Ltd., Japan
Filed Apr. 5, 1995, Ser. No. 416,987
Claims priority, application Japan, Jun. 1, 1994, 6-120138
Int. Cl.[6] A63J *21/00*
U.S. Cl. 472—71 **8 Claims**



1. A coin transfer apparatus for jugglery use, comprising:

a base member having a coin slot and openings formed therein;

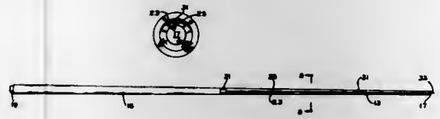
plate members disposed movably in relation to said base member to close and open said coin slot and openings;

support members supporting said plate members movably between closed and opened positions;

one of said plate members, when placed in said closed position, closing said coin slot and openings to block a coin set in said coin slot from falling and being generally flush at the top thereof with that of said base member so that said base member and said one of said plate members appear like a single plate; and

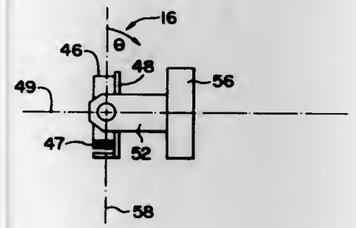
said plate members, when in said opened position, falling due to their own weight and said coin, having been held in said coin slot by said one of the plate members, falling down through said coin slot onto the top of a second of said plate members.

5,558,584
POOL CUE WITH SIGHT
James C. Brown, 2121 Skyhawk Dr., Fort Wayne, Ind. 46815
Filed Mar. 6, 1995, Ser. No. 398,774
Int. Cl.[6] A63D *15/08*
U.S. Cl. 473—44 **10 Claims**



1. An elongated cue including elongated tapered coaxial front and rear shaft sections, the front section having a pair of adjacent elongated indentations extending along a substantial portion of the length thereof and defining therebetween a straight line extending coplanar with and nearly parallel to the shaft axis to provide an aiming aid for a user, the cue front section being generally frusto-conical in shape and departing therefrom only along the two indentations.

5,558,585
DEVICE FOR DETECTING HEAD MOVEMENT
James F. Nolan, Jr., Tucson, Ariz., assignor to Muscle Memory, Inc., Tucson, Ariz.
Filed Dec. 6, 1994, Ser. No. 349,805
Int. Cl.[6] A63B *69/36*
U.S. Cl. 473—211 **28 Claims**



1. A device for detecting head movement of an individual during an activity of the individual, comprising:

a base;

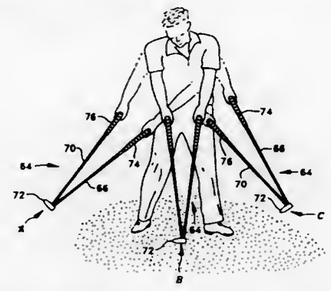
means for establishing a reference with respect to an initial position of the individual's head, the reference establishing means includes,

a platform having a shaft pivotally secured to the base, and

a weighted wheel rotatably secured to the platform and free to rotate about its axis, the platform free to pivot about an axis extending through the plane of the wheel and the shaft; and

means for detecting angular movement of the head with respect to the reference, the detecting means includes a first angular encoder positioned at the head of the golfer to measure a head angle between the reference and an axis extending forward from the head, the reference extending in a horizontal plane, and a second angular encoder positioned at the head of the golfer to measure an angular rotation of the head along the longitudinal axis of the head, the first angular encoder having an output signal representing the angle between the reference and the base, and the second angular encoder having an output signal representing the angle of rotation of the wheel about its axis.

5,558,586
GOLF PUTTER HEAD AND CLUB
George G. Izett, 165 Cassatt Rd., Berwyn, Pa. 19312, and Jay Ciccarone, 668 Woodland Ave., Pottstown, Pa. 19464
Continuation of Ser. No. 313,732, Sep. 27, 1994, abandoned.
This application Aug. 28, 1995, Ser. No. 524,124
Int. Cl.[6] A63B *53/14*
U.S. Cl. 473—251 **10 Claims**



1. A putter golf club for training a golfer to repeatedly putt using a constant putting stroke, said golfer having a pair of shoulders, first and second hands, first and second arms, and first and second wrists, said first wrist connecting said first arm and said first hand at a first wrist angle, said second wrist connecting said second arm and said second hand at a second wrist angle, said constant putting stroke being defined by movement of said shoulders of said golfer in a pendulum motion and an absence of angular movement in said first and second wrist angles during said pendulum motion, comprising:

a head having a body with a heel, a top and a ball striking face, said ball striking face being formed of a flat surface lying in a first plane;

a first hosel with a first proximate end attached to the top of the head and an opposing first distal end rigidly connected to a first end of a first flexible shaft;

a second hosel with a second proximate end attached to the top of the head and an opposing second distal end rigidly connected to a first end of a second flexible shaft, said first and second flexible shafts lying in a second plane that is perpendicular to said first plane;

said first and second hosels being substantially positioned at a first angle relative to each other such that the first and second flexible shafts extend therefrom with a desired second angle between the first and the second flexible shafts, said desired second angle tending to train said golfer to repeatedly putt using said constant putting stroke when said first and second shafts are simultaneously and respectively gripped by said first and second hands of said golfer;

and wherein said first and second flexible shafts each have a flexibility which is sufficiently rigid to hold said desired second angle fixed so long as said golfer uses said constant putting stroke to swing said putter club, said flexibility being insufficiently rigid to hold said desired second angle fixed when said golfer varies one or both of said first and second wrist angles during movement of said putter golf club.

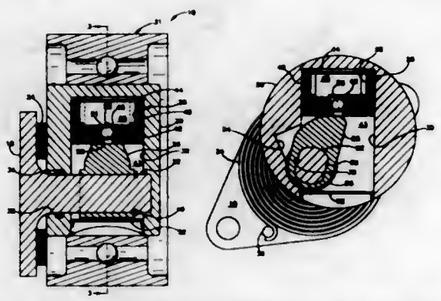
5,558,587
SELF-CONTAINED HYDRAULIC BELT TENSIONER
Kynan L. Church, Ceresco, Mich., assignor to Eaton Corporation, Cleveland, Ohio
Filed May 15, 1995, Ser. No. 440,580
Int. Cl.[6] F16H *7/10*
U.S. Cl. 474—112 **3 Claims**

1. A belt tensioner comprising a base member having a shaft extending therefrom; a housing received on said shaft for eccentric rotation relative thereto; a bore formed in said housing perpendicu-

means operatively to connect one of said gear members in said

5,558,590

the gears of the third planet gear train which are connected to



lar to said shaft, said bore being penetrated by said shaft; rotary seal means acting between said shaft and said housing operable to seal said bore to outside atmosphere; a cam mounted in a fixed angular position on said shaft within said bore; means biasing said housing in a first angular direction relative to said base member; and a hydraulic element received within said bore, said hydraulic element being in engagement with said cam and operable to resist rotation of said housing relative to said base member in a direction opposite said first angular direction.

5,558,588

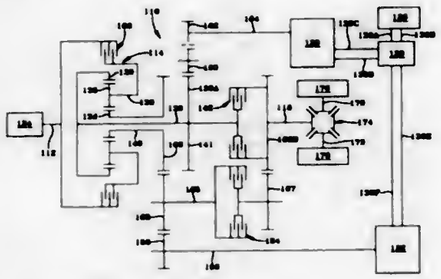
TWO-MODE, INPUT-SPLIT, PARALLEL, HYBRID TRANSMISSION

Michael R. Schmidt, Carmel, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 16, 1995, Ser. No. 389,464

Int. Cl.[6] F16H *3/72*; **B60K** *1/00*

U.S. Cl. 475—5 **23 Claims**



1. A hybrid transmission, comprising:

an input means to receive power from an engine;

power output means;

first and second motor/generators;

energy storage means for accepting power from, and supplying power to, said first and second motor/generators;

control means for regulating power flow between said energy storage means and said motor/generators as well as between said first and second motor/generators;

at least a first planetary gear set;

said first planetary gear set having at least three members including an inner gear member, an outer gear member and a carrier gear member having a plurality of planet gear members which meshingly engage both of the inner and outer gear members;

means operatively to connect said first motor/generator to a first of said gear members in said first planetary gear set

means operatively to connect said second motor/generator to a second of said gear members in said first planetary gear set;

means operatively to connect said input means to a third of said gear members of said first planetary gear set;

means operatively to connect one of said gear members in said first planetary gear set to said power output means;

a first torque transfer device selectively effecting an operative connection between one of said gear members in said first planetary gear set and said power output means; and

a second torque transfer device selectively effecting a power transfer between another of said gear members in said first planetary gear set and said power output means.

5,558,589

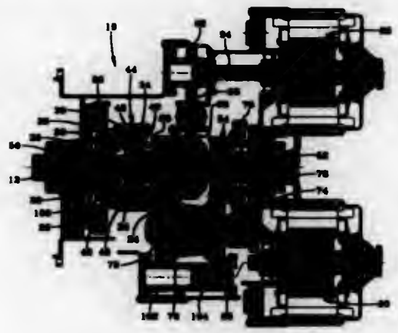
TWO-MODE, COMPOUND-SPLIT, ELECTRO-MECHANICAL VEHICULAR TRANSMISSION

Michael B. Schmidt, Carmel, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jul. 20, 1995, Ser. No. 504,625

Int. Cl.[6] B60K *41/28*

U.S. Cl. 475—5 **16 Claims**



1. An electro-mechanical transmission, comprising:

input means for receiving power from an engine;

power output means;

first and second motor/generators;

energy storage means for accepting power from, and supplying power to, said first and second motor/generators;

control means for regulating power flow between said energy storage means and said motor/generators as well as between said first and second motor/generators;

a compound planetary gear set having first and second planetary gear sub-sets;

each of said planetary gear sub-sets having an inner gear member and an outer gear member, each of which meshingly engage a plurality of planet gear members;

means operatively to connect said first motor/generator to at least one of said gear members in said compound planetary gear set;

means operatively to connect said second motor/generator to at least one of the other of said gear members in said compound planetary gear set;

means operatively to connect said input means to at least one of the remaining gear members in said compound planetary gear set; and,

means operatively to connect at least one of said gear members in said compound planetary gear set to said power output means.

5,558,590

GEARED STEERING DEVICE FOR CRAWLER VEHICLE AND CONTROL UNIT THEREFOR

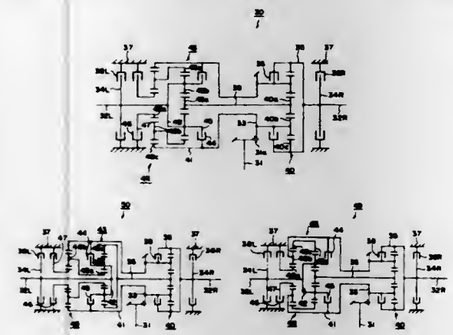
Toshikazu Okada; Hiroshi Itogawa, and Hidekazu Nagase, all of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jan. 28, 1994, Ser. No. 188,440

Claims priority, application Japan, Jan. 28, 1993, 5-006096

Int. Cl.[6] B62D *11/08*

U.S. Cl. 475—28 **21 Claims**



1. A geared steering device for a crawler vehicle having a prime mover, a rightside track shoe, a leftside track shoe, and rightside and leftside output shafts, for high speed rotation, low speed rotation, and braking to control steering of the rightside and leftside track shoes of the crawler vehicle, said geared steering device comprising:

a power input drive element adapted to receive driving power from the prime mover;

a fixed housing;

a first steering brake for engaging and releasing a first one of the output shafts with respect to the fixed housing;

a first rotatable housing coupled to the first one of said output shafts;

a first direct-coupled clutch for engaging and releasing said first rotatable housing with respect to said power input drive element;

a center shaft;

a first planet gear train having a first sun gear, a first carrier gear, and a first ring gear; each of said first sun gear, said first carrier gear, and said first ring gear being connected to a respective different one of said center shaft, said power input drive element, and said first rotatable housing;

a second steering brake for engaging and releasing a second one of said output shafts with respect to a fixed housing;

a second rotatable housing coupled to the power input drive element;

a drive hub coupled to the second one of the output shafts;

a second planet gear train having a second sun gear, a second carrier gear, and a second ring gear; each of said drive hub and said center shaft being connected to a respective different one of the second sun gear, the second carrier gear, and the second ring gear;

a second direct-coupled clutch for engaging and releasing said second rotatable housing with respect to the second carrier gear;

a third planet gear train having a third sun gear, a third carrier gear, and a third ring gear;

a turn clutch for engaging and releasing one of the gears of the third planet gear train with respect to a fixed housing; each of the second rotatable housing and the turn clutch being connected to a respective different one of the third sun gear, the third carrier gear, and the third ring gear;

wherein the gear of said second planet gear train other than the gears connected to the center shaft and the drive hub is coupled with a gear of the third planet gear train other than the gears of the third planet gear train which are connected to the turn clutch and the second rotatable housing.

5,558,591

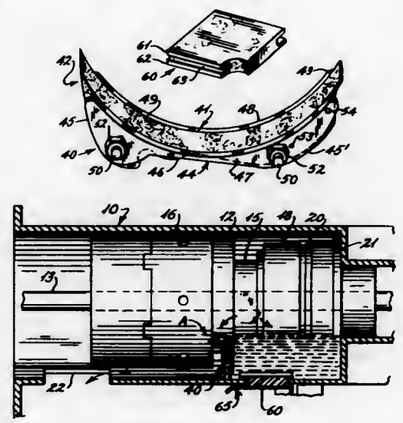
LUBRICATION DAM AND PLUG FOR A VEHICLE AUTOMATIC TRANSMISSION

Dennis C. Erickson; Paul R. Erickson, both of Tallahassee, and Jimmy Arledge, Havana, all of Fla., assignors to Superior Transmission Parts, Inc., Tallahassee, Fla.

Filed Jun. 1, 1995, Ser. No. 457,240

Int. Cl.[6] F16H *57/04*

U.S. Cl. 475—159 **18 Claims**



1. In an automatic transaxle for a front wheel drive automatic vehicle which includes a transaxle casing in which a drive shaft is mounted and wherein the drive shaft is connected through a reverse clutch cylinder to a planetary gear assembly mounted to a rear planet support assembly and wherein a spacing is created between the lower outer portion of the reverse clutch cylinder and the inner wall of the casing and a rear drain back slot is provided in the casing communicating the area in which the planetary gear assembly is housed within an oil pan, the improvement comprising, a lubrication dam means of a configuration to be seated between the lower portion of the reverse clutch cylinder and the inner wall of the casing, said lubrication dam means including outer surface portions for creating a seal between the lower portion of the reverse clutch cylinder and the transaxle casing, and a plug means, said plug means being of a size to substantially close the rear drain back slot in the transaxle casing, whereby said lubrication dam and said plug means will cause a buildup of lubricating fluid within the casing in the area of the planetary gear assembly.

5,558,592

ACCESSORY DRIVE

Herwig Hönlinger, Gross-Rohrheim; Hans-Gerd Eckel, Laudenbach, and Jürgen Eichhorn, Weinheim, all of Germany, assignors to Firma Carl Freudenberg, Germany

Filed Nov. 18, 1994, Ser. No. 342,288

Claims priority, application Germany, Nov. 18, 1993, 43 39 218.0

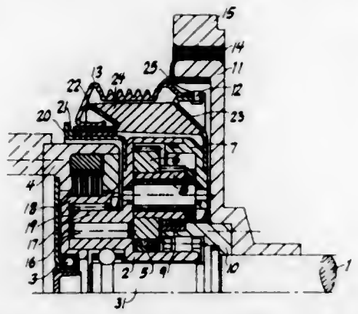
Int. Cl.[6] F16H *3/56;57/10*

U.S. Cl. 475—285 **11 Claims**

1. An accessory drive for attachment to the end of a shaft, comprising:

a belt pulley;

a torsion spring;



a carrier that is joined in rotary engangement with the belt pulley via the torsion spring;

at least a first and second planet wheel in association with the carrier, said first and second planet wheels being rigidly connected to one another and being of dissimilar diameter;

a first gear circulating along with the shaft, wherein the first planet wheel is in engagement with the first gear;

a second gear that is rotatable relative to the shaft, wherein the second planet wheel is in engagement with the second gear, wherein said first and second gears are arranged radially inside the carrier;

a selectively activatable brake located between a permanently stationary part and a part capable of relative rotation; and

a freewheel to prevent backward relative rotation of the carrier with respect to the sleeve;

wherein the freewheel is arranged between the carrier and the part capable of relative rotation, and the belt pulley at least partially surrounds the freewheel, the carrier, and the brake radially and externally.

5,558,593

PLANET CARRIER OF A PLANETARY TRANSMISSION

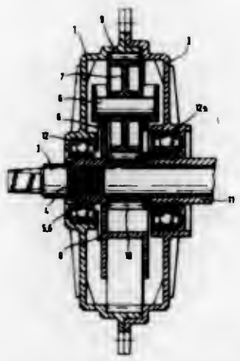
Ulrich Röder, Nürnberg; Sigurd Wilhelm, Weisendorf; Werner Hehn, Erlangen; Uwe Hammerl, Herzogenaurach; Doris Greiner, Hagenau; Wolfgang Hentschke, Herzogenaurach, and Udo Reinhardt, Höchstadt, all of Germany, assignors to Ina Walzlager Schaeffler KG, Germany

Filed Mar. 17, 1995, Ser. No. 407,449

Claims priority, application Germany, Apr. 2, 1994, 44 11 604.7

Int. Cl.[6] F16H *57/08*

U.S. Cl. 475—331 **8 Claims**



1. A planet carrier (**6**) of a planetary transmission wherein planet gears (**7**) in mesh with an annulus (**9**) and a sun gear (**10**) are mounted on pins (**8**) which are guided on both sides of the planet gears (**7**) in lodgings (**15**, **15***a*) of disk-shaped carrier elements (**13**, **13***a*) connected to each other whereby the lodgings (**15**, **15***a*) are made in the form of pockets opening radially outwards to enable radial insertion of the pins (**8**), characterized in that said planet carrier (**6**) comprises resilient projections (**20**, **20***a*) which extend into the lodgings (**15**, **15***a*) and at least partially overlap radially outer surfaces of the pins (**8**) lodged in the lodgings (**15**, **15***a*).

5,558,594

LOAD DISTRIBUTING HELICAL PLANETARY GEAR TRANSMISSION

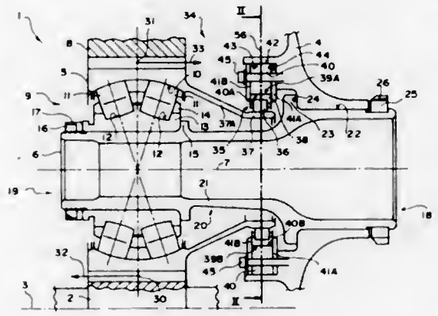
Bénédicte A. Lefranc, Paris; Hugues H. R. Linet, Courbevole, and Michel R. C. Virmoux, Colombes, all of France, assignors to Societe Hispano Suiza, Saint Cloud, Cedex, France

Filed Dec. 15, 1994, Ser. No. 356,590

Claims priority, application France, Dec. 15, 1993, 93.15053

Int. Cl.[6] F16H *57/08*

U.S. Cl. 475—347 **7 Claims**



1. A load distributing planetary gear transmission comprising:

a) a sun gear having helical gear teeth, the sun gear having a first central axis;

b) an annulus gear concentrically disposed around the sun gear and having helical gear teeth;

c) at least one planet wheel having helical teeth in meshing engagement with the helical teeth of the sun gear and of the annulus gear, the at least one planet wheel having a second central axis substantially parallel to, but spaced from the first central axis;

d) a planet wheel carrier having at least one flexible shaft extending therefrom;

e) swivel bearing means connecting the at least one planet wheel to the at least one flexible shaft such that the at least one planet wheel is rotatable about the second central axis; and,

f) reversal torque compensating means connected to the planet wheel and the planet wheel carrier to prevent pivoting movement of the planet wheel about an axis extending perpendicular to a plane passing through the first and second central axes, the reversal torque compensating means comprising a bearing assembly having:

i) a first race fixedly attached to the at least one planet wheel and,

ii) a second race slidably connected to the planet wheel carrier so as to slide with respect to the planet wheel carrier only in a direction substantially perpendicular to a plane passing through the first and second central axes.

5,558,595

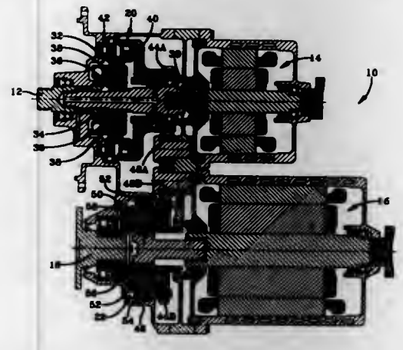
ONE-MODE, INPUT-SPLIT, PARALLEL, HYBRID TRANSMISSION

Michael R. Schmidt, and Donald Klemen, both of Carmel, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 17, 1995, Ser. No. 390,186

Int. Cl.[6] B60K *41/06*

U.S. Cl. 477—3 **8 Claims**



1. A hybrid transmission comprising:

an input shaft to receive power from an engine;

an output shaft;

first and second motor/generators;

energy storage means for accepting power from, and supplying power to, said first and second motor/generators;

control means for regulating power flow between said energy storage means and said motor/generators as well as between said first and second motor/generators;

at least a first planetary gear set;

said first planetary gear set having an inner gear member and an outer gear member, each of which meshingly engage a plurality of planet gear members;

said planet gear members are rotatably mounted on a carrier;

said input shaft is operatively connected to said carrier;

said output shaft being operatively connected to said outer gear member of said first planetary gear set;

a selectively operable torque transfer device interposed in the operative connection between said output shaft and said outer gear member in said first planetary gear set;

said first motor/generator operatively connected to said inner gear member of said first planetary gear set; and,

said second motor/generator being in continuous, operative connection to said output shaft.

5,558,596

METHOD AND SYSTEM USING FUZZY LOGIC FOR CONTROLLING A CUT TRANSMISSION

Masao Adachi, Zama; Makoto Shioya, Suginami-ku; Kazuhiko Sato, and Minoru Ohkubo, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan, and Hitachi Automotive Engineering Company, Ibaraki-ken, Japan

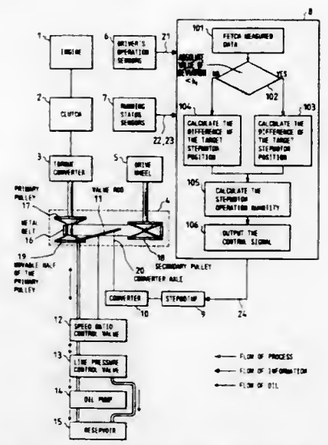
Continuation of Ser. No. 794,038, Nov. 19, 1991, abandoned. This application Oct. 25, 1994, Ser. No. 328,535

Claims priority, application Japan, Nov. 19, 1990, 2-311507

Int. Cl.[6] B60K *41/12*

U.S. Cl. 477—46 **6 Claims**

1. In a vehicle transmission system including an operation sensor, a running status sensor, a processor and a memory storing relation data between target speed and data measured by use of said operation sensor and said running status sensor, a speed ratio control method for a continuously variable transmission which transfer inputs from a power source to a drive wheel, comprising the steps of;



measuring through said operation and said running status sensors, a driver's operation quantity and a vehicle running status;

determining through said processor, by use of said relation data, one of a target value of speed ratio and a target value of revolution speed on an input of said transmission on a basis of results of said measuring step; and

changing a speed ratio using at least two different algorithms in correspondence with whether or not a value of deviation between said target value and a current actual value is greater than a threshold value.

5,558,597

HYDRAULIC CONTROL SYSTEM FOR CONTROLLING OIL PRESSURE BASED ON TEMPERATURE

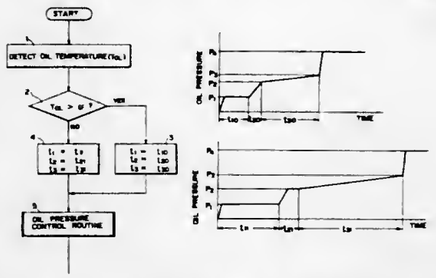
Hidehiro Oba, Aichi-ken, and Hiromichi Kimura, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 26, 1994, Ser. No. 280,464

Claims priority, application Japan, Jul. 26, 1993, 5-203636

Int. Cl.[6] F16H *61/04*

U.S. Cl. 477—98 **7 Claims**



1. A hydraulic control system for an automatic transmission having a valve mechanism for controlling an oil pressure to apply frictional engagement means to a value according to electric oil pressure command values inputted, so that the oil pressure of said frictional engagement means may be changed to a target value by outputting predetermined ones of said oil pressure command values to said valve mechanism at predetermined time intervals after a shift command has been outputted, comprising:

oil temperature detecting means for detecting the temperature of the oil which is to actuate said frictional engagement means; and

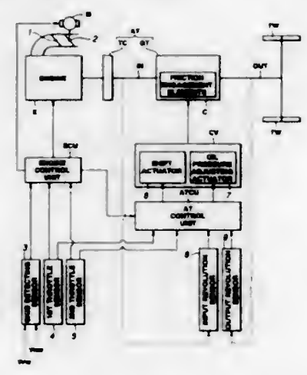
oil pressure command value outputting means for controlling at least any one of lapse time periods between an output of succeeding ones of said oil pressure command values and for setting said at least any one of lapse time periods to be longer in case the detected oil temperature is low than in case the detected oil temperature is high.

5,558,598

CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Yoshifumi Torimoto, Fuji, Japan, assignor to Jatco Corporation, Fuji, Japan

Filed Jun. 15, 1995, Ser. No. 490,633
Claims priority, application Japan, Aug. 2, 1994, 6-181537
Int. Cl.[6] B60K *41/04*
U.S. Cl. 477—110 **6 Claims**



1. A system for controlling an automatic transmission of a motor vehicle provided with an engine and driving wheels, the automatic transmission having friction engagement elements, a first actuator for switching a state of supplying hydraulic pressure to the friction engagement elements, and a second actuator for adjusting hydraulic pressure, the system comprising:

means for detecting a cruising state of the motor vehicle, said detecting means including mean for detecting an operation of skid reduction control for decreasing torque of the driving wheels when detecting skid thereof;

means for determining an optimum speed ratio in accordance with said cruising state detected, and providing to the first actuator a signal indicative of said optimum speed ratio determined;

means for determining an optimum value of hydraulic pressure upon shift based on a basic value of hydraulic pressure determined by at least an information on a load of the engine of said cruising state detected and a correction value thereof, and providing to the second actuator a signal indicative of said optimum value determined; and

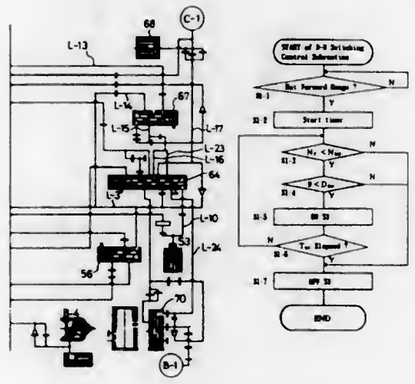
means for determining said correction value upon current shift by carrying out a comparison of a shift time upon previous shift with a reference shift time previously established, and modifying in accordance with a result of said comparison said correction value upon previous shift so that said shift time upon current shift approaches said reference shift time, said correction value determining means being prohibited from at least modifying said correction value when said operation detecting means detects said operation of skid reduction control.

5,558,599

DRIVE TO NEUTRAL SHIFT CONTROL SYSTEM

Kazumasa Tsukamoto, Toyota; Masahiro Hayabuchi; Masaaki Nishida, both of Anjo; Yoshihisa Yamamoto, Nishio; Muneo Kusafuka, Anjo; Kazuhiro Mikami, Kariya, and Hiroshi Tsutsui, Nishio, all of Japan, assignors to Aisin AW Co., Ltd., Japan

Filed Apr. 27, 1995, Ser. No. 431,074
Claims priority, application Japan, May 2, 1994, 6-093591
Int. Cl.[6] F16H *61/18*
U.S. Cl. 477—116 **7 Claims**



1. A control system for an automatic transmission which receives the rotation of an engine through a fluid coupling, the transmission having a clutch, applied responsive to selection of a forward running range and released responsive to selection of neutral range, and range selecting means for selecting a range, said control system comprising:

range detecting means for detecting the selected range;

a hydraulic circuit comprising:

a hydraulic servo which receives oil pressure for applying said clutch;

a manual valve movable by operation of said range selecting means between at least a forward range position for generating a forward range oil pressure and a neutral range position;

a regulator valve for regulating said forward range oil pressure to generate a regulated oil pressure;

a solenoid valve for generating a signal oil pressure in accordance with ON/OFF signals;

a change-over valve switched in response to said signal oil pressure between a first position for feeding said forward range oil pressure to said hydraulic servo and a second position for feeding said regulated oil pressure to said hydraulic servo; and

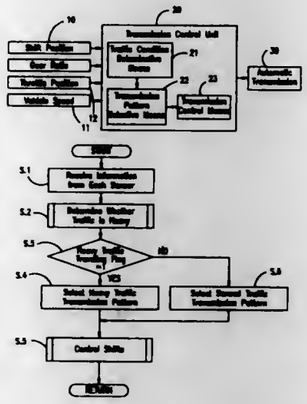
a control unit comprising delay means for outputting, responsive to detection of a switch from said forward running range to said neutral range by said range detecting means, a first signal to said solenoid valve to hold said change-over valve in said second position until lapse of a set time period, and for outputting a second signal to said solenoid valve to move said change-over valve to said first position when said set time period has elapsed.

5,558,600

HEAVY/LIGHT TRAFFIC BASED ON VEHICLE SPEEDS AND THROTTLE POSITIONS

Kazumasa Tsukamoto, Toyota; Masahiro Hayabuchi; Masaaki Nishida, both of Anjo; Yoshihisa Yamamoto; Hiroshi Tsutsui, both of Nishio, and Kaoru Nadayoshi, Anjo, all of Japan, assignors to Aisin AW Co., Ltd., Japan

Filed Apr. 26, 1995, Ser. No. 427,875
Claims priority, application Japan, Apr. 28, 1994, 6-111679
Int. Cl.[6] F16H *59/00*
U.S. Cl. 477—121 **10 Claims**



1. A transmission control unit for an automatic transmission for controlling the automatic transmission in accordance with one of a heavy traffic control scheme and a light traffic control scheme, said control unit comprising:

sensor means for detecting parameters representative of vehicle conditions including at least vehicle and throttle opening,

traffic condition determination means for classifying traffic as heavy or light, based on the parameters as detected by said sensor means, said traffic condition determination means including:

speed zone classification means for defining a plurality of vehicle speed zones, each of said zones extending over a range of vehicle speed values spanning a predetermined speed differential, said speed zones including a plurality of low speed zones, a plurality of high speed zones and a boundary dividing said low speed zones from said high speed zones, said speed zone classification means providing a predetermined control value for each of said plurality of vehicle speed zones, said predetermined control values being such that the difference between said predetermined control values for adjacent zones increases with increasing proximity to said boundary, said predetermined control values being positive for said low speed zones and negative for said high speed zones,

speed flag setting means for setting a vehicle speed value and for matching said vehicle speed detected by said sensor means to the one of said vehicle speed zones containing the detected speed, the predetermined control value for said one vehicle speed zone being added to said vehicle speed value to reset the vehicle speed value, the traffic being classified as heavy if said reset vehicle speed value exceeds a preset value and being classified as light if said reset vehicle speed value is less than said preset value, and

transmission pattern selective means for selecting one of a normal traffic transmission map and a heavy traffic transmission map in response to traffic classification determined by said traffic condition determination means, and

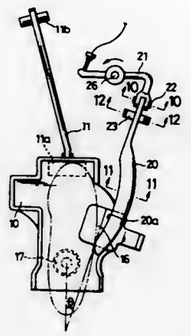
transmission control means for changing gear ratios according to the selected transmission map.

5,558,601

VEHICULAR PEDAL ASSEMBLY

Masuyuki Naruse, 603, Ohaza Noguchi, Taimei-machi, Tmano-gun, Kumamoto-ken, Japan

Filed Nov. 8, 1994, Ser. No. 337,373
Claims priority, application Japan, Nov. 12, 1993, 5-283284
Int. Cl.[6] F02D *9/06*
U.S. Cl. 477—213 **3 Claims**



1. A pedal assembly comprising for driving a vehicle, said pedal assembly comprising:

a brake pedal swingably disposed on a brake arm;

a laterally biased accelerator lever arranged above the right-hand side of said brake pedal, said accelerator lever being urged toward said brake pedal and being configured to have a lateral reciprocating stroke; and

a guide roller arranged at the right-hand portion of said brake pedal, said guide roller having a circumferential edge thereof protruded above the brake pedal,

wherein the a spring is disposed on a floor of the vehicle below said brake pedal, said spring urging a lower end portion of said brake pedal in a predetermined direction, and wherein said accelerator lever is arranged, when in a non-load state, at an inclination with respect to an axis of said brake pedal.

5,558,602

Patent Not Issued For This Number

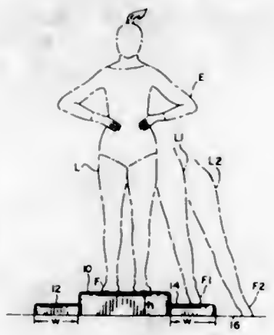
5,558,603

METHOD OF EXERCISE

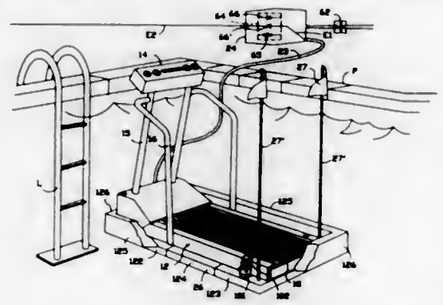
Agnes Simon, 87-13 160th St., Jamaica, N.Y. 11432

Division of Ser. No. 278,982, Jul. 21, 1994, Pat. No. 5,470,292, which is a continuation of Ser. No. 23,340, Feb. 26, 1993, abandoned. This application Jul. 17, 1995, Ser. No. 438,699
Int. Cl.[6] A63B *22/08*
U.S. Cl. 482—52 **4 Claims**

1. A method of providing variable exercising of the legs comprising the steps of providing exercise apparatus having a central platform with longitudinal and lateral sides at a fixed height of two steps above the floor, and extensible members on opposite lateral sides of said platform, said extensible members having coplanar supporting surfaces at a height of a single step above the floor, and exercising the legs by standing on the central platform of said apparatus, and stepping each leg longitudinally of the platform to one of the extensible members and to the floor and back to the central platform, and adjusting the extension of said extensible members to vary the stress upon the legs when stepping from the apparatus to the floor.

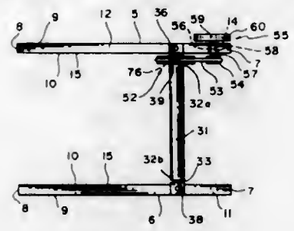


5,558,604
AQUATIC TREADMILL APPARATUS
Thomas H. Hopkins, 201 Gore Creek Dr., Vail, Colo. 81657
Filed Jun. 2, 1994, Ser. No. 252,702
Int. Cl.[6] A63B *22/02*
U.S. Cl. 482—54 **43 Claims**



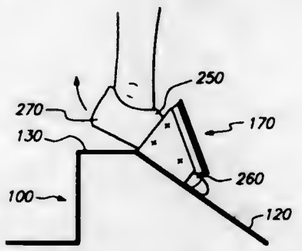
1. Underwater treadmill apparatus comprising:
a body of water in an enclosed area;
a treadmill belt submerged in the body of water including a support frame, a drive roller and driven roller about which said treadmill belt is trained;
submerged drive means drivingly connected to said drive roller including a drive shaft in spaced parallel relation to said drive roller, a fluid operated drive motor coupled to said drive shaft and flywheel means coupled to said drive shaft between said fluid operated drive motor and said drive roller, and flexible fluid pressure and return lines extending to and from said drive motor;
electric motor drive means located outside of said body of water including a pressurized fluid source to deliver fluid under pressure via said pressure line to said drive motor; and
said support frame being unattached in said body of water and with respect to the enclosed area and wherein said flywheel means cooperates with said support frame in stabilizing said apparatus in the water.

5,558,605
MOTOR-LESS TREADMILL WITH STEPPED-UP FLYWHEEL
Ned Gvoich, Beamsville, Canada, assignor to Kor-One, Ltd., Scottsdale, Artz.
Continuation-in-part of Ser. No. 262,235, Jun. 20, 1994, Pat. No. 5,447,479. This application May 26, 1995, Ser. No. 452,103
Int. Cl.[6] A63B *22/02*
U.S. Cl. 482—54 **14 Claims**



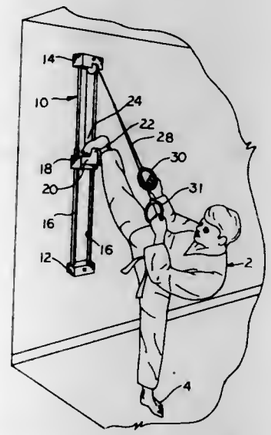
1. An exercise treadmill, comprising:
a main frame;
a handrail attached to said main frame;
a first roller rotatably mounted on said main frame;
a second roller rotatably mounted on said main frame;
an endless tread belt placed about said first roller and said second roller;
a first flywheel rotatably attached to said main frame; and,
a coupling means between said first flywheel and said first roller for rotatably driving said first flywheel at a rate of rotation greater than the rate of rotation of said first roller,
wherein said coupling means comprises a first drive wheel attached to said first flywheel; a second drive wheel attached to said first roller; and, an endless drive belt placed around said first drive wheel and said second drive wheel.

5,558,606
FULL CONTRACTION CALF MUSCLE EXERCISER
Richard D. Poscini, and Paul D. Poscini, both of 402 Foxborough Dr., Mountain View, Calif. 94041
Continuation of Ser. No. 41,089, Apr. 1, 1993, abandoned, which is a continuation-in-part of Ser. No. 11,665, Jan. 29, 1993, abandoned. This application Jul. 7, 1994, Ser. No. 271,254
Int. Cl.[6] A63B *23/04*
U.S. Cl. 482—79 **6 Claims**



1. A calf muscle exercise device for facilitating full contraction of a user's calf muscle, comprising:
a base configured to support full weight of the user;
an inclined surface attached to and supported by said base and extending upwardly from said base where a lower portion of said inclined surface is configured to accommodate a ball of the user's foot, said inclined surface extending upwardly to an upper horizontal surface of a size sufficient to accommodate a heel of the user's foot, said upper horizontal surface also supported by said base, said inclined surface forming a fixed angle of about 35° relative to the floor and having a rough high friction surface, wherein said inclined surface is sufficiently rigid to support the user's full weight during an exercise while substantially maintaining said fixed angle; and
a retainer to retain the ball of the user's foot against said lower portion of said inclined surface and to permit the heel of the user's foot to extend over said upper horizontal surface.

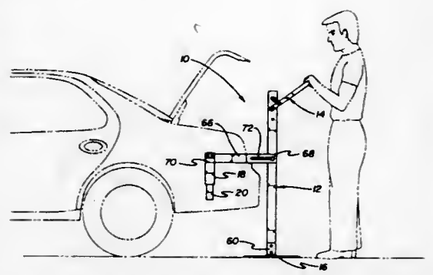
5,558,607
TRAINING DEVICE FOR MARTIAL ART ATHLETES
Thomas G. Darling, 727 N. 300 E, Decatur, Ind. 46733
Filed Sep. 12, 1995, Ser. No. 527,195
Int. Cl.[6] A63H *1/02*
U.S. Cl. 482—95 **2 Claims**



1. A training device for the athletes, the device including a generally rectangular frame member having a base and top interconnected by a pair of rails, the frame being configured for connection to a vertical support structure, a lift carried on the pair of rails and shiftable along the rails between the top and bottom of the frame, the lift having a pad attached thereto, said pad extending generally horizontally outward and substantially perpendicular, from the lift, said pad including a support which extends generally transverse to and upwardly from the pad, said pad and lift defining a recessed area between the support and the rails, said recessed area being configured in size to accommodate an athlete's foot, a pulley being carried by the top, a cable extending over the pulley and being connected at a first end to the lift and at a second end to a handle.

5,558,608
MOTOR VEHICLE MOUNTABLE EXERCISE DEVICE
Barry L. Hall, P.O. Box 1986, Valdosta, Ga. 31603-1986
Filed Sep. 29, 1995, Ser. No. 536,486
Int. Cl.[6] A63B *21/02*
U.S. Cl. 482—129 **3 Claims**

1. A new and improved motor vehicle mountable exercise device comprising, in combination:
a central beam fabricated of steel and formed in a hollow generally rectangular configuration with an upper end and a lower end, the central beam having a front face, a rear face and two side faces, the side faces each including first, second and third pairs of aligned circular apertures, the apertures being positioned below the upper end of the central beam one above the other, a cylindrical rod being positioned horizontally through the first and third pairs of apertures, each rod extending equidistantly from each side face;



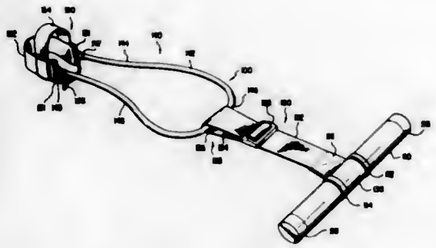
a handle comprising a generally cylindrical shaped gripping member and a pair of spaced arms affixed centrally thereto, each arm having a free end including a circular aperture extending therethrough, two cross members coupling the arms to each other, each arm including an outwardly extending cylindrical extension bar, a cylindrical pin adapted to couple the free ends of the arms of the handle to the central beam, the pin being positioned through the apertures in the arm and second pair of apertures thereby rotatably coupling the handle to the central beam, two elastomeric bands formed in a generally circular configuration, each band being coupled around an end of a cylindrical rod and an extension bar of an arm, in an operative orientation a user grasping the gripping member of the bar and pushing downward or pulling upward, the elastomeric bands providing the necessary resistance to aid in muscle development, the approximate centerpoint of the central beam including an aligned pair of central apertures extending through the sidewalls, the lower end of the central beam including a plurality of aligned lower apertures extending therethrough;
a ground base formed in a planar generally rectangular configuration with a pair of spaced upstanding brackets extending therefrom, each bracket including a plurality of apertures extending therethrough, at least two bolts being positioned through the apertures in the beam and brackets to couple the ground base to the lower end of the beam; and
two legs formed in a hollow generally rectangular configuration and including an upper extent, a lower leg being teleacopically positioned within each upper leg, each lower leg being vertically adjustable within an upper leg, the upper and lower legs to be coupled within the trunk of a motor vehicle, a cross support formed in a planar generally rectangular configuration being coupled across the upper extent of the upper legs, a horizontal beam having a first end and a second end, the second end being coupled to the approximate centerpoint of the cross support, the first end of the horizontal beam including a pair of elongated apertures, the first end adapted to be coupled to the approximate centerpoint of the central beam by a nut and bolt through the aligned elongated apertures in the horizontal beam and central apertures in the central beam, the elongated apertures permitting rearward or frontward adjustment of the central beam with respect to the horizontal beam.

5,558,609
GLUTEAL AND THIGH MUSCLE EXERCISE SYSTEM
Brad Olschansky, and Scott Olschansky, both of 2003 Lake Park Dr. Apt. H, Smyrna, Ga. 30080
Filed Nov. 9, 1994, Ser. No. 338,110
Int. Cl.[6] A63B *21/02*
U.S. Cl. 482—122 **6 Claims**

1. A device for exercising gluteal and thigh muscles, comprising:
a. a longitudinally extended handle member;
b. means for engaging a heel portion of a user's foot, said heel engagement means including a first band member configured and adapted to have a pair of opposing ends extending

a rolling roller in which said rolling ring is made by a rolling

5,558,612



between opposing sides of a user's foot at an inferior tarsal portion thereof and in substantial alignment with the user's ankle and load bearing axis of the user's leg; and,

c. means coupled on a first end to said handle member and on an opposing second end to said heel engagement means for providing a resistive force therebetween, said resistive means including means for adjusting an initial displacement dimension of said heel engagement means relative to said handle member and an elastic strap member coupled between said adjustment means and said heel engagement means, said adjustment means including a substantially inelastic strap member having a first end secured to said handle member and an opposing second end formed in a closed contour, said elastic strap member having opposing first and second ends respectively coupled to said opposing ends of said first band member and an intermediate section slidingly coupled to said closed contour second end of said inelastic strap member for providing balanced resistive force loading on opposing sides of a user's leg.

5,558,610

ROLLING ROLLER

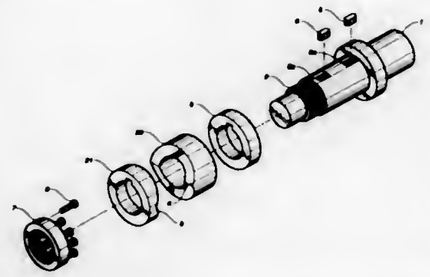
Kwun Byung-Gie, and Choi Chang-Hee, both of Seoul, Rep. of Korea, assignors to Korea Tungsten Co., Inc., Kyungsangbuk-Do, Rep. of Korea

Filed Jan. 6, 1995, Ser. No. 369,418

Claims priority, application Rep. of Korea, Mar. 5, 1994, 94-4300

Int. Cl.[6] B21B *13/00*

U.S. Cl. 492—40 **2 Claims**



1. In a rolling roller comprising a shaft 1 having key grooves 5*a*,6*a* and a thread portion 9 and which is constant in diameter of predetermined portion, keys 5,6 to be fixed by inserting respectively to the key grooves 5*a*,6*a* of the shaft 1, first and second spacers to be fixed to the shaft 1 by the keys 5,6, a rolling ring to be interposed between the first and second spacers, and a ring nut 7 to be coupled to a thread portion 9 of the shaft 1 together with a tightening adjusting screw 8,

a rolling roller in which said rolling ring is made by a rolling ring 20 having an appropriately projected slant surface a at a contacting portion with the second spacer, and a second spacer 21 forming an inclined groove b of shape being same as the projected slant surface a of the rolling ring 20.

5,558,611

APPARATUS FOR SHAPING BLANKS FOR HINGE-LID PACKS WITH ESPECIALLY ROUNDED LONGITUDINAL EDGES

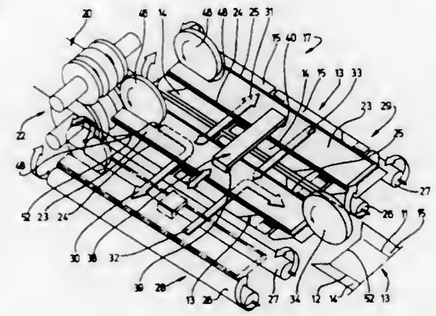
Heinz Focke, Verden, Germany, assignor to Focke & Co. (GmbH & Co.), Verden, Germany

Filed Feb. 9, 1995, Ser. No. 386,103

Claims priority, application Germany, Feb. 10, 1994, 44 04 278.7

Int. Cl.[6] B31B *1/52*

U.S. Cl. 493—162 **19 Claims**



9. An apparatus for shaping or pre-shaping blanks (13) for packs with rounded or polygonal longitudinal edges (11, 12), said apparatus having a shaping station (17) in which the blanks (13) are shaped by movable shaping tools in conjunction with shaping plates (23), and then are further transported in a longitudinal direction, wherein the shaping station (17) is provided with at least first and second shaping devices (28, 29) having shaping tools, wherein said apparatus comprises means for successively conveying the blanks into the shaping station (17), and for alternately feeding the blanks to said first and second shaping devices (28, 29);

wherein said first and second shaping devices (28, 29) are arranged next to one another, opposite sides of a longitudinal blank track (20), in a common plane, wherein the blanks (13) are alternately fed to said shaping devices (28, 29) by a transverse movement; and

wherein said shaping station (17) further comprises means for grasping one of the blanks arriving at the shaping station and for carrying out said transverse movement, relative to the blank track (20), to one or the other of said shaping devices (28, 29).

5,558,612

APPARATUS FOR THE CONTINUOUS PRODUCTION OF AN ARTICLE OF MANUFACTURE, SUCH AS ENVELOPES

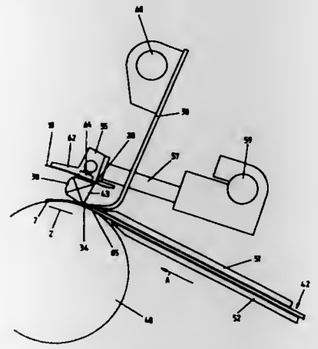
Martin Blümle, Horhausen, Germany, assignor to Winkler & Duennebier Maschinenfabrik und Eisengiesserei KG, Neuwied, Germany

Continuation-in-part of Ser. No. 839,108, Feb. 20, 1992. This application May 20, 1994, Ser. No. 246,832

Claims priority, application Germany, May 21, 1993, 43 17 071.4

Int. Cl.[6] B31B *1/54*

U.S. Cl. 493—177 **13 Claims**



1. Apparatus for continuously forming a stand-up or bed bottom in an article of manufacture made of sheet material having precreases for forming said stand-up bottom, comprising a drive device for transporting said sheet material through said apparatus in a feed advance direction, and a back folding mechanism (55, 56) cooperating with said drive device for folding a first portion (43) of said sheet material about a first precrease (33, 34) in a direction opposite to said feed advance direction (A), and for folding a second portion (8, 9, 10) of said sheet material forming part of said stand-up bottom about a second precrease (27, 28) in said feed advance directions (A), whereby a zig-zag fold is formed, wherein said back folding mechanism comprises at least one suction member (55) for lifting said second portion (8, 9, 10) while said sheet material is advancing, whereby said first portion (43) is folded back opposite to said feed advance direction and said second portion (8, 9, 10) is folded forward, and at least one folding member positioned for cooperation with said suction element (55) in producing said zig-zag fold.

5,558,613

METHOD FOR REDUCING THE VARIANCE IN THE FORCES NEEDED TO OPEN RECLOSABLE PLASTIC BAGS FROM WITHIN AND FROM WITHOUT

Paul A. Tilman, New City; Richmond M. Scott, Pleasantville, and Zdenek Machacek, Nanuet, all of N.Y., assignors to Minigrip, Inc., Orangeburg, N.Y.

Continuation-in-part of Ser. No. 174,273, Dec. 28, 1993, Pat. No. 5,368,394, and Ser. No. 249,144, May 25, 1994, Pat. No. 5,462,360. This application Nov. 10, 1994, Ser. No. 337,569

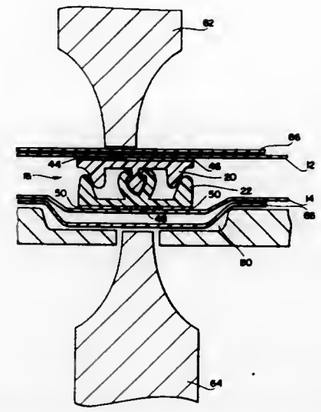
Int. Cl.[6] B65D *33/16;33/24;* **B31B** *3/72*

U.S. Cl. 493—214 **9 Claims**

1. A method for substantially reducing the variance in the forces needed to open reclosable plastic bags from within and from without comprising the steps of:

a) providing a first bag wall and a second bag wall;

b) providing a first zipper member having a male profile and a second zipper member having a female profile, said male profile and said female profile being interlocked with one another;



c) providing a first interlayer and a second interlayer, each of said interlayers being formed at least in part of a strip of material having a lower melting temperature than said zipper members and said bag walls, and having a preselected, constant width;

d) disposing said first interlayer between said first bag wall and said first zipper member;

e) disposing said second interlayer between said second bag wall and said second zipper member, said strip of material having a lower melting temperature being between said female profile of said second zipper member and said second bag wall;

f) providing a first sealing head and a second sealing head;

g) directing said first bag wall, first interlayer, first and second zipper members with respective interlocked male and female profiles, second interlayer and second bag wall along a channel between said first and second sealing heads, said first and second zipper members with respective interlocked male and female profiles being within and guided by said channel, said channel having a width such that any lateral movement of said first and second zipper members therein will be less than said preselected widths of said strips of said first and second interlayers;

h) disposing said first and second sealing heads over said strips in said first and second interlayers, respectively;

i) maintaining said first and second sealing heads at temperatures above the melting temperatures of said strips of material in said first and second interlayers, but below the melting temperatures of said first and second zipper members and said first and second bag walls; and

j) sealing said first bag wall to said first zipper member with said strip of said first interlayer, and said second bag wall to said second zipper member with said strip of said second interlayer.

5,558,614

TUBULAR CARTON OPENING, PRESENTING, AND CLOSING APPARATUS

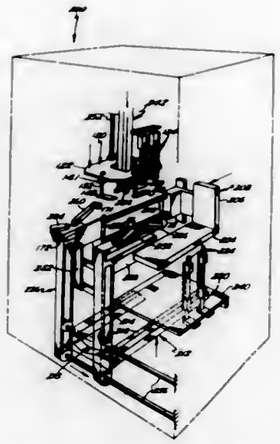
David L. Anderson, and Irvan L. Pazdernik, both of Alexandria, Minn., assignors to Douglas Machine Limited Liability Company, Alexandria, Minn.

Continuation-in-part of Ser. No. 89,042, Jul. 9, 1993, Pat. No. 5,352,178, which is a continuation-in-part of Ser. No. 17,480, Feb. 12, 1993, Pat. No. 5,445,590. This application Feb. 18, 1994, Ser. No. 198,060

Int. Cl.[6] B31B *49/00*

U.S. Cl. 493—312 **24 Claims**

10. Method for uniformly positioning cartons in a carriage, with the cartons each including panels defining a tubular body and having bottom edges, comprising the steps of: moving the carton



from a position spaced from the carriage for placing the carton in the carriage and for placing the carton under compression forces within the carriage; and pushing the carton by the bottom edges of the panels in a direction perpendicular to the compression forces and while the carton is under compression forces.

5,558,615

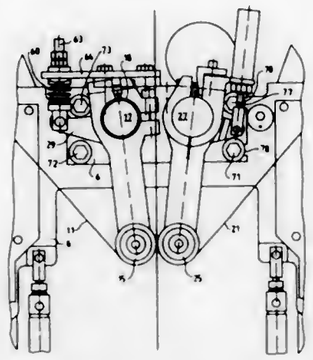
MODULAR EXIT ROLLER ASSEMBLY

Kevin F. Albert, Barrington, N.H., assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany, and Heidelberg Harris Inc., Dover, N.H.

Filed Aug. 29, 1994, Ser. No. 297,729

Int. Cl.[6] B31B *1/00*; **B31F** *1/00*; **B41F** *13/56*

U.S. Cl. 493—477 **6 Claims**



1. A modular cartridge comprising:

a mounting plate removable from a frame component of a folder, mounting plate having two notches on one side for receiving two bolts;

a lead-in tape mechanism having a first exit roller and a corresponding second exit roller, wherein the first exit roller and the second exit roller are mounted to the mounting plate.

5,558,616

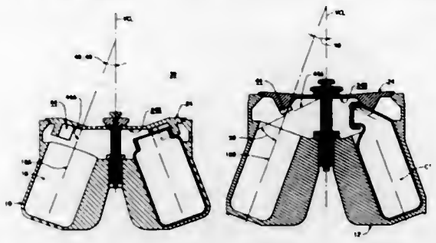
CENTRIFUGE ROTOR COVER HAVING CONTAINER SUPPORTS THEREON

David A. Barkus, Oakville, and Daniel D. Hanle, Southbury, both of Conn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 7, 1995, Ser. No. 524,682

Int. Cl.[6] B04B *7/06*; *5/02*

U.S. Cl. 494—12 **5 Claims**



1. A centrifuge rotor rotatable about an axis of rotation, the rotor having a body with a plurality of cavities formed therein, each cavity having an axis, the axis of rotation and the axis of each cavity lying in a predetermined respective common radial plane, the axis of each cavity being inclined with respect to the axis of rotation, and

a cover, the cover having an upper and a lower surface thereon, the cover having an array of container support surfaces depending from the lower surface thereof, each container support surface being associated with a respective one of the cavities, each container support surface being substantially cylindrical in configuration and having an axis,

the axis of each container support surface being inclined at a predetermined angle with respect to the axis of rotation and with respect to the axis of the cavity with which it is associated,

when the cover is attached to the body, the axis of each container support surface lies in the same common radial plane as the axis of the cavity with which it is associated and the axis of rotation.

5,558,617

CARDIAC COMPRESSION BAND-STAY-PAD ASSEMBLY AND METHOD OF REPLACING THE SAME

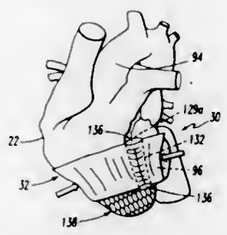
Marlin S. Heilman, Sarver; Steve A. Kolenik, Leechburg; Christopher D. Capone, Pittsburgh; Carl M. Parisi, Kittanning; Edward K. Prem, Allison Park, and Vernon L. Speicher, Leechburg, all of Pa., assignors to Vascor, Inc., Pittsburgh, Pa.

Division of Ser. No. 920,732, Jul. 28, 1992, Pat. No. 5,383,840.

This application Nov. 18, 1994, Ser. No. 341,188

Int. Cl.[6] A61H *31/00*

U.S. Cl. 600—16 **19 Claims**



1. A resilient pad assembly adapted for use in a ventricular assist device during direct mechanical assist to a heart, comprising:

a. a resilient elongated band member for encircling and disposal on at least a portion of the heart, said band member receiving a mechanical compression force from said ventricular assist device and transmitting said mechanical compression force to the heart;

b. a resilient sheath assembly having an inner interface assembly and an outer membrane, said band member being encased in said sheath assembly between said inner interface assembly and said outer membrane, at least a portion of said inner interface assembly adjustably persisting in intimate contact with the heart; and

c. a plurality of spaced-apart stay members movable on and mounted on said band member for circumferentially distributing at least a portion of said mechanical compression force to the heart.

5,558,618

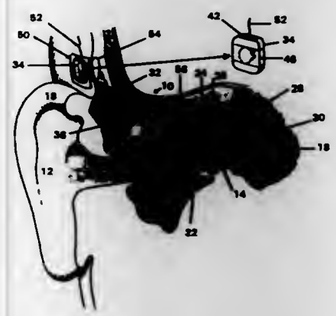
SEMI-IMPLANTABLE MIDDLE EAR HEARING DEVICE

Anthony J. Maniglia, 14450 County Line Rd., Hunting Valley, Ohio 44022

Filed Jan. 23, 1995, Ser. No. 376,750

Int. Cl.[6] H04R *25/00*

U.S. Cl. 600—25 **19 Claims**



1. A partially implantable hearing device comprising:

a high coercivity permanent magnet of 10.6 KOe or higher enclosed within a hermetically sealed case having a helium atmosphere therein and adapted to be mounted on the ossicular chain of a middle ear;

an electromagnet;

means for mounting said electromagnet a predetermined distance from said permanent magnet in a contactless manner;

means adapted to be mounted external of the ear for translating acoustic signal into electrical signals; and

means mounted on said mounting means for receiving said electrical signals from said translating means and sending them to said electromagnet to actuate same in response thereto.

5,558,619

ENDOSCOPE SYSTEM WITH AUTOMATIC CONTROL ACCORDING TO MOVEMENT OF AN OPERATOR

Kuniaki Kami; Hideyuki Adachi, both of Hachioji; Koichi Umeyama, Kasukabe; Yoshihiro Kosaka, Hachioji; Seiji Yamaguchi, Hachioji; Eiichi Fuse, Hachioji; Michio Sato, Hino; Masakazu Nakamura, Hachioji; Yasundo Tanaka, Urawa; Takashi Fukaya, Hachioji; Kiyotaka Matsuno, Hachioji, and Katsuya Suzuki, Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

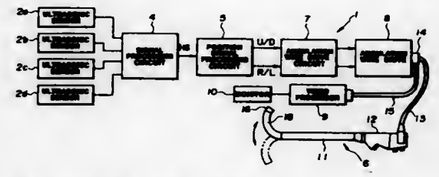
Continuation of Ser. No. 863,869, Apr. 6, 1992, abandoned.

This application Sep. 15, 1994, Ser. No. 306,726

Claims priority, application Japan, Apr. 23, 1991, 3-092235

Int. Cl.[6] A61B *1/00*

U.S. Cl. 600—146 **10 Claims**



1. An endoscope system, comprising:

a medical device for applying medical care to a subject by changing at least a part of a shape of said medical device;

a driving means for actuating said medical device;

a movement detecting means, having at least one sensor for receiving signals from at least one signal source, for processing said received signals, and for detecting a movement of an operator who operates said medical device; and

a control means, operably connected to said movement detecting means, for controlling said driving means to actuate said medical device and for changing at least a part of a shape of said medical device according to said operator's movement which is detected by said movement detecting means,

wherein said movement detecting means includes a means for detecting a movement of one of an operator's hand and an operator's head, and a superimposing means for superimposing an image associated with the movement of one of the hand and head on an image which an imaging means generates.

5,558,620

MEDICAL INSTRUMENT EMPLOYING CURVED SPREADING MEMBERS TO MANIPULATE ORGANS WITHIN THE BODY

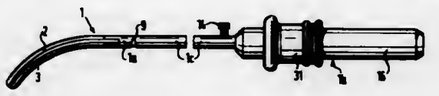
Helmut Heckele, Knittlingen; Andreas Dingler, Birkenfeld, and Ernst Falk, Sternenfels-Diefenbach, all of Germany, assignors to Richard Wolf GmbH, Knittlingen, Germany

Filed Feb. 1, 1994, Ser. No. 189,967

Claims priority, application Germany, Feb. 5, 1993, 43 03 274.5

Int. Cl.[6] A61B *17/02*

U.S. Cl. 600—208 **15 Claims**



1. A medical instrument for manipulating organs within the body of a patient, comprising:

an instrument shaft having a longitudinal axis;

an main body portion disposed at the distal end and constituting a prolongation of said instrument shaft, and at least one spreading member mounted at the distal end of said instrument shaft by a pivot axle perpendicular to the longitudinal axis of the instrument shaft so that said spreading member is

pivotable relative to the non-moving said main body portion about the pivot axle between non-spread out and spread out positions; and

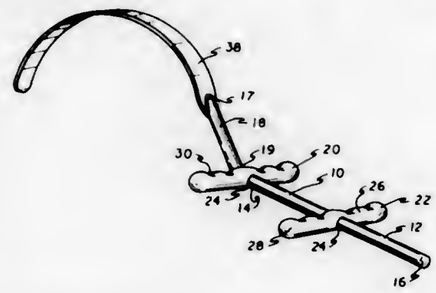
handle means for pivoting said spreading member about said pivot axle, said handle means including a handle disposed at the proximal end of said instrument shaft and at least one control member interconnecting said spreading member and said handle, said control member being displaceably guided within said instrument shaft such that said spreading member pivots about said pivot axle in response to movement of said handle means, wherein said main body portion and said at least one spreading member are curved so that outer surfaces thereof define a curved support plane when said spreading member is in the spread out position.

5,558,621

SURGICAL RETRACTOR WITH CROSS BAR GRIPS

Thomas L. Heil, Pittsburgh, Pa., assignor to Heil Associates Inc., Pittsburgh, Pa.

Filed Apr. 24, 1995, Ser. No. 426,976
Int. Cl.[6] A61B *17/02*
U.S. Cl. 600—226 **11 Claims**



1. A surgical retractor comprising

a retractor blade; and

a handle including,

an elongated central rod member having a front end and a rear end,

a connector portion having a distal end and a proximal ends, said connector portion attached at said distal end to said retractor blade, said connector portion attached at said proximal end to said front end of said rod member,

a first gripping and leverage crossbar attached to said rod member proximate said front end, and

a second gripping and leverage crossbar attached to said rod member intermediate between said front end and said rear end.

5,558,622

MANDIBULAR BORDER RETRACTOR AND METHOD FOR FIXATING A FRACTURED MANDIBLE

Alex M. Greenberg, New York, N.Y., assignor to Greenberg Surgical Technologies, LLC, New York, N.Y.

Filed Sep. 2, 1994, Ser. No. 300,708
Int. Cl.[6] A61C *11/00*
U.S. Cl. 600—237 **39 Claims**

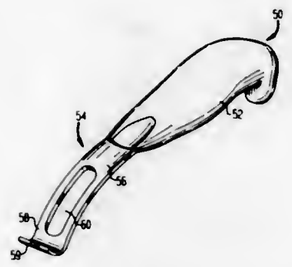
1. A mandibular retractor, comprising:

a. a handle; and

b. a retractor blade connected to a distal end of the handle, the retractor blade including:

(1) a curved portion at a proximal end of the retractor blade;

(2) an arcuate portion having a tip, the arcuate portion connected to a distal end of the curved portion; and



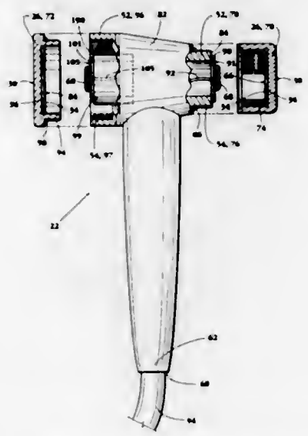
(3) an aperture defined in the retracting blade and located proximally from the tip, the aperture configured to allow a surgical instrument to extend through the retractor blade.

5,558,623

THERAPEUTIC ULTRASONIC DEVICE

G. Lee Cody, Inola, Okla., assignor to Rich-Mar Corporation, Inola, Okla.

Filed Mar. 29, 1995, Ser. No. 413,086
Int. Cl.[6] A61B *17/22*
U.S. Cl. 601—2 **11 Claims**



1. A therapeutic ultrasonic device having an ultrasonic applicator, the applicator comprising:

a handle;

at least two diaphragms located at one end of the handle, each diaphragm having an applicating face directed away from the handle and a rear face directed into the handle so that the applicating faces may be independently applied to a patient during therapy; and

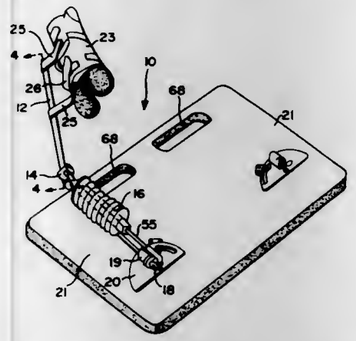
at least two piezoelectric crystals, at least one of the crystals being connected to the rear face of one of the diaphragms and at least one of the other crystals being connected to the rear face of the other diaphragm for converting periodic electrical energy to ultrasonic energy and transmitting the ultrasonic energy through the diaphragm to which the crystal is connected independently of the other diaphragm.

5,558,624

SHOULDER PHYSICAL THERAPY DEVICE

George R. Hepburn, Severna Park, and Russell Vedeloff, Greensboro, both of Md., assignors to Dynasplint Systems, Inc., Severna Park, Md.

Filed Jun. 22, 1995, Ser. No. 493,403
Int. Cl.[6] A61F *5/04*
U.S. Cl. 601—33 **21 Claims**



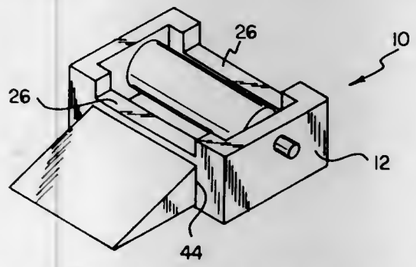
1. An articulated shoulder physical therapy device for improving the range of motion of a shoulder comprising an articulated device which allows for the active multiaxial exercise of a shoulder, the articulated device being provided with a forearm strut and an upper arm strut, as well as one or more tensioning means to place stress on the shoulder during active multiaxial exercise, the forearm strut being attached by a hinge to a first end of said upper arm strut to form an elbow hinge and the second end of the upper arm strut being provided with a shoulder hinge and means for accommodating the multiaxial rotation of the shoulder with the articulated shoulder physical therapy device being able to improve the mobility of the shoulder and hasten the return of the shoulder to normal mobility in the directions of flexion, extension, abduction, adduction, horizontal abduction, horizontal adduction, external rotation and internal rotation.

5,558,625

FOOT MASSAGER APPARATUS

Don W. McKay, 149 Dovertree Place SE, Calgary, Alberta, Canada

Filed Oct. 18, 1994, Ser. No. 324,622
Int. Cl.[6] A61H *1/00;15/00*
U.S. Cl. 601—118 **1 Claim**



1. A foot massaging apparatus for massaging a user's feet comprising, in combination:

a rigid box-shaped base having a bottom wall, a periphery formed of a front wall, a rear wall, and opposed side walls extended upward from the bottom wall, each of the side walls of the base including a mounting hole disposed thereon with the mounting holes of the side walls being coaxially aligned, each of the opposed side walls having an upper edge, the front wall, rear wall and opposed side walls defining a hollow interior and an opening for allowing access to the interior with the front wall and the rear wall each further having a rectangular notch formed thereon at a location adjacent to the top opening, each of the rectangular notches having an upper edge, and with the pair of notches positioned such that they are aligned with each other and define an access channel, wherein the upper edges of the notches are at an elevation below the elevation of the upper edges of the opposed side walls;

an axially rotatable roller disposed within the interior and having a pair of opposed cylindrical pegs extended radially outward and adapted to be disposed within the mounting holes of the base for affording the axial rotation thereof thereby allowing the user to actuate the roller with one foot while massaging the other foot, the roller being situated so as to project upwards into the access channel, the roller further including a removable pad disposed about the roller and having a plurality of nubs extending therefrom for massaging; and

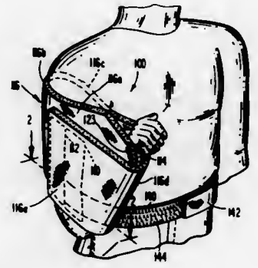
a wedge-shaped rigid foot rest having an outboard edge, an inboard vertical back surface, and a top surface extended therebetween and with the back surface coupled to the front wall such that the top surface extends angularly upwards to meet the access channel.

5,558,626

AMBULATORY ARM ELEVATION SLING

Elizabeth Holtzman, 180 Bergen St., Brooklyn, N.Y. 11217; Lynn Bassini, 479 10th St., Brooklyn, N.Y. 11215, and Mukund R. Patel, 35 Annfield Ct., Staten Island, N.Y. 10304

Continuation-in-part of Ser. No. 942,142, Sep. 8, 1992, abandoned. This application Feb. 23, 1994, Ser. No. 200,156
Int. Cl.[6] A61F *5/00;5/37*
U.S. Cl. 602—4 **21 Claims**



11. Improved sling apparatus for maintaining a patient's hand in an elevated position and adaptable to permit substantially unrestrained mobility of the patient's shoulder, said sling consisting essentially of a foam fabric material arm strap wrappable around the patient's upper and lower arms when said patient's elbow is bent thereby forming a loop with end portions of said arm strap overlapping each other, said loop being of adjustable length to establish the bend of said patient's elbow and the elevation of said patient's hand, said arm strap having an inner surface facing the patient's arm and an outer surface and removably securing means provided on the inner and outer surfaces to maintain said arm strap in said loop wrapped around the patient's arm, and a palm band fixed to a first end of said arm strap for receiving and locating the patient's hand in predetermined position; and a waist band wearable around the waist of said patient and having means thereon for removably securing said arm strap thereto so as to minimize mobility of said shoulder when said waist band is secured to said arm strap.

5,558,627

ORTHOPAEDIC BRACE WITH AN INFLATABLE AIR

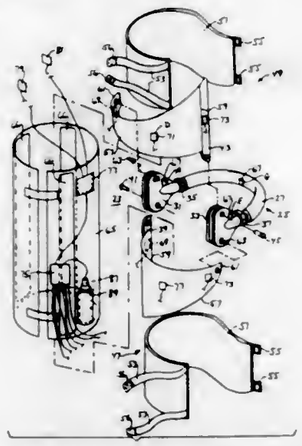
a center abduction bar, a first and second T-shaped connecting element movably attached at opposite ends of the center

5,558,630

INTRASCLERAL IMPLANT AND METHOD FOR THE

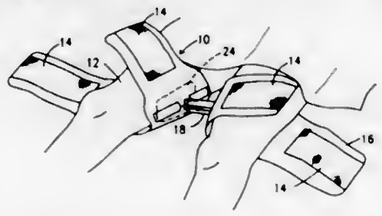
ter, polycaprolactone, and ethylene vinyl acetate, and having a WVTR of less than 100 g/m^2/day, so that the polymer

5,558,627
ORTHOPAEDIC BRACE WITH AN INFLATABLE AIR BAG
Samuel Singer, 125 Timber Springs La., and Jeffrey A. Fried, 499 S. Ben Franklin Rd., both of Indiana, Pa. 15701
Continuation-in-part of Ser. No. 861,722, Apr. 1, 1992, Pat. No. 5,267,946, which is a continuation-in-part of Ser. No. 662,879, Mar. 1, 1991, Pat. No. 5,133,341. This application Dec. 6, 1993, Ser. No. 162,562
Int. Cl.[6] A61F *5/00*
U.S. Cl. 602—13 **22 Claims**



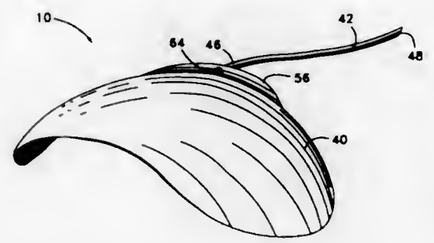
1. An orthopaedic brace for a joint joining two members, comprising:
hinged rigid support means affixed to said two members providing support to the joint and for permitting a predetermined range of movement of the joint and defining a void space substantially surrounding the joint between the support means and the joint;
an inflatable air bag in the void space;
sensor means attached to the hinged rigid support means for providing a trigger signal in response to a predetermined condition on the joint that is capable of injuring the joint; and
inflation means operably connected to the sensor means and the air bag for inflating the air bag in response to the trigger signal.

5,558,628
ADJUSTABLE HIP AND KNEE ORTHOSIS
Jan J. Bzoch, South Pasadena, Fla., assignor to Orthosis Corrective Systems Corp., Pinellas Park, Fla.
Filed May 23, 1995, Ser. No. 447,989
Int. Cl.[6] A61F *5/00*
U.S. Cl. 602—24 **7 Claims**



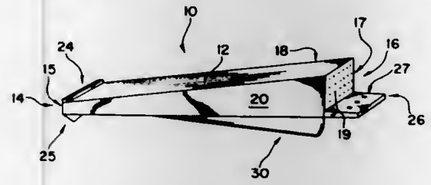
1. A hip and knee orthosis for attaching to opposed distal thighs of a patient comprising
a center abduction bar, a first and second T-shaped connecting element movably attached at opposite ends of the center abduction bar,
the T-shaped connecting elements each attached to a convex surface of a first and second curved plate, an opposite side concave surface of the first and second curved plates shaped to conform substantially to a distal thigh of the patient,
the first and second curved plates covered by a soft fabric configured to wrap around the opposed distal thighs of the patient and held together by hook and loop material,
the center abduction bar having a first and second threaded bore adjacent a first and second end respectively,
a hand operable first and second threaded thumb screw mounted within the first and second threaded bore to maintain the first and second T-shaped connecting elements respectfully in a desired position,
the center abduction bar having an inner bar slidable within an outer tube, the inner bar having a third threaded bore adjacent an end distal from the first threaded bore, the outer tube having a multiple position slotted opening extending from a location proximal to the second threaded bore to a location proximal to an end of the outer tube distal from the second threaded bore,
a third hand operated threaded thumbscrew mounted within the third threaded bore so that unscrewing of the third threaded screw will allow the inner bar to slide within the outer tube to provide extension or contraction of the orthosis and wherein unscrewing of the first or second thumb screw provides for ambulation of the patient.

5,558,629
GLAUCOMA IMPLANT
George Baerveldt, Pasadena; Larry W. Blake, Irvine, and George M. Wright, Mission Viejo, all of Calif., assignors to Iovision, Inc., Irvine, Calif.
Continuation of Ser. No. 531,010, May 31, 1990, Pat. No. 5,178,604. This application Jul. 21, 1992, Ser. No. 917,575
Int. Cl.[6] A61M *1/00*
U.S. Cl. 609—8 **9 Claims**



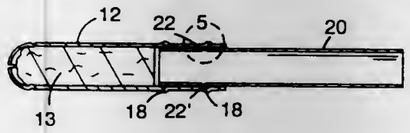
1. A device for draining fluid from a first region of an eye to a second region of an eye, said device comprising:
a single thin elastomeric plate having oppositely-disposed first and second primary surfaces, each of said surfaces being disposed to provide contact between said first region of said eye and substantially all of said first and second surfaces of said plate to form a bleb in said first region of said eye around said plate when said device is implanted within said eye, said plate sufficiently flexible to conform to the patient's eye when the device is implanted in said eye; and
a tube having a first end adjacent said first surface of said plate and a second end extendable into said second region of said eye to provide fluid communication between said first region of said eye and said second region of said eye.

5,558,630
INTRASCLERAL IMPLANT AND METHOD FOR THE REGULATION OF INTRAOCULAR PRESSURE
Bret L. Fisher, 224 S. Cove La., Panama City, Fla. 32401
Filed Dec. 30, 1994, Ser. No. 366,503
Int. Cl.[6] A61M *5/00*; A61F *2/14*
U.S. Cl. 604—8 **7 Claims**



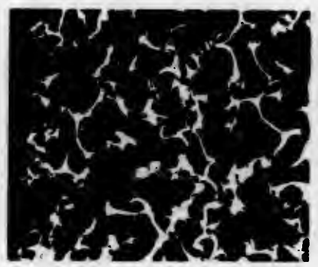
1. An intrascleral implant for implanting within the eye and for reducing intraocular fluid pressure, comprising:
a tubular body having a forward end, adapted for placement within an anterior chamber of an eye, and a rearward end, adapted for placement within the sclera of an eye, said tubular body being funnel shaped and enlarging in cross-section along said tubular body in a direction from said forward end to said rearward end, said rearward end including fluid passageways to limit and control a flow of intraocular fluid through said tubular body from said anterior chamber to said sclera, said tubular body further including side portions and at least one implant stability flange appending therefrom and adapted to stabilize said tubular body against said sclera, said tubular body further including a positioning ridge located on said forward end, said positioning ridge being smoothly finished and adapted to space said tubular body from an inner surface of said anterior chamber.

5,558,631
TAMPON APPLICATOR
Terese A. Campion, Enfield, Conn.; Mark D. Albright, Chichester, England, and Betsy A. Davison, Wilbraham, Mass., assignors to Tambrands Inc., White Plains, N.Y.
Continuation of Ser. No. 171,853, Dec. 22, 1993, Pat. No. 5,346,468, which is a continuation of Ser. No. 819,753, Jan. 13, 1992, abandoned. This application Aug. 18, 1994, Ser. No. 292,509
Int. Cl.[6] A61F *15/00*
U.S. Cl. 604—13 **64 Claims**



1. An insertion device for inserting a tampon material into the vagina comprising:
an elongate, tubular holder shaped for insertion into the vagina, adapted to hold the tampon to be inserted, and having an expulsion end portion; and
a plunger, telescopically and slidably mounted in said holder distal to said expulsion end and adapted to expel said tampon from said holder when pushed manually into said holder;
wherein said holder comprises an outer polymer film layer adhered to an outer surface of an underlying paper layer, and the polymer film layer having an outer surface and an inner surface, substantially all of the area of said inner surface being supported by and adhered to said outer surface of said underlying paper layer,
said polymer film layer comprising a polymer selected from the group consisting of cellophane, polypropylene, polyester, polycaprofactone, and ethylene vinyl acetate, and having a WVTR of less than 100 g/m^2/day, so that the polymer layer has adequate water resistance to maintain its integrity during insertion into the body cavity,
said polymer film being capable of separation from said underlying paper layer as an intact, self-supporting layer.

5,558,632
ELECTRODES FOR IONTOPHORESIS
Lindsay B. Lloyd, West Jordan; Jon E. Beck; Tomasz J. Petelenz, both of Salt Lake City; Clay H. Holt, Riverton, and William F. Felman, West Valley City, all of Utah, assignors to Iomed, Inc., Salt Lake City, Utah
Continuation of Ser. No. 45,040, Apr. 7, 1993, Pat. No. 5,087,242, which is a continuation-in-part of Ser. No. 645,028, Jan. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 383,939, Jul. 21, 1989, Pat. No. 5,087,242. This application Nov. 3, 1994, Ser. No. 333,844
Int. Cl.[6] A61N *1/30*
U.S. Cl. 604—20 **28 Claims**



1. A conformable electrode for iontophoretic delivery of an ionic drug solution comprising:
a conductive element for receiving an electric current delivered from an electric source;
a reticulated element, in contact with the conductive element, said reticulated element including a reticulum structure and a plurality of pores formed by said reticulum structure, said plurality of pores having an average pore size and having a pore size which is substantially uniform;
a substantially dry, dehydrated hydrophilic polymer within said plurality of pores throughout said reticulated element,
wherein said dehydrated hydrophilic polymer within said plurality of pores is characterized after hydration as being substantially uniformly hydrated throughout said plurality of pores and having sufficient fluidity, cohesiveness and viscosity to flow within said plurality of pores while still being substantially retained within said plurality of pores, and
wherein said average pore size enhances retention of said hydrophilic polymer within said plurality of pores when said reticulated element is hydrated to hydrate said hydrophilic polymer within said pores and contributes to rapid hydration of said hydrophilic polymer; and
means for securing the reticulated element to the conductive element so that electric current will be distributed substantially uniformly through the reticulated element when hydrated and when current is delivered to the conductive element from an electric current source, whereby the conformable electrode provides current to a skin surface with minimal electrode-induced unequal current distribution at different skin locations within the skin surface being contacted with the conformable electrode for delivery of an ionic drug solution to the skin surface.

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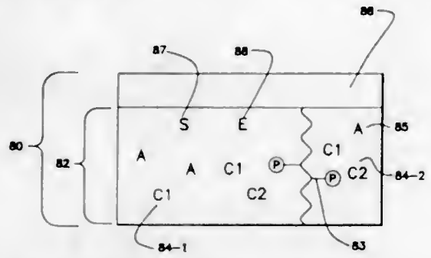
DEVICE AND METHOD FOR IONTOPHORETIC DRUG DELIVERY

Joseph B. Phipps, Plymouth; Warren W. Howland, Champlin; Allan H. Jevne, Anoka, and Carolann Holmblad, Cambridge, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 100,071, Jul. 30, 1993, Pat. No. 5,423,739, which is a continuation of Ser. No. 675,313, Mar. 26, 1991, abandoned, which is a continuation-in-part of Ser. No. 502,841, Mar. 30, 1990, abandoned. This application Dec. 1, 1994, Ser. No. 347,694
Int. Cl.[6] A61N *1/30*
U.S. Cl. 604—20 **15 Claims**

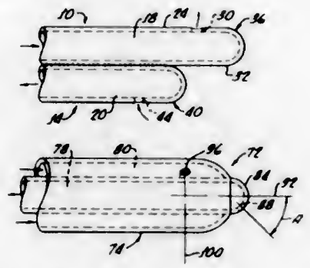


1. An iontophoretic delivery device, comprising:
a source of current;
an active electrode element in electrical contact with the source of current and adapted to make ion-transmitting contact with a body surface of a host, the active electrode element comprising a single polymer layer adapted to be placed in an ion-transmitting relation with the body surface and which contains an active agent having an electrical charge and being suitable for administration through the body surface of the host, said polymer layer containing an ionic organic polymer component with counter ions, said ionic organic polymer component having at least some pendent substituents having said charge; and
a counter electrode element in electrical contact with the current source and being adapted to be placed in ion-transmitting relation with the body surface.

5,558,634
APPARATUS FOR THE REMOVAL OF ADHERENT VISCOELASTIC

Paul G. Mitchell, 822 Pinnacle Pl., Marietta, Ga. 30062

Continuation of Ser. No. 56,373, Apr. 30, 1993, Pat. No. 5,358,473. This application Jun. 27, 1994, Ser. No. 265,762
Int. Cl.[6] A61M *1/00*
U.S. Cl. 604—35 **10 Claims**

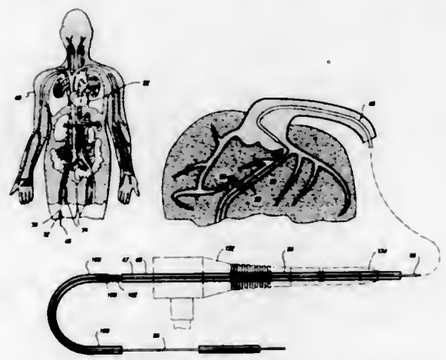


1. Apparatus for the removal of viscoelastic material from an eye chamber, said apparatus comprising:
first irrigation port means for directing a jet fluid toward a viscoelastic material disposed in an eye chamber to first penetrate said viscoelastic material and thereafter loosen said viscoelastic material from the chamber surfaces without substantial breakup of the viscoelastic material and hydraulically forcing by pushing the loosened viscoelastic material from the eye chamber surfaces without substantial breakup of the viscoelastic material, said first irrigation port means comprising an opening having a diameter of between about 0.3 mm and about 0.5 mm; and
aspiration port means for aspirating the loosened viscoelastic material from the eye chamber.

5,558,635
EXCHANGEABLE GUIDE SYSTEM

Louis A. Cannon, Saginaw, Mich., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Dec. 6, 1994, Ser. No. 349,949
Int. Cl.[6] A61M *31/00*
U.S. Cl. 604—49 **22 Claims**

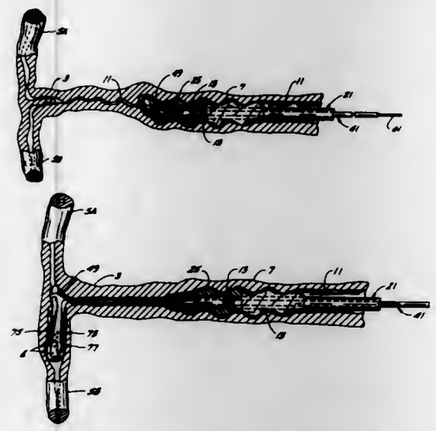


1. A method of exchanging a first guide catheter system with a second guide catheter system during coronary angioplasty of a patient, said first guide catheter system comprising a first guide catheter, said first guide catheter having a distal end and defining a lumen, said method comprises the steps of:
providing a guide wire having a proximal end and a distal end,
positioning the guide wire within the lumen of the first guide catheter;
positioning the first guide catheter within the patient with the distal end of said guidewire being adjacent to the vessel of interest;
advancing an extender guide catheter member over the proximal end of said guide wire;
attaching said extender guide catheter member to said first guide catheter;
inserting a second guide catheter having a distal end over said extender guide catheter member and first guide catheter;
advancing said second guide catheter to a point at which the distal end of said second guide catheter is adjacent to the distal end of said first guide catheter while captivating said guide wire such that the distal end of the guide wire remains adjacent to the vessel of interest;
removing said first guide catheter and extender guide catheter member.

5,558,636
METHOD OF EFFECTING EMBRYO TRANSPLANT

Jiewen Li, Columbia; August Rieke, Bland; Billy N. Day, Auxvasse, and Randall S. Prather, Rocheport, all of Mo., assignors to Curators of the University of Missouri, Columbia, Mo.

Filed May 9, 1995, Ser. No. 438,174
Int. Cl.[6] A61M *31/00*
U.S. Cl. 604—49 **19 Claims**



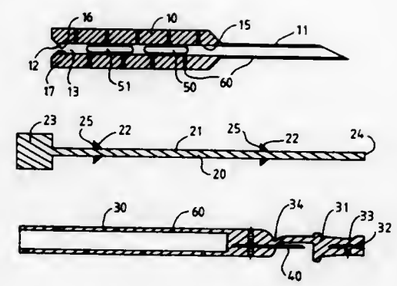
1. A method of effecting the non-surgical transplant of embryos into the uterus of an animal, said method involving the use of a long tubular gripping instrument having an open forward end and an external gripping formation generally adjacent its forward end, and a probe extending axially inside the tubular gripping instrument, said probe having a long tubular body with an open forward end and a probing member projecting in a generally non-axial direction from the probe body generally adjacent its forward end, said method comprising the steps of
inserting the gripping instrument, forward end first, into a cervix of the uterus of said animal,
establishing a grip between walls of the cervix and the external gripping formation on the gripping instrument,
while maintaining said grip, pulling the gripping instrument in a rearward direction to straighten the cervix, and simultaneously pushing the probe in a forward direction to advance the probing member beyond the open forward end of the gripping instrument and through the cervix to a position in the body of the uterus, and
placing an embryo carrier containing embryos inside the probe body and moving the carrier forwardly through the probe body out the open forward end of the probe body to an embryo release position for release of embryos from the carrier into the uterus.

5,558,637
IMPLANT INJECTION DEVICE

Hannu Alionen, Kirjala; Pekka Laakinen, Turku, and Matti Lehtinen, Pispanristi, all of Finland, assignors to Leiras Oy, Turku, Finland

Filed Sep. 28, 1994, Ser. No. 309,019
Claims priority, application Finland, Oct. 13, 1993, 934513
Int. Cl.[6] A61M *31/00*
U.S. Cl. 604—60 **16 Claims**

1. A single use implant injection device, said device comprising:
an implant housing having proximal and distal ends and an inner wall defining a channel therethrough, said inner wall having a projection thereon at said proximal end of said housing, said projection extending into said channel;
a cannula extending from said distal end of said housing;

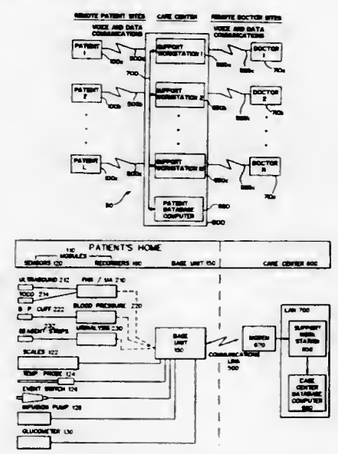


a plunger having proximal and distal ends, said plunger being longitudinally movable in said housing and having a projection thereon at said proximal end, said projection on said plunger and said projection on said inner wall being configured so that said plunger can be inserted in said proximal end of said housing but cannot be removed from said proximal end of said housing; and
a cap disposed on said cannula, said cap having an end, said end having an incision edge attached thereto.

5,558,638
PATIENT MONITOR AND SUPPORT SYSTEM

David C. Evers, Acworth; A. Darrell Lindsey, Marrietta; Marcus Finch, Atlanta, all of Ga., and Reynolds G. F. Gorsuch, Yountville, Calif., assignors to Healthdyne, Inc., Marietta, Ga.

Filed Apr. 30, 1993, Ser. No. 55,987
Int. Cl.[6] A61M *1/00*
U.S. Cl. 604—66 **99 Claims**



1. A system for monitoring and responding to the health and medical condition of a patient, comprising:
a sensor for monitoring the patient's medical condition, the sensor generating a parameter indicative of the patient's medical condition;
a data base located at a remote location from the sensor for storing the sensor parameter, said data base comprising at least one record specific to the patient, the record including the sensor parameter;
means for communicating the parameter to the data base;
means for retrieving the parameter from the data base; and

a software function executing on a processor for directing one or

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a software function executing on a processor for directing one or more medical procedures or activities to be carried out by the patient in response to the retrieved parameter.

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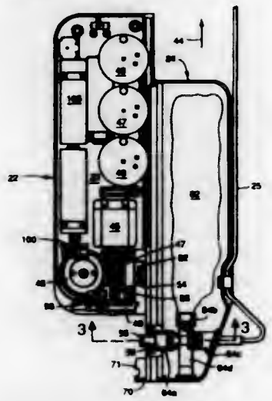
AMBULATORY PATIENT INFUSION APPARATUS

Ronald J. Gangemi, 10607 Banner Mine Way, and David Stokes, 11076 Sky Pines Ridge, both of Nevada City, Calif. 95959

Filed Jun. 10, 1993, Ser. No. 75,144
Int. Cl.[6] A61M *31/00*
U.S. Cl. 604—67 **33 Claims**



1. Infusion apparatus comprising:
a control module having motor means;
a cassette adapted for connection to said control module and having solution containing means therein, said cassette having a side thereof configured for matingly slidably engaging a side of said control module for connecting the two parts together as a unit;
a valve assembly within said cassette for controlling flow of solution from said solution containing means;
a piston member within said valve assembly, said piston member having a head protruding from said side of said cassette; and
reciprocable means within said control module protruding from said side thereof and reciprocated by said motor means, said reciprocable means and said head having coacting engaging configurations for enabling releasable attachment with said cassette positioned with its side in abutting relation with said side of said control module with said sides out of alignment, the sliding of one of said cassette and said module relative to the other both interlocking the two parts and engaging said head with said reciprocable means.

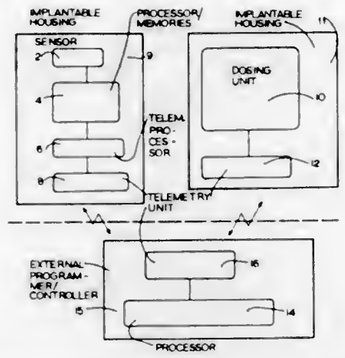
5,558,640

SYSTEM FOR INFUSION OF MEDICINE INTO THE BODY OF A PATIENT

Manfred Pfeiler, Erlangen; Konrad Mund, Uttenreuth; Walter Preidel, Erlangen, all of Germany, and Goesta Sjoeholm, Ekeroe, Sweden, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 8, 1995, Ser. No. 400,953
Claims priority, application European Pat. Off., Mar. 17, 1994, 94104243
Int. Cl.[6] A61M *31/00*; A61K *9/22*; A61N *1/18*
U.S. Cl. 604—67 **15 Claims**

1. In a system for infusing medication into the body of a patient having an implantable infusion apparatus containing a dosing unit



with a reservoir for medication and a pump for pumping doses of said medication from said reservoir into the patient, a sensor for sensing a physiological parameter of the patient for use in controlling the dosing of medication, dependent on said sensed parameter, and an external programmer/controller, the improvement comprising:

said sensor and said dosing unit having no galvanic connection therebetween;

first telemetry means implanted with and connected to said sensor, for bi-directional telemetry communication with said programmer/controller for transmitting data, at least comprising said sensed parameter, to, and for receiving data and instructions from, said programmer/controller;

second telemetry means implanted with and connected to said dosing unit, for bi-directional telemetry communication with said programmer/controller for transmitting data to, and receiving data and instructions from, said programmer/controller;

third telemetry means, disposed in said programmer/controller, for bi-directional telemetry communication with each of said first and second telemetry means, and means for selectively establishing said bi-directional communication with said first and second telemetry means individually or simultaneously; and

said first, second and third telemetry means comprising, in combination, means for closed-loop telemetric control of the delivery of medication to said patient by communication between said sensor and said dosing unit via said programmer controller.

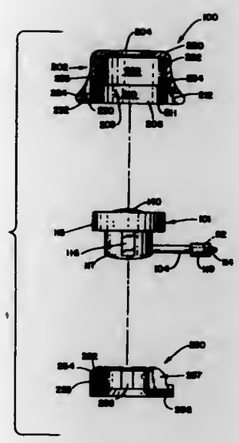
5,558,641

HYBRID PORTAL AND METHOD

Jerald Glantz, Lake Elmo; Mark D. Anderson, Stacy; Theodore A. Johnson, St. Paul; William L. Beling, New Brighton, and Cai Qingsheng, St. Paul, all of Minn., assignors to Sims Deltec, Inc., St. Paul, Minn.

Division of Ser. No. 186,171, Jan. 24, 1994, Pat. No. 5,378,192. This application Jan. 13, 1995, Ser. No. 372,776
Int. Cl.[6] A61M *5/32*
U.S. Cl. 604—93 **12 Claims**

1. A method of constructing a portal comprising the steps of:
providing a sealed reservoir defining a sealed interior chamber accessible through a septum; and
jacketing said sealed reservoir with a preformed jacket.

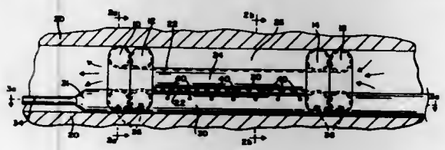


5,558,642

DRUG DELIVERY CATHETER

Cyril J. Schweich, Jr., St. Paul; Kent D. Harrison, Brooklyn Park, and Matthew M. Barras, Orono, all of Minn., assignors to Scimed Life Systems, Inc., Maple Grove, Minn.

Continuation of Ser. No. 740,047, Aug. 2, 1991, abandoned. This application Feb. 24, 1994, Ser. No. 201,069
Int. Cl.[6] A61M *29/00*
U.S. Cl. 604—96 **64 Claims**



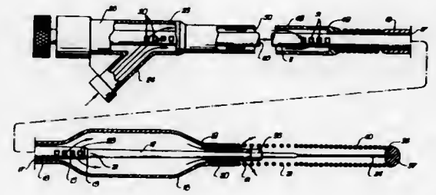
1. A drug delivery catheter for insertion into a vessel which contains a first flowing fluid, the drug delivery catheter comprising:
an elongated tubular member having a proximal end and a distal end;
a guide wire lumen for receiving a guide wire, the guide wire lumen running substantially coaxially through the length of the tubular member;
a drug lumen in fluid communication with the distal end of the tubular member for delivering a second fluid;
an inflatable balloon assembly disposed at the distal end of the tubular member, the balloon assembly including an inflatable balloon member having an uninflated state and an inflated state, the balloon assembly having apertures in fluid communication with the drug lumen;
the balloon assembly configured such that 1) when the balloon member is in an uninflated state, the first fluid in the vessel may flow around the balloon assembly, and 2) when the balloon member is in an inflated state, i) sections of the balloon member contact the vessel wall defining at least one containment pocket for containing the second fluid between the vessel wall and within the contacting sections of the balloon assembly, ii) the apertures are disposed in the containment pocket, and iii) a single flow lumen is defined through the balloon member to allow the first fluid to flow through the balloon member; and
an inflation lumen in fluid communication with the balloon member for inflating the balloon member.

5,558,643

CATHETER WITH NITI TUBULAR SHAFT

Wilfred J. Samson, Saratoga, and William S. Tremulis, Redwood City, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Continuation of Ser. No. 231,215, Aug. 11, 1988, Pat. No. 5,449,343, which is a continuation-in-part of Ser. No. 760,636, Jul. 30, 1985, abandoned. This application Jun. 8, 1994, Ser. No. 255,358
The portion of the term of this patent subsequent to Aug. 11, 2008, has been disclaimed.
Int. Cl.[6] A61M *29/00*
U.S. Cl. 604—96 **8 Claims**



1. A dilatation catheter for performing an angioplasty procedure, comprising:
a) an elongated catheter having a proximal shaft section and a distal shaft section;
b) an inner lumen extending through the proximal shaft section and into the distal shaft section;
c) a tubular element formed of a NiTi alloy which defines at least in part the inner lumen extending through the proximal shaft section; and
d) an inflatable dilatation balloon on the distal shaft section having an interior in fluid communication with the inner lumen extending within the distal shaft section.

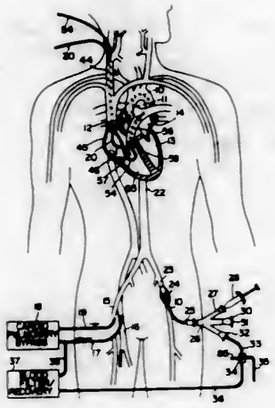
5,558,644

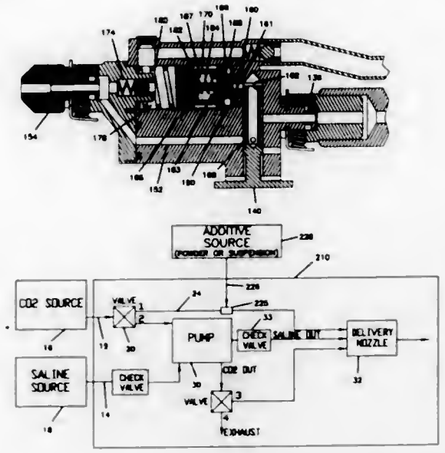
RETROGRADE DELIVERY CATHETER AND METHOD FOR INDUCING CARDIOPLEGIC ARREST

Stephen W. Boyd, Menlo Park; John H. Stevens; Phillip C. Evard, both of Palo Alto, and Craig I. Adams, San Ramon, all of Calif., assignors to Heartport, Inc., Redwood City, Calif.

Continuation-in-part of Ser. No. 282,192, Jul. 28, 1994, which is a continuation-in-part of Ser. No. 162,742, Dec. 3, 1993, abandoned, which is a continuation-in-part of Ser. No. 123,411, Sep. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 991,188, Dec. 15, 1992, abandoned, which is a continuation-in-part of Ser. No. 730,559, Jul. 16, 1991, Pat. No. 5,370,685. This application Jan. 12, 1995, Ser. No. 372,741
Int. Cl.[6] A61M *29/00*
U.S. Cl. 604—96 **29 Claims**

1. A retrograde delivery catheter adapted to be introduced into a peripheral vein and advanced into a coronary sinus of a patient's heart for retrograde delivery of a fluid into a coronary vasculature, the retrograde delivery catheter comprising:
a flexible, elongated shaft having a proximal end and a distal end, the shaft having sufficient length and flexibility so that the proximal end may extend intraluminally through a patient's peripheral vein when the distal end is positioned in the coronary sinus;
an expandable member near the distal end configured to occlude the patient's coronary sinus; and
a delivery lumen having an inlet port at the proximal end and an outlet port distal to the expandable member, the delivery lumen being configured to deliver a fluid having a viscosity of at least about 3.0 centipoise at a flow rate of at least 200 ml/min. and at a pump pressure of less than 300 mm Hg;





the distal end of the shaft having a shape configured to position the expandable member in the patient's coronary sinus when the proximal end of the shaft extends through the patient's peripheral vein.

interconnected to the nozzle wherein the pulses of liquid pumped through the liquid outlet line by the pump mechanism and the exhaust gas from the pump mechanism exit the lavage device at the outlet of the nozzle.

5,558,645

Patent Not Issued For This Number

5,558,646

DEVICES AND METHODS FOR BONE/TISSUE PREPARATION

Karen M. Roche, Stillwater, Minn., assignor to Innovative Surgical Devices Corporation, Stillwater, Minn.

Division of Ser. No. 268,297, Jan. 29, 1994, Pat. No. 5,520,667. This application Apr. 18, 1995, Ser. No. 423,684
Int. Cl.[6] A61M *37/00;9/00*
U.S. Cl. 604—143 **11 Claims**

1. A lavage device comprising:
- a gas-driven reciprocating pump mechanism for pumping pulses of liquid;
- a gas inlet line interconnected to the pump mechanism for driving the pump mechanism;
- a liquid inlet line interconnected to the pump mechanism for supplying liquid to be pumped by the pump mechanism;
- a liquid outlet line from the pump mechanism for carrying the pulses of liquid from the pump mechanism;
- a nozzle interconnected to the liquid outlet line, the nozzle having outlet; and
- a gas outlet line from the pump mechanism for exhausting exhaust gas from the pump mechanism, the gas outlet line

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5,558,647

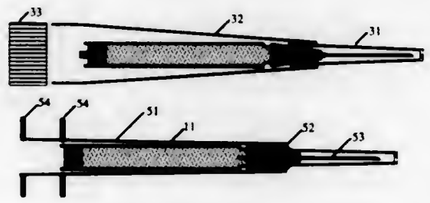
Patent Not Issued For This Number

5,558,648

DISPOSABLE CONICAL HOLD FOR A MEDICINAL CARTRIDGE WITH REUSABLE PLUNGER AND SHIELDS

Jack W. Shields, 1950 Las Tunas Rd., Santa Barbara, Calif. 93103

Continuation of Ser. No. 224,902, Apr. 8, 1994, abandoned. This application Jan. 9, 1995, Ser. No. 370,465
Int. Cl.[6] A61M *5/32*
U.S. Cl. 604—192 **8 Claims**



1. A safe disposable cartridge injection assembly, useful for aspirating tissue fluid from a patient and injection of sterile fluid medication into a patient, said assembly comprising:

a) a hollow needle with a sharp leading end and a needle hub;
b) a cylindric piston-activated medicinal cartridge with a leading end and a trailing end, said leading end connecting to said needle hub and said trailing end containing a piston;
c) a reusable plunger with a leading end reversibly attachable to the piston;
d) a conical holder having an apex, a body portion and a frustum wherein:
  i. said apex holds said hollow needle by means of said needle hub;
  ii. said body portion holds said cylindric piston-activated medicinal cartridge, after insertion, in a conical space with an axial length longer than the length of said cylindric piston-activated medicinal cartridge, an apical bore smaller in diameter than the external diameter of said cylindric piston-activated medicinal cartridge and a frustal bore larger in diameter than the external diameter of said insertable cylindric piston-activated medicinal cartridge, such that complete insertion of said cylindric piston-activated medicinal cartridge in an apical direction into said body portion of said conical holder wedge impacts said cylindric piston-activated medicinal cartridge in a position suitable for drainage by said hollow needle;
  iii. said frustum holds said reusable plunger by means of a reversible connection with a sleeve which slides over the plunger body;
  iv. said body portion has external flanges near said frustum for finger placement; and
e) an external shielding means which assures injection sterility and prevents injury from said hollow needle before and after use of said safe disposable cartridge injection assembly for injecting a sterile fluid into a patient.

5,558,649

CONICAL SYRINGE/NEEDLE SHIELD

Jack W. Shields, 1950 Las Tunas Rd., Santa Barbara, Calif. 93103

Filed Jan. 25, 1995, Ser. No. 377,929
Int. Cl.[6] A61M *5/32*
U.S. Cl. 604—192 **3 Claims**

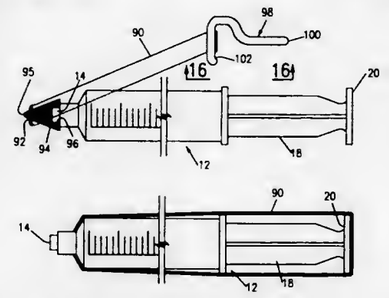
1. A conical syringe/needle shield for reversibly and safely enclosing a syringe having a cylindric barrel with an attached needle, a reversibly attachable needle scabbard and a trailing flange on the cylindric barrel, said conical syringe/needle shield comprising a hollow cone with:
- a. a needle puncture-resistant consistency,
- b. a closed apex,
- c. an open frustum having a trailing internal diameter greater than the external diameter of the cylindric barrel of the syringe;
- d. a hollow body between said closed apex and said open frustum, said hollow body having:
  - i. an axial length approximately equal to the combined axial length of the cylindric barrel of the syringe with the attached needle,
  - ii. an apical internal diameter smaller than the external diameter of the cylindric barrel of the syringe and larger than the outside diameter of the needle scabbard, and
  - iii. an internal diameter which gradually reduces in size from said frustal internal diameter to said apical internal diameter, such that insertion of the cylindric barrel of the syringe through said open frustum into said hollow body to the point where the external diameter the cylindric barrel of the syringe and the internal diameter of said hollow body become equal will create a wedge impaction which leaves the leading end of the barrel of the syringe with the attached needle having an affixed needle scabbard in a closed space longer and wider than the attached needle having the affixed needle scabbard, and which leaves said open frustum of said hollow cone in a position overlying the trailing end of the cylindric barrel of the syringe substantially ahead of the trailing flange on the cylindric barrel.

5,558,650

ELASTOMERIC SYRINGE ACTUATION DEVICE

Charles J. McPhee, Huntington Beach, Calif., assignor to I-Flow Corporation, Irvine, Calif.

Continuation-in-part of Ser. No. 208,729, Mar. 9, 1994, Pat. No. 5,429,607. This application Sep. 2, 1994, Ser. No. 300,157
Int. Cl.[6] A61M *5/315*
U.S. Cl. 604—218 **22 Claims**



1. A device for actuating a syringe having a barrel for containing a supply of fluid, the barrel having a proximal end terminating in an outlet tip, and a plunger slidably disposed within the barrel for movement between a withdrawn position and an inserted position, the plunger having an actuation portion extending distally from the barrel, the device comprising:
- a continuous elastomeric band having outlet tip engagement means for removably attaching the band to the outlet tip; and
- band-pulling means, removably engageable with the band when the band is removably attached to the outlet tip, for allowing the band to be pulled distally so as to seat against the actuation portion, the band-pulling means comprising:
  - a band-engaging portion that includes a generally U-shaped member having a pair of opposed ends; and
  - a handle portion, attached to the band-engaging portion, that includes a finger projecting from each of the opposed ends.

5,558,651

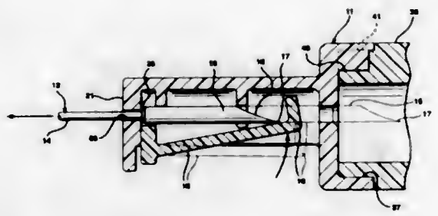
APPARATUS AND METHOD FOR A NEEDLE TIP COVER

Mark A. Crawford, Sandy; Timothy J. Erskine, and Gerald H. Peterson, both of Salt Lake City, all of Utah, assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

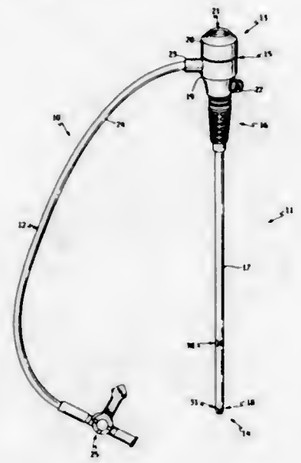
Continuation of Ser. No. 114,988, Aug. 12, 1993, abandoned, which is a continuation of Ser. No. 512,284, Apr. 20, 1990, abandoned. This application Dec. 27, 1994, Ser. No. 364,071
Int. Cl.[6] A61M *5/00*
U.S. Cl. 604—263 **11 Claims**

11. A catheter for use with an introducer needle for insertion of the catheter into a patient, comprising:
- a catheter adapter with a proximal end and a distal end;
- a cannula secured to the distal end of the catheter adapter;
- a cover removably connected to the proximal end of the catheter adapter; and
- a resilient, self-actuating guard connected to the cover, the guard having an arm and a single transverse wall extending at an angle from the arm, the single transverse wall located proximal of the proximal end of the catheter adapter.

c) said means for sealably containing said waste products within said unit comprising said inflatable walls (2) being in continu-



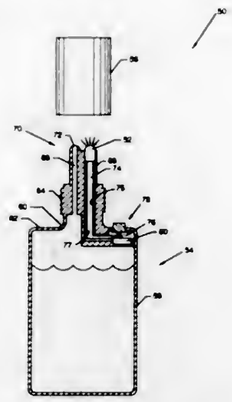
5,558,652
INTRODUCER WITH RADIOPAQUE MARKED TIP AND METHOD OF MANUFACTURE THEREFOR
Bruce D. Henke, Deephaven, Minn., assignor to B. Braun Medical, Inc., Bethlehem, Pa.
Filed Oct. 6, 1994, Ser. No. 318,951
Int. Cl.[6] A61M *25/00*
U.S. Cl. 604—280 **20 Claims**



1. A medical vascular introducer of the type having an elongated hollow shaft with proximal and distal portions, said distal portion being insertable into the body of a patient, wherein the improvement comprises at least one marker disposed on the exterior of said shaft, said at least one marker being constructed of a circumferentially discontinuous band of radiopaque material comprising at least two marker segments, said marker segments being circumferentially separated from each other by void areas of said shaft, whereby said void areas permit expansion and contraction of said radiopaque material with respect to said shaft.

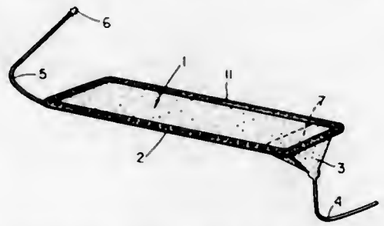
5,558,653
TARGETED EYE DROP DISPENSER
Richard L. Lindstrom, 2811 Westwood Rd., Wayzata, Minn. 55391
Filed Jun. 7, 1995, Ser. No. 484,073
Int. Cl.[6] A61M *35/00;* **B65D** *5/66*
U.S. Cl. 604—295 **2 Claims**

1. Targeted eye drop dispenser for dispensing eye drop solution into an eye, comprising:
a. reservoir means for containing said eye drop solution to be dispensed;



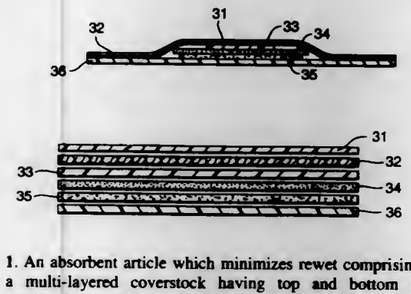
b. dispensing means extending from said reservoir means and in fluid communication therewith, said dispensing means having a dispensing orifice; and,
c. visual target means associated with said dispensing means in proximity to said dispensing orifice, such that said eye drop solution can be accurately dispensed into said eye upon focusing said eye on said visual target means, wherein said dispensing means comprises a tubular extension member having a proximal end in fluid communication with said reservoir means and a distal end terminating in said dispensing orifice, wherein said visual target means comprises a light source at said distal end, and wherein said light source comprises a plurality of liquid crystal display concentric rings formed about said dispensing orifice.

5,558,654
WASTE PRODUCT COLLECTION UNIT
John R. W. Hardy, 114 High St., Stony Stratford, Milton-Keynes MK 11 1AH, United Kingdom
Filed Feb. 13, 1995, Ser. No. 404,109
Claims priority, application United Kingdom, Aug. 14, 1992, 9217337
Int. Cl.[6] A61M *1/00;* **A61B** *19/00*
U.S. Cl. 604—322 **15 Claims**



1. A waste product collection unit for use in surgical procedures and the like, said unit comprising:
a) a base (1)
b) inflatable walls (2) having an inlet inflation tube (5); and
c) a liquid collection area (3) communicating with said base for the collection of liquid therefrom and having an outlet (4) for removal of collected liquid;
characterized in that
(d) said unit is adapted for use in a substantially sterile environment by the provision of means for sealably containing said waste products within said unit after use, so as to produce a sealed waste product containment envelope;
e) said means for sealably containing said waste products within said unit comprising said inflatable walls (2) being in continuous surrounding relation to said base (1) so as to maintain a barrier to leakage of liquid therefrom;
f) said means for sealably containing said waste products within said unit further comprising adherable means on the free edges of said inflatable walls which are in continuous surrounding relation to said base; and
g) said inflatable walls (2), said base (1) and said adherable means serving, in use, to define a sealable waste product containment volume.

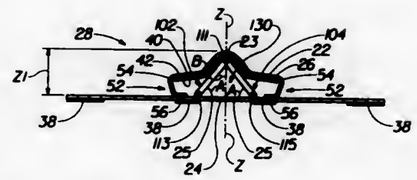
5,558,655
ABSORBENT ARTICLE WITH DRY SURFACE COMPOSITE CONSTRUCTION
Arrigo D. Jezzi, Berwyn; Charles F. Schroer, Jr., Phoenixville; Caroline Gephart, Spring City, and Daniel D. Biesterveld, Frazer, all of Pa., assignors to Contao, Inc., King of Prussia, Pa.
Filed May 3, 1994, Ser. No. 237,204
Int. Cl.[6] A61F *13/15;13/20*
U.S. Cl. 604—378 **17 Claims**



1. An absorbent article which minimizes rewet comprising:
a multi-layered coverstock having top and bottom layers, wherein the top layer is a two dimensional apertured film having a total open area of 35% or less and the bottom layer is a fluid transferring material;
a superabsorbent polymer-containing laminate which swells to at least three time its dry caliper upon wetting situated below said fluid transferring material;
an absorbent core below said laminate; and
a liquid impermeable backsheet below said absorbent core, wherein said superabsorbent polymer-containing laminate and absorbent core are situated between said coverstock and liquid impermeable backsheet
wherein said superabsorbent polymer-containing laminate moves at least a portion of said coverstock away from said absorbent core to substantially prevent fewer of said coverstock by fluid contained within said core.

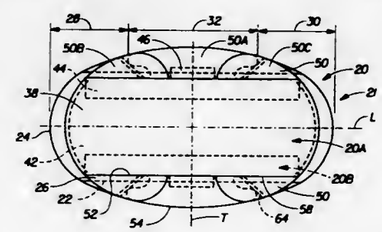
5,558,656
SANITARY NAPKIN HAVING AN INTERNAL SHAPING COMPONENT
Carl L. Bergman, Loveland, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 170,487, Dec. 20, 1993. This application Apr. 8, 1994, Ser. No. 225,411
Int. Cl.[6] A61F *13/15*
U.S. Cl. 604—385.1 **10 Claims**

1. A disposable absorbent article having a longitudinal centerline and longitudinal ends joining first and second lateral ends, the absorbent article comprising:
a liquid pervious topsheet having a body facing surface;
a liquid impervious backsheet joined to the topsheet; and
an absorbent core disposed intermediate the topsheet and the backsheet;



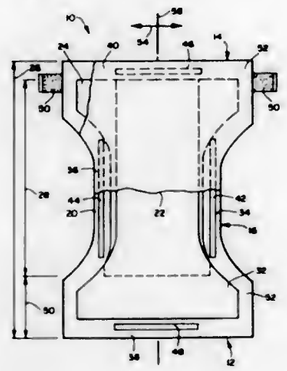
the disposable absorbent article having a first Z-direction caliper at a Z-direction compressive load of 2 grams and a second Z-direction caliper at a Z-direction compressive load of less than 100 grams, wherein the second Z-direction caliper is at least 15 millimeters less than the first Z-direction caliper.

5,558,657
ABSORBENT ARTICLES HAVING OVERLAPPING UNDERGARMENT COVERING COMPONENTS THAT AUTOMATICALLY WRAP THE SIDES OF UNDERGARMENTS
John L. Hammons, Hamilton; Patricia L. Lampson, and Thomas W. Osborn, III, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 915,133, Jul. 23, 1992, abandoned, Ser. No. 42,840, Apr. 5, 1993, Pat. No. 5,354,400, Ser. No. 73,256, Jun. 4, 1993, Pat. No. 5,389,094, Ser. No. 96,121, Jul. 22, 1993, Ser. No. 109,017, Aug. 18, 1993, Pat. No. 5,344,416, Ser. No. 192,240, Feb. 4, 1994. This application Jul. 15, 1994, Ser. No. 276,070
Int. Cl.[6] A61F *13/16*
U.S. Cl. 604—385.1 **8 Claims**



1. An absorbent article having a longitudinal dimension extending in a longitudinal direction and a transverse dimension extending in a transverse direction, said absorbent article comprising:
a main body portion comprising an absorbent core, said main body portion having a body-facing side, a garment-facing side, and a pair of longitudinal side edges; and
a pair of side wrapping elements joined to said main body portion and extending laterally outward beyond the longitudinal side edges of said main body portion to distal edges, wherein at least one of said side wrapping elements comprises more than one side wrapping element component, said side wrapping element components being flexible and joined to said main body portion at a proximal edge so that they are at least partially overlapping and unattached to each other along at least a portion of the distal edge of said side wrapping element so that the portions of said side wrapping element components comprising the distal edge of said side wrapping element are free to move relative to each other and spread apart when said side wrapping elements are folded.

5,558,658
DISPOSABLE DIAPER HAVING A HUMIDITY TRANSFER AREA
Karen M. Menard, Neenah; Thomas W. Odorzynski, Green Bay, and Joel S. Sherman, Neenah, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Nov. 23, 1994, Ser. No. 344,429
Int. Cl.[6] A61F *13/15*
U.S. Cl. 604—385.1 **26 Claims**

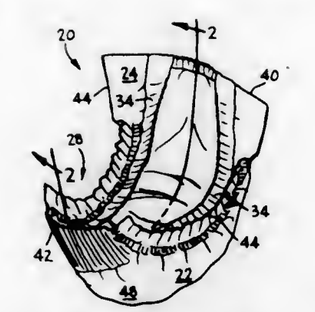


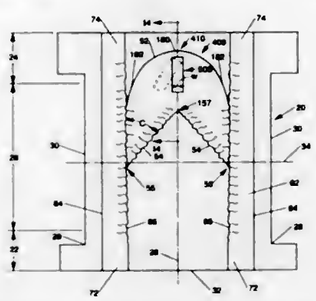
1. An absorbent article, which generally delimits a front waistband section, a rear waistband section and an intermediate section which interconnects said front and rear waistband sections, the article comprising:
- a substantially vapor-impermeable backsheet layer having a length;
- a liquid-permeable topsheet layer positioned in facing relation with said backsheet layer;
- an absorbent body located between said backsheet layer and said topsheet layer and having a length which is less than the length of said backsheet layer, said absorbent body overlaying at least a portion of said backsheet layer;
- a humidity transfer area formed by positioning said absorbent body such that an area of at least about 5.0 square centimeters of said backsheet in at least one waistband section of said article is not overlaid by said absorbent body and forming a vapor-permeable panel in said area of said backsheet, which vapor-permeable panel is substantially liquid impermeable, has a water vapor transmission rate value of at least about 2500 g/sq.m/24 hr. and an area of at least about 5.0 square centimeters; and
- a humidity transfer material located between said topsheet layer and said backsheet layer and having a wet compression recovery of at least about 74 percent, said humidity transfer material overlaying said humidity transfer area and extending over said absorbent body and into said intermediate section of said article.

5,558,659
INCONTINENCE ARTICLE FOR MALES
Earle H. Sherrod, Appleton; Lynn K. LeMahieu, Hortonville, and John A. Rooyakkers, Little Chute, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Dec. 9, 1993, Ser. No. 164,340
Int. Cl.[6] A61F *13/15;13/20*
U.S. Cl. 604—385.2 **26 Claims**

1. An absorbent article having a longitudinal axis and a transverse axis, the absorbent article comprising:
- a moisture barrier comprising a liquid impermeable material, the moisture barrier defining a front end, a back end longitudinally spaced from the front end, a pair of side edges extending between the front and back ends, an inner surface and an opposite outer surface, the moisture barrier having a length measured between the front and back ends of less than about 46 centimeters;
- an absorbent assembly disposed on the inner surface;
- a liner comprising a liquid permeable material, the liner bonded to the moisture barrier and sandwiching the absorbent assembly therebetween;
- means for gathering the moisture barrier along each side edge between forward and rearward terminal points, the forward terminal points spaced from the front end by at least about 7 centimeters and the rearward terminal points spaced from the back end by less than about 5 centimeters;
- a pair of elasticized containment flaps disposed on the liner, each containment flap extending longitudinally toward the front end to a position at least about 10 centimeters from the back end;
- means for gathering the moisture barrier along the back end; and
- attachment means disposed on the outer surface.

5,558,660
ABSORBENT ARTICLE HAVING A POCKET CUFF WITH A GLUTEAL GROOVE SPACER
Kimberly A. Dreier, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Sep. 8, 1994, Ser. No. 302,291
Int. Cl.[6] A61F *13/15*
U.S. Cl. 604—385.2 **6 Claims**

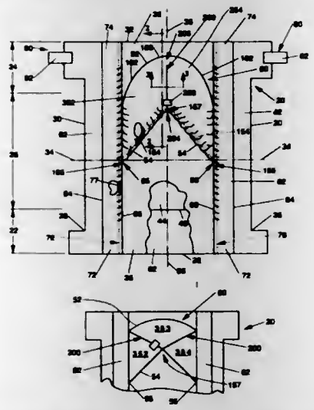




1. A disposable absorbent article having longitudinal edges, end edges, a longitudinal centerline and a lateral centerline, the disposable absorbent article comprising:
- a liquid pervious topsheet;
- a liquid impervious backsheet joined to the topsheet;
- an absorbent core positioned between the topsheet and the backsheet;
- a barrier cuff disposed adjacent each longitudinal edge of the disposable absorbent article, each barrier cuff extending longitudinally from a first barrier cuff end to a second barrier cuff end,

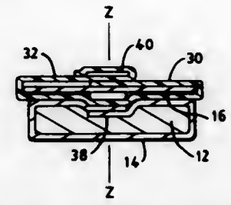
and each barrier cuff having a proximal edge and a distal edge; spacing means operatively associated with each barrier cuff for spacing a portion of each barrier cuff distal edge apart from the topsheet;
- a pocket cuff comprising an inwardly facing surface and an outwardly facing surface and positioned intermediate the barrier cuffs, the pocket cuff having an open edge, the open edge having an apex and laterally spaced apart open edge ends, each open edge end joined to a barrier cuff at a juncture positioned intermediate the first and second barrier cuff ends, the open edge being elastically extensible intermediate the apex and each of the open edge ends; and
- a gluteal groove spacer disposed longitudinally rearward of the apex on the outwardly facing surface of the pocket cuff for restricting leakage of fecal material from between the pocket cuff and the wearer.

5,558,661
ABSORBENT ARTICLE HAVING A POCKET CUFF WITH A RELEASABLE SEAM
Donald C. Roe, West Chester, and Kimberly A. Dreier, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Dec. 6, 1994, Ser. No. 350,284
Int. Cl.[6] A61F *13/15*
U.S. Cl. 604—385.2 **10 Claims**



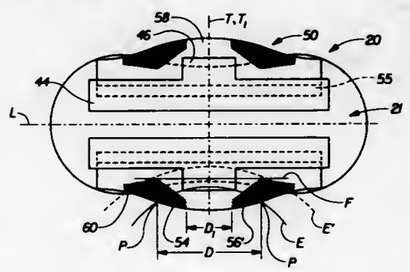
1. A disposable absorbent article having longitudinal edges, a front end edge, a rear end edge, a longitudinal centerline and a lateral centerline, the disposable absorbent article comprising:
- a liquid pervious topsheet;
- a liquid impervious backsheet joined to the topsheet;
- an absorbent core positioned between the topsheet and the backsheet; and
- a pocket cuff joined to the disposable absorbent article to form a pocket recess for receiving fecal material, the pocket cuff having an open edge having laterally spaced apart open edge ends, and the pocket cuff comprising a releasable seam wherein a first portion of the pocket cuff is separable from a second portion of the pocket cuff along the releasable seam, whereby fecal material in the pocket cuff can be exposed for removal from the absorbent article:
- wherein the releasable seam extends longitudinally and laterally from the pocket cuff open edge.

5,558,662
ABSORBENT ARTICLE HAVING AN ATTACHMENT MECHANISM AND A METHOD OF ATTACHING
Thomas P. Van Iten, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Apr. 20, 1994, Ser. No. 230,563
Int. Cl.[6] A61F *13/15*
U.S. Cl. 604—387 **2 Claims**



1. A method of attaching an absorbent article to a crotch portion of an undergarment, said undergarment having an interior surface and an exterior surface, said article having an absorbent, a baffle secured to said absorbent, said baffle having first and second longitudinal side edges, a first end, and first and second appendages extending laterally outward from said first and second longitudinal side edges, respectively, each of said first and second appendages positioned adjacent to said first end and aligned at an angle relative to said longitudinal side edges and having a sufficient length to be folded inward and overlap one another, and a first magnet secured to said baffle and a second magnet secured to said second appendage, said method comprising the steps of:
- a) positioning said absorbent article on said undergarment with said baffle contacting said interior surface; and
- b) folding said first and second appendages around said crotch portion of said undergarment such that said first appendage overlays said first magnet and said second appendage overlays said first appendage, and said second magnet is vertically aligned with and magnetically attracted to said first magnet.

5,558,663
ABSORBENT ARTICLES HAVING UNDERGARMENT COVERING COMPONENTS WITH ZONES OF EXTENSIBILITY
Eric P. Weinberger, Fairfield; Bruce W. Lavash, West Chester; Robb E. Olsen, and James W. Cree, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 915,133, Jul. 23, 1992, abandoned, Ser. No. 42,840, Apr. 5, 1993, Pat. No. 5,354,400, Ser. No. 73,256, Jun. 4, 1993, Pat. No. 5,389,094, Ser. No. 96,121, Jul. 22, 1993, Ser. No. 109,017, Aug. 18, 1993, Pat. No. 5,344,416, Ser. No. 124,180, Sep. 17, 1993, Ser. No. 192,240, Feb. 4, 1994. This application Jul. 20, 1994, Ser. No. 277,733
Int. Cl.[6] A61F *13/15*
U.S. Cl. 604—387 **14 Claims**



1. An absorbent article for wearing in a wearer's undergarment that has a crotch region with a pair of side edges, said absorbent

5,558,665
SURGICAL INSTRUMENT AND METHOD FOR

a movable position converging lens for relaying the virtual image formed by the fixed position diverging lens to a

1. An absorbent article for wearing in a wearer's undergarment that has a crotch region with a pair of side edges, said absorbent article having a longitudinal dimension extending in a longitudinal direction and a transverse dimension extending in a transverse direction, said absorbent article comprising:

a main body portion comprising an absorbent core, said main body portion having a body-facing side, a garment-facing side, and a pair of longitudinal side edges; and

a pair of side wrapping elements for folding around the side edges of the wearer's undergarment, said side wrapping elements being joined to said main body portion and extending laterally outward beyond the longitudinal side edges of said main body portion a distance of less than one-half the width of said main body portion, to distal edges, said side wrapping elements having a transverse centerline, wherein at least one of said side wrapping element comprises at least one zone of extensibility and another region that is stiffer than said at least one zone of extensibility, said at least one zone of extensibility being extensible when folded around the side edges of an undergarment wherein said at least one zone of extensibility are capable of extending longitudinally greater than or equal to about 20 mm, said stiffer region has a resistance to bending of between about 2 grams and about 50 grams, and wherein said zones of extensibility are primarily extensible in the longitudinal direction.

5,558,664

DEVICE FOR THE DERMAL ABSORPTION OF MEDICINAL SOLUTES

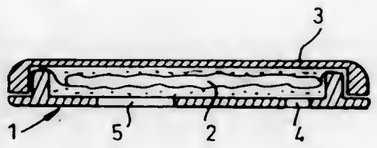
F. X. Sarzaud, 4 Square Villaret de Joyeuse, F-75017 Paris; Jean Perego, 2, rue du Cheflin, F-21250 Seurre, and A. Cabrera, 15, boulevard de Levallois, F-92200 Neuilly-sur-Seine, all of France

Filed Jan. 4, 1994, Ser. No. 177,736

Claims priority, application France, Jul. 5, 1991, 91 08483

Int. Cl.[6] A61K *9/22*

U.S. Cl. 604—890.1 **21 Claims**



1. A device for transcutaneous drug administration, comprising:

(a) an application reservoir including a base, said base including a filling hole and an opening;

(b) a means to pressurize said application reservoir, said means being connected to said application reservoir;

(c) a lid connected to said application reservoir, said lid hermetically sealing said application reservoir; and

(d) a stopper fitted in said opening of said base,

wherein said stopper includes micro-recesses on a periphery of said stopper that collaborate with the opening to produce at least one drug drainage hole with a a cross-section that provides regular drug flow.

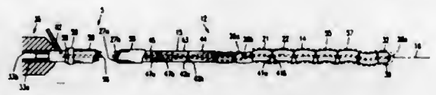
5,558,665

SURGICAL INSTRUMENT AND METHOD FOR INTRALUMINAL RETRACTION OF AN ANATOMIC STRUCTURE

Maciej J. Kieturakis, San Carlos, Calif., assignor to Archimedes Surgical, Inc., Menlo Park, Calif.

Filed Jun. 24, 1994, Ser. No. 265,577

Int. Cl.[6] A61B *1/06*

U.S. Cl. 606—1 **19 Claims**

16. A surgical instrument for repositioning an anatomic structure in a body, the anatomic structure defining a lumen, said instrument comprising:

an elongate member defining a central axis and having proximal, medial and distal portions, at least said distal portion comprising a coupled series of shaped longitudinal members, pairs of said members having complementary abutment portions; and

an actuator coupled to the proximal portion of said elongate member;

wherein the elongate member has a substantially flexible state in which relative movement between adjacent longitudinal members is possible and a substantially rigid state in which said complementary abutment portions are urged into engagement by said actuator, the shapes of said members and the orientation of said abutment portions being selected so that said members are urged to curve in more than one plane in said substantially rigid state.

5,558,666

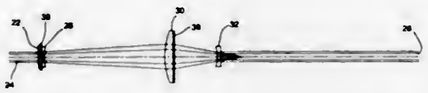
HANDPIECE FOR PRODUCING HIGHLY COLLIMATED LASER BEAM FOR DERMATOLOGICAL PROCEDURES

David A. Dewey, Sunnyvale; Michael Arnett, Los Altos Hills; Dale E. Koop, Sunnyvale, and David Trost, San Francisco, all of Calif., assignors to Coherent, Inc., Santa Clara, Calif.

Filed Jan. 14, 1994, Ser. No. 183,111

Int. Cl.[6] A61N *5/06*

U.S. Cl. 606—9 **10 Claims**



1. A handpiece for transforming an output beam of a laser into a highly collimated resultant beam having an image which is a spot on a patient's skin, comprising:

a handpiece body having an input end and an output end;

an optical system contained in the handpiece body, wherein the optical system includes a zoom lens system capable of producing a focused laser spot of varying sizes, the optical system forming the resultant beam by relaying an image of a beam waist of the laser output beam to a range of working positions, the beam waist being placed substantially at a center of the range of working positions and substantially offset from the output end of the handpiece, the zoom lens system further comprising:

a fixed position diverging lens for forming a virtual image of the beam waist;

a movable position converging lens for relaying the virtual image formed by the fixed position diverging lens to a range of positions from the surface of the diverging lens; and

a movable position diverging lens whose position is linked to that of the movable position converging lens so that the position of the movable position diverging lens is maintained at approximately one focal length behind the position of the laser beam waist projected by the movable position converging lens and acts to collimate the beam so that the resultant beam exits the handpiece with a diameter which depends on the positions of the two movable lenses.

5,558,667

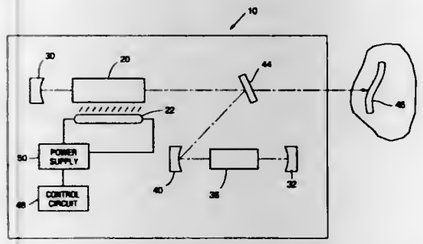
METHOD AND APPARATUS FOR TREATING VASCULAR LESIONS

J. Michael Yarborough, Tucson, Ariz.; R. Rox Anderson, Lexington, Mass.; George Marcellino, Los Gatos, Calif., and Gerald M. Mitchell, Tucson, Ariz., assignors to Coherent, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 355,512, Dec. 14, 1994, abandoned. This application Jan. 6, 1995, Ser. No. 369,465

Int. Cl.[6] A61B *17/36;* **H01S** *3/10*

U.S. Cl. 606—9 **5 Claims**



1. A method of treating vascular lesions with an intracavity doubled solid state laser, said laser having a neodymium doped solid state gain medium and a flashlamp for optically pumping the gain medium comprising of steps of:

energizing the flashlamp with pulses having a duration between 0.5 and 10.0 milliseconds and a wavelength of 532 nm; and

irradiating the lesion with said output pulses at a fluence level in excess of 1 joules/cm^2.

5,558,668

MEDICAL LASER TREATMENT SYSTEM AND METHOD

Donald M. Lankford, Acton, Mass.; Thomas S. MacGregor, III, Mantua, N.J., and Charles C. Negus, Taunton, Mass., assignors to PLC Medical Systems, Inc., Milford, Mass.

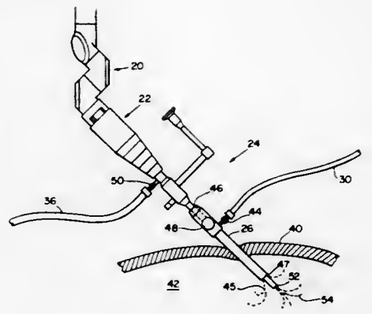
Filed Oct. 11, 1994, Ser. No. 320,946

Int. Cl.[6] A61B *17/36*

U.S. Cl. 606—14 **14 Claims**

1. An improved medical treatment laser system including a gas laser for generating a beam of laser energy at a predetermined wavelength, means for transmitting the beam of laser energy to a medical treatment site, and means for delivering to the medical treatment site an insufflating gas which use is absorbent at the predetermined wavelength, the improvement comprising:

means for introducing, to the means for delivering the laser beam a non-absorbent purge gas which is transparent to the predetermined wavelength of the gas laser at a flow rate for opposing the influx of insufflating gas to the means for delivering and reducing resonant absorption of the laser beam.



5,558,669

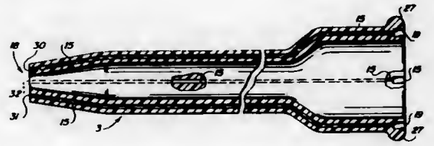
FIBER OPTIC SLEEVE FOR SURGICAL INSTRUMENTS

Michael Reynard, 1301-20th St. Suite #260, Santa Monica, Calif. 90404

Continuation of Ser. No. 125,774, Sep. 24, 1993, Pat. No. 5,478,338. This application Jun. 22, 1995, Ser. No. 493,811

Int. Cl.[6] A61F *9/007;* **A61B** *19/00*

U.S. Cl. 606—15 **25 Claims**



17. A disposable light transmitting sleeve device for use with a surgical instrument for endoscopy and treatment of intracorporeal structures with optical radiation, the instrument defining proximal and distal ends, comprising:

a sleeve formed of flexible, non-toxic medical grade plastic material bounded by inner and outer wall surfaces and having a hollow interior which is shaped and sized to fit the proximal end of the surgical instrument on which the sleeve is mounted, the sleeve defining a distal end located adjacent the proximal end of the surgical instrument and a proximal end remote from said distal end, the distal end being larger in diameter than the proximal end;

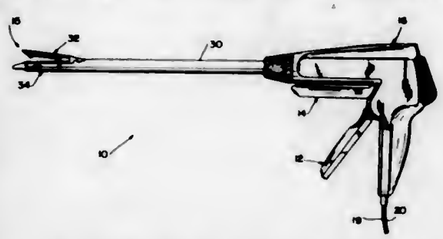
coupling means for removably mounting the sleeve on the proximal end of the surgical instrument; and,

light transmitting means mounted with the plastic material of the sleeve and extending from the distal end to the proximal end in order to transmit optical radiation the length of the sleeve within the plastic material between the inner and outer wall surfaces.

5,558,670
HANDPIECE FOR LASER APPARATUS
Ellie Kouwitz, Ramat Gan, Israel, and Yves V. Kamami, Paris, France, assignors to Laser Industries Ltd., Tel Aviv, Israel
Filed Jun. 8, 1994, Ser. No. 255,430
Claims priority, application Israel, Jun. 8, 1993, 105957
Int. Cl.[6] A61B *17/36*
U.S. Cl. 606—18 **14 Claims**

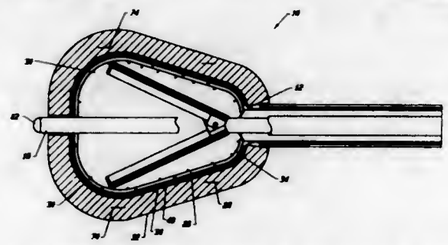
1. A handpiece for laser apparatus, comprising:
a handle having a proximal end connectible to a laser beam source, a distal end through which the laser beam is delivered to a working area, and a passageway connecting said proximal end to said distal end;
and a mirror carried at said distal end of the handle and tilted with respect to the longitudinal axis of said passageway to deliver said laser beam to a selected point in the working area;
said mirror being elongated in one direction to permit directing the laser beam along a beam axis which impinges the mirror at a first point thereof and reflects the laser beam to the working area, and also to permit viewing said working area along a viewing axis which extends externally of the handle, which is devoid of any optical elements to said mirror, and which impinges said mirror at a second point thereof displaced from said first point in said elongated direction;
said mirror being mounted in a metal mirror holder and being thermally insulated therefrom except for a thermally-conductive link conducting the heat from the mirror to said handle and substantially thermally insulating the remainder of the holder from the mirror.

5,558,671
IMPEDANCE FEEDBACK MONITOR FOR ELECTROSURGICAL INSTRUMENT
David C. Yates, 7534 Galway Ct., West Chester, Ohio 45069
Continuation-in-part of Ser. No. 95,797, Jul. 22, 1993, Pat. No. 5,403,312. This application Sep. 23, 1994, Ser. No. 311,297
Int. Cl.[6] A61B *17/36*
U.S. Cl. 606—38 **11 Claims**



1. An electrosurgical device for treating tissue during a surgical procedure, said device comprising:
a surgical instrument having a tissue treating portion including an end effector adapted to engage tissue to be treated;
electrically isolated first and second poles comprised of tissue contacting first and second electrodes adapted to receive electrosurgical energy from an energy source connected to said electrodes, said first and second electrodes being capable of conducting electrical energy therebetween, at least one of said first and second electrodes being connected to said tissue treating portion of said instrument;
an energy control signal generated by an energy control signal generator for controlling RF energy supplied from said energy source to said electrodes;
impedance measurement circuitry coupled to said electrodes for measuring the impedance of tissue engaged by said end effector, wherein said impedance measuring circuitry is adapted to determine a minimum impedance value, to determine a target impedance value as a function of said minimum impedance value and to compare measured impedance values to said target impedance value and alter said control signal when said measured impedance value exceeds said target impedance value.

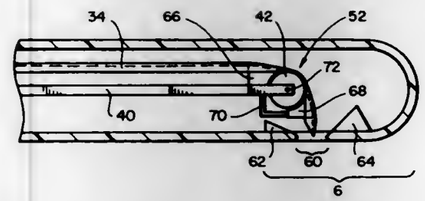
5,558,672
THIN LAYER ABLATION APPARATUS
Stuart D. Edwards, Los Altos; Kee S. Lee, Daly City; James Baker, and Bruno Strul, both of Palo Alto, all of Calif., assignors to Vidacare, Inc., Menlo Park, Calif.
Continuation-in-part of Ser. No. 272,162, Jul. 7, 1994, which is a continuation-in-part of Ser. No. 265,459, Jun. 24, 1994, Pat. No. 5,508,370. This application Aug. 4, 1994, Ser. No. 286,862
Int. Cl.[6] A61B *17/39*
U.S. Cl. 606—41 **24 Claims**



1. An ablation apparatus for ablating an inner layer in an organ of a body, comprising:
an expandable member, made of a material with a porous exterior surface, defining an expandable member interior that contains an electrolytic solution, the expandable member releasing electrolytic solution through the porous exterior surface;
a first fluid conduit including a back surface in surrounding relationship to the exterior surface of the expandable member and an opposing front surface, the first fluid conduit being made of material that passes electrolytic solution received from the expandable member through the first fluid conduit;
a second fluid conduit with a conductive surface and a back side in surrounding relationship to the first fluid conduit, the second fluid conduit being made of a material that provides substantial conformity between the conductive surface and the inner layer of the organ and passage of the electrolytic solution through the second fluid conduit, the second fluid conduit delivering electrolytic solution received from the first fluid conduit to the inner layer; and
a plurality of electrodes positioned between the first and second fluid conduits, each electrode including an insulator formed on a surface of the electrode adjacent to the second fluid conduit.

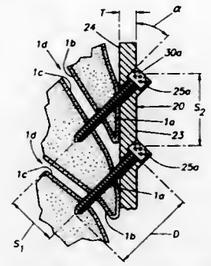
5,558,673
MEDICAL PROBE DEVICE AND METHOD HAVING A FLEXIBLE RESILIENT TAPE STYLET
Stuart D. Edwards, Los Altos, and Ronald G. Lax, Grass Valley, both of Calif., assignors to Vidamed, Inc., Menlo Park, Calif.
Filed Sep. 30, 1994, Ser. No. 316,318
Int. Cl.[6] A61B *17/39*
U.S. Cl. 606—41 **25 Claims**

1. A medical probe device for the treatment by radio frequency ablation of tissue in a prostate of a human male having a urethra



with the tissue of the prostate surrounding a portion of the urethra comprising an elongate guide member extending along a longitudinal axis and having proximal and distal extremities, the elongate guide member being sized to be able to enter the urethra and having a length so that when the distal extremity is disposed in the vicinity of the prostate the proximal extremity is outside of the urethra, the elongate guide member having a passageway extending along the longitudinal axis to an opening at the distal extremity, a tape-like stylet disposed in the passageway and having proximal and distal extremities, the stylet having a shape with a transverse cross-section which is generally arcuate for providing column strength to the stylet and being resiliently deformable along its length to an altered shape in which the stylet has a transverse cross-section which is generally planar, at least one electrode mounted on the distal extremity of the stylet, a handle secured to the proximal extremity of the elongate guide member, operative means carried by the handle and connected to the proximal extremity of the stylet for causing longitudinal movement of the stylet in the passageway and means carried by the distal extremity of the elongate guide member for deforming the distal extremity of the stylet to its altered shape for facilitating direction of the distal extremity of the stylet at an angle to the longitudinal axis through the opening and into the tissue of the prostate.

5,558,674
DEVICES AND METHODS FOR POSTERIOR SPINAL FIXATION
Michael H. Heggeness, Houston, Tex., and Brian J. Doherty, Atherton, Calif., assignors to Smith & Nephew Richards, Inc., Memphis, Tenn.
Filed Dec. 17, 1993, Ser. No. 169,998
Int. Cl.[6] A61B *17/70*
U.S. Cl. 606—61 **22 Claims**



1. A method for internal posterior spinal stabilization, comprising (a) drilling each of at least one first bore at a downward angle through a posterior cortex of a lateral mass of a first vertebra of a spine and an inferior articular surface of said first vertebra of a spine; (b) drilling each of at least one second bore at a downward angle through a superior articular surface of a second vertebra subjacent to said first vertebra; (c) drilling each of at least one third bore at an upward angle through a posterior cortex of a lateral mass of an inferior-most vertebra; and (d) inserting a first screw through said each of at least one first bore and said second bore to stabilize said first and second vertebrae of a spine.

CHEMICAL

5,558,675
PROCESS FOR AFTERTREATING TANNED LEATHER AND PELTS

5,558,677
DYEING AND PRINTING TEXTILE MATERIALS MADE OF CELLULOSE FIBERS

5,558,675

PROCESS FOR AFTERTREATING TANNED LEATHER AND PELTS

Alain Lauton, Saint-Louis, France, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 73,216, Jun. 4, 1993, abandoned. This application Sep. 6, 1994, Ser. No. 300,875

Int. Cl.[6] C14C *9/00*; C08F *122/06*

U.S. Cl. 8—94.21 **15 Claims**

1. A process for the treatment of tanned leather and pelts in order to improve their fullness and handle, which comprises contacting said leather or pelts in an aqueous liquor with an effective amount of a polymer which is obtained by

(a) polymerising a monoethylenically unsaturated dicarboxylic anhydride of 4 to 8 carbon atoms or a mixture of said dicarboxylic anhydrides, and

(b) thereafter esterifying or amidating or esterifying and amidating said polymer to the extent of to 75 molar % with compounds selected from the group consisting of (b_1), (b_1') and (b_2), wherein

(b_1) is a C_1-C_{30}alcohol,

(b_1') is ammonia or a primary or secondary amine and

(b_2) is the reaction product of

(α) an unsaturated or saturated C_1-C_{30}alcohol, a C_8-C_{22}fatty acid, a C_8-C_{22}fatty amine or a C_8-C_{22}amide and

(β) ethylene oxide, propylene oxide or a mixture thereof in the molar ratio of 1:2 to 1:20 of (α) to (β),

and subsequently hydrolysing the anhydride groups of said polymer with an aqueous base.

5,558,676

COMPOSITION AND A METHOD FOR TREATING GARMENTS WITH THE COMPOSITION

Donnie R. Gray, Dilley, and Glen A. Dickson, St. Hedwig, both of Tex., assignors to Ocean Wash, Inc., Dilley, Tex.

Filed Mar. 15, 1995, Ser. No. 404,520

Int. Cl.[6] D06L *3/02*; *3/08*

U.S. Cl. 8—107 **13 Claims**

1. A method of treating garments or fabric to produce a faded or worn look, wherein the method comprises the steps of:

a. providing a tumbler;

b. placing a gel composition containing an oxidizing agent and a gelling agent in said tumbler wherein said gelling agent is from 1 to 50 percent by weight of said gel composition and said gelling agent is selected from magnesium aluminum silicates, bentonite clays, nonorganic smectite clays, attapulgite clays, silicon dioxide, fumed silica, colloidal silicas, modified montmorillonite clay or amorphous silica powder;

c. placing a multiplicity of spreading agents into said tumbler, said spreading agents being nonreactive with the oxidizing agent and being selected from plastic pipes, golf balls, rubber blocks or rubber hoses;

d. placing the garments or fabric into said tumbler;

e. tumbling said garments or fabric, said multiplicity of spreading agents, and said gel composition for a period of time sufficient to produce said faded or worn look on said garments or fabric;

f. removing the garments or fabric from the tumbler; and

g. washing the removed garments or fabric to remove and neutralize the gel composition.

5,558,677

DYEING AND PRINTING TEXTILE MATERIALS MADE OF CELLULOSE FIBERS

Henric Wagenmann, Heidelberg; Ulf Baus, Donnenheim; Eberhard Beckmann, Neustadt, and Erich Kromm, Weisenheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP93/02424, § 371 Date Feb. 6, 1995, § 102(e) Date Feb. 6, 1995, PCT Pub. No. WO94/06961, PCT Pub. Date Mar. 31, 1994

PCT Filed Sep. 8, 1993, Ser. No. 379,433

Claims priority, application Germany, Sep. 16, 1992, 42 30 870.4

Int. Cl.[6] D06P *1/22*; *1/651*

U.S. Cl. 8—607 **7 Claims**

1. A process for dyeing and printing textile materials consisting of cellulose fibers or containing cellulose fibers in a blend with other fibers in an aqueous medium at above pH 12 with vattable dyes in the presence of at least one reducing agent for the vattable dyes and finishing the dyeing in a conventional manner, which comprises using reducing agents that are aliphatically saturated cyclic compounds which contain at least one instance of the structural unit

(I)

in the ring of the molecule.

5,558,678

PROCESS AND APPARATUS FOR CONTINUOUS CRYSTALLIZATION OF PLASTIC GRANULES

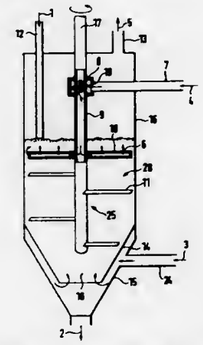
Friedrich Weger, Berlin, Germany, assignor to Karl Fischer Industrieanlagen GMBH, Berlin, Germany

Continuation-in-part of Ser. No. 150,832, Nov. 12, 1993, abandoned. This application Jun. 27, 1995, Ser. No. 495,093

Claims priority, application European Pat. Off., Nov. 13, 1992, 92250334

Int. Cl.[6] B01D *9/00*; B29B *13/02*

U.S. Cl. 23—295 R **7 Claims**



1. In a process for the continuous conversion of granules of amorphous plastic to granules of crystalline plastic, in which amorphous granules of plastics are introduced into a container to form a bed which moves downward under the influence of gravity, while being mechanically stirred and while a hot gas is passed as a primary gas in a countercurrent manner through the bed of granules, the improvement which comprises,

providing a rotating gas supply means in the transitional region of said bed of granules where the granules change from an amorphous state to a partially crystalline state;

expelling secondary gas from said gas supply means at a gas velocity of 120–150 meters/second so that the granulate layer overlaying the gas supply means is subjected to fountaining

and turbulence from the combination of forces resulting from said rotating gas supply means and the action of the secondary

5,558,681

METHOD OF BONDING A METAL CONNECTION TO AN

electrode and separator being all impregnated with an electrolyte comprising an alkaline aqueous solution, which comprises forming

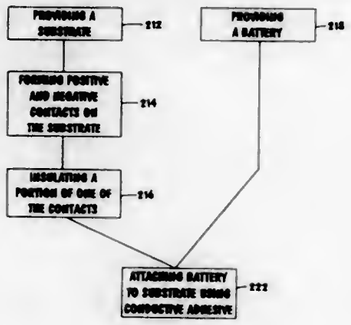
and turbulence from the combination of forces resulting from said rotating gas supply means and the action of the secondary gas, while maintaining an upward flow of the secondary gas together with the primary gas.

5,558,679

METHOD FOR MOUNTING A BATTERY ON A SUBSTRATE

Mark E. Tuttle, Boise, Id., assignor to Micron Communications, Inc., Boise, Id.

Filed Aug. 21, 1995, Ser. No. 517,504
Int. Cl.[6] H01M 06/00
U.S. Cl. 29—623.1 **17 Claims**



1. A method for mounting a battery on a substrate comprising the steps of:

providing a substrate;

providing a battery for mounting on said substrate, said battery having a first contact surface and a second contact surface;

forming a first contact on said substrate;

forming a second contact on said substrate;

insulating said second contact from said first contact; and

attaching said battery to said substrate using an electrically conductive adhesive to electrically connect said first contact surface to said first contact and said second contact surface to said second contact.

5,558,680

PREPARATION OF SILVER VANADIUM OXIDE CATHODES UTILIZING SOL-GEL TECHNOLOGY

Esther S. Takeuchi, East Amherst, and William C. Thiebolt, III, Tonawanda, both of N.Y., assignors to Wilson Greatbatch Ltd., Clarence, N.Y.

Continuation of Ser. No. 988,330, Nov. 23, 1992, abandoned. This application Jul. 6, 1994, Ser. No. 271,154
Int. Cl.[6] H01M 6/00
U.S. Cl. 29—623.1 **21 Claims**

1. A method of preparing a cathode of an electrochemical cell, the cathode containing as active material silver vanadium oxide prepared in a sol-gel solution, the method comprising:

a) mixing at least one silver-containing component with at least one vanadium-containing compound in a gel solution to thereby intimately contact them, in that manner providing silver vanadium oxide in the gel solution;

b) dehydrating the gel solution by heating to provide an anhydrous silver vanadium oxide; and

c) providing the cathode by forming the anhydrous silver vanadium oxide into a desired shape for the cathode.

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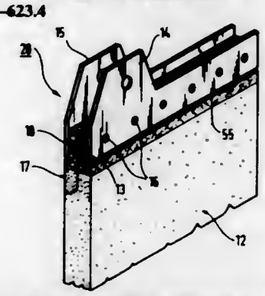
METHOD OF BONDING A METAL CONNECTION TO AN ELECTRODE INCLUDING A CORE HAVING A FIBER OR FOAM-TYPE STRUCTURE FOR AN ELECTROCHEMICAL CELL, AND A RESULTING ELECTRODE

Marie-Thérèse Loustau; Roelof Verhoog, both of Bordeaux, and Claude Precigout, Lormont, all of France, assignors to SAFT, Romainville, France

Filed May 24, 1994, Ser. No. 248,238
Claims priority, application France, May 26, 1993, 93 06314
Int. Cl.[6] H01M 2/26
U.S. Cl. 29—623.4 **15 Claims**



1. A method of bonding a metal connection to an electrode for an electrochemical cell, the electrode including a main core having one of a fiber and a foam structure, the metal connection including at least one metal strip, said method comprising steps of:

positioning a retaining core having substantially the same fiber or foam structure as the main core, but different dimensional characteristics, next to the main core;

pressing the at least one metal strip against one edge of the main core and the retaining core; and

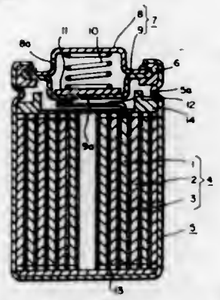
welding the at least one metal strip to the main core and the retaining core.

5,558,682

PROCESS FOR PRODUCING A WIND-TYPE ALKALINE SECONDARY BATTERY

Masakatsu Urairi; Toshimitsu Tachibana; Kenji Matsumoto; Toshihiko Shinomura; Hiroyuki Iida; Kazunori Kawamura; Shuuji Yano, and Osamu Ishida, all of Osaka, Japan, assignors to Nitto Denko Corporation, and Hitachi Maxell, LTD., both of Osaka, Japan

Division of Ser. No. 233,299, Apr. 26, 1994, abandoned. This application Jul. 28, 1995, Ser. No. 508,606
Claims priority, application Japan, Apr. 26, 1993, 5-099767
Int. Cl.[6] H01M 10/28
U.S. Cl. 29—623.5 **2 Claims**



1. A process for producing a wind-type alkaline secondary battery comprising of a negative electrode comprising cadmium, zinc or iron of an oxide or hydroxide thereof or a hydrogen absorbing alloy, a positive electrode comprising a metal oxide or a metal hydroxide, and a separator, said negative electrode, positive

electrode and separator being all impregnated with an electrolyte comprising an alkaline aqueous solution, which comprises forming said separator by subjecting a polyolefin fiber sheet having an initial O/C atomic ratio of 0 as measured by XPS to a plasma treatment to provide said sheet with an O/C atomic ratio of from 0.05 to 0.7 and to make at least the surface of said sheet hydrophilic to have a wicking rate of pure water of at least 10 mm per 2 minutes when one end of the sheet is dipped in pure water at 20° C. and 60% RH, and forming the treated sheet into said separator.

5,558,683

MANNICH BASE DERIVATIVES, AND THE PRODUCTION AND USES THEREOF

John T. Loper, Richmond, Va., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 20, 1995, Ser. No. 407,726
Int. Cl.[6] C10L 1/22
U.S. Cl. 44—415 **25 Claims**

1. A compound in which a phenolic moiety is linked by a Mannich base linkage to a polyamine moiety, and the polyamine moiety is linked to an alkylene-poly(oxyalkylene) moiety by a urea linkage involving one of the nitrogen atoms of the polyamine moiety.

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STABILIZED FUEL ADDITIVE COMPOSITION

Thomas F. DeRosa, Passaic, N.J.; Joseph M. Russo, Poughkeepsie, N.Y.; Benjamin J. Kaufmann, Hopewell Junction, N.Y., and Joseph T. Mastropierro, Cornwall, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 26, 1995, Ser. No. 578,296
Int. Cl.[6] C10L 1/22
U.S. Cl. 44—419 **14 Claims**

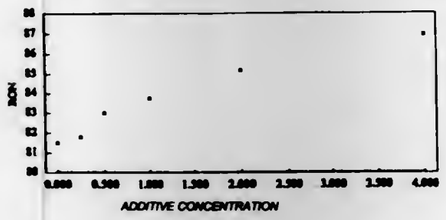
1. A stabilized fuel additive composition comprising a major portion of the reaction product of a 4-alkyl-2-morpholinone and an alkylphenoxypolyoxyalkylene amine and a minor portion of a stabilizing agent sufficient to prevent the formation of haze in the additive composition comprising a compound selected from the group consisting of polypropyleneoxide diamines of formula $H_2N(CH_2CHCH_3O)_nNH_2$ where n is a number between about 4 and about 25, and triethylene tetramine.

5,558,685

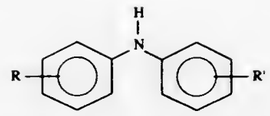
NON-METALLIC ANTI-KNOCK FUEL ADDITIVE

Thomas F. DeRosa, Passaic, N.J.; William M. Studzinski, Beacon, N.Y.; Joseph M. Russo, Poughkeepsie, N.Y.; Benjamin J. Kaufman, Hopewell Junction, N.Y., and Robert T. Hahn, Beacon, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 19, 1994, Ser. No. 308,890
Int. Cl.[6] C10L 1/22
U.S. Cl. 44—426 **2 Claims**



1. A lead free gasoline composition comprising a major portion of gasoline and about 0.5 to 2 wt % of a mixture of dialkyl diphenylamines represented by the formula:



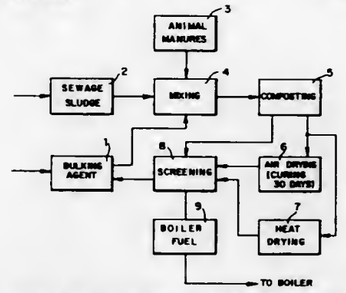
where R and R' independently comprise C_4 to C_8 alkyl radicals and wherein said mixture of dialkyl diphenylamines comprises said C_4 to C_8 alkyl radicals in Gaussian distribution of all isomers.

5,558,686

METHOD FOR MAKING A FUEL PRODUCT

William A. Lavelle, IV, Gouldsboro, Pa., assignor to Alpha-Omega Energia, Inc., Gouldsboro, Pa.

Filed Oct. 19, 1993, Ser. No. 138,943
Int. Cl.[6] C10L 1/00
U.S. Cl. 44—606 **15 Claims**



1. A method for producing a combustible fuel product from biological sludge comprising:

a) mixing a removable bulking agent with the sludge;

b) aerobically composting the mixture of step a) under conditions effective to attain a temperature to about 170° F. to about 175° F.;

c) maintaining the temperature of the mixture at about 170° F. to about 175° F. for a time period sufficient to substantially reduce pathogenic microorganisms and produce a composted sludge mixture having a moisture content of up to about 45 percent; and

d) separating the bulking agent from the composted sludge mixture to produce a treated sludge fuel product, wherein the fuel product has a heating value of about 3,800 Btu/lb to about 10,300 Btu/lb.

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VERTICAL, PACKED-BED, FILM EVAPORATOR FOR HALIDE-FREE, SILICON-CONTAINING COMPOUNDS

Michael B. Cain, Corning, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Dec. 30, 1994, Ser. No. 368,319
Int. Cl.[6] B01F 3/04
U.S. Cl. 55—233 **16 Claims**

1. Apparatus for vaporizing a liquid reactant used in the formation of a silicon dioxide containing preform, said reactant being polymerizable to form higher molecular weight species, said apparatus comprising:

a vertically-oriented, packed-bed column having a top surface, a bottom surface, and an internal operating pressure whose maximum value is P_{max};

introducing means for:

(a) introducing the liquid reactant to the packed-bed column at a first predetermined flow rate and for distributing the liquid reactant over the cross-sectional area of the column, and

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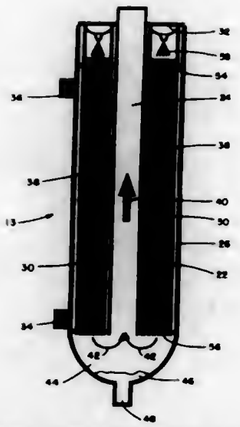
CULLET FEEDER



(b) introducing a gas to the packed-bed column in the region of the column's top surface at a second predetermined flow rate,

whereby the liquid reactant and the gas both flow downward through the packed-bed column;

heating means for heating the packed-bed column to a temperature sufficiently high so that before reaching the bottom surface of the packed-bed column, the liquid reactant and the gas at their predetermined flow rates are heated to a temperature above the liquid reactant's dew point temperature at P_{max}, whereby the liquid reactant is vaporized before reaching the bottom surface and exits from that surface as a mixture of the vaporized reactant and the gas (the vapor/gas mixture);

receiving means for receiving the vapor/gas mixture exiting from the bottom surface of the packed-bed column;

separating means between the bottom surface of the packed-bed column and the receiving means for separating higher molecular weight species of the reactant from the vapor/gas mixture; and

removing means for removing higher molecular weight species of the reactant from the separating means.

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BLOCK FILTER-PURIFIER

Cathy L. Cowan, San Jose, and Stephen Y. Lau, San Leandro, both of Calif., assignors to Semi-Gas Systems, Inc., San Jose, Calif.

Continuation of Ser. No. 275,036, Jul. 14, 1994, abandoned. This application Jan. 17, 1996, Ser. No. 591,214

Int. Cl.[6] B01D *46/00;35/02*

U.S. Cl. 55—312 **9 Claims**

1. A point-of-use block-filter purifier, comprising:

a removable canister assembly (**12**) having a cylinder (**14**) secured to a canister base (**16**) with a first flat face that provides a gas circuit (**22**, **24**, **26**, **28**, **30** and **32**) between two separate adjacent areas of said first flat face;

a modular cubic mating block body (**18**) with a second flat face removably connected to said first flat face of said canister base (**16**) and having a gas inlet (**32**) and a gas outlet (**36**) on a pair of opposite third and fourth faces that are at right angles to said first and second flat faces and respectively connect into said two separate adjacent areas of said first flat face and said gas circuit (**22**, **24**, **26**, **28**, **30** and **32**);

a first automatic closing valve (**24**) mounted in said canister base (**16**) intermediate said gas inlet (**32**) and said cylinder (**14**) at one of said two adjacent areas of said first flat face and that provides for an interruption of said gas circuit (**22**, **24**, **26**, **28**, **30** and **32**);

a second automatic closing valve (**22**) mounted in said canister base (**16**) intermediate said gas outlet (**36**) and said cylinder (**14**) at another one of said two adjacent areas of said first flat face and that provides for an interruption of said gas circuit (**22**, **24**, **26**, **28**, **30**, and **32**), wherein said first and second automatic valves (**24**, **22**) provide for automatic closing when the removable canister assembly (**12**) is removed from the mating block body (**18**), and provide for automatic opening when the removable canister assembly (**12**) is attached to the mating block body (**18**);

a filter (**34**) positioned in the mating block body (**18**) intermediate the second automatic closing valve (**22**) and said gas outlet (**36**); and

a sand-grain size granular gas purification material (**32**) in a resin bed disposed within said cylinder (**14**) providing for the removal of both particles and chemical impurities from process gases for the fabrication of semiconductor integrated circuits to flow and connected to be protected from atmospheric exposure through the first automatic closing valve (**24**) and the second automatic closing valve (**22**).

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REINFORCED FILTER ELEMENT

Hiroyuki Yanagihara; Seihou Taniguchi; Takeshi Hazeyama; Hitoshi Otaka; Teiji Hashimoto, and Sansan Souma, all of Tokyo, Japan, assignors to Nittetsu Mining Co., Ltd., Tokyo, Japan

Filed Mar. 15, 1995, Ser. No. 404,458

Claims priority, application Japan, Jul. 12, 1994, 6-181917; Jul. 22, 1994, 6-191225

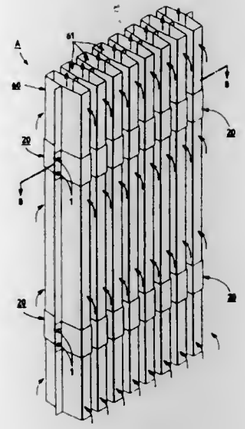
Int. Cl.[6] B01D *46/00*

U.S. Cl. 55—492 **32 Claims**

1. A reinforced filter element comprising:

a pair of filter plates, each being made of a nonwoven fabric or felt of a polymeric material and shaped into a plate having a corrugated cross section having a plurality of alternating ridges and grooves, said filter plates being positioned in such a way that the grooves in one filter plate are opposed to those in the other filter plate, said filter plates each having a first and a second longitudinal end, and said filter plates each having two side end portions; and

at least one rigid reinforcement having two end portions and provided in a direction perpendicular to the length of said ridges and said grooves for reinforcing said pair of said filter plates, with both end portions of said at least one reinforcement being respectively secured to both side end portions of said pair of filter plates, and said at least one reinforcement being spaced from said first and said second longitudinal end.



5,558,690

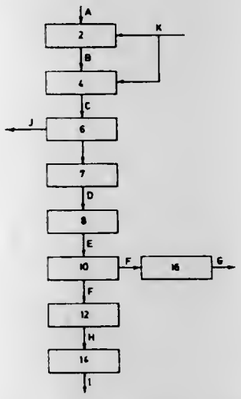
MANUFACTURE OF CERAMIC TILES FROM SPENT ALUMINUM POTLINING

James G. Hnat, Collegeville, Pa., and Akshay Mathur, Tampa, Fla., assignors to Vortec Corporation, Collegeville, Pa.

Filed Dec. 23, 1994, Ser. No. 364,478

Int. Cl.[6] C01F *7/04;7/50*

U.S. Cl. 65—134.8 **20 Claims**



20. A process of forming glass ceramic tiles comprising:

providing spent aluminum potliner containing carbonaceous material, fluorine, and glass-forming materials;

oxidizing the spent aluminum potliner under conditions effective to combust the carbonaceous material and to volatilize partially the fluorine in the glass-forming materials, wherein said oxidizing is carried out in a suspension preheater in which the spent aluminum potliner, the carbonaceous material, the fluorine, and the glass-forming materials are entrained in an oxidizing fluid;

vitrifying the oxidized glass forming materials to form a glass melt, wherein said vitrifying is carried out in a cyclone melting chamber; and

forming the glass melt into tiles containing fluorine;

cooling the tiles to effect nucleation;

heating the tiles after said cooling to cause crystallization of said tiles; and

glazing the heat treated tiles.

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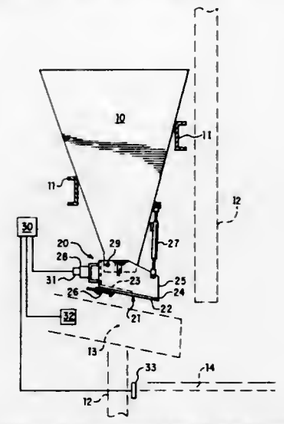
CULLET FEEDER

Larry L. Horn, Galena; Barry R. James, Apple River; William L. Merkle, Elizabeth, all of Ill.; William R. Materna, Dubuque, Iowa, and Stephen J. Coates, Galena, Ill., assignors to Merkle Engineers, Inc., Galena, Ill.

Filed Sep. 13, 1994, Ser. No. 305,030

Int. Cl.[6] C03B *3/00*

U.S. Cl. 65—335 **16 Claims**



1. A cullet feeder in combination with a batch feeder for feeding cullet from a storage hopper to a glass melting furnace comprising: a generally rectangular wide cullet feeder plate beneath said storage hopper to receive said cullet near its rear edge and to discharge said cullet over its opposite front edge; angular adjustment means for adjusting the angle of said cullet feeder plate to lower and raise said front edge relative to said rear edge; vibrating means for vibrating said cullet feeder plate at a determined intensity and frequency; and vibrating adjustment means for adjustment of at least one of said intensity and said frequency of said vibrations, the adjustable angle and said intensity and frequency of said vibrations of said cullet feeder plate controlling the discharge rate of said cullet, said cullet feeder in combination with said batch feeder having a batch feeder plate and positioned with said front edge of said cullet feeder plate over said batch feeder plate in a location wherein during operation said batch has already been deposited on said batch feeder plate, said cullet feeder plate being substantially the width of said batch feeder plate.

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OPTICAL WAVEGUIDE PREFORM MEASUREMENT DURING MANUFACTURE

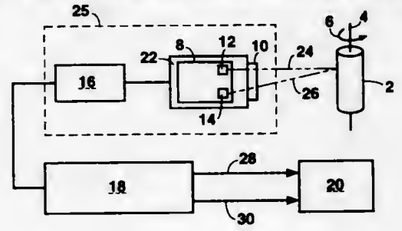
William J. Chervenak, Big Flats, and Robert S. Wagner, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jul. 25, 1994, Ser. No. 279,402

Int. Cl.[6] C03B *37/07*

U.S. Cl. 65—382 **24 Claims**

22. A method for mapping the shape of an optical waveguide



preform during manufacture of the preform comprising the steps of:

predetermined value between about 1 and about 26, where "t" is the thickness of the first cladding material layer, and

forming a non-composted wood-waste product containing dry wood particles of uniform size compatible with the size of the

preform during manufacture of the preform comprising the steps of:

providing a rotating bait rod, wherein successive layers of preform material are deposited on the rotating bait rod to form an outwardly growing preform surface;

providing two distance gauges each comprising, a sensing unit electrically connected to a control unit, wherein each said distance gauge produces an electric signal proportional to the respective distances between each said sensing unit and the preform surface;

positioning said two sensing units spaced apart from the preform surface and at respective fixed distances relative to a reference line, said two sensing units essentially centered on the preform and located to face diametrically opposite surfaces of the preform;

translating said respective electric signals into a measurement of the respective distances of each said sensing unit from the preform surface;

translating said respective distance measurements into a preform thickness measurement;

recording successive thickness measurements, made over a time period equal to or greater than the time required for the preform to make one revolution,

wherein the time interval between said successive measurements is less than or equal to the time required for the preform to make 0.25 revolutions; and,

moving said two sensing units in unison parallel to the axis of rotation of the preform.

5,558,693

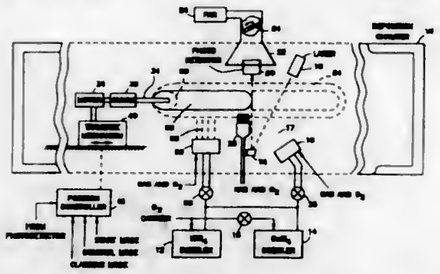
METHODS OF MAKING OPTICAL WAVEGUIDES

Arnab Sarkar, West Hills, Calif., assignor to SpecTran Communications Fiber Technologies, Inc., Sturbridge, Conn.

Division of Ser. No. 2,877, Jan. 8, 1993, Pat. No. 5,364,430, which is a continuation of Ser. No. 722,969, Jun. 28, 1991, abandoned, which is a division of Ser. No. 308,986, Feb. 8, 1989, Pat. No. 5,028,246, which is a continuation of Ser. No. 825,444, Feb. 3, 1986, abandoned. This application Oct. 6, 1994, Ser. No. 319,394

Int. Cl.[6] C03B *37/08*

U.S. Cl. 65—382 **27 Claims**



1. A method of making a proform for optical waveguides comprising the steps of:

a) forming a core cylinder onto a rotating bait rod the core cylinder having a longitudinal axis, a free end positioned away from said bait rod and a substantially constant radius "a" by; (1) directing core soot stream onto the free end of the core cylinder to deposit core soot material thereupon; and (2) modifying the position of the core soot stream relative to the core cylinder to maintain a controllable deposition rate of said core soot material on the core; wherein the core soot stream has a cross-section substantially uniform along its path and a Reynolds number greater than about 100;

b) depositing a first cladding material layer on an outer surface of the core cylinder using a radial cladding soot stream by reciprocating the core cylinder along the longitudinal axis of the core cylinder until the cladding ratio "t/a" reaches a predetermined value between about 1 and about 26, where "t" is the thickness of the first cladding material layer; and

c) drying and sintering the article formed in step (b) to provide a vitreous proform capable of being drawn into an optical waveguide.

5,558,694

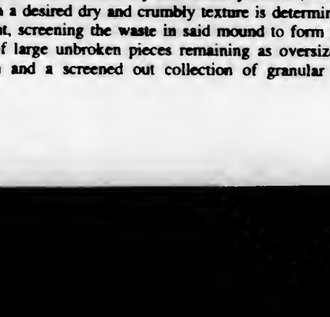
WOOD-WASTE PRODUCT FORMED

William S. Andrews, Jr., Durham, and William S. Andrews, III, Creedmoor, both of N.C., assignors to B & B Organic Composite and Soils, Inc., Durham, N.C.

Division of Ser. No. 223,839, Apr. 6, 1994, Pat. No. 5,435,819, which is a continuation of Ser. No. 944,889, Sep. 14, 1992, abandoned, which is a continuation-in-part of Ser. No. 813,364, Dec. 24, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 474,110

Int. Cl.[6] C05F *9/00*

U.S. Cl. 71—23 **4 Claims**



1. A wood-waste product containing dry wood particles of substantially uniform size and soil particles produced by a dry method for disintegrating relatively large, unbroken, unground wood-wastes such as stumps, limbs, branches, tree trunks and whole trees, and which operates in ambient temperature consisting essentially of:

(a) providing unbroken, unground wood-wastes having at least some associated soil;

(b) providing a waste-treatment site;

(c) depositing loads of said unbroken, unground wood-wastes on said waste-treatment site by dropping the loads including any soil associated therewith at the site to loosely pile said wood-wastes and form an uncovered mound of sufficient height to permit a lower internal portion of said mound to remain substantially dry in the presence of rainfall at the site and shaped to facilitate vegetation growth and avoid rainfall water collection thereon;

(d) enhancing the said dry method of disintegrating by allowing vegetation growth to permeate the uncovered surface of the mound to form a vegetation mass thereon;

(e) insuring that said unbroken, unground wood-wastes within said mound remain undisturbed and unturned for a period within a range of six months to five years without artificial aeration, without the addition of heat, without chemical treatment, in a condition which does not generate heat within the mound and without movement or breaking of the wood-wastes forming the mound until portions of the wood-wastes in the mound are of a desired dry and crumbly texture;

(f) periodically sampling the wood-wastes in the mound to determine when portions of wood in the wood-wastes in the mound are of a desired dry and crumbly texture; and

(g) when a desired dry and crumbly texture is determined to be present, screening the waste in said mound to form a collection of large unbroken pieces remaining as oversize on the screen and a screened out collection of granular material forming a non-composted wood-waste product containing dry wood particles of uniform size compatible with the size of the screen and soil particles making up at least a portion of said wood-waste product.

5,558,695

PROCESS AND UNIT FOR CONTINUOUS METAL REFINEMENT

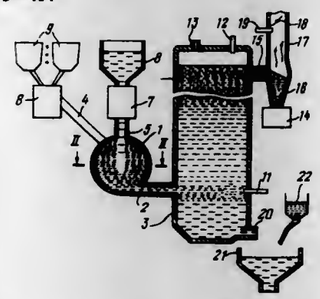
Valentin P. Tsymbal; Sergei P. Mochalov; Kim M. Shakirov; Rafik S. Aizatulov; Boris A. Kustov; Nikolai I. Mikheev, and Anatoly L. Toropov, all of Novokuznetsk, Russian Federation, assignors to Aktsionernoe Obochestvo Otkrytogo Tipa, Russian Federation

PCT No. PCT/RU93/00325, § 371 Date Aug. 29, 1995, § 102(e) Date Aug. 29, 1995, PCT Pub. No. WO95/18238, PCT Pub. Date Jun. 7, 1995

PCT Filed Dec. 30, 1993, Ser. No. 513,783

Int. Cl.[6] C21C *5/30*

U.S. Cl. 75—414 **2 Claims**



1. In a process for continuous metal refinement comprising the steps of feeding molten metal to a reaction chamber, introducing an oxidizing agent and bulk materials additives, converting the metal and resulting slag into a foamy emulsion, withdrawing the emulsion to a refining sump, separating the metal and slag in the sump and removing the gas formed through a layer of emulsion, the improvement which comprises the oxidizing agent comprising 25–80% solid oxidant and 20–75% gaseous oxygen and being introduced at an oxygen flow rate of 0.06 to 0.11 kg/kg of metal, the molten metal being fed at a flow rate of 2 to 60 kg/cm^3 of the volume of the reaction chamber such to establish a pressure of from 0.4 to 3.0 MPa and 0.15 to 0.20 MPa in the chamber and sump, respectively.

5,558,696

METHOD OF DIRECT STEEL MAKING FROM LIQUID IRON

Richard B. Greenwalt, Danville, Calif., assignor to Bechtel Group, Inc., San Francisco, Calif.

Filed Dec. 15, 1993, Ser. No. 167,268

Int. Cl.[6] C21B *13/14*

U.S. Cl. 75—505 **8 Claims**

1. A method for making steel comprising providing a melter gasifier having a fuel charging entry, an oxygen entry, a lower molten metal and slag collection end, a reduction gas discharging port and means providing an entry for charging ferrous material into said melter gasifier; introducing petroleum coke into said melter gasifier through said fuel charging entry; introducing oxygen into said melter gasifier through said oxygen entry and combusting petroleum coke in said melter gasifier to format least a first fluidized bed of coke particles from said petroleum coke and a hot reducing gas; directing said hot reducing gas to a primary direct reduction furnace and contacting iron ore with said hot reducing gas in said first direct reduction furnace to produce direct reduced metallic iron; introducing the direct reduced metallic iron into said melter gasifier and reacting petroleum coke, oxygen and the direct reduced metallic iron in said melter gasifier to produce reduction gas and molten iron containing heavy metals freed from the combustion of the petroleum coke.; removing said reduction gas from said melter gasifier; directing a portion of said reduction gas to the primary reduction furnace; providing a steel making reactor; introducing molten iron directly from said melter gasifier into said steel making reactor; introducing oxygen into said steel making reactor and reacting the oxygen with molten iron and secondary reduced metallic iron to form steel, off gas, and a steel making slag in said steel making reactor; and drawing off steel and steel making slag from said steel making reactor.

5,558,697

DUAL CYCLONIC VACUUM CLEANER

James Dyson, Chippenham, United Kingdom; Allan D. Millman, Toronto, and Tat-Chi A. Tsui, St. Catherines, both of Canada, assignors to Notetry Limited, Chippenham, United Kingdom

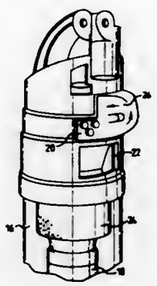
PCT No. PCT/GB93/01325, § 371 Date Apr. 17, 1995, § 102(e) Date Apr. 17, 1995, PCT Pub. No. WO94/00046, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 24, 1930, Ser. No. 360,653

Claims priority, application United Kingdom, Dec. 8, 1992, 9225599

Int. Cl.[6] B01D *45/00*

U.S. Cl. 95—12 **29 Claims**



29. A method of operating a cyclonic vacuum cleaner having first and second cyclones arranged in series along an airflow path, comprising the steps of:

a) admitting dirty air into the first cyclone;

b) partially cleaning the dirty air in the first cyclone to produce partially filtered air;

c) conducting the partially filtered air from the first cyclone to the second cyclone;

d) further cleaning the partially filtered air in the second cyclone to produce further cleaned air; and

e) exhausting the further cleaned air from the second cyclone through a clean air outlet

wherein bled air is admitted, in addition to the partially filtered air, into the second cyclone only when either the pressure of the air flowing along the airflow path falls to or below a predetermined level or the amount of particulates in the air at or adjacent the clean air outlet exceeds a predetermined level for reducing particulates in the further cleaned air.

5,558,698

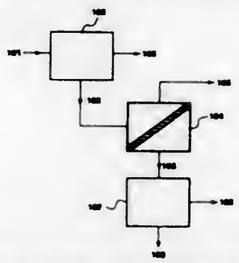
ACID GAS FRACTIONATION PROCESS

Richard W. Baker, Palo Alto, and Kaaeid A. Lokhandwala, Menlo Park, both of Calif., assignors to Membrane Technology and Research, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 143,283, Oct. 25, 1993, Pat. No. 5,401,308, Ser. No. 143,285, Oct. 25, 1993, Pat. No. 5,407,466, and Ser. No. 143,496, Oct. 25, 1993, Pat. No. 5,407,467. This application Mar. 27, 1995, Ser. No. 410,676

Int. Cl.[6] B01D *53/22;53/14*

U.S. Cl. 95—49 **35 Claims**



1. A process for treating a gas stream comprising hydrogen sulfide and carbon dioxide, said process comprising:

(a) carrying out an acid gas removal step on said gas stream, thereby generating an acid gas stream enriched in said hydrogen sulfide and said carbon dioxide compared with said gas stream;

(b) carrying out a membrane fractionation step, comprising:

(i) passing said acid gas stream across the feed side of a fractionation membrane having a feed side and a permeate side;

(ii) withdrawing from said feed side a residue stream depleted in said hydrogen sulfide compared with said acid gas stream;

(iii) withdrawing from said permeate side a permeate stream enriched in said hydrogen sulfide compared with said acid gas stream;

said membrane fractionation step being characterized in that said fractionation membrane exhibits a mixed gas selectivity for said hydrogen sulfide over said carbon dioxide of at least about 3, as measured with mixtures containing at least said hydrogen sulfide and said carbon dioxide and at a feed pressure of at least 200 psig;

(c) further treating said permeate stream in a sulfur-fixing step.

5,558,699

THERMOCHROMIC COLOR-MEMORY COMPOSITION

Akio Nakashima, Tsushima, and Yutaka Shibahashi, Nagoya, both of Japan, assignors to The Pilot Ink Co., Ltd., Nagoya, Japan

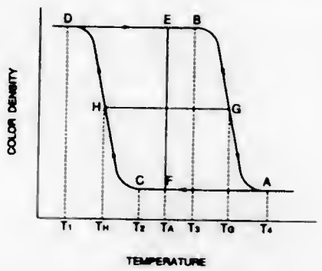
Filed Dec. 23, 1994, Ser. No. 362,984

Claims priority, application Japan, Dec. 24, 1993, 5-347757; Aug. 2, 1994, 6-201445

Int. Cl.[6] C09D *11/00*

U.S. Cl. 106—21 A **3 Claims**

1. A thermochromic color-memory composition comprises a homogeneous solubilized mixture of essential three components of (a) an electron-donating color-developing organic compound, (b) an electron-accepting compound, and (c) a reaction medium for



controlling a color reaction of the component (a) with the component (b); the component (c) being selected from aliphatic ketones of 10 to 22 total carbons and aryl alkyl ketones of 12 to 24 total carbons; and the composition changing the color thereof with a large hysteresis width (ΔH) of from 8° C. to 80° C.

5,558,700

REVERSIBLE THERMOCHROMIC COMPOSITION

Yutaka Shibahashi, and Jun Sugai, both of Nagoya, Japan, assignors to The Pilot Ink Co., Ltd., Nagoya, Japan

Filed Dec. 23, 1994, Ser. No. 362,991

Claims priority, application Japan, Dec. 24, 1993, 5-347755; Oct. 28, 1994, 6-288742

Int. Cl.[6] C09D *11/00*

U.S. Cl. 106—21 A **20 Claims**

1. A reversible thermochromic composition which develops fluorescent colors, comprising a solubilized mixture of three components of (a) an electron-donating color-developing organic compound selected from the group consisting of, quinazoline, and bisquinazoline compounds, (b) an electron-accepting compound for the electron-donating color-developing organic compound, and (c) a compound serving as a reaction medium for causing reversibly an electron exchange reaction between the components (a) and (b) within a specified temperature range.

5,558,701

SOL-GEL COMPOSITION FOR PRODUCING GLASSY COATINGS

Bipin C. M. Patel, Greenford, England, assignor to British Technology Group Limited, London, England

PCT No. PCT/GB94/00015, § 371 Date Jul. 25, 1995, § 102(e) Date Jul. 25, 1995, PCT Pub. No. WO94/15882, PCT Pub. Date Jul. 21, 1994

PCT Filed Jan. 5, 1994, Ser. No. 448,483

Claims priority, application United Kingdom, Jan. 8, 1993, 9300261

Int. Cl.[6] C09K *3/00;* **A61K** *6/093*

U.S. Cl. 106—35 **32 Claims**

1. A sol gel, xerogel or heat-consolidated gel composition comprising a hydrolyzable boron ester; a solvent; a metal alkoxide(s) of one or more metals selected from the group consisting of: Al, GpVB metals, and GpIVB metals; and a filler having a mean filler particle size of up to 3 μm in one dimension and 5–100 μm in the other two dimensions.

5,558,702

ASPHALT EMULSIONS CONTAINING AMPHOTERIC EMULSIFIER

Roger K. Chatterjee, Westerville, and Charles R. Millburn, Delaware, both of Ohio, assignors to Witco Corporation, Greenwich, Conn.

Filed Mar. 24, 1995, Ser. No. 409,663

Int. Cl.[6] C09D *195/00*

U.S. Cl. 106—277 **31 Claims**

1. An oil-in-water asphalt emulsion comprising

(A) water as a continuous phase;

(B) asphalt uniformly dispersed in said continuous phase;

(C) particulate filler uniformly dispersed in said continuous phase;

(D) at least one amphoteric emulsifier, said emulsifier having the formula:

$$R^4—(OC_3H_6)_{0-1}(C(O)NH(CH_2)_{1-3})_{0-1}— N(Z^1)(Z^2)_{0-1}—ZCOOX$$

wherein X is hydrogen, sodium, calcium, potassium, lithium, ammonium, an amine of the formula $—N^+H(C_1–C_{20}\ alkyl)_2$ or an amine of the formula $—N^+H_2(C_1–C_{20}\ alkyl)$; R^4 is straight or branched alkyl, straight or branched alkylene, homocyclic or heterocyclic aromatic optionally substituted with alkyl with the provisos that R^4 contains 4–40 carbon atoms and 0–5 carbon-carbon double bonds; Z^1 and Z^2 are independently C_fH_{2f+1} or $C_fH_{2f}OH$ with the proviso that one of Z^1 and Z^2 may also be —ZCOOX; f is 1 to 6; and Z is $(CH_2)_f$, $CH_2CH_2OCH_2CH_2$ or CH_2CHOCH_2; and

(E) at least one anionic emulsifier selected from the group consisting of (a) a compound having the structural formula $(R^1CH(OH)—(CH_2)_mSO_3)_iX$; (b) a compound having the structural formula $(R^1CH═CH(CH_2)_{m-1}SO_3)_iX$; (c) mixtures of compounds (a) and (b); (d) a compound having the structural formula $R^2O—(AlkO)CH_2COOX$; and (e) a compound having the structural formula $((R^3)_k—(A)—SO_3)_iX$, wherein R^1 contains 6 to 40 carbon atoms and is straight or branched aliphatic, aromatic, alkyl-aromatic, aromatic-alkyl or alkyl-aromatic-alkyl; m is 1 to 10; i is 1 or more; R^2 contains 6 to 40 carbon atoms and is straight or branched aliphatic, aromatic, alkyl-aromatic, aromatic-alkyl or alkyl-aromatic-alkyl; Alk is C_2H_4, C_3H_6 or C_4H_8; c is 1 to 200; R^3 contains 6 to 40 carbon atoms and is straight or branched aliphatic, aromatic-alkyl or alkyl-aromatic-alkyl; A is phenyl or naphthyl; k is 1, 2 or 3; i is 1 or more and is the valence of X; and X has the meanings given above.

19. An oil-in-water asphalt emulsion comprising

(A) water as a continuous phase;

(B) asphalt uniformly dispersed in said continuous phase;

(C) particulate filler uniformly dispersed in said continuous phase; and

(D) at least one amphoteric emulsifier, said emulsifier having the formula:

$$R^4—(OC_3H_6)_{0-1}(C(O)NH(CH_2)_{1-3})N(Z^2)ZSO_3X$$

wherein X is hydrogen, sodium, calcium, potassium, lithium, ammonium, an amine of the formula $—N^+H(C_1–C_{20}\ alkyl)_2$ or an amine of the formula $—N^+H_2(C_1–C_{20}\ alkyl)$; R^4 is straight or branched alkyl, straight or branched alkylene, homocyclic or heterocyclic aromatic optional substituted with alkyl with the provisos that R^4 contains 4–40 carbon atoms and 0–5 carbon-carbon double bonds; Z^1 and Z^2 are independently C_fH_{2f+1} or $C_fH_{2f}OH$; f is 1 to 6; and Z is $(CH_2)_f$, $CH_2CH_2OCH_2CH_2$ or CH_2CHOCH_2.

5,558,703

BITUMINOUS COMPOSITIONS

Pierre Bredael, Brussels, Belgium, assignor to Fina Research, S.A., Feluy, Belgium

Filed Nov. 12, 1993, Ser. No. 152,344

Claims priority, application Belgium, Nov. 12, 1992, 09200978

Int. Cl.[6] C08L *95/00*

U.S. Cl. 106—281.1 **8 Claims**

1. A composition comprising:

(A) 100 parts of an aggregate comprising

(i) from 79 to 88 parts by weight of macadam having a particle size of between 6 and 17 mm,

(ii) from 9 to 15 parts by weight of sand having a particle size of between 0.08 and 2 mm, and

(iii) from 3 to 8 parts by weight of inert filling material having a particle size smaller than 0.08 mm;

(B) from 3.5 to 7 parts by weight based on the aggregate of bitumen which has a penetration value from 65 to 150 tenths of millimeter at 25° C.;

(C) from 2 to 7% by weight of the bitumen of a first modifier chosen from the group consisting of styrene-butadiene polymers, styrene-isoprene polymers, recycled tires and mixtures thereof; and

(D) from 0.5 to 5 parts by weight based on the aggregate of a second modifier chosen from the group consisting of polyolefins, polyethylene terephthalate and mixtures thereof.

5,558,704

PAVING ASPHALT CONCRETE COMPOSITION

Kinji Masuda; Minoru Kuriki, both of Yokohama, and Kozo Hokari, Niigata, all of Japan, assignors to Bridgestone Corporation, Tokyo, and Fukuda Road Construction Co., Ltd., Niigata Pref, both of Japan

Filed Jul. 13, 1995, Ser. No. 502,157

Int. Cl.[6] C08L *9/00*

U.S. Cl. 106—281.1 **33 Claims**

1. A paving asphalt concrete composition consisting essentially of 0.3–20% by weight of an oil-impregnated vulcanized rubber crumb and 99.7–80% by weight of an asphalt-aggregate mixture, the oil-impregnated vulcanized rubber crumb being previously prepared before mixing with the asphalt-aggregate mixture and consisting of 99–60% by weight of vulcanized rubber and 1–40% by weight of an extender oil, wherein the extender oil is an aromatic oil.

5,558,705

COLORED METALLIC PIGMENTS

Craig B. Keemer, Reading; Walter S. Halbach, Wyomissing; William G. Jenkins, Larksville, and Russell L. Ferguson, Lehighton, all of Pa., assignors to Silberline Manufacturing Co., Inc., Tamaqua, Pa.

Filed Oct. 31, 1994, Ser. No. 332,600

Int. Cl.[6] C09C *1/62;1/64*

U.S. Cl. 106—403 **12 Claims**

1. A colored metallic pigment composition, comprising:

a metallic particle;

a pigment dispersion comprising colored pigment particles dispersed in a wax, adsorbed on part of the surface of the metallic particle;

an organometallic coupling agent bound to the surface of the metallic particle through a readily hydrolyzable group; and

a polymeric shell, the coupling agent having a relatively non-hydrolyzable group which serves as a binding site for the polymeric shell.

5,558,706

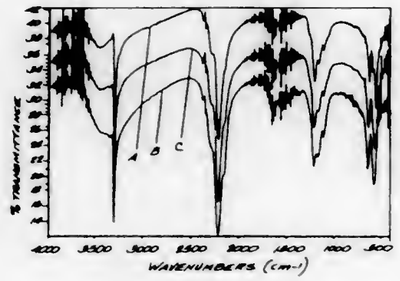
CORROSION INHIBITING PIGMENT COMPOSITION

John Sinko, Glendale, Wis., assignor to Wayne Pigment Corp., Milwaukee, Wis.

Continuation-in-part of Ser. No. 155,586, Nov. 19, 1993, Pat. No. 5,487,779. This application Dec. 15, 1995, Ser. No. 574,448

Int. Cl.[6] C04B *14/36*

U.S. Cl. 106—480 **5 Claims**



1. A corrosion inhibitor pigment composition comprising a solid solution of (Ni^{2+} and Co^{2+})-bis-hydrogen cyanamide.

5,558,707

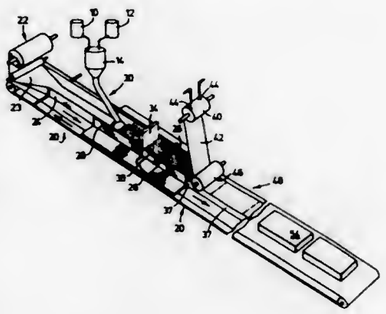
FIRE DOOR CORE

Jorgen O. Bernt, Oakville, and Kevin B. Langille, Burlington, both of Canada, assignors to J.O. Bernt & Associates Limited, Mississauga, Canada

Continuation-in-part of Ser. No. 247,249, May 23, 1994, abandoned. This application Jun. 1, 1995, Ser. No. 457,137

Int. Cl.[6] C04B *11/00*

U.S. Cl. 106—677 **8 Claims**



1. A core for fire doors, comprising the mixture of: hydrated gypsum occupying 40%–46% of the core volume,

the remainder of the core volume being large bubbles which are between 1 and 4 mm, small bubbles of about 80% of which are between 0.01 and 0.25 mm, and other components

where the large bubbles occupy about 31%–38% of the core volume,

and the small bubbles occupy about 17% to 25% of the core volume.

5,558,708

SYSTEM AND METHOD FOR DISPERSING PIGMENT IN CEMENT BASED COMPOSITIONS

Charles J. Johansen, Jr., Katy; Ernest D. Hollas, Weimax; Robert L. Vecchio, Spring, and Hani Zoumut, Houston, all of Tex., assignors to C-Cure Corporation, Houston, Tex.

Filed May 11, 1995, Ser. No. 438,781

Int. Cl.[6] C04B *14/00*

U.S. Cl. 106—712 **19 Claims**

1. A system for producing a pigmented cement composition consisting essentially of:

(a) a powder cement component; and

(b) an aqueous pigment component wherein the cement component and pigment component are separately packaged and mixed together prior to use to produce a composition with a uniform and standardized color.

5,558,709

FLOW IMPROVING AGENTS FOR BINDER SUSPENSIONS CONTAINING CEMENT

Josef Weichmann, Pleiskirchen; Aloisia Stadler, Tacherting, and Alfred Kern, Kirchweidach, all of Germany, assignors to SKW Trostberg, Trostberg, Germany

Filed Aug. 22, 1995, Ser. No. 517,818

Claims priority, application Germany, Aug. 26, 1994, 44 30 362.9

Int. Cl.[6] C04B *24/00;24/22*

U.S. Cl. 106—727 **15 Claims**

12. A self-levelling smoothing composition comprising: a cement-containing binder suspension; 0.01 to 10% by weight, relative to the cement content, of a flow improving agent said flow improving agent comprising (a) a condensation product with a molar ratio of amino-s-triazine:formaldehyde: sulfite of 1:1.3 to 6.0:0.3 to 1.5; free formaldehyde in an amount of up to 0.1% by weight; and (b) casein in a weight ratio of 10:1 to 1:10 relative to the condensation product.

5,558,710

GYPSUM/CELLULOSIC FIBER ACOUSTICAL TILE COMPOSITION

Mirza A. Baig, Des Plaines, Ill., assignor to USG Interiors, Inc., Chicago, Ill.

Filed Aug. 8, 1994, Ser. No. 287,392

The portion of the term of this patent subsequent to Jan. 14, 2014, has been disclaimed.

Int. Cl.[6] C04B *11/00*

U.S. Cl. 106—780 **42 Claims**

1. A wetted, mineral wool-free composition suitable for making acoustical tiles in water-felting process consisting essentially of gypsum, cellulosic fiber, a lightweight aggregate material and a binder, in which on a dry solids basis there is at least about 15% by weight of gypsum and at least 13% by weight of cellulose fiber.

5,558,711

ELECTRODE FORMING METHOD FOR SURFACE ACOUSTIC WAVE DEVICE

Atsushi Sakurai, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 5, 1994, Ser. No. 349,310

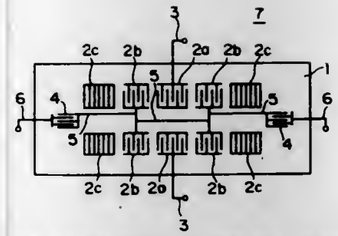
Int. Cl.[6] C30B *25/06*

U.S. Cl. 117—84 **57 Claims**

1. A method of forming electrodes of a surface acoustic wave device, said method comprising the steps of:

preparing a piezoelectric substrate; and

forming an epitaxial film of an electrode material on a surface of said piezoelectric substrate such that a (111) plane of the epitaxial film is oriented so as to be substantially parallel to said surface of said piezoelectric substrate by an epitaxial thin film forming method while simultaneously carrying out ion assistance at an ion energy.



5,558,712

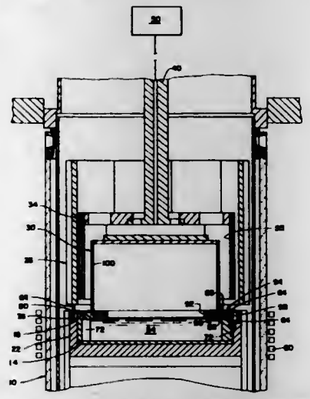
CONTOURED INNER AFTER-HEATER SHIELD FOR REDUCING STRESS IN GROWING CRYSTALLINE BODIES

Juris P. Kalejs, Wellesley, Mass., assignor to ASE Americas, Inc., Billerica, Mass.

Filed Nov. 4, 1994, Ser. No. 334,753

Int. Cl.[6] C30B *35/00*

U.S. Cl. 117—289 **9 Claims**



1. Apparatus for growing hollow crystalline bodies from a melt, said apparatus including in combination:

a furnace containing a crucible for holding a melt of material to be used to form said crystalline body;

a capillary die having an end face in the form of a selected polygon and capillary means for feeding melt from said crucible to said end face;

means for (a) holding an elongate hollow tubular seed of selected cross-sectional configuration in contact with a film of melt on said end face, and (b) moving said seed vertically away from said end face so as to grow a hollow crystalline body from said film of melt;

a radiation shield disposed interior to said capillary die end face and supported in such manner as to be clear of any contact with but at the same time confronting any melt in said crucible, said radiation shield having an outer edge configuration similar to said selected polygon and also having a central opening;

a hollow tubular inner after-heater so dimensioned as to be contained entirely within said tubular seed when said seed is in contact with a film of melt on said end face; said inner after-heater being supported on said radiation shield and having an interior in communication with said crucible through said opening in said radiation shield; and

a hollow tubular outer after-heater surrounding and spaced from said inner after-heater, said outer after-heater being dimensioned so as to surround said seed when said seed is in contact with said film of melt;

said radiation shield having an outer edge formed by a plurality of faces that is contoured so as to provide a temperature gradient along the periphery of said die end face that minimizes thermal stresses along the growing crystalline body.

5,558,713

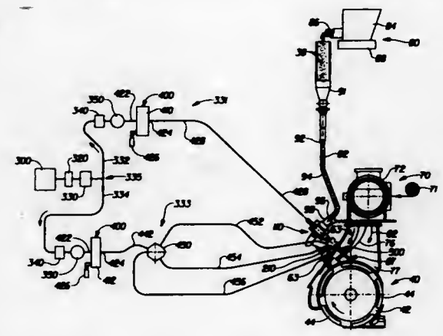
METHOD AND APPARATUS FOR FORMING A PULSED STREAM OF PARTICLES FOR APPLICATION TO A FIBROUS WEB

Robert H. Siegfried; James M. Fleming; Michael J. Stalford, all of Cincinnati, and John P. Jansen, Cleves, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 31, 1994, Ser. No. 332,022

Int. Cl.[6] B05D *1/12; B05C 5/00*

U.S. Cl. 118—308 **20 Claims**



1. An apparatus for forming a pulsed stream of discrete particles for application to a fibrous web, the apparatus comprising:

a particle metering apparatus for providing a stream or particles having a predetermined mass flow rate;

a particle accelerating apparatus for receiving and accelerating the stream of particles provided by the particle metering apparatus, the particle accelerating apparatus comprising:

an acceleration air nozzle mid a particle outlet disposed downstream of the acceleration air nozzle, the acceleration air nozzle providing a particle accelerating airflow in a downstream direction from the acceleration air nozzle toward the particle outlet; and

a particle inlet for receiving the stream of particles provided by the particle metering apparatus, the particle inlet disposed upstream of the particle outlet;

a particle distributing nozzle in flow communication with tho particle accelerating apparatus, the particle distributing nozzle disposed downstream of the acceleration air nozzle;

at least one deceleration air nozzle disposed downstream of the particle inlet and upstream of the particle distributing nozzle for providing a particle decelerating airflow in an upstream direction;

at least one pressurized air supply for providing airflow to the acceleration and deceleration air nozzles; and

valving for controlling tho airflow provided to the acceleration and deceleration air nozzles by the pressurized air supply.

170–921 O.G.–96–12: QL3

5,558,714

a pump outputting a predetermined quantity of liquid coating

wherein said insulating ring outside flange is configured to

5,558,714

TWO TANK AND WORK-HOLDER APPARATUS FOR LIQUID COATING FOR HONEYCOMB STRUCTURE

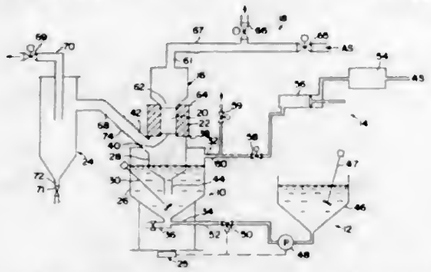
Tateshi Watanabe, Fuji; Tsunao Watanabe, Numazu; Tadashi Watanabe, Numazu; Hidetomo Matsugu, Numazu, and Yasuhiro Yamanouchi, Numazu, all of Japan, assignors to N. E. Chemcat Corporation, Tokyo, Japan

Continuation of Ser. No. 893,078, Jun. 2, 1992, Pat. No. 5,422,138, which is a division of Ser. No. 614,629, Nov. 16, 1990, Pat. No. 5,182,140. This application Jun. 24, 1994, Ser. No. 264,980

Claims priority, application Japan, Nov. 16, 1989, 1-296127; Jun. 4, 1990, 2-144418

Int. Cl.[6] B05C *3/00*

U.S. Cl. 118—421 **8 Claims**



1. A liquid coating apparatus for coating inner cells in a honeycomb structure with a liquid, comprising:

a liquid storage tank for storing a liquid to be used for coating, said storage tank having an upper opening and an air discharge outlet;

a holder for holding a honeycomb structure connected to the upper opening of the storage tank;

an air duct for supplying an air stream via an upper opening connected to an air supply, the air duct having a lower opening into a top of the holder for holding the honeycomb structure;

a first sealing element formed by the holder connecting a bottom of the holder to the upper opening of the liquid storage tank and a second sealing element formed by the holder connecting the top of the holder to the lower opening of the air duct; and

means for raising a liquid in the liquid storage tank through the upper opening and the inner cells in the honeycomb structure.

5,558,715

METHOD FOR THE PURIFICATION OF A BATH FOR COATING METALLURGICAL PRODUCTS WITH A METALLIC ALLOY, AND INSTALLATION FOR THE IMPLEMENTATION OF THIS METHOD

Patrick Abed, Poissy; Marc Dauzat, Magny Cours; Jean-Marc Rouxel, Conflans Sainte Honorine, and Michel Nogues, Triel sur Seine, all of France, assignors to SOLLAC, Societe anonyme, Puteaux, France

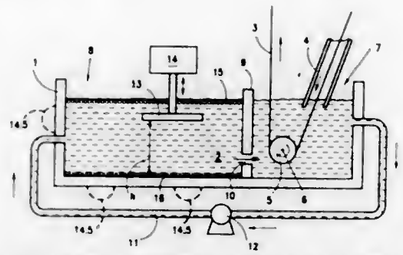
Filed Jan. 14, 1994, Ser. No. 181,553

Claims priority, application France, Jan. 22, 1993, 93 00761

Int. Cl.[6] B05C *3/00*

U.S. Cl. 118—429 **12 Claims**

1. An installation for coating steel products with a zinc alloy, comprising: a tank containing a bath of a molten zinc alloy wherein the tank includes a partition for separating the bath into first and second compartments and includes circulation means for circulating dross enriched alloy from said first compartment to said second compartment; a means for dipping steel products into a portion of said bath to coat said product with said zinc alloy, wherein said dipping means is contained in said first compartment; and means for accelerating the decantation of dross iron and zinc intermetallic compounds such that said dross is separated from said first compartment, wherein said means for accelerating the decantation includes means for exposing said bath with the circulated



dross enriched alloy to sound vibration for separating said dross in said with the circulated dross enriched alloy from the remainder of the zinc alloy,

wherein the means for exposing said bath to sound vibration is arranged in the second compartment and wherein said means for circulation further includes means for circulating the remainder of said zinc alloy from said second compartment to first compartment.

5,558,716

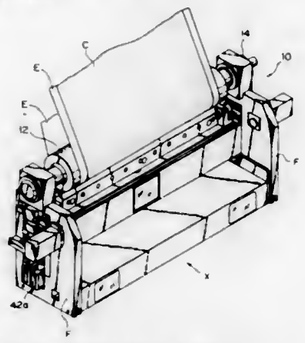
COATING MACHINE WITH AN ADJUSTABLE NOZZLE AND A PRESSURE SENSOR

Shigetoshi Mitani, and Takeshi Matsumoto, both of Nara, Japan, assignors to Hirano Tecseed Co., Ltd., Nara, Japan

Filed Apr. 1, 1993, Ser. No. 41,832

Int. Cl.[6] B05C *11/00*

U.S. Cl. 118—674 **6 Claims**



1. A coating machine comprising a frame;

a backing roll rotatably mounted to the frame for conveying a web to be coated at a conveying speed;

a nozzle mounted to the frame below the backing roll and extending parallel to the backing roll, the nozzle comprising a nozzle body having an upper wall, an inlet for receiving a liquid coating material, a first chamber connected to the inlet, a passage with a width generally corresponding to a width of the backing roll, said passage having a first end connected to said first chamber and a second end connected to an outlet for discharging the liquid coating material under pressure toward a web on the backing roll, the frame having a front side and the web to be coated travels from the front side of the frame past the nozzle;

the outlet comprising a recess in the upper wall having a size greater than a cross-sectional area of the second end of the passage and extending at least toward the front side to form a second chamber between the upper wall of the nozzle body and the backing roll;

a doctor edge arranged on the nozzle adjacent the outlet at a clearance between the backing roll and the doctor edge;

a support means including at least one actuator for adjustably supporting the nozzle body to the frame and for adjusting said clearance between the doctor edge and the backing roll;

a pump outputting a predetermined quantity of liquid coating material per revolution for supplying a liquid coating material to the inlet of the nozzle;

a first detecting means for detecting the conveying speed of the web;

a second detecting means for detecting a thickness of a layer of the coated material on the web;

a third detecting means for detecting a preasure in the second chamber of the nozzle;

a first control means for controlling a speed of the pump in response to output signals of the first and second detecting means;

a second control means for controlling the actuator of the support means in response to an output signal of the third detecting means as well as the output signal of said second detecting means.

5,558,717

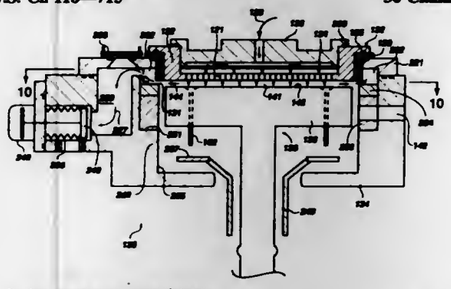
CVD PROCESSING CHAMBER

Jun Zhao, Milpitas; Tom Cho, San Francisco; Charles Dornfest, Fremont; Stefan Wolff, Sunnyvale; Kevin Fairbairn, Saratoga; Xin S Guo, Mountain View; Alex Schreiber, Santa Clara, and John M. White, Hayward, all of Calif., assignors to Applied Materials, Santa Clara, Calif.

Filed Nov. 30, 1994, Ser. No. 348,273

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—715 **36 Claims**



1. An apparatus comprising:

a vacuum processing chamber for processing a substrate at a substrate processing location therein;

a substrate support for supporting the substrate at said substrate processing location; and

a gas distribution faceplate opposite said substrate support for directing process gas toward said substrate processing location,

wherein said chamber includes a body portion surrounding a perimeter of said substrate support and said substrate processing location, said body portion including a top surface against which a lid of said chamber is sealed, said lid when in position on said top surface faces: a top of said substrate support, said substrate processing location, a top of a perimeter wall of said substrate processing location, and a bottom portion of a vacuum duct disposed between said lid and said body portion surrounding said top of the perimeter wall of said substrate processing location, inside seal limits of the chamber gas seal between the body portion and the lid, said vacuum duct being connected to a vacuum system evacuating the processing chamber;

wherein said lid includes a gas supply opening located opposite said substrate processing location;

wherein said gas distribution faceplate is located within said gas supply opening in said lid and is separated from said lid by an annular insulating ring, said annular insulating ring is configured in the shape of a hollow tube with an insulating ring outside flange at one end,

wherein an outside of said tube matches the shape of the inside of said gas supply opening in said lid and said tube is sized to pass through said gas supply opening into the chamber,

wherein said insulating ring outside flange is configured to overlap a top surface of said lid adjacent to an edge of said gas supply opening, Said insulating ring being sealed to said lid gas supply opening,

wherein said gas distribution faceplate is configured to be supported within said gas supply opening by said annular insulating ring to which it is sealed,

wherein in use a bottom end of said annular insulating ring is configured to be disposed opposite said top of the perimeter wall of said substrate processing location forming one or more openings between the bottom end of the annular insulating ring and the top of the perimeter wall of said substrate processing location, said one or more openings act as one or more orifice gas passages between the substrate processing location and vacuum duct of said chamber.

5,558,718

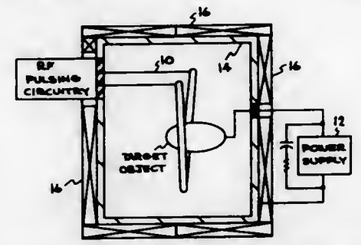
PULSED SOURCE ION IMPLANTATION APPARATUS AND METHOD

Ka-Ngo Leung, Hercules, Calif., assignor to The Regents, University of California, Oakland, Calif.

Filed Apr. 8, 1994, Ser. No. 225,043

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—723 E **25 Claims**



1. A plasma immersion ion implantation apparatus comprising:

a) a vacuum chamber;

b) a plasma source located within said vacuum chamber;

c) means to connect electrical pulsing circuitry to the plasma source, said circuitry comprising,

i) a sine-wave oscillator;

ii) a pulse generator;

iii) an RF generator, with one input connected to the output of the sine-wave oscillator and the other input electrically connected to the output of the pulse generator;

iv) an isolation transformer;

v) a coaxial cable electrically connecting the output of the RF generator to the isolation transformer;

vi) an impedance matching circuit with input electrically connected to the isolation transformer and output electrically connected to the plasma source; and

d) means to connect a voltage source to the target.

5,558,719

PLASMA PROCESSING APPARATUS

Shinji Tsuchida, Tsuzuki-gun; Shigenori Ueda, and Junichiro Hashizume, both of Nara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1995, Ser. No. 421,255

Claims priority, application Japan, Apr. 18, 1994, 6-079013

Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—723 E **7 Claims**

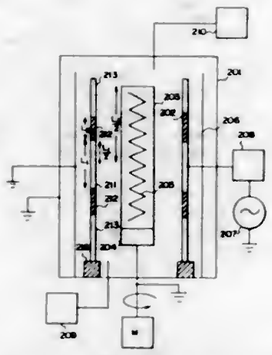
1. A plasma processing apparatus, having a cathode electrode surrounding a target film formation base set in a deposition apparatus capable of pressure reduction and arranged parallel to said target film formation base, in which a plasma is generated between said cathode electrode and said target film formation base by

5,558,721

VAPOR PHASE GROWTH SYSTEM AND A GAS-DRIVE

a substrate electrode;

a discharge coil which is partially or wholly made to have a



applying an RF power having a discharge frequency of 20 MHz to 450 MHz to said cathode electrode, wherein said cathode electrode is constituted by one metal material portion and at least two dielectric portions arranged at positions to sandwich said metal material portion, and a ratio (L_1/L_2) of a size (L_1) of said metal material portion of said cathode electrode in an axial direction to a size (L_2) of said target film formation base in the axial direction falls within a range of 0.1 to 0.45.

5,558,720

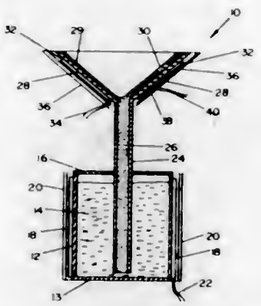
RAPID RESPONSE VAPOR SOURCE

David B. Sarraf, Elizabethtown, and David L. Miller, State College, both of Pa., assignors to Thermacore, Inc., Lancaster, and Pennsylvania State Research Foundation, University Park, both of Pa.

Filed Jan. 11, 1996, Ser. No. 584,288

Int. Cl.[6] C23C *14/00*

U.S. Cl. 118—726 **8 Claims**



1. An apparatus for controlled generation of vapors comprising:
an evaporator structure with a first and a second surface;
an evaporator wick attached to and covering the first surface of the evaporator structure;
at least one evaporator heater attached to the second surface of the evaporator structure and means to operate each evaporator heater;
a capillary tube with a first end of the tube attached to the evaporator structure and a second end remote from the evaporator structure;
a capillary wick located within the capillary tube so as to furnish a continuous capillary path from the second end to the first end of the capillary tube and also located so that a portion of the capillary wick is in contact with the evaporator wick;
a container with liquid in the container; and
the second end of the capillary tube located so that it is immersed in the liquid within the container.

5,558,721

VAPOR PHASE GROWTH SYSTEM AND A GAS-DRIVE MOTOR

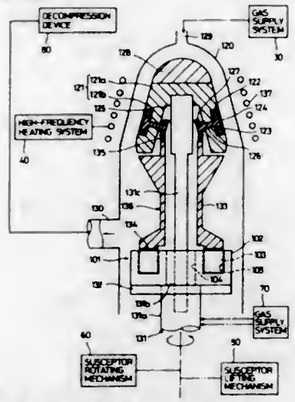
Yukio Kohmura, Chiba, and Koichi Toyosaki, Kisarazu, both of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1994, Ser. No. 337,056

Claims priority, application Japan, Nov. 15, 1993, 5-285245; May 31, 1994, 6-118112

Int. Cl.[6] C23C *16/00;* **F01D** *5/12;7/00*

U.S. Cl. 118—730 **19 Claims**



1. A vapor phase growth system comprising:
a reactor receiving therein a susceptor;
a tray arranged along an outer surface of the susceptor so as to be rotatable around an axis of the tray and adapted to support a wafer;
a heating system for heating at least the susceptor to a high temperature for carrying out vapor phase growth;
a gas-drive motor including a stator and a rotor which is rotatable with respect to the stator; and
a transmission mechanism having one side coupled to the rotor and another side and coupled to the tray; and
wherein the stator is formed with a rotor chamber, and the rotor is received in the rotor chamber so as to be liftable and rotatable with respect to the stator.

5,558,722

PLASMA PROCESSING APPARATUS

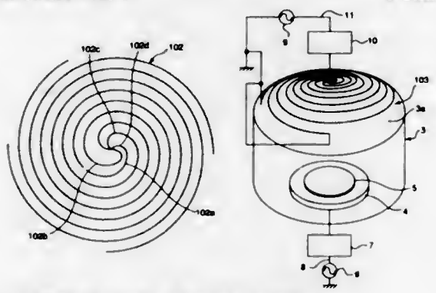
Tomohiro Okumura, Neyagawa; Ichiro Nakayama, Kadoma, and Yoshihiro Yanagi, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Sep. 14, 1995, Ser. No. 528,164

Claims priority, application Japan, Sep. 14, 1994, 6-219323

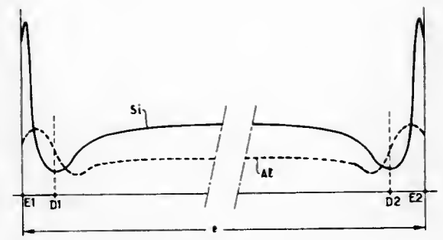
Int. Cl.[6] C23C *16/00*

U.S. Cl. 118—723 I **8 Claims**



1. A plasma processing apparatus comprising:
a vacuum vessel;

a substrate electrode;
a discharge coil which is partially or wholly made to have a multiple spiral configuration;
a high frequency power source; and
a matching circuit that is connected to the discharge coil by way of a conductor wire and connected to the high frequency power source via a connection cable, and generates plasma inside the vacuum vessel by applying a high frequency voltage to the discharge coil so as to process a substrate disposed on the substrate electrode.



5,558,723

THIN-FILM SOLAR MODULE WITH ELECTRICALLY CONDUCTIVE SUBSTRATE AND METHOD FOR THE MANUFACTURE THEREOF

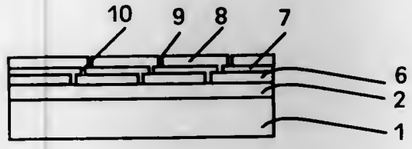
Klaus-Dieter Ufert, Unterschleissheim, Germany, assignor to Siemens Solar GmbH, Munich, Germany

Filed Apr. 10, 1995, Ser. No. 419,547

Claims priority, application Germany, Apr. 15, 1994, 44 13 215.8

Int. Cl.[6] H01L *31/042;31/18*

U.S. Cl. 136—244 **7 Claims**



1. A thin-film solar module comprising, in sequence:
an aluminum substrate;
an electrically insulating oxide layer disposed on and adjacent said aluminum substrate;
an electrically conducting, back electrode layer comprising an electrically conductive oxide layer disposed on and adjacent said electrically insulating oxide layer, said back electrode layer having a plurality of trenches therein dividing said back electrode layer into a plurality of back electrode layer regions, said electrically insulating oxide layer comprising an oxide which is the same as said back electrode layer but rendered electrically insulating;
an active semiconductor layer disposed in registry with and adjacent each back electrode layer region;
a front electrode composed of a transparent, conductive oxide disposed on and adjacent said active semiconductor layer; and
said back electrode layer regions, said active semiconductor layer and said front electrode, in combination, comprising a plurality of integrated, series-interconnected individual solar cells and forming a facade element.

5,558,724

METHOD OF INSULATING A MAGNETIC LAMINATION

Alain Roche, Villeurbanne, France, assignor to GEC Alsthom Transport SA, Paris, France

Filed Sep. 11, 1995, Ser. No. 526,455

Claims priority, application France, Sep. 12, 1994, 94 10860

Int. Cl.[6] C23F *7/10*

U.S. Cl. 148—113 **3 Claims**

1. A method for making a silicon magnetic lamination insulated with an iron-manganese phosphate coating that does not undergo substantial thinning when stress relieved at 600° C., comprising:
eliminating excess silicon and aluminum from the surface of a silicon magnetic substrate to allow the seeding and growth of iron-manganese phosphate crystals; and treating the surface with a solution of manganese phosphate to form an insulation coating of about 5 microns to 10 microns.

5,558,725

PROCESS FOR CARBURIZING WORKPIECES BY MEANS OF A PULSED PLASMA DISCHARGE

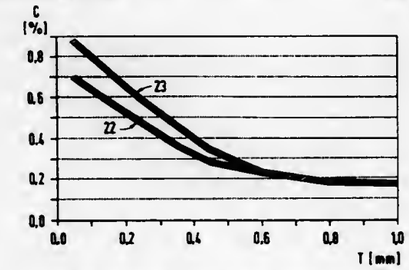
Frank Schnatbaum, Braunschweig, and Albrecht Melber, Darmstadt, both of Germany, assignors to ALD Vacuum Technologies GmbH, Erlensee, Germany

Filed Jul. 5, 1995, Ser. No. 498,216

Claims priority, application Germany, Aug. 6, 1994, 44 27 902.7

Int. Cl.[6] C23C *8/20*

U.S. Cl. 148—222 **9 Claims**



1. Process for carburizing a workpiece comprising
placing a workpiece of carburizable material in a chamber,
introducing a carbon-containing atmosphere at a pressure of 0.1–30 mbars into said chamber,
igniting a plasma in said chamber by means of a pulsed voltage during pulse times t_1 which are separated by pause times t_2, said pulsed voltage being 200–2000 V, and
maintaining a positive baseline voltage during said pause times, said baseline voltage being below a breakdown voltage at which the plasma can be ignited.

5,558,726

COLD ROLLED STEEL HAVING EXCELLENT MACHINABILITY AND PRODUCTION THEREOF

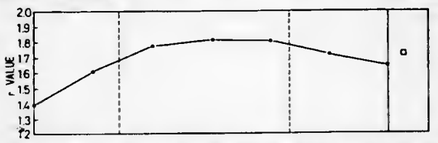
Hisayoshi Yatoh; Yasuhiko Yamashita; Takashi Harabuchi, and Seinosuke Yano, all of Kitakyusu, Japan, assignors to Nippon Steel Corporation, and Japan Casting & Forging Corporation, both of Tokyo, Japan

Filed Jun. 14, 1995, Ser. No. 481,426

Claims priority, application Japan, Oct. 18, 1993, 5-260247

Int. Cl.[6] C22C *38/14;* **C21D** *8/04*

U.S. Cl. 148—328 **7 Claims**



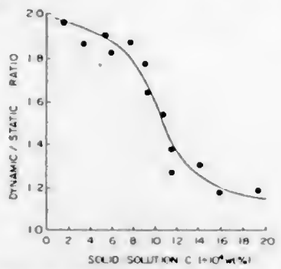
1. A cold rolled steel sheet having excellent formability and comprising not greater than 0.1 wt % of C, 0.0060 to 0.0150 wt %

of N, not greater than 0.4 wt % of Mn (within the range satisfying the relation Mn/S≧7), not greater than 0.030 wt % of S, 0.005 to 0.1% of Al, not greater than 0.08 wt % of Ti (within the range satisfying the relation (N (%)—Ti/3.42 (%)≦0.0070%), and the balance consisting of Fe and unavoidable impurities, wherein TiN having a size of 0.05 to 10 μm is precipitated in a weight of at least ½ of the total TiN weight.

5,558,727
STEEL SHEET FOR AUTOMOBILES HAVING EXCELLENT IMPACT RESISTANCE AND METHOD OF MANUFACTURING THE STEEL SHEET

Kazuya Miura; Shusaku Takagi; Takaaki Hira; Toshiyuki Kato, and Nobutaka Kurosawa, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Feb. 23, 1995, Ser. No. 393,445
Claims priority, application Japan, Dec. 26, 1994, 6-322737
Int. Cl.[6] C21D *8/02*; C22C *38/18*
U.S. Cl. 148—333 **9 Claims**

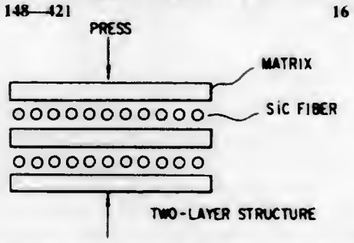


1. A steel sheet for automobiles having a dynamic/static ratio not less than 1.6, comprising 0.010–0.10 wt % of C, not greater than 1.50 wt % of Si, 0.50–3.00 wt % of Mn, not greater than 0.010 wt % of S and 0.01–0.1 wt % of Al, and at least one kind selected from 0.05– 0.15 wt % of P and 0.5–1.5 wt % of Cr, the balance being Fe and impurities, and having a structure mainly composed of 2–30 vol % of a martensite phase, and a ferrite phase containing a solid solution C not greater than 0.0010 wt %.

5,558,728
CONTINUOUS FIBER-REINFORCED TITANIUM-BASED COMPOSITE MATERIAL AND METHOD OF MANUFACTURING THE SAME

Masaru Kobayashi, Tokyo; Seiichi Suzuki, Kameda-machi; Hiroshi Iizumi, Kawasaki, and Chiaki Ouchi, Yokohama, all of Japan, assignors to NKK Corporation, Tokyo, and Shinanogawa Technopolis Development Organization, Nagaoka, both of Japan

Filed Jul. 5, 1994, Ser. No. 270,936
Claims priority, application Japan, Dec. 24, 1993, 5-345941
Int. Cl.[6] C22C *14/00*
U.S. Cl. 148—421 **16 Claims**

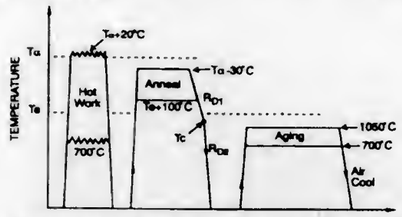


1. A continuous fiber-reinforced Ti-based composite material, comprising a Ti alloy matrix containing 3 to 7% by weight of Al, 2 to 5% by weight of V, 1 to 3% by weight of Mo, 1 to 3% by weight of Fe, 0.06 to 0.20% by weight of O, and a balance of Ti and unavoidable impurities, and SiC continuous fibers arranged within said matrix in one direction, said composite material having a strength exceeding 90% of a theoretical value obtained by the rules of mixtures.

5,558,729
METHOD TO PRODUCE GAMMA TITANIUM ALUMINIDE ARTICLES HAVING IMPROVED PROPERTIES

Young-Won Kim, Dayton, and Dennis M. Dimiduk, Beavercreek, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 27, 1995, Ser. No. 379,860
Int. Cl.[6] C22F *1/18*
U.S. Cl. 148—671 **3 Claims**



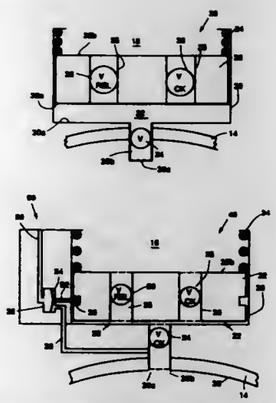
1. A method to produce duplex microstructure in an article of tungsten-containing gamma titanium aluminide alloy, which comprises the steps of (a) hot working the article, (b) annealing the so hot worked article at an annealing temperature in the range of T_β+100° C. to T_α–30° C. for about 1 to 15 hours, (c) cooling said article from said annealing temperature to a preselected temperature between said annealing temperature and about 700° C. at a first cooling rate of about 5° to 1000° C./min, (d) increasing the cooling rate to a second rate ranging from said first cooling rate to water quenching, and cooling said article from said preselected temperature to room temperature, and (e) aging the so cooled article at an aging temperature in the range of 700° to 1050° C. for about 2 to 150 hours.

5,558,730
VEHICLE WHEEL INCLUDING SELF-INFLATING TIRE PUMP

Ross D. Olney, West Hills; David E. Schnelker, Agoura, and William S. Griffin, Manhattan Beach, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 147,250, Oct. 22, 1993, abandoned. This application May 17, 1995, Ser. No. 442,608
Int. Cl.[6] B60C *23/12*; F04B *31/00*
U.S. Cl. 152—418 **30 Claims**

1. A pump for pumping air from the atmosphere through a vehicle wheel rim into a vehicle tire interior, comprising:
- a cylinder having a closed end adapted for connection to said wheel rim with said cylinder extending radially into said tire interior and terminating in an open end which communicates with said tire interior;
- a piston slidably received in said cylinder;
- a biasing element arranged to urge said piston towards said closed end;
- an inlet valve positioned at said cylinder closed end and arranged to communicate with said atmosphere, said inlet valve configured to block airflow from said cylinder and permit airflow into said cylinder as said piston moves towards said open end in response to centrifugal force; and
- an outlet valve carried by said piston and arranged to communicate with said tire interior, said outlet valve configured to

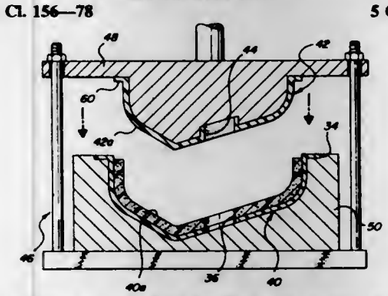


block airflow into said cylinder and permit airflow from said cylinder as said cylinder moves towards said closed end in response to said biasing element.

5,558,731
METHOD FOR FABRICATING VINYL COVERED FOAMED PARTS

Craig B. Labrie, Dover, N.H.; Claude E. Bemis, York, Me., and Robert J. Dadura, Hooksett, N.H., assignors to Davidson Textron Inc., Dover, N.H.

Filed Dec. 19, 1994, Ser. No. 358,358
Int. Cl.[6] B32B *31/12*
U.S. Cl. 156—78 **5 Claims**

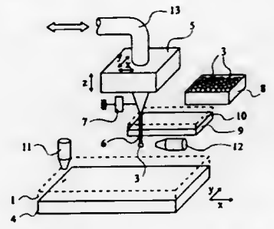


1. A method for fabricating an interior trim product having an insert with an opening therein, an outer shell of thermoplastic material and an interposed layer of urethane foam comprising the steps of:
- forming a shell of thermoplastic material by casting thermoplastic material against a heated mold; removing the shell from the heated mold;
- providing a closed foaming mold having a female cavity part and a cover;
- opening the closed foaming mold and locating the shell in the female cavity part; closing the mold cover with respect to the female cavity part to form a closed foaming mold cavity formed by the cover and the shell and directing foam precursors into the closed foaming mold cavity; reacting the foam precursors to fill the closed foaming mold cavity to form a composite preform having a layer of urethane foam and a shell layer of thermoplastic material;
- providing a cutting die and placing the preformed composite having a layer of urethane foam and shell layer of thermoplastic material thereon and cutting the preformed composite to form an opening therethrough;
- providing a press having first and second platens operable to press a part therebetween; supporting the cut preformed composite on one of the first and second platens and supporting the insert with an opening therein on the other of the first and second platens so as to locat the opening in the preformed composite in alignment with the opening in the insert with the foam layer on the preformed composite facing the insert;
- applying adhesive on the insert or the urethane foam layer of the preformed composite either before or after the insert and preformed composite are placed on the first and second platens; closing the press to hold the adhesive on the insert and/or preformed composite between the insert and preformed composite for adhering the insert to the urethane foam layer of the preformed composite; and
- forming an overlapping joint between the insert and the shell by engaging the insert with the shell at the edge of the foam layer.

5,558,732
PROCESS FOR POSITIONING SPACER BEADS IN FLAT DISPLAY SCREENS

Olivier Hamon, Voreppe, France, assignor to Pixel International, Rousset, France

Filed Dec. 23, 1994, Ser. No. 363,403
Claims priority, application France, Dec. 30, 1993, 93 16039
Int. Cl.[6] B05C *3/20*; B05D *1/18*; B32B *3/22*;*31/12*
U.S. Cl. 156—99 **17 Claims**



1. A process for positioning spacer beads on a plate of a flat display screen formed by two adjacent plates made of glass, quartz or silicon constituting a flat air tight chamber, including the following steps:
- providing a hollow needle mounted on a mobile head which is connected to a vacuum/overpressure system;
- sucking a bead from a bead tank;
- applying the bead on a plate covered with an adhesive material, thereby adhering an adhesive coating to a section of the bead and then, removing the bead from the plate;
- depositing the bead on one of said two adjacent plates; and
- repeating these operations for all the beads to be deposited.

5,558,733
BELT AND TREAD TRANSFER METHOD USING TRANSFER RING HAVING SELECTIVE ADJUSTABILITY OF SHOE MOVEMENT

Mark S. Byerley, Greenback, Tenn., assignor to Wyco, Inc., Greenback, Tenn.

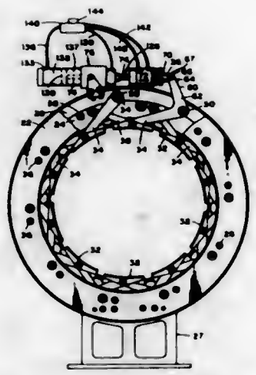
Division of Ser. No. 289,766, Aug. 12, 1994, Pat. No. 5,441,587. This application Jun. 7, 1995, Ser. No. 480,416
Int. Cl.[6] B29D *30/08*
U.S. Cl. 156—111 **3 Claims**

1. A method for the transfer of a belt and tread package component of a vehicle tire which has been formed on a belt and tread drum from a first location onto a carcass component of said tire at a second location employing a transfer ring which includes a plurality of shoes disposed in an annular configuration within said transfer ring and which are movably radially inwardly and outwardly of said transfer ring comprising the steps of
- positioning said transfer ring in encircling relationship to the outer circumference of said belt and tread package with said

providing a continuous moisture barrier web of liquid impervious moisture barrier material, the moisture barrier web having a machine direction and a transverse direction;

5,558,736
ELECTRON CYCLOTRON RESONANCE APPARATUS

having a first peripheral surface and a second peripheral surface, and having strands of reinforcement material embedded therein



shoes disposed in position to engage said outer circumference of said belt and tread package,

applying a first force to said shoes sufficient to cause said shoes to engage said outer circumference of said belt and tread package, thereupon

arresting the application of said first force with said shoes in engagement with said outer circumference of said belt and tread package, thereafter

applying a second force to said shoes sufficient to move said shoes a radial distance inwardly of said transfer ring which is less than that distance which causes deleterious distortion of said belt and tread package but is at least equal to that distance which ensures that said shoes supportingly engage said belt and tread package when said belt and tread package is unsupported on the belt and tread drum and free to assume a substantially relaxed state, and thereafter

while said belt and tread package is engaged by said transfer ring, transferring said belt and tread package onto a vehicle tire carcass.

5,558,734

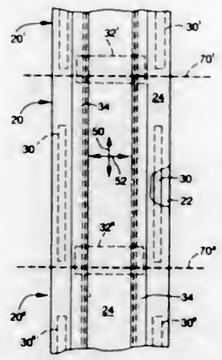
METHOD OF MANUFACTURING INCONTINENCE ARTICLE FOR MALES

Earle H. Sherrod, Appleton; Lynn K. LeMahieu, Hortonville, and John A. Rooyakkers, Little Chute, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Division of Ser. No. 164,340, Dec. 9, 1993. This application May 12, 1995, Ser. No. 440,048

Int. Cl.[6] A61F *13/15;13/56;* **B32B** *31/08;31/10*

U.S. Cl. 156—164 **9 Claims**



1. A method of making an absorbent article, comprising the steps of:

providing a continuous moisture barrier web of liquid impervious moisture barrier material, the moisture barrier web having a machine direction and a transverse direction;

disposing a plurality of absorbent assemblies on the moisture barrier web;

bonding a continuous liner web of liquid permeable liner material to the moisture barrier web, the liner web sandwiching the absorbent assemblies between the liner web and the moisture barrier web;

stretch bonding a plurality of longitudinal gathering members to the moisture barrier web, each longitudinal gathering member having a long dimension extending generally parallel to the machine direction of the moisture barrier web;

stretch bonding a plurality of transverse gathering members to the moisture barrier web, each transverse gathering member having a long dimension of at least about 8 centimeters and a width dimension of at least about 3 centimeters, the long dimension extending parallel to the transverse direction of the moisture barrier web; and

transversely cutting the assembly of the moisture barrier web, the liner web, and the longitudinal and transverse gathering members at spaced locations to form a series of individual absorbent articles and divide each transverse gathering member into front and back portions;

wherein each individual absorbent article has longitudinally spaced front and back ends and side edges extending between the front and back ends, each individual absorbent article has a length measured between the front and back ends of less than about 46 centimeters and a longitudinal gathering member along each side edge, the longitudinal gathering members of each individual absorbent article are longitudinally offset toward the back end, and the back portion of each transverse gathering member constitutes more than 55 percent of the width dimension of the transverse gathering member.

5,558,735

METHOD FOR MAKING LAMINATE WITH U. V. CURED POLYMER COATING

Richard R. Rettew, Fort Mill, S.C.; Richard T. Almashy, and Scott F. Lett, both of Monroe, N.C., assignors to Square D Company, Palatine, Ill.

Continuation-in-part of Ser. No. 110,025, Aug. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 815,314, Dec. 27, 1991, abandoned. This application Jun. 9, 1994, Ser. No. 257,069

Int. Cl.[6] B32B *31/06;31/12;31/26*

U.S. Cl. 156—275.5 **13 Claims**

1. A method for forming a metal laminate stack suitable for use in an electrical inductive apparatus, comprising the steps of:

(a) coating at least one side of a metal substrate with a polymer to form a first layer;

(b) curing the polymer to the C-stage to form a first solid layer;

(c) applying to the first solid layer, a solventless liquid resin system comprising an ultraviolet radiation curable acrylic or vinyl monomer and a heat reactive thermoset adhesive resin, to form a second layer;

(d) exposing the resin system to ultraviolet radiation to cure the ultraviolet radiation curable monomer to the C-stage while the heat reactive resin remains in the A-stage to form the second layer into a second solid layer with tack thus forming a lamination;

(e) assembling at least two laminations formed as in step (d) into a laminate stack, wherein the laminations are oriented such that the solid layers are between laminations; and

(f) heating the laminate stack to a temperature sufficient to cure the heat reactive thermoset resin of the second solid layer and adhere the substrates together.

5,558,736

ELECTRON CYCLOTRON RESONANCE APPARATUS

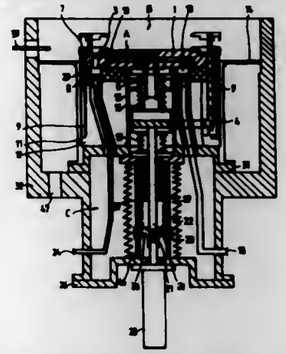
Sang Y. Lee; Roh Y. Sung; Cheong D. Lee, and Dae H. Kim, all of Bubaleub, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Rep. of Korea

Filed Feb. 4, 1994, Ser. No. 192,403

Claims priority, application Rep. of Korea, Feb. 6, 1993, 1993-1637

Int. Cl.[6] H05H *13/00*

U.S. Cl. 156—345 **10 Claims**



1. An electron cyclotron resonance apparatus having a coolant circulation line in a wafer pedestal, the coolant circulation line for conveying coolant to absorb heat transferred from a wafer laid on the wafer pedestal to the wafer pedestal, the apparatus comprising:

a process chamber for performing a treatment to the wafer;

a heat transfer chamber for injecting a heat transfer gas into a backside of the wafer to enhance a heat transfer contact area between the wafer and the wafer pedestal;

a vacuum chamber for eliminating a dewing phenomenon occurring in an interior of the apparatus due to injection of cryogenic refrigerant into said process chamber and due to injection of coolant into the wafer pedestal, the vacuum chamber being an isolated space and being configured for maintaining a vacuum within said isolated space, wherein the vacuum chamber is not connected to any means for introducing a dry gas; and

lifting means for vertically lifting the wafer on the wafer pedestal, said lifting means extending through said process chamber, heat transfer chamber, and vacuum chamber.

5,558,737

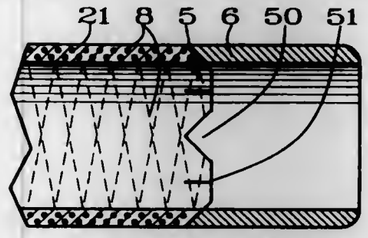
METHOD OF WELDING A TIP TO A CATHETER

Joe E. Brown, Lilburn; Matt D. Parsley, Dawsonville, and D. Joe Clark, Norcross, all of Ga., assignors to American Interventional Technologies, Inc., Stone Mountain, Ga.

Division of Ser. No. 881,422, May 11, 1992, Pat. No. 5,334,169. This application Sep. 3, 1993, Ser. No. 116,349

Int. Cl.[6] B29C *59/00;65/02*

U.S. Cl. 156—172 **11 Claims**



1. A method of welding a catheter tip to a distal end of a catheter, wherein the catheter comprises a monolithic tubular wall having a first peripheral surface and a second peripheral surface, and having strands of reinforcement material embedded therein and wherein the catheter tip comprises a tubular wall having a first peripheral surface and a second peripheral surface, the method comprising the steps of:

cutting axial relief cuts in a distal end of the catheter;

joining the catheter tip to the distal end of the catheter;

forming an inside surface by applying welding heat to the first peripheral surface of both the catheter and the catheter tip while dissipating heat through a cooling medium at the second peripheral surface of both the catheter arid the catheter tip; and

forming an outside weld surface by applying welding heat the second peripheral surface of both the catheter tube and the catheter tip while passing a cooling medium through both the catheter and the catheter tip.

5,558,738

METHOD FOR LAYING DOWN THREADS

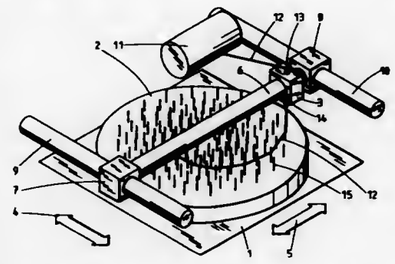
Horst D. Rector, Brunnenstrasse 70, D-52441 Linnich, Germany

Filed Oct. 5, 1993, Ser. No. 132,365

Claims priority, application Germany, Oct. 9, 1992, 42 34 083.7

Int. Cl.[6] B65H *81/00*

U.S. Cl. 156—175 **12 Claims**



1. A process for laying down textile threads, for use as reinforcement of fibre-reinforced plastic articles, comprising the steps of continuously feeding at least one thread and depositing said at least one thread around variable fixed points path to produce a thread layout wherein said at least one thread is deposited at least partially in a spiral pattern, said depositing step including guiding portions of said at least one thread from a radially inner region of the thread layout to a radially outer region of the thread layout along respective spiral paths that extend from one diametral side of a central opening of said thread layout to an opposite diametral side of said central opening of said thread layout, and wherein said portions of said at least one thread cross one another at intersection points, and wherein at each said intersection point there are only two of said portions of said at least one thread lying over one another.

5,558,739

APPARATUS AND PROCESS FOR APPLYING GLUE TO EDGES OF INSULATION TUBE SLIT

R. James Clark, Fort Worth, Tex., assignor to Insulation Materials Corporation of America, Haltom City, Tex.

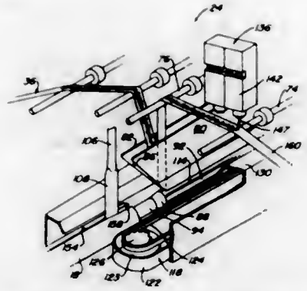
Filed Oct. 19, 1994, Ser. No. 325,706

Int. Cl.[6] B29C *53/50*

U.S. Cl. 156—203 **21 Claims**

1. An apparatus for applying adhesive to an edge of a longitudinal slit formed in a tubular body, the tubular body being formed from a substantially resilient material, the apparatus comprising in combination:

a conveyor for moving the tubular body along a conveyor path;



a feed assembly for feeding an elongate tape strip along a feed path;

an adhesive applicator located adjacent to the feed path for applying adhesive to a surface of the tape strip at an application point as the tape strip moves along the feed path;

a wedging member formed from a pair of flat plates having opposite exterior surfaces which converge at an acute angle, the wedging member having a guide portion for directing the tape strip from the feed path between the pair of plates and then along at least one of the exterior surfaces along lines parallel with the conveyor path, the wedging member engaging the slit of the tubular body as the tubular body is moved along the conveyor path so that the edges of the slit are directed along the exterior surfaces, at least one edge of the slit contacting the tape strip so that adhesive is applied to the at least one edge from the surface of the tape strip; and

means for supporting the tubular body as the tubular body is moved along the conveyor path into engagement with the wedging member so that the tubular body is held in a substantially tubular form.

16. A method of applying adhesive to an edge of a longitudinal slit having opposite edges formed in a tubular body, the tubular body being formed from a substantially resilient material, the method comprising the steps of:

moving the tubular body along a conveyor path;

feeding a pair of elongate tape strips along separate feed paths;

applying adhesive to a surface of each tape strip at an application point as each tape strip moves along the feed path;

providing a wedging member having opposite exterior surfaces which converge at an acute angle;

directing each tape strip along one of the exterior surfaces of the wedging member along lines parallel with the conveyor path; and

engaging the slit of the tubular body with the wedging member while the tubular body is held in a substantially tubular form as the tubular body is moved along the conveyor path so that the opposite edges of the slit are directed along the exterior surfaces with each opposite edge of the slit contacting one of the tape strips so that adhesive is applied to each opposite edge from the surface of said one of the tape strips.

5,558,740

METHOD AND APPARATUS FOR PRODUCING SEAMLESS RETROREFLECTIVE SHEETING

Gus Bernard, West Hartford; Robert B. Nilsen, Weatogue, and Michael J. Hanrahan, Danbury, all of Conn., assignors to Reflexite Corporation, Avon, Conn.

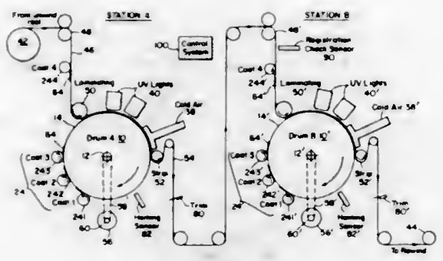
Filed May 19, 1995, Ser. No. 444,759

Int. Cl.[6] B29C *39/20*; **B29D** *11/00*; **G02B** *5/124*

U.S. Cl. 156—231 **10 Claims**

1. A method of forming retroreflective sheeting by a process in which at least two mold surfaces are provided, each surface containing areas of arrays of prismatic recesses and areas of blank spaces, the method comprising the steps of:

a) applying a prism forming material to a first such mold surface to fill the recesses with said material;



b) applying a base film to the recess filled mold surface;

c) attaching the material to the film to form areas of arrays of prisms on said film leaving blank areas of spaces on said film;

d) applying said prism forming material to a second such mold surface to fill the recesses in the second mold surface with said material; and

e) applying the film formed in step c) to the recess filled mold surface formed in step d) and transferring the material from the second mold surface onto the film in such a manner as to form additional areas of arrays of prisms on said film in the blank areas of spaces thereby to form a continuous seamless film of retroreflective sheeting.

5,558,741

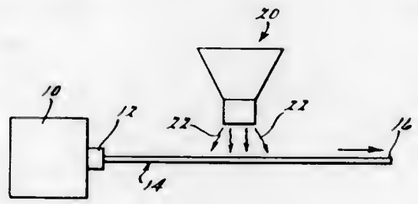
METHOD FOR MAKING A WEATHERSTRIP

Bruce D. Balcerski, Lexington, and James H. Tucker, Port Huron, both of Mich., assignors to Achason Industries, Inc., Port Huron, Mich.

Filed Jun. 28, 1994, Ser. No. 267,865

Int. Cl.[6] B60J *10/00*

U.S. Cl. 156—244.11 **7 Claims**



1. A method of making a weatherstripping product for attachment on an automotive vehicle or for other weatherstripping applications, said method comprising the steps of:

forming a support flange member to a predetermined configuration,

extruding an elastomeric weatherstrip,

treating a surface of the elastomeric weatherstrip with an abundance of ultraviolet radiation from a UV source to thereby provide a UV treated surface on the weatherstrip,

said ultraviolet radiation is applied from a UV source having an intensity

within the range of about 0.2 to about 40 Joules, and

said ultraviolet radiation is applied for a time period of about ½ to about 60 seconds,

applying a low friction surface coating to the UV treated surface on the weatherstrip to provide a coated elastomeric weatherstrip,

mounting the coated elastomeric weatherstrip on said support member, to thereby provide a weatherstripping product with markedly improved abrasion resistance, anti-squeak and ice release characteristics.

5,558,742

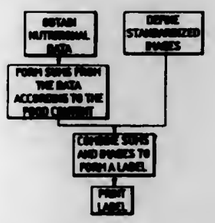
PROCESS FOR ANALYZING NUTRITIONAL CONTENT OF A COMPOSITION OF FOOD TO PRODUCE A CALCULATED PRINTED REPRESENTATION

Helen C. Kiefer, 407 N. Maple Ave., Oak Park, Ill. 60302

Filed Apr. 28, 1994, Ser. No. 236,741

Int. Cl.[6] B32B *3/00*

U.S. Cl. 156—244.16 **9 Claims**



1. A process for analyzing nutritional content of a composition of food to produce a calculated printed representation of the nutritional content in comparison to a quantitative standard, the process comprising the steps of:

determining a total amount of a nutrient in a composition of food;

calculating a first area representing said total amount of the nutrient in the composition and calculating a second area representing a quantitative standard for daily human consumption of the nutrient, wherein the second area is confined to a region within a pictorial image shape representing the nutrient and wherein said first area is proportionate to said second area, thereby forming a ration represented by the areas; and

printing said pictorial image shape and said first area to form a pictorial display of the ratio represented by the first and second areas to illustrate a comparison of the total amount of the nutrient in the composition with the quantitative standard.

5,558,743

PACKAGING MACHINE FOR CIGARETTE PACKS

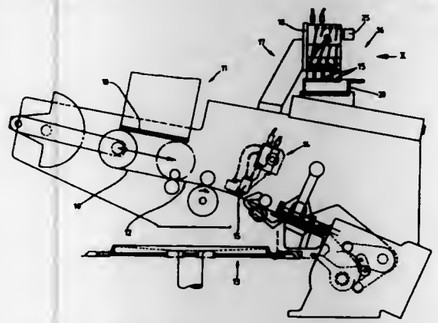
Heinz Focke, and Michael Schlenker, both of Verden, Germany, assignors to Focke & Co. (GmbH & Co.), Verden, Germany

Filed Sep. 30, 1994, Ser. No. 315,483

Claims priority, application Germany, Oct. 12, 1993, 43 34 745.2

Int. Cl.[6] B32B *31/00*; **B65B** *19/22*

U.S. Cl. 156—352 **13 Claims**



1. A packaging machine for the production of cigarette packs, and having at least one glue assembly (14),

wherein said glue assembly (14) comprises at least one glue nozzle (15) for directly coating glue onto folding tabs of blanks (10) which are to be adhesively bonded to one another in order to form the packs, and which are transported along a blank track (12);

wherein said machine comprises means for attaching said glue assembly (14) in a working and operating position above the track (12) on a supporting device located on said machine;

wherein said machine comprises, for cleaning and maintenance purposes, a maintenance station (16) containing a holding device (17) in a maintenance station (16), said glue assembly (14) being removable from said supporting device and being fittable in said holding device (17) in said maintenance station (16); and

wherein said maintenance station (16) and said holding device (17) are disposed in a position located away from said supporting device and, at the same time, in a region of the packaging machine which is convenient for the cleaning and maintenance operation of the glue assembly.

5,558,744

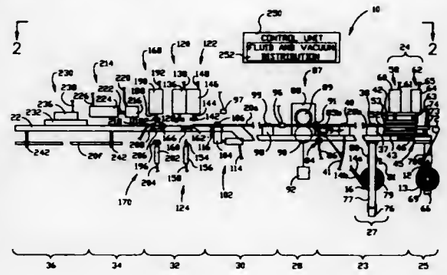
TAPE APPLICATION APPARATUS

Reinhold Rock, Westlake, and Josef Schuessler, Brecksville, both of Ohio, assignors to Herd Manufacturing, Inc., Cleveland, Ohio

Filed Dec. 8, 1994, Ser. No. 351,692

Int. Cl.[6] B32B *31/18*

U.S. Cl. 156—522 **16 Claims**



7. An apparatus for applying adhesive tape to workpieces, said apparatus comprising:

nest means for receiving a workpiece;

clamp means for holding the workpiece relative to said nest means;

stage means for holding a leading portion of a continuous tape;

first mover means for moving said nest means and the workpiece in a first direction relative to said stage means and the tape to engage the workpiece with the leading portion of the tape and affix the leading portion of the tape to the workpiece;

second mover means for moving said nest means, the workpiece and the affixed portion of the tape relative to said stage means in a second direction transverse to the first direction;

sever means for severing the affixed portion of the tape from a remaining portion of the tape;

means for releasing said clamp means; and

third mover means for moving the workpiece and the affixed portion of the tape relative to said nest means to remove the workpiece from said nest means.

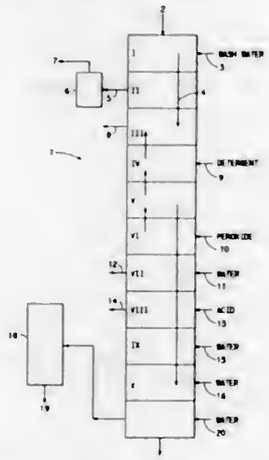
5,558,745

TREATMENT OF ABSORBENT SANITARY PAPER

than about 14:1 at the time the feed stream is charged to the distillation column to form an azeotropic mixture in the

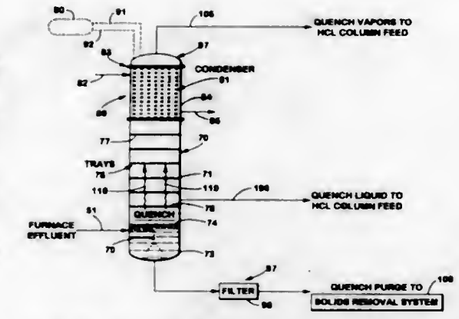
tion of said vapor phase into a condensate phase in said primary flow channel;

5,558,745
TREATMENT OF ABSORBENT SANITARY PAPER PRODUCTS
Marlene E. Conway, Brampton; Francois Jooste, Beamsville, and Michael D. Smith, Brampton, all of Canada, assignors to Knowaste Technologies Inc., Mississauga, Canada
PCT No. PCT/CA91/00393, § 371 Date Jun. 29, 1993, § 102(e) Date Jun. 29, 1993, PCT Pub. No. WO/9207995, PCT Pub. Date May 14, 1992
PCT Filed Oct. 29, 1991, Ser. No. 81,369
Claims priority, application United Kingdom, Oct. 29, 1990, 9023488; Jun. 17, 1991, 9113024
Int. Cl.[6] B21B *1/32*
U.S. Cl. 162—60 **31 Claims**



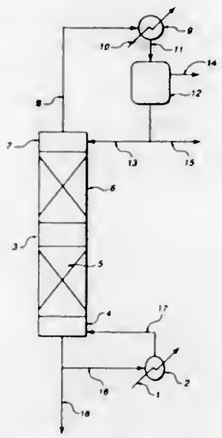
1. A process for the treatment of super absorbent polymer-bearing sanitary paper products to separate such products into components thereof that are in a form suitable for recycling or re-use, said products comprising plastic, cellulosic and super absorbent polymer solid fractions, the process including the steps of:
(a) treating said products in at least one bath of an aqueous solution:
(b) dissolving soluble matter from said products in said aqueous solution;
(c) treating the super absorbent polymer with a water-soluble compound of at least one of an alkali metal, an alkaline earth metal, aluminum, copper (II), iron (III) and zinc to reduce swelling of the super absorbent polymer in said aqueous solution; and
(d) separating said aqueous solution with soluble matter from at least one of the solid fractions.

5,558,746
APPARATUS FOR QUENCHING A GAS STREAM IN THE PRODUCTION OF VINYL CHLORIDE MONOMER
James E. Best, Paducah, Ky., assignor to Westlake Monomers Corporation, Houston, Tex.
Division of Ser. No. 355,918, Dec. 14, 1994, Pat. No. 5,507,921. This application Jun. 7, 1995, Ser. No. 475,566
Int. Cl.[6] B01D *3/14; C10B 39/00; C07C 17/38*
U.S. Cl. 202—158 **5 Claims**



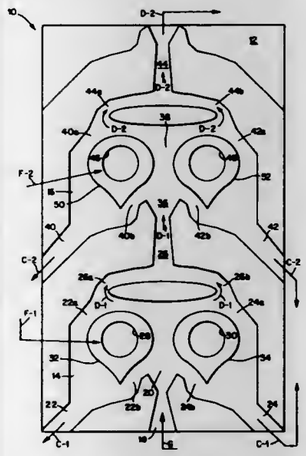
1. A quench column for quenching a gas stream including vinyl chloride, hydrogen chloride, and unreacted 1,2-dichloroethane produced by the pyrolysis of 1,2-dichloroethane and containing undesired byproducts of pyrolysis, comprising:
(a) a vertically disposed vessel having an upper and a lower end, the lower end adapted to contain a quantity of quench liquid;
(b) at least one nozzle disposed in the lower end of the vessel and adapted to be disposed within the quantity of quench liquid;
(c) a plurality of column fractional distillation trays, with at least an upper column fractional distillation tray and a bottom column fractional distillation tray, disposed within the vessel, above the at least one nozzle; and
(d) a means for introducing liquid unreacted 1,2-dichloroethane, vinyl chloride, and hydrogen chloride into the upper end of the vessel above the plurality of column fractional distillation trays.

5,558,747
PROCESS FOR AZEOTROPIC DISTILLATION OF AQUEOUS CHLORAL MIXTURES
Kevin Brady, Hacienda Heights, and Lester Friedmann, Long Beach, both of Calif., assignors to AMVAC Chemical Corporation, Los Angeles, Calif.
Continuation of Ser. No. 83,831, Jun. 25, 1993, abandoned. This application Nov. 3, 1995, Ser. No. 552,434
Int. Cl.[6] B01D *3/36; C07C 45/84*
U.S. Cl. 203—17 **10 Claims**



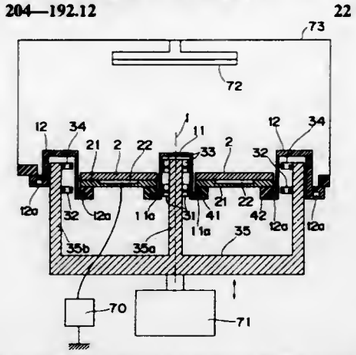
1. A process of azeotropic distillation of chloral comprising:
charging a feed stream including at least 60% by weight chloral and containing less than 40% by weight water and wherein the feed stream contains at least some ethylene dichloride to a distillation column having at least 6 theoretical trays therein;
adding additional ethylene dichloride when needed to the distillation column to that the ratio of the concentration of chloral in the feed stream to that of the ethylene dichloride is less than about 14:1 at the time the feed stream is charged to the distillation column to form an azeotropic mixture in the distillation column;
bringing the azeotropic mixture to a boil at a pressure consisting of atmospheric pressure;
allowing the distillation to proceed to completion;
recovering an anhydrous chloral product containing less than 0.1% by weight water; and
separating the ethylene dichloride from the recovered anhydrous chloral product by further distillation thereof.

5,558,748
PLATE-TYPE DISTILLATION/CONDENSATION APPARATUS AND METHOD OF USE
Jeffrey S. Dugan, Asheville, N.C., assignor to BASF Corporation, Mount Olive, N.J.
Filed May 12, 1995, Ser. No. 440,346
Int. Cl.[6] B01D *3/14; 3/00*
U.S. Cl. 203—87 **33 Claims**



1. A method of separating two or more volatility-differing vapor components or liquid components from a mixed fluid stream thereof, comprising the steps of:
(A) providing a distillation-condensation apparatus comprising at least one flow plate having formed on a common facial surface thereof at least one distillation-condensation chamber comprising:
an inlet port for said mixed fluid stream;
a primary flow channel in fluid communication with said inlet port and disposed to receive flow of said mixed fluid stream;
one or more heat exchange conduits, each of said one or more heat exchange conduits comprising a through-hole passage transversing said primary flow passage from said common facial surface of said at least one flow plate to an opposite second facial surface of said at least one flow plate, wherein (i) a heat exchange conduit for a cooling fluid is disposed in a heat exchange contact with said primary flow channel sufficient to condense at least a portion of a vapor component in said mixed fluid stream into a condensate phase in said primary flow channel, or (ii) a first heat exchange conduit for a heating fluid is disposed in a heat exchange contact with said primary flow channel sufficient to boil at least a portion of a liquid component in said mixed fluid stream into a vapor phase in said primary flow channel, and a second heat exchange conduit for a cooling fluid is disposed in a heat exchange contact with said primary flow channel sufficient to condense at least a portion of said vapor phase into a condensate phase in said primary flow channel;
at least one side outlet channel, said at least one side outlet channel being disposed in fluid communication with at least one side region of said primary flow channel such that said at least one side outlet channel is disposed to receive flow of at least a portion of said condensate phase from said primary flow channel, said at least one side region being disposed downstream of said inlet port of said primary flow channel; and
an overhead outlet port in fluid communication with said primary flow channel, said overhead outlet port being disposed downstream of said at least one side region of said primary flow channel and being disposed to receive flow of any distillate phase and any remaining portions of said condensate phase remaining in said primary flow channel after flow of said at least a portion of said condensate phase into said at least one side outlet channel; and
(B) passing the mixed fluid stream into said at least one distillation-condensation chamber through said inlet port and directing said mixed fluid stream through said primary flow channel while directing (i) said cooling fluid through said heat exchange conduit to form said condensate phase or (ii) said heating fluid through said first heat exchange conduit to form said vapor phase and said cooling fluid through said second heat exchange conduit to form said condensate phase; wherein said at least a portion of said condensate phase flows into said at least one side outlet channel, further wherein said any distillate phase and said any remaining portions of said condensate phase flow through said overhead outlet port, whereby said two or more volatility-differing vapor components or liquid components are separated from said mixed fluid stream thereof.

5,558,749
MAGNETRON SPUTTERING APPARATUS AND METHOD
Masahide Yokoyama, Hirakata, and Hiroshi Hayata, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan
Filed Jul. 7, 1995, Ser. No. 499,194
Claims priority, application Japan, Jul. 8, 1994, 6-157531
Int. Cl.[6] C23C *14/34*
U.S. Cl. 204—192.12 **22 Claims**



1. In a magnetron sputtering apparatus including a ring-shaped flat target, the ring-shaped flat target having an inner peripheral edge and an outer peripheral edge and opposite front and rear surfaces defining respective target planes of the target, the improvement comprising:
first and second magnets of the same polarity located on a front side and a rear side, respectively, of the respective target planes and extending along the inner peripheral edge of the target; and
third and fourth magnets of the same polarity located on the front side and the rear side, respectively, of the respective

target planes and extending along the outer peripheral edge of the target, wherein the polarity of the first and second magnets extending along the inner peripheral edge is opposite to the polarity of the third and fourth magnets extending along the outer peripheral edge.

5,558,750

PROCESS AND SYSTEM FOR COATING A SUBSTRATE

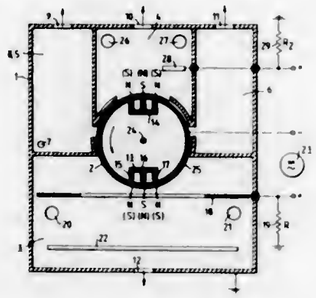
J. Szczyrbowski, D-63773 Goldbach, Germany, assignor to Leybold Aktiengesellschaft, Hanau, Germany

Filed Feb. 23, 1995, Ser. No. 392,700

Claims priority, application Germany, May 31, 1994, 44 18 906

Int. Cl.[6] **C23C** *14/34;14/35*

U.S. Cl. 204—192.12 **15 Claims**



1. A process for coating a substrate, comprising:

providing a target carrier which carries a target in front of a magnet, said target carrier having a part which projects into a target carrier coating chamber and a part which projects into a sputtering chamber,

rotating said target carrier so that the part which projects into the target carrier coating chamber passes continuously into the sputtering chamber thence back into the target carrier coating chamber,

applying a coating of target material to the target carrier by introducing said target material into said target carrier coating chamber continuously from outside the coating chamber, said coating of target material serving exclusively as said target on said target carrier, and

coating said substrate with said target material by sputtering said target in said sputtering chamber.

5,558,751

DUAL CATHODE SPUTTER COATING APPARATUS

Peter Mahler, Hainburg; Wolfgang Stang, Kefenrod; Michael Scherer, Rodenbach, and Roland Gesche, Seligenstadt, all of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Germany

Filed Feb. 8, 1995, Ser. No. 385,521

Claims priority, application Germany, Apr. 20, 1994, 44 13 655.2

Int. Cl.[6] **C23C** *14/54*

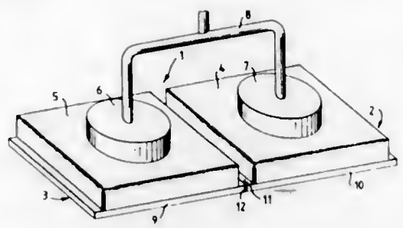
U.S. Cl. 204—298.26 **3 Claims**

1. Sputter coating apparatus comprising

a pair of side by side electrodes at common potential connected to a common power supply,

a pair of electrically non-conductive targets soldered to respective electrodes, each having a straight edge which abuts the straight edge of the other target, and

a common dark space shield surrounding both of said electrodes and said targets together.



5,558,752

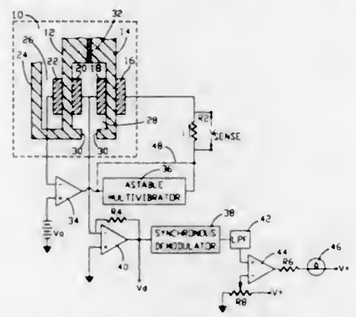
EXHAUST GAS SENSOR DIAGNOSTIC

Da Y. Wang, Lexington, Mass., and Larry M. Oberdier, Royal Oak, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 28, 1995, Ser. No. 431,200

Int. Cl.[6] **G01N** *27/26*

U.S. Cl. 204—401 **12 Claims**



1. A diagnostic apparatus for indicating current limiting behavior of an exhaust gas sensor having a gas chamber with a gas diffusion limiting means and a pump cell exposed to the gas chamber for pumping oxygen into and out of the gas chamber, creating a sensor electromotive force which is applied to drive circuitry for providing an electrical drive signal applied to the pump cell for driving the pump cell, comprising:

circuitry for applying a signal perturbation to the electrical drive signal;

sense circuitry for sensing change in electrical current through the sensor resulting from the applied signal perturbation; and

an indicator for indicating the sensed change in electrical current to indicate current limiting behavior of the sensor.

5,558,753

POLARITY REVERSAL AND DOUBLE REVERSAL ELECTRODEIONIZATION APPARATUS AND METHOD

Christopher J. Gallagher, Burlington; Frederick Wilkins, Pepperill, and Gary C. Ganzi, Lexington, all of Mass., assignors to U.S. Filter/Ionpure, Inc., Lowell, Mass.

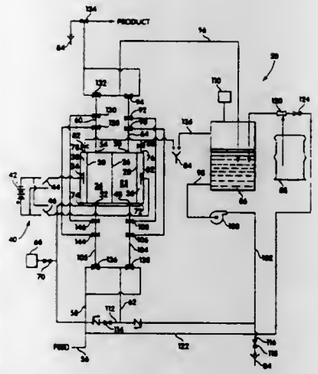
Division of Ser. No. 246,815, May 20, 1994. This application May 9, 1995, Ser. No. 437,624

Int. Cl.[6] **B01D** *61/48*

U.S. Cl. 204—632 **24 Claims**

1. Electrodeionization apparatus comprising:

a plurality of compartments comprising at least one ion-concentrating compartment positioned adjacent to at least one ion-depleting compartment, the ion-concentrating and ion-depleting compartments each containing an ion-exchange material and the plurality of compartments being defined in part by spaced, alternating anion-permeable membranes and cation-permeable membranes;



a first electrode on a first side of the plurality of compartments and in electrical communication therewith;

a second electrode on a second side of the plurality of compartments and in electrical communication therewith;

an electrical source in electrical communication with the first and second electrodes, which, in combination with the electrodes and the plurality of compartments defines an electrical circuit;

a first fluid circuit connecting a source of a first fluid stream having an ionic concentration to the ion-concentrating compartment, and connecting a source of a second fluid stream having an ionic concentration to the ion-depleting compartment; and

a second fluid circuit connecting a source of a third fluid stream to the ion-concentrating compartment, and connecting the source of the second fluid stream to the ion-depleting compartment, the third fluid stream having an ionic concentration lower than that of the first fluid stream.

5,558,754

METHOD FOR PREPARING 3-ALKYL-2,6-DICHLOROACYLANILIDES BY ELECTROLYTIC DEBROMINATION OF 3-ALKYL-4-BROMO-2,6-DICHLOROACYLANILIDES

Thomas Karcher, Hofheim, Germany, assignor to Hoechst Aktiengesellschaft, Germany

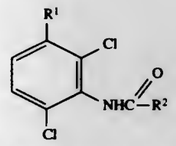
Filed Nov. 29, 1994, Ser. No. 346,831

Claims priority, application Germany, Dec. 1, 1993, 43 40 896.6

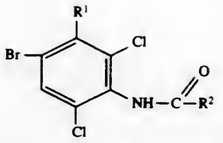
Int. Cl.[6] **C25B** *3/00*

U.S. Cl. 205—431 **23 Claims**

1. A method of preparing a 3-alkyl-2,6-dichloroacylanilide of the formula I



in which R^1 and R^2 are, independent of one another, C_1–C_4-alkyl, comprising electrolytically debrominating a bromo-alkylacylanilide of the formula II



in which R^1 and R^2 are as defined above in a reaction apparatus for electrolysis which is divided into an anode compartment containing an anolyte and a cathode compartment containing a catholyte, wherein the anolyte is an acid or alkali metal halide in aqueous solution having adequate conductivity and the catholyte contains a alcohol as a solvent and a electrolyte to provide conductivity.

5,558,755

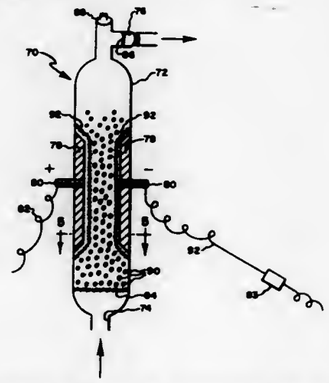
METHOD FOR REMOVING CONTAMINANTS FROM AN AQUEOUS MEDIUM

Thomas Gardner-Clayson, Buffalo, and Patrick J. Filey, Amherst, both of N.Y., assignors to Recra Environmental, Inc., Amherst, N.Y.

Division of Ser. No. 882,341, May 13, 1992, Pat. No. 5,372,690. This application Mar. 28, 1994, Ser. No. 219,701

Int. Cl.[6] **C02F** *1/46*

U.S. Cl. 205—753 **7 Claims**



1. A method for removing contaminants from an aqueous medium comprising the steps of:

a. providing a chamber having at least one pair of electrodes;

b. providing a fluidizable bed of metallic particles in the chamber between the electrodes;

c. flowing the medium through the bed thereby fluidizing the bed;

d. applying an electric current between the electrodes to effect dissolution of the metallic particles thereby introducing ions which effect agglomeration of the contaminants; and

e. removing the agglomerated contaminants from the medium after the medium has flowed out of the chamber.

5,558,756

METHOD FOR GEO-ELECTROCHEMICAL SAMPLING

Richard Van Blaricom, Colbert, Wash., assignor to Cominco Ltd., Vancouver, Canada

Division of Ser. No. 340,890, Nov. 15, 1994. This application Jun. 5, 1995, Ser. No. 460,882

Int. Cl.[6] **G01N** *27/26*

U.S. Cl. 205—789.5 **10 Claims**

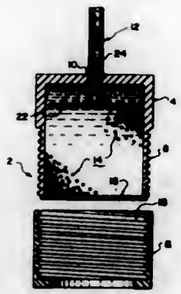
1. A method of sampling and analyzing ground water for underlying metallic ions contained in the ground water which comprises:

rods is switched at least once during the electrolytic coating of the work pieces from said first end to said opposite end.

through said body, and which can also function as a filter due to its porosity, wherein said body is itself conductive, said body being manufactured by a process comprising the steps of:

element into the collector and to progressively clean the filter element as the collector moves relative to the filter element.

2. A fluid filtering unit as claimed in claim 1, wherein the



(a) applying a negative voltage in the range of 200 to 2,000 volts DC to a cathode immersed in generally ion-free water proximate to the ground water thereby attracting metallic cations contained in the ground water to the cathode;
(b) exchanging the attracted metallic cations for hydrogen ions contained in a hydrogen ion charged ion exchange resin also immersed in mid generally ion-free water to thereby deposit the metallic cations on the ion exchange resin and release the hydrogen ions from the exchange resin to the cathode; and
(c) analyzing the concentration of metallic cations deposited on the ion exchange resin.

5,558,757

PROCESS FOR IMPROVING THE COATING OF ELECTROLYTICALLY TREATED WORK PIECES, AND ARRNGEMENT FOR CARRYING OUT THE PROCESS

Egon Hübel, Feucht, Germany, assignor to Atotech Deutschland GmbH, Berlin, Germany

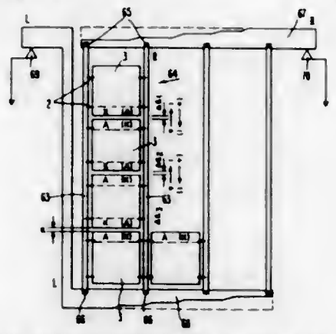
PCT No. PCT/DE92/01086, § 371 Date Jun. 29, 1994, § 102(e) Date Jun. 29, 1994, PCT Pub. No. WO93/13248, PCT Pub. Date Jul. 8, 1993

PCT Filed Dec. 22, 1992, Ser. No. 256,231

Claims priority, application Germany, Dec. 31, 1991, 41 43 247.9

Int. Cl.[6] C25D *17/00;21/12*

U.S. Cl. 205—96 **18 Claims**



Process for preventing differences in layer thickness during electrolytic coating of work pieces that are arranged in a row at intervals one after the other attached in a substantially longitudinal direction on at least one cathode rail or on carrier rods, said carrier rods being attached at opposite ends to cathode rails thereby forming cathode frames containing cathode carrier rods in a bath, whereby the current in the rail or in the frame runs substantially along the length of the cathode rail or carrier rods parallel to the direction of the work pieces arranged on said cathode rail or carrier rods, wherein the cathodic current is supplied to a first end or an opposite end of the cathode rail (1) or the cathodic carrier rods (63), anodic current is supplied to at least one anode rail (11) and the current supply location to said cathode rail or cathodic carrier rods is switched at least once during the electrolytic coating of the work pieces from said first end to said opposite end.

5,558,758

ELECTRODEPOSITED COMPOSITE COATINGS

John Foster, Worle, Great Britain, assignor to Praxair S.T. Technology, Inc., Danbury, Conn.

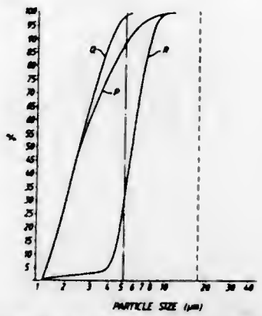
PCT No. PCT/GB93/01659, § 371 Date Aug. 31, 1994, § 102(e) Date Aug. 31, 1994, PCT Pub. No. WO94/03656, PCT Pub. Date Feb. 17, 1994

PCT Filed Aug. 5, 1993, Ser. No. 211,506

Claims priority, application United Kingdom, Jul. 6, 1992, 9216706

Int. Cl.[6] C25D *15/00*

U.S. Cl. 205—50 **28 Claims**



An electrodeposited wear resistant composite coating comprising, as deposited, a matrix which is at least 50% by weight cobalt and particles included in the matrix which are at least 50% by weight chromium carbide, at least 50% by weight of the particles fall within the size range of 4 to 12 μm, the particles being substantially evenly distributed in size across the said size range.

5,558,759

METAL FINISHING PROCESS

Roger Pudem, Clinton, Conn., assignor to Sargent Manufacturing Company, New Haven, Conn.

Filed Jul. 26, 1994, Ser. No. 280,725

Int. Cl.[6] C25D *7/00;5/10;5/34;5/48*

U.S. Cl. 205—50 **23 Claims**

A finishing process for a zinc die casting which inhibits the occurrence of leakout and outgassing, consisting essentially of the steps of:
(a) polishing the surface of the zinc die casting;
(b) electroplating the zinc die casting with copper;
(c) polishing the copper electroplated zinc die casting;
(d) electroplating a layer of metal over said polished copper; and
(e) depositing a substantially moisture impervious coating on said metal layer.

5,558,760

FILTER/HEATING BODY PRODUCED BY A METHOD OF SPRAYING A SHAPE

Jainagesh A. Sekhar, Cincinnati, Ohio, assignor to Micropyretics Heaters International, Inc., Cincinatti, Ohio

Continuation-in-part of Ser. No. 353,727, Dec. 12, 1994. This application Jan. 6, 1995, Ser. No. 369,426

Int. Cl.[6] B01D *35/14;39/20;* **C04B** *35/622*

U.S. Cl. 210—106 **8 Claims**

A single undivided porous body, which porous body can function as a heating element by heating up if a current is applied through said body, and which can also function as a filter due to its porosity, wherein said body is itself conductive, said body being manufactured by a process comprising the steps of:
providing an improved slurry comprising (A) at least one component selected from the group consisting of (a) at least two particulate ceramic precursors capable of undergoing combustion synthesis, (b) at least one non-micropyretic particulate ceramic material, (c) at least one metallic material, (d) at least one inter-metallic material, (e) at least one polymeric material, and mixtures thereof; and (B) hydroplastic materials selected from the group consisting of clays, colloidal silica, colloidal alumina, colloidal zirconia, colloidal ceria and mixtures thereof;
impregnating a polymeric shape with said improved slurry by (a) fluidizing said improved slurry with steam or heated water and spraying said shape with said fluidized slurry or (b) heating said improved slurry so as to reduce its viscosity and spraying said shape with said reduced viscosity slurry;
heating the improved-slurry-impregnated polymeric shape to a temperature sufficient to remove polymer from within said shape; and
obtaining a porous ceramic, ceramic composite, metallic or polymer structure by igniting, if present, said ceramic precursors to initiate combustion synthesis and/or by heating said non-micropyretic particulate ceramic; metallic, inter-metallic or polymeric material so as to cause said non-micropyretic particulate ceramic, metallic, inter-metallic or polymeric material to sinter.

3. A single porous body as in claim 1, in combination with a pressure release safety valve for removing collected particulate matter, the valve being self-resetting or otherwise.

element into the collector and to progressively clean the filter element as the collector moves relative to the filter element.

2. A fluid filtering unit as claimed in claim 1, wherein the collector is urged towards its first position relative to the filter element by differential pressure acting on the collector or the filter element.

5,558,761

FLUID FILTERING UNIT WITH MOVABLE COLLECTOR FOR CLEANING

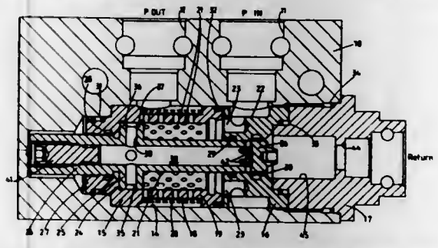
Peter Elliot-Moore, Alsager, and Christopher Oziem, Lymm, both of United Kingdom, assignors to Longwall Roof Supports Limited, Wigan, United Kingdom

Filed Jan. 25, 1995, Ser. No. 378,856

Claims priority, application United Kingdom, Jul. 1, 1994, 9413216

Int. Cl.[6] B01D *24/38;24/46*

U.S. Cl. 210—106 **9 Claims**



A fluid filtering unit comprising a filter element through which fluid being filtered must pass and means for cleaning the filter element in situ without interruption of fluid filtration, the cleaning means comprising a collector movable between a first position and a second position relative to the filter element on the upstream side of the filter element during a cleaning operation, means for urging the collector towards its first position relative to the filter element, means for moving the collector from its first position to its second position relative to the filter element against a force of the urging means, and means for automatically connecting the collector to dump fluid to a drain at a pressure less than that of the fluid being filtered as the collector moves from its first position relative to the filter element towards its second position relative to the filter element so that filtered fluid on the downstream side of the filter element will pass to dump via the filter element and the collector to force contaminants collected by the upstream side of the filter

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5,558,762

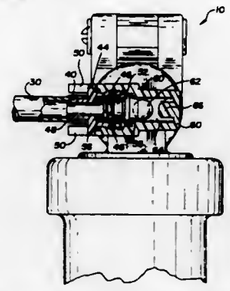
PORTABLE WATER FILTER AND VALVE ASSEMBLY

James F. Fife; Daniel J. Vorhis; Kenneth D. Laughlen, and Nancy L. Dienes, all of Seattle, Wash., assignors to MSR, Seattle, Wash.

Division of Ser. No. 108,442, Aug. 18, 1993, Pat. No. 5,330,640, which is a division of Ser. No. 732,975, Jul. 19, 1991, Pat. No. 5,266,196. This application May 26, 1994, Ser. No. 249,903

Int. Cl.[6] B01D *27/10*

U.S. Cl. 210—130 **10 Claims**



A valve assembly in combination with a portable water filter, comprising:
a portable hand-held filter housing;
an inlet conduit for directing water into a water filter within said housing;
means for drawing water through the inlet conduit;
a check valve operatively connected to the inlet conduit for allowing flow of water only in a direction toward the water filter; and
a relief valve for redirecting water if pressure within the filter increases beyond a predetermined level, the water being redirected back down the inlet conduit to confine the location of the redirected water to keep outer surfaces of the filter dry and free of contamination, the increased pressure resulting from the filter being clogged or from the flow of water through the filter being otherwise obstructed.

5,558,763

SEWAGE TREATMENT SYSTEM WITH AIR JETTING MEANS

Yasushi Funakoshi, c/o Bureau of Sewerage, Tokyo Metropolitan Government 8-1, Nishi-Shinjuku 2-chome, Shinjuku-ku, Tokyo, Japan; Khoji Ogata, Nishi-Shinjuku; Masayuki Kojima, Chiyoda-ku; Hitoshi Kawaziri, Chiyoda-ku; Hirofumi Yamamoto, Chiyoda-ku; Kazuhiko Noto, Chiyoda-ku, and Naomichi Mori, Chiyoda-ku, all of Japan, assignors to Hitachi Plant Engineering & Construction Co., Ltd., and Yasushi Funakoshi, both of Tokyo, Japan

Filed Jun. 21, 1994, Ser. No. 263,200

Claims priority, application Japan, Jun. 24, 1993, 5-153590; Apr. 21, 1994, 6-083472; Apr. 21, 1994, 6-083473

Int. Cl.[6] B01D *35/05*

U.S. Cl. 210—150 **10 Claims**

A sewage treatment system intended for filtering solid components in sewage and cleansing the sewage, the sewage treatment system comprising:

comprising a plurality of projections extending inwardly from at least one of said walls or said base of said tank forming means to

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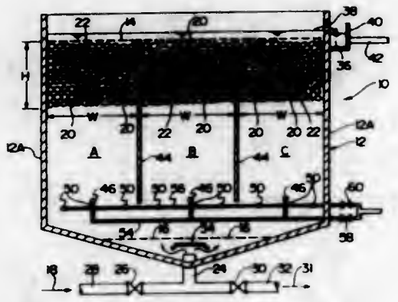
HYDROCRACKING OF FEEDSTOCKS AND CATALYST

support having a surface area in the range of about 200 m^2/gram to about 450 m^2/gram and at least about 95 percent

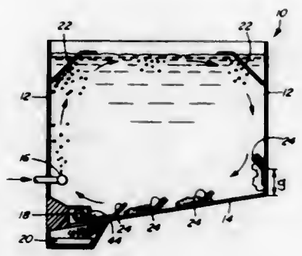


a floating filter media layer, which is provided in a treatment tank for filtering the solid components in the sewage which is upwardly flowed in the treatment tank by a layer which is formed with numerous floating filter medium which are meshy cylinders and have a smaller specific gravity than the sewage and in which both ends thereof are opened and a side thereof is meshy;

first air jetting means provided at a lower position of said floating filter media layer for jetting air upwardly from a horizontally-provided nozzle and from a central position of the treatment tank or a vicinity of a side wall of the treatment tank, and which produces a circular flow in the sewage in said treatment tank so as to exfoliate solid components adhering to said floating filter medium; and

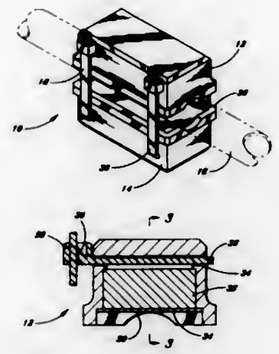
second air jetting means provided at a lower position of said floating filter media layer for jetting air to an entire bottom surface of the floating filter media layer so as to prevent the solid components in the sewage from adhering to the floating filter medium again when the sewage in the treatment tank, including the solid components exfoliated from said floating filter medium by said first air jetting means, is discharged from a bottom portion of the treatment tank.

5,558,764
RAG CATCHER
Ignacio Romo, 309-254 W. 3rd Street, North Vancouver, BC V7M 1G2, Canada
Filed Jun. 12, 1995, Ser. No. 489,572
Int. Cl.[6] B01D *21/26*
U.S. Cl. 210—220 **10 Claims**



1. In an aerated grit removal tank for the treatment of sewage, the tank having walls and a base and including a screw conveyor for removal of grit and an aerator pipe forming means to allow circulation of the sewage by the passage of air, the improvement comprising a plurality of projections extending inwardly from at least one of said walls or said base of said tank forming means to trap rags present in the sewage.

5,558,765
APPARATUS FOR SUBJECTING HYDROCARBON-BASED FUELS TO INTENSIFIED MAGNETIC FIELDS FOR INCREASING FUEL BURNING EFFICIENCY
Robert J. Twardzik, 1002 Newgate Dr., Allentown, Pa. 18103
Filed Mar. 28, 1995, Ser. No. 411,530
Int. Cl.[6] F02M *27/04*
U.S. Cl. 210—222 **6 Claims**



1. Apparatus for the intensified exposure of a hydrocarbon based fuel to a magnetic field comprising:

at least two permanent magnets each a parallelepiped having a greater length than width and first and second opposed major faces, said magnets being polarized such that the first major face is the north pole of each of said magnets and the second major face is the south pole of each of said magnets;

a pair of cover boxes made from non-magnetic material being sized and shaped to completely contain a respective one of said magnets, each said cover box having an opening and a peripheral outwardly depending flange surrounding said opening, said flange having curved hollows at opposite ends of the respective cover box for fitting closely about a fluid containment vessel;

a backing plate for closing said opening in each said cover box, each said backing plate being made from non-magnetic material, each said backing plate being recessed inward into the opening of each respective said cover box to permit the close fit of the fluid containment vessel within said curved hollows;

the first major face of all of said magnets positioned within a first of said pair of cover boxes abuts said backing plate for said first cover box, and the second major face of all of said magnets positioned within a second of said pair of cover boxes abuts said backing plate for said second cover box;

strapping means for securing said cover boxes in fixed diametrically opposed position about said fluid containment vessel with said magnets being separated from the outer surface of said fluid containment vessel only by said backing plate;

whereby said magnets are positioned proximate opposing tangential points of said fluid containment vessel with the second face of one of said magnets facing the fluid containment vessel and the first face of the other of said magnets facing the fluid containment vessel to create an electromagnetic circuit having an enhanced, substantially uniform, mono-directional, magnetic flux density for the polarization of the molecules of said fuel to increase the combustion efficiency of said fuel.

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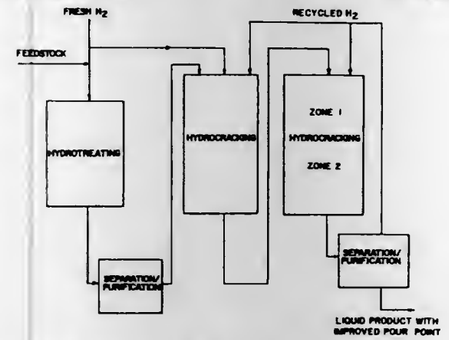
HYDROCRACKING OF FEEDSTOCKS AND CATALYST THEREFOR
Ricardo Prada, Caracas; Robert T. Gallasso, Miranda; Yilda Romero, Aragua; Edito Reyes, and Edilberto Rodriguez, both of Miranda, all of Venezuela, assignors to Intevep, S.A., Venezuela
Division of Ser. No. 127,805, Sep. 28, 1993, Pat. No. 5,384,297, which is a continuation-in-part of Ser. No. 837,806, Feb. 18, 1992, Pat. No. 5,254,240, which is a continuation-in-part of Ser. No. 697,118, May 8, 1991, Pat. No. 5,229,347. This application Oct. 24, 1994, Ser. No. 328,033
Int. Cl.[6] C10G *65/10*
U.S. Cl. 208—59 **25 Claims**

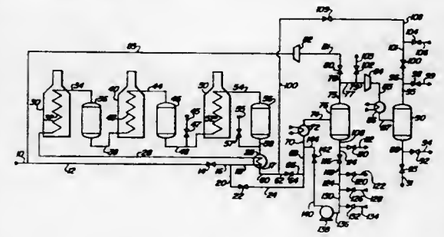


1. A multi-zone hydrogenation and hydrocracking process suitable for a petroleum hydrocarbon feedstock that contains sulfur, nitrogen, and aromatic components, which process comprises:

contacting said hydrocarbon feedstock, in a first process zone and under hydrocracking conditions, with a particulate catalyst constituted by a porous support comprising alumina and titania wherein the alumina is present in an amount in the range of about 95 weight percent to about 70 weight percent, and wherein the titania is present in an amount of about 5 to about 30 weight percent, both based on the weight of the support, and by a catalytically active tri-elemental phase on the support consisting essentially of a transition element of Group VI-B of the Periodic Table of Elements, a transition element of the first transition series of Group VIII of the Periodic Table of Elements, and a transition element of the second transition series of Group VIII of the Periodic Table of Elements; said porous support having a surface area in the range of about 130 m^2/gram to about 300 m^2/gram and at least about 95 percent of the pores thereof having a pore diameter in the range of about 20 Angstroms to about 500 Angstroms; and said Group VI-B transition element being present in an amount in the range of about 6 weight percent to about 30 weight percent, expressed as weight of the corresponding oxide and based on the weight of the catalyst, said Group VIII first transition series element being present in an amount in the range of about 2 weight percent to about 10 weight percent, expressed as weight of the corresponding oxide and based on the weight of the catalyst, and said Group VIII second transition series element being present in an amount in the range of about 0.01 weight percent to about 1 weight percent, based on the weight of the catalyst, for a time period sufficient to convert at least a portion of said cracked petroleum hydrocarbon feedstock into an effluent having relatively lower aromatic content; and thereafter

contacting said effluent, in a second process zone and under hydrocracking conditions, with a particulate catalyst constituted by a porous, catalytically active support comprising alumina, titania and a pentasil crystalline zeolite in which the alumina is present in an amount in the range of about 95 parts by weight to about 70 parts by weight, the titania is present in an amount in the range of about 0.01 parts by weight to about 10 parts by weight, and the zeolite is present in an amount in the range of about 5 to about 50 parts by weight, said porous support having a surface area in the range of about 200 m^2/gram to about 450 m^2/gram and at least about 95 percent of the pores thereof having a pore diameter in the range of about 20 Angstroms to about 600 Angstroms, and three catalytically-active moieties on said support, said moieties consisting essentially of a transition element of Group VIB of the Periodic Table of Elements, a transition element of the first transition series of Group VIII of the Periodic Table of Elements, and a transition element of the second transition series of Group VIII of the Periodic Table of Elements, said Group VIB transition element being present in an amount in the range of about 5 weight percent to about 30 weight percent, expressed as the weight of the corresponding oxide and based on the weight of the catalyst, said Group VIII first transition series element being present in an amount in the range of about 2 weight percent to about 10 weight percent, expressed as the weight of the corresponding oxide and based on the weight of the catalyst, and said Group VIII second transition series element being present in an amount in the range of about 0.005 weight percent to about 1 weight percent, expressed as the weight of the metal and based on the weight of the catalyst, for a time period sufficient to lower the pour point of said effluent.

5,558,767
CATALYST REGENERATION PROCEDURE USING NET GAS EQUIPMENT
Charles T. Ressl, Mount Prospect, Ill., assignor to UOP, Des Plaines, Ill.
Filed Dec. 29, 1994, Ser. No. 365,669
Int. Cl.[6] B01J *20/34;38/12;* **C10G** *49/22*
U.S. Cl. 208—105 **11 Claims**



1. A method of converting a hydrocarbon feed with a catalyst and regenerating the catalyst by contact with an oxygen-containing stream, said method comprising:

(a) contacting a feed stream comprising hydrocarbons with a hydrocarbon conversion catalyst at hydrocarbon conversion conditions; withdrawing from said catalyst an effluent stream comprising hydrogen, light hydrocarbons, and heavy hydrocarbons; passing said effluent stream to a separation zone; recovering from said separation zone a first process gas stream comprising hydrogen and said light hydrocarbons and a first process liquid stream comprising said heavy hydrocarbons; passing said first process gas stream to a purification zone; and recovering from said purification zone a second process gas stream comprising hydrogen and a second process liquid stream comprising said light hydrocarbons;

(b) discontinuing the contacting of said catalyst with said feed stream;

(c) contacting said catalyst with a regeneration stream comprising an inert compound and oxygen and producing a first flue gas stream comprising said inert compound and water;

(d) passing said first flue gas stream to said separation zone, and recovering from said separation zone a second flue gas stream comprising said inert compound and having a first concentration of water and a first waste liquid stream comprising water;

(e) passing said second flue gas stream to said purification zone, and withdrawing therefrom a third flue gas stream having a

second concentration of water that is less than said first concentration and a second waste liquid stream comprising

system component are rotated concurrently with the rotor, the gear system component being coupled by means of at least one coupling

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COMPOSITE ARTICLES SEPARATING MERCURY

second concentration of water that is less than said first concentration and a second waste liquid stream comprising water; and

(f) recovering at least a portion of said third flue gas stream as said regeneration stream.

5,558,768

PROCESS FOR REMOVING CHLORIDES FROM CRUDE OIL

Michio Ikura, Kanata, and Maria Stanciulescu, Orleans, both of Canada, assignors to Energy, Mines and Resources Canada, Ottawa, Canada

Filed Jan. 10, 1995, Ser. No. 370,639

Int. Cl.[6] C10G *33/00;17/00;* **B01D** *1/00;19/00*

U.S. Cl. 208—187 **11 Claims**

1. A process for removing chlorides from crude oil which comprises (1) mixing with the crude oil a non-ionic surfactant having a hydrophilic-lipophilic balance in the range of about 0.5 to about 10, (2) bubbling a gas into the crude oil-surfactant mixture to form a froth, (3) centrifuging the frothed mixture to obtain a chloride containing sediment and an oil product of reduced chloride content and (4) collecting the oil product.

5,558,769

LATCHING APPARATUS FOR A BEARING ASSEMBLY PARTICULARLY FOR A CENTRIFUGE SEPARATION CHAMBER

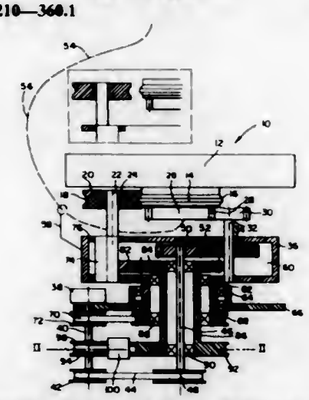
Friedrich Witthaus, St. Wendel; Wolfram Weber, Spiesen-Elversberg, and Lothar Leick, Merzig, all of Germany, assignors to Fresenius AG, Bad Homburg V.D.H., Germany

Filed Sep. 8, 1994, Ser. No. 303,300

Claims priority, application Germany, Sep. 11, 1993, 43 30 905.4

Int. Cl.[6] B04B *5/00*

U.S. Cl. 210—360.1 **25 Claims**



1. A latching apparatus for a bearing assembly for a removable part having a bearing race, comprising at least three bearing rollers each of which is rotatably supported on a respective bearing journal, said three bearing rollers, being positioned rotationally symmetrical and lying in one plane to guide and support between them the bearing race, the bearing journals being supported by a rotor that is in turn rotatably supported on a central axle aligned with a rotation axis of the bearing race, the bearing race and the removable part being driven by a drive apparatus such that the rotor and bearing race rotate with different angular velocities relative to a stationary housing, each of the bearing journals being located eccentrically on respective pins rotatably supported in the rotor, a gear system component that rotates at the same angular velocity as the rotor and engages said pins in such a way that when the gear system component is rotated, the pins engaged by the gear system component are rotated concurrently with the rotor, the gear system component being coupled by means of at least one coupling link with a shaft supported within the housing, and means for imparting to the gear system component a relative movement with respect to the rotor.

24. The latching apparatus in accordance with claim 1, wherein the removable part comprises a separation chamber and the bearing assembly is part of a centrifuge.

5,558,770

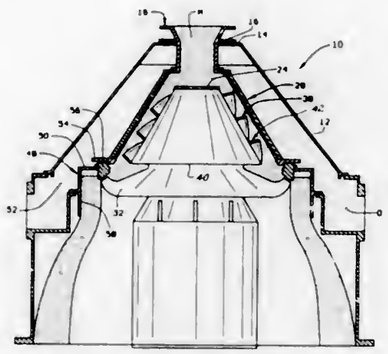
CENTRIFUGAL SEPARATOR HAVING A CONE FRUSTUM

Dewey M. Cope, and Thomas J. Magrecki, both of St. Louis, Mo., assignors to Elgin National Industries, Inc., St. Louis, Mo.

Filed Jul. 3, 1995, Ser. No. 497,975

Int. Cl.[6] B01D *33/00*

U.S. Cl. 210—374 **8 Claims**



1. A centrifugal separator comprising:

a drive mechanism including a drive shaft rotatable about a axis which the centrifuge rotates;

a flight assembly attached to the drive shaft and rotatably driven thereby, said flight assembly having an end, and a plate secured at the end of said flight assembly;

a screen assembly connected to the drive mechanism to be rotatably driven thereby, the screen assembly including a perforated screen installed radially outwardly of the flight assembly;

an inlet positioned adjacent said flight assembly for introducing material onto said plate and delivering said introduced material into a space between the screen and the flight assembly for separating fluids from the introduced material;

the improvement comprising a hollow cone frustum open at its ends, positioned radially inward from said screen assembly between said inlet and said flight assembly and operatively connected to said drive mechanism to be rotated thereby, such that material introduced into said centrifugal separator and onto said plate is initially flung against said cone frustum to shield an area of the screen adjacent said flight assembly from said material, said material being moved slowly onto said flights due to generated centrifugal forces and gravity for delivery of said material along said cone frustum, said screen having an angle of inclination flaring outwardly with respect to the axis of said flight assembly, and said cone frustum has an angle of inclination equal to or less than the angle of said screen, wherein said cone frustum has a diameter less than that of the screen, to form a space between said screen and said cone frustum.

5,558,771

COMPOSITE ARTICLES SEPARATING MERCURY FROM FLUIDS

Donald F. Hagen, Woodbury; Wanda Bahnuet, St. Paul; Louis C. Haddad, Mendota Heights, and Robert E. Perkins, Oakdale, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 268,286, Jun. 29, 1994, Pat. No. 5,492,627. This application Dec. 4, 1995, Ser. No. 566,554

Int. Cl.[6] B01D *39/00*

U.S. Cl. 210—500.25 **12 Claims**

1. A sorptive support comprising an inert, porous substrate on which is immobilized finely divided elemental gold-mercury amalgam, said immobilized gold-mercury amalgam being present in domains having a maximum dimension in the range of 1 to 100 nm, said substrate with said immobilized gold-mercury amalgam being enmeshed in a porous fibrous web.

5,558,772

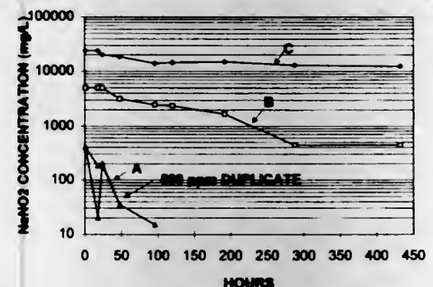
STABLE NITRITE SOLUTIONS

Samuel L. Bean, Wilmington, Del., and Walter H. Bortle, Jr., Chester, Pa., assignors to General Chemical Corporation, Parsippany, N.J.

Filed Mar. 3, 1995, Ser. No. 397,963

Int. Cl.[6] C02F *1/50*

U.S. Cl. 210—764 **5 Claims**



1. A method of inhibiting the activity of the bacteria *nitrobacter agilis* in dilute aqueous solutions containing a freezing point depressant additive and nitrite ions as a metal corrosion inhibitor and used in systems in contact with iron-based metal parts which comprises maintaining a concentration of nitrite ion as sodium nitrite of at least 2.5 percent by weight of said solution to inhibit the oxidation of nitrite ions to nitrate ions thereby preventing the loss of an anticorrosive effect of the nitrite ions on the iron-based metal parts.

5,558,773

METHOD FOR PRODUCING AND DRYING A FILTER CAKE, WHILE AVOIDING ENTERING OF THE FILTER CAKE INTO A THERMOPLASTIC PHASE

Jean-Claude Algeldinger, Wittnau, Switzerland, and Egon Hoffmann, Rheinfelden, Germany, assignors to Bertrams Dehydrat AG, Muttenz, Switzerland

PCT No. PCT/CH93/00263, § 371 Date Sep. 9, 1994, § 102(e) Date Sep. 9, 1994, PCT Pub. No. WO94/13382, PCT Pub. Date Jun. 23, 1994

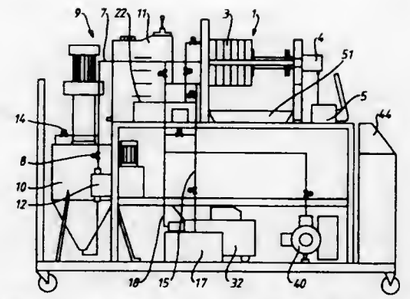
PCT Filed Nov. 19, 1993, Ser. No. 256,204

Claims priority, application Switzerland, Dec. 4, 1992, 03 735/92; Nov. 4, 1993, 03 319/93

Int. Cl.[6] B01D *37/00*

U.S. Cl. 210—770 **6 Claims**

1. A method for producing and drying a filter cake, while avoiding entering of the filter cake into a thermoplastic phase, comprising:



feeding a suspension into a chamber filter press, in which the suspension is filtered by a plurality of chamber filter plates, to produce a filter cake;

drying the filter cake under a reduced pressure in the interior of the chamber filter press beneath an upper limit of at most 200 mbar, and an increased temperature of said chamber filter plates being above a lower limit of at least 40° C., while controlling the pressure in the interior of the chamber filter press and the temperature of the chamber filter plates so that the temperature of the filter cake does not exceed 60° C. as long as dry matter contents of the filter cake lies between 65% and 85%, by weight.

5,558,774

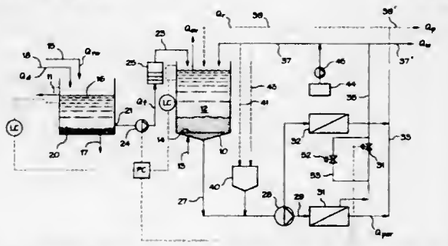
AERATED HOT MEMBRANE BIOREACTOR PROCESS FOR TREATING RECALCITRANT COMPOUNDS

Fernando A. Tonelli, Dundas, and Henry Behmann, Puslinch, both of Canada, assignors to Zenon Environmental Inc., Burlington, Canada

Continuation-in-part of Ser. No. 48,915, Apr. 19, 1993, Pat. No. 5,401,400, which is a continuation of Ser. No. 773,226, Oct. 9, 1991, Pat. No. 5,204,001. This application Mar. 27, 1995, Ser. No. 410,730

Int. Cl.[6] C02F *3/12*

U.S. Cl. 210—612 **10 Claims**



1. A single stage process for continuously biodegrading biochemically oxidizable organic material in a feed comprising dissolved and suspended solids in a wastewater mixture, said process comprising;

(a) flowing said feed at a controlled rate of flow to an autothermal aerobic bioreaction zone to provide an essentially constant hydraulic retention time (HRT) in a substantially autothermal bioreactor operating at substantially ambient pressure, said feed having suspended solids smaller than about 180 μm in nominal diameter, an ultimate BOD of at least 5000 mg/liter, and a BOD/COD ratio>0.6;

(b) forming a mixed liquor aqueous suspension of living thermophilic or caldo-active microorganisms ("cells") and said suspended solids which said cells are adapted to degrade at a temperature in the range from about 45° C. to 85° C.;

(c) maintaining an operating temperature within said range to maintain a predetermined stable population of said living cells, wherein said stable population is maintained with a regeneration

rate no more than 10% greater than the rate at which said cells are consumed, and said cells are consumed at a death rate no more than 10% greater than the rate at which they are regenerated;

(d) aerating said suspension in said autothermal bioreactor with enough oxygen-containing gas for utilization by said cells to maintain said regeneration rate while converting said organic material mainly to carbon dioxide and water;

(e) flowing said mixed liquor through a microfiltration or ultrafiltration membranous filtration zone at a velocity and pressure sufficient to maintain a predetermined membrane flux in said filtration zone, at which flux is maintained substantially constant, said membranes having a membrane area sufficiently large to provide a permeate flowing from said filtration zone, at a rate chosen to provide said HRT;

(f) flowing concentrate from said membranous filtration zone into said autothermal bioreactor as a concentrate recycle without thickening or hydrolyzing a portion of said concentrate;

(g) controlling the flow of said feed to said autothermal bioreactor to provide said controlled rate of flow sufficient to concurrently provide (1) sufficient nutrients to maintain a preselected growth rate of said cells in said stable population, and (2) enough feed in said autothermal bioreactor to equal in volume the amount of permeate removed; and,

(h) periodically removing a minor proportion, from 0 to 10% by volume of said concentrate recycle to modulate solids content in said bioreaction zone yet maintaining said stable population in said mixed liquor, said minor proportion being less than 10% by volume of said biochemically oxidizable material in said mixed liquor; whereby, sludge to be disposed of outside said process is less than 20% by weight of the amount one would expect to dispose of in a conventional activated sludge process with the same feed, operating with a mesophilic aerobic bioreactor at a HRT of less than 24 hr.

9. A single stage process for continuously biodegrading biochemically oxidizable organic material in a feed comprising dissolved and suspended solids in a wastewater mixture, said process comprising;

(a) flowing raw waste feed at a rate Q_w, in combination with from 0% to 200% as much dilution water as feed, the dilution water being fed at a rate Q_d, to an equalizer tank in a pretreatment zone for the raw waste, the zone having a volume sufficiently large to equalize variations in the flow rate of the raw waste to the pretreatment zone which is adapted to remove settlable solids and skimmable free oil, and to withdraw a skimmed feed containing hydrocarbons from the zone;

(b) removing non-dissolvable and non-emulsifiable solids larger than 106 μm from the skimmed feed and introducing it at a substantially constant flow rate Q_f to a bioreaction zone containing acclimated thermophilic living microorganisms in a mixed liquor;

(c) aerating the mixed liquor in the presence of the microorganisms at ambient or low pressure, in the range from about 1–5 atm, while maintaining a temperature in the range from 50° C.–60° C., and substantially constant HRT over an arbitrarily long time, longer than either the liquid residence time or the HRT of the bioreaction zone, based on Q_f in the presence of a stable cell population maintained with a regeneration rate no more than 10% greater than the rate at which cells are consumed, and said cells are consumed at a death rate no more than 10% greater than the rate at which they are regenerated;

(d) flowing a predetermined portion of mixed liquor from the bioreaction zone to a membranous filtration zone so as to generate a rate of flow of permeate greater than Q_f;

(e) maintaining a solids concentration of the predetermined portion within predetermined limits without externally hydrolyzing any portion of the mixed liquor;

(f) recycling a first portion Q_{p1} of the permeate to the bioreaction zone; and,

(g) removing a second portion Q_{p2} of permeate as reusable and sewerable (to city or municipal sewer system) water;

whereby, sludge to be disposed of outside said process is less than 20% by weight of the amount one would expect to dispose of in a conventional activated sludge process with the same feed, operating with a mesophilic aerobic bioreactor at a HRT of less than 24 hr.

10. A two stage process for continuously biodegrading biochemically oxidizable organic material in a feed comprising dissolved and suspended solids in a wastewater mixture, said process comprising;

(a) flowing said feed at a controlled rate of flow into a substantially mesophilic aerobic reaction zone in a first stage, to provide an essentially constant hydraulic retention time therein, less than 24 hr ("HRT24"), said first stage including a mesophilic aerobic bioreactor (MPB) and a cool mesophilic microfiltration or ultrafiltration membranous filtration zone, and said MPB operates at a temperature in a range from 10° C.–30° C. and ambient pressure with cool mixed liquor having volatile suspended solids (VSS) in the range from 100–25,000 mg/L, said feed having suspended solids smaller than about 180 μm in nominal diameter, an ultimate BOD of at least 100 mg/L and a BOD/COD ratio >0.6;

(b) flowing a mesophilic concentrate obtained from said cool filtration zone, to an autothermal aerobic reaction zone of a second stage which includes an autothermal aerobic bioreactor (ATAB) and an elevated temperature ("hot") membranous filtration zone;

(c) maintaining an operating temperature of said MPB within said cool range, to regenerate said cells at a regeneration rate greater than their death-rate so as to have a net production of biomass;

(d) aerating said suspension in said MPB with enough oxygen-containing gas for utilization by said cells to maintain said regeneration rate;

(e) flowing said cool mixed liquor through said cool filtration zone at a velocity and pressure sufficient to maintain a predetermined membrane flux in said cool filtration zone, at which flux essentially no solids are retained on the surface of membranes in said cool filtration zone, said membranes having a membrane area sufficiently large to provide a permeate flowing from said cool filtration zone, at a rate chosen to provide said HRT;

(f) recycling a major proportion of mesophilic concentrate from said cool filtration zone to said MPB as cool concentrate, and flowing a minor portion thereof to said ATAB;

(g) controlling the flow of said feed to said MPB to provide said controlled rate of flow sufficient to concurrently provide (1) sufficient nutrients to maintain a preselected growth rate of said cells to provide said net production, and (2) enough feed in said mesophilic reaction zone to equal in volume the mount of permeate removed from said first stage; and, in said second stage,

(h) flowing said cool concentrate feed at a controlled rate of flow into said ATAB operating at substantially ambient pressure and at a temperature in a hot range from about 45 ° C. to 85° C., With living thermophilic or caldo-active micro-organisms ("hot cells") and suspended solids which said hot cells are adapted to degrade in hot mixed liquor, so as to provide an essentially constant HRT ("HRTA") in the range from 1–12 days, in said ATAB;

(i) maintaining an operating temperature within said hot range to maintain a predetermined stable population of living cells in said hot mixed liquor, said suspended solids therein having a BOD of at least 20,000 mg/liter;

(j) aerating said hot mixed liquor with enough oxigen-containing gas to maintain said stable population;

(k) flowing said hot mixed liquor through said hot filtration zone at a velocity and pressure sufficient to maintain a predetermined membrane flux therein, at which flux essentially no solids are retained on the surface of membranes in said hot filtration zone, said membranes having a membrane area sufficiently large to provide a permeate flowing from said hot filtration zone, at a rate chosen to provide said HRTA;

(l) flowing hot concentrate from said hot filtration zone into said ATAB as a hot concentrate recycle without thickening or hydrolyzing a portion of said hot concentrate;

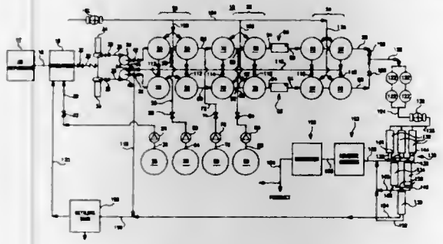
(m) controlling the flow of said cool concentrate to said ATAB to provide said controlled rate of flow sufficient to concurrently provide (1) sufficient nutrients to maintain a preselected growth rate of said hot cells, and (2) enough water in said autothermal bioreaction zone to equal in volume the amount of permeate removed; and,

(n) periodically removing a minor proportion, from 0 to 10% by volume of said hot concentrate recycle to modulate solids content in said autothermal bioreaction zone with essentially no loss of said cells in said mixed liquor, said minor proportion being less than 10% of said biochemically oxidizable material in said feed; whereby, sludge to be disposed of outside said process is less than 20% of the mount one would expect to dispose of in a conventional activated sludge process with the same feed, operating with said mesophilic aerobic bioreactor only, at a HRT of less than 24 hr.

5,558,775
PROCESS FOR THE TREATMENT OF HAZARDOUS WASTE WATER

Joseph B. Busch, Jr., Coral Springs, Fla., assignor to Joseph Busch, Jr., Coral Springs, Fla., and Joseph Busch, Sr., Edison, N.J.

Filed Nov. 1, 1994, Ser. No. 332,660
Int. Cl.[6] C02F *1/44*
U.S. Cl. 210—638 **8 Claims**



1. A process for treating hazardous waste water containing organic components, suspended solids, and colloidal matter to produce recyclable water, which comprises the steps of:

a) introducing said hazardous waste water stream;

b) contacting said stream with an oxidizing agent to oxidize said organic components in said said stream;

c) passing a stream resulting from step b) through a separation zone to remove solids having a specific gravity greater than 1.0 to form a liquid stream;

d) contacting said liquid stream of step c) with a polymer to facilitate suspended solids reduction and introducing same into a separation zone to remove suspended solids;

e) contacting a liquid stream from step d) with a caustic solution and introducing same into a separation zone to remove particulates of less than about 10 microns.

f) contacting a liquid stream from step e) with an alkali-metal precipitant if said hazardous waste water being treated contains a heavy metal compound and introducing same into a separation zone to remove solids of a particle size down to about 10 microns;

g) passing a liquid stream from step f) through an ultraviolet zone to reduce organic loading;

h) passing a liquid stream from step g) through a separation zone to reduce colloidal matter to less than about 10%;

i) passing a liquid stream from step h) through a carbon filter zone to further reduce organic components; and

j) passing a liquid stream from step i) through a micron filter zone to produce recyclable water.

5,558,776
PROCESS FOR THE MANUFACTURE OF A COMPOSITE PLASMA MEMBRANE AND USE THEREOF

Hermann Steinhauser, Saarbrücken; Hartmut Brüschke, Nussloch; Guido Ellinghorst, Overath, and Andreas Hübner, Unna, all of Germany, assignors to Deutsche Carbone, AG, Frankfurt, Germany

Division of Ser. No. 135,402, Oct. 13, 1993, abandoned. This application Oct. 17, 1994, Ser. No. 324,344
Claims priority, application Germany, Oct. 13, 1992, 42 34 521.9
Int. Cl.[6] B01D *61/36*
U.S. Cl. 210—640 **18 Claims**

1. A process for separating C_1–C_3 alkanols from mixtures thereof with other organic liquids by pervaporation using a composite plasma membrane, said method comprising:

obtaining a composite plasma membrane prepared by forming a pore-free impermeable plasma-polymer layer on a porous substrate by plasma polymerization of a plasma-forming gaseous mixture by means of glow discharge in an electrical alternating field, said plasma-forming gaseous mixture containing one or more hydrocarbons as a matrix-forming component, one or more nitrogen-, silicon-, sulphur- or phosphorus-containing inorganic compounds as a non-matrix-forming component, and an oxygen-containing component, said pore-free polymer layer being produced directly on the porous substrate without the use of an impermeable intermediate layer, the pores on the surface of said porous substrate on which the plasma-polymer layer is formed having a pore diameter of less than 100 nm,

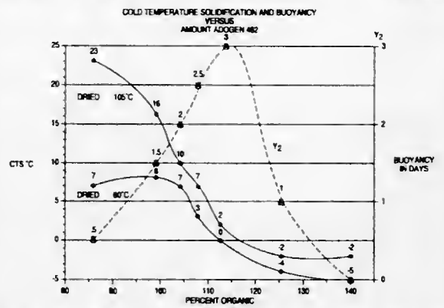
separating a mixture of a C_1–C_3 alkanol and other organic liquid by passing said C_1–C_3 alkanol through said composite plasma membrane from the pore-free side thereof, and

recovering a permeate containing said C_1–C_3 alkanol.

5,558,777
OIL SPILL FLOCCULATING AGENT AND METHOD OF REMEDIATING OIL SPILLS

Steven Kennetz, Trenton, and Charles A. Cody, Robbinsville, both of N.J., assignors to Rheox, Inc., Highstown, N.J.

Filed Apr. 13, 1995, Ser. No. 421,106
Int. Cl.[6] C02F *1/42*
U.S. Cl. 210—691 **5 Claims**



1. A process for remediating oil spills in water where the temperature of the water is about 10° C. or lower comprising:

(a) contacting oil on water with an organoclay on the surface of the water in an amount sufficient to cause agglomeration of the oil and the organoclay which organoclay has been made by the reaction of smectite clay and one or more quaternary ammonium compounds at a present organic ratio of from about 99% to about 140% of the cation exchange capacity of the clay wherein the quaternary compound is derived from an oil source selected from the group consisting of a naturally occuring coconut oil, a synthetic version of a naturally occuring coconut nut oil and modification of other naturally occuring oils to produce a derivative which is similar to coconut oil

with a carbon chain distribution wherein about 50% or more of the carbon chains are C_8 to C_{14} and then;

(b) collecting such agglomerated oil and organoclay from the surface of the water.

5,558,778

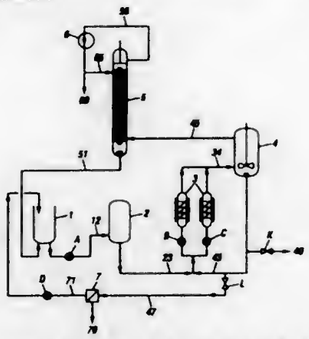
PROCESS FOR THE TREATMENT OF A WASTEWATER

Johannes J. Janssen; Arie L. Mos, and Theodoor J. L. W. Simons, all of The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 153,392, Nov. 16, 1993, abandoned. This application Sep. 14, 1995, Ser. No. 528,184

Int. Cl.[6] B01D *35/18*

U.S. Cl. 210—774 **7 Claims**



1. A process for the treatment of a wastewater feed containing hydrocarbons, aldehydes, ketones, alcohols, phenols and salts originated from a styrene monomer/propylene oxide production plant, said process comprising:

a. cooling said wastewater feed to form a freeze concentrate comprising salt crystals, a concentrated waste product and a substantially pure water product in the form of ice crystals;

b. separating said ice crystals from said freeze concentrate to form a residual freeze concentrate comprising said salt crystals and said concentrated waste product; and

c. removing said salt crystals from said residual freeze concentrate wherein said freeze concentrate contains at least twice the amount of waste products as said wastewater.

5,558,779

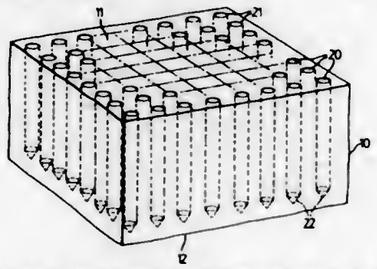
METHOD AND APPARATUS FOR EXTRACTING WATER FROM MARINE SEDIMENTS

Lars L. Eriksson, 108 Bedford Street, Port Hope, Ontario, Canada

Filed Oct. 10, 1995, Ser. No. 541,820

Int. Cl.[6] B01D *35/18*

U.S. Cl. 210—774 **11 Claims**



1. A method of dewatering marine sediment comprising the steps of:

(a) engaging at least one surface of a frozen block of sediment which was frozen and extracted from a marine environment and comprises one or more cavities, with an external wicking means;

(b) placing the frozen block in a porous enclosure; and

(c) thawing and removing melt water to a location away from the thawing block of sediment.

5,558,780

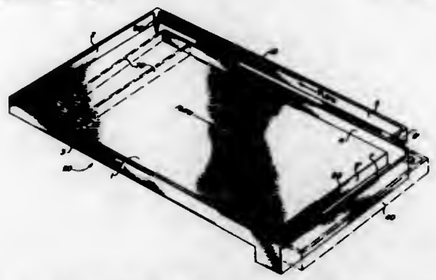
STRIPPING/EXTRACTION SETTLER APPARATUS AND METHOD

Mark F. Vancas, 305 N. Main St., San Manuel, Ariz. 85631

Filed Jun. 10, 1994, Ser. No. 258,390

Int. Cl.[6] C02F *1/40*; **B01D** *21/24*

U.S. Cl. 210—801 **24 Claims**



1. An apparatus for separating a heterogeneous mixture which comprises:

(a) a separator tank;

(b) means for withdrawal of an effluent flow connected to one side of the separator tank;

(c) means for an influent flow located near the side of the separator tank where the effluent is withdrawn; and

(d) means for transporting an influent to a wall of the separator tank furthest from the means for withdrawal of the effluent wherein said means for transporting an influent is connected to the means for an influent flow and lies adjacent a length of the separator tank such that a bottom of said means for transporting an influent is in longitudinal planar alignment with a bottom of said separator tank along substantially an entire length of the separator tank.

5,558,781

PROCESS FOR ENZYMATICALLY DEGUMMING VEGETABLE OIL

Henning Buchold, Hanau, and Rudolf Boenoch, Neckenheim, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, and Rohm GMBH Chemische Fabrik, Darmstadt, both of Germany

Filed Nov. 16, 1994, Ser. No. 340,829

Claims priority, application Germany, Nov. 19, 1993, 43 39 556.2

Int. Cl.[6] B01D *61/58*

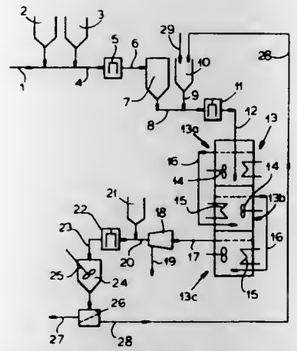
U.S. Cl. 210—805 **10 Claims**

1. A process for degumming vegetable oil, which comprises the steps of:

(a) adjusting the pH of the vegetable oil with an aqueous acid to a value of 3 to 6 to obtain a vegetable oil-water emulsion;

(b) dispersing throughout the vegetable oil-water emulsion an aqueous enzyme solution which contains at least one of the enzymes phospholipase A1, A2 or B to enzymatically degum the vegetable oil;

(c) stirring the vegetable oil-water emulsion to facilitate enzymatic degumming of the vegetable oil at a temperature of 20° to 90° C. to obtain a liquid which contains degummed vegetable oil and a watery sludge containing said phospholipase



enzymes which were used during step (b) and which are adsorbed on a phosphatide sludge;

(d) separating the degummed vegetable oil from the watery sludge which contains said phospholipase enzymes which were used during step (c) and which are adsorbed on said phosphatide sludge to obtain degummed vegetable oil and a water-sludge phase containing said used phospholipase enzymes adsorbed on said phosphatide sludge;

(e) adding a separation promoter selected from the group consisting of a polyethylene-sugar-fatty acid ester, ricinus ethoxylate, ethoxylated palmitate, an ethoxylated synthetic primary alcohol, an ethoxylated tallow fatty alcohol, a non-ionic surfactant, a hot water-soluble methyl cellulose, a hot water-soluble carboxymethylcellulose, a water-soluble starch, a xerogel, an alginate and a chitosan to said water-sludge phase following step (d) to promote separation of the used enzymes from the phosphatide sludge by desorption, and separating an aqueous solution of said used phospholipase enzymes from said phosphatide sludge to form a sludge-free aqueous solution containing the used phospholipase enzymes or

(e1) adding a solubilizer selected from the group consisting of a polyethylene-sugar-fatty acid ester, ricinus ethoxylate, ethoxylated palmitate, an ethoxylated synthetic primary alcohol, an ethoxylated tallow fatty alcohol, and a non-ionic surfactant to said watery sludge before step (d) or to said water-sludge phase following step (d) to solubilize said phosphatide sludge thereby also forming a sludge-free aqueous solution containing the used phospholipase enzymes;

(f) recovering the sludge-free aqueous solution containing the used phospholipase enzymes from step (e) or step (e1); and

(g) recycling at least in part to step (b) said aqueous solution containing the used phospholipase enzymes wherein said aqueous solution is dispersed throughout a fresh supply of the vegetable oil to be degummed according to step (c), and wherein the content of recycled used phospholipase enzymes in the total amount of phospholipase enzymes dispersed in the vegetable oil is at least 10%.

5,558,782

RECOVERY OF WATER AND SOLIDS IN A PAPER MILL

Ian S. Bleakley, and Hannu O. E. Toivonen, both of St. Austell, United Kingdom, assignors to ECC International Limited, United Kingdom

Continuation-in-part of Ser. No. 171,018, Dec. 21, 1993. This application Dec. 13, 1994, Ser. No. 355,038

Int. Cl.[6] C02F *1/52*

U.S. Cl. 210—712 **18 Claims**

1. A process for separating fine particulate material from water in the used water recovery system of a sheet forming mill, comprising the following steps: (a) precipitating calcium carbonate in an aqueous suspension constituting said used water to entrain the fine particulate material present in said used water in the calcium carbonate precipitate to form a mixed aggregated crystalline precipitate including scalenohedral calcium carbonate; (b) dewatering the suspension resulting from step (a) to separate the mixed precipitate in the form of a cake from the aqueous suspension by filtering or centrifuging; and (c) recovering the mixed precipitate.

5,558,783

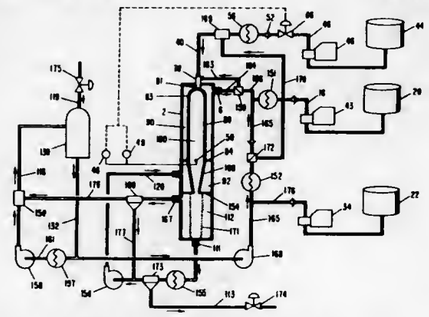
SUPERCRITICAL OXIDATION REACTOR

Thomas G. McGuinness, 500 N. Guadalupe St. #G-5, Santa Fe, N.M. 87501

Continuation-in-part of Ser. No. 14,345, Feb. 5, 1993, Pat. No. 5,384,051. This application Jan. 24, 1995, Ser. No. 377,420

Int. Cl.[6] C02F *1/72*

U.S. Cl. 210—761 **16 Claims**



1. A supercritical reactor apparatus comprising:

a pressure vessel capable of operating at a temperature in excess of a supercritical temperature of water;

a reaction zone enclosed within said pressure vessel;

a source of at least one fuel;

precombustion chamber means for introducing said fuel into said reaction zone;

a supply of at least one reactant;

means for pumping or compressing said reactant;

means for heating said reactant to or above said supercritical temperature;

means for injecting the heated and compressed reactant into said pressure vessel;

means for mixing a portion of said reactant with said fuel in said precombustion chamber means, thereby inducing a reaction at or above said supercritical temperature in said precombustion chamber means with said fuel;

a permeable liner comprising material capable of being permeable to a remaining portion of said reactant at a temperature in excess of the supercritical temperature of water, said liner disposed between said means for injecting and said reaction zone, and through which said liner said remaining portion of said reactant is dispersed into said reaction zone thereby inducing a reaction at or above said supercritical temperature in said reaction zone with said fuel; and

an exhaust, through which by-products of the reaction exit from said reaction zone.

5,558,784

METHOD FOR POSITIONING A WORK PIECE CARRIER MEMBER IN A MACHINING APPARATUS AND A WORK PIECE CARRIER MEMBER ADAPTED TO BE POSITIONED IN A MACHINE APPARATUS

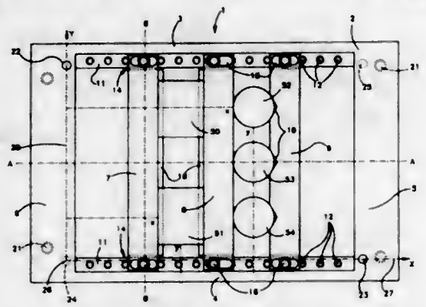
Basil Obrist, Gontenschwil, Switzerland, assignor to Erowa AG, Reinach, Switzerland

Filed Jul. 25, 1994, Ser. No. 279,883

Claims priority, application Germany, Aug. 5, 1993, 43 26 275.9

Int. Cl.[6] B23H *1/00*; B23Q *3/18;7/18;16/00*

U.S. Cl. 219—69.12 **27 Claims**



1. A method for positioning a work piece carrier member with work pieces received therein in a machining apparatus, comprising the steps of:

determining and recording the coordinates of each of said work pieces received in said work piece carrier member with reference to a virtual coordinate system in a measuring and aligning station prior to positionally fixing said work piece carrier member in said machining apparatus, said virtual coordinate system being defined by at least two reference marks provided on said work piece carrier member which are a horizontal distance from each other;

transmitting the coordinates of each of said work pieces determined and recorded in said measuring and aligning station to said machining apparatus;

inserting the work piece carrier member into the machining apparatus in a position which corresponds at least approximately to a preselected nominal position and positionally fixing said work piece carrier member in said position;

determining the coordinates of an effective position for said work piece carrier member in said machining apparatus by scanning said at least two reference marks with regard to a nominal reference coordinate system of said machining apparatus and storing the coordinates of said effective position in said machining apparatus; and

arithmetically superimposing said virtual coordinate system defined by said at least two reference marks provided on said work piece carrier member, together with the coordinates of each of said work pieces received in said work piece carrier member, onto said reference coordinate system of said machining apparatus.

5,558,785

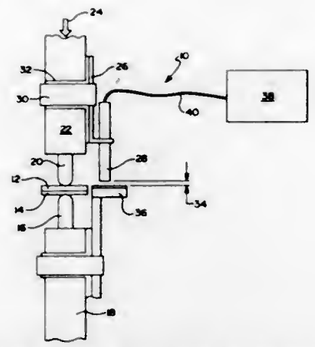
INTER-ELECTRODE DISPLACEMENT MONITORING AND CONTROL

Michael L. Killian, Troy, and Michael D. Orr, Commerce Township, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 224,899, Apr. 8, 1994, Pat. No. 5,393,950. This application Dec. 22, 1994, Ser. No. 362,391

Int. Cl.[6] B23K *11/25*

U.S. Cl. 219—110 **15 Claims**



1. In a resistance welding system wherein a pair of workpieces to be welded are positioned between a first electrode which is movable axially toward and away from a second electrode which remains substantially fixed in position during a weld cycle, wherein an electronic weld controller controls the application of alternating electrical current to at least one said electrode in order to melt a localized area of the material of said workpieces to weld said workpieces to one another, a method of predicting and adaptively controlling weld quality comprising the steps of:

positioning a sensor with respect to said welding system, said sensor being adapted to provide a series of discrete output signals each indicative of the instantaneous displacement of said movable electrode with respect to said fixed electrode;

identifying a reversal wherein said displacement signals cease increasing in magnitude and begin to decrease, said decrease being indicative of indentation of at least one said electrode into the surface of at least one said workpiece; and

applying a control signal indicative of said reversal to said electronic controller to cause said controller to adaptively control the application of said current in response thereto, said current being interrupted after a fixed number of half cycles of said alternating current have been applied after a said reversal has been identified.

5,558,786

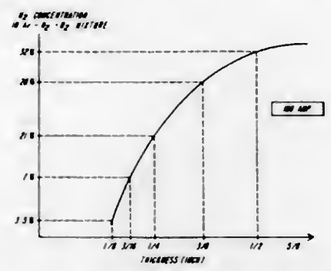
PROCESS FOR HIGH QUALITY PLASMA ARC AND LASER CUTTING OF STAINLESS STEEL AND ALUMINUM

Richard W. Couch, Jr., Hanover, N.H.; Nicholas A. Sanders, Norwich, Vt.; Zhipeng Lu; Lifeng Luo, both of Lebanon, N.H., and Staffan C. O. Stenfelt, Lammhult, Sweden, assignors to Hypertherm, Inc., Hanover, N.H.

Continuation of Ser. No. 024,416, Mar. 1, 1993, Pat. No. 5,380,976, which is a continuation-in-part of Ser. No. 989,183, Dec. 11, 1992, Pat. No. 5,414,236. This application Oct. 6, 1994, Ser. No. 319,470

Int. Cl.[6] B23K *10/00*

U.S. Cl. 219—121.44 **17 Claims**



1. A cutting process for producing a high quality kerf in stainless steel and non-ferrous workpieces using a laser cutting torch, the workpieces having an upper surface adjacent the torch and a bottom surface opposite the torch,the torch using a total gas flow to the kerf, the process comprising:

forming a portion of the total gas flow from a reducing gas, and adjusting the ratio of the reducing gas flow to the total gas flow prior to cutting to produce a predominantly reducing atmosphere through the kerf and predominately oxidizing atmosphere generally at the region defined by the bottom surface and the kerf, the adjusting including increasing the: proportion of the reducing gas introduced into the kerf in coordination with an increasing thickness of the workpiece.

5,558,787

Patent Not Issued For This Number

5,558,788

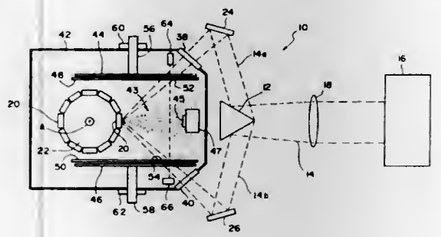
DUAL BEAM OPTICAL SYSTEM FOR PULSED LASER ABLATION FILM DEPOSITION

Douglas N. Mashburn, Knoxville, Tenn., assignor to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Filed Nov. 30, 1993, Ser. No. 159,163

Int. Cl.[6] B23K *26/00*

U.S. Cl. 219—121.68 **20 Claims**



1. A laser ablation apparatus comprising:

a pulsed light source outputting a pulsed light beam;

an ablation chamber having a sidewall;

means for focusing the pulsed light beam into the ablation chamber;

means, disposed within the ablation chamber, for supporting at least one target;

means for dividing the pulsed light beam into two substantially equal halves having the same spatial and temporal intensity profile; and

means for directing the two halves to a surface of the target such that they arrive from complementary angles relative to the target surface normal,

the two halves intersecting and overlapping at the target surface and having a summed energy and power per unit area sufficient to effect ablation of material from the target surface without producing texturing in the target surface, thereby generating a plume of ablated material emanating from the target,

the summed energy and power per unit area being selected to produce a non-textured target surface and a desired characteristic of the plume.

5,558,789

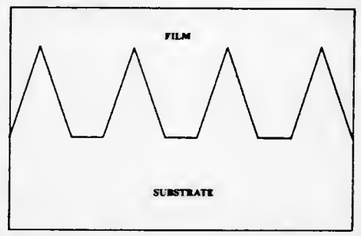
METHOD OF APPLYING A LASER BEAM CREATING MICRO-SCALE SURFACE STRUCTURES PRIOR TO DEPOSITION OF FILM FOR INCREASED ADHESION

Rajiv K. Singh, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Filed Mar. 2, 1994, Ser. No. 204,509

Int. Cl.[6] B23K *26/00*

U.S. Cl. 219—121.69 **19 Claims**



1. A method for adhering a thin film to a metal, ceramic or composite material substrate, comprising the steps of:

(A) providing a laser for producing a beam of radiation having a wavelength within the ultraviolet to infrared range, an energy density within the range of 0.01 to 15 J/cm^2, and pulse durations within the range of 100 femtoseconds to 1 millisecond;

(B) irradiating a single area of the surface of the material substrate to be treated with at least 50 pulses of radiation from said laser, said radiation having an energy density of between 0.01 to 15 J/cm^2, said pulses having duration of between 100 femtoseconds to 1 millisecond, thereby producing semi-periodic micro-scale surface structures of less than 200 microns in magnitude on the surface of said materials;

(C) depositing onto said material substrate a film of a material having properties different from said material substrate using conventional vapor deposition techniques.

5,558,790

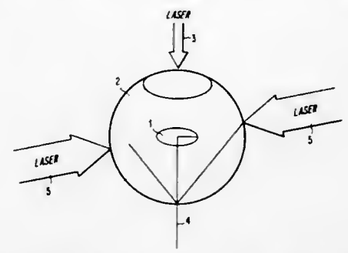
METHOD AND LASER SYSTEM FOR THE THERMAL ANALYSIS OF A SUBSTANCE

Ashot Nazarian, Gaithersburg, Md., assignor to Science Applications International Corporation, San Diego, Calif.

Filed Feb. 15, 1994, Ser. No. 196,491

Int. Cl.[6] B23K *26/00*; G01N *25/18;25/20*

U.S. Cl. 219—121.77 **40 Claims**



1. A method for the thermal analysis of a substance which comprises

(i) placing a sample of the substance on a thermally conductive substrate in a reactor with the substrate being suspended on a temperature sensor and positioned at the center of the reactor,

(ii) heating the reactor with laser beams of equal intensity from opposing sides;

(iii) measuring the reactor and gas temperature during the heating; and

(iv) additionally heating the sample and substrate to a temperature above the reactor temperature and measuring the rate at

wing, said second wiper wing also being engageable with said windshield during said wiping and cleaning function; and

a gas inlet port connected to said chamber to pressurize said chamber to prevent heated air inside said can from breaching

(iv) additionally heating the sample and substrate to a temperature above the reactor temperature and measuring the rate at which the sample and substrate temperature relaxes to the reactor temperature.

5,558,791

INERT GAS FOR THE ARC WELDING OF ALUMINUM

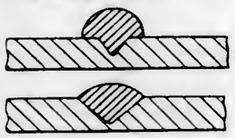
Alfward Fawer, Meerbuch, Germany, assignor to Messer Griesheim, Frankfurt

Filed Jun. 8, 1995, Ser. No. 482,410

Claims priority, application Germany, Dec. 12, 1992, 42 41 983.2; WIPO, Dec. 2, 1993, PCT/EP93/03392

Int. Cl.[6] B23K *9/167;9/173*

U.S. Cl. 219—137 WM **8 Claims**



3. A process for arc welding of aluminum, which comprises adding 80 to 250 ppm of a mixture of N_2 and N_2O to an inert gas, wherein the inert gas is:

(a) argon or

(b) a mixture of argon and helium.

5,558,792

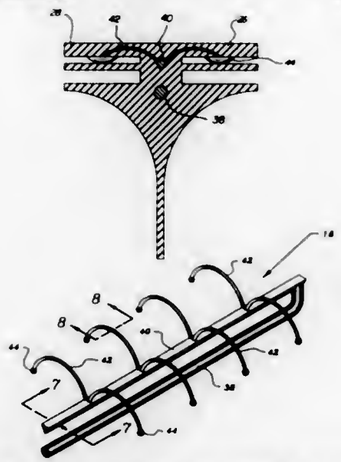
HEATED WINDSHIELD WIPER BLADE WITH ELECTRIC HEATER CORE AND OUTWARDLY EXTENDING ARCHED BRANCH MEMBERS

Kenneth G. Gauharou, 10 Dolores Dr., Ringwood, N.J. 07456

Filed Oct. 30, 1995, Ser. No. 550,009

Int. Cl.[6] H05B *3/00;* **B60S** *1/04*

U.S. Cl. 219—202 **10 Claims**



1. A heated windshield wiper blade construction comprising:

a flexible polymeric wiper blade selectively attachable to an existing movable metallic wiper blade support arm attached proximate and movable relative to a vehicle windshield, said wiper blade including a flexible first wiper wing extending along an axial length of said wiper blade and being engageable with said windshield to perform a conventional windshield wiping and cleaning function, and further including at least one flexible second wiper wing, said second wiper wing being orthogonal to and axially aligned with said first wiper wing, said second wiper wing also being engageable with said windshield during said wiping and cleaning function; and

a heating element interiorly disposed within said wiper blade and extending substantially along and through an axial length of said wiper blade, said heating element including a central core member extending through said axial length of said wiper blade and further including a plurality of branch members attached to and extending substantially orthogonally outwardly from said center core member, said branch members functioning to deliver and dissipate heat through said at least one second wiper wing, thereby to permit said at least one second wiper wing to selectively heat an exterior surface of said windshield during relative movement between said wiper blade and said windshield.

5,558,793

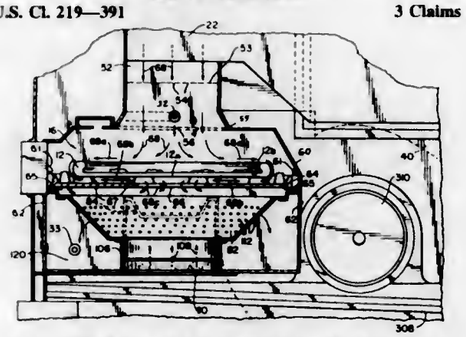
QUICK-COOKING OVEN

Philip R. McKee, Wichita, Kans., and Earl R. Winkelmann, Garland, Tex., assignors to TurboChef, Inc., Wichita, Kans.

Continuation of Ser. No. 128,897, Sep. 29, 1993, Pat. No. 5,434,390, which is a continuation-in-part of Ser. No. 761,285, Sep. 17, 1991, Pat. No. 5,254,823. This application Apr. 19, 1995, Ser. No. 424,902

Int. Cl.[6] F27D *11/00*

U.S. Cl. 219—391 **3 Claims**



1. An oven for cooking a food product at least partially by hot gas flow, comprising:

(A) a housing defining a cooking chamber adapted to receive and hold a food product for cooking;

(B) a hot gas plenum configured and dimensioned to hold and heat a volume of hot gas;

(C) conduit means for providing gaseous communication between said cooking chamber and said plenum;

(D) means for sensing the temperature in said plenum;

(E) means for sensing the temperature in said cooking chamber; and

(F) control means for selectively and variably causing the flow of hot gas between said plenum and said cooking chamber via said conduit means depending at least in part on said sensed temperature in said plenum and said sensed temperature in said cooking chamber.

5,558,794

COAXIAL HEATING CABLE WITH GROUND SHIELD

Peter J. Jansens, 3 Marcus Avenue, Morehill, Benoi, Transvaal, South Africa

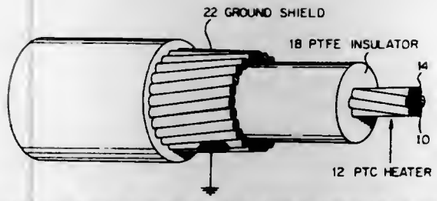
Continuation of Ser. No. 923,448, Aug. 3, 1992, abandoned. This application Oct. 6, 1994, Ser. No. 319,358

Claims priority, application South Africa, Aug. 2, 1991, 91/6100

Int. Cl.[6] H05B *3/00*

U.S. Cl. 219—549 **10 Claims**

1. A flexible coaxial space heater cable comprising a central electrically conductive multistrand heating core formed from a plurality of strands so as to provide a metallic conductor having a resistance with a positive temperature coefficient, an electrically insulating polymeric sheath surrounding the core, and an outer electrically conductive ground shield enclosing the polymeric sheath, the ground shield comprising a plurality of contiguous strands which are helically laid over the polymeric sheath, wherein said flexible coaxial space heater cable has a maximum diameter of 1.5 mm, wherein the contiguous strands are helically laid over the polymeric sheath at a varying pitch angle along the length of the polymeric sheath, in concert with variations in an outer diameter of the polymeric sheath along the length thereof, so as to provide constant and complete coverage of the polymeric sheath and to facilitate tangential heat flow around the ground shield.



5,558,795

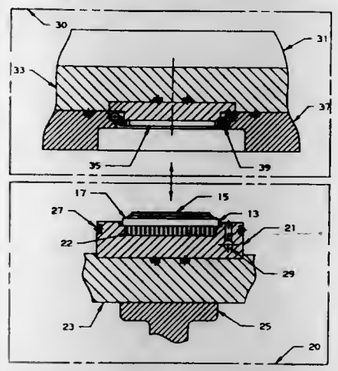
MODULE ENCAPSULATION BY INDUCTION HEATING

Vlastimil Frank, Warrenton, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 429,889, Oct. 31, 1989, Pat. No. 5,182,424. This application Apr. 30, 1992, Ser. No. 876,345

Int. Cl.[6] B23K *13/01*

U.S. Cl. 219—604 **13 Claims**



1. An apparatus for encapsulating a ceramic substrate having semiconductor chips joined thereon with a protective cap through the use of RF induction heating to melt a sealband placed between said cap, and said substrate near the periphery of said cap, said cap comprised of a material in which a electromagnetic field would induce an electric current, said apparatus connected to a source of RF power, comprising:

a substantially airtight chamber constructed from a high temperature insulator material in which said cap is positioned on said ceramic substrate;

a forcing means for forcing said cap and said substrate together to promote good bonding, said forcing means providing downward pressure on said cap;

an RF coil connected to said source of RF power oriented around the periphery of said cap which generates an RF spectrum of electromagnetic field to induce a current in said cap, said forcing means urging said cap into thermal contract with said sealband, and said thermal contact of said cap and said sealband enabling said induced current in said cap to melt said sealband; and

a gas inlet port connected to said chamber to pressurize said chamber to prevent heated air inside said cap from breaching said sealband during melting.

5,558,796

APPARATUS FOR ADJUSTING THE COOKING TIME AND POWER OUTPUT OF A MICROWAVE OVEN

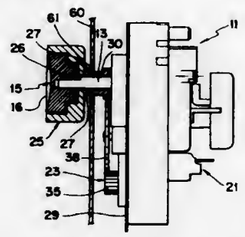
Whan H. Cho, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Apr. 11, 1995, Ser. No. 420,899

Claims priority, application Rep. of Korea, Apr. 11, 1994, 1994-7543

Int. Cl.[6] H05B *6/68*

U.S. Cl. 219—702 **6 Claims**



1. Apparatus for adjusting the operating functions of a microwave oven comprising:

a first function control unit for controlling a first operating function and having a first rotary shaft;

a second function control unit for controlling a second operating function and having a second rotary shaft spaced from and arranged parallel to said first shaft;

a first manual rotary actuator operably connected to said first shaft for rotating said first shaft in response to rotation of said first manual rotary actuator; and

a second manual rotary actuator operably connected to said second shaft for rotating said second shaft in response to rotation of said second manual rotary actuator;

said first and second manual rotary actuators being rotatable about a common axis;

wherein said second manual rotary actuator is operably connected to said second shaft by an idler gear lying in a plane oriented perpendicularly to said common axis, said idler gear mounted for rotation about an axis disposed between and parallel to said first and second shafts, said idler gear being operably connected to gear teeth rotatable with said second manual rotary actuator and to gear teeth rotatable with said second shaft.

5,558,797

AUTOMATIC FOOD TYPE DETERMINING DEVICE FOR A HEATING APPARATUS

Minoru Takagi, Aichi-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Oct. 25, 1993, Ser. No. 143,851

Claims priority, application Japan, Oct. 26, 1992, 4-287281

Int. Cl.[6] H05B *6/68*

U.S. Cl. 219—705 **11 Claims**

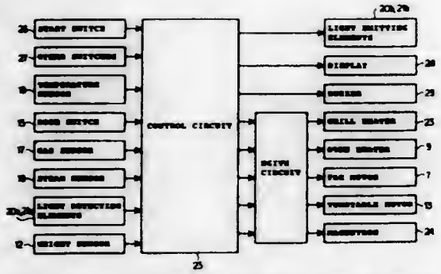
1. A heating apparatus comprising:

a) a heating chamber having a door;

b) heating means for heating food contained in the heating chamber;

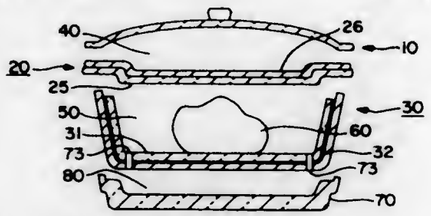
c) control means for controlling a heating operation of the heating means;

d) a temperature sensor connected to the control means and sending a temperature in the heating chamber before the substantial heating operation of the heating means is initiated;



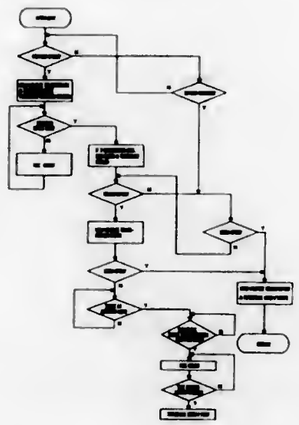
e) a gas sensor connected to the control means and sensing a volume of gas in the heating chamber;
f) gas volume change rate calculating means provided in the control means for calculating a change rate of the gas volume on the basis of output of the gas sensor;
g) means provided in the control means for storing data of a reference value with respect to the change rate of the gas volume, the reference value being capable of being varied;
h) means provided in the control means for varying the reference value in accordance with the sensed temperature in response to a signal generated by the temperature sensor; and
i) determining means provided in the control means for comparing the change rate of the gas volume calculated by the gas volume change rate calculating means with the varied reference value, thereby distinguishing an alcoholic content of the food.

5,558,798
MICROWAVE STEAM COOKING APPARATUS
Daniel T. Tsui, 7033 Burnside Dr., San Jose, Calif. 95120
Filed Jun. 12, 1995, Ser. No. 489,483
Int. Cl.[6] H05B *6/80*
U.S. Cl. 219—731 **22 Claims**



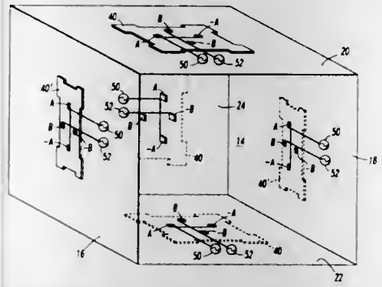
1. A vessel for cooking food which comprises:
a housing enclosing a first chamber and a second chamber;
said first and second chambers separated from one another by a divider;
said first chamber adapted for holding food;
said second chamber adapted for holding water;
said first chamber including first wall sections having a shape and constructed at least partially from microwave shielding material, said shape and said microwave shielding
material operably selected in combination with one another such that when said vessel is exposed to microwave radiation, said food in said first chamber is substantially shielded from said microwave radiation;
said microwave shielding material having a sufficiently small electrical conductivity and sufficiently large magnetic permeability to reflect microwaves without being heated by microwaves;
said second chamber including second wall sections constructed at least partially from at least one of microwave:
(i) transmitting material;
(ii) absorbing material and having a shape, said at least one of microwave transmitting material and absorbing material operably selected in combination with said shape such that when said vessel is exposed to microwave radiation, said water in said second chamber absorbs said microwave radiation whereby a portion of said water is converted to steam;
said microwave transmitting material having a sufficiently small electrical conductivity and small magnetic permeability such that said transmitting material is sufficiently transparent to microwaves such that said microwave energy is transmitted through said transmitting material without substantially heating said transmitting material;
said microwave absorbing material having an electrical conductivity that is sufficiently large and a permeability that is sufficiently low such that said absorbing material is substantially heated by said microwave energy;
said first chamber communicating with said second chamber through vent openings in one
of said housing and divider such that said food is cooked by exposure to said steam passing from said second chamber into said first chamber when steam is generated by microwaves exposed to water in said second chamber.

5,558,799
APPARATUS AND METHOD FOR CONTROLLING TURNTABLE OF MICROWAVE OVEN
Dae B. Kang, Changwon, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Dec. 30, 1994, Ser. No. 366,482
Claims priority, application Korea, Dec. 30, 1993, 1993-31371
Int. Cl.[6] H05B *6/78*
U.S. Cl. 219—754 **13 Claims**



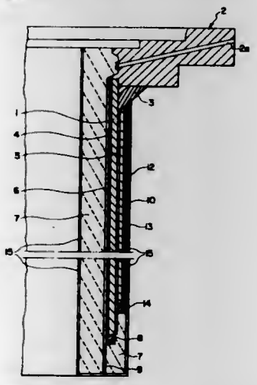
1. A method for controlling a turntable of a microwave oven, comprising the steps of:
a) driving a magnetron and a turntable motor during a cooking cycle;
b) checking an output of a means for sensing rotation positions of the turntable;
c) storing a time period, T_r, from a time of initiating the cooking cycle to a time of reaching a first half rotation position of a turntable shaft;
d) stopping energization of the magnetron at the end of the cooking cycle; and
e) controlling the turntable motor to continue rotating after the end of a full rotation of the turntable with respect to the first rotation position for an extra time, $T_e=T_p-T_r$, where T_p is a period of rotation of the turntable, such extra rotation returning the turntable to a starting position.

5,558,800
MICROWAVE POWER RADIATOR FOR MICROWAVE HEATING APPLICATIONS
Derrick J. Page, Crownsville, Md., assignor to Northrop Grumman, Baltimore, Md.
Filed Jun. 19, 1995, Ser. No. 491,664
Int. Cl.[6] H05B *6/72*
U.S. Cl. 219—761 **21 Claims**



1. A solid state microwave power source, comprising:
microwave signal generator means operated within a predetermined frequency range;
support means for solid state devices;
solid state microwave power amplification means coupled to said signal generator means, said amplification means being mounted on said support means and operated so as to excite a mode in a power radiating antenna;
said antenna having at least one low impedance connecting point, said power amplification means being integrated with said antenna and having a direct connection element connected to said at least one low impedance connecting point, whereby a radiating power mode is excited on the surface of said antenna.

5,558,801
CASTING STALK
Mikio Tsukahara, Inba-gun; Noboru Ohishi, Aki-gun, and Hisao Taguchi, deceased, Atsugi, all of Japan, assignors to Nichias Corporation, Tokyo, and Ohta Kasei Corporation, Yokohama, both of Japan
Filed Jun. 1, 1994, Ser. No. 251,927
Claims priority, application Japan, Jun. 1, 1993, 5-034847 U
Int. Cl.[6] B22D *18/04;41/50*
U.S. Cl. 222—607 **4 Claims**



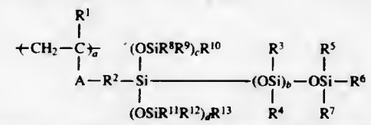
1. A casting stalk comprising:
a metallic cylindrical body;
an airtight and thermal insulating sheet formed on an inner surface of the metallic cylindrical body;
a first thermal insulating layer formed on the airtight and thermally insulating sheet;
a second thermal insulating layer formed on an outer surface of the cylindrical body; and
a layer of boron nitride formed between the inner surface of the metallic cylindrical body and the airtight sheet.

5,558,802
MULTIGRADE CRANKCASE LUBRICANTS WITH LOW TEMPERATURE PUMPABLILTY AND LOW VOLATILITY
Michael Dowling, Streatley, United Kingdom, assignor to Exxon Chemical Patents Inc, Linden, N.J.
Filed Sep. 14, 1995, Ser. No. 528,446
Int. Cl.[6] C10M *159/20*
U.S. Cl. 508—391 **9 Claims**

1. An SAE 5W multigrade lubricant comprising basestock, viscosity modifier, and at least one additive selected from the group consisting of dispersants, overbased and neutral salts of organic acids, corrosion inhibitors, antiwear agents, antioxidants, friction modifiers, antifoamants, and demulsifiers wherein the basestock has an average base stock neutral number of at least 105 and comprises less than 5 wt. % non conventional lubricant, and the lubricant has a maximum CCS viscosity of 3500×10^{-3} Pa.s at −25° C., a calibrated Noack volatility of not more than 22 wt. % loss, and a kinematic viscosity at 100° C. measured by ASTM D445 not greater than 12.5 cSt and contains no more than 0.0007 moles of calcium salts of organic acids per 100 grams of lubricant.

5,558,803
ELECTRORHEOLOGICAL FLUID WITH IMPROVED PROPERTIES COMPRISING COMPOSITE POLYMER
Izuho Okada; Yoshinobu Asako; Kiyomi Arimatsu; Minoru Kobayashi; Satoru Ono, and Ryuji Aizawa, all of Ibaraki-ken, Japan, assignors to Nippon Shokubai Co., Ltd., Osaka-fu, Japan
Continuation-in-part of Ser. No. 89,126, Jul. 9, 1993, Pat. No. 5,376,294, which is a continuation-in-part of Ser. No. 810,496, Dec. 19, 1921, abandoned. This application Dec. 22, 1994, Ser. No. 362,175
Claims priority, application Japan, Aug. 29, 1991, 3-218227; Oct. 21, 1991, 3-272212; Feb. 25, 1993, 5-36323; Feb. 25, 1993, 5-36324; Feb. 25, 1993, 5-36325; Feb. 25, 1993, 5-36326
Int. Cl.[6] C10M *169/04;171/00*
U.S. Cl. 252—78.3 **15 Claims**

1. An electrorheological fluid comprising
i) dielectric particles,
ii) insulating liquid, and
iii) a composite polymer exhibiting substantial insolubility in said insulating liquid, said composite polymer comprising particles substantially insoluble in said insulating liquid, and
a polysiloxane-containing polymer having a silicone component-containing structural unit (A)
and a dielectric particle-adsorbing chain-containing structural unit (B), as polysiloxane-containing structural unit (A-1) represented by the general formula (4):

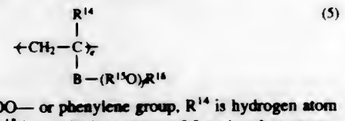


(4)

wherein A is —COO— or phenylene group, R^1 hydrogen atom or methyl group, R^2 is an alkylene group of 1 to 6 carbon atoms, R^3 to R^{13} are independently as aryl group, an alkyl group of 1 to 6 carbon atoms, or an alkoxy group of 1 to 10 carbon atoms, a is an arbitrary integer, c and d are independently an integer in the range of 0 to 10, and b is an integer in the range of 0 to 200,
and as the dielectric particle-adsorbing chain-containing structural unit (B) thereof at least one member selected from the group

consisting of an alkylene oxide chain-containing structural unit

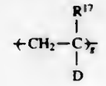
consisting of an alkylene oxide chain-containing structural unit (B-1) represented by the general formula (5):



(5)

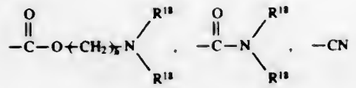
wherein B is —COO— or phenylene group, R^{14} is hydrogen atom or methyl group, R^{15} is an alkylene group of 2 to 4 carbon atoms, R^{16} is hydrogen atom or an alkyl group, e is an arbitrary integer, and f is an integer in the range of 2 to 100,

a nitrogen atom-containing structural unit (B-2) represented by the general formula (6):



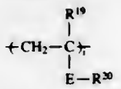
(6)

wherein D is



or a nitrogen-containing heterocycle-containing substituent, R^{17} is hydrogen atom or methyl group, R^{18} is hydrogen atom or an alkyl group, g is an arbitrary integer, and h is an integer in the range of 2 to 6,

and/or a hydrocarbon chain-containing structural unit (B-3) represented by the general formula (7):



(7)

wherein E is —COO— or a phenylene groups, R^{19} is hydrogen atom or methyl group, R^{20} is an alkyl group of 4 to 30 carbon atoms, and i is an arbitrary integer,

said insulating liquid being present in an amount in the range of 50 to 500 parts by weight, and said composite polymer being present in an amount in the range of 0.01 to 6 parts by weight, both amounts being based on 100 parts by weight of said dielectric particles,

said electrorheological fluid exhibiting a viscosity of not more than 0.2 Pa·s at a shear rate of 33/s when measured at 25° C. in the absence of supply of an electric field.

5,558,804

VIBRATION DAMPING MOUNTING

Argus Dass-Dessoza, Shatin, Hong Kong, assignor to Nokia Mobile Phones Ltd., Salo, Finland

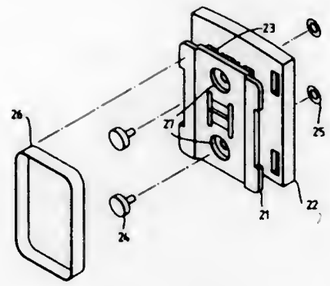
Filed Oct. 14, 1994, Ser. No. 323,266

Claims priority, application United Kingdom, Oct. 16, 1993, 9321388

Int. Cl.[6] F16M *13/00*

U.S. Cl. 248—634 **16 Claims**

1. A vibration damping mounting comprising a substantially rectangular body portion adapted for attachment to a load and including a substantially rectangular mounting surface having resilient spacers fixed thereto substantially at each corner of said rectangular body portion and said mounting surface, restraining means for inhibiting excess movement of the body portion relative to the mounting surface, and a resilient loop enclosing open sides between the body portion and the mounting surface, wherein said resilient spacers are adapted to exert a substantially equivalent restoring force on said body portion for substantially all directions of the load.



5,558,805

LUBRICATING COMPOSITIONS

Terence Coleclough, Abingdon, United Kingdom; Morton Beltzer, and Jacob J. Habeeb, both of Westfield, N.J., assignors to Exxon Chemical Patents Inc, Linden, N.J.

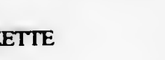
Filed Mar. 24, 1995, Ser. No. 410,251

Claims priority, application United Kingdom, Mar. 24, 1994, 9405983

Int. Cl.[6] C10M *141/12*

U.S. Cl. 508—243 **17 Claims**

1. A lubricating oil composition suitable for use as a crankcase lubricant, comprising a major amount of a lubricating oil, at least 5 parts per million by mass (ppm) of added copper present in oil-soluble form, and from 0.05 to 5 mass % of one or more oil-soluble diamine sulfides, and wherein said composition contains less than 0.1 mass % phosphorous, and wherein said alamine sulfide, or at least one diamine sulfide, is of the general formula:



wherein n is an integer of from 1 to 6; each of R_1 to R_4, which may be the same or different, represents a hydrogen atom or a substituted or unsubstituted hydrocarbyl radical, with the proviso that no more than one of R_1 and R_2 not more than one of R_3 and R_4 represents hydrogen; or at least one of R_1—$N(R_2)$— and R_4—N—(R_3)— represents a heterocylic radical containing 5 to 12 ring members, the heterocyclic ring in the said radical being saturated or unsaturated, substituted or unsubstituted, and optionally containing an additional heteroatom selected from O, S, and N-atoms, the said ring being linked to the —$(S)_n$— group via the N atom.

5,558,806

SURFACTANT BLEND OF A POLYALKLENEOXIDE POLYSILOXANE AND AN ORGANIC COMPOUND HAVING A SHORT CHAIN HYDROPHOBIC MOIETY

George A. Policello, Peekskill, and Dennis S. Murphy, Brewster, both of N.Y., assignors to OSI Specialties, Inc., Danbury, Conn.

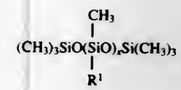
Continuation of Ser. No. 5,749, Jan. 19, 1993, abandoned, and a continuation-in-part of Ser. No. 917,846, Jul. 23, 1992, abandoned. This application Mar. 14, 1995, Ser. No. 403,538

Int. Cl.[6] B01F *17/18;17/28;17/32;17/56*

U.S. Cl. 252—355 **11 Claims**

7. A surfactant blend comprising:

(a) 1 to 99% by weight of a polyalkyleneoxide polysiloxane having the general formula



wherein x]has a value of 1 or 2 and R^1 has the formula $—C_nH_{2n}O(C_2H_4O)_a(C_3H_6O)_bR^2$

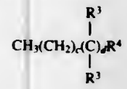
wherein n has a value of 3 or 4,

a has a value of 1 to 15,

b has a value of 0 to 14,

a+b has a value of 5 to 15, and each R^2 is the same or different and is selected from the group consisting of hydrogen, and alkyl having 1 to 4 carbon atoms, an an acetyl group; and

(b) 1 to 99% by weight of an organic compound having the general formula



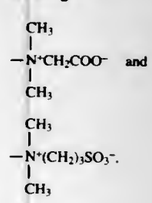
wherein R^3 is the same or different and is selected from the group consisting of hydrogen and an alkyl having 1 to 4 carbon atoms;

c has a value of 5 to 9,

d has a value of 0 to 4,

c+d has a value of 5 to 9, and

R^4 is a zwitterionic hydrophilic moiety selected from the group consisting of



(i)

and

(ii)

5,558,807

WAX ISOMERATE-BASED HIGH TEMPERATURE LONG BEARING LIFE GREASE

Jeenok T. Kim, Holmdel, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed May 19, 1995, Ser. No. 445,035

Int. Cl.[6] C10M *105/00;133/00*

U.S. Cl. 508—251 **6 Claims**

1. A grease composition comprising a major portion of a wax isomerate oil based base stock, a lithium soap thickener or a complex lithium soap thickener present in an amount in the range of 10 to 30 wt %, an antioxidant selected from the group consisting of alkylated diphenyl amine, phenothiazine and substituted and unsubstituted quinoline in an amount in the range 0.1 to 2 wt % and a metal salt of salicylic acid present in an amount in the range 0 to 5 wt %.

5,558,808

COLORED TRANSMISSION FLUID

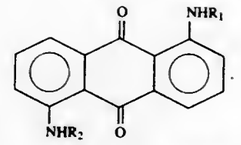
Michael J. Smith, Newtown, Pa., and Bharat Desai, Ringwood, N.J., assignors to United Color Manufacturing, Inc., Newtown, Pa.

Filed Jun. 7, 1995, Ser. No. 474,891

Int. Cl.[6] C10M *133/12;129/20;129/16*

U.S. Cl. 508—556 **19 Claims**

1. A composition comprising automatic transmission fluid and at least one of the following dyes:



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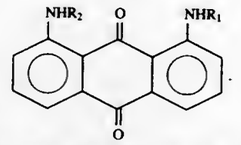


II

wherein R_1 and R_2 are the same or different alkyl groups containing at least 2 carbons each or a cycloalkyl group containing at least 3 carbons, and said dye is present in an amount sufficient to impart visible red color to said fluid.

5,558,809

POLYMER ELECTRETS WITH IMPROVED CHARGE STABILITY

Werner Groh, Lich; Hans-Tobias Macholdt, Darmstadt-Eberstadt, both of Germany; Baylor D. Gibson, Weddington, N.C.; James R. Walden, Matthews, N.C., and Clinton D. Felton, Charlotte, N.C., assignors to Hoechst Celanese Corporation, Somerville, N.J.

Continuation of Ser. No. 357,357, Dec. 15, 1994, abandoned, which is a continuation of Ser. No. 28,439, Mar. 9, 1993, abandoned. This application Oct. 10, 1995, Ser. No. 540,507

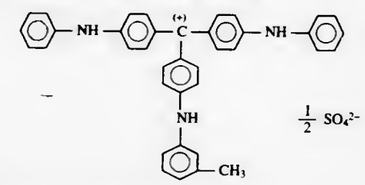
Int. Cl.[6] G11C *13/02*

U.S. Cl. 252—62.54 **1 Claim**

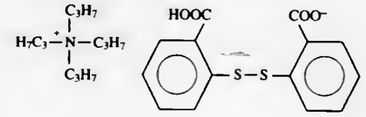
1. A polymer electret having a significant fraction of field-induced polarization after removal of a polarizing field comprising a mixture of

(a) a polymer selected from the group consisting of polypropylene, polyethylene, and polyesters; and

(b) a charge control agent selected from the group consisting of a triphenylmethane having the formula



an arylsulfide compound having the formula

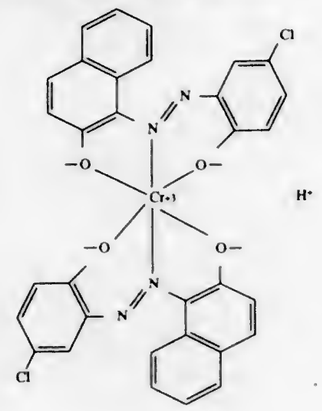


and an oxochromium complex having the formula

5,558,811

wherein said polymeric substance is a copolymer of a liquid crystal

and an azochromium complex having the formula

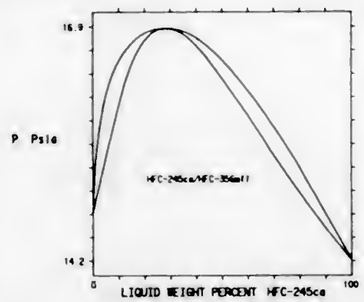


5,558,810

PENTAFLUOROPROPANE COMPOSITIONS

Barbara H. Minor, Elkton, Md., and Tuneen E. C. Chisolm, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 16, 1994, Ser. No. 341,943
Int. Cl.[6] C09K *5/04;3/30;* C11D *7/50;* C08J *9/14*
U.S. Cl. 252—67 4 Claims



1. An azeotropic or azeotrope-like composition consisting essentially of about 1–80 weight percent 1,1,2,2,3-pentafluoropropane and about 20–99 weight percent 1,1,1,4,4,4-hexafluorobutane wherein said composition has a vapor pressure of 15.1 to about 17 psia when the temperature is adjusted to 25° C.; about 1–60 weight percent 1,1,2,2,3-pentafluoropropane and about 40–99 weight percent $(CF_3)_2CHCH_3$ wherein said composition has a vapor pressure of 17 to about 18.5 psia when the temperature is adjusted to 25° C.; about 1–40 weight percent 1,1,2,3,3-pentafluoropropane and about 60–99 weight percent 1,1,1,4,4,4-hexafluorobutane wherein said composition has a vapor pressure of about 15 psia when the temperature is adjusted to 25° C.; about 1–10 weight percent 1,1,2,3,3-pentafluoropropane and about 90–99 weight percent $(CF_3)_2CHCH_3$ wherein said composition has a vapor pressure of about 17 psia when the temperature is adjusted to 25° C.; 11–99 weight percent 1,1,1,2,3-pentafluoropropane and 1–89 weight percent 1,1,1,4,4,4-hexafluorobutane wherein said composition has a vapor pressure of 17 to about 20 psia when the temperature has been adjusted to 25° C.; or 1–99 weight percent 1,1,1,2,3-pentafluoropropane and 1–99 weight percent $(CF_3)_2CHCH_3$ wherein said composition has a vapor pressure of 17.1 to about 21.4 psia when the temperature has been adjusted to 25° C.

5,558,811

ELECTRORHEOLOGICAL FLUIDS WITH HYDROCARBYL AROMATIC HYDROXY COMPOUNDS

Joseph W. Plaiet, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 30,688, Mar. 12, 1993, abandoned. This application Jul. 21, 1994, Ser. No. 278,695
Int. Cl.[6] C10M *171/00;169/04*
U.S. Cl. 252—73 33 Claims

1. An electrorheological fluid comprising:
(a) carbon-based hydrophobic base fluid selected from the group consisting of hydrophobic esters and polyalphaolefins;
(b) electrorheologically active solid particles; and
(c) an aromatic hydroxy compound substituted with an alkyl group containing at least 9 carbon atoms, in an amount suitable to improve the dispersive stability of the electrorheological fluid.

5,558,812

LIQUID ENZYME FORMULATIONS

Wilfried Hahn; Hubert Herrmann; Torsten Klesser, all of Nienburg, and Vera Sander, Garbsen, all of Germany, assignors to Solvay Enzymes GmbH & Co. KG., Neinburg/Weser, Germany

Filed Jun. 9, 1994, Ser. No. 257,826
Claims priority, application Germany, Jun. 16, 1993, 43 19 908.9
Int. Cl.[6] C12N *9/00;* C11D *7/00*
U.S. Cl. 510—321 12 Claims

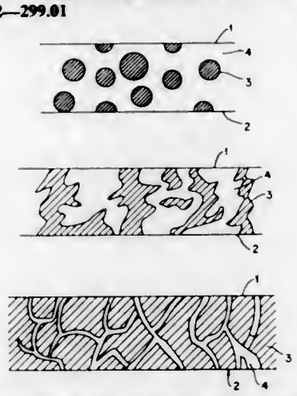
1. A liquid enzyme formulation comprising:
3 to 10 wt-% of suspended enzyme particles;
1 to 10 wt-% of a colloidal filler, and
80 to 90 wt-% of a liquid alkylene oxide polymer of ethylenediamine having a molecular weight in the range from 500 to 8200, and
balance water to make 100%.

5,558,813

LIQUID CRYSTAL-POLYMER COMPOSITE FILM

Ryojiro Akashi; Toru Ishii, and Tomozumi Uesaka, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 856,699, Mar. 24, 1992, abandoned. This application Nov. 23, 1994, Ser. No. 347,161
Claims priority, application Japan, Mar. 25, 1991, 3-083030
Int. Cl.[6] C09K *19/52;19/54*
U.S. Cl. 252—299.01 10 Claims



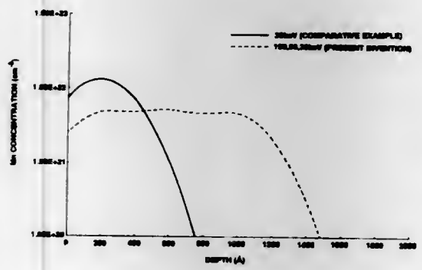
1. A liquid crystal-polymer composite film consisting essentially of a polymeric substance carrying a liquid crystal component and a non-liquid crystal component in the side chain thereof and having dispersed therein a low-molecular weight liquid crystal compound, wherein said polymeric substance is a copolymer of a liquid crystal vinyl monomer and a non-liquid crystal vinyl monomer and said polymeric substance and said low-molecular weight liquid crystal compound are in separate phases.

5,558,814

PHOSPHOR AND METHOD FOR PREPARING SAME

Shigeo Itoh; Yoshihisa Yonezawa, and Hitoshi Toki, all of Mobara, Japan, assignors to Hiroshi Kukimoto, Kanagawa-ken, and Futaba Denshi Kogyo Kabushiki Kaisha, Chiba-ken, both of Japan

Filed Nov. 7, 1994, Ser. No. 337,007
Claims priority, application Japan, Nov. 9, 1993, 5-279709
Int. Cl.[6] C09K *11/62*
U.S. Cl. 252—301.4 R 5 Claims



1.A phosphor for use in a luminescent display device consisting essentially of:
a matrix crystal of phosphor represented by a general formula $ZnGa_2O_4$, and
an additive for contributing luminescence of the phosphor, said phosphor being excited for luminescence by electrons under an acceleration voltage of 100 V to 2 KV,
wherein said additive is dispersed in a uniform concentration in a region of 2500 angstroms or less in depth from the surface of said phosphor.

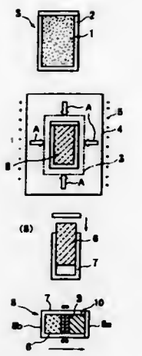
5,558,815

SINGLE CRYSTAL OF COMPOUND, LASER ROD, LASER OSCILLATOR, SCINTILLATOR, CT SCANNER, COLOR DISPLAY AND PROCESS FOR PREPARING THE SAME

Kazuto Yokota, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Division of Ser. No. 37,109, Mar. 26, 1993, Pat. No. 5,386,797. This application Nov. 10, 1994, Ser. No. 339,260
Claims priority, application Japan, Mar. 27, 1992, 4-68895
Int. Cl.[6] C09K *11/56;11/69*
U.S. Cl. 252—301.45 9 Claims

1. A single crystal of a compound in which at least part of the compound decomposes at a temperature around the melting point of the compound, a stoichiometric composition of the compound represented by the formula RE_2O_2S, where RE is at least one element selected from the group consisting of Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu, wherein said single crystal has a volume of 5 cc or more and wherein a deviation of respective elements in a composition of said single crystal from the stoichiometric composition is within the range of ±5% in terms of weight ratio.



5,558,816

STABLE LIQUID COMPOSITIONS AND THEIR USE

John D. Payne, Rossendale, United Kingdom, assignor to Zeneca Limited, London, England

PCT No. PCT/GB94/00100, § 371 Date Jul. 19, 1995, § 102(e) Date Jul. 19, 1995, PCT Pub. No. WO94/16564, PCT Pub. Date Aug. 4, 1994
PCT Filed Jan. 19, 1994, Ser. No. 492,003
Claims priority, application United Kingdom, Jan. 19, 1993, 9300936
Int. Cl.[6] A01N *43/80;* C07D *275/06*
U.S. Cl. 252—400.62 9 Claims

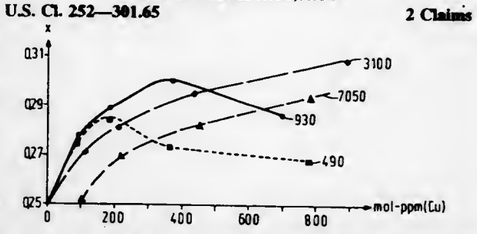
1. A stable composition comprising from 5 to 25% by weight of 1,2-benzisothiazolin-3-one (BIT) and from 40 to 68% dipropylene glycol wherein the BIT is present as an alkali metal salt formed by reacting from 0.75 to 1.07 moles alkali metal hydroxide with one mole of BIT.

5,558,817

GREEN-LUMINESCING ZINC SULPHIDE AND CATHODE RAY TUBE PROVIDED WITH THIS ZINC SULPHIDE

Michael Bredol, Aachen, and Ulrich Kynast, Roetgen, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 49,906, Apr. 20, 1993, abandoned. This application Sep. 22, 1994, Ser. No. 310,505
Claims priority, application Germany, May 15, 1992, 42 16 104.5
Int. Cl.[6] C09K *11/56;11/54*
U.S. Cl. 252—301.65 2 Claims



1. A method of manufacturing a luminescing zinc sulfide of cubic structure which is activated by dopants consisting of aluminum and copper so that a green-emitting luminescent material is created in which copper is present in a quantity of 200–450 mole ppm and aluminum is present in a quantity of 700–2000 mole ppm, the mole ppm ratio of aluminum to copper is from 2 to 5 and said zinc sulfide has x-values for the color point of at least 0.29 and brightness values of at least 70 m/W, said method comprising reacting zinc sulfide with dopants consisting of an aluminum and a

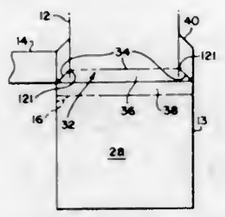
copper compound, heating the resultant product at an elevated temperature below 1000° C. and then annealing said product at a temperature of 300° C.–500° C.

5,558,818

WET FLUE GAS SCRUBBER HAVING AN EVENLY DISTRIBUTED FLUE GAS INLET

Wadie F. Gohara, Barberton; George B. Watson, Alliance; Randy J. Reynolds, and Thomas W. Strock, both of Canton, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Feb. 14, 1995, Ser. No. 388,708
Int. Cl.[6] B01F *3/04*
U.S. Cl. 261—17 **5 Claims**



1. An inlet assembly for a flue gas desulfurization system, comprising:

a flue gas inlet located at the side of an absorber tower, the absorber tower having a bottom section with a maintained level of slurry;

a ring plenum formed inside the bottom section of the absorber tower above the maintained level of slurry to communicate with said flue gas inlet; and

said ring plenum having a series of openings spaced along a circumference of a lower portion of the ring plenum, said openings being open downwardly and being separated by impervious portions of said lower plenum wall to distribute the flue gas evenly to the absorber tower.

5,558,819

DOWNFLOW HEATER PLANT FOR BRIEFLY HEATING A LIQUID WITH STEAM

Adriaan G. Den Hollander, Gorinchem, Netherlands, assignor to Den Hollander Engineering B.V., Gorinchem, Netherlands

PCT No. PCT/NL92/00236, § 371 Date Sep. 26, 1994, § 102(e) Date Sep. 26, 1994, PCT Pub. No. WO93/12673, PCT Pub. Date Jul. 8, 1993
PCT Filed Dec. 24, 1992, Ser. No. 256,076
Claims priority, application Netherlands, Dec. 24, 1991, 9102185
Int. Cl.[6] B01F *3/04*
U.S. Cl. 261—21 **8 Claims**

1. In a device for briefly heating a liquid, comprising:

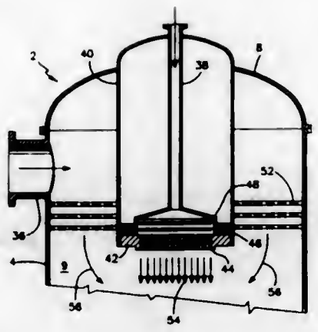
a pressure chamber;

at least one liquid supply channel, opening out into the pressure chamber, for supplying the liquid at a first temperature to the pressure chamber at a predetermined first level;

at least one liquid discharge channel, originating in the pressure chamber, for discharging the liquid from the pressure chamber from a predetermined second level lying lower than the first level;

at least one steam supply channel, opening out into the pressure chamber, for supplying steam under pressure to the pressure chamber, the steam temperature being higher than the first temperature of the liquid;

the improvement comprising a supply plate provided with a number of plate channels for forming a number of liquid jets in the pressure chamber placed in the mouth of the liquid



supply channel, the plate being plastic to maintain a temperature gradient at the level of the difference between the steam temperature and the first temperature of the liquid between the side of the supply plate facing the pressure chamber and the side facing the liquid supply channel, viewed in the direction of the plate channels.

5,558,820

PROCESS FOR PREPARING MICROCAPSULES

Hideo Nagano; Kazuo Niwa, and Takayuki Hayashi, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 165,527, Dec. 13, 1993, abandoned, which is a continuation of Ser. No. 827,647, Jan. 29, 1992, abandoned. This application May 30, 1995, Ser. No. 453,453
Claims priority, application Japan, Feb. 13, 1991, 3-040617
Int. Cl.[6] B01J *13/02;13/16*
U.S. Cl. 264—4.1 **5 Claims**

1. A process for the preparation of microcapsules having a polyurethane urea resin wall membrane, comprising the steps of:

mixing an oily solution and an aqueous solution;

passing the resulting mixed solution through a clearance between an inner cylinder and an outer cylinder, wherein a diameter of each of said inner cylinder and said outer cylinder remains constant for an entire longitudinal length of said inner cylinder and said outer cylinder;

rotating said inner cylinder and said outer cylinder relative to each other to form an oil-in-water type emulsion, wherein said clearance is in a range from 0.05 to 5 mm, said clearance being held constant over an entire longitudinal length of said inner cylinder and said outer cylinder causing a uniform shearing force to be applied to said resulting mixed solution to obtain a narrow particle size distribution of particles in said resulting mixed solution; and

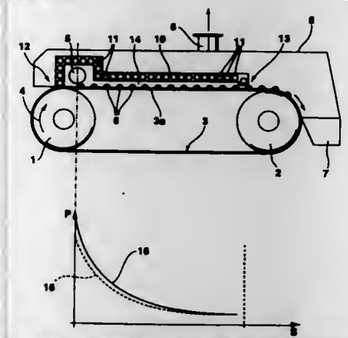
forming said polyurethane urea resin wall membrane on said emulsion.

5,558,821

METHOD AND APPARATUS FOR PURIFYING THE EXHAUST AIR OF INSTALLATIONS FOR CONSOLIDATING MOLTEN SUBSTANCES

Axel König, Stuttgart, Germany, assignor to Santrade Ltd., Luzern, Switzerland

PCT No. PCT/EP94/02610, § 371 Date Jul. 18, 1995, § 102(e) Date Jul. 18, 1995, PCT Pub. No. WO95/08390, PCT Pub. Date Mar. 30, 1995
PCT Filed Aug. 5, 1994, Ser. No. 436,461
Claims priority, application Germany, Sep. 25, 1993, 43 32 686.2
Int. Cl.[6] B29B *9/10*
U.S. Cl. 264—13 **11 Claims**



1. In a method of consolidating a molten substance by depositing the substance onto a cooling surface, the improvement comprising minimizing the formation of exhaust dust from the substances including the steps of:

A) conducting the deposited substance through a space, and

B) controlling a saturation pressure within the space so as to minimize a difference between the saturation pressure and a vapor pressure of the substance as the substance travels through the space.

5. In an apparatus for consolidating a molten substance by depositing the molten substance onto a cooling conveyor belt, the improvement comprising a structure for minimizing the formation of exhaust dust from the substance, the structure including:

a cooling surface for receiving and conveying the molten substance;

a hood overlying the cooling surface to form therewith a space in which the substance is conveyed; and

heaters for controlling the temperature in the space such that a difference between the saturation pressure in the space and a vapor pressure of the substance is minimized as the substance travels through the space.

5,558,822

METHOD FOR PRODUCTION OF SPHEROIDIZED PARTICLES

Gregory M. Gitman, Atlanta, and Anatolly Parnas, Norcross, both of Ga., assignors to Gas Research Institute, Chicago, Ill.

Filed Aug. 16, 1995, Ser. No. 515,860
Int. Cl.[6] B29C *35/02*
U.S. Cl. 264—15 **11 Claims**

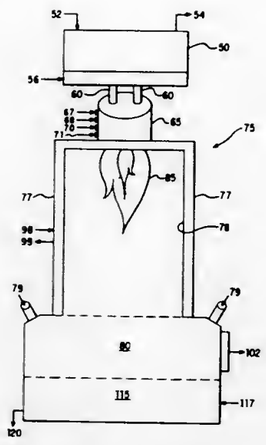
1. A method for producing spheroidized particles, comprising the steps of:

preheating a plurality of particles to a first temperature below an agglomeration temperature of said particles;

passing at least a portion of said particles through a flame region comprising a first flame envelope;

heating said particles in said flame region above a spheroidization temperature; and

cooling said particles at an initial rate to a first temperature below said spheroidization temperature in a first cooling zone downstream with respect to a direction of a first flame stream.

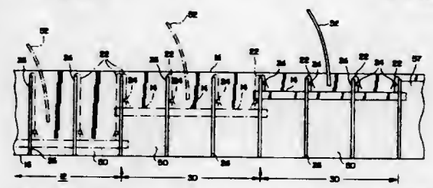


5,558,823

METHOD FOR FORMING WALLS

Leroy D. Gray, 1760 Ferry Ave., SW., Seattle, Wash. 98116

Division of Ser. No. 45,418, Apr. 9, 1993, abandoned. This application Aug. 12, 1994, Ser. No. 290,036
Int. Cl.[6] B28B *1/08;* **E04B** *1/16*
U.S. Cl. 264—33 **14 Claims**



1. A method for forming by extrusion a concrete wall having a predetermined thickness, height, and length adjacent to a preexisting member comprising the steps of:

(a) placing two or more substantially vertical support means at a distance from said preexisting member, said distance representing said predetermined thickness of said concrete wall;

(b) attaching to said support means at least one horizontally positioned slip forming means, said slip forming means being freely movable vertically along a height of said support means and initially resting at or near a bottom of said support means, and said slip forming means having a vertical dimension substantially less than its horizontal dimension and substantially less than said predetermined height of said concrete wall;

(c) delivering a layer of concrete between said preexisting member and said slip forming means along said predetermined length of said concrete wall from a first end of said concrete wall to a second end of said concrete wall,

(d) vibrating said layer of concrete along its entire length to consolidate said concrete and mesh said concrete layer to a layer of concrete immediately thereunder, when present,

(e) allowing said vibrated concrete to at least partially dry,

(f) raising said slip forming means upward along said support means to extrude said concrete up against said preexisting member by pressing said concrete against said preexisting member and to allow for pouring of a new layer of concrete vertically above and adjacent to said partially dried layer of concrete, and

(g) repeating steps (c) through (f) until said predetermined height for said concrete wall is reached, thus forming said concrete wall having said predetermined thickness, height, and length.

5,558,824

5,558,827

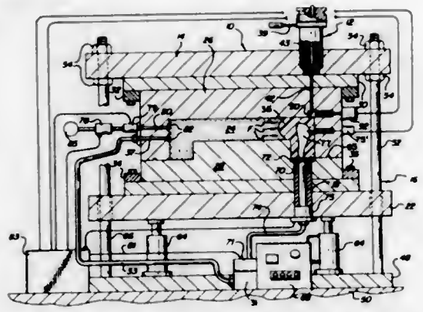
extruding the molding material supplied through the material

5,558,824

GAS-ASSISTED PLASTICS INJECTION MOLDING WITH CONTROLLED MELT FLOW AND METHOD OF CONTROLLING MELT FLOW

Suresh D. Shah, Troy, and Carl H. Visconti, Clarkston, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 23, 1994, Ser. No. 247,373
Int. Cl.[6] B29C *44/10;45/18;45/77*
U.S. Cl. 264—40.3 **7 Claims**



1. A method of gas assist injection molding of a quantity of plastics melt into a hollow stabilized plastics article with minimized plastics flow hesitation lines comprising the steps of:

a. pressurizing a profiled mold chamber within mold tooling with an inert charging gas,

b. injecting a short shot of heated plastics melt having a volume less than the volume of said chamber into said chamber while displacing said pressurized charging gas by said short shot of plastics melt,

c. injecting pressurized molding assist gas into said short shot of plastics melt within said chamber to form a cavity within said short shot and continuing said assist gas injection to expand said cavity within said short shot and thereby force said plastics melt of said short shot to expand against the opposing forces of said charging gas within said chamber,

d. releasing said charging gas from said chamber at a rate to modulate the rate of expansion of said short shot of plastics melt within said chamber, said rate selected to minimize plastics flow hesitation lines of said expanding short shot, said releasing continuing until said plastics melt fully forms as a wall against the profile of said mold chamber to complete the hollow article.

5,558,825

METHOD AND APPARATUS FOR PRODUCING POLYESTER FIBER

Kunihiko Ueda, Otsu; Shuko Arakane, Okazaki; Takao Sano, Moriyama, and Yuhei Maeda, Mishima, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

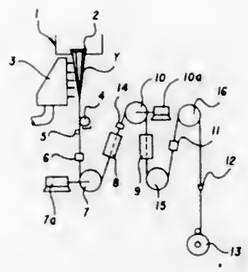
PCT No. PCT/JP93/01632, § 371 Date Sep. 9, 1994, § 102(e) Date Sep. 9, 1994, PCT Pub. No. WO94/11550, PCT Pub. Date May 26, 1994
PCT Filed Nov. 10, 1993, Ser. No. 256,144
Claims priority, application Japan, Nov. 10, 1992, 4-300120
Int. Cl.[6] D01D *5/088;5/16;10/02;* **D02J** *1/08*
U.S. Cl. 264—103 **24 Claims**

1. A method of producing a polyester fiber comprising:

cooling a plurality of polyester fibers melt-spun from a spinneret to a temperature below a glass transition point;

taking up said fibers at a take-up speed of less than 4,000 m/min by a non-heating first godet roller;

heat-drawing said fibers between said first godet roller and a non-heating second godet roller in a normal pressure steam atmosphere at a temperature above the glass transition point of said polyester fiber; and



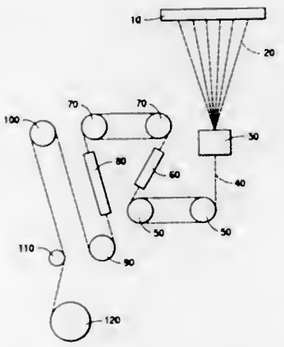
heat-treating said fibers in a pressurized steam atmosphere at a temperature not lower than 105° C.

5,558,826

HIGH SPEED PROCESS FOR MAKING FULLY-ORIENTED NYLON YARNS

Walter J. Jaegge, Ponca City, Okla.; Francis J. Malone, Jr., Hixson, Tenn.; Frank H. Overton, Signal Mountain, Tenn.; Roger A. Ross, Chattanooga, Tenn., and Ronald E. Steele, Hixson, Tenn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 7, 1995, Ser. No. 380,911
Int. Cl.[6] D01D *5/16;10/02;* **D01F** *6/60*
U.S. Cl. 264—103 **27 Claims**



1. A coupled spin-draw process for making a fully-oriented nylon yarn comprising:

extruding molten nylon polymer having a formic acid relative viscosity of about 35 to about 70 through a spinneret into multiple molten polymer streams;

cooling said molten polymer streams in a quench zone to form filaments and coalescing said filaments into a yarn;

withdrawing said yarn from said quench zone with a feed roll rotating at a peripheral speed of more than 4500 mpm;

drawing said yarn by advancing it to a draw roll rotating at a peripheral speed at least about 1.1 times the speed of said feed roll;

relaxing said yarn after said drawing by passing said yarn after drawing through a chamber containing a steam atmosphere, said yarn being exposed to said steam atmosphere for a period of at least about 1 millisecond; and

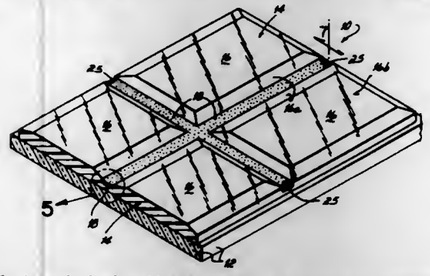
winding up said yarn.

5,558,827

DECORATIVE WINDOW HAVING SIMULATED CAME STRUCTURE

Stephen E. Howes, 741 SE. Sixth Ter., Pompano Beach, Fla. 33060

Continuation-in-part of Ser. No. 807,236, Dec. 16, 1991, abandoned. This application Mar. 16, 1995, Ser. No. 405,148
Int. Cl.[6] B32B *17/10;* **B44F** *1/06*
U.S. Cl. 264—220 **15 Claims**



1. A method of making a master of a decorative simulated multipane window, the method comprising the steps of:

adhering a plurality of generally flat master panel pieces to a backing sheet in a predetermined array and with gaps formed between adjacent master panel pieces;

filling in said gaps with a curable material to a height below upper surfaces of said master panel pieces; and,

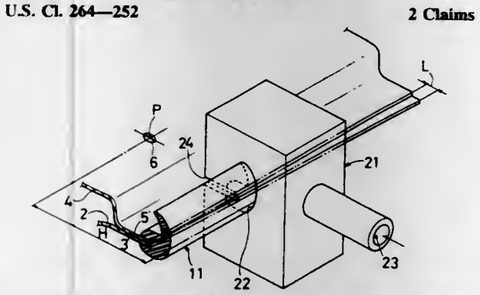
forming a peripheral upstanding framework about said master panel pieces and extending upwardly above said upper surfaces of said master panel pieces.

5,558,828

METHOD OF MOUNTING A TRIM MEMBER ON A FLANGE OF A PANEL

Yukihiko Yada, and Takeaki Niwa, both of Obu, Japan, assignors to Tokai Kogyo Kabushiki Kaisha, Japan

PCT No. PCT/JP94/01348, § 371 Date Apr. 17, 1995, § 102(e) Date Apr. 17, 1995, PCT Pub. No. WO95/05931, PCT Pub. Date Mar. 2, 1995
PCT Filed Aug. 14, 1994, Ser. No. 416,707
Claims priority, application Japan, Aug. 23, 1993, 5-2907707; Jun. 2, 1994, 6-121457
Int. Cl.[6] B29C *47/02*
U.S. Cl. 264—252 **2 Claims**



1. A method of mounting a trim member on a flange of a panel, comprising the steps of:

preparing an extrusion molding die having a supply passage for supplying a molding material for a trim member, an extrusion port communicating with the supply passage and an insertion slit communicating with and extending laterally from the extrusion port for insertion of a flange of a panel;

inserting the flange into the extrusion port through the insertion slit, thereby defining between the extrusion port and the flange a molding space which has a cross section corresponding to the trim member;

extruding the molding material supplied through the material supply passage forwardly of the extrusion port through the molding space; and

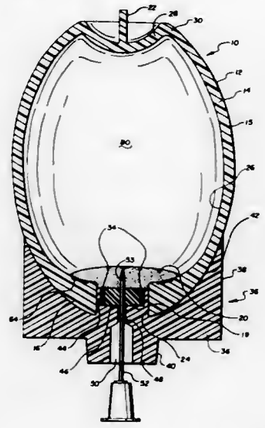
providing continuous relative movement of the molding die and the flange, while adjusting the amount of insertion of the flange into the extrusion port such that a distance from a reference position of the panel to an upper edge of the trim member is maintained at a predetermined distance.

5,558,829

METHOD FOR PROVIDING A PROSTHESIS WITH AN INJECTION PORT

Timothy B. Petrick, Brooklyn Park, Minn., assignor to Mentor Corporation, Santa Barbara, Calif.

Division of Ser. No. 207,023, Mar. 4, 1994. This application May 26, 1995, Ser. No. 452,007
Int. Cl.[6] B29C *65/54;* **A61F** *2/02*
U.S. Cl. 264—263 **4 Claims**



1. A method for placing an injection site into a prosthesis comprising the steps of:

a. providing a fixture including a cavity conforming to one end of a shell of said prosthesis, a portion on said fixture arranged to align with a bore in the shell of said prosthesis, and a bore extending through said fixture adapted to receive a self-sealing injection site;

b. providing and placing an injection site in said bore of said fixture said injection site having a top surface;

c. placing said shell in said cavity of said fixture over said injection site;

d. injecting a quantity of adhesive into said shell through said injection site with a needle;

e. causing said adhesive to overflow the top surface of the injection site and into and around the shell bore occupied by the injection site;

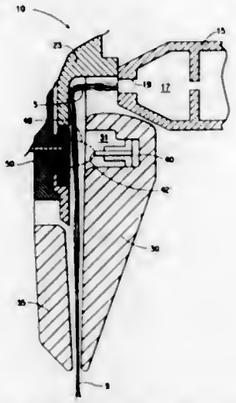
f. withdrawing said needle; and,

g. rotating and tipping said fixture with said injection site and shell, thereby forming an evacuation dome inside said shell over said injection site.

indium in a range from approximately 1.00 to 2.00 percent by

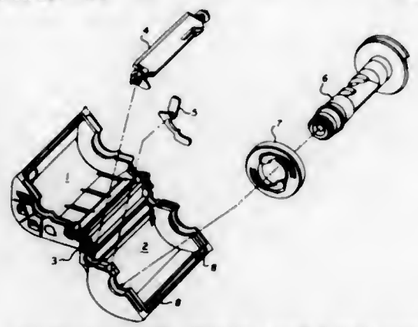
5,558,835

5,558,830
WAND PURGING FOR ELECTROSTATIC CHARGING SYSTEM IN FLASH SPINNING PROCESS
Ervin T. Powers, Jr., Midlothian, Va., and Edgar N. Rudisill, Hermitage, Tenn., assignors to E.I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Dec. 2, 1994, Ser. No. 348,684
Int. Cl.[6] D01D *5/11*
U.S. Cl. 264—441 **3 Claims**



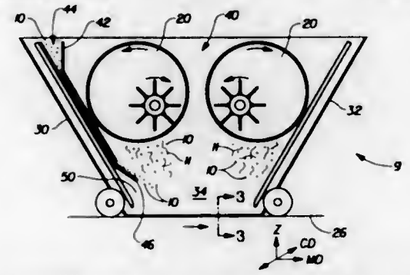
1. A process for flash spinning fiber forming polymer into a plexifilamentary film-fibril web and laying down the web to form a nonwoven batt material therefrom, the process comprising the steps of:
flash spinning polymer into a plexifilamentary web;
applying a charge to the web by passing the web between at least one electrically charged needle and a conductive target surface;
laying the web onto a surface to form the web into a batt that is suitable for being pressed into a sheet; and
impacting each needle with a stream of gaseous fluid to sweep away polymer dust and debris generated by the spinning process.

5,558,831
HINGE HEATING AND FOLDING METHOD
Gary E. Merz; Edward B. Richter; Robert W. Sanford, all of Rochester, and Jack Magliocco, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Feb. 20, 1995, Ser. No. 391,895
Int. Cl.[6] B29C *53/04*
U.S. Cl. 264—492 **4 Claims**



1. A method for relatively heating and folding a pair of members molded from a thermoplastic material, said members being joined by at least one integrally molded flexible hinge of said material, said members and said hinge having cooled substantially following molding thereof, comprising:
a) applying heat substantially only to said cooled hinge by controlled hot air to locally raise the temperature of said hinge to a level at which said material becomes more ductile while said material in said members remains cool;
b) folding said members by flexing said hinge while said hinge is more ductile; and
c) Allowing said hinge to cool.

5,558,832
APPARATUS FOR SORTING SUBSTRATE COMPONENTS ACCORDING TO SIZE AND METHOD OF SORTING SUBSTRATE COMPONENTS THEREWITH
John R. Noel, Cincinnati, and Mark R. Richards, Middletown, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Aug. 25, 1995, Ser. No. 519,475
Int. Cl.[6] B27N *3/04;3/02*
U.S. Cl. 264—510 **15 Claims**



1. A forming station for dispersing particles of different sizes in a matrix of fibers thereby creating a substrate of said fibers and said particles, said forming station having a machine direction, and a cross machine direction perpendicular to said machine direction, said forming station comprising:
a forming chamber;
a forming screen movable in the machine direction relative to said forming chamber, said forming screen receiving said particles and said fibers thereon;
at least one material distributor for distributing said fibers on said forming screen; and
at least one baffle disposed in said forming chamber for distributing said particles on said forming screen, said baffle having a differential pressure thereacross, thereby creating a low pressure zone, whereby said low pressure zone creates a velocity gradient in the particles having a component parallel to the plane of the forming screen, whereby said baffle creates a monotonic distribution of said substrate components according to the size of said particles throughout the thickness of said substrate.

5,558,833
SILVER ALLOY WITH COPPER, INDIUM AND MOLYBDENUM
Marek R. Zamojski, 11 Reade St., North Providence, R.I. 02904
Filed Jun. 9, 1995, Ser. No. 489,123
Int. Cl.[6] C22C *5/06*
U.S. Cl. 420—502 **1 Claim**

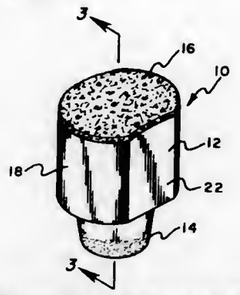
1. A silver alloy having a reduced porosity surface after it has been cast in a mold, said silver alloy consisting of:
silver in a range from approximately 92.50 to 93.50 percent by weight;
copper in a range from approximately 4.99 to 6.49 percent by weight;

indium in a range from approximately 1.00 to 2.00 percent by weight; and
approximately 0.01 percent by weight molybdenum.

5,558,834
DEVICE AND METHOD OF SEPERATING AND ASSAYING WHOLE BLOOD
Amy H. Chu, Granger, and Lon R. Stover, Elkhart, both of Ind., assignors to Bayer Corporation, Elkhart, Ind.
Continuation of Ser. No. 218,149, Mar. 25, 1994, abandoned, which is a continuation of Ser. No. 770,467, Oct. 3, 1991, abandoned. This application May 31, 1995, Ser. No. 454,614
Int. Cl.[6] G01N *33/48*
U.S. Cl. 422—55 **16 Claims**

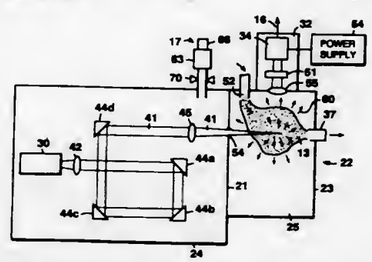
1. A device for separating undiluted plasma or serum from an undiluted whole blood sample including a filter pad consisting essentially of a single carrier matrix having homogeneously incorporated therein from about 5 to about 50 units of a blood cell agglutinizing agent per cm^3 of the carrier matrix, or from about 40 to about 100 NIH units of a blood cell coagulating agent per cm^3 of the carrier matrix, or a mixture thereof, and from about 0.3% to about 1.5% by weight of the carrier matrix of a nonhemolytic surfactant, to agglutinate or coagulate the cellular components from the undiluted whole blood sample in the area of the carrier matrix while allowing a quantity of the undiluted plasma or serum portion of the undiluted whole blood sample to chromatographically flow completely through the carrier matrix separate from the cellular components of the blood, wherein the agglutinizing agent is a lectin, the coagulating agent is a thrombin compound and the nonhemolytic surfactant is selected from the group consisting of octoxynol 40, PEG-36 castor oil, C_{11-15} pareth-12, C_{12-15} pareth-9, ceteareth-27, ceteth-30, laureth-23, oleth-15, PEG-20 laurate, PEG-36 oleate, PEG-44 sorbitan laurate, PEG-30 stearate, steareth-27, PEG-11 cocamide, PEG-15 cocamine, PEG-15 tallow amine, PEG-20 hydrogenated castor oil, PPG-5-ceteth 20, PPG-myreth-11, steareth-10, trideceth-15, C_{11-15} pareth-7 carboxylic acid, C_{12-13} pareth-5 carboxylic acid, C_{12-15} pareth-7 carboxylic acid, ceteareth-25 carboxylic acid, deceth-7 carboxylic acid, isosteareth-6 carboxylic acid, isosteareth-11 carboxylic acid, coceth-7 carboxylic acid, laureth-5 carboxylic acid, laureth-10 carboxylic acid, trideceth-4 carboxylic acid, trideceth-7 carboxylic acid, trideceth-15 carboxylic acid, trideceth-19 carboxylic acid, C_{12-15} pareth-2 phosphate, ceteareth-4 phosphate, deceth-4 phosphate, dilaureth-10 phosphate, dioleth-8 phosphate, laneth-4 phosphate, laureth-3 phosphate, laureth-8 phosphate, nonoxynol-6 phosphate, nonoxynol-9 phosphate, nonoxynol-10 phosphate, nonyl nonoxynol-7 phosphate, nonyl nonoxynol-9 phosphate, nonyl nonoxynol-10 phosphate, nonyl nonoxynol-15 phosphate, nonyl nonoxynol-24 phosphate, oleth-3 phosphate, oleth-4 phosphate, oleth-10 phosphate, oleth-20 phosphate, potassium octoxynol-12 phosphate, PPG-5-ceteth phosphate, PPG- 10 cetyl ether phosphate, tricetеareth-4 phosphate, triceteth-5 phosphate, trideceth-6 phosphate, trilaneth-4 phosphate, trilaureth-4 phosphate, trioleth-8 phosphate, and combinations thereof,
wherein the amount of agglutinin or coagulant incorporated in the carrier matrix is about two to about five times less than the amount of agglutinin or coagulant used in the absence of a nonhemolytic surfactant.

5,558,835
LEAD TEST DAUBER
Eliot M. Kozarsky, Moorestown, N.J., and Dianne C. Horton, Terrell, N.C., assignors to Universal Synergetics, Inc., Mt. Laurel, N.J.
Filed May 9, 1994, Ser. No. 240,038
Int. Cl.[6] G01N *33/20;21/78*
U.S. Cl. 422—56 **13 Claims**



1. A device for testing for a substance in a surface with a reagent material that is capable of reacting with the substance comprising:
a handle portion adapted to be held by a person utilizing the device, said handle portion having an upper end and a lower end;
a substantially rigid but liquid absorbent dauber secured to the lower end of said handle portion, at least a component of said reagent material impregnated within said dauber;
abrasive means carried adjacent the upper end of said handle portion for abrading said surface prior to testing; and
wherein said abrasive means is comprised of a layer of the particulate abrasive material mounted on the upper end of said handle portion.

5,558,836
EMISSION DETECTION SYSTEMS FOR DETERMINING THE PRESENCE OF CONTAMINANTS
David P. Rounbehler, Bedford; Dirk Appel, Salem; Daniel A. Dussault, Newburyport, all of Mass.; Thomas M. Levine, Lee, N.H., and Jonathan E. Bosworth, Acton, Mass., assignors to Thermedics Detection Inc., Woburn, Mass.
Filed Oct. 3, 1994, Ser. No. 316,905
Int. Cl.[6] G01N *21/15*
U.S. Cl. 422—91 **17 Claims**



1. A detection system for detecting the emission from a contaminant contained in a sample gas, said detection system comprising:
a housing containing a sample inlet port and a purge inlet port for independently directing the purge and sample gasses into said housing, and a vacuum port configured to direct both the sample and purge gases out of said housing;
a partition containing an aperture positioned within said housing;
a light source and a first optical system positioned within said housing and for providing a beam of radiation at an orientation, wavelength, and intensity sufficient to pass through said

tion of the particles as an indication of the presence or absence of

5,558,841

aperture and irradiate the sample gas directed into said housing, thereby inducing emission in the contaminant whereby the beam of radiation passes through said aperture prior to irradiation of the sample;

a purge gas flow path defined in said housing from said purge inlet port past said first optical system;

a photodetector positioned with respect to said housing so as to generate a light-induced signal in response to the emission from the contaminant;

a vacuum system connected to said vacuum port to draw: a) the sample gas into said housing through said sample inlet port, and then out of said housing through said vacuum port; and, b) the purge gas into said housing, from said purge inlet through said aperture, and then out of said housing through said vacuum port, thereby providing in said housing a flow of sample gas to be irradiated by said light source and said first optical system, and said purge gas flow path to reduce contact between the sample gas and said first optical system; and

a processor for analyzing the light-induced signal to determine the presence of the contaminant.

5,558,837

DROPLET FLOATING APPARATUS

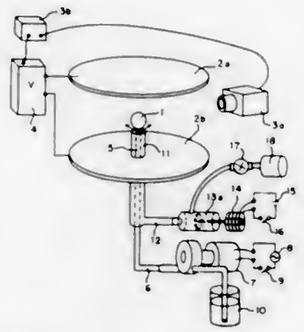
Chihiro Tsukishima, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1994, Ser. No. 340,272

Claims priority, application Japan, Apr. 5, 1994, 6-067010

Int. Cl.[6] B01L *3/00*

U.S. Cl. 422—99 **21 Claims**



1. A droplet floating apparatus comprising:

a liquid sample supply pipe having a first end that receives a liquid sample and a second end that provides a droplet of the liquid sample in a floating space;

separating means for applying a gas to the droplet to separate the droplet from the liquid sample supply pipe so that the droplet loses contact with the liquid sample supply pipe and floats within the floating space;

means for holding the droplet at the second end of the liquid sample supply pipe until the separating means separates the droplet from the second end of the liquid sample supply pipe; and

said means for holding including means for confining the droplet within the floating space after the separating means separates the droplet from the second end of the liquid sample supply pipe.

5,558,838

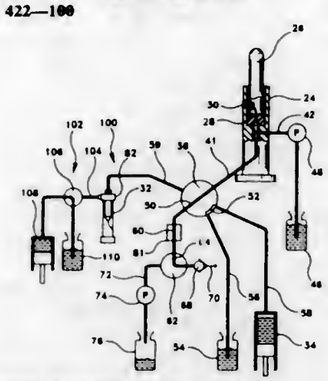
SAMPLE PREPARATION APPARATUS

Kenneth F. Uffenheimer, Los Gatos, Calif., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 29, 1993, Ser. No. 129,634

Int. Cl.[6] B01L *3/02*

U.S. Cl. 422—100 **12 Claims**



1. A sample preparation system comprising:

a sample tube holding structure, and a flow passage leading from said sample tube holding structure;

a reaction tube holding structure, and a reaction tube passage leading into said reaction tube holding structure;

a diluent pump in communication with a source of a diluent for moving said diluent along a diluent passage upon actuation of said diluent pump;

a vent passage leading to atmosphere;

a suction passage leading to a source of suction;

a first valve alternatively communicating said flow passage to a valve passage, or communicating said diluent passage to said reaction tube passage; and

a second valve selectively communicating said valve passage to said suction passage or said vent passage.

5,558,839

MAGNETIC DEVICE FOR IMMUNOLOGICAL ANALYSIS OF A SOLID PHASE

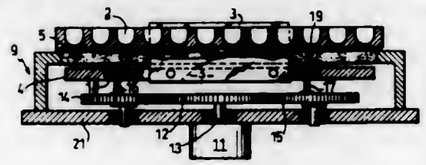
Claude Mattie, Paris, and Anne Muller, Gif/Yvette, both of France, assignors to Pasteur Sanofi Diagnostic, Marnes La Coquette, France

Division of Ser. No. 916,494, Jul. 21, 1992, Pat. No. 5,318,914. This application Mar. 14, 1994, Ser. No. 209,274

Claims priority, application France, Jul. 22, 1991, 91 09242

Int. Cl.[6] B01L *11/00*

U.S. Cl. 422—101 **4 Claims**



1. A device for use in an immunoassay, wherein a substance which specifically binds a biological substance to be assayed in a sample, immobilized on magnetic particles, is reacted with the sample in wells of a microtitration plate coated with a component which specifically binds the biological substance, and the distribution of the particles as an indication of the presence or absence of the biological substance is observed, said device comprising:

a horizontal microtitration plate having wells arranged in a zone, each well having a coating that can specifically bind the biological substance, and having supporting means comprising means for causing the plate to execute horizontally a circular translation movement,

a set of magnets positioned under the well zone, each magnet having upper and lower vertically aligned poles, with the upper poles disposed in a plane parallel to the plate and arranged in a checkered pattern of alternating poles or lines of alternating poles, said magnets arrayed so as to provide at least one magnetic field for attracting magnetic particles to at least a portion of a wall of each said well, when the supporting means is in a first position.

5,558,840

SPECIMEN CUP HOLDER

Timothy B. Jones, 2517 E. Sweetbriar, Edmond, Okla. 73034; Robert D. Jones, and Lori D. Jones, both of 2233 Hickory Dr., Ardmore, Okla. 73401

Filed Jul. 7, 1995, Ser. No. 499,224

Int. Cl.[6] B01L *9/00*

U.S. Cl. 422—104 **5 Claims**

1. A device for holding a specimen container comprising:

(a) a ring of predetermined size sufficient to supportingly engage a specimen container,

(b) a handle,

(c) a hinge means for joining said ring and said handle whereby said ring and said handle can assume different relative positions to one another,

(d) a securing means for holding the handle and the ring in an opposingly engaged, folded position opposite the side of the ring from the hinge means, said securing means located on a lower surface near an end of the handle distal to the hinge means, the length of the handle being substantially the same as an outer diameter of the ring such that the end of the handle aligns with the ring opposite the hinge means when the handle is folded parallel to the ring, the hinge means and the ring being made of a flexible material such that the ring may be elongated parallel to the long axis of the handle allowing the end of the handle to be positioned below the plain of the lower surface of the ring opposite the hinge means, the ring being allowed to resume a substantially circular configuration, the securing means and the ring being brought into contact with one another by the elastic quality of the hinge means and the ring to produce an opposingly engaged, folded position between the handle and the ring.

5,558,841

WASHING/STERILIZING APPARATUS FOR AN ENDOSCOPE AND METHOD FOR WASHING/STERILIZING ITS WATER SUPPLYING SYSTEM

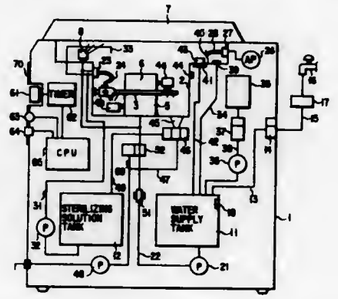
Mikihiko Nakagawa, Tokyo; Daisaku Negoro, Saitama-ken; Nobuyuki Nakanishi, Sagamihara; Akio Ogawa, Tokyo; Manabu Yajima, Tokyo, and Toshiharu Kinoshita, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 186,905, Jan. 26, 1994. This application Mar. 1, 1995, Ser. No. 396,576

Claims priority, application Japan, Apr. 26, 1993, 5-099332; Aug. 17, 1993, 5-203318; Nov. 30, 1993, 5-299697

Int. Cl.[6] G05D *7/06;* **A61L** *2/18;2/24*

U.S. Cl. 422—105 **14 Claims**



1. An apparatus for washing an endoscope with washing water and sterilizing the endoscope with sterilizing solution, comprising:

a bath for placing an endoscope therein;

a washing nozzle assembly for applying a jet of washing water to the endoscope placed in the bath;

a water tank;

a washing water passage for allowing only the washing water to flow when the endoscope placed in the bath is washed, a part of the washing water passage being connected between the water tank and the washing nozzle assembly;

a sterilizing solution passage for allowing only a sterilizing solution to flow when the endoscope placed in the bath is sterilized;

means for determining whether or not said part of the washing water passage needs sterilizing;

means for sterilizing said part of the washing water passage when the determining means determines that said part of the washing water passage needs sterilizing;

a tank for holding the sterilizing solution for sterilizing said part of the washing water passage;

a pouring inlet for pouring the Sterilizing solution into said part of the washing water passage so that the sterilizing solution is used for the means for sterilizing said part of the washing water passage;

means for detecting the pouring the sterilizing solution into said part of the washing water passage via the pouring inlet; and

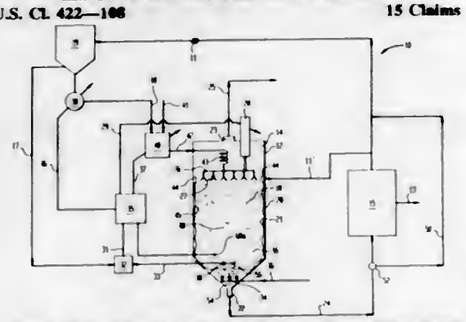
control means for, when the sterilizing solution pouring detecting means detects the pouring of the sterilizing solution by a selection of a user sterilizing said part of the washing water massage with the poured sterilizing solution and for, when the sterilizing solution pouring detecting means does not detect the pouring of the sterilizing solution by a selection of a user, sterilizing said part of the washing water massage with the sterilizing solution held in the tank.

5,558,842

DEVICES FOR MAKING REACTION PRODUCTS BY CONTROLLING PRE-COALESCING TEMPERATURE AND TRANSIENT TEMPERATURE DIFFERENCE IN AN ATOMIZED LIQUID

Eustathios Vassiliou, Newark, Del., and Mark W. Dassel, Indianola, Wash., assignors to Twenty-First Century Research Corporation, Newark, Del.

Filed Jun. 7, 1995, Ser. No. 475,340
Int. Cl.[6] G05D *7/00*; **B01F** *5/00*; **B01D** *11/04*
U.S. Cl. 422—108 **15 Claims**



1. A device for preparing a reaction product from a first liquid containing a first reactant and a gas containing a second reactant comprising:

a reaction chamber having an upper end, a lower end, a wall, and a reaction zone, in which zone the first liquid is brought in contact with the gas for reacting at a reaction pressure;

an atomizer disposed within the reaction chamber adapted to break the first liquid into a plurality of droplets within the gas at an atomization temperature in a manner that the droplets coalesce on a mass of a second liquid containing reaction product, the droplets having a pre-coalescing temperature before they coalesce, the mass of the second liquid having a second liquid surface, the atomizer being away from said second liquid surface at an atomization distance;

a first temperature monitor for measuring the atomization temperature;

a second temperature monitor for measuring the pre-coalescing temperature;

control means connected to the first and the second temperature monitors for obtaining temperature information and pointing a parameter or determinant selected from a group consisting of pre-coalescing temperature of the droplets, transient temperature difference of the droplets, and a combination thereof, toward respective predetermined ranges, the transient temperature difference of the droplets being the difference between the pre-coalescing temperature and the atomization temperature; and

a separator communicating with the reaction chamber for separating the reaction product from the second liquid.

5,558,843

NEAR ATMOSPHERIC PRESSURE TREATMENT OF POLYMERS USING HELIUM DISCHARGES

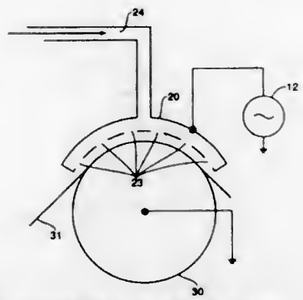
David A. Glocker, West Henrietta, and Mark M. Romach, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 1, 1994, Ser. No. 299,776
Int. Cl.[6] B01J *19/08*
U.S. Cl. 422—186.05 **2 Claims**

1. A device adapted for use in an atmospheric glow discharge chamber comprising:

an electrode having a first surface, the electrode including a plurality of holes terminating at the first surface, the first surface of the electrode being insulated;

a grounded transport drum for carrying a web to be transported between the drum and the electrode;



means for providing gas to the plurality of holes;

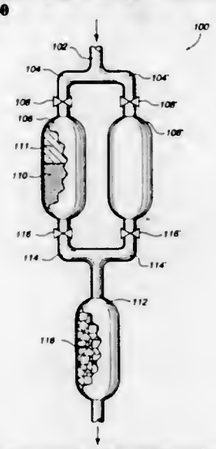
a power supply coupled to the electrode.

5,558,844

PROCESS FOR THE PURIFICATION OF HYDROGEN

Marco Succi, Milan, Italy, and D'Arcy Lorimer, San Luis Obispo, Calif., assignors to SAES Getters S.p.A., Italy

Continuation of Ser. No. 86,573, Jul. 6, 1993, abandoned, which is a continuation of Ser. No. 825,096, Jan. 24, 1992, abandoned. This application Feb. 10, 1995, Ser. No. 386,325
Int. Cl.[6] C01B *3/00*; **B01D** *53/54*;*53/62*
U.S. Cl. 423—230 **13 Claims**



1. A process for the removal of impurities of nitrogen and carbon monoxide, and optionally carbon dioxide, from hydrogen containing nitrogen and carbon monoxide and optionally carbon dioxide impurities, without generating the production of methane, said hydrogen containing no more than about 20 ppm by volume total nitrogen, carbon monoxide and carbon dioxide impurities, comprising the steps of:

a. passing said hydrogen through a hydrogen inlet in fluid communication with a first purification chamber; and

b. contacting said hydrogen with a bed of particulate material contained within said first purification chamber, said bed of particulate material comprised of elemental nickel in an amount of at least 5% by weight of the bed and said elemental nickel having a surface area of at least about 100 m^2/g, at a temperature of from 0° C. to 50° C. to reduce the concentration of carbon monoxide and any carbon dioxide, thus producing a partially purified hydrogen having a reduced concentration of carbon monoxide and any carbon dioxide, the first purification chamber being in fluid communication with a second purification chamber; and

c. contacting the partially purified hydrogen with a bed of getter material contained within said second purification chamber to remove nitrogen thus producing a purified hydrogen having

less than 20 ppb of total nitrogen, carbon monoxide and carbon dioxide, said second purification chamber being in fluid communication with a purified hydrogen outlet; and

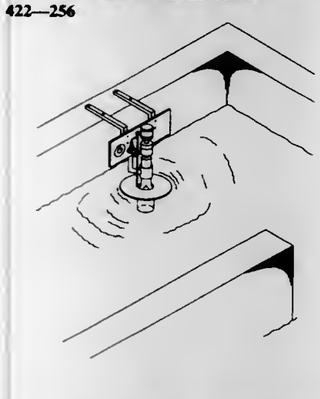
d. passing the purified hydrogen through said purified hydrogen outlet.

5,558,845

FILM PUMP FOR APPLYING A MONOLAYER FILM OVER WATER SURFACES

Michael T. Pauken; Sheldon M. Jeter, both of Atlanta, and Said I. Abdel-Khalik, Tucker, all of Ga., assignors to Georgia Tech Research Corp., Atlanta, Ga.

Filed Jul. 27, 1994, Ser. No. 281,412
Int. Cl.[6] B01D *11/04*
U.S. Cl. 422—256 **19 Claims**



1. A device for applying an evaporation-inhibiting film to an exposed liquid surface of a liquid body, comprising:

a. an impeller disposed below and coplanar with an exposed liquid surface;

b. means for rotating said impeller;

c. means for delivering the evaporation-inhibiting film to an exposed liquid surface at a location immediately above said impeller; and

d. means for bringing liquid from beneath the exposed surface of the liquid body to above said impeller.

5,558,846

APPARATUS FOR DISINFECTING CONTACT LENSES HAVING IMPROVED VENT MEANS

Larry A. Alvord, Lawrenceville, Ga., and Robert F. McCoy, Maplewood, N.J., assignors to Ciba Geigy Corporation, Tarrytown, N.Y.

Filed Dec. 5, 1994, Ser. No. 349,719
Int. Cl.[6] A61L *2/16*; **B65D** *51/16*
U.S. Cl. 422—301 **26 Claims**

1. An apparatus for treating ophthalmic lenses, comprising:

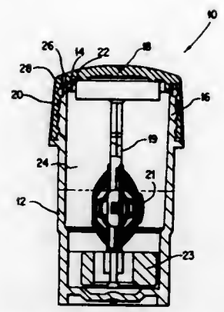
(a) a container adapted to receive a treating solution, said container having an end including a substantially circular periphery defining an opening which is adapted to receive a lens retaining means;

(b) a cap adapted to be affixed to said container at said open end, in order to provide a substantially liquid-impermeable seal,

said cap further including a sealing rim adapted to mate with said container periphery,

said cap and said container defining an apparatus for treating ophthlalmic lenses,

wherein said container periphery is sufficiently flexible to at least partially deform to allow gas to escape between said container periphery and said cap sealing rim when the gas



pressure within said container exceeds a predetermined pressure above atmospheric pressure, said container periphery and said sealing rim thereby forming a primary sealing and venting means,

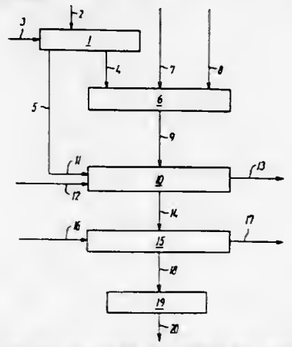
and wherein said apparatus further includes a secondary venting means which allows gas passing from said container through said primary sealing and venting means to pass to the surroundings.

5,558,847

PROCESS FOR RECOVERING ALUMINIUM AND FLUORINE FROM FLUORINE CONTAINING WASTE MATERIALS

Henning Kaaber, Den Gamle Skole, DK-3520 Farum, and Mogens Mollgaard, Søtofteparken 3, DK-3660 Stenløse, both of Denmark

Continuation of Ser. No. 296,261, Aug. 25, 1994, abandoned, which is a continuation of Ser. No. 98,311, Nov. 8, 1993, abandoned. This application May 5, 1995, Ser. No. 435,279
Claims priority, application Denmark, Feb. 5, 1991, 0193/91
Int. Cl.[6] C01F *7/00*
U.S. Cl. 423—111 **20 Claims**



1. A process for recovering aluminum and fluorine from a fluoride-containing waste material (FCWM) as AlF_2OH hydrate comprising the steps of

(a) conducting an acid leaching step in which FCWM is leached with dilute sulfuric acid to thereby produce an acid slurry containing fluorine, sodium and aluminum dissolved in the aqueous phase thereof and insuring the molar ratio of "F"/"Al" is in the interval from about 1.8 to 2.2, adjusting said ratio to said interval, by adding aluminum as required wherein "F" is the number of moles of leachable fluorine in the FCWM and "Al" is the number of moles of aluminum;

(b) separating the aqueous and solid phases;

(c) precipitating AlF_2OH hydrate from the aqueous phase by increasing the temperature to and maintaining the temperature at a value within the interval of from about 90° C. to the boiling point of the aqueous phase and gradually increasing

the pH value to about 3.7 to 4.1 by controlled continuous addition of an aqueous NaOH solution; and

(d) recovering the precipitated AlF_2OH hydrate,

wherein the operating conditions during the entire process are such as to prevent oxidation of ferrous ions to ferric ions, and wherein the amount of sulfuric acid used in the acid leaching step is such that the molar ratio ("Na"/2+"F"/4)/"SO_4^{--}" is less than or equal to 1, in which "Na" is the number of moles of leachable sodium in the FCWM plus the number of equivalents of the aqueous NaOH added prior to the precipitation of the AlF_2OH hydrate and "SO_4^{--}" is the number of moles of sulfate, and the amount of H_2SO_4 is also such that pH value of the aqueous phase during the acid leaching step does not exceed about 3.

5,558,848

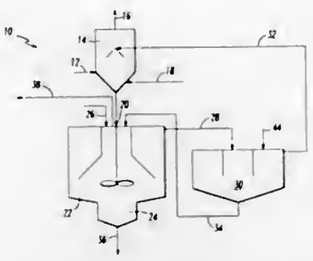
CLEAR LIQUID ACID FLUE GAS DESULFURIZATION SYSTEM

Robert E. Moser, 1560 Sand Hill Rd., #203, Palo Alto, Calif. 94303; David R. Owens, 437 Bella Corte, Mountain View, Calif. 94043; James H. Wilhelm, 2394 Charros Rd., Sandy, Utah 84092; James D. Colley, 12307 Log Cabin La., Anchorage, Ky. 40223, and Oliver W. Hargrove, Jr., 8508 Adirondack Ave., Austin, Tex. 78759

Continuation-in-part of Ser. No. 109,487, Aug. 20, 1993, abandoned. This application May 30, 1995, Ser. No. 453,897

Int. Cl.[6] B01D *53/50*

U.S. Cl. 423—243.01 **13 Claims**



I. A wet flue gas desulfurization process for removing sulfur oxides from flue gas conducted under conditions which inhibit the oxidation of sulfite to sulfate to produce a sulfur oxides-free gas and sulfite-containing solids including the steps of:

a) directing sulfur oxides-containing gas to a scrubber;

b) scrubbing the sulfur oxides from the flue gas with a clear scrubbing liquid that is substantially free from suspended solids and contains an organic acid buffer system capable of controlling and maintaining the pH of said process at a pH in the range of 4.5 to 6.0 to produce a sulfur oxides-free gas and a sulfur oxides-containing effluent liquor;

c) discharging the sulfur oxides-free gas from the process;

d) directing sulfur oxides-containing effluent liquor from the scrubber to a reactor system containing lime or limestone and a bed of calcium sulfite solids and separating the scrubber effluent into a clear liquor fraction substantially free from suspended solids and a thickened sulfite solids fraction;

e) maintaining the circulating calcium sulfite relative saturation of said process between 3 and 5 by control of the suspended solids concentration and by control of calcium ion concentration in the reactor system;

f) maintaining an organic acid buffer concentration in the clear liquor fraction to control and maintain a process pH of 4.5 to 6.0; and

g) dewatering the sulfite solids fraction.

5,558,849

PROCESS FOR MAKING INORGANIC GELS

Kenneth G. Sharp, Landenberg, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 128,437, Sep. 29, 1993, which is a continuation-in-part of Ser. No. 885,793, May 20, 1992, abandoned. This application Apr. 21, 1995, Ser. No. 426,325

Int. Cl.[6] C01B *33/12*

U.S. Cl. 423—338 **8 Claims**

1. An open pore, inorganic gel made by a process comprising:

(1) intimately mixing together the following components (A) and (B), either in a liquid state or in solution in an organic liquid:

(A) at least one compound selected from the group consisting of $Si(OR^1)_4$, $Ti(OR^2)_4$, $Zr(OR^3)_4$, $Ti^a(OR^4)_nX^d_p$, and $Zr^b(OR^5)_nX^d_p$

wherein

each one of R^1, R^2, R^3, R^4 and R^5 independently is a C_1–C_8 alkyl;

X is a chelating ligand;

each one of a and b is independently a coordination number having an integer value of 4–6;

d is a number corresponding to the chelating ability of ligand X, being 2 for bidentate chelating ligands and 3 for tridentate chelating ligands;

p is either 1 or 2, with the proviso that p is 1 for tridentate chelating ligands;

n=d–d.p; and

(B) a strong carboxylic acid selected from the group consisting of formic acid, monochloroacetic acid, dichloroacetic acid, trifluoroacetic acid and hydroxyacetic acid, and containing from 0 to 40 mole % water, the amount of carboxylic acid being at least 1.5 moles of —COOH groups per mole of compound (A), and the total amount of water from any source initially present in the reaction medium being less than 5 moles per mole of Component (A);

(2) agitating the above mixture while maintaining the mixture at a temperature within the range of about 0° to 100° C.; and

(3) isolating the inorganic gel wherein said open pore, inorganic gel has ultrafine pore structure, having less than 10 m^2/g specific surface area by nitrogen adsorption analysis after 4 hours at −196° C.

5,558,850

PRECIPITATED CALCIUM CARBONATE

Ian S. Bleakley, and Thomas R. Jones, both of St. Austell, United Kingdom, assignors to ECC International Limited, United Kingdom

Continuation-in-part of Ser. No. 996,677, Dec. 24, 1992, abandoned, which is a continuation-in-part of Ser. No. 736,488, Jul. 26, 1991, Pat. No. 5,232,678. This application Aug. 9, 1994, Ser. No. 287,966

Claims priority, application United Kingdom, Jul. 27, 1990, 9016552

Int. Cl.[6] C01F *11/18*

U.S. Cl. 423—432 **13 Claims**

1. In a process of preparing calcium carbonate, which comprises the following steps:

(a) slaking quicklime in an aqueous medium;

(b) carbonating the suspension of slaked lime formed in step (a) by passing therethrough sufficient of a gas comprising carbon dioxide to cause the pH of the suspension to fall to substantially neutral; and

(c) separating the precipitated calcium carbonate formed in step (b) from the aqueous medium in which it is suspended; wherein the improvement comprises adding a reagent comprising a polyhydric alcohol or a polyhydric phenol to the aqueous medium in which the quicklime is slaked in step (a).

5,558,851

PREPARATION OF ALUMINOSILICATE ZEOLITES

Stephen J. Miller, San Francisco, Calif., assignor to Chevron U.S.A. Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 141,142, Oct. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 991,872, Dec. 16, 1992. This application Sep. 20, 1994, Ser. No. 309,216

Int. Cl.[6] C01B *39/04;39/38;39/42*

U.S. Cl. 423—702 **52 Claims**

1. A method for preparing a crystalline zeolite, said method comprising:

a. preparing a reaction mixture comprising at least one active source of a first oxide selected from the group consisting of an oxide of silicon, germanium or both, optionally at least one active source of a second oxide selected from the group consisting of an oxide of aluminum, boron, gallium, iron or a mixture thereof, an organic templating agent capable of forming said crystalline zeolite, and sufficient water to shape said mixture; and

b. heating said reaction mixture at crystallization conditions and in the absence of an added external liquid phase for sufficient time to form a crystallized material containing crystals of said zeolite, wherein said zeolite crystals have a first oxide/second oxide molar ratio greater than 12.

5,558,852

METHODS OF TREATING MELANOMAS AND GLIOMAS WITH MONOCLONAL ANTIBODY ME1-14

Darell D. Bigner, Mebane, N.C., and Michael R. Zalutsky, Chaple Hill, N.C., assignors to Duke University, Durham, N.C.

Continuation of Ser. No. 33,864, Mar. 19, 1993, abandoned. This application Nov. 14, 1994, Ser. No. 339,582

Int. Cl.[6] A61K *39/395;39/44*

U.S. Cl. 424—1.49 **28 Claims**

1. A method of treating a cystic brain tumor in a human subject comprising:

administering to a human subject afflicted with a cystic brain tumor an antibody in a therapeutically effective amount,

wherein the Fc fragment of said antibody is deleted,

wherein said antibody is selected from the group consisting of monoclonal antibody Me1-14 having the amino acid sequence given in SEQ ID NO: 2 and SEQ ID NO: 4, and antibodies that specifically bind to the epitope specifically bound by monoclonal antibody Me1-14,

wherein said cystic brain tumor binds monoclonal antibody Me1-14;

and wherein said administering step is carried out by depositing said antibody in the cyst cavity of said cystic brain tumor.

5,558,853

PHASE SHIFT COLLOIDS AS ULTRASOUND CONTRAST AGENTS

Steven C. Quay, Pacific Palisades, Calif., assignor to Sonus Pharmaceuticals, Bothell, Wash.

Continuation-in-part of Ser. No. 148,284, Nov. 8, 1993, which is a continuation-in-part of Ser. No. 8,172, Jan. 25, 1993. This application Jan. 19, 1994, Ser. No. 182,024

Int. Cl.[6] A61K *49/00*

U.S. Cl. 424—9.5 **48 Claims**

I. An ultrasound contrast agent including a biocompatible colloidal dispersion, said dispersion comprising a liquid dispersed phase, an amphiphilic material and an aqueous continuous phase, said dispersed phase comprising a water immiscible fluorine-containing chemical in liquid form having a boiling point below about 40° C.

5,558,854

ULTRASOUND CONTRAST MEDIA COMPRISING PERFLUOROPENTANE AND PERFLUOROHEXANE GAS

Steven C. Quay, Pacific Palisades, Calif., assignor to Sonus Pharmaceuticals, Bothwell, Wash.

Division of Ser. No. 936,011, Sep. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 893,657, Jun. 5, 1992, Pat. No. 5,409,688, which is a continuation-in-part of Ser. No. 761,311, Sep. 17, 1991, abandoned. This application Jan. 30, 1995, Ser. No. 380,085

Int. Cl.[6] A61K *49/00*

U.S. Cl. 424—9.52 **13 Claims**

1. Contrast media for ultrasound imaging comprising gaseous dodecafluoropentane.

5,558,855

PHASE SHIFT COLLOIDS AS ULTRASOUND CONTRAST AGENTS

Steven C. Quay, Pacific Palisades, Calif., assignor to Sonus Pharmaceuticals, Bothell, Wash.

Filed Jan. 25, 1993, Ser. No. 8,172

Int. Cl.[6] A61K *49/00*

U.S. Cl. 424—95 **22 Claims**

1. A biocompatible ultrasound contrast agent including a liquid-in-liquid colloidal dispersion comprising a dispersed phase and an aqueous continuous phase, said dispersed phase comprising dodecafluoropentane and an amphiphile.

5,558,856

MICROBUBBLE-GENERATING CONTRAST AGENTS FOR ULTRASOUND AND MAGNETIC RESONANCE IMAGING

Jo Klaveness, Oslo; Pal Rongved, Hellvik, and Lars Stubberud, Sodertalje, all of Netherlands, assignors to Nycomed Imaging AS, Oslo, Norway

PCT No. PCT/EP93/00027, § 371 Date Dec. 9, 1994, § 102(e) Date Dec. 9, 1994, PCT Pub. No. WO93/13808, PCT Pub. Date Jul. 22, 1993

PCT Filed Jan. 8, 1993, Ser. No. 256,149

Claims priority, application United Kingdom, Jan. 9, 1992, 9200388

Int. Cl.[6] A61K *49/00*

U.S. Cl. 424—9.37 **35 Claims**

1. A contrast agent comprising microbubble-generating carbohydrate microparticles having a surfactant admixed within the microparticulate structures, wherein the contrast agent contains sulphur hexafluoride or low molecular weight fluorinated hydrocarbons optionally together with another biocompatible gas.

5,558,857

CONTRAST AGENTS

Jo Klaveness, Oslo; Pål Rongved, Nesoddtangen, and Per Strande, Oslo, all of Norway, assignors to Nycomed Imaging AS, Oslo, Norway

PCT No. PCT/EP92/01327, § 371 Date Dec. 23, 1993, § 102(e) Date Dec. 23, 1993, PCT Pub. No. WO92/21382, PCT Pub. Date Dec. 10, 1992

PCT Filed Jun. 3, 1992, Ser. No. 146,115

Claims priority, application United Kingdom, Jun. 3, 1991, 9111890; Jul. 5, 1991, 9114570; Jan. 9, 1992, 9200409

Int. Cl.[6] A61K *49/00*

U.S. Cl. 424—9.52 **12 Claims**

1. Ultrasound contrast agents in the form of microparticles comprising a biotolerable matrix in association with a gas or a precursor therefor, characterised in that the microparticles are stabilised by covalent bonding of the matrix and by having lipophilic groups, lipophilic molecules, or a combination thereof, covalently attached to the microparticles.

5,558,862

-continued

5,558,858

CO-DRIED ALUMINUM OXYHYDROXIDES

Andrew M. Rubino, Chatham, and Arthur A. Siciliano, Denville, both of N.J., assignors to Rebeis, Inc., Berkeley Heights, N.J.

Continuation of Ser. No. 289,687, Sep. 3, 1981, abandoned. This application Sep. 17, 1990, Ser. No. 586,333

Int. Cl.[6] A61K *7/32*

U.S. Cl. 424—68 **13 Claims**

1. A method for the preparation of adsorptive, protein-binding aluminum oxyhydroxides which comprises mixing a carbonate-free, highly hydrated, aluminum oxyhydroxide-containing aqueous suspension, which is relatively inert towards weak alkalis and acids, with an additive, said additive being soluble in water and furnishing coordinating moieties with aluminum, drying said mixture to form solid particles of adsorptive, protein-binding aluminum oxyhydroxide, which are resuspendable when acidified in water, and mixing water with the dried solid particles of aluminum oxyhydroxide and acidifying the resulting mixture to a pH value of between about 4 and about 6.5 to produce resuspended adsorptive, protein-binding, aluminum oxyhydroxide.

5,558,859

COMPOSITION FOR THE TREATMENT AND PROTECTION OF THE EXOSKELETAL PARTS BASED ON CERAMIDES AND VINYLPYRROLIDONE POLYMERS

Isabelle Cretois, Clichy, France, assignor to L'Oreal, Paris, France

Filed May 2, 1995, Ser. No. 433,392

Claims priority, application France, May 2, 1994, 94-05314

Int. Cl.[6] A61K *7/06;7/032*

U.S. Cl. 424—70.15 **17 Claims**

1. A composition for improving the shape-retention of hair, eyelashes or eyebrows, which comprises, in a cosmetically acceptable medium, at least one compound selected from a ceramide and a gtycoceramide and at least one vinylpyrrolidone polymer, said at least one compound and said at least one vinylpyrrolidone polymer being present in said composition in an amount effective to improve the shape-retention of said hair, eyelashes or eyebrows, said composition containing less than 4% by weight of anionic and/or amphotetric and/or zwitterionic surface-active agents.

5,558,860

VIRAL VACCINES

Louis J. N. Ross, Newbury, United Kingdom; Simon D. Scott, Amsterdam, Netherlands, and Matthew M. Binns, Ely, United Kingdom, assignors to Rhone Merieux, Lyons, France

Continuation-in-part of Ser. No. 669,392, Apr. 29, 1991, abandoned. This application Jun. 23, 1993, Ser. No. 81,932

Claims priority, application United Kingdom, Sep. 13, 1988, 8821441

Int. Cl.[6] A61K *39/255;* **C12N** *7/01;15/86*

U.S. Cl. 424—93.2 **14 Claims**

1. A vaccine against MDV (Mavek's Disease Virus), comprising a viral vector which contains a gene of the MDV virus inserted into the viral vector at a site which is not essential for infectivity and replication, which gene has the nucleotide sequence of the MDV gB gene.

5,558,861

MODIFIED MICROBIALLY-PRODUCED CELLULOSE GEL WITH HUMAN EPIDERMAL CELLS ADSORBED THEREON FOR USE AS A SKIN GRAFT OR VULNERARY COVER

Shigeru Yamanaka; Yuzuru Eto; Satoshi Takano; Kunihiko Watanabe, and Hiroshiro Shibai, all of Kawasaki, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of Ser. No. 407,250, Mar. 20, 1995, abandoned, which is a continuation of Ser. No. 281,135, Jul. 27, 1994, abandoned, which is a continuation of Ser. No. 159,708, Dec. 1, 1993, abandoned, which is a continuation of Ser. No. 44,083, Apr. 6, 1993, abandoned, which is a continuation of Ser. No. 653,473, Feb. 11, 1991, abandoned, which is a continuation of Ser. No. 39,739, Apr. 20, 1987, abandoned. This application Dec. 5, 1996, Ser. No. 567,212

Claims priority, application Japan, Apr. 22, 1986, 61-92479; Jul. 18, 1986, 61-169554

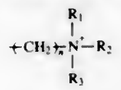
Int. Cl.[6] A01N *63/00;* **A61F** *13/00;2/10;* **A61L** *15/00;* **A61K** *9/14;35/36;* **C08B** *1/00;* **C12N** *1/02*

U.S. Cl. 424—93.7 **7 Claims**

1. A skin graft or vulnerary cover for external wound surfaces, which comprises a complex of a water-containing gel of modified microbially-produced cellulose with human cells bonded to or adsorbed in said gel, said human cells consisting of human epidermal cells, said human epidermal cells being cultured substantially in a monolayer state on the water-containing gel form of the modified microbially-produced cellulose, wherein:

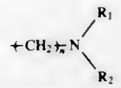
1) an animal cell adhesive protein is physically or chemically bonded to the modified microbially-produced cellulose, or
2) said cellulose contains hydroxyl groups, wherein at least a portion of the hydrogen atoms of the hydroxyl groups are substituted with a positively or negatively charged group, or
3) an animal cell adhesive protein is physically or chemically bonded to the modified microbially-produced cellulose, and the cellulose contains hydroxyl groups, wherein at least a portion of the hydrogen atoms of the hydroxyl groups are substituted with a positively or negatively charged group,

wherein the positively charged group has the formula (I) or (II):



(I)

or



(II)

wherein n is an integer of from 0 to 8, and R_1, R_2 and R_3 independently represents a hydrogen atom or an alkyl, aryl, arylalkyl, alkylaryl, cycloalkyl or alkoxyalkyl group, with the proviso that R_1, R_2 and R_3 are not a hydrogen atom simultaneously; and

wherein the negatively charged group is selected from the group consisting of a carboxy methyl group, a carboxy ethyl group, a phosphoric acid group and a sulfuric acid group.

5,558,862

METHOD OF CONTROLLING INSECTS

David R. Corbin, Chesterfield; John T. Greenplate, Manchester; Michael G. Jennings, Chesterfield; John P. Purcell, Ballwin, and Robert D. Sammons, New Melle, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 393,785, Feb. 24, 1995, which is a division of Ser. No. 83,948, Jun. 28, 1993, Pat. No. 5,518,908, which is a continuation-in-part of Ser. No. 937,195, Sep. 4, 1992, abandoned, which is a continuation-in-part of Ser. No. 762,682, Sep. 23, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 475,694

Int. Cl.[6] A61K *38/44;* **C12N** *9/02;1/20;* **C07H** *21/04*

U.S. Cl. 424—94.4 **21 Claims**

1. In a method of controlling plant insect pests by applying to the plant environment or plant seed an insecticidally effective amount of a protein toxin for ingestion by the insect, the improvement comprising applying to the plant environment or plant seed a plant-colonizing microorganism genetically engineered to contain and express a heterologous gene comprising a DNA sequence encoding 3-hydroxysteroid oxidase in an amount effective for controlling insect infestation, wherein the insect is a boll weevil or a lepidopteran.

5,558,863

METHOD FOR TREATMENT OF HERPES VIRUS INFECTIONS

Ellis L. Kline, Pendleton, and Walter W. McAlhaney, Anderson, both of S.C., assignors to Molecular Rx, Inc., Pendleton, S.C.

Continuation of Ser. No. 229,703, Apr. 19, 1994, abandoned, which is a continuation of Ser. No. 860,546, Apr. 3, 1992, abandoned, which is a continuation-in-part of Ser. No. 682,071, Apr. 9, 1991, abandoned. This application Feb. 21, 1995, Ser. No. 393,120

Int. Cl.[6] A61K *38/47*

U.S. Cl. 424—94.61 **7 Claims**

1. A method for treating herpes virus infections selected from the group consisting of HSV1, HSV2 and varicellazoster in a human or animal comprising the step of administering to the human or animal with the herpes virus infection a solution of neuraminidase at a dose of from between about 10^{-2} mg to about 10^{-8} mg.

5,558,864

HUMANIZED AND CHIMERIC ANTI-EPIDERMAL GROWTH FACTOR RECEPTOR MONOCLONAL ANTIBODIES

Mary M. Bendig, London; Catherine A. Kettleborough, Herts, and Jose Saldanha, Middlesex, all of United Kingdom, assignors to Merck Patent Gesellschaft Mit Beschrankter Haftung, Darmstadt, Germany

PCT No. PCT/EP92/00480, § 371 Date Nov. 6, 1992, § 102(e) Date Nov. 6, 1992, PCT Pub. No. WO92/15683, PCT Pub. Date Sep. 17, 1992

PCT Filed Mar. 4, 1992, Ser. No. 946,421

Claims priority, application European Pat. Off., Mar. 6, 1991, 911933892

Int. Cl.[6] A61K *35/16*

U.S. Cl. 424—133.1 **22 Claims**

1. A humanized antibody, comprising a variable region and a constant region, wherein the hypervariable region of the light chain CDRs has the following amino acid sequences:

CDR-1	Ser—Ala—Ser—Ser—Ser—Val—Thr—Tyr—Met—Tyr (SEQ ID NO:1),
CDR-2	Asp—Thr—Ser—Asn—Leu—Ala—Ser (SEQ ID NO:2) and
CDR-3	Gln—Gln—Trp—Ser—Ser—His—Ile—Phe—Thr (SEQ ID NO:3);

the hypervariable region of the heavy chain CDRs has the following amino acid sequences:

CDR-1	Ser—His—Trp—Met—His (SEQ ID NO:4),
CDR-2	Glu—Phe—Asn—Pro—Ser—Asn—Gly—Arg—Thr—Asn—Tyr—Asn—Glu—Lys—Phe—Lys—Ser (SEQ ID NO:5) and
CDR-3	Arg—Asp—Tyr—Asp—Tyr—Asp—Gly—Arg—Tyr—Phe—Asp—Tyr (SEQ ID NO:6);

the light chain framework region has the following amino acid sequences:

FR-1	Asp—Ile—Gln—Met—Thr—Gln—Ser—Pro—Ser—Ser—Leu—Ser—Ala—Ser—Val—Gly—Asp—Arg—Val—Thr—Ile—Thr—Cys (SEQ ID NO:7),
FR-2	Trp—Tyr—Gln—Gln—Lys—Pro—Gly—Lys—Ala—Pro—Lys—Leu—Leu—Ile—Tyr (SEQ ID NO:8),
FR-3	Gly—Val—Pro—Ser—Arg—Phe—Ser—Gly—Ser—Gly—Ser—Gly—Thr—Asp—Xaa_1—Thr—Phe—Thr—Ile—Ser—Ser—Leu—Gln—Pro—Glu—Asp—Ile—Ala—Thr—Tyr—Tyr—Cys (SEQ ID NO:9) and
FR-4	Phe—Gly—Gln—Gly—Thr—Lys—Val—Glu—Ile—Lys (SEQ ID NO:10);

the heavy chain framework region has the following amino acid sequences:

FR-1	Gln—Val—Gln—Leu—Val—Gln—Ser—Gly—Ala—Glu—Val—Lys—Lys—Pro—Gly—Ala—Ser—Val—Lys—Val—Ser—Cys—Lys—Ala—Ser—Gly—Tyr—Thr—Phe—Xaa_2 (SEQ ID NO:11),
FR-2	Trp—Val—Xaa_3—Gln—Xaa_4—Xaa_5—Gly—Gln—Gly—Leu—Glu—Trp—Xaa_6—Gly (SEQ ID NO:12),
FR-3	Xaa_7—Xaa_8—Thr—Met—Thr—Xaa_9—Asp—Thr—Ser—Thr—Asn—Thr—Ala—Tyr—Met—Xaa_{10}—Leu—Ser—Ser—Leu—Arg—Ser—Glu—Asp—Thr—Ala—Val—Tyr—Tyr—Cys—Ala—Ser (SEQ ID NO:13) and
Fr-4	Trp—Gly—Gln—Gly—Thr—Leu—Val—Thr—Val—Ser—Ser (SEQ ID NO:14);

wherein Xaa_1 is Tyr, Phe, Trp or His; Xaa_2 is Thr or Ser; Xaa_3 is Arg or His; Xaa_4 is Ala, Lys or His; Xaa_5 is Pro or Val; Xaa_6 is Ile, Val or Leu; Xaa_7 is Lys, Arg or His; Xaa_8 is Ala, Val, Pro or Gly; Xaa_9 is Val, Ala, Pro or Gly; and Xaa_{10} is Glu or Asn; and wherein said humanized antibody binds to human EGF receptors, and inhibits binding of EGF to EGF-receptor.

5,558,865

HIV IMMUNOTHERAPEUTICS

Tsuneya Ohno, Boston, Mass., assignor to Nissin Shokuhin Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 39,457, Apr. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 748,562, Aug. 22, 1991, abandoned. This application Aug. 24, 1993, Ser. No. 111,080

Int. Cl.[6] C12N *5/12;* **A61K** *39/42;* **C07K** *16/12*

U.S. Cl. 424—148.1 **8 Claims**

1. An NM01 monoclonal antibody characterized by the ability to specifically bind to the amino acids G-P-G-R (SEQ ID NO: 1) of HIV-1 gp120 or gp160 protein and the ability to neutralize in vitro the infection of H9 cells by live HIV-1 strains MN and III_B as determined by reverse transcriptase, p24. MT-2 and syncytia formation assays, the antibody being further characterized by comprising a heavy chain variable region consisting of the amino acid sequence set out in SEO ID NO: 20 and a light chain variable region consisting of the amino acid sequence set out in SEQ ID NO: 22.

5,558,866

ANTINEOPLASTIC CHEMOTHERAPEUTIC GR

5,558,869

MAJOR PLANT ALLERGEN

wherein said salicylic acid derivative has the formula

of an aqueous softening composition, said softening composition

5,558,866

ANTINEOPLASTIC CHEMOTHERAPEUTIC OF PLANT ORIGIN, HAVING HIGH SELECTIVITY AND GREATLY REDUCED TOXICITY, AND PROCESS FOR THE PREPARATION THEREOF

Claudio D'Arrigo, 2 Via Elea, I-00183 Rome RM, Italy

PCT No. PCT/IT92/00057, § 371 Date Jan. 28, 1993, § 102(e) Date Jan. 28, 1993, PCT Pub. No. WO92/21359, PCT Pub. Date Dec. 10, 1992

PCT Filed May 22, 1992, Ser. No. 961,695

Claims priority, application Italy, May 29, 1991, RM91A0372

Int. Cl.[6] A61K *35/78*

U.S. Cl. 424—195.1 **25 Claims**

1. A process for producing an antineoplastic substance, comprising:
(a) macerating an unripened fruit of a plant of the family Pittosporaceae in an alcohol to produce an alcoholic extract;
(b) stirring or shaking said alcoholic extract of step (a) with chloroform to produce an alcohol-chloroform phase and an aqueous phase;
(c) concentrating said alcohol-chloroform phase of step (b) by evaporation to produce a concentrated alcohol-chloroform phase;
(d) adding isopropyl alcohol to said concentrated alcohol-chloroform phase of step (c) to form an isopropyl alcohol suspension;
(e) filtering said isopropyl alcohol suspension of step (d) to produce a precipitate;
(f) drying and grinding said precipitate of step (e) to produce a powder;
(g) solubilizing said powder of step (f) in ethyl alcohol:water, 4:1, to produce a solution;
(h) purifying said solution of step (g) using active carbon, followed by washing said active carbon with ethyl alcohol-:water, 4:1, to obtain a limpid, colorless solution;
(i) concentrating said limpid, colorless solution of step (h) to produce a concentrated solution;
(j) adding isopropyl alcohol to said concentrated solution of step (i) to product an isopropyl alcohol suspension; and
(k) drying said isopropyl alcohol suspension of step (j) and grinding the dried product to produce a powder.

5,558,867

RECOMBINANT MAREK'S DISEASE VIRUS, PROCESS FOR PREPARING THE SAME AND VACCINE CONTAINING THE SAME

Sakaguchi Masashi, and Yamamoto Michitaka, both of Kikuchi-gun, Japan, assignors to Juridcal Foundation The Chemo-Sero-Therapeutic Research Institute, Kumamoto, Japan

Continuation of Ser. No. 910,554, Jul. 8, 1992, abandoned. This application Jul. 7, 1994, Ser. No. 272,513

Claims priority, application Japan, Jul. 9, 1991, 3-195703

Int. Cl.[6] A61K *39/295;39/17;39/255;* **C12N** *7/01;15/00*

U.S. Cl. 424—199.1 **7 Claims**

1. A recombinant Marek's disease virus type 1 produced by incorporating an exogenous gene expression cassette into a region of DNA extending from nucleotide no. 120 to nucleotide no. 758 of the DNA of SEQ ID NO:2, wherein said cassette comprises an exogenous gene and a promoter derived from an animal cell or an animal virus operably linked to said exogenous gene.

5,558,868

Patent Not Issued For This Number

5,558,869

MAJOR PEANUT ALLERGEN ARA H II

A. Wesley Burks, Jr., and Ricki M. Helm, both of Little Rock, Ark., assignors to University of Arkansas, Little Rock, Ark.

Continuation-in-part of Ser. No. 998,377, Dec. 30, 1992. This application Nov. 29, 1993, Ser. No. 158,704

Int. Cl.[6] C07K *14/415*

U.S. Cl. 424—276.1 **5 Claims**

1. An isolated and purified peanut allergen designated Ara h II and having a mean molecular weight of 17 kD as determined by IgE-specific immunoblotting and a mean isoelectric point of 5.2 as determined by two-dimensional gel electrophoresis.

5,558,870

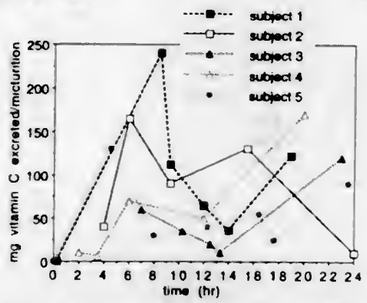
METHOD FOR MAINTAINING A CONTINUOUSLY-SATURATED LEVEL OF ASCORBIC ACID IN A PATIENT'S BODY

Alfred B. Ordman, Beloit, Wis., assignor to Harry M. Weiss, Phoenix, Ariz.

Filed Oct. 3, 1994, Ser. No. 317,311

Int. Cl.[6] A61K *9/20*

U.S. Cl. 424—400 **2 Claims**



1. In the oral administration of vitamin C to a person, a method for producing a continuously-saturated level of vitamin C in the body of the person, comprising the following steps:
(a) administering a predetermined dose of vitamin C to the person at a predetermined time;
(b) monitoring the concentration level of vitamin C in the urine of the person to record any increase thereof during a 24-hour period following said predetermined time;
(c) increasing said predetermined dose by a predetermined amount and repeating steps (a) and (b) until a threshold dose is found that produces a sustained increase in said concentration level of vitamin C in the urine of the person for a duration of time at least as long as a predetermined period; and
(d) administering no less than said threshold dose of vitamin C to the person at intervals not larger than said duration of time.

5,558,871

COSMETIC AND/OR DERMATOLOGICAL COMPOSITIONS CONTAINING SALICYLIC ACID

Jacqueline Griat, Ablon; Elisabeth Picard, Velizy Villacoublay, and Jean-Pierre Laugier, Antony, all of France, assignors to L'Oreal, Paris, France

Filed Dec. 29, 1994, Ser. No. 365,806

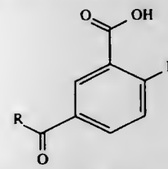
Claims priority, application France, Jan. 10, 1994, 94 00175

Int. Cl.[6] A61K *7/48;9/10*

U.S. Cl. 424—401 **18 Claims**

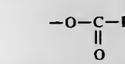
1. A process for solubilizing a salicylic acid derivative, comprising mixing a salicylic acid derivative with at least one vegetable oil, in a weight ratio of vegetable oil to salicylic acid derivative greater than 5 to form a single phase solution of said salicylic acid derivative and said vegetable oil,

wherein said salicylic acid derivative has the formula



wherein R is a saturated linear, branched, or cyclic aliphatic group having from 3 to 11 carbon atoms; an unsaturated linear, branched, or cyclic hydrocarbon group having from 3 to 17 carbon atoms and having one or more conjugated or unconjugated ethylenic double bonds; a saturated linear, branched, or cyclic aliphatic group having from 3 to 11 carbon atoms and substituted with at least one substituent selected from the group consisting of halogens, trifluoromethyl, hydroxyl, hydroxyl esterified with a carboxylic acid having from 1 to 6 carbon atoms, carboxyl, and carboxyl esterified with a lower alcohol having from 1 to 6 carbon atoms; or an unsaturated linear, branched, or cyclic hydrocarbon group having from 3 to 17 carbon atoms and having one or more conjugated or unconjugated ethylenic double bonds and substituted with at least one substituent selected from the group consisting of halogens, trifluoromethyl, hydroxyl, hydroxyl esterified with a carboxylic acid having from 1 to 6 carbon atoms, carboxyl, and carboxyl esterified with a lower alcohol having from 1 to 6 carbon atoms; and

R' represents a hydroxyl group or an ester function of formula (II):



(II)

where R_1 is a saturated or unsaturated aliphatic group having from 1 to 18 carbon atoms.

5,558,872

GELLED MINERAL OIL SKIN PROTECTANT

David P. Jones; William H. Woller, and Cynthia W. Jewett, all of San Antonio, Tex., assignors to Healthpoint Medical Limited Partnership, Reno, Nev.

Filed Mar. 7, 1995, Ser. No. 400,047

Int. Cl.[6] A61K *31/74*

U.S. Cl. 424—78.03 **10 Claims**

1. A smooth, greaseless gelled skin protectant for incontinence, comprising:
(a) from about 50% to about 99% of a gelled mineral oil, said gelled mineral oil comprising a blend of from about 80% to about 99% by Weight hydrocarbon oil and from about 1% to about 20% by weight of hydrogenated butylene/ethylene/styrene copolymer and hydrogenated ethylene/propylene/styrene copolymer;
(b) from about 2% to about 40% of a fatty acid ester modifier; and
(c) from about 1% to about 30% by weight of a silicone agent.

5,558,873

SOFT TISSUE CONTAINING GLYCERIN AND QUATERNARY AMMONIUM COMPOUNDS

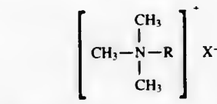
Barbara S. Funk, Weyauwega; Duane G. Krzysik, Appleton, and Patrick A. Panderuik, Neenah, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 263,109, Jun. 21, 1994, abandoned. This application Mar. 8, 1995, Ser. No. 400,896

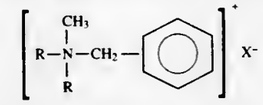
Int. Cl.[6] A01J *21/00*

U.S. Cl. 424—401 **14 Claims**

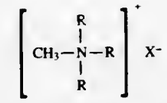
1. An absorbent tissue to which has been added by spraying or printing on its surface from about 3 to about 30 dry weight percent of an aqueous softening composition, said softening composition comprising from about 20 to about 98 weight percent glycerin and
(I) from about 0.2 to about 5 weight percent of a quaternary ammonium compound selected from the group consisting of:
monoalkyl trimethyl quaternary amines having the following structure:



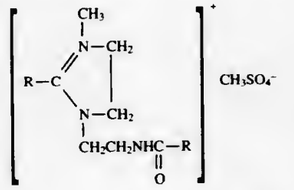
wherein X=chloride or methyl sulfate and R=aliphatic, saturated or unsaturated C_{12}-C_{22};
benzyl quaternary amines having the following structure:



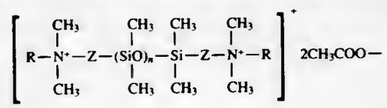
wherein X=chloride and R=aliphatic, normal C_{12}-C_{18};
monomethyl trialkyl quaternary amines having the following structure:



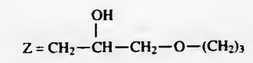
wherein X=chloride and R=aliphatic alkyl, normal or branched, C_8-C_{18};
imidazolinium quaternary amines having the following structure:



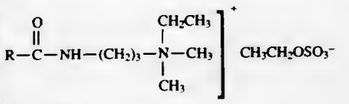
wherein X=methyl sulfate and R=aliphatic, normal, saturated or unsaturated, C_{12}-C_{18};
silicone quaternary amines having the following structure:



wherein



and R=long chain alkyl group, C_{12}-C_{18}; and
quaternized lanolin derivatives which have the following structure:



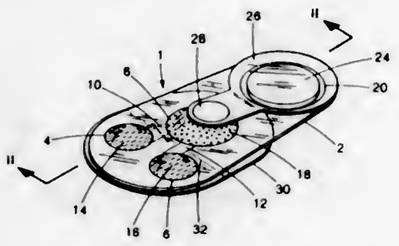
wherein RCO=lanolin acid radical.

5,558,874

MULTI-COMPARTMENT APPLICATOR FOR PACKAGING, RECONSTITUTING AND APPLYING A DEHYDRATED MULTI-CONSTITUENT MEDICATION

Terry M. Haber, El Toro; William H. Smedley, Lake Elsinore, and Clark B. Foster, Laguna Niguel, all of Calif., assignors to Habley Medical Technology Corporation, Lake Forest, Calif.

Filed Dec. 12, 1994, Ser. No. 354,219
Int. Cl.[6] A61K *9/00*
U.S. Cl. 424—402 **20 Claims**



1. An applicator for applying a liquid medication to a living tissue area, said applicator comprising:

a body having a top face and a bottom face;

a first flexible chamber sealed against the top face of said body, said first flexible chamber storing therein a first liquid;

a second flexible chamber sealed against the top face of said body, said second flexible chamber storing therein a dry medication;

a first fluid path extending between said first and second flexible chambers, said first fluid path being closed to block the introduction of the first liquid stored in said first flexible chamber to said second flexible chamber, said first flexible chamber being responsive to a compressive force applied thereto to generate a corresponding hydraulic pressure within the first liquid to cause said first fluid path to open and thereby establish fluid communication between said first and second flexible chambers so that the first liquid is introduced to and mixed with the dry medication to produce the liquid medication within said second flexible chamber, said dry medication comprising a dehydrated liquid disinfectant that is rehydrated when the first liquid is introduced thereto to form the liquid medication;

a third chamber located at the top face of said body, said third chamber having an access opening formed therethrough;

fluid collection and application means surrounded by said third chamber and accessible within said third chamber by way of said access opening;

a removable cover detachably connected to said third chamber to close said access opening therethrough;

a second fluid path extending between said second flexible chamber and said third chamber, said second fluid path being closed to block the introduction of the liquid medication from said second flexible chamber to said third chamber, said second flexible chamber being responsive to a compressive force applied thereto to generate a corresponding hydraulic pressure within the liquid medication to cause said second fluid path to open and thereby establish fluid communication between said second flexible chamber and said third chamber so that the liquid medication is supplied to said fluid collection and application means; and

means by which to detach said removable cover from said third chamber to open said access opening therethrough and enable said fluid collection and application means to be moved into contact with the living tissue area so that the fluid medication can be delivered to the tissue area via said access opening.

5,558,875

METHOD OF PREPARING COLLAGENOUS TISSUE

Su Wang, 858 59 St., Brooklyn, N.Y. 11220

Filed Jun. 6, 1994, Ser. No. 254,685
Int. Cl.[6] A61F *13/00;2/00;* **A61K** *35/34;38/17*
U.S. Cl. 424—422 **7 Claims**

1. A process of preparing collagenous prosthesis having elasticity from a biological collagenous tissue consisting of the following steps in order:

(a) soaking the tissue in an organic detergent for a sufficient time to disrupt cell membranes and to solubilize cellular membrane proteins of the collagenous tissue;

(b) washing the tissue with the organic detergent to remove the solubilized cellular membrane proteins;

(c) rinsing the tissue with distilled water to obtain the collagenous prosthesis having elasticity;

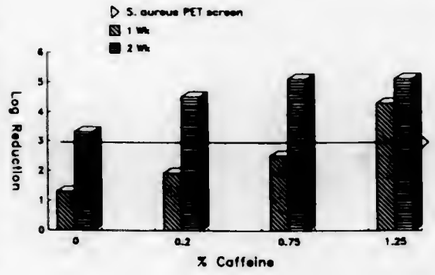
(d) storing the prosthesis in alcohol as a means to preserve the elasticity.

5,558,876

TOPICAL OPHTHALMIC ACIDIC DRUG FORMULATIONS

Suketu Desai, and Rajan Bawa, both of Fort Worth, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Mar. 29, 1995, Ser. No. 412,435
Int. Cl.[6] A61K *9/10*
U.S. Cl. 424—427 **12 Claims**



1. A topical ophthalmic aqueous solution comprising an acidic drug, tocophersolan, benzalkonium chloride or mixtures of at least two homologues of benzalkonium chloride, and caffeine.

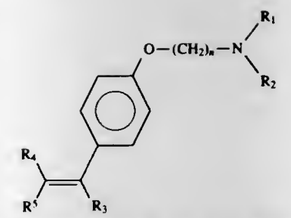
5,558,877

METHOD AND DEVICE FOR TREATMENT OF CANCER

Stephen A. Matlin, Birmingham, and Andrew T. Wilkins, Chippenham, both of England, assignors to Roussel Uclaf, France

Filed Dec. 15, 1994, Ser. No. 356,911
Claims priority, application United Kingdom, Dec. 23, 1993, 9326255
Int. Cl.[6] A61F *6/14;6/06*
U.S. Cl. 424—432 **6 Claims**

1. A medical device for insertion into a vaginal cavity consisting essentially of a silicone elastomeric ring containing 1 to 30% by weight of a compound of the formula



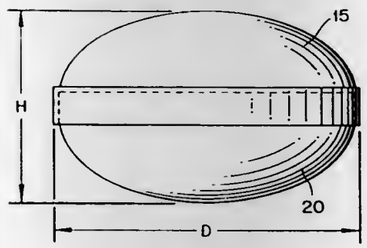
wherein R_1 is hydrogen or alkyl of 1 to 6 carbon atoms, R_2 and R_5 are individually alkyl of 1 to 6 carbon atoms, n is an integer from 2 to 6, R_3 and R_4 are individually aryl of 6 to 12 carbon atoms optionally substituted with 1 or 2 members of the group consisting of halogen and alkyl and alkoxy of 1 to 6 carbon atoms or its non-toxic, pharmaceutically acceptable acid addition salts.

5,558,878

METHOD FOR BLINDING A TABLETED MEDICATION

Manley A. Paulos, Granger, Ind., assignor to Captab, L.L.C., Rockford, Ill.

Division of Ser. No. 722,155, Jun. 27, 1991, Pat. No. 5,314,696. This application Apr. 15, 1994, Ser. No. 228,254
Int. Cl.[6] A61K *9/48*
U.S. Cl. 424—453 **23 Claims**



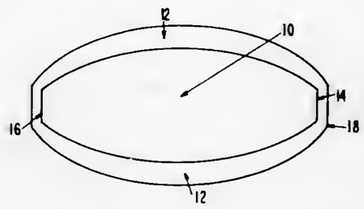
1. A method for blinding a tableted medication comprising placing said tableted medication within a capsule to be swallowed whole having a body portion and cap portion; said body portion comprising an open end and an oppositely positioned closed end, said open end being defined by a circumferential edge, said circumferential edge lying in a first plane, said body portion further including a second plane which contacts a outer surface of the closed end of the body portion and which is parallel to the first plane; said cap portion comprising an open end and an oppositely positioned closed end, said open end being defined by a circumferential edge, said circumferential edge lying in a first plane; said body and cap portions being configured such that when the capsule is closed the greatest straight line distance connecting two points on said circumferential edge of either said body portion or said cap portion is greater than the perpendicular distance between said second plane of said body portion and a second plane of the cap portion which contacts an outer surface of the closed end of the cap portion and which is parallel to the first plane of the cap portion; and then closing said capsule by locking said body portion and cap portion together.

5,558,879

CONTROLLED RELEASE FORMULATION FOR WATER SOLUBLE DRUGS IN WHICH A PASSAGEWAY IS FORMED IN SITU

Chih-Ming Chen, Cooper City, and Der-Yang Lee, Plantation, both of Fla., assignors to Andrx Pharmaceuticals, Inc., Fort Lauderdale, Fla.

Filed Apr. 28, 1995, Ser. No. 431,404
Int. Cl.[6] A61K *9/22;9/24;9/36*
U.S. Cl. 424—480 **10 Claims**



1. A controlled release pharmaceutical tablet which consists essentially of:

(a) a compressed core which consists essentially of

(i) a medicament;

(ii) from 5 to 20% by weight of a water soluble osmotic agent based on the total weight of the compressed core;

(iii) a water soluble pharmaceutically acceptable polymer binder;

(iv) a conventional pharmaceutical excipient; and

(b) a dual layer membrane coating around said core which consists essentially of:

(i) a first inner coating layer for sustained release of the medicament, said inner coating layer consisting essentially of a plasticized water insoluble pharmaceutically acceptable polymer and a pharmaceutically acceptable water soluble polymer, and;

(ii) a second outer coating layer for immediate release of a medicament, said outer coating layer consisting essentially of an effective amount of a medicament and a water soluble polymer.

5,558,880

PHARMACEUTICAL AND OTHER DOSAGE FORMS

Dilip J. Gole, Ann Arbor, Mich.; R. Saul Levinson, Chesterfield, Mo.; Paul K. Wilkinson, Ann Arbor, and J. Desmond Davies, Grosse Pointe Farms, both of Mich., assignors to Janssen Pharmaceutica Inc., Piscataway, N.J.

Continuation-in-part of Ser. No. 187,786, Jan. 26, 1994, abandoned, which is a continuation of Ser. No. 879,754, May 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 613,087, Nov. 6, 1990, Pat. No. 5,215,756, which is a continuation-in-part of Ser. No. 454,938, Dec. 22, 1989, abandoned. This application Apr. 28, 1994, Ser. No. 234,295
Int. Cl.[6] A61K *9/14*
U.S. Cl. 424—484 **60 Claims**

1. A method for preparing a solid, porous delivery matrix comprising a porous network of matrix material that disperses rapidly in water comprising the steps of:

(a) forming a matrix material dispersion containing from about

a surfacing unit suspended from said chassis-frame member and

5,558,884

(a) forming a matrix material dispersion containing from about 0.1% to about 7.5% matrix material by weight of the dispersion, the matrix material comprising a matrix forming agent and one or more amino acids having from about 2 to 12 carbon atoms; and

(b) subjecting the matrix material dispersion to lyophilization or solid-state dissolution to form the solid, porous delivery matrix.

5,558,881

IODOPHORS, PRODUCTION AND USE THEREOF

Michael P. Corby, Ravensheed, England, assignor to Diversey Corporation, Mississauga, Canada

Filed Mar. 24, 1994, Ser. No. 217,197

Claims priority, application United Kingdom, Mar. 26, 1993, 93 06296

Int. Cl.[6] A01N *59/12*

U.S. Cl. 424—672 **9 Claims**

1. An iodophor preparation composition comprising, in addition to a carrier, an iodide source, an oxidant and an acid source, characterized in that the oxidant is reactive with the other components only when dissolved in an aqueous medium at the point-of-use, said oxidant being present in said composition in an excess amount sufficient for the complete generation of iodine from iodide in said composition.

5,558,882

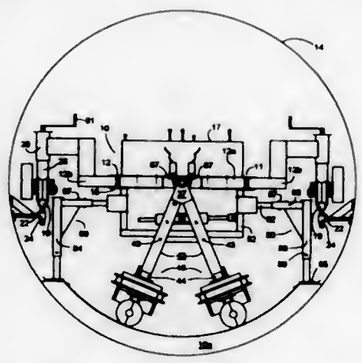
PIPE PAVER FINISHING MACHINE

Ewald R. Ulmer, Canton, S. Dak., assignor to CMI Corprora-tion, Oklahoma, Okla.

Filed Oct. 21, 1994, Ser. No. 327,017

Int. Cl.[6] E02D *29/00;* **B05C** *7/06;* **B28B** *19/00*

U.S. Cl. 425—11 **12 Claims**



1. A concrete finishing machine for applying a concrete liner over the interior surface of a lower segment portion of a drainage pipe, including in combination:

a chassis-frame member adapted for movement longitudinally along the interior of the drainage pipe; and

a surfacing unit suspended from said chassis-frame member and adapted for back and forth pendulum-type pivotal movement substantially about the center point and the vertical centerline of the drainage pipe, said surfacing unit comprised of a V-shaped downwardly extending leg structure adapted for said pivotal movement beyond said vertical centerline of said drainage pipe, with each of the legs thereof supporting a horizontally extending elongated concrete smoothing member, with said surfacing unit adapted to grade and to finish a concrete liner onto the bottom interior surface of a lower segment portion of the drainage pipe.

5,558,883

MOLD DESIGN AND PROCESS FOR PRODUCING A MULTILAYER PART BY INJECTION PROCESS MOLDING

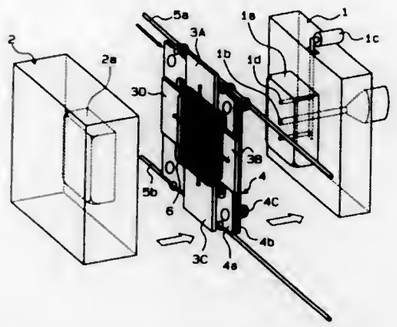
Tsunetoshi Shimada; Katuso Wada; Masaki Misumi, and Satoru Kurosu, all of Kanagawa-ken, Japan, assignors to Mitsui Toatsu Chemicals, Inc., and Moriroku Kabushiki Kaisha, both of Tokyo, Japan

Filed Dec. 28, 1994, Ser. No. 365,121

Claims priority, application Japan, Dec. 28, 1993, 5-336056

Int. Cl.[6] B29C *45/14;45/33;45/36*

U.S. Cl. 425—116 **8 Claims**



1. A molding equipment for making a composite molded article comprising:

(a) a fixed side mold having a convex portion integral with a gate, said convex portion being formed according to the shape of the molded article, said gate being used for injecting melted resin into a resin molding space;

(b) a movable side mold capable of being moved close to and away from said fixed side mold, said movable side mold having a concave portion, said concave portion being formed according to the shape of said molded article, said concave portion being inlaid with said convex portion to form said resin molding space when said molding equipment is clamped;

(c) a set of slide cores comprising a plurality of members being mounted between said fixed side mold and said movable side mold, said slide cores being movable toward and away from said fixed side mold, said slide cores being reciprocally movable toward and away along a near right angle direction to the moving direction of said movable side mold, said side cores forming an opening at the center when said slide cores are moved close to each other wherein said opening is smaller than said concave portion and said opening is sufficiently large for said convex portion to penetrate when said molding equipment is clamped; and

(d) a skin material setting frame mounted between said fixed side mold and said slide cores, said skin material setting frame being capable of setting a skin material.

5,558,884

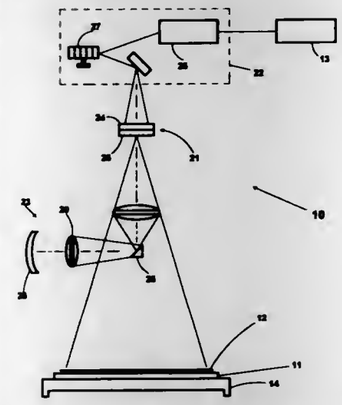
SYSTEM FOR RAPIDLY PRODUCING EITHER INTEGRATED CIRCUITS ON A SUBSTRATE, INTERCONNECTIONS ON A PRINTED CIRCUIT BOARD OR RAPIDLY PERFORMING LITHOGRAPHY

William F. Hug, Chino, and Ray D. Reid, Glendora, both of Calif., assignors to Omnichrome Corporation, Chino, Calif.

Continuation of Ser. No. 141,861, Oct. 21, 1993, abandoned, which is a continuation of Ser. No. 722,482, Jun. 25, 1991, abandoned, which is a continuation-in-part of Ser. No. 367,741, Jun. 16, 1989, Pat. No. 5,026,146, which is a continuation-in-part of Ser. No. 333,385, Apr. 3, 1989, abandoned. This application Mar. 29, 1995, Ser. No. 412,608

Int. Cl.[6] B29C *35/08*

U.S. Cl. 425—174.4 **15 Claims**



1. A system for rapidly producing an integrated circuit on a substrate using a curable liquid capable of solidification to form a photo-resist pattern corresponding to an artwork representation of interconnections when subjected to ultraviolet light energy in combination with a processor and computer aided design software, said system comprising:

a. an x-y table on which the substrate is positioned, the curable liquid which lies in a solidification plane on the substrate;

b. an electronically erasable mask which is an ultraviolet wavelength isolating image buffer and which is electrically coupled to the processor;

c. optical drawing means for optically drawing an image of the artwork representation for the interconnection onto said electronically erasable mask using light of a wavelength range having wavelengths longer than ultraviolet light, said drawing means being electrically coupled to the processor; and

d. projecting means for projecting ultra-violet light energy onto said electronically erasable mask so that said electronically erasable mask transfers a single frame exposure of said image in order to reflect said ultraviolet light energy onto the curable liquid in said solidification plane thereby forming the photo-resist pattern on the substrate.

5,558,885

INSERTS FOR SHEETING HEAD

Michael L. Herrera, Pomona, Calif., assignor to Casa Herrera, Inc., Los Angeles, Calif.

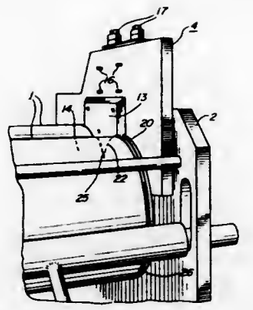
Filed Oct. 26, 1994, Ser. No. 329,330

Int. Cl.[6] A21C *3/02*

U.S. Cl. 425—363 **8 Claims**

1. An improved sheeting head for processing dough into thin sheets of uniform thickness, the sheeting head comprising:

a first and a second counterrotating roller, parallel and in a horizontal plane, for flattening and extruding dough;



a hopper structure to contain the dough and dispense it to the rollers, the hopper structure comprising endwalls at opposing ends of the rollers;

two inserts, one attached to an inner surface of each endwall, each insert with a tapering lower portion disposed to penetrate between the rollers with a first edge of the lower portion of the insert shaped to meet a surface of the first roller and a second edge of the lower portion of the insert shaped to meet a surface of the second roller;

a circumferential groove in one of the rollers;

a tongue located on at least one of the edges of the lower portion of the insert, the tongue sized and disposed for interacting with the circumferential groove forming a tongue-in-groove structure for preventing lateral deformation of the insert and escape of the dough under the edge of the insert;

a frame member for supporting the rollers; and

adjustment means for connecting the endwalls to the frame member and for providing adjustable force to keep the tongue seated in the groove.

5,558,886

EXTRUSION APPARATUS FOR THE PREPARATION OF INSTANT FRESH CORN DOUGH OR MASA

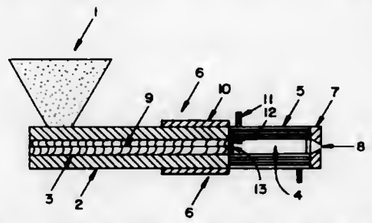
Fernando Martinez-Bustos, Orizaba; Juan De Dios Figueroa C., Valle Hermoso; Feliciano Sanchez-Sinencio, Tecamachalco; Jesus Gonzalez-Hernandez, Mexico; Jose De La Luz Martinez, Puebla, and Maximiano Ruiz-Torres, Morelia, all of Mexico, assignors to Centro de Investigacion y de Estudios Avanzados del I.P.N., Mexico, Mexico

Division of Ser. No. 326,519, Oct. 20, 1994. This application Jun. 2, 1995, Ser. No. 459,665

Claims priority, application Mexico, Oct. 21, 1993, 936544

Int. Cl.[6] A21C *1/00;* **B29C** *47/00*

U.S. Cl. 425—376.1 **10 Claims**



1. An extrusion apparatus for the preparation of fresh corn dough or masa comprising:

a feed hopper for receiving and admixing raw materials to be processed in suitable proportions to form the corn dough or masa

an extrusion or kneading chamber provided with a screw conveyor having a discharge end, the screw conveyor being

operable at a rotational speed suitable for providing shearing of said raw materials at a desired compression ratio;

heating means surrounding the discharge end of the extrusion chamber and forming a cooking section for heating said raw materials to a desired temperature;

a die located at the discharge end of the extrusion chamber and provided with a suitable orifice for discharging the raw materials at a suitable rate while at the same time providing a counterpressure to the screw conveyor in order to maintain a constant desired compression ratio throughout the extrusion chamber;

a holding chamber connected to the discharge end of said extrusion chamber, the holding chamber having a discharge end and being provided with cooling means for cooling the holding chamber; and

a discharge die having a discharge nozzle provided at the discharge end of the holding chamber.

5,558,887

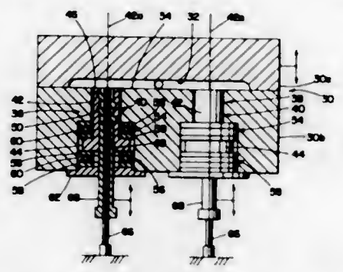
MOLD APPARATUS FOR HELICAL ARTICLES

James Skufca, Lakewood, and Matthew R. Skufca, Jr., Cleveland, both of Ohio, assignors to Heelix Fasteners, Inc., Cleveland, Ohio

Filed Feb. 23, 1995, Ser. No. 392,527

Int. Cl.[6] B29C *33/44;45/44*

U.S. Cl. 425—418 **14 Claims**



1. A mold apparatus for forming a helically shaped article comprising:

a mold having a mold cavity therein, said cavity having a molding surface configured to allow a part molded within the cavity to be withdrawn from the cavity in a first linear direction;

a portion of the mold cavity being formed by a body with a helically grooved cylindrical surface having a central axis and forming a portion of the molding surface;

means for mounting said body for unconstrained free rotation about the central axis of the helically grooved cylindrical surface with the central axis in alignment with the first linear direction; and,

further wherein the helically grooved cylindrical surface is an interior surface of the body.

5,558,888

INJECTION MOLDING NOZZLE HEATER CLAMP

John P. Beck, Savage, Minn., assignor to Rosemount Aerospace Inc., Burnsville, Minn.

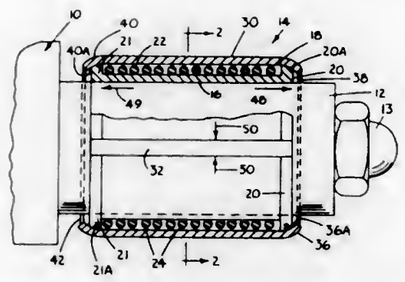
Filed Jun. 27, 1994, Ser. No. 266,966

Int. Cl.[6] B29C *45/23*

U.S. Cl. 425—549 **15 Claims**

1. A heater assembly for use on a cylindrical member, comprising:

a mandrel having a mandrel longitudinal length and a bore of sufficient size to receive a cylindrical member to be heated and having an outer surface;



a heater carried on the outer surface of the mandrel and coiled around the mandrel along the length thereof, said mandrel having a cam surface on a first end thereof that tapers relative to a longitudinal axis of the mandrel, the mandrel having at least one longitudinal slit having a width that permits the bore to reduce in size when the slit reduces in width; and

a sleeve that surrounds and is spaced from a substantial portion of the outer surface of the mandrel to form a space for the heater, the sleeve also being spaced outwardly from the heater, said sleeve having a complementary end cam surface on a first end thereof for engaging the at least one cam surface on the mandrel, one of the sleeve and mandrel having a higher coefficient of thermal expansion than the other of the sleeve and mandrel so that upon heating the sleeve and mandrel with the heater to a temperature above room temperature a differential longitudinal movement between the sleeve and the mandrel occurs, a second end of the sleeve and a second end of the mandrel being configured to restrain longitudinal movement induced by differential thermal expansion between the sleeve and the mandrel, the engaging cam surfaces causing forces when the sleeve and the mandrel have relative differential longitudinal movement to reduce the slit width to thereby clamp the mandrel onto a cylindrical member on which the mandrel is mounted substantially solely under cam generated forces.

5,558,889

ADDITIVES FOR ANIMAL NUTRITION AND TECHNIQUE FOR THEIR PREPARATION

Jean Rossi, Bellevue, Switzerland, assignor to Crina S.A., Gland, Switzerland

Filed Sep. 21, 1994, Ser. No. 309,675

Claims priority, application Switzerland, Oct. 5, 1993, 3000/93

Int. Cl.[6] A23K *1/00*

U.S. Cl. 426—89 **9 Claims**

1. A process for the production of a feed additive composition having reduced emission of a feed additive component, comprising dissolving at least one feed additive component in a first coagulating agent comprising at least one substituted phenol to form a solution, absorbing said solution on a particulate carrier, blending a coagulable protein with the particles of carrier with said solution absorbed thereon to form a material, and spraying water onto said material in the presence of a second coagulating agent.

5,558,890

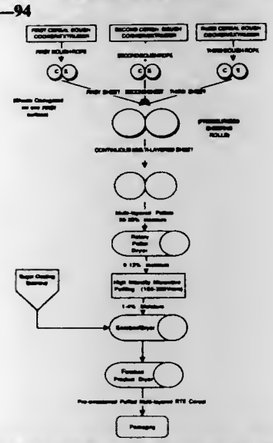
MULTILAYERED PUFFED R-T-E CEREAL AND HIGH INTENSITY MICROWAVE METHOD OF PREPARATION

George E. Brown, West St. Paul; Edward C. Schwab, New Brighton, and Terry R. Harrington, Albertville, all of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Oct. 27, 1994, Ser. No. 329,405

Int. Cl.[6] A23L *1/182*

U.S. Cl. 426—94 **47 Claims**



1. A method for preparing a multilayered puffed farinaceous piece comprising the steps of:

A. providing a laminated sheet having at least three discrete layers at least one of which layers is fabricated from an unpuffed puffable cooked cereal dough adhered to at least a portion of each other by a bond formed by mechanical compression, wherein each layer has a first and second major face and wherein the cumulative thickness of the layers ranges between about 0.050 to 0.500 in.;

B. forming the sheet into pieces;

C. drying the pieces to a moisture content of about 9% to 13% to form dried puffable laminated cereal pellets; and

D. puffing the cereal pellets by exposure to a high intensity microwave field having a field strength of about 125 to 350 V/cm to form puffed multilayered cereal pieces.

5,558,891

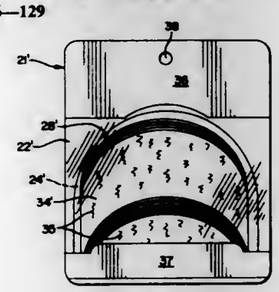
PACKAGING OF THINLY SLICED MEATS

Brian P. Lawless; Heidi A. Schmidt; Gary G. Winchester, all of Madison, and Kenneth E. Woode, DeForest, all of Wis., assignors to Kraft Foods, Inc., Northfield, Ill.

Continuation of Ser. No. 696,327, Apr. 30, 1991, Pat. No. 5,395,632, which is a continuation of Ser. No. 505,329, Apr. 5, 1990, abandoned. This application Dec. 30, 1994, Ser. No. 367,000

Int. Cl.[6] B65D *85/00*

U.S. Cl. 426—129 **30 Claims**



1. A packaged food product wherein thinly sliced proteinaceous products are hermetically sealed between generally opposing panels, comprising:

a formed panel member having an enclosure bubble cavity, said cavity having a planar access opening on one side thereof, and a substantially planar peripheral flange which surrounds and defines said access opening of said enclosure bubble cavity and is substantially in the plane of said planar access opening;

a substantially flat planar panel member overlying said planar peripheral flange and said access opening of the enclosure bubble cavity to thereby close said cavity;

means for sealing said substantially flat planar panel member to said planar flange of the formed panel member; and

a stack of thinly sliced proteinaceous products hermetically sealed within a compartment defined by said enclosure bubble cavity and said substantially flat planar panel member, said stack being folded up onto itself into a doubled-over configuration and in which the edges of a substantial number of said slices are in offset shingled relationship to each other with the direction of said offset being substantially parallel to the direction in which said stack is folded up onto itself.

5,558,892

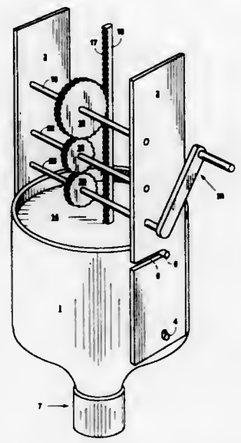
METHOD AND APPARATUS FOR MAKING CHURROS

Angeles Pelka; Bertha Betancourt, and Rogelio Catano, all of 7741 Dianjou Dr., El Paso, Tex. 79912

Filed Oct. 25, 1994, Ser. No. 328,811

Int. Cl.[6] A21C *11/18*

U.S. Cl. 426—283 **12 Claims**



1. A method of making a food product comprising the steps of:

a. providing a cylindrical housing for holding a food substance, said housing having pivot pins disposed near a bottom end of said housing and extending generally horizontally from the outer surface of said housing, and stabilizing pins disposed near a top end of said housing and extending generally horizontally from said outer surface of said housing;

b. placing said food substance in said housing;

c. inserting a removably slidable piston within said housing for urging said food substance from said housing, said piston having a drive shaft extending upwardly from a top surface of said piston;

d. attaching a removable frame to said bousing, said frame further comprising a drive assembly supported by a first and a second side wall, each of said side walls having a pivot pin opening for receiving one of said pivot pins, each of said side walls having an alignment slot for receiving one of said stabilizing pins;

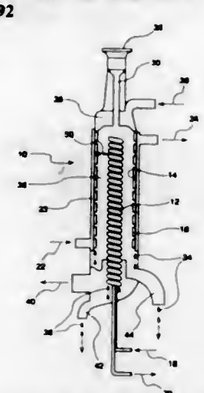
e. operatively engaging said drive assembly with said drive shaft on said piston by moving said housing such that said stabilizing pins are received into said alignment slots;
f. attaching a removable extrusion die assembly to a discharge end of said housing for forming an extruded food product when said food substance is discharged from said die assembly by operation of said drive assembly; and
g. moving said slidable piston through said housing to extrude said food substance through and out said die assembly.

5,558,893

REMOVAL OF PESTICIDES FROM CITRUS PEEL OIL

Harapanahalli S. Muraldihara, Plymouth, Minn., assignor to Cargill, Incorporated, Minneapolis, Minn.

Filed Mar. 27, 1995, Ser. No. 411,345
Int. Cl.[6] A23L *1/015*
U.S. Cl. 426—492 **22 Claims**



1. A method for producing an essentially pesticide-free citrus oil, said process comprising (1) gently distilling citrus oil feed material in a short-path distillation column at a temperature of about 80° to 135° C. and a pressure of about 2 to 80 mm Hg to form about 80 to 97 weight percent distillant and about 3 to 20 weight percent residue, wherein the distillant contains less than about 0.5 ppm total pesticides and the residue contains essentially all the pesticides from the citrus oil feed material and (2) collecting the distillant as the essentially pesticide-free citrus oil,
wherein the short-path distillation column has an evaporator surface and an internal condenser less than about 50 cm apart, and the feed material has a residence time on the column of about 1 to about 5 minutes.

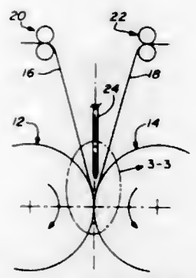
5,558,894

PROCESS FOR FORMING A PUFFED FOOD PRODUCT

William D. Henson, Duncanville, and Stephen L. Rice, Lewisville, both of Tex., assignors to Recot, Inc., Pleasanton, Calif.

Filed Apr. 5, 1995, Ser. No. 416,635
Int. Cl.[6] A21D *8/00;* **A23L** *1/18*
U.S. Cl. 426—498 **5 Claims**

1. A process for making a half-product for forming a puffed food comprising the steps of:
placing first and second rotatable rollers in abutting relationship, at least one of said rollers having a pattern of cutting elements on the periphery thereof to form a desired peripheral shape for the food half-product;
feeding first and second parallel food product dough strips between said rotating rollers in superimposed relationship such that the rollers cut out food product pieces of the desired peripheral shape and completely sealing all the peripheral edges around the desired shaped pieces with said cutting elements; and



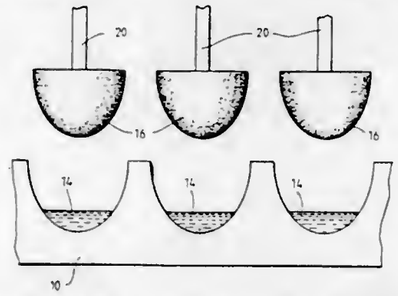
injecting air between said first and second food product dough strips as they enter between the rotating rollers to form a pocket between the first and second food product dough strips prior to the sealing of the peripheral edges completely around the periphery of the shaped pieces to ensure that the first and second product dough strips do not stick or bond together after the cutting operation thereby forming a half-product for producing a puffed food product.

5,558,895

MOLDING PROCESS AND APPARATUS

Laurence A. Boyhan, Lower Templestowe, Australia, assignor to Gradual Pty Ltd., Melbourne, Australia

PCT No. PCT/AU93/00061, § 371 Date Aug. 12, 1994, § 102(e) Date Aug. 12, 1994, PCT Pub. No. WO93/15613, PCT Pub. Date Aug. 19, 1993
PCT Filed Feb. 15, 1993, Ser. No. 290,716
Int. Cl.[6] A23G *1/21*
U.S. Cl. 426—515 **8 Claims**



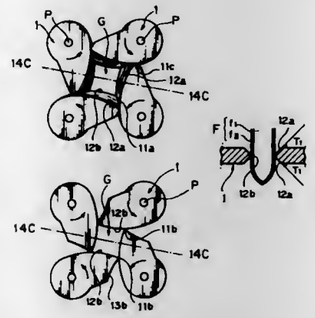
1. A process for producing a molded article having an exterior surface and an interior surface, said process including the following sequential steps:
introducing at atmospheric pressure, sufficient liquid material to form the article into the molding cavity of an open mold wherein the liquid in the mold is maintained at atmospheric pressure throughout the process;
locating a deformable forming member in said molding cavity, said forming member being formed from a flexible material and being positioned in said molding cavity so that the surfaces of the forming member which form the interior surface of said molded article are spaced from the walls of the mold cavity which forms the exterior surface of said molded article, in a predetermined manner, and, in such a way, that said liquid material in said molding cavity is displaced from the bottom of the molding cavity into the space between the surface of the molding cavity and said deformable forming member;
solidifying the liquid material;
deforming the forming member; and
removing said deformed forming member from said molding cavity.

5,558,896

METHOD FOR CUTTING A BAR-SHAPED FOOD AND ITS APPARATUS

Masao Kobayashi, Fukui, Japan, assignor to Kobird Co., Ltd., Fukui, Japan

PCT No. PCT/JP94/01339, § 371 Date Feb. 2, 1995, § 102(e) Date Feb. 2, 1995, PCT Pub. No. WO95/05755, PCT Pub. Date Mar. 2, 1995
PCT Filed Aug. 12, 1994, Ser. No. 379,594
Claims priority, application Japan, Aug. 26, 1993, 5-211883; May 1, 1994, 6-127987; Jul. 5, 1994, 6-153902
Int. Cl.[6] A23P *1/00;* **A21C** *5/00*
U.S. Cl. 426—516 **7 Claims**



1. A method for cutting bar-shaped food, comprising the steps of:
sequentially extruding food materials to form a bar-shaped food (F).
introducing the bar-shaped food (F) into a shaping cut gate (G) generated by at least three cutter pieces (1) each having shearing edges (11*a*) at its distal end portion and a clinch and squeeze fringe portion (12) on the side from said shearing edges (11*a*) to a supporting device (P), said cutter pieces (1) being arranged pivotally on each supporting device (P) on equally divided circumference (C) having a center (O) and a radius (R) in a manner such that the shearing edges (11*a*) of each cutter piece move slidably on the fringe portion (12) of its neighboring cutter,
synchronously cutting off the bar-shaped food (F) introduced into the shaping cut gate (G) by synchronously rotating said cutter pieces (1) at one time and opening and closing the shaping cut gate (G) enclosed by said fringe portions (12),
reducing said shaping cut gate (G) by clinching and constricting the portion around the food (F) and simultaneously rubbing and shaping the clinched and constricted food (F) by each clinch and squeeze fringe portion (12);
moving in an arc each shearing edge (11*a*) so that at least one part of the shearing edge (11*a*) exceeds the center (O),
cutting off the clinched and constricted food (F) by moving each shearing edge (11*a*) so that said edges pass and contact one another at a point,
squeezing and pushing the cut-off food (F') existing in a top head shaping area (H) so as to shape the surface of the cut-off food (F') spherically by reducing the top head shaping area (H) with the cut-off food (F') supported on a vertically movable conveyor (5), the top head shaping area (H) being generated by the combination of the clinch and squeeze fringe portions (12), and
pressing the surface of the cut-off food (F') into a substantially round shape.

5,558,897

MILK COMPOSITION CONTAINING FIBER AND METHOD FOR MAKING SAME

Marc S. Goldman, 316 Prospect Ave., PH2, Hackensack, N.J. 07601

Continuation-in-part of Ser. No. 223,042, Apr. 5, 1994, Pat. No. 5,447,741. This application Apr. 5, 1995, Ser. No. 418,149
Int. Cl.[6] A23C *9/154;9/20*
U.S. Cl. 426—580 **53 Claims**

1. A milk composition comprising milk and up to about 0.0205 weight percent soluble dietary fiber prepared from guar gum which has been enzymatically hydrolyzed.

5,558,898

CONTINUOUS METHOD OF PRODUCING MASA FLOUR

Robert D. Sunderland, Sabetha, Kans., assignor to Wenger Manufacturing Inc., Sabetha, Kans.

Filed Sep. 20, 1994, Ser. No. 309,199
Int. Cl.[6] A23L *1/00*
U.S. Cl. 426—626 **27 Claims**

1. A method of producing masa flour, comprising the steps of:
providing a quantity of whole grain;
contacting said whole grain with a beated alkaline solution for a period of time to partially cook the grain and loosen the bran fraction thereof;
separating said bran fraction from said grain to yield debranned grain;
flash dehydrating said debranned grain by passing hot air currents therethrough until the debranned grain has a moisture content of up to about 20% by weight; and
reducing the flash dehydrated and debranned grain to a masa flour.

5,558,899

METHOD FOR THE PREPARATION OF POLYSACCHARIDE DERIVATIVES

Hendrika C. Kuzee, Oost Souburg; Theodorus L. Hoeks, Bergen Op Zoom, and Paulus J. Visschedijk, Roosendaal, all of Netherlands, assignors to Cooperatie Suikerunie U.A., Roosendaal, Netherlands

Filed Dec. 28, 1994, Ser. No. 365,224
Claims priority, application Netherlands, Jan. 10, 1994, 9400040
Int. Cl.[6] A23L *1/025*
U.S. Cl. 426—658 **10 Claims**

1. Method for the preparation of polysaccharide derivatives comprising reacting at least a saccharide, an acid, which also acts as catalyst, and optionally a polyol at elevated temperature and ambient pressure, wherein the reactants, in the form of a 0.1–90 wt. % water-containing mixture comprising:
70–99.9 wt. % saccharide
0.1–10 wt. % polycarboxylic acid or inorganic acid
0–20 wt. % polyol
calculated as a dry solids mixture, are heated under the influence of electromagnetic waves, a reaction product at a temperature of 140°–300° C. being obtained.

5,558,900

ONE-STEP THROMBORESISTANT, LUBRICIOUS COATING

You-Ling Fan, 3 Heritage Ct., East Brunswick, N.J. 08816, and Lawrence Marlin, 7 Wight St., Bridgewater, N.J. 08807

Filed Sep. 22, 1994, Ser. No. 310,723
Int. Cl.[6] B05D *3/02;* **A61L** *29/00*
U.S. Cl. 427—2.28 **9 Claims**

1. A method for forming a hydrophilic polymeric coating on a substrate to provide a biocompatible surface having abrasion resistance, said method comprising:

a) contacting the substrate with a solution of a polyisocyanate and a poly(ethylene oxide) in an inert solvent, said solution comprising less than about 1 weight percent of polyols which can react with the polyisocyanate to form polyurethanes, said percentage based on the total weight of the poly(ethylene oxide), polyisocyanate and said polyol, and said poly(ethylene oxide) having a molecular weight of from about 100,000 to about 8,000,000 grams per gram mole, to provide at least a partially coated substrate; and

b) drying the at least partially coated substrate to provide a dried coating on said substrate;

wherein the weight ratio of said poly(ethylene oxide) to polyisocyanate ranges from about 0.5/1.0 to about 125/1.

5,558,901

FLOSS YARN BULKING ASSEMBLY AND METHOD

Sean G. Gilligan, Kilcullen; Dermot T. Freeman, Killiney, both of Ireland; Larry J. Oliphant, Swisher; Jeffrey S. Messmann, Iowa City, both of Iowa; Patrick J. Hanley, San Francisco, Calif., and Gerald S. Saczech, Iowa City, Iowa, assignors to Gillette Canada, Inc., Kirkland, Canada

Filed May 26, 1994, Ser. No. 249,515

Int. Cl.[6] B05D *1/38;3/02;3/04;3/12*

U.S. Cl. 427—2.29 **5 Claims**

1. A process for manufacturing a continuous dental floss brush comprising alternating portions of brush sections, which are expanded radially, and thread sections, the process comprising the steps of

a) coating only the thread sections of a twisted uncoated yarn with a solution of polymer in a volatile solvent, the polymer being selected from the group consisting of nylon, polyurethane, and mixtures thereof;

b) thereafter heating at least the thread sections of the yarn and vaporizing solvent therefrom while the thread sections being heated are maintained under a tension of from 0.15 to 10N; and

c) feeding the yarn through a humidifier zone containing a steam and gas mixture and exposing at least the brush sections of the yarn to the steam and gas mixture, the yarn being maintained at a substantially constant tension which is sufficiently low to allow the brush sections to contract longitudinally until the brush sections of the yarn have regained at least 100 percent of the diameter of the uncoated yarn when in a relaxed state, the yarn being fed into the humidifier zone at a speed greater than that at which the yarn is removed therefrom, to maintain a substantially constant yarn tension as the brush sections expand radially in the humidifier zone.

5,558,902

METHOD FOR DETECTING CONTAMINANTS CARRIED BY A FLUID

Anthony Sayka, San Antonio, Tex., and Patrica A. Vargas, Chesapeake Beach, Md., assignors to VLSI Technology, Inc., San Jose, Calif.

Division of Ser. No. 250,659, May 27, 1994, Pat. No. 5,509,375, which is a continuation of Ser. No. 902,119, Jun. 22, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 471,649

Int. Cl.[6] B05D *1/00;* **G01N** *21/00*

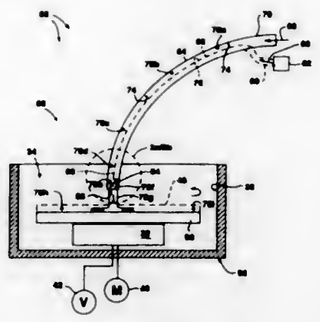
U.S. Cl. 427—8 **8 Claims**

1. A method for coating a workpiece, the method comprising the steps of:

directing a liquid along a flow path;

positioning the workpiece so that the workpiece receives the liquid; and

illuminating the liquid along the flow path to illuminate contaminant particles carried by the liquid at multiple locations in the flow path.



5,558,903

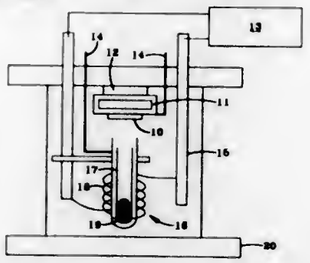
METHOD FOR COATING FULLERENE MATERIALS FOR TRIBOLOGY

Bharat Bhushan, Powell; James V. Coe, Jr., and Balkishan Gupta, both of Worthington, all of Ohio, assignors to The Ohio State University, Columbus, Ohio

Continuation of Ser. No. 75,135, Jun. 10, 1993, abandoned. This application Oct. 20, 1994, Ser. No. 326,345

Int. Cl.[6] C01B *31/02;* **C23C** *14/06*

U.S. Cl. 427—11 **5 Claims**



1. A method for improving the wear resistance of the surface of a substrate to exposure to sliding frictional engagement with another surface comprising the steps of;

(a) heating said substrate to a temperature between about 50° to 250° C.;

(b) exposing a fullerene source material containing C_{60} in the presence of said heated substrate to a pressure of about 10^{-6} to 10^{-5} torr and a temperature of between about 450° C. to 550° C. and depositing a continuous, adherent, uniform coating of C_{60} over the surface of said heated substrate.

5,558,904

ELECTROLUMINESCENT DEVICES CONTAINING A CONJUGATED POLYMER OBTAINED VIA HALOGEN PRECURSOR ROUTE CHEMISTRY

Bing R. Hsieh; Gordon E. Johnson, both of Webster; Homer Antoniadis, Rochester; Kathleen M. McGrane, Webster, and Milan Stolka, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 8, 1994, Ser. No. 272,172

Int. Cl.[6] D05D *5/12*

U.S. Cl. 427—66 **14 Claims**

1. A method for making an electroluminescent device via halogen precursor route chemistry, the method comprising:

a) polymerizing at least one 1,4-bis(halomethyl)-benzene monomer in a first solvent by adding 1.0–1.5 equivalents of a base at −78° to 30° C. under an inert atmosphere;

b) stirring the reaction mixture for 1–24 hours at room temperature upon completion of base addition;

c) pouring the reaction mixture into a non-solvent to precipitate the resulting polymer;

d) collecting and drying the polymer in air or under vacuum to give a halogen precursor polymer;

e) preparing a dilute solution of the polymer by dissolving it in a second solvent;

f) depositing a film of the dissolved halogen precursor polymer onto a substrate;

g) dehydrohalogenating the halogen precursor polymer to convert it to a poly(arylene vinylene) film;

h) optionally depositing an electron transport layer on said film;

i) depositing cathodes on to the polymer film or electron transport layer to give an electroluminescent device comprising a poly(arylene vinylene) conjugated polymer.

5,558,905

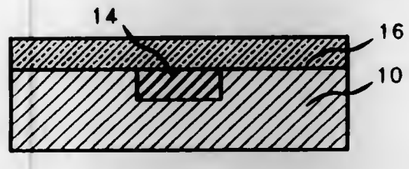
METHOD OF MAKING A PYROELECTRIC FILM SENSING DEVICE

Donald W. Eckart, Wall, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation of Ser. No. 287,641, Mar. 8, 1994, abandoned. This application Jul. 12, 1995, Ser. No. 501,636

Int. Cl.[6] B05D *5/12*

U.S. Cl. 427—160 **11 Claims**



1. A method of making a sensing device for rapid thermal response sensors from a single crystal substrate, said method including the steps of:

(A) etching the substrate to form a recess;

(B) epitaxially growing an oriented superconducting material into the recess to fill the recess;

(C) epitaxially growing an oriented film of a pyroelectric material over the entire surface of the substrate; and

(D) dissolving away the oriented superconducting material.

5,558,906

WEAR-RESISTANT DECORATIVE LAMINATES AND METHODS OF PRODUCING SAME

Donald J. Albrinck, and John J. Mascavage, both of Cincinnati, Ohio, assignors to Formica Technology Inc., Wilmington, Del.

Division of Ser. No. 967,917, Oct. 28, 1992, Pat. No. 5,362,557, which is a continuation of Ser. No. 570,025, Aug. 20, 1990, abandoned. This application Jul. 6. 1994, Ser. No. 271,349

Int. Cl.[6] B05D *1/18;1/36*

U.S. Cl. 427—180 **26 Claims**

1. A process for the production of decorative laminates having improved scratch, mar, scrape and abrasion resistance comprising the steps of:

preparing a mixture of (A) a liquid thermosetting, impregnating resin and (B) an abrasion resistant material comprising:

(1) a first amount of abrasion resistant mineral particles having an average particle size of about 3 microns and a second amount of abrasion resistant mineral particles having an average particle size of about 25 microns, both of which are present in a concentration sufficient to provide for abrasion resistance, the weight ratio of the larger particles to the smaller particles being 2 to 1;

(2) a coupling agent;

(3) a thickening agent in an amount sufficient to suspend said abrasion resistant mineral particles; and

(4) lubricating agents in a concentration sufficient to provide for scrape resistance;

simultaneously coating and impregnating a decorative paper sheet with said abrasion resistant mineral particles and said thermosetting resin by uniformly coating said decorative sheet with said mixture of thermosetting resin and abrasion resistant material, such that about 80 percent of the amount of thermosetting resin required for saturation of said decorative sheet is impregnated into said decorative sheet;

dipping said resin impregnated decorative sheet into an identically formulated mixture of thermosetting resin and abrasion resistant material, such that the remaining amount of thermosetting resin required for saturation of said decorative sheet is impregnated into said resin impregnated decorative sheet;

metering the total amount of thermosetting resin impregnated into the decorative sheet by metering means; and

drying and consolidating said resin impregnated decorative sheet using conventional heat and pressure laminating techniques, thereby obtaining a decorative laminate having improved scratch, mar, scrape and abrasion resistance.

5,558,907

PSEUDO-POROUS FIBER COATING FOR TOUGHENED CERAMIC COMPOSITE MATERIALS AND METHOD OF PRODUCING SAME

Wayne S. Steffier, Huntington Beach, Calif., assignor to Hyper-Therm High Temperature Composites, Inc., Huntington Beach, Calif.

Division of Ser. No. 132,671, Oct. 6, 1993, Pat. No. 5,480,707. This application Sep. 8, 1995, Ser. No. 525,846

Int. Cl.[6] B05D *3/02*

U.S. Cl. 427—227 **9 Claims**

1. A method of making a ceramic composite material comprising the following steps:

(a) preparing a fibrous preform and placing the preform in a CVD reactor;

(b) coating the fibrous preform with a 50–500 angstrom layer of carbon;

(c) coating the fibrous preform with a a 0.5–5.0 micron layer of carbon-enriched carbide ceramic coating over the layer of carbon; and

(d) consolidating the fibrous preform by infiltrating the preform with a ceramic matrix material and densifying the preform.

5,558,908

PROTECTIVE COMPOSITIONS AND METHODS OF MAKING SAME

Alexander Lukacs III, Wilmington; James A. Jensen, Hockessin, and Kurt J. Becker, Newark, all of Del., assignors to Lanxide Technology Company, LP, Newark, Del.

Filed Nov. 7, 1994, Ser. No. 335,536

Int. Cl.[6] B05D *3/02*

U.S. Cl. 427—228 **4 Claims**

1. A method of forming a coating comprising a first layer and at least one subsequent layer on at least one substrate material, comprising the steps of:

1) combining at least one boron source material comprising an extended boron-boron bonding network and at least one polymer comprising at least some silicon-nitrogen bonds to form a first mixture;

2) providing said first mixture onto at least a portion of at least one substrate to form a first layer on said at least one substrate;

3) combining at least one second boron source material comprising an extended boron-boron bonding network and at least one second polymer comprising at least some silicon-nitrogen bonds to form at least one subsequent mixture;

4) providing said at least one subsequent mixture over at least a portion of said first layer to form at least one subsequent layer on said at least one substrate;

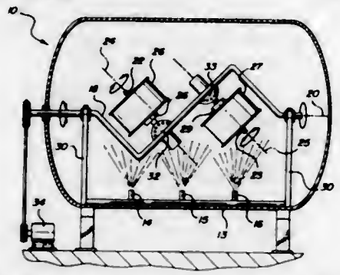
5) heating said at least one substrate material having thereon said first layer and said at least one subsequent layer in the presence of at least one oxidant to cause said coating to form.

5,558,909

APPARATUS AND METHOD FOR VACUUM-METALLIZING ARTICLES WITH SIGNIFICANT DEPOSITION ONTO THREE-DIMENSIONAL SURFACES

Alfred T. Peiquin, and Paul Hagenow, both of Dover, N.H., assignors to Textron Automotive Interiors, Inc., Troy, Mich.

Filed Jan. 17, 1996, Ser. No. 587,939
Int. Cl.[6] C23C *14/00*
U.S. Cl. 427—251 **17 Claims**



14. A method of vacuum-metallizing both recessed and non-recessed surfaces of a relatively massive article such as an automotive wheel, the method comprising the steps of:

providing a metallizing apparatus comprising a vacuum chamber, a metal particle emitter supported in the chamber, a rack having a rotational rack axis, said rack supported for rotation within the chamber about said rack axis and adjacent the emitter, a first mount assembly adapted to removably hold and rotatably support a first article about a second rotational axis, said second rotational axis extending at a first predetermined angle to the rack axis;

mounting a first article on the first mount assembly;

evacuating the chamber;

emitting metal particles toward the first article from the emitter;

rotating the first article around the rack axis; and

simultaneously rotating the first article around the second rotational axis.

5,558,910

UNIFORM TUNGSTEN SILICIDE FILMS PRODUCED BY CHEMICAL VAPOR DEPOSITION

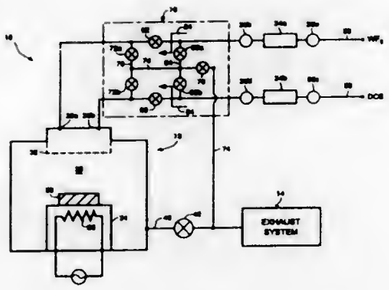
Susan G. Telford, Untergruppenbach, Germany; Meng C. Tseng, Saratoga, Calif.; Michio Aruga, Inba-gun, Japan, and Moshe Eizenberg, Haifa, Israel, assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 64,328, May 18, 1993, Pat. No. 5,500,249, which is a continuation-in-part of Ser. No. 995,211, Dec. 22, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 477,836
Int. Cl.[6] C23C *16/00*
U.S. Cl. 427—255 **11 Claims**

1. A chemical vapor deposition process for depositing a substantially uniform, substantially fluorine-free layer of WSi_x on a substrate, the process comprising the steps of:

(a) placing a substrate in a deposition zone;

(b) during a first stage, (i) introducing a first process gas comprising dichlorosilane and tungsten hexa-fluoride into the deposition zone, (ii) regulating the flow of the first process gas to maintain the pressure in the deposition zone at a first



higher pressure of at least 1 Torr, and (iii) heating the substrate to a sufficiently high temperature to deposit WSi_x directly on the substrate; and

(c) during a second stage, (i) introducing a second process gas comprising dichlorosilane and tungsten hexa-fluoride into the deposition zone, (ii) regulating the flow of the second process gas to lower the pressure in the deposition zone to a second lower pressure of at least 0.5 Torr, the second lower pressure being at least 0.5 Torr less than the first higher pressure, so that x is substantially uniform through the thickness of the WSi_x layer, and (iii) continuing to heat the substrate to a sufficiently high temperature to deposit WSi_x on the substrate.

5,558,911

COATING ARTICLES USING RADIATION-CURABLE POWDER COATINGS

Rainer Blum, Ludwigshafen, Germany, assignor to BASF Lacke + Farben Aktiengesellschaft, Muenster, Germany

Filed Apr. 17, 1995, Ser. No. 422,861
Claims priority, application Germany, Apr. 18, 1994, 44 13 436.3
Int. Cl.[6] B05D *3/06*
U.S. Cl. 427—517 **13 Claims**

1. A method of coating a substrate with a powder coating which comprises: applying the powder to the substrate; melting the powder and crosslinking the powder by UV radiation, wherein the powder consists essentially of a copolymer of

(a) at least one monomer of the formula I

$$CH_2{=}C(R^1){-}CO{-}OR^2 \quad (I)$$

where

R^1=H or C_3 and

R^2=H, C_nH_{2n+1} where n=from 1 to 30, or is an alicyclic, araliphatic or heterocyclic radical, hydroxylalkyl, alkoxyalkyl, glycidyl or aminoalkyl,

or of the formula (II)

$$CH_2{=}C(R^1){-}CO{-}NR^3R^4 \quad (II)$$

where R^1=H or CH_3 and

where R^3 and R^4 may be identical to or different from one another and are H, CH_2OH, C_nH_{2n+1} where n=1 to 30 or CH_2OR^5 where $R^5{=}C_mH_{2m+1}$ where m=1 to 12,

(b) at least one copolymerizable, ethylenically unsaturated, organic compound which is different from (a)

and

(c) at least one copolymerizable, ethylenically unsaturated, aromatic ketone which abstracts hydrogen in the excited triplet state, wherein component (c) is incorporated by polymerization into the copolymer in an amount of from 10 to 50% by weight, based on the overall weight of components (a), (b) and (c).

5,558,912

BLENDS OF ULTRAVIOLET ABSORBERS AND POLYESTERS

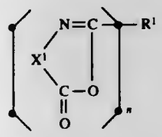
David R. Fagerburg, Kingsport, and Michael E. Donelson, Gray, both of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Division of Ser. No. 430,662, Apr. 28, 1995, Pat. No. 5,480,926. This application Sep. 26, 1995, Ser. No. 534,231
Int. Cl.[6] B32B *1/08*
U.S. Cl. 428—35.7 **11 Claims**

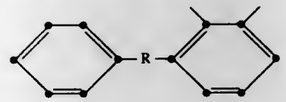
1. A photo-stabilized protective layer comprising a photo-stabilized polymer blend comprising:

(a) at least one polyethylene terephthalate-based copolymer comprising 1,4-cyclohexanedimethanol, and

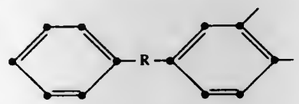
(b) an ultraviolet absorber, at least one compound selected from the consisting of cyclic imino esters represented by the following formula (I)



wherein X^1 represents 1,2-phenylene, 1,2-naphthylene, 2,3-naphthylene, a group represented by the formula (a)



wherein R is —O—, —CO—, —S—, $—SO_2—$, $—CH_2—$, $—(CH_2)_2—$ or $—C(CH_3)_2—$, or a group represented by the formula (b)



wherein R is as defined above, and n is 1, 2 or 3, and R^1 represents a hydrocarbon residue having a valence of n.

5,558,913

PRIMERLESS PRESSURE-SENSITIVE ADHESIVE CONSTRUCTIONS

Yukihiko Sasaki, Claremont; Luigi Sartor, Pasadena, both of Calif.; Yun L. Fu, Dayton, Ohio, and Henk de Koning, Zevenhuizen, Netherlands, assignors to Avery Dennison Corporation, Pasadena, Calif.

Filed Sep. 16, 1994, Ser. No. 307,944
Int. Cl.[6] B32B *7/10*
U.S. Cl. 428—41.5 **9 Claims**

1. A removable pressure-sensitive adhesive construction comprising:

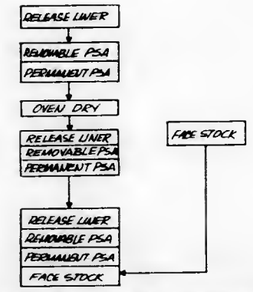
(a) a backing;

(b) a layer of a permanent pressure-sensitive adhesive in direct contact with a surface the backing,

(c) a layer of removable pressure-sensitive adhesive in direct contact with the layer of permanent pressure-sensitive adhesive, and

(d) a release surface in direct contact with the layer removable pressure-sensitive adhesive,

said removable pressure-sensitive adhesive being present at a coat weight of at least about 50% by weight of the total coat weight and in which the coat weight ratio of the removable pressure-sensitive adhesive to permanent pressure-sensitive



adhesive is at least 1:1, and the combination of said adhesive layers having a total coat weight of about 18 to 25 gsm.

5,558,914

WATER-BASED FORMULATION FOR THE TREATMENT OF SUNBURN

Peter D. Cohen, Edison, and Carl Haight, Lincoln Park, both of N.J., assignors to Water-Jel Technologies, Inc., Carlstadt, N.J.

Filed Apr. 11, 1994, Ser. No. 226,122
Int. Cl.[6] A61K *7/42*
U.S. Cl. 424—59 **24 Claims**

1. A water-based formulation for treating sunburn comprising:

a stable and thickened aqueous composition suitable for administration as a sunburn-treatment composition to the skin, the aqueous composition containing

(a) water,

(b) tea tree oil,

(c) a component that is present in an amount effective to function as a topical anesthetic,

(d) a fragrance-producing component that is present in an amount effective to mask the odor emanating from the tea tree oil and

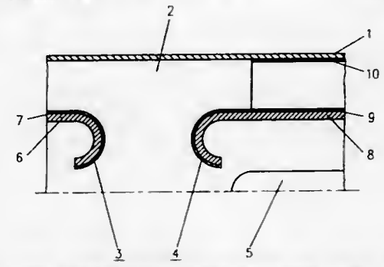
(e) a component for reducing tackiness, said component for reducing tackiness being present in an amount such as to produce a water-based formulation that is capable of being substantially non-tacky after drying on the skin.

5,558,915

HIGH-VOLTAGE INSTALLATION

Ingo Herbst, Greifensee, and Ralf-Dieter Pietsch, Oberrohrdorf, both of Switzerland, assignors to ABB Research Ltd., Zurich, Switzerland

Filed Dec. 7, 1994, Ser. No. 350,840
Claims priority, application Germany, Dec. 28, 1993, 43 44 764.3
Int. Cl.[6] B32B *9/00*
U.S. Cl. 428—76 **12 Claims**



1. A high: voltage installation with at least one voltage carrying active part, the high-voltage installation having a metallic enclo-

sure which is filled with insulating gas and surrounds the active part, and having at least one at least partial protective coating on at least one of an appropriate surface of an internal surface of the enclosure and an external surface of the active parts, wherein

the at least one protective coating is doped with at least one fullerene, and

the protective coating is applied to the appropriate surface as a lacquer doped with at least one fullerene.

5,558,916

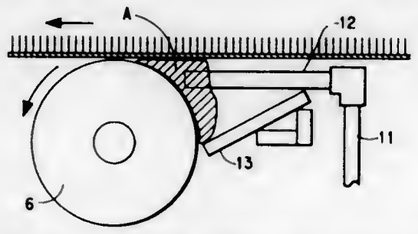
METHOD FOR MANUFACTURING A CARPET HAVING A SECONDARY BACKING SUBSTANTIALLY IMPERVIOUS TO LIQUIDS AND THE RESULTANT CARPET

William W. Heim, Signal Mountain, Tenn.; James K. Hendrix, Woodstock, Ga.; Joyce M. Materniak, Hockessin, Del.; Peter M. Murphy, Ooltewah; Neil A. Pauzier, Signal Mountain, both of Tenn., and Yashavant V. Vinod, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 292,534, Aug. 18, 1994, abandoned. This application Apr. 6, 1995, Ser. No. 418,993

Int. Cl.[6] B32B *5/26;33/00*

U.S. Cl. 428—95 **24 Claims**



1. A method for constructing a carpet having a secondary backing which is substantially impervious to liquids, comprising the steps of:

a) applying a repellent finish comprising a composition selected from the group consisting of silicones, wax emulsions, and hydrophobic acrylate resins, and mixtures thereof onto the secondary backing of a carpet having a tufted primary backing adhered to the secondary backing, and

b) drying the repellent finish onto the secondary backing to render the secondary backing substantially impervious to liquids.

21. A carpet having a secondary backing substantially impervious to liquids, comprising a tufted primary backing adhered to a secondary backing coated with a sufficient amount of dried repellent finish comprising a composition selected from the group consisting of silicones, wax emulsions, and hydrophobic acrylate resins, and mixtures thereof to render the secondary backing substantially impervious to liquids.

5,558,917

POLYURETHANE CARPET BACKING PROCESS BASED ON POLYMERIC MDI QUASI-PREPOLYMERS

Peter H. Markusch, McMurray, Pa., and James W. Rosthauser, Glendale, W. Va., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed May 10, 1995, Ser. No. 438,454

Int. Cl.[6] C08G *18/70*

U.S. Cl. 428—95 **24 Claims**

1. A polyisocyanate composition having a functionality of less than about 2.4, an isocyanate group content of 25 to 30%, and a urethane group content of from about 2 to 6%, and comprising polymethylene poly(phenylisocyanate), from about 5 to 25% of 4,4'-methylene bis(phenylisocyanate), and from about 20 to 50% of 2,2'- and 2'-4'-methylene bis(phenylisocyanate).

5,558,918

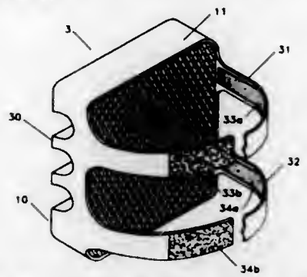
PRESSURE BANDAGE TO AVOID EXPOSURE TO BLOOD BORNE PATHOGENS

Chrisanne Gordon; George W. Waylonis, both of 2310 Hoxton Ct., and John G. Dirina, 3828 Norbrook Dr., all of Columbus, Ohio 43220

Filed Dec. 14, 1994, Ser. No. 355,496

Int. Cl.[6] A61F *13/00;* **A61L** *15/00*

U.S. Cl. 428—100 **24 Claims**



1. A multi-layered bandage for preventing or reducing transmission of blood borne pathogens from a bleeding wound area to a person applying the bandage to the wound, comprising:

a. A planar, non-porous first layer having a first side and a second side opposite the first, the first layer constructed of non-porous material that is impermeable to blood and body fluid, and sufficiently flexible to contour the wound area, and sufficiently firm to apply staunching pressure to the wound when pressed or secured to the wound area, and the first side of the non-porous first layer serves as a gripping means in the form of a plurality of finger grooves formed into the first side of the first layer wherein said grooves are parallel to each other and whereby the hand of the person applying the bandage is prevented from contacting blood from the wound;

b. a second layer, having a first side and a second side opposite the first, comprising material absorbent of blood and body fluid, the first side of the second layer affixed to the second side of the non-porous first layer;

c. a flexible strap having a first side and a second side opposite the first, and having a first end with a second end opposite the first, of substantial longitudinal elasticity to allow the strap to extend and wrap around the wound area and be secured, the first side of the strap is affixed by the first end to the first side of the first layer; and

d. a fastening means affixed to the second end of the strap and constructed of material to allow the strap to retain and compress the bandage on the wounded area.

5,558,919

DUCT COVER FOR DIRECTING A FLUID THERETHROUGH

Darryl M. Toni, Madison; Peter L. Grant, Hamden; Craig F. Johnson, Stratford; Steven R. Hayse, Naugatuck; William V. Forster, Seymour; Kenneth Nowak, Easton, and Larry J. Osiecki, Oxford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 20, 1993, Ser. No. 124,095

Int. Cl.[6] B32B *3/12*

U.S. Cl. 428—116 **36 Claims**

1. A duct cover operative for directing a fluid flow, the duct cover for use in combination with a duct within a vehicle, the fluid flow having an initial direction and a final direction, wherein the duct cover comprises:

a flow directing honeycomb, said honeycomb comprising an array of cells defined by an associated plurality of cell walls, said cells for conducting a fluid flow therethrough, said cells having a length sufficient for effecting a change in the fluid flow direction, and wherein said cells are biased with respect to the initial direction of the fluid flow for channeling the fluid flow from the initial direction to the final direction; and

a triangular framing member for rigidizing the flow directing honeycomb, the triangular framing member including skin structures which define at least two sides of said triangular framing member, and a core material disposed between and affixed to said skin structures, wherein one side of said triangular framing member forms a peripheral side of said flow directing honeycomb.

5,558,920

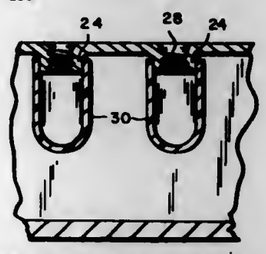
LIGHTWEIGHT HONEYCOMB TABLETOP

Ulf B. Heide, Marblehead, Mass., assignor to Technical Manufacturing Corporation, Peabody, Mass.

Filed Mar. 7, 1994, Ser. No. 206,954

Int. Cl.[6] B32B *3/12*

U.S. Cl. 428—116 **8 Claims**



1. In a breadboard having upper and lower skins rigidly secured in parallel relationship to the top and bottom surfaces of an outer wall, the improvement which comprises:

a plurality of extruded tapped holes formed in the upper skin, at least some of said holes characterized by an arcuate section of increased thickness formed in the skin and a sleeve formed integrally with and depending from the arcuate section of increased thickness, the holes characterized by threads extending downwardly from the arcuate section of increased thickness into the inner surface of the sleeve.

5,558,921

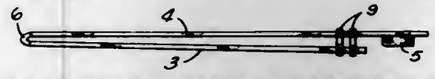
NOTE WRITER'S FRUGAL AID

John P. Pavlik, 20411 Lassen St., Chatsworth, Calif. 91311

Filed Feb. 4, 1993, Ser. No. 13,322

Int. Cl.[6] B32B *3/04*

U.S. Cl. 428—121 **4 Claims**



1. A note taking device that holds a writing instrument next to writing paper, provides storage for and use of envelopes as said writing paper or facilitates the use of a note pad as said writing paper, said device comprising: an elongate cardboard sheet of $3\frac{15}{16}$ width and having a transverse fold resulting in a first, long, fold member and a second, short, fold member connected to each other at the folded end, each of said fold members being essentially rectangular and the long fold member is folded over the short fold member such that said long fold member extends over and beyond the unconnected end of said short fold member, said fold members have both fold corners truncated and both fold members being bound together by more than one transversely positioned elastic rubber band, a resilient foam-rubber friction pad is affixed onto said long fold member along its unconnected end on the surface that faces and extends beyond the short fold member, such that insertion of the device, truncate corners first, into a flap-sealed, one-open-end envelope modifies the envelope into a backed writing surface that can either be hand-held or stabilized when the envelope-invention assembly is placed on a desk, extended resilient pad down, so that a writing arm rests over the resilient pad, such that the elastic bands can be spaced apart to receive and hold the hard back of a common note-pad when it is slipped between the bands and the second, short, fold member so that the connected end of the fold members is between the hard back and the bottom sheet of the note-pad, so that the note-pad can be held in one hand and utilized down to the bottom edge while the writing arm is resting on the projecting fold members, such that the so-coupled note-pad and the invention assembly can be placed on a desk, resilient pad down, so that the weight of a writing arm over the resilient pad stabilizes the note-pad while it is being utilized from the top to the bottom, whereby, in both applications, the invention can securely but removably hold a writing instrument partially inserted between the two fold members so that its projecting end is in contact with the resilient pad, transversely-folded envelopes for future use and already invention-utilized paper can be stored between the folds.

5,558,922

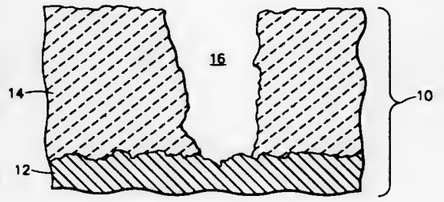
THICK THERMAL BARRIER COATING HAVING GROOVES FOR ENHANCED STRAIN TOLERANCE

Bhupendra K. Gupta; Gilbert Farmer, both of Cincinnati, Ohio, and Alan Walker, Niskayuna, N.Y., assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 28, 1994, Ser. No. 365,635

Int. Cl.[6] B32B *3/30*

U.S. Cl. 428—141 **13 Claims**



1. A thermal barrier coating formed on an article for use in an environment in which the article is subject to thermally, mechanically and dynamically-induced strains, the thermal barrier coating comprising:

a metallic oxidation-resistant bond layer covering a surface of the article, the bond layer having an average surface roughness R_a of at least about 7.5 micrometers;

a ceramic layer adherently formed on the bond layer, the ceramic layer being segmented on the article by first and second sets of grooves that define a grid pattern in the ceramic layer, the grooves of the first and second sets of grooves having substantially uniform widths of about 100 to about 500 micrometers, adjacent grooves within each of the first and second sets of grooves being spaced apart about 10 to about 250 millimeters.

170–921 O.G.–96–14: QL3

5,558,923

PACKAGE PADDING MATERIAL AND APPARATUS FOR

5,558,926

ENDLESS MULTILAYER FABRIC FOR DENSIEVING

5,558,928

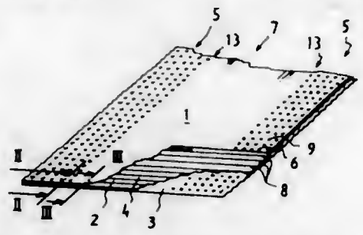
MULTILAYER CIRCUIT STRUCTURES, METHODS OF

5,558,923

PACKAGE PADDING MATERIAL AND APPARATUS FOR FORMING PACKAGE PADDING MATERIAL

Vesamaa Juusi, Raisio, Finland, assignor to Mercamer Oy, Vantaa, Finland

Filed Oct. 20, 1994, Ser. No. 326,463
Claims priority, application Finland, Oct. 27, 1993, 934765
Int. Cl.[6] D06N 7/04; B32B 3/00
U.S. Cl. 428—154 18 Claims



1. A package padding which is continuous and web-shaped and formed of a plurality of superimposed paper courses, and comprising a first paper course and a second paper course, and at least on the second paper course over a substantial part of an entire surface area of the second paper course being embossed a continuous series of successive and side-by-side eminences to give the package padding a cellular padding structure, the package padding comprising:

a first region, on an area of which the first paper course and second paper course are joined to each other by means of a first continuous series of punchings, which produce a plurality of punch joints; and

a second region substantially free of punchings, the package padding being more bulky and fluffy in an area of the second region than the area of the first region, the second region being disposed on one side of the first region;

the second paper course comprising a continuous series of successive pleats transversal in relation to a longitudinal direction of the package padding, the package padding containing per unit length a greater length of a paper material of the second paper course than of a paper material of the first paper course.

5,558,924

METHOD FOR PRODUCING A CORRUGATED RESIN-BONDED OR THERMO-BONDED FIBERFILL AND THE STRUCTURE PRODUCED THEREBY

Tien-Sheng Chien, deceased, late of Taipei, Taiwan; Jung-Fu Chien; Paul C. Chien, both of Montebello, Calif., and Hsiu-Lan Lu, Taipei Hsien, Taiwan, assignors to Shinih Enterprise Co., Ltd, Taipei, Taiwan

Continuation-in-part of Ser. No. 841,805, Feb. 26, 1992, abandoned, Ser. No. 246,880, May 20, 1994, and Ser. No. 246,953, May 20, 1994, abandoned. This application Aug. 19, 1994, Ser. No. 293,239
Int. Cl.[6] D04H 1/70
U.S. Cl. 428—181 16 Claims

1. A method for forming a corrugated, resin-bonded structure comprising:

(a) lapping a fibrous web in alternating directions to form alternating laps;

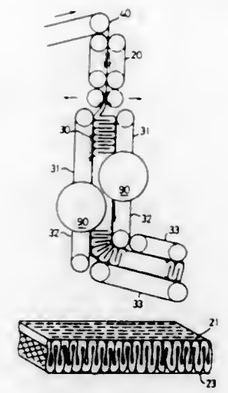
(b) folding said fibrous web to form a corrugated fibrous web;

(c) brushing peaks of said corrugated fibrous web so that fibers from one peak of said corrugated fibrous web extend to an adjacent peak, bridging a gap formed therebetween;

(d) applying resin to said corrugated fibrous web; and

(e) heating said corrugated fibrous web so that said corrugated fibrous web maintains said corrugations.

15. An improved corrugated, resin-bonded structure formed by the method set forth in claim 1.

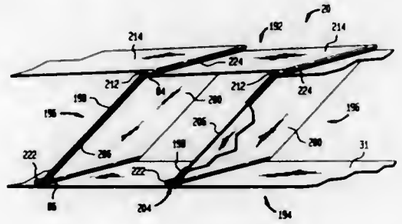


5,558,925

WINDOW TREATMENT ARTICLE

Ralph Fritzman, Sarasota, Fla., assignor to Cellular Designs Unlimited, Inc., Sarasota, Fla.

Filed Feb. 13, 1995, Ser. No. 388,270
Int. Cl.[6] B32B 3/28; E06B 9/26; A47H 5/00
U.S. Cl. 428—181 30 Claims



1. An article for use in fabricating a window covering assembly, comprising:

a first sheet;

a second sheet having a longitudinal axis, said second sheet being formed with a number of longitudinally spaced vanes each having an inner end and an outer end, said second sheet being formed with a number of connector sections each located between the outer end of one vane and the outer end of an immediately adjacent vane;

each of said vanes being formed by folding a portion of said second sheet upon itself thus defining a first side and second side which are interconnected by a fold line along said inner end thereof, said inner end of each of said vanes being affixed to said first sheet proximate said fold line and said outer end of each said vanes being closed at a location proximate said connector sections;

said first and second sides of each vane extending substantially parallel to one another from said inner end to said outer end of each vane, and being provided with a space therebetween along at least a portion of the distance between said inner and outer ends of each vane.

5,558,926

ENDLESS MULTILAYER FABRIC FOR DENSIFYING PAPER MATERIALS AND PRODUCTION PROCESS THEREOF

Takuo Tate; Nobuyoshi Takagi; Tsunekazu Kobayashi, and Akinori Sano, all of Tokyo, Japan, assignors to Nippon Filcon, Co., Ltd., Tokyo, Japan

Filed Oct. 31, 1995, Ser. No. 551,286
Claims priority, application Japan, Nov. 18, 1994, 6-321789
Int. Cl.[6] B32B 23/02
U.S. Cl. 428—193 11 Claims

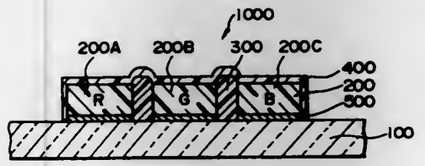
1. An endless multilayer fabric for densifying paper materials comprising: an endless fabric formed of multiple fabric woven from at least three layers of weft consisting of a plastic monofilament and warp consisting of a plastic monofilament; a bending resistant edge part of 30 through 50 mm width formed by filling not less than 85% of the space of the fabric at the edge with a thermoplastic resin arranged at least along one end edge of the trimming portion in the width direction of the endless fabric; and a guide protrusion member formed of a thermoplastic resin integrally bonded by fusion into one body with the thermoplastic resin filled in the running surface of the bending resistant part.

5,558,927

COLOUR FILTER FOR LIQUID CRYSTAL DISPLAYS AND FILM-FORMING APPARATUS

Hisashi Aruga, Suwa; Keiji Takizawa, Nagano-ken; Ryuji Sawata, Nagano-ken, and Takashi Kobayashi, Nagano-ken, all of Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

PCT No. PCT/JP93/01337, § 371 Date Jun. 30, 1994, § 102(e) Date Jun. 30, 1994, PCT Pub. No. WO94/07158, PCT Pub. Date Mar. 3, 1994
PCT Filed Sep. 17, 1993, Ser. No. 244,833
Claims priority, application Japan, Sep. 17, 1992, 4-248177; Dec. 2, 1992, 4-323381; Feb. 19, 1993, 5-30608; May 6, 1993, 5-105576
Int. Cl.[6] B32B 09/00
U.S. Cl. 428—195 22 Claims



1. A colour filter for a liquid crystal display comprising:

an optically transparent supporting member;

a transparent conductive layer formed upon said supporting member; and

a colour layer of a specified pattern of red, green and blue picture elements which is formed upon said transparent conductive layer wherein pigments are employed as the colouring agents to constitute said picture elements of said colour layer, said colour layer has a dielectric constant of at least 2.0 under measurement conditions of an alternating current having a voltage of 5 V and a frequency of from 1 kHz to 100 kHz, and each of said red, green and blue picture elements which form said colour layer has a dielectric constant being within a range of ±25% of a mean value of the dielectric constants of said red, green and blue picture elements and said colour layer has a thickness of from 0.4 μm to 1.0 μm.

5,558,928

MULTI-LAYER CIRCUIT STRUCTURES, METHODS OF MAKING SAME AND COMPONENTS FOR USE THEREIN

Thomas H. DiStefano, Bronxville; Scott G. Ehrenberg, Fishkill, and Igor Y. Khandros, Peekskill, all of N.Y., assignors to Tessera, Inc., San Jose, Calif.

Division of Ser. No. 815,401, Dec. 31, 1991, Pat. No. 5,367,764. This application Jul. 21, 1994, Ser. No. 278,426
Int. Cl.[6] B32B 9/00
U.S. Cl. 428—209 19 Claims

1. An interconnection and bonding interposer for an electrical circuit assembly comprising a generally lamellar body having a pair of oppositely-facing exposed major surfaces, electrically conductive elements extending through said body between said major surfaces so that said conductive elements are exposed at preselected interconnect locations on said major surfaces, said body including a flowable dielectric material incorporating a polymeric constituent, said flowable dielectric material being present at said major surfaces of said body except at said interconnect locations, said body including a generally lamellar interior element disposed between said major surfaces and extending generally parallel to said major surfaces, said flowable dielectric material being adapted to flow at an elevated temperature, said interior element having substantial dimensional stability at said elevated temperature.

5,558,929

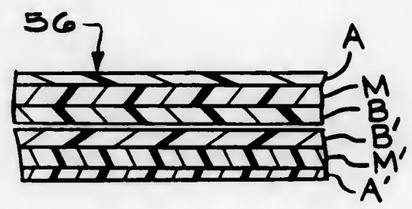
Patent Not Issued For This Number

5,558,930

HEAT SEALABLE, HIGH MOISTURE BARRIER FILM AND METHOD OF MAKING SAME

James P. DiPoto, Terre Haute, Ind., assignor to Tredegar Industries, Inc., Richmond, Va.

Filed Jun. 23, 1994, Ser. No. 264,564
Int. Cl.[6] B32D 7/02
U.S. Cl. 428—216 41 Claims



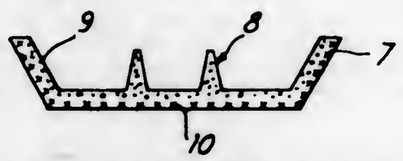
1. A multi-layer heat sealable barrier film, the film being produced by coextrusion and compression rolled orientation of at least one barrier layer of moisture resistant thermoplastic material with at least one sealant layer of a heat sealable thermoplastic material the film comprising about 2.5 to about 80% sealant material and about 20 to about 97.5% barrier material, based on the thickness of the film, the film having an average moisture vapor transmission rate less than about 0.2 grams/100 square inches per day at 100° F. and 90% relative humidity per mil of thickness.

5,558,931

FIBRE REINFORCED THERMOPLASTICS MATERIAL STRUCTURE

Ian S. Biggs, High Wycombe, and Bronislaw Radvan, Flackwell Heath, both of England, assignors to The Wiggins Teape Group Limited, Basingstoke, England

Division of Ser. No. 398,452, Aug. 3, 1989, Pat. No. 4,964,935, which is a continuation of Ser. No. 78,172, Jul. 27, 1987, abandoned. This application Jul. 9, 1990, Ser. No. 550,046
Claims priority, application United Kingdom, Jul. 31, 1986, 8618726
Int. Cl.[6] B32B *7/02;5/06;3/26;5/22*
U.S. Cl. 428—218 **15 Claims**



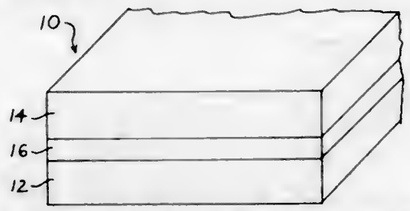
1. A fibre reinforced plastics structure having a plurality of layers, including a first layer which is fully consolidated with uniformly dispersed fibres and a second layer which is formed as an absorbent matrix, the first layer comprising a first sheet of fibre reinforced thermoplastics material which will consolidate when cooled after subjection to pressure at a temperature above the melt temperature of the thermoplastics material of said first sheet and the second layer comprising a second sheet of fibre reinforced thermoplastics material which will remain porous when cooled after subjection to pressure at a temperature above the melt temperature of the thermoplastics material of the second sheet and which has been heated to a temperature above that at which the thermoplastics material of both of said sheets have been caused to melt and subjected to pressure in a mould to bond said first and second sheets together.

5,558,932

INTEGRATED STRUCTURAL COMPOSITE AND CERAMIC FLAME BARRIER

John F. Scanlon, Bath, Mich., assignor to Auto-Air Composites, Inc., Lansing, Mich.

Filed Sep. 22, 1994, Ser. No. 310,472
Int. Cl.[6] D03D *3/00;* **B32B** *5/02;7/00;* **B27N** *9/00*
U.S. Cl. 428—229 **8 Claims**



1. An integrated structural composite panel and ceramic flame barrier having sufficient structural strength to form a rigid load bearing support member comprising in combination:

a first layer being a structural polymer composite having sufficient structural strength to define and form the load bearing support member,

a second layer bonded to the first layer, being a fiber reinforced film adhesive, and

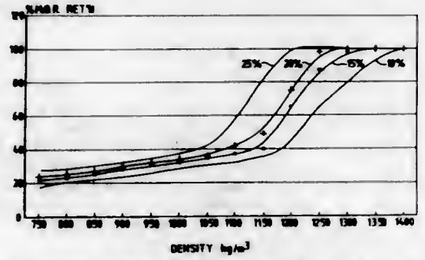
a third layer bonded to the second layer, being a polymer precursor of a ceramic matrix exhibiting polymeric properties at one temperature and ceramic matrix properties at a higher pyrolization temperature, the first and third layers being separated by the second layer, and the three layers being co-cured in a one-step process below the pyrolization temperature, the polymers in the first and third layers being different.

5,558,933

SHEETING MATERIAL AND METHOD OF MANUFACTURING THE SAME

Patrick Anthony, Wagga Wagga, Australia, assignor to ACI International Limited, Australia

Continuation of Ser. No. 828,972, Feb. 3, 1992, abandoned. This application Oct. 18, 1994, Ser. No. 325,557
Claims priority, application Australia, Jul. 24, 1989, PJ5399
Int. Cl.[6] B32B *3/00;* **D04H** *1/08;* **B27N** *3/04*
U.S. Cl. 428—290 **11 Claims**



1. A building substrate consisting essentially of cellulose fibres and a cured thermosetting resin present in an amount of at least 10% by weight of resin to dry fibre weight wherein the said cellulose fibres and resin are bonded together and the substrate has a moisture content after compression of 4 to 11% by weight of moisture to dry fibre weight and a density of 1100kg/m^3 or greater and wherein the thermosetting resin is present in an amount such that when the substrate is subjected to a water swell test in accordance with British Standard BS5669, the immersion time for the test being 24 hours, the water swelling of the substrate is less than 1.0%.

5,558,934

SILICON COATED MYLAR BEAMSPLITTER

Nelson L. Rowell, and Edward A. Wang, both of Ottawa, Canada, assignors to National Research Council of Canada, Ottawa, Canada

Filed Nov. 30, 1994, Ser. No. 352,026
Int. Cl.[6] B32B *5/16*
U.S. Cl. 428—333 **6 Claims**

1. A composite material for use in a far infrared beam splitter, consisting essentially of a substrate in the form of a thin, substantially uniformly thick film of polyethyleneterephthalate, and a substantially uniform thickness coating of the element germanlure, wherein the coating thickness is 1 to 2.1 microns.

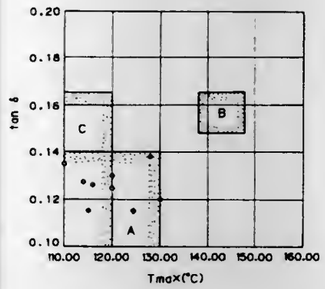
5,558,935

POLYESTER FIBER AND METHOD OF MANUFACTURING THE SAME

Jun Tanaka, and Fumio Himematsu, both of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 983,261, Nov. 30, 1992, abandoned, which is a continuation of Ser. No. 679,665, Apr. 4, 1991, abandoned. This application May 9, 1994, Ser. No. 239,853
Claims priority, application Japan, Apr. 6, 1990, 2-90087; Apr. 6, 1990, 2-90088
Int. Cl.[6] D02G *3/00*
U.S. Cl. 428—364 **10 Claims**

1. A polyester fiber comprising ethylene terephthalate as main recurrent units and having the following characteristics:



(a) an intrinsic viscosity η of between 0.50 and 0.80;

(b) a tan δ of 0.10 to 0.138 and a T_{max} of 110° C. to 130° C., wherein tan δ is the peak value of a dynamic loss tangent and T_{max} the peak temperature in ° C.;

(c) a value of E_2/E_1 of 0.49 or less, wherein E_1 is the elongation in % from zero to a secondary yield point and E_2 the elongation in % from the secondary yield point to a breaking point;

(d) a coefficient of stability, expressed as the reciprocal of the product of work loss ΔE in inch.lb at 150° C. multiplied by the shrinkage factor HS in % under a dry heat at 175° C., of 50 inch^{-1}.lb^{-1}.%$^{-1}$ or more;

(e) a value of TS/η of 9.0 or more, wherein TS in g/d is the strength of the fiber, and η is the intrinsic viscosity of the fiber;

(f) a Tm_1 of 260° C. or more, wherein Tm_1 is the melt starting temperature in ° C.; and

(g) a birefringence Δn of 0.150 to 0.180.

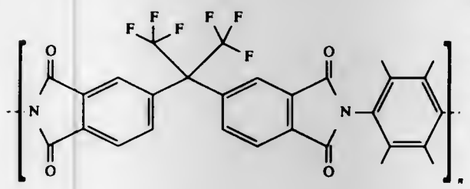
5,558,936

HIGH SELECTIVITY HOLLOW FIBERS

Tai-Shung Chung, Randolph, and Edward R. Kafchinski, Winfield, both of N.J., assignors to Hoechst Celanese Corp, Somerville, N.J.

Filed Aug. 1, 1991, Ser. No. 739,863
Int. Cl.[6] D02G *3/02;* **B01D** *39/00;63/02*
U.S. Cl. 428—378 **3 Claims**

1. A coated asymmetric hollow fiber for use in separation membranes consisting essentially of a polyimide of the formula



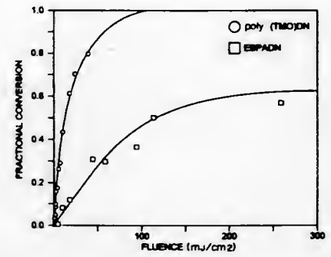
and a poly-4-vinylpyridine coating, which coated fiber has a separation factor of at least about 6.0 for oxygen and nitrogen and an oxygen permeance of at least about 10 ppm cc(STP)/(sec cm^2 cm-Hg).

5,558,937

OPTICAL FIBER PRIMARY COATINGS AND FIBERS COATED THEREWITH

John G. Woods, Farmington, Conn.; Margaret A. Rakas, Longmeadow, Mass.; Anthony F. Jacobine, Meriden; Louis M. Alberino, Chesire; Philip L. Kropp, Newington; Donna M. Sutkaitis, Cheshire; David M. Glaser, New Britain, and Steven T. Nakos, Andover, all of Conn., assignors to Loctite Corporation, Hartford, Conn.

Division of Ser. No. 80,748, Jun. 22, 1993, Pat. No. 5,459,175, which is a continuation-in-part of Ser. No. 619,068, Nov. 28, 1990, and a continuation-in-part of Ser. No. 56,128, Apr. 30, 1993, Pat. No. 5,399,624, which is a continuation-in-part of Ser. No. 746,649, Aug. 16, 1991, Pat. No. 5,208,281, which is a continuation-in-part of Ser. No. 651,271, Feb. 5, 1991, Pat. No. 5,167,882, which is a continuation-in-part of Ser. No. 632,391, Dec. 21, 1990, abandoned. This application May 3, 1995, Ser. No. 433,722
Int. Cl.[6] G02B *6/00;* **D02G** *3/00;* **C08G** *75/12;* **C08F** *2/50*
U.S. Cl. 428—378 **20 Claims**



1. An optical fiber having a primary coating thereon of a crosslinked polymer which is the addition product, at 80% or greater conversion, of a polythiol and a polyene, the polyene being a compound having a plurality of norbornene groups thereon, one of the polythiol or the polyene having a backbone of a poly(tetramethylene oxide), the poly(tetramethylene oxide) having a number average molecular weight of between 250 and 5,000, the coating having been formed by curing a thiol-ene composition comprising said polythiol and said polyene or an oligomer of said polythiol and said polyene.

5,558,938

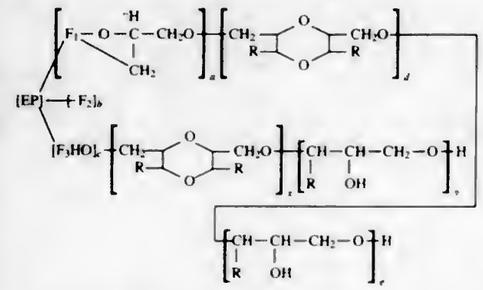
Patent Not Issued For This Number

5,558,939
COPOLYMERIZATION OF POLYETHERPOLYOLS WITH EPOXY RESINS

George C. Blytas, and Arthur H. Hale, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 68,329, May 27, 1993, abandoned. This application Jul. 28, 1995, Ser. No. 508,503
Int. Cl.[6] B32B 27/38
U.S. Cl. 428—414 1 Claim

1. An article comprising two parts joined by an adhesive made of an epoxy polyetherpolyol of the formula



a≧0; b≧0; c≧0; a+b+c≧1, a+c≧1; d≧0; e≧0; x≧0; y≧0; x+y≧1 and if a, b, and x are all 0 and c is one, y≧2

R can be H, alkyl, ether or hydroxyalkyl

EP refers to the central portion of the epoxy resin

F_1, F_2 and F_3 represent the two carbons and one oxygen atom of the epoxy ring with the provision that there is always at least one, generally at least two three-member epoxy functional groups.

5,558,940
OIL- AND WATER-REPELLENT PAPERS, PROCESSES FOR THEIR PRODUCTION AND NEW FLUORINE-CONTAINING COPOLYMERS FOR THIS PURPOSE

Gisbert Michels, Köln; Joachim König, Odenthal; Uwe Zweering, Düsseldorf, and Siegfried Korte, Odenthal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 17, 1995, Ser. No. 502,985
Claims priority, application Germany, Jul. 27, 1994, 44 26 537.9; Jul. 27, 1994, 44 26 536.0
Int. Cl.[6] B32B 27/00
U.S. Cl. 428—422 18 Claims

1. Oil- and water-repellent papers treated on the surface or in the pulp of the papers with fluorine-containing copolymers of

a) acrylates containing perfluoroalkyl groups of the formula

$$CH_2=CR^1-COO-X-C_nF_{2n+1} \quad (I),$$

b) monomers of the formula

$$CH_2=CR^2-COO-R^3 \quad (II),$$

c) monomers of the formula

$$CH_2=CR^4-COO-(CH_2CH_2O)_m-R^5 \quad (III),$$

d) monomers of the formula

$$CH_2=CR^6-COO-CH_2CH_2-N(R^7,R^8) \quad (IVa)$$

or, in salt-like form, of the formula

$$[CH_2=CR^6-COO-CH_2CH_2-N(R^7,R^8,R^9)]^{\oplus}Y^{\ominus} \quad (IVb)$$

or, in N-oxidized form, of the formula

$$CH_2=CR^6-COO-CH_2CH_2-N(R^7,R^8), \quad (IVc)$$

(O)

and

e) monomers of the formula

$$CH_2=CR^{10}CONHR^{11} \quad (V)$$

wherein, in the formulae,

n denotes a number from 4 to 20, or a mixture of various values of n and

m denotes a number from 3 to 20 or a mixture of various values of m,

X represents the formulae $-(CH_2)_o-$, $SO_2NR^{12}CH_2CHR^{13}-$ or $-O-(CH_2)_o-$, wherein o denotes a number from 1 to 4,

R^1, R^2, R^4, R^6, R^{10} and R^{13} independently of one another denote hydrogen or methyl,

R^3, R^7, R^8, R^9 and R^{12} independently of one another represent straight-chain or branched C_1–C_4-alkyl,

R^5 denotes hydrogen or straight-chain or branched C_1–C_8-alkyl and

R^{11} denotes hydrogen or straight-chain or branched C_1–C_{12}-alkyl, benzyl, $-CH_2OH$, $-CH_2OCH_3$, $-CH_2OC_4H_9$, $-(CH_2)_3N(CH_3)_2$ or $-(CH_2)N^{\oplus}(CH_3)_3Cl^{\ominus}$ and

$Y^{\ominus}$ denotes one equivalent of a 1- to 3-valent anion,

the copolymers comprising the monomers in amounts of a) = 50 to 90% by weight, b) = 1 to 35% by weight, c) = 3 to 20% by weight, d) = 1 to 20% by weight and e) = 0 to 10% by weight, all based on the total amount of comonomers, and 0.1 to 2.0% by weight of the above copolymers, based on the pulp, being employed for treatment on the surface and 0.5 to 2.0% by weight of the above copolymers, based on the pulp, being employed for pulp treatment in the chemical pulp suspension, it being possible for non-softened tap water to be employed as the water and it being possible for starch and retention agents to be employed, in addition to the above copolymers, the treatment compositions according to U.S. Pat. No. 5,247,008 being excluded.

5,558,941
ARTICLE INCLUDING AN ADHESIVELY BONDED MOISTURE CURED MATERIAL AND A METHOD OF MAKING THE SAME

Charles W. Stobbie, IV, Woodbury; John C. Tangen, Mahtomedi, and Lani S. Kangas, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 258,611, Jun. 10, 1994, Pat. No. 5,436,302, which is a continuation of Ser. No. 54,460, Apr. 27, 1993, abandoned, which is a continuation of Ser. No. 515,113, Apr. 27, 1990, abandoned. This application Jun. 2, 1995, Ser. No. 459,805
Int. Cl.[6] C08L 75/06; 75/08
U.S. Cl. 428—423.1 19 Claims

1. An article comprising a first substrate having a layer of a composition adhesively bonded thereto, wherein the composition is the moisture cured product of a material that comprised:

(a) from 10 to 90 parts by weight of a first isocyanate-terminated crystalline polyurethane prepolymer that comprises the reaction product of a polyhexamethylene adipate (PHA) having a number average molecular weight (Mn) of at least 2,400, with a polyisocyanate, and

(b) correspondingly, from 90 to 10 parts by weight of a second isocyanate-terminated polyurethane prepolymer that comprises the reaction product of a polytetramethylene ether glycol (THF) having a number average molecular weight (Mn) of at least 500 with a polyisocyanate.

5,558,942
ULTRAVIOLET RAY ABSORBENT COLORED GLASS

Mizuki Itoh, and Takashi Kijima, both of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Nov. 10, 1994, Ser. No. 338,800
Claims priority, application Japan, Nov. 12, 1993, 5-283301
Int. Cl.[6] B32B 17/06
U.S. Cl. 428—426 4 Claims

1. Ultraviolet ray absorbent colored glass for buildings and vehicles, which consists essentially of from 65 to 75 wt % of SiO_2, from 0.1 to 5.0 wt % of Al_2O_3, from 10 to 18 wt % of Na_2O, from 0 to 5 wt % of K_2O, from 5 to 15 wt % of CaO, from 1 to 6 wt % of MgO, from 0.05 to 1.0 wt % of SO_3, from 0.08 to 0.20 wt % of vanadium as calculated as V_2O_5, from 0.36 to 0.65 wt % of MnO_2, from 0 to 0.0020 wt % of CoO and from 0.06 to 0.18 wt % of iron as calculated as Fe_2O_3, wherein from 0 to 10 wt % of the total iron content is FeO.

5,558,943
MOLDING OFBMC MOLDING MATERIALS HAVING IMPROVED SURFACE PROPERTIES

Joachim Zwecker, Weinheim; Dieter Buhl, Frankenthal, and Anton Hesse, Weinheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 17, 1995, Ser. No. 422,908
Claims priority, application Germany, Apr. 29, 1994, 44 15 102.0
Int. Cl.[6] C08G 63/02
U.S. Cl. 428—458 7 Claims

1. A method for preparing an aluminum-coated molding, comprising the steps of:

1) mixing to form a paste

a) from 8 to 20% by weight of an unsaturated polyester resin in the form of a solution in styrene,

b) from 2 to 12% by weight of a crystalline unsaturated polyester, said crystalline unsaturated polyester being insoluble in styrene at room temperature,

c) 0 to 12% by weight of a low-shrink polymer component,

d) from 8 to 20% by weight of reinforcing fibers,

e) from 40 to 70% by weight of fillers, and

f) from 0.1 to 1% by weight of polymerization initiators;

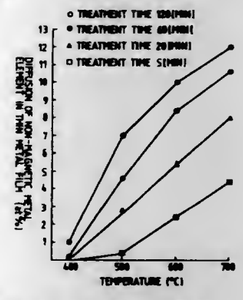
2) molding and curing said paste to form a surface; and

3) vapor depositing a layer of aluminum directly on said surface.

5,558,944
MAGNETIC HEAD AND A PROCESS FOR PRODUCTION THEREOF

Koichi Terunuma, Tokyo, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Aug. 4, 1994, Ser. No. 285,530
Claims priority, application Japan, Aug. 10, 1993, 5-218079
Int. Cl.[6] G11B 5/235
U.S. Cl. 428—611 11 Claims



1. A magnetic head comprising a substrate;

a thin ferromagnetic metal film comprising constituent elements formed on said substrate;

a gap film formed on said thin ferromagnetic metal film; and

an intermediate film having a thickness of 30 to 300 Å of a nonmagnetic metal selected from the group consisting of Cr, Al, Si and alloys thereof, formed between said substrate and ferromagnetic film, between said ferromagnetic film and gap film or between both said substrate and ferromagnetic film and said ferromagnetic film and gap film, forming an intermediate film-ferromagnetic film interface, an intermediate film-gap film interface, or both said interfaces, and

wherein the constituent elements of said thin ferromagnetic metal film are not present in said intermediate film,

prepared by a process comprising the step of:

heating said intermediate film at a temperature of 500°–700° C. for a period of 5 to 120 minutes sufficient to diffuse said nonmagnetic metal of said intermediate film into said ferromagnetic film forming a high concentration of said nonmagnetic metal at said intermediate film-ferromagnetic film interface, intermediate film-gap film interface, or both interfaces and a low concentration of said nonmagnetic metal distributed in a substantially uniform and continuous manner throughout the interior of said ferromagnetic film.

5,558,945
MAGNETIC RECORDING MEDIUM

Shinji Miyazaki; Jiro Yoshinari, and Koji Kobayashi, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Dec. 21, 1994, Ser. No. 360,965
Claims priority, application Japan, Dec. 28, 1993, 5-334145
Int. Cl.[6] G11B 5/66
U.S. Cl. 428—611 1 Claim

1. A magnetic recording medium comprising a non-magnetic substrate and a magnetic layer formed thereon by oblique deposition, said magnetic layer being composed of at least two ferromagnetic metal thin film layers, a lowest film layer disposed closest to the substrate and an uppermost film layer disposed farthest from the substrate, in which each of the thin film layers contains cobalt, nickel or iron, or an alloy thereof, and oxygen, the ferromagnetic thin film of the lowest film layer has a saturation magnetization of 300 emu/cc or less, a coercive force of 1000 Oe or less, a thickness of 300 to 1500 Å and an oxygen content 15 atomic per cent or more, the ferromagnetic thin layer of the uppermost film layer has a saturation magnetization of 300 emu/cc or more, a coercive force of 1000 Oe or more, a thickness of 400 to 1500 Å and an oxygen content of 15 atomic per cent or less, an average value (θ) of angles between growing directions of columnar crystalline particles constituting the ferromagnetic thin film of the lowest film layer and a principal plane of the substrate ranges from 50 to 70 degrees, and an average value (θ) of angles between growing directions of columnar crystalline particles constituting the ferromagnetic thin film of the uppermost film layer and the principal plane of the substrate ranges from 30 to 50 degrees.

5,558,946
MULTILAYERED THIN FERROELECTRIC FILM

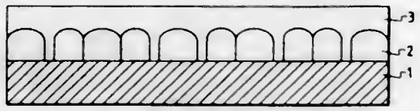
Keiichi Nishimoto, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 4, 1993, Ser. No. 130,882
Claims priority, application Japan, Oct. 5, 1992, 4-288152
Int. Cl.[6] G11B 5/66; B32B 9/00
U.S. Cl. 428—692 4 Claims

1. A multilayered thin ferroelectric film, comprising:

a substrate;

a first layer of polycrystalline ferroelectric film of a hydrolyzed organometallic compound that is formed on said substrate and has a refractive index of a single-crystal grade but whose surface is not optically smooth; and



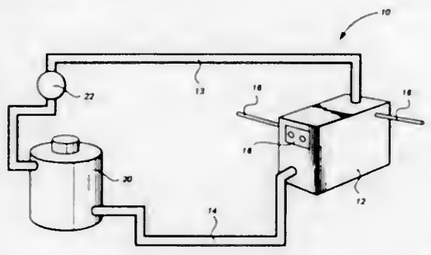
a second layer of polycrystalline ferroelectric film of a hydrolyzed organometallic compound that is formed on said first layer of polycrystalline ferroelectric film, and has a lower refractive index than a single crystal but has an optically smooth surface, the second layer having a density lower than the density of the first layer.

5,558,947

RECHARGEABLE BATTERY SYSTEM AND METHOD AND METAL-AIR ELECTROCHEMICAL CELL FOR USE THEREIN

George D. Robison, 840 W. Paces Ferry Rd., Atlanta, Ga. 30327

Filed Apr. 14, 1995, Ser. No. 422,450
Int. Cl.[6] H01M *8/06*
U.S. Cl. 429—13 **19 Claims**



1. A rechargeable battery system having an electrolyte slurry containing active metal particles, a portion of the active metal particles having an outer layer of reacted metal oxide, comprising:
a plurality of plates forming an anode and a cathode;
a cell case housing said plates and having an output and an input conduit;
divester means in communication with said cell case for at least partially divesting the outer layer of reacted metal oxide from the active metal particles in the electrolyte slurry;
and pump means for recirculating the electrolyte slurry from the output conduit to the input conduit through said divester means.

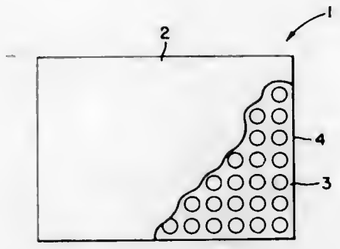
5,558,948

FUEL CELL ANODE AND FUEL CELL

Joel D. Doyon, Bantam, Conn., assignor to Energy Research Corporation, Danbury, Conn.

Filed Nov. 9, 1994, Ser. No. 336,870
Int. Cl.[6] H01M *4/02*
U.S. Cl. 429—40 **40 Claims**

1. A method comprising the steps of:
providing a porous cohesive member formed of a nickel alloy constituent, said porous cohesive member being formed when separate from a support member to which said cohesive member is to be laminated, and said step of providing being carried out such that said nickel alloy constituent of said porous cohesive member is non-sintered; and
laminating said porous cohesive member to said support member to form a nickel anode electrode component, said laminating including bringing said porous cohesive member and said support into contact under pressure of at least about 1000 psi.

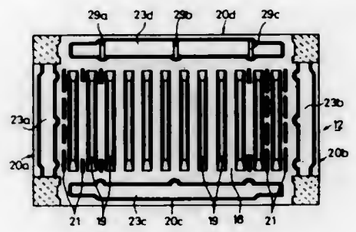


5,558,949

BATTERY BOX

Syuichiro Iwatsuki; Masami Fukagawa; Kei Oshida; Kazuyuki Mochizuki; Hiroyuki Fujimoto, and Masayoshi Okamoto, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1994, Ser. No. 364,610
Claims priority, application Japan, Dec. 27, 1993, 5-348396; Oct. 17, 1994, 6-251010
Int. Cl.[6] H01M *2/10*
U.S. Cl. 429—99 **19 Claims**



1. A battery box for housing at least two rows of batteries, comprising a center frame mounted in the battery box and disposed vertically between the two rows of batteries for holding the batteries in position, said center frame having a plurality of locking pins, holder means for holding the batteries, said holder means comprising central holding means for engaging said locking pins and holding adjacent inner ends of the batteries in the two rows, first end holding means for holding outer ends of the batteries in one of the two rows, and second end holding means for holding outer ends of the batteries in the other of the two rows.

5,558,950

OPTIMIZED CELL PACK FOR LARGE SEALED NICKEL-METAL HYDRIDE BATTERIES

Stanford R. Ovshinsky, Bloomfield Hills; Michael A. Fetcenko, Rochester Hills; Arthur Holland, Bloomfield Hills; Kevin Dean, and Doan Fillmore, both of Waterford, all of Mich., assignors to Ovonic Battery Company, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 26,901, Mar. 5, 1993, abandoned. This application May 5, 1994, Ser. No. 238,570
Int. Cl.[6] H01M *10/50*
U.S. Cl. 429—101 **36 Claims**

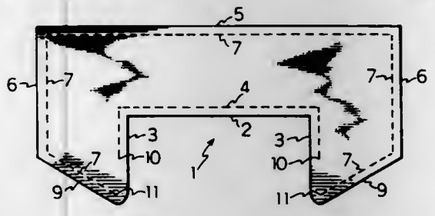
1. A sealed prismatic metal hydride battery greater than 10 Ah in size comprising:
a battery case of metallic thermally conductive material;
nickel hydroxide positive electrodes, and
at least one bundle of thermally conductive sintered metal hydride electrodes in thermal contact with said battery case.

5,558,951

DUST-PROOF DEVICE FOR SKIRT PORTION OF SEAM-TYPE BELLOWS

Takeshi Nemoto, and Teruko Nemoto, both of 4-32, Johmyoji 1-chome, Kamakura 248, Japan

Filed Dec. 12, 1994, Ser. No. 353,829
Claims priority, application Japan, Jan. 7, 1994, 6-012120
Int. Cl.[6] G12B *1/04*
U.S. Cl. 428—102 **3 Claims**



1. A bellows comprising:
a plurality of sheets of mutually identical configuration of the same size, each of said sheets has an upper portion and a pair of side portions extending downward from both ends of said upper portions, said sheets being adjacently ajoined for forming the bellows;
a pair of oblique edges provided in downward slopes to inner sides from outer sides on a pair of lower edges of said side portions;
an outer sewing line provided along outer edges of first adjacent sheets for interconnection therebetween, said outer sewing line extending to the inner sides on said pair of oblique edges;
an inner sewing line provided along inner edges of second adjacent sheets for interconnection therebetween, said inner serving line being terminated at a pair of middle points on the inner edges in the pair of side portions; and
a pair of unsewn portions formed between said pair of inner sides on the pair of oblique edges and said pair of middle points.

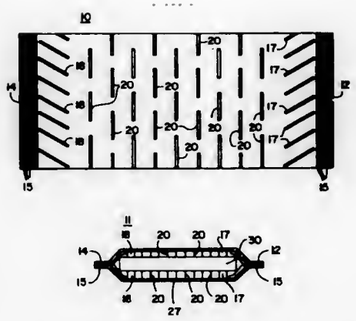
5,558,952

POCKET SEPARATOR FOR ELECTRIC STORAGE BATTERY PLATES

Davis J. Knauer, Kutztown, Pa., assignor to East Penn Mfg. Co., Lyon Station, Pa.

Filed Dec. 15, 1995, Ser. No. 573,139
Int. Cl.[6] H01M *2/18*
U.S. Cl. 429—139 **3 Claims**

1. A pocket separator for forming cell assemblies in an electric storage battery which contains a positive or negative electrode plate which comprises:
a pocket for retaining said plate,
said pocket includes an outer shell with an open top, a closed bottom and closed sides,
said shell is formed of separator material,
a plurality of continuous vertical ribs joined together at the side edges of said pocket,
a plurality of spaced, opposed, angled ribs on each side of said pocket, spaced inwardly from said ribs, facing towards and contacting said plate and,
a plurality of vertical non-continuous ribs in the middle of each of said pocket sides facing towards and in contact with said plate.

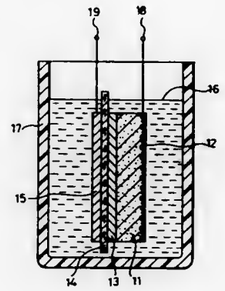


5,558,953

ELECTROCRYSTALLIZED LITHUIM METAL, METHOD FOR PRODUCING THE SAME, AND LITHIUM SECONDARY BATTERY

Tooru Matsui, Fujiidera, and Kenichi Takeyama, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., LTD., Osaka-Fu, Japan

Filed Oct. 7, 1994, Ser. No. 319,761
Claims priority, application Japan, Oct. 21, 1993, 5-263411
Int. Cl.[6] H01M *6/14;4/58*
U.S. Cl. 429—194 **16 Claims**



10. A non-aqueous liquid electrolyte lithium secondary battery comprising:
a rechargeable positive electrode,
a negative electrode consisting of metal lithium with a polygonal surface shape deposited on a metal substrate by electrolysis of a lithium ion-conductive non-aqueous liquid electrolyte, and
a lithium ion-conductive non-aqueous liquid electrolyte.

5,558,954

a) a first electrode flow field plate for use in a first fuel cell in

5,558,957

METHOD FOR MAKING A THIN FLEXIBLE PRIMARY

5,558,954
PREPARATION OF CARBON ELECTRODES BY POLYMER-PRECIPITATION

Robert L. Morrison, Modesto, Calif., assignor to PolyStor Corporation, Dublin, Calif.

Filed Oct. 13, 1994, Ser. No. 322,563
Int. Cl.[6] H01M *4/04*
U.S. Cl. 429—218 **33 Claims**

1. A method of preparing a carbon-based electrode for an electrochemical energy storage call, the method comprising the following steps:

precipitating a polymer from a solution of the polymer in a primary solvent, the precipitated polymer having a fractious morphology;

exchanging the primary solvent in the precipitated polymer with a secondary solvent, wherein the secondary solvent is miscible in the primary solvent, and wherein the polymer is substantially insoluble in a solution of the primary and secondary solvents;

removing the secondary solvent, while in liquid phase, from the precipitated polymer;

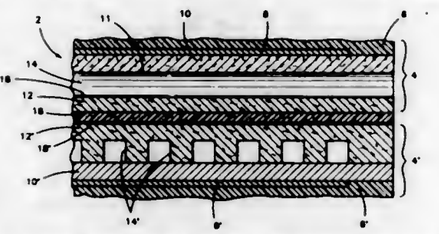
pyrolyzing the precipitated polymer to convert the polymer to a carbon material having the fractious morphology; and

fabricating said carbon-based electrode from the carbon material.

5,558,955
CATHODE REACTANT FLOW FIELD COMPONENT FOR A FUEL CELL STACK

Richard D. Breault, Coventry, Conn.; Ronald G. Martin, Monson, Mass.; Robert P. Roche, Cheshire, and Gregory R. Kline, Ledyard, both of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Filed Oct. 7, 1994, Ser. No. 319,897
Int. Cl.[6] H01M *4/96*
U.S. Cl. 429—38 **30 Claims**



13. A liquid electrolyte fuel cell stack subassembly comprising:

a) a first electrode flow field plate for use in a first fuel cell in said stack, said flow field plate being formed of a mixture of natural graphite flakes and a hydrophobic resinous binder and having first parallel reactant flow passages formed therein which passages extend transversely across one face of said plate from one side thereof to the other, said first electrode flow field plate being porous and capable of absorbing the electrolyte so as to serve as an electrolyte reservoir plate for the fuel cell stack;

b) an electrically conductive carbon separator plate adjacent to said first flow field plate on the side thereof opposite said first reactant flow passages, said separator plate separating said first fuel cell from an adjacent fuel cell in the stack;

c) a first melted and resolidified hydrophobic resin film layer interposed between said first flow field plate and said separator plate, said first resin film layer bonding said first flow field plate to said separator plate;

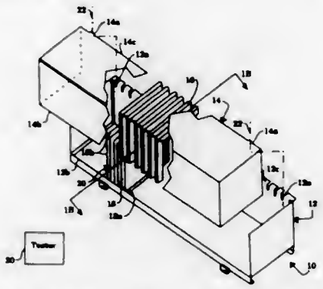
d) a second electrode flow field plate for use in said adjacent fuel cell in the stack, said second flow field plate having second parallel reactant flow passages formed therein which second passage extend transversely across a face of said second plate which is distal of said separator plate, said second flow passages extending in a direction which is perpendicular to said first flow passages, said second flow field plate being essentially non-porous and hydrophobic, and incapable of serving as an electrolyte reservoir plate for the fuel cell stack; and

e) a second melted and resolidified hydrophobic resin film layer interposed between said second flow field plate and said separator plate, said second resin film layer bonding said second flow field plate to said separator plate.

5,558,956
SYSTEM FOR ISOLATING BATTERIES DURING TESTING

Rudolf Gujer, 18423 McCoy Ave., Saratoga, Calif. 95070, and Clifford B. Simpson, 6452 Hesket Ct., San Jose, Calif. 95123

Filed Aug. 30, 1995, Ser. No. 522,211
Int. Cl.[6] H01M *2/10*
U.S. Cl. 429—99 **9 Claims**



1. An apparatus for isolating batteries during testing, comprising:

(a) a container including

(i) a shell; and

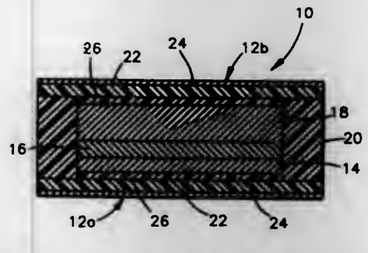
(ii) a plurality of partitions arranged in a linear array and attached to the shell, so that any two adjacent partitions and a portion of the shell between such two adjacent partitions form a pocket, each pocket adapted to receive a battery, each pocket having an opening for passage of the battery into the pocket, and wherein at least one of the partitions separating two adjacent pockets has a edge; and

(b) a cover including at least one shield blocking the opening of at least one pocket from an adjacent pocket, said shield having a U-shaped cross-section, and being shaped to enclose the edge of said partition, so that a battery inside said at least one pocket is shielded from a battery in the adjacent pocket.

5,558,957
METHOD FOR MAKING A THIN FLEXIBLE PRIMARY BATTERY FOR MICROELECTRONICS APPLICATIONS

Madhav Datta, Yorktown Heights, and Ravindra V. Shenoy, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 26, 1994, Ser. No. 329,347
Int. Cl.[6] H01M *4/70*
U.S. Cl. 429—127 **29 Claims**



1. A flexible primary battery suitable for microelectronics applications, the battery comprising::

a first flexible current collector comprising a first polymeric sheet having a first metal foil on a first surface of the first polymeric sheet and a first metal film on a second surface of the first polymeric sheet, the first polymeric sheet being exposed at the perimeter of the first surface;

a polymeric wall sealingly abutting the polymeric sheet along the perimeter of the first surface so as to form a cavity with the first flexible current collector;

a lithium anode disposed within the cavity and overlaying the first metal foil on the first surface of the first polymeric sheet;

a flexible lithium electrolyte membrane disposed within the cavity and overlaying the lithium anode;

a flexible cathode disposed within the cavity and overlaying the lithium electrolyte membrane, the cathode comprising an inorganic powder of lithium intercalation compound and lithium salts dispersed in a polymeric binder;

a second flexible current collector comprising a second polymeric sheet having a second metal foil on a first surface of the second polymeric sheet and a second metal film on a second surface of the second polymeric sheet, the second polymeric sheet sealingly abutting the polymeric wall at the perimeter of the first surface of the second polymeric sheet; and

leads associated with the first and second flexible current collectors;

wherein the first and second polymeric sheets and the polymeric wall form a sealed package which encloses the lithium anode, the lithium electrolyte membrane, and the cathode.

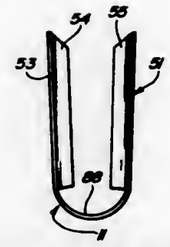
5,558,958
FLEXIBLE CORE SPACER FOR STORAGE BATERIES

Edward N. Mrotek, Grafton, and Norbert Schilling, Milwaukee, both of Wis., assignors to Globe-Union, Inc., Milwaukee, Wis.

Filed Oct. 13, 1994, Ser. No. 322,234
Int. Cl.[6] H01M *2/18*
U.S. Cl. 429—146 **17 Claims**

1. A flexible spacer for positioning in a cell compartment of a storage battery a cell element including a series of alternating positive and negative plates separated by separators, said cell element having first and second opposing side surfaces, said battery including a container having first and second walls which define said cell compartment within said container, said flexible spacer comprising:

a sheet member including first and second spacing portions having first ends joined together by a central portion defining a U-shaped receptacle for receiving and supporting said plates by lower edges of said plates;



said sheet member being adapted to be inserted, with said cell element formed by said positive and negative plates supported therein, into said cell compartment with said first spacing portion interposed between said first side surface of said cell element and said first wall of said container and engaging said first side surface of said cell element and said first wall of said container for spacing said cell element from said first wall of said container and with said second spacing portion interposed between said second side surface of said cell element and said second wall of said container and engaging said second side surface of said cell element and said second wall of said container for spacing said cell element from said second wall of said container;

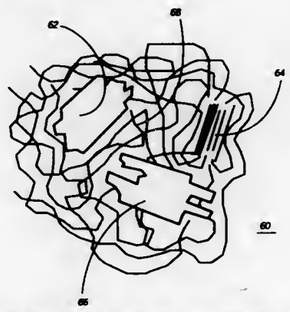
said first and second spacing portions each having first and second sides;

said first spacing portion including a first plurality of ribs disposed between said first and second sides thereof and said second spacing portion including a second plurality of ribs disposed between said first and second sides thereof, defining respective first and second corrugated sections that flex in spacing said cell element from said first and second walls of said container.

5,558,959
POLYURETHANE BASED ELECTROLYTES FOR ELECTROCHEMICAL CELLS AND ELECTROCHEMICAL CELLS USING SAME

Ganesh Venugopal, Duluth; Veronica R. Reichert, Bethlehem, and Jinshan Zhang, Duluth, all of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 279,131, Jul. 22, 1994. This application Feb. 21, 1996, Ser. No. 603,565
Int. Cl.[6] H01M *10/40;6/14*
U.S. Cl. 429—19.2 **7 Claims**



1. An electrolyte system for an electrochemical cell comprising an electrolyte active species dispersed in a polymeric support structure having a repeating unit of the following formula:

$$+R_1-NH-\overset{O}{\overset{\|}{C}}-O-R_2\rightarrow_x$$

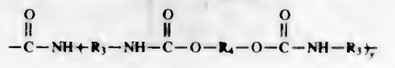
where x is the number of repeating m-fits and is selected so as to

a casing containing a sulfuric acid electrolyte solution including

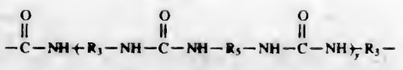
5,558,964

where x is the number of repeating m-fits and is selected so as to yield a product with a molecular weight between 10,000 and 500,000 g/mol.;

R_1 is a condensation product of a diisocyanate of the formula (OCN—R_3—NCO), and a chain extender having a formula selected from the group of (HO—R_4—OH), and (H_2N—R_5—NH_2), and wherein R_1 is represented by the formula:



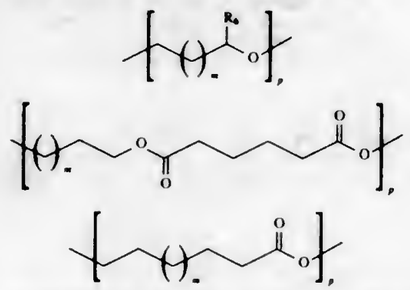
or



where y is the number of repeating units and is between 1 and 10, and R_3 is a linear, branch or cyclic aliphatic, an alkyl substituted aromatic, an alkyl linked diaromatic moiety, a fused aromatic group or a combination thereof;

R_4 and R_5 are alkyl or aryl groups; and

R_2 is represented by a formula selected from the group of;



and combinations thereof, and wherein p is selected so that the molecular weight of R_2 is between 300 & 10,000 g/mol, R_6 is selected from H and $—(CH_2)_mCH_3$, wherein m is the number of repeating units and is between 0 and 8.

5,558,960

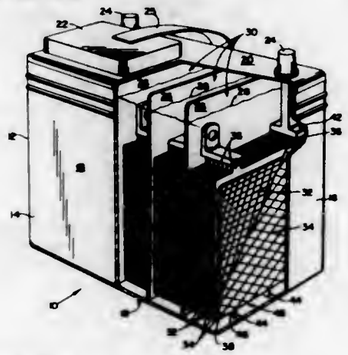
SEASONAL USE LEAD ACID ELECTRICAL STORAGE BATTERY

Howard E. Mitchell, Clarkston, Mich., assignor to Exide Corporation, Reading, Pa.

Filed May 3, 1995, Ser. No. 433,743

Int. Cl.[6] H01M *4/36*

U.S. Cl. 429—205 **1 Claim**



1. A lead acid battery comprising:

a casing containing a sulfuric acid electrolyte solution including sulfuric acid and sodium sulfate;

a plurality of positive plates immersed in the sulfuric acid electrolyte solution and including positive active lead materials;

a plurality of negative plates interspersed between the positive plates and immersed in the sulfuric acid electrolyte solution and including negative active lead materials;

wherein the ratio by weight of materials in a cell of the battery before discharge comprises:

1.3 to 1.5 parts active positive lead material to one part negative lead material,

1.1 to 1.2 parts sulfuric acid to one part negative lead material, and

0.025 to 0.035 parts sodium sulfate to one part negative lead material.

5,558,961

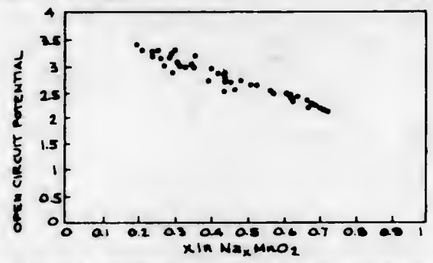
SECONDARY CELL WITH ORTHORHOMBIC ALKALI METAL/MANGANESE OXIDE PHASE ACTIVE CATHODE MATERIAL

Marca M. Doeff, Hayward; Marcus Y. Peng, Cupertino; Yanping Ma, Albany; Steven J. Visco, Berkeley, and Lutgard C. DeJonghe, Lafayette, all of Calif., assignors to Regents, University of California, Oakland, Calif.

Filed Jun. 13, 1994, Ser. No. 259,658

Int. Cl.[6] H01M *10/38*

U.S. Cl. 429—224 **31 Claims**



1. An alkali manganese oxide secondary cell characterized by the presence of orthorhombic alkali metal manganese oxide in the active cathode material comprising:

a) an anode; and

b) an orthorhombic active cathodic material, initially formed as orthorhombic $Na_{0.44}Z_yMn_{(1-y)}O_2$, said orthorhombic cathodic material having the formula $M_xZ_yMn_{(1-y)}O_2$, where M is one or more alkali metals selected from the group consisting of lithium, sodium, potassium, and mixtures of same, x ranges from 0.2 to 0.75, depending upon the state of charge of the cathode, Z is a metal capable of substituting for manganese in the orthorhombic structure, and y is 0 to 60 atomic %.

5,558,962

ALUMINUM CURRENT COLLECTOR FOR AN ELECTROCHEMICAL CELL HAVING A SOLID CATHODE

Nikola Mariscic, Winchester, and Luka Rabadjija, Newton, both of Mass., assignors to Pacesetter, Inc., Sylmar, Calif.

Filed Jun. 2, 1995, Ser. No. 459,684

Int. Cl.[6] H01M *4/64*

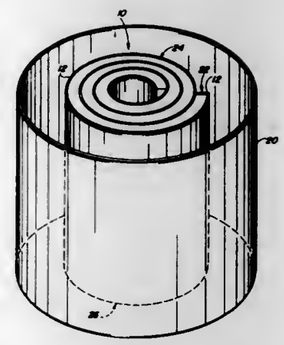
U.S. Cl. 429—233 **12 Claims**

1. An electrochemical cell for use in an implantable device, the electrochemical cell comprising:

an electrode structure including:

a solid cathode employing polycarbon monofluoride formed on one side of a current collector formed of aluminum,

an anode, and



a separator between the anode and the cathode;

a housing surrounding the electrode structure; and

a non-aqueous electrolyte filling a portion of the housing;

wherein the housing includes nickel and wherein the aluminum current collector of the electrode structure is interposed directly between the housing and the polycarbon monofluoride of the solid cathode.

5,558,963

METHOD OF PRODUCING PHOTOMASK AND EXPOSING

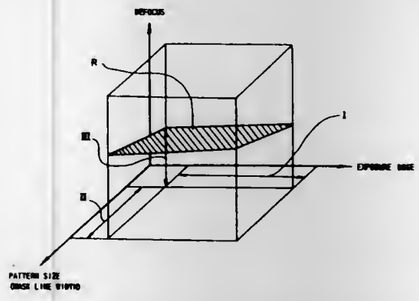
Keisuke Tsudaka, and Minoru Sugawara, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 4, 1994, Ser. No. 336,656

Claims priority, application Japan, Nov. 8, 1993, 5-302339; Mar. 11, 1994, 6-069113

Int. Cl.[6] G03F *9/00*

U.S. Cl. 430—22 **12 Claims**



6. A method of exposing using a photomask having a tansmitting area and a light shielding area, said method comprising the steps of:

setting combinations of pluralities of exposure dose and mask pattern size values in predetermined ranges of the exposure dose latitude and the mask pattern size latitude;

obtaining transfer patterns by varying the defocus in the neighborhood of the just focus; and

checking whether the transfer gatterns meet a design tolerance condition, thereby obtaining the defocus latitude as the range of defocus meeting the tolerance condition in all the predetermined ranges of the exposure dose latitude and the mask pattern size latitude;

a mask parameter being set for maximizing the obtained defocus latitude.

5,558,964

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER, AND ELECTROPHOTOGRAPHIC APPARATUS, DEVICE UNIT, AND FACSIMILE MACHINE EMPLOYING THE SAME

Toshiyuki Yoshihara, Tokyo; Nobuyuki Hanami, Matsudo; Hideyuki Takai, Yokohama; Hideki Anayama, Yokohama; Hajime Miyazaki, Yokohama; Junichi Kishi, Tokyo; Itaru Yamazaki, Yokohama; Harumi Sakoh, Kawasaki; Tetsuro Kanemaru, Tokyo; Kazushi Iuchi, Ebetsu, and Hideyuki Ainoya, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

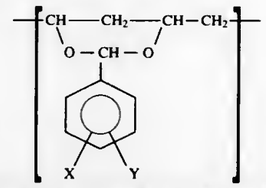
Continuation of Ser. No. 964,950, Oct. 22, 1992, abandoned. This application Dec. 12, 1994, Ser. No. 354,441

Claims priority, application Japan, Oct. 25, 1991, 3-305707

Int. Cl.[6] G03G *15/02*

U.S. Cl. 430—58 **14 Claims**

1. An electrophotographic photosensitive member comprising an electroconductive support, and a photosensitive layer formed thereon, the photosensitive layer containing oxytitanium phthalocyanine and a polyvinyl acetal resin having a structural unit represented by Formula (1) below:



(1)

wherein X is a hydrogen atom, a fluorine atom, a chlorine atom, a bromine atom, a nitro group, or a cyano group; and Y is a fluorine atom, a chlorine atom, a bromine atom, a nitro group, or a cyano group.

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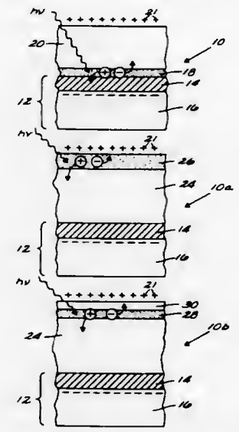
DIIMINOQUINILIDINES AS ELECTRON TRANSPORT AGENTS IN ELECTROPHOTOGRAPHIC ELEMENTS

Khe C. Nguyen, Los Altos, and Sivapackia Ganapathiappan, Fremont, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 21, 1995, Ser. No. 576,233

Int. Cl.[6] G03G *5/047;5/09*

U.S. Cl. 430—58 **20 Claims**



1. An electrophotographic element for use in electrophotographic printing, said electrophotographic element including a

charge generation region and a charge transport region and formed on an electrically conducting substrate, said charge transport region including at least one electron transport agent having the structure

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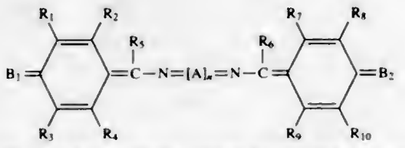
5,558,966

ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

component containing at least one polar group selected from the specified polar groups as described in the resin

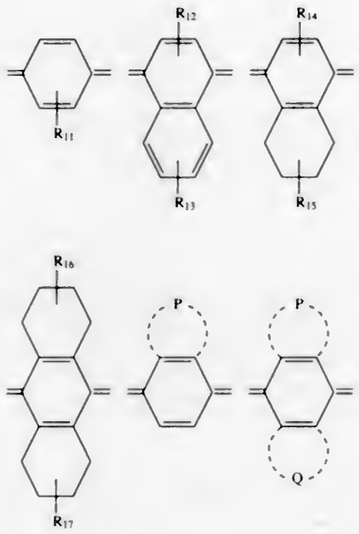
nent represented by the general formula (I) in an amount not less than 30% by weight based on the AB block

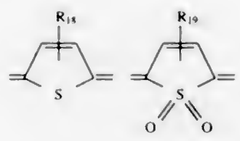
charge generation region and a charge transport region and formed on an electrically conducting substrate, said charge transport region including at least one electron transport agent having the structure



(I)

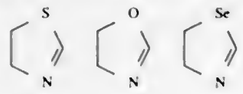
where A is a moiety selected from the group consisting of =CH—CH=,





B_1 and B_2 are independently selected from the group consisting of O, S, Se, Te, dicyano, and alkoxy, and R_1 to R_{20} are independently selected from the group consisting of alkyl, alkene, aryl, hydroxy, halogen, cyano, nitro, and sulfuryl, n is an integer within the range of 0 to 3, and

are independently selected from the group consisting of



and n is an integer of 0, 1, or 2.

5,558,966

ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Eiichi Kato, and Kazuo Ishii, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 30,498, Mar. 30, 1993, abandoned. This application May 30, 1995, Ser. No. 454,492

Claims priority, application Japan, Jul. 30, 1991, 3-211350; Aug. 5, 1991, 3-218048; Oct. 11, 1991, 3-290457; May 26, 1992, 4-157277; May 26, 1992, 4-157278; WIPO, Jul. 30, 1992, PCT/JP92/00967

Int. Cl.[6] G03G 5/05

U.S. Cl. 430—96 **7 Claims**

1. An electrophotographic light-sensitive material comprising a photoconductive layer containing at least an inorganic photoconductive substance, a spectral sensitizing dye and a binder resin, the binder resin comprising at least one resin selected from the group consisting of resin (A_1), resin (A_2) and resin (A_3) shown below and at least one resin (B) shown below:

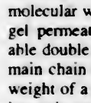
Resin (A_1):

A copolymer having a weight average molecular weight of from 1×10^3 to 2×10^4 as determined by gel permeation chromatography and being formed from at least a monofunctional macromonomer (M_1) described below and a monomer corresponding to a repeating unit represented by the general formula (I) described below, wherein the copolymer has a polymer component containing at least one polar group selected from the group consisting of $—PO_3H_2$, $—SO_3H$, —COOH,

(wherein R^1 represents a hydrocarbon group or $—OR^2$ (wherein R^2 represents a hydrocarbon group)) and a cyclic acid anhydride group bonded at one terminal of the main chain thereof;

Monofunctional macromonomer (M_1):

A monofunctional macromonomer having a weight average molecular weight of not more than 2×10^4 as determined by gel permeation chromatography and having a polymerizable double bond group bonded at only one terminal of the main chain of a polymer containing not less than 30% by weight of a polymer component corresponding to a repeating unit represented by the general formula (I) described below:



(I)

(wherein a^1 and a^2 each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group, $—COOR^4$ or $—COOR^4$ bonded via a hydrocarbon group (wherein R^4 represents a hydrocarbon group); and R^3 represents a hydrocarbon group);

Resin (A_2):

A copolymer having a weight average molecular weight of from 1×10^3 to 2×10^4 as determined by gel permeation chromatography and being formed from at least a monofunctional macromonomer (M_2) described below and a monomer corresponding to a repeating unit represented by the general formula (I) described above;

Monofunctional macromonomer (M_2):

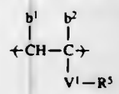
A monofunctional macromonomer having a weight average molecular weight of not more than 2×10^4 as determined by gel permeation chromatography and having a polymerizable double bond group at only one terminal of the main chain of a polymer containing at random not less than 30% by weight of a polymer component corresponding to a repeating unit represented by the general formula (I) described above and from 1 to 50% by weight of a polymer component containing at least one polar group selected from the specified polar groups as described in the resin (A_1) above;

Resin (A_3):

A copolymer having a weight average molecular weight of from 1×10^3 to 2×10^4 as determined by gel permeation chromatography and being formed from at least a monofunctional macromonomer (M_3) described below and a monomer corresponding to a repeating unit represented by the general formula (I) described above;

Monofunctional macromonomer (M_3):

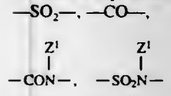
A monofunctional macromonomer having a weight average molecular weight of not more than 2×10^4 as determined by gel permeation chromatography, comprising an AB block copolymer being composed of an A block containing a polymer component containing at least one polar group selected from the specified polar groups as described in the resin (A_1) above and a B block containing a polymer component corresponding to a repeating unit represented by the general formula (II) described below and having a polymerizable double bond group bonded at the terminal of the main chain of the B block polymer:



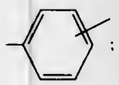
(II)

wherein b^1 and b^2 each represents a hydrogen atom, a halogen atom, a cyano group, a hydrocarbon group, $—COOR^4$ or $—COOR^4$ bonded via a hydrocarbon group (wherein R^4 represents a hydrocarbon group); V^1 represents —COO—, —OCO—,

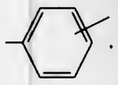
(wherein a represents an integer of from 1 to 3), —O—, $—SO_2—$, —CO—,



(wherein Z^1 represents a hydrogen atom or a hydrocarbon group), —CONHCOO—, —CONHCONH— or



and R^5 represents a hydrocarbon group, provided that when V^1 represents



R^5 represents a hydrogen atom or a hydrocarbon group;

Resin (B):

An AB block copolymer having a weight average molecular weight of from 3×10^4 to 1×10^6 as determined by gel permeation chromatography and comprising an A block comprising a polymer component containing at least one polar group selected from the specific polar groups as described in the resin (A_1) above and a B block containing a polymer component corresponding to a repeating unit represented by the general formula (I) as described in the resin (A_1) above, wherein the A block contains the polymer component containing the polar group in an amount of from 0.05 to 10% by weight based on the AB block copolymer and the B block contains the polymer component represented by the general formula (I) in an amount not less than 30% by weight based on the AB block copolymer.

5,558,967

TONER FOR DEVELOPING ELECTROSTATIC IMAGE AND TWO-COMPONENT TYPE DEVELOPER FOR DEVELOPING ELECTROSTATIC IMAGE

Takayuki Nagatsuka, Yokohama; Takashige Kasuya, Soka; Tatsuya Nakamura, Tokyo; Makoto Kanbayashi, Kawasaki, and Tatsuhiko Chiba, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 944,898, Sep. 15, 1992, abandoned. This application Oct. 31, 1994, Ser. No. 332,474

Claims priority, application Japan, Sep. 19, 1991, 3-268202; Aug. 31, 1992, 4-231975

Int. Cl.[6] G03G 9/087

U.S. Cl. 430—106.6 **69 Claims**

1. A toner for developing an electrostatic image, comprising toner particles and an inorganic oxide, wherein

said toner particles having been prepared by polymerizing in an aqueous medium a monomer composition containing at least polymerizable monomers, a paraffin wax and a polyester resin;

said toner particles contain from 0.1% by weight to 15% by weight of a polyester resin having an acid value from 5 mg KOH/g to 50 mg KOH/g and a weight average molecular weight from 1,000 to 14,000 and from 16% by weight to 50% by weight of a paraffin wax having a melting point of from 50° to 90° C.;

resin components in said toner particles, containing polymers produced by polymerization of the polymerizable monomers and the polyester resin, have a weight average molecular weight from 5,000 to 45,000;

said inorganic oxide has a BET specific surface area of not less than 80 m^2/g; and

said toner has a water absorption from 300 ppm to 5,000 ppm.

5,558,968

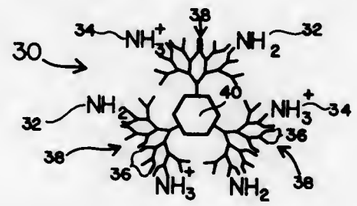
DENDRIMERIC TONER PARTICLES FOR LIQUID ELECTROPHOTOGRAPHY

Dale D. Russell, and James G. Bearss, both of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 26, 1995, Ser. No. 378,425

Int. Cl.[6] G03G 9/00

U.S. Cl. 430—109 **8 Claims**



1. A dendrimeric toner particle for use in liquid electrophotography comprising:

a core comprising a colorant, and

a plurality of dendrons covalently attached to and branching radially out from the core, each of said dendrons comprising:

a polymer unit comprising a resin, and

a final polymer unit comprising at least one coordinating group for a charge director.

5. An electrophotographic method comprising:

(a) establishing a uniform charge on a photoconductor;

(b) exposing said photoconductor to light to form a latent image

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RESIST MATERIAL

atoms, a straight-chain or branched alkoxy group having 1–5 carbon atoms or a group of the formula (d):

(a)

(b) exposing said photoconductor to light to form a latent image on said photoconductor; and

(c) developing said latent image with a liquid toner comprising a dendrimeric toner particle comprising:

a core comprising a colorant and a plurality of dendrons covalently attached to and branching radially out from the core,

wherein each of the dendrons comprise a polymer unit comprising a resin and a final polymer unit comprising at least one coordinating group for charge director.

5,558,969

ELECTRO(STATO)GRAPHIC METHOD USING REACTIVE TONERS

Carlo Uyttendaele, Mortsel; Werner O. de Beeck, Keerbergen; Luc Leenders, Herentals, and Serge Tavernier, Lint, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Sep. 22, 1995, Ser. No. 532,501

Claims priority, application European Pat. Off., Oct. 3, 1994, 94202848

Int. Cl.[6] G03G *13/20*

U.S. Cl. 430—124 **24 Claims**

1. An electro(stato)graphic method comprising the steps of image wise applying toner particles to a final non-photoconductive substrate and fixing said toner particles on said final substrate, wherein

(i) said toner particles comprise at least one reductant (compound A) and said final substrate comprises at least one substantially light insensitive silver salt (compound B) or vice versa, so as to be capable, upon reaction of compound A and B, of forming a light absorbing substance in said final substrate,

(ii) said toner particles optionally comprise a light absorbing pigment or dye,

(iii) said light absorbing substance can give a maximum density (D_{max})>2.00 either on itself or in combination with said light absorbing pigment or dye and

(iv) said toner particles are fixed on to the final substrate by heat or by heat and pressure.

5,558,970

ENHANCING COHESIVENESS OF DEVELOPED IMAGES

Benzion Landa, Edmonton, Canada; Yakov Krumberg, Rehovot, Israel; Yaacov Almog, Ramat Hasharon, and Yehude Niv, Rehovot, Israel, assignors to Indigo N.V., SM Veldhoven, Netherlands

Continuation of Ser. No. 272,323, Jan. 17, 1988, Pat. No. 5,426,491. This application Jun. 3, 1995, Ser. No. 433,564

Int. Cl.[6] G03G *13/16*

U.S. Cl. 430—126 **35 Claims**

1. An imaging process comprising:

forming an image on an electrostatic imaging surface;

at least partially fusing the image to produce a coalesced image prior to the transfer of the image from the surface without fixing the image to said surface; and

transferring the image to a final substrate.

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RESIST MATERIAL

Fumiyoshi Urano; Takaai Negishi, both of Kawagoe; Akiko Katsuyama, Moriguchi, and Masayuki Endo, Izumi, all of Japan, assignors to Wako Pure Chemical Industries, Ltd., and Matsushita Electric Industrial Co., Ltd., both of Osaka, Japan

Filed Mar. 21, 1995, Ser. No. 407,611

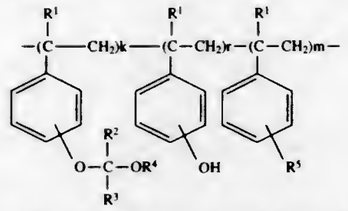
Claims priority, application Japan, Sep. 2, 1994, 6-234246

Int. Cl.[6] G03F *7/004; 7/30*

U.S. Cl. 430—170 **7 Claims**

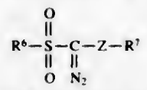
1. A resist material comprising:

(a) a polymer represented by the formula (1):



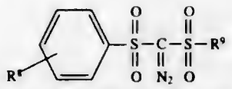
(1)

wherein R^2 is a hydrogen atom or a methyl group; R^2 and R^3 are independently a hydrogen atom, a straight-chain, branched or cyclic alkyl group having 1–6 carbon atoms, a straight-chain or branched haloalkyl group having 1–6 carbon atoms, or a phenyl group, provided that R^2 and R^3 are not hydrogen atom at the same time, or R^2 and R^3 may combine to form a methylene chain having 2–5 carbon atoms; R^4 is a straight-chain, branched or cyclic alkyl group having 1–10 carbon atoms, a straight-chain, branched or cyclic haloalkyl group having 1–6 carbon atoms, an acetyl group or an aralkyl group; R^5 is a hydrogen atom, a halogen atom, a straight-chain, branched or cyclic alkyl group having 1–6 carbon atoms, a straight-chain, branched or cyclic alkoxy group having 1–6 carbon atoms, a tetrahydropyranyloxy group, a tetrahydrofuranyloxy group, a tert-butoxycarbonyloxy group, a tert-butoxycarbonylmethoxy group or an acetyloxy group; and k, r and m are independently an integer of 1 or more, provided that $0.10 \leqq (k+m)/(k+r+m) \leqq 0.90$ and $0.01 \leqq m/(k+r+m) \leqq 0.25$, (b) at least one photosensitive compound capable of generating an acid upon exposure to light, selected from the group consisting of the photosensitive compounds represented by the following formula (2), the photosensitive compounds represented by the following formula (3), the photosensitive compounds represented by the following formula (4), the photosensitive compounds represented by the following formula (5), the photosensitive compounds represented by the following formula (6) and the photosensitive compounds represented by the following formula (7):



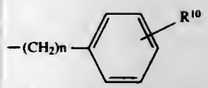
(2)

wherein R^6 and R^7 are independently a straight-chain, branched or cyclic alkyl group having 1–10 carbon atoms or a haloalkyl group having 1–10 carbon atoms; and Z is a sulfonyl group or a carbonyl group;



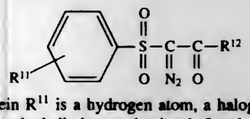
(3)

wherein R^8 is a hydrogen atom, a halogen atom, a straight-chain or branched alkyl group having 1–5 carbon atoms, a straight-chain or branched alkoxy group having 1–5 carbon atoms, or a straight-chain or branched haloalkyl group having 1–5 carbon atoms; and R^9 is a straight-chain, branched or cyclic alkyl group having 1–10 carbon atoms, a haloalkyl group having 1–10 carbon atoms, or a group represented by the formula (a):



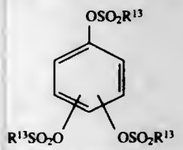
(a)

wherein R^{10} is a hydrogen atom, a halogen atom, a straight-chain or branched alkyl group having 1–5 carbon atoms, a straight-chain or branched alkoxy group having 1–5 carbon atoms, or a straight-chain or branched haloalkyl group having 1–5 carbon atoms; and n is 0 or an integer of 1–3;



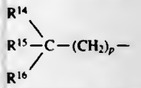
(4)

wherein R^{11} is a hydrogen atom, a halogen atom, a straight-chain or branched alkyl group having 1–5 carbon atoms, an aralkyl group or a trifluoromethyl group; and R^{12} is a straight-chain, branched or cyclic alkyl group having 1–10 carbon atoms, an aralkyl group, a straight-chain or branched alkoxy group having 1–5 carbon atoms, a phenyl group or a tolyl group;



(5)

wherein R^{13} is a group represented by the formula (b):

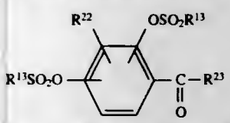


(b)

wherein R^{14}, R^{15} and R^{16} are independently a hydrogen atom or a halogen atom; and p is 0 or an integer of 1–3, or a group represented by the formula (c):

(c)

wherein R^{17} R^{18} R^{19} R^{20} and R^{21} are independently a hydrogen atom, a halogen atom, a straight-chain or branched alkyl group having 1–5 carbon atoms, a straight-chain or branched alkoxy group having 1–5 carbon atoms, a trifluoromethyl group, a hydroxyl group, a trifluoromethoxy group or a nitro group;

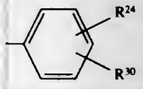


(6)

wherein R^{13} is as defined above; R^{23} is a hydrogen atom, a hydroxyl group or .a group represented by the formula (d):

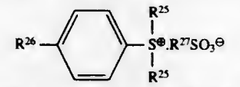
$$R^{13}SO_2O- \quad (d)$$

wherein R^{13} is as defined above; and R^{23} is a straight-chain or branched alkyl group having 1–5 carbon atoms or a group represented by the formula (e):



(e)

wherein R^{24} and R^{30} are independently a hydrogen atom, a halogen atom, a straight-chain or branched alkyl group having 1–5 carbon atoms, a straight-chain or branched alkoxy group having 1–5 carbon atoms or a group of the formula (d);



(7)

wherein R^{25} is a straight-chain or branched alkyl group having 1–4 carbon atoms, a phenyl group, a substituted phenyl group or an aralkyl group; R^{26} is a hydrogen atom, a halogen atom or a straight-chain, branched or cyclic alkyl group having 1–6 carbon atoms; R^{27} is a straight-chain or branched perfluoroalkyl group having 1–8 carbon atoms, a straight-chain, branched or cyclic alkyl group having 1–8 carbon atoms, a 1-naphthyl group, a 2-naphthyl group, a 10-camphor group, a phenyl group, a tolyl group, a 2,5-dichlorophenyl group, a 1,3,4-trichlorophenyl group or a trifluoromethylphenyl group; and

(c) a solvent capable of dissolving the above components (a) and (b).

5,558,972

THERMAL TRANSFER PRINTING OF A REDUCING AGENT TO A SILVER SOURCE CONTAINED IN AN IMAGE RECEIVING LAYER

Marc Van Damme, Heverlee; Herman Uytterhoeven, Bonheiden, and Geert Defieuw, Kessel-Lo, all of Belgium, assignors to Agfa-Gevaert, Mortsel, Belgium

Filed May 25, 1995, Ser. No. 450,632

Claims priority, application European Pat. Off., Jun. 27, 1994, 94201827

Int. Cl.[6] G03C *8/00*

U.S. Cl. 430—200 **7 Claims**

1. A thermal imaging process comprising the steps of:

a) bringing a donor layer of a donor element into face to face relationship with a curable layer of a receiving element to obtain an assemblage, said receiving element further having a receiving layer below said curable layer,

b) image-wise heating the assemblage, thereby causing image-wise transfer of an amount of a thermotransferable reducing agent to said receiving element, the amount of transferred reducing agent being proportional to the amount of heat supplied,

c) separating said donor element from said receiving element,

d) curing said curable layer, and

e) overall heating said receiving element, wherein

(i) said donor element comprises on a support, (a) a donor layer comprising a binder and a thermotransferable reducing agent which is capable of reducing a silver source to metallic silver upon heating, and

(ii) said receiving element comprises said receiving layer on a support, said receiving layer comprising a silver source which is capable of being reduced by means of heat in the presence of the reducing agent.

5,558,973

HEAT-DEVELOPABLE COLOR LIGHT-SENSITIVE MATERIAL AND METHOD FOR PRODUCING THE SAME

Makoto Yamada, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 31, 1995, Ser. No. 381,394

Claims priority, application Japan, Feb. 1, 1994, 6-010627

Int. Cl.[6] G03C *8/40; 1/825*

U.S. Cl. 430—203 **3 Claims**

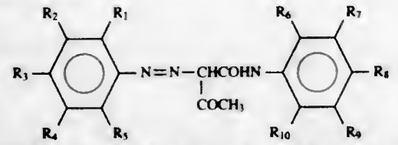
1. A heat-developable color light-sensitive material comprising, on a support, at least a light-sensitive silver halide, a non-diffusible dye-donating compound capable of releasing or forming a diffusible dye in correspondence or reverse correspondence with a reaction of reducing the silver halide to silver, and a binder, which

contains a solid organic pigment represented by the following

X is an acyl group selected from the group consisting of

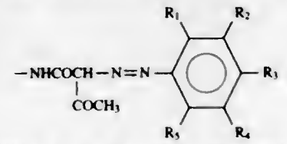
5,558,976

contains a solid organic pigment represented by the following formula (I) in at least one layer of a light-sensitive silver halide emulsion layer and its adjacent layers and which contains an alginic acid derivative in the same layer containing the solid organic pigment:



(I)

wherein R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9 and R_{10} each represents a hydrogen atom or a substituent selected from the group consisting of a halogen atom, an alkyl group, an alkoxy group, a nitro group, an acyl group, an aryl group, an aryloxy group, a sulfamoyl group, an alkylsulfamoyl group, an arylsulfamoyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a carbamoyl group, an alkylcarbamoyl group, an arylcarbamoyl group, an acylamino group, an alkylsulfonylamino group, an arylsulfonylamino group, a ureido group, and a group represented by the following formula (II), which may be substituted by one or more of said substituents:



(II)

wherein R_1, R_2, R_3, R_4 and R_5 in formula (II) have the same meanings as R_1, R_2, R_3, R_4 and R_5 in formula (I), however each are the same as or different from those in formula (I); R_1 and R_2; R_2 and R_3; R_3 and R_4; R_4 and R_5; R_6 and R_7; R_7 and R_8; R_8 and R_9; or R_9 and R_{10} may be combined with each other to form a heterocylic ring; and the pigment may be a biscompound formed by bonding two formulae (I) via R_3 or R_8, or via a single bond at a position of R_3 or R_8.

5,558,974

PHOTOGRAPHIC MATERIAL CONTAINING A NEW TYPE OF HYDRAZIDE

Johan Loccufier, Zwijnaarde, and Hieronymus Andriessen, Beerse, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

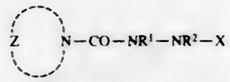
Filed Mar. 7, 1995, Ser. No. 399,594

Claims priority, application European Pat. Off., Mar. 11, 1994, 94200632

Int. Cl.[6] G03C 1/06

U.S. Cl. 430—264 **6 Claims**

1. Photographic material comprising a support and at least one silver halide emulsion layer, characterized in that said at least one emulsion layer contains a compound according to general formula (A):



(A)

wherein

Z represents the necessary atoms to close a heterocyclic ring which is either a five-membered ring containing at least two heteroatoms or a six-membered ring, which ring may carry one or more fused-on rings, and which ring must contain a C—H bond permitting oxidative aromatisation to an acylonium group by means of a hydride shift or a consecutive 2-electron-proton transfer; each of R^1 and R^2 independently represents a hydrogen atom or an alkali-labile group giving rise to a hydrogen atom on hydrolysis;

X is an acyl group selected from the group consisting of CO—R^3, CS—R^4, SO_2—R^5, PO—R^6R^7 and (CN—R^8)—R^9, wherein each of R^3 to R^9 independently represents alkyl, aryl, cycloalkyl, heterocycloalkyl, heteroaryl, O-alkyl, O-aryl, O-heteroaryl, O-heterocycloalkyl, S-alkyl, S-aryl, S-heterocycloalkyl, S-heteroaryl or N—$R^{10}R^{11}$, wherein each of R^{10} and R^{11} independently represents hydrogen, aryl, alkyl, heteroaryl, heterocycloalkyl or acyl as defined for X, and wherein R^6 together with R^7, and R^{10} together with R^{11} may represent the necessary atoms to close a ring.

5,558,975

LIQUID JET RECORDING HEAD AND RECORDING APPARATUS HAVING SAME

Hiromichi Noguchi, Atsugi; Tadayoshi Inamoto, Machida, and Megumi Saito, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 250,102, May 26, 1994, abandoned, which is a continuation of Ser. No. 119,898, Sep. 13, 1993, abandoned, which is a continuation of Ser. No. 979,377, Nov. 19, 1992, abandoned, which is a continuation of Ser. No. 497,136, Mar. 21, 1990, abandoned. This application Mar. 13, 1995, Ser. No. 403,115

Int. Cl.[6] B41J 2/16; C08F 2/50; C08L 51/00; G03F 7/004

U.S. Cl. 430—283.1 **24 Claims**

1. A process for producing a liquid jet recording head comprising a discharge opening for discharging a recording liquid, a liquid path communicating with the discharge opening and a discharge energy generating element aligned with the liquid path for generating an energy to discharge the recording liquid from the discharge opening, said process comprising the steps of:

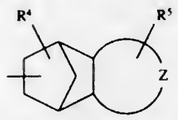
applying an active energy-curing resin composition onto at least a part of a surface of a first member for forming a wall of the liquid path;

exposing the applied active energy-ray-curing resin composition to an active energy ray selected from the group consisting of an ultraviolet-ray having an intensity of 1 mW/cm^2 to 100 mW/cm^2 and an electron beam having an intensity of 0.5M Rad to 20M Rad; and

providing a second member on the exposed active energy-ray-curing resin composition;

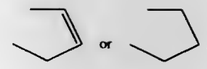
wherein said first member or said second member has a discharge energy generating element provided thereon and the active energy-ray-curing resin composition comprises

(a) a graft copolymerized polymer having a number average molecular weight of 5,000 or more and a weight average molecular weight of 50,000 or less, which comprises a trunk chain composed mainly of structural units derived from at least one monomer selected from the group consisting of a monomer containing, in the molecule, a (meth)acryloyl group and a dicyclopentenyl derivative group represented by the general formula (1):

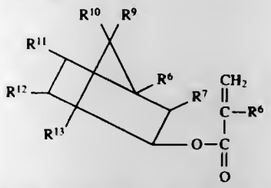


(I)

wherein Z represents a 5-member ring shown by

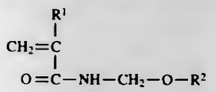


R^4 and R^5 each represents a hydrogen atom or an alkyl group with 1 to 3 carbon atoms, a monomer represented by the following general formula (II):

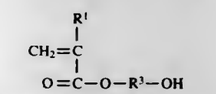


(II)

wherein R^6–R^{13} each represents a hydrogen atom or a methyl group, alkyl methacrylates, acrylonitrile and styrene and, added thereto, graft chains having structural units derived from at least one monomer selected from the group consisting of monomers represented by the following general formulae (x) and (y):



(x)

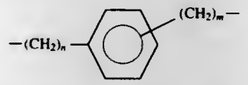


(y)

wherein R^1 is a hydrogen atom or an alkyl or hydroxyalkyl group having 1 to 3 carbon atoms, R^2 is a hydrogen atom or an alkyl or acryl group having 1 to 4 carbon atoms which may have hydroxy groups, R^3 is an alkyl group having 2 to 6 carbon atoms, a halogen-substituted alkyl group having 2 to 6 carbon atoms, an alkylether group represented by the formula:

$$+CH_2\rightarrow_n O+CH_2\rightarrow_m$$

wherein $2 \leqq m+n \leqq 6$, $n \neq O$, $m \neq O$, or a phenylalkyl group represented by the formula:



wherein $2 \leqq m+n \leqq 4$, or the case where n=O or m=O is contained);

(B) a linear polymer having a number average molecular weight of 50,000 or more and a weight average molecular weight of 350,000 or less and having a glass transition temperature of 60° C. or higher, which comprises (i) structural units derived from at least one monomer selected from the group consisting of methyl methacrylate, ethyl methacrylate, isobutyl methacrylate, t-butyl methacrylate, benzyl methacrylate, acrylonitrile, isobornyl methacrylate, isobornyl acrylate, tricyclodecane methacrylate, tricyclodecaneoxyethyl methacrylate, styrene, dimethylaminoethyl methacrylate and cyclohexyl methacrylate, and (ii) from 5 to 30 mol % of structural units derived from at least one monomer selected from the group consisting of said monomers represented by the formula (x) and the formula (y) described above;

(C) a monomer having ethylenically unsaturated bond, and

(D) a photopolymerization initiator capable of generating free radicals by irradiation of an active energy ray.

5,558,976

PATTERN FORMATION METHOD

Fumiyoshi Urano; Takaaki Negishi, both of Kawagoe; Akiko Katsuyama, Moriguchi, and Masayuki Endo, Izumi, all of Japan, assignors to Wako Pure Chemical Industries, LTD., and Matsushita Electric Industrial Co., LTD., both of Osaka, Japan

Division of Ser. No. 407,611, Mar. 21, 1995. This application Nov. 29, 1995, Ser. No. 564,591

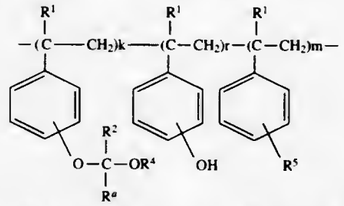
Claims priority, application Japan, Sep. 2, 1994, 6-234246

Int. Cl.[6] G03F 7/32

U.S. Cl. 430—326 **2 Claims**

1. A pattern forming process comprising the steps of: coating a resist material comprising:

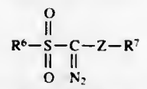
(a) a polymer represented by the formula (1):



(1)

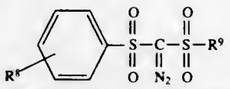
wherein R^1 is a hydrogen atom or a methyl group; R^2 and R^3 are independently a hydrogen atom, a straight-chain, branched or cyclic alkyl group having 1–6 carbon atoms, a straight-chain or branched haloalkyl group having 1–6 carbon atoms, or a phenyl group, provided that R^2 and R^3 are not a hydrogen atom at the same time, or R^2 and R^3 may combine to form a methylene chain having 2–5 carbon atoms; R^4 is a straight-chain, branched or cyclic alkyl group having 1–10 carbon atoms, a straight-chain, branched or cyclic haloalkyl group having 1–6 carbon atoms, an acetyl group or an aralkyl group; R^5 is a hydrogen atom, a halogen atom, a straight-chain, branched or cyclic alkyl group having 1–6 carbon atoms, a straight-chain, branched or cyclic alkoxy group having 1–6 carbon atoms, a tetrahydropyranyloxy group, a tetrahydrofuranyloxy group, a tert-butoxycarbonyloxy group, a tert-butoxycarbonylmethoxy group or an acetyloxy group; and k, r and m are independently an integer of 1 or more, provided that $0.10 \leqq (k+m)/(k+r+m) \leqq 0.90$ and $0.01 \leqq m/(k+r+m) \leqq 0.25$,

(b) at least one photosensitive compound capable of generating an acid upon exposure to light, selected from the group consisting of the photosensitive compounds represented by the following formula (2), the photosensitive compounds represented by the following formula (3), the photosenstive compounds represented by the following formula (4), the photosensitive compounds represented by the following formula (5), the photosensitive compounds represented by the following formula (6) and the photosensitive compounds represented by the following formula (7):



(2)

wherein R^6 and R^7 are independently a straight-chain, branched or cyclic alkyl group having 1–10 carbon atoms or a haloalkyl group having 1–10 carbon atoms; and Z is a sulfonyl group or a carbonyl group;



(3)

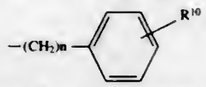
wherein R^8 is a hydrogen atom, a halogen atom, a straight-chain or branched alkyl group having 1–5 carbon atoms, a straight-chain or branched alkoxy group having 1–5 carbon atoms, or a straight-chain or branched haloalkyl group having 1–5 carbon atoms; and R^9 is a straight-chain, branched or cyclic alkyl group having 1–10 carbon atoms, a haloalkyl group having 1–10 carbon atoms, or a

group represented by the formula (a):

wherein R^{24} and R^{30} are independently a hydrogen atom, a halogen

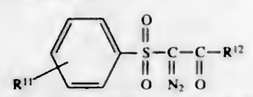
R_7 is selected from the group consisting of

group represented by the formula (a):



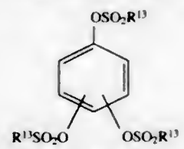
(a)

wherein R^{10} is a hydrogen atom, a halogen atom, a straight-chain or branched alkyl group having 1–5 carbon atoms, a straight-chain or branched alkoxy group having 1–5 carbon atoms, or a straight-chain or branched haloalkyl group having 1–5 carbon atoms; and n is 0 or an integer of 1–3;



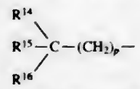
(4)

wherein R^{11} is a hydrogen atom, a halogen atom, a straight-chain or branched alkyl group having 1–5 carbon atoms, an aralkyl group or a trifluoromethyl group; and R^{12} is a straight-chain, branched or cyclic alkyl group having 1–10 carbon atoms, an aralkyl group, a straight-chain or branched alkoxy group having 1–5 carbon atoms, a phenyl group or a tolyl group;



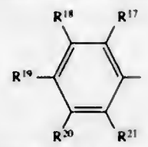
(5)

wherein R^{13} is a group represented by the formula (b):



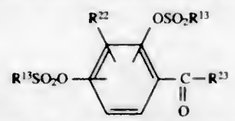
(b)

wherein R^{14}, R^{15} and R^{16} are independently a hydrogen atom or a halogen atom; and p is 0 or an integer of 1–3, or a group represented by the formula (c):



(c)

wherein R^{17}, R^{18}, R^{19}, R^{20} and R^{21} are independently a hydrogen atom, a halogen atom, a straight-chain or branched alkyl group having 1–5 carbon atoms, a straight-chain or branched alkoxy group having 1–5 carbon atoms, a trifluoromethyl group, a hydroxyl group, a trifluoromethoxy group or a nitro group;

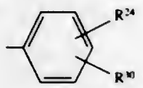


(6)

wherein R^{13} is as defined above; R^{23} is a hydrogen atom, a hydroxyl group or a group represented by the formula (d):

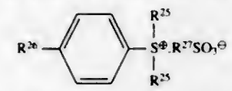
$$R^{13}SO_2O- \quad (d)$$

wherein R^{13} is as defined above; and R^{23} is a straight chain or branched alkyl group having 1–5 carbon atoms or a group represented by the formula (e):



(e)

wherein R^{24} and R^{30} are independently a hydrogen atom, a halogen atom, a straight-chain or branched alkyl group having 1–5 carbon atoms, a straight-chain or branched alkoxy group having 1–5 carbon atoms or a group of the formula (d);



(7)

wherein R^{25} is a straight-chain or branched alkyl group having 1–4 carbon atoms, a phenyl group, a substituted phenyl group or an aralkyl group; R^{26} is a hydrogen atom, a halogen atom or a straight-chain, branched or cyclic alkyl group having 1–6 carbon atoms; R^{27} is a straight-chain or branched perfluoroalkyl group having 1–8 carbon atoms, a straight-chain, branched or cyclic alkyl group having 1–8 carbon atoms, a 1-naphthyl group, a 2-naphthyl group, a 10-camphor group, a phenyl group, a tolyl group, a 2,5-dichlorophenyl group, a 1,3,4-trichlorophenyl group or a trifluoromethylphenyl group; and

(c) a solvent capable of dissolving the above components (a) and (b) on a substrate; heating and then exposing the resist film to light with a wavelength of 300 nm or less; and developing the exposed resist film with a developing solution.

5,558,977

IMAGING ELEMENT COMPRISING A TRANSPARENT MAGNETIC LAYER AND A TRANSPARENT ELECTRICALLY-CONDUCTIVE LAYER

Vito A. DePalma, Rochester; Robert G. Spahn, Webster; Bradley K. Coltrain, Fairport; George N. Mueshafen, and Sharon R. Girolmo, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 22, 1995, Ser. No. 575,786

Int. Cl.[6] G03C *1/85;1/76*

U.S. Cl. 430—496 **20 Claims**

1. An imaging element for use in an image-forming process; said imaging element comprising a support, an image-forming layer, a transparent magnetic layer comprising magnetic particles dispersed in a film-forming binder and a transparent electrically-conductive layer comprising a sputter-deposited layer of a metal oxide.

5,558,978

PHOTORESIST COMPOSITIONS CONTAINING COPOLYMERS HAVING ACID-LABILE GROUPS AND RECURRING UNITS DERIVED FROM EITHER N-(HYDROXYMETHYL)MALEIMIDE OR N-(ACETOXYMETHYL)MALEIMIDE OR BOTH

Ulrich Schädeli, Plasselb, Switzerland; Norbert Münzel, Heitersheim, Germany; Christoph De Leo, Ehrenkirchen, Germany; Heinz Holzwarth, Bad Krozingen, Germany, and Eric Tinguely, Fribourg, Switzerland, assignors to OCG Microelectronic Materials, Inc., Norwalk, Conn.

Filed Dec. 16, 1994, Ser. No. 358,131

Claims priority, application Switzerland, Dec. 21, 1993, 279/94

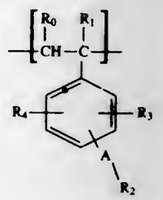
Int. Cl.[6] G03C *1/73*

U.S. Cl. 430—270.1 **11 Claims**

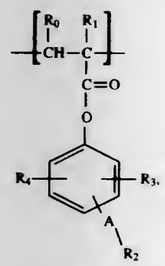
1. A radiation-sensitive composition useful as a positive photoresist comprising

a) at least one compound which forms an acid on exposure to actinic radiation; and

b) at least one polymer which comprises recurring structural units selected from the group consisting of at least one structural unit of formulae (Ib) and (Ib):

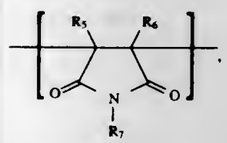


(Ia)



(Ib)

and, in addition to these structural units, recurring structural units of the formula (II)



(II)

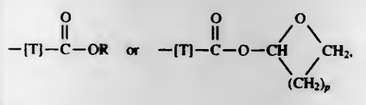
where

A is a direct single bond or a divalent group of the formula —O—;

R_0 and

R_1, independently of one another, are each a hydrogen atom, a C_1–C_6alkyl group or an aryl group having 6 to 14 ring carbon atoms;

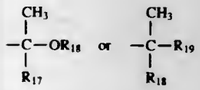
R_2 is a radical of the formula



in which

[T] is a C_1–C_6alkylene group or an arylene group having 6 to 14 ring carbon atoms,

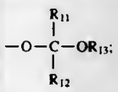
R is a tert-alkyl radical having 4 to 19 carbon atoms or a group of the formula



and

p is the number 2, 3 or 4; or

A together with R_2 is a group of the formula



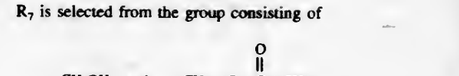
and where, furthermore, R_3 and

R_4, independently of one another, are each a hydrogen atom, a halogen atom, a C_1–C_6alkyl group or a C_1–C_6alkoxy group;

R_5 and

R_6, independently of one another, are each a hydrogen atom, a C_1–C_6alkyl group or an aryl group having 6 to 14 ring carbon atoms, and

R_7 is selected from the group consisting of



R_{11} and

R_{12}, independently of one another, are each a hydrogen atom, a C_1–C_6alkyl group, a cycloalkyl group having 3 to 6 ring carbon atoms or an aryl group having 6 to 10 ring carbon atoms, where aryl groups are either unsubstituted or have one or more substituents selected from halogen atoms, C_1–C_4alkyl and C_1–C_4alkoxy groups and —CN and —NO_2;

R_{13} is a C_1–C_6alkyl group, a cycloalkyl group having 3 to 6 ring carbon atoms or an aryl group having 6 to 10 ring carbon atoms, where aryl groups are either unsubstituted or have one or more substituents selected from halogen atoms, C_1–C_4alkyl and C_1–C_4alkoxy groups and —CN and —NO_2; and

R_{17} is a hydrogen atom or a C_1–C_4alkyl group;

R_{18} is a C_1–C_6alkyl group or a C_3–C_6cycloalkyl group, and

R_{19} is an aryl group having 6 to 14 ring carbon atoms.

5,558,979

SILVER HALIDE PHOTOGRAPHIC MATERIAL

Kunio Ishigaki, and Takashi Naoi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 22, 1995, Ser. No. 392,329

Claims priority, application Japan, Feb. 22, 1994, 6-046606

Int. Cl.[6] G03C *1/795*

U.S. Cl. 430—531 **3 Claims**

1. A silver halide photographic material which comprises a support having provided thereon at least one silver halide emulsion layer, wherein the total amount of gelatin in the total hydrophilic colloid layers on the side having said emulsion layer and the total hydrophilic colloid layers on the opposite side thereto is 6 g/m^2 or less, and said support is a styrene polymer having a syndiotactic structure, and wherein a surface of at least one outermost layer on the side having the silver halide emulsion layer and on the opposite side thereto has a Beck surface smoothness of 4000 seconds or less.

5,558,980

METHOD FOR PREPARING PHOTOGRAPHIC ELEMENTS COMPRISING LOADED LATEX COMPOSITIONS

Ralph B. Nielsen, Rochester; Thomas A. Rosick, Honeoye, and James S. Honan, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 17, 1995, Ser. No. 390,722

Int. Cl.[6] G03C *7/388*

U.S. Cl. 430—545 **26 Claims**

1. A method for preparing a photographic element comprising at least one hydrophilic colloid layer coated on a support, comprising:

(a) combining under conditions of low or moderate shear, in the presence of surfactant, and in the substantial absence of water-miscible or volatile organic solvents, a liquid organic composition comprising at least one photographically useful compound with an aqueous polymer latex,

(b) holding the combination resulting from (a) in a liquid state for sufficient time for substantial loading of the organic composition into the polymer latex to occur, and

(c) coating the loaded latex resulting from (b) on a support.

5,558,981

EMULSIONS WITH THE HIGHEST SPEEDS

on silver, wherein at least 50 percent of the total grain population projected area is accounted for by tabular grains

5,558,984

AUTOMATED SYSTEM AND PROCESS FOR

which is inert to the reference solution, wherein the stable aqueous reference solution comprises:

5,558,981

EMULSIONS WITH THE HIGHEST SPEEDS COMPATIBLE WITH LOW GRANULARITY

Robert B. Bayley, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 15, 1995, Ser. No. 442,238
Int. Cl.[6] G03C *1/035;1/09*
U.S. Cl. 430—567 **10 Claims**

1. A radiation-sensitive emulsion comprised of silver halide grains containing metal dopants

wherein the grains

(a) have a mean equivalent circular diameter of less than 0.6 μm;

(b) have a face centered cubic crystal lattice structure of the rock salt type;

(c) have six {100} faces;

(d) contain from 95 to 99.5 mole percent bromide ions and from 0.5 to 5 mole percent iodide ions, based on silver;

(e) contain in the face centered cubic crystal lattice structure from 5×10^{-8} to 1×10^{-6} mole per silver mole of an iridium dopant comprised of an Ir^{+3} ion forming coordination bonds with at least five halide ions occupying adjacent crystal lattice positions; and

(f) contain in the face centered cubic crystal lattice structure from 5×10^{-8} to 3×10^{-4} mole per silver mole of a speed enhancing dopant comprised of a divalent Group 8 metal ion chosen from among Fe^{+2}, Ru^{+2} and Os^{+2} and at least one coordination ligand more electron withdrawing than fluoride ion;

(g) the speed enhancing dopant is located in at least a portion of an internal region of the grains formed after 70 percent and before 90 percent of total grain silver has been precipitated; and

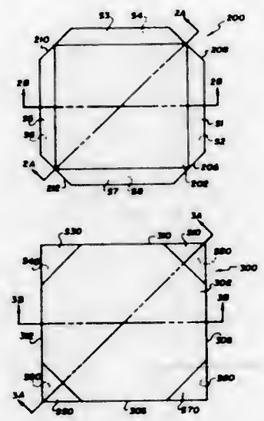
(h) the iridium dopant is located in at least a portion of a central region of the grains and is separated from the speed enhancing dopant by an interposed region containing at least 10 percent of the total grain silver.

5,558,982

HIGH CHLORIDE (100) TABULAR GRAIN EMULSIONS WITH MODIFIED EDGE STRUCTURES

Joe E. Maskasky, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 360,489, Dec. 21, 1994, abandoned. This application Sep. 19, 1995, Ser. No. 530,544
Int. Cl.[6] G03C *1/035*
U.S. Cl. 430—567 **6 Claims**



1. A radiation sensitive emulsion containing a silver halide grain population comprised of at least 90 mole percent chloride, based on silver, wherein at least 50 percent of the total grain population projected area is accounted for by tabular grains

(1) bounded by parallel major faces lying in {100} atomic planes and having adjacent edge ratios of less than 10,

(2) having a thickness of less than 0.2 μm, and

(3) having an average aspect ratio of greater than 8,

wherein each of the tabular grains accounting for at least 50 percent of the total grain projected area

(4) is comprised of eight equivalent crystal faces lying in like atomic planes that differ from the {100} atomic planes and

(5) exhibits a lower grain volume than a tabular grain of the same length, width and thickness bounded entirely by crystal faces lying in {100} atomic planes.

5,558,983

N-ACYL-HYDRAZINE COMPOUNDS AS CONTRAST ENHANCERS FOR BLACK-AND-WHITE PHOTOTHERMOGRAPHIC AND THERMOGRAPHIC ELEMENTS

Sharon M. Simpson, Lake Elmo, Minn., and Lori S. Harring, Hudson, Wis., assignors to Minnesota Mining &d Manufacturing Company, St. Paul, Minn.

Filed Sep. 19, 1995, Ser. No. 530,744
Int. Cl.[6] G03C *1/00*
U.S. Cl. 430—619 **19 Claims**

1. A photothermographic element comprising a support bearing at least one photosensitive, image-forming, photothermographic emulsion layer comprising:

(a) a photosensitive silver halide;

(b) a non-photosensitive, reducible silver source;

(c) a reducing agent system for silver ion; and

(d) a binder;

wherein said reducing agent system comprises:

(i) at least one hindered phenol;

(ii) at least one co-developer of the formula

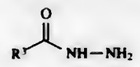
$$R^1\text{—}(C\text{=}O)\text{—}NHNH\text{—}R^2$$

wherein:

R^1 represents hydrogen and R^2 represents an aryl or substituted aryl group; or,

R^1 represents hydrogen, alkyl, or alkenyl groups of 1 to 20 carbon atoms; alkoxy, thioalkoxy, or amido groups of 1 to 20 carbon atoms; aryl, alkaryl, or aralkyl groups of up to 20 carbon atoms; aryloxy, thioaryloxy, or anilino groups of up to 20 carbon atoms; aliphatic or aromatic heterocyclic ring groups containing up to 6 ring atoms; carbocyclic ring groups comprising up to 6 ring carbon atoms; or fused ring or bridging groups comprising up to 14 ring atoms; and R^2 represents a trityl group; and

(iii) at least one N-acyl-hydrazine compound of the formula



wherein:

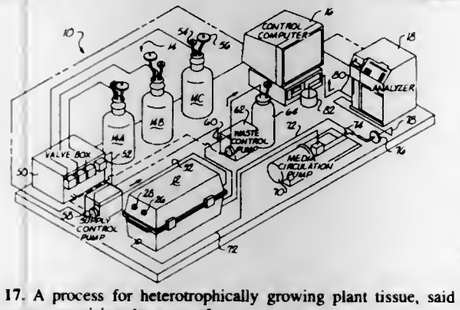
R^3 represents an alkyl or alkenyl groups of 1 to 20 carbon atoms; alkoxy, thioalkoxy, or amido groups of up to 20 carbons; aryl, alkaryl or aralkyl groups comprising up to 20 carbon atoms; aryloxy, thioaryloxy, or anilino groups of up to 20 carbon atoms; aliphatic or aromatic heterocyclic ring groups containing up to 6 ring atoms; carbocyclic ring groups comprising up to 6 ring carbon atoms; or fused ring or bridging groups comprising up to 14 ring atoms.

5,558,984

AUTOMATED SYSTEM AND PROCESS FOR HETEROTROPHIC GROWTH OF PLANT TISSUE

Roy E. Young, Six Mile, S.C., and S. Andrew Hale, Garner, N.C., assignors to Clemson University, Clemson, S.C.

Filed Jun. 3, 1994, Ser. No. 253,734
Int. Cl.[6] C12Q *3/00;* **A01G** *31/00*
U.S. Cl. 435—3 **21 Claims**



17. A process for heterotrophically growing plant tissue, said process comprising the steps of:

placing plant tissue in a bioreactor that is impermeable to microorganisms;

supplying a preset number of subcomponent solutions in predetermined concentrations to said bioreactor;

blending predetermined amounts of certain of said subcomponent solutions to form a plant growth media for circulation within said bioreactor and for absorption by said plant tissue, said plant growth media containing organic carbon for promoting the heterotrophic growth of said plant tissue;

analyzing said plant growth media at periodic intervals for determining the concentration of a particular component within said growth media; and

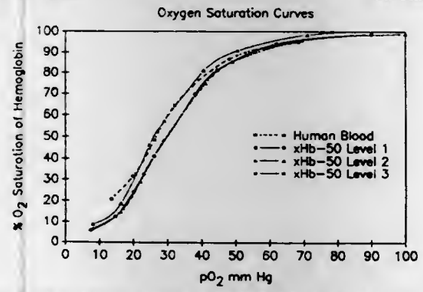
sending the analysis from said analyzing step to a controller for processing said analysis and for automatically feeding said subcomponent solutions to said bioreactor for maintaining the concentration of said particular component in said growth media within a preset range while maintaining a preset volume of growth media within said bioreactor.

5,558,985

STABLE HEMOGLOBIN REFERENCE SOLUTION

Ching Chiang, Acton, and Stanley M. Liffman, Andover, both of Mass., assignors to Bionostics Incorporated, Acton, Mass.

Continuation-in-part of Ser. No. 897,316, Jun. 11, 1992, Pat. No. 5,304,491, which is a continuation-in-part of Ser. No. 328,622, Mar. 27, 1989, Pat. No. 5,045,529. This application Jun. 10, 1994, Ser. No. 258,505
The portion of the term of this patent subsequent to Mar. 27, 2009, has been disclaimed.
Int. Cl.[6] C12Q *1/00;1/60;1/56;* **G01N** *31/00*
U.S. Cl. 435—4 **16 Claims**



1. A stable aqueous reference solution which is contained in a sealed container having a head space consisting essentially of gas which is inert to the reference solution, wherein the stable aqueous reference solution comprises:

a) hemoglobin;

b) a source of bicarbonate ions; and

c) an organic buffer.

5,558,986

METHOD AND KIT FOR ATP ASSAYS USING CYCLODEXTRIN

Arne Lundin, Dalaro, Sweden, and John G. Anson, Cardiff, Great Britain, assignors to Merck Patent GmbH, Darmstadt, Germany

Continuation of Ser. No. 75,484, Jun. 11, 1993. This application Nov. 23, 1994, Ser. No. 347,228
Claims priority, application United Kingdom, Jan. 10, 1991, 9100551
Int. Cl.[6] C12Q *1/00;1/66*
U.S. Cl. 435—4 **6 Claims**

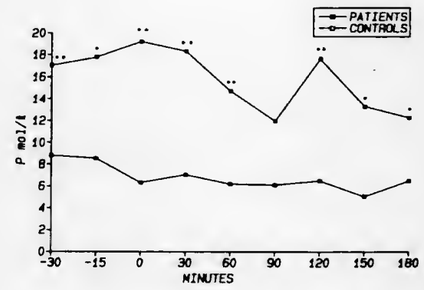
1. In a method of assaying for ATP which comprises providing a solution containing intracellular ATP and a cationic surfactant for extracting the ATP, adding to the solution an ATP-utilizing enzyme, and measuring the activity of the enzyme, the improvement which comprises contacting the solution, prior to or simultaneous with the addition thereto of the ATP-utilizing enzyme, with a cyclodextrin or a cyclodextrin derivative of an appropriate type and in an appropriate amount to neutralize the cationic surfactant.

5,558,987

BLOOD LEVELS OF CCK PEPTIDES RELATIVE TO PANIC DISORDER TREATMENT

Thomas N. Thomas, Palm Harbor; David V. Sheehan, and Janet D. Talbot, both of Lutz, all of Fla., assignors to University of South Florida, Tampa, Fla.

Continuation of Ser. No. 168,913, Dec. 16, 1993, abandoned, which is a continuation of Ser. No. 914,849, Jul. 15, 1992, abandoned. This application Nov. 18, 1994, Ser. No. 341,846
Int. Cl.[6] C12Q *1/00;1/37;* **G01N** *31/00;* **A61K** *38/00*
U.S. Cl. 435—4 **9 Claims**



1. A method of determining the efficacy of an anxiolytic drug for the treatment of panic disorders by administering the anxiolytic drug and detecting whether the the drug lowers elevated CCK peptide levels to the corresponding levels found in age- and sex-matched normal controls in a suitable model for panic disorders by analyzing blood plasma samples.

5,558,988

PRIMERS AND METHODS FOR DETECTING

rRNA of *Giardia lamblia* under the hybridization conditions

5,558,991

5,558,988

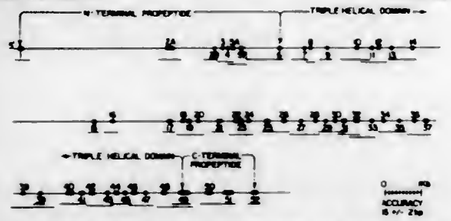
PRIMERS AND METHODS FOR DETECTING MUTATIONS IN THE PROCOLLAGEN II GENE THAT INDICATE A GENETIC PREDISPOSITION FOR OSTEOARTHRITIS

Darwin J. Prockop, Philadelphia; Leena Ala-Kokko, Audalusia, both of Pa., and Pertti Ritvaniemi, Oulu, Finland, assignors to Thomas Jefferson University, Philadelphia, Pa.

Filed Nov. 13, 1992, Ser. No. 977,284

Int. Cl.[6] C12Q *1/68*; C07H *21/04*; C12P *19/34*

U.S. Cl. 435—6 **2 Claims**



1. A primer for use in detecting mutations in the procollagen II (COL2A1) gene comprising a sequence selected from the group consisting of: SEQ ID NO:198, SEQ ID NO:199, SEQ ID NO:200, SEQ ID NO:201, SEQ ID NO:202, SEQ ID NO:203, SEQ ID NO:204, SEQ ID NO:205, SEQ ID NO:208, SEQ ID NO:209, SEQ ID NO:210, SEQ ID NO:211, SEQ ID NO:212, SEQ ID NO:213, SEQ ID NO:214, SEQ ID NO:215, SEQ ID NO:216, SEQ ID NO:217, SEQ ID NO:218, SEQ ID NO:219, SEQ ID NO:220, SEQ ID NO:235, SEQ ID NO:236, SEQ ID NO:237, SEQ ID NO:238, SEQ ID NO:239, SEQ ID NO:240, SEQ ID NO:241, SEQ ID NO:242, SEQ ID NO:243, SEQ ID NO:244, SEQ ID NO:245, SEQ ID NO:246, SEQ ID NO:247, SEQ ID NO:248, SEQ ID NO:249, SEQ ID NO:250, SEQ ID NO:251, and SEQ ID NO:252.

5,558,989

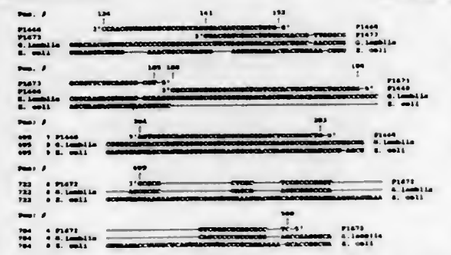
NUCLEIC ACID PROBES FOR THE DETECTION OF *GIARDIA LAMBLIA*

Jyotsna S. Shah, Nashua, N.H.; Amelia Buharin, Roslindale, and David J. Lane, Milford, both of Mass., assignors to Amoco Corporation

Continuation of Ser. No. 123,862, Sep. 20, 1993, abandoned, which is a continuation of Ser. No. 877,256, Apr. 28, 1992, abandoned, which is a continuation of Ser. No. 510,476, Apr. 18, 1990, abandoned. This application May 9, 1994, Ser. No. 239,949

Int. Cl.[6] C12Q *1/68*; C07H *21/02;21/04*

U.S. Cl. 435—6 **14 Claims**



8. A method for detecting the presence of a target region of the 18S rRNA of *Giardia lamblia* in a sample, the method comprising:

a) providing a sample to be analyzed for the presence the target region of the 18S rRNA treated, if necessary, to render nucleic acids present in the sample available for hybridization with complementary sequences;

b) contacting the sample with an isolated nucleic acid probe which hybridizes specifically to a target region of the 18S rRNA of *Giardia lamblia* under the hybridization conditions defined in step c), and which does not hybridize specifically to rRNA of non-*Giardia lamblia* under otherwise identical hybridization conditions, the target region being selected from the group consisting of:

5'-UCACCCGGUCGGCGCGGUCGCGGCGCGCCGAGG-GCCCGAC-3',

5'-GCGGGCGCCCGCGGGCGAGCAGCGUGACGCAGC-GACGGCCC-3',

5'-CCGCCACGAGGAAACGGGAGCGCUCCAGGCAGG-CCCGUUG-3',

5'-CGCGCGAGCGAGGCGGGCCCACAGCCCCCGCCG-CGG-3',

5'-CCUGCUAGCCGGACACCGCUGGCAACCCGGCGC-CAAGACGUGCGCGCA-3' and

5'-GGCCCGUUGGACCCGCCGCGUGGGACCGCGCAG-CGGGCGCGGCGCGCC-3';

c) intubating the mixture of step b) at a temperature of 60° C. for 14–16 hours in a hybridization solution comprising 0.9M NaCl, 0.12M Tris-HCl (pH 7.8), 6 mM EDTA, 0.1M KPO_4, 0.1% SDS, 0.1% pyrophosphate, 0.002% ficoll, 0.002% BSA and 0.002% polyvinylpyrrolidone, followed by three 15 minute post-hybridization washes at 60° C. in 0.03M NaCl, 0.004M Tris-HCl (pH 7.8), 0.2 mM EDTA, and 0.1% SDS; and

d) detecting specific hybridization as an indication of the presence of a target region of the 18S rRNA of *Giardia lamblia* in a sample.

5,558,990

NUCLEIC ACID PROBES TO BLASTOMYCES DERMATITIDIS AND PARACOCCIDIOIDES BRASILIENEIS

Curt L. Milliman, St. Louis, Mo., assignor to Gen-Probe Incorporated, San Diego, Calif.

Continuation of Ser. No. 811,046, Dec. 18, 1991, abandoned. This application Aug. 1, 1994, Ser. No. 283,981

Int. Cl.[6] C12Q *1/68*; C12P *19/34*; C12N *1/00*; C07H *21/04*

U.S. Cl. 435—6 **20 Claims**

1. An oligonucleotide hybridization assay probe able to detect the presence of *Blastomyces dermatitidis* and *Paracoccidioides brasiliensis*, wherein said probe has a length of 15 to 100 nucleotides and can form a stable hybrid under high stringency hybridization conditions with a nucleotide polymer containing a nucleotide base sequence selected from the group consisting of:

(SEQ ID NO: 1) 5' CCAGTAAAGGCCATGGGGCTT,

(SEQ ID NO: 4) 5' AAGCCCCATGGCCTTTACTGG, and

(SEQ ID NO: 5) 5' AAGCCCCAUGGCCUUUACUGG;

wherein said probe contains at least 14 out of 17 contiguous bases perfectly complementary to said nucleotide base sequence, can hybridize to 28S rRNA or rDNA from *Blastomyces dermatitidis* and 28S rRNA or rDNA from *Paracoccidioides brasiliensis* under said conditions, and under said conditions can distinguish *Blastomyces dermatitidis* and *Paracoccidioides brasiliensis* from *Cryptococcus neoformans*, *Histoplasma capsulatum*, *Coccidioides immitis*, *Aspergillus flavus*, *Aspergillus fumigatus*, *Aspergillus niger* and *Penicillium notatum*.

5,558,991

DNA SEQUENCING METHOD USING ACYCLONUCLEOSIDE TRIPHOSPHATES

George L. Trainor, Glen Mills, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 780,347, Oct. 22, 1991, Pat. No. 5,332,666, which is a division of Ser. No. 57,566, Jun. 12, 1987, abandoned, which is a continuation-in-part of Ser. No. 881,372, Jul. 2, 1986, abandoned. This application Feb. 7, 1994, Ser. No. 192,915

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 **1 Claim**

1. An improved chain termination DNA sequencing reaction, wherein the improvement comprises using as a chain terminator a nucleoside triphosphate derivative having the structure

wherein B is 1-uracil, 1-cytosine, 1-thymine, 9-adenine, 9-guanine, or 9-hypoxanthine.

5,558,992

DETECTION OF SYNTHETIC OLIGONUCLEOTIDES EXTRACTED FROM BODY FLUIDS OR TISSUES

Jamal Temsamani, and Sudhir Agrawal, both of Shrewsbury, Mass., assignors to Hybridon, Inc., Worcester, Mass.

Continuation of Ser. No. 2,786, Jan. 8, 1993, abandoned. This application May 11, 1994, Ser. No. 241,062

Int. Cl.[6] C12Q *1/68*

U.S. Cl. 435—6 **4 Claims**

1. A method of detecting exogenous oligonucleotides present in body fluids or tissues in a concentration of at least about 0.2 ng/ml, the method comprising the steps of:

(a) proteolytically digesting a body fluid or tissue sample;

(b) extracting the proteolytically digested body fluid or tissue sample with a partitioning agent;

(c) precipitating nucleic acids present in the sample, including the exogenous oligonucleotide to be detected;

(d) resuspending the nucleic acids into a solution;

(e) binding the nucleic acids to a hybridization membrane;

(f) treating the membrane having bound nucleic acids with a labeled oligonucleotide probe that is complimentary to the exogenous oligonucleotide to be detected;

(g) washing the membrane to remove any labeled oligonucleotide that is not hybridized to nucleic acids bound to the membrane; and

(h) detecting the labeled oligonucleotide being indicative of the presence of the exogenous oligonucleotide in the body fluids or tissues.

5,558,993

CLONED BORRELIA BURGDORFERI VIRULENCE PROTEIN

David R. Blanco, Beverly Hills; Cheryl I. Champion, Culver City; Michael A. Lovett, Los Angeles; David A. Haake, Culver City, and James N. Miller, Northridge, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Jun. 17, 1994, Ser. No. 261,825

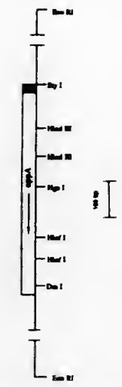
Int. Cl.[6] C07H *21/02;21/04*; C12N *1/21;15/70*

U.S. Cl. 435—6 **21 Claims**

15. A method of detecting the presence of pathogenic *B. burgdorferi* in a sample comprising:

contacting nucleic acid in the sample with a polynucleotide which is complementary to and binds to a polynucleotide which encodes EppA polypeptide; and

detecting the presence of said polynucleotide which encodes said EppA polypeptide, wherein said presence of the polynucleotide in the sample is indicative of the presence of said pathogenic *B. burgdorferi* in the sample.



5,558,994

Patent Not Issued For This Number

5,558,995

PEPTIDES WHICH ARE DERIVED FROM TUMOR REJECTION ANTIGEN PRECURSOR MOLECULE MAGE-1, WHICH COMPLEX TO MHC MOLECULE HLA-C CLONE 10, AND USES THEREOF

Pierre van der Bruggen, and Thierry Boon-Falleur, both of Brussels, Belgium, assignors to Ludwig Institute for Cancer Research, N.Y.

Continuation-in-part of Ser. No. 8,446, Jan. 22, 1993, abandoned. This application Feb. 14, 1994, Ser. No. 195,186

Int. Cl.[6] C12N *5/08*; C07K *7/06;7/08*; G01N *33/68*

U.S. Cl. 435—7.24 **7 Claims**

1. Isolated peptide selected from the group consisting of:

SEQ ID NO: 2

SEQ ID NO: 3, and

SEQ ID NO: 4.

5,558,996

FUNGUS EXTRACTION METHOD, KIT, AND EXTRACTION SOLUTION

William C. Bartlett, Wilmington, and James M. Melby, Newark, both of Del., assignors to Strategic Diagnostics Inc., Wilmington, Del.

Filed Jul. 1, 1994, Ser. No. 270,146

Int. Cl.[6] G01N *33/53*

U.S. Cl. 435—7.31 **17 Claims**

1. A method for extracting fungus from a plant comprising:

a) combining an extraction solution with tissue from the plant, wherein the extraction solution consists essentially of a dilute acid and an alkoxylated linear alcohol detergent, and

b) agitating the combination,

wherein the extraction solution extracts fungus from the plant and wherein the extraction solution is easily neutralized and does not degrade the fungus below a detectable level.

5,558,997

MONOCLONAL ANTIBODIES TO MYCOSPHAERELLA SPECIES

Frank P. Petersen, Burlington, N.J.; Mark D. Clymer, Norristown, Pa.; Sally A. Miller, Pennsauken, N.J.; James H. Rittenburg, Perkasie, Pa., and G. D. Grothaus, Burlington, N.J., assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 955,400, Oct. 1, 1992, abandoned, which is a continuation of Ser. No. 546,341, Jun. 29, 1990, abandoned. This application Sep. 26, 1994, Ser. No. 311,813

Int. Cl.[6] G01N *33/53;33/569;* **C07K** *16/00;* **C12P** *21/08*

U.S. Cl. 435—7.31 **33 Claims**

1. A hybridoma cell line that produces a monoclonal antibody which binds with at least one species of Mycosphaerella and does not exhibit cross-reactivity of greater than 10% with *Deightoniella torulosa, Cladosporium herbarum, Cladosporium musae, Dreschlera gigantea, Fusarium oxysporium,* and *Rhizopus stolonifer.*

5,558,998

DNA FRAGMENT SIZING AND SORTING BY LASER-INDUCED FLUORESCENCE

Mark L. Hammond, Angier, N.C.; James H. Jett, Los Alamos, N.M.; Richard A. Keller, Los Alamos, N.M.; Babetta L. Marrone, Los Alamos, N.M., and John C. Martin, Los Alamos, N.M., assignors to The Regents of the Univ. of California, Alameda, Calif.

Continuation-in-part of Ser. No. 218,148, Mar. 24, 1994, abandoned, which is a continuation-in-part of Ser. No. 7,308, Jan. 21, 1993, abandoned, which is a continuation-in-part of Ser. No. 841,114, Feb. 25, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 486,400

Int. Cl.[6] C12Q *1/68;* **G01N** *33/483;35/08*

U.S. Cl. 435—6 **12 Claims**

1. A method for quantitatively determining the number of nucleotides in DNA fragments of about 50 kbp or less, naturally occurring or obtained by fragmenting a larger piece of DNA at known sites within said piece of DNA by induced fluorescence, comprising the steps of:

staining said piece of DNA or said DNA fragments with a single dye effective to form stoichiometrically stained DNA or DNA fragments;

forming a flow stream of said stained DNA fragments serially spaced apart in said flow stream;

illuminating said flow stream with a light effective to cause said dye to fluoresce;

measuring the intensity of the fluorescence from each one of said stained fragments of DNA in said flow stream, wherein said intensity of said fluorescence is linearly related to said number of nucleotides in said stained DNA fragments Of about 50 kbp or less.

5,558,999

CHOLESTEROL 7α-HYDROXYLASE GENE REGULATORY ELEMENTS AND METHODS FOR USING THEM

John Y. L. Chiang, Stow, Ohio, assignor to Northeastern Ohio Universities, Rootstown, Ohio

Filed Oct. 13, 1993, Ser. No. 135,511

Int. Cl.[6] C12N *15/11;15/18;15/55;* **C12Q** *1/68*

U.S. Cl. 435—6 **16 Claims**

1. An isolated regulatory element of the cholesterol 7α-hydroxylase (CYP7) gene which consists of a DNA fragment selected from the group consisting of DNA fragments from about −191 to about +64 of the rat CYP7 gene, from about −252 to about +3 of the hamster CYP7 gene and from about −187 to about +65 of the human CYP7 gene, wherein said DNA fragment is regulatory with respect to CYP7 expression in the presence of bile acids, and wherein the numbering of said DNA fragment is measured relative to the transcription start site.

5,559,000

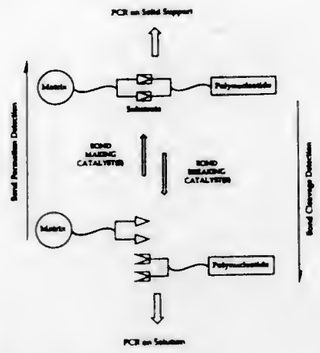
ENCODED REACTION CASSETTE

Kim D. Janda, San Diego; Richard A. Lerner, La Jolla, and Hicham Fenniri, San Diego, all of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Filed Jan. 18, 1995, Ser. No. 374,050

Int. Cl.[6] C12Q *1/68;1/70;* **C12P** *19/31;* **G01N** *27/26*

U.S. Cl. 435—6 **13 Claims**



1. An encoded reaction cassette for assaying a cleavage reaction comprising:

a solid phase matrix;

a substrate covalently linked to said solid phase matrix, said substrate being susceptible to cleavage by means of the cleavage reaction; and

a first polynucleotide linked to said substrate, said first polynucleotide including a first PCR primer sequence, an encoding sequence, and a second PCR primer sequence, said encoding sequence positioned between said first and second PCR sequences.

5,559,001

MULTI-DOMAIN DNA LIGANDS FOR PROTEIN AND NUCLEIC ACID AFFINITY CHROMATOGRAPHY AND PROCESSING OF SOLID-PHASE DNA

Joseph G. Utermohlen, Tucson, Ariz., assignor to Arizona Board of Regents for and on behalf of the University of Arizona, Tucson, Ariz.

Division of Ser. No. 742,856, Aug. 8, 1991, Pat. No. 5,437,976. This application Jun. 7, 1995, Ser. No. 478,049

Int. Cl.[6] C12Q *1/68;* **C12P** *19/34;* **C07H** *21/02*

U.S. Cl. 435—6 **6 Claims**

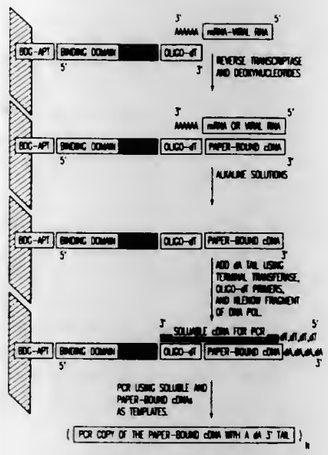
1. An RNA affinity-chromatography method, comprising the steps of:

(a) providing an arylamine-substituted solid phase binding matrix;

(b) constructing a multi-functional oligonucleotide ligand having a 3' terminal domain comprising polydeoxythymidine and a 5' terminal domain comprising at least one of polydeoxyguanosine, polydeoxyuracil, or poly-N-6-aminohexyldeoxyadenosine;

(c) covalently binding said oligonucleotide ligand to said activated solid phase binding matrix such that said 5' terminal domain is bound to said solid phase binding matrix; and

(d) annealing RNA to said multi-functional oligonucleotide ligand bound to said solid phase binding matrix.



5,559,002

APPARATUS FOR AUTOMATICALLY CARRYING OUT A MULTI-STAGE IMMUNOASSAY OF AT LEAST ONE BIOLOGICAL SUBSTANCE IN A PLURALITY OF BIOLOGICAL SAMPLES: METHOD USING SAID APPARATUS

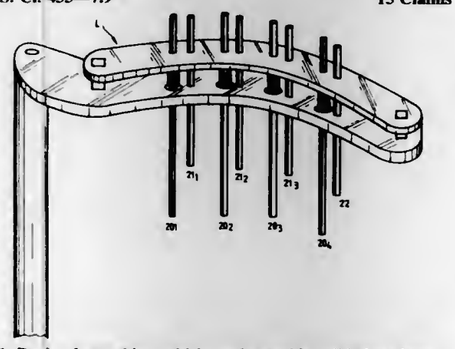
Michel Uzan, Les Pavillons Sous Bois; Thierry Gicquel, Jouy Le Moutier; Edouard Lenywojt, Saint Leu D'Esserent, and Dario Marminio, Louvres, all of France, assignors to Laboratoires Biotrol, Paris, France

Continuation of Ser. No. 721,520, Aug. 26, 1991, abandoned. This application Jan. 10, 1994, Ser. No. 179,543

Claims priority, application France, Nov. 17, 1989, 89 15095

Int. Cl.[6] G01N *33/538;33/553*

U.S. Cl. 435—7.9 **15 Claims**



1. Device for washing, which can be used in solid phase heterogeneous immunoassays, using a solid support in the form of magnetic balls, said device comprising:

(1) four means for application of a magnetic field to the lower part of test tubes Tr containing the sample to be analyzed and one or more reagents appropriate to the assays to be carried out, one of said reagents consisting of magnetic balls covered with a substance binding specifically to the substance to be detected, in suspension in a suitable liquid, wherein said balls consist of an organic matrix enclosing a magnetic charge, said balls having a magnetizable-material-mass/non-magnetizable-material-mass ratio greater than or equal to 45% and each of said means preferably consisting of a pair of magnets arranged face to face and on both sides of two consecutive test tubes, each pair of magnets being connected to a metallic armature for channelling said magnets' magnetic flux lines and

(2) a washing head (L) comprising on a means holder:

(i) four means for suction of the liquid contained in said test tubes,

(ii) three means for distribution of a washing liquid to said test tubes and,

(iii) one means for distribution of an enzyme substrate, said means being arranged on said means holder in the following defined order, from one end to the other end of said means holder: first means of suction, first means of distribution, second means of suction, second means of distribution, third means of suction, third means of distribution, fourth means of suction and means for distribution of a substrate, the first means of suction being necessarily used first when starting the assay, and said washing device being fixed along a horizontal axis.

5,559,003

ASSAY METHOD FOR BIOLOGICAL COMPONENTS

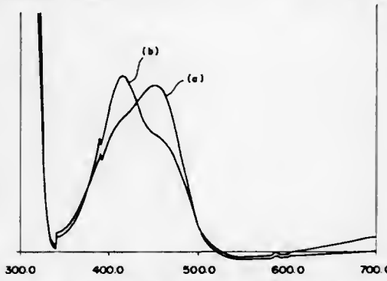
Sumi Kawahara; Toshikatsu Abe, and Kenji Hosoi, all of Tokyo, Japan, assignors to Daiichi Pure Chemicals Co., Ltd., Tokyo, Japan

Filed Nov. 29, 1994, Ser. No. 348,870

Claims priority, application Japan, Dec. 10, 1993, 5-310126

Int. Cl.[6] C12Q *1/28;1/26;1/54;* **G01N** *33/48*

U.S. Cl. 435—28 **20 Claims**



1. An assay method for biological components in a biological sample comprising at least the following first step (A), second step (B) and third step (C):

Step A: (i) a reaction step for generating a substrate of oxidase, or (ii) a reaction step for obtaining a blank value of a sample;

Step B: a reaction step for initially generating hydrogen peroxides through oxidase reaction and then detecting the generated hydrogen peroxides with peroxidase and a color developer capable of being oxidized; wherein Step (A) is carried out in the presence of amphoteric surfactant and in the absence of ferrocyanide, and Step (B) is carried out either in the presence of ferrocyanide or in the presence of amphoteric surfactant and ferrocyanide; and

Step C: a step for correlating the amount of color developed to the amount of biological components in the biological sample.

5,559,004

METHODS FOR SCREENING COMPOUNDS TO DETERMINE CALCIUM LEAK CHANNEL INHIBITION ACTIVITY

Richard A. Steinhardt, Berkeley; Varghese John, and Lawrence C. Fritz, both of San Francisco, all of Calif., assignors to The Regents of the University of California, Berkeley, and Athena Neurosciences, Inc., So. San Francisco, both of Calif.

Filed Jul. 12, 1994, Ser. No. 273,666

Int. Cl.[6] C12Q *1/02*

U.S. Cl. 435—29 **4 Claims**

1. A method for determining whether a test compound inhibits calcium leak channel activity in cells, said method comprising:

culturing myotubes under conditions where intracellular calcium concentrations depend on calcium leak channel activity; and

measuring intracellular calcium concentrations in the cultured myotubes in the presence and absence of the test compound to determine whether the intracellular calcium concentration in the myotubes cultured in the presence of the test compound is lower than the intracellular calcium concentration in the myotubes cultured in the absence of the test compound, wherein a test compound which lowers said calcium concentration is considered to be a calcium leak channel inhibitor.

5,559,005

BIOPROCESS FOR PREPARING 7-ACA AND 7-ADAC

Michael J. Conder, Harrisonburg, Va.; Phyllis C. McAda, Woodinville, Wash.; John A. Ramboseck, Seattle, Wash., and Christopher D. Reeves, Woodinville, Wash., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 953,492, Oct. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 777,833, Oct. 15, 1991, abandoned. This application May 27, 1994, Ser. No. 250,310

Int. Cl.[6] C12P *35/4;35/00;* **C12N** *1/16*

U.S. Cl. 435—47 **4 Claims**

1. A process for preparing adipoyl-7-ADAC within a cell comprising the steps:

(a) transforming cells of a strain of *Penicillium chrysogenum* which produces isopenicillin N with an expression vector containing isolated and purified DNA encoding an enzyme, said enzyme having expandase enzymatic activity capable of accepting adipoyl-6-APA as a substrate, and hydroxylase enzymatic activity capable of accepting adipoyl-7-ADCA as a substrate;

(b) culturing the transformed cells from step (a) in a suitable culture medium containing an adipate feedstock, wherein said cells produce adipoyl-6-APA; and

(c) culturing the transformed cells producing adipoyl-6-APA of step (b) under conditions suitable for expression of said DNA encoding said enzyme, thereby producing the end product adipoyl-7-ADAC.

5,559,006

METHOD FOR SELECTIVELY DEACTIVATING CATALASE WHILE RETAINING DAMINO ACID OXIDASE ACTIVITY

Jeffrey T. Vicenzi, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 212,656, Mar. 11, 1994, Pat. No. 5,424,203, which is a continuation of Ser. No. 83,207, Jun. 24, 1993, abandoned, which is a continuation of Ser. No. 4,210, Jan. 13, 1993, abandoned, which is a continuation of Ser. No. 382,505, Jul. 19, 1989, abandoned. This application Feb. 22, 1995, Ser. No. 392,438

Int. Cl.[6] C12N *9/02;9/08;9/99;* **C12P** *35/00*

U.S. Cl. 435—47 **5 Claims**

1. A method for selectively deactivating catalase while retaining D-amino acid oxidase activity, wherein the catalase and the D-amino acid oxidase are both present in whole cells or a cell-free extract, said method comprising combining said whole cells or said cell-free extract with a basic solution at a pH between about 11 and about 12, whereby catalase activity is eliminated and oxidase activity is unaffected to produce a solution containing said oxidase without catalase being present, and lowering the pH of the solution containing said oxidase to provide a D-amino acid oxidase capable of enzymatic oxidation of cephalosporin C to glutaryl-7-ACA in high yields.

5,559,007

BACTERIAL SHUTTLE VECTORS

Bruno Suri, Spalentorweg 4, and Albert Schmitz, Gasstrasse 53, both of Basle, Switzerland

Continuation of Ser. No. 672,205, Mar. 19, 1991, abandoned. This application Jan. 21, 1994, Ser. No. 186,222

Claims priority, application United Kingdom, Mar. 22, 1990, 9006400

Int. Cl.[6] C12N *15/70;15/74*

U.S. Cl. 435—69.1 **49 Claims**

1. A method for the preparation of a polypeptide comprising the steps of (a) fusing a homologous or heterologous structural gene in proper reading frame with a DNA sequence coding for a MSP signal peptide, said gene and MSP signal peptide operably linked with a suitable promoter, (b) transforming a suitable host with a hybrid vector comprising a fused gene prepared in (a), (c) secreting the polypeptide encoded by said fused gene from the host cells and, when required, (d) isolating the polypeptide from the supernatant.

5,559,008

LEUKOTOXIN GENE FROM *PASTEURELLA SUIS*

Yung-Fu Chang, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Division of Ser. No. 972,157, Nov. 5, 1992, abandoned. This application Mar. 22, 1994, Ser. No. 215,805

Int. Cl.[6] C12N *15/31;1/13;1/19;* **C12P** *21/02*

U.S. Cl. 435—69.1 **36 Claims**

1. An isolated DNA molecule encoding a pslktA gene product of *Pasteurella suis.*

5,559,009

VOLTAGE-GATED POTASSIUM CHANNEL GENE, KV1.7, VECTORS AND HOST CELLS COMPRISING THE SAME, AND RECOMBINANT METHODS OF MAKING POTASSIUM CHANNEL PROTEINS

Kanianthara G. Chandy, Laguna Beach; Katalin Kalman; Grischa Chandy, both of Irvine, and George A. Gutman, Costa Mesa, all of Calif., assignors to The Regents of The University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 207,401, Mar. 4, 1994, abandoned. This application Aug. 10, 1994, Ser. No. 288,405

Int. Cl.[6] C12N *15/12;15/63;5/10;1/21*

U.S. Cl. 435—69.1 **7 Claims**

1. An isolated DNA molecule encoding a Kv1.7 potassium channel protein having the amino acid sequence shown in SEQ ID NO: 10.

5,559,010

NUTRIENT REGULATED GENE EXPRESSION SYSTEMS

Daniel J. Klionsky, Davis, Calif.; Monika Destruelle, and Helmut Holzer, both of Freiburg, Germany, assignors to The Regents Of The University Of California, Oakland, Calif.

Filed Apr. 4, 1994, Ser. No. 222,289

Int. Cl.[6] C12N *1/15;15/11;15/81;* **C12P** *21/06*

U.S. Cl. 435—69.1 **10 Claims**

1. An isolated nucleic acid of at least 20 base pairs which hybridizes with a nucleic acid consisting of nucleotides 10 to 408 of SEQ ID NO:1 at 50° C. in SSC (0.9 M saline/0.09 M sodium citrate) and remaining bound when subject to washing at 55° C. with SSC, wherein said isolated nucleic acid regulates the transcription of a gene joined in cis to said isolated nucleic acid.

5,559,011

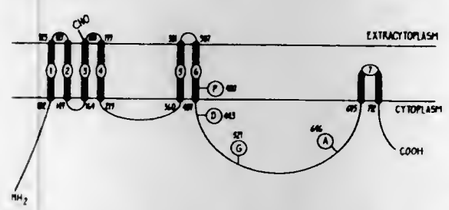
NUCLEIC ACIDS ENCODING MEMBRANE-ASSOCIATED IMMUNOGENS OF MYCOBACTERIAL AND CORRESPONDING PROBES, VECTORS, AND TRANSFORMED HOST CELLS

Archana Kapoor, Maison De L. Inde, 35 Boulvard Jourdan, 75014 Paris, France, and Anil Mhatre, 9450 Gilman Dr. No, 920573, LaJolla, Calif. 92092-0573

Division of Ser. No. 906,395, Jun. 29, 1992, Pat. No. 5,330,754. This application Feb. 7, 1994, Ser. No. 192,632

Int. Cl.[6] C12N *15/31;1/21*

U.S. Cl. 435—69.3 **12 Claims**



2. An isolated nucleic acid comprising a sequence which encodes a *M. bovis* BCG protein having the sequence shown in SEQ ID NO: 2.

5,559,012

THERAPEUTIC, IL-6 ANTIBODY KITS, AND PROCESS FOR THEIR PREPARATION

Hervé Bradly, Aix En Provence Bodches du Rhdne; Félix A. Montero-Julian, Marseille Bodches du Rhdne, and Bernard Klein, Vertou Loire-Atlantique, all of France, assignors to Immunotech, Marseille, France

Filed Jul. 25, 1994, Ser. No. 280,230

Claims priority, application France, Jul. 23, 1993, 93 09382

Int. Cl.[6] C12P *21/08;* **C12N** *5/12;* **C07K** *16/24*

U.S. Cl. 435—70.21 **10 Claims**

1. A therapeutic kit for neutralizing a short life IL-6 cytokine, said cytokine being of sufficient size to comprise at least three functional antibody-binding sites, wherein said kit includes at least three unlinked individual monoclonal antibodies which have an affinity greater than 10^9 liter/mole and bind three distinct epitopes of said cytokine, at least one of the said three monoclonal antibodies blocking the biological activity of said cytokine as evaluated in vitro with the aid of a biological assay measuring IL-6 activity.

5,559,013

METHOD OF AMPLIFICATION USING INTERMEDIATE RENATURATION STEP

John W. Backus, Williamson, and John W. H. Sutherland, Rochester, both of N.Y., assignors to Johnson & Johnson Clinical Diagnostics, Inc., Rochester, N.Y.

Filed Jun. 22, 1994, Ser. No. 264,102

Int. Cl.[6] C12P *19/34;* **C12Q** *1/68;1/70;* **C07H** *21/04*

U.S. Cl. 435—91.2 **15 Claims**

1. A method for the coamplification of two or more target nucleic acids, said method comprising:

I) at least 15 primary amplification cycles of from about 20 to about 360 seconds each, each cycle comprising the sequential steps of:

A) heating a reaction mixture of two or more target nucleic acids or their primer extension products, at least one of said target nucleic acids being a low copy target nucleic acid, and at least one other of sid target nucleic acids being a high copy target nucleic acid which is suspected of being present at at least about 1000 times the concentration of said low copy nucleic acid,

said heating being carried out at a first temperature, T_1, of from about 85° to about 100° C. for denaturation of the strands of said high and low copy target nucleic acids or their primer extension products,

B) priming said denatured strands with a set of primers specific to and hybridizable with opposing strands of each target nucleic acid to be amplified, by cooling to a second temperature, T_2, which is defined as:

$$(T_{mH}-15)°C. \leqq T_2 \leqq (T_{mH}+5)°C.$$

wherein T_{mH} is the melting temperature of the primers for the high copy target nucleic acid,

C) either as a continuation of step B) or in a different step, forming primer extension products in a reaction mixture of PCR reagents, by incubation at a third temperature, T_3, which is defined as:

$$(T_{mH}-15)°C. \leqq T_3 \leqq (T_{mH}+15)°C.,$$

provided that when priming and primer extension products formation are carried out in the same step, T_2 and T_3 are the same, and

II) at least 5 secondary amplification cycles of from about 20 to about 360 seconds each, each cycle comprising repeating steps A) through C) identified sequentially,

provided that between steps A) and B) of each secondary amplification cycle, the reaction mixture is cooled to and maintained at a fourth temperature, T_4, which is defined as:

$$(T_{mH}+5)°C. \leqq T_4 \leqq T_{PH}$$

wherein T_{PH} is the melting temperature of the double strands of said high copy target nucleic acid, for from about 15 to about 120 seconds,

wherein the total number of primary amplification cycles and secondary amplification cycles is 55 cycles or less.

5,559,014

METHODS AND REAGENTS TO DETECT AND CHARACTERIZE NORWALK AND RELATED VIRUSES

Mary K. Estes, Friendswood; Xi Jiang, and David Y. Graham, both of Houston, all of Tex., assignors to Baylor College of Medicine, Houston, Tex.

Continuation of Ser. No. 433,492, Nov. 8, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 485,576

Int. Cl.[6] C12N *15/10;15/40;* **C12P** *19/34*

U.S. Cl. 435—91.2 **1 Claim**

1. A method of synthesizing a clone of Norwalk virus, comprising the steps of:

isolating single stranded RNA from a Norwalk virus;

synthesizing a cDNA with reverse transcriptase and random primers;

synthesizing a second strand DNA from said cDNA;

amplifying said second strand DNA;

inserting at least one copy of said second strand DNA into a plasmid;

and

screening said plasmid to identify clones containing fragments of the Norwalk virus genome.

5,559,015

RECOMBINANT-DNA MEDIATED PRODUCTION OF XANTHAN GUM

Michael A. Capage; Daniel H. Doherty; Michael Betlach, and Rebecca W. Vanderslice, all of Boulder, Colo., assignors to Getty Scientific Development Company, Houston, Tex.

Continuation of Ser. No. 815,615, Jan. 7, 1992, abandoned, which is a continuation of Ser. No. 333,868, Apr. 3, 1989, abandoned, which is a continuation of Ser. No. 188,687, Apr. 27, 1988, abandoned, which is a continuation of Ser. No. 29,530, Mar. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 844,332, Mar. 26, 1986, abandoned. This application Dec. 2, 1994, Ser. No. 352,216

Int. Cl.[6] C12P *19/06;* **C12N** *1/21;15/70;15/74*

U.S. Cl. 435—104 **48 Claims**

1. A recombinant-DNA mediated method for the production of a variant xanthan which is a polytrimer or non-acetylated polytrimer, said method comprising:

(a)

(i) for production of non-acetylated polytrimer, obtaining at least one vector comprising a Xanthomonas nucleotide sequence encoding transferase I, transferase II, transferase III, and polymerase, or

(ii) for the production of polytrimer, obtaining at least one vector comprising a Xanthomonas nucleotide sequence encoding transferase I, transferase II, transferase III, acetylase and polymerase;

(b) transferring the vector or vectors into a gram negative bacterium, said bacterium producing UDP-glucose and GDP-mannose;

(c) culturing said gram negative bacterium under conditions appropriate for synthesis of said polytrimer or non-acetylated polytrimer; and

(d) harvesting said polytrimer or non-acetylated polytrimer.

5,559,017

MICROBIAL REDUCTION OF BENZAZEPINES AND BENZOTHIAZEPINE DERIVATIVES

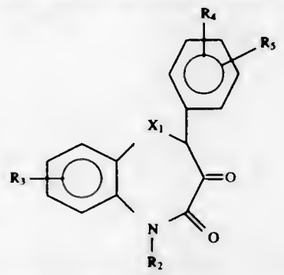
Ramesh N. Patel, Bridgewater; Laszlo J. Szarka, East Brunswick, and Richard H. Mueller, Ringoes, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 391,019, Aug. 9, 1989, abandoned. This application Nov. 19, 1990, Ser. No. 615,736

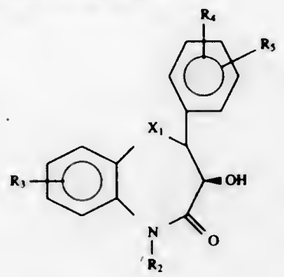
Int. Cl.[6] C12P *17/14;17/10;17/16*

U.S. Cl. 435—120 **24 Claims**

1. A process for transforming a substrate having the formula



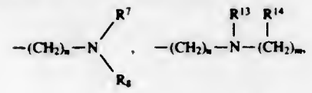
to a product having the formula

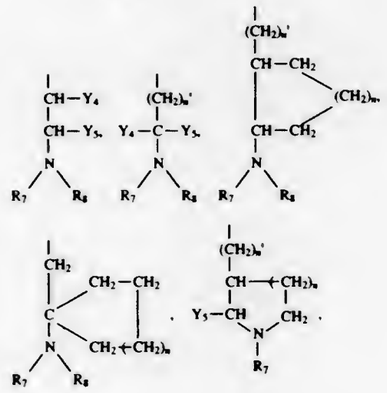


wherein:

X_1 is $—CH_2—$ or $—S—$;

when X_1 is $—CH_2—$, R_2 is hydrogen,





5,559,016

PROCESS FOR PRODUCING ALANINE

Ryoichi Katsumata, and Shin'ichi Hashimoto, both of Tokyo, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1993, Ser. No. 170,936

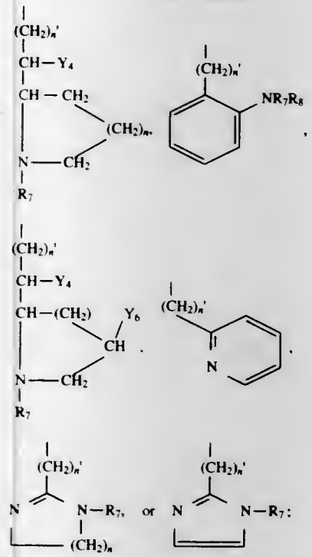
Claims priority, application Japan, Dec. 22, 1992, 4-342709

Int. Cl.[6] C12P *13/06;* **C12N** *1/21;15/53;9/02*

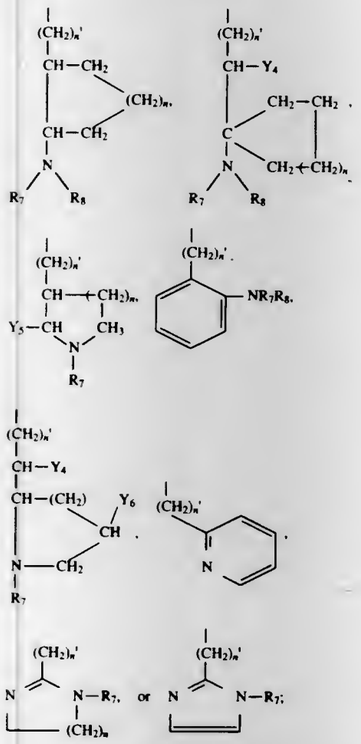
U.S. Cl. 435—116 **8 Claims**

1. A process for producing alanine which comprises culturing in a medium containing glucose for a carbon source a microorganism belonging to the genus Escherichia, Corynebacterium or Brevibacterium which is capable of producing alanine and harbors a recombinant DNA containing the gene coding for L-alanine dehydrogenase which is cloned from Arthrobacter sp. HAP1, under conditions such that alanine is produced and accumulated in the culture medium, and recovering alanine from said culture medium.

-continued

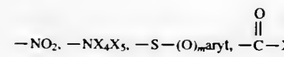


when X_1 is $—S—$, R_2 is hydrogen,



R_3, R_4 and R_5 are each independently hydrogen, halogen, alkyl, alkoxy, aryloxy, arylalkoxy, diarylalkoxy, arylalkyl, cyano, hydroxy, alkanoyloxy, nitro,

fluoro-substituted alkoxy, fluro-substituted alkyl, (cycloalkyl)alkoxy,



R_7 and R_8 are each independently hydrogen, alkyl, cycloalkyl, or arylalkyl; or R_7 and R_8, together with the nitrogen atom to which they are attached, are azetidinyl, pyrrolidinyl, piperidinyl, or morpholinyl;

R_{13} is hydrogen, alkyl, cycloalkyl, or arylalkyl;

R_{14} is heterocyclo or heteroaryl;

X_4 and X_5 are each independently hydrogen, alkyl, alkanoyl, arylcarbonyl, heteroarylcarbonyl, or $—C—NR_7R_8$;

X_6 is hydroxy, alkoxy, aryloxy, amino, alkylamino or dialkylamino;

X_7 is alkyl, alkoxy, or aryloxy;

Y_4 and Y_5 are each independently hydrogen, alkyl, aryl or arylalkyl, provided that when both are present they are not both hydrogen, and provided further that when both are attached to the same carbon atom neither of them is hydrogen;

Y_6 is hydrogen, hydroxy, alkoxy, aryloxy or aralkoxy;

m is 0, 1, or 2; and

n or n' is 0, 1, 2, or 3;

and wherein the process comprises treating the substrate with a reductase or a reductase-supplying microorganism.

5,559,018

INVIABLE PHAGES, THEIR PRODUCTION AND DNA THEREOF

Thomas L. Mattson, 19, rue de la Filature, 1227 Carouge, Geneva, and Richard Epstein, 56 avenue Communes-Reunies, 1212 Grand Lancy, Geneva, both of Switzerland

Continuation of Ser. No. 662,498, Feb. 28, 1991, abandoned, which is a continuation of Ser. No. 233,681, Jan. 16, 1986, abandoned. This application Sep. 15, 1992, Ser. No. 946,033

Claims priority, application United Kingdom, Sep. 13, 1983, 8324479

Int. Cl.[6] C12N *15/00;15/63*

U.S. Cl. 435—172.3 **22 Claims**

1. A method of producing a phage-infected host bacterium, for obtaining products including a population of inviable T-even bacteriophage particles containing DNA of a predetermined non-T-even base sequence and DNA thereof, and for expressing a protein encoded by a predetermined non-T-even base sequence, the method comprising:

infecting a host bacterium containing a replicon having a predetermined non-T-even base sequence with a T-even phage, said replicon also containing a DNA sequence sufficiently homologous to a DNA sequence in the T-even phage to allow recombination between the replicon and phage DNA to take place, said T-even phage having inactive wild type denB gene functions, and

recovering the phage-infected host bacterium containing the predetermined non-T-even base sequence.

5,559,019

PROTEIN SERINE KINASE, SRPK1

Jian-Fang Gui, and Xiang-Dong Fu, both of San Diego, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Jun. 22, 1994, Ser. No. 264,002

Int. Cl.[6] C12N *15/54;15/63;1/15;1/21;5/10*

U.S. Cl. 435—240.1 **5 Claims**

1. A purified polynucleotide, free of homologous chromosomal DNA, that encodes a peptide which is characterized by:
   a) having a molecular weight of about 92 kD as determined by non-reducing SDS-PAGE,
   b) having serine kinase activity,
   c) having the amino acid sequence of SEQ ID No:2, and
   d) phosphorylating the SR family of RNA splicing factors.

5,559,020

PROCESS FOR PREPARING GLY.OXYLIC ACID/ DIALKYL AMINOMETHYLPHOSPHONATE MIXTURES

David L. Anton, and Robert Dicosimo, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 67,250, May 28, 1993. This application Feb. 8, 1995, Ser. No. 385,260

Int. Cl.[6] C12P *7/40;7/42;13/00;* C07F *9/22*

U.S. Cl. 435—136 **4 Claims**

1. In a process for reacting glycolic acid with oxygen using as catalysts the enzymes glycolate oxidase and catalase in the presence of aminomethylphosphonic acid to prepare a product mixture comprising glyoxylic acid and aminomethylphosphonic acid the improvement comprising substituting for the aminomethylphosphonic acid a dialkyl aminomethylphosphonate, wherein the corresponding alkyl groups are individually selected from methyl, ethyl, propyl and isopropyl, thereby producing a mixture of glyoxylic acid and dialkyl aminomethylphosphonate wherein the yield of glyoxylic acid is increased, said increased yield resulting from a removal of the inhibition of a catalase by aminomethylphosphonic acid.

5,559,021

DNA ENCODING A NOVEL MAMMALIAN TRANSPORTER HOMOLOGOUS TO NEUROTRANSMITTER TRANSPORTERS AND USES THEREOF

Kelli E. Smith, Wayne, N.J., and Richard L. Weinshank, New York, N.Y., assignors to Synaptic Pharmaceutical Corporation, Paramus, N.J.

Filed Nov. 9, 1993, Ser. No. 149,100

Int. Cl.[6] C12N *5/06;1/21;1/19;15/63*

U.S. Cl. 435—240.2 **15 Claims**

1. An isolated nucleic acid molecule encoding a rat rB21a transporter having the amino acid sequence shown in SEQ. I.D. No. 2.

5,559,022

LIVER RESERVE CELLS

Brian A. Naughton, El Cajon, and Benson Sibanda, Oceanside, both of Calif., assignors to Advanced Tissue Sciences, Inc., La Jolla, Calif.

Continuation of Ser. No. 958,621, Oct. 9, 1992, abandoned. This application Jan. 26, 1995, Ser. No. 378,762

Int. Cl.[6] C12N *5/06;5/08*

U.S. Cl. 435—240.2 **11 Claims**

1. Isolated liver reserve cells which retain and are stained by Eosin Y dye when stained successively by a solution comprising Eosin Y dye, and then by a solution comprising both methylene blue and Azure A dyes.

5,559,023

TUMOR SUPPRESSOR GENE

Yusuke Nakamura, Kanagawa, and Takashi Imai, Chiba, both of Japan, assignors to Cancer Institute, and Eisai Co., Ltd., both of Tokyo, Japan

Filed Feb. 7, 1995, Ser. No. 384,850

Claims priority, application Japan, Feb. 14, 1994, 6-037649

Int. Cl.[6] C12N *5/10;* C07H *21/04*

U.S. Cl. 435—240.2 **7 Claims**

1. An isolated DNA fragment comprising the full structure or a part of the DNA represented by SEQ ID NO: 1, wherein said part of the DNA comprises a base sequence of at least 10 contiguous bases from the DNA represented by SEQ ID NO: 1.

5,559,024

CHIMERIC NITRILASE-ENCODING GENE FOR HERBICIDAL RESISTANCE

Bernard Leroux, Lozanne; Bernard Pelissier, and Michel Lebrun, both of Lyon, all of France, assignors to Rhone-Poulenc Agrochimie, Lyon, France

Continuation of Ser. No. 141,699, Oct. 26, 1993, abandoned, which is a continuation of Ser. No. 2,682, Jan. 8, 1993, abandoned, which is a continuation of Ser. No. 711,400, Jun. 6, 1991, abandoned, which is a continuation of Ser. No. 326,003, Mar. 20, 1989, abandoned. This application Jan. 13, 1995, Ser. No. 375,566

Claims priority, application France, Mar. 23, 1988, 88/04130

Int. Cl.[6] C12N *5/10;15/55;15/31*

U.S. Cl. 435—252.3 **11 Claims**

1. A chimetic nitrilase-encoding gene derived from bacteria which confers resistance to a herbicide based on 3,5-dihalo-4-hydroxybenzonitrile, comprising at least one gene coding for resistance to this herbicide, operably linked to a foreign promoter and a polyadenylation signal region, wherein the promoter originates from a gene which is naturally expressed in plant cells and is selected from the group consisting of the promoter operably linked with said gene of the 35 S RNA for cauliflower mosaic virus (CaMV 35S) the promoter of the small subunit (SSU) of sunflower (*Helianthus annuus*) ribulose-1,5-bisphosphate carboxylase/oxygenase (RubisCO) and a combination of the promoter of the 35 S RNA for cauliflower mosaic virus (CaMV 35S) and the promoter of the small subunit (SSU) of sunflower (*Helianthus annuus*) ribulose-1,5-bisphosphate carboxylase/oxygenase (RubisCO).

5,559,025

EXPRESSION OF MATURE PROTEINASE 2A, THE PARTIAL PURIFICATION THEREOF AND PREPARATION OF SUBSTRATES HAVING AN INHIBITORY EFFECT

Horst Ahorn, Weigelsdorf; Ingrid Maurer-Fogy; Wolfgang Sommergruber, both of Vienna; Andreas Zöphel, Neulengbach; Dieter Blaas, Vienna; Ernst Küchler, Vienna; Hans-Dieter Liebig, Vienna, and Timothy Skern, Vienna all of Austria, assignors to Boehringer Ingelheim International GmbH, Ingelheim, Germany

Continuation of Ser. No. 971,619, Nov. 6, 1992, abandoned. This application Oct. 11, 1994, Ser. No. 320,373

Claims priority, application Germany, Nov. 6, 1991, 41 36 443.0

Int. Cl.[6] C12N *1/21;15/70*

U.S. Cl. 435—252.33 **2 Claims**

1. A DNA comprising a DNA vector fragment which is:
   (a) NcoI/HindIII linearized pPROK-1 comprising a tac promoter, and
   (b) a DNA segment encoding an HRV proteinase 2A which is operably linked to said tac promoter, wherein said DNA is capable of expressing mature, soluble, enzymatically active HRV proteinase 2A when present in *E. coli;* wherein 15% to 20% of the total amount of HRV proteinase 2A is present in soluble form when expressed in said *E. coli,* and wherein said DNA vector is pPROK-½A-41.

5,559,026

GENES ENCODING A NOVEL FAMILY OF POTASSIUM CHANNELS

Laura A. Price, Langhorne, Pa., and Mark H. Pausch, Robbinsville, N.J., assignors to American Cyanamid Company, Madison, N.J.

Filed Oct. 31, 1994, Ser. No. 332,312

Int. Cl.[6] C12N *1/14;15/00;* C07H *21/04*

U.S. Cl. 435—254.2 **7 Claims**

1. An isolated nucleotide sequence comprising the nucleotide sequence of Seq. I.D. No. 1.

5,559,027

SYNTHETIC EUKARYOTIC PROMOTERS CONTAINING TWO INDUCIBLE ELEMENTS

Jorge Filmus, Toronto, and Michel Klein, Willowdale, both of Canada, assignors to Connaught Laboratories Limited, North York, Canada

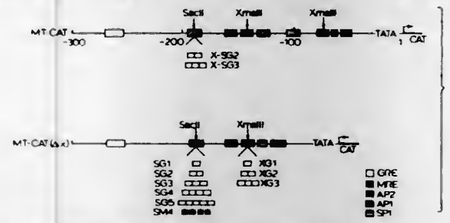
PCT No. PCT/CA93/00130, § 371 Date Oct. 20, 1994, § 102(e) Date Oct. 20, 1994, PCT Pub. No. WO93/20218, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 30, 1993, Ser. No. 256,720

Claims priority, application United Kingdom, Mar. 30, 1992, 9206874

Int. Cl.[6] C12N *5/10;15/11;* C07H *21/04*

U.S. Cl. 435—240.2 **19 Claims**



1. A synthetic inducible eukaryotic promoter for the regulation of transcription of a gene to produce a gene product, comprising at least two inserted linked responsive elements from a different class of inducible promoter, wherein (a) the inducible promoter is selected from the group consisting of the human metallothionein gene (hMT-IIA) promoter and the mouse mammary tumor virus/long terminal repeat (MMTV-LTR)promoter, (b) the inserted responsive elements are selected from the group consisting of glucocorticoid-responsive elements (GREs) and metal-responsive elements (MREs), and (c) said different classes of inducible elements are inserted such that induction of the promoter by both classes of inducers causes a synergistic increase in expression of the gene product in a eukaryotic expression system compared to induction by either inducer alone.

5,559,028

METHODS OF ENHANCING OR ANTIGEN PRESENTATION TO T CELLS INHIBITING

Robert E. Humphreys, Acton, Mass., assignor to Antigen Express, Inc., Wilmington, Del.

Filed May 19, 1993, Ser. No. 64,400

Int. Cl.[6] C12N *5/06;* C07K *7/00;* A61K *38/10*

U.S. Cl. 435—240.2 **3 Claims**

1. A method for enhancing presentation of an MHc class II restricted antigenic peptide to a T cell, comprisiog:
   a) forming a reaction mixture comprising:
      i) an MHC class II expressing antigen presenting cell;
      ii) the peptide YRMKLPKPPKPVSKMR (SEQ ID NO:1);
      iii) the MHC class II restricted antigenic peptide which, when added to the incubation mixture, is not in association with an antigen presenting cell; and
      iv) a T cell which is responsive to the MHC class II restricted antigenic peptide of part iii); and
   b) incubating the reaction mixture of step a) under conditions appropriate for interaction between the antigen presenting cell and the T cell.

5,559,029

METHOD OF DISPERSING A HYDROCARBON USING BACTERIA

Richard L. Tyndall, Clinton, Tenn., assignor to Martin Marietta Energy Systems, Inc., Oak Ridge, Tenn.

Division of Ser. No. 388,862, Feb. 15, 1995, Pat. No. 5,518,919, which is a division of Ser. No. 203,452, Feb. 28, 1994, Pat. No. 5,420,035, which is a division of Ser. No. 11,841, Feb. 1, 1993, Pat. No. 5,314,821, which is a continuation of Ser. No. 693,998, Apr. 26, 1991, abandoned. This application May 19, 1995, Ser. No. 445,150

Int. Cl.[6] C12P *1/02;1/04*

U.S. Cl. 435—262 **2 Claims**

1. A method of dispersing a hydrocarbon comprising:
   providing a bacterium selected from the group consisting of ATCC 75527, ATCC 75529, ATCC 55638, ATCC 55639, and ATCC 55640, a mutant of any one of said bacteria possessing all the identifying characteristics of any one of said bacteria, and mixtures thereof; and,
   contacting said bacterium with a hydrocarbon in an amount and under conditions suitable to disperse said hydrocarbon.

5,559,030

PROCESSES FOR PRODUCTION OF OPTICALLY ACTIVE 4-HALO-3-HYDROXYBUTYRIC ACID ESTERS

Akinobu Matsuyama, Arai; Akira Tomita, and Yoshinori Kobayashi, both of Joetsu, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

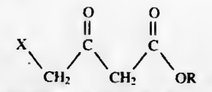
Filed Jan. 12, 1994, Ser. No. 180,420

Claims priority, application Japan, Jan. 12, 1993, 5-003422

Int. Cl.[6] C12P *7/40*

U.S. Cl. 435—280 **8 Claims**

1. A process for producing (S)-4-halo-3-hydroxybutyric acid ester which comprises
   treating a 4-halo-acetoacetic acid ester represented by the general formula (I):



(I)

   wherein X represents a halogen atom and R represents an alkyl group having 1 to 4 carbon atoms with at least one member selected from the group consisting of a microorganism, a culture broth thereof and a preparation from the microorganism capable of acting on said 4-halo-acetoacetic acid ester represented by the general formula (I), wherein said preparation is selected from the group consisting of a crude extract, disrupted cells, acetone-treated cells, lyophilized cells, immobilized cells, immobilized disrupted cells, immobilized acetone-treated cells and immobilized lyophilized cells, and said microorganism is selected from the group consisting of *Kluyveromyces lactis, Leucosporidium scottii, Leuconostoc dextranicum* IFO 3349, *Lodderomyces elongisporus, Oosporidium margaritiferum, Pediococcus parvulus, Pityrosporum ovale, Rhodosporidium diobovatum, Sporidiobolus pararoseus, Stephanoascus ciferrii, Streptococcus equi, Saccharomycopsis capsularis, Wickerhamia fluorescens,*

Zygosaccharomyces bailii, Zygoascus hellenicus, Lactobacillus buchneri, Lactobacillus bulgaricus, Lactobacillus casei, Lactobacillus delbrueckii, Lactobacillus frigidus, Lactobacillus hilgardii, Lactobacillus lactis, Lactobacillus malefermentans, Lactobacillus plantarum and *Lactobacillus xylosus* to produce (S)-4-halo-3-hydroxybutyric acid ester; and

recovering said (S)-4-halo-3-hydroxybutyric acid ester.

5,559,031

APPARATUS FOR THE CONTINUOUS PRODUCTION OF ETHANOL FROM CEREALS

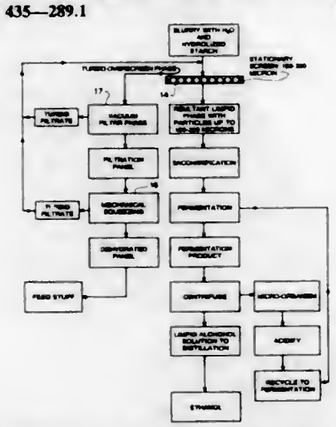
Francesco Zinnamosca, and Massimo Berruti, both of Rome, Italy, assignors to Technipetrol S.p.A., Rome, Italy

Continuation of Ser. No. 879,601, May 7, 1992, abandoned, which is a division of Ser. No. 353,641, Apr. 11, 1989, abandoned. This application Jul. 1, 1994, Ser. No. 269,634

Claims priority, application Italy, Apr. 11, 1989, 48298/87

Int. Cl.[6] C12M *1/40*

U.S. Cl. 435—289.1 **9 Claims**



1. A continuous cycle apparatus for the production of ethanol from an acidified hydrolyzed product of cereals obtained by an enzyme treatment of milled and cooked cereals, said apparatus comprising:

a stationary screen having a mesh size of 150–300 microns and having an inlet for receiving hydrolyzed product and recycled turbid filtrate, a first bottom outlet for limpid product, and a second bottom outlet for a turbid product;

a storing vessel for the turbid product having an inlet and an outlet, said inlet being connected to said second bottom outlet of said screen;

a stirrer in said storing vessel;

a horizontal band filter under vacuum having a first inlet connected to said storing vessel outlet, having a second inlet for receiving warm panel washing water, having a first outlet for a filtration panel, having a second outlet for a turbid filtrate and having a third outlet for the panel washing-water, said first band filter inlet being connected to said outlet of said storing vessel;

a mechanical squeezing filter coupled to said band filter first outlet for receiving the filtration panel for carrying out a hard dehydration of the filtration panel which is a by-product of the apparatus, said squeezing filter having an outlet for the panel and an outlet for a turbid filtrate;

filtrate receiving vessel means for receiving said turbid filtrate from said band filter second outlet through an inlet of said filtrate receiving vessel means, said filtrate receiving vessel means having an outlet coupled to said inlet of said stationary screen;

said filtrate receiving vessel means also receiving said turbid filtrate from said mechanical squeezing filter through an inlet of said filtrate receiving vessel means;

a limpid phase receiving vessel for receiving clarified hydrolyzed product from said first bottom outlet of said stationary screen through an inlet of said limpid phase receiving vessel, said limpid phase receiving vessel having an outlet;

a pre-saccharification tank coupled to said outlet of said limpid phase receiving vessel, said pre-saccharification tank having a bottom outlet;

a fermentation stage including yeast microorganisms coupled to said bottom outlet of said pre-saccharification tank and having an outlet for fermentation product;

a separator for separating the yeast microorganisms from the fermentation product, said separator having an inlet for receiving fermentation product from said fermentation stage and two outlets;

a yeast microorganisms treatment vessel having a stirrer therein and having two inlets and one outlet, one inlet being connected to one of said two outlets of said separator of yeast microorganisms, the other inlet being coupled to a source of sulfuric acid, and said outlet being coupled to said fermentation stage; and,

a wine storing vessel having an inlet and an outlet, said inlet being connected to said other outlet of said separator of yeast microorganisms and said outlet being coupled to a distillation stage.

5,559,032

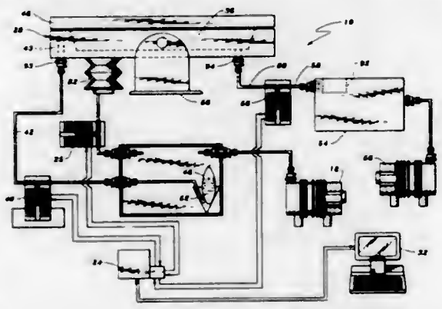
METHOD AND APPARATUS FOR POST-TRANSFER ASSAYING OF MATERIAL ON SOLID SUPPORT

Patrick C. Pomeroy, 1920 Gilly La., Concord, Calif. 94518; Randall Madsen, 8970 Taurus Pl., San Diego, Calif. 92126; Wai P. Chan, 18845 California St., Castro Valley, Calif. 94546, and Gary Lemke, 1630 St. David Dr., Danville, Calif. 94526

Continuation-in-part of Ser. No. 206,249, Mar. 4, 1994, abandoned, which is a continuation of Ser. No. 862,023, Apr. 2, 1992, abandoned, which is a continuation-in-part of Ser. No. 547,167, Jun. 29, 1990, abandoned. This application Feb. 9, 1995, Ser. No. 386,202

Int. Cl.[6] C12M *1/36*

U.S. Cl. 435—289.1 **9 Claims**



1. A device for treating reactant-carrying bodies with predetermined sequences of reagents, comprising:

a housing;

a reagent pouch container which is receivable in said housing and is manually removable therefrom without tools; at least one reagent pouch which is receivable in said reagent pouch container and is manually removable therefrom without tools, is capable of independently containing a quantity of a fluid reagent, and is provided with a valved conduit coupling capable of passing fluid only when coupled to another valved conduit coupling;

at least one flexible tubular conduit which is provided at each end with one of said valved conduit couplings;

a reactant-carrying body container which is receivable in said housing and is manually removable therefrom without tools;

at least one electrically operable pinch valve which is contained in said housing;

at least one transfer conduit for conducting fluid reagent from one of said reagent pouches to said reactant-carrying body container, which transfer conduit includes one of said flexible tubular conduits which passes through one of said pinch valves;

pressurized gas source means for supplying gas under superambient pressure to the interior of said reagent pouch container, whereby to compress all of the reagent pouches which are contained within said reagent pouch container; and

programmable control means for controlling the operation of said pinch valves.

5,559,033

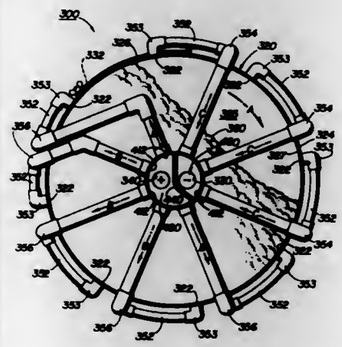
METHOD AND APPARATUS FOR CLOSED LOOP AIR CIRCULATION COMPOSTING WITH AN EXTERNAL AIR MANIFOLD

Richard N. Young, Atlanta, Ga., assignor to DBS Manufacturing, Inc., Forest Park, Ga.

Continuation-in-part of Ser. No. 323,451, Oct. 14, 1994. This application Sep. 26, 1995, Ser. No. 534,153

Int. Cl.[6] C12M *1/10*

U.S. Cl. 435—290.3 **17 Claims**



1. An apparatus for biologically decomposing a material, comprising:

a. a frame;

b. a substantially airtight housing rotatably mounted on said frame, said housing having a first outside surface and a first inside surface, a first end and a second end, the first inside surface defining an enclosure therein, the housing defining a plurality of openings therethrough;

c. a first air header;

d. a second air header;

e. a plurality of air manifolds disposed external to said housing and in fluid communication with the enclosure through the openings defined by said housing, said plurality of air manifolds including:

i. a first plurality of air manifolds in fluid communication with said first air header; and

ii. a second plurality of air manifolds in fluid communication with said second air header; and

f. a means for selectively directing fluid flow such that air passes from said first air header through said first plurality of air manifolds into the enclosure and passes out of the enclosure through said second plurality of manifolds to said second air header.

5,559,034

SYNERGISTIC ANTIFUNGAL PROTEIN AND COMPOSITIONS CONTAINING SAME

Walden K. Roberts, Denver; Claude P. Selitrennikoff, Evergreen, both of Colo.; Bridget E. Laue, Davis, Calif., and Sharon L. Potter, Raleigh, N.C., assignors to CIBA-GEIGY Corporation, Tarrytown, N.Y.

Division of Ser. No. 178,708, Jan. 10, 1994, which is a continuation-in-part of Ser. No. 505,781, Apr. 6, 1990, abandoned, which is a continuation-in-part of Ser. No. 104,755, Oct. 2, 1987, abandoned. This application Jun. 1, 1995, Ser. No. 457,552

Int. Cl.[6] C12N *15/00;1/20;* **C07H** *19/00;21/00*

U.S. Cl. 435—320.1 **2 Claims**

1. An isolated DNA sequence comprising the DNA sequence set forth in SEQ ID NO: 7.

5,559,035

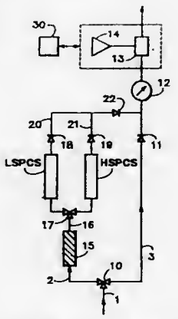
SOLID PHASE CALIBRATION STANDARDS

Clifford D. Jolly, Lakewood, Colo., assignor to Umpqua Research Company, Myrtle Creek, Oreg.

Continuation of Ser. No. 181,354, Jan. 12, 1994, abandoned, which is a continuation of Ser. No. 934,420, Aug. 24, 1992, abandoned. This application Dec. 7, 1994, Ser. No. 351,544

Int. Cl.[6] G01N *31/00*

U.S. Cl. 436—19 **1 Claim**



1. A method of preparing a non-buffered, low ionic strength aqueous calibration fluid, comprising contacting an aqueous fluid stream having a specific conductance of ≦5 micromho/cm with at least one compound selected from the group consisting of basic metal oxides, acidic metal oxides, amphoteric metal oxides, isopolyacids of metals, heteropolyacids of metals and carbonates of metals selected from the group consisting of barium, calcium, copper, molybdenum and lead.

5,559,036

FLUID ANALYSIS

Lodewyk J. Mienie, Potchefstroom; Ronald A. Van Steenderen, Pretoria; Elardus Erasmus, Fochville; Julius H. Ueckermann, Pretoria; Wouter J. De Wet, and Henning J. Els, both of Potchefstroom, all of South Africa, assignors to CSIR, Pretoria; Potchefstroom University for Christian Higher Education, and Lekratek Instrumentation, both of Potchefstroom, all of South Africa

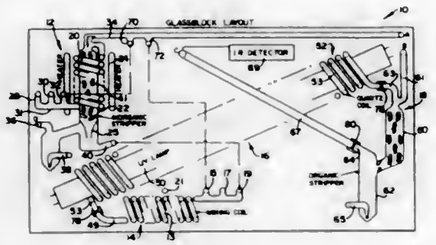
Continuation of Ser. No. 94,489, Jul. 19, 1993, abandoned. This application Dec. 5, 1994, Ser. No. 349,264

Claims priority, application South Africa, Jul. 20, 1992, 92/5393

Int. Cl.[6] G01N *33/48*

U.S. Cl. 436—63 **7 Claims**

1. A method for the preliminary screening for the presence of abnormal levels of metabolites in the urine of a human or animal



suspected of suffering from a metabolic disorder, the method comprising the steps of:

(a) determining the amount of creatinine in mmol/l in the urine of the human or animal, the amount of creatinine serving as an internal standard useful in correcting for variation in urine concentration;

(b) measuring the total urinary metabolites content in the urine by oxidizing the total urinary metabolites to carbon dioxide and measuring the amount of carbon dioxide produced;

(c) calculating a transformed ratio, the transformed ratio (TR) corresponding to the total urinary metabolites content corrected for urine concentration using the internal standard;

(d) comparing the transformed ratio calculated in (b) with a reference value, the reference value representing the transformed ratio of the total urinary metabolites content of urine from humans or animals who do not suffer from a metabolic disorder; and

wherein an increase in the transformed ratio above the reference value is abnormal and suggestive of a metabolic disorder.

5,559,037

METHOD FOR RAPID AND SIMULTANEOUS ANALYSIS OF NUCLEATED RED BLOOD CELLS

Young R. Kim; Michael W. Yee, both of Sunnyvale; Suresh N. Mehta, Pleasanton; Josefino C. Sagala, San Jose, and Johanna Kantor, Palo Alto, all of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Dec. 15, 1994, Ser. No. 356,932

Int. Cl.[6] G01N *33/48*

U.S. Cl. 436—63 **8 Claims**

1. A method of differentiating nucleated red blood cells (NRBC) from other cells by flow cytometry which comprises:

(a) mixing an aliquot of a blood sample with a lysing reagent system and a vital nuclear stain to stain the nuclei of the NRBC wherein the lysing reagent system comprises a red blood cell (RBC) lysing component, and a leukocyte preserving component wherein the leukocyte preserving component preserves leukocyte cellular membranes to prevent leukocyte staining by the vital nuclear stain;

(b) passing the mixed aliquot, substantially a cell at a time, through an area of optical stimulation;

(c) obtaining for each cell at least one signal for the parameters of fluorescence (FL) and scattered light at both a first and second range of scatter angles;

(d) qualifying the signals obtained by subjecting the signals to a logic wherein a signal, to be qualified, must be greater than a second scatter signal threshold, while at the same time the signal must be greater than either a first scatter signal threshold or a FL threshold wherein the thresholds are set to eliminate spurious FL noise signals and include NRBC population signals in the qualified signals obtained;

(e) constructing a three-dimensional plot of intensity signals of FL and scattered light at both the first and second range of scatter angles from the obtained and qualified signals; and

(f) differentiating the NRBC and white blood cells (WBC) from the constructed three-dimensional plot and the qualified signals and determining the number of cells of each.

5,559,038

GAS CHROMATOGRAPHY/MASS SPECTROMETRY DETERMINATION OF OXIDIZED SULFHYDRYL AMINO ACIDS

J. Fred Kolhouse, Denver; Cheruppolil R. Santhosh-Kumar, Lakewood, and John C. Deutsch, Denver, all of Colo., assignors to The Regents of the University of Colorado, Boulder, Colo.

Filed May 4, 1994, Ser. No. 238,754

Int. Cl.[6] G01N *30/00*

U.S. Cl. 436—86 **7 Claims**

1. A method for determination of in vivo concentration in a body fluid of one or more endogenous oxidized sulfhydryl amino acids selected from the group consisting of cysteine sulfinic acid, cysteic acid, homocysteine sulfinic acid and homocysteic acid, said method comprising the steps of:

(a) combining a known mount of at least one internal standard oxidized sulfhydryl amino acid selected from the group consisting of deuterated cysteine sulfinic acid, deuterated cysteic acid, deuterated homocysteine sulfinic acid and deuterated homocysteic acid, with a body fluid collected in vitro, said body fluid comprising at least one of said endogenous oxidized sulfhydryl amino acids;

(b) at least partially purifying said endogenous and internal standard deuterated oxidized sulfhydryl amino acids from other components in said in vitro body fluid;

(c) quantitating said endogenous oxidized sulfhydryl amino acid concentrations in said purified in vitro body fluid of step (b) by gas chromatography/mass spectrometry analysis;

(d) quantitating said internal standard deuterated oxidized sulfhydryl amino acid concentration in said purified in vitro body fluid of step (b) by gas chromatography/mass spectrometry analysis and determining the losses in said internal standard deuterated oxidized sulfhydryl amino acids; and

(e) determining the in vivo concentrations of said endogenous oxidized sulfhydryl amino acid(s) by correcting the quantitated in vitro endogenous concentrations for losses in said known amounts of the internal standard oxidized deuterated sulfhydryl amino acids.

5,559,039

METHOD OF USING LIQUID COLUMN PACKING MATERIALS

Dwight E. Williams, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 998,466, Dec. 30, 1992. This application Aug. 18, 1994, Ser. No. 292,520

Int. Cl.[6] G01N *30/02*

U.S. Cl. 436—161 **4 Claims**

1. A method of analysis by liquid chromatography, comprising:

a) preparing an analyte containing biological fluid to be analyzed;

b) contacting said analyte with a liquid chromatography column packed with a packing material comprising a porous protein-adsorptive support having a coating of crosslinked protein on the external surfaces thereof, said coating of crosslinked protein being a relatively thin but saturated one, such that the signal obtained by at least one surface selective analytical method for nitrogen due to the saturated crosslinked protein coating does not exceed 67 percent of that for a bulk amount of said crosslinked protein; and,

c) measuring said analyte as said analyte is passed through said chromatography column.

5,559,040

PULSING AND OSCILLATING METHODS OF CENTRIFUGING FOR IMPROVING THE RECOVERY OF VIABLE CELLS

Rajasingam S. Jeyendran, 1845 Golden Pond La., Wheaton, Ill. 77024

Filed Dec. 4, 1995, Ser. No. 566,670

Int. Cl.[6] B01D *21/26*

U.S. Cl. 436—177 **21 Claims**

1. A pulsing method of centrifuging samples for improving the recovery of viable cells, said method comprising the steps of:

obtaining a sample of viable cells and adding said sample to a biologically compatible medium;

depositing said sample and said medium in a chamber of a centrifuge;

rotating said chamber so that a predetermined g force is applied to said sample;

then, stopping said rotation of said chamber and allowing said chamber to come to rest;

then, alternately repeating said rotating and stopping steps until at least three total rotating steps have been completed; and

thereafter, removing said sample from said centrifuge.

5,559,041

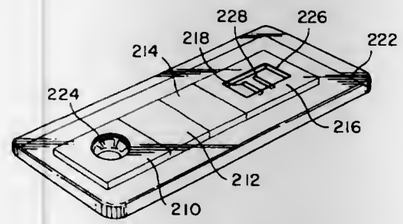
IMMUNOASSAY DEVICES AND MATERIALS

Jemo Kang, Princeton; Byungwoo Youn, Wyckoff, and Young H. Oh, Edison, all of N.J., assignors to Princeton Biomeditech Corporation, Monmouth, N.J.

Division of Ser. No. 456,982, Dec. 18, 1989, Pat. No. 5,252,496. This application Jun. 3, 1993, Ser. No. 70,803

Int. Cl.[6] G01N *33/543;33/558*

U.S. Cl. 436—518 **58 Claims**



1. An immunochemical assay device comprising:

a base member;

an array disposed on said base member, said array comprising:

(i) a reservoir pad having sufficient porosity and volume to receive and contain a liquid sample on which the assay is to be performed;

(ii) a wicking membrane disposed distally to said reservoir pad, said wicking membrane having sufficient porosity and volume to absorb a substantial proportion of the sample received in said reservoir pad; and

(iii) at least one filter zone which is separate and distinct from said reservoir pad and wicking membrane, and interposed between and contiguous with said wicking membrane and said reservoir pad, said filter zone having impregnated therein a labelled immunochemical component capable of binding to an analyte of interest in said sample to form an immuno-complex, said filter zone being operable to permit passage of any specific immuno-complex to said wicking membrane while impeding passage of larger components then contained in said sample; and

at least one immobilized substance disposed in at least one assay indicia zone of said wicking membrane downstream of said reservoir pad and defining assay indicia, said immobilized substance being operable to bind a specific immuno-complex contained in the sample to form said assay indicia.

5,559,042

METHOD OF FABRICATING A THIN FILM SEMICONDUCTOR DEVICE USING AN INSULATING FILM WHICH CONTRACTS WHEN THERMALLY TREATED

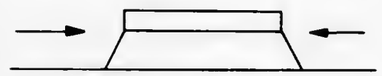
Shunpei Yamazaki, Tokyo, and Yasuhiko Takemura, Kanagawa, both of Japan, assignors to Semiconductor Energy Laboratory Co., Inc., Japan

Division of Ser. No. 858,883, Mar. 27, 1992, Pat. No. 5,365,081. This application Jul. 12, 1994, Ser. No. 273,923

Claims priority, application Japan, Mar. 27, 1991, 3-87778

Int. Cl.[6] H01L *21/336;21/324*

U.S. Cl. 437—21 **15 Claims**



1. A method of forming a semiconductor device comprising the steps of:

forming on a substrate an insulating film having the property of contracting in thermal treatment;

forming a semiconductor film on said insulating film;

forming a groove in said insulating film and said semiconductor film to form an island portion thereof;

contracting said insulating film by subjecting said insulating film to thermal treatment;

providing a gate oxide layer on a surface of said semiconductor film; and

providing a gate electrode on said gate oxide layer.

5,559,043

METHOD FOR PLACING SEMICONDUCTIVE PLATES ON A SUPPORT

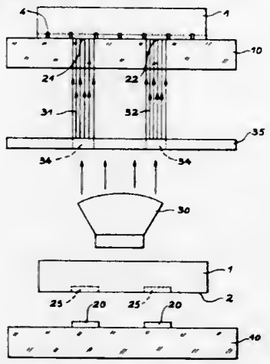
Michel Bruel, Veurey, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Jan. 25, 1995, Ser. No. 378,455

Claims priority, application France, Jan. 26, 1994, 94 00836

Int. Cl.[6] H01L *21/266*

U.S. Cl. 437—24 **10 Claims**



1. Method for placing at least one semiconductive plate having a specific size and thickness on a support and including the following stages:

the bombardment by ions of one face of a semiconductive substrate so as to create there a film of gaseous microbubbles along a splitting plane of the substrate, the ion implantation energy being provided so as to obtain the film of gaseous microbubbles at a depth corresponding to the specific thickness of the semiconductive plate, the ions being selected from rare gas or hydrogen gas ions,

then rendering integral structure by applying a support on said face of the substrate,

illuminating by a laser beam of a zone of the face of the substrate corresponding to the plate to be placed through the support, the luminous energy transmitted by the beam through said support needing to be sufficient so as to induce in the corresponding region of the film of gaseous microbubbles a temperature sufficient to cause splitting of the plate of the support and provoke increasing the adherence of the plate to the support,

thereby separating the substrate with respect to the support, this separation separating the plate from the substrate and retaining it on the support.

5,559,044

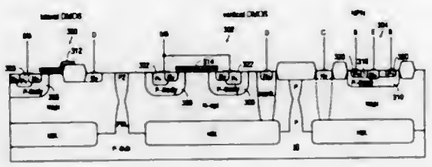
BICDMOS PROCESS TECHNOLOGY

Richard K. Williams, Cupertino; Hamza Yilmaz, Saratoga; Michael E. Cornell, Campbell, and Jun W. Chen, Saratoga, all of Calif., assignors to Siliconix incorporated, Santa Clara, Calif.

Continuation-in-part of Ser. No. 226,419, Apr. 11, 1994, Pat. No. 5,426,328, which is a continuation of Ser. No. 948,276, Sep. 21, 1992, abandoned. This application Oct. 17, 1994, Ser. No. 323,950

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—34 **12 Claims**



1. A method for forming a DMOS transistor and a bipolar transistor in a same substrate comprising the steps of:

forming a gate of said DMOS transistor overlying said substrate;

implanting ions of a first conductivity type into a first region of a semiconductor material of a second conductivity type at a first energy and dosage;

driving in said ions of said first conductivity type to form a body of said DMOS transistor, said body being formed so as to cause said DMOS transistor to have desired operating characteristics;

implanting said ions of said first conductivity type into a second region of said semiconductor material at a second energy and second dosage, said second energy being less than said first energy, said step of implanting said ions into said second region being conducted after the formation of said body of said DMOS transistor;

driving in said ions of said first conductivity type in said second region to form a base region of said bipolar transistor, said base region being shallower and more highly doped than said body to provide said bipolar transistor with desired operating characteristics;

implanting ions of said first conductivity type into said second region at a third energy, less than said second energy, and with a third dosage, greater than said second dosage, to provide a low resistivity surface doping of said base region of said bipolar transistor; and

implanting ions of said first conductivity type into said second region at a fourth dosage greater than said third dosage to create a base contact region at a top surface of said base region of said bipolar transistor to enable ohmic contact between a metal layer contacting said base contact region and said base region of said bipolar transistor.

5,559,045

METHOD OF FABRICATING VERTICAL-TYPE DOUBLE DIFFUSED MOSFET HAVING A SELF-ALIGNED FIELD OXIDE FILM

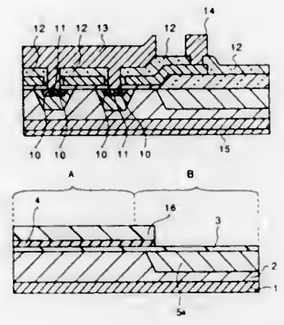
Masanori Yamamoto, Tokyo, Japan, assignor to NEC Corporation, Minato-ku, Japan

Continuation of Ser. No. 933,249, Aug. 21, 1992, abandoned. This application Feb. 13, 1995, Ser. No. 409,614

Claims priority, application Japan, Aug. 22, 1991, 3-209700

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—34 **2 Claims**



1. A method of forming a vertical-type double diffused field effect transistor comprising the steps of:

covering a silicon layer of one conductivity type with a first silicon oxide film, said silicon layer having an element formation area and a peripheral area, wherein said first silicon oxide film has a first portion formed on said element formation area and a second portion formed on said peripheral area of said silicon layer;

forming a silicon nitride film on said first portion of said first silicon oxide film substantially excluding said second portion of said first silicon oxide layer;

introducing impurities into said peripheral area of said silicon layer except said element formation area of said silicon layer to thereby form a first region of a conductivity type opposite to said one conductivity type in said peripheral area;

thickening said second portion of a first silicon oxide film to form a second silicon oxide film by using said silicon nitride film as a mask, said second silicon oxide film being thereby formed on said first region;

removing said silicon nitride film and said first portion of said first silicon oxide film to expose a surface of said element formation area of said silicon layer with said second silicon oxide film remaining on said first region;

forming a gate oxide film on said surface of said element formation area of said silicon layer in contact with said second silicon oxide layer;

forming a conductive layer which has a portion formed on a part of said gate oxide film and is elongated over said second silicon oxide film; and

forming a second region of said opposite conductivity type in said element formation area of said silicon layer at a distance from said first region.

5,559,046

SEMICONDUCTOR DEVICE HAVING A HOLLOW AROUND A GATE ELECTRODE AND A METHOD FOR PRODUCING THE SAME

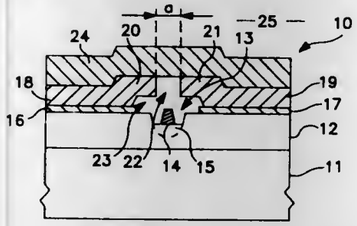
Yoshiro Oishi, Nishinomiya, and Daisuke Ueda, Ibaraki, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Division of Ser. No. 144,285, Oct. 27, 1993. This application Jun. 26, 1995, Ser. No. 494,371

Claims priority, application Japan, Oct. 28, 1992, 4-289878

Int. Cl.[6] H01L *21/265*

U.S. Cl. 437—39 **12 Claims**



1. A method for producing a semiconductor device operating at a high frequency, comprising the steps of:

(a) forming a semiconductor layer;

(b) forming a first electrode for being applied with a voltage to control a current flowing in said semiconductor layer;

(c) forming a source sidle electrode and a drain side electrode electrically connected to said semiconductor layer, said first electrode located between and physically spaced away from said source side electrode and said drain side electrode; and

(d) forming a passivation film on said source side and drain side electrodes whereby said source side and drain side electrodes, said passivation film, and said semiconductor layer form a hollow, said hollow including a first space between said first electrode and said source side electrode and a second space between said first electrode and said drain side electrode.

5,559,047

METHOD OF RELIABLY MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A TITANIUM SILICIDE NITRIDE

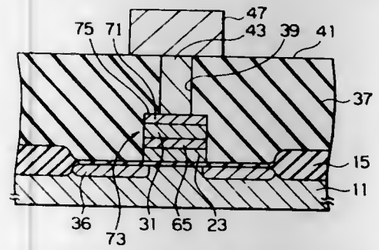
Kouji Urabe, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Jun. 29, 1995, Ser. No. 496,370

Claims priority, application Japan, Jun. 29, 1994, 6-148068

Int. Cl.[6] H01L *21/283*

U.S. Cl. 437—41 **3 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:

preparing a semiconductor substrate having a principal surface;

forming an insulator layer on said principal surface so as to have an upper insulator surface;

forming a polycrystal silicon layer on said upper insulator surface so as to have a first upper surface leaving a surrounding area of said upper insulator surface, said polycrystal silicon layer having impurities which are doped in said polycrystal silicon layer;

forming, by sputtering in an atmosphere comprising nitrogen, a titanium silicide nitride layer on said first upper surface so as to have a second upper surface; and

forming a titanium silicide layer on said second upper surface.

5,559,048

METHOD OF MAKING A DOUBLE LAYERED FLOATING GATE EPROM WITH TRENCH ISOLATION

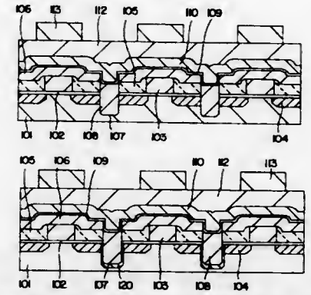
Tatsuro Inoue, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 17, 1994, Ser. No. 343,899

Claims priority, application Japan, Nov. 17, 1993, 5-311304

Int. Cl.[6] H01L *21/8247*

U.S. Cl. 437—43 **5 Claims**



1. A method for fabricating a semiconductor memory device having a double layered floating gate, said method comprising the steps of:

forming a single floating gate oxide film having an uniform thickness on an entire surface of a semiconductor substrate of a first conductivity type;

selectively forming a first floating gate made of a polysilicon film on an area of said single floating gate oxide film;

selectively forming diffusion regions by implanting a dopant of a second conductivity type into the surface of said semiconductor substrate through said single floating gate oxide film using said first floating gate as a mask;

selectively forming an interlayer insulator on said single floating gate oxide film over said diffusion regions, said interlayer insulator having a thickness nearly equal to a thickness of said first floating gate electrode so that an upper surface of said interlayer insulator is substantially level with an upper surface of said first floating gate electrode;

selectively forming a second floating gate electrode both on said first floating gate electrode and on a portion, in a vicinity of said first floating gate, of said interlayer insulator, said second floating gate electrode having a larger width than the width of said first floating gate electrode;

forming trench grooves by selective etching of said interlayer insulator, said gate oxide film, said diffusion region and an upper region of said semiconductor substrate, using said second floating gate electrode as a mask;

filling said trench grooves with an insulating material to form trench isolation wherein an upper surface of said insulating material is substantially level with the upper surface of said interlayer insulator;

forming a control gate oxide film on an entire surface of said resulting structure after the trench grooves are filled to thereby have said control gate oxide film cover the upper surface and sidewalls of said second floating gate electrode and said upper surface of said insulating material within said trench groove; and

forming a control gate electrode of polysilicon on an entire surface of said control gate oxide film so that all parts of said control gate oxide film except on said insulating material

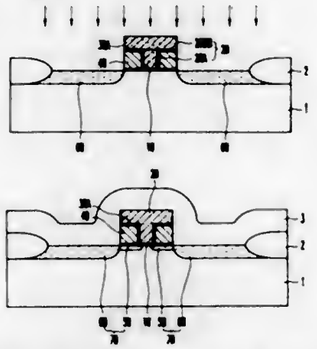
fabricating one or more silicon circuit devices in the silicon

within said trench groove are sandwiched between said second and floating gate electrode and said control gate electrode.

5,559,049
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Byung J. Cho, Kyungki-Do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., LTD

Filed Jul. 25, 1995, Ser. No. 507,668
Claims priority, application Rep. of Korea, Jul. 25, 1994, 94-17957
Int. Cl.[6] H01L *21/265*
U.S. Cl. 437—44 **11 Claims**



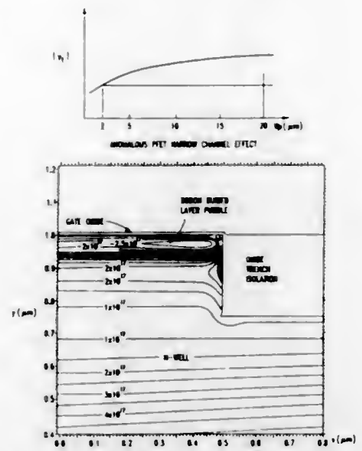
1. A method of manufacturing a semiconductor device comprising the steps of:
forming a gate oxide film and a T-shape gate electrode on a silicon substrate;
sequentially forming a thin doped oxide film and a thick polysilicon layer on top of entire structure of said silicon substrate including said T-shape gate electrode, and thereafter, forming auxiliary gates at undercut portions below both sides of said T-shape gate electrode by etching said polysilicon layer and doped oxide film by a blanket etching process;
forming heavily doped regions in said silicon substrate at both sides of said T-shape gate electrode by a high concentration impurity implantation process; and
performing a heat treatment process for surface planarization after depositing an inter-insulation film on the entire structure of said silicon substrate including said T-shape gate electrode, and forming a lightly doped region by diffusion toward said silicon substrate of dopants contained in said doped oxide film during said heat treatment process.

5,559,050
P-MOSFETS WITH ENHANCED ANOMALOUS NARROW CHANNEL EFFECT

Johann Alsmeier, Wappingers Falls, N.Y.; Wayne F. Ellis, Jericho, Vt.; Jack A. Mandelman, Stormville, N.Y., and Hing Wong, Norwalk, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1994, Ser. No. 269,857
Int. Cl.[6] H01L *21/265*
U.S. Cl. 437—45 **7 Claims**

1. A method of forming an integrated circuit having buried channel p-FETs, having p-FET gates, formed in p-sites in a substrate and isolated by trench isolation comprising the steps of:
preparing said substrate;
performing a latchup implant in at least some of said p-sites below said p-FETs to suppress latchup in said p-FETs, said latchup implant having a latchup dose and latchup energy;

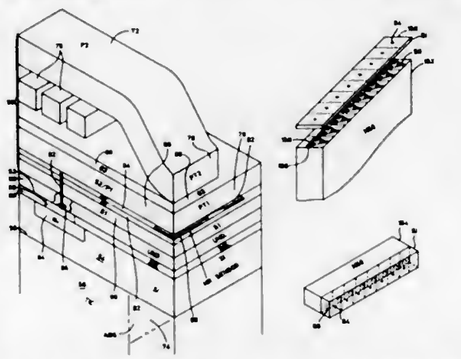


thereafter forming said p-FETs, including said p-FET gates, above said p-sites including performing a buried channel implant to set a logic threshold voltage; and
completing said circuit, characterized in that: said latchup dose and said latchup energy of
said latchup implant is set to provide a delta threshold voltage for those p-FETs having a channel width greater than 10 μm relative to said logic threshold voltage set by said buried channel implant for those p-FETs, whereby p-FETs having a channel width of 2 μm to 10 μm in the circuit have different threshold voltages dependent on their channel width.

5,559,051
SILICON CHIP WITH AN INTEGRATED MAGNETORESISTIVE HEAD MOUNTED ON A SLIDER

Steven H. Voldman, Burlington, Vt.; Albert J. Wallash, Morgan Hill, Calif., and Reginald B. Wilcox, Jr., Cambridge, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 324,841, Oct. 18, 1994. This application Dec. 23, 1994, Ser. No. 363,465
Int. Cl.[6] H01L *21/28;21/301;21/304;21/48*
U.S. Cl. 437—51 **11 Claims**



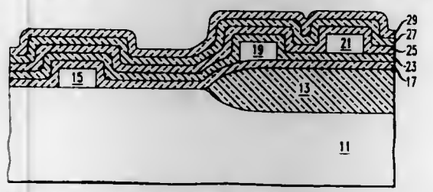
1. A method of manufacturing a magnetoresistive (MR) head and slider, the MR head having an MR stripe, the method comprising the steps of:
providing a silicon wafer which has a pair of oppositely facing substantially flat faces;

fabricating one or more silicon circuit devices in the silicon wafer;
dicing the silicon wafer into bars, each said bar including a plurality of said circuit devices;
providing a slider wafer which has a substantially flat face;
fabricating a plurality of MR heads with MR stripes on said flat face of the slider wafer;
dicing the slider water into bars, each bar having a row of MR heads;
fixedly joining each of said silicon bars to a separate one of said slider bars to provide a plurality of composite silicon/slider bars with one of the flat faces of each silicon bar facing the flat face of the slider bar;
lapping each said composite bar to provide each MR head on the bar with an air bearing surface; and
dicing each said composite bar into individual MR head and slider units.

5,559,052
INTEGRATED CIRCUIT FABRICATION WITH INTERLEVEL DIELECTRIC

Kuo-Hua Lee, and Chen-Hua D. Yu, both of Orlando, Fla., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 29, 1994, Ser. No. 366,192
Int. Cl.[6] H01L *21/31*
U.S. Cl. 437—52 **9 Claims**



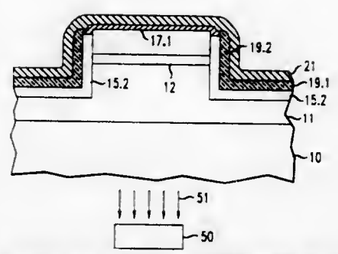
1. A method of integrated circuit fabrication comprising;
forming a gate upon a substrate;
forming a first dielectric layer over said gate;
forming a first patterned conductor upon said first dielectric;
forming a second doped dielectric over said patterned conductor and over said first dielectric;
heating said second doped dielectric to attract sodium ions;
forming a second patterned conductor over said second doped dielectric; and
forming a third doped dielectric overlying said second patterned conductor, said third doped dielectric being capable of gettering sodium ions.

5,559,053
VERTICAL CAVITY SEMICONDUCTOR LASER

Kent D. Choquette, Albuquerque, N.M.; Robert S. Freund, Livingston, N.J.; Minghwei Hong, Watchung, N.J., and Daryoosh Vakhshoori, Chatham Township, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Division of Ser. No. 227,419, Apr. 14, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 468,574
Int. Cl.[6] H01L *21/20*
U.S. Cl. 437—129 **8 Claims**

1. A method of making a laser comprising the steps of:
(a) providing an epitaxial III-V semiconductor structure comprising an epitaxial III-V semiconductor mesa located on a III-V semiconductor body, the body having a laterally extended top surface, the epitaxial semiconductor mesa having a top surface on which is located a protective masking layer;
(b) simultaneously forming an epitaxial III-V semiconductor sidewall layer on a sidewall surface of the epitaxial mesa structure, an epitaxial III-V semiconductor bottom layer on

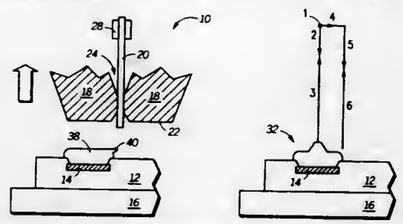


the top surface of the laterally extended top surface of the body, and a non-epitaxial III-V semiconductor top layer on a top surface of the protective masking layer;
(c) forming a planarized patterned resist layer on the epitaxial semiconductor sidewall and epitaxial semiconductor bottom layer but not on the non-epitaxial semiconductor top layer, the planarized patterned resist layer being contiguous with the epitaxial semiconductor sidewall layer;
(d) entirely removing first the non-epitaxial III-V semiconductor layer and then the protective masking layer from the top surface of the epitaxial semiconductor mesa without entirely removing the planarized patterned resist layer, whereby the top surface of the epitaxial semiconductor mesa is exposed;
(e) depositing a layer comprising gold on the top surface of the epitaxial semiconductor mesa and on the top surface of the planarized patterned resist layer, followed by removing a portion of the layer comprising gold by a resist lift off process, whereby a localized layer comprising gold remains intact on the top surface of the epitaxial semiconductor mesa.

5,559,054
METHOD FOR BALL BUMPING A SEMICONDUCTOR DEVICE

Waseem Adamjee, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 23, 1994, Ser. No. 363,112
Int. Cl.[6] H01L *21/60*
U.S. Cl. 437—183 **20 Claims**



1. A method for ball bumping a semiconductor device comprising the steps of:
providing a semiconductor die having a bond pad;
providing a wire bonding tool having a capillary, wherein the capillary has a feed hole therethrough for receiving a wire, a flat bottom face, and a chamfer surrounding the feed hole at the flat bottom face;
forming a ball bond on the bond pad by positioning the capillary in a first position, lowering the capillary toward the bond pad, and applying a force to form a ball bond, without breaking the wire;
raising the capillary away from the bond pad, without breaking the wire;
horizontally displacing the capillary to a second position; and
flattening the ball bond to form a ball bump having a flat top surface, wherein flattening is achieved by lowering the capillary from the second position toward the bond pad and forcibly pressing a portion of the flat bottom face against the ball bump, wherein during lowering the capillary a center of the

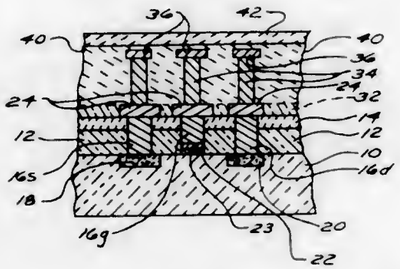
feed hole is beyond a perimeter of the ball bump formed and wherein during pressing the top surface of the ball bump is entirely in contact with the bottom face of the capillary.

5,559,055

METHOD OF DECREASED INTERLAYER DIELECTRIC CONSTANT IN A MULTILAYER INTERCONNECT STRUCTURE TO INCREASE DEVICE SPEED PERFORMANCE

Mark S. Chang, Los Altos, and Robin W. Cheung, Cupertino, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 21, 1994, Ser. No. 360,857
Int. Cl.[6] H01L *21/44*
U.S. Cl. 437—195 **17 Claims**



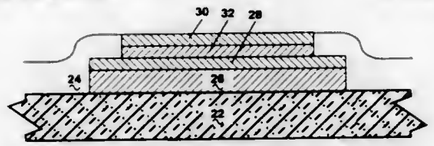
1. A process for fabricating a semiconductor device comprising source and drain regions contacted by source and drain contacts, respectively, and each source and drain region separated by a gate region contacted by a gate electrode through a gate oxide, said source and drain contacts and said gate electrode separated by a first oxide layer, with a first level patterned interconnect contacting said source and drain contacts and said gate electrode in a desired pattern and with a second level patterned interconnect contacting said first level patterned interconnect by a plurality of metal lines, said metal lines separated by an interlevel dielectric layer, comprising the steps of:
(a) prior to forming source and drain contacts and gate electrode, forming an etch stop layer on said first oxide layer;
(b) forming said source and drain contacts to respective source and drain regions and gate electrodes over said gate oxide;
(c) forming and patterning said first interconnect layer contacting said source and drain contacts and said gate electrodes;
(d) forming on said patterned first interconnect layer said interlevel dielectric layer comprising a first dielectric material having a first dielectric constant;
(e) etching vias through said interlevel dielectric layer and forming metal lines therein contacting portions of said first interconnect layer;
(f) forming and patterning said second interconnect layer contacting said metal lines;
(g) removing at least a portion of said interlevel dielectric layer, thereby forming air spaces between said metal lines which connect said first interconnect layer and said second interconnect layer;
(h) partially filling said air spaces between said metal lines with a second dielectric material having a second dielectric constant, said second dielectric constant lower than that of said first dielectric constant; and
(i) depositing a passivation layer which partially fills said air spaces between said metal lines and which leaves voids in said passivation layer or between said passivation layer and said metal lines thereby providing said interlevel dielectric layer with an effective dielectric constant that is lower than that of said first dielectric constant.

5,559,056

METHOD AND APPARATUS FOR CAPPING METALLIZATION LAYER

Peter M. Weiler, Palo Alto, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jan. 13, 1995, Ser. No. 372,386
Int. Cl.[6] H01L *21/44*
U.S. Cl. 437—195 **10 Claims**



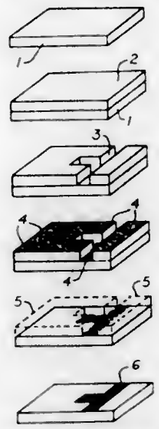
1. A method for fabricating bond pads on a semiconductor device formed on a semiconductor wafer, said semiconductor device including a substrate, said method comprising the steps of:
depositing a metallization layer over the substrate;
depositing a barrier layer over the metallization layer;
masking a portion of the barrier layer in preparation for a first etching step;
etching the barrier layer and the metallization layer utilizing the barrier layer mask as a mask for both the barrier layer and the metallization layer;
depositing a non-conductive passivation layer conformally overlying the barrier layer and the substrate;
masking a portion of the non-conductive passivation layer in preparation for a second etching step;
etching the non-conductive passivation layer thereby forming an exposed region of the barrier layer; and
forming a bond layer over the exposed region of the barrier layer.

5,559,057

METHOD FOR DEPOSITING AND PATTERNING THIN FILMS FORMED BY FUSING NANOCRYSTALLINE PRECURSORS

Avery N. Goldstein, Midland, Mich., assignor to Starfire Electronic Development & Marketing Ltd., Bloomfield Hills, Mich.

Filed Mar. 24, 1994, Ser. No. 217,161
Int. Cl.[6] H01L *21/20;21/44;* **G02B** *6/00;* **G02F** *1/00*
U.S. Cl. 437—228 **10 Claims**



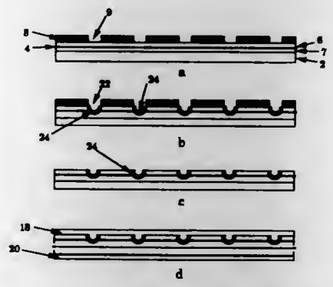
1. A process of patterning a material on a substrate using nanocrystalline precursors, comprising the steps of:
(a) depositing onto the substrate a thin mask of an organic material which is susceptible to electron beam induced decomposition;
(b) selectively decomposing a pattern into the mask using a directed electron beam;
(c) depositing a thin layer of nanocrystalline particles onto the mask and substrate areas exposed by the decomposition;
(d) dissolving the organic mask with a solvent; and
(e) fusing the nanocrystals to yield a patterned thin film.

5,559,058

METHOD FOR PRODUCING NATIVE OXIDES ON COMPOUND SEMICONDUCTORS

Peter S. Zory, Jr., 2457 NW 15th Pl., Gainesville, Fla. 32605; Douglas A. Hudson, Jr., Boulder, Colo., and Michael J. Grove, Fort Leavenworth, Kans., assignors to Peter S. Zory, Jr., Gainesville, Fla.

Filed Nov. 15, 1994, Ser. No. 339,811
Int. Cl.[6] H01L *21/02*
U.S. Cl. 437—237 **20 Claims**



Monolithic Laser Array

1. A method for producing native oxides on a multilayer compound semiconductor material, the multilayer compound semiconductor material comprising a substrate and a plurality of layers of compound semiconductor materials attached to the substrate, comprising:
contacting the compound semiconductor material with an electrically conducting oxygen containing fluid; and
pulsing a plurality of electrical current pulses between the fluid and the compound semiconductor material.

5,559,059

LEAD-FREE GLASS FRITS FOR CERAMICS ENAMELS

Joseph W. Ryan, Washington, Pa., assignor to Cerdec Corporation, Washington, Pa.

Filed May 22, 1995, Ser. No. 447,055
Int. Cl.[6] C03C *8/04;3/066;8/06;8/00*
U.S. Cl. 501—26 **9 Claims**

1. A lead-free glass frit having the following composition:

Component	Weight Percent
ZnO	25–35
SiO_2	10–17
ZrO_2	0–2
Al_2O_3	0–4
Na_2O	8–12
B_2O_3	20–30
Bi_2O_3	6–25
F^{-1}	1–5.

5,559,060

GLASS FOR LAMINATED GLASS ARTICLES

William H. Dumbaugh, Jr., Painted Post; Suresh T. Gulati, Elmira, and Robert W. Pfitzenmaier, Canisteo, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Division of Ser. No. 886,831, May 22, 1992. This application Apr. 24, 1995, Ser. No. 427,317
Int. Cl.[6] C03C *3/091;3/087*
U.S. Cl. 501—66 **2 Claims**

1. A glass demonstrating an annealing point between 682°–702° C., a linear coefficient of thermal expansion (25°–300° C.) between $57–59\times10^{-7}$/° C., a weight loss after immersion for 24 hours at 95° C. in an aqueous 5% by weight HCl solution of no more than 1 mg/cm^2, and a weight loss after immersion for 6 hours at 95° C. in an aqueous 0.02N Na_2CO_3 solution of no more than 0.25 mg/cm^2, said glass consisting essentially, expressed in terms of weight percent on the oxide basis, of

SiO_2	56–60	Na_2O	0–3
Al_2O_3	12–15	K_2O	0–3
B_2O_3	5.5–7	$Na_2O + K_2O$	0.5–3.
CaO	19–24.25		

5,559,061

GEM COMPRISED OF A GLASS BASED ON SILICON OXIDE AND CALCIUM OXIDE

Norbert Bilek, Wattens; Wolfgang Porcham, Mils; Michael Schlamadinger, Volders, and Gerold Sprachmann, Kolsass, all of Austria, assignors to D. Swarovski & Co., Wattens, Austria

Continuation of Ser. No. 277,227, Jul. 19, 1994, abandoned. This application Nov. 14, 1995, Ser. No. 557,518
Claims priority, application Germany, Jul. 21, 1993, 43 24 492.0
Int. Cl.[6] C03C *3/083;3/087*
U.S. Cl. 501—69 **12 Claims**

4. A gem comprised of a glass composition having the following composition in % by weight based on oxide:

SiO_2	42–64
CaO	21–57
Al_2O_3	1–15.

wherein at least one or more of the following components at least partially replaces the CaO of said composition:

BeO	0–4% by weight
MgO	0–20% by weight
SrO	0–8% by weight
BaO	0–5% by weight
Li_2O	0–8% by weight
Na_2O	0–8% by weight
K_2O	0–8% by weight
Rb_2O	0–8% by weight
Cs_2O	0–8% by weight.

5,559,069

5,559,062

METHOD OF MANUFACTURING A COMPOSITE SINTERED BODY

Masanori Okabe; Yoshikatsu Higuchi, and Yasunobu Kawakami, all of Saitama-ken, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 19, 1994, Ser. No. 358,534

Claims priority, application Japan, Dec. 17, 1993, 5-343986; Dec. 17, 1993, 5-344022; Dec. 21, 1993, 5-345174

Int. Cl.[6] C04B *35/571;35/589*

U.S. Cl. 501—92 **15 Claims**

1. A method of manufacturing a silicon nitride/silicon carbide composite sintered body having fine particles of SiCO and/or SiC dispersed in particles of Si_3N_4, comprising the steps of:

producing a powder of SiNC and/or a powder of SiNCO by thermally treating a polysilazane having an Si—C bond and a number average molecular weight of at least 400 at a temperature in the range of from 600° to 1600° C. to produce a mass of SiNCO and/or SiNC;

grinding said mass of SiNCO and/or SiNC into a powder;

mixing said powder with a sintering additive, thereby producing a mixed powder;

molding said mixed powder of SiNC and/or SiNCO into a shaped body; and

sintering said shaped body to form a composite sintered product.

5,559,063

REFRACTORY MATERIAL

Atul C. Sarma, Louisville, Ky., assignor to Whip Mix Corporation, Louisville, Ky.

Filed Jul. 12, 1995, Ser. No. 501,323

Int. Cl.[6] C04B *35/48;35/49;35/04;* **B28B** *7/28*

U.S. Cl. 501—104 **10 Claims**

1. A powder refractory material, comprising:

about 50 to 80 weight percent filler, comprising quartz powder and cristobalite powder;

about 20 to 50 weight percent binder, comprising ammonium phosphate powder and magnesium oxide powder; and

a metal powder.

5,559,064

CHROME-FREE BRICK

Akihiro Tsuchinari; Hiroaki Osaki; Hisato Okamoto, and Tetsuo Yamamoto, all of Takasago, Japan, assignors to Harima Ceramic Co., Ltd., Hyogo, Japan

PCT No. PCT/JP94/01892, § 371 Date Dec. 30, 1994, § 102(e) Date Dec. 30, 1994, PCT Pub. No. WO95/15932, PCT Pub. Date Jun. 15, 1995

PCT Filed Nov. 9, 1994, Ser. No. 360,819

Claims priority, application Japan, Dec. 9, 1993, 5-341365; Feb. 9, 1994, 6-037620; Mar. 8, 1994, 6-065512

Int. Cl.[6] C04B *35/03;35/04;35/52*

U.S. Cl. 501—120 **18 Claims**

1. A chrome-free brick prepared by combining and, optionally, burning a composition comprising a major amount of at least one of a magnesia material and a magnesia-alumina spinel material; 1 to 10% by weight of titania; and 1 to 15% by weight of alumina; provided that the ratio of titania to alumina is 0.3 to 1.3; such that a solid solution of $MgO.Al_2O_3$—$2MgO.TiO_2$ is formed on at least the surface of at least one of the magnesia material and magnesia-alumina spinel material.

5,559,065

COATED CATALYSTS

Guenter Lauth, Grosskaribach; Wolfgang Hoelderich, Frankenthal; Klaus Harth, Altleiningen, and Hartmut Hibst, Schriesheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 69,158, May 28, 1993, abandoned. This application Sep. 14, 1994, Ser. No. 305,817

Claims priority, application Germany, Jun. 26, 1992, 42 21 011.9

Int. Cl.[6] B01J *23/40*

U.S. Cl. 502—5 **16 Claims**

1. In a process for the preparation of a catalyst by vapor deposition of at least two different metal components to form a thin layer coating on a carrier with a thickness up to about 100 μm, the improvement which comprises:

carrying out said deposition by simultaneously sputtering at least one metal component A selected from Group VIII and Group Ib of the Periodic Table of Elements as a metal which is not readily oxidizable together with at least one other metal component B which is readily oxidizable in comparison to component A, said components A and B being arranged as one or more pure metal or metal alloy targets and applied to the carrier in a noble gas plasma at a reduced pressure of from 10^{-5} to 1 mbar to form an amorphous metal alloy coating; and

selectively reacting at least part of the metal component B with a reactive gas comprising at least one gas selected from the group consisting of oxygen, nitrogen and a hydrocarbon to form its oxide, nitride or carbide matrix, respectively, in which at least part of the metal component A is distributed in finely divided form, any remaining component A or unreacted component B being retained in the coating as the amorphous metal or an amorphous metal alloy.

5,559,066

PREPARATION OF IRON-, POTASSIUM- AND CERIUM-CONTAINING CATALYSTS

Wolfgang J. Poepel, Darmstadt; Gregor Tremmel, Gruenstadt; Wolfgang Buechele, Ludwigshafen; Axel Deimling, Neustadt, and Hermann Petersen, Gruenstadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP93/03083, § 371 Date Feb. 13, 1995, § 102(e) Date Feb. 13, 1995, PCT Pub. No. WO94/11104, PCT Pub. Date May 26, 1994

PCT Filed Nov. 5, 1993, Ser. No. 381,916

Claims priority, application Germany, Nov. 9, 1992, 42 37 740.4

Int. Cl.[6] B01J *38/00*

U.S. Cl. 502—20 **3 Claims**

1. A process for regenerating spent iron-, potassium-, and cerium-containing catalysts for the dehydration of hydrocarbons which comprises: grinding the spent catalysts and adding to the ground material an effective amount of potassium and such an amount of cerium that the total amount of cerium is greater than the amount originally present.

5,559,067

MODIFIED MICROSPHERE FCC CATALYSTS AND MANUFACTURE THEREOF

Bruce A. Lerner, Plainsboro; David M. Stockwell, Middlesex, and Rostam J. Madon, Flemington, all of N.J., assignors to Engelhard Corporation, Iselin, N.J.

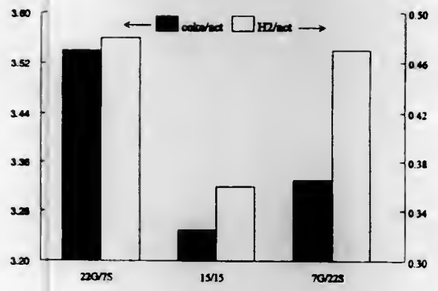
Filed Mar. 31, 1995, Ser. No. 414,071

Int. Cl.[6] B01J *29/06*

U.S. Cl. 502—68 **14 Claims**

1. A zeolitic fluid catalytic cracking catalyst having reduced coke yield and produced by the steps comprising:

(a) forming an aqueous slurry containing about 40 to 90 parts by weight hydrated kaolin clay, about 1 to 30 parts by weight



gibbsite, and about 1 to 30 parts by weight kaolin clay that has been calcined through its characteristic exotherm, and a silica binder;

(b) spray drying the aqueous slurry to obtain microspheres and then washing them substantially free of sodium unless the silica binder is substantially free of sodium;

(c) calcining the microspheres obtained in step (b) at a temperature and for a time sufficient to convert the hydrated kaolin clay in the microspheres substantially to metakaolin, but insufficient to cause metakaolin or hydrated kaolin to undergo the characteristic kaolin exotherm;

(d) mixing the microspheres obtained in step (c) with a solution comprising sodium silicate to obtain an alkaline slurry; (e) heating the slurry of microspheres of calcined clay to a temperature and for a time sufficient to crystallize at least about 40% by weight Y-faujasite in the microspheres, said Y-faujasite being in the sodium form; (f) and ion-exchanging the microspheres from step (e) to reduce the sodium content.

5,559,068

REFORMING/DEHYDROCYCLIZATION CATALYSTS

Qianjun Chen, Des Plaines; Peter K. Coughlin, Mundelein, both of Ill., and Regis J. Pellet, Croton-on-Hudson, N.Y., assignors to UOP, Des Plaines, Ill.

Division of Ser. No. 305,529, Sep. 13, 1994, which is a continuation-in-part of Ser. No. 86,961, Jul. 2, 1993, Pat. No. 5,346,611, which is a continuation-in-part of Ser. No. 855,301, Mar. 23, 1992, Pat. No. 5,225,071, which is a continuation-in-part of Ser. No. 625,273, Dec. 10, 1990, Pat. No. 5,098,877, which is a continuation-in-part of Ser. No. 447,340, Jan. 18, 1990, abandoned, which is a continuation of Ser. No. 157,977, Feb. 19, 1988, abandoned, which is a division of Ser. No. 844,951, Mar. 27, 1986, Pat. No. 4,741,820. This application May 12, 1995, Ser. No. 440,012

Int. Cl.[6] B01J *29/02;27/182*

U.S. Cl. 502—213 **11 Claims**

1. A catalyst system comprising a physical mixture of:

(a) a primary reforming catalyst comprising an effective amount of a platinum-group metal component supported on a refractory inorganic oxide; and,

(b) a molecular-sieve reforming catalyst comprising amounts effective to render the catalyst active as a reforming catalyst of at least one MP-NZMS characterized in the calcined form by an adsorption of isobutane of at least 2 percent by weight at a partial pressure of 500 torr and a temperature of 20° C. and also characterized by an adsorption of triethylamine less than about 5 percent by weight at a partial pressure of 2.6 torr and a temperature of 22° C., an inorganic-oxide binder and at least one Group VIII metal.

5,559,069

CATALYSTS FOR HALOGENATED HYDROCARBON PROCESSING, THEIR PRECURSORS AND THEIR PREPARATION AND USE

V. N. Mallikarjuna Rao, Wilmington, and Munirpallam A. Subramanian, New Castle, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 26, 1994, Ser. No. 249,765

Int. Cl.[6] B01J *27/138*

U.S. Cl. 502—226 **16 Claims**

1. A single phase fluoride composition having the formula $MM'F_5(H_2O)_2$ wherein M is at least one divalent element selected from the group consisting of Mn, Co, Zn and Cd and M' is at least one trivalent element selected from the group consisting of Al, Ga and Cr, provided that Cr is not more than about 10 atom percent of M'.

5,559,070

SYNTHETIC INORGANIC POROUS MATERIAL AND METHOD FOR THE PREPARATION THEREOF

Kazuo Torii, Sendai; Takashi Iwasaki, Tagajo; Yoshio Onodera, and Hiromichi Hayashi, both of Sendai, all of Japan, assignors to Director General of Agency of Industrial Science and Technology, Japan

Filed Oct. 7, 1994, Ser. No. 319,573

Int. Cl.[6] B01J *21/08*

U.S. Cl. 502—240 **9 Claims**

1. A synthetic inorganic porous material having a chemical composition represented by the formula

$$[(SiO_2)_b\cdot(MO_{2/3})_a\cdot(OH)_{3(a+b)}]^{b-}\cdot b/c(A^{c+}),$$

in which M is an ion of a divalent metal, A is a cation selected from the group consisting of an ion of an alkali metal, ion of an alkaline earth metal, hydrogen ion and ammonium ion, the subscript a is a positive number in the range from 3 to 10, the subscript b is a positive number in the range from 0.1 to 1 and the subscript c is a positive number in the range from 1 to 2, and which has a specific surface area in the range from 100° to 800° m^2/g, average pore diameter in the range from 2 to 8 nm, pore volume in the range from 0.1 to 0.8 cm^3/g and cation exchange capacity in the range from 0.1 to 1.2 meq/g.

5,559,071

CATALYST, PROCESS FOR THE PRODUCTION THEREOF, AND USE THEREOF FOR THE PREPARATION OF VINYL ACETATE

Roland Abel, Oberhausen, and Karl-Fred Wörner, Hofheim, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Jul. 18, 1994, Ser. No. 276,445

Claims priority, application Germany, Jul. 16, 1993, 43 23 981.1

Int. Cl.[6] B01J *23/40;23/42;23/58*

U.S. Cl. 502—326 **18 Claims**

1. A process for producing a surface impregnated catalyst comprising palladium, potassium and cadmium on porous support particles, which comprises impregnating the support particles, while mixing intimately, once or a plurality of times with at least one solution of at least one salt of each of the three elements and drying the support particles immediately after each impregnation, with the dynamic viscosity of the solution being at least 0.003 Pa·s and the solution volume in each impregnation being from 5 to 80% of the pore volume of the support particles.

5,559,076

fungicide; an insecticide; an insect repellent; an herbicide; a plant

5,559,072

NOX_x REMOVAL CATALYST AND METHOD OF PURIFYING EXHAUST GAS BY USING THE SAME

Takashi Itoh; Yukio Kosaki; Takeshi Chonan; Takashi Matsuda; Yasuharu Kanno, all of Ichikawa; Masao Wakabayashi, Chiba, and Makoto Nakamura, Ichikawa, all of Japan, assignors to N. E. Chemcat Corporation, and Sumitomo Metal Mining Co., Ltd., both of Tokyo, Japan

Filed Dec. 19, 1994, Ser. No. 358,373

Claims priority, application Japan, Dec. 17, 1993, 5-344302; Mar. 17, 1994, 6-046632; May 25, 1994, 6-135135

Int. Cl.[6] B01J *23/48*

U.S. Cl. 502—347 **8 Claims**

1. A NO_x removal catalyst, comprising an activated alumina wherein the specific surface area measured by the nitrogen adsorption method is 120 m^2/g or more, the bulk density measured by the mercury porosimetry is 0.60 g/cm^3 or more, and the skeleton density measured by the mercury porosimetry is 1.80 g/cm^3 or less and silver carried on said activated alumina.

5,559,073

POLLUTION CONTROL CATALYST WITH MUTUAL PROTECTIVE DISTRIBUTED-ACTIVE-COMBINATIONS EACH INCLUDING NOBLE-METAL-ATOMS STABLY STRUCTURED AND PROTECTED THEREIN

Yimin Hu, and Bifen Xu, both of Beijing, China, assignors to Beijing Huaxia Environmental Protection Company, Beijing, China

Filed Sep. 26, 1994, Ser. No. 312,139

Int. Cl.[6] B01J *23/38*

U.S. Cl. 502—302 **9 Claims**

1. A catalyst for reducing the pollutant release contained in an exhaust gas comprising:

a primary-core support means; and

a distributed-catalytically-active multi-combination structure formed on said primary core support means wherein said multi-combination structure includes a three active combination structure having a first stabilizing and catalytically active combination formed on top of said primary core support, a Perovskite composite of catalytically active combination overlying said first stabilizing and catalytically active combination, and an outermost gas-contact combination wherein each of these three active combination includes material compositions of catalytically active noble metals thus forming mutual protective layers therein.

5,559,074

HEAT-SENSITIVE STENCIL SHEET

Hideo Watanabe, and Sadanao Okuda, both of Tokyo, Japan, assignors to Riso Kagaku Corporation, Tokyo, Japan

Filed Apr. 11, 1995, Ser. No. 420,036

Claims priority, application Japan, Apr. 13, 1994, 6-074972

Int. Cl.[6] G01B *3/14*

U.S. Cl. 428—447 **4 Claims**

1. A heat-sensitive stencil sheet comprising a porous substrate, a thermoplastic resin film laminated thereon with an adhesive and a releasing layer provided on said thermoplastic resin film, wherein said releasing layer comprises silicone phosphate.

5,559,075

RECORDING MATERIAL FOR DIRECT THERMAL IMAGING

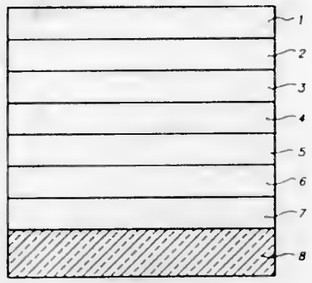
Luc Leenders, Herentals, and Luc Bastiaens, Brasschaat, both of Belgium, assignors to Agfa-Gevaert, Mortsel, Belgium

Filed Apr. 11, 1995, Ser. No. 419,821

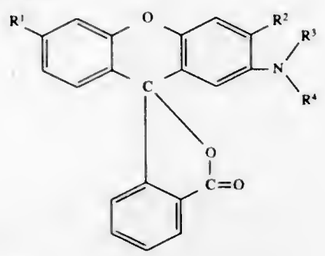
Claims priority, application European Pat. Off., May 2, 1994, 94201207

Int. Cl.[6] B41M *5/30;5/40*

U.S. Cl. 503—201 **13 Claims**



7. A recording process wherein a heat-sensitive recording material is exposed to a heat pattern in direct thermal imaging whereby during the application of said pattern a visible image is formed in said recording material without the aid of (a) substances(s) that from the exterior are thermally pattern-wise transferred thereon and/or therein, and said heat-sensitive recording material comprises on the same side of a support, called the heat-sensitive side, one or more binder layers containing a substantially light-insensitive metal salt in thermal working relationship with at least one organic reducing agent, characterized in that said recording material also comprises an acid-sensitive leuco dye transformable into dye by means of an acid-reacting compound serving as dye developer that is in thermal working relationship with said leuco dye, wherein said leuco dye corresponds to the following general formula (A):



(A)

wherein:

R^1 represents a mono- or dialkylamino group in which said alkyl groups are substituted or unsubstituted,

R^2 represents hydrogen, F, Cl, C1–C5 alkyl, C1–C5 alkoxy, phenyl or benzyl,

R^3 represents hydrogen, a C1–C4 alkyl group, an alkaryl group, a cycloalkyl group or an aryl group, and

R^4 represents a C1–C4 alkyl group, an alkaryl group, a cycloalkyl group or an aryl group.

5,559,076

THERMAL DYE TRANSFER SYSTEM CONTAINING A N-ARYLIMIDOETHYLIDENE-BENZ INDOLE DYE PRECURSOR

Steven Evans, Rochester, and Helmut Weber, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 6, 1995, Ser. No. 467,252

Int. Cl.[6] B41M *5/035;5/38*

U.S. Cl. 503—227 **16 Claims**

9. A process of forming a dye transfer image comprising imagewise-heating a dye-donor element comprising a support having thereon a dye layer comprising a dye dispersed in a polymeric binder, said dye comprising an N-arylimido-ethylidene-benz[c,d]indole dye precursor, and imagewise transferring said dye to a dye-receiving element to form said dye transfer image, said dye-receiving element comprising a support having thereon a polymeric dye image-receiving layer, said dye image-receiving layer containing an organic acid which is capable of converting said dye precursor into a cationic magenta anilinovinyl-benz[c,d]indolium dye.

5,559,077

ANTISTATIC BACKING LAYER FOR TRANSPARENT RECEIVER USED IN THERMAL DYE TRANSFER

Thomas W. Martin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 312,201, Sep. 26, 1994. This application Jun. 2, 1995, Ser. No. 459,391

Int. Cl.[6] B41M *5/035;5/38*

U.S. Cl. 503—227 **20 Claims**

11. A process of forming a dye transfer image in a dye-receiving element comprising:

(a) removing an individual dye-receiving element comprising a support having on one side thereof a polymeric dye image-receiving layer and on the other side thereof a backing layer from a stack of dye-receiving elements;

(b) moving said individual dye-receiving element to a thermal printer printing station and into superposed relationship with a dye-donor element comprising a support having thereon a dye-containing layer so that the dye-containing layer of the donor element faces the dye image-receiving layer of the receiving element; and

(c) imagewise-heating said dye-donor element and thereby transferring a dye image to said individual dye-receiving element;

wherein the backing layer comprises an antistatic backing layer which contains polymeric particles which are deformation-resistant.

5,559,078

AGRICULTURALLY ACTIVE COMPOSITION COMPRISING POLYHYDROXY ACID AMIDE ADJUVANT

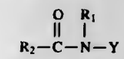
Roger H. Garst, Cincinnati, Ohio, assignor to Henkel Corporation, Plymouth Meeting, Pa.

Filed Dec. 1, 1994, Ser. No. 348,554

Int. Cl.[6] A01N *25/30*

U.S. Cl. 504—116 **24 Claims**

1. A composition for treating an agricultural substrate comprising: (1) a compound of the formula I



(I)

wherein: R_1 is H, C_1–C_4 hydrocarbyl, 2-hydroxy ethyl, 2-hydroxy propyl, or a mixture thereof, and R_2 is a C_5–C_{31} hydrocarbyl moiety, and Y is a polyhydroxyhydrocarbyl moiety having a linear hydrocarbyl chain with at least 3 hydroxyls directly connected to the chain, or an alkoxylated derivative thereof and; (2) a biologically active ingredient selected from the group consisting of a fungicide; an insecticide; an insect repellent; an herbicide; a plant growth regulator and mixtures thereof.

5,559,079

HERBICIDAL COMPOSITION FOR THE CONTROL OF ANNUAL BLUEGRASS COMPRISING XANTHOMONAS CAMPESTRIS AND SULFONYLUREA HERBICIDES

Seiko Imaizumi; Masao Yamada, and Tomoki Nishino, all of Yokohama, Japan, assignors to Japan Tobacco Inc., Tokyo, Japan

Filed Dec. 28, 1994, Ser. No. 365,421

Claims priority, application Japan, Dec. 28, 1993, 5-336655

Int. Cl.[6] A01N *63/00;43/50;43/54;43/56*

U.S. Cl. 504—117 **11 Claims**

1. A process for the control of annual bluegrass, which comprises applying to annual bluegrass a herbicidal composition comprising a microorganism having an ability to control annual bluegrass and belonging to *Xanthomonas campestris*, and a sulfonylurea compound.

5,559,080

3-PHENOXYPYRIDAZINES, HERBICIDAL COMPOSITIONS AND USES THEREOF

Michael S. South, St. Louis, and Michael J. Miller, Manchester, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 11, 1994, Ser. No. 321,069

Int. Cl.[6] A01N *43/58;* **C07D** *237/14;237/16;237/22*

U.S. Cl. 504—238 **5 Claims**

1. 4-Chloro-5-methoxy-3-pyridazine.

2. 3-(4-Chloro-3,5-dimethylphenoxy)-5-methoxypyridazine.

3. 5-Methoxy-3-pyridazine.

5,559,081

SULFONAMIDE HERBICIDES

Peter S. Gates; Graham P. Jones, and David E. Saunders, all of Cambridge, England, assignors to Agrevo UK Limited, England

PCT No. PCT/EP92/02558, § 371 Date May 6, 1994, § 102(e) Date May 6, 1994, PCT Pub. No. WO93/09099, PCT Pub. Date May 13, 1993

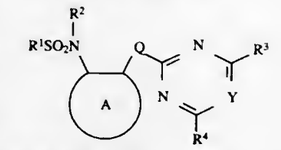
PCT Filed Nov. 2, 1992, Ser. No. 232,297

Claims priority, application United Kingdom, Nov. 7, 1991, 9123711; Mar. 25, 1992, 9206458; Mar. 25, 1992, 9206459; Mar. 25, 1992, 9206460; Mar. 25, 1992, 9206475; Jul. 7, 1992, 9214400

Int. Cl.[6] C07D *239/32;403/12;403/14;* **A01N** *43/54*

U.S. Cl. 504—242 **17 Claims**

1. A sulfonamide of the formula:



I

or a salt thereof, where:

A represents a substituted or unsubstituted benzene, or a 5-membered unsubstituted or substituted heteroaromatic ring selected from the group consisting of unsubstituted or substituted thiophene, furan, pyrrole, thiazole, isothiazole, pyrazole, imidazole, oxazole and isoxazole ring, any substituent on a carbon atom of which is halo, cyano, a group —$COOR^{10}$ where R^{10} represents hydrogen or an optionally-substituted alkyl group, or an optionally-substituted alkyl, alkoxy, aryloxy, heterocyclyloxy or amino group, and any substituent on

a nitrogen atom of the ring A is a substituted or unsubstituted

5,559,082

5,559,085

ORGANIC LIQUID BASE DRILLING FLUID WITH

(B) from 0.01% to about 15% by weight of the composition, of a diester having the formula R.R'R, wherein R' is a residue of

a nitrogen atom of the ring A is a substituted or unsubstituted alkyl, alkoxy, amino or aryl group;

Q is —O—, —S— or a group —CXX'—;

X and X', which may be the same or different, are each hydrogen, halogen, cyano, an optionally-substituted alkyl group or a group —OR^a, —SR^a, or —COR^b; or one of X and X' represents hydroxy and the other is as defined above; or X and X' together represent —O or =S;

R^a is an optionally-substituted alkyl, aryl or acyl group;

R^b is an optionally-substituted alkyl or aryl group, or a group —OR^c or —NR^cR^d;

R^c and R^d, which may be the same or different, are each hydrogen, or an optionally-substituted alkyl or aryl group;

Y is a group CR^9;

R^1 is an optionally-substituted alkyl, alkenyl, alkynyl, cycloalkyl, aryl, heterocyclyl, benzoheterocyclyl or amino group;

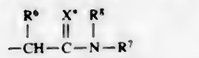
R^2 is hydrogen, an optionally-substituted alkyl or carboxylic acyl group, or a group —SO_2R^1;

R^3 and R^4, which may be the same or different, are each hydrogen, halo, an optionally-substituted alkyl, alkoxy, cycloalkyl or amino group, or an optionally substituted heterocyclyl group; and

R^9 represents hydrogen or an optionally-substituted alkyl group;

with the proviso that when Q is —O— or —S, the ring A is a substituted or unsubstituted heteroaromatic group, and

with the proviso that when R^1 is substituted alkyl, it is not:



in which X^a is oxygen or sulfur, and R^6, R^7 and R^8, which may be the same or different, are each hydrogen or an optionally-substituted alkyl group;

provided always that:

any alkyl group in the molecule is of 1 to 8 carbon atoms and, when substituted, is so by one or more halogen atoms, alkoxy or alkylthio groups of 1 to 4 carbon atoms, hydroxy, nitro, mercapto, amino, substituted amino, carbamoyl, substituted carbamoyl, thiocarbamoyl, substituted thiocarbamoyl, cyano, acyl, aryl or heteroaryl groups;

any alkenyl or alkynyl group in the molecule is of 2 to 6 carbon atoms which, when substituted, is so by halogen;

any cycloalkyl group in the molecule is of 3 to 7 carbon atoms;

any aryl group in the molecule is a phenyl group which, when substituted, is so by one or more alkyl, alkoxy, alkoxycarbonyl or alkylthio groups of 1 to 4 carbon atoms (which may themselves be further substituted), halogen atoms, cyano groups, aminosulfonyl groups or nitro groups;

any heterocyclyl group in the molecule, other than the ring A, is furyl, thienyl, pyrrolyl, oxazolyl, isoxazolyl, isothiazolyl, pyrimidinyl, triazolyl or imidazolyl or, for R^1 only, may be pyridyl, thiazolotriazolyl, triazolopyrimidinyl or pyrazolopyrimidinyl;

any benzoheterocyclyl group in the molecule is a benzothiophene, benzodioxole, quinoline, quinazoline, benzothiazole or dihydrobenzofuran group;

any substituted amino group in the molecule is mono- or di-substituted by alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, carbamoyl, carboxylic acyl, alkoxycarbonyl, alkylcarbamoyl or dialkylcarbamoyl in which any alkyl group is of 1 to 4 carbon atoms; and

the term 'acyl' means alkanoyl, alkenoyl, alkynoyl, cycloalkanoyl, aralkanoyl, aroyl, carbamoyl, thiocarbamoyl, alkoxycarbonyl, sulfonyl, sulfamoyl or phosphonyl groups, in which any alkyl, alkenyl, alkynyl or aryl group may be substituted or unsubstituted.

5,559,082

BORATE-STARCH COMPOSITIONS FOR USE IN OIL FIELD AND OTHER INDUSTRIAL APPLICATIONS

Todd Sanner, Duncan, Okla.; Adrian P. Kightlinger, Muscatine, Iowa, and J. Reagan Davis, Houston, Tex., assignors to Grain Processing Corporation, Muscatine, Iowa

Filed Jan. 13, 1995, Ser. No. 372,202

Int. Cl.[6] E21B *43/267;43/26*

U.S. Cl. 507—273 **18 Claims**

1. A composition useful for controlling the cross-linking rate of a hydratable polymer in the presence of borate ions which comprises a starch borate complex.

5,559,083

COMPOSITION COMPRISING AN ISOTHIAZOLONE COMPOUND

Naoki Kubota, Ibaraki, and Taiki Kusaka, Amagasaki, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

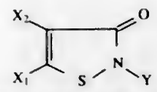
Filed Apr. 3, 1995, Ser. No. 415,517

Claims priority, application Japan, Apr. 4, 1994, 6-066281

Int. Cl.[6] A01N *43/80;* **C07D** *275/02;275/04*

U.S. Cl. 504—269 **12 Claims**

1. An industrial biocide composition which consists essentially of an isothiazolone compound mixed with a branched cyclodextrin, wherein the isothiazolone compound is represented by the following formula:



(1)

wherein Y is a hydrogen atom or an optionally substituted hydrocarbon group, and X_1 and X_2 are each independently a hydrogen atom, a halogen atom, a lower alkyl or X_1 and X_2 are taken together to form a benzene ring which may be optionally substituted.

5,559,084

SUPERCONDUCTING 2-4-7 OXIDES

John B. Vandersande, Newbury; Gregory J. Yurek, Wellesley, both of Mass., and Toshihiro Kogure, Tsukuba, Japan, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 28, 1991, Ser. No. 659,410

Int. Cl.[6] C04B *35/505;35/622;* **H01L** *39/12*

U.S. Cl. 505—125 **24 Claims**

1. A composition $R_2Q_xCu_7O_{15-\beta}$ having a perovskite unit cell structure of approximately the following dimensions a=3.8 Å; b=3.9 Å and c=50.5 Å, wherein R is one or more rare earth ions selected from the group consisting of Y, La, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu, and wherein Q is one or more alkaline earth metals selected from the group consisting of Ba, Sr and Ca and β is in the range of 0 to about 1.5.

5,559,085

ORGANIC LIQUID BASE DRILLING FLUID WITH TERPENE

William M. Duncan, Jr., Corpus Christi, Tex., assignor to Integrity Industries, Inc., Kingsville, Tex.

Continuation-in-part of Ser. No. 280,677, Feb. 23, 1994, and a continuation-in-part of Ser. No. 142,953, Oct. 29, 1993, abandoned, which is a continuation of Ser. No. 950,491, Sep. 25, 1992, abandoned. This application May 17, 1994, Ser. No. 243,764

Int. Cl.[6] C09K *7/00*

U.S. Cl. 507—103 **15 Claims**

1. An inverted emulsion drilling fluid having a continuous phase comprising an organic liquid base and a discontinuous phase comprising water, an emulsifier, a weight material selected from the group consisting of barium sulfate and hematite, and a viscosifier selected from the group consisting of bentonite and synthetic polymer, the continuous phase comprising 1–100% terpene.

5,559,086

EPOXY RESIN COMPOSITION AND WELL TREATMENT METHOD

Brahmadeo Dewprashad, Newcastle, and Jimmie D. Weaver, Duncan, both of Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Dec. 13, 1993, Ser. No. 166,561

Int. Cl.[6] C09K *7/02;7/00;3/20;* **C08G** *59/50*

U.S. Cl. 507—219 **10 Claims**

1. A well treating composition comprising:

an epoxy resin;

a partially reduced aromatic amine hardening agent;

wherein said aromatic amine hardening agent is a compound having at least one nonreduced inner aromatic structure and at least two outer cycloaliphatic ring structures; and

a carrier fluid.

5,559,087

THERMOPLASTIC COMPATIBLE LUBRICANT FOR PLASTIC CONVEYOR SYSTEMS

David A. Halsrud, Minneapolis, and Timothy A. Gutzmann, Eagan, both of Minn., assignors to Ecolab Inc., St. Paul, Minn.

Filed Jun. 28, 1994, Ser. No. 267,130

Int. Cl.[6] C10M *145/24*

U.S. Cl. 508—579 **24 Claims**

1. A method of lubricating a continuously moving plastic conveyor system for transporting a container, comprising the step of applying an aqueous thermoplastic compatible lubricant composition to the surface of a plastic belt or track, the aqueous lubricant composition comprising a block copolymer of ethylene oxide and propylene oxide.

5,559,088

DRYER-ACTIVATED FABRIC CONDITIONING AND ANTISTATIC COMPOSITIONS WITH IMPROVED PERFUME LONGEVITY

John C. Severns, West Chester; Mark R. Sivik, Fairfield; Frederick A. Hartman, Cincinnati, all of Ohio; Hugo R. G. Denutte, Hofstade, Belgium; Jill B. Costa, Cincinnati, and Alex H. Chung, West Chester, both of Ohio, assignors to The Proctor & Gamble Company, Cincinnati, Ohio

Filed Jul. 7, 1995, Ser. No. 499,158

Int. Cl.[6] D06M *13/224;13/46*

U.S. Cl. 510—102 **28 Claims**

1. A dryer added, dryer-activated fabric softening composition comprising:

(A) from 10% to 99.99% of a fabric softening compound; and

(B) from 0.01% to about 15% by weight of the composition, of a diester having the formula $R_1R'R_2$ wherein R' is a residue of an acid forming diester selected from the group consisting of succinic acid or maleic acid; and wherein R_1 and R_2 independently represent a residue of an alcohol forming diester selected from the group consisting of phenoxanol, floralol, B-citronellol, nonadyl, cyclohexyl ethanol, phenyl ethanol, isoborneol, fenchol, isocyclogeraniol, 2-phenyl-1-propanol, 3,7-dimethyl-1-octanol and mixtures thereof; and wherein said dryer added fabric softening composition is in the form of a tablet or attached to a substrate.

5,559,089

LOW-DOSAGE AUTOMATIC DISHWASHING DETERGENT WITH MONOPERSULFATE AND ENZYMES

Frederick A. Hartman, Cincinnati; Ronald J. Rice, West Chester; James C. T. R. Burckett-St. Laurent, Cincinnati; Lucille F. Taylor, Middletown, and Donna J. Haeggberg, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 108,783, Aug. 17, 1993, abandoned, which is a continuation of Ser. No. 849,907, Mar. 12, 1992, abandoned. This application May 17, 1995, Ser. No. 442,912

Int. Cl.[6] C11D *3/386;3/37;3/395*

U.S. Cl. 510—224 **9 Claims**

1. A granular low-dosage automatic dishwashing detergent composition which is essentially free of inorganic phosphate builders and substantially free of chlorine bleach, comprising:

(a) from about 3.5% to about 25%, by weight, of monopersulfate salts selected from the group consisting of OXONE monopersulfate triple salt, $2KHSO_5.KHSO_4.K2SO_4$, tetraalkylammonium monopersulfate, and mixtures thereof;

(b) from about 0.01% to about 0.5% by weight of active detersive enzyme;

(c) from about 0.1% to about 10% by weight of an organic dispersant;

(d) from about 5% to about 25%, by weight, of a pH adjusting agent selected from the group consisting of carbonate, bicarbonate, and mixtures thereof;

(e) from about 4% to about 25%, by weight, of a water-soluble silicate;

(f) from about 0% to about 1.5% by weight of a chlorine scavenger;

(g) from about 0% to about 40% by weight; of a weak builder selected from the group consisting of water-soluble citrates, water-soluble glucoheptanates, and mixtures thereof;

(h) from about 0.1% to about 2% by weight of a bleach stabilizer; and

(i) from about 0.1% to about 5% by weight of a low-sudsing surfactant; and

wherein said composition has a density of from about 1.1g/cm3 to about 1.1 g/cm3.

5,559,090

STABLE, HYDROGEN PEROXIDE-CONTAINING

5,559,092

COSMETIC COMPOSITION

5,559,095

DELAYED TREATMENT METHOD OF REDUCING

capable of suppressing mitogen-induced blastogenesis in vitro and (c) cross reactive with antisera to Pregnancy Specific

5,559,090

STABLE, HYDROGEN PEROXIDE-CONTAINING BLEACHING COMPOSITIONS

Stefano Scialla, and Sergio Cardola, both of Rome, Italy, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US92/04774, § 371 Date Sep. 22, 1994, § 102(e) Date Sep. 22, 1994, PCT Pub. No. WO92/22496, PCT Pub. Date Dec. 23, 1992

PCT Filed Jun. 8, 1992, Ser. No. 157,200

Claims priority, application European Pat. Off., Jun. 14, 1991, 91870094

Int. Cl.[6] **C11D** *1/72;3/04;3/395*

U.S. Cl. 510—303 **16 Claims**

1. An aqueous bleaching composition having a pH of from 2 to 6, comprising from 1% to 15% by weight of the total composition of hydrogen peroxide, and comprising a surfactant system, characterized in that the surfactant system comprises a compound of the formula

$R_1—O—[(R_2O)_n(R_3O)_m]—R_4$, wherein:

—R_1 is a C_1–25 Alkyl or alkenyl group;
—R_2 is a C_{2-4} aliphatic hydrocarbon chain;
—R_3 is a methyl or ethyl monosubstituted C_2–C_4 aliphatic hydrocarbon chain;
—R_4 is a C_{1-25} alkyl or alkenyl or carboxyl chain; or H;
—n is an integer of from 1 to 10;
—m is an integer of from 1 to 20; or mixtures thereof.

5,559,091

ALKALINE CLEANING COMPOSITIONS WITH COMBINED HIGHLY HYDROPHILIC AND HIGHLY HYDROPHOBIC NONIONIC SURFACTANTS

Peter R. J. Geboes, Kapellestraat, and Louise G. Scott, Stijn Streuvelslaan, both of Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US93/11293, § 371 Date May 5, 1995, § 102(e) Date May 5, 1995, PCT Pub. No. WO94/12599, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 19, 1993, Ser. No. 432,154

Claims priority, application European Pat. Off., Nov. 26, 1992, 92870191; Mar. 19, 1993, 93870050; Jun. 18, 1993, 93201757; Aug. 31, 1993, 93870181

Int. Cl.[6] **C11D** *1/825;1/72;1/722;3/30*

U.S. Cl. 510—422 **4 Claims**

1. An aqueous alkaline cleaning composition comprising, by weight of the total neat composition, from 0.5% to 30% of a nonionic surfactant system and from 0.1% to 10% of alkanolamine, characterized in that said nonionic surfactant system consists essentially of alkoxylated alcohols, alkoxylated phenylalcohols, or mixtures thereof and that:

at least 0.1% by weight of the total neat composition is a first highly hydrophilic nonionic surfactant of the formula $RO-(C_2H_4O)_n(C_3H_6O)_mH$ wherein R is a C_{8-22} alkyl chain or a C_{8-28} alkyl benzene chain, n and m are each from 0 to 100 and n+m is from 6 to 100, said first highly hydrophilic nonionic surfactant having an HLB of from 12 to 20, and

at least 0.1% by weight of the total neat composition is a second highly hydrophobic nonionic surfactant of the formula $RO-(C_2H_4O)_n(C_3H_6O)_mH$ wherein R is as defined above, n and m are each from 0 to 5 and n+m is from 0.5 to 5, said second highly hydrophobic nonionic surfactant having an HLB of from 2 to 10 and at least 4 less than the HLB of said first highly hydrophilic nonionic surfactant.

5,559,092

COSMETIC COMPOSITION

Walter T. Gibson, Wellingborough, and Gillian E. Westgate, Irthlingborough, both of United Kingdom, assignors to Chesebrough-Pond's USA Co. Division of Conopco, Inc., Greenwich, Conn.

Filed May 19, 1993, Ser. No. 64,535

Claims priority, application United Kingdom, May 20, 1992, 9210768

Int. Cl.[6] **A61K** *38/05*

U.S. Cl. 514—2 **12 Claims**

1. A method for maintaining or increasing hair growth by topically applying to mammalian hair a composition comprising:

i. from 0.001 to 99% by weight of a hair growth promoter which is a glutamine dipeptide; and

(ii) from 1 to 99.99% by weight of a cosmetically acceptable vehicle for the hair growth promoter.

5,559,093

N-TERMINALLY TRUNCATED HST-1 IS A PLATELET-INCREASING FACTOR

Sumie Yoshitomi, Osaka; Tsutomu Kurokawa, Kawanishi, and Koichi Igarashi, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Aug. 5, 1993, Ser. No. 102,691

Claims priority, application Japan, Aug. 5, 1992, 4-208746

Int. Cl.[6] **A61K** *38/18;* **C07K** *14/495;14/53;* **C12P** *21/06*

U.S. Cl. 514—2 **1 Claim**

1. A method of increasing platelet production in mammals which comprises administration to the mammal of an effective amount of a deletion mutein of a heparin-binding secretory transforming factor 1 protein (hst-1), where the deletion mutein has SEQ ID NO:3.

5,559,094

ASP^{B1} INSULIN ANALOGS

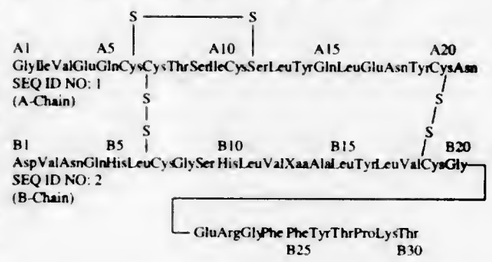
David N. Brems, and Diane L. Bakaysa, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 2, 1994, Ser. No. 285,661

Int. Cl.[6] **C07K** *14/62;* **A61K** *38/28;* **C12N** *15/00;15/17*

U.S. Cl. 514—3 **18 Claims**

1. An insulin analog monomer having the formula



wherein Xaa at amino acid position B13 is selected from the group consisting of Glu and Gln.

5,559,095

DELAYED TREATMENT METHOD OF REDUCING ISCHEMIA-RELATED NEURONAL DAMAGE

George P. Miljanich, Redwood; Stephen S. Bowersox, Menlo Park; James A. Fox, Palo Alto; Karen L. Valentino, San Carlos, all of Calif.; Robert S. Bitner, West Lafayette, Ind., and Donald H. Yamashiro, Cleveland Heights, Ohio, assignors to Neurex Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 561,766, Aug. 2, 1990, Pat. No. 5,189,020, which is a continuation-in-part of Ser. No. 440,094, Nov. 22, 1989, Pat. No. 5,051,403. This application Nov. 12, 1991, Ser. No. 789,913

The portion of the term of this patent subsequent to Sep. 24, 2018, has been disclaimed.

Int. Cl.[6] **A61K** *38/16*

U.S. Cl. 514—12 **5 Claims**

1. A method of reducing neuronal damage resulting from an ischemic condition in the central nervous system of a mammalian subject, comprising

parenterally administering to the subject, at a time 6–24 hours following the onset of the ischemic condition, a pharmaceutically acceptable amount of an OCT peptide effective to inhibit voltage-gated calcium channels selectively in neuronal tissue, as evidenced by the ability of the OCT peptide to

(a) bind to an MVIIA omega-conotoxin binding site in neuronal tissue with an affinity which is at least as great as that exhibited by any of the omega-conotoxins MVIIA, GVIA, TVIA and SNX-207 for said binding site; and

(b) inhibit norepinephrine release at a given site in neuronal tissue with at least the same potency as that exhibited by any of the omega-conotoxins MVIIA, GVIA, TVIA and SNX-207 at said neuronal site.

5,559,096

PHARMACEUTICAL COMPOSITIONS AGAINST GASTRIC DISORDERS

Peter J. Edwards, and Kim Morwood, both of Weybridge, United Kingdom, assignors to Applied Microbiology, Inc., Brooklyn, N.Y.

PCT No. PCT/GB92/00656, § 371 Date Dec. 14, 1993, § 102(e) Date Dec. 14, 1993, PCT Pub. No. WO92/18143, PCT Pub. Date Oct. 29, 1992

PCT Filed Apr. 10, 1992, Ser. No. 129,134

Claims priority, application United Kingdom, Apr. 15, 1991, 9108129; Jul. 1, 1991, 9114149

Int. Cl.[6] **A61K** *38/00;31/14*

U.S. Cl. 514—12 **2 Claims**

1. A pharmaceutical composition comprising a bacteriocin antimicrobial agent selected from the group consisting of nisin, gramicidin, tyrothricin and analogs thereof in combination with a mucoadherent or bioadhesive release-sustaining agent which is a natural gum, a plant extract, sucralfate, a cellulose derivative or an acrylic acid or methacrylic acid derivative in a pharmaceutically acceptable carrier.

5,559,097

USE OF A PREGNANCY SPECIFIC PROTIEN AS AN IMMUNOSUPPRESSIVE

R. Garth Sasser, Moscow, Id., assignor to Idaho Research Foundation, Inc., Moscow, Id.

Filed Jan. 12, 1990, Ser. No. 464,102

Int. Cl.[6] **A61K** *38/02*

U.S. Cl. 514—21 **6 Claims**

1. A method for immunosuppressing a non-human animal host, said method comprising:

administering to said animal host in an amount sufficient to immunosuppress said animal host a Pregnancy Specific Protein B characterized as (a) isolatable from conceptustissue, (b) capable of suppressing mitogen-induced blastogenesis in vitro and (c) cross reactive with antisera to Pregnancy Specific Protein B.

5,559,098

STABLE TOPICAL FORMULATIONS WITH GOOD ACTIVE INGREDIENT RELEASE CHARACTERISTICS, CONTAINING AT LEAST ONE LIPOPHILIZED MACROLIDE ANTIBIOTIC

Wolfgang A. Wohlrab; Reinhard Neubert; Sybille Matschiner, and Katrin Wellner, all of Halle, Germany, assignors to Roehm Pharma GmbH, Weiterstadt, Germany

Continuation of Ser. No. 130,911, Oct. 4, 1993, Pat. No. 5,476,843. This application Jan. 30, 1995, Ser. No. 380,656

Claims priority, application Germany, Oct. 10, 1992, 42 34 225.2

Int. Cl.[6] **C07H** *17/08;* **A61K** *31/70*

U.S. Cl. 514—29 **6 Claims**

1. A stable topical formulation with good active ingredient release characteristics, comprising:

at least one macrolide antibiotic which is lipophilized with one or more compounds which form oppositely charged ions selected from the group consisting of hexyl salicylate, heptyl salicylate, octyl salicylate, isooctyl salicylate, nonyl salicylate, decyl salicylate, isodecyl salicylate, undecyl salicylate, dodecyl salicylate, tetradecyl salicylate, isotetradecyl salicylate, hexadecyl salicylate, octadecyl salicylate, eicosyl salicylate, hexyl sulfate, octyl sulfate, isooctyl sulfate, decyl sulfate, isodecyl sulfate, dodecyl sulfate, tetradecyl sulfate, isotetradecyl sulfate, hexadecyl sulfate, octadecyl sulfate, isotetradecyl sulfate, hexadecyl sulfate, octadecyl sulfate, eicosyl sulfate, isooctyl sulfate, hexyl sulfonate, octyl sulfonate, isoctyl sulfonate, decyl sulfonate, isodecyl sulfonate, dodecyl sulfonate, tetradecyl sulfonate, isotetradecyl sulfonate, hexadecyl sulfonate and eicosyl sulfonate.

5,559,099

PENTON BASE PROTEIN AND METHODS OF USING SAME

Thomas J. Wickham, Gaithersburg; Imre Kovesdi, Rockville; Douglas E. Brough, Olney; Duncan L. McVey, Derwood, and Joseph T. Brader, New Market, all of Md., assignors to GenVec, Inc., Rockville, Md.

Filed Sep. 8, 1994, Ser. No. 303,162

Int. Cl.[6] **C12P** *21/04;* **C12N** *15/00;7/00*

U.S. Cl. 514—44 **35 Claims**

1. A recombinant adenovirus comprising (a) a chimeric penton base protein, wherein said chimeric penton base protein comprises a nonpenton base amino acid sequence, which is (i) specific for binding to a receptor, (ii) an antibody domain or (iii) an epitope, in addition to or in place of a wild-type penton base amino acid sequence, which is specific for binding to a receptor, and (b) a therapeutic gene that is capable of being expressed in a cell to which the recombinant adenovirus has attached or by which the recombinant adenovirus bas been internalized.

5,559,100

METHODS OF TREATING HEPATITIS B VIRUS INFECTION WITH THERAPEUTIC NUCLEOSIDES

George W. Kozzalka, Apex, and Thomas A. Krenitsky, Chapel Hill, both of N.C., assignors to Glaxo Wellcome Inc., Research Triangle Park, N.C.

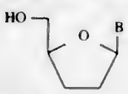
Continuation of Ser. No. 863,923, May 15, 1986, Pat. No. 4,920,210. This application Aug. 9, 1989, Ser. No. 391,799

Claims priority, application United Kingdom, May 15, 1985, 8512330

Int. Cl.[6] A61K *31/70*

U.S. Cl. 514—45 **12 Claims**

1. A method for the treatment of a hepatitis B virus infection in an animal comprising the administration to said animal of an effective anti-hepatitis B virus infection treatment amount of the compound of the formula (I)



(I)

wherein B is a purine base linked to the sugar residue at the 9-position, wherein said purine base is selected from the group consisting of 2-aminopurine, 2,6-diaminopurine, a pharmaceutically acceptable salt thereof and a pharmaceutically acceptable ester thereof.

5,559,101

L-RIBOFURANOSYL NUCLEOSIDES

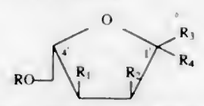
Alexander L. Weis; Kirupathevy Shanmuganathan, both of San Antonio, Tex., and Charles T. Goodhue, Rochester, N.Y., assignors to Genencor International, Inc., Rochester, N.Y., and Lipitek, Inc., San Antonio, Tex.

Filed Oct. 24, 1994, Ser. No. 328,304

Int. Cl.[6] A61K *31/70*; **C07H** *19/00*

U.S. Cl. 514—45 **13 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof,

wherein

R is H, COR_5, $P(O)_nR_6R_7$, or SO_3H wherein R_5 is alkyl of 1–5 carbon atoms or an aromatic ring structure, R_6 and R_7 are each H or alkyl of 1–5 carbon atoms and n is 2 or 3;

R_1 and R_2 are independently H, mono- or di-halogen, or OR_8 wherein R_8 is H, COR_9, $P(O)_mR_{10}R_{11}$ wherein R_9 is H_2, substituted or unsubstituted alkyl of 1–5 carbon atoms or a substituted or unsubstituted aromatic ring structure, R_{10} and R_{11} are each H or alkyl of 1–5 carbon atoms and m is 2 or 3, provided that when R_2 is OH, R_2 and B can combine to form a 5- membered cyclic ring structure;

R_3 and R_4 are independently B, H or OR_{12} where R_{12} is H, COR_{13}, $P(O)_pR_{14}R_{15}$ wherein R_{13} is substituted or unsubstituted alkyl of 1–5 carbon atoms or a substituted or unsubstituted aromatic ring structure,

R_{14} and R_{15} are each H or alkyl of C1-C5 carbon atoms and p is 2 or 3;

B is a naturally-occurring nucleobase selected from the group consisting of A, G, C, U, hypoxanthine or T or a modified base comprising one or more substitutions selected from the group consisting of H, halogen, C1-C6 alkyl, C2-C6 alkenyl, C1-C6 alkoxy, C3-C6 cycloalkyl-C1-C6 alkoxy, C3-C8 cycloalkyloxy, C3-C8 cycloalkylthio, C1-C6 alkylthio, a substituted amino group, an aryl, aralkyl, aryloxy, aralkoxy, arylthio, aralkylthio, a heterocyclic ring and an amino group, provided that when the base is a pyrimidine, the atom at position 4 of the base can be sulfur and further provided that when the base is a purine, the atom at position 6 of the base may be sulfur, provided that:

only one of R_3 or R_4 can be B and there is only one B;

when R=H, R_1=OH, R_2=H, R_3=H and R_4=B, then B cannot be U, C, T, 5-FU, hypoxanthine, A or G;

when R=H, R_1=OH, R_2=OH, R_3=B and R_4=H, then B cannot be C;

when R=H, R_1=OH, R_2=OH, R_3=H and R_4=B, then B cannot be 5-FU, C, U, A or hypoxanthine;

when R=H, R_1=OH, R_2=H, R_3=B and R_4=H, then B cannot be 5-FU, A, C, G, T, U or hypoxanthine;

when R=H, R_1=H, R_2=H, R_3=B and R_4=H, then B cannot be A, C, G, T, U, 5-FU, or hypoxanthine;

when R=H, R_1=H, R_2=H, R_3=H and R_4=B, then B can not be A, C, G, T, U, 5-FU or hypoxanthine;

when R=H or $P(O)_mR_{10}R_{11}$, where R_{10}=H and R_{11}=H and m=3, and R_1 and R_2 are independently H or F; and R_3=H and R_4=B, then B cannot be U, C, T, A, G or hypoxanthine; and

when R=H or $P(O)_mR_{10}R_{11}$, where R_{10}=H, R_{11}=H, and m=3; and R_1 and R_2 are independently H or F; and R_3=B and R_4=H, then B cannot be U, C, T, A, G or hypoxanthine.

12. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a therapeutically effective amount of one or more of the compounds of claim 1.

5,559,102

ADENOSINE AND GUANOSINE-3',5'-CYCLIC METHYLPHOSPHONATE DERIVATIVES

(f) **Junichi Yano, Nara; Tadaaki Ohgi, Otsu; Koichi Ishiyama, Oyamazaki, and Kazuko Hirabayashi, Kyoto, all of Japan, assignors to Nippon Shinyaku Company, Limited, Japan**

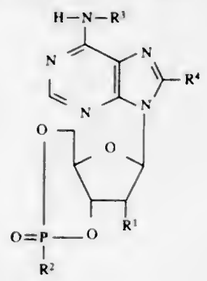
Continuation-in-part of Ser. No. 996,504, Dec. 23, 1992, abandoned, which is a continuation of Ser. No. 394,524, Aug. 16, 1989, abandoned. This application Jan. 13, 1994, Ser. No. 181,231

Claims priority, application Japan, Aug. 16, 1988, 63-203452

Int. Cl.[6] A61K *31/70*; **C07H** *19/167;19/173*

U.S. Cl. 514—46 **26 Claims**

1. A compound of the formula



wherein R^1 is hydrogen, hydroxyl or acyloxy; R^2 is lower alkyl; R^3 is hydrogen, methyl or acyl; and R^4 is hydrogen or halo; provided that when R^1 is hydrogen and R^2 is lower alkyl, R^3 and R^4 are not both hydrogen.

5,559,103

BIVALENT SIALYL X SACCHARIDES

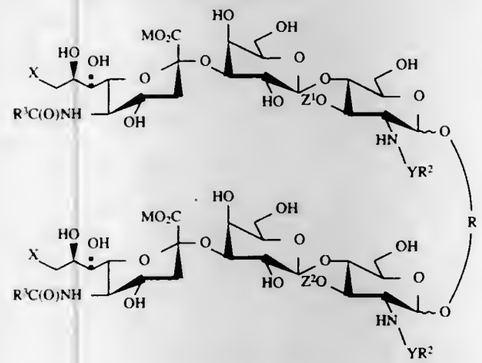
Federico C. A. Gaeta, Foster City, and Shawn A. DeFrees, San Marcos, both of Calif., assignors to Cytel Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 95,657, Jul. 21, 1993, abandoned. This application Jul. 20, 1994, Ser. No. 278,020

Int. Cl.[6] A61K *31/725*; **C08B** *37/00*

U.S. Cl. 514—54 **27 Claims**

1. A compound having the structure



wherein R is a directly linked divalent monosaccharide unit;

Y is selected from the group consisting of C(O), SO_2, HNC(O), OC(O) and SC(O);

R^2 is selected from the group consisting of a C_1–C_{18} aliphatic, an aryl, a substituted aryl and a phenyl C_1–C_3 alkylene group, wherein said aryl group has one six-membered aromatic ring or two fused six-membered aromatic rings, which ring or rings are hydrocarbyl, monoazahydrocarbyl, or diazahydrocarbyl rings, and said substituted aryl group is a beforementioned aryl group having a substituent selected from the group consisting of halo, trifluoromethyl, nitro, C_1–C_6 alkyl, C_1–C_6 alkoxy, amino, mono-C_1–C_6 alkylamino, di-C_1–C_6 alkylamino, benzylamino and C_1–C_6 alkylbenzylamino;

R^3 is methyl or hydroxymethyl;

X is selected from the group consisting of hydroxyl, C_1–C_6 acyloxy, C_2–C_6 hydroxylacyloxy, halo and azido;

Z^1 and Z^2 are α-L-fucosyl or hydrogen (H), but at least one of Z^1 and Z^2 is α-L-fucosyl; and

M is a proton (H^+) or a pharmaceutically acceptable cation.

5,559,104

PROCEDURE FOR THE PURIFICATION OF HYALURONIC ACID AND FRACTION OF PURE HYALURONIC ACID FOR OPHTHALMIC USE

Aurelio Romeo, Rome, and Silvana Lorenzi, Padova, both of Italy, assignors to Fidia S.p.A., Abano Terme, Italy

Continuation of Ser. No. 976,991, Feb. 5, 1993, abandoned. This application May 11, 1995, Ser. No. 439,437

Claims priority, application Italy, Apr. 19, 1991, PD91A0077; WIPO, Apr. 16, 1992, PCT/EP92/00861

Int. Cl.[6] A61K *31/725*; **C08B** *37/08*

U.S. Cl. 514—54 **25 Claims**

1. A hyaluronic acid fraction, or a salt thereof, having a mean molecular weight in the range of 750,000 Daltons to 1,230,000 Daltons and having the following characteristics:

a) limiting viscosity number ranging between 14.5 and 21 dl/g, when determined at 25° C. in 0.15M NaCl at pH 7.0 using an Ubbelhode suspended level viscosimeter;

b) protein content not exceeding 0.2% expressed as albumin;

c) a U.V. absorbance at 257 nm and at 280 nm not exceeding 1.0 A.U., when measured on a 1% weight per volume aqueous solution;

d) a dynamic viscosity of a 1% weight per volume solution in 0.15 NaCl at pH=7.0, not exceeding the following limits at the defined shear rates, using a rotational viscosimeter at a temperature of 20° C.:

Shear rate	Dynamic viscosity (mPa · s at 20° C.)
1 s^{-1}	not more than 20000 mPa · s
10 s^{-1}	not more than 2000 mPa · s
100 s^{-1}	not more than 1000 mPa · s
350 s^{-1}	not more than 500 mPa · s

e) a sulfated mucopolysaccharide content not exceeding 0.07% as sulfur;

f) an iron content not exceeding 10 p.p.m.; and

g) stability of isotonic buffered solutions with a physiological pH of the fraction, naturally aged and heat-sterilized, determined by assessment of the limiting viscosity number and expressed with the corresponding decrease in mean molecular weight, not exceeding the following limits:

the actual value after storage at 25° C. for 6 months must not be lower than 97% of the initial value

the actual value after sterilization at 118° C. for 32 minutes must not be lower than 75% of the initial value

the actual value after sterilization at 121° C. for 16 minutes must not be lower than 80% of the initial value

the actual value after sterilization at 124° C. for 8 minutes must not be lower than 90% of the initial value.

5,559,105

ENDOTHELIN RECEPTOR ANTAGONISTS

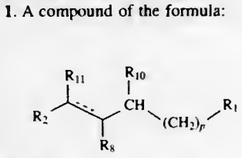
Deborah L. Bryan, West Chester, and John D. Elliott, Wayne, both of Pa., assignors to SmithKline Beecham Corporation, Philadelphia, Pa.

Filed Jan. 17, 1995, Ser. No. 374,544

Int. Cl.[6] A61K *31/41*; **C07D** *403/02*

U.S. Cl. 514—63 **8 Claims**

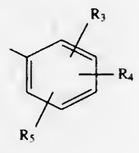
1. A compound of the formula:



(I)

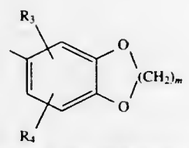
wherein:

R_1 and R_2 are independently:



(a)

or



(b)

R_3 and R_5 are independently hydrogen, R_{11}, OH, C_{1-5}alkoxy, $—S(O)_pR_{11}$, $—N(R_6)_2$, Br, F, I, Cl, CF_3, $—NHCOR_6$, $—R_{11}CO_2R_7$, $—XR_9—Y$ or $—X(CH_2)_nR_8$ wherein each

methylene group within $—X(CH_2)_nR_8$ may be unsubstituted or substituted by one or two $—(CH_2)_nAr$ groups;

R_4 is hydrogen, R_{11}, OH, C_{1-5}alkoxy, $—S(O)_pR_{11}$, $—N(R_6)_2$, $—XR_{11}$, Br, F, I, Cl or $—NHCOR_6$ wherein the C_{1-5}alkoxy may be unsubstituted or substituted by OH, methoxy or halogen;

R_6 is independently hydrogen or C_{1-5}alkyl;

R_7 is independently hydrogen, C_{1-10}alkyl, C_{2-10}alkenyl or C_{2-8}alkynyl all of which may be unsbubstituted or substituted by one or more OH, $N(R_6)_2$, CO_2R_{12}, halogen or XC_{1-5}alkyl; or R_7 is $(CH_2)_nAr$;

R_8 is R_{11}, $—CO_2R_7$, $—CO_2C(R_7)_2O(CO)XR_{11}$, $—PO_3(R_7)_2$, $—SO_2NR_7R_{11}$, $—CONR_7SO_2R_{11}$, $—SO_3R_7$, $—SO_2R_7$, $—P(O)(OR_7)R_7$, CN, $—NR_7SO_2R_{11}$, $—C(O)N(R_6)_2$ or tetrazole;

R_9 is $(CH_2)_n$, C_{1-10}alkyl, C_{2-10}alkenyl or phenyl all of which may be unsubstituted or substituted by one or more OH, $N(R_6)_2$, COOH, halogen, >C=O or XC_{1-5}alkyl;

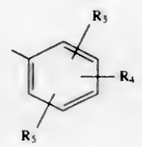
X is $(CH_2)_n$, O, NR_6 or $S(O)_p$;

Y is CH_3, $—X(CH_2)_nAr$ or Ar;

R_{10} is hydrogen, phenyl, benzyl, radical (b) from above, imidazolyl, thienyl, furyl, pyrazolyl, isoxazolyl, pyridyl or tetrazolyl all of which may be unsubstituted or substituted by C_{1-6}alkyl, C_{1-6}alkoxy, Cl, Br, F, I, $N(R_7)_2$, $—CO_2R_7$, $—SO_2NHR_7$, $—SO_3R_7$, $—CON(R_7)_2$, OH, NO_2, $—S(O)_pC_{1-6}$alkyl, or $—NR_7COC_{1-6}$alkyl;

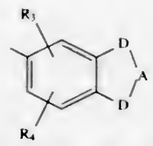
R_{11} is Ar, C_{3-8}cycloalkyl, C_{1-8}alkyl, C_{2-8}alkenyl, C_{2-8}alkynyl all of which may be unsubstituted or subsituted by one or more OH, CH_2OH, $N(R_6)_2$ or halogen;

Ar is:



(a)

or



(b)

naphthyl, indolyl, pyridyl, thienyl, oxazolidinyl, oxazolyl, thiazolyl, benzoyl, isothiazolyl, pyrazolyl, triazolyl, tetrazolyl, imidazolyl, imidazolidinyl, furyl, thiazolidinyl, isoxazolyl, oxadiazolyl, thiadiazolyl, morpholinyl, piperidinyl, piperazinyl, pyrrolyl, or pyrimidyl; all of which may be unsubstituted or substituted by one or more R_3 or R_4 groups;

A is C=O, or $[C(R_6)_2]_m$;

[B] D is $—CH_2—$ or —O—;

n is 0 to 6;

m is 1 or 2;

p is 0, 1 or 2;

and the dotted line indicates the optional presence of a double bond; or a pharmaceutically acceptable salt thereof, provided R_{10} is not H when R_1, R_2 and R_{11} are all unsubstituted phenyl and R_8 is COOH, and X is $(CH_2)_n$ when n= 0 and R_8 is COOH and provided the compound of Formula I is not 1-[2-(4-chlorophenyl)-3-(2,4-dichlorophenyl)-1-(4-methoxyphenyl)propyl]-1H-imidazole, and provided that R_3, R_4, and R_5 are not hydrogen.

5,559,106

HETEROCYCLIC COMPOUNDS, THEIR USE AND PREPARATION

Poul Jacobsen, Slangerup; Flemming E. Nielsen, and Lone Jeppesen, both of Virum, all of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

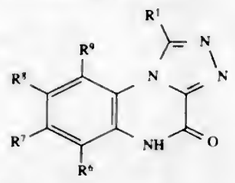
Continuation of Ser. No. 202,524, Feb. 28, 1994, abandoned. This application Dec. 7, 1994, Ser. No. 350,744

Claims priority, application Denmark, Mar. 19, 1993, 0310/93

Int. Cl.[6] C07D *487/04;* **A61K** *31/495;31/675;* **C07F** *9/6524*

U.S. Cl. 514—81 **25 Claims**

1. A compound of formula I



(I)

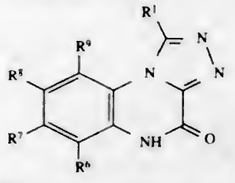
wherein

R^1 is COX', POX'X" or straight or branched C_{1-6}-alkyl substituted with COX' or POX'X", wherein X' and X" independently are hydroxy or C_{1-6}-alkoxy; and

R^6 and R^7 or R^8 and R^9 form a fused benzene or tetrahydro-benzene ring; or

a pharmaceutically acceptable salt thereof.

6. A compound of formula I



(I)

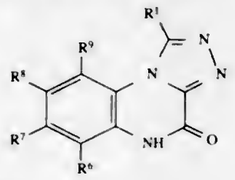
wherein

R^1 is POX'X" or straight or branched C_{1-6}-alkyl substituted with POX'X", wherein X' and X" independently are hydroxy or C_{1-6}-alkoxy; and

R^6, R^7, R^8, and R^9 independently are hydrogen; C_{1-6}-alkyl; halogen; NH_2; NO_2; CN; CF_3; triazolyl; imidazolyl; imidazolyl substituted with phenyl or C_{1-6}-alkyl; $SO_2NY'Y"$; or COZ' wherein Z' is NY'Y" or C_{1-6}-alkyl; wherein Y' and Y" independently are hydrogen or C_{1-6}-alkyl; or

a pharmaceutically acceptable salt thereof.

18. A compound of formula I



(I)

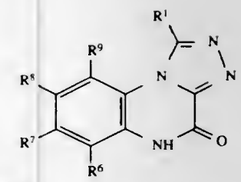
wherein

R^1 is COOH or straight or branched C_{1-6}-alkyl substituted with COX', wherein X' is hydroxy or C_{1-6}-alkoxy; and

R^6, R^7, R^8, and R^9 independently are hydrogen; C_{1-6}-alkyl; halogen; NH_2; NO_2; CN; CF_3; triazolyl; imidazolyl; imidazolyl substituted with phenyl or C_{1-6}-alkyl; $SO_2NY'Y"$; or COZ' wherein Z' is NY'Y" or C_{1-6}-alkyl; wherein Y' and Y" independently are hydrogen or C_{1-6}-alkyl; or

a pharmaceutically acceptable salt thereof.

23. A method of treating an indication, comprising administering a compound to a subject in need thereof, wherein the compound is of formula I:



(I)

wherein

R^1 is COX', POX'X" or straight or branched C_{1-6}-alkyl substituted with COX' or POX'X", wherein X' and X" independently are hydroxy or C_{1-6}-alkoxy; and

R^6, R^7, R^8, and R^9 independently are hydrogen; C_{1-6}-alkyl; halogen; NH_2; NO_2; CN; CF_3; triazolyl; imidazolyl; imidazolyl substituted with phenyl or C_{1-6}-alkyl; $SO_2NY'Y"$; or COZ' wherein Z' is NY'Y" or C_{1-6}-alkyl; wherein Y' and Y" independently are hydrogen or C_{1-6}-alkyl; or R^6 and R^7 or R^8 and R^9 form a fused benzene or tetrahydro-benzene ring; or

a pharmaceutically acceptable salt thereof,

wherein the indication is cerebral ischemia or Parkinson's disease.

5,559,107

REGULATION OF IMMUNE RESPONSE

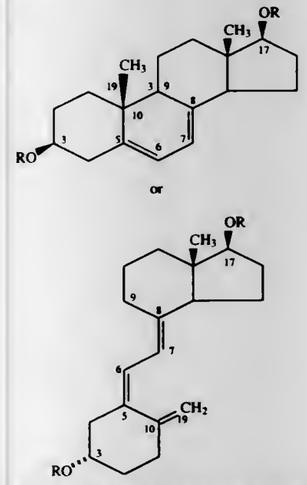
Stephen Gates, 8306 Crosspointe Dr., Fairfax Station, Va. 22039, and Roger M. Loria, 3219 Brook Rd., Richmond, Va. 23227

Filed Oct. 20, 1994, Ser. No. 325,151

Int. Cl.[6] A61K *31/56*

U.S. Cl. 514—167 **1 Claim**

1. A method of enhancing immune response in a mammal by the administration of an immune enhancing-effective amount of a composition containing as an active agent at least one compound of the formula:



(I)

or

(II)

wherein each R individually is chosen from hydrogen, alkyl having from 1–8 carbons, alkenyl having from 2–8 carbons, phenylalkyl wherein the alkyl has from 1–4 carbons, phenyl, and COR_1, wherein each R_1 individually is chosen from alkyl having from 1 to about 8 carbons, alkenyl having from 2 to about 8 carbons, phenylalkyl wherein the alkyl has from 1 to about 4 carbons, and phenyl, wherein any phenyl group may have up to three substituents chosen from among hydroxy, carboxy having from 1 to about 4 carbons, halo, alkoxy having from 1 to about 4 carbons or alkenyl having from 2 to about 4 carbons and wherein any alkyl is a straight chain, branched chain or wholly or partially cyclized.

5,559,108

CEPHALOSPORIN DERIVATIVES

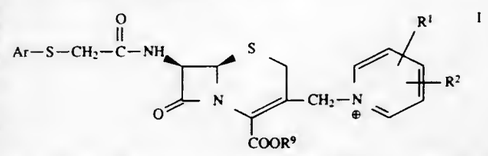
Choung U. Kim, San Carlos, Calif.; Muzammil M. Mansuri, Lexington, Mass.; Peter F. Misco, Jr., Durham, Conn.; John A. Wichtowski, Deep River, Conn.; Joanne J. Bronson, Madison, Conn.; Stanley V. D'Andrea, Middletown, Conn., and Thomas W. Hudyma, Durham, Conn., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

Continuation-in-part of Ser. No. 300,830, Sep. 2, 1994, abandoned. This application May 22, 1995, Ser. No. 445,628

Int. Cl.[6] C07D *501/38;* **A61K** *31/545*

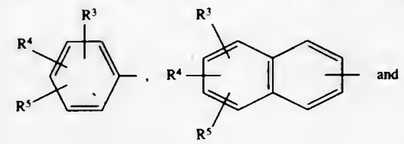
U.S. Cl. 514—203 **13 Claims**

1. A compound having the formula

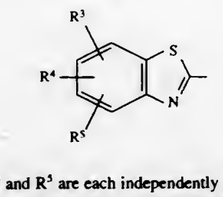


I

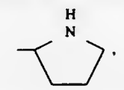
wherein Ar is an aryl group selected from the group consisting of



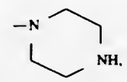
and



in which R^3, R^4 and R^5 are each independently hydrogen, halogen, trihalomethyl, nitro, C_1–C_6 alkyl, $—(CH_2)_nOR^6$ or $—(CH_2)_nSR^6$, with the proviso that when Ar is a phenyl group, R^3, R^4 and R^5 may not all be hydrogen; n is an integer of from 1 to 6; R^6 is hydrogen or C_1–C_6 alkyl; R^1 and R^2 are each independently hydrogen, $—(CH_2)_m$ $CONR^7R^8$, $—(CH_2)_mCOR^7$, $—(CH_2)_mCO_2R^7$, $—(CH_2)_mCN$, $—(CH_2)_mNR^7$ R^8, $—(CH_2)_mOR^7$, $—(CH_2)_mNHCONR^7R^8$ or $—(CH_2)_mNHCOR^7$ in which m is 0 or an integer of from 1 to 6 and R^7 and R^8 are each independently hydrogen, C_1–C_6 alkyl substituted by one or two amino or hydroxyl groups, or a group of the formula



or R^7 and R^8 taken together with the nitrogen atom to which they are attached represent



with the proviso that R^1 and R^2 may not both be hydrogen; and R^9 is hydrogen, an anionic charge or a carboxyl-protecting group, provided that when R^9 is hydrogen or a protecting group, there is also present a counter ion; or a pharmaceutically acceptable salt thereof.

5,559,109

METHOD OF TREATING A PAF-MEDIATED PATHOLOGY OR FOR TREATING OR PREVENTING PSORIASIS, NEPHRITIS, ASTHMA OR SHOCK BY ADMINISTERING A PAF ANTAGONIST

Norio Nakamura; Nobuyuki Ohkawa; Takeshi Oshima; Masaaki Miyamoto, and Yasuteru Iijima, all of Tokyo, Japan, assignors to Sankko Company, Limited, Tokyo, Japan

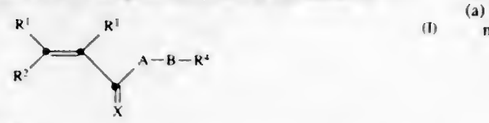
Division of Ser. No. 973,886, Nov. 6, 1992, Pat. No. 5,369,106, which is a division of Ser. No. 751,871, Aug. 28, 1991, Pat. No. 5,192,766, which is a continuation-in-part of Ser. No. 514,523, Apr. 25, 1990, abandoned. This application Oct. 7, 1994, Ser. No. 320,444

Claims priority, application Japan, Apr. 28, 1989, 111295

Int. Cl.[6] A61K *31/55;31/495;31/40*

U.S. Cl. 514—218 **8 Claims**

1. A method of treating or preventing a PAF-mediated pathology in a mammal suffering from or susceptible to said PAF-mediated pathology, said PAF-mediated pathology selected from the group consisting of myocardial infarction, angina pectoris, systemic anaphylaxis, gastric ulceration, intestinal ulceration and organ transplantation rejection by administering to said mammal an effective amount of a PAF antagonist compound of the formula (I)



(I)

wherein:

R^1 and R^2 are the same or different, and each represents $—R^5$ or a group having the formula $—CH═CH—R^5$ or $—C≡C—R^5$,

wherein R^5 represents a C_6–C_{14} carboxylic aryl group which is unsubstituted or has at least one substituent selected from the group consisting of substituents (a), defined below, or an aromatic heterocyclic group having from 5 to 14 ring atoms, of which from 1 to 5 are hetero-atoms selected from the group consisting of nitrogen, oxygen and sulfur hetero-atoms, said heterocyclic group being unsubstituted or having at least one substituent selected from the group consisting of substituents (a), defined below;

R^3 represents a hydrogen atom, a C_1–C_6 alkyl group, a cyano group, or said $—R^5$;

X represents an oxygen atom or a sulfur atom;

A represents a 1,4-piperazin-1,4-diyl group or a 1,4-homopiperazin-1,4-diyl group;

B represents a C_1–C_6 alkylene group, a carbonyl group, a thiocarbonyl group, a sulfinyl group or a sulfonyl group;

R^4 represents an unsubstituted phenyl group or a substituted phenyl group having from 1 to 5 substituents selected from the group consisting of substituents (a) and substituents (b), defined below:

substituents (a):

C_1–C_{22} alkyl groups; C_1–C_{22} alkoxy groups;

C_1–C_6 haloalkyl groups; hydroxy groups;

C_1–C_4 alkylenedioxy groups; C_1–C_6 aliphatic carboxylic acyloxy groups; substituted C_1–C_{22} aliphatic carboxylic acyloxy groups having at least one substituent selected from the group consisting of substituents (c), defined below; C_7–C_{15} carbocyclic aromatic carboxylic acyloxy groups; substituted C_7–C_{15} carbocyclic aromatic carboxylic acyloxy groups having at least one substituent selected from the group consisting of substituents (d), defined below; C_8–C_{15} aralkyloxycarbonyloxy groups in which the aryl part is unsubstituted or has at least one substituent selected from the group consisting of substituents (d), defined below; C_1–C_6 alkanesulfonyloxy groups in which the alkane part is unsubstituted or has at least one substituent selected from the group consisting of substituents (c), defined below; arylsulfonyloxy groups in which the aryl part is unsubstituted or has at least one substituent selected from the group consisting of substituents (d), defined below; halogen atoms; and nitro groups;

substituents (b):

C_1–C_6 alkylsulfonyl groups; C_1–C_6 alkylsulfinyl groups; and C_1–C_6 alkylthio groups;

substituents (c):

C_1–C_6 alkyl groups; C_1–C_6 haloalkyl groups, halogen atoms; C_1–C_6 alkoxy groups; and (C_1–C_6 alkanoyloxy)methoxycarbonyl groups;

substituents (d):

C_1–C_6 alkyl groups; C_1–C_6 alkoxy groups; halogen atoms; unsubstituted C_6–C_{10} aryl groups; nitro groups; and (C_1–C_6 alkoxy)carbonyl groups; and pharmaceutically acceptable salts thereof.

5,559,110

PHARMACEUTICAL FORMULATIONS OF CYCLIC UREA TYPE COMPOUNDS

Bruce J. Aungst, Wilmington, Del., assignor to The DuPont Merck Pharmaceutical Company, Wilmington, Del.

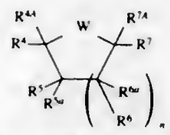
Filed Mar. 9, 1994, Ser. No. 208,243

Int. Cl.[6] A61K *31/55;9/66;9/50;* **C07D** *243/04*

U.S. Cl. 514—218 **41 Claims**

1. A pharmaceutical composition comprising:

(a) a therapeutically effective amount of compound of the Formula (I):



(I)

or a pharmaceutically acceptable salt or prodrug form thereof, wherein:

R^4 and R^7 are independently selected from the following groups:

hydrogen;

C_1–C_8 alkyl substituted with 0–3 R^{11};

C_2–C_8 alkenyl substituted with 0–3 R^{11};

C_2–C_8 alkynyl substituted with 0–3 R^{11};

a C_3–C_{14} carbocyclic ring system substituted with 0–3 R^{11} or 0–3 R^{12};

a 5- to 10-membered heterocyclic ring system containing 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, said heterocyclic ring system being substituted with 0–2 R^{12}; or

$—OR^{13}$; $—SR^{13}$; CO_2R^{13};

R^{4A} and R^{7A} are independently selected from the following groups:

hydrogen;

C_1–C_4 alkyl substituted with 0–6 halogen or 0–3 C_1–C_2 alkoxy;

benzyl substituted with 0–6 halogen or 0–3 C_1–C_2 alkoxy; or

$—OR^{13}$; $—SR^{13}$; CO_2R^{13};

R^4 and R^{4A} can alternatively join to form a 5–7 membered carbocyclic ring substituted with 0–2 R^{12};

R^7 and R^{7A} can alternatively join to form a 5–7 membered carbocyclic ring substituted with 0–2 R^{12};

n is 1;

R^5 is selected from H; halogen; C_1–C_6 alkyl substituted with 0–3 R^{11}; $—N(R^{20})_2$; $—SR^{20}$; or $—OR^{20}$, $—N_3$;

R^6 is independently selected from: hydrogen, halogen, C_1–C_6 alkyl substituted with 0–3 R^{11}, $—N(R^{20})_2$, $—SR^{20}$, or $—OR^{21}$, $—N_3$;

R^5 and R^6 can alternatively join to form an epoxide or aziridine ring: $—OCH_2SCH_2O—$; $—OS(=O)O—$; $—OC(=O)O—$; $—OCH_2O—$; $—OC(=S)O—$; $—OC(=O)C(=O)O—$; $—OC(CH_3)_2O—$; $—OC((CH_2)_3NH_2)(CH_3)O—$; $—OC(OCH_3)(CH_2CH_2CH_3)O—$; $—OS(=O)O—$; $—NHC(=O)NH—$; $—OC(=O)NH—$; $—NHC(=O)O—$; $—NHCH_2O—$; $—OCH_2NH—$; $—NHC(=S)O—$; $—OS(=O)NH—$; $—NHC(=O)C(=O)O—$; $—OC(=O)C(=O)NH—$; $—NHC(=O)C(=O)NH—$; $—OC(CH_3)_2O—$; $—NHC(CH_3)_2O—$; $—OC(CH_3)_2NH—$ or

any group that, when administered to a mammalian subject, cleaves to form a free dihydroxyl or diamino or hydroxyl and amino;

R^{5a} is selected from hydrogen, halogen, C_1–C_6 alkyl, $—N(R^{20})_2$, $—SR^{20}$, or $—OR^{20}$;

R^{6a} is selected from: hydrogen, halogen, C_1–C_6 alkyl, $—N(R^{20})_2$, $—SR^{20}$ or $—OR^{21}$;

R^5 and R^{5a} can alternatively join to form =O, =S, or a ketal ring;

R^6 and R^{6a} can alternatively join to form =O, =S, or a ketal ring;

R^{20} and R^{21} are independently selected from:

hydrogen;

C_1–C_6 alkyl substituted with 0–3 R^{11};

C_3–C_6 alkoxyalkyl substituted with 0–3 R^{11};

C_1–C_6 alkylcarbonyl substituted with 0–3 R^{11};

C_1–C_6 alkoxycarbonyl substituted with 0–3 R^{11};

C_1–C_6 alkylaminocarbonyl substituted with 0–3 R^{11};

benzoyl substituted with 0–3 R^{12};

phenoxycarbonyl substituted with 0–3 R^{12};

phenylaminocarbonyl substituted with 0–3 R^{12}; or

any group that, when administered to a mammalian subject, cleaves to form a free hydroxyl, amino or sulfhydryl;

R^{11} is selected from one or more of the following:

H, keto, halogen, cyano, $—CH_2NR^{13}R^{14}$, $—NR^{13}R^{14}$, $—CO_2R^{13}$, $—OC(=O)R^{13}$, $—O^{13}$, C_2–C_6 alkoxyalkyl, $—S(O)hd\ mR^{13}$, $—NHC(=NNH)NHR^{13}$, $—C(=NH)NHR^{13}$, $—C(=O)NR^{13}R^{14}$, $—NR^{14}C(=O)R^{13}$, $=NOR^{14}$, $—NR^{14}C(=O)OR^{14}$, $—OC(=O)NR^{13}R^{14}$, $—NR^{13}C(=O)NR^{13}R^{14}$, $—NR^{14}SO_2NR^{13}R^{14}$, $—NR^{14}SO_2R^{13}$, $—SO_2NR^{13}R^{14}$, $—OP(O)(OR^{13})_2$, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_3–C_{10} cycloalkyl, C_3–C_6 cycloalkylmethyl, benzyl, phenethyl, phenoxy, benzyloxy, nitro, C_7–C_{10} arylalkyl, hydroxamic acid, hydrazide, boronic acid, sulfonamide, formyl, C_3–C_6 cycloalkoxy, C_1–C_4 alkyl substituted with $—NR^{13}R^{14}$, C_1–C_4 hydroxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 haloalkyl, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, C_1–C_4 alkylcarbonylamino, $—OCH_2CO_2H$, 2-(1-morpholino)ethoxy, azido, or $—C(R^{14})=N(OR^{14})$;

1–3 amino acids linked together via amide bonds, said amino acid being linked via the amine or carboxylate terminus;

C_3–C_{10} cycloalkyl substituted with 0–2 R^{12};

C_1–C_4 alkyl substitued with 0–2 R^{12}

aryl(C_1–C_3 alkyl) substituted with 0–2 R^{12};

C_2–C_6 alkoxyalkyl, substituted with 0–2 R^{12};

C_1–C_4 alkylcarbonyloxy substituted with 0–2 R^{12},

C_6–C_{10} arylcarbonyloxy substituted with 0–2 R^{12},

a C_5–C_{14} carbocyclic residue substituted with 0–3 R^{12}; or

a 5- to 10-membered heterocyclic ring system containing 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, said heterocyclic ring system being substituted with 0–3 R^{12};

R^{11A} is selected from one or more of the following:

H, keto, halogen, cyano, $—CH_2NH_2$, $—NH_2$, —NHMe, $—CO_2H$, $—OC(=O)(C_1$–C_3 alkyl), —OH, C_2–C_6 alkoxyalkyl, $—C(=O)NH_2$, $—OC(=O)NH_2$, $—NHC(=O)NH_2$, $—SO_2NH_2$, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_3–C_{10} cycloalkyl, C_3–C_6 cycloalkylmethyl, benzyl, phenethyl, phenoxy, benzyloxy, nitro, C_7–C_{10} arylalkyl, hydroxamic acid, hydrazide, boronic acid, C_3–C_6 cycloalkoxy, C_1–C_4 alkyl substituted with $—NH_2$, C_1–C_4 hydroxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, C_1–C_4 alkylcarbonylamino, $—OCH_2CO_2H$, 2-(1-morpholino)ethoxy, azido, aryl(C_1–C_3 alkyl), a C_5–C_{14} carbocyclic residue; a 5- to 10-membered heterocyclic ring system containing 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, said heterocyclic ring system substituted with 0–3 R^{12A};

R^{12}, when a substituent on carbon, is selected from one or more of the following:

phenyl, benzyl, phenethyl, phenoxy, benzyloxy, halogen, hydroxy, nitro, cyano, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, C_7–C_{10} arylalkyl, C_1–C_4 alkoxy, $—CO_2H$, hydroxamic acid, hydrazide, oronic acid, sulfonamide, formyl, C_3–C_6 cycloalkoxy, $—OR^{13}$, C_1–C_4 alkyl substituted with $—NR^{13}R^{14}$, $—NR^{13}R^{14}$, C_7–C_6 alkoxyalkyl optionally substituted with $—Si(CH_3)_3$, C_1–C_4 hydroxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonylamino, $—S(O)_mR^{13}$, $—SO_2NR^{13}R^{14}$, $—NHSO_2R^{14}$, $—OCH_2CO_2R^{13}$, 2-(1-morpholino)ethoxy, or $—C(R^{14})=N(OR^{14})$; or

a 5-or 6-membered heterocyclic ring containing from 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur;

or R^{12} may be a 3-or 4-carbon chain attached to adjacent carbons on the ring to form a fused 5- or 6-membered ring, said 5- or 6-membered ring being optionally substituted on the aliphatic carbons with halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, or $—NR^{13}R^{14}$; or, when R^{12} is attached to a saturated carbon atom, it may be =O or =S; or when R^{12} is attached to sulfur it may be =O;

R^{12}, when a substituent on nitrogen, is selected from one or more of the following:

phenyl, benzyl, phenethyl, hydroxy, C_1–C_4 hydroxyalkyl, C_1–C_4 alkoxy, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, $—CH_2NR^{13}R^{14}$, $—NR^{13}R^{14}$, C_2–C_6 alkoxyalkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxycarbonyl, $—CO_2H$, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, or $—C(R^{14})=N(OR^{14})$;

R^{12A}, when a substituent on carbon, is selected from one or more of the following:

phenyl, benzyl, phenethyl, phenoxy, benzyloxy, halogen, hydroxy, nitro, cyano, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, C_7–C_{10} arylalkyl, C_1–C_4 alkoxy, $—CO_2H$, hydroxamic acid, hydrazide, boronic acid, sulfonamide, formyl, C_3–C_6 cycloalkoxy, $—OR^{13}$, C_1–C_4 alkyl substituted with $—NH_2$, $—NH_2$, —NHMe, C_2–C_6 alkoxyalkyl optionally substituted with $—Si(CH_3)_3$, C_1–C_4 hydroxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, C_1–C_4 alkylcarbonylamino, $—S(O)_mMe$, $—SO_2NH_2$, $—NHSO_2Me$, $—OCH_2CO_2R^{13}$, 2-(1-morpholino)ethoxy, $—C(=NOH)NH_2$; or

a 5-or 6-membered heterocyclic ring containing from 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur;

or R^{12A} may be a 3-or 4-carbon chain attached to adjacent carbons on the ring to form a fused 5-or 6-membered ring, said 5-or 6-membered ring being optionally substituted on the aliphatic carbons with halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, or $—NH_2$; or, when R^{12A} is attached to a saturated carbon atom or sulfur, it may be =O or =S;

R^{12A}, when a substituent on nitrogen, is selected from one or more of the following:

phenyl, benzyl, phenethyl, hydroxy, C_1–C_4 hydroxyalkyl, C_1–C_4 alkoxy, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, $—CH_2NH_2$, $—NH_2$, C_2–C_6 alkoxyalkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxycarbonyl, $—CO_2H$, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, $—C(=NOH)NH_2$;

R^{13} is selected from:

H;

phenyl substituted with 0–3 R^{11A};

benzyl substituted with 0–3 R^{11A};

C_1–C_6 alkyl substituted with 0–3 R^{11A};

C_2–C_4 alkenyl substituted with 0–3 R^{11A};

C_1–C_6 alkylcarbonyl substituted with 0–3 R^{11A};

C_1–C_6 alkoxycarbonyl substituted with 0–3 R^{11A};

C_1–C_6 alkylaminocarbonyl substituted with 0–3 R^{11A};

C_3–C_6 alkoxyalkyl substituted with 0–3 R^{11A};

an amine protecting group when R^{13} is bonded to N; or

a hydroxy protecting group when R^{13} is bonded to O;

R^{14} is hydrogen, hydroxy, CF_3; C_1–C_6 alkyl substituted with 0–3 groups selected from OH, C_1–C_4 alkoxy, halogen, NH_2, C_1–C_6 alkoxy; NH_2; —NH(C_1–C_4 alkyl), C_2–C_6 alkenyl;

phenyl, benzyl, an amine protecting group when R^{14} is bonded to N, or a hydroxy protecting group when R^{14} is bonded to O;

R^{13} and R^{14} can alternatively join to form $—(CH_2)_4—$, $—(CH_2)_5—$, $—CH_2CH_2N(R^{15})CH_2CH_2—$, or $—CH_2CH_2OCH_2CH_2—$;

R^{15} is H or CH_3;

m is 0, 1 or 2;

W is

$—N(R^{22})C(=Z)N(R^{23})—$;

wherein:

Z is O;

R^{22} and R^{23} are independently selected from the following:

hydrogen;

C_1–C_8 alkyl substituted with 0–3 R^{31};

C_2–C_8 alkenyl substituted with 0–3 R^{31};

C_2–C_8 alkynyl substituted with 0–3 R^{31};

a C_3–C_{14} carbocyclic ring system substituted with 0–5 R^{31} or R^{32};

a 5- to 10-membered heterocyclic ring system containing 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, said heterocyclic ring system being substituted with 0–5 R^{32}; a5-to 10-membered heterocyclic ring system containing 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, said heterocyclic ring system being substituted with 0–5 r^{32})

$—OR_{22a}$; or $—N(R^{22a})(R^{22b})$;

R^{22a} and R^{22b} are independently selected from the following:

hydrogen;

C_1–C_8 alkyl substituted with 0–3 R^{31};

C_2–C_8 alkenyl substituted with 0–3 R^{31};

C_2–C_8 alkynyl substituted with 0–3 R^{31};

a C_3–C^{14} carbocyclic ring system substituted with 0–5 R^{31} or R^{32};

a 5- to 10-membered heterocyclic ring system containing 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, said heterocyclic ring system being substituted with 0–5 R^{32};

alternatively, R^{22} can join with R^4 or R^{44} to form a 5- or 6-membered fused heterocyclic ring or carbocyclic ring substituted with 0–2 R^{12}, said heterocyclic ring containing 1–3 heteroatoms independently selected from N, S, or O; or

alternatively, R_{23} can join with R^7 or R^{7A} to form a 5- or 6-membered fused heterocyclic ring or carbocyclic ring substituted with 0–2 R^{12}, said heterocyclic ring containing 1–3 heteroatoms independently selected from N, S, or O; or

alternatively, R^{22} can join with R^5 or R^6 to form a 0- to 7-membered bridge to form a carbocyclic or heterocyclic ring, said bridge being substituted with 0–2 R^{12} and said bridge containing 0–3 heteroatoms independently selected from N, S, or O (i.e., a 0-membered bridge is formed when R^{22} or R^{23} are taken together with R^5 or R^6 to form a direct bond); or

alternatively R23 can join with R7A to form a direct bond; or

alternatively R22 can join with R4A to form a direct bond;

R^{31} is selected from one or more of the following:

keto, halogen, cyano, $—CH_2NR^{13}R^{14}$, $—NR^{13}R^{14}$, $—CO_2R^{13}$, $—C(=O)R^{11}$, $—OC(=O)R^{13}$, $—OR^{13}$, C_2–C_6 alkoxyalkyl, $—S(O)_mR^{13}$, $—NHC(=NH)NHR^{13}$, $—C(=NH)NHR^{13}$, $—C(=O)NR^{13}R^{14}$, $—NR^{14}C(=O)R^{13}$, $=NOR^{14}$, $—NR^{14}C(=O)OR^{14}$, $—OC(=O)NR^{13}R^{14}$, $—NR^{13}C(=O)NR^{13}R^{14}$, $—NR^{13}C(=S)NR^{13}R^{14}$, $—NR^{14}SO_2NR^{13}R^{14}$, $—NR^{14}SO_2R^{13}$, $—SO_2NR^{13}R^{14}$, C_1–C_4 alkyl, C_2–C_4 alkenyl, C_3–C_{10} cycloalkyl, C_3–C_6 cycloalkylmethyl, benzyl, phenethyl, phenoxy, benzyloxy, nitro, C_7–C_{10} arylalkyl, hydroxamic acid, hydrazide, oxime, boronic acid, sulfonamide, formyl, C_3–C_6 cycloalkoxy, C_1–C_4 alkyl substituted with $—NR^{13}R^{14}$, C_1–C_4 hydroxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_1–C_4 alkoxycarbonyl, C_1–C_4 alkylcarbonylamino, $—OCH_2CO_2R^{13}$, 2-(1-morpholino)ethoxy, azido, $—C(R^{14})=N(OR^{14})$; or

1–3 amino acids, linked together via amide bonds, said amino acid being linked via the amine or carboxylate terminus;

a C_5–C^{14} carbocyclic residue substituted with 0–5 R^{32}; or

a 5- to 10-membered heterocyclic ring system containing 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, said heterocyclic ring system being substituted with 0–2 R^{32};

R^{32}, when a substituent on carbon, is selected from one or more of the following:

phenethyl, phenoxy, C_3–C_{10} cycloalkyl, C_3–C_6 cycloalkylmethyl, C_7–C_{10} arylalkyl, hydrazide, oxime, boronic acid, C_2–C_6 alkoxyalkyl, methylenedioxy, ethylenedioxy, C_1–C_4 alkylcarbonyloxy, $—NHSO_2R^{14}$, benzyloxy, halogen, 2-(1-morpholino)ethoxy, $—CO_2R^{13}$, hydroxamic acid, $—CONR^{13}NR^{13}R^{14}$, cyano, boronic acid, sulfonamide, —CHO, C_3–C_6 cycloalkoxy, $—NR^{13}R^{14}$, $—C(R^{14})=N(OR^{14})$, NO_2, $—OR^{13}$, $—N^{40}R^{41}$, $—SO_mR^{13}$, $—SO_mNR^{13}R^{13}$, $—C(=O)NR^{13}R^{14}$, $—OC(=O)NR^{13}R^{14}$, $—C(=O)R^{11}$, $—OC(=O)R^{11}$, $—CO_2R^{13}$, phenyl, $—C(=O)NR^{13}—(C_1$–C_4 alkyl)-$NR^{13}R^{14}$, $—C(=O)NR^{40}R^{41}$, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, C_2–C_4 haloalkenyl, C_1–C_4 haloalkynyl, or

$—C(=O)NR^{13}C(R^{11})_2NR^{13}R^{14}$;

$—C(=O)NR^{13}C(R^{11})_2NR^{13}NR^{14}$;

$—C(=O)NR^{13}C(R^{11})_2NR^{13}CO_2R^{13}$;

$—C(=O)NR^{13}—(C_1$–C_4 alkyl)$—NR^{13}CO_2R^{13}$;

$—C(=O)N(R^{13})-(C_1$–C_4 alkyl)$—R^{11}$; or

$—C(=O)C(R^{11})_2NR^{13}R^{14}$; $—C(=O)C(R^{11})_2NR^{13}NR^{14}$;

$—C(=O)C(R^{11})_2NR^{13}CO_2R^{13}$; $—C(=O)-(C_1$–C_4 alkyl)$—NR^{13}R^{14}$;

$—C(=O)-(C_1$–C_4 alkyl)$—NR^{13}CO_2R^{13}$; or

C^1–C_4 alkoxy substituted with 0–4 groups selected from: R^{11}, C_3–C_6 cycloalkyl, $—CO_2R^{13}$, $—C(=O)NR^{13}R^{14}$, $—NR^{13}R^{14}$ or OH;

C_1–C_4 alkyl substituted with 0–4 groups selected from: R^{11}, $=NR^{14}$, $=NNR^{13}C(=O)NR^{13}R^{14}$ or $—NR^{13}R^{14}$, $=NNR^{13}C(=O)OR^{13}$;

C_2–C_4 alkenyl substituted with 0–4 R^{11};

C_2–C_4 alkynyl substituted with 0–4 R^{11};

a 5-or 6-membered heterocyclic ring containing from 1 to 4 heteroatoms independently selected from oxygen, nitrogen or sulfur, substituted with 0–2 R^{12};

or R^{32} may be a 3-or 4-carbon chain attached to adjacent carbons on the ring to form a fused 5-or 6-membered ring, said 5-or 6-membered ring being optionally substituted on the aliphatic carbons with halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, or $—NR^{13}R^{14}$; or, when R^{32} is attached to a saturated carbon atom, it may be =0 or =S, =NOH; or when R^{32} is attached to sulfur it may be =O;

R^{32}, when a substituent on nitrogen, is selected from one or more of the following:

phenyl, benzyl, phenethyl, hydroxy, C_1–C_4 hydroxyalkyl, C_1–C_4 alkoxy, C_1–C_4 alkyl, C_3–C_6 cycloalkyl, C_3–C_6 cycloalkylmethyl, $—CH_2NR^{13}R^{14}$, $—NR^{13}R^{14}$, C_2–C_6 alkoxyalkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxycarbonyl, $—CO_2H$, C_1–C_4 alkylcarbonyloxy, C_1–C_4 alkylcarbonyl, or $—C(R^{14})=N(OR^{14})$;

R^{40} is selected from : H or C_1–C_3 alkyl;

R^{41} is selected from:

$—C(=O)NR^{13}R^{14}$;

$—C(=O)NR^{13}NR^{13}R^{14}$;

$—C(=O)C(R^{11})_2NR^{13}R^{14}$;

$—C(=O)C(R^{11})_2NR^{13}NR^{13}R^{14}$;

$—C(=O)C(R^{11})_2NR^{13}CO_2R^{13}$;

$—C(=O)H$;

$—C(=O)R^{11}$;

$—C(=O)-(C_1$–C_4 alkyl)$—NR^{13}R^{14}$;

$—C(=O)-(C_1$–C_4 alkyl)$—NR^{13}CO_2R^{13}$;

1–3 amino acids linked together via amide bonds, and linked to the N atom via the carboxylate terminus;

provided that:

R^4, R^{44}, R^7 and R^{7A} are not all hydrogen;

when R^4, R^{44} are hydrogen, R^{22} is not hydrogen; and

(b) a vehicle comprising a fatty acid ester of glycerol, a fatty acid ester of polyethylene glycol, or mixture thereof, wherein said vehicle has a hydrophil-lipophil balance of at least about 10.

5,559,111

δ-AMINO-γ-HYDROXY-ω-ARYL-ALKANOIC ACID AMIDES

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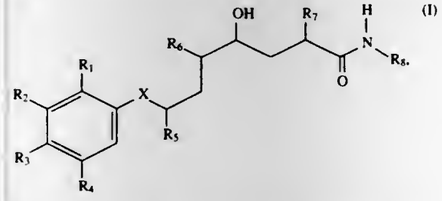
Filed Apr. 4, 1995, Ser. No. 416,242

Claims priority, application Switzerland, Apr. 18, 1994, 1169/94

Int. Cl.[6] A61K *31/165;31/54;* **C07D** *237/20;294/14*

U.S. Cl. 514—227.5 **24 Claims**

1. A novel δ-amino-γ-hydroxy-ω-aryl-alkanoic acid amide of formula I



(I)

wherein

R_1 is hydrogen, hydroxy, lower alkoxy, cycloalkoxy, lower alkoxy-lower alkoxy or free or esterified or amidated carboxy-lower alkoxy.

R_2 is hydrogen, lower alkyl, cycloalkyl, lower alkoxy-lower alkyl, lower alkoxy-lower alkoxy-lower alkyl, cycloalkoxy-lower alkyl, hydroxy, optionally lower alkanoylated, halogenated or sulfonylated hydroxy-lower alkoxy; amino-lower alkyl that is unsubstituted or substituted by lower alkyl, by lower alkanoyl and/or by lower alkoxycarbonyl; optionally hydrogenated heteroaryl-lower alkyl; amino-lower alkoxy that is substituted by lower alkyl, by lower alkanoyl and/or by lower alkoxycarbonyl; oxo-lower alkoxy, lower alkoxy, cycloalkoxy, lower alkenyloxy, cycloalkoxy-lower alkoxy, lower alkoxy-lower alkoxy, lower alkoxy-lower alkenyl, lower alkenyloxy-lower alkoxy, lower alkoxy-lower alkenyloxy, lower alkenyloxy-lower alkyl, lower alkanoyl-lower alkoxy, optionally S-oxidised lower alkylthio-lower alkoxy, lower alkylthio-(hydroxy)-lower alkoxy, aryl-lower alkoxy, optionally hydrogenated heteroaryl-lower alkoxy, cyano-lower alkoxy, free or esterified or amidated carboxy-lower alkoxy or free or esterified or amidated carboxy-lower alkyl.

R_3 is optionally halogenated lower alkyl, lower alkoxy-lower alkyl, cycloalkoxy-lower alkyl, hydroxy-lower alkyl, optionally S-oxidised lower alkylthio-lower alkyl, optionally hydrogenated heteroarylthio-lower alkyl, optionally hydrogenated heteroaryl-lower alkyl; amino-lower alkyl that is unsubstituted or N-mono- or N,N-di-lower alkylated. N-lower alkanoylated or N-lower alkane-sulfonylated or N,N-disubstituted by lower alkylene, by unsubstituted or N'-lower alkylated or N'-lower alkanoylated aza-lower alkylene, by oxa-lower alkylene or by optionally S-oxidised thia-lower alkylene; cyano-lower alkyl, free or esterified or amidated carboxy-lower alkyl, cycloalkyl, aryl, hydroxy, lower alkoxy, cycloalkoxy, lower alkoxy-lower alkoxy, cycloalkoxy-lower alkoxy, hydroxy-lower alkoxy, aryl-lower alkoxy, optionally halogenated lower alkoxy, optionally S-oxidised lower alkylthio-lower alkoxy, optionally hydrogenated heteroaryl-lower alkoxy, optionally hydrogenated heteroarylthio-lower alkoxy; amino-lower alkoxy that is unsubstituted or N-mono- or N,N-di-lower alkylated. N-lower alkanoylated or N-lower alkanesulfonylated or substituted by lower alkylene, by unsubstituted or N'-lower alkylated or N'-lower alkanoylated aza-lower alkylene, by oxa-lower alkylene or by optionally S-oxidised thia-lower alkylene; cyano-lower alkoxy or free or esterified or amidated carboxy-lower alkoxy,

R_4 is hydrogen, lower alkyl, hydroxy, lower alkoxy or cycloalkoxy.

X is methylene,

R_5 is lower alkyl or cycloalkyl.

R_6 is unsubstituted or N-mono- or N,N-di-lower alkylated or N-lower alkanoylated amino,

R_7 is lower alkyl, lower alkenyl, cycloalkyl or aryl-lower alkyl, and

R_8 is lower alkyl, cycloalkyl, free or aliphatically esterified or etherified hydroxy-lower alkyl; amino-lower alkyl that is unsubstituted or N-lower alkanoylated or N-mono- or N,N-di-lower alkylated or N,N-disubstituted by lower alkylene, by hydroxy-, lower alkoxy- or lower alkanoyloxy-lower alkylene, by unsubstituted or N'-lower alkanoylated or N'-lower alkylated aza-lower alkylene, by oxa-lower alkylene or by optionally S-oxidised thia-lower alkylene; free or esterified or amidated carboxy-lower alkyl, free or esterified or amidated dicarboxy-lower alkyl, free or esterified or amidated carboxy-(hydroxy)-lower alkyl, free or esterified or amidated carboxycycloalkyl-lower alkyl, cyano-lower alkyl, lower alkanesulfonyl-lower alkyl, unsubstituted or N-mono- or N,N-di-lower alkylated thiocarbamoyl-lower alkyl, unsubstituted or N-mono- or N,N-di-lower alkylated sulfamoyl-lower alkyl, or a heteroaryl radical bonded via a carbon atom and optionally hydrogenated and/or oxo-substituted, or lower alkyl substituted by a heteroaryl radical bonded via a carbon atom and optionally hydrogenated and/or oxo-substituted,

or a salt thereof.

5,559,112

CARBAMATES OF RAPAMYCIN

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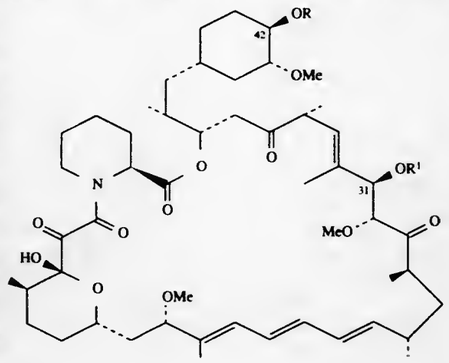
Division of Ser. No. 259,701, Jun. 14, 1994, Pat. No. 5,434,260, which is a continuation of Ser. No. 160,984, Dec. 1, 1993, abandoned, which is a division of Ser. No. 54,655, Apr. 23, 1993, Pat. No. 5,302,584, which is a continuation-in-part of Ser. No. 960,597, Oct. 13, 1992, abandoned. This application Feb. 27, 1995, Ser. No. 395,402

Int. Cl.[6] A61K *31/395;* **C07D** *491/06*

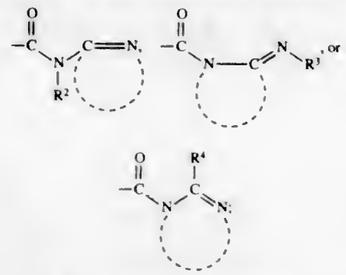
U.S. Cl. 514—291 **1 Claim**

1. A method of treating rheumatoid arthritis in a mammal in need thereof, which comprises administering to said mammal an antiarthritis effective amount of a compound of the structure



II

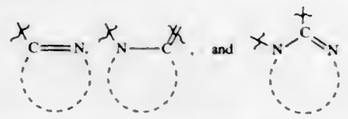
wherein R and R^1 are each, independently, hydrogen,



R^2 and R^3 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, $—CO_2R^5$, $—COR^5$, —CN, $—NO_2$, $—SO_2R^5$, $—SO_3R^5$, $—OR^5$, $—SR^5$, or Ar;

R^4 is hydrogen, alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, $—CF_3$, $—NR^5R^6$, $—CO_2R^5$, $—COR^5$, $CONR^5R^6$, $—NO_2$, halogen, $—OR^5$, $—SR^5$, —CN, $—SO_2R^5$, $—SO_3R^5$, $—SO_2NR^5R^6$, or Ar;

R^5 and R^6 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, or Ar;



are each, independently, a heterocyclic radical selected from the group consisting of pyrrolyl, 3,4-dihydropyrrolyl, pyrrolidinyl, pyrazolyl, imidazolyl, 4,5-dihydroimidazolyl, 2-pyrazolinyl, 1,2,4-triazolyl, isoxazolyl, oxazolyl, thiazolyl, isothiazolyl, pyridinyl, 1,2,3,6-tetrahydropyridinyl, piperidinyl, pyridazinyl, pyrimidinyl, 1,4,5,6-tetrahydropyrimidinyl, pyrazinyl, piperazinyl, 1,3,5-triazinyl, hexahydro-1,3,5-triazinyl, 1,2,4-triazinyl, 1,3,2-oxazinyl, 1,4-oxazinyl, morpholinyl, azepinyl, indolyl, indolinyl, indolenyl, benzoxazolyl, quinolinyl, 1,2,3,4-tetrahydroquinolinyl, 5,6,7,8-tetrahydroquinolinyl, isoquinolinyl, 3,4-dihydroisoquinolinyl, 1,2,3,4-tetrahydroisoquinolinyl, and 5,6,7,8-tetrahydroisoquinolinyl, wherein the heterocyclic radical may be optionally substituted by R^7;

R^7 is alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, $—CF_3$, $—NR^5R^6$, $—CO_2R^5$, $—COR^5$, $CONR^5R^6$, $—NO_2$, halogen, $—OR^5$, $—SR^5$, —CN, $—SO_2R^5$, $—SO_3R^5$, $—SO_2NR^5R^6$, or Ar;

Ar is phenyl, naphthyl, or hetaryl, wherein the foregoing may be optionally mono-, di-, or tri-substituted with a group selected from alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, arylalkyl of 7–10 carbon atoms, alkoxy of 1–6 carbon atoms, cyano, halo, hydroxy, nitro, carbalkoxy of 2–7 carbon atoms, trifluoromethyl, trifluoromethoxy, amino, dialkylamino of 1–6 carbon atoms per alkyl group, dialkylaminoalkyl of 3–12 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthio of 1–6 carbon atoms, $—SO_3H$, and $—CO_2H$;

hetaryl is a heterocyclic radical selected from the group consisting of furanyl, thiophenyl, pyrrolyl, pyrazolyl, imidazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, 1,2-dithiolyl, 1,3-dithiolyl, 1,2,3-oxathiol, isoxazolyl, oxazolyl, thiazolyl, isothiazolyl, 1,2,3-oxadiazolyl, 1,2,5-oxadiazolyl, 1,3,4-oxadiazolyl, 1,2,3,4-oxatriazolyl, 1,2,3,5-oxatriazolyl, 1,2,3-dioxazolyl, 1,2,4-dioxazolyl, 1,3,2-dioxazolyl, 1,3,4-dioxazolyl, 1,2,5-oxathiazolyl, 1,3-oxathiolyl, 1,2-pyranyl, 1,4-pyranyl, pyridinyl, pyridazinyl, pyrimidinyl, pyrazinyl, 1,3,5-triazinyl, 1,2,4-triazinyl, 1,2,3-triazinyl, 1,2,4-oxazinyl, 1,3,2-oxazinyl, 1,2,6-oxazinyl, 1,4-oxazinyl, isoxazinyl, 1,2,5-oxathiazinyl, 1,4-oxazinyl, o-isoxazinyl, p-isoxazinyl, 1,2,5-oxathiazinyl, 1,2,6-oxathiazinyl, 1,3,5,2-oxadiazinyl, azepinyl, oxepinyl, thiepinyl, 1,2,4-diazepinyl, benzofuranyl, isobenzofuranyl, thionaphthenyl, indolyl, indolenyl, 2-isobenzazolyl, 1,5-pyrindinyl, pyrano[3,4-b]pyrrolyl, benzpyrazolyl, benzisoxazolyl, benzoxazolyl, anthranilyl, 1,2-benzopyranyl, quinolinyl, isoquinolinyl, cinnolinyl, quinazolinyl, naphthyridinyl, pyrido[3,4-b]pyridinyl, pyrido[4,3-b]pyridinyl, pyrido[2,3-b]pyridinyl, 1,3,2-benzozazinyl, 1,4,2-benzoxazinyl, 2,3,1-benzoxazinyl, 3,1,4-benzoxazinyl, 1,2-benzisoxazinyl, 1,4-benzisoxazinyl, carbazolyl, purinyl, and a partially saturated heterocyclic radical selected from the foregoing: wherein the partially saturated heterocyclic radical contains at least one double bond:

with the proviso that R and R^1 are both not hydrogen, or a pharmaceutically acceptable salt thereof.

5,559,113

IMIDAZOLE COMPOUNDS AND THEIR THERAPEUTIC APPLICATIONS

Jean-Charles Schwartz, Paris; Jean-Michel Arrang, Gif Sur Yvette; Monique Garbarg; Jeanne-Marie Lecomte, both of Paris, all of France; Charon R. Ganellin, Welwyn, Great Britain; Abdellatif Fkyerat, La Bassee, France; Wasyl Tertiuk, Welwyn Garden City, Great Britain; Walter Schunack, Berlin, Germany; Ralph Lipp, Berlin, Germany; Holger Stark, Berlin, Germany, and Katja Purand, Berlin, Germany, assignors to Institut National de la Sante et de la Recherche Medicale, and Societe Civile Bioprojet, France

PCT No. PCT/FR93/00015, § 371 Date Jan. 28, 1994, § 102(e) Date Jan. 28, 1994, PCT Pub. No. WO93/14070, PCT Pub. Date Jul. 22, 1993

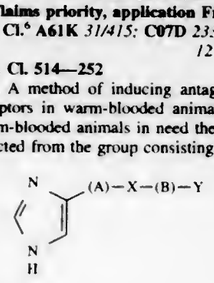
PCT Filed Jan. 8, 1993, Ser. No. 117,161

Claims priority, application France, Jan. 10, 1992, 92 00189

Int. Cl.[6] A61K *31/415;* **C07D** *233/64;233/84;401/12;403/12;417/12*

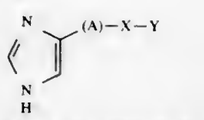
U.S. Cl. 514—252 **13 Claims**

1. A method of inducing antagonist activity of H_3 histamine receptors in warm-blooded animals comprising administering to warm-blooded animals in need thereof an amount of a compound selected from the group consisting of a compound of the formula



1A

and



1B

in which A is a hydrocarbon chain containing 1 to 6 carbon atoms uninterrupted or interrupted by a heteroatom selected from the group consisting of —S—, —O— and —NH—, X is selected from the group consisting of oxygen, sulfur, —NH—, —NHCO—, —N(alkyl)CO—, NHCONH—, —NH—CS—NH—, —NHCS—, —O—CO—, —CO—O—, —OCONH—, —OCON(alkyl)—, —OCONH— CO—, —CONH—, —CON(alkyl)—, —SO—, —CO—, —CHOH— and —NR—C(=NR*)—NR', R and R' are hydrogen or lower alkyl and R* is selected from the group consisting of hydrogen, cyano and COY_1, Y_1 is alkoxy, B is selected from the group consisting of $—(CH_2)_n—$, n is an integer from 0 to 5, a branched alkylene of 2 to 8 carbon atoms uninterrupted or interrupted by at least one oxygen or sulfur, $—(CH_2)_{n'}—O—$ and $—(CH_2)_{n'}—S—$ where n' is an integer of 1 or 2. Y is selected from the group consisting of

alkyl of 1 to 8 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, bicycloalkyl, cycloalkenyl, aryl 5- or 6-membered heterocycle selected from the group consisting of pyridyl, N-oxide-pyridyl, pyrimidinyl and pyrazinyl unsubstituted or substituted with at least one member of the group consisting of $—NO_2$, $—CF_3$, $—CH_3$, $—NH_2$, halogen, $—COOCH_3$, imidazolyl and thiazolyl and a bicyclic formed by a heterocycle as defined above to which a phenyl ring is fused, and a pharmaceutically acceptable salt, a hydrate, a hydrated salt, the polymorphic crystalline structures or the tautomeric forms thereof sufficient to induce said antagonist activity.

5,559,114

TREATMENT OF AUTOIMMUNE DISEASE USING 2-AMINO PURINE DERIVATIVES

Ray W. Exley, 9504 High Ridge Pl., Beverly Hills, Calif. 90210

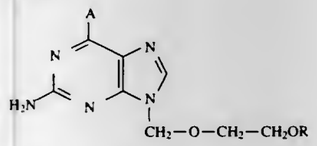
Filed Dec. 16, 1994, Ser. No. 358,335

Int. Cl.[6] A61K *31/52*

U.S. Cl. 514—261 **15 Claims**

1. A method of treating autoimmune disease in a mammalian subject, which method comprises administering a therapeutically effective mount of a compound of Formula (I) or (II) to a subject in need thereof, wherein

(a) Formula (I)

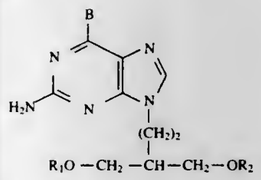


(I)

wherein

A is H or OH, OR is OH or a lower alkyl ester of 2–4 carbon atoms and

(b) Formula (II) is



(II)

wherein

B is hydrogen, chlorine, alkoxy of 1–6 carbons, phenoxy, phenylalkyloxy, $—NH_2$, —OH—or — SH,

each of R_1 and R_2 is independently hydrogen,

or phosphate wherein

R_3 is an alkyl of 1–6 carbons, alkoxy of 1–6 carbons or optionally substituted aryl; or

R_1 and R_2 are joined together to form a cyclic acetal, a cyclic carbonate or a cyclic phosphate group.

5,559,115

ONCOGENE FUNCTION-INHIBITORY AGENT, METHOD FOR INHIBITING ONCOGENE FUNCTION, AND TREATMENT OF CANCER

Kazuo Umezawa, 1-2-505, Hiroo 3-chome, Shibuya-ku, Tokyo; Takashi Koyano, Kanagawa; Hiroaki Takahashi, Kanagawa, and Takashi Yamamoto, Kanagawa, all of Japan, assignors to Terumo Kabushiki Kaisha, and Kazuo Umezawa, both of Tokyo, Japan

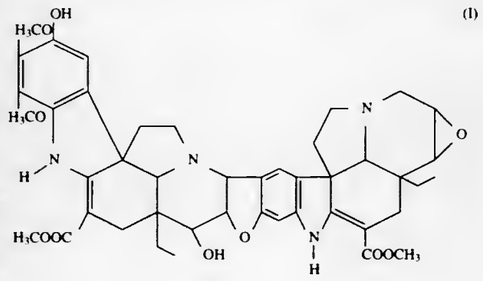
Filed Dec. 27, 1994, Ser. No. 364,305

Claims priority, application Japan, Dec. 28, 1993, 5-334563

Int. Cl.[6] A61K *31/44*

U.S. Cl. 514—279 **13 Claims**

4. A method of treating a subject having a cancer sensitive to treatment with a compound of general formula (I) below by administration of an effective amount of a compound represented by formula (I):



(I)

5,559,116

N-[(4-HETEROARYL-1-PIPERAZINYL) ALKYL]-1H-BENZ[DE]ISOQUINOLINE-1,3 (2H-)-DIONWS AND RELATED COMPOUNDS AND THEIR THERAPEUTIC UTILITY

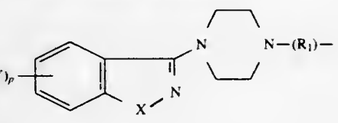
Edward J. Glamkowski, Warren, and Yulin Chiang, Covent Station, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 329,000, Oct. 25, 1994, which is a continuation-in-part of Ser. No. 144,265, Oct. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 969,383, Oct. 30, 1992, Pat. No. 5,364,866, which is a continuation-in-part of Ser. No. 788,269, Nov. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 944,705, Sep. 5, 1991, abandoned, which is a continuation of Ser. No. 619,825, Nov. 29, 1990, abandoned, which is a continuation of Ser. No. 456,790, Dec. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 354,411, May 19, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 469,521

Int. Cl.[6] A61K *31/495;31/445;31/415;* **C07D** *401/00;403/00;417/00;231/56;263/58*

U.S. Cl. 514—254 **17 Claims**

1. A compound of the formula:

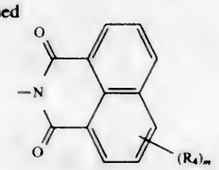


-continued

in addition, any nitrogen atom may alternatively be acylated

R_{24} is hydrogen, $(C_1–C_{18})$ linear alkyl, phenyl,

-continued



wherein

X is —O—, —S—, —NH—, or —N(R_2);

R_2 is selected from the group consisting of lower alkyl, aryl lower alkyl, aryl, cycloalkyl, aroyl, alkanoyl, alkoxy carbonyl, and phenylsulfonyl groups;

aryl is as defined hereinafter;

p is 1 or 2;

Y is hydrogen, lower alkyl, hydroxyl, chlorine, fluorine, bromine, iodine, lower alkoxy, trifluoromethyl, nitro, or amino;

R_1 is —$CR_{24}R_{27}$—$(CR_{23}R_{27})_n$—, where n is 0, 1, 2 or 3; or —$CHR_{24}CH$=CH—CHR_{24}—,

—CHR_{24}—C≡C—CHR_{24}—,

—CHR_{24}—CH=CH—$CR_{23}R_{24}$—CHR_{24}—,

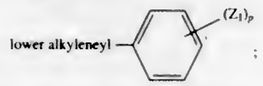
—CHR_{24}—$CR_{23}R_{24}$—CH=CH—CHR_{24}—,

—CHR_{24}—C≡C—$CR_{23}R_{24}$—CHR_{24}—, or

CHR_{24}—$CR_{23}R_{24}$—C≡C—CHR_{24},

the —CH=CH— bond being cis or trans;

R_{23} is hydrogen, (C_1–C_{18})linear alkyl, phenyl, hydroxy, (C_1–C_{18})alkoxy, aryloxy, aryl (C_1–C_{18})alkyloxy, (C_1–C_{18})alkanoyloxy, hydroxy (C_1–C_6)alkyl, (C_1–C_{18})alkoxy(C_1–C_6)alkyl, phenyl(C_1–C_6)alkyloxy, aryl(C_1–C_{18})alkyloxy(C_1–C_6)alkyl, (C_1–C_{18})alkanoyloxy (C_1–C_6)alkyl or



where Z_1 is lower alkyl, —OH, lower alkoxy, —CF_3, —NO_2, —NH_2, or halogen, and p is as previously defined;

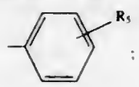
R_{24} is hydrogen, (C_1–C_{18})linear alkyl, phenyl, hydroxy(C_1–C_6)alkyl, (C_1–C_{18})alkoxy(CC_1–C_6)alkyl, phenyl (C_1–C_6)alkyloxy, aryl (C_1–C_{18})alkyoxy (C_1–C_6)alkyl, (C_1–C_{18}) alkanoyloxy (C_1–C_6)alkyl or

where Z_1 and p are as previously defined;

R_{27} is hydrogen or R_{24} and R_{27} taken together with the carbon to which they are attached form C=O or C=S;

R_4 is hydrogen, lower alkyl, lower alkoxy, hydroxy, tri(C_1–C_6)alkylsilyloxy, hydroxy lower alkyl, alkanoyloxy lower alkyl, amino, mono- or dialkylamino, (C_1–C_{18})acyl amino, (C_1–C_{18})alkanoyl, trifluoromethyl, chlorine, fluorine, bromine, —O—C(=O)—(C_1–C_{18}straight or branched chain) alkyl or —C(=O)-aryl;

in which aryl is phenyl or



where R_5 is hydrogen, lower alkyl, lower alkoxy, hydroxy, chlorine, fluorine, bromine, iodine, lower monoalkylamino, lower dialkylamino, nitro, cyano, trifluoromethyl, or trifluoromethoxy;

m is 1, 2, or 3; and, any hydroxyl group attached to an aliphatic or aromatic carbon atom, or any primary or secondary nitrogen atom may be acylated with a (C_4–C_{18})carboxylic group, in addition, any nitrogen atom may alternatively be acylated with a (C_4–C_{18})alkoxycarbonyl group;

all geometric, optical, and stereoisomers thereof, or a pharmaceutically acceptable acid addition salt thereof.

5,559,117

N-[(4-HETEROARYL-1-PIPERAZINYL) ALKYL]-2-BENOXAZOLININES AND RELATED COMPOUNDS AND THEIR THERAPEUTIC UTILITY

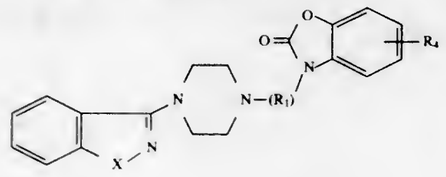
Joseph T. Strupczewski, Flemington; Grover C. Helsley, Stockton; Edward J. Glamkowski, Warren; Yulin Chiang, Covent Station, all of N.J.; Kenneth J. Bordeau, Kintnersville, Pa.; Peter A. Nemoto, Raritan, and John J. Tegeler, Bridgewater, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 329,000, Oct. 25, 1994, which is a continuation-in-part of Ser. No. 144,265, Oct. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 969,383, Oct. 30, 1992, Pat. No. 5,364,866, which is a continuation-in-part of Ser. No. 788,269, Nov. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 944,705, Sep. 5, 1991, abandoned, which is a continuation of Ser. No. 619,825, Nov. 29, 1990, abandoned, which is a continuation of Ser. No. 456,790, Dec. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 354,411, May 19, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 466,726

Int. Cl.[6] **A61K** *31/495;31/50;31/445;31/425;* **C07D** *403/00;413/00;221/02;239/02*

U.S. Cl. 514—254 **16 Claims**

1. A compound of the formula:



wherein:

X is —O—, —S—, —NH—, or —N(R_2);

R_2 is selected from the group consisting of lower alkyl, aryl lower alkyl, aryl, (C_3–C_{10}) cycloalkyl, aroyl, (C_2–C_{18}) alkanoyl, (C_1–C_{18}) alkoxycarbonyl and phenylsulfonyl groups;

aryl is as defined hereinafter;

p is 1 or 2;

Y is hydrogen, lower alkyl, hydroxy, chlorine, fluorine, bromine, iodine, lower alkoxy, trifluoromethyl, nitro, or amino;

R_1 is —$CR_{24}R_{27}$-$(CR_{23}R_{27})_n$—, where n is 0,1,2 or 4; or —$CHR_{24}CH$=CH—CHR_{24}—,

—CHR_{24}C≡C—CHR_{24}—,

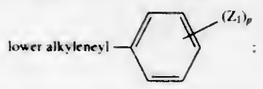
—CHR_{24}—CH=CH—$CR_{23}R_{24}$—CHR_{24}—,

—CHR_{24}—$CR_{23}R_{24}$—CH=CH—CHR_{24}—, or

—CHR_{24}—$CR_{23}R_{24}$—C≡C—CHR_{24},

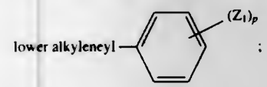
the —CH=CH— bond being cis or trans;

R_{23} is hydrogen, (C_1–C_{18}) linear alkyl, phenyl, hydroxy, (C_1–C_{18})alkoxy, aryloxy, aryl(C_1–C_{18})alkyloxy, (C_1–C_{18})alkanoyloxy, hydroxy(C_1–C_6)alkyl, (C_1–C_{18})alkoxy(C_1–C_6)alkyl, phenyl(C_1–C_6)alkyloxy, aryl(C_1–C_{18})alkyloxy(C_1–C_6)alkyl, (C_1–C_{18})alkanoyloxy(C_1–C_6)alkyl or



where Z_1 is lower alkyl, —OH, lower alkoxy, —CF_3, —NO_2, —NH_2, or halogen, and p is as previously defined;

R_{24} is hydrogen, (C_1–C_{18}) linear alkyl, phenyl, hydroxy(C_1–C_6)alkyl, (C_1–C_{18})alkoxy(C_1–C_6)alkyl, phenyl(C_1–C_6)alkyloxy, aryl(C_1–C_{18})alkyoxy(C_1–C_6)alkyl, (C_1–C_{18})alkanoyloxy(C_1–C_6)alkyl or

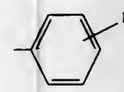


where Z_1 and p are as previously defined;

R_{27} is hydrogen or R_{24} and R_{27} taken together with the carbon to which they are attached form C=O or C=S;

R_4 is hydrogen, lower alkyl, lower alkoxy, hydroxy, tri(C_1–C_6)alkylsilyloxy, hydroxy lower alkyl, alkanoyloxy lower alkyl, amino, mono- or dialkylamino, (C_1–C_{18})acyl amino, (C_1–C_{18})alkanoyl, trifluoromethyl, chlorine, fluorine, bromine, —O—C(=O)—(C_1–C_{18}straight or branched chain-)alkyl or —C(=O)—aryl;

aryl is phenyl or



where R_5 is hydrogen, lower alkyl, lower alkoxy, hydroxy, chlorine, fluorine, bromine, iodine, lower monoalkylamino, lower dialkylamino, nitro, cyano, trifluoromethyl, or trifluoromethoxy;

and, any hydroxyl group attached to an aliphatic or aromatic carbon atom, or any primary or secondary nitrogen atom may be acylated with a (C_4–C_{18})carboxylic group, in addition, any nitrogen atom may alternatively be acylated with a (C_4–C_{18})alkoxycarbonyl group;

all geometric, optical, and stereoisomers thereof, or a pharmaceutically acceptable acid addition salt thereof.

5,559,118

Patent Not Issued For This Number

5,559,119

CARBAMATES OF RAPAMYCIN

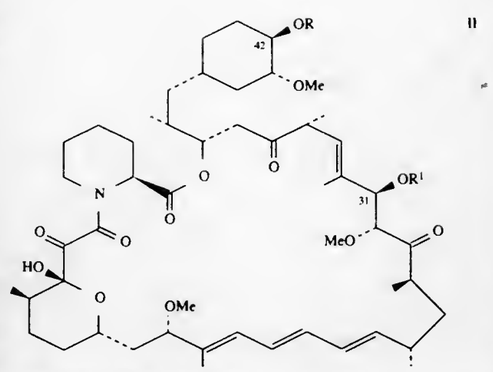
Jerauld S. Skotnicki, Allentown, N.J.; Yvette L. Palmer, Newtown, Pa.; Wenling Kao, Paoli, Pa., and Magid A. Abou-Gharbia, Glen Mills, Pa., assignors to American Home Products Corporation, Madison, N.J.

Division of Ser. No. 259,701, Jun. 14, 1994, Pat. No. 5,434,260, which is a continuation of Ser. No. 160,984, Dec. 1, 1993, abandoned, which is a division of Ser. No. 54,655, Apr. 23, 1993, Pat. No. 5,302,584, which is a continuation-in-part of Ser. No. 960,597, Oct. 13, 1992, abandoned. This application Feb. 27, 1995, Ser. No. 391,399

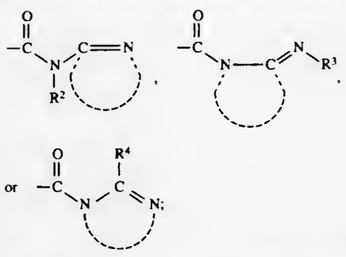
Int. Cl.[6] **A61K** *31/395;* **C07D** *498/04*

U.S. Cl. 514—291 **1 Claim**

1. A method of treating a fungal infection in a mammal in need thereof, which comprises administering to said mammal an antifungal effective amount of a compound of the structure



wherein R and R^1 are each, independently, hydrogen,

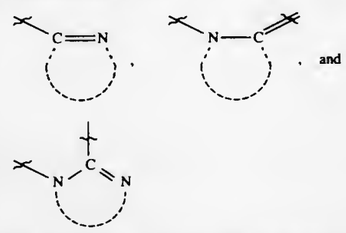


or

R^2 and R^3 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, —CO_2R^5, —COR^5, —CN, —NO_2, —SO_2R^5, — SO_3R^5, —OR^5, —SR^5, or Ar;

R^4 is hydrogen, alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, —CF_3, —NR^5R^6, —CO_2R^5, —COR^5, $CONR^5R^6$, —NO_2, halogen, — OR^5, —SR^5, —CN, —SO_2R^5, —SO_3R^5, —$SO_2NR^5R^6$, or Ar;

R^5 and R^6 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, or Ar;



are each, independently, a heterocyclic radical selected from the group consisting of pyrrolyl, 3.4-dihydropyrrolyl, pyrrolidinyl, pyrazolyl, imidazoyl, 4,5-dihydroimidazolyl, 2-pyrazolinyl, 1,2,4-triazolyl, isoxazolyl, oxazolyl, thiazolyl, isothiazolyl, pyridinyl, 1,2,3,6-tetrahydropyridinyl, piperidinyl, pyridazinyl, pyrimidinyl, 1,4,5,6-tetrahydropyrimidinyl, pyrazinyl, piperazinyl, 1,3,5-triazinyl, hexahydro-1,3,5-triazinyl, 1,2,4-triazinyl, 1,3,2-oxazinyl, 1,4-oxazinyl, morpholinyl, azepinyl, indolyl, indolinyl, indolenyl, benzoxazolyl, quinolinyl, 1,2,3,4-tetrahydroquinolinyl, 5,6,7,8-tetrahydroquinolinyl, isoquinolinyl, 3,4-dihydroisoquinolinyl, 1,2,3,4-tetrahydroisoquinolinyl, and 5,6,7,8-tetrahydroisoquinolinyl, wherein the heterocyclic radical may be optionally substituted by R^7;

R^7 is alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, —CF_3, —NR^5R^6, —CO_2R^5,

—COR^5, $CONR^5R^6$, —NO_2, halogen, —OR^5, —SR^5, —CN,

carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl

—COR^5, $CONR^5R^6$, —NO_2, halogen, —OR^5, —SR^5, —CN, —SO_2R^5, —SO_3R^5, —$SO_2NR^5R^6$, or Ar;

Ar is phenyl, naphthyl, or hetaryl, wherein the foregoing may be optionally mono-, di-, or tri-substituted with a group selected from alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, arylalkyl of 7–10 carbon atoms, alkoxy of 1–6 carbon atoms, cyano, halo, hydroxy, nitro, carbalkoxy of 2–7 carbon atoms, trifluoromethyl, trifluoromethoxy, amino, dialkylamino of 1–6 carbon atoms per alkyl group, dialkylaminoalkyl of 3–12 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthio of 1–6 carbon atoms, —SO_3H, and —CO_2H;

hetaryl is a heterocyclic radical selected from the group consisting of furanyl, thiophenyl, pyrrolyl, pyrazolyl, imidazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, 1,2-dithiolyl, 1,3-dithiolyl, 1,2,3-oxathiolyl, isoxazolyl, oxazolyl, thiazolyl, isothiazolyl, 1,2,3-oxadiazolyl, 1,2,5-oxadiazolyl, 1,3,4-oxadiazolyl, 1,2,3,4-oxatriazolyl, 1,2,3,5-oxatriazolyl, 1,2,3-dioxazolyl, 1,2,4-dioxazolyl, 1,3,2-dioxazolyl, 1,3,4-dioxazolyl, 1,2,5-oxathiazolyl, 1,3-oxathiolyl, 1,2-pyranyl, 1,4-pyranyl, pyridinyl, pyridazinyl, pyrimidinyl, pyrazinyl, 1,3,5-triazinyl, 1,2,4-triazinyl, 1,2,3-triazinyl, 1,2,4-oxazinyl, 1,3,2-oxazinyl, 1,2,6-oxazinyl, 1,4-oxazinyl, isoxazinyl, 1,2,5-oxathiazinyl, 1,4-oxazinyl, o-isoxazinyl, p-isoxazinyl, 1,2,5-oxathiazinyl, 1,2,6-oxathiazinyl, 1,3,5,2-oxadiazinyl, azepinyl, oxepinyl, thiepinyl, 1,2,4-diazepinyl, benzofuranyl, isobenzofuranyl, thionaphthenyl, indolyl, indolenyl, 2-isobenzazolyl, 1,5-pyrindinyl, pyrano[3,4-b]pyrrolyl, benzpyrazolyl, benzisoxazolyl, benzoxazolyl, anthranilyl, 1,2-benzopyranyl, quinolinyl, isoquinolinyl, cinnolinyl, quinazolinyl, naphthyridinyl, pyrido[3,4-b]pyridinyl, pyrido[4,3-b]pyridinyl, pyrido[2,3-b]pyridinyl, 1,3,2-benzozazinyl, 1,4,2-benzoxazinyl, 2,3,1-benzoxazinyl, 3,1,4-benzoxazinyl, 1,2-benzisoxazinyl, 1,4-benzisoxazinyl, carbazolyl, purinyl, and a partially saturated heterocyclic radical selected from the foregoing; wherein the partially saturated heterocyclic radical contains at least one double bond;

with the proviso that R and R^1 are both not hydrogen, or a pharmaceutically acceptable salt thereof.

5,559,120

CARBAMATES OF RAPAMYCIN

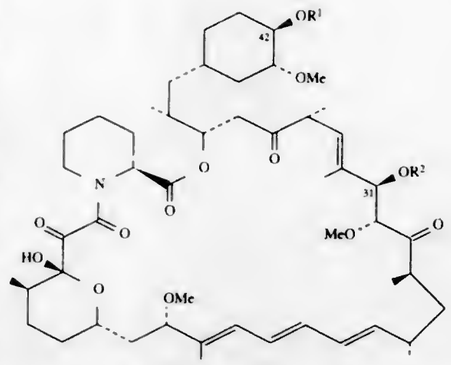
Wenling Kao, Paoli; Magid A. Abou-Gharbia, Glen Mills, both of Pa., and Robert L. Vogel, Stratford, N.J., assignors to American Home Products Corporation, Madison, N.J.

Division of Ser. No. 297,663, Sep. 1, 1994, Pat. No. 5,480,998, which is a continuation-in-part of Ser. No. 160,984, Dec. 1, 1993, abandoned, which is a division of Ser. No. 54,655, Apr. 23, 1993, Pat. No. 5,302,584, which is a continuation-in-part of Ser. No. 960,597, Oct. 13, 1992, abandoned. This application Mar. 13, 1995, Ser. No. 402,571

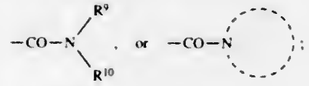
Int. Cl.[6] A61K *31/675;31/395;* **C07D** *491/06*

U.S. Cl. 514—291 **1 Claim**

1. A method of treating or preventing transplantation rejection in a mammal in need thereof which comprises administering an antirejection effective amount of a compound of the structure



wherein R^1 and R^2 are each, independently, hydrogen, —CONH—$[(CR^3R^4)_m$ (—A—$(CR^5R^6)_n)_p]_q$—B;



R^3, R^4, R^5, and R^6 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthioalkyl of 2–12 carbon atoms, alkylaminoalkyl of 2–12 carbon atoms, dialkylaminoalkyl of 3–12 carbon atoms, arylalkyl of 7–10 carbon atoms, cycloalkyl of 3–8 carbon atoms, —OR^7, —SR^7, halogen, —CN, —NO_2, —CF_3, —COR^7, —CO_2R^7, —$CONHR^7$, —SO_2R^7, —OSO_3R^7, —NR^7R^8, —$NHCOR^7$, —$NHSO_2R^7$, or Ar;

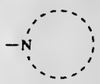
B is hydrogen, alkenyl of 2.7 carbon atoms, alkynyl of 2–7 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkylthioalkyl of 2–12 carbon atoms, alkylaminoalkyl of 2–12 carbon atoms dialkylaminoalkyl of 3–12 carbon atoms. —OR^7, —SR^7, —CN, —CF_3, —COR^7, — $CONHR^7$, —OSO_3R^7, —NR^7R^8, —$NHCOR^7$, —$NHSO_2R^7$, or Ar;

R^7 and R^8 are each, independently, hydrogen, alkyl of 1–6 carbon atoms, arylalkyl of 7–10 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthioalkyl of 2–12 carbon atoms, alkylaminoalkyl of 2–12 carbon atoms, dialkylaminoalkyl of 3–12 carbon atoms, cycloalkyl of 3–8 carbon atoms, or Ar;

R^9 and R^{10} are each, independently, alkyl of 1–6 carbon atoms, alkenyl of 2–7 carbon atoms, alkynyl of 2–7 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthioalkyl of 2–12 carbon atoms, alkylaminoalkyl of 2–12 carbon atoms, dialkylaminoalkyl of 3–12 carbon atoms, arylalkyl of 7–10 carbon atoms, cycloalkyl of 3–8 carbon atoms, —CF_3, —COR^7, —CO_2R^7, —$CONHR^7$, —SO_2R^7, or Ar;

A is —CH_2 —, —NR^7—, —O—, —S—, —SO—, —PR^7—, —NHCO—, —NHSO—, or —$P(O)(R^7)$—;

Ar is naphthyl, pyridyl, quinolyl, isoquinolyl, quinoxalyl, thienyl, thionaphthyl, furyl, benzofuryl, benzodioxyl, benzoxazolyl, benzoisoxazolyl, indolyl, thiazolyl, isoxazolyl, pyrimidinyl, pyrazinyl, imidazolyl, benzopyranyl, benzthiophenolyl, benzimidazolyl, benzthiazolyl, benzodioxolyl, piperidinyl, morpholinyl, piperazinyl, tetrahydrofuranyl, or pyrrolidinyl; wherein the Ar group may be optionally mono-, di-, or tri- substituted with a group selected from alkyl of 1–6 carbon atoms, arylalkyl of 7–10 carbon atoms, alkoxy of 1–6 carbon atoms, cyano, halo, hydroxy, nitro, carbalkoxy of 2–7 carbon atoms, trifluoromethyl, amino, dialkylamino of 1–6 carbon atoms per alkyl group, dialkylaminoalkyl of 3–12 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthio of 1–6 carbon atoms, —SO_3H, —PO_3H, and —CO_2H;



is a nitrogen containing heterocyclic radical selected from the group consisting of pyridyl, pyrazinyl, piperidinyl, morpholinyl, piperazinyl, pyrrolidinyl, thiazolyl, pyrimidinyl, isoxazolyl, pyrrolidinyl, and imidazolyl may be optionally mono-, di-, or tri- substituted with a group selected from alkyl of 1–6 carbon atoms, arylalkyl of 7–10 carbon atoms, alkoxy of 1–6 carbon atoms, cyano, halo, hydroxy, nitro, carbalkoxy of 2–7 carbon atoms, trifluoromethyl, amino, dialkylamino of 1–6 carbon atoms per alkyl group, dialkylaminoalkyl of 3–12 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthio of 1–6 carbon atoms, —SO_3H, —PO_3H, and —CO_2H; with the proviso that R^1 and R^2 are not both hydrogen and further provided that B is not hydrogen if q is 1;

m=0–6;

n=0–6;

p=0–1;

q=0–1;

or a pharmaceutically acceptable salt thereof.

5,559,121

RAPAMYCIN FORMULATIONS FOR ORAL ADMINISTRATION

Maureen M. Harrison, St. Albans, Vt.; Christian L. Ofslager, Plattsburgh; Robert P. Waranis, Chazy, both of N.Y., and Thomas W. Leonard, Wilmington, N.C., assignors to American Home Products Corporation, Madison, N.J.

Continuation-in-part of Ser. No. 129,523, Sep. 30, 1993, abandoned. This application May 23, 1995, Ser. No. 448,280

Int. Cl.[6] A61K *31/33;31/71*

U.S. Cl. 514—291 **10 Claims**

1. A composition comprising, per 100 ml composition, from about 0.01 to about 10.0 grams of rapamycin, from about 0.1 to about 10.0 ml of surfactant, from about 0.1 to about 25 ml of N,N-dimethylacetamide, and from about 65 to about 99.8 ml of a 50% lecithin or phospholipid solution.

5,559,122

HINDERED N-OXIDE ESTERS OF RAPAMYCIN

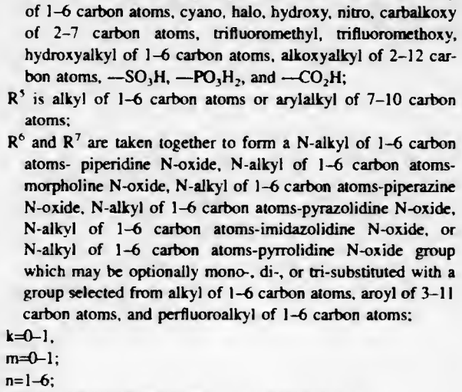
Frances C. Nelson, and Guy A. Schiehser, both of Yardley, Pa., assignors to American Home Products Corporation, Madison, N.J.

Division of Ser. No. 345,972, Nov. 28, 1994, Pat. No. 5,491,231. This application May 24, 1995, Ser. No. 448,843

Int. Cl.[6] A61K *31/395;* **C07D** *491/06*

U.S. Cl. 514—291 **1 Claim**

1. A method of treating pulmonary inflammation in a mammal in need thereof, which comprises administering to said mammal an antiinflammatory effective amount of a compound of the structure



wherein R and R^1 are each, independently,

or hydrogen;

R^2 and R^3 are each, independently, alkyl of 1–6 carbon atoms, arylalkyl of 7–10 carbons, or R^2 and R^3 may be taken together to form a cycloalkyl ring of 3–8 carbon atoms;

R^4 is a heterocyclic N-oxide radical selected from the group consisting of 1-methyl-pyrazolyl- 2-N-oxide, imidazolyl-3-N-oxide, 1,2,3-triazolyl 2- or 3-N-oxide, 1,2,4-triazolyl 2- or 4-N-oxide, 1,2,5-oxadiazolyl N-oxide, 1,2,3,5-oxatriazolyl N-oxide, pyridinyl N-oxide, pyridazinyl N-oxide, pyrimidinyl N-oxide, pyrazinyl N-oxide, 1,3,5-triazinyl N-oxide, 1,2,4-triazinyl N-oxide, 1,2,3-triazinyl N-oxide, 1,2,4-diazepinyl N-oxide, 2-isobenzazolyl N-oxide, 1,5-pyrindinyl N-oxide, benzpyrazolyl N-oxide, benzisoxazolyl N-oxide, benzoxazolyl N-oxide, quinolinyl N-oxide, isoquinolinyl N-oxide, cinnolinyl N-oxide, quinazolinyl N-oxide, naphthyridinyl N-oxide, pyrido[3,4-b] pyridinyl N-oxide, pyrido[4,3-b]pyridinyl N-oxide, pyrido[2,3-b]pyridinyl N-oxide, 1,4,2-benzoxazinyl N-oxide, 2,3,1-benzoxazinyl N-oxide, carbazolyl N-oxide, and purinyl N-oxide, which may be optionally mono-, di-, or tri- substituted with a group selected from alkyl of 1–6 carbon atoms, arylalkyl of 7–10 carbon atoms, alkoxy of 1–6 carbon atoms, cyano, halo, hydroxy, nitro, carbalkoxy of 2–7 carbon atoms, trifluoromethyl, trifluoromethoxy, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, —SO_3H, —PO_3H_2, and —CO_2H;

R^5 is alkyl of 1–6 carbon atoms or arylalkyl of 7–10 carbon atoms;

R^6 and R^7 are taken together to form a N-alkyl of 1–6 carbon atoms- piperidine N-oxide, N-alkyl of 1–6 carbon atoms-morpholine N-oxide, N-alkyl of 1–6 carbon atoms-piperazine N-oxide, N-alkyl of 1–6 carbon atoms-pyrazolidine N-oxide, N-alkyl of 1–6 carbon atoms-imidazolidine N-oxide, or N-alkyl of 1–6 carbon atoms-pyrrolidine N-oxide group which may be optionally mono-, di-, or tri-substituted with a group selected from alkyl of 1–6 carbon atoms, aroyl of 3–11 carbon atoms, and perfluoroalkyl of 1–6 carbon atoms;

k=0–1,

m=0–1;

n=1–6;

with the proviso that R and R^1 are not both hydrogen.

5,559,123

DERIVATIVES OF BENZOYLECGONINE, ECGONINE AND ECGONIDINE AND METHODS FOR PREPARING AND USING SAME

Lowell M. Somers, Indio, Calif., and James E. Wynn, Summerville, S.C., assignors to Entropin, Inc., Indio, Calif.

Division of Ser. No. 999,307, Dec. 31, 1992, Pat. No. 5,376,667. This application Oct. 7, 1994, Ser. No. 320,050

Int. Cl.[6] A61K *31/46;* **C07D** *451/02;451/04*

U.S. Cl. 514—304 **15 Claims**

1. A mixture of compounds comprising ecgonine, benzoylecgonine, ecgonidine, 2-hydroxypropyl ecgonine, 2-hydroxypropyl benzoylecgonine and 2-hydroxypropyl ecgonidine.

5,559,124

DEPOLARIZING SKELETAL MUSCLE RELAXANTS

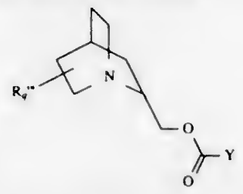
Merouane Bencherif, 5437-B Countryside Dr., Winston-Salem, N.C. 27105; Patrick M. Lippiello, 1233 Arboretum Dr., Lewisville, N.C. 27023, and William S. Caldwell, 1270 Yorkshire Rd., Winston-Salem, N.C. 27106

Division of Ser. No. 301,288, Sep. 6, 1994, Pat. No. 5,510,355. This application Jun. 5, 1995, Ser. No. 462,421

Int. Cl.[6] A61K *31/44*

U.S. Cl. 514—305 **8 Claims**

1. The method for providing musculoskeletal relaxation in a patient undergoing a surgical procedure requiring anesthesia, the method comprising administering to the patient an effective amount of a compound having the formula:



where R'' represents alkyl containing 1 to 7 carbon atoms or halo; q is an integer which ranges from 0–12; and Y is alkyl containing 1 to 7 carbon atoms.

5,559,125

HYDROXYQUINOLONE DERIVATIVES

Janusz J. Kulagowski, Bishops Stortford; Paul D. Leeson, Cambridge; Ian M. Mawer, Bishops Stortford, and Michael Rowley, Harlow, all of England, assignors to Merck, Sharp & Dohme Limited, Hoddesdon, England

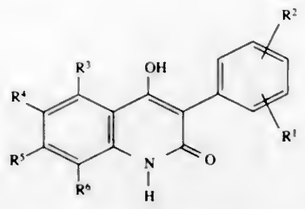
Division of Ser. No. 154,141, Nov. 18, 1993, Pat. No. 5,348,962. This application Jul. 11, 1994, Ser. No. 273,525

Claims priority, application United Kingdom, Oct. 19, 1990, 9022785

Int. Cl.[6] C07D *215/48;* **A61K** *31/47*

U.S. Cl. 514—312 **13 Claims**

1. A method for the treatment and/or prevention of conditions which require the administration of a selective non-competitive antagonist of NMDA receptors which comprises administering to a patient in need of such treatment an effective amount of a compound of formula I or a pharmaceutically acceptable salt thereof or a prodrug thereof:



(I)

wherein

R^1 and R^2 are independently selected from the group consisting of hydrogen, a heterocyclic group selected from the group consisting of C_{3-7}heterocycloalkyl, C_{3-7}heterocycloalkyl(C_{1-6})alkyl, heteroaryl and heteroaryl(C_{1-6})alkyl, —OR^a, —SR^a, —SOR^a, —SO_2R^a, —$SO_2NR^aR^b$, —NR^aR^b, —NR^aCOR^b, —$NR^aCO_2R^b$, —COR^a, —$CO_2R^a$and —$CONR^aR^b$, with the proviso that both R^1 and R^2 are not simultaneously hydrogen; or R^1 and R^2 together represent the residue of a heterocyclic ring, selected from the group consisting of dioxolane, dioxane, pyridine, furan, thiophene, pyrrole, thiazole and thiadiazole;

R^3, R^4, R^5 and R^6 are independently selected from the group consisting of hydrogen, hydrocarbon, a heterocyclic group, as defined above, halogen, cyano, trifluoromethyl, nitro, —OR^a, —SR^a, —SOR^a, —SO_2R^a, —$SO_2NR^aR^b$, —NR^aR^b, —NR^aCOR^b, —$NR^aCO_2R^b$, —COR^a, —CO_2R^a and —$CONR^aR^b$; and

R^a and R^b independently represent hydrogen or a heterocyclic group, as defined above, with the proviso that both R^a and R^b are not simultaneously hydrogen; provided also that when R^1 or R^2 represents —OR^a, —SR^a, —SOR^a, —SO_2R^a, —COR^a, or —CO_2R^a, then R^a is not hydrogen.

5,559,126

1-[(1,4-BENODIOXANYL)ALKYL]-4-(HETEROARYL)PIPERIDINES AND RELATED COMPOUNDS AND THEIR THERAPEUTIC UTILITY

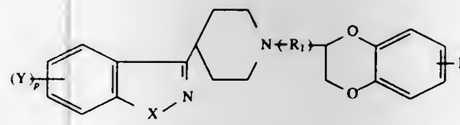
Edward J. Glamkowski, Warren, and Yulin Chiang, Covent Station, both of N.J., assignors to Hoechst-Roussel Pharmaceuticals, Inc., Somerville, N.J.

Division of Ser. No. 329,000, Oct. 25, 1994, which is a continuation-in-part of Ser. No. 144,265, Oct. 28, 1993, abandoned, which is a continuation-in-part of Ser. No. 969,383, Oct. 30, 1992, Pat. No. 5,364,866, which is a continuation-in-part of Ser. No. 788,269, Nov. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 944,705, Sep. 5, 1991, abandoned, which is a continuation of Ser. No. 619,825, Nov. 29, 1990, abandoned, which is a continuation of Ser. No. 456,790, Dec. 29, 1989, abandoned, which is a continuation-in-part of Ser. No. 354,411, May 19, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 471,237

Int. Cl.[6] A61K *31/445;31/55;31/495;31/47*

U.S. Cl. 514—321 **16 Claims**

1. A compound of the formula



wherein,

X is —O—, —S—, —NH—, or —$N(R_2)$—;

R_2 is selected from the group consisting of lower alkyl, aryl lower alkyl, aryl, cycloalkyl, aroyl, alkanoyl, alkoxycarbonyl, and phenysulfonyl groups;

aryl is as defined hereinafter;

p is 1 or 2;

Y is hydrogen, lower alkyl, hydroxy, chlorine, fluorine, bromine, iodine, lower alkoxy, trifluoromethyl, nitro, or amino;

R_1 is —$CR_{24}R_{27}$—$(CR_{23}R_{24})_n$—$CR_{24}R_{27}$— where n is 0, 1, 2, or 3; or

—CHR_{24}—CH═CH—CHR_{24}—,

—CHR_{24}—C≡C—CHR_{24}—,

—CHR_{24}—CH═CH—$CR_{23}R_{24}$—CHR_{24}—,

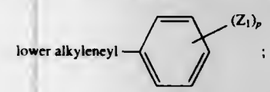
—CHR_{24}—$CR_{23}R_{24}$—CH═CH—CHR_{24}—,

—CHR_{24}—C≡C—$CR_{23}R_{24}$—CHR_{24}—, or

—CHR_{24}—$CR_{23}R_{24}$—C≡C—CHR_{24}—,

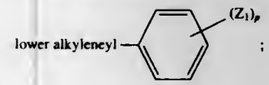
the —CH═CH— bond being cis or trans;

R_{23} is hydrogen, (C_1–C_{18}) linear alkyl, phenyl, hydroxy, (C_1–C_{18})alkoxy, aryloxy, aryl(C_1–C_{18})alkyloxy, (C_1–C_{18})alkanoyloxy, hydroxy (C_1–C_6)alkyl, (C_1–C_{18})alkoxy(C_1–C_6)alkyl, phenyl(C_1–C_6)alkoxy, aryl(C_1–C_{18})alkyloxy(C_1–C_6)alkyl, (C_1–C_{18})alkanoyloxy(C_1–C_6)alkyl, or



where Z_1 is lower alkyl, —OH, lower alkoxy, —CF_3, —NO_2, —NH_2, or halogen, and p is as previously defined; and

R_{24} is hydrogen, (C_1–C_{18}) linear alkyl, phenyl, hydroxy(C_1–C_6)alkyl, (C_1–C_{18})alkoxy (C_1–C_6)alkyl, phenyl(C_1–C_6)alkyloxy, aryl(C_1–C_{18})alkyloxy(C_1–C_6)alkyl, (C_1–C_{18})alkanoyloxy(C_1–C_6)alkyl, or

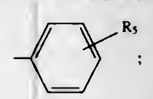


where Z_1 is as previously defined, and p is as previously defined;

R_{27} is hydrogen or R_{24} and R_{27} taken together with the carbon to which they are attached form C═O or C═S; and

R_4 is hydrogen, lower alkyl, lower alkoxy, hydroxy, tri(C_1–C_6)alkylsilyloxy, hydroxy lower alkyl, alkanoyloxy lower alkyl, amino, mono- or dialkylamino, (C_1–C_{18})acyl amino, (C_1–C_{18})alkanoyl, trifluoromethyl, chlorine, fluorine, bromine, —O—C(═O)—(C_1–C_{18}straight or branched chain-)alkyl, or —C(═O)-aryl;

in which aryl is phenyl or



where R_5 is hydrogen, lower alkyl, lower alkoxy, hydroxy, chlorine, fluorine, bromine, iodine, lower monoalkylamino, lower dialkylamino, nitro, cyano, trifluoromethyl, or trifluoromethoxy;

all geometric, optical and stereoisomers thereof, or a pharmaceutically acceptable acid addition salt thereof.

5,559,127

FIBRINOGEN RECEPTOR ANTAGONISTS

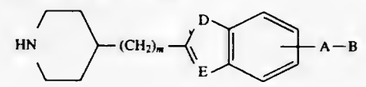
George D. Hartman, Lansdale; John D. Prugh, Chalfont; Melissa S. Egbertson, Ambler; Mark E. Duggan, Schwenksville, and William Hoffman, Lansdale, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 960,668, Oct. 14, 1992, abandoned. This application May 31, 1995, Ser. No. 416,770

Int. Cl.[6] A61K *31/445;* **C07D** *401/06;405/06;409/06*

U.S. Cl. 514—322 **5 Claims**

1. A compound of the formula



wherein

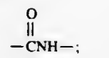
m is 0–6;

D is O,S, or N;

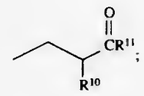
E is C or N;

A is

$(CH_2)_n$, wherein n is 0–6, or



B is



R^{10} is

carboxyC_{0-6}alkyl,

benzyloxycarbonylamino,

C_{1-8} alkylsulfonylamino, or

phenylC_{0-8}alkylaminocarbonylaminoC_{0-6}alkyl; and

R^{11} is hydroxy or alkoxy.

5,559,128

3-SUBSTITUTED PIPERIDINES PROMOTE RELEASE OF GROWTH HORMONE

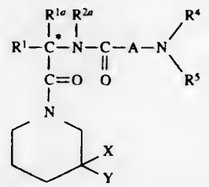
Prasun K. Chakravarty, Edison; Ravi Nargund, East Brunswick; Robert W. Marquis, Iselin; Arthur A. Patchett, Westfield, and Lihu Yang, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 18, 1995, Ser. No. 424,750

Int. Cl.[6] A61K *31/445;* **C07D** *401/06;209/04*

U.S. Cl. 514—323 **8 Claims**

1. A compound of the formula:



Formula I

wherein:

R^1 is selected from the group consisting of: C_1–C_{10} alkyl, aryl, aryl(C_1–C_6 alkyl), (C_3–C_7 cycloalkyl)(C_1–C_6 alkyl)-, (C_1–C_5 alkyl)-K-(C_1–C_5 alkyl)-, aryl(C_0–C_5 alkyl)-K-(C_1–C_5 alkyl)-, and (C_3–C_7 cycloalkyl)(C_0–C_5 alkyl)-K-(C_1–C_5 alkyl)-, where K is —O—, —$S(O)_m$—, —$N(R^2)C(O)$—, —$C(O)N(R^2)$—, —OC(O)—, —C(O)O—, —CR^2═CR^2—, or —C≡C—, where aryl is selected from: phenyl, naphthyl,

indolyl, azaindole, pyridyl, benzothienyl, benzofuranyl, thiazolyl, and benzimidazolyl, and R^2 and alkyl may be further substituted by 1 to 9 halogen, $S(O)_mR^{2a}$, 1 to 3 of OR^{2a} or $C(O)OR^{2a}$, and aryl may be further substituted by 1 to 3 of C_1–C_6 alkyl, 1 to 3 of halogen, 1 to 2 of $—OR^2$, methylenedioxy, $—S(O)_mR^2$, 1 to 2 of $—CF_3$, $—OCF_3$, nitro, $—N(R^2)C(O)(R^2)$, $—C(O)OR^2$, $—C(O)N(R^2)(R^2)$, —1H-tetrazol-5-yl, $—SO_2N(R^2)(R^2)$, $—N(R^2)SO_2$ phenyl, or $—N(R^2)SO_2R^2$;

R^{1a} is selected from hydrogen and C_1–C_6 alkyl;

R^2 is selected from: hydrogen, C_1–C_6 alkyl, and C_3–C_7 cycloalkyl, and where two C_1–C_6 alkyl groups are present on one atom, they may be optionally joined to form a C_3–C_6 cyclic ring, optionally including oxygen, sulfur or NR^{3a}, where R^{3a} is hydrogen, or C_1–C_6 alkyl, optionally substituted by hydroxyl;

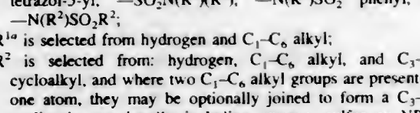
R^{2a} is selected from hydrogen and C_1–C_6 alkyl;

R^4 and R^5 are independently hydrogen, C_1–C_6 alkyl, or substituted C_1–C_6 alkyl where the substituents are selected from: 1 to 5 halo, 1 to 3 hydroxy, 1 to 3 C_1–C_{10} alkanoyloxy, 1 to 3 C_1–C_6 alkoxy, phenyl, phenyloxy, 2-furyl, C_1–C_6 alkoxycarbonyl, $S(O)_m(C_1$–C_6 alkyl), or R^4 and R^5 may be taken together to form $—(CH_2)_d$-L_a-$(CH_2)_e—$ where L_a is $—C(R^2)_2—$, —O—, $—S(O)_m—$ or $—N(R^2)—$, d and e are independently 1 to 3 and R^2 is as defined above;

X is selected from the group consisting of: $—(CH_2)_qN(R^8)C(O)R^2$, $—(CH_2)_qN(R^8)C(O)R^8$, $—(CH_2)_qN(R^8)C(O)OR^2$, $—(CH_2)_qN(R^8)C(O)OR^8$, $—(CH_2)_qN(R^2)C(O)OR^8$, $—(CH_2)_qN(R^8)C(O)OR^8$, $—(CH_2)_qN(R^2)SO_2R^9$, $—(CH_2)_qN(R^8)SO_2R^8$, $—(CH_2)_qN(R^8)SO_2R^2$, $—(CH_2)_qN(R^2)SO_2N(R^2)(R^8)$, $—(CH_2)_qN(R^8)C(O)N(R^2)(R^2)$, $—(CH_2)_qN(R^8)C(O)N(R^2)(R^8)$, $—(CH_2)_qSO_2N(R^2)(R^2)$, $—(CH_2)_qSO_2N(R^2)(R^8)$, $—(CH_2)_qN(R^2)(R^8)$, and $—(CH_2)_qR^{10}$, where the R^2 and $(CH_2)_q$ groups may be optionally substituted by 1 to 2 C_1–C_4 alkyl, hydroxyl, C_1–C_4 lower alkoxy, carboxyl, $CONH_2$, $S(O)_mCH_3$, carboxylate C_1–C_4 alkyl esters, or 1H-tetrazol-5-yl;

Y is selected from the group consisting of: hydrogen, C_1–C_{10} alkyl, $—(CH_2)_raryl$, $—(CH_2)_q(C_3$–C_7 cycloalkyl), $—(CH_2)_q—K—(C_1$–C_6 alkyl), $—(CH_2)_q—K—(CH_2)_raryl$, $—(CH_2)_q—K—(CH_2)_r(C_3$–C_7 cycloalkyl containing —O—, $—NR^2—$, or —S—), and $—(CH_2)_q—K—(CH_2)_r(C_3$–C_7 cycloalkyl), where K is as defined above, and where the alkyl, R^2, $(CH_2)_q$ and $(CH_2)_r$ groups may be optionally substituted by C_1–C_4 alkyl, hydroxyl, C_1–C_4 lower alkoxy, carboxyl, $—CONH_2$ or carboxylate C_1–C_4 alkyl esters, and where aryl is phenyl, naphthyl, pyridyl, 1-H-tetrazol-5-yl, thiazolyl, imidazolyl, indolyl, pyrimidinyl, thiadiazolyl, pyrazolyl, oxazolyl, isoxazolyl, thiophenyl, quinolinyl, pyrazinyl, or isothiazolyl which is optionally substituted by 1 to 3 halogen, 1 to 3 $—OR^2$, $—C(O)OR^2$, $—C(O)N(R^2)(R^2)$, nitro, cyano, benzyl, 1 to 3 C_1–C_4 alkyl, $—S(O)_mR^2$, or 1H-tetrazol-5-yl;

A is:



where x and y are independently 0, 1, 2 or 3;

Z is $—N(R^{3a})—$ or —O—, where R^{3a} is hydrogen or C_1–C_6 alkyl;

R^7 and R^{7a} are independently hydrogen, C_1–C_6 alkyl, trifluoromethyl, phenyl, or substituted C_1–C_6 alkyl where the substituents are imidazolyl, naphthyl, phenyl, indolyl, p-hydroxyphenyl, $—OR^2$, $—S(O)_mR^2$, $—C(O)OR^2$, C_3–C_7 cycloalkyl, $—N(R^2)(R^2)$, $—C(O)N(R^2)(R^2)$, or R^7 and R^{7a} may independently be joined to one or both of R^4 and R^5 groups to form an alkylene bridge between the terminal nitrogen and the alkyl portion of the R^7 or R^{7a} groups, wherein the bridge contains 1 to 5 carbons atoms, or R^7 and R^{7a} can be joined to one another to form C_3–C_7 cycloalkyl;

R^8 is $—(CH_2)_paryl$, where aryl is selected from: phenyl, naphthyl, pyridyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, thienyl, pyrazinyl, pyrimidinyl, benzothienyl, benzofuranyl, benzimidazolyl, imidazolyl, indolyl, quinolinyl, and isoquinolinyl, and where the aryl is optionally substituted with 1 to 2 of halogen, $—R^2$, $—OR^2$, $—N(R^2)(R^2)$, $—C(O)OR^2$, or $—C(O)N(R^2)(R^2)$;

R^9 is selected from the group consisting of: isoxazolyl, thiazolyl, isothiazolyl, thienyl, benzothienyl, benzofuranyl, benzimidazolyl, imidazolyl, indolyl, quinolinyl, and isoquinolinyl, which are optionally substituted by 1 to 2 of halogen, $—R^2$, $—OR^2$, $—N(R^2)(R^2)$, $—C(O)OR^2$, or $—C(O)N(R^2)(R^2)$;

R^{10} is selected from the group consisting of: 1,2,4-oxadiazolyl, pyrazinyl, triazolyl, and phthalimidoyl, which are optionally substituted with $—R^2$, $—OR^2$ or $—N(R^2)(R^2)$;

m is 0, 1, or 2;

p is 0, 1, 2, or 3;

q is 0, 1, 2, 3, or 4;

t is 0, 1, 2, or 3;

and pharmaceutically acceptable salts and individual diastereomers thereof.

5,559,129

INDOLE DERIVATIVES

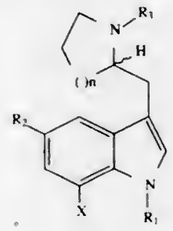
John E. Macor, and Martin J. Wythes, both of New York, N.Y., assignors to Pfizer Inc, New York, N.Y.

Continuation-in-part of Ser. No. 401,647, Mar. 10, 1995, abandoned, which is a continuation of Ser. No. 53,930, Apr. 27, 1993, abandoned, which is a continuation-in-part of Ser. No. 39,244, Apr. 27, 1993, abandoned, which is a continuation-in-part of Ser. No. 597,928, Oct. 15, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 466,645

Int. Cl.[6] A61K *37/40;* **C07D** *401/06;403/06*

U.S. Cl. 514—323 **8 Claims**

1. A compound of the formula



I

wherein

n is 0, 1, or 2; X is hydrogen, chlorine, bromine, or iodine; R_1 is hydrogen; R_2 is $—(CH_2)_m—SO_2NR_5R_6$;

R_3 is C_1 to C_6 linear or branched alkyl; R_5 and R_6 are hydrogen; y is 0, 1, or 2; x is 1 or 2; m is 0, 1, 2, or 3; and the above aryl groups and the aryl moieties of the above alkylaryl groups are independently selected from phenyl and substituted phenyl, wherein said substituted phenyl may be substituted with one to three groups selected from C_1 to C_4 alkyl, halogen, hydroxy, cyano, carboxamido, nitro, and C_1 to C_4 alkoxy, or the pharmaceutically acceptable salt thereof.

5,559,130

PYRROLIDINYL PYRIDONES FOR TREATING PAIN

François Clemence; Michel Fortin, and Odile Le Martret, all of Paris, France, assignors to Roussel Uclaf, France

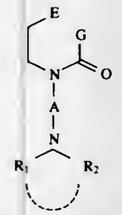
Division of Ser. No. 56,241, Apr. 30, 1993, Pat. No. 5,395,843, which is a continuation of Ser. No. 598,545, Nov. 16, 1990, abandoned. This application Nov. 29, 1994, Ser. No. 346,017

Claims priority, application France, Oct. 17, 1989, 89 13545

Int. Cl.[6] A61K *31/445;* **C07D** *401/08*

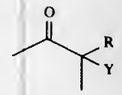
U.S. Cl. 514—326 **10 Claims**

1. A compound selected from the group consisting of all possible racemic, enantioneric and diastereoisomeric forms of a compound of a formula

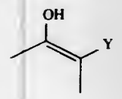


I

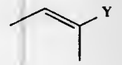
wherein E and G together form a group consisting of a)



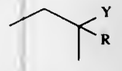
or, if appropriate,



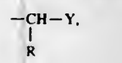
its tautomer



and



or E is $—COOR_3$ and G is



R is selected from the group consisting of hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl or alkynyl of 2 to 6 carbon atoms optionally substituted with carbocyclic aryl selected from the group consisting of phenyl, naphthyl and indenyl optionally substituted with at least one member of the group consisting of —OH, $—CF_3$, alkoxy of 1to 6 carbon atoms, $—NO_2$, —CN, NH_2, free and esterified carboxy, acyl selected from the group consisting of formyl, acetyl, propionyl and benzoyl, alkylamino and dialkylamino of 1 to 6 carbon atoms, acyloxy selected from the group consisting of formyloxy, acetyloxy, propionyloxy and benzoyloxy, carbamoyl and halogen, Y is selected from the group consisting of disubstituted phenyl and optionally substituted naphthyl or indenyl, wherein the substitutents are independently selected from the group consisting of halogen, hydroxy, alkyl, alkynyl and alkenyl of up to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, halo alkylthio of 1 to 6 carbon atoms, mono or dialkylamino of 1 to 6 carbon atoms, optionally esterified carboxy, haloalkyl of 1 to 6 carbon atoms, haloalkoxy of 1 to 6 carbon atoms, lower alkanoyl of up to 7 carbon atoms, lower alkanoylamido, carbamoyl, phenyl and benzoyl, R_3 is hydrogen or alkyl of 1 to 4 carbon atoms, A is

B is selected from the group consisting of hydrogen, phenyl optinally substituted with at least one member of the group consisting of halogen, —OH, —CN, NO_2, alkyl and alkoxy of 1 to 5 carbon atoms, R_1 and R_2 together with the nitrogen to which they are attached form pyrrolidino or piperidino and their non-toxic, pharmaceutically acceptable salts with acids and bases.

5,559,131

CARBOXAMIDE DERIVATIVES FOR TREATING ASTHMA

Scott C. Miller, Wilmington, Del., assignor to Zeneca Limited, London, United Kingdom

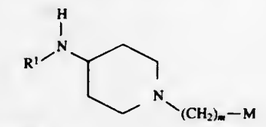
Division of Ser. No. 148,184, Nov. 3, 1993, which is a continuation-in-part of Ser. No. 971,141, Nov. 3, 1992, abandoned. This application Feb. 21, 1995, Ser. No. 392,012

Claims priority, application United Kingdom, Jul. 16, 1993, 9314783

Int. Cl.[6] A61K *31/445;* **C07D** *211/58;211/72;401/04*

U.S. Cl. 514—329 **10 Claims**

1. A compound of formula II:



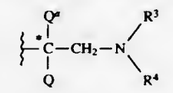
II

wherein

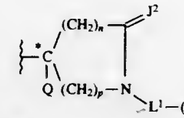
R^1 is hydrogen, (1–6C)alkyl, (3–6C)alkenyl (in which a vinyl carbon is not bound to nitrogen), 2-hydroxyethyl, or (3–7C)cyloalkyl;

m is 2 or 3;

M is a residue of formula Ia or formula Ib:



Ia



Ib

wherein

Q is phenyl which may bear one or two substituents independently selected from halo, trifluoromethyl, hydroxy, (1–3C)alkoxy, (1–3C)alkyl and methylenedioxy; or Q is thienyl, imidazolyl, benzo thiophenyl or naphthyl any of which may bear a halo substituent; or Q is biphenylyl; or Q is carbon-linked indolyl which may bear a benzyl substituent at the 1-position;

Q^a is hydrogen, (1–4C)alkyl, or a radical of formula $—(CH_2)_q—NR^7R^8$ in which q is 2 or 3 and R^7 and R^8 are independently (1–4C)alkyl or NR^7R^8 is piperidino or 4-benzylpiperidino;

R^3 is hydrogen, methyl or (2–6C)n-alkyl which may bear a terminal amino radical;

R^4 is $—COR^5$, $—COOR^5$ or $—C(=J^1)NHR^5$ in which J^1 is oxygen or sulfur and R^5 is hydrogen, (1–6C)alkyl, phenyl(1–3C)alkyl (in which the phenyl may bear one or more halo, hydroxy, (1–4C)alkoxy or (1–4C)alkyl substitu-

ents), pyridyl(1–3C)alkyl, naphthyl(1–3C)alkyl, pyridylthio(1–3C)alkyl, styryl, 1-methylimidazol-2-ylthio(1–3C)alkyl, aryl (which may bear one or more halo, hydroxy, (1–4C)alkoxy or (1–4C)alkyl substituents), heteroaryl (which may bear one or more halo, hydroxy, (1–4C)alkoxy or (1–4C)alkyl substituents), or, when R^4 is —COR^5, α-hydroxybenzyl;

n is 0, 1, 2 or 3;

p is 1 or 2, and when p is 2, n is 1 and J^2 is two hydrogens;

J^2 is oxygen or two hydrogens;

L^1 is carbonyl or methylene;

r is 0, 1, 2, or 3; and

R^6 is phenyl which may bear one or more halo, trifluoromethyl, (1–4C)alkyl, hydroxy or (1–4C)alkoxy substituents; naphthyl which may bear one or more halo, trifluoromethyl, (1–4C)alkyl or hydroxy substituents; pyridyl; thienyl; indolyl; quinolinyl; benzothienyl or imidazolyl; or when L^1 is carbonyl, the group —$(CH_2)_r$—R^6 may represent a benzyl group bearing an α-substituent selected from hydroxy, (1–4C)alkoxy and (1–4)alkyl, wherein the phenyl portion of the benzyl group may bear one or more substituents selected independently from halo, trifluoromethyl, (1–4C), hydroxy and (1–4C) alkoxy.

5,559,132

CARBOXAMIDE DERIVATIVES FOR TREATING ASTHMA

Scott C. Miller, Wilmington, Del., assignor to Zeneca Limited, London, United Kingdom

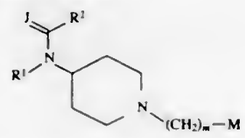
Division of Ser. No. 148,184, Nov. 3, 1993, which is a continuation-in-part of Ser. No. 971,141, Nov. 3, 1992, abandoned. This application Feb. 21, 1995, Ser. No. 392,013

Claims priority, application United Kingdom, Jul. 16, 1993, 9314783

Int. Cl.[6] **A61K** *31/445;* **C07D** *211/58;211/72;401/04*

U.S. Cl. 514—329 **11 Claims**

1. A compound of formula I:



I

wherein

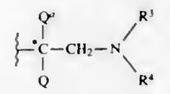
J is oxygen, sulfur or NR^a in which R^a is hydrogen or (1-3C)alkyl;

R^1 is hydrogen, (1-6C)alkyl, (3-6C)alkenyl (in which a vinyl carbon is not bound to nitrogen), 2-hydroxyethyl, or (3-7C)cyloalkyl:

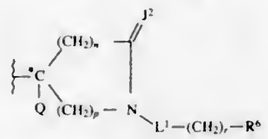
R^2 is hydrogen, (1-6C)alkyl which may bear a hydroxy substituent and/or one to three fluoro substituents, (3-6C)cycloalkyl, (1-5C)alkoxy (only when J is oxygen), (3-6C)cycloalkyloxy (only when J is oxygen), or an amino group of formula NR^cR^b containing zero to about seven carbon atoms in which each of R^a and R^b is independently hydrogen, (1-5C)alkyl or (3-6C)cyloalkyl, or R^a and R^b together with the nitrogen to which they are attached form a pyrrolidino, piperidino, morpholino, thiomorpholino (or its S-oxide) or piperazinyl group (which piperazinyl group may bear a methyl or ethyl group at the 4-position):

m is 2 or 3;

M is a residue of formula Ia or formula Ib:



Ia



Ib

wherein

Q is phenyl which may bear one or two substituents independently selected from halo, trifluoromethyl, hydroxy, (1-3C)alkoxy, (1-3C)alkyl and methylenedioxy; or Q is thienyl, imidazolyl, benzo[b]thiophenyl or naphthyl any of which may bear a halo substituent; or Q is biphenylyl; or Q is carbon-linked indolyl which may bear a benzyl substituent at the 1-position;

Q^a is hydrogen, (1-4C)alkyl, or a radical of formula —$(CH_2)_q$—NR^7R^8 in which q is 2 or 3 and R^7 and R^8 are independently (1-4C)alkyl or NR^7R^8 is piperidino or 4 -benzylpiperidino;

R^3 is hydrogen, methyl or (2-6C)n-alkyl which may bear a terminal amino radical;

R^4 is —COR^5, —$COOR^5$ or —$C(=J^1)NHR^5$ in which J^1 is oxygen or sulfur and R^5 is hydrogen, (1-6C)alkyl, phenyl(1-3C)alkyl (in which the phenyl may bear one or more halo, hydroxy, (1-4C)alkoxy or (1-4C)alkyl substituents), pyridyl(1-3 C)alkyl, naphthyl(1-3C)alky pyridylthio(1-3C)alkyl, styryl, 1-methylimidazol-2-ylthio(1-3C)alkyl, aryl (which may bear one or more halo, hydroxy, (1-4C)alkoxy or (1-4C)alkyl substituents), heteroaryl (which may bear one or more halo, hydroxy, (1-4C)alkoxy or (1-4C)alkyl substituents), or (when R^4 is —COR^5) α-hydroxybenzyl;

n is 0, 1,2 or 3;

p is 1 or 2, and when p is 2, n is 1 and J^2 is two hydrogens;

J^2 is oxygen or two hydrogens;

L^1 is carbonyl or methylene;

r is 0, 1, 2, or 3; and

R^6 is phenyl which may bear one or more halo, trifluoromethyl, (1-4C)alkyl, hydroxy or (1-4C)alkoxy substituents; naphthyl which may bear one or more halo, trifluoromethyl, (1-4C)alkyl or hydroxy substituents; pyridyl; thienyl; indolyl; quinolinyl; benzothienyl or imidazolyl; or when L^1 is carbonyl, the group —$(CH_2)_r$—R^6 may represent a benzyl group bearing an α-substituent selected from hydroxy, (1-4C)alkoxy and (1-4)alkyl, wherein the phenyl portion of the benzyl group may bear one or more substituents selected independently from halo, trifluoromethyl, (1-4C)alkyl, hydroxy and (1-4C)alkoxy:

or the N-oxide of the piperidino nitrogen indicated by Δ;

or a pharmaceutically acceptable salt thereof;

or a quaternary ammonium salt thereof in which the piperidino nitrogen indicated by Δ is a quadricovalent ammonium nitrogen wherein the fourth radical on the nitrogen R^9 is (1-4C)alkyl or benzyl and the associated counterion A is a pharmaceutically acceptable anion.

5,559,133

ORALLY ACTIVE ANTIVIRAL COMPOUNDS

Vlyyoor M. Girijavallabhan, Parsippany; Ashit K. Ganguly, Upper Montclair; Richard W. Versace, Wanaque; Anil K. Saksena, Upper Monctlair, and Patrick A. Pinto, Mine Hill, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

PCT No. PCT/US92/04961, § 371 Date Dec. 16, 1993, § 102(e) Date Dec. 16, 1993, PCT Pub. No. WO92/22520, PCT Pub. Date Dec. 23, 1992

PCT Filed Jun. 17, 1992, Ser. No. 167,812

Int. Cl.[6] **C07C** *43/225;* **A61K** *31/44;31/09;* **C07D** *213/63*

U.S. Cl. 514—335 **13 Claims**

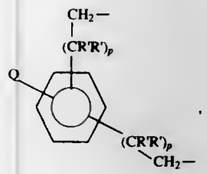
1. A compound represented by formula I

$$Ar_1—O—M—O—Ar_2 \qquad I$$

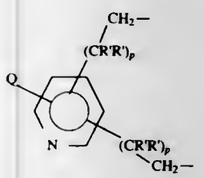
wherein Ar_1 and Ar_2 are independently substituted phenyl or substituted pyridinyl, the substituents on said phenyl or pyridinyl being independently selected from one, two or three of halogen (C_1–C_{10}) alkyl (C_1–C_{10}) perhaloalkyl, (C_1–C_{10}) alkoxy, halogen, carbamyl, dialkylcarbamyl (C_1–C_{10}) alkoxycarbonyl, oxazolinyl, and (C_1–C_{10}) alkyl substituted by (C_1–C_{10}) alkoxy, hydroxy, or (C_1–C_{10}) alkoxycarbonyl;

M is

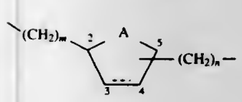
M-1



M-2



M-3



M-4

O is oxygen

R' is (C_1–C_3) alkyl or H;

A is oxygen or sulfur;

Q is selected from hydrogen, halogen, nitro, (C_1–C_6) alkyl, (C_1–C_6) perhaloalkyl, (C_1–C_6) alkylthio, and (C_1–C_6) alkylsulfonyl;

the dotted lines in M-3 and M-4 between the carbons 2 and 3, 3 and 4 and 4, and 5 mean that the bonds between carbons 2 and 3, and 3 and 4, and 4 and 5 may each be a single or double bond;

n=1 or 2;

m=1 or 2;

p=0 or 1; and

or pharmaceutically acceptable salts thereof; with the proviso that when Q is hydrogen, p is not 0.

5,559,134

LEUKOTRIENE-B_4 ANTAGONISTS, PROCESS FOR THEIR PRODUCTION AND THEIR USE AS PHARMACEUTICAL AGENTS

Bernd Buchmann; Werner Skuballa; Josef Heindl; Wolfgang Fröhlich; Roland Ekerdt, and Claudia Giesen, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

PCT No. PCT/EP93/02225, § 371 Date Mar. 23, 1995, § 102(e) Date Mar. 23, 1995, PCT Pub. No. WO94/04522, PCT Pub. Date Mar. 3, 1994

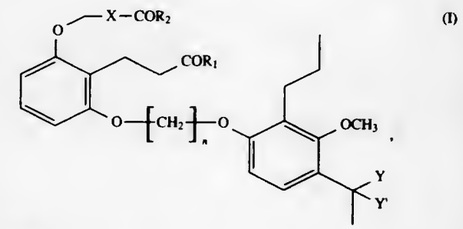
PCT Filed Aug. 19, 1993, Ser. No. 387,863

Claims priority, application Germany, Aug. 25, 1992, 42 28 201.2

Int. Cl.[6] **C07D** *213/79;* **C07C** *69/712;* **A61K** *31/215*

U.S. Cl. 514—336 **11 Claims**

1. A leukotriene-B_4 antagonist compound of formula I



(I)

in which

n represents a whole number from 2 to 5,

X represents a direct bond, 1 to 6 methylene units, an ortho-, meta- or para-substituted phenyl ring or a meta- or para-substituted pyridine ring,

Y represents a hydrogen atom and Y' a hydroxy group, or Y and Y' together represent a double-bound oxygen atom or Y and Y' together represent —O—CH_2—CH_2—O— forming a ring together with the carbon atom to which they are bound,

R_1 and R_2, independently represent the radical OH, —O—(C_1-C_4)—alkyl, —O—(C_3-C_6)—cycloalkyl, —O—(C_6-C_{10})—aryl, —O—(C_7-C_{12})—aralkyl, O—(CH_2) —CO— (C_6-C_{10})—aryl or the radical NMR_3 with R_3 representing hydrogen, (C_1-C_4)—alkyl, (C_3-C_6)—cycloalkyl or (C_7-C_{12})—aralkyl or a salt thereof with a physiologically compatible base or cyclodextrin clathrate.

11. A method for treating or preventing a picomaviral infection in a mammal in need of such treating or preventing which comprises administering to such a mammal an anti-picomaviral effective amount of a compound of claim 1.

(a) (C_1–C_6)-alkyl, unsubstituted or substituted with a substitu-

(d) (CH_2CH_2O)$_y$—O—[(C_1–C_4)-alkyl], whereto y is 1 or 2,

5,559,135

ENDOTHELIN ANTAGONISTS BEARING PYRIDYL AMIDES

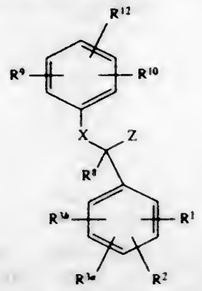
Wallace T. Ashton, Clark; Linda L. Chang, Wayne, and William J. Greenlee, Teaneck, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 14, 1994, Ser. No. 306,271

Int. Cl.[6] C07D *405/12*; A61K *31/44*

U.S. Cl. 514—338 **8 Claims**

1. A compound of structural formula I:



I

or a pharmaceutically acceptable salt thereof, wherein:

R^1 and R^2 on adjacent carbon atoms are joined together to form a ring structure:

A represents:

a) —Y—C(R^4)=C(R^5)—,

b) —Y—C(R^4)=N—,

c) —Y—N=C(R^4)—,

d) —Y—[C(R^6)(R^6)]$_l$—Y—,

e) —Y—C(R^6)(R^6)—C(R^6)(R^6)—,

f) —C(R^4)=C(R^5)—Y—,

g) —N=C(R^4)—Y—,

h) —C(R^6)(R^6)—C(R^6)(R^6)—Y—, or

R^{1a} and R^{1b} are independently:

(a) H,

(b) F, Cl, Br, or I,

(c) —NO_2,

(d) —NH_2,

(e) —NH(C_1–C_4)-alkyl,

(f) —N[(C_1–C_4)-alkyl]$_2$,

(g) —SO_2NHR^7,

(h) —CF_3,

(i) (C_1–C_6)-alkyl,

(j) —OR^7,

(k) —S(O)$_n$—(C_1–C_4)-alkyl,

(l) —NHCO—(C_1–C_4)-alkyl,

(m) —NHCO—O(C_1–C_4)-alkyl,

(n) —CH_2O-(C_1–C_4)-alkyl,

(o) —O—(CH_2)$_m$—OR^7,

(p) —$CONR^7R^{11}$, or

(q) —$COOR^7$;

m is 2, 3 or 4,

n is 0, 1 or 2,

s is 1,

Y is —O—,—S(O)$_n$— and NR^7;

R^4 and R^5 are independently:

(a) H,

(b) (C_1–C_6)-alkyl or (C_2–C_6)-alkenyl each of which is unsubstituted or substituted with one or two substituents selected from the group consisting of:

i) —OH,

ii) —O—(C_1–C_4)-alkyl,

iii) —S(O)$_n$—(C_1–C_4)-alkyl,

iv) —NR^7—(C_1–C_4)-alkyl,

v) —NHR^7,

vi) —$COOR^7$,

vii) —$CONHR^7$,

viii) —$OCOR^{11}$, or

ix) —$CONR^7R^{11}$,

(c) (C_3–C_7)-cycloalkyl,

(d) F, Cl, Br, I,

(e) CF_3,

(f) —$COOR^7$,

(g) —$CONR^7R^{11}$,

(h) —NR^7R^{11},

(i) —$NR^7CONR^7R^{11}$,

(j) —NR^7COOR^{11},

(k) —$SO_2NR^7R^{11}$,

(l) —O—(C_1–C_4)-alkyl,

(m) —S(O)$_n$—(C_1–C_4)-alkyl, or

(n) —$NHSO_2R^{11}$;

R^6 is:

(a) H,

(b) (C_1–C_4)-alkyl unsubstituted or substituted with one or two substituents selected from the group consisting of:

i) —OH,

ii) —NR^7R^{11},

iii) —$COOR^7$,

iv) —$CONHR^7$, or

v) —$CONR^7R^{11}$, or

(c) Cl, or F;

R^7 is:

(a) H,

(b) (C_1–C_6)-alkyl,

(c) phenyl,

(d) (C_1–C_6)-alkylphenyl, or

(e) (C_3–C_7)-cycloalkyl;

R^8 is:

(a) H,

(b) (C_1–C_6)-alkyl, unsubstituted or substituted with one or two substituents selected from the group consisting of:

(i) —phenyl,

(ii) —(C_3–C_7)-cycloalkyl,

(iii) —NR^7R^{11},

(iv) —OH,

(v) —CO_2R^7, or

(vi) —$CON(R^7)_2$, or

(c) phenyl;

R^9 and R^{10} are independently:

(a) H,

(b) (C_1–C_6)-alkyl, unsubstituted or substituted with (C_3–C_7)-cycloalkyl or —CO_2R^7,

(c) (C_2–C_6)-alkenyl,

(d) (C_2–C_6)-alkynyl,

(e) Cl, Br, F, I,

(f) (C_1–C_6)-alkoxy,

(g) perfluoro-(C_1–C_6)-alkyl,

(h) (C_3–C_7)-cycloalkyl, unsubstituted or substituted with (C_1–C_6)-alkyl,

(i) phenyl,

(j) (C_1–C_6)-alkyl—S(O)$_n$—(CH_2)$_n$—,

(k) hydroxy-(C_1–C_6)-alkyl,

(l) —CN,

(m) —CO_2R^7,

(n) —OH,

(o) —NR^7R^{11},

(p) —[(C_1–C_6)-alkyl]NR^7R^{11},

(q) —NO_2,

(r) —(CH_2)$_n$—SO_2—$N(R^7)_2$,

(s) —NR^7CO—(C_1–C_4)-alkyl, or

(t) —$CON(R^7)_2$;

R^9 and R^{10} on adjacent carbons can join together to form a fused phenyl ring, unsubstituted or substituted with a substituent selected from the group consisting of: (C_1–C_6)-alkyl, (C_1–C_6)-alkoxy, (C_3–C_7)-cycloalkyl and (C_1–C_6)-alkyl-(C_3–C_7)-cycloalkyl,

R^{11} is:

(a) (C_1–C_6)-alkyl, unsubstituted or substituted with a substituent selected from the group consisting of:

i) —OR^7,

ii) —$N[R^7]_2$,

iii) —NH_2,

iv) —$COOR^7$,

v) —CF_3, or

vi) —$CON(R^7)_2$;

(b) aryl, wherein aryl is defined as phenyl or naphthyl which is unsubstituted or substituted with one or two substituents selected from the group consisting of:

i) (C_1–C_4)-alkyl,

ii) —O—(C_1–C_4)-alkyl,

iii) —$CO[NR^7]_2$,

iv) F, Cl, Br or I,

v) —$COOR^7$,

vi) —NH_2,

vii) —N[(C_1–C_4)-alkyl], or

viii) —N[(C_1–C_4)-alkyl]$_2$;

(c) —(C_1–C_4)-alkylaryl, wherein aryl is as defined above,

(d) (C_1–C_7)-cycloalkyl, or

(e) CF_3;

Q is O, S or —NR^7;

R^{12} is —$CONR^7(CH_2)_p$—E—R^{16};

p is 0 to 4;

E is a single bond, NH, O, S, with the proviso that E is a single bond when p is 0 or 1;

X is:

(a) —O—,

(b) —S(O)$_n$—,

(c) —NR^7—,

(d) —CH_2O—,

(e) —CH_2S(O)$_n$—,

(f) —CH_2NR^7—,

(g) —OCH_2—,

(h) —$N(R^7)CH_2$—,

(i) —S(O)$_n$$CH_2$—, or

(j) —single bond;

Z is:

(a) —CO_2H,

(b) —CO_2R^{13},

(c) —$CONHSO_2OR^{11}$,

(d) —$CONHSO_2NR^7R^{11}$,

(e) —$CONHSO_2$-aryl, wherein aryl is defined as phenyl or naphthyl which is unsubstituted or substituted with one, two or three substituents selected from the group consisting of:

i) (C_1–C_4)-alkyl,

ii) —O—(C_1–C_4)-alkyl,

iii) —$CONR^7R^{11}$,

iv) F, Cl, Br or I,

v) —$COOR^7$,

vi) —NH_2,

vii) —N[(C_1–C_4)-alkyl],

viii) —N[(C_1–C_4)-alkyl]$_2$,

ix) —phenyl,

x) —OH,

xi) —OCH_2CH_2OH,

xii) —CF_3;

(g) —$CONHSO_2$—(C_1–C_8)-alkyl, wherein the alkyl group is unsubstituted or substituted as defined in R^4(b),

(h) —$CONHSO_2$—(C_1–C_4)-perfluoroalkyl,

(i) —SO_2NHCO—aryl, wherein aryl is defined in Z(e) above,

(j) —SO_2NHCO—(C_1–C_8)-alkyl, wherein the alkyl group is unsubstituted or substituted as defined in R^4(b),

(k) —SO_2NHCO—(C_1–C_4)-perfluoroalkyl,

(l) —$SO_2NHCON(R^{11})_2$ wherein the R^{11} groups are the same or different,

(m) —$PO(OR^7)_2$, wherein the R^7 groups are the same or different, or

(n) —$PO(R^{11})OR^7$;

R^{13} is:

(a) (C_1–C_4)-alkyl,

(b) CHR^{14}—O—COR^{15},

(c) CH_2CH_2—N[(C_1–C_2)-alkyl]$_2$,

(d) (CH_2CH_2O)$_y$—O—[(C_1–C_4)-alkyl], whereto y is 1 or 2,

(e) phenyl, naphthyl, CH_2-phenyl or CH_2-naphthyl, where phenyl or naphthyl is substituted or unsubstituted with CO_2-(C_1–C_4)-alkyl;

R^{14} and R^{15} independently are (C_1–C_6)-alkyl or phenyl; and

R^{16} is a 2-,3-, or 4-pyridyl, wherein the pyridyl is unsubstituted, monosubstituted, disubstituted, or trisubstituted with R^{17}; and

R^{17} is:

(a) H,

(b) (C_1–C_6)-alkyl, unsubstituted or substituted with (C_3–C_7)-cycloalkyl or —CO_2R^7,

(c) (C_2–C_6)-alkenyl,

(d) (C_2–C_6)-alkynyl,

(e) Cl, Br, F, I,

(f) (C_1–C_6)-alkoxy,

(g) perfluoro-(C_1–C_6)-alkyl,

(h) (C_3–C_7)-cycloalkyl, unsubstituted or substituted with (C_1–C_6)-alkyl,

(i) phenyl,

(j) (C_1–C_6)-alkyl—S(O)$_n$—(CH_2)$_n$-,

(k) hydroxy-(C_1–C_6)-alkyl,

(l) —CN,

(m) —CO_2R^7,

(n) —OH,

(o) —NR^7R^{11},

(p) —[(C_1–C_6)-alkyl]NR^7R^{11},

(q) —NO_2,

(r) —(CH_2)$_n$—SO_2—$N(R^7)_2$,

(s) —NR^7CO—(C_1–C_4)-alkyl, or

(t) —$CON(R^7)_2$.

5,559,136

TREATMENT OF ALZHEIMER'S DISEASE USING AZACYCLIC COMPOUNDS

Per Sauerberg, Valby; Preben H. Olesen, Copenhagen, both of Denmark, and Charles H. Mitch, Columbus, Ind., assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

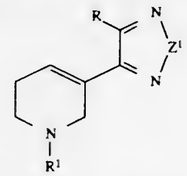
Division of Ser. No. 362,031, Dec. 22, 1994, which is a division of Ser. No. 26,708, Mar. 5, 1993, Pat. No. 5,376,668, which is a continuation-in-part of Ser. No. 745,033, Aug. 14, 1991, Pat. No. 5,328,924. This application May 30, 1995, Ser. No. 455,300

Claims priority, application Denmark, Aug. 21, 1990, 1983/90

Int. Cl.[6] A61K *31/44;31/41;31/425*; C07D *413/04*

U.S. Cl. 514—340 **12 Claims**

1. A method for treating Alzheimer's disease or stimulating the cognitive function of the forebrain and hippocampus of a mammal, comprising administering to a subject in need thereof an effective amount of a compound of formula I:



(I)

wherein

Z^1 is oxygen or sulphur;

R^1 is hydrogen, straight or branched C_{1-5}-alkyl, straight or branched C_{2-5}-alkenyl or straight or branched C_{2-5}-alkynyl; and

R is -Z^2-R^2-X or -Z^2-R^2-Z^3-X, wherein Z^2 and Z^3independently are oxygen or sulphur, R^2 is straight or branched C_{1-15}-alkylene, straight or branched C_{2-15}-alkenylene, straight or branched C_{2-15}-alkynylene, each of which is substituted with halogen, -OH, -CN, -CF_3, one or two phenyl, phenoxy, benzoyl, or benzyloxycarbonyl groups wherein each aromatic group is optionally substituted with halogen, -CN, C_{1-4}-alkyl

or C_{1-4}-alkoxy, and X is a heterocyclic group selected from the group consisting of 1,3-dioxolanyl, pyridyl, thienyl, pyrrolidonyl, oxazolidonyl, thiazolidonyl, pyrrolidinyl, 1,2,5-thiadiazolyl, 1,3,4-thiadiazolyl, tetrazolyl, thiazolyl and oxazolyl, which heterocyclic group is optionally substituted at a carbon or nitrogen atom with straight or branched C_{1-6}-alkyl, phenyl, benzyl or pyridine, or which heterocyclic group is optionally fused with a phenyl group; or a pharmaceutically acceptable salt thereof.

5,559,137

COMPOUNDS

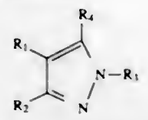
Jerry L. Adams, Wayne; Timothy G. Gallagher, Harleysville, and Susan M. Thompson, Phoenixville, all of Pa., assignors to SmithKline Beecham Corp., Philadelphia, Pa.

Filed May 16, 1994, Ser. No. 242,906

Int. Cl.[6] A61K *31/44*; **C07D** *401/04*

U.S. Cl. 514—341 **16 Claims**

1. A compound of the formula:



(I)

wherein

one of R_1 and R_2 is a 4-pyridyl ring, which ring is optionally substituted with one or two substituents each of which is independently selected from C_{1-4} alkyl, halo, C_{1-4} alkoxy, C_{1-4} alkylthio, CH_2OR_8, NH_2, mono- or di-C_{1-6}-alkylamino or N-heterocyclyl ring selected from pyrrolidine, piperidine, piperazine, morpholine, imidazolidine, and pyrazolidine;

the other of R_1 and R_2 is selected from an optionally substituted phenyl ring, or naphthyl ring, which ring is substituted by one or two substituents, each of which is independently selected, and which, for a 4-phenyl, 4-naphth-1-yl or 5-naphth-2-yl substituent, is halo, nitro, cyano, $—C(Z)NR_7R_{17}$, $—C(Z)OR_{23}$, $—(CR_{10}R_{20})_nCOR_{36}$, $—SR_5$, $—S(O)R_5$, $—OR_{36}$, halo-substituted C_{1-4} alkyl, C_{1-4} alkyl, $—ZC(Z)R_{36}$, $—NR_{10}C(Z)R_{23}$, or $—(CR_{10}R_{20})_nNR_{10}R_{20}$ and which, for other positions of substitution, is halo, $—(CR_{10}R_{20})_n$ nitro, $—(CR_{10}R_{20})_n$cyano, $—(CR_{10}R_{20})_nC(Z)NR_{16}R_{26}$, $—(CR_{10}R_{20})_nC(Z)OR_{18}$, $—(CR_{10}R_{20})_nCOR_{25}$, $—(CR_{10}R_{20})_n$-$S(O)_mR_8$, $—(CR_{10}R_{20})_nOH$, $—(CR_{10}R_{20})_nOR_{25}$, halo-substituted-$C_{1-4}$ alkyl, $—C_{1-4}$ alkyl, $—(CR_{10}R_{20})_nNR_{10}C(Z)R_{25}$, $—(CR_{10}R_{20})_nNHS(O)_mR_6$, $—(CR_{10}R_{20})_nNHS(O)_mNR_7R_{17}$, $—(CR_{10}R_{20})_nNR_6S(O)_mR_6$, $—(CR_{10}R_{20})_nNR_6S(O)_mNR_7R_{17}$; $—(CR_{10}R_{20})_nZC(Z)R_{18}$ or $—(CR_{10}R_{20})_nNR_7R_{17}$;

n is 0 or an integer of 1 or 2;

m is 0 or an integer of 1 or 2;

m' is an integer of 1 or 2;

R_3 is Q-$(Y_1)_t$;

Q is an aryl;

t is an integer having a value of 1 to 3;

R_4 is hydrogen, C_{1-10}alkyl, halo-substituted C_{1-10} alkyl, C_{2-10} alkenyl, C_{2-10} alkynyl, C_{3-7} cycloalkyl, C_{3-7}cycloalkylC_{1-10} alkyl, C_{5-7} cycloalkenyl, C_{5-7}cycloalkenyl-C_{1-10} aryl, arylC_{1-10} alkyl, $—(CR_{10}R_{20})_nOR_{12}$, $(CR_{10}R_{20})_nOR_{13}$, $(CR_{10}R_{20})_nS(O)_mR_{18}$, $(CR_{10}R_{20})_nNHS(O)_2R_{18}$, $(CR_{10}R_{20})_nNR_{16}R_{26}$, $(CR_{10}R_{20})_nNO_2$, $(CR_{10}R_{20})_nCN$, $(CR_{10}R_{20})_nSO_2R_{18}$, $(CR_{10}R_{20})_nS(O)_mNR_{16}R_{26}$, $(CR_{10}R_{20})_nC(Z)R_{13}$, $(CR_{10}R_{20})_nOC(Z)R_{13}$, $(CR_{10}R_{20})_nC(Z)OR_{13}$, $(CR_{10}R_{20})_nC(Z)NR_{16}R_{26}$, $(CR_{10}R_{20})_nC(Z)NR_{13}OR_9$, $(CR_{10}R_{20})_nNR_{10}C(Z)R_{11}$, $(CR_{10}R_{20})_nNR_{10}C(Z)NR_{16}R_{26}$, $(CR_{10}R_{20})_nN(OR_{36})C(Z)NR_{16}R_{26}$, $(CR_{10}R_{20})_nN(OR_{36})C(Z)R_{13}$, $(CR_{10}R_{20})_nC(=NOR_{36})R_{13}$, $(CR_{10}R_{20})_nNR_{10}C(=NR_{19})NR_{16}R_{26}$, $(CR_{10}R_{20})_nOC(Z)NR_{16}R_{26}$, $(CR_{10}R_{20})_nNR_{10}C(Z)NR_{16}R_{26}$, $(CR_{10}R_{20})_nNR_{10}C(Z)OR_{10}$, wherein the aryl, cycloalkyl, cycloalkylalkyl can be optionally substituted by halogen, hydroxyl, C_{1-6}alkoxy, S(O)m C_{1-6}alkyl, NR_7R_{17}, C_{1-6} alkyl, haloC_{1-6}alkyl, C_{3-7}cycloalkyl, aryl, or aryalkyl;

R_6 is C_{1-10} alkyl, C_{3-7} cycloalkyl, aryl, arylC_{1-10}alkyl;

R_5 is hydrogen, C_{1-4} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl or NR_7R_{17}, excluding the moieties — SR_5 being $—SNR_7R_{17}$ and $—SOR_5$ being —SOH;

R_{16} and R_{26} are independently hydrogen, or C_{1-4} alkyl or R_{16} and R_{26} together with the nitrogen to which they are attached form a heterocyclic selected from pyrrolidine, piperidine, piperazine, morpholine, imidazolidine, and pyrazolidine;

Y_1 is independently selected from hydrogen, C_{1-5} alkyl, halo-substituted C_{1-5} alkyl, halogen, or $—(CR_{10}R_{20})_nY_2$;

Y_2 is hydrogen, halogen, $—OR_8$, $—NO_2$, $—S(O)_mR_{11}$, $—SR_8$, $—S(O)_2OR_8$, $—S(O)_mNR_8R_9$, $—NR_8R_9$, $—O(CR_{10}R_{20})_nNR_8R_9$, $—C(O)R_8$, $—CO_2R_8$, $—CO_2(CR_{10}R_{20})_m$-$CONR_8R_9$, $—ZC(O)R_8$, —CN, $—C(Z)NR_8R_9$, $—NR_{10}C(Z)R_8$, $—C(Z)NR_8OR_9$, $—NR_{10}C(Z)NR_8R_9$, $—NR_{10}S(O)_mR_{11}$, $—N(OR_{21})C(Z)NR_8R_9$, $—N(OR_{21})C(Z)R_8$, $—C(=NOR_{21})R_8$, $—NR_{10}C(=NR_{14})SR_{11}$, $—NR_{10}C(=NR_{15})NR_8R_9$, $—NR_{10}C(=CR_{14}R_{24})SR_{11}$, $—NR_{10}C(=CR_{14}R_{24})NR_8R_9$, $—NR_{10}C(O)C(O)NR_8R_9$, $—NR_{10}C(O)C(O)OR_{10}$, $—C(=NR_{13})NR_8R_9$, $—C(=NOR_{13})NR_8R_9$, $—C(=NR_{13})ZR_{11}$, $—OC(Z)NR_8R_9$, $—NR_{10}S(O)_mCF_3$, $—NR_{10}C(Z)OR_{10}$, 5-(R_{18})-1,2,4-oxadizaol-3-yl or 4-(R_{12})-5-($R_{18}R_{19}$)- 4,5-dihydro-1,2,4-oxadiazol-3-yl;

n' is 0 or an integer having a value of 1 to 10;

m' is an integer having a value of 1 to 10;

R_7 and R_{17} is each independently selected from hydrogen or C_{1-4} alkyl or R_7 and R_{17} together with the nitrogen to which they are attached form a heterocyclic ring selected from pyrrolidine, piperidine, piperazine, morpholine, imidazolidine, and pyrazolidine:

R_8 is hydrogen, C_{1-10} alkyl, C_{3-7} cycloalkyl, aryl, arylC_{1-10}alkyl;

R_9 is hydrogen, C_{1-10} alkyl, C_{2-10} alkenyl, C_{2-10} alkynyl, C_{3-7} cycloalkyl, C_{5-7} cycloalkenyl, aryl, arylalkyl, or R_8 and R_9 may together with the nitrogen to which they are attached form a heterocyclic selected from pyrrolidine, piperidine, piperazine, morpholine, imidazolidine, and pyrazolidine;

R_{10} and R_{20} is each independently selected from hydrogen or C_{1-4} alkyl;

R_{11} is C_{1-10} alkyl, halo-substituted C_{1-10} alkyl, C_{2-10} alkenyl, C_{2-10} alkynyl, C_{3-7} cycloalkyl, C_{5-7} cycloalkenyl, aryl, aryl C_{1-10}alkyl;

R_{12} is hydrogen, $—C(Z)R_{13}$, optionally substituted C_{1-4} alkyl, optionally substituted aryl, optionally substituted aryl-C_{1-4} alkyl, or $S(O)_2R_{18}$;

R_{13} is hydrogen, C_{1-10} alkyl, C_{3-7} cycloalkyl, aryl, arylC_{1-10}alkyl;

R_{14} and R_{24} is each independently selected from hydrogen, alkyl, nitro or cyano;

R_{15} is hydrogen, cyano, C_{1-4} alkyl, C_{3-7} cycloalkyl or aryl;

R_{18} is C_{1-10} alkyl, C_{3-7} cycloalkyl, aryl, arylC_{1-10}alkyl;

R_{19} is hydrogen, cyano, C_{1-4} alkyl, C_{3-7} cycloalkyl or aryl;

R_{21} is hydrogen, a pharmaceutically acceptable cation, C_{1-10} alkyl, C_{3-7} cycloalkyl, aryl, aryl C_{1-4} alkyl, aroyl, or C_{1-10} alkanoyl;

R_{22} is R_{10} or C(Z)-C_{1-4} alkyl;

R_{23} is C_{1-4} alkyl, halo-substituted-C_{1-4} alkyl, or C_{3-7} cycloalkyl;

R_{25} is C_{1-10} alkyl, halo-substituted C_{1-10} alkyl, C_{2-10} alkenyl, C_{2-10} alkynyl, C_{3-7} cycloalkyl, C_{5-7} cycloalkenyl, aryl, arylC_{1-10} alkyl, $(CR_{10}R_{20})_nOR_8$, $(CR_{10}R_{20})_nS(O)_mR_{18}$, $(CR_{10}R_{20})_nNHS(O)_2R_{18}$, $(CR_{10}R_{20})_nNR_7R_{17}$; wherein the aryl, or arylalkyl, is optionally substituted by halogen, hydroxyl, C_{1-6}alkoxy, S(O)m C_{1-6}alkyl, NR_7R_{17}, C_{1-6}alkyl, haloC_{1-6}alkyl, C_{3-7} cycloalkyl, aryl, or aryalkyl;

R_{36} is hydrogen or R_{23};

Z is oxygen:

Aryl is phenyl or naphthyl:

or a pharmaceutically acceptable salt thereof.

5,559,138

METHOD OF TREATING GLAUCOMA USING OXADIAZOLYL OR THIADIAZOLYL TETRAHYDROPYRIDINES

Per Sauerberg, Valby, and Preben H. Olesen, København, both of Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

Continuation of Ser. No. 144,951, Oct. 29, 1993, abandoned, which is a division of Ser. No. 745,568, Aug. 15, 1991, Pat. No. 5,284,859, which is a continuation of Ser. No. 482,272, Feb. 20, 1990, Pat. No. 5,041,455, which is a continuation-in-part of Ser. No. 401,370, Aug. 31, 1989, Pat. No. 5,043,345.

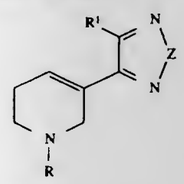
This application Jun. 7, 1995, Ser. No. 472,356

Claims priority, application Denmark, Feb. 22, 1989, 0825/89; May 12, 1989, 2315/89

Int. Cl.[6] A61K *31/44*; **P07D** *419/04*

U.S. Cl. 514—342 **5 Claims**

1. A method for treating glaucoma in a subject in need thereof, comprising administering topically to said subject an effective amount of a compound of formula I



(I)

wherein

Z is oxygen or sulphur;

R is H, C_{1-3}-alkyl, C_{3-4}-cycloalkyl, C_{2-4}-alkenyl or C_{2-4}-alkynyl; and

R^1 is C_{1-15}-alkyl, C_{2-15}-alkenyl, C_{2-15}-alkynyl, C_{3-7}-cycloalkyl, -C_{1-3}-alkyl-C_{3-5}-cycloalkyl, phenoxy, benzyloxy, morpholino, halogen, amino, C_{1-6}-acylamino, C_{1-15}-alkylamino, C_{1-15}-dialkylamino, C_{1-5}-alkoxyamino or piperidine substituted with C_{1-6}-alkyl, or R^1 is —S—R^2 or —O—R^2, wherein R^2 is straight or branched C_{1-15}-alkyl, straight or branched C_{2-15}-alkenyl, straight or branched C_{2-15}-alkynyl, $—R^3—O—R^4$, $—R^3—S—R^4$ or $—R^3—O—R^4—O—R^5$ wherein R^3, R^4 and R^5 are independently C_{1-15}-alkyl, C_{2-15}-alkynyl; or

a pharmaceutically acceptable salt thereof.

5,559,139

SPECIFIC 1,4-DIHYDROPYRIDINE-3,5-DICARBOXYLIC ACID ESTER, AND ITS PHARMACEUTICAL USE

Otto Bellner; Hartmund Wollweber, both of Wuppertal; Bruno Rosen, Wuelfrath; Siegfried Zaiss, and Siegfried Goldmann, both of Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jul. 13, 1993, Ser. No. 90,722

Claims priority, application Germany, Jul. 20, 1992, 42 23 867.6

Int. Cl.[6] C07D *211/86*; **A61K** *31/455*

U.S. Cl. 514—356 **3 Claims**

1. Dimethyl 4-(4-chloro-3-trifluoromethylphenyl)-1-cyclopropyl-2,6-dimethyl-1,4-dihydropyridine- 3,5-dicarboxylate.

5,559,140

DIFLUORO STATONE ANALOGS

Daniel Schirlin, Lampertheim; Viviane Van Dorsselaer, and Céline Tarnus, both of Strasbourg, France, assignors to Merrell Pharmaceuticals Inc., Cincinnati, Ohio

PCT No. PCT/US91/09741, § 371 Date Jun. 30, 1993, § 102(e) Date Oct. 29, 1993, PCT Pub. No. WO92/12123, PCT Pub. Date Jul. 23, 1993

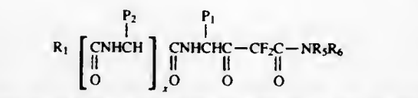
PCT Filed Dec. 20, 1991, Ser. No. 81,368

Claims priority, application European Pat. Off., Jan. 2, 1991, 91400005

Int. Cl.[6] A61K *31/44*

U.S. Cl. 514—357 **11 Claims**

1. A compound of the formula

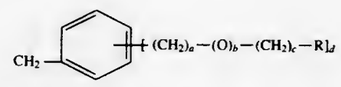


I

and the hydrates, isosteres and the pharmaceutically acceptable salts thereof wherein

x is zero or one,

P_1 is Q, or B, B being



with the proviso that B is other than p-hydroxybenzyl or p-alkoxybenzyl,

a is zero, or 1, 2 or 3,

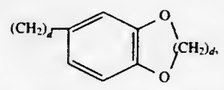
b is zero or 1,

c is zero or 1, 2, 3, 4 or 5,

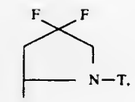
d is 1 or 2,

e is zero, 1 or 2,

Q is

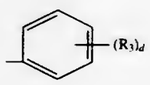


P_2 is C_{1-6} alkyl, cyclopentyl, cyclohexyl, hydroxy C_{1-6} alkylene, or



with T being H or $C(O)R_4$,

R is $—CH_2CHO$, hydroxy C_{1-6} alkylene, C_{1-6} alkoxy C_{1-6} alkylene, C_{1-6} alkyl, phenyl



or Q,

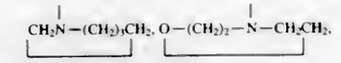
R_1 is benzyloxy, C_{1-6} alkoxy, C_{1-6} alkyl, phenyl, benzyl, phenethyl, fluorenylmethylenoxy, 2-isoquinolinyl, PDL,

5,559,141

NEW SELECTIVE AROMATASE INHIBITING 4(5)-

compound of the formula:

haloalkyl of from one to six carbon atoms,



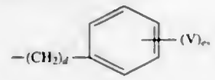
$NHSO_2R_4$, $N(R_4)$(benzyl),

and $N(R_4)$(PDL), with PDL being $-(CH_2)_a$-2-, -3-, or 4-pyridyl, or p-W-substituted benzyloxy with W being nitro, OH amino, C_{1-6} alkoxy, or hydroxy C_{1-6} alkylene, or halogeno,

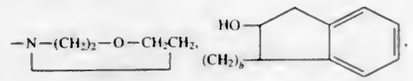
R_3 is C_{1-6} allenyl C_{1-6} alkoxy, C_{1-6} alkoxy C_{1-6} alkylene, hydroxy C_{1-6} alkylene, C_{1-6} alkyl, H, or OH,

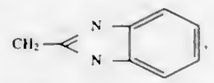
R_4 is H, C_{1-6} alkyl, phenyl or benzyl

R_5 is H, C_{1-6} alkyl, OH, C_{1-6} alkoxy,



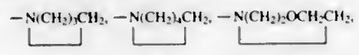
V being OR_4 or hydroxy C_{1-6} alkylene, $CH_2Si(CH_3)_2(R_3)$, $-(CH_2)_d-Q$, PDL,



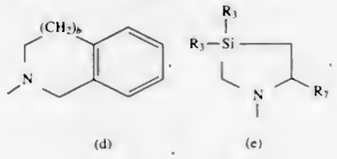


~~C_{1-6} alkylene-~~OR_4 or $-CH(Y)(Z)$, Y being hydroxy C_{1-6} alkylene, C_{1-6} alkyl, or $(CH_2)_eC_6H_4$-(V)$_e$, and Z being CHO, CO_2R_4, CO_2NHR_4 or $(CH_2)_eOR_4$,

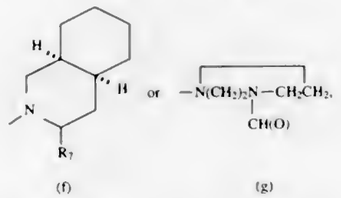
R_6 is as defined for R_5 with the proviso that R_6 is other than H when R_5 is H, and when R_5 and R_6 are taken together with nitrogen atom to which they are attached form a heterocyclic moiety of the formulae



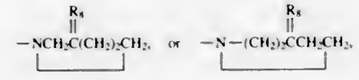
(a) (b) (c)



(d) (e)



(f) (g)



(h) (i)

R_7 is CH_2OR_4 or $C(O)NHR_4$.

R_8 (H,OH) or =O.

5,559,141

NEW SELECTIVE AROMATASE INHIBITING 4(5)-IMIDAZOLES

Arto J. Karjalainen; Marja-Liisa Sodervall; Arja M. Kalapudas; Reino O. Pelkonen, all of Oulu; Aire M. Laine, Turku; Risto A. Lammintausta, Turku, and Jarmo S. Salonen, Turku, all of Finland, assignors to Orion-yhtyma Oy, Espoo, Finland

PCT No. PCT/FI92/00184, § 371 Date May 9, 1994, § 102(e) Date May 9, 1994, PCT Pub. No. WO92/22537, PCT Pub. Date Dec. 23, 1992

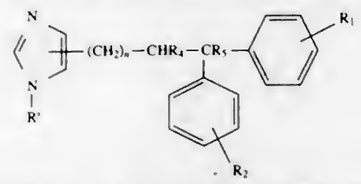
PCT Filed Jun. 12, 1992, Ser. No. 167,873

Claims priority, application United Kingdom, Jun. 18, 1991, 9113142; Dec. 5, 1991, 9125924

Int. Cl.[6] A61K *31/415;* **C07D** *233/64*

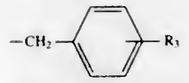
U.S. Cl. 514—400 **24 Claims**

1. A compound which is a substituted imidazole of the formula



(Ia)

a stereoisomer or a non-toxic pharmaceutically acceptable acid addition salt thereof wherein R_1 is CN, R_2 is H, CH_3, OCH_3, NO_2, NH_2, CF_3 CHF_2, Ch_2F or halogen; R' is H or



where R_3 is H, CH_3 or halogen; R_4 is H and R_5 is H or R_4 and R_5 together form a bond and n is 1 or 2.

5,559,142

AMINO ACID SUPPLEMENTATION OF DIETARY PROTEINS

Charles I. Jarowski, 67 Harbor La., Massapequa Park, N.Y. 11762

Filed Sep. 22, 1994, Ser. No. 310,350

Int. Cl.[6] A61K *31/40;31/505;31/19*

U.S. Cl. 514—419 **1 Claim**

1. A method for improving the efficiency of amino acid utilization by humans which comprises providing a dietary supplement after meals, consisting of L-Tryptophan, L-Methionine, L-Valine and L-Lysine Monohydrochloride, in such amounts that the relative proportions of at least the first three limiting essential amino acids in the supplemented ration conform adequately to the respective proportions found in the blood plasma of humans upon fasting.

5,559,143

SEROTONIN 5HT$_{1A}$ AGONISTIC METHOD

Ian A. McDonald, Loveland; Ronald C. Bernotas, Cincinnati; Mark W. Dudley, Somerville, and Jeffrey S. Sprouse, Cincinnati, all of Ohio, assignors to Merrell Pharmaceuticals Inc., Cincinnati, Ohio

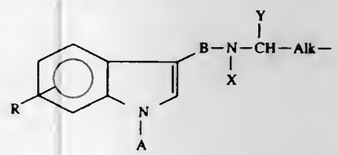
Division of Ser. No. 962,434, Oct. 16, 1992, Pat. No. 5,387,604, which is a division of Ser. No. 735,700, Jul. 30, 1991, Pat. No. 5,189,179, which is a continuation of Ser. No. 574,710, Aug. 29, 1990, abandoned. This application Oct. 7, 1994, Ser. No. 319,916

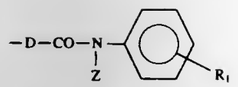
Int. Cl.[6] A61K *31/405;31/40*

U.S. Cl. 514—419 **2 Claims**

1. A method for the treatment of migraine comprising administering to a patient in need thereof, an anti-migraine amount of a

compound of the formula:





in which B is represented by a C_{1-4} alkylene bridging group; Alk is represented by a linear alkylene bridging group containing from 2–8 carbon atoms; D is represented by a bond or an ethenylene bridging group; X, Y, and Z are each independently represented by hydrogen; R_1 is represented by a substituent selected from the group consisting of hydrogen, halogen, C_{1-4} alkyl, C_{1-5} alkoxy, $-CF_3$, $-OCF_3$, —OH, $-NO_2$, —CN, and $-NR_2R_3$; R_2 and R_3 are each independently represented by H or a C_{1-4} alkyl; R is represented by a substituent selected from the group consisting of hydrogen, halogen, C_{1-4} alkyl, C_{1-5} alkoxy, $-CF_3$, $-OCF_3$, —OH, $-NO_2$, and —CN; and, A is represented by H, or C_{1-4} alkyl; or a pharmaceutically acceptable salt thereof.

5,559,144

FURYL AND THIENYL ALKYNYL-N-HYDROXY UREA DERIVATIVES

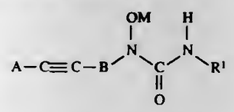
Dee W. Brooks, Libertyville; Andrew O. Stewart, Wildwood; Daniel J. Kerkman, Lake Villa; Pramila A. Bhatia, Mundelein; Anwer Basha, Lake Forest, all of Ill., and Jonathan G. Martin, Knoxville, Tenn., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 229,860, Apr. 19, 1994, Pat. No. 5,476,873, which is a continuation of Ser. No. 971,841, Jan. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 684,614, Apr. 12, 1991, abandoned, which is a continuation-in-part of Ser. No. 558,050, Jul. 25, 1990, abandoned. This application May 5, 1995, Ser. No. 435,399

Int. Cl.[6] A61K *31/34;31/38;* **C07D** *307/46;333/22*

U.S. Cl. 514—445 **8 Claims**

1. A compound having the structure



or a pharmaceutically acceptable salt thereof wherein

B is a valence bond or is a straight or branched divalent alkylene group of from one to twelve carbon atoms;

M represents hydrogen or a pharmaceutically acceptable cation;

R^2 is selected from the group consisting of

hydrogen,

alkyl of from one to six carbon atoms,

hydroxyalkyl of from one to six carbon atoms, and

alkanoyl of from two to eight carbon atoms;

A is selected from the group consisting of

(a) 2- or 3-furyl, optionally substituted with

phenyl, optionally substituted with

alkyl of from one to six carbon atoms,

haloalkyl of from one to six carbon atoms,

alkoxy of from one to six carbon atoms,

hydroxy or

halogen,

phenoxy, optionally substituted with

alkyl of from one to six carbon atoms,

haloalkyl of from one to six carbon atoms,

alkoxy of from one to six carbon atoms,

hydroxy or

halogen,

(b) 2- or 3-thienyl, optionally substituted with

phenyl, optionally substituted with

alkyl from one to six carbon atoms,

haloalkyl of from one to six carbon atoms,

alkoxy of from one to six carbon atoms,

hydroxy or

halogen,

phenoxy, optionally substituted with

alkyl of from one to six carbon atoms,

haloalkyl of from one to six carbon atoms,

alkoxy of from one to six carbon atoms,

hydroxy or

halogen.

5,559,145

1,2,4-TRIOXANE DERIVATIVES

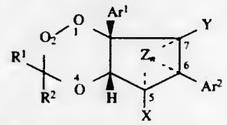
Charles W. Jefford, Troinex, Switzerland, assignor to Oxaco S.A., Geneva, Switzerland

Continuation-in-part of Ser. No. 327,224, Oct. 21, 1994, abandoned, which is a continuation of Ser. No. 186,812, Jan. 24, 1994, abandoned, which is a continuation of Ser. No. 53,294, Apr. 26, 1993, abandoned, which is a continuation of Ser. No. 926,553, Aug. 6, 1992, abandoned, which is a continuation of Ser. No. 759,712, Sep. 12, 1991, abandoned, which is a continuation of Ser. No. 528,028, May 23, 1990, abandoned, which is a continuation-in-part of Ser. No. 201,060, Jun. 1, 1988, abandoned. This application Jun. 7, 1995, Ser. No. 479,948

Int. Cl.[6] A61K *31/335;* **C07D** *323/04*

U.S. Cl. 514—452 **12 Claims**

1. A pharmaceutical composition which comprises a 1,2,4-trioxane derivative of formula:



(I)

wherein

the subscript n is equal to 0 or 1;

the symbol Z represents an epoxide oxygen atom at the 5,6 or 6,7 positions, or a pair of electrons forming a double bond at the 5,6 or 6,7 positions;

each of the symbols Ar^1 and Ar^2, being the same or different, represents an aromatic group which is phenyl, naphthyl or pyridyl, said aromatic group being unsubstituted or substituted with one or more substituents chosen from alkyl groups, a phenyl group, alkoxy groups, a hydroxy group, halogen atoms, carboxy groups, optionally alkyl-substituted amino groups or alkoxycarbonyl groups;

each of the symbols R^1 and R^2, being the same or different, represents a linear or branched alkyl group, or R^X and R^2, taken together with the carbon atom to which they are attached, form an alicyclic group of 3 to 7 carbon atoms which is optionally interrupted by one oxygen, sulphur or nitrogen atom and which group is optionally substituted with one or more substituents chosen from alkyl groups, a phenyl group, alkoxy groups, a hydroxy group, halogen atoms, carboxy groups, optionally alkyl-substituted amine groups or alkoxycarbonyl groups;

X represents a hydrogen atom, a hydroxy group, a hydroperoxy group; an oxo group or a carbonyloxy group selected from o-fluorobenzoyloxy, isopropoxyearbonyloxy and isopentanoyloxy; and

Y is hydrogen:

with the exclusion of the following compounds;

the compound of formula (I) wherein n is 1; Z is a 5:6 double bond; Ar^1 and A^2 are both phenyl: R^1 R^2 are both methyl; X and Y are hydrogen;

the compound of formula (I) wherein n is 1; Z is a 5,6 double bond; Ar^1 and Ar^2 are both phenyl; R^1 and R^2 together form a group $—(CH_2)_4—$; X and Y are hydrogen;

the compound of formula (I) wherein n is 1; Z is a 5,6 or a 6,7 double bond; Ar^1 and Ar^2 are both phenyl; R^1 and R^2 are both methyl; X is —OOH and Y is hydrogen; and

the compound of formula (I) wherein n is 1; Z is a 5,6 or 6,7 double bond; Ar^1 and Ar^3 are both phenyl; R^1 and R^2 are both methyl; X is —OH and Y is hydrogen;

together with a pharmaceutically acceptable carrier.

5,559,146

METHOD OF USING COSMETIC COMPOSITION COMPRISING AN EXTRACT OF ECLIPTA ALBA

Lewis E. Sablon, Rue Lethière, 97180 Sainte-Anne, Quadeloupe, France

PCT No. PCT/FR92/00699, § 371 Date Jul. 27, 1994, § 102(e) Date Jul. 27, 1994, PCT Pub. No. WO93/01796, PCT Pub. Date Feb. 4, 1993

PCT Filed Jul. 17, 1992, Ser. No. 182,026

Claims priority, application France, Jul. 19, 1991, 91 09184

Int. Cl.[6] A61K *31/34;35/78*

U.S. Cl. 514—468 **11 Claims**

1. A method for regulating cutaneous pigmentation comprising applying to the skin of a patient in need thereof a composition comprising as an active ingredient an effective amount to regulate pigment of a compound selected from the group consisting of wedelolactone, demethylwedelolactone, and mixtures thereof.

5,559,147

AROMATIC FLUORINE-CONTAINING ORGANOTIN COMPOUNDS AND ANTI-TUMOUR COMPOSITION

Marcel Gielen, Wezenbeek-Oppem; Rudolph Willem, Vilvoorde; Abdeslam Boubdid, Brussel, all of Belgium, and Dick de Vos, Oegstugeest, Netherlands, assignors to Pharmachemie B.V., Haarlem, Netherlands

Filed Aug. 24, 1995, Ser. No. 519,026

Claims priority, application European Pat. Off., Sep. 9, 1994, 94202612

Int. Cl.[6] A61K *31/32;* **C07F** *7/22*

U.S. Cl. 514—493 **3 Claims**

1. An aromatic fluorine-containing organotin compound of the formula $\{(F_5C_6RCO_2SnBu_2)_2O\}_2$ or $\{(F_5C_6RCO_2)_2SnBu_2)\}$ wherein R is CH_2, CH=CH or a single bond between the phenyl ring and the CO_2 group, and Bu is a butyl group.

3. A process of preparing an aromatic fluorine-containing organotin compound of the formula $\{(F_5C_6RCO_2SnBu_2)_2O\}_2$ or $\{(F_5C_6RCO_2)_2SnBu_2\}$ wherein R is CH_2, CH=CH or a single bond between the phenyl ring and the CO_2 group, and Bu is a butyl group, by reacting the corresponding acid with di-n-butyltin in a molar ratio of from 1:1 to about 2:1 under reflux conditions in a suitable solvent, followed by removal of the solvent to obtain the desired compound.

5,559,148

PARENTERAL BUSULFAN FOR TREATMENT OF MALIGNANT DISEASE

Borje S. Andersson; Harshal P. Bhagwatwar, and Diana S. Chow, all of Houston, Tex., assignors to Board Of Regents, The University Of Texas System, Austin, and University Of Houston-University Park, Houston, both of Tex.

Continuation of Ser. No. 129,995, Sep. 30, 1993, Pat. No. 5,430,057. This application May 24, 1995, Ser. No. 449,685

Int. Cl.[6] A61K *31/255*

U.S. Cl. 514—517 **36 Claims**

1. A method for treating malignant disease responsive to busulfan in an individual comprising parenterally administering a pharmaceutically effective amount of busulfan dissolved in a solvent comprising water and a water miscible, physiologically acceptable, busulfan solvent.

5,559,149

SKIN CARE COMPOSITIONS CONTAINING RETINOIDS

Charles E. Clum, Ewing, and Jonas C. T. Wang, Robbinsville, both of N.J., assignors to Johnson & Johnson Consumer Products, Inc., Skillman, N.J.

Continuation of Ser. No. 719,264, Jun. 27, 1991, abandoned, which is a continuation-in-part of Ser. No. 471,760, Jan. 29, 1990, abandoned. This application Nov. 16, 1993, Ser. No. 153,543

Int. Cl.[6] A61K *31/215*

U.S. Cl. 514—529 **30 Claims**

1. A skin care composition comprising a water-in-oil emulsion and a retinoid selected from the group consisting of Vitamin A alcohol, Vitamin A aldehyde, retinyl acetate, retinyl palmitate and mixtures thereof, said composition further comprising a stabilizing system selected from the group consisting of:

a) a chelating agent and at least one oil-soluble antioxidant; and

b) antioxidant present in each of the oil and water phases of said emulsion; said composition retaining at least about 60% by weight of said retinoid after 13 weeks storage at 40° C.

5,559,150

N,N-DISULFONYLATED AMINOBENZENE CARBOXLIC ACIDS AND THE USE THEREOF AS THROMBIN INHIBITORS

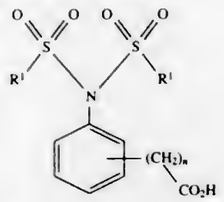
Richard M. Soll, Lawrenceville, N.J., assignor to 3-Dimensional Pharmaceuticals, Inc., Exton, Pa.

Filed Jun. 6, 1995, Ser. No. 470,578

Int. Cl.[6] A61K *31/19;* **C07C** *317/26;311/21;* **C07D** *213/42*

U.S. Cl. 514—562 **13 Claims**

1. A compound having the formula:



and pharmaceutically acceptable salts thereof;

wherein

each R^1 is independently one of alkyl; alkyl substituted by one or two halo substituents, or by one; of $C_{6\text{-}10}$aryl, $C_{1\text{-}6}$alkyl($C_{6\text{-}10}$)aryl, halo($C_{6\text{-}10}$)aryl, $C_{3\text{-}8}$cycloalkyl, $C_{1\text{-}6}$alkyl($C_{3\text{-}8}$)cycloalkyl, $C_{2\text{-}8}$alkenyl, $C_{2\text{-}8}$alkynyl, hydroxy, amino, nitro, cyano or carboxy; cycloalkyl; aryl; substituted aryl; heteroaryl; or substituted heteroaryl;

n is from zero to five; and

the substituent $—(CH_2)_n—CO_2H$ is ortho-, meta- or para- to the N,N-disulfonylamino group.

5,559,151

METHOD FOR REDUCING INTRAOCULAR PRESSURE IN THE MAMMALIAN EYE BY ADMINISTRATION OF CHLORIDE CHANNEL BLOCKERS

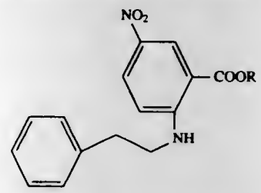
Joseph S. Adorante, Irvine; Elizabeth WeldeMussie, Laguna Niguel, and Guadalupe Ruiz, Corona, all of Calif., assignors to Allergan, Waco, Tex.

Filed Nov. 30, 1994, Ser. No. 346,660

Int. Cl.[6] A61K *31/195*

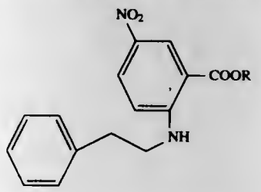
U.S. Cl. 514—567 **10 Claims**

1. A method of treating animals of the mammalian species, including humans, for the purpose of reducing intraocular pressure in the eye of the mammal comprising the step of administering to the mammal a pharmaceutical composition which comprises as its active ingredient a compound having chloride channel blocking activity, wherein said compound is selected from the group consisting of compounds represented by the formula:



wherein R is hydrogen or a pharmaceutically-acceptable cation of R represents a easter-forming moiety.

8. A method for providing neuroprotective effect to the eye of a mammal which comprises the step of administering to the mammal a pharmaceutical composition which comprises as its active ingredient one or more compounds having chloride channel blocking activity wherein said compound having a chloride channel blocking activity is selected from the group consisting of N-phenylanathracilic acid, DPC (diphenylamine-2-carboxylic acid), IAA-94 (R+)-methylidazone, indanyloxyacetic, acid 94), MK-447 (2-aminoemethyl-4-(1,1 -dimethyl ethyl)-6-iodophenol hydrochloride, DIDS (4,4'-diisothiocyanostilbene- 2,2'-disulfonic acid) and compounds represented by the formula:



wherein R is hydrogen or a pharmaceutically-acceptable cation, or R represents a ester-forming moiety.

5,559,152

PHATMACEUTICAL COMPOSITION HAVING ANTIACOHOLIC ACTIVITY

Irina A. Komissarova, ulitsa Medikov, 24, kv. 47; Julia V. Gudkova, ulitsa Berzarina, 9, kv. 94; Tatyana D. Soldatenkova, Pokrovsky bulvar, 14/5, kv. 73, all of Moscow; Natalya M. Burbenskaya, Ozersky raion, selo Sennitsy, Moscowskaya; Tatyana T. Kondrashova, ulitsa Severodvinskaya, 9, kv. 305; Irina L. Kalantar, ulitsa Festivalnaya, 28, kv. 66, both of Moscow; Jury M. Toropov, Kyrgyzstan ulitsa Moldybaeva, 28, kv. 24, Beshkek; Galina F. Semenova, ulitsa Perekopskaya, 11, kv. 43, Moscow; Rjurik P. Nartsissov, ulitsa Medikov, 24, kv. 47, Moscow, and Elena V. Kalinina, ulitsa Teply Stan, 15, kv. 14, Moscow, all of Russian Federation

PCT No. PCT/RU92/00134, § 371 Date May 24, 1994, § 102(e) Date May 24, 1994, PCT Pub. No. WO94/01099, PCT Pub. Date Jan. 20, 1994

PCT Filed Jul. 6, 1992, Ser. No. 204,163

Int. Cl.[6] A61K *31/19*

U.S. Cl. 514—557 **9 Claims**

1. A pharmaceutical composition having activity for treating alcohol intoxication and alcohol abstinence syndrome consisting essentially of as active ingredients a mixture of succinic acid and citric acid or pharmaceutically acceptable salts thereof and a pharmaceutically acceptable solvent, diluent or carrier.

5,559,153

UREA-SUBSTITUTED BENZOYLGUANIDINES, PROCESS FOR THEIR PREPARATION, THEIR USE AS PHARMACEUTICAL OR DIAGNOSTIC, AND PHARMACEUTICAL CONTAINING THEM

Jan-Robert Schwark, Frankfurt; Hans-Jochen Lang, Hofheim; Heinz-Werner Kleemann, Bad Homburg; Andreas Weichert, Egelsbach; Wolfgang Scholz, Eschborn, and Udo Albus, Florstadt, all of Germany, assignors to Hoechst Aktiengesellschaft, D-65926 Frankfurt am Main, Germany

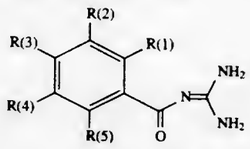
Filed Aug. 11, 1994, Ser. No. 289,674

Claims priority, application Germany, Aug. 13, 1993, 43 27 244.4

Int. Cl.[6] A61K *31/16;31/535;31/40;31/445*

U.S. Cl. 514—597 **19 Claims**

1. A benzoylguanidine of the formula I



(I)

in which:

R(1), R(3) or R(4) is —NR(6) C=X NR(7)R(8),

X is oxygen, S,

R(6) is hydrogen, $(C_1–C_8)$-alkyl, $(C_1–C_8)$-perfluoroalkyl, $(C_3–C_8)$-alkenyl, $—C_nH_{2n}—R(9)$,

n is zero, 1, 2, 3 or 4,

R(9) is $(C_3–C_8)$-cycloalkyl, phenyl, biphenylyl or naphthyl, where the aromatic systems are unsubstituted or substituted by 1–3 substituents from the group consisting of F, Cl, CF_3, methyl, methoxy and NR(10) R(11),

R(10) and R(11) are H, $(C_1–C_4)$-alkyl or $(C_1–C_4)$-perfluoroalkyl;

R(7) is hydrogen, $(C_1–C_8)$-alkyl, $(C_1–C_8)$-perfluoroalkyl, $(C_3–C_8)$-alkenyl, $—C_oH_{2o}—R(12)$,

o is zero, 1, 2, 3 or 4,

R(12) is $(C_3–C_8)$-cycloalkyl, pbenyl, biphenylyl or naphthyl, where the aromatic systems are unsubstituted or substituted by 1–3 substituents from the group consisting of F, Cl, CF_3, methyl, methoxy and NR(13)R(14),

R(13) and R(14) are H, $(C_1–C_4)$-alkyl or $(C_1–C_4)$-perfluoroalkyl;

R(8) is defined as R(7);
where R(7) and R(8) can also together be 4 or 5 methylene groups, of which one CH_2 group can be replaced by oxygen, S, NH, N—CH_3 or N-benzyl;
the substituents R(2), R(3), R(4), R(5) or R(1), R(2), R(4), R(5) or R(1), R(2), R(3), R(5) remaining in each case are independently of one another
hydrogen, F, Cl, Br, I, —O_m(C_1–C_8)-alkyl,
—O_m(C_3–C_8)-alkenyl,
—O_k-$(CH_2)_b$-C_dF_{2d+1}, —O_m-C_pH_{2p}-R(18),
or up to 2 groups CN, NO_2, NR(16)R(17),
b is zero or 1,
d is 1, 2, 3, 4, 5, 6 or 7,
ta is zero or 1,
tb is zero or 1,
tc is zero or 1,
td is zero or 1,
p is zero, 1, 2, 3 or 4,
R(18) is (C_3–C_8)-cycloalkyl, phenyl, biphenylyl or naphthyl, where the aromatic systems are unsubstituted or substituted by 1–3 substituents from the group consisting of F, Cl, CF_3, methyl, methoxy and NR(19)R(20),
R(19) and R(20) are hydrogen, (C_1–C_4)-alkyl, (C_1–C_4)-perfluoroalkyl,
R(16) is hydrogen, (C_1–C_8)-alkyl, (C_1–C_8)-perfluoroalkyl, (C_3–C_8)-alkenyl, —C_qH_{2q}—R(21),
q is zero, 1, 2, 3 or 4,
R(21) is (C_3–C_8)-cycloalkyl, phenyl, biphenylyl or naphthyl, where the aromatic systems are unsubstituted or substituted by 1–3 substituents from the group consisting of F, Cl, CF_3, methyl, methoxy and NR(22)R(23),
R(22) and R(23) are hydrogen, (C_1–C_4)-alkyl or (C_1–C_4)-perfluoroalkyl,
R(17) is hydrogen, (C_1–C_8)-alkyl, (C_1–C_8)-perfluoroalkyl, (C_3–C_8)-alkenyl, —C_rH_{2r}—R(24),
r is zero, 1, 2, 3 or 4,
R(24) is (C_3–C_8)-cycloalkyl, phenyl, biphenylyl or naphthyl, where the aromatic systems are unsubstituted or substituted by 1–3 substituents from the group consisting of F, Cl, CF_3, methyl, methoxy and NR(25) R(26),
R(25) and R(26) are hydrogen, (C_1–C_4)-alkyl or (C_1–C_4)-perfluoroalkyl;
where R(16) and R(17) can also together be 4 or 5 methylene groups, of which one CH_2 group can be replaced by oxygen, S, NH, N—CH_3 or N-benzyl,
as well as pharmaceutically tolerated salts thereof.

5,559,154

TRI- AND TETRA-SUBSTITUTED GUANIDINES AND THEIR USE AS EXCITATORY AMINO ACID ANTAGONISTS

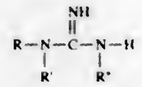
Eckard Weber, Laguna Beach, Calif., and John F. W. Keana, Eugene, Oreg., assignors to Oregon State Board of Higher Education; Oregon Health Sciences University, and University of Oregon, Portland, Oreg.

Division of Ser. No. 663,134, Mar. 4, 1991, Pat. No. 5,262,568, which is a continuation-in-part of Ser. No. 487,036, Mar. 2, 1990, abandoned. This application Aug. 11, 1993, Ser. No. 105,456

Int. Cl.[6] C07C *279/18;* **A61K** *31/155*

U.S. Cl. 514—634 **35 Claims**

1. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and an effective amount of a guanidine having the formula:



wherein R' is a C_1–C_8 alkyl group, a C_2–C_6 alkenyl group, a C_2–C_6 alkynyl group, a cycloalkyl group, cycloalkyl substituted by one or more substituents, a cycloalkenyl group, cycloalkenyl substituted by one or more substituents, carbocyclic group, alkaryl group, or an alkaryl group substituted by one or more substituents;
R and R" are each independently a carbocyclic aryl group, carbocyclic aryl group substituted by one or more substituents, alkaryl group, or an alkaryl group substituted by one or more substituents; or a physiologically acceptable salt thereof;
wherein said substituent is chloro, fluoro, bromo, iodo, C_1–C_8 alkyl, C_1–C_8 alkoxy, cyano, C_3–C_{15} dialkylaminoalkyl, carboxy, carboxamido, C_1–C_8 alkylthio, allyl, aralkyl, alkaryl, C_3–C_6 cycloalkyl, aroyl, aralkoxy, C_2–C_8 acyl, aryl, heteroaryl, a carbocyclic aryl fused to a benzene ring, a heteroaryl fused to a benzene ring, C_3–C_6 heterocycloalkyl, a C_3–C_6 heterocycloalkyl ring fused to a benzene ring, C_1–C_8 alkysulfonyl, arylthio, amino, C_1–C_8 alkylamino, C_2–C_{15} dialkylamino, hydroxy, hydroxyalkyl, carbamoyl, C_1–C_6 N-alkylcarbamoyl, C_2–C_{15} N,N-dialkylcarbamoyl, nitro or C_2–C_{15} dialkylsulfamoyl.

5,559,155

QUATERNARY AMMONIUM HYDROXIDE COMPOSITIONS AND PREPARATION THEREOF

Leigh E. Walker, Macungie, Pa., assignor to Lonza Inc., Annandale, N.J.

Division of Ser. No. 74,313, Jun. 9, 1993, Pat. No. 5,399,762. This application Dec. 5, 1994, Ser. No. 349,448

Int. Cl.[6] A01N *33/12*

U.S. Cl. 514—642 **7 Claims**

1. Biodegradation resistant wood comprising
(A) a substrate comprising wood; and
(B) a wood preservative system comprising a biocidal effective amount of
(i) at least one C_1–C_{20} alkyl or aryl-substituted alkyl, C_8–C_{20} alkyl quaternary ammonium hydroxide; and
(ii) a solvent;
said wood preservative system being metal-free.

5,559,156

METHOD FOR TREATING ANIMALS INFECTED WITH BABESIA SPP.

Winston E. Gutteridge; Alan T. Hudson; Victoria S. Latter, and Mary Pudney, all of Beckenham, England, assignors to Glaxo Wellcome, Inc., Research Triangle Park, N.C.

Continuation of Ser. No. 104,034, Sep. 30, 1993. This application Nov. 8, 1994, Ser. No. 335,990

Int. Cl.[6] A61K *31/12*

U.S. Cl. 514—682 **4 Claims**

1. A method of treating an animal having an infection caused by Babesia spp which comprises administering to said infected animal an effective Babesia spp treatment amount of 2-[4-(4-chlorophenyl) cyclohexyl]-3-hydroxy-1,4-naphthoquinone or a physiologically acceptable salt thereof.

5,559,157

OPHTHALMIC COMPOSITIONS CONTAINING VITAMIN E OR ESTER THEREOF AS AN ACTIVE INGREDIENT

Yoichi Kawashima, Kyoto, and Mitsuaki Kuwano, Osaka, both of Japan, assignors to Santen Pharmaceutical Co., LTD., Osaka, Japan

Filed May 19, 1993, Ser. No. 64,763

Claims priority, application Japan, May 26, 1992, 4-133193

Int. Cl.[6] A61F *2/14;* **A61K** *9/54;47/36*

U.S. Cl. 514—777 **22 Claims**

1. An aqueous ophthalmic composition for those in need thereof which comprises (a) 0.5 to 5 weight % of an active ingredient selected from the group consisting of vitamin E and an ester thereof selected from the group consisting of an acetic acid ester, a nicotinic acid ester and a succinic acid ester, (b) 0.1 to 2.0 weight % of a preservative selected from the group consisting of sorbic acid and a salt thereof selected from the group consisting of a sodium salt and a potassium salt, and (c) a surfactant selected from the group consisting of (i) a mixture of polyoxyethylene esters of mixed partial oleic esters of sorbitol anhydrides and (ii) polyoxyethylene hydrogenated castor oil, said surfactant being in an amount of 0.2 to 30 times the amount of said active ingredient selected from the group consisting of vitamin E and an ester thereof.

5,559,158

PHARMACEUTICAL COMPOSITION

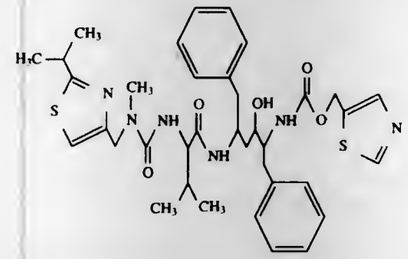
Laman A. Al-Razzak, Libertyville; Kennan C. Marsh, Lake Forest, and Richard A. Pyter, Libertyville, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 267,273, Jun. 28, 1994, abandoned, which is a continuation-in-part of Ser. No. 130,409, Oct. 1, 1993, abandoned. This application Aug. 31, 1994, Ser. No. 297,804

Int. Cl.[6] A61K *31/16;31/695;31/425;31/42*

U.S. Cl. 514—616 **16 Claims**

1. A solid pharmaceutical composition comprising a pharmaceutically acceptable adsorbent or a mixture of pharmaceutically acceptable adsorbents to which is adsorbed a mixture of (1) a pharmaceutically acceptable organic solvent or a mixture of pharmaceutically acceptable organic solvents, (2) a compound of the formula:



and (3) a pharmaceutically acceptable acid or a combination of pharmaceutically acceptable acids.

5,559,159

PROCESS INCLUDING DEPOLYMERIZATION IN POLYESTER REACTOR FOR RECYCLING POLYESTER MATERIALS

Bobby J. Sublett, Kingsport, and Gary W. Connell, Church Hill, both of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Dec. 7, 1995, Ser. No. 570,175

Int. Cl.[6] C08J *11/04*

U.S. Cl. 521—48.5 **20 Claims**

1. A process for preparing a polyester product from a polyester material to be recycled comprising:
preparing a first reaction mixture including (1) a polyester material to be recycled, (2) a diol and (3) a first dicarboxylic or dicarboxylate species effective for transesterification with said diol to produce a second diester species which is effective for polycondensation to produce a polyester product;
subjecting said first reaction mixture to conditions effective for causing transesterification of said diol and said first species to thereby produce said second species and simultaneously causing depolymerization of said polyester material to be recycled to thereby produce a regenerated species which is also effective for polycondensation to produce a polyester product, whereby to produce a second reaction mixture which contains both said second species and said regenerated species; and
subjecting said second reaction mixture to conditions effective for causing polycondensation of said second species and said regenerated species, whereby to produce a new polyester product which contains units of both said second species and said regenerated species; and
recovering said new polyester product from said reaction mixture.

5,559,160

LIQUID ABSORBABLE MATERIAL AND METHOD FOR PRODUCTION THEREOF

Nobuyuki Harada, Osaka; Katsuyuki Wada, Hyogo; Hisanori Obara, Hyogo, and Toru Inaoka, Hyogo, all of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan

Filed Apr. 28, 1994, Ser. No. 234,416

Claims priority, application Japan, Apr. 28, 1993, 5-102138; Jul. 30, 1993, 5-190205

Int. Cl.[6] C08J *9/28*

U.S. Cl. 521—64 **6 Claims**

1. A liquid absorbable material comprising a porous compression formed article comprising partitioning walls of a cross-linked polymer and continuous micropores, said material having a density in the range of 0.2 to 1.0 g/cm^3, said partitioning walls exhibiting a swelling degree to kerosine in the range of 2 to 10, and said material having an absorption capacity per unit volume of at least 4 cm^3/cm^3 for water, ethanol, toluene and kerosine, respectively.

5,559,161

HYDROXY-FUNCTIONAL TRIAMINE CATALYST COMPOSITIONS FOR THE PRODUCTION OF POLYURETHANES

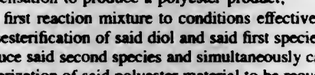
Herbert C. Klotz; Kevin R. Lassila, both of Allentown; Mark L. Listemann, Whitehall; Kristen E. Minnich, Allentown, and Ann C. L. Savoca, Bernville, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 18, 1994, Ser. No. 198,925

Int. Cl.[6] C08J *9/00;* **C08K** *5/16*

U.S. Cl. 521—129 **22 Claims**

1. In a method for catalyzing the trimerization of an isocyanate and/or the reaction of an isocyanate with an active hydrogen-containing compound, the improvement which comprises employing a catalyst composition consisting essentially of a compound selected from the group consisting of compounds of the following formula



wherein R is a C_1–C_4 alkyl, C_6–C_8 aryl, or C_7–C_9 aralkyl group and n is 1 to 8.

5,559,162

POLYMERIC PEROXYCARBONATES AND PROCESS FOR MAKING THEM

John Meijer, and Petrus J. T. Alferink, both of Deventer, Netherlands, assignors to Akzo Nobel, NV, Arnhem, Netherlands

PCT No. PCT/EP93/01997, § 371 Date Feb. 23, 1995, § 102(e) Date Feb. 23, 1995, PCT Pub. No. WO94/03525, PCT Pub. Date Feb. 17, 1994

PCT Filed Jul. 26, 1993, Ser. No. 379,636

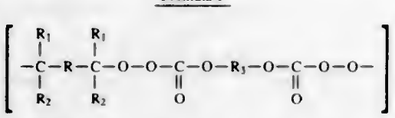
Claims priority, application European Pat. Off., Aug. 7, 1992, 92202441

Int. Cl.[6] C08F *2/46*

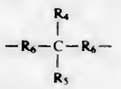
U.S. Cl. 522—60 **9 Claims**

1. A polymeric peroxycarbonate which comprises at least two structural units represented by the formula I:

Formula I



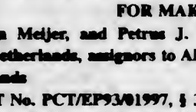
wherein R is selected from C_1–C_6 alkylene, alkyne, alkadiyne, 1,3-phenylene, 1–4 phenylene, cis-alkene, trans-alkene, or alkadiene; R_1 and R_2 are independently selected from C_1–C_6 alkyl, or C_6–C_{10} aryl, and R_1 and R_2 my combine to form a C_3–C_{12} alkyl ring; and R_3 is selected from (A)–(F):



(A)

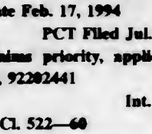
wherein R_4 and R_5 are independently selected from C_1–C_6 alkyl, or C_6–C_{10} aryl and R_4 and R_5 my combine to form a C_3–C_{12} alkyl ring; R_6 is selected from methylene, 1,4-phenylene,

wherein R_7 is selected from hydrogen or methyl;



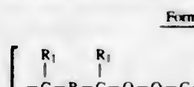
(B)

wherein R_8 is selected from nothing, ethyl or ethoxy;



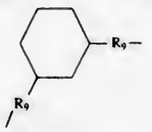
(C)

wherein R_8 is as defined above;



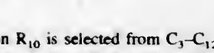
(D)

wherein R_9 is nothing or methyl;



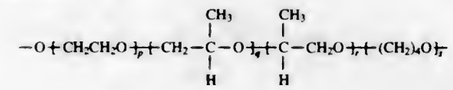
(E)

wherein R_9 is as defined above;



(F)

wherein R_{10} is selected from C_3–C_{12} alkyl, 2-butenediyl-1,4, 2,2-hexadienediyl, 2-butynediyl- 1,4, 2,4-hexadiynediyl-1,6, 3-hexynediyl-1,4, 3-methylpentadiyl-1,5, or —O—R_3—O can be represented by



wherein p+q+r+s can be a value from 1 up to a value giving a maximum molecular weight of 10,000 grams/mole.

5,559,163

UV CURABLE COATINGS HAVING IMPROVED WEATHERABILITY

William R. Dawson, Matteson, and Goutam Gupta, Homewood, both of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Continuation of Ser. No. 189,812, Jan. 31, 1994, which is a continuation-in-part of Ser. No. 27,933, Mar. 8, 1993, abandoned, which is a continuation of Ser. No. 647,377, Jan. 28, 1991, abandoned. This application Aug. 31, 1994, Ser. No. 298,730

Int. Cl.[6] C08F *2/50*

U.S. Cl. 522—75 **32 Claims**

1. A UV curable coating composition comprising:

a) at least one photoinitiator selected from the group consisting of acylphosphine oxides, Michler's ketone, benzil, 2-chlorothioxanthone, and mixtures thereof;

b) at least one photopolymerizable UV absorber having ethylenic unsaturation;

c) at least one UV curable acrylic monomer: and

d) silica;

wherein said photoinitiator has the ability to absorb a significant portion of the total energy needed to cure said coating from wavelengths in which said UV absorber does not appreciably absorb.

5,559,164

RADIATION CURABLE SATURATED POLYOLEFIN PRESSURE SENSITIVE ADHESIVE

Gaddam N. Babu, Woodbury, and James R. Peterson, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

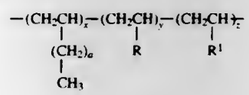
Continuation-in-part of Ser. No. 799,118, Nov. 27, 1991, abandoned. This application Dec. 2, 1994, Ser. No. 348,337

Int. Cl.[6] C08J *3/28*

U.S. Cl. 522—157 **20 Claims**

1. A composition comprising:

a) at least one copolymer having the general formula



wherein

x, y, and z are numbers designating the relative molar amounts of monomer units comprising the backbone chain of the copolymer such that

(1) the sum (x+ y+ z) is about 35 to 400,000, and

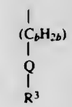
(2) z is 0.1 to 9.9%, y is 0 to 30%, and x is 60.1 to 99.9% of the sum

(x+ y+ z);

a is an integer from 3 to 7, inclusive;

R is hydrogen or a lower alkyl group; and

R^1 is a monovalent organic group, having the structure



wherein

b is an integer from 1 to 5,

Q is a single bond, oxygen, or a divalent group selected from the class consisting of an arylene group having 6 to 15 carbon atoms and

in which each R^4 is independently a lower alkyl group of 1 to 4 carbon atoms or R^3; and R^3 is a methylidyne group having the formula

in which

(1) each R^5 is independently an alkyl group having 1 to 4 carbon atoms or

(2) both R^5s together provide an alkylene group that, with the methylidyne carbon to which they are attached, forms a 5- or 6-membered ring of carbon atoms,

with the proviso that b can be zero when Q is an arylene group;

b) sufficient photoactive hydrogen abstracting agent to crosslink said composition upon exposure to radiation, said hydrogen abstracting agent being selected from the group consisting of aldehydes, ketones, quinones, thioxanthones, and chromophore-substituted halomethyl-s-triazines; and

c) optionally, a tackifying resin,

said composition being radiation curable to a pressure sensitive adhesive having peel adhesion of at least 35N/dm both in the presence and absence of said tackifying resin.

5,559,165

HOT MELT ADHESIVES FOR BONDING TO SENSITIVE AREAS OF THE HUMAN BODY

Charles W. Paul, Madison, N.J., assignor to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed Aug. 8, 1995, Ser. No. 512,579

Int. Cl.[6] C08L *93/04;57/02;53/02;* **C08K** *5/01*

U.S. Cl. 523—111 **20 Claims**

1. A pressure sensitive hot melt adhesive comprising a high molecular weight block copolymer and 60 to 95 parts by weight oil or other liquid midblock diluent, the adhesive being characterized by a midblock Tg less than −10° C., a G' less than 15×10^4 dynes/cm^2 at 10 rad/s (25° C.), a G" of 1 to 6×10^4 dynes/cm^2 (25° C.) and a tensile strength greater than 10 psi and requiring no subsequent curing operation after cooling.

5,559,166

SUBSTITUTE GROUND SURFACE MATERIAL, PREPARATION METHOD THEREFORE, AND GROUND TREATMENT METHOD

Charles R. Bearden, 100 Laurel Valley Dr., West Columbia, Tex. 77486

Filed Jan. 18, 1994, Ser. No. 183,050

Int. Cl.[6] C09K *17/00;* **A63K** *1/00;* **C08K** *3/34*

U.S. Cl. 523—132 **18 Claims**

1. A process for treating an existing dirt surface comprising sand and at least one of clay or silt, the method comprises contacting the dirt surface in situ with a binder comprising an interpolymer and a non or low aromatic oil, wherein the binder is fluid during the contacting.

5,559,167

GAMMA IRRADIATED THERMOPLASTICS AND ARTICLES

James A. Mahood, Morgantown, W. Va., assignor to General Electric Company, Pittsfield, Mass.

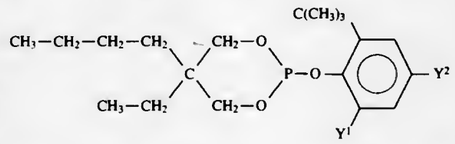
Continuation-in-part of Ser. No. 307,545, Sep. 16, 1994, Pat. No. 5,424,348, which is a continuation-in-part of Ser. No. 096,530, Jul. 22, 1993, abandoned. This application Dec. 21, 1994, Ser. No. 361,785

Int. Cl.[6] C08K *5/529*

U.S. Cl. 523—136 **16 Claims**

1. A method for enhancing resistance to discoloration incurred by gamma irradiation of an article made from a polymeric resin composition, said composition comprising a polymeric resin, said method comprising:

(a) incorporating into said composition prior to gamma irradiation a phosphite at a level of from 0.01 to 5 percent by weight based on the total weight of the composition, said phosphite being of the formula:



wherein Y^1 is alkyl and Y^2 is tert-butyl or sec-butyl; and (b) then subjecting said article to gamma irradiation.

5,559,168

METHOD FOR PRODUCTION OF MICROFINE COLORED PARTICLES AND ELECTROPHOTOGRAPHIC TONER USING THE PARTICLES

Yoshikuni Mori; Mitsuo Kushino; Hideki Oishi, and Tadahiro Yoneda, all of Osaka, Japan, assignors to Nippon Shokubai Co., Ltd., Osaka-fu, Japan

Filed Jun. 28, 1993, Ser. No. 82,365

Claims priority, application Japan, Aug. 30, 1988, 63-213827; Apr. 17, 1989, 1-95419; Jul. 24, 1990, 2-195514

Int. Cl.[6] C08J *3/12; G03G 9/08;9/083*

U.S. Cl. 523—205 22 Claims

1. A method for the production of microfine colored particles, comprising subjecting a polymerizable monomer component suspended in a suspension medium to suspension polymerization in the presence of a coloring agent and/or a magnetic powder thereby forming microfine globular colored particles possessing an average particle diameter in the range of from 3 to 50 μm in said suspension solution medium, separating mechanically said microfine globular colored particles in the form of a cake from said suspension solution medium, subjecting said cake to a heating and humidifying treatment under the conditions of 50° C. to 130° C. in temperature and 70 to 100% in relative humidity thereby inducing fusion of said particles and giving rise to blocks of fused particles, however maintaining at least partially the boundary surface of said microfine globular colored particles, and then disintegrating mechanically said blocks of particles to an average particle diameter substantially equal to the average particle diameter of said microfine globular colored particles existent prior to said fusion,

wherein said polymeric monomer component comprises a hydrophobic monomer capable of free-radical addition polymerization, and having a single vinyl group or an alpha-beta unsaturated group;

wherein said mechanical separation of said microfine globular colored particles from said suspension medium is effected after said microfine globular colored particles in said suspension medium have been subjected to cohesion or sedimentation, said cohesion or sedimentation being caused by addition of at least one member selected from the group consisting of flocculating agents, sedimenting agents and microfine water-insoluble particles, to said suspension medium;

wherein said flocculating agent is one member selected from the group consisting of inorganic acids, organic acids, and water-soluble metal salts thereof;

wherein said sedimenting agent is selected from the group consisting of organic non-solvents for the polymer obtained by polymerizing said polymerizable monomer component, said organic non-solvents being selected from the group consisting of hydrocarbons and lower alcohols; and

wherein said microfine water-insoluble particle is one member selected from the group consisting of cross-linked and non-cross-linked organic polymer and resin powders, organic pigments, organic charge-controlling agent powders, wax powders, inorganic pigments, and inorganic oxide powders.

5,559,169

EPDM, HNBR AND BUTYL RUBBER COMPOSITIONS CONTAINING CARBON BLACK PRODUCTS

James A. Belmont, Acton, and Thomas F. Reed, Andover, both of Mass., assignors to Cabot Corporation, Boston, Mass.

Filed Dec. 15, 1994, Ser. No. 356,459

Int. Cl.[6] C08K *9/04;;5/36;* C08L *23/22;9/00*

U.S. Cl. 523—215 12 Claims

1. A rubber composition prepared by the process comprising mixing rubber selected from the group consisting of a copolymer of ethylene-propylene-diene monomers (EPDM), a partially hydrogenated copolymer of acrylonitrile and butadiene (HNBR), and a butyl rubber, and 10 to 300 parts by weight of a carbon black product per 100 parts by weight of the rubber, wherein the carbon black product has an attached organic group of the formula —Ar—(S)$_n$—Ar'— in which Ar and Ar' are arylene groups and n is 1 to 8.

5,559,170

COMPOSITIONS COMPRISING FUSED PARTICULATES AND METHODS OF MAKING THEM

Richard B. Castle, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 231,937, Apr. 25, 1994. This application May 31, 1995, Ser. No. 456,179

Int. Cl.[6] C08K *3/34;7/18*

U.S. Cl. 523—223 21 Claims

1. A combination comprising an admixture of a polymeric material and a composition of matter comprising solid particles wherein

A. at least a portion of said solid particles are generally ellipsoidal particles that are substantially glassy;

B. at least a portion of said solid particles have chemical compositions corresponding substantially with that of material selected from the group consisting of wollastonite, alkali feldspar, plagioclase feldspar and nepheline; and

C. said composition of matter comprising about 15 to 100% by volume of said generally ellipsoidal particles that have said chemical compositions, based on the total volume of said solid particles present in said composition of matter.

5,559,171

ALIPHATIC-AROMATIC COPOLYESTERS AND CELLULOSE ESTER/POLYMER BLENDS

Charles M. Buchanan, Bluff City; Robert M. Gardner, Gray; Matthew D. Wood, Kingsport; Alan W. White, Kingsport; Steven C. Gedon, Kingsport, and Fred D. Barlow, Jr., Kingsport, all of Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Division of Ser. No. 163,441, Dec. 7, 1993, Pat. No. 5,446,079, which is a division of Ser. No. 797,512, Nov. 12, 1991, Pat. No. 5,292,783, which is a continuation-in-part of Ser. No. 736,262, Jul. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 620,225, Nov. 30, 1990, abandoned. This application Apr. 26, 1995, Ser. No. 429,400

Int. Cl.[6] C08L *1/10;3/06;* C08F *265/04;267/06*

U.S. Cl. 524—41 37 Claims

1. A binary blend comprising:

(A) about 5% to about 98% of a C_1–C_{10} ester of cellulose having a number of substituents per anhydroglucose unit of about 1.7 to 3.0 and an inherent viscosity of about 0.2 to about 3.0 deciliters/gram as measured at a temperature of 25° C. for a 0.5 g sample in 100 ml of a 60/40 parts by weight solution of phenol/tetrachloroethane, and

(B) about 2% to about 95% of an aliphatic-aromatic copolyester having an inherent viscosity of about 0.2 to about 2.0 deciliters/gram as measured at a temperature of 25° C. for a 0.5 g sample in 100 ml of a 60/40 parts by weight solution of phenol/tetrachloroethane, said percentages being based on the weight of component (A) plus component (B).

5,559,172

VINYL AROMATIC RESIN COMPOSITIONS CONTAINING CONDENSATION PRODUCT OF HALOGENATED AROMATIC DIOL AND AN ALKYLENE DIHALIDE

Donald M. Kulich, Marietta, Ohio; Thomas B. Cleveland, Parkersburg, W. Va.; Enrico J. Termine, West Lafayette, and Arthur G. Mack, Lafayette, both of Ind., assignors to General Electric Company, Pittsfield, Mass.

Filed May 11, 1995, Ser. No. 439,014

Int. Cl.[6] C08K *5/06;5/36;5/02*

U.S. Cl. 524—155 27 Claims

1. A vinyl aromatic resin composition comprising from 3 to 40 percent by weight of a flame retardant which is an oligomeric condensation product of a halogenated aromatic diol and an alkylene dihalide composition comprising alkylene dihalide.

5,559,173

SYSTEM FOR CONTROLLING THE COLOR OF COMPOUNDED POLYMER(S) USING IN-PROCESS COLOR MEASUREMENTS

Peter J. Campo, Niskayuna, and Paul K. Houpt, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 131,232, Oct. 4, 1993, abandoned. This application Jan. 26, 1995, Ser. No. 378,993

Int. Cl.[6] G05D *25/02;25/00;* B01F *15/04*

U.S. Cl. 523—303 10 Claims

1. A method for controlling the color of at least one compounded thermoplastic consisting essentially of resin and colorant comprising the steps of:

selecting at least three colorant additives so that a gain matrix, G, for the effects of concentration of said at least three colorant additives on the color of the at least one compounded thermoplastic will have a condition number indicative of no rank deficiency;

compounding an amount of the at least one thermoplastic to produce a substantially homogeneous mixture;

measuring optical signals providing information about the color of the mixture;

comparing the measured color of the mixture with a predetermined target color; and

selectively increasing or decreasing the predetermined concentration of at least one of the colorant additives in the mixture in response to the comparison of the measured color and the predetermined target color.

5,559,174

ELECTROCOATING COMPOSITION OF A POLYAMINE SELF-CONDENSED EPOXY ADDUCT AND COATINGS PRODUCED THEREBY

Peter D. Clark, Farmington Hills; John A. Gilbert, Beverly Hills, both of Mich.; Gunther Ott; Dieter Ruhl, both of Munster, Germany; David J. Santure, Northville, Mich.; Ulrich Heimann, and Klaus Cibura, both of Munster, Germany, assignors to BASF Corporation, Clifton, N.J.

Continuation of Ser. No. 250,991, May 31, 1994, abandoned, which is a continuation of Ser. No. 112,864, Aug. 26, 1993, abandoned, which is a continuation of Ser. No. 970,432, Nov. 2, 1992, abandoned, which is a continuation of Ser. No. 798,359, Nov. 21, 1991, abandoned, which is a continuation of Ser. No. 697,491, May 2, 1991, abandoned, which is a continuation of Ser. No. 506,955, Apr. 10, 1990, abandoned, which is a division of Ser. No. 288,327, Dec. 22, 1988, Pat. No. 4,920,162, which is a continuation of Ser. No. 574,901, Jan. 30, 1984, abandoned, and a continuation-in-part of Ser. No. 759,618, Jul. 26, 1985, abandoned. This application Jun. 7, 1995, Ser. No. 487,575

Int. Cl.[6] C08L *63/02*

U.S. Cl. 523—428 11 Claims

1. A coating composition comprising:

a principal resin comprising a self-addition epoxide resin-polyamine adduct with pendant alkylphenoxy groups;

a cross-linker comprising a toluene diisocyanate compound, a blocked isocyanurate of a hexane diisocyanate compound or mixtures thereof;

a grind resin comprising the reaction product of an aromatic diglycidyl ether, an aromatic diol, an aminopolyalkoxy alcohol, a diamine and an alkylaryl glycidyl ether;

a plasticizer; and

pigments selected from a group consisting of inorganic, organometallic and organic compounds.

5,559,175

POLYVINYL ACETALS WHICH CAN FORM EMULSIFIER-FREE AQUEOUS DISPERSIONS AND REDISPERSIBLE DRY POWDERS, PROCESSES FOR THEIR PREPARATION AND THEIR USE

Matthias Kroggel, Kelkheim, and Hermann Schindler, Hofheim, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 138,121, Oct. 15, 1993, abandoned. This application Feb. 24, 1995, Ser. No. 394,418

Claims priority, application Germany, Oct. 19, 1992, 42 35 151.0

Int. Cl.[6] C08K *5/09;5/12*

U.S. Cl. 524—297 14 Claims

1. A process for the preparation of a polyvinyl acetal with, in amounts sufficient to form a dispersion, sulfo salt groups with a —SO_3 content or an emulsifier-free aqueous dispersion thereof and its aqueous emulsifier-free dispersion by acetalization of a polyvinyl alcohol (PVAL) with an aldehyde or aldehyde acetal under acid catalysts in an aqueous medium comprising reacting a copolymeric PVAL containing comonomer units carrying sulfo salt groups in an amount sufficient to form a dispersion, or a mixture thereof, capable of forming a dispersion, with a PVAL free from sulfo salt groups with the stoichiometrically required amount of an aldehyde or an aldehyde acetal in aqueous solution with addition of an acid catalyst under acetalization conditions in the absence of a low molecular weight emulsifier or surfactant to form a stable aqueous polyvinyl acetal dispersion, and recovering the resulting dispersion, or isolating the polymer content of the resulting aqueous dispersion in a dry, water-redispersible powder form by removal of water.

5,559,176

AQUEOUS POLYOLEFIN RESIN COMPOSITION

Hiroaki Namba, and Ken-ichi Fujino, both of Iwakuni, Japan, assignors to Nippon Paper Industries, Co., Ltd., Tokyo, Japan

Division of Ser. No. 166,903, Dec. 15, 1993, which is a continuation-in-part of Ser. No. 145,090, Nov. 3, 1993, abandoned. This application Apr. 28, 1995, Ser. No. 430,363

Claims priority, application Japan, Nov. 11, 1992, 4-326118; Mar. 2, 1993, 5-64874; Oct. 13, 1993, 5-280127

Int. Cl.[6] C08K *5/04*

U.S. Cl. 524—377 6 Claims

1. A method of producing an aqueous polyolefin composition upon aqueous conversion of a polyolefin and/or modified polyolefin raw material resin wherein the aqueous polyolefin composition contains a poly(alkylene oxide) compound and a solubility parameter (SP value) of not lower than 7 $cal^{1/2}\cdot cm^{-3/2}$ to not higher than 12 $cal^{1/2}\cdot cm^{-3/2}$ at a proportion of not less than 0.001 wt. % to not more than 50%, said method comprising the steps of melting the raw material resin under an absolute pressure ranging from 1.1 kg/cm^2 to 101 kg/cm^2, mixing with a surfactant and/or alcohol and basic substance, gradually adding water dropwise under the same pressure and stirring to cause phase inversion, thereby conducting the aqueous conversion while maintaining the resulting mixture within a range from not lower than 100° C. to not higher than 300° C.,

wherein the modified polyolefin raw material resin is a modified polyolefin resin comprising one or more resins selected from the group consisting of (A) a polyolefin resin modified by graft copolymerization with an unsaturated carboxylic acid, unsaturated carboxylic acid anhydride or mixture thereof, (B) a polyolefin resin modified by chlorination and (C) a polyolefin resin modified by graft copolymerization with a reactive monomer having radical polymerizability.

5,559,177

Patent Not Issued For This Number

5,559,178

PROCESS FOR MANUFACTURING FRIABLE RUBBER

5,559,181

STABLE CHLOROSULFONATED RESIN LATEX

5,559,184

THERMOPLASTIC RESIN COMPOSITIONS

more, wherein said grafting degree is determined according to the formula:

5,559,178

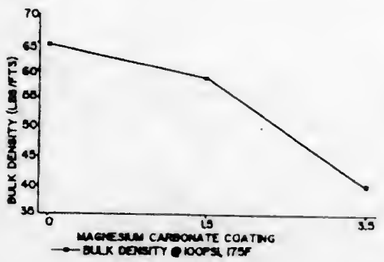
PROCESS FOR MANUFACTURING FRIABLE RUBBER BALES

Lincoln Widmer, Baton Rouge, La., assignor to DSM Copolymer, Inc., Baton Rouge, La.

Continuation of Ser. No. 823,701, Feb. 2, 1992, abandoned, which is a division of Ser. No. 435,198, Nov. 9, 1989, Pat. No. 5,098,635. This application Jan. 18, 1994, Ser. No. 182,749

Int. Cl.[6] C08K *3/26*

U.S. Cl. 524—425 **23 Claims**



1. A composition for coating wet rubber particles during extrusion and pelletization comprising a water soluble thickener and binder reagent, water, a water soluble anionic dispersant and an inorganic partitioning agent selected from the group consisting of (a) $MgCO_3$, (b) $CaCO_3$ and (c) $ZnCO_3$.

5,559,179

MOLDING COMPOUND

Shinji Mori, Koriyama, and Matsutoshi Ishioka, Fukushima, both of Japan, assignors to NOK Corporation, Tokyo, Japan

Filed Nov. 10, 1994, Ser. No. 339,201

Int. Cl.[6] C08L *81/04;61/04*

U.S. Cl. 524—494 **25 Claims**

1. A molding compound which comprises polyphenylenesulfide resin, chopped strands of glass fibers and powdery glass fibers having a length of about 10 to about 200 μm.

14. A molding compound which comprises phenol resin, a curing agent for the phenol resin, chopped strands of glass fibers and powdery glass fibers having a length of about 10 to about 200 μm.

5,559,180

POLYACETAL COMPOSITIONS FOR USE IN WEAR APPLICATIONS

Tatsuhiro Takahashi, Kanagawa, Japan; Edmund A. Flexman, Wilmington, and Robert J. Kassal, Newport, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 243,611, May 16, 1994, abandoned, which is a continuation of Ser. No. 35,062, Mar. 22, 1993, abandoned. This application Apr. 3, 1995, Ser. No. 415,869

Int. Cl.[6] B29D *22/00*; **C08L** *71/00*

U.S. Cl. 524—512 **6 Claims**

1. A composition comprised of

(a) about 85 to 99 weight percent polyacetal,

(b) 0 to 5 weight percent polytetrafluoroethylene fibers,

(c) about 0.5 to 5 weight percent of an ethylene methyl acrylate copolymer having a number average particle size of less than 15 microns, and

(d) about 0.5 to 5 weight percent of at least one lubricant, with said percents being based upon the total weight of components (a), (b), (c), and (d) only.

5,559,181

STABLE CHLOROSULFONATED RESIN LATEX

John C. Chen, Hockessin, Del., assignor to E. I. du Pont De Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 866,764, Apr. 7, 1992, Pat. No. 5,491,191, which is a continuation-in-part of Ser. No. 864,118, Apr. 6, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 477,752

Int. Cl.[6] C08L *33/06*

U.S. Cl. 524—560 **7 Claims**

1. A self-stabilized chlorosulfonated resin latex composition comprising an aqueous suspension of a salt of a chlorosulfonated copolymer of a C_2–C_8 alpha-olefin and a compound selected from the group consisting of C_1–C_{12} alkyl esters of unsaturated C_3–C_{20} monocarboxylic acids and vinyl esters of saturated C_2–C_{18} carboxylic acids, said chlorosulfonated alpha-olefin copolymer having a chlorine content of 20–70 weight percent, based on the weight of said chlorosulfonated alpha-olefin copolymer, and a sulfur content of 1.5–10 weight percent, based on the weight of said chlorosulfonated alpha-olefin copolymer, with the proviso that the latex is substantially free of surfactants.

5,559,182

STABLE CHLOROSULFONATED RESIN LATEX

Edward G. Brugel, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 866,764, Apr. 7, 1992, Pat. No. 5,491,191, which is a continuation-in-part of Ser. No. 864,118, Apr. 6, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 477,753

Int. Cl.[6] C08L *33/06*

U.S. Cl. 524—560 **7 Claims**

1. A self-stabilized chlorosulfonated resin latex composition comprising an aqueous suspension of a salt of a polymer consisting essentially of a chlorosulfonated C_2–C_8 alpha-olefin polymer grafted with an unsaturated acid or anhydride, said chlorosulfonated polymer having a chlorine content of 20–70 weight percent, based on the weight of said grafted chlorosulfonated alpha-olefin polymer, and a sulfur content of 1.5–10 weight percent, based on the weight of said grafted chlorosulfonated alpha-olefin polymer, with the proviso that the latex is substantially free of surfactants.

5,559,183

SILICONE OIL-SILICA FILLER PASTE USEFUL IN LIQUID INJECTION MOLDING APPLICATIONS, METHOD FOR MAKING, AND USE

John S. Razzano, Cohoes, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jun. 7, 1995, Ser. No. 474,218

Int. Cl.[6] C08L *83/04*

U.S. Cl. 524—862 **10 Claims**

1. A silicone paste having an application rate of greater than 60 to about 400 g/min through a ¼ inch nozzle at 90 psi, comprising by weight,

(A) 100 parts of a vinyl containing polydiorganosiloxane oil having a viscosity of about 20,000 centipoise to about 100,000 centipoise at 25° C., and

(B) about 20 to about 50 parts of reinforcing silica filler, which silicone paste is made by adding the reinforcing silica filler to the vinyl containing polydiorganosiloxane oil while the vinyl containing polydiorganosiloxane oil is being agitated at a temperature in the range of between about–10° to about –60° C. and the agitation of the mixture is continued until the vinyl containing polydiorganosiloxane oil and reinforcing silica filler forms a substantially uniform paste.

5,559,184

THERMOPLASTIC RESIN COMPOSITIONS COMPRISING AMINOMETHYL SUBSTITUTED POLYPHENYLENE ETHERS

Motonobu Furuta, Chiba, and Takanari Yamaguchi, Tsukuba, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jun. 9, 1994, Ser. No. 257,289

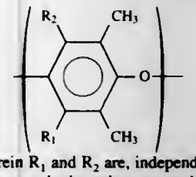
Claims priority, application Japan, Jun. 10, 1993, 5-138395

Int. Cl.[6] C08L *23/12;71/12*

U.S. Cl. 525—68 **10 Claims**

1. A thermoplastic resin composition comprising

(A) 1 to 99% by weight of a modified polyphenylene ether comprising repeating units of the formula (1):



(1)

wherein R_1 and R_2 are, independently from each other, a hydrogen atom or a hydrocarbon group having 1 to 20 carbon atoms and having a number average polymerization degree of 20 to 1200, in which 0.02/X to 1/X of methyl groups at the 2- and/or 6-positions of phenylene group are substituted by an aminomethyl group wherein X is a number average polymerization degree, and

(B) 99 to 1% by weight of a polyolefin which is modified with a compound having a functional group reactive with an amino group in a molecule.

5,559,185

THERMOPLASTIC RESIN COMPOSITION

Hiroomi Abe; Taichi Nishio; Yasurou Suzuki; Mitsuji Tsuji, and Takashi Sanada, all of Chiba, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 102,226, Aug. 5, 1993, abandoned, which is a continuation of Ser. No. 472,643, Jan. 30, 1990, abandoned. This application Jan. 13, 1995, Ser. No. 372,863

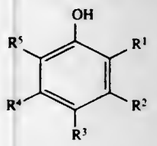
Claims priority, application Japan, Jan. 31, 1989, 1-23179

Int. Cl.[6] C08L *71/12;25/06;13/02*

U.S. Cl. 525—68 **5 Claims**

1. A process for preparing a thermoplastic resin composition which comprises melt-blending:

(A) 5–95 parts by weight of a polyphenylene ether obtained by oxidation polymerization of at least one phenol compound represented by the following formula:



wherein R^1, R^2, R^3, R^4, and R^5 each represent a hydrogen atom, a halogen atom or a substituted or unsubstituted hydrocarbon group and at least one of them is a hydrogen atom, or a polyphenylene ether-based resin composition comprising said polyphenylene ether and polystyrene,

(A') 95–5 parts by weight of a polyamide resin,

(B) 5–50 parts by weight of a saturated rubber modified by grafting 5–100 parts by weight of an aromatic vinyl compound onto 100 parts by weight of a saturated rubber and allowing 0.05–10 parts by weight of at least one compound selected from the group consisting of unsaturated carboxylic acids and unsaturated carboxylic anhydrides having a reactive unsaturated bond to react with said rubber, the grafting degree of said aromatic vinyl compound being 50% by weight or more, wherein said grafting degree is determined according to the formula:

$$\text{Grafting degree} = \frac{\text{(total amount of polystyrene} - \text{amount of homopolystyrene)}}{\text{total amount of polystyrene}}$$

and wherein said saturated rubber is at least one rubber selected from the group consisting of ethylene-propylene copolymer rubber and ethylene-1-butene copolymer rubber, and

(C) 0.05–20 parts by weight of at least one compatibilizing agent selected from the group consisting of:

maleic anhydride, fumaric acid, acrylamide, endo methylene-tetra-hydro phthalic anhydride, and derivatives thereof.

5,559,186

THERMOPLASTIC RESIN COMPOSITIONS COMPRISING BLENDS OF POLYPHENYLENE ETHER AND POLYSTYRENE COPOLYMER RESINS

Takeshi Fujii, Sodegaura; Yasuro Suzuki, Kisarazu; Hayato Kihara, and Takashi Anbo, both of Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 29, 1995, Ser. No. 413,158

Claims priority, application Japan, Mar. 31, 1994, 6-063022

Int. Cl.[6] C08L *25/08;71/12*

U.S. Cl. 525—68 **20 Claims**

1. A thermoplastic resin composition comprising:

(A) 1 to 99% by weight of a polyphenylene ether resin,

(B) 99 to 1% by weight of:

(i) a polystyrene resin prepared by copolymerization of: (a) a styrene compound, (b) about 100–500 ppm by weight of with respect to said styrene compound a compound containing 2–6 vinyl groups, and (c) optionally, a compound capable of copolymerizing with said styrene compound, wherein compounds (b) and (c) are different,

(ii) a polystyrene resin prepared by copolymerization of (a) a styrene compound, (b) about 100–500 ppm by weight of with respect to said styrene compound a compound containing a 2–6 vinyl groups, (c) optionally, a compound capable of copolymerizing with said styrene compound, and (d) a first rubber, wherein compounds (b) and (c) are different, or

(iii) a mixture of polystyrene resins (i) and (ii),

wherein said polystyrene resin (B) has a weight average molecular weight of about 150,000– 1,000,000 and a number of branching points in a z-average molecular weight of about 2–15, wherein said percentages of (A) and (B) are with respect to the total amount of (A) and (B), and said percentages of (A) and (B) total 100 percent, and

(C) 0 to 100 parts by weight of a second rubber per 100 parts by weight of the total amount of (A) and (B), wherein, for purposes of calculating parts by weight of (C), when (B) contains said first rubber, the amount of (B) excludes the amount of said first rubber, and the amount of said first rubber is added to the amount of said second rubber.

5,559,187

THERMOPLASTIC COPOLYMER, METHOD FOR PRODUCTION THEREOF, AND THERMOPLASTIC RESIN COMPOSITION CONTAINING THE COPOLYMER

Katsuaki Maeda, Yokohama; Akihiro Watanabe, Tokyo, and Hajime Nishihara, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 640,436, Jan. 31, 1991, Pat. No. 5,310,831. This application Dec. 7, 1993, Ser. No. 162,257

Claims priority, application Japan, May 30, 1989, 1-134568; Sep. 6, 1989, 1-229207; Sep. 6, 1989, 1-229325; Oct. 5, 1989, 1-258925

Int. Cl.[6] C08F *12/04;12/08;283/00*

U.S. Cl. 525—73 **13 Claims**

1. A solid thermoplastic resin composition comprising a thermoplastic terpolymer consisting of the following components:

30–70% by weight based on the weight of the terpolymer of an aromatic vinyl compound unit;

4–40% by weight based on the weight of the terpolymer of an acrylonitrile or methacrylonitrile unit; and

26–50% by weight based on the weight of the terpolymer of a maleimide unit selected from the group consisting of N-methyl maleimide, N-ethyl maleimide, N-butyl maleimide, N-phenyl maleimide, N-cyclohexyl maleimide and N-chlorophenyl maleimide; wherein the content of each of the components in each molecular weight fraction of the thermoplastic polymer is 80–120% of the content of the components in the thermoplastic polymer, said thermoplastic polymer having no acetone-insoluble content, a weight average molecular weight of not less than 100,000 and not more than 300,000, a number average molecular weight of not less than 50,000 and not more than 150,000, and a residual maleimide monomer content of not more than 50 ppm.

5,559,188

GOLF BALL

Yoshinori Egashira; Yasushi Ichikawa, and Hideo Watanabe, all of Chichibu, Japan, assignors to Bridgestone Sports Co., Ltd., Tokyo, Japan

Filed Apr. 19, 1995, Ser. No. 424,196

Claims priority, application Japan, Apr. 22, 1994, 6-107711

Int. Cl.[6] A63B *37/12;* **C08L** *33/02;9/00*

U.S. Cl. 525—74 **9 Claims**

1. A golf ball comprising a core and a cover around the core, said cover being formed of a resin composition comprising 10 to 60 parts by weight of a thermoplastic elastomer having a crystalline polyethylene block, wherein said thermoplastic elastomer is a hydrogenated product of a polybutadiene or a styrene-butadiene copolymer having a hard segment in the form of a polyethylene block or a polyethylene block and a polystyrene block and a soft segment in the form of an ethylene/butylene random copolymer and 90 to 40 parts by weight of an ionomer resin.

5,559,189

FAST CURING THERMOSETTING ACETYLENIC POLYMERIC VEHICLE

Stoil Dirlikov, and Zhao Chen, both of Ypsilanti, Mich., assignors to Easter Michigan University, Ypsilanti, Mich.

Filed Feb. 14, 1994, Ser. No. 195,541

Int. Cl.[6] C08F *8/32*

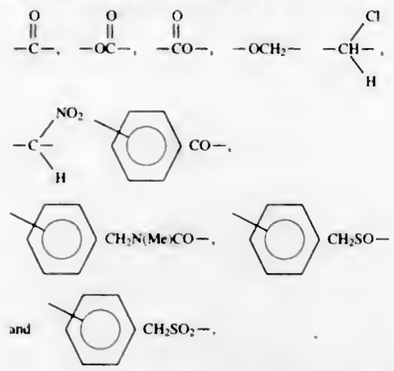
U.S. Cl. 525—105 **20 Claims**

1. A polymeric vehicle comprising:

a reactant selected from the group consisting of a homopolymer of alpha, beta unsaturated monomers and a copolymer of alpha, beta unsaturated monomers, the homopolymer and copolymer having pendent activated acetylenic groups; and

a coreactant having at least two functional groups reactive with the activated triple bonds of the reactant,

the activating group selected from the group consisting of



the coreactant functional group selected from the group consisting of amino, hydroxyl, carboxyl, thiol and $X[Si(R_1)(R_2)O]_nSi(R_1)(R_2)X$, wherein X is H or OH, wherein R_1 and R_2 are 1 to 4 carbon alkyl or phenyl groups and n=0 to 100.

5,559,190

DIFUNCTIONAL TELECHELIC LINEAR NON-CROSSLINKED POLYOLEFINS

Philip O. Nubel, and Howard B. Yokelson, both of Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 68,236, May 27, 1993, Pat. No. 5,403,904, and a continuation-in-part of Ser. No. 68,240, May 27, 1993, Pat. No. 5,519,101, and a continuation-in-part of Ser. No. 167,668, Dec. 15, 1993, Pat. No. 5,512,635. This application Jun. 2, 1995, Ser. No. 459,652

Int. Cl.[6] C08F *8/14;8/32;* **C08G** *61/12*

U.S. Cl. 525—270 **9 Claims**

1. A difunctional telechelic linear non-crosslinked polyolefin without pendant chain-branched groups wherein the functionality number of said polyolefin as determined by NMR is 2.0, the functional groups consisting essentially of ester moieties, alcohol moieties and amine moieties are other than vinyl groups, polydispersity is from 1.3 to 3.0, and polyolefin molecular structure is

$$X-[CH=CH(CH_2)_n]_m-CH=CH-X$$

wherein X is selected from the group consisting of —COOR, $-CH_2OC(O)R$, $-(CH_2)_8COOR$, $-CH_2OH$, $-(CH_2)_8COO(CH_2)_pOH$, $-COO(CH_2)_pOH$, $-(CH_2)_8C(O)NR'(CH_2)_pNHR'$ and $-C(O)NR'(CH_2)_pNHR'$, wherein p is 2 to 12, wherein R is an alkyl group of from 1 to 8 carbon atoms, R' is hydrogen or an alkyl group of 1 to 8 carbon atoms, n is 1 to 10, and m is a number average value of up to 1000.

5,559,191

FUNCTIONALISED HYDROCARBYL POLYMERS

John R. Blackborow, Edinburgh, Scotland, assignor to BP Chemicals Limited, London, England

Filed Aug. 30, 1995, Ser. No. 520,955

Claims priority, application Scotland, Aug. 30, 1994, 9417422; Aug. 30, 1994, 9417424

Int. Cl.[6] C08F *255/02;255/10;210/16;210/10*

U.S. Cl. 525—275 **11 Claims**

1. A process for functionalising synthetic hydrocarbyl polymers having at least one olefinic group, said process comprising:

i. reacting at elevated temperature the synthetic hydrocarbyl polymer with an alkyne compound substituted with at least one electron withdrawing— C(O)R or a —CN group so that the olefinic group in the polymer reacts with the alkyne group of the alkyne compound to form an intermediate and

ii. reacting the intermediate from step (i) above with a nucleophile to form a functionalised hydrocarbyl polymer.

5,559,192

AIR CURING POLYMER COMPOSITIONS

Daniel A. Bors, Warminster; Alvin C. Lavole, Lansdale, and William D. Emmons, Huntingdon Valley, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 367,482, Dec. 30, 1994, which is a continuation of Ser. No. 114,117, Aug. 30, 1993, abandoned, which is a continuation of Ser. No. 24,031, Mar. 1, 1993, abandoned, which is a continuation of Ser. No. 632,302, Dec. 21, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 467,347

Int. Cl.[6] C08F *261/10*

U.S. Cl. 525—300 **16 Claims**

1. A self-crosslinking film-forming composition consisting essentially of a vinyl polymer containing pendant acetoacetate functionality and a polyunsaturated aerobic radical source which generates a free radical flux on exposure of the composition to oxygen, wherein said aerobic radical source is selected from the group consisting of allyl and polyallyl ethers, provided that said composition contains substantially no conventional polymerization initiator.

5,559,193

CONTROLLED FUNCTIONAL DENSITY POLYAMINES AND METHOD FOR PREPARATION THEREOF

Martin P. McGrath, Webster Groves, and Samuel J. Tremont, Manchester, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 20, 1993, Ser. No. 169,236

Int. Cl.[6] C08F *2/00;8/00;8/32*

U.S. Cl. 525—326.1 **30 Claims**

1. A process for preparing a polyamine containing a controlled amount of pendant tertiary amine groups and a controlled amount of pendant secondary amine or different tertiary amine groups comprising:

(a) contacting a polyaldehyde containing a controlled amount of pendant aldehyde groups and carbon-carbon double bonds and a first secondary amine under reductive amination conditions in the presence of (1) hydrogen and a ruthenium-containing imine hydrogenation catalyst or (2) an alkali metal borohydride to produce a poly(tertiary amine) having a substantially equivalent ratio of tertiary amine groups to carbon-carbon double bonds as the ratio of aldehyde groups to carbon-carbon double bonds in said polyaldehyde,

(b) contacting said poly(tertiary amine) containing carbon-carbon double bonds with carbon monoxide and hydrogen under hydroformylation conditions in the presence of a hydroformylation catalyst to produce a poly(tertiary amine) containing a controlled amount of aldehyde groups and carbon-carbon double bonds, and

(c) subsequently contacting said poly(tertiary amine) containing a controlled amount of aldehyde groups and carbon-carbon double bonds with a primary amine or a second secondary amine and reacting said poly(tertiary amine) containing a controlled amount of aldehyde groups and carbon-carbon double bonds and said primary amine or said second secondary amine under reductive amination conditions in the presence of (1) hydrogen and a ruthenium-containing imine hydrogenation catalyst or (2) an alkali metal borohydride to produce said polyamine having a substantially equivalent ratio of secondary, amine groups derived from said primary amine or tertiary amine groups derived from said second secondary amine to carbon-carbon double bonds as the ratio of aldehyde groups to carbon-carbon double bonds in said poly(tertiary amine) containing a controlled amount of aldehyde groups and carbon-carbon double bonds, provided that when said reductive amination of (c) is done with a primary amine in the presence of an alkali metal borohydride, said primary amine is a sterically hindered aliphatic or cycloaliphatic primary amine or an aromatic primary amine.

5,559,194

MODIFIED NYLON FIBERS

Richard Kotek, Arden, N.C., and Hans-Georg Matthies, Ludwigshafen, Germany, assignors to BASF Corportion, Mt. Olive, N.J.

Continuation of Ser. No. 12,821, Feb. 3, 1993, abandoned. This application Oct. 7, 1994, Ser. No. 319,723

Int. Cl.[6] C08L *77/02;77/12*

U.S. Cl. 525—397 **9 Claims**

1. A fiber comprised of a polymer blend comprising:

a) from about 70 to about 99.85% by weight of a polyamide;

b) from about 1 to about 5% by weight of a copolymer miscible with the polyamide a) derived from hexamethylenediamine, isophthalic acid (I), and terephthalic acid (T); and

c) from about 10 to about 25% by weight of an amorphous poly(phenylene oxide) polymer immiscible with the polyamide a).

5,559,195

COATING COMPOSITION CONTAINING CARBAMATE FUNCTIONAL AND ACRYLAMIDE FUNCTIONAL COMPONENTS

John D. McGee; Brian D. Bammel, both of Highland, and John W. Rehfuss, West Bloomfield, all of Mich., assignors to BASF Corporation, Southfield, Mich.

Filed Dec. 21, 1994, Ser. No. 361,273

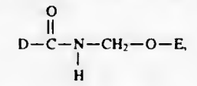
Int. Cl.[6] G08F *8/00*

U.S. Cl. 525—383 **15 Claims**

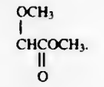
1. A coating composition comprising:

(a) a first component comprising a compound having appended thereto more than one carbamate functional group, and

(b) a second component comprising a compound reactive with said carbamate groups of component (a), which is a functionalized acrylamide compound having the formula:



where D is an aliphatic radical having a carbon chain length of between 2 and 6 carbon atoms and containing a single polymerizable double bond in the alpha-beta position with respect to the carbonyl group, where the double bond is in the terminal position, and E is a functionality selected from the group consisting of, hydrogen, an alkyl radical containing from 1 to 18 carbon atoms, and a functional group,



5,559,196

MIXTURE OF ISOCYANATE-TERMINATED POLYURETHANE PREPOLYMERS

Charles W. Stobbie, IV, Maplewood; John C. Tangen, Lake Elmo, and Lani S. Kangas, Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 258,611, Jun. 10, 1994, Pat. No. 5,436,302, which is a continuation of Ser. No. 54,460, Apr. 27, 1993, abandoned, which is a continuation of Ser. No. 515,113, Apr. 27, 1990, abandoned. This application Jun. 2, 1995, Ser. No. 459,887

Int. Cl.[6] C08L *75/06;75/08*

U.S. Cl. 525—458 **8 Claims**

1. A composition comprising:

(a) from 10 to 90 parts by weight of a first isocyanate-terminated crystalline polyurethane prepolymer that comprises the reaction product of a polybexamethylene adipate (PHA) having a number average molecular weight (Mn) of at least 2,400, with a polyisocyanate, and

(b) correspondingly, from 90 to 10 parts by weight of a second isocyanate-terminated polyurethane prepolymer that comprises the reaction product of a polytetramethylene ether glycol (THF) having number average molecular weight (Mn) of at least 500 with a polyisocyanate;

wherein the composition has been moisture cured.

5,559,197

MODIFIED PHENOLIC RESIN TOUGHENED BY PHENOXY RESIN

Chen-Chi M. Ma, and Hew-Der Wu, both of Hsinchu, Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed Aug. 15, 1995, Ser. No. 515,133

Int. Cl.[6] C08G *59/14*

U.S. Cl. 525—533 **7 Claims**

1. A modified phenolic resin toughened by phenoxy resin, which is prepared by the following steps:

a) mixing a phenoxy resin having a weight average molecular weight of 10,000–1,000,000 and phenol in a weight ratio of phenoxy resin:phenol=1.5:1–1:1 at an elevated temperature to form a glutinous mixture;

b) mixing the glutinous mixture of step a) and an acid catalyst to obtain a viscous mixture having a relatively low viscosity compared to the glutinous mixture;

c) mixing the viscose mixture of step b) and a resole type phenolic resin to form a modified phenolic resin, wherein the resole type phenolic resin has a solid content of 60–75 wt. % and a free aldehyde content of 5–10 wt. %, the amount of the acid catalyst mixed is 2–10 wt. %, and the amount of the phenoxy resin mixed is 3–25 wt. % based on the resole type phenolic resin.

5,559,198

PROCESS FOR PREPARING POLY(VINYL TRIFLUOROACETATE) AND POLY(VINYLTRIFLUOROACETATE/VINYL ESTER) COPOLYMERS IN SUPERCRITICAL CO_2

Gilbert L. Elan, Mahtomedi, and Cheryl L. S. Elsbernd, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jul. 8, 1994, Ser. No. 273,421

Int. Cl.[6] C08F *2/00*

U.S. Cl. 526—89 **11 Claims**

1. A method for the free-radical (co)polymerization of vinyl trifluoroacetate monomer comprising the steps of;

(a) preparing a homogeneous mixture comprising:

(i) vinyl trifluoroacetate monomer;

(ii) optionally, vinyl ester monomer(s);

(iii) supercritical fluid CO_2 solvent;

(iv) a peroxydicarbonate free-radical polymerization initiator; and

(b) activating the mixture to effect precipitation (co)polymerization of the monomers and form a (co)polymer, while maintaining supercritical fluid CO_2 conditions.

5,559,199

PROCESS FOR PRODUCTION OF ETHYLENE-CYCLIC OLEFIN COPOLYMER

Yoshiharu Abe; Toshihiro Sagane, and Akinori Toyota, all of Yamaguchi-ken, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan, and Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Apr. 21, 1995, Ser. No. 426,252

Claims priority, application Japan, Apr. 22, 1994, 6-084725

Int. Cl.[6] C08F *2/38;210/02*

U.S. Cl. 526—160 **5 Claims**

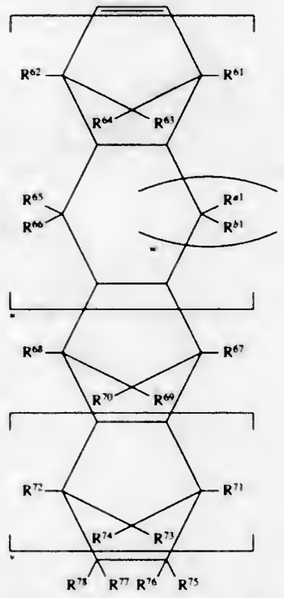
1. A process for producing a cyclic olefin copolymer, which comprises copolymerizing

(A) ethylene, and

(B) at least one cyclic olefin selected from the group consisting of

a compound represented by the following formula [I]

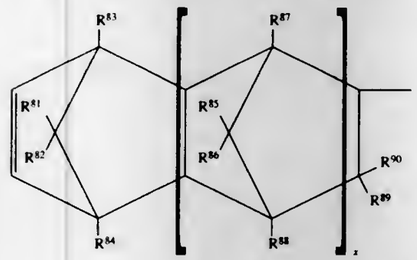
[I]

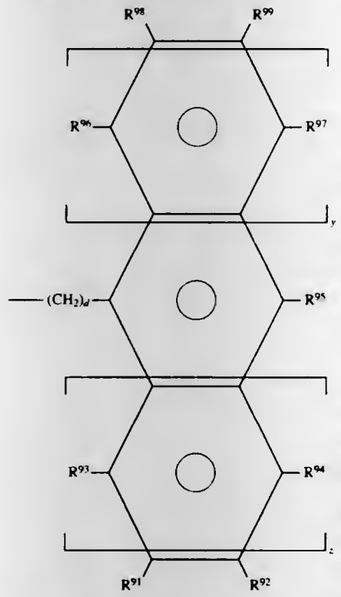


(wherein u is 0 or 1; v is 0 or a positive integer; w is 0 or 1; R^{61} to R^{78}, R^{a1} and R^{b1} are independently selected from the group consisting of a hydrogen atom, a halogen atom and a hydrocarbon group; R^{75} to R^{78} may be bonded together to form a single ring or multiple rings; the single ring or the multiple rings may have a double bond; and R^{75} and R^{76}, or R^{77} and R^{78} may form an alkylidene group).

a compound represented by the following formula [II]

[II]

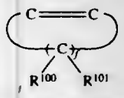




(wherein x and d are 0 or an integer of 1 or more; y and z are each 0, 1 or 2; R^{81} to R^{99} are independently selected from the group consisting of a hydrogen atom, a halogen atom, an aliphatic hydrocarbon group, an alicyclic hydrocarbon group, an aromatic hydrocarbon group and an alkoxy group; the carbon atom to which R^{89} and R^{90} are bonded and the carbon to which R^{93} is bonded or the carbon atom to which R^{91} is bonded may be bonded together directly or via an alkylene group having 1 to 3 carbon atoms; and R^{95} and R^{92}, or R^{95} and R^{99} may be bonded together to form a single aromatic ring or multiple aromatic rings when y=z=0), and

a compound represented by the following formula [III]

[III]



(wherein R^{100} and R^{101} are independently a hydrogen atom or a hydrocarbon group having 1 to 5 carbon atoms, and f is an integer of 1 to 18), in the presence of

(C) a catalyst comprising

(C_1) a transition metal compound represented by the following formula [IV]

[IV]

and

(C_2) at least one member selected from the group consisting of an organic aluminum oxy compound, a compound capable of reacting with said transition metal compound (C_1) to form an ionic complex, and a combination of at least one of these two compounds with an organic aluminum compound, and in the presence of

(D) an α-olefin having 3 to 20 carbon atoms, the α-olefin (D) having 3 to 20 carbon atoms being used in a molar ratio of α-olefin (D) to ethylene (A), of 0.0005 to 0.2.

5,559,200

RESIN FOR PLASTIC LENS

Minoru Suzuki, Funabashi; Akihiro Sasaki, Ichihara; Hiromasa Kawai, Ichihara, and Fumiaki Kanega, Ichihara, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Division of Ser. No. 128,772, Sep. 30, 1993, Pat. No. 5,449,731. This application Jun. 6, 1995, Ser. No. 470,631

Claims priority, application Japan, Oct. 1, 1992, 4-263513

Int. Cl.[6] C08F *2/38*

U.S. Cl. 526—224 **7 Claims**

1. A process for producing a resin for plastic lenses, which comprises polymerizing (a) 30 to 60 parts by weight of styrene, (b) 10 to 70 parts by weight of methacrylic acid ester or acrylic acid ester having an alicyclic hydrocarbon group having 5 to 22 carbon atoms at the ester portion, (c) 1 to 30 parts by weight of an polyfunctional monomer having 2 or more radical polymerizable functional groups, and (d) 0 to 40 parts by weight of a copolymerizable vinyl monomer other than the components (a) to (c), a total of (a) to (d) being 100 parts by weight, in the presence of 0.1 to 5% by weight of a molecular weight modifier based on the weight of the total monomers; said molecular weight modifier being selected from the group consisting of mercaptans and alphamethylstyrene dimer.

5,559,201

CYCLOALIPHATIC ACRYLIC MONOMER

Kent Sörensen, Perstorp, Sweden, assignor to Perstorp AB, Perstorp, Sweden

PCT No. PCT/SE93/00360, § 371 Date Jul. 19, 1995, § 102(e) Date Jul. 19, 1995, PCT Pub. No. WO94/17057, PCT Pub. Date Aug. 4, 1994

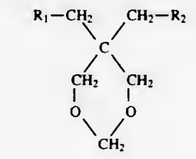
PCT Filed Apr. 26, 1993, Ser. No. 492,053

Claims priority, application Sweden, Jan. 20, 1993, 9300145

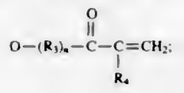
Int. Cl.[6] C08F *224/00;2/46;* **C07D** *319/06*

U.S. Cl. 526—266 **13 Claims**

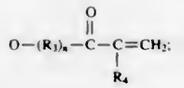
1. A cycloaliphatic acrylic monomer comprising compound having the structural formula



wherein R_1 is H, CH_3, HO, HO—$(R_3)_n$ or



R_2 is



R_3 is C_2H_4O, C_3H_6O, C_4H_8O, C_8H_8O or mixtures thereof; R_4 is H or CH_3; and n is 1–24.

5,559,202

BOWL-SHAPE MICROPARTICLE AND PRODUCTION THEREOF

Hirofumi Yoshikawa, Yao, Japan, assignor to Matsumoto Yushi-Seiyaku Co., Ltd., Osaka, Japan

Continuation of Ser. No. 182,038, Jan. 21, 1994. This application Jun. 6, 1995, Ser. No. 466,422

Claims priority, application Japan, May 20, 1992, 4-127260

Int. Cl.[6] C06F *2/18*

U.S. Cl. 526—207 **5 Claims**

1. A bowl-shaped crosslinked polymer microparticle of hemisphere or half elliptic sphere having a depression at the center, and a water uptake of from 80 to 140 ml/100 g, wherein the crosslinked polymer comprises at least one monomer selected from the group consisting of styrene, methylstyrene, vinyl toluene, methacrylic esters, acrylic esters, vinyl acetate, acrylonitrile, vinyl chloride, vinylidene chloride, chloroprene, isoprene, butadiene, acrolein, acrylamide, allyl alcohol, vinyl pyridine, vinyl benzoate, allyl benzoate, and combinations thereof, and wherein the crosslinked polymer is cross-linked with a cross-linking agent selected from the group consisting of divinylbenzene, ethylene dimethacrylate, triethylene glycol dimethacrylate, ethylene glycol dimethacrylate, 1,3-butylene dimethacrylate, allyl methacrylate, and trimethylolpropane trimethacrylate.

5,559,203

POLYMER PRECURSORS FOR ALUMINUM NITRIDE

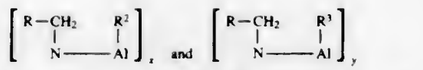
James A. Jensen, Hockessin, Del., assignor to Lanxide Technology Company, LP, Newark, Del.

Continuation of Ser. No. 176,559, Jan. 3, 1994, Pat. No. 5,457,173, which is a continuation-in-part of Ser. No. 907,726, Jul. 2, 1992, Pat. No. 5,276,105, which is a continuation-in-part of Ser. No. 594,754, Oct. 9, 1990, abandoned. This application Aug. 11, 1995, Ser. No. 514,198

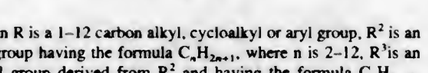
Int. Cl.[6] C08G *79/00*

U.S. Cl. 528—9 **9 Claims**

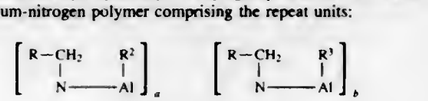
4. A transaminated aluminum-nitrogen polymer prepared by reacting a polymer comprising the repeat units:



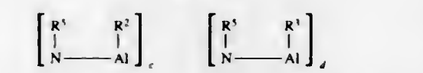
and



wherein R is a 1–12 carbon alkyl, cycloalkyl or aryl group, R^2 is an alkyl group having the formula C_nH_{2n+1}, where n is 2–12, R^3 is an alkenyl group derived from R^2 and having the formula C_nH_{2n-1}, where n is 2–12 and is the same as in R^2, y and x are each greater than 0 and y is greater than x, with ammonia or a 1–12 carbon primary alkyl, cycloalkyl or aryl amine. R^4NH_2, wherein R^4 is a 1–12 carbon alkyl, cycloalkyl or aryl group, said transaminated aluminum-nitrogen polymer comprising the repeat units:



and



wherein R, R^2 and R^3 are defined as above, and R^5 is H or R^4 and further wherein x and y are each greater than zero and a, b, c, and d are each greater than or equal to zero with the proviso that at least one of a and b is not zero, and wherein the values of a, b, c and d depend upon the original amounts of x and y and the amount of said ammonia or said 1–12 carbon primary alkyl, cycloalkyl or aryl amine added in the transamination reaction.

5,559,204

POLYISOCYANATE/POLYAMINE MIXTURES AND THEIR USE FOR THE PRODUCTION OF POLYUREA COATINGS

Edward P. Squiller, Pittsburgh, Pa., and Christian Zweiner, Leverkusen, Germany, assignors to Bayer Corporation, Pittsburgh, Pa., and Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 297,357, Aug. 29, 1994, Pat. No. 5,489,704. This application May 24, 1995, Ser. No. 449,037

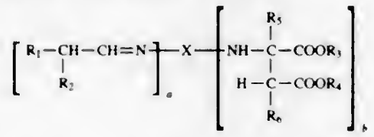
Int. Cl.[6] C08G *18/34*

U.S. Cl. 528—84 **16 Claims**

1. A coating composition comprising

a) a polyisocyanate component,

b) an isocyanate-reactive component comprising an aldimine/aspartate corresponding to the formula



wherein

X represents an organic group which has a valency of n and is inert towards isocyanate groups at a temperature of 100° C. or less,

R_1 and R_2 may be the same or different and represent optionally substituted hydrocarbon radicals, or R_1 and R_2 together with the β-carbon atom form a cycloaliphatic or heterocyclic ring and

R_3 and R_4 may be identical or different and represent organic groups which are inert towards isocyanate groups at a temperature of 100° C. or less,

R_5 and R_6 may be identical or different and represent hydrogen or organic groups which are inert towards isocyanate groups at a temperature of 100° C. or less, and

a and b represent integers with a value of 1 to 5, provided that the sum of a and b is 2 to 6

wherein polyisocyanate a) and isocyanate-reactive component b) are present in an amount sufficient to provide an equivalent ratio of isocyanate groups to aldimine groups and aspartate groups of 0.5:1 to 20:1.

5,559,205

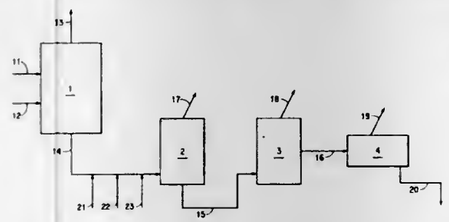
SULFONATE-CONTAINING POLYESTERS DYEABLE WITH BASIC DYES

Steven M. Hansen, Kinston; James M. Howell, Greenville, and Cecil E. Reese, Kinston, all of N.C., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 18, 1995, Ser. No. 443,744

Int. Cl.[6] C08G *63/82*

U.S. Cl. 528—279 **10 Claims**



1. A continuous process for preparing basic-dyeable polyester polymer, involving reacting terephthalic acid or dimethyl terephthalate with excess glycol to form a low molecular weight glycollate of terephthalic acid (HPG) in a first reaction zone, passing a stream of molten HPG from said first reaction zone to a condensation polymerization zone, carrying out condensation polymerization of said molten HPG to form the desired polyester polymer in molten state in said condensation polymerization zone, and cooling the resulting polymer to a solid, wherein an improvement comprises making delustered basic-dyeable polyester polymer by metering into said stream of molten HPG titanium dioxide, in amount 0.1 to 2 percent by weight, followed by metering into the resulting stream of molten HPG well-mixed with titanium dioxide a metal sulphonate salt of a glycollate of isophthalic acid, in amount 0.5 to 5 mole percent, said percent amounts being calculated with respect to the polyester polymer that is prepared.

5,559,206

PARTIALLY ESTERIFIED ROSIN BASED RESINS

Theodore J. Williams, Panama City, Fla., assignor to Arizona Chemical Company, Panama City, Fla.

Filed Mar. 1, 1995, Ser. No. 396,530

Int. Cl.[6] C09F *1/02*

U.S. Cl. 530—210 **24 Claims**

1. A process for preparing a rosin ester resin which comprises:

reacting rosin with from about 5 to about 35 wt. %, based on the weight of rosin, of an ethylenically unsaturated carboxylic acid in a reaction vessel to form an adduct thereof;

reacting the adduct in a closed reaction vessel at superatmospheric pressure and elevated temperature with from about 1 to about 40 wt. %, based on the weight of rosin, of a polyol to form a rosin ester reaction product and water of reaction; and

retaining at least a portion of the water of reaction in the reaction vessel during the adduct/polyol esterification reaction whereby the progress of the adduct/polyol esterification reaction is limited to enable achievement of a desired degree of partial esterification as a function of the amount of water retained in the vessel.

5,559,207

TEXAPHYRIN METAL COMPLEX MEDIATED ESTER HYDROLYSIS

Jonathan L. Sessler, Austin, Tex.; Daniel A. Smith, Goshen, Ind.; Richard A. Miller, Portola Valley, Calif.; Kevin L. Ross, Blue Ash, Ohio; Meredith Wright, San Jose; William C. Dow, Fremont, both of Calif.; Vladimir A. Král; Brent Iverson, both of Austin, Tex., and Darren Magda, Cupertino, Calif., assignors to Board of Regents, University of Texas, Austin, Tex., and Pharmacyclics, Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 75,123, Jun. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 822,964, Jan. 21, 1992, Pat. No. 5,252,720, which is a continuation-in-part of Ser. No. 771,393, Sep. 30, 1991, abandoned, which is a continuation-in-part of Ser. No. 539,975, Jun. 18, 1990, Pat. No. 5,162,509, which is a division of Ser. No. 320,293, Mar. 6, 1989, Pat. No. 4,935,498. This application Apr. 14, 1994, Ser. No. 227,370

Int. Cl.[6] C07K *2/00;16/00;* **C07H** *3/00;* **C07F** *5/00*

U.S. Cl. 530—300 **40 Claims**

1. A method of phosphate ester hydrolysis, comprising

obtaining an aqueous phosphate ester solution, and

incubating the solution with a texaphyrin metal complex, said incubation being under conditions and for a time sufficient to hydrolyze the phosphate ester.

5,559,208

ANTI-OBESITY PROTEINS

Margret B. Basinski, Indianapolis; Richard D. DiMarchi, Carmel; William F. Heath, Jr., Fishers, and Brigitte E. Schoner, Monrovia, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 381,031, Jan. 31, 1995, abandoned. This application Feb. 6, 1995, Ser. No. 383,639

Int. Cl.[6] A61K *35/00;* **C07K** *7/10*

U.S. Cl. 530—317 **15 Claims**

1. A protein comprising the amino acids of position 95 through position 119 of SEQ ID NO: 1 properly crosslinked to SEQ ID NO: 2, or a pharmaceutically acceptable salt thereof.

5,559,209

REGULATOR REGIONS OF G PROTEINS

Ikuo Nishimoto, Brookline, Mass., assignor to The General Hospital Corporation, Boston, Mass.

Filed Feb. 18, 1993, Ser. No. 19,073

Int. Cl.[6] A61K *38/00;* **C07K** *7/06;7/08;7/10*

U.S. Cl. 530—326 **14 Claims**

1. A molecule comprising the anticouplone sequence of a G protein, wherein said molecule consists of a peptide having an amino acid sequence selected from the group consisting of

DAVTDVIIKNNLKDC	(SEQ ID NO: 3);
DTKNVQFVFDAVTDVIIKNNLKDC	(SEQ ID NO: 4);
DAVTDVIIKNNLKEC	(SEQ ID NO: 5);

DTKNVQFVFDAVTDVIIKNNLKEC	(SEQ ID NO: 6);

(b) X is a linking moiety wherein —X—P is attached to a

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POLYETHYLENE PROTEIN CONJUGATES

DTKNVQFVFDAVTDVIIKNNLKEC (SEQ ID NO: 6);

DAVTDIIIANNLRGC (SEQ ID NO: 8);

NNIQVVFDAVTDIIIANNLRGC (SEQ ID NO: 9);

DAVTDIIIAKNLRGC (SEQ ID NO: 10);

NNIQFVFDAVTDIIIAKNLRGC (SEQ ID NO: 11);

NDCRDIIQRMHLRQY (SEQ ID NO: 12);

DTENIRRVFNDCRDIIQRMHLRQY (SEQ ID NO: 13);

AAVKDTILQLNLKEY (SEQ ID NO: 14); and

DTENIRFVFAAVKDTILQLNLKEY (SEQ ID NO: 15).

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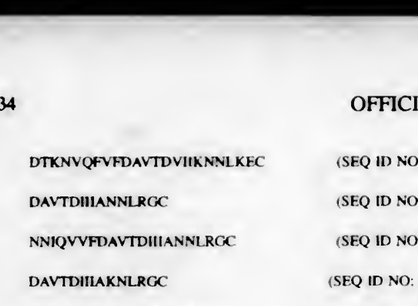
REAGENTS AND METHODS FOR THE DETECTION AND QUANTIFICATION OF TESTOSTERONE IN FLUID SAMPLES

Maciej Adamczyk, Gurnee; Yon-Yih Chen, Mundelein, both of Ill.; John A. Walling, Charles City, Iowa; Bryan D. James, Chicago, and Sharon G. Artip, Elmhurst, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

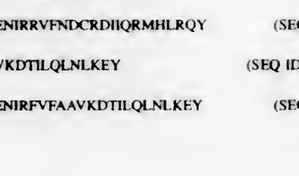
Division of Ser. No. 102,083, Aug. 3, 1993, Pat. No. 5,491,071. This application Apr. 28, 1995, Ser. No. 430,638

Int. Cl.[6] A61K *38/00;38/24;* **C07H** *21/04;* **C12Q** *1/26*

U.S. Cl. 530—345 **17 Claims**



1. A Position 1 immunogen having the following formula,



wherein

(a) P is an immunogenic carrier material,

(b) X is a linking moiety wherein —X—P is attached to a testosterone derivative,

(c) n is from 1 [and]to 10, inclusive, and

(d) the degree of substitution of the P by the testosterone derivative is from 1% to 100%, inclusive.

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BIOLOGICALLY ACTIVE PRODUCT PRODUCED BY STREPTOCOCCUS PYOGENES AND METHOD OF PURIFICATION

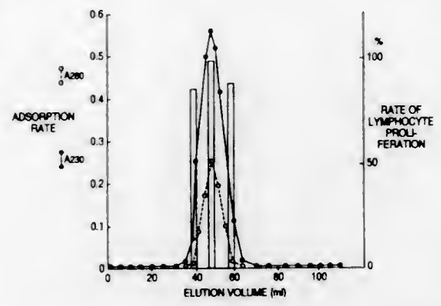
Katsuo Kumagai, Aoba-ku Sendai; Hidemi Rikiishi, Tagajo; Keiji Tamura; Shunji Sugawara, both of Aobaku Sendai; Fiji Nemoto, Tokyo; Shigefumi Okamoto, Aobaku Sendai, and Tokio Onta, Tokyo, all of Japan, assignors to Kabushiki Kaisha Saikin Kagaku Kenkyujo, Miyagi-ken, Japan

Filed Feb. 18, 1994, Ser. No. 198,345

Claims priority, application Japan, Jun. 11, 1993, 140893

Int. Cl.[6] C07K *14/315;1/36;* **C12N** *1/20;* **C12Q** *1/02*

U.S. Cl. 530—350 **4 Claims**



1. A stable biologically active protein having a molecular weight of 20,000 to 30,000 and an isoelectric point of 8.0 to 10.0 with the amino acid composition:

Aspartic acid	3.2 nm %
Threonine	7.5
Serine	2.9
Glutamic acid	19.5
Proline	1.9
Glycine	30.0
Alanine	2.3
Valine	4.7
Methionine	3.6
Isoleucine	1.3
Leucine	11.5
Tyrosine	0.3
Phenylalanine	2.0
Lysine	2.2
Histidine	5.2
Arginine	1.9

obtained from a culture of *Streptococcus pyogenes.*

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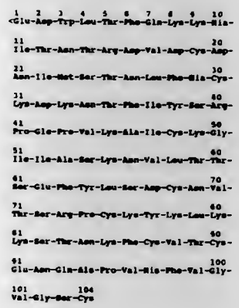
FROG EMBRYO AND EGG-DERIVED TUMOR CELL ANTI-PROLIFERATION PROTEIN

Wojciech J. Ardelt, Passaic, N.J., assignor to Alfacell Corporation, Bloomfield, N.J.

Continuation of Ser. No. 814,332, Feb. 3, 1992, which is a continuation-in-part of Ser. No. 436,141, Nov. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 178,118, Apr. 6, 1988, Pat. No. 4,882,421. This application Aug. 1, 1994, Ser. No. 283,970

Int. Cl.[6] C07K *14/475*

U.S. Cl. 530—350 **1 Claim**



1. A homogeneous protein having the following amino acid sequence:

1 2 3 4 5 6 7 8 9 10
<Glu—Asp—Trp—Leu—Thr—Phe—Gln—Lys—Lys—His—

11 20
Ile—Thr—Asn—Thr—Arg—Asp—Val—Asp—Cys—Asp—

21 30
Asn—Ile—Met—Ser—Thr—Asn—Leu—Phe—His—Cys—

31 40
Lys—Asp—Lys—Asn—Thr—Phe—Ile—Tyr—Ser—Arg—

41 50
Pro—Glu—Pro—Val—Lys—Ala—Ile—Cys—Lys—Gly—

51 60
Ile—Ile—Ala—Ser—Lys—Asn—Val—Leu—Thr—Thr—

61 70
Ser—Glu—Phe—Tyr—Leu—Ser—Asp—Cys—Asn—Val—

71 80
Thr—Ser—Arg—Pro—Cys—Lys—Tyr—Lys—Leu—Lys—

81 90
Lys—Ser—Thr—Asn—Lys—Phe—Cys—Val—Thr—Cys—

91 100
Glu—Asn—Gln—Ala—Pro—Val—His—Phe—Val—Gly—

101 104
Val—Gly—Ser—Cys.

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POLYETHYLENE-PROTEIN CONJUGATES

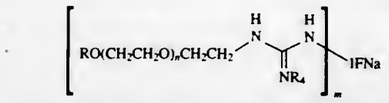
John Hakimi, Scarsdale, N.Y.; Patricia Kilian, Upper Montclair, and Perry Rosen, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 767,000, Sep. 27, 1991, which is a continuation-in-part of Ser. No. 674,001, Mar. 25, 1991, abandoned. This application Jun. 1, 1995, Ser. No. 457,057

Int. Cl.[6] C07K *1/00;* **A61K** *45/05;38/21;* **C12N** *9/96*

U.S. Cl. 530—351 **4 Claims**

1. A physiologically active IFNα conjugate of the formula



I-A

wherein R is lower alkyl; R_4 is lower alkyl or cyclo lower alkyl; m and n form any combination of numbers such that the conjugate and are selected such that the molecular weight of the conjugate, excluding the IFNα, is from 300 to 30,000 daltons has a portion of the biological activity of the protein which forms the conjugate.

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UNSYMMETRICAL COMPLEXING AGENTS AND TARGETING IMMUNOREAGENTS USEFUL IN THEARPEUTIC AND DIAGNOSTIC COMPOSITIONS AND METHODS

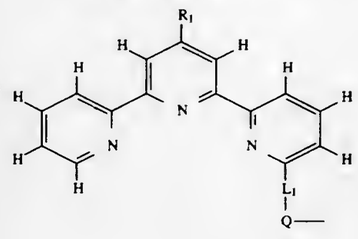
Daniel J. Delecki, Upper Merion Township, Montgomery County; Ashis K. Saha, Frazer, and Robert A. Snow, West Chester, all of Pa., assignors to Sterling Winthrop Inc., New York, N.Y.

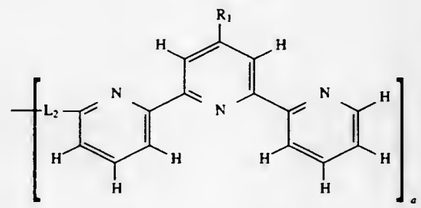
Filed May 28, 1993, Ser. No. 69,242

Int. Cl.[6] C07F *13/00;5/00;* **C07D** *213/22*

U.S. Cl. 534—10 **18 Claims**

1. A compound having the structure:





wherein

each R_1 is independently selected from the group consisting of optionally substituted C_{1-20}alkyl, C_{1-20}-alkoxy, C_{1-20}-alkylthio, N,N-di-C_{1-20}-alkylamino, (C_{1-20}-alkyl)formamido, C_{6-24}-aryl groups, optionally substituted monocyclic heterocyclic groups having 5 or 6 ring atoms and containing a heteroatom selected from N, S, P and O. optionally substituted bicyclic heterocycyl groups having 5 or 6 ring atoms in each ring and containing a heteroatom selected from N, S, P and O, and protein reactive groups;

each of L_1 and L_2 is a linking group independently selected from a chemical bond, a methylene group, and an imino group;

Q is the residue of a chelating agent selected from the group

4. A monoazo compound of the formula (2A)

2-phenylbenzothiazole, benzothiazolone, indazole, phthalim-

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Q is the residue of a chelating agent selected from the group consisting of polyphosphate, aminocarboxylic acid, 1,3-diketone, hydroxycarboxylic acid, polyamine, aminoalcohol, aromatic heterocyclic base, phenol, aminophenol, oxime, peptide, Schiff's base, tetrapyrrole, sulphur compound, synthetic macrocyclic compound, phosponic acid and combinations thereof;

and a is 0 or 1.

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BLACK MIXTURE OF FIBRE-REACTIVE AZO DYES CONTAINING ESSENTIALLY A NAVY-BLUE DISAZO DYE AND AN ORANGE MONOAZO DYE, AS WELL AS NOVEL FIBRE-REACTIVE PHENYLAZONAPHTHOL DYES CONTAINING A 2-(2'-SUFOPHENYLAMINO)-4-FLUORO-1,3,5-TRIAZIN-6-YLAMINO GROUP

Jörg Daanheim, Frankfurt, and Werner H. Russ, Flörsheim, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

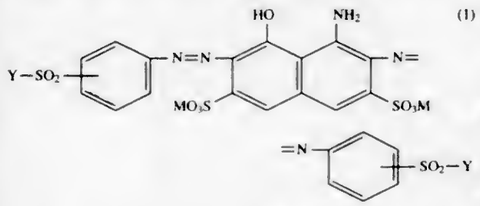
Filed Apr. 28, 1995, Ser. No. 430,405

Claims priority, application Germany, May 2, 1994, 44 15 385.6

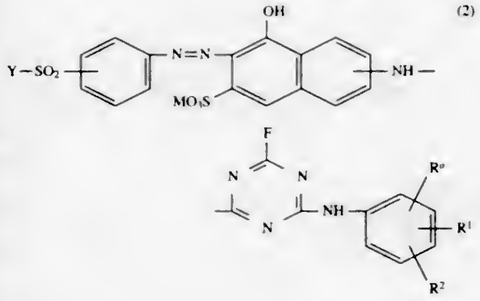
Int. Cl.[6] **C09B** *62/008;43/16;67/22;67/24;* **D06P** *1/38;3/10*

U.S. Cl. 534—573 **4 Claims**

1. A dye mixture comprising one or more disazo dyes of the formula (1) and one or more monoazo dyes of the formula (2)



(1)



(2)

in which:

M is hydrogen or an alkali metal;

R^o is sulfo or carboxy;

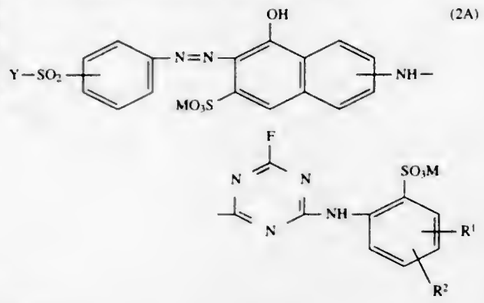
R^1 is hydrogen, methyl, ethyl, methoxy, ethoxy, sulfo or carboxy;

R^2 is hydrogen, methyl, ethyl, methoxy or ethoxy;

Y is at each occurrence independently of the others vinyl, β-chloroethyl, β-thiosulfatoethyl, β-phosphatoethyl or β-sulfatoethyl;

in formula (2) the fluorotriazinyl group is attached in position 2 or 3 to the 8-hydroxy- 6-sulfonaphthalene radical.

4. A monoazo compound of the formula (2A)



(2A)

in which

M is hydrogen or an alkali metal,

Y is vinyl, β-chloroethyl, β-phosphatoethyl, β-thiosulfatoethyl or β-sulfatoethyl,

R^1 is hydrogen, methyl, ethyl, methoxy, ethoxy, sulfo or carboxy,

R^2 is hydrogen, methyl, ethyl, methoxy or ethoxy, and

the fluorotriazinylamino group is attached in position 2 or 3 to the 8-hydroxy- 6-sulfonaphthalene radical.

5,559,216

SINGLE-STEP PROCESS FOR THE PREPARATION OF BIS-(ACETOACETYLAMINO) BENZENE DISAZO PIGMENTS

Ruediger Jung; Joachim Weide, both of Kelkheim, and Hans J. Metz, Darmstadt, all of Germany, assignors to Hoechst AG, Germany

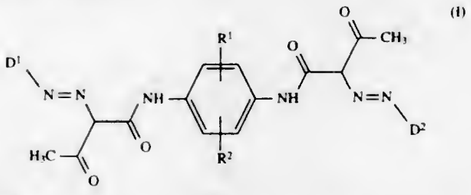
Filed Sep. 1, 1993, Ser. No. 115,894

Claims priority, application Germany, Sep. 2, 1992, 42 29 207.7

Int. Cl.[6] **C09B** *41/00;33/153;56/12;* **C09D** *11/02;* **B41M** *1/00*

U.S. Cl. 534—579 **18 Claims**

1. A process for preparing printing inks comprising the step of preparing a disazo pigment of the formula (I) or a mixture of said disazo pigments



(I)

where

D^1 and D^2 are identical or different and each is unsubstituted phenyl or phenyl substituted by from 1 to 3 radicals selected from the group consisting of C_1–C_4-alkyl, C_1–C_4-alkoxy, phenoxy, halophenoxy, carboxyl, carbalkoxy, acyl, acyloxy, acylamino, N-mono- or N,N-disubstituted carbamoyl, N-mono- or N,N-disubstituted sulfamoyl, sulfo, cyano, halogen, nitro and trifluoromethyl; or

each is an anthraquinone radical which is linked by the 1- or 2-position to the nitrogen atom of the azo bridge and is unsubstituted or substituted by from 1 to 3 radicals selected from the group consisting of halogen, hydroxyl, nitro, C_1–C_4-alkyl, carboxyl, acyl, COO-C_1–C_4-alkyl, $CONH_2$, acylamino, C_1–C_4-alkoxy, C_1–C_8-alkylamino, benzylamino, anilino, C_1–C_4-alkylthio and C_1–C_4-alkylphenylsulfonylamino; or

each is a radical of an aromatic heterocycle selected from the group consisting of benzimidazole, benzimidazolone, benzimidazolethione, benzoxazole, benzoxazolone, benzothiazole, 2-phenylbenzothiazole, benzothiazolone, indazole, phthalimide, naphthalimide, benzotriazole, quinonline, quinazoline, quinazolinone, phthalazine, phthalazinone, quinoxaline, benzo{c,d,}indolone, benzimidazo{1,2}-pyrimidone, benzo{e}{1,3}oxazinone, dibenzo{a,c}phenazine, quionxalinone, carbazole and indole, said heterocycles being unsubstituted or substituted by from 1 to 3 radicals selected from the group consisting of halogen, amino, (C_1–C_4-alkyl, acetamido, carbomethoxyamino, C_1–C_4-alkoxy, nitro, hydroxyphenyl, phenyl, sulfo and carboxyl,

R^1 and R^2 are identical or different and each is hydrogen, halogen, C_1–C_4-alkyl, C_1–C_4 -alkoxy, C_1–C_5-alkoxycarbonyl, nitro, cyano, phenoxy or trifluoromethyl, by azo coupling, which comprises am coupling in an aqueous medium and in the absence of an organic solvent and without a separate after treatment in an organic solvent and adding at the latest immediately prior to the isolation of the disazo pigment at least one nonionic surfactant which has a cloud point in aqueous solution;

and incorporating said disazo pigment into a printing ink medium.

5,559,217

DISAZO DYES AND A PROCESS OF DYEING PAPER THEREWITH

Adolf Käser, Bottmingen, Switzerland, assignor to Ciba-Geigy Corporation, Tarrytown, N.Y.

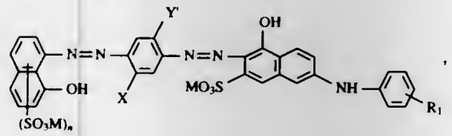
Division of Ser. No. 230,264, Apr. 20, 1994, Pat. No. 5,487,761. This application Oct. 2, 1995, Ser. No. 538,091

Claims priority, application Switzerland, Apr. 29, 1993, 1303/93

Int. Cl.[6] **C09B** *31/072;* **D21H** *21/28*

U.S. Cl. 534—828 **3 Claims**

1. A dye of the formula



(6)

in which

X is hydrogen, alkyl, alkoxy or —NH—CO—Z,

Y' is a C_1–C_4alkoxy radical, which is substituted by hydroxyl, C_1–C_4alkoxy, sulfo, carboxyl, phenyl, phenoxy or phenylaminocarbonyl,

Z is hydrogen, alkyl, aryl, alkoxy, amino, mono- or dialkylamino or arylamino,

R_1 is hydrogen, alkyl, alkoxy, halogen, SO3M or carboxyl,

M is hydrogen or one equivalent of a colourless cation,

n is 1 or 2 and

m is 0 or 1.

5,559,218

2-AROYLCYCLOHEXANEDIONES AND THEIR USE AS HERBICIDES OR PLANT GROWTH-REGULATING AGENTS

Jürgen Kast, Böhl-Iggelheim; Wolfgang von Deyn, Neustadt; Christoph Nübling, Hassloch; Helmut Walter, Obrigheim; Matthias Gerber, Limburgerhof, and Karl-Otto Westphalen, Speyer, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

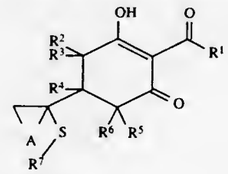
Filed Feb. 6, 1995, Ser. No. 384,155

Claims priority, application Germany, Feb. 7, 1994, 44 03 670.1

Int. Cl.[6] **C07C** *245/02;317/12;321/22;* **A01N** *41/10*

U.S. Cl. 534—850 **6 Claims**

1. A 2-aroylcyclohexanedione of the formula I



I

where

A is C_1–C_6-alkylene;

R^1 is the phenyl ring or a 5-membered or 6-membered hetaryl ring, each phenyl or hetaryl ring carrying at least one substituent but not more than four substituents, each selected from the group consisting of halogen, cyano, nitro, —N=N—Ph, —$S(O)_mR^8$, (C_1–C_4-alkoxy)carbonyl, —SO_2—$N(R^9)R^{10}$, —$N(R^9)$—COR^{10}, —$N(R^9)$—SO_2R^{11}, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-haloalkyl and C_1–C_4-haloalkoxy, where the four last-mentioned radicals are unsubstituted or optionally substituted by one or two of the following: C_1–C_4-alkoxy, C_1–C_4-alkylthio and/or cyano,

and where two adjacent carbon atoms of the phenyl and hetaryl rings may be bridged by a chain selected from the group consisting of

—$C(R^{12})$=$C(R^{13})$—$C(R^{14})$=$C(R^{15})$—, —X—$C(R^{12})$=N—, —X—N=$C(R^{12})$—, —$C(R^{12})$=N—$C(R^{14}, R^{15})$—X—, —X—$C(R^{12})$=N—$C(R^{13}, R^{14})$—, —X—$C(R^{12})$=$C(R^{13})$—, —X—$C(R^{12})$=$C(R^{13})$—$C(R^{14}, R^{15})$—, —X—$C(R^{12}, R^{13})$—$C(R^{14}, R^{15})$—, —$C(R^{12}, R^{13})$—X—$C(^{14}, R^{15})$—, —X—$C(R^{12}, R^{13})$—Y—, —X—$C(R^{12}, R^{13})$—$C(R^{14}, R^{15})$—Y—, —X—$C(R^{12}, R^{13})$—$C(R^{14}, R^{15})$—$C(R^{16}, R^{17})$—, —$C(R^{12}, R^{13})$—X—$C(R^{14}, R^{15})$—$C(R^{16}, R^{17})$—, —X—$N(R^{20})$—X—, —S—$N(R^{20})$—X—, —$C(R^{12}, R^{13})$—$N(R^{20})$—X—, —X—$N(R^{20})$—Y—$N(R^{21})$— and —$N(R^{20})$—X—N=$X(R^{12})$—,

X and Y independently of one another are each oxygen, sulfur, —SO—, —SO_2—, —CO—, —$C(R^{18}, R^{19})$— or —NR^{20}— and R^{12} to R^{19} are each hydrogen, halogen, hydroxyl, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-alkylamino, di-(C_1–C_4-alkyl)amino or phenyl and R^{20} and R^{21} are each hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, (C_1–C_4-alkyl)carbonyl, phenyl or benzoyl;

Ph is phenyl which is unsubstituted or optionally is substituted by from one to three substituents selected from the group consisting of halogen, cyano, nitro, —$S(O)_nR^{22}$, (C_{1-C4}-alkoxy)carbonyl, —SO_2—$N(R^{23})R^{24}$, — $N(R^{23})$—COR^{24}, —$N(R^{23}$—SO_2R^{25}, C_{1-C4}-alkyl, C_1–C_4-alkoxy, C_{1-C4}-haloalkyl and C_{1-C4}-haloalkoxy, where the four last-mentioned radicals in turn optionally are substituted by one or two of the following substituents: C_{1-C4}-alkoxy, C_1—alkylthio and/or cyano;

m and n are each 0, 1 or 2;

R^8 and R^{22} independently of one another are each C_1–C_4-alkyl or C_1–C_4-haloalkyl, where these groups are unsubstituted or, are substituted by one or two C_1–C_4-alkoxy, C_1–C_4-alkylthio and/or cyano radicals;

R^9, R^{10}, R^{23} and R^{24} independently of one another are each hydrogen, C_1–C_4alkyl, C_1–C_4-haloalkyl, unsubstituted phenyl

or phenyl which carries from one to three radicals selected

5,559,221

METHOD OF SEPARATING OLIGONUCLEOTIDES

ribopentofuranosyl)-cytosine (VI and VIA) and separating the (VI and VIA) from the fifth reaction mixture

represents a hydrogen atom, a hydroxyl group, a lower alkyl group,

or phenyl which carries from one to three radicals selected from the group consisting of halogen, C_1–C_4-alkyl and C_1–C_4-alkoxy;

R^{11} and R^{25} independently of one another are each C_1–C_4-alkyl or C_1–C_4-haloalkyl, where these groups optionally carry one or two cyano, phenyl and/or benzyl radicals;

R^2, R^3, R^4 and R^5 independently of one another are each hydrogen or C_1–C_4-alkyl;

R^6 is hydrogen, C_1–C_4-alkyl or (C_1–C_4-alkoxy)-carbonyl;

R^7 is C_1–C_4-alkyl,

with the proviso that R^1 is not mono- or dihalophenyl, or the agriculturally useful salts thereof or the esters of I with C_1–C_{10}-carboxylic acids or inorganic acids.

4. A method for controlling undesirable plant growth, wherein a herbicidal amount of at least one 2-aroylcyclohexanedione of the formula I or an agriculturally useful salt or an ester of I, as defined in claim 1, is caused to act on plants or their habitat or on seed.

5,559,219

MODIFIED PROCESS FOR THE DIRECT PRODUCTION OF ALKYL GLYCOSIDES

Willi Wuest, Ratingen; Joseph Wollmann, Herzogenrath, and Rainer Eskuchen, Duesseldorf-Benrath, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP91/01010, § 371 Date Feb. 9, 1992, § 102(e) Date Feb. 9, 1992, PCT Pub. No. WO91/19722, PCT Pub. Date Dec. 26, 1991

PCT Filed May 31, 1991, Ser. No. 952,535

Claims priority, application Germany, Jun. 9, 1990, 40 18 583.4

Int. Cl.[6] **C07H** *1/00;3/02;15/04*

U.S. Cl. 536—18.6 **20 Claims**

1. A process for the production of alkyl glycosides comprising the steps of

A) heating a mixture of an alcohol and an acidic catalyst in a reaction zone;

B) circulating a portion of said mixture to a premixing zone maintained at a pressure in the range of from about 300 to about 900 mbar and mixing said mixture with a solid glycose to form a paste;

C) introducing said paste into the reaction zone which is maintained at a pressure below 100 mbar; and

D) continuing the reaction in the reaction zone to produce the alkyl glycoside product;

wherein the alcohol in step A) is the total quantity of alcohol used in the process.

5,559,220

GENE ENCODING ACETYL-COENZYME A CARBOXYLASE

Paul G. Roessler, Golden, Colo., and John B. Ohlrogge, Okemos, Mich., assignors to Midwest Research Institute, Kansas City, Mo.

Continuation of Ser. No. 120,938, Sep. 14, 1993, abandoned. This application Apr. 7, 1995, Ser. No. 418,893

Int. Cl.[6] **C12N** *15/29;5/04;15/55;9/18;1/13*

U.S. Cl. 536—23.6 **9 Claims**

1. An isolated and purified DNA encoding an acetyl-coenzyme A carboxylase (ACCase) protein from *Cyclotella cryptica* having ACCase activity.

5,559,221

METHOD OF SEPARATING OLIGONUCLEOTIDES FROM A MIXTURE

Sudhir Agrawal, and Paul C. Zamecnik, both of Shrewsbury, Mass., assignors to Worcester Foundation for Experimental Biology, Shrewsbury, Mass.

Continuation of Ser. No. 311,111, Feb. 15, 1989, Pat. No. 5,352,578. This application May 10, 1994, Ser. No. 240,256

The portion of the term of this patent subsequent to Oct. 4, 2011, has been disclaimed.

Int. Cl.[6] **C07H** *21/00*

U.S. Cl. 536—25.4 **9 Claims**

1. A method of separating full length target oligonucleotides from failed sequences in an oligonucleotide mixture resulting from an oligonucleotide synthesis reaction, the method comprising:

a. contacting the oligonucleotide mixture with a solid support to which short oligonucleotides are covalently bound, said contacting being done under conditions appropriate for hybridization of complementary nucleotide sequences resulting in hybridization of the short oligonucleotides with both full length target oligonucleotides and nearly full length failed oligonucleotides complementary to the 5' end of the full length target oligonucleotide, wherein the oligonucleotide mixture results from an oligonucleotide synthesis reaction and wherein the short oligonucleotides have nucleotide sequences complementary to the 5' end of the full length target oligonucleotides;

b. subjecting the hybridized products of (a) to a gradient appropriate for disrupting the hybridization of the short oligonucleotides with nearly full length failed oligonucleotides, but not for disrupting the hybridization of the short oligonucleotides with full length target oligonucleotides;

c. recovering full length target oligonucleotides by subjecting the short oligonucleotide-target oligonucleotide products remaining in (b) to conditions appropriate for disrupting hybridization.

5,559,222

PREPARATION OF 1-(2'-DEOXY-2',2'-DIFLUORO-D-RIBO-PENTOFURANOSYL)-CYTOSINE FROM 2-DEOXY-2,2-DIFLUORO-β-D-RIBO-PENTOPYRANOSE

David D. Wirth, Lafayette, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 3, 1995, Ser. No. 383,165

Int. Cl.[6] **C07H** *19/00*

U.S. Cl. 536—28.5 **5 Claims**

1. A process for the preparation of 1-(2'-deoxy-2',2'-difluoro-D-ribo-pentofuranosyl)-cytosine (VI) and an α isomer (VIA) which comprises:

(a) reacting in a first reaction mixture 2-deoxy-2,2-difluoro-D-ribo-pentopyranose (I) with triphenylmethyl chloride and with an amine base at a temperature between about 20° C. and 100° C. to produce 2-deoxy-2,2-difluoro-5-O-triphenylmethyl-D-ribofuranose (II) and separating (II) from the first reaction mixture;

(b) reacting in a second reaction mixture (II) with methanesulfonyl chloride in the presence of an amine base in an organic solvent to form 2-deoxy-2,2-difluoro-3-O-methylsulfonyl-5-O-triphenylmethyl-D-ribo-pentofuranose-1-methanesulfonate (III) and separating (III) from the second reaction mixture;

(c) reacting in a third reaction mixture (III) with a protected cytosine in an inert solvent to form 1-(2'-deoxy-2',2'-difluoro-3'-O-methylsulfonyl- 5-O-triphenylmethyl-D-ribo-furanosyl)-cytosine (IV) which is separated from the third reaction mixture;

(d) reacting (IV) in a fourth reaction mixture with an acid in the presence of an organic solvent to produce 1-(2'-deoxy-2',2'-difluoro-3 '-O-methylsulfonyl-D-ribo-pentofuranosyl)-cytosine (V) and separating (V) from the fourth reaction mixture; and

(e) reacting (v) in a fifth reaction mixture with an alkali metal alkoxide in a solvent to form 1-(2'-deoxy-2',2'-difluoro-D-ribopentofuranosyl)-cytosine (VI and VIA) and separating the (VI and VIA) from the fifth reaction mixture.

5,559,223

SYNTHETIC STORAGE PROTEINS WITH DEFINED STRUCTURE CONTAINING PROGRAMMABLE LEVELS OF ESSENTIAL AMINO ACIDS FOR IMPROVEMENT OF THE NUTRITIONAL VALUE OF PLANTS

Saverio C. Falco, Arden; Sharon J. Keeler, Newark, and Janet A. Rice, Wilmington, all of Del., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US92/06412, § 371 Date Feb. 3, 1994, § 102(e) Date Feb. 3, 1994, PCT Pub. No. WO93/03160, PCT Pub. Date Feb. 18, 1993

PCT Filed Aug. 7, 1992, Ser. No. 182,175

Int. Cl.[6] **C12N** *15/11;15/82;* **A01H** *5/00*

U.S. Cl. 536—23.1 **18 Claims**

1. A chimeric gene comprising a nucleic acid fragment encoding a synthetic polypeptide comprising n heptad units in which the residues of each heptad are designated as d e f g a b c, each heptad unit being either the same or different, wherein:

n is at least 4;

a and d are independently selected from the group consisting of Met, Leu, Val, Ile and Thr;

each e and g is independently selected from the group consisting of Glu, Lys, Arg and Asp, provided that, within the same heptad,

when e is Glu or Asp, g is Lys or Arg; and

when e is Lys or Arg, g is Glu or Asp; and

b, c and f are independently any amino acids except Gly or Pro and at least two amino acids of b, c and f in each heptad are selected from the group consisting of Glu, Lys, Asp, Arg, His, Thr, Ser, Asn, Ala, Gln and Cys operably linked to transcriptional and translational regulatory sequences that are functional in plant cells.

5,559,224

CARBEPENEM DERIVATIVES

Toshiyuki Nishi; Hiroko Koda; Kazuyuki Sugita; Yohhei Ishida; Makoto Takemura, and Takeshi Hayano, all of Tokyo, Japan, assignors to Daiichi Pharmaceutical Co., Ltd., Tokyo, Japan

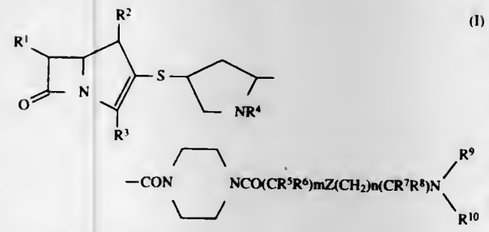
Continuation of Ser. No. 167,965, Dec. 20, 1993, abandoned. This application May 5, 1995, Ser. No. 435,271

Claims priority, application Japan, Feb. 18, 1992, 4-031054; Jun. 20, 1992, 3-148469

Int. Cl.[6] **C07D** *487/04*

U.S. Cl. 540—350 **6 Claims**

1. A compound which is a derivative of carbapenem represented by formula (I):



(I)

wherein R^1 represents a lower alkyl group, a hydroxy lower alkyl group or a hydroxy lower alkyl group which has a protecting group; R^2 represents a hydrogen atom or a lower alkyl group; R^3 represents a carboxyl group or an esterified carboxyl group; R^4 represents an amino protecting group, a hydrogen atom or a lower alkyl group; R^5 and R^6, which are the same or different, each represents a hydrogen atom, a hydroxyl group, a lower alkyl group, a hydroxy lower alkyl group or a halogen atom, or R^5 and R^6 together form an alkylene group having 2 to 6 carbon atoms; R^7 represents a hydrogen atom, a lower alkyl group, a carboxyl group, a carboxyl group having a protecting group, or a group represented by $—CONR^{71}R^{72}$ where R^{71} and R^{72}, which are the same or different, each represents a hydrogen atom or a lower alkyl group; R^8 represents a hydrogen atom, a lower alkyl group or a hydroxy lower alkyl group, or R^7 and R^8 together form an alkylene group having 2 to 6 carbon atoms; R^9 and R^{10}, which are the same or different, each represents an amino protecting group, a hydrogen atom or a lower alkyl group; Z represents a single bond, an oxygen atom, a sulfur atom, or a group represented by $—CR^{11}R^{12}—$, $—NR^{13}CO—$, $—CONR^{14}—$ or $—NR^{15}—$ where R^{11} and R^{12}, which are the same or different, each represents a hydrogen atom, a hydroxyl group, a lower alkyl group, a hydroxy lower alkyl group or a halogen atom, or R^{11} and R^{12} together form an alkylene group having 2 to 6 carbon atoms, R^{13} and R^{14}, which are the same or different, each represents a hydrogen atom or a lower alkyl group and R^{15} represents an amino protecting group, a hydrogen atom or a lower alkyl group; and each of m and n represents an integer of 0 to 6, or a pharmaceutically acceptable salt thereof.

5,559,225

7-ACYL-3-(SUBSTITUTED CARBAMOYLOXY) CEPHEM COMPOUND

Shigeto Negi, Ibaraki; Motosuke Yamanaka, Chiba; Kanemasa Katsu, Ibaraki; Isao Sugiyama, Ibaraki; Yuuki Komatu, Ibaraki; Atsushi Kamata, Ibaraki; Akihiko Tsuruoka, Ibaraki, and Yoshimasa Machida, Ibaraki, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

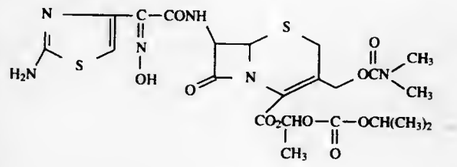
Continuation of Ser. No. 789,669, Nov. 8, 1991, abandoned. This application Mar. 14, 1994, Ser. No. 209,484

Claims priority, application Japan, Nov. 9, 1990, 2-302783; Feb. 14, 1991, 3-040747; Mar. 8, 1991, 3-067709; Apr. 12, 1991, 3-169512

Int. Cl.[6] **C07D** *501/34;* **A61K** *31/545*

U.S. Cl. 540—222 **1 Claim**

1. The compound



5,559,226

PROCESS FOR MAKING POLYOL FATTY ACID POLYESTERS HAVING OXIDATIVE STABILITY

Robert J. Sarama, Loveland, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 993,492, Dec. 18, 1992, abandoned, which is a continuation of Ser. No. 685,419, Apr. 12, 1991, abandoned. This application Mar. 21, 1994, Ser. No. 215,403

Int. Cl.[6] **C07H** *1/06;13/02*

U.S. Cl. 536—115 **29 Claims**

1. A process for making polyol fatty acid polyesters having improved oxidative stability, which process comprises the steps of:

A. heating a mixture of a polyol, a fatty acid ester, an emulsifier and a catalyst to form a reaction mixture;

B. adding to the reaction mixture more fatty acid ester to form a crude polyol fatty acid polyester;

C. refining the crude polyol fatty acid polyester;

D. adding an alkaline material to the crude polyol fatty acid polyester in an amount such that the final product has a pH of from about 6.5 to about 8.5; and

E. finishing the crude polyol fatty acid polyester by heating the crude to a temperature ranging from about 190° C. to about 290° C.;

F. isolating the polyol fatty acid polyester of step E.

5,559,227

CARBAMATES OF RAPAYCIN

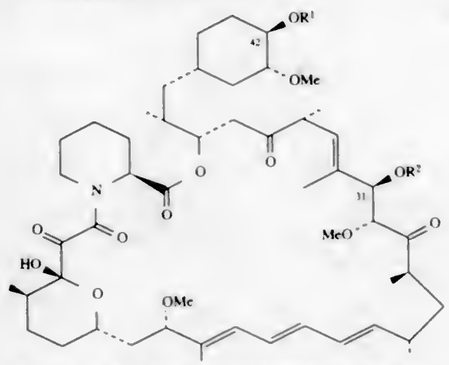
Amedeo A. Failli, Princeton Junction, N.J.; Oleg I. Bleyman, Holland, Pa.; Wenling Kao, Paoli, Pa., and Magid A. Abou-Gharbia, Glen Mills, Pa., assignors to American Home Products Corporation, Madison, N.J.

Division of Ser. No. 284,764, Aug. 2, 1994, Pat. No. 5,480,988, which is a continuation-in-part of Ser. No. 160,984, Dec. 1, 1993, abandoned, which is a division of Ser. No. 54,655, Apr. 23, 1993, Pat. No. 5,302,584, which is a continuation-in-part of Ser. No. 960,597, Oct. 13, 1992, abandoned. This application May 24, 1995, Ser. No. 449,593

Int. Cl.[6] **C07D** *491/06;* **A61K** *31/675;31/395*

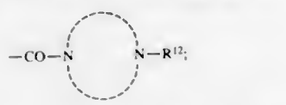
U.S. Cl. 540—456 **2 Claims**

1. A compound of the structure



II

wherein R^1 and R^2 are each, independently, hydrogen or



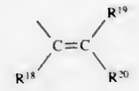
R^{10} is hydrogen, alkyl of 1–6 carbon atoms, or arylalkyl of 4–10 carbon atoms;

R^{12} is $—(CR^{15}R^{16})_rR^{17}$;

R^{14} is hydrogen, alkyl of 1–6 carbon atoms, tri-(alkyl of 1–6 carbon atoms)silyl, tri-(alkyl of 1–6 carbon atoms)silylethyl, triphenylmethyl, benzyl, alkoxymethyl of 2–7 carbon atoms, tri-(alkyl of 1–6 carbon atoms)silylethoxymethyl, or tetrahydropyranyl;

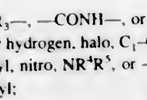
R^{15} and R^{16} are each, independently, hydrogen or alkyl of 1–6 carbon atoms;

R^{17} is



or $—C{\equiv}C—R^{21}$;

R^{18}, R^{19}, R^{20}, and R^{21} are each, independently, hydrogen, alkyl of 1–6 carbon atoms, halogen, or phenyl, wherein the phenyl group may be optionally mono-, di-, or tri-substituted with a group selected from alkyl of 1–6 carbon atoms, arylalkyl of 7–10 carbon atoms, alkoxy of 1–6 carbon atoms, trifluoroalkoxy of 1–6 carbon atoms, cyano, halo, hydroxy, nitro, carbalkoxy of 2–7 carbon atoms, trifluoromethyl, amino, dialkylamino of 1–6 carbon atoms per alkyl group, dialkylaminoalkyl of 3–12 carbon atoms, hydroxyalkyl of 1–6 carbon atoms, alkoxyalkyl of 2–12 carbon atoms, alkylthio of 1–6 carbon atoms, $—SO_3H$, $—PO_3H$, and $—CO_2H$;



is a heterocyclic radical selected from the group consisting of tetrahydroimidazolyl, 1, 4, 5, 6-tetrahydropyrimidinyl, piperazinyl, hexahydro-1, 3, 5-triazinyl, or homopiperazinyl wherein the ring carbons may optionally be substitued by alkyl of 1–6 carbon atoms, arylalkyl of 4–10 carbon atoms, halogen, $—CF_3$, $—OR^{14}$, or $—CO_2R^{10}$;

and

r=1–6 with the proviso that R^1 and R^2 are both not hydrogen, or a pharmaceutically acceptable salt thereof.

5,559,228

SYNTHESIS OF BISINDOLYLMALEIMIDES

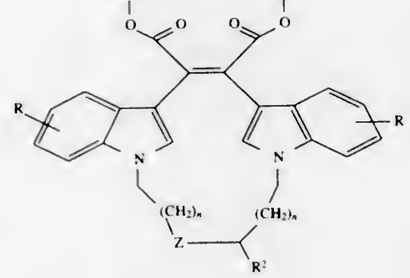
James R. Gillig, and Michael R. Jirousek, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 30, 1995, Ser. No. 413,311

Int. Cl.[6] **C07D** *487/08;487/06;498/16;498/18*

U.S. Cl. 540—460 **4 Claims**

1. A compound of the Formula:



wherein:

Z is —O—, $—NR_3—$, —CONH—, or —NHCO—;

R is independently hydrogen, halo, C_1–C_4 alkyl, hydroxy, C_1–C_4 alkoxy, haloalkyl, nitro, NR^4R^5, or $—NHCO(C_1–C_4$ alkyl);

R^1 is a C_1–C_4 alkyl;

R^2 is hydrogen, $—(CH_2)_nC_1–C_4$ alkoxy, $—(CH_2)_nNR^4R^5$, $—(CH_2)_nNH(CF_3)$, $—(CH_2)_nH(CF_3)(CH_3)$, $—(CH_2)_nNH(CH_2)_n$aryl, $—(CH_2)_nNH(CH_2)_n$pyridyl, $—(CH_2)_nCONH((CH_2)_m$aryl), $—(CH_2)_nCONH(C_1–C_4$ alkyl), $—(CH_2)_nNHCO(C_1–C_4$ alkyl), $—(CH_2)_nNHCO(CH_2)_n$aryl, $—(CH_2)_nOCONH(C_1–C_4$ alkyl), $—(CH_2)_nOCONH(CH_2)_n$aryl, $—(CH_2)_nNHCOO$(alkyl), $—(CH_2)_nNHCOO$(benzyl), $—(CH_2)_nNHSO_2(C_1–C_4$ alkyl), $—(CH_2)_nNHSO_2(CH_2)_n$aryl, $—(CH_2)_nCN$, $—(CH_2)_nSO_2(NR^4R^5)$, $—(CH_2)_nSO_2(C_1–C_4$ alkyl), or $—(CH_2)_nSO(C_1–C_4$ alkyl);

R^3 is hydrogen, $(CH_2)_n$aryl or C_1–C_4 alkyl;

R^4 and R^5 are independently hydrogen, methyl, phenyl, benzyl, or combine to the nitrogen to which they are bonded to form a saturated or unsaturated 5 or 6 membered ring; and

n is independently 1, 2 or 3.

5,559,229

METHOD FOR THE MANUFACTURE OF BENZOTHIAZEPINE

Keshava Murthy; Gamini Weeratunga, both of Brantford, and Burchat Andrew, Guelph, all of Canada, assignors to ACIC (Canada) Inc., Brantford, Canada

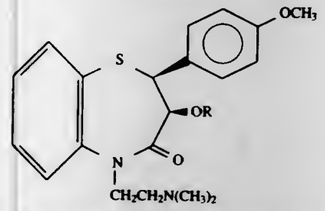
Filed Jun. 1, 1995, Ser. No. 456,761

Int. Cl.[6] **C07D** *281/00;283/00;285/00*

U.S. Cl. 540—491 **5 Claims**

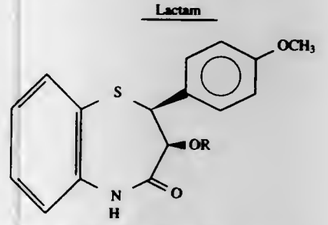
4. A process of preparing Benzothiazepine derivative of the structural formula:

Diltiazem



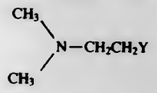
wherein R is hydrogen or acetyl, (and where R is acetyl, thereby producing Diltiazem, or a pharmaceutically acceptable acid addition salt thereof), which process comprises condensing a compound of the formula:

Lactam



II

wherein R is the same as defined above, with



where Y is suitable leaving group in the presence of the solvent methyl isobutyl ketone (MIBK) and the base sodium hydroxide in water.

5,559,230

BENZOHETEROCYCLIC COMPOUNDS

Hidenori Ogawa, Tokushima-ken; Hisashi Miyamoto, Kyoto-ku; Kazumi Kondo, Tokushima-ken; Hiroshi Yamashita, Tokushima-ken; Kenji Nakaya, Tokushima-ken; Hajime Komatsu, Tokushima-ken; Michinori Tanaka, Tokushima-ken; Shinya Kora, Nagasaki-ken; Michiaki Tominaga, Tokushima-ken, and Yoichi Yabuuchi, Tokushima-ken, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

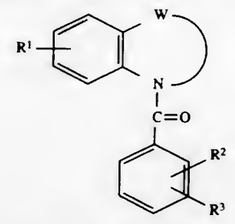
Division of Ser. No. 851,541, Mar. 13, 1992, Pat. No. 5,258,510, which is a continuation-in-part of Ser. No. 762,015, Jun. 19, 1991, abandoned. This application Jun. 10, 1993, Ser. No. 76,804

Claims priority, application Japan, Mar. 15, 1990, 2-66063; Apr. 20, 1990, 2-105580; Jul. 9, 1990, 2-181858; Apr. 19, 1991, 3-182066

Int. Cl.[6] **C07D** *223/16;243/12;* **A61K** *31/55*

U.S. Cl. 540—569 **63 Claims**

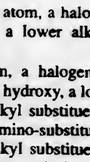
1. A benzoheterocyclic compound of the following formula:



wherein R^1 is a hydrogen atom, a halogen atom, a lower alkyl, an amino having optionally a lower alkyl substituent, or a lower alkoxy,

R^2 is a hydrogen atom, a halogen atom, a lower alkoxy, a phenyl(lower)alkoxy, hydroxy, a lower alkyl, an amino having optionally a lower alkyl substituent, a carbamoyl-substituted lower alkoxy, an amino-substituted lower alkoxy having optionally a lower alkyl substituent, or a benzoyloxy which has optionally a halogen substituent on the phenyl ring,

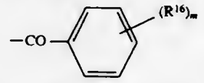
R^3 is a group of the formula:



or a group of the formula:

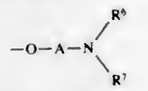
R^4 is a hydrogen atom, a benzoyl which has optionally a halogen substituent on the phenyl ring, or a lower alkyl,

R^5 is a group of the formula:

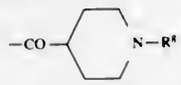


wherein R^{16} is a halogen atom; a lower alkyl which has optionally a substituent selected from a halogen atom and hydroxy; hydroxy; a lower alkoxy; a lower alkanoyloxy; a lower alkylthio; a lower alkanoyl; carboxy; a lower alkoxycarbonyl; cyano; nitro; an amino which has optionally a substituent selected from a lower alkyl and a lower alkanoyl; phenyl; a cycloalkyl having 3 to 8 carbon atoms; a lower alkanoyloxy-substituted lower alkoxy; a carboxy-substituted

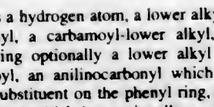
lower alkoxy; a halogen-substituted lower alkoxy; a carbamoyl-substituted lower alkoxy; a hydroxy-substituted lower alkoxy; a lower alkoxycarbonyl-substituted lower alkoxy; a phthalimido-substituted lower alkoxy; an aminocarbonyl-lower alkoxy having a lower alkyl substituent; or a group of the formula:



wherein A is a lower alkylene, and R^6 and R^7 are the same or different and are each a hydrogen atom, a lower alkyl having optionally a hydroxy substituent, a lower alkanoyl, or benzoyl, or R^6 and R^7 may bind together with the nitrogen atom to which they are bonded to form a 5- or 6-membered saturated heterocyclic group with or without a second nitrogen atom or an oxygen atom wherein said heterocyclic group is selected from the group consisting of pyrrolidinyl, piperidinyl, piperazinyl and morpholino, and wherein the heterocyclic group has optionally a substituent selected from piperidinyl and a lower alkyl; and m is an integer of 0 to 3, a phenyl-lower alkoxycarbonyl, a lower alkanoyl, a phenyl-lower alkanoyl, a cycloalkyl-lower alkanoyl wherein said cycloalkyl group has 3 to 8 carbon atoms, a cycloalkyl-carbonyl wherein said cycloalkyl group has 3 to 8 carbon atoms, tricyclo(3.3.1.1)decanylcarbonyl, naphthylcarbonyl, pyridylcarbonyl, furoyl, thenoyl, a phenoxy-lower alkanoyl which phenyl ring has optionally 1 to 3 substituents selected from a lower alkyl, a lower alkoxy and an amino having optionally a lower alkanoyl substituent, a phthalimido-substituted lower alkanoyl, a lower alkoxycarbonyl-lower alkanoyl, a carboxy-lower alkanoyl, a naphthyloxy-lower alkanoyl, a halogen-substituted lower alkanoyl, a group of the formula:



wherein R^8 is a hydrogen atom, a lower alkyl, a phenyl-lower alkoxycarbonyl, a carbamoyl-lower alkyl, an amino-lower alkanoyl having optionally a lower alkyl substituent, or a lower alkanoyl, an anilinocarbonyl which has optionally a lower alkyl substituent on the phenyl ring, phenoxycarbonyl, a phenylsulfonyl which has optionally a substituent selected from a halogen atom and a lower alkyl on the phenyl ring, quinolylsulfonyl, or a group of the formula:



wherein B is a lower alkylene, n is an integer of 0 or 1, and R^9 and R^{10} are the same or different and are each a hydrogen atom, a lower alkyl having optionally a hydroxy substituent, a cycloalkyl having 3 to 8 carbon atoms, a phenyl-lower alkyl, a lower alkanoyl, a lower alkenyl, a phenoxy-lower alkyl, a phenyl which has optionally 1 to 3 substituents selected from an amino-lower alkyl having optionally a lower alkanoyl substituent, a lower alkyl, a lower alkoxy and a halogen atom, a phthalimido-substituted lower alkyl, an amino-lower alkyl having optionally a lower alkanoyl substituent, a lower alkynyl, or an amino-lower alkyl having optionally a lower alkyl substituent, or R^9 and R^{10} may bind together with the nitrogen atom to which they are bonded to form a 5- or 6-membered saturated heterocyclic group with or without a second nitrogen atom or an oxygen atom wherein said heterocyclic group is selected from the group consisting of pyrrolidinyl, piperidinyl, piperazinyl and morpholino, and wherein the heterocyclic group has optionally a substituent selected from a lower alkyl, a lower alkoxycarboyl and piperidinyl,

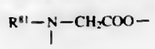
R^{11} is a hydrogen atom or a lower alkyl,

R^{12} is a cycloalkyl, or a phenyl which has optionally 1 to 3 substituents selected from a lower alkoxy, a lower alkyl and a halogen atom,

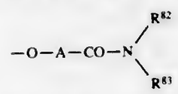
W is a group of the formula: $-(CH_2)_p-$ wherein p is an integer of 3 to 5, or a group of the formula: $-CH=CH-(CH_2)_q-$ wherein q is an integer of 1 to 3, the carbon atom of these groups: $-(CH_2)_p-$ and $-CH=CH-(CH_2)_q-$ being replaced by a group of the formula:

wherein R_{13} is a hydrogen atom, a cycloalkyl having 3 to 8 carbon atoms, or a lower alkyl, and further said $-(CH_2)_p-$ and $-CH=CH-(CH_2)_q-$ groups having optionally 1 to 3 substituents selected from a lower alkyl having optionally a hydroxy substituent, a lower alkoxycarbonyl, carboxy, hydroxy, oxo, a lower alkanoyloxy having optionally a halogen substituent, an amino-lower alkyl having optionally a substituent selected from a lower alkyl and a lower alkanoyl, a lower alkanoyloxy-substituted lower alkyl, a lower alkyl sulfonyloxy-lower alkyl, an azido-lower alkyl, a group of the formula:

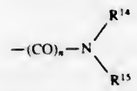
an aminocarbonyloxy having optionally a lower alkyl substituent, a lower alkoxy, a lower alkoxycarbonyl-substituted lower alkoxy, a carboxy-substituted lower alkoxy, an aminocarbonyl-lower alkoxy having optionally a lower alkyl substituent, an amino-lower alkoxy having optionally a substituent selected from a lower alkyl and a lower alkanoyl, a phthalimido-substituted lower alkoxy, hydroxyimino, a lower alkanoyloxy-imino, a lower alkylidene, a halogen atom, azido, sulfoxyimino, a group of the formula:



wherein R^{81} is a hydrogen atom or a lower alkyl, hydrazino, pyrrolyl, an amino-lower alkanoyloxy having optionally a lower alkyl substituent, a group of the formula:



wherein A is as defined above, and R^{82} and R^{83} are the same or different and are each a hydrogen atom, a lower alkyl, a carbamoyl-substituted lower alkyl, a hydroxy-substituted lower alkyl, or a pyridyl-lower alkyl, or R^{82} and R^{83} may bind together with the nitrogen atom to which they are bonded to form a 5- or 6-membered saturated heterocyclic group with or without a second nitrogen atom, an oxygen atom or a sulfur atom wherein said heterocyclic group is selected from the group consisting of pyrrolidinyl, piperidinyl, piperazinyl, morpholino and thiomorpholino, and wherein the heterocyclic group has optionally a substituent selected from oxo, a lower alkyl, a lower alkanoyl, and carbamoyl, and a group of the formula:



wherein n is as defined above, and R^{14} and R^{15} are the same or different and are each a hydrogen atom, a lower alkyl, a lower alkenyl, a lower alkanoyl, a cycloalkyl, an oxiranyl-

substituted lower alkyl, a lower alkyl having 1 to 2 substituents selected from a lower alkoxy, hydroxy and an amino having optionally a lower alkyl substituent, a phenyl-lower alkyl, a pyridyl-lower alkyl, a lower alkylsulfonyl, benzoyl, a lower alkoxycarbonyl, anilinocarbonyl, an aminocarbonyl having optionally a lower alkyl substituent, a cyano-substituted lower alkyl, a lower alkoxycarbonyl-substituted lower alkyl, a carbamoyl-substituted lower alkyl, a carboxy-substituted lower alkyl, a tetrahydropyranyloxy-substituted lower alkyl, a lower alkanoyloxy-substituted lower alkyl, a piperidinyl having optionally a phenyl-lower alkyl substituent on the piperidinyl ring, a halogen-substituted substituted lower alkanoyl, an imidazolyl-substituted lower alkanoyl, an amino-lower alkanoyl having optionally a substituent selected from a lower alkyl and a lower alkoxycarbonyl, an aminocarbonyl-lower alkyl having optionally a lower alkyl substituent, or a phenyl-lower alkoxycarbonyl, or R^{14} and R^{15} may bind together with the nitrogen atom to which they are bonded to form a 5- or 6-membered saturated heterocyclic group with or without a second nitrogen atom or an oxygen atom wherein said heterocyclic group is selected from the group consisting of pyrrolidinyl, piperidinyl, piperazinyl and morpholino, and wherein the heterocyclic group may optionally have a substituent selected from a lower alkyl, a phenyl-lower alkyl or a lower alkanoyl, and a pharmaceutically acceptable salt thereof.

5,559,231

SPIRO-OXAZINE COMPOUNDS

Shinichi Yamamoto, Kyoto, and Takashi Taniguchi, Yasu-gun, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 38,073, Mar. 29, 1993, Pat. No. 5,374,723, which is a continuation of Ser. No. 425,205, Oct. 6, 1989, abandoned. This application Aug. 1, 1994, Ser. No. 283,945

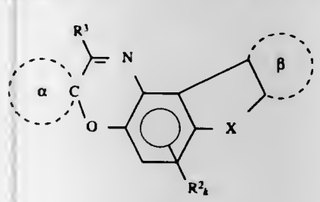
Claims priority, application Japan, Feb. 8, 1988, 63-27327; May 27, 1988, 63-130833

The portion of the term of this patent subsequent to Dec. 20, 2012, has been disclaimed.

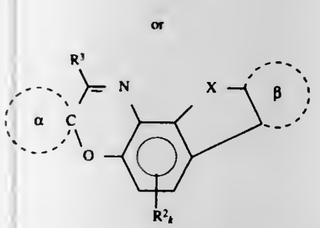
Int. Cl.[6] C07D 491/10

U.S. Cl. 544—70 **2 Claims**

1. A spiro-oxazine compound represented by the following formula (A) or (A'):



(A)



(A')

wherein,

the α ring is selected from the group consisting of a 5-membered ring having one nitrogen atom and a 5-membered ring having one nitrogen atom and being connected to a benzene ring or naphthalene ring, with a proviso that the nitrogen atom in the α ring is bonded to an organic group R^0 and is expressed as >N–R^0 wherein R^0 is a substituent selected from the group consisting of an alkyl group having 1 to 20 carbon atoms, an alkenyl group having 2 to 20 carbon atoms, an aralkyl group having 7 to 20 carbon atoms and an aryl group having 6 to 19 carbon atoms;

the β ring is a benzene ring or a naphthalene ring;

X is selected from the group consisting of O, S, Se and N–R^1 wherein R^1 is selected from the group consisting of a hydrogen atom, an alkyl group having 1 to 20 carbon atoms, an alkenyl group having 2 to 20 carbon atoms, an aralkyl group having 7 to 20 carbon atoms, an aryl group having 6 to 19 carbon atoms and an acyl group having 2 to 20 carbon atoms;

R^2 and R^3 are each a substituent selected from the group consisting of a hydrogen atom, a hydroxyl group, an amino group having 0 to 20 carbon atoms, an alkoxy group having 1 to 20 carbon atoms, an aralkoxy group having 7 to 15 carbon atoms, an aryloxy group having 6 to 14 carbon atoms, an acyloxy group having 2 to 20 carbon atoms, an alkyl group having 1 to 20 carbon atoms, an alkenyl group having 2 to 20 carbon atoms, an aralkyl group having 7 to 15 carbon atoms, an aryl group having 6 to 14 carbon atoms, a halogen group, a cyano group, a carboxyl group, an alkoxycarbonyl group having 2 to 20 carbon atoms, a carbamoyl group having 2 to 20 carbon atoms, and a sulfonic acid group, with a proviso that R^2 is not a hydrogen atom; and

k is an integer of from 0 to 2.

5,559,232

CARBOXAMIDES

Jean Ackermann; David Banner, both of Basel, Switzerland; Klaus Gubernator, Freiburg, Germany; Kurt Hilpert, Hoffstetten, and Gérard Schmid, Kienberg, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

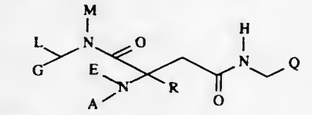
Filed Sep. 2, 1994, Ser. No. 300,821

Claims priority, application Switzerland, Sep. 7, 1993, 2667/93; Jul. 5, 1994, 2150/94

Int. Cl.[6] C07D 211/14;265/28;401/12;413/12

U.S. Cl. 544—121 **74 Claims**

1. Carboxamides of the formula



I

wherein

E is hydrogen,

G is H, lower-alkyl or (optionally bonded via lower-alkylene) COOH, COO-lower-alkyl, lower-alkanoyl, OH, lower-alkanoyloxy, lower-alkoxy, aryl-lower-alkoxy, $CONH_2$, $CONHCH_2CH_2OH$, CONHOH, $CONHOCH_3$, CONHO-benzyl, $CONHSO_2$-lower-alkyl, $CONHCH_2CH_2$-aryl, CONH-cycloalkyl, $CONHCH_2$-heteroaryl, NH_2, NHCOO-lower-alkyl, NHCOO-lower-aralkyl, $NHSO_3H$, ($NHSO_2$ or $NHSO_3$)-lower-alkyl, NH lower-alkanoyl, NHCOCOOH, NHCOCOO-lower-alkyl, NH-cycloalkyl, NH-(3,4-dioxo-2-hydroxy-cyclobut-1-enyl), NH-[2-lower-(alkoxy or -alkenyloxy)-3,4-dioxocyclobut-1-enyl], $NHCH_2$-heteroaryl, NHCOCO-(aryl or lower-alkyl), $NHCOCH_2Cl$, NHCO-lower-alkylene-O-(lower-alkyl or aryl), $NHCOCH_2$[aryl, heteroaryl or —N(Het)], NHCOC(NOH)-lower-alkylene-COOH, $NHSO_2$-N(Het), NHCO-(aryl, beteroaryl or heterocyclyl), $NHPO_3(R^{10},R^{20})$, heteroaryl or a group CO—N(Het),

R^{10} and R^{20} are H, lower-alkyl or phenyl,

M is H, lower-alkyl or -alkenyl, aryl, heteroaryl, cycloalkyl or (aryl, heteroaryl or cycloalkyl)-lower-alkyl and

L is H, lower-alkyl, aryl, cycloalkyl or (aryl or cycloalkyl)-

5,559,233

R_5 is a cycloalkyl or a cycloalkylmethyl, the cycloalkyl being

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L is H, lower-alkyl, aryl, cycloalkyl or (aryl or cycloalkyl)-lower-alkyl or

M and L together with the atoms to which they are attached form a group —N(Het) or

E and G together form a methylene or carbonyl group and

M is H, lower-alkyl or-alkenyl, aryl, heteroaryl, cycloalkyl, (aryl, heteroaryl or cycloalkyl)-lower-alkyl or carboxy-lower-alkyl and

L is H, lower-alkyl, aryl, cycloalkyl or (aryl or cycloalkyl)-lower-alkyl,

A is H, alkyl, lower-aralkyl or a group of the formula:

$$—C(O)R^2 \quad (A^1),$$

$$—S(O)_2N(R^3,R^4) \quad (A^2)$$

or, where group Q contains a hydroxy group and/or where E and G together are CH_2 or CO, then A can also be a group of the formula

$$—S(O)_2R^3 \quad (A^3)$$

R^2 is lower-alkyl, aryl, heteroaryl or cycloalkyl optionally bonded via lower-alkylene, carbo-lower-alkoxy bonded via lower-alkylene or —(O or S)-(aryl, heteroaryl or cycloalkyl) bonded via lower-alkylene, whereby a lower-alkylene group present in R^2 can be substituted by hydroxy, amino or lower-alkanoylamino in the α-position to the carbonyl group to which R^2 is bonded or

R^2 is halogen, carboxy, lower alkoxy, amino, mono- or di-lower-alkyl-amino or a group —N(Het) bonded via lower alkylene or

R^2 is a group —OR^{22} or —NHR^{22},

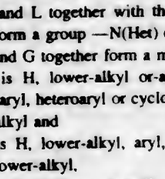
R^{22} is lower-alkyl, or aryl, heteroaryl or cycloalkyl optionally bonded via lower-alkylene, or lower-aralkyl substituted in the lower-alkyl moiety by aryl, carbo-lower-alkoxy or COOH.

R^3 and R^4 each independently are hydrogen, alkyl or aryl-lower-alkyl or together with the N atom to which they are attached form a group —N(Het),

R^5 is aryl, heteroaryl, heterocyclyl, alkyl or cycloalkyl,

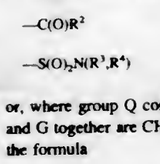
—N(Het) is N-bonded —$N(CH_2)_{4-9}$ optionally interrupted by O, S, NH or N-lower-alkyl and optionally substituted by up to 2 substituents from the group of lower-alkyl, OH, oxo, COOH, COO-lower-alkyl, CH_2OH and CH_2O-benzyl,

Q is a group of formula Q^1 or Q^2:



(Q^1)

and



(Q^2)

T is CH_2 or O,

one of R^6 and R^7 is hydrogen or carbo-lower-alkoxy and the other is hydrogen, carbo-lower-alkoxy or hydroxy, and

R is hydrogen or lower-alkyl,

as well as hydrates or solvates and physiologically compatible salts thereof.

5,559,233

METHODS FOR PREPARING N-SUBSTITUTED HETEROCYCLIC DERIVATIVES

Claude Bernhart, Saint Gely du Fesc; Jean-Claude Breliere, Montpellier; Jacques Clement, Saussan; Dino Nisato, Saint Georges d'Orques; Pierre Perreault, Montpellier; Claude Muneaux, and Yvette Muneaux, both of Les Matelles, all of France, assignors to Sanofi, Paris, France

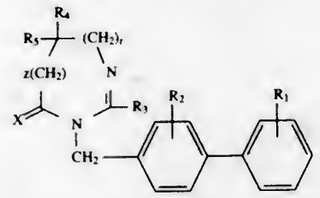
Division of Ser. No. 079,866, Jun. 23, 1993, Pat. No. 5,352,788, which is a division of Ser. No. 794,497, Nov. 20, 1991, Pat. No. 5,270,317. This application Jun. 30, 1994, Ser. No. 269,101

Claims priority, application France, Mar. 20, 1990, 90 03563; Aug. 8, 1990, 90 10144; Sep. 10, 1991, 91 11161

Int. Cl.[6] C07D *473/38;239/36;233/70*

U.S. Cl. 544—321 **13 Claims**

1. A method of preparing a compound of formula (I)



(I)

in which

R_1 and R_2 are similar or different and are each independently hydrogen or a group selected from the group consisting of C_1–C_6 alkyl, C_1–C_4 alkoxy, amino, aminomethyl, carboxyl, alkoxycarbonyl in which the alkoxy is C_1–C_4, cyano, tetrazolyl, methyltetrazolyl, methylsulfonylamino, trifluoromethylsulfonylamino, trifluoromethylsulfonylaminomethyl, N-cyanoacetamide, N-hydroxyacetamide, N-(4-carboxy- 1,3-thiazol-2-yl)acetamide, ureido, 2-cyano-guanidinocarbonyl, 2-cyanoguanidinomethyl, imidazol-1-ylcarbonyl and 3-cyano-2-methylisothioureidomethyl, with the proviso that at least one of the substituents R_1 or R_2 is other than hydrogen;

R_3 is a hydrogen, a C_1–C_6 alkyl which is unsubstituted or substituted by one or more halogen atoms, a C_2–C_6 alkenyl, a C_3–C_7 cycloalkyl, a phenyl, a phenylalkyl in which the alkyl is C_1–C_3, or a phenylalkenyl in which the alkenyl is C_2–C_3, said phenyl groups being unsubstituted or monosubstituted or polysubstituted by a halogen atom, a C_1–C_4 alkyl, a C_1–C_4 halogenoalkyl, a C_1–C_4 polyhalogenoalkyl, a hydroxyl or a C_1–C_4 alkoxy; and

either R_4 and R_5 are each independently a C_1–C_6 alkyl, a phenyl or a phenylalkyl in which the alkyl is C_1–C_3, said alkyl, phenyl or phenylalkyl groups being unsubstituted or substituted by one or more halogen atoms or by a group selected from the group consisting of C_1–C_4 perfluoroalkyl, hydroxyl and C_1–C_4 alkoxy; or

R_4 and R_5 together form a group of the formula $=CR_7R_8$, in which R_7 is hydrogen, a C_1–C_4 alkyl or a phenyl and R_8 is C_1–C_4 alkyl or a phenyl; or

R_4 and R_5 together are either a group of the formula $(CH_2)_n$ or a group of the formula $(CH_2)_pY—(CH_2)_q$, in which Y is either an oxygen atom, or a sulfur atom, or a carbon atom substituted by a C_1–C_4 alkyl group, a phenyl or a phenylalkyl in which the alkyl is C_1–C_3, or a group N-R_6, in which R_6 is a hydrogen, a C_1–C_4 alkyl, a phenylalkyl in which the alkyl is C_1–C_3, a C_1–C_4 alkylcarbonyl, a C_1–C_4 halogenoalkylcarbonyl, a C_1–C_4 polyhalogenoalkylcarbonyl, a benzoyl, an alpha-aminoacyl or an N-protecting group, or

R_4 and R_5, together with the carbon atom to which they are bonded, form an indane or an adamantane;

p+q=m;

n is an integer between 2 and 11; and

m is an integer between 2 and 5; or

R_4 is a C_1–C_6 alkyl which is unsubstituted or substituted by one or more halogen atoms; and

R_5 is a cycloalkyl or a cycloalkylmethyl, the cycloalkyl being C_3–C_7, which is unsubstituted or substituted by one or more halogen atoms; or

R_4 and R_5 are each a cyclopropyl;

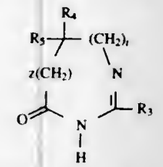
X is an oxygen atom; and

z and t are zero or one is zero and the other is one;

and its salts;

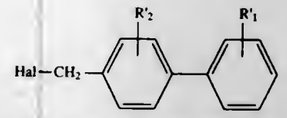
which method comprises:

a1) reacting a heterocyclic derivative of the formula



2

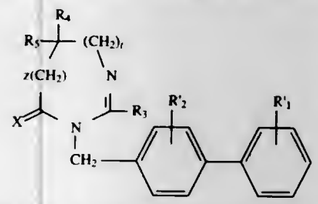
in which z, t, R_3, R_4 and R_5 are as defined above, with a (biphenyl-4-yl)methyl derivative of formula (3)



3

in which Hal is halogen atom and R'$_1$ and R'$_2$ are respectively either R_1 and R_2 or a precursor group of R_1 and R_2; and

b1) reacting the compound obtained in a1), of formula (5)



5

in which X is an oxygen atom, to convert either or both of the groups R'$_1$ and R'$_2$ to either or both of the groups R_1 and R_2, wherein

if either or both of R'$_1$ and R'$_2$ is an esterified carboxy group, then either or both of R_1 and R_2 is a carboxy group;

if either or both of R'$_1$ and R'$_2$ is a protected tetrazolyl group, then either or both of R_1 and R_2 is a tetrazolyl group;

if either or both of R'$_1$ and R'$_2$ is a cyano group, then either or both of R'$_1$ and R'$_2$ are initially converted into a protected tetrazolyl group which is then converted so that either or both of R_1 and R_2 is a tetrazolyl group;

if either or both of R'$_1$ and R'$_2$ is a carboxy group, then either or both of R_1 and R_2 is selected from the group consisting of imidazol-1-ylcarbonyl and N-(4-carboxy-1,3-thiazol-2-yl)acetamide;

if either or both of R'$_1$ and R'$_2$ is an acid chloride, then either or both of R_1 and R_2 is selected from the group consisting of N-hydroxyacetamide, N-cyanoacetamide, ureido and 2-Cyanoguanidinocarbonyl;

if tither or both of R'$_1$ and R'$_2$ is a nitro group, then the nitro group is convened into an amino group, which is then convened so that either or both of R_1 and R_2 is selected from the group consisting of methylsulfonylamino, trifluoromethylsulfonylamino and trifluoromethylsulfonylaminomethyl;

if either or both of R'$_1$ and R'$_2$ is a cyano group, then the cyano group is converted into an aminomethyl group, which is then convened so that either or both of R_1 and R_2 is selected from the group consisting of 3-cyano-2-methylisothioureidomethyl or a 2-cyanoguanidinomethyl.

5,559,234

PROCESS FOR THE MANUFACTURE OF HERBICIDAL 1-{[2-(CYCLOPROPYLCARBONYL)PHYENYL]SULFAMOYL}-3-(4,6-DIALKOXY-2-PYRIMIDINYL)UREA COMPOUNDS

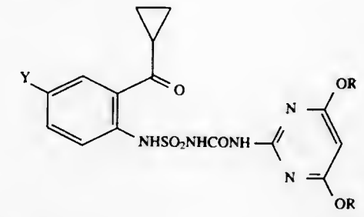
Thomas W. Drabb, Jr., Trenton, N.J., assignor to American Cyanamid Company, Madison, N.J.

Filed Jun. 6, 1995, Ser. No. 468,101

Int. Cl.[6] C07D *239/69*

U.S. Cl. 544—321 **11 Claims**

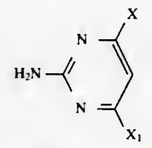
1. A process for the preparation of a compound having the structural formula



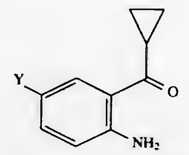
wherein

Y is hydrogen, halogen, C_1–C_4alkyl or C_1–C_4haloalkyl; and

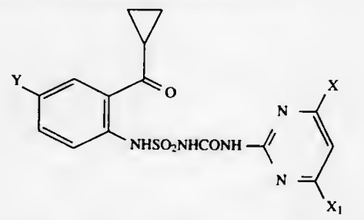
R is C_1–C_6alkyl, which comprises reacting a 2-amino- 4,6-dihalopyrimidine having the structural formula



wherein X and X_1 are each independently Cl, Br or I with chlorosulfonyl isocyanate in the presence of a first solvent to obtain an intermediate compound, reacting the intermediate compound in situ with a 2 -aminophenyl cyclopropyl ketone having the structural formula



wherein Y is as described above and a base to form a 1-{[2-(cyclopropylcarbonyl)phenyl]sulfamoyl}-3-(4,6-dihalo-2-pyrimidinyl)urea having the structural formula



wherein Y, X and X_1 are as described above, and reacting the 1-{[2-(cyclopropylcarbonyl)phenyl]sulfamoyl} -3-(4,6-dihalo-2-

pyrimidinyl)urea with at least about two molar equivalents of an alkali metal alkoxide having the structual formula

RO^-M^+

wherein M is an alkali metal and R is as described above in the presence of a second solvent to form the desired compound.

5,559,235

WATER SOLUBLE CAMPTOTHECIN DERIVATIVES

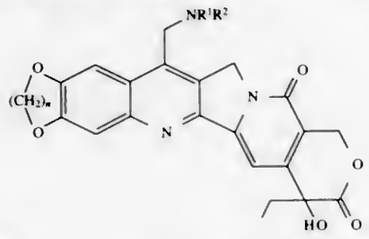
Michael J. Luzzio; Jeffrey M. Besterman, both of Durham; Michael G. Evans, Pittsboro, and Peter L. Myers, Chapel Hill, all of N.C., assignors to Glaxo Wellcome Inc., Research Triangle Park, N.C.

Continuation of Ser. No. 113,968, Aug. 30, 1993, abandoned, which is a continuation of Ser. No. 960,192, Oct. 9, 1992, abandoned, which is a continuation-in-part of Ser. No. 826,729, Jan. 28, 1992, abandoned, which is a continuation-in-part of Ser. No. 784,275, Oct. 29, 1991, abandoned. This application Jun. 10, 1994, Ser. No. 258,136

Int. Cl.[6] C07D *491/22;* **A61K** *31/47*

U.S. Cl. 544—361 **14 Claims**

1. A compound of formula (I),



(I)

wherein:

n represents the integer 1 or 2; and

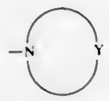
i) R^1 and R^2 represent independently, hydrogen, lower alkyl, (C_{3-7})cycloalkyl, (C_{3-7})cycloalkyl lower alkyl, lower alkenyl, hydroxy lower alkyl or lower alkoxy lower alkyl; or

ii) R^1 represents hydrogen, lower alkyl, (C_{3-7})cycloalkyl, (C_{3-7})cycloalkyl lower alkyl, lower alkenyl, hydroxy lower alkyl or lower alkoxy lower alkyl, and R^2 represents $—COR^3$,

wherein:

R^3 represents hydrogen, lower alkyl, perhalo-lower alkyl, C_{3-7}cycloalkyl, (C_{3-7})cycloalkyl lower alkyl, lower alkenyl, hydroxy lower alkyl, lower alkoxy, lower alkoxy lower alkyl; or

iii) R^1 and R^2 taken together with the linking nitrogen form a saturated 3 to 7 atom heterocyclic group of formula (IA)



(IA)

wherein:

one curved line connecting the groups N and Y in formula (IA) is a single bond or one or more methylene groups, the other curved line connecting the groups N and Y is one or more methylene groups, the total number of methylene groups present is that which is necessary to form said heterocyclic group of formula (IA);

Y represents O, S, SO, SO_2, CH_2 or NR^4

wherein:

R^4 represents hydrogen, lower alkyl, perhalo lower alkyl, aryl, aryl substituted with one or more lower alkyl, lower alkoxy, halogen, nitro, amino, lower alkyl amino, perhalo-lower alkyl, hydroxy lower alkyl, or lower alkoxy lower alkyl groups; or $—COR^5$,

wherein:

R^5 represents hydrogen, lower alkyl, perhalo-lower alkyl, lower alkoxy, aryl, aryl substituted with one or more lower alkyl, perhalo-lower alkyl, hydroxy lower alkyl, or lower alkoxy lower alkyl groups;

or the pharmaceutically acceptable salts thereof.

5,559,236

INTERMEDIATES FOR SUBSTITUTED BIPHENYLMETHYLMIDAZOPYRIDINE ANGIOTENSIN II ANTAGONISTS

Yoshio Urawa; Ken Furukawa; Toshikazu Shimizu; Yoji Yamagishi, all of Ibaraki; Tomio Tsurugi, Chiba, and Tomio Ichino, Ibaraki, all of Japan, assignors to Eisai Co., Ltd., Tokyo, and Eisai Chemical Co., Ltd., Ibaraki, both of Japan

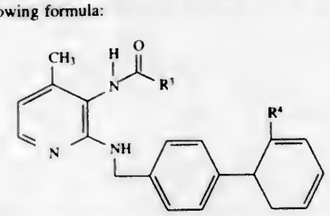
Division of Ser. No. 256,869, Aug. 5, 1994. This application Jun. 6, 1995, Ser. No. 471,465

Claims priority, application Japan, Dec. 7, 1992, 4-351139; Dec. 16, 1992, 4-353865; Jun. 17, 1993, 5-169805; Jun. 17, 1993, 5-169823; Jun. 17, 1993, 5-169824; Jun. 17, 1993, 5-169825

Int. Cl.[6] C07D *413/10;213/75*

U.S. Cl. 546—14 **7 Claims**

1. A 2-[N-(biphenyl-4-yl)methyl] amino-3-acylaminopyridine or a 2-[N-(biphenyl-4-yl)methyl] amino-3-alkoxycarbonylaminopyridine derivative (VI) represented by the following formula:

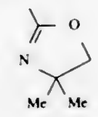


(VI)

wherein R^1 represents a hydrogen atom or a bromine atom or a chlorine atom; R^2 represents a hydrogen atom or a methyl group; R^3 represents a cycloalkyl group, a lower alkyl group or a lower alkoxy group; and R^4 represents a group represented by the following formula:

$—COOR^5$

wherein R^5 represents a lower alkyl group, a cycloalkyl group, an alkoxyalkyl group, a thioalkoxyalkyl group, a cycloether group, an aryl group, an aralkyl group, an alkenyl group, an alkynyl group or a trialkylsilyl group, or R^4 is a group represented by the following general formula:



5,559,237

PROCESS FOR PREPARATION OF 2-OXO-1-PIPERIDINYL DERIVATIVES

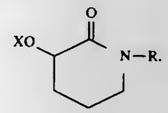
Ramachandran S. Ranganathan, Princeton; Thangavel Arunachalam, Plainsboro, and Kenneth J. Natalie, Jr., Dayton, all of N.J., assignors to Bracco International B.V., Amsterdam, Netherlands

Division of Ser. No. 893,856, Jun. 5, 1992. This application Jul. 15, 1994, Ser. No. 276,185

Int. Cl.[6] C07D *711/40;711/30*

U.S. Cl. 546—220 **36 Claims**

1. A process for preparing a compound of the formula

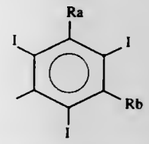


I

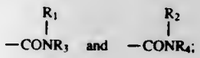
where

X is hydrogen or an oxygen protecting group;

R is alkyl, cycloalkyl, aryl, hydroxyalkyl, protected hydroxyalkyl or



Ra and Rb are independently selected from hydrogen, $—COX_1$,



X_1 is —OX or a leaving group;

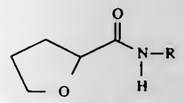
R_1 and R_2 are the same or different and are hydrogen, alkyl, hydroxyalkyl or protected hydroxyalkyl;

R_3 and R_4 are the same or different and are hydrogen, alkyl, hydroxyalkyl or protected hydroxyalkyl;

the term alkyl refers to straight or branched chain groups of one to six carbon atoms;

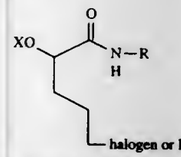
hydroxyalkyl refers to said alkyl groups having one or more hydroxy moieties;

which process comprises treating a compound of the formula



II

with a Lewis acid, a source of halide or leaving group and optionally a source of oxygen protection to provide a compound of the formula



III

halogen or leaving group

and thereafter, treating the so-formed compound with a base.

5,559,238

N-SUBSTITUTED TRIFLUOROMETHYLPHENYLTETRAHYDROPYRIDENES PROCESS FOR THE PREPARATION THEREOF, INTERMEDIATES IN SAID PROCESS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Umberto Guzzi; Costantino Palmieri, and Tiziano Croci, all of Milano, Italy, assignors to Sanofi, France

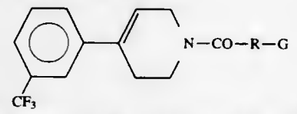
Division of Ser. No. 141,066, Oct. 26, 1993, Pat. No. 5,462,945, which is a continuation of Ser. No. 705,704, May 23, 1991, Pat. No. 5,281,606. This application Jun. 7, 1995, Ser. No. 482,748

Claims priority, application France, May 23, 1990, 90 06474

Int. Cl.[6] C07D *211/70*

U.S. Cl. 546—314 **1 Claim**

1. A compound of formula



(V)

wherein —R— represents a straight or branched alkylene radical of from 1 to 3 carbon atoms, and —G may represent naphthyl monosubstituted with hydroxy or $(C_1–C_4)$alkoxy; naphthyl di-substituted with hydroxy, $(C_1–C_4)$alkoxy or $(C_1–C_4)$alkyl; or naphthyl substituted with methylenedioxy.

5,559,239

PROCESS FOR PREPARING CARBAMOYL PYRIDINIUM COMPOUNDS

Paolo Vacca, Vado Ligure, and Marco Frezzati, Savona, both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 2, 1995, Ser. No. 459,782

Claims priority, application European Pat. Off., Jul. 12, 1994, 94110803

Int. Cl.[6] C07D *213/81*

U.S. Cl. 546—323 **12 Claims**

1. Process for synthesizing a carbamoyl pyridinium compound comprising the steps of:

a) reacting a pyridine sulfonic acid compound with a carbamoyl halide in the presence of a tert.-amine compound in a ketone solvent to form a mixture comprising carbamoyl pyridinium compound and a tert.-ammonium halide,

b) recovering from the reaction mass a mixture of the carbamoyl pyridinium compound and the tert.-ammonium halide, and

c) separating the carbamoyl pyridinium compound from the tert.-ammonium halide by washing the mixture with a selective solvent for the tert.-ammonium halide.

5,559,240

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Ken Kawata, and Tadashi Ikeda, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 44,061, Apr. 8, 1993, Pat. No. 5,397,693. This application Dec. 6, 1994, Ser. No. 354,729

Claims priority, application Japan, Apr. 9, 1992, 4-116809; Sep. 2, 1992, 4-259029

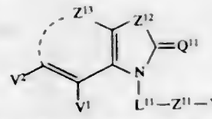
Int. Cl.[6] C07D *277/84;277/62*

U.S. Cl. 548—150 **8 Claims**

1. A methine compound represented by the following formula (II):

5,559,241

duce the novel 5(S)-(3-methyl-5-isoxazolyl)-2-pyrrolidinone



(II)

wherein Y^{11} is a group which is cleavable by a nucleophile at the portion bonding to Z^{11};

Z^{11} represents —O—, —S—, or —NR^{11}— in which R^{11} is a hydrogen atom, an alkyl group, an alkyl group which is substituted with alkoxy, an aryl group, an aryl group which is substituted with a halogen, a heterocyclic group, or a group which is clearable by a nucleophile at the portion bonding to N;

L^{11} represents an ethylene group; a propylene group; an ethylene group which is substituted with a hydroxyl group, a sulfo group, a carboxyl group, an alkyl group, an alkoxy group, an aryloxy group, an alkylthio group, an acyloxy group, an acyl group, a sulfamoyl group, an aryl group or a heterocyclic group; or a propylene group which is substituted with a hydroxyl group, a sulfo group, a carboxyl group, an alkyl group, an alkoxy group, an aryloxy group, an alkylthio group, an acyloxy group, an acyl group, a sulfamoyl group, an aryl group or a heterocyclic group;

Z^{12} represents —S—;

V^1 represents a halogen atom, a sulfo group, a carboxyl group, a nitro group, an alkyl group, an alkyl group which is substituted with alkoxy, an alkenyl group, an acyl group, an acyloxy group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, an acylamino group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, an alkylsulfonamido group, an arylsulfonamido group, a ureido group, an alkylsulfonyl group, an arylsulfonyl group, an aryl group, an aryl group which is substituted with halogen, or a heterocyclic group;

V^2 represents a hydrogen atom, a halogen atom, a sulfo group, a carboxyl group, a nitro group, a cyano group, a hydroxy group, an alkyl group, an alkyl group which is substituted with alkoxy, an alkenyl group, an acyl group, an acyloxy group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, an acylamino group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, an alkylsulfonamido group, an arylsulfonamido group, a ureido group, an alkylsulfonyl group, an arylsulfonyl group, an aryl group, an aryl group which is substituted with halogen, or a heterocyclic group; or V^1 and V^2 are each combined to form an unsaturated ring or an aromatic ring together with double bond to which V^1 and V^2 are attached;

Z^{13} represents —CV^3=CV^4—, —CV^5V^6—CV^7V^8— or —$CV^{18}V^{19}$— in which V^3, V^4, V^5, V^6, V^7, V^8, V^{18} and V^{19} are each independently a hydrogen atom, a halogen atom, a sulfo group, a carboxyl group, a nitro group, a cyano group, a hydroxyl group, an alkyl group, an alkenyl group, an acyl group, an acyloxy group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, an acylamino group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, an alkylsulfonamido group, an arylsulfonamido group, a ureido group, an alkylsulfonyl group, an arylsulfonyl group, an aryl group or a heterocyclic group; and

Q^{11} represents a methine or polymethine group which is terminated by a bicyclic thiazole group or a tricyclic thiazole group.

5,559,241

PROCESS FOR THE PREPARATION OF STERILE AMOXYCILLIN SODIUM SALT

Giordano B. Corsi, Genzano; Alberto Brandt, Rome, and Loredana Cecchetelli, Castelgandolfo, all of Italy, assignors to Instituto Biochimico Italiano Giovanni Lorenzini S.p.A., Milan, Italy

Continuation of Ser. No. 130,969, Oct. 4, 1993, abandoned. This application Sep. 15, 1995, Ser. No. 528,546

Claims priority, application Italy, Oct. 5, 1992, MI92A2296

Int. Cl.[6] C07D *277/60*

U.S. Cl. 548—178 **6 Claims**

1. A process for the preparation of sterile sodium amoxycillin comprising reacting a stable solution of amoxycillin trihydrate in a mixture of methyl alcohol and a lower C_2C_5 alcohol under sterile conditions with a solution of a suitable salifying agent selected from the group consisting of an alcoholate and carboxylate of sodium in methyl acetate, and separating the resulting precipitate.

5,559,242

METHOD OF PREPARING ENANTIOMERICALLY-PURE 3-METHYL-5-(1-ALKYL-2(S)-PYRROLIDINYL) ISOXAZOLES

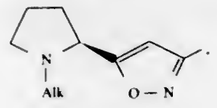
Nan-Horng Lin, Mundelein; Yun He, Zion, and Steven J. Wittenberger, Mundelein, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 475,717, Jun. 7, 1995, Pat. No. 5,516,912, which is a continuation-in-part of Ser. No. 234,442, Apr. 28, 1994, Pat. No. 5,424,444, which is a continuation-in-part of Ser. No. 117,819, Sep. 8, 1993, abandoned. This application Jan. 25, 1996, Ser. No. 591,806

Int. Cl.[6] C07D *261/06*

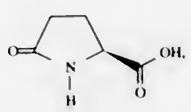
U.S. Cl. 548—247 **3 Claims**

1. A process for preparing in high yield the enantiomerically-pure 3-methyl-5-(1-(C_1– C_3-alkyl)-2-pyrrolidinyl)isoxazole of the formula

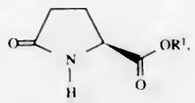


wherein Alk is C_1–C_3-alkyl, comprising:

(a) reacting a starting material, (S)-pyroglutamic acid, having the formula

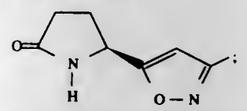


with an esterifying reagent at from −10° C. to 80° C. for from 3-to-48 hours, to prepare the (S)-pyroglutamic acid ester having the formula.

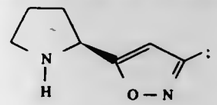


wherein R^1 is methyl or ethyl;

(b) reacting the (S)-pyroglutamic acid ester with an excess of a salt of the dianion of acetone oxime in a suitable solvent, at a temperature of from −30° C. to ambient temperature, with vigorous mixing of the reagents, to form the intermediate product, 1-(1-methyl-5-oxo-2(S)-pyrrolidinyl)-1,3-butanedione-3-oxime, which is not isolated, but which is dehydrated and cyclized by reaction with a strong acid at ambient-to-reflux temperature for from 0.5-to-3 hours, to produce the novel 5(S)-(3-methyl-5-isoxazolyl)-2-pyrrolidinone compound having the formula



(c) reducing the 5(S)-(3-methyl-5-isoxazolyl)-2-pyrrolidinone with a reducing agent known to reduce lactams to cyclic amines, particularly an agent selected from the group consisting of lithium aluminum hydride, $NaBH_4/BF_3$, $NaBH_4/CH_3SO_3H$, $NaBH_4$/camphorsulfonic acid, borane/dimethyl sulfide and borane/THF, to give the 3-methyl-5-(2(S)-pyrrolidinyl)isoxazole compound having the formula



then

(d) N-alkylating the 3-methyl-5-(2(S)-pyrrolidinyl)isoxazole by treatment with an N-alkylating agent, such as formaldehyde, acetaldehyde or propanal, for example, in the presence of a reducing agent and under reaction conditions capable of reducing an iminium compound, and isolating the desired 3-methyl-5-(1-(C_1–C_3-alkyl)-2-pyrrolidinyl)isoxazole in high chiral purity.

5,559,243

PROCESSES FOR PRODUCING A SALT OF N-GUANIDINO THIOUREA AND 3-AMINO-5-MERCAPTO-1,2,4-TRIAZOLE

Takehiko Yoshie, Uozu; Masanori Sasaki, Shinagawa-ku; Hiroshi Shibafuchi, Uozu, and Yasushi Imai, Omiya, all of Japan, assignors to Nippon Carbide Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 16, 1994, Ser. No. 357,807

Claims priority, application Japan, Dec. 13, 1994, 6-308862

Int. Cl.[6] C07D *249/12*

U.S. Cl. 548—263.8 **18 Claims**

1. A process for producing a salt of N-guanidino thiourea comprising the step of allowing to react (i) a compound having both a thiocyanate group and an aminoguanidino group, or (ii) (a) a compound having a thiocyanate group and (b) a compound having an aminoguanidino group, in the presence of an acid, while heating, in a polar solvent.

5,559,244

PREPARATION OF 1-(HET) ARYL-3-HYDROXYPYRAZOLES

Hartmann König, Heidelberg; Norbert Götz, Worms; Reinhard Kirstgen, Neustadt; Bernd Müller, Frankenthal, and Klaus Oberdorf, Heidelberg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

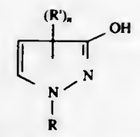
Filed Apr. 26, 1995, Ser. No. 429,322

Claims priority, application Germany, May 3, 1994, 44 15 484.4

Int. Cl.[6] C07D *231/22;231/14;231/16;401/04*

U.S. Cl. 548—371.1 **8 Claims**

1. A process for preparing 1-(het)aryl-3-hydroxypyrazoles of the formula I



I

where

R is an unsubst. or subst. aromatic or heteroaromatic radical,

n is 1 and

R' is a group which is stable under the reaction conditions, from propiolic acid esters of the formula II

$$R'—C\equiv C—CO_2R^1 \qquad II$$

where R^1 is an alkyl, cycloalkyl or aryl group, and (het)arylhydrazines of the formula III

$$R—NH—NH_2 \qquad III$$

in a solvent in the presence of a base, which comprises first mixing II and III with one another in a solvent and then treating this mixture with the base at from 0° C. to 60° C.

5,559,245

INTERMEDIATES TO 4-AMINO- HEXAHYDROBENZ (CD) INDOLES AND PROCESSES THEREFOR

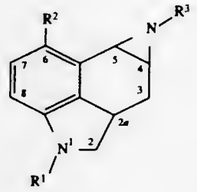
Thomas J. Kress, Indianapolis, Ind.; M. Robert Leanna, Mundelein, Ill.; Michael J. Martinelli, and Barry C. Peterson, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 289,619, Aug. 12, 1994, abandoned, which is a continuation of Ser. No. 36,599, Mar. 24, 1993, abandoned, which is a division of Ser. No. 799,924, Nov. 26, 1991, Pat. No. 5,212,319, which is a continuation of Ser. No. 485,194, Feb. 26, 1990, abandoned. This application Sep. 12, 1995, Ser. No. 527,150

Int. Cl.[6] C07D *487/02*

U.S. Cl. 548—422 **10 Claims**

1. A compound of the formula



IV

wherein

R^1 is hydrogen or an amino-protecting group; R^2 is hydrogen, halo, hydroxy, carboxy, C_1–C_4 alkoxy, C_1–C_4 alkylthio, C_1–C_4 alkoxycarbonyl, cyano, aminocarbonyl, or aminocarbonyl substituted with one or two C_1–C_4 alkyl groups; R^3 is hydrogen, a C_1–C_4 alkyl, or a C_1–C_4 alkyl substituted with one to three groups selected from halo, nitro, or phenyl which is substituted with zero to three groups selected from hydroxy, methyl, nitro, or halo; provided that if the 4-position is in the R configuration, the 5-position is in the S-configuration and further provided that if the 4-position is in the S configuration, the 5-position is in the R configuration.

5,559,246

INDOLE DERIVATIVES

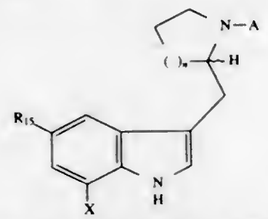
John E. Macor, New York, N.Y., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 401,647, Mar. 10, 1995, abandoned, which is a continuation of Ser. No. 53,930, Apr. 27, 1993, abandoned, which is a continuation-in-part of Ser. No. 39,244, Apr. 27, 1993, abandoned, which is a continuation-in-part of Ser. No. 597,928, Oct. 15, 1990, abandoned. This application Jun. 6, 1995, Ser. No. 466,650

Int. Cl.[6] C07D *403/06*

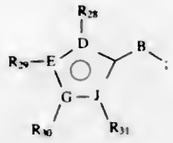
U.S. Cl. 548—468 **4 Claims**

1. A process for preparing a compound of the formula

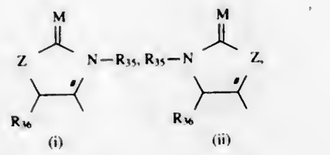


(XVI)

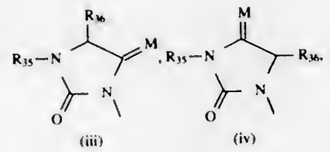
wherein X is chlorine, bromine, or iodine; A is a first suitable nitrogen protecting group; R_{15} is hydrogen, halogen, cyano, $—OR_{16}$, $—(CH_2)_m—(C═O)NR_{17}R_{18}$, $—(CH_2)_m—SO_2NR_{17}R_{18}$, $—(CH_2)_m—NR_{19}(C═O)R_{20}$, $—(CH_2)_m—NR_{19}SO_2R_{20}$, $—(CH_2)_m—S(O)_yR_{20}$, $—(CH_2)_m—NR_{19}(C═O)NR_{17}R_{18}$, $—(CH_2)_m—NR_{19}(C═O)OR_{21}$, $—CH═CH(CH_2)_xR_{22}$, $—(CH_2)_m—T$, and a substituent of the formula



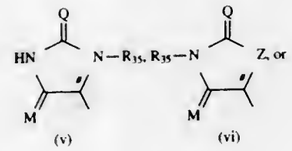
B represents a direct bond, C_1-C_4 alkyl, or C_1-C_4 alkenyl; D, E, G, and J are each independently oxygen, sulfur, nitrogen or carbon, provided that at least one of D, E, G, and J is nitrogen; R_{28}, R_{29}, R_{30}, and R_{31} are each independently hydrogen, C_1-C_6 alkyl, aryl, C_1-C_3 alkylaryl, C_1-C_3 alkylheteroaryl, halogen, cyano, trifluoromethyl, nitro, $—OR_{32}$, $—NR_{32}R_{33}$, $—(CH_2)_mOR_{32}$, $—SR_{32}$, $—SO_2NR_{32}R_{33}$, $—NR_{32}SO_2R_{33}$, $—NR_{32}CO_2R_{33}$, $—CONR_{32}R_{33}$, or $—CO_2R_{32}$; one of R_{28} and R_{29}, R_{29} and R_{30}, or R_{30} and R_{31} may be taken together to form a five- to seven-membered alkyl ring, a six-membered aryl ring, a five- to seven-membered heteroalkyl ring having 1 heteroatom of N, O, or S, or a five- to six-membered heteroaryl ring having 1 or 2 heteroatoms of N, O, or S; R_{32} and R_{33} are each independently hydrogen, $C_1$to C_6 alkyl, $—(CH_2)_qR_{34}$, C_1 to C_3 alkylaryl, or aryl; R_{32} and R_{33} may be taken together to form a C_4-C_7 alkyl ring; R_{34} is cyano, trifluoromethyl, or C_1-C_4 alkoxy; R_{16} is selected from hydrogen, C_1 to C_6 alkyl, and aryl; T is



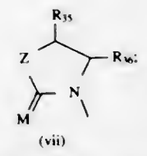
(i) (ii)



(iii) (iv)



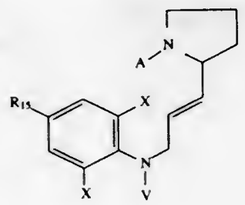
(v) (vi)



(vii)

M and Q are each independently oxygen or sulfur; Z is —O—, —S—, —NH, or $—CH_2$; R_{35} and R_{36} are each independently hydrogen, C_1 to C_6 alkyl, aryl, C_1 to C_3 alkylaryl, or C_1 to C_3 alkylheteroaryl; R_{22} is selected from $—(C═O)NR_{23}R_{24}$, $—SO_2NR_{23}R_{24}$, $—NR_{25}(C═O)R_{26}$, $—NR_{25}SO_2R_{26}$, $—NR_{25}(C═O)NR_{23}R_{24}$, $—S(O)_yR_{26}$ and $—NR_7(C═O)OR_{27}$; R_{17}, R_{18}, R_{23}, and R_{24} are independently selected from hydrogen, C_1 to C_6 alkyl, aryl, and C_1 to C_3 alkyl-aryl, or R_{17} and R_{18} or R_{23} and R_{24} maybe taken together to form a 4, 5, or 6 membered ring; R_{19}, R_{20}, R_{21}, R_{25}, R_{26}, and R_{27} are independently selected from hydrogen, C_1 to C_6 alkyl, aryl, and C_1 to C_3 alkyl-aryl; y is 0, 1, or 2; x is 1 or 2; m is 0, 1, 2, or 3; n is 1; q is 1, 2, or 3; a chiral carbon designated by #; and the above aryl groups and the aryl moieties of the above alkylaryl groups are independently selected from phenyl and substituted phenyl, wherein said substituted phenyl may be substituted with one to three groups selected from C_1 to C_4 alkyl, halogen, hydroxy, cyano, carboxamido, nitro, and C_1 to C_4 alkoxy,

comprising, performing a transition metal catalyzed cyclization on a compound of the formula



(XVII)

wherein A and R_{15} are as defined above and V is a second suitable nitrogen protecting group.

5,559,247

CARBOXYLATE AND HEAT-SENSITIVE RECORDING MATERIAL USING SAME

Mansuke Matsumoto, Kawanishi; Nobuaki Sasaki, Sourakugun; Bunji Sawano, Osaka-fu; Kiyoharu Hasegawa, Yokohama, and Kazuyoshi Kikkawa, Kamakura, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Toyko, and Yamamoto Chemicals, Inc., Yao, both of Japan

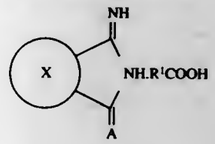
Filed Apr. 14, 1995, Ser. No. 422,033

Claims priority, application Japan, Apr. 26, 1994, 6-088426; Jun. 2, 1994, 6-121082; Aug. 9, 1994, 6-187280; Aug. 25, 1994, 6-200774

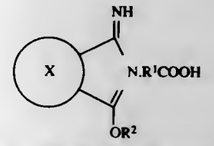
Int. Cl.[6] C07D *209/44*

U.S. Cl. 548—471 **3 Claims**

1. A carboxylate represented by formula (1) or (2)



(1)



(2)

wherein a ring X is an unsubstituted aromatic residue or an aromatic residue substituted with a halogen atom, alkyl group, alkoxy group, aryloxy group, alkylcarbonyl group, arylcarbonyl group, alkylthio group, arylthio group, nitro group, dialkylamino group, amino group, alkylsilyl group, alkylsilyloxy group or trifluoromethyl group; A is =NH or (—OR^3 and —OR^4) (wherein each of R^3 and R^4 is independently an alkyl group having 1 to 8 carbon atoms which is unsubstituted or substituted with an allyloxy group or hydroxy group, and R^3 and R^4 may bond to each other to form a ring); R^1 is a hydrogen atom, an alkyl group having 1 to 20 carbon atoms which is unsubstituted or substituted with a halogen atom, hydroxy group, alkoxy group having 1 to 4 carbon atoms, aryloxy group, alkylthio group having 1 to 4 carbon atoms, alkoxycarbonyl group having 2 to 20 carbon atoms, amino group or amide group, an aralkyl group which is unsubstituted or substituted with a halogen atom, hydroxy group, alkyl group having 1 to 4 carbon atoms, alkoxy group having 1 to 4 carbon atoms, alkylthio group having 1 to 4 carbon atoms, amino group, carboxyl group, acyl group or nitro group, or an aryl group which is unsubstituted or substituted with a halogen atom, hydroxy group, alkyl group having 1 to 4 carbon atoms, alkoxy group having 1 to 4 carbon atoms, alkylthio group having 1 to 4 carbon atoms, amino group, carboxyl group, acyl group or nitro group, but when A is =NH, R^1 is a residue of benzoic acid, chlorobenzoic acid, hydroxybenzoic acid, anisic acid, toluic acid or nitrobenzoic acid; and R^2 is an alkyl group having 1 to 8 carbon atoms which is unsubstituted or substituted with an allyloxy group or hydroxy group.

5,559,248

RETINOID-LIKE HETEROCYCLES

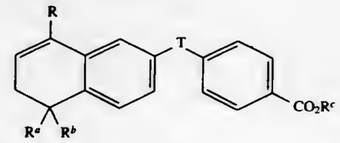
John E. Starrett, Jr., Middletown, Conn.; David R. Tortolani, Princeton, N.J.; Muzammil M. Mansuri, Lexington, Mass., and Nicholas A. Meanwell, East Hampton, Conn., assignors to Bristol-Myers Squibb Co., Princeton, N.J.

Filed Apr. 5, 1995, Ser. No. 417,180

Int. Cl.[6] C07D *307/38;333/06*

U.S. Cl. 549—79 **5 Claims**

I. A compound of formula I



I

in which

T is —CONH— or —CH═CH—;

R^a and R^b are independently C_{1-6} alkyl;

R^c is C_{1-6} alkyl or hydrogen; and

R is thienyl, methylthienyl, or furyl.

5,559,249

7'-AMINO-NAPHTHAZARIN ANTIBIOTIC DERIVATIVES

Aldo Trani; Clelia M. L. Dallanoce, both of Milan, and Romeo Ciabatti, Novate Milanese, all of Italy, assignors to Gruppo Lepetit Spa, Gerenzano, Italy

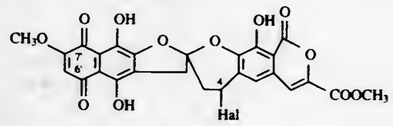
Filed May 25, 1995, Ser. No. 450,194

Claims priority, application European Pat. Off., Dec. 18, 1991, 91121674; Oct. 22, 1992, 92118035

Int. Cl.[6] C07D *493/20*

U.S. Cl. 549—264 **4 Claims**

1. Compound of general formula V



(V)

wherein Hal is a chlorine or bromine atom.

5,559,250

TREATING RED BLOOD CELL SOLUTIONS WITH ANTI-VIRAL AGENTS

David Cook; Susan Wollowitz, both of Walnut Creek, and Aileen Nerio, Fremont, all of Calif., assignors to Steritech, Inc., Concord, Calif.

Division of Ser. No. 338,040, Nov. 14, 1994. This application Jun. 5, 1995, Ser. No. 464,471

Int. Cl.[6] C07D *493/04*

U.S. Cl. 549—282 **1 Claim**

1. A composition of matter, comprising: 5-[N,N-bis(2-chloroethyl)amino] methyl-8-methoxypsoralen.

5,559,251

5,559,253

5,559,256

AMINEDIOL PROTEASE INHIBITORS

(II)

5,559,251

DERIVATIVES OF AMINO-ASCORBIC ACID, THE PROCESSES FOR THEIR PREPARATION AND USE

Bozidar Sunković; Vanja Vela, and Mira Buncić, all of Zagreb, Croatia, assignors to Pliva, farmaceutska, Croatia

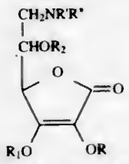
Filed Feb. 3, 1994, Ser. No. 190,921

Claims priority, application Croatia, Feb. 5, 1993, 38103/93010366

Int. Cl.[6] C07D *305/12*

U.S. Cl. 549—315 **5 Claims**

1. Derivatives of amino-ascorbic acid of the general formula (1):



wherein R'=H,R"=COR"' wherein R"'=H, C_1–C_{18} alkyl, C_6 cycloalkyl, C_6–C_{12} aryl, or heteroyl atoms, which represents a heterocyclic compound containing in the ring oxygen, sulfur or nitrogen as heteroatom and R, R_1 and R_2=H or benzyl and their salts with acids and alkalis.

5,559,252

PROCESS FOR THE PREPARATION OF DIAMINE INTERMEDIATES USEFUL IN THE SYNTHESIS OF HIV PROTEASE INHIBITORS

Robert F. Kaltenbach III, New Castle, Del., assignor to The DuPont Merck Pharmaceutical Company, Wilmington, Del.

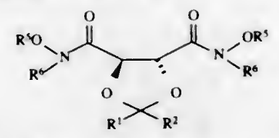
Continuation-in-part of Ser. No. 197,630, Feb. 16, 1994. This application Jun. 30, 1994, Ser. No. 268,609

Int. Cl.[6] C07C *235/06*

U.S. Cl. 549—342 **2 Claims**

1. A compound of formula (II):

(II)



wherein:

R^5 and R^6 are independently C_1–C_4 alkyl or benzyl; and

R^1 and R^2 are independently: H, C_1–C_4 alkyl, C_1–C_4 alkoxy, C_6–C_{10} aryl, C_7–C_{14} arylalkyl, C_1–C_4 haloalkyl, C_3–C_7 cycloalkyl, or can be taken together to be keto, or, alternatively, R^1 and R^2 can be taken together with the carbon to which they are attached to form a 3–7 membered saturated carbocyclic ring system.

5,559,253

PROCESS FOR THE PREPARATION OF FLUORINE-SUBSTITUTED AMINOBENZODIOXLES AND -BENZODIOXANES AND NEW INTERMEDIATES

Peter Andres, Leichlingen, and Albrecht Marhold, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 380,933, Jan. 31, 1995, which is a continuation of Ser. No. 89,966, Jul. 9, 1993, abandoned, which is a continuation of Ser. No. 952,019, Sep. 28, 1992, Pat. No. 5,260,460. This application Dec. 8, 1995, Ser. No. 569,341

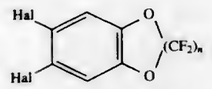
Claims priority, application Germany, Oct. 7, 1991, 41 33 156.7

Int. Cl.[6] C07D *319/20;317/62*

U.S. Cl. 549—362 **1 Claim**

1. Halogen-substituted benzodioxole or benzodioxane of the formula (III)

(III)



in which Hal represents halogen and n represents an integer 1 or 2.

5,559,254

SEPARATION OF A MIXTURE OF METHANOL AND TETRAHYDROFURAN INTO ITS CONSTITUENTS

Joseph Krug, Weisenheim am Berg, and Christof Palm, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP93/03184, § 371 Date Mar. 24, 1995, § 102(e) Date Mar. 24, 1995, PCT Pub. No. WO94/12456, PCT Pub. Date Jun. 9, 1994

PCT Filed Nov. 12, 1993, Ser. No. 403,770

Claims priority, application Germany, Nov. 21, 1992, 42 39 243.8

Int. Cl.[6] C07D *307/06;307/08*

U.S. Cl. 549—429 **4 Claims**

1. A process for separating a mixture of methanol and tetrahydrofuran into its constituents in a liquid or gas phase, wherein the separation is carried out by pervaporation using as an organophilic/hydrophilic membrane, a plasma polymerization membrane.

2. A process for separating a mixture of methanol/water/tetrahydrofuran mixture in to a methanol/water mixture and tetrahydrofuran in a liquid or gas phase, wherein the separation is carried out by pervaporation using as an organophilic/hydrophilic membrane, a plasma polymerization membrane.

3. A process for separating mixtures composed of methanol or methanol/water and aliphatic and/or aromatic ethers of the formula I

$$R^1—O—R^2 \quad (I)$$

where R^1 and R^2 are identical or different and are each linear or branched C_1-C_6-alkenyl,

C_2-C_6-alkenyl,

C_6-C_{12}-aryl,

it being possible for these groups to be substituted by hydroxyl and/or alkoxy groups with 1–4 carbons wherein the separation is carried out in a liquid or gas phase by pervaporation using as an organophilic/hydrophilic membrane, a plasma polymerization membrane.

4. A process for separating mixtures composed of methanol and cyclic ethers of the formula II, or methanol/water and cyclic ethers of the formula II

(II)

where R^3 is

C_4-C_6-alkylene which can be substituted by

C_1-C_4-alkyl groups, or is

C_2-C_8-alkylene which can be interrupted 1 to 4 times by oxygen atoms and can be substituted by C_1-C_4-alkyl groups in a liquid or gas phase, wherein the separation is carried out by pervaporation using as an organophilic/hydrophilic membrane, a plasma polymerization membrane.

5,559,255

METHOD OF RECOVERING ETHYLENE OXIDE

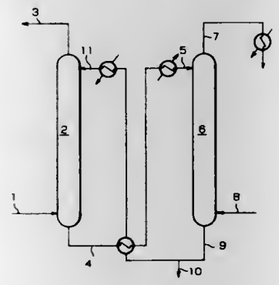
Kazuki Kawabe; Kazuhiko Murata, and Toshiyuki Furuya, all of Yokkaichi, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Sep. 5, 1995, Ser. No. 523,199

Claims priority, application Japan, Sep. 8, 1994, 6-214919

Int. Cl.[6] C07D *301/32;303/04*

U.S. Cl. 549—538 **13 Claims**



1. A method of recovering ethylene oxide comprising the steps of:

bringing a mixed gas containing ethylene oxide into contact with an absorbent so as to cause said absorbent to absorb said ethylene oxide; and

stripping and separating said ethylene oxide to recover it from said absorbent;

characterized in that said absorbent contains propylene carbonate.

7. A method according to claim 1 wherein said mixed gas mentioned above is a reaction product gas obtained from the vapor phase catalytic oxidation of ethylene with oxygen over a silver catalyst.

5,559,256

AMINEDIOL PROTEASE INHIBITORS

Eric M. Gordon, Palo Alto, Calif.; Joel C. Barrish, Holland, Pa.; Gregory S. Bisacchi, Lawrenceville, N.J.; Choong-Qing Sun, East Windsor, N.J.; Joseph A. Tino, Lawrenceville, N.J.; Gregory D. Vite, Trenton, N.J., and Robert Zahler, Pennington, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

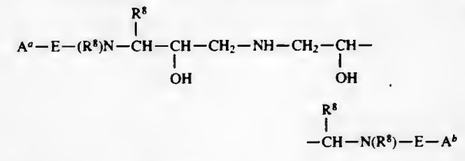
Continuation-in-part of Ser. No. 927,027, Aug. 6, 1992, abandoned, which is a continuation-in-part of Ser. No. 916,916, Jul. 20, 1992, abandoned. This application Jun. 25, 1993, Ser. No. 79,978

Int. Cl.[6] C07D *401/12*

U.S. Cl. 552—303 **18 Claims**

1. A compound of the following formula I:

(I)

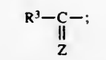


where

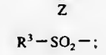
A^a and A^b are independently:

(1) hydrogen;

(2) alkyl;



(3)



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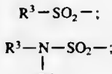
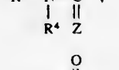


(5)

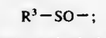
(6)

(7)



(8)

or



(9)

each E is independently a single bond or a peptide chain containing 1 to 4 amino acids, the N-terminus of which is bonded to A^a or A^b;

R^3 and R^4 are each independently:

(1) hydrogen;

(2) alkyl;

(3) aryl; or

(4) carbocyclo;

R^5, R^6 and R^7 are each independently:

(1) hydrogen;

(2) alkyl;

(3) aryl;

(4) carbocyclo;

(5) fluorenyl;

(6) R^5, R^6 and R^7 may, independently, be joined together with the carbon atom to which they are bonded, to form a mono-, bi- or tricyclic carbocyclic ring system;

(7) alkynyl; or

(8) alkenyl;

each R^8 is independently:

(1) hydrogen; or

(2) alkyl;

each R^9 is independently arylalkyl; and

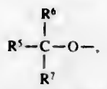
Z is oxygen or sulfur; or a salt thereof.

(1) hydrogen;

G is a compound of formula III having rings a and b.

R' and R" independently of one another are hydrogen or (C_1–C_6) alkyl

each R^9 is independently arylalkyl; and
Z is oxygen or sulfur; or a salt thereof,
wherein:
wherever they appear alone or as part of another group, unless otherwise indicated, the terms "alk" or "alkyl" denote a straight or branched chain saturated radical containing 1 to 12 carbons in the normal chain, optionally substituted by one or more groups selected from: (1) hydroxy or protected hydroxy; (2) oxo, with the proviso that the carbon bearing the oxo group is not adjacent to a heteroatom; (3) carboxy, (4) halo; (5) alkoxy; (6) aryloxy; (7) alkoxycarbonyl; (8) $(R^{12})(R^{13})N—C(O)—$; (9) $(R^{12})(R^{13})N—$; (10) $(R^{15})—C(O)—N(R^{14})—$; (11) $(R^{15})—SO_2—N(R^{14})—$; (12) carbocyclo; (13) aryl; (14) alkylcarbonyloxy; (15) arylcarbonyloxy, (16) cyano; (17) mercapto; (18) alkenyl; (19) alkynyl; (20) alkylthio; (21) arylthio; (22) trialkylsilyl; (23) azo; or (24) $(R^{12})(R^{13})N—C(O)—O—$;
wherever it appears alone or as part of another group, unless otherwise indicated, the term "alkenyl" denotes a straight or branched chain radical containing 2 to 12 carbons in the normal chain which contains at least one carbon to carbon double bond and which is directly attached through one of the carbons composing said double bond, optionally substituted by one or more groups selected from: (1) alkyl; (2) aryl; (3) carbocyclo; (4) carboxy; (5) halo; (6) $(R^{12})(R^{13})N—C(O)—$; (7) cyano; (8) alkoxycarbonyl; (9) trialkylsilyl; or (10) alkynyl;
wherever it appears alone or as part of another group, unless otherwise indicated, the term "alkynyl" denotes a straight or branched chain radical containing 2 to 12 carbons in the normal chain which contains at least one carbon to carbon triple bond and which is directly attached through one of the carbons composing said triple bond, optionally substituted by one or more groups selected from: (1) alkyl; (2) aryl; (3) carbocyclo; (4) carboxy; (5) $(R^{12})(R^{13})N—C(O)—$; (6) cyano; (7) alkoxycarbonyl; (8) alkenyl; or (9) trialkylsilyl;
wherever they appear alone or as part of another group, unless otherwise indicated, the terms "carbocyclo", "carbocyclic" or "carbocyclic ring system" denote a saturated or partially unsaturated, homocyclic carbon ring system containing from 1 to 3 rings and from 3 to 12 carbons per homocyclic ring, optionally substituted by one or more groups selected from: (1) alkyl; (2) hydroxy or protected hydroxy, (3) halo; (4) mercapto; (5) cyano; (6) carboxy; (7) alkoxycarbonyl; (8) $(R^{12})(R^{13})N—C(O)—$; (9) alkylcarbonyloxy; (10) arylcarbonyloxy; (11) $(R^{12})(R^{13})N—$; (12) alkoxy; (13) aryl, where said aryl group may be bonded through a single bond or fused; (14) oxo; (15) aryloxy; (16) alkylthio; (17) arylthio; (18) $(R^{15})—(O)—N(R^{14})—$; (19) alkenyl; (20) alkynyl; or (21) trialkylsilyl;
wherever it appears alone or as part of another group, unless otherwise indicated, the term "aryl" denotes, a homocyclic, aromatic group containing 1 or 2 rings and from 6 to 12 carbons in the aromatic ring portion, optionally substituted by one or more groups selected from: (1) alkyl; (2) alkoxy; (3) hydroxy or protected hydroxy; (4) halo; (5) $(R^{12})(^{13})N—$; (6) alkylthio; (7) mercapto; (8) nitro; (9) cyano; (10) carboxy; (11) carboalkoxy; (12) carbocyclo, where said carbocyclo group may be bonded through a single bond or fused; (13) $(R^{12})(R^{13})N—C(O)—$; (14) $(R^{12})(R^{13})N—SO_2—$; (15) $R^3—C(O)—N(R^{17})—$; (16) $R^3—SO_2—N(R^{17})—$; (17) phenyl; (18) alkylcarbonyloxy; (19) arylcarbonyloxy; (20) arylthio; (21) aryloxy; (22) alkylthio; or (23) alkenyl;
where
R^{12} and R^{13} are independently:
(1) hydrogen;
(2) alkyl;
(3) aryl; or
(4) carbocyclo;
R^{14} is:
(1) hydrogen;
(2) alkyl;
(3) aryl; or
(4) carbocyclo;
R^{15} is:
(1) hydrogen;
(2) alkyl;
(3) alkenyl;
(4) aryl;
(5) carbocyclo; or



(6)

wherein R^5, R^6 and R^7 are, independently, those groups (1) through (8) recited for R^5, R^6 and R^7 above; and
R^{17} is:
(1) hydrogen;
(2) alkyl;
(3) aryl; or
(4) carbocyclo.

5,559,257

PROCESS FOR THE PREPARATION OF TETRACHLORO-1,4-BENZOQUINONE

Otto Arndt, Hofheim, and Wolfgang Tronich, Eppstein, both of Germany, assignors to Hoechst A G, Germany

Filed Feb. 22, 1995, Ser. No. 392,469
Claims priority, application Germany, Feb. 24, 1994, 44 05 929.9
Int. Cl.[6] C07C *50/20*
U.S. Cl. 552—308 **19 Claims**

1. A process for the preparation of tetrachloro-1,4-benzoquinone of high purity in a reactor by the action of chlorine and concentrated hydrochloric acid on hydroquinone, which comprises the steps of:
a) introducing hydrochloric acid containing catalytic amounts of iron (III) ions and an anionic dispersant into the reactor;
b) introducing a portion of the hydroquinone to be employed into the reactor containing the hydrochloric acid to form a solution,
c) introducing chlorine gas into the solution at a temperature from 20° to 107° C.,
d) adding the residual quantity of hydroquinone as a solid or in solution,
e) raising the temperature to from 80° to 107° C. while continuing to pass in gaseous chlorine,
f) adding, after the introduction of gaseous chlorine has ended, a relative high-boiling organic solvent which is not miscible with hydrochloric acid, and
g) subsequently subjecting the reaction mixture to thermal aftertreatment.

5,559,258

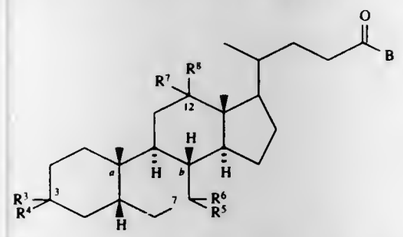
ETHYLENICALLY UNSATURATED BILE ACID DERIVATIVES, PROCESSES FOR THEIR PREPARATION AND PRECURSORS

Alfons Enhsen, Büttelborn; Heiner Glombik, Hofheim am Taunus; Stefan Müllner, Hochheim am Main, and Günther Wess, Erlensee, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 993,243, Dec. 17, 1992, abandoned. This application Nov. 22, 1994, Ser. No. 345,803
Claims priority, application Germany, Dec. 20, 1991, 41 42 323.2; Sep. 1, 1992, 42 29 033.3
Int. Cl.[6] C07J *9/00*
U.S. Cl. 552—550 **9 Claims**

1. An ethylenically unsaturated bile acid derivative of the formula I
in which

G is a compound of formula III having rings a and b,



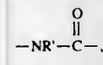
(III)

in which
R^5 to R^8 independently of one another are hydrogen, OH, NH_2 or an OH group protected by an OH protective group, R^3 and R^4 independently of one another are hydrogen, NH_2 or an OH group protected by an OH protective group, and one of the radicals R^3 or R^4, is a bond to the group X, where this bond starts from position 3(R^3 or R^4) and the position 7(R^5 or R^6) carries an OH group or a protected OH group,
B is —O-alkali metal, —O-alkaline earth metal, —O—(C_1–C_{12})-alkyl, —O-allyl or —O-benzyl, where a resultant ester group

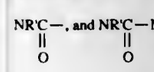
is an ester optionally hydrolyzed by acid or by base, and G is bonded via ring a or b to the group X wherein,
X is a bridge group of formula II

(II)

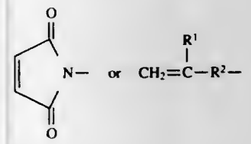
in which
Y is adjacent to G and is —O—, —NR'—, or



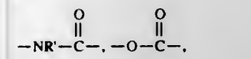
Z is (C_1–C_{12})-alkylene or (C_7–C_{13})-aralkylene, where individual methylene groups in the alkylene chain of the alkylene or aralkylene can be replaced by groups selected from the group consisting of —O—, —NR'—,



o and p independently of one another are zero or one, where o and p are not simultaneously zero, and
A is



where
R^1 is hydrogen or CH_3 and
R^2 is



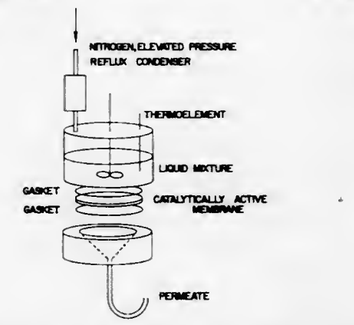
—O—, —NR'— or a single bond, where the carbonyl groups are adjacent to the C—C double bond, and
R' and R" independently of one another are hydrogen or (C_1–C_6) alkyl.

5,559,259

PROCESS FOR PRODUCING POISON-RESISTANT CATALYSTS

Wilhelm F. Maier, Mülheim an der Ruhr, Germany, assignor to Studiengesellschaft Kohle mbH, Mulheim An Der Ruhr, Germany

Division of Ser. No. 191,836, Feb. 4, 1994, Pat. No. 5,492,873. This application Nov. 3, 1995, Ser. No. 552,712
Claims priority, application Germany, Sep. 2, 1993, 43 03 610.4
Int. Cl.[6] C07C *51/36*
U.S. Cl. 554—141 **8 Claims**



1. In the carrying out of a heterogeneously catalyzed reaction between a smaller reactant and a reaction liquid larger reactant with a catalyst under conditions which prevent the catalyst from being poisoned; the improvement which comprises employing as said catalyst a poison-resistant continuous membrane for heterogeneously catalyzed reactions permeable to one of the reactants separated by said membrane, the membrane having pores distributed throughout of which more than 90% have a pore diameter smaller than 1.2 nm, the membrane containing as integral part thereof in said pores at least one catalytically active component, the smaller reactant being supplied by metered addition through the membrane, the reaction liquid (larger reactant) and the contaminants contained therein being incapable of penetrating the membrane pores due to their molecular sizes.

5,559,260

PRECURSORS AND PROCESSES FOR MAKING METAL OXIDES

Michael C. Scott; Carlos A. Paz de Araujo, and Larry D. McMillan, all of Colorado Springs, Colo., assignors to Symetrix Corporation, Colorado Springs, Colo.

Continuation-in-part of Ser. No. 132,744, Oct. 6, 1993, Pat. No. 5,514,822, which is a continuation-in-part of Ser. No. 993,380, Dec. 18, 1992, Pat. No. 5,456,945, Ser. No. 981,133, Nov. 24, 1992, Pat. No. 5,423,285, and Ser. No. 965,190, Oct. 23, 1992, abandoned, said Ser. No. 981,133and Ser. No. 965,190, , each is a continuation-in-part of Ser. No. 807,439, Dec. 13, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 477,068
Int. Cl.[6] C07F *5/00;7/22*
U.S. Cl. 556—28 **17 Claims**

1. A method of making a precursor for fabricating a metal oxide, said method comprising the steps of:
mixing a metal alkoxycarboxylate-containing liquid with a 2-ethylhexanoic acid in an effective amount for shelf-stabilizing said liquid by substituting 2-ethylhexanoate ligands for alkoxide ligands, thereby forming a mixture; and

heating said mixture to so substitute said carboxylate ligands for said alkoxide ligands.

10. A method of making a barium strontium titanate precursor, said method comprising the steps of:

combining a polyoxyalkylated barium moiety, a polyoxyalkylate strontium moiety, and a polyoxyalkylated titanium moiety to form a liquid solution,

each of said respective moieties having a formula in which corresponding barium, strontium, and titanium atoms bond with an oxygen atom in a ligand selected from a ligand group consisting of alkoxides and carboxylates; and heating said liquid solution.

15. A method of making a strontium bismuth tantalate precursor, said method comprising the steps of:

combining a polyoxyalkylated strontium moiety, a polyoxyalkylated bismuth moiety, and a polyoxyalkylated tantalum moiety to form a liquid solution;

each of said respective moieties having a formula in which corresponding strontium, bismuth, and tantalum atoms bond with an oxygen atom in a ligand selected from a ligand group consisting of alkoxides and carboxylates; and heating said liquid solution.

5,559,261

METHOD FOR MANUFACTURING COBALT CATALYSTS

Mark R. Sivik, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 27, 1995, Ser. No. 508,195

Int. Cl.[6] C07F *15/06*

U.S. Cl. 56—148 **12 Claims**

1. A method for manufacturing cobalt complexes having the formula:

$$[Co(NH_3)_5M]T_y;$$

wherein the M ligand is selected from substituted and unsubstituted C_1–C_{30} carboxylic acids having the formula:

$$RC(O)O—;$$

said method comprising the steps of:

(a) reacting cobalt (II) carboxylate having the formula:

$$Co(M)_2xH_2O$$

wherein x is from about 0 to about 8,

with concentrated ammonium hydroxide and ammonium carboxylate salt;

(b) reacting the product of step (a) with an oxidizing agent selected from the group consisting of oxygen, hydrogen peroxide, and mixtures thereof;

(c) optionally, exchanging one T counterion with another T counterion; and

(d) collecting the cobalt complex;

wherein T is one or more counteranions present in a number y to obtain a charge-balanced salt; and y is 1 or 2.

5,559,262

PROCESS FOR THE PREPARATION OF RUTHENIUM COMPLEXES AND THEIR IN SITU USE AS HYDROGENATION CATALYSTS

Richard P. Beatty, Newark, Del., and Rocco A. Paciello, Bad Durkheim, Germany, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 31, 1995, Ser. No. 381,598

Int. Cl.[6] C07F *9/50;* **B01J** *31/24*

U.S. Cl. 556—20 **8 Claims**

1. A process for the preparation of a ruthenium complex having the formula $RuH_2(PR_3)_2L_2$ wherein:

each PR_3 is an organophosphorus ligand present as a separate ligand or cojoined with at least one other organophosphorus ligand PR_3;

each R is a substituent independently selected from the group consisting of: H, R', OR', $OSiR'_3$, NH_2, NHR' and NR'_2;

each R' is independently selected from the group consisting of: a hydrocarbyl group, and an assembly of at least two hydrocarbyl groups connected by ether or amine linkages; and

each L is a ligand independently selected from the group consisting of: H_2, and an additional equivalent of the organophosphorus ligand PR_3;

comprising the steps of:

(a) contacting a ruthenium compound having the formula $R^2{}_2RuA_2$ wherein R^2 is a mono- or poly-, cyclic- or acyclic alkene ligand, present as either two separate ligands or as a single polyalkene ligand, and A is an allyl ligand or a hydrocarbyl-substituted allyl ligand; an organic solvent; and PR_3 wherein the molar ratio of PR_3 to the ruthenium compound is at least 2:1, with gaseous hydrogen;

(b) agitating the solution at a temperature of about −30° C. to about 200° C.; and optionally isolating the ruthenium complex from the organic solvent.

5,559,263

ALUMINUM CITRATE PREPARATIONS AND METHODS

J. E. Smith, Lakewood, Colo., assignor to Tlorco, Inc., Englewood, Colo.

Filed Nov. 16, 1994, Ser. No. 340,585

Int. Cl.[6] C07F *5/06*

U.S. Cl. 556—183 **11 Claims**

1. An aluminum citrate preparation in dry form having at least about 1.1 percent chloride by weight and a molar ratio of aluminum to citrate of between about 0.5:1 and about 2.2:1, capable of forming a clear aqueous solution having a pH between about 5.0 and about 9.0 at a concentration of at least about 3.1 percent by weight aluminum.

5. A clear aqueous aluminum citrate solution having at least about 3.1 percent by weight aluminum, a pH between about 5.0 and about 9.0 and a molar ratio of aluminum to citrate at most about 2.2:1.

6. A method for the preparation of a solution comprising aluminum citrate complex comprising the following steps:

a. providing a first aqueous solution compriaing an aluminum-chloride containing complex wherein the aluminum:chloride ratio is at least about 1:3;

b. mixing said first solution with a second solution comprising citric acid to form a composition having a molar ratio of aluminum:citrate at most about 2.2:1;

c. stirring said composition of step b. continuously at a rate sufficient to keep the resultant slurry in motion;

d. adjusting the pH of said composition to between about 5.0 and about 9.0 to obtain a clear solution.

5,559,264

PROCESS FOR MAKING CHLOROORGANOSILICON COMPOUNDS

Mark P. Bowman, and Curtis L. Schilling, Jr., both of Marietta, Ohio, assignors to OSi Specialities, Inc., Danbury, Conn.

Continuation of Ser. No. 202,192, Feb. 24, 1994, abandoned. This application Feb. 14, 1995, Ser. No. 389,081

Int. Cl.[6] C07F *7/08*

U.S. Cl. 556—479 **38 Claims**

1. A method for preparing a chloroalkylalkoxysilane comprising reacting an allylic chloride with a molar excess of a hydromethoxysilane in a reaction vessel in the presence of an effective amount of a ruthenium metal-containing catalyst, and in substantial absence of an inert solvent with the proviso that when the ruthenium metal-containing catalyst is a phosphine complex, the catalyst must contain an additional ligand other than hydrogen and chlorine.

5,559,265

ASHLESS ANTIOXIDANT LUBRICATING OIL ADDITIVE

Doris Love, Fishkill, and Alison E. Hadowanetz, Maybrook, both of N.Y., assignors to Ethyl Additives Corporation, Richmond, Va.

Continuation of Ser. No. 274,106, Jul. 12, 1994, abandoned, which is a continuation of Ser. No. 708,262, May 28, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 481,207

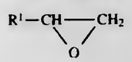
Int. Cl.[6] C07F *9/165*

U.S. Cl. 558—177 **6 Claims**

1. An ashless, antioxidant lubricating oil additive, comprising the additive prepared by:

(a) reacting an alcohol selected from the group consisting of 2-octanol, isopropanol, 1-hexanol and 4-methyl-2-pentanol with phosphorus pentasulfide to form a dithiophosphoric acid intermediate;

(b) treating said dithiophosphoric acid intermediate with an epoxide represented by the formula



wherein R^1 is CH_3 (CH_2)$_x$ where x is a value of about 9 to about 40.

(c) recovering said ester alcohol product lubricant oil additive.

5,559,266

IODINATED ESTERS

Jo Klaveness, and Per Strande, both of Oslo, Norway, assignors to Nycomed Imaging AS, Oslo, Norway

Division of Ser. No. 315,502, Sep. 30, 1994, Pat. No. 5,416,223, which is a division of Ser. No. 210,739, Mar. 21, 1994, Pat. No. 5,370,861, which is a continuation of Ser. No. 688,488, May 20, 1991, abandoned. This application May 12, 1995, Ser. No. 440,456

Claims priority, application United Kingdom, Sep. 1, 1989, 8900376

Int. Cl.[6] A61K *49/00;* **C07C** *69/78*

U.S. Cl. 558—275 **5 Claims**

1. A compound which is a water-insoluble iodinated ester of the formula (I):

(I)

in which

R^1 is a substituted or unsubstituted C_{1-20} aliphatic, C_{7-20}-araliphatic or C_{6-20} aryl group or a 5 or 6 membered heterocyclic group having one or more hetero atoms selected from O, S and N;

R^2 is hydrogen or a substituted or unsubstituted C_{1-6} aliphatic, C_{6-10} aryl or C_{7-20} araliphatic group; and

R^3 is a group as defined above for R^1, which may be the same as or different from R^1,

or R^2 and R^3 together represent a substituted or unsubstituted C_{1-4} alkylene group,

the compound containing at least one iodine atom and being metabolisable to products which are soluble in body fluids and are physiologically acceptable.

5,559,267

HYDROGENATION PROCESS USING CATALYSTS MADE FROM CHIRAL PHOSPHOLANES VIA CHIRAL 1,4-DIOL CYCLIC SULFATES

Mark J. Burk, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

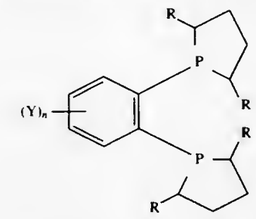
Division of Ser. No. 324,329, Oct. 17, 1994, abandoned, which is a division of Ser. No. 222,750, Apr. 4, 1994, Pat. No. 5,386,061, which is a division of Ser. No. 978,215, Jul. 27, 1992, Pat. No. 5,329,015, which is a division of Ser. No. 725,121, Jul. 2, 1991, Pat. No. 5,171,892. This application May 24, 1995, Ser. No. 449,181

Int. Cl.[6] C07C *229/02*

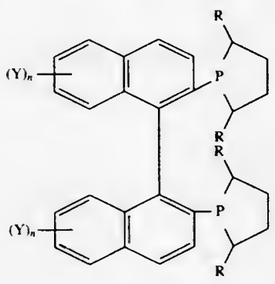
U.S. Cl. 560—41 **17 Claims**

1. In a process for hydrogenation across a carbon-carbon double bond of unsaturated substrates, the improvement comprises using a catalyst complex consisting of one or more transition metals, lanthanides, or actinides bonded to both phosphorus atoms of one or more chiral ligands of formulae II, IIIc, IVc, Vc or VIc:

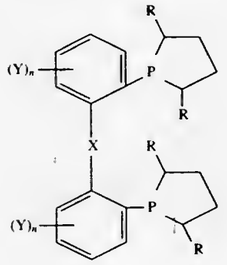
II



IIIc



IVc



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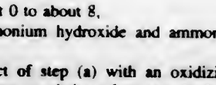
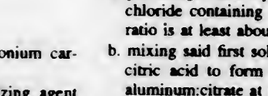
Vc



I

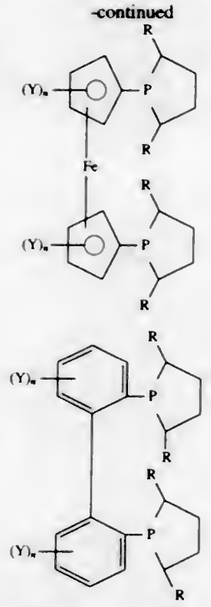


sulphamoyl or halogen, and X represents a tertiary amino group of formula II

5,559,272

AROMATIC COMPOUNDS

-continued



wherein

R is a radical selected from the group consisting of alkyl, fluoroalkyl or perfluoroalkyl, each up to about 8 carbon atoms; aryl; aralkyl; or $—CR'_2(CR'_2)_qX(CR'_2)_pR'$;

q and p are each integers, the same or different, ranging from 1 to about 8;

R' is H; F; aryl; or alkyl, fluoroalkyl or perfluoroalkyl, each up to about 8 carbon atoms;

or where together R' and R* form a ring;

X is O, S, NR*, PR*, AsR*, SbR*, divalent aryl, divalent fused aryl, divalent 6-membered ring heterocyclic group, divalent 5-membered ring heterocyclic group, or divalent fused heterocyclic group;

R* is hydrogen; alkyl, fluoroalkyl or perfluoroalkyl, each up to about 8 carbon atoms; aryl; aralkyl; or $—CR'_2(CR'_2)_qZ(CR'_2)_pR'$;

Z is O, S, NR', PR', AsR', or SbR', and R', p, and q are as defined above;

or where together R' and R* form a ring; and each Y is independently hydrogen, halogen, alkyl, alkoxy, aryl, aryloxy, nitro, amino, vinyl, substituted vinyl, alkynyl or sulfonic acid, and n is an integer from 1 to 6 equal to the number of unsubstituted aromatic ring carbons,

and wherein said complex exhibits optical activity of not less than 90% enantiomeric access.

5,559,268

PROCESS FOR THE EFFICIENT PREPARATION OF N-SUBSTITUTED DEHYDROAMINO ACID ESTERS

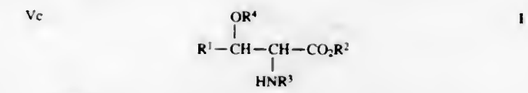
William A. Nugent, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 17, 1994, Ser. No. 340,781

Int. Cl.[6] C07C *229/00*

U.S. Cl. 560—172 **8 Claims**

1. A process for the preparation of N-substituted dehydroamino acid esters comprising contacting a β-hydroxy-α-amino acid ester or N- or O-substituted β-hydroxy-α-amino acid ester of formula I



I

wherein

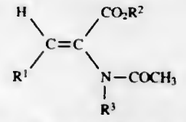
R^1 is hydrogen, C_1–C_{20} alkyl, a C_3 to C_{20} cycloalkyl, a C_6–C_{12} aryl, C_7 to C_{20} aralkyl or C_7 to C_{20} alkylaryl optionally substituted with NR^5R^6, OR^5,$(CO)OR^5$, $(CO)NR^5R^6$ or CN wherein R^5 and R^6 are each independently C_1–C_6 alkyl or C_6 aryl;

R^2 is C_1–C_{20} alkyl, a C_3 to C_{20} cycloalkyl, C_6–C_{12} aryl, C_7 to C_{20} aralkyl or C_7 to C_{20} alkylaryl optionally substituted with NR^5R^6, OR^5, $(CO)OR^5$, $(CO)NR^5R^6$ or CN wherein R^5 and R^6 are each independently C_1–C_6 alkyl or C_6 aryl;

R^3 is hydrogen, C_1–C_{20} acyl, C_1–C_{20} alkyl, a C_3 to C_{20} cycloalkyl, a C_6–C_{12} aryl, a C_7 to C_{20} aralkyl or a C_7 to C_{20} alkylaryl optionally substituted with NR^5R^6, OR^5, $(CO)OR^5$, $(CO)NR^5R^6$ or CN wherein R^5 and R^6 are each independently C_1–C_6 alkyl or a C_6 aryl;

R^4 is H or C_1–C_{20} acyl;

with an excess of acetic anhydride and a base to yield an N-substituted dehydroamino acid ester of formula II



II

wherein R^1, R^2 and R^3 are as defined above in formula I.

5,559,269

3,3-DIPHENYLPROPYLAMINES, THEIR USE AND PREPARATION

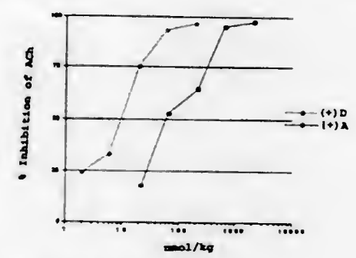
Rolf A. Johansson, Huddinge; Pinchas Moses, Satsjö-Boo; Lisbeth Nilvebrant, Bromma, and Bengt ÅSparf, Trängsund, all of Sweden, assignors to Pharmacia AB, Stockholm, Sweden

Filed May 5, 1995, Ser. No. 432,113

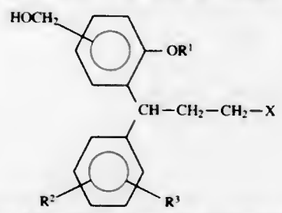
Claims priority, application Sweden, Nov. 6, 1992, 9203318

Int. Cl.[6] A61K *31/135*

U.S. Cl. 564—443 **15 Claims**



1. A 3,3-diphenylpropylamine of formula I



I

wherein R^1 represents hydrogen or methyl, R^2 and R^3 independently represent hydrogen, methyl, methoxy, hydroxy, carbamoyl, sulphamoyl or halogen, and X represents a tertiary amino group of formula II

II

wherein R^4 and R^5 represent non-aromatic hydrocarbyl groups, which are the same or different and which together contain at least three carbon atoms, and wherein R^4 and R^5 may form a ring together with the amine nitrogen; or a physiologically acceptable acid salt thereof.

5,559,270

METHOD OF SYNTHESIZING PURE ADDITIVES AND THE IMPROVED COMPOSITIONS THEREBY PRODUCED

Donald E. Koehler, Mentor, and William J. Claffey, Novelty, both of Ohio, assignors to Petrokleen, Ltd., Cleveland, Ohio

Filed Dec. 15, 1994, Ser. No. 356,700

Int. Cl.[6] C07C *209/06*

U.S. Cl. 564—484 **13 Claims**

1. A method of synthesizing polyolefinic amines or polyether amines, comprising the steps:

(a) forming a polymeric halide;

(b) reacting said polymeric halide with from about 0.01 to about 0.99 molar equivalent of a polyamine having only one reactive amine, for a period of from about 0.5 to about 15.0 hours at a temperature of from about 75° F. to about 410° F. at a pressure of from about 0 to about 6 atmospheres;

(c) adding to said reaction mass at least one additional polyamine having at least two primary amine moieties, in an amount equal to from 0.01 to about 10 times the molar quantity of polyolefinic halide employed to form the first reaction mass and reacting said second reaction mass for a period of from about 1 to about 15 hours at a temperature of from about 75° F. to about 410° F. at a pressure of from about 0 to about 6 atmospheres;

(d) distilling off any unreacted polyamine at a distillation temperature below about 400° F; and,

(e) treating said second reaction mass to recover polyolefinic amine products.

5,559,271

ORGANIC POLYSULFIDE COMPOSITIONS HAVING REDUCED ODOR

James E. Shaw, and Howard F. Efner, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 26, 1995, Ser. No. 508,150

Int. Cl.[6] C07C *319/28;319/26;319/22*

U.S. Cl. 568—21 **19 Claims**

1. A composition comprising an organic polysulfide and an odor-masking amount of an odor-masking compound selected from the group consisting of wintergreen, terpenes, vanillins, cinnamons, sesquiterpenes, and combinations of any two or more thereof.

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AROMATIC COMPOUNDS

Charles Fehr, Versoix, and JoséGalindo, Les Avanchets, both of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Division of Ser. No. 195,803, Feb. 14, 1994, Pat. No. 5,442,124, which is a continuation-in-part of Ser. No. 911,447, Jul. 10, 1992, Pat. No. 5,324,875, which is a division of Ser. No. 544,285, Jun. 26, 1990, Pat. No. 5,162,588. This application Mar. 17, 1995, Ser. No. 406,285

Claims priority, application Switzerland, Jun. 30, 1989, 2454/89

Int. Cl.[6] C07C *43/168*

U.S. Cl. 568—592 **1 Claim**

1. A compound of:

a. 6-dimethoxymethyl-1,2,3,4-tetrahydro-1,1,2,3,4,4,7-heptamethylnapbthalene;

b. cis-6-dimethoxymethyl-1,2,3,4-tetrahydro-1,1,2,3,4,4,7-heptamethylnaphthalene;

or

c. trans-6-dimethoxymethyl-1,2,3,4-tetrahydro-1,1,2,3,4,4,7-heptamethylnaphthalene.

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AQUEOUS TEXTILE AUXILIARY COMPOSITIONS

Christian Guth, Birsfelden, Switzerland; Albert Stehlin, Rosenau, France, and Christoph Krõhnke, Breisach-Oberrimsingen, Germany, assignors to Ciba-Geigy Corporation, Tarrytown, N.Y.

Continuation of Ser. No. 107,768, Aug. 25, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 484,374

Claims priority, application Switzerland, Mar. 4, 1991, 638/91

Int. Cl.[6] C07C *43/15*

U.S. Cl. 568—622 **3 Claims**

1. A low foaming, nonsilicone, aqueous textile auxiliary composition, consisting essentially of

(a) 2 to 22% by weight of a polyacrylic acid,

(b_1) 25 to 60% of a nonionic surfactant of the formula

(1) $R—O-(alkylene-O-)_pH$ and a nonionic surfactant of the formula

(3)

(b_2) 25 to 60% of a nonionic surfactant of the formula (3), wherein

R is an aliphatic radical of 8 to 22 carbon atoms.

R_2 is C_9–C_{14}alkyl,

R_3 is C_1–C_4alkyl,

Y_3 and Y_4 are hydrogen,

m_2 is an integer from 0 to 8

n_2 is an integer from 4 to 10,

p is an integer from 4 and 20 and optionally

(c) 0 to 15% by weight of 2-ethylhexyl sulfate.

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PRODUCTION OF PHENOL FROM A HYDROCARBON FEEDSTOCK

John I. Hammerman, Arlington Heights, and Peter R. Pujado, Palatine, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Apr. 25, 1995, Ser. No. 427,783

Int. Cl.[6] C07C *37/60*

U.S. Cl. 568—803 **21 Claims**

1. A process combination for the production of a hydroxylaromatic compound from a mixed hydrocarbon feedstock comprising the steps of:

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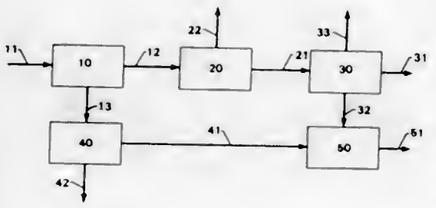
PROCESS FOR THE MANUFACTURE OF 1,1,1,2-

is acetate, propionate, benzoate, chloride, bromide, iodide, fluoride, (II) sulfate, hydrogensulfate, nitrate, phosphate, tetrafluoroborate, tosy-



(a) contacting the feedstock with an aromatization catalyst in an aromatization zone at reforming conditions to obtain an aromatics-rich effluent stream and a hydrogen concentrate;

(b) upgrading the hydrogen concentrate to a purified hydrogen stream in a hydrogen-upgrading zone to obtain a purified hydrogen stream;

(c) separating the aromatics-rich effluent into an aromatics concentrate and a nonaromatics stream in an aromatics-recovery zone and partitioning the concentrate to obtain an aromatic compound;

(d) processing the purified hydrogen stream in a peroxidation zone at peroxidation conditions to obtain a peroxide; and,

(e) hydroxylating the aromatic nucleus of the aromatic compound comprising reacting the aromatic compound with the peroxide in the presence of a hydroxylation catalyst at hydroxylation conditions in a hydroxylation zone to obtain a hydroxylaromatic product.

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PROCESS FOR THE CONVERSION OF LOWER ALCOHOLS TO HIGHER BRANCHED OXYGENATES

Paul T. Barger, Arlington Heights, Ill., assignor to UOP, Des Plaines, Ill.

Filed Feb. 21, 1995, Ser. No. 391,892

Int. Cl.[6] C07C *27/00;29/34;31/12;41/09*

U.S. Cl. 568—905 **15 Claims**

1. A process for the conversion of a lower alcohol selected from the group consisting of methanol, ethanol, propanol, and mixtures thereof to a higher branched oxygenate by aldol condensation, said process comprising contacting said lower alcohol at a reaction pressure ranging between atmospheric and about 200 kPa and a weight hour space velocity between about 0.05 and about 10 hr^{-1} with a solid catalyst comprising:

a) a mixed metal oxide support having at least two components selected from the group consisting of zinc oxide, magnesium oxide, zirconium oxide, manganese oxide, titanium oxide, chromium oxide, and a lanthanide oxide; and

b) an activator metal selected from the group consisting of palladium, platinum, silver, rhodium, cobalt, and mixtures thereof.

14. A process for the conversion of a feedstream comprising methanol to a C_4^+ alcohol product stream comprising isobutanol by aldol condensation, said process comprising contacting said feedstream at reaction conditions including a reaction pressure ranging between atmospheric and about 200 kPa and a weight hour space velocity of about 0.05 to about 10 hr^{-1}, and a reaction temperature between about 300° and about 400° C. with a solid catalyst comprising:

a mixed metal oxide base comprising zinc oxide, manganese oxide, and zirconium oxide; and an activator metal selected from the group consisting of palladium, platinum, silver, rhodium, cobalt, and mixtures thereof;

wherein the mixed metal oxides base is co-precipitated with an alkali or alkaline earth metal to provide a precipitate, the precipitate is calcined in air to provide a calcined precipitate and the calcined precipitate is impregnated with 0.2 to 5.0 wt-% of said activator metal.

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PROCESS FOR THE MANUFACTURE OF 1,1,1,2-TETRAFLUOROETHANE

John D. Scott, Cheshire, and Rachel A. Steven, Manley, both of England, assignors to Imperial Chemical Industries PLC, London, England

Continuation-in-part of Ser. No. 83,691, Jun. 30, 1993, Pat. No. 5,382,722, and a continuation-in-part of Ser. No. 11,537, Feb. 1, 1993, Pat. No. 5,395,996, said Ser. No. 83,691is a continuation of Ser. No. 755,554, Sep. 5, 1991, Pat. No. 5,145,826, said Ser. No. 11,537is a continuation of Ser. No. 804,550, Dec. 11, 1991, Pat. No. 5,243,105, which is a continuation of Ser. No. 676,703, Mar. 29, 1991, abandoned. This application Sep. 15, 1994, Ser. No. 305,304

Claims priority, application United Kingdom, Mar. 29, 1990, 9007029

Int. Cl.[6] C07C *17/08*

U.S. Cl. 570—165 **11 Claims**

1. In a method for the production of 1,1,1,2-tetrafluoroethane in two separate reaction zones involving (1) reaction of trichloroethylene and hydrogen fluoride to produce 1,1,1-trifluoro-2-chloroethane in reaction zone (1) and (2) reaction of the 1,1,1-trifluoro-2-chloroethane and hydrogen fluoride to produce 1,1,1,2-tetrafluoroethane in reaction zone (2) wherein both reaction are carried out at superatmospheric pressure, reaction (2) is carried out at a temperature in the range of 250°–450° C., reaction (1) is carried out at a temperature in the range of 200°–400° C. but below that used in reaction (2) and unconverted 1,1,1-trifluoro-2-chloroethane is recycled for further reaction with hydrogen fluoride.

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PROCESS FOR PREPARING BIPHENYLS USING PALLADACYCLES AS CATALYSTS

Matthias Beller, Niedernhausen; Wolfgang A. Herrmann, Freising, and Christoph Brossmer, Frankfurt, all of Germany, assignors to Haechst AG, Germany

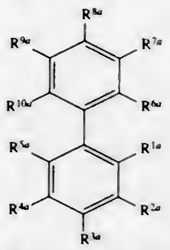
Filed Jun. 29, 1995, Ser. No. 496,392

Claims priority, application Germany, Jul. 1, 1994, 44 23 061.3

Int. Cl.[6] C07C *255/50;253/30;1/32*

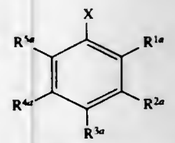
U.S. Cl. 585—469 **18 Claims**

1. A process for preparing biphenyls of the formula (I)



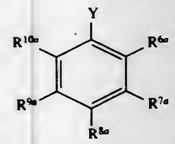
(I)

where R^{1a} to R^{10a} are, independently of one another, hydrogen, C_1–C_{12}-alkyl, C_1–C_{12}-alkenyl, C_1–C_{12}-alkynyl, alkoxy-(C_1–C_{12}), acyloxy-(C_1–C_{12}), O-phenyl, phenyl, tolyl, xylyl, mesityl, fluorine, chlorine, OH, NO_2, CN, COOH, CHO, SO_3H, NH_2, NH-alkyl-(C_1–C_{12}), N-alkyl$_2$-(C_1–C_{12}), C-Hal$_3$, NHCO-alkyl-(C_1–C_8, CONH-alkyl-(C_1–C_4), CON-(alkyl)$_2$-(C_1–C_4), COO-alkyl-(C_1–C_{12}), $CONH_2$, CO-alkyl-(C_1–C_{12}), NHCOH, NHCOO-alkyl-(C_1–C_8), CO-phenyl, COO-phenyl, $CHCHCO_2$-alkyl-(C_1–C_{12}), $CHCHCO_2H$, PO-phenyl$_2$, PO-alkyl$_2$-(C_1–C_8), which comprises a reaction of haloaromatics or aryl sulfonates of the formula (II)



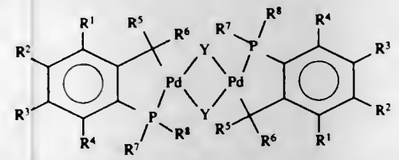
(II)

with arylboron derivatives of the formula III



(III)

where R^{1a} to R^{10a} are as defined above and X is bromine, chlorine, OSO_2CF_3, OSO_2-aryl or OSO_2-alkyl and Y is $B(OH)_2$, B(O-alkyl)$_2$, B(O-aryl)$_2$, and a catalyst comprising a palladium compound of the formula (IV)



(IV)

where R^1, R^2, R^3, R^4, R^5 and R^6 are, independently of one another, hydrogen, (C_1–C_4)-alkyl, (C_5–C_8)-cycloalkyl, (C_1–C_4)-alkoxy, fluorine, NH_2, NH-alkyl(C_1–C_4), N(alkyl)$_2$-(C_1–C_4), CO$_2$-alkyl-(C_1–C_4), OCO-alkyl-(C_1–C_4) or phenyl, or R^1 and R^2, R^2 and R^3, R^3 and R^4 or R^5 and R^6 together form an aliphatic or aromatic ring, and R^7 and R^8 are, independently of one another, (C_1–C_8)-alkyl, (C_3–C_{12})-cycloalkyl, substituted or unsubstituted aryl and Y is acetate, propionate, benzoate, chloride, bromide, iodide, fluoride, sulfate, hydrogensulfate, nitrate, phosphate, tetrafluoroborate, tosylate, mesylate, acetylacetonate, hexafluoroacetylacetonate or pyrazolyl.

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METHODS FOR THE DESTRUCTION OF OZONE DEPLETING SUBSTANCES

Robert W. Mouk, Westerville, and Albert E. Abel, Powell, both of Ohio, assignors to Commodore Laboratories, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 207,289, Mar. 7, 1994, Pat. No. 5,414,200. This application Dec. 21, 1994, Ser. No. 360,398

The portion of the term of this patent subsequent to Mar. 7, 2014, has been disclaimed.

Int. Cl.[6] A63D *3/00*

U.S. Cl. 588—205 **21 Claims**

1. A method of purifying a refrigerant composition, which comprises the steps of:

(a) introducing into a reactor a used refrigerant composition comprising at least two refrigerants, (i) a primary perhalogenated carbon compound having at least one other halogen atom in addition to fluorine and (ii) a contaminating fluoroalkane compound having one or two carbon atoms, at least one hydrogen atom and at least one other halogen atom in addition to fluorine;

(b) reacting the refrigerant composition of step (a) with a non-aqueous nitrogen-containing base to selectively decompose said contaminating fluoroalkane refrigerant compound (ii), and

(c) recovering a refrigerant composition from the reaction mixture of step (b), said composition comprising the primary perhalogenated carbon compound (i), said recovered composition being essentially free of the contaminating fluoroalkane refrigerant compound (ii).

ELECTRICAL

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METHOD AND APPARATUS FOR DYNAMIC

(b) supporting a pressure responsive diaphragm in said port with one side thereof exposed to the combustion;

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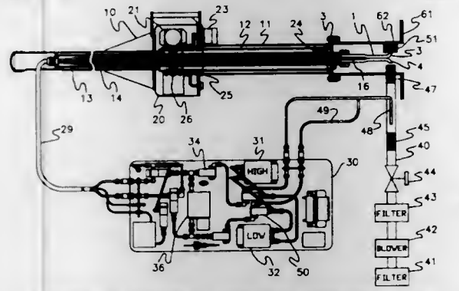
METHOD AND APPARATUS FOR DYNAMIC CALIBRATION OF A FLOW MONITOR

John E. Traina, Glenshaw, and Richard Myers, Gibsonia, both of Pa., assignors to United Sciences, Inc., Gibsonia, Pa.

Filed Jan. 19, 1995, Ser. No. 375,529
Int. Cl.[6] G01F *25/00*
U.S. Cl. 73—3 **5 Claims**



1. A method for calibrating monitoring equipment of the type which uses a Type-S pitot tube connected to at least one transducer, the Type-S pitot tube having a first opening and a second opening comprising the steps of:

a. placing a calibration air conduit having a distal end so that the distal end is adjacent the first opening of the Type-S pitot tube;

b. placing a standard pitot tube within the calibration air conduit;

c. blowing calibration air at a selected speed through the calibration air conduit so that the calibration air passes past the standard pitot tube and also past the first opening of the Type-S pitot tube;

d. making first differential pressure readings for the standard pitot tube and for the first opening of the Type-S pitot tube at various flow speeds;

e. finding a relationship between the readings first over a range of flow speeds, using a curve-fitting regression analysis technique;

f. repeating steps c, d and e at a subsequent time; and

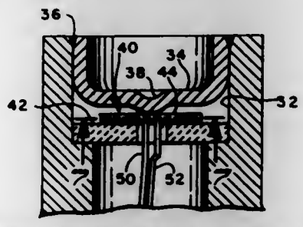
g. checking to see if the relationship found in step f differs from the relationship previously found in step e.

5,559,280

COMBUSTION CHAMBER PRESSURE TRANSDUCER AND METHOD OF MAKING SAME

John A. Kovacich, Wauwatosa, Wis.; Donald R. Haefner, Oak Park, Mich.; Bruce M. Hatton, Carol Stream, Ill.; Donald M. Stout, Troy, Mich.; Lawrence J. Ryczek, Oconomowoc, and Arlene M. Klumb, Richfield, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Nov. 14, 1994, Ser. No. 339,097
Int. Cl.[6] G01L *7/08;9/06*
U.S. Cl. 73—35.13 **17 Claims**



1. A method of sensing combustion pressure in a port in the combustion chamber of an internal combustion engine comprising:

(a) forming a beam of refractory piezoresistive material and supporting said beam at its ends for bending;

(b) supporting a pressure responsive diaphragm in said port with one side thereof exposed to the combustion;

(c) disposing said beam adjacent the side of said diaphragm opposite said combustion with a portion of said diaphragm contacting said beam and applying to said beam a force indicative of the combustion pressure forces acting on said diaphragm; and,

(d) deflecting said beam with said force and generating an electrical signal representative of said beam deflection.

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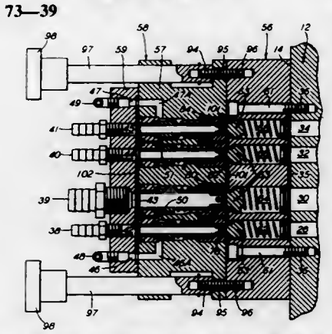
TEST CONNECTOR FOR ACCESSING COMPRESSED AIR AT TEST PORTS OF A RAILROAD BRAKE CONTROL VALVE

Albert A. McKay, Stoney Creek; Stanley J. Pasek, Brantford; David A. Porteous, Burlington; Jeffrey D. Reid, St. Catharines; Trevor A. Scott, Stoney Creek; Eric G. Smith, Burlington; Ulf Stahmer, Hamilton, and W. Thomas Digweed, Beamsville, all of Canada, assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Apr. 25, 1995, Ser. No. 427,358
Int. Cl.[6] B60T *17/22*
U.S. Cl. 73—39 **11 Claims**



1. For a railroad car control valve device having a plurality of test ports in fluid pressure communication with a respective one of a brake pipe, an auxiliary reservoir, an emergency reservoir and a brake cylinder device of said railroad car, a test connector connected to said control valve device at said test ports thereof for conducting fluid under pressure from said test ports to apparatus for testing operation of the railroad car brakes, said test ports being normally closed by check valve means, said test connector comprising:

a. a body having a plurality of channels therethrough aligned with corresponding ones of said test ports;

b. actuator means reciprocally disposed in respective ones of said plurality of channels for opening said check valve means each said actuator means comprising:

(i) a stem having one end adjacent said check valve means;

(ii) a piston member operatively connected to said stem and cooperatively arranged with said channel therefor to form a pilot chamber on one side of said piston member; and

c. bias means acting on the other side of each said piston member for urging movement of each said actuator means in a first direction away from engagement of said one end of said stems with said check valve means; and

d. means for connecting a supply of fluid under pressure to each said pilot chamber to urge each said actuator means in a direction opposite said first direction to effect engagement of said one end of said stems with said check valve means to effect opening thereof, whereby the fluid under pressure effective at said test ports is conducted to said test apparatus via said channels.

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METHOD AND APPARATUS FOR TESTING THE

interpreting said value of resistance and then calculating the wear and temperature of said friction lining.

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METHOD AND APPARATUS FOR TESTING THE EFFECTIVENESS OF AN AIR BARRIER INSTALLATION

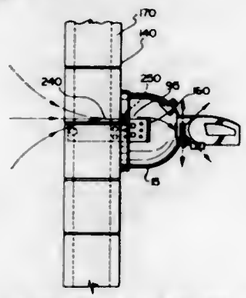
Kevin D. Knight, Grosse Isle; Graham A. Knight, and Colin D. Knight, both of Winnipeg, all of Canada, assignors to Retro-Specs Ltd., Winnipeg, Canada

Continuation-in-part of Ser. No. 260,319, Jun. 15, 1994. This application May 5, 1995, Ser. No. 437,072

Claims priority, application Canada, Jun. 8, 1994, 2125420

Int. Cl.[6] G01M *3/04;3/26*

U.S. Cl. 73—40 **17 Claims**



1. A method of testing a selected test area of an air barrier forming part of a building construction for air leakage through said air barrier, whereby said method permits said testing of said test area to be conducted on site during construction of the building and in isolation of other areas of said construction, said method comprising the steps of:

(a) applying a soap solution, or other solution having similar bubbling properties, to a surface of said selected test area;

(b) positioning an open end of a chamber over said test area comprising said surface and fitting said chamber to the bounds of said test area in a sufficiently air-tight manner to permit maintenance of an air pressure differential across said air barrier in said test area;

(c) removing a sufficient amount of air from said chamber to produce a selected air pressure differential, of less than approximately 2000 Pa, across said air barrier in said test area; and,

(d) identifying whether said soap or other similar solution has bubbled, foamed or become otherwise visibly distended at the location of said test area while in the presence of said air pressure differential.

5,559,283

CASING STRUCTURE FOR CHROMATOGRAPH

Hironori Kaji, Katsuta; Atsuhi Ninomiya, Oume; Isamu Takeuchi, Edogawa-ku; Hideo Seki, Naka-gun, and Kaoru Hagiya, Hitachi, all of Japan, assignors to Hitachi, LTD., Tokyo, Japan

Filed Sep. 21, 1994, Ser. No. 309,695

Claims priority, application Japan, Oct. 5, 1993, 5-249336

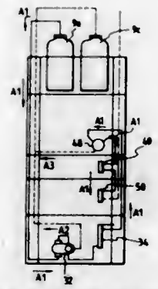
Int. Cl.[6] G01N *30/54*

U.S. Cl. 73—61.56 **13 Claims**

1. A casing structure for a chromatograph comprising:

a plurality of casings, one of said casings containing a separating column, another of said casings containing a sample injector and a third casing containing a detector, wherein said casings can be vertically stacked;

a passage containing eluent feed pipes therein, portions of said passage being located at respective outside portions of each casing, each portion of said passage connecting with another portion of said passage when the casings are stacked, said passage includes an inner hole on the inner side of one of the casings connecting at least one of said eluent feed pipes to at least one of said separating column, said sample injector, and said detector; and



a cover at least partially covering the eluent feed pipes accommodated in the passage, said passage being opened towards the outside of the casing when the cover is opened.

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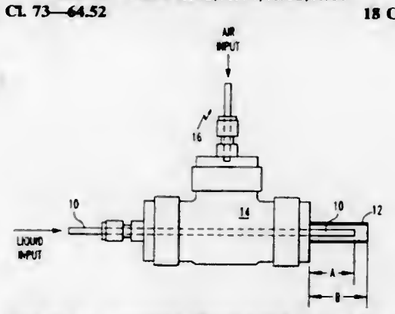
METHOD FOR DETERMINING ELONGATIONAL VISCOSITY AND DYNAMIC SURFACE TENSION IN LIQUID SOLUTIONS

Joseph E. Matta, deceased, late of Bel Air, Md., and Raymond P. Tytus, Bel Air, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 17, 1995, Ser. No. 422,966

Int. Cl.[6] G01N *15/02;15/14;13/02;11/00*

U.S. Cl. 73—64.52 **18 Claims**



1. A method for determining intermolecular force related physical properties of an objective liquid, comprising the steps of:

(a) atomizing a neat liquid to a particle size in a gaseous fluid stream, said neat liquid having known intermolecular force related physical properties;

(b) measuring the particle size of said atomized neat liquid;

(c) determining an empirical expression based on the known physical properties of said neat liquid and the atomization conditions; and

(d) using said empirical expression and identical atomization conditions to determine said intermolecular force related physical properties of said objective liquid.

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FUZZY LOGIC METHOD FOR DETECTING MISFIERS IN INTERNAL COMBUSTION ENGINES

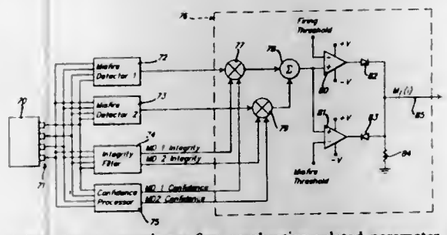
Bruce D. Bryant, Royal Oak; Kenneth A. Marko, Ann Arbor, and John V. James, Walled Lake, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 5, 1994, Ser. No. 349,580

Int. Cl.[6] G01M *15/00*

U.S. Cl. 73—117.3 **10 Claims**

1. Apparatus for monitoring misfires in an internal combustion engine having a plurality of cylinders, comprising:



a first detector sensing a first combustion-related parameter of said engine and producing a first misfire determination for each individual cylinder event, said first misfire determination having a respective first confidence variable determined according to an instantaneous operating point within an engine operating area;

a second detector sensing a second combustion-related parameter of said engine and producing a second misfire determination for each individual cylinder event, said second misfire determination having a respective second confidence variable determined according to said instantaneous operating point within said engine operating area;

a sensor sensing said instantaneous operating point within said engine operating area; and

a fuzzy logic analyzer coupled to said first detector, said second detector, and said sensor, said fuzzy logic analyzer weighing said first and second misfire determinations according to said respective first and second confidence variables to produce first and second weighted misfire determinations, summing said weighted misfire determinations to produce a sum, and comparing said sum to a threshold to produce a final misfire determination.

5,559,286

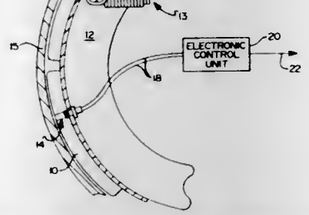
VEHICLE FRICTION MATERIAL CONDITION MEASUREMENT SYSTEM

Jay D. White, Galesburg; James R. Clark, Plainwell, and LaVerne A. Caron, Kalamazoo, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 10, 1995, Ser. No. 541,537

Int. Cl.[6] G01L *5/28*

U.S. Cl. 73—129 **12 Claims**



1. In a frictional power transfer device including a friction lining mounted to a support member having a wearing surface engageable with a power transfer surface, the combination comprising an electrically resistive sensor embedded within said friction lining extending from said support member to said wearing surface having a value of resistance dependent on both a temperature and a length of said sensor and oriented such that wear of the friction lining results in wear of said sensor and a reduction in the length of said sensor thereby changing said value of resistance of said sensor, an insulated connector in electrical connection with said sensor and with an electronic control unit for monitoring and interpreting said value of resistance and then calculating the wear and temperature of said friction lining.

5,559,287

DEVICE FOR REDUCING DRIFT IN MEASURING INSTRUMENTS

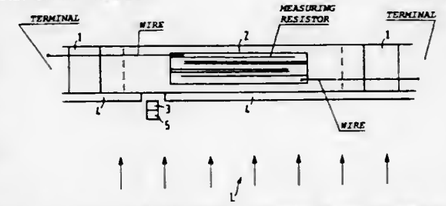
Andreas Wildgen, Nittendorf, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 251,570, May 31, 1994, abandoned. This application Sep. 22, 1995, Ser. No. 531,888

Claims priority, application Germany, May 28, 1993, 43 17 952.5

Int. Cl.[6] G01P *5/00*

U.S. Cl. 73—204.21 **4 Claims**



1. In an electrical measuring instrument being exposed to a flowing medium and having a mount, a substrate retained in the mount, terminals disposed on the mount, and a temperature-dependent measuring resistor disposed on the substrate and electrically connected between two of the terminals, the substrate having a side facing into the flowing medium,

a device for drift reduction in the electrical measuring instrument, comprising an obstruction disposed upstream of the substrate at the side at which the medium strikes the measuring resistor, said obstruction preventing the development of a dirt film between the terminals, which would otherwise create a parallel resistor connected between the terminals.

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VOLUME SENSOR FOR LIQUIDS USING TOOTHED METER WHEELS

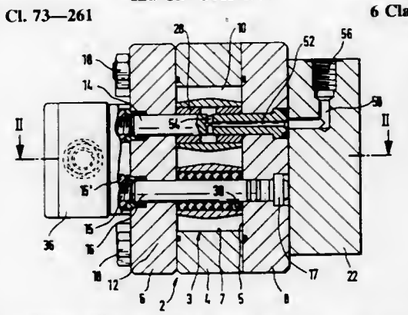
Johannes A. Schumacher, Werdohl, Germany, assignor to VSE SchweiBtechnik GmbH, Neuenrade 2, Germany

Continuation of Ser. No. 374,994, Jan. 18, 1995, abandoned, which is a continuation of Ser. No. 227,190, Apr. 13, 1994, abandoned, which is a continuation of Ser. No. 808,018, Dec. 16, 1991, abandoned. This application Dec. 7, 1995, Ser. No. 568,739

Claims priority, application Germany, Dec. 18, 1990, 40 40 409.9

Int. Cl.[6] G01F *3/04*

U.S. Cl. 73—261 **6 Claims**



1. A volume sensor for liquids comprising:

a housing including a measuring chamber having first and second opposing end walls, said first end wall being planar and

having an inlet side and an outlet side which are separated by a separating plane extending perpendicular to said first end

a signal processing circuit for processing an electric signal generated between the lead-out part of first plate and the

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METHOD AND APPARATUS FOR THE IDENTIFICATION

having an inlet side and an outlet side which are separated by a separating plane extending perpendicular to said first end wall, said first end wall further including an inlet opening in said inlet side and an outlet opening in said outlet side, said inlet opening and said outlet opening having inner edge portions adjacent to said separating plane which cooperate to define a web on said first end wall, said inner edge portions of said inlet opening and said outlet opening being symmetrical on opposite sides of said separating plane;

first and second toothed meter wheels rotatably mounted in said measuring chamber for rotation on respective first and second pivot shafts extending between said first and second ends walls, said first and second pivot shafts being mounted in parallel spaced relation in said measuring chamber wherein said pivot shafts are aligned within said separating plane,

said first and second toothed meter wheels including a plurality of teeth wherein outer terminal ends of said teeth define outer peripheral edges of said first and second meter wheels, said measuring chamber further including peripheral chamber walls which are positioned in closely spaced adjacent relation to the outer peripheral edges of said first and second meter wheels,

each of said first and second meter wheels further having a first planar end face and a second end face which are respectively disposed in closely spaced adjacent relation to said first and second end walls of said measuring chamber,

each of said first and second meter wheels further having a respective pitch circle, and a respective root circle,

each of said teeth of said first and second meter wheels having side flanks, each of said first and second meter wheels further having recesses formed between adjacent teeth wherein said recesses extend radially inward of said respective root circle, said recesses including generally parallel side flanks,

said teeth of said first and second meter wheels engaging at said pitch circles wherein adjacent engaging teeth cooperate with said measuring chamber to define a transfer pocket of predetermined volume, said first and second meter wheels being operative for transporting a liquid from said inlet opening to said outlet opening in said transfer pocket,

said inner edge portions of said inlet and outlet openings substantially corresponding in shape to said side flanks of said recesses and said side flanks of said teeth, said inner edge portions of said inlet opening and said outlet opening being spaced by a distance which is greater than a distance between said side flanks of said adjacent teeth wherein said transfer pocket is isolated from said inlet opening and said outlet opening as said pocket passes through said web; and

sensor means fixed in said housing for detecting passage of said teeth of one of said first and second meter wheels as said meter wheel rotates.

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INTEGRAL WATER FLOW METER AND BACKFLOW PREVENTION ASSEMBLY

Charles P. Brunson, IV, Macon, France, and Thierry W. Swinson, Wetumpka, Ala., assignors to Schlumberger Industries, Inc., Norcross, Ga.

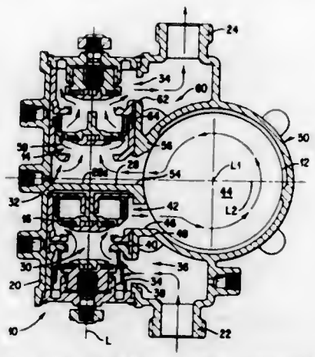
Filed Jun. 2, 1994, Ser. No. 252,859
Int. Cl.[6] G01F *15/18*
U.S. Cl. 73—275 **24 Claims**

1. A water meter and backflow preventer adapted to be installed within a water meter box, comprising:

(a) a housing, including a water infeed fitting connectable to a main utility pipeline and a water outfeed fitting connectable to a customer domestic water system;

(b) a water meter mounted within said housing;

(c) a normally closed first check valve mounted within said housing, said first check valve (1) opening when flow of water through said water infeed fitting is above a predetermined threshold value to permit water to flow into said meter, and



(2) closing when said flow of water diminishes below said threshold value or reverses direction to prevent a backflow condition;

(d) a normally closed second check valve mounted within said housing, said second check valve (1) opening when flow of water through said infeed fitting is above said predetermined threshold value to permit water to flow into said water outfeed fitting, and (2) closing when said flow of water diminishes below said threshold value or reverses its direction to prevent a backflow condition; and

(e) wherein said housing further includes a plurality of test ports in respective communication with flow areas located upstream and downstream from each of said first and second check valves.

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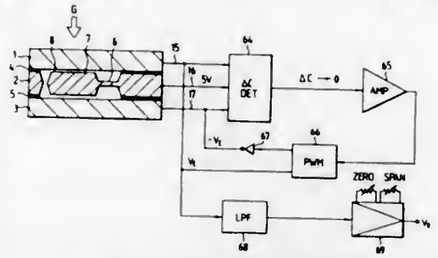
CAPACITANCE TYPE ACCELEROMETER

Seiko Suzuki, Hitachioota; Shigeki Tsuchitani, Mito; Masayuki Miki, Katsuta, and Masahiro Matsumoto, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 252,602, Jun. 1, 1994, abandoned, which is a continuation of Ser. No. 161,456, Dec. 6, 1993, Pat. No. 5,392,651, which is a continuation of Ser. No. 757,648, Sep. 11, 1991, abandoned, which is a division of Ser. No. 429,546, Oct. 31, 1989, Pat. No. 5,095,752. This application Jun. 1, 1995, Ser. No. 457,491
Claims priority, application Japan, Nov. 15, 1988, 63-286714
Int. Cl.[6] H01L *21/283*
U.S. Cl. 73—514.36 **10 Claims**



1. A capacitance type accelerometer comprising:

a first plate made of silicon and formed with a movable electrode part which is supported by a silicon beam and is moved in accordance with acceleration, the movable electrode part of the first plate having a lead-out part;

a pair of second plates respectively having fixed electrodes thereon disposed so as to respectively face the movable electrode part with a certain separation distance, the fixed electrode plates of the pair of second plates having respective lead-out parts; and

a signal processing circuit for processing an electric signal generated between the lead-out part of first plate and the lead-out parts of the pair of second plates due to the acceleration;

wherein the first plate and the pair of second plates are laminated, and the lead-out part of the movable electrode part of the first plate and the lead-out parts of the pair of second plates are diced so as to have a common side plane and are electrically connected to the signal processing circuit.

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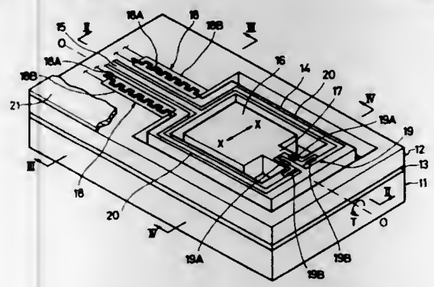
ANGULAR VELOCITY SENSOR

Tomoyasu Hasegawa, Nagaokakyo, Japan, assignor to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

PCT No. PCT/JP94/00114, § 371 Date Aug. 29, 1994, § 102(e) Date Aug. 29, 1994, PCT Pub. No. WO94/17363, PCT Pub. Date Aug. 4, 1994
PCT Filed Jan. 28, 1994, Ser. No. 284,611
Claims priority, application Japan, Jan. 29, 1993, 5-34534
Int. Cl.[6] G01C *19/00*; G01P *3/44;9/00;15/08*
U.S. Cl. 73—504.12 **11 Claims**



1. A semiconductor angular velocity sensor, comprising:

a substrate;

a first vibratory member supported on said substrate and parallel thereto through a first support beam for vibration in a lateral direction relative to said substrate;

a second vibratory member supported in axial alignment with the support axis of said first support beam and supported on said first vibratory member and parallel thereto through a second support beam for vibrating in the lateral direction and also in a perpendicular direction relative to the face of said substrate;

a vibration generating means vibrating said first vibratory member and second vibratory member in the lateral direction relative to said substrate; and

a displacement detection means detecting the extent of displacement of said second vibratory member in the perpendicular direction while the second vibratory member is vibrated by the vibration generating means.

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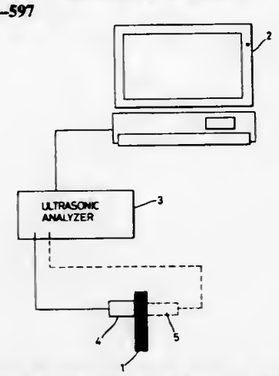
METHOD AND APPARATUS FOR THE IDENTIFICATION OF SPECIES

John B. Hull, Dore, and Christian M. Langton, Doncaster, both of United Kingdom, assignors to University of Bradford, Bradford, United Kingdom

PCT No. PCT/GB93/00017, § 371 Date Oct. 12, 1994, § 102(e) Date Oct. 12, 1994, PCT Pub. No. WO93/14397, PCT Pub. Date Jul. 22, 1993
PCT Filed Jan. 7, 1993, Ser. No. 256,484
Claims priority, application United Kingdom, Jan. 7, 1992, 9200218
Int. Cl.[6] G01N *29/08*
U.S. Cl. 73—597 **28 Claims**



1. A method for identifying the presence or concentration of a target species in a sample, comprising the steps of:

a. transmitting a wave of ultrasonic vibration of known strength through the sample;

b. receiving and measuring the strength of the transmitted wave, or a reflection of the wave, after passage of the wave through the sample;

c. measuring the time of flight of the wave through the sample, between transmission and reception of the wave;

d. calculating the attenuation of the strength of the wave during a time of flight of the wave;

e. calculating from values for the time of flight and attenuation, an identification parameter dependent on the type or concentration of the target species in the sample and independent of the distance travelled by the wave through the sample; and,

f. comparing the calculated identification parameter with known identification parameters for known types or concentrations of species, for identifying the presence or concentration of the target species in the sample.

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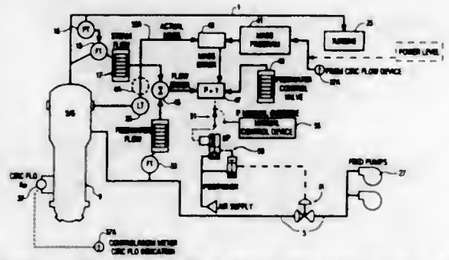
STEAM GENERATION SYSTEM MASS AND FEEDWATER CONTROL SYSTEM

William J. Kirkpatrick, 308 Edjil Dr., Newark, Del. 19713

Division of Ser. No. 123,291, Sep. 20, 1993, Pat. No. 5,406,915, which is a division of Ser. No. 847,697, Mar. 6, 1992, Pat. No. 5,249,551, which is a continuation-in-part of Ser. No. 682,390, Apr. 9, 1991, abandoned. This application Feb. 8, 1995, Ser. No. 386,304
Int. Cl.[6] G01F *1/00*; F22D *5/26*; G21C *7/32*
U.S. Cl. 73—861 **4 Claims**

1. A feedwater control apparatus for a steam generation system of the type including a pressure vessel having a upper zone in which steam and water are separated, a riser having a top communicating with the upper zone and a riser bottom to receive fluid for flow therethrough to said upper zone, heating means for heating the fluid within the riser, a downcomer communicating with the upper zone for recirculating water from the upper zone and for circulating feedwater toward the riser bottom, and a narrow range



pressure sensor for measuring a narrow range water level in the upper zone, said feedwater control system comprising,

a. first measuring means for sensing the mass flow rate of water in the downcomer,

b. second measuring means for sensing the height of liquid in the upper zone,

c. control means responsive to said first and second measuring means for producing control information related to the total mass of fluid in upper zone, riser, and downcomer, and

d. feedwater control means operable in response to said control means for controlling the amount of feedwater delivered to the downcomer.

5,559,294

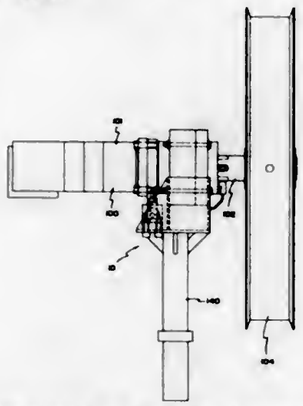
TORQUE MEASURING DEVICE

Jonathan A. Holum, North Mankato, and Gregory L. Hasse, Mankato, both of Minn., assignors to Condux International, Inc., Mankato, Minn.

Filed Sep. 15, 1994, Ser. No. 306,715

Int. Cl.[6] G01L *5/00*

U.S. Cl. 73—862.44 **14 Claims**



1. A torque measuring device for measuring torque on an output shaft of a motor, said device comprising:

a support rotatably receiving said motor; said motor having an output shaft;

a lever arm extending from said motor;

a transducer for measuring the torque .applied to said output shaft, said transducer constraining said lever arm and said motor from rotating within said support, so that when a torque is applied to said output shaft said lever arm applies a force to said transducer which is proportional to said torque applied to said output shaft; and

a capstan connected to said output shaft, said capstan operable in receiving cable.

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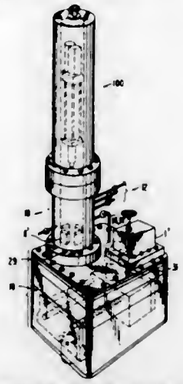
UNDERWATER SAMPLING METHOD AND APPARATUS

Richard P. Sheryll, 340 W. 87th St., New York, N.Y. 10024

Filed Dec. 1, 1994, Ser. No. 347,858

Int. Cl.[6] G01N *1/12*

U.S. Cl. 73—864.63 **9 Claims**



1. Underwater sampling apparatus for collecting uncontaminated samples from an underwater environment at in situ pressure, said apparatus comprising

a sample chamber in which-a sample is to be collected, said sample chamber having an opening, and

a lid chamber coupled to said sample chamber and defining a controllable interface between said sample chamber and the underwater environment, said lid chamber including

a movable lid movable between a closed position wherein said lid closes said opening to seal said sample chamber, and an open position wherein said lid is clear of said opening and said sample chamber is open to the underwater environment, and

a plurality of stacked lid-chamber-defining plates, said stacked lid-chamber-defining plates being coupled together to form a unitary whole,

each of said stacked plates having a respective aperture, each said respective aperture being aligned with each other to define lid-chamber through which said lid is movable between said closed position and said open position such that said lid at said open position is spaced from said lid at said closed position, and

motion control elements which selectively move said lid between said closed position and said open position.

5,559,296

SNARE DRUM HAVING PARALLEL SNARES UNIFORMLY MOUNTED BY PARALLEL, CLOSELY-SPACED STRAINERS

Toshinori Yamashita, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Continuation-in-part of Ser. No. 67,484, May 26, 1993, abandoned, which is a continuation of Ser. No. 793,810, Nov. 18, 1991, abandoned. This application Mar. 25, 1994, Ser. No. 217,671

Claims priority, application Japan, Jun. 6, 1991, 3-135162

Int. Cl.[6] G10D *13/02*

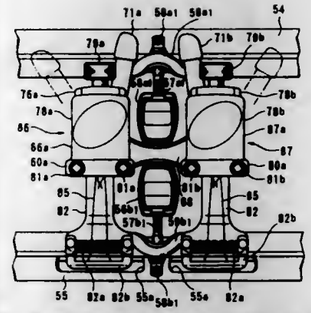
U.S. Cl. 84—415 **6 Claims**

1. A snare drum comprising:

a hollow cylindrical drum body having an outer surface;

upper and lower drum heads fitted over respective openings formed at upper and lower ends of said drum body at peripheral edges of the upper and lower drum heads;

upper and lower rims, each of which engages said peripheral edge of a corresponding one of said upper and lower drum heads;



a plurality of lugs arranged around the outer surface of said drum body and each having a bolt extending through one or the other of said upper and lower rims;

a plurality of nuts mounted on said bolts to connect said upper and lower rims with the plurality of said lugs so as to pull said upper and lower rims toward one another, thereby applying and maintaining centrifugally directed tension to said upper and lower drum heads along the peripheral edges thereof;

a plurality of snares extending across said lower drum head;

a plurality of snare strainers provided on said drum body, with each of the snare strainers having a movable section coupled to one of the plurality of said snares to move said one of said plurality of said snares between a position in which said one of the plurality of said snares is in contact with a surface of said lower drum head and a position in which said one of the plurality of said snares is out of contact with said lower drum head in response to movement of said movable section; and

mounting means including a base for mounting a pair of the plurality of said snare strainers in proximity to opposite sides of two of the plurality of lugs, the base being mounted on the outer surface of said drum body between said two of the plurality of lugs and having said pair of the plurality of said snare strainers mounted on opposite ends of the base;

the mounting means further including a pair of elongated guides mounted on the opposite ends of the base adjacent different ones of said pair of the plurality of said snare strainers, the pair of elongated guides being generally equidistantly spaced from said two of the plurality of lugs on opposite sides thereof and lying generally within a common plane so as to dispose the pair of snare strainers within a common plane and being generally parallel to each other.

5,559,297

KEY FOR KEYBOARD INSTRUMENT HAVING A PERSPIRATION-ABSORBING SURFACE

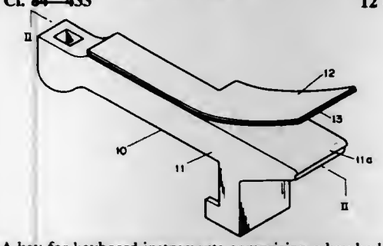
Yoshimasa Yoshikawa, and Keisuke Watanabe, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Japan

Filed Jul. 22, 1994, Ser. No. 278,899

Claims priority, application Japan, Jul. 28, 1993, 5-186277

Int. Cl.[6] G10C *3/12*

U.S. Cl. 84—433 **12 Claims**



1. A key for keyboard instruments comprising a key body and a perspiration-absorbing sheet formed of wood provided over a surface of said key body so that said perspiration-absorbing sheet provides a top playing surface of said key.

5,559,298

WAVEFORM READ-OUT SYSTEM FOR AN ELECTRONIC MUSICAL INSTRUMENT

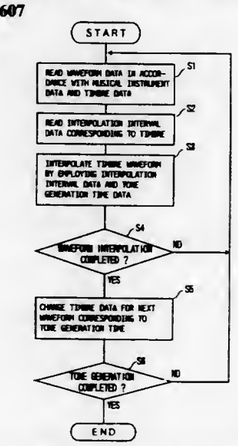
Seiji Okamoto, Shizuoka-ken, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Filed Sep. 29, 1994, Ser. No. 321,154

Claims priority, application Japan, Oct. 13, 1993, 5-278851; Oct. 13, 1993, 5-278852

Int. Cl.[6] G10H *1/02;1/06;7/12*

U.S. Cl. 84—607 **8 Claims**



5. In an electronic musical instrument having a tone generating system that sequentially generates musical notes, improved means for smoothly changing timbre characteristics of a note or of the notes by providing a crossfade from a preceding timbre characteristic to a successive timbre characteristic by interpolation in a variable interpolation interval in which the preceding timbre characteristic overlaps the succeeding timbre characteristic, said means comprising:

waveform storage means for storing a selected number of sets of timbre characteristic waveform data;

means for selecting waveform data corresponding to timbre characteristics for a note or notes being generated by the instrument and for sequentially reading out same from said waveform storage means to form the preceding timbre characteristic waveform data and the succeeding timbre characteristic waveform data of the timbre characteristic changes;

interpolation interval determining means for determining, by interpolative calculation, an interpolation interval for preceding and succeeding timbre characteristics that form a given timbre characteristic change;

means for performing interpolation between said preceding timbre characteristic waveform data and succeeding timbre characteristic waveform data from said waveform storage means in said interpolation interval determined by said determining means; and

means for applying timbre characteristics corresponding to the interpolated timbre characteristic waveform data to the note or notes being generated by the tone generating system of the instrument.

5,559,299

5,559,300

supplying an interface display to the touchscreen having an icon

5,559,299

METHOD AND APPARATUS FOR IMAGE DISPLAY, AUTOMATIC MUSICAL PERFORMANCE AND MUSICAL ACCOMPANIMENT

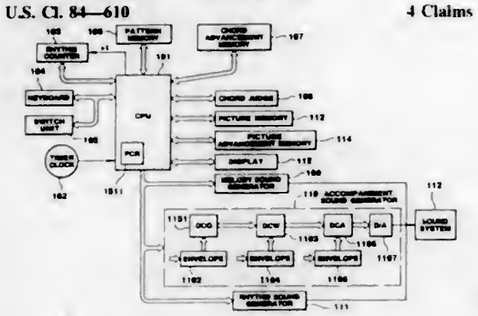
Youichiro Tajima, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 971,249, Nov. 3, 1992, Pat. No. 5,391,828, which is a continuation of Ser. No. 771,408, Oct. 2, 1991, abandoned. This application Sep. 19, 1994, Ser. No. 308,834

Claims priority, application Japan, Oct. 18, 1990, 2-279923; Nov. 5, 1990, 2-299544; Nov. 5, 1990, 2-299545

Int. Cl.[6] G10G *1/00*

U.S. Cl. 84—610 **4 Claims**



1. An apparatus comprising:

automatic rhythm pattern data storing means for storing automatic rhythm pattern data of a normal pattern and a fill-in pattern, said automatic rhythm pattern data including rhythm tone data determining rhythm tones at respective standard timings;

playing means for playing a rhythm performance by sequentially reading the automatic rhythm pattern data from said automatic rhythm pattern data storing means to generate rhythm tones;

manual instructing means for manually instructing said playing means to play a rhythm performance based on the fill-in pattern in place of the normal pattern;

image data storing means for storing a plurality of image data, each of which represents a corresponding image and has corresponding image number data, the image data storing means being capable of accessing the image data in a random order relative to an order of reproduction of the corresponding images;

image play pattern data storing means for storing image play pattern data of a normal image pattern and a fill-in image pattern, said normal image pattern data including image number data determining image data to be reproduced and timing data controlling a time interval for respective image data, and said fill-in image pattern data including image number data at respective standard timings;

control means for controlling said image play pattern data storing means to read out the fill-in image play pattern data in place of the normal image play pattern data in response to the operation of the manual instructing means to access corresponding image data;

image data reading means coupled to said control means for reading image data which the image number data designates from the image data storing means; and

displaying means for displaying the image based on the image data read by said image data reading means in synchronous with rhythm performance played by said playing means.

5,559,300

DELAY TIME MODULATION EFFECTING APPARATUS FOR PROCESSING MUSICAL TONE SIGNAL

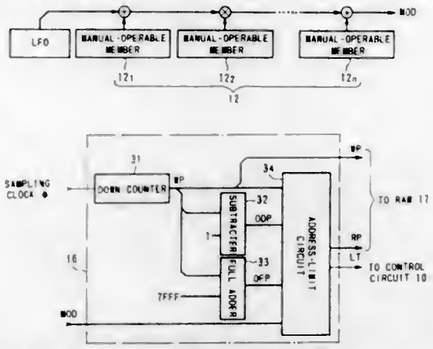
Yoshio Fujita, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Filed Sep. 2, 1994, Ser. No. 300,377

Claims priority, application Japan, Sep. 3, 1993, 5-220329

Int. Cl.[6] G10H *1/04;7/00*

U.S. Cl. 84—624 **7 Claims**



1. A delay-time-modulation effecting apparatus comprising:

storage means for storing musical tone signals supplied thereto;

write-address generating means for generating a write address whose number circulates within a predetermined range of numbers at a predetermined speed;

modulation-address generating means for generating a modulation address whose number is varied in a lapse of time in response to a desired modulation effect to be realized;

computation means for performing a computation using the modulation address and an offset address, which is determined in advance in response to the write address, so as to produce a read address;

address-limiting means for limiting the read address such that the read address does not advance ahead of the write address; and

read/write means for writing the musical tone signal into the storage means by the write address and for reading the musical tone signal from the storage means by the read address which is limited by the address-limiting means.

5,559,301

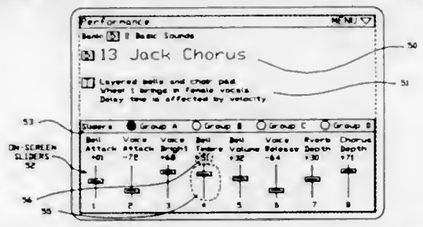
TOUCHSCREEN INTERFACE HAVING POP-UP VARIABLE ADJUSTMENT DISPLAYS FOR CONTROLLERS AND AUDIO PROCESSING SYSTEMS

Marcus K. Bryan, Jr.; Alexander J. Limberis; John S. Bowen, all of San Jose, and Daniel A. Phillips, Palo Alto, all of Calif., assignors to Korg, Inc., Tokyo, Japan

Filed Sep. 15, 1994, Ser. No. 306,365

Int. Cl.[6] G10H *1/057;1/06;1/08;1/46*

U.S. Cl. 84—653 **44 Claims**



22. A method for setting a variable used by a controller having a touchscreen, comprising:

supplying an interface display to the touchscreen having an icon representative of a variable parameter used by the controller, said icon having a size and a position on the touchscreen;

supplying a variable adjustment display to the touchscreen in response to a touch near the position of said icon, the variable adjustment display overlying said interface display and having a size on the touchscreen larger than the size of said icon; and

adjusting the variable parameter and removing the variable adjustment display from the touchscreen, in response to a touch sequence on the touchscreen over the variable adjustment display.

5,559,302

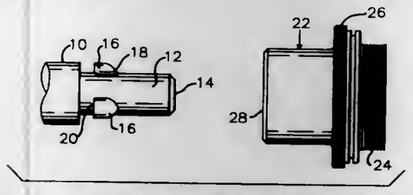
BAYONET TYPE COUPLING FOR FIREARMS

Gregory S. Latka, Jackson, Mich., assignor to GSL Technology, Inc., Jackson, Mich.

Filed Aug. 31, 1995, Ser. No. 522,016

Int. Cl.[6] F41A *21/32*

U.S. Cl. 89—14.05 **6 Claims**



1. A bayonet type coupling to removably coaxially attach accessories to a gun barrel wherein the gun barrel includes an end, an end region, an exterior surface and a radially extending lug defined on the end region axially spaced from the end having a forward edge facing the barrel end and a rear edge facing away from the barrel end, an accessory adapter having an axis, accessory mounting means, an axial bore, an inner barrel receiving end, a lug receiving opening defined in the adapter inner end, and a lug retaining recess defined in the adapter bore retaining the lug upon insertion of the lug within the opening and rotating the adapter and barrel relative to each other about the adapter axis, the improvement comprising, a sleeve within the adapter bore axially displaceable between first and second positions, a bore with said sleeve receiving the gun barrel end and end region upon being inserted into the adapter opening, an abutment defined upon said sleeve engaging the lug forward edge upon insertion of the barrel end region into the sleeve bore to displace said sleeve from said first position to said second position, and a spring biasing said sleeve toward said first position, said sleeve retaining the lug within the adapter lug retaining recess under the force of said spring.

5,559,303

PYROTECHNIC IGNITION APPARATUS

Joseph L. La Mura, West Caldwell, and Ronald C. Wallenburg, Pennsauken, both of N.J., assignors to Joanell Laboratories, Inc., Livingston, N.J.

Continuation of Ser. No. 145,499, Nov. 1, 1993, Pat. No. 5,450,686, which is a division of Ser. No. 877,809, May 4, 1992, Pat. No. 5,284,094, which is a division of Ser. No. 419,549, Oct. 10, 1989, Pat. No. 5,157,222. This application May 22, 1995, Ser. No. 447,077

Int. Cl.[6] F41A *19/68;19/70*

U.S. Cl. 89—28.05 **18 Claims**

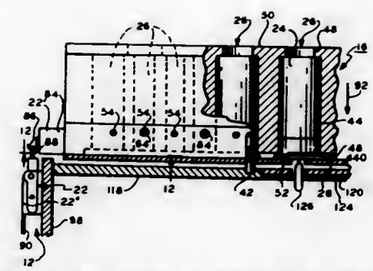
1. A pyrotechnic device ignition apparatus comprising:

a magazine for receiving at least one pyrotechnic device;

a housing;

a plurality of spaced electrical contacts;

means secured to and in relative fixed relationship to the housing for resiliently securing the contacts to the housing in the relative fixed relationship; and



means for movably securing the magazine to the housing for movement between a first position in which the received at least one device is spaced ohmically disengaged from any of the contacts and in a second contact engaging position so that at least one of said plurality of contacts ohmically engages the at least one received device while the magazine is secured to the housing and in response to and while the magazine is moved from the first to the second position.

5,559,304

INSERT FOR A WARHEAD

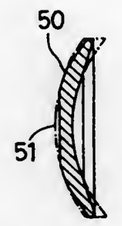
Raimund Schweiger, Duesseldorf; Herbert Scholles, Meerbusch; Hans Orth, and Hendrik Lips, both of Duesseldorf, all of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Germany

Filed Aug. 11, 1986, Ser. No. 901,064

Claims priority, application Germany, Aug. 16, 1985, 35 29 405.1

Int. Cl.[6] F42B *12/10*

U.S. Cl. 102—501 **5 Claims**



1. An improved insert for a warhead for producing a projectile by explosive deformation, said warhead comprising a housing containing an explosive charge and said insert forming part of said housing and having an exterior surface which is exposed to the streaming air during flight of said warhead and having an interior surface confronting said explosive charge of said warhead, said insert having an outer peripheral tapered region with an angle of taper, said insert is calotte-shaped, said interior surface of said insert is convex and includes a central flat surface region, said outer peripheral tapered region has a tapered inner surface and a tapered outer surface.

5,559,305

b) an electronic device mounted on said die pad and electrically

tion when an acceleration smaller than a first specified acceleration is applied to the acceleration switch, the at least one

5,559,305

SEMICONDUCTOR PACKAGE HAVING ADJACENTLY ARRANGED SEMICONDUCTOR CHIPS

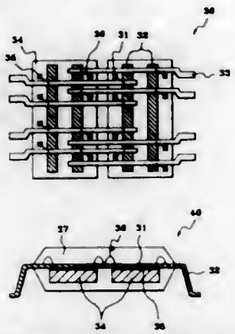
Chung W. Lee, Kyungki-do; Young J. Song, Tongdaemun-gu; Dong S. Seo, Mapo-gu, and Jung Il Park, Songbuk-gu, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

Filed Aug. 29, 1994, Ser. No. 296,596

Claims priority, application Rep. of Korea, Aug. 27, 1993, 16780/93

Int. Cl.[6] H01L *23/02*

U.S. Cl. 174—52.4 **14 Claims**



1. A method for manufacturing a semiconductor chip package including at least two semiconductor chips mounted via a lead on chip method, the method comprising the steps of:

providing a lead frame having first and second sets of leads on opposite sides of the lead frame, the first set of leads and the second set of leads extending in opposite directions, wherein at least end portions of the first and second sets of leads, respectively, are alternately arranged;

mounting at least two semiconductor chips on the first and second sets of leads, such that the at least two semiconductor chips are substantially coplanar, the at least two semiconductor chips each having bonding pads provided thereon;

electrically connecting the at least two semiconductor chips to respective leads of the first and second sets of leads, and electrically connecting at least one lead among the first and second sets of leads to each of the at least two semiconductor chips; and

encapsulating the at least two semiconductor chips and a portion of the first and second sets of leads with a molding compound.

5,559,306

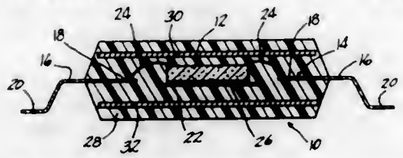
ELECTRONIC PACKAGE WITH IMPROVED ELECTRICAL PERFORMANCE

Deepak Mahulikar, Madison, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 245,195, May 17, 1994, abandoned. This application Oct. 11, 1995, Ser. No. 540,835

Int. Cl.[6] H01L *23/02*

U.S. Cl. 174—52.4 **8 Claims**



1. An electronic package comprising:

a) a leadframe having a plurality of leads, each of said plurality of leads having an inner lead portion and an outer lead portion, and a die pad;

b) an electronic device mounted on said die pad and electrically connected to said inner lead portions;

c) a plastic body encasing said electronic device and said inner lead portions with said outer lead portions projecting beyond said plastic body; and

d) at least one metallic plate within the plastic body overlapping at least 66% of the length of said encased inner lead portions, said at least one metallic plate extending in a plane generally parallel to said inner lead portions and in contact only with the plastic body.

5,559,307

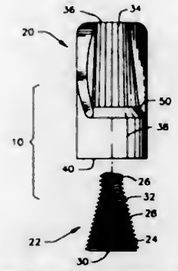
TWIST-ON CONNECTOR HAVING IMPROVED FINGER GRIP WINGS

James H. Whitehead, Collierville, and Francis X. Lynch, Memphis, both, Tenn., assignors to Thomas & Betts Corporation, Memphis, Tenn.

Filed Jun. 30, 1994, Ser. No. 268,428

Int. Cl.[6] H01R *4/22*

U.S. Cl. 174—87 **16 Claims**



7. An electrical connector for twisting onto stripped ends of a pair of insulated conductors for effecting electrical connection of said conductors, said connector comprising:

an elongate hollow electrically insulative shell having a closed upper end and an opposed open end; and

a spring contact member supported within said shell for electrically connecting said stripped ends of said insulated conductors;

said shell including a pair of longitudinal outwardly directed manual gripping wings extending from said closed upper end toward said open end, each of said wings having a first elongate wing surface and an opposed second elongate wing surface defining a transverse wing width which at least a portion thereof widens progressively substantially non-linearly from a point proximate said closed upper end toward said open end of said shell.

5,559,308

PERPENDICULARLY JOINED STRUCTURE WITH THIN-WALLED PLATES AND THIN-WALLED TUBES AND THE METHOD OF MANUFACTURE

Toshiomi Hayashi, 2-18-7 Omachi Nishi, Asaminami-ku, Hiroshima-shi, Hiroshima-ken, Japan

Filed Jun. 30, 1994, Ser. No. 269,006

Claims priority, application Japan, Jun. 30, 1993, 5-186793

Int. Cl.[6] F01N *1/08*

U.S. Cl. 181—265 **11 Claims**

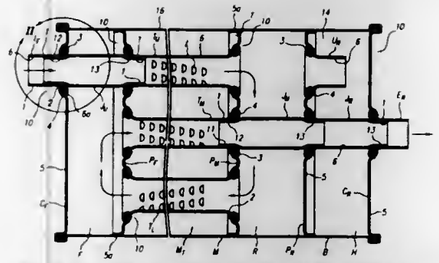
1. A structure comprising

a large diameter thin-walled tube;

thin-walled plates positioned within and across the large diameter thin-walled tube and spaced one from another;

thin-walled tubes positioned perpendicular to the thin-walled plates, a first tube of the thin-walled tubes being joined with a first plate of the thin-walled plates, the first plate having a first hole therethrough and a first circular groove about the first hole, the first tube being held together with the first plate in the first circular groove with the first circular groove deformed, a second tube of the thin-walled tubes being joined with a second plate of the thin-walled plates, the second plate having a second hole therethrough and a second circular groove about the hole, the second tube being held together with the second plate in the second circular groove with the second circular groove deformed;

a joint tube extending between the first plate and the second plate, the joint tube having an outside diameter at each end thereof to allow telescoping into the first tube and the second tube where the first tube and the second tube are held with the first plate and the second plate, respectively, at least the first plate being fixed to the large diameter thin-walled tube.



5,559,309

ACCELERATION SWITCH AND METHOD OF FABRICATION

Erich Zabler, Stutensee; Werner Uhler, Bruchsal; Andreas Baumann, Ettlingen; Joachim Eicher, Dortmund, and Ralf-Peter Peters, Bergisch Gladbach, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

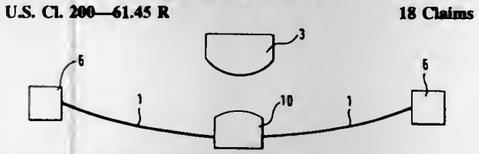
PCT No. PCT/DE93/00708, § 371 Date Apr. 29, 1994, § 102(e) Date Apr. 29, 1994, PCT Pub. No. WO94/06144, PCT Pub. Date Mar. 17, 1994

PCT Filed Aug. 7, 1993, Ser. No. 232,178

Claims priority, application Germany, Sep. 1, 1992, 42 29 068.6

Int. Cl.[6] H01H *35/14*

U.S. Cl. 200—61.45 R **18 Claims**



1. An acceleration switch comprising:

at least one seismic mass;

at least one spring having a first end and a second end, the first end connected to the seismic mass;

at least one contact block, the at least one seismic mass disposed at a first distance from the at least one contact block, the at least one contact block and the at least one seismic mass including a conductive material;

at least one bearing block, the second end of the at least one spring connected to the at least one bearing block;

a one piece insulating substrate, the at least one contact block and the at least one bearing block secured to the insulating substrate, the at least one seismic mass and the at least one spring disposed at a second distance from the insulating substrate, the at least one bearing block, the at least one spring, and the at least one seismic mass each having a side which is substantially perpendicular to a plane of the insulating substrate, the at least one seismic mass moving in a direction parallel to the plane of the insulating substrate; and

the at least one seismic mass residing in a first position when no acceleration is applied to the acceleration switch, the at least one seismic mass being displaced slightly from the first position when an acceleration smaller than a first specified acceleration is applied to the acceleration switch, the at least one seismic mass moving to a second position when an acceleration greater than the first specified acceleration is applied to the acceleration switch, the at least one seismic mass contacting the at least one contact block when the at least one seismic mass is in the second position, the at least one seismic mass being displaced from the second position to the first position when an acceleration smaller than a second specified acceleration is applied to the acceleration switch while the at least one seismic mass is in the second position, the second specified acceleration being smaller than the first specified acceleration.

5,559,310

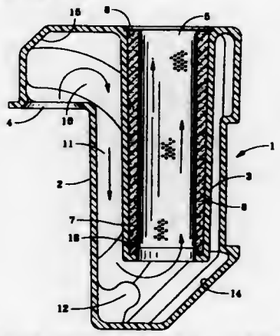
MUFFLER FOR AIR OPERATED RECIPROCATING PUMPS

Rick D. Hoover; Nicholas Kozumplik, Jr., both of Bryan, Ohio, and Joseph W. Sullivan, Lafayette, Ind., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Apr. 26, 1995, Ser. No. 492,868

Int. Cl.[6] F01N *3/02*

U.S. Cl. 181—230 **5 Claims**



1. A muffler for exhausting air from a reciprocating air motor comprising:

a molded muffle chamber having an inlet for receiving exhaust air flowing in a first inlet direction, a first exhaust air turn chamber located anterior to said muffle chamber between said inlet and one near end of said muffle chamber for changing said exhaust air flow to a second muffle chamber exhaust air flow direction, a concentric flow path for said exhaust air formed within and along a length of said molded muffle chamber, a second exhaust air turn chamber located interior of and at a distal end of said molded muffle chamber, and a sound absorbing lined duct inserted within said molded muffle chamber and forming part of said concentric flow path, said sound absorbing lined duct further extending substantially the length of said molded muffle chamber from said second exhaust air turn chamber to and terminating in an exhaust outlet at a surface in said near end of said molded muffle chamber for conducting said exhaust air from said second exhaust air turn chamber to said exhaust outlet.

5,559,311

DUAL DETENT DOME SWITCH ASSEMBLY

Christopher J. Gorbatoff, Vienna, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 27, 1994, Ser. No. 364,377

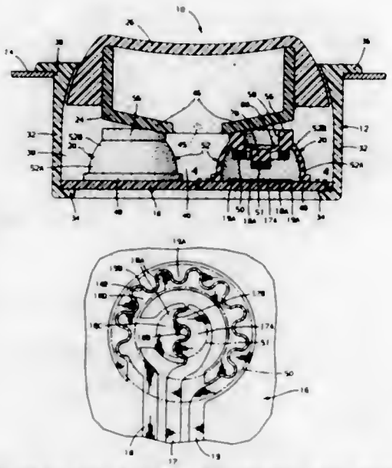
Int. Cl.[6] H01H *1/14*

U.S. Cl. 200—513 **3 Claims**

1. An electric switch assembly comprising a printed circuit means having circuit traces thereon which terminate in ends

5,559,314

RECORDING MEDIUM USING REVERSIBLE



closely spaced from each other, an elastomeric dome having an annular base which is mounted on said printed circuit and which overlies said ends of said circuit traces and an actuator for depressing said dome,

the elastomeric dome having a resilient annular outer side wall of a given thickness, said side wall at its lower end being integral with said base and at its upper end being integral with an annular ring which carries an electrically conductive element on its underside, a central button carrying an electrically conducting pellet on its underside and a deflectable annular web having an inner end integral with said button and an outer end integral with said ring, said outer end of said web being spaced a greater distance from said printed circuit means than said inner end thereof when the dome is in its normal free state position, said pellet on said button being spaced from said printed circuit means a lesser distance than said element on said ring and said ring and button having thicknesses which are substantially greater than the thicknesses of said side wall and web, said side wall deflecting outwardly when said ring of said dome is being depressed by said actuator to move said pellet into engagement with certain of said ends of said circuit traces and said side wall and said web both being deflectable upon further depression of said ring and with the web moving from its free state position over dead center with a snap action feel to a position in which its outer end is spaced a lesser distance from the printed circuit means than its inner end and until the conductive element is engaged with the ends of said circuit traces on said printed circuit means,

wherein said ends of said circuit traces are undulated and closely spaced, but interdigitated with one another.

5,559,312

GAMING MACHINE SYSTEM OPERABLE WITH GENERAL PURPOSE CHARGE CARDS

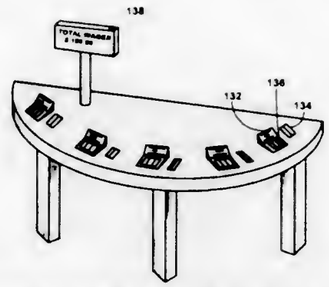
James L. Lucero, Arcadia, Calif., assignor to Scotch Twist, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 60,277, May 11, 1993, Pat. No. 5,457,306, which is a continuation-in-part of Ser. No. 950,980, Sep. 23, 1992, abandoned, which is a continuation of Ser. No. 740,814, Aug. 6, 1991, abandoned, which is a continuation of Ser. No. 453,991, Dec. 19, 1989, Pat. No. 5,038,022. This application Apr. 28, 1995, Ser. No. 430,354

Int. Cl.[6] G06F *15/44;15/21*

U.S. Cl. 235—380 **6 Claims**

1. A method of using general purpose charge cards to obtain and use playing credit for games of chance played on gaming machines which are remote from and different from financial institutions



which maintain accounts for said general purpose charge cards and bill the persons to whom said charge cards are issued, comprising the steps of:

causing information about said general purpose charge cards to be received by said gaming machines;

requesting playing credits from a processing facility through said gaming machines based on said charge cards;

determining by said processing facility whether to grant said requested playing credits and, in case of determinations to grant, transmitting credit approvals to said gaming machines;

conditioning said gaming machines in response to said credit approvals to permit plays thereon using said playing credits as payment for plays;

forming multiple player groups for playing multiple player games on said gaming machines;

maintaining by said processing facility net playing credits which account for said credit approvals and for plays on said gaming machines; and

selectively causing said processing facility to transmit information respecting said net playing credits to said remote financial institutions for use in maintaining said accounts for said general purpose charge cards at said remote financial institutions.

5,559,313

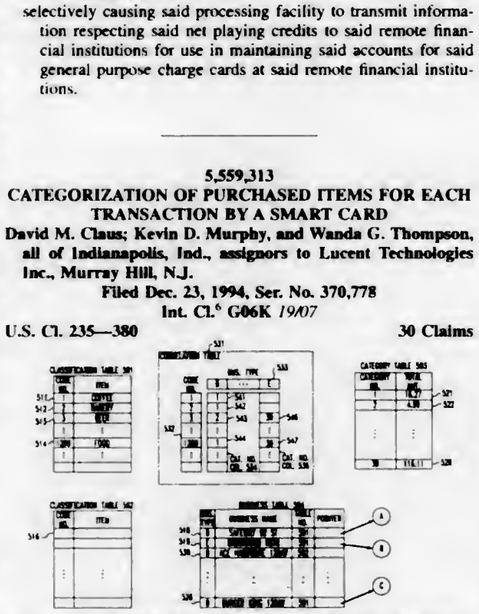
CATEGORIZATION OF PURCHASED ITEMS FOR EACH TRANSACTION BY A SMART CARD

David M. Claus; Kevin D. Murphy, and Wanda G. Thompson, all of Indianapolis, Ind., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 23, 1994, Ser. No. 370,778

Int. Cl.[6] G06K *19/07*

U.S. Cl. 235—380 **30 Claims**



1. A smart card for categorizing items of a transaction, comprising:

means for receiving individual item names, item prices, and a business name for a transaction from a point of sale terminal;

means for identifying each item name with a item code;

means for determining a business type from the business name;

means for designating a category for each item name in response to each item code and business type; and

means for adding each item price into each designated category with the categories being stored in the smart card.

5,559,314

RECORDING MEDIUM USING REVERSIBLE RECORDING MATERIAL AND METHOD OF PROCESSING RECORD TO RECORDING MEDIUM

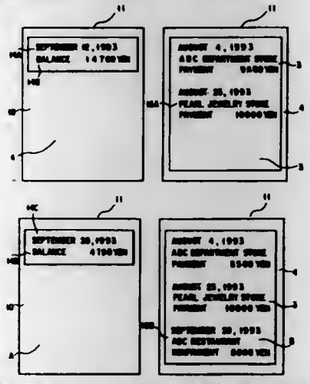
Tadayoshi Ohno; Shinichi Itoh; Takashi Yamaguchi, and Hisatoshi Tanaka, all of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 21, 1994, Ser. No. 309,634

Claims priority, application Japan, Sep. 22, 1993, 5-236691

Int. Cl.[6] G06K *19/00;* **G06F** *3/12*

U.S. Cl. 235—432 **2 Claims**



1. A method of processing a recording medium having a first recording layer wherein a first history information indicating data of use is rewritably recorded by being applied with first recording energy, and a second recording layer wherein a second history information which is different from the first history information and indicates a history of use is non-erasably recorded by Use of second recording energy higher than the first recording energy, said method comprising the steps of:

recording the first history information on the first recording layer of the recording medium with the first recording energy;

determining whether or not a part of the first history information recorded in the first recording layer satisfies a predetermined condition;

preparing the second history information different from the first history information when the first history information satisfies said predetermined condition; and

recording the second history information in the second recording layer in the recording medium with the second recording energy higher than the first recording energy.

5,559,315

EMBOSSED CARD READER

Parameswaran B. Nair, Acworth; John C. Evans, Atlanta, and James F. Price, Alpharetta, all of Ga., assignors to MicroBilt Corporation, Atlanta, Ga.

Division of Ser. No. 970,410, Oct. 30, 1992, Pat. No. 5,369,263. This application Jun. 28, 1994, Ser. No. 262,622

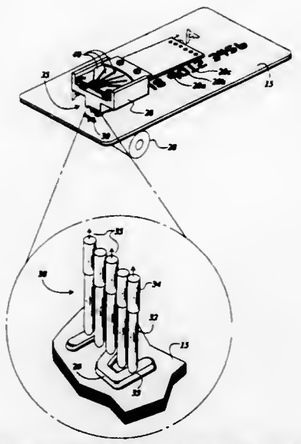
Int. Cl.[6] G06K *7/04*

U.S. Cl. 235—448 **56 Claims**

1. In an embossed card reader, including a plurality of data sensing elements for providing signals indicative of paths of travel of the sensing elements with respect to characters embossed on a data card, a method for decoding an embossed character, comprising the steps of:

acquiring sampled data states from the sensing elements at a predetermined sampling rate, said sampling rate being substantially greater than the expected rate of switch bounce for the sensing elements;

storing said sampled data states;



filtering the sampled data states to remove states of the sensing elements having sampling occurrences less than a predetermined filter thresbold value, thereby providing filtered data states;

discarding invalid data states from said filtered data states, thereby providing valid data states; and

in response to a predetermined proper succession of said valid data states, providing an output indicative of decoding of the embossed characters.

5,559,316

PLASTIC-MOLDED SEMICONDUCTOR DEVICE CONTAINING A SEMICONDUCTOR PELLET MOUNTED ON A LEAD FRAME

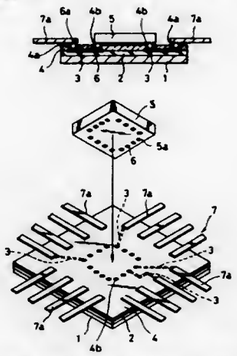
Yoshiyuki Tomoda, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 22, 1994, Ser. No. 310,698

Claims priority, application Japan, Sep. 25, 1993, 5-261690

Int. Cl.[6] H01L *23/02;23/28*

U.S. Cl. 257—666 **11 Claims**



1. A plastic-molded semiconductor device comprising:

(a) a leadframe including a die pad, inner leads, and outer leads;

(b) a semiconductor pellet supported by said die pad;

(c) a first insulator film formed on said die pad;

(d) a patterned interconnection film for making electrical interconnections between said pellet and said inner leads;

said interconnection film being formed on said first insulator film and being electrically insulated from said die pad by said first insulator film;

said interconnection film having first bonding portions for said

5,559,318

ENCODED SYMBOL READER WITH CALCULATION OF

1. A bar code reader comprising

optical scanning means which is arranged to provide an optical

5,559,321

FOCUS DETECTING DEVICE HAVING LIGHT

said interconnection film having first bonding portions for said pellet and second bonding portions for said inner leads;

(e) a second insulator film formed to cover said interconnection film;

said second insulator film having first windows for said pellet and second windows for said inner leads to expose said interconnection film therethrough;

(f) said pellet having bonding pads connected to said respective first bonding portions of said interconnection film through said corresponding first windows, said bonding pads of said semiconductor pellet being further joined to said first bonding portions of said interconnection film by solder balls, respectively, said pellet being electrically connected to said interconnection film by said bonding pads;

(g) said inner leads being electrically connected to said respective second bonding portions of said interconnection film through said corresponding second windows;

(h) a plastic-molded package confining said die pad, said first insulator film, said interconnection film, said second insulator film, said pellet and said inner leads; and

(i) said outer leads extending from said corresponding inner leads toward an outside to protrude from said package;

said bonding pads of said semiconductor pellet being electrically connected through said interconnection film to said respective outer leads.

5,559,317

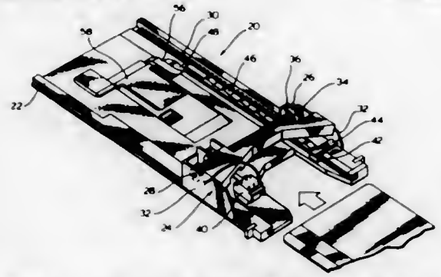
CARD READER WITH CARRIAGE POWERED BY MOVEMENT OF INSERTED CARD

Yiu K. Wong, Scarborough; David H. Groves, Adjala, and Martin F. Hemy, Palgrave, all of Canada, assignors to International Verifact Inc., Toronto, Canada

Filed Mar. 27, 1995, Ser. No. 418,302

Int. Cl.[6] G06K *7/08*

U.S. Cl. 235—449 **23 Claims**



23. In a card reader an interface for reading by means of a magnetic head information recorded on a magnetic stripe of a card, said interface comprising a housing with a card slot therein and a movable carriage having a magnetic read head thereon positioned relative to said card slot for alignment with the magnetic stripe of a card, said carriage being biased to move to an initial position adjacent said card slot when a card is not inserted in said slot and to move to a carriage release position when a card is fully inserted in said slot, said carriage including a drive member and associated energy storage arrangement which cooperate to store energy during movement of said carriage from said initial position to said carriage release position and use said stored energy to drive said carriage over said card to sweep said stripe in a predetermined manner between said carriage release position and said initial position.

5,559,318

ENCODED SYMBOL READER WITH CALCULATION OF MAGNIFICATION

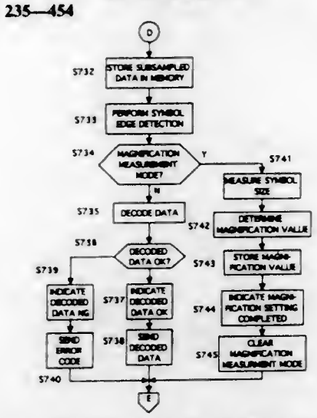
Harumi Aoki, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1995, Ser. No. 404,996

Claims priority, application Japan, Mar. 16, 1994, 6-071577

Int. Cl.[6] G06K *7/10*

U.S. Cl. 235—454 **12 Claims**



1. An encoded symbol reader for reading a two-dimensional encoded symbol, said encoded symbol having a matrix of cells, said encoded symbol reader comprising:

means for reading an image of said encoded symbol, said reading means outputting an electrical signal corresponding to said read image;

means for processing said output electrical signal; and

means for storing information related to a processing of said output signal;

wherein said reading means comprises:

means for sensing said image; and

means for forming said image on said sensing means, and

wherein said processing means comprises:

means for detecting a size of said image formed on said sensing means; and

means for calculating a magnification of said image forming means based on said size of said image detected by said detecting means and a size of said encoded symbol.

5,559,319

OSCILLATION BAR CODE READER

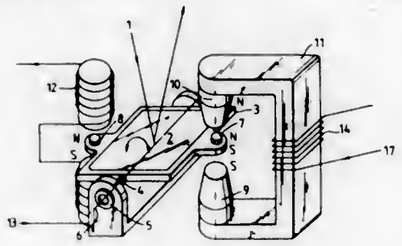
Ke-Ou Peng, 2612 kv. Delft, Netherlands, assignor to Opticon Sensors Europe BV, Netherlands

Filed Dec. 22, 1994, Ser. No. 361,481

Claims priority, application United Kingdom, Dec. 24, 1993, 9326471; Jan. 20, 1994, 9401042

Int. Cl.[6] G06K *7/10*

U.S. Cl. 235—462 **8 Claims**



1. A bar code reader comprising

optical scanning means which is arranged to provide an optical image of a bar code by means of an optical beam, and includes optical beam deflecting means which is arranged to oscillate at a resonant frequency so as to deflect the optical beam in a scanning motion to provide the optical image of the bar code,

light detecting means by which the optical image of the bar code can be received and formed into an electrical signal,

and decoding means for decoding the electrical signal,

the said optical beam deflection means comprising magnetic force applying means and magnetic restorative means which are arranged to act against each other to provide oscillation and at least one of which is arranged to deflect the beam in said scanning motion

and magnetic means for adjustment of the resonant frequency of oscillation.

5,559,320

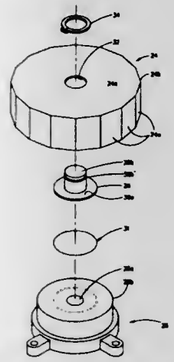
MOUNTING AND BALANCING SYSTEM FOR ROTATING POLYGON MIRROR IN A BAR CODE SCANNER

Richard R. Loya, Seattle, Wash., assignor to Microscan Systems Incorporated, Renton, Wash.

Filed May 19, 1995, Ser. No. 444,851

Int. Cl.[6] G06K *7/10*

U.S. Cl. 235—467 **9 Claims**



1. In a barcode scanner, a polygonal scanning mirror having a plurality of reflective faces arranged about the outer circumference of a substantially hollow cylindrical support body open at one axial end and partly enclosed at the other axial end by an apertured wall structure; an electrical motor having a motor shaft for rotating the scanning mirror about the principal axis of said cylindrical support body; a cylindrical motor hub fixed coaxially on said motor shaft and having a cylindrical outer surface and a closed end surface for nesting inside the open end of said cylindrical support body; and adjustable fastening means disposed at said apertured wall structure for fastening said cylindrical support body to said closed end surface of said hub so as to adjustably balance mass and geometric eccentricities thereof.

5,559,321

FOCUS DETECTING DEVICE HAVING LIGHT DISTRIBUTION DETECTION

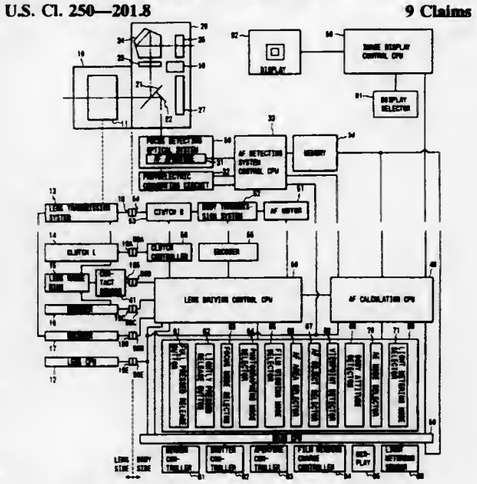
Yosuke Kusaka, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

Division of Ser. No. 311,896, Sep. 26, 1994, which is a continuation of Ser. No. 225,913, Apr. 11, 1994, abandoned, which is a continuation of Ser. No. 129,576, Sep. 30, 1993, abandoned, which is a continuation of Ser. No. 32,176, Mar. 15, 1993, abandoned, which is a continuation of Ser. No. 951,317, Sep. 25, 1992, abandoned, which is a continuation of Ser. No. 837,106, Feb. 18, 1992, abandoned, which is a continuation of Ser. No. 641,431, Jan. 15, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 483,834

Claims priority, application Japan, Jan. 18, 1990, 2-11066

Int. Cl.[6] G01J *1/20*

U.S. Cl. 250—201.8 **9 Claims**



1. A camera comprising:

a phototaking optical system which forms an image of an object in an image field provided in a prearranged focal plane;

a focus detecting device which detects focus conditions of an image plane formed by said phototaking optical system relative to the prearranged focal plane in a plurality of focus detecting positions provided in the image field;

a selector which selects at least one of said plurality of focus detecting positions;

a finder having a finder image field for observing an image of an object formed by said phototaking optical system;

a displaying device which displays at least one focus condition corresponding to the selected at least one of said plurality of focus detecting positions superimposed on an image of an object on said finder image field;

a light measuring device disposed in said finder for measuring an intensity of light from the object through said phototaking optical system; and

an inhabiting device which inhibits said light measuring device from measuring the intensity of light.

5,559,322

IMAGING OPTICAL TRACKER

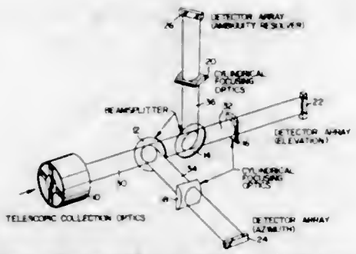
Jerold L. Jacoby, Long Beach, and Peter M. Livingston, Palos Verdes Estates, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Mar. 11, 1985, Ser. No. 710,735

Int. Cl.[6] G01C *21/02*; **G01J** *5/02*; **G01B** *11/26*

U.S. Cl. 250—203.1 **7 Claims**

1. An optical imaging system, comprising:



telescopic collection optics, to produce an input beam from a field of view in which one or more targets are to be detected;

power dividing means, for dividing the beam into first, second and third sub-beams;

first, second and third linear detector arrays, two of which are oriented to provide orthogonal coverage of the field of view and the third of which is oriented at an angle to the other two;

cylindrical focusing optics, for focusing each of the sub-beams onto the respective linear detector arrays; and

signal processing means for determining from the outputs of the arrays the coordinates of one or more targets within the field of view.

5,559,323

OPTICAL PROCESSING DEVICE FOR LIGHT RADIATIONS

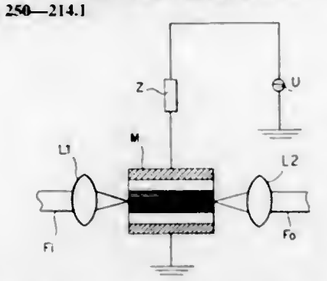
Domenico Campi, and Heinz-Christoph Neitzert, both of Torino, Italy, assignors to CSELT- Centro Studi E laboratori Telecomunicazioni S.P.A., Romoli, Italy

Filed Mar. 9, 1995, Ser. No. 401,564

Claims priority, application Italy, Mar. 22, 1994, 94A000204

Int. Cl.[6] G02B *6/10*; H01J *40/14*

U.S. Cl. 250—214.1 **1 Claim**



1. An optical processor for light radiation comprising:

a coupled quantum well modulator having a multiplicity of parallel layers with at least some of said layers forming a guiding zone comprised of a sequence of alternating quantum wells and barrier layers;

means at one side of said coupled quantum well modulator for launching into said guiding zone light radiation to be processed, said light radiation to be processed passing parallel to said layers through said guiding zone;

means at an opposite side of said coupled quantum well modulator for deriving light radiation processed in said coupled quantum well modulator; and

an adjustable dc source in series with an impedance connected across said multiplicity of parallel layers and selected to establish for given values of the dc source and said impedance a respective nonlinear transfer function for processing said light radiation as said light radiation passes through said guiding zone, said impedance having a voltage drop due to a photocurrent in said coupled quantum well modulator creating a feedback acting upon light absorption characteristics of the coupled quantum well modulator.

5,559,324

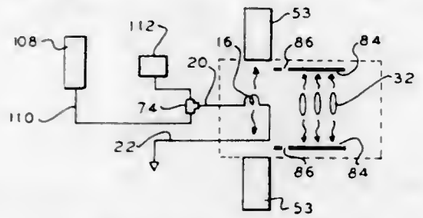
CONTINUOUS SAMPLE DETECTOR WITH STANDARD

Edward Rapkin, Short Hills, N.J., and Gavin Steele, Tampa, Fla., assignors to In/Us Systems, Inc., Fairfield, N.J.

Filed Mar. 23, 1995, Ser. No. 409,003

Int. Cl.[6] G01T *1/204*

U.S. Cl. 250—252.1 **39 Claims**



1. A continuous sample detector comprising:

a sample chamber;

a cell body having a cell and being mounted in said sample chamber for conducting a continuous sample flow;

a standard source of radiation mounted adjacent to said cell body; and

a sensor mounted and arranged proximate said cell and said standard source and including moving means for allowing relative motion between said sensor and said cell and between said sensor and said standard source to cause said sensor to alternately detect radiation (a) predominantly from said cell, or (b) predominantly from said standard source of radiation.

5,559,325

METHOD OF AUTOMATICALLY CONTROLLING THE SPACE CHARGE IN ION TRAPS

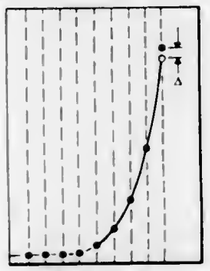
Jochen Franzen, Bremen, Germany, assignor to Bruker-Franzen Analytik GmbH, Bremen, Germany

Filed Aug. 5, 1994, Ser. No. 286,672

Claims priority, application Germany, Aug. 7, 1993, 43 26 549.9

Int. Cl.[6] G01D *59/44*; H01J *49/00*

U.S. Cl. 250—282 **12 Claims**



1. A method of obtaining a mass spectrum of a sample, which method comprises generating ions from the sample, storing the ions in an ion trap, and carrying out successive mass scans on ions stored in the ion trap, wherein the method includes the step of compensating for changes in concentration of the substance to be analysed by,

measuring the integrated ion currents in successive mass scans, and thereby determining the ion generation rate, calculating the expected ion generation rate for a subsequent mass scan, by extrapolation of said generation rates thereby determined in at least two preceding mass scans, and

controlling the ion generation process in dependence upon said calculated expected ion generation rate.

5,559,326

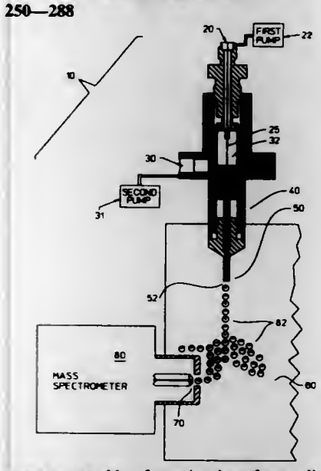
SELF GENERATING ION DEVICE FOR MASS SPECTROMETRY OF LIQUIDS

Paul C. Goodley, Cupertino; Steven M. Fischer, Hayward, and Darrell L. Gourley, San Francisco, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 28, 1995, Ser. No. 508,729

Int. Cl.[6] H01J *49/04*

U.S. Cl. 250—288 **9 Claims**



1. An apparatus capable of creating ions from a liquid sample, said ions being suitable for mass analysis, comprising:

an inlet to receive said liquid sample, said inlet being further connected to a generally tubular first chamber and defining a nozzle on one end thereof and first pump attached to a controllably move said liquid sample through said tubular first chamber in a liquid stream and out of said nozzle;

a pneumatic nebulizer downstream from said inlet and coupled with said first chamber;

an annular second chamber surrounding said first chamber and both said first and second chambers extending laterally about substantially the same centerline, said second chamber defining a nozzle on one end thereof at a point in close proximity to said nozzle end of said first chamber;

gas flow introduction device attached to said second chamber whereby a gas is introduced in a manner so said gas is caused to flow in said second chamber parallel to the flow of said liquid sample stream in said first chamber;

a second pump attached to said second chamber to control velocity of said gas relative to said liquid sample flow in said first chamber;

nozzle device formed in and by the nebulizer housing through said gas and said liquid sample flow and through which point, as a result of the velocity of said gas and liquid and the physical interactions between gas and liquid, ions are created and dispersed into a collecting chamber.

5,559,327

ION FILTER AND MASS SPECTROMETER USING ARCUATE HYPERBOLIC QUADRAPOLES

Urs Steiner, Sunnyvale, Calif., assignor to Bear Instruments, Inc., Santa Clara, Calif.

Filed Jul. 27, 1995, Ser. No. 508,029

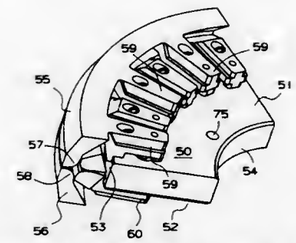
Int. Cl.[6] H01J *49/42*

U.S. Cl. 250—292 **25 Claims**

1. An ion filter comprising:

a support plate having opposing parallel support surfaces,

first and second arcuate outer pole segments each having an arcuate hyperbolic pole surface along one side and a plurality of support spokes extending from an opposing side,



first and second arcuate inner pole segments each having an arcuate hyperbolic pole surface along said one side and a plurality of support spokes extending from said opposing side,

means for fastening one arcuate outer pole segment and one arcuate inner pole segment on each support surface, said one arcuate outer pole segment and said one arcuate inner pole segment having opposing hyperbolic surfaces, and

means for electrically connecting said opposing hyperbolic surfaces.

5,559,328

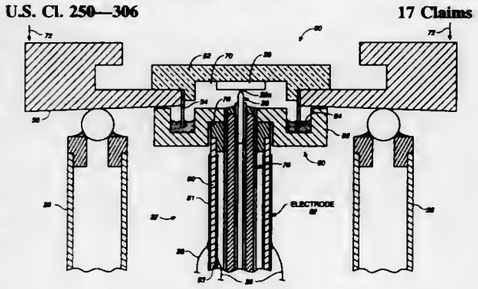
SMALL CAVITY ANALYTICAL INSTRUMENTS

Paul S. Weiss; Lloyd A. Bumm, both of State College, Pa.; Barry G. Willis, Los Altos Hills, and Richard L. Baer, Los Altos, both of Calif., assignors to Biotechnology Research and Development Corporation, Peoria, Ill.

Continuation-in-part of Ser. No. 120,560, Sep. 13, 1993. This application Jul. 29, 1994, Ser. No. 283,007

Int. Cl.[6] H01J *37/20*

U.S. Cl. 250—306 **17 Claims**



1. An apparatus for analyzing samples, comprising:

at least one analytical instrument applying or detecting an AC electrical signal from a sample, said signal including a signal component at a frequency; and

a housing enclosing a cavity, including:(a) a first electrically conductive portion for holding the sample and (b) a second electrically conductive portion for holding the instrument, said cavity having at least one electromagnetic resonant mode;

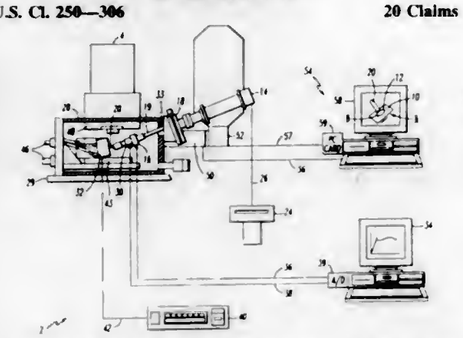
wherein dimensions of the cavity are such that frequency of the lowest electromagnetic resonant mode of the cavity and structures enclosed in the cavity is greater than the frequency of the signal component.

5,559,329

SCANNING ELECTRON MICROSCOPE FIBER PUSH-OUT APPARATUS AND METHOD

Brian E. Joseph; Russell P. Stackpole, II, and Everett H. Baker, all of Wheeling, W. Va., assignors to Touchstone Research Laboratory, Ltd., Triadelphia, W. Va.

Filed Aug. 31, 1994, Ser. No. 298,572
Int. Cl.[6] H01J *37/28*
U.S. Cl. 250—306 **20 Claims**



1. Apparatus for use in measuring properties of a fiber-matrix composite material including a plurality of fibers in a matrix with at least one interface between each of the fibers and said matrix, each of the plurality of fibers has an end, said apparatus comprising:

pushing means for pushing the end of an individual fiber of the plurality of fibers with respect to the matrix;

sensing means for sensing at least one interfacial property of the fiber-matrix composite material whenever the individual fiber is pushed with respect to the matrix;

means for identifying the interface associated with debonding of the individual fiber from the matrix; and

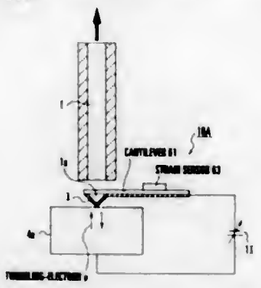
electron microscope means for magnifying the fiber-matrix composite material in order to align said pushing means with the end of the individual fiber and observe the interface during said pushing of the end of the individual fiber.

5,559,330

SCANNING TUNNELING MICROSCOPE

Toru Murashita, Kanagawa, Japan, assignor to Nippon Telegraph and Telephone Corporation, Japan

Filed Dec. 19, 1994, Ser. No. 359,193
Claims priority, application Japan, Dec. 20, 1993, 5-320344; May 13, 1994, 6-100103; Oct. 31, 1994, 6-266656
Int. Cl.[6] H01J *37/00*
U.S. Cl. 250—306 **27 Claims**



1. A scanning tunneling microscope comprising:

a probe including a tip made of a sharpened light transparent material and arranged opposite a sample incorporating a quantum structure, and a light transparent electrode which covers a surface of the tip and is optically transparent;

an optical waveguide having one end arranged on a proximal side of the tip;

a photodetector, arranged on the other end of said optical waveguide, for detecting luminescence from the sample; and

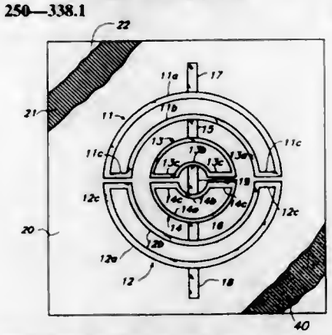
bias power supply for applying a bias voltage between said light transparent electrode and the sample, the power supply varying the bias voltage.

5,559,331

SPLIT-RING INFRARED DETECTOR

Richard C. McKee, Glenwood, Md., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Dec. 24, 1990, Ser. No. 632,790
Int. Cl.[6] G01J *5/28*
U.S. Cl. 250—338.1 **12 Claims**



11. A detector for infrared radiation, comprising

a substrate of cadmium telluride or cadmium zinc telluride;

a metal layer on said substrate;

a matched dielectric layer of cadmium telluride, cadmium zinc telluride, zinc sulfide, silicon dioxide or silicon nitride on said metal layer; and

a multiple split-ring pattern of mercury cadmium telluride or indium antimonide on said matched dielectric layer, said pattern including multiple concentric portions of which evenly-spaced, nearby-portions are cross-connected in a non-polarization-sensitive pattern to reduce the volume of said pattern; said pattern having a surface remote from said matched dielectric layer of providing substantial reflectivity.

5,559,332

THERMAL DETECTOR AND METHOD

Edward G. Meissner, Dallas, and Howard R. Beratan, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 4, 1994, Ser. No. 334,666
Int. Cl.[6] G01J *5/02;* **H01L** *27/02;31/00*
U.S. Cl. 250—338.2 **27 Claims**

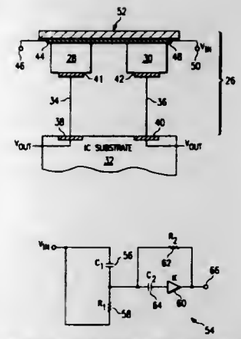
1. A method for producing an image representative of an amount of thermal radiation incident to a thermal imaging system, the method comprising the steps of:

forming a layer of temperature sensitive material as a thermal detector and first element of a signal-producing circuit, said first element having one of a resistance and capacitance value depending on its temperature;

forming a second element of the signal-producing circuit complementary and electrically coupled to the first element in an integrated circuit substrate:

providing an output signal having a frequency from the signal-producing circuit, the frequency of the output signal depending on the value of the first element and representing a temperature of the detector; and

monitoring said frequency of said output signal of the signal-producing circuit so as to detect a change in said temperature



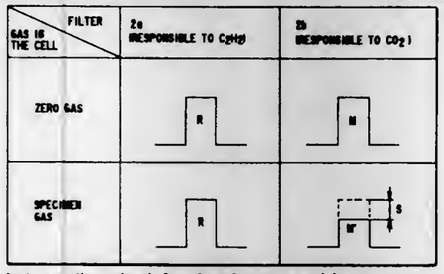
of said thermal detector, wherein said first and second elements further comprise a resistor-capacitor (RC) network of an oscillator circuit.

5,559,333

APPARATUS OF NON-DISPERSIVE INFRARED ANALYZER

Katsuhiko Araya, Kyoto; Youzo Morita, Kameoka; Shingo Sumi, Moriyama, and Hiroaki Matsuhisa, Muko, all of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Nov. 29, 1994, Ser. No. 350,057
Claims priority, application Japan, Nov. 29, 1993, 5-298579
Int. Cl.[6] G01N *21/35;* **G02B** *5/20*
U.S. Cl. 250—344 **14 Claims**



1. A non-dispersive infrared analyzer, comprising:

an infrared light source which emits a beam of infrared light in a beam path;

a cell configured to have a gas flow therethrough, said cell having an infrared light passage through which a sample gas stream containing a gas to be measured and said infrared light beam emitted from said infrared source travels;

a sector disposed in said beam path, said sector having at least two means for filtering infrared light therein, said at least two means selected from the group consisting of a first means for filtering infrared light responsive to an absorption band of the gas to be measured, a second means for filtering infrared light responsive to an absorption band of a preselected reference gas which is not included in said sample gas, and a third means for filtering infrared light which is transparent to the infrared light beam emitted by the infrared source, said at least two means for filtering being alternatively inserted into the infrared beam,

a detector in said beam path, said detector sensing a first wavelength of said infrared light beam which corresponds to the absorption band of the gas to be measured, and which senses an infrared band of a second wavelength corresponding to the absorption band of the preselected reference gas, and which receives the infrared light beam after said beam has traveled through the sample cell, said detector generating an electrical signal based upon detected infrared light,

a position indicating means for detecting which of said first, second, and third means for filtering the infrared light is placed in the light path, and for generating a position signal corresponding thereto,

processing means coupled to said detector and said position indicating means, for receiving the position signal from the position indicating means and receiving the electrical signal from the detector, said processing means producing a first signal representing a concentration of the gas to be measured in the cell, and producing a second signal representing overall sensitivity for infrared light of the infrared gas analyzer,

rectifier means coupled to said processing means for receiving the first signal and the second signal from the processing means and producing a normalized intensity ratio thereof,

calculating means coupled to said rectifier means for receiving the normalized intensity ratio and for calculating the concentration of the gas to be measured in the cell.

14. A method for determining a gas concentration, comprising the steps of:

providing a cell configured to have a gas flow therethrough, said cell having an infrared light passage through which a sample gas stream containing a gas to be measured, and an infrared light beam, travels;

flowing the sample gas stream through the cell;

irradiating an infrared light beam through said cell, whereby said infrared light beam and said sample gas stream share a common path;

alternatingly disposing at least two means for filtering infrared light in said beam path, said at least two means for filtering being selected from the group consisting of a first means for filtering infrared light responsive to an absorption band of the gas to be measured, a second means for filtering infrared light responsive to an absorption band of a preselected reference gas which is not included in the sample gas, and a third means for filtering infrared light which is transparent to the infrared light beam emitted by the infrared source;

sensing a first wavelength of the infrared light beam which corresponds to the absorption band of the gas to be measured;

sensing an infrared band of a second wavelength corresponding to the absorption band of the preselected reference gas, said sensing steps being carried out with a detector disposed in said beam path, said detector receiving the infrared light beam after the beam has traveled through the sample cell, said detector generating an electrical position signal based upon detected infrared light;

detecting which of the first, second, and third means for filtering the infrared light is being placed in the light path;

producing a first signal representing a concentration of the gas to be measured in the cell based upon the detected filter means and the generated electrical signal;

producing a second signal representing overall sensitivity for infrared light;

normalizing an intensity ratio of the first and second signals;

calculating the concentration of the gas to be measured based upon the normalized intensity ratio.

5,559,334

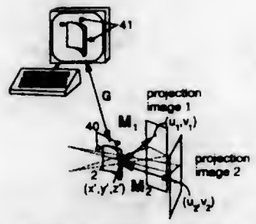
EPIPOLAR RECONSTRUCTION OF 3D STRUCTURES

Rajiv Gupta, and Richardian Hartley, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 22, 1995, Ser. No. 447,021
Int. Cl.[6] G01N *23/02*
U.S. Cl. 250—360.1 **2 Claims**

1. A method of reconstructing structures of a part from N linear pushbroom (LPB) projection images, where N is greater than 1, given the mapping matrices M_j for each of the projection images j=1 . . . N comprising the steps of:

a) acquiring a plurality of linear pushbroom images at different angles about an axis of rotation passing through the part;



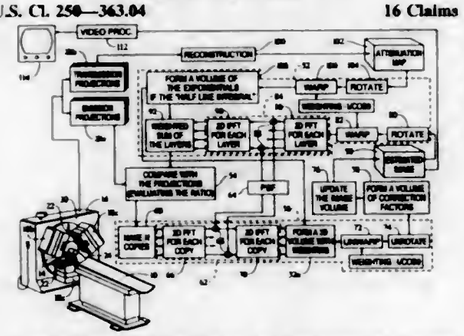
b) selecting a first set of screen coordinates (u_1,v_1) having an intensity I of a first projection image being part of a feature desired to be reconstructed;
c) creating a first ray passing through the selected screen coordinate and through a center of projection;
d) multiplying a plurality of points along the ray by the matrix M_j to result in substantially a hyperbola on a second projection image;
e) correlating intensities along the hyperbola to intensity I to determine a second set of screen coordinates (u_2,v_2) on the second projection image where the hyperbola intersects the selected structure, the second set of screen coordinates (u_2,v_2) corresponding to the same point on said part as the first set of screen coordinates (u_1,v_1)
f) creating a second ray passing through the second set of screen coordinates (u_2,v_2) and through a center of projection;
g) identifying a 3D location where the rays intersect as the reconstructed point; and
h) repeating steps "b"–"g" for a plurality of points on the desired feature; and
i) displaying the 3D reconstructed point to result in a reconstructed 3D structure.

5,559,335

ROTATING AND WARPING PROJECTOR/ BACKPROJECTOR FOR CONVERGING-BEAM GEOMETRIES

Gengsheng L. Zeng, and Grant T. Gullberg, both of Salt Lake City, Utah, assignors to The University of Utah, Salt Lake City, Utah

Filed Dec. 28, 1994, Ser. No. 365,087
Int. Cl.[6] G01T *1/166*
U.S. Cl. 250—363.04 **16 Claims**



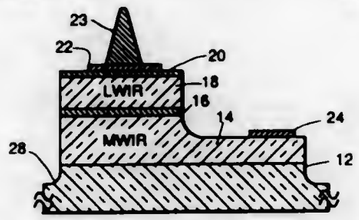
1. A diagnostic imaging system for reconstructing a volume image in an image memory from emission data projections collected at a plurality of projection angles by a radiation detector head having a cone beam convergent ray collimator, the diagnostic imaging system comprising:
a projector for projecting the volume image stored in the image memory along a selected projection direction to form a two-dimensional reprojection along the selected projection direction, the projector including a warping means for transforming the volume image in two dimensions such that rays which converge at a common angle with the cone beam convergent ray collimator become parallel;
a projection combining means for combining each two-dimensional reprojection from the projector with a collected emission data projection in a common projection direction to generate a two-dimensional data array;
a backprojector for backprojecting the two-dimensional data array to form a volume of correction factors, the backprojector including:
an unwarping means for transforming the backprojected data arrays such that parallel rays converge in two dimensions at the common angle with the cone beam convergent ray collimator,
a processor for weighting the data arrays with a weighting function to generate an unwarped volume, and
an unrotating means Which rotates the unwarped volume to a preselected orientation to form the volume of correction factors; and
a volumetric image updating means for correcting the volume image in the image memory in accordance with the volume of correction factors.

5,559,336

INTEGRATED LPE-GROWN STRUCTURE FOR SIMULTANEOUS DETECTION OF INFRARED RADIATION IN TWO BANDS

Kenneth Kosai; Jerry A. Wilson, and Bonnie A. Baumgratz, all of Goleta, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Jul. 5, 1994, Ser. No. 270,965
Int. Cl.[6] H01L *31/0296*
U.S. Cl. 250—370.13 **20 Claims**



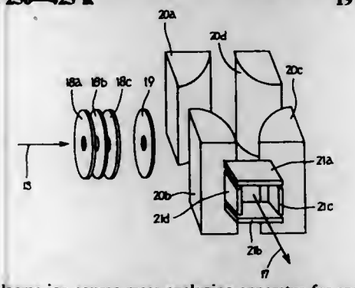
1. A radiation detector unit cell that is responsive to electromagnetic radiation within two spectral bands, said radiation detector unit cell including a plurality of adjacently disposed layers of adjustable energy gap semiconductor material that are disposed upon a first surface of a transparent substrate, said substrate having a second surface opposite the first surface for admitting electromagnetic radiation to be detected, said detector unit cell comprising:
a first photodiode having an anode and a cathode, said first photodiode being responsive to electromagnetic radiation within a first spectral band for generating a detectable photocurrent in response thereto; and
a second photodiode having an anode and a cathode, said second photodiode being responsive to electromagnetic radiation within a second spectral band for generating a detectable photocurrent in response thereto; wherein
said first photodiode is electrically coupled in series with said second photodiode such that said anode of said first photodiode is coupled to said anode of said second photodiode; said unit cell further comprising
a plurality of connection means individual ones of which are electrically coupled to said cathode of said first photodiode, to said cathode of said second photodiode, and to said anodes of said first and said second photodiodes;
a first mesa structure formed through a plurality of said adjacently disposed layers, a second mesa structure formed through a plurality of said adjacently disposed layers, and a third mesa structure formed through a plurality of said adjacently disposed layers, each of said mesa structures having a top surface that supports one of said plurality of connection means, and
a trench that surrounds said unit cell, said trench extending through said plurality of adjacently disposed layers and into said substrate.

5,559,337

PLASMA ION SOURCE MASS ANALYZING APPARATUS

Tetsumasa Ito, and Yoshitomo Nakagawa, both of Chiba, Japan, assignors to Seiko Instruments Inc., Japan

Filed Sep. 8, 1994, Ser. No. 302,503
Claims priority, application Japan, Sep. 10, 1993, 5-226098
Int. Cl.[6] H01J *27/00;49/00;* **B01D** *59/44*
U.S. Cl. 250—423 R **19 Claims**



1. A plasma ion source mass analyzing apparatus for specifying and measuring a minute level of impurities in a sample, comprising: a plasma ion source for ionizing a sample, in a plasma; a vacuum container; a sampling interface for introducing the produced ions into the vacuum container; an ion lens disposed in the vacuum container for focusing the ions; a mass filter disposed in the vacuum container for separating ions by mass; and a detector disposed in the vacuum container for detecting the separated ions; wherein a 90° angle exists between an axis of the sampling interface and an axis of the mass filter, the ion lens has a deflector for deflecting an ion beam that has passed through the sampling interface by 90°, the deflector has a opening on a side opposite the sampling interface, and wherein the deflector has quaternary electrodes for forming a quaternary pole field, and an ion beam that has passed through the sampling interface is incident from an axis of the quaternary pole field, is emergent from an axis that is at an angle of 90° with respect to the axis of the quaternary pole field, and is introduced into the mass filter.

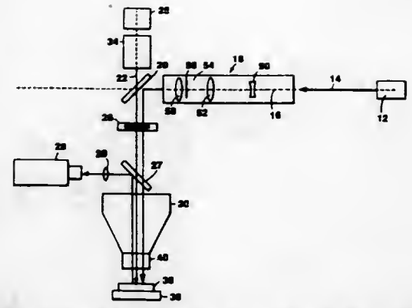
5,559,338

DEEP ULTRAVIOLET OPTICAL IMAGING SYSTEM FOR MICROLITHOGRAPHY AND/OR MICROFABRICATION

David J. Elliott, Wayland; Richard F. Hellmann, Chelmsford, both of Mass., and David Shafer, Fairfield, Conn., assignors to Excimer Laser Systems, Inc., Wayland, Mass.

Filed Oct. 4, 1994, Ser. No. 317,332
Int. Cl.[6] B23K *26/00;* **H01L** *21/268*
U.S. Cl. 250—492.1 **19 Claims**

1. A high resolution, deep UV beam delivery system for exposing a surface, directly or through a mask, for purposes such as photolithography, surface cleaning, microstructuring, pattern micro imaging, or surface modification, said delivery system comprising a deep UV radiation source for generating a beam of deep ulraviolet radiation along a path, a first optical system in said path for homogenizing and shaping the deep UV energy in said path, said homogenizing optical system including a binary optic plate with a first set of regions of normal transmission and a second set of regions where the UV radiation undergoes a 180° phase shift upon transmission; and a second optical system in said path for directing radiation energy onto the surface of a substrate to be processed, said second optical system including large area mirror structure having a numerical aperture of at least 0.3 and a modular compensation assembly of refractive elements disposed between said large area mirror structure and said substrate and corresponding to the wavelength of said radiation source for compensating (reducing) image curvature introduced into the system by said large area mirror structure.

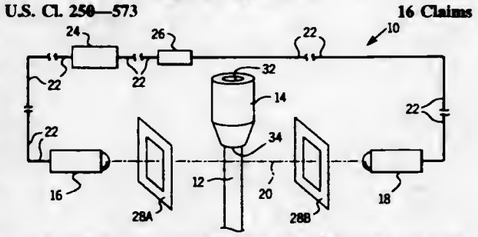


5,559,339

METHOD AND APPARATUS FOR VERIFYING DISPENSE OF A FLUID FROM A DISPENSE NOZZLE

Richard A. Domanik, Libertyville, Ill.; Gordon Sohl, Richardson, Tex.; John Kotlarik, Vernon Hills, and Noman Abunimeh, Grayslake, both of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Oct. 31, 1994, Ser. No. 332,307
Int. Cl.[6] G01N *15/06*
U.S. Cl. 250—573 **16 Claims**



1. A method for verifying dispense of a fluid from a dispense nozzle, the method comprising the steps of:
(a) providing a source of electromagnetic radiation and a receiver of the electromagnetic radiation from the source of electromagnetic radiation operatively associated with the dispense nozzle in an analytical instrument;
(b) energizing the source such that the source produces electromagnetic radiation;
(c) illuminating the receiver with the electromagnetic radiation;
(d) generating with the receiver a first signal;
(e) setting a threshold based on the first signal;
(f) dispensing fluid from the dispense nozzle;
(g) obstructing the electromagnetic signal between the source and the receiver with the fluid dispensed from the dispense nozzle;
(h) generating with the receiver a second signal;
(i) comparing the threshold and the second signal to indicate start of a dispense of fluid from the dispense nozzle;
(j) generating with the receiver a third signal;
(k) comparing the third signal and the threshold to indicate finish of a dispense of fluid from the dispense nozzle;
(l) determining a first time period between generation of the second signal and generation of the third signal;
(m) determining a second time period representing an expected temporal duration between start and finish of the dispense of fluid from the dispense nozzle;
(n) comparing the first time period and the second time period to verify the dispense of fluid from the dispense nozzle; and

(o) updating the threshold after expiration of the second time period.

degrees and such that the beam approaches the transparent article from beyond the side edge;

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THIN FILM TRANSISTOR HAVING REDUNDANT

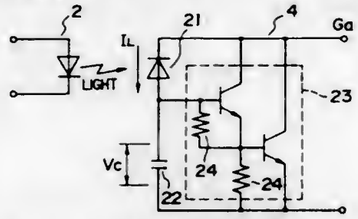
(o) updating the threshold after expiration of the second time period.

5,559,340

PHOTOCOUPLER CAPABLE OF EFFECTING PHASE CONTROL WITH AN EMBEDDED JUNCTION CAPACITOR

Hideyuki Nakamura, Kitakatsuragi-gun, and Atsushi Murayama, Nabari, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 24, 1995, Ser. No. 426,869
Claims priority, application Japan, Apr. 25, 1994, 6-086395
Int. Cl.[6] G02B 27/00
U.S. Cl. 250—551 13 Claims



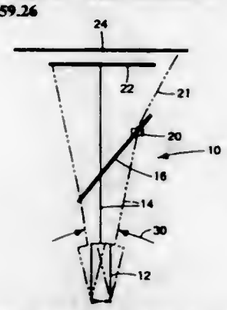
1. A photocoupler capable of effecting phase control, comprising:
a first chip having a light emitting element emitting light in response to an input current; and
a semiconductor chip formed with a light receiving element outputting a current having a magnitude related to the intensity of light received from said light emitting element, a junction capacitor formed in said semiconductor chip for storing charges from the output current from said light receiving element, and a Darlington circuit having said capacitor interposed between the base and emitter thereof.

5,559,341

SYSTEM FOR DETECTING DEFECTS IN ARTICLES USING A SCANNING WIDTH WHICH IS LESS THAN WIDTH OF PORTION OF THE ARTICLE SCANNED

Jerzy S. Krasinski, and Yin M. Wang, both of Stillwater, Okla., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 117,249, Sep. 3, 1993, abandoned. This application Jan. 31, 1995, Ser. No. 381,023
Int. Cl.[6] G01N 21/00;21/86
U.S. Cl. 250—559.26 53 Claims



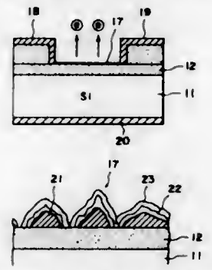
1. An apparatus for detecting defects in a transparent article which cause the deflection of a scanning beam when the beam is directed through the transparent article, the transparent article having a side edge, the apparatus comprising:
means for directing a scanning beam through the transparent article at an angle of incidence ranging from 70 degrees to 90 degrees and such that the beam approaches the transparent article from beyond the side edge;
means for stopping the beam when the beam passes through the transparent article and is not sufficiently deflected by the defect in the transparent article; and
means for collecting the beam when the beam is deflected sufficiently off course by striking the defect as the beam passes through the transparent article such that the beam is not stopped by the stopping means but not deflected beyond the perimeter of the collecting means.

5,559,342

ELECTRON EMITTING DEVICE HAVING A POLYCRYSTALLINE SILICON RESISTOR COATED WITH A SILICIDE AND AN OXIDE OF A WORK FUNCTION REDUCING MATERIAL

Takeo Tsukamoto, Atsugi; Akira Shimizu, Sagamihara; Akira Suzuki; Masao Sugata, both of Yokohama; Isamu Shimoda, Zama, and Masahiko Okunuki, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 213,521, Mar. 16, 1994, abandoned, which is a division of Ser. No. 874,218, Apr. 27, 1992, Pat. No. 5,327,050, which is a continuation of Ser. No. 525,314, May 21, 1990, abandoned, which is a continuation of Ser. No. 370,125, Jun. 20, 1989, abandoned, which is a continuation of Ser. No. 69,215, Jul. 2, 1987, abandoned. This application Apr. 6, 1995, Ser. No. 418,091
Claims priority, application Japan, Jul. 4, 1986, 61-156265; Sep. 9, 1986, 61-210588
Int. Cl.[6] H01J 19/24; H01L 29/12
U.S. Cl. 257—10 2 Claims



1. An electron emitting device for causing electron emission by a current supply in a coarse thin resistor film, wherein said coarse thin resistor film is composed of at least a coarse thin silicon film provided thereon with, in succession, a first layer formed of a silicide of a work function reducing material and a second layer formed of an oxide of said work function reducing material, said work function reducing material being capable of reducing a work function of the coarse thin resistor film.

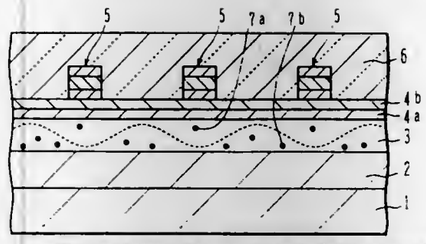
5,559,343

SEMICONDUCTOR DEVICE WITH METALLIC PRECIPITATE AND ITS MANUFACTURE

Richard A. Kiehl, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Feb. 14, 1995, Ser. No. 388,408
Claims priority, application Japan, Feb. 15, 1994, 6-017977
Int. Cl.[6] H01L 29/06;31/0328
U.S. Cl. 257—14 26 Claims

1. A semiconductor device comprising:
a semiconductor body having a main surface;
one or more thin layers of semiconductor material formed in said semiconductor body, each of said thin layers having selectively disturbed perfectness of crystallinity at a defined region; and



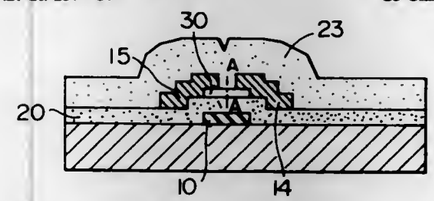
a metallic precipitate formed in and forming metallic-semiconductor contact with each of said thin layers at a position aligned with said defined region.

5,559,344

THIN-FILM SEMICONDUCTOR ELEMENT, THIN FILM SEMICONDUCTOR DEVICE AND METHODS OF FABRICATING THE SAME

Genshiro Kawachi, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 22, 1993, Ser. No. 8,359
Claims priority, application Japan, Jan. 31, 1992, 4-016672; Mar. 23, 1992, 4-065040
Int. Cl.[6] H01L 29/04
U.S. Cl. 257—57 28 Claims



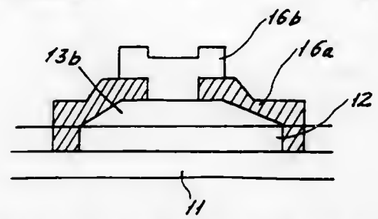
1. A thin-film semiconductor element comprising:
a gate electrode formed on an insulating substrate;
an insulating film formed on the gate electrode;
a semiconductor film formed on the insulating film and doped with an n-type impurity, wherein an n-type impurity concentration in the semiconductor film decreases exponentially with a depth from an upper surface of the semiconductor film;
source and drain electrodes formed on the semiconductor film and separated from each other, that region of the semiconductor film corresponding to a gap between the source electrode and the drain electrode, being doped with a p-type impurity so that the p-type impurity concentration decreases exponentially with depth from the upper surface of the semiconductor film and the concentration profile of the p-type impurity in the semiconductor film is nearly equal to that of the n-type impurity in the semiconductor film, to form an intrinsic layer; and
a passivation layer covering and in contact with said source and drain electrodes and that portion of said semiconductor film corresponding to the gap between the source electrode- and the drain electrode, said passivation layer containing neither p-type nor n-type impurities therein.

5,559,345

THIN FILM TRANSISTOR HAVING REDUNDANT METAL PATTERNS

Jeong J. Kim, Kyungki-Do, Rep. of Korea, assignor to Goldstar Co., Ltd., Rep. of Korea

Filed Dec. 20, 1994, Ser. No. 359,419
Int. Cl.[6] H01L 31/036
U.S. Cl. 257—59 8 Claims



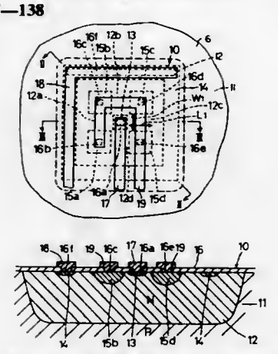
1. A liquid crystal display element having a thin film transistor, a data line and a gate line perpendicular to each other, the data line connected to one of a source and a drain electrode of the thin film transistor, and the gate line connected to a gate electrode of the thin film transistor, the display element comprising:
a substrate;
an insulation layer formed on the substrate;
a thin film transistor over the substrate, wherein a source electrode and a drain electrode of the thin film transistor are formed on the insulation layer;
a pixel electrode formed on the insulation layer, the pixel electrode being connected to the other of the source and drain electrode not connected to the data line; and
a data line on the insulation layer, the data line including a first data line layer and a redundancy line layer, wherein the first data line layer includes material which is the same as a material of the one of the source and drain electrode connected to the data line,
wherein the redundancy line layer is partially patterned so as to include at least two subredundancy lines.

5,559,346

FIELD-EFFECT SEMICONDUCTOR DEVICE WITH INCREASED BREAKDOWN VOLTAGE

Tomoyoshi Kushida, Seto, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 18, 1994, Ser. No. 324,662
Claims priority, application Japan, Mar. 2, 1994, 6-032525; Jun. 23, 1994, 6-141806
Int. Cl.[6] H01L 29/74;31/111
U.S. Cl. 257—138 25 Claims



1. A field-effect semiconductor device comprising:
a semiconductor region of a first conductivity type having a surface;

a source region of a second conductivity type disposed in a first

5,559,350

a source region of a second conductivity type disposed in a first portion of said semiconductor region such that said source region is contiguous to said surface of said semiconductor region;

a drain region disposed in a second portion of said semiconductor region such that said drain region is contiguous to said surface of said semiconductor region and such that a portion of said semiconductor region at said surface thereof linearly couples said source region to said drain region; and

gate regions of a third conductivity type disposed in said semiconductor region and contiguous to said surface of said semiconductor region, wherein said portion of said semiconductor region linearly coupling said source region and said drain region to each other is disposed between said gate regions.

5,559,347

INSULATED GATE-TYPE BIPOLAR TRANSISTOR

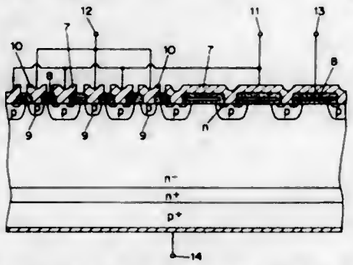
Tomoyuki Yamazaki, and Masahito Otsuki, both of Nagano, Japan, assignors to Fuji Electronic Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1995, Ser. No. 397,418

Claims priority, application Japan, Mar. 1, 1994, 6-030723

Int. Cl.[6] H01L *29/74;29/76*

U.S. Cl. 257—139 **6 Claims**



1. An insulating gate-type bipolar transistor with overcurrent protection comprising:

a main cell formed from a semiconductor substrate, including first emitter electrode;

a sensing cell formed from said semiconductor substrate comprising a P-well located near said main cell, wherein said sensing cell includes a second emitter electrode; and

an overcurrent protection circuit responsive to said second emitter electrode for limiting said current to said main cell,

wherein said main cell and said sensing cell are physically separated and said second emitter electrode is connected to said overcurrent protection current.

5,559,348

SEMICONDUCTOR DEVICE HAVING INSULATED GATE BIPOLAR TRANSISTOR

Kiyoto Watabe; Ikunori Takata, and Masana Harada, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 5, 1995, Ser. No. 460,942

Claims priority, application Japan, Nov. 11, 1994, 6-277429

Int. Cl.[6] H01L *29/74;27/01;23/58*

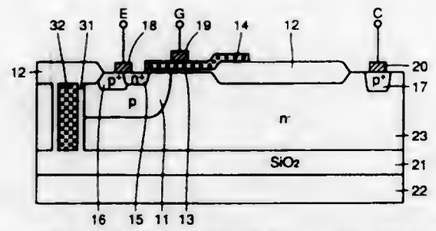
U.S. Cl. 257—141 **13 Claims**

1. A semiconductor device comprising:

a first base layer of a first conductivity type;

a second base layer of a second conductivity type formed in a predetermined region of the main surface of said first base layer;

an emitter layer of the first conductivity type formed in a predetermined region of the main surface of said second base layer;



a collector layer of the second conductivity type formed in a region of the main surface of said first base layer at a predetermined interval from said second base layer;

a high impurity concentration region of a second conductivity type formed in the main surface of and entirely within said second base layer;

a field oxide formed in a region on the main surface of said first base layer between said second base layer and said collector layer; and

a gate electrode comprising a first region formed on said second base layer between said emitter layer and said first base layer and a second region formed on said first base layer with a gate insulating film therebetween, wherein a planar area of said first region is smaller than a planar area of said second region and wherein said gate electrode extends onto an upper surface of said insulating film.

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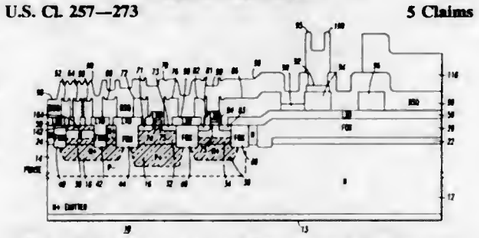
SILICON INTEGRATED CIRCUIT WITH PASSIVE DEVICES OVER HIGH RESISTIVITY SILICON SUBSTRATE PORTION, AND ACTIVE DEVICES FORMED IN LOWER RESISTIVITY SILICON LAYER OVER THE SUBSTRATE

James R. Cricchi, Cantonsville; Paul A. Potyraj, Dundalk, and Mike L. Salib, Millersville, all of Md., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Mar. 7, 1995, Ser. No. 399,802

Int. Cl.[6] H01L *29/80*

U.S. Cl. 257—273 **5 Claims**



1. A silicon microwave monolithic integrated circuit device comprising:

a high resistivity silicon substrate of a first conductivity type;

a masking layer formed over a first area of said substrate comprising a plurality of sub-layers of silicon dioxide atop said first area of said substrate: silicon nitride atop said silicon dioxide sub-layer: and oxidized polysilicon atop said sub-layer of silicon nitride;

a well region formed in said substrate and doped with second conductivity type dopant forming a second area of said substrate:

a silicon epitaxial layer formed over said second area of said substrate, said silicon epitaxial layer having a second resistivity lower than said high resistivity;

a microwave bipolar junction transistor (BJT) formed in said silicon epitaxial layer and a portion of said second area of said substrate; and

a passive element formed over said masking layer and said first area of said silicon substrate.

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DYNAMIC RAM AND METHOD OF MANUFACTURING THE SAME

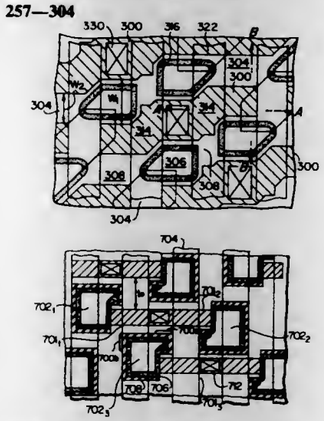
Thoru Ozaki, Tokyo; Kazumasa Sunouchi, Kanagawa-ken; Seiichi Takedai, Tokyo, and Yoshiyuki Shioyama, Kanagawa-ken, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Continuation of Ser. No. 909,392, Jul. 8, 1992, abandoned.

This application Nov. 29, 1994, Ser. No. 350,156

Int. Cl.[6] H01L *27/108*

U.S. Cl. 257—304 **17 Claims**



1. A dynamic RAM array comprising:

a substrate;

a plurality of semiconductor island regions on the substrate;

a trench region in the substrate, the trench region surrounding each of the island regions, and the trench region having a plurality of first trench portions and a plurality of a second trench portions, the first trench portions being wider than said second trench portions;

an insulation layer on the trench region;

capacitors in the first trench portions, the capacitors not extending beyond the first trench portions, and each of the capacitors having a plate electrode, a capacitor insulating layer and a storage node electrode;

field isolation regions entirely in the second trench portions;

MOS transistors on the island regions, each of the MOS transistors having a source, a drain and a gate, the gate being a word line, one of the source and drain being coupled with the storage node electrode; and

bit lines perpendicular to the word line, the bit lines being coupled with other of the source and drain of the MOS transistors.

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SEMICONDUCTOR ELEMENT HAVING CR IN SILICON DIOXIDE

Makoto Takiyama, Tokyo, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed Jul. 13, 1994, Ser. No. 274,558

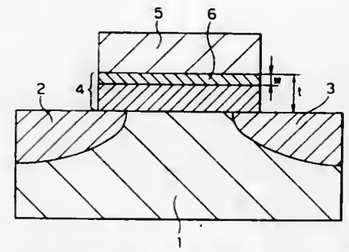
Claims priority, application Japan, Jni. 13, 1993, 5-195384; Jul. 13, 1993, 5-195385

Int. Cl.[6] H01L *29/792*

U.S. Cl. 257—324 **29 Claims**

1. A semiconductor element comprising:

a silicon substrate;



a silicon oxide film formed on said silicon substrate; and

a top electrode formed on said silicon oxide film which includes chromium located only in a region of said silicon oxide film, said region being adjacent said top electrode and having a thickness of 75% or less of a thickness of said silicon oxide film for controlling a threshold voltage in said semiconductor element.

5,559,352

ESD PROTECTION IMPROVEMENT

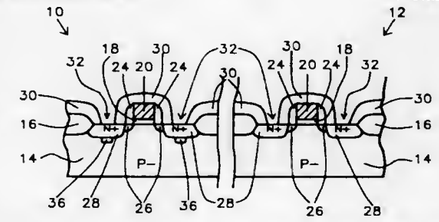
Chen-Chiu Hsue, Hsin-chu, and Joe Ko, Hsinchu, Taiwan, assignors to United Microelectronics Corporation, Hsinchu, Taiwan

Division of Ser. No. 139,858, Oct. 22, 1993, Pat. No. 5,374,565.

This application Dec. 12, 1994, Ser. No. 354,373

Int. Cl.[6] H01L *29/76*

U.S. Cl. 257—328 **8 Claims**



1. An ESD protection device with reduced junction breakdown voltage, connected to an integrated circuit which includes FET devices, comprising:

a silicon substrate having a first conductivity type;

field oxide regions in and on said silicon substrate for isolation of said ESD protection device;

a gate with adjacent spacers for said ESD protection device, between said field oxide regions;

source/drain regions for said ESD protection device between said gate and said field oxide regions, with each source/drain region comprising:

a first lightly implanted region having a second conductivity type opposite to said first conductivity type, under one of said spacers;

a heavier implanted region of the same conductivity type as said first lightly implanted region, located between said first lightly implanted region and one of said field oxide regions;

a second lightly implanted region of same conductivity type as said silicon substrate, centered under said heavier implanted region.

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INTEGRATED CIRCUIT STRUCTURE HAVING AT LEAST ONE CMOS-NAND GATE AND METHOD FOR THE MANUFACTURE THEREOF

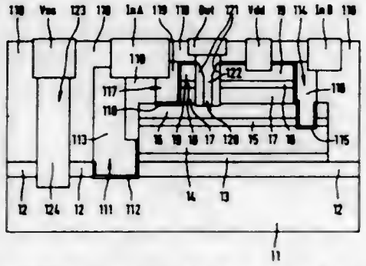
Lothar Risch, Neubiberg; Thomas Vogelsang; Franz Hofmann, both of Munich, and Karl Hofmann, Wessling, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 1, 1994, Ser. No. 332,737

Claims priority, application Germany, Dec. 7, 1993, 43 41 667.5

Int. Cl.[6] H01L *27/092;29/78*

U.S. Cl. 257—334 **5 Claims**



1. An integrated circuit structure having at least one CMOS-NAND gate, said integrated circuit structure comprising:

a first MOS transistor and a second MOS transistor connected in series with a first complementary MOS transistor and a second complementary MOS transistor that are connected in parallel with one another;

each of said transistors having a vertical layer sequence forming a source, a channel having a channel length and a drain for that transistor and each layer sequence for each transistor having a sidewall at which a gate dielectric and a gate electrode are disposed;

the respective vertical layer sequences of the first and second complementary MOS transistors connected in parallel being a single, common layer sequence forming the source, channel and drain for both first and second complementary MOS transistors; and

the respective layer sequences that form the series-connected first and second transistors, and said common layer sequence, being disposed above one another and said first and second transistors having respective channel lengths which are substantially equal.

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Patent Not Issued For This Number

5,559,355

VERTICAL MOS SEMICONDUCTOR DEVICE

Tomoyuki Yamazaki; Shigeyuki Obinata; Masahito Otsuki; Seiji Momota, and Tatsuhiko Fujihira, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 397,417, Mar. 1, 1995. This application Jun. 20, 1995, Ser. No. 492,854

Claims priority, application Japan, Mar. 4, 1994, 6-033985; Jun. 22, 1994, 6-139748

Int. Cl.[6] H01L *29/76*

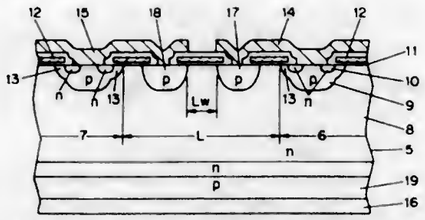
U.S. Cl. 257—341 **8 Claims**

1. A vertical MOS semiconductor device comprising:

(a) a semiconductor layer of a first conductivity type;

(b) a main cell portion comprising

a first base region of a second conductivity type formed selectively at a first surface of the semiconductor layer,



a first emitter region of the first conductivity type formed selectively in the surface of the first base region,

a gate electrode fixed via a gate oxide film to a portion of the first base region extending between the semiconductor layer and the first emitter region, and

an emitter electrode connected to the surfaces of the first base region and the first emitter region;

(c) a sensing cell portion for detecting a current of the main cell portion comprising

a second base region of a second conductivity type formed selectively at a second surface of the semiconductor layer,

a second emitter region of the first conductivity type formed selectively at the surface of the second base region,

a gate electrode fixed via a gate oxide film to a portion of the second base region extending between the semiconductor layer and the second emitter region, and

an emitter electrode connected to the second base region and the second emitter region;

(d) a first well region of the second conductivity type formed between the main and sensing cell portions, the first well region being connected to the emitter electrode of the sensing cell portion; and

(e) a second well region of the second conductivity type formed between the main and sensing cell portions, the second well region being connected to the emitter electrode of the main cell portion.

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SEMICONDUCTOR DEVICE WITH LARGE SUBSTRATE CONTACT REGION

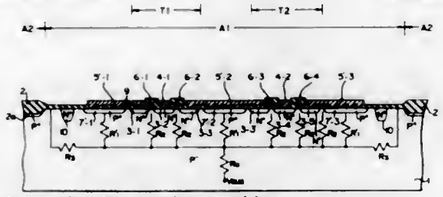
Akira Yukawa, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Oct. 16, 1995, Ser. No. 543,285

Claims priority, application Japan, Oct. 17, 1994, 6-250853

Int. Cl.[6] H01L *29/76;29/94*

U.S. Cl. 257—371 **16 Claims**



1. A semiconductor device comprising:

a semiconductor substrate of a first conductivity type;

a drain region of a second conductivity type opposite to said first conductivity type, formed in said semiconductor substrate;

a source region of said second conductivity type, formed in said semiconductor substrate;

a gate electrode, formed over said semiconductor substrate between said drain region and said source region;

a substrate contact region of said first conductivity type having a higher impurity concentration than said semiconductor substrate, said substrate contact region being formed in said semiconductor substrate adjacent to said source region;

a source electrode formed on said source region; and

a drain electrode formed on said drain region,

said substrate contact region being wider than said drain region and said source region.

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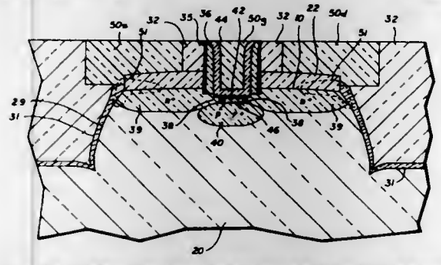
POLY LDD SELF-ALIGNED CHANNEL TRANSISTORS

Zoran Krivokapic, 2321 De Varona Pl., Santa Clara, Calif. 95050

Division of Ser. No. 369,766, Jan. 6, 1995, which is a continuation-in-part of Ser. No. 948,365, Sep. 21, 1992, abandoned. This application May 24, 1995, Ser. No. 449,619

Int. Cl.[6] H01L *27/108*

U.S. Cl. 257—336 **9 Claims**



1. A short channel metal-oxide semiconductor device in a semiconductor substrate separated from neighboring devices wherein trenches are formed in said substrate to define each device, said trenches having sidewalls lined with an oxide liner and filled with an oxide filler, wherein said device includes lightly doped source and drain regions and heavily doped source and drain regions having a first conductivity separated by a gate region; a shallow channel doping region having a second conductivity opposite to said first conductivity formed in said gate region; a gate oxide formed over said gate region; a gate electrode comprising doped polysilicon of said first conductivity, said gate electrode having a horizontal portion and vertical portions, said horizontal portion contacting said gate oxide and said vertical portions extending from said horizontal portion; and doped polysilicon source and drain contacts, said polysilicon source and drain contacts separated from said horizontal portion of said gate electrode by oxide regions; said short channel metal-oxide semiconductor device fabricated by a method comprising:

(a) depositing doped polysilicon layers atop and in contact with said source and drain regions, said polysilicon layers extending beneath said oxide regions and said doped polysilicon source and drain contacts and abutting said oxide liner, said doped polysilicon layers preventing said oxide filler from being overetched to the point of exposing said trench sidewalls during subsequent process steps, thereby preventing the formation of parasitic devices in said sidewalls; and

(b) depositing vertical insulation spacers to separate said gate electrode from said oxide regions, wherein said method increases the drive currents attainable by said device.

5,559,358

OPTO-ELECTRO-MECHANICAL DEVICE OR FILTER, PROCESS FOR MAKING, AND SENSORS MADE THEREFROM

David W. Burns, Minneapolis, Minn.; Henry Guckel, Madison, Wis., and James D. Zook, Minneapolis, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

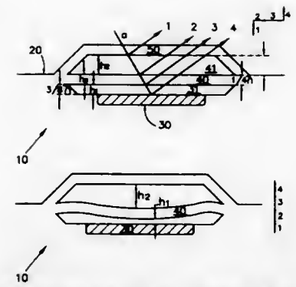
Continuation-in-part of Ser. No. 67,872, May 25, 1993, abandoned. This application May 23, 1994, Ser. No. 247,911

Int. Cl.[6] H01L *29/82*

U.S. Cl. 257—431 **49 Claims**

1. A resonant semiconductor microstructure, comprising:

a semiconductor base having a cavity on one side;



a vibratory flexible member formed of a semiconductor material and having at least one portion connected to the semiconductor base proximate the cavity; and forming an integrated optical interference structure in cooperation with at least one other fixed surface of the semiconductor base, so that an amount of incident light energy traverses the vibratory flexible member and is then reflected from the at least one other fixed surface of the semiconductor base thereby creating an optical interference pattern consistent with the vibration of the flexible member.

5,559,359

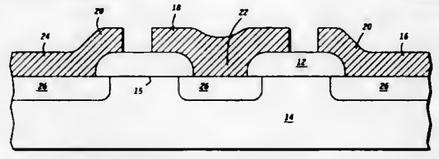
MICROWAVE INTEGRATED CIRCUIT PASSIVE ELEMENT STRUCTURE AND METHOD FOR REDUCING SIGNAL PROPAGATION LOSSES

Adolfo C. Reyes, 866 W. Saint Andrews Blvd., #1084., Chandler, Ariz. 85224

Continuation-in-part of Ser. No. 282,444, Jul. 29, 1994, abandoned. This application Jan. 3, 1995, Ser. No. 367,664

Int. Cl.[6] H01L *31/00*

U.S. Cl. 257—453 **25 Claims**



1. A microwave integrated circuit formed on a silicon substrate and having a passive element for carrying a signal, said passive element comprising:

an insulating layer overlying said substrate and having a first opening; and

a metal layer overlying said insulating layer, wherein at least a portion of said metal layer contacts a depletion region in said substrate through said first opening.

5,559,360

INDUCTOR FOR HIGH FREQUENCY CIRCUITS

Tzu-Yin Chiu, Martinsville, N.J.; Frank M. Erceg, Bethlehem, Pa.; Duk Y. Jeon, Seoul, Rep. of Korea, and Janmye Sung, Warren, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 19, 1994, Ser. No. 359,309

Int. Cl.[6] H01L *29/00;* **H01F** *27/06;27/28;5/00*

U.S. Cl. 257—531 **14 Claims**

1. An integrated circuit for use in high frequency applications that includes an inductive structure, said structure comprising:

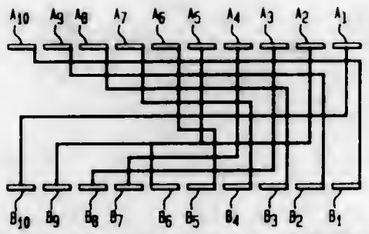
a) a first electrical conductor comprising a sequence of substantially parallel first conductive elements electrically connected in parallel, each having first and second ends and disposed

5,559,364

LEADFRAME

5,559,366

LEAD FINGER TREAD FOR A SEMICONDUCTOR LEAD



sequentially to form a first planar pattern, said first conductive elements having unequal electrical lengths and being electrically isolated from each other along said first pattern; and a second electrical conductor

b) comprising a sequence of substantially parallel second conductive elements connected in parallel, each having first and second ends and disposed sequentially to form a second planar pattern, said second conductive elements having unequal electrical lengths and being electrically isolated from each other along said second pattern, said first planar pattern separated from said second planar pattern by a layer of dielectric material,

wherein individual said second ends of sequentially longer ones of said first conductive elements are electrically coupled to individual first ends of sequentially shorter ones of said second conductive elements thereby forming a combination of substantially equal length, equiresistant conductive elements from said first ends of said first conductive elements to said second ends of said second conductive elements.

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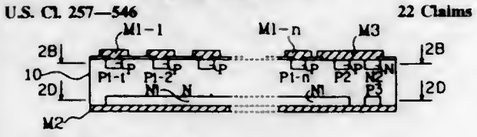
MONOLITHIC DIODE ASSAY

Robert Pezzani, Vouvray, France, assignor to SGS-Thomson Microelectronics S.A., Saint Genis, France

Filed Mar. 22, 1994, Ser. No. 216,585
Claims priority, application France, Apr. 13, 1993, 93 04586
Int. Cl.[6] H01L *27/082*
U.S. Cl. 257—546 **22 Claims**



1. A semiconductor component including:

a plurality of protection diodes that are vertically disposed in a semiconductor wafer, a first electrode of each of the plurality of protection diodes being disposed along at least one row on a first surface of the semiconductor wafer; and a contact region, on the first surface, that extends substantially along a length of said first surface and being substantially at a potential of a second electrode of each of said plurality of protection diodes, the second electrode of each of the plurality of protection diodes being formed at a second surface of the semiconductor wafer.

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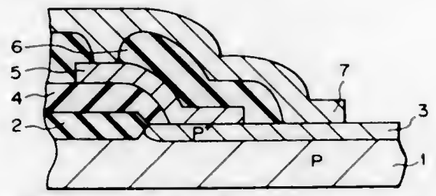
SEMICONDUCTOR DEVICE HAVING DOUBLE METAL CONNECTION LAYERS CONNECTED TO EACH OTHER AND TO THE SUBSTRATE IN THE SCRIBE LINE AREA

Kaoru Narita, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 17, 1994, Ser. No. 323,836
Claims priority, application Japan, Oct. 27, 1993, 5-291162
Int. Cl.[6] H01L *23/58;29/40*
U.S. Cl. 257—620 **12 Claims**

1. A semiconductor device comprising:



two metal connection layers formed on a scribe line area of a semiconductor substrate; and

a first insulating layer formed between said metal connection layers;

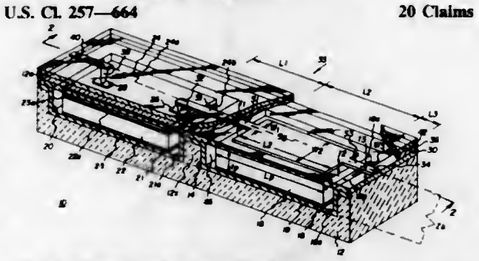
said metal connection layers being connected directly to each other, via contact holes, and directly to said semiconductor substrate.

5,559,363

OFF-CHIP IMPEDANCE MATCHING UTILIZATING A DIELECTRIC ELEMENT AND HIGH DENSITY INTERCONNECT TECHNOLOGY

Anthony A. Immorlica, Jr., Manlius, N.Y., assignor to Martin Marietta Corporation, Bethesda, Md.

Filed Jun. 6, 1995, Ser. No. 469,706
Int. Cl.[6] H01L *29/40;23/34*
U.S. Cl. 257—664 **20 Claims**



1. An electronic system comprising:

a substrate having an upper surface, said upper surface having first and second adjacent openings defining respective first and second chip-wells therein;

a conductive ground plane, including a first ground plane conductor disposed in said first chip-well and having an upper surface;

a dielectric element formed of a dielectric material having a dielectric constant ϵ_1, and disposed upon said first ground plane conductor upper surface, said dielectric element having an upper surface;

a semiconductor device disposed in said second chip-well, said semiconductor device having an upper surface and at least one electrode disposed upon said upper surface, said semiconductor device also having an impedance Z_a between a selected one of said at least one electrode and said ground plane;

a dielectric layer formed of a dielectric material having a dielectric constant ϵ_2 and overlying at least a portion of each of said semiconductor device upper surface, said dielectric element upper surface and said substrate upper surface;

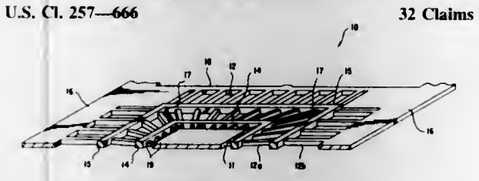
at least one patterned metal layer disposed upon said dielectric layer, in electrical contact with said semiconductor device selected electrode and in alignment over said dielectric element; said metal layer forming with said ground plane conductor, said dielectric element and said dielectric layer, an impedance-matching network at least partially matching said semiconductor device impedance Z_a to an other impedance Z_b external to said semiconductor device.

5,559,364

LEADFRAME

Tetsuya Hojyo, Sakai, Japan, assignor to Contex Incorporated, Osaka, Japan

Filed Feb. 14, 1994, Ser. No. 195,340
Claims priority, application Japan, Feb. 15, 1993, 5-048582
Int. Cl.[6] H01L *23/495*
U.S. Cl. 257—666 **32 Claims**



1. A leadframe comprising:

a resin encapsulated package with an inside section;

internal leads, each with a top, bottom and side surfaces, arranged in rows, with respect to said sides of said internal leads, on a side of a die pad, wherein each of said internal leads are in said inside section of said encapsulated package;

a lead retaining section means for securely operationally retaining said internal leads; and

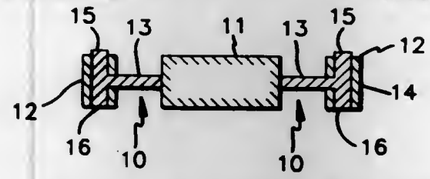
wherein said lead retaining section is disposed so as to adhere to said internal leads and so as to be embedded between said side surfaces of said internal leads.

5,559,365

SEMICONDUCTOR DEVICE INCLUDING A PLURALITY OF LEADS EACH HAVING TWO END PORTIONS EXTENDING DOWNWARD AND UPWARD

Shotaro Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 28, 1994, Ser. No. 365,226
Claims priority, application Japan, Dec. 28, 1993, 5-334466
Int. Cl.[6] H01L *23/02*
U.S. Cl. 257—666 **10 Claims**



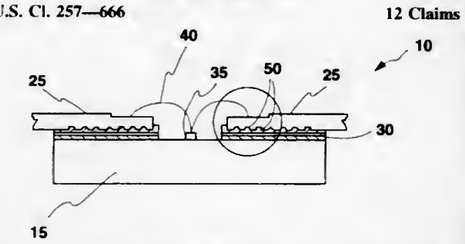
1. A semiconductor device comprising a package sealing a semiconductor chip, a plurality of terminals each horizontally led out from said package and having an inner part, a tip part, and an intermediate part between said inner part and said tip part, said inner part of each of said terminals being encapsulated in said package, and a terminal protecting frame formed in contact with the tip part of each of said terminals to hold the respective tip parts of said terminals, said terminal protecting frame being spaced apart from and not contacting said package thereby to expose said intermediate part of each of said terminals, said tip part of each of said terminals having a thickness greater than a thickness of said package and a tip edge exposed from said terminal protecting frame.

5,559,366

LEAD FINGER TREAD FOR A SEMICONDUCTOR LEAD PACKAGE SYSTEM

Rich Fogal, and Michael B. Ball, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Aug. 4, 1994, Ser. No. 285,974
Int. Cl.[6] H01L *23/48*
U.S. Cl. 257—666 **12 Claims**



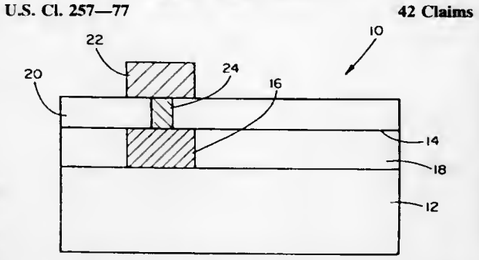
1. A lead frame for wire bonding with a semiconductor die, the lead frame including at least one lead finger having a tread on a surface thereof for increasing adhesion between the finger and an insulator, the insulator disposed between the tread and the die, and wherein the tread is formed as voids in the surface of the lead finger which do not penetrate through the lead finger, the voids having substantially rectilinear walls for providing an optimal tread surface area for contact with the insulator.

5,559,367

DIAMOND-LIKE CARBON FOR USE IN VLSI AND ULSI INTERCONNECT SYSTEMS

Stephen A. Cohen, Wappingers Falls; Daniel C. Edelstein, New Rochelle; Alfred Grill, White Plains; Jurij R. Paraszczak, Pleasantville, and Vishnubhai V. Patel, Yorktown, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 12, 1994, Ser. No. 273,689
Int. Cl.[6] H01L *31/0312*
U.S. Cl. 257—77 **42 Claims**



1. An insulator for spacing apart one or more levels of conductors comprising:

a substrate having an upper surface with exposed first regions of metal imbedded therein;

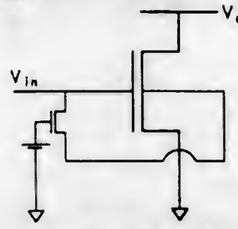
an insulator layer of diamond-like carbon material formed on said surface of said substrate, and

a layer of metal patterned to form a plurality of conductors on said insulator layer.

5,559,368
DYNAMIC THRESHOLD VOLTAGE MOSFET HAVING GATE TO BODY CONNECTION FOR ULTRA-LOW VOLTAGE OPERATION

Chenming Hu, Alamo; Ping K. Ko, Richmond; Fariborz Assaderaghi, Berkeley, all of Calif., and Stephen Parke, Poughkeepsie, N.Y., assignors to The Regents of the University of California, Oakland, Calif.

Filed Aug. 30, 1994, Ser. No. 297,995
Int. Cl.[6] H01L *29/76*
U.S. Cl. 257—369 **2 Claims**



1. A dynamic threshold insulated gate field effect device comprising

a first transistor formed in a first semiconductor body region and having a source, a drain, a channel region between said source and said drain, and a gate contact overlying said channel region,

a second transistor formed in a second semiconductor body region and having a source, a drain, a channel region between said source and said drain, and a gate contact overlying said channel region,

means for interconnecting said drain of said second transistor to said gate of said first transistor,

means for interconnecting said source of said second transistor to said first semiconductor body region,

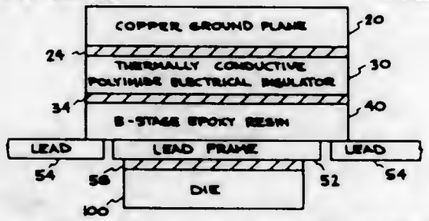
means for interconnecting said source of said first transistor to a reference potential, and

means for biasing said gate contact of said second transistor with an appropriate gate voltage whereby said second transistor applies a forward bias to said first semiconductor body region relative to said source of said first transistor.

5,559,369
GROUND PLANE FOR PLASTIC ENCAPSULATED INTEGRATED CIRCUIT DIE PACKAGES

Robert A. Newman, Santa Clara, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 971,421, Nov. 4, 1992, abandoned, which is a continuation-in-part of Ser. No. 822,330, Jan. 15, 1992, Pat. No. 5,208,188, and Ser. No. 710,416, Jun. 5, 1991, Pat. No. 5,237,205,. This application May 23, 1995, Ser. No. 447,930
Int. Cl.[6] H01L *23/495;23/48*
U.S. Cl. 257—668 **12 Claims**



1. A multilayer ground plane assembly capable of bonding to a lead frame and an integrated circuit die to form a composite assembly which may be encapsulated in plastic to form a plastic encapsulated integrated circuit package comprising:

a) a 1.5 to 20 mil metal ground plane layer;

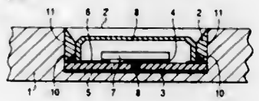
b) a polyamide insulating layer bonded to said metal ground plane layer with a high temperature-resistant adhesive; and

c) a b-stage adhesive layer bonded to an opposite surface of said insulating layer using said high temperature-resistant adhesive to thereby permit said ground plane assembly to be subsequently heated to bond said b-stage adhesive layer to a metal lead frame.

5,559,370
ELECTRONIC LABEL AND CARRIERS THEREFOR

Jean-Claude Berney, Les Charbonnières, Switzerland, assignor to Gay Freres Vente et Exportation S.A., Geneva, Switzerland

Filed Oct. 7, 1994, Ser. No. 319,992
Claims priority, application Switzerland, Oct. 8, 1993, 03032/93
Int. Cl.[6] H01L *23/043*
U.S. Cl. 257—679 **13 Claims**



1. An electronic label comprising the combination of an electrically non-conductive support having an inner surface and an outer surface;

an integrated memory circuit attached to said inner surface of said support, said integrated memory circuit having first and second input/output terminals;

a metal cover attached to said inner surface of said support and forming, with said support, a housing for said integrated memory circuit;

means for electrically connecting said first input/output terminal to said metal cover;

an electrically conductive region on said outer surface of said support; and

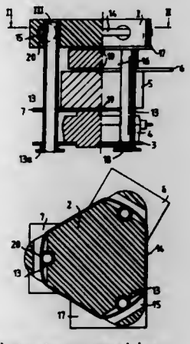
means for electrically connecting said second input/output terminal to said electrically conductive region;

whereby electrical connection can be made to said first input/output terminal by electrical contact with said cover and electrical connection to said second input/output terminal can be made by contact with said electrically conductive region.

5,559,371
ARRANGEMENT FOR PREMOUNTING DISK-SHAPED CELL SEMICONDUCTORS CONTACTABLE BY PRESSURE

Joerg Feldhusen, and Bernd Von Der Heydt, both of Berlin, Germany, assignors to AEG Schienenfahrzeuge GmbH, Berlin, Germany

PCT No. PCT/EP93/01578, § 371 Date Jan. 12, 1995, § 102(e) Date Jan. 12, 1995, PCT Pub. No. WO94/03927, PCT Pub. Date Feb. 17, 1994
PCT Filed Jun. 19, 1993, Ser. No. 367,295
Claims priority, application Germany, Aug. 10, 1992, 42 26 727
Int. Cl.[6] H01L *23/02;23/48;23/34;23/04*
U.S. Cl. 257—686 **13 Claims**



1. A preassembled structure, comprising:

a stacked module including a disc cell semiconductor;

a plurality of insulating pipes each being provided at one end with a flange;

a plurality of spring elements positioned upon the respective flanges;

a common holding plate at a first end of said stacked module for receiving said insulating pipes and being axially and movably guided by said insulating pipes, said holding plate having a lower side supported by the spring elements positioned on the flanges of said insulating pipes;

a common insulator at a second end of said stacked module, said insulating pipes being guided through said common insulator so that said common insulator is axially and movably guided by said insulating pipes; and

frictional lockup means comprising a tightening strap collectively surrounding said insulating pipes at said common insulator for causing a frictional lockup connection between said stacked module and said insulating pipes to axially secure said stacked module, said means cooperating with said spring elements for permitting a limited axial movement of said insulating pipes relative to said common holding plate and said common insulator.

5,559,372
THIN SOLDERED SEMICONDUCTOR PACKAGE

Yong T. Kwon, Seoul, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Choongchungbook-Do, Rep. of Korea

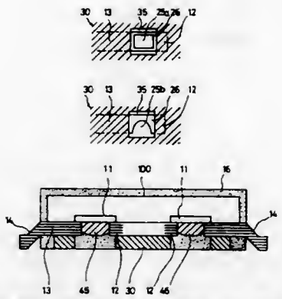
Filed Jan. 10, 1995, Ser. No. 370,903
Claims priority, application Rep. of Korea, Dec. 19, 1994, 94-35092
Int. Cl.[6] H01L *23/48;23/13;29/44*
U.S. Cl. 257—692 **3 Claims**

1. A semiconductor package comprising:

a chip pad placed on a bottom surface of an inner lead extending from a lead frame to opposed sides of said chip pad,

at least one inner lead hole formed in said inner lead; and

a solder resist film bonded to the top surface of said lead frame, said solder resist film having at least one hole communicating



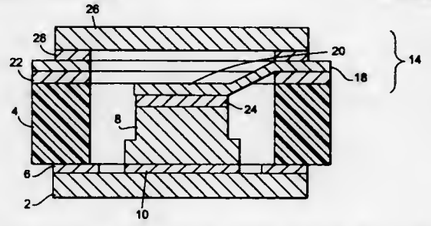
with said inner lead hole; wherein the chip pad is soldered to the lead frame at the inner lead hole,

wherein said inner lead hole is a rectangular hole.

5,559,373
HERMETICALLY SEALED SURFACE MOUNT DIODE PACKAGE

Edward B. Applebaum, La Habra, Calif., assignor to Solid State Devices, Inc., La Mirada, Calif.

Filed Dec. 21, 1994, Ser. No. 360,882
Int. Cl.[6] H01L *23/10;23/48;23/52;29/40*
U.S. Cl. 257—710 **8 Claims**



1. A hermetically sealed surface mount diode package comprising:

a support member of electrically conductive material;

a diode element having two mutually opposed surfaces constituting, respectively, cathode and anode contact surfaces, said element resting on said support member so that one of said surfaces is in contact with said support member;

an electrical contact member for conductively contacting the other one of said surfaces of said diode member, said contact member having a frame portion which surrounds said diode and a connection portion enclosed by said frame portion and conductively connected to said other one of said surfaces;

a frame member of electrical insulating material surrounding said diode and interposed between, and secured to, said support member and said frame portion to form a hermetic seal with said support member and said frame portion; and

a cover plate of electrically conductive material disposed on, secured to, and forming a hermetic seal with, said frame portion,

wherein said support member, said frame portion, said frame member and said cover plate form a hermetically sealed space enclosing said diode.

5,559,374

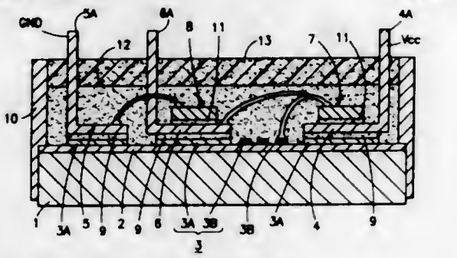
power off sequence being for putting said plurality of power

5,559,378
THREE-POLE ELECTROMAGNETIC ACTUATOR FOR

5,559,374
HYBRID INTEGRATED CIRCUIT

Susumu Obta; Katsumi Ohkawa, and Noriaki Sakamoto, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 25, 1994, Ser. No. 218,604
Claims priority, application Japan, Mar. 25, 1993, 5-066741; Mar. 31, 1993, 5-074215; Mar. 31, 1993, 5-074217
Int. Cl.[6] H01L *23/48;23/34*
U.S. Cl. 257—723 **5 Claims**



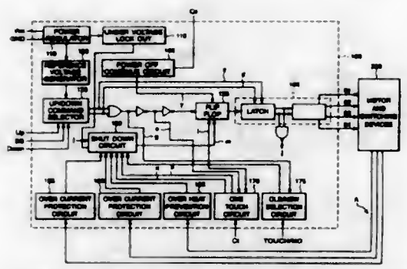
1. A hybrid integrated circuit comprising:
a metallic substrate:
first and second metal plates;
said first metal plate being mounted on said metallic substrate;
said second metal plate shaped substantially as a step and having an upper step portion and a lower step portion;
said lower step portion being mounted on said metallic substrate;
said upper step portion of said second metal plate disposed above a portion of said first metal plate.
said upper step portion having an opening above a part of said portion of said first metal plate;
said upper step portion of said second metal plate having a control pattern thereon;
said first metal plate having means for mounting a switching element;
said switching element being arranged on said part of said portion of said first metal plate below said opening such that a plurality of connections between said switching element and said control pattern are of equal length, through said opening;
means for encasing said metallic substrate, said plurality of switching elements, said first and said second metal plates, and said plurality of connections;
said first and said second metal plates each including an end extending said first and said second metal plates beyond said means for encasing.

5,559,375
POWER WINDOW CONTROL SYSTEM OF AN AUTOMOTIVE VEHICLE

Hyun M. Jo, and Yong H. Kim, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Sep. 15, 1994, Ser. No. 304,213
Claims priority, application Rep. of Korea, Sep. 15, 1993, 93-18577
Int. Cl.[6] H02P *1/22*
U.S. Cl. 307—10.1 **15 Claims**

1. An apparatus for controlling the supply of power from a battery to a window driving motor in response to actuation of a control switch having window up and window down switch positions to initiate raising and lowering of power windows in a vehicle comprising:
a constant voltage generator for generating a substantially constant DC voltage from said battery;
a desired window position signal detector which detects window up and window down switch signals resulting from said

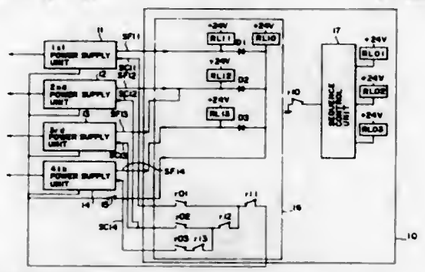


switch positions of said control switch and which outputs only one of said window up and window down switch signals at a time;
a switching control signal generator for controlling said window driving motor according to said one window up and window down switch signal detected by said signal detector, said switching control signal generator including a flip-flop which uses said one window up and window down switch signal as a clock input and outputs a positive output signal indicating said one window up and window down switch signal is different from a previous one window up and window down switch signal;
a one-touch control circuit which inputs said one window up and window down switch signal, said one touch circuit generating a first one touch signal to cause said switching control signal generator to control said window driving motor so that said window fully raises or lowers when said one-touch circuit detects that said one window up and window down switch signal continuously occurs for greater than a predetermined timer and
a shut-down circuit which inputs said first one-touch signal from said one-touch control circuit to initiate one-touch operation.

5,559,376
POWER SUPPLY CONTROL SYSTEM COMPRISING A PLURALITY OF POWER SUPPLY UNITS

Hiroshi Tachikawa, Yamanashi, Japan, assignor to Nec Corporation, Tokyo, Japan

Filed Jan. 29, 1993, Ser. No. 10,805
Claims priority, application Japan, Jan. 29, 1992, 4-038623
Int. Cl.[6] H02J *1/00*
U.S. Cl. 307—86 **6 Claims**

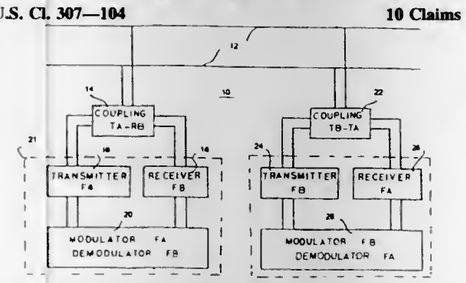


5. A power supply control system comprising:
a plurality of power supply units generating output voltages and producing a plurality of failure signals;
indicating means for selectively indicating one of a power on sequence and a power off sequence of said plurality of power supply units;
sequence control means for carrying out one of said power on sequence and said power off sequence according to said indicating means, said power on sequence being for putting said plurality of power supply units into an on state, said power off sequence being for putting said plurality of power supply units into an off state; and
failure power off sequence means responsive to said plurality of failure signals for executing a failure power off sequence different from said power off sequence, said failure power off sequence including (i) putting failed power supply units of said plurality of power supply units that produce the failure signals into the off state and, simultaneously, putting the power supply units having output voltages which are higher than or equal to that of said failed power supply units into the off state and (ii) subsequently putting the power supply unit having the output voltages which are lower than that of said failed power supply units into the off state.

5,559,377
TRANSFORMER COUPLER FOR COMMUNICATION OVER VARIOUS LINES

Charles Abraham, 1434 Sugartown Rd., Berwyn, Pa. 19312

Continuation-in-part of Ser. No. 822,329, Jan. 17, 1992, abandoned, which is a continuation of Ser. No. 515,578, Apr. 26, 1990, abandoned, which is a continuation-in-part of Ser. No. 429,208, Oct. 30, 1989, abandoned, which is a continuation-in-part of Ser. No. 344,907, Apr. 28, 1989, abandoned. This application Jul. 1, 1994, Ser. No. 270,002
Int. Cl.[6] H01F *27/42*
U.S. Cl. 307—104 **10 Claims**

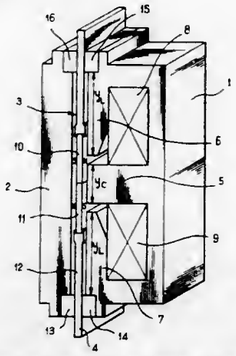


1. A communications apparatus for communicating electrical signals through an electrical line having a characteristic impedance comprising:
modulator means for modulating the electrical signals to produce a modulated carrier signal having a first preselected frequency;
transmitter means having an output impedance, connected to said modulator means for transmitting the modulated carrier signal;
first coupler means connected between the electrical line and the transmitter means for matching the output impedance of said transmitter means to the characteristic impedance of the electrical line,
said first coupler means comprising linear phase means for communicating the modulated carrier signal to the electrical line without phase distortion and capacitor means for resonating with the linear phase means at the first preselected frequency.

5,559,378
THREE-POLE ELECTROMAGNETIC ACTUATOR FOR PNEUMATIC DISTRIBUTING DEVICES

Claude Oudet, Besancon, and Pierre Gandel, Montancon, both of France, assignors to Moving Magnet Technologies, S.A., Besancon, France

PCT No. PCT/FR92/00940, § 371 Date Jun. 30, 1994, § 102(e) Date Jun. 30, 1994, PCT Pub. No. WO93/07673, PCT Pub. Date Apr. 15, 1993
PCT Filed Oct. 9, 1992, Ser. No. 211,426
Claims priority, application France, Oct. 11, 1991, 91 12587
Int. Cl.[6] H02K *33/12*
U.S. Cl. 310—17 **11 Claims**



1. An electromagnetic actuator generating a force resulting from a substantially constant current applied over an entire functional course of travel and producing a reduced force in an absence of the constant current, comprising:
a stator structure made of a soft magnetic material and including first and second stator components, the first stator component incorporating a central pole having a length Y_C and two lateral poles each having a length Y_L, said first and second stator components delimiting an air gap;
a mobile device positioned inside said first and second stator components and comprising two pairs of poles having a length Y_R formed by adjacent thin permanent magnets, transversely magnetized;
wherein said length Y_C of said central pole is greater than or equal to a course of travel Y of the mobile device, increased by a length substantially equal to a length of said air gap, the length Y_L of said lateral poles being determined by a volume filled by an electric trip coil as a function of a force generated by an applied electric power and of a thickness Z of said coil, said thickness Z being measured along an axis perpendicular to a plane of said thin permanent magnets, the length Y_L of said lateral poles being greater than the length Y_C of said central pole, and wherein said thickness Z of said coil is less than, or equal to, its length.

5,559,379
INDUCTION AIR DRIVEN ALTERNATOR AND METHOD FOR CONVERTING INTAKE AIR INTO CURRENT

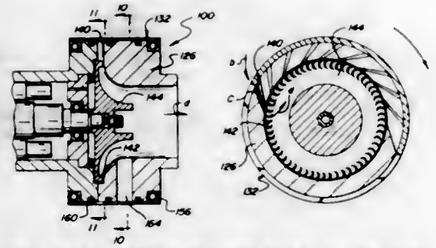
Mark G. Voss, Brighton, Mich., assignor to Nartron Corporation, Reed City, Mich.

Continuation-in-part of Ser. No. 12,942, Feb. 3, 1993, abandoned. This application Oct. 14, 1993, Ser. No. 136,666
Int. Cl.[6] H02K *9/00*
U.S. Cl. 310—63 **24 Claims**

1. In combination with a port fuel injected internal combustion engine having an intake manifold for receiving and conducting combustion air to the engine, an induction intake air driven alternator assembly comprising: a turbine assembly and an electrical current generating assembly mounted on the intake manifold and being interposed in the flow of combustion air, the turbine assembly including a partial admission variable area nozzle member

5,559,383
MOTOR BEARING WITH RESILIENT GUIDE

Russell D. Ide, 122 Ridge Dr., Exeter, R.I. 02822



having a series of adjacent individual nozzles arranged in an arc and regulator means adjustable to sequentially close completely one or more of said individual nozzles to define in part a variable inlet air intake; said alternator assembly defining an engine power control; said assembly also being operable for converting the change in kinetic energy of the combustion air moving therethrough into electrical energy.

5,559,380

AIR-COOLED MOTOR

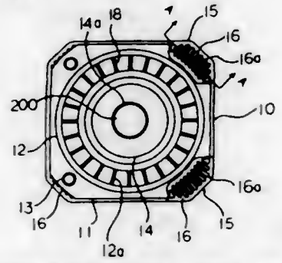
Kosei Nakamura; Yukio Katsuzawa, and Yoshinobu Maeda, all of Yamanashi, Japan, assignors to Fanuc Ltd., Japan

Filed Dec. 12, 1994, Ser. No. 355,333

Claims priority, application Japan, Dec. 20, 1993, 5-319965

Int. Cl.[6] H02K *1/32*

U.S. Cl. 310—64 **3 Claims**



1. An air-cooled motor comprising: a stator, a front housing and a rear housing provided on opposite sides of said stator, said stator, said front housing and said rear housing constructed in one piece, cooling-air passages formed in said front housing, said stator and said rear housing and extending therethrough, and each of said cooling-air passages formed by a plurality of small ventilation passages each having end faces on cooling-air inlet sides thereof which are aligned with each other.

5,559,381

FLYWHEEL SUPPORT SYSTEM FOR MOBILE ENERGY STORAGE

Robert W. Bosley, Cerritos, and Harold A. Rosen, Santa Monica, both of Calif., assignors to Rosen Motors, L.P., Tarzana, Calif.

Filed Nov. 8, 1993, Ser. No. 148,361

Int. Cl.[6] H02K *7/02; 7/09*

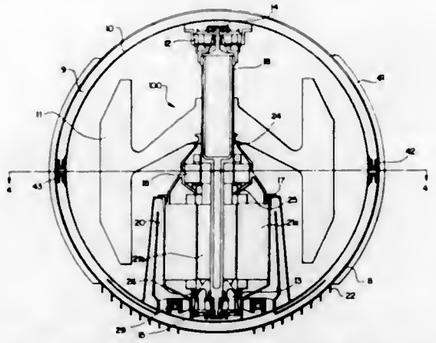
U.S. Cl. 310—34 **20 Claims**

1. A flywheel support system for a flywheel-motor-generator assembly providing mobile energy storage, said support system including a liquid suspension system comprising:

an outer housing;

a vacuum housing disposed within said outer housing, wherein said vacuum housing and said outer housing define a cavity;

a radiator operatively attached to said outer housing; and



a pump disposed within said cavity for circulating a liquid in a predetermined portion of said cavity so as to transfer waste heat to said radiator.

5,559,382

SPINDLE MOTOR

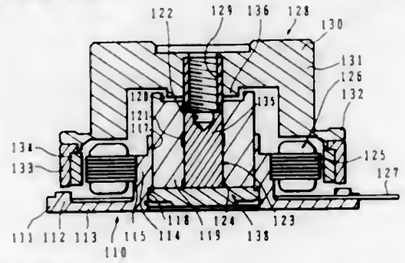
Yoshito Oku, Osaka; Shozo Ibara; Shigeharu Sumi, both of Kyoto, and Hiromasa Fujii, Kyoto, all of Japan, assignors to Nidec Corporation, Kyoto, Japan

Filed Sep. 30, 1993, Ser. No. 129,658

Claims priority, application Japan, Oct. 1, 1992, 4-289471; Dec. 4, 1992, 4-350887; Dec. 17, 1992, 4-337174; Dec. 17, 1992, 4-355106

Int. Cl.[6] F16C *32/06;* **H02H** *7/00; 7/08*

U.S. Cl. 310—90 **15 Claims**



1. A spindle motor comprising:

a stator having a stator coil for generating a magnetic field during excitation of said stator coil;

a rotor having rotor magnets for receiving rotational force in cooperation with said magnetic field generated by said stator coil;

a first dynamic pressure bearing formed at an area where said stator and said rotor face each other, said area being filled with a lubricating material, and said first dynamic pressure bearing having at least one groove of a predetermined shape; and

rotation direction controlling means for controlling said rotor to rotate in such direction that said lubricating material is pushed radially solely outwardly from the axis of said rotor by rotation of said groove of said first dynamic pressure bearing.

5,559,383

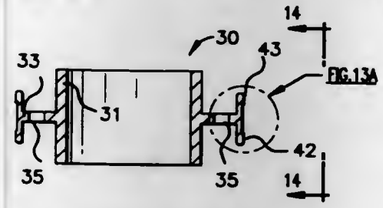
MOTOR BEARING WITH RESILIENT GUIDE

Russell D. Ide, 122 Ridge Dr., Exeter, R.I. 02822

Continuation of Ser. No. 286,639, Mar. 7, 1994, Pat. No. 5,436,515, which is a continuation-in-part of Ser. No. 118,195, Sep. 9, 1993, Pat. No. 5,321,328, which is a continuation-in-part of Ser. No. 991,461, Dec. 16, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 483,705

Int. Cl.[6] H02K *7/08; 5/12*

U.S. Cl. 310—90 **17 Claims**



1. An elongated electric motor comprising:

a tubular housing;

a stator mounted in said housing;

a shaft rotatably mounted within said stator;

a rotor composed of spaced apart rotor sections mounted on said shaft;

a plurality of spaced bearing assemblies, located between adjacent rotor sections for supporting the shaft, each of the bearing assemblies comprising: a sleeve portion for supporting the shaft, the sleeve portion having spaced longitudinal ends; a support portion extending from the sleeve portion, at a location spaced from the spaced longitudinal ends of the sleeve portion, radially outward from the sleeve portion toward the stator, the support portion having an outer periphery, the support portion having a radial dimension measured from the sleeve portion to the outer periphery and the support being substantially inflexible in the radial direction between the sleeve portion and the outer periphery, and resilient elements provided at the outer periphery of the support portion and extending radially outward of the outer periphery by a distance that is less than the radial dimension of the support portion such that the outer periphery of the bearing assembly is defined by the resilient elements so that the outer periphery of the bearing assembly may be moved radially inward without inward delection of the support portion.

5,559,384

CONTROLLED LEVITATION/SUSPENSION IN A MAGNET-SUPERCONDUCTOR SYSTEM

John J. Boland, Stormville; Derek B. Dove, Mt. Kisco, and Takeshi Takamori, Mahopac, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 919,702, Jul. 24, 1992, abandoned, which is a continuation of Ser. No. 451,915, Dec. 15, 1989, abandoned, which is a continuation-in-part of Ser. No. 370,487, Jun. 23, 1989, abandoned. This application Mar. 29, 1993, Ser. No. 41,275

Int. Cl.[6] H02K *7/09*

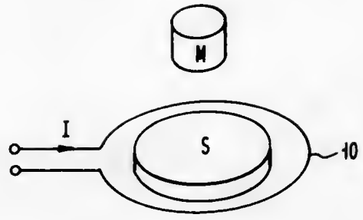
U.S. Cl. 310—90.5 **38 Claims**

1. A device including:

a type II superconductor,

a magnet,

a conductor through which an electrical current can flow to produce a magnetic field intercepting said superconductor to alter the flux penetration properties of said superconductor, said magnet being capable of suspension or levitation with respect to said superconductor, the levitation or suspension distance being continuously adjustable over a range depending on the magnitude of electrical current through said conductor.



5,559,385

STATOR OF AC ELECTRIC MACHINE

Nikolai V. Yalovega; Sergei N. Yalovega, and Konstantin A. Belanov, all of Moscow, Russian Federation, assignors to Maloe Naochno-Vnedrencheskoe Predpriyatie "KOPEN", Moscow, Russian Federation

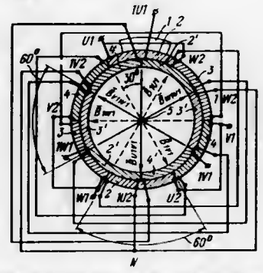
PCT No. PCT/RU93/00145, § 371 Date Dec. 9, 1994, § 102(e) Date Dec. 9, 1994, PCT Pub. No. WO94/24757, PCT Pub. Date Oct. 27, 1994

PCT Filed Jun. 29, 1993, Ser. No. 351,463

Claims priority, application Russian Federation, Apr. 14, 1993, 93019472; Apr. 14, 1993, 93019473; Apr. 14, 1993, 93019474; Apr. 14, 1993, 93019495; Apr. 14, 1993, 93019814; Apr. 14, 1993, 93019815; Apr. 14, 1993, 93019817; Apr. 14, 1993, 93019818

Int. Cl.[6] H02K *3/28*

U.S. Cl. 310—198 **4 Claims**



1. A stator of an ac electric machine electrically coupled to an external circuit comprising:

a cylindrical magnetic circuit having a circumference and a plurality of slots spaced apart equidistantly along the circumference;

a delta-connected three-phase winding comprising three coil groups arranged symmetrically along the circumference and disposed within a first group of slots of said magnetic circuit to occupy a set phase zone and generate magnetic fields when a current passes therethrough, said magnetic fields being represented by magnetic induction vectors $\bar{B}U1V1$, $\bar{B}$ V1W1, and $\bar{B}W1U1$; and

a star-connected three-phase winding comprising three coil groups arranged symmetrically along the circumference and disposed within a second group of slots of said magnetic circuit, distinct from said first group of slots, to occupy a set phase zone and generate magnetic fields being represented by magnetic induction vectors $\bar{B}1U1$, $\bar{B}1V1$, and $\bar{B}1W1$, said delta-connected and star-connected three-phase windings having power ratings close to each other;

each three-phase winding having three leads adapted for connection to the external circuit, coil groups from each three-phase winding of like phases overlap one another in a cross section of the stator and are displaced 30 electrical degrees from each other, wherein temporal and geometric orthogonality occurs between pairs of magnetic induction vectors $\bar{B}U1V1$-$\bar{B}1W1$; $\bar{B}W1U1$-$\bar{B}1V1$; $\bar{B}V1W1$-$\bar{B}1U1$ generated by currents passing

along coil groups of one phase of said delta-connected wind-

set of said turns and said second half lengths face one another in a

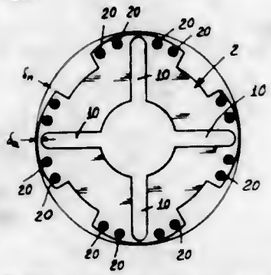
along coil groups of one phase of said delta-connected winding and coil groups of a next phase of said star-connected winding.

5,559,386

HIGH EFFICIENCY SALIENT POLE RELUCTANCE SYNCHRONOUS MOTOR

Giorgio Gurrieri, Ragusa, Italy, assignor to Giovani Torti, Milan, Italy

Filed Oct. 18, 1994, Ser. No. 324,745
Claims priority, application Italy, Oct. 21, 1993, RG93A0007
Int. Cl.[6] H02K *17/16*
U.S. Cl. 310—211 **8 Claims**



1. A high efficiency salient pole reluctance synchronous motor, comprising a rotor and at least two poles, each pole having a central region with a gap which is substantially constant and two side regions in which said gap quickly increases, so that said gap δm, measured in said central region, and said gap δM measured on pole horns of said motors meet a relationshi

$$\frac{\delta M}{\delta m} \geq 6,$$

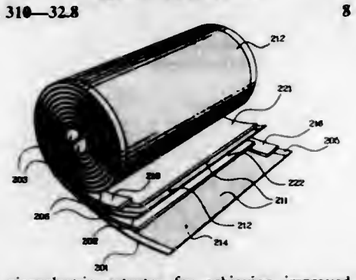
in said rotor there being moreover provided a cage secondary assembly which is shorted by front rings, and wherein in each said pole is formed a flux barring slot which extends substantially diametrically through said pole.

5,559,387

PIEZOELECTRIC ACTUATORS

Henry R. Beurrier, 817 Old Chester Rd., Far Hills, N.J. 07931

Continuation-in-part of Ser. No. 242,618, May 13, 1994, Pat. No. 5,440,1945. This application Jul. 20, 1995, Ser. No. 504,522
Int. Cl.[6] H01L *41/08*
U.S. Cl. 310—32.8 **8 Claims**



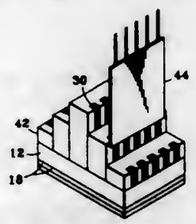
1. A piezoelectric actuator for achieving improved overall motion comprising a length of piezoelectric material fixed at a central axis in a manner to define first and second half lengths to first and second sides thereof respectively, said material being coiled in increasing circles about said central axis for defining turns thereof, said first and second half lengths being oppositely poled such that first half lengths face one another in a first alternate set of said turns and said second half lengths face one another in a second set of turns between said first set of alternate turns, said central axis being perpendicular to the plane of said concentric circles, said turns of piezoelectric material being maintained in fixed spatial relationship one to the other by means of adhesive material bonded only to alternate turn edges where like-poled first half lengths face one another and where like-poled second half lengths face one another, and means for applying electric field signals to alternate turns of said piezoelectric material to stimulate one alternate set of half lengths to contract and the second set of half lengths to elongate.

5,559,388

HIGH DENSITY INTERCONNECT FOR AN ULTRASONIC PHASED ARRAY AND METHOD FOR MAKING

Peter W. Lorraine, and Lowell S. Smith, both of Niskayuna, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 3, 1995, Ser. No. 398,336
Int. Cl.[6] H01L *41/04;* **H03H** *9/00*
U.S. Cl. 310—334 **3 Claims**



1. A high density interconnect for an ultrasonic phased array having an array of piezoelectric elements and a plurality of matching layers coupled to the piezoelectric elements at one end, the high density interconnect comprising:

a backfill material formed from a plurality of sections of backfill material of varying lengths coupled to each other, wherein each section of backfill material is staggered into a different height and coupled to each other, each section of backfill material having a plurality of grooves therein, each of the plurality of grooves separated a predetermined distance from each other and having a predetermined groove depth; each of the plurality of grooves containing a metallized conducting material therein, the sectioned backfill material attached to the piezoelectric elements of the ultrasonic phased array at an end opposite of the plurality of matching layers.

5,559,389

ELECTRON-EMITTING DEVICES HAVING VARIOUSLY CONSTITUTED ELECTRON-EMISSIVE ELEMENTS, INCLUDING CONES OR PEDESTALS

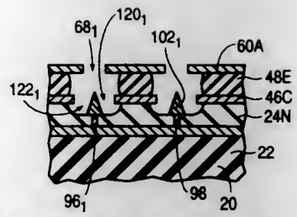
Christopher J. Spindt, Menlo Park, and John M. Macaulay, Palo Alto, both of Calif., assignors to Silicon Video Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 118,490, Sep. 8, 1993, Pat. No. 5,462,467. This application Nov. 24, 1993, Ser. No. 158,102
Int. Cl.[6] H01J *1/30*
U.S. Cl. 313—310 **32 Claims**

25. An electron-emitting structure comprising:

a lower electrically conductive region which comprises (a) a highly conductive part and (b) a highly resistive part situated over the highly conductive part; and

a multiplicity of laterally separated electron-emissive elements situated on the highly resistive part above the highly conductive part, each electron-emissive element comprising (a) an electrically conductive pedestal situated over the highly resistive part and (b) an electron-emissive portion situated over the pedestal, the electron-emissive portion being generally in the shape of a cone that points away from the highly resistive part, the diameter of the cone at its base being greater than the maximum diameter of the pedestal.

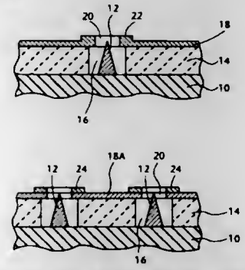


5,559,390

FIELD EMISSION COLD CATHODE ELEMENT WITH LOCALLY THICKENED GATE ELECTRODE LAYER

Hideo Makishima; Keizo Yamada, and Hironori Imura, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 12, 1994, Ser. No. 225,976
Claims priority, application Japan, Apr. 13, 1993, 5-085825
Int. Cl.[6] H01J *1/46*
U.S. Cl. 313—308 **12 Claims**



3. A field emission cold cathode element, comprising:

a substrate having a conducting surface;

at least one emitter electrode which stands on said surface of the substrate and has a sharp-pointed tip;

a dielectric layer which is formed on said surface of the substrate and, for each emitter electrode, is formed with a hole such that the emitter electrode stands in the hole;

a gate electrode layer which is formed on the dielectric layer and for each emitter electrode, is formed with an aperture which is right above and contiguous to the hole in the dielectric layer; and

a supplementary gate electrode layer which is formed on said gate electrode layer only in a limited region surrounding said aperture for each emitter electrode.

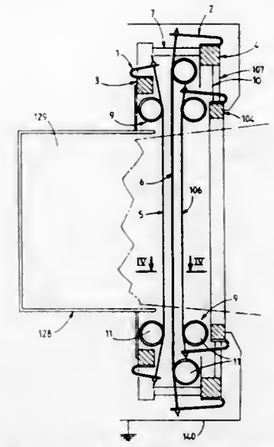
5,559,391

THREE-GRID ION-OPTICAL SYSTEM

Dominique Valentian, Rosny, France, assignor to Societe Europeenne de Propulsion, Suresnes, France

Filed Feb. 21, 1995, Ser. No. 391,503
Claims priority, application France, Feb. 24, 1994, 94 02108
Int. Cl.[6] H01J *23/18*
U.S. Cl. 313—360.1 **11 Claims**

1. An ion-optical system for a gas-discharge ion source, the system comprising a screen grid and an accelerator grid constituted by respective frames and respective sets of wires held parallel by supports and fixed to the frames by means of springs, the frames and the grids being assembled together by means of insulators to which they are fixed, the system further comprising a decelerator grid constituted by a frame and a set of wires, the frame of the decelerator grid being engaged in the frame of the accelerator grid and being separated therefrom by insulators.

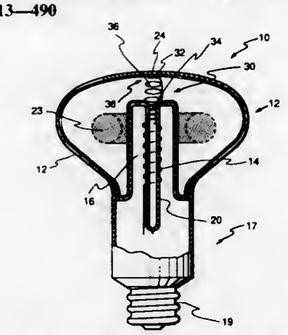


5,559,392

APPARATUS FOR SECURING AN AMALGAM AT THE APEX OF AN ELECTRODELESS FLUORESCENT LAMP

John P. Cocoma, Clifton Park; Joseph C. Boroweic, and Ronald H. Wilson, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 13, 1994, Ser. No. 258,879
Int. Cl.[6] H01J *61/28;* **H05B** *41/00*
U.S. Cl. 313—490 **3 Claims**



1. A solenoidal electric field (SEF) fluorescent discharge lamp, comprising:

a light-transmissive bulb containing an ionizable, gaseous fill for sustaining an arc discharge when subjected to a radio frequency magnetic field and for emitting ultraviolet radiation as a result thereof, said bulb having an interior phosphor coating for emitting visible radiation when excited by said ultraviolet radiation, said bulb having an apex portion, said bulb further having a re-entrant cavity therein;

an excitation coil contained within said re-entrant cavity for providing said radio frequency magnetic field when excited by a radio frequency power supply;

an exhaust tube extending through said re-entrant cavity;

an amalgam support for supporting an amalgam within said bulb, said amalgam support comprising a spiral wire having a first portion fitted within said exhaust tube and a second portion extending within said bulb, said second portion having an end thereof for holding said amalgam in thermal contact with said apex portion of said bulb during lamp

operation, said second portion of said spiral wire having a larger diameter than said first portion.

5,559,393

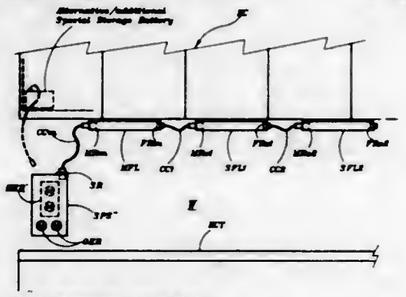
UNDER-THE-CABINET LIGHTING SYSTEM

Ole K. Nilssen, 408 Caesar Dr., Barrington, Ill. 60010

Continuation of Ser. No. 220,520, Mar. 31, 1994, Pat. No. 5,426,347, which is a continuation-in-part of Ser. No. 47,944, Apr. 16, 1993, abandoned, which is a continuation-in-part of Ser. No. 955,229, Oct. 1, 1992, which is a continuation-in-part of Ser. No. 607,271, Oct. 31, 1990, which is a continuation-in-part of Ser. No. 787,692, Oct. 15, 1985, which is a continuation of Ser. No. 644,155, Aug. 27, 1984, which is a continuation of Ser. No. 555,426, Nov. 23, 1983, which is a continuation of Ser. No. 178,107, Aug. 14, 1980, said Ser. No. 220,520is a continuation-in-part of Ser. No. 62,329, May 17, 1993, which is a continuation of Ser. No. 708,049, May 8, 1991, which is a continuation of Ser. No. 489,096, Apr. 27, 1983, which is a continuation-in-part of Ser. No. 178,107, Aug. 14, 1980. This application Jun. 2, 1995, Ser. No. 459,732

Int. Cl.[6] H01J *7/44*

U.S. Cl. 315—58 **18 Claims**



1. An arrangement comprising:

a cabinet mounted on a wall or the like; the cabinet having a lower substantially horizontal surface;

a gas discharge lamp mounted on the horizontal surface; the gas discharge lamp having (i) a glass envelope having a first and a second end, (ii) a pair of lamp electrodes, one located near each of said ends, and (iii) a longitudinal axis disposed parallel to the horizontal surface; the gas discharge lamp being further characterized by being adjusted to receive electric power at its first end and to supply at least a part of the electric power so received from its second end; and

a power supply powered from the power line voltage of an ordinary electric utility power line and having pair of conductors across which is provided a high-frequency AC voltage; the frequency of the high-frequency AC voltage being substantially higher than that of the power line voltage; the conductors being connected with the lamp electrodes and operative to cause an alternating current to flow therebetween; the alternating current being of frequency equal to that of the high-frequency AC voltage.

5,559,394

MOS GATE DRIVER FOR BALLAST CIRCUITS

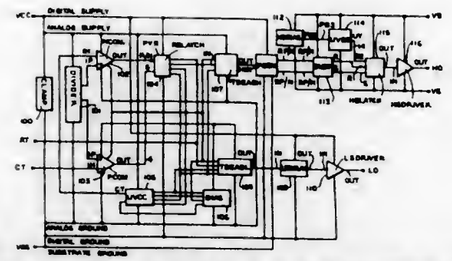
Peter N. Wood, Rolling Hills Est., Calif., assignor to International Rectifier Corporation, El Segundo, Calif.

Continuation of Ser. No. 206,123, Mar. 4, 1994. This application Aug. 11, 1995, Ser. No. 513,688

Int. Cl.[6] H05B *37/02*

U.S. Cl. 315—224 **18 Claims**

1. An integrated circuit formed in a silicon substrate for driving first and second MOS gated power devices which are connected in a half bridge circuit which has first and second d-c terminals and a common terminal at the node between said first and second MOS gated power devices; a pair of synchronizing diodes connected in back-to-back relation with one another and in series with said half bridge circuit; said integrated circuit including timer circuit means having an input control terminal C_T, coupling means coupling said control terminal C_T to said pair of synchronizing diodes to sense the zero crossing of the current at said node, latch circuit means coupled to said timer circuit means for controlling the frequency at which said first and second MOS devices are switched on and off and having an output which is switched in response to a predetermined signal applied to said input control terminal; a high side dead time delay circuit and a low side dead time delay circuit each coupled to said latch circuit means for delaying the transmission of a latch output signal for a predetermined time delay following the switching of the output of said latch circuit means; a high side level shifting means and a high side driver circuit means and a low side driver circuit means; said high side driver circuit means, and said low side driver means coupled to said high side dead time circuit and said low side dead time circuit respectively and having high side and low side output pins respectively which produce outputs for turning on and off said first and second MOS gated power devices in response to control signals at said input control terminal C_T; said dead time delay circuits preventing the simultaneous conduction of said first and second MOS gated power devices.



5,559,395

ELECTRONIC BALLAST WITH INTERFACE CIRCUITRY FOR PHASE ANGLE DIMMING CONTROL

Sreeraman Venkitasubrahmanian, Torrance, Calif.; Thomas Farkas, South Euclid, Ohio; Raj Jayaraman, Rancho Palos Verdes, and Yongping Xia, Torrance, both of Calif., assignors to Philips Electronics North America Corporation, New York, N.Y.

Filed Mar. 31, 1995, Ser. No. 414,859

Int. Cl.[6] H05B *37/02*

U.S. Cl. 315—247 **28 Claims**

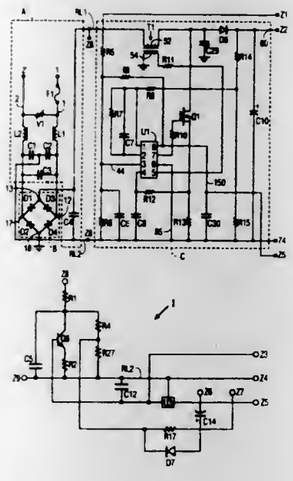
1. A gas discharge lamp ballast for use with a phase angle dimmer, said ballast comprising:

a pair of mains input terminals for receiving a phase angle controlled AC mains voltage;

ballasting means for providing electrical power to a gas discharge lamp, said ballasting means including (i) a DC input at which a substantially constant DC voltage is received, (ii) a dim input separate from said DC input for receiving a dimming signal and (iii) first control means for controlling the electrical power supplied to the gas discharge lamp at a level corresponding to a characteristic of the dimming signal;

power supply means connected to said mains input terminals for supplying the substantially constant DC voltage to said DC input of said ballasting means; and

dim signal deriving means for deriving the dimming signal from the phase angle controlled AC mains voltage and for supplying the dimming signal to said dim input of said ballasting means, said dimming signal being independent of the DC voltage provided by said power supply means at said DC input of said ballasting means.



5,559,396

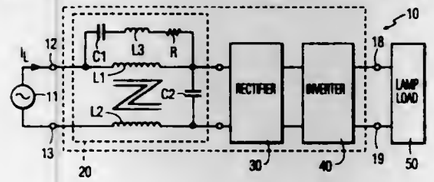
BALLAST FILTERING SCHEME FOR REDUCED HARMONIC DISTORTION

Gert W. Bruning, No. Tarrytown, N.Y., and Pawel M. Gradzki, Milford, Conn., assignors to Philips Electronics North America Inc., New York, N.Y.

Filed Oct. 14, 1994, Ser. No. 323,289

Int. Cl.[6] H02M *1/12*

U.S. Cl. 315—291 **16 Claims**



1. A ballast having an input for receiving from a utility power line, under nominally rated ballast load conditions, an alternating current having a peak amplitude and characterized by a ballast input equivalent impedance Z_{IN} as measured across the ballast input and further comprising a filter characterized by an equivalent impedance Z_{eq}, coupled to the ballast input and including a filter output, an inductor having a core and a capacitor coupled to the output of the filter and at least a portion of the inductor, the core being substantially characterized by a B-H curve having a substantially linear region and a substantially non-linear region with a substantially uniform flux density existing throughout the core when in the non-linear region of its B-H curve, wherein, under nominally rated ballast load conditions, the core operates within the non-linear region of its B-H curve when at least at the peak amplitude of the alternating current and the relationship between the equivalent impedance Z_{eq} and input impedance Z_{IN} is as follows: $0.5 \leq Z_{eq}/Z_{IN} \leq 1.5$.

5,559,397

COLOR FILTER AND FLUORESCENT DISPLAY DEVICE HAVING COLOR FILTERS INCORPORATED THEREIN

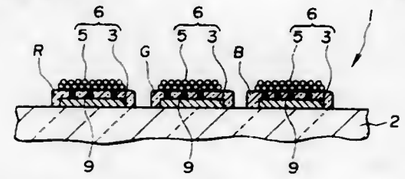
Yoshihisa Tsuruoka; Haruhisa Hirakawa; Yoshinari Okamoto, and Eiji Sato, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Division of Ser. No. 273,757, Jul. 12, 1994. This application Apr. 21, 1995, Ser. No. 426,406

Claims priority, application Japan, Jul. 12, 1993, 5-171708; Jul. 12, 1993, 5-171709

Int. Cl.[6] H01J *1/62*

U.S. Cl. 313—496 **7 Claims**



1. A fluorescent display comprising:

an envelope;

an insulating anode substrate constituting a part of said envelope;

light-permeable anode conductors formed on an inner surface of said anode substrate;

color filters made of a mixture of an insulating in organic pigment and a conductive material and formed on at least an upper surface of each of said anode conductors; and

phosphor layers each formed on an upper surface of each of said color filters.

5,559,398

CATHODE RAY TUBE AND METHOD OF MAKING THE SAME

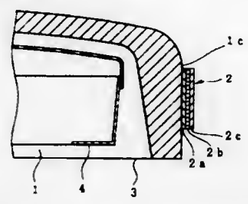
Syunichi Asakura; Hiroyuki Minagawa, both of Mobara, and Koji Sugimoto, Sakura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 982,975, Nov. 30, 1992, abandoned. This application Jun. 5, 1995, Ser. No. 461,518

Claims priority, application Japan, Nov. 28, 1991, 3-338016

Int. Cl.[6] H01J *31/00*

U.S. Cl. 313—477 R **8 Claims**



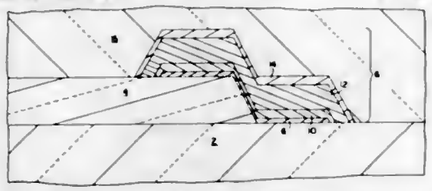
1. A cathode ray tube having a glass panel and an optically machine-readable marking on a sidewall of said glass panel, said machine-readable marking comprising an undercoating layer of heat-resistant and acid-resistant paint, a mark printed on said undercoating layer with heat-resistant ink, and a transparent heat-resistant and acid-resistant overcoating layer covering said mark.

5,559,399

LOW RESISTANCE, THERMALLY STABLE ELECTRODE STRUCTURE FOR ELECTROLUMINESCENT DISPLAYS

William J. Tanski, Glastonbury; Roger Carroll, Willimantic, and Emilio J. Branciforte, Cromwell, all of Conn., assignors to Norden Systems, Inc., Norwalk, Conn.

Filed Jun. 11, 1992, Ser. No. 897,201
Int. Cl.[6] H01J *1/62*
U.S. Cl. 313—506 **27 Claims**



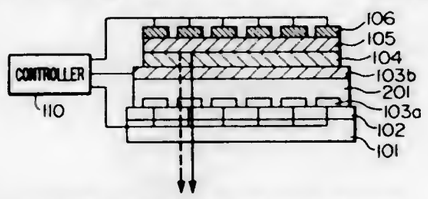
1. An electroluminescent display, comprising:
a glass substrate;
a plurality of transparent electrodes deposited on said glass substrate, each of said transparent electrodes having a metal assist structure formed on and in electrical contact over a portion of said transparent electrode and also partially formed on a portion of said glass substrate, wherein said metal assist structure comprises a first refractory metal layer, a primary conductor layer formed on said first refractory metal layer, and a second refractory metal layer formed on said primary conductor layer;
a first dielectric layer deposited on said plurality of transparent electrodes and exposed portions of said glass substrate;
a layer of phosphor material deposited on said first dielectric layer;
a second dielectric layer deposited on said layer of phosphor material; and
a plurality of electrodes deposited on said second dielectric layer.

5,559,400

VARIABLE WAVELENGTH LUMINESCENT DEVICE AND CONTROL METHOD THEREFOR

Takahiro Nakayama, Hitachi, and Atsushi Kakuta, Hitachiota, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 9, 1994, Ser. No. 338,151
Claims priority, application Japan, Nov. 15, 1993, 5-284758
Int. Cl.[6] H01J *1/70*
U.S. Cl. 313—506 **19 Claims**



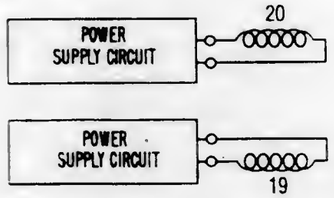
1. A variable wavelength luminescent device comprising:
an active layer;
two light reflective layers provided on upper and lower sides of said active layer;
signal application means for applying an input signal; and
optical length control means for varying an optical length between said two light reflective layers in accordance with the input signal of said signal application means,
wherein light of said active layer is resonated by said two light reflective layers and emission spectrum of output light is controlled by said input signal.

5,559,401

COLOUR DISPLAY DEVICE COMPRISING A COLOR DISPLAY TUBE AND A DELAYING DEMAGNETIZING DEVICE

Hendrik J. De Wit, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 4, 1995, Ser. No. 539,143
Claims priority, application European Pat. Off., Oct. 21, 1994, 94203072
Int. Cl.[6] H01J *29/06*
U.S. Cl. 315—8 **4 Claims**



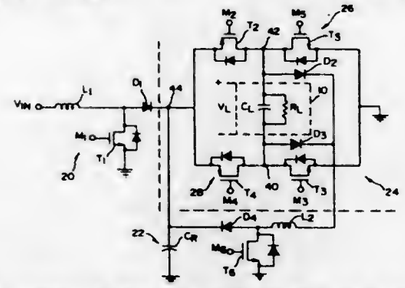
1. A color display device comprising a color display tube with a rear portion having a cylindrical neck which accommodates a device for generating a plurality of electron beams, and a front portion having a truncated cone whose widest part is present at the front side, and an apertured color selection electrode manufactured of a ferromagnetic material, and a display screen with phosphor elements, the display device being further provided with a screen of a ferromagnetic material extending substantially parallel to the surface of the truncated cone, and a demagnetizing device having a first and a second demagnetizing coil which extend along the outer circumference of the cone surface, characterized in that the demagnetizing device is provided with means for energizing the first demagnetizing coil in a first step and the second demagnetizing coil in a second step, which first and second step are shifted in time with respect to each other, the location of the turns of the demagnetizing coils being such that upon the passage of current through only the one coil, the magnetic field generated by said one coil is capable of demagnetizing those parts of said color selection electrode and screen which are not demagnetized upon the passage of current through only the other coil, and conversely.

5,559,402

POWER CIRCUIT WITH ENERGY RECOVERY FOR DRIVING AN ELECTROLUMINESCENT DEVICE

George H. Corrigan, III, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 24, 1994, Ser. No. 296,194
Int. Cl.[6] G09G *3/30*; **H05B** *37/00*
U.S. Cl. 315—169.3 **12 Claims**



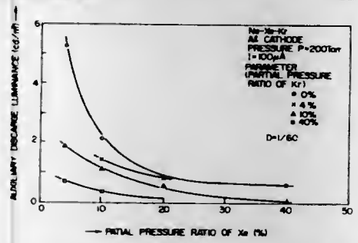
8. A method of charging and discharging an EL device during a power cycle, comprising the steps of:
charging the EL device by transferring a sequence of discrete energy portions from a power source to the EL device during a power cycle charging phase to incrementally accumulate a high energy potential across the EL device; and
discharging the EL device by transferring a sequence of discrete discharge energy portions from the EL device and accumulating discrete discharge energy portions discharged from the EL device at a capacitor during a power cycle discharging phase to incrementally recover energy from the EL device; and
wherein the step of charging further comprises discharging the capacitor into the EL device during the power cycle charging phase.

5,559,403

DC TYPE GAS-DISCHARGE DISPLAY PANEL AND GAS-DISCHARGE DISPLAY APPARATUS WITH EMPLOYMENT OF THE SAME

Tetsuo Sakai; Yasushi Motoyama, and Mizumoto Ushirozawa, all of Tokyo, Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan

Continuation of Ser. No. 913,903, Jul. 16, 1992, abandoned. This application Apr. 6, 1995, Ser. No. 418,155
Claims priority, application Japan, Jul. 18, 1991, 3-202135; Nov. 18, 1991, 3-301832; Nov. 21, 1991, 3-306247
Int. Cl.[6] G09G *3/10*
U.S. Cl. 315—169.4 **12 Claims**



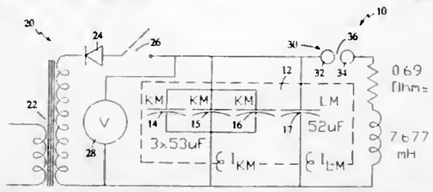
1. A DC (direct current) type gas-discharge display panel comprising:
a plurality of discharge cells;
a discharge current limiting means provided for each of the discharge cells, for limiting a discharge current of each of said discharge cells; and
a filling gas filled into each of said discharge cells, and consisting essentially of a noble gas mixture;
wherein a partial pressure ratio of said noble gas mixture to total pressure of said filling gas is at least 0.95;
said noble gas mixture is selected from the group consisting of (1) a first gas mixture consisting of a He gas and a Xe gas, (2), a second gas mixture consisting of a He gas, a Xe gas, and a Kr gas, (3) a third gas mixture consisting of a Ne gas and a Xe gas, and (4) a fourth gas mixture consisting of a Ne gas, a Xe gas and a Kr gas;
assuming now that the total pressure of said filling gas is "p" Torr, a partial pressure ratio of said Xe gas to the total pressure of said filling gas is "x", and also a partial pressure ratio of said Kr gas to the total pressure of said filling gas is "k";
when said noble gas mixture corresponds to said first gas mixture, a condition of $0.01 \leqq x \leqq 0.5$, a condition of $p \leqq 600$, and another condition of $xp^5 \geqq 1.4 \cdot 10^{11}$ are satisfied;
when said noble gas mixture corresponds to said second gas mixture, a condition of $0.01 \leqq x \leqq 0.5$, a condition of $0 < k \leqq 0.5$, a condition of $p \leqq 600$, and also another condition of $\{1+700xk^2/(p/200)^4\}\ xp^5 \geqq 1.4 \cdot 10^{11}$ are satisfied;
when said noble gas mixture corresponds to said third gas mixture, a condition of $0.01 \leqq x \leqq 0.5$, a condition of $p \leqq 500$, and another condition of $xp^5 \geqq 8.0 \cdot 10^9$; and also
when said noble gas mixture corresponds to said fourth gas mixture, a condition of $0.01 \leqq x \leqq 0.5$, a condition of $0 < k \leqq 0.5$, a condition of $p \leqq 500$, and a condition of $\max\{80xk(1-3.3x),1\}xp^5 \geqq 8.0 \cdot 10^9$ are satisfied.

5,559,404

CAPACITIVE PULSE FORMING NETWORK

Frederick W. MacDougall, and Xiao H. Yang, both of Marion, Mass., assignors to Aerovox Incorporated, New Bedford, Mass.

Filed Jun. 21, 1995, Ser. No. 493,161
Int. Cl.[6] H05B *37/02*
U.S. Cl. 315—209 CD **13 Claims**



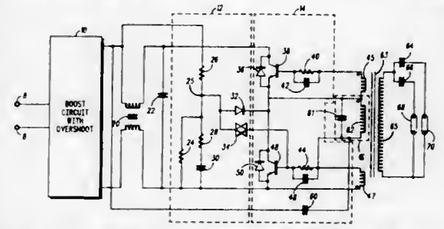
1. A high energy pulse forming network for delivering high level energy pulses to an external load, comprising:
a plurality of interconnected capacitors, at least one of the capacitors comprises conductive electrodes separated by a linear dielectric sheet to provide a substantially linear discharge versus voltage characteristic for storing energy delivered from an electrical source and at least another of the plurality of capacitors comprises conductive electrodes separated by a nonlinear dielectric sheet to provide a nonlinear discharge versus voltage characteristic for storing energy delivered from said electrical source; and
a discharge system, connected to the plurality of capacitors, for discharging the plurality of capacitors and delivering the stored energy to an external load.

5,559,405

PARALLEL RESONANT BALLAST WITH BOOST

Hubie Notohamiprodjo, Vernon Hills, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 102,668, Aug. 5, 1993, abandoned. This application Sep. 14, 1995, Ser. No. 528,514
Int. Cl.[6] H01P *1/20*
U.S. Cl. 315—209 R **7 Claims**



1. An electronic ballast for energizing at least one fluorescent lamp from an AC power source operating at a first frequency, the ballast comprising:
terminals disconnectably coupled to the AC power source;
a boost converter having an input and an output, the boost converter input being coupled to the AC power source, the boost converter having a DC output voltage;
an inverter having an input and an output, the inverter input being coupled to the output of the boost converter, the inverter having an AC output voltage at a second frequency, the second frequency being greater than the first frequency;
an inverter control circuit for starting the inverter, the inverter control circuit being operable to delay startup of the inverter until after the boost converter has begun to operate; and
a parallel resonant circuit having an input and an output, the input of the parallel resonant circuit being coupled to the inverter output, the output of the parallel resonant circuit being substantially sinusoidal and coupled to at least one fluorescent lamp.

5,559,406

CEILING FAN AND LIGHT ASSEMBLY CONTROL

a plurality of strain gauges formed on said arm member wherein at least one of the plurality of strain gauges extends along the

5,559,410

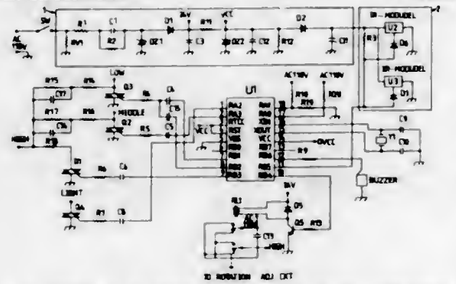
DEVICE FOR CONTROLLING THE FUNCTION OF AN

5,559,406

CEILING FAN AND LIGHT ASSEMBLY CONTROL CIRCUIT WITH REMOTE CONTROLLER/SINGLE-THROW SWITCH OPTIONAL CONTROLS

Chin-Hsing Chang, No. 192, Shu Jen Rd., Ban Tan Chun, Wu Fong Hsiang, Taichung Hsien, Taiwan

Filed Nov. 18, 1994, Ser. No. 341,119
Int. Cl.[6] H02J *4/00*; H04B *10/00*
U.S. Cl. 315—322 **3 Claims**



1. A ceiling fan and light assembly control circuit comprising a direct current power supply circuit, a single-throw switch, shunt resistors, a portable infrared remote controller, an infrared receiver, and a microprocessor; said direct current power supply circuit receiving alternating current power through said single-throw switch, converting said alternating current into low voltage direct current power when said single-throw switch is on and supplying said low voltage direct current power to said microprocessor and said infrared receiver; said direct current supply circuit containing filter capacitors for supplying direct current to said microprocessor for about 5 to 10 seconds when said single-throw switch is turned off after said capacitors are charged; said shunt resistors arranged betweeo said single-throw switch and an input of said microprocessor and creating a square wave signal from said alternating current power and supplying said square wave signal to said microprocessor only when said single-throw switch is on; said microprocessor having an input terminal connected to said infrared receiver, an output terminal connected to a fan speed control circuit and a light intensity control circuit of a ceiling fan and light assembly and an internal program; said internal program monitoring said square wave signal and, when said square wave signal is interrupted by turning said single-throw switch off and on within a period not exceeding 5 to 10 seconds, changing modes of operation of said fan speed control circuit between high, medium, low and off and modes of operation of said light intensity control circuit including on and off; and

said infrared remote controller adapted to send fan speed and light intensity regulating signals, independent of said single-throw switch, to said microprocessor through said infrared receiver while said single-throw switch is on, causing said internal program of said microprocessor to change said modes of operation of said fan speed control circuit and said light intensity control circuit.

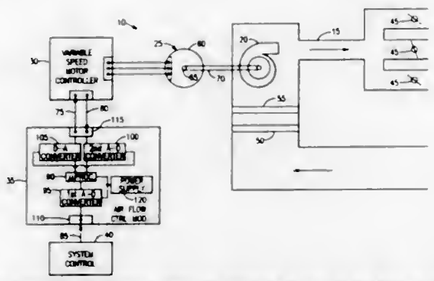
5,559,407

AIRFLOW CONTROL FOR VARIABLE SPEED BLOWERS

Kevin F. Dudley, Cazenovia, and Peter G. Pierret, Fayetteville, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed May 2, 1994, Ser. No. 236,824
Int. Cl.[6] H02P *7/50*
U.S. Cl. 318—439 **13 Claims**

1. An apparatus for controlling an air distribution system of the type which includes a duct system, a motor drivingly associated with a blower and a target air flow rate signal which represents a target air flow for the air distribution system, the apparatus provid-



ing control of the motor speed to maintain a rate of air flow in the system at substantially the target air flow rate, wherein the apparatus comprises:

means for providing a speed signal representative of the speed of the motor;

means for providing a control signal in response to the target air flow rate signal and the speed signal, wherein the control signal is provided independent of the duct system;

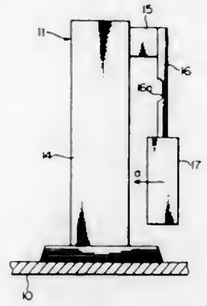
means for controlling the motor speed in response to the control signal wherein the motor speed is controlled for maintaining the rate of air flow in the system at substantially the target air flow rate.

5,559,408

APPARATUS FOR CONTROLLING A MOTOR USING PIEZOELECTRIC RESISTANCE

Toru Araki, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 44,076, Apr. 6, 1993, which is a continuation of Ser. No. 973,534, Nov. 9, 1992, abandoned, which is a continuation of Ser. No. 714,712, Jun. 3, 1991, abandoned.
This application Nov. 21, 1995, Ser. No. 561,392
Claims priority, application Japan, Aug. 31, 1990, 2-228011
Int. Cl.[6] G01L *3/02*
U.S. Cl. 318—271 **4 Claims**



1. A device for measuring acceleration comprising:

a rotary member;

a coupling mechanism attached to said rotary member;

an arm member having first and second ends, the first end being fixed to said coupling mechanism, the arm member including a semiconductor material having a length and a breadth;

a weight attached to the second end of said arm member; and

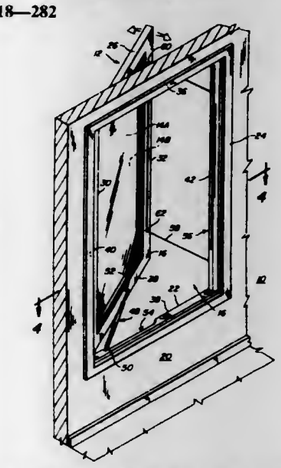
a plurality of strain gauges formed on said arm member wherein at least one of the plurality of strain gauges extends along the length of the arm member and at least one of the strain gauges extends across the breadth of said arm member, each strain gauge having a resistance that changes as said arm member is displaced due acceleration acting on said weight from rotation of said rotary member.

5,559,409

AUTOMATED WINDOW SYSTEM AND METHOD FOR A BUILDING

William T. Beierwaltes, 1907 Gail Ct., Loveland, Colo. 80537, and Kevin L. Miller, 6200 Becker La., Loveland, Colo. 80538

Filed Jan. 18, 1995, Ser. No. 373,851
Int. Cl.[6] H02P *1/00*
U.S. Cl. 318—282 **18 Claims**



1. An actuation system for a window including at least one window panel having a peripherally surrounding window sash disposed in a hinged relationship with respect to a window frame, said window frame having a hinged frame member and a jamb member that are parallel and spaced-apart, said window sash presenting parallel, spaced-apart and oppositely disposed proximal and distal members and parallel, spaced-apart and oppositely disposed first and second portions extending between said proximal and distal members, said proximal member being hinged to said hinged frame member, said actuation system comprising:

first and second expansible spring means coupling said window frame and said first and second portions of said window sash for force biasing said window sash toward an open relationship with respect to said window frame;

first and second spaced-apart threadable pulls affixed to said distal portion of said window sash for threadably guiding a mid-portion of a cord having first and second ends, said cord for opposing a bias force exerted on said window sash by said first and second expansible spring means; and

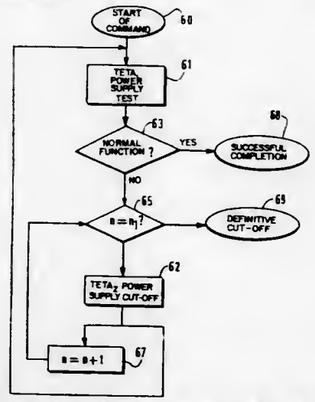
a spindle motor in conjunction with said jamb member, said spindle motor including a generally elongate spindle having first and second ends thereof rotatably secured to said jamb member, said first and second ends of said cord being coupled to said first and second ends of said generally elongate spindle, said spindle motor for selectively winding and unwinding varying lengths of said first and second ends of said cord about said elongate spindle to position said window sash with respect to said window frame.

5,559,410

DEVICE FOR CONTROLLING THE FUNCTION OF AN ELECTRIC STARTING MOTOR FOR A WINDSHIELD WIPER OF A REAR WINDOW OF AN AUTOMOTIVE VEHICLE AND FOR SUPPLYING AN ELECTRIC MOTOR PARTICULARLY TO ACTIVATE THE WINDSHIELD

Samuel Papazian, Chatellerault, and Eric Douville, Colombes, both of France, assignors to Valeo Systemes D'Essuyage, Le Bretoneux, France

Filed Dec. 17, 1993, Ser. No. 169,653
Claims priority, application France, Dec. 17, 1992, 92 15237; Dec. 17, 1992, 92 15238
Int. Cl.[6] G05B *5/00*
U.S. Cl. 318—445 **20 Claims**



1. A device for powering an electric motor, particularly for driving a windshield wiper arm of a motor vehicle, of the type comprising:

a control unit connected to user activated control elements and to a means of detection equipped with windshield wiper arm position sensors and comprising:

a motor supply control circuit, controlled by the control unit,

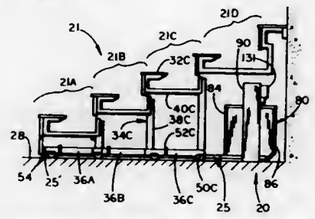
wherein the control unit comprises means for interrupting, at least temporarily, the operation of said electric motor at the end of a first time span, which is at least greater than the longest of the round trip times necessary for the arm of the windshield wiper to travel from a given starting position to a given end position and signifying incorrect operation of said windshield wiper arm.

5,559,411

NONFRICTION POWER SYSTEM FOR EXTENDING/RETRACTING A STRUCTURE

David W. Winship, Effingham, Ill., assignor to Irwin Seating Company, Grand Rapids, Mich.

Filed Feb. 7, 1995, Ser. No. 385,663
Int. Cl.[6] E04H *3/12*
U.S. Cl. 318—466 **38 Claims**



1. A power system for extending and retracting telescopic seating systems, comprising:

a frame;

a drum operably supported on said frame for rotational and vertical movement;

an extendable chain adapted for connection to a telescopic seating system to extend and retract the telescopic seating system, said chain being configured to selectively mateably wind onto and off from said drum as said drum is being rotated, said chain having a thickness such that successive wraps of said chain on said drum have an increased diameter; and

a power mechanism operably attached to said frame and to said drum, said power mechanism being configured to rotate said drum to selectively extend and retract said extendable chain, said power mechanism further being configured to raise and lower said drum as said extendable chain is retracted and extended, respectively, so that an extended portion of said chain is substantially continuously tangentially aligned with a wound portion of said chain on the drum as said chain is selectively retracted and extended.

5,559,412

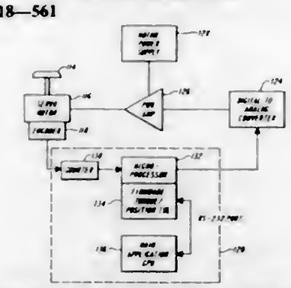
ACTUATOR HAVING ELECTRONICALLY CONTROLLABLE TACTILE RESPONSIVENESS

Chester L. Schuler, Sudbury, Mass., assignor to Lex Computer and Management Corporation, Keene, N.H.

Continuation of Ser. No. 76,344, Jun. 11, 1993, Pat. No. 5,414,337, which is a continuation-in-part of Ser. No. 783,635, Oct. 24, 1991, Pat. No. 5,220,260. This application May 3, 1995, Ser. No. 434,176

Int. Cl.[6] G05B *13/00*

U.S. Cl. 318—561 **1 Claim**



1. An actuator having tactile feedback capabilities, comprising:

an actuatable member for receiving a tactile feedback;

a servo motor having said actuatable member attached thereto;

a position encoder in communication with said servo motor, said encoder providing position information of said servo motor relative to a reference position;

a controller receiving said position information from said encoder;

a store of force-position relation information accessible to said controller, said controller outputting at least one force value in response to said position information and said store of force-position relation information; and

a drive signal source generating a drive signal to said servo motor in response to said at least one force value, said drive signal causing a force in said servo motor, said force providing said tactile feedback to said actuatable member.

5,559,413

SCREW SHAFT FEED MECHANISM AND POSITIONING CONTROL METHOD THEREFOR

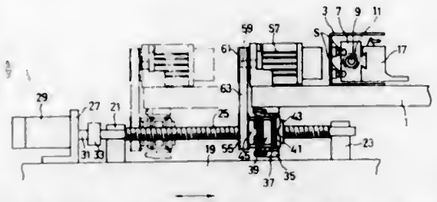
Yoshiharu Seto, La Mirada, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Filed Jul. 29, 1994, Ser. No. 282,592

Int. Cl.[6] G05B *1/06*

U.S. Cl. 318—568.18 **8 Claims**

1. A screw shaft feed mechanism comprising:



a feeding screw shaft rotatably supported by a fixed member and extending in a shaft feed direction of a shaft fed base;

a nut member rotatably supported by the shaft fed base and engaged with the feeding screw shaft; wherein the feeding screw shaft and the nut member are driven simultaneously;

screw shaft driving means for rotating the feeding screw shaft; and

nut driving means for rotating the nut member, the nut driving means mounted on the shaft fed base;

wherein both screw shaft driving means and nut driving means are each provided with a motor having a device detecting a rotational angle of a motor shaft; and

a controller for controlling deceleration of both of the screw shaft driving means and the nut driving means.

5,559,414

CONTROL UNIT OF DIRECT-CURRENT MOTOR

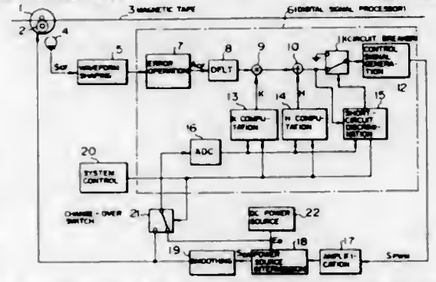
Kouji Minabe; Hideo Nishijima, both of Hitachinaka; Kouji Kaniwa, Yokohama; Hiroya Abe, Hiratsuka, and Yoshio Narita, Hitachinaka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 24, 1995, Ser. No. 409,660

Claims priority, application Japan, Apr. 1, 1994, 6-065212

Int. Cl.[6] G11B *19/28*

U.S. Cl. 318—606 **13 Claims**



1. A control unit of a direct-current motor comprising at least:

error arithmetic means for obtaining a digital error signal by processing a rotational frequency signal detected from a motor to be controlled;

control signal generating means for generating a pulse width modulation control signal using said error signal;

driving signal generating means for generating a motor driving signal by intermitting a direct-current power source using said control signal;

driving signal supply means for smoothing said driving signal and supplying the smoothed driving signal to the motor to be controlled; and

error signal correction means for generating a digital correction signal by processing the voltage value of said power source and for correcting said error signal using said correction signal.

5,559,415

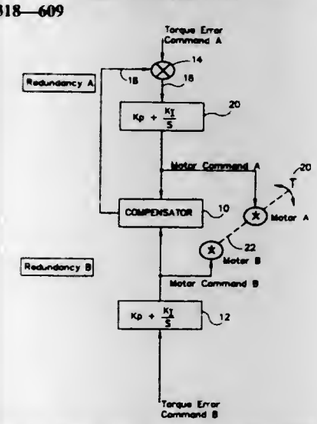
INTEGRATOR MANAGEMENT FOR REDUNDANT ACTIVE HAND CONTROLLERS

William W. Gregory, St. Petersburg; Wayne E. Lance, Largo, and Jeffrey W. Hegg, North Redington Beach, all of Fla., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 30, 1994, Ser. No. 269,275

Int. Cl.[6] G05B *11/36*

U.S. Cl. 318—609 **6 Claims**



1. A redundant active hand controller system, comprising:

a control stick;

a first motor;

a second motor;

a common shaft mechanically connecting said first motor and said second motor, said shaft coupled to said control stick;

a control redundancy A having at least a first proportional and integrating controller having a first error signal input and providing a first motor command signal, said first proportional and integrating controller having a first integrating control function;

a control redundancy B having at least a second proportional and integrating controller having a second error signal input and providing a second motor command signal, said second proportional and integrating controller having a second integrating control function;

first compensating means for differentiating said first motor command signal, for differentiating said second motor command signal and for subtracting said differentiated first motor command signal from said differentiated second motor command signal to provide a first offset correction signal; and

means for summing said first error signal and said first offset correction signal into said first proportional and integral controller to allow the first proportional and integrating controller and the second proportional and integrating controller to operate at a null condition.

5,559,416

DIRECT CURRENT MOTOR CONTROL CIRCUIT IN POSITIONING SYSTEMS

Peter Hrassky, Wasserburg am Inn, Germany, assignor to SGS-Thomson Microelectronics GmbH, Munich, Germany

PCT No. PCT/EP93/01212, § 371 Date Jan. 31, 1995, § 102(e) Date Jan. 31, 1995, PCT Pub. No. WO93/23920, PCT Pub. Date Nov. 25, 1993

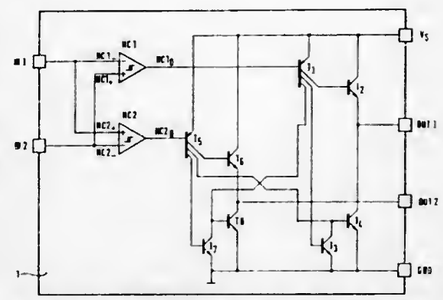
PCT Filed May 14, 1993, Ser. No. 335,809

Claims priority, application Germany, May 15, 1992, 42 16 203.3

Int. Cl.[6] G05B *9/02*; **H03F** *3/45*

U.S. Cl. 318—678 **4 Claims**

1. A control circuit, in particular for a direct current motor control in positioning systems, comprising:



an input stage having hysteresis-type comparators adapted to have control signals applied thereto,

a control logic connected downstream of said input stage,

and a driver stage connected downstream of said control logic, characterized in that the input stage comprises:

a differential input having a first input terminal and a second input terminal,

and two offset-type hysteresis comparators each having a first comparator input, a second comparator input and a comparator output,

each of said hysteresis comparators comprising a switchable current mirror stage, with said current mirror stage changing its switching state in response to the output signal of said hysteresis comparator, said current mirror stage comprising a multi-emitter transistor, with the number of the emitters of said multi-emitter transistor through which current is passed being changed as a function of the switching state of the current mirror,

said offset-type hysteresis comparators each having a differential input configuration,

and each of said hysteresis comparators having one of said two comparator inputs connected to one of said two input terminals and the other one of said two comparator inputs connected to the other one of said two input terminals,

and the comparator inputs of said two hysteresis comparators furthermore being connected to each other such that the inverting comparator input of the first comparator is connected to the non-inverting comparator input of the second comparator and the non-inverting comparator of the first comparator is connected to the inverting comparator input of the second comparator,

that the control logic has two control logic inputs connected to one of said comparator outputs each, and

that the control circuit comprises two control circuit outputs.

5,559,417

ELECTRONICALLY COMMUTATED TWO-AXIS GYRO CONTROL SYSTEM

Jerome Sears, Wyckoff; Walter Parfomak, Wallington, and Walter J. Kluss, Kearny, all of N.J., assignors to AlliedSignal Inc., Morris Township, N.J.

Continuation-in-part of Ser. No. 985,091, Dec. 2, 1992, Pat. No. 5,313,148. This application May 11, 1994, Ser. No. 241,300

Int. Cl.[6] G05B *17/00*

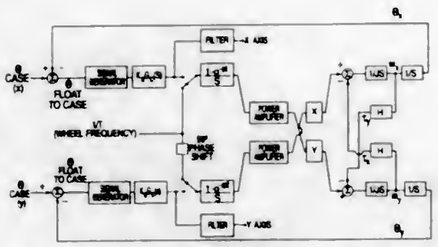
U.S. Cl. 318—689 **7 Claims**

1. A two degree of freedom gyroscope including a motor with a stator having driven phase windings and open phase windings and a permanent magnet rotor connected to rotate the rotatable portion of the gyroscope around a null spin axis, comprising:

motor drive means for driving the permanent magnet rotor to rotate around an actual spin axis, with a voltage induced in the open stator phase windings corresponding to the position of the permanent magnet rotor poles for motor commutation;

reverses from a decreasing value to an increasing value in response to changes in motor speed.

electric power system, to supply electric power from the selected one of said first and second generators to the electric



said open stator phase windings including a first winding arrangement and an oppositely disposed second winding arrangement;

said first and second open stator phase winding arrangements each having two leads leading therefrom;

one of the two leads from each of the first and second winding arrangements being jumped and the other of the two leads from each of the winding arrangements providing outputs relating to the position of the permanent magnet rotor poles for motor commutation;

sensing means for sensing the X-axis and Y-axis deviations of the actual spin axis of the rotor from the null spin axis and providing an X-axis and a Y-axis signal and which signals are a function of the deviation;

a torquer coil having at least one loop which lies in a plane orthogonal to the null spin axis and which is disposed in proximity to the permanent magnet rotor; and

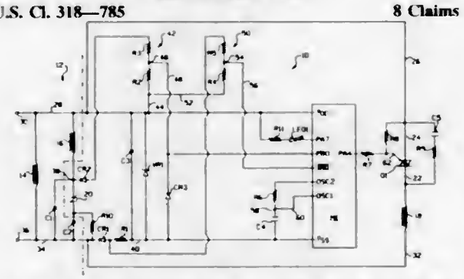
torquer drive means responsive to the X-axis signal and the Y-axis signal when the actual spin axis of the permanent magnet rotor is displaced from the null spin axis for providing drive current, at the proper time and with the proper polarity, to said torquer coil to urge the permanent magnet rotor to a position wherein the actual spin axis coincides with the null spin axis.

5,559,418

STARTING DEVICE FOR SINGLE PHASE INDUCTION MOTOR HAVING A START CAPACITOR

Richard M. Burkhart, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 3, 1995, Ser. No. 433,171
Int. Cl.[6] H02P *1/44*
U.S. Cl. 318—785 **8 Claims**



1. In a starting device for a single phase induction motor having a main winding, a start winding and a start capacitor, comprising:

means for monitoring voltage across the main winding;

means for monitoring voltage across the start winding;

means responsive to both said monitoring means for determining phase relationship between said voltages across said main winding and said start winding; and

means responsive to a specific condition of said phase relationship for effecting disconnection of the start capacitor from said start winding,

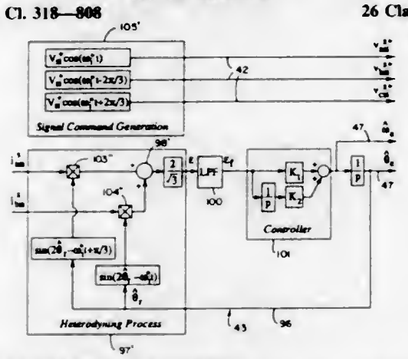
said specific condition of said phase relationship being a condition wherein a phase angle defined by said phase relationship reverses from a decreasing value to an increasing value in response to changes in motor speed.

5,559,419

METHOD AND APPARATUS FOR TRANSDUCERLESS FLUX ESTIMATION IN DRIVES FOR INDUCTION MACHINES

Patrick L. Jansen, Boise, Id., and Robert D. Lorenz, Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 173,405, Dec. 22, 1993. This application Jun. 21, 1994, Ser. No. 263,142
Int. Cl.[6] H02P *5/40*
U.S. Cl. 318—808 **26 Claims**



1. A motor drive system comprising:

(a) an induction motor including a stator with a plurality of stator windings thereon, and a rotor mounted for rotation within the stator, the rotor being uniform such that the impedance as seen by the stator windings does not substantially vary as a function of the rotational position of the rotor;

(b) drive means, connected to the stator windings, for providing AC drive power to the stator windings at a fundamental drive frequency of the motor which is at a level sufficient to provide magnetic saturation in the stator and for also providing power to the stator windings at a signal frequency which is substantially higher than the drive frequency; and

(c) means for measuring the response of the stator windings to the signal frequency power to determine the variation of the response as a function of time during operation of the motor whereby the angular position or the speed of the magnetic flux vector or both can be determined.

5,559,420

ELECTRICITY SUPPLY UNIT TRAILER FOR ELECTRIC VEHICLES

Akira Kobchi, Ashiya, Japan, assignor to Institute For Home Economics Of Japan, Inc., Hyogo-ken, Japan

Filed May 3, 1994, Ser. No. 237,119
Claims priority, application Japan, Sep. 7, 1993, 5-221929
Int. Cl.[6] H01M *10/46*
U.S. Cl. 320—2 **16 Claims**

1. A unit apparatus for supplying electricity to art electric vehicle comprising:

a plurality of batteries for accumulating electricity;

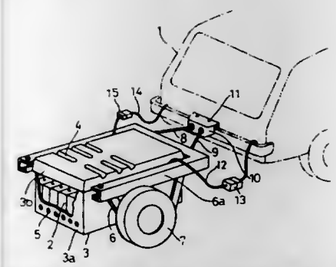
an encasement for enclosing said batteries in a compact manner;

means provided on said encasement for cooling said batteries;

terminals provided on said encasement and electrically connected with said batteries therein;

electric cables with a multi-plug connector for supplying electricity from said batteries through said terminals to an electric vehicle;

transportation means for permitting movement whereby said encasement is removably held on a frame body mounted on



wheels, said frame body having a draw bar, the encasement being configured to slide onto and off of the frame body;

securing means at said draw bar for securing said unit to said vehicle; and

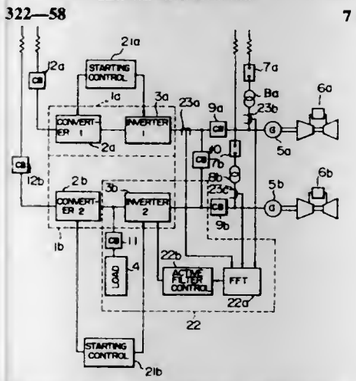
electric cords with a multi-plug connector for receiving control signals from said vehicle.

5,559,421

APPARATUS FOR REMOVING HARMONIC COMPONENTS OF AN ELECTRIC POWER FREQUENCY GENERATED IN ELECTRIC POWER GENERATION EQUIPMENT

Kado Miyakawa, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 4, 1994, Ser. No. 205,808
Claims priority, application Japan, Mar. 9, 1993, 5-048087
Int. Cl.[6] H02K *11/00*
U.S. Cl. 322—58 **7 Claims**



1. An apparatus for removing harmonic components of electric power frequency generated in electric power equipment, said apparatus comprising:

a first electric generator;

a second electric generator;

a first frequency converter connected to said first and second generators;

a second frequency converter connected to said first and second generators;

means for supplying electricity from an electric power system to said first and second frequency converters, to supply variable-voltage, variable-frequency electric power to a selected one of said first and second generators to make said selected one of said generators operate as a motor, to thereby start said selected one of said generators;

a first transformer connected to said first generator;

a second transformer connected to said second generator;

switchiag means for alternatively connecting a selected one of said first transformer and said second transformer to the electric power system, to supply electric power from the selected one of said first and second generators to the electric power system;

a detector for detecting harmonic components of an electric power frequency contained in the electric power supplied from said first frequency converter to the selected one of said first and second generators; and

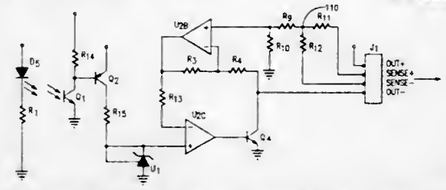
an active filter for removing the harmonic components of the electric power frequency contained in the electric power supplied from said first frequency converter, said active filter including said second frequency converter.

5,559,422

WALL TRANSFORMER

Corinn Fahrenkrug, Liverpool, and Shawn Briggman, Syracuse, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Jul. 1, 1994, Ser. No. 270,139
Int. Cl.[6] G05F *1/10*
U.S. Cl. 323—221 **15 Claims**



1. In an apparatus of the type having a power supply unit including a voltage regulator circuit, an instrument handle adapted to be connected to a load, a cable for conveying electrical power from said power supply unit to said instrument handle and load, and a cradle mounted on said power supply unit for holding said handle when said handle is not in use, the improvement comprising:

variable resistance means, disposed within said handle, and connected in a non-series relationship with said load, for adjusting the output voltage of said voltage regulator circuit through said cable;

switching means attached to said cradle for interrupting the supply of power to said load when said handle reposes in said cradle, said switching means being in a non-series connection with said load;

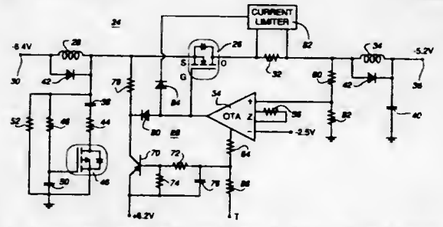
whereby the voltage supplied to said load is independent of the voltage drop in said cable.

5,559,423

VOLTAGE REGULATOR INCLUDING A LINEAR TRANSCONDUCTANCE AMPLIFIER

Stephen G. Harman, Nepean, Canada, assignor to Norhtern Telecom Limited, Montreal, Canada

Filed Mar. 31, 1994, Ser. No. 220,651
Int. Cl.[6] G05F *1/565*
U.S. Cl. 323—277 **13 Claims**



1. A voltage regulator comprising a FET having a source coupled to an input terminal for a voltage to be regulated, a drain

coupled to an output terminal for a regulated output voltage, and a

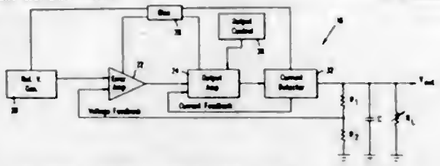
measurement means measuring the resistance and the capacitance between said first and second wires to produce resis-

coupled to an output terminal for a regulated output voltage, and a gate, a linear transconductance amplifier responsive to the output voltage for supplying a current drive to the gate of the FET, a current-sensing resistor in series with the source-drain path of the FET between the input and output terminals, and a current limiting circuit responsive to an excessive current flow through the current-sensing resistor for reducing current drive from the transconductance amplifier to the gate of the FET.

5,559,424
VOLTAGE REGULATOR HAVING IMPROVED STABILITY

Robert S. Wrathall, Scotts Valley, and Steven J. Franck, Felton, both of Calif., assignors to Siliconix Incorporated, Santa Clara, Calif.

Filed Oct. 20, 1994, Ser. No. 326,408
Int. Cl.[6] G05F *1/573*
U.S. Cl. 323—277 **11 Claims**



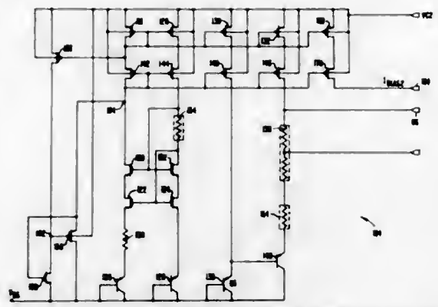
1. A linear voltage regulator comprising:
an MOS transistor connected between a power supply terminal and a load terminal of said linear voltage regulator for providing an output current to said load, said MOS transistor being continually in a conductive state while said output current is being provided to said load;
a voltage feedback loop comprising an error amplifier for comparing a feedback voltage to a reference voltage and outputting an error signal to control a magnitude of a gate voltage of said MOS transistor so as to control said output current of said MOS transistor;
a current feedback loop comprising a current detector for detecting said output current and, in response to said detecting, generating a compensation gate voltage for said MOS transistor to stabilize the impedance of said MOS transistor, as seen at said load terminal, as said load fluctuates,
said current feedback loop having a faster response to load fluctuations than said voltage feedback loop.

5,559,425
VOLTAGE REGULATOR WITH HIGH GAIN CASCODE MIRROR

Gary L. Altman, San Jose, Calif., assignor to Crosspoint Solutions, Inc., Santa Clara, Calif.

Division of Ser. No. 206,566, Mar. 4, 1994, Pat. No. 5,512,814, which is a division of Ser. No. 831,211, Feb. 7, 1992, Pat. No. 5,336,986. This application Jun. 6, 1995, Ser. No. 469,155
Int. Cl.[6] G05F *3/16*
U.S. Cl. 323—315 **2 Claims**

1. AMOS bandgap voltage generator coupled between a first and second voltage source, said bandgap generator comprising:
first and second MOS transistors, each coupled to said first voltage source and to each other in such manner that said first and second MOS transistors form current sources, a second current from said second MOS transistor mirroring a first current from said first MOS transistor;
first and second bipolar transistors, each having a base-emitter junction and coupled to said second voltage source, said first bipolar transistor coupled to said first MOS transistor for receiving said first current therethrough, said second bipolar transistor coupled to said second MOS transistor for receiving said second current therethrough;



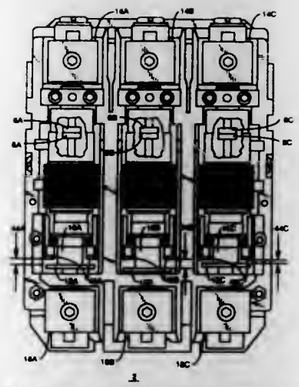
resistive means coupled between said first MOS transistor and said first bipolar transistor;
third and fourth MOS transistors, each having first and second source/drain terminals and a gate terminal, said third MOS+transistor having said first source/drain terminal coupled to said resistive means and said second source/drain terminal coupled to said first MOS transistor, said fourth MOS transistor having said first source/drain terminal coupled to said second bipolar transistor and said second source/drain terminal coupled to said second MOS transistor, said gate terminals of said third and fourth MOS transistors coupled in common to a first node maintaining said third and fourth MOS transistors in saturation, said first and second bipolar transistors differently sized so that a differential in base-emitter junction voltages between said first and second bipolar transistors is generated across said resistive means;
first and second cascode transistors, each having first and second source/drain terminals and a gate terminal, coupled to each other, said first cascode transistor having said first source/drain terminal coupled to said second source/drain terminal of said third MOS transistor and said second source/drain terminal coupled to said first MOS transistor, said second cascode transistor having said first source/drain terminal coupled to said second source/drain terminal of said fourth MOS transistor and said second source/drain terminal coupled to said second MOS transistor, said gate terminals of said first and second cascode transistors coupled in common to a second node maintaining said first and second cascode transistors in saturation; and
a bias resistor having first and second terminals, said first terminal coupled to said second source/drain terminal of said second cascode transistor and said second terminal coupled to said second MOS transistor, and wherein said first node comprises said second source/drain terminal of second cascode transistor and said second node comprises said second terminal of said bias resistor.

5,559,426
SYNCHRONOUS CONTACTOR

John J. Shea, Ross Township, Pa.; James A. Bauer, Asheville, N.C.; Henry A. Wehrli, III, Monroeville, Pa.; Denis A. Mueller, Asheville, N.C.; Thomas A. Wilsdon, Skyland, N.C., and John R. Wilson, Fletcher, N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 3, 1994, Ser. No. 253,800
Int. Cl.[6] G05B *24/02*
U.S. Cl. 323—319 **15 Claims**

1. A contactor for selectively connecting an alternating current (AC) power line to a load, the AC power line sourcing an AC current having periodic zero crossings, said contactor comprising:
fixed contact means;
movable contact means for movement between a first position, where said movable contact means contacts said fixed contact means in order to connect the AC power line to the load, and a second position, where said movable contact means is separated from said fixed contact means;

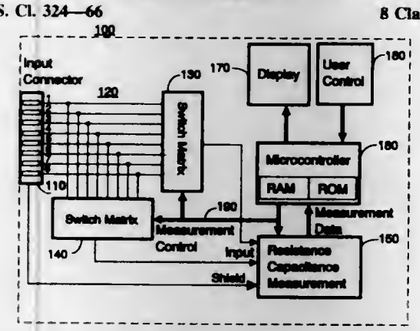


enclosure means for enclosing said fixed contact means and said movable contact means;
operating means for moving said movable contact means between the first position and the second position, said operating means engaging and moving said movable contact means to the second position in an absence of a closing signal, said operating means disengaged from said movable contact means, in the first position, by a gap having a predetermined length; and
synchronized opening means for disabling the closing signal in synchronization with a zero crossing of the AC current, the length of the gap predetermined in order that said fixed contact means and said movable contact means are separated at a time of the zero crossing of the AC current.

5,559,427
INSTRUMENT AND METHOD FOR TESTING LOCAL AREA NETWORK CABLES

Mark E. Hinds; Robert J. Lewandowski, both of Seattle; Thomas P. Locke, Woodinville, and Tzafrir Sheffer, Seattle, all of Wash., assignors to Fluke Corporation, Everett, Wash.

Filed Apr. 4, 1994, Ser. No. 222,156
Int. Cl.[6] G01R *31/02*
U.S. Cl. 324—66 **8 Claims**

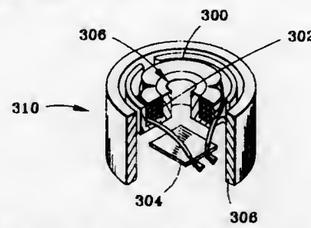


1. A LAN cable test instrument for testing a LAN cable having a near-end and a far-end, comprising:
(a) input means for coupling to a plurality of wires from said LAN cable at said near-end, said plurality of wires forming twisted-wire pairs within said LAN cable;
(b) first and second switch means coupled to said input means, said first switch means selectively coupling a first wire of said plurality of wires to a first output and said second switch means selectively coupling a second wire of said plurality of wires to a second output;
(c) measurement means with a first input coupled to said first output and a second input coupled to said second output, said measurement means measuring the resistance and the capacitance between said first and second wires to produce resistance and capacitance measurement values;
(d) memory means coupled to said measurement means for storing said resistance and capacitance measurement values; and
(e) a microprocessor coupled to said said memory means wherein said microprocessor operates on said resistance and capacitance measurement values to determine said twisted-wire pairs in said LAN cable.

5,559,428
IN-SITU MONITORING OF THE CHANGE IN THICKNESS OF FILMS

Leping Li, Poughkeepsie; Steven G. Barbee, Dover Plains; Arnold Halperin, Cortlandt Manor, and Tony F Heinz, Chappaqua, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1995, Ser. No. 419,206
Int. Cl.[6] G01R *27/00*
U.S. Cl. 324—71.5 **19 Claims**

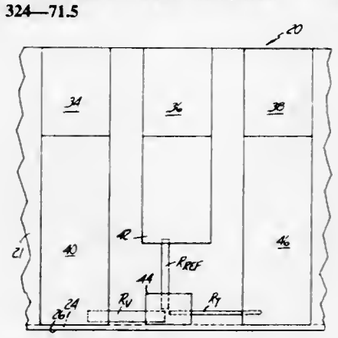


1. A method of in-situ monitoring of the change in thickness of a conductive film on an underlying body comprising the steps of:
(a) inducing an eddy current in the film by producing an alternating electromagnetic field with a sensor proximate the film, the sensor including a coil, a capacitor electrically connected to the coil, and a ferrite pot core for shaping the electromagnetic field; and
(b) detecting a change in the current due to the change in thickness of the film.

5,559,429
MR HEAD LAP MONITOR RESISTORS

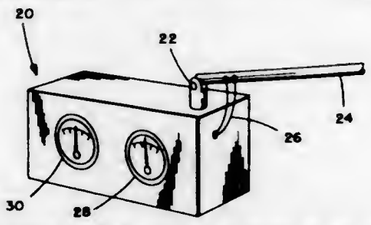
Gregory S. Mowry; Phillip E. Gorka, both of Burnsville; Brian D. Strayer, Minneapolis, and Alan G. Kracke, Minnetonka, all of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Division of Ser. No. 192,673, Feb. 7, 1994, Pat. No. 5,463,805. This application Apr. 13, 1995, Ser. No. 421,205
Int. Cl.[6] G01N *27/04;19/06*
U.S. Cl. 324—71.5 **7 Claims**



1. A magnetoresistive lap monitor for determining a final height of a magnetoresistive sensor during a lapping process, the magnetoresistive lap monitor comprising:
a first bond pad;
a first magnetoresistive contact electrically connected to the first bond pad;
a second bond pad;
a second magnetoresistive contact electrically connected to the second bond pad;
a third bond pad;
a third magnetoresistive contact electrically connected to the third bond pad;
a fourth magnetoresistive contact;
a variable resistor electrically connected between the first and fourth magnetoresistive contacts;
a reference resistor connected between the second and fourth magnetoresistive contacts; and
a target resistor electrically connected between the third and fourth magnetoresistive contacts.

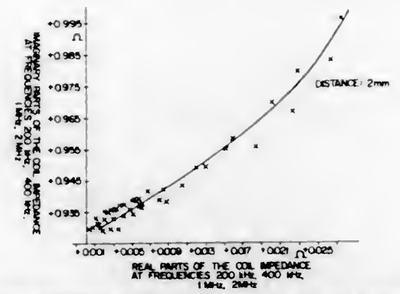
5,559,430
NET RADIATION SENSOR
Tapani O. Seppa, 39 N. Valley Rd., Ridgefield, Conn. 06897
Filed Jul. 27, 1994, Ser. No. 280,995
Int. Cl.[6] G01R *1/00*; G01N *25/00*
U.S. Cl. 324—158.1 **7 Claims**



6. A portable device for monitoring the current carrying capacity of an electrical power line conductor comprising:
an enclosure;
a section of an overhead power line conductor;
said section being of the same material as the electrical power line being monitored;
mounting means to secure one end of said section to the enclosure;
said mounting means including swivel means to permit said section to be pivoted in three-dimensional space;
temperature measuring means connected to said section to measure the temperature thereof;
ambient temperature measuring means to measure the surrounding ambient temperature; and
visually indicating means to display the temperature and ambient temperature.

5,559,431
METHOD OF CALIBRATING A SENSOR
Martin Sellen, Merzig, Netherlands, assignor to Micro-Epsilon Messtechnik GmbH & Co. KG, Ortenburg, Germany
Filed Oct. 7, 1994, Ser. No. 319,882
Claims priority, application Germany, Oct. 8, 1993, 43 34 380.5
Int. Cl.[6] G01R *35/02*; G01N *27/72*; G01G *23/48*
U.S. Cl. 324—202 **18 Claims**

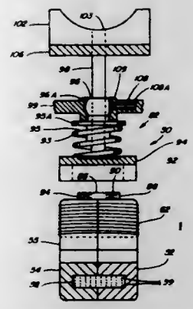
1. A method of calibrating a sensor, in which at most as many influence variables affecting the measuring results are considered as measurable quantities are detected by the sensor, the number of influence variables being composed of at least one disturbance



variable influencing the measurement and at least one target quantity to be determined from the measurable quantities, and comprising the steps of:
defining several values of the at least one target quantity and defining several values of the at least one disturbance variable for each of the defined values of the at least one target quantity;
detecting the corresponding values of the measurable quantities for all combinations of defined values of the at least one target quantity with corresponding defined Values of the at least one disturbance variable;
determining from each of the defined values of the at least one target quantity and the corresponding detected values of the measurable quantities a respective set of coefficients;
associating each of the sets of coefficients to the corresponding defined values of the at least one target quantity; and
storing the sets of coefficients,
wherein for determining an unknown value of the at least one target quantity the corresponding values of the measurable quantities are detected, wherein the detected values of the measurable quantities for the corresponding unknown value of the at least one target quantity are multiplied with each of the stored sets of coefficients and added up to a subtotal for each set of coefficients, the subtotal being associated to the same defined value of the at least one target quantity as the respective set of coefficients, and that a range of values between two successive defined values of the at least one target quantity is determined as a range of values for the unknown target quantity, the deviation from the corresponding subtotal being positive for one of these two defined values of the at least one target quantity, whereas the deviation from the corresponding subtotal is negative for the other of these two defined values of the at least one target quantity.

5,559,432
JOYSTICK GENERATING A POLAR COORDINATES SIGNAL UTILIZING A ROTATING MAGNETIC FIELD WITHIN A HOLLOW TOROID CORE
Delmar L. Logue, R.R. #1, Box 60, Herrick, Ill. 62431
Continuation-in-part of Ser. No. 842,244, Feb. 27, 1992, Pat. No. 5,404,101, and a continuation-in-part of Ser. No. 108,880, Aug. 13, 1993, abandoned, and a continuation-in-part of Ser. No. 142,933, Oct. 29, 1993, and a continuation-in-part of Ser. No. 170,058, Dec. 20, 1993, and a continuation-in-part of Ser. No. 187,072, Jan. 27, 1994, and a continuation-in-part of Ser. No. 217,738, Mar. 25, 1994. This application Jun. 29, 1994, Ser. No. 267,511
Int. Cl.[6] G01B *7/30*; G05D *1/08*; G05G *9/00*; G09G *5/00*
U.S. Cl. 324—207.17 **10 Claims**

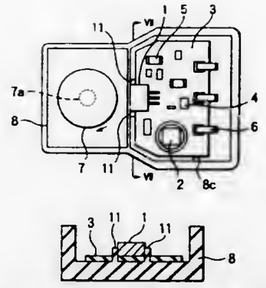
1. A joystick generating a polar coordinates signal in which the signal phase angle represents the joystick tilt direction, and the signal amplitude represents the magnitude of tilt, said joystick comprising:
a) a toroidal shaped azimuth flux directing means concentrically attached to one end of an operator rod, the said operator rod being pivotably mounted in a housing;



b) a polar sensor having an annular sensing face driven by a rotating magnetic field within a hollow toroid driving core for generating said polar coordinates signal;
i) the said driving core comprising:
ii) a hollow toroid core formed of a ferromagnetic material having an octagonal outer circumference;
iii) a bore disposed in the center of a flat portion of the octagonal shaped outer circumference, the axis of said bore being perpendicular to the central axis of the hollow toroid core;
iv) the polar sensor being mounted partially within the said bore, with an extending portion outside the hollow toroid wall;
v) a first excitation winding wound within the hollow toroid core for inducing a first magnetic field throughout the hollow toroid core;
vi) a second excitation winding wound around the outside of the hollow toroid core, comprising four sub-coils at equally spaced positions, being wound in symmetry to the mounted polar sensor, for flux balance, said second excitation winding for inducing a second magnetic field throughout the hollow toroid core;
vii) sine-cosine excitation being applied to the first and second excitation windings for inducing a rotating magnetic field throughout the hollow toroid core, said field having distributive axes perpendicular to a line drawn tangent to the surface of the hollow toroid core at all points;
viii) the hollow toroid core being separable for assembly;
ix) the hollow toroid driving core being rigidly mounted in the housing with the mounted polar sensor disposed concentrically adjacent the toroidal shaped azimuth flux directing means.

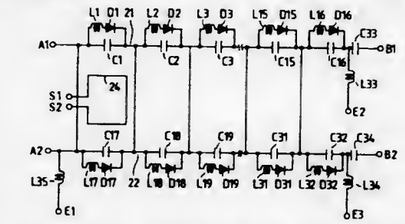
5,559,433
MAGNETIC SENSOR DEVICE INCLUDING APPARATUS FOR ALIGNING A MAGNETORESISTANCE ELEMENT AND A CIRCUIT BOARD AND A METHOD OF MANUFACTURING THE MAGNETORESISTIVE DEVICE
Shoko Onizuka, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 3, 1994, Ser. No. 191,452
Claims priority, application Japan, Feb. 4, 1993, 5-017424
Int. Cl.[6] G01B *7/30*; H05K *3/30*; H01L *43/08*; G01R *33/06*
U.S. Cl. 324—207.21 **7 Claims**

6. A method of manufacturing a magnetic sensor device comprising the steps of:
providing a first structural member on a circuit board for securing an orthogonal-type magnetoresistance element in a desired position;
forming a sensor circuit on said circuit board, said sensor circuit including the magnetoresistance element and a thick film resistor, including mounting the magnetoresistance element on the circuit board by engaging the magnetoresistance element with the first structural member of the circuit board;
trimming the thick film resistor so that the output voltage of said sensor circuit matches a predetermined reference value; and



mounting the circuit board to a frame, the frame containing a magnet and a second structural member, wherein mounting includes 1) aligning the circuit board with the frame by engaging the circuit board with the second structural member of the frame and 2) engaging the second structural member of the frame with a recess formed in the circuit board.

5,559,434
MAGNETIC RESONANCE IMAGING APPARATUS AND RF COIL EMPLOYED THEREIN
Tetsuhiko Takahashi, Souka; Etsuji Yamamoto, Akishima; Yoshiki Murakami, Nerima-ku, and Yoshikuni Matsunaga, Hachiouji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Division of Ser. No. 926,517, Aug. 10, 1992. This application Aug. 18, 1995, Ser. No. 516,892
Claims priority, application Japan, Aug. 9, 1991, 2-200253; Aug. 9, 1991, 2-200254
Int. Cl.[6] G01V *3/00*
U.S. Cl. 324—318 **7 Claims**



1. An MRI RF coil comprising first and second ring elements having a plurality of peripheral segments connected in a ring shape respectively which are apart from each other along a common vertical axial line, a plurality of axial conductive segments for connecting said first and second ring elements electrically to each other at the contacts of said plurality of peripheral segments, a plurality of current loops formed by neighboring axial conductive segments and two peripheral segments connected thereby, wherein at least one control signal feeding point is positioned at any one of the peripheral segments of the first or second ring elements, and capacitive elements are inserted into said plurality of peripheral segments respectively, and series circuits of diodes and inductive elements are connected in parallel with said capacitive elements, and said diodes are kept under ON and OFF control in a batch by a control voltage externally applied from the at least one control signal feeding point, and the number of the control signal feeding points is less than the number of said diodes being coupled to the peripheral segments and being kept under ON and OFF control.

5,559,435

displaying the difference in a digital readout as a measure of the

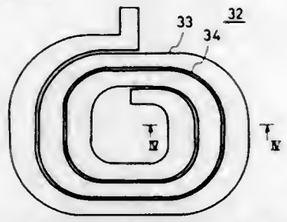
a voltage measuring element for providing a signal representa-

5,559,435

INCLINED MAGNETIC FIELD GENERATOR

Akihiro Harada, Hyogo-ken, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1995, Ser. No. 490,860
Claims priority, application Japan, Jul. 1, 1994, 6-151091
Int. Cl.[6] G01V *3/00*
U.S. Cl. 324—318 **8 Claims**



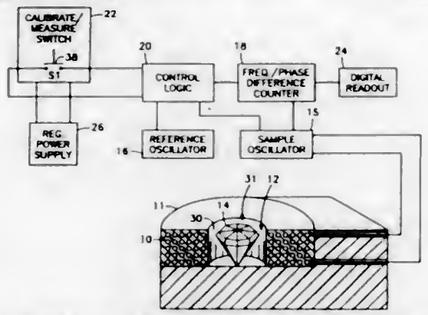
1. A magnetic field generator for generating a magnetic field in a magnetic resonance diagnostic apparatus in which a coil for an X axis field and a coil for a Y axis field are individually defined by a spiral conductor strip placed over a bobbin to thereby attain a saddle shade following a contour of said bobbin, and a coil for a Z axis field wound around said bobbin, wherein said coils for the X and Y axes are formed by spirally cutting a flat plate of conducting material wherein a width of the cut is set at a fixed cutting width through an entire length of the spiral conductor strip obtained from said flat plate.

5,559,436

METHOD AND APPARATUS FOR DISTINGUISHING SYNTHETIC DIAMONDS FROM NATURAL DIAMONDS

Marion Matthews, 8461 Vereda del Padre, Goleta, Calif. 93117, and Charles R. Perry, Goleta, Calif., assignors to Marion Matthews, Goleta, Calif.

Filed Nov. 21, 1994, Ser. No. 342,840
Int. Cl.[6] G01R *33/12;* **G01N** *27/72*
U.S. Cl. 324—236 **13 Claims**



1. A method for distinguishing a synthetic diamond from a natural diamond by measuring a magnetic characteristic of a sample diamond, comprising:

providing an oscillator having a frequency determining inductor, said inductor being at least in part air-cored and having a port therein for admitting a sample diamond for testing,

providing a counter for measuring counting transitions of said oscillator,

up counting the oscillations over a precise time interval with no sample diamond present,

then placing a sample diamond into said port of said inductor to change the frequency of said circuit by an amount related to the quantity of magnetic material in said sample diamond,

down counting the oscillations with the sample diamond in place over a second time interval equal to said first interval,

determining the difference in said counts, and

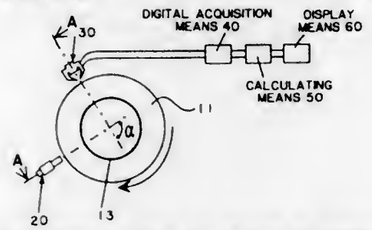
displaying the difference in a digital readout as a measure of the magnetic content of said sample and the degree of likelihood of said sample being synthetic.

5,559,437

PROCESS AND DEVICE FOR MAGNETICALLY CHECKING WORN TIRES

Armand Baccaud, Epoissotte, and Damien Baudrit, Avallon, both of France, assignors to Pneu Laurent, Avallon, France

Filed May 1, 1995, Ser. No. 431,574
Claims priority, application France, May 4, 1994, 94 05571
Int. Cl.[6] G01N *27/82;* **B07C** *5/02;* **B60C** *11/24*
U.S. Cl. 324—240 **18 Claims**



12. A non-destructive device for verifying the condition of a metallic reinforcement element of a tire comprising:

means for subjecting said metallic reinforcement element to a magnetic field and magnetizing it;

a device for detecting variations in magnetization of said metallic reinforcement element which includes at least one conductor placed opposite said metallic reinforcement element for detecting variations in magnetization of said metallic reinforcement element;

means for creating a relative movement between said metallic reinforcement element and said detection device;

means for recording said variations detected by said conductor; and

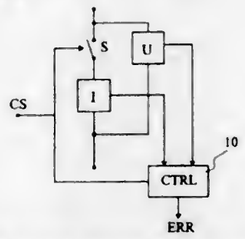
means for determining at least one magnitude characteristic of the whole of the recorded variations for comparison with a reference magnitude to determine the condition of said metallic reinforcement element.

5,559,438

COMPOSITE SAFETY SWITCH

Bernard Bedouet, Bourg-Les-Valence, and Christophe Taurand, Valence, both of France, assignors to Sextant Avionique, Meudon-La-Foret Cedex, France

Filed Jan. 25, 1995, Ser. No. 377,733
Claims priority, application France, Jan. 31, 1994, 94 01305
Int. Cl.[6] H03K *19/007*
U.S. Cl. 324—418 **11 Claims**



1. A composite switch including at least two series of single switches connected between two terminals of the composite switch, wherein the states of the single switches are separately controllable by respective control signals and each single switch comprises:

a voltage measuring element for providing a signal representative of the voltage across the single switch;

a current measuring element for providing a signal representative of the current in the single switch;

a high value resistance connected across the single switch; and

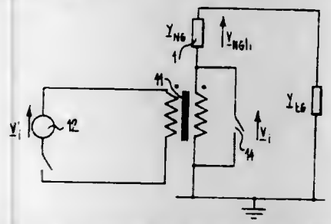
a control circuit receiving the signals of the voltage and current measuring elements and the control signal, for providing an active failure signal when the signal of the voltage measuring element exceeds a high voltage threshold or the signal of the current measuring element is below a low current threshold while the control signal determines an on-state of the single switch, or when the signal of the voltage measuring element is below a low voltage threshold or the signal of the current measuring element exceeds a high current threshold while the control signal determines an off-state of the single switch.

5,559,439

METHOD AND DEVICE FOR MEASURING THE COMPENSATION TUNING AND DETUNING OF AN ELECTRICAL DISTRIBUTION NETWORK

Jean Bergeal, Palaiseau, France, assignor to Electricite De France Service National, Paris, France

PCT No. PCT/FR93/01000, § 371 Date Apr. 19, 1995, § 102(e) Date Apr. 19, 1995, PCT Pub. No. WO94/10735, PCT Pub. Date May 11, 1994
PCT Filed Oct. 8, 1993, Ser. No. 290,744
Claims priority, application France, Oct. 26, 1992, 92 12756
Int. Cl.[6] G01R *31/00*
U.S. Cl. 324—509 **10 Claims**



1. Method for measuring the tuning and the detuning of the compensation of an electrical distribution network comprising a compensation coil (1), characterized in that an auxiliary measurement signal is injected into the neutral circuit of the network, in that the variation in the homopolar voltage induced by the said auxiliary signal injection is measured and in that an impedance measurement is carried out by comparison, in amplitude and in phase shift, of the variation in the homopolar voltage with the auxiliary measurement signal.

5,559,440

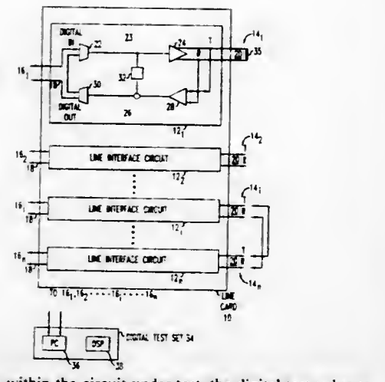
METHOD AND APPARATUS FOR TESTING TELECOMMUNICATIONS EQUIPMENT HAVING BOTH ANALOG AND DIGITAL INTERFACES

Philip V. Lopresti, Pennington, and Steven C. Pinault, Hopewell, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 22, 1994, Ser. No. 361,404
Int. Cl.[6] G01R *27/02;23/20*
U.S. Cl. 324—607 **9 Claims**

1. A method for testing a circuit having a digital interface for receiving and transmitting digital values and an analog interface for receiving and transmitting analog signals, the analog interface coupled to the digital interface via a transmission path, comprising the steps of:

applying to the digital interface of the circuit under test at last one digital test value;



converting, within the circuit under test, the digital test value to an analog signal for transmission on the transmission path to the analog interface;

terminating the analog interface with a termination impedance chosen such that the analog signal at the analog interface causes a voltage to appear across the termination impedance that is sensed on the transmission path;

converting, within the circuit under test, the voltage sensed on the transmission path to a digital value;

storing the digital value;

processing the digital value;

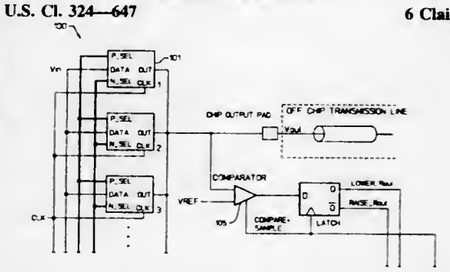
comparing the processed value to a reference digital value that represents a desired operating tolerance for the circuit, as derived by modeling the circuit and determining its response to conventional testing.

5,559,441

TRANSMISSION LINE DRIVER WITH SELF ADJUSTING OUTPUT IMPEDANCE

Alan R. Desroches, San Jose, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 19, 1995, Ser. No. 424,935
Int. Cl.[6] G01R *31/08*
U.S. Cl. 324—647 **6 Claims**



1. An apparatus for driving a transmission line having an impedance comprising:

an integrated circuit chip including:

a set of selectively activatable pad drivers, each pad driver having a respective low activated impedance and a respective high inactivated impedance, the pad drivers being arranged in parallel so as to provide a parallel impedance for electrical coupling to the impedance of transmission line;

a counter coupled with the drivers for selectively activating an initial number of members of the set of the pad drivers to drive the transmission line with a test pulse;

a comparator having a first and second input and an output, the first input of the comparator being coupled with the

drivers and the transmission line for sensing a voltage amplitude of the test pulse, the second input of the com-

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PROBING METHOD AND DEVICE

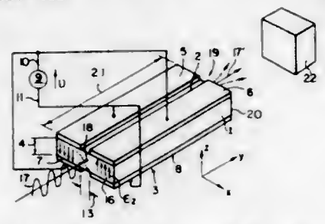
drivers and the transmission line for sensing a voltage amplitude of the test pulse, the second input of the comparator being coupled with a reference voltage for comparing the voltage amplitude of the test pulse with the reference voltage, the output of the comparator being coupled with the counter for increasing the counter's initial number of selected members of the set of the pad drivers if the voltage amplitude of the test pulse is less than the reference voltage, and for decreasing the counter's initial number of selected members of the set of pad drivers if the voltage amplitude of the test pulse is greater than the reference voltage.

5,559,442

PROCESS AND SENSOR FOR MEASURING ELECTRIC VOLTAGES AND/OR ELECTRIC FIELD INTENSITIES

Dirk Peier, Dortmund, and Holger Hirsch, Bönen, both of Germany, assignors to MWB High Voltage Systems GmbH, Bamberg, Germany

Filed Aug. 24, 1994, Ser. No. 294,029
Int. Cl.[6] G01R *19/00;23/16*
U.S. Cl. 324—753 **11 Claims**



9. Sensor for carrying out the process for measuring electric voltages and electric field intensities using the electro-optical effect occurring in a crystal in which the field intensity in the crystal and thus the refractive index of the crystal along a light path along a y axis of the crystal can be changed by a voltage applied across a z axis of the crystal transverse to the light path, comprising:

a flat crystal having opposed surfaces extending in the direction of its x and y axis and whose thickness extends in the direction of its z axis;

two pairs of strip-shaped electrodes, with members of each pair arranged on the opposed surfaces in a mutually opposite manner, extending along the y axis and the pairs being spaced from each other long the x axis; and

means connecting diametrically opposite electrodes of each pair to each other and to an electric voltage to be measured such that a gradient of the electric field intensity in the z axis occurs along an x axis of the crystal and thus a gradient of the refractive index and, as a result, light wave in the crystal is deflected along the x axis as a function of the voltage to be measured.

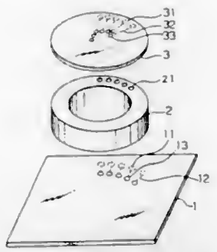
5,559,443

JIG FOR MEASURING THE CHARACTERISTICS OF A SEMICONDUCTOR, MANUFACTURING METHOD FOR THE SAME, AND USAGE OF THE SAME

Yasuhiko Yokoya, Shimodate; Noboru Yamazaki, Minoo; Mitsuo Nakamura, Osaka; Syuuichi Hasuda; Eisaku Namai, both of Shimodate, and Syuuzou Yamada, Osaka, all of Japan, assignors to Hitachi Chemical Company Ltd., Tokyo, and Yamada Den-On Co., Ltd., Osaka, both of Japan

Filed Mar. 6, 1995, Ser. No. 399,220
Claims priority, application Japan, Mar. 7, 1994, 6-035708
Int. Cl.[6] G01R *31/02*
U.S. Cl. 324—754 **16 Claims**

1. A jig for measuring the characteristics of a semiconductor, comprising:



a first circuit board, an intermediate board, and a second circuit board;

said first circuit board comprising a multi-wire board having a first group of terminals to be connected to a measuring instrument or a power supply, a second group of terminals to be connected to the second circuit board, and a group of wiring conductors for making electrical connection between the first group of terminals and the second group of terminals;

said second circuit board comprising a multi-wire board having a third group of terminals to be connected to the second group of terminals of the first circuit board, said third group of terminals being located in a position corresponding to a position of the second group of terminals of the first circuit board, a fourth group of terminals to be connected to a semiconductor chip to be mounted at least on the second circuit board or to a socket for connection with a semiconductor chip, and another group of wiring conductors for making electrical connection between the third group of terminals and the fourth group of terminals; and

the intermediate board being located between the first and second circuit boards, said intermediate board comprising an insulated board which has a plurality of through holes with metallized inner walls in positions matching to corresponding positions of the second group of terminals of the first circuit board and the third group of terminals of the second circuit board and springy pins which are inserted in the through holes and which are isolated from the metallized inner walls thereof.

5,559,444

METHOD AND APPARATUS FOR TESTING UNPACKAGED SEMICONDUCTOR DICE

Warren Farnworth, Nampa; Salman Akram, and David Hembree, both of Boise, all of Id., assignors to Micron Technology, Inc., Boise, Id.

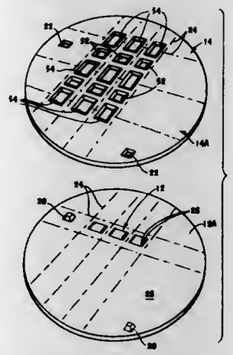
Continuation-in-part of Ser. No. 387,687, Feb. 13, 1995, which is a continuation-in-part of Ser. No. 137,675, Oct. 14, 1993, abandoned, which is a continuation-in-part of Ser. No. 709,858, Jun. 4, 1991, abandoned, and a continuation-in-part of Ser. No. 788,065, Nov. 5, 1991, Pat. No. 5,440,240, and a continuation-in-part of Ser. No. 981,956, Nov. 24, 1992. This application May 30, 1995, Ser. No. 452,990
Int. Cl.[6] G01R *1/02*
U.S. Cl. 324—754 **30 Claims**

13. A fixture for testing an unpackaged semiconductor die, said fixture comprising:

a substrate having raised contact members corresponding to contact locations on the die, each of said contact member including a projection for penetrating a contact location on the die to a limited penetration depth;

a conductive layer formed on each raised contact member in electrical communication with a conductive trace formed on the substrate; and

an alignment plate attached to the substrate said alignment plate including a first etched opening for aligning the die with the contact members and a second etched opening for establishing an electrical path to the conductive trace for each contact member.

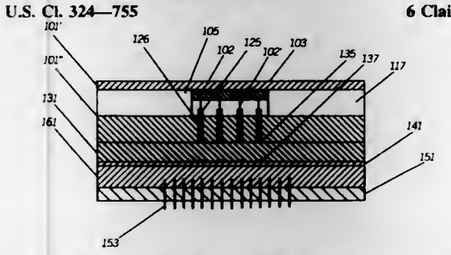


5,559,445

ADAPTER FOR TESTING INTEGRATED CIRCUITS

Jasper Eaddy; William M. Pistole, III, both of Ft. Lauderdale, and Robert J. Gentile, Plantation, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 3, 1994, Ser. No. 333,663
Int. Cl.[6] G01R *1/06*
U.S. Cl. 324—755 **6 Claims**



4. An integrated circuit testing adapter for adapting a chip carrier to test equipment comprising:

a housing for accepting at least one chip carrier, said housing including a hinged cover for holding said chip carrier in a fixed position within said housing;

a plurality of adjustable length contact pins extending through an interior portion of said housing for providing electrical contact with said chip carrier;

a circuit board including first and second sides positioned under said housing and contacting said plurality of adjustable length contact pins on said first side, said circuit board providing a connection between said plurality of adjustable contact pins and a plurality of solder balls on said second side of said circuit board, wherein said plurality of solder balls are arranged in a predetermined pattern;

a pin array forming a grid and positioned under said circuit board, said pin array connected to said plurality of solder balls for providing electrical contact between said plurality of solder balls and said test equipment;

at least one layer of conductive elastomeric material positioned between said circuit board and pin array for providing increased electrical contact between said plurality of solder balls and pin array; and

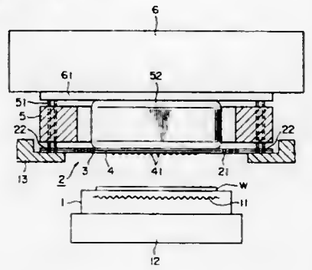
whereby said plurality of adjustable length contact pins adjust longitudinally in response to said chip carrier being placed in said housing so said housing moves in relation to said circuit board to maintain electrical contact with said chip carrier.

5,559,446

PROBING METHOD AND DEVICE

Kunio Sano, Showa-Cho, Japan, assignor to Tokyo Electron Kabushiki Kaisha, Tokyo, and Tokyo Electron Yamanashi Kabushiki Kaisha, Yamanashi-Ken, both of Japan

Filed Jul. 18, 1994, Ser. No. 276,847
Claims priority, application Japan, Jul. 19, 1993, 5-200023; Aug. 3, 1993, 5-212214; Aug. 3, 1993, 5-212215
Int. Cl.[6] G01R *31/02*
U.S. Cl. 324—760 **7 Claims**



1. A probing device, comprising:

object mounting means for supporting an object to be inspected, having a silicon substrate with electrode pads;

measuring means;

a probe card having contacts electrically connected to said measuring means and arranged so as to face said object, said probe card being formed of silicon nitride at at least one surface thereof facing said object;

supporting means for supporting a circumferential portion of said probe card;

a wiring substrate connected to said measuring means and provided so as to face the probe card supported by said supporting means;

connecting conductor means provided in a circumferential portion of the probe card and electrically connected to said contacts;

means for moving said mounting means relative to said probe card so that the contacts can be brought into contact with the electrode pads of the object mounted on said mounting means;

means for changing the temperature of the object;

interim connecting means for electrically connecting said connecting conductor means to said wiring substrate, said interim connecting means including a first connecting means provided on a side of said probe card and a second connecting means provided on a side of the wiring substrate, said first and second connecting means being removably connected to each other, said first connecting means including a first block body formed with a first through hole, said second connecting means including a second block body formed with a second through hole which is coaxial with said first through hole;

a first hollow insulating member fitted in said first through hole;

a second hollow insulating member fitted in said second through hole; and

a first conductive axle extending through said first insulating member and electrically connected to said connecting conductor means;

a second conductive axle extending through said second insulating member and electrically connected to said wiring substrate; and

said first and second conductive axles having mutually adjoining ends that are separably connected.

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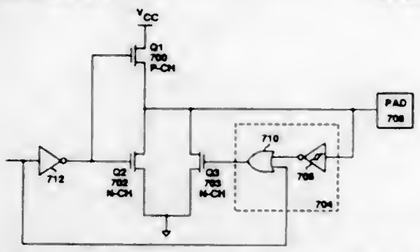
the first control electrode of the internal reference transmission

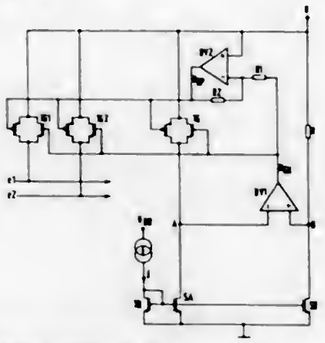
a clamp releasing circuit, connected to said voltage detecting

5,559,447
OUTPUT BUFFER WITH VARIABLE OUTPUT IMPEDANCE
David Rees, Overton, United Kingdom, assignor to Cypress Semiconductor, San Jose, Calif.
Filed Nov. 17, 1994, Ser. No. 341,371
Int. Cl.[6] H03K *19/0185;19/0948*
U.S. Cl. 326—30 **30 Claims**



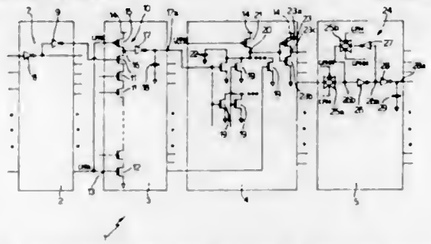
1. A variable impedance output buffer having an input for receiving an input signal and an output for outputting an output signal, wherein the output signal undergoes a transition in response to a transition in the input signal, and the buffer has an output impedance, the output buffer comprising:
a first feedback circuit for outputting a first control signal in a first state during a first portion of the output transition, and for outputting the first control signal in a second state during a second portion of the output transition after the first portion; transition, and for outputting the first control signal in a second state during a second portion of the output transition after the first portion, wherein said first feedback circuit includes a Schmitt trigger inverter; and
a first switched resistive element, coupled to receive the first control signal from the first feedback circuit, for increasing the output impedance of the buffer in response to the first control signal being in the second state.

5,559,448
CMOS TERMINATING RESISTOR CIRCUIT
Wilhelm Koenig, Stadtbergen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Filed Apr. 7, 1995, Ser. No. 418,367
Claims priority, application Germany, Apr. 7, 1994, 4412055.9
Int. Cl.[6] H03K *17/16;19/094*
U.S. Cl. 326—30 **11 Claims**



1. A CMOS termination circuit comprising:
a CMOS transmission gate having first and second control electrodes, the transmission gate control electrodes connected to corresponding first and second control electrodes of an internal reference transmission gate;
the first control electrode of the internal reference transmission gate connected to an output of a differential amplifier;
the second control electrode of the internal reference transmission gate connected to an output of an inverting amplifier;
the output of the differential amplifier connected to an inverting input of the inverting amplifier;
the internal reference transmission gate connected in series with a first current mirror transistor of a current mirror circuit which is connected to a reference current source;
an external reference resistor connected in series with a second current mirror transistor of the current mirror circuit;
a first input of the differential amplifier connected to a connection point between the internal reference transmission gate and the first current mirror transistor;
a second input of the differential amplifier connected to a connection point between the external reference resistor and the second current mirror transistor.

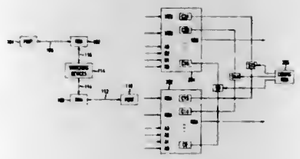
5,559,449
PROGRAMMABLE LOGIC ARRAY STRUCTURE FOR SEMICONDUCTOR NONVOLATILE MEMORIES, PARTICULARLY FLASH-EEPROMS
Silvia Padoan, Rimini, and Luigi Pascucci, San Giovanni, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy
Filed Feb. 21, 1995, Ser. No. 391,149
Claims priority, application European Pat. Off., Feb. 18, 1994, 94830072
Int. Cl.[6] H03K *19/177;19/173*
U.S. Cl. 326—40 **28 Claims**



1. A programmable logic array structure for semiconductor nonvolatile memories, particularly flash-EEPROMs, comprising:
a PLA including an AND stage, an OR stage and an output latch stage cascade connected to one another, said AND stage having a NAND configuration followed by non-clocked logic inverters; and
a clock generator for generating a clock signal having a switching edge, said clock generator having a monostable read enabling circuit, the clock generator controlling said AND stage and said OR stage and said output latch stage such that said AND stage and said OR stage are evaluated in a same clock period following a same switching edge of the clock signal.

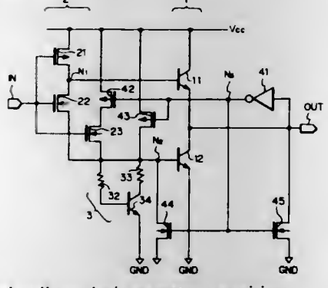
5,559,450
FIELD PROGRAMMABLE GATE ARRAY WITH MULTI-PORT RAM
Kai-Kit Ngai, Allentown, and Satwant Singh, Macungie, both of Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.
Filed Jul. 27, 1995, Ser. No. 507,957
Int. Cl.[6] H03K *19/177*
U.S. Cl. 326—40 **25 Claims**

1. An integrated circuit including a field programmable gate array (FPGA) which includes a programmable function unit (PFU), comprising:



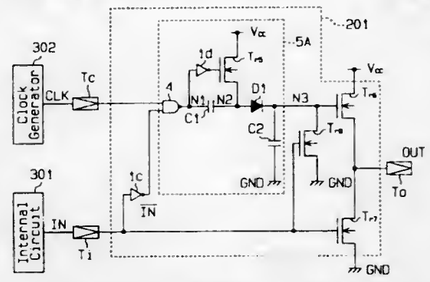
first and second programmable elements for generating various functions including first and second respective RAM cells in response to a configuration bit stream; and
a programmable switching device responsive to the configuration bit stream for providing bit-level coupling between the RAM cells so that the RAM cells together provide a multi-port RAM cell.

5,559,451
BICMOS PUSH-PULL TYPE LOGIC APPARATUS WITH VOLTAGE CLAMP CIRCUIT AND CLAMP RELEASING CIRCUIT
Hitoshi Okamura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan
Filed Sep. 7, 1995, Ser. No. 528,647
Claims priority, application Japan, Sep. 8, 1994, 6-214835
Int. Cl.[6] H03K *19/08*
U.S. Cl. 326—84 **29 Claims**



1. A push-pull type logic apparatus comprising:
an input terminal;
an output terminal;
a push-pull buffer, connected to said output terminal and formed by two bipolar transistors;
a control circuit, connected between said input terminal and said push-pull buffer, for turning ON one of said bipolar transistors and turning OFF the other of said bipolar transistor in accordance with a voltage at said input terminal;
a voltage clamp circuit, connected to one of the bases of said bipolar transistors, for clamping a voltage thereof at a forward voltage, said voltage clamp circuit having a higher impedance than a base input impedance of the same one of the bases of said bipolar transistors;
a voltage detecting circuit, connected to said output terminal, for detecting a voltage at said output terminal;
a clamp releasing circuit, connected to said voltage detecting circuit and said voltage clamp circuit, for releasing a clamp operation of said voltage clamp circuit in accordance with an output of said voltage detecting circuit.

5,559,452
N CHANNEL OUTPUT DRIVER WITH BOOSTED GATE VOLTAGE
Teruhiko Saito, Kasugai, Japan, assignor to Fujitsu Limited, Kawasaki, Japan
Filed Apr. 12, 1995, Ser. No. 420,487
Claims priority, application Japan, Apr. 13, 1994, 6-075168
Int. Cl.[6] H03K *19/0185*
U.S. Cl. 326—88 **15 Claims**



1. A semiconductor device having improved load driving characteristics when powered by a high-potential power supply and a low-potential power supply, the device comprising:
an internal circuit portion for producing a first signal; and
an output circuit portion coupled to said internal circuit portion of the semiconductor device for driving the load in response to a clock signal and said first signal, said output circuit portion further comprising,
a first N channel MOS transistor and a second N channel MOS transistor coupled in series between the high and low power supplies, said second N channel MOS transistor being supplied with a first input signal; and
a booster circuit coupled between said high-potential power supply and said first N channel MOS transistor for providing said first N channel MOS transistor with a boosted input signal at a potential higher than that of the high-potential power supply in response to the clock signal and a second input signal, said first and second N channel MOS transistors operating to provide an output signal from said output circuit at a node between said first and second N channel MOS transistors, wherein said booster circuit includes a gate circuit responsive to said second input signal and said clock signal for regulating the operation of said booster circuit.

5,559,453
INTERLOCKED RESTORE CIRCUIT
James J. Covino, Essex, and Jose R. Sousa, Colchester, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sep. 28, 1995, Ser. No. 534,920
Int. Cl.[6] H03K *19/01*
U.S. Cl. 326—93 **7 Claims**

1. A low power, high speed, multi-stage asynchronous-logic circuit, comprising:
a first logic circuit having a plurality of inputs and an output, the first logic circuit having means for detecting the presence of valid data at its inputs and means for generating a logic output signal;

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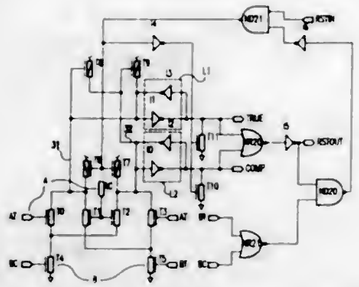
a data line discharging means having as an input said electric

in series at a junction and in series to said phase shifter



a second logic circuit having means for detecting the presence of the logic output signal and means for generating a data ready signal; and

means for coupling the data ready signal to the first logic circuit for resetting the output of the first logic circuit when the inputs of the first logic circuit have been restored.

5,559,454

CIRCUIT ARRANGEMENT FOR SIGNAL PROCESSING FOR INDUCTIVITY USING SENSOR

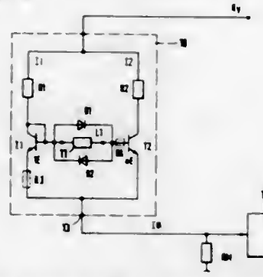
Thomas Schneider, Markgroeningen, Germany, assignor to Robert Bosc GmbH, Stuttgart, Germany

Filed Dec. 5, 1994, Ser. No. 349,612

Claims priority, application Germany, Dec. 14, 1993, 43 42 585.2

Int. Cl.° G01R *25/00*

U.S. Cl. 327—4 **8 Claims**



1. A circuit arrangement for a signal processing, comprising a sensor for sensing a movable part and having an inductivity formed as a coil; and a current reflecting circuit connected with said inductivity of said sensor, said current reflecting circuit actuating a current amplification and including a transistor with a base which is directly connected with said inductivity of said sensor, and a further transistor having a base additionally connected with said inductivity of said sensor, said transistors having connectors to which a supply voltage is supplied via a first interface and emitters connected with a resistance RM at which a measuring signal is pickable through a second interface, said circuit arrangement also including a first additional resistor located between said base of said further transistor and said coil and a second additional resistor located between said emitter of said first mentioned transistor and said resistance RM.

5,559,455

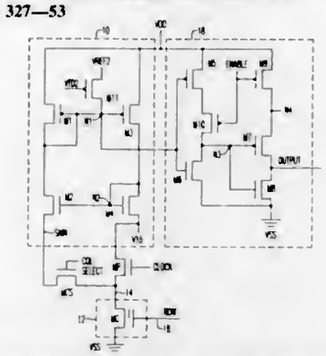
SENSE AMPLIFIER WITH OVERVOLTAGE PROTECTION

Richard J. McPartland, Nazareth, Pa., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 23, 1994, Ser. No. 363,045

Int. Cl.° G01R *19/00; G11C 11/40*

U.S. Cl. 327—53 **8 Claims**



1. An integrated circuit including a current mode sense amplifier, the current mode sense amplifier comprising:

first and second transistors each having a conduction path and a gate electrode, the conduction path of said first and second transistors in series between a power supply node and an input;

third and fourth transistors each having a conduction path and a gate electrode, the conduction path of said third and fourth transistors in series between the power supply node and a first reference potential, the gate electrodes of the first and third transistors each electrically coupled to an output node; and

a fifth transistor, the fifth transistor having a conduction path and a gate electrode, the conduction path electrically coupled between a second reference potential and the output node, the gate electrode maintained at a voltage that is about two threshold voltage drops below the voltage level of the power supply node.

5,559,456

SENSING CIRCUIT UNIT FOR A DYNAMIC CIRCUIT

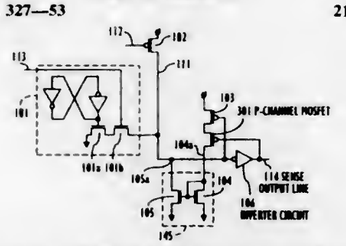
Tsuguyasu Hatsuda, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 16, 1993, Ser. No. 106,551

Claims priority, application Japan, Aug. 17, 1992, 4-217768; Apr. 9, 1993, 5-083100

Int. Cl.° H03F *3/45*

U.S. Cl. 327—53 **21 Claims**



1. A sensing circuit unit for a dynamic circuit for detecting voltage level variations of a data line which is disposed in the dynamic circuit and which is precharged to a predetermined voltage level, said sensing circuit unit comprising:

an electric current supply means for detecting voltage level variations of said data line, said electric current supply means connected to said data line for supplying an electric current when the voltage level of said data line varies;

a data line discharging means having as an input said electric current from said electric current supply means and having an output current terminal connected to said data line for electrically discharging said data line according to the presence or absence of an electric current supplied from said electric current supply means;

whereby the decal line discharging means is operated directly by the electric current of said electric current supply means,

an inverter circuit having a gate input line connected to said data line; and

a supplied electric current control means, connected to said data line discharging means and an output line of said inverter circuit, for cutting off said electric current supplied from the electric current supply means to the data lane discharging means when a change of the voltage level of an output line of said inverter circuit is determined.

5,559,457

DOUBLE-BALANCED MIXER CIRCUIT

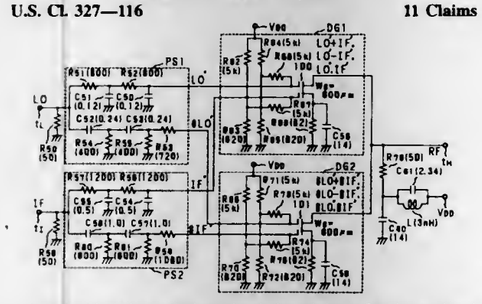
Hisanori Uda; Tetsuro Sawai; Toshikazu Imaoka; Toshikazu Hirai, and Yasoo Harada, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 21, 1994, Ser. No. 215,193

Claims priority, application Japan, Mar. 26, 1993, 5-093763; Dec. 9, 1993, 5-309503

Int. Cl.⁶ H04B *1/28; 1/26*

U.S. Cl. 327—116 **11 Claims**



1. A double-balanced mixer circuit for mixing a first input signal of a first frequency and a second input signal of a second frequency comprising:

a first phase shifter, comprising passive elements, having an input, and receiving at said input the first input signal and providing as outputs a first output signal having a phase lag of 90° from said first input signal and a second output signal having a phase lead of 90° from said first input signal;

a second phase shifter, comprising passive elements, having an input, and receiving at said input the second input signal and providing as outputs a third output signal having a phase lag of 90° from said second input signal and a fourth output signal having a phase lead of 90° from said second input signal;

wherein the passive elements forming each of said first and second phase shifters comprise only resistors and capacitors between said input and an output of a respective said phase shifter, the passive elements of each said phase shifter having an equivalent electrical circuit represented by first and second branches originating from said input of a respective said phase shifter;

said first branch of the equivalent electrical circuit having first and second resistances each of value R_3 connected in series at a junction and in series with said phase shifter input, a capacitance of value C_B connected from the junction of said first and second resistances to a common potential point, and another capacitance of value C_B connected from the end of the resistance remote from the said phase shifter input to the common potential point,

said second branch of the electrical equivalent circuit having first and second capacitances each of a value C_A connected in series at a junction and in series to said phase shifter input, and a resistance of a value R_A connected from the junction of the first and second capacitances to the common potential point and another resistance of value R_A connected from the end of the capacitance remote from the input to the common potential point, and wherein

$$R_B=2\cdot R_A \quad (1)$$

$$C_B=(\tfrac{1}{2})\cdot C_A \quad (2)$$

where

$$1/(R_A\cdot C_A)=1/(R_B C_B)=2\pi f \quad (3)$$

and where f is the frequency of one of the signals of a first frequency and a second frequency;

a first dual gate mixer circuit having an input and an output and a dual gate FET receiving as inputs said first and third output signals and mixing the same to produce at said output said first output signal and said third output signal;

a second dual gate mixer circuit having an input and an output and a dual gate FET receiving as inputs said second output signal and said fourth output signal and mixing the same to produce at said output said second output signal and said fourth output signal; and

combining means coupled to said output of each of said first dual gate mixer circuit and said second dual gate mixer circuit for providing a combined output signal by combining said first output signal outputted from said first dual gate mixer circuit and said second output signal outputted from said second dual gate mixer circuit to cancel each other, and said third output signal outputted from said first dual gate mixer circuit and said fourth output signal outputted from said second dual gate mixer circuit to cancel each other.

5,559,458

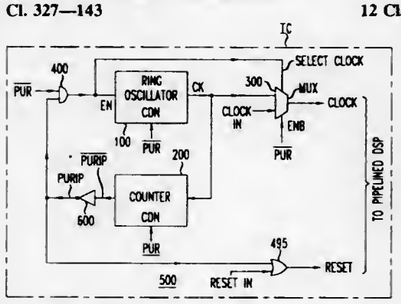
RESET CIRCUIT FOR A PIPELINED SIGNAL PROCESSOR

Paul T. Holler, Jr., Allentown, Pa., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed May 11, 1995, Ser. No. 438,720

Int. Cl.° H03K *3/037*

U.S. Cl. 327—143 **12 Claims**



1. An integrated circuit comprising:

a power-up reset circuit for a pipelined signal processor, said power-up reset circuit including:

a counter; and

a digital signal oscillator;

said digital signal oscillator and said counter being coupled in a configuration so as to provide a predetermined number of clock pulses substantially in response to a power-up signal and with the oscillator being coupled to a multiplexer;

wherein said multiplexer initially selects said digital signal oscillator during a power-up period, and thereafter selects said an operational clock source, as the source of clock pulses to said pipelined processor.

5,559,459

CLOCK SIGNAL GENERATION ARRANGEMENT

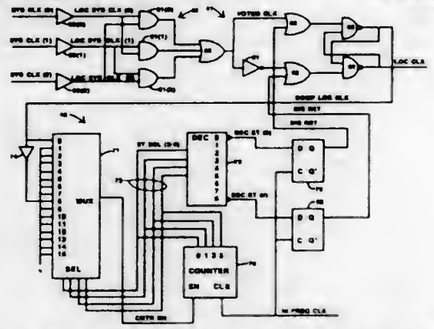
a first amplifier stage having a lower half-power gain roll-off frequency greater than 300 percent of said data rate;

wherein the first switch is operated oppositely to the second switch and the third switch is operated oppositely to the fourth

5,559,459
CLOCK SIGNAL GENERATION ARRANGEMENT INCLUDING DIGITAL NOISE REDUCTION CIRCUIT FOR REDUCING NOISE IN A DIGITAL CLOCKING SIGNAL

Paul R. Back, Groton; Paul R. Carlin, Bolton, and Joseph M. Lamb, Hopedale, all of Mass., assignors to Stratus Computer, Inc., Marlboro, Mass.

Filed Dec. 29, 1994, Ser. No. 366,414
Int. Cl.[6] H03K *19/00*
U.S. Cl. 326—93 **11 Claims**



1. A clock signal generation arrangement for generating a unitary timing signal for use by a timing signal utilization device in response to a common clock signal, the clock signal generation arrangement comprising:

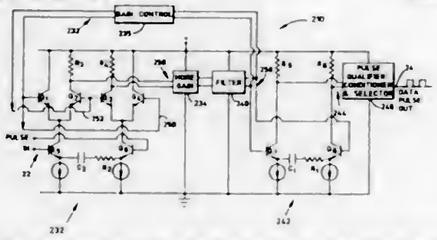
A. a system clock signal generator for generating, in response to the common clock signal, a plurality of system clock signals of uniform frequency and phase; and

B. a clock signal recovery circuit for receiving the system clock signals from the system clock signal generator and for generating in response the unitary timing signal for use by the timing signal utilization device, the clock signal recovery circuit generating the unitary timing signal to have signal transitions that are generally aligned with transitions of a majority of the system clock signals, the clock signal recovery circuit inhibiting transitions of the unitary timing signal for a selected time period after a previous transition so as to inhibit generation of noise in the unitary timing signal following such a transition.

5,559,460
PEAK DETECTION CIRCUIT FOR SUPPRESSING MAGNETORESISTIVE THERMAL ASPERITY TRANSIENTS IN A DATA CHANNEL

Earl A. Cunningham, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 363,431, Dec. 22, 1994, Pat. No. 5,497,111.
This application Dec. 4, 1995, Ser. No. 566,756
Int. Cl.[6] H03K *5/02*
U.S. Cl. 327—179 **1 Claim**



1. A pulse detector circuit for detecting magnetoresistive sensor data pulses, said data pulses occurring at a data rate, said pulse detector comprising:

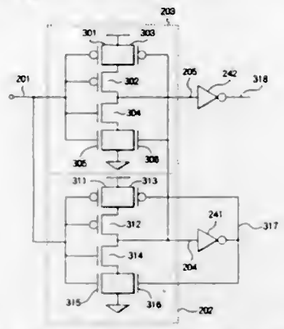
a first amplifier stage having a lower half-power gain roll-off frequency greater than 300 percent of said data rate;

a second amplifier stage coupled to the output of said first amplifier stage having a lower half-power gain roll-off frequency less than 3.0 percent of said data rate.

5,559,461
DRIVE CIRCUIT DETECTING SLOW SIGNAL TRANSITION

Masakazu Yamashina; Youichi Koseki, and Masayuki Mizuno, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jun. 27, 1995, Ser. No. 495,032
Claims priority, application Japan, Jun. 28, 1994, 6-146339
Int. Cl.[6] H03K *17/16;5/22*
U.S. Cl. 327—205 **10 Claims**



1. A drive circuit for detecting a slow signal transition, comprising:

first and second circuit sections each having an input connected to an input signal line,

said first circuit section comprising:

a first circuit portion for detecting a transient state of an input signal, said first circuit portion responding to said input signal supplied through said input signal line to generate a first output signal at a first output of said first circuit section; and

a second circuit portion coupled to said first circuit portion for delaying the first output signal of said first circuit section during an initial stage of a transient period for the input signal to produce a time delay of said first output signal from said first circuit section,

said second circuit section comprising:

a third circuit portion for detecting said transient state of said input signal, said third circuit portion responding to the input signal to generate a second output signal at a second output, and

a fourth circuit portion coupled between said first output and said second output, responsive to the time delay of said first output signal of said first circuit section, for accelerating said slow signal transition of the second output signal.

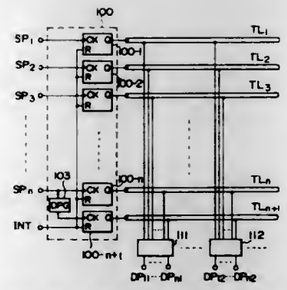
5,559,462
DIGITAL SIGNAL TRANSMISSION CIRCUIT

Satoru Tanoi, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1994, Ser. No. 317,245
Claims priority, application Japan, Oct. 5, 1993, 5-249164
Int. Cl.[6] H03H *11/26*
U.S. Cl. 327—231 **17 Claims**

1. A digital signal transmission circuit for transmitting an input pulse signal to receiving circuits through transmission lines, comprising:

a phase converting circuit for outputting:



a first output signal having a transition of a potential level thereof according to a transition of a potential of the input pulse signal from a first level to a second level, and

a second output signal having a transition of a potential level thereof according to a transition of the potential of the input pulse signal from the second level to the first level;

a first line included in the transmission lines, for transmitting the first output signal;

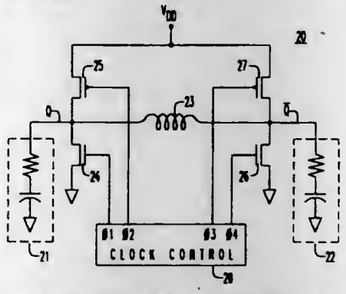
a second line included in the transmission lines, for transmitting the second output signal; and

a phase decoding circuit for receiving the first and second output signals from said first and second lines and outputting a decoding signal having a transition of a potential thereof according to the transition of the potential level of the first or second output signal, wherein said phase converting circuit sets each of the potential levels of the first and second output signals to a predetermined potential level in response to a reset signal.

5,559,463
LOW POWER CLOCK CIRCUIT

John S. Denker, Leonardo; Alexander G. Dickinson, Neptune, both of N.J.; Alan H. Kramer, Berkeley, Calif., and Thomas R. Wik, Hanover Township, Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Apr. 18, 1994, Ser. No. 229,258
Int. Cl.[6] H03K *5/12;5/18*
U.S. Cl. 327—300 **5 Claims**



1. A clock generator having first and second outputs, for generating complementary clock signals to loads coupling to the outputs, the loads having capacitance, the generator being CHARACTERIZED BY:

an inductor coupled between both generator outputs;

a first switch between the first output and a first power supply rail;

a second switch between the first output and a second power supply rail;

a third switch between the second output and the first power supply rail; and

a fourth switch between the second output and the second power supply rail;

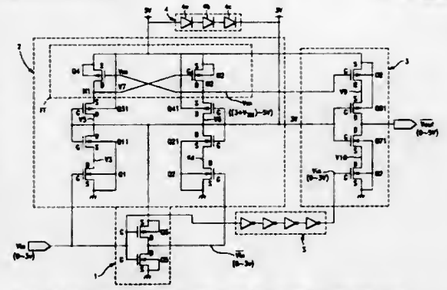
wherein the first switch is operated oppositely to the second switch and the third switch is operated oppositely to the fourth switch in response to control signals coupled to the switches; and

wherein the combination of inductor and load capacitance has a resonant frequency and the switches are switched at a frequency approximately equal to the resonant frequency.

5,559,464
SIGNAL VOLTAGE LEVEL CONVERSION CIRCUIT AND OUTPUT BUFFER CIRCUIT

Toshio Orii, and Masahiro Kanai, both of Suwa, Japan, assignors to Seiko Epson Corporation, Japan

Filed Jul. 6, 1994, Ser. No. 271,331
Claims priority, application Japan, Jul. 6, 1993, 5-167116; May 9, 1994, 6-095297
Int. Cl.[6] H03L *5/00;* **H03K** *1/175*
U.S. Cl. 327—333 **38 Claims**



1. A signal voltage level conversion circuit, comprising:

inverter means for receiving an input signal having a first logical amplitude defined by a first level and a second level higher than the first level and for generating an inverted input signal;

mediator signal generation means for receiving said input signal and the inverted input signal and for generating a mediator signal having a second logical amplitude defined by a third level which is higher than the second level and a fourth level which is higher than the third level; and

output buffer means for receiving said input signal and said mediator signal and for generating an output signal having a third logical amplitude defined by the first level and the fourth level.

5,559,465
OUTPUT PRECONDITIONING CIRCUIT WITH AN OUTPUT LEVEL LATCH AND A CLAMP

Shailesh Shah, San Jose, Calif., assignor to Cypress Semiconductor Corporation, San Jose, Calif.

Filed Jul. 29, 1994, Ser. No. 283,223
Int. Cl.[6] H03K *17/04*
U.S. Cl. 327—374 **15 Claims**

1. A method for preconditioning a circuit output coupled to one of a heavy capacitive load or a light capacitive load, said method comprising the steps of:

sensing a voltage level of said circuit output;

comparing said voltage level to at least a first reference voltage;

latching at least a first value in response to said comparison;

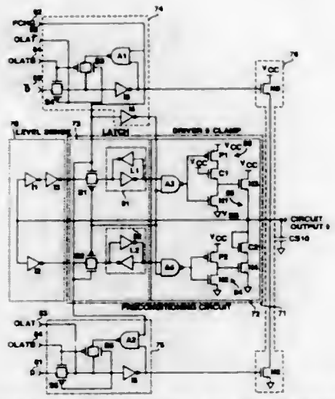
clamping said circuit output to an intermediate voltage level when said first value indicates that said circuit output is out of a range;

comparing said voltage level to a second reference voltage before the step of latching said first value;

latching a second value in response to the step of comparing said voltage level to said second reference voltage before the step clamping said circuit output to said intermediate voltage level;

5,559,468
FEEDBACK LOOP CLOSURE IN A LINEAR

5,559,470
CIRCUIT TECHNIQUE THAT SETS



wherein the step of latching said first value in response to said comparison is controlled by a control circuit;

wherein when said first value is latched, a first latch device for performing said step of latching said first value is inhibited from receiving a new value until said control circuit allows said latch device receive said new value;

wherein the step of clamping said circuit output to said intermediate voltage level is controlled by said control circuit;

wherein the step of comparing said voltage level to said first reference voltage includes (1) outputting a first high signal when said voltage level is below a first trip point and a first low signal when said voltage level is above said first trip point and (2) inverting one of said first high signal and said first low signal;

wherein the step of comparing said voltage level to said second reference voltage includes outputting a second high signal when said voltage level is below a second trip point and a second low signal when said voltage level is above said second trip point;

wherein said second trip point is higher than said first trip point;

wherein said first trip point is said first reference voltage, and said second trip point is said second reference voltage;

wherein the step of latching said first value includes the steps of (1) passing one of said first high signal and said first low signal through a first analog switch circuit and (2) latching one of said first high signal and said first low signal in said first latch device; and

wherein the step of latching said second value includes the steps of (1) passing one of said second high signal and said second low signal through a second analog switch circuit and (2) latching one of said second high signal and said second low signal in a second latch device.

5,559,466

SEMICONDUCTOR RELAY FOR TRANSMITTING HIGH FREQUENCY SIGNALS

Hisaya Okumura, Kawasaki, and Yoshiaki Aizawa, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

Filed Jul. 25, 1994, Ser. No. 279,892

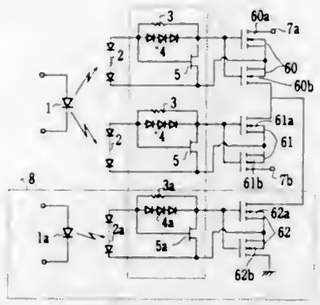
Claims priority, application Japan, Jul. 29, 1993, 5-188461

Int. Cl.[6] H03K *3/42;17/92;17/687;* **G02B** *27/00*

U.S. Cl. 327—514 **7 Claims**

1. A semiconductor relay, comprising:

a first pair of MOSFETs including first and second MOSFETs oppositely connected in series with each other via a first connection point, said first and second MOSFETs each having a gate;



a second pair of MOSFETs including third and fourth MOSFETs oppositely connected in series with each other via a second connection point, said third and fourth MOSFETs each having a gate;

means for simultaneously turning on or turning off said first and second MOSFET pairs by applying a control signal between the gates of the first and second MOSFETs and said first connection point, and applying said control signal between the gates of the third and fourth MOSFETs and said second connection point; and

a switch which is inserted between a ground conductor and a junction between said first and second MOSFET pairs.

5,559,467

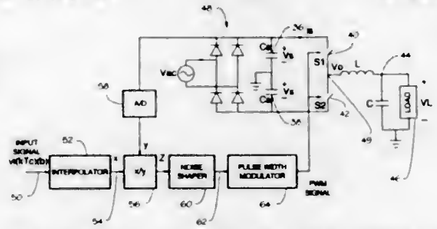
DIGITAL, PULSE WIDTH MODULATION AUDIO POWER AMPLIFIER WITH NOISE AND RIPPLE SHAPING

Keyue M. Smedley, Irvine, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Jan. 27, 1995, Ser. No. 379,800

Int. Cl.[6] H03F *3/38;1/30*

U.S. Cl. 330—10 **20 Claims**



1. An improvement in a digital pulse-width-modulated audio power amplifier having a substantially unregulated power source and a power switch for generating a digital PWM output signal comprising:

an analog-to-digital converter having an input coupled to said unregulated power source;

a digital divider having a dividend input, x, coupled to a digital audio input signal and a digital divisor input, y, coupled to an output of said analog-to-digital converter to generate a quotient output signal, x/y;

a noise shaper for selectively filtering said quotient output signal, x/y, from said digital divider; and

a pulse-width modulator having an input coupled to an output of said noise shaper, said pulse-width modulator having an output coupled to said power switch in said power amplifier to control switching of said power switch so that a power amplified output signal corresponding to said digital input signal is generated without distortion notwithstanding ripple on said unregulated power source.

5,559,468

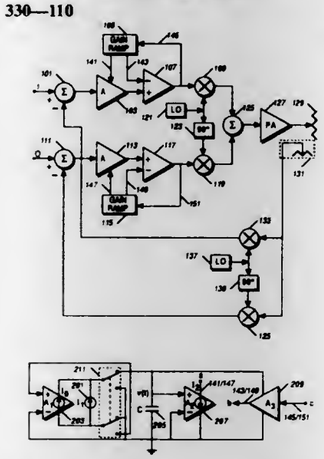
FEEDBACK LOOP CLOSURE IN A LINEAR TRANSMITTER

Paul H. Gailus, Prospect Heights; Ronald H. Chapman, Carol Stream, and Jeffrey B. Wilhite, Rolling Meadows, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 28, 1993, Ser. No. 84,661

Int. Cl.[6] H03F *1/34*

U.S. Cl. 330—110 **26 Claims**



1. An apparatus comprising:

a linear amplifier having a negative feedback loop that has a closed loop gain and a forward path gain; and

means for closing the negative feedback loop, wherein the means for closing prevents quick changes in the closed loop gain, thereby reducing splatter, wherein the means for closing comprises a secondary feedback loop.

5,559,469

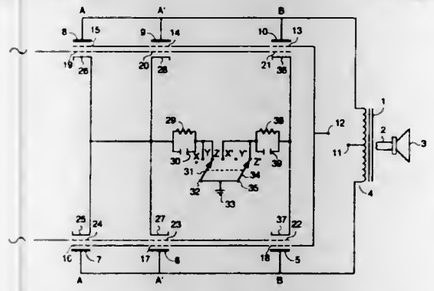
VACUUM TUBE AMPLIFIER WITH SELECTABLE POWER DEVICES

Randall C. Smith, 1317 Ross St., Petaluma, Calif. 94952

Filed Mar. 14, 1994, Ser. No. 213,123

Int. Cl.[6] H03F *3/26;3/68*

U.S. Cl. 330—123 **10 Claims**



1. A power output amplifier for use with electric guitar comprising a plurality of pairs of output devices arranged in a substantially push-pull-parallel configuration wherein at least two of said pairs comprise devices of dissimilar types and further including a switch means such that the pairs of differing types of output device may be selected to function alternately.

5,559,470

CIRCUIT TECHNIQUE THAT SETS TRANSCONDUCTANCE

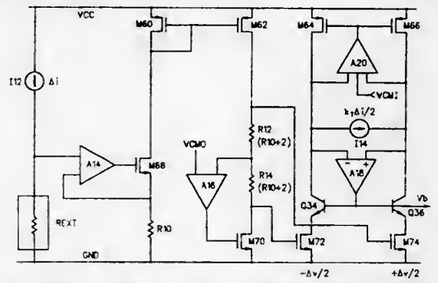
Carlos A. Laber, Los Altos, and Paul R. Gray, Orinda, both of Calif., assignors to Micro Linear Corporation, San Jose, Calif.

Continuation of Ser. No. 9,641, Jan. 27, 1993, abandoned.

This application Feb. 17, 1995, Ser. No. 391,256

Int. Cl.[6] H03F *3/45*

U.S. Cl. 330—252 **9 Claims**



4. An apparatus for setting a transconductance of a transconductor comprising:

a. a differential BiCMOS transconductance amplifier having a pair of differential inputs;

b. a voltage circuit for providing a predetermined differential voltage signal to the differential inputs;

c. a current circuit for providing a predetermined differential current signal to the transconductance amplifier; and

d. a differential feedback path for adjusting the transconductance of the transconductance amplifier in proportion to a ratio of the differential current signal to the differential voltage signal.

5,559,471

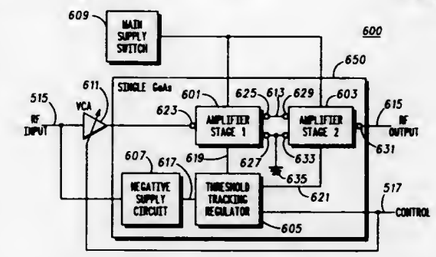
AMPLIFIER AND BIASING CIRCUIT THEREFORE

Gregory R. Black, Vernon Hills, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 21, 1994, Ser. No. 361,927

Int. Cl.[6] H03F *3/193*

U.S. Cl. 330—277 **15 Claims**



1. A power amplifier for amplifying a radio frequency (RF) signal, the power amplifier having a RF input signal and a RF output signal, the power amplifier comprising:

an amplifier stage having a gate threshold voltage, a drain port, a gate port and a source port, the source port is connected to an electrical ground, the gate port is coupled to receive the RF input signal, the drain port is coupled to provide the RF output signal;

a main power supply coupled to the drain port of the amplifier stage;

a biasing power supply circuit coupled to receive the RF input signal, the RF input signal being the power supply for the biasing power supply circuit, the biasing power supply circuit

to generate a RF generated negative biasing voltage and to

5,559,475

isolation, comprising:

to generate a RF generated negative biasing voltage and to supply the RF generated negative biasing voltage to the amplifier stage; and

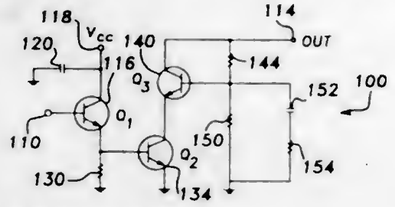
a gate threshold tracking circuit coupled to the gate port of the amplifier stage to track the RF generated negative biasing voltage.

5,559,472

LOSS COMPENSATED GAIN CELL FOR DISTRIBUTED AMPLIFIERS

Kevin W. Kobayashi, Torrance, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed May 2, 1995, Ser. No. 433,266
Int. Cl.[6] H03F *1/34;3/19*
U.S. Cl. 330—293 **31 Claims**



1. An electrical circuit comprising:

an amplifier including an amplifier input and an amplifier output;

a gain cell having low input and output losses at microwave frequencies due to input and output attenuation compensation of said gain cell, said gain cell being coupled between the amplifier input and the amplifier output for providing gain, said gain cell including:

input means, coupled to said amplifier input and including a common-collector bipolar transistor having a base coupled to said amplifier input, for reducing input capacitance and resistive losses at microwave frequencies; and

output means, coupled to said amplifier output and including a common-base bipolar transistor in series with a common emitter bipolar transistor, for reducing output resistive losses at microwave frequencies, of said common-collector bipolar transistor defining an equivalent circuit according to the right hand side of the following relationship:

$$C \leq \frac{R_{11}C_{11}}{|\beta_o * (R_b + R_e)|}$$

wherein R_e is a first parasitic resistance, C_e is an input capacitance, β_o is an ac beta at low frequencies, R_b is a second parasitic resistance, R_e is a third parasitic resistance, and wherein the size and bias of said common-emitter bipolar transistor, which determines an effective input capacitance of said common-emitter bipolar transistor, is defined by C.

5,559,473

MULTI-RANGE VOLTAGE CONTROLLED OSCILLATOR

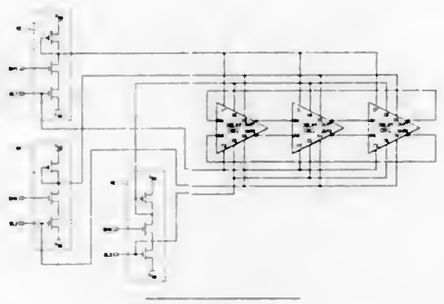
Michael B. Anderson, and Kenneth C. Schmitt, both of Colorado Springs, Colo., assignors to AT&T Global Information Solutions Company, Milpitas, Calif., and Hyundai Electronics America & Symbios Logic Inc., Fort Collins, Colo.

Filed Jun. 23, 1994, Ser. No. 264,815
Int. Cl.[6] H03L *7/00*
U.S. Cl. 331—34 **16 Claims**

1. A multi-range voltage controlled oscillator operable at a plurality of dissimilar operating frequency ranges, comprising:

a plurality of delay cells with booster inverters; and

means for scaling current in at least one of the booster inverters to alter operating frequency range of the oscillator.

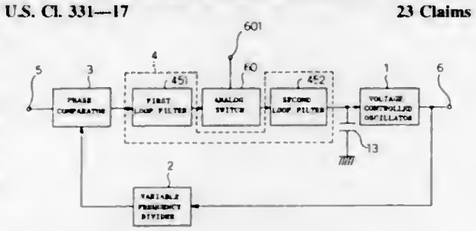


5,559,474

FREQUENCY SYNTHESIZER WITH CONTROLLABLE LOOP FILTER

Takayuki Matsumoto, Kadoma; Hisashi Adachi, Mino; Hiroaki Kosugi, Hirakata, and Makoto Sakakura, Uji, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed May 26, 1995, Ser. No. 450,895
Claims priority, application Japan, May 26, 1994, 6-113055; Aug. 22, 1994, 6-196429
Int. Cl.[6] H03L *7/08;7/093;7/099;7/18*
U.S. Cl. 331—17 **23 Claims**



1. A frequency synthesizer comprising:

a voltage controlled oscillator in which an output oscillation frequency can continuously be changed in accordance with a value of a control signal voltage;

a variable frequency divider which divides a frequency of an output signal of said voltage controlled oscillator;

a phase comparator which compares a phase of an output signal of said variable frequency divider with a phase of a reference signal, and which outputs the control signal voltage;

a loop filter which limits a frequency band of an output signal of said phase comparator, said loop filter including at least one capacitor; and

an ON/OFF switch which is disposed at a position closer to said phase comparator than at least a part of said loop filter, and which closes and opens a loop state consisting of said voltage controlled oscillator, said variable frequency divider, said phase comparator, and said loop filter,

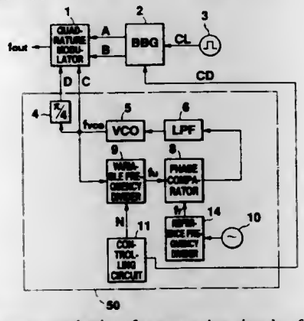
said at least one capacitor of said loop filter disposed between said ON/OFF switch and said voltage controlled oscillator having properties in which a capacitance change in response to an applied voltage is smaller than a predetermined value and hysteresis is smaller than a predetermined value.

5,559,475

FREQUENCY SYNTHESIZER FOR SYNTHESIZING SIGNALS OF A VARIETY OF FREQUENCIES BY CROSS MODULATION

Shinjiro Fukuyama, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1995, Ser. No. 404,624
Claims priority, application Japan, Mar. 16, 1994, 6-046104
Int. Cl.[6] H03L *7/18;* **H04L** *27/20*
U.S. Cl. 331—31 **7 Claims**



3. A frequency synthesizer for generating signals of a variety of frequencies, comprising:

a signal generator for outputting two signals of a predetermined frequency and of phases different from each other by 90 degrees;

a base band generator for digitally generating two shifting signals of a frequency designated by a command and of phases different from each other by 90 degrees; and

a quadrature modulator for performing quadrature modulation with two output signals from said signal generator and two shifting signals from the base band generator, in order to output a signal shifted by just the frequency of the shifting signal from that of the output signal from the signal generator;

wherein said base band generator sequentially reads out the digital data written in a built-in-memory in accordance with a clock supplied from an outside clock oscillator and converts the read out digital data into analog signals using a D/A converter in order to generate the shifting signals; and

wherein the read out address of said digital data read out from the built-in-memory is changed by a step k (where k is a variable integer) thereby allowing the frequencies of the two shifting signals to be changed by changing the value of the step k without changing the frequency of the clock supplied from the outside oscillator.

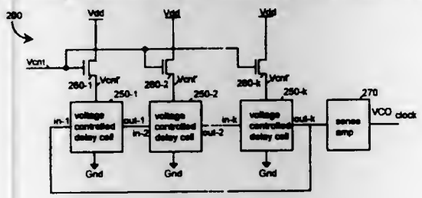
5,559,476

VOLTAGE CONTROLLED OSCILLATOR INCLUDING VOLTAGE CONTROLLED DELAY CIRCUIT WITH POWER SUPPLY NOISE ISOLATION

Zhongxuan Zhang, Fremont, and He Du, Campbell, both of Calif., assignors to Cirrus Logic, Inc., Fremont, Calif.

Filed May 31, 1995, Ser. No. 455,311
Int. Cl.[6] H03B *5/02*
U.S. Cl. 331—57 **23 Claims**

1. A voltage controlled delay circuit with power supply noise isolation, comprising:



delay means responsive to an input voltage for varying the delay of a signal propagating through said delay means, and

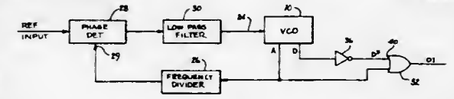
a transistor having a drain connected to a power supply, a gate connected to a control voltage, and a source providing said input voltage to said delay means such that said input voltage follows said control voltage and is isolated from noise on said power supply connection to said transistor.

5,559,477

PULSE GENERATOR HAVING CONTROLLED DELAY TO CONTROL DUTY CYCLE

Orhan Tozun, Monte Sereno; Chit-Ah Mak, Fremont, and Werner Hoeft, Saratoga, all of Calif., assignors to International Microcircuits, Inc., Milpitas, Calif.

Continuation of Ser. No. 194,533, Feb. 10, 1994. This application Sep. 15, 1995, Ser. No. 528,603
Int. Cl.[6] H03B *5/02;* **H03K** *3/017;* **H03L** *7/099*
U.S. Cl. 331—97 **5 Claims**



1. A circuit for generating a train of pulses having a selectable duty cycle, comprising:

a source of pulses comprising:

an odd number of similar inverters connected in a series ring to form an oscillator; and

delay means for causing said inverters to have a selectable gate delay, said delay means comprising:

an odd number of voltage controlled current sources equal in number to said inverters and respectively connected to P channel current inputs thereof; and

an odd number of voltage controlled current sources equal in number to said inverters and respectively connected to N channel current inputs thereof, said current sources having respective control inputs connected to a source of a control voltage, said current sources each providing a current proportional to said control voltage whereby said inverters and said current sources form a voltage controlled oscillator (VCO), the inputs thereof being controlled inputs;

a gate having an input connected to said pulse source wherein said gate is an inverter of said oscillator;

means for causing said gate to have a selectable gate delay; and

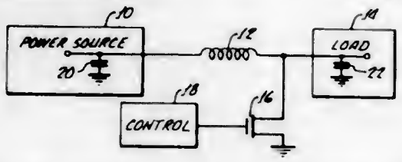
means for logically combining the output of said pulse source with the output of said gate.

5,559,478

HIGHLY EFFICIENT, COMPLEMENTARY, RESONANT PULSE GENERATION

William C. Athas, Redondo Beach, and Lars G. Svensson, Santa Monica, both of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Jul. 17, 1995, Ser. No. 503,169
Int. Cl.[6] H02M *7/5383;* **H03K** *3/354*
U.S. Cl. 331—117 FE **26 Claims**



9. A pulse generating circuit for driving a load having an input capacitance with a stream of pulses, each pulse having a substantially sinusoidal shape, comprising:

A. a power source having an output capacitance;

B. an inductor connected to said power source and to the load which cooperates with the output capacitance and the input capacitance to generate the stream of sinusoidal pulses; and

C. a clamping device connected to said inductor for preventing the stream of pulses which are driving the load from exceeding a clamping level.

5,559,479

VOLTAGE CONTROL OSCILLATOR VARIABLE CAPACITANCE DIODE BIASING CIRCUIT

Hideki Ohmori, and Kenji Fukayama, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 15, 1995, Ser. No. 404,728
Claims priority, application Japan, Mar. 17, 1994, 6-047548
Int. Cl.[6] H03B *5/00*
U.S. Cl. 331—177 V **12 Claims**

1. A voltage control oscillator which has an oscillator circuit comprising at least an inductive resonator, active element, and variable capacitance diode, comprising:

a bias circuit comprising a low-pass filter comprising a resistor and a capacitor, said bias circuit reducing oscillation amplitude of the oscillation circuit; and

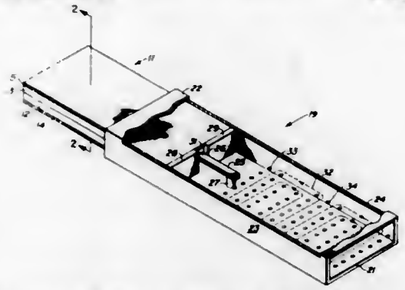
means for externally applying a direct current control voltage to the variable capacitance diode through said bias circuit to change an oscillation frequency by altering a capacitance value of the variable capacitance diode with variations of the direct current voltage, said oscillation frequency being set higher than a cut-off frequency of the low-pass filter.

5,559,480

STRIPLINE-TO-WAVEGUIDE TRANSITION

Andrew Ivanivsky, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 22, 1983, Ser. No. 526,746
Int. Cl.[6] H01P *1/16;* **H03H** *5/00*
U.S. Cl. 333—21 R **6 Claims**



1. A coplanar stripline-to-waveguide transition device, comprising;

a stripline having a terminal end;

a rectangular waveguide having two broad and two narrow inner walls and having a receiving end coupled to said stripline terminal end, said stripline terminal end fitting snugly within said rectangular waveguide receiving end;

a conductive strip extension coplanar with and extending from said stripline into said rectangular waveguide, said conductive strip having a remote end centrally positioned within said rectangular waveguide;

a conductive ground post orthogonally connecting said conductive strip extension remote end to one of said rectangular waveguide broad inner walls; and

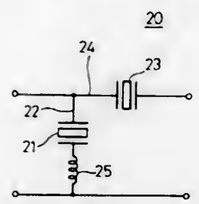
a pair of conductive stripline termination plates mounted on said stripline terminal end on each side of said conductive strip extension coupling one of said rectangular waveguide broad inner walls with the opposite broad inner wall.

5,559,481

SURFACE ACOUSTIC WAVE FILTER

Yoshio Satoh; Osamu Ikata; Tsutomu Miyashita; Takashi Matsuda, and Mitsuo Takamatsu, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 23, 1992, Ser. No. 965,774
Claims priority, application Japan, Oct. 28, 1991, 3-281694; Feb. 19, 1992, 4-032270
Int. Cl.[6] H03H *9/64*
U.S. Cl. 333—143 **52 Claims**



1. A SAW filter comprising:

a first SAW resonator having a pair of terminals and a predetermined resonance frequency (f_{r1}), said first SAW resonator being provided in a parallel arm of the SAW filter;

a second SAW resonator having a pair of terminals and a predetermined resonance frequency (f_{r2}) approximately equal to a predetermined antiresonance frequency of the first SAW resonator (f_{ap}), said second SAW resonator being provided in a series arm of the SAW filter; and

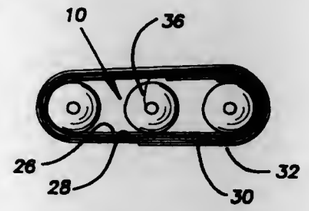
an inductance element connected in series with the first SAW resonator in the parallel arm, the inductance element functioning to increase the admittance of the parallel arm and decrease the resonance frequency.

5,559,482

DUAL SHIELDED RELAY REED PACK

Robert R. Close, Bedford, and William Knauer, Portage, both of Ohio, assignors to Keithley Instruments, Inc., Cleveland, Ohio

Filed May 17, 1995, Ser. No. 446,896
Int. Cl.[6] H01H *1/66*
U.S. Cl. 335—151 **13 Claims**



1. A relay, comprising:

first and second contacts, said contacts being connectable;

an operator that connects the contacts in one of an energized or de-energized state and disconnects the contacts in the other of the energized or de-energized state;

a first electrically conductive shield electrically connected to the first contact and disposed around the contacts and insulated therefrom;

a second electrically conductive shield electrically connected to the second contact and disposed around the contacts and insulated therefrom; and

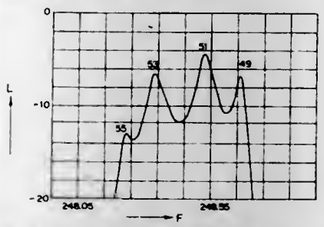
an insulating material disposed between the shields.

5,559,483

TWO-PORT TRIPLE-MODE SAW RESONATORS PARALLEL CONNECTED INTO A SAW FILTER ON A SUBSTRATE

Ryuuji Kajihara, and Yasushi Yamamoto, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 18, 1994, Ser. No. 292,038
Claims priority, application Japan, Aug. 20, 1993, 5-206219
Int. Cl.[6] H03H *9/64*
U.S. Cl. 333—195 **8 Claims**



1. A surface acoustic wave filter comprising:

a first two-port triple-mode surface acoustic wave resonator and a second two-port triple-mode surface acoustic ways resonator geometrically arranged and electrically connected in parallel with one another on a piezoelectric substrate, each of said first and second resonator comprising an input interdigital transducer and an output interdigital transducer oriented in a predetermined direction and a pair of grating reflectors outwardly of said input and said output interdigital transducers in said predetermined direction, each of said first and second resonators having a lower, a middle and a higher resonance frequency;

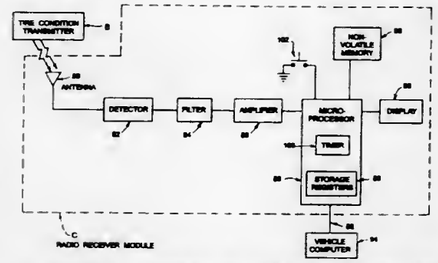
wherein said middle and higher resonance frequencies of said first resonator are in substantial coincidence with said lower and said middle resonance frequencies of said second resonator, to thereby smooth the filter pass band and attenuate spurious resonance peaks near the pass band.

5,559,484

DATA LOGGING TIRE MONITOR WITH CONDITION PREDICTIVE CAPABILITIES AND INTEGRITY CHECKING

Donald V. Nowicki, Lorain, and Christopher A. Munroe, Norwalk, both of Ohio, assignors to Epic Technologies, Inc., Norwalk, Ohio

Continuation-in-part of Ser. No. 699,758, May 14, 1991, Pat. No. 5,285,189. This application Feb. 7, 1994, Ser. No. 192,672
Int. Cl.[6] B60C *23/00*
U.S. Cl. 340—447 **8 Claims**



1. A method of monitoring the condition of a non-rotating pneumatic tire for use with a monitoring system having a transmitter device including a power supply, a condition sensor, a microcontroller, a radio signal generating circuit, and a receiver device for receiving radio siqnals, the method comprising the steps of:

disposing the transmitter device within the pneumatic tire;

sensing a vibration of said pneumatic tire while the tire is stationary;

enabling said microcontroller by connection of the microcontroller to the power supply through a first switch responsive to said sensed vibration by intermittently closing contacts of a vibration switch on the transmitter device and operating said first switch when said intermittently closing contacts of said vibration switch are closed;

sensing said pneumatic tire condition with said condition sensor;

controlling the radio signal generating circuit with the enabled microcontroller to generate a radio signal representative of said sensed pneumatic tire condition; and,

receiving the generated radio signal with the receiver device;

wherein said step of operating said first switch when said intermittently closing contacts of said vibration switch are closed includes the steps of:

providing a buffering circuit in said first switch, the buffering circuit having a characteristic time constant;

connecting said microcontroller to the power supply through said first switch responsive to i) said intermittently closing contacts being closed and ii) said buffering circuit being in a first state; and,

maintaining said microcontroller connected to said power supply while said buffering circuit remains in said first state for at least a time period corresponding to said buffering circuit characteristic time constant.

5,559,485

DIELECTRIC RESONATOR

Michiaki Matsuo, Kawasaki; Masikazu Sagawa, Tokyo, and

ing member, said first and second bobbin housing members substantially completely enclosing their respective windings;

5,559,488

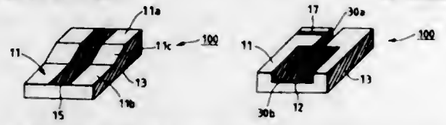
CURRENT LIMITING FUSE HAVING COMPACT STRUCTURE

5,559,485

DIELECTRIC RESONATOR

Michiaki Matsuo, Kawasaki; Morikazu Sagawa, Tokyo, and Mitsuo Makimoto, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 21, 1994, Ser. No. 360,875
Claims priority, application Japan, Dec. 24, 1993, 5-328245
Int. Cl.[6] H01P *7/04;7/10*
U.S. Cl. 333—222 **31 Claims**



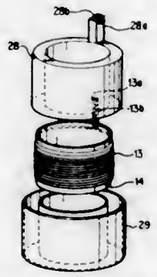
1. A dielectric resonator comprising:
a dielectric block having a preselected length in a predetermined direction;
a groove, extending in a surface of said dielectric block along the preselected length,
said groove having a continuous center line substantially parallel to said predetermined direction and having different widths relative to said center line;
an inner conductor provided on an inner surface of said groove; and
an outer conductor provided on an outer surface of said dielectric block,
wherein said groove has the different widths varying in stepwise fashion.

5,559,486

BOBBIN FOR HIGH FREQUENCY CORE

Tsuneo Ikenoue, 14-6 1-bancho 1-chome, Sendai-shi, Miyagi-ken, Japan, and Hisahiro Kamata, Iwanuma, Japan, assignors to Tohoku Ricoh Co., Ltd., and Tsuneo Ikenoue, both of Miyagi-ken, Japan

Continuation of Ser. No. 981,481, Nov. 25, 1992, abandoned.
This application Apr. 17, 1995, Ser. No. 424,580
Claims priority, application Japan, Nov. 28, 1991, 3-338002
Int. Cl.[6] H01F *27/02;27/30*
U.S. Cl. 336—90 **11 Claims**



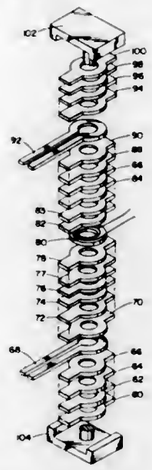
1. A bobbin arrangement for a high-frequency core having a center hole and having a first bobbin set and a second bobbin set, said first bobbin set enclosing a first winding, said second bobbin set enclosing a second winding, said first bobbin set arranged coaxially and concentrically with respect to said second bobbin set, each of set first and said second bobbin sets comprising:
a winding bobbin member on which the respective winding is wound;
a first bobbin housing member accommodating therein a predetermined portion of said winding bobbin member and respective winding;
a second bobbin housing member coupled with said first bobbin housing member coaxially so as to cover a portion of said winding bobbin member exposed from said first bobbin housing member, said first and second bobbin housing members substantially completely enclosing their respective windings; and
a leading-out guide provided on said second bobbin housing member for insertion and leading-out of lead wires of said respective winding wound on said winding bobbin member.

5,559,487

WINDING CONSTRUCTION FOR USE IN PLANAR MAGNETIC DEVICES

Jerry L. Butcher, Chesterland, and Harold E. Lee, Lorain, both of Ohio, assignors to Reltec Corporation, Lorain, Ohio

Filed May 10, 1994, Ser. No. 241,176
Int. Cl.[6] H01F *15/10;27/30*
U.S. Cl. 336—178 **21 Claims**



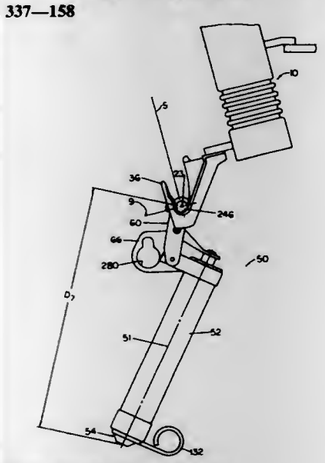
1. A transformer assembly comprising:
a first winding having a first surface and a second surface;
first reflowable material, disposed adjacent the first surface of the first winding;
second reflowable material, disposed adjacent the second surface of the first winding;
a second winding having a first surface and a second surface;
third reflowable material, disposed adjacent the first surface of the second winding;
fourth reflowable material, disposed adjacent the second surface of the second winding;
insulation means disposed adjacent a surface of the first reflowable material opposite the first winding, disposed adjacent a surface of the fourth reflowable material opposite the second winding and between the second and third reflowable material; and
a core means inserted into apertures of at least the first winding and the second winding, defining a magnetic path linking the first and second windings.

5,559,488

CURRENT LIMITING FUSE HAVING COMPACT STRUCTURE

Stephen P. Hassler, Muskego, Wis.; Stephen P. Johnson, Olean, N.Y., and John Lapp, Franklin, Wis., assignors to Cooper Industries, Inc., Houston, Tex.

Division of Ser. No. 946,961, Sep. 17, 1992, Pat. No. 5,274,349.
This application May 24, 1993, Ser. No. 67,512
Int. Cl.[6] H01H *85/04*
U.S. Cl. 337—158 **58 Claims**



1. A current limiting fuse, comprising:
a body;
a support structure disposed within said body and having spaced-apart fuse element supporting surfaces;
a fuse element spirally disposed about said support structure in a plurality of spaced-apart turns, said fuse element being in contact with said supporting surfaces and having an array of reduced area portions;
wherein said reduced area portions of said array are nonrandomly disposed about said support structure so as to be substantially free from contact with said supporting surfaces;
wherein said reduced area portions in said turns of said fuse element are aligned in columns; and
wherein said reduced area portions in at least one of said turns of said fuse element are offset from said reduced area portions in said turns that are adjacent to said one turn.

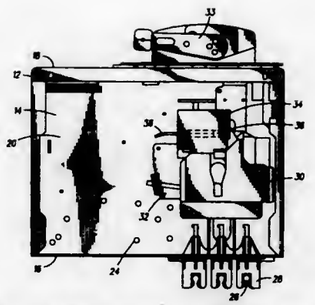
5,559,489

FUSE HOLDER FOR AN ELECTRIC SWITCH

Conrad Welden, Chapel Hill, N.C., assignor to Square D Company, Palatine, Ill.

Filed Sep. 13, 1994, Ser. No. 305,375
Int. Cl.[6] H01H *85/14*
U.S. Cl. 337—215 **17 Claims**

1. A fuse holder for attachment to a fusible switch having one or more phases between the line and load side of a circuit, the fusible switch having a switch base assembly for opening and closing a switch contact, the switch base assembly having a mounting surface, the fuse holder comprising:
a generally planar base made of electrically-insulating material, the base having a top and bottom face, the top face having a plurality of upstanding walls integrally formed therewith which define a compartment corresponding to each phase, the bottom face having a contoured surface adapted to abut the mounting surface of the switch base assembly, bottom face having a plurality of upstanding tabs integrally formed therewith which define a u-shaped channel corresponding to each phase, the channel extending across the bottom face of the base and having a cross-sectional size sufficient to accommodate the elongated connector therethrough, the plurality of upstanding tabs being adapted to abut the mounting surface of the switch base assembly;
a first and second fuse clip corresponding to each phase, the first and second fuse clip being secured on opposite ends of the top face within the compartment;
terminal means for connecting to the load side of the circuit, the terminal means electrically and mechanically connecting to the first fuse clip;
an elongated connector having two ends, one end of the connector electrically and mechanically connecting to the second fuse clip, the opposite end of the connector being adapted to electrically connect to the switch contact and the line side of the circuit;
means for securing the base to the mounting surface of the switch base assembly, the securing means being coupled to the base.

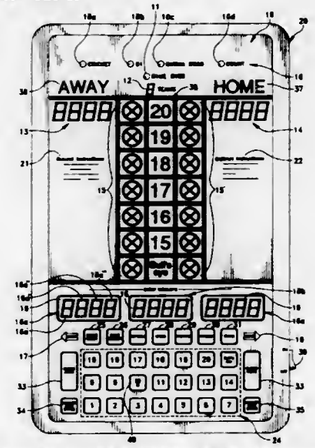


5,559,490

ELECTRONIC SCORING APPARATUS FOR DART GAMES

Joseph A. McDonald, Quincy, and Algis E. Karosas, Hingham, both of Mass., assignors to Majek, Inc., Braintree, Mass.

Filed Jul. 14, 1994, Ser. No. 275,126
Int. Cl.[6] G08B *23/00*
U.S. Cl. 340—323 R **5 Claims**



1. An electronic scoring apparatus for dart games comprising:
a housing,
a control and display panel on said housing,
means on said panel for selection of one of a plurality of dart games,
a game selection light array on said panel,
scoring entering means for said plurality of games on said panel,

two lighted numerical displays, each of said numerical displays comprising a plurality of digits for indicating scores,

5,559,492

SYNCHRONIZED STROBE ALARM SYSTEM

function of said temperature of said oil, said function establishing a penalty factor multiplier which increases with

two lighted numerical displays, each of said numerical displays comprising a plurality of digits for indicating scores,

a lighted entry display field indicating quantities of hits, and targets hit, for any three dart throw;

input switches adapted to define any of sixty-two scoring areas of different numerical values on a dart board with no more than two keystrokes, and

a plurality of displays on said panel for a dart game of Cricket, said displays being operable to indicate the first three hits for each of said targets by at least five display symbols historically used in said game of Cricket; wherein said lighted displays for said first three hits on each of said targets in said game of Cricket are illuminated in such a fashion as to provide an indication of the score for said first three hits and the manner in which said score was compiled, whereby to provide an observer of said apparatus with an indication as to the ease with which a player compiled said score.

5,559,491

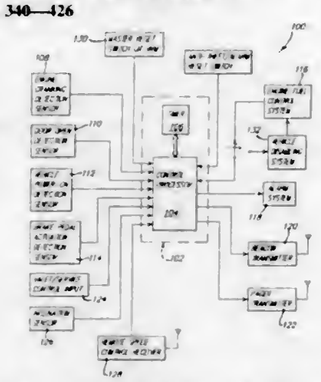
AUTOMATICALLY ARMED VEHICLE ANTI-THEFT SYSTEM

David M. Stadler, 28421 Santa Barbara, Lathrup Village, Mich. 48076

Continuation-in-part of Ser. No. 990,418, Dec. 15, 1992, Pat. No. 5,394,135, which is a continuation-in-part of Ser. No. 801,701, Dec. 2, 1991, Pat. No. 5,172,094. This application Feb. 28, 1995, Ser. No. 395,432

Int. Cl.[6] B60R *25/10*

U.S. Cl. 340—426 **17 Claims**



1. An automatically armed motorized vehicle anti-theft system comprising:

a first sensor means for providing an output signal in response to detection of either an attempt to start the vehicle motor or the opening of a vehicle door;

a timer means having a timer cycle, said timer means being responsive to detection of vehicle power activation and to said first sensor means output signal for automatically starting the timer cycle, wherein when the timer cycle is complete, said timer means outputs a trigger signal;

means for generating a first reset signal to reset said timer means;

an engine speed detection means coupled to the vehicle engine for providing a signal representative of contemporaneous engine operating speed;

a second sensor means for providing an output signal in response to actuation of a vehicle brake mechanism; and

a vehicle disabling means which is responsive to said trigger signal, said engine operating speed signal, and said second sensor means output signal, for only permitting the vehicle engine to operate properly near an engine idling speed in response to detection of a vehicle brake actuation after the receipt of said trigger signal.

5,559,492

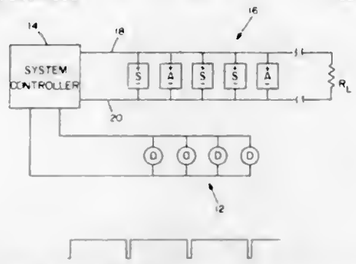
SYNCHRONIZED STROBE ALARM SYSTEM

Albert J. Stewart, Otter River, and Lawrence G. Stanley, Templeton, both of Mass., assignors to Simplex Time Recorder Co., Gardner, Mass.

Continuation of Ser. No. 126,791, Sep. 24, 1993, abandoned. This application Jan. 25, 1996, Ser. No. 591,902

Int. Cl.[6] G08B *5/00*

U.S. Cl. 340—331 **13 Claims**



4. A building alarm system comprising:

a plurality of warning strobes powered through common power lines, each strobe comprising:

a flash lamp;

a capacitor for carrying a charge to be discharged through the flash lamp;

a charging circuit powered from the power lines for applying a series of current pulses to the capacitor to charge the capacitor; and

a firing circuit connected to the capacitor responsive to a pulsed change in voltage across the power lines to discharge the capacitor through the flash lamp; and

a system controller connected to the power lines for responding to an alarm condition to power the plurality of warning strobes and to cause the pulsed change in voltage to cause the strobes to flash in synchronization with each other wherein the system controller applies across the strobes a supply voltage of a first polarity during an alarm condition to power the strobes, and a supervisory voltage of a second polarity during a nonalarm condition to monitor for a fault in the power lines, the second polarity being the reverse of the first polarity.

5,559,493

AUTOMOBILE ANTI-THEFT DEVICE

Daniel Karnwie-Tuah, 605 Harriet Ave., Apt. No. 509, Shoreview, Minn. 55126

Filed May 5, 1994, Ser. No. 238,427

Int. Cl.[6] B60R *25/10*

U.S. Cl. 340—426 **20 Claims**

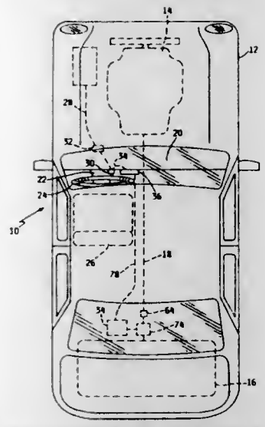
1. A combination vehicle and vehicle anti-theft device comprising:

(a) a vehicle;

(b) a control unit affixed to the interior of said vehicle, said control unit being electrically connected to a power source for the provision of power to said vehicle anti-theft device, said control unit having a first means for input for generating a personal access code, a first means for display, an operational control chip in communication with said first means for display and said first means for input for communication of said personal access code, a retractable penetrating adapter in communication with said operational control chip, and a means of locking for restricting access to said retractable penetrating adapter;

(c) a circuit unit having a valve attached in fuel-flow relationship to a fuel line of said vehicle, said circuit unit having a programmable read-only memory having a stored key access, said programmable read only memory being in communication with said operational control chip for receipt and comparison of said personal access code to said stored key access for communication of a compared signal, said valve being in communication with said programmable read-only memory for permitting fuel-flow passage within said fuel line upon receipt of said compared signal; and

(d) an independent and remotely located programming unit separated from said vehicle, said programming unit having a power source, an interface operational chip, a second means for display in communication with said interface operational chip, a second means for input for generation of a change signal for modification of said stored key access within said programmable read-only memory, and a receiving adapter in communication with said interface operational chip for coupling to said penetrating adapter during modification of said stored key access within said programmable read-only memory.



5,559,494

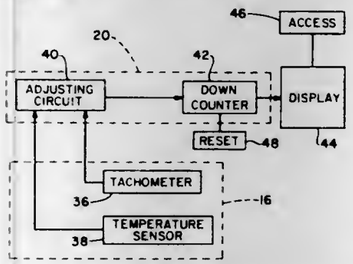
TRANSMISSION OIL MONITOR SYSTEM

Scott M. Thompson, Zionsville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 18, 1992, Ser. No. 992,677

Int. Cl.[6] B60Q *1/00*

U.S. Cl. 340—439 **3 Claims**



1. Apparatus for monitoring the condition of oil in a transmission, comprising:

first means connected to the transmission for sensing an actual number of revolutions of the transmission during transmission operation;

second means connected to the transmission for sensing the temperature of the oil during said operation;

third means connected to said first and second means generating an effective number of transmission revolutions during said operation, said effective number comprising said actual number weighted as a function of said temperature, said effective number being derived from said actual number as a linear function of said temperature of said oil, said function establishing a penalty factor multiplier which increases with increasing temperature, said effective number being said actual number multiplied by said penalty factor; and

fourth means connected to said third means for totalling said effective number of revolutions over a course of transmission operations and producing an indicia that servicing of the oil is required when said total of said effective number of revolutions exceeds a particular level.

5,559,495

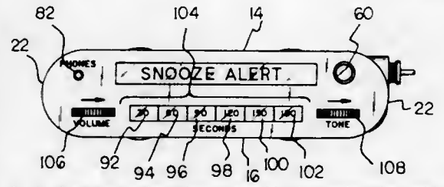
SLEEP-PREVENTING ALARM OPERABLE IN CONJUNCTION WITH A MOTOR VEHICLE

Danny M. Cochran, 109 NW. Rock Creek Cir., Ankeny, Iowa 50021

Filed Jan. 17, 1995, Ser. No. 373,760

Int. Cl.[6] B60Q *5/00*

U.S. Cl. 340—457 **8 Claims**



1. A sleep-preventing alarm operable in conjunction with a motor vehicle for providing a periodic visual and audible alert to thereby preclude a driver of a motor vehicle from falling asleep comprising, in combination:

a hollow rigid housing having a top wall, a bottom wall, and a periphery interconnecting the top wall with the bottom wall formed of an upstanding oval front face, an upstanding oval rear face, and a pair of opposed and curved side walls;

a rigid mounting bracket having a planar central portion removably coupled to the housing and two L-shaped feet extended downwards therefrom, each foot further having a pair of mounting holes formed thereon and with each mounting hole adapted to receive a bolt for coupling the mounting bracket to a vehicle, each foot additionally having a layer of adhesive applied thereto between the mounting holes and covered with a peel-off paper backing and with the backing removed for adhering the feet to a surface of a vehicle;

timer circuitry disposed within the housing for transmitting a periodic indicator signal upon completion one of a 30-second interval in a first mode of operation, a 60-second time interval in a second mode of operation, a 90-second interval in a third mode of operation, a 120-second interval in a fourth mode of operation, a 150-second interval in a fifth mode of operation, and a 180-second interval in a sixth mode of operation;

a lamp extended through the front face of the housing for transmitting a visual alert upon receipt of a lamp indication signal;

a speaker extended from the top wall of the housing for transmitting an audible alert upon receipt of a speaker activation signal;

indicator circuitry coupled to the timer circuitry, the speaker, and the lamp and with the indicator circuitry generating both a periodic lamp indication signal for a pre-determined amount of time and a periodic speaker activation signal with a characteristic strength and frequency for a pre-determined amount of time upon receipt of the indicator signal from the timer circuitry, the indicator circuitry further including a head-phone jack coupled thereto and with the head-phone jack couplable with an external head-phone set;

keypad circuitry extended from the housing and coupled to the timer circuitry and indicator circuitry, the keypad circuitry including a first, a second, a third, a fourth, a fifth, and a sixth back-lit momentary pushbutton switch and with the pushbutton switches arranged in a horizontal sequential fashion to

define a timing bar, the first pushbutton depressible for placing the timing circuitry in a first mode of operation, the second pushbutton depressible for placing the timing circuitry in a second mode of operation, the third pushbutton depressible for placing the timing circuitry in a third mode of operation, the fourth pushbutton depressible for placing the timing circuitry in a fourth mode of operation, the fifth pushbutton depressible for placing the timing circuitry in a fifth mode of operation, and the sixth pushbutton depressible for placing the timing circuitry in a sixth mode of operation, the keypad circuitry further including a volume control dial and a tone control dial extended from the front face of the housing with the volume control dial rotatable for adjusting the strength of the speaker activation signal and thereby controlling the volume of the audible alert transmitted from the speaker and with the tone control dial rotatable for adjusting the frequency of the speaker activation signal and thereby controlling the pitch of the audible alert signal transmitted from the speaker;

a rotatable spring-loaded spool secured within the housing and including an actuateable spool switch engaged therewith and with the spool manually rotatable in one direction when a torquing force is applied thereto and automatically rotatable in an opposite direction upon activation of the switch; and

a power cable having a proximal terminal end coupled to the timer circuitry, indicator circuitry, and keypad circuitry and a distal plug end couplable with a lighter socket of a vehicle for receiving electrical energy therefrom for circuitry operation, the power cable positioned in a wrapped configuration around the spool and selectively manually payable therefrom and automatically retractable thereon.

5,559,496

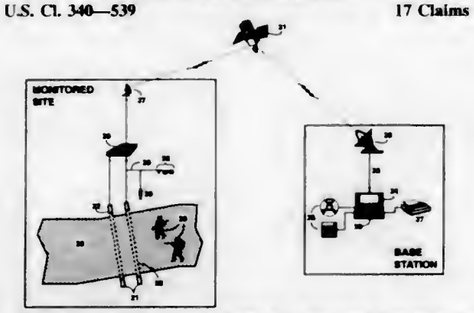
REMOTE PATROL SYSTEM

William C. Dubats, 12967 Crooked Lake La., Coon Rapids, Minn. 55448

Filed May 19, 1993, Ser. No. 64,766

Int. Cl.[6] G08B *1/08*; H04Q *7/00*

U.S. Cl. 340—539 **17 Claims**



1. An intrusion detection apparatus for detecting the presence of an object, comprising:

a. first energy projection means for projecting a first beam of energy along a first linear axis;

b. second energy projection means for projecting a second beam of energy along a second linear axis, wherein said second linear axis is substantially parallel to said first linear axis and is spaced a predetermined separation distance therefrom;

c. first receiving means positioned along the first linear axis at a predetermined distance from said first energy projection means, said first energy receiving means for receiving at least a portion of the first beam of energy projected by said first energy projection means, said first energy receiving means indicating an interruption in the first beam of energy when an object passes between said first energy projection means and said first energy receiving means;

d. second receiving means positioned along the second linear axis at a predetermined distance from said second energy projection means, said second energy receiving means for receiving at least a portion of the second beam of energy projected by said second energy projection means, said second energy receiving means indicating an interruption in the second beam of energy when an object passes between said second energy projection means and said second energy receiving means;

e. data log means coupled to said first energy receiving means and said second energy receiving means for storing data defining timing and duration of when said first energy receiving means indicates an interruption in said first beam of energy, and when said second energy receiving means indicates an interruption in said second beam of energy;

f. processing means located remotely from said data log means for processing the data log and for providing for user interface inputs and outputs; and

g. communication means coupled to said data log means and said processing means for transmitting the data from said data log means to said remotely located processing means.

5,559,497

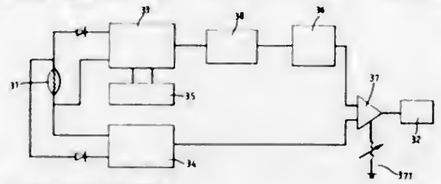
BODY TEMPERATURE SENSING AND ALARMING DEVICE

Chia-Ping Hong, P.O. Box 1750, Taichung, Taiwan

Filed Nov. 28, 1994, Ser. No. 345,944

Int. Cl.[6] G08B *23/00*

U.S. Cl. 340—573 **1 Claim**



1. A device comprising:

means for sensing body temperature and outputting temperature signals over time,

a first converting means for converting a sensed body temperature signal into a first reference value,

adder means coupled to said first converting means for adding a predetermined value to said first reference value so as to form a second reference value,

a second converting means for converting a sensed body temperature delayed in time from said body temperature signal converted by said first converting means into a third reference value,

comparator means coupled to said adder means and said second converting means for comparing said third reference value with said second reference value, and

alarming means coupled to said comparator means for generating alarm signals when said third reference value reaches said second reference value.

5,559,498

COMBINATION CONFINEMENT AND REMOTE TRAINING SYSTEM

Michael D. Westrick, and Greg V. Curen, both of Fort Wayne, Ind., assignors to Innotek Inc., Fort Wayne, Ind.

Filed Dec. 30, 1994, Ser. No. 366,898

Int. Cl.[6] G08B *23/00*

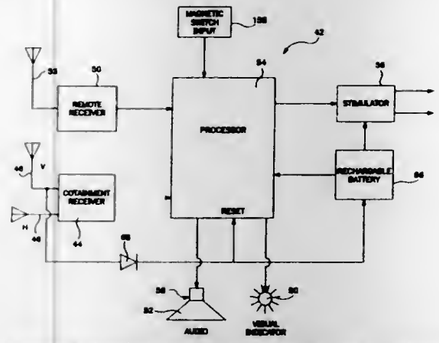
U.S. Cl. 340—573 **31 Claims**

1. A combined animal confinement and remote training system, comprising:

a confinement wire oriented to define a boundary;

a confinement transmitter associated with the confinement wire so that the confinement wire emits a transmitter signal from the confinement transmitter;

a confinement receiver fitted to the animal and tuned to receive the transmitter signal from the confinement transmitter;



a remote transmitter actuable to transmit a remote correction signal;

a remote receiver fitted to the animal and tuned to receive the remote signal from the remote transmitter;

a stimulator fitted to the animal; and

a processor associated with the stimulator and the confinement and remote receivers, the processor decoding both the remote correction signal and the transmitter signal from the confinement transmitter and activating the stimulator to administer a stimulation signal to the animal upon decoding one of the remote correction signal and the transmitter signal from the confinement transmitter.

5,559,499

RECEIVER FOR THE RECEPTION OF WIRELESSLY TRANSMITTED INFORMATION

Georg Haubner, Berg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

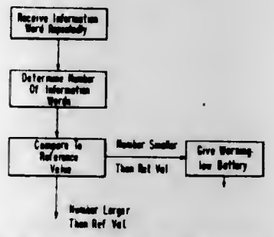
PCT No. PCT/DE92/01067, § 371 Date Aug. 1, 1994, § 102(e) Date Aug. 1, 1994, PCT Pub. No. WO93/15486, PCT Pub. Date Aug. 5, 1993

PCT Filed Dec. 19, 1992, Ser. No. 256,982

Claims priority, application Germany, Jan. 31, 1992, 42 02 759.4

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—636 **8 Claims**



1. A receiver for receiving information transmitted without the use of wires by infrared signals, which information is transmitted by a battery-operated transmitter in form of at least one information word including a plurality of bits, the receiver comprising an evaluating unit which evaluates received pulses and recognizes from the received pulse a diminishing of a battery capacity in a sending device; a display unit controlled for sending a warning signal when said evaluating unit recognizes a diminishing of the battery capacity of the sending device, said evaluating unit being designed so that it determines during a receiving process at least a number of completely received information words, said display unit being controlled for sending the warning signal when the number of the completely received information words is smaller than a predetermined reference value thus indicating the diminishing of the battery capacity.

5,559,500

OVERCURRENT SENSE CIRCUIT

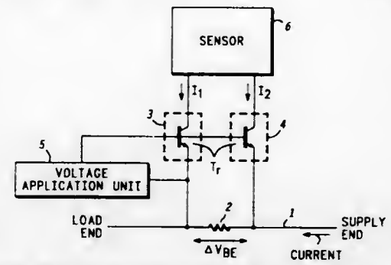
Kiyoshi Kase, Chiba, Japan, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 9, 1995, Ser. No. 401,751

Claims priority, application Japan, Mar. 11, 1994, 6-067697

Int. Cl.[6] G08B *21/00*

U.S. Cl. 340—664 **4 Claims**



1. An overcurrent sense circuit for detecting when an overcurrent flows through a load current conduction path, comprising:

a current sense resistor provided in said conduction path;

a first transistor section, comprised of a bipolar transistor, having its emitter connected to a load end of the current sense resistor;

a second transistor section, comprised of a bipolar transistor, having its emitter connected to a supply end of the current sense resistor, and its base commonly connected to a base of the first transistor section;

a voltage application unit for applying a voltage between each base and emitter of the first and second transistor sections; and

a sensor for detecting the overcurrent as a voltage across the current sense resistor, based on the collector current of the first transistor section and the collector current of the second transistor section.

5,559,501

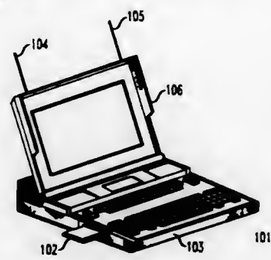
PLUG-IN WIRELESS MODULE FOR OPERATION WITH PORTABLE WIRELESS ENABLED HOST EQUIPMENT

Farhad Barzegar, Township of Hillsborough, Somerset County, and Peter B. Guerlain, Boonton, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Aug. 12, 1994, Ser. No. 289,739

Int. Cl.[6] H04B *1/06*

U.S. Cl. 340—825 **9 Claims**



1. A plug-in module for enabling wireless communication for a host electronic apparatus having an antenna,

comprising: the host electronic apparatus having a plug-in receptacle and having a connection from the receptacle to the antenna in addition thereto; and

the plug-in module having radio circuitry connectors to engage the plug-in receptacle to permit circuitry of the host to access base band circuitry of the radio circuitry and to access the antenna with terminals to access the antenna being extended

beyond a range of other plug-in terminals so as to not interfere with terminals of plug in modules not intending to access the antenna.

5,559,502

TWO-WIRE BUS SYSTEM COMPRISING A CLOCK WIRE AND A DATA WIRE FOR INTERCONNECTING A NUMBER OF STATIONS AND ALLOWING BOTH LONG-FORMAT AND SHORT-FORMAT SLAVE ADDRESSES

Herman Schutte, Groenewoudseweg 1, Eindhoven, Netherlands

Filed Jan. 14, 1993, Ser. No. 216,192

Int. Cl.[6] H04L *7/00*; **H03M** *13/00*; **G06F** *11/10*

U.S. Cl. 340—825.21 **20 Claims**

1. A communication bus system having an extended addressability feature, comprising:

a single clock wire and a single data wire each including logic means for enabling said wires to each assume a particular second voltage value and to enable each wire to be forced to a first voltage value;

a plurality of stations interconnected by said clock wire and said data wire, wherein at least one of said stations includes means for forcing each of said wires to their respective first voltage values and means for allowing each of said wires to assume their respective second voltage values, and wherein a master station is one of said stations which has gained priority to said data wire for initiating transfer of information on said data wire, said system being arranged for transferring information between said stations on said data wire under the synchronization of the voltage levels of said clock wire, and wherein each of said stations is addressable by one of (i) a long-format slave address and (ii) a short-format slave address;

arbitration means for selecting one of said stations as a master station upon more than one of said stations attempting to provide information on said data wire at the same time;

said master station having protocol means for generating information on said data wire in synchronization with the voltage level of said clock wire, said master station further including message formatting means for enabling said master station to produce in an initial byte of information one of

a) a short-format address and

b)(i) a control signal indicating a forthcoming long-format address and (ii) a first significant portion of the long-format address, and

if the control signal is present in the initial byte of data then in a second byte of data said message formatting means producing a second significant portion of the long-format address such that said master station does not address a station having a short-format address when addressing a station having a long-format address thereby enabling stations having both short-format and long-format addresses to communicate in said system.

5,559,503

A COMMUNICATIONS DEVICE FOR INITIALIZING TERMINALS IN A SIGNAL DISTRIBUTION SYSTEM

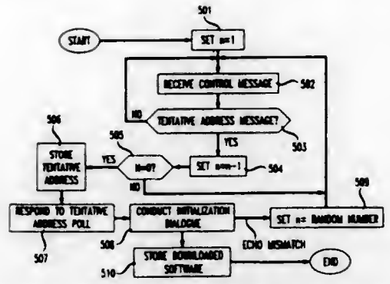
Donald E. Blahut, Holmdel, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 965,463, Oct. 23, 1992, Pat. No. 5,373,288. This application Dec. 12, 1994, Ser. No. 354,174

Int. Cl.[6] H04N *7/16*

U.S. Cl. 340—825.08 **4 Claims**

1. A method for use by a communications device for communicating with a server in a signal distribution system, said method comprising the steps of:



receiving a control message transmitted by said server, said control message containing a tentative address;

storing said tentative address as the specific address for said communications device, said specific address providing identification for said communications device when receiving said control message;

transmitting an uplink message to said server in response to a communication which includes said specific address; and

comparing an echoed uplink message transmitted by said server with said uplink message as originally sent by said communications device, and if such messages match, said specific address is assigned to said communications device.

5,559,504

SURFACE SHAPE SENSOR, IDENTIFICATION DEVICE USING THIS SENSOR, AND PROTECTED SYSTEM USING THIS DEVICE

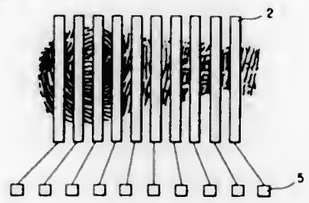
Kazuhiro Itsumi, Yokohama; Masayuki Shiratori, Kawasaki; Tatsuro Beppu; Shiroh Saitoh, both of Tokyo; Yujiro Naruse, Yokohama; Shigeki Obata, Kanagawa-ken, and Shunji Shirouzu, Ayase, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 7, 1994, Ser. No. 178,902

Claims priority, application Japan, Jan. 8, 1993, 5-002059; Sep. 20, 1993, 5-256401

Int. Cl.[6] H04Q *1/00*

U.S. Cl. 340—825.30 **20 Claims**



1. A sensor for sensing a surface shape of an object surface, comprising:

an input unit having a contact surface to be brought into contact with the object surface, said input unit having a plurality of electrodes arranged laterally with intervals in a first direction; and

a converter for detecting degrees of an electrical resistance between pairs of adjacent of said laterally arranged electrodes of said plurality of electrodes, and forming data representing a distribution of said electrical resistance in said first direction, said electrical resistance being variable by contact of said contact surface with the object surface.

5,559,505

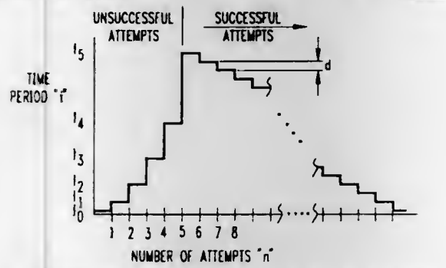
SECURITY SYSTEM PROVIDING LOCKOUT FOR INVALID ACCESS ATTEMPTS

Bruce E. McNair, Holmdel, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 886,539, May 20, 1992, abandoned. This application Mar. 21, 1995, Ser. No. 409,482

Int. Cl.[6] H04Q *1/00*

U.S. Cl. 340—825.31 **17 Claims**



1. A system for controlling access of a user to a resource comprising

means for determining the validity of a user-entered password,

means for allowing access to the resource if the password is valid,

means for allowing the same user to re-attempt access to said resource after a time interval "t", and

means for repeatedly increasing the value of "t" as a function of the number of invalid access attempts by the user.

5,559,506

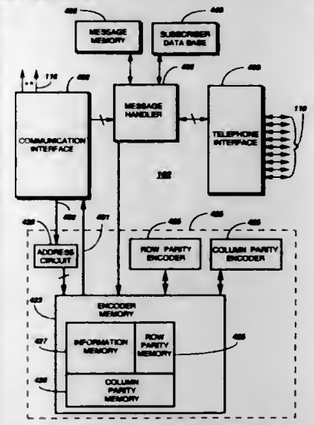
METHOD AND APPARATUS FOR ENCODING AND DECODING A DIGITAL RADIO SIGNAL

Clifford D. Leitch, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 4, 1994, Ser. No. 238,082

Int. Cl.[6] G06F *12/00*

U.S. Cl. 340—825.440 **20 Claims**



3. A system controller for use in a selective call radio communication system, wherein the system controller encodes information in a digital radio signal having N×Q×R information symbols, wherein Q, R, and N are positive integers, comprising:

an information memory for arranging the N×Q×R information symbols into N tiers of Q×R information symbols, wherein each tier of Q×R information symbols includes R rows having Q information symbols in each row, and includes Q columns having R information symbols in each column;

a parity generator, coupled to said information memory, for determining parity symbols from the information symbols, and generating a total quantity of N×(R+T)×(Q+S) symbols for transmission in the digital radio signal, wherein said parity generator comprises:

a row parity encoder, coupled to said information memory, for determining S row parity symbols for addition to each of the R rows as a function of the Q information symbols in each row, wherein S is a positive integer;

a row parity memory, coupled to said row parity encoder, for expanding each of the N tiers to Q+S columns by adding to each row of each tier the S row parity symbols determined for each row, at a predetermined location which is the same in each row;

a column parity encoder, coupled to said information and row parity memories, for determining T column parity symbols for addition to each of the Q+S columns as a function of the R symbols in each column, wherein T is a positive integer; and

a column parity memory, coupled to said column parity encoder, for expanding each tier to R+T rows by adding to each column the T column parity symbols determined for each column;

an address circuit, coupled to said encoder, for sequentially selecting each of the N×(R+T)×(Q+S) symbols, which is in one of (Q+S) columns, one of (R+T) rows, and one of N tiers, by sequentially selecting the (R+T) columns after sequentially selecting the (Q+S) rows after sequentially selecting the N tiers; and

a communication interface, coupled to said address circuit, for transmitting the sequentially selected symbols at a transmission rate of SPS symbol per second, and wherein SPS, Q, R, S, T, and U are related to a difference frequency of two transmitters of the radio communication system.

5,559,507

SIGNAL TRANSMISSION AND TAG READING CIRCUIT FOR AN INDUCTIVE READER

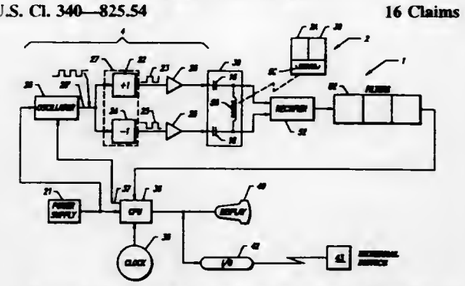
Michael L. Beigel, Corona, Calif., assignor to Avid Marketing, Inc., Norco, Calif.

PCT No. PCT/US92/04608, § 371 Date Nov. 30, 1993, § 102(e) Date Nov. 30, 1993, PCT Pub. No. WO92/22045, PCT Pub. Date Dec. 10, 1992

Continuation of Ser. No. 708,028, May 31, 1991, Pat. No. 5,266,926. This PCT application May 28, 1992, Ser. No. 150,175

Int. Cl.[6] G06K *19/077*; **G01S** *13/75*

U.S. Cl. 340—825.54 **16 Claims**



1. A signal transmission and tag power variation measurement circuit for an inductive tag reader wherein the tag reader is operative with a tag having an ID means for providing a data signal and a receiving coil coupled to the ID means for inducing a power supply voltage, the tag reader including a differential driver means coupled to a power source for producing first and second complementary drive signals, the gag power variation measurement circuit comprising:

a coil having first and second ends;

paired capacitors, including a first capacitor for first differentially coupling said first complementary drive signal to said

and second ends on either side of the road and defining first and second side boundaries, said crosswalk warning light system com-

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VEHICLE ROUTE GUIDANCE APPARATUS FOR

5,559,512

METHOD AND APPARATUS FOR ENTERING ALPHA-

paired capacitors, including a first capacitor for first differentially coupling said first complementary drive signal to said first end of the coil, and a second capacitor for second differentially coupling said second complementary drive signal to said second end of said coil, wherein each of said first and second differential couplings generates an electromagnetic field which is emitted from said coil, and wherein both of said first and second capacitors sense a data signal output from the tag;

rectifier means coupled to the first and second sides of the coil means in parallel with said capacitance bank for producing a rectified encoded signal representing the data signal; and

signal conversion means, coupled to said rectifier means, for providing an output signal representative of the data signal of the tag.

5,559,508

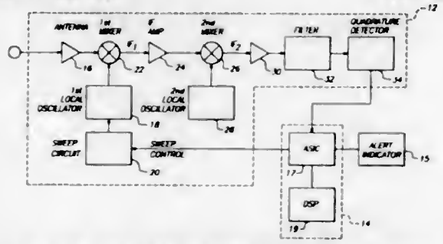
EMERGENCY VEHICLE DETECTOR

Steven K. Orr, Loveland, and Daniel G. Kindel, Mason, both of Ohio, assignors to Cincinnati Microwave, Inc., Cincinnati, Ohio

Filed Aug. 10, 1994, Ser. No. 288,335

Int. Cl.[6] G08G *1/0965*

U.S. Cl. 340—902 **6 Claims**



1. In a radar detector having means for detecting the presence of a radio frequency signal within a preselected frequency band and means for generating an alert thereto, wherein in the improvement, the detecting means includes means for distinguishing at least two discrete radio frequency signals each of which is fixed at a different frequency within the preselected frequency band and means for generating a modified alert upon detecting and distinguishing the discrete signals, wherein the discrete signals are fixed so as to differ in frequency by at least 40 MHz.

5,559,509

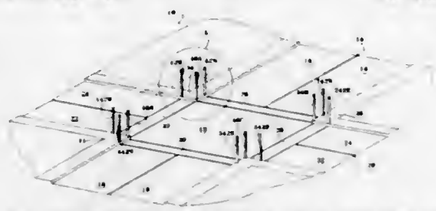
CROSS-WALK WARNING LIGHT SYSTEM

Terry B. Ogle, 1341 Dolly Parton Pkwy., Sevierville, Tenn. 37862

Filed Jan. 9, 1995, Ser. No. 369,902

Int. Cl.[6] G08G *1/095*

U.S. Cl. 340—944 **20 Claims**



1. A crosswalk warning light system for giving visual indication to motor traffic on a selected road that at least one pedestrian is within a crosswalk crossing the selected road by illuminating the cross-walk and objects therein, the crosswalk terminating at first and second ends on either side of the road and defining first and second side boundaries, said crosswalk warning light system comprising:

a power supply;

at least a first scanning laser vertically spaced from ground for scanning at least a portion of said cross-walk with at least a portion of said visual indication, said scanned portion defining a paint area, said portion of said visual indication including at least a first scanning beam of laser light;

at least a first scanning laser support for supporting said first scanning laser above and proximate said cross-walk such that said first scanning laser illuminates said paint area;

a sensor for detecting at least one pedestrian entering said crosswalk at either of said first and second ends of said crosswalk; and

a controller for activating and deactivating said first scanning laser, said controller activating said first scanning laser upon detection by said sensor of at least one pedestrian entering said crosswalk.

5,559,510

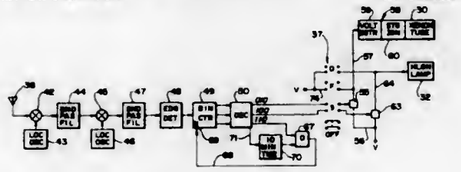
AIRCRAFT LANDING SITE INDICATION AND LIGHT

Maurice L. Strong, III, Wheeling; Charles J. Tranchita, Glen Ellyn, both of Ill.; Christopher R. Welch, Atlantic, Ga., and Gerald Griffith, Western Springs, Ill., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Apr. 12, 1995, Ser. No. 421,716

Int. Cl.[6] B64F *1/20*

U.S. Cl. 340—954 **16 Claims**



1. A light unit comprising:

a flash tube disposed at the top of said light unit;

an incandescent lamp disposed beneath said flash tube;

a source of stroboscopic voltage for intermittently igniting said flash tube;

a power source;

control means for selectively connecting power to said source of stroboscopic voltage or to said incandescent lamp;

characterized by the improvement in which said control means includes:

a radio receiver; and

means responsive to radio frequency (RF) radiation received by said receiver when said power source is not connected to said source of stroboscopic voltage or to said incandescent lamp for connecting power to said source of stroboscopic voltage to thereby cause said flash tube to provide a high intensity, intermittent light, and responsive to RF radiation received by said receiver when said power source is connected to said source of stroboscopic voltage to disconnect said power source from said source of stroboscopic voltage and connect said power source to said incandescent lamp, thereby to cause a steady, low intensity ring of light to emerge from and surround said light unit.

5,559,511

VEHICLE ROUTE GUIDANCE APPARATUS FOR RE-SEARCHING FOR A NEW ROUTE WHEN VEHICLE GOES OUT OF ROUTE

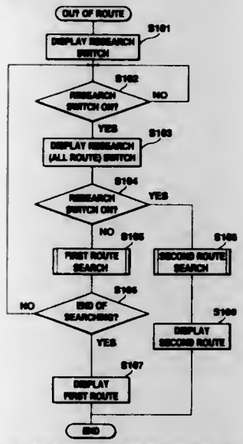
Toru Ito, Nagoya; Hiroshi Kishi, Toyota; Mitsuhiro Nimura, Okazaki; Akimasa Nanba, Chiryu; Kyosai Morimoto, Nishio; Shigekazu Ohara, Chiryu; Shoji Yokoyama, Anjo; Kazuteru Maekawa, Nishikamo-gun; Kiyohide Katoh, Chiryu; Hiroyoshi Masuda, Nagoya; Shinichi Katoh, Anjo, and Koji Hashimoto, Kariya, all of Japan, assignors to Aisin Aw Co., Ltd., Anjo, Japan

Filed Jul. 23, 1993, Ser. No. 286,516

Claims priority, application Japan, Jul. 23, 1992, 4-195777; Aug. 19, 1992, 4-219886; Aug. 19, 1992, 4-219887; Aug. 19, 1992, 4-219913; Aug. 19, 1992, 4-220062; Aug. 19, 1992, 4-220063; Aug. 19, 1992, 4-220092

Int. Cl.[6] G08G *1/123*

U.S. Cl. 340—995 **11 Claims**



1. A vehicle route guidance apparatus for searching and selecting a route to a destination and guiding a vehicle at a branch point, comprising:

current position detecting means for detecting a current position of said vehicle;

on-route comparing means for comparing said current position with a first route;

off-route detection means for detecting an off-route condition of said vehicle on a basis of a comparison result of said on-route comparing means;

notification means for notifying a driver of said off-route condition;

first re-search means for re-searching a second route which is a shortest route to said first route from said current position;

second re-search means for re-searching a third route from said current position to said destination;

a single re-search switch comprising:

first re-search switch means operable by a user, for selectively enabling activation of said first re-search means to re-search said second route, and

second re-search switch means operable by said user, for enabling activation of said second re-search means to re-search said third route;

re-search control means for activating said first re-search means when said off-route condition is detected and said first re-search switch means is operated by said user, and for activating said second re-search means when said off-route condition is detected and said second re-search switch means is operated by said user; and

display means for displaying one of said second and third routes.

5,559,512

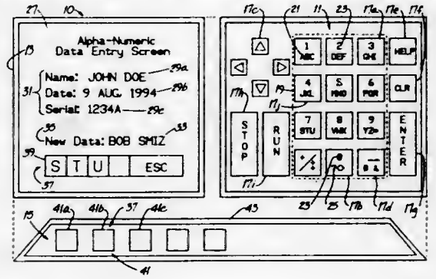
METHOD AND APPARATUS FOR ENTERING ALPHA-NUMERIC DATA

Vincent J. Jasinski, Grand Rapids, and Mark W. Briggs, Holland, both of Mich., assignors to Venturedyne, Ltd., Milwaukee, Wis.

Filed Mar. 20, 1995, Ser. No. 406,743

Int. Cl.[6] H03K *17/94*

U.S. Cl. 341—22 **14 Claims**



1. A method for entering data comprised of characters and including the steps of:

providing a plurality of hard keys arranged within an area, each of the hard keys being identified with two characters;

providing two soft keys at locations away from the area;

actuating one of the hard keys, thereby displaying a different character at each of the soft keys; and

actuating the soft key displaying the character desired to be entered.

5,559,513

DIGITAL SAMPLING RATE CONVERTER

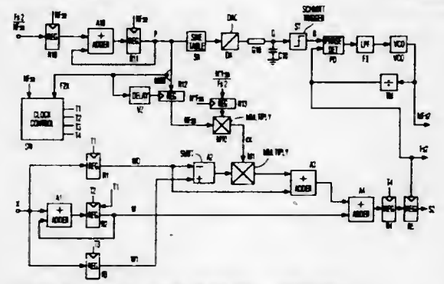
Karin Rothermel, and Heinrich Schemmann, both of Villingen-Schwenningen, Germany, assignors to Deutsche Thomson-Brandt GmbH, Villingen-Schwenningen, Germany

Filed Aug. 8, 1994, Ser. No. 287,002

Claims priority, application Germany, Aug. 6, 1993, 43 26 427.1

Int. Cl.[6] G06F *15/31;* **H03M** *3/02*

U.S. Cl. 341—61 **5 Claims**



1. Sample rate conversion apparatus comprising:

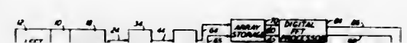
a first interpolator, responsive to samples occurring at a first rate for providing interpolated intermediate samples occurring at a rate N times the first rate where N is an integer greater than one;

means for generating a sampling clock equal to a desired sample rate and for generating a signal representing a scale factor α corresponding to a time difference between the occurrence of one of said intermediate samples and a time of occurrence of a sample at said desired sample rate;

circuitry, including a serial multiplier responsive to said signal representing a scale factor α, for combining a first and a K[th]

antenna means having three receive apertures—a left aperture, a center aperture, and a right aperture—each for receiving radar

antenna means having a transmit aperture for transmitting radar pulses at a pulse repetition frequency (PRF), and having three



circuitry, including a serial multiplier responsive to said signal representing a scale factor α, for combining a first and a K^{th} (a predetermined integer) intermediate samples in proportions (1−α) and α, to form a combined signal;

an accumulator for accumulating values of intermediate samples between said first and K^{th} intermediate samples to form an intermediate sum signal; and

means for adding said combined signal and said intermediate sum signal to form a rate converted signal at said desired sample rate.

5,559,514

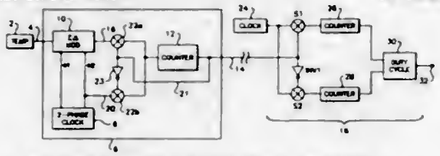
ANALOG-TO-DIGITAL CONVERTER WITH SIGMA-DELTA DUTY CYCLE ENCODED OUTPUT

David Thomson, Fremont, Calif., assignor to Analog Devices, Inc., Norwood, Mass.

Continuation-in-part of Ser. No. 54,556, Apr. 27, 1993, abandoned. This application Aug. 9, 1994, Ser. No. 287,664

Int. Cl.[6] H03M *3/02;1/60*

U.S. Cl. 341—143 **16 Claims**



1. An analog-to-digital converter (ADC), comprising:

a clock having a frequency output that can vary with temperature, and

a modulating circuit connected to receive an input analog signal and to operate in response to said clock output, said modulating circuit producing a digital output with a duty cycle that corresponds to an input analog signal generally independent of the clock frequency,

said modulating circuit comprising a sigma-delta modulator which receives said input analog signal, and an output circuit which responds to said sigma-delta modulator and to said clock output to produce said digital output, wherein said clock output and an output signal from said sigma-delta modulator are selectively applied one-at-a-time as inputs to said output circuit.

5,559,515

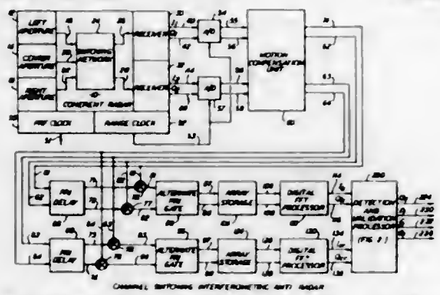
CHANNEL SWITCHING INTERFEROMETRIC AMTI RADAR

James J. Alimena, Fairfield, Conn., and Richard J. Briones, Fort Salonga, N.Y., assignors to Northrop Grumman Norden Systems, Norwalk, Conn.

Filed Nov. 27, 1981, Ser. No. 325,521

Int. Cl.[6] G01S *13/08*

U.S. Cl. 342—118 **4 Claims**



1. An AMTI radar system for a moving platform comprising:

antenna means having three receive apertures—a left aperture, a center aperture, and a right aperture—each for receiving radar return signals;

first receiver means, associated with a first channel, for converting received radar return signals to in-phase and quadrature components;

second receiver means associated with a second channel for converting received radar return signals to in-phase and quadrature components;

pulse repetition frequency means for providing timing signals at pulse repetition intervals, PRI's,

switching means, responsive to the timing signals, for connecting the left aperture to the first receiver means and the center aperture to the second receiver means during odd PRI's so that in-phase and quadrature signals related to the left aperture are provided in the first channel and in-phase and quadrature signals related to the center aperture are provided in the second channel during said odd PRI's; and for connecting the center aperture to the first receiver means and the right aperture to the second receiver means during even PRI's so that in-phase and quadrature signals related to the center aperture are provided in the first channel and in-phase and quadrature signals related to the right aperture are provided in the second channel during said even PRI's;

motion compensation means connected in each channel to the outputs of the receiver means and responsive to platform motion for providing in each channel motion compensated in-phase and quadrature signals;

first signal processing means, connected in the first channel, for providing left-minus-center information based on the in-phase and quadrature signals related to the left aperture during odd PRI's and the in-phase and quadrature signals related to the center aperture during even PRI's;

second signal processing means, connected in the second channel, for providing center-minus-right information based on the in-phase and quadrature signal's related to the center aperture during odd PRI's and the in-phase and quadrature signals related to the right aperture during even PRI's;

array storage means connected in each channel for storing said left-minus-center information and said center-minus-right information in separate range doppler maps; and

third signal processing means connected to said array storage means for providing range, doppler, angle, and amplitude information in response to the range doppler maps.

5,559,516

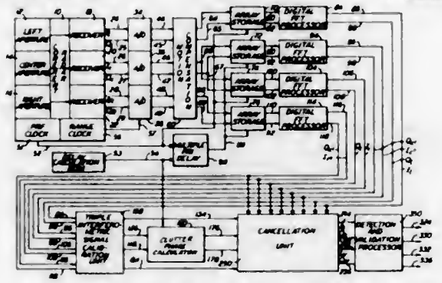
DUAL CANCELLATION INTERFEROMETRIC AMTI RADAR

John A. Didomizio, Norwalk, and Robert A. Guarino, Monroe, both of Conn., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Nov. 27, 1981, Ser. No. 325,522

Int. Cl.[6] G01S *13/08*

U.S. Cl. 342—118 **4 Claims**



1. An airborne moving target indicator (AMTI) for effectively detecting and measuring slowly moving targets in main beam clutter from a moving platform, comprising:

antenna means having a transmit aperture for transmitting radar pulses at a pulse repetition frequency (PRF), and having three spaced-apart receive apertures; a left aperture (**12**), a center aperture (**14**), and a right aperture (**16**) for receiving radar return signals;

receiver means (**18**, **20**, **22**) for providing in-phase (I) and quadrature (Q) component signals associated with each receive aperture in response to the radar return signals;

clock means (**51**) for providing a timing signal (**52**) related to each transmitted radar pulse;

delay means (**53**) for providing a delay signal in response to platform movement, PRF and interaperture spacing;

storage means (**70**, **72**, **74**, **76**) for providing delayed and undelayed sets of data in a time domain format in response to the timing signal, the delay signal and the in-phase and quadrature component signals;

FFT means (**84**, **94**, **104**,**114**) for providing delayed and undelayed sets of data in a frequency domain format in response to the delayed and undelayed sets of data in time domain format;

interferometer means (**158**) connected to the FFT means for providing phase calibration signals (**126**, **146**) indicative of the measured angle versus doppler characteristic for a left/center interferometer comprising the left and center apertures and a center/right interferometer comprising the center and right apertures in response to the delayed and undelayed sets of data in frequency domain format, and for providing amplitude calibration signals (**134**, **154**) indicative of the ratio of the average clutter powers for the left/center and center/right interferometers in response to the delayed and undelayed sets of data in frequency domain format;

phase computation means (**169**) for providing a phase difference signal indicative of the phase difference between the delayed and undelayed delta sets of data in response to the delay signal;

phase calculation means (**160**) for providing phase correction signals for the left/center and center/right interferometers indicative of a time delay phase correction, the positional phase relationship between adjacent apertures, and a phase due to motion of the targets in response to the coherent addition of the phase difference signal and the phase calibration signals;

cancellation means (**250**) for providing clutter-cancelled in-phase and quadrature component signals that have significantly suppressed clutter characteristics in response to the phase correction signals, the amplitude calibration signals and the delayed and undelayed sets of data in frequency domain format; and

detect ion means (**350**) for providing range (r_i), doppler (f_i), amplitude (a_i), and angle (θ_i) signals indicative of target motion in response to the clutter cancelled in-phase and quadrature component signals.

5,559,517

MAXIMIZED/MINIMIZED PHASE CALCULATOR FOR AN INTERFEROMETRIC AMTI RADAR

John A. Didomizio, Norwalk, Conn., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Nov. 27, 1981, Ser. No. 325,523

Int. Cl.[6] G01S *13/00*

U.S. Cl. 342—156 **4 Claims**

1. A method for processing radar returns in an interferometric moving platform radar comprising:

calculating a phase correction signal based on a maximum ratio of target-to-noise plus clutter in a first pass;

recalculating the phase correction signal based on minimum target angle measurement error; and

applying the phase correction signal to the radar returns for eliminating clutter.

5,559,518

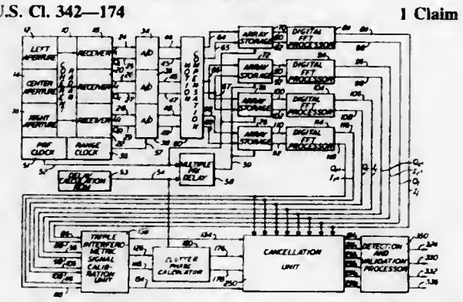
LOW TARGET VELOCITY INTERFEROMETRIC AMTI RADAR

John A. DiDomizio, Norwalk, Conn., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Nov. 27, 1981, Ser. No. 325,524

Int. Cl.[6] G01S *7/40*

U.S. Cl. 342—174 **1 Claim**



1. An airborne moving target indicator (AMTI) for effectively detecting and measuring slowly moving targets in main beam clutter from a moving platform, comprising:

antenna means having a transmit aperture for transmitting radar pulses at a pulse repetition frequency (PRF), and having three spaced-apart receive apertures; a left aperture (**12**), a center aperture (**14**), and a right aperture (**16**) for receiving radar return signals;

receiver means (**18**, **20**, **22**) for providing in-phase (I) and quadrature (Q) component signals associated with each receive aperture in response to the radar return signals;

clock means (**51**) for providing a timing signal (**52**) related to each transmitted radar pulse;

delay means (**53**) for providing a delay signal in response to platform movement, PRF and interaperture spacing;

storage means including a first array storage (**70**) for providing an undelayed set of data (**80**, **82**) in time domain format in response to the timing signal and the in-phase and quadrature component signals associated with the left aperture, a second array storage (**72**) for providing a delayed set of data (**90**, **92**) in time domain format in response to the timing signals, the delay signal and the in-phase and quadrature component signals associated with the center aperture, a third array storage (**74**) for providing an undelayed set of data in time domain format in response to the timing signal and the in-phase and quadrature component signals associated with the center aperture, and a fourth array storage (**76**) for providing a delayed set of data in time domain format in response to the timing signal, delay signal and the in-phase and quadrature component signals associated with the right aperture;

FFT means including a first FFT processor (**84**) for providing an undelayed set of data in frequency domain format associated with the left aperture in response to the undelayed set of data in time domain associated with the left aperture, a second FFT processor (**94**) for providing a delayed set of data in frequency

domain format associated with the center aperture in response to the delayed set of data set in time domain format associated with the center aperture, a third FFT processor (**104**) for providing an undelayed set of data in frequency domain format associated with the center aperture in response to the undelayed set of data in time domain format associated with the center aperture, and a fourth FFT processor (**114**) for providing a delayed set of data in frequency domain format associated with the right aperture in response to the delayed set of data in time domain format associated with the right aperture;

interferometer means (**158**) for providing a left/center phase calibration signal (**126**) indicative of the measured angle versus dopper characteristic for a left/center interferometer comprising the left and center apertures in response to the undelayed sets of data in frequency domain format associated with the left and center apertures, for providing a left/center amplitude calibration signal (**134**) indicative of the amplitude difference in clutter spectrum between the left and center apertures in response to the undelayed sets of data in frequency domain format associated with the left and center apertures, for providing a center/right phase calibration signal (**146**) indicative of the measured angle versus doppler characteristic for a center/right interferometer comprising the center and right apertures in response to the delayed sets of data in frequency domain format associated with the center and right apertures, for providing a center/right amplitude calibration signal indicative of the amplitude difference in clutter spectrum between the center and right apertures in response to the delayed data sets in frequency domain format associated with the center and right apertures;

phase computation means (**169**) for providing a phase difference signal indicative of the phase difference between the delayed and undelayed sets of data in response to the delay signal;

phase calculation means (**160**) for providing a left/center phase correction signal (**176**) for the left/center interferometer indicative of a time delay phase correction, the positional phase relationship between the left and center apertures, and a phase due to motion of the targets in response to the phase addition of the phase difference signal and the left/center phase calibration signal, and for providing a center/right phase correction signal (**178**) for the center/right interferometer indicative of the time delay phase correction, the positional phase relationship between the center and right apertures, and the phase due to motion of the targets in response to the phase addition of the phase difference signal and the center/right phase calibration signal;

cancellation means for providing left/center clutter cancelled in-phase and quadrature component signals (**214**, **216**) that have significantly suppressed clutter characteristics in response to the left/center phase correction signal (**176**), the left/center amplitude calibration signal (**134**), and the difference (**210**, **212**) between the undelayed set of data in frequency domain format associated with the left aperture (**86**, **88**) and the delayed set of data in frequency domain format associated with the center aperture (**96**, **98**); for providing center/right clutter cancelled in-phase and quadrature component signals (**234**, **236**) that have significantly suppressed clutter characteristics in response to the center/right phase correction signal (**178**), the center/right amplitude calibration signal (**154**), and the difference (**230**, **232**) between the undelayed set of data in frequency domain format associated with the center aperture (**106**, **108**) and the delayed set of data in frequency domain format associated with the right aperture (**116**, **118**); and for providing left/right clutter cancelled in-phase and quadrature component signals (**254**, **256**) that have significantly suppressed clutter characteristics in response to the difference (**177**) between the left/center phase correction signal (**176**) and the center/right phase correction signal (**178**), the ratio (**196**) of the left/center amplitude calibration signal (**134**) and the center/right amplitude calibration signal (**154**), and the difference between the (**251**, **252**) delayed set of data in frequency domain format associated with the right aperture (**116**, **118**) and the undelayed set of data in frequency domain format associated with the left aperture (**86**, **88**); and

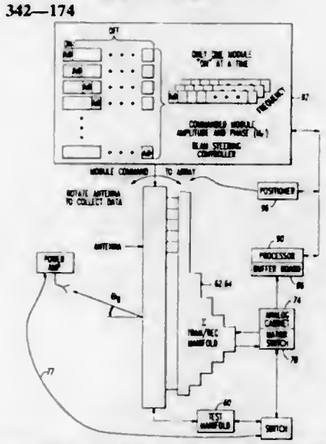
detection means (**350**) connected to the cancellation/enhancement means, for providing range (r_t), doppler (f_t), amplitude (a_t), and angle (θ_t) signals indicative of target motion in response to the clutter cancelled left/center, center/right, and left/right in-phase and quadrature signals.

5,559,519

METHOD AND SYSTEM FOR THE SEQUENTIAL ADAPTIVE DETERMINISTIC CALIBRATION OF ACTIVE PHASED ARRAYS

David K. Fenner, Columbia, Md., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed May 4, 1995, Ser. No. 434,810
Int. Cl.[6] G01S *7/40*
U.S. Cl. 342—174 **15 Claims**



1. A method of calibrating a phased array antenna having a plurality of active modules, and a test manifold, comprising the steps of:

collecting, for each module of the array in sequence, first phase and amplitude data of radar pulses applied to a receiver from a far field range;

collecting, for each module of the array in sequence, second phase and amplitude data of said radar pulses applied to a receiver from the test manifold;

determining a command phase and amplitude for each steering angle of each module;

comparing the phase and amplitude data from the test manifold with the phase and amplitude data from the far field range to obtain an error signal; and

combining the error signal with the command amplitude and phase iteratively until the error signal is minimized.

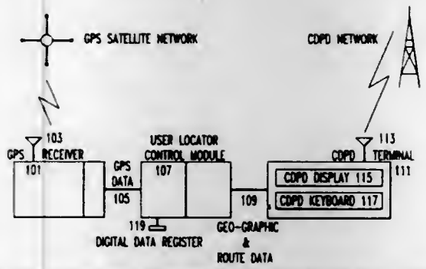
5,559,520

WIRELESS INFORMATION SYSTEM FOR ACQUIRING LOCATION RELATED INFORMATION

Farhad Barzegar, Hillsborough; Irwin Gerszberg, Kendall Park; Martin J. McGowan, III, Cranford, and Robert E. Schroeder, Morris, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 26, 1994, Ser. No. 312,360
Int. Cl.[6] H04B *7/185*; G01S *5/02*
U.S. Cl. 342—357 **2 Claims**

1. An interactive wireless information system for locating and providing location related information to and from a mobile vehicle;



a global positioning system at the mobile vehicle for receiving GPS time signals and providing coordinates indicating location of the mobile vehicle;

cellular digital packet data communication means at the mobile vehicle for communicating with a source of location pertinent information;

a controller module for integrating the coordinates and the location pertinent information including:

a data receiver for receiving location information from the global positioning system and storage means for storing the location information;

a communication interface at the mobile vehicle for exchanging digital packet data information with the cellular digital packet data communication means with the digital packet information concerning information pertinent to the location information;

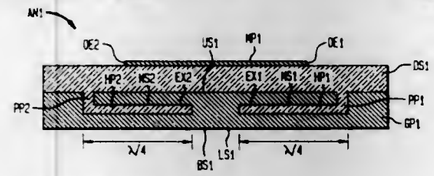
a processor having a geographic module responsive to data in the storage means for geographically locating the mobile vehicle and a routes module for accepting information from the communication interface and integrating information form the geographic module and the routes module to provide location related information for readout in the mobile vehicle.

5,559,521

ANTENNAS WITH MEANS FOR BLOCKING CURRENT IN GROUND PLANES

James G. Evans, Colts Neck; Martin V. Schneider, and Robert W. Wilson, both of Holmdel, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 8, 1994, Ser. No. 351,905
Int. Cl.[6] H01Q *1/38*
U.S. Cl. 343—700 MS **22 Claims**



1. An antenna, comprising

a ground plane having a pair of parallel surfaces

a dielectric substrate on one of said surfaces,

a microstrip patch on said substrate;

a dielectric component in said ground plane and extending between said surfaces;

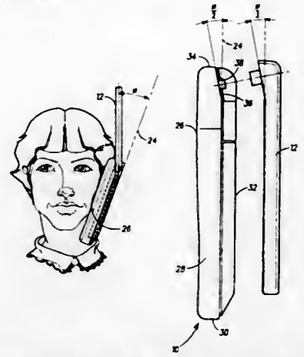
said dielectric component forming a quarter wave choke in said ground plane.

5,559,522

ANTENNA POSITIONING APPARATUS CAPABLE OF SUBSTANTIALLY VERTICAL ORIENTATION

Martin V. Seitz, Fox River Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 25, 1994, Ser. No. 280,094
Int. Cl.[6] H01Q *1/24*
U.S. Cl. 343—702 **19 Claims**



1. An antenna positioning apparatus in a portable communication device, the communication device having a front surface, a top surface, a bottom surface, and two side surfaces essentially describing a rectangular box, the antenna positioning apparatus comprising:

a wedge connected to a proximal end of an antenna, the wedge having a angle of inclination;

a planar attaching surface near the top surface of the communication device, intersecting the plane formed by the front surface of the communication device at an intersection angle;

said wedge and the antenna pivotally connected to the attaching surface, the antenna pivoting from a first position, in which a distal end of the antenna is near the bottom surface of the communication device, next to one side of the communication device and parallel to the plane formed by the front surface of the communication device, to a second position, in which the distal end of the antenna is above the top surface of the communication device and the antenna is not parallel to the plane formed by the front surface of the communication device.

5,559,523

LAYERED ANTENNA

Martin S. Smith, and Dean Kitchener, both of Chelmsford, United Kingdom, assignors to Northern Telecom Limited, Quebec, Canada

Continuation-in-part of Ser. No. 969,750, Oct. 30, 1992, abandoned. This application Dec. 19, 1994, Ser. No. 358,735
Claims priority, application United Kingdom, Nov. 15, 1991, 9124291.7
Int. Cl.[6] H01Q *21/12*
U.S. Cl. 343—795 **20 Claims**

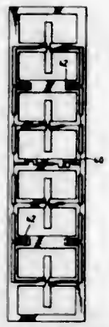
1. A layered antenna having at least one radiating element comprising:

a metallic ground plane having a pair of identical rectangular apertures in alignment;

a pair of colinear probes each projecting in opposite direction into a respective aperture to form a dipole, and;

a feed network conductor pattern connected to and arranged to feed the probes in antiphase whereby each probe radiates through its respective aperture;

wherein the probes are continuations of the feed network conductor pattern, the feed network conductor pattern and the probes are formed on an insulating substrate adjacent to and spaced at a uniform distance to the ground plane;



wherein the dimensions of the apertures and the bounding portions of the ground plane are chosen so that the bounding portions parallel with the probes act as parasitic antenna radiating elements, which together with the pair of radiating probes shape the radiation pattern of the antenna; and

wherein the feed network conductor pattern is positioned so as to be in alignment with unapertured portions of the ground plane in a microstrip configuration.

5,559,524

ANTENNA SYSTEM INCLUDING A PLURALITY OF MEANDER CONDUCTS FOR A PORTABLE RADIO APPARATUS

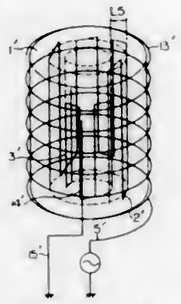
Ken Takei; Masami Ohnishi, both of Hachioji, and Mikio Kuwahara, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 834,350, Feb. 12, 1992, Pat. No. 5,298,910, and Ser. No. 24,459, Mar. 1, 1993, abandoned. This application Mar. 8, 1994, Ser. No. 207,428

Claims priority, application Japan, Mar. 18, 1991, 3-052191; Feb. 28, 1992, 4-042836; Mar. 27, 1992, 4-070596

Int. Cl.[6] H01Q *1/36;1/08*

U.S. Cl. 343—895 **11 Claims**



1. An antenna system of small size that can be mass-produced and that has a wide frequency band for use with a portable receiver, comprising:

a plurality of meander conductors printed on at least one film of a dielectric material and satisfying respectively different resonance conditions in a frequency band used by the receiver;

at least one solid cylinder of a dielectric material for winding said dielectric film therearound; and

a hollow cylinder of a dielectric material for covering said dielectric film wound around said dielectric solid cylinder,

wherein said individual meander conductors, which are printed on said dielectric film, do not make direct electrical contact with each other, wherein said plural meander conductors include a first meander conductor, which is used an antenna, connected to the feeder and second and third meander Conductors, which are used as resonators, spaced apart by predetermined distances from said first meander conductor, respectively, for producing multiple resonance by electromagnetic coupling with said first meander conductor, thereby widening the frequency band, wherein said first and second meander conductors are printed on a first dielectric film, while said third meander conductor is printed on a second dielectric film, wherein said dielectric solid cylinder includes an inner dielectric solid cylinder disposed at a central area of the antenna system and an inner dielectric hollow cylinder having a predetermined thickness and covering said inner dielectric solid cylinder, and wherein said second dielectric film is disposed between said inner dielectric solid cylinder and said inner dielectric hollow cylinder, while said first dielectric film is disposed to surround the outer periphery of said inner dielectric hollow cylinder.

5,559,525

FLAT PANEL DISPLAY CONTROL SYSTEM

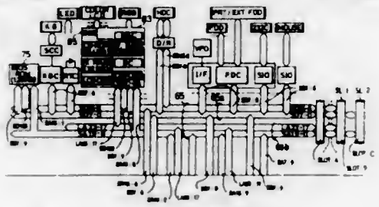
Hiroki Zenda, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

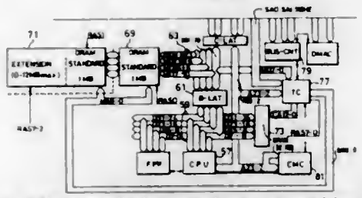
Continuation of Ser. No. 229,137, Apr. 18, 1994, abandoned, which is a continuation of Ser. No. 953,152, Sep. 29, 1992, abandoned. This application Apr. 20, 1995, Ser. No. 425,774

Claims priority, application Japan, Sep. 30, 1991, 3-250684

Int. Cl.[6] G09G *5/00*

U.S. Cl. 345—1 **13 Claims**





1. A flat panel display control system comprising:

a portable computer having a first graphics subsystem for generating first data to be displayed and flat panel display means for displaying the first data supplied from the first graphic subsystem, the first graphics subsystem including:

a first display controller for outputting the first data and first control signals;

first converting means for converting the first display data to first color data;

a second graphics subsystem generates second control signals and second color data;

connector means, connecting the second graphics subsystem to the portable computer, for supplying the first data from the first graphics subsystem to the second graphics subsystem, and for supplying the second data from the second graphics subsystem to the flat panel display means,

wherein the flat panel display means selectively displays the first data supplied from the first graphics subsystem or the second data supplied from the second graphics subsystem, the second graphics subsystem including:

second display means for generating the second color data and the second control signals, the second display means generating a changeover signal when the first display data supplied from the first display controller has a specific value; and

selector means for selecting, in response to the changeover signal, the second color data and the second control signals from the second display means and for supplying the selected second color data and the second control signals to the portable computer through the connector means to display the second color data on the flat panel display means.

5,559,526

LIQUID CRYSTAL DISPLAY HAVING A DRIVE CIRCUIT

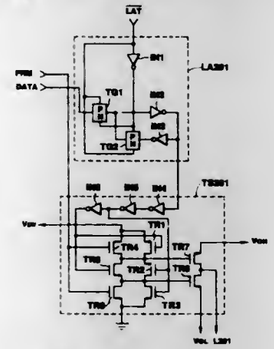
Mitsuharu Izawa, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 40,463, Apr. 1, 1993, abandoned. This application May 25, 1994, Ser. No. 249,078

Claims priority, application Japan, Apr. 9, 1992, 4-088586

Int. Cl.[6] G09G *3/36*

U.S. Cl. 345—96 **10 Claims**



1. A liquid crystal display comprising:

a pair of spaced apart base plates;

a liquid crystal sealed in between said base plates;

a plurality of data lines and a plurality of address lines formed on a surface of one of said plates, said address lines intersecting said data lines;

a plurality of pixel electrodes placed near the intersections of said data lines and said address lines;

a plurality of switching devices each connected to one of said data lines, to one of said address lines and to one of said pixel electrodes;

peripheral circuit means comprising thin film transistors and formed on either of said base plates, said peripheral circuit means including:

shift circuit means for sequentially shifting digital image data for a single scanning line;

latch circuit means for latching said digital image data for a single scanning line;

frame signal supplying means for supplying a high frame voltage and a low frame voltage alternately to each of said data lines;

first switching means connected to said latch circuit means and to said frame signal supplying means for providing:

(i) a high drive voltage for said liquid crystal to said data lines when said digital image data is one of a high data voltage and a low data voltage and when one of said high frame voltage and said low frame voltage is applied,

(ii) a low drive voltage for said liquid crystal to said data lines when said digital image data is one of said high data voltage and said low data voltage and when the other of said high frame voltage and said low frame voltage is applied, polarity, and

(iii) no output when said digital image data is the other of said high data voltage and said low data voltage;

second switching means connected to said latch circuit means for providing a common voltage, independently of said high frame voltage and said low frame voltage, to said data lines when said digital image data is said other of said high data voltage and said low data voltage, said common voltage being substantially in the middle of said high drive voltage and said low drive voltage; and

means for providing digital image data for a subsequent scanning line to said shift circuit means while said plurality of switching means are selectively driven to provide one of said high drive voltage, said low drive voltage and said common voltage to said data lines according to said digital image data for a current scanning line latched in said latch circuit means.

5,559,527

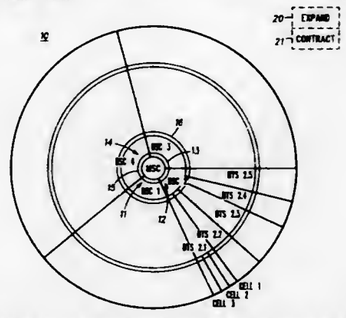
METHOD AND APPARATUS FOR DISPLAYING PERFORMANCE METRICS IN A COMMUNICATION SYSTEM

Robert Quinn, Wheeling, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 24,048, Mar. 1, 1993, abandoned. This application Feb. 7, 1995, Ser. No. 385,210

Int. Cl.[6] G09G *5/00;* **H04B** *17/00*

U.S. Cl. 345—115 **19 Claims**



1. An apparatus for displaying performance metrics of a wireless cellular communication system having a mobile switching center, and a plurality of base site controllers comprising:

a hierarchical display of the mobile switching center and the plurality of base site controllers, the mobile switching center depicted at a center of the hierarchical display and the base site controllers radiating outwardly from the center in a hierarchical order;

means for selecting a performance metric of one of the mobile switching center and the plurality of base site controllers; and

means for displaying the performance metric for the mobile switching center or the plurality of base site controllers within the hierarchical display.

5,559,528

DISPLAY HAVING REDUNDANT SEGMENTS

Arie Ravid, Palo Alto, and Robert G. Poli, Campbell, both of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Sep. 21, 1993, Ser. No. 125,508

Int. Cl.[6] G09G *3/04*

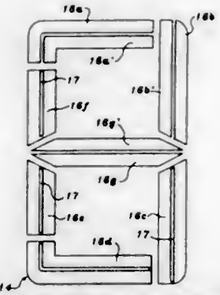
U.S. Cl. 345—117 **26 Claims**

1. A display circuit, comprising:

(a) a substrate on which is defined a circuit of conducting traces;

(b) a plurality of segments electrically coupled to the conducting traces and configured in a predefined pattern on said substrate, at least some of the segments being configured in segment pairs, each segment pair including a first and a second segment that are proximate to each other and extend in a common direction, but are spaced apart, each segment pair comprising a portion of at least one icon character;

(c) segment control means, coupled to the segments, for causing selected ones of said segments to be visually perceptible by



simultaneously energizing each first segment in a segment pair whenever each second segment in a segment pair is energized, said selected ones of the segments thereby visually representing a desired icon character; and

(d) whereby a defective segment pair that includes a failed segment and an operating segment continues to accurately represent a part of the desired icon character, said failed segment providing a visual warning that one of the first and the second segments comprising that defective segment pair has failed by appearing visually different than the operating segment of that defective segment pair.

5,559,529

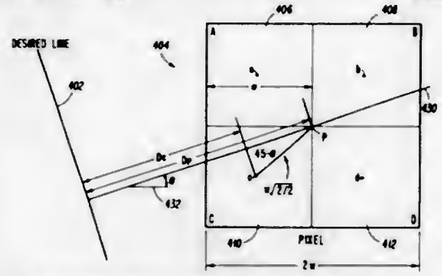
DISCRETE MEDIA DISPLAY DEVICE AND METHOD FOR EFFICIENTLY DRAWING LINES ON SAME

Steven C. Maher, Cedar Rapids, Iowa, assignor to Rockwell International, Seal Beach, Calif.

Filed Feb. 26, 1992, Ser. No. 841,686

Int. Cl.[6] G09G *5/10*

U.S. Cl. 345—136 **9 Claims**



1. An improved display apparatus comprising:

an array of individually addressable display elements;

a vector generator for rendering lines by addressing a plurality of pixels, where each pixel includes a plurality of elements arranged in a predetermined pixel pattern, and generating signals relating to a first pixel, where said signals include a pixel distance signal, representative of the distance from said first pixel to a predetermined line, and an orientation signal, representative of the orientation of the first pixel with respect to the predetermined line;

a memory, coupled with said array, for storing individual intensity signals for each of said elements;

means, coupled with said vector generator and said memory, for generating an element distance signal for each element in said first pixel, by modifying said pixel distance signal in response to said orientation signal and as a function of said predetermined pixel pattern, and further for generating an element intensity signal for each element in said first pixel in response to said element distance signals; and,

WHEREBY, the display apparatus is improved when individual intensities are generated for each element in a pixel, while the vector generator generates signals relating to pixels.

5,559,530

IMAGE DATA PROCESSING APPARATUS

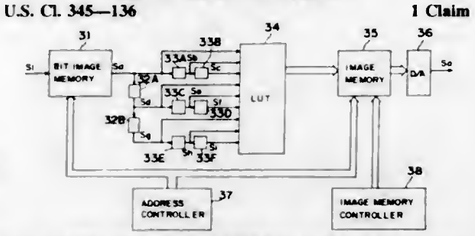
Haruo Yamashita, Osaka; Masami Matsumiya, Higashiosaka, and Tsumoru Fukushima, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 14, 1993, Ser. No. 75,999

Claims priority, application Japan, Jun. 15, 1992, 4-154644

Int. Cl.[6] G09G *5/36;* **G06K** *9/56*

U.S. Cl. 345—136 **1 Claim**



1. An image data processing apparatus for generating multilevel data values from bit-map image data values corresponding to respective pixels, each of said pixels having a respective binary level and including four sub-areas, each of said four sub-areas corresponding to a respective sub-pixel, said apparatus comprising:

data memory means for storing said bit-map image data values;

locating means for locating a 3×3 matrix of ones of said bit-map image data values stored in said data memory;

arranging means for arranging said bit-map image data in a linear arrangement to produce a binary data value having a 3^2 bit numeric value;

conversion table means having $2^{3\times3}$ elements addressed by said 3^2 bit numeric value from said arranging means for:

a) producing a multilevel data value corresponding to a target pixel which is located at the center of said 3×3 matrix, each one of said $2^{3\times3}$ elements including a set of density data values arranged in a 2×2 matrix in a predetermined order wherein said density data values are calculated from the percentage of black area of said sub-area of each of said sub-pixels which is estimated based on one or more main contour lines which is predicted from the positions of black pixels in the matrix-shaped area, said sub-pixels being 2×2 sub-divisions of pixel area of said target pixel; and

b) outputting a respective second density data value enlarged two times vertically and horizontally as each of said density data values; and

output means for outputting said multilevel data value as a new center pixel which replaces said target pixel to enhance gradation of said bit-map image data.

5,559,531

CONTROL UNIT FOR AN INJECTION MOULDING MACHINE

Alfred Schiffer, Neustadt/Wied, Germany, assignor to Dr. Boy GmbH, Germany

Filed May 3, 1994, Ser. No. 237,194

Claims priority, application Germany, May 12, 1993, 43 15 902.8

Int. Cl.[6] G09G *5/00*

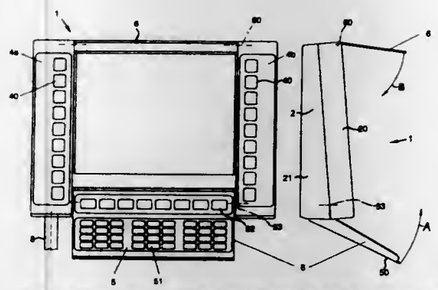
U.S. Cl. 345—168 **7 Claims**

1. A control unit for an injection moulding machine, the control unit including the following features:

a screen

a keyboard for inputting data which is secured to a first flap, the flap being pivotally secured to the control unit at a first pivotal axis arranged below the screen such that the keyboard, in the unused state, can adopt a raised position against the screen in which it covers at least a lower region of the screen; and

a first function key set with function keys for controlling the functional sequence of the injection moulding machine, whereby the function key set is arranged on a first side of the screen in a fixed relationship to the latter such that the function keys are freely accessible and actuable, even when the screen is covered.



5,559,532

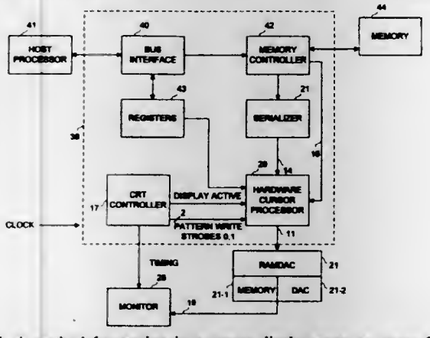
METHOD AND APPARATUS FOR PARALLEL PIXEL HARDWARE CURSOR

Robert P. Gardyne, Oakland, Calif., assignor to LSI Logic, Inc., Milpitas, Calif.

Filed Nov. 10, 1994, Ser. No. 337,264

Int. Cl.[6] G09G *5/08*

U.S. Cl. 345—145 **2 Claims**



1. A method for storing in a cursor display array a cursor for display on a screen having a plurality of pixels, the cursor display array having a plurality of storage elements, the method comprising the steps of:

receiving a series of clock signals;

receiving concurrently and in parallel a number P pixels of the cursor responsive to one of the series of clock signals;

receiving a cursor position signal indicative of a position on the screen where the cursor is to be displayed;

receiving a preset signal indicative of the first pixel of the cursor that is to be displayed;

calculating the number of the first pixel within the number P concurrent pixels of the cursor that is to be displayed responsive to the cursor position signal and the preset signal;

storing the cursor in the cursor display array starting at one of the plurality of storage elements of the cursor display array corresponding to the calculated number of the pixel;

providing codes indicative of picture data;

storing the codes indicative of picture data in ones of the plurality of storage elements having no cursor data stored therein;

receiving concurrently and in parallel the number P pixels of video data responsive to one of the series of clock signals;

receiving a video position signal indicative of a position on the screen where the video data is to be displayed;

comparing the video position signal to the cursor position signal;

generating an indicator having a first logic state if the cursor position signal matches the video position signal and having a second logic state if the cursor position signal does not match the video position signal;

providing in parallel the number P pixels of video data responsive to one of the series of clock signals if the indicator has a second logic state;

retrieving the cursor if the indicator has a first logic state;

providing the pixel of the cursor if the corresponding one of the plurality of storage elements has cursor data stored therein; and

if the one storage element has a code indicative of picture data stored therein, providing the pixel of the video data corresponding to the one storage element.

5,559,533

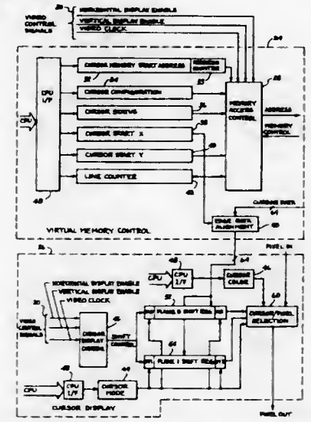
VIRTUAL MEMORY HARDWARE CUSOR AND METHOD

Gary D. Hicok; Dale C. Penner, both of Mesa, and Mike Nakahara, Phoenix, all of Ariz., assignors to VLSI Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 42,331, Apr. 2, 1994, abandoned. This application Sep. 30, 1994, Ser. No. 316,063

Int. Cl.[6] G09G *5/08*

U.S. Cl. 345—162 **4 Claims**



1. A hardware cursor for a video display system comprising, in combination:

cursor memory means for storing cursor data, said cursor memory means residing within an unused portion of a video RAM used to store display data within said video display system, said cursor memory means occupying only the number of locations within said video RAM necessary for storing valid cursor data;

memory access control means for reading said valid cursor data from said cursor memory means during the horizontal non-display portion of a scan of said video display system;

first shift register means for storing and shifting a first portion of said valid cursor data to be displayed on said video display system retrieved from said cursor memory means by said memory access control means, and having a shift output for said valid cursor data to be displayed on said video display system;

second shift register means coupled in parallel to said first shift register means for storing and shifting a second portion of said valid cursor data to be displayed on said video display system retrieved from said cursor memory means by said memory access control means, and having a shift output for said valid cursor data to be displayed on said video display system;

cursor display control means for shifting out said valid cursor data stored in said first shift register means and for shifting out said valid cursor data stored in said second shift register means;

a plurality of video control signals comprising horizontal display enable signals, vertical display enable signals, and video clock

member, the position signals generated by the photoelectric sensor, the improvement wherein:

thermal time constant of said recording head and an energy of the driving signal supplied to said recording head during unit

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SUCTION RECOVERY DEVICE FOR INK JET

a plurality of video control signals comprising horizontal display enable signals, vertical display enable signals, and video clock signals from said video display system coupled to said memory access control means and coupled to said cursor display control means for synchronizing the operation of said memory access control means and said cursor display control means to the output of said display data by said video display system to a display monitor coupled to said video display system;

cursor color means for determining the color of said hardware cursor;

cursor/pixel selection means having an input coupled to a pixel data input from said video display system, said pixel data input providing pixel data comprising a sequence of said display data stored within said video RAM, said cursor/pixel selection means also having an input coupled to said shift output of said first shift register means, having an input coupled to said shift output of said second shift register means, having at least one input coupled to said cursor color means, and having an output that passes through said pixel data from said pixel data input unchanged when said pixel data is not at a location of said hardware cursor, and that modifies said pixel data according to said inputs to make said hardware cursor appear on said display monitor when said pixel data is at a location of said hardware cursor; and

programmable control register means coupled to said memory access control means, coupled to said first shift register means, coupled to said second shift register means, and coupled to said cursor/pixel selection means for programming and determining the location and appearance of said hardware cursor on said display monitor, and for determining the location of said cursor memory means within said unused portion of said video RAM.

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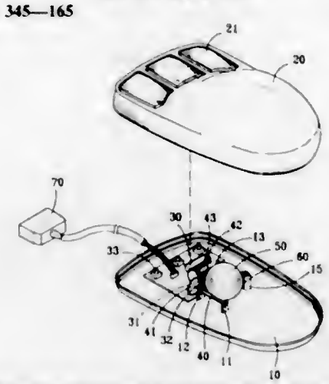
PHOTOELECTRIC SENSOR FOR AN X-Y POSITION DEVICE

Lin Chia-Hui, Hsin Tien, Taiwan, assignor to Sysgration Ltd., Taiwan

Filed Jul. 28, 1995, Ser. No. 506,958
Int. Cl.[6] G09G *3/02*
U.S. Cl. 345—165 **2 Claims**



1. In a photoelectric sensor arrangement for an X-Y input device includes:

a top casing and a bottom casing that together form a casing for a photoelectric sensor X-Y position device in which is positioned a vertical shaft, a horizontal shaft, a vertical slotted disc positioned at an end of the vertical shaft, a horizontal slotted disc positioned at an end of the horizontal slotted disc, a ball member, an idle roller arranged to press the ball member against the vertical and horizontal shafts to cause the vertical and horizontal shafts, and therefore the vertical and horizontal discs, to rotate in response to movement of the ball member, the position signals generated by the photoelectric sensor, the improvement wherein:

portions of the vertical and horizontal slotted discs are very close to each other but do not touch,

an LED is positioned on one side of the slotted discs to face said very close portions,

a photoelectric sensor is positioned on an opposite side of the slotted discs to face the LED,

the photoelectric sensor includes four photoelectric sensor areas A, B, C, and D on a single photoelectric sensor chip, said areas having widths corresponding to widths of the slots such that rotation of the vertical disc causes light from the LED to alternately illuminate areas A and B and rotation of the horizontal disc causes light from the LED to alternately illuminate areas C and D, the respective areas generating signals when illuminated or shaded,

a direction of rotation of the vertical disc is determined by whether a phase difference between signals generated by areas A and B is positive or negative, and

a direction of rotation of the horizontal disc is determined by whether a phase difference between signals generated by areas C and D is positive or negative.

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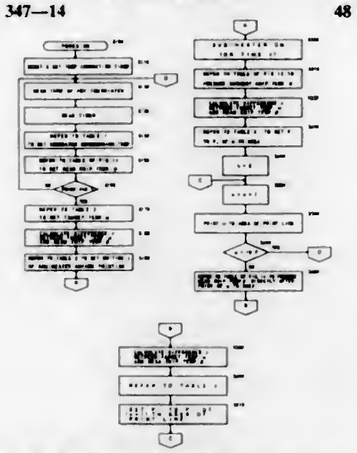
TEMPERATURE CONTROL OF INK-JET RECORDING HEAD USING HEAT ENERGY

Naoji Otsuka, Kawasaki; Hiromitsu Hirabayashi, Yokohama; Kentaro Yano, Yokohama, and Kiichiro Takahashi, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 852,671, Mar. 17, 1992, abandoned. This application Oct. 25, 1995, Ser. No. 547,848
Claims priority, application Japan, Mar. 20, 1991, 3-057457; Mar. 20, 1991, 3-057460; Mar. 2, 1992, 4-044773
Int. Cl.[6] B41J *29/38*
U.S. Cl. 347—14 **48 Claims**



1. A recording apparatus comprising:

a recording head for performing a recording operation by ejecting an ink from an ejection port using a heat energy of a driving signal;

drive means for supplying the driving signal to said recording head;

ejection quantity control means for controlling an ink ejection quantity ejected from the ejection port by changing the driving signal to be supplied to said recording head;

temperature measurement means for measuring a surrounding temperature;

temperature variation calculation means for calculating a variation in temperature of said recording head on the basis of a thermal time constant of said recording head and an energy of the driving signal supplied to said recording head during unit time; and

presumption means for presuming the temperature of said recording head on the basis of the variation in temperature calculated by said temperature variation calculation means, and the surrounding temperature measured by said temperature measurement means, wherein said ejection quantity control means controls the ink ejection quantity by changing the driving signal on the basis of the presumed temperature presumed by said presumption means, and said temperature variation calculation means calculates a variation in temperature of said recording head on the basis of the driving signal changed by said ejection quantity control means.

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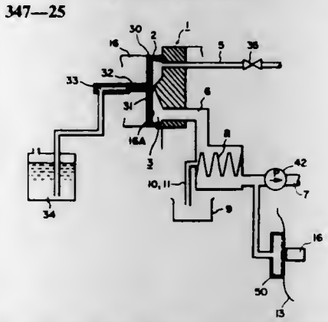
RECOVERY DEVICE HAVING A PROTRUDING PORTION PROVIDING REDUCED PRESSURE FOR IMPROVED RECOVERY AND METHOD USING SAME

Atsushi Saito, Yokohama; Yutaka Koizumi, Tokyo; Toshihiro Mori, Hiratsuka, and Minoru Nozawa, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 137,508, Oct. 18, 1993, abandoned, which is a continuation of Ser. No. 758,504, Sep. 6, 1991, abandoned, which is a continuation of Ser. No. 428,922, Oct. 30, 1989, abandoned, which is a continuation of Ser. No. 171,462, Mar. 21, 1988, Pat. No. 4,908,636. This application Apr. 13, 1994, Ser. No. 227,094
Claims priority, application Japan, Mar. 31, 1987, 62-076353
Int. Cl.[6] B41J *2/165*
U.S. Cl. 347—25 **27 Claims**



1. A cleaning device for an ink jet recording head having at least one discharge port for ejecting recording liquid, the device including a cap member for facing a region of the recording head having the discharge port therein, a supply path for supplying a fluid medium comprising a gas to said cap member for flow along the discharge port region and a discharge path for discharging the medium from said cap member wherein:

the gas flow is generated by a suction pump for generating suction in said discharge path; the gas flow inside said cap member from said supply path to said discharge path is constricted by a protruding portion in said cap member;

said protruding portion is disposed in said cap member such that the discharge port is spaced opposite said protruding portion when the discharge port region faces said cap member; and

the gas flows along the discharge port region such that a negative pressure is generated for drawing recording liquid from the discharge port into the gas flow.

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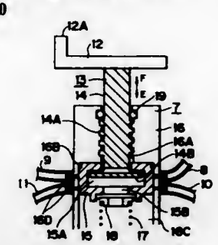
SUCTION RECOVERY DEVICE FOR INK JET RECORDING APPARATUS

Koji Terasawa, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 973,541, Nov. 9, 1992, abandoned, which is a continuation of Ser. No. 726,729, Jul. 2, 1991, abandoned, which is a continuation of Ser. No. 370,131, Jun. 20, 1989, abandoned, which is a continuation of Ser. No. 106,901, Oct. 9, 1987, abandoned, which is a continuation of Ser. No. 844,217, Mar. 21, 1986, abandoned, which is a continuation of Ser. No. 536,736, Sep. 28, 1983, Pat. No. 4,631,554. This application Feb. 15, 1995, Ser. No. 389,629
Claims priority, application Japan, Oct. 4, 1982, 57-174201
Int. Cl.[6] B41J *2/165*
U.S. Cl. 347—30 **16 Claims**



1. A suction recovery device for an ink jet recording apparatus including printing means having an opening for ejecting ink and a capping member for covering the opening, said device comprising:

suction means for applying negative pressure to the opening, wherein said suction means includes a cylinder communicating with the inside of the capping member, a piston including a rotatable member for rotating relative to said cylinder to move said piston along a longitudinal axis of said cylinder between an initial position and an operative position, and a partition member sealingly mounted in said cylinder for movement with said piston along a longitudinal axis of said cylinder, said partition member abutting an end of said cylinder when said piston is in the initial position and abutting said piston after said piston has moved a predetermined distance from the initial position toward the operative position for forming in said cylinder a sealed suction chamber and creating a negative pressure in said sealed suction chamber and

selection means for selecting a suitable angular displacement of said rotatable member to provide a negative pressure level inside of the capping member suitable for recovering ink ejection from the opening.

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POSITIONING OF SERVICE STATION AND PAPER PICK PRESSURE PLATE USING SINGLE MOTOR

Chan Nguyen, San Diego, Calif.; Alan Shibata, Vancouver, Wash.; Atsushi Kobayashi, and Noriyoshi Fujimori, both of Nagano-Ken, Japan, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 12, 1994, Ser. No. 289,875
Int. Cl.[6] B41J *2/165*
U.S. Cl. 347—32 **21 Claims**

1. Structure for use with an inkjet printing apparatus, comprising:

a sled assembly, comprising:

a wiper for wiping a printhead of a print cartridge of the apparatus; and

a cap for enclosing the printhead when the print cartridge is not in use;

a paper pick pressure plate for selectively contacting a paper pick roller of the apparatus such that a print medium is advanced through a printing path defined by the apparatus when the pressure plate contacts the pick roller and the print

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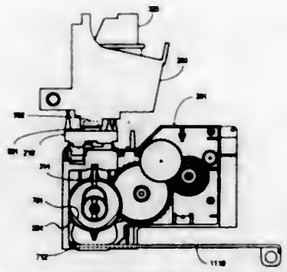
5,559,540

providing a magnetic flux density of at least **600** gauss at said



medium is not advanced through the printing path when the pressure plate does not contact the pick roller; and

means for simultaneously controlling movement of the sled assembly and the pressure plate.

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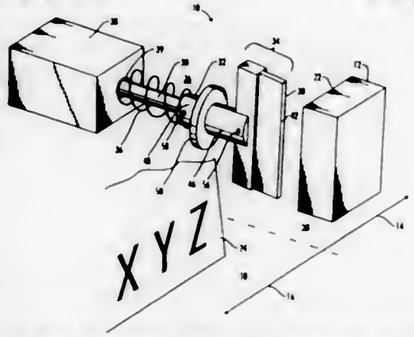
INK JET RECORDING APPARATUS HAVING SELF ALIGNING PRINT HEAD CLEANING SYSTEM AND METHOD OF OPERATING THE PRINT HEAD CLEANING SYSTEM

Giang Vo, Moorpark, and Akihiro Okada, Agoura Hills, both of Calif., assignors to Dataproducts Corporation, Simi Valley, Calif.

Filed Oct. 12, 1993, Ser. No. 136,111
Int. Cl.[6] B41J *2/165*
U.S. Cl. 347—33 **17 Claims**



1. In an ink jet apparatus including a recording head having a jetting surface, the jetting surface defining therein a discharge port for ejecting ink therethrough and cleaning apparatus for cleaning the jetting surface, the improvement wherein the cleaning apparatus comprises:

a cleaning blade having an elongated edge for contacting the jetting surface;

a blade support structure supporting the cleaning blade, the blade support structure including a plunger moveable between extended and retracted positions;

a pivotal joint pivotally coupling the cleaning blade to the blade support structure to allow the cleaning blade to pivot to a position in which the elongated edge of the cleaning blade is substantially parallel with the plane of the jetting surface, upon the cleaning blade contacting the jetting surface;

wherein the pivotal joint comprises an adaptor body, a first pivot link coupling the cleaning blade to the adaptor body and a second pivot link coupling the adaptor body to the plunger.

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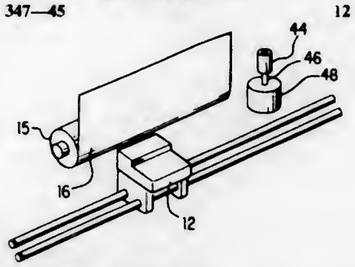
APPARATUS AND METHOD FOR PROVIDING A HYDROPHOBIC COATING ON AN INK JET PRINTING HEAD

Vincent A. Burolla, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 12, 1994, Ser. No. 274,089
Int. Cl.[6] B41J *2/165*
U.S. Cl. 347—45 **12 Claims**



1. An ink jet printer, comprising:

means for supporting a recording medium;

an ink jet printing head, with droplet emitting nozzles on a nozzle face of the printing head, for printing on a recording medium;

an applicator, supported on the printer, for depositing a hydrophobic material on the nozzle face of the ink jet printing head; wherein said applicator comprises a solid hydrophobic material which is transferable to the nozzle face by sliding contact between applicator and the nozzle face;

means for moving the printing head in sliding contact with the applicator so that a portion of the solid hydrophobic material comprising the applicator is transferred to the nozzle face of the printing head during said sliding contact.

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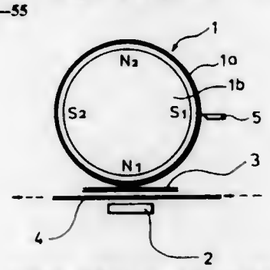
DIRECT RECORDING METHOD

Masumi Asanae; Masahisa Ochiai, both of Kumagaya, and Koji Noguchi, Tokyo, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Continuation of Ser. No. 217,180, Mar. 24, 1994, abandoned. This application Jul. 14, 1995, Ser. No. 502,066
Claims priority, application Japan, Mar. 24, 1993, 5-087786
Int. Cl.[6] B41J *2/06*
U.S. Cl. 347—55 **4 Claims**



1. A direct recording method for forming a toner image on a recording medium employing a toner carrying drum comprising a magnetic roll disposed within a toner carrying sleeve which rotates around said roll and presents a toner carrying surface, a background electrode and a foraminous recording electrode located between said surface and said background electrode, and wherein the recording medium is placed between said background electrode and said recording electrode and the toner is caused to jump from said surface through said recording electrode onto said medium as a result of an electrical potential pattern corresponding to an image signal applied to said recording electrode, said method comprising the steps of:

providing a magnetic flux density of at least **600** gauss at said surface of the drum;

supplying said toner as a magnetic toner material having an apparent density of at least 0.5 g/cc and an angle of repose not greater than 45 degrees to said surface of the drum having said flux density, said magnetic material including a fixing resin and 10 to 60 weight percent of a magnetic powder having a coercive force of 50 to 500 Oe;

regulating the thickness of the toner material on said surface having said flux density so as to provide a toner layer having a thickness of 5 to 100 μm thereon; and

transferring said layer from said surface to said recording medium while rotating said sleeve about said magnetic roll by applying an image signal voltage to said recording electrode.

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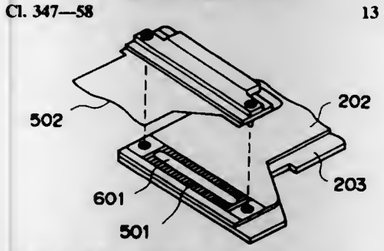
INK JET HEAD, RECORDING APPARATUS PROVIDED WITH SUCH A HEAD, AND METHOD FOR MANUFACTURING HEAD

Keiichiro Tsukuda, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1993, Ser. No. 49,315
Claims priority, application Japan, Apr. 22, 1992, 4-103181
Int. Cl.[6] G01D *15/18*
U.S. Cl. 347—58 **13 Claims**



1. An ink jet head comprising:

(a) a discharging element having (i) discharging ports for discharging ink; (ii) ink passages conductively connected to the discharging ports; and (iii) exothermic elements for applying thermal energy to ink distributed in the ink passages, and

(b) a silicone resin covering at least a part of said discharge element, said silicone resin having 500 ppm or less of an amount of low molecular siloxane component of said silicone resin, said low molecular siloxane component represented by the formula $((C_3)_2SiO)_x$, wherein x is from 3 to 10.

5,559,543

METHOD OF MAKING UNIFORMLY PRINTING INK JET RECORDING HEAD

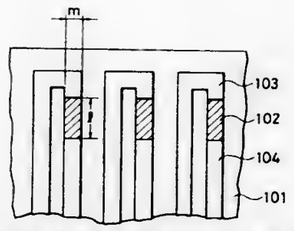
Hirokazu Komuro, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 867,079, Apr. 14, 1992, abandoned, which is a continuation of Ser. No. 700,056, May 8, 1991, abandoned, which is a continuation of Ser. No. 486,855, Mar. 1, 1990, abandoned. This application Jun. 1, 1994, Ser. No. 252,391
Claims priority, application Japan, Mar. 1, 1989, 1-48841; Mar. 1, 1989, 1-48842
Int. Cl.[6] B41J *2/05*
U.S. Cl. 347—62 **9 Claims**

1. A method for manufacturing a substrate for a liquid jet recording head having a plurality of heat generating resistance elements each for generating thermal energy to discharge a liquid droplet, each said heat generating resistance element having a resistance value, comprising the steps of:

preparing a substrate;

forming, on said substrate, a film from which said heat generating resistance elements are formed;



measuring a distribution of a thickness of the film from which said heat generating resistance elements are formed;

forming a mask on which a plurality of different patterns for preparing said heat generating resistance elements are arranged, so that the resistance values of said heat generating resistance elements are substantially the same in accordance with the distribution of the thickness of the film; and

etching said film from which said heat generating resistance elements are formed using said mask to form said plurality of different patterns for said heat generating resistance elements on said substrate,

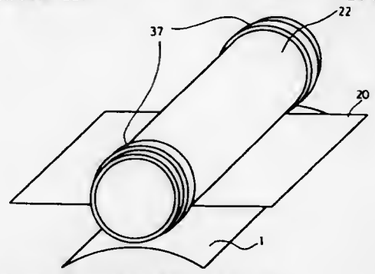
wherein said different patterns for said heat generating resistance elements all have substantially a same area.

5,559,544

IMAGE FORMING APPARATUS WITH COOPERATING HOUSING STRUCTURE

Shougo Sato, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 2, 1994, Ser. No. 190,497
Claims priority, application Japan, May 31, 1993, 5-128730
Int. Cl.[6] B41J *2/415;2/41;2/385;* **G01D** *15/06*
U.S. Cl. 347—127 **24 Claims**



1. An image forming apparatus comprising:

a lower frame;

an upper frame movably coupled to said lower frame;

a toner case for storing toner supported by one of said lower frame and said upper frame;

a toner carrier having a surface provided in said toner case for carrying toner on said surface thereof;

a toner flow controlling member having plurality of openings through which toner carried by said toner carrier is passed and control electrodes around said plurality of openings supported by said one of said lower frame and said upper frame;

a back electrode confronting said toner carrier and sandwiching said toner flow controlling member therebetween; and

at least ones spacer provided on one of said toner flow controlling member and said back electrode, said back electrode being spaced away from said toner flow controlling member at a predetermined space by said at least one spacer, and said back electrode being supported by an other of said lower frame and said upper frame;

wherein said upper frame is connected to said lower frame such that said upper frame can be moved close to and away from said lower frame to allow access to said toner flow controlling member.

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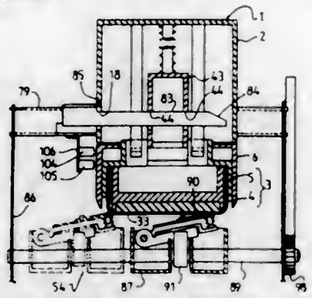
PERFORATING DEVICE OF STAMP UNIT

Tetsuji Fuwa, Hashima, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 26, 1995, Ser. No. 578,232
Claims priority, application Japan, Jan. 27, 1995, 7-031494
Int. Cl.[6] B41J *2/32*
U.S. Cl. 347—171 **20 Claims**



1. A perforating device used by a stamp unit for perforating a desired character string pattern on a print face portion of said stamp unit having an ink impregnation member covered with a heat sensitive stencil paper including a thermoplastic film, said perforating device comprising:

a thermal head having a plurality of heating elements selectively heated to a first temperature to melt and perforate portions of said thermoplastic film based on the desired character string pattern;

moving means for moving said thermal head and said print face portion relative to each other after said thermal head has perforated said film; and

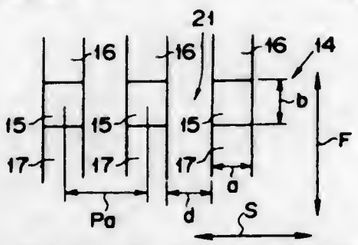
head driving means for heating said heating elements to a second temperature after said thermal head has perforated said film, the second temperature being less than said first temperature.

5,559,546

STENCIL PERFORATING METHOD, STENCIL PERFORATING SYSTEM, AND STENCIL PRINTING MACHINE

Mitsuo Sato, Shibata-machi, Japan, assignor to Tohoku Ricoh Co., Ltd., Miyagi, Japan

Filed Aug. 16, 1994, Ser. No. 291,549
Claims priority, application Japan, Dec. 17, 1993, 5-318333; Jul. 8, 1994, 6-157599
Int. Cl.[6] B41J *2/335*
U.S. Cl. 347—200 **4 Claims**



1. A method of perforating a heat sensitive stencil, the method comprising the steps of:

bringing the heat sensitive stencil into contact with a thermal head having a plurality of heating resistors arranged in a row;

moving the heat sensitive stencil in a sub-scanning direction which is orthogonal to a main-scanning direction in which the plurality of heating resistors are arranged; and

perforating the heat sensitive stencil in a dot matrix shape with selectively heated heating resistors of said plurality of heating resistors;

the method comprising the further steps of:

making the heat sensitive stencil of substantially only a thermoplastic resin film; and

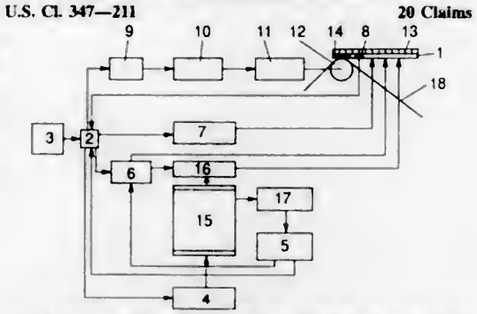
making a width of a space between two adjacent heating resistors of said plurality of heating resistors in the main scanning direction 30% or more of a pitch between the two adjacent heating resistors in the main scanning direction so as to regulate a width of a non-perforated portion of the heat sensitive stencil between two adjacent perforations in the main scanning direction to be 20% or more of the pitch between the two adjacent heating resistors in the main-scanning direction.

5,559,547

THERMAL PRINTER

Gamal Hagar, Neckarsteinach, Germany, assignor to Esselte Meto International GmbH, Heppenheim, Germany

Filed Sep. 23, 1994, Ser. No. 311,778
Claims priority, application Germany, Sep. 24, 1993, 43 32 572.6
Int. Cl.[6] B41J *2/32;2/325;2/355;2/365*
U.S. Cl. 347—211 **20 Claims**



1. A thermal printer for printing an image on a carrier, said printer comprising:

a housing;

means for printing an image onto a carrier;

said printing means being disposed at said housing;

means for permitting movement of the carrier to said printing means and away from said printing means;

a microprocessor;

said microprocessor comprising means for converting input data from an input source into image data;

means for storing and buffering image data;

said buffer storage means comprising means for storing image data received from said microprocessor;

means for transmitting image data from said microprocessor to said buffer storage means;

said buffer storage comprising means of transmitting image data upon a first predetermined condition being met;

a register;

said register comprising means for storing image data received from the said buffer storage means;

means for transmitting image data from said buffer storage means to said register;

said printing means comprising a print head means;

said print head means comprising at least one printing element;

means for transmitting image data from said register to said print head;

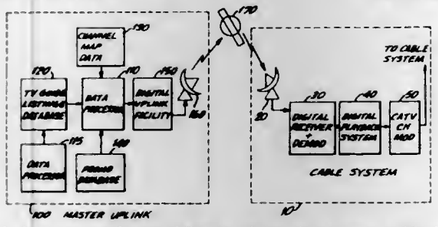
means for activating said at least one printing element to permit the printing of image data onto a carrier by said at least one printing element.

5,559,548

SYSTEM AND METHOD FOR GENERATING AN INFORMATION DISPLAY SCHEDULE FOR AN ELECTRONIC PROGRAM GUIDE

Bruce Davis, 5505 Preserve Pkwy. South, Greenwood Village, Colo. 80121; James Gutman, 6745 S. Detroit Ct., Littleton, Colo. 80122; Michael Heydt, 1589 Reed St., Coatesville, Pa. 19320, and Larry Miller, 35 Gleanmoore Dr., Greenwood Village, Colo. 80111

Continuation-in-part of Ser. No. 247,059, May 20, 1994. This application Sep. 23, 1994, Ser. No. 311,475
Int. Cl.[6] H04N *7/10*
U.S. Cl. 348—6 **50 Claims**



1. In a system for providing an electronic program guide for transmission on a television channel, a method for generating a schedule for display of information, said method comprising the steps of:

providing a database of a plurality of pieces of information to a data processor,

selecting a time period for generation of said schedule,

assigning each said piece of information a priority factor based on the desired display frequency of said piece of information,

establishing a first time slot in said time period, said first time slot commencing concurrently with the beginning of said time period,

selecting, for said first time slot, one of said pieces of information for display from said plurality of pieces based on the priority factor of said selected piece,

scheduling said selected piece of information for display during said first time slot,

adjusting the priority factor of said selected piece of information in accordance with a user-defined post-selection priority adjustment factor, and

repeating said establishing, information selecting, scheduling, and adjusting steps for a plurality of temporally sequential time slots in said time period.

5,559,549

TELEVISION PROGRAM DELIVERY SYSTEM

John S. Hendricks, Potomac, and Alfred E. Bonner, Bethesda, both of Md., assignors to Discovery Communications, Inc., Bethesda, Md.

Continuation-in-part of Ser. No. 991,074, Dec. 9, 1992. This application Dec. 2, 1993, Ser. No. 160,191
Int. Cl.[6] H04N *7/16*
U.S. Cl. 348—6 **21 Claims**

1. A television program delivery and program selection system offering a plurality of television programs for selection by a subscriber, using a program control information signal carrying data on program lineups of the plurality of the television programs and using computer program instructions stored at each subscriber location to present options on a menu displayed on a television, the system comprising:

an operations center for creating a plurality of television program lineups and for generating the program control information signal that includes data on the plurality of television program lineups and control information for use at the subscriber location, the operations center comprising a computer assisted packaging system;

delivery means, connected to the computer assisted packaging system, for delivering at least one of the plurality of television program lineups included in the program control information signal from the operations center to the subscriber location;

menu generation means, operably connected to the delivery means, for generating menus with the options presented for display, the menu generation means comprising a microprocessor for using the stored computer program instructions to assist in generating menus, wherein the menu generation means is located at the subscriber location; and

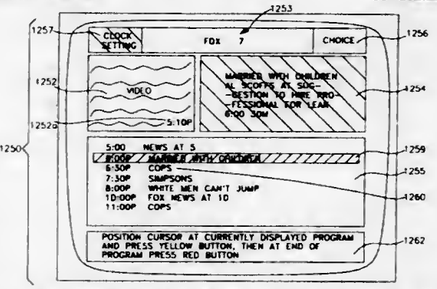
selection means, connected to the menu generation means, for selecting at least one of the plurality of television programs for display on the television using the options on the generated menus, the selection means comprising a subscriber interface.

5,559,550

APPARATUS AND METHODS FOR SYNCHRONIZING A CLOCK TO A NETWORK CLOCK

Roy J. Mankovitz, Encino, Calif., assignor to Gemstar Development Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 404,046, Mar. 14, 1995, which is a continuation-in-part of Ser. No. 396,559, Mar. 1, 1995. This application Apr. 13, 1995, Ser. No. 421,385
Int. Cl.[6] H04N *5/76*
U.S. Cl. 348—6 **35 Claims**



1. An apparatus for synchronizing a clock to a network clock comprising:

a calendar clock;

means for receiving a first compressed code representative of, and compressed in length from, the combination of a channel, a time-of-day, and a length of time for a first program on a first day and on a first channel currently tuned to and displayed on a television;

means for decoding the first compressed code into a first channel, a first time-of-day, and a first length of time;

means for receiving an end of program indication for the program on the first channel; and

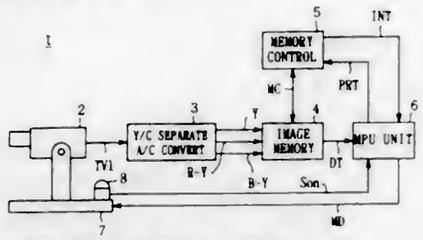
means for loading the sum of the first time-of-day and the first length of time into the clock calendar in response to receiving the end of program indication.

5,559,551

SUBJECT TRACKING APPARATUS

Takayuki Sakamoto, and Taro Suito, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 25, 1995, Ser. No. 450,022
Claims priority, application Japan, May 30, 1994, 6-139475
Int. Cl.[6] H04N *5/225*
U.S. Cl. 348—169 **8 Claims**



1. A subject tracking apparatus comprising:

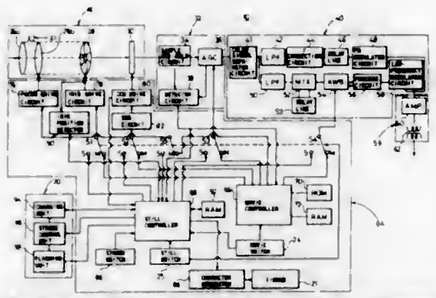
a color estimation function determining means for judging the hue of a target from a first and second color difference signal contained in the target area among an input color video signal, and for modeling each of said first and second color difference signal by a color estimation function having the luminance of said input color video signal as a variable, in accordance with said hue;

permissible error model determining means for calculating a permissible error model with respect to each of a first color estimation function corresponding to said first color difference signal and a second color estimation function corresponding to said second color difference signal;

color information judging means for comparing the permissible error model which are respectively calculated with respect to said first and second color estimation function to said input color video signal, to extract the area which conforms to said permissible error model;

feature plane setting means for calculating the reference feature plane representing said target based on the pixel value of the area extracted by said color information judging means among the target areas; and

position determining means for extracting the area which conforms to said permissible error model by comparing said permissible error model to the input color video signal input after setting said reference feature plane to obtain the feature plane with respect to said input color video signal, and for determining the position where the correlation between said feature plane and said reference feature plane becomes maximum as the position where the target exists.



(d) a light source for emitting an electronic flash, to illuminate the subject;

(e) shutter speed and light source controlling means, responsive to the temporary interruption, for setting the speed of said shutter higher than when shooting the movie, and for controlling said light source so that said electronic flash is synchronized with the opening of said shutter and is terminated before the closing of said shutter;

(f) an amplifier for amplifying said image signal;

(g) switcher means for manually temporarily interrupting a movie shooting operation to perform said still image shooting during emission of said electronic flash, and automatically returning to the movie shooting operation upon completion of said still shooting operation;

(h) amplification controlling means for automatically controlling the amplification of said amplifier; and

(i) white balancing means for adjusting the white balance of the color signals of the image signal corresponding to the still image shot during the temporary interruption, for color temperature of the electronic flash, wherein the image signal corresponding to the still image is recorded on the same recording medium as the image signal corresponding to the movie shooting, in proper chronology.

5,559,552

MOVIE CAMERA WITH STROBE LIGHT

Masafumi Inuiya, and Yoshiaki Nakayama, both of Tokyo, Japan, assignors to Fuji Photo Film Company, Ltd., Kanagawa-ken, Japan

Continuation of Ser. No. 188,117, Jan. 28, 1994, abandoned, which is a continuation of Ser. No. 873,104, Apr. 24, 1992, abandoned. This application Sep. 6, 1994, Ser. No. 300,230
Claims priority, application Japan, Apr. 26, 1991, 3-097388
Int. Cl.[6] H04N *5/225*
U.S. Cl. 348—220 **8 Claims**

1. A movie camera for shooting a movie and for shooting a still image during a temporary interruption of the movie shooting, said movie camera comprising:

(a) a photoelectric device for producing an image signal of color signals corresponding to light received from a subject;

(b) a shutter associated with said photoelectric device;

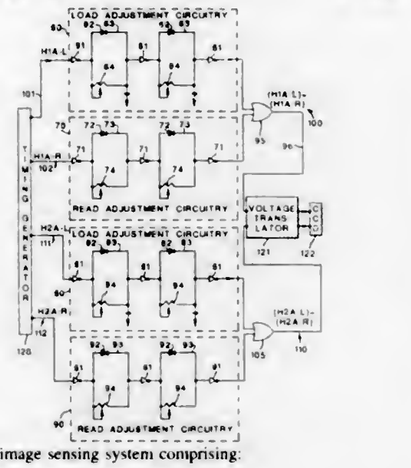
(c) optical means for receiving said light from a subject and controlling the passage of said light to said photoelectric device;

5,559,553

CLOCK CONTROL CIRCUIT WITH INDEPENDENT TIMING ADJUSTMENTS FOR IMAGE SENSING DEVICES

Alfred O. Bitek, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 28, 1994, Ser. No. 330,484
Int. Cl.[6] H04N *3/14*
U.S. Cl. 348—312 **11 Claims**



1. An image sensing system comprising:

an imaging region having a substrate of semiconductor material including means for accumulation and transfer of charge carriers contained within said imaging region;

at least two shift registers located adjacent to said region, said shift registers having a series of storage regions for receiving said charge carriers from said region;

first control means for implementing transfer of charge carriers out of said region into one of said registers;

second control means for transferring charge carriers out of said one of said registers; and

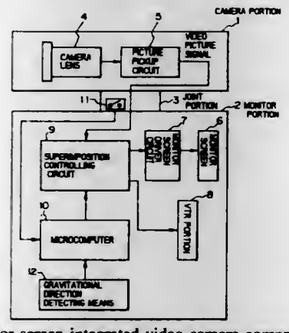
multiple clocking means responsive to said second control means for transferring charge carriers out of each of said registers, said multiple clocking means having independent timing adjustment means for controlling register loading periods and for controlling register readout periods for each of said shift registers by adjusting when rising and falling edges of the multiple clocking means occur.

5,559,554

MONITOR SCREEN-INTEGRATED VIDEO CAMERA

Kentarou Uekane, Yaita, and Hiroshi Ikeda, Tochigi, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 19, 1994, Ser. No. 277,045
Claims priority, application Japan, Dec. 1, 1993, 5-302017
Int. Cl.[6] H04N *5/225*
U.S. Cl. 348—333 **29 Claims**



1. A monitor screen-integrated video camera comprising:

a camera portion having a camera lens for picking up a picture of objects;

a monitor portion having a monitor screen that displays the picture taken by said camera portion;

a joint portion for joining said camera portion with said monitor portion in a relatively rotatable manner such that said camera lens and said monitor screen can both be oriented in the same direction toward an identical object or, in a normal picture-taking state, in different directions toward different objects;

a monitor driver circuit which, when said monitor screen is vertically inverted as compared to its orientation in the normal picture-taking state and only when both said camera lens and said monitor screen are oriented toward an identical object, inverts a scanning direction on said monitor screen thereby allowing said monitor screen to display an horizontally inverted mirror-image of the picture taken by said camera portion;

character code generating means for generating character codes for texts to be superimposed over said monitor screen;

text memory for storing the character codes generated by said character code generating means;

a character generator for generating character patterns corresponding to character codes supplied from said text memory;

an inverting circuit for horizontally inverting a character pattern output generated from said character generator, the inverted character pattern being for superimposition on said monitor screen when said monitor screen is vertically inverted as compared to its orientation in the normal picture-taking state and both said camera lens and said monitor screen are oriented toward an identical object; and

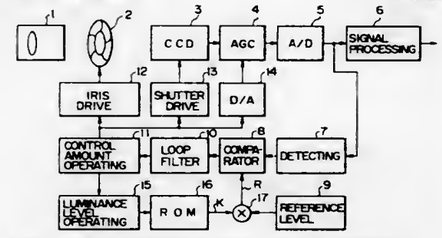
editing means for controlling the order of character codes generated by said character code generating means, such that an horizontally inverted order of arrayed character codes is supplied from said character code generating means to said text memory only when both said camera lens and said monitor screen are oriented toward the identical object, the arrayed characters constituting text to be displayed on said monitor screen.

5,559,555

APPARATUS FOR PERFORMING EXPOSURE CONTROL PERTAINING TO THE LUMINANCE LEVEL OF AN OBJECT

Shuji Shimizu, Kanagawa; Osamu Kuroda, Tokyo; Yasutaka Ito, and Yoshikazu Takahashi, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 260,381, Jun. 14, 1994, Pat. No. 5,473,374. This application May 16, 1995, Ser. No. 442,495
Claims priority, application Japan, Jun. 17, 1993, 5-171135; Jul. 12, 1993, 5-195218
Int. Cl.[6] H04N *5/238*
U.S. Cl. 348—364 **5 Claims**



1. An exposing apparatus in a video camera, comprising:

a lens group for fetching a light from an object;

an iris for adjusting an amount of light from said lens group;

an image pickup device for converting the light which passed through said iris into an electric signal;

an AGC circuit for setting a signal level of an output signal from said image pickup device into a predetermined level;

a detecting circuit for detecting a luminance signal level from an output signal from said AGC circuit;

a reference level signal setting circuit for supplying an exposure control reference value;

an exposure control reference value modulating circuit for modulating said exposure control reference value, said exposure control reference value modulating circuit comprising

a luminance level operating circuit to which a gain of said iris and a gain amount of said AGC circuit are supplied; and

an ROM having a reference level modulation coefficient according to a luminance level, and wherein an output signal from said ROM and an output signal from said reference level signal setting circuit are multiplied so as to form a modulation signal; and

control means for receiving said modulation signal and said luminance signal level and for producing a plurality of control signals therefrom, said control signals being respectively utilized to control said iris, said image pickup device and said AGC circuit.

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wherein the number of data sets corresponding to a particular coding technique is unique to said particular coding tech-

5,559,556

APPARATUS FOR CONNECTING AN IMAGE SENSOR AND AN OPTICAL UNIT TO A CIRCUIT BOARD SO THAT THEY ARE PROPERLY ALIGNED

Tor Kagebeck, Linköping, Sweden, assignor to ICL Systems AB, Kista, Sweden

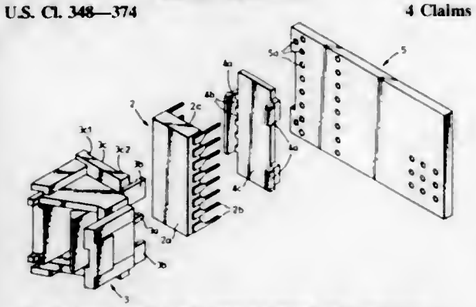
PCT No. PCT/SE93/00529, § 371 Date Jan. 9, 1995, § 102(e) Date Jan. 9, 1995, PCT Pub. No. WO94/00883, PCT Pub. Date Jan. 6, 1994

PCT Filed Jun. 15, 1993, Ser. No. 367,238

Claims priority, application Sweden, Jun. 30, 1992, 9202016.3

Int. Cl.[6] H04N *5/225*

U.S. Cl. 348—374 **4 Claims**



1. An arrangement for an image scanning unit comprising:

a semiconductor package, so arranged as to generate electrical signals corresponding to an image incident upon a light-sensitive surface of the package, and so arranged as to be connected to a circuit board by soldering its contact legs to the circuit board, the semiconductor package extending generally in a first, longitudinal, direction and a second, transverse, direction, and the light-sensitive surface extending in said longitudinal and transverse directions;

an optical system arranged in a holder for projecting the image to be scanned onto the light-sensitive surface;

a mounting plate positioned between the semiconductor package and the circuit board, and

devices for joining together the holder and the mounting plate and ensuring correct mutual alignment between the semiconductor package and the optical system;

wherein, for ensuring correct alignment between the optical system and the light-sensitive surface of the semiconductor package in the longitudinal direction of the semiconductor package, said joining devices comprise a projection projecting from the holder in such a way that, when the unit is assembled, it engages between two of the contact legs of the semiconductor package;

and wherein, for ensuring correct alignment in the transverse direction of the semiconductor package and in a direction normal to the light-sensitive surface, said joining devices comprise snap elements, capable of interacting with one another, arranged on the holder and on the mounting plate.

5,559,557

MOTION VIDEO CODING WITH ADAPTIVE PRECISION FOR DC COMPONENT COEFFICIENT QUANTIZATION AND VARIABLE LENGTH CODING

Motoki Kato, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 28, 1993, Ser. No. 127,569

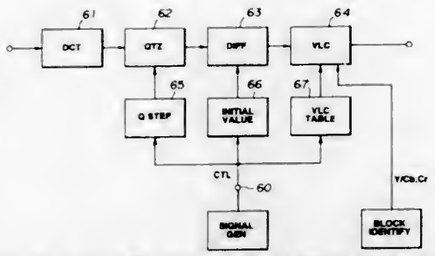
Claims priority, application Japan, Sep. 28, 1992, 4-258200; Jul. 1, 1993, 5-163433

Int. Cl.[6] H04N *7/30*

U.S. Cl. 348—405 **29 Claims**

1. A method of encoding a video signal having pixels represented by n bits, n being an integer, comprising the steps of:

receiving a picture quality signal;



selecting an encoding precision of n+m bits, m being a non-negative integer, in accordance with said picture quality signal;

orthogonally transforming said video signal to produce direct current component coefficients and alternating current component coefficients;

quantizing only said direct current component coefficients using the selected encoding precision;

obtaining a difference between a first of said quantized direct current component coefficients and an initial value set in accordance with said selected encoding precision; and

variable length encoding the differentiated direct current component coefficients using variable length coding tables, each of said coding tables having a length that is a function of said selected encoding precision.

5,559,558

APPARATUS AND METHODOLOGY FOR CODING DIGITAL VIDEO SIGNALS TO IMPROVE PICTURE QUALITY WITH MINIMAL OVERHEAD

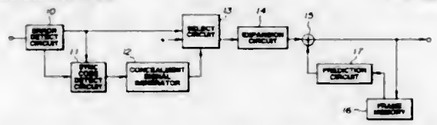
Naohisa Kitazato, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 5, 1994, Ser. No. 286,210

Claims priority, application Japan, Aug. 31, 1993, 5-216099

Int. Cl.[6] H04N *7/12*

U.S. Cl. 348—416 **6 Claims**



1. A method of coding a digital video signal having a plurality of frames, comprising the steps of:

receiving said digital video signal;

coding each frame of said digital video signal according to one of a plurality of coding techniques to produce a coded frame;

slicing each coded frame into a number of independently decodable data sets, said number corresponding to the coding technique employed to produce the coded frame; and

adding a synchronization code to each of the data sets;

wherein the number of data sets corresponding to each of said plurality of coding techniques is predetermined; and

wherein the number of data sets corresponding to a particular coding technique is unique to said particular coding technique.

5,559,559

TRANSMITTING A SECONDARY SIGNAL WITH DYNAMIC INJECTION LEVEL CONTROL

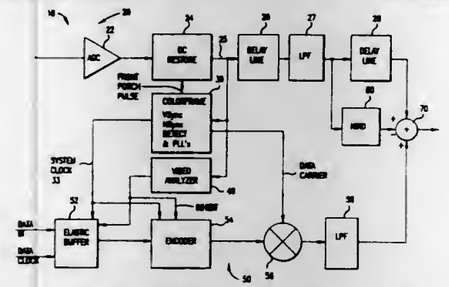
Charles Jungo, Gilbert; Gerald D. Montgomery, Mesa, and Christopher J. Schur, Payson, all of Ariz., assignors to WavePhore, Inc., Tempe, Ariz.

Continuation-in-part of Ser. No. 947,134, Sep. 18, 1992, Pat. No. 5,387,941, which is a continuation-in-part of Ser. No. 715,920, Jun. 14, 1991, Pat. No. 5,327,237. This application Jun. 14, 1993, Ser. No. 76,199

The portion of the term of this patent subsequent to Feb. 7, 2012, has been disclaimed.

Int. Cl.[6] H04N *7/08;11/00*

U.S. Cl. 348—432 **27 Claims**



13. A method of combining a primary video signal having a bandwidth with upper and lower ends, a luminance portion an a color portion nearer the upper end and a color carrier with a secondary signal having a bandwidth greater than 100 KHz for subsequent transmission based upon a control signal, the method comprising:

attenuating a part of the color portion above the color carrier;

rasterizing the secondary signal for injection into the primary video signal;

dynamically controlling an injection level to different levels for the secondary signal; and

injecting the secondary signal into the primary video signal in the attenuated portion.

5,559,560

CAPTION LINE FINDING CIRCUIT FOR PICTORIAL SIGNAL PROCESSOR

Chang Y. Lee, Seoul, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed Jul. 14, 1995, Ser. No. 502,846

Claims priority, application Rep. of Korea, Jul. 15, 1994, 17120/1994

Int. Cl.[6] H04N *7/087*

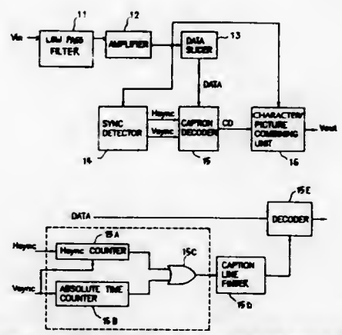
U.S. Cl. 348—465 **14 Claims**

1. In a circuit capable of extracting caption data of a horizontal scanning line of a video signal, a caption line finding circuit comprising:

synchronous signal detecting means for detecting a vertical synchronous signal and a horizontal synchronous signal from a video signal applied thereto;

caption data slicing means for extracting caption data from the video signal applied thereto;

caption line detecting means for detecting a predetermined scanning line carrying caption data by counting a predetermined time from the time when the vertical synchronous signal is applied thereto, and outputting a caption line finding signal for a predetermined duration thereafter; and



decoding means for decoding the caption data extracted by the caption data slicing means during the duration of the caption line finding signal outputted by the caption line detecting means.

5,559,561

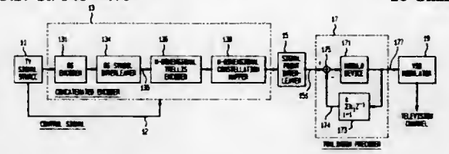
CODED MODULATION WITH SHAPING GAIN AND TOMLINSON PRECODING

Lee-Fang Wei, Lincroft, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jul. 15, 1994, Ser. No. 276,079

Int. Cl.[6] H04N *7/04*

U.S. Cl. 348—470 **26 Claims**



1. Apparatus comprising

means for receiving a stream of data,

encoder means for mapping said data into signal points of a predetermined base constellation with unequal probabilities,

means for processing the mapped signal points through a Tomlinson precoder, said encoder means and said Tomlinson precoder being such that the signal points provided at the output of said Tomlinson precoder exhibit at least 1.0 dB of shaping gain, and

means for applying to a transmission channel a modulated signal representing said signal points provided at the output of said Tomlinson precoder.

5,559,562

MPEG EDITOR METHOD AND APPARATUS

William Ferster, 4928 Reservoir Rd., N.W., Washington, D.C. 20007

Filed Nov. 1, 1994, Ser. No. 332,876

Int. Cl.[6] H04N *7/50*

U.S. Cl. 348—584 **14 Claims**

1. Apparatus for editing MPEG formatted image representative electrical signals comprising

first storage for storing components of a first MPEG formatted stream of image data,

second storage for storing components of a second MPEG formatted stream of image data,

transition circuitry responsive to a transition position value representing a transition position for generating an edited video stream of image data representing the first MPEG formatted stream of image data prior to the transition position and, at least in part, said second MPEG formatted stream of

fourth delaying means for outputting a signal which is obtained

5,559,566

INTEGRAL READING GLASSES WITH NECKLACE

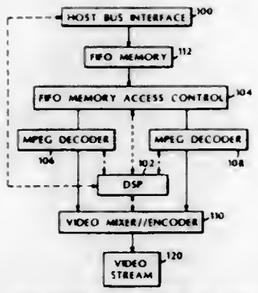


image data subsequent to said transition position, said transition circuitry comprising

a register for storing said transition position value,

a register for storing a transition mode,

a first frame decoder circuitry for decoding and playing a current frame first image for said first image data,

a second frame decoder circuitry for decoding and playing a current frame second image for said second image data, and

selective addition circuitry for selectively adding, in response to said transition mode register value and said transition position register value, a first variable fraction of each current frame first image and a second variable fraction of a corresponding current frame second image to generate said edited video stream.

5,559,563

WAVEFORM RESPONSE IMPROVEMENT CIRCUIT

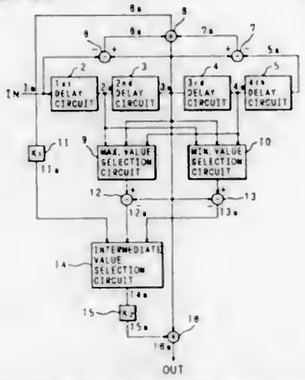
Akihito Takahashi, and Koji Hasegawa, both of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1994, Ser. No. 355,240

Claims priority, application Japan, Dec. 27, 1993, 5-330745

Int. Cl.[6] H04N *5/208*

U.S. Cl. 348—625 **16 Claims**



1. A waveform response improvement circuit which inputs an image signal and improves a waveform of said image signal, comprising:

first delaying means for outputting a signal which is obtained by delaying an input signal of said image signal by a first delay time;

second delaying means for outputting a signal which is obtained by delaying the output signal of said first delaying means by a second delay time;

third delaying means for outputting a signal which is obtained by delaying the output signal of said second delaying means by a third delay time;

fourth delaying means for outputting a signal which is obtained by delaying the output signal of said third delaying means by a fourth delay time;

first subtracting means for outputting a signal which is obtained by subtracting said input signal from the output signal of said second delaying means;

second subtracting means for outputting a signal which is obtained by subtracting the output signal of said fourth delaying means from the output signal of said second delaying means;

first adding means for outputting a signal which is obtained by adding the output signal of said first subtracting means and the output signal of said second subtracting means;

first amplitude adjusting means for outputting a signal which is obtained by adjusting an amplitude of the output signal of said first adding means;

maximum value selecting means for selecting a maximum value from the output signals of said first, second and third delaying means;

minimum value selecting means for selecting a minimum value from the output signals of said first, second and third delaying means;

third subtracting means for outputting a signal which is obtained by subtracting the output signal of said second delaying means from the output signal of said maximum value selecting means;

fourth subtracting means for outputting a signal which is obtained by subtracting the output signal of said second delaying means from the output signal of said minimum value selecting means;

intermediate value selecting means for selecting an intermediate value from the output signal of said first amplitude adjusting means, the output signal of said third subtracting means, and the output signal of said fourth subtracting means, and for outputting a signal of the intermediate value;

second amplitude adjusting means for outputting a signal which is obtained by adjusting an amplitude of the output signal of said intermediate value selecting means; and

second adding means for adding the output signal of said second amplitude adjusting means and the output signal of said second delaying means to produce a resulting signal, and for outputting the resulting signal.

5,559,564

CATHODE RAY TUBE APPARATUS FOR PROJECTION TV SYSTEM

Tsuneharu Nomura, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 7, 1994, Ser. No. 271,670

Claims priority, application Japan, Jul. 15, 1993, 5-175680

Int. Cl.[6] H04N *5/72;9/31*

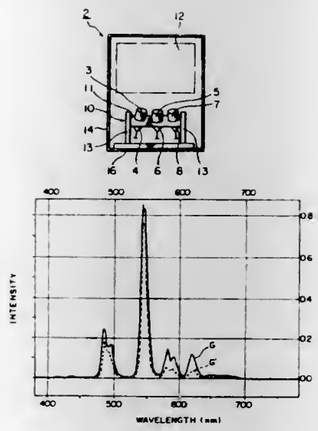
U.S. Cl. 348—779 **11 Claims**

10. A cathode ray tube apparatus for a projection TV system having a display screen and a reflection mirror, said cathode ray tube apparatus comprising:

a cathode ray tube for projecting red light on the reflection mirror, said cathode ray tube including a panel glass and a funnel glass;

a light absorbing agent of CdS·CdSe, Sb_2S, Cu or Au included in the panel glass of said cathode ray tube; and

a phosphor film coating of Y_2O_3:Eu formed on an internal surface of the panel glass of said cathode ray tube.



5,559,565

CONVERGENCE CORRECTING METHOD AND APPARATUS FOR CORRECTING CONVERGENCE DISTORTION IN A CRT

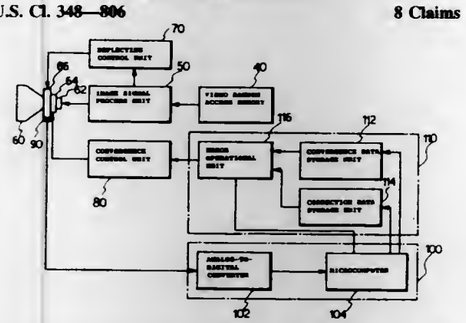
Hong-Su Yun, Yongdeungpo-gu, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Japan

Filed Aug. 25, 1993, Ser. No. 111,503

Claims priority, application Rep. of Korea, Aug. 25, 1992, 92-15336

Int. Cl.[6] H04N *3/22;3/26*

U.S. Cl. 348—806 **8 Claims**



1. A convergence correcting method of an image system having a cathode ray tube comprising the steps of:

detecting a temperature of a deflecting coil of the cathode ray tube;

calculating a difference between distorted convergence data obtained in accordance with the detected temperature and optimum convergence data; and

correcting a convergence by adjusting a field produced by a convergence coil of the cathode ray tube in accordance with the calculated difference;

wherein the optimum convergence data is pre-calculated and is of such a value as to accurately control the convergence of the image system in a stable temperature state of the deflecting coil.

5,559,566

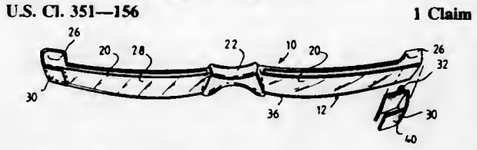
INTEGRAL READING GLASSES WITH NECKLACE SUPPORT

Donna Hansman, P.O. Box 314, Millry, Ala. 36558

Filed Oct. 7, 1994, Ser. No. 319,874

Int. Cl.[6] G02C *3/00*

U.S. Cl. 351—156 **1 Claim**



1. Reading neckglasses comprising:

a) a front piece used for reading when placed in front of the eyes of a person, said front piece consisting of a pair of corrective lenses, a bridge between said lenses, and flat side pieces with a protruding side member on each side piece extending backwardly all formed by a single transparent hardened abrasion resistant plastic material integral member without a frame; and

b) means for suspending said front piece about a neck of the person consisting of a pair of generally C-shaped spring clamps for sliding on and engaging said flat side pieces and surrounding said side members and each of said clamps having a rearwardly facing eyelet and a lanyard having two ends which are each connected to one said eyelet extending about the neck of said person, so that said front piece will always be at hand for use by the person, and permitting convenient replacement of said front piece and/or said lanyard.

5,559,567

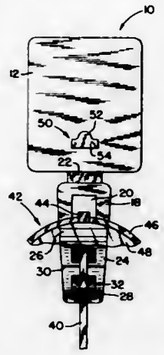
EYEGLASSES HANGER

Chester Kolton, Westfield, and Stuart S. Spater, Livingston, both of N.J., assignors to B&G Plastics, Inc., Newark, N.J.

Filed Dec. 29, 1994, Ser. No. 366,254

Int. Cl.[6] G02C *1/00*

U.S. Cl. 351—158 **26 Claims**



1. In combination:

(a) eyeglasses inclusive of a bow supporting lenses aside a nose bridge thereof, said bow defining first and second temple supports at first and second ends thereof, and first and second temples joined respectively with said first and second temple supports; and

(b) an upstanding hanger secured with said eyeglasses and hanging said eyeglasses with said first and second temple supports in vertical alignment, said hanger comprising a display portion and a tail portion depending from said display portion and extending in engagement with said first temple, the entirety of said tail portion extending vertically downwardly of said display portion.

5,559,568

INFORMATION RECORDING/REPRODUCTION

5,559,571

LENS BARREL AND ELECTRIC CIRCUIT BOARD

wherein said photographing portion of said film is slanted by a roller guiding the passage of said film, and wherein the camera has

5,559,568

INFORMATION RECORDING/REPRODUCTION APPARATUS FOR CAMERA

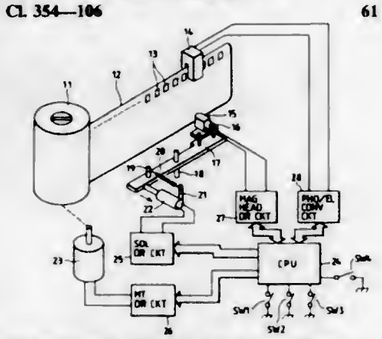
Kazyuki Kazami, Tokyo; Koichi Daitoku, Sagamihara; Tsutomu Wakabayashi, Tokyo; Tetsuro Goto, Funabashi; Akira Ezawa, and Naoki Tomino, both of Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 457,883, Jun. 1, 1995, abandoned, which is a continuation of Ser. No. 307,895, Sep. 16, 1994, abandoned, which is a continuation of Ser. No. 32,177, Mar. 15, 1993, abandoned, which is a continuation of Ser. No. 905,209, Jun. 26, 1992, abandoned, which is a continuation of Ser. No. 785,164, Oct. 31, 1991, abandoned, which is a continuation of Ser. No. 624,993, Dec. 10, 1990, abandoned. This application Nov. 21, 1995, Ser. No. 561,585

Claims priority, application Japan, Dec. 12, 1989, 1-322097; Dec. 28, 1989, 1-338349; Dec. 29, 1989, 1-341369; Feb. 28, 1990, 2-45792

Int. Cl.[6] G03B *17/24*

U.S. Cl. 354—106 **61 Claims**



1. An information processing apparatus comprising:

a magnetic recorder provided with a magnetic head which reads information on a magnetic recording medium arranged in advance on a film;

a detector for detecting whether a predetermined positional relationship between said film and said magnetic recorder is established; and

a controller for changing said magnetic recorder, between a first state where said magnetic head can read the information on said magnetic recording medium and a second state where said magnetic head can not read the information thereon, said controller changing the positional relationship from the second state to the first state in response to the detection result of said detector.

5,559,569

MOTOR DRIVEN SHUTTER HAVING FOCUS ADJUSTING AND STOP SETTING MEANS

Kazuo Akimoto, and Toshiaki Hirai, both of Chiba-ken, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Division of Ser. No. 83,806, Jun. 28, 1993, Pat. No. 5,420,660. This application Nov. 9, 1994, Ser. No. 336,443

Claims priority, application Japan, Sep. 14, 1992, 4-244985; Jan. 12, 1993, 5-3383

Int. Cl.[6] G03B *7/00*

U.S. Cl. 354—195.11 **3 Claims**

1. A motor driven shutter for a camera in which the camera has a photographic lens, said motor driven shutter being adapted to be independently controlled by means of a single motor, comprising:

a driving member actuated by said motor and having a focus adjusting section for said photographic lens and a stop setting section for said shutter;

a focus adjusting means for setting said photographic lens into a selected one of a plurality of focus positions, said focus adjusting means being actuated by said focus adjusting section of said driving member upon one directional rotation of said motor;

a stop setting mean for setting an opening of said shutter into a selected one of a plurality of stop values, said stop setting means being actuated by said stop setting section of said driving member upon said one directional rotation of said motor;

said focus adjusting section being operable to actuate said focus adjusting means simultaneously as said stop setting section actuates said stop setting means during said one directional rotation of said motor; and

said stop setting means being operable to set said selected one stop value independently of said focus adjusting means setting said selected one focus position.

5,559,570

CAMERA HAVING AN ANTI-VIBRATION DEVICE WITH IMPROVED POSITIONING OF ANTI-VIBRATION SENSORS

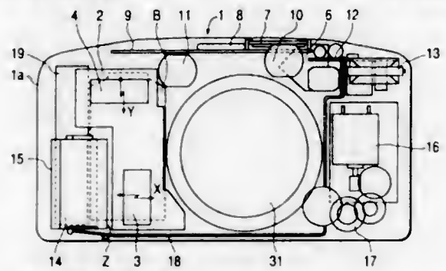
Isao Soshi, Tokyo; Hidenori Miyamoto, Urayasu; Minoru Katou; Junichi Omi, both of Kawasaki, and Tatsuo Amanuma, Ageo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed May 24, 1994, Ser. No. 248,013

Claims priority, application Japan, May 24, 1993, 5-144325; May 28, 1993, 5-151026

Int. Cl.[6] G03B *17/00;7/08;39/00*

U.S. Cl. 354—202 **16 Claims**



1. A camera comprising:

a camera body having first, second and third portions, the second portion for coupling a photographic lens barrel to the camera body and being between the first and third portions;

an anti-vibration sensor positioned on the first portion of the camera body; and

an electrical noise generating source positioned on the third portion of the camera body, so that the photographic lens barrel acts as a shielding member when the photographic lens barrel is coupled to the second portion of the camera body.

5,559,571

LENS BARREL AND ELECTRIC CIRCUIT BOARD CONNECTION STRUCTURE

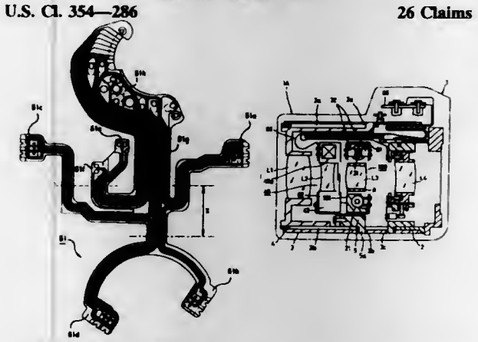
Hidenori Miyamoto, Chiba-ken; Minoru Kato; Junichi Omi, both of Kanagawa-ken; Isao Soshi, Tokyo, and Yoshio Imura, Kanagawa- ken, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Jan. 20, 1995, Ser. No. 375,686

Claims priority, application Japan, Jan. 20, 1994, 6-004888; Jan. 27, 1994, 6-023604; Feb. 4, 1994, 6-032054

Int. Cl.[6] G03B *17/00*

U.S. Cl. 354—286 **26 Claims**



1. A lens barrel comprising:

an optical system including at least part of a main optical system;

a support unit that supports the main optical system;

an electrical mechanism positioned as part of the support unit, the electrical mechanism having electrical connections both to a front and a back in a direction of an optical axis of the support unit; and

wiring structure for connecting the electrical connections in the electrical mechanism to external components, wherein the wiring structure includes a single flexible printed circuit board having connecting ends connected to the electrical connections, and wherein connecting ends of the single flexible printed circuit board are mounted to pinch the support unit that contains the electrical mechanism from both the front and the back in the direction of the optical axis.

5,559,572

CAMERA

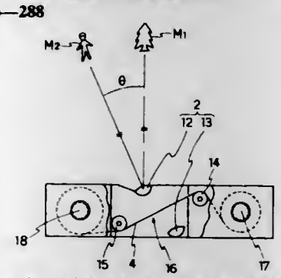
Shinichi Nagai, 17-2, Kitanakafuri 3-chome, Hirakata, Oaka-fu, Japan

Filed May 24, 1994, Ser. No. 248,237

Claims priority, application Japan, Apr. 11, 1994, 6-003622 U

Int. Cl.[6] G03B *17/02*

U.S. Cl. 354—288 **5 Claims**



1. A camera for taking snapshots, comprising a camera body equipped with optical lenses including an objective lens and a viewfinder lens, and film loaded in the camera body, wherein said objective lens, said viewfinder lens and a photographing portion of said film are substantially parallel to one another and are slanted with respect to the camera body to substantially the same degree, wherein said photographing portion of said film is slanted by a roller guiding the passage of said film, and wherein the camera has a thickness substantially equal to that of a conventional camera.

5,559,573

SIMPLIFIED CAMERA

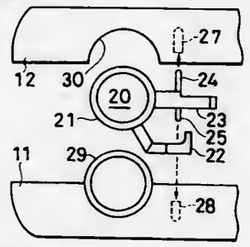
Takashi Kamoda, and Hiromitsu Kaburagi, both of Omiya, Japan, assignors to Fuji Photo Optical Co. Ltd., Omiya, Japan

Filed Feb. 6, 1995, Ser. No. 384,642

Claims priority, application Japan, Feb. 7, 1994, 6-034126; Feb. 7, 1994, 6-034127

Int. Cl.[6] G03B *17/02*

U.S. Cl. 354—288 **6 Claims**



1. A simplified camera, comprising:

a support that supports a photography button with which an acting member for executing photography is integrated and that has pivot axes relative to which said photography button is pivoted;

two cases made by dividing a camera case back and forth; that is, front and back cases that have axis receptor holes into which said pivot axes are fitted and that when joined together, hold said support in such a manner that said photography button can pivot;

a back cover of a camera serving as part of said back case; and

a mounting structure for mounting said back cover securely by uniting pin axes and axis receptor holes which are formed as parts of a side surface of said back cover and side surfaces of said front case and back case.

5,559,574

IMAGE MOVEMENT CORRECTING DEVICE EFFECTING IMAGE MOVEMENT CORRECTION DEPENDING ON POSITION OF CENTER OF ROTATION OF ANGULAR FLUCTUATION

Tadao Kai, Kawasaki; Etsuo Tanaka, Tokyo, and Akira Katayama, Koganei, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 156,926, Nov. 24, 1993, abandoned, which is a continuation of Ser. No. 900,491, Jun. 18, 1991, abandoned. This application Oct. 24, 1995, Ser. No. 547,411

Claims priority, application Japan, Jun. 21, 1991, 3-177214

Int. Cl.[6] G03B *13/00*

U.S. Cl. 354—400 **58 Claims**

1. An image movement correcting device for a photographing apparatus, comprising:

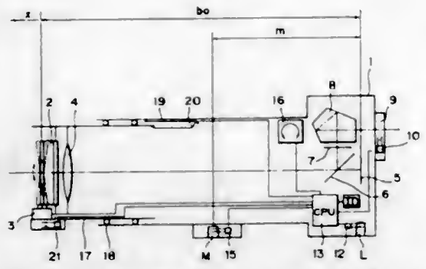
angular displacement detecting means for detecting an angular fluctuation of an optical axis of the photographing apparatus;

image movement correcting means for effecting image movement correction on a photographing image field;

photograph distance detecting means for detecting a photographing distance to an object to be photograpbed;

rotation center position discriminating means for discriminating a position of a center of rotation of the detected angular fluctuation; and

image movement correction control means for controlling an amount of image movement correction by said image move-



ment correcting means based on the angular fluctuation detected by said angular displacement detecting means, the photographing distance detected by said photographing distance detecting means, and the position of the center of rotation discriminated by said rotation center position discriminating means.

5,559,575

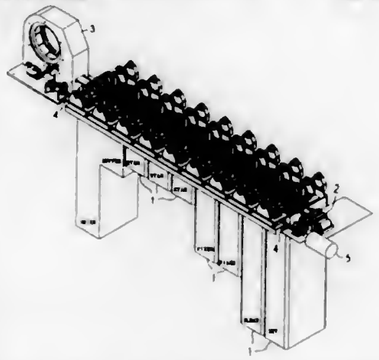
EDGE-BELT FILM HANDLING SYSTEM FOR FILM PROCESSORS AND ACCUMULATORS

Roger A. King, 300 Wrenco Heights, Sandpoint, Id. 83864

Filed Feb. 3, 1995, Ser. No. 383,197

Int. Cl.[6] G03D *3/08*

U.S. Cl. 354—320 **20 Claims**



1. Apparatus for transporting film in a process, comprising:

a pair of flexible belts;

a system of belt supports for holding said belts in spaced relation and for moving said belts in a non-linear film path in said process;

and wherein each of said belts has a groove therealong for receiving an edge of said film therein, said grooves defining a space therebetween wherein said film floats freely vertically and side to side so that said film may be moved guided and transported in said process by intermittent frictional contact with and movement of said belts through said non-linear film path.

5,559,576

SOLID PROCESSING AGENT REPLENISHING DEVICE FOR USE IN A PHOTOSENSITIVE MATERIAL PROCESSING APPARATUS

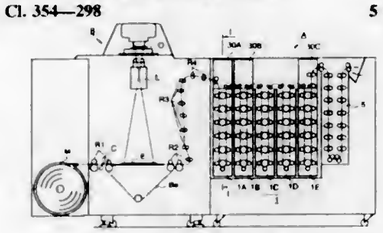
Yorikatsu Miyazawa; Yutaka Teraoka, and Hideo Ishii, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

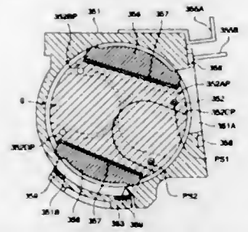
Filed Jan. 30, 1995, Ser. No. 380,374

Claims priority, application Japan, Feb. 16, 1994, 6-019550; Jun. 10, 1994, 6-129156

Int. Cl.[6] G03D *13/00*

U.S. Cl. 354—298 **5 Claims**





1. A solid processing agent device for use in a light-sensitive material processing apparatus provided with a processing tank for storing therein a processing solution by which a light-sensitive material is processed, the solid processing agent device comprising:

(a) storing means for storing a solid processing agent;

(b) replenishing means for replenishing said processing solution with the agent supplied from the storing means, the replenishing means including:

(i) a housing member having an opening through which the agent is replenished to the processing tank from the replenishing means; and

(ii) a receiving member provided in the housing member, the receiving member having an initial position, a receiving position and a replenishing position, said receiving member being movable from said initial position to said receiving position for receiving the agent, and said receiving member being movable from said receiving position to said replenishing position for replenishing the agent to the processing tank through said opening;

(c) first detecting means for detecting said receiving member and outputting a first signal when said receiving member is not located at the initial position;

(d) second detecting means for detecting whether the agent is in said receiving member at said initial position, and outputting a second signal when the agent remains in the receiving member at said initial position;

(e) third detecting means for detecting whether the agent is in said receiving member after being positioned at said receiving position, and for outputting a third signal when the agent is not received in said receiving member at said receiving position;

(f) fourth detecting means for detecting the agent which is received in said receiving member at said receiving position, and outputting a fourth signal when the agent is not replenished to the processing tank at said replenishing position; and

(g) controller means for controlling said receiving member not to start moving when said controller means receives the first or second signal, and for controlling said receiving member to stop moving when said controller means receives said third or fourth signal.

5,559,577

DEVICE FOR REPLENISHING SOLID PROCESSING AGENT USED IN A LIGHT-SENSITIVE MATERIAL PROCESSING APPARATUS

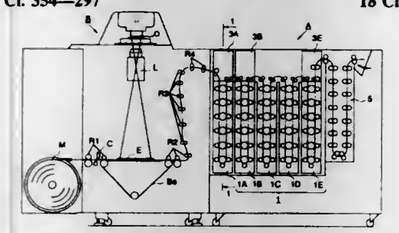
Yorikatsu Miyazawa; Hideo Ishii; Toshiyuki Ikariya; Hideo Kobayashi; Shigeharu Koboshi; Yutaka Takei, and Haruo Hakamada, all of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

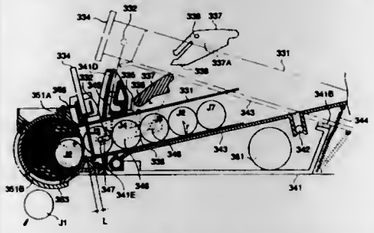
Filed Feb. 10, 1995, Ser. No. 387,114

Claims priority, application Japan, Feb. 16, 1994, 019551; Feb. 16, 1994, 019552; Feb. 16, 1994, 041925

Int. Cl.[6] G03D *13/00;* **B65H** *1/00*

U.S. Cl. 354—297 **18 Claims**





1. An apparatus for supplying a solid processing agent having a predetermined size to a processing tank of a photographic material processing apparatus, comprising:

an accommodation container in which the solid processing agent is stored, the accommodation container having an outlet section provided with an outlet opening larger than the size of the solid processing agent so that the solid processing agent is enabled to be discharged through the outlet opening;

a container holder to hold the accommodation container, wherein the container holder is moved together with the accommodation container between at least two positions, on a first position of which the accommodation container is mounted on or dismounted from the container holder and on a second position of which the solid processing agent is discharged from the accommodation container;

a supply device having an inlet section to receive the solid processing agent from the outlet opening of the accommodation container arranged in the second position, and a supplying member to supply the solid processing agent to the processing tank;

urging means for applying an urging force to urge the accommodation container arranged in the second position toward the supply device so that the outlet section of the accommodation container is brought into contact with the inlet section of the supply device, to thereby discharge the solid processing agent to the inlet section;

releasing means for releasing the accommodation container from the urging force and for allowing the accommodation container to move toward the first position; and

put-back means for putting the discharged solid processing agent back from the inlet section into the accommodation container when the accommodation container is moved from the second position to the first position.

5,559,578

ELECTROSTATIC RECORDING APPARATUS WITH ELECTRIFIED CAP AND MANAGING SYSTEM THEREOF

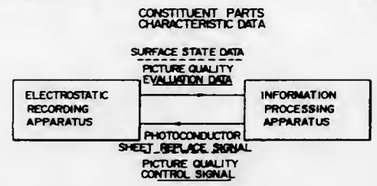
Takao Umeda, Mito; Toru Miyasaka, Hitachi; Osamu Namikawa, Katsuta; Isamu Komatsu, Takahagi; Tetsuya Nagata; Yasuo Takuma, both of Hitachi, and Tatsuo Igawa, Kitaibaraki, all of Japan, assignors to Hitachi, Ltd., and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 917,709, Jul. 16, 1992, Pat. No. 5,373,351, and Ser. No. 827,939, Jan. 29, 1992, Pat. No. 5,404,201, which is a division of Ser. No. 325,386, Mar. 20, 1989, Pat. No. 5,138,380. This application Dec. 30, 1993, Ser. No. 175,867

Claims priority, application Japan, Mar. 22, 1988, 63-65636; Dec. 6, 1988, 63-306844; Jul. 22, 1991, 3-204539

Int. Cl.[6] G03G *15/00;21/00*

U.S. Cl. 355—208 **26 Claims**



20. An electrostatic recording apparatus comprising:

a plurality of constituent elements;

at least one current detecting means provided for said plurality of constituent elements, for detecting a value of current flowing therein; and

transmitting means for transmitting the detected current value as a state data.

5,559,579

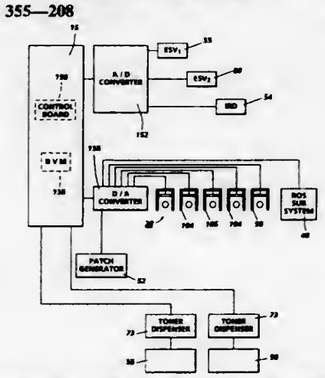
CLOSED-LOOP DEVELOPABILITY CONTROL IN A XEROGRAPHIC COPIER OR PRINTER

Mark A. Gwaltney, and Robert E. Grace, both of Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 29, 1994, Ser. No. 315,018

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—208 **18 Claims**



1. In a method of creating toner patterns on a charge retentive surface, the steps including:

moving said charge retentive surface past a plurality of process

carried out with the bipolar photosensitive member charged to

wherein said positioning reference, said feed guide reference, and said projection reference are disposed on a same side of a

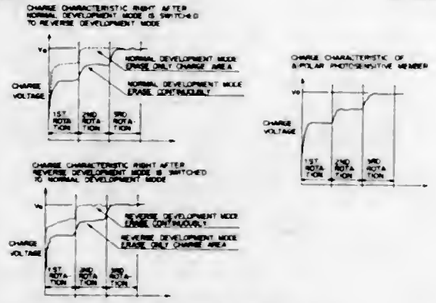
moving said charge retentive surface past a plurality of process stations including a charging station where said charge retentive surface is uniformly charged;
selectively discharging said charge retentive surface for forming electrostatic patterns therein, said electrostatic patterns comprising areas at different charge levels;
forming test patches on said charge retentive surface;
using a developer structure containing a mixture of toner and carrier particles, presenting toner material to said electrostatic patterns and said test patches;
using a toner dispenser, replenishing toner in said developer structure;
controlling the replenishment of toner by:
temporarily stopping toner dispensing until toner concentration is reduced by a predetermined amount;
generating a signal representative of toner concentration reduction;
sensing said test patches and generating signals representative of toner density;
using said signals representative of toner density and said signal representative of toner concentration reduction for determining a rundown slope;
comparing said rundown slope to a target value;
increasing or decreasing a rate of replenishing toner depending on whether said rundown slope is greater than or less than said target value.

5,559,580

IMAGE FORMING APPARATUS HAVING A BIPOLAR PHOTOSENSITIVE MEMBER

Koji Nitzawa, Toyokawa; Masami Matsuura, Toyohashi, and Hideo Yamaki, Toyokawa, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Jun. 1, 1995, Ser. No. 457,142
Claims priority, application Japan, Jun. 8, 1994, 6-126367; Apr. 10, 1995, 7-084034
Int. Cl.[6] G03G *15/045;15/00*
U.S. Cl. 355—219 **2 Claims**



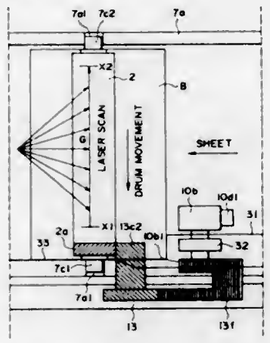
2. An image forming apparatus comprising:
a bipolar photosensitive member which can be charged to have a first or a second polarity;
a main charger for charging the bipolar photosensitive member to have the first or the second polarity;
an exposure optical system for exposing the bipolar photosensitive member which is charged by the main charger to a light and forming an electrostatic latent image thereon;
a developing device for carrying out a normal development or a reverse development to develop the electrostatic latent image formed on the bipolar photosensitive member with toner;
a transfer charger for transferring a developed toner image onto a sheet;
an eraser for erasing charge by irradiating the bipolar photosensitive member after the transfer;
a switching device for switching an image forming mode which is carried out with the bipolar photosensitive member charged to have the first polarity and an image forming mode which is carried out with the bipolar photosensitive member charged to have the second polarity; and
a controller for controlling the main charger, the controller, in an image forming operation right after the image forming mode is switched, setting a charge output value of the main charger higher than a specified value while the bipolar photosensitive member rotates by a specified amount and thereafter setting the charge output value of the main charger at the specified value so as to continue the image forming operation.

5,559,581

IMAGE FORMING APPARATUS WITH HELICAL GEAR DRIVE TRAIN

Yoshinori Sugiura; Jun Azuma, both of Kawasaki; Nobukazu Adachi, Yokohama; Takeshi Setoriyama, Toride; Chitose Tenpaku, Kawasaki; Noriyoshi Ishikawa, Yokohama; Tatsuo Hamada, Kawasaki; Yoshiro Tsuchiya, Yokohama; Takeshi Kubota, Tama; Yoshiya Nomura, Tokyo; Akira Kuroda, Yokohama; Ken Murooka, Toride; Takeshi Sugita, Yokohama; Takeshi Nimura, Musashino, and Akira Yuza, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1994, Ser. No. 233,949
Claims priority, application Japan, Apr. 28, 1993, 5-123164
Int. Cl.[6] G03G *15/00*
U.S. Cl. 355—200 **28 Claims**



1. An image forming apparatus for forming an image on a recording material, to which a process cartridge is detachably mountable, said image forming apparatus comprising:
mounting means for mounting a process cartridge including an image bearing member comprising a helical gear, and process means actable on said image bearing member;
feeding means for feeding the recording material;
projection means for projecting image information light onto said image bearing member in a direction from a projection reference disposed at one side of an axis of said image bearing member to the other side;
a positioning reference for positioning said image bearing member in its axial direction;
a feed guide reference for guiding the recording material fed by said feeding means; and

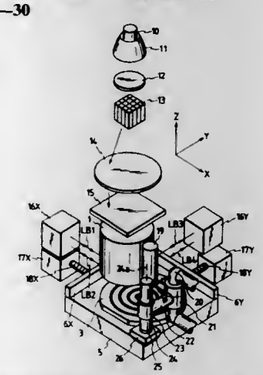
wherein said positioning reference, said feed guide reference, and said projection reference are disposed on a same side of a main assembly of said image forming apparatus which is a downstream side in a direction of a thrust force received by said helical gear when the helical gear is driven by said main assembly.

5,559,582

EXPOSURE APPARATUS

Kenji Nishi, Yokohama, and Masaaki Aoyama, Chigasaki, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 103,141, Aug. 9, 1993, abandoned. This application Aug. 1, 1994, Ser. No. 283,829
Claims priority, application Japan, Aug. 28, 1992, 4-230069; Aug. 31, 1993, 5-216570
Int. Cl.[6] G03B *27/52*
U.S. Cl. 355—30 **34 Claims**



1. An exposure apparatus including a stage which has a holding member and which moves within a stage movable range on a two-dimensional plane, said holding member having a surface on which a photosensitive substrate is held by a chucking mechanism, and said apparatus being adapted to expose a pattern of a mask onto the photosensitive substrate and comprising:
(a) cleaning means for performing a cleaning operation with respect to the surface of said holding member; and
(b) biasing means for biasing said cleaning means to bring said cleaning means into contact with the surface of said holding member in the cleaning operation,
wherein (c) said stage moves within the stage movable range on the two-dimensional plane to cause said cleaning means to execute the cleaning operation while said cleaning means is biased against the surface.

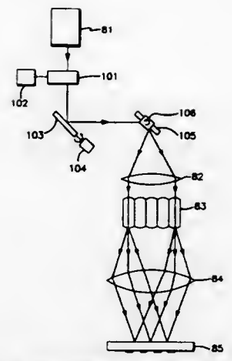
5,559,583

EXPOSURE SYSTEM AND ILLUMINATING APPARATUS USED THEREIN AND METHOD FOR EXPOSING A RESIST FILM ON A WAFER

Hiroyoshi Tanabe, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 24, 1995, Ser. No. 394,942
Claims priority, application Japan, Feb. 24, 1994, 6-025828; May 13, 1994, 6-099816
Int. Cl.[6] G03B *27/42;27/72;27/32*
U.S. Cl. 355—71 **13 Claims**

1. An illuminating system involved in an exposure system for irradiating a linearly polarized illumination light on a mask with a predetermined pattern, wherein provision is made of means for controlling a polarization direction of said light at a p-polarization direction, said controlling means being provided between a light source and optical lenses and having an oblique incident feature which allows said light to be irradiated on said mask at an oblique angle to a surface of said mask, said controlling means comprising a space filter having at least a plurality of half wave plates being spaced apart from each other, each of said half wave plates having a polarization direction along with a radial direction of said filter.

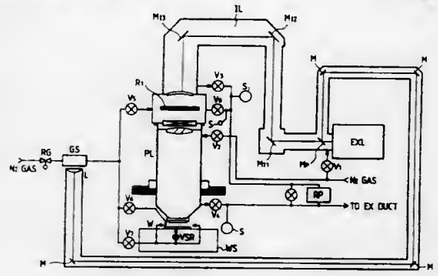


5,559,584

EXPOSURE APPARATUS

Akira Miyaji, and Masatoshi Ikeda, both of Tokyo, Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 206,168, Mar. 7, 1994, abandoned. This application Jan. 30, 1995, Ser. No. 380,447
Claims priority, application Japan, Mar. 8, 1993, 5-046519; Mar. 8, 1993, 5-046520
Int. Cl.[6] G03B *27/34*
U.S. Cl. 355—73 **24 Claims**



21. A projection exposure method for exposing a pattern of a mask onto a photosensitive substrate through a projection optical system, the method comprising the steps of:
providing an ArF excimer laser emitting an ultraviolet radiation which has a spectral band narrowed so as to avoid absorption spectrum lines of oxygen;
providing an inert gas atmosphere comprising nitrogen gas in which oxygen density is less than 10% at least in a space of a projection path between said projection optical system and the substrate; and
irradiating the mask with the ultraviolet radiation emitted from said ArF excimer laser to project a pattern image of the mask onto the substrate through said projection optical system and said inert gas atmosphere.

170–921 O.G.–96–21: QL3

5,559,585

5,559,588

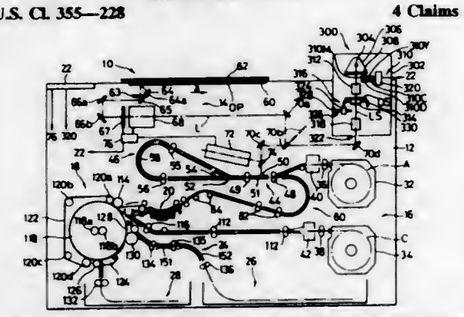
LID MACHINE CAPABLE OF PRODUCING CLEAN

5,559,585

IMAGE FORMING APPARATUS ADAPTED FOR REFLECTION-TYPE OR TRANSMISSION-TYPE ORIGINALS

Atsushi Takagi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 119,589, Sep. 13, 1993, abandoned. This application Oct. 17, 1995, Ser. No. 544,255
Claims priority, application Japan, Sep. 14, 1992, 4-244693
Int. Cl.[6] G03G *15/04*
U.S. Cl. 355—228 **4 Claims**



1. An image forming apparatus for duplicating an image of an original document, comprising:

an imagewise exposing section having a plurality of exposure optics defining a plurality of optical paths for selective use depending upon whether the .original document is a reflection-type or a transmission-type original;

a light-sensitive material feed section where a light-sensitive material is fed to a predetermined position for imagewise exposure;

a developing section where the exposed light-sensitive material is subjected to a development process;

input means for inputting by the user the kind of document to be duplicated and for allowing the user to perform color and density related adjustments during image formation by means of the selected exposure optics selected in accordance with the kind of document;

a plurality of light filters responsive to said input means for being inserted into the optical path of the selected exposure optics by predetermined amount depending upon the kind of document to be duplicated; and

a variable diaphragm, responsive to said input means, an opening of which is adjusted to be a predetermined level depending-upon the kind of document to be duplicated.

5,559,586

IMAGE FORMING DEVICE HAVING CONTROL GRID WITH APPLIED VOLTAGE OF THE SAME POLARITY AS TONER

Takasumi Wada, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 291,337, Aug. 17, 1994, abandoned, which is a continuation of Ser. No. 1,116, Jan. 6, 1993, abandoned. This application Nov. 21, 1995, Ser. No. 561,142
Claims priority, application Japan, Jan. 7, 1992, 4-000588
Int. Cl.[6] G03G *15/06*
U.S. Cl. 355—245 **8 Claims**

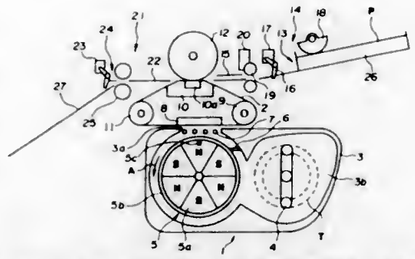
1. An image-forming device comprising:

a toner carrier for polarizing and carrying toner;

a backing electrode placed facing the toner carrier and supplied with voltage of an opposite polarity to the toner carrier;

a control grid placed between toner on the toner carrier and the backing electrode and for controlling the movement of the toner from the toner carrier towards the backing electrode;

a recording element movable between the control grid and the backing electrode; and



a control voltage applying means for adjusting voltage applied to the control grid;

said control grid comprises wire electrodes extending in the direction (X) to carry the recording element and wire electrodes extending in the direction (Y) intersecting the direction (X), said control grid having grid openings defined by said wire electrodes;

said control voltage applying means applying voltage having the same polarity as that of the toner to each of the wire electrodes in both directions (X and Y) in such a way that a continuously applied toner-repulsing force produced by an electrical field within each of the grid openings is selectively changed to a larger or smaller one than the other attracting force produced by the backing electrode,

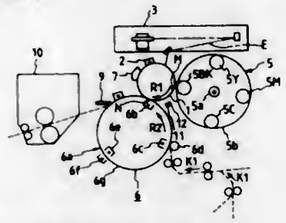
further in which the recording element is a single transfer belt, said single transfer belt cooperating with said toner and control grid to preliminarily receive a toner image, and cooperating with a fixing holder to transfer and fix said toner image onto a sheet of paper.

5,559,587

IMAGE FORMING APPARATUS

Takao Ogata, Yokohama, and Takeshi Menjo, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 275,711, Jul. 19, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 469,422
Claims priority, application Japan, Jul. 21, 1993, 5-200969
Int. Cl.[6] G03G *21/00*
U.S. Cl. 355—246 **17 Claims**



1. An image forming apparatus comprising:

a rotatable member having an image bearing portion on the surface thereof;

image forming means for forming a toner image on the surface of said rotatable member;

detecting means for detecting a density of a predetermined toner image formed on the surface of said rotatable member under a predetermined image forming condition; and

control means for controlling an image forming condition of said image forming means when forming a toner image corresponding to image information on the basis of the density detected by said detecting means and

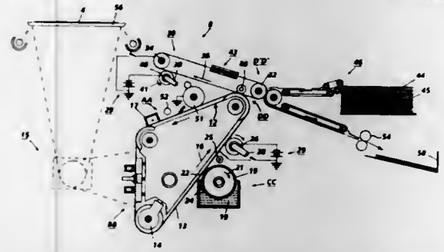
eccentricity data of said rotatable member.

5,559,588

LID MACHINE CAPABLE OF PRODUCING CLEAN-BACKGROUND STABILIZED LIQUID TONER IMAGES

James R. Larson, Fairport; Anthony M. Wallace, Penfield; Clifford H. Griffiths, and Dennis A. Abramsohn, both of Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 13, 1995, Ser. No. 527,615
Int. Cl.[6] G03G *9/13;9/00*
U.S. Cl. 355—256 **8 Claims**



1. A liquid reproduction machine for producing a stabilized liquid toner image having clean-background areas, the reproduction machine comprising:

(a) a movable image bearing member having an image bearing surface;

(b) latent image forming means mounted along a path of movement of said image bearing member for forming a latent image electrostatically on said image bearing surface, said latent image having image areas and background areas;

(c) a development apparatus containing liquid toner developer material for developing said latent image, said liquid toner developer material including a carrier liquid having a relatively low conductivity within a range of 0.01 to 1.00 pmho/cm, and charged toner particles having a relatively high charge level per particle resulting an absolute zeta potential within a range of 150 to 400 mV dispersed within said carrier liquid; and

(d) an image stabilization roller including a relatively low voltage bias having an absolute value within a range from 200 to 1500 volts, said relatively low voltage bias having a polarity selected to be of the same electrical sign as a polarity of the toner particle charge, so as to combine with low conductivity of the carrier liquid and high charge level per particle of the toner particles to achieve effective image stabilization and clean developed image background areas.

5,559,589

KEYING METHOD AND APPARATUS

David Eichberger, Houston, and Nicholas G. Forlenza, Cypress, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

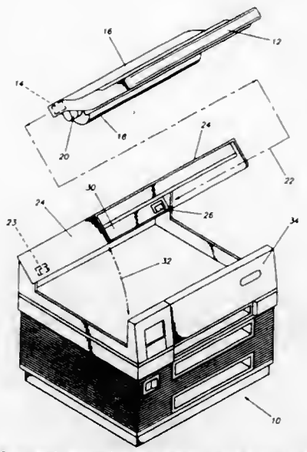
Continuation of Ser. No. 127,247, Sep. 27, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 468,981
Int. Cl.[6] G03G *15/06*
U.S. Cl. 355—260 **17 Claims**

1. A system comprising two components which are keyed to each other to facilitate categorization of one of the components, comprising:

(a) a first component which is relatively long-lived portion;

(b) a second component which is a consumable cartridge; and

(c) categorization means for categorizing one of said two components by providing a keying interconnection between said first component and said second component, said categorization means comprising a lug element formed on said first component and a void formed within said second component, said void defining an enclosed area shaped like said lug element, said lug element being insertable into said void to form said keying interconnection;



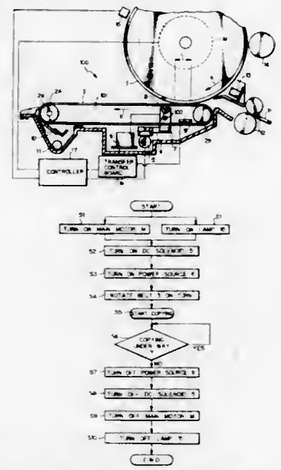
(d) said first and second components operably engaging each other only when said lug element is inserted into said void.

5,559,590

IMAGE FORMING APPARATUS WHICH CLEANS A TRANSFER BELT BY APPLYING A BIAS VOLTAGE

Makoto Arai, Tokyo; Norimasa Sohmiya; Masakuni Konja, both of Souka, and Satoshi Takano, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 17, 1995, Ser. No. 373,428
Claims priority, application Japan, Jan. 19, 1994, 6-003992; Dec. 28, 1994, 6-328848
Int. Cl.[6] G03G *15/14*
U.S. Cl. 355—271 **24 Claims**



1. An image forming apparatus, comprising:

an image carrier for carrying a toner thereon;

endless conveying means for conveying an image transfer medium;

charge applying means for applying a charge to said endless conveying means in order to transfer the toner image from said image carrier to the image transfer medium;

control means for controlling, when the image transfer medium is absent from a nip formed by said endless conveying means and said image carrier contacting each other, said charge

applying means to apply a charge having a same polarity as a

5,559,594

applying means to apply a charge having a same polarity as a charge which transfers the toner image to the image transfer medium;

drive means for moving each of said image carrier and endless conveying means in a predetermined direction; and

moving means for selectively moving said conveying means into or out of contact with said image carrier, said endless conveying means forming said nip when in contact with said image carrier.

5,559,591

IMAGE FORMING APPARATUS WITH FUNCTION OF REQUESTING EXCHANGE OF FIXING UNIT

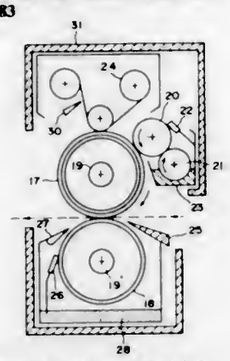
Motoi Kato; Haruo Fujii; Toshifumi Moritani, all of Yokohama; Tatsuya Kobayashi, Tokyo; Tetsuya Kobayashi, Kawasaki; Toshiaki Miyashiro, Ichikawa; Naoki Enomoto; Akihiko Uchiyama, both of Yokohama, and Yoshiro Saito, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 079,920, Jun. 23, 1993, abandoned. This application Jun. 2, 1996, Ser. No. 460,520

Claims priority, application Japan, Jun. 26, 1992, 4-191374

Int. Cl.[6] G03G *15/20;15/22*

U.S. Cl. 355—283 **3 Claims**



1. An image forming apparatus comprising:

image forming means for forming an unfixed image on a recording medium;

a pair of fixing rotary members for fixing the unfixed image on the recording medium; and

a cleaning web for cleaning a surface of one of said fixing rotary members, said cleaning web being adapted to wind up in one direction.

wherein a length of said Cleaning web is set such that a completion time of winding-up is substantially equal to a time for exchanging said fixing rotary members;

said pair of fixing rotary members and said cleaning web being an integral unit separable from said apparatus, said pair of fixing rotary members and said cleaning web being exchangeable together as a unit.

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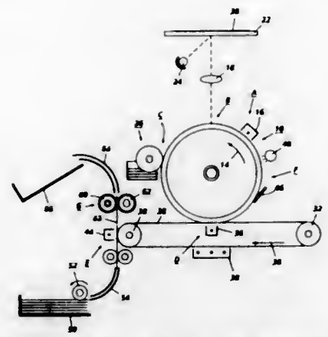
SINTERED IMAGE TRANSFER SYSTEM

James R. Larson, Fairport; David H. Pan, Rochester, and John S. Berkes, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 30, 1995, Ser. No. 497,561

Int. Cl.[6] G03G *15/20*

U.S. Cl. 355—285 **21 Claims**



1. An apparatus for transferring a developed image including a plurality of individual toner particles from a photoreceptive imaging member to an image support surface, comprising:

means for heating the developed image on the photoreceptive imaging member to a given temperature such that the developed image is sintered to form a coherent bonded network of toner particles on the photoreceptive imaging member without melting the individual toner particles into a substantially solid mass; and

means for transferring the sintered image to the image support surface.

5,559,593

CLEANING DEVICE FOR AN IMAGE FORMING APPARATUS

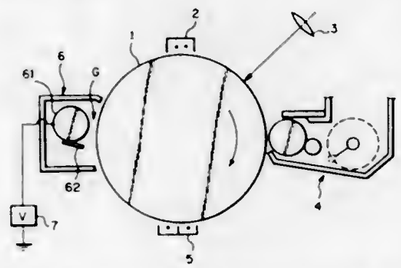
Hiroshi Yoshinaga, Ichikawa, and Akira Sawada, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 15, 1995, Ser. No. 441,609

Claims priority, application Japan, May 13, 1994, 6-124363; Sep. 20, 1994, 6-253026; Apr. 3, 1995, 7-101710

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—296 **11 Claims**



7. A cleaning device for an image forming apparatus and for removing toner left on an image carrier after a toner image has been transferred from said image carrier to a transfer medium, said device comprising:

cleaning means spaced apart from a surface of the image carrier by a predetermined gap;

electric field forming means for forming between said cleaning means and the image carrier an electric field for causing the toner to fly from said image carrier toward said cleaning means; and

said cleaning means having a rotatable roller, said roller having a volume resistivity of 1×10^3 Ωcm or less.

5,559,594

COPYING METHOD AND APPARATUS FOR COPYING A DOCUMENT IN TWO-IN-ONE MODE

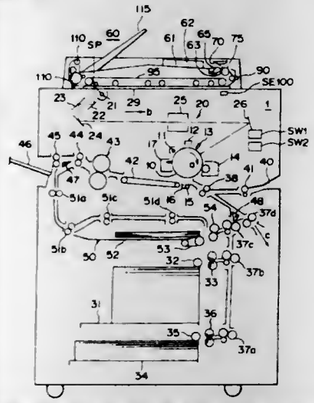
Akira Ohhata, Toyohashi, and Masao Kondo, Toyokawa, both of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Feb. 27, 1995, Ser. No. 394,793

Claims priority, application Japan, Feb. 28, 1994, 6-055213; Feb. 28, 1994, 6-055232

Int. Cl.[6] G03G *21/00*

U.S. Cl. 355—317 **13 Claims**



1. A copying machine for copying a document through the steps of feeding a plurality of stacked document sheets one by one; arranging two document sheets on a glass platen in series with respect to a document conveying direction; and copying images of the two document sheets onto one sheet by a single exposure scanning process, the copying machine comprising:

a scale arranged upstream or downstream of the glass platen in the document conveying direction and protruded upward from an upper surface of the glass platen;

a document conveying means having a first mode and a second mode, in the first mode the document conveying means conveying two document sheets to an exposure position with their ends made coincident with each other without restricting them by the scale, in the second mode the document conveying means conveying two document sheets on the glass platen with an interval provided therebetween and making the ends of the two document sheets coincident with each other by restricting one of the two sheets arranged on one side close to the scale;

selection means for selecting either the first mode or the second mode according to the quality of the document; and

control means for controlling the document conveying means in the mode selected by the selection means.

5,559,595

APPARATUS AND METHOD FOR SCHEDULING INVERSIONS OF POST PRINTING INSERTS

Michael E. Farrell, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 12, 1994, Ser. No. 353,874

Int. Cl.[6] G03G *21/00*

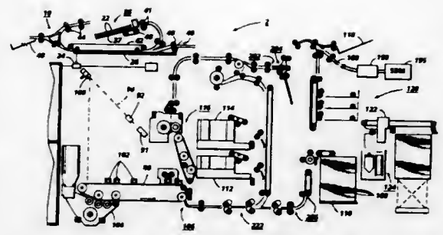
U.S. Cl. 355—325 **14 Claims**

1. In a printing system for producing a print job, the printing system including a print engine for imaging regular substrates, fed to the print engine from a regular substrate feeding apparatus, and delivering the imaged regular substrates as output, each of the imaged regular substrates of the delivered output of imaged regular substrates being disposed in one of a first stock orientation and a second stock orientation, an apparatus for handling one or more special sheets comprising:

special sheet insertion means for inserting one or more special sheets into a special sheet insertion path, said special sheet insertion path being operatively coupled with the print engine, said special sheet insertion means including the one or more special sheets, one of the one or more special sheets being fed to the special sheet insertion path and added to the delivered output of imaged regular substrates, the one of the one or more special sheets, when disposed in the special sheet insertion path, being in one of the first stock orientation and the second stock orientation;

means for determining whether the stock orientation of the one of the one or more special sheets, as disposed in the special sheet insertion path, is the same as the stock orientation of the delivered output of imaged regular substrates; and

means, communicating with the special sheet insertion path, for inverting the one of the one or more special sheets when the one of the one or more special sheets is invertible and the stock orientation of the one of the one or more special sheets is different than the stock orientation of the delivered output of imaged regular substrates.



5,559,596

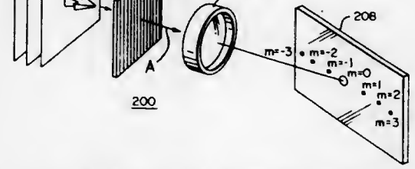
FLUID SAMPLE ANALYSIS BY OPTICAL FOURIER TRANSFORM IMAGING

Steven H. Mersch, Germantown, Ohio, assignor to Point Source, Inc., Germantown, Ohio

Filed Feb. 13, 1995, Ser. No. 387,484

Int. Cl.[6] G01N *21/41*

U.S. Cl. 356—128 **8 Claims**



1. An optical fourier transform system for analyzing a liquid sample comprising:

a liquid sample container defining a microchanneled liquid sample receiving housing having a plurality of parallel open-ended microchannels lying within a plane and forming a lenticular array;

a light source for illuminating a liquid sample received within said microchannels of said liquid sample container along an optical axis intersecting said plane within which said microchannels of said liquid sample container lie at an angle greater than zero relative to said plane;

a transform lens for receiving light from said liquid sample container and for generating an optical fourier transform of received light at a fourier transform plane; and

detector apparatus positioned at said fourier transform plane for detecting said optical fourier transform.

5,559,597

produces one of first and second diffracted light beams of

whereby interference of the electromagnetic radiation causes a beat signal having an amplitude:

5,559,597

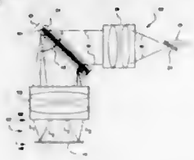
SPECTROGRAPH WITH MULTIPLEXING OF DIFFERENT WAVELENGTH REGIONS ONTO A SINGLE OPTO-ELECTRIC DETECTOR ARRAY

David E. Battey; Harry Owen, both of Ann Arbor, and James M. Tedesco, Livonia, all of Mich., assignors to Kaiser Optical Systems, Inc., Ann Arbor, Mich.

Continuation of Ser. No. 50,862, Apr. 21, 1993, Pat. No. 5,442,439. This application May 30, 1995, Ser. No. 453,908

Int. Cl.[6] G01J *3/28*

U.S. Cl. 356—328 **18 Claims**



1. An optical spectrograph for use in analyzing a plurality of incoming light beams, comprising:

a two-dimensional opto-electric detector array containing rows and columns of detector elements;

a plurality of holographic transmission optical gratings, each recorded to diffract a predetermined range of wavelengths, said gratings being supported so that each light beam to be analyzed passes through each, with each grating diffracting wavelengths of each beam in its range onto a different row of said detector array, resulting in multiple bands of radiation incident upon said array, each band having a height in pixels related to the number of incoming beams.

5,559,598

APPARATUS FOR DETECTING MISALIGNMENT BETWEEN DIFFRACTION GRATINGS AND THE POSITION OF A DIFFRACTION GRATING BASED ON THE PHASES OR THE PHASE DIFFERENCE BETWEEN ELECTRICAL SIGNALS

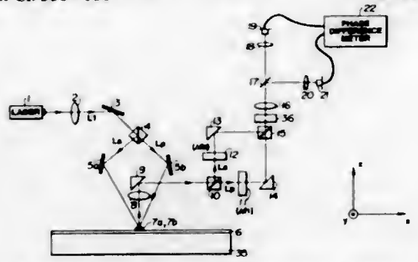
Takahiro Matsumoto, Zama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1994, Ser. No. 326,962

Claims priority, application Japan, Oct. 26, 1993, 5-290024; Sep. 29, 1994, 6-259413

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—356 **9 Claims**



1. A position detection apparatus for detecting a position of an object, said apparatus comprising:

a diffraction grating provided on the object;

a light source for emitting light having a single frequency;

illuminating means for projecting the light of said light source onto said diffraction grating so that said diffraction grating produces one of first and second diffracted light beams of different diffraction orders and first and second diffracted light beams of the same diffraction order but of different signs;

a plurality of frequency modulators for performing frequency modulation of the first and second diffracted light beams from said diffraction grating and introducing aberration into the first and second diffracted light beams;

combining means for combining the first diffracted light beam subjected to frequency modulation by one of said frequency modulators, and a second diffracted light beam subjected to frequency modulation by one of the frequency modulators;

photoelectric conversion means for converting the light combined by said combining means into electrical signals comprising beat signals having an offset due to the aberration introduced by said plurality of frequency modulators; and

a signal processing system for eliminating the offset and for detecting the position of said diffraction grating based on the phases of the electrical signals.

5,559,599

GRADUATION SCALE HAVING A CONTINUOUS PLANAR SURFACE WITH A PROTECTIVE DIFFUSION BARRIER LAYER THEREON

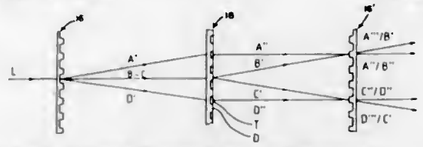
Dieter Michel, Traunstein, Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Germany

Filed Nov. 14, 1994, Ser. No. 339,120

Claims priority, application Germany, Nov. 12, 1993, 43 38 680.6

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—356 **23 Claims**



1. A length or angle measuring instrument comprising:

a first grating graduation for diffracting a beam of light;

a carrier member having a phase graduation thereon in a graduation region of the carrier member wherein the graduation has graduation structures spaced apart from one another in the graduation region, the graduation structures having transmission properties different from that of carrier member wherein the graduation is an integrated component of the carrier member and forms a continuous planar surface in the graduation region, wherein said continuous planar surface has a protective diffusion barrier layer thereon, the graduation of the carrier member further diffracts the beam of light passed through the first graduation;

a second grating graduation for bring the diffracted beams from the carrier member into interference; and

detectors for detecting the interference.

5,559,600

APPARATUS FOR DETECTING RELATIVE MOVEMENT

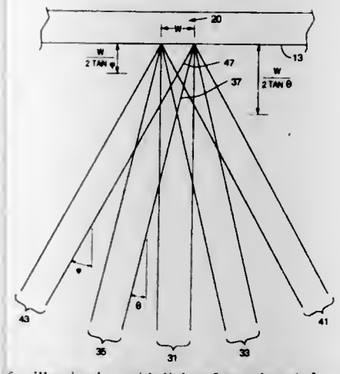
Donald K. Mitchell, Marblehead, Mass., assignor to MicroE, Inc., Needham, Mass.

Continuation of Ser. No. 293,090, Aug. 19, 1994, abandoned, which is a continuation of Ser. No. 878,494, May 5, 1992, abandoned. This application Feb. 1, 1995, Ser. No. 383,700

Int. Cl.[6] G01B *9/02*

U.S. Cl. 318—356 **18 Claims**

1. Apparatus for detecting relative movement comprising a diffraction scale relatively movable with respect to a source of light and having a period P and a characteristic which concentrates light diffracted at a preselected wavelength λ into the positive and negative first orders;



means for illuminating with light of wavelength λ a region of said scale having a width W along the length of the scale;

a periodic detector having a sensing plane spaced from said scale a distance less than

$$\frac{W}{2\tan\theta} \text{ where } \theta = \arcsin\left(\frac{\lambda}{P}\right)$$

the period of said detector being equal to P/2 whereby said detector responds principally to interference at said sensing plane between the positive and negative first orders diffracted from said scale.

5,559,601

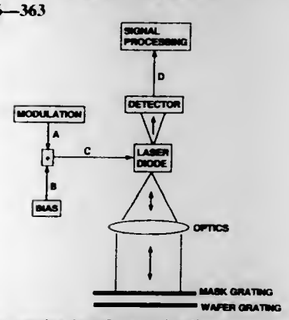
MASK AND WAFER DIFFRACTION GRATING ALIGNMENT SYSTEM WHEREIN THE DIFFRACTED LIGHT BEAMS RETURN SUBSTANTIALLY ALONG AN INCIDENT ANGLE

Gregg M. Gallatin, Newtown; Justin L. Kreuzer, Trumbull, and Michael L. Nelson, W. Redding, all of Conn., assignors to SVG Lithography Systems, Inc., Wilton, Conn.

Continuation of Ser. No. 185,644, Jan. 24, 1994, abandoned. This application Jan. 20, 1995, Ser. No. 375,636

Int. Cl.[6] G01B *9/02*

U.S. Cl. 356—363 **5 Claims**



1. A grating-grating interferometric alignment system for determining the alignment of a mask and a wafer comprising:

a first diffraction grating placed on the mask;

a second diffraction grating placed on the wafer;

a laser diode illumination source directing electromagnetic radiation of a predetermined frequency onto said first diffraction grating and positioned to receive backscatter from said first and second diffraction gratings;

drive means, coupled to said laser diode, for varying the predetermined frequency of said laser diode;

an electromagnetic radiation intensity detector positioned to collect electromagnetic radiation emitted by said laser diode and the backscatter from the mask and wafer gratings, whereby interference of the electromagnetic radiation causes a beat signal having an amplitude;

signal processing means, coupled to said electromagnetic radiation intensity detector, for determining the mask and wafer alignment from the beat signal; and

motor means, coupled to said signal processing means, for moving the first and second gratings relative to each other whereby the mask and wafer are aligned.

5,559,602

ROTATION MEASURING APPARATUS AND DISPLACEMENT MEASURING APPARATUS

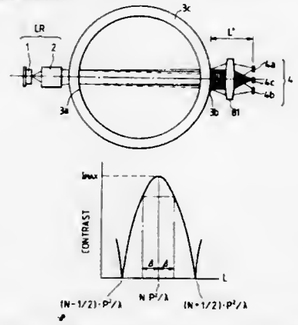
Masaru Nyui, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1993, Ser. No. 29,636

Claims priority, application Japan, Mar. 13, 1992, 4-089760

Int. Cl.[6] G01D *5/34;* **G01B** *11/02*

U.S. Cl. 356—374 **2 Claims**



1. An apparatus for detecting information regarding displacement between a first grating of a grating pitch P and a second grating, comprising:

an illuminating system for applying a light beam to said first grating, said illuminating system including a light source and a lens system for directing the light beam from said light source, said illuminating system being supported by a support member, light emerging from said first grating to which the light beam is applied by said illuminating system being applied to said second grating; and

a light receiving element for receiving a light beam emerging from said second grating to which the light is applied, information regarding the displacement between said first grating and said second grating being detected by the light reception of said light receiving element;

wherein when a reference wavelength of the light beam from said light source is λ_0 and a focal length temperature coefficient of said lens system is α and wavelength temperature coefficient of said light source is γ and a coefficient of linear expansion of said support member is β and a natural number is N and an amount of environmental temperature variation is Δt, the following condition is satisfied:

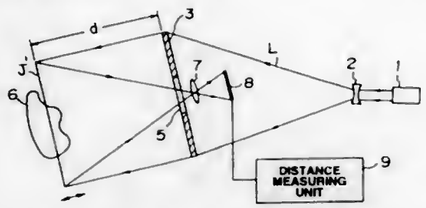
$$\lambda_0/\{(N+1/5)P^2\} \leqq (\lambda_0+\gamma\cdot\Delta t)/(N\cdot P^2) - (\alpha-\beta)\Delta t/\{(1+\alpha\cdot\Delta t)(1+\beta\cdot\Delta t)f_0\} \leqq \lambda_0/\{(N-1/5)P^2\}.$$

5,559,603

THREE-DIMENSIONAL IMAGE MEASURING DEVICE

Hideyuki Wakai; Toru Suzuki; Keiji Terada; Masato Moriya, and Masabu Ando, all of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Division of Ser. No. 165,418, Dec. 13, 1993, Pat. No. 5,448,360. This application Jun. 7, 1995, Ser. No. 483,899
Claims priority, application Japan, Dec. 18, 1992, 4-338914
Int. Cl.[6] G01B *11/24*
U.S. Cl. 356—376 **3 Claims**



1. A three-dimensional image measuring device comprising:

a hologram adapted to be subjected to multi-exposure such that when reproduced light is irradiated, a plane light image is formed at a plurality of different positions in a depth direction corresponding to a rotational angle of the hologram itself;

a light source for irradiating the reproduced light on the hologram;

hologram rotation drive means for imaging the plane light image at positions in the depth direction according to each rotational angle by rotationally driving the hologram at a plurality of different rotational angles;

an object adapted to be measured being disposed in a space where the plane light image is formed;

light receiving means including a plurality of two-dimensional-arranged light receiving elements, for sequentially measuring the strength of scattered light of the plane light image imaged on a surface of the object as the hologram is rotated by the hologram rotation drive means; and

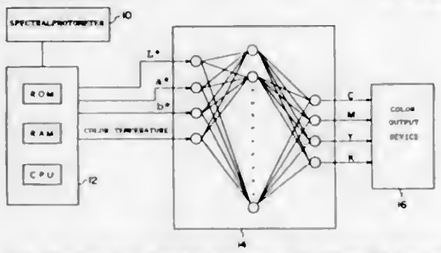
distance measuring means for measuring the distance to the object based on an output of each light receiving element of the light receiving means.

5,559,604

COLOR MATCHING APPARATUS FOR REPRODUCING THE SAME COLOR UNDER DIFFERENT ILLUMINANTS

Yoshifumi Arai, Tokyo, Japan, assignor to Toyo Ink Manfacturing Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1994, Ser. No. 313,470
Claims priority, application Japan, Sep. 27, 1993, 5-239578; Sep. 27, 1993, 5-239579; Sep. 27, 1993, 5-239580
Int. Cl.[6] G01N *21/27*
U.S. Cl. 356—402 **16 Claims**



1. A color matching apparatus for reproducing visually the same color under different illuminants, said apparatus comprising:

a spectralphotometer for detecting the color temperature of an observational illuminant; and

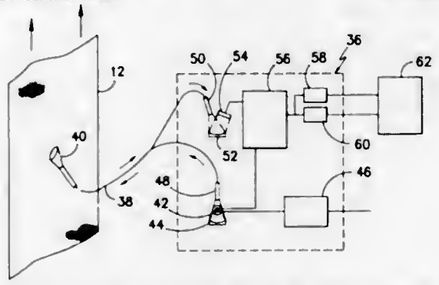
a transforming means for transforming colorimetric values of a target color under a predetermined first illuminant into color separation values for a reproduced color which under said observational illuminant visually appears the same as said target color under said first illuminant, said transforming means storing the relationship between the colorimetric values of said target color and corresponding color separation values under a plurality of second illuminants having given color temperatures, said corresponding color separation values determined so as to visually reproduce with a colorant at each of said second illuminants the same color as said target color under said first illuminant, into which transforming means the color temperature detected by said spectralphotometer and the colorimetric values of said target color under said first illuminant are inputted, and from which transforming means the color separation values of said reproduced color under the observational illuminant are outputted into a color output device.

5,559,605

METHOD AND APPARATUS FOR DETERMINING DIRECTIONAL VARIATION OF SHADE OF PILE AND NAPPED MATERIALS

Morton W. Reed, LaGrange, Ga., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation of Ser. No. 174,984, Dec. 29, 1993, abandoned. This application Feb. 17, 1995, Ser. No. 391,311
Int. Cl.[6] G01J *3/46*
U.S. Cl. 356—402 **37 Claims**



1. An apparatus for measuring directional variation of shade of pile or napped textile materials which comprises:

(a) a spectrophotometer;

(b) a bifurcated fiber optic cable, having a first portion and a second portion, wherein said first portion of said bifurcated fiber optic cable is connected to said spectrophotometer; and

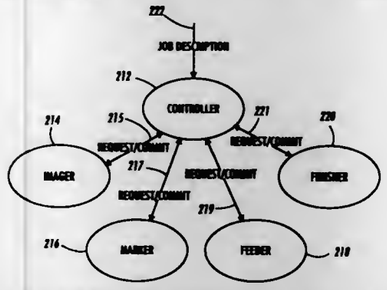
(c) a positioning mechanism that is operatively attached to said second portion of said bifurcated fiber optic cable for rotating said bifurcated fiber optic cable in a plurality of angles with respect to said textile materials, whereby said spectrophotometer shines light through said bifurcated fiber optic cable against said textile materials and said spectrophotometer receives reflected light from said textile materials through said bifurcated fiber optic cable at said plurality of angles to measure directional variation of shade of said pile or napped textile materials.

5,559,606

FLEXIBLE CONFIGURATION OF DOCUMENT OUTPUT TERMINALS FROM AUTONOMOUS MACHINE MODULES

Marc W. Webster, Rochester; Paul A. Rulli, Webster; Michael E. Farrell, Ontario, all of N.Y., and Gene A. McDaniel, Los Altos Hills, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 1995, Ser. No. 565,189
Int. Cl.[6] H04N *1/00;1/23;* **G06F** *15/00*
U.S. Cl. 358—296 **19 Claims**



1. In an electronic image processing apparatus comprising a controller and a plurality of resources, the resources being in an arbitrary configuration, each of the resources including an associated processor, each of the processors storing data related to operational constraints of the associated resource, a bus for interconnecting the processors to the controller for directing the operation of the resources, a method of operation of the image processing apparatus independent of a particular configuration of the plurality of resources comprising the steps of:

receiving from each of the processors the data related to the operational constraints of each associated resource,

interrogating each of the processors to determine the geometrical relationship of the interconnection of the resources, and

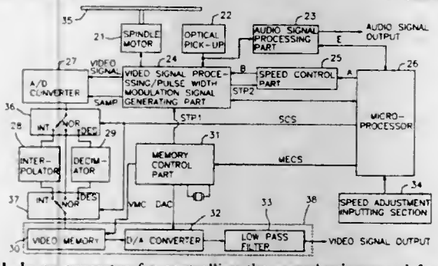
responding to the data related to the operational constraints of each of the processors and to the geometrical relationship of the interconnection of the resources for dynamically configuring the controller to operate in accordance with the the operational constraints of each of the processors and to the geometrical relationship of the interconnection of the resources.

5,559,607

APPARATUS FOR CONTROLLING REPRODUCTION SPEED FOR LASER DISC PLAYER

Hong-Moon Bae, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Sep. 23, 1994, Ser. No. 311,107
Claims priority, application Rep. of Korea, Sep. 25, 1993, 93-19714
Int. Cl.[6] H04N *5/781*
U.S. Cl. 358—342 **3 Claims**



1. In an apparatus for controlling the reproduction speed for a laser disc player, including a speed controlling inputting part, a spindle motor driven by driving pulses, an optical pick-up part for reading out RF signals from a disc rotated by said spindle motor, and an audio signal processing part and a video signal processing part for detecting respectively audio signals and video signals from the RF signals read-out by said optical pick-up part,

said apparatus further comprising:

a control means for outputting a plurality of control signals in accordance with signals received from said speed controlling inputting part;

a memory control means for outputting control pulses to control a reference pulse and said video signal processing part upon receipt of a control signal from said control means;

a speed control means for outputting a main clock which is varied in accordance with an inputted control signal upon receipt of a control signal from said control means;

a video signal processing and pulse width modulation signal generating means for outputting a reference pulse same as the reference pulse received from said memory control means, video signals received from said optical pick-up part, a sampling pulse for sampling said video signals, and a spindle motor driving pulse for controlling a speed of said spindle motor;

an A/D converter for receiving video signals and sampling pulses from said video signal processing and pulse width modulation signal generating means to convert said video signals to digital data; and

an interpolating and decreasing means for interpolating or decreasing an data amount of the digital data signals to control an output supplied to said video signal processing part,

wherein said data amount interpolating and decreasing means comprises an interpolator, a decimator, and first and second switching parts, and

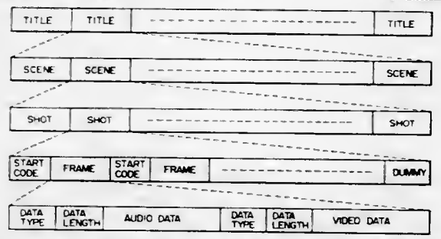
said data amount interpolating and decreasing means controls in such a manner that said A/D convertor video signals converted by means of said interpolator or said decimator should be outputted to said video signal processing part in accordance with the spindle motor accelerating or decelerating signals from said speed controlling inputting part, and in accordance with the control signals of said control means.

5,559,608

METHOD OF DIGITALLY COMPRESSED VIDEO AND AUDIO DATA

Hideto Kunihiro, Osaka, Japan, assignor to Nec Corporation, Tokyo, and Nec Home Electronics, Ltd., Osaka, both of Japan

Continuation of Ser. No. 225,457, Apr. 6, 1994, abandoned, which is a division of Ser. No. 48,207, Apr. 20, 1993, abandoned, which is a continuation of Ser. No. 603,054, Oct. 25, 1990, abandoned. This application Oct. 23, 1995, Ser. No. 553,743
Claims priority, application Japan, Oct. 25, 1989, 2-76118
Int. Cl.[6] H04N *5/76*
U.S. Cl. 358—343 **6 Claims**



1. A method of digitally recording a plurality of data groups, each of which has composite data segments, on a recording medium, comprising the steps of:

providing a recording medium having a plurality of physical segments, each of which has a leading end; and

recording on said recording medium said plurality of data groups, wherein each of said composite data segments has (1) plural segments of compressed motion picture data, compressed by efficient coding, with a data length variable on a unit time basis, and (2) corresponding audio data divided by time division at predetermined time intervals so that the divided audio data are synchronous with a motion picture represented by the compressed motion picture data;

wherein one of said plurality of data groups extends over more than one of said plurality of physical segments;

wherein a leading end of each of said plurality of data groups coincides with the leading end of a respective one of said plurality of physical segments; and

wherein each of said plurality of data groups represents a shot or clip of a scene of said motion picture.

5,559,609

FACSIMILE TRANSCEIVER

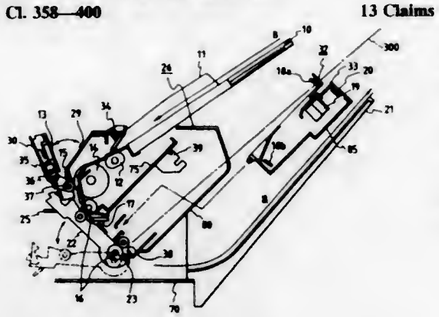
Hiroyuki Yamada, Nagano; Minoru Ichimura, and Takashi Naito, both of Saku, all of Japan, assignors to Matsushita Graphic Communication Systems, Inc., Tokyo, Japan

Filed Jul. 15, 1994, Ser. No. 272,984

Claims priority, application Japan, Jul. 30, 1993, 5-190022; Aug. 2, 1993, 5-191113

Int. Cl.[6] H04N *1/00*

U.S. Cl. 358—400 **13 Claims**



1. A facsimile apparatus comprising:

a housing body;

a paper storage member for storing therein a stack of recording paper sheets, said paper storage member being disposed in a lower portion of said housing body;

printing means for printing an image on the recording paper sheet;

a recorded image outlet formed in an upper surface of said housing body;

paper feeding means for feeding the recording paper sheets, in sequence, to said recorded image outlet through said printing means along a feeding path extending from said paper storage member to said recorded image outlet through a side wall of said housing body; and

a plurality of paper directing stations,

the facsimile apparatus being free of paper directing stations for redirecting a path of the recording paper sheet by an angle substantially in excess of 90° thereby avoiding any U-shaped portions in said feeding path.

5,559,610

IMAGE PROCESSING APPARATUS

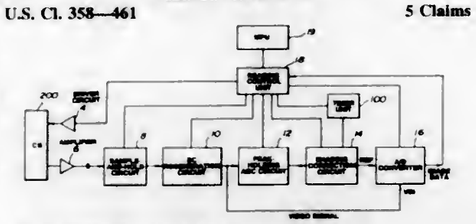
Kozo Toda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 30, 1994, Ser. No. 297,832

Claims priority, application Japan, Sep. 13, 1993, 5-227307

Int. Cl.[6] H04N *1/40*

U.S. Cl. 358—461 **5 Claims**



1. An image processing apparatus comprising:

reading means for photoelectrically reading an image;

forming means for forming a reference signal which follows an output signal from said reading means;

detecting means for detecting whether a level of the output signal from said reading means is greater or smaller than a level of the reference signal;

capacitance means for performing a charging operation or a discharging operation in accordance with a result output from said detecting means; and

switching means for switching a time constant of a circuit for charging said capacitance means, during a predetermined time period after the start of the output of the output signal from said reading means.

5,559,611

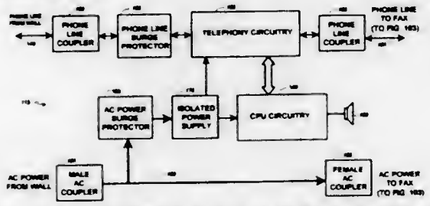
FACSIMILE STORE AND FORWARD SYSTEM WITH LOCAL INTERFACE

Mark C. Bloomfield, Marietta; Edward F. Castro, Acworth; Joseph T. Dyer, Marietta; Deborah J. Jackson, Smyrna; Charles E. Lemons, Alpharetta, and Bruce A. McCown, Marietta, all of Ga., assignors to Audiofax, Inc., Marietta, Ga.

Continuation of Ser. No. 132,997, Oct. 7, 1993. This application Dec. 5, 1995, Ser. No. 567,410

Int. Cl.[6] H04N *1/32*

U.S. Cl. 358—407 **2 Claims**



1. A method of interfacing between a local facsimile machine and a public switched telephone network, said method comprising the steps of:

coupling an interface device to a first telephone line connected to the local facsimile machine and a second telephone line connected to the public switched telephone network;

receiving a destination telephone number of a remote facsimile machine over the first telephone line at the interface device in response to a user dialing a destination telephone number at the local facsimile machine;

dialing the destination telephone number over the second telephone line from the interface device;

connecting the first telephone line to the second telephone line at the interface device;

monitoring the connected second telephone line at the interface device for call progress signals; and

supplying battery from the interface device only to the first telephone line in response to an inability to establish communication with the destination facsimile machine.

5,559,612

IMAGE READING DEVICE WITH BLACK AND WHITE PLATEN

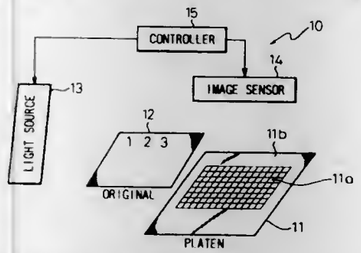
Norio Kanemitsu, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 20, 1995, Ser. No. 406,401

Claims priority, application Japan, Apr. 6, 1994, 6-067501

Int. Cl.[6] H04N *1/04*

U.S. Cl. 358—471 **19 Claims**



1. An image reading device comprising:

a housing having a reading station therein;

a light source for irradiating a first surface of an original with a light at the reading station;

reading means receiving a light reflected by the first surface of the original for reading information on the original to produce an image; and

platen means adapted to contact a second surface of the original opposite the first surface thereof at the reading station, the platen means including first and second variable portions depending on a position of a particular original so that the first portion appears substantially black in view of the reflection and transmission of light and the second portion appears substantially white in view of the reflection and a transmission of light.

5,559,613

PHOTOREFRACTIVE DEVICE WITH QUANTUM WELLS

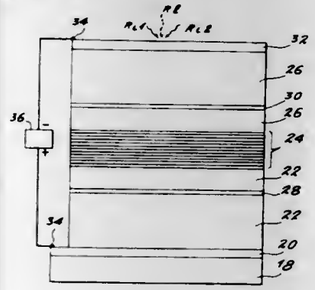
Benoit Deveaud-Pledran, Ferney Voltaire; Christian Guillemot, Perros Guirec, and Jean-Michel Gerard, Paris, all of France, assignors to France Telecom Etablissement Autonome De Droit Public, Paris, France

Filed Aug. 5, 1994, Ser. No. 286,703

Claims priority, application France, Aug. 9, 1993, 93 09784

Int. Cl.[6] G02B *5/18;5/32*

U.S. Cl. 359—4 **7 Claims**



1. A photorefractive device intended to be exposed to a marking radiation which is provided to create a grating of interference fringes in the device, and to a reading radiation diffracted by the created grating, said device comprising:

an electro-optical material having a structure of layered quantum wells and being formed in an intrinsic semi-conductor matrix, said structure having an axis perpendicular to the layers of said quantum wells; and

means for modifying an electric field in said material during an illumination by the marking radiation, said device being characterized in that said modifying means are placed on both sides of said material in said semi-conductor matrix and are able to trap, both parallel to the axis of the structure and perpendicular to this axis, free carriers generated by the marking radiation, said modifying means including on both sides of said material in said semi-conductor matrix at least one rough quantum well having a local width variation of more than 10% or at least one plane of inclusions able to trap the free carriers, wherein the inclusions are made of semi-conductor material whose band gap has a width smaller than that of the band gap of the material of the quantum wells.

5,559,614

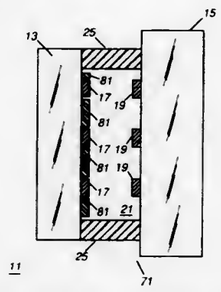
LIQUID CRYSTAL DISPLAY WITH INTEGRAL HEATER AND METHOD OF FABRICATING SAME

Glenn F. Urbish; Dale W. Dorinski, both of Coral Springs, and Thomas J. Swirbel, Davie, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 1, 1995, Ser. No. 432,346

Int. Cl.[6] G02F *1/133*

U.S. Cl. 359—44 **8 Claims**



1. A liquid crystal display device with integral heating elements, comprising:

first and second substrates, each having an active face, the substrates; arranged in parallel fashion to form a uniform gap between them:

a plurality of electrodes, comprising a thin film of indium-tin oxide and copper, disposed directly on the active face of each substrate;

internal heating means, comprising a thin film of indium-tin oxide and copper oxide resistive heating elements interlaced among and between the plurality of electrodes, the internal heating means disposed directly on the active face of at least one of the substrates;

a liquid crystal fluid disposed in the uniform gap, in intimate contact with and responsive to the internal heating means: and

absent an external heating mean.

5,559,615
POLYMER DISPERSED LIQUID CRYSTAL DISPLAY DEVICE

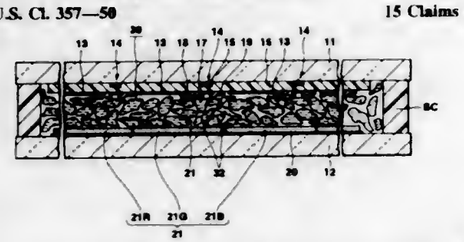
Jiro Takei, Tama; Tetsushi Yoshida, Kanagawa-ken, and Zenta Kikuchi, Hamura, all of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1994, Ser. No. 317,242

Claims priority, application Japan, Oct. 7, 1993, 5-251976; Oct. 7, 1993, 5-251978

Int. Cl.[6] G02F *1/1335;1/13*

U.S. Cl. 357—50 **15 Claims**



1. A polymer dispersed liquid crystal display device comprising:

a pair of substrates arranged to oppose one another and having electrodes respectively formed on opposing surfaces of said pair of substrates; and

a polymer dispersed liquid crystal film arranged between said pair of substrates and formed by dispersing a polymer resin and a cholesteric liquid crystal, wherein said polymer dispersed liquid crystal film has a plurality of domains of said cholesteric liquid crystal in said polymer dispersed liquid crystal film, and a mean diameter d of said liquid crystal domains is larger than a helical pitch p of said cholesteric liquid crystal.

5,559,616
DRIVING METHOD FOR FERROELECTRIC LIQUID CRYSTAL DEVICE WITH PARTIAL ERASURE AND PARTIAL WRITING

Junichiro Kanbe, and Kazuharu Katagiri, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

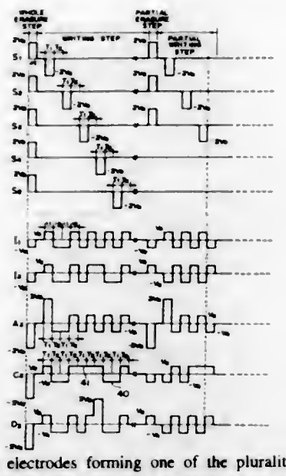
Division of Ser. No. 79,215, Jun. 21, 1993, Pat. No. 5,296,953, which is a continuation of Ser. No. 919,381, Jul. 29, 1992, abandoned, which is a continuation of Ser. No. 760,504, Sep. 16, 1991, abandoned, which is a division of Ser. No. 390,922, Aug. 8, 1989, Pat. No. 5,092,665, which is a division of Ser. No. 320,798, Mar. 9, 1989, abandoned, which is a continuation of Ser. No. 135,535, Dec. 17, 1987, abandoned, which is a continuation of Ser. No. 691,761, Jan. 15, 1985, abandoned.

This application Mar. 3, 1994, Ser. No. 206,211

Claims priority, application Japan, Jan. 23, 1984, 59-10503; Jan. 24, 1984, 59-10504; Dec. 13, 1984, 59-263662; Dec. 24, 1984, 59-272357

Int. Cl.[6] G02F *1/141;* **G09G** *3/36*

U.S. Cl. 359—56 **5 Claims**



1. A driving method for driving a display apparatus including a display device having a plurality of picture elements arranged in a matrix, the apparatus comprising scanning electrodes; data electrodes spaced apart from and intersecting with the scanning electrodes, each of the intersections between the scanning electrodes and the data electrodes, the optical modulation material assuming a first orientation state or a second orientation state depending on a polarity of an electric field applied thereto, the polarity of the electric field being determined with respect to a voltage level of a non-selected scanning electrode, said method comprising the steps of:

(i) applying a scanning side voltage signal comprising a voltage of one polarity and a voltage of the other polarity sequentially to each of the scanning electrodes so that at least said voltage of the other polarity is sequentially applied to all the scanning electrodes, and

applying data signals to the data electrodes in synchronism with the scanning side voltage signal, thereby,

when the voltage of one polarity of the scanning side voltage signal is applied, causing the optical modulation material to assume the first orientation state at the intersections of a scanning electrode receiving the voltage of one polarity and all the data electrodes, and,

when the voltage of the other polarity of the scanning side voltage signal is applied, causing the optical modulation material to assume the second orientation state at intersections of the scanning electrode receiving the voltage of the other polarity and a data electrode selected based on a data signal applied thereto,

the polarity of voltage being determined with respect to the voltage level of a non-selected scanning electrode; and

(ii) applying a scanning side voltage signal comprising a voltage of one polarity and a voltage of the other polarity to a part of the scanning electrodes so that at least the voltage of the other polarity is sequentially applied to only the part of the scanning electrodes, and

applying data signals to the data electrodes in synchronism with the scanning side voltage signal, thereby,

when the voltage of one polarity of the scanning side voltage signal is applied, causing the optical modulation material to assume the first orientation state at the intersections of a scanning electrode receiving the voltage of one polarity and all the data electrodes, and,

when the voltage of the other polarity of the scanning side voltage signal is applied, causing the optical modulation material to assume the second orientation state at intersections of the scanning electrode receiving the voltage of the other polarity and a data electrode selected based on a data signal applied thereto,

the polarity of voltage being determined with respect to the voltage level of a non-selected scanning electrode.

5,559,617
LIQUID CRYSTAL DISPLAY DEVICE WITH OVERLAPPING COMPENSATORS WITH PORTIONS HAVING DIFFERENT RETARDATION VALUES

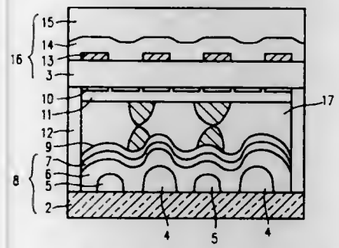
Seiichi Mitsui, Nara, and Kozo Nakamura, Kashiba, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 27, 1994, Ser. No. 281,004

Claims priority, application Japan, Jul. 30, 1993, 5-190500

Int. Cl.[6] G02F *1/1347;1/1335*

U.S. Cl. 359—73 **13 Claims**



1. A liquid crystal display device providing enhanced color display, comprising: a first substrate and a second substrate; a liquid crystal layer sandwiched between said first and said second substrates; electrodes attached to said first and second substrates for applying an electric filed to said liquid crystal layer to control a retardation of said liquid crystal layer; and at least one polarizer disposed outside of said first substrate; wherein

said first substrate positioned between said polarizer and said liquid crystal layer comprises an optical phase compensation means which includes at least two optical compensation members, at least one of said optical compensation members overlapping another of said optical compensation members so as to form at least a first region having a first retardation and a second region having a second retardation different from the first retardation, whereby a color of emitted light from each of said first and said second regions is selected to be a specific one, in accordance with said retardations of said optical phase compensation means and said retardation of said liquid crystal layer.

5,559,618
LIQUID CRYSTAL COMPENSATOR SATISFYING NX>NZ>NY HAVING NY AND NZ INCLINED

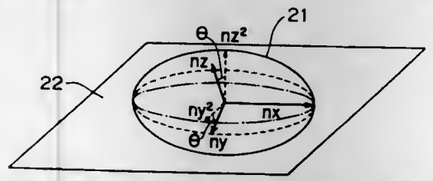
Hiroyuki Mori, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 20, 1994, Ser. No. 327,794

Claims priority, application Japan, Oct. 22, 1993, 5-264996

Int. Cl.[6] G02F *1/1335;1/133*

U.S. Cl. 359—73 **9 Claims**



1. An optical compensatory sheet which has main refractive indices of nx, ny and nz satisfying the condition of nx>nz>ny, wherein the direction of nx is on the plane of the sheet, the direction of ny is inclined from the plane of the sheet and the direction of nz is inclined at 5 to 50 degrees from the normal to the sheet, the directions of ny and nz crossing each other at a right angle.

5,559,619
LIQUID CRYSTAL ELECTRO-OPTICAL DEVICE AND MANUFACTURING METHOD FOR THE SAME

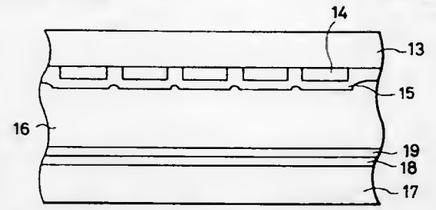
Masahiko Sato, Isehara, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Division of Ser. No. 950,771, Sep. 24, 1992, Pat. No. 5,309,263, which is a continuation of Ser. No. 616,359, Nov. 21, 1990, abandoned. This application Feb. 14, 1994, Ser. No. 195,451

Claims priority, application Japan, Nov. 24, 1989, 1-305888

Int. Cl.[6] G02F *1/1337*

U.S. Cl. 359—75 **22 Claims**



1. A liquid crystal electro-optical display device comprising:

a pair of substrates provided with electrodes thereon, to which a plurality of display pixel elements are connected;

a liquid crystal layer interposed between said substrates;

an orientation control film comprising polyimide formed adjacent to one of said substrates and contacting one surface of said liquid crystal layer; and

a film comprising polyvinyl carbazole formed adjacent to the other one of said substrates and contacting the other surface of said liquid crystal.

5,559,620
ANTI-FERROELECTRIC LIQUID CRYSTAL DISPLAY DEVICE WITH INTERSECTING ALIGNMENT FILM DIRECTIONS

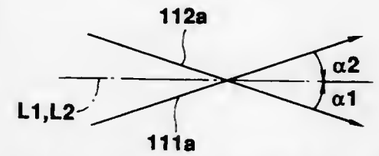
Tomio Tanaka, Hachioji, and Katsuhito Sakamoto, Yokohama, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 25,080, Mar. 2, 1993, abandoned. This application Mar. 9, 1995, Ser. No. 405,177

Claims priority, application Japan, Mar. 5, 1992, 4-048499; Mar. 5, 1992, 4-048501; Jun. 17, 1992, 4-158276

Int. Cl.[6] G02F *1/141;* **C09K** *19/02*

U.S. Cl. 359—78 **10 Claims**



1. An anti-ferroelectric liquid crystal display device comprising:

a first substrate on which are mounted a plurality of first electrodes;

a second substrate which is arranged to face said first substrate with a predetermined gap therebetween, and on which second substrate is mounted at least one second electrode facing the first electrodes;

an anti-ferroelectric liquid crystal filled in the gap between said first substrate and said second substrate, said anti-ferroelectric liquid crystal being aligned in one of a first aligning stable state and a second aligning stable state in accordance with a direction of an electric field applied across the first electrodes and said at least one second electrode, and said anti-ferroelectric liquid crystal being capable of being aligned in a third aligning stable state;

a first alignment film covering surfaces of the first electrodes, and said first alignment film being subjected to a first aligning treatment in a first direction for aligning molecules of said anti-ferroelectric liquid crystal which are adjacent to said first alignment film in a predetermined direction, and for controlling a formation of a smectic layer of said anti-ferroelectric liquid crystal being adjacent to said first alignment film, whereby a direction of a normal line of the smectic layer differs from said first direction;

a second alignment film covering a surface of said at least one second electrode, and said second alignment film being subjected to a second aligning treatment in a second direction for aligning molecules of said anti-ferroelectric liquid crystal which are adjacent to said second alignment film in a predetermined direction, and for controlling a formation of a smectic layer of said anti-ferroelectric liquid crystal being adjacent to said second alignment film, the second direction intersecting the first direction at a predetermined angle so that the normal line of the smectic layer adjacent to said first alignment film is substantially parallel to the normal line of the smectic layer adjacent to said second alignment film, whereby said anti-ferroelectric liquid crystal is aligned uniformly in the third aligning stable state by the alignment restriction force of said first and second alignment films; and

a sealing member bonding said first and second substrates to each other and sealing said anti-ferroelectric liquid crystal in the gap between said first and second substrates.

5,559,621

LIQUID CRYSTAL HAVING A PLURALITY OF RECTILINEAR BARRIER MEMBERS

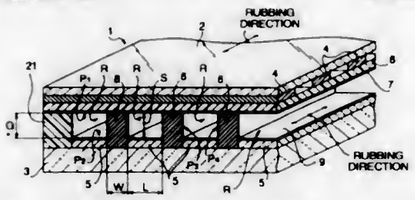
Takao Minato; Katsuhiro Suzuki; Hisao Hoshi, and Masafumi Yoshida, all of Tokyo, Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

Filed Jul. 20, 1994, Ser. No. 277,650

Claims priority, application Japan, Jul. 22, 1993, 5-181032; Dec. 3, 1993, 5-303180; Mar. 31, 1994, 6-085477; Mar. 31, 1994, 6-085478

Int. Cl.[6] G02F *1/1333;1/347*

U.S. Cl. 359—81 **28 Claims**



2. Liquid crystal panel assembly comprising:

a pair of substrates at least one of which is transparent and composed of glass;

a pair of electrodes each formed on said substrates so as to oppose each other;

a plurality of rectilinear barrier members which are provided between both substrates and which are arrayed in parallel to each other at predetermined intervals; and

an orientation film formed on at least one of said substrates and to which the uniaxial alignment treatment is applied;

each barrier member extending in substantially in parallel to the direction in which the uniaxial alignment treatment is carried out;

each barrier member being Composed of photosensitive resin and adhered to the opposed substrates so that portions other than an aperture formed at end portion thereof through which the liquid passes form a rectilinear space sealed against liquid; and

ferroelectric liquid crystal or anti-ferroelectric liquid crystal being encapsulated in each rectilinear space.

5,559,622

CIRCUIT ARRANGEMENT FOR SWITCHING IN AN ALTERNATE CIRCUIT BETWEEN TWO FIBERS OF A DOUBLE LIGHT WAVEGUIDE CONNECTION BETWEEN TWO NODES

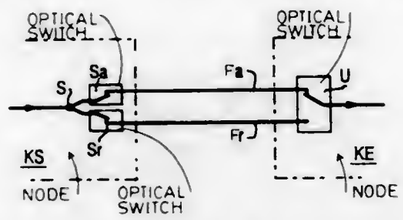
Manfred Huber, Graefelfing, and Oliver Jahreis, Muenchen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jun. 16, 1995, Ser. No. 491,595

Claims priority, application Germany, Jun. 17, 1994, 44 21 305.0

Int. Cl.[6] H04B *10/08*

U.S. Cl. 359—110 **6 Claims**



1. A circuit arrangement for alternate circuit switching between two optical fibers of a double light waveguide connection between two nodes, comprising:

working and redundant optical fibers operationally connected between a transmission side of a first node and a receive side of a second node;

an optical splitter for splitting an optical signal onto the working and redundant optical fibers at the node of the transmission side;

an optical switch over device connected to said working and redundant optical fibers at the node of the receive side, the working optical fiber connected via the optical switch over device to the node of the receive side during a normal operation mode and the redundant optical fiber being disconnected via the optical switch over device from the node of the receive side during the normal operating mode, and, in an alternate circuit mode, the redundant optical fiber being automatically connected to the node of the receive side and the working optical fiber being automatically disconnected from the node of the receive side;

first and second optical switches at the transmission side, said first and second optical switches located between the splitter and the working and redundant optical fibers, respectively, both of said first and second optical switches being closed in the normal operating mode, and, in the alternate circuit mode, the second optical switch that is located between the redundant optical fiber and the splitter being closed, and the first optical switch that is located between said working optical fiber and the splitter being opened.

5,559,623

METHOD AND ARRANGEMENT FOR ARRANGING AN INTERCEPTION-PROOF OPTICAL LINK

Göran Einarsson, Nacka, Sweden, assignor to Telia AB, Farsta, Sweden

Filed May 16, 1994, Ser. No. 242,850

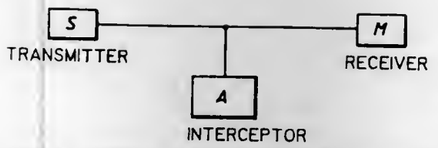
Claims priority, application Sweden, May 18, 1993, 9301710

Int. Cl.[6] H04B *10/00*

U.S. Cl. 359—112 **4 Claims**

1. A method of securely communicating over an optical link between a first station and a second station, comprising the steps of:

transmitting a pulse position modulated signal from the first station to the second station over the optical link, the transmitted signal having a high proportion of noise in order to



reduce a possibility of an unauthorized tapping of the pulse position modulated signal from the optical link; and

receiving by the second station the pulse position modulated signal transmitted by the first station,

wherein an error probability at the second station which is a legal receiver is

$$P(E) \leqq [1-(1-p)^n]2^{-(n-k)},$$

where p is a bit error probability, n is a code length, and n−k is a number of parity bits in the code, and

wherein a probability that an unauthorized receiver will be able to obtain information out of a tapped signal is

$$P(C) = \sum_{i=0}^{j} \binom{n}{i} (e)^i (1-e)^{n-i}$$

where j is a maximum number of incorrectly received symbols which can be corrected using coding and e is a probability of errors in transmission for the unauthorized receiver.

5,559,624

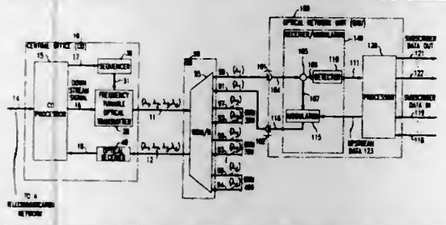
COMMUNICATION SYSTEM BASED ON REMOTE INTERROGATION OF TERMINAL EQUIPMENT

Thomas E. Darcie, Middletown; N. J. Frigo, Aberdeen, and Peter D. Magill, Lakewood, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 29,724, Mar. 11, 1993. This application Nov. 3, 1994, Ser. No. 333,926

Int. Cl.[6] H04B *10/20*

U.S. Cl. 359—125 **38 Claims**



1. Apparatus including an input port and an output port, responsive to an information bearing optical input signal arriving at the input port, comprising:

a splitter responsive to the optical input signal for splitting the optical input signal into a first and a second signal, where the second signal carries at least some of the information borne by the optical input signal;

a receiver responsive to the first signal for detecting information contained in the first signal;

and

frequency shifting modulation means responsive to said second signal for modulating the second signal with an applied upstream signal to provide thereby a return signal to the output port.

5,559,625

DISTRIBUTIVE COMMUNICATIONS NETWORK

Phillip J. Smith, and David W. Faulkner, both of Suffolk, United Kingdom, assignors to British Telecommunications public limited company, London, England

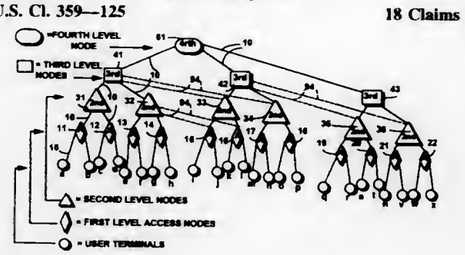
PCT No. PCT/GB93/01898, § 371 Date Apr. 21, 1995, § 102(e) Date Apr. 21, 1995, PCT Pub. No. WO94/07340, PCT Pub. Date Mar. 31, 1994

PCT Filed Sep. 8, 1993, Ser. No. 403,744

Claims priority, application European Pat. Off., Sep. 14, 1992, 92308356

Int. Cl.[6] H04J *14/02*

U.S. Cl. 359—125 **18 Claims**



1. A distributive communications network comprising:

n access levels of nodes,

each node comprising a first input path, power divider means connected with the first input path and arranged to split incoming traffic on the first input path along a local output path and a wider area output path, a second input path, and power coupler means arranged to combine traffic from the second input path with traffic on the local output path,

wherein filter means are arranged in one or both output paths, the filter means being arranged to discriminate between relatively local area traffic in a first band of wavelengths and wider area traffic in a second band of wavelengths, and to allow the local area traffic along the local output path and the wider area traffic along the wider area output path, and

wherein each node has:

(a) its first input path connected with a plurality of user terminals or with the wider area output paths of associated nodes at a lower access level;

(b) its local output path connected with the associated user terminals or with the second input paths of the associated lower access level nodes; and

(c) its wider area output path connected with the first input path of an associated node at a higher access level,

each user terminal being operable at n different wavelengths, the ith wavelength of which being used for communication with any other user terminal via an ith level node, where i=1 to n.

5,559,626

ENERGY RESOURCE SHARING METHOD AND APPARATUS

Ami Kestenbaum, West Windsor Township, and Richard S. Armington, Hopewell, both of N.J., assignors to National Center for Manufacturing Sciences, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 103,099, Aug. 9, 1993. This application Feb. 24, 1995, Ser. No. 394,360

Int. Cl.[6] H04B *10/12*

U.S. Cl. 359—144 **7 Claims**

1. A system for sharing an energy resource, comprising:

at least one energy resource;

energy-routing means for receiving the energy from the resource and directing the energy along one of a plurality of energy paths;

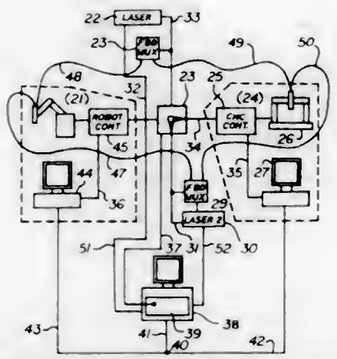
a plurality of work areas, each connected to receive energy from the resource over one of the energy paths to perform a process;

a control computer;

along the first path as the beam passes through said lens means and to focus the beam in the sagittal plane after

5,559,631

METHOD AND APPARATUS FOR CONTROLLING THE



a local-area network connecting the control computer to the work areas so that each work area may receive information relating to the process to be performed there; and

a digital network connected to the energy resource and each work area, whereby a work area may assume direct, real-time control over the energy resource in order to perform a particular process.

5,559,627

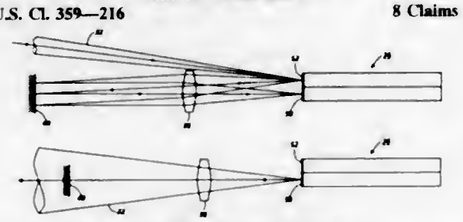
OPTICS FOR PASSIVE FACET TRACKING

Ellis D. Harris, Claremont; Jean-Michel Guerin, Glendale, and James M. Wilson, Glendora, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 19, 1994, Ser. No. 359,121

Int. Cl.[6] G02B *26/08*

U.S. Cl. 359—216 **8 Claims**



1. A passive facet tracking system comprising:

A) a dual mirror rotating polygon having an axis of rotation and two facets, one facet located above the other in a direction which is along the axis of rotation, one of said facets being a flat facet and the other of said facets being a convex facet,

B) a retro-reflector which has no power in a sagittal plane,

C) a lens means,

D) said polygon, said lens means and said retro-reflector being so constructed and arranged relative to each other for said polygon convex facet to reflect a beam along a first path through said lens means to said retro-reflector, said retro-reflector receiving the beam reflected from said polygon convex facet and reflecting the beam through a second path through said lens means to said polygon flat facet, and said polygon flat facet reflecting the beam received from said retro-reflector in a post scan direction, and

E) said lens means being so constructed to partially collimate the beam, which has been focussed on said polygon convex facet, in a tangential plane after reflection from said polygon convex facet along the first path as the beam passes through said lens means and to complete collimation of the beam in the tangential plane after reflection from said retro-reflector along the second path as it passes through said lens means so that the beam is collimated in the tangential plane when it arrives at said polygon flat facet and to substantially collimate the beam, which has been focussed on said polygon convex facet, in the sagittal plane after reflection from said polygon convex facet along the first path as the beam passes through said lens means and to focus the beam in the sagittal plane after reflection from said retro-reflector along the second path as it passes through said lens means so that the beam is focussed in the sagittal plane when it arrives at said polygon flat facet.

5,559,628

LIGHT PULSE GENERATOR

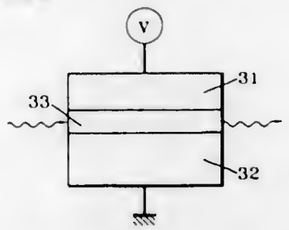
Fabrice Devaux, Paris, France, assignor to France Telecom, Paris, France

Filed Jun. 30, 1994, Ser. No. 268,813

Claims priority, application France, Jul. 2, 1993, 93 08138

Int. Cl.[6] G02F *1/03*

U.S. Cl. 359—248 **5 Claims**



1. A light pulse generator comprising:

a source for generating a light beam;

an electroabsorbent modulator for modulating said light beam into light pulses, said electroabsorbent modulator including at least two doped layers and at least one intermediate layer interposed between said two layers, the intermediate layer being made of a material that is not intentionally doped and that has an electroabsorbent material included therein, the electroabsorbent or transparent state of said intermediate layer being controlled by a voltage applied across two of the layers; and

means for controlling said modulator by means of a periodic type control voltage;

wherein the two layers of the modulator between which the voltage is applied have doping of the same sign, light transmission of the modulator as a function of the control voltage applied thereto being at a maximum in the vicinity of zero volts and being symmetrical thereabout, the control voltage for the modulator being a periodic voltage centered on zero volts.

5,559,629

UNIT MAGNIFICATION PROJECTION SYSTEM AND METHOD

Ronald E. Sheets, Santa Ana, and Yanrong Yuan, Irvine, both of Calif., assignors to Tamarack Scientific Co., Inc., Anaheim, Calif.

Continuation-in-part of Ser. No. 302,584, Sep. 8, 1994, abandoned, which is a continuation-in-part of Ser. No. 293,398, Aug. 19, 1994, abandoned. This application Nov. 30, 1994, Ser. No. 347,818

Int. Cl.[6] G02B *17/00*

U.S. Cl. 359—364 **59 Claims**

1. A Dyson lens system, which comprise:

a primary mirror having a substantially spherical concave mirror surface on one side thereof,

a radiation source that passes radiation through an object plane,

a lens group disposed on the same side as said mirror surface, and spaced from said mirror surface,

means to direct said radiation from said source thereof to said lens group,

said lens group and said mirror surface being so constructed that said radiation passes through said lens group to said mirror surface and is reflected back from said mirror surface through said lens group, and

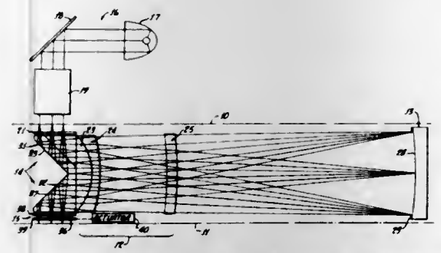
means to direct said reflected radiation from said lens group to an image plane,

said lens group including a first lens and a second lens,

said second lens being between said first lens and said mirror surface, and being spaced from said first lens a large part of the distance from said first lens to said mirror surface,

said large part of the distance from said first lens to said mirror surface being at least substantially one-quarter of the distance from said first lens to said mirror surface,

said mirror surface and said lens group being constructed and arranged generally in Dyson relationship, and producing a substantially one-to-one image at said image plane.



5,559,630

POLARIZED LIGHT MICROSCOPY

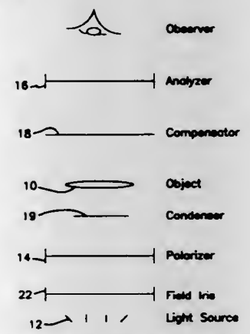
Mae-Wan Ho, London, and Michael J. Lawrence, Milton Keynes, both of England, assignors to The Open University, Bucks, England

Continuation-in-part of Ser. No. 118,323, Sep. 9, 1993, abandoned. This application Feb. 17, 1995, Ser. No. 390,513

Claims priority, application United Kingdom, Sep. 10, 1992, 9219180; Nov. 20, 1992, 9224365

Int. Cl.[6] G02B *21/14*

U.S. Cl. 359—371 **17 Claims**



1. A method of generating interference colors in an object which is a living organism or a weakly birefringent material using a polarizing microscope, which, comprises placing a compensating wave-plate in series with the object in the light path between crossed polarizers, and aligning one or other of the vibrational directions of the compensating wave-plate at a small angle of horizontal rotation from either of the vibrational directions of the crossed polarizers.

5,559,631

METHOD AND APPARATUS FOR CONTROLLING THE BRIGHTNESS AND/OR COLOR TEMPERATURE OF A MICROSCOPE ILLUMINATION SYSTEM

Lucius Remer, Moerfelden-Walldorf; Joerg Schoenenborn, Wetzlar, and Manfred Gilbert, Solms, all of Germany, assignors to Leica Mikroskopie und Systeme GmbH, Wetzlar, Germany

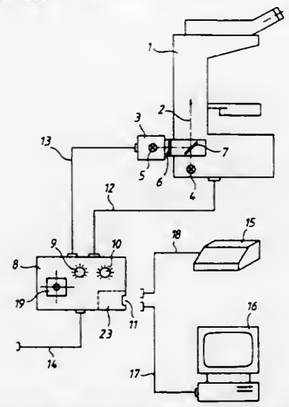
PCT No. PCT/DE92/01085, § 371 Date Aug. 4, 1993, § 102(e) Date Aug. 4, 1993, PCT Pub. No. WO93/13444, PCT Pub. Date Jul. 8, 1993

PCT Filed Dec. 23, 1992, Ser. No. 94,045

Claims priority, application Germany, Dec. 24, 1991, 41 42 925.7

Int. Cl.[6] G02B *21/06*

U.S. Cl. 359—385 **28 Claims**



1. A microscope illumination system, comprising:

a microscope housing containing an illumination beam;

a fixed main light source whose brightness and color temperature vary in accordance with a first current provided to said main light source;

a fixed secondary light source whose brightness and color temperature vary in accordance with a second current provided to said secondary light source;

optics to combine light from said main light source and from said secondary light source to produce said illumination beam; and

a regulating circuit to vary said first current and said second current such that (1) a brightness of said illumination beam is varied while maintaining a color temperature of said illumination beam constant and (2) a color temperature of said illumination beam is varied while maintaining a brightness of said illumination beam constant.

5,559,632

OPTICAL VIEWING SYSTEM FOR VIEWING 3-D IMAGES

John Lawrence, and Linda S. Lukens, both of 2525 Verbena Dr., Los Angeles, Calif. 90068

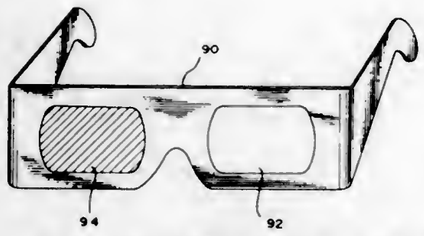
Continuation-in-part of Ser. No. 735,260, Jul. 24, 1991, abandoned. This application Sep. 7, 1993, Ser. No. 117,499

Int. Cl.[6] G02B *27/22;* **G02C** *7/10*

U.S. Cl. 359—478 **5 Claims**

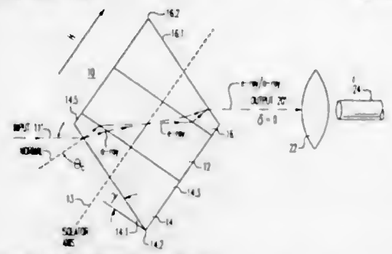
1. An optical viewing system for viewing 3-D images, said optical viewing system comprising:

a pair of lenses with a first of said lenses passing light at an intensity less than 50% of the intensity passed by a second lens and with no discernable wavelength, color or spectral peak in either, said first lens having vapor deposited metal formed thereon production a mirror effect and resulting in low transmittivity without color absorption to distort picture colors, wherein when said lenses are used to view an environ-



ment having layered lighting, optimized use of chromostereography is provided and an improved simulated stereoscopic effect is achieved.

5,559,633
OPTICAL ISOLATOR WITH REDUCED RELATIVE WALK-OFF
William L. Emkey, Bethlehem, Pa., assignor to Lucent Technologies Inc., Murray Hill, N.J.
Continuation of Ser. No. 151,444, Nov. 12, 1993, abandoned. This application Oct. 16, 1995, Ser. No. 543,692
Int. Cl.[6] G02B *5/30;27/28*
U.S. Cl. 359—484 **6 Claims**



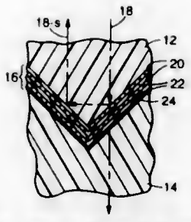
1. An optical isolator comprising
first and second birefringent wedges, said first wedge having an input surface positioned to receive an input optical signal and said second wedge having an output surface positioned to emit an output optical signal,
a non-reciprocal rotator disposed between said wedges,
within said wedges and said rotator said signals being composed of both ordinary rays and extraordinary rays which tend to be displaced from one another in said output signal, CHARACTERIZED IN THAT
said inpot signal is incident on said input surface at an angle above the normal thereto, and
said angle is given approximately by

$$\theta_c = \gamma \left[\frac{n_e n_o}{n_r} \right] \left[\frac{t_r}{2t_w} \right],$$

where γ is the wedge angle, n_e and n_o are the refractive indices of the extraordinary and ordinary rays, respectively, in said wedges, n_r is the refractive index in said rotator, t_r is the thickness of said rotator, and t_w is the thickness of each of said wedges.

5,559,634
RETROREFLECTING POLARIZER
Michael F. Weber, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation of Ser. No. 714,688, Jun. 13, 1991, abandoned. This application Oct. 26, 1994, Ser. No. 329,623
Int. Cl.[6] G02B *27/14;5/124;5/30*
U.S. Cl. 359—638 **11 Claims**

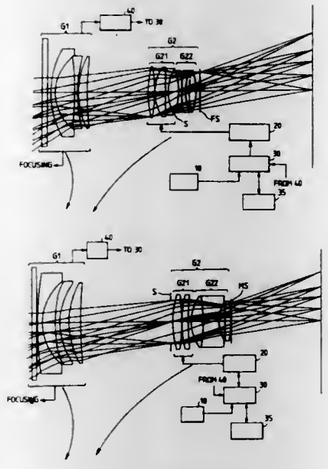
1. A retroreflecting polarizer, comprising:



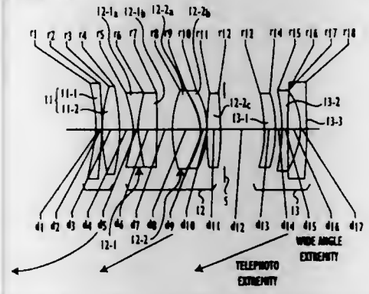
(a) a first flexible material about 0.33 mm thick having a structured surface consisting of a linear array of isosceles prisms about 0.18 mm in height arranged side by side and having sides which make an angle in the range of 40° to 50° with respect to the tangent to a smooth surface opposite the structured surface, wherein the isosceles prisms are present at a frequency of about 28 per cm;
(b) a second flexible material essentially like the first flexible material;
(c) on the structured surface of at least one flexible material, at least one optical stack of alternating layers of high and low refractive index materials of selected optical thicknesses;
the first and second flexible materials all optically cemented to form a single unit in which the refractive index of the first and second flexible materials, and the refractive indices and optical thickness of the layers of the optical stack, are all chosen to produce selective reflection of polarized light, and wherein the optical stack is configured to:
(d) separate an incident light beam of mixed polarization having all wavelengths between about 400 and 700 nm into an s-polarized component and a p-polarized component;
(e) reflect the s-polarized component onto another portion of the optical stack and there parallel to the incident beam but proceeding in an opposite direction; and
(f) transmit the p-polarized component parallel to the incident beam.

5,559,635
ZOOM LENS SYSTEM CAPABLE OF CORRECTING IMAGE POSITION
Susumu Sato, Chiba, Japan, assignor to Nikon Corporation, Tokyo, Japan
Filed Aug. 15, 1994, Ser. No. 290,300
Claims priority, application Japan, Aug. 27, 1993, 5-235499
Int. Cl.[6] G02B *15/14;27/64*
U.S. Cl. 359—689 **21 Claims**

1. A zoom lens system capable of correcting an image position, comprising, in the following order from an object side:
a first lens group with a negative refractive power; and
a second lens group with a positive refractive power, said second lens group having, in the following order from the object side, a front group with a positive refractive power and a rear group with a negative refractive power,
wherein a distance of an air space between said first lens group and said second lens group along an optical axis of said zoom lens system changes when changing a focal length of said zoom lens system, said second lens group moves integrally when changing said focal length, and at least one lens element of said front group of said second lens group shifts along a direction transverse to said optical axis to change said image position.



5,559,636
ZOOM LENS SYSTEM
Takayuki Ito, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 10, 1994, Ser. No. 339,255
Claims priority, application Japan, Nov. 12, 1993, 5-283619
Int. Cl.[6] G02B *15/14*
U.S. Cl. 359—689 **5 Claims**



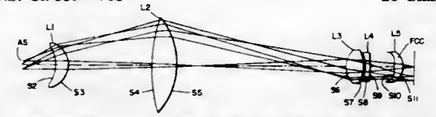
1. A zoom lens system including at least three lens groups, comprising:
a positive first lens group;
a positive second lens group; and
a negative third lens group, arranged in this order from an object side,
wherein said first, second and third lens groups are all moved toward said object side during zooming from a wide angle extremity to a telephoto extremity, such that a distance between said first lens group and said second lens group increases and a distance between said second lens group and said third lens group decreases, and
wherein said zoom lens system satisfies the following relationships:

$$0.7 < f_L/f_1 < 1.4;$$

$$2.0 < m_{3L} < 2.8,$$

wherein, "f_L" designates a focal length of a whole lens system at said telephoto extremity; "f_1" designates a focal length of said first lens group; and "m_{3L}" designates a lateral magnification of said third lens group at said telephoto extremity.

5,559,637
FIELD CURVATURE CORRECTOR
Jacob Moskovich, Cincinnati, Ohio, assignor to Corning Incorporated, Corning, N.Y.
Filed Feb. 4, 1994, Ser. No. 192,117
Int. Cl.[6] G02B *3/02;9/00*
U.S. Cl. 359—708 **26 Claims**

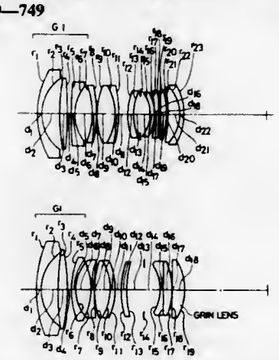


1. An optical system which (a) forms an image of an object, (b) has a positive power, and (c) has a limiting principal ray associated with the system's maximum field of view, said system comprising:
at least one positive lens element; and
a field curvature corrector unit having a positive power and at least one aspheric surface;
wherein:
(i) the exact field curvature (EFC) of said field curvature corrector unit computed along at least one principal ray of the optical system is positive, where the exact field curvature of the field curvature corrector unit is given by:

$$EFC = -\Sigma(n'-n)c/nn'$$

where the summation is taken over the surfaces of the unit, and for each of said surfaces, n is the index of refraction on the object side of the surface, n' is the index of refraction on the image side of the surface, and c is the curvature of the surface at the intersection of the surface with the principal ray, c being positive if the center of curvature is on the image side of the surface; and
(ii) the system is free of lens elements having a negative power which provide substantial correction of the field curvature of the lens system.

5,559,638
WIDE-ANGLE LENS SYSTEM #6
Norihiko Aoki, Hachioji; Takanori Yamanashi, Kokubunji, and Masashi Hankawa, Hino, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Jul. 28, 1994, Ser. No. 281,608
Claims priority, application Japan, Jul. 29, 1993, 5-205537
Int. Cl.[6] G02B *13/04*
U.S. Cl. 359—749 **30 Claims**



1. A wide-angle lens system comprising, in order from the object side: a front unit, a stop and a rear unit; wherein said front unit comprises, in order from the object side, a first lens unit which comprises a plurality of lens components including a positive lens component and has a negative refractive power as a whole, a negative lens component which has a concave surface on the object side as well as air-contact surfaces on the object side and the image side, and a cemented lens component, and wherein said rear unit

comprises a negative lens component disposed at a location closest

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4. A data recording apparatus having a recording head for

comprises a negative lens component disposed at a location closest to said stop and at least two positive lens components disposed on the image side of said negative lens component.

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BEAM RECEIVING POSITION ADJUSTING DEVICE

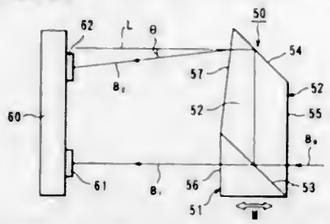
Toshio Nakagishi; Hitoshi Kimura; Masahiro Oono; Koichi Maruyama, and Masato Noguchi, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1993, Ser. No. 47,460

Claims priority, application Japan, Apr. 20, 1992, 4-128312; Apr. 23, 1992, 4-130026

Int. Cl.[6] G02B *7/02; G11B 7/00*

U.S. Cl. 359—823 **18 Claims**



1. A device for adjusting a position of a beam receiving portion of a photo sensor, comprising:

means for generating a first luminous flux and a second luminous flux from an incident luminous flux entering said generating means, said first luminous flux being spaced from said second luminous flux;

means for receiving said first luminous flux and said second luminous flux, said receiving means having a first beam receiving portion onto which said first luminous flux is radiated, and a second beam receiving portion onto which said second luminous flux is radiated, the position of said first beam receiving portion being spaced from the position of said second beam receiving portion;

means for moving said generating means to change the spacing between said first beam receiving portion and said second beam receiving portion;

said generating means comprising means for generating said first luminous flux and said second luminous flux so that they are inclined by a predetermined angle relative to each other; and

said moving means moving said generating means along a direction of one of said first luminous flux and said second luminous flux.

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AUTOMOTIVE REAR VIEW MIRROR SYSTEM

Frederick R. Vaches; William H. Southwell, both of Thousand Oaks, Calif.; Joseph Malus, Bloomfield Hills, Mich., and Mohsen Khoshnevisan, Newbury Park, Calif., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Mar. 29, 1995, Ser. No. 412,644

Int. Cl.[6] G02B *5/08; 5/10;* **B60R** *1/02*

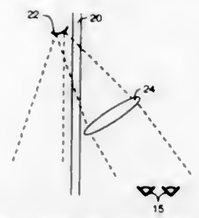
U.S. Cl. 359—838 **18 Claims**

1. A rear view system for an automotive vehicle, comprising;

a plurality of passive optical elements including at least one mirror, where the number of mirrors is odd;

a first of said passive optical elements comprising a negative optical element having a maximum width dimension of 3 inches mounted on the exterior close to the body of the vehicle;

a second of said passive optical elements comprising a positive optical element mounted inside the vehicle and positioned substantially confocal with said first optical element;



said first optical element directing a rear view image to said second optical element; and

said second optical element directing said rear view image to a vehicle operator with objects at infinity focused at infinity in a substantially flat, undistorted optical image viewable by both eyes of the operator simultaneously.

5,559,641

VIDEO EDITING SYSTEM WITH AUTO CHANNEL ALLOCATION

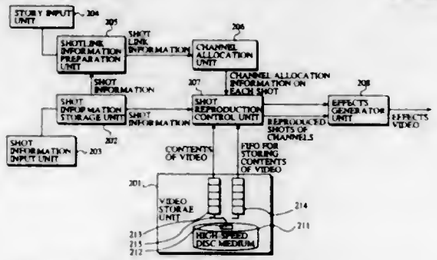
Kazuo Kajimoto, Neyagawa; Kinya Kanno, Katano, and Tetsuyuki Nakayasu, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 7, 1993, Ser. No. 132,790

Claims priority, application Japan, Oct. 9, 1992, 4-271339

Int. Cl.[6] G11B *27/02*

U.S. Cl. 360—14.1 **6 Claims**



1. An image editing apparatus, comprising:

image storage means, including a disk storing a source material and a plurality of FIFO memory units, which can reproduce images stored on the disk simultaneously on two or more channels;

shot information storage means for storing shot information which expresses every block of images to be reproduced as an area in the image storage means;

shot link information preparation means for preparing shot link information which defines a link order for the blocks of images to be reproduced and a link method, based on the shot information and on a shot link order and link method inputted by an operator;

channel allocation decision means for referring to the shot link information and deciding to which channel the blocks of images to be reproduced should be allocated;

shot reproduction control means for referring to the shot information, the shot link information and the channel allocation information, for accessing the image storage means, and for retrieving each of the blocks of images to be reproduced in a decided order from the decided channel, the shots being allocated to the channels as they are read from the image storage means; and

effects execution means for linking a number of image blocks outputted by the shot reproduction control means on a number of channels according to the decided link method and for generating image effects.

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REPRODUCING DEVICE USED WITH A RECORD CARRIER CONTAINING TWO SIDES RECORDED IN OPPOSITE DIRECTIONS THAT DETERMINES THE SELECTION OF PARTICULAR READ BACK CHARACTERISTICS

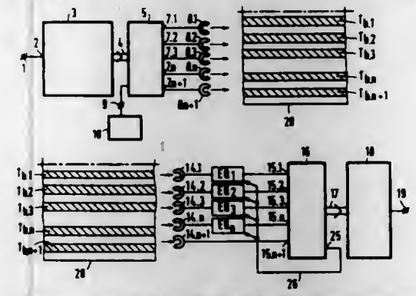
Abraham Hoogendoorn, and Gerardus C. P. Lokhoff, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 939,775, Sep. 3, 1992, Pat. No. 5,325,239. This application Mar. 9, 1994, Ser. No. 208,775

Claims priority, application European Pat. Off., Sep. 17, 1991, 91202384

Int. Cl.[6] G11B *5/02*

U.S. Cl. 360—27 **17 Claims**



1. Reproducing device for reproducing digital information recorded in tracks on A and B sides of a record carrier, the device comprising reading means which include a read head device for reading digital information from a track on the A or B side, and equalization means for performing an equalization filtering on the digital information read from a track, characterized in that the read head device is further arranged for reading from the A or B side a first or second marker respectively, in that the reading means further include generator means for deriving first and second control signals respectively, from the markers belonging to a side of the record carrier while the digital information is being read out from this side depending on whether the transport direction during reproduction is similar or opposite respectively, to the transport direction during recording, in that the equalization means are arranged for performing, in response to the first or second control signal respectively, a first or second equalization filtering on the digital information read from the tracks.

5,559,643

APPARATUS FOR RECORDING A DIGITAL SIGNAL ONTO A RECORDING MEDIUM AT ONE OF A PLURALITY OF DATA RECORDING RATES

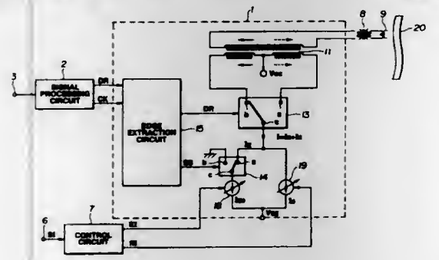
Tetsuro Makise, and Teruyuki Yoshida, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 24, 1995, Ser. No. 394,261

Claims priority, application Japan, Feb. 28, 1994, 6-030522

Int. Cl.[6] G11B *5/09*

U.S. Cl. 360—46 **7 Claims**



4. A data recording apparatus having a recording head for recording a signal onto a recording medium at one of a plurality of data recording rates, said apparatus comprising:

means for receiving an input signal and for processing the received input signal so as to form a digital data signal and a clock signal;

means, operative with said clock signal, for determining a change in value of said digital data signal;

means for generating first and second control signals;

first variable current generating means for generating a first current in accordance with said first control signal;

second variable current generating means for generating a second current in accordance with said second control signal;

switching means for selecting one of said second current and a combination of said first and second currents in accordance with an output from the determining means; and

means for driving said recording head in response to said digital data signal and the selected one of said second current and a combination of said first and second currents from said switching means so as to enable recording at a desired data rate.

5,559,644

DATA RECORDING/REPRODUCING APPARATUS HAVING A FIRST ERROR CORRECTING CODE ON BOTH SIDES OF A MAIN DATA AREA OF EACH AZIMUTH TRACK

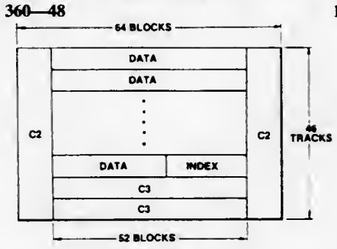
Shinya Ozaki, and Hideki Nonoyama, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 7, 1995, Ser. No. 399,636

Claims priority, application Japan, Mar. 15, 1994, 6-043749

Int. Cl.[6] G11B *5/09*

U.S. Cl. 360—48 **14 Claims**



1. A method for recording data on a plurality of azimuth tracks formed on a tape-shaped recording medium, comprising:

dividing each azimuth track into a main data area and a pair of margin areas on both sides of said main data area;

arraying main data recorded in said main data area of each azimuth track;

appending a first parity for error detection and correction to a data string arrayed in the track direction;

appending a second parity for error detection and correction to a data string arrayed in a direction normal to the track direction; and

recording the first parity by a rotary head so that the first parity is arrayed on both sides of the main data area of each azimuth track.

5,559,645

DISK RECORDING APPARATUS WITH ADAPTIVE WINDOW ADJUSTING

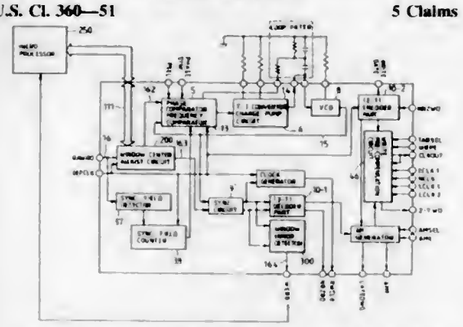
Shyoichi Miyazawa; Ryutaro Horita, both of Yokohama; Kenichi Hase, Fujisawa; Satoshi Kawamura, Yokohama; Shinichi Kojima, Takasaki, and Toshiyuki Iseki, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 964,294, Oct. 21, 1992, Pat. No. 5,402,274, which is a continuation of Ser. No. 734,073, Jul. 22, 1991, Pat. No. 5,187,615, which is a continuation of Ser. No. 329,552, Mar. 28, 1989, abandoned. This application Mar. 23, 1994, Ser. No. 216,606

Claims priority, application Japan, Mar. 30, 1988, 63-74326; Apr. 27, 1988, 63-102511; Jul. 22, 1988, 63-181892

Int. Cl.[6] G11B *5/09*

U.S. Cl. 360—51 **5 Claims**



1. A disk recording apparatus wherein a second read signal is produced from a first read signal read out from a disk shaped record medium, comprising:

a data separator chip which includes:

a signal processing meads which produces said second read signal by employing a window which has been formed based upon a clock pulse generated from said first read signal,

window timing varying means for varying timing of said window relative to said first read signal, and

memory means for holding control data which is used by said window timing varying means;

a microprocessing chip for setting said control data to said memory means of said data separator chip for adjusting window timing of said window relative to said first read signal; and

window error detecting means for judging whether an error has occurred in said second read signal produced by said signal processing means,

wherein said microprocessor chip executes varying of said control data, calculating of first data from said control data at borders of said error and setting of said first data as said control data in memory means.

5,559,646

BALANCED ARRANGEMENT FOR READING INFORMATION FROM A TRACK ON A RECORD CARRIER WHICH ARRANGEMENT INCLUDES AMPLIFIER CIRCUITS CONTAINING CUT-OFF CAPACITORS WHICH ARE CROSS-COUPLED TO REDUCE NOISE

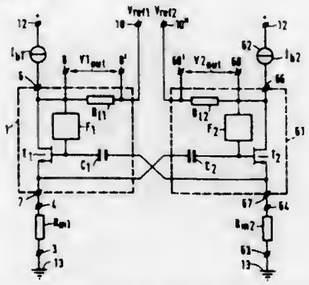
Johannes O. Voorman, and Joao N. V. L. Ramalho, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 5, 1994, Ser. No. 318,302

Claims priority, application European Pat. Off., Oct. 6, 1993, 93202836; Jun. 23, 1994, 94201804

Int. Cl.[6] G11B *5/02*

U.S. Cl. 360—67 **31 Claims**



1. An arrangement for reading out an information signal from a magnetic record carrier, comprising:

a read head including a magneto-resistive element having a first terminal connected to a first point of constant potential, and a second terminal;

first bias-current means for supplying a first bias-current, the first bias-current means having a first terminal coupled to a second point of constant potential, and a second terminal;

a first amplifier circuit having an output terminal for supplying the information signal, a first terminal coupled to the second terminal of the first bias-current means, and a second terminal coupled to the second terminal of the magneto-resistive element, whereby the first bias-current-means, the first amplifier circuit and the magneto-resistive element are in series with one another in that order between the second point of constant potential and the first point of constant potential, the first terminal of the first amplifier circuit further being coupled to the output terminal of the first amplifier circuit, and the first amplifier circuit including a first transistor, a first feedback circuit, a first load impedance and a first capacitor element, a first main flow terminal of the first transistor being connected to the second terminal of the first amplifier circuit, a second main flow terminal of the first transistor being coupled to the first terminal of the first amplifier circuit, a control terminal of the first transistor (T_1) being coupled to the output terminal of the first amplifier circuit via the first feedback circuit, and the first load impedance being coupled between the output terminal of the first amplifier circuit and a first reference voltage terminal;

second bias-current means for supplying a second bias-current, the second bias-current means having a first terminal coupled to the second point of constant potential, and a second terminal; and

a second amplifier circuit having an output terminal, a first terminal coupled to the second terminal of the second bias-current means, and a second terminal coupled to the first point of constant potential, whereby the second bias-current means, and the second amplifier circuit are in series with one another in that order between the second point of constant potential and the first point of constant potential, the first terminal of the second amplifier circuit further being coupled to the output terminal of the second amplifier circuit, and the second amplifier circuit including a second transistor, a second feedback circuit, a second load impedance and a second capacitor element, a first main flow terminal of the second transistor being connected to the second terminal of the second amplifier circuit, a second main flow terminal of the second transistor being coupled to the first terminal of the second amplifier circuit, a control terminal of the second transistor being coupled to the output terminal of the second amplifier circuit via the second feedback circuit, and the second load impedance being coupled between the output terminal of the second amplifier circuit and a second reference voltage terminal;

wherein the control terminal of the second transistor is coupled to the second terminal of the first amplifier circuit via the second capacitor element, and the control terminal of the first transistor is coupled to the second terminal of the second amplifier circuit via the first capacitor element.

5,559,647

MAGNETIC DISK CONTROLLER WHICH AVOIDS ERRONEOUS WRITE OPERATIONS TO ZBR-TYPE MAGNETIC DISKS UPON DETECTION OF A NEXT SECTOR MARK FROM THE ZBR MAGNETIC DISK

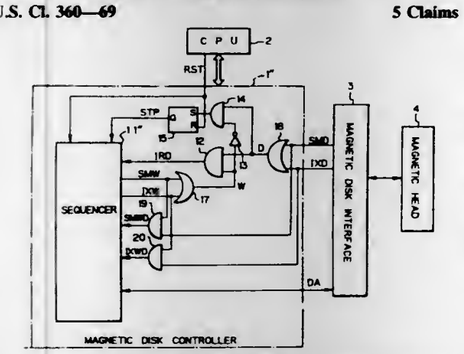
Takao Kusano, Kanagawa, Japan, assignor to NEC Corporation, Tokyo, Japan

Division of Ser. No. 139,789, Oct. 22, 1993. This application Mar. 8, 1995, Ser. No. 400,571

Claims priority, application Japan, Oct. 27, 1992, 4-288044

Int. Cl.[6] G11B *15/18;11/00;19/02*

U.S. Cl. 360—69 **5 Claims**



1. A magnetic disk controller for a ZBR-type magnetic disk by a magnetic head, comprising:

a sequencer for generating a sector mark waiting signal and an index waiting signal to wait for an index pulse signal generated from said magnetic disk at every revolution thereof;

a detecting means, connected to said magnetic head, for detecting a sector mark in said magnetic disk to generate a sector mark detecting signal;

a means for generating said index pulse signal;

a first gate circuit, connected to said sequencer, for generating a waiting signal, transmitting it to said first and second gate circuits, when at least one of said sector mark waiting signal and said index waiting signal is generated;

a second gate circuit, connected to said sector mark detecting means and to said index pulse signal generating means, for generating a detecting signal, when at least one of said sector mark detecting signal and said index pulse signal is generated;

a third gate circuit, connected between said first and second gate circuits and said sequencer, for generating an ID read signal and transmitting it to said sequencer, when said waiting signal is generated and said detecting signal is generated; and

a fourth gate circuit, connected between said first and second gate circuits and said sequencer, for generating a stop signal and transmitting it to said sequencer, when said waiting signal is not generated and said detecting signal is generated,

said sequencer performing a write operation of sector data on said magnetic disk when receiving said ID read signal,

said sequencer stopping the write operation of sector data from being performed when receiving said stop signal.

5,559,648

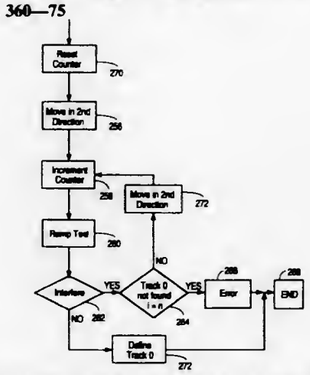
METHOD FOR OPTIMIZING TRACK LOCATION DURING SERVO WRITING

Dan A. Hunter, Boulder; Michael R. Utenick, Niwot; James H. Morehouse, Jamestown, and Nelson Chenkin, Ft. Collins, all of Colo., assignors to Integral Peripherals, Inc., Boulder, Colo.

Filed Aug. 13, 1993, Ser. No. 106,264

Int. Cl.[6] G11B *5/596*

U.S. Cl. 360—75 **31 Claims**



1. A method for optimizing the storage capacity of a disk drive comprising the steps of:

moving a transducer in first predetermined increments in a first direction over a disk;

measuring after each first predetermined increment whether a mechanical component of said disk drive interfered with movement of said transducer in said first direction; and

defining a reference track zero after detection of interference by said mechanical component with movement of said transducer in said first direction wherein in servo formatting of said disk, said reference track zero is a starting reference track for said servo formatting.

5,559,649

DISC CARTRIDGE LOADING APPARATUS IN RECORDING AND/OR REPRODUCING APPARATUS

Masayasu Ito, and Hiroyuki Chigasaki, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 966,103, Oct. 22, 1992, abandoned. This application Jul. 27, 1994, Ser. No. 283,724

Claims priority, application Japan, Oct. 23, 1991, 3-304042; May 25, 1992, 4-157482

Int. Cl.[6] G11B *17/04*

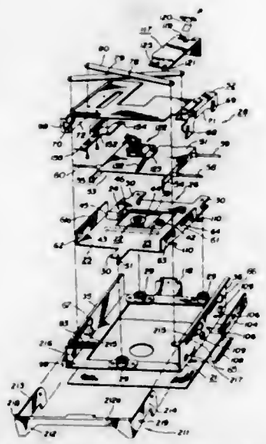
U.S. Cl. 360—99.06 **11 Claims**

1. A disc cartridge loading apparatus for a recording/reproducing apparatus for loading a disc cartridge housing a disc having an information signal recorded thereon on a cartridge loading unit in the recording/reproducing apparatus, comprising

a drive unit supporting base plate having loaded thereon a driving unit for driving said disc, said driving unit supporting base plate being flexibly supported on a stationary substrate by elastic supporting means and having a plurality of shafts projecting from sidewalls thereof,

a cartridge holder for supporting said disc cartridge inserted into a main body of said recording/reproducing apparatus,

plural supporting members projecting from opposite sides of said cartridge holder, each of said plural supporting members engaging L-shaped guide slots formed in opposite sidewalls



of said drive unit supporting base plate for movably supporting said cartridge holder, wherein said guide slots are closed at opposite ends thereof for restricting movement of said plural supporting members for guiding said cartridge holder in a horizontal and a vertical direction,

a cartridge holder transporting member movably supported by said stationary substrate for movement in a direction of insertion into or ejection from said main body of said recording/reproducing apparatus, said cartridge holder transporting member having a plurality of cam grooves for engagement with said plural supporting members of said cartridge holder such that each of said plural supporting members that engages a cam groove simultaneously engages a corresponding guide slot, said cartridge holder transporting member being moved for loading said disc cartridge on said cartridge loading unit, each of said plurality of cam grooves being closed at a first end and having an opening at a second end thereof opposite said first end for release of said engagement between each corresponding one of said plural supporting members and said cam groove at a state of completion of loading of said disc cartridge, and

cartridge holder position adjustment means for causing said plural supporting members to align with said opening ends of said plurality of cam grooves for engagement therewith during an operation of ejecting said disc cartridge out of said main body, said position adjusting means including a securing lever slidably supported by said stationary substrate, said securing lever having a plurality of engaging grooves for engaging said plurality of shafts of said drive unit supporting base plate.

5,559,650

LUBRICATED DISK DRIVE

William Repphun, 2652 Crestridge Ct.; Walter Woog, 8654 Thunderhead Dr.; Robert E. Yates, 8324 Larkspur Rd., all of Boulder, Colo. 80302; Gregg Johnson, 2645 Valewood Ave., Carlsbad, Calif. 92008, and Terence West, 12921 Caminito Del Barco, Del Mar, Calif. 92014

Continuation of Ser. No. 976,198, Nov. 13, 1992, abandoned. This application Mar. 23, 1995, Ser. No. 410,555

Int. Cl.[6] G11B *33/14*

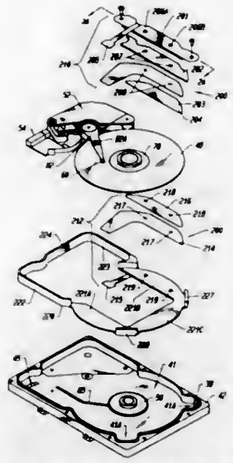
U.S. Cl. 360—97.02 **17 Claims**

1. A storage device, comprising:

a housing defining a controlled environment isolated from ambient atmospheric conditions;

a disk storage medium, mounted in the housing, having a surface including a data region and a non-data region;

a liquid lubricant disposed on the surface of the disk storage medium and within the housing;



a spindle motor for rotating the disk storage medium;

at least one read/write head;

actuator means for positioning the read/write head with respect to the disk storage medium;

a wick structure including a deposition wick comprising a first porous material, positioned overlying at least a portion of the data region adjacent to the surface of the disk storage medium, and a collection wick comprising a second porous material coupled to the first porous material each porous material having a porosity sufficient to carry the liquid lubricant through capillary action such that liquid in the housing is transferred from the collection wick to the deposition wick;

control means, coupled to the actuator means, read write head, and spindle motor, for interacting with the actuator means, head, and motor to read data from and write data to the disk storage medium; and

wherein the housing has a length of about four inches, a height of about five-tenths inch, and a width of about two and three-quarters inches.

5,559,651

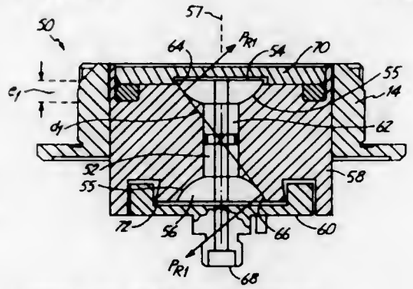
MAGNETIC DISC STORAGE SYSTEM WITH HYDRODYNAMIC BEARING

Alan L. Grantz, Aptos, and Wesley R. Clark, Watsonville, both of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Apr. 12, 1995, Ser. No. 420,740

Int. Cl.[6] G11B *17/02*

U.S. Cl. 360—99.08 **20 Claims**



1. A magnetic disc storage system, comprising:

a base;

a rotatable magnetic storage disc having an axis of rotation;

a transducing head for reading and writing information on the disc;

a fixed member attached to the base, the fixed member having a shaft carrying opposing first and second convex bearing portions at opposite ends of the shaft and extending toward each other in inward directions along the axis of rotation and wherein the convex bearing portions have outwardly fixing surfaces which are substantially flat;

a rotating member attached to the disc which rotates relative to the fixed member on the axis of rotation, the rotating member including a first concave bearing portion rotatably engaging the first convex bearing portion forming a first bearing interface therebetween having a first gap, the rotating member further including a second concave bearing portion rotatably engaging the second convex bearing portion forming a second bearing interface therebetween having a second gap, the rotating member further including a sleeve extending between the first and second concave bearing portions and rotatably receiving the shaft therethrough, the first and second interfaces forming acute angles with the axis of rotation;

lubricating fluid in the first and second gaps separating the first concave portion from the first convex portion and the second concave portion from the second; and

means operably coupled to the rotating member for rotating the rotating member.

5,559,652

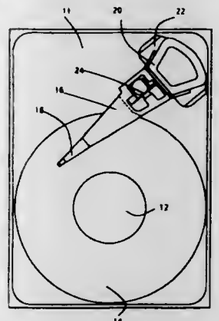
DISK DRIVE ROTARY ACTUATOR WITH ROCKING PIVOT

John S. Heath, 34 Olivers Battery Rd. North, Winchester Hants SO22 4JB, England, and Michael R. Hatchett, 31 Westwood Gardens, Chandlers Ford Hants SO5 IFN, England

Continuation of Ser. No. 383,697, Feb. 1, 1995, abandoned, which is a continuation of Ser. No. 110,710, Aug. 23, 1993, abandoned. This application Sep. 15, 1995, Ser. No. 528,861

Int. Cl.[6] G11B *5/55;21/08*

U.S. Cl. 360—106 **13 Claims**



1. A disk drive apparatus, comprising:

a housing;

a disk for storing data;

an actuator arm assembly having a transducer mounted thereon for writing and reading data to and from said disk;

a mounting device attached to said housing;

rocker means provided on said actuator arm assembly for engaging said mounting device with a rolling contact motion;

a resilient bias device engaging said actuator arm assembly and said mounting device, for biasing said rocker means into engagement with said mounting device; and

constraining means, connected between said rocker means and said mounting device, for constraining all motion between said rocker means and said mounting device other than said rolling contact motion.

5,559,653

THIN FILM MAGNETIC HEAD HAVING A MULTILAYER UPPER CORE

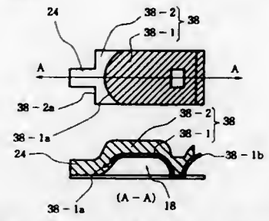
Shigeru Shouji, and Atsushi Toyoda, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Dec. 2, 1994, Ser. No. 349,163

Claims priority, application Japan, Dec. 10, 1993, 5-341376

Int. Cl.[6] G11B *5/147;5/17;5/187*

U.S. Cl. 360—126 **20 Claims**



1. A thin film magnetic head having a laminated structure comprising:

a lower core portion provided over a substrate and having a pole portion;

a magnetic gap layer provided on the lower core portion;

an insulating layer provided on the magnetic gap layer and having a top section, a transition portion adjacent to the top section and having an inclined section located below the top section and a skirt portion located below the inclined section;

conduction coils provided in the insulating layer;

an upper core portion provided on the insulating layer; and

an overcoat layer provided on the upper core portion;

said upper core portion having a pole tip portion of a reduced width which is opposed to the pole portion of the lower core portion through the magnetic gap layer and whose foremost end portion is opposed to a recording surface of a magnetic medium, and a back region;

said back region including a top-forming portion, of a larger width than the pole tip portion of the upper core portion, formed on the top section of the insulating layer and having side edges formed in parallel to a longitudinal center axis of the pole tip portion, said longitudinal center axis normal to said recording surface, and a transition portion formed on the inclined section of the insulating layer and located between the top-forming portion and the pole tip portion,

the improvement comprising that said transition portion of the back region of the upper core portion is made of a plurality of layers and that a core angle of an uppermost layer of the plurality of layers of the back region is set at an angle which is about 120 degrees or larger and is smaller than about 180 degrees, said core angle of said uppermost layer measured in a first plane substantially parallel to a surface of said substrate, and a core angle of a lower layer or layers of the plurality of layers of the back region is set at an angle which is smaller than the core angle of the uppermost layer and is larger than about 60 degrees, said core angle of said lower layer or layers measured in a second plane substantially parallel to the surface of said substrate.

5,559,654

NARROW TRACK THIN FILM HEAD FOR HIGH TRACK DENSITY RECORDING

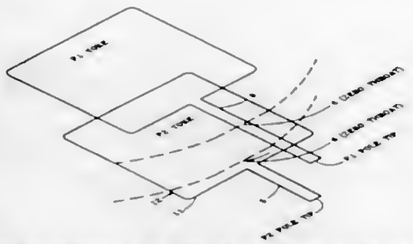
Shyam C. Das, 7 Shadow Oak Dr., Sudbury, Mass. 01776

Division of Ser. No. 888,350, May 21, 1992, Pat. No. 5,404,635. This application Jan. 23, 1995, Ser. No. 376,246

Int. Cl.[6] G11B *5/147*

U.S. Cl. 360—126 **2 Claims**

1. A transducing head for use in a magnetic storage device in a digital data processing system for writing and/or reading data in the form of magnetic flux onto and/or from a magnetic media



which moves relative to the head, the head having at least first and second pole pieces, P1 and P2, each with a wide yoke portion which narrows to define a poletip, the first and second pole pieces being separated by a gap, the poletips each having an end, which together define an air bearing surface of the head, the second poletip defining a zero throat point of the head at a location where the second pole piece angles away from the first pole tip to increase the gap and where the second poletip widens into the yoke portion of the second pole piece, the first pole tip extending beyond the zero throat point away from the air bearing surface of the head, wherein the wide yoke portion of the second pole piece has a wider yoke portion that overlaps the first pole tip, whereby the demagnetizing field effect and misalignment of the second pole piece over the first pole piece are minimized, thus requiring a smaller orienting magnetic field to define an easy axis during formation of the head.

5,559,655

GUIDE ROLLERS FOR A TAPE DRIVING BELT IN A DATA STORAGE CARTRIDGE

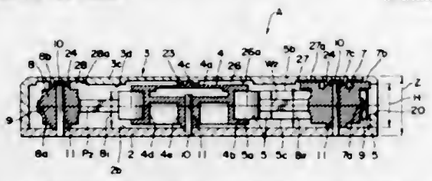
Kengo Saitou; Kazuo Sasaki, and Taizo Aizawa, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 411,587, Mar. 29, 1995, Pat. No. 5,515,216, which is a continuation of Ser. No. 123,171, Sep. 20, 1993, Pat. No. 5,416,659. This application Sep. 28, 1995, Ser. No. 535,350

Claims priority, application Japan, Sep. 25, 1992, 4-279316; Sep. 25, 1992, 4-279320

Int. Cl.[6] G11B *23/087*

U.S. Cl. 360—132 **3 Claims**



1. In a data storage cartridge comprising a base plate and a case body joined to each other to form a cartridge case having substantially parallel front and back sides; a pair of tape reels rotatably mounted in side-by-side relation within said cartridge case with axes of rotation of said reels being situated approximately on a median of said cartridge case which is parallel to said front and back sides of the latter; a magnetic tape coiled on said reels and selectively having either a first width or a second width different from said first width; a driving roller rotatably mounted in said cartridge case adjacent said front side at a mid-position relative to said reels; a pair of guide rollers rotatably mounted in said cartridge case adjacent opposite ends of said back side of the latter; and a driving belt wound around said driving roller and said guide rollers so as to travel along a substantially T-shaped path including portions where said driving belt is pressed into contact with coils of said magnetic tape coiled on the pair of tape reels for driving the tape and rotating the tape reels in response to rotation of said driving roller: the improvement comprising each of said guide rollers including a crowned peripheral working surface in contact with said driving belt, said crowned peripheral working surface extending axially at least partly between opposite ends of the respective guide roller and having a maximum diameter at an axial position that deviates from a mid-position between said opposite ends of the respective guide roller in a direction toward one of said ends of said respective guide roller, each of said guide rollers being disposed in said cartridge case in a first orientation in which said one end of the respective guide roller faces toward said base plate when said magnetic tape has said first width, and each of said guide rollers being disposed in said cartridge case in a second orientation in which said one end of the respective guide roller faces away from said base plate when said magnetic tape has said second width.

5,559,656

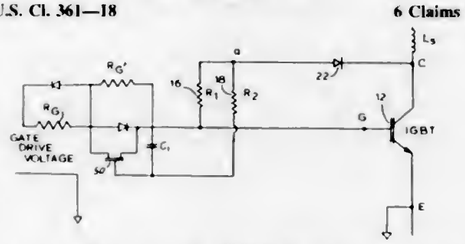
IGBT SWITCHING VOLTAGE TRANSIENT PROTECTION CIRCUIT

Rahul S. Chokhawala, Phoenix, Ariz., assignor to International Rectifier Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 40,212, Apr. 1, 1993, Pat. No. 5,444,591. This application Feb. 22, 1995, Ser. No. 392,233

Int. Cl.[6] H02H *9/04*

U.S. Cl. 361—18 **6 Claims**



1. A circuit for protecting an IGBT against voltage transients occurring during fault shut-off, the IGBT having a collector, an emitter, and a gate, the circuit comprising:

a diode connected to the collector of the IGBT and oriented so as to be rendered non-conductive during a short circuit condition when the voltage at the collector of the IGBT rises;

a gate drive resistor connected to the gate of the IGBT;

an additional resistor connectable in series with the gate drive resistor;

a P-channel MOSFET having a gate, a drain, a source, and an input capacitance, the drain and source of the P-channel MOSFET being connected across the additional resistor;

two series resistors coupled in parallel with the input capacitance of the P-channel MOSFET; and

a diode coupled at one end at a point between the series resistors and at the other end to the collector of the IGBT, the diode being oriented so as to be rendered non-conductive when the voltage at the collector of the IGBT rises, such that, during a short circuit condition when the voltage at the collector of the IGBT rises and the diode becomes non-conductive, the input capacitance of the P-channel MOSFET discharges through both of the two series resistors, and the voltage at the gate of the P-channel MOSFET decreases, thereby turning off the P-channel MOSFET and electrically connecting the additional resistor in series with the gate drive resistor to slow the rate of turn-off of the IGBT.

5,559,657

EARTH FAULT CIRCUIT BREAKER

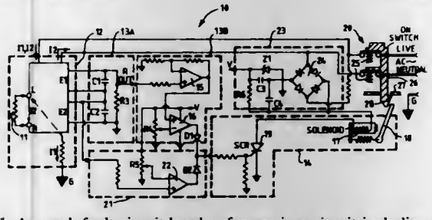
Sheir C. Lam, 507 Thriving Industrial Centre, 26-38 Sha Tsui Road, Tuen Wan New Territories, Hong Kong, assignor to Sheir C. Lam, Kowloon, and Pui Y. Tam, both of Hong Kong

Filed Jun. 15, 1994, Ser. No. 261,894

Claims priority, application United Kingdom, Jun. 15, 1993, 9312284

Int. Cl.[6] H02H *3/00*

U.S. Cl. 361—42 **9 Claims**



1. An earth fault circuit breaker for use in a circuit including an AC power supply and a load, said circuit breaker comprising

a current-to-voltage converter having first and second transformers for monitoring current flowing into the load and current flowing from the load, each transformer including first and second primary windings, the first primary winding of at least one of the transformers being arranged to be connected to a first side of the load and the second primary winding of the at least one transformer being arranged to be connected to a second side of the load, and including a secondary winding wherein a voltage is induced in the secondary winding of the first transformer;

a leakage current/voltage detector for processing the induced voltage of the first and second transformers to produce a resultant voltage;

a voltage comparator for comparing the resultant voltage with a predetermined reference voltage and for generating a signal indicative of a difference between the induced voltage of the first transformer and the induced voltage of the second transformer; and

a switching circuit for disconnecting the load from the power supply in response to a signal from said voltage comparator representing a difference between the induced voltages of the first and second transformers, the first and second transformers being connected such that a component of the induced voltage in the first transformer is out of phase with a component of the induced voltage in the second transformer.

5,559,658

SOLID-STATE HIGH VOLTAGE CROWBAR CIRCUIT

James L. Cooper, Everett, and Mark Adams, Arlington, both of Wash., assignors to ELDEC Corporation, Lynnwood, Wash.

Filed Sep. 6, 1994, Ser. No. 301,229

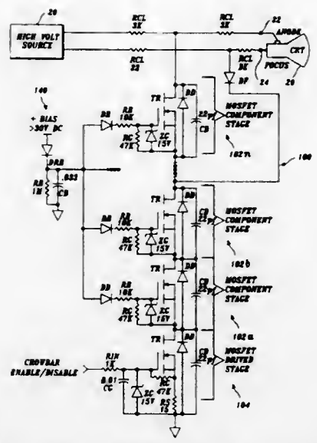
Int. Cl.[6] H02H *9/00*

U.S. Cl. 361—56 **26 Claims**

1. A solid-state crowbar circuit for shunting a high voltage to a predetermined potential much lower than the high voltage, comprising:

(a) a first component stage coupled to the high voltage and operable to conduct current flow in a conduction path from the high voltage when said first component stage is biased in an on state, said first component stage normally being biased in an off state so that the first component stage will not conduct current;

(b) a driver stage coupled to the first component stage and operable to regulate current along the conduction path when biased in an on state, said driver stage including a discharge impedance coupled to the predetermined potential, said driver stage normally being biased in an off state so that the driver stage will not regulate current; and



(c) an enable source coupled to said driver stage for generating an enable signal, the enable signal biasing said driver stage in the on state and creating a regulated current through the discharge impedance to the predetermined potential, the regulated current further biasing said first component stage in an on state, thereby shunting the high voltage to the predetermined potential by discharge along the conduction path through the first component stage and the driver stage.

5,559,659

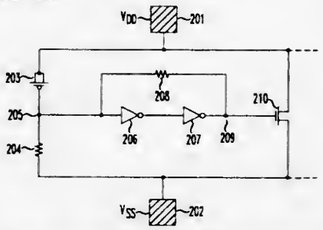
ENHANCED RC COUPLED ELECTROSTATIC DISCHARGE PROTECTION

Mark S. Strauss, Allentown, Pa., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 23, 1995, Ser. No. 410,427

Int. Cl.[6] H02H *9/04*

U.S. Cl. 361—56 **7 Claims**



1. An integrated circuit including a protective transistor connected between a first power supply bondpad and a second power supply bondpad, and a drive circuit for causing said protective transistor to conduct during an electrostatic discharge event and to not conduct during normal operation of the integrated circuit,

characterized in that said drive circuit includes a non-inverting portion controlled by a resistor-capacitor series circuit connected between the first and second bondpads and providing an RC time constant, and further characterized in that a feedback device is provided to extend the conduction of said protective transistor beyond the time provided by the RC time constant of the resistor-capacitor series circuit.

5,559,660

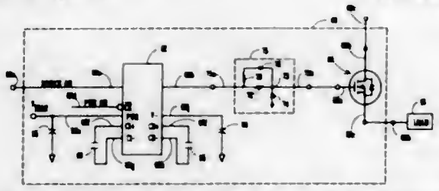
INRUSH CURRENT LIMITER

Donald R. Watson, Gr ton, and Christopher A. Heyden, Belmont, both of Mass., assignors to EMC Corporation, Hopkinton, Mass.

Continuation-in-part of Ser. No. 984,351, Dec. 2, 1992, abandoned. This application Mar. 22, 1994, Ser. No. 215,895

Int. Cl.[6] H02H *9/00*

U.S. Cl. 361—58 **20 Claims**



7. An inrush current limiter circuit having an input port, an output port and a bias terminal for limiting inrush current between a source and a load, the current limiter circuit comprising:

a driver circuit having an input terminal coupled to the input port of the current limiter circuit and an output terminal; and

a transistor having a first terminal coupled to the output terminal of said driver circuit, a second terminal coupled to the bias terminal and a drain electrode coupled to the output port of the inrush current limiter circuit wherein the transistor is activatable by applying a control voltage to the first terminal of said transistor and wherein said transistor has first and second operating modes wherein in the first operating mode said transistor has an on resistance which decreases between a first gate-to-source voltage and a second higher gate-to-source voltage during a predetermined time period such that said transistor limits inrush current between the source and the load during the predetermined time period, said predetermined time period being set by a time delay circuit having an input terminal coupled to the output terminal of said driver circuit and an output terminal coupled to the first terminal of said transistor, said time delay circuit comprising a resistor and a diode coupled in series between said input terminal and said output terminal of said time delay circuit and a capacitor coupled between said output terminal of said time delay circuit and a reference potential, and wherein in the second operating mode said transistor has a substantially fixed on resistance and wherein said transistor transitions from said second operating mode to said first operating mode by discharging said capacitor through said diode and said resistor into said output terminal of said driver circuit.

5,559,661

SHORT-CIRCUIT-PROOF TRANSISTOR OUTPUT STAGE, ESPECIALLY IGNITION OUTPUT STAGE FOR MOTOR VEHICLES

Horst Meinders, Reutlingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

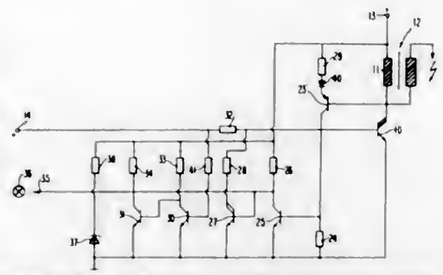
Continuation of Ser. No. 860,512, Jun. 11, 1992, abandoned. This application Jul. 11, 1994, Ser. No. 273,316

Claims priority, application Germany, Mar. 23, 1990, 40 09 304.2

Int. Cl.[6] H02H *3/00*

U.S. Cl. 361—93 **19 Claims**

1. Short-circuit-proof transistor output stage which forms an ignition output stage for a motor vehicle, including a power transistor (**10**) having a collector-emitter path connected in series to a load (**12**); voltage detection means for detecting voltage drop across the load when a short circuit occurs in the load, and a blocking device including a first switching transistor (**27**) for turning off the power transistor when a voltage drop is detected by the detection means, said detection means comprising a second switching transistor (**23**) and a third switching transistor (**25**) of opposite conductivity type, a base-emitter path of said second



switching transistor (**23**') being connected across said load (**12**), an emitter-collector path of said second switching transistor being connected in series with a base-emitter path of said third switching transistor (**25**) and a collector-emitter path of said third switching transistor being connected parallel to a base-emitter path of said first switching transistor so that during normal condition of the load the third switching transistor (**25**) is turned-on by a collector current of the second switching transistor (**23**) and blocks the first switching transistor (**27**), while in the event of a short-circuit the second and third switching transistors are blocked, the first switching transistor is turned on and the power transistor is blocked, and a transistor switching stage connected to a base of the power transistor (**10**) and including a fourth switching transistor (**30**) and a fifth switching transistor (**31**), a collector of the fifth switching transistor (**31**) being connected with a collector of the third switching transistor (**25**), the collector of the fifth switching transistor (**31**) being at positive potential when a drive signal is present for the power transistor (**10**) and the first switching transistor (**27**) leading away a base current for the power transistor (**10**) to earth only when both the collector of the third switching transistor (**25**) and the collector of the fifth switching transistor (**35**) are at the positive potential.

5,559,662

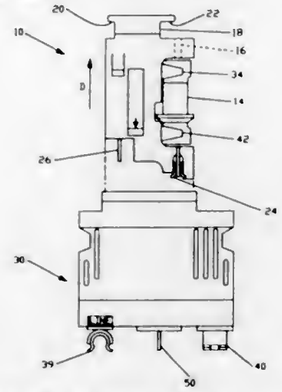
FUSED DISCONNECT SWITCH

Lawrence R. Happ, Mundelein, and Conrad Alfaro, Harwood Heights, both of Ill., assignors to Cooper Industries, Houston, Tex.

Filed May 20, 1994, Ser. No. 246,703

Int. Cl.[6] H02H *5/04*

U.S. Cl. 361—104 **14 Claims**



1. A fused disconnect device comprising:

a housing having an opening at a top thereof, a line side contact and a load side contact;

a removable fuse holder which is insertable into said opening having means for holding at least one fuse and having line and load side contact which mate with said line and load side

contacts of said housing when said removable fuse holder is inserted in said housing to form a device circuit;

an alarm circuit for indicating that; a fuse in said fuse holder is in an interrupt condition including a bipolar LED in a top, handle portion of said removable fuse holder, and a deflectable tab for electably connecting said alarm circuit to the device circuit, wherein said removable fuse holder has an access opening positioned over said deflectable tab;

wherein said removable fuse holder has a viewing opening disposed over an end of said fuse so that the presence of a fuse can be visually verified when said removable fuse holder is inserted into said housing; and

wherein said line side contact of said removable fuse holder includes a blade which defines a first plane that is substantially parallel to a second plane defined by a removal direction of said removable fuse holder and a line perpendicular to said removal direction.

5,559,663

SURGE ABSORBER

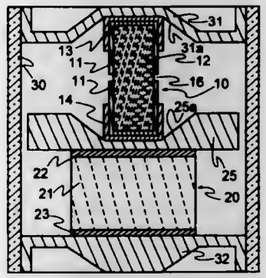
Yoshiyuki Tanaka; Masatoshi Abe, and Taka-aki Ito, all of Saitama, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Continuation of Ser. No. 37,297, Mar. 26, 1993, abandoned. This application Jul. 27, 1995, Ser. No. 507,972

Claims priority, application Japan, Mar. 31, 1992, 4-106062

Int. Cl.[6] H02H *1/00*

U.S. Cl. 361—127 **9 Claims**



5. A surge absorber, comprising:

a first insulating tube;

a varistor in said first insulating tube;

first and second conductive portions over a second insulating tube;

a gap between said first and second conductive portions forming a gap-type surge absorbing element;

said gap-type surge absorbing element including first and second cap electrodes at opposed ends of said second insulating tube;

said varistor having first and second external electrodes at opposed ends thereof;

means for electrically connecting said first cap electrode to said first external electrode;

an inert gas in said first insulating tube;

said means for electrically connecting said first cap electrode to said first external electrode including means for preventing propagation of a discharge from said gap-type surge absorbing element to a surface of said varistor; and

first and second sealing electrodes inserted into opposed ends of said first insulating tube, thereby closing, sealing, and retaining said gap-type surge absorbing element, said varistor, and said inert gas in said first insulating tube.

5,559,664

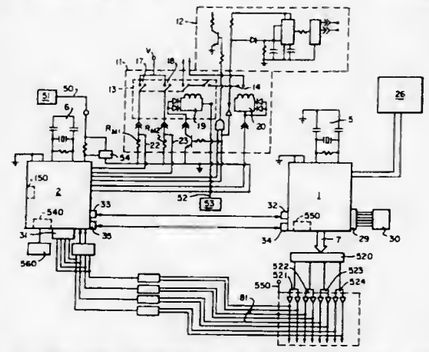
ELECTROMECHANICAL RELAY SYSTEM

James Dogul, Hudson, N.H.; Sandip Sarkar, North Providence, R.I.; Frederick Thomson, Cumberland, R.I., and Robert Thomson, Warwick, R.I., assignors to Frost Controls, Inc., Smithfield, R.I.

Division of Ser. No. 755,566, Sep. 5, 1991, Pat. No. 5,218,196. This application Jun. 7, 1993, Ser. No. 73,096

Int. Cl.[6] G01V *9/04*

U.S. Cl. 361—191 **23 Claims**



1. A compound, monitorable electromechanical relay system comprising:

a. a primary relay with primary relay contacts;

b. a primary solenoid connected to said primary relay so as to activate said primary relay contacts when said primary solenoid is energized, with said primary solenoid having a primary coil, wherein said primary coil is activated in a turn-off state; and

c. a primary relay monitor circuit having a dummy relay with dummy relay contacts wherein said dummy relay is mechanically coupled to but electrically isolated from said primary relay in such a way that when said primary relay contacts are in an open state, said dummy relay contacts are in a closed state, and wherein when said primary relay contacts are in a closed state, said dummy relay contacts are in an open state, and wherein said dummy relay is connected to said primary solenoid.

5,559,665

CAPACITIVE SWITCHING ASSEMBLY

Michael G. Taranowski, Greendale; Douglas E. Wickert, Pewaukee; Ruth E. Hubbell, Milwaukee; Denis J. Leveque, Milwaukee, and Michael R. Larsen, Milwaukee, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 10, 1995, Ser. No. 386,586

Int. Cl.[6] H01G *5/01;5/16*

U.S. Cl. 361—280 **6 Claims**

1. A capacitive switch assembly comprising:

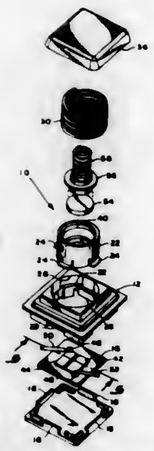
(a) housing means;

(b) a pair of relatively thin conductive plates juxtaposed on said housing means in spaced coplanar arrangement, each of said plates having on a common side thereof dielectric material superposed thereon;

(c) a carrier disposed for relative movement with respect to said housing means;

(d) a switching member disposed on said carrier, said member formed of elastomer interspersed with carbon thereby becoming conductive material wherein the surface of said elastomer contacts said dielectric material upon said relative movement; and,

(e) an actuator extending externally of said housing means and operable upon user movement thereof to effect said movement of said carrier to compress said switching member in contact with said dielectric and to form with said plates a pair of



capacitors electrically in series wherein resilient deformation of said switching member changes the capacitance of said pair of capacitors, said change being electrically detectable.

5,559,666

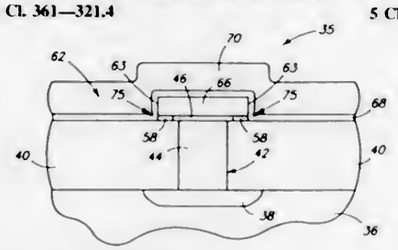
CAPACITOR CONSTRUCTION WITH OXIDATION BARRIER BLOCKS

Thomas A. Figura, and Paul J. Schuele, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Division of Ser. No. 328,095, Oct. 24, 1994, Pat. No. 5,464,786. This application May 23, 1995, Ser. No. 447,750

Int. Cl.[6] H01G *4/06;* **G11C** *11/24*

U.S. Cl. 361—321.4 **5 Claims**



1. A capacitor apparatus comprising:

a substrate having a node;

an inner capacitor plate in ohmic electrical connection with the substrate node;

an outer capacitor plate;

a capacitor dielectric layer interposed between inner and outer capacitor plates;

an electrically conductive reaction barrier layer interposed between the substrate node and the inner capacitor plate, the reaction barrier layer having outer lateral edges which are recessed beneath the inner capacitor plate; and

oxidation barrier blocks being received over the recessed outer lateral edges beneath the inner capacitor plate.

5,559,667

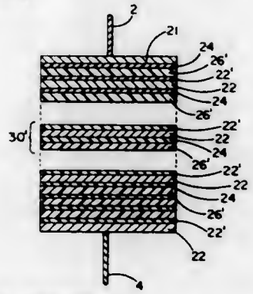
CAPACITOR INCLUDING SERIALLY CONNECTED CAPACITOR CELLS EMPLOYING A SOLID ELECTROLYTE

David A. Evans, Seekonk, Mass., assignor to Evans Findings Company, East Providence, R.I.

Division of Ser. No. 282,229, Jul. 29, 1994, Pat. No. 5,469,325, which is a continuation-in-part of Ser. No. 35,224, Mar. 22, 1993, Pat. No. 5,369,547. This application Aug. 11, 1995, Ser. No. 514,145

Int. Cl.[6] H01G *9/15*

U.S. Cl. 361—526 **3 Claims**



1. A capacitor comprising:

a plurality of capacitor cells, each cell including:

a first metal body having opposed first and second surfaces; a cathode comprising a porous coating including an oxide of at least one metal selected from the group consisting of ruthenium, iridium, nickel, rhodium, platinum, palladium, and osmium disposed on the first surface of said first metal body; an electrically insulating oxide disposed on the second surface of the first metal body; and

a solid electrolyte in contact with the cathode opposite the first metal body wherein the plurality of capacitor cells are disposed in a serial arrangement, the electrolyte of one cell contacting the electrically insulating oxide on the second surface of the first metal body of an adjacent cell;

a second metal body having first and second opposed surfaces, disposed at one end of the serial arrangement, and including a cathode comprising a porous coating including an oxide of at least one metal selected from the group consisting of ruthenium, iridium, nickel, rhodium, platinum, palladium, and osmium, disposed on one side of the second metal body, opposite an electrically insulating film in the serial arrangement and functioning as a cathode of the capacitor, and a solid electrolyte disposed between and contacting the porous coating of the second metal body and the electrically insulating oxide of the opposite first metal body in the serial arrangement;

a third metal body having first and second opposed surfaces, disposed at the other end of the serial arrangement, and including an electrically insulating oxide disposed on one side of the third metal body, opposite a porous coating of a first metal body in the serial arrangement, but no porous coating, and functioning as an anode of the capacitor, and a solid electrolyte disposed between and contacting the electrically insulating oxide of the third metal body and the porous coating of the opposite first metal body in the serial arrangement.

5,559,668

PACKAGE-TYPE SOLID ELECTROLYTIC CAPACITOR

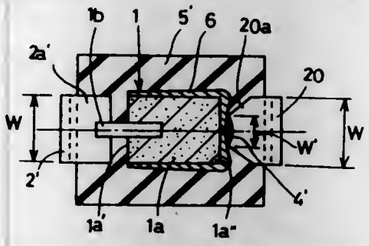
Chojiro Kariyama, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Continuation-in-part of Ser. No. 214,190, Mar. 17, 1994, abandoned. This application Apr. 25, 1996, Ser. No. 428,421

Claims priority, application Japan, Mar. 25, 1993, 5-66610

Int. Cl.[6] H01G *9/012*

U.S. Cl. 361—533 **10 Claims**



1. A package-type solid electrolytic capacitor comprising:

a capacitor chip having a first end face and a second end face opposite to the first end face, the chip being formed with a cathode terminal coating at least covering the second end face;

an anode wire partially projecting from the first end face of the chip;

a plate-like metal anode lead having an inner end electrically connected to the anode wire;

a plate-like metal cathode lead having an inner end which has an upper face, a lower face opposite to the upper face and an inner face located between the upper face and the lower end face, the inner end of the cathode lead being electrically connected to the cathode terminal coating of the chip; and

a resin package enclosing the capacitor chip, the anode wire and the inner ends of the anode and cathode leads;

wherein the cathode lead has a wider portion projecting out of the resin package, the inner end of the cathode lead being narrower than the wider portion of the cathode lead, the inner end face of the cathode lead being held in abutment with and electrically connected to the cathode terminal coating at the second end face of the chip.

5,559,669

COMPRESSED GAS INSULATION SWITCHGEAR

Yoshiaki Inami; Toyokazu Tanaka, and Masahira Wachi, all of Kokubu Works of Hitachi, Ltd. 1-1, Kokubumachi 1-chome, Hitachi, Ibaraki-ken, Japan

Continuation-in-part of Ser. No. 79,798, Jun. 23, 1993, Pat. No. 5,450,281, which is a continuation-in-part of Ser. No. 935,405, Aug. 26, 1992, abandoned. This application Mar. 16, 1995, Ser. No. 405,353

Claims priority, application Japan, Mar. 18, 1994, 6-048259

Int. Cl.[6] H02B *5/00*

U.S. Cl. 361—612 **6 Claims**

1. A gas insulation switchgear comprising:

a potential current transformer unit,

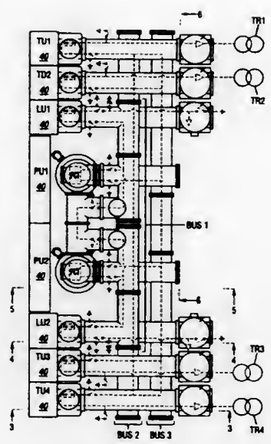
a power receiving unit,

a transformer side unit,

wherein:

said potential current transformer unit, said power receiving unit, and said transformer side unit being arranged in a row and electrically connected by buses; and

said power receiving unit resides between said potential current transformer unit and said transformer side unit.



5,559,670

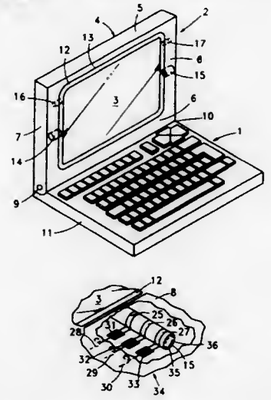
CONVERTIBLE DISPLAY COMPUTER

Ephraim B. Flint, Garrison; Alphonso P. Lanzetta, Marlboro, and Lawrence S. Mok, Brewster, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1994, Ser. No. 324,567

Int. Cl.[6] H05K *5/03;* **G06F** *1/16*

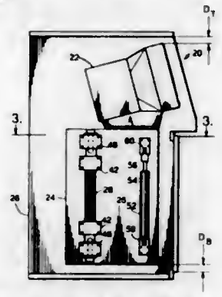
U.S. Cl. 361—681 **6 Claims**



4. A computer of the notebook or laptop type wherein a superimposed display and graphic input part as a unit in a frame reversably rotates on centrally positioned side pivot members, said frame being hinged on and foldable over a computer base that supports a keyboard, the improvement comprising,

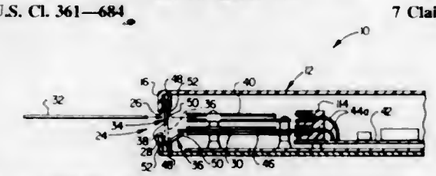
providing, in said frame an electrical interconnection between said display and graphical input part and wiring to said computer base, using at least one of conductive ring and brush at said pivot members, and, a spring loaded contact at said frame edge.

5,559,671
BI-DIRECTIONAL SHOCK ISOLATION MOUNTING SYSTEM AND METHOD
James R. Dan, Fullerton; Charles R. Caverley, La Palma; Steven A. Schechter, Fountain Valley; Steven S. Seeley, Corona; Chris A. Jameson, Fullerton, and David A. Lee, Santa Monica, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.
Filed Jun. 30, 1994, Ser. No. 268,684
Int. Cl.[6] H05K *7/14; G06F 1/16; F16M 13/00*
U.S. Cl. 361—682 **13 Claims**



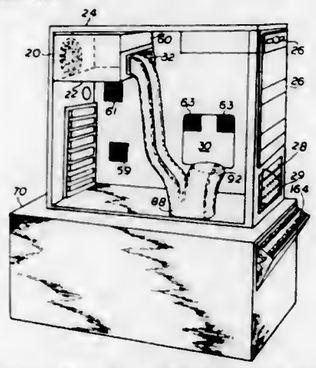
1. A bi-directional shock isolation mounting system, comprising:
an apparatus;
a base;
an apparatus chassis that carries the apparatus and is vertically slidable with respect to the base; and
means for supporting the apparatus chassis from the base, the means for supporting including
at least one self-centering preloaded spring attached between the base and the apparatus chassis said self-centering preloaded spring further including an internal guide rod slidingly connecting the apparatus chassis and the base, and
at least one shock damper attached between the apparatus chassis and the base.

5,559,672
DOOR APPARATUS FOR A PORTABLE COMPUTER
Kenneth J. Buras, Jr., Houston, and Neil L. Condra, The Woodlands, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.
Filed Dec. 5, 1994, Ser. No. 349,400
Int. Cl.[6] H05K *7/14*
U.S. Cl. 361—684 **7 Claims**



1. A computer comprising:
a housing having an exterior wall through which an opening extends into the interior of said housing, said opening being partially bounded by first and second opposing edge portions of said exterior wall and being configured to permit at least one memory card to be inserted therethrough into the interior of said housing;
a printed circuit board disposed within the interior of said housing;
a guide/ejector structure disposed within the interior of said housing and being operative to releasable receive each inserted memory card and electrically couple it to said printed circuit board; and
memory card opening door apparatus including (1) first and second door members each having opposite first and second edge portions, (2) mounting means for securing said first edge portions of said first and second door members to said first and second opposing edge portions of said opening in a manner permitting said first and second door members to be pivoted relative to said exterior wall between a closed position in which said first and second door members are generally parallel to one another and to said exterior wall, with each of said first and second door members blocking approximately half of said opening, and an open position in which said first and second door members are swung inwardly into the interior of said housing, and (2) spring means for resiliently biasing said first and second door members toward said closed position thereof, said mounting means including:
spaced first and second pluralities of transverse support plate members integrally formed on inner side portions of said first and second opposing edge portions of said exterior wall and having side edge depressions formed thereon, and
spaced first and second pluralities of side edge tab members integrally formed on said first edge portions of said first and second door members, each of said tab members having integrally formed thereon a journal member, said journal members being aligned with and rotatably snapped into said corresponding ones of said side edge depressions of said first and second pluralities of transverse support plate members in a manner permitting said first and second door members to be selectively pivoted between said open and closed positions thereof.

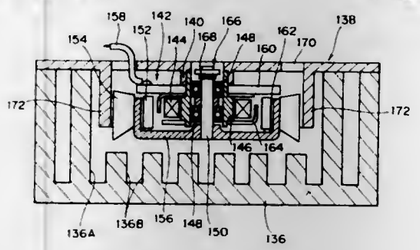
5,559,673
DUAL FILTERED AIRFLOW SYSTEMS FOR COOLING COMPUTER COMPONENTS, WITH OPTIMALLY PLACED AIR VENTS AND SWITCHBOARD CONTROL PANEL
Kevin M. Gagnon, 1668 Larwood Rd., Lemon Grove, Calif. 91945, and Victor H. Goulter, 485 Molimo Dr., San Francisco, Calif. 94127-1655
Filed Sep. 1, 1994, Ser. No. 299,293
Int. Cl.[6] H05K *7/20*
U.S. Cl. 361—695 **7 Claims**



1. A cooling system in a personal computer, said personal computer including an electrical power supply and at least one microprocessor retained in a computer housing, said cooling system comprising:
a cooling system housing having a top and a bottom, said cooling system housing supporting said computer housing on the top thereof;
at least one air blower means located in said cooling system housing, said blower means inducing a positive air pressure within said computer housing;
at least one air filter element in a serial arrangement with said blower means and located in said cooling system housing, said air filter element located upstream of said computer housing, such that said blower means delivers a stream of filtered air to said computer housing;

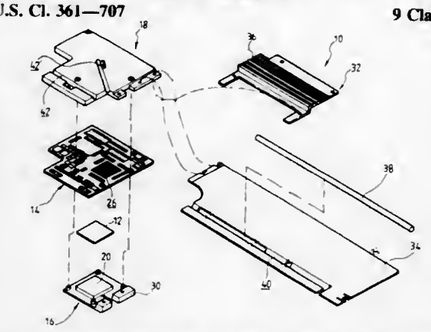
means for directing said stream of filtered air from said at least one air blower means in said cooling system housing to said computer housing, said stream of filtered air directing means comprising an air outlet port formed through the top of said cooling system housing in fluid connection with an air inlet port disposed in the bottom of said computer housing; and
means for dividing said stream of filtered air into at least two flow paths, including a first flow path and a second flow path, said dividing means comprising an air duct within said computer housing and in fluid connection with said air inlet port, said air duct having a first branch directing filtered air from said blower means, along said first flow path, to said electrical power supply and a second branch directing filtered air from said blower means, along said second flow path, to said at least one microprocessor and to other electrical components retained within said computer housing.

5,559,674
HEAT SINK AND MOUNTING STRUCTURE FOR HEAT SINK
Tadashi Katsui, Kawasaki, Japan, assignor to Fujitsu Limited, Japan
Continuation of Ser. No. 214,702, Mar. 18, 1994, abandoned. This application Dec. 15, 1995, Ser. No. 568,396
Claims priority, application Japan, Mar. 19, 1993, 5-060004; Sep. 10, 1993, 5-225650; Feb. 25, 1994, 6-028413
Int. Cl.[6] H05K *7/20*
U.S. Cl. 361—697 **4 Claims**



1. A heat sink, comprising:
a base member having a lower face adapted to be in contact with an upper face of an integrated circuit package and having an upper face from which a plurality of heat radiation fins extend;
an air blasting device including a motor having a rotary shaft and blades located around the rotary shaft, to blast air to said heat radiation fins of said base member, said air blasting device being disposed above a set of said plurality of heat radiation fins, a diameter of said air blasting device being substantially smaller than a width of said base member to provide a region between said air blasting device and an outer periphery of said base member, said set of said plurality of heat radiation fins located below said air blasting device being shorter than another set of said plurality of heat radiation fins located at a different position; and
a cover having a lower face from which said air blasting device extends, said cover mounted to close an upper portion of said region between said air blasting device and said outer periphery of said base member.

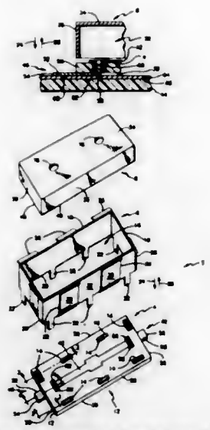
5,559,675
COMPUTER CPU HEAT DISSIPATING AND PROTECTING DEVICE
Chih-Ho Hsieh, Taipei, and Ing-Jen Lee, Hsin Tien, both of Taiwan, assignors to Twinhead International Corp., Taiwan
Filed Mar. 28, 1995, Ser. No. 411,545
Int. Cl.[6] H05K *7/20*
U.S. Cl. 361—707 **9 Claims**



1. A heat dissipating and protecting device for a computer central processing unit having a bottom surface mounted on a first surface of a printed circuit board and in contact with first ends of heat conductive plugs in holes through the printed circuit board, the device comprising:
a first conduction member for making heat conductive contact with a top surface of the central processing unit opposite to the bottom surface,
a second conduction member for making heat conductive contact with second ends of the plugs at a second surface of the printed circuit board opposite to the first surface,
fasteners securing the second conduction member to the first conduction member with the computer central processor unit and the printed circuit board sandwiched therebetween,
a first convection member which has a plurality of fins formed thereon for heat convection, secured to and in heat conductive contact engagement with the conduction members, and
a second convection member secured in a heat conductive manner with securing means to the conduction members to dissipate heat from the conduction members.

5,559,676
SELF-CONTAINED DROP-IN COMPONENT
Martin J. Gessaman, P.O. Box 219, Sebago Lake, Me. 04075
Filed Jun. 7, 1995, Ser. No. 475,988
Int. Cl.[6] H05K *5/00*
U.S. Cl. 361—752 **20 Claims**

1. A self contained drop-in component, comprising:
a first printed circuit board removably attachable to a second printed circuit board, said first printed circuit board having a self-contained circuit including an input and an output electrically and mechanically connected to said self-contained circuit and electrically and mechanically connectable to and disconnectable from a circuit of said second printed circuit board, said first printed circuit board having an edge which forms a periphery of said component, said first printed circuit board having a plurality of apertures extending therethrough adjacent said periphery;
a side rail adjacent said periphery and comprising a plurality of legs extending in a first direction and a plurality of clips extending in an opposite second direction, respective legs of said plurality of legs extending through respective apertures of said plurality of apertures, one or more of said respective legs comprising a length which is folded against a conductive portion of a surface of said first printed circuit board which is external of said component; and said side rail peripherally enclosing said self-contained circuit; and



a cover comprising a side which is attached to said side rail by said plurality of clips, said printed circuit board, side rail and cover comprising a housing having a housing cavity in which said self-contained circuit is positioned.

5,559,677

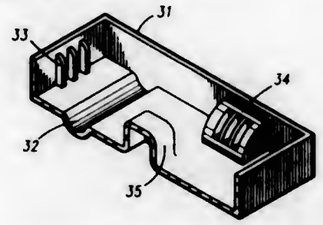
METHOD OF FORMING A DEVICE BY SELECTIVELY THERMAL SPRAYING A METALLIC CONDUCTIVE MATERIAL THEREON

Dominic R. Errichiello, Roselle, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 235,612, Apr. 29, 1994, abandoned. This application Feb. 14, 1995, Ser. No. 386,416

Int. Cl.[6] H05K *9/00*

U.S. Cl. 361—816 **7 Claims**



7. An electronic device comprising:

(a) a printed circuit board assembly having a plurality of electronic components forming an electronic circuit;

(b) a three-dimensional molded housing comprised of plastic, the three-dimensional molded housing including;

(i) an inner surface disposed about the electronic circuit, wherein at least a part of the inner surface has a ground shield comprised of a metallic conductive material thermally sprayed thereon; and

(ii) a plurality of molded elements, wherein selected areas of the plurality of molded elements are thermally sprayed with a metallic conductive material, wherein the plurality of molded elements includes a slot connector.

5,559,678

ELECTRONIC DEVICE HOUSING

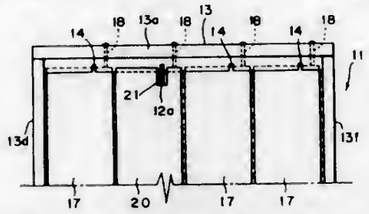
Hirofumi Fukuda; Kazuo Hatori; Kazumi Yamada, all of Kawasaki; Toshiaki Nogiri, Fukuoka, and Kozo Mori, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Oct. 12, 1995, Ser. No. 542,350

Claims priority, application Japan, Mar. 16, 1995, 7-057153

Int. Cl.[6] H05K *9/00*

U.S. Cl. 361—818 **8 Claims**



1. An electronic device housing for storing a plurality of electronic circuit packages, comprising:

a box-shaped rack having a plurality of guide grooves for guiding opposite side edges of said electronic circuit packages, and having an opening for allowing insertion and removal of said electronic circuit packages;

a package surface plate mounted on each of said electronic circuit packages, for shielding a partial region of said opening of said rack when one of said electronic circuit packages is inserted into said rack as being guided by said guide grooves; and

a plurality of dummy surface plates pivotably mounted on said rack, each of said dummy surface plates being pivoted inward of said rack by a pushing force applied to said dummy surface plate from one of said electronic circuit packages when said electronic circuit package is inserted into said rack as being guided by said guide grooves, whereas each of said dummy surface plates being pivoted so as to shield said partial region of said opening of said rack having been closed by said package surface plate when said electronic circuit package is removed from said rack as being guided by said guide grooves.

5,559,679

LIGHTING DEVICE FOR VEHICLES

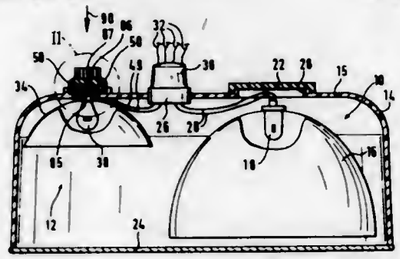
Frieder Liedtke, Dettingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Apr. 17, 1995, Ser. No. 423,035

Claims priority, application Germany, May 26, 1994, 44 18 399.2

Int. Cl.[6] B60Q *1/04*

U.S. Cl. 362—61 **15 Claims**



1. A lighting device for vehicles, comprising a housing; at least one light source; a holder fastenable to said housing and formed so that said at least one light source is insertable in said holder, said holder being provided with at least one electrical contact element

on which said light source comes to rest; at least one electrical lead connected with said at least one electrical contact and connectable to a voltage source, said holder having a covering composed of an electrically insulating material; a plug including a plug part; at least one electrical connecting element connected with said plug part and arranged on one part of said housing, said connecting element being bringable to rest at said at least one contact element of said holder under the action of a spring force in built-in position of said holder in said housing, said light source being insertable in said housing, said plug being arranged on said housing, said housing having an opening through which a section of said holder passes in an axial insertion direction, and a collar at least approximately coaxially surrounding said opening and sticking out to an outside of said housing, said covering of said holder having a section which at least approximately coaxially surrounds said collar toward an outside of said housing, said section of said covering cooperating with said collar for sealing said opening, said at least one connecting element extending outwardly inside said collar.

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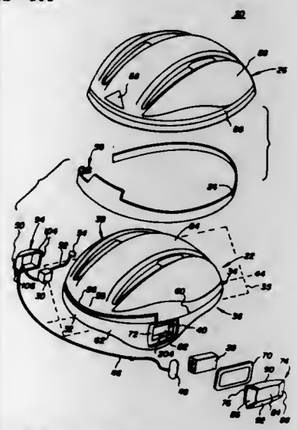
ELECTROLUMINESCENT BICYCLE HELMET

Dennis A. Tabanera, 228 Willowdale Rd., Morgantown, W. Va. 26505

Filed Apr. 11, 1995, Ser. No. 419,797

Int. Cl.[6] F21L *15/14*

U.S. Cl. 362—106 **7 Claims**



1. A bicycle helmet comprising:

(a) a structural foam liner,

(b) a plastic shell overlaying said liner, said shell comprising an opaque zone and a transparent window zone,

(c) an electroluminescent lamp film positioned between said shell and said liner, said film being positioned to emit light through said transparent window zone,

(d) an inverter in electrical communication with said film for supplying alternating current from said inverter to said film,

(e) a battery in electrical communication with said inverter for supplying direct current from said battery to said inverter.

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FLEXIBLE, SELF-ADHESIVE, MODULAR LIGHTING SYSTEM

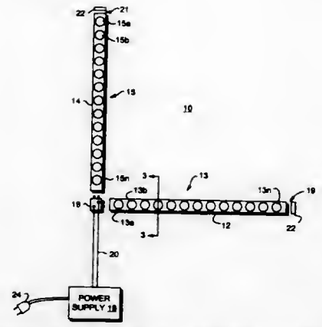
Noah G. Duarte, Merrimack, N.H., assignor to CNC Automation, Inc., Amherst, N.H.

Filed May 13, 1994, Ser. No. 242,293

Int. Cl.[6] F21P *1/02*

U.S. Cl. 362—252 **14 Claims**

10. A flexible, self-adhesive, lighting system, comprising:



a continuous length of flexible, self-adhesive, light emissive material adapted to be cut at any location along said continuous length of flexible, self-adhesive, light emissive material into at least a first light emissive segment;

said continuous length of flexible, self-adhesive, light emissive material including at least one negative electrical conductor and at least two positive electrical conductors and a plurality of groups of light emissive devices, each light emissive device in a group of light emissive devices being electrically coupled to said at least one negative electrical conductor and one of said at least two positive electrical conductors; said continuous length of flexible, self-adhesive, light emissive material further including a plurality of lenses, each lens of said plurality of lenses covering a respective group of light emissive devices; and

at least a first light emissive coupler, for electrically coupling said first light emissive segment to a source of power.

5,559,682

MULTI-OUTPUT DC-DC CONVERTOR

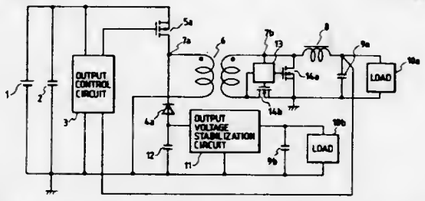
Akihiko Kanouda, Katsuta; Tadashi Takahashi, Hitacho; Hideaki Horie, Hitachi; Kenichi Onda, Hitachi, and Syuya Hagiwara, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 6, 1994, Ser. No. 177,961

Claims priority, application Japan, Jan. 6, 1993, 5-000612

Int. Cl.[6] H02M *3/335*

U.S. Cl. 363—21 **17 Claims**



1. A multi-output DC-DC convertor for supplying a first direct current to a first load and a second direct current to a second load, comprising:

a pair of input terminals, a first pair of output terminals which pair is different from said pair of input terminals, and a second pair of output terminals which pair is different from said pair of input terminals;

a transformer having a primary winding and a secondary winding;

at least one switching dement connected in series with said primary winding of said transformer such that a series circuit of said primary winding and said at least one switching element are connected to a direct current power source across said pair of input terminals;

a first rectifying and smoothing circuit connected to said secondary winding of said transformer; and

a second rectifying and smoothing circuit connected to rectify

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a second rectifying and smoothing circuit connected to rectify and smooth an output selected from said primary winding and said secondary winding of said transformer; wherein

during an on-condition of said switching dement, a first direct current output is obtained across said first pair of output terminals due to a current flowing in said first rectifying and smoothing circuit, said first direct current output for delivery to said first load; and

during an off-condition of said switching dement, a second direct current output is obtained across said second pair of output terminals due to a current flowing to said second rectifying and smoothing circuit, said second direct current output for delivery to said second load.

5,559,683

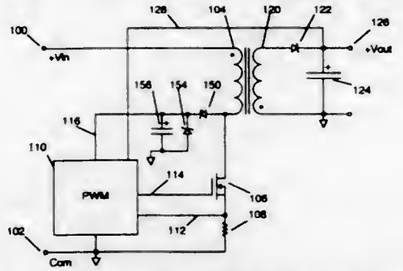
FLYBACK SWITCHING POWER SUPPLY WITH BOOTSTRAPPED GATE DRIVE

David S. Schoenwald, Los Gatos, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 30, 1994, Ser. No. 316,282

Int. Cl.[6] H02M *3/335;* **H02H** *7/122*

U.S. Cl. 363—21 **6 Claims**



1. In a switching power supply having an input terminal, a common terminal, a controller, a transformer primary having a top primary winding lead and a bottom primary winding lead, the top primary winding lead connected to the input terminal, a switch controlled by the controller, the switch connected between the bottom primary winding lead and common terminal, an improved drive voltage generator comprising:

a series diode connected to the junction of the bottom primary winding lead and the switch;

a capacitor connected between the output of the series diode and common; and

a voltage clamp connected to the output of the series diode, the voltage clamp providing a bootstrapped voltage rising to a voltage higher than the voltage at the input terminal, the bootstrapped voltage being used to drive the switch.

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SWITCHING REGULATOR

Franz Ohms, Oberrot, and Heike Rupright, Booknang, both of Germany, assignors to Ant Nachrinctentechnik GmbH, Backnang, Germany

PCT No. PCT/DE92/00416, § 371 Date Dec. 17, 1993, § 102(e) Date Dec. 17, 1993, PCT Pub. No. WO92/22955, PCT Pub. Date Dec. 23, 1992

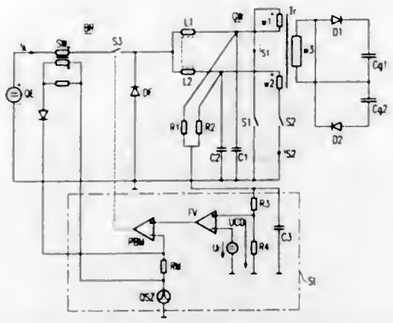
PCT Filed May 23, 1992, Ser. No. 167,820

Claims priority, application Germany, Jun. 19, 1991, 41 20 147.7; Jul. 17, 1991, 41 23 634.3

Int. Cl.[6] H02M *3/337*

U.S. Cl. 363—25 **12 Claims**

1. A switching regulator, comprising a push-pull converter (GW), which is embodied as a resonance converter, with a series-connected buck or boost regulator, wherein the primary windings



(W1, W2) of the push-pull converter transformer (Tr) are galvanically separated from each other, characterized in that the output inductance of the buck or boost regulator (BR) is divided into two individual inductances (L1, L2), wherein these individual inductances (L1, L2) are respectively supplied to one of the push-pull branches of the push-pull converter (GW), and that each of the push-pull branch of the push-pull converter has at least one resonance capacitor (C1; C2), which is respectively connected to the series connection of one individual inductances (L1, L2) with a primary winding of the push-pull converter transformer (Tr).

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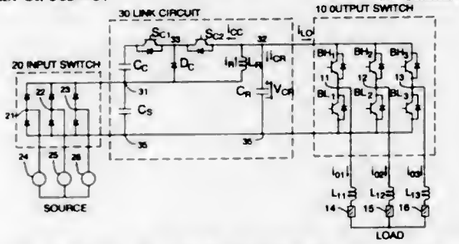
VOLTAGE CLAMPED PARALLEL RESONANT CONVERTER WITH CONTROLLABLE DUTY CYCLE

Hian K. Lauw, and Robert S. Zedwick, both of Corvallis, Oreg., assignors to Electronic Power Conditioning, Inc., Corvallis, Oreg.

Filed Oct. 12, 1994, Ser. No. 322,100

Int. Cl.[6] H02M *5/45*

U.S. Cl. 363—37 **20 Claims**



1. A parallel resonant converter for transferring electrical power between a power source and a load, comprising:

a first switch circuit for coupling the source to the load;

a link circuit for generating link signal pulses connected between the source and the first switch circuit, said link circuit containing a parallel resonant tank circuit with a resonant capacitor connected in parallel to the first switch circuit; and

the link circuit containing link switches which are electronically switched to generate a train of link voltage pulses that are transmitted to the output terminals of the first switch circuit with each voltage pulse consisting of a zero and non-zero segment and both segments being continuously and independently controllable in duration by said link switches.

5,559,686

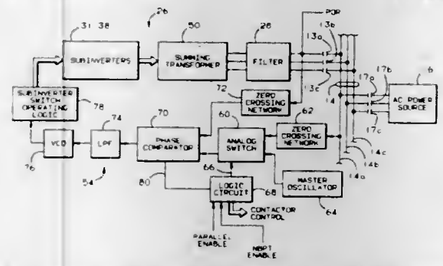
STEPPED WAVEFORM INVERTER CONTROL

Sunil Patel; Chi-Nam Ng; P. John Dhyanchand; Vietson M. Nguyen, all of Rockford, and Michael Teagardin, Loves Park, all of Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 8, 1994, Ser. No. 273,039

Int. Cl.[6] H02M *1/12*

U.S. Cl. 363—43 **10 Claims**



1. A control for an inverter having a plurality of subinverters coupled to inputs of a summing transformer wherein the summing transformer includes an output at which an AC stepped waveform is produced, comprising:

a phase comparator having first and second inputs coupled to the summing transformer output and an AC reference source, respectively, and an output at which a phase comparison signal is produced;

a compensation unit coupled to the output of the phase comparator and developing a compensated phase comparison signal;

a voltage controlled oscillator (VCO) coupled to the compensation unit developing a command signal from the compensated phase comparison signal;

means coupled between the VCO and the subinverters and responsive to the command signal for controlling the subinverters such that the AC stepped waveform has a desired frequency; and

wherein the inverter is connectable in parallel with a further inverter to a power bus wherein the AC reference source includes a switch having first and second inputs coupled to a master oscillator and the power bus, respectively, and an output wherein the switch is operated to connect the master oscillator to the phase comparator when the inverters are not to be connected in parallel and is operated to connect the power bus to the phase comparator when the inverters are to be connected in parallel.

5,559,687

VOLTAGE MULTIPLIER FOR HIGH OUTPUT CURRENT WITH STABILIZED OUTPUT VOLTAGE

Germano Nicollini, Piacenza; Pierangelo Confalonieri, Canonica D'Adda, and Carlo Crippa, Merate, all of Italy, assignors to SGS-Thomson Microelectronics, S.r.l., Agrate Brianza, Italy

Filed Jun. 17, 1994, Ser. No. 261,473

Claims priority, application European Pat. Off., Jun. 21, 1993, 93830265

Int. Cl.[6] H02M *3/18*

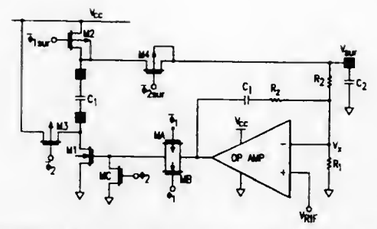
U.S. Cl. 363—60 **40 Claims**

1. A voltage multiplier circuit, comprising:

at least a first charge transfer capacitance and a second output storing capacitance,

a first switch, comprising a single transistor, for connecting to ground a first terminal of said first capacitance; said first terminal of said first capacitance being connected to ground only through said first switch;

a second switch for connecting a second terminal of said first capacitance to a supply node;



a third switch for connecting said first terminal of said first capacitance to said supply node;

a fourth switch for connecting the second terminal of said first capacitance to a first terminal of said second capacitance which provides an output node of the voltage multiplier;

said second switch being controlled by a first clock phase and said third and fourth switches being controlled by a second clock phase;

and further comprising a voltage divider functionally connected between said output node and a ground node of the circuit;

a differential amplifier having a noninverting input to which a reference voltage is fed, an inverting input connected to an intermediate node of said voltage divider and to the output of the amplifier through a series comprising an integrating capacitance and a resistance;

a first transfer gate, controlled by a first timing signal and by a complementary signal, coincident with said first clock phase, an input of said transfer gate being connected to said output of the amplifier and an output of said transfer gate being connected to a control terminal of said first switch;

a fifth switch, controlled by a second timing signal coincident with said second clock phase being functionally connected between said control terminal of said first switch and ground.

5,559,688

RESONANT POWER FACTOR CONVERTER

Daniel Pringle, Guelph, Canada, assignor to 1,005,539 Ontario Inc., Guelph, Canada

Filed Feb. 15, 1994, Ser. No. 196,554

Claims priority, application Canada, May 19, 1993, 2096559

Int. Cl.[6] H02M *7/04*

U.S. Cl. 363—89 **22 Claims**

1. A converter for interposition between an AC power source and a DC load to maintain a substantially Unity Power Factor independent of the impedance of the load, said converter having rectifying circuit means to provide DC power to a DC power output circuit from an AC source, impedance varying means for varying the impedance seen by the AC source in the DC output circuit, and means responsive to a shift in AC input current away from an in-phase relation with the voltage of the AC source under loading of the DC power output circuit for controlling said impedance varying means in a direction to return the AC current towards in-phase relation with the AC voltage or to alter the magnitude of the AC current to counteract any variation of DC output voltage under loading, said means for varying the impedance seen by the AC source comprises an inverter having a power resonant circuit interposed between said rectifying means and said DC power output circuit and a phase shift control means controlling the phase between the voltage and current in said power resonant circuit while always maintaining the voltage leading the current, and said means responsive to a shift in AC input current from an in-phase relation with the voltage of the AC source and to DC output voltage variations is connected to control said phase shift control means.

5,559,689

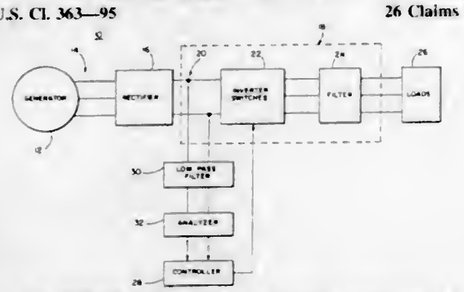
HARMONIC CONTENT DETERMINATION APPARATUS

Maurice Kirchberg, Dubuque, Iowa, and Alec Cook, Belvidere, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 8, 1994, Ser. No. 287,326

Int. Cl.[6] H02M *7/48;1/12;5/458*

U.S. Cl. 363—95 **26 Claims**



1. An apparatus for determining a frequency component of a signal comprising:

sampling means for sampling the signal at a sampling frequency, wherein the sampling means produces first and second sets of samples at the sampling frequency, and wherein corresponding samples of the first and second sets of samples are separated in phase by substantially 90°; and,

frequency component determining means for determining the frequency component of the signal from the first and second sets of samples.

5,559,690

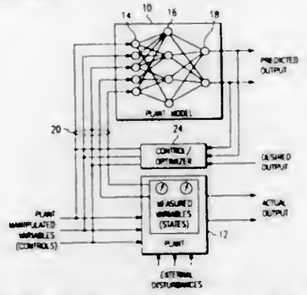
RESIDUAL ACTIVATION NEURAL NETWORK

James D. Keeler; Eric J. Hartman; Kadir Liano, and Ralph B. Ferguson, all of Austin, Tex., assignors to Pavilion Technologies, Inc., Austin, Tex.

Continuation of Ser. No. 896,755, Jun. 10, 1992, Pat. No. 5,353,207. This application Sep. 16, 1994, Ser. No. 307,521

Int. Cl.[6] G05B *13/02;* **G06F** *15/18*

U.S. Cl. 364—164 **9 Claims**



1. A network for predicting plant outputs of a plant and for receiving control variables that are used to control the plant and measurable state variables of the plant, with the measurable state variables having dependencies on the control variables and unmeasurable external influences, the control network for projecting out the dependencies of the measurable state variables on the control variables, comprising:

a residual activation neural network for generating an estimation of the unmeasurable external influences on the plant and having:

an input layer for receiving the control variables,

an output layer for outputting predicted state variables,

a hidden layer for mapping said input layer to said output layer through a representation of the dependencies of the state variables on the control variables to generate said predicted state variables, which said representation is trained on the measurable state variables, and

a residual layer for determining as a residual the difference between said predicted state variables and the input state variables, said residual comprising an estimation of the unmeasurable external influences on the plant; and

a main neural network having:

an input layer for receiving as inputs the control variables and input signals parameterized by said residual,

an output layer for outputting a predicted plant output, and

a hidden layer for mapping said input layer to said output layer through a representation of the plant as a function of the control variables and said residual.

5,559,691

PLANT CONDITION DISPLAY SYSTEM

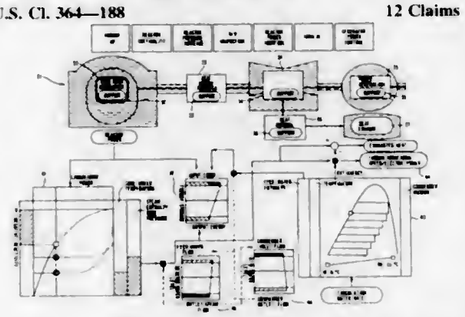
Kazuo Monta, Yokohama, and Juichiro Itoh, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 24, 1994, Ser. No. 248,142

Claims priority, application Japan, May 26, 1993, 5-124464

Int. Cl.[6] G21D *1/00*

U.S. Cl. 364—188 **12 Claims**



1. A plant condition display system for displaying for an operator items of information regarding the operation of a plant comprising:

a process signal input means into which process values from the plant are inputted and converted into process signals;

a display data preparation means for preparing data for displaying plant conditions in response to the process signals from the process signal input means; and

a plant condition information display means for representing process information of the plant in accordance with plant condition display data from the display data preparation means and then displaying represented process information on a display screen, wherein the plant condition information display means displays starting conditions of the plant, and wherein the plant condition information display means includes means for displaying, as image representations, flows of mass and energy at plant start up and an energy balance of the plant on the display screen and means for displaying, as image representations, principles and law governing an operating fluid with respect to a steam cycle on the display screen.

5,559,692

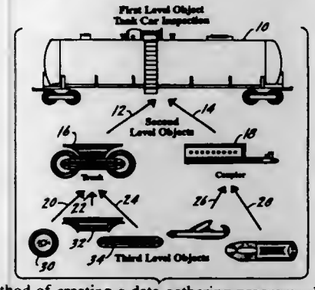
CUSTOMIZABLE DATA GATHERING METHOD WHICH ALLOWS THE USER TO DEFINE THE CLASSES OF DATA WHICH ARE GATHERED

Eric Telingator; Owen Ward, and Edward J. Ross, all of Boulder, Colo., assignors to Core Systems, Inc., Boulder, Colo.

Filed Oct. 5, 1994, Ser. No. 318,229

Int. Cl.[6] G06F *12/00;17/30;3/00*

U.S. Cl. 364—401 R **4 Claims**



1. A method of creating a data gathering program which can be customized by a user for use in situ with a transportable computing device having a display screen, data storage means and input means for accepting user instructions, said method including the steps of providing fixed source code in the computing device which permits a user to perform the following functions:

inputting into the data storage means a plurality of levels of user-defined structural data objects representing the categories of information to be obtained from in situ data gathering, the levels proceeding from the general to the specific in terms of information detail;

inputting into the data storage means at least one user-defined data table structure containing user-defined fields representing the items of information to be obtained from in situ data gathering;

organizing the objects and tables into a tree structure by storing with each object a pointer directed to a related object or table in the next higher level;

providing a standardized screen format for displaying each level of structural data objects; and

accepting input from an in situ user to select at least one of the structural data objects or fill in at least one of said fields.

5,559,693

METHOD AND APPARATUS FOR EFFICIENT MORPHOLOGICAL TEXT ANALYSIS USING A HIGH-LEVEL LANGUAGE FOR COMPACT SPECIFICATION OF INFLECTIONAL PARADIGMS

Peter G. Anick, Marlboro, and Suzanne O. Artemieff, Concord, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 28, 1991, Ser. No. 723,145

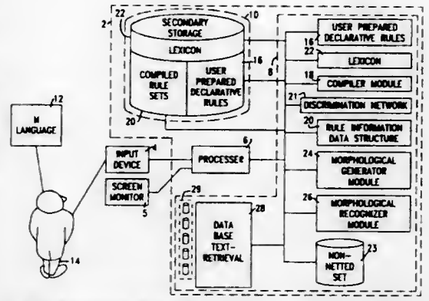
The portion of the term of this patent subsequent to Jul. 12, 2011, has been disclaimed.

Int. Cl.[6] G06F *17/27;17/28*

U.S. Cl. 364—419.08 **18 Claims**

1. A computer implemented method for performing morphological analysis in a computer system by describing inflectional operations on a natural language, the computer system comprising an input device, a memory and a computer processor capable of manipulating a data structure, the natural language comprising sequences of surface strings encoding grammatical properties, the computer implemented method comprising the steps of:

a. providing a language syntax that defines statement forms for statements that describe the inflectional morphology of the natural language;



b. accepting as input at the input device, which is coupled to the computer processor, a set of language statements that follow said language syntax to describe the inflectional morphology of the natural language, said input comprising rule statements:

i. defining a set of morpho-syntactic features corresponding to grammatical distinctions within the parts of speech categories in the natural language;

ii. defining a set of inflectional morphological paradigms, said inflectional morphological paradigms comprising form rule statements to describe the construction of word forms and associate with each construction pre-selected ones of said morpho-syntactic features, said form rule statements comprising stem and affix components that describe the inflectional morphology corresponding to grammatical construction rules commonly known in the natural language;

iii. defining a lexicon, said lexicon containing a set of word entries containing representative forms of each word of a language that are associated to a pre-selected one of said inflectional morphological paradigms;

c. creating a computer-manipulatable data structure from the set of language statements; and

d. performing a morphological analysis utilizing said computer-manipulatable data structure.

5,559,694

DEVICE FOR REDUCING TORQUE WHEN SHIFTING A TRANSMISSION

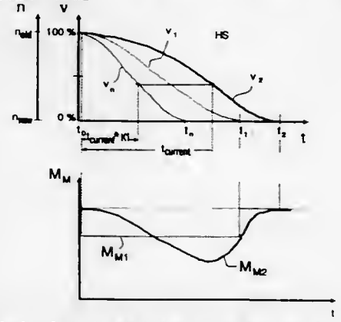
Gerd Kraemer, Baierbrunn, and Lothar Wolf, Munich, both of Germany, assignors to Bayerische Motoren Werke AG, Munich, Germany

Filed Aug. 19, 1994, Ser. No. 287,687

Claims priority, application Germany, Aug. 19, 1993, 43 27 906.6

Int. Cl.[6] B60K *41/22;* **F02D** *29/00*

U.S. Cl. 364—424.1 **7 Claims**



1. A device for reducing engine torque between the beginning and end of a shift of a transmission in motor vehicles, comprising:

a control device that continuously detects a beginning of a shift and a current engine rpm, said control device including means for calculating in advance an engine rpm anticipated at an end

of the shift, and means for regulating an amount of reduction

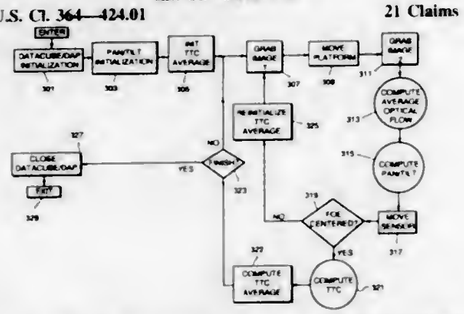
5,559,698

SYSTEM FOR DYNAMICALLY ADJUSTING THE TOE

an input means for organizing the acceleration data into n time

of the shift, and means for regulating an amount of reduction of an engine torque (M_{e2}) between the beginning (t_0) and end (t_2) of the shift in such a manner that a predetermined engine rpm curve (v_2) is achieved.

5,559,695
APPARATUS AND METHOD FOR SELF-CALIBRATING VISUAL TIME-TO-CONTACT SENSOR
Michael J. Daily, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.
Filed Dec. 27, 1994, Ser. No. 364,158
Int. Cl.[6] G06F *7/70*
U.S. Cl. 364—424.01 **21 Claims**



1. A self-calibrating visual sensor system, mounted on a mobile vehicle, comprising:

a visual time-to-contact (TTC) sensor that determines a time before said sensor will contact an object in its path, said TTC sensor generating a plurality of image frames descriptive of a travel area in the direction of movement of the mobile vehicle;

an image sensor processor, coupled to said visual TTC sensor, comprising an image memory for storing at least two image frames outputted by the visual TTC sensor;

an image processing unit comprising an image grabber, coupled to the image memory and operable for reading the stored image frames from the image memory, and a visual control means for continuous calibration of the visual TTC sensor to point in the direction of focus of expansion (FOE) by adjusting pan and tilt angles of the visual TTC sensor; and

a video bus between the image processing unit and the image sensor processor for transfer of image frames.

5,559,696
MOBILE ROBOT INTERNAL POSITION ERROR CORRECTION SYSTEM
Johann Borenstein, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.
Filed Feb. 14, 1994, Ser. No. 194,873
Int. Cl.[6] G01C *21/12*
U.S. Cl. 364—424.02 **14 Claims**

1. A mobile robot positioning system for performing internal correction of dead-reckoning errors comprising:

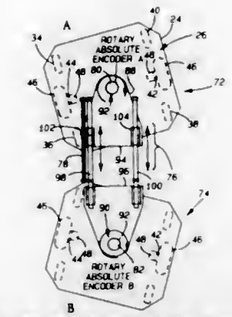
a first mobile robotic vehicle;

a second mobile robotic vehicle spaced apart from said first vehicle;

a relative positioning system for ascertaining relative bearing between said first and second vehicles;

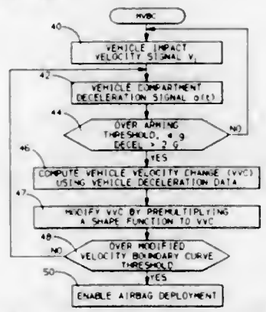
a dead-reckoning system for ascertaining position and bearing of said first vehicle relative to a last known position;

error discriminating means for detecting and correcting systematic and non-systematic dead-reckoning errors of said first vehicle by comparing said ascertained relative bearing between said first and second vehicles from said relative positioning system with an ascertained position and bearing from said dead-reckoning system;



wherein said first and second vehicles travel in spaced apart relation while collaborating via said relative positioning system to measure the bearing of said first vehicle with respect to said second vehicle to obtain relative position information for correcting dead-reckoning errors of said robot positioning system.

5,559,697
METHOD FOR CONTROLLING ACTUATION OF A VEHICLE SAFETY DEVICE
Jenne-Tai Wang, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 14, 1994, Ser. No. 355,781
Int. Cl.[6] B60R *21/32*
U.S. Cl. 364—424.05 **8 Claims**



1. A method for controlling actuation of a vehicle safety device, comprising the steps of:

sampling vehicle velocity to obtain discrete values of velocity;

sampling vehicle deceleration to obtain discrete values of deceleration;

comparing the discrete values of deceleration with a deceleration threshold value to detect the onset of a crash event, a discrete value of deceleration greater than the deceleration threshold value corresponding to a crash event;

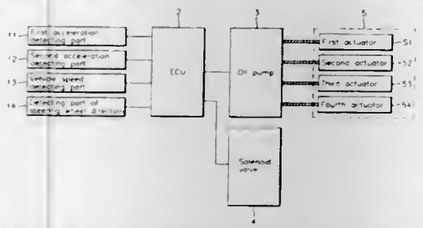
calculating, upon the onset of the detected crash event, crash severity parameter values as a function of the discrete values of deceleration;

modifying the crash severity parameter values as a function of the discrete value of velocity obtained at the onset of the detected crash event;

comparing the modified crash severity parameter values with time-dependent parameter threshold values, a value of the modified crash severity parameter greater than the parameter threshold value for the corresponding time into the crash event being indicative of a severe crash event; and

actuating the vehicle safety device when the severe crash event has been indicated.

5,559,698
SYSTEM FOR DYNAMICALLY ADJUSTING THE TOE ANGLE OF VEHICLE WHEELS
Hwang Insoo, Kyungsangnam-do, Rep. of Korea, assignor to Hyundai Motor Company, Jongro-ku, Rep. of Korea
Filed Aug. 4, 1994, Ser. No. 284,974
Claims priority, application Rep. of Korea, Aug. 6, 1993, 93-15315
Int. Cl.[6] B62D *6/00*
U.S. Cl. 364—424.05 **10 Claims**



1. In an automotive vehicle having front and rear wheels and steering wheel, a system for dynamically adjusting the toe angle positions of the front and rear wheels comprising:

a first accelerometer disposed to sense acceleration of the front wheels and to generate a first electrical signal representative of the sensed acceleration;

a second accelerometer disposed to sense acceleration of the rear wheels and to generate a second electrical signal representative of the sensed acceleration;

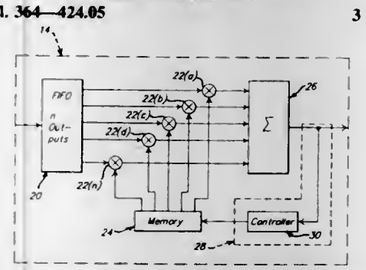
a speed sensor disposed to sense speed of the vehicle and to generate a third electrical signal representative of the sensed speed;

means for sensing the position of the steering wheel of the vehicle and for generating a fourth electrical signal representative of the sensed steering wheel position;

a plurality of actuators, at least one being connected to each of the front and rear wheels to selectively adjust the toe angle of each of the front and rear wheels; and

control means connected to the actuators and responsive to the first, second, third and fourth electrical signals for controlling the actuators to dynamically adjust the toe angle of each of the front and rear wheels to a position determined by the control means to be optimum for the vehicle operating at the sensed acceleration, speed and steering wheel position.

5,559,699
MATCHED FILTER FOR VEHICLE CRASH DISCRIMINATION
Tony Gioutsos, Brighton, Mich., assignor to Automotive Systems Laboratory, Inc., Franklin Hills, Mich.
Filed Aug. 26, 1994, Ser. No. 296,524
Int. Cl.[6] B60R *21/00*
U.S. Cl. 364—424.05 **3 Claims**



1. A matched filter for processing data representative of vehicle acceleration to produce a discrimination output value suitable for threshold comparison to determine whether to deploy an occupant safety restraint device, said filter comprising:

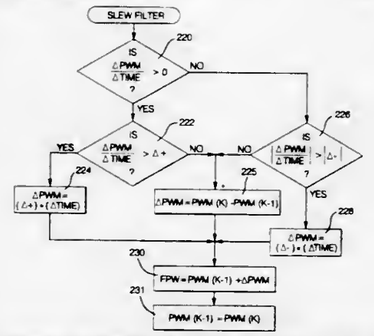
an input means for organizing the acceleration data into n time sequential data samples ranging from a current sample to an n^{th} oldest sample;

a memory means for storing at least one set of n predetermined scaling factors;

means for combining each of the n data samples with a predefined one of the n scaling factors, wherein the respective values of said n scaling factors are predetermined to effect a predetermined vehicle crash discrimination strategy; and

means for combining the n scaled data samples to produce the discrimination output value.

5,559,700
CONTINUOUSLY VARIABLE DAMPING SYSTEM
Kamal N. Majeed, Centerville, and Scott A. Stacey, Kettering, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed Mar. 27, 1995, Ser. No. 409,441
Int. Cl.[6] B60G *17/00*
U.S. Cl. 364—424.15 **4 Claims**



1. A method of controlling a vehicle suspension system including a real time continuously variable damper comprising the steps of:

(a) receiving input data of a set of vehicle parameters;

(b) determining a desired damping force for the continuously variable damper responsive to the input data;

(c) determining a present actuator command responsive to the determined desired damping force;

(d) comparing the present actuator command to a previous actuator command to determine a rate of change value of the actuator commands;

(e) if the rate of change value is positive, comparing that rate of change value to a positive Delta threshold;

(f) if the rate of change value is positive and is greater than the positive Delta threshold, limiting the rate of change value equal to the positive Delta threshold;

(g) if the rate of change value is negative, comparing the rate of change value to a negative Delta threshold;

(h) if the rate of change value is negative and if a first magnitude of the rate of change value is greater than a second magnitude of the negative Delta threshold, limiting the rate of change value to the negative Delta threshold, wherein the second magnitude of the negative Delta threshold is different from a third magnitude of the positive Delta threshold;

(i) determining an output actuator command responsive to said rate of change value; and

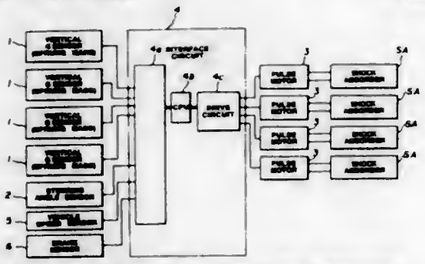
(j) outputting the output actuator command to the damper to control damper force.

5,559,701

AUTOMOTIVE SUSPENSION CONTROL SYSTEM FOR ANTI-ROLLING CONTROL UTILIZING A STEERING SENSOR AND BODY ACCELEROMETERS

Hiroyuki Shimizu; Toru Takahashi, and Makoto Kimura, all of Kanagawa Prefecture, Japan, assignors to Atsugi Unisia Corporation, Japan

Continuation of Ser. No. 922,490, Jul. 31, 1992, abandoned. This application May 11, 1995, Ser. No. 439,235
Claims priority, application Japan, Aug. 6, 1991, 3-196514
Int. Cl.[6] B60G *17/033*
U.S. Cl. 364—424.05 **5 Claims**



1. A suspension control system for a vehicle comprising:

shock absorbers disposed between a vehicle body and vehicle wheels, respectively, each shock absorber being variable of damping characteristic from soft to hard;

damping characteristic modifying means for modifying the damping characteristics of said shock absorbers;

sensor means, including a steering angle sensor which detects a steered angle of the steering wheel, for monitoring a preselected vehicle driving parameter representing rolling motion of the vehicle body and for providing a signal indicative thereof;

a first vertical acceleration sensor mounted on a first lateral portion of the vehicle body to detect vertical acceleration of the first lateral portion and produce a first signal indicative thereof;

a second vertical acceleration sensor mounted on a second lateral portion of the vehicle body opposite to the first lateral portion to detect vertical acceleration of the second lateral portion and produce a second signal indicative thereof; and

control means, responsive to said sensor means and said first and second vertical acceleration sensors, for determining a steering angular velocity based on the steered angle detected by the steering angle sensor and for determining that the vehicle is in a transient status of rolling motion when the steering angular velocity is greater than a preselected threshold value, and for computing a vertical speed difference between the first and second lateral portions of the vehicle body based on said signals from said first and second vertical acceleration sensors, said control means controlling said damping characteristic modifying means based on said vertical speed difference when the vehicle is in the transient status of rolling motion, said control means terminating rolling motion control when the vertical speed difference becomes a preselected value.

5,559,702

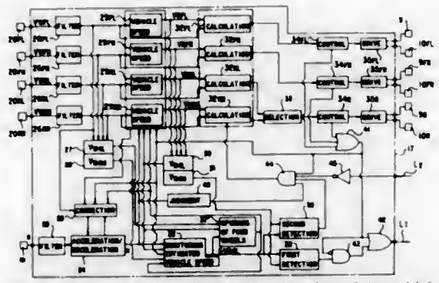
ANTILOCK BRAKE CONTROL METHOD FOR FOUR-WHEEL DRIVE VEHICLE

Takeshi Kojima; Toshio Yahagi; Kazuaki Fukami; Syouji Suzuki, and Kunimichi Hatano, all of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1995, Ser. No. 377,087
Claims priority, application Japan, Jan. 26, 1994, 6-007204
Int. Cl.[6] B60T *8/32*; **B60K** *17/348*
U.S. Cl. 364—426.02 **4 Claims**

1. An antilock brake control method for a four-wheel drive vehicle, said method comprising the steps of:

(a) sensing a speed of each of four vehicle wheels;



sensing a longitudinal acceleration/deceleration of the vehicle;

(c) determining an offset value corresponding to an output error of said longitudinal acceleration/deceleration of the vehicle;

(d) determining if the four vehicle wheels are in a spinning state;

(e) calculating a first estimated vehicle speed for executing antilock brake control as a function of wheel speed and a sum of the longitudinal acceleration/deceleration and the offset value, when the four vehicle wheels are not in a spinning state;

(f) calculating a second estimated vehicle speed for executing antilock brake control as a function of wheel speed and the longitudinal acceleration/deceleration when the four vehicle wheels are in a spinning state; and

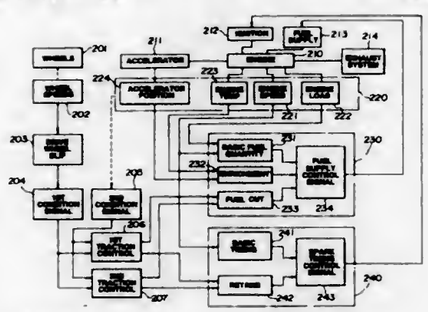
executing antilock brake control using one of said first and second estimated vehicle speeds.

5,559,703

FUEL CUT AND IGNITION TIMING CONTROL SYSTEM FOR CONTROLLING ACCELERATION SLIP

Toru Iwata, and Sota Yasuda, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 2, 1994, Ser. No. 353,248
Claims priority, application Japan, Dec. 14, 1993, 5-313537
Int. Cl.[6] B60K *28/16*
U.S. Cl. 364—426.03 **22 Claims**



11. A vehicle comprising:

an internal combustion engine having a plurality of cylinders;

wheels;

an ignition system for varying an ignition timing of the engine in response to an ignition timing control signal;

a fuel supply system for supplying fuel to all the cylinders of the engine in response to a fuel supply control signal when a number of selected fuel cut cylinders indicated by the fuel supply control signal is equal to zero, and cutting off fuel supply to at least one of the cylinders of the engine when the number of selected fuel cut cylinders is equal to or greater than one;

wheel speed sensors for sensing wheel speeds of the wheels;

a parameter sensor for sensing an engine operating parameter of the engine; and

a controller for estimating a drive wheel slip condition from the wheel speeds sensed by the wheel speed sensors, for producing a first condition signal requesting an acceleration slip control when the drive wheel slip condition is greater than a predetermined threshold, for monitoring the engine operating parameter sensed by the parameter sensor to determine whether a predetermined engine operating state exists, for producing a second condition signal when said predetermined engine operating state exists; and for producing the ignition timing control signal and the fuel supply control signal in a first control mode for reducing an engine output torque by:

varying the ignition timing by an ignition timing variation to reduce the engine output torque and

increasing the number of selected fuel cut cylinders from zero when the first condition signal is present and the second condition signal is absent,

and in a second control mode for reducing the engine output torque by implementing only one of:

varying the ignition timing by the ignition timing variation and

increasing the number of selected fuel cut cylinders, and by preventing the other of:

varying the ignition timing variation and

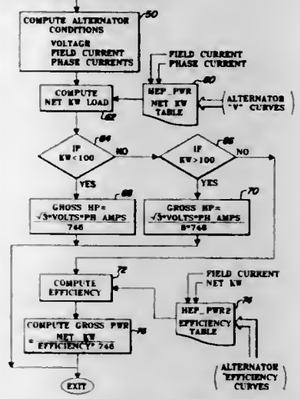
increasing the number of selected fuel cut cylinders from further reducing the engine output torque when the first and second condition signals are both present.

5,559,704

METHOD TO COMPUTE HORSEPOWER REQUIRED BY AN INTERNAL COMBUSTION ENGINE COUPLED TO AN AUXILIARY ALTERNATOR

Laurence D. Vanek, Girard; Myron L. Smith, Fairview, and Ojekunle Aboyade, Erie, all of Pa., assignors to General Electric Company, Erie, Pa.

Continuation of Ser. No. 979,995, Nov. 23, 1992, abandoned. This application Dec. 7, 1994, Ser. No. 350,637
Int. Cl.[6] G06G *7/70*; **F02N** *11/06*
U.S. Cl. 364—431.01 **2 Claims**



1. A method for determining gross engine horsepower required by an internal combustion engine coupled in driving relationship to an auxiliary alternating current electric alternator, the auxiliary alternator supplying electric power to variable loads with variable power factors, and for determining available horsepower remaining for another alternator coupled to the engine, the engine having a predetermined maximum horsepower capability at a selected RPM, the method comprising the steps of:

measuring field current and average per phase armature current supplied by the alternator;

computing magnitude of electric power supplied by the alternator from the measured values of field current and armature phase current by developing a set of constant power characteristic curves representative of alternator performance as a function of field current and phase current, converting the constant power characteristic curves into a set of data points suitable for storage in a computer memory, extracting data points from memory most closely corresponding to the measured values of field and phase currents, and interpolating from the extracted data points to a value of electric power actually corresponding to the measured values of field and phase current;

determining engine efficiency at the computed magnitude of electric power by developing a set of alternator efficiency characterisitics for selected electric power outputs as a function of alternator efficiency and field current, converting the efficiency characteristics into a set of data points suitable for storage in a computer memory, extracting efficiency data points from memory most nearly corresponding to the computed electric power output and measure field current, and interpolating from the extracted efficiency data points to a value of efficiency actually corresponding to the computed electric power and measure field current;

converting the computed electric power to engine horsepower at the determined efficiency; and

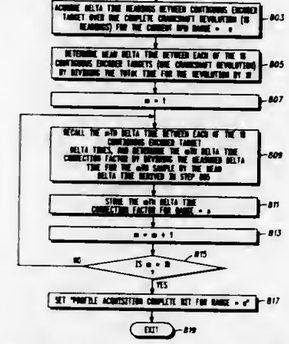
subtracting the converted engine horsepower from the maximum horsepower capability for determining the available horsepower remaining for said another alternator.

5,559,705

ADAPTIVE PROFILE CORRECTION FOR ROTATING POSITION ENCODERS IN RECIPROCATING ENGINES

Michael A. McClish, Northville; Steven L. Plee, Brighton; Donald J. Remboski, Jr., Dearborn; Marvin L. Lynch, Detroit, and Susan K. Sonday, Dearborn, all of Mich., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 3, 1995, Ser. No. 383,119
Int. Cl.[6] G06G *7/70*; **G01P** *3/42*
U.S. Cl. 364—431.07 **15 Claims**



14. A method of engine speed adaptive encoder profile correction for a rotating position encoder in a reciprocating engine, the method comprising the steps of:

providing a normal-firing indication while the reciprocating engine is not misfiring;

measuring a speed of the reciprocating engine;

acquiring a first encoder profile dependent on the measured speed of the reciprocating engine while the reciprocating engine is operating bounded within a first speed range and the reciprocating engine is not misfiring per the provided indication;

storing the first encoder profile if the reciprocating engine exceeds the first speed range;

providing a first speed range profile corrected engine speed dependent on the measured speed of the reciprocating engine and the first encoder profile;

acquiring a second encoder profile dependent on the measured speed of the reciprocating engine while the reciprocating engine is operating bounded within a second speed range and the reciprocating engine is not misfiring per the provided indication;

storing the second encoder profile if the reciprocating engine exceeds the second speed range; and

providing an encoder profile corrected engine speed for the rotating position encoder dependent on the measured speed of the reciprocating engine, and one of the first and second encoder profiles.

5,559,706

APPARATUS FOR DETERMINING ENGINE ABNORMALITY

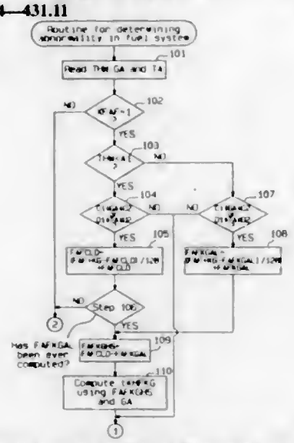
Tomohiro Fujita, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi-ken, Japan

Filed Jul. 18, 1994, Ser. No. 276,397

Claims priority, application Japan, Jul. 29, 1993, 5-188496

Int. Cl.[6] F02D *41/22*

U.S. Cl. 364—431.11 **20 Claims**



1. An engine system capable of diagnosing an occurrence of malfunction in engine operation represented as a plurality of controlled variables associated with the engine operation, the engine system comprising:

condition detecting means for detecting an operational condition of the engine and for outputting a signal indicative of the detection result;

first regulating means for regulating a first controlled variable;

first control means for computing a parameter value used to control said first controlled variable based on the signal from said condition detecting means, and for controlling said first regulating means with said computed parameter value to allow said operational condition of the engine to approach a requested condition;

second regulating means for regulating a second controlled variable, wherein the variance of the second controlled variable affects said first controlled variable;

determining means for determining whether the engine is properly functioning, said determining means determining that an abnormality has occurred in the engine when said parameter value computed by said first control means is continuously outside a predetermined numerical range over a predetermined period of time; and

range adjusting means for automatically adjusting said numerical range in accordance with a degree of influence of the variance in said second controlled variable on said first controlled variable.

5,559,707

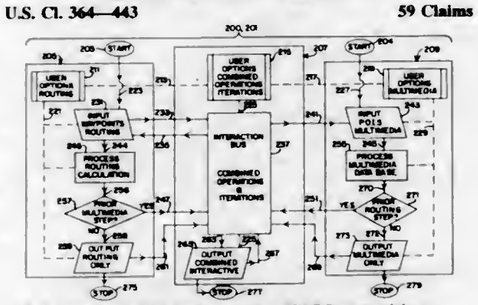
COMPUTER AIDED ROUTING SYSTEM

David M. DeLorme, Cumberland, and Keith A. Gray, Dresden, both of Me., assignors to DeLorme Publishing Company, Freeport, Me.

Continuation-in-part of Ser. No. 265,327, Jun. 24, 1994. This application Jan. 31, 1995, Ser. No. 381,214

Int. Cl.[6] G01C *21/00;* **G08G** *1/123*

U.S. Cl. 364—443 **59 Claims**



1. A computer aided routing system (CARS) comprising:

a digital computer having a computer display;

a map database providing a set of electronic maps for presentation on the computer display;

said electronic maps depicting transportation routes having identified waypoints including route intersections at geographical locations along the transportation routes, said identified waypoints depicted on the electronic maps being identified in the computer by coordinate locations of a selected geographical coordinate system;

a CARS database of geographically locatable points of interest (POIs) identified by coordinate locations in said geographical coordinate system, said POIs being organized into a plurality of types for user selection of POIs by type, said POI types comprising overlays of the CARS database for display over the electronic maps on the computer display;

CARS software constructed for user travel planning using said electronic maps presented on the computer display, said CARS software permitting user selection of a travel origin, travel destination, and desired waypoints between the travel origin and travel destination, said CARS software calculating, delineating, and displaying a travel route between the travel origin and travel destination via the selected waypoints according to user choice of the shortest travel route, quickest travel route, or user selected preferred travel route;

said CARS software permitting user selection of a region of interest along the user defined travel route, said region of interest having user specified dimensions and permitting user selection of specified POI types within said region of interest and user selection of particular POIs from the selected types within the region of interest, said region of interest being identified in the computer by coordinate locations of said geographical coordinate system;

said CARS database comprising travel information selected from the group consisting of graphics, photos, videos, animations, audio information, and text information about POIs of the CARS database and about selected transportation routes and waypoints of the electronic maps;

said CARS software being constructed to present a user customized travelog for preview on the computer display of the user defined travel route including said travel information in the CARS database on the transportation routes and waypoints of the electronic maps and the selected POIs of the CARS database in the user defined region of interest along the travel route.

5,559,708

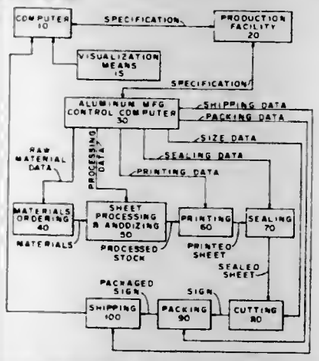
COMPUTER CONTROLLED FLEXIBLE MANUFACTURING OF ALUMINUM ARTICLES

G. Keith Turnbull, Pittsburgh; Eileen M. Peretic, Murrysville; George T. Rogan, New Kensington; John H. Powers, Lower Burrell; Scot R. Fugger, Monroeville, and Daniel A. Sullivan, Jr., Upper Burrell Twp, Westmoreland all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 598,763, Oct. 15, 1990, abandoned. This application Apr. 1, 1993, Ser. No. 41,243

Int. Cl.[6] G06F *19/00;17/50*

U.S. Cl. 364—468.03 **2 Claims**



1. A computer automated flexible manufacturing system, comprising:

visualization means for creating a computerized design specification of an aluminum article of manufacture, the computerized design information including a specification of a material for the aluminum medium, size information for the aluminum article of manufacture, packaging instructions and shipping information for the aluminum article of manufacture upon completion; and

a manufacturing computer, remote from the visualization means, connected to the visualization means to receive the computerized design specification; and

a printing unit operating under control of the manufacturing computer, the printing unit receiving an aluminum medium and printing a pattern on the aluminum medium as specified by the computerized design specification to produce the aluminum article of manufacture, wherein the manufacturing computer orders the aluminum medium, controls pre-printing processing of the aluminum medium prior to presentation to the printing unit, controls post-printing processing of the aluminum article and controls shipping of the article of manufacture.

5,559,709

PATTERN MAKING AND PATTERN DRAFTING SYSTEM

Junnosuke Ohno, Tokyo; Muneko Kobsaka, Ashiya; Kazunari Noguchi, Tarumi-ku; Hirotoshi Kamiyama, Takarazuka, and Kimiko Nishii, Nara, all of Japan, assignors to Kabushiki Kaisha World, Kobe, Japan

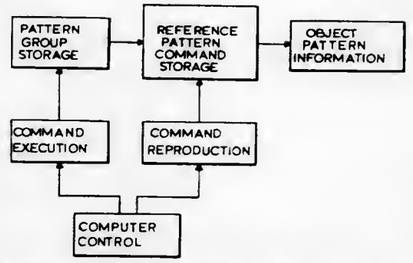
Filed Dec. 22, 1994, Ser. No. 362,116

Claims priority, application Japan, Dec. 27, 1993, 5-330171

Int. Cl.[6] G06F *17/50;19/00*

U.S. Cl. 364—468.01 **17 Claims**

1. A pattern making and pattern drafting system comprising:



(A) pattern storing means for storing a pattern group including a plurality of base patterns each having a prescribed base line and base point;

(B) command executing means for executing commands to perform prescribed processing on said patterns;

(C) executed-command storing means for sequentially storing the commands performed by an operator on a reference pattern selected from said pattern group; and

(D) command reproducing means for sequentially reproducing the commands stored in said executed-command storing means, thereby performing the processing, in the same order as followed by said command executing means, on at least one object pattern to be processed, other than said reference pattern, selected from said pattern group.

5,559,710

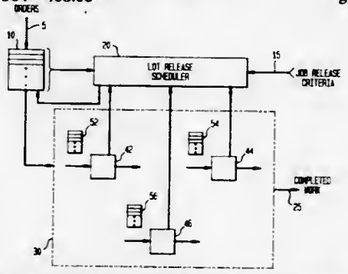
APPARATUS FOR CONTROL AND EVALUATION OF PENDING JOBS IN A FACTORY

Maryam S. Shahraray, Freehold, N.J., and Khosrow Hadavi, Dallas, Tex., assignors to Siemens Corporate Research, Inc., Princeton, N.J.

Continuation of Ser. No. 22,250, Feb. 5, 1993, abandoned. This application Nov. 22, 1995, Ser. No. 563,911

Int. Cl.[6] G06F *19/00*

U.S. Cl. 364—468.06 **8 Claims**



1. A factory for processing jobs-in-progress, and producing completed work, said factory comprising:

a plurality of machines for receiving and processing ones of said jobs-in-progress and at least a portion of said plurality of machines having waiting queues, said machines providing status information relating to respective ones of said waiting queues;

a source of orders;

a source of user-selected job release criteria, said criteria including at least one of a respective utilization factor and a respective job on-time factor assigned to respective ones of said machines;

storing means, responsive to said source of orders, for storing pending orders, and for releasing a selected order for inclusion in said jobs-in-progress in response to selection information; and

means, responsive to information from said storing means, to said source of job release criteria and to said machine status information, for producing and revising said selection infor-

mation so as to establish a Factory Profile curve of an optimum release strategy for said factory, determining a corresponding curve of predicted actual processing for each of said jobs from a trial start date through the expected completion of said job in said factory, comparing said actual job curve for each of said jobs with said Factory Profile optimum curve, and accepting said job for processing by said factory on said trial start date if said actual job curve closely follows said Factory Profile curve, within predefined bounds, throughout the processing time for said job, and otherwise determining a new curve of predicted actual processing for said job from a new trial start date and repeating said comparison.

5,559,711

APPARATUS AND METHOD FOR PROCESSING EMBROIDERY DATA BASED ON ROUNDNESS OF EMBROIDERY REGION

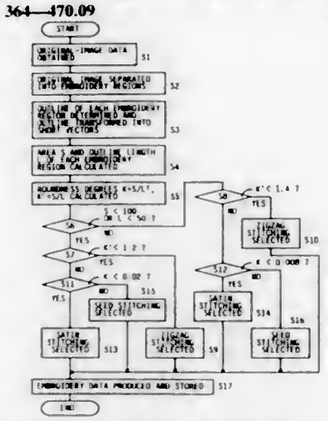
Masao Futamura, Nagoya; Mitsuyasu Kyuno, Aichi-ken; Yukiyoshi Muto, Nagoya, and Masahiro Mizuno, Kasugai, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi-ken, Japan

Filed Nov. 14, 1994, Ser. No. 340,356

Claims priority, application Japan, Nov. 15, 1993, 5-284668

Int. Cl.[6] G06F *19/00*; **G06G** *7/64*;*7/66*

U.S. Cl. 364—470.09 **24 Claims**



1. An apparatus for processing embroidery data to control a sewing machine to form an embroidery on a work sheet, the apparatus comprising:

determining means for determining, based on outline data representing an outline of an embroidery region, an area of said embroidery region bounded by said outline thereof and a length of the outline of the embroidery region, and determining a degree of roundness of the embroidery region based on the determined area and length; and

selecting means for selecting, based on the determined degree of roundness of said embroidery region, one of a plurality of different stitching manners in which said embroidery is to be formed in said embroidery region by the sewing machine according to said embroidery data.

5,559,712

THREE-DIMENSIONAL MODEL FORMING DEVICE

Tomohiko Kihara, Utsunomiya; Kentaro Furuhata, Ootawara, and Noriyuki Iida, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 121,911, Sep. 17, 1993, abandoned. This application Apr. 21, 1995, Ser. No. 427,656

Claims priority, application Japan, Sep. 18, 1992, 4-249914; Sep. 18, 1992, 4-250164

Int. Cl.[6] G06F *159/00*

U.S. Cl. 364—468.25 **33 Claims**

1. A three-dimensional model forming device comprising:

re-constructing means for re-constructing tomographic image data of multiple cross sections based on a plurality of projection data items covering a three-dimensional area of an object;

threshold value setting means for setting a threshold value to establish a solid level in a tomographic image;

binary coding means for converting the tomographic image data of multiple cross sections into binary image data of multiple cross sections based on the set threshold value so as to extract image data for a specific region;

constructing means for constructing a three-dimensional image data based on the binary image data of multiple cross sections;

display means for displaying a three-dimensional images as an artist concept of a three-dimensional model;

threshold value changing means for changing the set threshold value so that a desired region is extracted; and

model forming means for forming a three-dimensional model of the desired resin by hardening liquid region based on the binary image data of multiple cross sections.

5,559,713

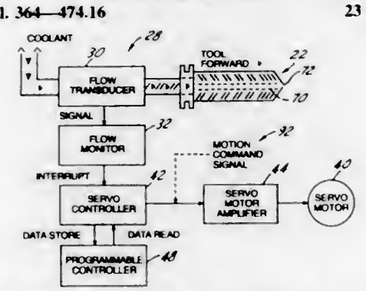
CHIP BUILDUP DETECTION AND CONTROL METHOD AND APPARATUS

Jeffrey Brown, and Dennis G. Rochon, both of Windsor, Canada, assignors to Western Atlas, Inc., Hebron, Ky.

Filed Nov. 22, 1994, Ser. No. 343,652

Int. Cl.[6] B23B *51/06*

U.S. Cl. 364—474.16 **23 Claims**



1. An apparatus for detecting chip buildup on a cutter of a machine tool that is movable relative to a workpiece comprising:

a supply for providing coolant to the cutter;

a drive for relatively moving the cutter toward and away from the workpiece;

a transducer for sensing coolant flow to the cutter;

and

a monitor in communication with said transducer for monitoring said coolant flow to the cuter and causing the drive to move the cutter relatively away from the workpiece if said coolant flow is less than a minimum acceptable coolant flow rate limit indicating chip buildup on the cutter for enabling chip buildup to be removed from the cutter.

5,559,714

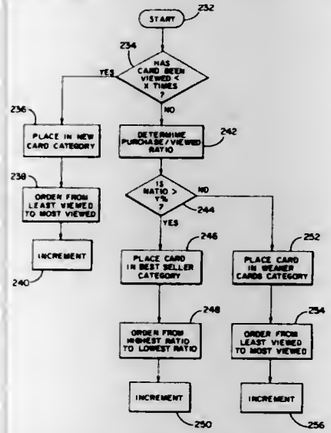
METHOD AND APPARATUS FOR DISPLAY SEQUENCING PERSONALIZED SOCIAL OCCASION PRODUCTS

Thomas B. Banks, Prairie Village, Kans., and Daniel B. Laughlin, Kansas City, Mo., assignors to Hallmark Cards, Incorporated, Kansas City, Mo.

Continuation-in-part of Ser. No. 864,418, Apr. 6, 1992, which is a continuation-in-part of Ser. No. 602,439, Oct. 22, 1990. This application May 10, 1993, Ser. No. 60,094

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—479.03 **2 Claims**



1. A method for sequentially displaying personalized social occasion products in response to a request to view available products of a given type in a machine comprising the steps of

assigning a value to each of a plurality of personalized products of a given type related to prior sales of each of said plurality of personalized products;

ranking each of the plurality of personalized products in accordance with said value;

displaying each of the plurality of products in accordance with the ranking; and

periodically updating the ranking of each of the personalized social occasion products of a given type.

5,559,715

TIMING MODEL AND CHARACTERIZATION SYSTEM FOR LOGIC SIMULATION OF INTEGRATED CIRCUITS WHICH TAKES INTO ACCOUNT PROCESS, TEMPERATURE AND POWER SUPPLY VARIATIONS

Michael N. Misheloff, Dublin, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 849,242, Mar. 11, 1992. This application Mar. 28, 1994, Ser. No. 219,585

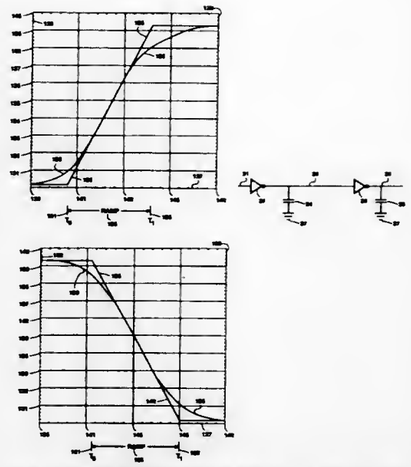
Int. Cl.[6] G06F *17/10*

U.S. Cl. 364—488 **23 Claims**

1. A method to aid in designing integrated circuits, the method comprising the steps of:

(a) providing a cell library including the following substeps:

(a.1) obtaining parameters for each logic cell in the cell library, the parameters defining propagation delay through each logic cell based on output load and input ramp when the logic cell operates at baseline conditions, parameters for each logic cell being obtained by individually characterizing the logic cell at the baseline conditions to obtain parameters specific to that logic cell, wherein the parameters define propagation delay through each logic cell in accordance with the following:



(a.1.1) when the logic device operates in a fast input ramp region in which an input ramp to the logic device is completely switched before the output signal wave form changes significantly, the parameters are used in a first formula to obtain a first value, the first value representing delay through the logic device, and

(a.1.2) when the logic device operates in a slow input ramp region in which the input ramp switches so slowly that the output signal switches while the input ramp is still switching, the parameters are used in a second formula to obtain the first value, the second formula being different than the first formula; and,

(a.2) obtaining scaling parameters for the logic cells in the cell library, the scaling parameters modifying values of the parameters for the logic cells within the library in order to approximate changes in propagation delay through each logic cell resulting from changes in the baseline conditions, wherein the scaling parameters are obtained by characterizing a subset of the logic cells at conditions varying from the baseline conditions, the scaling parameters thus obtained being used for all logic cells in the cell library, including logic cells not within the subset of logic cells used to obtain the scaling parameters.

5,559,716

LIVESTOCK FEED CONSUMPTION METER

Mark K. Gaalswyk, R.R. One - Box 85, Welcome, Minn. 56181

Filed Dec. 28, 1994, Ser. No. 365,196

Int. Cl.[6] G06F *19/00*; **A01K** *5/00*

U.S. Cl. 364—479.1 **12 Claims**

1. A livestock feed consumption meter for use in combination with a bulk feed storage bin having a feed delivery motor operably attached to a feed discharge system, the consumption meter comprising:

means for sensing the operation of the motor; and

a data processing unit connected in communication with the motor sensing means, the data processing unit including:

data receiving means for receiving data from the motor sensing means;

data input means for inputting data relevant to livestock feed consumption, wherein the data input means includes a key pad having keys operable to set parameters including;

setting current date and time;

setting an number of animals to be fed;

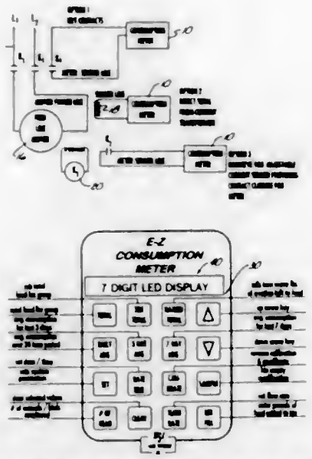
setting an estimated feed flow rate from the storage bin;

setting an amount of feed added to the storage bin; and

5,559,718

5,559,719

5,559,720



setting a periodic sampling time for moving daily memory registers to history registers and updating average feed consumption records;

data storage means for storing the motor sensing data and the inputted data;

data processing means for processing the motor sensing data and the inputted data; and

display means for displaying the inputted data and processed data.

5,559,717

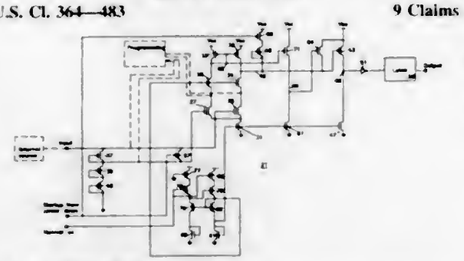
HIGH PRECISION VOLTAGE DETECTOR UTILIZING FLASH EEPROM MEMORY CELLS

Kerry Tedrow, Orangevale; Joseph W. Tsang, Elk Grove, and Kenneth Wojciechowski, Folsom, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 23, 1994, Ser. No. 217,165

Int. Cl.[6] **G11C** *7/00*

U.S. Cl. 364—483 **9 Claims**



1. A voltage detector comprising:

a first current path including a first flash memory device programmed to a first switching voltage;

a second current path including a second flash memory device programmed to a second switching voltage higher than the first switching voltage;

a voltage divider network having an input node and an output node, the input node coupled to a source voltage at a first potential and to the second current path, the output node coupled to the first current path, the output node of the voltage divider network being at a predetermined fraction of the source voltage potential; and

an output device, wherein the output device generates an output signal indicating when the current through the second current path is higher than the current through the first current path.

5,559,718

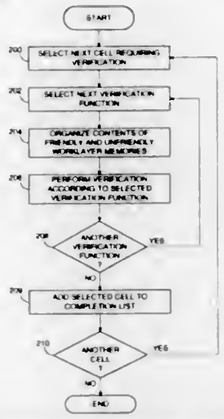
SYSTEM AND METHOD FOR MODEL-BASED VERIFICATION OF LOCAL DESIGN RULES

Allen Baisuck, San Jose, Calif.; Richard L. Fairbank, Schenectady, N.Y.; Walter K. Gowen, III, Troy, N.Y.; Jon R. Henriksen, Latham, N.Y.; William W. Hoover, III, Ballston Lake, N.Y.; Judith A. Huckabay, Union City; Eric Rogoyski, Los Gatos, both of Calif., and Anton G. Salecker, Clifton Park, N.Y., assignors to Cadence Design Systems, Inc., San Jose, Calif.

Filed Apr. 28, 1994, Ser. No. 234,410

Int. Cl.[6] **G06F** *17/50*

U.S. Cl. 364—491 **23 Claims**



6. In a system having a processing unit, a verification memory storing a verification function, and a verification database storing a cell reference graph representing a physical integrated circuit design as a hierarchical collection of cells, each cell in the cell reference graph associated with a hierarchical level and comprising one of a reference to a constituent model and a reference to a shape model, each constituent model comprising one from the group of a reference to a shape model and a reference to another cell at a lower hierarchical level, a method for model-based verification of local design rules in the physical integrated circuit design comprising the steps of:

selecting a cell for verification;

selecting a verification function;

identifying each shape model referenced by the selected cell that is unfriendly with another shape model referenced by the selected cell;

determining whether the selected cell references a first cell at a lower hierarchical level that is unfriendly with one of said selected cell shape models and a second cell at one of the same hierarchical level or a lower hierarchical level as said first cell;

performing a decomposition upon the first cell and the second cell if the selected cell references a first cell at a lower hierarchical level that is unfriendly with a second cell at one of the same hierarchical level and said lower hierarchical level as the first cell;

applying said selected verification function to the identified unfriendly shape models to determine a verification result representative of whether a design rule associated with said selected verification function is violated; and

storing said verification result in a memory location associated with said selected cell and overriding any previous verification result associated with one of said first cell and said second cell, in said verification memory.

5,559,719

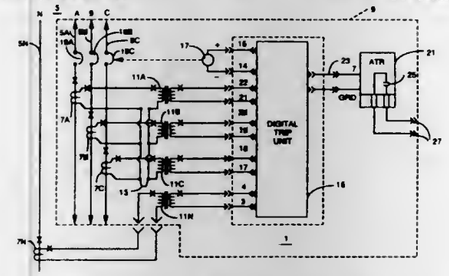
DIGITALLY CONTROLLED CIRCUIT INTERRUPTER WITH IMPROVED AUTOMATIC SELECTION OF SAMPLING INTERVAL FOR 50 HZ AND 60 HZ POWER SYSTEMS

Richard A. Johnson, Murrysville; Joseph C. Engel, Monroeville; Gary F. Saletta, Irwin, and Alan B. Shimp, Monroeville, all of Pa., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 26, 1994, Ser. No. 249,829

Int. Cl.[6] **H02H** *3/26;* **G01R** *19/00;* **H02J** *3/00*

U.S. Cl. 364—483 **10 Claims**



1. Electrical apparatus for connecting a load to either of a 50 Hz power source and a 60 Hz power source, said apparatus comprising:

separable contacts selectively connecting said load to a selected one of said 50 Hz power source and said 60 Hz power source when closed and disconnecting the load from the selected power source when open;

sensing means sensing current flowing through said separable contacts to the load when said contacts are closed;

digital control means including digitizing means digitally sampling said current sensed by said sensing means at selectable time intervals to generate digital current signals, and means responsive to predetermined values of said digital current signals to generate a trip signal;

means setting said selectable interval either to a first interval for a 50 Hz source or a second interval for a 60 Hz source and comprising zero crossing counting means generating a count of zero crossings of said current and means changing said selectable interval from said first interval to said second interval when said count during a first predetermined time period is within a first preselected number of zero crossings of a first number of zero crossings produced by an undistorted 60 Hz source during said first predetermined time period, and changing said selectable interval from said second interval to said first interval when said count within a second predetermined time period is within a second preselected number of zero crossings of the number of zero crossing produced by an undistorted 50 Hz source during said second predetermined time period;

means responsive to a trip signal to open said contacts; and

wherein said means changing said selectable interval only changes said interval from said first interval to said second interval when said count is within said first preselected number of zero crossings of said first count during a designated number of said first predetermined time periods, and only changes said interval from said second interval to said first interval when said count is within said second preselected number of zero crossings of said second count during said designated number of said second predetermined time periods, wherein said means setting said selectable interval includes an **EEPROM** in which the interval selectable is written for use by said digitizing means upon powering up of said digital control means and means blocking said means changing said selectable interval from further writing of said selected interval into said **EEPROM** after said selectable interval has been written into said **EEPROM** a predetermined number of times.

5,559,720

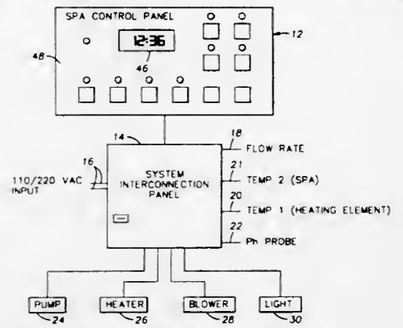
SPA CONTROL SYSTEM

Michael E. Tompkins, Missouri City, and Michael J. Green, Houston, both of Tex., assignors to Irving C. Siegel, Houston, Tex.

Continuation of Ser. No. 225,282, Jan. 11, 1994, Pat. No. 5,361,215, which is a continuation of Ser. No. 224,869, Jul. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 54,581, May 27, 1987, abandoned. This application Oct. 24, 1994, Ser. No. 327,927

Int. Cl.[6] **F22B** *35/00*

U.S. Cl. 364—505 **42 Claims**



1. A spa system for controlling water, comprising:

a spa for holding the water;

a heater for heating the water;

a pump for circulating the water past said heater;

a first sensor for measuring the temperature of the water at a first location in said spa system and producing an output signal indicative thereof;

a second sensor for measuring the temperature of the water at a second location in said spa system and producing an output signal indicative thereof; and

a microcomputer for receiving said output signals from said first and second sensors, and for selectively activating and deactivating said heater or said pump.

5,559,721

MULTI-MEDIA INFORMATION TRANSFER SYSTEM

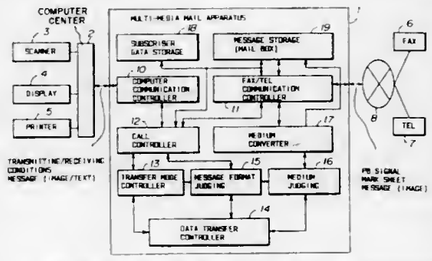
Toshio Ishii, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 9, 1992, Ser. No. 973,293

Claims priority, application Japan, Nov. 11, 1991, 3-294280

Int. Cl.[6] **H04N** *1/00*

U.S. Cl. 364—514 A **12 Claims**



1. A multi-media information transfer system for transferring information between a computer center and a multi-media mail apparatus which is coupled to a communication network, said multi-media information transfer system comprising:

first means, provided in the computer center and the multi-media mail apparatus, for specifying a transfer mode to be one of:

(a) a general transfer mode in which a plurality of pages are

transferred together in response to one instruction of a transfer

5,559,725

(b) estimating a mean and variance from a distribution of the

transferred together in response to one instruction of a transfer format, (b) a page transfer mode in which the transfer is made one page at a time by instructing the transfer format of each page, and (c) a combined transfer mode in which the general transfer mode and the page transfer mode are combined depending on whether information which is to be transferred;

second means, provided in the multi-media mail apparatus, for storing information which is received from the computer center and the communication network; and

third means, provided in the computer center and the multi-media mail apparatus, for transferring the information between the computer center and the multi-media mail apparatus in the transfer mode specified by said first means,

wherein said third means includes means for transmitting attribute information related to information which is to be transmitted next, and means for specifying an appropriate transfer mode for the next information depending on the attribute information.

5,559,722

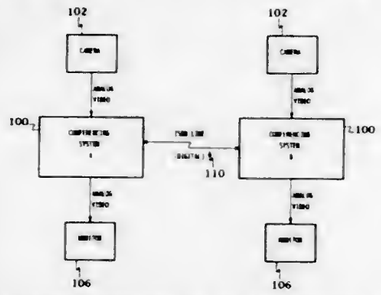
PROCESS, APPARATUS AND SYSTEM FOR TRANSFORMING SIGNALS USING PSEUDO-SIMD PROCESSING

Brain Nickerson, Aloha, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 158,855, Nov. 24, 1993. This application Apr. 28, 1994, Ser. No. 234,976

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—514 R **22 Claims**



1. A computer-implemented process for transforming signals, comprising the steps of:

(a) loading a plurality of signals in a first domain into a plurality of registers, wherein each register contains two or more signals;

(b) applying a transform to the plurality of registers to transform the contents of the registers to a second domain; and

(c) retrieving from the plurality of registers a plurality of transformed signals in the second domain corresponding to the plurality of signals in the first domain.

5,559,723

LEARNING SEQUENCE FOR ESTIMATING A TRANSMISSION CHANNEL AND CORRESPONDING ESTIMATOR DEVICE

Christophe Mourot, Asnieres; Armelle Wautier, and Jean-Claude Dany, both of Gif sur Yvette, all of France, assignors to Alcatel N.V., Amsterdam, Netherlands

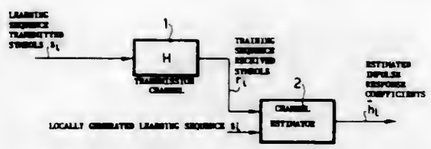
Filed Nov. 17, 1993, Ser. No. 153,097

Claims priority, application France, Nov. 18, 1992, 92 13847

Int. Cl.[6] G01S *17/08*

U.S. Cl. 364—517 **9 Claims**

1. A learning sequence of symbols for estimating a transmission characteristic of a transmission channel of length L on which said sequence is transmitted, said sequence comprising:



a guard sequence of length L, and

a reference sequence of length N following said guard sequence;

wherein the learning sequence is selected to have a total length N+L greater than or equal to 2L+1;

wherein the learning sequence is selected so that a transmission matrix A, associated with the learning sequence, is such that the product of the Hermitian transpose A^H of the transmission matrix by the transmission matrix A is inversible; and

wherein the length L is defined as the number of symbol periods equivalent to the difference between the longest and shortest transmission paths of the channel.

5,559,724

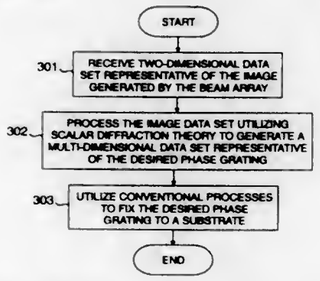
METHODS AND SYSTEMS FOR DESIGNING BEAM ARRAY GENERATORS

Rick L. Morrison, Naperville, Ill., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 27, 1994, Ser. No. 312,858

Int. Cl.[6] G06F *17/00*

U.S. Cl. 364—525 **31 Claims**



1. A system comprising:

input means for receiving an input data set representing a desired image intensity;

means for generating an output data set representing a desired phase grating, said output data set comprising a plurality of phase cells, each one of said phase cells including a phase value;

means for traversing ones of said plurality of phase cells, each one of said traversed phase cells' phase value is in one of a first state equal to an adjacent phase cell's phase value and a second state not equal to said adjacent phase cell's phase value; and

means, operable when a current traversed phase cell's phase value is in said second state, for processing said output data set as a function of said input data set to improve the quality of said desired phase grating.

5,559,725

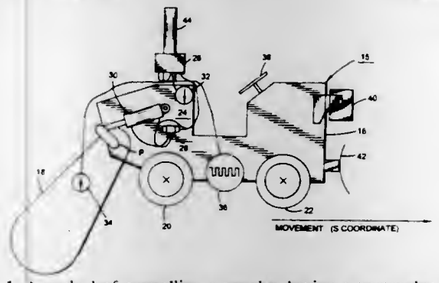
AUTOMATIC DEPTH CONTROL FOR TRENCHER

Edward G. Nielson; Timothy S. DeBruine, both of Grands Rapids; Daniel P. Modzeleski, Belmont, and Ross C. Stoepker, Kentwood, all of Mich., assignors to Laser Alignment, Inc., Grand Rapids, Mich.

Filed Oct. 7, 1994, Ser. No. 319,961

Int. Cl.[6] G05D *1/04*; **E02F** *5/02*

U.S. Cl. 364—550 **33 Claims**



1. A method of controlling a trencher having a tractor that is propelled along terrain and a trenching implement adjustably mounted to said tractor at a rearward portion of said tractor with respect to movement of said tractor along terrain, including:

monitoring movement of the tractor as said tractor is propelled along terrain in order to establish in a memory a contour map of the slope of the terrain in the vicinity of the trencher; and

adjusting the position of said trenching implement with respect to said tractor as a function of the slope of the terrain at the trenching implement by retrieving data from the contour map.

5,559,726

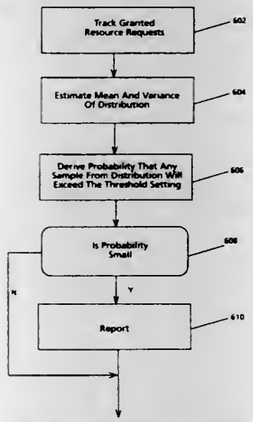
METHOD AND SYSTEM FOR DETECTING WHETHER A PARAMETER IS SET APPROPRIATELY IN A COMPUTER SYSTEM

Robert F. Berry, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 6, 1994, Ser. No. 301,094

Int. Cl.[6] G06F *11/34*

U.S. Cl. 364—554 **13 Claims**



1. A method for detecting whether a consumption threshold parameter is appropriately set in an computer system, the computer system including a plurality of system resources that are controlled by corresponding resource managers, the method comprising the steps of:

(a) tracking a plurality of granted resource requests from at least one of the plurality of resource managers;

(b) estimating a mean and variance from a distribution of the plurality of granted resource requests; and

(c) determining a probability that any sample from the distribution will exceed the threshold parameter.

5,559,727

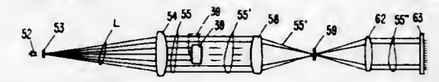
APPARATUS AND METHOD FOR DETERMINING THE POSITION OF A COMPONENT PRIOR TO PLACEMENT

Michael T. Deley, Warrington, and Edwin R. Phillips, Rosemont, both of Pa., assignors to Quad Systems Corporation, Horsham, Pa.

Filed Feb. 24, 1994, Ser. No. 201,369

Int. Cl.[6] G01B *11/00*

U.S. Cl. 364—559 **14 Claims**



1. Apparatus for determining the position of a component, comprising:

a movable frame,

pick up means mounted on said movable frame and movable with said frame for picking up and supporting a component to be positioned on a work piece,

collimating lens means for producing a thin wide sheet of non-coherent collimated light which is projected onto and illuminates a component held by said pick up means in an object field,

objective lens means for receiving and refocusing the portion of said thin wide sheet of non-coherent collimated light not blocked by said component to provide a focused image,

relay projection lens means for receiving the focused light not blocked and for producing refocused collimated light rays,

linear array sensing means mounted on said movable frame for receiving said refocused collimated light rays and the projected image,

said linear array sensing means having a plurality of pixel sensors whose position is known relative to said pick up means,

drive means coupled to said pick up means for rotating said component whose position is to be determined,

encoder means coupled to said pick up means,

a computer/controller coupled to said drive means, said linear array sensor means and to said encoder means for producing sets of X, Y and Ø digital data indicative of said image and said refocused collimated light rays projected onto said pixel sensors, and

said computer/controller comprising means for analyzing said digital data and for determining the X, Y and Ø position of said component relative to said pick up means.

5,559,728

CALIBRATION TRANSFER FOR SECOND ORDER ANALYTICAL INSTRUMENTS

Bruce R. Kowalski, Issaquah, Wash., and Yongdong Wang, Norwalk, Conn., assignors to University of Washington, Seattle, Wash.

Continuation-in-part of Ser. No. 720,256, Jun. 24, 1991, Pat. No. 5,459,677, which is a continuation-in-part of Ser. No. 595,458, Oct. 9, 1990, abandoned. This application May 3, 1994, Ser. No. 237,368

Int. Cl.[6] G01N *21/01*

U.S. Cl. 364—571.02 **9 Claims**

1. A method of calibrating an uncalibrated output from a first spectrometer relative to an output from a second reference spectrometer, said outputs from said first and second reference spectrometers being a two-dimensional matrix of data, the method comprising the steps of:

(b) determining values of the design variables for giving an optimum value of the objective function while considering the

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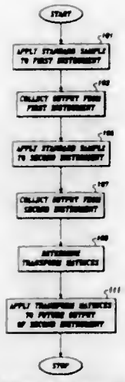
5,559,733

MEMORY WITH FERROELECTRIC CAPACITOR



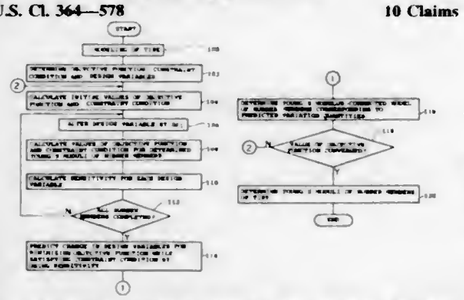
(a) calculating a first banded diagonal transformation matrix, said first banded diagonal transformation matrix depending upon the output provided by said second reference spectrometer in response to a standard sample and the output provided by said first spectrometer in response to said standard sample;
(b) calculating a second banded diagonal transformation matrix, said second banded diagonal transformation matrix depending upon the output provided by said second reference spectrometer in response to said standard sample and the output provided by said first spectrometer in response to said standard sample; and
(c) multiplying said first and second banded diagonal transformation matrices with said uncalibrated output from said first spectrometer in response to a subsequent sample to provide a calibrated output.

5,559,729

METHOD FOR DESIGNING PNEUMATIC TIRES

Akihiko Abe, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Filed Oct. 3, 1994, Ser. No. 317,593
Claims priority, application Japan, Oct. 6, 1993, 5-250371; Sep. 29, 1994, 6-235730
Int. Cl.[6] G06F *17/11;17/50*
U.S. Cl. 364—578 **10 Claims**



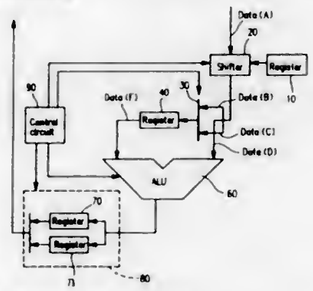
1. A method for designing pneumatic tires comprising the steps of:
(a) determining a tire basic model for representing a tire cross-sectional shape including an internal structure, determining an objective function for representing a physical quantity for evaluation of tire performance, determining design variables for determining a physical property of rubber members and a physical property of reinforcing materials, and determining a constraint condition for constraining at least one of the physical property of the rubber members, the physical property of the reinforcing materials, the physical quantity for evaluation of performance, and a tire dimension degree;
(b) determining values of the design variables for giving an optimum value of the objective function while considering the constraint condition; and
(c) designing a tire on the basis of the design variables which give the optimum value of the objective function.

5,559,730

SHIFT OPERATION UNIT AND SHIFT OPERATION METHOD

Shinichi Marui, Katano, and Katsuhiko Ueda, Sakai, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 10, 1995, Ser. No. 386,732
Claims priority, application Japan, Feb. 18, 1994, 6-021037
Int. Cl.[6] G06F *5/01*
U.S. Cl. 364—715.08 **14 Claims**



1. A shift operation unit comprising:
shift means for shifting data in accordance with a shift count and outputting most significant part bit data, intermediate bit data, and least significant part bit data;
first selection means coupled to an output of the shift means, for selecting one of the most significant part bit data and the least significant part bit data in accordance with a shift direction;
first storage means coupled to an output of the first selection means, for storing data selected by the first selection means;
operation means coupled to an output of the shift means and an output of the first storage means, for operating the intermediate bit data and the data stored in the first storage means and outputting an operation result; and
second storage means coupled to an output of the operation means, for storing the operation result.

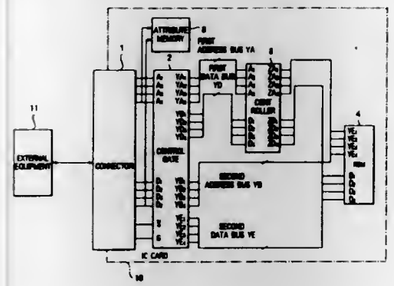
5,559,731

IC CARD

Hidenori Mitani, and Shin-ichi Ishimoto, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 26, 1995, Ser. No. 507,165
Claims priority, application Japan, Dec. 15, 1994, 6-312130
Int. Cl.[6] G11C *5/06;17/00*
U.S. Cl. 365—52 **8 Claims**

1. An IC card comprising:
a memory for storing a program;
an input-output section for inputting signals from and outputting signals to external equipment;
a processing section for processing the signals input from and output to the external equipment in accordance with the program stored in said memory; and
a connection controlling section for, in normal operation, connecting said input-output section to said processing section and for connecting said input-output section to said processing section and to said memory when the external equipment is to rewrite said memory.

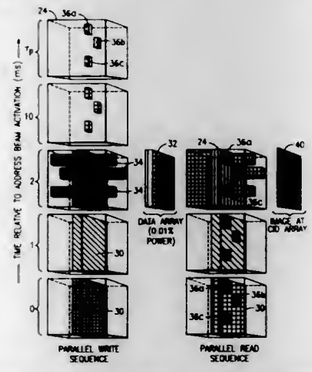


5,559,732

BRANCHED PHOTOCYCLE OPTICAL MEMORY DEVICE

Robert R. Birge, Onodaga County, N.Y., assignor to Syracuse University, Syracuse, N.Y.

Filed Dec. 27, 1994, Ser. No. 364,138
Int. Cl.[6] G11C *13/00*
U.S. Cl. 365—120 **10 Claims**



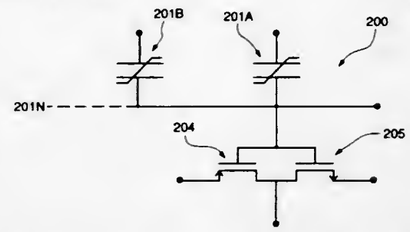
1. Sequential one-photon branched photocycle volumetric optical memory device comprising:
a volume of a photooptical material that has a stable resting state and a series of intermediate states including a metastable stable state which can be photochemically converted to a branched state; said volume being configured as a succession of planar pages each page being configured as an orthogonal array of data cells;
paging means for illuminating a selected page of said volume but not illuminating the remaining pages of said volume at a first wavelength to elevate the photooptical material within said selected page from said resting state to said metastable state;
data selection array operative after said paging means for illuminating one or more selected data cells within said selected page but not non-selected cells, at a second wavelength to convert said material within said selected cells from said metastable state to said stable branched state, the material in said non-selected cells returning to said resting state; with said stable branched state representing one binary condition and said resting state representing a complementary binary condition; and
optical read means for optically selecting a page of the volume and reading the binary condition of each of the data cells of the so-selected page of said volume.

5,559,733

MEMORY WITH FERROELECTRIC CAPACITOR CONNECTABLE TO TRANSISTOR GATE

Larry D. McMillan, Colorado Springs, Colo.; Takashi Mihara, Saitama Pref; Hiroyuki Yoshimori, Kanagawa Pref., both of Japan, and John W. Gregory, Colorado Springs, Colo., assignors to Symetrix Corporation, Colorado Springs, Colo., and Olympus Optical Co., Ltd., Japan

Division of Ser. No. 224,241, Apr. 7, 1994, Pat. No. 5,523,964.
This application Jun. 7, 1995, Ser. No. 482,765
Int. Cl.[6] G11C *11/22*
U.S. Cl. 365—145 **4 Claims**



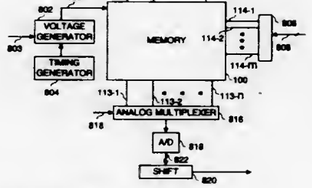
3. A ferroelectric non-volatile, non-destructive read-out integrated circuit memory unit comprising: a plurality of ferroelectric capacitors, each ferroelectric capacitor having a first electrode, a second electrode, and a ferroelectric material between said first and second electrodes; a transistor having a gate; and said first electrode of each of said capacitors connected to said gate of said transistor.

5,559,734

MULTIPLE VOLTAGE MEMORY

Tamio Saito, 100 Century Centre Ct. Ste. 503, San Jose, Calif. 95112-4512

Filed Apr. 24, 1995, Ser. No. 427,570
Int. Cl.[6] G11C *11/56*
U.S. Cl. 365—168 **20 Claims**



1. A memory comprising:
a plurality of memory cells, each memory cell having a first input for receiving a selection signal, having a second input for receiving a voltage signal having a voltage level for storage in the memory cell responsive to the selection signal, and having an output for providing an output signal indicative of the voltage signal stored in the memory cell, the voltage level being in a first voltage range divided into a plurality of nonequal second voltage ranges, each nonequal second voltage range being indicative of a different multiple bit digital signal, the voltage level of the voltage signal having a decay that is greater for larger voltages of the voltage signal, and the plurality of nonequal second voltage ranges being selected so that, for each of the second voltage ranges, the decay of the

voltage level of the voltage signal in the second voltage range remains in such second voltage range at a predetermined time;

a sense amplifier, having first and second input terminals, for

write enable signal selection and supply means for supplying

voltage level of the voltage signal in the second voltage range remains in such second voltage range at a predetermined time; and

a voltage generator coupled to the second input of the memory cell and having an output for providing the voltage signal responsive to a multiple bit digital data signal.

5,559,735

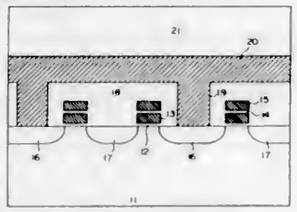
FLASH MEMORY HAVING SELECT TRANSISTORS

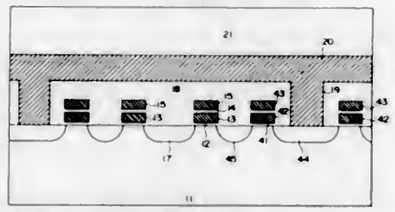
Takashi Ono, and Masami Ikegami, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Mar. 28, 1995, Ser. No. 412,276

Int. Cl.[6] G11C *11/34*

U.S. Cl. 365—185.17 **3 Claims**





1. A flash type memory cell comprising:

a first transistor having a floating gate and a control gate stacked on a semiconductor substrate;

a second transistor having gates stacked on one another with a drain diffusion layer of said first transistor as a source diffusion layer of said second transistor, said gates being made of the same materials as those of the floating gate and the control gate; and

a memory cell each provided as a single unit, being composed of said first transistor and said second transistor;

said second transistor being electrically connected to one another at a location different from that of said single-unit memory cell and activated as select gates;

wherein the density of impurities of said drain diffusion layer of said second transistor, said impurities being provided in the neighborhood of the gate thereof, is lower than that of impurities of the drain diffusion layer of said first transistor, said impurities being provided in the neighborhood of the gate thereof.

5,559,736

NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE CAPABLE OF PREVENTING EXCESSIVE-WRITING

Naohiro Matsukawa, Kamakura; Keniti Imamiya, Kawasaki; Toshiharu Watanabe, and Michiharu Matsui, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

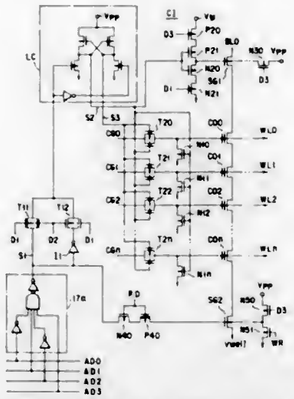
Filed Apr. 19, 1995, Ser. No. 424,646

Claims priority, application Japan, Apr. 20, 1994, 6-081617

Int. Cl.[6] G11C *11/34*

U.S. Cl. 365—185.24 **33 Claims**

1. A non-volatile semiconductor memory device comprising:



a memory cell array having a plurality of memory cells each having a control gate and a floating gate and arranged in a matrix form, said memory cell array having a plurality of word lines to which the control gates of said plurality of memory cells are connected;

data writing means connected to said memory cell array, for writing data into the floating gates of a plurality of memory cells which are contained in said plurality of memory cells and are simultaneously selected by one of said plurality of word lines; and

data erasing means connected to said memory cell array, for supplying an erasing voltage to each of said memory cells into which data is written for a short period of time to slightly lower the threshold voltage of each of said memory cells.

5,559,737

NONVOLATILE SEMICONDUCTOR MEMORY CAPABLE OF SIMULTANEOUSLY EQUALIZING BIT LINES AND SENSE LINES

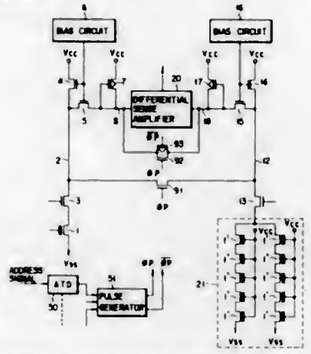
Sumio Tanaka; Shigeru Atsumi, both of Tokyo, and Masao Kuriyama, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 917,958, Jul. 24, 1992, abandooed. This application Nov. 10, 1994, Ser. No. 338,827

Claims priority, application Japan, Jul. 25, 1991, 3-186438

Int. Cl.[6] G11C *16/06*

U.S. Cl. 365—185.25 **11 Claims**



11. A nonvolatile semiconductor memory comprising:

a first bit line;

a first memory cell connected to said first bit line for holding and decreasing a potential of said first bit line in accordance with stored data by discharging the first bit line potential;

a sense amplifier, having first and second input terminals, for comparing the potentials of said first and second input terminals, and amplifying and outputting a difference between the potentials;

a first transfer gate connected between said first bit line and said first input terminal of said sense amplifier and having a gate applied with a first bias voltage;

a first load circuit for charging said first input terminal of said sense amplifier;

a second bit line;

a second memory cell, connected to said second bit line, for decreasing a potential of said second bit line by discharging the second bit line potential;

a second transfer gate connected between said second bit line and said second input terminal of said sense amplifier and having a gate applied with a second bias voltage;

a second load circuit for charging said second input terminal of said sense amplifier;

a first equalizing circuit, connected between said first and second input terminals of said sense amplifier and controlled by a precharge signal, for equalizing potentials of said first and second input terminals of said sense amplifier during a precharge period; and

a second equalizing circuit, connected between said first bit line and said second bit line, for equalizing potentials of said first bit line and said second bit line during the precharge period,

wherein a conductance ratio of a first load generated by said first load circuit to said first transfer gate and a conductance ratio of a second load generated by said second load circuit to said second transfer gate are set to be approximately equal.

5,559,738

SEMICONDUCTOR DATA STORAGE APPARATUS

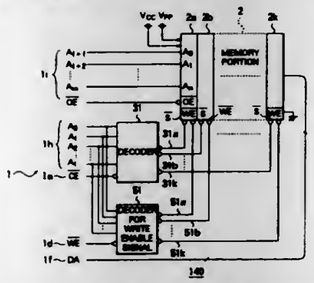
Akira Mizobata; Masanori Nagahama, both of Sanda, and Tadakatu Watanabe, Itami, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 22, 1994, Ser. No. 361,723

Claims priority, application Japan, Dec. 27, 1993, 5-330479

Int. Cl.[6] G06K *19/07*

U.S. Cl. 365—189.01 **2 Claims**



1. A semiconductor data storage apparatus comprising:

data storage means including a plurality of memory devices into which bytes of data can be programmed in a write mode of the respective memory devices in response to memory selection and write enable signals applied to the memory devices, each of the memory devices having a plurality of sequential address portions into which data can be written, programming of data into an address portion including, during a first wait period, (i) initially writing data into an address portion as written data, (ii) after a second wait period, reading the written data from the address portion as read data, and (iii) confirming agreement of the written data and the read data;

memory selection means for supplying the memory selection signals to the memory devices for selectively activating respective memory devices in response to lower address signals specifying which memory devices are to be activated; and

write enable signal selection and supply means for supplying write enable signals to the memory devices for bringing the memory devices into the write mode in response to the lower address signals, the write enable signals being supplied simultaneously with the memory selection signals, wherein the write enable signal selection and supply means, after supplying a write enable signal to a first of the plurality of memory devices for writing data into a first address portion of the first memory device, during one of the first and second wait times, in response to each increase in the lower address signals by one, sequentially activates the other memory devices so that sequential programming of the other memory device begins while data is being written into the first address portion of the first of the memory devices whereby the time required to program one byte into each of the memory devices is reduced.

5,559,739

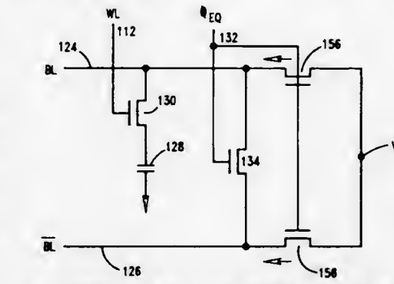
DYNAMIC RANDOM ACCESS MEMORY WITH A SIMPLE TEST ARRANGEMENT

John K. DeBrosse, Burlington, Vt.; Toshiaki Kirihata, Wappingers Falls, N.Y., and Hing Wong, Norwalk, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 28, 1995, Ser. No. 535,702

Int. Cl.[6] G11C *7/00;29/00*

U.S. Cl. 365—189.01 **16 Claims**



1. A Dynamic Random Access Memory (DRAM) including an array of memory cells arranged in rows and columns, a word line in each said row responsive to a row address, a pair of complementary bit lines in each said column, said DRAM further comprising:

a sense amp in each said column connected between a sense enable and said pair of complementary bit lines;

a bit line pre-charge connected to each pair of complementary bit lines, said bit line pre-charge being connected between said complementary bit line pair and a reference voltage; and,

test control means for selectively holding said sense amp disabled and said bit line pairs in a pre-charge state responsive to a test control signal.

5,559,740

IMAGE MEMORY APPARATUS

Hiroyuki Futami, and Hiroyuki Yamamoto, both of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed May 2, 1995, Ser. No. 432,689

Claims priority, application Japan, May 19, 1994, 6105134

Int. Cl.[6] G11C *11/40*

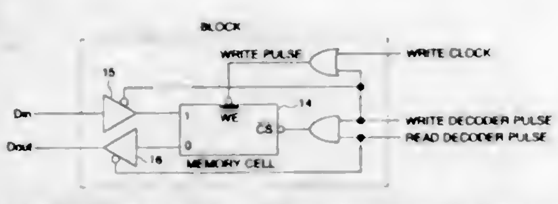
U.S. Cl. 365—189.04 **10 Claims**

1. An image memory apparatus for storing image data, comprising:

a plurality of memory cells, arranged in a one-chip memory, for inputting image data and for outputting said image data therefrom;

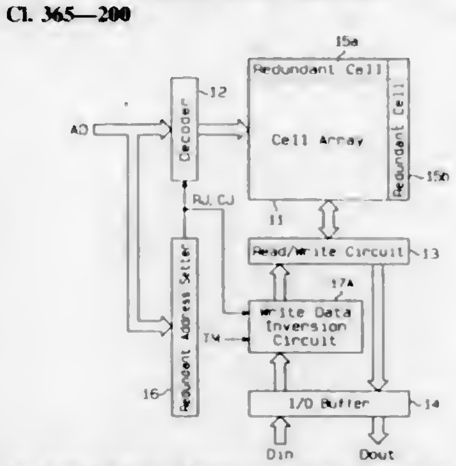
a data buffer communicatively coupled to said read/write circuit,

5,559,743



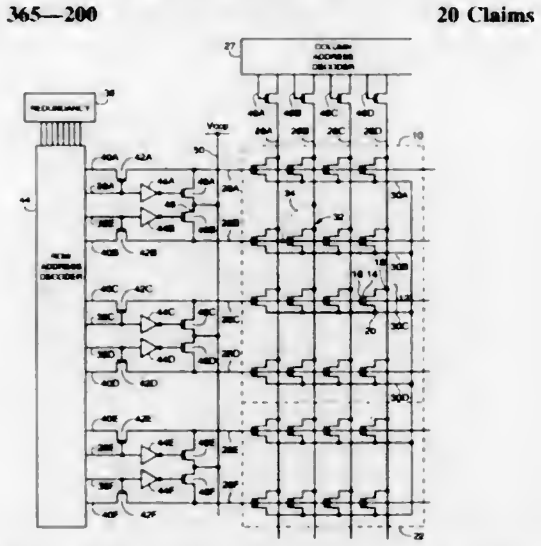
a plurality of writing lines, each connected with said plurality of memory cells, for inputting said image data into said plurality of memory cells;
a plurality of readout lines, provided independent from said plurality of writing lines and each connected to said plurality of memory cells, for outputting said image data from said plurality of memory cells;
a first address designating line, connected with said plurality of memory cells, for identifying one of said plurality of memory cells which is subjected to an input of said image data through said writing line;
a clock signal generator for generating periodic clock signals with which said inputting of said image data is enabled;
a second address designating line, provided independent from said first address designating line and connected with said plurality of memory cells, for identifying one of said plurality of memory cells which is subjected to an output of said image data through said readout line; and
control means for identifying one of said plurality of memory cells with said first address designating line and said second address designating line so that said input and said output of said image data to and from the identified one of said plurality of memory cells are both carried out in a minimum of one cycle of said periodic clock signal.

5,559,741
SEMICONDUCTOR MEMORY DEVICE
Isaya Sobue, Kasugai, Japan, assignor to Fujitsu Limited, Kawasaki, and Fujitsu VLSI Limited, Kasugai, both of Japan
Filed Dec. 30, 1994, Ser. No. 366,729
Claims priority, application Japan, Jan. 31, 1994, 6-009992
Int. Cl.⁶ G11C *7/00;29/00*
U.S. Cl. 365—200 **7 Claims**



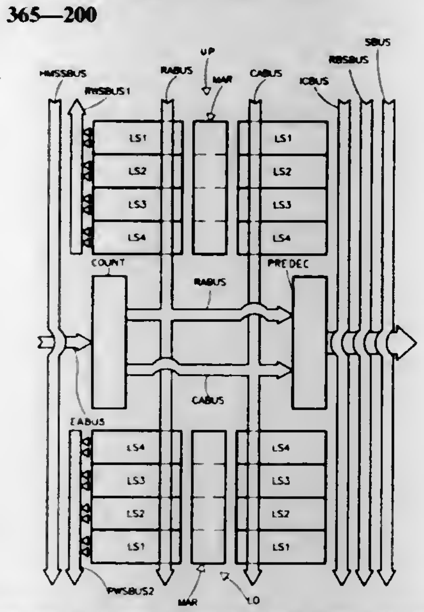
1. A semiconductor memory device having a plurality of memory cells forming a memory cell array and at least one redundant memory cell, wherein when a memory cell is determined to be defective, the address location of a redundant memory cell is set as the address location of the defective memory cell, said semiconductor memory device comprising:
a decoder coupled to said memory cell array and responsive to an address signal, for selecting a specific memory cell in said cell array;
a read/write circuit communicatively coupled to said cell array, for performing one of a reading and a writing operation with respect to said selected cell;
a data buffer communicatively coupled to said read/write circuit, for buffering the flow of data associated with said read/write circuit during one of a read mode, a write mode, and a test mode;
a redundant address setter communicatively coupled to said decoder and responsive to the address signal, for setting the address location of a redundant memory cell to that of a memory cell determined to be defective and for outputting a redundant setting signal; and
a data logic control circuit, communicatively coupled to said read/write circuit and to said data buffer, for inverting the logic of data associated with the redundant memory cell in response to a memory device test mode signal and said redundant setting signal in the test mode, and for allowing the data associated with the selected cell to pass therethrough in the read mode and the write mode.

5,559,742
FLASH MEMORY HAVING TRANSISTOR REDUNDANCY
Roger R. Lee, and Fernando Gonzalez, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.
Filed Feb. 23, 1995, Ser. No. 393,578
Int. Cl.⁶ G11C *11/40*
U.S. Cl. 365—200 **20 Claims**



1. A method of programming a memory array, said memory array comprising at least first and second conductive lines each having memory elements therealong, said method comprising the steps of:
a) erasing all memory elements along said first and second conductive lines;
b) subsequent to said step of erasing, programming all memory elements along said first conductive line;
c) selectively programming memory elements along said second conductive line, wherein said first conductive line is bypassed during any read cycle.

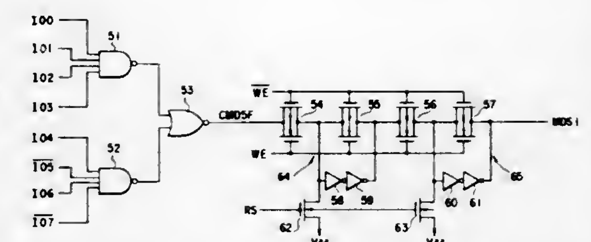
5,559,743
REDUNDANCY CIRCUITRY LAYOUT FOR A SEMICONDUCTOR MEMORY DEVICE
Luigi Pascucci, Sesto S. Giovanni; Marcello Carrera, Trescore Balneario, and Marco Defendi, Sulbiate, all of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy
Filed Mar. 29, 1995, Ser. No. 412,550
Claims priority, application European Pat. Off., Mar. 29, 1994, 94830146
Int. Cl.⁶ G11C *7/00*
U.S. Cl. 365—200 **19 Claims**



1. Redundancy circuitry layout for a semiconductor memory device, the redundancy circuitry comprising a first plurality of programmable non-volatile memory registers for the selection of redundancy bit lines of redundancy memory elements and a second plurality of programmable non-volatile memory registers for the selection of redundancy word lines of redundancy memory elements, wherein the redundancy circuitry layout comprises an array of programmable non-volatile memory elements for storing the addresses of defective bit lines and word lines which must be functionally replaced respectively by redundancy bit lines and word lines, and in the first and second plurality of programmable non-volatile memory registers are divided into layout strips which are perpendicular to said array of memory elements and which comprise each a first and a second strip sides located at opposite sides of the array of memory elements, the first strip side containing at least one memory register of the first plurality and being crossed by a column address signal bus running parallel to the array of memory elements, the second strip side containing one memory register of the second plurality and being crossed by a row address signal bus running parallel to the array of memory elements.

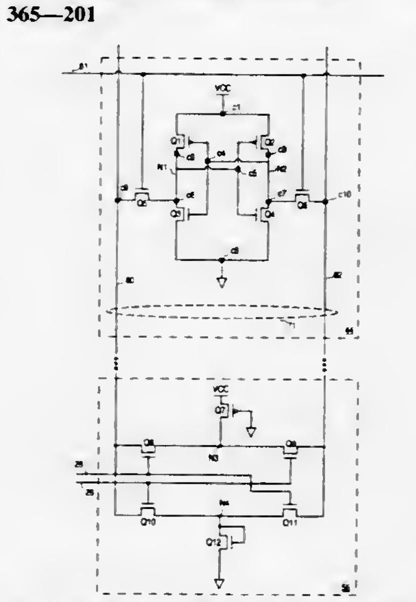
5,559,744
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE HAVING A TEST MODE SETTING CIRCUIT
Masao Kuriyama, and Hironori Banba, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Feb. 15, 1995, Ser. No. 389,165
Claims priority, application Japan, Feb. 15, 1994, 6-018119
Int. Cl.⁶ G11C *7/00*
U.S. Cl. 365—201 **34 Claims**

9. A semiconductor integrated circuit device having a test mode, comprising:
a semiconductor memory device having an address input pad;
a test mode setting circuit including



a logic circuit for logically combining a test mode setting permission signal and an address signal input from said address input pad, and
a latch circuit set by an output from said logic circuit and reset by a test mode setting release signal, for outputting a test signal for setting said semiconductor memory device into the test mode; and
a circuit for supplying the test mode setting permission signal to said test mode setting circuit, said circuit including
a first logic gate supplied with a first data signal,
a second logic gate supplied with a second data signal;
a third logic gate supplied with output signals of said first and second logic gates,
a first latch,
a first transfer gate for transferring an output signal of said third logic gate to said first latch in response to a write-in signal,
a second latch, and
a second transfer gate for transferring data latched in said first latch to said second latch in response to the write-in signal data latched in said second latch being output as the test mode setting permission signal.

5,559,745
STATIC RANDOM ACCESS MEMORY SRAM HAVING WEAK WRITE TEST CIRCUIT
Jashojiban Banik; Anne Meixner; Glenn F. King, all of Aloha, and Doug Guddat, Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.
Filed Sep. 15, 1995, Ser. No. 529,016
Int. Cl.⁶ G11C *7/00;29/00*
U.S. Cl. 365—201 **16 Claims**



1. In a static random access memory having at least one memory cell capable of storing either a first value or a second value where the memory cell contains the first value, the memory cell being coupled to a bit line and a complementary bit line, a test circuit comprising:
a charging device coupled to charge either the bit line or the complementary bit line;

a discharging device coupled to discharge either the bit line or

5,559,749

a discharging device coupled to discharge either the bit line or the complementary bit line,

the charging device charging the bit line, and the discharging device discharging the complementary bit line causing a weak write of the second value to the memory cell, the weak write overwriting the first value contained in the memory cell with the second value if the memory cell is defective, the memory cell retaining the first value if the memory cell is functioning properly.

5,559,746

SEMICONDUCTOR MEMORY DEVICE

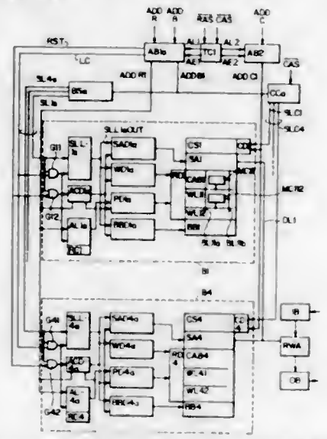
Yukio Fukuzo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 159,233, Nov. 30, 1993, abandoned. This application Jul. 20, 1995, Ser. No. 504,308

Claims priority, application Japan, Dec. 1, 1992, 4-321730

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—203 **2 Claims**



1. A semiconductor memory device comprising: a plurality of memory cell array blocks each having at least one word line and at least one pair of bit lines and associated with a word line drive circuit, a precharge circuit and a sense amplifier circuit; a block select circuit for selectively outputting a block select signal corresponding to one of said memory cell array blocks; and an address buffer for outputting word address signals to said memory cell array blocks,

wherein said word line drive circuit is associated with an address latch circuit which latches and continuously outputs one of said word address signals thereto, according to a first logical level of said block select signal.

5,559,747

STATIC RAM AND PROCESSING APPARATUS INCLUDING STATIC RAM

Masayoshi Kasamizugami, and Takuya Kokuryo, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 28, 1995, Ser. No. 496,184

Claims priority, application Japan, Aug. 25, 1994, 6-200619

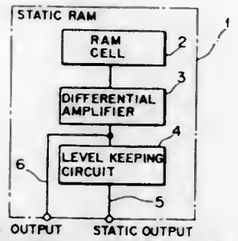
Int. Cl.[6] G11C *7/02*

U.S. Cl. 365—207 **5 Claims**

1. A static RAM constructed using a dynamic circuit for precharging and discharging a bit line, comprising:

a RAM cell for storing data;

a differential amplifier for amplifying a signal read out from said RAM cell;



a level keeping circuit for keeping a level of a signal outputted from said differential amplifier;

a first output line for outputting an output signal of a kept level from said level keeping circuit upon reading accessing to said static RAM as a static output; and

a second output line for outputting a state of at least one of a positive phase bit line and an inverted phase bit line of said differential amplifier upon reading accessing to said static RAM as a dynamic output.

5,559,748

SEMICONDUCTOR INTEGRATED CIRCUIT ALLOWING CHANGE OF PRODUCT SPECIFICATION AND CHIP SCREENING METHOD THEREWITH

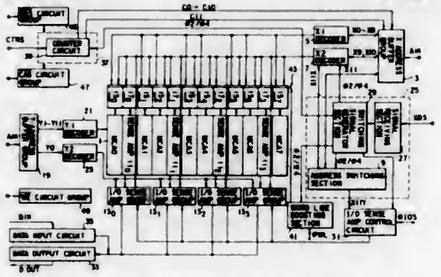
Kenji Numata, Yamato, and Masaki Ogihara, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 935,174, Aug. 26, 1992, abandoned. This application May 9, 1995, Ser. No. 438,656

Claims priority, application Japan, Aug. 30, 1991, 3-219926; Aug. 20, 1992, 4-221694

Int. Cl.[6] G11C *7/00*

U.S. Cl. 365—222 **69 Claims**



1. A semiconductor integrated circuit device comprising:

a memory cell array containing memory cell sections;

address signal generator means for producing a plurality of address signals;

memory cell section selecting means for selecting memory cell blocks from a plurality of memory cell blocks which are formed by grouping said plurality of memory cell sections into blocks;

receiving means for receiving a decision signal;

switching signal generator means, connected to said receiving means, for producing a switching signal for changing a product specification according to the decision signal; and

address signal switching means which receives some of said address signals and said switching signal, and which, based on the switching signal, switches the supply of said received address signal either to said memory cell section selecting means or to said memory cell block selecting means.

5,559,749

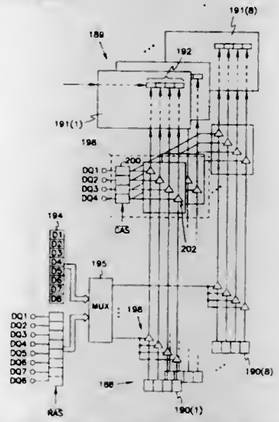
MULTI-BIT BLOCK WRITE IN A RANDOM ACCESS MEMORY

Loren L. McLaury, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed May 11, 1995, Ser. No. 439,358

Int. Cl.[6] G11C *8/00*

U.S. Cl. 365—230.02 **13 Claims**



1. An integrated circuit memory having a plurality of memory cells comprising;

an addressable block of memory cells located in one memory cell plane of the integrated circuit memory, the addressable block of memory cells comprising a plurality of memory cells; and

a write register having a plurality of register bits corresponding to the one plane of the integrated circuit memory with each register bit writable to one of the plurality of memory cells of the addressable block of memory cells.

5,559,750

SEMICONDUCTOR MEMORY DEVICE

Katsumi Dosaka; Masaki Kumanoya; Kouji Hayano; Akira Yamazaki; Hisashi Iwamoto; Hideaki Abe; Yasuhiro Konishi; Katsumitsu Himukashi; Yasuhiro Ishizuka, and Tsukasa Saiki, all of Hyogo-ken, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, and Mitsubishi Electric Engineering Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 869,917, Apr. 15, 1992. This application Jun. 5, 1995, Ser. No. 465,472

Claims priority, application Japan, Apr. 18, 1991, 3-85625; Aug. 23, 1991, 3-212140; Sep. 24, 1991, 3-242286; Feb. 3, 1992, 4-17809

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—230.06 **2 Claims**

1. A semiconductor memory device, comprising:

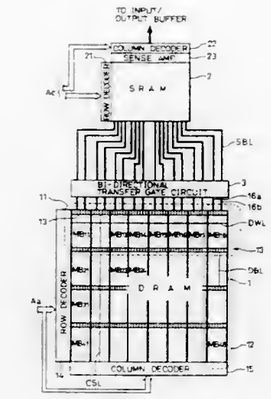
a first memory cell array including a plurality of memory cells arranged in a matrix of rows and columns;

a second memory cell array including a plurality of memory cells arranged in a matrix of rows and columns;

first address means for generating a first internal address signal for designating a row and a column of said first memory array in accordance with an externally applied address; and

second address means responsive to an externally applied address for generating a second internal address signal for designating a row and a column of said second memory cell array; wherein

said first and second address means are activated in synchronization with an externally applied clock signal and operates simultaneously for generating said first internal address and said second internal address simultaneously.



5,559,751

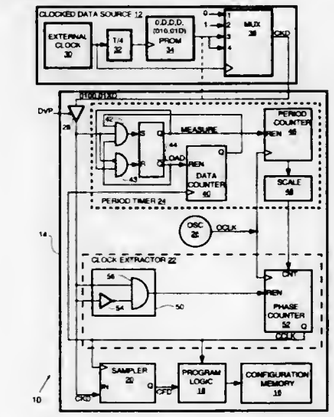
ELECTRICALLY CONFIGURABLE INTEGRATED CIRCUIT CONFIGURATION USING CLOCKED DATA

Stephen M. Trinberger, San Jose, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Filed Jun. 7, 1995, Ser. No. 482,205

Int. Cl.[6] G11C *13/00*

U.S. Cl. 365—233 **10 Claims**



1. An electrically configurable integrated circuit comprising:

configuration memory;

programming means for programming said configuration memory in response to a configuration data signal and a configuration clock, said configuration clock having a clock period, said programming means being coupled to said configuration memory;

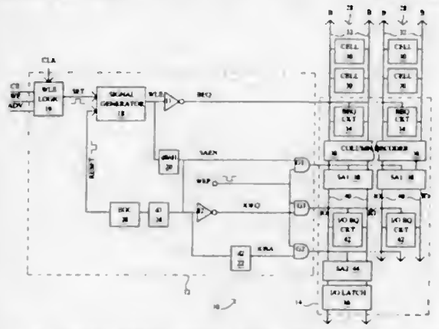
receiving means for receiving a clocked data signal including both data bits and dedicated tinning transitions, said clock data signal having a timing period;

clock extraction means for extracting said configuration clock from said clocked data signal, said clock extraction means being coupled to said receiving means for receiving said clocked data signal therefrom, said clock extraction means being coupled to said programming means for providing said clock signal thereto; and

sampling means for sampling said clocked data signal at times determined by said configuration clock to yield said configuration data signal, said sampling means having a data input coupled to said receiving means for receiving said clocked data signal therefrom, said sampling means having a data

output coupled to said programming means for providing said configuration data signal thereto, said sampling means having a clock input coupled to said clock extraction means for receiving said configuration clock.

5,559,752
TIMING CONTROL CIRCUIT FOR SYNCHRONOUS STATIC RANDOM ACCESS MEMORY
Michael C. Stephens, Jr., San Jose; Chitranjan N. Reddy, Los Altos Hills, and Kenneth A. Poteet, San Jose, all of Calif., assignors to Alliance Semiconductor Corporation, San Jose, Calif.
Filed Aug. 14, 1995, Ser. No. 514,693
Int. Cl.[6] G11C *8/00*
U.S. Cl. 365—233 **20 Claims**



11. In a semiconductor memory device having a bit line equalization circuit and a sense amplifier coupled to a bit line pair, an I/O line pair coupled to the output of the sense amplifier, an I/O line equalization circuit coupled to the I/O line pair, and a secondary sense amplifier coupled to the I/O line pair for amplifying a voltage differential on the I/O line pair when enabled, a timing circuit, comprising:

read/write timing means for, in a sequential order, disabling the bit line equalization circuit, enabling the sense amplifier, disabling the I/O equalization circuit, and enabling the secondary sense amplifier to complete a read/write operation; and

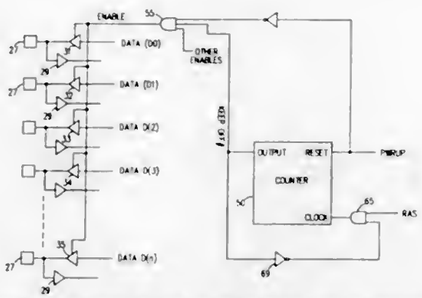
reset timing means for, in a sequential order, enabling the bit line equalization circuit, disabling the sense amplifier, enabling the I/O equalization circuit, and disabling the secondary sense amplifier to complete a reset operation, said reset timing means being activated during the read/write operation of said read/write timing means.

5,559,753
APPARATUS AND METHOD FOR PREVENTING BUS CONTENTION DURING POWER-UP IN A COMPUTER SYSTEM WITH TWO OR MORE DRAM BANKS
Thomas J. Kocis, Austin, Tex., assignor to Dell USA, L.P., Austin, Tex.
Filed Jan. 25, 1995, Ser. No. 378,164
Int. Cl.[6] G11C *8/00*
U.S. Cl. 365—236 **32 Claims**

17. A first and second DRAM circuit forming part of a memory subsystem for a personal computer, said first and second DRAM circuits both connected to common data lines on a memory bus, each of the DRAM circuits comprising:

a plurality of memory data lines connected to the memory bus to drive a data input onto said memory bus;

tri-state gates connected to each of said memory data lines for driving data onto said memory bus, each of said tri-state gates including an enable input for enabling the data input to said gate;



said enable inputs for each of said tri-state gates comprising:

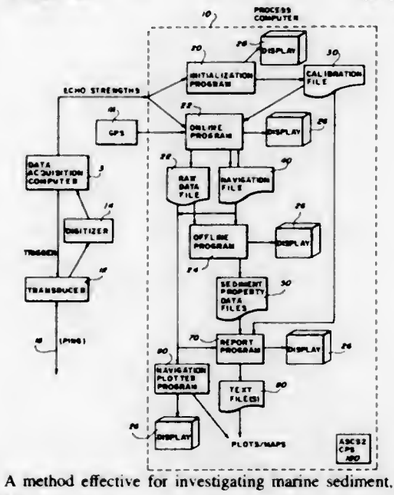
an output signal from a counter; and

an output signal from a voltage detection circuit;

said counter output signal and said voltage detection circuit output signal being ANDed together to produce said enable inputs;

wherein said counter receives a row address strobe (RAS) signal as a clock signal and the output signal from the voltage detection circuit as a reset input.

5,559,754
SEDIMENT CLASSIFICATION SYSTEM
Frank S. Carnaggio, Slidell; Douglas N. Lambert, Pearl River, both of La., and David C. Young, Long Beach, Miss., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Apr. 14, 1994, Ser. No. 227,640
Int. Cl.[6] G01V *1/38*
U.S. Cl. 367—15 **20 Claims**



1. A method effective for investigating marine sediment, comprising:

(a) launching an acoustic ping into the water column above said sediment;

(b) receiving echoes of said ping;

(c) digitally sampling said echoes;

(d) partitioning said samples according to a preselected number of time intervals following said launching;

(e) for each of said intervals: using ones of said samples partitioned into said each of said intervals for estimating the echo strength magnitude of said echoes during said each of said intervals to produce a plurality of echo strength magnitudes corresponding to said intervals;

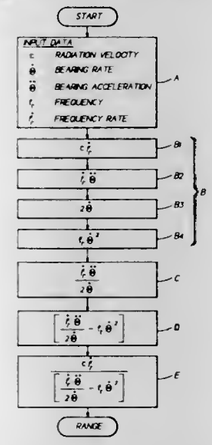
storing said plurality of echo strength magnitudes in computer memory;

using said echo strength magnitudes to generate information sufficient to estimate the sediment corresponding to said time intervals; and

associating said information in computer memory with said echo strength magnitudes;

wherein said method further comprises repeating steps (a)-(e) one or more times.

5,559,755
RANGE FINDING DEVICE AND METHOD
Jon P. Beam, 242 Nautilus Dr. #302, New London, Conn. 06320
Filed May 31, 1995, Ser. No. 463,000
Int. Cl.[6] G01S *3/80*
U.S. Cl. 367—118 **4 Claims**



1. A method for determining a range of a radiating source relative to an observer, the radiating source being in a state of motion relative to the observer, comprising the steps of:

providing a bearing rate $\dot{\theta}$ over a plurality of time periods;

providing a bearing acceleration [$]$"g$\ddot{\theta}$ over a plurality of time periods;

providing a frequency f_r of the radiating source over a plurality of time periods;

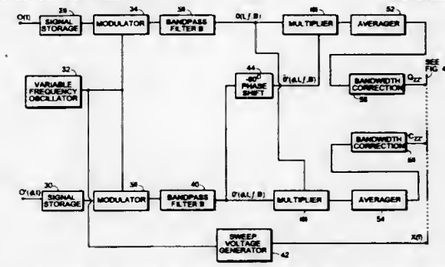
providing a frequency rate $\dot{f}_r$ over a plurality of time periods;

providing a velocity c of the radiation relative to a medium through which said radiation propagates over a plurality of time periods; and

determining the range r of said radiating source relative to said observer in accordance with the expression:

$$\frac{c\dot{f}_r}{\left[\frac{\dot{f}_r\ddot{\theta}}{2\dot{\theta}} - \dot{f}_r\dot{\theta}^2\right]}.$$

5,559,756
ACOUSTIC INTERCEPT RECIEVER-COMBINED FREQUENCY AND BEARING PROCESSOR
George C. Connolly, Jr., Niantic, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Jni. 19, 1971, Ser. No. 167,056
Int. Cl.[6] G01S *3/80*
U.S. Cl. 367—125 **6 Claims**



1. A signal processor for obtaining bearing and frequency information of a plane-wave acoustical signal comprising:

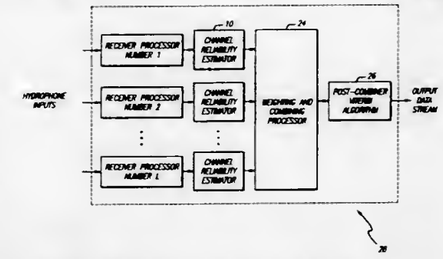
a hydrophone for generating a plurality of electrical signals responsive to such acoustical signal;

means for combining said electrical signals into a first omnidirectional signal and two spatially orthogonal directional signals containing the frequency and bearing information;

means for combining the two directional signals to form a second omnidirectional signal; and

a circuit for extracting said bearing and frequency information from the first and second omnidirectional signals.

5,559,757
SPATIAL DIVERSITY PROCESSING FOR UNDERWATER ACOUSTIC TELEMETRY
Josko A. Catipovic, 20 McGregor Rd. PO Box 705, and Lee E. Freitag, 86 Water St., both of Woods Hole, Mass. 02543
Continuation of Ser. No. 41,326, Mar. 31, 1993, abandoned, which is a continuation of Ser. No. 709,574, Dec. 18, 1991, abandoned. This application Feb. 9, 1994, Ser. No. 195,965
Int. Cl.[6] H04B *11/00*
U.S. Cl. 367—134 **18 Claims**



1. An underwater telemetry system, comprising:

multiple spatially diverse hydrophones;

means associated with a first one of said spatially diverse hydrophones for receiving underwater acoustic signals transmitted from an underwater acoustic: source along a first path;

means associated with a second of said spatially diverse hydrophones for receiving underwater acoustic signals transmitted from said underwater acoustic source along a second path, said second path being spatially diverse from said first path;

means for determining an estimate of the relative reliability of the underwater acoustic signals received along said first and second paths;

means for weighting the received underwater acoustic signals in accordance with said reliability estimate; and

means for combining said weighted underwater acoustic signals

5,559,759

and displaying the time, a high-frequency transmitter, a current

5,559,762

means for combining said weighted underwater acoustic signals to recover an accurate representation of the underwater acoustic signals transmitted from said underwater acoustic source.

5,559,758

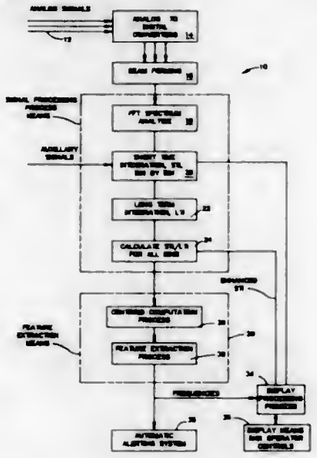
ALERTING PROCESS

William A. Wilson, Anaheim, Calif., assignor to Rockwell International Corporation, Seal Beach, Calif.

Filed Mar. 6, 1989, Ser. No. 318,890

Int. Cl.[6] H04B *1/06*

U.S. Cl. 367—136 **15 Claims**



1. An alerting process comprising the steps of:

receiving at least a first signal from a signal source for a predetermined short interval;

analyzing said first signal over said predetermined short interval to obtain the spectral energy of said first signal within contiguous incremental frequency bands extending over a frequency spectrum, the energy value obtained for each incremental frequency band being stored as a short term integrated value corresponding to said incremental frequency;

integrating successive short term integrated values over a predetermined long term interval to obtain a long term integrated value for each respective incremental frequency band;

dividing each short term integrated value by the corresponding long term integrated value to obtain an enhanced STI frequency value for each incremental frequency band;

storing the frequency of each enhanced STI frequency value exceeding a predetermined threshold;

forming a present track frequency value by calculating the centroid of adjacent stored STI frequency values;

correlating present track frequency values with past track frequency values to form and extend frequency tracks;

calculating the variance value for each present track frequency value and for a predetermined number of past frequency values corresponding to the same frequency track; and

providing an alert signal in response to a variance value exceeding a predetermined threshold.

5,559,759

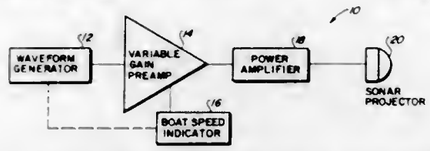
METHOD OF ALERTING MARINE MAMMALS AND OTHER MAMMALS UNDERWATER OF THE DANGER OF APPROACHING MOTOR VESSELS

Laura A. Gerstein; Edmund R. Gerstein, both of 1318 SW. 14th St., Boca Raton, Fla. 33486, and Joseph E. Blue, 3313 Northglen Dr., Orlando, Fla. 32806

Filed Dec. 9, 1994, Ser. No. 352,874

Int. Cl.[6] H04B *1/02*

U.S. Cl. 367—139 **5 Claims**



1. A method of alerting marine mammals and other mammals underwater to the danger of approaching motor vessels, comprising the steps of:

generating a pulsed signal, said pulsed signal being pulsed at a rate proportional with a speed at which the motor vessel is moving through the water,

transforming said pulsed signal into a pulsed acoustical signal, and

projecting said pulsed acoustical signal in a directional manner underwater from a motor vessel in a direction corresponding with a direction of movement of the motor vessel, said projected pulsed acoustical signal having a beam width between 2° and 18° and resulting in an underwater acoustical signal having a frequency ranging between 3 kHz and 26 kHz, wherein said projected pulse acoustical signal is audible to mammals underwater up to a range that allows mammals a predetermined amount of time to hear and avoid collision with the motor vessel.

5,559,760

WRISTWATCH WITH HIGH-FREQUENCY TRANSMITTER

Ernest Schneider, Evilard, Switzerland, assignor to Breitling S. A., Grenchen, Switzerland

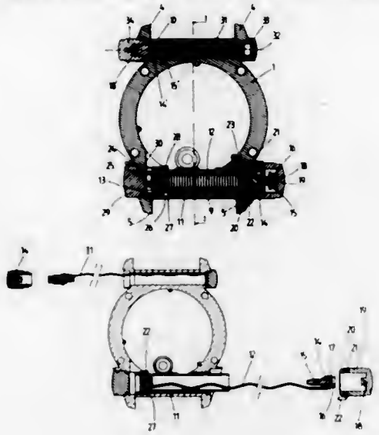
Filed Nov. 14, 1995, Ser. No. 557,313

Claims priority, application Switzerland, Dec. 20, 1994, 3842/94

Int. Cl.[6] G04B *47/00*

U.S. Cl. 368—10 **8 Claims**

1. Wristwatch comprising, in addition to a device for measuring



and displaying the time, a high-frequency transmitter, a current source for the supply to this transmitter, a switch for turning on the transmitter, an extensible antenna in the form of a wire wound up in a housing of the watch before use, one of whose ends is fastened to the watch, the other end being secured to a plug removably fastened to the watch before use of the transmitter, the antenna being unfurled by pulling on the plug, this unfurling moreover having the effect of closing the switch and turning on the transmitter and a counterpoise antenna of the same type as the main antenna and also wound up, before use, in a housing of the watch and one end of which being also secured to a plug removably fastened to the watch before use, said counterpoise antenna being arranged in such a way as to be able to be unfurled in a direction opposite to that of the main antenna.

5,559,761

WATCH WITH TIME INFORMATION VIA SILENT VIBRATION

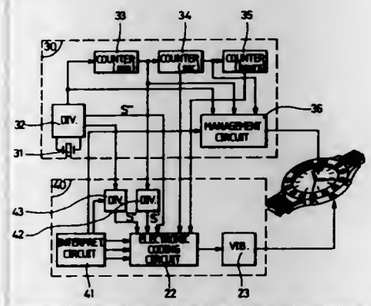
Erik J. Frenkel, Neuchâtel, and Jean-Jacques Born, Morges, both of Switzerland, assignors to Asulab S.A., Bienne, Switzerland

Filed Nov. 2, 1995, Ser. No. 556,838

Claims priority, application Switzerland, Nov. 3, 1994, 03281/94

Int. Cl.[6] G04C *17/00*; G04B *23/02;21/02*

U.S. Cl. 368—69 **17 Claims**



1. An electronic timepiece adapted to deliver time information in silent tactile manner and comprising:

a housing closed by a glass;

a time-keeping circuit associated with an analog or digital display, notably comprising an oscillator and its maintenance circuit, a division chain and counters;

control elements provided on the outside of said housing, selected from amongst a bezel (L) provided with numerical tactile marks (Ni) or functional marks (Mi) opposite sensors and a crown and buttons with push-button function (C, B_1, B_2),

an interpretation circuit of the displacements of said control elements (L, C, B_1, B_2),

electronic coding means adapted to code time signals received from said time-keeping circuit and/or non-time signals received from said interpretation circuit in the form of pulse strings, and

a device generating silent vibrations, wherein, in said timepiece, said control elements (L, C, B_1, B_2) cooperate via the intermediary of said interpretation circuit with said electronic coding means to drive the vibration generating device by means of pulse trains so as to emit vibration pulses representative of time information or of the accuracy of a time instruction or non-time instruction introduced by means of said control elements.

5,559,762

ELECTRONIC CLOCK WITH ALARM AND METHOD FOR SETTING ALARM TIME

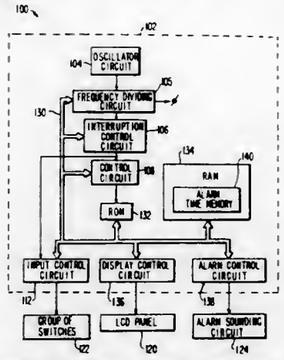
Yumi Sakamoto, Nagano-ken, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

Filed Jun. 6, 1995, Ser. No. 466,496

Claims priority, application Japan, Jun. 22, 1994, 6-140468

Int. Cl.[6] G04B *23/02*

U.S. Cl. 368—74 **16 Claims**



1. An electronic clock with an alarm, comprising:

a clock timing circuit counting a basic time;

an alarm time setting circuit operable to set an alarm time;

an alarm time storing circuit, operatively coupled to said alarm time setting circuit, storing said alarm time;

an alarm coincidence detecting circuit operatively coupled to said clock timing circuit and said alarm time storing circuit, detecting the coincidence between said basic time and the alarm time stored in said alarm timing storing circuit;

an alarm sounding circuit;

an alarm setting/resetting circuit, operatively coupled to said alarm time setting circuit, said alarm coincidence detecting circuit to be in a set state when said alarm coincidence detecting circuit detects that said basic time and said alarm time do not coincide with each other, and to be in a reset state when said alarm coincidence detecting circuit detects coincidence between said basic time and said alarm time, said alarm time setting circuit is in operation, and said alarm sounding circuit is actuated after setting, to store said basic time in said alarm time storing circuit;

an alarm sounding control circuit, operatively coupled to said alarm setting/resetting circuit and alarm sounding circuit, actuating said alarm sounding circuit to sound said alarm after said alarm setting/resetting circuit is set and said alarm coincidence detecting circuit detects the coincidence between said basic time and said alarm time.

5,559,763

MAGNETIC HEAD DRIVING DEVICE AND MAGNETOOPTICAL RECORDING APPARATUS WITH ACCELERATION COIL FOR SHORTENING CURRENT INVERSION TIME

Kazuyoshi Ishii, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1993, Ser. No. 26,551

Claims priority, application Japan, Mar. 6, 1992, 4-083056; Feb. 17, 1993, 5-049939

Int. Cl.[6] G11B *5/02;11/10*

U.S. Cl. 369—13 **34 Claims**

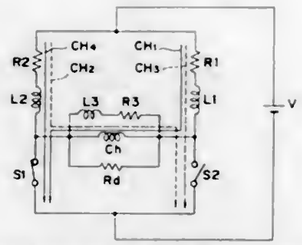
10. A magnetooptical recording apparatus comprising:

an optical head for irradiating a light beam onto a magnetooptical recording medium; and

a magnetic field generation device for applying a magnetic field to the magnetooptical recording medium, said magnetic field generation device comprising (i) a power source, (ii) a mag-

5,559,765

said optical composite unit, comprising



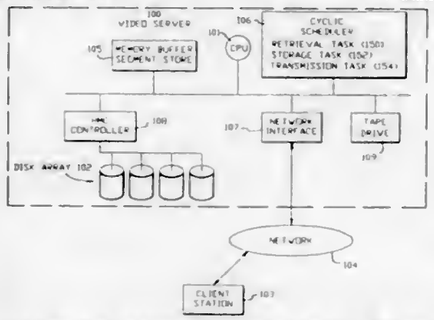
netic field generation core, (iii) a magnetic field generation coil wound around said magnetic field generation core, (iv) a switch element for switching a path of current to be supplied to said magnetic field generation coil from said power source, (v) a secondary coil wound around said magnetic field generation core, (vi) an acceleration circuit, connected to said secondary coil, for accelerating shortening of an inversion time of current supplied to said magnetic field generation coil, wherein a synthesized inductance of said magnetic field generation coil and said acceleration circuit is less than the inductance of said magnetic field generation coil, and (vii) means for blocking a current flowing into said acceleration circuit.

5,559,764

HMC: A HYBRID MIRROR-AND-CHAINED DATA REPLICATION METHOD TO SUPPORT HIGH DATA AVAILABILITY FOR DISK ARRAYS

Ming-Syan Chen; Hui-I Hsiao, both of Yorktown Heights; Chung-Shen Li, Ossining, and Philip S. Yu, Chappaqua, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 18, 1994, Ser. No. 292,640
Int. Cl.[6] G11B *17/22*
U.S. Cl. 369—30 **7 Claims**



1. A method of distributing a set of data among a plurality of disks, comprising steps of:

dividing a total number of the disks into a plurality of clusters; and,

storing blocks of the data in each cluster such that each cluster contains a complete set of the data and such that data block placement in at least some of the clusters are unique permutations of data block placement in other ones of the clusters;

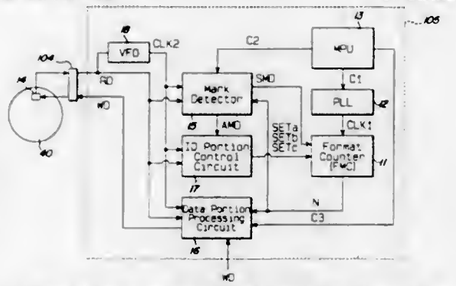
wherein for given number m of the disks numbered 0, 1, 2, . . . , m−1, where r is a number of clusters, n is a number of disks of a cluster, the i^{th} partition of the j^{th} replica is placed on the disk numbered d(i,j) in accordance with the relationship $d(i,j)=(i+\lfloor i/n \rfloor * (j-1)) \bmod n+(j-1) * n$.

5,559,765

DISK DRIVE ACCESS CONTROLLER

Katsumi Andou, Kasugai, Japan, assignor to Fujitsu Limited, and Fujitsu VLSI Limited, both of Japan

Filed Mar. 17, 1995, Ser. No. 406,152
Claims priority, application Japan, Mar. 18, 1994, 6-049272
Int. Cl.[6] G11B *7/007*
U.S. Cl. 369—32 **17 Claims**



1. A data access controller for a disc device for accessing data recorded on a disc by a drive head, said disc having a plurality of sectors, each sector having areas in which a sector mark, an address mark, a physical address and user data are stored, said data access controller comprising:

a control unit for outputting a plurality of control signals containing a mode switching signal to control the whole system of said disc device;

a mark detector for detecting a sector mark and address mark in read data from a target sector by the drive head, and for outputting a first detection signal indicating detection of sector mark and a second detection signal indicating detection of address mark, said mark detector enters a first search mode, in which all data bits of the target sector are detected, in response to the mode switching signal from said control unit;

a physical address read circuit for reading physical address data in said read data in response to the second detection signal, and for outputting a synchronizing signal;

a format counter for receiving a basic clock signal to count the number of pulses of the clock signal and outputting the count value, said format counter resetting the count value to a prescribed value in accordance with the first detection signal and the synchronizing signal in order to synchronize the count value with the position of the drive head over the target sector; and

a circuit for referring to the count value from said format counter to read user data in the read data.

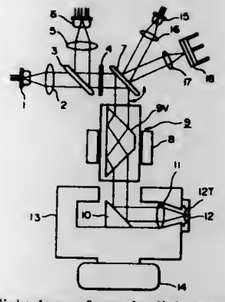
5,559,766

ROTARY DRUM TAPE RECORDING APPARATUS WITH CONTROLLING OPTICAL RECORDING TRACKS USING STORED RESULTS OF SCANNING OF REFERENCE TRACKS

Takashi Nakao, Tokyo; Kiyoshi Ohsato, Chiba; Yoshiteru Kamatani, Kanagawa; Tatsuya Narahara, Kanagawa, and Tadashi Ozue, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 225,511, Apr. 11, 1994, abandoned, which is a continuation of Ser. No. 925,763, Aug. 7, 1992, abandoned. This application Jul. 10, 1995, Ser. No. 500,028
Claims priority, application Japan, Aug. 9, 1991, 3-224569
Int. Cl.[6] G11B *7/09*
U.S. Cl. 369—44.18 **3 Claims**

1. A method of recording information on an optical recording tape trained about a rotary drum and formed without preformatted recording tracks by scanning the optical recording tape by a scanning system using a light beam emitted by a light source, said scanning system including a mirror and an image rotator, said method comprising the steps of:



reflecting the light beam from the light source to the image rotator by using the mirror;

rotating the image rotator at half the rotary speed of the rotary drum;

reflecting the light beam from the image rotator to the rotary drum and thence to the optical recording tape;

training about the rotary drum an optical reference track tape having ideal reference tracks formed thereon;

reproducing information recorded on the ideal reference tracks in a tracking control mode to acquire tracking control data prior to recording information on the optical recording tape;

storing the tracking control data for tracking control;

controlling an angular position of the mirror according to the tracking control data; and

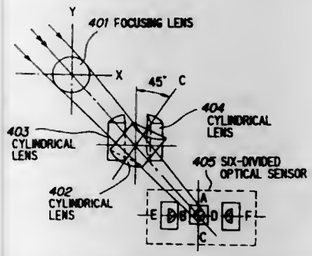
removing the optical reference track tape and training the optical recording tape about the rotary drum and recording information on recording tracks thereon based on the stored tracking control data, said recording tracks being formed so that they conform to the reference tracks under tracking control using the previously stored tracking control data.

5,559,767

APPARATUS FOR DETECTING A FOCUS ERROR AND A TRACKING ERROR OF AN OPTICAL HEAD

Tsutomu Matsui, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 27, 1994, Ser. No. 364,761
Claims priority, application Japan, Dec. 27, 1993, 5-333639
Int. Cl.[6] G11B *7/12*
U.S. Cl. 369—44.23 **5 Claims**



1. An apparatus for detecting a servo signal of an optical head, comprising:

a focusing lens for focusing a light reflected from an optical disc storing information to provide a focused light;

an optical composite unit for providing a cylindrical beam and side beams by receiving said focused light, said cylindrical beam having a long axis including a diameter of said focused light thus received and a short axis being narrower than said diameter, and said side beams being separated from said cylindrical beam; and

an optical sensor for detecting focus error and tracking error by separately receiving light beams based on said cylindrical beam and said side beams;

said optical composite unit, comprising:

a first cylindrical lens for forming said cylindrical beam, an axis of said first cylindrical lens being slant by 45° relative to said long axis of said cylindrical beam and having a height including said diameter of said focused light and a width being narrower than said diameter;

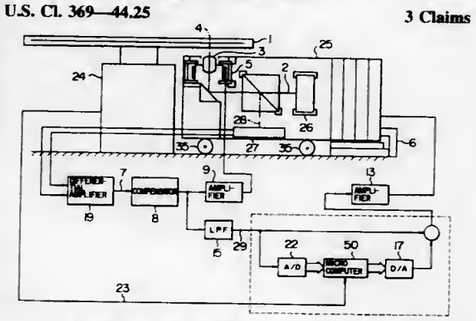
two second cylindrical lenses for forming said side beams, said two second cylindrical lenses being positioned on both sides of said first cylindrical lens in parallel to said long axis of said cylindrical beam.

5,559,768

TRACKING FOLLOWING APPARATUS FOR OPTICAL DISK DEVICE

Masamichi Ito, Ibaraki-ken, and Masahiro Takasago, Odawara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 29, 1994, Ser. No. 267,395
Claims priority, application Japan, Jun. 29, 1993, 5-158546
Int. Cl.[6] G11B *7/00*
U.S. Cl. 369—44.25 **3 Claims**



1. A tracking following apparatus for an optical disk device, comprising:

an objective for focusing a laser light and forming a light spot on a rotating optical disk;

detecting means for sensing an error signal representing a relative positional error between the light spot and a track on the optical disk;

fine actuator means responsive to the error signal sensed by the detecting means for driving the objective;

coarse actuator means for driving the fine actuator means;

low-pass filter means for removing a high-frequency component from the error signal from the detecting means;

storage means for keeping therein data associated with one rotation of the optical disk, the data being used to drive the coarse actuator means;

attenuator means for attenuating an output from the low-pass filter means;

arithmetic and logic means for adding an attenuated signal from the attenuator means to data stored in the storage means and storing a result of the addition in the storage means, the data associated with a rotation angle position of the optical disk when the error signal is sensed by the detecting means; and

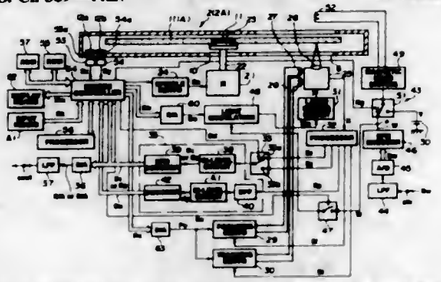
adder means for adding an output from the low-pass filter means to data corresponding to the rotation angle position read from the storage means, producing thereby a drive signal to drive the coarse actuator, and driving the coarse actuator according to the generated drive signal.

5,559,769

RECORDING/REPRODUCING APPARATUS FOR BOTH READ-ONLY AND MAGNETO-OPTICAL DISC-SHAPED RECORDING MEDIUM

Nobuhiko Ando; Ryo Aiido, and Kazuhiko Fujiie, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 122,012, Sep. 15, 1993, abandoned.
This application Jun. 6, 1995, Ser. No. 469,808
Claims priority, application Japan, Sep. 24, 1992, 4-255023
Int. Cl.[6] G11B 7/09
U.S. Cl. 369—44.27 12 Claims



1. A recording and/or reproducing apparatus for a disc-shaped optical recording medium of the read-only type, in which data is recorded as a series of pits, or the magneto-optical type, comprising:

a rotation drive means having the disc-shaped optical recording medium loaded thereon for rotationally driving the optical recording medium;

recording and/or reproducing means movable in the radial direction of the disc-shaped optical recording medium for recording and/or reproducing information signals on or from the recording medium via a light beam;

discriminating means for discriminating the type of the disc-shaped optical recording medium as loaded;

photodetector means including a first photodetector, a second photodetector and a third photodetector;

first processing means for taking a difference between an output signal of the first photodetector and an output signal of the second photodetector;

second processing means for taking a sum of the output signal of the first photodetector and the output signal of the second photodetector; and

third processing means for generating an error signal based on an output signal from the third photodetector for controlling the recording and/or reproducing means;

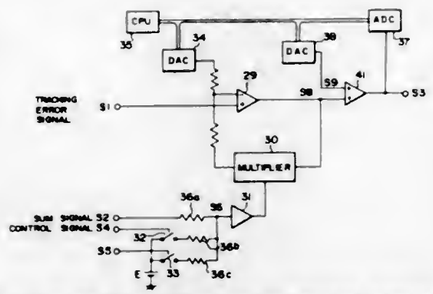
controller means for selectively switching between the outputs of the first processing means and the second processing means based on an output of the discriminating means, for generating playback signals.

5,559,770

AUTOMATIC GAIN CONTROL METHOD AND DEVICE FOR SERVO LOOP, AND INFORMATION RECORDING AND/OR REPRODUCTION APPARATUS

Tomoyuki Hiroki, Zama, and Hisatoshi Baba, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 29, 1994, Ser. No. 296,158
Claims priority, application Japan, Aug. 30, 1993, 5-235893
Int. Cl.[6] G11B 7/095
U.S. Cl. 369—44.350 15 Claims



1. An automatic gain control device which inputs an error signal generated based on output signals from a divided sensor to an operational amplifier, inputs a sum signal of the output signals from the divided sensor to a multiplier, and divides the error signal by the sum signal by negatively feeding an output signal from the operational amplifier back to the operational amplifier via the multiplier, comprising:

means for alternately applying two predetermined voltages to the multiplier in a state in which the sum signal is 0;

means for detecting amplitudes of output signals from said automatic gain control device corresponding to the two predetermined voltages; and

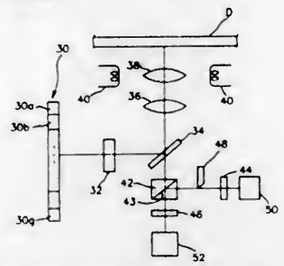
means for calculating input offsets of the operational amplifier and the multiplier on the basis of the detected amplitudes of the output signals of said automatic gain control device, two predetermined voltages, and a gain of the multiplier and for cancelling the input offsets of the operational amplifier and the multiplier.

5,559,771

TRACKING CONTROL APPARATUS AND OPTICAL PICKUP HAVING THE SAME

Seong-Min Kim, Incheon, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Apr. 27, 1995, Ser. No. 429,632
Claims priority, application Rep. of Korea, Apr. 30, 1994, 94-9415
Int. Cl.[6] G11B 7/09
U.S. Cl. 369—44.35 7 Claims



1. A tracking control apparatus comprising:

a laser source having a plurality of laser emitting devices for generating a laser beam, each of said laser emitting devices being operated selectively;

a receiving means for receiving a part of the laser beam reflected from a data recording medium when tracking the data recording medium by means of the laser beam irradiated through an objective lens from said laser source;

a means for generating a tracking error signal relative to a tracking error which represents a difference between a desired track and a position tracked by the laser beam, on the basis of an image of the laser beam received by said receiving means; and

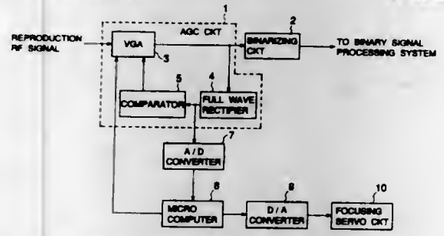
an actuating means for selectively actuating laser emitting devices located at a position compensatory for the tracking error among said laser emitting devices in response to the tracking error signal generated by said tracking error signal generating means.

5,559,772

INFORMATION RECORDING AND/OR REPRODUCING APPARATUS AND METHOD FOR ADJUSTING AN OFFSET AMOUNT OF A FOCUSING SERVO CIRCUIT

Junichi Takeda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1994, Ser. No. 195,197
Claims priority, application Japan, Feb. 17, 1993, 5-049938
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—44.360 6 Claims



1. An information recording and/or reproducing apparatus comprising:

auto gain control means for controlling the amplitude level of a reproduction signal read out from a recording medium to be at a predetermined level, said auto gain control means having variable gain amplifying means for amplifying the reproduction signal, converting means for converting the output of said variable gain amplifying means into a DC voltage, and comparing means for comparing the output from said converting means with a predetermined reference value and sending the result of the comparison to said variable gain amplifying means;

fixing means for fixing the gain of said variable gain amplifying means;

a. focusing servo circuit for performing focusing control of a light spot with respect to the recording medium; and

focusing offset adjusting means having an analog-to-digital converter, a microcomputer and a digital-to-analog converter, wherein when a fixation instruction is issued from the microcomputer and the gain is fixed by said fixing means in response thereto, the output from said converting means is inputted into said microcomputer via said analog-to-digital converter while said microcomputer applies a focusing offset to said focusing servo circuit via said digital-to-analog converter, and said microcomputer adjusts the focusing offset so that the output of said converting means is maximized.

5,559,773

SELF CORRECTING RECORDING REPRODUCING APPARATUS FOR AN OPTICAL CARD

Kunihiro Kentatsu, Kyoto; Kazuo Tsuboi, and Takeshi Ishida, both of Takatsuki, all of Japan, assignors to OMRON Corporation, Japan

Continuation of Ser. No. 912,575, Aug. 12, 1992, abandoned, which is a continuation of Ser. No. 476,756, Feb. 8, 1990, abandoned. This application May 31, 1994, Ser. No. 251,033
Claims priority, application Japan, Feb. 13, 1989, 1-33226; Feb. 13, 1989, 1-33227; Feb. 13, 1989, 1-33228
Int. Cl.[6] G11B 7/09
U.S. Cl. 369—44.42 5 Claims

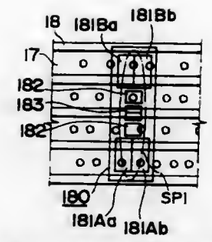
1. An optical card recording/reproducing apparatus for recording/reproducing information onto/from an optical card formed with a plurality of track guides which are arranged in parallel with each other with a predetermined pitch, comprising:

a light source for emitting light;

a photo detector including a photo sensitive element for focusing control; and

an optical system for converging said light emitted from said light source onto said optical card and for forming an image of reflected light onto said photo detector, the image including an image of said track guides of said optical card;

wherein said photo sensitive element has a detection area, and a width of said detection area in the direction perpendicular to said track guides is set to a length equal to an integer times a pitch of said track guides in said image formed on said photo detector, wherein said integer is greater than or equal to two.

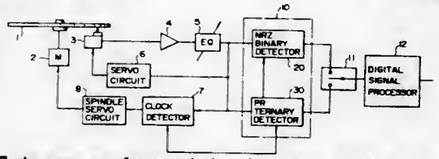


5,559,774

OPTICAL DISC REPRODUCING APPARATUS WHICH EMPLOYS A BINARY DETECTOR FOR THE OUTER TRACKS AND A TERNARY DETECTOR FOR THE INNER TRACKS

Tetsu Watanabe, Tokyo; Tamotsu Yamagami, and Yoshiyuki Urakawa, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 21, 1991, Ser. No. 795,724
Claims priority, application Japan, Nov. 27, 1990, 2-320764
Int. Cl.[6] G11B 5/09
U.S. Cl. 369—47 8 Claims



7. An apparatus for reproducing signals from an optical disc, comprising:

a binary detector means supplied with first reproduced data from an outer portion of the disc for comparing the level of the first reproduced data with a predetermined threshold level to produce non-return to zero (NRZ) data as first detected data, the binary detector means including:

a first comparator having one input supplied with the first reproduced data and a another input supplied with a first predetermined threshold level for outputting a first pulse train;

a first flip-flop supplied with the first pulse train and a clock signal from an external source for outputting a second pulse train;

a second flip-flop supplied with the second pulse train and the clock signal for outputting a third pulse train;

an exclusive OR gate supplied with the second and third pulse trains for producing a fourth pulse train; and

a third flip-flop supplied with the fourth pulse train and the clock signal for outputting first non-return to zero data;

a partial response ternary detector means supplied with second reproduced data from an inner portion of the disc for comparing the level of the second reproduced data with two different threshold levels to form two binary digital signals, extracting two series of pulse trains from the two binary digital signals, and producing second detected data from the two series of pulse trains; and

switch means supplied with the first detected data and the second detected data for producing an output by selectively switching between the first detected data and the second detected data.

5,559,775

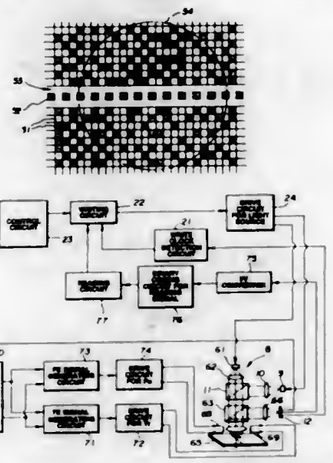
and a position of an end of the previous recording is not known,

5,559,775

CLOCK DETECTION DEVICE OF INFORMATION RECORDING/REPRODUCING APPARATUS AND CLOCK DETECTION DEVICE OF INFORMATION RECORDING APPARATUS

Akira Matsueda, Tachikawa, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 13, 1993, Ser. No. 119,397
Claims priority, application Japan, Sep. 14, 1992, 4-245261
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—47 **5 Claims**



1. A clock detection device of an information recording/reproducing apparatus adapted to an information recording/reproducing apparatus which detects whether or not data is present on a recording medium with the edge of a data reproduction clock obtained by reproducing clock information for use to synchronize with said data recorded on said recording medium to reproduce data on said medium and which records data while reproducing said clock information and arranged to generate a data recording clock for use at the time of recording said data and a data reproducing clock for use at the time of reproducing said data in accordance with said clock information, said clock detection device of an information recording/reproducing apparatus, comprising:

a first detection device for detecting said clock information and for generating said data reproduction clock; and

a second detection device, disposed away from said first detection device, for generating said data recording clock by a predetermined distance so as to cause the phase difference between said data reproduction clock and said data recording clock to be odd number times 90 degrees, said second detection device detecting said clock information for generating said data recording clock.

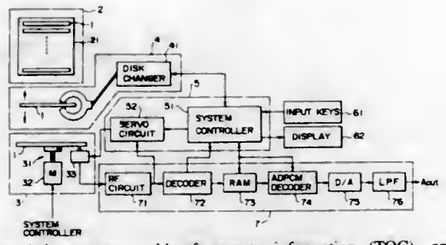
5,559,776

DISK PLAYBACK APPARATUS

Takashi Ikenaga, Kanagawa, Japan, assignor to Sony Corporation, Japan

Continuation of Ser. No. 430,137, Apr. 26, 1995, abandoned, which is a continuation of Ser. No. 140,241, Oct. 21, 1993, abandoned. This application Feb. 27, 1996, Ser. No. 607,656
Claims priority, application Japan, Oct. 26, 1992, 4-311221
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—47 **4 Claims**

1. A continuous-playback method for continuously playing back a plurality of recording media each containing a plurality of recorded digital information signals corresponding to a plurality of



recorded programs, table-of-contents information (TOC), and address information comprising the steps of:

(a) operating a recording media magazine apparatus to selectively fetch a recording medium from among the plurality of recording media;

(b) reading the TOC information, a digital information signal corresponding to a selected program, and the address information recorded in the selectively fetched recording medium;

(c) temporarily storing the digital information signal read from the selectively fetched recording medium in a storage means;

(d) audibly reproducing the digital information signal stored in the storage means while comparing the address information read from the selectively fetched recording medium to both a predetermined address corresponding to a predetermined time, the predetermined time corresponding to a time which is less than is required to reproduce the selected program from a start address for the selected program derived from the TOC information, and an end address of the recording medium which is derived from the TOC information; and

(i) if the address information is equal to the predetermined address, stopping audible reproduction of the digital information signal stored in the storage means, reading a different digital information signal and address information from the fetched recording medium corresponding to a second selected program, and repeating steps (c) and (d); and

(ii) if the address information read from the selectively fetched recording medium is equal to the end address, controlling the recording media magazine apparatus to replace the recording medium with another recording medium while continuously outputting data from the storage means and audibly reproducing the output data while the recording medium is being replaced with another recording medium.

5,559,777

OPTICAL RECORDING METHOD EMPLOYING PIT EDGE RECORDING ON RECORDING MEDIUM DIVIDED INTO A PLURALITY OF ZONES WHEREIN RECORDING PARAMETERS VARY FROM ZONE TO ZONE

Takeshi Maeda, Kokubunji; Shinichi Arai; Kazuo Isaka, both of Odawara; Atsushi Saito, Ichikawa; Takuya Mizokami, Odawara; Hisataka Sugiyama, Kodaira, and Satoshi Kawamura, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

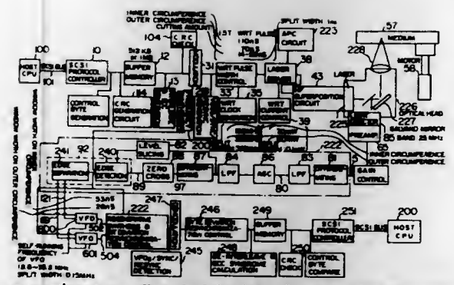
Continuation of Ser. No. 820,593, Jan. 27, 1992, Pat. No. 5,414,689. This application Apr. 25, 1995, Ser. No. 428,057
Claims priority, application Japan, May 25, 1990, 2-133819; May 25, 1990, 2-133820; Aug. 31, 1990, 2-228128
Int. Cl.[6] G11B 5/09
U.S. Cl. 369—50 **6 Claims**

2. An optical recording method comprising the steps of:

dividing an optical disk constituting a recording medium into a plurality of zones each including a plurality of concentric tracks;

rotating the optical disk at a constant angular velocity;

selecting one of the tracks onto which information is to be recorded;



generating a recording clock having a frequency which depends on the zone in which the selected track is located, the frequency of the recording clock being different for each of the zones;

setting a light pulse width correction amount ΔT_W which depends on the zone in which the selected track is located, the light pulse width correction amount ΔT_W being different for each of the zones;

setting a light pulse width T_W which depends on the zone in which the selected track is located by correcting a predetermined light pulse width by the light pulse width correction amount ΔT_W to obtain the light pulse width T_W, the light pulse width T_W being different for each of the zones;

modulating light in accordance with the information to be recorded, the recording clock, and the set light pulse width T_W to produce light pulses indicative of the information to be recorded and having the set light pulse width T_W; and

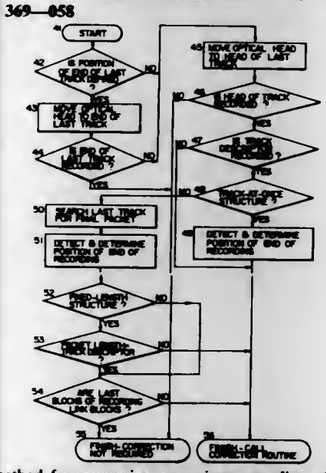
irradiating the selected track with the light pulses to record elongated recording marks along the selected track, the elongated recording marks having edges corresponding to the information to be recorded.

5,559,778

APPARATUS AND METHOD FOR COMPLETING AN INCOMPLETE RECORDING ON AN OPTICAL DISC

Tatsuya Inokuchi, Kanagawa; Shigeki Tsukatani, Tokyo, and Tadayuki Misaizu, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 28, 1994, Ser. No. 365,098
Claims priority, application Japan, Dec. 28, 1993, 5-349649
Int. Cl.[6] G11B 7/00
U.S. Cl. 369—058 **30 Claims**



1. A method for processing a previous recording of data on a write-once optical disc to enable the previous recording to be read when it is not known whether the previous recording is incomplete and a position of an end of the previous recording is not known, and to enable additional data to be recordable on the write-once optical disc following the previous recording when the previous recording is incomplete, the previous recording, when incomplete, lacking at least an end portion that would be included in the previous recording when complete, the method comprising steps of:

detecting when the previous recording is incomplete; and

when the detecting step determines that the previous recording is incomplete:

determining the position of the end of the previous recording,

generating a pseudo signal for recording on the write-once optical disc, and

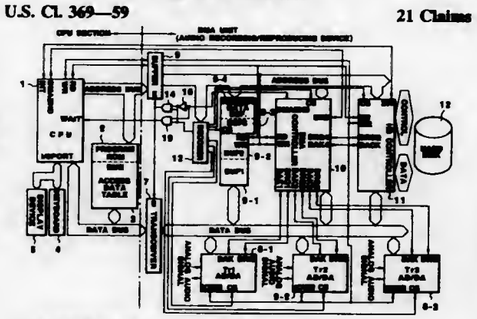
writing the pseudo signal generated in the generating step on the write-once optical disc, starting at the position of the end of the previous recording determined by the determining step, to append to the previous recording an additional recording including a replacement for the end portion lacking from the previous recording.

5,559,779

DIGITAL AUDIO RECORDER USING EXTERNAL MEMORY MEDIUM AND LEADING PORTION AUDIO DATA MEMORY

Nobuo Iizuka, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 795,983, Nov. 22, 1991, abandoned. This application Oct. 6, 1993, Ser. No. 132,445
Claims priority, application Japan, Dec. 28, 1990, 2-416544
Int. Cl.[6] G11B 5/09
U.S. Cl. 369—59 **21 Claims**



1. A digital recorder comprising:

external memory medium means for storing digital audio data corresponding to a digitized version of an analog signal representing a tone;

reading control means coupled to said external memory medium means for reading out the digital audio data from said external memory medium means, including reading out a leading portion audio data;

leading portion audio data semiconductor memory means for storing the leading portion audio data prior to a tone reproducing operation, the leading portion audio data being a leading portion of the digital audio data stored in said external memory medium means;

audio data memory means for temporarily storing the digital audio data following the leading portion audio data, said digital audio data being read out and successively supplied from said external memory medium means to said audio data memory means by said reading control means;

audio output means for outputting an audio signal to produce a tone; and

control means coupled to said leading portion audio data semiconductor memory means, to said audio data memory means and to said audio output means, for:

reading out and outputting the leading portion audio data stored in said leading portion audio data semiconductor memory means to said audio output means in response to a command for reproducing the digital audio data, to output an audio signal based on said digital audio data of said leading portion audio data, and

then reading out and outputting the digital audio data to said audio output means which have been successively transferred from said external memory medium means to said audio data memory means to be temporarily stored therein by said reading control means.

5,559,780

RECORDING APPARATUS FOR AN OPTICAL RECORDING MEDIUM

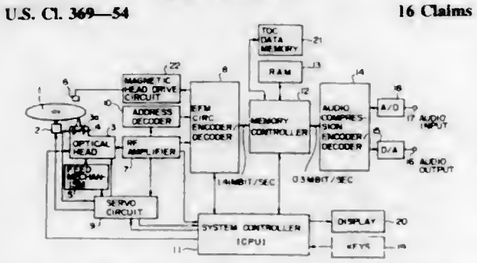
Yasuaki Maeda, Kanagawa, and Hideki Nagashima, Tokyo, both of Japan, assignors to Sony Corporation, Japan

Continuation of Ser. No. 139,555, Oct. 20, 1993, abandoned. This application Apr. 19, 1995, Ser. No. 426,144

Claims priority, application Japan, Oct. 23, 1992, 4-307838

Int. Cl.[6] G11B 7/00

U.S. Cl. 369—54 **16 Claims**



1. A recording apparatus for an optical recording medium, the recording medium having a pregroove and address data identifying a plurality of sectors provided along the pregroove, said apparatus comprising:

recording means for recording data on the optical recording medium along the pregroove, said recording means having an optical head device for radiating a light beam having an intensity which is enough to record the data on the optical recording medium, said optical head device including a photodetector for detecting the quantity of light reflecting from the optical recording medium, and storing means for temporarily storing data, said optical head device being capable of receiving data supplied from said storing means; and

a controller for controlling the operation of said recording means, said controller receiving an output signal from said photodetector for detecting the occurrence of a recording error within a recording start sector according to said output signal from said photodetector, said storing means being controlled to store the data when said recording error occurs and said optical head device being controlled to move a recording start point along the pregroove from the previous recording start point on the pregroove by a predetermined distance within the recording start sector and restart recording of the data supplied from said storing means from the thus moved recording start point on the optical recording medium.

5,559,781

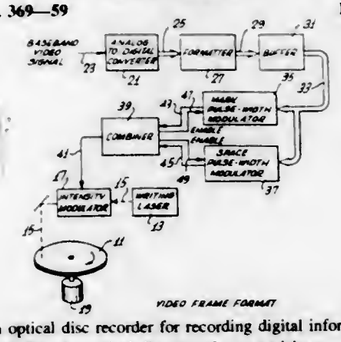
SYSTEM FOR RECORDING DIGITAL INFORMATION IN A PULSE-LENGTH MODULATION FORMAT

Jack H. Bailey, Villa Park, Calif., assignor to DiscoVision Associates, Irvine, Calif.

Division of Ser. No. 180,312, Jan. 12, 1994, Pat. No. 5,373,490, which is a continuation of Ser. No. 75,275, Jun. 11, 1993, Pat. No. 5,321,680, which is a continuation of Ser. No. 948,267, Sep. 21, 1992, Pat. No. 5,253,244, which is a continuation of Ser. No. 825,640, Jan. 19, 1992, abandoned, which is a continuation of Ser. No. 645,638, Jan. 25, 1991, Pat. No. 5,084,852, which is a continuation of Ser. No. 499,217, Mar. 16, 1990, Pat. No. 5,003,526, which is a continuation of Ser. No. 782,156, Jan. 2, 1985, abandoned, which is a continuation of Ser. No. 169,238, Jul. 16, 1980, abandoned. This application May 13, 1994, Ser. No. 242,636

Int. Cl.[6] G11B 7/00

U.S. Cl. 369—59 **11 Claims**



1. An optical disc recorder for recording digital information on an optical disc, the optical disc recorder comprising:

a modulator, which receives a succession of original binary bits of digital information to be recorded, and produces a succession of coded signals to be recorded, by encoding portions of the succession of original binary bits into corresponding encoded portions using only a first encoding operation to encode information contained in each portion of the succession of original binary bits and no operation, subsequent to the first encoding operation, which processes that encoded portion, each encoded portion being a final code indicative of each corresponding portion of the succession of original binary bits, the encoded portions including a succession of alternating marks and spaces, each of the successive marks and spaces having a length which is discretely varied between a minimum length and a maximum length in accordance with information contained in the final code, the length of each of the successive marks and spaces being limited in its run length to be not less than the minimum length and to be not greater than the maximum length, the maximum length being greater than double the minimum length, wherein said modulator also limits said run length such that a minimum non-zero length difference between a first length of any mark or space and a second length of any other mark or space is less than said minimum length; and

a writing device which produces a beam for writing information on the disc, said information being indicative of the succession of coded signals.

5,559,782

RECORDING METHOD AND RECORDING AND REPRODUCING APPARATUS FOR OPTICAL DISK

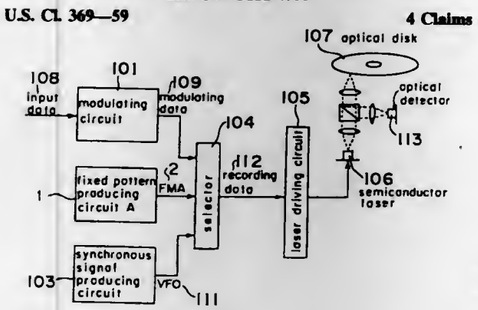
Takashi Ishida, Osaka; Shunji O'Hara, Higashiosaka; Kenzo Ishibashi, Moriguchi, and Tadashige Furutani, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Division of Ser. No. 235,637, Apr. 29, 1994, Pat. No. 5,467,330, which is a division of Ser. No. 118,353, Sep. 9, 1993, Pat. No. 5,331,620, which is a continuation of Ser. No. 651,618, Feb. 6, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 461,008

Claims priority, application Japan, Feb. 9, 1990, 2-30841

Int. Cl.[6] G11B 7/00

U.S. Cl. 369—59 **4 Claims**



1. A method of generating optical disk recording data formed of successive one bits and zero bits having a run length limited code data format in which at least a predetermined minimum run length of recorded zero bits or at most a predetermined maximum run length of zero bits is located on each side of recorded one bits, said method comprising:

generating a fixed pattern data frame used as a synchronous signal, the fixed pattern data frame having plural successive adjacent run lengths of zero bits with respective one bits located between each successive adjacent run lengths of zero bits and having at least three different run lengths of zero bits including at least one of the minimum run length of zero bits and at least two of the maximum run lengths of zero bits; and,

combining the fixed pattern data frame with input data in accordance with the run length limited code data format to generate the optical disk recording data;

wherein, in the optical disk recording data, an initial run length of zero bits of said fixed pattern data frame is immediately preceded by a one bit and a last run length of zero bits of said fixed pattern data frame is immediately followed by a one bit, and

wherein said fixed pattern data frame is a first fixed pattern data frame, and wherein said method further comprises:

generating at least a second fixed pattern data frame which is different from the first fixed pattern data frame to thereby obtain plural different fixed pattern data frames, the second fixed pattern data frame having plural successive adjacent run lengths of zero bits with respective one bits located between each successive adjacent run lengths of zero bits and having at least three different run lengths of zero bits including at least one of the minimum run lengths of zero bits and at least two of the maximum run lengths of zero bits; and,

selecting from the plural different fixed pattern data frames to obtain a selected fixed pattern data frame to be combined with the input data.

5,559,783

AN OPTICAL HEAD HAVING A ROTATING MIRROR

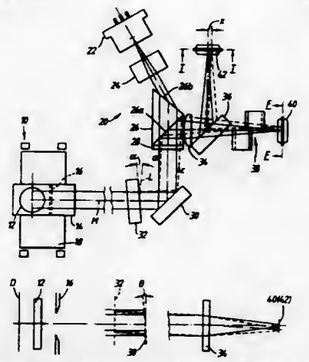
Sou Ishika, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 19, 1994, Ser. No. 308,453

Claims priority, application Japan, Sep. 22, 1993, 5-236883

Int. Cl.[6] G11B 7/00

U.S. Cl. 369—112 **48 Claims**



1. An optical head device for irradiating a light beam onto a recording medium to optically reproduce information recorded on the recording medium, the device comprising:

means for generating a light beam having a prescribed intensity to project onto the recording medium;

means for detecting the light beam reflected from the recording medium;

optical means for leading the light beam from the generating means to the recording medium along a first optical axis and leading the light beam reflected from the recording medium along the first optical axis to the detecting means;

reflecting means arranged between the optical means and the recording medium, for reflecting a part of the light beam led to the recording medium toward the optical means which leads the part of the light beam onto the detecting means, the reflecting means being tilted at a prescribed angle against the first optical axis to lead the part of the light beam reflected along a second optical axis different from the first optical axis to the detecting means; and

means for controlling the prescribed intensity of the light beam generated by the generating means based on an intensity of light beam led to the detecting means by the reflecting means.

5,559,784

MULTI-LAYER OPTICAL INFORMATION DETECTION BY TWO LASER BEAM AND OPTICAL MULTILAYER RECORDING MEDIUM

Takeshi Ota, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1994, Ser. No. 217,353

Claims priority, application Japan, Mar. 26, 1993, 5-068694; Mar. 26, 1993, 5-068721; Feb. 28, 1994, 6-030184

Int. Cl.[6] G11B 7/00

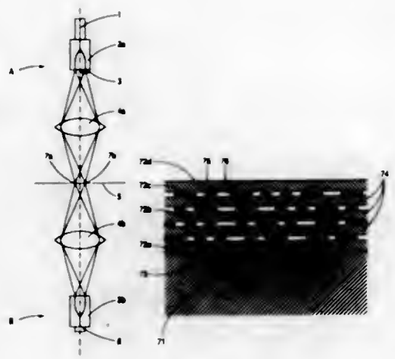
U.S. Cl. 369—124 **32 Claims**

21. An optical multi-layer recording medium comprising a substrate, recording layers and transparent spacer layers alternately layered on said substrate, said recording layers each being made of a material having a physical property nonlinearly varying with intensity of a light beam received.

5,559,786

5,559,788

pilot signal generating means for generating a pilot signal which

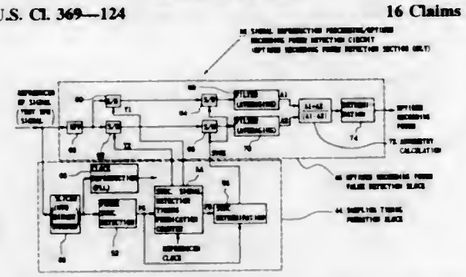


5,559,785

OPTIMUM RECORDING LASER POWER CONTROL BY TESTING AN EFT SIGNAL'S ASYMMETRY WITH A FRAME SYNCHRONIZATION CIRCUIT

Kazuhiko Honda; Kazunobu Fujiwara, and Katsuichi Osakabe, all of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Nov. 9, 1994, Ser. No. 336,490
Claims priority, application Japan, Nov. 12, 1993, 5-307342
Int. Cl.[6] G11B *11/03*
U.S. Cl. 369—124 16 Claims



13. An optical disk recording device for a writable optical disk having a test signal recorded thereon, the device comprising:

a test signal reproduction circuit that irradiates a reproducing laser beam onto a part of the optical disk where the test signal is recorded, and receives a reflection from the part of the optical disk to generate a received beam signal;

a synchronizing signal detection circuit that, from the received beam signal generated by the test signal reproduction circuit, detects a synchronizing signal having an 11T—11T signal pattern in which the pattern is repetitive and is formed by a former section having a high level for 11T and a latter section having a low level for 11T;

a signal level detection circuit that detects corresponding peak level values of former and latter 11T sections of the synchronizing signal detected by the synchronizing signal detection circuit; and

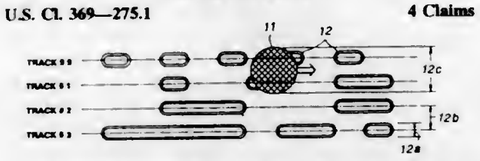
an asymmetry calculation circuit that obtains asymmetry of the test signal on the basis of the corresponding peak level values detected by the signal level detection circuit.

5,559,786

INFORMATION RECORDING ON A TRACK BY LOGICAL OPERATION OF THE INFORMATION ON A NEIGHBORING TRACK

Hideyoshi Horimai, and Goro Fujita, both of Kanagawa, Japan, assignors to Sony Corporation, Japan

Division of Ser. No. 133,113, Oct. 12, 1993, abandoned. This application Aug. 17, 1994, Ser. No. 292,338
Claims priority, application Japan, Feb. 19, 1992, P04-069736; May 25, 1992, P04-157434; Jun. 18, 1992, P04-182847
Int. Cl.[6] G11B *7/24*
U.S. Cl. 369—275.1 4 Claims



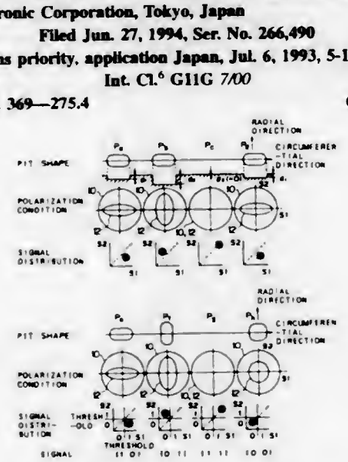
1. An optical recording medium wherein an n-th recording track is located at a distance from an (n−1)th recording track preceding said n-th recording track in a recording region both the (n−1)th recording track and the n-th recording track simultaneously scanned by a light beam radiated onto the recording area, data recorded on the n-th recording track generated by logical operation of input data with data recorded on the (n−1)th recording track.

5,559,787

POLARIZATION OF A REFLECTED LIGHT BEAM IS CHANGED ACCORDING TO THE DEPTH OF PITS

Takayuki Nomoto, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 27, 1994, Ser. No. 266,490
Claims priority, application Japan, Jul. 6, 1993, 5-166703
Int. Cl.[6] G11G *7/00*
U.S. Cl. 369—275.4 6 Claims



1. An optical disk comprising:

an information recording surface on which information is recorded by irradiating a laser light, the information being readable based on the laser light reflected by the information recording surface; and

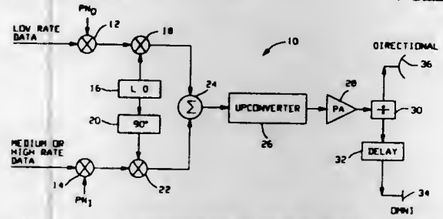
a plurality of information pits arranged on the information recording surface in a manner that depths of the pits differ in accordance with information to be recorded so that the information is read by detecting difference of polarization conditions of the laser light reflected by the information pits.

5,559,788

MULTIPLE CHANNEL QUADRATURE COMMUNICATION SYSTEM AND METHOD

John W. Zscheile, Jr., West-Farmington; Michael L. Wilson, Salt Lake City; Richard J. Saggio, Salt Lake City, and Alan E. Lundquist, Salt Lake City, all of Utah, assignors to Unisys Corporation, Blue Bell, Pa.

Filed Dec. 29, 1994, Ser. No. 366,198
Int. Cl.[6] H04J *13/00*
U.S. Cl. 370—18 7 Claims



1. Apparatus for communication of multiple signals, comprising:

pseudonoise generating means for generating at least one mutually orthogonal pair of pseudonoise signals;

first combining means for combining one of an orthogonal pair of said pseudonoise signals with a first signal to produce a first spread signal;

second combining means for combining the other of said orthogonal pair of pseudonoise signals with a second signal to produce a second spread signal;

modulating means for modulating the first and second spread signals with a common carrier that is shifted in phase for the two spread signals to produce first and second modulated signals;

third combining means for combining said first and second modulated signals to produce a combined signal;

a first data antenna for receiving the combined modulated signals for transmitting same to predetermined receivers; and

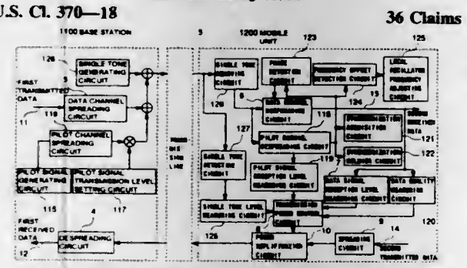
a second control antenna for receiving the combined modulated signals for transmitting same as a control signal for a plurality of receivers.

5,559,789

CDMA/TDD RADIO COMMUNICATION SYSTEM

Takayuki Nakano, Kanazawa; Kazuyuki Miya, Machida; Osamu Kato, and Masatoshi Watanabe, both of Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 6, 1995, Ser. No. 369,485
Claims priority, application Japan, Jan. 31, 1994, 6-009610; Feb. 16, 1994, 6-019366
Int. Cl.[6] H04J *13/04*
U.S. Cl. 370—18 36 Claims



1. A code-division multiple access/time division duplex radio communication system comprising a base station and one or more mobile units, wherein:

said base station comprises:

pilot signal generating means for generating a pilot signal which has a constant transmission power level and which has contents that are previously known in said one or more mobile units;

pilot signal spreading means for spreading said pilot signal in accordance with spreading codes to generate a spread pilot signal; and

pilot signal transmitting means for transmitting said spread pilot signal in a bursting manner to said one or more mobile units; and

each of said mobile units comprises:

pilot signal despreading means for despreading said spread pilot signal to obtain said pilot signal;

pilot signal level measuring means for measuring a reception power of said pilot signal obtained by said despreading means; and

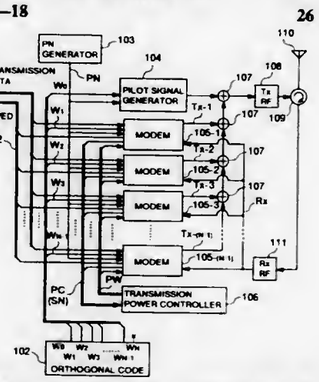
transmission power control means for controlling a transmission power based on the measured reception power of said pilot signal obtained by said despreading means.

5,559,790

SPREAD SPECTRUM COMMUNICATION SYSTEM AND TRANSMISSION POWER CONTROL METHOD THEREFOR

Takashi Yano, Tokorozawa, and Nobukazu Doi, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 20, 1995, Ser. No. 375,679
Int. Cl.[6] H04B *7/216*
U.S. Cl. 370—18 26 Claims



8. A mobile terminal for performing communication with a base station by using spectrum spreading, said base station performing spectrum modulation on a pilot signal and a transmission signal for said mobile terminal by using first and second orthogonal codes, respectively, said first and second codes being selected from among a plurality of orthogonal codes except a specific orthogonal code assigned to power control, said mobile terminal comprising:

first means for measuring a signal-to-noise ratio value on the basis of a value of a noise component obtained by de-spreading an antenna-received signal with said specific orthogonal code and a value of a signal component obtained by de-spreading the antenna-received signal with said first orthogonal code assigned to the pilot signal;

second means for transmitting a power control signal produced depending upon a result of said measuring to the base station; and

third means for reproducing the transmission signal transmitted for the mobile terminal by de-spreading the antenna-received signal with said second orthogonal code assigned to the mobile terminal.

line echo cancellation means connected to the line analog-to-

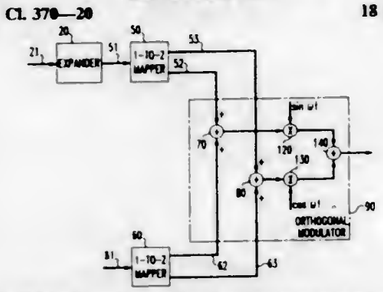
on-line state and for obtaining a relatively limited user inter-

5,559,791

COMPANDING OF VOICE SIGNAL FOR SIMULTANEOUS VOICE AND DATA TRANSMISSION

Gordon Bremer; Kenneth D. Ko, both of Clearwater, and Luke J. Smithwick, New Port Richey, all of Fla., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Jun. 14, 1993, Ser. No. 76,506
Int. Cl.[6] H04J *11/00*
U.S. Cl. 370—20 **18 Claims**



1. A method for conditioning a signal for transmission, comprising the steps of:

receiving in a modem a first applied signal and a data signal;

expanding the first applied signal to provide an expanded first signal, where the expanding is performed to increase the size of small amplitude levels of the first applied signal relative to large amplitude levels of the first applied signal; and

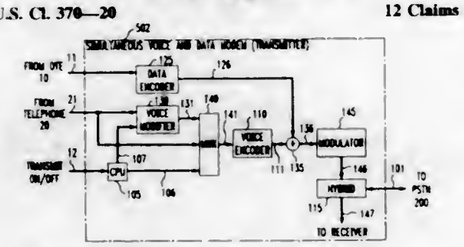
processing the expanded first signal and the data signal to provide a resultant signal for transmission from the modem, where the resultant signal represents a sequence of N-dimensional signal points for transmission, where each one of the N-dimensional signal points is selected as a function of the expanded first signal and the data signal such that each N-dimensional signal points in a region of a signal space that is dictated by the data signal and is at a point in that region that is dictated by the expanded first signal.

5,559,792

SOUND MODIFICATION FOR USE IN SIMULTANEOUS VOICE AND DATA COMMUNICATIONS

Stanley Bottoms, Seminole; Gordon Bremer; Kenneth D. Ko, both of Clearwater, and Luke J. Smithwick, New Port Richey, all of Fla., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Apr. 20, 1994, Ser. No. 230,565
Int. Cl.[6] H04J *11/00*
U.S. Cl. 370—20 **12 Claims**



1. A modem comprising:

a data port for receiving a data signal from data terminal equipment;

a voice port for receiving a voice signal from voice terminal equipment;

a line port for coupling a modulated signal to a communications channel;

means for selecting one of a number of sound effects;

means for modifying the voice signal in accordance with the selected sound effect;

means for combining the modified voice signal and the data signal to provide a combined signal; and

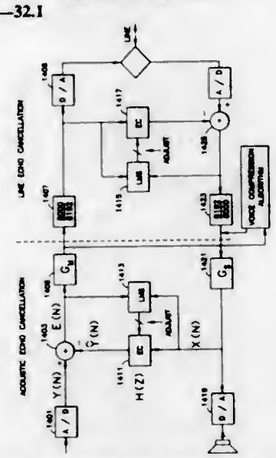
modulation means for modulating the combined signal to provide the modulated signal to the communications channel.

5,559,793

ECHO CANCELLATION SYSTEM AND METHOD

Raghu Sharma, North Oaks; Jeffrey P. Davis, Ham Lake; Timothy D. Gunn, Mounds View; Ping Li, New Brighton, all of Minn.; Sidhartha Maitra, Saratoga, Calif.; Ashish Thanawala, Saratoga, Calif., and Steve Young, Saratoga, Calif., assignors to Multi-Tech Systems, Inc., Mounds View, Minn.

Division of Ser. No. 2,467, Jan. 8, 1993, Pat. No. 5,452,289.
This application Aug. 11, 1994, Ser. No. 289,305
Int. Cl.[6] H04B *3/23*
U.S. Cl. 370—32.1 **6 Claims**



1. A system for performing both digital acoustic echo cancellation and digital line echo cancellation, comprising:

voice interface including voice input means for receiving local voice signals from a local user and including sound output means for conveying remote voice signals from a remote user to the local user, the voice interface having an acoustic path between the voice input means and the sound output means;

telephone line interface means for full-duplex transmission and reception of outgoing analog voice signals and incoming analog voice signals;

voice analog-to-digital conversion means connected to the voice interface for converting the local voice signals into outgoing digital voice data;

line analog-to-digital conversion means connected to the telephone line interface means for converting the incoming analog voice signals into converted incoming digital voice data;

digital signal processor means including

means for selecting voice over data mode of operation or analog mode of operation;

acoustic echo cancellation means connected to the voice analog-to-digital conversion means for receiving the outgoing digital voice data from the voice analog-to-digital conversion means, for selectively receiving line echo cancelled incoming digital voice data if in analog mode of operation or for selectively receiving decompressed incoming digital voice data if in voice over data mode of operation, the acoustic echo cancellation means including a first Finite Impulse Response filter and operable in response to the selected line echo cancelled incoming digital voice data or the selected decompressed incoming digital voice data for removing acoustic echo from the outgoing digital voice data and for producing therefrom acoustic echo cancelled outgoing digital voice data,

line echo cancellation means connected to the line analog-to-digital conversion means for receiving the converted incoming digital voice data and connected to the acoustic echo cancellation means for receiving the acoustic echo cancelled outgoing digital voice data, the line echo cancellation means including a second Finite Impulse Response filter and operable in response to the acoustic echo cancelled outgoing digital voice data for removing line echo from the converted incoming digital voice data and for producing therefrom line echo cancelled incoming digital voice data,

voice compression means operable in voice over data mode for receiving and compressing the acoustic echo cancelled outgoing digital voice data, for receiving compressed incoming digital voice data and decompressing the compressed incoming digital voice data to produce the decompressed incoming digital voice data;

line digital-to-analog conversion means connected to the telephone line interface means for converting the acoustic echo cancelled outgoing digital voice data into outgoing analog voice signals,

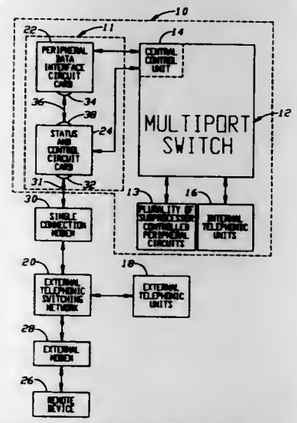
voice digital-to-analog conversion means connected to the line echo cancellation means for selectively converting the line echo cancelled incoming distal voice data to the remote voice signals if in analog mode or for selectively converting the decompressed incoming digital voice data to the remote voice signals.

5,559,794

TELECOMMUNICATION SYSTEM WITH SELECTIVE REMOTE INTERFACE ASSEMBLY AND METHOD

Lawrence A. Willis, McHenry; Daniel A. Mershon, Chicago, and Boris Dubinsky, Buffalo Grove, all of Ill., assignors to Rockwell International Corporation, Seal Beach, Calif.

Filed Sep. 9, 1993, Ser. No. 118,866
Int. Cl.[6] H04Q *11/04*
U.S. Cl. 370—58.3 **23 Claims**



1. In a telecommunication system with a distributed processor architecture having a central control processor and a plurality of subprocessor controlled peripheral circuits through which the central control processor receives information and affects a central control of the system, the improvement being a selective remote interface assembly, comprising:

means for connecting with a single connection modem;

means for determining the operating state of the telecommunication system; and

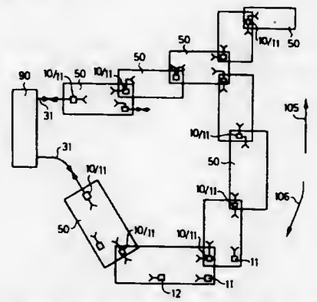
means responsive to the operating state determining means for selectively obtaining a relatively full featured user interface through the single connection modem connecting means when it is determined that the telecommunication system is in an on-line state and for obtaining a relatively limited user interface through the single connection modem connecting means when it is determined that the telecommunication system is in an off-line state.

5,559,795

METHOD IN A TDMA RADIOSYSTEM TO LET A CENTRAL STATION COMMUNICATE WITH BOTH PERIPHERAL STATIONS AND OTHER CENTRAL STATIONS

Peter Ahl, Malmo, Sweden, assignor to Inventahl AB, Malmo, Sweden

PCT No. PCT/SE93/00091, § 371 Date Sep. 16, 1994, § 102(e) Date Sep. 16, 1994, PCT Pub. No. WO93/15565, PCT Pub. Date Aug. 5, 1993
PCT Filed Feb. 3, 1993, Ser. No. 284,409
Claims priority, application Sweden, Feb. 3, 1992, 9200283
Int. Cl.[6] H04B *7/24*
U.S. Cl. 370—60 **29 Claims**



1. A method in a digital wide area radio system including two or more subsystems, each of which includes at least one central station and one or more geographically spread out peripheral stations, said central station communicating with said peripheral stations in a radio covering area, said method comprising the steps of:

(a) transmitting a first set of information in radio signals from said central station to a receiver of a first peripheral station;

(b) storing said first set of information in an intermediate memory in said first peripheral station, either for transmitting said information to a second peripheral station in a second subsystem or for dropping user information as digital signals when the information is intended for the first peripheral station;

(c) switching a function of said first peripheral station from a peripheral station mode to a central station mode;

(d) transmitting said first set of information in radio signals from a transmitter of said first peripheral station, now operating in the central station mode, to the second peripheral station in the second subsystem;

(e) receiving in said receiver of said first peripheral station, still operating in the central station mode, signals including a second set of information from said second peripheral station and storing said information in the intermediate memory;

(f) switching the function of said first peripheral station from the central station mode to the peripheral station mode; and

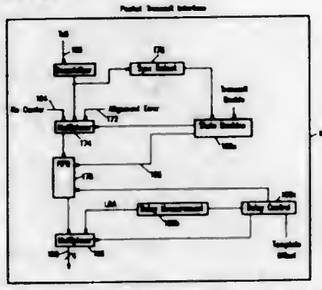
(g) transmitting said second set of information in radio signals from said transmitter of said first peripheral station, operating in the peripheral station mode, to said central station.

5,559,799

5,559,796
DELAY CONTROL FOR FRAME-BASED TRANSMISSION OF DATA

Brian C. Edem, San Jose, and Debra J. Worsley, Santa Clara, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Feb. 28, 1995, Ser. No. 396,445
Int. Cl.[6] H04J 3/26
U.S. Cl. 370—60 **21 Claims**



1. A method for transmitting first information from a data source in a first data station to a first data destination in a second data station coupled to said first data station by physical media, wherein the data source outputs said first information in a plurality of data packets, the beginning times for output of said data packets from said data source defining a plurality of packet-start times, the method comprising:

initiating transmission of the information contained in a first of said packets of said first information over said physical media, beginning at a transmission-start time;

determining a first value related to the length of time from said packet-start time of said first packet until said transmission-start time;

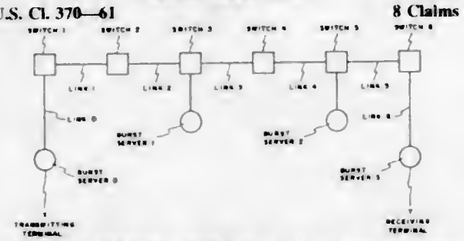
communicating said first value to said second data station;

delaying, in said second data station, initiating transfer of said information contained in said first packet to said first data destination for a delay period based on said first value.

5,559,797
BURST SERVER STORED SWITCHING SYSTEM AND ITS METHOD

Tutomu Murase, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed May 23, 1994, Ser. No. 247,699
Claims priority, application Japan, May 31, 1993, 5-128566
Int. Cl.[6] H04L 12/58
U.S. Cl. 370—61 **8 Claims**



8. A packet transmission apparatus for a packet switching system having at least one burst server interposed between a transmitting terminal and a receiving terminal, transmission being through at least one link when the terminals are separated by at least two links, said burst server comprising:

means for performing packet transmission which requires a reservation of a necessary bandwidth through relevant links and a sufficient storage capacity for storing the message packet at the furthest available burst server which is a first blocked burst server in a path including a plurality of burst servers;

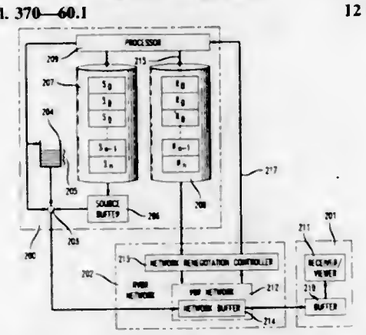
means for storing a message packet as it is being receiving; and

means for releasing the link used for transmitting the message packet responsive to a complete transmission and storage of the message packet at the burst server.

5,559,798
DATA SEGMENTATION WITHIN A RENOGOTIATED BIT-RATE SERVICE TRANSMISSION SYSTEM

Kenneth L. Clarkson, Madison, N.J.; Matthias Grossglauser, Sophia-Antipolis, France; Srinivasan Keshav, Berkeley Heights, and David Tse, New Providence, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Apr. 19, 1995, Ser. No. 424,838
Int. Cl.[6] H04Q 11/04
U.S. Cl. 370—60.1 **12 Claims**



1. A data transmission system comprising:

a first site, including a first memory storing a series of data segments, and a second memory storing a previously compiled record of instantaneous transmission rates, each of said stored rates being associated with one or more of said stored data segments;

a second site;

a variable bit-rate network providing a connection between said first and said second sites;

a network controller adapted to negotiate a connection between said first site and said second site having a particular bandwidth in response to the contents of said second memory;

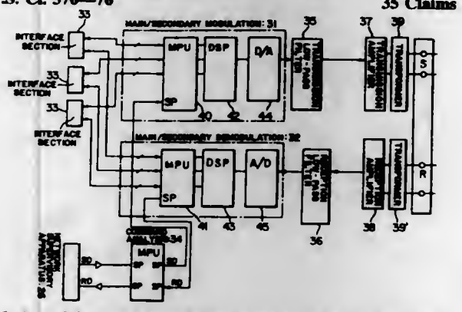
a data buffer, interposed between said first site and said variable bit-rate network, and adapted to store a finite amount of data segments; and

a data pre-processor adapted to optimally segment incoming data so as to minimize the cost of negotiating and effecting the transmission of said segmented data from said first site to said second site via said data buffer and said variable bit-rate network, store said optimally segmented data in said first memory, and store a record indicative of the instantaneous transmission rate associated with each of said stored segments in said second memory.

5,559,799
MODULATOR AND DEMODULATOR APPARATUS AS WELL AS MODULATION AND DEMODULATION METHOD

Hiroyasu Murata; Hideo Miyazawa, and Takashi Kaku, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Aug. 19, 1993, Ser. No. 108,536
Claims priority, application Japan, Feb. 18, 1993, 5-029367
Int. Cl.[6] H04B 1/38; H04J 1/14; H04L 27/22
U.S. Cl. 370—76 **35 Claims**



1. A modulator and demodulator apparatus in which a signal is communicated in a main channel for main data and a secondary channel for secondary data obtained by frequency division, said modulator and demodulator apparatus comprising:

modulation means for modulating and transmitting main data and secondary data; and

demodulation means for receiving and demodulating a receive signal to reproduce main data and secondary data, said demodulation means comprising timing phase discrimination means for receiving, as an input signal thereto, a demodulation vector signal sampled into a digital value and discriminating to which one of a plurality of regions of a discrimination plane the phase of the input signal belongs;

said timing phase discrimination means for inputting, as an input to a next processing stage, a rotated demodulation vector signal obtained by rotating the demodulation vector signal, for moving the rotated demodulation vector signal to a first quadrant which includes a reference discrimination region of the discrimination plane, for performing a predetermined calculation outputting one of two binary values when the rotated demodulation vector signal is not in the reference discrimination region of the discrimination plane, for performing another calculation outputting the other one of the two binary values when the rotated demodulation vector signal is within the reference discrimination region of the discrimination plane, and for discriminating a timing phase of the rotated demodulation vector signal from the result of one of the predetermined calculation and the another calculation.

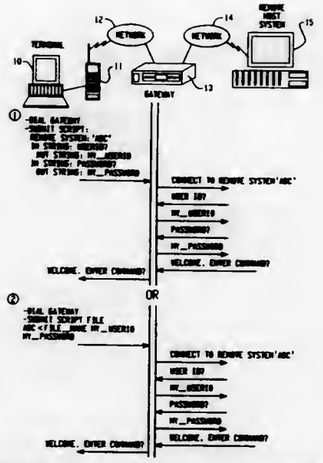
5,559,800
REMOTE CONTROL OF GATEWAY FUNCTIONS IN A WIRELESS DATA COMMUNICATION NETWORK

Gary P. Mousseau; Mihal Lazaridis; Herb A. Little, and Michael A. Barnstijn, all of Waterloo, Canada, assignors to Research In Motion Limited, Ontario, Canada

Filed Jan. 19, 1994, Ser. No. 183,598
Int. Cl.[6] H04L 12/66
U.S. Cl. 370—85.13 **28 Claims**

1. A method of remote control by a user of a gateway that forms a bridge between different data networks, said gateway converting received data from one data network protocol to another, the method comprising the steps of:

storing, within the gateway, one or more commands which may be invoked remotely by the user, said commands causing a data exchange between the gateway and a remote system connected to one of the data networks;



transmitting via one of the data networks at least one data packet from data terminal equipment operated by the user to the gateway, wherein at least one data packet includes control data containing information directing the gateway to execute one or more commands on behalf of the user;

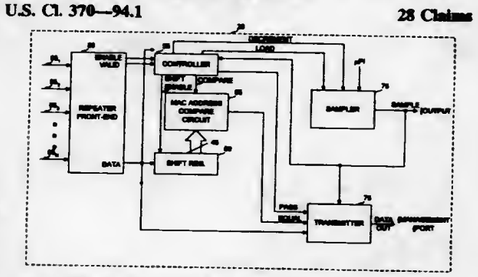
validating that each of the one or more commands to be executed on behalf of the user is stored within the gateway; and

executing each command that is validated in the validating step.

5,559,801
PROGRAMMABLE PACKET SAMPLING FOR NETWORK MANAGEMENT

William Lo, Santa Clara, Calif., assignor to Advanced Micro Devices Inc., Sunnyvale, Calif.

Continuation of Ser. No. 376,153, Jan. 20, 1995, abandoned.
This application May 11, 1995, Ser. No. 438,982
Int. Cl.[6] H04J 3/06
U.S. Cl. 370—94.1 **28 Claims**



28. A data packet sampling system, comprising:

a repeater, including a transmitter, for disrupting a retransmitted data packet, wherein said repeater does not disrupt said retransmitted data packet in response to an assertion of a disrupt control signal; and

means, coupled to said repeater, for periodically asserting said disrupt control signal to said repeater independent of data in the data packet.

said second control field being divided into a plurality of time

5,559,802

COMMUNICATION SYSTEMS

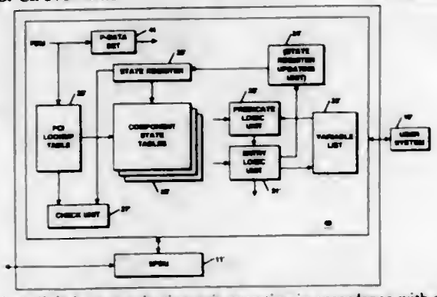
David C. Robinson, Thatcham, and Nicholas W. Emery, Wokingham, both of United Kingdom, assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 6, 1994, Ser. No. 178,188

Claims priority, application United Kingdom, Jan. 7, 1993, 9300222

Int. Cl.[6] H04J *3/24*

U.S. Cl. 370—94.1 **6 Claims**



1. A digital communication unit operating in accordance with an Open Systems Interconnection (OSI) 7-layer communication model, including:

a single amalgamated state table into which three OSI upper layer state tables have been merged and comprising an array of cells in rows and columns, the cells containing entries each of which consists of a predicate actions and next state information;

table row look-up means responsive to message protocol data units (PDU's);

table column look up means storing an amalgamated state;

entry logic means for processing the entries of a selected one of the array of cells;

predicate logic means for processing the predicate of a selected entry; and

a variable list containing the variables referred to by predicates and actions;

the variable list including a variable which represents a plurality of session layer states associated with a presentation layer service; and

the predicates including a set of new predicates which detect a variety of possible combinations of states of the variable which represents the plurality of session layer states associated with the presentation dervice.

5,559,803

COMMUNICATION SYSTEM USING A BIDIRECTIONAL TREE STRUCTURE NETWORK

Seiichiro Sakai, Tokyo; Yoshio Takeuchi, Saitama; Masayoshi Ohashi, Saitama, and Toshio Mizuno, Saitama, all of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1995, Ser. No. 494,086

Claims priority, application Japan, Jun. 28, 1994, 6-167562

Int. Cl.[6] H04H *1/02*

U.S. Cl. 370—95.2 **6 Claims**

1. A communication system comprising:

a bidirectional tree network having a base end and a plurality of terminating ends;

a central apparatus connected to said base end;

a plurality of terminating equipment connected respectively to said terminating ends; and

a plurality of subscriber terminals accommodated respectively in said terminating equipment,

each of said terminating equipment including a multiplexer for multiplexing information transmitted from one of the subscriber terminals accommodated therein to said central apparatus, and a signal selection device for discriminating and selectively receiving only information which is destined for the one of the subscriber terminals accommodated in this terminating equipment from information transmitted from said central apparatus to all the subscriber terminals via the tree network,

said central apparatus including an exchange equipment for discriminating a destination of the information transmitted from said subscriber terminals via the tree network, and a loop back device for scrambling the information transmitted from the subscriber terminals via the tree network so that the scrambled signal can be decoded only by a signal selection device corresponding to the discriminated destination and for sending back the scrambled information to the tree network, wherein said central apparatus further includes a demultiplexer for demultiplexing multiplexed signals transmitted from the terminating equipment via the tree network into respective time slot signals.

5,559,804

WIRELESS COMMUNICATION SYSTEM AND WIRELESS TERMINAL DEVICE USING FIXED LENGTH COMMUNICATION FRAME

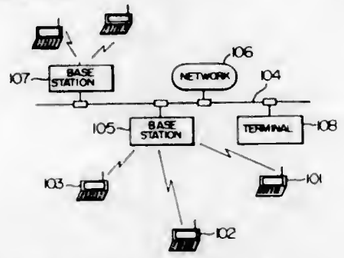
Eiichi Amada, Tokyo; Yoshihiro Takiyasu, Higashimurayama; Tomoaki Ishifuji, Tokyo; Genichi Ishii, Hachioji; Hidehiko Jusa, and Shuichi Adachi, both of Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 21, 1994, Ser. No. 230,773

Claims priority, application Japan, Apr. 21, 1993, 5-094066

Int. Cl.[6] H04J *3/00*

U.S. Cl. 370—95.3 **7 Claims**



1. A wireless communication system comprising:

a plurality of wireless terminals having their individual addresses; and

a base station for periodically generating a fixed-length communication frame composed of an information field which includes a plurality of information slots, and a first control field and a second control field which are arranged preceding said information field, said first control field being divided into a plurality of time slots each being used for allowing said based station to send control data each including an address of a terminal which should make transmission or reception of data in said information field of said communication frame,

said second control field being divided into a plurality of time slots each being used for allowing one of said plurality of wireless terminals to send control data indicating a slot access requirement for requesting assignment of at least one information slot in a next communication frame for data transmission;

each of said plurality of wireless terminals including:

judgement means for judging, from the address in first control field of said communication frame, whether or not said wireless terminal is designated by said base station,

control means for making, when said judgement means detects said wireless terminal is designated by control data transmitted in an i-th time slot of said first control field, reception or transmission of data in an i-th information slot in said information field of said communication frame, wherein i is a positive integer representing a location of said i-th time slot in said first control field and a location of said i-th information slot in said information field; and

means for transmitting control data in one of said plurality of time slots of said second control field of said communication frame to request at least one information slot in the next communication frame for data transmission when transmission data to be sent has been prepared.

5,559,805

OUTSTATION RANGING IN DEMAND ASSIGNMENT, TIME DIVISION MULTIPLE ACCESS, COMMUNICATION SYSTEM

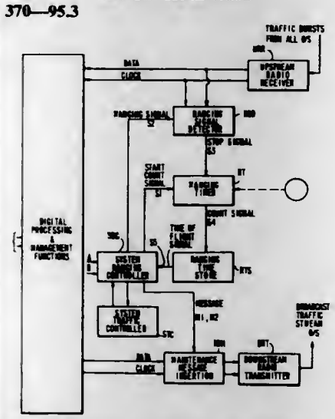
David L. Hedderly, Nottingham, England, assignor to GPT Limited, United Kingdom

Continuation-in-part of Ser. No. 976,978, Mar. 29, 1993, abandoned. This application Aug. 22, 1994, Ser. No. 294,139

Claims priority, application United Kingdom, Dec. 12, 1990, 9026932

Int. Cl.[6] H04B *7/212*

U.S. Cl. 370—95.3 **5 Claims**



1. In a demand assignment, time division multiple access, communication system having a plurality of outstations operative for transmitting digital bursts of information in frames having multiple timeslots to a head station, said outstations being located in a range of distances relative to the head station,

a ranging system for ensuring the sequential arrival of the bursts at the head station, said ranging system comprising:

means at the head station for temporarily reserving a group of adjacent, successive, free timeslots in a consolidated time period in each frame when ranging-in is required;

means at the head station for ranging-in a new outstation demanding a timeslot assignment during said consolidated time period; and

said consolidated time period having a time duration sufficient to enable the ranging-in means to range-in an outstation located at a maximum end of said range.

5,559,806

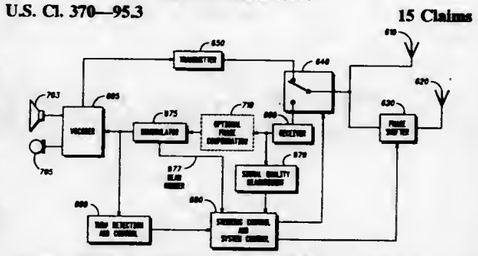
TRANCEIVER HAVING STEERABLE ANTENNA AND ASSOCIATED METHOD

Christopher N. Kurby, Elmhurst; John W. Arens, Grayslake, and James P. Phillips, Lake in the Hills, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 27, 1995, Ser. No. 394,982

Int. Cl.[6] H04B *7/195*

U.S. Cl. 370—95.3 **15 Claims**



5. A subscriber transceiver for handoff among at least two downlink cell sites, said transceiver comprising:

an antenna having an array of antenna elements for creating an antenna pattern capable of communication with the downlink cell sites; and

steering circuitry operatively coupled to said antenna for steering the antenna pattern to an orientation having optimum signal quality upon communication with one of the downlink cell sites at a position and, when determining whether to make an intra-site handoff, for fixing the antenna pattern by disabling the steering during intra-site handoff measurements and immediately after an intra-site handoff occurs.

5,559,807

POWER AMPLIFIER LINEARIZATION IN A TDMA MOBILE RADIO SYSTEM

Anthony P. van den Heuvel, Windlesham; Stephen T. Valentine, and Dragan Boscovich, both of Basingstoke, all of United Kingdom, assignors to Motorola, Inc., Schaumburg, Ill.

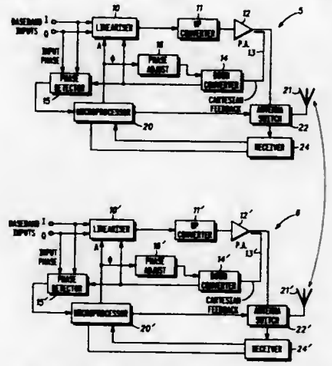
PCT No. PCT/EP93/02743, § 371 Date Nov. 17, 1994, § 102(e) Date Nov. 17, 1994, PCT Pub. No. WO94/10765, PCT Pub. Date May 11, 1994

PCT Filed Oct. 7, 1993, Ser. No. 256,299

Claims priority, application United Kingdom, Nov. 2, 1992, 922292

Int. Cl.[6] H04J *3/16*

U.S. Cl. 370—95.3 **30 Claims**



1. A radio system for communicating over time slots of a time divided radio channel comprising:

a base station (**6**) and a plurality of remote radio units (**5**);

the base station having means (**20'**, **12'**) for transmitting a

5,559,809

TRANSMIT BLOCK UP-CONVERTER FOR VERY

receiving a message that provides information regarding reception of the at least one block of data, including whether

5,559,812

DIGITAL TIME BASE CORRECTOR USING A MEMORY WITH REDUCED MEMORY CAPACITY

the base station having means (20', 12') for transmitting a synchronization signal for defining the timing of the time slots; and

each of the remote radio units having a power amplifier (12) with linearization means (10, 13, 15, 16) for linearizing the power amplifier;

characterized in that the time divided radio channel comprises predetermined linearization time slots (120) for transmission of training signals, interspersed between other time slots; and

each remote radio unit comprises means (20) for generating a training signal during a linearization time slot and linearizing its power amplifier (12) during that time slot in advance of and independent of transmission of signals during one of said other time slots.

5,559,808

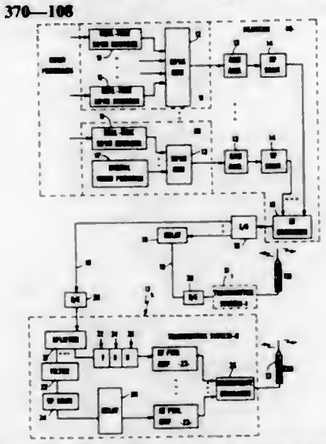
SIMULCASTING DIGITAL VIDEO PROGRAMS

Bruce Kostreski, Wheaton, Md., and Kamran Sistanizadeh, Arlington, Va., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

Continuation-in-part of Ser. No. 405,558, Mar. 16, 1995. This application May 16, 1995, Ser. No. 441,976

Int. Cl.[6] H04B *7/005;* **H04J** *4/00*

U.S. Cl. 370—108 **25 Claims**



22. A simulcasting method for broadcasting a multi-channel digital video signal, the method comprising the steps of:

broadcasting the multi-channel digital video signal into a reception area from a transmitter at a first site at a first time;

broadcasting the multi-channel digital video signal into the reception area from a transmitter at a second site separate from the first site at a second time a predetermined delay period later than the first time, the predetermined delay period substantially corresponding to the time of propagation of the multi-channel digital video signal between the sites;

areas of propagation of the multi-channel digital video signal from the transmissions from the first and second sites substantially overlapping in a major portion of the reception area;

receiving the multi-channel digital video signal at a plurality of receiving locations in the reception area; and

at each receiving location, processing at least a portion of the multi-channel digital video signal to display selected video information to a user in humanly perceptible form.

5,559,809

TRANSMIT BLOCK UP-CONVERTER FOR VERY SMALL APERTURE TERMINAL REMOTE STATION

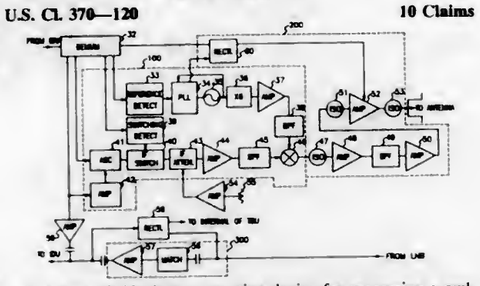
Soon I. Jeon, and Jeong H. Kim, both of Deajeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Feb. 1, 1995, Ser. No. 382,395

Claims priority, application Rep. of Korea, Sep. 27, 1994, 1994-24374

Int. Cl.[6] H04J *1/02*

U.S. Cl. 370—120 **10 Claims**



1. A transmit block up-converting device for processing a multiplexed signal including a transmit IF signal, a reference frequency signal, a switching signal, a level signal and a constant-current signal, which is provided through one transmitting line from an indoor unit in the very small aperture terminal remote station for satellite communications, comprising:

a means for demultiplexing said multiplexed signal;

a means for frequency up-converting said transmit IF signal from said means for demultiplexing in response to said reference frequency signal, said switching signal and said level signal;

a means for amplifying the output signal of said means for frequency up-converting in response to said constant-current signal from said means for demultiplexing; and

a means for impedance matching and amplifying an IF signal received from an external unit, and for outputting the impedance matched and amplified signal through one receiving line.

5,559,810

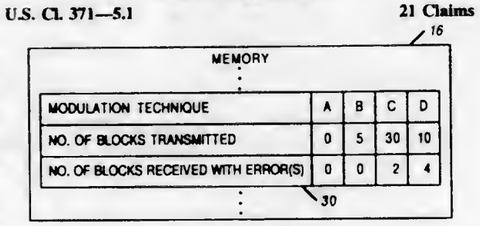
COMMUNICATION OF DATA RECEPTION HISTORY INFORMATION

Stephen S. Gilbert; Michael L. Needham, both of Palatine, and Kenneth J. Crisler, Wheaton, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 31, 1994, Ser. No. 220,619

Int. Cl.[6] G06F *11/00*

U.S. Cl. 371—5.1 **21 Claims**



1. A method comprising the steps of:

for each of a plurality of modulation techniques, storing corresponding data reception history information;

selecting a particular modulation technique from amongst the plurality of modulation techniques;

transmitting at least one block of data using the particular modulation technique;

receiving a message that provides information regarding reception of the at least one block of data, including whether reception of each of the at least one block of data occurred without error;

updating the data reception history information for the particular modulation technique using the information regarding reception.

5,559,811

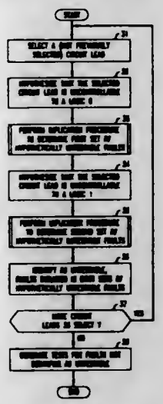
METHOD FOR IDENTIFYING UNTESTABLE & REDUNDANT FAULTS IN SEQUENTIAL LOGIC CIRCUITS.

Miron Abramovici, Murray Hill, and Mahesh A. Iyer, Cranbury, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 366,075, Dec. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 306,088, Sep. 14, 1994. This application Feb. 9, 1996, Ser. No. 599,289

Int. Cl.[6] G01R *31/28*

U.S. Cl. 371—27 **24 Claims**



1. A method of identifying untestable faults in a model of a sequential logic circuit, the model of the sequential logic circuit representing a sequential logic circuit comprising a plurality of circuit elements having one or more circuit leads and a plurality of circuit lines interconnecting the circuit leads of the circuit elements, the plurality of circuit elements including at least one flip-flop, each of the circuit leads able to assume one of a predetermined plurality of logic values at each of a plurality of time frames, the plurality of time frames including a starting time frame, the method comprising the steps of:

selecting one of the circuit leads of the sequential logic circuit;

determining a first set of faults, the first set of faults comprising faults which would be undetectable at a given one of the time frames if the selected circuit lead were unable to assume a first one of the predetermined plurality of logic values at the starting time frame;

determining a second set of faults, the second set of faults comprising faults which would be undetectable at the given time frame if the selected circuit lead were unable to assume a second one of the predetermined plurality of logic values at the starting time frame; and

identifying as untestable faults one or more faults included in both the first set of faults and the second set of faults.

5,559,812

DIGITAL TIME BASE CORRECTOR USING A MEMORY WITH REDUCED MEMORY CAPACITY

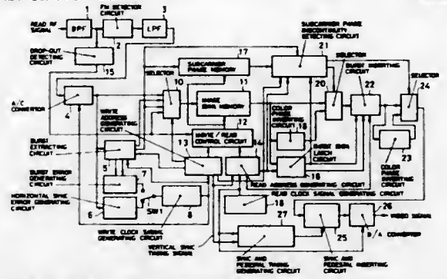
Hitoshi Otaki, and Masahiro Nakajima, both of Koufu, Japan, assignors to Pioneer Video Corporation, Yamanashi, and Pioneer Electronics Corporation, Tokyo, both of Japan

Filed Dec. 16, 1994, Ser. No. 357,736

Claims priority, application Japan, Dec. 16, 1993, 5-316940

Int. Cl.[6] H04N *7/00;11/00;9/88;9/89*

U.S. Cl. 371—31 **2 Claims**



1. A digital time base corrector comprising:

A/D converting means for converting a composite color video signal which was read out and reproduced from a recording medium into a digital signal;

means for extracting a burst signal in said digital signal every horizontal scan period and generating absolute value data of an amplitude of said burst signal and polarity data of said burst signal;

writing means for writing said absolute value data and said polarity data into a memory and for writing the portion in which a sync signal interval, a pedestal level interval, and a burst signal interval in said digital signal are eliminated into said memory as image data;

reading means for reading out said absolute value data, said polarity data, and said image data from said memory;

burst reproducing means for reproducing burst signal data on the basis of said absolute value data and said polarity data which were read out;

data inserting means for inserting said burst signal data, sync signal data, and pedestal level data into said image data read out; and

D/A converting means for converting output data of said data inserting means into an analog signal and for outputing said analog signal as a color video signal.

5,559,813

DIGITAL DATA PROCESSING SYSTEM FOR TRANSMITTING INFORMATION GROUPS DIVIDED INTO SEGMENTS COMPRISED OF VIDEO DATA, EDC'S, ECC'S AND SYNC DATA

Tetsuya Shimizu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 710,405, Jun. 5, 1991, abandoned. This application Mar. 16, 1994, Ser. No. 213,478

Claims priority, application Japan, Jun. 15, 1990, 2-157330

Int. Cl.[6] G06F *11/10;* **H03M** *13/00*

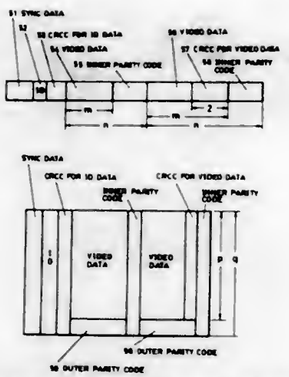
U.S. Cl. 371—37.4 **19 Claims**

1. A device for processing video data, wherein on transmitting an information group consisting of a plurality of samples of video data, an error detection code is added to said information group for forming a data group by an error detecting coding operation, an error correcting code is added to said data group by an error correcting operation, and then said data group to which said error correcting code is added is divided into a plurality of segments, wherein a plurality of sync blocks are generated by adding sync data to a front portion of each of the plurality of segments which includes the video data, the error detection code and the error correcting code, comprising:

identification word of said received sequence corresponding

5,559,818

SEMICONDUCTOR LASER DEVICE



receiving means for receiving the plurality of sync blocks to output the data group;

error correcting means for correcting errors in the data group by using the error correcting code;

error detecting means for detecting errors in the data group output from said error correcting means by using the error detecting code; and

interpolating means for interpolating the information group containing error data relating to the errors detected by said error detecting means.

5,559,814

VERIFICATION OF INTEGRITY OF DATA EXCHANGED BETWEEN TWO TELECOMMUNICATION NETWORK STATIONS

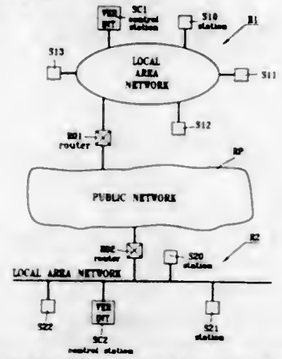
Pierre Rolin, Cesson Sevigne; Sylvain Gombault, and Laurent Toutain, both of Rennes, all of France, assignors to France Telecom, Paris, France

Filed Mar. 6, 1995, Ser. No. 398,766

Claims priority, application France, Mar. 11, 1994, 94 02964

Int. Cl.[6] G06F *11/34*

U.S. Cl. 371—67.1 **6 Claims**



1. A method of verifying the integrity of data sequences transmitted from a first application means in a first station to a second application means in a second station in a network during an exchange of data between said first station and second station, said method comprising for each transmitted data sequence the steps of:

calculating a first encipherment seal in a control means separate from and independent of said first application means and second application means, in response to reception of a received sequence corresponding to said transmitted data sequence from skid first application means,

writing said first encipherment seal in a correspondence table stored in said control means at an address equal to a first identification word of said received sequence corresponding to said transmitted sequence,

calculating in said control means a second encipherment seal in response to reception of a sequence retransmitted by said second application means and received by said second application means and corresponding to said transmitted data sequence,

reading said first encipherment seal in said correspondence table as a function of a second identification word of said sequence retransmitted by said second application means, and

comparing in said control means the read first encipherment seal and the calculated second encipherment seal to detect any alteration of said sequence received by said second application means in comparison with said transmitted data sequence.

5,559,815

PULSED LASER

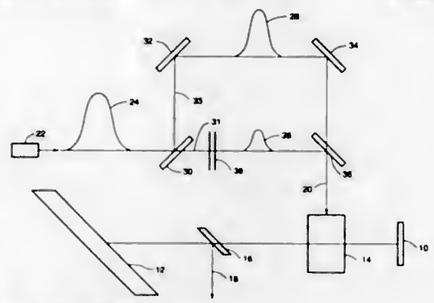
Vadim Berger, Bad Sooden-Allendorf; Jürgen Kleinschmidt, Weissenfels; Uwe Stamm, Göttingen, and Wolfgang Zschocke, Altena/Westf, all of Germany, assignors to Lambda Physik Gesellschaft Zur Herstellung Von Lasern mbH, Germany

Filed May 9, 1995, Ser. No. 438,168

Claims priority, application Germany, May 31, 1994, 44 19 069.7

Int. Cl.[6] H01S *3/10*

U.S. Cl. 372—25 **9 Claims**



1. A pulsed oscillator comprising:

a resonant cavity;

a gain medium located within the cavity;

a wavelength selective member for narrowing the wavelengths of light emitted from the cavity; and

means for exciting said gain medium to generate output pulses of laser light, said excitation means generating at least one seed excitation pulse followed by a primary excitation pulse and wherein the time interval between the seed pulse and the primary pulse is sufficient to allow light generated by the gain medium in response to the seed pulse to reach the wavelength selective member and return to said gain medium whereby the light generated in response to the subsequent primary pulse will have an enhanced spectral purity.

5,559,816

NARROW-BAND LASER APPARATUS

Dirk Basting, Gottingen, and Jurgen Kleinschmidt, Weissenfels, both of Germany, assignors to Lambda Physik Gesellschaft Zur Herstellung Von Lasern mbH, Germany

Filed May 30, 1995, Ser. No. 453,609

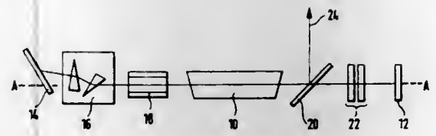
Claims priority, application Germany, Oct. 26, 1994, 44 38 283.9

Int. Cl.[6] H01S *3/10*

U.S. Cl. 372—27 **27 Claims**

1. A narrow band laser apparatus comprising:

a resonant cavity including a pair of reflective end mirrors;



a gain medium located within said resonant cavity;

means for exciting the gain medium to generate a laser beam;

means for linearly polarizing the laser beam;

first line narrowing means located between the polarizing means and one end mirror;

means for controllably rotating the plane of polarization of the light beam while maintaining the linear polarization of the beam, said rotation means being located between said polarizing means and the ocher end mirror;

means connected to the rotating means for independently varying the amount the rotation means rotates the plane of polarization of the laser beam; and

means for coupling the laser beam out the cavity, with the percentage of the light beam that is coupled out of the cavity being a function of the amount the rotation means rotates the plane of polarization of the laser beam.

5,559,817

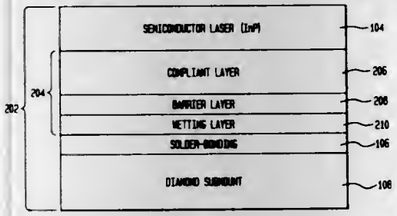
COMPLAINT LAYER METALLIZATION

Gustav E. Derkits, Jr., New Providence; Jose A. Lourenco, Union, and Ramesh R. Varma, Berkeley Heights, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Nov. 23, 1994, Ser. No. 344,448

Int. Cl.[6] H01S *3/19*; **H01L** *23/48*

U.S. Cl. 372—36 **10 Claims**



1. A semiconductor laser assembly comprising:

a semiconductor laser;

a semiconductor submount; and

a compliant layer metallization disposed between said semiconductor laser and said semiconductor submount, comprising a compliant layer, in contact with said semiconductor laser to minimize thermal and mechanically induced stress between said semiconductor laser and said semiconductor submount, a wetting layer, in contact with said semiconductor submount, to ensure adequate wetting during soldering of said semiconductor laser onto said submount, and a barrier layer, disposed between said compliant layer and said wetting layer, to prevent diffusion of soldering material into said compliant layer during said soldering.

5,559,818

SEMICONDUCTOR LASER DEVICE

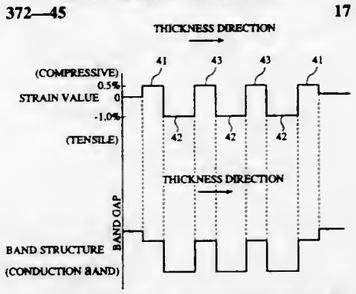
Masayuki Shono; Ryoji Hiroyama, and Yodoshi Keiichi, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Sep. 27, 1994, Ser. No. 312,696

Claims priority, application Japan, Mar. 24, 1994, 6-054171

Int. Cl.[6] H01S *3/18*; **H01L** *33/00*

U.S. Cl. 372—45 **17 Claims**



1. In a semiconductor laser device comprising an active layer including a quantum well structure having a layered structure of a well layer and a barrier layer formed on a semiconductor substrate, and cladding layers provided with the active layer interposed therebetween, wherein the value of strain in said well layer, Δa_{wi}, is defined as $\Delta a_{wi}=(a_{wi}-a)/a$, the value of strain in said barrier layer, Δa_{bj}, is defined as $\Delta a_{bj}=(a_{bj}-a)/a$, and the product of strain accumulated in said active layer and the layer thickness (t_{wi} and t_{bj}), Δ, is calculated by the following equation:

$$\Delta = \sum_{i=1}^{n} \Delta a_{wi} \times t_{wi} + \sum_{j=1}^{m} \Delta[a_{bj}]\, a_{bj} \times t_{bj},$$

where a is the lattice constant of said semiconductor substrate, a_{wi} is the lattice constant of said well layer, t_{wi} is the thickness of the well layer, a_{bj} is the lattice constant of said barrier layer, and t_{bj} is the thickness of the barrier layer,

said Δa_{wi}, Δa_{bj} and Δ respectively satisfy the following relationships:

$-2.0\% \leqq \Delta a_{wi} < 0\%$,

$0\% < \Delta a_{bj} \leqq +1.5\%$, and

-3.6×10^{-10} (meter) $\leqq \Delta < 0$.

5,559,819

SEMICONDUCTOR LASER DEVICE

Katsunori Abe, Chita-gun; Yuji Kimura, Nagoya; Kinya Atsumi; Yoshiki Ueno, both of Okazaki, and Noriyuki Matsushita, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 18, 1995, Ser. No. 423,345

Claims priority, application Japan, Apr. 19, 1994, 6-080612; Jul. 19, 1994, 6-166775; Oct. 28, 1994, 6-264764; Feb. 7, 1995, 7-019563

Int. Cl.[6] H01S *3/19*

U.S. Cl. 372—46 **22 Claims**

1. A semiconductor laser device having a stripe width of 100 μm or more, comprising:

an active layer which is injected of a carrier and generates a light by recombining the injected carrier;

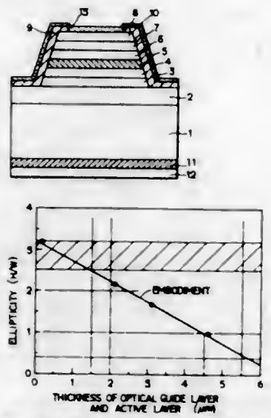
an optical guide layer which is formed at least either side of upper or lower side of the active layer and formed of material having a refractive index substantially lower than that of the active layer to confine the light generated in the active layer; and

clad layers formed on upper and lower of the active layer including the optical guide layer, formed of material having a refractive index substantially lower than that of the optical guide layer,

5,559,821

third controllable stimulating means for selectively causing pro-

providing an unstable resonator semiconductor laser including a



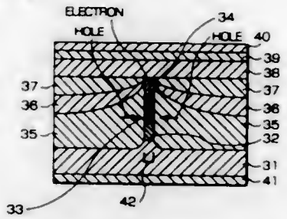
wherein a sum of thicknesses of the active layer and optical guide layer is made equal to or more than 1.5 μm.

5,559,820

MULTIPLE QUANTUM WELL SEMICONDUCTOR LASER

Akitaka Kimura; Masaaki Nido; Akihisa Tomita, and Akira Suzuki, all of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Jul. 7, 1995, Ser. No. 499,661
Claims priority, application Japan, Jul. 7, 1994, 6-155920
Int. Cl.[6] H01S *3/19*
U.S. Cl. 372—46 **7 Claims**



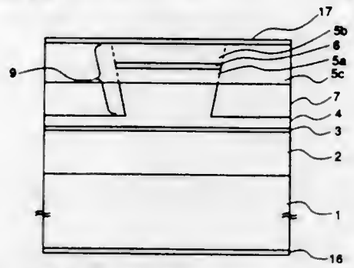
1. A multiple quantum well semiconductor laser comprising:
a stripe structure including an active layer having quantum well layers and barrier layers alternately stacked one on another, said stripe structure having a width equal to or smaller than about two times a diffusion length of holes; and
a p type semiconductor layer, formed on both sides of said stripe structure so as to be in contact with every quantum well layer in said active layer, for injecting holes into said quantum well layers, said p type semiconductor layer being sufficiently thick on sides of said stripe structure in such a manner that an amount of holes injected into said active layer from both sides of said stripe structure becomes equal to or greater than an amount of injection from other parts.

5,559,821

SEMICONDUCTOR LASER

Tetsuya Yagi, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 28, 1995, Ser. No. 519,703
Claims priority, application Japan, Sep. 2, 1994, 6-209981
Int. Cl.[6] H01S *3/19*
U.S. Cl. 372—46 **8 Claims**



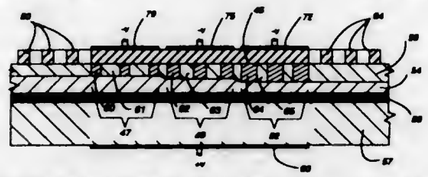
1. A semiconductor laser comprising:
a semiconductor substrate having a surface;
a first conductivity type first cladding layer disposed on the surface of said semiconductor substrate;
an active layer disposed on said first cladding layer;
a second conductivity type second cladding layer disposed on said active layer;
a ridge stripe structure having opposed sides and including part of said second cladding layer and further including, successively disposed, a first contact layer of the second conductivity type disposed on said second cladding layer, a superlattice layer parallel to the surface of said substrate and disposed on said first contact layer, and a second contact layer of the second conductivity type disposed on said superlattice layer; and
a layer including a current blocking layer contacting the sides of said ridge stripe structure.

5,559,822

SILICON QUANTUM DOT LASER

Jacques I. Pankove; Garret R. Moddel, and Kenneth Douglas, all of Boulder, Colo., assignors to The Regents of the University of Colorado, Boulder, Colo.

Filed Jun. 7, 1995, Ser. No. 473,523
Int. Cl.[6] H01S *3/19*
U.S. Cl. 372—50 **16 Claims**



1. Apparatus for producing dynamically varying colors of light comprising:
a plurality of first-sized quantum dots for producing a first color of light,
first controllable stimulating means for selectively causing production of a varying amount of light by said first-sized quantum dots;
a plurality of second-sized quantum dots for producing a second color of light;
second controllable stimulating means for selectively causing production of a varying amount of light by said second-sized quantum dots;
a plurality of third-sized quantum dots for producing a third color of light;

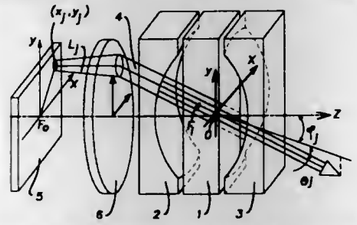
third controllable stimulating means for selectively causing production of a varying amount of light by said third-sized quantum dots; and
means for extracting at least a portion of the first, second, and third colors of light from the apparatus.

5,559,823

LASER WITH CONTROLLABLE BEAM DIRECTION

Serge Valette, Grenoble, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed Jan. 12, 1995, Ser. No. 372,440
Claims priority, application France, Jan. 21, 1994, 94 00645
Int. Cl.[6] H01S *3/08*
U.S. Cl. 372—92 **20 Claims**



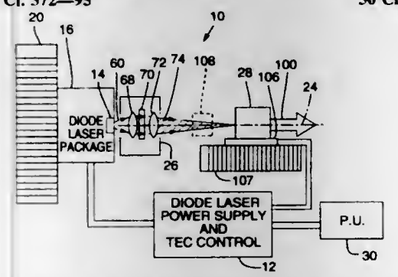
1. Microchip laser comprising: a resonant cavity having a solid amplifier medium, a spherical inlet mirror, and an outlet mirror, means for generating a pumping beam which optically pumps the solid amplifier medium, a saturable absorbent thin film for Q-switching the resonant cavity, said saturable absorbent thin film being disposed in the resonant cavity, and means for varying a direction of the pumping beam in the solid amplifier medium comprising a focusing lens having first and second focal points and being situated in a path of the pumping beam so that the second focal point is approximately merged with a center of curvature of the inlet mirror, the resonant cavity being adapted to generate a laser beam having a direction determined by the direction of the pumping beam.

5,559,824

OPTICAL FREQUENCY-CONVERTING MEDIUM PUMPED BY UNSTABLE RESONATOR SEMICONDUCTOR LASER

Brian Baird, Oregon City, and Richard DeFreez, Hillsboro, both of Oreg., assignors to Electro Scientific Industries, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 873,408, Apr. 24, 1992, Pat. No. 5,317,447. This application May 31, 1994, Ser. No. 251,475
The portion of the term of this patent subsequent to May 31, 2011, has been disclaimed.
Int. Cl.[6] H01S *3/08*
U.S. Cl. 372—95 **50 Claims**



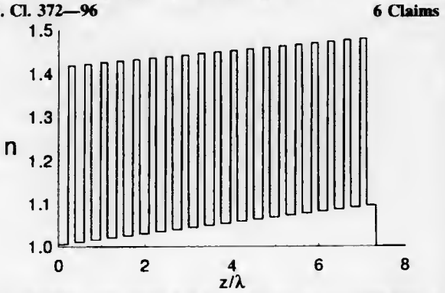
1. A method for generating frequency-converted laser optical output, comprising:
providing an unstable resonator semiconductor laser including a wavelength-selecting grating and a resonator having a length, a virtual point source in a lateral plane, a real point source in a transverse plane, and mirrors with radii of curvatures enclosing the resonator, the resonator length and the mirror radii of curvatures being selected to impart a greater than unity lateral magnification to an optical field propagating within the resonator and to make substantially equal a lateral divergence angle originating from the virtual point source to a transverse divergence angle originating from the real point source;
generating from the unstable resonator semiconductor laser an URSL optical output of greater than 50 mW with a high degree of lateral and transverse spatial coherence; and
coupling the URSL optical output into a frequency-converting medium to convert the URSL optical output to frequency-converted laser optical output.

5,559,825

PHOTONIC BAND EDGE OPTICAL DIODE

Michael Scalora; Jonathan P. Dowling; Charles M. Bowden, all of Huntsville, and Mark J. Bloemer, Athens, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 25, 1995, Ser. No. 431,166
Int. Cl.[6] G02B *1/10*; H01S *3/08*
U.S. Cl. 372—96 **6 Claims**



1. A photonic band edge optical diode, said diode comprising: a plurality of first and second dielectric layers, said first and second dielectric layers having a first and second refractive indices, respectively; said second layers further having varying optical pathlengths and said second refractive index exhibiting an optically nonlinear dependence on the incident light; and said first layers and second layers being arranged in a stack such that they alternate and impart a spatial optical anisotropy to the entire stack, said optical nonlinear dependence and optical anisotropy together causing incident light to be transmitted through the stack predominantly in only one direction.

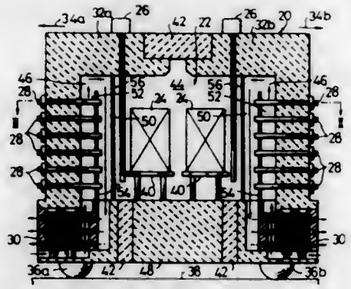
5,559,826

CALCINATION FURNACE

Yasuo Ohtani, Yokohama; Takuo Katabo, Nishimemachi; Makoto Satoh, Nikahomachi; Tsutomu Tanaka, Chiba; Yoshimasa Nose, Funabashi; Kazuyoshi Kobayashi, Nikahomachi; Tetsuhide Uchikawa, Shizuoka-ken, and Toshihiro Hamahata, Sakura, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jun. 21, 1993, Ser. No. 80,570
Claims priority, application Japan, Jun. 23, 1992, 4-188763; Sep. 14, 1992, 4-271216; Oct. 20, 1992, 4-306418
Int. Cl.[6] H05B *3/00*
U.S. Cl. 373—109 **37 Claims**

37. A furnace for accommodating different size products, comprising:



a furnace body in which a furnace chamber is defined, said furnace body including at least one movable section to adjust an internal volume of said furnace chamber;

adjustment means for insertion into the furnace body to fill the void left by movement of the movable section whereby a predetermined internal volume of said furnace chamber is provided; and

a heat source for heating said furnace chamber, including first and second heat source means;

said furnace chamber including a first furnace chamber section for receiving the products, the adjustment means forming a portion of said first furnace chamber, and at least one second furnace chamber partitioned from said first furnace chamber, said first heat source means is provided in said first furnace chamber and transmits heat to said second furnace chamber, and said second heat source means is provided in said second furnace chamber.

5,559,827

VACUUM MELTING-PRESSURE POURING INDUCTION FURNACE

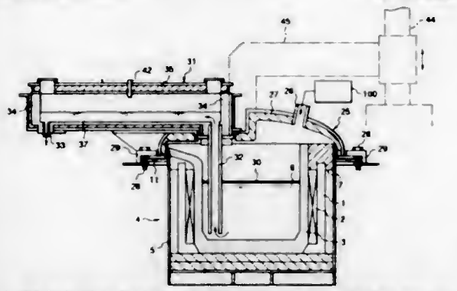
Takashi Shimada; Kenji Kitanaka; Akio Kaneshiro, and Michio Kawasaki, all of Kanagawa-ken, Japan, assignors to Nippon Mining & Metals Co., Ltd., Tokyo, and Fuji Electric Co., Ltd., Kanagawa-ken, both of Japan

Filed Apr. 7, 1995, Ser. No. 418,326

Claims priority, application Japan, Apr. 28, 1994, 6-113879

Int. Cl.[6] F27D *3/00*

U.S. Cl. 373—142 **20 Claims**



1. An induction furnace useful both for vacuum melting and for pressure pouring, comprising an induction melting furnace housed in an air-tight container which is pressurizable to a desired maximum allowable pressure and is evacuatable to a desired level of vacuum pressure; a vacuum melting furnace cover having a vacuum evacuating pipe; and a pressure pouring furnace cover having a pressure piping to impose a pouring pressure, a control device for controlling pressure inside the furnace, and a pouring siphon having a lower end opened to a bottom part within said induction melting furnace and an upper end connected to a pouring chamber having a pouring nozzle, the pouring siphon penetrating through the pressure pouring furnace cover; whereby metal vacuum melted in the induction melting furnace with the air-tight container tightly closed with said vacuum melting furnace cover and vacuum evacuated with the vacuum evacuating pipe is pourable from the pouring nozzle using said pouring siphon by replacing said vacuum melting furnace cover with said pressuring pouring furnace cover and by imposing pressure from the pressure piping to the air-tight container, which has been tightly closed by said pressure pouring furnace cover.

5,559,828

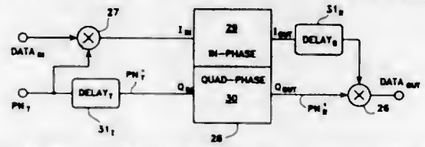
TRANSMITTED REFERENCE SPREAD SPECTRUM COMMUNICATION USING A SINGLE CARRIER WITH TWO MUTUALLY ORTHOGONAL MODULATED BASIS VECTORS

John T. Armstrong, 297 S. Roosevelt Ave., Pasadena, Calif. 91107, and John D. Richert, 460 Avocado Crest Rd., La Habra Heights, Calif. 90631

Continuation-in-part of Ser. No. 246,068, May 16, 1994, abandoned. This application Oct. 18, 1994, Ser. No. 324,844

Int. Cl.[6] H04B *1/69;1/707;* **H04J** *13/02;13/04*

U.S. Cl. 375—200 **29 Claims**



1. A transmitted reference spread spectrum communication process comprising the steps:

providing a wideband reference signal;

providing an original message signal having a first bandwidth;

convolving the reference signal with the original message signal to form an encoded message signal having a respective bandwidth greater than the first bandwidth;

using the reference signal to form a second encoded signal also having a respective bandwidth greater than first bandwidth;

using a predetermined orthogonal relationship to combine at least the encoded message signal and the second encoded signal to thereby form a combined signal;

transmitting the combined signal over a same communication channel thereby making both the encoded message signal add the second encoded signal subject to similar signal path distortion effects;

receiving the combined signal;

using the predetermined orthogonal relationship to extract at least two signal components from the combined signal; and

using a de-convolving process to retrieve the original message signal from said at least two signal components independent of the wideband reference signal.

5,559,829

METHOD OF CONSTRUCTING A SPREADING CODE ASSOCIATED WITH ONE USER OF A DIRECT SEQUENCE CODE DIVISION MULTIPLE ACCESS DIGITAL TRANSMISSION SYSTEM AND CORRESPONDING METHOD OF GENERATING A TABLE

Evelyne Le Strat, Paris, and René Olivier, St Germain de la Grange, both of France, assignors to Alcatel Mobile Communication France, Paris, France

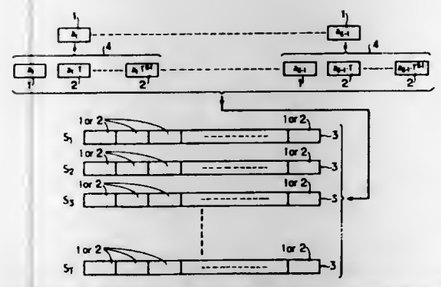
Filed Nov. 9, 1994, Ser. No. 338,114

Claims priority, application France, Nov. 10, 1993, 93 13477

Int. Cl.[6] H04B *1/707;* **H04J** *13/04;* **G06F** *7/58*

U.S. Cl. 375—206 **16 Claims**

1. A method of constructing a spreading code signal associated with one user of a direct sequence code division multiple access digital transmission system, comprising the steps of:



constructing said spreading code signal by performing at least one stage of concatenating a plurality of different sub-codes, including:

at least two cyclically different basic sub-codes belonging to the same family of basic sub-codes; and

at least one secondary sub-code obtained by circular permutation of one of said basic sub-codes; and

designating said spreading code signal as being associated with said one user.

5,559,830

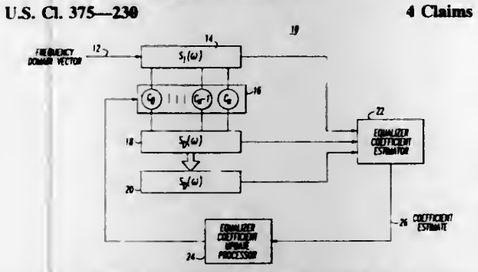
EQUALIZATION SYSTEM FOR AM COMPATIBLE DIGITAL RECEIVER

Mark J. Dapper, Cincinnati; Michael J. Geile, Loveland, and Barry W. Carlin, Greenhills, all of Ohio, assignors to Xetron Corp., Cincinnati, Ohio

Filed Jan. 23, 1995, Ser. No. 376,986

Int. Cl.[6] H03H *7/30*

U.S. Cl. 375—230 **4 Claims**



1. An equalizer for producing an output signal in a receiver provided in an amplitude modulated compatible digital broadcasting system comprising:

a. means for receiving an amplitude modulated compatible digital broadcasting waveform and storing said waveform as a waveform vector in the frequency domain;

b. means for processing said waveform by multiplying said waveform vector by an equalization vector, said equalization vector comprising a plurality of equalizer coefficients, said equalizer coefficients initially set to a predetermined value;

c. means for comparing each location of said processed waveform vector with a stored waveform vector and selecting as the signal that vector location closest to said stored waveform vector; and

d. means for updating said equalizer coefficients using said waveform vector, said processed waveform vector and said stored waveform vector.

5,559,831

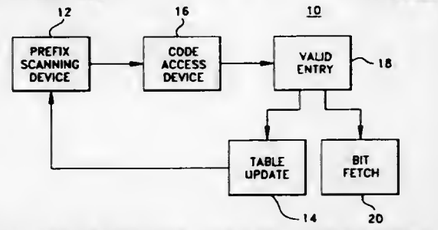
CIRCUITRY FOR DECODING HUFFMAN CODES

Michael Keith, Holland, Pa., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 279,260, Jul. 22, 1994, abandoned, which is a continuation of Ser. No. 173,714, Dec. 23, 1993, abandoned, which is a continuation of Ser. No. 812,418, Dec. 23, 1991, abandoned. This application Oct. 23, 1995, Ser. No. 546,619

Int. Cl.[6] H04B *1/66;* **H03M** *7/40;7/00*

U.S. Cl. 375—240 **11 Claims**



1. A variable-length decoder system for decoding a variable-length code having a plurality of code values representing variable frequency of occurrence data values and a plurality of differing code prefixes in a variable-length encoded input bit stream, comprising:

means for determining a first code prefix of said plurality of differing code prefixes in said variable-length encoded input bit stream; and

first code book means having means for determining whether to select a first number of selected bits to be fetched from said variable-length encoded input bit stream in accordance with said first code prefix or

to select a second code book means, said second code book means having means for determining a second number of selected bits to be fetched from said variable-length encoded input bit stream in accordance with a second code prefix, wherein said second code prefix is determined from said plurality of differing code prefixes in a variable-length encoded input bit stream after the second code book is selected.

5,559,832

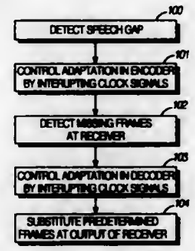
METHOD AND APPARATUS FOR MAINTAINING CONVERGENCE WITHIN AN ADPCM COMMUNICATION SYSTEM DURING DISCONTINUOUS TRANSMISSION

Kevin M. Laird, Haltom City, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 82,632, Jun. 28, 1993, abandoned. This application Mar. 16, 1995, Ser. No. 405,452

Int. Cl.[6] H04R *14/06*

U.S. Cl. 375—244 **13 Claims**



1. A method of maintaiting convergence of an encoder and decoder of an adaptive differential pulse code modulated (ADPCM) communication system during discontinuous transmis-

sion, said method comprising the steps of: detecting, at a transmit-

5,559,838

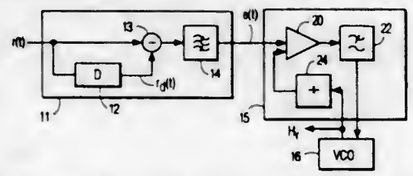
sion, said method comprising the steps of: detecting, at a transmitter having a voice activity detector (VAD), an information gap in a signal to be transmitted; controlling, at the transmitter, an encoder adaptation during the information gap by interrupting a clock of the encoder, the interruption being based, in part, upon an output from the VAD; transmitting an ADPCM signal, having the interruption, from said transmitter; and controlling a decoder adaptation upon receipt of the interruption of the ADPCM signal at a receiver.

5,559,833

TRANSMISSION SYSTEM COMPRISING TIMING RECOVERY

Pascal Hayet, Brunoy, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 19, 1994, Ser. No. 184,626
Claims priority, application France, Jan. 20, 1993, 93 00539
Int. Cl.[6] H04L *27/00;27/06;25/38*
U.S. Cl. 375—259 **10 Claims**



6. A receiver for receiving a digital transmit signal subdivided into frames and formatted in blocks having a block frequency, the blocks being formed by symbols of a constellation, wherein the symbols are coded with a certain timing in accordance with a coded modulation, each block including a first and a second occurrence of an identical information signal at a beginning and an end of each block, respectively, said receiver comprising:

a first generator means for generating a local symbol clock signal, said local symbol clock signal having a first frequency, the first frequency being higher than the block frequency;

a second generator means for generating a difference signal having a second frequency, the second frequency being equal to the block frequency, the difference signal further being generated by a correlation between the first occurrence of the information signal and the second occurrence of the information signal for each block; and

a feedback circuit means coupled to said first generator means and said second generator means for locking the first frequency on to the second frequency, wherein said first generator means further generates the local symbol clock signal at a recovered timing corresponding to the timing of coded modulation symbols contained in the transmit signal.

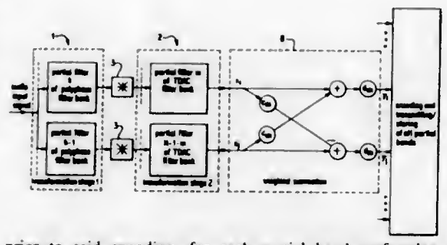
5,559,834

METHOD OF REDUCING CROSSTALK IN PROCESSING OF ACOUSTIC OR OPTICAL SIGNALS

Bernd Edler, Henelingstrasse 10, D-3000 Hanover 21, Germany

PCT No. PCT/DE92/00855, § 371 Date Apr. 15, 1994, § 102(e) Date Apr. 15, 1994, PCT Pub. No. WO93/08482, PCT Pub. Date Apr. 29, 1993
PCT Filed Oct. 6, 1992, Ser. No. 211,769
Claims priority, application Germany, Oct. 17, 1991, 41 34 420.0
Int. Cl.[6] H04K *1/10*
U.S. Cl. 375—260 **12 Claims**

1. Method for reducing frequency crosstalk in processing of digitized input signals, in which input signals are subdivided into partial frequency bands by means of series connected transformation stages, for subsequent encoding, transmission or storage, followed by decoding, the signals from the partial bands being again combined to form a signal, said method comprising the steps of:



prior to said encoding, for each partial band performing a weighted summation of a partial band signal thereof, which signal contains spectral components of specific frequencies as signal components, and other partial band signals from partial bands in which said spectral components of said specific frequencies occur as crosstalk components in a stop range;

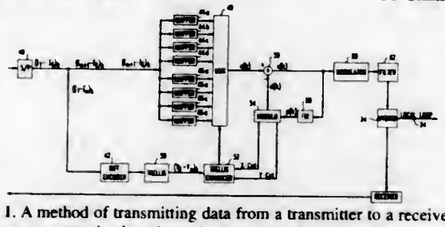
processing the partial band signals by means of an inverse operation to the weighted summation, following decoding.

5,559,835

METHOD AND APPARATUS FOR ENCODING DATA FOR TRANSFER OVER A COMMUNICATION CHANNEL

William L. Betts, St. Petersburg, Fla., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 93,508, Jul. 16, 1993, abandoned. This application Feb. 21, 1995, Ser. No. 391,328
Int. Cl.[6] H04B *15/00*
U.S. Cl. 375—265 **30 Claims**



1. A method of transmitting data from a transmitter to a receiver over a communication channel, comprising the steps of:

generating a first signal using an output from a filter that receives prior transmitted signal points as inputs;

selecting a subset of a predefined signal point constellation based on at least one bit of a data word and a modulo count derived by counting modifications made to an amplitude of said signal, said modifications resulting in said amplitude being between an upper predetermined threshold and a lower predetermined threshold;

selecting a signal point in said subset based on at least one bit of said data word; and

transmitting a second signal representative of said signal point over the communication channel.

5,559,836

KEYED PULSE SENSOR CIRCUIT

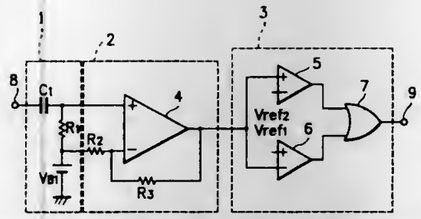
Kazunori Nishijima, Tokyo, Japan, assignor to NEC Corporation, Japan

Continuation of Ser. No. 90,403, Jul. 12, 1993, abandoned. This application Jan. 13, 1995, Ser. No. 372,859
Claims priority, application Japan, Jul. 15, 1992, 4-188034
Int. Cl.[6] H04L *27/06;* **H03K** *5/08*
U.S. Cl. 375—318 **7 Claims**

1. A keyed pulse sensor circuit comprising:

differentiating circuit means for receiving an input pulse signal and producing a differentiation signal therefrom;

dc amplifier means for amplifying the differentiation signal; and



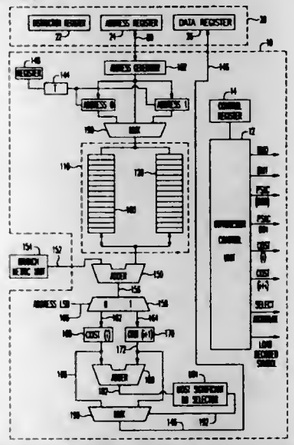
window comparator means for receiving as an input thereto an output signal from said dc amplifier means and setting a central voltage of a blind sector thereof to a dc voltage from said dc amplifier means in a signal-free state where said dc amplifier means is not producing any amplified output.

5,559,837

EFFICIENT UTILIZATION OF PRESENT STATE/NEXT STATE REGISTERS

David M. Blaker, Emmaus; Marc S. Diamondstein, Allentown, both of Pa.; Gregory S. Ellard, Forest Park, England; Mohammad S. Mobin, Whitehall, Pa.; Homayoon Sam, Wescosville, Pa., and Mark E. Thierbach, South Whitehall Township, Lehigh County, Pa., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Division of Ser. No. 153,334, Nov. 16, 1993, Pat. No. 5,465,275. This application Jun. 7, 1995, Ser. No. 488,274
Int. Cl.[6] H04L *27/06*
U.S. Cl. 375—341 **11 Claims**



1. A method of efficiently utilizing memory in determining which next state accumulated cost to retain in a communication system having a portion of memory allocated to a first array and a portion of memory allocated to a second array, the method comprising the steps of:

retrieving a present state accumulated cost from a storage register of a first array;

calculating a next state accumulated cost based on the present state accumulated cost;

storing the next state accumulated cost in a storage register of a second array.; and

designating the second array as containing a present state accumulated cost;

retrieving a present state accumulated cost from a storage register of the second array; and

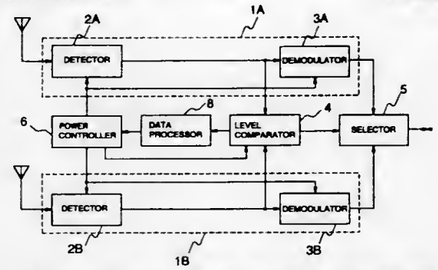
assessing whether the present state accumulated cost is accurate.

5,559,838

DIVERSITY RECEIVING APPARATUS

Arata Nakagoshi, Kokubunji, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 350,023, Nov. 29, 1994. This application Nov. 16, 1995, Ser. No. 558,483
Claims priority, application Japan, Dec. 1, 1993, 5-301441; Dec. 7, 1993, 5-306246
Int. Cl.[6] H04B *7/12;7/26*
U.S. Cl. 375—347 **20 Claims**



1. A diversity receiving apparatus for selecting and extracting a received signal of a good receiving state from a plurality of received signals, comprising:

a plurality of receivers each of which is constructed by a detector for selecting a desired signal from said received signals and a demodulator for demodulating the selected signal;

a level comparator for comparing each received signal level of the signal selected by each of said detectors of said plurality of receivers;

a selector for selecting a demodulated signal from said demodulator of the receiver having the high received signal level on the basis of the comparison result in said level comparator and for outputting the selected demodulated signal; and

a power controller for controlling a power supply to said plurality of receivers and said level comparator,

wherein said power controller supplies electric powers to all of said receivers and said level comparator in accordance with a preset period of the comparison of the received signal levels and continues only the power supply to the receiver having the high received signal level on the basis of the comparison result in said level comparator and stops the power supply to the receivers other than said receiver having the high received signal level and to said level comparator.

5,559,839

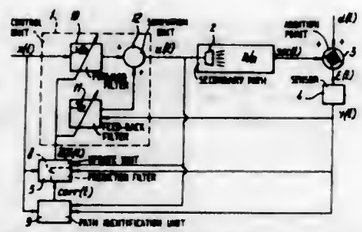
SYSTEM FOR THE GENERATION OF A TIME VARIANT SIGNAL FOR SUPPRESSION OF A PRIMARY SIGNAL WITH MINIMISATION OF A PREDICTION ERROR

Nicolaas J. Doelman, Delft, Netherlands, assignor to Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek TNO, Delft, Netherlands

Filed Nov. 30, 1994, Ser. No. 352,671
Claims priority, application Netherlands, Nov. 30, 1993, 9302076
Int. Cl.[6] H04B *1/10;* **H03H** *7/30*
U.S. Cl. 375—350 **16 Claims**

1. A system for the generation of a time variant signal (sec(t)) for suppression of a primary signal (d(t)) at an addition point (3), comprising:

a control unit (1) provided with at least one digital filter (10, 11), a first control unit input for receiving a reference signal (x(t)), and for providing said reference signal (x(t) to said at least one digital filter, a second control unit input for receiving an update signal (up(t)) for updating coefficients of said at least one digital filter (10, 11) and a control unit output for providing a cancellation control signal (u(t)) in response to an output from said at least one digital filter;



cancellation-generating means (2) which is connected to the output of the control unit (1) for the generation of a cancellation signal to be transmitted through a secondary transfer path having a secondary path transfer function (B/A) corresponding to a certain reaction time, to render said time variant signal (sec(t)) at said addition point (3);

sensor means (4) for measuring a residual signal (e(t)) resulting from adding said time variant signal (sec(t)) and said primary signal (d(t)) at the addition point (3), and for providing an output signal (y(t));

update means (5) provided with a first update means input for receiving said output signal (y(t)), a second update means input for receiving said cancellation control signal (u(t)), and a third update means input for receiving said reference signal (x(t)), which update means is arranged to establish said update signal (up(t)) based on the signals received on said first, second and third update means inputs, said update signal (up(t)) being provided at an update means output,

wherein said update means (5) is provided with a prediction filter (8) which is arranged to calculate a predicted value ($y_{pred}(t)$) based on the signals actually received on said first, second, and third update means inputs such that said predicted value ($y_{pred}(t)$) equals an anticipated, calculated output value of said sensor means (4), calculated under the assumption that said coefficients of said at least one digital filter (10, 11) were already updated in accordance with the signals actually received on said first, second, and third update means inputs and taking into account the secondary path transfer function (B/A), said predicted value ($y_{pred}(t)$) being used by said update means to calculate the update signal (up(t)) to be transmitted to the control unit (1) in accordance with a predetermined algorithm.

5,559,840

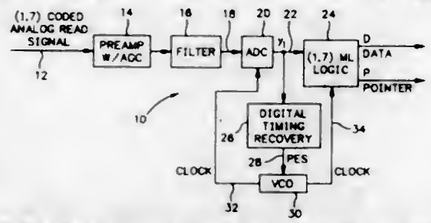
DIGITAL TIMING RECOVERY METHOD AND APPARATUS FOR A CODED DATA CHANNEL

Constantin M. Melas, Los Gatos; Arvind M. Patel, San Jose; Robert A. Rutledge, San Jose, and Bum S. So, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 27, 1994, Ser. No. 312,727

Int. Cl.[6] H04L *7/00*

U.S. Cl. 375—355 **24 Claims**



1. In a signal processing channel for recovering coded binary data from an analog signal having extrema, said channel having clock means for generating a channel clock signal and sampling means for sampling said analog signal to produce a plurality of sequential signal samples $\{S_i\}$ responsive to said channel clock signal, wherein i is an integer, a method for phase-synchronizing said channel clock signal to said analog signal, said method comprising the steps of:

(a) producing a multiplicity of digital signals $\{y_i\}$ representing said sequential signal samples $\{S_i\}$;

b) encoding a predetermined number of said digital signals $\{y_i\}$ to produce a digital detector code d_i having one of at least two values representing whether or not an extremum occurs in said analog signal near the signal sample S_i corresponding to said each digital signal y_i;

(c) producing a digital clock phase error signal (PES) e_i in response to each sequence of three adjacent said detector codes (d_{i-1}, d_i, d_{i+1}); and

(d) adjusting said channel clock signal phase responsive to said digital clock PES e_i.

5,559,841

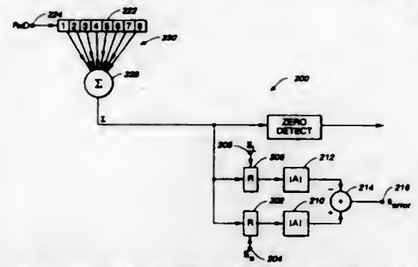
DIGITAL PHASE DETECTOR

Louis Pandula, Sunnyvale, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Jul. 10, 1995, Ser. No. 500,416

Int. Cl.[6] H03D *3/24*

U.S. Cl. 375—375 **21 Claims**



1. An improved early-late gate digital phase detector for use in a digital phase lock loop having a digitally controlled oscillator which includes a state controller and a counter, the digital phase detector, comprising:

a digital integrator, having an input terminal for receiving binary samples of a data stream, where the sample rate of the binary samples is x times the data rate of the data stream, and having an output terminal at which is provided the sum of a number n of binary samples and having a tapped delay line and a parallel summing network;

a first register for sampling and holding the output value of the digital integrator;

a first absolute value function for taking the absolute value of the output value of first register;

a second register for sampling and holding the output value of the digital integrator;

a second absolute value function for taking the absolute value of the output value of the second register;

a subtractor for combining the absolute value of the output value of the first register and the absolute value of the output value of the second register, said subtractor providing an output error signal.

5,559,842

NETWORK-CONTROLLED REFERENCE FREQUENCY GENERATOR

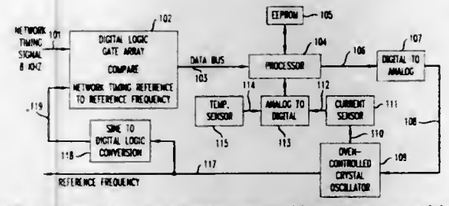
Joel I. Javitt, Hillside, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 30, 1994, Ser. No. 220,351

Int. Cl.[6] H03D *3/24*

U.S. Cl. 375—376 **10 Claims**

1. Apparatus for generating a reference frequency signal in response to an external signal having the desired accuracy but



suffering from outages or impairments, said apparatus comprising an oscillator means having an output signal and an input for receiving a control signal, and feedback means for coupling said control signal to the input of said oscillator means in response to a frequency comparison of said external signal and said output signal of said oscillator means, characterized in that said feedback means includes means responsive to said external signal output signal for developing samples at periodic intervals representing differences in frequency between said external signal and said output signal, means for comparing each one of said samples to an expected value to develop data representing a frequency error, and means responsive to said comparing means and operative upon the developed data for selectively discarding data which represent differences during said outages or impairments and for developing said control signal from data which is not discarded.

5,559,843

DEVICE FOR MOUNTING AND EXTRACTING A LOCKING SLEEVE OF A GUIDE TUBE IN A DISMOUNTABLE END NOZZLE OF A NUCLEAR REACTOR FUEL ASSEMBLY

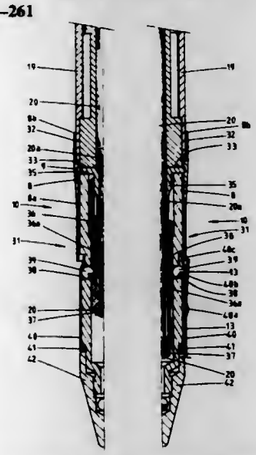
Pierre Amiet, Condrieu, and Serge Roillet, Lyon, both of France, assignors to Framatome, Coupole, and Cogema, Velizy Villacoublay, both of France

Filed Jul. 3, 1995, Ser. No. 498,015

Claims priority, application France, Jul. 7, 1994, 94 08429

Int. Cl.[6] G21C *19/32*

U.S. Cl. 376—261 **11 Claims**



1. Device for mounting and extracting a locking sleeve having an inner groove relative to a guide tube in a dismountable end nozzle of a fuel assembly disposed under water in a storage pool, said end nozzle of said assembly comprising a transverse plate and openings extending through said transverse plate, each opening receiving an end part of a respective guide tube of said assembly, said end part of each guide tube comprising bendable sectors defined by longitudinally extending slots and a radially projecting hooking part and receiving said locking sleeve in said end part of said guide tube for achieving a radial expansion and a hooking of said guide tube by said hooking part thereof in an annular enlargement of said opening of said end nozzle,

said mounting and extracting device comprising a pole for connection in a vertical position to handling and hoisting means disposed over said pool, an actuating rod extending and movable axially in said pole, a lower end part of said pole having a diameter less than the inside diameter of said locking sleeve, a plurality of sleeve-hooking members movably mounted in said lower end part of said pole and having actuating surfaces cooperative with said actuating rod so that said hooking members are shiftable between a retracted position inside said lower part of said pole and a locking sleeve-hooking projecting position of engagement with said inner groove of said locking sleeve when said lower part of said pole is inserted in said locking sleeve, an expansion bush engaged and fixed on said lower part of said pole in a first end part of said bush and comprising longitudinally extending slots defining resiliently bendable strips at least in a second end part of said bush remote from said first end part of said bush, a plurality of balls each mounted to be radially movable in a respective opening in said lower part of said pole and each bearing against a respective bendable strip of said expansion bush, and a cylindrical cam fixed on said actuating rod and bearing against said balls and permitting a displacement of said balls between a retracted position and a position corresponding to an expansion of said bendable strips of said expansion bush to a diameter larger than the outside diameter of said locking sleeve by displacement of said actuating rod.

5,559,844

BINARY COUNTER WITH SPED-UP RIPPLE CARRY

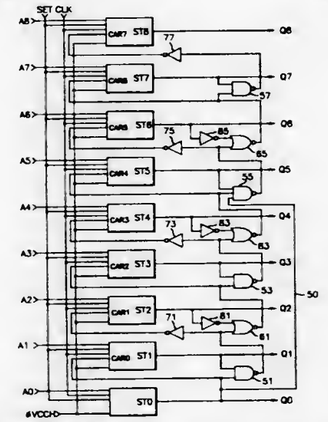
Si-Yeol Lee, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 8, 1994, Ser. No. 337,503

Claims priority, application Rep. of Korea, Nov. 8, 1993, 23598/1993

Int. Cl.[6] H03K *21/00*

U.S. Cl. 377—116 **50 Claims**



1. A counter comprising:

a succession of counter stages, including an earlier counter stage in said succession and a next later counter stage in said succession, said earlier counter stage receiving a respective carry input thereto and supplying a respective output signal therefrom, said next later counter stage in said succession receiving a respective carry input thereto and supplying a respective output signal and a respective complemented output signal therefrom;

an earlier carry generation circuit for supplying said carry input to said next later counter stage in said succession, said earlier carry generation circuit including

a NAND gate for generating a NAND gate response responsive to said carry input to said earlier counter stage and responsive to said output signal from said earlier counter stage and

a logic inverter for converting said NAND gate response to an AND response to said carry input to said earlier counter stage and said output signal from said earlier counter stage, for application with neither modification nor further delay as said respective carry input to said next later counter stage; and

a next later carry generation circuit for supplying a carry output applied with neither modification nor further delay to said next later counter stage as its said carry input, said next later carry generation circuit including

a NOR gate for generating said carry output as a NOR gate response responsive to said NAND gate response and to said complemented output signal from said next later counter stage.

5,559,845

COMPUTED TOMOGRAPHY APPARATUS WITH A ROTATING ANODE X-RAY TUBE AND METHOD FOR OPERATING SAME

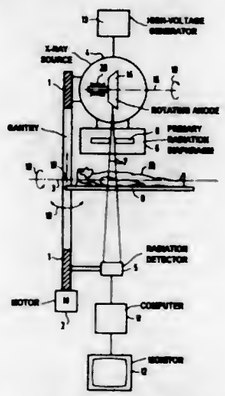
Wolfgang Strob, Neunkettelsau, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 20, 1995, Ser. No. 531,278

Claims priority, application Germany, Dec. 1, 1994, 44 42 854.5

Int. Cl.[6] A61B 6/03

U.S. Cl. 378—4 **2 Claims**



2. A method for operating a computed tomography apparatus comprising:

generating an x-ray beam from an x-ray tube having a rotating anode disposed therein while rotating said anode in a first rotational direction;

disposing a patient in said x-ray beam;

detecting said x-ray beam, after attenuation thereof by said patient, with an x-ray detector and generating electrical signals corresponding to the attenuated x-ray beam;

rotating said x-ray tube and said x-ray detector around said examination subject, for conducting a scan of said subject, in a second rotational direction, opposite to said first rotational direction; and

reconstructing and displaying an image of a slice of said examination subject from said electrical signals.

5,559,846

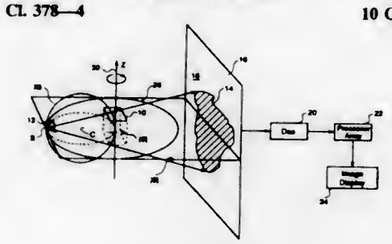
TECHNIQUE FOR IMPROVING PROCESSOR EFFICIENCY IN CT IMAGING

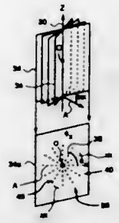
Kwok C. Tam, Edison, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 22, 1995, Ser. No. 532,063

Int. Cl.[6] A61B 6/03

U.S. Cl. 378—4 **10 Claims**





1. In an arrangement for CT imaging of an object, wherein a cone beam X-ray source traverses a scan path to acquire line integral data at a plurality of view positions, and wherein a set of Radon data points in Radon space is associated with the arrangement, it being necessary to compute the Radon derivative for each Radon data point in order to construct an image of the object, a method for computing at least a portion of the said Radon derivatives comprising the steps of:

providing said arrangement with a specified number of processors, said specified number being greater than one;

partitioning said Radon space with a number of coaxial planes which are separated from one another by an angle equal to π divided by said specified number;

selecting a set of view positions from said plurality, the view positions in said set likewise being separated from one another by an angle equal to π divided by said specified number;

projecting each of said view positions in said view position set into a different one of said planes to define subsets of Radon data points respectively corresponding to said planes and to said processors; and

operating said processors in substantially simultaneous relationship to compute the Radon derivatives for the Radon data points of their respectively corresponding subsets.

5,559,847

SYSTEMS, METHODS AND APPARATUS FOR RECONSTRUCTING IMAGES IN A CT SYSTEM IMPLEMENTING A HELICAL SCAN

Hui Hu, Waukesha, Wis., and Norbert J. Pelc, Los Altos, Calif., assignors to General Electric Company, Milwaukee, Wis.

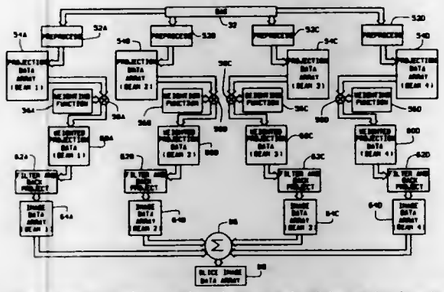
Filed Dec. 6, 1995, Ser. No. 567,922

Int. Cl.[6] A61B 6/03

U.S. Cl. 378—4 **18 Claims**

7. A method for producing a tomographic image of an object from projection data acquired from a four row detector array in a helical scan, said method comprising the steps of:

(a) creating projection data arrays corresponding to the data obtained from each of the x-ray fan beams;



(b) applying a weighting function to each of the projection data arrays generated in step (a) to generate respective weighted projection data arrays, the weighting factors to be applied for each data set, denoted as $W1(\beta,\gamma)$, $W2(\beta,\gamma)$, $W3(\beta,\gamma)$ and $W4(\beta,\gamma)$, being:

$$W1(\beta,\gamma)=\begin{cases}0 & \beta \leqq \beta 2_- \\ \dfrac{\beta-\beta 2_-}{\beta 1-\beta 2_-^{\alpha(x_1)}} & \beta 2_- < \beta 1 \leqq \beta 1 \\ \dfrac{\beta-\beta 3_-}{\beta 1-\beta 3_-^{\alpha(x_1)}} & \beta 1 < \beta < \beta 3_- \\ 0 & \beta \geqq \beta 3_-\end{cases}$$

$$W2(\beta,\gamma)=\begin{cases}0 & \beta \leqq \beta 3_- \\ \dfrac{\beta-\beta 3_-}{\beta 2-\beta 3_-} & \beta 3_- < \beta \leqq \beta 2 \\ w2_1(\beta,\gamma)+w2_2(\beta, & \beta 2 < \beta < \beta_M \\ 0 & \beta \geqq \beta_M\end{cases}$$

where:

$$W2_1(\beta,\gamma)=\begin{cases}0 & \beta \leqq \beta 2 \\ \dfrac{\beta-\beta 1_+}{\beta 2-\beta 1_+^{\alpha(x_2)}} & \beta 2 < \beta < \beta 1_+ \\ 0 & \beta \geqq \beta 1_+\end{cases}$$

$$W2_2(\beta,\gamma)=\begin{cases}0 & \beta \leqq \beta 2 \\ \dfrac{\beta-\beta 4_-}{\beta 2-\beta 4_-^{[1-\alpha(x_2)]}} & \beta 2 < \beta < \beta 4_- \\ 0 & \beta \geqq \beta 4_-\end{cases}$$

$$W3(\beta,\gamma)=\begin{cases}0 & \beta \leqq \beta_m \\ w3_1(\beta,\gamma)+w3_2(\beta,\gamma) & \beta_m < \beta < \beta 3 \\ \dfrac{\beta-\beta 2_+}{\beta 3-\beta 2_+} & \beta 3 \leqq \beta < \beta 2_+ \\ 0 & \beta \geqq \beta 2_+\end{cases}$$

where:

$$W3_1(\beta,\gamma)=\begin{cases}0 & \beta \leqq \beta 1_+ \\ \dfrac{\beta-\beta 1_+}{\beta 3-\beta 1_+^{\alpha(x_2)}} & \beta 1_+ < \beta < \beta 3 \\ 0 & \beta \geqq \beta 3\end{cases}$$

$$W3_2(\beta,\gamma)=\begin{cases}0 & \beta \leqq \beta 4_- \\ \dfrac{\beta-\beta 4_-}{\beta 3-\beta 4_-^{[1-\alpha(x_2)]}} & \beta 4_- < \beta < \beta 3 \\ 0 & \beta \geqq \beta 3\end{cases}$$

-continued

$$W4(\beta,\gamma)=\begin{cases}0 & \beta \leqq \beta 2_+ \\ \dfrac{\beta-\beta 2_+}{\beta 4-\beta 2_+^{[1-\alpha(x_3)]}} & \beta 2_+ < \beta \leqq \beta 4 \\ \dfrac{\beta-\beta 3_+}{\beta 4-\beta 3_+^{[1-\alpha(x_3)]}} & \beta 4 < \beta < \beta 3_+ \\ 0 & \beta \geqq \beta 3_+\end{cases}$$

where:

$$\alpha(\beta,\gamma)=\alpha[x(\beta,\gamma)]=3x^2(\beta,\gamma)-2x^3(\beta,\gamma)$$

and where:

$$x_1=\frac{\beta-\beta 2_-}{\beta 3_- - \beta 2_-} \qquad x_2=\frac{\beta-\beta 2}{\beta 3-\beta 2} \qquad x_3=\frac{\beta-\beta 2_+}{\beta 3_+ - \beta 2_+}$$

(c) from the projection data arrays generated in step (b), generating image data arrays to be used to construct a slice image.

16. A volumetric computed tomography apparatus, comprising:

(a) a gantry having an x-ray source and a multi-row detector;

(b) a data acquisition system coupled to said detector; and

(c) a processor coupled to said data acquisition system, said processor configured to estimate, for a location z_0, projection data $P_{z0}(\beta,\gamma)$ using projection data measured by said detector rows at locations z_1 and z_2, said processor programmed to estimate the projection data $P_{z0}(\beta,\gamma)$ using the relationship:

$$P(\theta,\gamma,z_0)=\frac{\sum_i [w(z_i-z_0)P(\theta,\gamma,z_i)]}{\sum_i w(z_i-z_0)}.$$

5,559,848

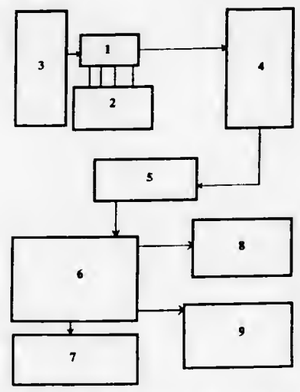
IMAGING SYSTEM FOR PLASTIC COMPONENTS

Theresa A. Collins, Park Ridge, Ill., assignor to Wesley-Jessen Corporation, Des Plaines, Ill.

Filed Aug. 16, 1994, Ser. No. 291,219

Int. Cl.[6] G01B 15/06

U.S. Cl. 378—58 **9 Claims**



1. A process for imaging a contact lens casting cup assembly which comprises transmitting x-rays through the contact lens casting cup assembly and then onto an image sensing means.

5,559,849

X-RAY DEVICE

attenuated by said subject, is present, and having an output screen at which an optical image corresponding to said x-ray

5,559,852

ROTARY-ANODE X-RAY TUBE COMPRISING A SLEEVE

5,559,854

SUBSCRIBER'S LINE TESTING APPARATUS

5,559,849

X-RAY DEVICE

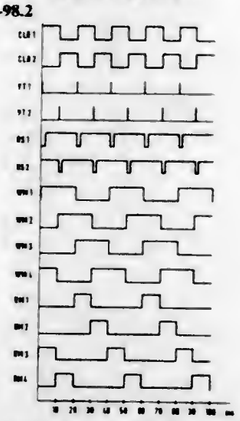
Antonius J. C. Bruijns, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 16, 1995, Ser. No. 405,061

Claims priority, application European Pat. Off., Mar. 17, 1994, 94200686

Int. Cl.[6] H05G *1/64*

U.S. Cl. 378—98.2 **10 Claims**



1. An X-ray device for producing X-ray images in cine mode, comprising an X-ray tube and an image intensifier/pick-up chain, including an X-ray image intensifier, an image pick-up system with at least a first and a second image sensor, an image processing system, and an optical beam splitter which is arranged between the image intensifier and the image pick-up system in order to image an exit screen of the image intensifier on the image sensors, characterized in that the image pick-up system comprises a control circuit for alternatively sensitizing the image sensors to receive successive fields of image information at alternative image sensors and for interleaving the fields of image information received by the image sensors to produce X-ray images in cine mode at an image field rate higher than the image field rate at which each one of the image sensors is receiving image information.

5,559,850

X-RAY DIAGNOSTICS INSTALLATION

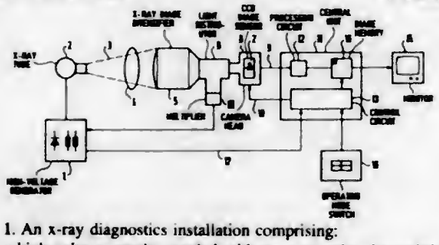
Anton Nekovar, Neunkirchen, and Andreas Meyer, Bubenreuth, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 289,210, Aug. 12, 1994, abandoned. This application Oct. 11, 1995, Ser. No. 541,118

Claims priority, application Germany, Sep. 10, 1993, 43 30 784.1

Int. Cl.[6] H05G *1/64*

U.S. Cl. 378—98.8 **5 Claims**



1. An x-ray diagnostics installation comprising:

a high-voltage supply coupled with an x-ray tube, for emitting an x-ray beam directed at a subject;

an x-ray image intensifier having an input screen on which an x-ray image, corresponding to x-rays from said x-ray tube attenuated by said subject, is present, and having an output screen at which an optical image corresponding to said x-ray image is present;

a video camera having a CCD image sensor coupled to said output screen of said x-ray image intensifier, said CCD image sensor having a control input supplied with a read-out clock signal for causing read-out of said CCD image sensor;

means for activating said x-ray tube to emit said x-ray beam and for generating an activation signal as long as said x-ray tube is activated; and

said video camera including control means, connected to said control input of said CCD image sensor and connected to receive said activation signal indicating when said x-ray generator is activated, for generating a sensor control signal for interrupting said read-out clock after a beginning of said activation signal and starting said read-out clock after an ending of said activation signal, for asynchronously controlling said read-out clock relative to activation of said x-ray tube.

5,559,851

X-RAY DIAGNOSTIC INSTALLATION HAVING A SCATTERED RADIATION GRID MOVEABLE IN A PLANE

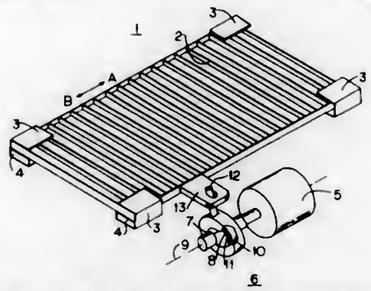
Thomas Schmitt, Forchheim, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 18, 1995, Ser. No. 374,027

Claims priority, application Germany, Jan. 24, 1994, 44 01 939.4

Int. Cl.[6] G01N *23/04*

U.S. Cl. 378—155 **8 Claims**



1. In an x-ray diagnostic apparatus having a scattered radiation grid, the improvement of means for reciprocatingly moving said scattered radiation grid comprising:

drive means having a drive shaft which rotates around a longitudinal axis;

a single wobble element mounted on said drive shaft for corotation therewith, said wobble element having an exterior surface with a single channel therein disposed in a plane oriented obliquely relative to said longitudinal axis; and

non-articulated means mechanically interconnected between said single channel and said scattered radiation grid for following said single channel as said single wobble element is rotated converting rotational motion of said drive shaft into reciprocating motion of said scattered radiation grid in first and second directions with short standstill times of said radiation grid when changing between said first and second directions of movement.

5,559,852

ROTARY-ANODE X-RAY TUBE COMPRISING A SLEEVE BEARING

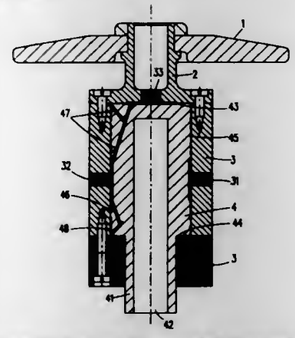
Axel Vetter, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 2, 1995, Ser. No. 382,765

Claims priority, application Germany, Feb. 2, 1994, 44 03 116.5

Int. Cl.[6] H01J *35/10*

U.S. Cl. 378—133 **11 Claims**



1. A rotary-anode X-ray tube comprising portions with a vacuum space, portions outside a vacuum space and a sleeve bearing therebetween, said sleeve bearing having a stationary bearing portion and a rotatable bearing portion, one of the facing surfaces of which is provided with a groove pattern, between the two bearing portions there being formed a bearing gap which is filled with a lubricant at least at the area of the groove pattern, characterized in that a filter member which cannot be wetted by the lubricant extends from the bearing gap through one of the two bearing portions to the vacuum space, said filter member being provided in an area outside the groove pattern, the bearing gap communicating with the vacuum space of the X-ray tube directly through said filter member via a plurality of passageways extending through said filter member, said passageways having a size too small for passage of said lubricant therethrough but sufficiently large in size to allow passage of gas therethrough.

5,559,853

X-RAY EXAMINATION APPARATUS COMPRISING A FILTER

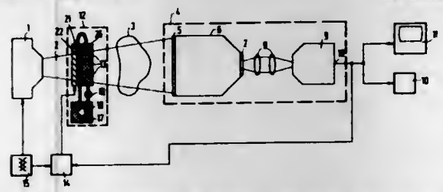
Petrus W. J. Linders; Marcel R. Böhmer, and Michael J. M. J. Severens, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 3, 1995, Ser. No. 497,964

Claims priority, application European Pat. Off., Jun. 30, 1994, 94201884.7

Int. Cl.[6] G21K *3/00*

U.S. Cl. 378—159 **20 Claims**



1. An X-ray examination apparatus, comprising a filter which is arranged between an X-ray source and an X-ray detector and which comprises filter members having an adjustable X-ray absorptivity, characterized in that the filter comprises X-ray absorbing bodies which can be influenced by an electric field adjusted by means of an adjusting circuit.

5,559,854

SUBSCRIBER'S LINE TESTING APPARATUS

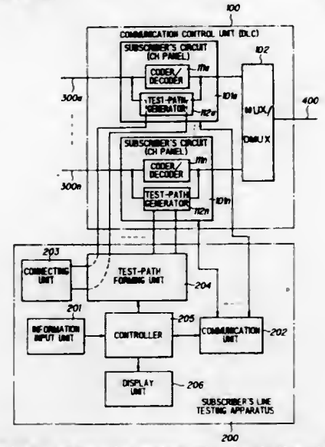
Yasuo Suzuki, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

Filed Mar. 3, 1994, Ser. No. 205,418

Claims priority, application Japan, Sep. 20, 1993, 5-232676

Int. Cl.[6] H04M *1/24*

U.S. Cl. 379—27 **10 Claims**



1. A testing apparatus for testing subscriber's lines in combination with a communication control unit of a communication system having a plurality of subscriber's lines and at least one digital transmission line wherein the communication control unit is positioned between the plurality of subscriber's lines and the digital transmission line and is configured for A/D-converting analog signals which enter from the plurality of subscriber's lines, into digital signals, subjecting the digital signals to time-shared multiplexing and sending the multiplexed digital signals to the digital transmission line, demultiplexing a time-shared multiplexed digital signal which has entered from the digital transmission line, D/A-converting the demultiplexed digital signal into an analog signal and sending the analog signal to a prescribed subscriber's line, the combination comprising:

said communication control unit including a plurality of subscriber's circuits each connected to a respective subscriber's line;

an information input unit in said testing apparatus for entering identifying information for specifying a subscriber's circuit to be tested in correspondence with a respective subscriber's line and test-path specifying information for each subscriber's circuit,

each subscriber' circuit including a coder/decoder for performing the A/D conversion and the D/A conversion, and a test path generator for establishing on a side of the communication control unit a predetermined test path specified by the test-path specifying information;

a communication unit, connected to said information input unit, for sending the test-path specifying information to a specified subscriber's circuit of said communication control unit;

at least one testing unit for applying a test signal to the testing apparatus, said testing unit outputting said test signal to said test path for sending said test signal to the specified subscriber's circuit and receiving therefrom an answer signal generated in response to said test signal for verifying said test path;

a connecting unit for connecting said testing unit to the testing apparatus; and

a test-path forming unit connected between said connecting unit and the communication control unit to input said test signal to said test-path generator of said specified subscriber's circuit to establish a test path on a side of the testing apparatus from an output of said testing unit to an input of said testing unit via said test path on the side of the communication control unit to enable outputting of said test signal into said test path on the

side of the communication control unit and inputting of said

a first database means coupled to the switching network for

5,559,859

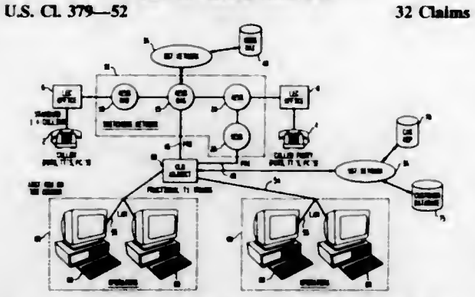
side of the communication control unit and inputting of said answer signal into said testing unit.

5,559,855

SYSTEM AND METHOD FOR RECOGNIZING AND ROUTING TELEPHONE CALLS INVOLVING HEARING OR SPEECH IMPAIRED PERSONS

Jac P. Dowens, Red Bank, and Elvis Hernandez, Union City, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Nov. 29, 1994, Ser. No. 346,055
Int. Cl.[6] H04M *11/00;3/42*
U.S. Cl. 379—52 **32 Claims**



1. A system for recognizing and routing telephone call activity involving a hearing or speech impaired person, comprising:

a switching network having one or more switches for mounting telephone call activity, said telephone call activity having been initiated by a caller dialing a three digit prefix together with a called party number;

wherein said three digit prefix indicates that one of the parties involved in said telephone call activity is hearing or speech impaired;

the switching network coupled to an originating telephone call location and a destination telephone call location;

a first database means coupled to the switching network for analyzing origination and destination information associated with the telephone call activity so as to retrieve a profile of the hearing or speech impaired person involved in said telephone call activity;

a signaling network coupling the switching network with the first database means for transmitting the origination and destination information from said switching network to said first database means, and for transmitting said profile from said database means to said switching network;

an adjunct coupled to the switching network for controlling routing of the telephone call activity in the system;

a first interface for routing the telephone call activity, including said profile, from the switching network to the adjunct in response to the dialing of said three digit prefix by said caller; and

a relay center operably connected to the adjunct for servicing said telephone call activity when a hearing or speech impaired person is involved.

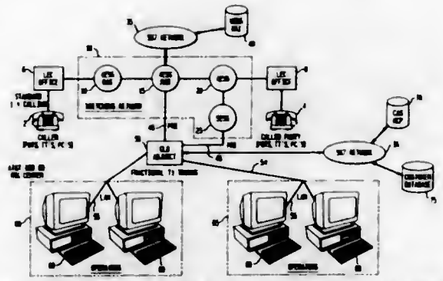
5,559,856

SYSTEM AND METHOD FOR RECOGNIZING AND ROUTING TELEPHONE CALLS INVOLVING HEARING OR SPEECH IMPAIRED PERSONS

Jac P. Dowens, Red Bank, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Nov. 29, 1994, Ser. No. 346,056
Int. Cl.[6] H04M *11/00;3/42*
U.S. Cl. 379—52 **14 Claims**

1. A system for recognizing and routing telephone call activity involving a hearing or speech impaired person, comprising:



a switching network having one or more switches for routing telephone call activity, said telephone call activity having been initiated by a caller using 1+ calling;

the switching network coupled to an originating telephone call location and a destination telephone call location;

said switching network including a means for analyzing origination and destination information associated with the telephone call activity to detect when the telephone call activity involves a hearing or speech impaired person;

an adjunct coupled to the switching network for controlling routing of the telephone call activity in the system;

an interface for routing the telephone call activity from the switching network to the adjunct when the switching network detects that one of the parties involved in said telephone call activity is hearing or speech impaired; and

a relay center operably connected to the adjunct for servicing the telephone call activity when a hearing or speech impaired person is involved.

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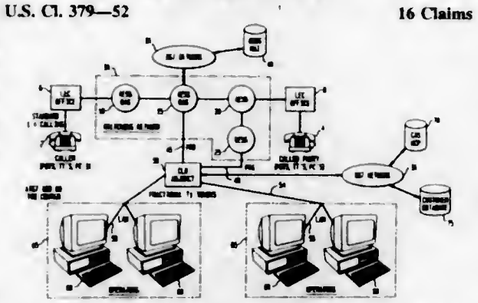
SYSTEM AND METHOD FOR RECOGNIZING AND ROUTING TELEPHONE CALLS INVOLVING HEARING OR SPEECH IMPAIRED PERSONS

Jac P. Dowens, Red Bank, N.J., assignor to Lucent Technology Inc., Murray Hill, N.J.

Filed Nov. 29, 1994, Ser. No. 346,106
Int. Cl.[6] H04M *11/00;3/42*
U.S. Cl. 379—52 **16 Claims**



1. A system for recognizing and routing telephone call activity involving a hearing or speech impaired person, comprising:

a switching network having one or more switches for routing telephone call activity, said telephone call activity having been initiated by a caller using 1+ calling;

the switching network coupled to an originating telephone call location and a destination telephone call location;

a first database means coupled to the switching network for analyzing origination and destination information associated with the telephone call activity so as to retrieve a profile of the parties involved in said telephone call activity;

a signaling network coupling the switching network with the first database means for transmitting the origination and destination information from said switching network to said first database means, and for transmitting said profile from said database means to said switching network;

an adjunct coupled to the switching network for controlling routing of the telephone call activity in the system;

a first interface for routing the calling activity from the switching network to the adjunct in response to said profile indicating that one of the parties involved in said telephone call activity is hearing or speech impaired; and

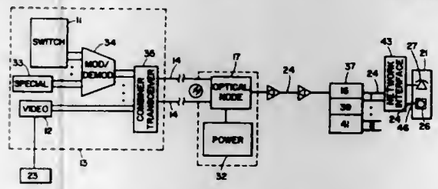
a relay center operably connected to the adjunct for servicing the telephone call activity when a hearing or speech impaired person is involved.

5,559,858

METHOD AND APPARATUS FOR DELIVERING SECURED TELEPHONY SERVICE IN A HYDRID COAXIAL CABLE NETWORK

Gregory J. Beveridge, Thornton, Colo., assignor to U S West Advanced Technologies, Inc., Boulder, Colo.

Continuation of Ser. No. 357,558, Dec. 16, 1994, Pat. No. 5,469,495, which is a continuation of Ser. No. 69,227, May 28, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 467,343
Int. Cl.[6] H04M *11/00*
U.S. Cl. 379—56 **6 Claims**



1. A method for segregating telephony services and telephony special services in a logical bus network, operating in the frequency domain, said network including a central office and a transport system connected to said central office, said central office including a telephony switch and special service equipment, said transport system including a fiber optic system and a coaxial cable system connected to said fiber optic system, said method comprising the steps of:

dedicating at least one line card in said network to a subscriber;

assigning a frequency pair to said line card, said frequency pair corresponding to one of said services;

transmitting a signal including said frequency pair to and from said central office;

recognizing said frequency pair as indicative of a telephony service or a telephony special service; and

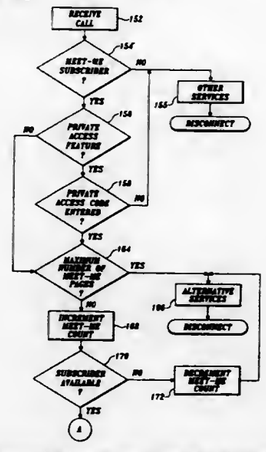
routing a recognized telephony service to said switch and routing a recognized telephony special service to said special services equipment.

5,559,859

PAGING SYSTEM THAT ALLOWS CALLER/SUBSCRIBER INTERCONNECTION

Susan W. S. Dai, Richmond; Donald W. Gayton; Brian G. Laird, both of Vancouver; Randy T. Tkatch, Burnaby, all of Canada; Sonny Bettis, Lawrenceville, Ga.; Marc Fitzhugh, Alpharetta, Ga.; Shandton Williams, Atlanta, Ga.; Phillip Lowman, Ellijay, Ga., and Julio Gonzalez, Tucker, Ga., assignors to Glenayre Electronics, Inc., Charlotte, N.C.

Continuation-in-part of Ser. No. 848,413, Mar. 6, 1992, Pat. No. 5,307,399. This application Mar. 10, 1995, Ser. No. 302,682
Int. Cl.[6] H04Q *7/38*
U.S. Cl. 379—51 **8 Claims**



1. A telecommunications system capable of receiving telephone calls for meet-me page subscribers and telephone calls for non-meet-me page subscribers from a publicly switched telephone network, wherein the subscribers are provided with portable page receivers, comprising:

a paging system including a first processing circuit connected to the publicly switched telephone network for receiving telephone calls to the non-meet-me page subscribers, which, in response to the telephone calls, generates page requests; a second processing circuit connected to said first processing circuit for receiving said page requests, which, in response to said page requests, forms one of pages or page messages according to a time of the day at which the page requests are received and selectively forwards said one of pages or page messages to one of a plurality of terminal devices;

a meet-me unit connected to the publicly switched telephone network for receiving telephone calls to the meet-me page subscribers and for receiving telephone calls from the meet me page subscribers, wherein said meet-me unit is capable of distinguishing between calls to the meet-me page subscribers and calls from the meet-me page subscribers and in response to an incoming call for a specific meet-me page subscriber, generates a meet-me page request and parks the incoming call, said meet-me unit including means for generating a ring signal to a caller for a predefined time interval while said incoming call is parked, so that a caller is at least initially unaware that a meet-me page request has been generated and wherein said meet-me unit is further connected to said paging systems second processing circuit for forwarding said meet-me page request thereto; and

call connection circuitry integral with said meet-me unit for determining from which meet-me page subscriber that said meet-me page subscriber call has been received, determining if said parked call is for the calling meet-me page subscriber; and, if said parked call is for the calling meet-me page subscriber, establishing a single link between said parked call and the call from the meet-me page subscriber, said caller being connected in communication with the calling meet-me

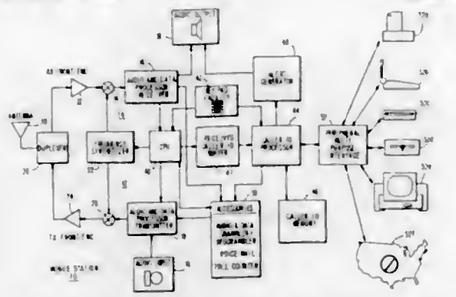
page subscriber without being informed that the calling meet-me page subscriber has been paged if the signal link is established within said predefined time interval.

5,559,860

USER SELECTABLE RESPONSE TO AN INCOMING CALL AT A MOBILE STATION

Semyon Mizikovsky, Union, N.J., assignor to Sony Corporation, Tokyo, Japan, and Sony Electronics, Inc., Park Ridge, N.J.

Filed Jun. 11, 1992, Ser. No. 897,046
Int. Cl.[6] H04Q *7/20*
U.S. Cl. 379—58 **7 Claims**



1. Apparatus for selectively answering an incoming call transmitted from a cellular telephone base station to a mobile station, the incoming call including the telephone number of a calling party, said apparatus comprising, as integral parts of said mobile station:

processor means operable by a user of said mobile station to select telephone numbers representing particular calling parties and to assign predetermined response categories to said particular calling parties;

memory means for storing the selected telephone numbers along with data representing the response categories to which the respective calling parties have been assigned;

means for comparing the telephone number of the calling party which placed the incoming call with the telephone numbers stored in said memory means so as to identify the particular calling party from which the incoming call is being received;

means responsive to said data representing the response category to which the identified calling party has been assigned for initiating a respective one of plural predetermined types of responses to incoming calls as determined by said response categories, said predetermined types of responses including a distinctive ringing indicator to identify a high priority incoming call, a distinctive ringing indicator to identify a long distance incoming call, a muted ringing alert, whereby said user is not informed of the receipt at said mobile station of an incoming call, and a transmitted audio message from a speaker, without user intervention, to identify an incoming call, which speaker is an integral part of the mobile station;

a voice recorder operable to receive said incoming call and selectively actuable to record voice messages received by said mobile station from the calling party;

scrambling means selectively actuable to enable scrambled communication between said mobile station and the calling party;

a facsimile device selectively actuable to receive and display facsimile information received from the calling party, print indicia derived from said facsimile information, and transmit facsimile information to the calling party; and

a data modem selectively actuable to communicate data between said mobile station and the calling party,

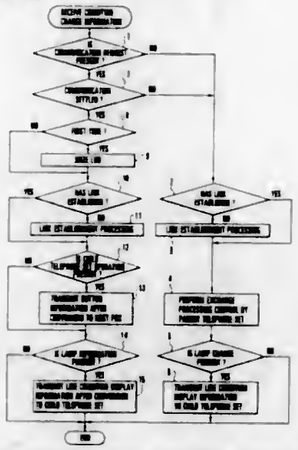
wherein said predetermined types of responses include the activation of said voice recorder, said scrambling means, said facsimile device or said data modem to receive the incoming call from the calling party to which a predetermined response category has been assigned.

5,559,861

BUTTON TELEPHONE SYSTEM WHICH DISPLAYS LINE STATUS INFORMATION

Yoshihiro Takehisa, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 24, 1994, Ser. No. 264,908
Claims priority, application Japan, Jul. 12, 1993, 5-171412
Int. Cl.[6] H04Q *7/20;7/26*
U.S. Cl. 379—58 **11 Claims**



1. A button telephone system comprising a parent telephone set provided with an exchange function, and a child telephone set, said parent telephone set being connected to a public telephone line through a channel line and being connected to a host private branch exchange through said channel line and a data communication line,

said parent telephone set including:

a public telephone interface section having a line control means for transmitting a second voice signal, which is transmitted from said child telephone set, to said public telephone line or an extension telephone line of said host private branch exchange through said channel line, and a first communication control means for performing data communication with said host private branch exchange through said data communication line;

second communication control means for performing radio communication with said child telephone set by modulating a first voice signal, which is transmitted from said public telephone line or said extension telephone line of said host private branch exchange through said channel line, by modulating a first control data into a first radio wave to transmit said first radio wave to said child telephone set, and by receiving a second radio wave, which is transmitted from said child telephone set, to demodulate a second control data and said second voice signal from said second radio wave;

a channel switch provided between said line control means and said second communication control means, for connecting and releasing a voice channel between said public telephone interface section and said second communication control means; and

line condition display conversion means for converting an external telephone line condition signal into a line condition display signal which is transmitted to said child telephone set, said external telephone line condition signal being transmitted from said host private branch exchange through said data communication line and said first communication control means;

wherein when communication request data are transmitted from said host private branch exchange to said first communication control means through said data communication line, said parent telephone set enters a mode in which said parent telephone set operates as an extension telephone terminal of said host private branch exchange, and said second communication control means modulates said line condition display signal into said first radio wave to transmit the modulated first radio wave to said child telephone set, and

said child telephone set including:

line condition display means;

child telephone set control means for controlling said line condition display means to display a line condition in accordance with said line condition display signal transmitted from said parent telephone set; and

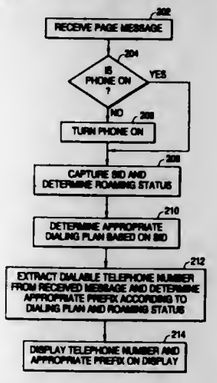
an operation button used for operating said child telephone set.

5,559,862

MOBILE PAGING TELEPHONE CALL BACK SYSTEM AND METHOD

Jai P. Bhagat, Jackson; Ernest A. Oswalt, Raymond, and William D. Hays, Jackson, all of Miss., assignors to Mobile Telecommunication Technologies, Jackson, Miss.

Filed Sep. 2, 1994, Ser. No. 299,891
Int. Cl.[6] H04Q *7/38*
U.S. Cl. 379—58 **20 Claims**



7. A method of receiving a page message containing a call back number on a mobile paging telephone call back device, comprising the steps of:

receiving an incoming message at the mobile paging telephone call back device;

extracting a call back number from the received message;

receiving a system identification number (SID) at the mobile paging telephone call back device;

determining a roaming status of the mobile paging telephone call back device;

determining an appropriate dialing plan based on the received SID; and

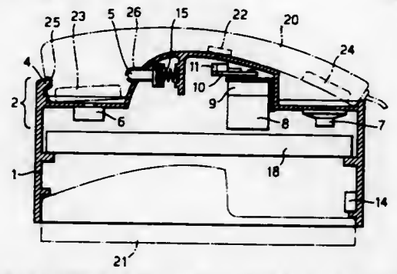
determining a prefix for the call back number based on the appropriate dialing plan and roaming status of the mobile paging telephone call back device.

5,559,863

CAR TELEPHONE ACCESSORY DEVICE WITH TELEPHONE ANSWERING FUNCTION

Kazuo Hashimoto, Tokyo, Japan, assignor to Hashimoto Corporation, Tokyo, Japan

Filed Dec. 22, 1994, Ser. No. 361,420
Claims priority, application Japan, Dec. 28, 1993, 5-348943
Int. Cl.[6] H04M *1/64*
U.S. Cl. 379—58 **7 Claims**



1. A car telephone accessory device with telephone answering function comprising:

a box-shaped housing being fitted onto a car telephone cradle;

a cradle section of said housing having a shape such that a handset for said car telephone can be stably placed thereon;

a magnet being installed inside said cradle section in such a manner that said car telephone is maintained in an on-hook condition by a reed relay, said reed relay being built into said handset for controlling on- or off-book condition of said car telephone;

supporting means attached to said magnet in order to facilitate movement of said magnet to a position where said reed relay sets said car telephone to an off-book condition;

means for detecting a ringing signal;

means for generating an outgoing message;

voice storage means for storing incoming messages;

moving means for moving said magnet;

circuit means for rotating said moving means in response to detection of a ringing signal;

a limit switch being installed, for purposes of terminating operation of said circuit means, at such a position that said limit switch operates when said magnet moves in an arc of predetermined angle;

a first transducing element being installed near a mouthpiece of said handset in order to transmit an outgoing message; and

a second transducing element being installed near an earpiece of said handset in order to record a callers' voice;

wherein said magnet, which moves in response to detection of a ringing signal, causes said reed relay to cancel the on-hook condition of said car telephone, an outgoing message is transmitted to a caller by means of said first transducing element after said car telephone is set to conversation mode, the caller's voice in response to the outgoing message is stored in said voice storage device by means of said second transducing element.

5,559,864

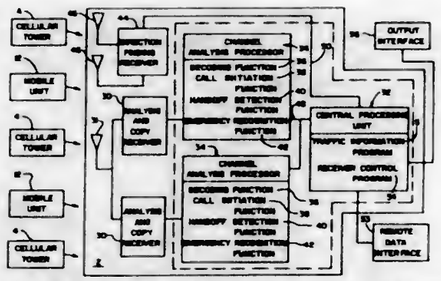
CELLULAR BASED TRAFFIC SENSOR SYSTEM

Joseph P. Kennedy, Jr., Great Falls, Va., assignor to E-Systems, Inc., Dallas, Tex.

Continuation of Ser. No. 26,568, Mar. 5, 1993. This application Jun. 5, 1995, Ser. No. 460,852
Int. Cl.[6] H04Q *7/20*
U.S. Cl. 379—59 **10 Claims**

1. A method for providing vehicular traffic information, comprising the steps of:

monitoring signals on control and voice channels of a cellular telephone system by means of a plurality of receivers tuneable to a desired control or voice channel;



analyzing the signals monitored on the control and voice channels of the cellular telephone system for recognition of an emergency, the steps of analyzing the signals including:

detecting a preselected signal within the signals monitored on the control channels;

monitoring a voice channel for a preselected signal for key words indicating an emergency;

classifying the emergency in response to the detected key words; and

generating vehicular traffic reports in response to analysis of the signals monitored on the control and voice channels.

5,559,865

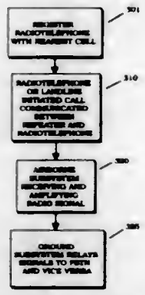
AIRBORNE RADIOTELEPHONE COMMUNICATIONS SYSTEM

Klein S. Gilhousen, Bozeman, Mont., assignor to QUALCOMM Incorporated, San Diego, Calif.

Filed Jul. 8, 1994, Ser. No. 272,060

Int. Cl.[6] H04Q *7/20*

U.S. Cl. 379—60 **7 Claims**



1. A communications system comprising:

a code division multiple access (CDMA) ground based subsystem comprising:

a plurality of base stations for transmitting communication signals having a quality level and receiving radio signals from an airborne based subsystem, the plurality of base stations being coupled to a public switched telephone network (PSTN);

the airborne based subsystem for transmitting the radio signals to, and receiving the communication signals from, a first base station of said plurality of base stations, and if the quality level of said first base station's communication signal is less than a predetermined amount, transmitting the radio signals to, and receiving the communication signals from, a second base station of said plurality of base stations, the airborne based subsystem comprising:

an airborne wireless radio for originating the radio signals and receiving the communication signals and selecting the second base station in response to the quality level of the second base station's communication signal; and

an airborne wireless repeater for repeating the radio signals to the ground based subsystem.

5,559,866

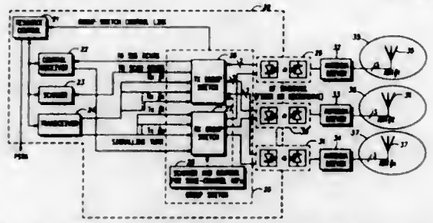
METHOD OF REUSE THROUGH REMOTE ANTENNA AND SAME CHANNEL CELL DIVISION

Frank O'Neill, Richland Hills, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 891,247, Jun. 1, 1992, abandoned. This application Jan. 20, 1995, Ser. No. 376,476

Int. Cl.[6] H04Q *7/22*

U.S. Cl. 379—60 **8 Claims**



1. In a cellular communication system having a plurality of service coverage areas each with a base site, at least one of the plurality of service coverage areas having a plurality of shared frequency microcells each having an omnidirectional, remote antenna interconnected with the base site, a method of providing communication services comprising the steps of:

receiving a request, at the base site, to provide communication access to a communication unit;

simulcasting supervisory audio tone through each omnidirectional, remote antenna of the plurality of shared frequency microcells;

measuring a signal quality factor of a looped-back supervisory audio tone received from the communication unit at each omnidirectional, remote antenna of the plurality of shared frequency microcells; and

establishing a communication link between the communication unit and base site through a selected antenna of said plurality of omnidirectional, remote antennas of the plurality of shared frequency microcells, said selected antenna being selected based upon said signal quality factor of said looped-back supervisory audio tone received at said selected antenna.

5,559,867

AUTOMATED CALLING SYSTEM WITH DATABASE UPDATING

Al Langsenkamp; William D. Arnold, and Scott Arnold, all of Indianapolis, Ind., assignors to Sigma/Micro Corporation, Indianapolis, Ind.

Filed Jun. 20, 1994, Ser. No. 262,923

Int. Cl.[6] H04M *3/02;3/44*

U.S. Cl. 379—69 **16 Claims**

1. An automated phone calling system for placing outgoing phone calls comprising:

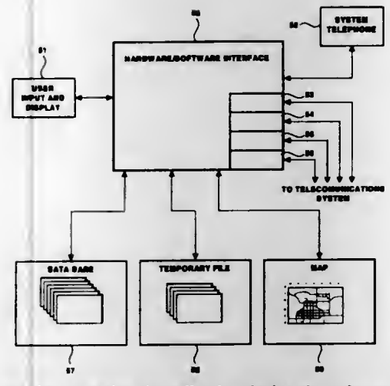
a database comprising a plurality of phone numbers and one or more data fields associated with each of the plurality of phone numbers;

means for selecting a subset of phone numbers from the plurality of phones numbers of the database based on the selection of at least one of the data fields associated with at least one of the plurality of phone numbers,

means for recording a voice message to be transmitted over at least one outgoing phone line,

means for connection to the at least one outgoing phone line, the connection means operatively connected to the voice recording means,

means for initiating at least one phone call to a callee via a callee phone number over the at least one outgoing phone line with the callee's phone number being one of the subset of phone numbers stored in the database as selected by the selecting means,



means for prompting the callee by playing the voice message recorded with the voice recording means, after the outgoing phone call connection has been established, to enter one of a plurality of different dial codes,

means for recording a dial code entered by the callee, and

means for automatically updating at least one of the data fields in the database for the callee's phone number based on the recorded dial code, the at least one updated data field used by the selection means for selecting a future subset of phone numbers, the system thereby providing the callee with She ability to control future phone calls initiated by the system to the callee's phone number.

5,559,868

METHOD FOR SENDING AND RECEIVING VIDEO IMAGES

Greg E. Blonder, Summit, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Aug. 30, 1993, Ser. No. 113,935

Int. Cl.[6] H04M *11/00;* **H04N** *7/14*

U.S. Cl. 379—96 **4 Claims**

1. In a telecommunications network connecting a first telecommunications device to a second telecommunications device, a method of selectively switching to in-band signaling between said first and second telecommunications devices, said method comprising the steps of:

initiating a communication between said first telecommunications device and said second telecommunications device,

sending a first signal from said first telecommunications device to said second telecommunications device,

displaying via said second telecommunications device a first icon represented by said first signal,

sending a second signal from said second telecommunications device to said first telecommunications device, said second signal representing a second icon, and

thereafter selectively switching said first telecommunications device and said second telecommunications device to in-band signaling based on said first icon.

5,559,869

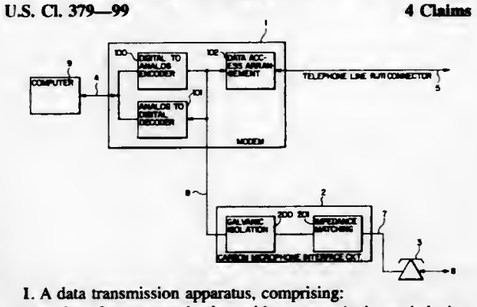
CARBON MICROPHONE INTERFACE FOR A MODEM

Steven P. Weir, Petaluma, Calif., assignor to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 358,997, Dec. 19, 1994, abandoned, which is a continuation of Ser. No. 83,513, Jun. 30, 1993, abandoned. This application Jan. 29, 1996, Ser. No. 590,675

Int. Cl.[6] H04M *1/76*

U.S. Cl. 379—99 **4 Claims**



1. A data transmission apparatus, comprising:

a modem for communicating with a remotely located device, said modem comprising a data access arrangement circuit having a line side for directly connecting said modem to a telecommunications line and a computer side for receiving data from a computer; and

a carbon microphone interface circuit, comprising isolation means and impedance matching means, for connecting said modem to an audio terminal device having a carbon microphone interface, wherein said carbon microphone interface circuit is connected to the computer side of said data access arrangement circuit.

5,559,870

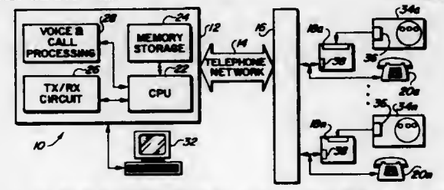
METHOD AND APPARATUS FOR PROVIDING INFORMATION TO A SUBSCRIBER OVER AN ELECTRONIC NETWORK

Mark W. Patton, Alpharetta; Douglas W. Todd, Lawrenceville, and Glenn A. Davis, Lilburn, all of Ga., assignors to Scientific-Atlanta, Inc., Norcross, Ga.

Filed Jun. 30, 1995, Ser. No. 497,503

Int. Cl.[6] H04M *11/00*

U.S. Cl. 379—107 **21 Claims**



1. An apparatus for indicating power consumption to a subscriber in response to commands provided by the subscriber, the apparatus comprising:

a remote unit including:

(a) a sensor detecting power readings of an electronic power meter;

(b) a transmitter providing the detected power readings onto the network;

a control device including:

(a) a receiver receiving commands provided by a subscriber and receiving the provided power readings from the network;

(b) a computer computing a power consumption value in response to the received power readings; and

(c) an indicator circuit responsive to the computer and providing the computed power consumption value onto the network to the subscriber.

5,559,871

CALL CHARGE CONTROL AND NOTIFICATION

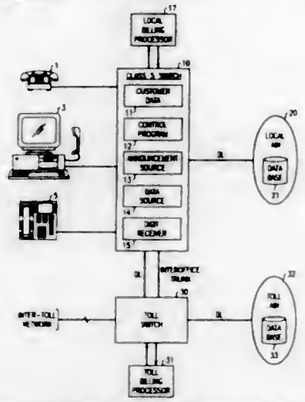
signal generating means which is operable in response to the timing means to generate a time-related signal corresponding

5,559,871

CALL CHARGE CONTROL AND NOTIFICATION

David B. Smith, Hinsdale, Ill., assignor to Lucent Technologies Inc., Del.

Filed Sep. 23, 1994, Ser. No. 311,638
Int. Cl.[6] H04M *15/00;17/00*
U.S. Cl. 379—115 **15 Claims**



1. In a telecommunications network, a method of managing call charges comprising the steps of:

specifying a tentative limit for charges to be incurred on a telecommunications call between a calling party and a called party, comprising the steps of testing if said telecommunications call is a collect call, and if the result of said testing is that said telecommunications call is a collect call, obtaining said tentative limit from said called party, and if the result of said testing is that said telecommunications call is not a collect call, obtaining said tentative limit from said calling party;

specifying a destination for said call;

establishing said call;

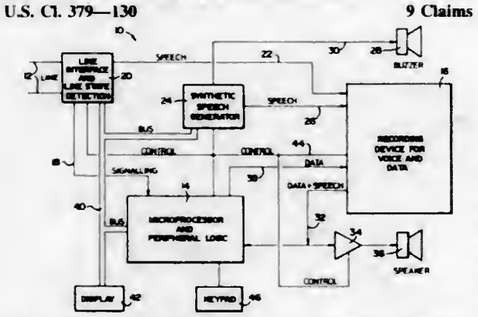
maintaining in said network a running indication of accumulated telecommunications charges for said call.

5,559,872

TELEPHONE TIME RECORDING SYSTEM

Alastair M. Van Huyssteen, Bellville, South Africa, assignor to Compu-Time (Proprietary) Limited, Bellville, South Africa

Filed Nov. 3, 1994, Ser. No. 333,857
Claims priority, application South Africa, Nov. 5, 1993, 93/8277
Int. Cl.[6] H04M *15/00;11/00;1/64*
U.S. Cl. 379—130 **9 Claims**



1. A telephone time recording system connectable to a telephone instrument, the system comprising:

timing means for timing the duration of a telephone call made from or to the instrument;

signal generating means which is operable in response to the timing means to generate a time-related signal corresponding to said duration;

a sound recording device for making a sound recording, on a record medium, of voice communication taking place during the call;

the sound recording device being coupled to the signal generating means for making a recording, on the record medium, of the time-related signal, and a switching arrangement which is operable;

to switch the sound recording device on at the beginning of the call;

to switch the sound recording device off a pre-determined period after it was switched on whereby only the opening part of voice communication taking place during the call is recorded;

to switch the sound recording device on again at the end of the telephone call for recording of the time-related signal corresponding to said duration; and

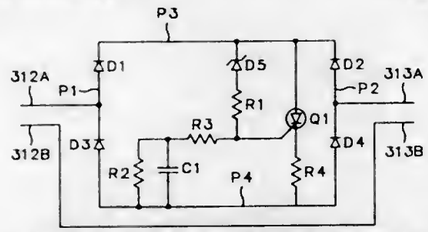
to switch the sound recording device off again after the time related signal corresponding to said duration has been recorded.

5,559,873

TELEPHONE PRIVACY DEVICE WITH CONFERENCE AND INDICATOR FEATURES

Samuel F. Wood, Los Altos, and Gaylan I. Larson, San Jose, both of Calif., assignors to Notify Corporation, San Jose, Calif.

Filed Dec. 14, 1994, Ser. No. 355,963
Int. Cl.[6] H04M *1/00;1/60;13/00;3/00*
U.S. Cl. 379—161 **12 Claims**



1. A telephone privacy device for a telephone line which has a nominal off line voltage and a nominal on line voltage, said device including a bridge circuit which has input points and midpoints, a Silicon Controlled Rectifier (SCR) with a resistor in series therewith connected across said midpoints of said bridge circuit, a Zener diode in series with a current limiting resistor connected from the anode of said SCR to the gate of said SCR, the threshold of said Zener diode being less than said nominal off voltage and more than said nominal on voltage.

5,559,874

TELEPHONE SERVICE PROTECTION DEVICE

Richard Panosh, 101 S. Canyon, Bolingbrook, Ill. 60440

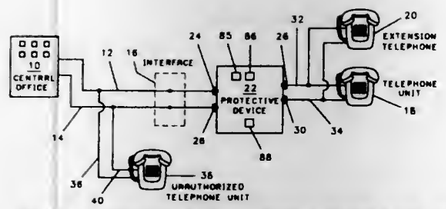
Filed Mar. 13, 1995, Ser. No. 402,944
Int. Cl.[6] H04M *1/66*
U.S. Cl. 379—189 **14 Claims**

14. A method of protecting a telephone line comprising a ring line and a tip line extending from a telephone company central office to one or more authorized telephone units comprising the steps of

detecting a reduction in voltage between said ring line and said tip line which is indicative that a telephone unit connected to said ring line and said tip line is in use,

detecting that current is not flowing through any one of the authorized telephone units, and

connecting a dialing blocking means between said ring line and said tip line while said voltage between said ring line and said tip line is reduced and while no current is flowing to any one of the authorized telephone units for blocking the dialing of an unauthorized telephone unit.

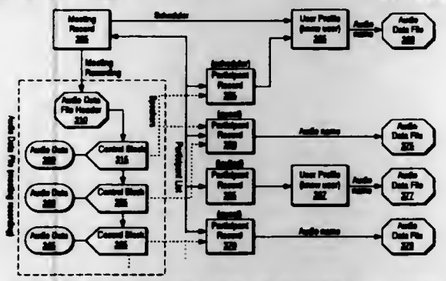


5,559,875

METHOD AND APPARATUS FOR RECORDING AND RETRIEVAL OF AUDIO CONFERENCES

David N. Bieselin, Menlo Park; Glenn A. Eaton, San Jose; Joseph A. McFadden, Palo Alto; Stuart A. Taylor, Menlo Park; Edward D. Tracy, Palo Alto, and Emil C. W. Wang, Menlo Park, all of Calif., assignors to Latitude Communications, Santa Clara, Calif.

Filed Jul. 31, 1995, Ser. No. 509,390
Int. Cl.[6] H04M *3/56;3/50*
U.S. Cl. 379—202 **22 Claims**



1. In an audio conferencing system, an apparatus for recording a conference comprising:

a data storage subsystem; and

a server coupled to the data storage subsystem, said server receiving input voice signals generated by conference participants during the conference, said server storing the input voice signals as voice data representative of the input voice signals in audio data blocks of a determined size and corresponding to a predetermined time duration of recording, said server further generating audio data file control blocks corresponding to the audio data blocks, and providing information regarding the audio data blocks, wherein the conference is recorded in the data storage subsystem.

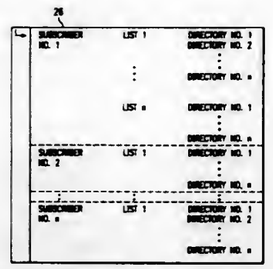
5,559,876

CONFERENCING CIRCUIT, AND ASSOCIATED METHOD, FOR AUTOMATICALLY CONFERENCING SUBSCRIBER UNITS TOGETHER IN A TELEPHONIC CONFERENCE

Vladimir Alperovich, Dallas, Tex., assignor to Telefonaktiebolaget L M Ericsson (publ), Stockholm, Sweden

Filed Sep. 1, 1995, Ser. No. 523,886
Int. Cl.[6] H04M *3/42;3/00*
U.S. Cl. 379—205 **18 Claims**

1. In a communications network having a switch for selectively effectuating communication links between subscriber units connected to the network, the subscriber units each identified by an identification number, conferencing circuitry for conferencing selected subscriber units together with an initiating subscriber unit in a common communications link responsive to entry at the initiating subscriber unit of a conferencing code, said conferencing circuitry comprising:



a memory device for storing at least one list of identification numbers identifying the selected subscriber units to be conferenced together in the common communications link;

a control device operative responsive to detection of the entry of the conferencing code at the initiating subscriber unit, said control device coupled to said memory device for accessing a selected list of said at least one list stored at said memory device and for implementing effectuation of communication links between the subscriber units identified by the identification numbers of the selected list and the initiating subscriber unit, thereby conferencing the selected subscriber units together with the initiating subscriber unit; and

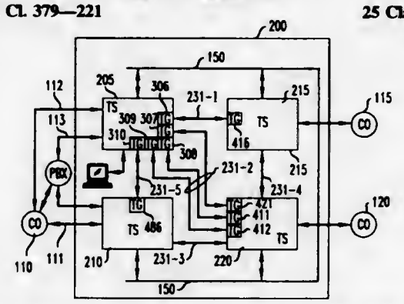
said control device further operative, responsive to a prompt by the initiating subscriber unit, to provide indications of to which subscriber units of the selected subscriber units communication links have been effectuated.

5,559,877

AUTOMATIC PROVISIONING OF TRUNKING AND ROUTING PARAMETERS IN A TELECOMMUNICATIONS NETWORK

Gerald R. Ash, West Long Branch; Kenneth K. Chan, Eatontown; Jiayu Chen, Middletown, all of N.J.; Alan E. Frey, Naperville, Ill.; James J. Gallagher, Bridgewater, N.J., and Andrew W. Peck, Wheaton, Ill., assignors to AT&T, Holmdel, N.J.

Filed Mar. 21, 1995, Ser. No. 407,171
Int. Cl.[6] H04M *7/00*
U.S. Cl. 379—221 **25 Claims**



1. An arrangement for provisioning call processing parameters in a telecommunications network, said network comprising a plurality of interconnected switches, said arrangement comprising:

means, responsive to an equipment change affecting particular trunking or routing parameters associated with one of said plurality of switches, for changing in said one of said plurality of switches call processing routing data associated with said change, and

means, in said one of said plurality of switches and responsive to said change, for forming a message characterizing the change

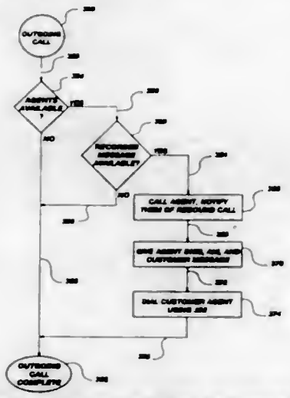
in said associated call processing routing data and then sending said message to each of the other ones of said plurality of switches.

5,559,878

TELEPHONIC COMMUNICATIONS ANSWERING AND CALLBACK PROCESSING SYSTEM

Lyle O. Keys, Salt Lake City; Neil J. Gardner, Murray; Arthur C. Bruinsholz, and Richard R. Heath, both of Salt Lake City, all of Utah, assignors to Teltrust, Inc., Salt Lake City, Utah

Filed May 23, 1994, Ser. No. 247,839
Int. Cl.[6] H04M *1/64*
U.S. Cl. 379—265 **17 Claims**



4. A method for selectively processing and responding to a large volume of incoming calls all of which cannot be answered by Agents, the method comprising the steps of:

providing an Agent manned system for manually answering a number of incoming phone calls defined by the number of Agents available;

providing an automatic system for handling an overload of incoming calls which exceed the defined number of answerable incoming calls defined by the number of said Agents available;

manually answering incoming phone calls until the defined number of incoming calls which may be manually answered is exceeded;

establishing a Queue Signal which indicates that the number of incoming calls exceeds said defined number which can be manually answered;

automatically answering incoming calls not manually answered by the manned system responsive to detecting said Queue Signal such that incoming calls are not kept "ON HOLD" for an undesirable extended period;

collecting information from said automatically answered incoming calls to enable the incoming calls to be returned later as outgoing calls;

storing data from said automatically answered incoming calls for later review by an Agent prior to placement of an outgoing call relating to said stored data;

transferring said stored data to said Agent for processing by said Agent prior to said Agent placing an outgoing call relating to said stored data, said transfer of said stored data to said Agent being effected responsive to said Queue Signal indicating that the number of incoming calls has decreased below said defined number of incoming calls such that Agents are available for placing outgoing calls responsive to said stored data; and

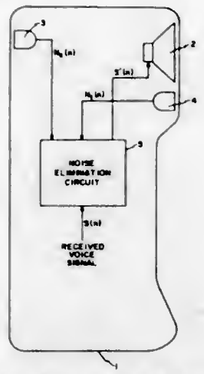
completing an outgoing call by said Agent.

5,559,879

TELEPHONE SET WITH BACKGROUND NOISE SUPPRESSION FUNCTION

Masato Kubo, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Dec. 20, 1994, Ser. No. 359,516
Claims priority, application Japan, Dec. 29, 1993, 5-353601
Int. Cl.[6] H04M *1/00*
U.S. Cl. 379—387 **4 Claims**



1. A telephone set for suppressing background noise in the vicinity of a speaker, said telephone set comprising:

a speaker for outputting sound in response to a first voice signal;

a first microphone provided in the vicinity of said speaker, for receiving said sound outputted from said speaker and said background noise in the vicinity of the speaker, and for generating a first voice band signal;

a second microphone for generating a second voice band signal including said background noise; and

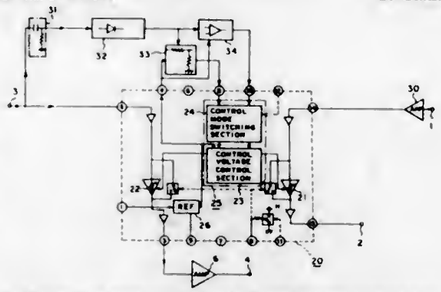
a noise elimination circuit for estimating said background noise responsive to said first voice band signal and said second voice band signal and for subtracting the estimated background noise from a voice signal received from a transmitter which generates said first voice signal.

5,559,880

CIRCUIT FOR HANDS FREE TALKING

Takashi Shiono, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 151,686, Nov. 12, 1993, abandoned. This application Nov. 1, 1995, Ser. No. 551,444
Claims priority, application Japan, Jan. 19, 1993, 5-023190
Int. Cl.[6] H04M *1/60;9/08*
U.S. Cl. 379—390 **16 Claims**



1. A circuit for hands free talking for being connected between a telephone and a speaker and a microphone which are separate from said telephone to realize hands free talking for a user of said telephone, said circuit comprising:

a receiving level detector for detecting the signal level of a receive signal which is sent from a far end side to said telephone and for generating a control signal responsive to said signal level; and

an electronic volume control circuit for controlling the volume of transmit and receive audio signals, said electronic volume control circuit including

a transmitting variable attenuator to attenuate the transmit signal which is sent from said microphone through said telephone to reach said far end side,

a receiving variable attenuator to attenuate said receive signal, and

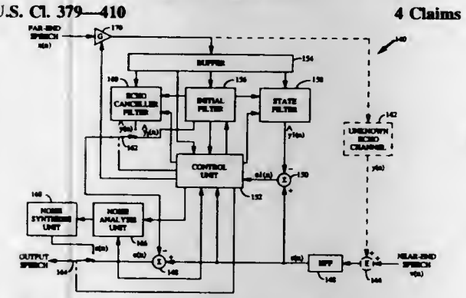
an attenuator controller to control attenuation of said transmitting variable attenuator and said receiving variable attenuator, said attenuator controller being connected to said receiving level detector to respond only to said control signal which is fed from said receiving level detector and to set said transmitting variable attenuator at a high impedance only when said control signal which is fed from said receiving level detector indicates that a user at said far end is speaking.

5,559,881

NETWORK ECHO CANCELLER

Gilbert C. Sih, San Diego, Calif., assignor to Qualcomm Incorporated, San Diego, Calif.

Continuation of Ser. No. 951,074, Sep. 25, 1992, Pat. No. 5,307,405. This application Feb. 28, 1994, Ser. No. 202,520
Int. Cl.[6] H04B *3/20*
U.S. Cl. 379—410 **4 Claims**



1. An echo canceller system for cancelling an echo receive channel signal from a return channel, said echo receive channel signal being introduced into said return channel from an echo channel in communication with said return channel, said system comprising:

an automatic gain control unit for receiving a far-end signal from a far-end channel and for scaling said far-end signal in accordance with a gain control signal to provide a controlled dynamic range signal; and

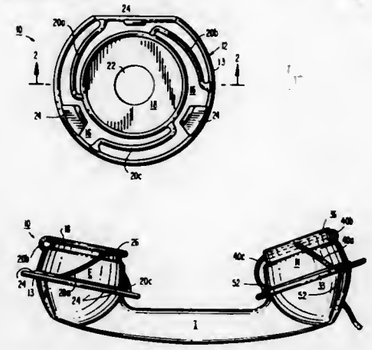
echo canceller means, coupled to said automatic gain control unit, for receiving said controlled dynamic range signal from said automatic gain control unit and for receiving from said return channel a combined signal comprised of said echo receive channel signal and an input return channel signal, for subtracting an estimate of said echo receive channel signal from said return channel and for providing said gain control signal to said automatic gain control unit.

5,559,882

SANITARY DEVICE FOR USE WITH TELEPHONES

David Herczl, and Mike Kohn, both of Brooklyn, N.Y., assignors to Healthy Calls, Inc., New York, N.Y.

Filed Aug. 30, 1994, Ser. No. 298,436
Int. Cl.[6] H04M *1/00*
U.S. Cl. 379—452 **20 Claims**



1. A sanitary device for covering a mouthpiece or earpiece of a telephone handset to protect the user from the transmission of germs contained thereon, comprising

a frame element defining an open interior,

a substantially planar member arranged in said element interior, and

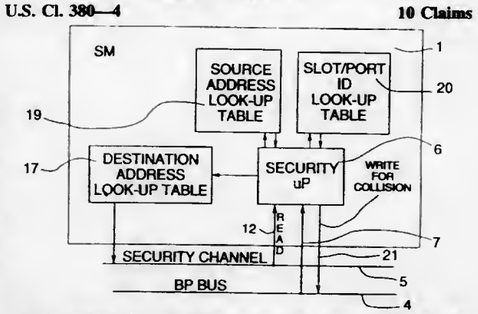
connecting means for resiliently connecting said element to said member, said connecting means having a first position in which said member and said element rest in a first, substantially common plane and a second position in which said member is completely displaced from said first plane and situated in a second plane whereby the mouthpiece or earpiece of the telephone handset is positionable between said first plane and said second plane.

5,559,883

METHOD AND APPARATUS FOR SECURE DATA PACKET BUS COMMUNICATION

Richard Williams, Leominster, Mass., assignor to Chipcom Corporation, Southborough, Mass.

Filed Aug. 19, 1993, Ser. No. 109,578
Int. Cl.[6] H04L *9/00*
U.S. Cl. 380—4 **10 Claims**



1. A method for providing secure data communication, the method comprising the steps of:

providing a communication channel;

providing a plurality of ports on said communication channel;

providing a plurality of users, each of said users being connected to one of said plurality of ports and communicating between each other through said plurality of ports and over said communication channel;

transmitting a data packet over said communication channel

(2) receiving, by said second transfer device said first certifica-

transmitting a data packet over said communication channel from one port to another port for said communicating, the data packet being transmitted with a destination address;

providing a security module connected to said communication channel and to said plurality of ports;

said security module reading the contents of the data packet;

said security module retrieving previously stored information regarding eligibility of said plurality of ports to receive the data packet;

said security module sending an security message to said plurality of ports, said security message indicating a groop of said plurality of ports eligible to receive the data packet;

each of said plurality of ports reading said security message;

said each of said plurality of ports comparing said security message with a plurality of ID codes of said respective port, and determining if said respective port is one of said eligible ports indicated by said security message;

said respective port blocking the data packet from reaching a respective connected user if said respective port is not one of said eligible ports;

said respective port passing the data packet to said respective connected user if said respective port is one of said eligible ports.

5,559,884

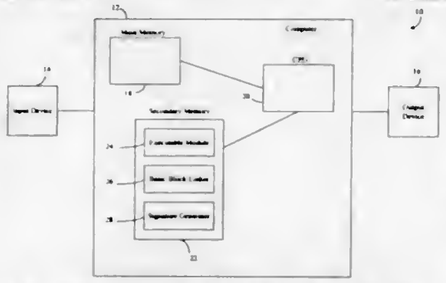
METHOD AND SYSTEM FOR GENERATING AND AUDITING A SIGNATURE FOR A COMPUTER PROGRAM

Robert I. Davidson, and Nathan Myhrvold, both of Bellevue, Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Jun. 30, 1994, Ser. No. 268,967

Int. Cl.° G06F *9/42*

U.S. Cl. 380—4 **26 Claims**



1. In a computer system, a method for encoding a signature in a plurality of copies of a computer program, the computer program having a plurality of code portions, the method comprising:

selecting a group of code portions having a flow of execution from among the plurality of code portions; and

for each of the plurality of copies of the computer program;

reordering the selected group of code portions to encode a signature into the copy of the computer program; and

modifying the code portions within the reordered group of code portions in order to maintain the flow of execution, wherein each of the plurality of the copies of the computer program is identifiable by its signature from other copies of the computer program.

5,559,885

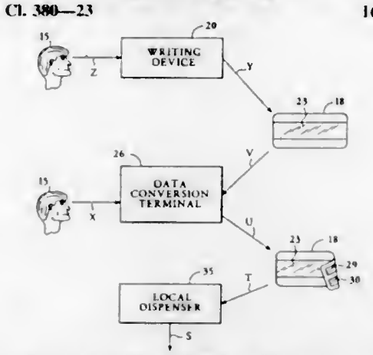
TWO STAGE READ-WRITE METHOD FOR TRANSACTION CARDS

Jerome Drexler, Los Altos Hills, and Christopher J. Dyball, Half Mooo Bay, both of Calif., assignors to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 181,697, Jan. 14, 1994. This application Feb. 22, 1994, Ser. No. 200,779

Int. Cl.° G06F *7/08*

U.S. Cl. 380—23 **16 Claims**



1. A method of providing benefits comprising,

indelibly writing, on a first area of a card, data denoting a first set of entitlements, with said first area of said card being an optical storage medium,

reading said first area of said card and acquiring information representing a second set of entitlements from a possessor of said card,

if said second set of entitlements is a subset of said first set of entitlements, then writing, on a second area of said card, data authorizing use of said second set of entitlements, said second area of said card being a magnetic recording medium, and

reading said second area of said card and providing benefits according to said use of said second set of entitlements.

5,559,886

METHOD OF CARRYING OUT AN AUTHENTICATION CHECK BETWEEN A BASE STATION AND A MOBILE STATION IN A MOBILE RADIO SYSTEM

Paul W. Dent, Stehag; Alex K. Raith, Kista, and Jan E. Å. S. Dahlin, Järfälla, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation of Ser. No. 43,758, Apr. 7, 1993, Pat. No. 5,390,245, which is a continuation of Ser. No. 655,771, Feb. 15, 1991, Pat. No. 5,220,605, which is a continuation of Ser. No. 68,234, May 27, 1993, Pat. No. 5,282,250. This application Aug. 31, 1994, Ser. No. 298,782

Claims priority, application Sweden, Mar. 9, 1990, 9000856

Int. Cl.° H04L *9/00;9/32*

U.S. Cl. 380—23 **16 Claims**

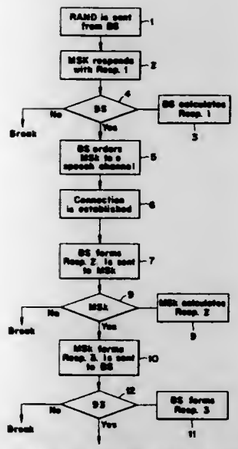
9. A method for authenticating a base station and a mobile station in a mobile radio system, the method comprising the steps of:

prior to establishing a connection, sending from the base station an interrogative message concerning authenticity of the mobile station;

sending from the mobile station a first response signal;

using the first response signal in the base station to preliminarily establish the authenticity of the mobile station, and in response to preliminary establishment of the authenticity of the mobile station, establishing a service connection on a traffic channel;

using the established service connection on the traffic channel to send a second response signal and a first value from the base station to the mobile station;



using the first value in the mobile station to form a first corresponding signal and comparing the first corresponding signal with the second response signal, thereby alternatively establishing or disproving authenticity of the base station; and

when the authenticity of the base station has been established, sending from the mobile station a third response signal and using the third response signal in the base station to finally establish the authenticity of the mobile station.

5,559,887

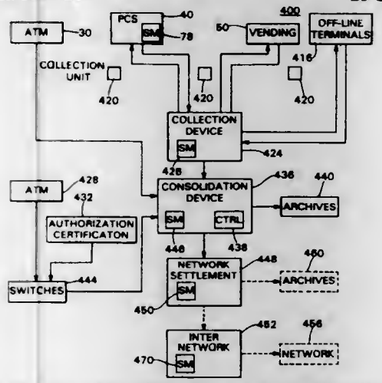
COLLECTION OF VALUE FROM STORED VALUE SYSTEMS

Terry L. Davis, Scottsdale, Ariz.; James A. Hart, Radnor; Michael F. O'Malley, Glenside, both of Pa.; James F. Russell, Hockessin, Del.; John W. Sears, Peoria, and Philip H. Trice, Phoenix, both of Ariz., assignors to Electronic Payment Service, Wilmington, Del.

Filed Sep. 30, 1994, Ser. No. 316,308

Int. Cl.° H04K *1/00*

U.S. Cl. 380—24 **26 Claims**



1. A method for determining value in a stored value transaction system having a plurality of value storing transfer devices, including a local device, a collection device, a consolidation device and a settlement device, said value transfer devices each having a device identification number, comprising the steps of:

(1) receiving, by a first transfer device, a first transaction signal from a second transfer device and providing a first certification signal in response to said first transaction signal;

(2) receiving, by said second transfer device said first certification signal and encrypting said first certification signal to provide a first encrypted signal;

(3) receiving, by said first transfer device, said first encrypted signal;

(4) encrypting, by said first transfer device, said first certification signal to provide a second encrypted signal;

(5) first verifying a transaction in accordance with said first and second encrypted signals and transferring stored value between said first and second transfer devices in accordance with said first verifying;

(6) receiving, by a third transfer device separate from said first and second transfer devices, a second transaction signal from a first selected one of said first and second transfer devices and providing a second certification signal in response to said second transaction signal;

(7) receiving, by said first selected transfer device, said second certification signal and encrypting said second certification signal to provide a third encrypted signal;

(8) receiving, by said third transfer device, said third encrypted signal;

(9) encrypting, by said third transfer device, said second certification signal to produce a fourth encrypted signal;

(10) second verifying a transaction in accordance with said third and fourth encrypted signals and transferring stored value between said first selected transfer device and said third transfer device in accordance with said second verifying.

5,559,888

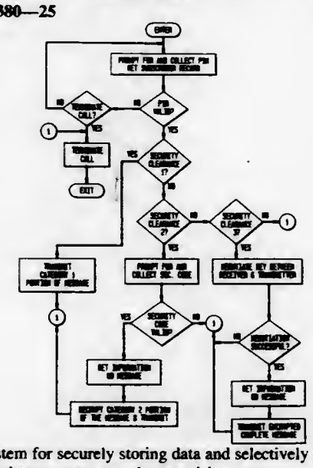
SECURE INFORMATION RETRIEVAL SERVICE (SIRS)

Ajay Jain, Holmdel; Paramdeep S. Sahni, and Alok K. Gupta, both of Marlboro, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Feb. 15, 1994, Ser. No. 196,961

Int. Cl.° H04L *9/00*

U.S. Cl. 380—25 **12 Claims**



1. A system for securely storing data and selectively transmitting the stored data over a network comprising:

(a) means for storing data in a plurality of separate data storage devices,

wherein said means for storing data comprises means for encrypting and decrypting data,

and wherein said plurality of separate data storage devices comprises:

(i) a first set of data storage devices each containing data in unencrypted form,

(ii) a second set of data storage devices each containing data in encrypted form, and

(iii) a third set of data storage devices each containing data in encrypted form;

(b) means for accessing the data stored in said plurality of

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(b) means for accessing the data stored in said plurality of separate data storage devices,

wherein said means for accessing data permits access to the data stored in said first set of data storage devices in response to the proffer of any of a first set of authorization commands,

and wherein said means for accessing data permits access to the data stored in said second set of data storage devices and the data stored in said first set of data storage devices in response to the proffer of any of a second set of authorization commands,

and wherein said means for accessing data permits access to the data stored in said third set of data storage devices and the data stored in said second set of data storage devices and the data stored in said first set of data storage devices in response to the proffer of any of a third set of authorization commands;

(c) means for transmitting over said network the data accessed by said means for accessing the data stored in said plurality of separate data storage devices,

wherein said means for transmitting data produces and transmits a composite data signal comprising the data accessed from said first set of data storage devices, said second set of data storage devices and said third set of data storage devices in response to a particular authorization command taken from the group of authorization commands consisting of said first set of authorization commands, said second set of authorization commands, and said third set of authorization commands,

and wherein said composite data signal comprises:

(i) unencrypted data from said first set of data storage devices,

(ii) data from said second set of data storage devices which is decrypted by said means for encrypting and decrypting data, and

(iii) encrypted data from said third set of data storage devices,

when said particular authorization command is any of said third set of authorization commands; and

(d) means for receiving said composite data signal transmitted by said means for transmitting the data stored in said plurality of separate data storage devices comprising:

(i) means for proffering said particular authorization command to said means for accessing data,

(ii) means for decrypting the encrypted data of said composite data signal, and

(iii) and means for displaying the data of said composite data signal.

5,559,890

CRYPTO EQUIPMENT

Siegfried Obermeier, Unterschleissheim, and Peter Bergner, Obeschleissheim, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jul. 27, 1989, Ser. No. 386,802

Claims priority, application Germany, Jul. 29, 1988, 38 25 880.3

Int. Cl.[6] H04L *9/00*

U.S. Cl. 380—48 **8 Claims**

1. Crypto equipment constructed in accordance with CMOS technology, comprising:

an encoder device at a transmitting side and a decoder device at a receiving side for bit-by-bit encoding and decoding of a bit stream having a high bit rate representing a binary signal;

said encoder device comprising n encoders and said decoding device comprising n decoders;

a first multiplexer for receiving the bit stream connected to n encoders for dividing the bit stream into n bit streams;

a first multiplexer connected to said n encoders for combining the encoded bit streams for transmission;

a second demultiplexer for receiving the encoded bit stream, said second multiplexer connected to said n decoders and operated to divide the encoded bit stream into n encoder bit streams;

a second multiplexer connected to said n decoders for combining the n decoder bit streams; and

synchronization means at the transmitting and receiving sides connected to said n encoders and n decoders for individual synchronization thereof.

5,559,889

SYSTEM AND METHODS FOR DATA ENCRYPTION USING PUBLIC KEY CRYPTOGRAPHY

Randall J. Easter, Poughquag, and William A. Merz, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1995, Ser. No. 414,852

Int. Cl.[6] H04L *9/30*

U.S. Cl. 380—30 **9 Claims**

1. An integrated circuit ("IC") chip for use in a cryptographic system, said IC chip comprising:

a non-volatile memory containing a private key; and

a public key cryptographic engine coupled to said non-volatile memory, said public key cryptographic engine using said private key during operation.

5,559,891

DEVICE TO BE USED FOR CHANGING THE ACOUSTIC PROPERTIES OF A ROOM

Juha Kuusama, and Aki Makivirta, both of Tampere, Finland, assignors to Nokia Technology GmbH, Pforzheim, Germany

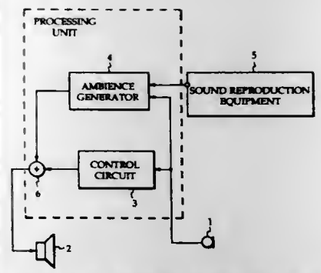
Continuation-in-part of Ser. No. 16,107, Feb. 10, 1993, abandoned. This application Sep. 30, 1994, Ser. No. 316,101

Claims priority, application Finland, Feb. 13, 1992, 920608

Int. Cl.[6] G10K *11/16*

U.S. Cl. 381—63 **10 Claims**

1. A device to be used for changing the acoustic properties of a room, comprising a pressure transducer, a loudspeaker and an electronic control circuit adapted to generate, in response to pressure changes in the room, an electrical signal that serves to cancel the pressure change detected by the pressure transducer when it is reproduced through the loudspeaker, wherein the device further includes an ambience generator adapted to receive an electrical signal proportional to the sound present in the room and to generate, in response to said signal, a second electrical signal which produces an acoustic field containing early reflections and reverberation in the room when reproduced through the loudspeaker.



5,559,892

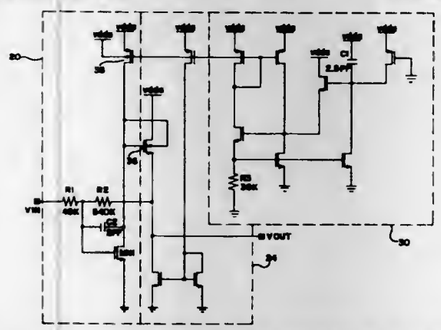
IMPEDENCE BUFFERING MOS CIRCUIT WITH DYNAMICALLY REDUCED THRESHOLD VOLTAGE, AS FOR USE IN AN OUTPUT BUFFER OF A HEARING AID AMPLIFIER

Steven E. Boor, Lombard, Ill., assignor to Knowles Electroulcs, Inc., Itasca, Ill.

Filed Mar. 28, 1994, Ser. No. 218,603

Int. Cl.[6] H04R *25/00;* **H03F** *3/16*

U.S. Cl. 381—68.4 **5 Claims**



1. An impedence buffering circuit for permitting smooth signal flow from a first transmission medium to a second transmission medium comprising:

an input adapted for coupling to the first transmission medium for receiving a signal;

a MOS transistor coupled through the input to the first transmission medium for transforming the impedance imposed on the signal, the MOS transistor including a well terminal and a gate terminal both having an AC potential that is substantially equal to the input AC potential, such that the threshold voltage V^T of the MOS transistor is reduced to reduce the gate-to-source voltage of the MOS transistor; and

means for reducing the threshold voltage V^T of the MOS transistor to reduce the gate-to-source voltage of the MOS transistor;

an output coupled to the MOS transistor and adapted for coupling to the second transmission medium for conveying the impedence-transformed signal to the second transmission medium.

5,559,893

METHOD AND DEVICE FOR ACTIVE NOISE REDUCTION IN A LOCAL AREA

Asbjørn Krokstad; Odd K. Ø. Pettersen, and Svein Sørsdal, all of Trondheim, Norway, assignors to Sinvent A/S, Trondheim, Norway

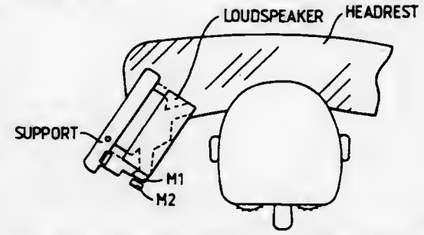
PCT No. PCT/NO93/00114, § 371 Date Mar. 21, 1995, § 102(e) Date Mar. 21, 1995, PCT Pub. No. WO94/02935, PCT Pub. Date Feb. 3, 1994

PCT Filed Jul. 9, 1993, Ser. No. 374,578

Claims priority, application Norway, Jul. 22, 1992, 922911

Int. Cl.[6] A61F *11/06;* **H03B** *29/00;* **H04R** *27/00*

U.S. Cl. 381—71 **14 Claims**



1. A method for active noise reduction in a local area, especially for generating a so-called quiet zone in the local area, wherein a loudspeaker and two microphones are used, the meshed being characterized in that the loudspeaker is provided adjacent to the local area where the quiet zone is to be generated, the loudspeaker being an open loudspeaker, that a first microphone is provided at a given first radial distance from the loudspeaker's centre axis, that a second microphone is provided at a given second radial distance from the loudspeaker's centre axis, the second radial distance being greater than the first radial distance and the microphones being located in the same radial direction, orthogonal to the loudspeaker's centre axis, that the acoustic signal generated by the loudspeaker, overlaid on the sound field which exists in the local area, is detected with the first and the second microphone respectively, thus obtaining a first and second microphone signal respectively, that the first microphone signal is delayed by a value corresponding to the difference in running time between the first and second radial distance, that the first microphone signal is attenuated by a value corresponding to the difference in intensity between the detected microphone signals, thus obtaining a processed first microphone signal with the same intensity as the second microphone signal, whereafter the first processed microphone signal is inverted and summed with the second microphone signal to obtain a summed signal which, after filtering and amplification, is transmitted to the loudspeaker.

5,559,894

AUTOMATED METER INSPECTION AND READING

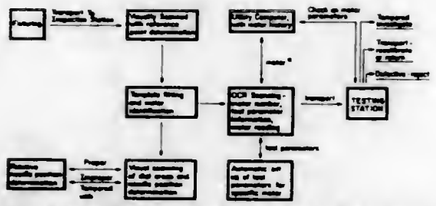
David J. Lubliner, 143 Howell Ave., Fords, N.J. 08863; Jaskaran Dhaliwal, 10 Challenger Ct., North Plainfield, N.J. 07060; John Gidney, 45 Glenwood Dr., North Bergenfield, N.J. 07621; Gerald E. Gore, 1005 Hwy. 28, North Branch, N.J. 08876; Jack J. Greenfeder, 9 Deepdale Dr., Randolph, N.J. 07869; Joshua Greenfeld, 54 Leslie St., Edison, N.J. 08817; Melvin C. Hinton, 147 Fulton Ave., New Brunswick, N.J. 08901; William McHugh, 6 Walden La., Denville, N.J. 07834; Anthony Parsio, 461 Hickory Ave., Kearney Pt., N.J. 07481; Ian Rintel, 57 Ottawa Rd., South Marlboro, N.J. 07746; Harry T. Roman, 25 Laurel Ave., East Orange, N.J. 07017, and Jake Vogelaar, 729 Willow Run, Wyckoff, N.J. 07481

Filed Jun. 28, 1993, Ser. No. 84,458

Int. Cl.[6] G06K *9/00*

U.S. Cl. 382—100 **17 Claims**

1. A method for automated obtaining of information from devices having exposed faces, with fixed and changeable visual



indicia of information thereon; and wherein each of said devices, is fixedly positioned in a pre-set position; said method comprising the steps of:

a. illuminating an exposed face with non shadow casting diffused light;

b. finding a location reference point on the face of the device by visually scanning the illuminated exposed face and the area peripheral thereto, by visual scanning means, with computer feedback means, whereby the periphery of the illuminated exposed face is determined; and determining the location reference point on the illuminated face relative to said periphery, with said computer feedback means;

c. identifying the face of the device and the device by fitting areas of the face of the device, relative to the location reference point, with computer feedback means utilizing computer-stored visual template means, comprising individual templates unique to each of the devices, until a template correlates with a pre-located position on the face of the device being template fitted; with the particular face and device being thereby identified;

d. visually scanning the illuminated identified face for the visual indicia thereon, by optical character recognition means, with location instructions by the computer feedback means, with reference to computer stored parameters of the device and the face thereof; and

e. wherein the said illuminated exposed face is circular and has a circumference, wherein the said area peripheral to the illuminated face is a light pixel area, and the said periphery of the illuminated face is a dark pixel area; wherein the circumference of the illuminated exposed face is determined by visually scanning the area peripheral to the illuminated exposed face, for light and dark pixel areas, in diagonal directions, which intersect said face at least at three points, wherein for each intersection, light pixel areas change to dark pixel areas; said three points defining the circumference of the face.

5,559,895

ADAPTIVE METHOD AND SYSTEM FOR REAL TIME VERIFICATION OF DYNAMIC HUMAN SIGNATURES

Luan L. Lee, and Toby Berger, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Nov. 8, 1991, Ser. No. 790,965

Int. Cl.[6] G06K 9/00

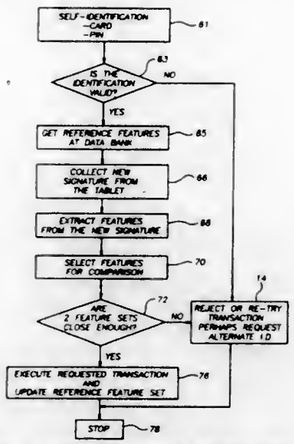
U.S. Cl. 382—119 **16 Claims**

1. A signature verification system comprising:

digitizer means for digitizing a signature of a signatory whose signature is to be verified, said digitizer means having a pad upon which said signatory can write or otherwise scribe a signature to be converted into digital data; and

a computer, operatively connected to said digitizer means for receiving said digital data, said computer having storage means for storing digital data and information, including a database comprising sets of features relating to a plurality of previously entered signatory signatures, wherein said database includes a set of feature values for each signature and each feature value represents a mean value and a standard deviation value for the corresponding feature calculated from a plurality of signatures of a signatory, both said mean values and said standard deviation being used to verify said signature, said computer having a program and:

a) means for acquiring said digital data from said pad;



b) means for generating a set of feature values based upon said acquired digital data, a portion of said set of features being values having a time variable relating to when a portion of said digital data of said signature was made;

c) means for selecting feature values of said acquired and stored digital data for comparison; and

d) means for making a verification decision with respect to said signature based upon comparison of said selected feature values including establishing a decision verification threshold, said verification decision updating said database-selected feature values when a current signature is verified.

5,559,896

METHOD AND APPARATUS FOR RECOGNIZING MEANDERING OF WEB

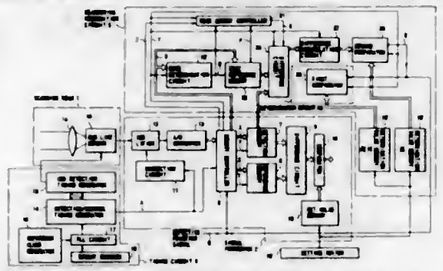
Tetsuya Okuda, and Shinichi Kojima, both of Ibaraki, Japan, assignors to Komori Corporation, Japan

Continuation of Ser. No. 289,995, Aug. 12, 1994, abandoned, which is a continuation of Ser. No. 944,519, Sep. 14, 1992, abandoned. This application Jul. 24, 1995, Ser. No. 506,434

Claims priority, application Japan, Sep. 19, 1991, 3-266984

Int. Cl.[6] G06K 9/00

U.S. Cl. 382—141 **17 Claims**



1. A computer implemented method of recognizing meandering of a web, comprising the steps of:

receiving signals that represent all pixel addresses and all pixel data of printed matter serving as a reference and determining whether each pixel represents an edge region in which an abrupt change in density occurs as an edge;

storing, as reference data, the signals that represent the pixel address and pixel data only of each pixel determined to represent the edge region in which the abrupt change in density occurs as an edge;

calculating a difference value signal between the signals that represent the pixel data of test image data obtained from the web on which a test object is printed and the signals that represent the pixel data of the reference data in accordance with the pixel addresses of the reference data in the edge region;

comparing the difference value signal with a first predetermined value signal to count the number of edge pixels having difference value signals exceeding the first predetermined value signal in the edge region;

recognizing the meandering state of the web when a total number of edge pixels having difference value signals exceeding the first predetermined value signal is not less than a predetermined number; and

generating a meandering notification signal when the meandering state of the web is recognized.

5,559,897

METHODS AND SYSTEMS FOR PERFORMING HANDWRITING RECOGNITION FROM RAW GRAPHICAL IMAGE DATA

Michael K. Brown, North Plainfield; Stephen C. Glinski, Edison; Jianying Hu, Hoboken, and William Turin, East Brunswick, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation-in-part of Ser. No. 184,811, Jan. 21, 1994. This application Aug. 15, 1994, Ser. No. 290,623

Int. Cl.[6] G06K 9/00

U.S. Cl. 382—186 **11 Claims**

1. A method for performing handwriting recognition on a received data set, said received data set comprising data points representative of a handwriting sample, said method comprising the steps of:

preprocessing said data points of said data set and generating a set of resampled data points, said resampled data points being substantially equidistantly spaced along said handwriting sample, said preprocessing step further comprising the step of preprocessing said data points of said data set to reduce signal abnormalities of said data set; said preprocessing step further including the step of filtering said data set to remove extraneous noise, wherein said filtering step further includes the steps of:

identifying cusps within said data set, said identifying cusps step further including the steps of:

constructing a focus region, said focus region including data points in the data set in sequence starting from a starting focus point to an ending focus point, said starting focus point corresponding to the first data point in the data set, said ending focus data point being at least two data points in sequence from said starting focus point;

determining linear distances to the starting focus point and the ending focus point for each said data point in the focus region;

identifying a data point in the focus region as a potential cusp point if the magnitude of either of the starting or the ending focus point linear distances exceeds the linear distance between the starting and the ending focus point;

determining, for each of the potential cusp points, the smaller of the linear distance from the potential cusp data point to the starting focus point and the linear distance from the potential cusp point to the ending focus point;

determining whether the maximum of the smaller linear distances for all the potential cusp points exceeds a threshold value; and,

storing the data point corresponding to the maximum as a cusp point; and

screening said extraneous noise from said data set utilizing a curve approximating technique, said curve approximating technique treating each identified cusp as a boundary point, said preprocessing step further including the step of normalizing said data set to reduce the geometric variance in said handwriting sample thereby causing said data set to lie within a prescribed range;

computing a sequence of features from said resampled data points;

comparing each feature to stochastic recognition models to obtain feature scores, said stochastic recognition models comprising a plurality of probability distributions; and

propagating said feature scores in sequence through an evolutional grammar network for obtaining cumulative hypothesis scores using a stochastic recognition algorithm.

5,559,898

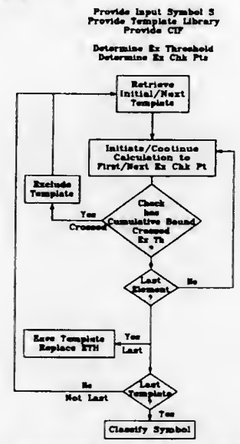
COMPARISON INEQUALITY FUNCTION BASED METHOD FOR ACCELERATED OCR CORRELATION

Hadar Avi-Itzhak, Mountain View, Calif., assignor to Canon Inc., Tokyo, Japan

Continuation of Ser. No. 140,310, Oct. 22, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 461,924

Int. Cl.[6] G06K 9/68

U.S. Cl. 382—218 **36 Claims**



1. A computer-implemented method of accelerating the classification of an unclassified input symbol S into a library of preclassified templates, said method comprising the steps of:

a) providing as an input to a processing unit of a computer an input symbol S in the form of an input vector defining an unclassified character having q elements ($S = s_1, s_2, s_3, \ldots s_k \ldots s_j \ldots s_q$);

b) storing within a first storage device associated with said commuter a library of T templates ($T_1, T_2, T_3, \ldots T_i \ldots T_T$) to be retrieved by the processing unit for correlation with the input vector, each template in the form of a template vector defining a pre-classified character having q elements ($T_i = t_1, t_2, t_3, \ldots t_k \ldots t_j \ldots t_q$) forming q pairs of corresponding elements with the q elements of the input vector;

c) storing within a second storage device associated with said commuter a comparison inequality function for correlating the input vector with the template vectors, which function defines an element by element correlation calculation (s,t_i), executes an element calculation cycle for each of the q pairs of corresponding elements of the input vector and each retrieved template vector to yield an element term for each pair of corresponding elements, and sums the element terms from

previous calculation cycles of the correlation calculation (s,t_i)

defining a plurality of initial vertices being located on a seed

5,559,903

previous calculation cycles of the correlation calculation (s,t_j) to yield a cumulative bound after k calculation cycles and a final bound after the completion of q calculation cycles;

d) determining an exclusion threshold for excluding the retrieved template if the cumulative bound crosses the exclusion threshold and non-excluding the retrieved template if the cumulative bound does not cross the exclusion threshold;

e) causing the processing unit to retrieve an initial template from the library of templates;

f) causing the processing unit to initiate the element by element correlation calculation (s,t_j) for the q pairs of corresponding elements from the input symbol and the retrieval template to yield a cumulative bound;

g) excluding the retrieved templates if the cumulative bound crosses the exclusion threshold;

h) repeating steps f) and g) until the retrieved template has been excluded or until the correlation calculation (s,t_j) for the retrieved template has proceeded to completion to yield a final bound;

i) saving the retrieved template if non-excluded;

j) causing the processing unit to retrieve a next template from the library of templates;

k) repeating steps f) through j) until all of the template vectors have been correlated with the input vector; and

l) classifying the unclassified input symbol against the non-excluded pre-classified templates on the basis of the values of the final bound yielded by the correlation calculations.

5,559,899

METHOD FOR THE ADAPTIVE QUANTIZATION OF A RANGE OF INPUT VALUES

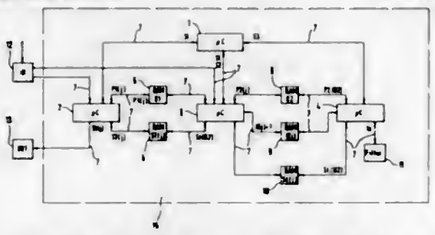
Hauke Schmidt, Ulm, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Dec. 9, 1993, Ser. No. 165,605

Claims priority, application Germany, Dec. 11, 1992, 42 41 812.7

Int. Cl.[6] G06K *9/62*

U.S. Cl. 382—224 **15 Claims**



1. A method for classifying objects, comprising the steps of:

measuring a parameter of each of a plurality of objects;

dividing a range of parameter values into partitions;

assigning measured parameter values to the partitions;

determining a density estimate for each partition based upon a relative frequency with which the measured parameter values are assigned to the partitions;

based on the density estimates, redividing the range of parameter values into new partitions, each new partition having a plurality of new density estimates, such that a difference between two of the new density estimates of a new partition does not exceed a predetermined value; and

classifying each object in accordance with the new partition in which the measured parameter of the object falls.

5,559,900

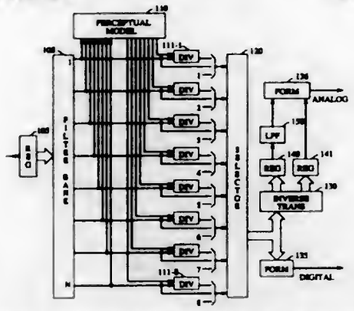
COMPRESSION OF SIGNALS FOR PERCEPTUAL QUALITY BY SELECTING FREQUENCY BANDS HAVING RELATIVELY HIGH ENERGY

Nuggehally S. Jayant, Gillette, and Robert J. Safranek, New Providence, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 12, 1991, Ser. No. 667,851

Int. Cl.[6] G06K *9/36*

U.S. Cl. 382—248 **16 Claims**



1. A method for coding a physical, electrical, signal comprising the steps of:

receiving said electrical signal at an apparatus port;

separating said signal into band signals, where each band signal occupies a frequency band and where the collection of the band signals corresponds to said signal;

comparing the energy level of each of said band signals to a noise measure specified for the frequency band of each of said band signals;

selecting N band signalss that have the highest energy relative to the given noise measure for that frequency band;

coding the selected band signals; and

delivering to an output port of said apparatus a physical, electrical, signal corresponding to the aggregate of the selected and coded band signals.

5,559,901

METHOD AND DEVICE FOR DETERMINING A CONTOUR IN A SPACE OF IMAGE PARAMETER VALUES

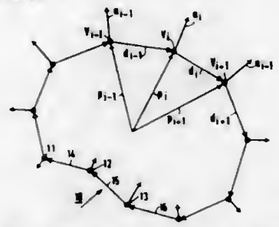
Steven Lobregt, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 28, 1994, Ser. No. 268,080

Claims priority, application European Pat. Off., Jun. 29, 1993, 93201882

Int. Cl.[6] G06K *9/40;9/48*

U.S. Cl. 382—256 **20 Claims**



1. Method for determining a contour in a space of image parameter values, comprising the following steps implemented on a computer:

accessing a memory storing image parameter values in a space in the form of a matrix of pixel values;

defining a plurality of initial vertices being located on a seed contour in said space, said vertices being connected by edges to neighbouring vertices;

evaluating an energy function comprising an internal portion which is a function of a curvature at each of the vertices and an external portion determined by the variation of the image parameter values at the location of each of said vertices;

determining a final contour by continuouly varying the position of the vertices till the energy function reaches a minimum, characterised in that,

for each of the vertices the internal portion of the energy function is dependent on the angle between the edges at the respective vertex and in that the external portion of the energy function is determined by the variation of the image parameter values in a single direction that bisects the angle between the edges at the respective vertex.

5,559,902

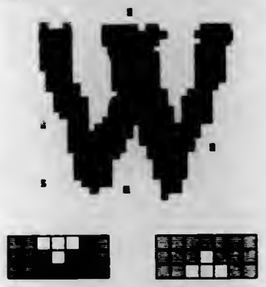
METHOD FOR ENHANCING CONNECTED AND DEGRADED TEXT RECOGNITION

Chinmoy B. Bose, Green Brook, and Shyh-Shiaw Kuo, Berkeley Heights, both of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 813,225, Dec. 23, 1991, abandoned. This application May 31, 1994, Ser. No. 251,676

Int. Cl.[6] G06K *9/40*

U.S. Cl. 382—263 **6 Claims**



1. A method of generating an enhanced image based on a scanned image, the scanned image comprising image pixel signals having been generated with use of an image scanner, an image pixel signal having a binary value, the method comprising the automated steps of:

filtering one or more image pixel signals of the scanned image to form a filter signal, the filter signal corresponding to a given image pixel signal;

comparing a value of the filter signal with a value of the given image pixel signal;

determining whether complementing the value of the given image pixel signal reduces the sharpness of a wedge-like shape in the image; and complementing the binary value of the given image pixel signal when

(i) doing so does not reduce the sharpness of the wedge-like shape in the image and (ii) said filter signal value and given image pixel signal value are not equal, to generate an image pixel signal of the enhanced image.

5,559,903

METHOD FOR GENERATING GEOMETRIC MASKS WITH A DIGITAL COLOR COMPUTER

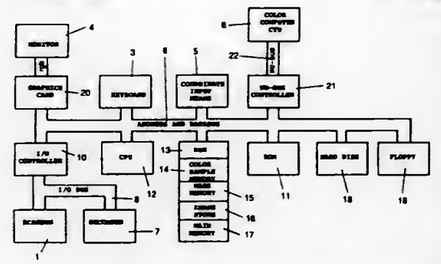
Uwe-Jens Krabbenhoeft, Landwehr, Germany, assignor to Linotype Hell AG, Kiel, Germany

Filed Apr. 7, 1994, Ser. No. 224,050

Claims priority, application Germany, Apr. 8, 1993, 43 11 613.2; Dec. 21, 1993, 43 43 581.5

Int. Cl.[6] G06K *9/20*

U.S. Cl. 382—283 **27 Claims**



17. A method for generating a geometric mask within a stored color image, comprising the steps of:

providing a monitor for displaying the stored color image;

providing a coordinate input unit for indicating image coordinates on the monitor;

providing a color sample memory for storing color samples;

providing a mask memory for storing at least one mask;

providing a color computer for correcting color values of the stored color image;

providing an image store for storing the color image;

collecting color samples from the color image with the coordinate input unit;

storing the collected color samples in said color sample memory;

displaying an arrangement of the color samples in a color space on a monitor with a color coordinate system;

subjecting the collected color samples to a filtering, a color sample space produced by the filtering having an arbitrary shape and being employed for selective color correction;

inputting color correction values that act on colors defined by the color sample space;

with said color computer, using the color sample space that has been generated and the color correction values for the selected color correction of the color image;

writing an extreme value into the color computer at locations in the color space defined by the color sample space and applying image data of the color image to the color computer;

comparing output data of the color computer to a threshold;

setting a memory cell in the mask memory when the comparison to the threshold shows that color or data belong to one of the color samples;

displaying a geometric mask generated in the above steps in the image on the monitor; and

said step of subjecting the color samples to a filtering comprises providing the filtering in a L*a*b* color space and establishing the filtering by the function

$$S(L^*,a^*,b^*) = \sum_i \sum_j \sum_k a(i,j,k)P(L^*+i,a^*+j,b^*+k)$$

whereby a(i,j,k) is a weighting matrix, P(L*,a*,b*) is a color sample at location L*, a*, b* in the L*,a*,b* color space, and the sum S(L*,a*,b*) is compared to thresholds.

5,559,904

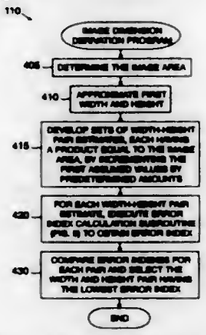
METHOD AND APPARATUS FOR DERIVING IMAGE WIDTH AND HEIGHT FROM RAW GRAPHICAL IMAGE DATA

Gerard J. Holzmann, Murray Hill, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Continuation-in-part of Ser. No. 134,234, Oct. 8, 1993, abandoned. This application Mar. 10, 1995, Ser. No. 401,655

Int. Cl.[6] G06K *9/36*

U.S. Cl. 382—286 **20 Claims**



1. A method for use in image reconstruction for calculating the width and height of a graphical image having unknown dimensions, said graphical image being represented by graphical image data, said graphical image data comprised of a plurality of data elements, each of said data elements representing a characteristic of a region of said graphical image, said method employing a computing system having one or more processors and a memory device, said method comprising the steps of:

storing said graphical image data in said memory device;

analyzing said memory device to obtain a size in memory units of said stored graphical image data using at least one of said processors, said size representing the area of said image in pixel units;

obtaining a plurality of pixel width-height pair estimates, each of said pixel width-height pair estimates having a product equal to said area of said image in pixel units;

calculating an error index for each of said width-height pair estimates, said error indexes evaluating the correlation of brightness values of vertically adjacent pixels in said stored graphical image data corresponding to a configuration of said graphical image having the width and height associated with the corresponding width-height pair estimate; and

determining the width and height in pixels of the graphical image by selecting the width-height pair estimate having the lowest error index to produce graphical image data corresponding to a graphical image of known dimensions.

5,559,905

DIGITAL IMAGE RESIZING APPARATUS

Lance Greggain, Woodbridge; Peter Mandl, Aurora, and Bruce Ittner, Willowdale, all of Canada, assignors to Genesis Microchip Inc., Markham, Canada

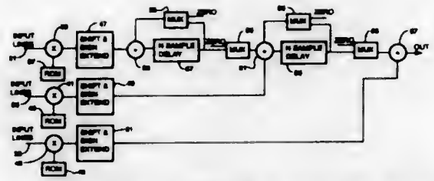
Filed Sep. 22, 1993, Ser. No. 125,530

Int. Cl.[6] G06K *9/32*

U.S. Cl. 382—298 **16 Claims**

1. Apparatus for resizing an image, comprising:

a) interpolation filter means for receiving a stream of input pixels having a predetermined sampling period P and a first sampling rate of S pixels/lines, and interpolating said stream of input pixels at a predetermined interpolation rate for generating a first derived sample stream of pixels having a further sampling period (M/(CL))P and a second sampling rate of T pixels/lines, where L is a first positive integer greater than one, C is a positive integer and M is smaller than CL, and



where either $2^{n}M/CL$ or $2^{-n}M/CL$ is equal to time step increment M/L and the absolute value of n is at least equal to zero;

b) octave filtering means having a predetermined sampling rate which is related to the interpolation rate of said interpolation filter, for receiving said first derived sample stream of pixels and in response generating a stream of filtered output pixels having a sample period of (M/L)P;

c) means for decrementing said first rate S by one and in response outputting a decremented first rate S−1;

d) means for decrementing said second rate T by one and in response outputting a decremented second rate [S−1] T−1;

e) means for dividing said decremented first rate S−1 by said decremented second rate T−1 and in response outputting said time step increment M/L; and

f) resampling said input pixels at said step increment M/L, thereby producing said resampled pixels at said second rate of T, with alignment of said input pixels and said resampled pixels at said boundaries of said image.

5,559,906

OPTICAL ARRANGEMENT OF A STRIP-SHAPED OPTICAL WAVEGUIDE

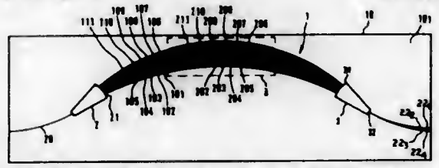
Reinhard Maerz, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 11, 1995, Ser. No. 371,299

Claims priority, application Germany, Jan. 11, 1994, 44 00 554.7

Int. Cl.[6] G02F *1/035*

U.S. Cl. 385—3 **14 Claims**



1. In an optical arrangement composed of more than two strip-shaped optical waveguides, each waveguide optically connects an optical input port of the arrangement to an optical output port of the arrangement allocated only to this waveguide and comprises a specific path length between the input port and the allocated output port so that the path lengths of at least two waveguides differ and wherein the output ports are arranged side-by-side at such a slight spatial distance that the optical waves being guided in the waveguides and outfed via the output ports are coherently superimposed on one another, the improvements comprising at least two waveguides having a controllable phase shifting means for the controlled generation of a phase shift of an optical wave being guided in each of the waveguides, each controllable phase shifting means including the waveguide comprising a longitudinal section of material having a refractive index that can be varied by a specific physical quantity extending along the path length with the overall length of each section being different for each waveguide, each section having means for generating a controllable variation of the physical quantity in the section comprising the material extending between electrodes and means for applying electrical current to said electrodes to cause said material to vary the refractive index so that the amount of phase shifting in adjacent waveguides created by the controllable phase shifting means is different.

5,559,907

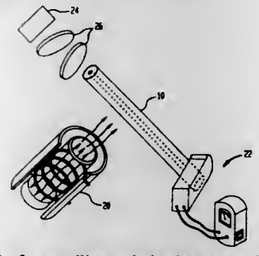
METHOD OF CONTROLLING POLARIZATION PROPERTIES OF A PHOTO-INDUCED DEVICE IN AN OPTICAL WAVEGUIDE AND METHOD OF INVESTIGATING STRUCTURE OF AN OPTICAL WAVEGUIDE

Daryl Inniss, Hillsborough; Ashish M. Vengsarkar, Chatham, and Qian Zhong, Scotch Plains, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Feb. 17, 1994, Ser. No. 198,802

Int. Cl.[6] G02B *6/00;* **C03B** *37/023*

U.S. Cl. 385—11 **6 Claims**



1. A method of controlling polarization properties of a photo-induced device in an optical fiber comprising the steps of

writing the device by exposing one side of the optical fiber to light while leaving another side unexposed, and then

exposing the previously unexposed side to light in an amount sufficient to symmetrize the refractive index change about the optical axis of the fiber.

5,559,908

METHOD FOR DAMPING OPTICAL FIBER ON A BIAS OPTICAL PHASE MODULATOR

Richard J. August, Scottsdale; Kevin B. Dimond; John R. Feth, both of Phoenix; Clarence E. Laskoskie, Scottsdale; Lee K. Strandjord, Glendale, and Bogdan Szafraniec, Cave Creek, all of Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 250,970, May 31, 1994, Pat. No. 5,457,532. This application Jun. 6, 1995, Ser. No. 468,783

Int. Cl.[6] G02B *6/00;* **G01B** *9/02*

U.S. Cl. 385—12 **3 Claims**

1. A method for damping optical fiber on a bias optical phase modulator means having two optical fiber leads, comprising:

securing the bias phase modulator means;

applying a silicone or acrylate type of substance to an outward facing surface of the fiber wound on the bias phase modulator means;

applying the silicone or acrylate type of substance on the two optical fiber leads for at least 0.5 inch (1.28 cm.) along each lead which is apart from the place where the optical fiber is wound on the bias phase modulator;

frequently brushing or smoothing or evening out the applied silicone or acrylate type of substance until the substance begins to set; and

drying the substance on the optical fiber until the substance is cured.

5,559,909

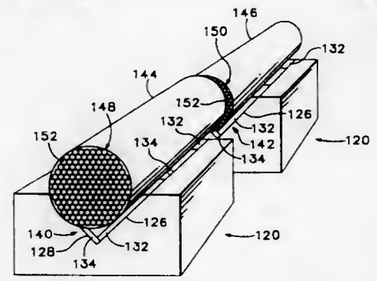
MECHANICAL OPTICAL SWITCH

Duwayne R. Anderson; Steve U. Reinhold, both of Redmond; Lorimer L. Twigg, Sisters, and Mark D. Marineau, Redmond, all of Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Continuation-in-part of Ser. No. 393,582, Feb. 23, 1995, abandoned, which is a continuation-in-part of Ser. No. 223,298, Apr. 5, 1994, Pat. No. 5,438,638. This application Jun. 7, 1995, Ser. No. 484,222

Int. Cl.[6] G02B *6/38*

U.S. Cl. 385—16 **36 Claims**



21. An optical switch comprising:

least a first optical fiber disposed within a first ferrule rotating about a first independent and offset rotational axis with the first optical fiber positioned within the ferrule to move on a first closed curve and the first ferrule having a hardness greater than the optical fiber for forming a recessed polished end face on the ferrule;

at least a second optical fiber disposed within a second ferrule rotating about a second independent and offset rotational axis with the second optical fiber positioned within the ferrule to move on a second closed curve and the second ferrule having a hardness greater than the optical fiber for forming a recessed polished end face on the ferrule, the first and second optical fiber being in opposing relationship forming an optical interface at the polished end faces of the ferrules, with the first and second rotational axes being laterally offset from each other for offsetting the closed curve of the first optical fiber from the closed curve of the second optical fiber for establishing intersecting points between the closed curves of the first and second optical fibers;

first and second offset holder assemblies for receiving the first and second ferrules with each holder assembly having a kinematic V-groove structure with an apex and angularly extending sidewalls forming a V-shaped cavity for receiving the respective ferrules and a spring clamp having first and second spring clamp members positioned over the V-shaped cavity for securing the ferrule in the cavity, the sidewalls of the V-groove structure and the spring clamp members having wear resistant inserts secured thereto having a hardness equal to or greater than the ferrule;

means for storing angular coordinates representative of the intersecting points between the closed curve of the first optical fiber and the closed curve of the second optical fiber; and

means for selectively rotating the first and second optical fibers relative to each other about their respective independent and offset rotational axes for axially aligning the first and second optical fibers at one of the intersecting points on the closed curves.

5,559,910

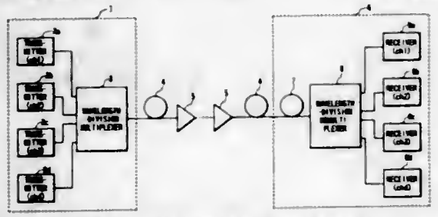
which each have a discrete focal point, wherein said segments are

end segments (37, 38), said second straight segment (28)

5,559,910
WAVELENGTH DIVISION MULTIPLEXED OPTICAL FIBER TRANSMISSION EQUIPTMENT

Hidenori Taga, Saitama-ken; Noboru Edagawa, Tokyo; Shu Yamamoto; Noriyuki Takeda, both of Saitama-ken, and Shigeyuki Akiba, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed May 26, 1995, Ser. No. 452,028
Claims priority, application Japan, Jun. 6, 1994, 145812
Int. Cl.[6] G02B *6/28*
U.S. Cl. 385—24 **8 Claims**

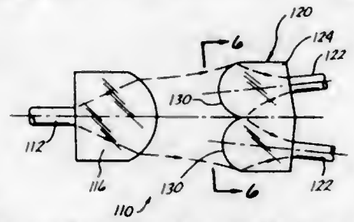


1. A wavelength division multiplexed optical fiber transmission equipment comprising:
- a transmitter for transmitting a wavelength multiplexed optical signal,
- a receiver for receiving the wavelength multiplexed optical signal sent from said transmitter,
- optical fibers for interconnecting said transmitter and said receiver,
- an optical repeater inserted into said optical fibers for performing an optical amplification, and
- a dispersion medium inserted between said transmitter and said receiver for equalizing the chromatic dispersion distortion caused by the difference between the respective optical signal wavelengths of the wavelength multiplexed signal sent from said transmitter and the total average zero-dispersion wavelength of said optical fibers and said optical repeater, by means of a chromatic dispersion of the opposite sign,
- wherein the respective optical signal wavelengths output from said transmitter are all lying on one of the short-wavelength side and the long-wavelength side with respect to the total zero-dispersion wavelength of the optical transmission path comprising of said optical fibers, said repeater and said dispersion medium.

5,559,911
OPTICAL FIBER COUPLER USING SEGMENTED LENSES

John F. Forkner, Laguna Beach; Andrew P. Riser, Menifee, both of Calif.; Ronald F. Rykowski, Woodinville, Wash., and Stephen S. Wilson, San Juan Capistrano, Calif., assignors to Radiant Imaging, Inc., San Juan Capistrano, Calif.

Filed Jan. 17, 1995, Ser. No. 374,163
Int. Cl.[6] G02B *6/32;* **F21V** *7/04*
U.S. Cl. 385—33 **24 Claims**



1. An optical fiber manifold for coupling light from an illumination source to a plurality of output optical fibers, said output optical fibers each having a proximal end for receiving said light and said manifold comprising a lens having a plurality of segments which each have a discrete focal point, wherein said segments are adapted to converge the light from said illumination source to their respective focal points, the proximal end of each of said optical fibers being located at the focal point of a corresponding lens segment for receiving light therefrom, the lens segments further being in abutting structural relationship with the proximal ends of their corresponding output optical fibers, whereby the focal point of each lens segment is substantially coincident with its exit plane.

5,559,912
WAVELENGTH-SELECTIVE DEVICES USING SILICON-ON-INSULATOR

Farid Agahi, Danbury; Bardia Pezeshki, Stamford, both of Conn.; Jeffrey A. Kash, Pleasantville, N.Y., and Jeffrey J. Welser, Greenwich, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

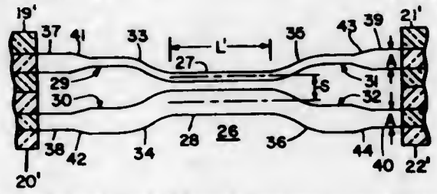
Filed Sep. 15, 1995, Ser. No. 529,933
Int. Cl.[6] G02B *6/26;* **H04J** *14/02*
U.S. Cl. 385—42 **9 Claims**

1. An optical filter comprising:
- an asymmetric waveguide directional coupler having two waveguides, one of said waveguides being a silicon waveguide substantially made of silicon and another of said waveguides being low index waveguide substantially made of a low index material, where said silicon waveguide extracts a selected wavelength from a plurality of wavelengths in said low index waveguide, where refractive indices and thicknesses of said two waveguides are adjusted so that said selected wavelength has the same propagation constant in said two guides, where said extraction of said selected wavelength into said silicon waveguide occurs without requiring a diffraction grating.

5,559,913
BROADBAND INTEGRATED OPTICAL PROXIMITY COUPLER

Christian Lerminiaux, Fontainebleau, France, assignor to Corning Incorporated, Corning, N.Y.

Filed Jan. 30, 1995, Ser. No. 380,748
Claims priority, application European Pat. Off., Feb. 3, 1994, 94400230
Int. Cl.[6] G02B *6/26*
U.S. Cl. 385—43 **20 Claims**

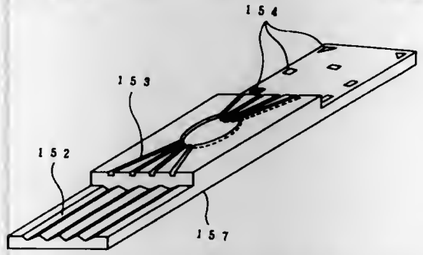


1. An integrated optical device for proximity coupling between two waveguides comprising
- first and second waveguide input end segments (37, 38) waving the same width,
- first and second straight interaction waveguide segments (27, 28) that are parallel and near to one another, said first straight segment (27) being narrower than said first and second input end segments (37, 38), said second straight segment (28) being wider than said first and second input end segments (37, 38), the spacing between said first and second straight interaction waveguide segments (27, 28) being less than the spacing between said first and second waveguide input end segments (37, 38),
- first input means (29) for connecting said first input end segment (37) to said first straight segment (27),
- second input means (30) for connecting said second input end segment (38) to said second straight segment (28), and
- output means (31, 32) for coupling a signal from one of said first and second straight paths (27, 28).

5,559,914
COMPONENTS FOR OPTICAL CIRCUITS AND METHOD OF MANUFACTURING THE SAME

Hiroyuki Asakura, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 12, 1994, Ser. No. 321,615
Claims priority, application Japan, Oct. 19, 1993, 5-260510; Apr. 14, 1994, 6-076079
Int. Cl.[6] G02B *6/43*
U.S. Cl. 385—49 **8 Claims**



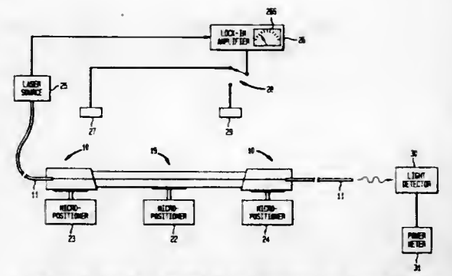
2. An amorphous glass submount for optical circuits comprising:
- a submount pan on which an optical waveguide is formed;
- at least one reference groove formed on said amorphous glass submount, having at least one optical fiber disposed in said reference groove;
- a plurality of positioning marks for mounting components formed on said amorphous glass submount; and
- an electronic circuit mounted on said amorphous glass submount.

5,559,915
APPARATUSES AND METHODS FOR ALIGNING AN OPTICAL FIBER ARRAY WITH AN OPTICAL INTEGRATED CIRCUIT ASSEMBLY

George F. Deveau, Cumming, Ga., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Apr. 13, 1995, Ser. No. 421,274
Int. Cl.[6] G02B *6/30*
U.S. Cl. 385—49 **13 Claims**

11. An apparatus for aligning a first optical fiber array with an optical integrated circuit (OIC) assembly comprising:
- a first micropositioner for mounting a first optical fiber array having an end exposing first ends of spaced optical fibers housed in the first optical fiber array;
- a second micropositioner for mounting an optical integrated circuit (OIC) assembly having a first end exposing first ends of optical waveguides coupled to an OIC in the OIC assembly;
- a laser source coupled to the second ends of the first optical fibers housed in the first optical fiber array, generating and supplying laser light to the optical fibers in the optical fiber array and a signal indicative of a modulation frequency of the laser light;

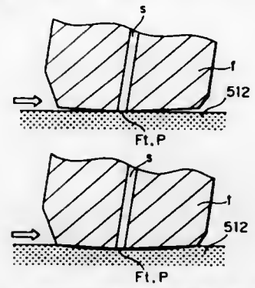


- a first light detector arranged in proximity to a first interface between the end of the first optical fiber array and the end of the OIC assembly, detecting light scattered from the first interface and generating a signal based on the light scattered from the first interface; and
- a lock-in amplifier coupled to receive the signal from the laser source and the signal from the light detector, and capable of generating a display indicative of an amount of the light scattered from the first interface, based on the signal indicative of the wavelength of the laser light and the signal generated by the first light detector.

5,559,916
METHOD FOR MANUFACTURING OPTICAL FIBER ASSEMBLY WITH POLISHED END-FACE, AN END FACE POLISHING APPARATUS, AND A METHOD FOR EXAMINING THE END POINT OF END-FACE POLISHING PROCESS OF OPTICAL FIBER

Kazuhiko Terao; Hidetoku Iida; Takeyasu Nakayama; Toshiya Kubo; Jiro Horigome, all of Nagano; Yoshihiro Matsuoka, Chiba; Nobutoshi Takeda, Chiba, and Tohru Mizuhashi, Chiba, all of Japan, assignors to Totoku Electric Co., Ltd., and Emit Seiko Co., Ltd., both of Tokyo, Japan

Filed Dec. 8, 1994, Ser. No. 352,258
Claims priority, application Japan, Dec. 10, 1993, 5-310265
Int. Cl.[6] G02B *6/00;6/36*
U.S. Cl. 385—85 **11 Claims**



1. A method for manufacturing an optical fiber assembly with a polished end face, comprising the steps of:
- first polishing said optical fiber assembly including an optical fiber and a ferrule to form a conical surface at the end face such that:
- a central axis of said conical surface makes an inclination of θ° with respect to an optical axis of said optical fiber, and
- a top of said conical surface coincides with the optical axis of said optical fiber, and has a taper angle of α°, and
- further polishing said optical fiber assembly to form a convex spherical surface at the end face such that a central axis of said convex spherical surface makes an inclination of θ° with respect to the optical axis of said optical fiber.

5,559,917

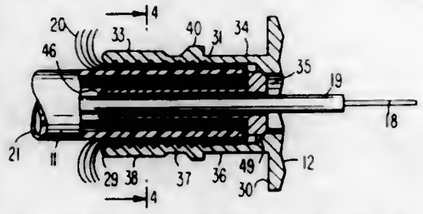
CONNECTOR FOR TERMINATED FIBER OPTIC CABLE

Conrad L. Ott, 43 Washburn St., Lake Grove, N.Y. 11744

Continuation-in-part of Ser. No. 23,678, Feb. 26, 1993, Pat. No. 5,436,994. This application Apr. 25, 1995, Ser. No. 428,293

Int. Cl.[6] G02B *6/00;6/36*

U.S. Cl. 385—86 **5 Claims**



1. In a combination of a terminated fiber optic cable and connector therefor, the connector including a rear body element having a hollow tubular body into which said fiber optic cable is inserted, said fiber optic cable including a glass fiber and surrounding polymer buffer, plural longitudinally aligned strength members surrounding said buffer, and a synthetic resinous sheath surrounding said strength members; said rear body including a deformable tubular sleeve having a first through bore of first diameter, and a counter bore of second diameter, said cable having a length of sheath removed to expose said strength members, the improvement comprising: an elongated hollow sleeve having an enlarged terminal at one end thereof, having an internal diameter which provides clearance for said buffer, said sleeve being inserted coaxially into said cable at a first end thereof between said strength members and said buffer to a point where said terminal engages an exposed end of said sheath, said terminal radially spreading said strength members to be folded upon an outer surface of said sheath subsequent to insertion of said cable into said deformable sleeve of said body; said sleeve of said rear body being crimped upon said sheath and strength members to compress said sheath and strength members upon said elongated hollow sleeve, said hollow sleeve preventing compression of said buffer to allow relative movement of said buffer relative to said rear body and said sheath.

5,559,918

OPTICAL SEMICONDUCTOR MODULE IN WHICH A HERMETICALLY SEALED OPTICAL SEMICONDUCTOR DEVICE IS CONNECTED TO AN ELECTRICAL WIRING LAYER

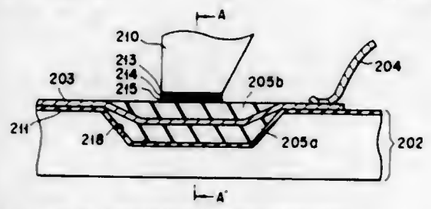
Hideto Furuyama, Yokohama; Hiroshi Hamasaki, Sagamihara, and Tamon Kobayashi, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 160,919, Dec. 3, 1993, Pat. No. 5,412,748. This application Jan. 27, 1995, Ser. No. 379,282

Claims priority, application Japan, Dec. 4, 1992, 4-325210; Sep. 16, 1993, 5-229781

Int. Cl.[6] G02B *6/00;6/36*

U.S. Cl. 385—92 **16 Claims**



1. An optical semiconductor module comprising:

a semiconductor substrate having a first groove, buried with an insulator, for extending an electrical wiring layer therethrough and a second groove in which an optical fiber is to be mounted;

an optical semiconductor device mounted on said semiconductor substrate;

an optical fiber arranged in the second groove such that an optical axis of said optical fiber coincides with an optical axis of output/input light from/to said optical semiconductor device;

a cap member arranged across the first and second grooves on said semiconductor substrate and bonded and fixed to said semiconductor substrate by a bonding member, for hermetically sealing said optical semiconductor device and said optical fiber; and

an electrical wiring layer arranged to extend from an outside of said cap member on said semiconductor substrate to an inside of said cap member through the groove buried with the insulator, said electrical wiring layer being electrically connected to said optical semiconductor device.

5,559,919

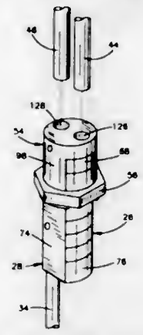
PHOTOELECTRIC OPTICAL FIBER CONNECTOR AND SENSOR APPARATUS

Jeffry W. Solberg, Snohomish, Wash., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 25, 1995, Ser. No. 449,993

Int. Cl.[6] G02B *6/36;* **G01J** *1/04*

U.S. Cl. 385—92 **14 Claims**



1. A photoelectric sensor apparatus comprising a housing enclosing a light source and a photodetector, said housing having an end face with an outlet through which light is conducted from said light source and an inlet through which light is conducted to said photodetector, an adapter, said adapter having a head end portion which extends across said end face of said housing, a connector which interconnects said adapter and said housing, first surface means defining a first passage extending through said head end portion of said adapter, said first passage being axially aligned with said outlet in said end face of said housing, second surface means defining a second passage extending through said head end portion of said adapter, said second passage being axially aligned with said inlet in said end face of said housing, a first fiber optic cable extending into said first passage and engaging said outlet in said end face of said housing to conduct light transmitted from said light source through said outlet in said end face of said housing to a location spaced from said housing, and a second fiber optic cable extending into said second passage and engaging said inlet in said end face of said housing to conduct light from the location spaced from said housing to said inlet in said end face of said housing and said photodetector.

5,559,920

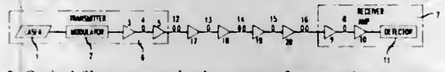
DISPERSION COMPENSATION IN OPTICAL FIBER COMMUNICATIONS

Andrew R. Chraplyvy, Matawan; Fabrizio Forghieri, Princeton Junction; Alan H. Gnauck, Middletown, and Robert W. Tkach, Little Silver, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 1, 1995, Ser. No. 396,841

Int. Cl.[6] G02B *6/02*

U.S. Cl. 385—123 **9 Claims**



1. Optical fiber communication system for operation at a system wavelength, including a transmitter, a receiver, and a transmission line comprising successive amplified fiber spans of alternating sign of dispersion; in which the transmission line includes an initial fiber span following the transmitter, a terminal span before the receiver, and at least one intermediate span; in which length and dispersion magnitude of the terminal span is such as to compensate dispersion for a signal introduced into the receiver characterized in that

the transmission line includes at least one pair of successive spans in addition to the terminal span, such that residual dispersion of the line is at least ±50 ps/nm at the commencement of the pair, and in that members of the pair are of lengths and dispersion magnitudes such that residual dispersion at their termini is at least ±50 ps/nm, whereby residual dispersion of the transmission line is compensated at the system wavelength.

5,559,921

SINGLE MODE OPTICAL FIBER

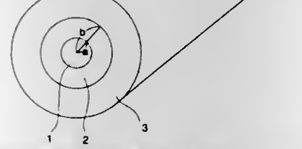
Yoshiaki Terasawa, and Yuji Kubo, both of Kanagawa, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 7, 1995, Ser. No. 478,089

Claims priority, application Japan, Jun. 24, 1994, 6-143036; Dec. 12, 1994, 6-307270

Int. Cl.[6] G02B *6/02;6/18*

U.S. Cl. 385—124 **15 Claims**



1. A single mode optical fiber comprising:

an inner core portion having a diameter of 2a and a refractive index n_1;

an outer core portion having a diameter of 2b and a refractive index n_2 which is smaller than the refractive index n_1 of said inner core portion, said outer core being disposed around said inner core;

a clad portion disposed around said outer core portion, which has a refractive index n_0,

wherein said single mode optical fiber satisfies relations of:

$$0.70\% \leqq \Delta n_1 \leqq 1.2\%,$$

$$0.12 \leqq \Delta n_2/\Delta n_1 \leqq 0.16, \text{ and}$$

$$0.15 \leqq 2a/2b \leqq 0.25$$

where $\Delta n_1=(n_1^2-n_0^2)/n_1^2$, and $\Delta n_2=(n_2^2-n_0^2)/n_2^2$.

5,559,922

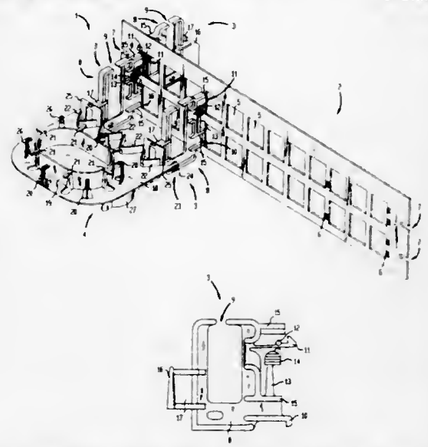
WIRE GUIDE AND OPTICAL FIBER STORAGE SPOOL ASSEMBLY

Jaime R. Arnett, Fishers, Ind., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Feb. 28, 1995, Ser. No. 395,735

Int. Cl.[6] G02B *6/43*

U.S. Cl. 385—135 **8 Claims**



1. An assembly for use with a patch panel housing connectors for optical fibers and wires, said assembly comprising:

at least one wire guide having a first side for engaging with the patch panel for support thereon, and a second side opposite first side of said wire guide for guiding conductive wires to respective connectors;

an optical fiber storage spool for storing slack optical fibers to be coupled to respective connectors; and

means for mounting said storage spool to said second side of said wire guide.

5,559,923

VAPOR GENERATOR WAND

David B. Robelen, Yorktown, Va., assignor to Administrator, National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 28, 1994, Ser. No. 359,320

Int. Cl.[6] F22B *29/06*

U.S. Cl. 392—397 **4 Claims**

1. A vapor generator wand, comprising:

a fluid supply means;

a fluid capable of producing vapor when heated, the fluid being contained within the fluid supply means;

means for controlling pressure in the fluid supply means such that the fluid may be caused to move;

a power supply;

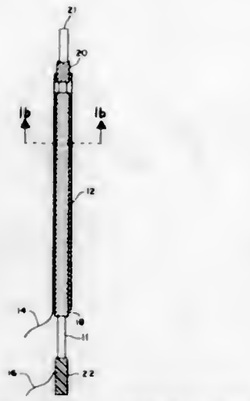
a substantially straight, electrically conducting, heating tube for heating the fluid having a fluid intake end and an opposed vapor output end, the fluid intake end being connected with the fluid supply means;

the power supply being connected in a series circuit with the heating tube and providing a current through the heating tube, causing the tube to heat up through electrical resistance heating; and

a radiation reflection member positioned on the exterior of said

providing an utterance to the speech recognition system while in

an input label sorter for receiving the plurality of input labels



an electrically conductive outer tube, coaxial to the heating tube, the outer tube electrically connected to the heating tube so as to form a return portion of the series circuit.

5,559,924

RADIANT FLUID HEATER ENCASED BY INNER TRANSPARENT WALL AND RADIATION ABSORBING/REFLECTING OUTER WALL FOR FLUID FLOW THERE BETWEEN

Kanichi Kadotani; Kazuhiko Kubota, and Mitsuru Ohaku, all of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

PCT No. PCT/JP92/00086, § 371 Date Aug. 5, 1993, § 102(e) Date Aug. 5, 1993, PCT Pub. No. WO92/14102, PCT Pub. Date Aug. 20, 1942

PCT Filed Jan. 29, 1992, Ser. No. 98,314

Claims priority, application Japan, Feb. 8, 1991, 3-039203; Mar. 29, 1991, 3-027818; Jun. 13, 1991, 3-168738

Int. Cl.° F24H *1/10*

U.S. Cl. 392—483 **14 Claims**

1. A fluid heating device comprising:

a transparent annular inner wall forming an internal space for receiving an infrared radiation heating member, said transparent annual inner wall having first and second open ends;

an annular outer wall spaced outwardly from said transparent annular inner wall to form a fluid passageway therebetween;

an infrared radiation heating member removably positioned in said internal space so that said infrared radiation heating member can be removed from said fluid heating device without requiring that said fluid passageway be opened; said infrared radiation heating member, when positioned in said internal space, being spaced from said transparent annular inner wall to form a clearance between said infrared radiation heating member and said transparent annular inner wall such that said infrared radiation heating member is at least partially surrounded by said transparent annular inner wall while avoiding direct contact between said infrared radiation heating member and said transparent annular inner wall; and

a radiation reflection member positioned on the exterior of said annular outer wall so as to reflect infrared radiation, which has passed from said infrared radiation heating member through said transparent annular inner wall, said fluid passageway, and said annular outer wall, back through said annular outer wall into said fluid passageway.

5,559,925

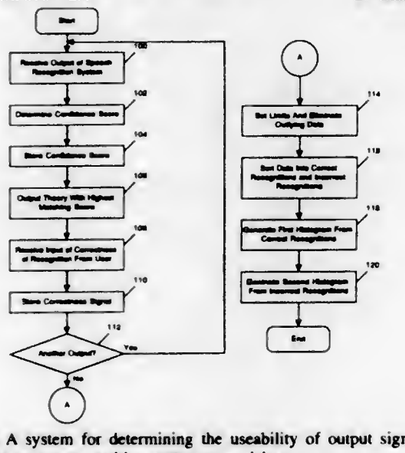
DETERMINING THE USEABILITY OF INPUT SIGNALS IN A DATA RECOGNITION SYSTEM

Stephen C. Austin, San Mateo, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Jun. 24, 1994, Ser. No. 267,113

Int. Cl.° G10L *5/00*

U.S. Cl. 395—2.4 **27 Claims**



18. A system for determining the useability of output signals from a pattern recognition system comprising:

a means for accepting an output signal from the pattern recognition system;

a means for obtaining a confidence score for the output signal;

a means for retrieving occurrence data from a lookup table;

a means for comparing the retrieved occurrence data; and

a means for generating an output signal based on the compared occurrence data.

5,559,926

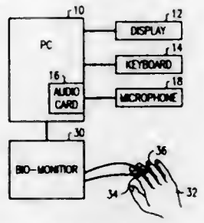
SPEECH RECOGNITION TRAINING USING BIO-SIGNALS

Joseph DeSimone, Bradley Beach, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 22, 1993, Ser. No. 171,585

Int. Cl.° G10L *5/06*

U.S. Cl. 395—2.52 **36 Claims**



1. A method for training a speech recognition system to recognize a user's utterance, comprising the steps of:

providing an utterance to the speech recognition system while in a training mode;

monitoring a bio-signal derived from the user; and

using said bio-signal to identify said utterance for retraining.

5,559,927

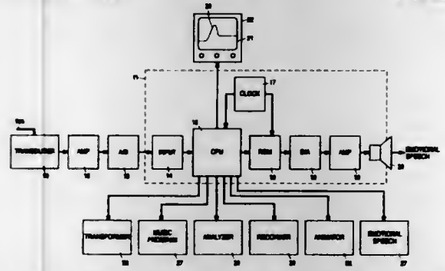
COMPUTER SYSTEM PRODUCING EMOTIONALLY-EXPRESSIVE SPEECH MESSAGES

Manfred Clynes, 19181 Mesquite Ct., Sonoma, Calif. 95476

Continuation-in-part of Ser. No. 931,963, Aug. 19, 1992, Pat. No. 5,305,423. This application Apr. 13, 1994, Ser. No. 227,119

Int. Cl.° G10L *5/02;3/00*

U.S. Cl. 395—267 **6 Claims**



1. A computer system adapted to produce emotionally-expressive speech messages, the system comprising:

A. a computer having stored or synthesized therein the sounds of different speech messages, and including means to select for reproduction one of these messages and to reproduce the selected message so that it can be heard by a user of the system;

B. a set of sentograms stored in the computer having respective wave forms reflecting different emotions; and

C. means to select one or more sentograms from the set and to modulate the message being reproduced as a function of the selected sentogram to impart emotional expressivity thereto.

5,559,928

MIN-MAX COMPUTING CIRCUIT FOR FUZZY INFERENCE

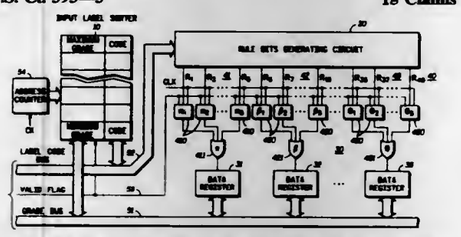
Ken Ota, Yokohama, Japan, and William Archibald, Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 195,949, Feb. 14, 1994, abandoned. This application Feb. 2, 1995, Ser. No. 382,957

Claims priority, application Japan, Mar. 31, 1993, 5-097154

Int. Cl.° G06F *7/00;9/44*

U.S. Cl. 395—3 **18 Claims**



1. A data processing system for performing a fuzzy inference operation, comprising:

bus means for transferring a plurality of input labels, a plurality of grades, and a plurality of valid bits, each of the plurality of input labels corresponding to one of the plurality of grades and each of the plurality of valid bits corresponding to the plurality of input labels;

an input label sorter for receiving the plurality of input labels and the plurality of grades, the input label sorter sorting a first portion of the plurality of grades in a first order based on magnitude, the input label sorter sorting each of the plurality of input labels and storing each of the plurality of input labels in a memory location which corresponds to a one of the first portion of the plurality of grades;

a rule bits generating circuit coupled to the input label sorter for receiving the plurality of input labels corresponding to the first portion of the plurality of grades in a second order based on magnitude, the rule bits generating circuit successively comparing each of the plurality of input labels with a first one of a plurality of antecedents of a first rule and selectively asserting a first rule signal each time one of the plurality of input labels corresponds to the first one of the plurality of antecedents of the first rule, the rule bits generating circuit concurrently successively comparing each of the plurality of input labels with a first one of the plurality of antecedents of a second rule and selectively asserting a second rule signal each time one of the plurality of input labels corresponds to the first one of the plurality of antecedents of the second rule;

a minimum determination circuit coupled to the rule bits generating circuit to indicate a first minimum value corresponding to the first rule and a second minimum value corresponding to the second rule, the minimum determination circuit indicating the first minimum value when the first rule signal is first asserted and a first corresponding one of the plurality of valid bits is in a first logic state which inhibits determination of the first minimum value and the minimum determination circuit indicating the second minimum value when the second rule signal is first asserted and a second corresponding one of the plurality of valid bits is in a second logic state which inhibits determination of the second minimum value;

a maximum determination circuit coupled to the minimum determination circuit, the maximum determination circuit asserting an enable signal when one of the first minimum value and the second minimum value is asserted; and

latch means coupled to the maximum determination circuit for receiving the enable signal and coupled to the bus means for selectively receiving the plurality of grades, the latch means latching a one of the plurality of grades when the enable signal is asserted, wherein a last one of the plurality of grades latched by the latch means is a first maximum output value.

5,559,929

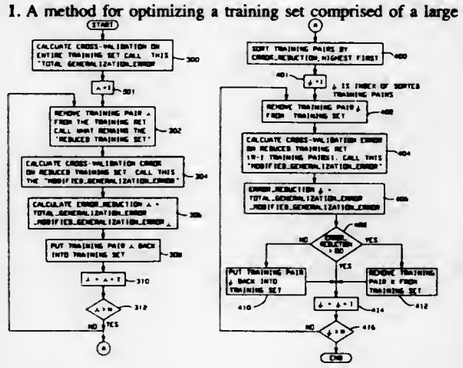
METHOD OF ENHANCING THE SELECTION OF A TRAINING SET FOR USE IN TRAINING OF A NEURAL NETWORK

Philip D. Wasserman, Cupertino, Calif., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Jul. 29, 1994, Ser. No. 282,250

Int. Cl.° G06F *7/00*

U.S. Cl. 395—23 **9 Claims**



1. A method for optimizing a training set comprised of a large

plurality of training pairs for use in training a neural network, said

(E) organizing each row of the raster data into non-overlapping

5,559,932

PRINTER AND COMPUTER SYSTEM WITH

of the computer systems having a memory, and printing files on printers coupled to the computer systems comprising:

plurality of training pairs for use in training a neural network, said method comprising the steps of:

a) training a neural network using said training set;

b) measuring a generalization error of the trained neural network;

c) removing a training pair from the training set to produce a reduced training set;

d) training the neural network using the reduced training set;

e) measuring the generalization error of the trained reduced training set;

f) reinserting the removed training pair into the training set;

g) performing steps c), d), e), and f) above for each training pair in the training set;

h) sorting the training pairs based on their measured generalization error; and

i) performing steps c), d), e) and f) above for each training pair in the training set, except that said reinserting in step f) is not performed when the measured generalization error in step e) is less than that obtained before removal of the training pair.

5,559,930

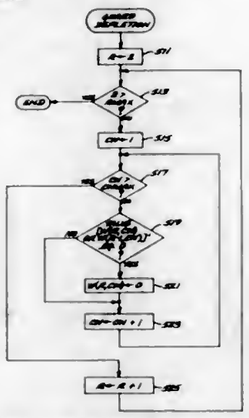
METHOD FOR REDUCING PIXEL DENSITY ALONG A PLURALITY OF AXES OF A MULTIPLE DIMENSION IMAGE REPRESENTATION

Alan E. Cariffe, San Diego; Anne P. Kadonaga, Del Mar; Steven L. Bass, San Diego, all of Calif., and Ine-Shneun Chen, Singapore, Singapore, assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 3, 1992, Ser. No. 925,723

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—102 **4 Claims**



4. In a swath type printer having a movable carriage for supporting a plurality of print elements which are controlled to print dots on a rectilinear array of pixels each having an associated pixel data bit in a bit-mapped pixel data array which is logically organized in rows and columns to correspond to the printed pixel array, a method for depleting a pixel data array comprising the steps of:

(A) defining for all rows of the pixel data array a starting end such that the bits in each row are in a column sequence that starts at the starting end;

(B) sequentially selecting the second through last in sequence bit in each row, and setting the selected bit to 0 if the immediately adjacent prior in column sequence bit is a 1;

(C) defining for all columns of the pixel data array a starting end such that the bits in each column are in a row sequence that starts at the starting end;

(D) sequentially selecting the second through last in sequence bit in each column, and setting the selected bit to 0 if the immediately adjacent prior in row sequence bit is a 1;

(E) organizing each row of the raster data into non-overlapping immediately adjacent M-bit words which are in a sequence that starts at a starting end that is common for all rows; and

(F) sequentially selecting each M-bit word in each of the second through last rows starting with the second row, and performing the following on the selected M-bit word:

(1) bitwise binary ORing the selected M-bit word with the prior in row sequence M-bit word that has the same word sequence as the selected M-bit word;

(2) determining whether the result of step (1) contains all 1's;

(3) replacing the selected M-bit word with an M-bit word containing all 0's if the result of step (1) contains all 1's.

5,559,931

COMPRESSION/DECOMPRESSION SYSTEM WHICH PERFORMS AN ORTHOGONAL TRANSFORMATION IN A TIME DIRECTION WITH RESPECT TO PICTURE PLANES

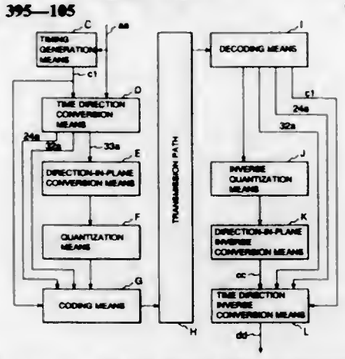
Tomoyuki Shindou, Yamato, and Seiji Higurashi, Tokyo-To, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 27, 1993, Ser. No. 141,676

Claims priority, application Japan, Oct. 27, 1992, 4-311172

Int. Cl.[6] H04N *7/137*

U.S. Cl. 395—105 **7 Claims**



1. A compression system and/or compression/decompression system for image data, which perform or performs an orthogonal transformation in a time direction with respect to a plurality of picture planes with one pair of a reference plane and other plane(s) with performing a motion compensation prediction, comprising

motion estimation means for obtaining motion information with respect to the other plane and/or planes;

motion prediction means for outputting predictive image data obtained by performed motion compensation prediction to the other plane and/or planes on the basis of the motion information;

first orthogonal transformation means for outputting transformed image data obtained by performing an orthogonal transformation in a time direction with respect to the plurality of planes on the basis of image data of the reference plane and the predictive image data; and

second orthogonal transformation means for performing an orthogonal transformation in a screen with respect to data outputted from said first orthogonal transformation means.

5,559,932

PRINTER AND COMPUTER SYSTEM WITH DETACHABLE BUILT-IN PRINTER

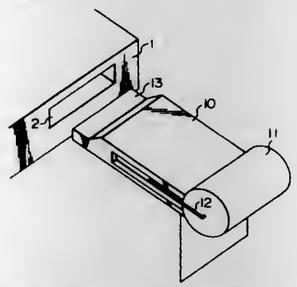
Tetsuo Machida, Tokyo; Toshihiko Matsuda, deceased, late of Owariasahi; Akihiro Kawaoka, Owariasahi, and Toshinori Kajfura, Ichinomiya, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 27, 1995, Ser. No. 379,767

Claims priority, application Japan, Jan. 31, 1994, 6-009504

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—114 **10 Claims**



1. A printer, connectable to a computer with a PC card slot, for printing print data supplied from the computer, said computer having a housing with a portion circumscribing said PC card slot, said printer comprising:

interfacing means for interfacing with said computer;

print pattern generating means for converting print data supplied from said computer via said interfacing means into print image data;

printing means for receiving said print image data generated by said print pattern generating means, synchronously with print timing, and printing said print image data on a recording sheet fed synchronously with said print timing; and

printer controlling means for controlling all of said interfacing means, said print pattern generating means, and said printing means,

wherein said interfacing means, said print pattern generating means, said printing means, and said printer controlling means are assembled in a PC card insertable into said PC card slot.

5,559,933

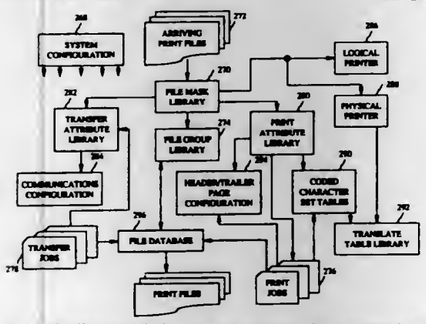
DISTRIBUTED ENTERPRISE PRINT CONTROLLER

R. Stephen Boswell, Fridley, Minn., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Apr. 22, 1994, Ser. No. 231,547

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—114 **42 Claims**



1. A distributed printing control system for transferring files between computer systems connected by a computer network, each of the computer systems having a memory, and printing files on printers coupled to the computer systems comprising:

file database means for storing a file to and retrieving said file from the memory, said file containing a file mask specifying file identification, transfer, and printing parameters, and for storing and retrieving a predetermined set of file masks;

file mask processing means coupled to said file database means for comparing said file mask of said file against said predetermined set of file masks stored in said file database means, for creating a transfer job to transfer said file or a print job to print said file or both said transfer job and said print job according to said file mask when said file mask matches a file mask in said predetermined set of file masks, and for directing said file database means to store said file;

file transfer means coupled to said file database means and said file mask processing means for executing said transfer job to transfer said file according to said file mask to another computer system coupled to the computer network; and

file print means coupled to said file database means and said file mask processing means for executing said print job to print said file according to said file mask on a computer printer interfaced to a computer system coupled to the computer network.

5,559,934

LABEL PRINTING APPARATUS AND WORDPROCESSOR

Wataru Ogura; Yoshito Kawagoe; Satoru Takizawa; Yasuo Takeuchi; Kimihiko Okimura, all of Suwa; Hiroshi Yoshida, deceased, late of Shiojiri; Atsushi Kobayashi; Noboru Ogura, both of Suwa, and Kenji Arioka, Ikoma, all of Japan, assignors to Chinon Industries, Inc., Japan

Division of Ser. No. 29,662, Mar. 11, 1993, Pat. No. 5,448,685.

This application Jun. 7, 1995, Ser. No. 479,458

Claims priority, application Japan, Mar. 11, 1992, 4-52727; Jun. 3, 1992, 4-142964; Jun. 16, 1992, 4-156672; Jun. 18, 1992, 4-159518; Jun. 29, 1992, 4-170917; Jun. 29, 1992, 4-170924; Jul. 2, 1992, 4-175512; Jul. 10, 1992, 4-183814; Jul. 13, 1992, 4-185302; Jul. 17, 1992, 4-191148; Aug. 4, 1992, 4-208184; Aug. 4, 1992, 4-208189; Aug. 19, 1992, 4-220412; Aug. 19, 1992, 4-220415

Int. Cl.[6] G06K *15/00*

U.S. Cl. 395—117 **6 Claims**

INPUT KEY	MEMBER LIST
1	1 ① (1) 1 Ⅰ ⅰ —
2	2 ② (2) 2 Ⅱ ⅱ 二
3	3 ③ (3) 3 Ⅲ ⅲ 三
4	4 ④ (4) 4 Ⅳ ⅳ 四
5	5 ⑤ (5) 5 Ⅴ ⅴ 五
6	6 ⑥ (6) 6 Ⅵ ⅵ 六
7	7 ⑦ (7) 7 Ⅶ ⅶ 七
8	8 ⑧ (8) 8 Ⅷ ⅷ 八
9	9 ⑨ (9) 9 Ⅸ ⅸ 九
0	0 0 〇

1. A word processor for forming a desired character string by key operations comprising:

a keyboard having input keys for inputting letters, symbols and numbers, a cursor shift key for moving a cursor and a confirmation key for confirming the selected letters, symbols and numbers;

display means for displaying the character string inputted by key operations of said keyboard;

storage means for registering a plurality of symbols and numbers which are divided in groups by specific concept; and

control means,

(c) generating and storing in a second memory a list of polyhe-

5,559,937

5,559,938

control means,

wherein said keyboard provides a symbol key and a number key which are typically assigned with a symbol or a number included in each group, and

said control means includes,

first control means for causing said display means to display a plurality of the symbols and numbers as non-confirmed data which are members of the groups corresponding to the depressed symbol or number keys,

second control means for displaying the cursor on the symbol or number displayed on said display means, and for moving the cursor in turn on the symbol or number according to the key operations of the cursor shift key,

third control means for confirming the symbol or number positioned at the cursor as the selected symbol or number when the confirmation key is depressed, and

fourth control means for displaying the confirmed symbol or number on the rear of the character string displayed on said display means and for erasing the non-confirmed data from said display means.

5,559,935

METHOD AND APPARATUS FOR GENERATING ISOSURFACES

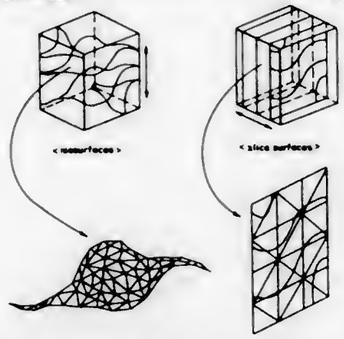
Takayuki Itoh, Sagamihara, and Koji Koyamada, Hadano, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 30, 1994, Ser. No. 347,014

Claims priority, application Japan, Dec. 16, 1993, 5-316747

Int. Cl.[6] G06T *17/20*

U.S. Cl. 395—124 **18 Claims**



1. A method for generating an isosurface constituting grid points having a predetermined scalar value from volume data stored in a first memory, said volume data consisting of multiple polyhedrons composed of a plurality of grid points each having an associated scalar value, the method comprising the steps of:

(a) extracting from said first memory a first grid point having a maximum scalar value with respect to said scalar values of said plurality of grid points of said multiple polyhedrons;

(b) extracting from said first memory a second grid point having a minimum scalar value with respect to said scalar values of said plurality of grid points of said multiple polyhedrons;

(c) generating and storing in a second memory a list of polyhedrons that intersect a line connecting said first grid point extracted in step (a) to said second grid point extracted in step (b); and

(d) generating said isosurface according to said list of polyhedrons stored in said second memory and said predetermined scalar value.

5,559,936

DATA RETRIEVAL SYSTEM, DISPLAY APPARATUS AND METHOD OF RECORDING AND DISPLAYING

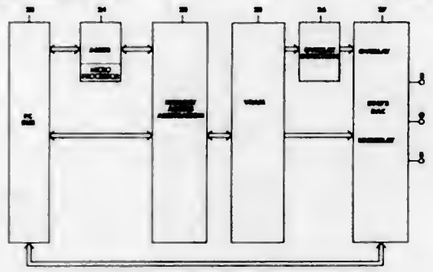
Graham G. Poulter, Leeds, and Peter J. S. Ashley, Warrington, both of United Kingdom, assignors to On Demand Information International PLC, Leeds, United Kingdom

Filed May 31, 1991, Ser. No. 708,738

Claims priority, application United Kingdom, Jun. 6, 1990, 9012601

Int. Cl.[6] G06T *3/00*

U.S. Cl. 395—128 **29 Claims**



1. An interactive data retrieval system for selectively retrieving and displaying stored visual images, comprising:

a) a recording medium having a multiplicity of visual images recorded thereon;

b) playback means arranged to access and read said visual images from said recording medium;

c) memory means containing a plurality of stored data fields, the data in at least one of said data fields identifying said visual images and the data in at least one other of said data fields being associated with said visual images;

d) database program means in association with a microprocessor for enabling a user to access data in said data fields and said visual images read by said playback means;

e) display means arranged to display under the control of said database program means, at least said visual images accessed by a user, said display means comprising means for dividing the image into square groups of adjacent pixels, means for replicating a predetermined pixel within each group by other pixels in that group to form a low resolution image composed of groups of identical adjacent pixels, means for substituting true image pixels for said other pixels in each group to form a high resolution image composed of individual pixels, and a display device responsive to said replicating means and substituting means to display an image of gradually increasing resolution; and

f) an electronic data communications link between the user specified in subparagraph d) and at least one of (i) a master database source, (ii) at least one remote user, (iii) at least one supplier of products shown in said recorded visual image, and (iv) at least one supplier of information shown in said recorded visual images.

5,559,937

CLIPPING PROCESSING DEVICE, THREE-DIMENSIONAL SIMULATOR DEVICE, AND CLIPPING PROCESSING METHOD

Masaki Takeda, Toshima-ku, Japan, assignor to Namco LTD., Tokyo, Japan

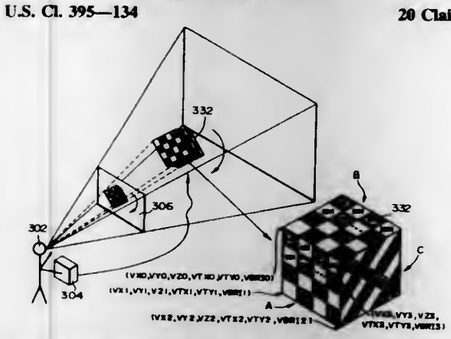
PCT No. PCT/JP94/01597, § 371 Date May 25, 1995, § 102(e) Date May 25, 1995, PCT Pub. No. WO95/09405, PCT Pub. Date Apr. 6, 1995

PCT Filed Sep. 28, 1994, Ser. No. 446,632

Claims priority, application Japan, Aug. 28, 1993, 5-264411

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—134 **20 Claims**



1. A clipping processing device for performing clipping processing using a plurality of clipping surfaces on a three-dimensional object represented by a plurality of polygons, comprising:

a priority memory means for storing clipping surface priorities which has a storage means for storing index data specifying said clipping surfaces to be used in clipping processing and stores said index data in a sequence in which clipping processing is executed, starting at an uppermost storage location of said storage means and proceeding downward;

an initial-value setting means for setting an initial value for said index data with respect to said priority memory means;

a reading means for reading said index data of said clipping surface from said priority memory means;

a priority modification means for modifying said index data that has been read by said reading means and rewriting modified data to said priority memory means; and

a clipping calculation means for performing clipping calculation with respect to a polygon to be processed, using said clipping surfaces specified by said index data read out by said reading means in sequence from the uppermost storage location of said storage means; wherein:

said clipping calculation means comprises inside/outside decision means for determining whether said polygon to be processed is in one of a display region, a boundary region, or an out-of-display region of said clipping surfaces; an interior-division-point calculation means for calculating interior division points between said polygon and said clipping surface when said inside/outside decision means determines that said polygon is in said boundary region; and means for performing calculation processing that invalidates said polygon when said inside/outside decision means determines that said polygon is in said out-of-display region; and

said priority modification means comprises means for transferring index data of said clipping surface to the uppermost storage location of said storage means when said clipping calculation means determines that said polygon to be processed is in the out-of-display region of said clipping surface.

5,559,938

DISPLAY SYSTEM FOR DISPLAYING A NET INTERCONNECTED GEOGRAPHICAL PATHS OF PROVIDED WITH ASSOCIATED GEOGRAPHICAL NAMES AND ROAD VEHICLE WITH ON-BOARD ROAD-BASED NAVIGATION SYSTEM HAVING SUCH DISPLAY SYSTEM

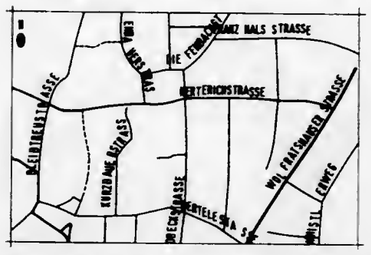
Jauke Van Roekel, Laufdorf, and Georg E. Kaeser, Herborn, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 2, 1994, Ser. No. 333,570

Claims priority, application European Pat. Off., Nov. 5, 1993, 93203106

Int. Cl.[6] G06T *3/00*

U.S. Cl. 395—141 **11 Claims**



1. A display system for displaying a net of distinct and interconnected geographical paths having various path orientations and comprising:

(a) storage means for storing said net as an arrangement of vectors each associated with one of said paths, said vectors including a geographical name comprised of characters for its associated path,

(b) select means for signalling an intended selection from said net,

(c) reading and routing means controlled by said select means for reading said storage means and outputting said selection,

(d) display means for displaying said selection including at least one of said paths in its actual orientation, said display means comprising font means for generating a character font for the characters of a name to be displayed adjacent the displayed geographical path of the selection,

(e) each said character being displayable in one of a plurality of different character orientations,

(f) means for determining the path orientation of each segment of the displayed path where a particular character of its associated name is to be displayed,

(g) means for displaying the particular character with one of its character orientations that substantially follows the determined path orientation of the adjacent path segment.

5,559,939

METHOD AND APPARATUS FOR PREPARING A DOCUMENT CONTAINING INFORMATION IN REAL MATHEMATICAL NOTATION

Yutaka Wada, Hitachiota; Yukihiro Oda, Katsuta; Tunemasa Miyo; Yasuhiro Noguchi, both of Hitachi, and Kazuo Takei, Ibaraki-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 671,213, Mar. 18, 1991, abandoned. This application Feb. 10, 1995, Ser. No. 386,623

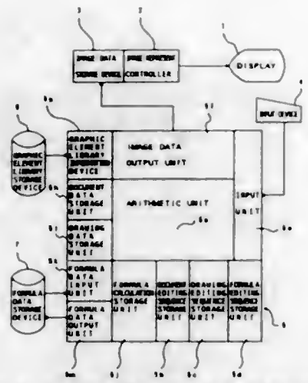
Claims priority, application Japan, Mar. 19, 1990, 2-067039

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—146 **33 Claims**

1. For operation on a processing system including a processor, a memory device, a display device, and an input device, a document preparation method comprising the steps of:

(a) inputting a mathematical expression in real mathematical notation via said input device for storage in said memory



device, the mathematical expression including operators and operands as constituent elements;

(b) displaying the mathematical expression in real mathematical notation on said display device;

(c) analyzing the displayed mathematical expression with said processor, by:

(1) analyzing positional relationships between each operator and respective adjacent operands of the displayed mathematical expression to thereby identify operands associated with each operator; and

(2) storing the identified associated operators and operands in said memory device;

(d) when a set of the associated operators and operands presents the displayed mathematical expression as a desired algebraic equation, converting the set of associated operators and operands into a binary tree structure of the desired algebraic equation;

(e) creating a program for calculating the equation on the basis of the binary tree structure;

(f) executing the program on said processor; and

(g) preparing a document including information resulting from step (f).

5,559,940

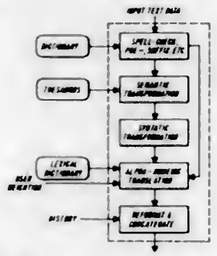
METHOD AND SYSTEM FOR REAL-TIME INFORMATION ANALYSIS OF TEXTUAL MATERIAL

William H. Hutson, 47 Grange Ave., Box 221, Little Compton, R.I. 02837-0221

Continuation of Ser. No. 238,375, May 5, 1994, abandoned, which is a continuation-in-part of Ser. No. 119,362, Sep. 10, 1993, Pat. No. 5,379,268, which is a continuation of Ser. No. 978,245, Nov. 18, 1992, Pat. No. 5,245,587, which is a continuation-in-part of Ser. No. 628,337, Dec. 14, 1990, Pat. No. 5,175,710. This application Jun. 5, 1995, Ser. No. 462,129

Int. Cl.[6] G09G *5/26*

U.S. Cl. 395—151 **37 Claims**



1. A system for at least enhancing selected information contained in a data containing media, comprising:

input means for inputting to the system data representing a textual document having a number of human-readable words;

first processing means that receives the data input from the input means, the first processing means for converting the input data from a first form to a second form;

second processing means for receiving an output of the first processing means, the second processing means for compressing the converted input data into compressed data structures, with the compressed data structures having information regarding a location and relative importance of elements of the input data according to a predetermined translation means, and with at least a subset of the compressed data structures being enhanced with respect to a remainder of the compressed data structures by modifying at least the subset of the compressed data structures;

third processing means for receiving an output of the second processing means, the third processing means for expanding the compressed data structures, with the subset of the compressed data structures enhanced, to a full form of data structures, the full form of data structures being representative of the converted input data with enhanced data structures being distinguishable from a remainder of data structures; and

readable form means for receiving an output of the third processing means, the readable form means for providing in readable form the full form of data structures representative of the converted input data, with the enhanced data structures being represented differently than the remainder of data structures by the readable form means.

5,559,941

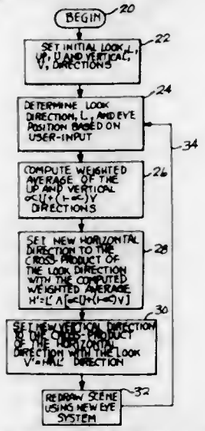
METHOD FOR SMOOTHLY MAINTAINING A VERTICAL ORIENTATION DURING COMPUTER ANIMATION

Eric L. Brechner, 9601 169th Ave. NE., Redmond, Wash. 98052

Filed Oct. 26, 1994, Ser. No. 329,350

Int. Cl.[6] G06T *13/00*

U.S. Cl. 395—152 **4 Claims**



1. A method for smoothly maintaining a vertical orientation during a computer animation comprising the steps of:

a) setting initial look, L, up, U, and vertical, V, directions for an initial computer generated scene;

b) determining the current look, L', direction based on user input;

c) determining the weighted average of the up and vertical directions in accordance with:

$\alpha U+(1-\alpha)$ V, where α is a predetermined value between zero and one, but not zero and not one;

d) setting a new horizontal H' direction in accordance with:

$$H'=L' \times [\alpha U+(1-\alpha) V];$$

e) setting a new vertical V' direction in accordance with:

$$V=H' \times L';$$

and

f) redrawing the computer generated scene in accordance with the new horizontal and vertical directions H', V', respectively.

5,559,942

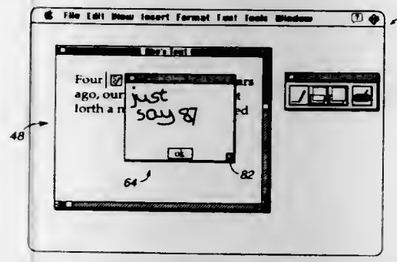
METHOD AND APPARATUS FOR PROVIDING A NOTE FOR AN APPLICATION PROGRAM

Michael L. Gough, Ben Lomond, and Bruce V. Holloway, Marina, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 10, 1993, Ser. No. 59,468

Int. Cl.[6] G06F *3/14*

U.S. Cl. 395—155 **49 Claims**



1. A method for providing a handwritten note on an application program image comprising:

noticing a note anchor object included with application data processed by an application program, wherein said note anchor object is manipulable as said application data by a function of said application program that processed said application data, said manipulation including moving, deleting, or inserting said anchor object as said application data; and

displaying a note slip image and an application image on a computer screen, said application image being created on said computer screen by said application program, said note slip image being displayed on said computer screen by a note slip program executing simultaneously with said application program, said note slip image being associated with said noticed note anchor object and portraying a handwritten note.

5,559,943

METHOD AND APPARATUS CUSTOMIZING A DUAL ACTUATION SETTING OF A COMPUTER INPUT DEVICE SWITCH

Clark R. Cyr, Redmond; Jon B. Kimmich; Timothy T. Brewer, both of Bellevue; Jeffrey S. Hanson, Woodinville; Miles Richardson, Renton; Kenneth R. Robertson, Redmond; Cheryl Jenkins, Seattle; Brenda L. Diaz, Redmond; John G. Pierce, Vashon, and Gregory Lee, Redmond, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

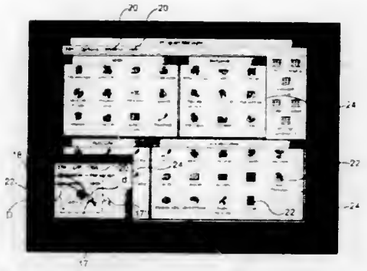
Filed Jun. 27, 1994, Ser. No. 266,177

Int. Cl.[6] G06F *3/14*

U.S. Cl. 395—155 **17 Claims**

8. In a computer system having a computer and display and pointing devices coupled thereto, the display device displaying a cursor and the pointing device having a switch and providing switch signals to the computer, a method of customizing a selected input time period and cursor movement distance occurring between a dual actuation of the switch, wherein dual actuation of the switch within the selected input time period and cursor movement distance provides a selected input to the computer, the selected input time period having a preselected setting, the method comprising the steps of:

displaying an object on the display device;



moving the cursor to the object;

actuating the switch to produce a first actuation signal;

actuating the switch to produce a second actuation signal;

determining a distance moved by the cursor between the first and second actuation signals;

determining a time interval between the first and second actuation signals;

resetting the selected input time period to the determined time interval; and

setting the cursor movement distance as the determined distance.

5,559,944

USER SPECIFICATION OF PULL DOWN MENU ALIGNMENT

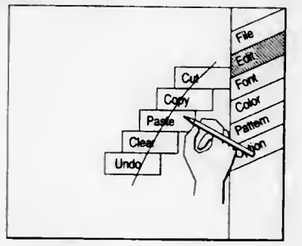
Makoto Ono, Yokohama, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 11, 1993, Ser. No. 6,271

Claims priority, application Japan, Feb. 7, 1992, 4-022602

Int. Cl.[6] G06F *3/14*

U.S. Cl. 395—156 **27 Claims**



1. A menu display system including processor and for user specification of pull down menu alignment comprising:

a display device;

pointing means for inputting points on the screen of the display device;

calibrating means for fitting the points input by the pointing means to an arc;

means for displaying a set of menu items on the display device in a vertical direction; and

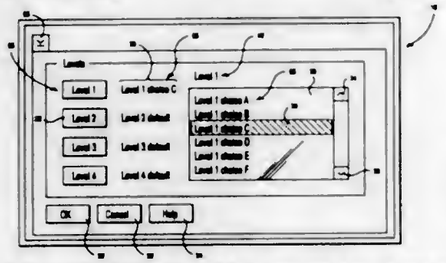
means, responsive to selecting one of the set of menu items, for displaying a pull down menu of the selected menu item aligned along the arc extending generally from the selected menu item.

5,559,945

DYNAMIC HIERARCHICAL SELECTION MENU

Phillip Beaudet, Pickering, Canada; Matthew Black; Jonathan Edwards, both of Lexington, Ky.; Julian Jones, Toronto, Canada; Eduardus A. T. Merks, and Roger Spall, both of North York, Canada, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 25, 1994, Ser. No. 233,160
Claims priority, application Canada, May 4, 1993, 2095452
Int. Cl.[6] G06F 3/14
U.S. Cl. 395—156 **20 Claims**



1. In a computer system having a display screen, a user interface mechanism for hierarchical menu selections comprising:

a zoned menu control window including a first zone displaying indicators representing a plurality of selection levels in a menu hierarchy, and a second zone having contents comprising a displayed list of selection options for one of said selection levels;

means for entering an option selected from said displayed list of selection options;

means for refreshing the contents of the second zone by replacing the displayed list of selection options with a second list of selection options for a different selection level in response to entry of an option selected from said displayed list of selection options; and

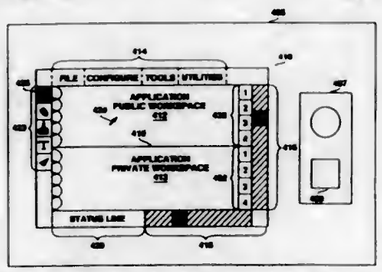
registration means for implementing a computer task on selection of options for all selection levels in the menu hierarchy.

5,559,946

METHOD AND APPARATUS FOR ADDING A NEW TAB TO A TAB BAR WINDOW

Dan R. Porter, Beaverton, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Aug. 30, 1994, Ser. No. 298,145
Int. Cl.[6] G06F 3/14
U.S. Cl. 395—157 **12 Claims**



1. A multiple window computer display system, the multiple window computer display system comprising:

a processor;

a display device, the display device coupled to the processor for displaying a visual output;

a data input device, the data input device electrically coupled to the processor such that various commands may be selected by manipulating the data input device;

an application program, the application program for providing instructions to be executed by the processor;

an operating system, the operating system for providing an environment under which the application program is run; and

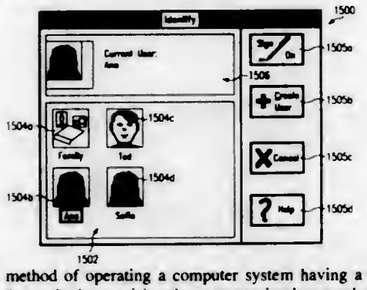
a windowing library, the windowing library being interactive with the operating system and the application program to provide a first display including a first primary window and a tab bar window, the tab bar window including a plurality of tabs corresponding to data displayable in the first primary window, the tab bar window including a special function tab which, upon selection by the data input device, creates a new tab and adds the new tab to the tab bar window.

5,559,947

COMPONENT-BASED ICON CONSTRUCTION AND CUSTOMIZATION SYSTEM

Theodore D. Wugofski, Fort Worth, Tex., assignor to AST Research, Inc., Irvine, Calif.

Continuation of Ser. No. 378,065, Jan. 25, 1995, Pat. No. 5,490,245, which is a continuation of Ser. No. 105,605, Aug. 12, 1993, abandoned. This application May 23, 1995, Ser. No. 449,893
Int. Cl.[6] G06F 3/14
U.S. Cl. 395—159 **5 Claims**



1. A method of operating a computer system having a display screen, the method comprising the computer implemented steps of:

displaying a plurality of icons on said display screen, each of said icons being associated with a user of said computer system and comprising at least two user-modifiable non-text icon components; and

responsive to a user's selecting one of said icons, logging said user associated with said selected icon on to a network to which said computer system is connected.

5,559,948

APPARATUS AND METHOD FOR MANIPULATING AN OBJECT IN A COMPUTER SYSTEM GRAPHICAL USER INTERFACE

Marc A. Bloomfield, Lighthouse Point, Fla.; Christopher A. H. Andrew, Orem, Utah, and Peter G. Magid, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

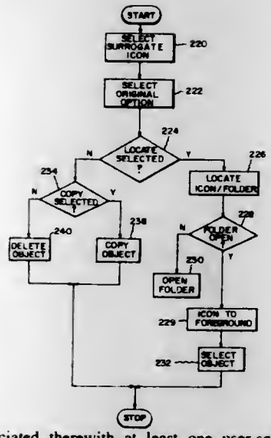
Continuation of Ser. No. 263,906, Jun. 22, 1994, abandoned, which is a continuation of Ser. No. 993,875, Dec. 23, 1992, abandoned. This application Mar. 22, 1995, Ser. No. 408,334
Int. Cl.[6] G06F 3/153
U.S. Cl. 395—159 **3 Claims**

1. A graphical user interface, executable on a computer system, said graphical user interface comprising:

a user-selectable first icon, displayable on said computer system, said user-selectable first icon representing an object having desired properties;

a user-selectable second icon, displayable on said computer system, said user-selectable second icon having an appearance visually different from said user-selectable first icon, said user-selectable second icon representing said object and having associated therewith at least one user-selectable command, said at least one user-selectable command enabling manipulation of said object properties; and

means, responsive to selection of the user-selectable second icon and said at least one user-selectable command, and coupled to said computer system, for manipulating the property of said object, wherein all properties of said object subject to manipulation by said at least one user-selectable command are manipulated in response to selection of user-selectable second icon and said at least one user-selectable command, wherein said at least one user-selectable command includes a location command, wherein said user-selectable first icon in a folder view is displayed and said user-selectable second icon is displayed in a current folder view and wherein said means includes a location means for displaying said user-selectable first icon in the response to selection of said user-selectable second icon in the current folder view and said at least one user-selectable command.

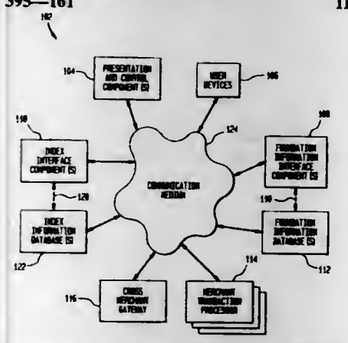


5,559,949

COMPUTER PROGRAM PRODUCT AND PROGRAM STORAGE DEVICE FOR LINKING AND PRESENTING MOVIES WITH THEIR UNDERLYING SOURCE INFORMATION

James A. Reimer, Morgan Hill, and Roger A. Reinsch, Cupertino, both of Calif., assignors to International Business Machine Corporation, Armonk, N.Y.

Division of Ser. No. 407,306, Mar. 20, 1995. This application Jun. 5, 1995, Ser. No. 462,842
Int. Cl.[6] G06F 15/00
U.S. Cl. 395—161 **11 Claims**



1. A computer program product comprising a computer readable medium having computer program logic recorded thereon for enabling a processor in a computer system to provide on demand access to movie related information, wherein said movie related information includes any of actors, directors, characters, props, contracts, sets or location related information, while said movie is being: continuously presented to a user, the system comprising:

movie presenting means for enabling said processor to present said movie to said user in a continuous manner;

pause means for enabling said processor to pause the presentation of said movie in response to a user generated pause signal defining a pause generated at user determined intervals; menu presenting means for enabling said processor to present a menu of user query selection,

query signal receiving means for enabling said processor to receive during a pause of said movie a user generated query signal representing a query pertaining to said movie related information;

frame identifying means for enabling a processor to identify a frame of said movie being presented to said user when said query signal is received, wherein said frame identifying means includes means for enabling said processor to extract from said movie a time code of said frame;

means for enabling a processor to identify, as specified by said query signal, portions of said movie related information relating to said frame;

means for enabling a processor to retrieve said identified portions of said movie related information;

means for enabling a processor to present to said user the retrieved portions of said movie related information; and

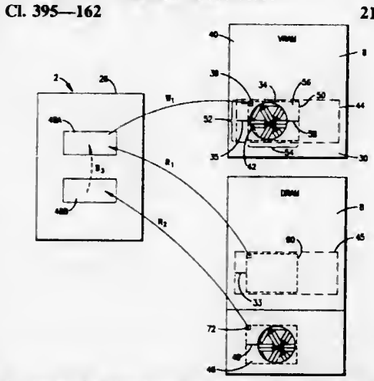
means for resuming continuous presentation of said movie.

5,559,950

GRAPHICS PROCESSOR ENHANCEMENT UNIT

Lee Cannon, Bozeman, Mont., assignor to Video Lottery Technologies, Inc., Bozeman, Mont.

Filed Feb. 2, 1994, Ser. No. 191,019
Int. Cl.[6] G06F 15/00
U.S. Cl. 395—162 **21 Claims**



1. A system for displaying an animated object upon a background on a screen, the object being moved between consecutive image frames, said system comprising:

a data bus;

a virtual memory area, connected to said data bus, said virtual memory area including first and second memory areas, said first memory area storing a memory map corresponding to an image frame, said memory map storing object and background data defining an object and background displayed in said image frame, said second memory area storing a copy of background data located within an animation area in said first memory area, said animation area corresponding to a portion of said background through which said object moves during animation;

a screen for displaying said image frame;

processor means, connected to said data bus, for accessing said object and background data during read and write operations,

respectively, to said virtual memory area to move said object

(3) a memory controller, coupled to said printer video processor,

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5,559,953

METHOD FOR INCREASING THE PERFORMANCE OF

first pixel map storage means for storing a format pixel map comprising a plurality of format identifiers, wherein said

respectively, to said virtual memory area to move said object between consecutive image frames;

an address bus connected to said virtual memory area and said processor means; and

an address control means, connected to said address bus, for selectively enabling said first and second memory areas to provide access by said processor means to said object and background data, said address control means enabling said second memory area when said processor means reads data from said virtual memory area, said address control means enabling said first memory area when said processor means writes object and background data to said virtual memory area.

5,559,951

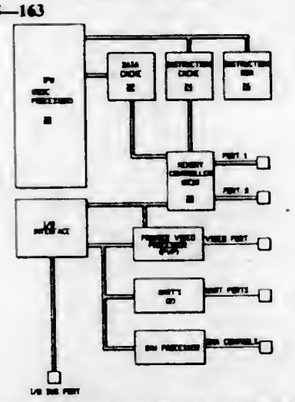
PAGE PRINTER CONTROLLER INCLUDING A SINGLE CHIP SUPERSCALAR MICROPROCESSOR WITH GRAPHICS FUNCTIONAL UNITS

Derek J. Lentz, Los Gatos; Johannes Wang, San Mateo; Trevor Deosaran, Sunnyvale; Linley M. Young, La Jolla; Kian-Chin Yap, San Jose; Le Trong Nguyen, Monte Sereno, all of Calif.; Makoto Matsubayashi, Suwa, Japan, and Te-Li Lau, Palo Alto, Calif., assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 267,646, Jun. 28, 1994, Pat. No. 5,394,515, which is a continuation of Ser. No. 817,813, Jan. 8, 1992, abandoned, which is a continuation of Ser. No. 726,929, Jul. 8, 1991, abandoned. This application Feb. 3, 1995, Ser. No. 383,015

Int. Cl.[6] G06F *15/16*

U.S. Cl. 395—163 **4 Claims**



1. A printer controller, implemented as a single chip superscalar microprocessor, comprising:

(1) a printer video processor for generating a plurality of control signals for a printer engine, for generating memory addresses of data to be fetched, for serializing fetched data, and for providing serialized data to said printer engine;

(2) an instruction processor comprising:

a plurality of graphical functional units, interconnected in said instruction processor as internal functional units to support operation of said printer video processor, comprising

an orthogonal rotator unit for assembling blocks of orthogonally rotated bit map data,

a bit/byte mirror unit for outputting received data in reverse order, and

a pixel modification unit for modifying pixels in response to graphics instructions;

a plurality of register files and multiplexers interconnecting said register files with said graphical functional units; and

an instruction scheduler for issuing instructions in parallel to said graphical functional units; and

(3) a memory controller, coupled to said printer video processor, for receiving and processing memory transaction requests from said printer video processor.

5,559,952

DISPLAY CONTROLLER INCORPORATING CACHE MEMORY DEDICATED FOR VRAM

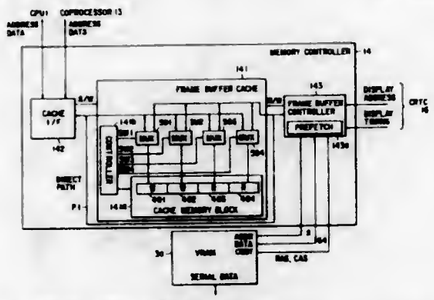
Akihisa Fujimoto, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 22, 1994, Ser. No. 215,948

Claims priority, application Japan, Mar. 23, 1993, 5-063985; Mar. 15, 1994, 6-044449

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—164 **16 Claims**



7. A display control system comprising:

an image memory for storing image data generated by a CPU of a host computer including said display control system and a drawing processor arranged in said display control system;

display means for displaying the image data, stored in said image memory, on a display;

a cache memory for storing part of the image data stored in said image memory, said cache memory being designed such that the image data is read/written therefrom/therein in accordance with a read/write request from said CPU of said host computer or said drawing processor, said cache memory including first and second write cache memory blocks for respectively storing image data to be written in said image memory and allowing data write/read operations independently, and first and second read cache memory blocks for respectively storing image data read out from said image memory and allowing write/read operations independently;

memory control means;

write cache switching means for alternately switching and connecting said first and second write cache memory blocks to the processor and said memory control means to simultaneously execute write access and read access to said write cache memory block;

read cache switching means for alternately switching and connecting said first and second read cache memory blocks to the processor and said memory control means so as to allow the processor and said memory control means to simultaneously execute read access and write access to said read cache memory block; and

hit detection means for detecting a cache hit/cache miss depending on whether data, read access of which is requested by said CPU of the host computer or said drawing processor, is stored in said cache memory; and

said memory control means, being connected to said cache memory, said image memory, and said hit detection means for replacing contents of said cache memory by transferring image data stored in said image memory to said cache memory in response to a cache miss detected by said hit detection means.

5,559,953

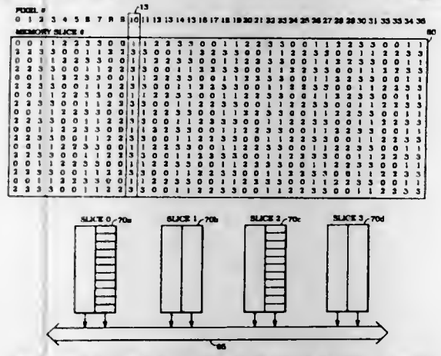
METHOD FOR INCREASING THE PERFORMANCE OF LINES DRAWN INTO A FRAMEBUFFER MEMORY

Larry D. Seiler, Boylston, Mass.; Robert S. McNamara, Bolton; Christopher C. Gianos, Sterling, all of Mass., and Joel J. McCormack, Woodside, Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jul. 1, 1994, Ser. No. 270,189

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—164 **8 Claims**



1. A method for storing a plurality of pixels forming a plurality of scan lines in a video memory, said video memory apportioned into a plurality of slices of memory, each of said slices of memory accessed by a plurality of controllers, said method comprising the step of allocating each of said pixels of said scan lines to predetermined ones of said plurality of slices of memory such that a plurality of successive pixels forming a line in said video memory may be accessed in parallel by said plurality of controllers

wherein said step of allocating further comprises the step of ordering the storage of successive pixels in a scan line in said plurality of memory slices to ensure that for a given pixel stored in a given slice of said plurality of slices, the neighboring pixels of neighboring scan lines are stored in different ones of said plurality of slices than said given slice.

5,559,954

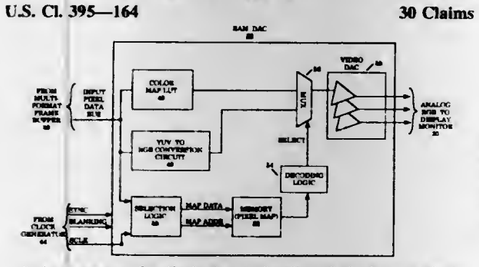
METHOD & APPARATUS FOR DISPLAYING PIXELS FROM A MULTI-FORMAT FRAME BUFFER

Thomas Y. Sakoda, and Bruce Young, both of Tigard, Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 22,719, Feb. 24, 1993, abandoned. This application Mar. 29, 1995, Ser. No. 413,922

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—164 **30 Claims**



1. An apparatus for displaying a plurality of pixels on a display monitor, said apparatus comprising:

multi-format pixel storage means for storing said plurality of pixels, each pixel comprising one of a plurality of pixel format types;

first pixel map storage means for storing a format pixel map comprising a plurality of format identifiers, wherein said format identifiers specify a pixel format type for a corresponding pixel;

conversion means coupled to said multi-format pixel storage means for converting a pixel to a display compatible pixel for each format type to generate a plurality of display compatible pixels;

second pixel map storage means coupled to said first pixel map storage means for said format pixel map for rendering pixels for display on said display monitor; and

transferring means coupled to said first pixel map storage means and second pixel map storage means for transferring said format pixel map from said first pixel map storage means to said second pixel map storage means during a pre-determined interval, and for transferring a format identifier from said format pixel map to said second pixel map storage means for selection of said display compatible pixel; and

selection means coupled to said conversion means and said second pixel map storage means for selecting a display compatible pixel from said plurality of display compatible pixels based on a corresponding format identifier from said format pixel map such that said display compatible pixel selected is compatible for display on said display monitor.

5,559,955

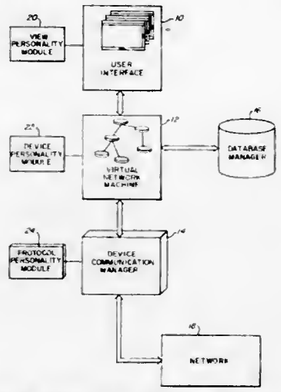
METHOD AND APPARATUS FOR MONITORING THE STATUS OF NON-POLLABLE DEVICE IN A COMPUTER NETWORK

Roger H. Dev, Durham, and Mark H. Nelson, Fremont, both of N.H., assignors to Cabletron Systems, Inc., Del.

Continuation of Ser. No. 216,696, Mar. 23, 1994, abandoned, which is a continuation of Ser. No. 797,121, Nov. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 583,509, Sep. 17, 1990, abandoned. This application Dec. 13, 1994, Ser. No. 355,430

Int. Cl.[6] G06F *11/34*

U.S. Cl. 395—182.02 **29 Claims**



1. A method for determining a contact status in a computer network using a network management system, the computer network including a plurality of interconnected network entities including communicating network entities and at least one non-communicating network entity, the network management system executing the steps of:

maintaining a virtual network of models of the network entities and model relations representing relations between the network entities, each model including a number of attributes and one or more inference handlers, the attributes being data which define the characteristics of the network entity being modeled, and the inference handler preforming a process on the data upon the occurrence of predetermined events in the

model which trigger the inference handler, the attributes including a contact status for the corresponding network entity;

communicating with the communicating network entities to obtain operational information as to the status of the communicating network entities and updating the corresponding contact status attributes in the corresponding models; and

the inference handlers using the operational information as to the communicating network entities and the model relations between the non-communicating network entities and the communicating network entities to infer the contact status of the non-communicating network entity and updating its contact status, said non-communicating network entity being incapable of communicating with the network management system.

5,559,956

STORAGE SYSTEM WITH A FLASH MEMORY MODULE

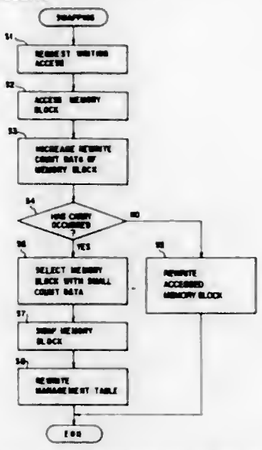
Hiroshi Sukegawa, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 1,750, Jan. 7, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 481,156

Claims priority, application Japan, Jan. 10, 1992, 4-003368; Sep. 14, 1992, 4-244713

Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—182.06 **18 Claims**



18. A method of using a flash memory module in a semiconductor memory device effectively, said flash memory module comprising at least two memory blocks of equal size, which include a first memory block to which data has been written n times and a second memory block to which data has been written m times, said method comprising the steps of:

receiving a request for writing data to the first memory block;

comparing a value of n with a value of m; and

swapping a content and logical address of the first memory block with a content and a logical address of the second memory block if a value of (n−m) is larger than a predetermined value.

5,559,957

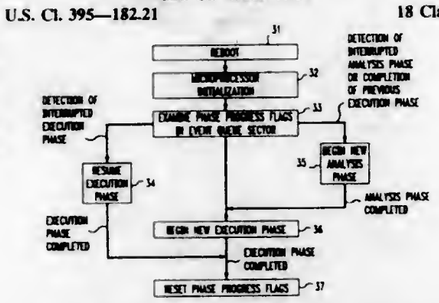
FILE SYSTEM FOR A DATA STORAGE DEVICE HAVING A POWER FAIL RECOVERY MECHANISM FOR WRITE/REPLACE OPERATIONS

Michael W. Balk, Piscataway, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed May 31, 1995, Ser. No. 455,926

Int. Cl.[6] G06F *11/34*

U.S. Cl. 395—182.21 **18 Claims**



1. In a data storage device under control of microprocessor and having storage locations for storing files written to the data storage device, a method is provided for preventing a microprocessor stall during reboot of the microprocessor and initialization of the data storage device, the method comprising the steps:

writing files to a first storage area of the data storage device;

tagging those files successfully written to the first storage area of the data storage device with a first tag; and

commencing initialization of the data storage device upon reboot of the microprocessor, the data storage device initialization forming a garbage collection routine comprising the steps of tagging files stored in the first storage area of the data storage device comprising unwanted files which are no longer desired for use with a second tag, and

erasing files stored in the first storage area of the data storage device comprising files not tagged with the first tag and files tagged with the second tag.

5,559,958

GRAPHICAL USER INTERFACE FOR COMPUTER MANAGEMENT SYSTEM AND AN ASSOCIATED MANAGEMENT INFORMATION BASE

Scott C. Farrand, Tomball; Jonathan R. Didner, Houston; Daniel J. Mazina, Spring; Jeffrey S. Autor, Houston; Paul J. Muraski, Spring; Gregory M. Stewart, and John A. Dysart, both of Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 933,920, Aug. 21, 1992, Pat. No. 5,471,617, which is a continuation-in-part of Ser. No. 720,259, Jun. 24, 1991, abandoned. This applicatioo Aug. 20, 1993, Ser. No. 110,652

Int. Cl.[6] G06F *11/30*

U.S. Cl. 395—183.03 **32 Claims**

1. A method for managing from a management console, a plurality of file servers networked thereto, each said file server having at least one manageable device associated therewith, comprising the steps of:

displaying, at said management console, a list of said networked file servers;

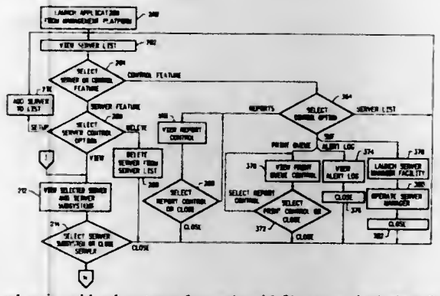
selecting, from a list of said networked file servers, a file server to be managed;

displaying a plurality of subsystems for said selected file server;

selecting, from said plurality of displayed subsystems, a subsystem to be viewed;

selectively viewing management information which describes said selected subsystem; and

modifying the operation of said selected file server based upon said viewed management information



wherein said subsystems for each said file server include a first subsystem which contains management information for a first manageable device associated with said file server and a second subsystem which contains management information for said file server.

5,559,959

METHOD FOR TRANSMITTING MESSAGE CELLS VIA REDUNDANT VIRTUAL PATH PAIRS OF AN ATM COMMUNICATION NETWORK

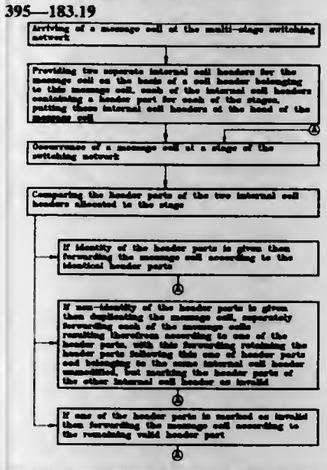
Andreas Foglar, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sep. 9, 1994, Ser. No. 303,941

Claims priority, application Germany, Sep. 16, 1993, 43 31 579.8

Int. Cl.[6] H04L *12/56*

U.S. Cl. 395—183.19 **4 Claims**



1. A method for transmitting message cells via redundant virtual path pairs, each of the path pairs formed of two separate paths of an asynchronous transfer mode (ATM) communication network having a plurality of multi-stage switching networks, message cells to be transmitted via a respective path pair being duplicated by a respective switching network located at a beginning of the respective path pair and the message cells allocated to one another being separately transmitted via the separate paths of the respective path pair, comprising the steps of:

providing with at least the respective switching network located at the beginning of the respective path pair a separate internal cell header, that precedes each of the message cells accepted by the respective switching network, for the two paths according to the cell header respectively belonging thereto, each of said separate internal cell headers having a plurality of header parts corresponding in number to the plurality of switching stages in a sequence of switching stages to be traversed within the respective switching network, a route through a respective switching stage being defined by a respective header part of said plurality of header parts;

attaching a respective validity bit to header parts of said plurality of header parts in each of the internal cell headers that precede each of the message cells to be transmitted, said validity bit being initially set to a defined logical level as a validity mark of a respective header part;

comparing, in each of the switching stages of the respective switching network, respective header parts of the plurality of header parts of internal cell headers that correspond to a respective switching stage and that are allocated to one another, given the appearance of a message cell;

forwarding, given an identity of the respective header parts that are compared to one another, the message cell based on the identical respective header parts;

duplicating, given a non-identity of the respective header parts that are compared to one another, the message cell, each of the two duplicated message cells resulting therefrom being separately forwarded according to one respective header part of the respective header parts that were compared to one another and, with this individual forwarding, further header parts following the one respective header part and belonging to the same internal cell header being retained unmodified, and the header parts of the other internal cell header being marked as invalid; and

for each of the two duplicated message cells, only forwarding such message cell based on a remaining valid respective header part when one of the respective header parts that are compared to one another is marked as being invalid.

5,559,960

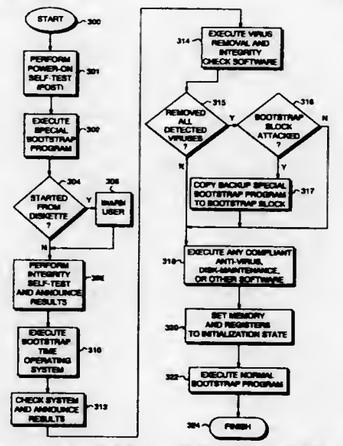
SOFTWARE ANTI-VIRUS FACILITY

Jonathan D. Lettvin, 194 Waltham St., Lexington, Mass. 02173

Filed Apr. 21, 1995, Ser. No. 426,943

Int. Cl.[6] G06F *11/34*

U.S. Cl. 395—186 **16 Claims**



12. A method of causing a computer to execute at least one program upon startup of the computer but before the computer executes an ultimate operating system, the method comprising the steps:

(a) providing a startup disk comprising a hidden partition comprising storage space inaccessible to conventional programs and not reducing conventional storage capacity of the disk;

(b) providing a bootstrap-time operating system stored in the hidden partition;

(c) causing the computer to execute the bootstrap-time operating system upon startup of the computer but before the computer executes the ultimate operating system;

(d) causing the computer to execute the at least one program under the control of the bootstrap-time operating system; and

(e) upon completion of the at least one program, executing the ultimate operating system.

5,559,961

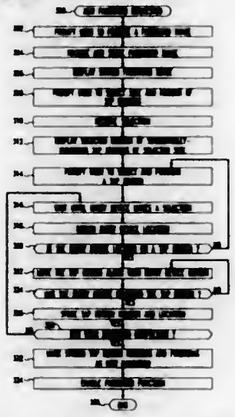
GRAPHICAL PASSWORD

Greg E. Blonder, Summit, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 223,252, Apr. 4, 1994, abandoned. This application Aug. 30, 1995, Ser. No. 520,904

Int. Cl.[6] G06F *11/00*

U.S. Cl. 395—188.01 **10 Claims**



1. A graphical password arrangement comprising:

a display;

first means, responsive to an initial request of a user, for displaying on the display one or more position indicators along with an image;

second means, for moving the displayed position indicators on the display, relative to the displayed image, under control of the user;

third means, cooperative with the second means, for determining the user's positioning of the displayed position indicators in the displayed image;

a memory;

fourth means, responsive to the determined positioning of the position indicators in the displayed image, for storing positions of the position indicators in the displayed image in the memory as a password;

fifth means, responsive to a subsequent request of the user, for displaying on the display the image without the one or more position indicators;

sixth means, responsive to the user's selection of one or more locations in the displayed image without the one or more position indicators, for determining positions of the selected locations in the displayed image;

seventh means, for determining whether the positions of the selected locations correspond to the positions that are stored in the memory as the password; and

eighth means, responsive to a determination of a lack of correspondence between the positions of the selected locations and the positions that are stored in the memory as the password, for denying the user access to a resource protected by the password.

5,559,962

DATA TRANSMISSION SYSTEM SELECTING BOTH SOURCE AND DESTINATION USING ADDRESSING MECHANISM

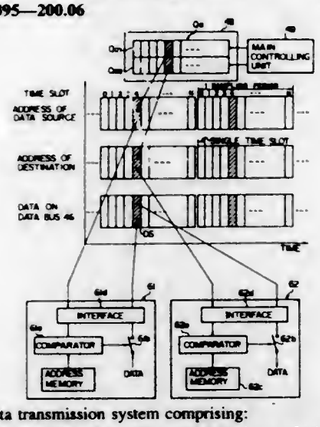
Yashikoi Okamura; Yasuo Kageyama; Takashi Suzuki, and Junichi Fujimori, all of Shizuoka-ken, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Continuation of Ser. No. 161,085, Dec. 3, 1993, abandoned, which is a continuation of Ser. No. 594,004, Oct. 9, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 487,660

Claims priority, application Japan, Oct. 9, 1989, 1-263666; Oct. 9, 1989, 1-263667; Oct. 27, 1989, 1-281190

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—200.06 **12 Claims**



8. A data transmission system comprising:

a) main controlling means for providing pieces of address information, each piece of address information including a first address for a data source and a second address for a data destination, said main controlling means further providing mode information indicative of information included in said second address,

b) bus means having an address bus and a data bus,

c) a plurality of component units assigned individual addresses, and broadcasting data, respectively, and individually connected with said bus means for communicating with one another,

d) timing controlling means outputting a timing signal,

e) address controlling means receiving said pieces of address information supplied from said main controlling means, and responsive to said timing signal for sequentially supplying said pieces of address information through said bus means to said component units at predetermined timings,

f) each of said plurality of component units further including a means for receiving each of said pieces of address information from said address controlling means and for checking each of said pieces of address information to determine whether the individual address assigned thereto matches said first address or said second address, and

g) each of said plurality of component units further including means for supplying data to said data bus when said first address matches said individual address assigned thereto and for receiving data from said data bus in response to said mode information when said second address matches said individual address assigned thereto, wherein one of said component units is an analog-to-digital converting unit, and one of said pieces of address information includes first and second addresses identical with those of a subsequent piece of address information, and wherein a time interval between said one of said pieces of address information and said subsequent piece of address information is equal to a sampling period of said analog-to-digital converting unit.

5,559,963

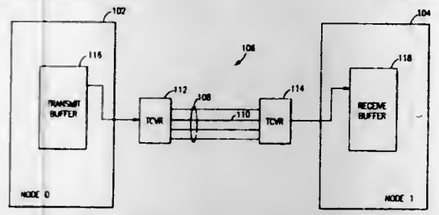
SUSPENDING, RESUMING, AND INTERLEAVING FRAME-GROUPS

Thomas A. Gregg, Highland; Joseph M. Hoke, Millerton, and Kulwant M. Pandey, Lagrangeville, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 839,986, Feb. 20, 1992, Pat. No. 5,267,240. This application Nov. 4, 1993, Ser. No. 148,113

Int. Cl.[6] H04L *5/00;7/00*

U.S. Cl. 395—200.13 **27 Claims**



1. A method for transmitting frame groups which may contain information field(s) from a main processor storage buffer area across a communications link including a plurality of carriers to a receiving buffer area, comprising the steps of:

beginning transmission of a frame group without waiting to receive any further information field(s) for the frame group from main processor storage;

providing information in a link-control word portion of a frame specifying a total number of blocks to be transmitted to the receiving buffer;

specifying in the link-control word that the frame group for which the link-control word is associated is the first of one or the first of multiple frame groups required to transmit the contents of the buffer area.

5,559,964

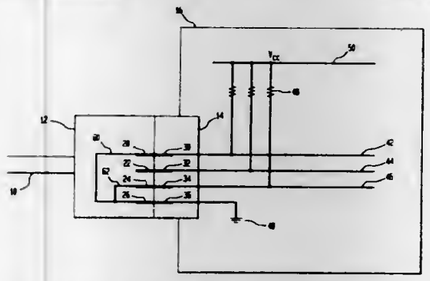
CABLE CONNECTOR KEYING

John R. Klimek, Cupertino, and David Weiss, Palo Alto, both of Calif., assignors to Rolm Company, Santa Clara, Calif.

Continuation of Ser. No. 990,738, Dec. 15, 1992, abandoned. This application Aug. 19, 1994, Ser. No. 293,103

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—280 **14 Claims**



1. An apparatus for conveying a binary code having a plurality of binary elements to a selectively-mating connector means, comprising:

a plurality of pins;

wire means for selectively connecting a first one of the plurality of pins to at least one of the other of the plurality of pins; and

means for selectively mating the first one of the plurality of pins with a pin having a first potential and the other of the plurality of pins with pins having a second potential.

5,559,965

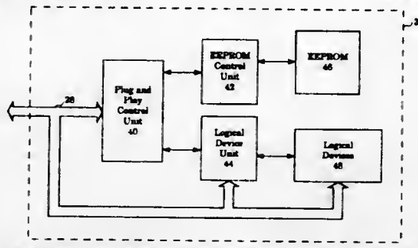
INPUT/OUTPUT ADAPTER CARDS HAVING A PLUG AND PLAY COMPLIANT MODE AND AN ASSIGNED RESOURCES MODE

Ali S. Oztaskin, Beaverton; John L. Allen, and Ganesh Murthy, both of Hillsboro, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 1, 1994, Ser. No. 299,906

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—284 **26 Claims**



1. An input/output adapter card for a standard bus in a computer system, comprising:

configuration registers that determine a set of system resources allocated to the input/output adapter card;

nonvolatile memory that stores a plug and play identifier, a set of resource data, and a mode indication, the resource data indicating the system resources required by the input/output adapter card, the mode indication specifying whether the computer system is plug and play compliant; and

a control unit that accesses the mode indication, the control unit reading a configuration record from the nonvolatile memory and writing the configuration record into the configuration registers if the mode indication specifies that the computer system is not plug and play compliant.

5,559,966

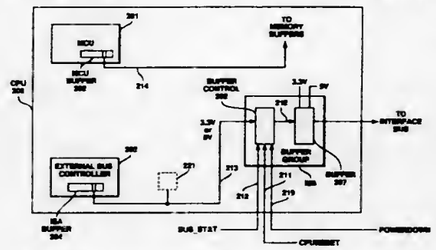
METHOD AND APPARATUS FOR INTERFACING A BUS THAT OPERATES AT A PLURALITY OF OPERATING POTENTIALS

Sung Soo Cho, Sunnyvale, and Eugene P. Matter, Folsom, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 973,079, Nov. 6, 1992, abandoned. This application Sep. 13, 1993, Ser. No. 120,292

Int. Cl.[6] H03K *19/0175;* **H02J** *1/04;3/18;* **G06F** *13/00*

U.S. Cl. 395—285 **28 Claims**



7. A computer system comprising:

a bus to transfer data, wherein said bus is sends signals of a plurality of operating potentials and sends at one of the plurality of operating potentials at any one time;

a processor coupled to said bus and manipulating data, wherein said processor comprises

an integrated circuit including core logic and a plurality of processor bus buffers, and further wherein said core logic operates at a first operating potential and said processor bus buffers include voltage level translators, to perform voltage translation, if necessary, on signal information being trans-

ferred, for translating signal information between said bus and said core logic at respective operating potentials of said bus means and said core logic;

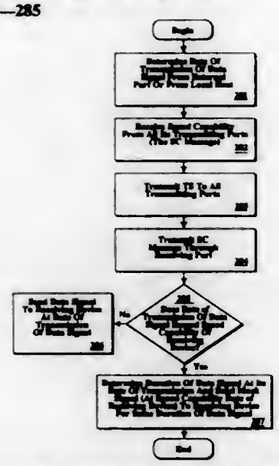
a control mechanism coupled to said processor and responsive to a change in the operating potential of said bus, said control mechanism isolating the processor bus buffers in response to the change, such that the operating potential of the bus is changed without powering down the computer system.

5,559,967

METHOD AND APPARATUS FOR A DYNAMIC, MULTI-SPEED BUS ARCHITECTURE IN WHICH AN EXCHANGE OF SPEED MESSAGES OCCURS INDEPENDENT OF THE DATA SIGNAL TRANSFERS

Florin Oprescu, Sunnyvale, and Roger Van Brunt, San Francisco, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed Mar. 18, 1993, Ser. No. 33,119
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—285 **13 Claims**



1. A method for transmitting signals on a multi-speed bus coupled to a first node which is adapted to transmit a data message having a message length on said bus at a data transmission rate, said data message being sent to a particular node said bus being coupled to a second node which is adapted to receive data signals from said bus at a data reception rate, the method comprising:

sending a transmission speed signal indicative of said data transmission rate from said first node to said second node;

sending a speed capability signal indicative of said data reception rate from said second node to said first node;

determining whether said data transmission rate exceeds said data reception rate; and

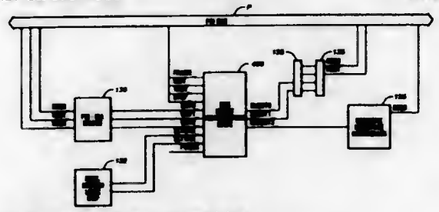
if said data transmission rate exceeds said data reception rate, then determining from said message length a data message duration, at said data transmission rate, for the data message and sending a mock data signal from said first node to said second node, wherein said mock data signal is sent at said data reception rate and has a duration equal to said data message duration said data message being sent to said particular node.

5,559,968

NON-CONFORMING PCI BUS MASTER TIMING COMPENSATION CIRCUIT

Charles J. Stancil, Tomball; William M. Vaughn, Houston, and Jeff W. Wolford, Spring, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Mar. 3, 1995, Ser. No. 398,382
Int. Cl.[6] G06F *13/00; 1/14*
U.S. Cl. 395—306 **4 Claims**



1. A computer system, comprising:

a Peripheral Component Interconnect (PCI) bus;

a PCI bus master device providing a bus request signal for accessing said PCI bus and an address, said PCI bus master receiving a bus grant signal when access is granted, said PCI bus master being capable of performing multiple single cycle bus transactions over said PCI bus;

a PCI bus target for receiving the address, wherein the address is received from said PCI bus master when a first single cycle bus transaction begins, and wherein the address is not received in time from said PCI bus master when a subsequent single cycle bus transaction begins;

a PCI bus arbiter for receiving said bus request signal and providing a bus grant signal when said PCI bus master is granted control of the PCI bus; and

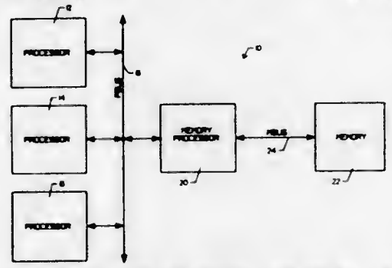
means receiving the bus grant signal and selectably providing a modified bus grant signal to said PCI bus master as said PCI bus master bus grant signal for causing said PCI bus master to release control of said PCI bus before the subsequent bus transaction begins and while the bus grant signal is asserted.

5,559,969

METHOD AND APPARATUS FOR EFFICIENTLY INTERFACING VARIABLE WIDTH DATA STREAMS TO A FIXED WIDTH MEMORY

Kevin F. Jennings, Novi, Mich., assignor to Unisys Corporation, Blue Bell, Pa.

Filed Aug. 9, 1994, Ser. No. 287,880
Int. Cl.[6] G06F *13/38*
U.S. Cl. 395—307 **62 Claims**



61. A method for interfacing between a first bus and a second bus wherein the second bus is wider than the first bus, comprising:

a. programming one of a plurality of formatting functions;

b. receiving a plurality of first data packets from the first bus;

c. formatting a predetermined number of the plurality of first data packets into a second data packet;

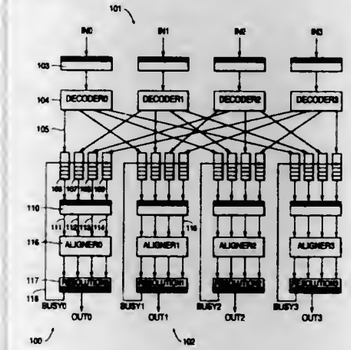
d. writing the second data packet onto the second bus.

5,559,970

CROSSBAR SWITCH FOR MULTI-PROCESSOR, MULTI-MEMORY SYSTEM FOR RESOLVING PORT AND BANK CONTENTION THROUGH THE USE OF ALIGNERS, ROUTERS, AND SERIALIZERS

Vinod Sharma, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 4, 1994, Ser. No. 237,843
Claims priority, application Japan, May 6, 1993, 5-105226
Int. Cl.[6] G06F *13/00*
U.S. Cl. 395—312 **5 Claims**



1. A crossbar switch in a multi-processing system, having N input ports respectively connected to N processors, wherein N is an integer, and N output ports respectively connected to N memory modules, comprising:

decoders respectively coupled to said input ports for distributing memory access requests from said processors to output ports among said N output ports which are designated as destination ports by said memory access requests;

N×N first-in first-out buffers provided at respective outputs of said decoders and separated into N groups, each of said N groups containing N buffers connected to a common destination port;

N N-input and N-output aligners, coupled to outputs of said respective groups of N×N first-in first-out buffers, for aligning effective memory access requests in series; and

N serializers connected to outputs of said respective aligners, for serializing the memory access requests aligned by said aligners and outputting to one of said output ports, wherein each of said N-input and N-output aligners includes,

two (N/2)-input and (N/2)-output aligners, having two N/2 inputs, each of which correspond to a respective input of said N-input and N-output aligner, for aligning effective memory access requests in series; and

an N-input and N-output router, having N inputs, each of which correspond to a respective output of said two (N/2)-input and (N/2)-output aligners, for shifting forward the memory access requests in order so that said memory access requests are packed in series.

5,559,971

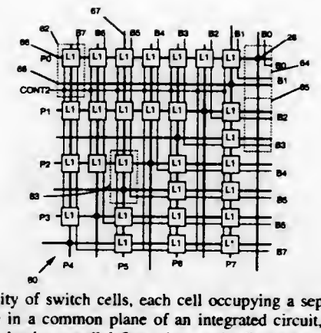
FOLDED HIERARCHICAL CROSSPOINT ARRAY

Wen-Jai Hsieh; Chi-Song Horng, and Chun C. D. Wong, all of Palo Alto, Calif., assignors to I-Cube, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 171,752, Dec. 21, 1993, Pat. No. 5,426,738, which is a continuation of Ser. No. 785,082, Oct. 30, 1991, abandoned. This application Nov. 2, 1991, Ser. No. 333,371
Int. Cl.[6] G06F *13/00; H03K 19/0175*
U.S. Cl. 395—312 **10 Claims**

1. A crosspoint array comprising:

means for generating a control signal;



a plurality of switch cells, each cell occupying a separate rectangle in a common plane of an integrated circuit, said rectangle having parallel first edges and adjacent second edges, said first edges being substantially longer than said second edges, each cell comprising

a first conductor extending between said first edges of said rectangle,

a second conductor extending between said second edges of said rectangle,

first memory means for storing a first data bit and producing an output signal indicating a state of said stored first data bit,

logic means receiving said output signal and receiving said control signal for producing a logic signal in response to a logical combination of states of said output signal and said logic signal, and

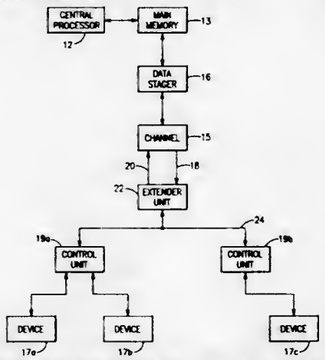
switch means coupled to said first and second conductors and receiving said logic signal for selectively providing a signal path between said first and second conductors in response to said logic signal.

5,559,972

METHOD AND APPARATUS FOR SUPPORTING BYTE-MODE DEVICES AND NON-BYTE-MODE DEVICES ON A BUS

Maurice E. Carey, Kingston; Gerald H. Miracle, Pleasant Valley; James T. Moyer, Endwell, and Richard A. Neuner, Port Ewen, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 392,629, Aug. 11, 1989, abandoned. This application Nov. 24, 1992, Ser. No. 981,930
Int. Cl.[6] G06F *13/42*
U.S. Cl. 395—281 **10 Claims**



6. A method for supporting the disconnection of a device after it has transmitted at least one byte of data, said method comprising:

transmitting a command frame of serial data from a channel to an extender unit over a serial bus, said command frame including a flag having a state indicating that a device may disconnect after the transmission of at least one byte of data;

decoding by decoding means in said extender unit, said com-

of instructions, the history value indicating whether the stor-

decoding by decoding means in said extender unit, said command frame of serial data for detecting said flag;

conducting a data transmission operation by protocol means in said extender unit in accordance with the state of said flag whereby data is transmitted to and from said channel, said data transmission operation using tag lines in a parallel bus connected to said extender unit and a control unit controlling a device;

sending tag signals over said tag lines from said control unit to said extender unit for signalling disconnection during said data transmission operation after at least one byte of data has been sent from said device to said extender unit via said control unit; and

detecting by said protocol means, said disconnection as indicated by the tag signals on said tag lines and transmitting a serial frame from said extender unit to said channel having a code indicating said disconnection.

5,559,973

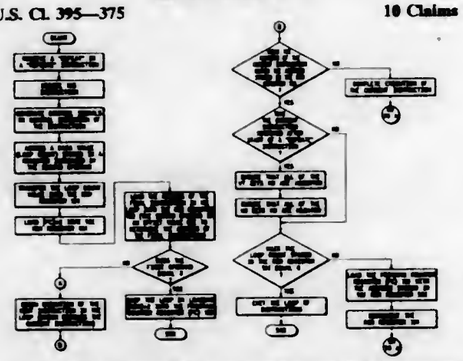
DATA PROCESSING SYSTEM AND METHOD THEREOF

Micheal G. Gallup; L. Rodney Goke; Robert W. Seaton, Jr.; Terry G. Lawell; Stephen G. Osborn, and Thomas J. Tomazin, all of Austin, Tex., assignors to Motorola Inc., Schaumburg, Ill.

Division of Ser. No. 40,779, Mar. 31, 1993, abandoned. This application Apr. 17, 1995, Ser. No. 425,804

Int. Cl.[6] G06F *9/40*

U.S. Cl. 395—375 **10 Claims**



1. A method for executing a repeat instruction in a data processor, comprising the steps of:

i) receiving the repeat instruction at a first address in a program, the repeat instruction having a first operand and a second operand;

ii) decoding the repeat instruction to provide a plurality of control signals;

iii) accessing a data value stored in a storage location indicated by the second operand of the repeat instruction in response to the plurality of control signals;

iv) executing the following steps for a preselected number of times, the preselected number of times being provided by the second operand of the repeat instruction.

v) sequentially executing a plurality of instructions, a first one of the plurality of instructions being at a second address and a last one of the plurality of instructions being at a third address, the second address being an address following the first address and the third address being based upon the first operand of the repeat instruction;

vi) asserting an enable value corresponding to a storage location accessed during execution of the last one of the plurality of instructions, the enable value selectively enabling the storage location to participate in execution of the one of the plurality of instructions; and

vii) negating a history value corresponding to the storage location accessed during execution of the last one of the plurality of instructions, the history value indicating whether the storage location has been used previously in execution of a instruction.

5,559,974

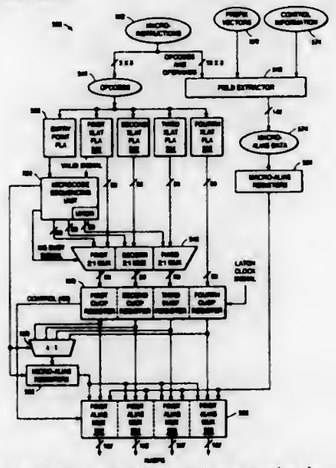
DECODER HAVING INDEPENDENTLY LOADED MICRO-ALIAS AND MACRO-ALIAS REGISTERS ACCESSIBLE SIMULTANEOUSLY BY ONE MICRO-OPERATION

Darrell D. Boggs; Gary L. Brown, both of Aloha; Michael M. Hancock, and Donald D. Parker, both of Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 204,680, Mar. 1, 1994, abandoned. This application Jun. 2, 1995, Ser. No. 459,284

Int. Cl.[6] G06F *9/22*

U.S. Cl. 395—375 **16 Claims**



1. A method for assembling a micro-operation in a decoder, comprising the steps of:

a. decoding a macroinstruction into a plurality of intermediate micro-operations including a source intermediate micro-operation and a subsequent intermediate micro-operation;

b. storing a selected field of the source intermediate micro-operation in a micro-alias register, wherein the selected field of the source intermediate micro-operation is independent of any operand of the macroinstruction;

c. assembling an aliased micro-operation from the subsequent intermediate micro-operation and the selected field stored in the micro-alias register.

5,559,975

PROGRAM COUNTER UPDATE MECHANISM

David S. Christie; Scott A. White, and Michael D. Goddard, all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

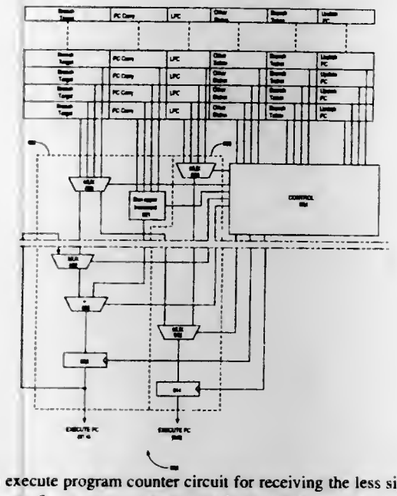
Filed Jun. 1, 1994, Ser. No. 252,830

Int. Cl.[6] G06F *9/26*

U.S. Cl. 395—375 **8 Claims**

1. An apparatus for generating a program counter value for use in a microprocessor having a pipeline for processing instructions, the apparatus comprising:

a first program counter circuit for providing a first program counter value having a more significant first program counter portion, a less significant first program counter portion and a first carry signal, the first counter value representing a program count value of a retrieved instruction; and



an execute program counter circuit for receiving the less significant first program counter portion and the first carry signal and generating an execute program counter value using the less significant first program counter portion, the execute program counter circuit being coupled to the first program counter circuit, the execute program counter value representing a program count value of an executed instruction;

the first program counter circuit includes a less significant program counter value generator circuit and a more significant program counter value generator circuit;

the less significant program counter value generator circuit includes a plurality of adder circuits for providing a plurality of sequential next program counter values, each adder circuit receiving a less significant portion of a present program counter value and an instruction length value of a respective sequential instruction in the pipeline and adding the less significant portion of the present program counter value to the instruction length value to provide a respective less significant portion of one of the next program counter values and a corresponding carry signal.

5,559,976

SYSTEM FOR INSTRUCTION COMPLETION INDEPENDENT OF RESULT WRITE-BACK RESPONSIVE TO BOTH EXCEPTION FREE COMPLETION OF EXECUTION AND COMPLETION OF ALL LOGICALLY PRIOR INSTRUCTIONS

Seungyoon P. Song, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1994, Ser. No. 220,998

Int. Cl.[6] G06F *9/38*

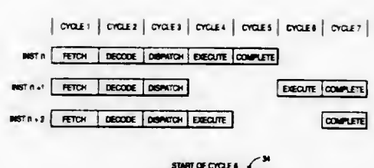
U.S. Cl. 395—375 **24 Claims**

1. A method of operating a processing system, comprising the steps of:

dispatching multiple instructions from a sequence of instructions to execution circuitry;

executing at least one of said dispatched instructions with said execution circuitry and outputting at least one result in response thereto; and

completing said executed instruction, independent of whether said result is stored in at least one storage location specified by said executed instruction, in response to finishing execution of said executed instruction without exceptions and to completing each dispatched instruction preceding said executed instruction within said sequence.



5,559,977

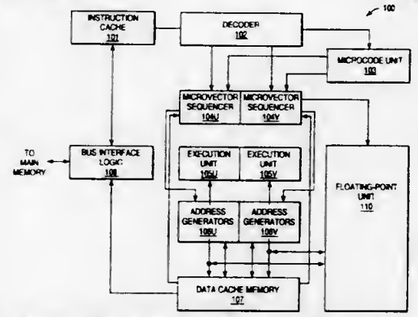
METHOD AND APPARATUS FOR EXECUTING FLOATING POINT (FP) INSTRUCTION PAIRS IN A PIPELINED PROCESSOR BY STALLING THE FOLLOWING FP INSTRUCTIONS IN AN EXECUTION STAGE

Dror Avnon, Milpitas; Harshvardhan P. Sharangpani, Santa Clara, and Jonathan B. Sweedler, Sunnyvale, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 924,742, Aug. 4, 1992, abandoned. This application Oct. 24, 1994, Ser. No. 328,395

Int. Cl.[6] G06F *9/38*

U.S. Cl. 395—375 **11 Claims**



1. A method of executing floating-point instructions in a processor in a computer system, said method comprising the steps of:

decoding each of said floating-point instructions into one or more microinstructions;

issuing two of the one or more microinstructions as a floating-point microinstruction pair to an on-chip, pipelined floating-point execution unit in the processor that executes the floating-point instruction pair in a plurality of execution stages in a locked-step manner, such that both microinstructions in the pair advance at the same time from one stage to the next;

fetching operands and data necessary to execute said floating-point microinstruction pair during a first (E stage) of the plurality of stages in which the floating-point execution unit executes floating-point read/write memory microinstructions;

executing the floating-point microinstruction pair in a second (X1 stage) and subsequent stages of plurality of execution stages to generate results, wherein said step of executing comprises the steps of

determining during the second (X1) stage whether one of the microinstructions in said floating-point microinstruction pair is capable of raising an exception;

stalling a floating-point microinstruction that is immediately subsequent to the floating-point microinstruction pair in the first (E) stage of the plurality of execution stages after

fetching operands and any integer microinstruction in a

5,559,979

TABLE-BASED INTER-SYSTEM SERIALIZATION

having a plurality of entries each for storing an address of an

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5,559,981

fetching operands and any integer microinstruction in a separate integer execution pipeline in the processor that is in a decoding stage that precedes execution while continuing to execute the floating-point microinstruction pair if said step of determining determines that at least one of the microinstructions in the floating-point instruction pair is capable of raising an exception,

updating a register file using said results; and then

reporting said exception, wherein the step of reporting includes handling said exception.

5,559,978

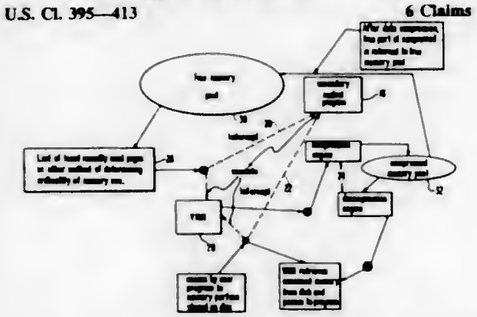
METHOD FOR INCREASING THE EFFICIENCY OF A VIRTUAL MEMORY SYSTEM BY SELECTIVE COMPRESSION OF RAM MEMORY CONTENTS

Michael L. Spilo, New York, N.Y., assignor to Helix Software Company, Inc., Long Island City, N.Y.

Continuation of Ser. No. 960,720, Oct. 14, 1992, abandoned. This application Jan. 18, 1995, Ser. No. 375,172

Int. Cl.[6] G06F *12/08;13/00*

U.S. Cl. 395—413 **6 Claims**



1. A method for managing RAM memory in a virtual memory computer system having a CPU and RAM, comprising the steps of:

a) monitoring the computer system to track the extent of usage and the criticality of RAM memory regions utilized, said usage being the frequency and extent of use of the RAM regions by the CPU and said criticality being the ability of the CPU to function without immediate access to the contents of such memory regions;

b) determining when system RAM is sufficiently depleted with reference to operating system and user program requirements to require augmentation;

c) upon determination of sufficient depletion compressing the contents of a portion of memory according to a determined priority based upon relative usage and criticality of RAM regions available for compression to create a compressed portion in RAM memory and freeing the RAM memory previously occupied by the uncompressed contents and unoccupied by the compressed contents for other use;

d) awaiting an attempt by the CPU to access data contained in said compressed portion and suspending such access; and

e) decompressing a portion of the compressed RAM portion bearing the data sought to be accessed and passing the access to the decompressed RAM portion.

5,559,979

TABLE-BASED INTER-SYSTEM SERIALIZATION CONTROL SYSTEM

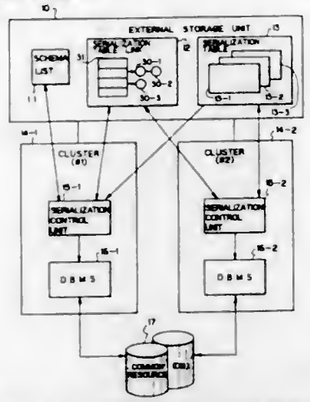
Koichi Shiga, and Yukiyoshi Yanase, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Nov. 6, 1992, Ser. No. 972,392

Claims priority, application Japan, Nov. 6, 1991, 3-289031

Int. Cl.[6] G06F *15/16*

U.S. Cl. 395—421.08 **12 Claims**



1. An inter-system serialization control system for serially allowing access to shared resources among a plurality of computer systems, comprising:

an external storage unit commonly connected to said computer systems, for storing, when a request for accessing a logical processing unit in said shared resources is generated from one of said computer systems, serialization management information corresponding to said logical processing unit, said logical processing unit being smaller than a volume of said shared resources; and

a serialization control unit provided in each of said computer systems and operatively connected to said external storage unit, for reading, in response to said request for accessing a logical processing unit of said shared resources, the corresponding logical processing unit in said serialization management information from said external storage unit and for accessing the corresponding logical processing unit in said shared resources under a serialization control based on the read serialization management information, wherein said external storage unit stores:

a serialization table having a plurality of entries, said serialization information of a logical processing unit being stored in an empty entry of said plurality of entries when said request for accessing said logical processing unit in said shared resources is generated from one of said computer systems; and

a serialization table link information storage unit for storing address information of the entries in said serialization tables and identification information for identifying logical processing units in said shared resources, the capacity of said serialization table link information storage unit being smaller than the capacity of said serialization tables;

wherein said serialization control unit searches, in response to a request for exclusively accessing a logical processing unit in said shared resources, the entry of said serialization table in which said serialization information of said logical processing unit is stored, and judges whether or not the request for serially processing the logical processing unit conflicts with another serialization request, and when it is determined that the request for serially processing the logical processing unit does not conflict with another serialization request, the corresponding logical processing unit in said shared resources is accessed in accordance with the contents in the searched entry of said serialization table;

wherein said serialization table link information storage unit stores a link table and a serialization table hash, said link table having a plurality of entries each for storing an address of an entry in said serialization table, and said serialization table hash having a plurality of entries each for storing an identification of a logical processing unit and an address of an entry in said link table.

5,559,980

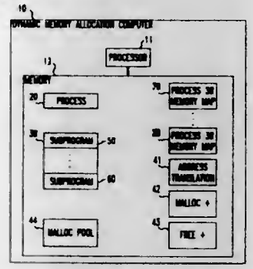
METHOD AND APPARATUS FOR DETECTING REFERENCES TO DEALLOCATED MEMORY IN A DYNAMIC MEMORY ALLOCATION SYSTEM

Paul A. Connors, Broomfield, and Alan L. Robertson, Westminster, both of Colo., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 18, 1993, Ser. No. 32,918

Int. Cl.[6] G06F *12/02;12/10*

U.S. Cl. 395—427 **27 Claims**



1. A dynamic memory allocation system having an address space comprising a plurality of non-overlapping address-space pages, each address-space page including a plurality of addresses of the address space, the system comprising:

a memory comprising a plurality of non-overlapping memory pages, each memory page including a plurality of memory locations each having a corresponding first address for use in accessing that memory location;

a memory map for representing a mapping of addresses from the address space to the memory locations, the memory map representing a mapping of the addresses from a first portion of the address space that presently resides in the memory to the memory locations;

memory allocating means (42) responsive to a dynamic memory allocation request, for allocating to a requestor a memory location from a memory page having at least one other memory location already allocated in response to another dynamic memory allocation request, mapping to the allocated memory location a second address from an address-space page none of whose included addresses are presently mapped to memory locations, and giving the second address to the requestor for referencing the allocated memory location;

memory deallocating means (43) responsive to a dynamic memory deallocation request, for deallocating the allocated memory location from the requestor and canceling the mapping of the second address to the deallocated memory location; and

address translating means (41) responsive to the requestor referencing the deallocated memory location with the second address, for using the memory map to translate the second address to the deallocated memory location's first address, the address translating means failing to accomplish the translation if the mapping of the second address to the deallocated memory location is not represented in the memory map, whereby the reference by the requestor to the deallocated memory location is detected.

5,559,981

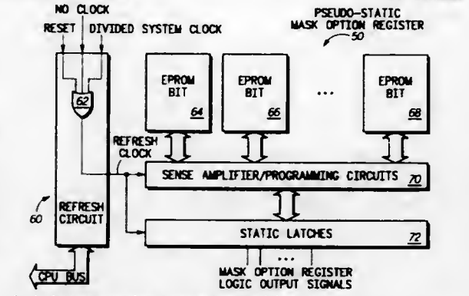
PSEUDO STATIC MASK OPTION REGISTER AND METHOD THEREFOR

Gregory A. Racino, Austin, Tex., and Jeffrey R. Jorvig, Chandler, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 14, 1994, Ser. No. 194,900

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—430 **25 Claims**



1. A data processing system, comprising:

an interface means for providing a mask option program value;

input means for providing a reset signal;

a system clock circuit for generating a system clock signal;

a first peripheral device for executing a first predetermined data processing function in response to a first enable signal; and

a main memory for storing a plurality of main memory values;

a mask option register having a first input coupled to the interface means for receiving the mask option program value, a second input coupled to the system clock circuit for receiving the system clock signal, and an output for providing the first enable signal, the mask option register, comprising:

logic means for generating a refresh signal in response to the system clock signal and the reset signal;

a plurality of programmable memory bits for collectively storing the mask option program value, each of the plurality of memory bits providing a bit of the mask option program value;

a plurality of sense amplifier circuits coupled to the plurality of memory bits for sensing a logic value of the mask option program value collectively provided by the plurality of memory bits in response to the refresh signal; and

a plurality of static latches for collectively storing the mask option program value, the plurality of static latches being periodically refreshed in response to the refresh signal, a first one of the plurality of static latches providing the first enable signal.

5,559,982

METHOD AND APPARATUS FOR CONTROLLING STORAGE UTILIZATION

Roderick B. Wideman, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1995, Ser. No. 419,563

Int. Cl.[6] G11B *17/22*

U.S. Cl. 395—438 **7 Claims**

4. An automated data storage and retrieval system, comprising:

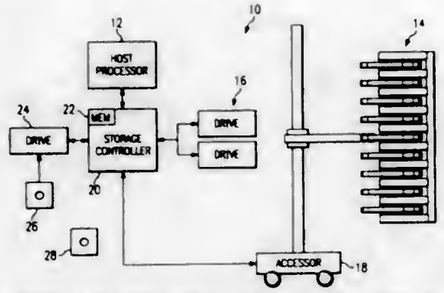
a storage module with cells for storing data cartridges and having an actual physical capacity of X cartridges;

a storage controller;

a device for reading data from data cartridges;

an accessor directed by said storage controller for retrieving and replacing data cartridges from and to any of a plurality Y of said cells, where $Y \leq X$ and Y represents the maximum number of data cartridges which are authorized to be stored in said storage module;

a memory store interconnected with said storage controller for storing a serial number of said storage controller and the authorized number Y;



whereby, if the actual physical capacity X of said storage module is greater than the authorized number Y, said controller prevents said accessor from retrieving from and replacing to said storage module more than Y data cartridges; and

a piece of removable, recordable media on which is recorded the serial number of said storage controller, the authorized number Y, and a number Z, where $Y+Z \leqq X$ and $Y+Z$ represents a new maximum number of data cartridges which are authorized to be stored in said storage module.

5,559,983

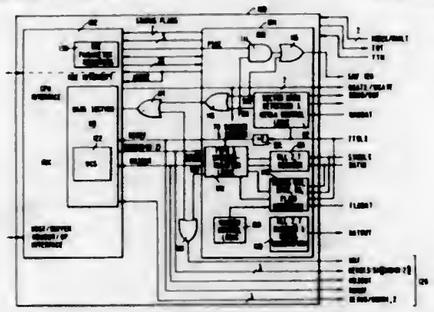
SINGLE CHIP CONTROLLER FOR OPTICAL DATA DISK DRIVES

Shakeel Masood, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 813,275, Dec. 24, 1991, abandoned. This application Aug. 16, 1994, Ser. No. 291,814

Int. Cl.[6] G06F *11/30*

U.S. Cl. 395—439 **17 Claims**



1. An integrated optical data disk controller for an optical data disk having tracks with data arranged in sectors, comprising on a common semiconductor substrate:

optical encoder/decoder (ODE) circuitry for finding reference marks and decoding data from a bit stream supplied from said disk and for supplying reference marks and encoding and supplying data to said optical data disk;

optical data controller (ODC) circuitry interconnected with said ODE and a host interface and supplying disk read/write data and control signals to an external disk drive unit; and

signal flow paths for transferring signals between said ODC and ODE, said common semiconductor substrate having diagnostic pins coupled to said ODE and ODC for enabling monitoring of said integrated optical data disk controller combining functions of said ODE and ODC on said common semiconductor substrate.

5,559,984

DISTRIBUTED FILE SYSTEM PERMITTING EACH USER TO ENHANCE CACHE HIT RATIO IN FILE ACCESS MODE

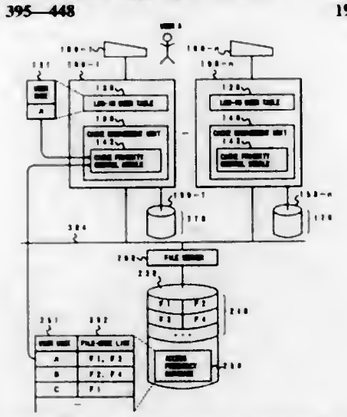
Hirohiko Nakano; Seiichi Domyo; Takaki Kuroda; Naofumi Shouji, all of Yokohama, and Atsushi Kobayashi, Machida, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1994, Ser. No. 313,844

Claims priority, application Japan, Sep. 28, 1993, 5-241534

Int. Cl.[6] G06F *12/02;12/12;15/177*

U.S. Cl. 395—448 **19 Claims**



1. In a distributed file system wherein a file server for administering a plurality of files, and clients for accessing the files administered by the file server are connected through a network; and each of the clients has a cache memory for administering copies of the files, and a priority table for storing therein priority levels which function as criteria for judging, when a copy of one of the files is to be expelled, if the copies of the files placed in the cache memory of the pertinent client through accesses from the pertinent client to the file server are to be kept in the cache memory;

a method of controlling a cache memory for files, comprising the steps of:

prestoring names of users and names of those ones of said files which are frequently accessed by the users, as an access frequency database in said file server, the user names and the file names being associated for the respective users who log into any of said clients, in the access frequency database;

recognizing the user name of a certain one of said users, in one client when the certain user is logging into said one client;

checking if a particular one of said files having a certain one of said file names is the file which is frequently accessed by the recognized user, in said one client and on the basis of the contents of said access frequency database when said recognized user has loaded the copy of the particular file from said file server into said cache memory;

setting the priority level of said particular file in accordance with the checked result so that the priority levels of the files of high access frequencies may become high, and then storing the set priority level in said priority table; and

determining the file whose priority level is low for the user currently operating said one client, as the file to-be-expelled on the basis of the contents of said priority table when said copy of one of said files is to be expelled from said cache memory of said one client.

5,559,985

CACHE MEMORY HAVING IMPROVED HIT RATIO BY SELECTING THE NUMBER OF BUS CYCLES REQUIRED FOR BLOCK REPLACEMENT

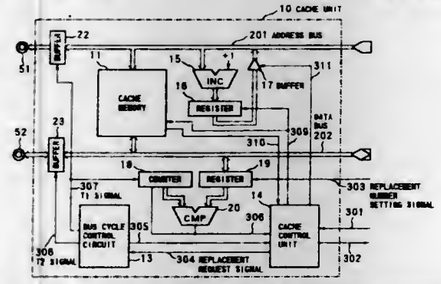
Kouji Maemura, Kanagawa, Japan, assignor to NEC Corporation, Japan

Filed Sep. 1, 1993, Ser. No. 115,223

Claims priority, application Japan, Sep. 3, 1992, 4-235764

Int. Cl.[6] G06F *13/14*

U.S. Cl. 395—467 **20 Claims**



1. A microprocessor incorporating a cache memory, comprising an instruction execution unit for decoding and executing instructions, and a cache memory unit, said cache memory unit comprising:

a cache memory;

address holding means for holding an address to index said cache memory;

address updating means for updating the address in said address holding means during accessing of said cache memory;

bus cycle control means for activating bus cycles for replacement upon a miss at said cache memory;

counting means for counting a number of bus cycles activated by said bus cycle control means, and providing a count value;

bus cycle number holding means for storing a specified value for said number of bus cycles;

comparison means for comparing the count value from said counting means with the specified value at said bus cycle number holding means, said comparison means outputting a replacement completion signal when said count value and the specified value match; and

cache control means for outputting a replacement request signal to request activation of bus cycles to said bus cycle control means until receipt of the replacement completion signal from said comparison means when a miss occurs at said cache memory.

5,559,986

INTERLEAVED CACHE FOR MULTIPLE ACCESSES PER CLOCK CYCLE IN A MICROPROCESSOR

Donald B. Alpert, Santa Clara; Mustafiz R. Choudhury, Sunnyvale, and Jack D. Mills, Mountain View, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

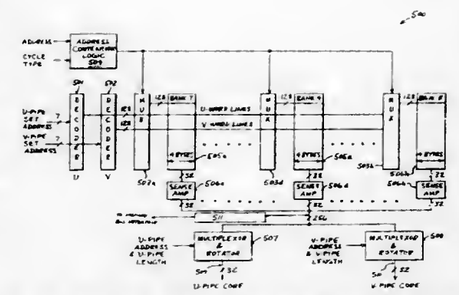
Continuation of Ser. No. 813,378, Dec. 23, 1991, abandoned. This application Feb. 2, 1994, Ser. No. 191,052

Int. Cl.[6] G06F *12/08*

U.S. Cl. 395—471 **23 Claims**

1. An on chip cache memory for use in a microprocessor, wherein the microprocessor includes a plurality of execution units for executing a plurality of instructions, wherein a plurality of simultaneous data accesses are required for the execution of said plurality of instructions, each of said plurality of data accesses being independently addressable, said cache memory comprising:

a single-ported interleaved storage array comprising a plurality of banks of single-ported memory cells, wherein the storage array stores a plurality of cache lines, wherein a portion of each of the plurality of cache lines is stored in each of the plurality of banks;



access control logic coupled to said storage array, wherein the access control logic receives the plurality of accesses and determines if data corresponding to the plurality of data accesses is present in said interleaved storage array using tag matching, and further wherein said access control logic accesses a plurality of banks in said storage array per clock cycle in response to said plurality of data accesses of said plurality of execution units, wherein the plurality of data accesses are performed by the access control logic in instances where tag matching confirms that data requested by the plurality of data accesses are present in the storage array; and

datapath means coupled to said storage array for providing a datapath between said storage array and said plurality of execution units to accommodate said plurality of data accesses, wherein the datapath means directs data corresponding to the plurality of data accesses from said storage array to the plurality of execution units, such that multiple data accesses occur per clock cycle.

5,559,987

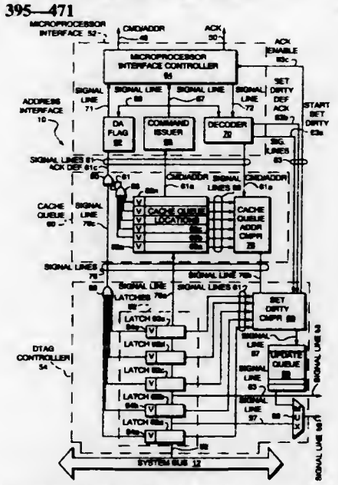
METHOD AND APPARATUS FOR UPDATING A DUPLICATE TAG STATUS IN A SNOOP BUS PROTOCOL BASED COMPUTER SYSTEM

Denis Foley, Shrewsbury; Maurice B. Steinman, Hudson, and Stephen R. VanDoren, Shrewsbury, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 30, 1994, Ser. No. 268,409

Int. Cl.[6] G06F *12/08*

U.S. Cl. 395—471 **6 Claims**



1. In a computer system having at least one processor module coupled to a system bus operating in accordance with a SNOOPING bus protocol, said system bus capable of transmitting system

bus commands and addresses, and each of said processor modules including a processor which issues processor commands and addresses, an address interface coupled to said system bus, said address interface including interface pipeline means for receiving and storing said system bus commands and addresses in an ordered sequence, and a Duplicate Tag memory coupled to said address interface, said duplicate Tag memory including means for storing Duplicate Tag addresses and Duplicate Tag status information, a method of updating said Duplicate Tag status information, comprising the steps of:

providing by one of said processors to said address interface of said one of said processors, processor commands and addresses for modification of an entry of Duplicate Tag status information of said one of said processors;

receiving and storing by said interface pipeline means of said address interface of said one of said processors, system bus command and address information from said system bus;

determining if said system bus commands and addresses received and stored in said interface pipeline means are valid; and

if said determining step establishes that there are no valid system bus commands and addresses in said interface pipeline means, causing an updating of said Duplicate Tag status information in accordance with said processor commands and addresses for modification without determining if said processor commands and addresses conflict with said system bus commands and addresses.

5,559,988

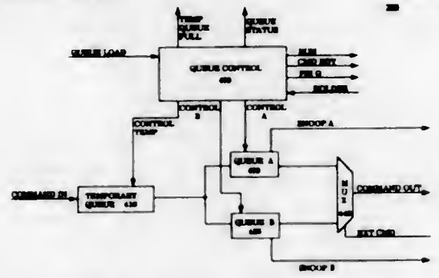
METHOD AND CIRCUITRY FOR QUEUING SNOOPING, PRIORITIZING AND SUSPENDING COMMANDS

Richard J. Durante, Citrus Heights; Rodney R. Rozman, and Mickey L. Fandrich, both of Placerville, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 175,734, Dec. 30, 1993, abandoned. This application Mar. 21, 1995, Ser. No. 408,100

Int. Cl.[6] G06F *12/06*

U.S. Cl. 395—479 **28 Claims**



1. Command queuing circuitry comprising:

a primary queue for holding a first command, the first command being an erase block command specifying a first flash memory block to be erased;

a secondary queue for holding a second command, received subsequent to the first command, the second command being either a second erase block command specifying a second flash memory block to be erased or a first program word command specifying a first flash memory word to be programmed;

snooping circuitry for examining the second command, without servicing the second command, prior to completion of service of the first command;

prioritization circuitry for determining the priority of the snooped second command, if the second command is the first program word command and the first flash memory word is not part of the first flash memory block, the second command having a higher priority than the first command;

switching circuitry for suspending service of the first command and permitting service of the second command if the second command has a higher priority; and

command absorption circuitry to incorporate service of the second command into service of the first command and then purge the second command from the secondary queue if the second command is the second erase flash block command.

5,559,989

DEVICE FOR PROTECTING MEMORY AREAS OF AN ELECTRONIC MICROPROCESSOR

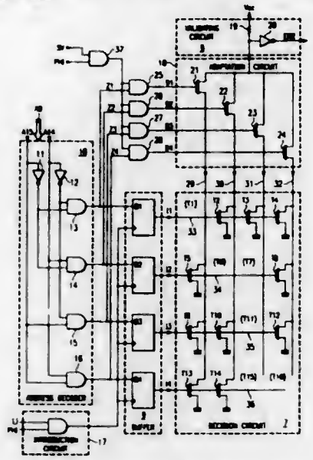
Laurent Sourgen, and Rodolphe Uhlmann, both of Aix en Provence, France, assignors to SGS-Thomson Microelectronics, S.A., Gentilly Cedex, France

Division of Ser. No. 16,012, Feb. 10, 1993, Pat. No. 5,361,341, which is a continuation of Ser. No. 490,615, Mar. 22, 1990, abandoned. This application Aug. 5, 1994, Ser. No. 286,771

Claims priority, application France, Oct. 2, 1987, 87 13936

Int. Cl.[6] G06F *12/14*

U.S. Cl. 395—481 **19 Claims**



1. A device for enabling access to the content of memory areas of a system comprising a microprocessor and memory areas, said memory areas being divided between areas of a first type where instructions are stored at instruction addresses, and areas of a second type corresponding to areas where data is stored at data addresses, comprising:

a hardware decision matrix having first and second sets of input lines;

an instruction address input circuit, connected to receive a respective subset of bits said instruction addresses, and connected to drive one of said first set of input lines which corresponds to a decoded value of said respective subset;

a data address input circuit, connected to receive a respective subset of bits of said data addresses, and connected to drive one of said second set of input lines which corresponds to a decoded value of said respective subset;

said hardware decision matrix being connected to output an inhibit signal if successive accesses to one of said first set of input lines and one of said second set of input lines jointly define a forbidden combinations is permanently a set of said forbidden combination; wherein programmed into said decision matrix.

5,559,990

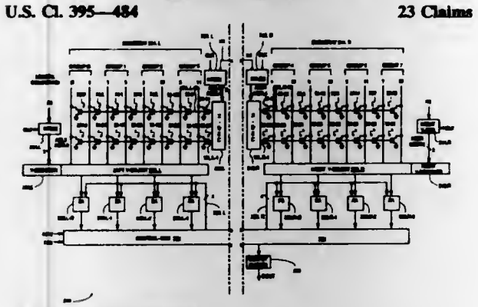
MEMORIES WITH BURST MODE ACCESS

Pearl P. Cheng, Cupertino; Michael S. Briner, and James C. Yu, both of San Jose, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Continuation of Ser. No. 836,667, Feb. 14, 1992, abandoned. This application Oct. 24, 1994, Ser. No. 328,337

Int. Cl.[6] G06F *12/00*

U.S. Cl. 395—484 **23 Claims**



1. A memory comprising:

a plurality of rows of memory locations;

a plurality of first registers, each first register for receiving a row address;

a plurality of row decoders, each row decoder for activating a portion of a row identified by signals from one of said first registers;

one or more sense amplifiers for amplifying contents of said memory locations in the row portions; and

an output for providing output signals from said sense amplifiers,

wherein at least two locations L1 and L2 in different rows having different row addresses in said memory can be read out to said output in burst mode such that the memory receives an address of one of said locations and provides in response contents of a plurality of memory locations, including the locations L1 and L2, in the sequence of consecutive addresses, so that while one of said row decoders is activating a row portion comprising said location L1 and contents of said location L1 are being transferred from one or more of said sense amplifiers to said output, another one of said row decoders is activating a row portion comprising said location L2 and contents of said location L2 are being transferred from said location L2 to one or more of said sense amplifiers.

5,559,991

INCREMENTAL COMPUTER FILE BACKUP USING CHECK WORDS

Arnon Kanfi, Randolph, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 258,352, Jun. 9, 1994, abandoned, which is a continuation of Ser. No. 787,276, Nov. 4, 1991, abandoned. This application Jun. 27, 1995, Ser. No. 495,242

Int. Cl.[6] G06F *12/16*

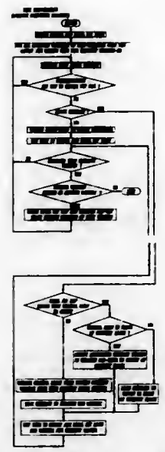
U.S. Cl. 395—489 **23 Claims**

1. Apparatus for storing a file in an archive memory comprising

means for dividing said file into a plurality of blocks and for assigning respective block numbers to said blocks, each of said blocks containing a predetermined number of data bytes,

means for generating for each of said blocks of said file a current check word determined as a function of the current contents of the respective block of said file and for storing each said current check word in said archive memory, and

means for storing in said archive memory each of said current blocks of said file having a current check word different from a check word that was generated for a correspondingly numbered block of a prior version of said file stored in said archive memory, wherein different groups of stored blocks of said data bytes form respective versions of is said file, and wherein said apparatus further comprises



a global bit map comprising a plurality of bit locations corresponding to respective ones of said block numbers,

means, responsive to one of said blocks being unloaded from said memory, for setting in said bit map the bit whose location corresponds with the block number of said one block, and

means, operative prior to unloading another one of said stored blocks of a respective one of said groups, for preventing the unloading of said other one of said blocks if the corresponding bit in said bit map for said other one of said blocks had been set as a result of unloading a correspondingly numbered block of another one of said groups.

5,559,992

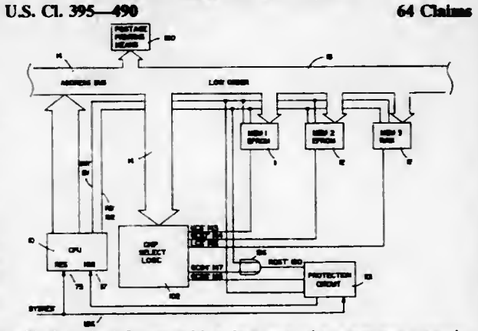
APPARATUS AND METHOD FOR PROTECTING DATA IN A MEMORY ADDRESS RANGE

Peter Stutz, Hinterkappelen, and Daniel Flückiger, Walkringen, both of Switzerland, assignors to Ascom Autelca AG, Berne, Switzerland

Filed Jan. 11, 1993, Ser. No. 2,737

Int. Cl.[6] G06F *12/14;12/16;17/00*

U.S. Cl. 395—490 **64 Claims**



64. A method for use with a data protection apparatus comprising a processor, a memory device, a protection circuit operatively coupled to the processor to receive a request signal therefrom, and an address decoder generating a selection signal corresponding to a protected region of the memory device, the protected region comprising less than all of the addresses of the memory device, the method comprising the steps of:

addressing an address in the protected region of the memory device during a write cycle;

providing an output signal annunciating whether the request signal has been received by the protection circuit prior to the addressing step; and

interrupting the processor if no request signal has been received prior to the addressing step.

5,559,993

HARDWARE CIRCUIT FOR SECURING A COMPUTER AGAINST UNDESIRED WRITE AND/OR READ OPERATIONS

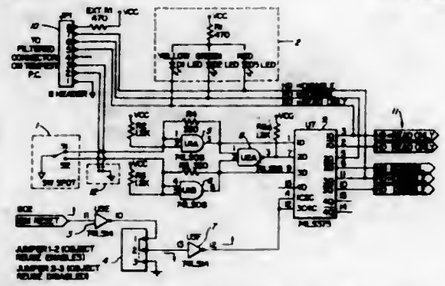
Thomas E. Elliott, Nepean, and Richard L. Gonzalez, Ottawa, both of Canada, assignors to Her Majesty the Queen as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ontario, Canada

Filed Nov. 17, 1993, Ser. No. 153,164

Claims priority, application Canada, Mar. 11, 1993, 2091501

Int. Cl.[6] G06F *13/12*

U.S. Cl. 395—490 **18 Claims**



1. A write protect device for a computer comprising a switch connected to a circuit assembly, which circuit assembly can be internally installed in the computer, the circuit assembly being provided with cable connections between a drive controller cable from a controller for the computer and at least one data storage device drive of the computer, the drive controller cable containing drive selection and control lines and the circuit assembly intercepting said lines, the switch being connected to inputs of a latch circuit in the circuit assembly wherein one position of the switch provides inputs to the latch circuit which results in generation of *READONLY and READONLY signals at two outputs of the latch circuit, said outputs being connected to *READONLY and READONLY signal lines, respectively, of the circuit assembly, a *READONLY signal line being connected to one input of a first NAND gate of the circuit assembly with another input of the first NAND gate being connected through a first inverter to a *WRITE GATE line of the drive controller cable, the first NAND gate having an output connected to a *WRITE GATE line to the at least one data storage device drive, wherein a *READONLY signal on an input of the first NAND gate prevents any *WRITE GATE signal appearing at the output of the first NAND gate and wherein a second position of the switch provides inputs to the latch circuit which result in generation of *DISABLE and DISABLE signals at two outputs of the latch circuit, said outputs of the latch circuit being connected to *DISABLE and DISABLE signal lines, respectively, of the circuit assembly, a *DISABLE signal line being connected to one input of a second NAND gate of the circuit assembly, another input of the second NAND gate being connected through a fourth inverter to a *DRIVE SEL line of the drive controller cable, the second NAND gate having an output connected to a *DRIVE SEL line of the cable to the at least one data storage device drive, a *DISABLE signal on an input of the second NAND gate preventing any *DRIVE SEL signal existing at the output of the second NAND gate.

5,559,994

MEMORY CONTROL APPARATUS PERMITTING CONCURRENT ACCESS BY COMPRESSING ADDRESSING TIME WINDOW AND MULTIPLEXING

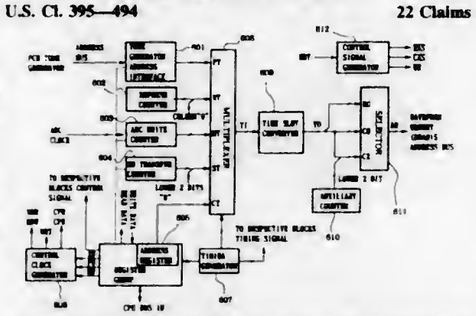
Tokiharu Ando, Hamamatsu, Japan, assignor to Yamaha Corporation, Japan

Continuation of Ser. No. 89,759, Jul. 9, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 461,168

Claims priority, application Japan, Jul. 15, 1992, 4-210944

Int. Cl.[6] G06F *13/16; G10H 7/02*

U.S. Cl. 395—494 **22 Claims**



1. A memory control apparatus arranged between a memory and data processing means comprising:

address generation means for generating first address data to execute refresh processing of said memory or data transfer processing between a second data processing means and said memory;

time slot compression means for receiving second address data sequentially outputted from said data processing means in each time slot of a first time width, compressing said first time width to a second time width shorter than said first time width, sequentially outputting said second address data in time slots having said second time width, inserting said first address data in a vacant time slot corresponding to a time slot formed by the compression, and sequentially outputting the first address data and the second address data;

control means for reading out data from said memory based on the second address data during time slots having said second time width in which address data sequentially outputted from said time slot compression means is said second address data, and for executing said refresh processing of said memory or said data transfer processing between said second data processing means and said memory during time slots in which address data sequentially outputted from said time slot compression means is said first address data; and

time slot expansion means for expanding a time width of said data read from said memory by said control means to said first time width, and supplying expanded data to said data processing means in time slots having said first time width.

5,559,995

METHOD AND APPARATUS FOR CREATING A WIREFRAME AND POLYGON VIRTUAL WORLD

Dan D. Browning, San Francisco; Ethan D. Joffe, Menlo Park, and Jaron Z. Lanier, Palo Alto, all of Calif., assignors to VPL Research, Inc., Redwood City, Calif.

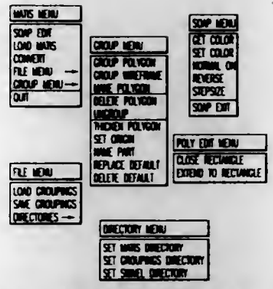
Continuation of Ser. No. 621,474, Nov. 30, 1990, abandoned. This application Sep. 2, 1992, Ser. No. 939,834

Int. Cl.[6] G06F *9/455*

U.S. Cl. 395—500 **9 Claims**

1. An apparatus for creating a virtual world data base, comprising:

receiving means for receiving first, second and third polygon representations of respective first, second and third virtual objects in a virtual world;



selecting means, coupled to said receiving means, for selecting a first edge of said first virtual object and for selecting a second edge of said second virtual object; and

grouping means, coupled to the receiving means and the selecting means, for grouping said first and second virtual objects in the virtual world into a grouped object comprising said first and second virtual objects joined at an intersection of the first and second edges, the grouped object represented by at least one of a three-dimensional and rotatable wireframe object and a three-dimensional and rotatable sweep polygon.

5,559,996

LEVEL CONVERTER INCLUDING WAVE-SHAPING CIRCUIT AND EMULATOR MICROCOMPUTER INCORPORATING THE LEVEL CONVERTER

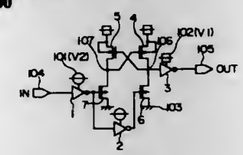
Shuzo Fujioka, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

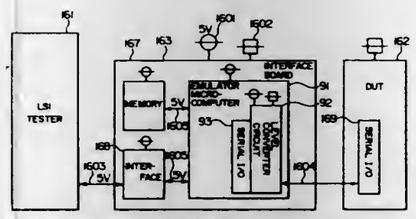
Filed Jan. 11, 1994, Ser. No. 180,063

Claims priority, application Japan, Jan. 12, 1993, 5-003267

Int. Cl.[6] G06F *3/00*

U.S. Cl. 395—500 **8 Claims**





1. A level converter comprising:

first and second P-channel transistors having respective gates, sources, drains, and identical first β values, the sources being commonly connected to a first potential V1 and the drains of said first and second P-channel transistors being connected to the gates of said second and first P-channel transistors, respectively;

first and second N-channel transistors having respective gates, sources, drains, and identical second β values, the drains of said first and second N-channel transistors being respectively connected to the drains of said first and second P-channel transistors, and the sources of said first and second N-channel transistors being grounded wherein the second β value is more than 50 times the first β value;

a first inverter for inverting a level-conversion input signal and supplying the inverted level-conversion input signal as an output signal of said first inverter to the gate of said second N-channel transistor, said first inverter being operated by a power supply at a second potential V2 different from the first potential V1;

a second inverter for inverting the output signal of said first inverter and supplying that inverted signal to the gate of said first N-channel transistor, said second inverter being operated by a power supply at the second potential V2; and

a flip-flop circuit for receiving a first signal produced at the drain of said first P-channel transistor and the drain of said first N-channel transistor, receiving a second signal produced at the drain of said second P-channel transistor and the drain of said second N-channel transistor, producing an output signal of said level converter circuit, and changing state only when either of the first and second signals changes state from a low level.

5,559,997

SYSTEM AND METHOD FOR DESIGNING A PRINTED-CIRCUIT BOARD

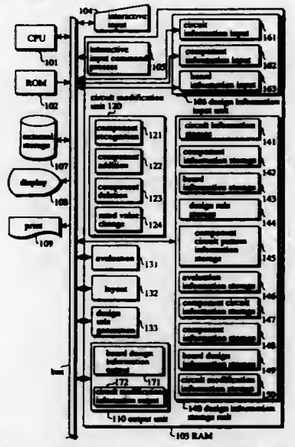
Masayuki Tsuchida, Osaka; Hirokazu Uemura, Yao; Shinji Miura, Kyoto; Yoshiyuki Saito, Hirakata; Niroyuki Yoshimura, Ashiya; Yuichi Nishimura, Katano, and Nobuo Sueda, Ikeda, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 4, 1994, Ser. No. 317,859

Claims priority, application Japan, Oct. 4, 1993, 5-247889

Int. Cl.[6] G06F *17/50*

U.S. Cl. 395—500 **47 Claims**



1. A system for designing a circuit board, based on circuit board information, noise reduction information, and evaluation information, said circuit board information indicating a board to be used for a circuit board to be designed, a circuit to be laid out on the board, and components to be included in the circuit, said noise reduction information indicating anti-noise solution, said evaluation information indicating electric characteristics of the circuit board in process of designing, said system comprising:

an input means for receiving said circuit board information, said noise reduction information, and said evaluation information;

noise reduction component addition means for adding noise reduction components to the circuit described in said circuit board information, based on information on noise reduction components described in the received noise reduction information, and for modifying the circuit board information in accordance with the noise reduction components-added circuit;

a layout means for (1) laying out components and routes on the board described by said circuit board information, based on the circuit board information which has been modified by said noise reduction component addition means, and another infor-

mation on restrictions to the layout described in said noise

serial/parallel converting means for converting the values out-

mation on restrictions to the layout described in said noise reduction information, for (2) generating layout information, using locations of the components and the routes laid out on the board as coordinate values, and for (3) further modifying the circuit board information modified by said noise reduction component addition means in accordance with the laid out circuit;

an evaluation means for evaluating electric characteristics of evaluation targets in the circuit described by said layout information and the circuit board information at that moment, based on said evaluation information on the electric characteristics of the circuit board in the process of designing;

rated value modification means for replacing the noise reduction components with other noise reduction components having different rated values, based on information on noise reduction components in said noise reduction information, and for modifying said circuit board information in accordance with the circuit having changed rated values;

a control means for starting said evaluation means every time said layout means completes a layout, and for starting said evaluation means every time said rated value modification means changes a rated value of a noise reduction component in the circuit;

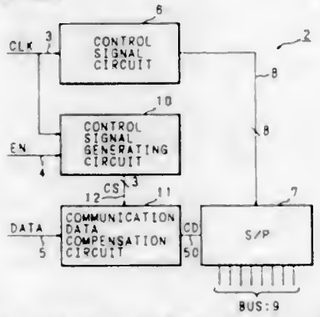
an output means for outputting said circuit board information and said layout information when the electric characteristics of predetermined evaluation targets among the evaluation targets in the circuit described in said circuit board information and said layout information have been fairly evaluated by said evaluation means.

5,559,958

CLOCK SYNCHRONOUS SERIAL INFORMATION RECEIVING APPARATUS RECEIVING RELIABLE INFORMATION EVEN WHEN NOISE IS PRESENT

Katsunori Suzuki, and Masayuki Hata, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 30, 1994, Ser. No. 268,746
Claims priority, application Japan, Jul. 2, 1993, 5-164621
Int. Cl.[6] G06F *1/14*
U.S. Cl. 395—550 **8 Claims**



1. A clock synchronous serial information receiving apparatus for receiving an information signal in synchronism with a clock, comprising:

control signal generating means for generating at least a first control signal and a second control signal commonly transitioning from a second state to a first state in synchronism with said clock;

information compensating means for storing values of said information respectively at the timings of transition of said at least first and second control signals from the first state to the second state, and for outputting, when the stored values agree with each other, the concurring stored values agree with each other, the concurring stored value, or when the store values do not agree with each other, one of the stored values according to a predetermined logic; and

serial/parallel converting means for converting the values outputted serially from said information compensating means into a parallel output signal;

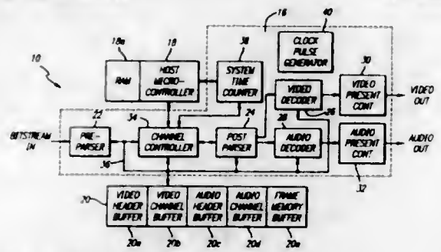
wherein said control signal generating means has signal generating means for varying the respective timings of transition of said at least first and second control signals from the first state to the second state.

5,559,999

MPEG DECODING SYSTEM INCLUDING TAG LIST FOR ASSOCIATING PRESENTATION TIME STAMPS WITH ENCODED DATA UNITS

Greg Maturi, Tracy, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Sep. 9, 1994, Ser. No. 303,444
Int. Cl.[6] G06F *13/372*
U.S. Cl. 395—550 **26 Claims**



1. A decoding system for decoding a data stream:

the data stream comprising:

an encoded data unit;

a header corresponding to said encoded data unit; and

a time stamp included in said header for indicating a requested decoding time for said encoded data unit;

the system comprising:

a header memory;

a data memory;

a list memory;

parsing means for parsing said data stream, storing said header in the header memory, storing said encoded data unit in the data memory beginning at a starting address and capturing said time stamp;

computing means responsive to said parsing by the parsing means for storing said time stamp and said starting address as a list entry in said list memory; and

decoding means for reading and decoding said encoded data unit from the data memory at an actual decoding time which can differ from said requested decoding time to produce a decoded data unit;

the computing means being further responsive to said reading and decoding by the decoding means for accessing said list entry in the list memory using said starting address to obtain said time stamp;

wherein the relationship between said requested decoding time and said actual decoding time can be utilized to synchronize subsequent presentation of said decoded data unit.

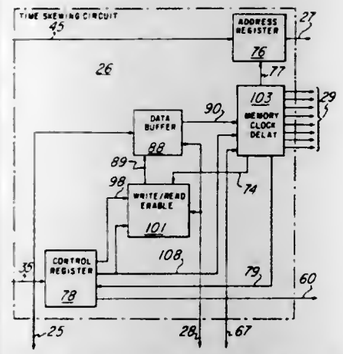
5,560,000

TIME SKEWING ARRANGEMENT FOR OPERATING MEMORY IN SYNCHRONISM WITH A DATA PROCESSOR

Wilbur C. Vogley, Missouri City, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 891,483, May 28, 1992, abandoned. This application Jan. 7, 1995, Ser. No. 473,608
Int. Cl.[6] G06F *1/10;12/00*
U.S. Cl. 395—550 **9 Claims**

1. A circuit for a data processing system, the circuit comprising:



an address register, interconnected with a plurality of synchronous random access memory devices and arranged for receiving and storing synchronous random access memory address information;

a control signal register, interconnected with the plurality of synchronous random access memory devices and arranged for receiving and storing synchronous random access memory control signals;

a data buffer register, interconnected with a memory clock delay circuit and the plurality of synchronous random access memory devices and arranged for receiving and storing data bits during a memory write operation; and

the memory clock delay circuit, interconnected with the address register, the control signal register, and the plurality of synchronous random access memory devices and responsive to a system clock signal and memory clock delay data, for producing a plurality of time skewed memory clock signals each one to be applied to a separate one of the synchronous random access memory devices, and each time skewed memory clock signal being delayed a different increment of time so that the plurality of synchronous random access memory devices each can operate at a different time in response to the one of the time skewed memory clock signals to accept the address information, the control signals, and data bits.

5,560,001

METHOD OF OPERATING A PROCESSOR AT A REDUCED SPEED

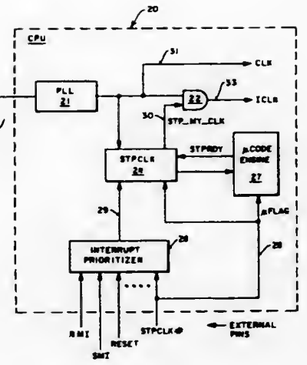
James P. Kardach, San Jose; Tosaku Nakanishi, and Jimmy S. Cheng, both of Cupertino, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 970,576, Nov. 3, 1992, Pat. No. 5,473,767. This application Sep. 27, 1995, Ser. No. 534,480
Int. Cl.[6] G06F *1/08*
U.S. Cl. 395—550 **2 Claims**

1. A method of operating a microprocessor to execute a program of instructions at a reduced speed comprising the steps of:

(a) providing a reference oscillatory signal to said microprocessor, said microprocessor generating an internal clock signal having an operating rate therefrom;

(b) successively asserting and deasserting an external pin of said microprocessor to effectively throttle said operating rate, the assertion of said external pin causing the execution of a routine in a microcode engine of said microprocessor which places said microprocessor in a known state and decouples said internal clock signal from at least a portion of said microprocessor, deasserting said external pin causing said microprocessor to resume executing said program of instructions by recoupling said internal clock signal to said at least a portion of said microprocessor.

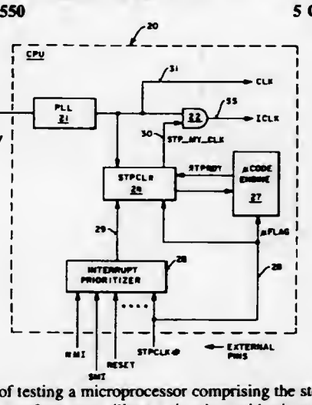


5,560,002

METHOD OF TESTING A MICROPROCESSOR BY MASKING OF AN INTERNAL CLOCK SIGNAL

James P. Kardach, San Jose; Tosaku Nakanishi, and Jimmy S. Cheng, both of Cupertino, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 970,576, Nov. 3, 1992, Pat. No. 5,473,767. This application Sep. 27, 1995, Ser. No. 534,596
Int. Cl.[6] G06F *1/14*
U.S. Cl. 395—550 **5 Claims**



1. A method of testing a microprocessor comprising the steps of:

(a) providing a reference oscillatory signal to said microprocessor, said microprocessor generating an internal clock signal therefrom;

(b) asserting an external pin of said microprocessor to initiate the routine first placing said microprocessor in a known state and then asserting a logic signal which masks said internal clock signal from at least a portion of said microprocessor;

(c) retrieving information associated with said known state from said microprocessor.

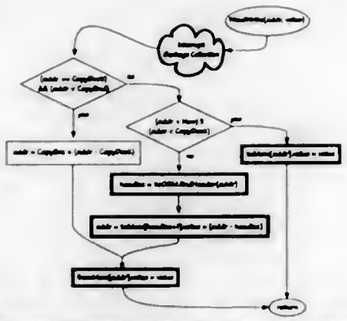
5,560,003

SYSTEM AND HARDWARE MODULE FOR INCREMENTAL REAL TIME GARBAGE COLLECTION AND MEMORY MANAGEMENT

Kelvin D. Nilsen, Ames, Iowa, and William Schmidt, Rochester, Minn., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Dec. 21, 1992, Ser. No. 945,171
Int. Cl.[6] G06F *17/30*
U.S. Cl. 395—600 **48 Claims**

1. A garbage-collecting memory module (GCMM) for use with a computer system having one or more digital processors, said



digital processor(s) maintaining list(s) of source descriptors pointing to regions of memory in said GCMM containing live objects, said GCMM comprising:

a memory for the storage of objects;

a means for communicating with said digital processor(s);

a garbage-collecting control unit which (1) allocates space for and stores an object in said memory upon request by one of said digital processor(s), (2) causes an object to be retrieved from said memory and returned to one of said digital processor(s) upon request, and (3) collects garbage from said memory utilizing said source descriptors supplied by said digital processor(s).

5,560,004

METHOD FOR PROCESSING PROGRAM MODULES BEING TRANSFERRED AND STORED IN NETWORK MANAGEMENT CENTRAL BASED ON INFORMATIONAL CONTENTS IN UPDATING MESSAGE FROM CONNECTED DATA PROCESSING SYSTEM

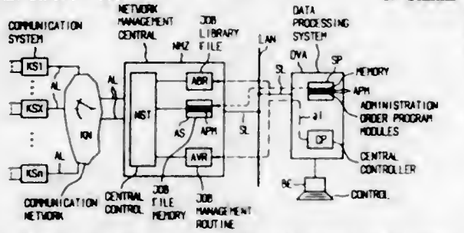
Wolfgang Weng, Munich, and Friedrich Woerndle, Ostermuenchen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 24, 1994, Ser. No. 185,510

Claims priority, application Germany, Feb. 26, 1993, 43 06 030.7

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—600 **19 Claims**



1. A method for transferring and logging operator-task-oriented administration order program modules formed by administration and maintenance instructions from a data processing system via a local network to a network management central that can be connected to communications systems via a communication network, the network management central having a job management routine that coordinates the processing of the administration order program modules, comprising the steps of:

transferring the administration order program modules from the data processing system into a job file memory of the network management central;

entering job information, communication system information, and type of job information contained in an allocated updating message into a job library file of the network management central, the respective entry into the job library file being indicated to the job management routine by the respective updating message, said type of job information being status information;

dependent on the informational contents of the type of job information and the job and communication system information contained in the updating message, processing the stored administration order program modules using the job management routine; and

entering processing status information into the job library file respectively associated to administration order program modules.

5,560,005

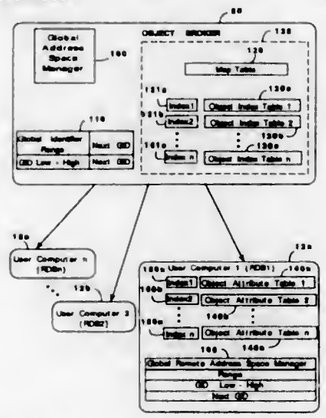
METHODS AND SYSTEMS FOR OBJECT-BASED RELATIONAL DISTRIBUTED DATABASES

Michael K. Hoover, Roswell; Barrick H. Miller, Marietta; Kurt Schurenberg, Roswell, and Richard A. Daigle, Atlanta, all of Ga., assignors to ActaMed Corp., Atlanta, Ga.

Filed Feb. 25, 1994, Ser. No. 202,493

Int. Cl.[6] G06F *17/30;15/163*

U.S. Cl. 395—600 **85 Claims**



1. A method of operating a distributed data processing system including a plurality of independent remotely located user computers that process user data in user databases and at least one object broker computer,

the user computers being interconnected with the object broker computer by data communication hardware over a data communication network,

the user computers being operative to perform data operations of storing, updating, and retrieving user data items in response to user commands, comprising the steps of:

(a) for a subject at one of the user computers for which data is to be processed in the system, creating an object instance by assigning a unique object identifier to data items associated with the subject by:

(a1) providing a global object identification address space corresponding to a range of object identifiers for association with a plurality of subjects; and

(a2) allocating a predetermined range of object identifiers within the global object identification address space to each remotely located user computer;

(b) storing the data items associated with the subject at the user computer in association with the object identifier;

(c) at the object broker computer, storing the locations of the user computers in a mapping table in association with object identifiers;

(d) in response to a query to the object broker computer for data relating to a particular subject in question, retrieving a selected object identifier for the subject in question;

(e) in response to retrieval of an object identifier for the subject in question in the preceding step, retrieving the location of a remote user computer associated with the selected object identifier; and

(f) retrieving data stored at the remote user computer associated with the selected object identifier via the data communication network.

5,560,006

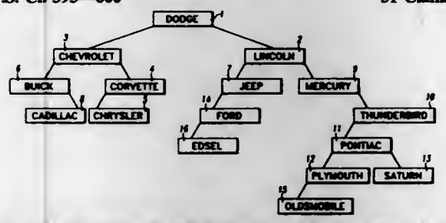
ENTITY-RELATION DATABASE

John E. Layden; David J. Layden, both of Indianapolis, and Thomas A. Pearson, Fishers, all of Ind., assignors to Automated Technology Associates, Inc., Indianapolis, Ind.

Continuation of Ser. No. 922,491, Jul. 30, 1992, abandoned, which is a continuation-in-part of Ser. No. 700,548, May 15, 1991, Pat. No. 5,339,257. This application May 8, 1995, Ser. No. 436,786

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 **31 Claims**



1. A data processing system for processing data elements reflecting selected parameters comprising:

a memory,

means for writing the data elements into the memory arranged as an entity-relation database, the data elements reflecting each selected parameter being arranged into an entity field of data elements, with related data elements reflecting a common parameter with at least some of the data elements being included in at least one additional entity field,

means for generating for each selected parameter a linked list linking all the related data elemeats of the selected parameter, the linked list including a head portion containing an address within the memory for a first and last data element of the selected parameter, and a continuation portion, associated with each data element of the selected parameter, containing an address for each next element and each previous element of the selected parameter,

means for associating at least some of the data elements with the related data elements reflecting a common parameter with at least some of the data elements, arranged as a relationship defining field within the memory, including means for pointer indexing the data elements of at least some of the entity fields, each pointer index covering only a single entity field and including a searchable network of addresses of data elements within each single entity field and, associated with each address, a linking pointer list providing means for retrieving all related elements reflecting a common parameter with the data element at the address from at least one other entity field in an order defiand by the linking pointer list,

means for binary sort tree indexing the data elements of at least some of the fields into ordered arrays, each binary sort tree index covering only a single entity field and including a searchable network of integers arranged in groups of three integers for each of the data elements, each group of three integers being associated with the address of a single data element, one of the three integers specifying the indexing integer of a parent data element of the same entity field, and each of the two remaining integers specifying the indexing integer of any immediately dependent data elements of the same entity field, and

means for retrieving all of the related data elements of a chosen data element including means for searching the network of integers of a selected field to identify the address of the chosen data element, and means for reading a linked list associated with the chosen data element thereby retrieving a chosen data set within a predetermined known upper limit of time.

5,560,007

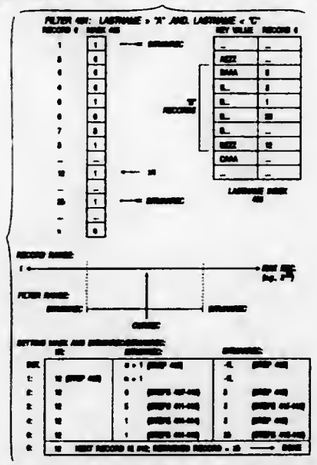
B-TREE KEY-RANGE BIT MAP INDEX OPTIMIZATION OF DATABASE QUERIES

Lam H. Thai, San Jose, Calif., assignor to Borland International, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 85,214, Jun. 30, 1993, abandoned. This application Oct. 18, 1995, Ser. No. 544,679

Int. Cl.[6] G06F *17/30*

U.S. Cl. 395—600 **19 Claims**



1. In a system for processing data records, each record including at least one field for storing information, the system including means for logically ordering the records by an index, said index comprising a tree structure storing key values derived from values stored by said at least one field of each record, said index including a plurality of leaf nodes, each leaf node comprising a particular key value together with a record identifier for indicating a particular record which stores said particular key value, said leaf nodes being sorted by the key values stored thereat according to a user-specified sort order, said leaf nodes being linked via pointers, a method for identifying from said index records of interest to a user comprising:

(a) receiving a query expression specifying at least one condition for selecting particular records of interest to the user;

(b) with the index that logically orders the records according to key values, locating first and second leaf nodes of said plurality of leaf nodes which store a bottom and a top key value of the index, respectively, which satisfies said at least one condition, said bottom key value identifying a first record of interest and said top key value identifying a second record of interest, said method locating said first and second leaf nodes before attempting to locate other leaf nodes storing key values which satisfy said at least one condition; and

(c) after locating said first and second leaf nodes, identifying others of said records of interest without reading key values stored at leaf nodes by traversing pointers of leaf nodes which lie between said first and second leaf nodes, for locating all nodes storing key values of the index which logically lie between said bottom and top key values, wherein each located key value occurs at a leaf node storing a record identifier which identifies a record satisfying said at least one condition.

5,560,008

determining whether the external declaration is an external definition or a typedef declaration;

5,560,012

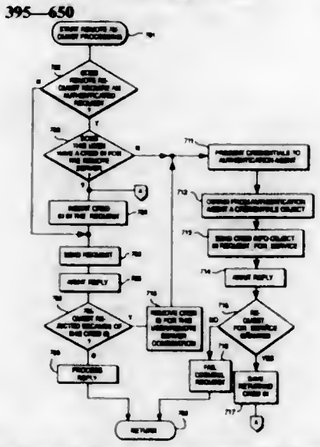
OBJECT-ORIENTED DATA PROCESSING SYSTEM

5,560,008

REMOTE AUTHENTICATION AND AUTHORIZATION IN A DISTRIBUTED DATA PROCESSING SYSTEM

Donavon W. Johnson, Georgetown, and Todd A. Smith, Austin, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 15, 1989, Ser. No. 352,075
Int. Cl.[6] G06F *15/163*
U.S. Cl. 395—650 **24 Claims**



1. A method for determining credentials of a process, running at a first data processing system, when accessing a service at a second data processing system, said method comprising:

creating, at the second data processing system, a set of credentials for said process in response to a first request received from said first data processing system;

returning a value to said first data processing system;

receiving, at the second data processing system, a second request from said first data processing system comprising said value; and

using the value to determine said set of credentials for said process during access to the service at the second data processing system.

5,560,009

GENERATING SYMBOLIC DEBUG INFORMATION BY MERGING TRANSLATION AND COMPILER DEBUG INFORMATION

Dmitry Lenkov; Shankar Unni; Michey Mehta, all of San Jose; Mark W. McDowell, Fort Collins; Manoj Dadoo, San Jose, and Bruno Melli, Fort Collins, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 21, 1990, Ser. No. 586,521
Int. Cl.[6] G06F *9/45*
U.S. Cl. 395—700 **27 Claims**

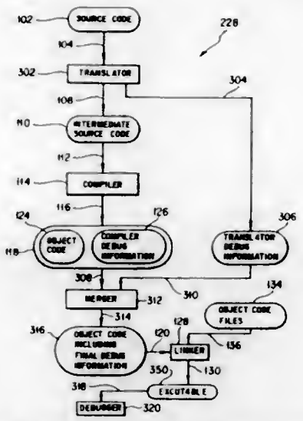
1. A computer-based system for generating meaningful symbolic debug information for a source code, adapted for use in translator-based software compilers, the system comprising:

(1) first means for generating a translator debug information for the source code;

(2) second means comprising:

(a) means for generating an object code for the source code;

(b) means for generating a compiler debug information for the source code; and



(c) means for storing said object code and said compiler debug information in a first object code file; and

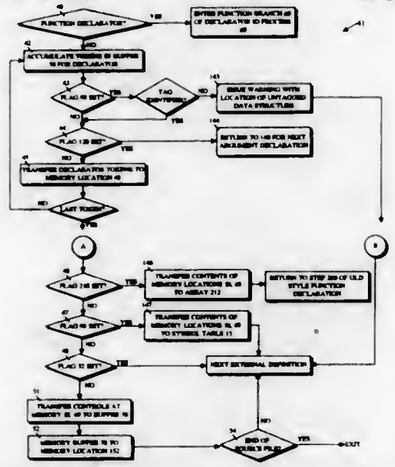
(3) third means for merging said translator and compiler debug information to form final debug information for the source code, wherein said final debug information completely and accurately represents the source code.

5,560,010

METHOD FOR AUTOMATICALLY GENERATING OBJECT DECLARATIONS

Anthony J. Albert, San Francisco, Calif., assignor to Symantec Corporation, Cupertino, Calif.

Filed Oct. 28, 1993, Ser. No. 144,699
Int. Cl.[6] G06F *9/44*
U.S. Cl. 395—700 **10 Claims**



1. A computer-implemented process for generating declaration statements for objects defined in the external declarations of a source file, the process comprising the steps of:

identifying data-type identifiers in an external declaration of the source file;

storing a representation of the data-type identifiers as data-type keywords in a first memory location;

identifying object declarators in the external declaration;

storing a representation of the object declarators in a second memory location;

determining whether the external declaration is an external definition or a typedef declaration;

when the external declaration is an external definition, combining the data-type keywords in the first memory location and the object declarators in the second memory location to generate a declaration statement;

when the external declaration is a typedef declaration, generating an entry in a symbol table with the data-type keywords from the first memory location, indexed by the object declarators from the second memory location;

and

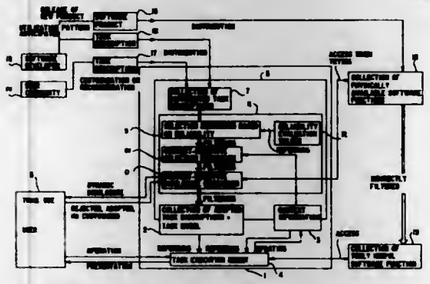
repeating the preceding steps until all external declarations of the source file have been analyzed.

5,560,011

COMPUTER SYSTEM FOR MONITORING A USER'S UTILIZATION PATTERN TO DETERMINE USEFUL TASKS

Masashi Uyama, Tokyo, Japan, assignor to New Media Development Association, Tokyo, Japan

Filed Apr. 7, 1994, Ser. No. 224,575
Claims priority, application Japan, Oct. 19, 1993, 5-261289
Int. Cl.[6] G06F *15/38*
U.S. Cl. 395—700 **3 Claims**



1. A computer system, comprising:

task model holding means for holding a task model, which is a collection of knowledge, modeled after task execution pattern of a user;

context information holding means for holding context information, which is a knowledge to represent a context of task execution of the user, sequentially calculated and updated based on input information from task model and operation series of the user;

task execution means for making access to software functions necessary to task execution wanted by the user referring to the task model and the context information based on input operation by the user and for converting the results of execution of the software functions to adequate expression to present to the user, referring to the task model and context information;

whereby there are further provided:

task description holding means for holding a collection of task descriptions formally describing individual utilization patterns of the software functions; and

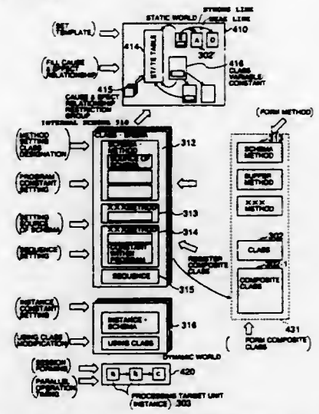
filtering means for finding and selecting a task description describing utilization pattern, not tried by the user in the past and regarded as useful to the user, from a collection of task descriptions held by the task description holding means, and for disclosing it to the user.

5,560,012

OBJECT-ORIENTED DATA PROCESSING SYSTEM

Tadamitsu Ryu; Hiroyuki Izumi; Masahiko Murakawa; Masanobu Toyota; Takeshi Adachi, all of Kawasaki, and Naomi Ichikawa, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 25, 1994, Ser. No. 248,978
Claims priority, application Japan, May 25, 1993, 5-122557
Int. Cl.[6] G06F *17/30;7/00*
U.S. Cl. 395—700 **4 Claims**



1. An object-oriented data processing system for performing a desired processing based upon an object model, said object model including a plurality of objects combined with each other, each of said objects being formed of data and methods, said object-oriented data processing system comprising:

an external definition provided for each of said objects for identifying said object, said external definition including an identifier that identifies said object;

an internal definition provided for each of said objects for carrying out a procedure of said object, said internal definition including an identifier corresponding to said identifier in said external definition for the object;

model classification means for classifying said object model, based upon said external definition, into a static model indicating a relationship between classes, and a dynamic model indicating a time sequential relationship between instances of classes as a session the session providing a motion of said dynamic model;

class generation means for creating classes by combining one of an existing and newly created method with one of a existing and newly created method, said class including a composite class formed of a plurality of classes;

instance generation means for creating instances in correspondence to each of said classes;

said existing methods, said newly created methods, said class and said composite class, and said session being stored in a concealed area corresponding to said internal definition as a functional model such that each object is related to said identifier;

link setting means for setting a link between said plurality of objects forming said static model and dynamic model to provide a structure to said static model and said dynamic model;

said link being selected from a strong link that causes a propagation of operation applied to an object, to another object connected by said strong link; and a weak link connecting an object to another object such that propagation of an operation applied to the object does not occur to said other object that is connected thereto by the weak link;

said link setting means conditionally converting a weak link to a strong link;

said link setting means thereby setting a range of propagation of

5,560,014

5,560,017

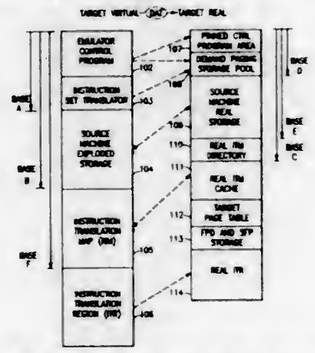
said link setting means thereby setting a range of propagation of operation, when executing a processing upon construction of said class, composite class, and said instance, in according to a type of said link.

5,560,013

METHOD OF USING A TARGET PROCESSOR TO EXECUTE PROGRAMS OF A SOURCE ARCHITECTURE THAT USES MULTIPLE ADDRESS SPACES

Casper A. Scalzi, Poughkeepsie, N.Y., and William J. Starke, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 6, 1994, Ser. No. 349,772
Int. Cl.[6] G06F 9/40
U.S. Cl. 395—700 **12 Claims**



1. An emulation method for executing individual source instructions in a target processor to execute source programs requiring source processor features not built into the target processor, comprising the steps of:

inputting instructions of a source processor program to an emulation target processor having significant excess virtual addressing capacity compared to a virtual addressing capacity required for a source processor to natively execute the source processor program, and supporting multiple source virtual address spaces in the operation of the source processor,

building a virtual ITM (instruction translation map) in a target virtual address space supported by the target processor, the virtual ITM containing an ITM entry for each source instruction addressable unit, each source instruction addressable unit beginning on a source storage instruction boundary, structuring each ITM entry for containing a translation address to a target translation program that executes a source instruction having a source address associated with the ITM entry,

determining a ratio R by dividing the length of each ITM entry by the length of each source instruction addressable unit,

accessing an ITM entry for an executing source instruction by:

generating a source aggregate virtual address for the source instruction by combining the source address of the source instruction with a source address space identifier of a source virtual address space containing the instruction,

multiplying the source aggregate virtual address by R to obtain a target virtual address component, and

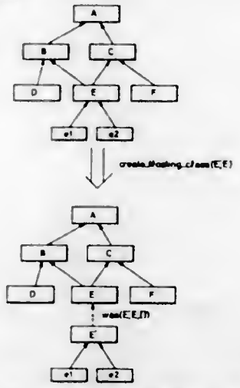
inserting the target virtual address component into a predetermined component location in a target virtual address to generate an ITM entry target virtual address for locating an ITM entry associated with the source instruction in order to obtain a one-to-one addressing relationship between ITM entry target virtual addresses and source instruction addresses.

5,560,014

DYNAMIC OBJECT MANAGEMENT METHOD IN OBJECT ORIENTED LANGUAGE

Satoshi Imamura, Tsuchiura, Japan, assignor to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Mar. 27, 1995, Ser. No. 410,750
Claims priority, application Japan, Jun. 2, 1994, 6-121081
Int. Cl.[6] G06F 9/44
U.S. Cl. 395—700 **6 Claims**



1. A dynamic object management method in an object oriented language having a hierarchy of class objects describing slots for storing data and object methods consisting of groups of algorithms for conducting operations on the data and having instance objects associated with the individual class objects, the dynamic object management method comprising the steps of:

providing the object oriented language with a group of meta operators for modifying the class objects and the instance objects, and

modifying an original class object according to the steps of

obtaining a floating class object that is a copy of a class object by using the group of meta operators,

creating a new class object by modifying the floating class object, and

linking the new class object with the original class object by a link describing both a history of the modification and a relationship between the new class object and the original class object.

5,560,015

COMPILER AND METHOD OF COMPILATION

Tamiya Onodera, Tokyo, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 6,335, Jan. 19, 1993, abandoned. This application May 30, 1995, Ser. No. 454,446
Claims priority, application Japan, Jan. 17, 1992, 4-006093
Int. Cl.[6] G06F 9/45
U.S. Cl. 395—700 **6 Claims**

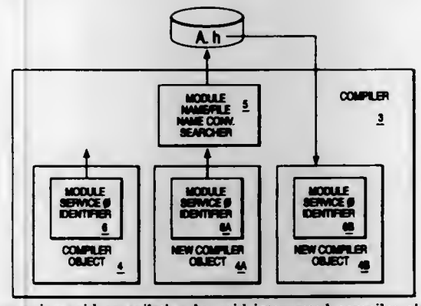
1. A method for compiling a source program comprising one or more program modules, each program module consisting of a first part which defines specifications and a second part which performs functions, said compilation method comprising steps of:

detecting an encounter with a compilation phase during which a program module, not previously read, is being used while a source program is analyzed by a compiler object;

interrupting the compiler object in operation in response to said detection;

searching automatically for said first part of said program module in response to said detection;

generating a new compiler object, and compiling said first part of said program module thus searched out automatically by the new compiler object; and



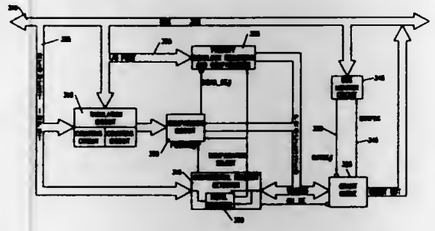
resuming said compilation by said interrupted compiler object after compilation of said first part of said program module.

5,560,016

SYSTEM AND METHOD FOR DYNAMIC BUS ACCESS PRIORITIZATION AND ARBITRATION BASED ON CHANGING BUS MASTER REQUEST FREQUENCY

Greg R. Fiebrich, and Oscar Leal, both of Austin, Tex., assignors to Dell USA, L.P., Austin, Tex.

Filed Oct. 6, 1994, Ser. No. 319,204
Int. Cl.[6] G06F 13/36
U.S. Cl. 395—728 **50 Claims**



1. In a computer system having a plurality of devices coupled to a bus, said plurality of devices having a bus master mode allowing a selected one of said devices to function as a bus master and adapted to request designation as a bus master, an arbitration circuit for determining which one of said plurality of devices is to function as said bus master when two of said plurality of devices coincidentally request said designation, comprising:

a tabulation circuit for tabulating a relative request activity of each of said plurality of devices; and

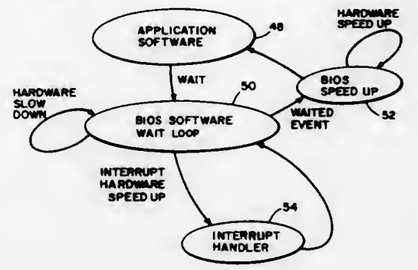
a comparison circuit coupled to said tabulation circuit for granting only one of said coinciding requests as a function of said relative request activity to thereby allow a bus master priority level between said plurality of devices to change as a function of an activity of said plurality of devices.

5,560,017

SYSTEM WITH CLOCK FREQUENCY CONTROLLER RESPONSIVE TO INTERRUPT INDEPENDENT OF SOFTWARE ROUTINE AND SOFTWARE LOOP REPEATEDLY EXECUTING INSTRUCTION TO SLOW DOWN SYSTEM CLOCK

David M. Barrett, Tyngsboro, Mass.; Mary Letourneau, Westmoreland, N.H.; Patricia A. Martin, Groton, Mass., and J. Michael McNally, Derry, N.H., assignors to Wang Laboratories, Inc., Billerica, Mass.

Continuation of Ser. No. 654,406, Feb. 8, 1991, abandoned, which is a continuation-in-part of Ser. No. 611,990, Nov. 9, 1990, abandoned. This application Apr. 29, 1994, Ser. No. 236,878
Int. Cl.[6] G06F 15/16;1/08;1/26
U.S. Cl. 395—733 **9 Claims**



1. A data processing system comprising:

memory;

a processing unit for processing software routines stored in memory at a normal frequency determined by a system clock; and

a clock control circuit for generating the system clock, the clock control circuit including:

circuitry responsive to a control software routine processed in the processing unit to periodically slow the system clock to a reduced frequency while waiting for an event by executing a wait loop including:

software instructions to slow the system clock to a reduced frequency, followed by software instructions to determine whether the awaited event has occurred, followed by

software instructions to return the system clock to the normal frequency and exit the wait loop when the awaited event occurs, and

circuitry for decoding signals on a system bus indicative of an interrupt and returning the system clock to the normal frequency in response to said interrupt indicative signals independent of any of the software routines.

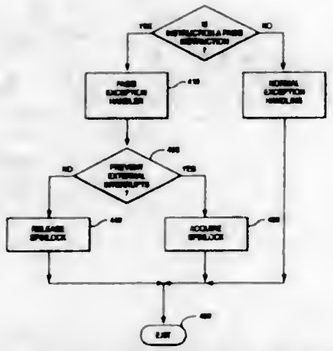
5,560,018

PROVIDING EXTERNAL INTERRUPT SERIALIZATION COMPATIBILITY IN A MULTIPROCESSING ENVIRONMENT FOR SOFTWARE WRITTEN TO RUN IN A UNIPROCESSOR ENVIRONMENT

James F. Macon, Jr., Boynton Beach; David Medina, Boca Raton, and Mark A. Peloquin, Boynton Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1994, Ser. No. 358,158
Int. Cl.[6] G06F 13/00
U.S. Cl. 395—733 **8 Claims**

1. In a multiprocessor computing system having memory shared by all processors in said computing system, apparatus for providing serialization throughout said system of the handling of external interrupts, relative to currently executing program tasks written to run in a uniprocessor environment, said system comprising:



means in each processor of said system for detecting execution in the respective processor of instructions of one class of instructions; said instructions of one class being architected for use in a uniprocessor environment to indicate whether external interrupt requests, presented during execution of program task segments containing said instructions of one class, should or should not be serviced prior to completing execution of respective task segments; said instructions of one class thereby being useful to selectively prevent servicing of external interrupt requests from interfering with timely execution of time-sensitive functions defined by individual said program tasks;

means in each processor of said system for receiving external interrupt requests;

means in each processor of said system, cooperative with said instruction execution detecting means in the respective processor, for determining whether said instructions of one class require preventing of servicing of external interrupt requests received by said receiving means;

means in each said processor, responsive to a determination that a said instruction of one class requires preventing received external interrupt requests from being serviced, for preventing servicing of external interrupt requests received by said receiving means of all processors of said system; said means for preventing servicing of received external interrupt requests acting to acquire exclusive control of a spinlock in said shared memory; which effectively prevents all processors of said system from servicing external interrupt requests until said exclusive control of said spinlock is relinquished; and

means in each said processor, effective when said spinlock is uncontrolled, for permitting servicing of an external interrupt request received by the respective receiving means; said means for permitting servicing requiring the respective processor to acquire exclusive control of said spinlock and thereafter execute an external interrupt service routine appropriate to said external interrupt request received by the respective receiving means, said spinlock being released when execution of said interrupt service routine has been completed.

5,560,019

METHOD AND APPARATUS FOR HANDLING INTERRUPTS IN A MULTIPROCESSOR COMPUTER SYSTEM

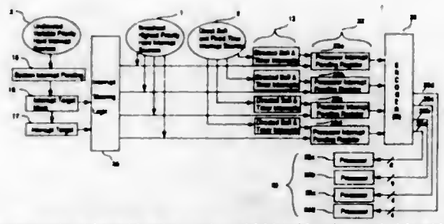
Charles E. Narad, Santa Clara, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 320,280, Oct. 7, 1994, abandoned, which is a continuation of Ser. No. 767,023, Sep. 27, 1991, abandoned. This application Jan. 16, 1996, Ser. No. 586,539

Int. Cl.[6] G06F *13/24*

U.S. Cl. 395—733 **23 Claims**

13. In a computer system, an interrupt steering system for dynamically directing a multiplicity of interrupts of unequal priority to any of a plurality of processors, each processor having a



predetermined identification code, said identification code identifying that processor, said interrupt steering system comprising:

an interrupt pending register for receiving a plurality of assigned priority interrupt signals issued by at least one system device;

an interrupt target masking register for variably blocking said assigned priority interrupts, said interrupt target masking register coupled to said interrupt pending register and producing a plurality of masked priority interrupt signals;

a target interrupt processor identification register accessible to the processors, said processors programming the target interrupt processor identification register with the identification code of one of the processors to designate that processor as a target interrupt processor;

steering means coupled to the target interrupt for directing said plurality of assigned priority interrupt signals to the target interrupt processor, said steering means having an input connected to receive said plurality of masked priority interrupt signals from said interrupt target masking register;

a selected one of a plurality of processor-specific interrupt pending notification registers coupled to said steering means for notifying said target interrupt processor when said assigned priority interrupt signals are pending, each said processor-specific interrupt pending notification register corresponding to one of said processors, each said processor-specific interrupt pending register including a plurality of priority indicators, each indicator for specifying an interrupt priority level;

said plurality of processor interrupt pending registers further coupled to said plurality of system devices for receiving a plurality of highest priority broadcast interrupt signals;

a selected one of a plurality of processor specific directed interrupt receiving means including soft interrupt registers coupled to said plurality of processors for receiving a plurality of soft interrupt signals generated by any of said plurality of processors, said soft interrupt registers further coupled to said processor interrupt pending registers;

said plurality of directed interrupt receiving means further comprising timer interrupt means, coupled to said processor interrupt pending registers, for generating a plurality of timed interrupt signals for any of said plurality of processors;

processor encoding means coupled to said plurality of processor interrupt pending registers for converting said assigned priority interrupt signals, said soft interrupt signals, and said broadcast interrupt signals into a plurality of encoded processor-specific interrupt notification signals; and

a plurality of interrupt request lines coupled to said processor encoding means, said interrupt request lines further coupled to said plurality of processors and transmitting said encoded processor-specific interrupt notification signals to said plurality of processors.

5,560,020

POWER SAVING PROCESSING SYSTEM

Kohichi Nakatani, Yokohama; Akio Hayashi, Funabashi, and Tomohisa Kohiyama, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

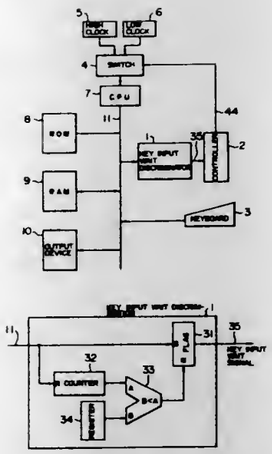
Filed Sep. 20, 1991, Ser. No. 763,152

Claims priority, application Japan, Sep. 21, 1990, 2-250183

Int. Cl.[6] G06F *1/32;11/02;1/04*

U.S. Cl. 395—750 **3 Claims**

1. A data processing system comprising:



a processor which calls a key sense routine to issue a flag set instruction pulse signal on a system bus when waiting for input of data;

discrimination means for receiving said flag set instruction pulse signal from said processor and generating a first signal when said flag set instruction pulse signal is received,

wherein said discrimination means includes time measuring means for measuring a first predetermined time during which said flag set instruction pulse signal is not received, and

wherein said time measuring means includes first free running counter means which is reset by a pulse in said flag set instruction pulse signal, first register means having stored therein a value corresponding to said first predetermined time, first comparator means for comparing an output of said first free running counter means with an output of said first register means, and first flag means for receiving said flag set instruction pulse signal as a set input and receiving an output of said first comparator means as a reset input;

control means for generating a second signal in response to receipt of said first signal from said discrimination means; and

switch means for selecting one of at least two clock signals of different frequencies to be sent to said processor in response to presence or absence of receipt of said second signal from said control means.

5,560,021

POWER MANAGEMENT AND PACKET DELIVERY METHOD FOR USE IN A WIRELESS LOCAL AREA NETWORK (LAN)

Frederick W. Vook, 130 Crestwood Ct. #7, Schaumburg, Ill. 60195; Mark Demange, 132 Wilmslow Ln., Schaumburg, Ill. 60194, and Hungkun Chang, 1501 Crowfoot Cir. N., Hoffman Estates, Ill. 60194

Filed Apr. 4, 1994, Ser. No. 223,497

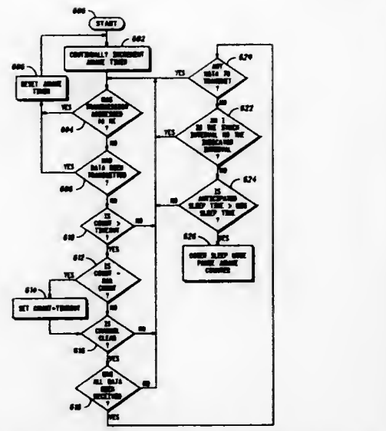
Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—750 **15 Claims**

11. A power management and packet delivery method for use in a wireless local area network (LAN) having a plurality of mobile battery powered user devices, said user devices in communication with each other, said power management and packet delivery method comprising the steps of:

establishing a plurality of recurring time intervals, each time interval having a portion during which all user devices are in the active mode of operation;

transmitting an indicator signal from a user device having data to transmit during at least one of the plurality of recurring time intervals and prior to transmission of said data;



receiving said transmitted indicator signal at an intended destination device;

determining whether the signal was addressed for use;

remaining in an active mode of operation when the indicator signal is addressed for use;

else,

entering a sleep mode of operation when sleep mode conditions are satisfied;

calculating an arrival time for a next synchronization signal;

establishing a minimum transmit time for transmission of data to be transmitted by the user device;

comparing the calculated arrival time to the minimum transmit time;

transitioning from the sleep mode of operation to the active mode of operation when the arrival time is greater than the minimum transmit time; else

transitioning from the sleep mode of operation to the active mode of operation at the arrival time of the next synchronization signal.

5,560,022

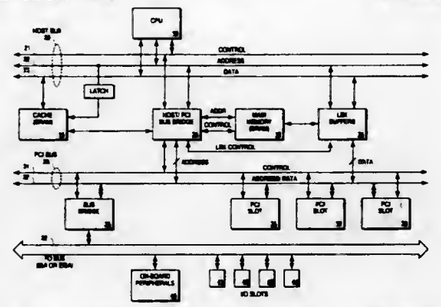
POWER MANAGEMENT COORDINATOR SYSTEM AND INTERFACE

Robert A. Dunstan, Beaverton; Marion H. Shimoda, Aloha; Kelan C. Silvester, Portland, all of Oreg., and Sun Jiming, Spring, Tex., assignors to Intel Corporation, Santa Clara, Calif.

Filed Jul. 19, 1994, Ser. No. 278,054

Int. Cl.[6] G06F *1/32*

U.S. Cl. 395—750 **16 Claims**



14. In a computer system having a plurality of system devices including add-in devices, a power management device driver associated with each of said add-in devices, said device driver contain-

ing power management information specific to controlling the power consumption of its associated device, one or more modules for providing power management for use in said computer system and a power management core communicating with each of said device drivers and each of said modules, said device drivers and modules being able to generate receive and execute power events, a method of power management comprising the steps of:

registering said plurality of device drivers and modules with said power management core;

generating a power event by a first client;

directing said generated power event to all other device drivers and modules; and

causing all devices and modules to execute said event.

5,560,023

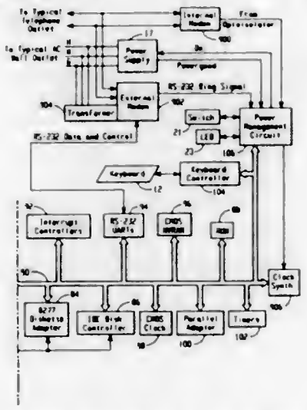
AUTOMATIC BACKUP SYSTEM FOR ADVANCED POWER MANAGEMENT

Dwayne T. Crump, and Steven T. Pancoast, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 7, 1994, Ser. No. 301,943

Int. Cl.[6] G06F 1/32

U.S. Cl. 395—750 **20 Claims**



11. In a computer system having at least two states of power management, namely (i) a normal operating state in which code is executed normally by the computer system, (ii) a power conservation state in which the computer system consumes less electrical power than in said normal operating state, a method of managing the usage of power by the computer system comprising the steps of:

executing an operating system having a power management driver on the computer system, the operating system periodically interrupting execution of any application programs and causing execution of a power management supervisory routine, wherein under certain conditions in the normal operating state the operating system ceases causing execution of the power management supervisory routine;

starting an inactivity timer to expire after a first preselected time interval;

starting a backup inactivity timer to expire after a second preselected time interval;

operating the computer system in the normal operating state;

restarting the inactivity timer responsive to user activity occurring while the computer system is in the normal operating state;

testing the inactivity timer for expiration via the power management supervisory routine;

restarting the backup inactivity timer responsive to the execution of the power management supervisory routine;

transitioning the computer system to the power conservation state, via the execution of at least one of the power management driver and the power management supervisory routine, responsive to expiration of the first time interval; and

transitioning the computer system to the power conservation state, without the operating system causing execution of the power management supervisory routine, at least partially responsive to expiration of the second time interval.

5,560,024

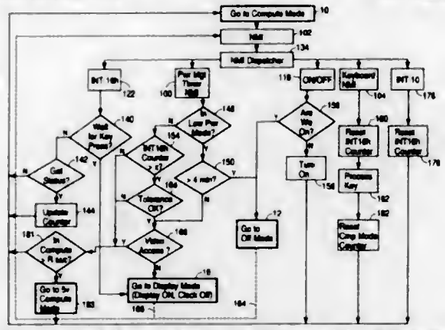
COMPUTER POWER MANAGEMENT SYSTEM

Leroy D. Harper, Sunnyvale; Grayson C. Schlichting, Cupertino; Douglas A. Hooks, Sunnyvale; Ian H. S. Cullimore, Palo Alto; Gavin A. Bradshaw, Cupertino; Biswa R. Banerjee, San Jose; John P. Fairbanks, and Roderick W. Stone, both of Sunnyvale, all of Calif., assignors to Fujitsu Personal Systems, Inc., Santa Clara, Calif.

Division of Ser. No. 87,249, Jul. 1, 1993, abandoned, which is a division of Ser. No. 436,642, Nov. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 373,440, Jun. 30, 1989, abandoned. This application Feb. 1, 1995, Ser. No. 384,284

Int. Cl.[6] G06F 1/08

U.S. Cl. 395—750 **13 Claims**



1. A method for reducing power consumed by a computer having a processor for executing at least one application program and having a manual input device for inputting data to the processor, the application program generating interrupts to call for receiving the data input from the manual input device, the method comprising the steps of:

during execution of the application program, counting a first number of the interrupts generated by the application program during a first time interval of predetermined duration;

counting a second number of the interrupts generated by the application program during a second time interval of equal duration and subsequent to the first;

determining a difference between the first number and the second number; and

reducing power consumed by the processor if the difference is within a predetermined range.

5,560,025

ENTRY ALLOCATION APPARATUS AND METHOD OF SAME

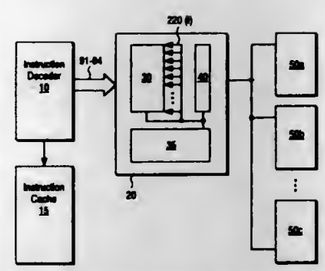
Shantanu R. Gupta, Beaverton, and James S. Griffith, Aloha, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 31, 1993, Ser. No. 40,659

Int. Cl.[6] G06F 9/00

U.S. Cl. 395—800 **23 Claims**

1. An apparatus for storing instructions and instruction data into an instruction scheduler of a pipelined or superscalar microprocessor, said apparatus comprising:



first vector means for indicating vacancies within said instruction scheduler;

processing means communicating with said first vector means for examining separate portions of said first vector means for vacancies and for generating a plurality of indicating means associated with said each separate portion examined, each indicating means associated with a separate portion of said first vector means representing a single vacancy of any vacancies indicated by said separate portion of said first vector means;

multiplexing means for multiplexing each of said indicating means and generating therefrom an enable vector for each of said instructions to be stored in said instruction scheduler, said enable vector for indicating a single vacant storage location within said instruction scheduler, said multiplexing means communicating with said processing means;

means for storing each of said instructions into said instruction scheduler according to a corresponding enable vector, said means for storing communicating with said enable vector for each of said instructions;

a reservation station means for storing said instructions into said instruction scheduler, said reservation station means coupled to said means for storing, and wherein said first vector means indicates vacancy within said reservation station means, wherein said first vector means is a deallocation vector having a predetermined number of entries each one bit wide, wherein each bit of said deallocation vector indicates whether or not a corresponding entry of said reservation station is vacant, wherein said processing means, for each of said separate portions of said first vector means, generates an indicating means associated with each instruction to be stored within said reservation station, wherein said instructions to be stored are four in number and wherein:

said deallocation vector is examined by said processing means in three separate portions.

5,560,026

METHOD AND SYSTEM FOR CORRECTIVE RE-INSTALLATION OF AN OBJECT ON A DATA PROCESSING SYSTEM

George C. Manthuruthil, Coppell; Shrikant N. Parikh, Mesquite, and Hari N. Reddy, Colleyville, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 10, 1993, Ser. No. 104,962

Int. Cl.[6] G06F 11/30

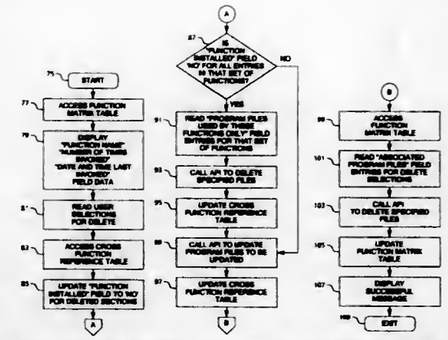
U.S. Cl. 395—800 **5 Claims**

1. A method of allowing a user to re-install an object on a data processing system, said object having plural components, comprising the steps of:

a) measuring each use of at least one of said components by a user to provide information about use of said measured component on said data processing system;

b) providing said information to said user so that said user can determine whether to retain said measured component on said data processing system;

c) deleting said measured component from said data processing system;



d) determining if there are constituents exclusively related to said measured component and an other one of said components;

e) determining if said other component has been deleted from said data processing system; and

f) said step of deleting said measured component further comprising the step of deleting said constituents of said measured component and said other component if said other component has been deleted from said data processing system upon a command from said user to delete said measured component from said system.

5,560,027

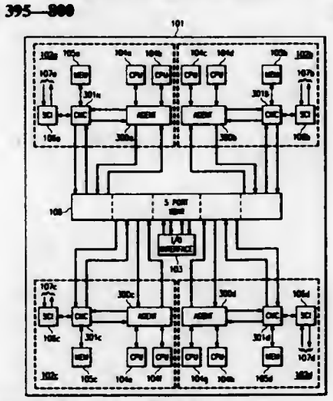
SCALABLE PARALLEL PROCESSING SYSTEMS WHEREIN EACH HYPERNODE HAS PLURAL PROCESSING MODULES INTERCONNECTED BY CROSSBAR AND EACH PROCESSING MODULE HAS SCI CIRCUITRY FOR FORMING MULTI-DIMENSIONAL NETWORK WITH OTHER HYPERNODES

Thomas L. Watson, Dallas; David M. Chastain, Plano, and Tony M. Brewer, Dallas, all of Tex., assignors to Convex Computer Corporation, Richardson, Tex.

Filed Dec. 15, 1993, Ser. No. 167,663

Int. Cl.[6] G06F 15/16;15/173

U.S. Cl. 395—800 **16 Claims**



1. A processing system comprising:

first processing circuitry including a processor and a partially global memory coupled by associated control circuitry to a first crossbar and a first coherent interconnect network;

second processing circuitry including a processor and a partially global memory coupled by associated control circuitry to said first crossbar and a second coherent interconnect network;

third processing circuitry including a processor and a partially global memory coupled by associated control circuitry to a

pipeline decoder means responsive to the pipeline identifier of each individual instructions in the very long instruction word

5,560,030

TRANSFER PROCESSOR WITH TRANSPARENCY

third processing circuitry including a processor and a partially global memory coupled by associated control circuitry to a second crossbar and said first coherent interconnect network; and

fourth processing circuitry including a processor and a partially global memory coupled by associated control circuitry to said second crossbar and said second coherent interconnect network.

5,560,028

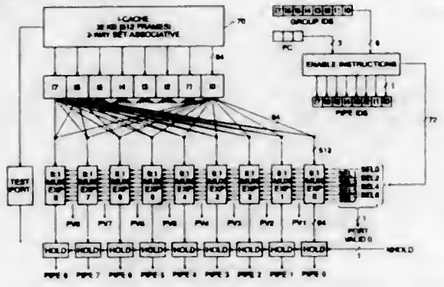
SOFTWARE SCHEDULED SUPERSCALER COMPUTER ARCHITECTURE

Howard G. Sachs, Belvedere, and Simak Arya, Palo Alto, both of Calif., assignors to Intergraph Corporation, Huntsville, Ala.

Continuation of Ser. No. 147,800, Nov. 5, 1993, abandoned. This application Apr. 13, 1995, Ser. No. 422,753

Int. Cl.[6] G06F *9/00;9/38*

U.S. Cl. 395—800 **23 Claims**



1. A computing system having a plurality of processing pipelines for executing groups of individual instructions, within very long instruction words, each individual instruction to be executed in each group being executed by different processing pipelines in parallel, the computing system comprising:

a main memory for storing a very long instruction word;

a very long instruction word storage, coupled to the main memory, for receiving the very long instruction word from the main memory, and for holding the very long instruction word, the very long instruction word including a predetermined number N of individual instructions, and including at least one group of M individual instructions to be executed in parallel, where M≦N, each individual instruction in the very long instruction word storage to be executed having a pipeline identifier indicative of a processing pipeline for executing the individual instruction, and having a group identifier indicative of a group of individual instructions to which the individual instruction is assigned for execution in parallel;

group decoder means responsive to the group identifier for each individual instruction in the very long instruction word storage to be executed for enabling each individual instruction in the very long instruction word storage having a similar group identifier, to be executed in parallel by the plurality of processing pipelines; and

pipeline decoder means responsive to the pipeline identifier of each individual instructions in the very long instruction word storage to be executed for causing each individual instruction in a group of individual instructions having the similar group identifier to be supplied to the different processing pipelines.

5,560,029

DATA PROCESSING SYSTEM WITH SYNCHRONIZATION COPROCESSOR FOR MULTIPLE THREADS

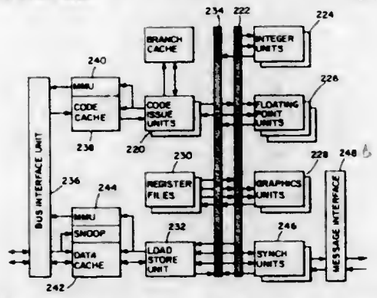
Gregory M. Papadopoulos, Acton; Rishiyur S. Nikhil, Arlington, both of Mass.; Robert J. Greiner, Chandler, Ariz., and Arvind, Arlington, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

PCT No. PCT/US92/06150, § 371 Date May 31, 1994, § 102(e) Date May 31, 1994, PCT Pub. No. WO93/02414, PCT Pub. Date Feb. 4, 1994

Continuation-in-part of Ser. No. 734,252, Jul. 22, 1991, Pat. No. 5,430,850. This PCT application Jul. 21, 1992, Ser. No. 185,783

Int. Cl.[6] G06F *15/80*

U.S. Cl. 395—800 **5 Claims**



1. A data processing system comprising a plurality of processing nodes, each node comprising:

a continuation queue which receives continuations which identify operations to be performed with respect to frames of data, the operations identified by the continuations being blocks of code sequences;

a message queue which receives messages which identify blocks of code sequences to be performed with respect to frames of data; and

data processing means for processing the blocks of code sequences identified by the continuation queue and by the message queue;

the data processing means processing individual blocks of code sequences identified by messages from the message queue as message handlers which generate continuations for the continuation queue when conditions required by the operations identified by the continuations are met; and

the data processing means processing individual blocks of code sequences identified by continuations from the continuation queue as threads of computation, threads of computation including operations to generate messages for initiating new threads of computation; and

wherein the data processing means comprises a synchronization coprocessor and a data processor, the synchronization coprocessor processes messages from the same node and other nodes of the system, stores values from the messages as operands for threads of computation, determines when all operands required for a thread of computation have been received and provides an indication to a data processor that a thread of computation may be initiated, and the data processor nonsynchronously initiates processing of a thread of computation after completion of a prior thread of computation in response to the indication from the synchronization processor.

5,560,030

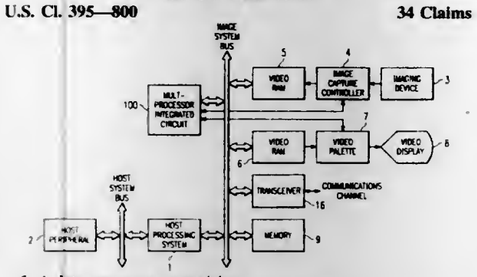
TRANSFER PROCESSOR WITH TRANSPARENCY

Karl M. Guttag, Sugar Land; Christopher J. Read, Houston; Sydney W. Poland, Katy; Robert J. Gove, Plano, and Jeremiah E. Golston, Sugar Land, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 8, 1994, Ser. No. 208,413

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—800 **34 Claims**



1. A data processor comprising:

a memory having plurality of storage locations;

a transparency register storing transparency data, said transparency register storing an integral multiple of a minimum amount of data to be transferred, said transparency data being repeated within transparency register said integral multiple number of times;

a source address controller coupled to said memory, said source address controller calculating source addresses and recalling data to be transferred from said memory at storage locations corresponding to said source addresses;

a comparator coupled to said transparency register and said source address controller, said comparator comparing said data to be transferred with said transparency data stored in said transparency register and indicating whether said data to be transferred is to be written to said memory, said comparator comparing a block of said data to be transferred equal in size to said transparency register to said transparency data stored in said transparency register in units of said minimum amount of data to be transferred and providing a plurality of indications whether data is to be written to said memory, one indication for each unit of said minimum amount of data to be transferred; and

a destination address controller coupled to said comparator calculating destination addresses, said destination address controller writing data to be transferred into said memory at storage locations corresponding to said destination addresses if said comparator indicates said data to be transferred is to be written to said memory and not writing any data into said memory at storage locations corresponding to said destination addresses if said comparator does not indicate said data to be transferred is to be written to said memory.

5,560,031

PROCESSOR CIRCUIT COMPRISING A FIRST PROCESSOR, AND SYSTEM COMPRISING THE PROCESSOR CIRCUIT AND A SECOND PROCESSOR

Franciscus A. G. Vankan, Tilburg, and Rob Pieterse, Zandvoort, both of Netherlands, assignors to Koninklijke PTT Nederland N.V., Netherlands

Filed Jun. 22, 1994, Ser. No. 263,538

Claims priority, application Netherlands, Jun. 29, 1993, 9301129

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—800 **10 Claims**

7. A processor circuit for coupling a digital network to a second processor, comprising:

a parallel address input for coupling to the second processor;

a parallel data in/output for coupling to the second processor;

a serial in/output for coupling to the digital network;

a first processor having a first and a second serial processor in/output, the first serial processor in/output being coupled via a converter circuit to the serial in/output of the processor circuit;

a receiving/transmitting circuit, for converting between parallel and serial information, coupled to the second serial processor in/output, the parallel address input, and the parallel data in/output;

dual memory means including:

i. a first parallel address input coupled to a parallel address output of the first processor;

ii. a first parallel data in/output coupled to a parallel data in/output of the first processor;

iii. a second parallel address input coupled to the parallel address input of the processor circuit; and

iv. a second parallel data in/output coupled to the parallel data in/output of the processor circuit; and

control means for controlling communication of information between the second processor, the receiving/transmitting circuit and the dual memory means.

5,560,032

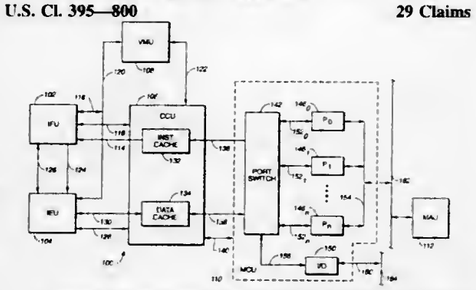
HIGH-PERFORMANCE, SUPERSCALAR-BASED COMPUTER SYSTEM WITH OUT-OF-ORDER INSTRUCTION EXECUTION AND CONCURRENT RESULTS DISTRIBUTION

Le Trong Nguyen, Monte Sereno; Derek J. Lentz, Los Gatos; Yoshiyuki Miyayama, Santa Clara; Sanjiv Garg, Freemont; Yasuaki Hagiwara, Santa Clara; Johannes Wang, Redwood City; Te-Li Lau, Palo Alto; Sze-Shun Wang, San Diego, and Quang H. Trang, San Jose, all of Calif., assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 817,809, Jan. 8, 1992, abandoned, which is a continuation of Ser. No. 727,058, Jul. 8, 1991, abandoned. This application Mar. 1, 1995, Ser. No. 397,016

Int. Cl.[6] G06F *9/38*

U.S. Cl. 395—800 **29 Claims**



1. A superscalar processing system having a plurality of stages, including a first stage for decoding and issuing instructions in a prescribed program order and a second stage for executing instructions out-of-order with respect to said prescribed program order, said superscalar processing system comprising:

first means for storing a source of operands corresponding to a plurality of instruction operations;

a plurality of power control circuits connected to each of said

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5,560,036

second means for concurrently transferring said operands from said first means to a plurality of functional units;

third means for performing said instruction operations to generate results using said plurality of functional units; and

fourth means for concurrently distributing said results,

wherein said first and fourth means including temporary buffer means selectively coupled with register file means, said results are stored in said temporary buffer means rather than said register file means, if said results are distributed out-of-order with respect to said prescribed program order, and

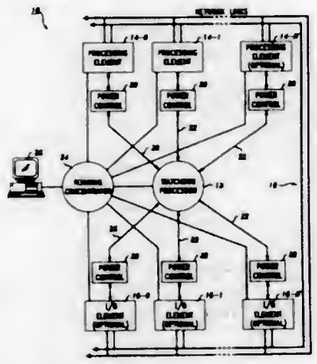
said register file means directly receives a result of an instruction operation from said fourth means, thereby bypassing said temporary buffer means, if said instruction operation is performed in said prescribed program order.

5,560,033

SYSTEM FOR PROVIDING AUTOMATIC POWER CONTROL FOR HIGHLY AVAILABLE N+K PROCESSORS

Brian P. Doherty, Lisle; Douglas A. Kimber, Batavia; Mikiel L. Larson, St Charles, and John H. Pokropinski, Woodridge, all of Ill., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Aug. 29, 1994, Ser. No. 297,458
Int. Cl.[6] G06F *11/20*
U.S. Cl. 395—800 **2 Claims**



1. An N+K sparing processing arrangement comprising:

a watchdog processor;

a plurality of processors connected to said watchdog processor for message communication, each of said plurality of processors sending periodic messages to said watchdog processor, said plurality of processors being configured into processing groups by said watchdog processor, each of said processing groups including one or more active processors and one or more spare processors, each processor in each group performing a similar task, and each group performing different tasks for the other groups; and

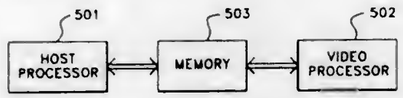
a plurality of power control circuits connected to each of said plurality of processors and each of said plurality of power control circuits communicating with said watchdog processor; said watchdog processor reconfiguring said processing groups and taking corrective action in response to receipt or non-receipt of said periodic messages from said plurality of processors, said corrective action including causing said power control circuits to remove power from one or more of said plurality of processors.

5,560,034

SHARED COMMAND LIST

Judith Goldstein, Hillsboro, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 88,546, Jul. 6, 1993, abandoned. This application Mar. 28, 1995, Ser. No. 411,384
Int. Cl.[6] F06F *9/00*
U.S. Cl. 395—800 **15 Claims**



6. An apparatus for processing digital video data, the apparatus comprising:

(a) a first processor for implementing sequences of first processor commands of a plurality of first processor commands;

(b) a second processor for implementing sequences of second processor commands of a plurality of second processor commands, wherein the second processor runs asynchronously to the first processor;

(c) a memory shared by the first and second processors and comprising a set queue for storing the plurality of first processor commands and the plurality of second processor commands, wherein:

a first processor offset is associated with the first processor for indicating the location in the set queue of a next first processor command to be implemented by the first processor; and

a second processor offset is associated with the second processor for indicating the location in the set queue of a next second processor command to be implemented by the second processor;

(d) means for comparing the first processor offset with the second processor offset to determine whether the second processor may implement the next second processor command, wherein:

if the second processor may implement the next second processor command, then the first processor implements the next first processor command and the second processor implements the next second processor command;

else the first processor implements the next first processor command and the second processor does not implement the next second processor command; further wherein:

an atomic sequence of first processor commands comprises a sequence of first processor commands that is required to be performed by the first processor without interruption by the second processor performing selected next second processor commands of the plurality of second processor commands; and

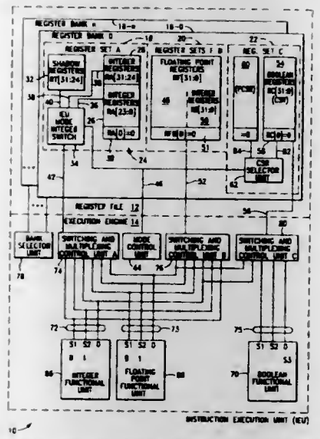
values of the first and second processor offsets are such that after the first processor implements an initial command of an atomic sequence of first processor commands, the first and second processor offsets are not equal.

5,560,035

RISC MICROPROCESSOR ARCHITECTURE IMPLEMENTING MULTIPLE TYPED REGISTER SETS

Sanjiv Garg, Fremont; Derek J. Lentz, Los Gatos; Le T. Nguyen, Monte Sereno, and Sho L. Chen, Saratoga, all of Calif., assignors to Seiko Epson Corporation, Tokyo, Japan

Continuation of Ser. No. 726,773, Jul. 8, 1991, Pat. No. 5,493,687. This application Jun. 5, 1995, Ser. No. 465,239
Int. Cl.[6] G06F *9/34*
U.S. Cl. 395—800 **8 Claims**



1. An apparatus for executing a set of instructions, wherein said set of instructions include Boolean combinational instructions each operating on one or more Boolean operands to generate a Boolean result, each Boolean combinational instruction including one or more Boolean fields specifying a location of each operand and result, integer instructions each operating on one or more integer operands to generate an integer result, each integer instruction including one or more integer fields specifying a location of each operand and result, and floating point instructions each operating one or more floating point operands to generate a floating point result, each floating point instruction including one or more floating point fields specifying a location of each operand and result, said apparatus comprises:

processing means for executing said instructions including Boolean execution means for executing said Boolean combinational instructions, integer execution means for executing said integer instructions, and floating point execution means for executing said floating point instructions; and

a register file, coupled to said processing means, for storing operands and results of said instructions, wherein,

said register file includes a plurality of register banks, each of said register banks including a plurality of register sets including a Boolean register set having a plurality of Boolean registers, each Boolean register for holding one of said Boolean operands or Boolean results, an integer register set of integer registers, each integer register for holding one of said integer operands or integer results, and a re-typable register set, wherein each register in said re-typable register set can be used for holding one of said integer operands or integer results or one of said floating point operands or floating point results, and

means for selecting between said plurality of register banks,

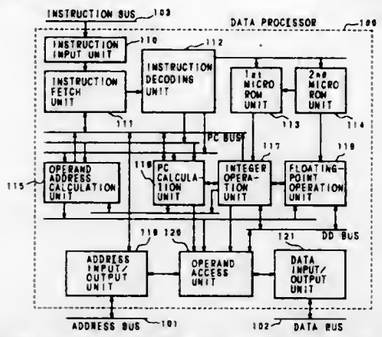
wherein said register file is responsive to one or more of the fields in a given instruction to retrieve an operand of the given instruction from, or store a result of the given instruction into, a given register in a given one of the register sets as identified by the one or more fields in the given instruction.

5,560,036

DATA PROCESSING HAVING INCIRCUIT EMULATION FUNCTION

Toyohiko Yoshida, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 220,414, Mar. 30, 1994, abandoned, which is a continuation of Ser. No. 624,026, Dec. 7, 1990, abandoned. This application May 1, 1995, Ser. No. 432,316
Claims priority, application Japan, Dec. 14, 1989, 1-326292
Int. Cl.[6] G06F *1/00*
U.S. Cl. 395—800 **23 Claims**



1. A data processor, coupled to an external memory that stores data and instructions and including a memory interface comprising memory address and data buses for transferring data and instructions between said external memory and said data processor, said data processor comprising:

an instruction decoding unit for decoding an instruction to be executed and generating a decoded result based on said instruction;

a program counter generating means for generating a program counter value identifying an instruction to be executed;

an instruction execution unit for executing said instruction, calculating an address of an operand to be processed, and forming resultant operand data;

a control unit which is connected to said instruction decoding unit and said instruction execution unit, and controls said instruction execution unit according to the decoded result generated by said instruction decoding unit;

a high-speed storing means;

control information holding means, included in said instruction execution unit, for holding high speed-storing means control information, said control information including a first part having either a first or second value, with the value of said control information held in said control information holding means set by said control unit according to the decoded result generated by said instruction decoding unit;

data input/output means, responsive to said control information, having a first input/output port coupled to said high-speed storing means and having a second input/output port coupled to said instruction execution unit, said data input/output means for selectively transferring a program counter value of an instruction executed in said instruction execution unit to said high-speed storing means in response to said control information having said first value so that program counter values are stored in said high-speed storing means; and

an operand access control unit, coupled to said instruction execution unit to receive operand data and coupled to said control information holding means, for preventing access to said high-speed storing means to transfer operand data when said control information has said first value so that operand data must be transferred between said data processor and said external memory when program counter values are stored in said high-speed storing means and for permitting access to said high-speed storing means when said control information has said second value so that operand data is transferred between said instruction execution unit and said high-speed

storing means when program counter values are not stored in

collapsing the word data determining to represent the

means for decoding said data frame to determine when said

updating a pointer and said means for performing an opera-

storing means when program counter values are not stored in said high-speed storing means.

5,560,037

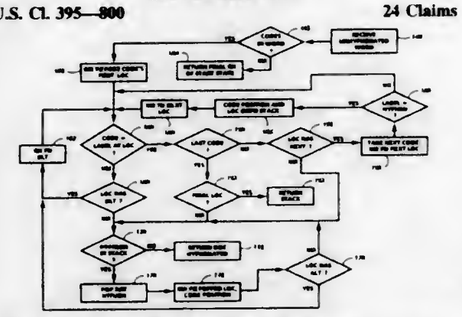
COMPACT HYPHENATION POINT DATA

Ronald M. Kaplan, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 739,798, Aug. 1, 1991, abandoned, which is a continuation of Ser. No. 478,043, Feb. 6, 1990, abandoned, which is a continuation of Ser. No. 138,543, Dec. 28, 1987, abandoned. This application Apr. 10, 1995, Ser. No. 420,397

Int. Cl.[6] G06F *15/00*

U.S. Cl. 395—800 **24 Claims**



1. A method of operating a processor comprising:

operating the processor to produce word data representing a large set of words; the large set of words including a set of shared suffix branches, each shared suffix branch occurring at least twice in the large set of words; a first one of the words in the large set having two or more characters and a hyphenation point between a preceding character and a subsequent character; the hyphenation point of the first word being a point at which the first word can properly be hyphenated; the first word and a second one of the words in the large set both including a shared suffix that occurs in a first one of the shared suffix branches; the shared suffix following a first word character in the first word and following a second word character in the second word; the word data including codes; the codes including character codes representing characters of the words; the act of operating the processor to produce word data comprising:

including a hyphenation code representing the hyphenation point of the first word in the word data; the word data being searchable for a first sequence of the codes and a second sequence of the codes; the first sequence representing the first word and including a preceding one of the character codes representing the preceding character, a following one of the character codes representing the subsequent character, the hyphenation code, and a first word character code representing the first word character; the second sequence of the codes representing the second word; the second sequence of codes including a second word character code representing the second word character; the act of including the hyphenation code comprising:

positioning the hyphenation code between the preceding character code and the following character code in the first code sequence so that the hyphenation point of the first word can be determined from the position of the hyphenation code; and

collapsing the word data so that the first sequence of codes and the second sequence of codes both include shared suffix codes; the shared suffix codes representing the shared suffix in both the first word and the second word; the act of collapsing the word data comprising:

detecting each of the set of shared suffix branches; and

for each shared suffix branch detected, determining whether to represent the shared suffix branch only once; the act of collapsing the word data determining to represent the first shared suffix branch only once; and

storing the collapsed word data in a memory so that the shared suffix codes begin at a first location in the memory, so that the first sequence of codes includes information that a processor can use, after accessing the first word character code, to continue search by accessing the shared suffix codes at the first location, and so that the second sequence of codes includes information that a processor can use, after accessing the second word character code, to continue search by accessing the shared suffix codes at the first location; the act of storing the collapsed word data comprising:

for the shared suffix branches determined to be represented only once, including location codes in the collapsed word data, each location code indicating a location in the memory at which a shared suffix branch is represented; at least one of the first and second word character codes being followed by a first one of the location codes; the first location code indicating the first location so that the processor can use the first location code to continue search by accessing the shared suffix codes at the first location.

5,560,038

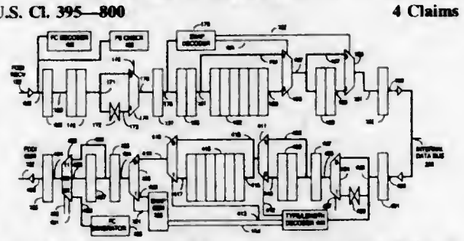
APPARATUS FOR TRANSLATING FRAMES OF DATA TRANSFERRED BETWEEN HETEROGENEOUS LOCAL AREA NETWORKS

Stephen R. Haddock, Los Gatos, Calif., assignor to Network Peripherals, Inc., Milpitas, Calif.

Continuation of Ser. No. 279,096, Jul. 22, 1994, abandoned. This application Nov. 28, 1995, Ser. No. 563,345

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—800 **4 Claims**



3. An apparatus for translating a data frame by including or removing a field in said data frame while transferring said data frame between a first data bus and a second data bus, comprising:

a first register array having:

an input coupled to said first data bus for receiving said data frame,

means for holding a first field in said data frame, and

an output for transmitting said data frame;

a first selector having:

a first data input coupled to said first data bus for receiving said data frame,

a second data input coupled to said output of said first register array for receiving said data frame,

a data output for transmitting said data frame, and

a selector input for receiving a first signal to select said first data input and a second signal to select said second data input;

a first decoder having:

an input coupled to said first data bus for receiving said data frame,

an output coupled to said selector input of said first selector for transmitting, while said first register array is holding said first field, said first signal to select said first data input of said first selector thereby removing from said data frame said first field, or said second signal to select said second data input of said first selector thereby including in said data frame said first field, and

means for decoding said data frame to determine when said output of said first decoder will transmit said first signal or said second signal;

a second register array having:

an input coupled to said data output of said first selector for receiving said data frame,

means for holding a second field, and

an output for transmitting said data frame;

a second selector having:

a first data input coupled to said data output of said first selector for receiving said data frame,

a second data input coupled to said output of said second register array for receiving said data frame,

a data output coupled to said second data bus for transmitting said data frame, and

a selector input for receiving a third signal to select said first data input and a fourth signal to select said second data input; and,

a second decoder having:

an input coupled to said first data bus for receiving said data frame,

an output coupled to said selector input of said second selector for transmitting, while said second register array is holding said second field, said third signal to select said first data input of said second selector thereby removing from said data frame said second field, or said fourth signal to select said second data input of said second selector thereby including in said data frame said second field, and

means for decoding said data frame to determine when said output of said second decoder will transmit said third signal or said fourth signal.

5,560,039

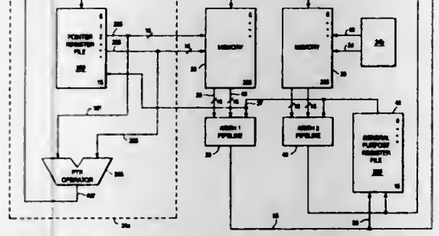
APPARATUS AND METHOD FOR A FOUR ADDRESS ARITHMETIC UNIT

Carole Dulong, Saratoga, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 22,541, Feb. 25, 1993, abandoned. This application Jan. 2, 1996, Ser. No. 581,761

Int. Cl.[6] G06F *7/38*

U.S. Cl. 395—800 **52 Claims**



1. An apparatus for executing an arithmetic instruction, said arithmetic instruction including more than three addresses, said apparatus comprising:

means for selecting a first source of information from two addresses of said more than three addresses specified within said arithmetic instruction;

means for selecting a second source of information from an address of said more than three addresses specified within said arithmetic instruction;

means for perforating an operation upon said first source and said second source to generate a result, said operation specified within said arithmetic instruction;

means for selecting a destination storage for said result from an address of said more than three addresses specified within said arithmetic instruction; and means for updating a pointer represented as an address of said more than three addresses specified within said arithmetic instruction, said means for updating a pointer and said means for performing an operation occurring in parallel.

5,560,040

LIBRARY UNIT SHARING SYSTEM FOR ENSURING SEQUENTIAL RECORDING MEDIA ACCESS

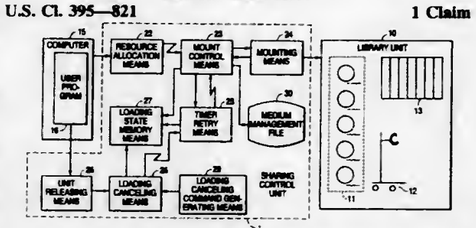
Hiroaki Mizumachi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 799,102, Nov. 27, 1991, abandoned. This application May 11, 1995, Ser. No. 439,098

Claims priority, application Japan, Nov. 27, 1990, 2-327378

Int. Cl.[6] G06F *13/00*

U.S. Cl. 395—821 **1 Claim**



1. A library unit sharing system which implements sequential usage of recording media if multiple requests are simultaneously made by a plurality of computers to access the same recording media, said system comprising:

(a) a library unit which can be shared and accessed by said plurality of computers, including

(1) a plurality of cells containing a plurality of recording media each having its own cell address,

(2) a plurality of I/O units for performing read/write operations on said recording media, and

(3) an accessor unit having a robot hand to load a recording medium into one of said I/O units, said accessor unit issuing a normal loading termination notice when loading of said recording medium is completed;

(b) a sharing control unit which controls access to said library unit by said plurality of computers, including

(1) a medium management means for storing and managing the cell addresses of said recording media,

(2) a resource allocation means for allocating an I/O unit in response to a recording medium access request made by one of said plurality of computers and issuing an instruction to load a recording medium specified by the recording medium access request into the allocated I/O unit,

(3) a mounting means for controlling loading of the specified recording medium by said accessor unit into the allocated I/O unit by instructing said accessor unit to position the robot hand of said accessor unit to retrieve the specified recording medium for loading into the allocated I/O unit, said mounting means issuing a recording medium absence notice if the robot hand cannot retrieve the specified recording medium because the specified recording medium is absent from its storage cell, wherein said mounting means, upon receipt of said normal loading termination notice from said accessor unit, proceeds with I/O prepatory work, said I/O prepatory work including waiting for the specified recording medium to rotate and checking a label of the specified recording medium to verify that a correct recording medium has been loaded,

(4) a loading state memory means for storing, upon receipt of a loading retry instruction, a loading progress information including the cell address of the specified recording medium, an address of the allocated I/O unit, and an indication that the allocated I/O unit is in a loading retry state,

(5) a timer retry means for setting, upon receipt of the loading retry instruction, a predetermined period of time on a timer for the allocated I/O unit, for determining, after the predetermined period of time has elapsed, if the allocated I/O

unit is in the loading retry state by referring to said loading

(7) a loading canceling means for determining, in response to

DESIGNS

unit is in the loading retry state by referring to said loading state memory means, and for issuing a reloading instruction if the allocated I/O unit is in the loading retry state, and

(6) a mount control means for reading out the cell address of the specified recording medium by referring to said medium management means in response to the instruction received from said resource allocation means and issuing an instruction to load the specified recording medium into the allocated I/O unit to said mounting means, and for issuing, upon receipt of the recording medium absence notice from said mounting means, the loading retry instruction which directs said timer retry means to retry the loading of the specified recording medium after the predetermined period of time has elapsed and directs said loading state memory means to store the loading retry state,

(7) a loading canceling means for determining, in response to a forced termination request, if the allocated I/O unit is in the loading retry state by referring to said loading state memory means, and if so, for resetting the timer for the allocated I/O unit and canceling the indication that the allocated I/O unit is in the loading retry state,

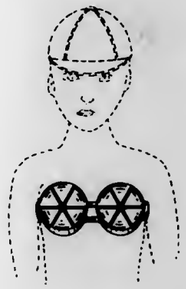
(8) a unit releasing means for determining if the forced termination request is issued by said one of said plurality of computers and issuing the forced termination request to said loading canceling means, and

(9) a loading canceling command generating means for issuing the forced termination request specified by a system operator to said loading canceling means and issuing a loading failure notice to said one of said plurality of computers.

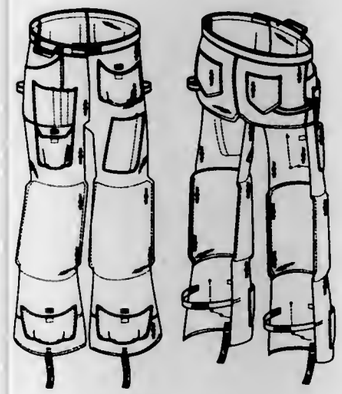
DESIGNS

SEPTEMBER 24, 1996

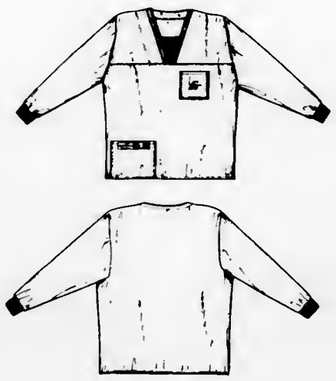
373,891
SPORTS CAP BRASSIERE
Yvonne Cayce, 499 Margate Dr., Marathon, Fla. 33050
Filed Jan. 28, 1994, Ser. No. 18,070
Term of patent 14 years
U.S. Cl. D2—706



373,892
WORK CHAPS
Paul H. Landwehr, 3198 201st St. West, Minneapolis, Minn. 55024
Continuation-in-part of Ser. No. 790,113, Nov. 12, 1991, abandoned, which is a continuation-in-part of Ser. No. 82,721, Aug. 6, 1987, abandoned. This application Oct. 17, 1994, Ser. No. 29,758
Term of patent 14 years
U.S. Cl. D2—747

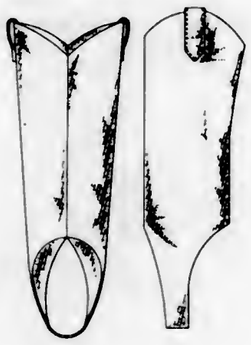


373,893
GARMENT WITH V-NECK INSERT
Sureshchandra R. Patel, Dalqetubay, and John A. Duncan, Glenrothes, both of Scotland, assignors to Rotecno AG, Zurich, Switzerland
Filed Feb. 12, 1993, Ser. No. 4,751
Claims priority, application United Kingdom, Aug. 12, 1992, 2024947
Term of patent 14 years
U.S. Cl. D2—841

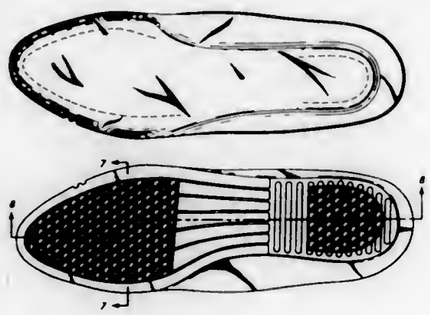


373,894
CAP
Larry G. Turner, 3180 Brandywine Pl., Marietta, Ga. 30064
Filed May 23, 1995, Ser. No. 39,201
Term of patent 14 years
U.S. Cl. D2—881

373,895
LEGGIN
Betty C. Bilyew, 1201 W. Jackson, Broken Arrow, Okla. 74012
Filed Jan. 24, 1994, Ser. No. 17,834
Term of patent 14 years
U.S. Cl. D2—901

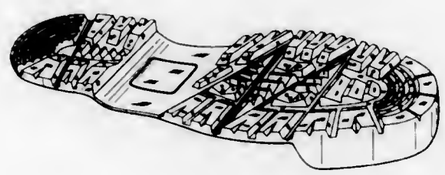


373,896
BOOT FOOTBED
Pamela A. Parker, San Carlos, Calif., assignor to Ariat International, Inc., San Carlos, Calif.
Filed Feb. 28, 1994, Ser. No. 19,210
Term of patent 14 years
U.S. Cl. D2—954



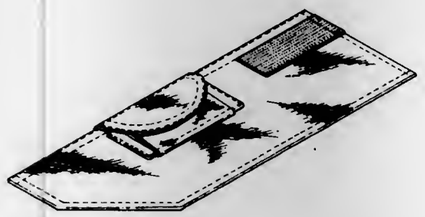
373,897
SHOE SOLE
Toshimi Takatani; Kazumasa Yoshikawa, and Toshikazu Ujishima, all of Hyogo-ken, Japan, assignors to Asics Corporation, Japan
Filed Oct. 3, 1994, Ser. No. 29,259
Term of patent 14 years
U.S. Cl. D2—957

373,898
SHOE SOLE
Marco Bramani, Milan, Italy, assignor to Vibram S.p.A., Italy
Filed Jan. 3, 1995, Ser. No. 33,003
Term of patent 14 years
U.S. Cl. D2—953

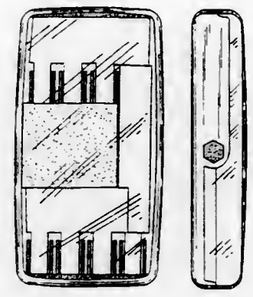


373,899
KEY RING
Yu-Hwei Huang, Sec. 2, Nan-Kan Rd, Lou-Choo Hsiang, Taoyuan Hsien, Taiwan
Filed Aug. 14, 1995, Ser. No. 42,596
Term of patent 14 years
U.S. Cl. D3—207

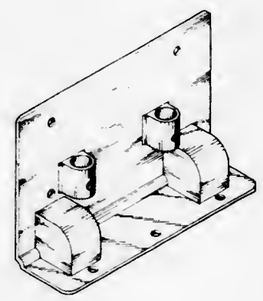
373,900
WRIST WALLET WITH POCKET
John T. Montgomery, Sr., 3450 Youth Monroe Rd., Loganville, Ga. 30249
Filed Jun. 1, 1995, Ser. No. 39,636
Term of patent 14 years
U.S. Cl. D3—226



373,901
BOX FOR TOOL PARTS
Peder Bergstedt, Lokvägen 31c, S-260 33 Påarp, Sweden
Filed Jul. 7, 1994, Ser. No. 25,639
Claims priority, application Sweden, Jan. 11, 1994, 94-0042
Term of patent 14 years
U.S. Cl. D3—294



373,902
SUPPORTING BRACKET FOR A RETRACTABLE HANDLE OF A SUITCASE
King-sheng Wang, No. 17, Lane 116, Ta An Gan Rd., Tachia Chen, Taichung Hsien, Taiwan
Filed Aug. 9, 1995, Ser. No. 42,379
Term of patent 14 years
U.S. Cl. D3—318



373,903
TOOTHBRUSH

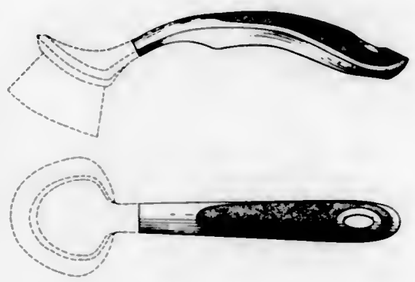
373,905
EMBOSSED PAPER PRODUCT

373,907
FOLDABLE GARMENT HANGER HAVING STORAGE

373,909
CHAIR

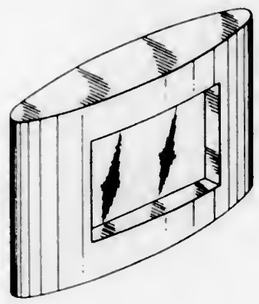
373,903
TOOTHBRUSH
Franz A. Stützer, Offenbach am Main, and Bernd Figur, Schaafheim-Schlierbach, both of Germany, assignors to Rowenta Werke GmbH, Offenbach am Main, Germany
Filed May 25, 1994, Ser. No. 23,468
Claims priority, application Germany, Nov. 25, 1993, M 93 09 870.6
Term of patent 14 years
U.S. Cl. D4—104

373,904
HANDLE FOR A HOUSEHOLD UTENSIL
John P. Vanderhoef, Cummaquid, and Edward St. Yves, Yarmouthport, both of Mass., assignors to Kellogg Brush Manufacturing Co., Easthampton, Mass.
Filed Oct. 2, 1995, Ser. No. 44,844
Term of patent 14 years
U.S. Cl. D4—138

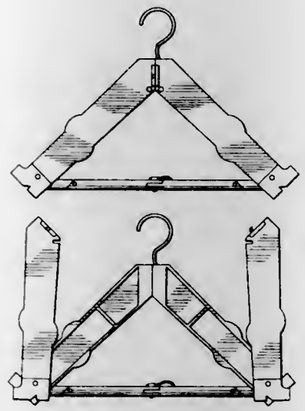


373,905
EMBOSSED PAPER PRODUCT
Gayln A. Schulz, Greenville, Wis., assignor to James River Corporation, Richmond, Va.
Continuation-in-part of Ser. No. 29,525, Oct. 7, 1994, Pat. No. Des. 368,587. This application Nov. 2, 1994, Ser. No. 30,125
The portion of the term of this patent subsequent to Jan. 31, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D5—53

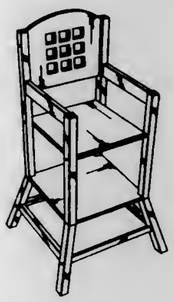
373,906
DISPLAY FRAME
Arthur J. Wang, 300 E. 40th St., Apt. 22-D, New York, N.Y. 10016
Filed Dec. 22, 1994, Ser. No. 32,627
Term of patent 14 years
U.S. Cl. D6—300



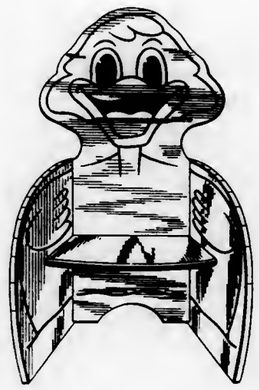
373,907
FOLDABLE GARMENT HANGER HAVING STORAGE SPACES
Manuel Morales-Rivera, Calle 1 S.O. 759 Caparra Terrace, San Juan, Puerto Rico
Filed Jan. 10, 1995, Ser. No. 33,325
Term of patent 14 years
U.S. Cl. D6—316



373,908
JUVENILE CHAIR
Kenneth O. Morgan, Solona Beach, Calif., assignor to MBM Design Company, Kansas City, Mo.
Division of Ser. No. 19,596, Mar. 7, 1994, Pat. No. Des. 363,400. This application Sep. 29, 1995, Ser. No. 44,712
Term of patent 14 years
U.S. Cl. D6—339



373,909
CHAIR
Gerald R. Loader, Slough, United Kingdom, assignor to Button Fronts (London) Limited, Berkshire, United Kingdom
Filed Aug. 31, 1995, Ser. No. 43,392
Claims priority, application United Kingdom, Mar. 6, 1995, 2045855
Term of patent 14 years
U.S. Cl. D6—359



373,910
CHAIR
Richard Frinier, Long Beach, Calif., assignor to Brown Jordan Company, El Monte, Calif.
Filed Apr. 21, 1995, Ser. No. 37,816
Term of patent 14 years
U.S. Cl. D6—370

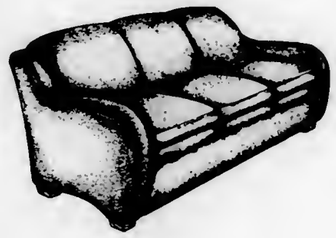
373,911
SEAT

373,913
MERCHANDISING DISPLAY RACK

373,915

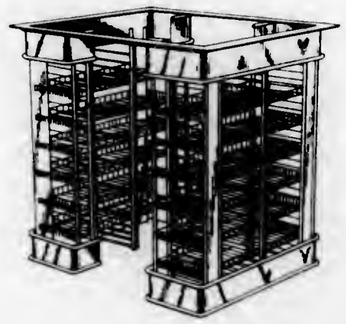
373,917

373,911
SEAT
Michael J. Paus, High Point, N.C., assignor to Universal Furniture Industries, Inc., High Point, N.C.
Filed Mar. 16, 1995, Ser. No. 36,281
Term of patent 14 years
U.S. Cl. D6—381

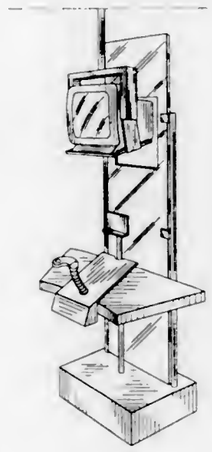


373,912
PEDESTAL DISPLAY UNIT
Juan V. Lladro Roig, and Rafael Tamarit Pitarch, both of Valencia, Spain, assignors to Lladro Comercial, S.A., Valencia, Spain
Division of Ser. No. 25,247, Jun. 28, 1994. This application Sep. 7, 1995, Ser. No. 43,612
Term of patent 14 years
U.S. Cl. D6—396

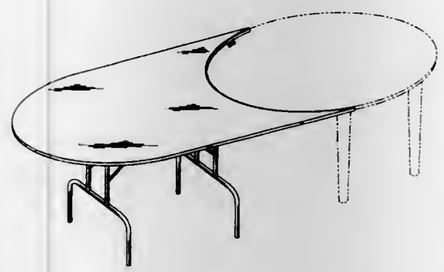
373,913
MERCHANDISING DISPLAY RACK
Philip D. Wyatt, Neosho, Mo., and Jeffery M. Talbot, Austin, Tex., assignors to L&P Property Management Company, Chicago, Ill.
Filed May 15, 1995, Ser. No. 38,966
Term of patent 14 years
U.S. Cl. D6—465



373,914
VIDEO GAME DISPLAY
Paul R. Lechleiter, Powell, and Mark B. Artus, Beechwold, both of Ohio, assignors to Blockbuster Entertainment Corp., Ft. Lauderdale, Fla.
Filed Aug. 29, 1994, Ser. No. 27,744
Term of patent 14 years
U.S. Cl. D6—470

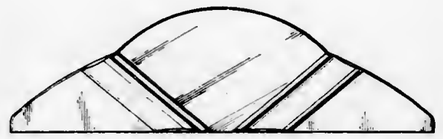


373,915
EXTENSION TABLE FOR A CURVED-END TABLE
Mark Lobl, and Laura Lobl, both of 410 Chateau Dr., Buffalo Grove, Ill. 60089
Filed Dec. 22, 1994, Ser. No. 32,613
Term of patent 14 years
U.S. Cl. D6—482

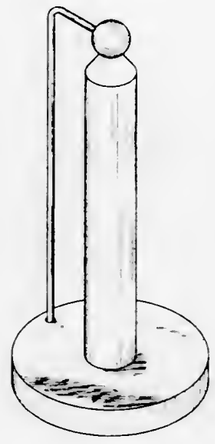


373,916
TABLE STAND
Avi Yofan, Tampa, Fla., assignor to Rooms To Go, Inc., Seffner, Fla.
Filed Apr. 12, 1995, Ser. No. 37,420
Term of patent 14 years
U.S. Cl. D6—497

373,917
HEADBOARD
Ronald G. Wanek, Arcadia; Jericho P. Pauer, Onalaska, both of Wis., and Darrin M. Swagel, Winona, Minn., assignors to Ashley Furniture Industries, Inc., Arcadia, Wis.
Filed Mar. 3, 1995, Ser. No. 35,638
Term of patent 14 years
U.S. Cl. D6—505

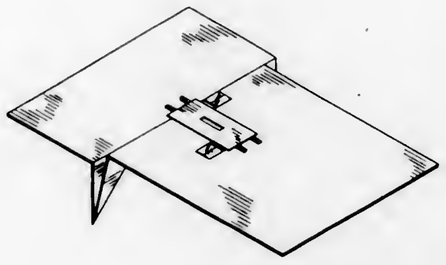


373,918
PAPER ROLL HOLDER
Carsten Joergensen, Kriens, Switzerland, assignor to Pi-Design AG, Triegen, Switzerland
Filed Feb. 24, 1995, Ser. No. 35,352
Term of patent 14 years
U.S. Cl. D6—521



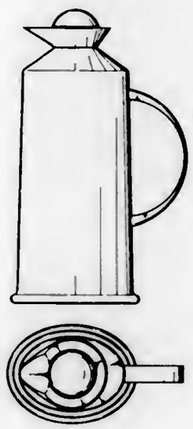
373,919
BUSINESS CARD DISPLAY AND DISPENSER
Lorene Farrell, 709-B W. Rusk #323, Rockwall, Tex. 75087
Filed Sep. 11, 1995, Ser. No. 43,681
Term of patent 14 years
U.S. Cl. D6—570

373,921
COMBINED UNIVERSAL SPINE DRAPE AND ANESTHESIA SCREEN
Joseph A. Palomo, Ingleside; Nancy L. Walker, and Donna L. Christofel, both of Evanston, all of Ill., assignors to Baxter International, Inc., Deerfield, Ill.
Filed Mar. 23, 1994, Ser. No. 20,298
Term of patent 14 years
U.S. Cl. D6—602



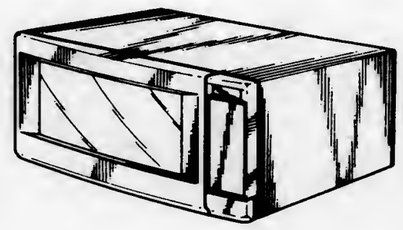
373,922
VACUUM FLASK
Frank T. S. Huang, Suite 804, 8 Fl., No. 128, Sec. 3, Ming-Sheng E. Rd., Taipei, Taiwan
Filed Apr. 12, 1995, Ser. No. 37,413
Term of patent 14 years
U.S. Cl. D7—319

373,920
CUSHION
Harold Stephan, Box 328, Kindersley, Saskatchewan, Canada
Filed Jun. 26, 1995, Ser. No. 40,714
Term of patent 14 years
U.S. Cl. D6—599

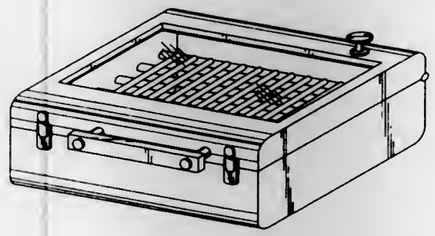


373,923
VACUUM FLASK
Frank T.-S. Huang, Suite 804, 8 Fl., No. 128, Sec. 3, Ming-Sheng E. Rd., Taipei, Taiwan
Filed May 10, 1995, Ser. No. 38,679
Term of patent 14 years
U.S. Cl. D7—319

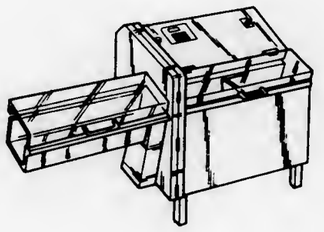
373,925
MICROWAVE OVEN
Byung S. Kim, Seoul, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea
Filed May 5, 1995, Ser. No. 38,629
Term of patent 14 years
U.S. Cl. D7—351



373,924
SOLAR POWERED COOKER
Frank Tralongo, 212 Benjamin St., Schenectady, N.Y. 12303
Filed Aug. 25, 1995, Ser. No. 43,094
Term of patent 14 years
U.S. Cl. D7—324



373,926
AUTOMATIC HORIZONTAL MEAT SLICER
Timothy L. White, Port Clinton, and David B. Mischler, Oak Harbor, both of Ohio, assignors to The Biro Manufacturing Co., Marblehead, Ohio
Filed Dec. 27, 1994, Ser. No. 32,742
Term of patent 14 years
U.S. Cl. D7—381



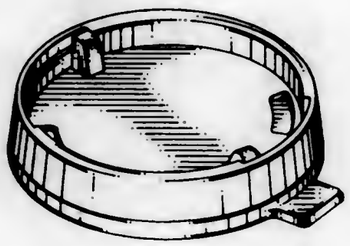
373,927

373,929

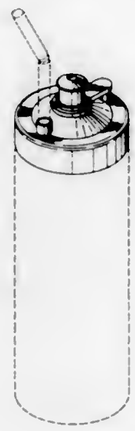
373,931

373,933

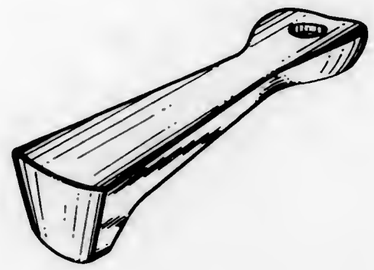
373,927
LID
Jeffrey A. Kramer, 1241 NE 83rd St., Miami, Fla. 33138, and William W. Rosenfeld, 8501 S.W. 30 St., St. Davie, Fla. 33328
Filed Feb. 17, 1995, Ser. No. 35,023
Term of patent 14 years
U.S. Cl. D7—392.1



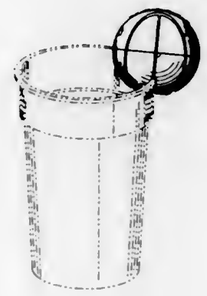
373,928
REMOVABLE TOP FOR DRINKING BOTTLES
Dennis E. Green, 102 Falcon Hills Dr., Highlands Ranch, Colo. 80126
Filed Oct. 3, 1995, Ser. No. 44,904
Term of patent 14 years
U.S. Cl. D7—392.1



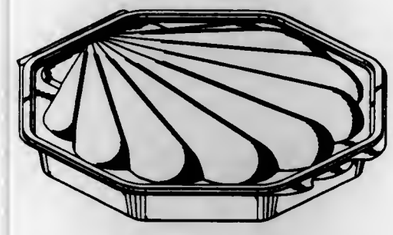
373,929
HANDLE FOR KITCHEN CONTAINERS
Rino Gambini, Fermignano, Italy, assignor to TVS S.P.A., Trasanni, Italy
Filed Jul. 26, 1995, Ser. No. 41,891
Claims priority, application Italy, Jan. 25, 1995, MI 95/0 000044
Term of patent 14 years
U.S. Cl. D7—395



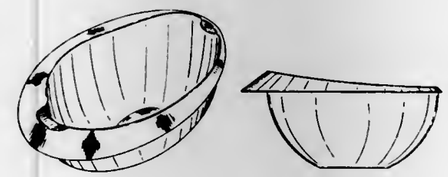
373,930
BASKETBALL DRINK CONTAINER
Albert H. Gruneisen, III, Louisville, Ky., assignor to Operational Profit Systems, Inc., Louisville, Ky.
Filed Jan. 17, 1995, Ser. No. 33,601
Term of patent 14 years
U.S. Cl. D7—515



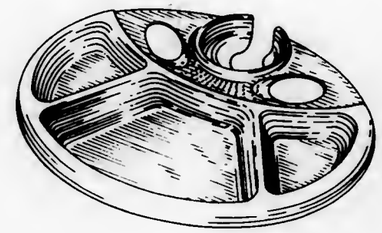
373,931
COVERED FOOD TRAY
Daniel T. Whitehead, Atlanta, Ga., assignor to De Ster Corporation, Atlanta, Ga.
Filed Aug. 30, 1995, Ser. No. 43,226
Term of patent 14 years
U.S. Cl. D7—539



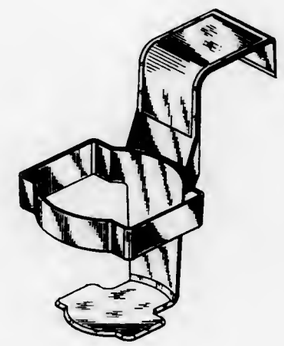
373,932
MIXING BOWL
Frederik J. Onneweer, Tervuren, Belgium, assignor to Dart Industries Inc., Deerfield, Ill.
Filed Aug. 22, 1995, Ser. No. 42,337
Term of patent 14 years
U.S. Cl. D7—543



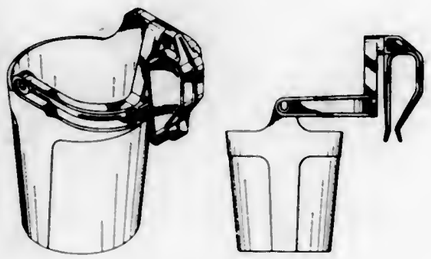
373,933
PLATE
Thomas M. Gibbs, III, Granite Bay, Calif., assignor to Winner's Circle Plastics, Inc., Granity City, Calif.
Filed Oct. 19, 1994, Ser. No. 29,950
Term of patent 14 years
U.S. Cl. D7—555



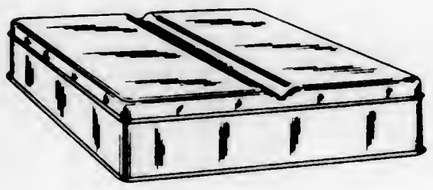
373,934
BEVERAGE CONTAINER HOLDER
Phillip T. Morris, 183 Dexter St., Prescott, Wis. 54021
Filed Jun. 6, 1995, Ser. No. 39,965
Term of patent 14 years
U.S. Cl. D7—620



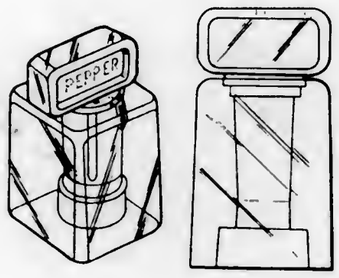
373,935
CUP HOLDER
Steven R. Cole, 5917 Reiger Ave., Dallas, Tex. 75214, and Jacob C. Runsler, III, Dallas, Tex., assignors to Steven R. Cole, Dallas, Tex.
Filed May 19, 1995, Ser. No. 39,027
Term of patent 14 years
U.S. Cl. D7—621



373,936
TIN
Alison Sale, Ringwood; Christine J. Howell, Bournemouth, and Jillian Sheppard, Branksome, all of United Kingdom, assignors to The Silver Crane Company Limited, Dorset, United Kingdom
Filed Oct. 4, 1994, Ser. No. 29,403
Claims priority, application United Kingdom, Aug. 19, 1994, 2041171
Term of patent 14 years
U.S. Cl. D7—629

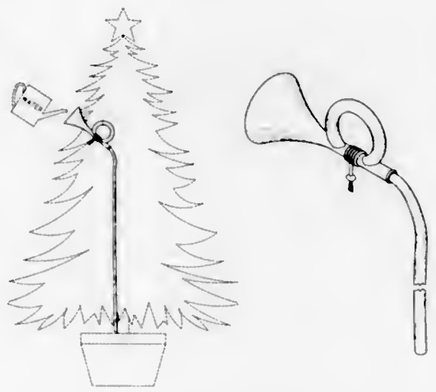


373,937
PEPPERMILL
Wayne Husted, 415 Main St., Sausalito, Calif. 94965
Filed Feb. 24, 1995, Ser. No. 35,294
Term of patent 14 years
U.S. Cl. D7—679

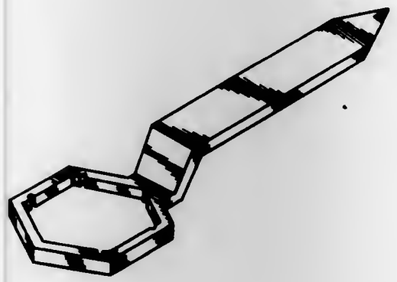


373,938
Patent Not Issued For This Number

373,939
CHRISTMAS TREE WATERING ORNAMENT
Ken Swerdlick, and Jennifer Fazzina, both of 6 Carol Dr., Rocky Hill, Conn. 06067
Filed Sep. 18, 1995, Ser. No. 44,078
Term of patent 14 years
U.S. Cl. D8—1

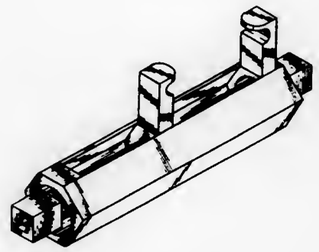


373,940
PLUMBER TOOL
Scott A. Kerlee, 1005 SW. Berry Lake Rd., and Bart Lovely, 4891 Lovely Ln SE., both of Pt. Orchard, Wash. 98366
Filed Feb. 24, 1995, Ser. No. 35,347
Term of patent 14 years
U.S. Cl. D8—17

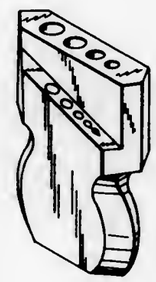


373,941
RING TYPE BOTTLE AND POP-TOP CAN OPENER
William N. Davis, 4914 Hampton Dr., North Olmsted, Ohio 44070
Filed May 15, 1995, Ser. No. 39,270
Term of patent 14 years
U.S. Cl. D8—40

373,942
CHAIN TIGHTENER
Peter A. Sears, Box 96 Depot St., Natural Bridge, N.Y. 13665
Filed Dec. 14, 1994, Ser. No. 32,222
Term of patent 14 years
U.S. Cl. D8—51



373,943
TOOL HOLDER, ESPECIALLY FOR ALLEN WRENCHES
Joachim J. Fuhrmann, Breckerfeld, Germany, assignor to Hans-Jurgen Fuhrmann GmbH Spezial-Werkzeugeabrikation, Breckerfeld, Germany
Filed Jan. 25, 1995, Ser. No. 34,001
Claims priority, application Germany, Oct. 26, 1994, M9408399.1
Term of patent 14 years
U.S. Cl. D8—71



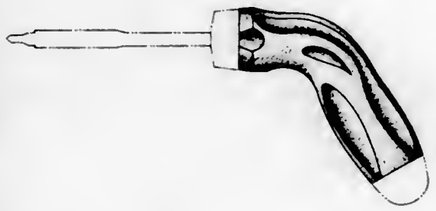
373,944

373,946

373,948
SIDING HOOK

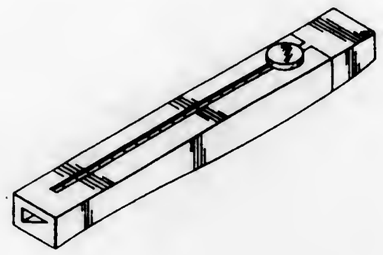
373,950
LINK PLATE FOR A CHAIN

373,944
SCREWDRIVER HANDLE
Christopher D. Thompson, Milwaukee, and Daniel M. Eggert, Kenosha, both of Wis., assignors to Snap-on Technologies, Inc., Crystal Lake, Ill.
Filed Feb. 21, 1995, Ser. No. 35,164
Term of patent 14 years
U.S. Cl. D8—83

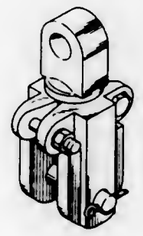


373,945
HANDLE FOR A SCREWDRIVER
Tsung-Chieh Chang, No. 101, Alley 81, Lane 2, Sec. 1, Chung Hsin Road, Ta-Li, Taichung Hsien, Taiwan
Filed Mar. 13, 1995, Ser. No. 36,071
Term of patent 14 years
U.S. Cl. D8—83

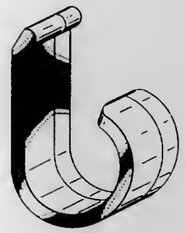
373,946
RETRACTABLE BLADE KNIFE
Kazuyo Sawano, Kyoto, Japan, assignor to Kyoto Measuring Instruments Corp., Japan
Filed Feb. 9, 1995, Ser. No. 34,629
Term of patent 14 years
U.S. Cl. D8—99



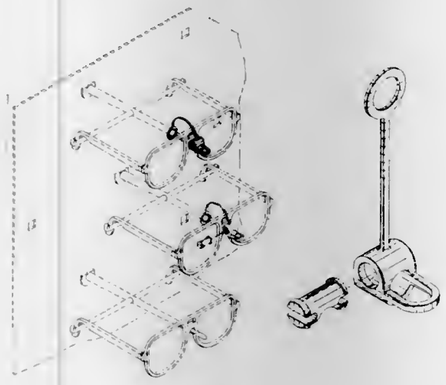
373,947
BALANCE ADJUSTER EYEBOLT
A. Philip Parduhn, 14501 Wilson Rd., Edmond, Okla. 73013
Filed Jan. 26, 1995, Ser. No. 34,055
Term of patent 14 years
U.S. Cl. D8—373



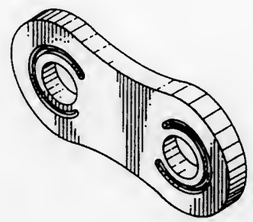
373,948
SIDING HOOK
Curtis L. Etzel, Colden; David E. Moomaw, Aurora, both of N.Y., and Andrew G. Avinger, Lubbock, Tex., assignors to Gary Products Group, Inc., Lubbock, Tex.
Filed Feb. 23, 1995, Ser. No. 35,251
Term of patent 14 years
U.S. Cl. D8—367



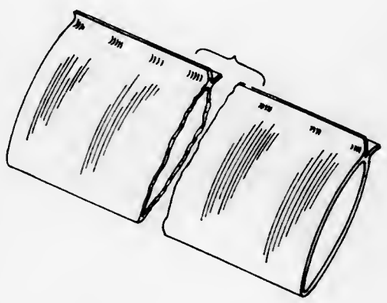
373,949
SECURITY CABLE FOR A DISPLAY FIXTURE
James B. Eldon, III, Barto; Richard J. Winig, Bluebell, and Alan M. Winig, Lafayette Hill, all of Pa., assignors to Eye Designs, Inc., Norristown, Pa.
Filed Sep. 12, 1994, Ser. No. 28,340
Term of patent 14 years
U.S. Cl. D8—382



373,950
LINK PLATE FOR A CHAIN
Tomofumi Otani, Suita; Joichi Nakamura, Kobe; Takero Nakagawa, Osaka; Shuji Sasamoto, Toyonaka, and Yoshitaka Yoshimura, Kadoma, all of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan
Filed Jun. 14, 1995, Ser. No. 40,262
Claims priority, application Japan, Dec. 16, 1994, 6-38436
Term of patent 14 years
U.S. Cl. D8—499



373,951
PLASTIC BAG FOR FROZEN FOOD STORAGE
Duane H. Heinhold, 412 W. 2300 S., Bountiful, Utah 84010; Kenneth E. Heinhold, 3015 Chaucer Pl., Salt Lake City, Utah 84108, and Don H. Savage, 6851 S. Country Woods Cir., Midvale, Utah 84047
Filed Mar. 18, 1994, Ser. No. 20,079
Term of patent 14 years
U.S. Cl. D9—305



373,952
CONTAINER

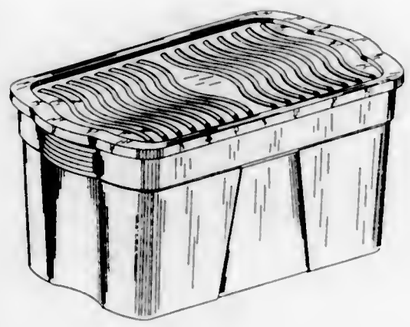
373,954
WREATH STORAGE BOX

373,956
BOTTLE

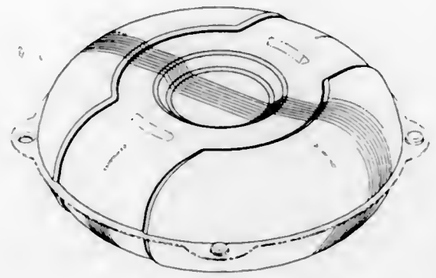
373,958
FABRIC GRADING RULER
Karen Terwilleger, Cos Cob, and Carol Robbins, Chappaqua, William A. Bartlett, Jr., Dunn, N.C., assignor to William

373,952
CONTAINER
Patricia M. Exarhos, Appleton, Wis.; William H. Valls, Harwinton; David W. Schweitzer, West Hartford, both of Conn., and Wayne S. Marcus, Warwick, R.I., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Sep. 6, 1995, Ser. No. 43,534
Term of patent 14 years
U.S. Cl. D9—423

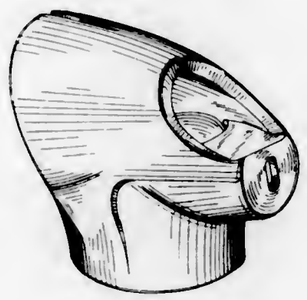
373,953
STORAGE CONTAINER WITH LID
Bradley D. Gale, St. Louis, Mo., assignor to Contico International Inc., St. Louis, Mo.
Filed Apr. 11, 1995, Ser. No. 37,369
Term of patent 14 years
U.S. Cl. D9—425



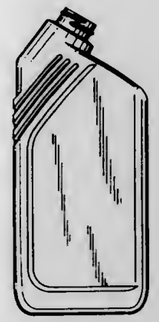
373,954
WREATH STORAGE BOX
Stacy L. Wolff, Akron, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed May 5, 1995, Ser. No. 38,424
Term of patent 14 years
U.S. Cl. D9—429



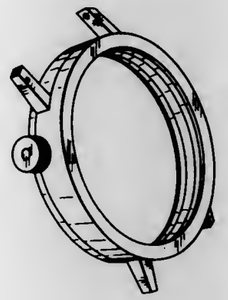
373,955
CAP FOR A SPRAY BOTTLE
Robert W. Boxer, Bayside; Peter S. Martin, Pewaukee, and Timothy B. Strandell, Racine, all of Wis., assignors to Athea Laboratories, Inc., Milwaukee, Wis.
Filed Jan. 3, 1995, Ser. No. 33,015
Term of patent 14 years
U.S. Cl. D9—448



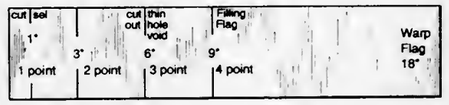
373,956
BOTTLE
Karen Terwilleger, Cos Cob, and Carol Robbins, Chappaqua, N.Y., assignors to Benckiser Consumer Products, Inc., Danbury, Conn.
Filed Aug. 19, 1994, Ser. No. 27,369
Term of patent 14 years
U.S. Cl. D9—526



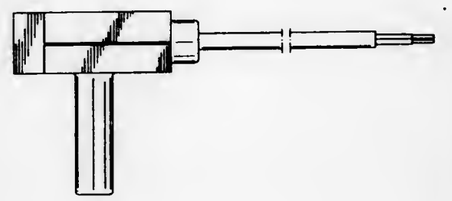
373,957
WATCH-CASE
Jean-Christophe Mareschal, Le Chateau, 70600 Oyrieres, France
Filed Mar. 1, 1994, Ser. No. 19,347
Claims priority, application France, Sep. 3, 1993, 934513
Term of patent 14 years
U.S. Cl. D10—30



373,958
FABRIC GRADING RULER
William A. Bartlett, Jr., Dunn, N.C., assignor to William Archibald Bartlett, Jr., Dunn, N.C.
Filed Dec. 5, 1994, Ser. No. 31,759
Term of patent 14 years
U.S. Cl. D10—71



373,959
SOLID STATE PRESSURE DETECTOR
Shogo Kurisaki; Masao Kataoka, and Kuniko Suzuki, all of Ibaraki-ken, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 10, 1995, Ser. No. 35,985
Claims priority, application Japan, Sep. 12, 1994, 6-27686
Term of patent 14 years
U.S. Cl. D10—83



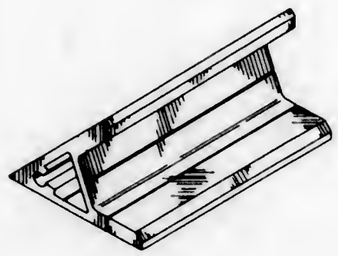
373,960
COUPLING MEMBER FOR FRAMES

373,962
COUPLING MEMBER FOR FRAMES

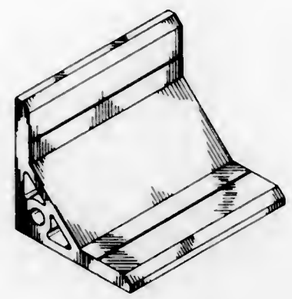
373,964
MEDICATION ALARM

373,966
AUDIBLE SIGNAL FOR ALARM UNITS

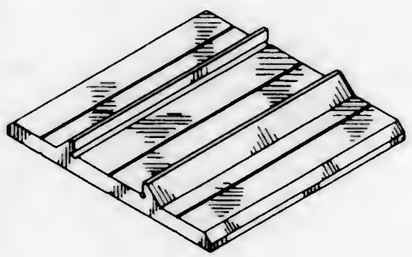
373,960
COUPLING MEMBER FOR FRAMES
Shigekazu Nagai, and Koji Sugano, both of Ibaraki-ken, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 18, 1995, Ser. No. 37,749
Claims priority, application Japan, Oct. 19, 1994, 6-31729
Term of patent 14 years
U.S. Cl. D10—94



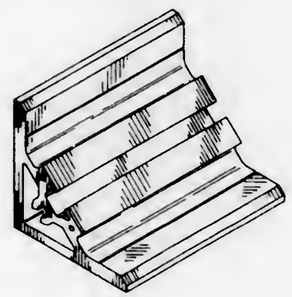
373,962
COUPLING MEMBER FOR FRAMES
Shigekazu Nagai, and Koji Sugano, both of Tsukuba-gun, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 18, 1995, Ser. No. 37,751
Claims priority, application Japan, Oct. 19, 1994, 6-31727
Term of patent 14 years
U.S. Cl. D10—94



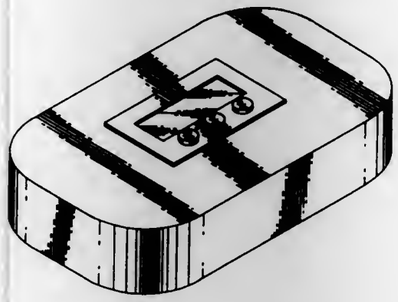
373,961
COUPLING MEMBER FOR FRAMES
Shigekazu Nagai, and Koji Sugano, both of Ibaraki-ken, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 18, 1995, Ser. No. 37,750
Claims priority, application Japan, Oct. 19, 1994, 6-31731
Term of patent 14 years
U.S. Cl. D10—94



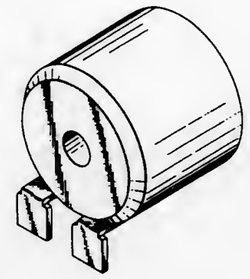
373,963
COUPLING MEMBER FOR FRAMES
Shigekazu Nagai, and Koji Sugano, both of Tsukuba-gun, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 18, 1995, Ser. No. 37,754
Claims priority, application Japan, Oct. 19, 1994, 6-31728
Term of patent 14 years
U.S. Cl. D10—94



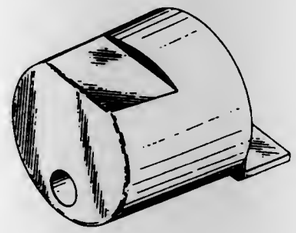
373,964
MEDICATION ALARM
Robert E. Alexander, 673 Hahaione St., Honolulu, Hi. 96825
Filed Jun. 22, 1995, Ser. No. 40,600
Term of patent 14 years
U.S. Cl. D10—106



373,966
AUDIBLE SIGNAL FOR ALARM UNITS
Takahiro Sone, and Naoyuki Kigawa, both of Shizuoka, Japan, assignors to Star Micronics Co., Ltd., Shizuoka-ken, Japan
Filed Jun. 9, 1995, Ser. No. 40,093
Claims priority, application Japan, Dec. 19, 1994, 6-38836
Term of patent 14 years
U.S. Cl. D10—116



373,965
AUDIBLE SIGNAL FOR ALARM UNITS
Takahiro Sone, Shizuoka, Japan, assignor to Star Micronics Co., Ltd., Shizuoka-ken, Japan
Filed Jun. 9, 1995, Ser. No. 40,092
Claims priority, application Japan, Dec. 18, 1994, 6-38744
Term of patent 14 years
U.S. Cl. D10—116



373,967
BRACELET
Henri Samuel, Paris, France, assignor to Fred S.A., Paris, France
Filed Mar. 22, 1994, Ser. No. 20,234
Claims priority, application WIPO, Sep. 22, 1993, DM/027.491
Term of patent 14 years
U.S. Cl. D11—4

373,968
JEWELRY CHAIN

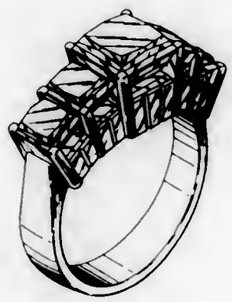
373,970
PENDANT

373,972
ATHLETIC TEAM PLAQUE

373,974
HELMET STRAP BUCKLE

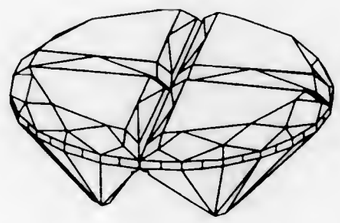
373,968
JEWELRY CHAIN
David Rozenwasser, 26 Har Dafna Street, Savion, Israel
Filed Jul. 6, 1995, Ser. No. 41,330
Claims priority, application Israel, Mar. 20, 1995, 24139
Term of patent 14 years
U.S. Cl. D11—13

373,969
FINGER RING
Ambar Betzalel, Los Angeles, Calif., assignor to Ambar Diamonds Inc., Los Angeles, Calif.
Filed Feb. 17, 1995, Ser. No. 35,013
Term of patent 14 years
U.S. Cl. D11—34

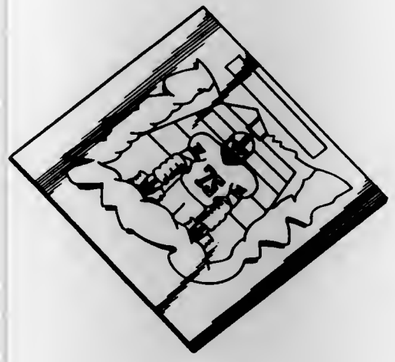


373,970
PENDANT
Jose Gonzalez, and Maria C. Fraiberg, both of 36 Atlas La., Hicksville, N.Y. 11801
Filed May 1, 1995, Ser. No. 38,222
Term of patent 14 years
U.S. Cl. D11—75

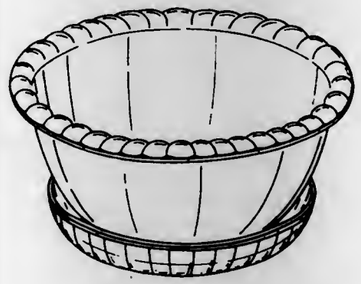
373,971
GEMSTONE
Avi Katz, Netanya, Israel, assignor to Dan E. Alpert, Encino, Calif.
Filed May 4, 1995, Ser. No. 38,470
Term of patent 14 years
U.S. Cl. D11—90



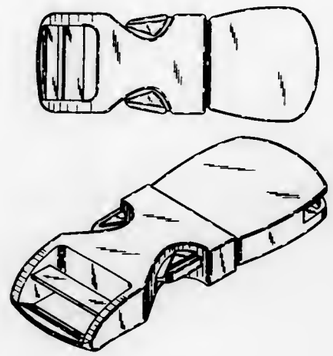
373,972
ATHLETIC TEAM PLAQUE
Westley S. Aldridge, 1347 Duncan Dr., Tracy, Calif. 95376
Filed Jun. 8, 1995, Ser. No. 39,996
Term of patent 14 years
U.S. Cl. D11—136



373,973
FLOWER POT OR PLANTER WITH CONVERTIBLE BASE
Thomas Dickinson, and Bradley D. Gale, both of St. Louis, Mo., assignors to Contico International, Inc., St. Louis, Mo.
Filed Dec. 5, 1994, Ser. No. 31,727
Term of patent 14 years
U.S. Cl. D11—152



373,974
HELMET STRAP BUCKLE
Joseph Anscher, Muttontown, N.Y., assignor to National Molding Corporation, Farmingdale, N.Y.
Continuation-in-part of Ser. No. 300,167, Sep. 2, 1994, Pat. No. 5,459,910. This application Oct. 10, 1995, Ser. No. 45,146
Term of patent 14 years
U.S. Cl. D11—216



373,975
SLIDABLE STRAP DIVIDER
Joseph Anscher, Muttontown, N.Y., assignor to National Molding Corp., Farmingdale, N.Y.
Filed Jul. 14, 1994, Ser. No. 25,872
Term of patent 14 years
U.S. Cl. D11—218

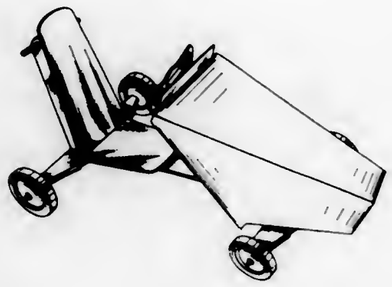
373,976
[illegible]
U.S. Cl. D11—[illegible]

373,978
AUTOMOBILE [illegible]
U.S. Cl. D12—[illegible]

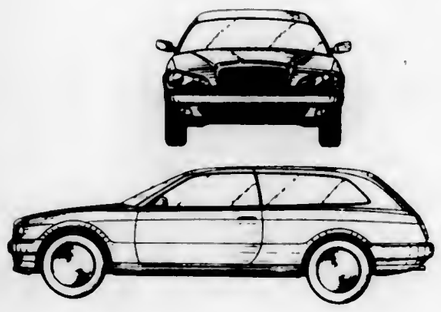
373,980
BICYCLE
U.S. Cl. D12—[illegible]

373,982
HOLLOW WINDOW PANEL WITH MEANS TO

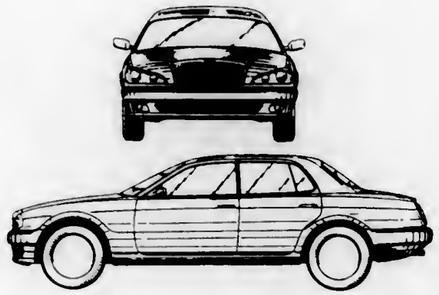
373,976
GO CART
Frank J. Bartolini, 7 Morning Dove, Laguna Niguel, Calif. 92677
Filed Aug. 11, 1995, Ser. No. 42,519
Term of patent 14 years
U.S. Cl. D12—88



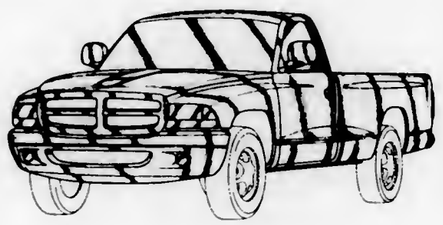
373,977
AUTOMOBILE
Royden Axe, Warwick, and Ewart M. Bourne, Crewe, both of England, assignors to Rolls-Royce Motor Cars Limited, Crewe, England
Filed Jan. 26, 1995, Ser. No. 34,150
Claims priority, application United Kingdom, Jul. 29, 1994, 2040646
Term of patent 14 years
U.S. Cl. D12—91



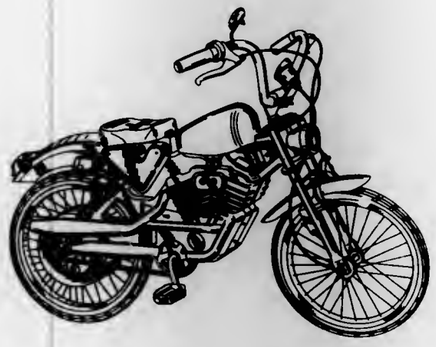
373,978
AUTOMOBILE
Royden Axe, Warwick, and Ewart M. Bourne, Crewe, both of England, assignors to Rolls-Royce Motor Cars Limited, Crewe, England
Filed Jan. 26, 1995, Ser. No. 34,472
Claims priority, application United Kingdom, Jul. 29, 1994, 2040648
Term of patent 14 years
U.S. Cl. D12—92



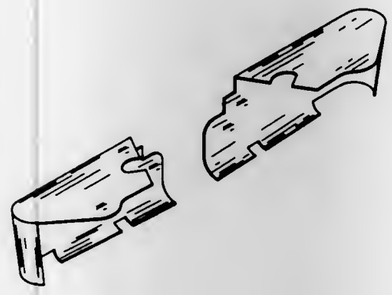
373,979
PICK-UP TRUCK BODY EXTERIOR SURFACE
John R. Starr, Woodhaven; Joseph A. Papal, Bloomfield Township; Dennis Myles, West Bloomfield; Ricardo Z. Aneiros, Dearborn, and Trevor M. Creed, West Bloomfield, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.
Filed May 20, 1994, Ser. No. 23,246
Term of patent 14 years
U.S. Cl. D12—98



373,980
BICYCLE
David K. Camfield, Olney, Ill., assignor to Roadmaster Corporation, Olney, Ill.
Continuation of Ser. No. 248,806, May 24, 1994, abandoned, which is a continuation-in-part of Ser. No. 896,155, Jun. 10, 1992, Pat. No. 5,314,207. This application Jul. 18, 1994, Ser. No. 26,043
Term of patent 14 years
U.S. Cl. D12—111



373,981
SNOWMOBILE SUSPENSION FAIRING
Dale D. Cormican, Rural Rte 2, box 186, Crookston, Minn. 56716
Filed May 30, 1995, Ser. No. 39,558
Term of patent 14 years
U.S. Cl. D12—182



373,982
HOLLOW WINDOW PANEL WITH MEANS TO INTRODUCE AND REMOVE TINTING MATERIAL
Rui S. Rodrigues, 158 Bristol Rd. W., Mississauga, Ontario, Canada
Filed May 3, 1995, Ser. No. 38,311
Term of patent 14 years
U.S. Cl. D12—183

373,983
MUFFLER
Rodney L. Verlengiere, Santa Maria, Calif., assignor to R.L.V. Tuned Exhaust Products, Inc., Santa Maria, Calif.
Filed Mar. 14, 1994, Ser. No. 19,905
The portion of the term of this patent subsequent to Sep. 10, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—194

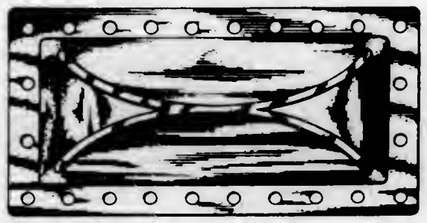
373,984
PRESSURE RELIEF PLATE

373,986
INTERIOR CARGO COVER FOR MOTOR VEHICLES

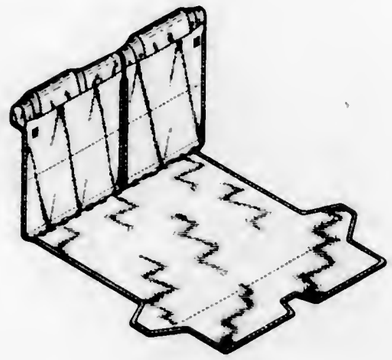
373,988
UTILITY BODY

373,990
TRUCK STORAGE COMPARTMENT

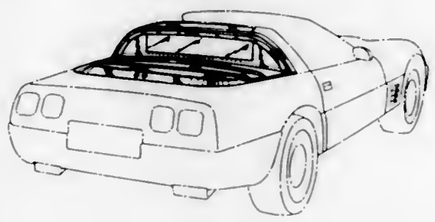
373,984
PRESSURE RELIEF PLATE
Jerry Darien, 1537 W. McKinley St., #18, Azusa, Calif. 91702
Filed May 4, 1995, Ser. No. 38,356
Term of patent 14 years
U.S. Cl. D12—400



373,986
INTERIOR CARGO COVER FOR MOTOR VEHICLES
Thomas F. Hamilton, 1634 Ixias Ct., San Jose, Calif. 95124, assignor to Thomas F. Hamilton, San Jose, Calif.
Filed Sep. 20, 1995, Ser. No. 44,204
Term of patent 14 years
U.S. Cl. D12—401

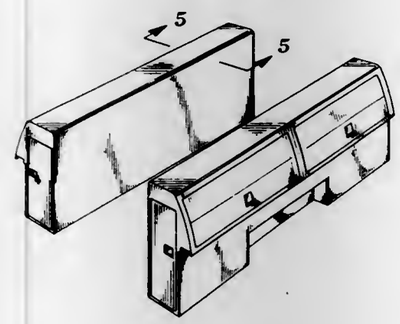


373,985
COMBINED REAR DECKLID, ARCH AND WINDOW PANEL UNIT
John Weaver, Boalsburg; Allen Runkle, Fleming, and Dan LeKander, Boalsburg, all of Pa., assignors to Auto Accessories of America, Boalsburg, Pa.
Filed Feb. 21, 1995, Ser. No. 35,137
Term of patent 14 years
U.S. Cl. D12—401

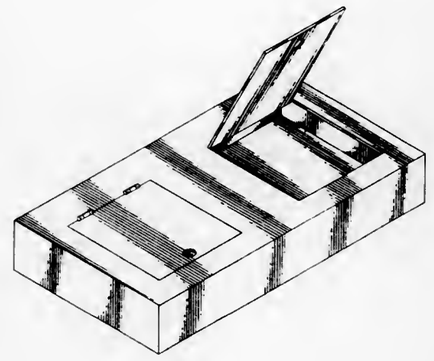


373,987
FLOOR CONSOLE
D. W. Diem, Newport Beach, Calif., assignor to Performance Marketing, Inc., Santa Ana, Calif.
Filed Oct. 13, 1995, Ser. No. 45,240
Term of patent 14 years
U.S. Cl. D12—419

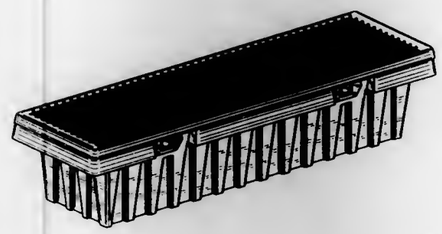
373,988
UTILITY BODY
Lynn M. Johnson, 2921 Schabacker #4, Menomonie, Wis. 54751
Filed Apr. 18, 1994, Ser. No. 21,460
Term of patent 14 years
U.S. Cl. D12—423



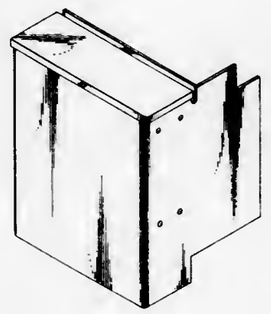
373,990
TRUCK STORAGE COMPARTMENT
Edward J. Loehnis, 19909 Blackburn, St. Clair Shores, Mich. 48080
Filed Jul. 12, 1995, Ser. No. 41,366
Term of patent 14 years
U.S. Cl. D12—423



373,989
TRUCK BED TOOL BOX WITH SINGLE ACCESS DOOR
Thomas Dickinson, St. Louis, Mo., assignor to Contico International, Inc., St. Louis, Mo.
Filed Jan. 25, 1995, Ser. No. 34,004
Term of patent 14 years
U.S. Cl. D12—423



373,991
STORAGE CONTAINER FOR MOTORCYCLES
Fred W. Timms, 3095 Tig Knight Rd., Loganville, Ga. 30249
Filed May 6, 1994, Ser. No. 22,540
Term of patent 14 years
U.S. Cl. D12—424



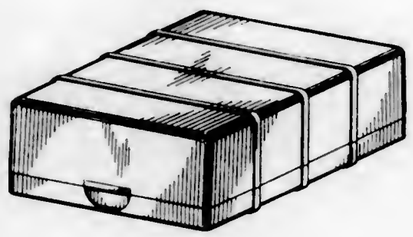
373,992
DESIGN FOR A BATTERY CHARGER

373,994
FIXED CURVED JUMPER

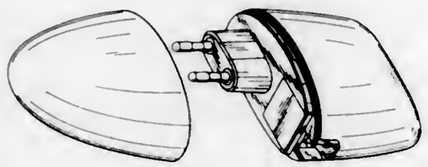
373,996
REMOTE CONTROL RECEIVER

373,998

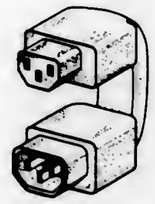
373,992
DESIGN FOR A BATTERY CHARGER
Marc A. Rosen, New York, N.Y.; Richard J. Suchanek; Judith D. Pyle, both of Madison, Wis.; Kevin A. Marshall, Williston Park, N.Y.; Gerald A. Albright, Middleton, Wis.; Theresa A. Pyle-Smith, Madison, Wis.; Robert W. Zimmermann, Suo Prairie, Wis., and Robert K. Kloppenburg, Middleton, Wis., assignors to Rayovac Corporation, Madison, Wis.
Filed Jan. 14, 1994, Ser. No. 17,591
Term of patent 14 years
U.S. Cl. D13—107



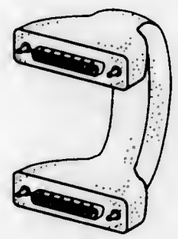
373,993
BATTERY CHARGER AND ADAPTER
Jan Kettula, Turky, Finland, assignor to Salcomp OY, Salo, Finland
Filed Nov. 14, 1994, Ser. No. 30,934
Claims priority, application Finland, May 11, 1994, 354/94
Term of patent 14 years
U.S. Cl. D13—107



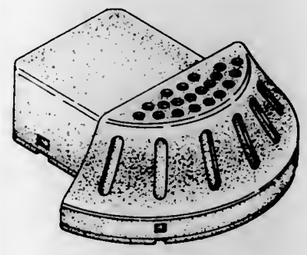
373,994
FIXED CURVED JUMPER
Dana W. Kammersgard, Vista; Angus R. Colson, Jr., Jamul, and Steven B. Cook, Vista, all of Calif., assignors to Artecon, Carlsbad, Calif.
Division of Ser. No. 40,141, Jun. 12, 1995, which is a division of Ser. No. 28,437, Sep. 15, 1994, abandoned. This application Oct. 30, 1995, Ser. No. 45,796
Term of patent 14 years
U.S. Cl. D13—146



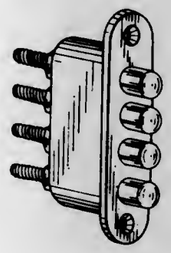
373,995
FIXED CURVED JUMPER
Dana W. Kammersgard, Vista; Angus R. Colson, Jr., Jamul, and Steven B. Cook, Vista, all of Calif., assignors to Artecon, Carlsbad, Calif.
Division of Ser. No. 28,437, Sep. 15, 1994, abandoned. This application Jun. 12, 1995, Ser. No. 40,141
Term of patent 14 years
U.S. Cl. D13—147



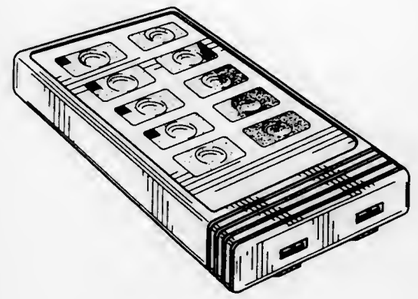
373,996
REMOTE CONTROL RECEIVER
Chen-fa Ko, Taichung Hsien, Taiwan, assignor to Wei Tec Precision Industry Co. Ltd., Taichung Hsien, Taiwan
Filed Sep. 14, 1994, Ser. No. 28,266
Term of patent 14 years
U.S. Cl. D13—158



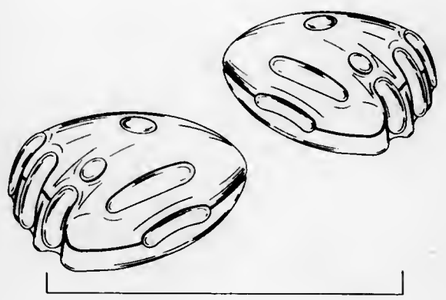
373,997
ELECTRICAL CONTACT CARTRIDGE BOX
Dave Kopeer, P.O. Box 146, Golden, Colo. 80402-0146
Continuation-in-part of Ser. No. 227,558, Apr. 14, 1994, abandoned, which is a continuation of Ser. No. 876,774, May 1, 1992, abandoned. This application Apr. 17, 1995, Ser. No. 37,575
Term of patent 14 years
U.S. Cl. D13—164



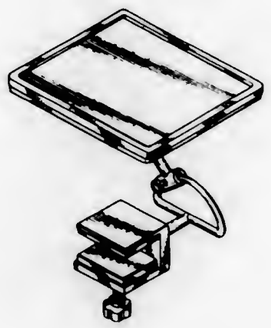
373,998
KEYPAD
Peter A. Tutt, Tawa, and James C. Jared, Lower Hutt, both of New Zealand, assignors to Interlock Industries Limited, Wellington, New Zealand
Filed Jul. 13, 1994, Ser. No. 25,839
Claims priority, application New Zealand, Jan. 21, 1994, 25693
Term of patent 14 years
U.S. Cl. D13—168



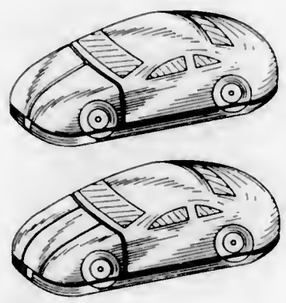
373,999
COMBINED ERGONOMIC SPLIT KEYBOARD AND MOUSE SET
Kai Staats, 518 W. Coronado Rd., Phoenix, Ariz. 85003-1149
Filed Oct. 29, 1993, Ser. No. 14,813
Term of patent 14 years
U.S. Cl. D14—114



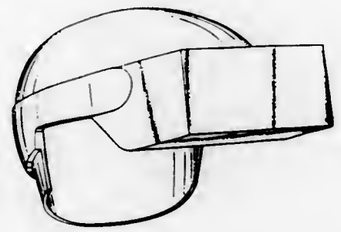
374,000
CHAIR MOUNTED MOUSE PAD
David E. Wood; Karen L. Wood, and Ryan D. Wood, all of 1245 West Blvd., Berkley, Mich. 48072
Filed Apr. 11, 1995, Ser. No. 37,353
Term of patent 14 years
U.S. Cl. D14—114



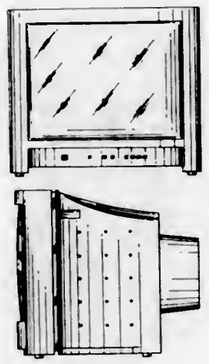
374,001
COMPUTER MOUSE
David K. Vance, 21213 Alto Terra Dr., Davidson, N.C. 28036
Filed Jun. 2, 1995, Ser. No. 39,704
Term of patent 14 years
U.S. Cl. D14—114



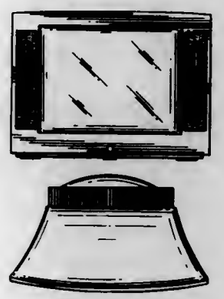
374,002
VIRTUAL REALITY VISUAL DISPLAY HELMET
Bruce R. Bassett, Sunnyvale; Kenneth Pimentel, Sausalito, and Peter A. Ronzani, Los Gatos, all of Calif., assignors to Virtual Research Systems, Inc., Santa Clara, Calif.
Division of Ser. No. 919,486, Jul. 27, 1992, Pat. No. 5,321,416. This application Mar. 9, 1994, Ser. No. 212,534
Term of patent 14 years
U.S. Cl. D14—124



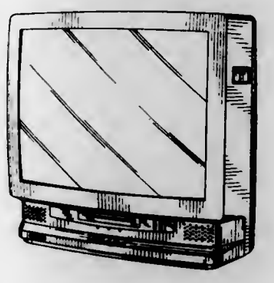
374,003
TELEVISION SET
Philippe Stark, Issy-Moulineaux, France, assignor to Thomson Consumer Electronics (Societe Anonyme), Courbevoie, France
Filed Jun. 22, 1995, Ser. No. 40,667
Claims priority, application France, Dec. 23, 1994, 946998
Term of patent 14 years
U.S. Cl. D14—126



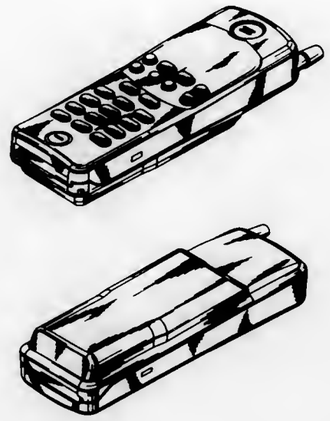
374,004
TELEVISION SET
Philippe Starck, Paris, France, assignor to Thomson Consumer Electronics (Societe Anonyme), Courbevoie, France
Division of Ser. No. 26,656, Aug. 2, 1994, Pat. No. Des. 365,557. This application Sep. 21, 1995, Ser. No. 44,295
Claims priority, application France, Feb. 4, 1994, 94 0627
Term of patent 14 years
U.S. Cl. D14—126



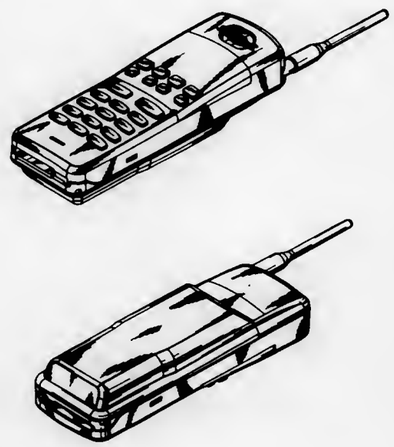
374,005
TELEVISION RECEIVER WITH VIDEO TAPE RECORDER
Norihiko Shimose, and Koji Yukikado, both of Ehime, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 14, 1995, Ser. No. 40,293
Claims priority, application Japan, Dec. 21, 1994, 6-39426
Term of patent 14 years
U.S. Cl. D14—129



374,006
MOBILE TELEPHONE
Jouko Tattari, Helsinki, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland
Filed Apr. 19, 1995, Ser. No. 37,708
Claims priority, application Finland, Oct. 20, 1994, 696/94
Term of patent 14 years
U.S. Cl. D14—138

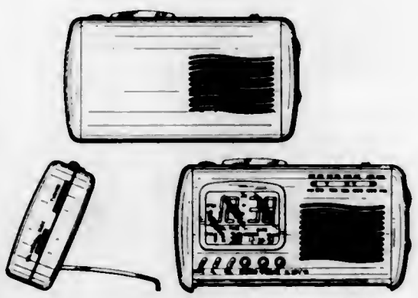


374,007
MOBILE TELEPHONE
Jouko Tattari, Helsinki, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland
Filed Apr. 19, 1995, Ser. No. 37,720
Claims priority, application Finland, Oct. 20, 1994, 695/94
Term of patent 14 years
U.S. Cl. D14—138

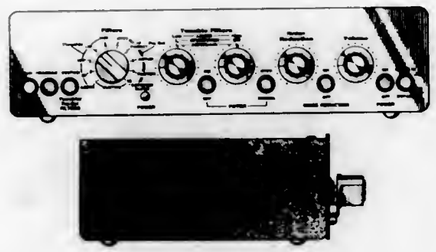


374,008
TELEPHONE SET
Josh Zeitman, Brooklyn, N.Y., assignor to Lenoxx Electronics Corp., Brooklyn, N.Y.
Filed Jul. 12, 1995, Ser. No. 41,382
Term of patent 14 years
U.S. Cl. D14—151

374,009
TRAVEL CLOCK RADIO
Cheng F. W. George, Shiu Fai terrace, Hong Kong, assignor to Tomor Electronics Ltd., Quarry Bay, Hong Kong
Filed Oct. 13, 1994, Ser. No. 29,699
Term of patent 14 years
U.S. Cl. D14—171

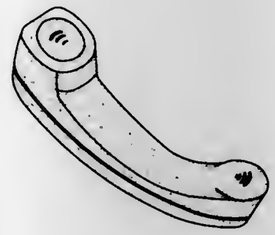


374,010
DIGITAL SIGNAL PROCESSOR
Martin F. Jue, and Steven S. Pan, both of Starkville, Miss., assignors to MFJ Enterprises, Inc., Starkville, Miss.
Filed Oct. 12, 1994, Ser. No. 29,644
Term of patent 14 years
U.S. Cl. D14—188



374,011
COMMUNICATION AID FOR BICYCLE RIDERS
Eric C. Baxter, 241 NE. Vena, Bremerton, Wash. 98310
Filed Mar. 17, 1995, Ser. No. 36,318
Term of patent 14 years
U.S. Cl. D14—206

374,012
TELEPHONE HANDSET
Stephen E. Bennett, Succasunna, N.J.; Mark Biasotti, San Jose, Calif.; Reed S. Brown, Indianapolis, Ind.; Michael J. Nuttall, Portola Vally, Calif., and John H. Schofield, New Vernon, N.J., assignors to AT&T IPM Corp., Coral Gables, Fla.
Filed Dec. 30, 1994, Ser. No. 32,958
The portion of the term of this patent subsequent to Sep. 17, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D14—248

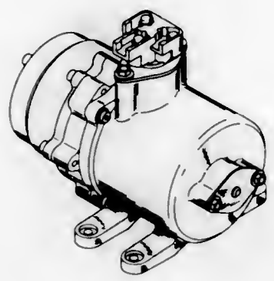


374,013
PEDESTAL
Jennifer M. Hislop, Barrington, and Daniel J. Repplinger, Hawthorn Woods, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 21, 1994, Ser. No. 32,543
Term of patent 14 years
U.S. Cl. D14—251

374,014
HANG UP CUP
Albert L. Nagele, Wilmette; Jennifer M. Hislop, Barrington, and Daniel J. Repplinger, Hawthorn Woods, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 21, 1994, Ser. No. 32,542
Term of patent 14 years
U.S. Cl. D14—253

374,015
GASKET
Lilian E. Wainer, Newark, Del., and Ross K. Hutter, West Grove, Pa., assignors to W. L. Gore & Associates, Inc., Newark, Del.
Filed Jun. 27, 1995, Ser. No. 40,783
Term of patent 14 years
U.S. Cl. D15—5

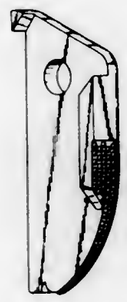
374,016
REFRIGERANT COMPRESSOR
Hirofumi Wada; Takayuki Kudo, and Shinichi Otake, all of Isesaki, Japan, assignors to Sanden Corp., Isesaki, Japan
Filed Jun. 26, 1995, Ser. No. 40,762
Claims priority, application Japan, Feb. 24, 1995, 7-5006
Term of patent 14 years
U.S. Cl. D15—9



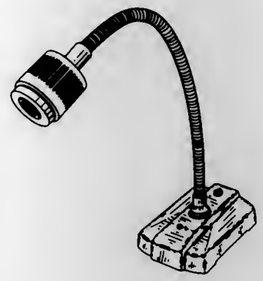
374,017
LAWN MOWER
Daniel A. Chunn, Greenville, S.C.; James B. Watson, Conyers, and William J. Saunders, Lithonia, both of Ga., assignors to Ryobi Motor Products, Corp, Easley, S.C.
Filed Mar. 4, 1994, Ser. No. 19,528
Term of patent 14 years
U.S. Cl. D15—14

374,018
GROUND OPENER TOOL
Ricky Schemenauer; Linus Yeager, and Ian Martin, all of St. Brieux, Canada, assignors to F. P. Bourgault Tillage Tools Ltd., St. Brieux, Canada
Filed May 19, 1994, Ser. No. 23,210
Claims priority, application Canada, Nov. 26, 1993, 26-11-93-2
Term of patent 14 years
U.S. Cl. D15—29

374,019
DOWNHOLD CUTTER BLADE
Charles D. Hailey, 11628 Burning Oaks, Oklahoma City, Okla. 73150
Filed Jun. 16, 1994, Ser. No. 24,554
Term of patent 14 years
U.S. Cl. D15—139



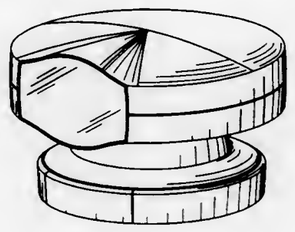
374,020
VIDEO MICROSCOPE
Thomas M. Dunn, Leawood, Kans., assignor to Ken-A-Vision Manufacturing Company, Inc., Kansas City, Mo.
Filed Jan. 25, 1995, Ser. No. 33,897
Term of patent 14 years
U.S. Cl. D16—131



374,021
TELESCOPE
Manfred Meinzer, Hemer, Germany, assignor to Leica Camera GmbH, Solms, Germany
Filed Aug. 22, 1994, Ser. No. 27,423
Claims priority, application Germany, Feb. 22, 1994, M 94 01 476.0
Term of patent 14 years
U.S. Cl. D16—132

374,022
TELESCOPE
Manfred Meinzer, Hemer, Germany, assignor to Leica Camera GmbH, Solms, Germany
Filed Aug. 22, 1994, Ser. No. 30,162
Claims priority, application Germany, Feb. 22, 1994, M9401476.0
Term of patent 14 years
U.S. Cl. D16—132

374,023
REMOTELY CONTROLLED CAMERA
Benjamin J. Beck, Boston; Anthony M. Duys, Newburyport, both of Mass., and Frank Labuski, Wells, Me., assignors to PictureTel Corporation, Danvers, Mass.
Filed Jun. 27, 1995, Ser. No. 40,801
Term of patent 14 years
U.S. Cl. D16—202



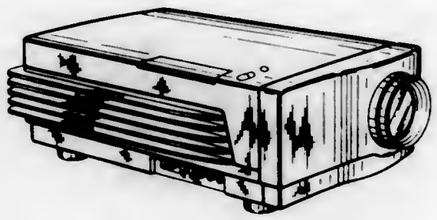
374,024

374,026

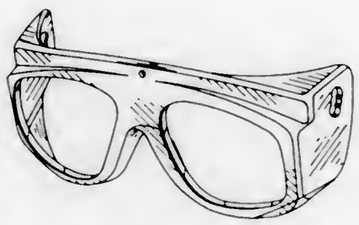
374,028

374,030

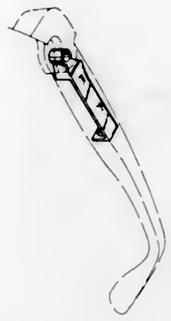
374,024
LIQUID CRYSTAL VIDEO PROJECTOR
Akira Onoda, Ehime, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jun. 14, 1995, Ser. No. 40,289
Claims priority, application Japan, Dec. 14, 1994, 6-38342
Term of patent 14 years
U.S. Cl. D16—221



374,025
CORRECTIVE LENS CARRIER FOR SAFETY EYEGLASSES
Richard W. Canavan, East Woodstock, Conn., assignor to Uvex Safety, Inc., Smithfield, R.I.
Division of Ser. No. 18,250, Feb. 1, 1994, Pat. No. Des. 365,837. This application Dec. 29, 1994, Ser. No. 32,816
Term of patent 14 years
U.S. Cl. D16—330

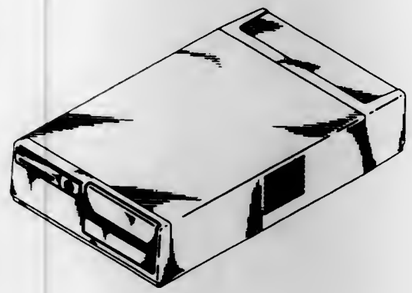


374,026
ELEMENT OF AN EYEWARE TEMPLE
Yuen-Hu Chen, No. 28, Avenue 12, Lane 76, Hsi An Road, Taichung, Taiwan
Filed Jun. 22, 1995, Ser. No. 40,591
Term of patent 14 years
U.S. Cl. D16—330



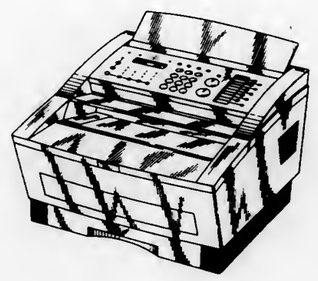
374,027
SAXOPHONE
Kuo-Chung Lee, P.O. Box 453, Taichung, Taiwan
Filed Jul. 24, 1995, Ser. No. 41,729
Term of patent 14 years
U.S. Cl. D17—10

374,028
CONTROL UNIT FOR A CASH REGISTER
Maki Sato, Yokohama, Japan, assignor to Kabushiki Kaisha TEC, Shizuoka, Japan
Filed Oct. 4, 1995, Ser. No. 44,969
Claims priority, application Japan, Apr. 17, 1995, 7-10654
Term of patent 14 years
U.S. Cl. D18—4

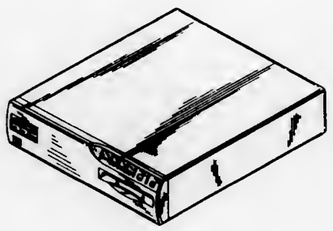


374,029
CALCULATOR
William T. Stokes, 1125 Robin Way, Sunnyvale, Calif. 94087
Filed Aug. 28, 1995, Ser. No. 43,186
Term of patent 14 years
U.S. Cl. D18—7

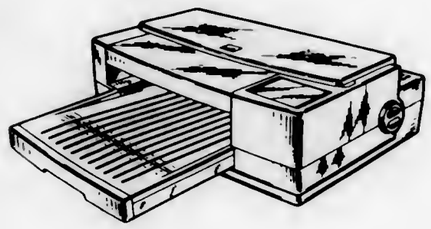
374,030
ELECTRONIC COPYING MACHINE WITH FACSIMILE
Toshio Horiki; Tetsuya Imamura; Chikako Tada, and Shinichi Sugihara, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sep. 6, 1995, Ser. No. 43,512
Claims priority, application Japan, Mar. 9, 1995, 7-6548
Term of patent 14 years
U.S. Cl. D18—36



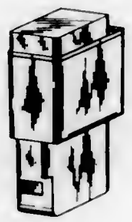
374,031
PRINTER
Takashi Ikenaga, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jan. 31, 1995, Ser. No. 34,237
Claims priority, application Japan, Aug. 1, 1994, 6-22881
Term of patent 14 years
U.S. Cl. D18—50



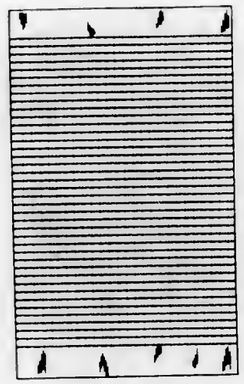
374,032
COMPUTER PRINTER
Makoto Kobayashi; Hiromi Shishiuchi, both of Suwa, and Mitsuru Iseki, Nagoya, all of Japan, assignors to Seiko Epson Corporation, Tokyo, Japan
Filed May 30, 1995, Ser. No. 39,519
Claims priority, application Japan, Nov. 30, 1994, 6-36545
Term of patent 14 years
U.S. Cl. D18—55



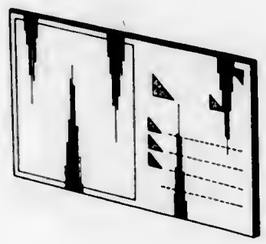
374,033
INK TANK FOR PRINTER
Hiroyuki Tokuda; Masanori Takenouchi, both of Yokohama; Yasuo Kotaki, Machida, and Yuji Hamasaki, Sagamihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 22, 1995, Ser. No. 35,182
Claims priority, application Japan, Aug. 23, 1994, 6-25176
The portion of the term of this patent subsequent to Aug. 6, 2010, has been disclaimed.
Term of patent 14 years
U.S. Cl. D18—56



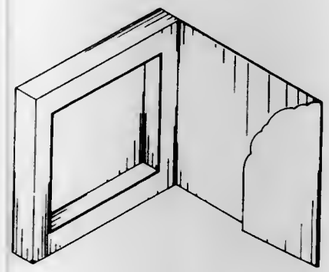
374,034
STATIONERY
Lloyd McElfresh, 6743 North Artesian, Chicago, Ill. 60645
Filed Feb. 23, 1993, Ser. No. 5,091
Term of patent 14 years
U.S. Cl. D19—1



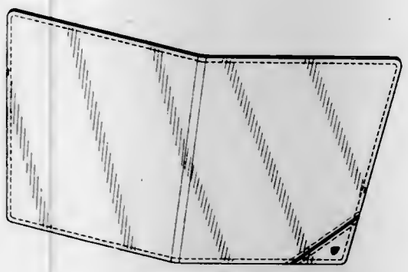
374,035
POSTCARD
Myriam Nielsen, 8 Place Garibaldi, and Jean-Charles Dusanter, 20 Rue Smolett, both of 06300 Nice, France
Filed Dec. 30, 1994, Ser. No. 32,916
Term of patent 14 years
U.S. Cl. D19—1



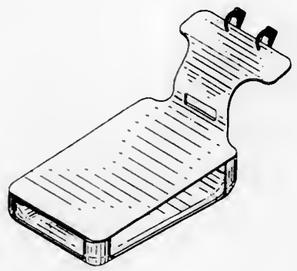
374,036
CARD
Jen J. Lin, 24-3F, 303 Jong-Ming S. Rd., Taichung, Taiwan
Filed May 9, 1995, Ser. No. 38,669
Term of patent 14 years
U.S. Cl. D19—1



374,037
PORTFOLIO
Jon R. Wyant, Spring Valley, and Marc Moor, Dayton, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio
Filed Oct. 5, 1993, Ser. No. 13,873
Term of patent 14 years
U.S. Cl. D19—26



374,038
PHONE CADDY
Joe D. Gillespie, El Dorado, Kans., assignor to St. Francis Research Institute, Wichta, Kans.
Filed Aug. 11, 1995, Ser. No. 42,523
Term of patent 14 years
U.S. Cl. D19—87



374,039
SPIRAL GUMBALL MACHINE
Jamie Beene, 701 Brandon Dr., Cleburne, Tex. 76031
Filed Aug. 28, 1995, Ser. No. 44,750
Term of patent 14 years
U.S. Cl. D20—7

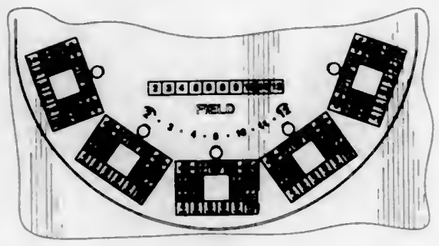
374,040

374,042

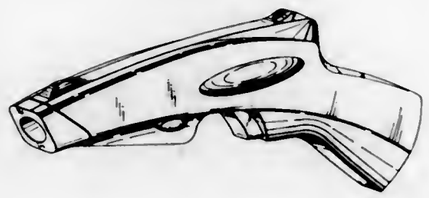
374,044

374,046

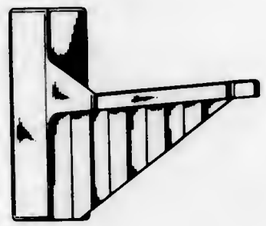
374,040
TOP SURFACE FOR A DICE GAME
Michael T. Klaric, 5605 Port Barrington Way, Las Vegas, Nev. 89130
Filed May 16, 1995, Ser. No. 38,845
Term of patent 14 years
U.S. Cl. D21—37



374,041
INPUT UNIT FOR VIDEO GAME MACHINE
Akitoshi Oikawa, Tokyo, Japan, assignor to Sega Enterprises, Ltd., Japan
Filed Jan. 16, 1996, Ser. No. 49,639
Claims priority, application Japan, Jul. 21, 1995, 7-21329
Term of patent 14 years
U.S. Cl. D21—48

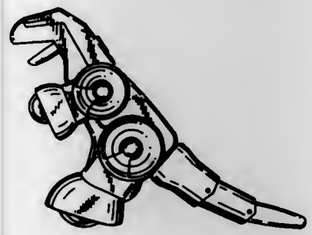


374,042
STILT FOOT SUPPORT
Lauren Guenette, 7 Lynnview Court S.E., Calgary, Alberta, Canada
Filed Nov. 8, 1994, Ser. No. 30,797
Term of patent 14 years
U.S. Cl. D21—72



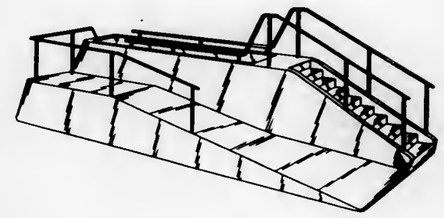
374,043
BUCKET FOR A TOY BUILDING SET
Jan Ryaa, Billund, and Lene Köhler, Jelling, both of Denmark, assignors to Interlego AG, Baar, Switzerland
Filed Sep. 22, 1993, Ser. No. 13,282
Term of patent 14 years
U.S. Cl. D21—120

374,044
TOY FIGURINE
Keiko Doi, and Masatsune Sasaki, both of Tokyo, Japan, assignors to Tomy Company, Ltd., Tokyo, Japan
Filed May 2, 1995, Ser. No. 38,385
Claims priority, application Japan, Nov. 2, 1994, 6-33761
Term of patent 14 years
U.S. Cl. D21—148



374,045
EXERCISE DEVICE FOR PUSH-UPS
Robert T. Ward, III, U.S.S. Cromelin FFG-37, FPO AP 46662-1492
Filed Jun. 22, 1995, Ser. No. 40,630
Term of patent 14 years
U.S. Cl. D21—191

374,046
TREADMILL HOUSING
Ray Drennan, P.O. Box 250, Ozark, Mo. 65721
Filed Feb. 7, 1995, Ser. No. 34,553
Term of patent 14 years
U.S. Cl. D21—192



374,047
HAND-HELD EXERCISE WEIGHT
Justine D. Thielemann, 4092 Navajo Trail, Atlanta, Ga. 30319
Filed Mar. 8, 1995, Ser. No. 35,871
Term of patent 14 years
U.S. Cl. D21—197

374,048
COORDINATION ENHANCEMENT DEVICE
Dennis Lance, 2439 W. Shannon Dr., Bennion, Utah 84118
Filed Jun. 2, 1995, Ser. No. 39,714
Term of patent 14 years
U.S. Cl. D21—199

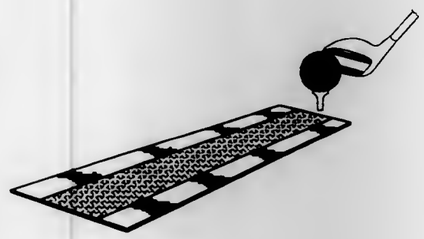
374,049
GOLF PUTTER
James L. Shenoha, Lockport, and Dean E. Meyer, Lagrange Park, both of Ill., assignors to Wilson Sporting Goods Co., Chicago, Ill.
Division of Ser. No. 7,824, May 7, 1993, Pat. No. Des. 362,882. This application Aug. 16, 1995, Ser. No. 42,744
Term of patent 14 years
U.S. Cl. D21—217

374,050
GOLF PUTTER
Paul Gurrola, 949 S. Hope St. #3130, Los Angeles, Calif. 90015
Filed May 10, 1995, Ser. No. 38,644
Term of patent 14 years
U.S. Cl. D21—219

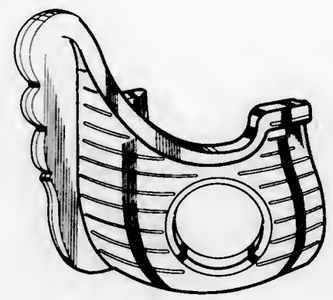
374,051
COVER FOR GOLF CLUB HEADS
James M. Sheppard, Jr., Monroe, N.C., assignor to Devant Ltd., Monroe, N.C.
Division of Ser. No. 14,529, Oct. 22, 1993, Pat. No. Des. 362,890. This application Jun. 26, 1995, Ser. No. 40,917
Term of patent 14 years
U.S. Cl. D21—221

374,052
COMBINED ROLLERSKATE AND BRAKE OR SIMILAR ARTICLE
Peter Edauw, San Zenone Degli Ezzelini, and Claudio Zorzi, Paderno Di Ponzano Veneto, both of Italy, assignors to Nordica S.p.A., Italy
Filed Jan. 11, 1994, Ser. No. 17,360
Claims priority, application WIPO, Jul. 13, 1993, DM/026685
Term of patent 14 years
U.S. Cl. D21—226

374,053
INSTRUCTIONAL DEVICE FOR SWINGING A GOLF CLUB
Benjamin S. Daniel, 1053 W. Columbia Ave., Chicago, Ill. 60626
Filed Jun. 22, 1995, Ser. No. 40,652
Term of patent 14 years
U.S. Cl. D21—234



374,054
PIRATE SHIP CLIMBER PANEL
Mitchell L. Wilgus, Farmington, Mo., assignor to Iron Mountain Forge Corporation, Farmington, Mo.
Filed Oct. 5, 1995, Ser. No. 44,999
Term of patent 14 years
U.S. Cl. D21—245



374,055
CAM FOR A COMPOUND BOW
Kevin D. Strother, 2145 Laurelhurst Dr., Eugene, Oreg. 97402
Filed May 15, 1995, Ser. No. 38,971
Term of patent 14 years
U.S. Cl. D22—107

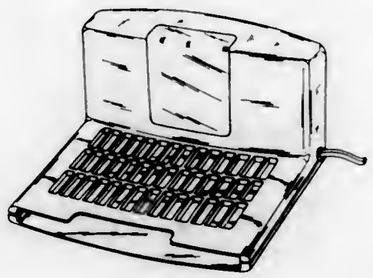
374,056
INSECT TRAP

374,058
FISHING ROD WRAPPING TOOL BASE

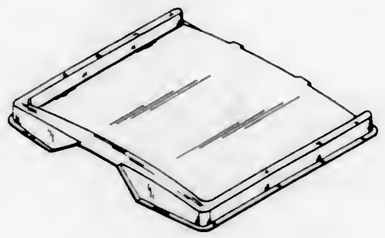
374,060
ROTOR FOR A SPINNING FISHING REEL

374,062
ADJUSTABLE FISHING POLE HOLDER

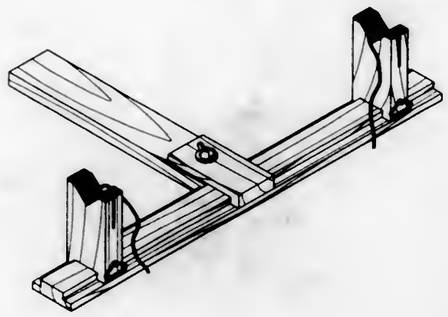
374,056
INSECT TRAP
Scott W. Demarest, Caledonia, and Nicholas M. Gerritz, Whitefish Bay, both of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Mar. 3, 1995, Ser. No. 35,661
Term of patent 14 years
U.S. Cl. D22—122



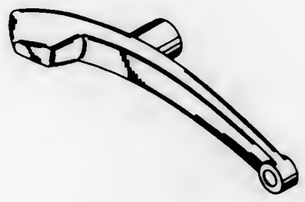
374,057
INSERT TRAY FOR AN INSECT TRAP
Scott W. Demarest, Caledonia; Donald E. McCumber, Madison, and Joseph E. Reimer, Oregon, all of Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.
Filed Apr. 5, 1995, Ser. No. 37,921
The portion of the term of this patent subsequent to Apr. 18, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D22—122



374,058
FISHING ROD WRAPPING TOOL BASE
Charles A. Lindquist, II, N. 5736 Walnut, Spokane, Wash. 99205
Filed Jan. 27, 1995, Ser. No. 34,105
Term of patent 14 years
U.S. Cl. D22—134

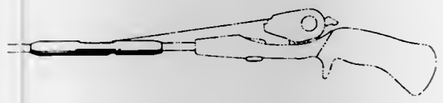


374,059
CRANK HANDLE FOR A FISHING REEL
Randy L. Atherton; Kent L. Zwayer, both of Tulsa, Okla., and Richard J. Robbins, Derby, Kans., assignors to Zebco Division of Brunswick Corporation, Tulsa, Okla.
Filed Jan. 9, 1995, Ser. No. 33,284
Term of patent 14 years
U.S. Cl. D22—140



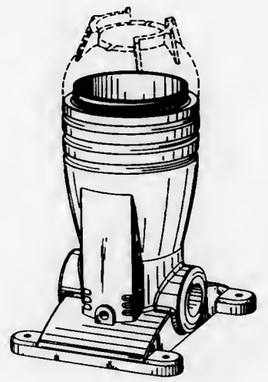
374,060
ROTOR FOR A SPINNING FISHING REEL
Shinichi Asano, Musashino, and Yasuhiro Takigasaki, Higashikurume, both of Japan, assignors to Daiwa Seiko, Inc., Higashikurume, Japan
Filed Feb. 17, 1994, Ser. No. 18,891
Claims priority, application Japan, Aug. 17, 1993, 5-24996; Oct. 29, 1993, 5-32954
The portion of the term of this patent subsequent to Apr. 11, 2009, has been disclaimed.
Term of patent 14 years
U.S. Cl. D22—141

374,061
FISHLINE GUIDE PIPE
Seiji Myojo; Yasunori Hosoya, and Hiroshi Hashimoto, all of Osaka, Japan, assignors to Shimano Inc., Osaka, Japan
Filed Oct. 4, 1994, Ser. No. 29,362
Claims priority, application Japan, Jun. 17, 1994, 6-17887; Jun. 17, 1994, 6-17888; Jun. 17, 1994, 6-17889
Term of patent 14 years
U.S. Cl. D22—142



374,062
ADJUSTABLE FISHING POLE HOLDER
Tommy L. Carter, Seaside, Calif., assignor to E-Z Catch & Company, Seaside, Calif.
Filed Jul. 13, 1995, Ser. No. 41,409
Term of patent 14 years
U.S. Cl. D22—147

374,063
PLATFORM FOR WATER PURIFIER
Diane M. Brancazio, Cambridge; Susannah E. Gardner, Brookline; Matthew D. Hern, Boston, all of Mass.; Francis M. Lubrano, Narragansett; David A. Snow, Barrington, both of R.I., and David M. Sykes, Cambridge, Mass., assignors to Fountainhead Technologies, Providence, R.I.
Continuation-in-part of Ser. No. 30,668, Nov. 4, 1994, abandoned, and a continuation-in-part of Ser. No. 30,686, Nov. 4, 1994, abandoned. This application Apr. 25, 1995, Ser. No. 37,955
Term of patent 14 years
U.S. Cl. D23—209



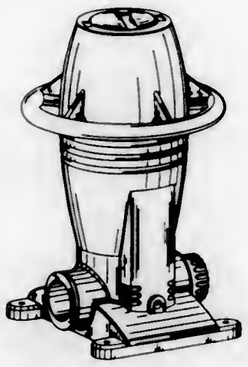
374,064
WATER PURIFIER

374,066
BALL VALVE

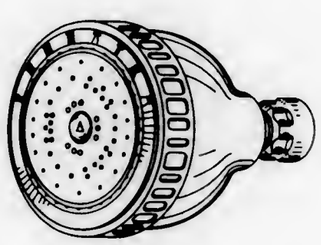
374,068
LAVATORY

374,070
HUMIDIFIER WITH EXPOSED TWIN BOTTLES

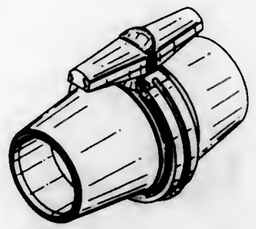
374,064
WATER PURIFIER
Diane M. Brancazio, Cambridge; Susannah E. Gardner, Brookline; Matthew D. Hern, Boston, all of Mass.; Francis M. Labrana, Narragansett; David A. Snow, Barrington, both of R.I., and David M. Sykes, Cambridge, Mass., assignors to Fountainhead Technologies, Providence, R.I.
Continuation of Ser. No. 30,686, Nov. 4, 1994, abandoned. This application Sep. 14, 1995, Ser. No. 44,010
Term of patent 14 years
U.S. Cl. D23—209



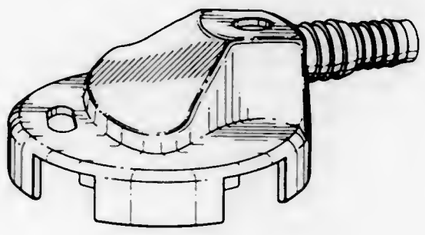
374,065
WALL MOUNT SHOWER HEAD
Raymond W. M. Chan, Vancouver, Canada, assignor to Jing Mei Industrial Limited, Tsuen Wan
Filed Jun. 24, 1994, Ser. No. 24,994
Term of patent 14 years
U.S. Cl. D23—213



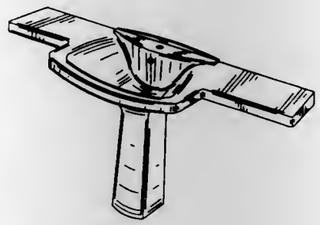
374,066
BALL VALVE
Naef Gregor, Baden-Dattwil, Switzerland, assignor to Georg Fischer Rohrleitungssysteme AG, Schaffhausen, Switzerland
Division of Ser. No. 21,437, Apr. 18, 1994, Pat. No. Des. 366,693. This application May 31, 1995, Ser. No. 39,579
Claims priority, application WIPO, Oct. 18, 1993, DM/027612
Term of patent 14 years
U.S. Cl. D23—233



374,067
WATER SOFTENER FLOOR DRAIN ADAPTER
Ralph H. Crook, 141 S. 350 East, North Salt Lake, Utah 84054
Filed Mar. 6, 1995, Ser. No. 35,715
Term of patent 14 years
U.S. Cl. D23—261

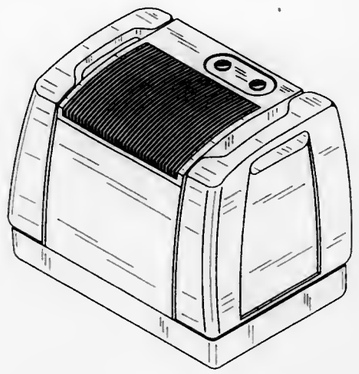


374,068
LAVATORY
Ludwig A. Segenschmid, Munich, Germany, assignor to American Standard Inc., Piscataway, N.J.
Division of Ser. No. 13,182, Sep. 20, 1993, Pat. No. Des. 361,830. This application May 16, 1995, Ser. No. 39,774
Term of patent 14 years
U.S. Cl. D23—286

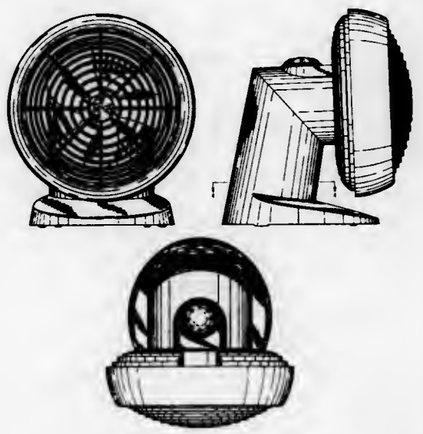


374,069
TRAVEL TOILET
Yih-Shin Her, 221, Sec 2, Chung Shan Road, Yung Ching Hsiang, Changhua, Taiwan
Filed Aug. 30, 1995, Ser. No. 43,230
Term of patent 14 years
U.S. Cl. D23—299

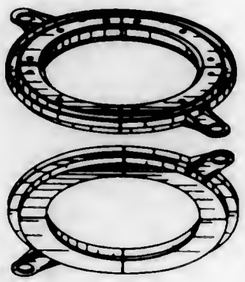
374,070
HUMIDIFIER WITH EXPOSED TWIN BOTTLES
Mark J. Tomasiak, O'Fallon, and Gregory F. Dix, Florissant, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Filed Dec. 5, 1994, Ser. No. 31,748
Term of patent 14 years
U.S. Cl. D23—356



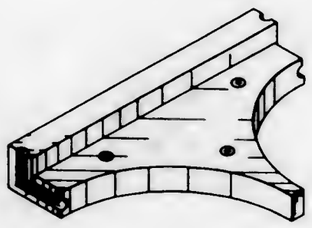
374,071
PORTABLE ELECTRIC FAN WITH A SWIVEL MOUNT
Jui-Shang Wang, Taipei, Taiwan; Rodney Jané, Westboro; John Longan, Natick, both of Mass.; Stanley Greaens, Homewood, Ill.; Gregory Holderfield, Oak Park, Ill., and Steven Valentor, Wesmont, Ill., assignors to Duracraft Corporation, Southborough, Mass.
Filed Apr. 10, 1995, Ser. No. 37,280
Term of patent 14 years
U.S. Cl. D23—382



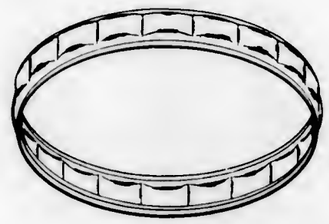
374,872
ASSEMBLY OF ARCUATE CAST REFRACTORY AND STEEL SEGMENTS OF AN ANNEALING FURNACE BASE
Gary L. Coble, R.D. #2, Box 214, DuBois, Pa. 15801
Filed Dec. 21, 1994, Ser. No. 32,588
Term of patent 14 years
U.S. Cl. D23—386



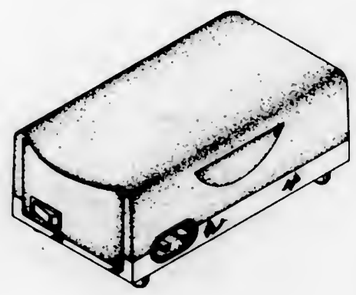
374,873
CAST REFRACTORY SIDE SEGMENT OF AN ANNEALING FURNACE BASE
Gary L. Coble, R.D., #2, Box 214, DuBois, Pa. 15801
Filed Dec. 21, 1994, Ser. No. 32,591
Term of patent 14 years
U.S. Cl. D23—386



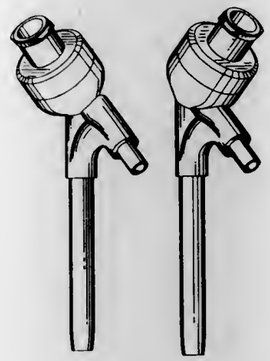
374,874
CEILING FAN BELLY BAND HOUSING
Li-Su Chen, 58, Ma Yuan West St., Taichung, Taiwan
Filed Apr. 7, 1995, Ser. No. 37,390
Term of patent 14 years
U.S. Cl. D23—411



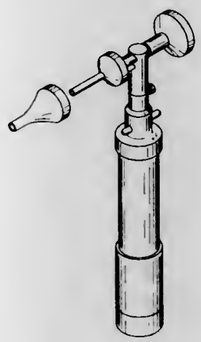
374,875
AIR PUMP FOR MEDICAL USE
Daniel Lee, 11th Floor, No. 20, Alley 1, Lane 768, Sec. 4, Pa-Te Road, Taipei, Taiwan
Filed Feb. 22, 1995, Ser. No. 35,217
Term of patent 14 years
U.S. Cl. D24—111



374,876
SHEATH INTRODUCER
Richard A. Hillstead, Duluth, Ga., and Joseph B. Muhlestein, Bountiful, Utah, assignors to Novoste Corporation, Norcross, Ga.
Filed Jun. 14, 1994, Ser. No. 24,444
Term of patent 14 years
U.S. Cl. D24—112



374,877
OTOSCOPE
F. Paul Butler, 1201 Oakfield Dr., Brandon, Fla. 33511
Filed Jun. 2, 1994, Ser. No. 23,844
Term of patent 14 years
U.S. Cl. D24—137



374,878
FEMORAL IMPLANT
Todd S. Johnson, Fort Wayne, and Kevin M. Greig, Leesburg, both of Ind., assignors to Zimmer, Inc., Warsaw, Ind.
Filed Jun. 9, 1994, Ser. No. 24,171
Term of patent 14 years
U.S. Cl. D24—155

374,879
BALL ABUTMENT FOR A DENTAL IMPLANT
Leif Broberg, Gothenburg, Sweden, assignor to Astra Aktiebolag, Sodertalje, Sweden
Filed Jul. 12, 1995, Ser. No. 41,337
Claims priority, application Sweden, Jan. 12, 1995, 95-0071; Jan. 12, 1995, 95-0072; Jan. 12, 1995, 95-0073
Term of patent 14 years
U.S. Cl. D24—156

374,880
ABUTMENT FOR A DENTAL IMPLANT
Leif Broberg, Gothenburg, Sweden, assignor to Astra Aktiebolag, Sodertalje, Sweden
Filed Jul. 12, 1995, Ser. No. 41,338
Claims priority, application Sweden, Jan. 12, 1995, 95-0071; Jan. 12, 1995, 95-0072; Jan. 12, 1995, 95-0073
Term of patent 14 years
U.S. Cl. D24—156

374,882
PORTABLE BACK MASSAGER
Chin-Chuan Chang, 3rd Floor, No. 3, Lane 2, Sec. 1, Chung-Ching Rd., Taipei, Taiwan
Filed Jan. 31, 1995, Ser. No. 36,124
Term of patent 14 years
U.S. Cl. D24—111

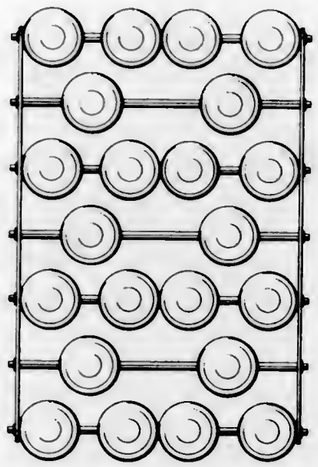
374,884
MASSAGER
Chin-Chuan Chang, 3rd Floor, No. 3, Lane 2, Sec. 1, Chung-Ching Rd., Taipei, Taiwan
Filed Jan. 31, 1995, Ser. No. 36,125
Term of patent 14 years
U.S. Cl. D24—111

374,886
LUMINOUS GANGWAY SIGNPOST
Ronald Lee Hall, Jr., Virginia Beach, Va., assignor to Hall Signs, Inc., Virginia Beach, Va.
Filed Jan. 31, 1995, Ser. No. 36,126
Term of patent 14 years
U.S. Cl. D25—56

374,080
ABUTMENT FOR A DENTAL IMPLANT
Leif Broberg, Gothenburg, Sweden, assignor to Astra Aktiebolag, Sodertalje, Sweden
Filed Jul. 12, 1995, Ser. No. 41,389
Claims priority, application Sweden, Jan. 12, 1995, 95-0070; Jan. 12, 1995, 95-0067; Jan. 12, 1995, 95-0074; Jan. 12, 1995, 95-0075
Term of patent 14 years
U.S. Cl. D24—156

374,081
FORCE APPLYING END OF A CHIROPRACTIC ADJUSTING INSTRUMENT INCLUDING BODY CONTACT MEMBER AND SHANK
Tony S. Keller, Burlington, Vt., and Arlan W. Fuhr, Phoenix, Ariz., assignors to Activator Methods, Inc., Phoenix, Ariz.
Filed May 23, 1995, Ser. No. 39,287
Term of patent 14 years
U.S. Cl. D24—200

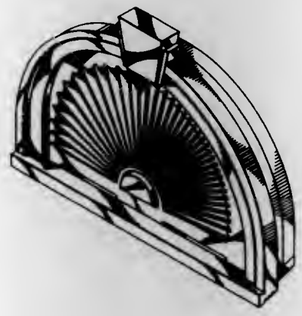
374,082
PORTABLE BACK MASSAGER
David M. Vitko, 973 Fairfield Ave., Columbiana, Ohio 44408
Filed Nov. 17, 1994, Ser. No. 31,102
Term of patent 14 years
U.S. Cl. D24—211



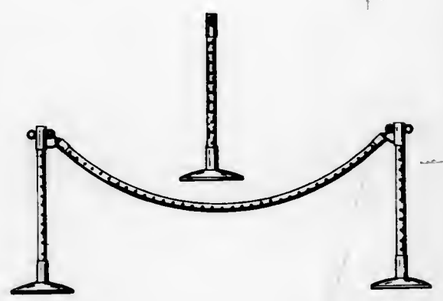
374,083
LINKING MASSAGE BOARD
Bernard B. N. Duh, No. 87, Ming-Teh Rd., Taipei 112, Taiwan
Filed Feb. 28, 1995, Ser. No. 35,476
Term of patent 14 years
U.S. Cl. D24—211

374,084
MASSAGER
Wan-Chun Chen, 903, No. 110, Section 4, Jen-Ai Rd., Taipei, Taiwan
Filed Mar. 14, 1995, Ser. No. 36,154
Term of patent 14 years
U.S. Cl. D24—211

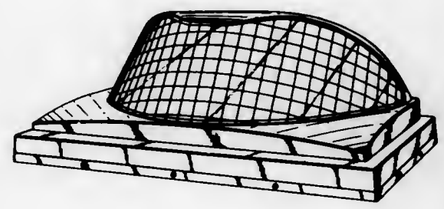
374,085
DECORATIVE HOUSE LOUVER
John F. LaVoie, P.O. Box 15, Springfield, Vt. 05156-9143
Filed Jan. 17, 1995, Ser. No. 33,633
Term of patent 14 years
U.S. Cl. D25—47



374,086
LUMINOUS GANGWAY SIGNPOST
Wim Kabout, Sterrebosiaan 4, 1271 PA Huizen; René R. Waart, Slingerduin 14, 1187 JM Amstelveen, and Eric A. Oehlers, Lambertus hortensiusiaan 17, 1412 GV Naarden, all of Netherlands, assignors to Wim Kabout, Huizen; René R. Waart, Amstelveen, and Eric A. Oehlers, Naarden, all of Netherlands
Filed Oct. 11, 1994, Ser. No. 29,587
Claims priority, application Hague Agreement, May 9, 1994, DM/029 577
Term of patent 14 years
U.S. Cl. D25—50



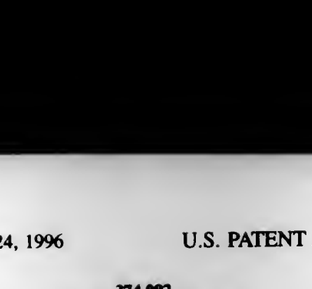
374,087
SKYLIGHT
David A. Eljadi, St. Paul; Loren Abraham, White Bear Lake, and Dawn DeKeyser, Minneapolis, all of Minn., assignors to Andersen Corporation, Bayport, Minn.
Filed Nov. 29, 1994, Ser. No. 31,490
Term of patent 14 years
U.S. Cl. D25—52



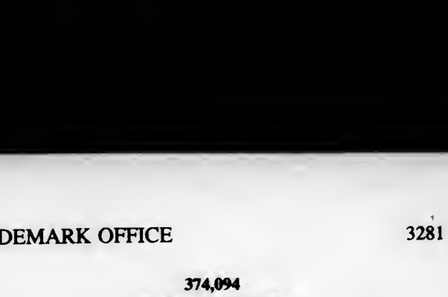
374,088
PREFABRICATED SHELTER
Jeffrey Lee Hall, 1 Hall Rd., Lake Placid, N.Y. 12946
Filed Jan. 17, 1995, Ser. No. 33,634
Term of patent 14 years
U.S. Cl. D25—54

374,090
WINDOW JAMB
Jeffrey Lee Hall, 1 Hall Rd., Lake Placid, N.Y. 12946
Filed Jan. 17, 1995, Ser. No. 33,635
Term of patent 14 years
U.S. Cl. D25—54

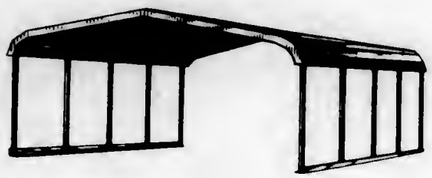
374,092
WINDOW HEADER
Jeffrey Lee Hall, 1 Hall Rd., Lake Placid, N.Y. 12946
Filed Jan. 17, 1995, Ser. No. 33,636
Term of patent 14 years
U.S. Cl. D25—54



374,094
WINDOW JAMB
Jeffrey Lee Hall, 1 Hall Rd., Lake Placid, N.Y. 12946
Filed Jan. 17, 1995, Ser. No. 33,637
Term of patent 14 years
U.S. Cl. D25—54

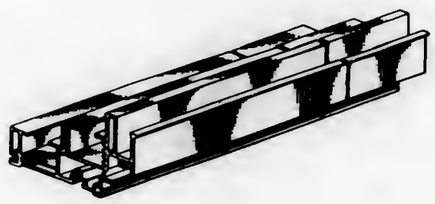


374,088
PREFABRICATED SHELTER
Leroy H. Collier, 716 Gay St., Portsmouth, Ohio 45662
Continuation-in-part of Ser. No. 952,957, Sep. 28, 1992, Pat. No. 5,295,335. This application Mar. 11, 1994, Ser. No. 19,822
Term of patent 14 years
U.S. Cl. D25—56

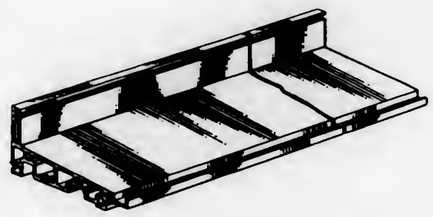


374,089
EXTENSIBLE SUPPORT
Robert S. Meadows, Rt. 5, Box 156, DeRidder, La. 70634
Filed Jun. 30, 1995, Ser. No. 40,970
Term of patent 14 years
U.S. Cl. D25—68

374,090
WINDOW JAMB
Keith Hart, Newmarket, Canada, assignor to Majestic Plastics Ltd., Weston, Canada
Filed Oct. 24, 1995, Ser. No. 45,571
Term of patent 14 years
U.S. Cl. D25—124

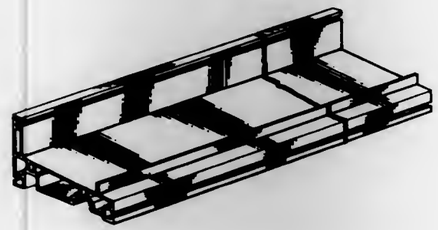


374,091
WINDOW SILL
Keith Hart, Newmarket, Canada, assignor to Majestic Plastics Ltd., Weston, Canada
Filed Oct. 24, 1995, Ser. No. 45,573
Term of patent 14 years
U.S. Cl. D25—124

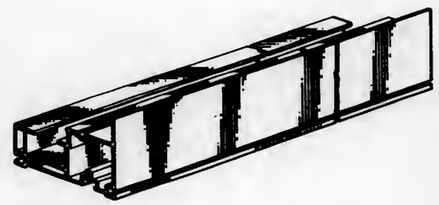


374,092
WINDOW HEADER
Keith Hart, Newmarket, Canada, assignor to Majestic Plastics Ltd., Weston, Canada
Filed Oct. 24, 1995, Ser. No. 45,577
Term of patent 14 years
U.S. Cl. D25—124

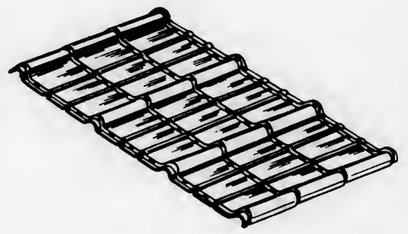
374,093
WINDOW SILL
Keith Hart, Newmarket, Canada, assignor to Majestic Plastics Ltd., Weston, Canada
Filed Oct. 24, 1995, Ser. No. 45,578
Term of patent 14 years
U.S. Cl. D25—124



374,094
WINDOW JAMB
Keith Hart, Newmarket, Canada, assignor to Majestic Plastics Ltd., Weston, Canada
Filed Oct. 24, 1995, Ser. No. 45,579
Term of patent 14 years
U.S. Cl. D25—124



374,095
ROOFING TILE
Luke Y. Ing, Singapore, Singapore, assignor to Besalon International Limited, Hong Kong, Hong Kong
Filed Oct. 3, 1990, Ser. No. 592,072
Claims priority, application New Zealand, Apr. 3, 1990, 23185
Term of patent 14 years
U.S. Cl. D25—140



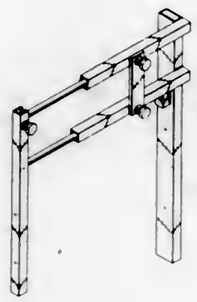
374,096
ADJUSTABLE CURB STAKE

374,098
LANTERN

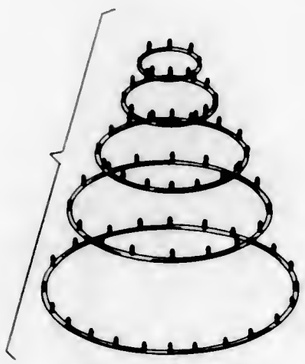
374,100
MINIATURE PORTABLE LAMP

374,102
CHANDELIER

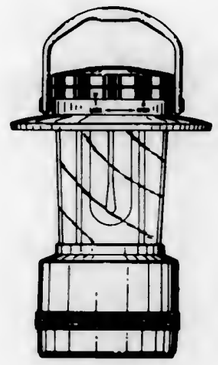
374,096
ADJUSTABLE CURB STAKE
Leroy C. Fischer, 3210 Shadow Canyon Cir., Norco, Calif. 91760
Filed Jul. 8, 1994, Ser. No. 26,781
Term of patent 14 years
U.S. Cl. D25—199



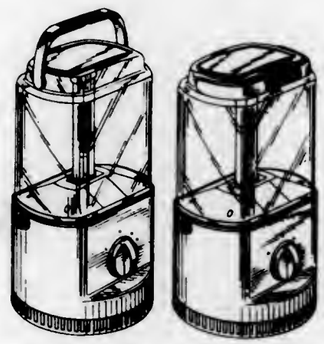
374,097
TREE LIGHTING ASSEMBLY
Vernon Aiken, 135 Cocoanut St., Brentwood, N.Y. 11717
Filed Jun. 22, 1995, Ser. No. 40,606
Term of patent 14 years
U.S. Cl. D26—25



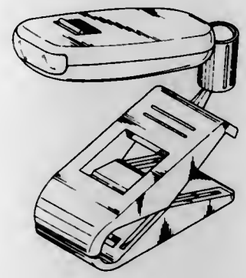
374,098
LANTERN
Ying-Hoi Lo, Kowloon, Hong Kong, assignor to Lomak Industrial Co. Limited, Hong Kong
Filed May 2, 1994, Ser. No. 22,222
Claims priority, application United Kingdom, Nov. 1, 1993, 2034916
Term of patent 14 years
U.S. Cl. D26—37



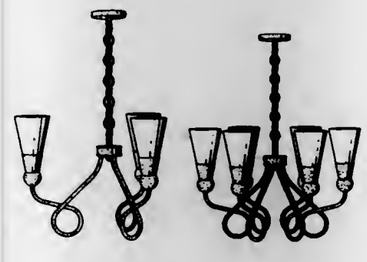
374,099
ELECTRIC LANTERN
David J. Bamber, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.
Filed Nov. 13, 1995, Ser. No. 46,311
Term of patent 14 years
U.S. Cl. D26—41



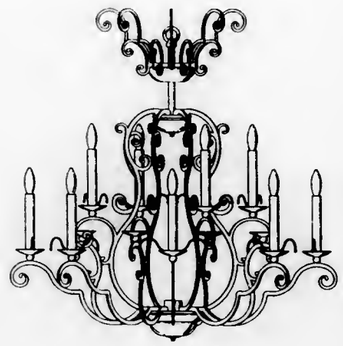
374,100
MINIATURE PORTABLE LAMP
Mike Chen, P.O. Box 55-1670, Taipei (10477), Taiwan
Filed Jul. 10, 1995, Ser. No. 41,219
Term of patent 14 years
U.S. Cl. D26—60



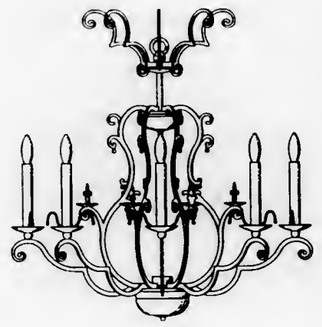
374,101
CHANDELIER
Simon Benghozi, Montreal, Que., Canada, assignor to Bazz Inc., Montreal, Canada
Filed Aug. 26, 1994, Ser. No. 27,654
Term of patent 14 years
U.S. Cl. D26—81



374,102
CHANDELIER
Arnold Schonbek, Plattsburgh, N.Y., assignor to Schonbek Worldwide Lighting Inc., Plattsburgh, N.Y.
Filed Dec. 23, 1994, Ser. No. 32,680
Term of patent 14 years
U.S. Cl. D26—81



374,103
CHANDELIER
Arnold Schonbek, Plattsburgh, N.Y., assignor to Schonbek Worldwide Lighting Inc., Plattsburgh, N.Y.
Filed Dec. 23, 1994, Ser. No. 34,923
Term of patent 14 years
U.S. Cl. D26—81



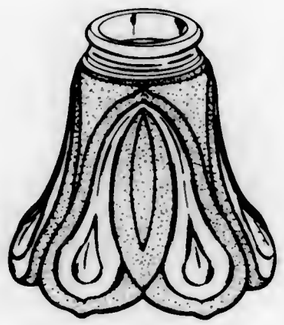
374,104
GLASS SHADE

374,106
LAMPSHADE

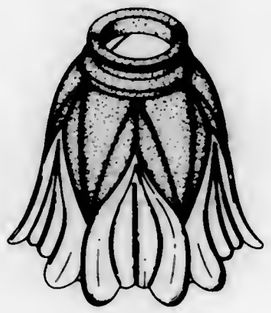
374,109
PET FEEDING STATION

374,110
SCOOPER FRAME FOR REMOVAL OF ANIMAL WASTE

374,104
GLASS SHADE
Jyh-Horng Jen, 3rd F., No. 23, Yuan Huang West Road, Fung Yung, Taichung, Taiwan
Filed Jun. 19, 1995, Ser. No. 40,473
Term of patent 14 years
U.S. Cl. D26—133

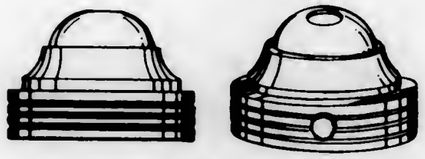


374,105
GLASS SHADE
Sun-Jhy Yan, No. 81, Chung Shan Rd., Fungyung, Taichung, Taiwan
Filed Oct. 27, 1995, Ser. No. 45,713
Term of patent 14 years
U.S. Cl. D26—133

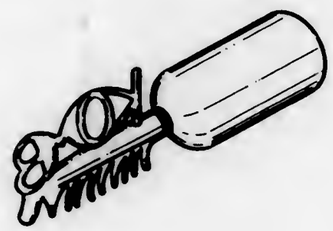


374,106
LAMPSHADE
Yuh-Shyong Wang, 58, Ma Yuan West St., Taichung, Taiwan
Filed Jun. 26, 1995, Ser. No. 40,737
Term of patent 14 years
U.S. Cl. D26—134

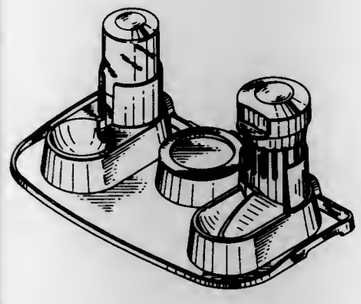
374,107
GLASS SHADE CUP WITH THREE HORIZONTAL LINES
Hsing-Min Keng, Palos Verdes Estates, and Richard W. McDowell, Palos Verdes, both of Calif., assignors to Jinway, Inc., Bell, Calif.
Filed Oct. 24, 1994, Ser. No. 30,244
Term of patent 14 years
U.S. Cl. D26—142



374,108
DISPENSER COMB
Gloria Moody, and Percy M. Miller, both of 660 Valley Crest Dr., Apt. 118-G, Birmingham, Ala. 35215
Filed Dec. 28, 1994, Ser. No. 32,776
Term of patent 14 years
U.S. Cl. D28—25



374,109
PET FEEDING STATION
Stig Lillelund, Gentofte, and Mikael Koch, København, both of Denmark, assignors to Dart Industries Inc., Deerfield, Ill.
Filed Mar. 16, 1995, Ser. No. 36,005
Term of patent 14 years
U.S. Cl. D30—121



374,110
SCOOPER FRAME FOR REMOVAL OF ANIMAL WASTE
Harold L. Hull, 401 Canyon Way #43, Sparks, Nev. 89434; Steven L. Caddel, 1235 Radford Dr., Reno, Nev. 89511, and Matthew T. Pearson, 3945 Covington Dr. Apt. C, Reno, Nev. 89503
Filed Oct. 18, 1994, Ser. No. 29,878
Term of patent 14 years
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TO WHOM

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NOTE— Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Drabb, Thomas W., Jr., 5,559,234, Cl. 544-321.000.
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Brady, Kevin; and Friedmann, Lester, 5,558,747, Cl. 203-17.000.

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Thomson, David, 5,559,514, Cl. 341-143.000.

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Anderson, Stuart W., to General Motors Corporation. Self-cleaning core print. 5,558,152, Cl. 164-340.000.
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Chen, Chih-Ming; and Lee, Der-Yang, 5,558,879, Cl. 424-480.000.
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Gough, Michael L.; and Holloway, Bruce V., 5,559,942, Cl. 395-155.000.
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Zhao, Jun; Cho, Tom; Dornfest, Charles; Wolff, Stefan; Fairbairn, Kevin; Guo, Xin S; Schreiber, Alex; and White, John M., 5,558,717, Cl. 118-715.000.
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Itoh, Mizuki; and Kijima, Takashi, 5,558,942, Cl. 428-426.000.
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Cooke, Richard D. M.; and Curtis, Anthony J., 5,557,984, Cl. 74-574.000.
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Adams, Lowell J., 5,558,304, Cl. 244-134.00A.

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Hyde, Robert W.; Holzworth, William T.; and Baden, Bradley J., 5,558,186, Cl. 188-218.0XL.

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Holcombe, Michael W.; Rothers, David E.; Owens, Steve C.; Henderson, William D.; and Doane, James C., 5,558,153, Cl. 166-373.000.

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Cox, Dennis, 5,558,100, Cl. 128-751.000.

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Peake, Steven C., 5,558,029, Cl. 110-345.000.

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Mousseau, Gary P.; Lazaridis, Mihal; Little, Herb A.; and Barnstijn, Michael A., 5,559,800, Cl. 370-85.130.

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Thigpen, Gary M.; Sherwood, William H., Jr.; and Fielder, Coy M., 5,558,170, Cl. 175-57.000.

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Kast, Jürgen; von Deyn, Wolfgang; Nübling, Christoph; Walter, Helmut; Gerber, Matthias; and Westphalen, Karl-Otto, 5,559,218, Cl. 534-850.000.
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Behner, Otto; Wollweber, Hartmund; Rosen, Bruno; Zaiss, Siegfried; and Goldmann, Siegfried, 5,559,139, Cl. 514-356.000.
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Chu, Amy H.; and Stover, Lon R., 5,558,834, Cl. 422-55.000.
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Brooks, Dennis L.; Bayot, Alfredo G.; Chow, Mina W. B.; and Muller, Paul F., 5,558,101, Cl. 728-772.000.

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Steiner, Urs, 5,559,327, Cl. 250-292.000.

Bearden, Charles R. Substitute ground surface material, preparation method therefor, and ground treatment method. 5,559,166, Cl. 523-132.000.

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Beck, John P., to Rosemount Aerospace Inc. Injection molding nozzle heater clamp. 5,558,888, Cl. 425-549.000.

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Cochran, Danny M. Sleep-preventing alarm operable in conjunction with a motor vehicle. 5,559,495, Cl. 340-457.000.

Cocoma, John P.; Boroweic, Joseph C.; and Wilson, Ronald H., to General Electric Company. Apparatus for securing an amalgam at the apex of an electrodeless fluorescent lamp. 5,559,392, Cl. 313-490.000.

Cody, Charles A.: *See—*
Kennetz, Steven; and Cody, Charles A., 5,558,777, Cl. 210-691.000.

Cody, G. Lee, to Rich-Mar Corporation. Therapeutic ultrasonic device. 5,558,623, Cl. 601-2.000.

Coe, James V., Jr.: *See—*
Bbushan, Bharat; Coe, James V., Jr.; and Gupta, Balkishan, 5,558,903, Cl. 427-11.000.

Coelho, Philip H.; and Wolf, Terry, to ThermoGenesis Corporation. Rapid cooling through a thin flexible membrane. 5,557,943, Cl. 62-376.000.

Cogema: *See—*
Amiet, Pierre; and Roillet, Serge, 5,559,843, Cl. 376-261.000.

Cohee, Donald R.; Sandy, Charles; Martz, Pete; Clougherty, M. James; and Pauly, Robert, to ILC Dover Incorporated. Apparatus for blocking fluid flow through a conduit responsive to an emergency condition. 5,558,131, Cl. 138-93.000.

Cohen, Nissim C.: *See—*
Göschke, Richard; Maibaum, Jürgen K.; Schilling, Walter; Stutz, Stefan; Rigollier, Pascal; Yamaguchi, Yasuchika; Cohen, Nissim C.; and Herold, Peter, 5,559,111, Cl. 514-227.500.

Cohen, Peter D.; and Haight, Carl, to Water-Jel Technologies, Inc. Water-based formulation for the treatment of sunburn. 5,558,914, Cl. 424-59.000.

Cohen, Stephen A.; Edelstein, Daniel C.; Grill, Alfred; Paraszczak, Jurij R.; and Patel, Vishnubhai V., to International Business Machines Corporation. Diamond-like carbon for use in VLSI and ULSI interconnect systems. 5,559,367, Cl. 257-77.000.

Coherent, Inc.: *See—*
Dewey, David A.; Arnett, Michael; Koop, Dale E.; and Trost, David, 5,558,666, Cl. 606-9.000.
Yarborough, J. Michael; Anderson, R. Rox; Marcellino, George; and Mitchell, Gerald M., 5,558,667, Cl. 606-9.000.

Colclough, Terence; Beltzer, Morton; and Habeeb, Jacob J., to Exxon Chemical Patents Inc. Lubricating compositions. 5,558,805, Cl. 508-243.000.

Cole, Arthur W.; and Heffernan, John M., to Wheelabrator Environmental Systems, Inc.; and Carborundum Company, The. Refractory tile for open-spaced boiler tubes. 5,558,045, Cl. 122-6.00A.

Coleman, John D.: *See—*
Stevens, Albert F.; Chodack, Jeffrey L.; Lange, Russell M.; Dewitt, Robert R.; Coleman, John D.; Bressler, Peter W.; and Forsyth, Keith W., 5,558,232, Cl. 209-584.000.

Colley, James D.: *See—*
Moser, Robert E.; Owens, David R.; Wilhelm, James H.; Colley, James D.; and Hargrove, Oliver W., Jr., 5,558,848, Cl. 423-243.010.

Collins Co., Ltd.: *See—*
Chang, Chih-Huang, 5,558,397, Cl. 297-281.000.

Collins, Theresa A., to Wesley-Jessen Corporation. Imaging system for plastic components. 5,559,848, Cl. 378-58.000.

Colson, Kennie R. Universal mount fishing rod holder. 5,557,877, Cl. 43-21.200.

Coltrain, Bradley K.: *See—*
DePalma, Vito A.; Spahn, Robert G.; Coltrain, Bradley K.; Musshafen, George N.; and Girolmo, Sharon R., 5,558,977, Cl. 430-496.000.

Colwell, Betsy P.; Wagner, Wendy A.; Graham, Paul; and Kline, John, to Droll Yankees, Inc. Bird feeder. 5,558,040, Cl. 119-52.200.

Combi Corporation: *See—*
Ishikura, Takashi; and Takahashi, Hayato, 5,558,405, Cl. 297-487.000.

Combustion Electromagnetics, Inc.: *See—*
Ward, Michael A. V.; Hill, Winfield; and Pennell, Arthur J., 5,558,071, Cl. 123-598.000.

Cominco Ltd.: *See—*
Blaricom, Richard Van, 5,558,756, Cl. 205-789.500.

Commissariat a l'Energie Atomique: *See—*
Bruel, Michel, 5,559,043, Cl. 437-24.000.
Valette, Serge, 5,559,823, Cl. 372-92.000.

Commodore Laboratories, Inc.: *See—*
Mouk, Robert W.; and Abel, Albert E., 5,559,278, Cl. 588-205.000.

Compaq Computer Corporation: *See—*
Buras, Kenneth J., Jr.; and Condra, Neil L., 5,559,672, Cl. 361-684.000.
Eichberger, David; and Forlenza, Nicholas G., 5,559,589, Cl. 355-260.000.
Farrand, Scott C.; Didner, Jonathan R.; Mazina, Daniel J.; Autor, Jeffrey S.; Muraski, Paul J.; Stewart, Gregory M.; and Dysart, John A., 5,559,958, Cl. 395-183.030.
Stancil, Charles J.; Vaughn, William M.; and Wolford, Jeff W., 5,559,968, Cl. 395-306.000.

Compu-Time (Proprietary) Limited: *See—*
Van Huyssteen, Alastair M., 5,559,872, Cl. 379-130.000.

Conder, Michael J.; McAda, Phyllis C.; Rambosek, John A.; and Reeves, Christopher D., to Merck & Co., Inc. Bioprocess for preparing 7-ACA and 7-ADAC. 5,559,005, Cl. 435-47.000.

Condon, Duane R.; and Davis, Richard G. Wall mounted box for connecting a P-trap to a trap arm. 5,558,119, Cl. 137-360.000.

Condra, Neil L.: *See—*
Buras, Kenneth J., Jr.; and Condra, Neil L., 5,559,672, Cl. 361-684.000.

Condux International, Inc.: *See—*
Hoium, Jonathan A.; and Hasse, Gregory L., 5,559,294, Cl. 73-862.440.

Confab, Inc.: *See—*
Jezzi, Arrigo D.; Schroer, Charles F., Jr.; Gephart, Caroline; and Biesterveld, Daniel D., 5,558,655, Cl. 604-378.000.

Confalonieri, Pierangelo: *See—*
Nicollini, Germano; Confalonieri, Pierangelo; and Crippa, Carlo, 5,559,687, Cl. 363-60.000.

Conlan, Joseph: *See—*
Menard, Alan W.; Wolfson, Larwence S.; and Conlan, Joseph, 5,558,320, Cl. 271-4.010.

Connaught Laboratories Limited: *See—*
Filmus, Jorge; and Klein, Michel, 5,559,027, Cl. 435-240.200.

Connell, Gary W.: *See—*
Sublett, Bobby J.; and Connell, Gary W., 5,559,159, Cl. 521-48.500.

Connell, James E., Jr.: *See—*
Sarkady, Michael D.; Reisinger, Jason M.; Pauza, William V.; Fetterolf, James R., Sr.; and Connell, James E., Jr., 5,558,534, Cl. 439-352.000.

Connolly, George C., Jr., to United States of America, Navy. Acoustic intercept reciever-combined frequency and bearing processor. 5,559,756, Cl. 367-125.000.

Connolly, John R.; and Forbes, Terry L., to Borg-Warner Automotive, Inc. Solenoid valve harness. 5,558,311, Cl. 251-129.150.

Connolly, Thomas: *See—*
Crowley, H. W.; Clifford, John W.; Connolly, Thomas; Fairhurst, John R.; and Taylor, Bruce, 5,558,319, Cl. 270-58.310.

Connors, Paul A.; and Robertson, Alan L., to Lucent Technologies Inc. Method and apparatus for detecting references to deallocated memory in a dynamic memory allocation system. 5,559,980, Cl. 395-427.000.

Constantinescu, Eugen; and Wagner, Robert F., to Ohio Mattress Licensing and Components Group. Multi-fold interlockable spring for use in mattress foundation assemblies. 5,558,315, Cl. 267-103.000.

Contex Incorporated: *See—*
Hojyo, Tetsuya, 5,559,364, Cl. 257-666.000.

Convex Computer Corporation: *See—*
Watson, Thomas L.; Chastain, David M.; and Brewer, Tony M., 5,560,027, Cl. 395-800.000.

Conway, Marlene E.; Jooste, Francois; and Smith, Michael D., to Knowaste Technologies Inc. Treatment of absorbent sanitary paper products. 5,558,745, Cl. 162-60.000.

Cook, Alec: *See—*
Kirchberg, Maurice; and Cook, Alec, 5,559,689, Cl. 363-95.000.

Cook, David; Wollowitz, Susan; and Nerio, Aileen, to Steritech, Inc. Treating red blood cell solutions with anti-viral agents. 5,559,250, Cl. 549-282.000.

Cook, Raymon W., to Kliker Golf Company, Inc. Golf club head. 5,558,332, Cl. 473-341.000.

Cooke, Richard D. M.; and Curtis, Anthony J., to Automotive Products, plc. Twin mass flywheel. 5,557,984, Cl. 74-574.000.

Cooper Cameron Corporation: *See—*
Hopper, Hans P., 5,558,532, Cl. 439-310.000.

Cooper Industries: *See—*
Happ, Lawrence R.; and Alfaro, Conrad, 5,559,662, Cl. 361-104.000.

Cooper Industries, Inc.: *See—*
Hassler, Stephen P.; Johnson, Stephen P.; and Lapp, John, 5,559,488, Cl. 337-158.000.

Cooper, James L.; and Adams, Mark, to ELDEC Corporation. Solid-state high voltage crowbar circuit. 5,559,658, Cl. 361-56.000.

Cooperatie Suikerunie U.A.: *See—*
Kuzee, Hendrika C.; Hoeks, Theodorus L.; and Visschedijk, Paulus J., 5,558,899, Cl. 426-658.000.

Coors Brewing Company: *See—*
Miller, David R.; and Fischer, Gregory J., 5,558,202, Cl. 198-624.000.

Cope, Dewey M.; and Magrecki, Thomas J., to Elgin National Industries, Inc. Centrifugal separator having a cone frustum. 5,558,770, Cl. 210-374.000.

Corain, Luciano: *See—*
Bortoli, Giulio; and Corain, Luciano, 5,558,133, Cl. 139-448.000.

Corbin, David R.; Greenplate, John T.; Jennings, Michael G.; Purcell, John P.; and Sammons, Robert D., to Monsanto Company. Method of controlling insects. 5,558,862, Cl. 424-94.400.

Corby, Michael P., to Diversey Corporation. Iodophors, production and use thereof. 5,558,881, Cl. 424-672.000.

Core Systems, Inc.: *See—*
Telingator, Eric; Ward, Owen; and Ross, Edward J., 5,559,692, Cl. 364-401.00R.

Cornea, Joel T.; and Tomlin, Andrew J., to Chrysler Corporation. Tapping plate and retention bracket assembly. 5,558,369, Cl. 280-800.000.

Cornelius, Richard G., to SciMed Life Systems, Inc. Variable stiffness multi-lumen catheter. 5,558,645, Cl. 604-96.000.

Cornell, Michael E.: *See—*
Williams, Richard K.; Yilmaz, Hamza; Cornell, Michael E.; and Chen, Jun W., 5,559,044, Cl. 437-34.000.

Cornell Research Foundation, Inc.: *See—*
Chang, Yung-Fu, 5,559,008, Cl. 435-69.100.
Lee, Luan L.; and Berger, Toby, 5,559,895, Cl. 382-119.000.

Corning Incorporated: *See—*
Cain, Michael B., 5,558,687, Cl. 55-233.000.
Chervenak, William J.; and Wagner, Robert S., 5,558,692, Cl. 65-382.000.

Dumbaugh, William H., Jr.; Gulati, Suresh T.; and Pfitzenmaier, Robert W., 5,559,060, Cl. 501-66.000.
Lerminiaux, Christian, 5,559,913, Cl. 385-43.000.
Moskovich, Jacob, 5,559,637, Cl. 359-708.000.

Corrigan, George H., III, to Hewlett-Packard Company. Power circuit with energy recovery for driving an electroluminescent device. 5,559,402, Cl. 315-169.300.

Corry, Kevin A. Cooling system pressure testing device for leak detection. 5,557,966, Cl. 73-49.700.

Corsi, Giordano B.; Brandt, Alberto; and Cecchetelli, Loredana, to Instituto Biochimico Italiano Giovanni Lorenzini S.p.A. Process for the preparation of sterile amoxycillin sodium salt. 5,559,241, Cl. 548-178.000.

Costa, Jill B.: *See*—
Severns, John C.; Sivik, Mark R.; Hartman, Frederick A.; Denutte, Hugo R. G.; Costa, Jill B.; and Chung, Alex H., 5,559,088, Cl. 510-102.000.

Cote, William J.; and Lofaro, Michael F., to International Business Machines Corporation. Method and apparatus for uniform polishing of a substrate. 5,558,563, Cl. 451-41.000.

Coteus, Paul W.; and Lanzetta, Alphonso P., to International Business Machines Corporation. Pad on pad type contact interconnection technology for electronic apparatus. 5,558,523, Cl. 439-67.000.

Couch, Richard W., Jr.; Sanders, Nicholas A.; Lu, Zhipeng; Luo, Lifeng; and Stenfelt, Staffan C. O., to Hypertherm, Inc. Process for high quality plasma arc and laser cutting of stainless steel and aluminum. 5,558,786, Cl. 219-121.440.

Coughlin, Peter K.: *See*—
Chen, Oianjun; Coughlin, Peter K.; and Pellet, Regis J., 5,559,068, Cl. 502-213.000.

Covino, James J.; and Sousa, Jose R., to International Business Machines Corporation. Interlocked restore circuit. 5,559,453, Cl. 326-93.000.

Cowan, Cathy L.; and Lau, Stephen Y., to Semi-Gas Systems, Inc. Block filter-purifier. 5,558,688, Cl. 55-312.000.

Cox, David I., to Eaton Corporation. Neutral position detent for synchronizer. 5,558,194, Cl. 192-53.310.

Cox, Dennis, to Ballard Medical Products. Biopsy forceps for obtaining tissue specimen and optionally for coagulation. 5,558,100, Cl. 128-751.000.

Crane, David O.; Golding, Ian B.; and Lester, Andrew C., to Crane Electronics Limited. Torque transducers. 5,557,975, Cl. 73-862.338.

Crane Electronics Limited: *See*—
Crane, David O.; Golding, Ian B.; and Lester, Andrew C., 5,557,975, Cl. 73-862.338.

Crawford, Mark A.; Erskine, Timothy J.; and Peterson, Gerald H., to Becton Dickinson and Company. Apparatus and method for a needle tip cover. 5,558,651, Cl. 604-263.000.

Createchnic AG: *See*—
Dubach, Werner F., 5,558,116, Cl. 137-101.110.

Cree, James W.: *See*—
Weinberger, Eric P.; Lavash, Bruce W.; Olsen, Robb E.; and Cree, James W., 5,558,663, Cl. 604-387.000.

Cretois, Isabelle, to L'Oreal. Composition for the treatment and protection of the exoskeletal parts based on ceramides and vinylpyrrolidone polymers. 5,558,859, Cl. 424-70.150.

Cricchi, James R.; Potyraj, Paul A.; and Salih, Mike L., to Northrop Grumman Corporation. Silicon integrated circuit with passive devices over high resistivity silicon substrate portion, and active devices formed in lower resistivity silicon layer over the substrate. 5,559,349, Cl. 257-273.000.

Crina S.A.: *See*—
Rossi, Jean, 5,558,889, Cl. 426-89.000.

Crippa, Carlo: *See*—
Nicollini, Germano; Confalonieri, Pierangelo; and Crippa, Carlo, 5,559,687, Cl. 363-60.000.

Crisler, Kenneth J.: *See*—
Gilbert, Stephen S.; Needham, Michael L.; and Crisler, Kenneth J., 5,559,810, Cl. 371-5.100.

Croci, Tiziano: *See*—
Guzzi, Umberto; Palmieri, Costantino; and Croci, Tiziano, 5,559,238, Cl. 546-314.000.

Crosspoint Solutions, Inc.: *See*—
Allman, Gary L., 5,559,425, Cl. 323-315.000.

Croswell, Ted B., Sr. Process for removing zebra mussels from rigid structures. 5,558,108, Cl. 134-22.120.

Crowley, H. W.; Silva, Stephen E.; Bianchetto, Peter E.; Clifford, John W.; and Taylor, Bruce J., to Roll Systems, Inc. Separator for forming discrete stacks of folded web. 5,558,318, Cl. 270-39.050.

Crowley, H. W.; Clifford, John W.; Connolly, Thomas; Fairhurst, John R.; and Taylor, Bruce, to Roll Systems, Inc. Web stacker and separator with sheet offsetting kicker. 5,558,319, Cl. 270-58.310.

Crump, Dwayne T.; and Pancoast, Steven T., to International Business Machines Corporation. Automatic backup system for advanced power management. 5,560,023, Cl. 395-750.000.

CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Campi, Domenico; and Neitzert, Heinz-Christoph, 5,559,323, Cl. 250-214.100.

CSIR: *See*—
Mienie, Lodewyk J.; Van Steenderen, Ronald A.; Erasmus, Elardus; Ueckermann, Julius H.; De Wet, Wouter J.; and Els, Henning J., 5,559,036, Cl. 436-63.000.

Cuevas, Jess A., to TRW Inc. Dual stage augmented inflator for an air bag. 5,558,367, Cl. 280-737.000.

Cullimore, Ian H. S.: *See*—
Harper, Leroy D.; Schlichting, Grayson C.; Hooks, Douglas A.; Cullimore, Ian H. S.; Bradshaw, Gavin A.; Banerjee, Biswa R.; Fairbanks, John P.; and Stone, Roderick W., 5,560,024, Cl. 395-750.000.

Cummins Engine Company, Inc.: *See*—
Blizard, Norman C.; and Free, Paul D., 5,558,067, Cl. 123-501.000.
Zhao, Alan H., 5,558,066, Cl. 123-495.000.

Cunningham, Earl A., to International Business Machines Corporation. Peak detection circuit for suppressing magnetoresistive thermal asperity transients in a data channel. 5,559,460, Cl. 327-179.000.

Curen, Greg V.: *See*—
Westrick, Michael D.; and Curen, Greg V., 5,559,498, Cl. 340-573.000.

Curry, Richard A.: *See*—
Cerny, John R.; El-Zein, Mohamad S.; Curry, Richard A.; Popelier, Maurice A.; and Krause, Harold E., 5,558,368, Cl. 280-781.000.

Curtis, Anthony J.: *See*—
Cooke, Richard D. M.; and Curtis, Anthony J., 5,557,984, Cl. 74-574.000.

Cybulski, Stephen. Bed sheeting arrangement. 5,557,814, Cl. 5-496.000.

Cypress Semiconductor: *See*—
Rees, David, 5,559,447, Cl. 326-30.000.

Cypress Semiconductor Corporation: *See*—
Shah, Shailesh, 5,559,465, Cl. 327-374.000.

Cyr, Clark R.; Kimmich, Jon B.; Brewer, Timothy T.; Hanson, Jeffrey S.; Richardson, Miles; Robertson, Kenneth R.; Jenkins, Cheryl; Diaz, Brenda L.; Pierce, John G.; and Lee, Gregory, to Microsoft Corporation. Method and apparatus customizing a dual actuation setting of a computer input device switch. 5,559,943, Cl. 395-155.000.

Cyr, Robert D.: *See*—
McKenney, Darryl J.; and Cyr, Robert D., 5,557,843, Cl. 29-851.000.

Cytel Corporation: *See*—
Gaeta, Federico C. A.; and DeFrees, Shawn A., 5,559,103, Cl. 514-54.000.

D. Swarovski & Co.: *See*—
Bilek, Norbert; Porcham, Wolfgang; Schlamadinger, Michael; and Sprachmann, Gerold, 5,559,061, Cl. 501-69.000.

Dadoo, Manoj: *See*—
Lenkov, Dmitry; Unni, Shankar; Mehta, Michey; McDowell, Mark W.; Dadoo, Manoj; and Melli, Bruno, 5,560,009, Cl. 395-700.000.

Dadura, Robert J.: *See*—
Labrie, Craig B.; Bemis, Claude E.; and Dadura, Robert J., 5,558,731, Cl. 156-78.000R.

Daewoo Electronics Co., Ltd.: *See*—
Bae, Hong-Moon, 5,559,607, Cl. 358-342.000.
Kim, Seong-Min, 5,559,771, Cl. 369-44.350.

Dahl, Kim V., to Morton International, Inc. Slide-on combustion chamber for automotive airbag module. 5,558,363, Cl. 280-728.200.

Dahlin, Jan E. Å. S.: *See*—
Dent, Paul W.; Raith, Alex K.; and Dahlin, Jan E. Å. S., 5,559,886, Cl. 380-23.000.

Dahowski, Donald E., to Quaker Plastic Corporation. Thermoformable plastic framin/connecting strip. 5,557,904, Cl. 52-631.000.

Dai, Susan W. S.; Gayton, Donald W.; Laird, Brian G.; Tkatch, Randy T.; Bettis, Sonny; Fitzhugh, Marc; Williams, Shandton; Lowman, Phillip; and Gonzalez, Julio, to Glenayre Electronics, Inc. Paging system that allows caller/subscriber interconnection. 5,559,859, Cl. 379-51.000.

Daicel Chemical Industries, Ltd.: *See*—
Matsuyama, Akinobu; Tomita, Akira; and Kobayashi, Yoshinori, 5,559,030, Cl. 435-280.000.

Daigle, Richard A.: *See*—
Hoover, Michael K.; Miller, Barrick H.; Schurenberg, Kurt; and Daigle, Richard A., 5,560,005, Cl. 395-600.000.

Daiichi, Denso Buhin Co., Ltd.: *See*—
Takano, Tsunesuke; and Sinzawa, Kouichi, 5,558,543, Cl. 439-699.200.

Daiichi Pharmaceutical Co., Ltd.: *See*—
Nishi, Toshiyuki; Koda, Hiroko; Sugita, Kazuyuki; Ishida, Yohhei; Takemura, Makoto; and Hayano, Takeshi, 5,559,224, Cl. 540-350.000.

Daiichi Pure Chemicals Co., Ltd.: *See*—
Kawahara, Sumi; Abe, Toshikatsu; and Hosoi, Kenji, 5,559,003, Cl. 435-28.000.

Daikoku, Takahiro: *See*—
Hayashi, Yutaka; Miyamoto, Mitsuo; Watarai, Michihito; Atarashi, Takayuki; Tanaka, Tetsuya; Hatada, Toshio; Takada, Yoshihiro; and Daikoku, Takahiro, 5,558,493, Cl. 415-208.100.

Daily, Michael J., to Hughes Aircraft Company. Apparatus and method for self-calibrating visual time-to-contact sensor. 5,559,695, Cl. 364-424.010.

Daitoku, Koichi: *See*—
Kazami, Kazyuki; Daitoku, Koichi; Wakabayashi, Tsutomu; Goto, Tetsuro; Ezawa, Akira; and Tomino, Naoki, 5,559,568, Cl. 354-106.000.

Dallanoce, Clelia M. L.: *See*—
Trani, Aldo; Dallanoce, Clelia M. L.; and Ciabatti, Romeo, 5,559,249, Cl. 549-264.000.

Dambly, Ben: *See*—
Marozzi, John; Rochon, Greg; Patel, Urmil; and Dambly, Ben, 5,558,020, Cl. 101-228.000.

Dan, James R.; Caverley, Charles R.; Schechter, Steven A.; Seeley, Steven S.; Jameson, Chris A.; and Lee, David A., to Hughes Aircraft Company. BI-directional shock isolation mounting system and method. 5,559,671, Cl. 361-682.000.

Dana Corporation: *See*—
Kestly, Michael J.; and Lehmann, Rob, 5,558,344, Cl. 277-167.500.

D'Andrea, Stanley V.: *See*—
Kim, Choung U.; Mansuri, Muzammil M.; Misco, Peter F., Jr.; Wichtowski, John A.; Bronson, Joanne J.; D'Andrea, Stanley V.; and Hudyma, Thomas W., 5,559,108, Cl. 514-203.000.

Daniell, Michael G.; and Clark, Andrew B., to Fisher & Paykel Limited. Humidifier with delivery tube condensation preventing structure and control. 5,558,084, Cl. 128-203.170.

Dannheim, Jörg; and Russ, Werner H., to Hoechst Aktiengesellschaft. Black mixture of fibre-reactive azo dyes containing essentially a navy-blue disazo dye and an orange monoazo dye, as well as novel fibre-reactive phenylazonaphthol dyes containing A 2-(2'-sulfophenylamino)-4-fluoro-1,3,5-triazin-6-ylamino group. 5,559,215, Cl. 534-573.000.

Dannöhl, Peter F., to Druckluft-Dannohl GmbH. Apparatus for producing nitrogen under high pressure. 5,558,141, Cl. 141-197.000.

Dany, Jean-Claude: *See*—
Mourot, Christophe; Wautier, Armelle; and Dany, Jean-Claude, 5,559,723, Cl. 364-517.000.

Danzl, Martin: *See*—
Fürst, Arpad; Danzl, Martin; Mayer, Johann; and Miklosi, Stefan, 5,558,388, Cl. 296-107.000.

Dao, Anthony X.: *See*—
de la Fuente, Horacio M.; Eubanks, Michael C.; and Dao, Anthony X., 5,558,182, Cl. 188-67.000.

Dapper, Mark J.; Geile, Michael J.; and Carlin, Barry W., to Xetron Corp. Equalization system for AM compatible digital receiver. 5,559,830, Cl. 375-230.000.

Darcie, Thomas E.; Frigo, N. J.; and Magill, Peter D., to Lucent Technologies Inc. Communication system based on remote interrogation of terminal equipment. 5,559,624, Cl. 359-125.000.

Daringer, Ronald G., to Maryland Wire Belts, Inc. Modular components and weld-free belting assembly. 5,558,204, Cl. 198-778.000.

Darling, Thomas G. Training device for martial art athletes. 5,558,607, Cl. 482-95.000.

D'Arrigo, Claudio. Antineoplastic chemotherapeutic of plant origin, having high selectivity and greatly reduced toxicity, and process for the preparation thereof. 5,558,866, Cl. 424-195.100.

Darsey, Ralph J.; and Horne, Gregory D., to Lucent Technologies Inc. Apparatus and method to prevent flailing damage to a strand wound on a spool. 5,558,287, Cl. 242-18.00R.

Das, Shyam C. Narrow track thin film head for high track density recording. 5,559,654, Cl. 360-126.000.

Dasher, James F.; and Fiori, Michael A., to Whirlpool Corporation. Pull-out freezer floor for refrigerator and freezers. 5,558,419, Cl. 312-404.000.

Dashevsky, Leon G., to Innovex Inc. Three axis control for machine tool. 5,558,557, Cl. 451-10.000.

Dassel, Mark W.: *See*—
Vassiliou, Eustathios; and Dassel, Mark W., 5,558,842, Cl. 422-108.000.

Dataproducts Corporation: *See*—
Vo, Giang; and Okada, Akihiro, 5,559,539, Cl. 347-33.000.

Datta, Madhav; and Shenoy, Ravindra V., to International Business Machines Corporation. Method for making a thin flexible primary battery for microelectronics applications. 5,558,957, Cl. 429-127.000.

Daugherty, David W., Jr., to Westinghouse Air Brake Company. Freight railway car slackless drawbar assembly. 5,558,238, Cl. 213-50.500.

Dauzat, Marc: *See*—
Abed, Patrick; Dauzat, Marc; Rouxel, Jean-Marc; and Nogues, Michel, 5,558,715, Cl. 118-429.000.

Davidson, Robert: *See*—
Wengler, James J., 5,558,382, Cl. 294-157.000.

Davidson, Robert L.; and Myhrvold, Nathan, to Microsoft Corporation. Method and system for generating and auditing a signature for a computer program. 5,559,884, Cl. 380-4.000.

Davidson Textron Inc.: *See*—
Labrie, Craig B.; Bemis, Claude E.; and Dadura, Robert J., 5,558,731, Cl. 156-78.000.

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Focke, Heinz; and Spöring, Heido, to Focke & Co. (GmbH & Co.). Hinge-lid pack for cigarettes. 5,558,217, Cl. 206-268.000.
Focke, Heinz, to Focke & Co. (GmbH & Co.). Apparatus for shaping blanks for hinge-lid packs with especially rounded longitudinal edges. 5,558,611, Cl. 493-162.000.
Focke, Heinz; and Schlenker, Michael, to Focke & Co. (GmbH & Co.). Packaging machine for cigarette packs. 5,558,743, Cl. 156-352.000.
Fogal, Rich; and Ball, Michael B., to Micron Technology, Inc. Lead finger tread for a semiconductor lead package system. 5,559,366, Cl. 257-666.000.
Fogler, Andreas, to Siemens Aktiengesellschaft. Method for transmitting message cells via redundant virtual path pairs of an atm communication network. 5,559,959, Cl. 395-183.190.
Fogle, Homer W., Jr.; Bailey, Todd; Pitstick, Brian R.; and Streif, Eric, to TRW Inc. Initiator assembly for air bag inflator. 5,558,366, Cl. 280-736.000.
Fogle, James C., to Riverwood International Corporation. Triangular article carrier. 5,558,224, Cl. 206-427.000.
Foley, Denis; Steinman, Maurice B.; and VanDoren, Stephen R., to Digital Equipment Corporation. Method and apparatus for updating a duplicate tag status in a snoop bus protocol based computer system. 5,559,987, Cl. 395-471.000.
Forbes, James F.: *See*—
Horn, Jerold S.; and Forbes, James F., 5,558,516, Cl. 433-9.000.
Forbes, Terry L.: *See*—
Connolly, John R.; and Forbes, Terry L., 5,558,311, Cl. 251-129.150.
Ford, Colin: *See*—
Moncrief, Frank; Bacco, David R.; McNamara, Charles; Smith, Dwight L.; and Ford, Colin, 5,558,489, Cl. 414-793.700.
Ford Motor Company: *See*—
Bryant, Bruce D.; Marko, Kenneth A.; and James, John V., 5,559,285, Cl. 73-117.300.
Petersen, James R.; and Champagne, Raymond T., 5,558,176, Cl. 180-68.300.
Stockton, Thomas R., 5,557,977, Cl. 74-15.840.
Forghieri, Fabrizio: *See*—
Chraplyvy, Andrew R.; Forghieri, Fabrizio; Gnauck, Alan H.; and Tkach, Robert W., 5,559,920, Cl. 385-123.000.
Forkner, John F.; Riser, Andrew P.; Rykowski, Ronald F.; and Wilson, Stephen S., to Radiant Imaging, Inc. Optical fiber coupler using segmented lenses. 5,559,911, Cl. 385-33.000.
Forlenza, Nicholas G.: *See*—
Eichberger, David; and Forlenza, Nicholas G., 5,559,589, Cl. 355-260.000.
Forma Scientific, Inc.: *See*—
Rode, Donald W., 5,558,437, Cl. 366-208.000.
Formica Technology Inc.: *See*—
Albrinck, Donald J.; and Mascavage, John J., 5,558,906, Cl. 427-180.000.
Forster, William V.: *See*—
Toni, Darryl M.; Grant, Peter L.; Johnson, Craig F.; Hayse, Steven R.; Forster, William V.; Nowak, Kenneth; and Osiecki, Larry J., 5,558,919, Cl. 428-116.000.
Forsyth, Keith W.: *See*—
Stevens, Albert F.; Chodack, Jeffrey L.; Lange, Russell M.; Dewitt, Robert R.; Coleman, John D.; Bressler, Peter W.; and Forsyth, Keith W., 5,558,232, Cl. 209-584.000.
Fortin, Michel: *See*—
Clemence, François; Fortin, Michel; and Le Martret, Odile, 5,559,130, Cl. 514-326.000.
Foster, Clark B.: *See*—
Haber, Terry M.; Smedley, William H.; and Foster, Clark B., 5,558,874, Cl. 424-402.000.
Foster, John, to Praxair S.T. Technology, Inc. Electrodeposited composite coatings. 5,558,758, Cl. 205-50.000.
Fox, James A.: *See*—
Miljanich, George P.; Bowersox, Stephen S.; Fox, James A.; Valentino, Karen L.; Bitner, Robert S.; and Yamashiro, Donald H., 5,559,095, Cl. 514-12.000.
Framatome: *See*—
Amiet, Pierre; and Roillet, Serge, 5,559,843, Cl. 376-261.000.
France Telecom: *See*—
Devaux, Fabrice, 5,559,628, Cl. 359-248.000.
Pecot, Alain; and Lesueur, Philippe, 5,558,465, Cl. 405-178.000.
Rolin, Pierre; Gombault, Sylvain; and Toutain, Laurent, 5,559,814, Cl. 371-67.100.
France Telecom Etablissement Autonome De Droit Public: *See*—
Deveaud-Pledran, Benoit; Guillemot, Christian; and Gerard, Jean-Michel, 5,559,613, Cl. 359-4.000.
Franck, Steven J.: *See*—
Wrathall, Robert S.; and Franck, Steven J., 5,559,424, Cl. 323-277.000.
Frank, Louis C., III. Dart board golf game. 5,558,337, Cl. 273-408.000.
Frank, Vlastimil, to International Business Machines Corporation. Module encapsulation by induction heating. 5,558,795, Cl. 219-604.000.
Frankel, Julius: *See*—
Abbate, Agostino; Frankel, Julius; and Doabeck, Mark, 5,557,970, Cl. 73-597.000.
Franzen, Jochen, to Bruker-Franzen Analytik GmbH. Method of automatically controlling the space charge in ion traps. 5,559,325, Cl. 250-282.000.
Free, Paul D.: *See*—
Blizard, Norman C.; and Free, Paul D., 5,558,067, Cl. 123-501.000.
Freedom Air Services: *See*—
Smith, Donald M.; and Townley, Roderick M., 5,558,086, Cl. 128-204.260.
Freeman, Dermot T.: *See*—
Gilligan, Sean G.; Freeman, Dermot T.; Oliphant, Larry J.; Messmann, Jeffrey S.; Hanley, Patrick J.; and Szczech, Gerald S., 5,558,901, Cl. 427-2.290.
Freitag, Lee E.: *See*—
Catipovic, Josko A.; and Freitag, Lee E., 5,559,757, Cl. 367-134.000.
Frenkel, Erik J.; and Born, Jean-Jacques, to Asulab S.A. Watch with time information VIA silent vibration. 5,559,761, Cl. 368-69.000.
Fresenius AG: *See*—
Witthaus, Friedrich; Weber, Wolfram; and Leick, Lothar, 5,558,769, Cl. 210-360.100.
Freudenberg-NOK General Partnership: *See*—
Sakata, David, 5,558,056, Cl. 123-188.600.
Freund, Robert S.: *See*—

Choquette, Kent D.; Freund, Robert S.; Hong, Minghwei; and Vakhshoori, Daryoosh, 5,559,053, Cl. 437-129.000.
Frey, Alan E.: *See*—
Ash, Gerald R.; Chan, Kenneth K.; Chen, Jiayu; Frey, Alan E.; Gallagher, James J.; and Peck, Andrew W., 5,559,877, Cl. 379-221.000.
Frezzati, Marco: *See*—
Vacca, Paolo; and Frezzati, Marco, 5,559,239, Cl. 546-323.000.
Fried, Jeffrey A.: *See*—
Singer, Samuel; and Fried, Jeffrey A., 5,558,627, Cl. 602-13.000.
Friedmann, Lester: *See*—
Brady, Kevin; and Friedmann, Lester, 5,558,747, Cl. 203-17.000.
Friedrich Grohe Aktiengesellschaft: *See*—
Pawelzik, Manfred; Derr, Max; and Kahle, Dieter, 5,558,128, Cl. 137-801.000.
Friesen, Randall M.: *See*—
Madgwick, Kenneth B.; and Friesen, Randall M., 5,558,169, Cl. 173-185.000.
Frigo, N. J.: *See*—
Darcie, Thomas E.; Frigo, N. J.; and Magill, Peter D., 5,559,624, Cl. 359-125.000.
Frisina, Giacomo. Hand tool with five cutting edges. 5,557,852, Cl. 30-167.000.
Fritz, Gerald W. Amusement device having a secret compartment. 5,558,226, Cl. 206-457.000.
Fritz, Lawrence C.: *See*—
Steinhardt, Richard A.; John, Varghese; and Fritz, Lawrence C., 5,559,004, Cl. 435-29.000.
Fritzman, Ralph, to Cellular Designs Unlimited, Inc. Window treatment article. 5,558,925, Cl. 428-181.000.
Froehlich, Harry W. Support device for a brassiere strap. 5,558,556, Cl. 450-86.000.
Fröhlich, Wolfgang: *See*—
Buchmann, Bernd; Skuballa, Werner; Heindl, Josef; Fröhlich, Wolfgang; Ekerdt, Roland; and Giesen, Claudia, 5,559,134, Cl. 514-336.000.
Frost Controls, Inc.: *See*—
Dogul, James; Sarkar, Sandip; Thomson, Frederick; and Thomson, Robert, 5,559,664, Cl. 361-191.000.
Frutschi, Hans U.; and Wettstein, Hans, to ABB Management AG. Power plant. 5,557,921, Cl. 60-39.530.
Fu, Xiang-Dong: *See*—
Gui, Jian-Fang; and Fu, Xiang-Dong, 5,559,019, Cl. 435-240.100.
Fu, Yun L.: *See*—
Sasaki, Yukihiko; Sartor, Luigi; Fu, Yun L.; and de Koning, Henk, 5,558,913, Cl. 428-41.500.
Fu Chien, Jung, legal representative: *See*—
Chien, Tien-Sheng, deceased; Chien, Jung-Fu; Chien, Paul C.; and Lu, Hsiu-Lan, 5,558,924, Cl. 428-181.000.
Fugger, Scot R.: *See*—
Turnbull, G. Keith; Peretic, Eileen M.; Rogan, George T.; Powers, John H.; Fugger, Scot R.; and Sullivan, Daniel A., Jr., 5,559,708, Cl. 364-468.030.
Fuji Electric Co., Ltd.: *See*—
Shimada, Takashi; Kitanaka, Kenji; Kaneshiro, Akio; and Kawasaki, Michio, 5,559,827, Cl. 373-142.000.
Yamazaki, Tomoyuki; Obinata, Shigeyuki; Otsuki, Masahito; Momota, Seiji; and Fujihira, Tatsuhiko, 5,559,355, Cl. 257-341.000.
Fuji Electronic Co., Ltd.: *See*—
Yamazaki, Tomoyuki; and Otsuki, Masahito, 5,559,347, Cl. 257-139.000.
Fuji Photo Film Company, Ltd.: *See*—
Inuiya, Masafumi; and Nakayama, Yoshiaki, 5,559,552, Cl. 348-220.000.
Ishigaki, Kunio; and Naoi, Takashi, 5,558,979, Cl. 430-531.000.
Kato, Eiichi; and Ishii, Kazuo, 5,558,966, Cl. 430-96.000.
Kawata, Ken; and Ikeda, Tadashi, 5,559,240, Cl. 548-150.000.
Mori, Hiroyuki, 5,559,618, Cl. 359-73.000.
Nagano, Hideo; Niwa, Kazuo; and Hayashi, Takayuki, 5,558,820, Cl. 264-4.100.
Takagi, Atsushi, 5,559,585, Cl. 355-228.000.
Yamada, Makoto, 5,558,973, Cl. 430-203.000.
Fuji Photo Optical Co. Ltd.: *See*—
Kamoda, Takashi; and Kaburagi, Hiromitsu, 5,559,573, Cl. 354-288.000.
Fuji Xerox Co., Ltd.: *See*—
Akashi, Ryojiro; Ishii, Toru; and Uesaka, Tomozumi, 5,558,813, Cl. 252-299.010.
Nishimoto, Keiichi, 5,558,946, Cl. 428-692.000.
Ota, Takeshi, 5,559,784, Cl. 369-124.000.
Fujicopian Co., Ltd.: *See*—
Tsuboi, Seiji; and Cai, Zheng l., 5,558,450, Cl. 400-241.300.
Fujie, Naofumi: *See*—
Mori, Keiji; Kato, Katsutoshi; Fujie, Naofumi; and Sometani, Akitoshi, 5,558,394, Cl. 296-214.000.
Fujihira, Tatsuhiko: *See*—
Yamazaki, Tomoyuki; Obinata, Shigeyuki; Otsuki, Masahito; Momota, Seiji; and Fujihira, Tatsuhiko, 5,559,355, Cl. 257-341.000.
Fujii, Haruo: *See*—
Kato, Motoi; Fujii, Haruo; Moritani, Toshifumi; Kobayashi, Tatsuya; Kobayashi, Tetsuya; Miyashiro, Toshiaki; Enomoto, Naoki; Uchiyama, Akihiko; and Saito, Yoshiro, 5,559,591, Cl. 355-283.000.
Fujii, Hiromasa: *See*—
Oku, Yoshito; Ibara, Shozo; Sumi, Shigeharu; and Fujii, Hiromasa, 5,559,382, Cl. 310-90.000.
Fujii, Mutsumasa: *See*—
Miyashita, Akimi; Fujii, Mutsumasa; and Mishina, Haruo, 5,558,015, Cl. 100-50.000.
Fujii, Takeshi; Suzuki, Yasuro; Kihara, Hayato; and Anbo, Takashi, to Sumitomo Chemical Company, Limited. Thermoplastic resin compositions comprising blends of polyphenylene ether and polystyrene copolymer resins. 5,559,186, Cl. 525-68.000.
Fujiie, Kazuhiko: *See*—
Ando, Nobuhiko; Ando, Ryo; and Fujiie, Kazuhiko, 5,559,769, Cl. 369-44.270.
Fujimori, Junichi: *See*—
Okamura, Yashikoi; Kageyama, Yasuo; Suzuki, Takashi; Fujimori, Junichi; and Funada, Takeshi, 5,559,962, Cl. 395-200.060.
Fujimori, Noriyoshi: *See*—
Nguyen, Chan; Shibata, Alan; Kobayashi, Atsushi; and Fujimori, Noriyoshi, 5,559,538, Cl. 347-32.000.
Fujimoto, Akihisa, to Kabushiki Kaisha Toshiba. Display controller incorporating cache memory dedicated for VRAM. 5,559,952, Cl. 395-164.000.
Fujimoto, Hiroyuki: *See*—
Iwatsuki, Syuichiro; Fukagawa, Masami; Oshida, Kei; Mochizuki, Kazuyuki; Fujimoto, Hiroyuki; and Okamoto, Masayoshi, 5,558,949, Cl. 429-99.000.
Fujino, Ken-ichi: *See*—
Namba, Hiroaki; and Fujino, Ken-ichi, 5,559,176, Cl. 524-377.000.
Fujioka, Hakaru, to NSK Ltd. Method for measuring preload clearance in double row rolling bearing and apparatus therefore. 5,557,854, Cl. 33-517.000.
Fujioka, Shuzo, to Mitsubishi Denki Kabushiki Kaisha. Level converter including wave-shaping circuit and emulator microcomputer incorporating the level converter. 5,559,996, Cl. 395-500.000.
Fujisawa, Shigeo: *See*—
Oki, Yoji; Hanaski, Koichi; and Fujisawa, Shigeo, 5,558,420, Cl. 362-31.000.
Fujita, Goro: *See*—
Horimai, Hideyoshi; and Fujita, Goro, 5,559,786, Cl. 369-275.100.
Fujita, Tomohiro, to Toyota Jidosha Kabushiki Kaisha. Apparatus for determining engine abnormality. 5,559,706, Cl. 364-431.110.
Fujita, Yoshio, to Yamaha Corporation. Delay time modulation effecting apparatus for processing musical tone signal. 5,559,300, Cl. 84-624.000.
Fujitsu Limited: *See*—
Andou, Katsumi, 5,559,765, Cl. 369-32.000.
Fukuda, Hirofumi; Hatori, Kazuo; Yamada, Kazumi; Nogiri, Toshiaki; and Mori, Kozo, 5,559,678, Cl. 361-818.000.
Ishii, Toshio, 5,559,721, Cl. 364-514.00A.
Kanemitsu, Norio, 5,559,612, Cl. 358-471.000.
Kasamizugami, Masayoshi; and Kokuryo, Takuya, 5,559,747, Cl. 365-207.000.
Katsui, Tadashi, 5,559,674, Cl. 361-697.000.
Kiehl, Richard A., 5,559,343, Cl. 257-14.000.
Murata, Hiroyasu; Miyazawa, Hideo; and Kaku, Takashi, 5,559,799, Cl. 370-76.000.
Ohmori, Hideki; and Fukayama, Kenji, 5,559,479, Cl. 331-177.00V.
Ryu, Tadamitsu; Izumi, Hiroyuki; Murakawa, Masahiko; Toyota, Masanobu; Adachi, Takeshi; and Ichikawa, Naomi, 5,560,012, Cl. 395-700.000.
Saito, Teruhiko, 5,559,452, Cl. 326-88.000.
Satoh, Yoshio; Ikata, Osamu; Miyashita, Tsutomu; Matsuda, Takashi; and Takamatsu, Mitsuo, 5,559,481, Cl. 333-143.000.
Shiga, Koichi; and Yanase, Yukiyoshi, 5,559,979, Cl. 395-421.080.
Sobue, Isaya, 5,559,741, Cl. 365-200.000.
Suzuki, Yasuo, 5,559,854, Cl. 379-27.000.
Fujitsu Personal Systems, Inc.: *See*—
Harper, Leroy D.; Schlichting, Grayson C.; Hooks, Douglas A.; Cullimore, Ian H. S.; Bradshaw, Gavin A.; Banerjee, Biswa R.; Fairbanks, John P.; and Stone, Roderick W., 5,560,024, Cl. 395-750.000.
Fujitsu VLSI Limited: *See*—
Andou, Katsumi, 5,559,765, Cl. 369-32.000.
Sobue, Isaya, 5,559,741, Cl. 365-200.000.
Fujiwara, Kazunobu: *See*—
Honda, Kazuhiko; Fujiwara, Kazunobu; and Osakabe, Katsuichi, 5,559,785, Cl. 369-124.000.
Fujiwara, Takayoshi; Okuda, Masayuki; Sone, Yoshinori; and Honjo, Takashi, to Kabushiki Kaisha Toshiba. Fluid compressor with vertical longitudinal axis. 5,558,512, Cl. 418-188.000.
Fukagawa, Masami: *See*—
Iwatsuki, Syuichiro; Fukagawa, Masami; Oshida, Kei; Mochizuki, Kazuyuki; Fujimoto, Hiroyuki; and Okamoto, Masayoshi, 5,558,949, Cl. 429-99.000.
Fukami, Kazuaki: *See*—
Kojima, Takeshi; Yahagi, Toshio; Fukami, Kazuaki; Suzuki, Syouji; and Hatano, Kunimichi, 5,559,702, Cl. 364-426.020.
Fukatsu, Katsuaki; Sugiura, Noboru; Koguchi, Hayato; and Anzo, Yoichi, to Hitachi, Ltd. Ignition device for internal-combustion engine. 5,558,074, Cl. 123-647.000.
Fukaya, Takashi: *See*—
Kami, Kuniaki; Adachi, Hideyuki; Umeyama, Koichi; Kosaka, Yoshihiro; Yamaguchi, Seiji; Fuse, Eiichi; Sato, Michio; Nakamura, Masakazu; Tanaka, Yasundo; Fukaya, Takashi; Matsuno, Kiyotaka; and Suzuki, Katsuya, 5,558,619, Cl. 600-146.000.

Fukayama, Kenji: *See*—
Ohmori, Hideki; and Fukayama, Kenji, 5,559,479, Cl. 331-177.00V.
Muto, Yukiyoshi; Futamura, Masao; and Mizuno, Masahiro, 5,558,032, Cl. 112-102.500.

Gitman, Gregory M.; and Parnas, Anatoliy, 5,558,822, Cl. 264-15.000.
Gaskins, Kevin K.: *See*—
Stapenses, Neil P.; Gaskins, Kevin K.; Pronke, Dan J.; and Rollings, Gil
Schmidt, Michael R.; and Klemen, Donald, 5,558,595, Cl. 477-3.000.
Shah, Suresh D.; and Visconti, Carl H., 5,558,824, Cl. 264-40.300.

Fukayama, Kenji: *See*—
Ohmori, Hideki; and Fukayama, Kenji, 5,559,479, Cl. 331-177.00V.
Fukazawa, Tetsuo; and Chin, Chugen, to Pacific Machinery & Engineering Co., Ltd. Turbo pump and supply system with the pump. 5,558,502, Cl. 417-36.000.
Fukuda, Hirofumi; Hatori, Kazuo; Yamada, Kazumi; Nogiri, Toshiaki; and Mori, Kozo, to Fujitsu Limited. Electronic device housing. 5,559,678, Cl. 361-818.000.
Fukuda Road Construction Co., Ltd.: *See*—
Masuda, Kinji; Kuriki, Minoru; and Hokari, Kozo, 5,558,704, Cl. 106-281.100.
Fukushima, Masafumi: *See*—
Makino, Masahiko; Yamamura, Michio; Fukushima, Masafumi; and Iwanami, Kunio, 5,558,510, Cl. 418-55.200.
Fukushima, Tsumoru: *See*—
Yamashita, Haruo; Matsumiya, Masami; and Fukushima, Tsumoru, 5,559,530, Cl. 345-136.000.
Fukuyama, Shinjiro, to Mitsubishi Denki Kabushiki Kaisha. Frequency synthesizer for synthesizing signals of a variety of frequencies by cross modulation. 5,559,475, Cl. 331-31.000.
Fukuzo, Yukio, to NEC Corporation. Semiconductor memory device. 5,559,746, Cl. 365-203.000.
Funada, Takeshi: *See*—
Okamura, Yashikoi; Kageyama, Yasuo; Suzuki, Takashi; Fujimori, Junichi; and Funada, Takeshi, 5,559,962, Cl. 395-200.060.
Funakoshi, Yasushi; Ogata, Khoji; Kojima, Masayuki; Kawaziri, Hitoshi; Yamamoto, Hirofumi; Noto, Kazuhiko; and Mori, Naomichi, to Hitachi Plant Engineering & Construction Co., Ltd.; and Funakoshi, Yasushi. Sewage treatment system with air jetting means. 5,558,763, Cl. 210-150.000.
Funk, Barbara S.; Krzysik, Duane G.; and Pazdernik, Patrick A., to Kimberly-Clark Corporation. Soft tissue containing glycerin and quaternary ammonium compounds. 5,558,873, Cl. 424-401.000.
Fürst, Arpad; Daazl, Martin; Mayer, Johann; and Miklosi, Stefan, to Webasto Karosseriesysteme GmbH. Vehicle roof. 5,558,388, Cl. 296-107.000.
Furuhashi, Hitoshi: *See*—
Yoshinaga, Kei; Ito, Katsuhiko; Ebara, Katsumi; Furuhashi, Hitoshi; Shichinohe, Takashi; and Omagari, Masaharu, 5,558,059, Cl. 123-198.00E.
Furuhata, Kentaro: *See*—
Kihara, Tomohiko; Furuhata, Kentaro; and Iida, Noriyuki, 5,559,712, Cl. 364-468.250.
Furuie, Tsuneichi; Ueno, Masato; Maeno, Takashi; Ogasawara, Yutaka; Inoue, Masaki; and Mori, Naoki, to Toyoda Gosei Co., Ltd. Radiator support bracket. 5,558,310, Cl. 248-573.000.
Furukawa Electric Co., Ltd., The: *See*—
Kohmura, Yukio; and Toyosaki, Koichi, 5,558,721, Cl. 118-730.000.
Sasaki, Kouji; and Kaneda, Kazuji, 5,558,296, Cl. 242-18.00A.
Furukawa, Ken: *See*—
Urawa, Yoshio; Furukawa, Ken; Shimizu, Toshikazu; Yamagishi, Yoji; Tsurugi, Tomio; and Ichino, Tomio, 5,559,236, Cl. 546-14.000.
Furukawa, Masahiro: *See*—
Mizukami, Kazuaki; Ogawa, Atsushi; Yasuda, Masashi; Furukawa, Masahiro; Arima, Hidetoshi; and Ozawa, Yoshio, 5,557,939, Cl. 62-148.000.
Furuta, Motonobu; and Yamaguchi, Takanari, to Sumitomo Chemical Company, Limited. Thermoplastic resin compositions comprising aminomethyl substituted polyphenylene ethers. 5,559,184, Cl. 525-68.000.
Furutani, Tadashige: *See*—
Ishida, Takashi; O'Hara, Shunji; Ishibashi, Kenzo; and Furutani, Tadashige, 5,559,782, Cl. 369-59.000.
Furuya, Toshiyuki: *See*—
Kawabe, Kazuki; Murata, Kazuhiko; and Furuya, Toshiyuki, 5,559,255, Cl. 549-538.000.
Furuyama, Hideto; Hamasaki, Hiroshi; and Kobayashi, Tamon, to Kabushiki Kaisha Toshiba. Optical semiconductor module in which a hermetically sealed optical semiconductor device is connected to an electrical wiring layer. 5,559,918, Cl. 385-92.000.
Fuse, Eiichi: *See*—
Kami, Kuniaki; Adachi, Hideyuki; Umeyama, Koichi; Kosaka, Yoshihiro; Yamaguchi, Seiji; Fuse, Eiichi; Sato, Michio; Nakamura, Masakazu; Tanaka, Yasundo; Fukaya, Takashi; Matsuno, Kiyotaka; and Suzuki, Katsuya, 5,558,619, Cl. 600-146.000.
Futaba Denshi Kogyo K.K.: *See*—
Tsuruoka, Yoshihisa; Hirakawa, Haruhisa; Okamoto, Yoshinari; and Sato, Eiji, 5,559,397, Cl. 313-496.000.
Futaba Denshi Kogyo Kabushiki Kaisha: *See*—
Itoh, Shigeo; Yonezawa, Yoshihisa; and Toki, Hitoshi, 5,558,814, Cl. 252-301.40R.
Futami, Hiroyuki; and Yamamoto, Hiroyuki, to Konica Corporation. Image memory apparatus. 5,559,740, Cl. 365-189.040.
Futamura, Masao; Muto, Yukiyoshi; and Mizuno, Masahiro, to Brother Kogyo Kabushiki Kaisha. Image figure processing method and device. 5,558,033, Cl. 112-475.190.
Futamura, Masao; Kyuno, Mitsuyasu; Muto, Yukiyoshi; and Mizuno, Masahiro, to Brother Kogyo Kabushiki Kaisha. Apparatus and method for processing embroidery data based on roundness of embroidery region. 5,559,711, Cl. 364-470.090.
Futamura, Masao: *See*—
Muto, Yukiyoshi; Futamura, Masao; and Mizuno, Masahiro, 5,558,031, Cl. 112-102.500.
Muto, Yukiyoshi; Futamura, Masao; and Mizuno, Masahiro, 5,558,032, Cl. 112-102.500.
Futerman, Charles S., to Mulox IBC Limited. Container bag for a closed fill system. 5,558,137, Cl. 141-44.000.
Fuwa, Tetsuji, to Brother Kogyo Kabushiki Kaisha. Perforating device of stamp unit. 5,559,545, Cl. 347-171.000.
Gaalswyk, Mark K. Livestock feed consumption meter. 5,559,716, Cl. 364-479.100.
Gaeta, Federico C. A.; and DeFrees, Shawn A., to Cytel Corporation. Bivalent sialyl X saccharides. 5,559,103, Cl. 514-54.000.
Gagnon, Kevin M.; and Goulter, Victor H. Dual filtered airflow systems for cooling computer components, with optimally placed air vents and switchboard control panel. 5,559,673, Cl. 361-695.000.
Gailus, Paul H.; Chapman, Ronald H.; and Wilhite, Jeffrey B., to Motorola, Inc. Feedback loop closure in a linear transmitter. 5,559,468, Cl. 330-110.000.
Galiasso, Robert T.: *See*—
Prada, Ricardo; Galiasso, Robert T.; Romero, Yilda; Reyes, Edito; and Rodriguez, Edilberto, 5,558,766, Cl. 208-59.000.
Galindo, José: *See*—
Fehr, Charles; and Galindo, José, 5,559,272, Cl. 568-592.000.
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Dai, Susan W. S.; Gayton, Donald W.; Laird, Brian G.; Tkatch, Randy T.; Bettis, Sonny; Fitzhugh, Marc; Williams, Shandton; Lowman, Phillip; and Gonzalez, Julio, 5,559,859, Cl. 379-51.000.

Gonzalez, Richard L.: *See*—
Elliott, Thomas E.; and Gonzalez, Richard L., 5,559,993, Cl. 395-490.000.

Gonzalez-Hernandez, Jesus: *See*—
Martinez-Bustos, Fernando; De Dios Figueroa C., Juan; Sanchez-Sinencio, Feliciano; Gonzalez-Hernandez, Jesus; De La Luz Martinez, Jose; and Ruiz-Torres, Maximiano, 5,558,886, Cl. 425-376.100.

Goodhue, Charles T.: *See*—
Weis, Alexander L.; Shanmuganathan, Kirupathevy; and Goodhue, Charles T., 5,559,101, Cl. 514-45.000.

Goodley, Paul C.; Fischer, Steven M.; and Gourley, Darrell L., to Hewlett-Packard Company. Self generating ion device for mass spectrometry of liquids. 5,559,326, Cl. 250-288.000.

Goor, Dan: *See*—
Kalberer, Robert C.; and Goor, Dan, 5,558,300, Cl. 244-121.000.

Gorbatoff, Christopher J., to General Motors Corporation. Dual detent dome switch assembly. 5,559,311, Cl. 200-513.000.

Gordon, Chrisanne; Waylonis, George W.; and Dirina, John G. Pressure bandage to avoid exposure to blood borne pathogens. 5,558,918, Cl. 428-100.000.

Gordon, Eric M.; Barrish, Joel C.; Bisacchi, Gregory S.; Sun, Chong-Qing; Tino, Joseph A.; Vite, Gregory D.; and Zahler, Robert, to E. R. Squibb & Sons, Inc. Aminediol protease inhibitors. 5,559,256, Cl. 552-303.000.

Gore, Gerald E.: *See*—
Lubliner, David J.; Dhaliwal, Jaskaran; Gidney, John; Gore, Gerald E.; Greenfeder, Jack J.; Greenfeld, Joshua; Hinton, Melvin C.; McHugh, William; Parsio, Anthony; Rintel, Ian; Roman, Harry T.; and Vogelaar, Jake, 5,559,894, Cl. 382-100.000.

Gorka, Phillip E.: *See*—
Mowry, Gregory S.; Gorka, Phillip E.; Strayer, Brian D.; and Kracke, Alan G., 5,559,429, Cl. 324-71.500.

Gorsuch, Reynolds G. F.: *See*—
Evers, David C.; Lindsey, A. Darrell; Finch, Marcus; and Gorsuch, Reynolds G. F., 5,558,638, Cl. 604-66.000.

Göschke, Richard; Maibaum, Jürgen K.; Schilling, Walter; Stutz, Stefan; Rigollier, Pascal; Yamaguchi, Yasuchika; Cohen, Nissim C.; and Herold, Peter, to Ciba-Geigy Corporation. δ-amino-γ-hydroxy-ω-aryl-alkanoic acid amides. 5,559,111, Cl. 514-227.500.

Gosebruch, Harald: *See*—
Focke, Heinz; and Gosebruch, Harald, 5,558,216, Cl. 206-256.000.

Goto, Tetsuro: *See*—
Kazami, Kazyuki; Daitoku, Koichi; Wakabayashi, Tsutomu; Goto, Tetsuro; Ezawa, Akira; and Tomino, Naoki, 5,559,568, Cl. 354-106.000.

Gottschalk, Werner: *See*—
Kullmann, Bernhard W.; Scheibel, Joerg L.; and Gottschalk, Werner, 5,558,184, Cl. 188-72.400.

Götz, Norbert: *See*—
König, Hartmann; Götz, Norbert; Kirstgen, Reinhard; Müller, Bernd; and Oberdorf, Klaus, 5,559,244, Cl. 548-371.100.

Gough, Michael L.; and Holloway, Bruce V., to Apple Computer, Inc. Method and apparatus for providing a note for an application program. 5,559,942, Cl. 395-155.000.

Goulter, Victor H.: *See*—
Gagnon, Kevin M.; and Goulter, Victor H., 5,559,673, Cl. 361-695.000.

Gourley, Darrell L.: *See*—
Goodley, Paul C.; Fischer, Steven M.; and Gourley, Darrell L., 5,559,326, Cl. 250-288.000.

Gove, Robert J.: *See*—
Guttag, Karl M.; Read, Christopher J.; Poland, Sydney W.; Gove, Robert J.; and Golston, Jeremiah E., 5,560,030, Cl. 395-800.000.

Gowen, Walter K., III: *See*—
Baisuck, Allen; Fairbank, Richard L.; Gowen, Walter K., III; Henriksen, Jon R.; Hoover, William W., III; Huckabay, Judith A.; Rogoyski, Eric; and Salecker, Anton G., 5,559,718, Cl. 364-491.000.

GPT Limited: *See*—
Hedderly, David L., 5,559,805, Cl. 370-95.300.

Grace, Robert E.: *See*—
Gwaltney, Mark A.; and Grace, Robert E., 5,559,579, Cl. 355-208.000.

Gradual Pty, Ltd.: *See*—
Boyhan, Laurence A., 5,557,909, Cl. 53-474.000.
Boyhan, Laurence A., 5,558,895, Cl. 426-515.000.

Gradzki, Pawel M.: *See*—
Bruning, Gert W.; and Gradzki, Pawel M., 5,559,396, Cl. 315-291.000.

Graham, David Y.: *See*—
Estes, Mary K.; Jiang, Xi; and Graham, David Y., 5,559,014, Cl. 435-91.200.

Graham, Paul: *See*—
Colwell, Betsy P.; Wagner, Wendy A.; Graham, Paul; and Kline, John, 5,558,040, Cl. 119-52.200.

Grain Processing Corporation: *See*—
Sanner, Todd; Kightlinger, Adrian P.; and Davis, J. Reagan, 5,559,082, Cl. 507-273.000.

Grandjean, Alain J.: *See*—
Argouarch, Jean-Rene; Brasse, Dominique X.; and Grandjean, Alain J., 5,557,861, Cl. 34-461.000.

Grandner, Wayne: *See*—
Acker, David E.; McNulty, Ian; Pacheco, Robert C.; and Grandner, Wayne, 5,558,091, Cl. 128-653.100.

Granich, Marilyn: *See*—
Granich, Timothy E.; and Granich, Marilyn, 5,557,803, Cl. 2-16.000.

Granich, Timothy E.; and Granich, Marilyn. Shock absorbent protective glove. 5,557,803, Cl. 2-16.000.

Grant, Peter L.: *See*—
Toni, Darryl M.; Grant, Peter L.; Johnson, Craig F.; Hayse, Steven R.; Forster, William V.; Nowak, Kenneth; and Osiecki, Larry J., 5,558,919, Cl. 428-116.000.

Grantz, Alan L.; and Clark, Wesley R., to Seagate Technology, Inc. Magnetic disc storage system with hydrodynamic bearing. 5,559,651, Cl. 360-99.080.

Grapha-Holding AG: *See*—
Oppliger, Jean-Claude; Grünenfelder, Robert; and Maier, Willy, 5,558,201, Cl. 198-476.100.

Gray, Donnie R.; and Dickson, Glen A., to Ocean Wash, Inc. Composition and a method for treating garments with the composition. 5,558,676, Cl. 8-107.000.

Gray, Keith A.: *See*—
DeLorme, David M.; and Gray, Keith A., 5,559,707, Cl. 364-443.000.

Gray, Leroy D. Method for forming walls. 5,558,823, Cl. 264-33.000.

Gray, Paul R.: *See*—
Laber, Carlos A.; and Gray, Paul R., 5,559,470, Cl. 330-252.000.

Green, David T.; Bolanos, Henry; Ratcliff, Keith; Heaton, Lisa W.; and Robertson, John C., to United States Surgical Corporation. Apparatus for applying surgical fasteners. 5,558,266, Cl. 227-178.100.

Green, Michael J.: *See*—
Tompkins, Michael E.; and Green, Michael J., 5,559,720, Cl. 364-505.000.

Greenberg, Alex M., to Greenberg Surgical Technologies, LLC. Mandibular border retractor and method for fixating a fractured mandible. 5,558,622, Cl. 600-237.000.

Greenberg Surgical Technologies, LLC: *See*—
Greenberg, Alex M., 5,558,622, Cl. 600-237.000.

Greenfeder, Jack J.: *See*—
Lubliner, David J.; Dhaliwal, Jaskaran; Gidney, John; Gore, Gerald E.; Greenfeder, Jack J.; Greenfeld, Joshua; Hinton, Melvin C.; McHugh, William; Parsio, Anthony; Rintel, Ian; Roman, Harry T.; and Vogelaar, Jake, 5,559,894, Cl. 382-100.000.

Greenfeld, Joshua: *See*—
Lubliner, David J.; Dhaliwal, Jaskaran; Gidney, John; Gore, Gerald E.; Greenfeder, Jack J.; Greenfeld, Joshua; Hinton, Melvin C.; McHugh, William; Parsio, Anthony; Rintel, Ian; Roman, Harry T.; and Vogelaar, Jake, 5,559,894, Cl. 382-100.000.

Greenlee, William J.: *See*—
Ashton, Wallace T.; Chang, Linda L.; and Greenlee, William J., 5,559,135, Cl. 514-338.000.

Greenplate, John T.: *See*—
Corbin, David R.; Greenplate, John T.; Jennings, Michael G.; Purcell, John P.; and Sammons, Robert D., 5,558,862, Cl. 424-94.400.

Greenwalt, Richard B., to Bechtel Group, Inc. Method of direct steel making from liquid iron. 5,558,696, Cl. 75-505.000.

Gregg, Thomas A.; Hoke, Joseph M.; and Pandey, Kulwant M., to International Business Machines Corporation. Suspending, resuming, and interleaving frame-groups. 5,559,963, Cl. 395-200.130.

Greggain, Lance; Mandl, Peter; and Intihar, Bruce, to Genesis Microchip Inc. Digital image resizing apparatus. 5,559,905, Cl. 382-298.000.

Gregory, John W.: *See*—
McMillan, Larry D.; Mihara, Takashi; Yoshimori, Hiroyuki; Gregory, John W.; and Paz de Araujo, Carlos A., 5,559,733, Cl. 365-145.000.

Gregory, William W.; Lance, Wayne E.; and Hegg, Jeffrey W., to Honeywell Inc. Integrator management for redundant active hand controllers. 5,559,415, Cl. 318-609.000.

Greiner, Doris: *See*—
Röder, Ulrich; Wilhelm, Sigurd; Hehn, Werner; Hammerl, Uwe; Greiner, Doris; Hentschke, Wolfgang; and Reinhardt, Udo, 5,558,593, Cl. 475-331.000.

Greiner, Robert J.: *See*—
Papadopoulos, Gregory M.; Nikhil, Rishiyur S.; Greiner, Robert J.; and Arvind, , 5,560,029, Cl. 395-800.000.

Greive, Martin; and Ruf, Bernd, to Heidelberger Druckmaschinen AG. Device for facilitating sheet separation or singling. 5,558,321, Cl. 271-98.000.

Gresens, Stanley: *See*—
Wang, Jui-Shang; Jané, Rodney; Longan, John; Gresens, Stanley; Holderfield, Gregory; Hootstein, Donald; and Valentor, Steven R., 5,558,501, Cl. 416-244.00R.

Griat, Jacqueline; Picard, Elisabeth; and Laugier, Jean-Pierre, to L'Oreal. Cosmetic and/or dermatological compositions containing salicylic acid. 5,558,871, Cl. 424-401.000.

Griffin, William S.: *See*—
Olney, Ross D.; Schnelker, David E.; and Griffin, William S., 5,558,730, Cl. 152-418.000.

Griffith, Gerald: *See*—
Strong, Maurice L., III; Tranchita, Charles J.; Welch, Christopher R.; and Griffith, Gerald, 5,559,510, Cl. 340-954.000.

Griffith, James S.: *See*—
Gupta, Shantanu R.; and Griffith, James S., 5,560,025, Cl. 395-800.000.

Griffiths, Clifford H.: *See*—
Larson, James R.; Wallace, Anthony M.; Griffiths, Clifford H.; and Abramsohn, Dennis A., 5,559,588, Cl. 355-256.000.

Grill, Alfred: *See*—
Cohen, Stephen A.; Edelstein, Daniel C.; Grill, Alfred; Paraszczak, Jurij R.; and Patel, Vishnubhai V., 5,559,367, Cl. 257-77.000.

Grindmaster Corporation: *See*—
Fisher, Charles M.; and McNeill, Robert C., 5,558,283, Cl. 241-100.000.

Groh, Werner; Macholdt, Hans-Tobias; Gibson, Baylor D.; Walden, James R.; and Felton, Clinton D., to Hoechst Celanese Corporation. Polymer electrets with improved charge stability. 5,558,809, Cl. 252-62.540.

Grohman, Craig C.; Robinson, Edward; and Barton, Bob L., to Modine Manufacturing Company. Grease collecting baffle and heat exchanger assembly for a water heating system. 5,558,080, Cl. 126-299.00D.

Gross, Helmut; Leilich, Martin; and Zuschanko, Hans, to Audi AG. Movable glove compartment having a rear mounted, remotely actuated lock. 5,558,385, Cl. 296-37.120.

Grossglauser, Matthias: *See*—
Clarkson, Kenneth L.; Grossglauser, Matthias; Keshav, Srinivasan; and Tse, David, 5,559,798, Cl. 370-60.100.

Grothaus, G. David: *See*—
Petersen, Frank P.; Clymer, Mark D.; Miller, Sally A.; Rittenburg, James H.; and Grothaus, G. David, 5,558,997, Cl. 435-7.310.

Grove, Michael J.: *See*—

Zory, Peter S., Jr.; Hudson, Douglas A., Jr.; and Grove, Michael J., 5,559,058, Cl. 437-237.000.

Groves, David H.: *See—*
Wong, Yiu K.; Groves, David H.; and Hemy, Martin F., 5,559,317, Cl. 235-449.000.

Gruenberger, Joachim: *See—*
Schwarzenthal, Dietmar; and Gruenberger, Joachim, 5,558,052, Cl. 123-90.160.

Grünenfelder, Robert: *See—*
Oppliger, Jean-Claude; Grünenfelder, Robert; and Maier, Willy, 5,558,201, Cl. 198-476.100.

Gruppo Lepetit Spa: *See—*
Trani, Aldo; Dallanoce, Clelia M. L.; and Ciabatti, Romeo, 5,559,249, Cl. 549-264.000.

GSL Technology, Inc.: *See—*
Laska, Gregory S., 5,559,302, Cl. 89-14.050.

GST Systeme, Gesellschaft Fur Abscheide-Und Steuertechnik mbH: *See—*
Bolt, Heinz; Walser, Franz; and Schoneborn, Axel, 5,557,923, Cl. 60-274.000.

Guarino, Robert A.: *See—*
Didomizio, John A.; and Guarino, Robert A., 5,559,516, Cl. 342-118.000.

Guastella, Michael V. Decorative fiber optic lamp. 5,558,421, Cl. 362-32.000.

Gubernator, Klaus: *See—*
Ackermann, Jean; Banner, David; Gubernator, Klaus; Hilpert, Kurt; and Schmid, Gérard, 5,559,232, Cl. 544-121.000.

Guckel, Henry: *See—*
Burns, David W.; Guckel, Henry; and Zook, James D., 5,559,358, Cl. 257-431.000.

Guddat, Doug: *See—*
Banik, Jashojiban; Meixner, Anne; King, Glenn F.; and Guddat, Doug, 5,559,745, Cl. 365-201.000.

Gudkova, Julia V.: *See—*
Komissarova, Irina A.; Gudkova, Julia V.; Soldatenkova, Taryana D.; Burbenskaya, Natalya M.; Kosdrashova, Tatyana T.; Kalantar, Irina L.; Toropov, Jury M.; Semenova, Galina F.; Nartsissov, Rjurik P.; and Kalinina, Elena V., 5,559,152, Cl. 514-557.000.

Guerin, Jean-Michel: *See—*
Harris, Ellis D.; Guerin, Jean-Michel; and Wilson, James M., 5,559,627, Cl. 359-216.000.

Guerlain, Peter B.: *See—*
Barzegar, Farhad; and Guerlain, Peter B., 5,559,501, Cl. 340-825.000.

Gui, Jian-Fang; and Fu, Xiang-Dong, to University of California, The Regents of the. Protein serine kinase, SRPK1. 5,559,019, Cl. 435-240.100.

Guilford Mills, Inc.: *See—*
Richards, David T.; McCartney, Phillip D.; and Casper, Billy J., 5,557,950, Cl. 66-194.000.

Guillemot, Christian: *See—*
Deveaud-Pledran, Benoit; Guillemot, Christian; and Gerard, Jean-Michel, 5,559,613, Cl. 359-4.000.

Gujer, Rudolf; and Simpson, Clifford B. System for isolating batteries during testing. 5,558,956, Cl. 429-99.000.

Gulati, Suresh T.: *See—*
Dumbaugh, William H., Jr.; Gulati, Suresh T.; and Pfitzenmaier, Robert W., 5,559,060, Cl. 501-66.000.

Gullberg, Grant T.: *See—*
Zeng, Gengsheng L.; and Gullberg, Grant T., 5,559,335, Cl. 250-363.040.

Guo, Xin S: *See—*
Zhao, Jun; Cho, Tom; Dornfest, Charles; Wolff, Stefan; Fairbairn, Kevin; Guo, Xin S; Schreiber, Alex; and White, John M., 5,558,717, Cl. 118-715.000.

Gupta, Alok K.: *See—*
Jain, Ajay; Sahni, Paramdeep S.; and Gupta, Alok K., 5,559,888, Cl. 380-25.000.

Gupta, Balkishan: *See—*
Bhushan, Bharat; Coe, James V., Jr.; and Gupta, Balkishan, 5,558,903, Cl. 427-11.000.

Gupta, Bhupendra K.; Farmer, Gilbert; and Walker, Alan, to General Electric Company. Thick thermal barrier coating having grooves for enhanced strain tolerance. 5,558,922, Cl. 428-141.000.

Gupta, Goutam: *See—*
Dawson, William R.; and Gupta, Goutam, 5,559,163, Cl. 522-75.000.

Gupta, Rajiv; and Hartley, Richard I., to General Electric Company. Epipolar reconstruction of 3D structures. 5,559,334, Cl. 250-360.100.

Gupta, Shantanu R.; and Griffith, James S., to Intel Corporation. Entry allocation apparatus and method of same. 5,560,025, Cl. 395-800.000.

Gurevich, Serge: *See—*
Mikulicz, Michael Z.; and Gurevich, Serge, 5,558,484, Cl. 414-301.000.

Gurrieri, Giorgio, to Torti, Giovanni. High efficiency salient pole reluctance synchronous motor. 5,559,386, Cl. 310-211.000.

Guth, Christian; Stehlin, Albert; and Kröhnke, Christoph, to Ciba-Geigy Corporation. Aqueous textile auxiliary compositions. 5,559,273, Cl. 568-622.000.

Gutman, George A.: *See—*
Chandy, Kanianthara G.; Kalman, Katalin; Chandy, Grischa; and Gutman, George A., 5,559,009, Cl. 435-69.100.

Gutman, James: *See—*
Davis, Bruce; Gutman, James; Heydt, Michael; and Miller, Larry, 5,559,548, Cl. 348-6.000.

Guttag, Karl M.; Read, Christopher J.; Poland, Sydney W.; Gove, Robert J.; and Golston, Jeremiah E., to Texas Instruments Incorporated. Transfer processor with transparency. 5,560,030, Cl. 395-800.000.

Gutteridge, Winston E.; Hudson, Alan T.; Latter, Victoria S.; and Pudney, Mary, to Glaxo Wellcome, Inc. Method for treating animals infected with Babesia spp.. 5,559,156, Cl. 514-682.000.

Gutzmann, Timothy A.: *See—*
Halsrud, David A.; and Gutzmann, Timothy A., 5,559,087, Cl. 508-579.000.

Guzzi, Umberto; Palmieri, Costantino; and Croci, Tiziano, to Sanofi. N-substituted trifluoromethylphenyltetrahydropyridenes process for the preparation thereof, intermediates in said process and pharmaceutical compositions containing them. 5,559,238, Cl. 546-314.000.

Gvoich, Ned, to Kor-One, Ltd. Motor-less treadmill with stepped-up flywheel. 5,558,605, Cl. 482-54.000.

Gwaltney, Mark A.; and Grace, Robert E., to Xerox Corporation. Closed-loop developability control in a xerographic copier or printer. 5,559,579, Cl. 355-208.000.

H-C Industries, Inc.: *See—*
Smith, David W.; and Kamath, Ramesh, 5,557,999, Cl. 83-880.000.

Haake, David A.: *See—*
Blanco, David R.; Champion, Cheryl I.; Lovett, Michael A.; Haake, David A.; and Miller, James N., 5,558,993, Cl. 435-6.000.

Habeeb, Jacob J.: *See—*
Colclough, Terence; Beltzer, Morton; and Habeeb, Jacob J., 5,558,805, Cl. 508-243.000.

Haber, Terry M.; Smedley, William H.; and Foster, Clark B., to Habley Medical Technology Corporation. Multi-compartment applicator for packaging, reconstituting and applying a dehydrated multi-constituent medication. 5,558,874, Cl. 424-402.000.

Habley Medical Technology Corporation: *See—*
Haber, Terry M.; Smedley, William H.; and Foster, Clark B., 5,558,874, Cl. 424-402.000.

Hadavi, Khosrow: *See—*
Shahraray, Maryam S.; and Hadavi, Khosrow, 5,559,710, Cl. 364-468.060.

Haddad, Louis C.: *See—*
Hagen, Donald F.; Bahmet, Wanda; Haddad, Louis C.; and Perkins, Robert E., 5,558,771, Cl. 210-500.250.

Haddock, Henry J. Protective cover for hospital bed rails. 5,557,817, Cl. 5-663.000.

Haddock, Robert M. M. Mounting clip for paneled roof. 5,557,903, Cl. 52-508.000.

Haddock, Stephen R., to Network Peripherals, Inc. Apparatus for translating frames of data transferred between heterogeneous local area networks. 5,560,038, Cl. 395-800.000.

Hadowanetz, Alison E.: *See—*
Love, Doris; and Hadowanetz, Alison E., 5,559,265, Cl. 558-177.000.

Haefner, Donald R.: *See—*
Kovacich, John A.; Haefner, Donald R.; Hatton, Bruce M.; Stout, Donald M.; Ryczek, Lawrence J.; and Klumb, Arlene M., 5,559,280, Cl. 73-35.130.

Haeggberg, Donna J.: *See—*
Hartman, Frederick A.; Rice, Ronald J.; Burckett-St. Laurent, James C. T. R.; Taylor, Lucille F.; and Haeggberg, Donna J., 5,559,089, Cl. 510-224.000.

Haeussler, Horst; and Herrlein, Wilhelm, to Lindauer Dornier Gesellschaft mbH. Adjustable warp tension roll support in a weaving loom. 5,558,132, Cl. 139-115.000.

Hagar, Gamal, to Esselte Meto International GmbH. Thermal printer. 5,559,547, Cl. 347-211.000.

Hagen, Donald F.; Bahmet, Wanda; Haddad, Louis C.; and Perkins, Robert E., to Minnesota Mining and Manufacturing Company. Composite articles separating mercury from fluids. 5,558,771, Cl. 210-500.250.

Hagenow, Paul: *See—*
Poliquin, Alfred T.; and Hagenow, Paul, 5,558,909, Cl. 427-251.000.

Hagiwara, Syuya: *See—*
Kanouda, Akihiko; Takahashi, Tadashi; Horie, Hideaki; Onda, Kenichi; and Hagiwara, Syuya, 5,559,682, Cl. 363-21.000.

Hagiwara, Yasuaki: *See—*
Nguyen, Le Trong; Lentz, Derek J.; Miyayama, Yoshiyuki; Garg, Sanjiv; Hagiwara, Yasuaki; Wang, Johannes; Lau, Te-Li; Wang, Sze-Shun; and Trang, Quang H., 5,560,032, Cl. 395-800.000.

Hagiya, Kaoru: *See—*
Kaji, Hironori; Ninomiya, Atushi; Takekoshi, Isamu; Seki, Hideo; and Hagiya, Kaoru, 5,559,283, Cl. 73-61.560.

Hahn, Robert T.: *See—*
DeRosa, Thomas F.; Studzinski, William M.; Russo, Joseph M.; Kaufman, Benjamin J.; and Hahn, Robert T., 5,558,685, Cl. 44-426.000.

Hahn, Wilfried; Herrman, Hubert; Kiesser, Torsten; and Sander, Vera, to Solvay Enzymes GmbH & Co. KG. Liquid enzyme formulations. 5,558,812, Cl. 510-321.000.

Haight, Carl: *See—*
Cohea, Peter D.; and Haight, Carl, 5,558,914, Cl. 424-59.000.

Hakamada, Haruo: *See—*
Miyazawa, Yoritatsu; Ishii, Hideo; Ikariya, Toshiyuki; Kobayashi, Hideo; Koboshi, Shigeharu; Takei, Yutaka; and Hakamada, Haruo, 5,559,577, Cl. 354-297.000.

Hakamada, Ituhiro. Sealed container having a calendar function. 5,558,227, Cl. 206-459.500.

Hakansson, Bjorn; Von Holst, Peder; and Oskarsson, Rolf, to Sandvik AB. Ball nose end mills. 5,558,475, Cl. 407-54.000.

Hakimi, John; Kilian, Patricia; and Rosen, Perry, to Hoffmann-La Roche Inc. Polyethylene-protein conjugates. 5,559,213, Cl. 530-351.000.

Halbach, Walter S.: *See—*
Keemer, Craig B.; Halbach, Walter S.; Jenkins, William G.; and Ferguson, Russell L., 5,558,705, Cl. 106-403.000.

Halbich, Frank. Dispenser assembly and method of administering medication. 5,558,229, Cl. 206-534.000.

Hale, Arthur H.: *See—*
Blytas, George C.; and Hale, Arthur H., 5,558,939, Cl. 428-414.000.

Hale, S. Andrew: *See—*
Young, Roy E.; and Hale, S. Andrew, 5,558,984, Cl. 435-3.000.

Halezenko, Wasyl: *See—*
Hartman, George D.; Prugh, John D.; Egbertson, Melissa S.; Duggan, Mark E.; Hoffman, William; Halezenko, Wasyl; and Askew, Ben, 5,559,127, Cl. 514-322.000.

Hall, Barry L. Motor vehicle mountable exercise device. 5,558,608, Cl. 482-129.000.

Hall, Wallace T.: *See—*
Ni, Chi-Mou; Bruggemann, Charles J.; Hassan, Tasnim; and Hall, Wallace T., 5,557,961, Cl. 72-61.000.

Hallenstvedt, Oddbjörn: *See—*
Olofsson, Niclas; Rydberg, Anders; and Hallenstvedt, Oddbjörn, 5,558,548, Cl. 440-66.000.

Halliburton Company: *See—*
Dewprashad, Brahmadeo; and Weaver, Jimmie D., 5,559,086, Cl. 507-219.000.
Manke, Kevin R.; and Ringgenberg, Paul, 5,558,162, Cl. 166-319.000.
Vitthal, Sanjay M.; Hardy, Mary A.; McMechan, David E.; Martch, William E.; and Dusterhoft, Ronald G., 5,558,161, Cl. 166-280.000.

Hallmark Cards, Incorporated: *See—*
Banks, Thomas B.; and Laughlin, Daniel B., 5,559,714, Cl. 364-479.030.

Halperin, Arnold: *See—*
Li, Leping; Barbee, Steven G.; Halperin, Arnold; and Heinz, Tony F., 5,559,428, Cl. 324-71.500.

Halsrud, David A.; and Gutzmann, Timothy A., to Ecolab Inc. Thermoplastic compatible lubricant for plastic conveyor systems. 5,559,087, Cl. 508-579.000.

Hamad, Abdel-Jaber A.: *See—*
Macaluso, Virgil; Hamad, Abdel-Jaber A.; and Marshall, Dewey, 5,557,858, Cl. 34-273.000

Hamada, Kenjiro; and Masubuchi, Akira, to NKK Corporation. Method for preventing accumulation of sludge in a coal water mixture storage tank. 5,558,434, Cl. 366-137.000.

Hamada, Koshi: *See—*
Sasano, Hiroshi; Hamada, Koshi; and Kubota, Akihiko, 5,558,508, Cl. 417-569.000.

Hamada, Tatsuo: *See—*
Sugiura, Yoshinori; Azuma, Jun; Adachi, Nobukazu; Setoriyama, Takeshi; Tenpaku, Chitose; Ishikawa, Noriyoshi; Hamada, Tatsuo; Tsuchiya, Yoshiro; Kubota, Takeshi; Nomura, Yoshiya; Kuroda, Akira; Murooka, Ken; Sugita, Takeshi; Niimura, Takeshi; and Yuza, Akira, 5,559,581, Cl. 355-200.000.

Hamahata, Toshihiro: *See—*
Ohtani, Yasuo; Kataho, Takuo; Satoh, Makoto; Tanaka, Tsutomu; Nose, Yoshimasa; Kobayashi, Kazuyoshi; Uchikawa, Tetsuhide; and Hamahata, Toshihiro, 5,559,826, Cl. 373-109.000.

Hamamoto, Magozo: *See—*
Yabe, Toshikazu; Asai, Hiromitsu; and Hamamoto, Magozo, 5,558,448, Cl. 384-470.000.

Hamasaki, Hiroshi: *See—*
Furuyama, Hideto; Hamasaki, Hiroshi; and Kobayashi, Tamon, 5,559,918, Cl. 385-92.000.

Hamblin, David S.: *See—*
Basile, Vincent L., II.; Veldkamp, Brent M.; McCloskey, Douglas N.; and Hamblin, David S., 5,558,573, Cl. 452-127.000.

Hameur Et Cie: *See—*
Ansquer, Henri, 5,558,514, Cl. 431-153.000.

Hammerl, Uwe: *See—*
Röder, Ulrich; Wilhelm, Sigurd; Hehn, Werner; Hammerl, Uwe; Greiner, Doris; Hentschke, Wolfgang; and Reinhardt, Udo, 5,558,593, Cl. 475-331.000.

Hammerman, John I.; and Pujado, Peter R., to UOP. Production of phenol from a hydrocarbon feedstock. 5,559,274, Cl. 568-803.000.

Hammond, Mark L.; Jett, James H.; Keller, Richard A.; Marrone, Babetta L.; and Martin, John C., to Univ. of California, The Regents of the. DNA fragment sizing and sorting by laser-induced fluorescence. 5,558,998, Cl. 435-6.000.

Hammons, John L.; Lampson, Patricia L.; and Osborn, Thomas W., III, to Procter & Gamble Company, The. Absorbent articles having overlapping undergarment covering components that automatically wrap the sides of undergarments. 5,558,657, Cl. 604-385.100.

Hammond, Majid; Kresky, Fred C.; and McCarthy, Jay P., to Atoma International, Inc. Seat recliner. 5,558,403, Cl. 297-378.120.

Hamon, Olivier, to Pixel International. Process for positioning spacer beads in flat display screens. 5,558,732, Cl. 156-99.000.

Hanabusa, Tadashi; Kaneko, Masanori; and Hasegawa, Koh, to Canon Kabushiki Kaisha. Shiftable guide member with rollers in a sheet feeding apparatus. 5,558,451, Cl. 400-637.000.

Hanami, Nobuyuki: *See—*
Yoshihara, Toshiyuki; Hanami, Nobuyuki; Takai, Hideyuki; Anayama, Hideki; Miyazaki, Hajime; Kishi, Junichi; Yamazaki, Itaru; Sakoh, Harumi; Kanemaru, Tetsuro; Iuchi, Kazushi; and Ainoya, Hideyuki, 5,558,964, Cl. 430-58.000.

Hanaski, Koichi: *See—*
Oki, Yoji; Hanaski, Koichi; and Fujisawa, Shigeo, 5,558,420, Cl. 362-31.000.

Hanauer, Nicolas J.: *See—*
Pedersen, Samuel B.; and Hanauer, Nicolas J., 5,557,816, Cl. 5-645.000.

Hancock, Michael M.: *See—*
Boggs, Darrell D.; Brown, Gary L.; Hancock, Michael M.; and Parker, Donald D., 5,559,974, Cl. 395-375.000.

Hankawa, Masashi: *See—*
Aoki, Norihiko; Yamanashi, Takanori; and Hankawa, Masashi, 5,559,638, Cl. 359-749.000.

Hanle, Daniel D.: *See—*
Barkus, David A.; and Hanle, Daniel D., 5,558,616, Cl. 494-12.000.

Hanley, Patrick J.: *See—*
Gilligan, Sean G.; Freeman, Dermot T.; Oliphant, Larry J.; Messmann, Jeffrey S.; Hanley, Patrick J.; and Szczech, Gerald S., 5,558,901, Cl. 427-2.290.

Hanrahan, Michael J.: *See—*
Bernard, Gus; Nilsen, Robert B.; and Hanrahan, Michael J., 5,558,740, Cl. 156-231.000.

Hansen, Bryan P.; and Hurtado, Roberto, to Capcom Coin-Op, Inc. Pinball wand. 5,558,327, Cl. 273-121.00A.

Hansen, Steven M.; Howell, James M.; and Reese, Cecil E., to Du Pont de Nemours, E. I., and Company. Sulfonate-containing polyesters dyeable with basic dyes. 5,559,205, Cl. 528-279.000.

Hansman, Donna. Integral reading glasses with necklace support. 5,559,566, Cl. 351-156.000.

Hanson, Jay L.; and Herrig, Doyle G., to Thermo King Corporation. Transport refrigeration unit and method of operating same. 5,557,938, Cl. 62-126.000.

Hanson, Jay L.; Nixon, James E.; Herrig, Doyle G.; and Ladendorf, Gerald J., to Thermo King Corporation. Refrigeration unit and method of operating same. 5,557,941, Cl. 62-160.000.

Hanson, Jeffrey S.: *See—*
Cyr, Clark R.; Kimmich, Jon B.; Brewer, Timothy T.; Hanson, Jeffrey S.; Richardson, Miles; Robertson, Kenneth R.; Jenkins, Cheryl; Diaz, Brenda L.; Pierce, John G.; and Lee, Gregory, 5,559,943, Cl. 395-155.000.

Hansotia, Eric P.: *See—*
Muzzy, Norman E.; Klages, Corwin L.; and Hansotia, Eric P., 5,558,404, Cl. 297-411.380.

Happ, Lawrence R.; and Alfaro, Conrad, to Cooper Industries. Fused disconnect switch. 5,559,662, Cl. 361-104.000.

Hara, James H., to Skarhar, Inc. Integrated tug/barge system with riding pusher boat. 5,558,036, Cl. 114-249.000.

Hara, Seinosuke; and Yamada, Yosihiko, to Unisia Jecs Corporation. Device for moving cam relative to its driving shaft. 5,557,983, Cl. 74-568.00R.

Harabuchi, Takashi: *See—*
Yatoh, Hisayoshi; Yamashita, Yasuhiko; Harabuchi, Takashi; and Yano, Seinosuke, 5,558,726, Cl. 148-328.000.

Harada, Akihiro, to Mitsubishi Denki Kabushiki Kaisha. Inclined magnetic field generator. 5,559,435, Cl. 324-318.000.

Harada, Masana: *See—*
Watabe, Kiyoto; Takata, Ikunori; and Harada, Masana, 5,559,348, Cl. 257-141.000.

Harada, Nobuyuki; Wada, Katsuyuki; Obara, Hisanori; and Inaoka, Toru, to Nippon Shokubai Co., Ltd. Liquid absorbable material and method for production thereof. 5,559,160, Cl. 521-64.000.

Harada, Yasoo: *See—*
Uda, Hisanori; Sawai, Tetsuro; Imaoka, Toshikazu; Hirai, Toshikazu; and Harada, Yasoo, 5,559,457, Cl. 327-116.000.

Harding, Kay J. Bit for administering animal medication. 5,557,905, Cl. 54-7.000.

Hardtke, Hans, to LISEGA GmbH. Roller bearing. 5,558,447, Cl. 384-418.000.

Hardy, John R. W. Waste product collection unit. 5,558,654, Cl. 604-322.000.

Hardy, Mary A.: *See—*
Vitthal, Sanjay M.; Hardy, Mary A.; McMechan, David E.; Martch, William E.; and Dusterhoft, Ronald G., 5,558,161, Cl. 166-280.000.

Hargis, I. Glen; Miranda, Richard A.; Wilson, John A.; and Yeoh, Oon H., to GenCorp Inc. Play balls or pressureless tennis balls. 5,558,325, Cl. 273-61.00C.

Hargrove, Oliver W., Jr.: *See—*
Moser, Robert E.; Owens, David R.; Wilhelm, James H.; Colley, James D.; and Hargrove, Oliver W., Jr., 5,558,848, Cl. 423-243.010.

Harima Ceramic Co., Ltd.: *See—*
Tsuchinari, Akihiro; Osaki, Hiroaki; Okamoto, Hisato; and Yamamoto, Tetsuo, 5,559,064, Cl. 501-120.000.

Harima, Kenji; Nagai, Toshinari; Kanai, Hiroshi; Osanai, Akinori; Iwano, Kazuhiro; and Yuda, Shuji, to Toyota Jidosha Kabushiki Kaisha. Apparatus for disposing of fuel-vapor. 5,558,072, Cl. 123-677.000.

Harman, Stephen G., to Norhtern Telecom Limited. Voltage regulator including a linear transconductance amplifier. 5,559,423, Cl. 323-277.000.

Harnischfeger Corporation: *See—*
Kallenberger, Harvey J., 5,558,446, Cl. 384-368.000.

Harper, Leroy D.; Schlichting, Grayson C.; Hooks, Douglas A.; Cullimore, Hashimoto, Koji: *See—*

Hayashi, Seita: *See—*

Lötsch, Kurt, 5,557,987, Cl. 74-810.100.

Heil Associates Inc.: *See—*

Harper, Leroy D.; Schlichting, Grayson C.; Hooks, Douglas A.; Cullimore, Ian H. S.; Bradshaw, Gavin A.; Banerjee, Biswa R.; Fairbanks, John P.; and Stone, Roderick W., to Fujitsu Personal Systems, Inc. Computer power management system. 5,560,024, Cl. 395-750.000.

Harr, Deborah L., to Hubbell Incorporated. Door retainer mechanism for automatically retaining access door on cabinet in opened position. 5,557,825, Cl. 16-82.000.

Harring, Lori S.: *See*—
Simpson, Sharon M.; and Harring, Lori S., 5,558,983, Cl. 430-619.000.

Harrington, Terry R.: *See*—
Brown, George E.; Schwab, Edward C.; and Harrington, Terry R., 5,558,890, Cl. 426-94.000.

Harris Corporation: *See*—
Weir, Steven P., 5,559,869, Cl. 379-99.000.

Harris, Ellis D.; Guerin, Jean-Michel; and Wilson, James M., to Xerox Corporation. Optics for passive facet tracking. 5,559,627, Cl. 359-216.000.

Harris, Mark J.: *See*—
Chiu, Randolph K.; and Harris, Mark J., 5,558,575, Cl. 445-7.000.

Harrison, Kenneth. Contact lens applicator. 5,558,374, Cl. 294-1.200.

Harrison, Kent D.: *See*—
Schweich, Cyril J., Jr.; Harrison, Kent D.; and Burns, Matthew M., 5,558,642, Cl. 604-96.000.

Harrison, Maureen M.; Ofslager, Christian L.; Waranis, Robert P.; and Leonard, Thomas W., to American Home Products Corporation. Rapamycin formulations for oral administration. 5,559,121, Cl. 514-291.000.

Hart, James A.: *See*—
Davis, Terry L.; Hart, James A.; O'Malley, Michael F.; Russell, James F.; Sears, John W.; and Trice, Philip H., 5,559,887, Cl. 380-24.000.

Hartery, William, to Illinois Tool Works, Inc. Push plug seal with sealing patch secured by tabs. 5,558,346, Cl. 277-189.000.

Harth, Klaus: *See*—
Lauth, Guenter; Hoelderich, Wolfgang; Harth, Klaus; and Hibst, Hartmut, 5,559,065, Cl. 502-5.000.

Hartley, Richard I.: *See*—
Gupta, Rajiv; and Hartley, Richard I., 5,559,334, Cl. 250-360.100.

Hartman, Eric J.: *See*—
Keeler, James D.; Hartman, Eric J.; Liano, Kadir; and Ferguson, Ralph B., 5,559,690, Cl. 364-164.000.

Hartman, Frederick A.; Rice, Ronald J.; Burckett-St. Laurent, James C. T. R.; Taylor, Lucille F.; and Haeggberg, Donna J., to Procter & Gamble Company, The. Low-dosage automatic dishwashing detergent with monopersulfate and enzymes. 5,559,089, Cl. 510-224.000.

Hartman, Frederick A.: *See*—
Severns, John C.; Sivik, Mark R.; Hartman, Frederick A.; Denutte, Hugo R. G.; Costa, Jill B.; and Chung, Alex H., 5,559,088, Cl. 510-102.000.

Hartman, George D.; Prugh, John D.; Egbertson, Melissa S.; Duggan, Mark E.; Hoffman, William; Halezenko, Wasyl; and Askew, Ben, to Merck & Co., Inc. Fibrinogen receptor antagonists. 5,559,127, Cl. 514-322.000.

Haruta, Keitoshi: *See*—
Noguchi, Yukihiko; Haruta, Keitoshi; Sakamoto, Isamu; Yamanaka, Mituo; Uchinono, Makoto; and Shiohara, Takashi, 5,558,559, Cl. 451-14.000.

Hase, Hiroyuki; and Shoji, Rihito, to Matsushita Electric Industrial Co., Ltd. Torque sensor using magnetostrictive alloy and method of manufacturing the same. 5,557,974, Cl. 73-862.335.

Hase, Kenichi: *See*—
Miyazawa, Shyoichi; Horita, Ryutaro; Hase, Kenichi; Kawamura, Satoshi; Kojima, Shinichi; and Iseki, Toshiyuki, 5,559,645, Cl. 360-51.000.

Hasebe, Tomiaki: *See*—
Kunishima, Akira; Hasebe, Tomiaki; Kikuchi, Hideya; Hozumi, Etsuro; and Kushida, Takeo, 5,558,068, Cl. 123-516.000.

Hasegawa, Hiroshi: *See*—
Yamashima, Osamu; Inoue, Toshihiro; and Hasegawa, Hiroshi, 5,558,012, Cl. 100-26.000.

Hasegawa, Kiyoharu: *See*—
Matsumoto, Mansuke; Sasaki, Nobuaki; Sawano, Bunji; Hasegawa, Kiyoharu; and Kikkawa, Kazuyoshi, 5,559,247, Cl. 548-471.000.

Hasegawa, Koh: *See*—
Hanabusa, Tadashi; Kaneko, Masanori; and Hasegawa, Koh, 5,558,451, Cl. 400-637.000.

Hasegawa, Koji: *See*—
Takahashi, Akihito; and Hasegawa, Koji, 5,559,563, Cl. 348-625.000.

Hasegawa, Tomoyasu, to Murata Manufacturing Co., Ltd. Angular velocity sensor. 5,559,291, Cl. 73-504.120.

Hasegawa, Toshiaki: *See*—
Hashizawa, Shigemi; Inaba, Shigemitsu; and Hasegawa, Toshiaki, 5,558,533, Cl. 439-310.000.

Hasegawa, Yusuke: *See*—
Maki, Hidetaka; Hasegawa, Yusuke; and Akazaki, Shusuke, 5,558,075, Cl. 123-680.000.
Maki, Hidetaka; Akazaki, Shusuke; Hasegawa, Yusuke; and Nishimura, Yoichi, 5,558,076, Cl. 123-687.000.

Haselden, Geoffrey G., to University of Leeds, The. Vapour compression systems. 5,557,937, Cl. 62-114.000.

Hashii, Toshimitsu; and Everts, Robert G., to Ryobi Motor Products. Oscillating spindle sander. 5,558,566, Cl. 451-157.000.

Hashimoto Corporation: *See*—
Hashimoto, Kazuo, 5,559,863, Cl. 379-58.000.

Hashimoto, Kazuo, to Hashimoto Corporation. Car telephone accessory device with telephone answering function. 5,559,863, Cl. 379-58.000.

Hashimoto, Koji: *See*—
Ito, Toru; Kishi, Hiroshi; Nimura, Mitsuhiro; Nanba, Akimasa; Morimoto, Kyomi; Ohara, Shigekazu; Yokoyama, Shoji; Maekawa, Kazuteru; Katoh, Kiyohide; Masuda, Hiroyoshi; Katoh, Shinichi; and Hashimoto, Koji, 5,559,511, Cl. 340-995.000.

Hashimoto, Shin'ichi: *See*—
Katsumata, Ryoichi; and Hashimoto, Shin'ichi, 5,559,016, Cl. 435-116.000.

Hashimoto, Teiji: *See*—
Yanagihara, Hiroyuki; Taniguchi, Seihou; Hazeyama, Takeshi; Otaka, Hitoshi; Hashimoto, Teiji; and Souma, Sansan, 5,558,689, Cl. 55-492.000.

Hashizawa, Shigemi; Inaba, Shigemitsu; and Hasegawa, Toshiaki, to Yazaki Corporation. Electrical connector. 5,558,533, Cl. 439-310.000.

Hashizume, Junichiro: *See*—
Tsuchida, Shinji; Ueda, Shigenori; and Hashizume, Junichiro, 5,558,719, Cl. 118-723.00E.

Hassan, Tasnim: *See*—
Ni, Chi-Mou; Bruggemann, Charles J.; Hassan, Tasnim; and Hall, Wallace T., 5,557,961, Cl. 72-61.000.

Hasse, Gregory L.: *See*—
Hoium, Jonathan A.; and Hasse, Gregory L., 5,559,294, Cl. 73-862.440.

Hassler, Stephen P.; Johnson, Stephen P.; and Lapp, John, to Cooper Industries, Inc. Current limiting fuse having compact structure. 5,559,488, Cl. 337-158.000.

Hasuda, Syuuichi: *See*—
Yokoya, Yasuhiko; Yamazaki, Noboru; Nakamura, Mitsuo; Hasuda, Syuuichi; Namai, Eisaku; and Yamada, Syuuzou, 5,559,443, Cl. 324-754.000.

Hata, Masayuki: *See*—
Suzuki, Katsunori; and Hata, Masayuki, 5,559,998, Cl. 395-550.000.

Hatada, Toshio: *See*—
Hayashi, Yutaka; Miyamoto, Mitsuo; Watarai, Michihito; Atarashi, Takayuki; Tanaka, Tetsuya; Hatada, Toshio; Takada, Yoshihiro; and Daikoku, Takahiro, 5,558,493, Cl. 415-208.100.

Hatano, Kunimichi: *See*—
Kojima, Takeshi; Yahagi, Toshio; Fukami, Kazuaki; Suzuki, Syouji; and Hatano, Kunimichi, 5,559,702, Cl. 364-426.020.

Hatch, Michael R.: *See*—
Chen, Shuo-Hao; Zang, Yan; and Hatch, Michael R., 5,558,445, Cl. 384-132.000.

Hatchett, Michael R.: *See*—
Heath, John S.; and Hatchett, Michael R., 5,559,652, Cl. 360-106.000.

Hatori, Kazuo: *See*—
Fukuda, Hirofumi; Hatori, Kazuo; Yamada, Kazumi; Nogiri, Toshiaki; and Mori, Kozo, 5,559,678, Cl. 361-818.000.

Hatsuda, Tsuguyasu, to Matsushita Electric Industrial Co., Ltd. Sensing circuit unit for a dynamic circuit. 5,559,456, Cl. 327-53.000.

Hatton, Bruce M.: *See*—
Kovacich, John A.; Haefner, Donald R.; Hatton, Bruce M.; Stout, Donald M.; Ryczek, Lawrence J.; and Klumb, Arlene M., 5,559,280, Cl. 73-35.130.

Haubner, Georg, to Robert Bosch GmbH. Receiver for the reception of wirelessly transmitted information. 5,559,499, Cl. 340-636.000.

Hauni Maschinenbau Aktiengesellschaft: *See*—
Roether, Friedemann; Niehues, Heiko; Leckband, Uwe; Drewes, Harry; Christ, Horst-Udo; and Dierken, Hans, 5,558,199, Cl. 198-461.200.

Hauser, Ray; Smothers, Daryl; and Schreier, John, to Hydro-Gear Limited, Limited Partnership. Charge pump for axle driving apparatus including hydrostatic transmission. 5,557,931, Cl. 60-455.000.

Hausman, Herbert H.: *See*—
Rothschild, Wayne H.; Soyka, Edward J.; Hausman, Herbert H.; and Pirzadeh, Joe, 5,558,197, Cl. 194-344.000.

Hawkins, James T.; and Hawkins, Michael, to Proteus Engineering, Inc. Composite multi-wave compression spring. 5,558,393, Cl. 267-162.000.

Hawkins, Michael: *See*—
Hawkins, James T.; and Hawkins, Michael, 5,558,393, Cl. 267-162.000.

Hayabuchi, Masahiro: *See*—
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Nishida, Masaaki; Yamamoto, Yoshihisa; Kusafuka, Muneo; Mikami, Kazuhiro; and Tsutsui, Hiroshi, 5,558,599, Cl. 477-116.000.
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Nishida, Masaaki; Yamamoto, Yoshihisa; Tsutsui, Hiroshi; and Nadayoshi, Kaoru, 5,558,600, Cl. 477-121.000.

Hayano, Kouji: *See*—
Dosaka, Katsumi; Kumanoya, Masaki; Hayano, Kouji; Yamazaki, Akira; Iwamoto, Hisashi; Abe, Hideaki; Konishi, Yasuhiro; Himukashi, Katsumitsu; Ishizuka, Yasuhiro; and Saiki, Tsukasa, 5,559,750, Cl. 365-230.060.

Hayano, Takeshi: *See*—
Nishi, Toshiyuki; Koda, Hiroko; Sugita, Kazuyuki; Ishida, Yohhei; Takemura, Makoto; and Hayano, Takeshi, 5,559,224, Cl. 540-350.000.

Hayashi, Akio: *See*—
Nakatani, Kohichi; Hayashi, Akio; and Kohiyama, Tomohisa, 5,560,020, Cl. 395-750.000.

Hayashi, Bunya; and Ishikawa, Makoto, to SMC Corporation. Double solenoid type electromagnetic valve. 5,558,126, Cl. 137-625.640.

Hayashi, Hiromichi: *See*—
Torii, Kazuo; Iwasaki, Takashi; Onodera, Yoshio; and Hayashi, Hiromichi, 5,559,070, Cl. 502-240.000.

Hayashi, Seita: *See*—
Maruyama, Jun; Hayashi, Seita; Hori, Suji; and Karakama, Tadao, 5,558,127, Cl. 137-636.100.

Hayashi, Takayuki: *See*—
Nagano, Hideo; Niwa, Kazuo; and Hayashi, Takayuki, 5,558,820, Cl. 264-4.100.

Hayashi, Toshiomi. Perpendicularly joined structure with thin-walled plates and thin-walled tubes and the method of manufacture. 5,559,308, Cl. 181-265.000.

Hayashi, Yutaka; Miyamoto, Mitsuo; Watarai, Michihito; Atarashi, Takayuki; Tanaka, Tetsuya; Hatada, Toshio; Takada, Yoshihiro; and Daikoku, Takahiro, to Hitachi, Ltd. Forced air cooling apparatus having blower and air current regulating plate that reduces eddy air current at inlet of blower. 5,558,493, Cl. 415-208.100.

Hayata, Hiroshi: *See*—
Yokoyama, Masahide; and Hayata, Hiroshi, 5,558,749, Cl. 204-192.120.

Hayes Wheels International, Inc.: *See*—
Jaskiery, Dennis, 5,558,407, Cl. 301-63.100.

Hayet, Pascal, to U.S. Philips Corporation. Transmission system comprising timing recovery. 5,559,833, Cl. 375-259.000.

Haynes, Terry. Lift and dump apparatus. 5,558,485, Cl. 414-421.000.

Hays, William D.: *See*—
Bhagat, Jai P.; Oswalt, Ernest A.; and Hays, William D., 5,559,862, Cl. 379-58.000.

Hayse, Steven R.: *See*—
Toni, Darryl M.; Grant, Peter L.; Johnson, Craig F.; Hayse, Steven R.; Forster, William V.; Nowak, Kenneth; and Osiecki, Larry J., 5,558,919, Cl. 428-116.000.

Hazeyama, Takeshi: *See*—
Yanagihara, Hiroyuki; Taniguchi, Seihou; Hazeyama, Takeshi; Otaka, Hitoshi; Hashimoto, Teiji; and Souma, Sansan, 5,558,689, Cl. 55-492.000.

He, Yun: *See*—
Lin, Nan-Horng; He, Yun; and Wittenberger, Steven J., 5,559,242, Cl. 548-247.000.

Healthdyne, Inc.: *See*—
Evers, David C.; Lindsey, A. Darrell; Finch, Marcus; and Gorsuch, Reynolds G. F., 5,558,638, Cl. 604-66.000.

Healthpoint Medical Limited Partnership: *See*—
Jones, David P.; Woller, William H.; and Jewett, Cynthia W., 5,558,872, Cl. 424-78.030.

Healthy Calls, Inc.: *See*—
Herczl, David; and Kohn, Mike, 5,559,882, Cl. 379-452.000.

Heartport, Inc.: *See*—
Boyd, Stephen W.; Stevens, John H.; Evard, Philip C.; and Adams, Craig L., 5,558,644, Cl. 604-96.000.

Heath, John S.; and Hatchett, Michael R. Disk drive rotary actuator with rocking pivot. 5,559,652, Cl. 360-106.000.

Heath, Richard R.: *See*—
Keys, Lyle O.; Gardner, Neil J.; Brunisholz, Arthur C.; and Heath, Richard R., 5,559,878, Cl. 379-265.000.

Heath, William F., Jr.: *See*—
Basinski, Margret B.; DiMarchi, Richard D.; Heath, William F., Jr.; and Schoner, Brigitte E., 5,559,208, Cl. 530-317.000.

Heaton, Lisa W.: *See*—
Green, David T.; Bolanos, Henry; Ratcliff, Keith; Heaton, Lisa W.; and Robertson, John C., 5,558,266, Cl. 227-178.100.

Heckele, Helmut; Dingler, Andreas; and Falk, Ernst, to Richard Wolf GmbH. Medical instrument employing curved spreading members to manipulate organs within the body. 5,558,620, Cl. 600-208.000.

Heckner, Christoph, to Dürkopp Adler Aktiengesellschaft. Multi-section actuator. 5,558,005, Cl. 92-66.000.

Hedberg, Olle, to Lidköping Machine Tools AB. Centerless machine. 5,558,567, Cl. 451-242.000.

Hedderly, David L., to GPT Limited. Outstation ranging in demand assignment, time division multiple access, communication system. 5,559,805, Cl. 370-95.300.

Hedeen, Nils E. Bicycle carrier. 5,558,261, Cl. 224-511.000.

Hedelin, Lars G., to Fanja Ltd. Sliding vane machine having vane guides and inlet opening regulation. 5,558,511, Cl. 418-150.000.

Heelix Fasteners, Inc.: *See*—
Skufca, James; and Skufca, Matthew R., Jr., 5,558,887, Cl. 425-418.000.

Heffernan, John M.: *See*—
Cole, Arthur W.; and Heffernan, John M., 5,558,045, Cl. 122-6.00A.

Hegg, Jeffrey W.: *See*—
Gregory, William W.; Lance, Wayne E.; and Hegg, Jeffrey W., 5,559,415, Cl. 318-609.000.

Heggeness, Michael H.; and Doherty, Brian J., to Smith & Nephew Richards, Inc. Devices and methods for posterior spinal fixation. 5,558,674, Cl. 606-61.000.

Hehn, Werner: *See*—
Röder, Ulrich; Wilhelm, Sigurd; Hehn, Werner; Hammerl, Uwe; Greiner, Doris; Hentschke, Wolfgang; and Reinhardt, Udo, 5,558,593, Cl. 475-331.000.

Heide, Ulf B., to Technical Manufacturing Corporation. Lightweight honeycomb tabletop. 5,558,920, Cl. 428-116.000.

Heidelberg Harris Inc.: *See*—
Albert, Kevin F., 5,558,615, Cl. 493-477.000.

Heidelberger Druckmaschinen AG: *See*—
Albert, Kevin F., 5,558,615, Cl. 493-477.000.
Greive, Martin; and Ruf, Bernd, 5,558,321, Cl. 271-98.000.

Lötsch, Kurt, 5,557,987, Cl. 74-810.100.

Heil Associates Inc.: *See*—
Heil, Thomas L., 5,558,621, Cl. 600-226.000.

Heil, Thomas L., to Heil Associates Inc. Surgical retractor with cross bar grips. 5,558,621, Cl. 600-226.000.

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Enhsen, Alfons; Glombik, Heiner; Müllner, Stefan; and Wess, Günther, 5,559,258, Cl. 552-550.000.
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Malin, Art; Van Erden, Donald; and McMahon, Michael, 5,557,907, Cl. 53-139.200.
McElderry, James W., 5,558,479, Cl. 411-178.000.
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Yoshie, Takehiko; Sasaki, Masanori; Shibafuchi, Hiroshi; and Imai, Yasushi, 5,559,243, Cl. 548-263.800.

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Unger, Evan C.; and Yellowhair, David W., 5,558,092, Cl. 128-660.030.

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Scott, John D.; and Steven, Rachel A., 5,559,276, Cl. 570-165.000.

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Röder, Ulrich; Wilhelm, Sigurd; Hehn, Werner; Hammerl, Uwe; Greiner, Doris; Hentschke, Wolfgang; and Reinhardt, Udo, 5,558,593, Cl. 475-331.000.

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Harada, Nobuyuki; Wada, Katsuyuki; Obara, Hisanori; and Inaoka, Toru, 5,559,160, Cl. 521-64.000.

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Landa, Benzion; Krumberg, Yakov; Almog, Yaacov; and Niv, Yehuda, 5,558,970, Cl. 430-126.000.

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Melas, Constantin M.; Patel, Arvind M.; Rutledge, Robert A.; and So, Bum S., 5,559,840, Cl. 375-355.000.

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Hoover, Rick D.; Kozumplik, Nicholas, Jr.; and Sullivan, Joseph W., 5,559,310, Cl. 181-230.000.
Sell, Leslie J., 5,558,125, Cl. 137-625.270.

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Krolikowski, Anthony E., 5,557,819, Cl. 15-1.700.

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Roche, Karen M., 5,558,646, Cl. 604-143.000.

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Schwartz, Jean-Charles; Arrang, Jean-Michel; Garbarg, Monique; Lecomte, Jeanne-Marie; Ganellin, Charon R.; Fkyerat, Abdellatif; Tertiuk, Wasyl; Schunack, Walter; Lipp, Ralph; Stark, Holger; and Purand, Katja, 5,559,113, Cl. 514-252.000.

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Corsi, Giordano B.; Brandt, Alberto; and Cecchetelli, Loredana, 5,559,241, Cl. 548-178.000.

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Clark, R. James, 5,558,739, Cl. 156-203.000.

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Hunter, Dan A.; Utenick, Michael R.; Morehouse, James H.; and Chenkin, Nelson, 5,559,648, Cl. 360-75.000.

Integrity Industries, Inc.: *See*—
Duncan, William M., Jr., 5,559,085, Cl. 507-103.000.

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Alpert, Donald B.; Choudhury, Mustafiz R.; and Mills, Jack D., 5,559,986, Cl. 395-471.000.
Avnon, Dror; Sharangpani, Harshvardhan P.; and Sweedler, Jonathan B., 5,559,977, Cl. 395-375.000.
Banik, Jashojiban; Meixner, Anne; King, Glenn F.; and Guddat, Doug, 5,559,745, Cl. 365-201.000.
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Dent, David, 5,558,522, Cl. 439-65.000.
Dulong, Carole, 5,560,039, Cl. 395-800.000.
Dunstan, Robert A.; Shimoda, Marion H.; Silvester, Kelan C.; and Sun, Jiming, 5,560,022, Cl. 395-750.000.
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Gupta, Shantanu R.; and Griffith, James S., 5,560,025, Cl. 395-800.000.
Kardach, James P., Nakanishi, Tosaku; and Cheng, Jimmy S., 5,560,001, Cl. 395-550.000.
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Keith, Michael, 5,559,831, Cl. 375-240.000.
Nickerson, Brian, 5,559,722, Cl. 364-514.00R.
Oztaskin, Ali S.; Allen, John L.; and Murthy, Ganesh, 5,559,965, Cl. 395-284.000.
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Sakoda, Thomas Y.; and Young, Bruce, 5,559,954, Cl. 395-164.000.
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Agahi, Farid; Pezeshki, Bardia; Kash, Jeffrey A.; and Welser, Jeffrey J., 5,559,912, Cl. 385-42.000.

Alsmeier, Johann; Ellis, Wayne F.; Mandelman, Jack A.; and Wong, Hing, 5,559,050, Cl. 437-45.000.

Beaudet, Phillip; Black, Matthew; Edwards, Jonathan; Jones, Julian; Merks, Eduardus A. T.; and Spall, Roger, 5,559,945, Cl. 395-156.000.

Berry, Robert F., 5,559,726, Cl. 364-554.000.

Bhatt, Anilkumar C.; Magnuson, Roy H.; Markovich, Voya R.; Papathomas, Konstantinos I.; and Powell, Douglas O., 5,557,844, Cl. 29-852.000.

Bloomfield, Marc A.; Andrew, Christopher A. H.; and Magid, Peter G., 5,559,948, Cl. 395-159.000.

Boland, John J.; Dove, Derek B.; and Takamori, Takeshi, 5,559,384, Cl. 310-90.500.

Carey, Maurice E.; Miracle, Gerald H.; Moyer, James T.; and Neuner, Richard A., 5,559,972, Cl. 395-281.000.

Chen, Ming-Syan; Hsiao, Hui-I; Li, Chung-Shen; and Yu, Philip S., 5,559,764, Cl. 369-30.000.

Cohen, Stephen A.; Edelstein, Daniel C.; Grill, Alfred; Paraszczak, Jurij R.; and Patel, Vishnubhai V., 5,559,367, Cl. 257-77.000.

Cote, William J.; and Lofaro, Michael F., 5,558,563, Cl. 451-41.000.

Coteus, Paul W.; and Lanzetta, Alphonso P., 5,558,523, Cl. 439-67.000.

Covino, James J.; and Sousa, Jose R., 5,559,453, Cl. 326-93.000.

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Cunningham, Earl A., 5,559,460, Cl. 327-179.000.

Datta, Madhav; and Shenoy, Ravindra V., 5,558,957, Cl. 429-127.000.

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Easter, Randall J.; and Merz, William A., 5,559,889, Cl. 380-30.000.

Flint, Ephraim B.; Lanzetta, Alphonso P.; and Mok, Lawrence S., 5,559,670, Cl. 361-681.000.

Frank, Vlastimil, 5,558,795, Cl. 219-604.000.

Gregg, Thomas A.; Hoke, Joseph M.; and Pandey, Kulwant M., 5,559,963, Cl. 395-200.130.

Itoh, Takayuki; and Koyamada, Koji, 5,559,935, Cl. 395-124.000.

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Li, Leping; Barbee, Steven G.; Halperin, Arnold; and Heinz, Tony F., 5,559,428, Cl. 324-71.500.

Lofaro, Michael F., 5,558,111, Cl. 134-95.200.

Macon, James F., Jr.; Medina, David; and Peloquin, Mark A., 5,560,018, Cl. 395-733.000.

Manthuruthil, George C.; Parikh, Shrikant N.; and Reddy, Hari N., 5,560,026, Cl. 395-800.000.

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Scalzi, Casper A.; and Starke, William J., 5,560,013, Cl. 395-700.000.

Song, Seungyoon P., 5,559,976, Cl. 395-375.000.

Voldman, Steven H.; Wallash, Albert J.; and Wilcox, Reginald B., Jr., 5,559,051, Cl. 437-51.000.

Wideman, Roderick B., 5,559,982, Cl. 395-438.000.

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International Microcircuits, Inc.: *See*—
Tozun, Orhan; Mak, Chit-Ah; and Hoeft, Werner, 5,559,477, Cl. 331-97.000.

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Wood, Peter N., 5,559,394, Cl. 315-224.000.

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International Verifact Inc.: *See*—
Wong, Yiu K.; Groves, David H.; and Hemy, Martin F., 5,559,317, Cl. 235-449.000.

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Prada, Ricardo; Galiasso, Robert T.; Romero, Yilda; Reyes, Edito; and Rodriguez, Edilberto, 5,558,766, Cl. 208-59.000.

Intihar, Bruce: *See*—
Greggain, Lance; Mandl, Peter; and Intihar, Bruce, 5,559,905, Cl. 382-298.000.

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Lloyd, Lindsay B.; Beck, Jon E.; Petelenz, Tomasz J.; Holt, Clay H.; and Feiman, William F., 5,558,632, Cl. 604-20.000.

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Wentworth, Fred A., Jr., 5,558,513, Cl. 431-4.000.

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Baerveldt, George; Blake, Larry W.; and Wright, George M., 5,558,629, Cl. 609-8.000.

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Winship, David W., 5,559,411, Cl. 318-466.000.

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Ishida, Osamu: *See*—
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Kato, Eiichi; and Ishii, Kazuo, 5,558,966, Cl. 430-96.000.

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Ito, Eiji, to Mitsubishi Denki Kabushiki Kaisha. Cooling apparatus and assembling method thereof. 5,558,155, Cl. 165-80.300.

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Ito, Masuyasu; and Chigasaki, Hiroyuki, to Sony Corporation. Disc cartridge loading apparatus in recording and/or reproducing apparatus. 5,559,649, Cl. 360-99.060.
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Ito, Taka-aki: *See*—
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Ito, Toru; Kishi, Hiroshi; Nimura, Mitsuhiro; Nanba, Akimasa; Morimoto, Kyomi; Ohara, Shigekazu; Yokoyama, Shoji; Maekawa, Kazuteru; Katoh, Kiyohide; Masuda, Hiroyoshi; Katoh, Shinichi; and Hashimoto, Koji, to Aisin Aw Co., Ltd. Vehicle route guidance apparatus for re-searching for a new route when vehicle goes out of route. 5,559,511, Cl. 340-995.000.
Ito, Yasutaka: *See*—
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Itogawa, Hiroshi: *See*—
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Monta, Kazuo; and Itoh, Juichiro, 5,559,691, Cl. 364-188.000.
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ITT Automotive Europe GmbH: *See*—
Buschmann, Gunther; and Woywod, Jürgen, 5,558,415, Cl. 303-186.000.
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Izawa, Mitsuharu, to Casio Computer Co., Ltd. Liquid crystal display having a drive circuit. 5,559,526, Cl. 345-96.000.
Izett, George G.; and Ciccarone, Jay. Golf putter head and club. 5,558,586, Cl. 473-251.000.
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Izzo, Theodore-James, 5,558,259, Cl. 224-627.000.
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Terpening, John P., 5,557,840, Cl. 29-727.000.
J.O. Bernt & Associates Limited: *See*—
Bernt, Jorgen O.; and Langille, Kevin B., 5,558,707, Cl. 106-677.000.
J/B Industries, Inc.: *See*—
Randall, Scott R., 5,558,124, Cl. 137-597.000.
Jackisch, David A.; and Styles, David A., to E.I. Du Pont de Nemours and Company. Water-soluble polymer packaging for delivery of incompatible crop protection chemicals. 5,558,228, Cl. 206-524.700.
Jackson, Deborah J.: *See*—
Bloomfield, Mark C.; Castro, Edward F.; Dyer, Joseph T.; Jackson, Deborah J.; Lemons, Charles E.; and McCown, Bruce A., 5,559,611, Cl. 358-407.000.
Jacobine, Anthony F.: *See*—
Woods, John G.; Rakas, Margaret A.; Jacobine, Anthony F.; Alberino, Louis M.; Kropp, Philip L.; Sutkaitis, Donna M.; Glaser, David M.; and Nakos, Steven T., 5,558,937, Cl. 428-378.000.
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Jaegge, Walter J.; Malone, Francis J., Jr.; Overton, Frank H.; Ross, Roger A.; and Steele, Ronald E., to Du Pont de Nemours, E. I., and Company. High speed process for making fully-oriented nylon yarns. 5,558,826, Cl. 264-103.000.
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Jain, Ajay; Sahni, Paramdeep S.; and Gupta, Alok K., to Lucent Technologies Inc. Secure information retrieval service (SIRS). 5,559,888, Cl. 380-25.000.
Jakus, Stephen A. Device for retaining body heat. 5,557,801, Cl. 2-2.000.
James, Barry R.: *See*—
Horn, Larry L.; James, Barry R.; Merkle, William L.; Materna, William R.; and Coates, Stephen J., 5,558,691, Cl. 65-335.000.
James, Bryan D.: *See*—
Adamczyk, Maciej; Chen, Yon-Yih; Walling, John A.; James, Bryan D.; and Artip, Sharon G., 5,559,210, Cl. 530-345.000.
James, John V.: *See*—
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James, Lonnie A. Multi-purpose head-mounted adjustable medical tube holder. 5,558,090, Cl. 128-207.180.
James, William A.; Breitkopf, Stephen H.; Provell, Robert G.; and Moody, Ralph A., III, to McNeil-PPC, Inc. Shipping container for large cylindrical sleeves. 5,558,218, Cl. 206-303.000.
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Jansens, Peter J. Coaxial heating cable with ground shield. 5,558,794, Cl. 219-549.000.
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Gole, Dilip J.; Levinson, R. Saul; Wilkinson, Paul K.; and Davies, J. Desmond, 5,558,880, Cl. 424-484.000.
Japan Aviation Electronics Industry, Limited: *See*—
Kato, Nobukazu; and Suzuki, Mamoru, 5,558,540, Cl. 439-637.000.
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Yatoh, Hisayoshi; Yamashita, Yasuhiko; Harabuchi, Takashi; and Yano, Seinosuke, 5,558,726, Cl. 148-328.000.
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Jarowski, Charles I. Amino acid supplementation of dietary proteins. 5,559,142, Cl. 514-419.000.
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Torimoto, Yoshifumi, 5,558,598, Cl. 477-110.000.
Javitt, Joel I., to Lucent Technologies Inc. Network-controlled reference frequency generator. 5,559,842, Cl. 375-376.000.
Jaw, Link C., to Scientific Monitoring, Inc. Engine stall and distortion suppression system. 5,557,917, Cl. 60-39.020.
Jayant, Nuggehally S.; and Safranek, Robert J., to Lucent Technologies Inc. Compression of signals for perceptual quality by selecting frequency bands having relatively high energy. 5,559,900, Cl. 382-248.000.
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Jefford, Charles W., to Oxaco S.A. 1,2,4-trioxane derivatives. 5,559,145, Cl. 514-452.000.
Jenkins, Borden. Combination grill-wok barbecue. 5,558,008, Cl. 99-340.000.
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Cyr, Clark R.; Kimmich, Jon B.; Brewer, Timothy T.; Hanson, Jeffrey S.; Richardson, Miles; Robertson, Kenneth R.; Jenkins, Cheryl; Diaz, Brenda L.; Pierce, John G.; and Lee, Gregory, 5,559,943, Cl. 395-155.000.
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Jenkins, Scott A.; Wasyl, Joseph; and Robins, Charles. Apparatus for enhancing wave height in ocean waves. 5,558,460, Cl. 405-29.000.
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Jennings, Kevin E., to Unisys Corporation. Method and apparatus for efficiently interfacing variable width data streams to a fixed width memory. 5,559,969, Cl. 395-307.000.
Jennings, Michael G.: *See*—
Corbin, David R.; Greenplate, John T.; Jennings, Michael G.; Purcell, John P.; and Sammons, Robert D., 5,558,862, Cl. 424-94.400.
Jensen, Howard A.: *See*—
Ben-Aissa, M. Nebil; Doran, Jerry J.; Jensen, Howard A.; and Monroe, Dick, 5,558,274, Cl. 236-13.000.
Jensen, James A., to Lanxide Technology Company, LP. Polymer precursors for aluminum nitride. 5,559,203, Cl. 528-9.000.
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Lukacs III, Alexander; Jensen, James A.; and Becker, Kurt J., 5,558,908, Cl. 427-228.000.
Jenski, Gary M., Jr.: *See*—
Webster, Alexander P.; and Jenski, Gary M., Jr., 5,558,121, Cl. 137-511.000.
Jeon, Duk Y.: *See*—
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Jessop, Richard E.; and Demmer, John E., to Demmer Corporation. Double plane bend former. 5,557,964, Cl. 72-389.100.
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Hammond, Mark L.; Jett, James H.; Keller, Richard A.; Marrone, Babetta L.; and Martin, John C., 5,558,998, Cl. 435-6.000.
Jevne, Allan H.: *See*—
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Jewett, Cynthia W.: *See*—
Jones, David P.; Woller, William H.; and Jewett, Cynthia W., 5,558,872, Cl. 424-78.030.
Jeyendran, Rajasingam S. Pulsing and oscillating methods of centrifuging for improving the recovery of viable cells. 5,559,040, Cl. 436-177.000.
Jezzi, Arrigo D.; Schroer, Charles F., Jr.; Gephart, Caroline; and Biesterveld, Daniel D., to Confab, Inc. Absorbent article with dry surface composite construction. 5,558,655, Cl. 604-378.000.
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Estes, Mary K.; Jiang, Xi; and Graham, David Y., 5,559,014, Cl. 435-91.200.
Jikuhara, Seiki: *See*—
Hirano, Yutaka; Komatubara, Takeo; Sunaga, Takashi; Takahashi, Yasuki; Tanaka, Kiyoshi; Akazawa, Kiyoshi; Watanabe, Masato; and Jikuhara, Seiki, 5,557,944, Cl. 62-469.000.
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Gillig, James R.; and Jirousek, Michael R., 5,559,228, Cl. 540-460.000.
JMA & Associates: *See*—
Rouda, Dawn V., 5,557,823, Cl. 15-400.000.
Jo, Hyun M.; and Kim, Yong H., to Samsung Electronics Co., Ltd. Power window control system of an automotive vehicle. 5,559,375, Cl. 307-10.100.
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La Mura, Joseph L.; and Wallenburg, Ronald C., 5,559,303, Cl. 89-28.050.
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Browning, Dan D.; Joffe, Ethan D.; and Lanier, Jaron Z., 5,559,995, Cl. 395-500.000.
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John, Varghese: *See*—
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Backus, John W.; and Sutherland, John W. H., 5,559,013, Cl. 435-91.200.
Johnson & Johnson Consumer Products, Inc.: *See*—
Clum, Charles E.; and Wang, Jonas C. T., 5,559,149, Cl. 514-529.000.
Johnson, Candace L. Combination wheelchair and walker. 5,558,358, Cl. 280-648.000.
Johnson, Craig F.: *See*—
Toni, Darryl M.; Grant, Peter L.; Johnson, Craig F.; Hayse, Steven R.; Forster, William V.; Nowak, Kenneth; and Osiecki, Larry J., 5,558,919, Cl. 428-116.000.
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Johnson, Gordon E.: *See*—
Hsieh, Bing R.; Johnson, Gordon E.; Antoniadis, Homer; McGrane, Kathleen M.; and Stolka, Milan, 5,558,904, Cl. 427-66.000.
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Johnson, Richard A.; Engel, Joseph C.; Saletta, Gary F.; and Shimp, Alan B., to Eaton Corporation. Digitally controlled circuit interrupter with improved automatic selection of sampling interval for 50 Hz and 60 Hz power systems. 5,559,719, Cl. 364-483.000.
Johnson, Robert R.: *See*—
Casteel, Ronald G.; Davis, Dennis E.; and Johnson, Robert R., 5,558,113, Cl. 134-122.00R.
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Ben-Aissa, M. Nebil; Doran, Jerry J.; Jensen, Howard A.; and Monroe, Dick, 5,558,274, Cl. 236-13.000.
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Jones, Julian: *See*—
Beaudet, Phillip; Black, Matthew; Edwards, Jonathan; Jones, Julian; Merks, Eduardus A. T.; and Spall, Roger, 5,559,945, Cl. 395-156.000.
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Kaltenbach III, Robert F., to DuPont Merck Pharmaceutical Company, The. Process for the preparation of diamine intermediates useful in the synthesis of HIV protease inhibitors. 5,559,252, Cl. 549-342.000.

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Jooste, Francois: *See*—
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Juarez, Ramiro O. Band transportation system. 5,558,198, Cl. 198-324.000.

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Sakaguchi, Masashi; and Yamamoto, Michitaka, 5,558,867, Cl. 424-199.100.

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Amada, Eiichi; Takiyasu, Yoshihiro; Ishifuji, Tomoaki; Ishii, Genichi; Jusa, Hidehiko; and Adachi, Shuichi, 5,559,804, Cl. 370-95.300.

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Ibe, Takaya; Tanaka, Kazuyoshi; Ota, Kaname; Yamamoto, Goujun; and Okabe, Toshihiro, 5,558,340, Cl. 273-448.000.

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Maruyama, Jun; Hayashi, Seita; Hori, Suji; and Karakama, Tadao, 5,558,127, Cl. 137-636.100.
Nishida, Kenji; and Shiroza, Kazuhiko, 5,557,958, Cl. 72-20.100.
Okada, Toshikazu; Itogawa, Hiroshi; and Nagase, Hidekazu, 5,558,590, Cl. 475-28.000.
Sawamura, Hitoshi, 5,558,000, Cl. 91-164.000.
Wakai, Hideyuki; Suzuki, Toru; Terada, Keiji; Moriya, Masato; and Ando, Masabu, 5,559,603, Cl. 356-376.000.

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Kumagai, Katsuo; Rikiishi, Hidemi; Tamura, Keiji; Sugawara, Shunji; Nemoto, Eiji; Okamoto, Shigefumi; and Onta, Tokio, 5,559,211, Cl. 530-350.000.

Kabushiki Kaisha Tokai-Rika-Denki Seisakusho: *See*—
Oe, Naoki; Sato, Koki; and Tamura, Keiichi, 5,558,365, Cl. 280-731.000.

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Fujiwara, Takayoshi; Otuda, Masayuki; Sone, Yoshinori; and Honjo, Takashi, 5,558,512, Cl. 418-188.000.
Furuyama, Hideto; Hamasaki, Hiroshi; and Kobayashi, Tamon, 5,559,918, Cl. 385-92.000.
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Itsumi, Kazuhiro; Shiratori, Masayuki; Beppu, Tatsuro; Saitoh, Shiroh; Narase, Yujiro; Obata, Shigeki; and Shirouzu, Shunji, 5,559,504, Cl. 340-825.300.
Kihara, Tomohiko; Furuhata, Kentaro; and Iida, Noriyuki, 5,559,712, Cl. 364-468.250.
Kuriyama, Masao; and Banba, Hironori, 5,559,744, Cl. 365-201.000.
Matsukawa, Naohiro; Imamiya, Keaiti; Watanabe, Toshiharu; and Matsui, Michiharu, 5,559,736, Cl. 365-185.240.
Morita, Kazuo; and Itoh, Juichiro, 5,559,691, Cl. 364-188.000.
Nakatomi, Yoshitsugu, 5,558,322, Cl. 271-209.000.
Numata, Kenji; and Ogihara, Masaki, 5,559,748, Cl. 365-222.000.
Ohno, Tadayoshi; Itoh, Shinichi; Yamaguchi, Takashi; and Tanaka, Hisatoshi, 5,559,314, Cl. 235-432.000.
Okumura, Hisaya; and Aizawa, Yoshiaki, 5,559,466, Cl. 327-514.000.
Ozaki, Thoru; Sunouchi, Kazumasa; Takedai, Seiichi; and Shioyama, Yoshiyuki, 5,559,350, Cl. 257-304.000.
Sukegawa, Hiroshi, 5,559,956, Cl. 395-182.060.
Takagi, Minoru, 5,558,797, Cl. 219-705.000.
Tanaka, Sumio; Atsumi, Shigeru; and Kuriyama, Masao, 5,559,737, Cl. 365-185.250.
Yokota, Kazuto, 5,558,815, Cl. 252-301.450.
Zenda, Hiroki, 5,559,525, Cl. 345-1.000.

Kabushiki Kaisha World: *See*—
Ohno, Junnosuke; Kohsaka, Muneko; Noguchi, Kazunari; Kamiyama, Hirotoshi; and Nishii, Kimiko, 5,559,709, Cl. 364-468.010.

Kade, Alexander: *See*—
Walenty, Allen J.; Leppek, Kevin G.; and Kade, Alexander, 5,558,409, Cl. 303-10.000.

Kadonaga, Anne P.: *See*—
Cariffe, Alan E.; Kadonaga, Anne P.; Bass, Steven L.; and Chen, Iue-Shuenn, 5,559,930, Cl. 395-102.000.

Kadotani, Kanichi; Kubota, Kazuhiko; and Ohaku, Mitsuru, to Kabushiki Kaisha Komatsu Seisakusho. Radiant fluid heater encased by inner transparent wall and radiation absorbing/reflecting outer wall for fluid flow there between. 5,559,924, Cl. 392-483.000.

Kaeser, Georg E.: *See*—
Van Roekel, Jauke; and Kaeser, Georg E., 5,559,938, Cl. 395-141.000.

Kafchinski, Edward R.: *See*—
Chung, Tai-Shung; and Kafchinski, Edward R., 5,558,936, Cl. 428-378.000.

Kagebeck, Tor, to ICL Systems AB. Apparatus for connecting an image sensor and an optical unit to a circuit board so that they are properly aligned. 5,559,556, Cl. 348-374.000.

Kageyama, Yasuo: *See*—
Okamura, Yashikoi; Kageyama, Yasuo; Suzuki, Takashi; Fujimori, Junichi; and Funada, Takeshi, 5,559,962, Cl. 395-200.060.

Kahle, Dieter: *See*—
Pawelzik, Manfred; Derr, Max; and Kahle, Dieter, 5,558,128, Cl. 137-801.000.

Kai, Tadao; Tanaka, Etsuo; and Katayama, Akira, to Nikon Corporation. Image movement correcting device effecting image movement correction depending on position of center of rotation of angular fluctuation. 5,559,574, Cl. 354-400.000.

Kain, Jeffrey A., to Westinghouse Electric Corporation. Combustor bypass system for a gas turbine. 5,557,920, Cl. 60-39.230.

Kaiser Optical Systems, Inc.: *See*—
Battey, David E., Owen, Harry; and Tedesco, James M., 5,559,597, Cl. 356-328.000.

Kaji, Hironori; Ninomiya, Atushi; Takekoshi, Isamu; Seki, Hideo; and Hagiya, Kaoru, to Hitachi, Ltd. Casing structure for chromatograph. 5,559,283, Cl. 73-61.560.

Kajihara, Ryuuji; and Yamamoto, Yasushi, to NEC Corporation. Two-port triple-mode saw resonators parallel connected into a saw filter on a substrate. 5,559,483, Cl. 333-195.000.

Kajimoto, Kazuo; Kanno, Kinya; and Nakayasu, Tetsuyuki, to Matsushita Electric Industrial Co., Ltd. Video editing system with auto channel allocation. 5,559,641, Cl. 360-14.100.

Kajiura, Toshinori: *See*—
Machida, Tetsuo; Matsuda, Toshihiko, deceased; Kawaoka, Akihiro; and Kajiura, Toshinori, 5,559,932, Cl. 395-114.000.

Kakeno, Tomiyasu: *See*—
Kazino, Hiroshi; Ide, Masaaki; Kondo, Shinichi; and Kakeno, Tomiyasu, 5,558,480, Cl. 411-368.000.

Kaku, Takashi: *See*—
Murata, Hiroyasu; Miyazawa, Hideo; and Kaku, Takashi, 5,559,799, Cl. 370-76.000.

Kakuta, Atsushi: *See*—
Nakayama, Takahiro; and Kakuta, Atsushi, 5,559,400, Cl. 313-506.000.

Kalantar, Irina L.: *See*—
Komissarova, Irina A.; Gudkova, Julia V.; Soldatenkova, Tatyana D.; Burbenskaya, Natalya M.; Kondrashova, Tatyana T.; Kalantar, Irina L.; Toropov, Jury M.; Semenova, Galina F.; Nartsissov, Rjurik P.; and Kalinina, Elena V., 5,559,152, Cl. 514-557.000.

Kalapudas, Arja M.: *See*—
Karjalainen, Arto J.; Sodervall, Marja-Liisa; Kalapudas, Arja M.; Pelkonen, Reino O.; Laine, Aire M.; Lammintausta, Risto A.; and Salonen, Jarmo S., 5,559,141, Cl. 514-400.000.

Kalberer, Robert C.; and Goor, Dan, to Flight Safety Systems, Inc. Adaptable aircraft airbag protection apparatus and method. 5,558,300, Cl. 244-121.000.

Kalejs, Juris P., to ASE Americas, Inc. Contoured inner after-heater shield for reducing stress in growing crystalline bodies. 5,558,712, Cl. 117-209.000.

Kalinina, Elena V.: *See*—
Komissarova, Irina A.; Gudkova, Julia V.; Soldatenkova, Tatyana D.; Burbenskaya, Natalya M.; Kondrashova, Tatyana T.; Kalantar, Irina L.; Toropov, Jury M.; Semenova, Galina F.; Nartsissov, Rjurik P.; and Kalinina, Elena V., 5,559,152, Cl. 514-557.000.

Kallenberger, Harvey J., to Harnischfeger Corporation. Bearing arrangement with gravity-fed lubrication. 5,558,446, Cl. 384-368.000.

Kalman, Katalin: *See*—
Chandy, Kanianthara G.; Kalman, Katalin; Chandy, Grischa; and Gutman, George A., 5,559,009, Cl. 435-69.100.

Kaltenbach III, Robert F., to DuPont Merck Pharmaceutical Company, The. Process for the preparation of diamine intermediates useful in the synthesis of HIV protease inhibitors. 5,559,252, Cl. 549-342.000.

Kamami, Yves V.: *See*—
Konwitz, Ellie; and Kamami, Yves V., 5,558,670, Cl. 606-18.000.

Kamata, Atsushi: *See*—
Negi, Shigeto; Yamanaka, Motosuke; Katsu, Kanemasa; Sugiyama, Isao; Komatu, Yuuki; Kamata, Atsushi; Tsuruoka, Akihiko; and Machida, Yoshimasa, 5,559,225, Cl. 540-222.000.

Kamata, Hisahiro: *See*—
Ikenoue, Tsuneo; and Kamata, Hisahiro, 5,559,486, Cl. 336-90.000.

Kamatani, Yoshiteru: *See*—
Nakao, Takashi; Ohsato, Kiyoshi; Kamatani, Yoshiteru; Narahara, Tatsuya; and Ozue, Tadashi, 5,559,766, Cl. 369-44.180.

Kamath, Ramesh: *See*—
Smith, David W.; and Kamath, Ramesh, 5,557,999, Cl. 83-880.000.

Kami, Kuniaki; Adachi, Hideyuki; Umeyama, Koichi; Kosaka, Yoshihiro; Yamaguchi, Seiji; Fuse, Eiichi; Sato, Michio; Nakamura, Masakazu; Tanaka, Yasundo; Fukaya, Takashi; Matsuno, Kiyotaka; and Suzuki, Katsuya, to Olympus Optical Co., Ltd. Endoscope system with automatic control according to movement of an operator. 5,558,619, Cl. 600-146.000.

Kamiyama, Hirotoshi: *See*—
Ohno, Junnosuke; Kohsaka, Muneko; Noguchi, Kazunari; Kamiyama, Hirotoshi; and Nishii, Kimiko, 5,559,709, Cl. 364-468.010.

Kamoda, Takashi; and Kaburagi, Hiromitsu, to Fuji Photo Optical Co. Ltd. Simplified camera. 5,559,573, Cl. 354-288.000.

Kanai, Hiroshi: *See*—
Harima, Kenji; Nagai, Toshinari; Kanai, Hiroshi; Osanai, Akinori; Iwano, Kazuhiro; and Yuda, Shuji, 5,558,072, Cl. 123-677.000.

Kanai, Masahiro: *See*—
Orii, Toshio; and Kanai, Masahiro, 5,559,464, Cl. 327-333.000.

Kanamori, Yoshihiko: *See*—
Sumida, Atsushi; and Kanamori, Yoshihiko, 5,558,387, Cl. 296-93.000.

Kanayama, Ryoji: *See*—
Uzaki, Nagato; Oishi, Ukichi; Kanayama, Ryoji; Amano, Hironobu; and Terabe, Tokiya, 5,558,148, Cl. 164-7.100.

Kanbayashi, Makoto: *See*—
Nagatsuka, Takayuki; Kasuya, Takashige; Nakamura, Tatsuya; Kanbayashi, Makoto; and Chiba, Tatsuhiko, 5,558,967, Cl. 430-106.600.

Kanbe, Junichiro; and Katagiri, Kazuharu, to Canon Kabushiki Kaisha. Driving method for ferroelectric liquid crystal device with partial erasure and partial writing. 5,559,616, Cl. 359-56.000.

Kaneda, Kazuji: *See*—
Sasaki, Kouji; and Kaneda, Kazuji, 5,558,296, Cl. 242-18.00A.

Kanega, Fumiaki: *See*—
Suzuki, Minoru; Sasaki, Akihiro; Kawai, Hiromasa; and Kanega, Fumiaki, 5,559,200, Cl. 526-224.000.

Kaneko, Masanori: *See*—
Hamabusa, Tadashi; Kaneko, Masanori; and Hasegawa, Koh, 5,558,451, Cl. 400-637.000.

Kaneko, Tadahiro: *See*—
Toyoshima, Takeshi; Kawakami, Yo; Ishikawa, Hiroyasu; Abe, Takao; Sato, Satsuo; Noto, Nobuhiro; Kaneko, Tadahiro; Kaneta, Takayoshi; Kobayahsi, Juurou; and Kawanobe, Osamu, 5,558,571, Cl. 451-358.000.

Kanemaru, Tetsuro: *See*—
Yoshihara, Toshiyuki; Hanami, Nobuyuki; Takai, Hideyuki; Anayama, Hideki; Miyazaki, Hajime; Kishi, Junichi; Yamazaki, Itaru; Sakoh, Harumi; Kanemaru, Tetsuro; Iuchi, Kazushi; and Ainoya, Hideyuki, 5,558,964, Cl. 430-58.000.

Kanemitsu, Norio, to Fujitsu Limited. Image reading device with black and white platen. 5,559,612, Cl. 358-471.000.

Kaneshiro, Akio: *See*—
Shimada, Takashi; Kitanaka, Kenji; Kaneshiro, Akio; and Kawasaki, Michio, 5,559,827, Cl. 373-142.000.

Kaneta, Takayoshi: *See*—
Toyoshima, Takeshi; Kawakami, Yo; Ishikawa, Hiroyasu; Abe, Takao; Sato, Satsuo; Noto, Nobuhiro; Kaneko, Tadahiro; Kaneta, Takayoshi; Kobayahsi, Juurou; and Kawanobe, Osamu, 5,558,571, Cl. 451-358.000.

Kanfi, Arnon, to Lucent Technologies Inc. Incremental computer file backup using check words. 5,559,991, Cl. 395-489.000.

Kang, Dae B., to Goldstar Co., Ltd. Apparatus and method for controlling turntable of microwave oven. 5,558,799, Cl. 219-754.000.

Kang, Jemo; Youn, Byungwoo; and Oh, Young H., to Princeton Biomeditech Corporation. Immunoassay devices and materials. 5,559,041, Cl. 436-518.000.

Kangas, Lani S.: *See*—
Stobbie, Charles W., IV; Tangen, John C.; and Kangas, Lani S., 5,558,941, Cl. 428-423.100.
Stobbie, Charles W., IV; Tangen, John C.; and Kangas, Lani S., 5,559,196, Cl. 525-458.000.

Kaniwa, Kouji: *See*—
Minabe, Kouji; Nishijima, Hideo; Kaniwa, Kouji; Abe, Hiroya; and Narita, Yoshio, 5,559,414, Cl. 318-606.000.

Kanjo, Wajih, to Westinghouse Air Brake Company. Combination wear and lubricating liner assembly for railway car truck bolster bowl. 5,558,025, Cl. 105-199.400.

Kanjo, Wajih; Smith, Eric; Demoise, Thomas J.; Girotti, Michael; McCabe, Thomas; Fessler, Charles B.; and Natschke, Scott, to Westinghouse Air Brake Co. Railway braking apparatus. 5,558,410, Cl. 303-71.000.

Kanjo, Wajih; Smith, Eric; Demoise, Thomas J.; Girotti, Michael; McCabe, Thomas; Fessler, Charles B.; and Natschke, Scott, to Westinghouse Air Brake Company. Railway braking apparatus. 5,558,411, Cl. 303-71.000.

Kanjo, Wajih; Smith, Eric; Demoise, Thomas J.; Girotti, Michael; McCabe, Thomas; Fessler, Charles B.; and Natschke, Scott, to Westinghouse Air Brake Company. Railway braking apparatus. 5,558,412, Cl. 303-74.000.

Kanno, Kinya: *See*—
Kajimoto, Kazuo; Kanno, Kinya; and Nakayasu, Tetsuyuki, 5,559,641, Cl. 360-14.100.

Kanno, Yasuharu: *See*—
Itoh, Takashi; Kosaki, Yukio; Chonan, Takeshi; Matsuda, Takashi; Kanno, Yasuharu; Wakabayashi, Masao; and Nakamura, Makoto, 5,559,072, Cl. 502-347.000.

Kanouda, Akihiko; Takahashi, Tadashi; Horie, Hideaki; Onda, Kenichi; and Hagiwara, Syuya, to Hitachi, Ltd. Multi-output DC-DC convertor. 5,559,682, Cl. 363-21.000.

Kantor, Johanna: *See*—
Kim, Young R.; Yee, Michael W.; Mehta, Suresh N.; Sagala, Josefino C.; and Kantor, Johanna, 5,559,037, Cl. 436-63.000.

Kao, Wenling; Abou-Gharbia, Magid A.; and Vogel, Robert L., to American Home Products Corporation. Carbamates of rapamycin. 5,559,120, Cl. 514-291.000.

Kao, Wenling: *See*—
Failli, Amedeo A.; Bleyman, Oleg I.; Kao, Wenling; and Abou-Gharbia, Magid A., 5,559,227, Cl. 540-456.000.
Skotnicki, Jerauld S.; Palmer, Yvette L.; Kao, Wenling; and Abou-Gharbia, Magid A., 5,559,112, Cl. 514-291.000.
Skotnicki, Jerauld S.; Palmer, Yvette L.; Kao, Wenling; and Abou-Gharbia, Magid A., 5,559,119, Cl. 514-291.000.

Kapes, Richard C.; and Feher, Dennis M., to Chrysler Corporation. Inside door handle toggle release mechanism. 5,558,372, Cl. 292-336.300.

Kaplan, Ronald M., to Xerox Corporation. Compact hyphenation point data. 5,560,037, Cl. 395-800.000.

Kapoor, Archana; and Munshi, Anil. Nucleic acids encoding membrane-associated immunogens of mycobacterial and corresponding probes, vectors, and transformed host cells. 5,559,011, Cl. 435-69.300.

Karakama, Tadao: *See*—
Maruyama, Jun; Hayashi, Seita; Hori, Suji; and Karakama, Tadao, 5,558,127, Cl. 137-636.100.

Karcher, Thomas, to Hoechst Aktiengesllschaft. Method for preparing 3-alkyl-2,6-dichloroacylanilides by electrolytic debromination of 3-alkyl-4-bromo-2,6-dichloroacylanilides. 5,558,754, Cl. 205-431.000.

Kardach, James P.; Nakanishi, Tosaku; and Cheng, Jimmy S., to Intel Corporation. Method of operating a processor at a reduced speed. 5,560,001, Cl. 395-550.000.

Kardach, James P.; Nakanishi, Tosaku; and Cheng, Jimmy S., to Intel Corporation. Method of testing a microprocessor by masking of an internal clock signal. 5,560,002, Cl. 395-550.000.

Karjalainen, Arto J.; Sodervall, Marja-Liisa; Kalapudas, Arja M.; Pelkonen, Reino O.; Laine, Aire M.; Lammintausta, Risto A.; and Salonen, Jarmo S., to Orion-yhtyma Oy. Selective aromatase inhibiting 4(5)-imidazoles. 5,559,141, Cl. 514-400.000.

Karl Fischer Industrieanlagen GmbH: *See*—
Weger, Friedrich, 5,558,678, Cl. 23-295.00R.

Karnwie-Tuah, Daniel. Automobile anti-theft device. 5,559,493, Cl. 340-426.000.

Karosas, Algis E.: *See*—
McDonald, Joseph A.; and Karosas, Algis E., 5,559,490, Cl. 340-323.00R.

Karp, Morry. Cup handle. 5,558,240, Cl. 215-398.000.

Kasamizugami, Masayoshi; and Kokuryo, Takuya, to Fujitsu Limited. Static RAM and processing apparatus including static RAM. 5,559,747, Cl. 365-207.000.

Kase, Kiyoshi, to Motorola, Inc. Overcurrent sense circuit. 5,559,500, Cl. 340-664.000.

Käser, Adolf, to Ciba-Geigy Corporation. Disazo dyes and a process of dyeing paper therewith. 5,559,217, Cl. 534-828.000.

Kash, Jeffrey A.: *See*—
Agahi, Farid; Pezeshki, Bardia; Kash, Jeffrey A.; and Welser, Jeffrey J., 5,559,912, Cl. 385-42.000.

Kassal, Robert J.: *See*—
Takahashi, Tatsuhiro; Flexman, Edmund A.; and Kassal, Robert J., 5,559,180, Cl. 524-512.000.

Kast, Jürgen; von Deyn, Wolfgang; Nübling, Christoph; Walter, Helmut; Gerber, Matthias; and Westphalen, Karl-Otto, to BASF Aktiengesellschaft. 2-aroylcyclohexanediones and their use as herbicides or plant growth-regulating agents. 5,559,218, Cl. 534-850.000.

Kasuya, Takashige: *See*—
Nagatsuka, Takayuki; Kasuya, Takashige; Nakamura, Tatsuya; Kanbayashi, Makoto; and Chiba, Tatsuhiko, 5,558,967, Cl. 430-106.600.

Katagiri, Kazuharu: *See*—
Kanbe, Junichiro; and Katagiri, Kazuharu, 5,559,616, Cl. 359-56.000.

Kataho, Takuo: *See*—
Ohtani, Yasuo; Kataho, Takuo; Satoh, Makoto; Tanaka, Tsutomu; Nose, Yoshimasa; Kobayashi, Kazuyoshi; Uchikawa, Tetsuhide; and Hamahata, Toshihiro, 5,559,826, Cl. 373-109.000.

Katariya, Devinder N.: *See*—
Elliott, Bob; Katariya, Devinder N.; Minnick, Robert G.; Peralta, Rita A.; Rich, Ronald J.; Voron, Daniel M.; and Cave, Michael J., 5,558,500, Cl. 416-220.00R.

Katayama, Akira: *See*—

Kai, Tadao; Tanaka, Etsuo; and Katayama, Akira. 5,559,574, Cl. 354-400.000.
Kato, Eiichi; and Ishii, Kazuo, to Fuji Photo Film Co., Ltd. Electrophotographic light-sensitive material. 5,558,966, Cl. 430-96.000.
Kato, Hiroyasu: *See*—
Kishi, Hajime; Odagiri, Nobuyuki; Tazaki, Tokuo; Nagata, Hideo; Terashita, Takeshi; Nishimura, Akira; and Kato, Hiroyasu. 5,557,831, Cl. 28-167.000.
Kato, Hiroyuki: *See*—
Uryu, Naoyuki; Watanabe, Hiroshi; and Kato, Hiroyuki. 5,558,578, Cl. 464-52.000.
Kato, Katsutoshi: *See*—
Mori, Keiji; Kato, Katsutoshi; Fujie, Naofumi; and Sometani, Akitoshi. 5,558,394, Cl. 296-214.000.
Kato, Minoru: *See*—
Miyamoto, Hidenori; Kato, Minoru; Omi, Junichi; Soshi, Isao; and Imura, Yoshio. 5,559,571, Cl. 354-286.000.
Kato, Motoi; Fujii, Haruo; Moritani, Toshifumi; Kobayashi, Tatsuya; Kobayashi, Tetsuya; Miyashiro, Toshiaki; Enomoto, Naoki; Uchiyama, Akihiko; and Saito, Yoshiro, to Canon Kabushiki Kaisha. Image forming apparatus with function of requesting exchange of fixing unit. 5,559,591, Cl. 355-283.000.
Kato, Motoki, to Sony Corporation. Motion video coding with adaptive precision for DC component coefficient quantization and variable length coding. 5,559,557, Cl. 348-405.000.
Kato, Nobukazu; and Suzuki, Mamoru, to Japan Aviation Electronics Industry, Limited. Multi-connector assembly. 5,558,540, Cl. 439-637.000.
Kato, Osamu: *See*—
Nakano, Takayuki; Miya, Kazuyuki; Kato, Osamu; and Watanabe, Masatoshi. 5,559,789, Cl. 370-18.000.
Kato, Shuhei, to Nintendo Company, Ltd. Electronic game machine and main body apparatus and controllers used therein. 5,558,577, Cl. 463-36.000.
Kato, Soichi, to Zexel Corporation. Header tank structure for heat exchanger. 5,558,159, Cl. 165-153.000.
Kato, Toshiyuki: *See*—
Miura, Kazuya; Takagi, Shusaku; Hira, Takaaki; Kato, Toshiyuki; and Kurosawa, Nobutaka. 5,558,727, Cl. 148-333.000.
Katoh, Kiyohide: *See*—
Ito, Toru; Kishi, Hiroshi; Nimura, Mitsuhiro; Nanba, Akimasa; Morimoto, Kyomi; Ohara, Shigekazu; Yokoyama, Shoji; Maekawa, Kazuteru; Katoh, Kiyohide; Masuda, Hiroyoshi; Katoh, Shinichi; and Hashimoto, Koji. 5,559,511, Cl. 340-995.000.
Katoh, Shinichi: *See*—
Ito, Toru; Kishi, Hiroshi; Nimura, Mitsuhiro; Nanba, Akimasa; Morimoto, Kyomi; Ohara, Shigekazu; Yokoyama, Shoji; Maekawa, Kazuteru; Katoh, Kiyohide; Masuda, Hiroyoshi; Katoh, Shinichi; and Hashimoto, Koji. 5,559,511, Cl. 340-995.000.
Katou, Minoru: *See*—
Soshi, Isao; Miyamoto, Hidenori; Katou, Minoru; Omi, Junichi; and Amanuma, Tatsuo. 5,559,570, Cl. 354-202.000.
Katsu, Kanemasa: *See*—
Negi, Shigeto; Yamanaka, Motosuke; Katsu, Kanemasa; Sugiyama, Isao; Komatu, Yuuki; Kamata, Atsushi; Tsuruoka, Akihiko; and Machida, Yoshimasa. 5,559,225, Cl. 340-222.000.
Katsui, Tadashi, to Fujitsu Limited. Heat sink and mounting structure for heat sink. 5,559,674, Cl. 361-697.000.
Katsumata, Ryoichi; and Hashimoto, Shin'ichi, to Kyowa Hakko Kogyo Co., Ltd. Process for producing alanine. 5,559,016, Cl. 435-116.000.
Katsuyama, Akiko: *See*—
Urano, Fumiyoshi; Negishi, Takasi; Katsuyama, Akiko; and Endo, Masayuki. 5,558,971, Cl. 430-170.000.
Urano, Fumiyoshi; Negishi, Takaaki; Katsuyama, Akiko; and Endo, Masayuki. 5,558,976, Cl. 430-326.000.
Katsuzawa, Yukio: *See*—
Nakamura, Kosei; Katsuzawa, Yukio; and Maeda, Yoshinobu. 5,559,380, Cl. 310-64.000.
Katz, Jeffrey A.: *See*—
Hyason, James M.; and Katz, Jeffrey A., 5,558,095, Cl. 128-668.000.
Kaufman, Benjamin J.: *See*—
DeRosa, Thomas F.; Russo, Joseph M.; Kaufman, Benjamin J.; and Mastropierro, Joseph T., 5,558,684, Cl. 44-419.000.
DeRosa, Thomas F.; Studzinski, William M.; Russo, Joseph M.; Kaufman, Benjamin J.; and Hahn, Robert T., 5,558,685, Cl. 44-426.000.
Kawabe, Kazuki; Murata, Kazuhiko; and Furuya, Toshiyuki, to Mitsubishi Chemical Corporation. Method of recovering ethylene oxide. 5,559,255, Cl. 549-538.000.
Kawachi, Genshiro, to Hitachi, Ltd. Thin-film semiconductor element, thin-film semiconductor device and methods of fabricating the same. 5,559,344, Cl. 257-57.000.
Kawagoe, Yoshito: *See*—
Ogura, Wataru; Kawagoe, Yoshito; Takizawa, Satoru; Takeuchi, Yasuo; Okimura, Kimihiko; Yoshida, Hiroshi, deceased; Kobayashi, Atsushi; Ogura, Noboru; and Arioka, Kenji. 5,559,934, Cl. 395-117.000.
Kawahara, Sumi; Abe, Toshikatsu; and Hosoi, Kenji, to Daiichi Pure Chemicals Co., Ltd. Assay method for biological components. 5,559,003, Cl. 435-28.000.
Kawai, Hiromasa: *See*—
Suzuki, Minoru; Sasaki, Akihiro; Kawai, Hiromasa; and Kanega, Fumiaki. 5,559,200, Cl. 526-224.000.
Kawai, Masateru, to Akashi Hifuku Kogyo Co., Ltd. Skirt with variable sized pleats. 5,557,808, Cl. 2-211.000.
Kawai, Muneaki; and Oyama, Koichi, to Riso Kagaku Corporation. Rotary printing machine. 5,558,019, Cl. 101-116.000.
Kawakami, Yasunobu: *See*—
Okabe, Masanori; Higuchi, Yoshikatsu; and Kawakami, Yasunobu. 5,559,062, Cl. 501-92.000.
Kawakami, Yo: *See*—
Toyoshima, Takeshi; Kawakami, Yo; Ishikawa, Hiroyasu; Abe, Takao; Sato, Satsuo; Noto, Nobuhiro; Kaneko, Tadahiro; Kaneta, Takayoshi; Kobayahsi, Juurou; and Kawanobe, Osamu. 5,558,571, Cl. 451-358.000.
Kawamura, Hideki; Tomita, Shinji; Murayama, Shuichi; and Nishikawa, Yukinobu, to Teisan K.K. Piping installation for low temperature fluid. 5,557,925, Cl. 62-50.500.
Kawamura, Kazunori: *See*—
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Kawano, Kazuya: *See*—
Numata, Akihito; Mukaihira, Takashi; Ishii, Toshio; Takaku, Yutaka; and Kawano, Kazuya. 5,557,933, Cl. 60-274.000.
Kawanobe, Osamu: *See*—
Toyoshima, Takeshi; Kawakami, Yo; Ishikawa, Hiroyasu; Abe, Takao; Sato, Satsuo; Noto, Nobuhiro; Kaneko, Tadahiro; Kaneta, Takayoshi; Kobayahsi, Juurou; and Kawanobe, Osamu. 5,558,571, Cl. 451-358.000.
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Machida, Tetsuo; Matsuda, Toshihiko, deceased; Kawaoka, Akihiro; and Kajiura, Toshinori. 5,559,932, Cl. 395-114.000.
Kawasaki, Michio: *See*—
Shimada, Takashi; Kitanaka, Kenji; Kaneshiro, Akio; and Kawasaki, Michio. 5,559,827, Cl. 373-142.000.
Kawasaki Steel Corporation: *See*—
Miura, Kazuya; Takagi, Shusaku; Hira, Takaaki; Kato, Toshiyuki; and Kurosawa, Nobutaka. 5,558,727, Cl. 148-333.000.
Kawashima, Yoichi; and Kuwano, Mitsuaki, to Santen Pharmaceutical Co., LTD. Ophthalmic compositions containing vitamin E or ester thereof as an active ingredient. 5,559,157, Cl. 514-777.000.
Kawata, Ken; and Ikeda, Tadashi, to Fuji Photo Film Co., Ltd. Silver halide photographic light-sensitive material. 5,559,240, Cl. 548-150.000.
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Suzuki, Makoto; Abe, Shizuo; and Kawauchi, Masato. 5,558,048, Cl. 123-41.240.
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Funakoshi, Yasushi; Ogata, Khoji; Kojima, Masayuki; Kawaziri, Hitoshi; Yamamoto, Hirofumi; Noto, Kazuhiko; and Mori, Naomichi. 5,558,763, Cl. 210-150.000.
Kazami, Kazyuki; Daitoku, Koichi; Wakabayashi, Tsutomu; Goto, Tetsuro; Ezawa, Akira; and Tomino, Naoki, to Nikon Corporation. Information recording/reproduction apparatus for camera. 5,559,568, Cl. 354-106.000.
Kazial, Walter M.: *See*—
Zabron, Florian S.; Rothman, Miles S.; and Kazial, Walter M., 5,558,207, Cl. 198-847.000.
Kazino, Hiroshi; Ide, Masaaki; Kondo, Shinichi; and Kakeno, Tomiyasu, to Aoyama Seisakusho Co., Ltd. Bolt for truss, wherein the bolt has shaft portions separated by a groove and a stopper having protrusions engaged in the groove. 5,558,480, Cl. 411-368.000.
Keana, John F. W.: *See*—
Weber, Eckard; and Keana, John F. W., 5,559,154, Cl. 514-634.000.
Kearnes, Thomas: *See*—
Bell, Ronald F.; Botsford, Charles W.; Kearnes, Thomas; and Smith, Detlev F., 5,558,453, Cl. 401-137.000.
Keeler, James D.; Hartman, Eric J.; Liano, Kadir; and Ferguson, Ralph B., to Pavilion Technologies, Inc. Residual activation neural network. 5,559,690, Cl. 364-164.000.
Keeler, Sharon J.: *See*—
Falco, Saverio C.; Keeler, Sharon J.; and Rice, Janet A., 5,559,223, Cl. 536-23.100.
Keemer, Craig B.; Halbach, Walter S.; Jenkins, William G.; and Ferguson, Russell L., to Silberline Manufacturing Co., Inc. Colored metallic pigments. 5,558,705, Cl. 106-403.000.
Keith, Michael, to Intel Corporation. Circuitry for decoding huffman codes. 5,559,831, Cl. 375-240.000.
Keithley Instruments, Inc.: *See*—
Close, Robert R.; and Knauer, William, 5,559,482, Cl. 335-151.000.
Keller, Jakob: *See*—
Althaus, Rolf; and Keller, Jakob, 5,558,515, Cl. 431-284.000.
Keller, Richard A.: *See*—
Hammond, Mark L.; Jett, James H.; Keller, Richard A.; Marrone, Babetta L.; and Martin, John C., 5,558,998, Cl. 435-6.000.
Kelsey-Hayes Company: *See*—
Ganzel, Blaise J., 5,557,935, Cl. 60-578.000.
Kelson, Robert E.: *See*—

Kelson, Steven M.; and Kelson, Robert E., 5,558,333, Cl. 473-131.000.
Kelson, Steven M.; and Kelson, Robert E. Golf game data recorder, analyzer, and game improver using display simulations with plural resolutions. 5,558,333, Cl. 473-131.000.
Kemnetz, Steven; and Cody, Charles A., to Rheox, Inc. Oil spill flocculating agent and method of remediating oil spills. 5,558,777, Cl. 210-691.000.
Kennedy, Joseph P., Jr., to E-Systems, Inc. Cellular based traffic sensor system. 5,559,864, Cl. 379-59.000.
Kennedy, Melvin. Skating doll platform. 5,558,555, Cl. 446-359.000.
Kentatsu, Kunihiro; Tsuboi, Kazuo; and Ishida, Takeshi, to OMRON Corporation. Self correcting recording reproducing apparatus for an optical card. 5,559,773, Cl. 369-44.420.
Kerdoncuff, Ronan; and Martin, Gabriel, to Aerospatiale Societe Nationale Industrielle. Aircraft and in particular rotary-wing aircraft seat having an energy absorption device automatically adjustable as a function of the size of the occupant. 5,558,301, Cl. 244-122.00R.
Kerkman, Daniel J.: *See*—
Brooks, Dee W.; Stewart, Andrew O.; Kerkman, Daniel J.; Bhatia, Pramila A.; Basha, Anwer; and Martin, Jonathan G., 5,559,144, Cl. 514-445.000.
Kern, Alfred: *See*—
Weichmann, Josef; Stadler, Aloisia; and Kern, Alfred, 5,558,709, Cl. 106-727.000.
Kerttula, Reima, to Valmet Corporation. Arrangement for the space underneath a dryer section of a paper machine. 5,557,856, Cl. 34-117.000.
Keshav, Srinivasan: *See*—
Clarkson, Kenneth L.; Grossglauser, Matthias; Keshav, Srinivasan; and Tse, David. 5,559,798, Cl. 370-60.100.
Kestenbaum, Ami; and Armington, Richard S., to National Center for Manufacturing Sciences. Energy resource sharing method and apparatus. 5,559,626, Cl. 359-144.000.
Kestly, Michael J.; and Lehmann, Rob, to Dana Corporation. Exhaust pipe flange gasket. 5,558,344, Cl. 277-167.500.
Kettleborough, Catherine A.: *See*—
Bendig, Mary M.; Kettleborough, Catherine A.; and Saldanha, Jose, 5,558,864, Cl. 424-133.100.
Keys, Lyle O.; Gardner, Neil J.; Brunisholz, Arthur C.; and Heath, Richard R., to Teltrust, Inc. Telephonic communications answering and callback processing system. 5,559,878, Cl. 379-265.000.
Khandros, Igor Y.: *See*—
DiStefano, Thomas H.; Ehrenberg, Scott G.; and Khandros, Igor Y., 5,558,928, Cl. 428-209.000.
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Vachss, Frederick R.; Southwell, William H.; Malus, Joseph; and Khoshnevisan, Mohsen, 5,559,640, Cl. 359-838.000.
KHS Maschinen- und Anlagenbau AG: *See*—
Stock, Klaus-Friedrich; and Sindermann, Siegmar, 5,558,138, Cl. 141-90.000.
Kiefer, Helen C. Process for analyzing nutritional content of a composition of food to produce a calculated printed representation. 5,558,742, Cl. 156-244.160.
Kieffer, Dale: *See*—
Odenbach, Peter W.; and Kieffer, Dale, 5,558,459, Cl. 405-21.000.
Kieffer, Joseph W., to Wagner Spray Tech Corporation. Paint sprayer with inlet silencer. 5,558,492, Cl. 415-119.000.
Kiehl, Richard A., to Fujitsu Limited. Semiconductor device with metallic precipitate and its manufacture. 5,559,343, Cl. 257-14.000.
Kiesser, Torsten: *See*—
Hahn, Wilfried; Herrman, Hubert; Kiesser, Torsten; and Sander, Vera, 5,558,812, Cl. 510-321.000.
Kieturakis, Maciej J., to Archimedes Surgical, Inc. Surgical instrument and method for intraluminal retraction of an anatomic structure. 5,558,665, Cl. 606-1.000.
Kightlinger, Adrian P.: *See*—
Sanner, Todd; Kightlinger, Adrian P.; and Davis, J. Reagan, 5,559,082, Cl. 507-273.000.
Kihara, Hayato: *See*—
Fujii, Takeshi; Suzuki, Yasuro; Kihara, Hayato; and Anbo, Takashi, 5,559,186, Cl. 525-68.000.
Kihara, Tomohiko; Furuhata, Kentaro; and Iida, Noriyuki, to Kabushiki Kaisha Toshiba. Three-dimensional model forming device. 5,559,712, Cl. 364-468.250.
Kijima, Takashi: *See*—
Itoh, Mizuki; and Kijima, Takashi, 5,558,942, Cl. 428-426.000.
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Matsumoto, Mansuke; Sasaki, Nobuaki; Sawano, Bunji; Hasegawa, Kiyoharu; and Kikkawa, Kazuyoshi, 5,559,247, Cl. 548-471.000.
Kikuchi, Hideya: *See*—
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Kikuchi, Zenta: *See*—
Takei, Jiro; Yoshida, Tetsushi; and Kikuchi, Zenta, 5,559,615, Cl. 357-50.000.
Kilian, Patricia: *See*—
Hakimi, John; Kilian, Patricia; and Rosen, Perry, 5,559,213, Cl. 530-351.000.
Killian, Michael L.; and Orr, Michael D., to Eaton Corporation. Interelectrode displacement monitoring and control. 5,558,785, Cl. 219-110.000.
Kim, Choung U.; Mansuri, Muzammil M.; Misco, Peter F., Jr.; Wichtowski, John A.; Bronson, Joanne J.; D'Andrea, Stanley V.; and Hudyma, Thomas W., to Bristol-Myers Squibb Company. Cephalosporin derivatives. 5,559,108, Cl. 514-203.000.
Kim, Dae H.: *See*—
Lee, Sang Y.; Sung, Roh Y.; Lee, Cheong D.; and Kim, Dae H., 5,558,736, Cl. 156-345.000.
Kim, Hyeong S. (Motin), to Georg Wiegner. Hair curler especially for cold waving. 5,558,107, Cl. 132-228.000.
Kim, Jeenok T., to Exxon Research and Engineering Company. Wax isomerate-based high temperature long bearing life grease. 5,558,807, Cl. 508-251.000.
Kim, Jeong H.: *See*—
Jeon, Soon I.; and Kim, Jeong H., 5,559,809, Cl. 370-120.000.
Kim, Jeong J., to Goldstar Co., Ltd. Thin film transistor having redundant metal patterns. 5,559,345, Cl. 257-59.000.
Kim, Jong C.: *See*—
Lee, Young S.; and Kim, Jong C., 5,557,849, Cl. 30-29.000.
Kim, Sang U.; and Bang, Suk, to Samsung Electronics Co., Ltd. Methods and apparatus for equalizing pressure between a refrigerating compartment and ambient air. 5,557,942, Cl. 62-288.000.
Kim, Seong-Min, to Daewoo Electronics Co., Ltd. Tracking control apparatus and optical pickup having the same. 5,559,771, Cl. 369-44.350.
Kim, Yong H.: *See*—
Jo, Hyun M.; and Kim, Yong H., 5,559,375, Cl. 307-10.100.
Kim, Young R.; Yee, Michael W.; Mehta, Suresh N.; Sagala, Josefino C.; and Kantor, Johanna, to Abbott Laboratories. Method for rapid and simultaneous analysis of nucleated red blood cells. 5,559,037, Cl. 436-63.000.
Kim, Young-Won; and Dimiduk, Dennis M., to United States of America, Air Force. Method to produce gamma titanium aluminide articles having improved properties. 5,558,729, Cl. 148-671.000.
Kimber, Douglas A.: *See*—
Doherty, Brian P.; Kimber, Douglas A.; Larson, Mikiel L.; and Pokropinski, John H., 5,560,033, Cl. 395-800.000.
Kimberly-Clark Corporation: *See*—
Funk, Barbara S.; Krzysik, Duane G.; and Pazdernik, Patrick A., 5,558,873, Cl. 424-401.000.
Menard, Karen M.; Odorzynski, Thomas W.; and Sherman, Joel S., 5,558,658, Cl. 604-385.100.
Sherrod, Earle H.; LeMahieu, Lynn K.; and Rooyakkers, John A., 5,558,659, Cl. 604-385.200.
Sherrod, Earle H.; LeMahieu, Lynn K.; and Rooyakkers, John A., 5,558,734, Cl. 156-164.000.
Van Iten, Thomas P., 5,558,662, Cl. 604-387.000.
Kimbrough, Scott S.; and Vincent, R. Scott, to University of Utah Research Foundation. Steering control system for trailers. 5,558,350, Cl. 280-426.000.
Kimmich, Jon B.: *See*—
Cyr, Clark R.; Kimmich, Jon B.; Brewer, Timothy T.; Hanson, Jeffrey S.; Richardson, Miles; Robertson, Kenneth R.; Jenkins, Cheryl; Diaz, Brenda L.; Pierce, John G.; and Lee, Gregory, 5,559,943, Cl. 395-155.000.
Kimura, Akitaka; Nido, Masaaki; Tomita, Akihisa; and Suzuki, Akira, to NEC Corporation. Multiple quantum well semiconductor laser. 5,559,820, Cl. 372-46.000.
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Oba, Hidehiro; and Kimura, Hiromichi, 5,558,597, Cl. 477-98.000.
Kimura, Hitoshi: *See*—
Nakagishi, Toshio; Kimura, Hitoshi; Oono, Masahiro; Maruyama, Koichi; and Noguchi, Masato, 5,559,639, Cl. 359-823.000.
Kimura, Makoto: *See*—
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Kimura, Yuji: *See*—
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Kindel, Daniel G.: *See*—
Orr, Steven K.; and Kindel, Daniel G., 5,559,508, Cl. 340-902.000.
King, Glenn F.: *See*—
Banik, Jashojiban; Meixner, Anne; King, Glenn F.; and Guddat, Doug, 5,559,745, Cl. 365-201.000.
King, Roger A. Edge-belt film handling system for film processors and accumulators. 5,559,575, Cl. 354-320.000.
Kinoshita, Toshihara: *See*—
Nakagawa, Mikihiko; Negoro, Daisaku; Nakanishi, Nobuyuki; Ogawa, Akio; Yajima, Manabu; and Kinoshita, Toshihara. 5,558,841, Cl. 422-105.000.
Kinsella, Daniel E. Hot water faucet locking device. 5,557,955, Cl. 70-177.000.
Kirchberg, Maurice; and Cook, Alec, to Sundstrand Corporation. Harmonic content determination apparatus. 5,559,689, Cl. 363-95.000.
Kirihata, Toshiaki: *See*—
DeBrosse, John K.; Kirihata, Toshiaki; and Wong, Hing, 5,559,739, Cl. 365-189.010.
Kirkpatrick, William J. Steam generation system mass and feedwater control system. 5,559,293, Cl. 73-861.000.
Kirstgen, Reinhard: *See*—
König, Hartmann; Götz, Norbert; Kirstgen, Reinhard; Müller, Bernd; and Oberdorf, Klaus, 5,559,244, Cl. 548-371.100.

Kishi, Hajime; Odagiri, Nobuyuki; Tazaki, Tokuo; Nagata, Hideo; Terashita, Takeshi; Nishimura, Akira; and Kato, Hiroyasu, to Toray Industries Inc. Process for producing a woven carbon reinforcing fabric with a high cover
Kluss, Walter J.: *See*—
Sears, Jerome; Parfomak, Walter; and Kluss, Walter J., 5,559,417, Cl. 318-689.000.
Knauer, Davis L., to East Penn Mfg. Co. Pocket separator for electric storage

Kobayashi, Tetsuya: *See*—
Kato, Motoi; Fujii, Haruo; Moritani, Toshifumi; Kobayashi, Tatsuya; Kobayashi, Tetsuya; Miyashiro, Toshiaki; Enomoto, Naoki;
Heilman, Marlin S.; Kolenik, Steve A.; Capone, Christopher D.; Parisi, Carl M.; Prem, Edward K.; and Speicher, Vernon L., 5,558,617, Cl. 600-16.000.

Kishi, Hajime; Odagiri, Nobuyuki; Tazaki, Tokuo; Nagata, Hideo; Terashita, Takeshi; Nishimura, Akira; and Kato, Hiroyasu, to Toray Industries Inc. Process for producing a woven carbon reinforcing fabric with a high cover factor. 5,557,831, Cl. 28-167.000.
Kishi, Hiroshi: *See*—
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Kishi, Junichi: *See*—
Yoshihara, Toshiyuki; Hanami, Nobuyuki; Takai, Hideyuki; Anayama, Hideki; Miyazaki, Hajime; Kishi, Junichi; Yamazaki, Itaru; Sakoh, Harumi; Kanemaru, Tetsuro; Iuchi, Kazushi; and Ainoya, Hideyuki, 5,558,964, Cl. 430-58.000.
Kisiel, Joseph L.: *See*—
Dimmick, Henry M.; Shetter, Jerrold K.; and Kisiel, Joseph L., 5,558,233, Cl. 209-522.000.
Kitanaka, Kenji: *See*—
Shimada, Takashi; Kitanaka, Kenji; Kaneshiro, Akio; and Kawasaki, Michio, 5,559,827, Cl. 373-142.000.
Kitazato, Naohisa, to Sony Corporation. Apparatus and methodology for coding digital video signals to improve picture quality with minimal overhead. 5,559,558, Cl. 348-416.000.
Kitchener, Dean: *See*—
Smith, Martin S.; and Kitchener, Dean, 5,559,523, Cl. 343-795.000.
Klages, Corwin L.: *See*—
Muzzy, Norman E.; Klages, Corwin L.; and Hansotia, Eric P., 5,558,404, Cl. 297-411.380.
Klaveness, Jo; Rongved, Pal; and Stubberud, Lars, to Nycomed Imaging AS. Microbubble-generating contrast agents for ultrasound and magnetic resonance imaging. 5,558,856, Cl. 424-9.370.
Klaveness, Jo; Rongved, Pål; and Strande, Per, to Nycomed Imaging AS. Contrast agents. 5,558,857, Cl. 424-9.520.
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Klear-Vu Corp.: *See*—
Mintz, Jacob; and Andrade, Cidalisa, 5,557,815, Cl. 5.636.000.
Kleemann, Heinz-Werner: *See*—
Schwark, Jan-Robert; Lang, Hans-Jochen; Kleemann, Heinz-Werner; Weichert, Andreas; Scholz, Wolfgang; and Albus, Udo, 5,559,153, Cl. 514-597.000.
Klein, Bernard: *See*—
Brailly, Hervé; Montero-Julian, Félix A.; and Klein, Bernard, 5,559,012, Cl. 435-70.210.
Klein Bicycle Corporation: *See*—
Voss, Darrell W.; Klein, Gary G.; and Randall, Richard, 5,557,982, Cl. 74-551.100.
Klein, Gary G.: *See*—
Voss, Darrell W.; Klein, Gary G.; and Randall, Richard, 5,557,982, Cl. 74-551.100.
Klein, Jeffrey F., to Chesapeake Advanced Sail Hardware, Inc. Spinnaker pole and dip pole jibing system using same. 5,558,035, Cl. 114-89.000.
Klein, Michel: *See*—
Filmus, Jorge; and Klein, Michel, 5,559,027, Cl. 435-240.200.
Klein, Richard B.; Sersley, Chris; and Ratia, Ristomatti, to Lynk, Inc. Garment/towel hook. 5,558,307, Cl. 248-309.100.
Kleinschmidt, Jurgen: *See*—
Basting, Dirk; and Kleinschmidt, Jurgen, 5,559,816, Cl. 372-27.000.
Berger, Vadim; Kleinschmidt, Jürgen; Stamm, Uwe; and Zschoke, Wolfgang, 5,559,815, Cl. 372-25.000.
Klemen, Donald: *See*—
Schmidt, Michael R.; and Klemen, Donald, 5,558,595, Cl. 477-3.000.
Klemme, Heiko: *See*—
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Kliker Golf Company, Inc.: *See*—
Cook, Raymon W., 5,558,332, Cl. 473-341.000.
Klimek, John R.; and Weiss, David, to Rolm Company. Cable connector keying. 5,559,964, Cl. 395-280.000.
Kline, Ellis L., and McAlhaney, Walter W., to Molecular Rx, Inc. Method for treatment of herpes virus infections. 5,558,863, Cl. 424-94.610.
Kline, Gregory R.: *See*—
Breault, Richard D.; Martin, Ronald G.; Roche, Robert P.; and Kline, Gregory R., 5,558,955, Cl. 429-38.000.
Kline, John: *See*—
Colwell, Betsy P.; Wagner, Wendy A.; Graham, Paul; and Kline, John, 5,558,040, Cl. 119-52.200.
Klionsky, Daniel J.; Destruelle, Monika; and Holzer, Helmut, to University of California, The Regents of the. Nutrient regulated gene expression systems. 5,559,010, Cl. 435-69.100.
Kloppsteck, Gerd, to Heinrich Berndes Produktionsgesellschaft mbH. Heat insulating handle for metallic cooking pots and the like. 5,557,826, Cl. 16-166.00R.
Klotz, Herbert C.; Lassila, Kevin R.; Listemann, Mark L.; Minnich, Kristen E.; and Savoca, Ann C. L., to Air Products and Chemicals, Inc. Hydroxy-functional triamine catalyst compositions for the production of polyurethanes. 5,559,161, Cl. 521-129.000.
Klumb, Arlene M.: *See*—
Kovacich, John A.; Haefner, Donald R., Hatton, Bruce M.; Stout, Donald M.; Ryczek, Lawrence J.; and Klumb, Arlene M., 5,559,280, Cl. 73-35.130.
Kluss, Walter J.: *See*—
Sears, Jerome; Parfomak, Walter; and Kluss, Walter J., 5,559,417, Cl. 318-689.000.
Knauer, Davis J., to East Penn Mfg. Co. Pocket separator for electric storage battery plates. 5,558,952, Cl. 429-139.000.
Knauer, William: *See*—
Close, Robert R.; and Knauer, William, 5,559,482, Cl. 335-151.000.
Knight, Colin D.: *See*—
Knight, Kevin D.; Knight, Graham A.; and Knight, Colin D., 5,559,282, Cl. 73-40.000.
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Knight, Kevin D.; Knight, Graham A.; and Knight, Colin D., 5,559,282, Cl. 73-40.000.
Knight, Kevin D.; Knight, Graham A.; and Knight, Colin D., to Retro-Specs Ltd. Method and apparatus for testing the effectiveness of an air barrier installation. 5,559,282, Cl. 73-40.000.
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Knoff, Warren F.; McAllister, Robert W.; Popper, Peter; Shibata, Steven K.; Taylor, Robert E.; and Yngve, Paul W., to Du Pont de Nemours, E. I., and Company. Method and apparatus for making alternate twist plied yarn and product. 5,557,915, Cl. 57-204.000.
Knowaste Technologies Inc.: *See*—
Conway, Marlene E.; Jooste, Francois; and Smith, Michael D., 5,558,745, Cl. 162-60.000.
Knowles Electronics, Inc.: *See*—
Boor, Steven E., 5,559,892, Cl. 381-68.400.
Ko, Joe: *See*—
Hsue, Chen-Chiu; and Ko, Joe, 5,559,352, Cl. 257-328.000.
Ko, Kenneth D.: *See*—
Bottoms, Stanley; Bremer, Gordon; Ko, Kenneth D.; and Smithwick, Luke J., 5,559,792, Cl. 370-20.000.
Bremer, Gordon; Ko, Kenneth D.; and Smithwick, Luke J., 5,559,791, Cl. 370-20.000.
Ko, Ping K.: *See*—
Hu, Chenming; Ko, Ping K.; Assaderaghi, Fariborz; and Parke, Stephen, 5,559,368, Cl. 257-369.000.
Kobayahsi, Juurou: *See*—
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Kobayashi, Atsushi: *See*—
Nakano, Hirohiko; Domyo, Seiichi; Kuroda, Takaki; Shouji, Naofumi; and Kobayashi, Atsushi, 5,559,984, Cl. 395-448.000.
Nguyen, Chan; Shibata, Alan; Kobayashi, Atsushi; and Fujimori, Noriyoshi, 5,559,538, Cl. 347-32.000.
Ogura, Wataru; Kawagoe, Yoshito; Takizawa, Satoru; Takeuchi, Yasuo; Okimura, Kimihiko; Yoshida, Hiroshi, deceased; Kobayashi, Atsushi; Ogura, Noboru; and Arioka, Kenji, 5,559,934, Cl. 395-117.000.
Kobayashi, Hideo: *See*—
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Kobayashi, Kazuyoshi: *See*—
Ohtani, Yasuo; Kataho, Takuo; Satoh, Makoto; Tanaka, Tsutomu; Nose, Yoshimasa; Kobayashi, Kazuyoshi; Uchikawa, Tetsuhide; and Hamahata, Toshihiro, 5,559,826, Cl. 373-109.000.
Kobayashi, Kevin W., to TRW Inc. Loss compensated gain cell for distributed amplifiers. 5,559,472, Cl. 330-293.000.
Kobayashi, Kinzo; Suzuki, Shinji; and Tokunaga, Takahiro, to Tokico, Ltd. Stepped boot attachment structure. 5,558,345, Cl. 277-168.000.
Kobayashi, Koji: *See*—
Miyazaki, Shinji; Yoshinari, Jiro; and Kobayashi, Koji, 5,558,945, Cl. 428-611.000.
Kobayashi, Masao, to Kobird Co., Ltd. Method for cutting a bar-shaped food and its apparatus. 5,558,896, Cl. 426-516.000.
Kobayashi, Masaru; Suzuki, Seiichi; Iizumi, Hiroshi; and Ouchi, Chiaki, to NKK Corporation; and Shinanogawa Technopolis Development Organization. Continuous fiber-reinforced titanium-based composite material and method of manufacturing the same. 5,558,728, Cl. 148-421.000.
Kobayashi, Minoru: *See*—
Okada, Izuho; Asako, Yoshinobu; Arimatsu, Kiyomi; Kobayashi, Minoru; Ono, Satoru; and Aizawa, Ryuji, 5,558,803, Cl. 252-78.300.
Kobayashi, Shotaro, to NEC Corporation. Semiconductor device including a plurality of leads each having two end portions extending downward and upward. 5,559,365, Cl. 257-666.000.
Kobayashi, Takao. Centrifugal blower wheel with backward curved blades. 5,558,499, Cl. 416-186.00R.
Kobayashi, Takashi: *See*—
Aruga, Hisashi; Takizawa, Keiji; Sawata, Ryuji; and Kobayashi, Takashi, 5,558,927, Cl. 428-195.000.
Kobayashi, Tamon: *See*—
Furuyama, Hideto; Hamasaki, Hiroshi; and Kobayashi, Tamon, 5,559,918, Cl. 385-92.000.
Kobayashi, Tatsuya: *See*—
Kato, Motoi; Fujii, Haruo; Moritani, Toshifumi; Kobayashi, Tatsuya; Kobayashi, Tetsuya; Miyashiro, Toshiaki; Enomoto, Naoki; Uchiyama, Akihiko; and Saito, Yoshiro, 5,559,591, Cl. 355-283.000.

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Kato, Motoi; Fujii, Haruo; Moritani, Toshifumi; Kobayashi, Tatsuya; Kobayashi, Tetsuya; Miyashiro, Toshiaki; Enomoto, Naoki; Uchiyama, Akihiko; and Saito, Yoshiro, 5,559,591, Cl. 355-283.000.
Kobayashi, Tsunekazu: *See*—
Tate, Takuo; Takagi, Nobuyoshi; Kobayashi, Tsunekazu; and Sano, Akinori, 5,558,926, Cl. 428-193.000.
Kobayashi, Yoshinori: *See*—
Matsuyama, Akinobu; Tomita, Akira; and Kobayashi, Yoshinori, 5,559,030, Cl. 435-280.000.
Kobird Co., Ltd.: *See*—
Kobayashi, Masao, 5,558,896, Cl. 426-516.000.
Koboshi, Shigeharu: *See*—
Miyazawa, Yorikatsu; Ishii, Hideo; Ikariya, Toshiyuki; Kobayashi, Hideo; Koboshi, Shigeharu; Takei, Yutaka; and Hakamada, Haruo, 5,559,577, Cl. 354-297.000.
Kocis, Thomas J., to Dell USA, L.P. Apparatus and method for preventing bus contention during power-up in a computer system with two or more DRAM banks. 5,559,753, Cl. 365-236.000.
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Nishi, Toshiyuki; Koda, Hiroko; Sugita, Kazuyuki; Ishida, Yohhei; Takemura, Makoto; and Hayano, Takeshi, 5,559,224, Cl. 540-350.000.
Koda, Masanori: *See*—
Tsuchiya, Shouichi; Morishita, Tatsuya; Koda, Masanori; Mori, Atsuhiro; and Murasugi, Takashi, 5,558,579, Cl. 464-64.000.
Kodama, Seiki: *See*—
Uemura, Fumito; Kodama, Seiki; and Nakamura, Hiroshi, 5,557,971, Cl. 73-702.000.
Koehler, Donald E.; and Claffey, William J., to Petrokleen, Ltd. Method of synthesizing pure additives and the improved compositions thereby produced. 5,559,270, Cl. 564-484.000.
Koenig, Wilhelm, to Siemens Aktiengesellschaft. CMOS terminating resistor circuit. 5,559,448, Cl. 326-30.000.
Koethe, Terence L.; Wilson, Richard M.; and Reid, Gary L. Method and apparatus for using hot fuels to de-ice aircraft. 5,558,303, Cl. 244-134.00R.
Koganei Corporation: *See*—
Kawamura, Takahide; and Kotsuji, Kazuo, 5,558,122, Cl. 137-596.170.
Koguchi, Hayato: *See*—
Fukatsu, Katsuaki; Sugiura, Noboru; Koguchi, Hayato; and Anzo, Yoichi, 5,558,074, Cl. 123-647.000.
Kogure, Toshihiro: *See*—
Vandersande, John B.; Yurek, Gregory J.; and Kogure, Toshihiro, 5,559,084, Cl. 505-125.000.
Kohchi, Akira, to Institute For Home Economics Of Japan, Inc. Electricity supply unit trailer for electric vehicles. 5,559,420, Cl. 320-2.000.
Kohiyama, Tomohisa: *See*—
Nakatani, Kohichi; Hayashi, Akio; and Kohiyama, Tomohisa, 5,560,020, Cl. 395-750.000.
Kohlmann, Thomas S.: *See*—
Bathe, Duncan P. L.; Kohlmann, Thomas S.; Pinkert, John R.; and Tham, Robert Q., 5,558,083, Cl. 128-203.120.
Kohmura, Yukio; and Toyosaki, Koichi, to Furukawa Electric Co., Ltd., The. Vapor phase growth system and a gas-drive motor. 5,558,721, Cl. 118-730.000.
Kohn, Mike: *See*—
Herczl, David; and Kohn, Mike, 5,559,882, Cl. 379-452.000.
Kohsaka, Muneko: *See*—
Ohno, Junnosuke; Kohsaka, Muneko; Noguchi, Kazunari; Kamiyama, Hirotoshi; and Nishii, Kimiko, 5,559,709, Cl. 364-468.010.
Koizumi, Yutaka: *See*—
Saito, Atsushi; Koizumi, Yutaka; Mori, Toshihiro; and Nozawa, Minoru, 5,559,536, Cl. 347-25.000.
Kojima, Masayuki: *See*—
Funakoshi, Yasushi; Ogata, Khoji; Kojima, Masayuki; Kawaziri, Hitoshi; Yamamoto, Hirofumi; Noto, Kazuhiko; and Mori, Naomichi, 5,558,763, Cl. 210-150.000.
Kojima, Shinichi: *See*—
Miyazawa, Shyoichi; Horita, Ryutaro; Hase, Kenichi; Kawamura, Satoshi; Kojima, Shinichi; and Iseki, Toshiyuki, 5,559,645, Cl. 360-51.000.
Okuda, Tetsuya; and Kojima, Shinichi, 5,559,896, Cl. 382-141.000.
Kojima, Takeshi; Yahagi, Toshio; Fukami, Kazuaki; Suzuki, Syouji; and Hatano, Kunimichi, to Honda Giken Kogyo Kabushiki Kaisha. Antilock brake control method for four-wheel drive vehicle. 5,559,702, Cl. 364-426.020.
Kokkala, Hannu, to Valmet Corporation. Blow device for a dryer section of a paper machine. 5,557,863, Cl. 34-629.000.
Kokuryo, Takuya: *See*—
Kasamizugami, Masayoshi; and Kokuryo, Takuya, 5,559,747, Cl. 365-207.000.
Kokusai Denshin Denwa Co., Ltd.: *See*—
Sakai, Seiichiro; Takeuchi, Yoshio; Ohashi, Masayoshi; and Mizuno, Toshio, 5,559,803, Cl. 370-95.200.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Taga, Hidenori; Edagawa, Noboru; Yamamoto, Shu; Takeda, Noriyuki; and Akiba, Shigeyuki, 5,559,910, Cl. 385-24.000.
Kokusan Denki Co., Ltd.: *See*—
Arakawa, Yoshinobu, 5,558,065, Cl. 123-490.000.
Kolenik, Steve A.: *See*—
Heilman, Marlin S.; Kolenik, Steve A.; Capone, Christopher D.; Parisi, Carl M.; Prem, Edward K.; and Speicher, Vernon L., 5,558,617, Cl. 600-16.000.
Kolhouse, J. Fred; Santhosh-Kumar, Cheruppolil R.; and Deutsch, John C., to University of Colorado, The Regents of the. Gas chromatography/mass spectrometry determination of oxidized sulfhydryl amino acids. 5,559,038, Cl. 436-86.000.
Kolton, Chester; and Spater, Stuart S., to B&G Plastics, Inc. Eyeglasses hanger. 5,559,567, Cl. 351-158.000.
Komatsu, Hajime: *See*—
Ogawa, Hidenori; Miyamoto, Hisashi; Kondo, Kazumi; Yamashita, Hiroshi; Nakaya, Kenji; Komatsu, Hajime; Tanaka, Michinori; Kora, Shinya; Tominaga, Michiaki; and Yabuuchi, Yoichi, 5,559,230, Cl. 540-569.000.
Komatsu, Isamu: *See*—
Umeda, Takao; Miyasaka, Toru; Namikawa, Osamu; Komatsu, Isamu; Nagata, Tetsuya; Takuma, Yasuo; and Igawa, Tatsuo, 5,559,578, Cl. 355-208.000.
Komatsu, Shinichi: *See*—
Akaike, Seiji; and Komatsu, Shinichi, 5,558,244, Cl. 220-374.000.
Komatu, Yuuki: *See*—
Negi, Shigeto; Yamanaka, Motosuke; Katsu, Kanemasa; Sugiyama, Isao; Komatu, Yuuki; Kamata, Atsushi; Tsuruoka, Akihiko; and Machida, Yoshimasa, 5,559,225, Cl. 540-222.000.
Komatubara, Takeo: *See*—
Hirano, Yutaka; Komatubara, Takeo; Sunaga, Takashi; Takahashi, Yasuki; Tanaka, Kiyoshi; Akazawa, Kiyoshi; Watanabe, Masato; and Jikuhara, Seiki, 5,557,944, Cl. 62-469.000.
Komissarova, Irina A.; Gudkova, Julia V.; Soldatenkova, Tatyana D.; Burbenskaya, Natalya M.; Kondrashova, Tatyana T.; Kalantar, Irina L.; Toropov, Jury M.; Semenova, Galina F.; Nartsissov, Rjurik P.; and Kalinina, Elena V. Pharmaceutical composition having antiacoholic activity. 5,559,152, Cl. 514-557.000.
Komori Corporation: *See*—
Okuda, Tetsuya; and Kojima, Shinichi, 5,559,896, Cl. 382-141.000.
Komuro, Hirokazu, to Canon Kabushiki Kaisha. Method of making uniformly printing ink jet recording head. 5,559,543, Cl. 347-62.000.
Kondo, Kazumi: *See*—
Ogawa, Hidenori; Miyamoto, Hisashi; Kondo, Kazumi; Yamashita, Hiroshi; Nakaya, Kenji; Komatsu, Hajime; Tanaka, Michinori; Kora, Shinya; Tominaga, Michiaki; and Yabuuchi, Yoichi, 5,559,230, Cl. 540-569.000.
Kondo, Masao: *See*—
Ohhata, Akira; and Kondo, Masao, 5,559,594, Cl. 355-317.000.
Kondo, Shinichi: *See*—
Kazino, Hiroshi; Ide, Masaaki; Kondo, Shinichi; and Kakeno, Tomiyasu, 5,558,480, Cl. 411-368.000.
Kondrashova, Tatyana T.: *See*—
Komissarova, Irina A.; Gudkova, Julia V.; Soldatenkova, Tatyana D.; Burbenskaya, Natalya M.; Kondrashova, Tatyana T.; Kalantar, Irina L.; Toropov, Jury M.; Semenova, Galina F.; Nartsissov, Rjurik P.; and Kalinina, Elena V., 5,559,152, Cl. 514-557.000.
Konermann, Herbert; and Helmer, Reinhard, to Du Pont de Nemours, E. I., and Company. Apparatus for the aftertreatment of photopolymerizable printing plates. 5,557,857, Cl. 34-189.000.
Konica Corporation: *See*—
Futami, Hiroyuki; and Yamamoto, Hiroyuki, 5,559,740, Cl. 365-189.040.
Miyazawa, Yorikatsu; Teraoka, Yutaka; and Ishii, Hideo, 5,559,576, Cl. 354-298.000.
Miyazawa, Yorikatsu; Ishii, Hideo; Ikariya, Toshiyuki; Kobayashi, Hideo; Koboshi, Shigeharu; Takei, Yutaka; and Hakamada, Haruo, 5,559,577, Cl. 354-297.000.
König, Axel, to Santrade Ltd. Method and apparatus for purifying the exhaust air of installations for consolidating molten substances. 5,558,821, Cl. 264-13.000.
König, Hartmann; Götz, Norbert; Kirstgen, Reinhard; Müller, Bernd; and Oberdorf, Klaus, to BASF Aktiengesellschaft. Preparation of 1-(het) aryl-3-hydroxypyrazoles. 5,559,244, Cl. 548-371.100.
König, Joachim: *See*—
Michels, Gisbert; König, Joachim; Zweering, Uwe; and Korte, Siegfried, 5,558,940, Cl. 428-422.000.
Koninklijke PTT Nederland N.V.: *See*—
Vankan, Franciscus A. G.; and Pieterse, Rob, 5,560,031, Cl. 395-800.000.
Konishi, Yasuhiro: *See*—
Dosaka, Katsumi; Kumanoya, Masaki; Hayano, Kouji; Yamazaki, Akira; Iwamoto, Hisashi; Abe, Hideaki; Konishi, Yasuhiro; Himukashi, Katsumitsu; Ishizuka, Yasuhiro; and Saiki, Tsukasa, 5,559,750, Cl. 365-230.060.
Konja, Masakuni: *See*—
Arai, Makoto; Sohmiya, Norimasa; Konja, Masakuni; and Takano, Satoshi, 5,559,590, Cl. 355-271.000.
Konwitz, Ellie; and Kamami, Yves V., to Laser Industries Ltd. Handpiece for laser apparatus. 5,558,670, Cl. 606-18.000.
Koop, Dale E.: *See*—
Dewey, David A.; Arnett, Michael; Koop, Dale E.; and Trost, David, 5,558,666, Cl. 606-9.000.
Kor-One, Ltd.: *See*—
Gvoich, Ned, 5,558,605, Cl. 482-54.000.
Kora, Shinya: *See*—

Terasawa, Yoshiaki; and Kubo, Yuji, 5,559,921, Cl. 385-124.000.
Kurokawa, Tsutomu: *See*—

Ogawa, Hidenori; Miyamoto, Hisashi; Kondo, Kazumi; Yamashita, Hiroshi; Nakaya, Kenji; Komatsu, Hajime; Tanaka, Michinori; Kora, Shinya; Tominaga, Michiaki; and Yabuuchi, Yoichi, 5,559,230, Cl. 540-569.000.
Korea Tungsten Co., Inc.: *See*—
Byung-Gie, Kwun; and Chang-Hee, Choi, 5,558,610, Cl. 492-40.000.
Korg, Inc.: *See*—
Bryan, Marcus K., Jr.; Limberis, Alexander J.; Bowen, John S.; and Phillips, Daniel A., 5,559,301, Cl. 84-653.000.
Korte, Siegfried: *See*—
Michels, Gisbert; König, Joachim; Zweering, Uwe; and Korte, Siegfried, 5,558,940, Cl. 428-422.000.
Kossi, Kenneth; Wilson, Jerry A.; and Baumgratz, Bonnie A., to Santa Barbara Research Center. Integrated LPE-grown structure for simultaneous detection of infrared radiation in two bands. 5,559,336, Cl. 250-370.130.
Kosaka, Yoshihiro: *See*—
Kami, Kuniaki; Adachi, Hideyuki; Umeyama, Koichi; Kosaka, Yoshihiro; Yamaguchi, Seiji; Fuse, Eiichi; Sato, Michio; Nakamura, Masakazu; Tanaka, Yasundo; Fukaya, Takashi; Matsuno, Kiyotaka; and Suzuki, Katsuya, 5,558,619, Cl. 600-146.000.
Kosaki, Yukio: *See*—
Itoh, Takashi; Kosaki, Yukio; Chonan, Takeshi; Matsuda, Takashi; Kanno, Yasuharu; Wakabayashi, Masao; and Nakamura, Makoto, 5,559,072, Cl. 502-347.000.
Koseki, Youichi: *See*—
Yamashina, Masakazu; Koseki, Youichi; and Mizuno, Masayuki, 5,559,461, Cl. 327-205.000.
Koshiba, Yoshikazu; Aoki, Yukio; Minakata, Tsuyoshi; Inamura, Michio; Yasunaga, Tomohiro; Imoto, Fujiya; and Nakagawa, Junichi, to Nippon Yakin Kogyo Co., Ltd. Method of producing a metal honeycomb carrier. 5,557,847, Cl. 29-890.000.
Kostreski, Bruce; and Sistanizadeh, Kamran, to Bell Atlantic Network Services, Inc. Simulcasting digital video programs. 5,559,808, Cl. 370-108.000.
Kosugi, Hiroaki: *See*—
Matsumoto, Takayuki; Adachi, Hisashi; Kosugi, Hiroaki; and Sakakura, Makoto, 5,559,474, Cl. 331-17.000.
Koszalka, George W.; and Krenitsky, Thomas A., to Glaxo Wellcome Inc. Methods of treating hepatitis B virus infection with therapeutic nucleosides. 5,559,100, Cl. 514-45.000.
Kosek, Richard; and Matthies, Hans-Georg, to BASF Corportion. Modified nylon fibers. 5,559,194, Cl. 525-397.000.
Kotitschke, Gerhard; Sollinger, Hans-Peter; Oechsle, Markus; and Straub, Karlheinz, to Voith Sulzer Papermaschinen GmbH. Dryer section with moistening devices at latter ends. 5,557,860, Cl. 34-455.000.
Kotlarik, John: *See*—
Domanik, Richard A.; Sohl, Gordon; Kotlarik, John; and Abunimeh, Noman, 5,559,339, Cl. 250-573.000.
Kotsuji, Kazuo: *See*—
Kawamura, Takahide; and Kotsuji, Kazuo, 5,558,122, Cl. 137-596.170.
Koudal, Ole; and Wenger, Alfred, to Endress + Hauser Flowtec AG. Coriolis-type mass flow sensor with a helical measuring tube. 5,557,973, Cl. 73-861.355.
Kovacich, John A.; Haefner, Donald R.; Hatton, Bruce M., Stout, Donald M.; Ryczek, Lawrence J.; and Klumb, Arlene M., to Eaton Corporation. Combustion chamber pressure transducer and method of making same. 5,559,280, Cl. 73-35.130.
Kovesdi, Imre: *See*—
Wickham, Thomas J.; Kovesdi, Imre; Brough, Douglas E.; McVey, Duncan L.; and Brader, Joseph T., 5,559,099, Cl. 514-44.000.
Kowalski, Bruce R.; and Wang, Yongdong, to University of Washington. Calibration transfer for second order analytical instruments. 5,559,728, Cl. 364-571.020.
Koyamada, Koji: *See*—
Itoh, Takayuki; and Koyamada, Koji, 5,559,935, Cl. 395-124.000.
Koyano, Takashi: *See*—
Umezawa, Kazuo; Koyano, Takashi; Takahashi, Hiroaki; and Yamamoto, Takashi, 5,559,115, Cl. 514-279.000.
Kozarsky, Eliot M.; and Horton, Dianne C., to Universal Synergetics, Inc. Lead test dauber. 5,558,835, Cl. 422-56.000.
Kozumplik, Nicholas, Jr.: *See*—
Hoover, Rick D.; Kozumplik, Nicholas, Jr.; and Sullivan, Joseph W., 5,559,310, Cl. 181-230.000.
Krabbenhoeft, Uwe-Jens, to Linotype Hell AG. Method for generating geometric masks with a digital color computer. 5,559,903, Cl. 382-283.000.
Kracke, Alan G.: *See*—
Mowry, Gregory S.; Gorka, Phillip E.; Strayer, Brian D.; and Kracke, Alan G., 5,559,429, Cl. 324-71.500.
Kraemer, Gerd; and Wolf, Lothar, to Bayerische Motoren Werke AG. Device for reducing torque when shifting a transmission. 5,559,694, Cl. 364-424.100.
Kraft Foods, Inc.: *See*—
Lawless, Brian P.; Schmidt, Heidi A.; Winchester, Gary G.; and Woode, Kenneth E., 5,558,891, Cl. 426-129.000.
Kraft, Robert J.; and McClelland, Robert J., to United Technologies Corporation. Airfoil vibration damping device. 5,558,497, Cl. 416-96.00A.
Král, Vladimir A.: *See*—
Sessler, Jonathan L.; Smith, Daniel A.; Miller, Richard A.; Ross, Kevin L.; Wright, Meredith; Dow, William C.; Král, Vladimir A.; Iverson, Brent; and Magda, Darren, 5,559,207, Cl. 530-300.000.
Kramer, Alan H.: *See*—
Denker, John S.; Dickinson, Alexander G.; Kramer, Alan H.; and Wik, Thomas R., 5,559,463, Cl. 327-300.000.
Krantz, Tomas, to Turn it, Inc. Relative frequency-based word game. 5,558,328, Cl. 273-146.000.
Kranz, Klaus; and Schubert, Reinhard, to BRAAS GmbH. Fastening device for a roof sealing strip or the like. 5,557,897, Cl. 52-410.000.
Krasinski, Jerzy S.; and Wang, Yin M., to Minnesota Mining and Manufacturing Company. System for detecting defects in articles using a scanning width which is less than width of portion of the article scanned. 5,559,341, Cl. 250-559.260.
Krassnitzer, Otto; Zitz, Alfred; and Felber, Robert, to VOEST-ALPINE Bergtechnik Gesellschaft mbH. Gear box. 5,557,979, Cl. 74-377.000.
Kraus, Steffen: *See*—
Samonil, Otto; and Kraus, Steffen, 5,558,188, Cl. 188-299.000.
Krause, Harold E.: *See*—
Cerny, John R.; El-Zein, Mohamad S.; Curry, Richard A.; Popelier, Maurice A.; and Krause, Harold E., 5,558,368, Cl. 280-781.000.
Krempl, Peter W.; and Selic, Roland, to AVL Gesellschaft für Verbrennungskraftmaschinen und Messtechnik m.b.H. Prof. Dr.Dr.h.c. Hans List. Piezoelectric measuring element for measuring mechanical variables. 5,557,968, Cl. 73-497.000.
Krenitsky, Thomas A.: *See*—
Koszalka, George W.; and Krenitsky, Thomas A., 5,559,100, Cl. 514-45.000.
Kresky, Fred C.: *See*—
Hammoud, Majid; Kresky, Fred C.; and McCarthy, Jay P., 5,558,403, Cl. 297-378.120.
Kress, Thomas J.; Leanna, M. Robert; Martinelli, Michael J.; and Peterson, Barry C., to Eli Lilly and Company. Intermediates to 4-amino- hexahydrobenz (cd) indoles and processes therefor. 5,559,245, Cl. 548-422.000.
Kressley, Mark A.: *See*—
Finklea, John E.; Shen, Chi-Cheong; Vickers, Kenneth G.; and Kressley, Mark A., 5,558,554, Cl. 445-52.000.
Kreuzer, Justin L.: *See*—
Gallatin, Gregg M.; Kreuzer, Justin L.; and Nelson, Michael L., 5,559,601, Cl. 356-363.000.
Krieger, Douglas P.: *See*—
Lambright, Michael D.; and Krieger, Douglas P., 5,558,418, Cl. 312-321.500.
Krinickas, Alexander: *See*—
Parker, Barry J.; Krinickas, Alexander; Stilwell, John D.; and Brown, Neil L., 5,558,495, Cl. 416-95.000.
Krismanth, Kenneth A.: *See*—
Whitby, Thomas G.; Krismanth, Kenneth A.; Lawn, Joseph R.; and Black, David W., 5,558,200, Cl. 198-470.100.
Krivokapic, Zoran. Poly LDD self-aligned channel transistors. 5,559,357, Cl. 257-336.000.
Kroggel, Matthias; and Schindler, Hermann, to Hoechst Aktiengesellschaft. Polyvinyl acetals which can form emulsifier-free aqueous dispersions and redispersible dry powders, processes for their preparation and their use. 5,559,175, Cl. 524-297.000.
Kröhnke, Christoph: *See*—
Guth, Christian; Stehlin, Albert; and Kröhnke, Christoph, 5,559,273, Cl. 568-622.000.
Kroiss, Daniel: *See*—
Jacobson, Peter; and Kroiss, Daniel, 5,558,097, Cl. 128-705.000.
Krokstad, Asbjørn; Pettersen, Odd K. Ø.; and Sørdal, Svein, to Sinvent A/S. Method and device for active noise reduction in a local area. 5,559,893, Cl. 381-71.000.
Krolikowski, Anthony E., to Innovating Corporation. Pool cleaner with weighted hose. 5,557,819, Cl. 15-1.700.
Kromm, Erich: *See*—
Wagenmann, Henric; Baus, Ulf; Beckmann, Eberhard; and Kromm, Erich, 5,558,677, Cl. 8-607.000.
Krones AG Hermann Kronseder Maschinenfabrik: *See*—
Kronseder, Hermann; and Weiss, Wilhelm, 5,558,135, Cl. 141-6.000.
Kronseder, Hermann; and Weiss, Wilhelm, to Krones AG Hermann Kronseder Maschinenfabrik. Process and device for the sterile filling of beverage liquids. 5,558,135, Cl. 141-6.000.
Kropp, Philip L.: *See*—
Woods, John G.; Rakas, Margaret A.; Jacobine, Anthony F.; Alberino, Louis M.; Kropp, Philip L.; Sutkaitis, Donna M.; Glaser, David M.; and Nakos, Steven T., 5,558,937, Cl. 428-378.000.
Krug, Joseph; and Palm, Christof, to BASF Aktiengesellschaft. Separation of a mixture of methanol and tetrahydrofuran into its constituents. 5,559,254, Cl. 549-429.000.
Krumberg, Yakov: *See*—
Landa, Benzion; Krumberg, Yakov; Almog, Yaacov; and Niv, Yehuda, 5,558,970, Cl. 430-126.000.
Krzysik, Duane G.: *See*—
Fusk, Barbara S.; Krzysik, Duane G.; and Pazdernik, Patrick A., 5,558,873, Cl. 424-401.000.
Kuan, Hung. Structure of outer case. 5,558,242, Cl. 220-4.310.
Kubo, Masato, to NEC Corporation. Telephone set with background noise suppression function. 5,559,879, Cl. 379-387.000.
Kubo, Toshiya: *See*—
Terao, Kazuhiko; Iida, Hidetoku; Nakayama, Takeyasu; Kubo, Toshiya; Horigome, Jiro; Matsuoka, Yoshihiro; Takeda, Nobutoshi; and Mizuhashi, Tohru, 5,559,916, Cl. 385-85.000.
Kubo, Yuji: *See*—

Terasawa, Yoshiaki; and Kubo, Yuji, 5,559,921, Cl. 385-124.000.
Kubota, Akihiko: *See*—
Sasano, Hiroshi; Hamada, Koshi; and Kubota, Akihiko, 5,558,508, Cl. 417-569.000.
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Maher, Steven C., to Rockwell International. Discrete media display device and method for efficiently drawing lines on same. 5,559,529, Cl. 345-136.000.
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Makino, Masahiko; Yamamura, Michio; Fukushima, Masafumi; and Iwanami, Kunio, to Matsushita Electric Industrial Co., Ltd. Scroll compressor having wrap elements with rigidified inner ends. 5,558,510, Cl. 418-55.200.
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Malin, Art; Van Erden, Donald; and McMahon, Michael, to Illinois Tool Works Inc. Transverse zipper system. 5,557,907, Cl. 53-139.200.
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Manders, Paulus. Hand held device. 5,558,250, Cl. 222-99.000.
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Maniglia, Anthony J. Semi-implantable middle ear hearing device. 5,558,618, Cl. 600-25.000.
Manke, Kevin R.; and Ringgenberg, Paul, to Halliburton Company. Mechanical lockout for pressure responsive downhole tool. 5,558,162, Cl. 166-319.000.
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Starrett, John E., Jr.; Tortolani, David R.; Mansuri, Muzammil M.; and Meanwell, Nicholas A., 5,559,248, Cl. 549-79.000.
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Marechal, Robert R. L., to Societe Industrielle et Commerciale de Materiel Aeronautique. Convertible structure comprising a plurality of adjacent seats and of variable size along a sliding axis. 5,558,309, Cl. 248-424.000.
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Marozzi, John; Rochon, Greg; Patel, Urmil; and Dambly, Ben, to Marozzi, John; Pugh, Theresa; and Batesko, Barbara. Flexographic printing system. 5,558,020, Cl. 101-228.000.
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Martin, Jonathan G.: *See*—
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Martin, Thomas W., to Eastman Kodak Company. Antistatic backing layer for transparent receiver used in thermal dye transfer. 5,559,077, Cl. 503-227.000.
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Martinez-Bustos, Fernando; De Dios Figueroa C., Juan; Sanchez-Sinencio, Feliciano; Gonzalez-Hernandez, Jesus; De La Luz Martinez, Jose; and Ruiz-Torres, Maximiano, to Centro de Investigacion y de Estudios Avanzados del I.P.N. Extrusion apparatus for the preparation of instant fresh corn dough or masa. 5,558,886, Cl. 425-376.100.
Martz, Pete: *See*—
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Maruyama, Jun; Hayashi, Seita; Hori, Suji; and Karakama, Tadao, to Kabushiki Kaisha Komatsu Seisakusho. Hydraulic pilot valve. 5,558,127, Cl. 137-636.100.
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Mashburn, Douglas N., to Martin Marietta Energy Systems, Inc. Dual beam optical system for pulsed laser ablation film deposition. 5,558,788, Cl. 219-121.680.
Maskasky, Joe E., to Eastman Kodak Company. High chloride (100) tabular grain emulsions with modified edge structures. 5,558,982, Cl. 430-567.000.
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Massachusetts Institute of Technology: *See*—
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Massotte, Philippe; and Liebmann, Hubert, to Superba. Machine for dyeing textile yarns. 5,557,953, Cl. 68-205.00R.
Mastache, Mark; and Capano, Peter A., to Hewlett-Packard Company. Method of fabricating an improved transducer suspension assembly. 5,557,839, Cl. 29-603.030.
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Mastroianni, Cesare G.; and Mick, Timothy E., to Getrag Gears of North America, Inc. One-piece gear rattle prevention for countershaft transmission. 5,557,980, Cl. 74-443.000.
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Hamada, Kenjiro; and Masubuchi, Akira, 5,558,434, Cl. 366-137.000.
Masuda, Hiroyoshi: *See*—

Ito, Toru; Kishi, Hiroshi; Nimura, Mitsuhiro; Nanba, Akimasa; Morimoto, Kyomi; Ohara, Shigekazu; Yokoyama, Shoji; Maekawa, Kazuteru; Katoh, Kiyohide; Masuda, Hiroyoshi; Katoh, Shinichi; and Hashimoto, Koji, 5,559,511, Cl. 340-995.000.
Matsumoto, Takeshi: *See*—
Mitani, Shigetoshi; and Matsumoto, Takeshi, 5,558,716, Cl. 118-674.000.

Maturi, Greg; Auld, David R.; and Neuman, Darren, to LSI Logic Corporation. MPEG decoding system including tag list for associating presentation time stamps with encoded data units. 5,559,999, Cl. 395-550.000.
McElderry, James W., to Illinois Tool Works Inc. Wall anchor accommodating fasteners of varying thread diameters. 5,558,479, Cl. 411-178.000.
McFadden, Joseph A.: *See*—

Ito, Toru; Kishi, Hiroshi; Nimura, Mitsuhiro; Nanba, Akimasa; Morimoto, Kyomi; Ohara, Shigekazu; Yokoyama, Shoji; Maekawa, Kazuteru; Katoh, Kiyohide; Masuda, Hiroyoshi; Katoh, Shinichi; and Hashimoto, Koji, 5,559,511, Cl. 340-995.000.
Masuda, Junichi, to Murata Kikai Kabushiki Kaisha. Article transfer apparatus with vacuum operated work holder and articulated work holder mover. 5,558,483, Cl. 414-278.000.
Masuda, Kinji; Kuriki, Minoru; and Hokari, Kozo, to Bridgestone Corporation; and Fukuda Road Construction Co., Ltd. Paving asphalt concrete composition. 5,558,704, Cl. 106-281.100.
Materiaux de Construction 2 Plus 2 Inc.: *See*—
Dubé, Pierre; Yane, Barry; and Boudreau, Yvon, 5,557,899, Cl. 52-455.000.
Materiels Equipements Graphiques, S.A.: *See*—
Argouarch, Jean-Rene; Brasse, Dominique X.; and Grandjean, Alain J., 5,557,861, Cl. 34-461.000.
Materna, William R.: *See*—
Horn, Larry L.; James, Barry R.; Mertkle, William L.; Materna, William R.; and Coates, Stephen J., 5,558,691, Cl. 65-335.000.
Materniak, Joyce M.: *See*—
Heim, William W.; Hendrix, James K.; Materniak, Joyce M.; Murphy, Peter M.; Panzier, Neil A.; and Vinod, Yashavant V., 5,558,916, Cl. 428-95.000.
Mathur, Akshay: *See*—
Hnat, James G.; and Mathur, Akshay, 5,558,690, Cl. 65-134.800.
Matlin, Stephen A.; and Wilkins, Andrew T., to Uclaf, Roussel. Method and device for treatment of cancer. 5,558,877, Cl. 424-432.000.
Matschiner, Sybille: *See*—
Wohlrab, Wolfgang A.; Neubert, Reinhard; Matschiner, Sybille; and Wellner, Katrin, 5,559,098, Cl. 514-29.000.
Matsubayashi, Makoto: *See*—
Lentz, Derek J.; Wang, Johannes; Deosaran, Trevor; Young, Linley M.; Yap, Kian-Chin; Nguyen, Le Trong; Matsubayashi, Makoto; and Lau, Te-Li, 5,559,951, Cl. 395-163.000.
Matsuda, Michiko, Satomi Matsuda, legal representatives: *See*—
Machida, Tetsuo; Matsuda, Toshihiko, deceased; Kawaoka, Akihiro; and Kajiura, Toshinori, 5,559,932, Cl. 395-114.000.
Matsuda, Takashi: *See*—
Itoh, Takashi; Kosaki, Yukio; Chonan, Takeshi; Matsuda, Takashi; Kanno, Yasuharu; Wakabayashi, Masao; and Nakamura, Makoto, 5,559,072, Cl. 502-347.000.
Satoh, Yoshio; Ikata, Osamu; Miyashita, Tsutomu; Matsuda, Takashi; and Takamatsu, Mitsuo, 5,559,481, Cl. 333-143.000.
Matsuda, Toshihiko, deceased (by Michiko Matsuda, Satomi Matsuda, legal representatives): *See*—
Machida, Tetsuo; Matsuda, Toshihiko, deceased; Kawaoka, Akihiro; and Kajiura, Toshinori, 5,559,932, Cl. 395-114.000.
Matsueda, Akira, to Olympus Optical Co., Ltd. Clock detection device of information recording/reproducing apparatus and clock detection device of information recording apparatus. 5,559,775, Cl. 369-47.000.
Matsugu, Hidetomo: *See*—
Watanabe, Tateshi; Watanabe, Tsunao; Watanabe, Tadashi; Matsugu, Hidetomo; and Yamanouchi, Yasuhiro, 5,558,714, Cl. 118-421.000.
Matsuhisa, Hiroaki: *See*—
Araya, Katsuhiko; Morita, Youzo; Sumi, Shingo; and Matsuhisa, Hiroaki, 5,559,333, Cl. 250-344.000.
Matsui, Michiharu: *See*—
Matsukawa, Naohiro; Imamiya, Keniti; Watanabe, Toshiharu; and Matsui, Michiharu, 5,559,736, Cl. 365-185.240.
Matsui, Tooru; and Takeyama, Kenichi, to Matsushita Electric Industrial Co., LTD. Electrocrystallized lithuim metal, method for producing the same, and lithium secondary battery. 5,558,953, Cl. 429-194.000.
Matsui, Tsutomu, to NEC Corporation. Apparatus for detecting a focus error and a tracking error of an optical head. 5,559,767, Cl. 369-44.230.
Matsukawa, Naohiro; Imamiya, Keniti; Watanabe, Toshiharu; and Matsui, Michiharu, to Kabushiki Kaisha Toshiba. Non-volatile semiconductor memory device capable of preventing excessive-writing. 5,559,736, Cl. 365-185.240.
Matsuki, Masuo: *See*—
Hirase, Satoshi; and Matsuki, Masuo, 5,558,293, Cl. 242-372.000.
Matsumiya, Masami: *See*—
Yamashita, Haruo; Matsumiya, Masami; and Fukushima, Tsumoru, 5,559,530, Cl. 345-136.000.
Matsumoto, Kenji: *See*—
Urairi, Masakatsu; Tachibana, Toshimitsu; Matsumoto, Kenji; Shinomura, Toshihiko; Iida, Hiroyuki; Kawamura, Kazunori; Yano, Shuuji; and Ishida, Osamu, 5,558,682, Cl. 29-623.500.
Matsumoto, Mansuke; Sasaki, Nobuaki; Sawano, Bunji; Hasegawa, Kiyoharu; and Kikkawa, Kazuyoshi, to Mitsui Toatsu Chemicals, Inc.; and Yamamoto Chemicals, Inc. Carboxylate and heat-sensitive recording material using same. 5,559,247, Cl. 548-471.000.
Matsumoto, Masahiro: *See*—
Suzuki, Seiko; Tsuchitani, Shigeki; Miki, Masayuki; and Matsumoto, Masahiro, 5,559,290, Cl. 73-514.360.
Matsumoto, Takahiro, to Canon Kabushiki Kaisha. Apparatus for detecting misalignment between diffraction gratings and the position of a diffraction grating based on the phases or the phase difference between electrical signals. 5,559,598, Cl. 356-356.000.
Matsumoto, Takayuki; Adachi, Hisashi; Kosugi, Hiroaki; and Sakakura, Makoto, to Matsushita Electric Industrial Co., Ltd. Frequency synthesizer with controllable loop filter. 5,559,474, Cl. 331-17.000.
Matsumoto, Takeshi: *See*—
Mitani, Shigetoshi; and Matsumoto, Takeshi, 5,558,716, Cl. 118-674.000.
Matsumoto Yushi-Seiyaku Co., Ltd.: *See*—
Yoshikawa, Hirofumi, 5,559,202, Cl. 526-207.000.
Matsunaga, Yoshikuni: *See*—
Takahashi, Tetsuhiko; Yamamoto, Etsuji; Murakami, Yoshiki; and Matsunaga, Yoshikuni, 5,559,434, Cl. 324-318.000.
Matsuno, Kiyotaka: *See*—
Kami, Kuniaki; Adachi, Hideyuki; Umeyama, Koichi; Kosaka, Yoshihiro; Yamaguchi, Seiji; Fuse, Eiichi; Sato, Michio; Nakamura, Masakazu; Tanaka, Yasundo; Fukaya, Takashi; Matsuno, Kiyotaka; and Suzuki, Katsuya, 5,558,619, Cl. 600-146.000.
Matsuo, Michiaki; Sagawa, Morikazu; and Makimoto, Mitsuo, to Matsushita Electric Industrial Co., Ltd. Dielectric resonator. 5,559,485, Cl. 333-222.000.
Matsuoka, Yoshihiro: *See*—
Terao, Kazuhiko; Iida, Hideioku; Nakayama, Takeyasu; Kubo, Toshiya; Horigome, Jiro; Matsuoka, Yoshihiro; Takeda, Nobutoshi; and Mizuhashi, Tohru, 5,559,916, Cl. 385-85.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Asakura, Hiroyuki, 5,559,914, Cl. 385-49.000.
Hase, Hiroyuki; and Shoji, Rihito, 5,557,974, Cl. 73-862.335.
Hatsuda, Tsuguyasu, 5,559,456, Cl. 327-53.000.
Ishida, Takashi; O'Hara, Shunji; Ishibashi, Kenzo; and Furutani, Tadashige, 5,559,782, Cl. 369-59.000.
Kajimoto, Kazuo; Kanno, Kinya; and Nakayasu, Tetsuyuki, 5,559,641, Cl. 360-14.100.
Makino, Masahiko; Yamamura, Michio; Fukushima, Masafumi; and Iwanami, Kunio, 5,558,510, Cl. 418-55.200.
Marui, Shinichi; and Ueda, Katsuhiko, 5,559,730, Cl. 364-715.080.
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Nakano, Takayuki; Miya, Kazuyuki; Kato, Osamu; and Watanabe, Masatoshi, 5,559,789, Cl. 370-18.000.
Okumura, Tomohiro; Nakayama, Ichiro; and Yanagi, Yoshihiro, 5,558,722, Cl. 118-723.001.
Takehisa, Yoshihiro, 5,559,861, Cl. 379-58.000.
Tsuchida, Masayuki; Uemura, Hirokazu; Miura, Shinji; Saito, Yoshiyuki; Yoshimura, Hiroyuki; Nishimura, Yuichi; and Sueda, Nobuo, 5,559,997, Cl. 395-500.000.
Urano, Fumiyoshi; Negishi, Takaaki; Katsuyama, Akiko; and Endo, Masayuki, 5,558,971, Cl. 430-170.000.
Urano, Fumiyoshi; Negishi, Takaaki; Katsuyama, Akiko; and Endo, Masayuki, 5,558,976, Cl. 430-326.000.
Yamashita, Haruo; Matsumiya, Masami; and Fukushima, Tsumoru, 5,559,530, Cl. 345-136.000.
Yokoyama, Masahide; and Hayata, Hiroshi, 5,558,749, Cl. 204-192.120.
Matsushita Electronics Corporation: *See*—
Oishi, Yoshiro; and Ueda, Daisuke, 5,559,046, Cl. 437-39.000.
Matsushita Graphic Communication Systems, Inc.: *See*—
Yamada, Hiroyuki; Ichimura, Minoru; and Naito, Takashi, 5,559,609, Cl. 358-400.000.
Matsushita, Noriyuki: *See*—
Abe, Katsunori; Kimura, Yuji; Atsumi, Kinya; Ueno, Yoshiki; and Matsushita, Noriyuki, 5,559,819, Cl. 372-46.000.
Matsushita Refrigeration Company: *See*—
Mangyo, Masao; Ito, Sinya; and Nakaoka, Seishi, 5,557,945, Cl. 62-474.000.
Sasano, Hiroshi; Hamada, Koshi; and Kubota, Akihiko, 5,558,508, Cl. 417-569.000.
Matsuura, Masami: *See*—
Niizawa, Koji; Matsuura, Masami; and Yamaki, Hideo, 5,559,580, Cl. 355-219.000.
Matsuyama, Akinobu; Tomita, Akira; and Kobayashi, Yoshinori, to Daicel Chemical Industries, Ltd. Processes for production of optically active 4-halo-3-hydroxybutyric acid esters. 5,559,030, Cl. 435-280.000.
Matta, Joseph E., deceased (by Karen A. Matta, administratrix); and Tytus, Raymond P., to United States of America, Army. Method for determining elongational viscosity and dynamic surface tension in liquid solutions. 5,559,284, Cl. 73-64.520.
Matta, Karen A., administratrix: *See*—
Matta, Joseph E., deceased; and Tytus, Raymond P., 5,559,284, Cl. 73-64.520.
Matte, Claude; and Muller, Anne, to Pasteur Sanofi Diagnostic. Magnetic device for immunological analysis of a solid phase. 5,558,839, Cl. 422-101.000.
Matter, Eugene P.: *See*—
Cho, Sung S.; and Matter, Eugene P., 5,559,966, Cl. 395-285.000.
Matthews, LeRoy. Plank support jacket. 5,558,179, Cl. 182-222.000.
Matthews, Marion; and Perry, Charles R., to Matthews, Marion. Method and apparatus for distinguishing synthetic diamonds from natural diamonds. 5,559,436, Cl. 324-236.000.
Matthies, Hans-Georg: *See*—
Kotek, Richard; and Matthies, Hans-Georg, 5,559,194, Cl. 525-397.000.
Mattson, Thomas L.; and Epstein, Richard. Inviable phages, their production and DNA thereof. 5,559,018, Cl. 435-172.300.

Maturi, Greg; Auld, David R.; and Neuman, Darren, to LSI Logic Corporation. MPEG decoding system including tag list for associating presentation time stamps with encoded data units. 5,559,999, Cl. 395-550.000.
Maurer-Fogy, Ingrid: *See*—
Ahorn, Horst; Maurer-Fogy, Ingrid; Sommergruber, Wolfgang; Zöphel, Andreas; Blaas, Dieter; Küchler, Ernst; Liebig, Hans-Dieter; and Skern, Timothy, 5,559,025, Cl. 435-252.330.
Mawer, Ian M.: *See*—
Kulagowski, Janusz J.; Leeson, Paul D.; Mawer, Ian M.; and Rowley, Michael, 5,559,125, Cl. 514-312.000.
Max Co., Ltd.: *See*—
Miyazaki, Atsushi, 5,558,134, Cl. 140-57.000.
May, Karl: *See*—
Herm, Hartmut; May, Karl; Unverzagt, Karlheinz; and Werdinig, Helmut, 5,558,203, Cl. 198-661.000.
Mayer, Johann: *See*—
Fürst, Arpad; Danzl, Martin; Mayer, Johann; and Miklosi, Stefan, 5,558,388, Cl. 296-107.000.
Mayeux, Donald P., to Whitey Co. Stream selector for process analyzer. 5,558,129, Cl. 137-885.000.
Mazda Motor Corporation: *See*—
Miyanaka, Hiroshi; Sakimori, Hideharu; and Uotani, Yuzo, 5,557,834, Cl. 29-407.050.
Mazina, Daniel J.: *See*—
Farrand, Scott C.; Didner, Jonathan R.; Mazina, Daniel J.; Autor, Jeffrey S.; Muraski, Paul J.; Stewart, Gregory M.; and Dysart, John A., 5,559,958, Cl. 395-183.030.
McAda, Phyllis C.: *See*—
Conder, Michael J.; McAda, Phyllis C.; Rambosek, John A.; and Reeves, Christopher D., 5,559,005, Cl. 435-47.000.
McAlhaney, Walter W.: *See*—
Kline, Ellis L.; and McAlhaney, Walter W., 5,558,863, Cl. 424-94.610.
McAllister, Robert W.: *See*—
Knoff, Warren F.; McAllister, Robert W.; Popper, Peter; Shibata, Steven K.; Taylor, Robert E.; and Yngve, Paul W., 5,557,915, Cl. 57-204.000.
McAskill, John P., to Deere & Company. Countershaft power transmission. 5,557,978, Cl. 74-331.000.
McCabe, Martin B.; and Saunders, Anthony C., to Synthotech Marine Limited. Pipe stopper having a guide member to assist in guiding the stopper around a bend in a pipe. 5,558,130, Cl. 138-89.000.
McCabe, Thomas: *See*—
Kanjo, Wajih; Smith, Eric; Demoise, Thomas J.; Girotti, Michael; McCabe, Thomas; Fessler, Charles B.; and Natschke, Scott, 5,558,410, Cl. 303-71.000.
Kanjo, Wajih; Smith, Eric; Demoise, Thomas J.; Girotti, Michael; McCabe, Thomas; Fessler, Charles B.; and Natschke, Scott, 5,558,411, Cl. 303-71.000.
Kanjo, Wajih; Smith, Eric; Demoise, Thomas J.; Girotti, Michael; McCabe, Thomas; Fessler, Charles B.; and Natschke, Scott, 5,558,412, Cl. 303-74.000.
McCarthy, Andrew D. Universal tie-less patient limb restraint device. 5,558,102, Cl. 128-878.000.
McCarthy, Jay P.: *See*—
Hammoud, Majid; Kresky, Fred C.; and McCarthy, Jay P., 5,558,403, Cl. 297-378.120.
McCartney, Phillip D.: *See*—
Richards, David T.; McCartney, Phillip D.; and Casper, Billy J., 5,557,950, Cl. 66-194.000.
McClelland, Robert J.: *See*—
Kraft, Robert J.; and McClelland, Robert J., 5,558,497, Cl. 416-96.00A.
McClish, Michael A.; Plec, Steven L.; Remboski, Donald J., Jr.; Lynch, Marvin L.; and Sonday, Susan K., to Motorola, Inc. Adaptive profile correction for rotating position encoders in reciprocating engines. 5,559,705, Cl. 364-431.070.
McCloskey, Douglas N.: *See*—
Basile, Vincent L., II.; Veldkamp, Brent M.; McCloskey, Douglas N.; and Hamblin, David S., 5,558,573, Cl. 452-127.000.
McCormack, Joel J.: *See*—
Seiler, Larry D.; McNamara, Robert S.; Gianos, Christopher C.; and McCormack, Joel J., 5,559,953, Cl. 395-164.000.
McCown, Bruce A.: *See*—
Bloomfield, Mark C.; Castro, Edward F.; Dyer, Joseph T.; Jackson, Deborah J.; Lemons, Charles E.; and McCown, Bruce A., 5,559,611, Cl. 358-407.000.
McCoy, Robert F.: *See*—
Alvord, Larry A.; and McCoy, Robert F., 5,558,846, Cl. 422-301.000.
McCune, Eve N. Playing card organizer. 5,558,330, Cl. 273-150.000.
McDaniel, Gene A.: *See*—
Webster, Marc W.; Rulli, Paul A.; Farrell, Michael E.; and McDaniel, Gene A., 5,559,606, Cl. 358-296.000.
McDonald, Ian A.; Bernotas, Ronald C.; Dudley, Mark W.; and Sprouse, Jeffrey S., to Merrell Pharmaceuticals Inc. Serotonin $5HT_{1A}$ agonistic method. 5,559,143, Cl. 514-419.000.
McDonald, Joseph A.; and Karosas, Algis E., to Majek, Inc. Electronic scoring apparatus for dart games. 5,559,490, Cl. 340-323.00R.
McDonnell Douglas Corporation: *See*—
Veile, Joseph R., 5,558,299, Cl. 244-49.000.
McDowell, Mark W.: *See*—
Lenkov, Dmitry; Unni, Shankar; Mehta, Michey; McDowell, Mark W.; Dadoo, Manoj; and Melli, Bruno, 5,560,009, Cl. 395-700.000.
McElderry, James W., to Illinois Tool Works Inc. Wall anchor accommodating fasteners of varying thread diameters. 5,558,479, Cl. 411-178.000.
McFadden, Joseph A.: *See*—
Bieselin, David N.; Eaton, Glenn A.; McFadden, Joseph A.; Taylor, Stuart A.; Tracy, Edward D.; and Wang, Emil C. W., 5,559,875, Cl. 379-202.000.
McGee, John D.; Bammel, Brian D.; and Rehfuss, John W., to BASF Corporation. Coating composition containing carbamate functional and acrylamide functional components. 5,559,195, Cl. 525-383.000.
McGlothlin, Raymond E.; and Woodworth, Frank B., to M-I Drilling Fluids L.L.C. Well drilling process and clay stabilizing agent. 5,558,171, Cl. 175-64.000.
McGowan, Martin J., III: *See*—
Barzegar, Farhad; Gerszberg, Irwin; McGowan, Martin J., III; and Schroeder, Robert E., 5,559,520, Cl. 342-357.000.
McGrane, Kathleen M.: *See*—
Hsieh, Bing R.; Johnson, Gordon E.; Antoniadis, Homer; McGrane, Kathleen M.; and Stolka, Milan, 5,558,904, Cl. 427-66.000.
McGrath, Martin P.; and Tremont, Samuel J., to Monsanto Company. Controlled functional density polyamines and method for preparation thereof. 5,559,193, Cl. 525-326.100.
McGuinness, Frank J. Pneumatic valve assembly with dynamic annular seal flange. 5,558,117, Cl. 137-223.000.
McGuinness, Thomas G. Supercritical oxidation reactor. 5,558,783, Cl. 210-761.000.
McHugh, William: *See*—
Lubliner, David J.; Dhaliwal, Jaskaran; Gidney, John; Gore, Gerald E.; Greenfeder, Jack J.; Greenfeld, Joshua; Hinton, Melvin C.; McHugh, William; Parsio, Anthony; Rintel, Ian; Roman, Harry T.; and Vogelaar, Jake, 5,559,894, Cl. 382-100.000.
McKay, Albert A.; Pasek, Stanley J.; Porteous, David A.; Reid, Jeffrey D.; Scott, Trevor A.; Smith, Eric G.; Stahmer, Ulf; and Digweed, W. Thomas, to Westinghouse Air Brake Company. Test connector for accessing compressed air at test ports of a railroad brake control valve. 5,559,281, Cl. 73-39.000.
McKay, Don W. Foot massager apparatus. 5,558,625, Cl. 601-118.000.
McKee, Philip R.; and Winkelmann, Earl R., to TurboChef, Inc. Quick-cooking oven. 5,558,793, Cl. 219-391.000.
McKee, Richard C., to Northrop Grumman Corporation. Split-ring infrared detector. 5,559,331, Cl. 250-338.100.
McKenney, Darryl J.; and Cyr, Robert D., to Parlex Corporation. Method of making a circuit board or layer thereof including semi-curing a second adhesive coated on a cured first adhesive. 5,557,843, Cl. 29-851.000.
McKeon, George: *See*—
Blum, Robert; and McKeon, George, 5,558,377, Cl. 294-19.100.
McKown, Alan G.: *See*—
Owen, Ian R.; and McKown, Alan G., 5,558,277, Cl. 239-322.000.
McLaury, Loren L., to Micron Technology, Inc. Multi-bit block write in a random access memory. 5,559,749, Cl. 365-230.020.
McMahon, Michael: *See*—
Malin, Art; Van Erden, Donald; and McMahon, Michael, 5,557,907, Cl. 53-139.200.
McMechan, David E.: *See*—
Vitthal, Sanjay M.; Hardy, Mary A.; McMechan, David E.; Martch, William E.; and Dusterhoft, Ronald G., 5,558,161, Cl. 166-280.000.
McMillan, Larry D.; Mihara, Takashi; Yoshimori, Hiroyuki; Gregory, John W.; and Paz de Araujo, Carlos A., to Symetrix Corporation; and Olympus Optical Co., Ltd. Memory with ferroelectric capacitor connectable to transistor gate. 5,559,733, Cl. 365-145.000.
McMillan, Larry D.: *See*—
Scott, Michael C.; Paz de Araujo, Carlos A.; and McMillan, Larry D., 5,559,260, Cl. 556-28.000.
McNair, Bruce E., to Lucent Technologies Inc. Security system providing lockout for invalid access attempts. 5,559,505, Cl. 340-825.310.
McNally, J. Michael: *See*—
Barrett, David M.; Letourneau, Mary; Martin, Patricia A.; and McNally, J. Michael, 5,560,017, Cl. 395-733.000.
McNamara, Charles: *See*—
Moncrief, Frank; Bacco, David R.; McNamara, Charles; Smith, Dwight L.; and Ford, Colin, 5,558,489, Cl. 414-793.700.
McNamara, Don B., to Outboard Marine Corporation. Boat hull gunwale construction and process therefor. 5,558,038, Cl. 114-355.000.
McNamara, Robert S.: *See*—
Seiler, Larry D.; McNamara, Robert S.; Gianos, Christopher C.; and McCormack, Joel J., 5,559,953, Cl. 395-164.000.
McNeil-PPC, Inc.: *See*—
James, William A.; Breitkopf, Stephen H.; Provell, Robert G.; and Moody, Ralph A., III, 5,558,218, Cl. 206-303.000.
McNeill, Robert C.: *See*—
Fisher, Charles M.; and McNeill, Robert C., 5,558,283, Cl. 241-100.000.
McNickle, Alan D.; Hwang, Mingfong; and Pope, Adam N., to Stein Seal Company. Seal for sealing an incompressible fluid between a relatively stationary seal and a movable member. 5,558,341, Cl. 277-3.000.
McNulty, Ian: *See*—
Acker, David E.; McNulty, Ian; Pacheco, Robert C.; and Grandner, Wayne, 5,558,091, Cl. 128-653.100.
McPartland, Richard J., to Lucent Technologies Inc. Sense amplifier with overvoltage protection. 5,559,455, Cl. 327-53.000.
McPhee, Charles J., to I-Flow Corporation. Elastomeric syringe actuation device. 5,558,650, Cl. 604-218.000.
McVey, Duncan L.: *See*—

Wickham, Thomas J.; Kovesdi, Imre; Brough, Douglas E.; McVey, Duncan L.; and Brader, Joseph T., 5,559,099, Cl. 514-44.000.
Kulagowski, Janusz J.; Leeson, Paul D.; Mawer, Ian M.; and Rowley, Michael, 5,559,125, Cl. 514-312.000.

Micropyretics Heaters International, Inc.: *See*—
Alpert, Donald B.; Choudhury, Mustafiz R.; and Mills, Jack D.,

Wickham, Thomas J.; Kovesdi, Imre; Brough, Douglas E.; McVey, Duncan L.; and Brader, Joseph T., 5,559,099, Cl. 514-44.000.

Meacham, Patrick E.: *See*—
Huffstutler, M. Conrad, Jr.; Meacham, Patrick E.; Wallace, Mark W.; and Nyberg, Carl R., 5,558,241, Cl. 220-1.500.

Meanwell, Nicholas A.: *See*—
Starrett, John E., Jr.; Tortolani, David R.; Mansuri, Muzammil M.; and Meanwell, Nicholas A., 5,559,248, Cl. 549-79.000.

Medina, David: *See*—
Macon, James F., Jr.; Medina, David; and Peloquin, Mark A., 5,560,018, Cl. 395-733.000.

Medtronic, Inc.: *See*—
Cannon, Louis A., 5,558,635, Cl. 604-49.000.
Phipps, Joseph B.; Howland, Warren W.; Jevne, Allan H.; and Holmblad, Carolann, 5,558,633, Cl. 604-20.000.

Meegan, Owen J.: *See*—
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Meepo USA Co.: *See*—
Lee, Young S.; and Kim, Jong C., 5,557,849, Cl. 30-29.000.

Mehta, Michey: *See*—
Lenkov, Dmitry; Unni, Shankar; Mehta, Michey; McDowell, Mark W.; Dadoo, Manoj; and Melli, Bruno, 5,560,009, Cl. 395-700.000.

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Sellen, Martin, 5,559,431, Cl. 324-202.000.

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Beierwaltes, William T.; and Miller, Kevin L., 5,559,409, Cl. 318-282.000.

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Elan, Gilbert L.; and Elsbernd, Cheryl L. S., 5,559,198, Cl. 526-89.000.
Hagen, Donald F.; Bahmet, Wanda; Haddad, Louis C.; and Perkins, Robert E., 5,558,771, Cl. 210-500.250.
Horn, Jerold S.; and Forbes, James F., 5,558,516, Cl. 433-9.000.
Krasinski, Jerzy S.; and Wang, Yin M., 5,559,341, Cl. 250-559.260.
Lai, Ming-Lai, 5,558,191, Cl. 188-379.000.
Owen, Ian R.; and McKown, Alan G., 5,558,277, Cl. 239-322.000.
Simpson, Sharon M.; and Harring, Lori S., 5,558,983, Cl. 430-619.000.
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Vacca, Paolo; and Frezzati, Marco, 5,559,239, Cl. 546-323.000.
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Niizawa, Koji; Matsuura, Masami; and Yamaki, Hideo, 5,559,580, Cl. 355-219.000.
Ohhata, Akira; and Kondo, Masao, 5,559,594, Cl. 355-317.000.

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Carey, Maurice E.; Miracle, Gerald H.; Moyer, James T.; and Neuner, Richard A., 5,559,972, Cl. 395-281.000.

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Hargis, I. Glen; Miranda, Richard A.; Wilson, John A.; and Yeoh, Oon H., 5,558,325, Cl. 273-61.00C.

Misaizu, Tadayuki: *See*—
Inokuchi, Tatsuya; Tsukatani, Shigeki; and Misaizu, Tadayuki, 5,559,778, Cl. 369-58.000.

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Fukuyama, Shinjiro, 5,559,475, Cl. 331-31.000.
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Moribayashi, Satoshi; Isozumi, Shuzo; and Morishita, Akira, 5,557,976, Cl. 74-7.00E.
Onizuka, Shoko, 5,559,433, Cl. 324-207.210.
Shiono, Takashi, 5,559,880, Cl. 379-390.000.
Suzuki, Katsunori; and Hata, Masayuki, 5,559,998, Cl. 395-550.000.
Takahashi, Akihito; and Hasegawa, Koji, 5,559,563, Cl. 348-625.000.
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Yagi, Tetsuya, 5,559,821, Cl. 372-46.000.
Yoshida, Toyohiko, 5,560,036, Cl. 395-800.000

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Dosaka, Katsumi; Kumanoya, Masaki; Hayano, Kouji; Yamazaki, Akira; Iwamoto, Hisashi; Abe, Hideaki; Konishi, Yasuhiro; Himukashi, Katsumitsu; Ishizuka, Yasuhiro; and Saiki, Tsukasa, 5,559,750, Cl. 365-230.060.

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Tanaka, Yoshiyuki, Abe, Masatoshi, and Ito, Taka-aki, 5,559,663, Cl. 361-127.000.

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Abe, Yoshiharu; Sagane, Toshihiro; and Toyota, Akinori, 5,559,199, Cl. 526-160.000.

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Mizuhashi, Tohru: *See*—
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Yamashina, Masakazu; Koseki, Youichi; and Mizuno, Masayuki, 5,559,461, Cl. 327-205.000.

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Pankove, Jacques I.; Moddel, Garret R.; and Douglas, Kenneth, 5,559,822, Cl. 372-50.000.

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Grohman, Craig C.; Robinson, Edward; and Barton, Bob L., 5,558,080, Cl. 126-299.00D.
Lefeber, Thomas E., 5,558,154, Cl. 165-51.000.

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Nielson, Edward G.; DeBruine, Timothy S.; Modzeleski, Daniel P.; and Stoepker, Ross C., 5,559,725, Cl. 364-550.000.

Mohsen, Jafar. Lockout for conventional wall-type toggle or rocker electrical switch assemblies. 5,558,209, Cl. 200-43.220.

Mok, Lawrence S.: *See*—
Flint, Ephraim B.; Lanzetta, Alphonso P.; and Mok, Lawrence S., 5,559,670, Cl. 361-681.000.

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Kline, Ellis L.; and McAlhaney, Walter W., 5,558,863, Cl. 424-94.610.

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O'Sullivan, Michael; and Wetter, James A., 5,558,542, Cl. 439-682.000.

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Kaaber, Henning; and Mollgaard, Mogens, 5,558,847, Cl. 423-111.000.

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Moncrief, Frank; Bacco, David R.; McNamara, Charles; Smith, Dwight L.; and Ford, Colin, to Riverwood International Corporation. Mass feeder for product delivery system. 5,558,489, Cl. 414-793.700.

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Ben-Aissa, M. Nebil; Doran, Jerry J.; Jensen, Howard A.; and Monroe, Dick, 5,558,274, Cl. 236-13.000.

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Corbin, David R.; Greenplate, John T.; Jennings, Michael G.; Purcell, John P.; and Sammons, Robert D., 5,558,862, Cl. 424-94.400.
McGrath, Martin P.; and Tremont, Samuel J., 5,559,193, Cl. 525-326.100.
South, Michael S.; and Miller, Michael J., 5,559,080, Cl. 504-238.000.

Monta, Kazuo; and Itoh, Juichiro, to Kabushiki Kaisha Toshiba. Plant condition display system. 5,559,691, Cl. 364-188.000.

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Brailly, Hervé; Montero-Julian, Félix A.; and Klein, Bernard, 5,559,012, Cl. 435-70.210.

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Jungo, Charles; Montgomery, Gerald D.; and Schur, Christopher J., 5,559,559, Cl. 348-432.000.

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James, William A.; Breitkopf, Stephen H.; Provell, Robert G.; and Moody, Ralph A., III, 5,558,218, Cl. 206-303.000.

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Mordue, George S.; Henderson, Richard S.; Gilbert, Ronald E.; and Masarin, David M., to Metaullics Systems Co., L.P. Molten metal pump support post and apparatus for removing it from a base. 5,558,505, Cl. 417-360.000.

Morehouse, James H.: *See*—
Hunter, Dan A.; Utenick, Michael R.; Morehouse, James H.; and Chenkin, Nelson, 5,559,648, Cl. 360-75.000.

Morello, John R.; and Huff, Daniel H., to General Motors Corporation. Electrical connector assembly having a terminal locking bussing plate. 5,558,530, Cl. 439-189.000.

Morgan, Donald F., to Batts, Inc. Method and system for recycling and reusing garment hangers. 5,558,280, Cl. 241-24.280.

Morgavi, Paul, to Gemplus Card International. Simultaneous two-face printing machine. 5,558,449, Cl. 400-188.000.

Mori, Atsuhiro: *See*—
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Mori, Hiroyuki, to Fuji Photo Film Co., Ltd. Liquid crystal compensator satisfying nx>nz>ny having ny and nz inclined. 5,559,618, Cl. 359-73.000.

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Mori, Kozo: *See*—
Fukuda, Hirofumi; Hatori, Kazuo; Yamada, Kazumi; Nogiri, Toshiaki; and Mori, Kozo, 5,559,678, Cl. 361-818.000.

Mori, Masakazu; and Yoshioka, Toyotoshi, to Luwa Japan Ltd.; and Kabushiki Kaisha Fukuharaseiki Seisakusho. Dust collecting and removing device in a circular knitting machine and a knit fabric manufacturing apparatus. 5,557,949, Cl. 66-168.000.

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Mori, Naomichi: *See*—
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Mori, Shinji; and Ishioka, Katsutoshi, to NOK Corporation. Molding compound. 5,559,179, Cl. 524-494.000.

Mori, Toshihiro: *See*—
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Moribayashi, Satoshi; Isozumi, Shuzo; and Morishita, Akira, to Mitsubishi Denki Kabushiki Kaisha. Planetary gear reduction starter. 5,557,976, Cl. 74-7.00E.

Morimoto, Kyomi: *See*—
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Shinada, Tsunetoshi; Wada, Katsuo; Misumi, Masaki; and Kurono, Satoru, 5,558,883, Cl. 425-116.000.

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Araya, Katsuhiko; Morita, Youzo; Sumi, Shingo; and Matsuhisa, Hiroaki, 5,559,333, Cl. 250-344.000.

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Morton International, Inc.: *See*—
Dahl, Kim V., 5,558,363, Cl. 280-728.200.

Morwood, Kim: *See*—
Edwards, Peter J.; and Morwood, Kim, 5,559,096, Cl. 514-12.000.

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Janssen, Johannes J.; Mos, Arie L.; and Simons, Theodoor J. L. W., 5,558,778, Cl. 210-774.000.

Moser, Robert E.; Owens, David R.; Wilhelm, James H.; Colley, James D.; and Hargrove, Oliver W., Jr. Clear liquid acid flue gas desulfurization system. 5,558,848, Cl. 423-243.010.

Moses, Pinchas: *See*—
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Moskovich, Jacob, to Corning Incorporated. Field curvature corrector. 5,559,637, Cl. 359-708.000.

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Ehrle, Bruno; Herzog, Rolf; Mosmann, Andreas; Riedberger, Reto; and Weber, Alfred, 5,558,142, Cl. 144-230.000.

Motorola, Inc.: *See*—
Adamjee, Waseem, 5,559,054, Cl. 437-183.000.
Bailey, Keith W., 5,557,842, Cl. 29-827.000.
Black, Gregory R., 5,559,471, Cl. 330-277.000.
Eaddy, Jasper; Pistole, William M., III; and Gentile, Robert J., 5,559,445, Cl. 324-755.000.
Errichiello, Dominic R., 5,559,677, Cl. 361-816.000.

Gailus, Paul H.; Chapman, Ronald H.; and Wilhite, Jeffrey B., 5,559,468, Cl. 330-110.000.

Gallup, Micheal G.; Goke, L. Rodney; Seaton, Robert W., Jr.; Lawell, Terry G.; Osborn, Stephen G.; and Tomazin, Thomas J., 5,559,973, Cl. 395-375.000.

Gilbert, Stephen S.; Needham, Michael L., and Crisler, Kenneth J., 5,559,810, Cl. 371-5.100.

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Kurby, Christopher N.; Arens, John W.; and Phillips, James P., 5,559,806, Cl. 370-95.300.

Laird, Kevin M., 5,559,832, Cl. 375-244.000.

Leitch, Clifford D., 5,559,506, Cl. 340-825.440.

McClish, Michael A.; Plee, Steven L.; Remboski, Donald J., Jr.; Lynch, Marvin L.; and Sonday, Susan K., 5,559,705, Cl. 364-431.070.

O'Neill, Frank, 5,559,866, Cl. 379-60.000.

Ota, Ken; and Archibald, William, 5,559,928, Cl. 395-3.000.

Quinn, Robert, 5,559,527, Cl. 345-115.000.

Racino, Gregory A.; and Jorvig, Jeffrey R., 5,559,981, Cl. 395-430.000.

Seitz, Martin V., 5,559,522, Cl. 343-702.000.

Urbish, Glenn F.; Dorinski, Dale W.; and Swirbel, Thomas J., 5,559,614, Cl. 359-44.000.

Venugopal, Ganesh; Reichert, Veronica R.; and Zhang, Jinshan, 5,558,959, Cl. 429-19.200.

van den Heuvel, Anthony P.; Valentine, Stephen T.; and Boscovich, Dragan, 5,559,807, Cl. 370-95.300.

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Mouk, Robert W.; and Abel, Albert E., to Commodore Laboratories, Inc. Methods for the destruction of ozone depleting substances. 5,559,278, Cl. 588-205.000.

Mourot, Christophe; Wautier, Armelle; and Dany, Jean-Claude, to Alcatel N.V. Learning sequence for estimating a transmission channel and corresponding estimator device. 5,559,723, Cl. 364-517.000.

Mousseau, Gary P.; Lazaridis, Mihal; Little, Herb A.; and Barnstijn, Michael A., to Research In Motion Limited. Remote control of gateway functions in a wireless data communication network. 5,559,800, Cl. 370-85.130.

Mouterde, Renaud; Jacquemont, Jacky; and Lamarche, Michel, to Giat Industries. Motorized breakdown vehicle. 5,558,384, Cl. 296-37.100.

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Oudet, Claude; and Gandel, Pierre, 5,559,378, Cl. 310-17.000.

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Carey, Maurice E.; Miracle, Gerald H.; Moyer, James T.; and Neuner, Richard A., 5,559,972, Cl. 395-281.000.

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Clark, Jay V.; Bramlett, William L., Jr.; and Moyer, Judith, 5,558,521, Cl. 434-322.000.

Mrotek, Edward N.; and Schilling, Norbert, to Globe-Union, Inc. Flexible core spacer for storage bateries. 5,558,958, Cl. 429-146.000.

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Fife, James F.; Vorhis, Daniel J.; Laughlen, Kenneth D.; and Dienes, Nancy L., 5,558,762, Cl. 210-130.000.

MTU Motoren- und Turbinen-Union Muenchen GmbH: *See*—
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Shea, John J., Bauer, James A.; Wehrli, Henry A., III; Mueller, Denis A.; Wilsdon, Thomas A.; and Wilson, John R., 5,559,426, Cl. 323-319.000.

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Mulox IBC Limited: *See*—
Pusterman, Charles S., 5,558,137, Cl. 141-44.000.

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Maitra, Siddhartha; Thanawala, Ashish; and Young, Steve, 5,559,793, Cl. 370-32.100.

Mun, Kug H., to Samsung Electronics Co., Ltd. Reciprocal electric shaver. 5,557,850, Cl. 30-43.920.

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Pfeiler, Manfred; Mund, Konrad; Preidel, Walter; and Sjoeholm, Goesta, 5,558,640, Cl. 604-67.000.

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Weisburn, James T.; Mundorf, Larry K.; Ramsey, Roger H.; and Brazis, William E., 5,558,225, Cl. 206-455.000.

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Munshi, Anil: *See*—
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Schädeli, Ulrich; Münzel, Norbert; De Leo, Christoph; Holzwarth, Heinz; and Tinguely, Eric, 5,558,978, Cl. 430-270.100.

Murakami, Yoshiki: *See*—
Takahashi, Tetsuhiko; Yamamoto, Etsuji; Murakami, Yoshiki; and Matsunaga, Yoshikuni, 5,559,434, Cl. 324-318.000.

Murakawa, Masahiko: *See*—
Ryu, Tadamitsu; Izumi, Hiroyuki; Murakawa, Masahiko; Toyota, Masanobu; Adachi, Takeshi; and Ichikawa, Naomi, 5,560,012, Cl. 395-700.000.

Muraldihara, Harapanahalli S., to Cargill, Incorporated. Removal of pesticides from citrus peel oil. 5,558,893, Cl. 426-492.000.

Murase, Tutomu, to NEC Corporation. Burst server stored switching system and its method. 5,559,797, Cl. 370-61.000.

Murashita, Toru, to Nippon Telegraph and Telephone Corporation. Scanning tunneling microscope. 5,559,330, Cl. 250-306.000.

Muraski, Paul J.: *See*—
Farrand, Scott C.; Didner, Jonathan R.; Mazina, Daniel J.; Autor, Jeffrey S.; Muraski, Paul J.; Stewart, Gregory M.; and Dysart, John A., 5,559,958, Cl. 395-183.030.

Murasugi, Takashi: *See*—
Tsuchiya, Shouichi; Morishita, Tatsuya; Koda, Masanori; Mori, Atsuhiro; and Murasugi, Takashi, 5,558,579, Cl. 464-64.000.

Murata, Hiroyasu; Miyazawa, Hideo; and Kaku, Takashi, to Fujitsu Limited. Modulator and demodulator apparatus as well as modulation and demodulation method. 5,559,799, Cl. 370-76.000.

Murata, Kazuhiko: *See*—
Kawabe, Kazuki; Murata, Kazuhiko; and Furuya, Toshiyuki, 5,559,255, Cl. 549-538.000.

Murata Kikai Kabushiki Kaisha: *See*—
Masuda, Junichi, 5,558,483, Cl. 414-278.000.

Murata Manufacturing Co., Ltd.: *See*—
Hasegawa, Tomoyasu, 5,559,291, Cl. 73-504.120.
Sakurai, Atsushi, 5,558,711, Cl. 117-84.000.

Murayama, Atsushi: *See*—
Nakamura, Hideyuki; and Murayama, Atsushi, 5,559,340, Cl. 250-551.000.

Murayama, Shuichi: *See*—
Kawamura, Hideki; Tomita, Shinji; Murayama, Shuichi; and Nishikawa, Yukinobu, 5,557,925, Cl. 62-50.500.

Murooka, Ken: *See*—
Sugiura, Yoshinori; Azuma, Jun; Adachi, Nobukazu; Setoriyama, Takeshi; Tenpaku, Chitose; Ishikawa, Noriyoshi; Hamada, Tatsuo; Tsuchiya, Yoshiro; Kubota, Takeshi; Nomura, Yoshiya; Kuroda, Akira; Murooka, Ken; Sugita, Takeshi; Niimura, Takeshi; and Yuza, Akira, 5,559,581, Cl. 355-200.000.

Murphy, Dennis S.: *See*—
Policello, George A.; and Murphy, Dennis S., 5,558,806, Cl. 252-355.000.

Murphy, Kevin D.: *See*—
Claus, David M.; Murphy, Kevin D.; and Thompson, Wanda G., 5,559,313, Cl. 235-380.000.

Murphy, Peter M.: *See*—
Heim, William W.; Hendrix, James K.; Materniak, Joyce M.; Murphy, Peter M.; Panzier, Neil A.; and Vinod, Yashavant V., 5,558,916, Cl. 428-95.000.

Murthy, Ganesh: *See*—
Oztaskin, Ali S.; Allen, John L.; and Murthy, Ganesh, 5,559,965, Cl. 395-284.000.

Murthy, Keshava; Weeratunga, Gamini; and Andrew, Burchat, to ACIC (Canada) Inc. Method for the manufacture of benzothiazepine. 5,559,229, Cl. 540-491.000.

Muscle Memory, Inc.: *See*—
Nolan, James F., Jr., 5,558,585, Cl. 473-211.000.

Musshafen, George N.: *See*—
DePalma, Vito A.; Spahn, Robert G.; Coltrain, Bradley K.; Musshafen, George N.; and Girolmo, Sharon R., 5,558,977, Cl. 430-496.000.

Muto, Yukiyoshi; Futamura, Masao; and Mizuno, Masahiro, to Brother Kogyo Kabushiki Kaisha. Apparatus for processing embroidery data so as to enlarge local blocks of adjacent embroidery patterns. 5,558,031, Cl. 112-102.500.

Muto, Yukiyoshi; Futamura, Masao; and Mizuno, Masahiro, to Brother Kogyo Kabushiki Kaisha. Embroidery data preparing device. 5,558,032, Cl. 112-102.500.

Muto, Yukiyoshi: *See*—
Futamura, Masao; Muto, Yukiyoshi; and Mizuno, Masahiro, 5,558,033, Cl. 112-475.190.
Futamura, Masao; Kyuno, Mitsuyasu; Muto, Yukiyoshi; and Mizuno, Masahiro, 5,559,711, Cl. 364-470.090.

Muzzy, Norman E.; Klages, Corwin L.; and Hansotia, Eric P., to Deere & Company. Adjustable armrest. 5,558,404, Cl. 297-411.380.

MWB High Voltage Systems GmbH: *See*—
Peier, Dirk; and Hirsch, Holger, 5,559,442, Cl. 324-753.000.

Mydata Automation AB: *See*—
Stridsberg, Lennart, 5,558,504, Cl. 417-322.000.

Myers, Peter L.: *See*—
Luzzio, Michael J.; Besterman, Jeffrey M.; Evans, Michael G.; and Myers, Peter L., 5,559,235, Cl. 544-361.000.

Myers, Richard: *See*—
Traina, John E.; and Myers, Richard, 5,559,279, Cl. 73-3.000.

Myhrvold, Nathan: *See*—
Davidson, Robert I.; and Myhrvold, Nathan, 5,559,884, Cl. 380-4.000.

N.E. Chemcat Corporation: *See*—
Itoh, Takashi; Kosaki, Yukio; Chonan, Takeshi; Matsuda, Takashi; Kanno, Yasuharu; Wakabayashi, Masao; and Nakamura, Makoto, 5,559,072, Cl. 502-347.000.
Watanabe, Tateshi; Watanabe, Tsunao; Watanabe, Tadashi; Matsugu, Hidetomo; and Yamanouchi, Yasuhiro, 5,558,714, Cl. 118-421.000.

Naaktgeboren, Adrianus: *See*—
Ameye, Danny R.; Desnijder, Dirk J.; and Naaktgeboren, Adrianus, 5,558,282, Cl. 241-60.000.

Nachon, Beni; Efrat, Ehud; Razon, Eli; and Perlberg, Gil, to Kulicke and Soffa Investments, Inc. Fine pitch capillary/wedge bonding tool. 5,558,270, Cl. 228-180.500.

Nadayoshi, Kaoru: *See*—
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Nishida, Masaaki; Yamamoto, Yoshihisa; Tsutsui, Hiroshi; and Nadayoshi, Kaoru, 5,558,600, Cl. 477-121.000.

Naedler, Mark H.; and Goldfein, Nathan L., to International Transquip Industries, Inc. Vehicle brake system. 5,558,408, Cl. 303-7.000.

Nagahama, Masanori: *See*—
Mizobata, Akira; Nagahama, Masanori; and Watanabe, Tadakatu, 5,559,738, Cl. 365-189.010.

Nagai, Shinichi. Camera. 5,559,572, Cl. 354-288.000.

Nagai, Toshinari: *See*—
Harima, Kenji; Nagai, Toshinari; Kanai, Hiroshi; Osanai, Akinori; Iwano, Kazuhiro; and Yuda, Shuji, 5,558,072, Cl. 123-677.000.

Nagamine, Akira, to Whitaker Corporation, The. Connector with a contact-aligning device. 5,558,526, Cl. 439-140.000.

Nagano, Hideo; Niwa, Kazuo; and Hayashi, Takayuki, to Fuji Photo Film Co., Ltd. Process for preparing microcapsules. 5,558,820, Cl. 264-4.100.

Nagano, Masashi, to Shimano Inc. Bicycle cleat coupling structure. 5,557,985, Cl. 74-594.600.

Nagase, Hidekazu: *See*—
Okada, Toshikazu; Itogawa, Hiroshi; and Nagase, Hidekazu, 5,558,590, Cl. 475-28.000.

Nagashima, Hideki: *See*—
Maeda, Yasuaki; and Nagashima, Hideki, 5,559,780, Cl. 369-54.000.

Nagata, Hideo: *See*—
Kishi, Hajime; Odagiri, Nobuyuki; Tazaki, Tokuo; Nagata, Hideo; Terashita, Takeshi; Nishimura, Akira; and Kato, Hiroyasu, 5,557,831, Cl. 28-167.000.

Nagata, Tetsuya: *See*—
Umeda, Takao; Miyasaka, Toru; Namikawa, Osamu; Komatsu, Isamu; Nagata, Tetsuya; Takuma, Yasuo; and Igawa, Tatsuo, 5,559,578, Cl. 355-208.000.

Nagatsuka, Takayuki; Kasuya, Takashige; Nakamura, Tatsuya; Kanbayashi, Makoto; and Chiba, Tatsuhiko, to Canon Kabushiki Kaisha. Toner for developing electrostatic image and two-component type developer for developing electrostatic image. 5,558,967, Cl. 430-106.600.

Nagorski, Boguslaw A.: *See*—
Talieh, Homayoun; Weldon, David E.; and Nagorski, Boguslaw A., 5,558,568, Cl. 451-303.000.

Nair, Parameswaran B.; Evans, John C.; and Price, James F., to MicroBilt Corporation. Embossed card reader. 5,559,315, Cl. 235-448.000.

Naito, Takashi: *See*—
Yamada, Hiroyuki; Ichimura, Minoru; and Naito, Takashi, 5,559,609, Cl. 358-400.000.

Nakagawa, Junichi: *See*—
Koshiba, Yoshikazu; Aoki, Yukio; Minakata, Tsuyoshi; Inamura, Michio; Yasunaga, Tomohiro; Imoto, Fujiya; and Nakagawa, Junichi, 5,557,847, Cl. 29-890.000.

Nakagawa, Kiyoshi, to Sony Corporation. Transporting system for an article. 5,558,487, Cl. 414-744.600.

Nakagawa, Mikihiko; Negoro, Daisaku; Nakanishi, Nobuyuki; Ogawa, Akio; Yajima, Manabu; and Kinoshita, Toshihara, to Olympus Optical Co., Ltd. Washing/sterilizing apparatus for an endoscope and method for washing/sterilizing its water supplying system. 5,558,841, Cl. 422-105.000.

Nakagawa, Yoshitomo: *See*—
Ito, Tetsumasa; and Nakagawa, Yoshitomo, 5,559,337, Cl. 250-423.00R.

Nakagishi, Toshio; Kimura, Hitoshi; Oono, Masahiro; Maruyama, Koichi; and Noguchi, Masato, to Asahi Kogaku Kogyo Kabushiki Kaisha. Beam receiving position adjusting device. 5,559,639, Cl. 359-823.000.

Nakagoshi, Arata, to Hitachi, Ltd. Diversity receiving apparatus. 5,559,838, Cl. 375-347.000.

Nakahara, Mike: *See*—
Hicok, Gary D.; Penner, Dale C.; and Nakahara, Mike, 5,559,533, Cl. 345-162.000.

Nakajima, Masahiro: *See*—
Otaki, Hitoshi; and Nakajima, Masahiro, 5,559,812, Cl. 371-31.000.

Nakamura, Hideyuki; and Murayama, Atsushi, to Sharp Kabushiki Kaisha. Photocoupler capable of effecting phase control with an embedded junction capacitor. 5,559,340, Cl. 250-551.000.

Nakamura, Hiroshi: *See*—
Uemura, Fumito; Kodama, Seiki; and Nakamura, Hiroshi, 5,557,971, Cl. 73-702.000.

Nakamura, Kosei; Katsuzawa, Yukio; and Maeda, Yoshinobu, to Fanuc Ltd. Air-cooled motor. 5,559,380, Cl. 310-64.000.

Nakamura, Kozo: *See*—
Mitsui, Seiichi; and Nakamura, Kozo, 5,559,617, Cl. 359-73.000.

Nakamura, Makoto: *See*—
Itoh, Takashi; Kosaki, Yukio; Chonan, Takeshi; Matsuda, Takashi; Kanno, Yasuharu; Wakabayashi, Masao; and Nakamura, Makoto, 5,559,072, Cl. 502-347.000.

Nakamura, Masakazu: *See*—
Kami, Kuniaki; Adachi, Hideyuki; Umeyama, Koichi; Kosaka, Yoshihiro; Yamaguchi, Seiji; Fuse, Eiichi; Sato, Michio; Nakamura, Masakazu; Tanaka, Yasundo; Fukaya, Takashi; Matsuno, Kiyotaka; and Suzuki, Katsuya, 5,558,619, Cl. 600-146.000.

Nakamura, Mitsuo: *See*—
Yokoya, Yasuhiko; Yamazaki, Noboru; Nakamura, Mitsuo; Hasuda, Syuuichi; Namai, Eisaku; and Yamada, Syuuzou, 5,559,443, Cl. 324-754.000.

Nakamura, Nobuhisa; Ohzeki, Kazuhide; and Takano, Hiroshi, to Hitachi Koki Co., Ltd. Power tool having detachable auxiliary handle. 5,558,570, Cl. 451-357.000.

Nakamura, Norio; Ohkawa, Nobuyuki; Oshima, Takeshi; Miyamoto, Masaaki; and Iijima, Yasuteru, to Sankko Company, Limited. Method of treating a PAF-mediated pathology or for treating or preventing psoriasis, nephritis, asthma or shock by administering a PAF antagonist. 5,559,109, Cl. 514-218.000.

Nakamura, Tatsuya: *See*—
Nagatsuka, Takayuki; Kasuya, Takashige; Nakamura, Tatsuya; Kanbayashi, Makoto; and Chiba, Tatsuhiko, 5,558,967, Cl. 430-106.600.

Nakamura, Yusuke; and Imai, Takashi, to Cancer Institute; and Eisai Co., Ltd. Tumor suppressor gene. 5,559,023, Cl. 435-240.200.

Nakanishi, Nobuyuki: *See*—
Nakagawa, Mikihiko; Negoro, Daisaku; Nakanishi, Nobuyuki; Ogawa, Akio; Yajima, Manabu; and Kinoshita, Toshihara, 5,558,841, Cl. 422-105.000.

Nakanishi, Tosaku: *See*—
Kardach, James P.; Nakanishi, Tosaku; and Cheng, Jimmy S., 5,560,001, Cl. 395-550.000.
Kardach, James P.; Nakanishi, Tosaku; and Cheng, Jimmy S., 5,560,002, Cl. 395-550.000.

Nakano, Hirohiko; Domyo, Seiichi; Kuroda, Takaki; Shouji, Naofumi; and Kobayashi, Atsushi, to Hitachi, Ltd. Distributed file system permitting each user to enhance cache hit ratio in file access mode. 5,559,984, Cl. 395-448.000.

Nakano, Takayuki; Miya, Kazuyuki; Kato, Osamu; and Watanabe, Masatoshi, to Matsushita Electric Industrial Co., Ltd. CDMA/TDD Radio Communication System. 5,559,789, Cl. 370-18.000.

Nakao, Takashi; Ohsato, Kiyoshi; Kamatani, Yoshiteru; Narahara, Tatsuya; and Ozue, Tadashi, to Sony Corporation. Rotary drum tape recording apparatus with controlling optical recording tracks using stored results of scanning of reference tracks. 5,559,766, Cl. 369-44.180.

Nakaoka, Seishi: *See*—
Mangyo, Masao; Ito, Sinya; and Nakaoka, Seishi, 5,557,945, Cl. 62-474.000.

Nakase, Ryoichi; and Suganuma, Noboru, to Sanshin Kogyo Kabushiki Kaisha. Drive bearing arrangements for watercraft. 5,558,456, Cl. 403-359.000.

Nakase, Ryoichi; and Nanami, Masayoshi, to Sanshin Kogyo Kabushiki Kaisha. Four cycle engine for watercraft. 5,558,549, Cl. 440-88.000.

Nakashima, Akio; and Shibahashi, Yutaka, to Pilot Ink Co., Ltd., The. Thermochromic color-memory composition. 5,558,699, Cl. 106-21.00A.

Nakatani, Kohichi; Hayashi, Akio; and Kohiyama, Tomohisa, to Hitachi, Ltd. Power saving processing system. 5,560,020, Cl. 395-750.000.

Nakatomi, Yoshitsugu, to Kabushiki Kaisha Toshiba. Paper discharge unit for use in image forming apparatus. 5,558,322, Cl. 271-209.000.

Nakaya, Kenji: *See*—
Ogawa, Hidenori; Miyamoto, Hisashi; Kondo, Kazumi; Yamashita, Hiroshi; Nakaya, Kenji; Komatsu, Hajime; Tanaka, Michinori; Kora, Shinya; Tominaga, Michiaki; and Yabuuchi, Yoichi, 5,559,230, Cl. 540-569.000.

Nakayama, Ichiro: *See*—
Okumura, Tomohiro; Nakayama, Ichiro; and Yanagi, Yoshihiro, 5,558,722, Cl. 118-723.001.

Nakayama, Takahiro; and Kakuta, Atsushi, to Hitachi, Ltd. Variable wavelength luminescent device and control method therefor. 5,559,400, Cl. 313-506.000.

Nakayama, Takeyasu: *See*—
Terao, Kazuhiko; Iida, Hidetoku; Nakayama, Takeyasu; Kubo, Toshiya; Horigome, Jiro; Matsuoka, Yoshihiro; Takeda, Nobutoshi; and Mizuhashi, Tohru, 5,559,916, Cl. 385-85.000.

Nakayama, Tatsuo. Ratchet handle with torque adjustment. 5,557,994, Cl. 81-478.000.

Nakayama, Yoshiaki: *See*—
Inuiya, Masafumi; and Nakayama, Yoshiaki, 5,559,552, Cl. 348-220.000.

Nakayasu, Ritsuo; and Miyazaki, Shinichi, to Sumitomo Rubber Industries, Ltd. Pneumatic radial tire with hybrid band cord. 5,558,144, Cl. 152-527.000.

Nakayasu, Tetsuyuki: *See*—
Kajimoto, Kazuo; Kanno, Kinya; and Nakayasu, Tetsuyuki, 5,559,641, Cl. 360-14.100.

Nakos, Steven T.: *See*—
Woods, John G.; Rakas, Margaret A.; Jacobine, Anthony F.; Alberino, Louis M.; Kropp, Philip L.; Sutkaitis, Donna M.; Glaser, David M.; and Nakos, Steven T., 5,558,937, Cl. 428-378.000.

Namai, Eisaku: *See*—
Yokoya, Yasuhiko; Yamazaki, Noboru; Nakamura, Mitsuo; Hasuda, Syuuichi; Namai, Eisaku; and Yamada, Syuuzou, 5,559,443, Cl. 324-754.000.

Namba, Hiroaki; and Fujino, Ken-ichi, to Nippon Paper Industries, Co., Ltd. Aqueous polyolefin resin composition. 5,559,176, Cl. 524-377.000.

Namco LTD.: *See*—
Takeda, Masaki, 5,559,937, Cl. 395-134.000.

Namikawa, Osamu: *See*—
Umeda, Takao; Miyasaka, Toru; Namikawa, Osamu; Komatsu, Isamu; Nagata, Tetsuya; Takuma, Yasuo; and Igawa, Tatsuo, 5,559,578, Cl. 355-208.000.

Namur, Marc, to Fanatic Sports GmbH. Fastening for the foot-loop straps of surfboards. 5,558,552, Cl. 441-75.000.

Nanami, Masayoshi: *See*—
Nakase, Ryoichi; and Nanami, Masayoshi, 5,558,549, Cl. 440-88.000.

Nanba, Akimasa: *See*—
Ito, Toru; Kishi, Hiroshi; Nimura, Mitsuhiro; Nanba, Akimasa; Morimoto, Kyomi; Ohara, Shigekazu; Yokoyama, Shoji; Maekawa, Kazuteru; Katoh, Kiyohide; Masuda, Hiroyoshi; Katoh, Shinichi; and Hashimoto, Koji, 5,559,511, Cl. 340-995.000.

Naoi, Takashi: *See*—
Ishigaki, Kunio; and Naoi, Takashi, 5,558,979, Cl. 430-531.000.

Narad, Charles E., to Sun Microsystems, Inc. Method and apparatus for handling interrupts in a multiprocessor computer system. 5,560,019, Cl. 395-733.000.

Narahara, Tatsuya: *See*—
Nakao, Takashi; Ohsato, Kiyoshi; Kamatani, Yoshiteru; Narahara, Tatsuya; and Ozue, Tadashi, 5,559,766, Cl. 369-44.180.

Nargund, Ravi: *See*—
Chakravarty, Prasun K.; Nargund, Ravi; Marquis, Robert W.; Patchett, Arthur A.; and Yang, Lihu, 5,559,128, Cl. 514-323.000.

Narita, Kaoru, to NEC Corporation. Semiconductor device having double metal connection layers connected to each other and to the substrate in the scribe line area. 5,559,362, Cl. 257-620.000.

Narita, Yoshio: *See*—
Minabe, Kouji; Nishijima, Hideo; Kaniwa, Kouji; Abe, Hiroya; and Narita, Yoshio, 5,559,414, Cl. 318-606.000.

Nartron Corporation: *See*—
Voss, Mark G., 5,559,379, Cl. 310-63.000.

Nartsissov, Rjurik P.: *See*—
Komissarova, Irina A.; Gudkova, Julia V.; Soldatenkova, Tatyana D.; Burbenskaya, Natalya M.; Kondrashova, Tatyana T.; Kalantar, Irina L.; Toropov, Jury M.; Semenova, Galina F.; Nartsissov, Rjurik P.; and Kalinina, Elena V., 5,559,152, Cl. 514-557.000.

Naruse, Masuyuki. Vehicular pedal assembly. 5,558,601, Cl. 477-213.000.

Naruse, Yujiro: *See*—
Itsumi, Kazuhiro; Shiratori, Masayuki; Beppu, Tatsuro; Saitoh, Shiroh; Naruse, Yujiro; Obata, Shigeki; and Shirouzu, Shunji, 5,559,504, Cl. 340-825.300.

Nash, Dudley O., to United States of America, Air Force. Low thermal stress impingement cooling apparatus. 5,557,932, Cl. 60-266.000.

Nasser, Joseph E., Jr.; and Nasser, Nancy M. Illuminated dog leash handle. 5,558,044, Cl. 119-796.000.

Nasser, Nancy M.: *See*—
Nasser, Joseph E., Jr.; and Nasser, Nancy M., 5,558,044, Cl. 119-796.000.

Natalie, Kenneth J., Jr.: *See*—
Ranganathan, Ramachandran S.; Arunachalam, Thangavel; and Natalie, Kenneth J., Jr., 5,559,237, Cl. 546-220.000.

National Center for Manufacturing Sciences: *See*—
Kestenbaum, Ami; and Armington, Richard S., 5,559,626, Cl. 359-144.000.

National Computer Systems, Inc.: *See*—
Clark, Jay V.; Bramlett, William L., Jr.; and Moyer, Judith, 5,558,521, Cl. 434-322.000.

National Polymers Inc.: *See*—
Anderson, Dennis C.; and Hjermstad, Harold T., II, 5,558,254, Cl. 220-527.000.

National Research Council of Canada: *See*—
Rowell, Nelson L.; and Wang, Edward A., 5,558,934, Cl. 428-333.000.

National Science Council: *See*—
Ma, Chen-Chi M.; and Wu, Hew-Der, 5,559,197, Cl. 525-533.000.

National Semiconductor Corporation: *See*—
Edem, Brian C.; and Worsley, Debra J., 5,559,796, Cl. 370-60.000.
Weiler, Peter M., 5,559,056, Cl. 437-195.000.

National Starch and Chemical Investment Holding Corporation: *See*—
Paul, Charles W., 5,559,165, Cl. 523-111.000.

Natschke, Scott: *See*—
Kanjo, Wajih; Smith, Eric; Demoise, Thomas J.; Girotti, Michael; McCabe, Thomas; Fessler, Charles B.; and Natschke, Scott, 5,558,410, Cl. 303-71.000.
Kanjo, Wajih; Smith, Eric; Demoise, Thomas J.; Girotti, Michael; McCabe, Thomas; Fessler, Charles B.; and Natschke, Scott, 5,558,411, Cl. 303-71.000.
Kanjo, Wajih; Smith, Eric; Demoise, Thomas J.; Girotti, Michael; McCabe, Thomas; Fessler, Charles B.; and Natschke, Scott, 5,558,412, Cl. 303-74.000.

Naughton, Brian A.; and Sibanda, Benson, to Advanced Tissue Sciences, Inc. Liver reserve cells. 5,559,022, Cl. 435-240.200.

Nazarian, Ashot, to Science Applications International Corporation. Method and laser system for the thermal analysis of a substance. 5,558,790, Cl. 219-121.770.

Neal, Leonard; and Elliott, Robert, to Tamco Limited. One-piece gearshift lever with cold formed end. 5,557,981, Cl. 74-523.000.

NEC Corporation: *See*—
Fukuzo, Yukio, 5,559,746, Cl. 365-203.000.
Inoue, Tatsuro, 5,559,048, Cl. 437-43.000.
Kajihara, Ryuuji; and Yamamoto, Yasushi, 5,559,483, Cl. 333-195.000.
Kimura, Akitaka; Nido, Masaaki; Tomita, Akihisa; and Suzuki, Akira, 5,559,820, Cl. 372-46.000.
Kobayashi, Shotaro, 5,559,365, Cl. 257-666.000.
Kubo, Masao, 5,559,879, Cl. 379-387.000.
Kunihiro, Hideto, 5,559,608, Cl. 358-343.000.
Kusano, Takao, 5,559,647, Cl. 360-69.000.
Maemura, Kouji, 5,559,985, Cl. 395-467.000.
Makishima, Hideo; Yamada, Keizo; and Imura, Hironori, 5,559,390, Cl. 313-308.000.
Matsui, Tsutomu, 5,559,767, Cl. 369-44.230.
Mizumachi, Hiroaki, 5,560,040, Cl. 395-821.000.
Murase, Tutomu, 5,559,797, Cl. 370-61.000.
Narita, Kaoru, 5,559,362, Cl. 257-620.000.
Nishijima, Kazunori, 5,559,836, Cl. 375-318.000.
Otamura, Hitoshi, 5,559,451, Cl. 326-84.000.
Sharma, Vinod, 5,559,970, Cl. 395-312.000.
Tachikawa, Hiroshi, 5,559,376, Cl. 307-86.000.
Tanabe, Hiroyoshi, 5,559,583, Cl. 355-71.000.
Tomoda, Yoshiyuki, 5,559,316, Cl. 257-666.000.
Urabe, Kouji, 5,559,047, Cl. 437-41.000.
Yamamoto, Masanori, 5,559,045, Cl. 437-34.000.
Yamashina, Masakazu; Koseki, Youichi; and Mizuno, Masayuki, 5,559,461, Cl. 327-205.000.
Yukawa, Akira, 5,559,356, Cl. 257-371.000.

Nec Home Electronics, Ltd.: *See*—
Kunihiro, Hideto, 5,559,608, Cl. 358-343.000.

Nederlandse Organisatie voor Toegepast-Natuurwetenschappelijk Onderzoek TNO: *See*—
Doelman, Nicolaas J., 5,559,839, Cl. 375-350.000.

Needham, Michael L.: *See*—
Gilbert, Stephen S.; Needham, Michael L.; and Crisler, Kenneth J., 5,559,810, Cl. 371-5.100.

Negi, Shigeto; Yamanaka, Motosuke; Katsu, Kanemasa; Sugiyama, Isao; Komatu, Yuuki; Kamata, Atsushi; Tsuruoka, Akihiko; and Machida, Yoshimasa, to Eisai Co., Ltd. 7-acyl-3-(substituted carbamoyloxy) cephem compound. 5,559,225, Cl. 540-222.000.

Negishi, Takaai: *See*—
Urano, Fumiyoshi; Negishi, Takaai; Katsuyama, Akiko; and Endo, Masayuki, 5,558,971, Cl. 430-170.000.

Negishi, Takaaki: *See*—
Urano, Fumiyoshi; Negishi, Takaaki; Katsuyama, Akiko; and Endo, Masayuki, 5,558,976, Cl. 430-326.000.

Negoro, Daisaku: *See*—
Nakagawa, Mikihiko; Negoro, Daisaku; Nakanishi, Nobuyuki; Ogawa, Akio; Yajima, Manabu; and Kinoshita, Toshihara, 5,558,841, Cl. 422-105.000.

Negus, Charles C.: *See*—
Lankford, Donald M.; MacGregor, Thomas S., III; and Negus, Charles C., 5,558,668, Cl. 606-14.000.

Neitzert, Heinz-Christoph: *See*—
Campi, Domenico; and Neitzert, Heinz-Christoph, 5,559,323, Cl. 250-214.100.

Nekovar, Anton; and Meyer, Andreas, to Siemens Aktiengesellschaft. X-ray diagnostics installation. 5,559,850, Cl. 378-98.800.

Nels, Terry E., to General Motors Corporation. Volute springs adapted for torsional damper assemblies and method of manufacturing same. 5,558,317, Cl. 267-156.000.

Nelson, Frances C.; and Schiehser, Guy A., to American Home Products Corporation. Hindered N-oxide esters of rapamycin. 5,559,122, Cl. 514-291.000.

Nelson, Mark H.: *See*—
Dev, Roger H.; and Nelson, Mark H., 5,559,955, Cl. 395-182.020.

Nelson, Michael L.: *See*—
Gallatin, Gregg M.; Kreuzer, Justin L.; and Nelson, Michael L., 5,559,601, Cl. 356-363.000.

Nemoto, Eiji: *See*—
Kumagai, Katsuo; Rikiishi, Hidemi; Tamura, Keiji; Sugawara, Shunji; Nemoto, Eiji; Okamoto, Shigefumi; and Onta, Tokio, 5,559,211, Cl. 530-350.000.

Nemoto, Peter A.: *See*—
Strupczewski, Joseph T.; Helaley, Grover C.; Glamkowski, Edward J.; Chiang, Yulin; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., 5,559,117, Cl. 514-254.000.

Nemoto, Takeshi; and Nemoto, Teruko. Dust-proof device for skirt portion of seam-type bellows. 5,558,951, Cl. 428-102.000.

Nemoto, Teruko: *See*—
Nemoto, Takeshi; and Nemoto, Teruko, 5,558,951, Cl. 428-102.000.

Neri, Giuseppe. Apparatus for metering pigments for paints and the like. 5,558,251, Cl. 222-135.000.

Nerio, Aileen: *See*—
Cook, David; Wollowitz, Susan; and Nerio, Aileen, 5,559,250, Cl. 549-282.000.

Network Peripherals, Inc.: *See*—
Haddock, Stephen R., 5,560,038, Cl. 395-800.000.

Neubert, Heinz: *See*—
Calendahl, Alfred; Sigg, Horst; Neubert, Heinz; and Meyen, Hans-Peter, 5,558,478, Cl. 408-226.000.

Neubert, Reinhard: *See*—
Wohlrab, Wolfgang A.; Neubert, Reinhard; Matschiner, Sybille; and Wellner, Katrin, 5,559,098, Cl. 514-29.000.

Neuman, Darren: *See*—
Maturi, Greg; Auld, David R.; and Neuman, Darren, 5,559,999, Cl. 395-550.000.

Neuner, Richard A.: *See*—
Carey, Maurice E.; Miracle, Gerald H.; Moyer, James T.; and Neuner, Richard A., 5,559,972, Cl. 395-281.000.

Neurex Corporation: *See*—
Miljanich, George P.; Bowersox, Stephen S.; Fox, James A.; Valentino, Karen L.; Bitner, Robert S.; and Yamashiro, Donald H., 5,559,095, Cl. 514-12.000.

Neville, Jonathan E.: *See*—
Swensen, Loran L.; and Neville, Jonathan E., 5,558,582, Cl. 472-43.000.

New Holland North America, Inc.: *See*—
Ameye, Danny R.; Desnijder, Dirk J.; and Naaktgeboren, Adrianus, 5,558,282, Cl. 241-60.000.

New Media Development Association: *See*—
Uyama, Masashi, 5,560,011, Cl. 395-700.000.

Newman, Kenneth L., to Deere & Company. Quick attach, reusable hose fittings. 5,558,375, Cl. 285-23.000.

Newman, Robert A., to Advanced Micro Devices, Inc. Ground plane for plastic encapsulated integrated circuit die packages. 5,559,369, Cl. 257-668.000.

Ng, Alison, to Thomson Industries, Inc. Linear motion bearing assembly. 5,558,442, Cl. 384-43.000.

Ng, Chai-Nam: *See*—
Patel, Sunil; Ng, Chai-Nam; Dhyanchand, P. John; Nguyen, Vietson M.; and Teagardin, Michael, 5,559,686, Cl. 363-43.000.

Ngai, Kai-Kit; and Singh, Satwant, to Lucent Technologies Inc. Field programmable gate array with multi-port RAM. 5,559,450, Cl. 326-40.000.

Nguyen, Chau; Shibata, Alan; Kobayashi, Atsushi; and Fujimori, Noriyoshi, to Hewlett-Packard Company. Positioning of service station and paper pick pressure plate using single motor. 5,559,538, Cl. 347-32.000.

Nguyen, Khe C.; and Ganapathiappan, Sivapackia, to Hewlett-Packard Company. Diiminoquinilidines as electron transport agents in electrophotographic elements. 5,558,965, Cl. 430-58.000.

Nguyen, Le T.: *See*—
Garg, Sanjiv; Lentz, Derek J.; Nguyen, Le T.; and Chen, Sho L., 5,560,035, Cl. 395-800.000.

Nguyen, Le Trong; Lentz, Derek J.; Miyayama, Yoshiyuki; Garg, Sanjiv; Hagiwara, Yasuaki; Wang, Johannes; Lau, Te-Li; Wang, Sze-Shun; and Trang, Quang H., to Seiko Epson Corporation. High-performance, superscalar-based computer system with out-of-order instruction execution and concurrent results distribution. 5,560,032, Cl. 395-800.000.

Nguyen, Le Trong: *See*—
Lentz, Derek J.; Wang, Johannes; Deosaran, Trevor; Young, Linley M.; Yap, Kian-Chin; Nguyen, Le Trong; Matsubayashi, Makoto; and Lau, Te-Li, 5,559,951, Cl. 395-163.000.

Nguyen, Vietson M.: *See*—
Patel, Sunil; Ng, Chai-Nam; Dhyanchand, P. John; Nguyen, Vietson M.; and Teagardin, Michael, 5,559,686, Cl. 363-43.000.

Nguyen-Schaefer, Thanh-Hung: *See*—
Dobler, Klaus; Nguyen-Schaefer, Thanh-Hung; and Huebel, Michael, 5,558,490, Cl. 415-55.100.

Ni, Chi-Mou; Bruggemann, Charles J.; Hassan, Tasnim; and Hall, Wallace T., to General Motors Corporation. Hydroformed structural member with varied wall thickness. 5,557,961, Cl. 72-61.000.

Nichias Corporation: *See*—
Tsukahara, Mikio; Ohishi, Noboru; Taguchi, Hisao, deceased, 5,558,801, Cl. 222-607.000.

Nicholson, Terence P., to Specialist Sealing Limited. Seal. 5,558,347, Cl. 277-229.000.

Nickerson, Brian, to Intel Corporation. Process, apparatus and system for transforming signals using pseudo-SIMD processing. 5,559,722, Cl. 364-514.00R.

Nicollini, Germano; Confalonieri, Pierangelo; and Crippa, Carlo, to SGS-Thomson Microelectronics, S.r.l. Voltage multiplier for high output current with stabilized output voltage. 5,559,687, Cl. 363-60.000.

Nidec Corporation: *See*—
Oku, Yoshito; Ibara, Shozo; Sumi, Shigeharu; and Fujii, Hiromasa, 5,559,382, Cl. 310-90.000.

Nido, Masaaki: *See*—
Kimura, Akitaka; Nido, Masaaki; Tomita, Akihisa; and Suzuki, Akira, 5,559,820, Cl. 372-46.000.

Niehues, Heiko: *See*—
Roether, Friedemann; Niehues, Heiko; Leckband, Uwe; Drewes, Harry; Christ, Horst-Udo; and Dierken, Hans, 5,558,199, Cl. 198-461.200.

Nielsen, Flemming E.: *See*—
Jacobsen, Poul; Nielsen, Flemming E.; and Jeppesen, Lone, 5,559,106, Cl. 514-81.000.

Nielson, Edward G.; DeBruine, Timothy S.; Modzeleski, Daniel P.; and Stoepker, Ross C., to Laser Alignment, Inc. Automatic depth control for trencher. 5,559,725, Cl. 364-550.000.

Nielson, Ralph B.; Rosiek, Thomas A.; and Honan, James S., to Eastman Kodak Company. Method for preparing photographic elements comprising loaded latex compositions. 5,558,980, Cl. 430-545.000.

Nihei, Ryo; Terada, Akihiro; Iwasaki, Kyozi; and Ito, Masatoshi, to Fanuc Ltd. Device for detecting limits of rotational motion in a robot. 5,558,196, Cl. 192-142.00R.

Niimura, Takeshi: *See*—
Sugiura, Yoshinori; Azuma, Jun; Adachi, Nobukazu; Setoriyama, Takeshi; Tenpaku, Chitose; Ishikawa, Noriyoshi; Hamada, Tatsuo; Tsuchiya, Yoshiro; Kubota, Takeshi; Nomura, Yoshiya; Kuroda, Akira; Murooka, Ken; Sugita, Takeshi; Niimura, Takeshi; and Yuza, Akira, 5,559,581, Cl. 355-200.000.

Niizawa, Koji; Matsuura, Masami; and Yamaki, Hideo, to Minolta Co., Ltd. Image forming apparatus having a bipolar photosensitive member. 5,559,580, Cl. 355-219.000.

Nikhil, Rishiyur S.: *See*—
Papadopoulos, Gregory M.; Nikhil, Rishiyur S.; Greiner, Robert J.; and Arvind, , 5,560,029, Cl. 395-800.000.

Nikon Corporation: *See*—
Kai, Tadao; Tanaka, Etsuo; and Katayama, Akira, 5,559,574, Cl. 354-400.000.
Kazami, Kazyuki; Daitoku, Koichi; Wakabayashi, Tsutomu; Goto, Tetsuro; Ezawa, Akira; and Tomino, Naoki, 5,559,568, Cl. 354-106.000.
Kusaka, Yosuke, 5,559,321, Cl. 250-201.800.
Miyaji, Akira; and Ikeda, Masatoshi, 5,559,584, Cl. 355-73.000.
Miyamoto, Hidenori; Kato, Minoru; Omi, Junichi; Soshi, Isao; and Imura, Yoshio, 5,559,571, Cl. 354-286.000.
Nishi, Kenji; and Aoyama, Masaaki, 5,559,582, Cl. 355-30.000.
Sato, Susumu, 5,559,635, Cl. 359-689.000.
Soshi, Isao; Miyamoto, Hidenori; Katou, Minoru; Omi, Junichi; and Amanuma, Tatsuo, 5,559,570, Cl. 354-202.000.

Nilsen, Kelvin D.; and Schmidt, William, to Iowa State University Research Foundation, Inc. System and hardware module for incremental real time garbage collection and memory management. 5,560,003, Cl. 395-600.000.

Nilsen, Robert B.: *See*—
Bernard, Gus; Nilsen, Robert B.; and Hanrahan, Michael J., 5,558,740, Cl. 156-231.000.

Nilssen, Ole K. Under-the-cabinet lighting system. 5,559,393, Cl. 315-58.000.

Nilvebrant, Lisbeth: *See*—
Johansson, Rolf A.; Moses, Pinchas; Nilvebrant, Lisbeth; and Sparf, Bengt A., 5,559,269, Cl. 564-443.000.

Nimura, Mitsuhiro: *See*—
Ito, Toru; Kishi, Hiroshi; Nimura, Mitsuhiro; Nanba, Akimasa; Morimoto, Kyomi; Ohara, Shigekazu; Yokoyama, Shoji; Maekawa, Kazuteru; Katoh, Kiyohide; Masuda, Hiroyoshi; Katoh, Shinichi; and Hashimoto, Koji, 5,559,511, Cl. 340-995.000.

Ninomiya, Atushi: *See*—
Kaji, Hironori; Ninomiya, Atushi; Takekoshi, Isamu; Seki, Hideo; and Hagiya, Kaoru, 5,559,283, Cl. 73-61.560.

Nintendo Company, Ltd.: *See*—
Kato, Shuhei, 5,558,577, Cl. 463-36.000.

Nippon Carbide Kogyo Kabushiki Kaisha: *See*—
Yoshie, Takehiko; Sasaki, Masanori; Shibafuchi, Hiroshi; and Imai, Yasushi, 5,559,243, Cl. 548-263.800.

Nippon Filcon, Co., Ltd.: *See*—
Tate, Takuo; Takagi, Nobuyoshi; Kobayashi, Tsunekazu; and Sano, Akinori, 5,558,926, Cl. 428-193.000.

Nippon Hoso Kyokai: *See*—
Sakai, Tetsuo; Motoyama, Yasushi; and Ushirozawa, Mizumoto, 5,559,403, Cl. 315-169.400.

Nippon Mining & Metals Co., Ltd.: *See*—
Shimada, Takashi; Kitanaka, Kenji; Kaneshiro, Akio; and Kawasaki, Michio, 5,559,827, Cl. 373-142.000.

Nippon Paper Industries, Co., Ltd.: *See*—
Namba, Hiroaki; and Fujino, Ken-ichi, 5,559,176, Cl. 524-377.000.

Nippon Shinyaku Company, Limited: *See*—
Yano, Junichi; Ohgi, Tadaaki; Ishiyama, Koichi; and Hirabayashi, Kazuko, 5,559,102, Cl. 514-46.000.

Nippon Shokubai Co., Ltd.: *See*—

Harada, Nobuyuki; Wada, Katsuyuki, Obara, Hisanori; and Inaoka, Toru, 5,559,160, Cl. 521-64.000.
Mori, Yoshikuni; Kushino, Mitsuo; Oishi, Hideki; and Yoneda, Tadahiro, 5,559,168, Cl. 523-205.000.
Okada, Izuho; Asako, Yoshinobu; Arimatsu, Kiyomi; Kobayashi, Minoru; Ono, Satoru; and Aizawa, Ryuji, 5,558,803, Cl. 252-78.300.
Nippon Steel Corporation: *See*—
Takiyama, Makoto, 5,559,351, Cl. 257-324.000.
Yatoh, Hisayoshi; Yamashita, Yasuhiko, Harabuchi, Takashi; and Yano, Seinosuke, 5,558,726, Cl. 148-328.000.
Nippon Telegraph and Telephone Corporation: *See*—
Murashita, Toru, 5,559,330, Cl. 250-306.000.
Nippon Yakin Kogyo Co., Ltd.: *See*—
Koshiba, Yoshikazu; Aoki, Yukio; Minakata, Tsuyoshi; Inamura, Michio; Yasunaga, Tomohiro; Imoto, Fujiya; and Nakagawa, Junichi, 5,557,847, Cl. 29-890.000.
Nippondenso Co., Ltd.: *See*—
Abe, Katsunori; Kimura, Yuji; Atsumi, Kinya; Ueno, Yoshiki; and Matsushita, Noriyuki, 5,559,819, Cl. 372-46.000.
Minagawa, Kazuji; Oi, Kiyotoshi; and Akiba, Takashi, 5,558,063, Cl. 123-457.000.
Nisato, Dino: *See*—
Bernhart, Claude; Breliere, Jean-Claude; Clement, Jacques; Nisato, Dino; Perreault, Pierre; Muneaux, Claude; and Muneaux, Yvette, 5,559,233, Cl. 544-321.000.
Nishi, Kenji; and Aoyama, Masaaki, to Nikon Corporation. Exposure apparatus. 5,559,582, Cl. 355-30.000.
Nishi, Toshiyuki; Koda, Hiroko; Sugita, Kazuyuki; Ishida, Yohhei; Takemura, Makoto; and Hayano, Takeshi, to Daiichi Pharmaceutical Co., Ltd. Carbepenem derivatives. 5,559,224, Cl. 540-350.000.
Nishida, Kenji; and Shiroza, Kazuhiko, to Kabushiki Kaisha Komatsu Seisakusho. Dynamic balancer circuit of transfer feeder. 5,557,958, Cl. 72-20.100.
Nishida, Masaaki: *See*—
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Nishida, Masaaki; Yamamoto, Yoshihisa; Kusafuka, Muneo; Mikami, Kazuhiro; and Tsutsui, Hiroshi, 5,558,599, Cl. 477-116.000.
Tsukamoto, Kazumasa; Hayabuchi, Masahiro, Nishida, Masaaki; Yamamoto, Yoshihisa; Tsutsui, Hiroshi; and Nadayoshi, Kaoru, 5,558,600, Cl. 477-121.000.
Nishihara, Hajime: *See*—
Maeda, Katsuaki; Watanabe, Akihiro; and Nishihara, Hajime, 5,559,187, Cl. 525-73.000.
Nishii, Kimiko: *See*—
Ohno, Junnosuke; Kohsaka, Muneko; Noguchi, Kazunari; Kamiyama, Hirotoshi; and Nishii, Kimiko, 5,559,709, Cl. 364-468.010.
Nishijima, Hideo: *See*—
Minabe, Kouji; Nishijima, Hideo; Kaniwa, Kouji; Abe, Hiroya; and Narita, Yoshio, 5,559,414, Cl. 318-606.000.
Nishijima, Kazunori, to NEC Corporation. Keyed pulse sensor circuit. 5,559,836, Cl. 375-318.000.
Nishikawa, Yukinobu: *See*—
Kawamura, Hideki; Tomita, Shinji; Murayama, Shuichi; and Nishikawa, Yukinobu, 5,557,925, Cl. 62-50.500.
Nishimoto, Ikuo, to General Hospital Corporation, The. Regulator regions of G proteins. 5,559,209, Cl. 530-326.000.
Nishimoto, Keiichi, to Fuji Xerox Co., Ltd. Multilayered thin ferroelectric film. 5,558,946, Cl. 428-692.000.
Nishimura, Akira: *See*—
Kishi, Hajime; Odagiri, Nobuyuki; Tazaki, Tokuo; Nagata, Hideo; Terashita, Takeshi; Nishimura, Akira; and Kato, Hiroyasu, 5,557,831, Cl. 28-167.000.
Nishimura, Yoichi: *See*—
Maki, Hidetaka; Akazaki, Shusuke; Hasegawa, Yusuke; and Nishimura, Yoichi, 5,558,076, Cl. 123-687.000.
Nishimura, Yuichi: *See*—
Tsuchida, Masayuki; Uemura, Hirokazu; Miura, Shinji; Saito, Yoshiyuki; Yoshimura, Hiroyuki; Nishimura, Yuichi; and Sueda, Nobuo, 5,559,997, Cl. 395-500.000.
Nishino, Tomoki: *See*—
Imaizumi, Seiko; Yamada, Masao; and Nishino, Tomoki, 5,559,079, Cl. 504-117.000.
Nishio, Taichi: *See*—
Abe, Hiroomi; Nishio, Taichi; Suzuki, Yasurou; Tsuji, Mitsuji; and Sanada, Takashi, 5,559,185, Cl. 525-68.000.
Nishizawa, Kimiyoshi: *See*—
Sato, Ritsuo; and Nishizawa, Kimiyoshi, 5,557,929, Cl. 60-276.000.
Nising, Wolfgang: *See*—
Scholl, Thomas; Bier, Peter; and Nising, Wolfgang, 5,558,938, Cl. 428-412.000.
Nissan Motor Co., Ltd.: *See*—
Iwata, Toru; and Yasuda, Sota, 5,559,703, Cl. 364-426.030.
Sato, Ritsuo; and Nishizawa, Kimiyoshi, 5,557,929, Cl. 60-276.000.
Tsuchiya, Shouichi; Morishita, Tatsuya; Koda, Masanori; Mori, Atsuhiro; and Murasugi, Takashi, 5,558,579, Cl. 464-64.000.
Nissin Shokuhin Kabushiki Kaisha: *See*—
Ohno, Tsuneya, 5,558,865, Cl. 424-148.100.
Nittetsu Mining Co., Ltd.: *See*—
Yanagihara, Hiroyuki; Taniguchi, Seihou; Hazeyama, Takeshi; Otaka, Hitoshi; Hashimoto, Teiji; and Souma, Sansan, 5,558,689, Cl. 55-492.000.
Nitto Denko Corporation: *See*—
Urairi, Masakatsu; Tachibana, Toshimitsu; Matsumoto, Kenji; Shinomura, Toshihiko; Iida, Hiroyuki; Kawamura, Kazunori; Yano, Shuuji; and Ishida, Osamu, 5,558,682, Cl. 29-623.500.
Niv, Yehuda: *See*—
Landa, Benzion; Krumberg, Yakov; Almog, Yaacov; and Niv, Yehuda, 5,558,970, Cl. 430-126.000.
Niwa, Kazuo: *See*—
Nagano, Hideo; Niwa, Kazuo; and Hayashi, Takayuki, 5,558,820, Cl. 264-4.100.
Niwa, Takeaki: *See*—
Yada, Yukihiko; and Niwa, Takeaki, 5,558,828, Cl. 264-252.000.
Nixon, James E.: *See*—
Hanson, Jay L.; Nixon, James E.; Herrig, Doyle G.; and Ladendorf, Gerald J., 5,557,941, Cl. 62-160.000.
Niyada, Masateru: *See*—
Uchida, Toshiaki; Niyada, Masateru; Shinohara, Shigeru; Orikasa, Hiroaki; and Ishikawa, Hiroyasu, 5,558,476, Cl. 408-1.00R.
NKK Corporation: *See*—
Hamada, Kenjiro; and Masubuchi, Akira, 5,558,434, Cl. 366-137.000.
Kobayashi, Masaru; Suzuki, Seiichi; Iizumi, Hiroshi; and Ouchi, Chiaki, 5,558,728, Cl. 148-421.000.
Noel, John R.; and Richards, Mark R., to Procter & Gamble Company, The. Apparatus for sorting substrate components according to size and method of sorting substrate components therewith. 5,558,832, Cl. 264-510.000.
Nofziger Doors International, Inc.: *See*—
Nofziger, Edward L., 5,558,147, Cl. 160-190.000.
Nofziger, Edward L., to Nofziger Doors International, Inc. Door counterweight assembly. 5,558,147, Cl. 160-190.000.
Nogiri, Toshiaki: *See*—
Fukuda, Hirofumi; Hatori, Kazuo; Yamada, Kazumi; Nogiri, Toshiaki; and Mori, Kozo, 5,559,678, Cl. 361-818.000.
Noguchi, Hiromichi; Inamoto, Tadayoshi; and Saito, Megumi, to Canon Kabushiki Kaisha. Liquid jet recording head and recording apparatus having same. 5,558,975, Cl. 430-283.100.
Noguchi, Kazunari: *See*—
Ohno, Junnosuke; Kohsaka, Muneko; Noguchi, Kazunari; Kamiyama, Hirotoshi; and Nishii, Kimiko, 5,559,709, Cl. 364-468.010.
Noguchi, Koji: *See*—
Asanae, Masumi; Ochiai, Masahisa; and Noguchi, Koji, 5,559,541, Cl. 347-55.000.
Noguchi, Masato: *See*—
Nakagishi, Toshio; Kimura, Hitoshi; Oono, Masahiro; Maruyama, Koichi; and Noguchi, Masato, 5,559,639, Cl. 359-823.000.
Noguchi, Yasuhiro: *See*—
Wada, Yutaka; Oda, Yukihiro; Miyo, Tunemasa; Noguchi, Yasuhiro; and Takei, Kazuo, 5,559,939, Cl. 395-146.000.
Noguchi, Yukihiko; Haruta, Keitoshi; Sakamoto, Isamu; Yamanaka, Mituo; Uchinono, Makoto; and Shiohara, Takashi, to Sumitomo Metal Industries, Ltd. Polishing system for opposite edge faces of plated steel strip. 5,558,559, Cl. 451-14.000.
Nogues, Michel: *See*—
Abed, Patrick; Dauzat, Marc; Rouxel, Jean-Marc; and Nogues, Michel, 5,558,715, Cl. 118-429.000.
NOK Corporation: *See*—
Mori, Shinji; and Ishioka, Katsutoshi, 5,559,179, Cl. 524-494.000.
Okuyama, Koshi, 5,558,580, Cl. 464-175.000.
Nokia Mobile Phones Ltd.: *See*—
Doss-Desouza, Argus, 5,558,804, Cl. 248-634.000.
Nokia Technology GmbH: *See*—
Kuusama, Juha; and Makivirta, Aki, 5,559,891, Cl. 381-63.000.
Nolan, James F., Jr., to Muscle Memory, Inc. Device for detecting head movement. 5,558,585, Cl. 473-211.000.
Nomoto, Takayuki, to Pioneer Electronic Corporation. Polarization of a reflected light beam is changed according to the depth of pits. 5,559,787, Cl. 369-275.400.
Nomura, Tsuneharu, to Sony Corporation. Cathode ray tube apparatus for projection TV system. 5,559,564, Cl. 348-779.000.
Nomura, Yoshiya: *See*—
Sugiura, Yoshinori; Azuma, Jun; Adachi, Nobukazu; Setoriyama, Takeshi; Tenpaku, Chitose; Ishikawa, Noriyoshi; Hamada, Tatsuo; Tsuchiya, Yoshiro; Kubota, Takeshi; Nomura, Yoshiya; Kuroda, Akira; Murooka, Ken; Sugita, Takeshi; Niimura, Takeshi; and Yuza, Akira, 5,559,581, Cl. 355-200.000.
Nonoyama, Hideki: *See*—
Ozaki, Shinya; and Nonoyama, Hideki, 5,559,644, Cl. 360-48.000.
Norden Systems, Inc.: *See*—
Tanski, William J.; Carroll, Roger; and Branciforte, Emilio J., 5,559,399, Cl. 313-506.000.
Norhtern Telecom Limited: *See*—
Harman, Stephen G., 5,559,423, Cl. 323-277.000.
Northeastern Ohio Universities: *See*—
Chiang, John Y. L., 5,558,999, Cl. 435-6.000.
Northern Telecom Limited: *See*—
Smith, Martin S.; and Kitchener, Dean, 5,559,523, Cl. 343-795.000.
Northrop Grumman: *See*—
Page, Derrick J., 5,558,800, Cl. 219-761.000.
Northrop Grumman Corporation: *See*—
Cricchi, James R.; Potyraj, Paul A.; and Salib, Mike L., 5,559,349, Cl. 257-273.000.
DiDomizio, John A., 5,559,518, Cl. 342-174.000.

Didomizio, John A.; and Guarino, Robert A., 5,559,516, Cl. 342-118.000.
Didomizio, John A., 5,559,517, Cl. 342-156.000.
Fenner, David K., 5,559,519, Cl. 342-174.000.
McKee, Richard C., 5,559,331, Cl. 250-338.100.
Strong, Maurice L., III; Tranchita, Charles J.; Welch, Christopher R.; and Griffith, Gerald, 5,559,510, Cl. 340-954.000.
Northrop Grumman Norden Systems: *See*—
Alimena, James J.; and Briones, Richard J., 5,559,515, Cl. 342-118.000.
Nose, Yoshimasa: *See*—
Ohtani, Yasuo; Kataho, Takuo; Satoh, Makoto; Tanaka, Tsutomu; Nose, Yoshimasa; Kobayashi, Kazuyoshi; Uchikawa, Tetsuhide; and Hamahata, Toshihiro, 5,559,826, Cl. 373-109.000.
Notetry Limited: *See*—
Dyson, James; Millman, Allan D.; and Tsui, Tat-Chi A., 5,558,697, Cl. 95-12.000.
Notify Corporation: *See*—
Wood, Samuel F.; and Larson, Gaylan I., 5,559,873, Cl. 379-161.000.
Noto, Kazuhiko: *See*—
Funakoshi, Yasushi; Ogata, Khoji; Kojima, Masayuki; Kawaziri, Hitoshi; Yamamoto, Hirofumi; Noto, Kazuhiko; and Mori, Naomichi, 5,558,763, Cl. 210-150.000.
Noto, Nobuhiro: *See*—
Toyoshima, Takeshi; Kawakami, Yo; Ishikawa, Hiroyasu; Abe, Takao; Sato, Satsuo; Noto, Nobuhiro; Kaneko, Tadahiro; Kaneta, Takayoshi; Kobayahsi, Juurou; and Kawanobe, Osamu, 5,558,571, Cl. 451-358.000.
Notohamiprodjo, Hubie, to Motorola, Inc. Parallel resonant ballast with boost. 5,559,405, Cl. 315-209.00R.
Novadent Ltd.: *See*—
Bab, Itai; and Porat, Gadi, 5,558,518, Cl. 433-80.000.
Novation Research, Inc.: *See*—
Wilson, Andrew V., 5,558,431, Cl. 362-376.000.
Novo Nordisk A/S: *See*—
Jacobsen, Poul; Nielsen, Flemming E.; and Jeppesen, Lone, 5,559,106, Cl. 514-81.000.
Sauerberg, Per; Olesen, Preben H.; and Mitch, Charles H., 5,559,136, Cl. 514-340.000.
Sauerberg, Per; and Olesen, Preben H., 5,559,138, Cl. 514-342.000.
Nowak, Kenneth: *See*—
Toni, Darryl M.; Grant, Peter L.; Johnson, Craig F.; Hayse, Steven R.; Forster, William V.; Nowak, Kenneth; and Osiecki, Larry J., 5,558,919, Cl. 428-116.000.
Nowicki, Donald V.; and Munroe, Christopher A., to Epic Technologies, Inc. Data logging tire monitor with condition predictive capabilities and integrity checking. 5,559,484, Cl. 340-447.000.
Nozawa, Minoru: *See*—
Saito, Atsushi; Koizumi, Yutaka; Mori, Toshihiro; and Nozawa, Minoru, 5,559,536, Cl. 347-25.000.
NSK Ltd.: *See*—
Fujioka, Hakaru, 5,557,854, Cl. 33-517.000.
Hirase, Satoshi; and Matsuki, Masuo, 5,558,293, Cl. 242-372.000.
Sasaki, Takanobu; and Hirata, Kazumi, 5,558,294, Cl. 242-377.000.
Yabe, Toshikazu; Asai, Hiromitsu; and Hamamoto, Magozo, 5,558,448, Cl. 384-470.000.
Nubel, Philip O.; and Yokelson, Howard B., to Amoco Corporation. Difunctional telechelic linear non-crosslinked polyolefins. 5,559,190, Cl. 525-270.000.
Nübling, Christoph: *See*—
Kast, Jürgen; von Deyn, Wolfgang; Nübling, Christoph; Walter, Helmut; Gerber, Matthias; and Westphalen, Karl-Otto, 5,559,218, Cl. 534-850.000.
Nugent, William A., to Du Pont de Nemours, E. I., and Company. Process for the efficient preparation of N-substituted dehydroamino acid esters. 5,559,268, Cl. 560-172.000.
Numata, Akihito; Mukaihira, Takashi; Ishii, Toshio; Takaku, Yutaka; and Kawano, Kazuya, to Hitachi, Ltd. Malfunction diagnosis apparatus for internal combustion engine. 5,557,933, Cl. 60-274.000.
Numata, Kenji; and Ogihara, Masaki, to Kabushiki Kaisha Toshiba. Semiconductor integrated circuit allowing change of product specification and chip screening method therewith. 5,559,748, Cl. 365-222.000.
Nuovo Pignone S.p.A.: *See*—
Bortoli, Giulio; and Corain, Luciano, 5,558,133, Cl. 139-448.000.
Nyberg, Carl R.: *See*—
Huffstutler, M. Conrad, Jr.; Meacham, Patrick E.; Wallace, Mark W.; and Nyberg, Carl R., 5,558,241, Cl. 220-1.500.
Nycomed Imaging AS: *See*—
Klaveness, Jo; Rongved, Pal; and Stubberud, Lars, 5,558,856, Cl. 424-9.370.
Klaveness, Jo; Rongved, Pål; and Strande, Per, 5,558,857, Cl. 424-9.520.
Klaveness, Jo; and Strande, Per, 5,559,266, Cl. 558-275.000.
Nyui, Masaru, to Canon Kabushiki Kaisha. Rotation measuring apparatus and displacement measuring apparatus. 5,559,602, Cl. 356-374.000.
Oba, Hidehiro; and Kimura, Hiromichi, to Toyota Jidosha Kabushiki Kaisha. Hydraulic control system for controlling oil pressure based on temperature. 5,558,597, Cl. 477-98.000.
Obara, Hisanori: *See*—
Harada, Nobuyuki; Wada, Katsuyuki; Obara, Hisanori; and Inaoka, Toru, 5,559,160, Cl. 521-64.000.
Obata, Shigeki: *See*—
Itsumi, Kazuhiro; Shiratori, Masayuki; Beppu, Tatsuro; Saitoh, Shiroh; Naruse, Yujiro; Obata, Shigeki; and Shirouzu, Shunji, 5,559,504, Cl. 340-825.300.
Oberdier, Larry M.: *See*—
Wang, Da Y.; and Oberdier, Larry M., 5,558,752, Cl. 204-401.000.
Oberdorf, Klaus: *See*—
König, Hartmann; Götz, Norbert; Kirstgen, Reinhard; Müller, Bernd; and Oberdorf, Klaus, 5,559,244, Cl. 548-371.100.
Obermeier, Siegfried; and Bergner, Peter, to Siemens Aktiengesellschaft. Crypto equipment. 5,559,890, Cl. 380-48.000.
Obinata, Shigeyuki: *See*—
Yamazaki, Tomoyuki; Obinata, Shigeyuki; Otsuki, Masahito; Momota, Seiji; and Fujihira, Tatsuhiko, 5,559,355, Cl. 257-341.000.
Obrist, Basil, to Erowa AG. Method for positioning a work piece carrier member in a machining apparatus and a work piece carrier member adapted to be positioned in a machining apparatus. 5,558,784, Cl. 219-69.120.
Ocean Wash, Inc.: *See*—
Gray, Donnie R.; and Dickson, Glen A., 5,558,676, Cl. 8-107.000.
OCG Microelectronic Materials, Inc.: *See*—
Schädeli, Ulrich; Münzel, Norbert; De Leo, Christoph; Holzwarth, Heinz; and Tinguely, Eric, 5,558,978, Cl. 430-270.100.
Ochiai, Masahisa: *See*—
Asanae, Masumi; Ochiai, Masahisa; and Noguchi, Koji, 5,559,541, Cl. 347-55.000.
O'Connell, Daniel B.: *See*—
De Minco, Christopher M.; O'Connell, Daniel B.; and Faville, Michael T., 5,558,062, Cl. 123-361.000.
Oda, Yukihiro: *See*—
Wada, Yutaka; Oda, Yukihiro; Miyo, Tunemasa; Noguchi, Yasuhiro; and Takei, Kazuo, 5,559,939, Cl. 395-146.000.
Odagiri, Nobuyuki: *See*—
Kishi, Hajime; Odagiri, Nobuyuki; Tazaki, Tokuo; Nagata, Hideo; Terashita, Takeshi; Nishimura, Akira; and Kato, Hiroyasu, 5,557,831, Cl. 28-167.000.
Odenbach, Peter W.; and Kieffer, Dale. Wave suppression means for large waves. 5,558,459, Cl. 405-21.000.
Odendahl, Alfred; Sigg, Horst; Neubert, Heinz; and Meyen, Hans-Peter, to Robert Bosch GmbH. Device for transferring a torque to a tool in a hand tool apparatus. 5,558,478, Cl. 408-226.000.
Odorzynski, Thomas W.: *See*—
Menard, Karen M.; Odorzynski, Thomas W.; and Sherman, Joel S., 5,558,658, Cl. 604-385.100.
Oe, Naoki; Sato, Koki; and Tamura, Keiichi, to Kabushiki Kaisha Tokai-Rika-Denki Seisakusho. Tethered air bag. 5,558,365, Cl. 280-731.000.
Oechsle, Markus: *See*—
Kotitschke, Gerhard; Sollinger, Hans-Peter; Oechsle, Markus; and Straub, Karlheinz, 5,557,860, Cl. 34-455.000.
Oertli Werkzeuge AG: *See*—
Ehrle, Bruno; Herzog, Rolf; Mosmann, Andreas; Riedberger, Reto; and Weber, Alfred, 5,558,142, Cl. 144-230.000.
Ofslager, Christian L.: *See*—
Harrison, Maureen M.; Ofslager, Christian L.; Waranis, Robert P.; and Leonard, Thomas W., 5,559,121, Cl. 514-291.000.
Ogasawara, Yutaka: *See*—
Furuie, Tsuneichi; Ueno, Masato; Maeno, Takashi; Ogasawara, Yutaka; Inoue, Masaki; and Mori, Naoki, 5,558,310, Cl. 248-573.000.
Ogata, Khoji: *See*—
Funakoshi, Yasushi; Ogata, Khoji; Kojima, Masayuki; Kawaziri, Hitoshi; Yamamoto, Hirofumi; Noto, Kazuhiko; and Mori, Naomichi, 5,558,763, Cl. 210-150.000.
Ogata, Takao; and Menjo, Takeshi, to Canon Kabushiki Kaisha. Image forming apparatus. 5,559,587, Cl. 355-246.000.
Ogawa, Akio: *See*—
Nakagawa, Mikihiko; Negoro, Daisaku; Nakanishi, Nobuyuki; Ogawa, Akio; Yajima, Manabu; and Kinoshita, Toshihara, 5,558,841, Cl. 422-105.000.
Ogawa, Atsushi: *See*—
Mizukami, Kazuaki; Ogawa, Atsushi; Yasuda, Masashi; Furukawa, Masahiro; Arima, Hidetoshi; and Ozawa, Yoshio, 5,557,939, Cl. 62-148.000.
Ogawa, Hidenori; Miyamoto, Hisashi; Kondo, Kazumi; Yamashita, Hiroshi; Nakaya, Kenji; Komatsu, Hajime; Tanaka, Michinori; Kora, Shinya; Tominaga, Michiaki; and Yabuuchi, Yoichi, to Otsuka Pharmaceutical Co., Ltd. Benzoheterocyclic compounds. 5,559,230, Cl. 540-569.000.
Ogawa, Hiroyuki; Hirata, Seiji; and Sasaki, Yoshizumi, to Sumitomo Chemical Company, Limited. Method and apparatus for transporting particles. 5,558,472, Cl. 106-12.000.
Ogihara, Masaki: *See*—
Numata, Kenji; and Ogihara, Masaki, 5,559,748, Cl. 365-222.000.
Ogino, Hiroshi, to Sanshin Kogyo Kabushiki Kaisha. Propeller shaft assembly for marine propulsion system. 5,558,498, Cl. 416-129.000.
Ogle, Terry B. Cross-walk warning light system. 5,559,509, Cl. 340-944.000.
Ogura, Noboru: *See*—
Ogura, Wataru; Kawagoe, Yoshito; Takizawa, Satoru; Takeuchi, Yasuo; Okimura, Kimihiko; Yoshida, Hiroshi, deceased; Kobayashi, Atsushi; Ogura, Noboru; and Arioka, Kenji, 5,559,934, Cl. 395-117.000.
Ogura, Wataru; Kawagoe, Yoshito; Takizawa, Satoru; Takeuchi, Yasuo; Okimura, Kimihiko; Yoshida, Hiroshi, deceased (by Hiromi Yoshida, legal representative); Kobayashi, Atsushi; Ogura, Noboru; and Arioka, Kenji, to Chinon Industries, Inc. Label printing apparatus and wordprocessor. 5,559,934, Cl. 395-117.000.

Oh, Young H.: *See*—
Kang, Jemo; Youn, Byungwoo; and Oh, Young H., 5,559,041, Cl.
Uzaki, Nagato, Oishi, Ukichi; Kanayama, Ryoji; Amano, Hironobu; and Terabe, Tokiya, 5,558,148, Cl. 164-7.100.

Gilligan, Sean G.; Freeman, Dermot T.; Oliphant, Larry J.; Messmann,
Stevens, Albert F.; Chodack, Jeffrey L.; Lange, Russell M.; Dewitt,

Oh, Young H.: *See*—
Kang, Jemo; Youn, Byungwoo; and Oh, Young H., 5,559,041, Cl. 436-518.000.
Ohaku, Mitsuru: *See*—
Kadotani, Kanichi; Kubota, Kazuhiko; and Ohaku, Mitsuru, 5,559,924, Cl. 392-483.000.
Ohara, Shigekazu: *See*—
Ito, Toru; Kishi, Hiroshi; Nimura, Mitsuhiro; Nanba, Akimasa; Morimoto, Kyomi; Ohara, Shigekazu; Yokoyama, Shoji; Maekawa, Kazuteru; Katoh, Kiyohide; Masuda, Hiroyoshi; Katoh, Shinichi; and Hashimoto, Koji, 5,559,511, Cl. 340-995.000.
O'Hara, Shunji: *See*—
Ishida, Takashi; O'Hara, Shunji; Ishibashi, Kenzo; and Furutani, Tadashige, 5,559,782, Cl. 369-59.000.
Ohashi, Masayoshi: *See*—
Sakai, Seiichiro; Takeuchi, Yoshio; Ohashi, Masayoshi; and Mizuno, Toshio, 5,559,803, Cl. 370-95.200.
O'Haver, George G., to United States of America, Interior. Flat plate fish screen system. 5,558,462, Cl. 405-81.000.
Ohgi, Tadaaki: *See*—
Yano, Junichi; Ohgi, Tadaaki; Ishiyama, Koichi; and Hirabayashi, Kazuko, 5,559,102, Cl. 514-46.000.
Ohhata, Akira; and Kondo, Masao, to Minolta Co., Ltd. Copying method and apparatus for copying a document in two-in-one mode. 5,559,594, Cl. 355-317.000.
Ohio Mattress Licensing and Components Group: *See*—
Constantinescu, Eugen; and Wagner, Robert F., 5,558,315, Cl. 267-103.000.
Ohio State University, The: *See*—
Bhushan, Bharat; Coe, James V., Jr.; and Gupta, Balkishan, 5,558,903, Cl. 427-11.000.
Ohishi, Noboru: *See*—
Tsukahara, Mikio; Ohishi, Noboru; Taguchi, Hisao, deceased, 5,558,801, Cl. 222-607.000.
Ohkawa, Katsumi: *See*—
Ohta, Susumu; Ohkawa, Katsumi; and Sakamoto, Noriaki, 5,559,374, Cl. 257-723.000.
Ohkawa, Nobuyuki: *See*—
Nakamura, Norio; Ohkawa, Nobuyuki; Oshima, Takeshi; Miyamoto, Masaaki; and Iijima, Yasuteru, 5,559,109, Cl. 514-218.000.
Ohkubo, Minoru: *See*—
Adachi, Masao; Shioya, Makoto, Sato, Kazuhiko; and Ohkubo, Minoru, 5,558,596, Cl. 477-46.000.
Ohkubo, Takuya: *See*—
Inaguma, Yoshiharu; Mori, Yutaka; Suzuki, Keiji; and Ohkubo, Takuya, 5,558,177, Cl. 180-422.000.
Ohlrogge, John B.: *See*—
Roessler, Paul G.; and Ohlrogge, John B., 5,559,220, Cl. 536-23.600.
Ohmeda Inc.: *See*—
Bathe, Duncan P. L.; Kohlmann, Thomas S.; Pinkert, John R.; and Tham, Robert Q., 5,558,083, Cl. 128-203.120.
Ohmori, Hideki; and Fukayama, Kenji, to Fujitsu Limited. Voltage control oscillator variable capacitance diode biasing circuit. 5,559,479, Cl. 331-177.00V.
Ohms, Franz; and Rupright, Heike, to Ant Nachrinctentechnik GmbH. Switching regulator. 5,559,684, Cl. 363-25.000.
Ohnishi, Masami: *See*—
Takei, Ken; Ohnishi, Masami; and Kuwahara, Mikio, 5,559,524, Cl. 343-895.000.
Ohno, Junnosuke; Kohsaka, Muneko; Noguchi, Kazunari; Kamiyama, Hirotoshi; and Nishii, Kimiko, to Kabushiki Kaisha World. Pattern making and pattern drafting system. 5,559,709, Cl. 364-468.010.
Ohno, Tadayoshi; Itoh, Shinichi; Yamaguchi, Takashi; and Tanaka, Hisatoshi, to Kabushiki Kaisha Toshiba. Recording medium using reversible recording material and method of processing record to recording medium. 5,559,314, Cl. 235-432.000.
Ohno, Tsuneya, to Nissin Shokuhin Kabushiki Kaisha. HIV immunotherapeutics. 5,558,865, Cl. 424-148.100.
Ohsato, Kiyoshi: *See*—
Nakao, Takashi; Ohsato, Kiyoshi; Kamatani, Yoshiteru; Narahara, Tatsuya; and Ozue, Tadashi, 5,559,766, Cl. 369-44.180.
Ohta Kasei Corporation: *See*—
Tsukahara, Mikio; Ohishi, Noboru; Taguchi, Hisao, deceased, 5,558,801, Cl. 222-607.000.
Ohta, Susumu; Ohkawa, Katsumi; and Sakamoto, Noriaki, to Sanyo Electric Co., Ltd. Hybrid integrated circuit. 5,559,374, Cl. 257-723.000.
Ohtani, Yasuo; Kataho, Takuo; Satoh, Makoto; Tanaka, Tsutomu; Nose, Yoshimasa; Kobayashi, Kazuyoshi; Uchikawa, Tetsuhide; and Hamahata, Toshihiro, to TDK Corporation. Calcination furnace. 5,559,826, Cl. 373-109.000.
Ohzeki, Kazuhide: *See*—
Nakamura, Nobuhisa; Ohzeki, Kazuhide; and Takano, Hiroshi, 5,558,570, Cl. 451-357.000.
Oi, Kiyotoshi: *See*—
Minagawa, Kazuji; Oi, Kiyotoshi; and Akiba, Takashi, 5,558,063, Cl. 123-457.000.
Oishi, Hideki: *See*—
Mori, Yoshikuni; Kushino, Mitsuo; Oishi, Hideki; and Yoneda, Tadahiro, 5,559,168, Cl. 523-205.000.
Oishi, Ukichi: *See*—
Uzaki, Nagato; Oishi, Ukichi; Kanayama, Ryoji; Amano, Hironobu; and Terabe, Tokiya, 5,558,148, Cl. 164-7.100.
Oishi, Yoshiro; and Ueda, Daisuke, to Matsushita Electronics Corporation. Semiconductor device having a hollow around a gate electrode and a method for producing the same. 5,559,046, Cl. 437-39.000.
OK-1 Manufacturing Company: *See*—
Caswell, Charles A.; and Davis, Richard K., 5,557,806, Cl. 2-161.100.
Oka, Shigeo; and Hoshi, Takayuki, to Pentel Kabushiki Kaisha. Holder tube for writing instrument. 5,558,452, Cl. 401-6.000.
Okabe, Masanori; Higuchi, Yoshikatsu; and Kawakami, Yasunobu, to Honda Giken Kogyo Kabushiki Kaisha. Method of manufacturing a composite sintered body. 5,559,062, Cl. 501-92.000.
Okabe, Toshihiro: *See*—
Ibe, Takaya; Tanaka, Kazuyoshi; Ota, Kaname; Yamamoto, Goujun; and Okabe, Toshihiro, 5,558,340, Cl. 273-448.000.
Okada, Akihiro: *See*—
Vo, Giang; and Okada, Akihiro, 5,559,539, Cl. 347-33.000.
Okada, Hajime; and Tabata, Masaaki, to Sumitomo Wiring Systems, Ltd. Battery terminal. 5,558,544, Cl. 439-762.000.
Okada, Izuho; Asako, Yoshinobu; Arimatsu, Kiyomi; Kobayashi, Minoru; Ono, Satoru; and Aizawa, Ryuji, to Nippon Shokubai Co., Ltd. Electrorheological fluid with improved properties comprising composite polymer. 5,558,803, Cl. 252-78.300.
Okada, Toshikazu; Itogawa, Hiroshi; and Nagase, Hidekazu, to Kabushiki Kaisha Komatsu Seisakusho. Geared steering device for crawler vehicle and control unit therefor. 5,558,590, Cl. 475-28.000.
Okamoto, Hisato: *See*—
Tsuchinari, Akihiro; Osaki, Hiroaki; Okamoto, Hisato; and Yamamoto, Tetsuo, 5,559,064, Cl. 501-120.000.
Okamoto, Masayoshi: *See*—
Iwatsuki, Syuichiro; Fukagawa, Masami; Oshida, Kei; Mochizuki, Kazuyuki; Fujimoto, Hiroyuki; and Okamoto, Masayoshi, 5,558,949, Cl. 429-99.000.
Okamoto, Seiji, to Kabushiki Kaisha Kawai Gakki Seisakusho. Waveform read-out system for an electronic musical instrument. 5,559,298, Cl. 84-607.000.
Okamoto, Shigefumi: *See*—
Kumagai, Katsuo; Rikiishi, Hidemi; Tamura, Keiji; Sugawara, Shunji; Nemoto, Eiji; Okamoto, Shigefumi; and Onta, Tokio, 5,559,211, Cl. 530-350.000.
Okamoto, Yoshinari: *See*—
Tsuruoka, Yoshihisa; Hirakawa, Haruhisa; Okamoto, Yoshinari; and Sato, Eiji, 5,559,397, Cl. 313-496.000.
Okamura, Hitoshi, to NEC Corporation. Bicmos push-pull type logic apparatus with voltage clamp circuit and clamp releasing circuit. 5,559,451, Cl. 326-84.000.
Okamura, Yashikoi; Kageyama, Yasuo; Suzuki, Takashi; Fujimori, Junichi; and Funada, Takeshi, to Yamaha Corporation. Data transmission system selecting both source and destination using addressing mechanism. 5,559,962, Cl. 395-200.060.
Okano, Kiyoshige. Water walking device, hull and stock thereof. 5,558,553, Cl. 441-76.000.
Oki Electric Industry Co., Ltd.: *See*—
Ono, Takashi; and Ikegami, Masami, 5,559,735, Cl. 365-185.170.
Tanoi, Satoru, 5,559,462, Cl. 327-231.000.
Oki, Yoji; Hanaski, Koichi; and Fujisawa, Shigeo, to Stanley Electric Co., Ltd. Flat lighting device. 5,558,420, Cl. 362-31.000.
Okimura, Kimihiko: *See*—
Ogura, Wataru; Kawagoe, Yoshito; Takizawa, Satoru; Takeuchi, Yasuo; Okimura, Kimihiko; Yoshida, Hiroshi, deceased; Kobayashi, Atsushi; Ogura, Noboru; and Arioka, Kenji, 5,559,934, Cl. 395-117.000.
Oklahoma Safety Equipment Co.: *See*—
Strelow, John L., 5,558,114, Cl. 137-68.270.
Oku, Yoshito; Ibara, Shozo; Sumi, Shigeharu; and Fujii, Hiromasa, to Nidec Corporation. Spindle motor. 5,559,382, Cl. 310-90.000.
Okuda, Masayuki: *See*—
Fujiwara, Takayoshi; Okuda, Masayuki; Sone, Yoshinori; and Honjo, Takashi, 5,558,512, Cl. 418-188.000.
Okuda, Sadanao: *See*—
Watanabe, Hideo; and Okuda, Sadanao, 5,559,074, Cl. 428-447.000.
Okuda, Tetsuya; and Kojima, Shinichi, to Komori Corporation. Method and apparatus for recognizing meandering of web. 5,559,896, Cl. 382-141.000.
Okumura, Hisaya; and Aizawa, Yoshiaki, to Kabushiki Kaisha Toshiba. Semiconductor relay for transmitting high frequency signals. 5,559,466, Cl. 327-514.000.
Okumura, Tomohiro; Nakayama, Ichiro; and Yanagi, Yoshihiro, to Matsushita Electric Industrial Co., Ltd. Plasma processing apparatus. 5,558,722, Cl. 118-723.001.
Okunuki, Masahiko: *See*—
Tsukamoto, Takeo; Shimizu, Akira; Suzuki, Akira, Sugata, Masao; Shimoda, Isamu; and Okunuki, Masahiko, 5,559,342, Cl. 257-10.000.
Okuyama, Koshi, to NOK Corporation. Boot. 5,558,580, Cl. 464-175.000.
Olesen, Preben H.: *See*—
Sauerberg, Per; Olesen, Preben H.; and Mitch, Charles H., 5,559,136, Cl. 514-340.000.
Sauerberg, Per; and Olesen, Preben H., 5,559,138, Cl. 514-342.000.
Olin Corporation: *See*—
Mahulikar, Deepak, 5,559,306, Cl. 174-52.400.
Oliphant, Larry J.: *See*—

Gilligan, Sean G.; Freeman, Dermot T.; Oliphant, Larry J.; Messmann, Jeffrey S.; Hanley, Patrick J.; and Szczech, Gerald S., 5,558,901, Cl. 427-2.290.
Olivier, René: *See*—
Le Strat, Evelyne; and Olivier, René, 5,559,829, Cl. 375-206.000.
Olney, Ross D.; Schnelker, David E.; and Griffin, William S., to Hughes Aircraft Company. Vehicle wheel including self-inflating tire pump. 5,558,730, Cl. 152-418.000.
Olofsson, Niclas; Rydberg, Anders; and Hallenstvedt, Oddbjörn, to AB Volvo Penta. Propeller drive for boats. 5,558,548, Cl. 440-66.000.
Olschansky, Brad; and Olschansky, Scott. Gluteal and thigh muscle exercise system. 5,558,609, Cl. 482-122.000.
Olschansky, Scott: *See*—
Olschansky, Brad; and Olschansky, Scott, 5,558,609, Cl. 482-122.000.
Olsen, Robb E.: *See*—
Weinberger, Eric P.; Lavash, Bruce W.; Olsen, Robb E.; and Cree, James W., 5,558,663, Cl. 604-387.000.
Olympic General Corporation: *See*—
Davis, William B., 5,557,830, Cl. 24-459.000.
Olympus Optical Co., Ltd.: *See*—
Aoki, Norihiko; Yamanashi, Takanori; and Hankawa, Masashi, 5,559,638, Cl. 359-749.000.
Kami, Kuniaki; Adachi, Hideyuki; Umeyama, Koichi; Kosaka, Yoshihiro; Yamaguchi, Seiji; Fuse, Eiichi; Sato, Michio; Nakamura, Masakazu; Tanaka, Yasundo; Fukaya, Takashi; Matsuno, Kiyotaka; and Suzuki, Katsuya, 5,558,619, Cl. 600-146.000.
Matsueda, Akira, 5,559,775, Cl. 369-47.000.
McMillan, Larry D.; Mihara, Takashi; Yoshimori, Hiroyuki; Gregory, John W.; and Paz de Araujo, Carlos A., 5,559,733, Cl. 365-145.000.
Nakagawa, Mikihiko; Negoro, Daisaku; Nakanishi, Nobuyuki; Ogawa, Akio; Yajima, Manabu; and Kinoshita, Toshihara, 5,558,841, Cl. 422-105.000.
Omagari, Masaharu: *See*—
Yoshinaga, Kei; Ito, Katsuhiko; Ebara, Katsumi; Furuhashi, Hitoshi; Shichinohe, Takashi; and Omagari, Masaharu, 5,558,059, Cl. 123-198.00E.
O'Malley, Michael F.: *See*—
Davis, Terry L.; Hart, James A.; O'Malley, Michael F.; Russell, James F.; Sears, John W.; and Trice, Philip H., 5,559,887, Cl. 380-24.000.
Omi, Junichi: *See*—
Miyamoto, Hidenori; Kato, Minoru; Omi, Junichi; Soshi, Isao; and Imura, Yoshio, 5,559,571, Cl. 354-286.000.
Soshi, Isao; Miyamoto, Hidenori; Katou, Minoru; Omi, Junichi; and Amanuma, Tatsuo, 5,559,570, Cl. 354-202.000.
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Hug, William F.; and Reid, Ray D., 5,558,884, Cl. 425-174.400.
OMRON Corporation: *See*—
Kentatsu, Kunihiro; Tsuboi, Kazuo; and Ishida, Takeshi, 5,559,773, Cl. 369-44.420.
OMT Engineering Inc.: *See*—
Washnock, John T.; and Thomas, Harold L., 5,557,821, Cl. 15-3.130.
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Poulter, Graham G.; and Ashley, Peter J. S., 5,559,936, Cl. 395-128.000.
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Kanouda, Akihiko; Takahashi, Tadashi; Horie, Hideaki; Onda, Kenichi; and Hagiwara, Syuya, 5,559,682, Cl. 363-21.000.
Onderka, Oswald: *See*—
Heydner, Konrad; and Onderka, Oswald, 5,558,211, Cl. 200-553.000.
O'Neill, Frank, to Motorola, Inc. Method of reuse through remote antenna and same channel cell division. 5,559,866, Cl. 379-60.000.
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Ono, Makoto, to International Business Machines Corporation. User specification of pull down menu alignment. 5,559,944, Cl. 395-156.000.
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Kumagai, Katsuo; Rikiishi, Hidemi; Tamura, Keiji; Sugawara, Shunji; Nemoto, Eiji; Okamoto, Shigefumi; and Onta, Tokio, 5,559,211, Cl. 530-350.000.
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Talieh, Homayoun; Weldon, David E.; and Nagorski, Boguslaw A., 5,558,568, Cl. 451-303.000.
Oono, Masahiro: *See*—
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Ho, Mae-Wan; and Lawrence, Michael J., 5,559,630, Cl. 359-371.000.
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Stevens, Albert F.; Chodack, Jeffrey L.; Lange, Russell M.; Dewitt, Robert R.; Coleman, John D.; Bressler, Peter W.; and Forsyth, Keith W., 5,558,232, Cl. 209-584.000.
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Anderson, James S.; Gerfast, Sten R.; Opheim, Warren W.; Tapani, Robert W.; and Tran, Hung T., 5,558,291, Cl. 242-336.000.
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Levy, Claude; Smadja, Jean-Claude; and Opman, Pierre, 5,557,890, Cl. 49-502.000.
Oppliger, Jean-Claude; Grünenfelder, Robert; and Maier, Willy, to Grapha-Holding AG. Conveyor apparatus for further conducting individually supplied, flat products. 5,558,201, Cl. 198-476.100.
Oprescu, Florin; and Van Brunt, Roger, to Apple Computer, Inc. Method and apparatus for a dynamic, multi-speed bus architecture in which an exchange of speed messages occurs independent of the data signal transfers. 5,559,967, Cl. 395-285.000.
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Peng, Ke-Ou, 5,559,319, Cl. 235-462.000.
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Karjalainen, Arto J.; Sodervall, Marja-Liisa; Kalapudas, Arja M.; Pelkonen, Reino O.; Laine, Aire M.; Lammintausta, Risto A.; and Salonen, Jarmo S., 5,559,141, Cl. 514-400.000.
Orr, Michael D.: *See*—
Killian, Michael L.; and Orr, Michael D., 5,558,785, Cl. 219-110.000.
Orr, Steven K.; and Kindel, Daniel G., to Cincinnati Microwave, Inc. Emergency vehicle detector. 5,559,508, Cl. 340-902.000.
Orrico, Michael R., to Stryker Corporation. Bone cement cartridge with secondary piston. 5,558,136, Cl. 141-23.000.
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Schweiger, Raimund; Scholles, Herbert; Orth, Hans; and Lips, Hendrik, 5,559,304, Cl. 102-501.000.
Orthosis Corrective Systems Corp.: *See*—
Bzoch, Jan J., 5,558,628, Cl. 602-24.000.
Ortiz, Ernest A., to Warner-Lambert Company. Dynamic flexible razor head. 5,557,851, Cl. 30-50.000.
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Honda, Kazuhiko; Fujiwara, Kazunobu; and Osakabe, Katsuichi, 5,559,785, Cl. 369-124.000.
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Osborn, Stephen G.: *See*—
Gallup, Micheal G.; Goke, L. Rodney; Seaton, Robert W., Jr.; Lawell, Terry G.; Osborn, Stephen G.; and Tomazin, Thomas J., 5,559,973, Cl. 395-375.000.
Osborn, Thomas W., III: *See*—
Hammons, John L.; Lampson, Patricia L.; and Osborn, Thomas W., III, 5,558,657, Cl. 604-385.100.
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Iwatsuki, Syuichiro; Fukagawa, Masami; Oshida, Kei; Mochizuki, Kazuyuki; Fujimoto, Hiroyuki; and Okamoto, Masayoshi, 5,558,949, Cl. 429-99.000.
Oshima, Takeshi: *See*—
Nakamura, Norio; Ohkawa, Nobuyuki; Oshima, Takeshi; Miyamoto, Masaaki; and Iijima, Yasuteru, 5,559,109, Cl. 514-218.000.
OSi Specialities, Inc.: *See*—
Bowman, Mark P.; and Schilling, Curtis L., Jr., 5,559,264, Cl. 556-479.000.
OSI Specialties, Inc.: *See*—
Policello, George A.; and Murphy, Dennis S., 5,558,806, Cl. 252-355.000.
Osiecki, Larry J.: *See*—
Toni, Darryl M.; Grant, Peter L.; Johnson, Craig F.; Hayse, Steven R.; Forster, William V.; Nowak, Kenneth; and Osiecki, Larry J., 5,558,919, Cl. 428-116.000.
Oskarsson, Rolf: *See*—
Hakansson, Bjorn; Von Holst, Peder; and Oskarsson, Rolf, 5,558,475, Cl. 407-54.000.
Osram Sylvania Inc.: *See*—
Casteel, Ronald G.; Davis, Dennis E.; and Johnson, Robert R., 5,558,113, Cl. 134-122.00R.

O'Sullivan, Michael; and Wetter, James A., to Molex Incorporated. Electrical connector with improved terminal-receiving passage means. 5,558,542, Cl. 439-682.000.

Oswalt, Ernest A.: *See—*
Bhagat, Jai P.; Oswalt, Ernest A., and Hays, William D., 5,559,862, Cl. 379-58.000.

Ota, Kaname: *See—*
Ibe, Takaya; Tanaka, Kazuyoshi; Ota, Kaname; Yamamoto, Goujun; and Okabe, Toshihiro, 5,558,340, Cl. 273-448.000.

Ota, Ken; and Archibald, William, to Motorola Inc. Min-max computing circuit for fuzzy inference. 5,559,928, Cl. 395-3.000.

Ota, Takeshi, to Fuji Xerox Co., Ltd. Multi-layer optical information detection by two laser beam and optical multilayer recording medium. 5,559,784, Cl. 369-124.000.

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Otaki, Hitoshi; and Nakajima, Masahiro, to Pioneer Video Corporation; and Pioneer Electronics Corporation. Digital time base corrector using a memory with reduced memory capacity. 5,559,812, Cl. 371-31.000.

Otsuka, Naoji; Hirabayashi, Hiromitsu; Yano, Kentaro; and Takahashi, Kiichiro, to Canon Kabushiki Kaisha. Temperature control of ink-jet recording head using heat energy. 5,559,535, Cl. 347-14.000.

Otsuka Pharmaceutical Co., Ltd.: *See—*
Ogawa, Hidenori; Miyamoto, Hisashi; Kondo, Kazumi; Yamashita, Hiroshi; Nakaya, Kenji; Komatsu, Hajime; Tanaka, Michinori; Kora, Shinya; Tominaga, Michiaki; and Yabuuchi, Yoichi, 5,559,230, Cl. 540-569.000.

Otsuki, Masahito: *See—*
Yamazaki, Tomoyuki; and Otsuki, Masahito, 5,559,347, Cl. 257-139.000.
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Ott, Conrad L. Connector for terminated fiber optic cable. 5,559,917, Cl. 385-86.000.

Ott, Gunther: *See—*
Clark, Peter D.; Gilbert, John A.; Ott, Gunther; Ruhl, Dieter; Santure, David J.; Heimann, Ulrich; and Cibura, Klaus, 5,559,174, Cl. 523-428.000.

Ott, Russell J. Ant shocking apparatus. 5,557,879, Cl. 43-112.000.

Ouchi, Chiaki: *See—*
Kobayashi, Masaru; Suzuki, Seiichi; Iizumi, Hiroshi; and Ouchi, Chiaki, 5,558,728, Cl. 148-421.000.

Oudet, Claude; and Gandel, Pierre, to Moving Magnet Technologies, S.A. Three-pole electromagnetic actuator for pneumatic distributing devices. 5,559,378, Cl. 310-17.000.

Outboard Marine Corporation: *See—*
McNamara, Don B., 5,558,038, Cl. 114-355.000.
Ming, Lam H.; and Ying, Chu K., 5,558,058, Cl. 123-196.00A.

Overberg, Matthias: *See—*
Hemmis, Ludger; Overberg, Matthias; and Schröder, Burkhard, 5,558,390, Cl. 296-146.140.

Overton, Frank H.: *See—*
Jaegge, Walter J.; Malone, Francis J., Jr.; Overton, Frank H.; Ross, Roger A.; and Steele, Ronald E., 5,558,826, Cl. 264-103.000.

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Ovshinsky, Stanford R.; Fetcenko, Michael A.; Holland, Arthur; Dean, Kevin; and Fillmore, Donn, 5,558,950, Cl. 429-101.000.

Ovortrup ApS: *See—*
Ovortrup, Klaus; and Jeppesen, Henrik, 5,557,804, Cl. 2-23.000.

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Ovshinsky, Stanford R.; Fetcenko, Michael A.; Holland, Arthur; Dean, Kevin; and Fillmore, Donn, to Ovonic Battery Company, Inc. Optimized cell pack for large sealed nickel-metal hydride batteries. 5,558,950, Cl. 429-101.000.

Owen, Harry: *See—*
Battey, David E.; Owen, Harry; and Tedesco, James M., 5,559,597, Cl. 356-328.000.

Owen, Ian R.; and McKown, Alan G., to Minnesota Mining and Manufacturing Company. Applicator for shear thinning viscous coating materials. 5,558,277, Cl. 239-322.000.

Owen, Samuel S.: *See—*
Castro, Jaoquin H.; Owen, Samuel S.; and Santangelo, Salvatore, 5,557,928, Cl. 60-260.000.

Owen, Sonia, to Avery Dennison Corporation. One-piece laser/ink jet printable divider which is folded over at the binding edge. 5,558,454, Cl. 402-79.000.

Owens, David R.: *See—*
Moser, Robert E.; Owens, David R.; Wilhelm, James H.; Colley, James D.; and Hargrove, Oliver W., Jr., 5,558,848, Cl. 423-243.010.

Owens, Steve C.: *See—*
Holcombe, Michael W.; Rothers, David E.; Owens, Steve C.; Henderson, William D.; and Doane, James C., 5,558,153, Cl. 166-373.000.

Oxaco S.A.: *See—*
Jefford, Charles W., 5,559,145, Cl. 514-452.000.

Oy Aura-Machine Ltd.: *See—*
Räsänen, Pentti, 5,558,285, Cl. 241-273.000.

Oyama, Koichi: *See—*
Kawai, Muneaki; and Oyama, Koichi, 5,558,019, Cl. 101-116.000.

Ozaki, Shinya; and Nonoyama, Hideki, to Sony Corporation. Data recording/reproducing apparatus having a first error correcting code on both sides of a main data area of each azimuth track. 5,559,644, Cl. 360-48.000.

Ozaki, Thoru; Sunouchi, Kazumasa; Takedai, Seiichi; and Shioyama, Yoshiyuki, to Kabushiki Kaisha Toshiba. Dynamic RAM and method of manufacturing the same. 5,559,350, Cl. 257-304.000.

Ozawa, Yoshio: *See—*
Mizukami, Kazuaki; Ogawa, Atsushi; Yasuda, Masashi; Furukawa, Masahiro; Arima, Hidetoshi; and Ozawa, Yoshio, 5,557,939, Cl. 62-148.000.

Ozeki, Masamichi; Takasaki, Mamoru; Miyamoto, Katsuyuki; and Tsuruda, Mitsumasa, to Laural Bank Machine Co., Ltd. Coin processing machine. 5,557,908, Cl. 53-212.000.

Oziem, Christopher: *See—*
Elliot-Moore, Peter; and Oziem, Christopher, 5,558,761, Cl. 210-106.000.

Oztaskin, Ali S.; Allen, John L.; and Murthy, Ganesh, to Intel Corporation. Input/output adapter cards having a plug and play compliant mode and an assigned resources mode. 5,559,965, Cl. 395-284.000.

Ozue, Tadashi: *See—*
Nakao, Takashi; Ohsato, Kiyoshi; Kamatani, Yoshiteru; Narahara, Tatsuya; and Ozue, Tadashi, 5,559,766, Cl. 369-44.180.

Pacesetter, Inc.: *See—*
Marincic, Nikola; and Rahadjija, Luka, 5,558,962, Cl. 429-233.000.
Renger, Herman L., 5,557,967, Cl. 73-204.240.

Pacheco, Robert C.: *See—*
Acker, David E.; McNulty, Ian; Pacheco, Robert C.; and Grandner, Wayne, 5,558,091, Cl. 128-653.100.

Paciello, Rocco A.: *See—*
Beatty, Richard P.; and Paciello, Rocco A., 5,559,262, Cl. 556-20.000.

Pacific Coast Feather Company: *See—*
Pedersen, Samuel B.; and Hanauer, Nicolas J., 5,557,816, Cl. 5-645.000.

Pacific Inks (Australia) Pty Ltd.: *See—*
Marjo, Erik, 5,558,435, Cl. 366-141.000.

Pacific Machinery & Engineering Co., Ltd.: *See—*
Fukazawa, Tetsuo; and Chin, Chugen, 5,558,502, Cl. 417-36.000.

Padoan, Silvia; and Pascucci, Luigi, to SGS-Thomson Microelectronics S.r.l. Programmable logic array structure for semiconductor nonvolatile memories, particularly flash-eeproms. 5,559,449, Cl. 326-40.000.

Page, Derrick J., to Northrop Grumman. Microwave power radiator for microwave heating applications. 5,558,800, Cl. 219-761.000.

Palatnik, Eugene S., to Biochem International, Inc. Blood pulse detection method using autocorrelation. 5,558,096, Cl. 128-687.000.

Palm, Christof: *See—*
Krug, Joseph; and Palm, Christof, 5,559,254, Cl. 549-429.000.

Palmer, Yvette L.: *See—*
Skotnicki, Jerauld S.; Palmer, Yvette L.; Kao, Wenling; and Abou-Gharbia, Magid A., 5,559,112, Cl. 514-291.000.
Skotnicki, Jerauld S.; Palmer, Yvette L.; Kao, Wenling; and Abou-Gharbia, Magid A., 5,559,119, Cl. 514-291.000.

Palmieri, Costantino: *See—*
Guzzi, Umberto; Palmieri, Costantino; and Croci, Tiziano, 5,559,238, Cl. 546-314.000.

Pan, David H.: *See—*
Larson, James R.; Pan, David H.; and Berkes, John S., 5,559,592, Cl. 355-285.000.

Pancoast, Steven T.: *See—*
Crump, Dwayne T.; and Pancoast, Steven T., 5,560,023, Cl. 395-750.000.

Pandey, Kulwant M.: *See—*
Gregg, Thomas A., Hoke, Joseph M., and Pandey, Kulwant M., 5,559,963, Cl. 395-200.130.

Pandula, Louis, to VLSI Technology, Inc. Digital phase detector. 5,559,841, Cl. 375-375.000.

Pankove, Jacques I.; Moddel, Garret R.; and Douglas, Kenneth, to University of Colorado, The Regents of the. Silicon quantum dot laser. 5,559,822, Cl. 372-50.000.

Panosh, Richard. Telephone service protection device. 5,559,874, Cl. 379-189.000.

Panzier, Neil A.: *See—*
Heim, William W.; Hendrix, James K.; Matemiak, Joyce M.; Murphy, Peter M.; Panzier, Neil A.; and Vinod, Yashavant V., 5,558,916, Cl. 428-95.000.

Papadopoulos, Gregory M.; Nikhil, Rishiyur S.; Greiner, Robert J.; and Arvind, , to Massachusetts Institute of Technology. Data processing system with synchronization coprocessor for multiple threads. 5,560,029, Cl. 395-800.000.

Papathomas, Konstantinos I.: *See—*
Bhatt, Anilkumar C.; Magnuson, Roy H.; Markovich, Voya R.; Papathomas, Konstantinos I., and Powell, Douglas O., 5,557,844, Cl. 29-852.000.

Papazian, Samuel; and Douville, Eric, to Valeo Systemes D'Essuyage. Device for controlling the function of an electric starting motor for a windshield wiper of a rear window of an automotive vehicle and for supplying an electric motor particularly to activate the windshield. 5,559,410, Cl. 318-445.000.

Paper Converting Machine Company: *See—*
Wunderlich, Gary R.; and Wierschke, Larry D., 5,557,997, Cl. 83-174.000.

Paproski, Vern. Snowmobile trailer with front gravel guards. 5,558,486, Cl. 414-537.000.

Paraszczak, Jurij R.: *See—*
Cohen, Stephen A.; Edelstein, Daniel C.; Grill, Alfred; Paraszczak, Jurij R.; and Patel, Vishnubhai V., 5,559,367, Cl. 257-77.000.

Parfomak, Walter: *See—*
Sears, Jerome; Parfomak, Walter; and Kluss, Walter J., 5,559,417, Cl. 318-689.000.

Parikh, Shrikant N.: *See—*
Manthuruthil, George C.; Parikh, Shrikant N.; and Reddy, Hari N., 5,560,026, Cl. 395-800.000.

Parisi, Carl M.: *See—*
Heilman, Marlin S.; Kolenik, Steve A.; Capone, Christopher D.; Parisi, Carl M.; Prem, Edward K.; and Speicher, Vernon L., 5,558,617, Cl. 600-16.000.

Park, Joon, to Hughes Aircraft Co. Carrier opener system. 5,558,381, Cl. 294-88.000.

Park, Joon. Self-locking quick disengagement nut for clamps and the like. 5,558,481, Cl. 411-433.000.

Park, Jung Il: *See—*
Lee, Chung W.; Song, Young J.; Seo, Dong S.; and Park, Jung Il, 5,559,305, Cl. 174-52.400.

Parke, Stephen: *See—*
Hu, Chenming; Ko, Ping K.; Assaderaghi, Fariborz; and Parke, Stephen, 5,559,368, Cl. 257-369.000.

Parker, Barry J.; Krinickas, Alexander; Stilwell, John D.; and Brown, Neil L., to Sundstrand Corporation. Electromagnetic heating devices, particularly for ram air turbines. 5,558,495, Cl. 416-95.000.

Parker, Donald D.: *See—*
Boggs, Darrell D.; Brown, Gary L.; Hancock, Michael M.; and Parker, Donald D., 5,559,974, Cl. 395-375.000.

Parker, Michael D. Fishing rod holder. 5,557,876, Cl. 43-21.200.

Parlex Corporation: *See—*
McKenney, Darryl J.; and Cyr, Robert D., 5,557,843, Cl. 29-851.000.

Parnas, Anatoliy: *See—*
Gitman, Gregory M.; and Parnas, Anatoliy, 5,558,822, Cl. 264-15.000.

Paro, Daniel, to Wartsila Diesel International Ltd Oy. Arrangement for the control of valve timing in a combustion engine. 5,558,050, Cl. 123-90.130.

Parsio, Anthony: *See—*
Lubliner, David J.; Dhaliwal, Jaskaran; Gidney, John; Gore, Gerald E.; Greenfeder, Jack J.; Greenfeld, Joshua; Hinton, Melvin C.; McHugh, William; Parsio, Anthony; Rintel, Ian; Roman, Harry T.; and Vogelaar, Jake, 5,559,894, Cl. 382-100.000.

Pasch, Nicholas F.: *See—*
Rostoker, Michael D.; and Pasch, Nicholas F., 5,558,271, Cl. 228-180.220.

Pascucci, Luigi; Carrera, Marcello; and Defendi, Marco, to SGS-Thomson Microelectronics S.r.l. Redundancy circuitry layout for a semiconductor memory device. 5,559,743, Cl. 365-200.000.

Pascucci, Luigi: *See—*
Padoan, Silvia; and Pascucci, Luigi, 5,559,449, Cl. 326-40.000.

Pasek, Stanley J.: *See—*
McKay, Albert A.; Pasek, Stanley J.; Porteous, David A.; Reid, Jeffrey D.; Scott, Trevor A.; Smith, Eric G.; Stahmer, Ulf; and Digweed, W. Thomas, 5,559,281, Cl. 73-39.000.

Pasteur Sanofi Diagnostic: *See—*
Matte, Claude; and Muller, Anne, 5,558,839, Cl. 422-101.000.

Patchett, Arthur A.: *See—*
Chakravarty, Prasun K.; Nargund, Ravi; Marquis, Robert W.; Patchett, Arthur A.; and Yang, Lihu, 5,559,128, Cl. 514-323.000.

Patel, Arvind M.: *See—*
Melas, Constantin M.; Patel, Arvind M.; Rutledge, Robert A.; and So, Bum S., 5,559,840, Cl. 375-355.000.

Patel, Bipin C. M., to British Technology Group Limited. Sol-gel composition for producing glassy coatings. 5,558,701, Cl. 106-35.000.

Patel, Mukund R.: *See—*
Holtzman, Elizabeth; Bassini, Lynn; and Patel, Mukund R., 5,558,626, Cl. 602-4.000.

Patel, Ramesh N.; Szarka, Laszlo J.; and Mueller, Richard H., to E. R. Squibb & Sons, Inc. Microbial reduction of benzazepines and benzothiazepine derivatives. 5,559,017, Cl. 435-120.000.

Patel, Sunil; Ng, Chai-Nam; Dhyanchand, P. John; Nguyen, Vietson M.; and Teagardin, Michael, to Sundstrand Corporation. Stepped waveform inverter control. 5,559,686, Cl. 363-43.000.

Patel, Urmil: *See—*
Marozzi, John; Rochon, Greg; Patel, Urmil; and Dambly, Ben, 5,558,020, Cl. 101-228.000.

Patel, Vishnubhai V.: *See—*
Cohen, Stephen A.; Edelstein, Daniel C.; Grill, Alfred; Paraszczak, Jurij R.; and Patel, Vishnubhai V., 5,559,367, Cl. 257-77.000.

Patton, Mark W.; Todd, Douglas W.; and Davis, Glenn A., to Scientific-Atlanta, Inc. Method and apparatus for providing information to a subscriber over an electronic network. 5,559,870, Cl. 379-107.000.

Pauken, Michael T.; Jeter, Sheldon M.; and Abdel-Khalik, Said I., to Georgia Tech Research Corp. Film pump for applying a monolayer film over water surfaces. 5,558,845, Cl. 422-256.000.

Paul, Charles W., to National Starch and Chemical Investment Holding Corporation. Hot melt adhesives for bonding to sensitive areas of the human body. 5,559,165, Cl. 523-111.000.

Paulos, Manley A., to Captab, L.L.C. Method for blinding a tableted medication. 5,558,878, Cl. 424-453.000.

Pauly, Robert: *See—*
Cohee, Donald R.; Sandy, Charles; Martz, Pete; Clougherty, M. James; and Pauly, Robert, 5,558,131, Cl. 138-93.000.

Pausch, Mark H.: *See—*
Price, Laura A.; and Pausch, Mark H., 5,559,026, Cl. 435-254.200.

Pauza, William V.: *See—*
Sarkady, Michael D.; Reisinger, Jason M.; Pauza, William V.; Fetterolf, James R., Sr.; and Connell, James E., Jr., 5,558,534, Cl. 439-352.000.

Pavilion Technologies, Inc.: *See—*
Keeler, James D.; Hartman, Eric J.; Liano, Kadir; and Ferguson, Ralph B., 5,559,690, Cl. 364-164.000.

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James, William A.; Breitkopf, Stephen H.; Provell, Robert G.; and Moody, Ralph A., III, 5,558,218, Cl. 206-303.000.
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Hartman, George D.; Prugh, John D.; Egbertson, Melissa S.; Duggan, Mark E.; Hoffman, William; Halezenko, Wasyl; and Askew, Ben, 5,559,127, Cl. 514-322.000.
Psaros, Georgios; and Johansson, Marie, to Siemens Elema AB. Device for reducing the relative humidity of a flowing gas. 5,558,087, Cl. 128-205.120.
Pudem, Roger, to Sargem Manufacturing Company. Metal finishing process. 5,558,759, Cl. 205-50.000.
Pudney, Mary: *See*—
Gutteridge, Winston E.; Hudson, Alan T.; Latter, Victoria S.; and Pudney, Mary, 5,559,156, Cl. 514-682.000.
Pugh, Theresa: *See*—
Marozzi, John; Rochon, Greg; Patel, Urmil; and Dambly, Ben, 5,558,020, Cl. 101-228.000.
Pujado, Peter R.: *See*—
Hammerman, John I.; and Pujado, Peter R., 5,559,274, Cl. 568-803.000.
Purand, Katja: *See*—

Schwartz, Jean-Charles; Arrang, Jean-Michel; Garbarg, Monique; Rao, V. N. Mallikarjuna; and Subramanian, Munirpallam A., to Du Pont de

Reimer, James A.; and Reinsch, Roger A., to International Business Machine Corporation. Computer program product and program storage device for
Cody, G. Lee, 5,558,623, Cl. 601-2.000.
Rich, Ronald J.: *See*—

Schwartz, Jean-Charles; Arrang, Jean-Michel; Garbarg, Monique; Lecomte, Jeanne-Marie; Ganellin, Charon R.; Ekyerat, Abdellatif; Tertiuk, Wasyl; Schunack, Walter; Lipp, Ralph; Stark, Holger; and Purand, Katja, 5,559,113, Cl. 514-252.000.

Purcell, John P.: *See—*
Corbin, David R.; Greenplate, John T.; Jennings, Michael G.; Purcell, John P.; and Sammons, Robert D., 5,558,862, Cl. 424-94.400.

Pursley, Matt D.: *See—*
Brown, Joe E.; Pursley, Matt D.; and Clark, D. Joe, 5,558,737, Cl. 156-172.000.

Pyter, Richard A.: *See—*
Al-Razzak, Laman A.; Marsh, Kennan C.; and Pyter, Richard A., 5,559,158, Cl. 514-616.000.

Qingsheng, Cai: *See—*
Glantz, Jerald; Anderson, Mark D.; Johnson, Theodore A.; Beling, William L.; and Qingsheng, Cai, 5,558,641, Cl. 604-93.000.

Quad Systems Corporation: *See—*
Deley, Michael T.; and Phillips, Edwin R., 5,559,727, Cl. 364-559.000.

Quaker Plastic Corporation: *See—*
Dabowski, Donald E., 5,557,904, Cl. 52-631.000.

QUALCOMM Incorporated: *See—*
Gilhousen, Klein S., 5,559,865, Cl. 379-60.000.
Sih, Gilbert C., 5,559,881, Cl. 379-410.000.

Quantum Corporation: *See—*
Chen, Shuo-Hao; Zang, Yan; and Hatch, Michael R., 5,558,445, Cl. 384-132.000.
Zang, Yan, 5,558,443, Cl. 384-112.000.

Quay, Steven C., to Sonus Pharmaceuticals. Phase shift colloids as ultrasound contrast agents. 5,558,853, Cl. 424-9.500.

Quay, Steven C., to Sonus Pharmaceuticals. Ultrasound contrast media comprising perfluoropentane and perfluorohexane gas. 5,558,854, Cl. 424-9.520.

Quay, Steven C., to Sonus Pharmaceuticals. Phase shift colloids as ultrasound contrast agents. 5,558,855, Cl. 424-9.500.

Quay, Steven M., to Sonus Pharmaceuticals, Inc. Methods for using persistent gases as ultrasound contrast media. 5,558,094, Cl. 128-662.020.

Quickdraw Design and Drafting, Inc.: *See—*
Helgerson, David E.; and Lee, Brian R., 5,558,205, Cl. 198-781.040.
Helgerson, David E.; and Lee, Brian R., 5,558,206, Cl. 198-781.040.

Quinn, Robert, to Motorola, Inc. Method and apparatus for displaying performance metrics in a communication system. 5,559,527, Cl. 345-115.000.

Quirini, Graziano: *See—*
Lombardi, Massimo; Luciani, Sabatino; Ponzio, Massimo; and Quirini, Graziano, 5,557,838, Cl. 29-597.000.

R. Baumung Industries Limited: *See—*
Baumung, Ralph F.; and Everett, Gary L., 5,558,284, Cl. 241-101.741.

R.R. Donnelley & Sons Company, Inc.: *See—*
Gentry, Glenn M., 5,558,488, Cl. 414-790.400.

Rabadjija, Luka: *See—*
Marincic, Nikola; and Rabadjija, Luka, 5,558,962, Cl. 429-233.000.

Raceside Holdings Pty Ltd.: *See—*
Mason, James R.; and Mason, Philip J., 5,558,022, Cl. 104-126.000.

Racino, Gregory A.; and Jorvig, Jeffrey R., to Motorola, Inc. Pseudo static mask option register and method therefor. 5,559,981, Cl. 395-430.000.

Radiant Imaging, Inc.: *See—*
Forkner, John F.; Riser, Andrew P.; Rykowski, Ronald F.; and Wilson, Stephen S., 5,559,911, Cl. 385-33.000.

Radke, Edward F.: *See—*
Hoosic, Thomas P.; and Radke, Edward F., 5,557,901, Cl. 52-506.030.

Radvan, Bronislaw: *See—*
Biggs, Ian S.; and Radvan, Bronislaw, 5,558,931, Cl. 428-218.000.

Rahm, Erik R., to Atlas Copco Tools AB. Phenmatic power nutrunner. 5,558,168, Cl. 173-178.000.

Raith, Alex K.: *See—*
Dent, Paul W.; Raith, Alex K.; and Dahlin, Jan E. Å. S., 5,559,886, Cl. 380-23.000.

Rajiyah, Harindra: *See—*
Pla, Frederic G.; and Rajiyah, Harindra, 5,558,298, Cl. 244-1.00N.

Rakas, Margaret A.: *See—*
Woods, John G.; Rakas, Margaret A.; Jacobine, Anthony F.; Alberino, Louis M.; Kropp, Philip L.; Sutkaitis, Donna M.; Glaser, David M.; and Nakos, Steven T., 5,558,937, Cl. 428-378.000.

Ramalho, Joao N. V. L.: *See—*
Voorman, Johannes O.; and Ramalho, Joao N. V. L., 5,559,646, Cl. 360-67.000.

Rambosek, John A.: *See—*
Conder, Michael J.; McAda, Phyllis C.; Rambosek, John A.; and Reeves, Christopher D., 5,559,005, Cl. 435-47.000.

Ramsey, Roger H.: *See—*
Weisburn, James T.; Mundorf, Larry K.; Ramsey, Roger H.; and Brazis, William E., 5,558,225, Cl. 206-455.000.

Randall, Richard: *See—*
Voss, Darrell W.; Klein, Gary G.; and Randall, Richard, 5,557,982, Cl. 74-551.100.

Randall, Scott R., to J/B Industries, Inc. Refrigeration manifold. 5,558,124, Cl. 137-597.000.

Ranganathan, Ramachandran S.; Arunachalam, Thangavel; and Natalie, Kenneth J., Jr., to Bracco International B.V. Process for preparation of 2-oxo-1-piperidinyl derivatives. 5,559,237, Cl. 546-220.000.

Rao, V. N. Mallikarjuna, and Subramanian, Munirpallam A., to Du Pont de Nemours, E. I., and Company. Catalysts for halogenated hydrocarbon processing, their precursors and their preparation and use. 5,559,069, Cl. 502-226.000.

Rapkin, Edward; and Steele, Gavin, to IN/US Systems, Inc. Continuous sample detector with standard. 5,559,324, Cl. 250-252.100.

Räsänen, Pentti, to Oy Aura-Machine Ltd.; and Savonlinnan PR-Urakointi OY. Apparatus for lifting and dropping a drop hammer. 5,558,285, Cl. 241-273.000.

Ratcliff, Keith: *See—*
Green, David T.; Bolanos, Henry; Ratcliff, Keith; Heaton, Lisa W.; and Robertson, John C., 5,558,266, Cl. 227-178.100.

Ratia, Ristomatti: *See—*
Klein, Richard B.; Serslev, Chris; and Ratia, Ristomatti, 5,558,307, Cl. 248-309.100.

Ravid, Arie; and Poli, Robert G., to Abbott Laboratories. Display having redundant segments. 5,559,528, Cl. 345-117.000.

Raychem S.A.: *See—*
Delalle, Jacques, 5,558,538, Cl. 439-583.000.

Razon, Eli: *See—*
Nachon, Beni; Efrat, Ehud; Razon, Eli; and Perlberg, Gil, 5,558,270, Cl. 228-180.500.

Razzano, John S., to General Electric Company. Silicone oil-silica filler paste useful in liquid injection molding applications, method for making, and use. 5,559,183, Cl. 524-862.000.

Rea, David S.: *See—*
Voss, Douglas A.; Link, David G.; Rea, David S.; and Mills, Murray W., 5,557,912, Cl. 56-130.000.

Read, Christopher J.: *See—*
Guttag, Karl M.; Read, Christopher J.; Poland, Sydney W.; Gove, Robert J.; and Golston, Jeremiah E., 5,560,030, Cl. 395-800.000.

Reber, James K.; and Reber, Jill A. Method and apparatus for cutting pieces of cloth for use in quilts or the like. 5,557,996, Cl. 83-56.000.

Reber, Jill A.: *See—*
Reber, James K.; and Reber, Jill A., 5,557,996, Cl. 83-56.000.

Recot, Inc.: *See—*
Henson, William D.; and Rice, Stephen L., 5,558,894, Cl. 426-498.000.

Recra Environmental, Inc.: *See—*
Gardner-Clayson, Thomas; and Filey, Patrick J., 5,558,755, Cl. 205-753.000.

Rector, Horst D. Method for laying down threads. 5,558,738, Cl. 156-175.000.

Reddy, Chitranjan N.: *See—*
Stephens, Michael C., Jr.; Reddy, Chitranjan N.; and Poteet, Kenneth A., 5,559,752, Cl. 365-233.000.

Reddy, Hari N.: *See—*
Manthuruthil, George C.; Parikh, Shrikant N.; and Reddy, Hari N., 5,560,026, Cl. 395-800.000.

Reed, Morton W., to Milliken Research Corporation. Method and apparatus for determining directional variation of shade of pile and napped materials. 5,559,605, Cl. 356-402.000.

Reed, Thomas F.: *See—*
Belmont, James A.; and Reed, Thomas F., 5,559,169, Cl. 523-215.000.

Rees, David, to Cypress Semiconductor. Output buffer with variable output impedance. 5,559,447, Cl. 326-30.000.

Reese, Cecil E.: *See—*
Hansen, Steven M.; Howell, James M.; and Reese, Cecil E., 5,559,205, Cl. 528-279.000.

Reeves, Christopher D.: *See—*
Conder, Michael J.; McAda, Phyllis C.; Rambosek, John A.; and Reeves, Christopher D., 5,559,005, Cl. 435-47.000.

Reflexite Corporation: *See—*
Bernard, Gus; Nilsen, Robert B.; and Hanrahan, Michael J., 5,558,740, Cl. 156-231.000.

Regents, University of California: *See—*
Doeff, Marca M.; Peng, Marcus Y.; Ma, Yanping; Visco, Steven J.; and DeJonghe, Lutgard C., 5,558,961, Cl. 429-224.000.
Leung, Ka-Ngo, 5,558,718, Cl. 118-723.00E.

Reheis, Inc.: *See—*
Rubino, Andrew M.; and Siciliano, Arthur A., 5,558,858, Cl. 424-68.000.

Rehfuss, John W.: *See—*
McGee, John D.; Bammel, Brian D.; and Rehfuss, John W., 5,559,195, Cl. 525-383.000.

Reichert, Cory A. Detachable motorcycle passenger seat and/or luggage rack. 5,558,260, Cl. 224-413.000.

Reichert, Veronica R.: *See—*
Venugopal, Ganesh; Reichert, Veronica R.; and Zhang, Jinshan, 5,558,959, Cl. 429-19.200.

Reid, Gary L.: *See—*
Koethe, Terence L.; Wilson, Richard M.; and Reid, Gary L., 5,558,303, Cl. 244-134.00R.

Reid, Jeffrey D.: *See—*
McKay, Albert A.; Pasek, Stanley J.; Porteous, David A.; Reid, Jeffrey D.; Scott, Trevor A.; Smith, Eric G.; Stahmer, Ulf; and Digweed, W. Thomas, 5,559,281, Cl. 73-39.000.

Reid, Ray D.: *See—*
Hug, William F.; and Reid, Ray D., 5,558,884, Cl. 425-174.400.

Reimer, James A.; and Reinsch, Roger A., to International Business Machine Corporation. Computer program product and program storage device for linking and presenting movies with their underlying source information. 5,559,949, Cl. 395-161.000.

Reiner, Richard A.; and Swedowski, John E., to Eaton Corporation. Load center door hinge element. 5,557,828, Cl. 16-257.000.

Reinhardt, Udo: *See—*
Röder, Ulrich; Wilhelm, Sigurd; Hehn, Werner; Hammerl, Uwe; Greiner, Doris; Hentschke, Wolfgang; and Reinhardt, Udo, 5,558,593, Cl. 475-331.000.

Reinhold, Steve U.: *See—*
Anderson, Duwayne R.; Reinhold, Steve U.; Twigg, Lorimer L.; and Marineau, Mark D., 5,559,909, Cl. 385-16.000.

Reinsch, Roger A.: *See—*
Reimer, James A.; and Reinsch, Roger A., 5,559,949, Cl. 395-161.000.

Reinthal, Peter: *See—*
Berger, Bernd; Reinthal, Peter; and Benfer, Manfred, 5,558,017, Cl. 100-93.0RP.

Reisinger, Jason M.: *See—*
Sarkady, Michael D.; Reisinger, Jason M.; Pauza, William V.; Fetterolf, James R., Sr.; and Connell, James E., Jr., 5,558,534, Cl. 439-352.000.

Reltec Corporation: *See—*
Butcher, Jerry L.; and Lee, Harold E., 5,559,487, Cl. 336-178.000.

Remboski, Donald J., Jr.: *See—*
McClish, Michael A.; Plee, Steven L.; Remboski, Donald J., Jr.; Lynch, Marvin L.; and Sonday, Susan K., 5,559,705, Cl. 364-431.070.

Remer, Lucius; Schoenenborn, Joerg; and Gilbert, Manfred, to Leica Mikroskopie und Systeme GmbH. Method and apparatus for controlling the brightness and/or color temperature of a microscope illumination system. 5,559,631, Cl. 359-385.000.

Renger, Herman L., to Pacesetter, Inc. Thermopile flow sensor. 5,557,967, Cl. 73-204.240.

Repp, Timothy: *See—*
Staubitz, Robert; and Repp, Timothy, 5,558,219, Cl. 206-308.100.

Repphun, William; Wong, Walter; Yates, Robert E.; Johnson, Gregg; and West, Terence Lubricated disk drive. 5,559,650, Cl. 360-97.020.

Resch, Ludwig: *See—*
Vetter, Gerhard; and Resch, Ludwig, 5,557,862, Cl. 34-618.000.

Resch, Reinhard, to Mercedes-Benz AG. Brake-pressure control device having rear-axle brake circuit self-priming recirculation pump. 5,558,413, Cl. 303-115.300.

Research In Motion Limited: *See—*
Mousseau, Gary P.; Lazaridis, Mihal; Little, Herb A.; and Barnstijn, Michael A., 5,559,800, Cl. 370-85.130.

Respironics, Inc.: *See—*
Lordo, Richard J., 5,558,371, Cl. 285-114.000.

Ressl, Charles T., to UOP. Catalyst regeneration procedure using net gas equipment. 5,558,767, Cl. 208-105.000.

Retro-Specs Ltd.: *See—*
Knight, Kevin D.; Knight, Graham A.; and Knight, Colin D., 5,559,282, Cl. 73-40.000.

Rettew, Richard R.; Almashy, Richard T.; and Lett, Scott F., to Square D Company. Method for making laminate with U. V. cured polymer coating. 5,558,735, Cl. 156-275.500.

Rex-Rosenlew International Incorporated: *See—*
Warr, Charles J., 5,558,438, Cl. 383-10.000.

Reyes, Adolfo C. Microwave integrated circuit passive element structure and method for reducing signal propagation losses. 5,559,359, Cl. 257-453.000.

Reyes, Edito: *See—*
Prada, Ricardo; Galiasso, Robert T.; Romero, Yilda; Reyes, Edito; and Rodriguez, Edilberto, 5,558,766, Cl. 208-59.000.

Reynard, Michael. Fiber optic sleeve for surgical instruments. 5,558,669, Cl. 606-15.000.

Reyner, Mark: *See—*
Rosenwinkel, Donald; and Reyner, Mark, 5,558,105, Cl. 132-212.000.

Reynolds, Randy J.: *See—*
Gohara, Wadie F.; Watson, George B.; Reynolds, Randy J.; and Strock, Thomas W., 5,558,818, Cl. 261-17.000.

Reynolds, Richard A.: *See—*
Cala, Francis R.; and Reynolds, Richard A., 5,558,109, Cl. 134-42.000.

Rheinmetall GmbH: *See—*
Schweiger, Raimund; Scholles, Herbert; Orth, Hans; and Lips, Hendrik, 5,559,304, Cl. 102-501.000.

Rheox, Inc.: *See—*
Kemnetz, Steven; and Cody, Charles A., 5,558,777, Cl. 210-691.000.

Rhone Meneux: *See—*
Ross, Louis J. N.; Scott, Simon D.; and Binns, Matthew M., 5,558,860, Cl. 424-93.200.

Rhone-Poulenc Agrochimie: *See—*
Leroux, Bernard; Pelissier, Bernard; and Lebrun, Michel, 5,559,024, Cl. 435-252.300.

Rice, Janet A.: *See—*
Falco, Saverio C.; Keeler, Sharon J.; and Rice, Janet A., 5,559,223, Cl. 536-23.100.

Rice, Ronald J.: *See—*
Hartman, Frederick A.; Rice, Ronald J.; Burckett-St. Laurent, James C. T. R.; Taylor, Lucille F.; and Haeggberg, Donna J., 5,559,089, Cl. 510-224.000.

Rice, Stephen L.: *See—*
Henson, William D.; and Rice, Stephen L., 5,558,894, Cl. 426-498.000.

Rich-Mar Corporation: *See—*
Cody, G. Lee, 5,558,623, Cl. 601-2.000.

Rich, Ronald J.: *See—*
Elliott, Bob; Katariya, Devinder N.; Minnick, Robert G.; Peralta, Rita A.; Rich, Ronald J.; Voron, Daniel M.; and Cave, Michael J., 5,558,500, Cl. 416-220.00R.

Richard Wolf GmbH: *See—*
Heckele, Helmut; Dingler, Andreas; and Falk, Ernst, 5,558,620, Cl. 600-208.000.

Richards, David T.; McCartney, Phillip D.; and Casper, Billy J., to Guilford Mills, Inc. Warp knitted plush fabric resistant to pile pull-through. 5,557,950, Cl. 66-194.000.

Richards, Mark R.: *See—*
Noel, John R.; and Richards, Mark R., 5,558,832, Cl. 264-510.000.

Richards, Michael F., to Landis & Gyr, Inc. Thermally isolated room temperature sensing apparatus. 5,558,436, Cl. 374-208.000.

Richardson, Miles: *See—*
Cyr, Clark R.; Kimmich, Jon B.; Brewer, Timothy T.; Hanson, Jeffrey S.; Richardson, Miles; Robertson, Kenneth R.; Jenkins, Cheryl; Diaz, Brenda L.; Pierce, John G.; and Lee, Gregory, 5,559,943, Cl. 395-155.000.

Richert, John D.: *See—*
Armstrong, John T.; and Richert, John D., 5,559,828, Cl. 375-200.000.

Richter, Edward B.: *See—*
Merz, Gary E.; Richter, Edward B.; Sanford, Robert W.; and Magliocco, Jack, 5,558,831, Cl. 264-492.000.

Ricoh Company, Ltd.: *See—*
Arai, Makoto; Sohmiya, Norimasa; Konja, Masakuni; and Takano, Satoshi, 5,559,590, Cl. 355-271.000.
Yoshinaga, Hiroshi; and Sawada, Akira, 5,559,593, Cl. 355-296.000.

Riedberger, Reto: *See—*
Ehrle, Bruno; Herzog, Rolf; Mosmann, Andreas; Riedberger, Reto; and Weber, Alfred, 5,558,142, Cl. 144-230.000.

Rieke, August: *See—*
Li, Jiewen; Rieke, August; Day, Billy N.; and Prather, Randall S., 5,558,636, Cl. 604-49.000.

Rieter Ingolstadt Spinnereimaschinenbau AG: *See—*
Messmer, Susanne; and Müller, Josef, 5,557,916, Cl. 57-261.000.

Rigollier, Pascal: *See—*
Göschke, Richard; Maibaum, Jürgen K.; Schilling, Walter; Stutz, Stefan; Rigollier, Pascal; Yamaguchi, Yasuchika; Cohen, Nissim C.; and Herold, Peter, 5,559,111, Cl. 514-227.500.

Rikiishi, Hidemi: *See—*
Kumagai, Katsuo; Rikiishi, Hidemi; Tamura, Keiji; Sugawara, Shunji; Nemoto, Eiji; Okamoto, Shigefumi; and Onta, Tokio, 5,559,211, Cl. 530-350.000.

Ringgenberg, Paul: *See—*
Manke, Kevin R.; and Ringgenberg, Paul, 5,558,162, Cl. 166-319.000.

Rintel, Ian: *See—*
Lubliner, David J.; Dhaliwal, Jaskaran; Gidney, John; Gore, Gerald E.; Greenfeder, Jack J.; Greenfeld, Joshua; Hinton, Melvin C.; McHugh, William; Parsio, Anthony; Rintel, Ian; Roman, Harry T.; and Vogelaar, Jake, 5,559,894, Cl. 382-100.000.

Risch, Lothar; Vogelsang, Thomas; Hofmann, Franz; and Hofmann, Karl, to Siemens Aktiengesellschaft. Integrated circuit structure having at least one CMOS-NAND gate and method for the manufacture thereof. 5,559,353, Cl. 257-334.000.

Riser, Andrew P.: *See—*
Forkner, John F.; Riser, Andrew P.; Rykowski, Ronald F.; and Wilson, Stephen S., 5,559,911, Cl. 385-33.000.

Riso Kagaku Corporation: *See—*
Kawai, Muneaki; and Oyama, Koichi, 5,558,019, Cl. 101-116.000.
Watanabe, Hideo; and Okuda, Sadanao, 5,559,074, Cl. 428-447.000.

Rittenburg, James H.: *See—*
Petersen, Frank P.; Clymer, Mark D.; Miller, Sally A.; Rittenburg, James H.; and Grothaus, G. David, 5,558,997, Cl. 435-7.310.

Ritvaniemi, Pertti: *See—*
Prockop, Darwin J.; Ala-Kokko, Leena; and Ritvaniemi, Pertti, 5,558,988, Cl. 435-6.000.

River Medical, Inc.: *See—*
Sancoff, Gregory E.; Doyle, Mark C.; and Field, Frederic P., 5,558,255, Cl. 222-189.060.

Riverwood International Corporation: *See—*
Fogle, James C., 5,558,224, Cl. 206-427.000.
Moncrief, Frank; Bacco, David R.; McNamara, Charles; Smith, Dwight L.; and Ford, Colin, 5,558,489, Cl. 414-793.700.
Sutherland, Robert L., 5,558,212, Cl. 206-147.000.
Sutherland, Robert L., 5,558,213, Cl. 206-147.000.

Robbins, Keith J.; Williamson, Michael; and Broadwell, Andrew R., to Lucas Industries, Public Limited Company. Hydraulic boosters for vehicle hydraulic systems. 5,558,002, Cl. 91-378.000.

Robelen, David B., to United States of America, National Aeronautics and Space Administration. Vapor generator wand. 5,559,923, Cl. 392-397.000.

Robert Bosch GmbH: *See—*
Dobler, Klaus; Nguyen-Schaefer, Thanh-Hung; and Huebel, Michael, 5,558,490, Cl. 415-55.100.
Haubner, Georg, 5,559,499, Cl. 340-636.000.
Hess, Werner; and Zhang, Hong, 5,558,178, Cl. 180-197.000.
Liedtke, Frieder, 5,559,679, Cl. 362-61.000.
Meinders, Horst, 5,559,661, Cl. 361-93.000.
Odendahl, Alfred; Sigg, Horst; Neubert, Heinz; and Meyen, Hans-Peter, 5,558,478, Cl. 408-226.000.

Schmidt, Hauke, 5,559,899, Cl. 382-224.000.

Schneider, Thomas, 5,559,454, Cl. 327-4.000.

Bors, Daniel A.; Lavoie, Alvin C.; and Emmons, William D., 5,559,192, Cl. 525-300.000.

Rothe, Karl; Lehnig, Frank; and Klemme, Heiko, to Wilhelm Karmann GmbH. Retractable folding top for a convertible. 5,558,389, Cl. 296-

Olofsson, Niclas; Rydberg, Anders; and Hallenstvedt, Oddbjörn, 5,558,548, Cl. 440-66.000.

Schmidt, Hauke, 5,559,899, Cl. 382-224.000.
Schneider, Thomas, 5,559,454, Cl. 327-4.000.
Zabler, Erich; Uhler, Werner; Baumann, Andreas; Eicher, Joachim; and Peters, Ralf-Peter, 5,559,309, Cl. 200-61.45R.

Roberts, Walden K.; Selitrennikoff, Claude P.; Laue, Bridget E.; and Potter, Sharon L., to Ciba-Geigy Corporation. Synergistic antifungal protein and compositions containing same. 5,559,034, Cl. 435-320.100.

Robertson, Alan L.: *See*—
Connors, Paul A.; and Robertson, Alan L., 5,559,980, Cl. 395-427.000.

Robertson, John C.: *See*—
Green, David T.; Bolanos, Henry; Ratcliff, Keith; Heaton, Lisa W.; and Robertson, John C., 5,558,266, Cl. 227-178.100.

Robertson, Kenneth R.: *See*—
Cyr, Clark R.; Kimmich, Jon B.; Brewer, Timothy T.; Hanson, Jeffrey S.; Richardson, Miles; Robertson, Kenneth R., Jenkins, Cheryl; Diaz, Brenda L.; Pierce, John G.; and Lee, Gregory, 5,559,943, Cl. 395-155.000.

Robins, Charles: *See*—
Jenkins, Scott A.; Wasyl, Joseph; and Robins, Charles, 5,558,460, Cl. 405-29.000.

Robinson, David C.; and Emery, Nicholas W., to Digital Equipment Corporation. Communication systems. 5,559,802, Cl. 370-94.100.

Robinson, Edward: *See*—
Grohman, Craig C.; Robinson, Edward; and Barton, Bob L., 5,558,080, Cl. 126-299.00D.

Robinson, Jerry H., to Wellcutter, Inc. Radial cutting tools for cutting thick-walled tubular members. 5,557,995, Cl. 82-113.000.

Robinson, Lonnie R., to Lindemann Recycling Equipment, Inc. Method and apparatus for baling loose materials. 5,558,014, Cl. 100-35.000.

Robison, George D. Rechargeable battery system and method and metal-air electrochemical cell for use therein. 5,558,947, Cl. 429-13.000.

Roch, Jean: *See*—
Ruchat, Rene; Planche, Bernard; and Roch, Jean, 5,557,888, Cl. 49-362.000.

Roche, Alain, to GEC Alsthom Transport SA. Method of insulating a magnetic lamination. 5,558,724, Cl. 148-113.000.

Roche, Karen M., to Innovative Surgical Devices Corporation. Devices and methods for bone/tissue preparation. 5,558,646, Cl. 604-143.000.

Roche, Mortimer P. Golf tee platform. 5,558,334, Cl. 473-279.000.

Roche, Robert P.: *See*—
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Klimek, John R.; and Weiss, David, 5,559,964, Cl. 395-280.000.

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Glocker, David A.; and Romach, Mark M., 5,558,843, Cl. 422-186.050.

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Sherrod, Earle H.; LeMahieu, Lynn K.; and Rooyakkers, John A., 5,558,659, Cl. 604-385.200.
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Beck, John P., 5,558,888, Cl. 425-549.000.

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Lenz, Gary A.; Brown, Gregory C.; and Warrior, Jogesh, 5,558,115, Cl. 137-86.000.

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Hakimi, John; Kilian, Patricia; and Rosen, Perry, 5,559,213, Cl. 530-351.000.

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Sessler, Jonathan L.; Smith, Daniel A.; Miller, Richard A.; Ross, Kevin L.; Wright, Meredith; Dow, William C.; Král, Vladimir A.; Iverson, Brent; and Magda, Darren, 5,559,207, Cl. 530-300.000.

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Jaegge, Walter J.; Malone, Francis J., Jr.; Overton, Frank H.; Ross, Roger A.; and Steele, Ronald E., 5,558,826, Cl. 264-103.000.

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Markusch, Peter H.; and Rosthauser, James W., 5,558,917, Cl. 428-95.000.

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Holcombe, Michael W.; Rothers, David E.; Owens, Steve C.; Henderson, William D.; and Doane, James C., 5,558,153, Cl. 166-373.000.

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Zabron, Florian S.; Rothman, Miles S.; and Kazial, Walter M., 5,558,207, Cl. 198-847.000.

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Kulagowski, Janusz J.; Leeson, Paul D.; Mawer, Ian M.; and Rowley, Michael, 5,559,125, Cl. 514-312.000.

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Powers, Ervin T., Jr.; and Rudisill, Edgar N., 5,558,830, Cl. 264-441.000.

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Greive, Martin; and Ruf, Bernd, 5,558,321, Cl. 271-98.000.

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Clark, Peter D.; Gilbert, John A.; Ott, Gunther; Ruhl, Dieter; Santure, David J.; Heimann, Ulrich; and Cibura, Klaus, 5,559,174, Cl. 523-428.000.

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Adorante, Joseph S.; WoldeMussie, Elizabeth; and Ruiz, Guadalupe, 5,559,151, Cl. 514-567.000.

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Webster, Marc W.; Rulli, Paul A.; Farrell, Michael E.; and McDaniel, Gene A., 5,559,606, Cl. 358-296.000.

Rupright, Heike: *See*—
Ohms, Franz; and Rupright, Heike, 5,559,684, Cl. 363-25.000.

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Albini, Giovanni; Ruscitti, Tommaso; and Carlappi, Franco, 5,558,258, Cl. 222-496.000.

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Dannheim, Jörg; and Russ, Werner H., 5,559,215, Cl. 534-573.000.

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DeRosa, Thomas F.; Russo, Joseph M.; Kaufman, Benjamin J.; and Mastropierro, Joseph T., 5,558,684, Cl. 44-419.000.
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Melas, Constantin M.; Patel, Arvind M.; Rutledge, Robert A.; and So, Bum S., 5,559,840, Cl. 375-355.000.

Ryan, Joseph W., to Cerdec Corporation. Lead-free glass frits for ceramics enamels. 5,559,059, Cl. 501-26.000.

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Olofsson, Niclas; Rydberg, Anders; and Hallenstvedt, Oddbjörn, 5,558,548, Cl. 440-66.000.

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Forkner, John F.; Riser, Andrew P.; Rykowski, Ronald F.; and Wilson, Stephen S., 5,559,911, Cl. 385-33.000.

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Hashii, Toshimitsu; and Everts, Robert G., 5,558,566, Cl. 451-157.000.

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Succi, Marco; and Lorimer, D'Arcy, 5,558,844, Cl. 423-230.000.

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Fix, John W., Jr., 5,558,265, Cl. 228-2.300.

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Brennan, Daniel, 5,558,312, Cl. 256-65.000.

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Jayant, Nuggehally S.; and Safranek, Robert J., 5,559,900, Cl. 382-248.000.

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Loustau, Marie-Thérèse; Verhoog, Roelof; and Precigout, Claude, 5,558,681, Cl. 29-623.400.

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Kim, Young R.; Yee, Michael W.; Mehta, Suresh N.; Sagala, Josefino C.; and Kantor, Johanna, 5,559,037, Cl. 436-63.000.

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Abe, Yoshiharu; Sagane, Toshihiro; and Toyota, Akinori, 5,559,199, Cl. 526-160.000.

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Zscheile, John W., Jr.; Wilson, Michael L.; Saggio, Richard J.; and Lundquist, Alan E., 5,559,788, Cl. 370-18.000.

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Delecki, Daniel J.; Saha, Ashis K.; and Snow, Robert A., 5,559,214, Cl. 534-10.000.

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Jain, Ajay; Sahni, Paramdeep S.; and Gupta, Alok K., 5,559,888, Cl. 380-25.000.

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Dosaka, Katsumi; Kumanoya, Masaki; Hayano, Kouji; Yamazaki, Akira; Iwamoto, Hisashi; Abe, Hideaki; Konishi, Yasuhiro; Himukashi, Katsumitsu; Ishizuka, Yasuhiro; and Saiki, Tsukasa, 5,559,750, Cl. 365-230.060.

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Noguchi, Yukihiko; Haruta, Keitoshi; Sakamoto, Isamu; Yamanaka, Mituo; Uchinono, Makoto; and Shiohara, Takashi, 5,558,559, Cl. 451-14.000.

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Tanaka, Tomio; and Sakamoto, Katsuhito, 5,559,620, Cl. 359-78.000.

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Ohta, Susumu; Ohkawa, Katsumi; and Sakamoto, Noriaki, 5,559,374, Cl. 257-723.000.

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Miyanaka, Hiroshi; Sakimori, Hideharu; and Uotani, Yuzo, 5,557,834, Cl. 29-407.050.

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Sakurai, Atsushi, to Murata Manufacturing Co., Ltd. Electrode forming method for surface acoustic wave device. 5,558,711, Cl. 117-84.000.

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Johnson, Richard A.; Engel, Joseph C.; Saletta, Gary F., and Shimp, Alan B., 5,559,719, Cl. 364-483.000.

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Cricchi, James R.; Potyraj, Paul A., and Salib, Mike L., 5,559,349, Cl. 257-273.000.

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Arduin, Joël; and Le Masson, Jacques, 5,558,353, Cl. 280-602.000.
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Sam, Homayoon: *See*—
Blaker, David M.; Diamondstein, Marc S.; Ellard, Gregory S.; Mobin, Mohammad S.; Sam, Homayoon, and Thierbach, Mark E., 5,559,837, Cl. 375-341.000.

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Corbin, David R.; Greenplate, John T.; Jennings, Michael G.; Purcell, John P.; and Sammons, Robert D., 5,558,862, Cl. 424-94.400.

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Cho, Whan H., 5,558,796, Cl. 219-702.000.
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Kim, Sang U.; and Bang, Suk, 5,557,942, Cl. 62-288.000.
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Mun, Kug H., 5,557,850, Cl. 30-43.920.
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Sanchez-Sinencio, Feliciano: *See*—
Martinez-Bustos, Fernando; De Dios Figueroa C., Juan; Sanchez-Sinencio, Feliciano; Gonzalez-Hernandez, Jesus; De La Luz Martinez, Jose; and Ruiz-Torres, Maximiano, 5,558,886, Cl. 425-376.100.

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Sander, Vera: *See*—
Hahn, Wilfried; Herrman, Hubert; Kiesser, Torsten; and Sander, Vera, 5,558,812, Cl. 510-321.000.

Sanders, Nicholas A.: *See*—
Couch, Richard W., Jr.; Sanders, Nicholas A.; Lu, Zhipeng; Luo, Lifeng; and Stenfelt, Staffan C. O., 5,558,786, Cl. 219-121.440.

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Sandvik AB: *See*—
Hakansson, Bjorn; Von Holst, Peder; and Oskarsson, Rolf, 5,558,475, Cl. 407-54.000.

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Cohee, Donald R., Sandy, Charles; Martz, Pete; Clougherty, M. James; and Pauly, Robert, 5,558,131, Cl. 138-93.000.

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Sanford, Robert W.: *See*—
Merz, Gary E.; Richter, Edward B.; Sanford, Robert W.; and Magliocco, Jack, 5,558,831, Cl. 264-492.000.

Sankko Company, Limited: *See*—
Nakamura, Norio; Ohkawa, Nobuyuki; Oshima, Takeshi; Miyamoto, Masaaki; and Iijima, Yasuteru, 5,559,109, Cl. 514-218.000.

Sanner, Todd; Kightlinger, Adrian P.; and Davis, J. Reagan, to Grain Processing Corporation. Borate-starch compositions for use in oil field and other industrial applications. 5,559,082, Cl. 507-273.000.

Sano, Akinori: *See*—
Tate, Takuo; Takagi, Nobuyoshi; Kobayashi, Tsunekazu; and Sano, Akinori, 5,558,926, Cl. 428-193.000.

Sano, Kunio, to Tokyo Electron Kabushiki Kaisha, and Tokyo Electron Yamanashi Kabushiki Kaisha. Probing method and device. 5,559,446, Cl. 324-760.000.

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Ueda, Kunihiko; Arakane, Shuko; Sano, Takao, and Maeda, Yuhei, 5,558,825, Cl. 264-103.000.

Sanofi: *See*—
Bernhart, Claude; Breliere, Jean-Claude; Clement, Jacques; Nisato, Dino; Perreault, Pierre; Muneaux, Claude; and Muneaux, Yvette, 5,559,233, Cl. 544-321.000.
Guzzi, Umberto; Palmieri, Costantino; and Croci, Tiziano, 5,559,238, Cl. 546-314.000.

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Nakase, Ryoichi; and Suganuma, Noboru, 5,558,456, Cl. 403-359.000.
Nakase, Ryoichi; and Nanami, Masayoshi, 5,558,549, Cl. 440-88.000.
Ogino, Hiroshi, 5,558,498, Cl. 416-129.000.

Santa Barbara Research Center: *See*—
Kosai, Kenneth; Wilson, Jerry A.; and Baumgratz, Bonnie A., 5,559,336, Cl. 250-370.130.

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Castro, Jaoquin H.; Owen, Samuel S.; and Santangelo, Salvatore, 5,557,928, Cl. 60-260.000.

Santen Pharmaceutical Co., LTD.: *See*—
Kawashima, Yoichi; and Kuwano, Mitsuaki, 5,559,157, Cl. 514-777.000.

Santhosh-Kumar, Cheruppolil R.: *See*—
Kolhouse, J. Fred; Santhosh-Kumar, Cheruppolil R.; and Deutsch, John C., 5,559,038, Cl. 436-86.000.

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König, Axel, 5,558,821, Cl. 264-13.000.

Santure, David J.: *See*—
Clark, Peter D.; Gilbert, John A., Ott, Gunther; Ruhl, Dieter; Santure, David J.; Heimann, Ulrich; and Cibura, Klaus, 5,559,174, Cl. 523-428.000.

Sanyo Electric Co., Ltd.: *See*—
Hirano, Yutaka; Komatubara, Takeo; Sunaga, Takashi; Takahashi, Yasuki; Tanaka, Kiyoshi; Akazawa, Kiyoshi; Watanabe, Masato; and Jikuhara, Seiki, 5,557,944, Cl. 62-469.000.
Mizukami, Kazuaki; Ogawa, Atsushi; Yasuda, Masashi; Furukawa, Masahiro; Arima, Hidetoshi; and Ozawa, Yoshio, 5,557,939, Cl. 62-148.000.
Ohta, Susumu; Ohkawa, Katsumi; and Sakamoto, Noriaki, 5,559,374, Cl. 257-723.000.
Shono, Masayuki; Hiroyama, Ryoji; and Yodoshi, Keiichi, 5,559,818, Cl. 372-45.000.
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Pudem, Roger, 5,558,759, Cl. 205-50.000.

Sarkady, Michael D.; Reisinger, Jason M.; Pauza, William V.; Fetterolf, James R., Sr.; and Connell, James E., Jr., to Whitaker Corporation, The. Self sacrificing latching system. 5,558,534, Cl. 439-352.000.

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Sarkar, Sandip: *See*—

Dogul, James; Sarkar, Sandip; Thomson, Frederick; and Thomson, Robert, 5,559,664, Cl. 361-191.000.

Sarma, Atul C., to Whip Mix Corporation. Refractory material. 5,559,063, Cl. 501-104.000.

Sarraf, David B.; and Miller, David L., to Thermacore, Inc.; and Pennsylvania State Research Foundation, Rapid response vapor source. 5,558,720, Cl. 118-726.000.

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Sasaki, Akihiro: *See*—
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Sasaki, Kouji; and Kaneda, Kazuji, to Furukawa Electric Co., Ltd., The. Method of successively winding an elongated member and an apparatus therefor. 5,558,296, Cl. 242-18.00A.

Sasaki, Masanori: *See*—
Yoshie, Takehiko; Sasaki, Masanori; Shibafuchi, Hiroshi; and Imai, Yasushi, 5,559,243, Cl. 548-263.800.

Sasaki, Nobuaki: *See*—
Matsumoto, Mansuke; Sasaki, Nobuaki; Sawano, Bunji; Hasegawa, Kiyoharu; and Kikkawa, Kazuyoshi, 5,559,247, Cl. 548-471.000.

Sasaki, Takanobu; and Hirata, Kazumi, to NSK Ltd. Retractor for seat belt. 5,558,294, Cl. 242-377.000.

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Ogawa, Hiroyuki; Hirata, Seiji; and Sasaki, Yoshizumi, 5,558,472, Cl. 106-12.000.

Sasaki, Yukihiko; Sartor, Luigi; Fu, Yun L.; and de Koning, Henk, to Avery Dennison Corporation. Primerless pressure-sensitive adhesive constructions. 5,558,913, Cl. 428-41.500.

Sasano, Hiroshi; Hamada, Koshi; and Kubota, Akihiko, to Matsushita Refrigeration Company. Reed-type discharge valve arrangement for a hermetic compressor. 5,558,508, Cl. 417-569.000.

Sasser, R. Garth, to Idaho Research Foundation, Inc. Use of a pregnancy specific protien as an immunosuppressive. 5,559,097, Cl. 514-21.000.

Sato, Eiji: *See*—
Tsuruoka, Yoshihisa; Hirakawa, Haruhisa; Okamoto, Yoshinari; and Sato, Eiji, 5,559,397, Cl. 313-496.000.

Sato, Jun, to Shimano Inc. Baitcasting reel having a removable spool. 5,558,290, Cl. 242-313.000.

Sato, Kazuhiko: *See*—
Adachi, Masao; Shioya, Makoto; Sato, Kazuhiko; and Ohkubo, Minoru, 5,558,596, Cl. 477-46.000.

Sato, Koki; *See*—
Oe, Naoki; Sato, Koki; and Tamura, Keiichi, 5,558,365, Cl. 280-731.000.

Sato, Masahiko, to Semiconductor Energy Laboratory Co., Ltd. Liquid crystal electro-optical device and manufacturing method for the same. 5,559,619, Cl. 359-75.000.

Sato, Michio: *See*—
Kami, Kuniaki; Adachi, Hideyuki; Umeyama, Kōichi; Kosaka, Yoshihiro; Yamaguchi, Seiji; Fuse, Eiichi; Sato, Michio; Nakamura, Masakazu; Tanaka, Yasundo; Fukaya, Takashi; Matsuno, Kiyotaka; and Suzuki, Katsuya, 5,558,619, Cl. 600-146.000.

Sato, Mitsuo, to Tohoku Ricoh Co., Ltd. Stencil perforating method, stencil perforating system, and stencil printing machine. 5,559,546, Cl. 347-200.000.

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Sato, Satsuo: *See*—
Toyoshima, Takeshi; Kawakami, Yo; Ishikawa, Hiroyasu; Abe, Takao; Satō, Satsuo; Noto, Nobuhiro; Kaneko, Tadahiro; Kaneta, Takayoshi; Kobayahsi, Juurou; and Kawanobe, Osamu, 5,558,571, Cl. 451-358.000.

Sato, Shougo, to Brother Kogyo Kabushiki Kaisha. Image forming apparatus with cooperating housing structure. 5,559,544, Cl. 347-127.000.

Sato, Susumu, to Nikon Corporation. Zoom lens system capable of correcting image position. 5,559,635, Cl. 359-689.000.

Satoh, Makoto: *See*—
Ohtani, Yasuo; Kataho, Takuo; Satoh, Makoto; Tanaka, Tsutomu; Nose, Yoshimasa; Kobayashi, Kazuyoshi; Uchikawa, Tetsuhide; and Hamahata, Toshihiro, 5,559,826, Cl. 373-109.000.

Satoh, Yoshio; Ikata, Osamu; Miyashita, Tsutomu; Matsuda, Takashi; and Takamatsu, Mitsuo, to Fujitsu Limited. Surface acoustic wave filter. 5,559,481, Cl. 333-143.000.

Sattelmayer, Thomas: *See*—
Chyou, Yau-Pin; Sattelmayer, Thomas; and Senior, Peter, 5,557,918, Cl. 60-39.040.

Sauder Woodworking Co.: *See*—
Lambright, Michael D.; and Krieger, Douglas P., 5,558,418, Cl. 312-321.500.

Sauerberg, Per; Olesen, Preben H.; and Mitch, Charles H., to Novo Nordisk A/S. Treatment of Alzheimer's disease using azacyclic compounds. 5,559,136, Cl. 514-340.000.

Sauerberg, Per; and Olesen, Preben H., to Novo Nordisk A/S. Method of Treating Glaucoma Using Oxadiazolyl or Thiadiazolyl Tetrahydropyridines. 5,559,138, Cl. 514-342.000.

Saunders, Anthony C.: *See*—
McCabe, Martin B.; and Saunders, Anthony C., 5,558,130, Cl. 138-89.000.

Saunders, David E.: *See*—
Gates, Peter S.; Jones, Graham P.; and Saunders, David E., 5,559,081, Cl. 504-242.000.

Saviano, Albert A.: *See*—
Pietrandrea, Samuel J.; and Saviano, Albert A., 5,557,874, Cl. 43-4.000.

Savkar, Sudhir D.: *See*—
Jenkins, Harold J.; Sundell, Robert E.; and Savkar, Sudhir D., 5,558,193, Cl. 192-45.000.

Savoca, Ann C. L.: *See*—
Klotz, Herbert C.; Lassila, Kevin R.; Listemann, Mark L.; Minnich, Kristen E.; and Savoca, Ann C. L., 5,559,161, Cl. 521-129.000.

Savonlinnan PR-Urakointi OY: *See*—
Räsänen, Pentti, 5,558,285, Cl. 241-273.000.

Sawada, Akira: *See*—
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Sawai, Tetsuro: *See*—
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Sawamura, Hitoshi, to Kabushiki Kaisha Komatsu Seisakusho. High speed and high load cylinder device. 5,558,000, Cl. 91-164.000.

Sawano, Bunji: *See*—
Matsumoto, Mansuke; Sasaki, Nobuaki; Sawano, Bunji; Hasegawa, Kiyoharu; and Kikkawa, Kazuyoshi, 5,559,247, Cl. 548-471.000.

Sawata, Ryuji: *See*—
Aruga, Hisashi; Takizawa, Keiji; Sawata, Ryuji; and Kobayashi, Takashi, 5,558,927, Cl. 428-195.000.

Sayant, Eric H. Waste water reuse system. 5,557,812, Cl. 4-665.000.

Sayka, Anthony; and Vargas, Patricia A., to VLSI Technology, Inc. Method for detecting contaminants carried by a fluid. 5,558,902, Cl. 427-8.000.

Scalora, Michael; Dowling, Jonathan P.; Bowden, Charles M.; and Bloemer, Mark J., to United States of America, Army. Photonic band edge optical diode. 5,559,825, Cl. 372-96.000.

Scalzi, Casper A.; and Starke, William J., to International Business Machines Corporation. Method of using a target processor to execute programs of a source architecture that uses multiple address spaces. 5,560,013, Cl. 395-700.000.

Scanlon, John F., to Auto-Air Composites, Inc. Integrated structural composite and ceramic flame barrier. 5,558,932, Cl. 428-229.000.

Schädeli, Ulrich; Münzel, Norbert; De Leo, Christoph; Holzwarth, Heinz; and Tinguely, Eric, to OCG Microelectronic Materials, Inc. Photoresist compositions containing copolymers having acid-labile groups and recurring units derived from either N-(hydroxymethyl)maleimide or N-(acetoxymethyl)maleimide or both. 5,558,978, Cl. 430-270.100.

Schaeff, Incorporated: *See*—
Avitan, Isaac; and Weihe, Robert C., 5,558,174, Cl. 180-60.000.

Schatka, Wilhelm; Seiger, Ralf; and Wieneke, Josef, to Hella KG Hueck & Co. Headlights for motor vehicles. 5,558,423, Cl. 362-61.000.

Schatz, Oskar, to Schatz Thermo System GmbH. Method and an assembly for operating sensible heat storages. 5,558,055, Cl. 123-142.50R.

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Schatz, Oskar, 5,558,055, Cl. 123-142.50R.

Schechter, Steven A.: *See*—
Dan, James R.; Caverley, Charles R.; Schechter, Steven A.; Seeley, Steven S.; Jameson, Chris A.; and Lee, David A., 5,559,671, Cl. 361-682.000.

Scheibel, Joerg L.: *See*—
Kullmann, Bernhard W.; Scheibel, Joerg L.; and Gottschalk, Werner, 5,558,184, Cl. 188-72.400.

Schemmann, Heinrich: *See*—
Rothermel, Karin; and Schemmann, Heinrich, 5,559,513, Cl. 341-61.000.

Scherer, Michael: *See*—
Mahler, Peter; Stang, Wolfgang; Scherer, Michael; and Gesche, Roland, 5,558,751, Cl. 204-298.260.

Schering Aktiengesellschaft: *See*—
Buchmann, Bernd; Skuballa, Werner; Heindl, Josef; Fröhlich, Wolfgang; Ekerdt, Roland; and Giesen, Claudia, 5,559,134, Cl. 514-336.000.

Schering Corporation: *See*—
Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Versace, Richard W.; Saksena, Anil K.; and Pinto, Patrick A., 5,559,133, Cl. 514-335.000.

Schiehser, Guy A.: *See*—
Nelson, Frances C.; and Schiehser, Guy A., 5,559,122, Cl. 514-291.000.

Schiffer, Alfred, to Dr. Boy GmbH. Control unit for an injection moulding machine. 5,559,531, Cl. 345-168.000.

Schifko, Herbert: *See*—
Classon, John A.; and Schifko, Herbert, 5,558,524, Cl. 439-92.000.

Schilling, Curtis L., Jr.: *See*—
Bowman, Mark P.; and Schilling, Curtis L., Jr., 5,559,264, Cl. 556-479.000.

Schilling, Norbert: *See*—
Mrotek, Edward N.; and Schilling, Norbert, 5,558,958, Cl. 429-146.000.

Schilling, Walter: *See*—
Göschke, Richard; Maibaum, Jürgen K.; Schilling, Walter; Stutz, Stefan; Rigollier, Pascal; Yamaguchi, Yasuchika; Cohen, Nissim C.; and Herold, Peter, 5,559,111, Cl. 514-227.500.

Schindler, Hermann: *See*—
Kroggel, Matthias; and Schindler, Hermann, 5,559,175, Cl. 524-297.000.
Schirlin, Daniel; Van Dorsselaer, Viviane; and Tarnus, Céline, to Merrell Pharmaceuticals Inc. Difluoro statone analogs. 5,559,140, Cl. 514-357.000.
Schlamadinger, Michael: *See*—
Bilek, Norbert; Porcham, Wolfgang; Schlamadinger, Michael; and Sprachmann, Gerold, 5,559,061, Cl. 501-69.000.
Schlenker, Michael: *See*—
Focke, Heinz; and Schlenker, Michael, 5,558,743, Cl. 156-352.000.
Schlichting, Grayson C.: *See*—
Harper, Leroy D.; Schlichting, Grayson C.; Hooks, Douglas A.; Cullimore, Ian H. S.; Bradshaw, Gavin A.; Banerjee, Biswa R.; Fairbanks, John P.; and Stone, Roderick W., 5,560,024, Cl. 395-750.000.
Schlumberger Industries, Inc.: *See*—
Brunson, Charles P., IV; and Swinson, Thierry W., 5,559,289, Cl. 73-275.000.
Schmid, Gérard: *See*—
Ackermann, Jean; Banner, David; Gubernator, Klaus; Hilpert, Kurt; and Schmid, Gérard, 5,559,232, Cl. 544-121.000.
Schmidt, Hauke, to Robert Bosch GmbH. Method for the adaptive quantization of a range of input values. 5,559,899, Cl. 382-224.000.
Schmidt, Heidi A.: *See*—
Lawless, Brian P.; Schmidt, Heidi A.; Winchester, Gary G.; and Woode, Kenneth E., 5,558,891, Cl. 426-129.000.
Schmidt, Michael B., to General Motors Corporation. Two-mode, compound-split, electro-mechanical vehicular transmission. 5,558,589, Cl. 475-5.000.
Schmidt, Michael R., to General Motors Corporation. Two-mode, input-split, parallel, hybrid transmission. 5,558,588, Cl. 475-5.000.
Schmidt, Michael R.; and Klemen, Donald, to General Motors Corporation. One-mode, input-split, parallel, hybrid transmission. 5,558,595, Cl. 477-3.000.
Schmidt, William: *See*—
Nilsen, Kelvin D.; and Schmidt, William, 5,560,003, Cl. 395-600.000.
Schmitt, Kenneth C.: *See*—
Anderson, Michael B.; and Schmitt, Kenneth C., 5,559,473, Cl. 331-34.000.
Schmitt, Martina: *See*—
Steigerwald, Franz; Schmitt, Martina; and Bock, Gabriele, 5,558,215, Cl. 206-222.000.
Schmitt, Thomas, to Siemens Aktiengesellschaft. X-ray diagnostic installation having a scattered radiation grid moveable in a plane. 5,559,851, Cl. 378-155.000.
Schmitz, Albert: *See*—
Suri, Bruno; and Schmitz, Albert, 5,559,007, Cl. 435-69.100.
Schnatbaum, Frank; and Melber, Albrecht, to ALD Vacuum Technologies GmbH. Process for carburizing workpieces by means of a pulsed plasma discharge. 5,558,725, Cl. 148-222.000.
Schneider, Ernest, to Breitling S. A. Wristwatch with high-frequency transmitter. 5,559,760, Cl. 368-10.000.
Schneider, Georg: *See*—
Erhard, Helmut; and Schneider, Georg, 5,558,021, Cl. 101-232.000.
Schneider, Martin V.: *See*—
Evans, James G.; Schneider, Martin V.; and Wilson, Robert W., 5,559,521, Cl. 343-700.0MS.
Schneider, Thomas, to Robert Bosch GmbH. Circuit arrangement for signal processing for inductivity using sensor. 5,559,454, Cl. 327-4.000.
Schneidmiller, Rodney G., to Sterling International, Inc. Yellow jacket trap. 5,557,880, Cl. 43-122.000.
Schnelker, David E.: *See*—
Olney, Ross D.; Schnelker, David E.; and Griffin, William S., 5,558,730, Cl. 152-418.000.
Schoen, Robert M.; and Thurk, Gregory E., to Chrysler Corporation. Vehicle multi-link hinge flush positioning arrangement. 5,557,829, Cl. 16-375.000.
Schoenenborn, Joerg: *See*—
Remer, Lucius; Schoenenborn, Joerg; and Gilbert, Manfred, 5,559,631, Cl. 359-385.000.
Schoenwald, David S., to Apple Computer, Inc. Flyback switching power supply with bootstrapped gate drive. 5,559,683, Cl. 363-21.000.
Schoettle, Klaus; Borck, Gerald-Wolfgang; and Wollensack, Heinrich, to BASF Magnetics GmbH. Protective covering for articles, in particular of rectangular parallelepiped form. 5,558,275, Cl. 229-125.370.
Scholl, Thomas; Bier, Peter; and Nising, Wolfgang, to Bayer Aktiengesellschaft. Coated polycarbonate moldings. 5,558,938, Cl. 428-412.000.
Scholles, Herbert: *See*—
Schweiger, Raimund; Scholles, Herbert; Orth, Hans; and Lips, Hendrik, 5,559,304, Cl. 102-501.000.
Scholz, Wolfgang: *See*—
Schwark, Jan-Robert; Lang, Hans-Jochen; Kleemann, Heinz-Werner; Weichert, Andreas; Scholz, Wolfgang; and Albus, Udo, 5,559,153, Cl. 514-597.000.
Schoneborn, Axel: *See*—
Bolt, Heinz; Walser, Franz; and Schoneborn, Axel, 5,557,923, Cl. 60-274.000.
Schoner, Brigitte E.: *See*—
Basinski, Margret B.; DiMarchi, Richard D.; Heath, William F., Jr.; and Schoner, Brigitte E., 5,559,208, Cl. 530-317.000.
Schoppe, Fritz; and Prötler, Josef, to Dr.-Ing. Fritz Schoppe. Fire-tube boiler. 5,558,046, Cl. 122-367.100.
Schreiber, Alex: *See*—
Zhao, Jun; Cho, Tom; Dornfest, Charles; Wolff, Stefan; Fairbairn, Kevin; Guo, Xin S; Schreiber, Alex; and White, John M., 5,558,717, Cl. 118-715.000.
Schreier, John: *See*—
Hauser, Ray; Smothers, Daryl; and Schreier, John, 5,557,931, Cl. 60-455.000.
Schreiner, Joel M.: *See*—
Sanderson, Leon F.; and Schreiner, Joel M., 5,557,911, Cl. 56-41.000.
Schröder, Burkhard: *See*—
Hemmis, Ludger; Overberg, Matthias; and Schröder, Burkhard, 5,558,390, Cl. 296-146.140.
Schroeder, Robert E.: *See*—
Barzegar, Farhad; Gerszberg, Irwin; McGowan, Martin J., III; and Schroeder, Robert E., 5,559,520, Cl. 342-357.000.
Schroeppel, Joerg: *See*—
Buchold, Henning; Boensch, Rudolf; and Schroeppel, Joerg, 5,558,781, Cl. 210-805.000.
Schroer, Charles F., Jr.: *See*—
Jezzi, Arrigo D.; Schroer, Charles F., Jr.; Gephart, Caroline; and Biesterveld, Daniel D., 5,558,655, Cl. 604-378.000.
Schubert, Reinhard: *See*—
Kranz, Klaus; and Schubert, Reinhard, 5,557,897, Cl. 52-410.000.
Schuele, Paul J.: *See*—
Figura, Thomas A.; and Schuele, Paul J., 5,559,666, Cl. 361-321.400.
Schuessler, Josef: *See*—
Rock, Reinhold; and Schuessler, Josef, 5,558,744, Cl. 156-522.000.
Schuler, Chester L., to Lex Computer and Management Corporation. Actuator having electronically controllable tactile responsiveness. 5,559,412, Cl. 318-561.000.
Schumacher, Johannes A., to VSE Schweisstechnik GmbH. Volume sensor for liquids using toothed meter wheels. 5,559,288, Cl. 73-261.000.
Schunack, Walter: *See*—
Schwartz, Jean-Charles; Arrang, Jean-Michel; Garbarg, Monique; Lecomte, Jeanne-Marie; Ganellin, Charon R.; Pkyerat, Abdellatif; Tertiuk, Wasyl; Schunack, Walter; Lipp, Ralph; Stark, Holger; and Purand, Katja, 5,559,113, Cl. 514-252.000.
Schur, Christopher J.: *See*—
Jungo, Charles; Montgomery, Gerald D.; and Schur, Christopher J., 5,559,559, Cl. 348-432.000.
Schurenberg, Kurt: *See*—
Hoover, Michael K.; Miller, Barrick H.; Schurenberg, Kurt; and Daigle, Richard A., 5,560,005, Cl. 395-600.000.
Schutte, Herman. Two-wire bus system comprising a clock wire and a data wire for interconnecting a number of stations and allowing both long-format and short-format slave addresses. 5,559,502, Cl. 340-825.210.
Schwab, Edward C.: *See*—
Brown, George E.; Schwab, Edward C.; and Harrington, Terry R., 5,558,890, Cl. 426-94.000.
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Lesley, Paul M.; and Toler, Michael D., 5,558,373, Cl. 273-119.00R.
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Aruga, Hisashi; Takizawa, Keiji; Sawata, Ryuji; and Kobayashi, Takashi, 5,558,927, Cl. 428-195.000.
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Krempl, Peter W.; and Selic, Roland, 5,557,968, Cl. 73-497.000.
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Antos, John M.; Selina, John R.; and Byrne, James M., 5,557,810, Cl. 4-321.000.
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Yu, Tsai-Yun, 5,558,396, Cl. 297-208.000.
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Cowan, Cathy L.; and Lau, Stephen Y., 5,558,688, Cl. 55-312.000.
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Yamazaki, Shunpei; and Takemura, Yasuhiko, 5,559,042, Cl. 437-21.000.
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Pezzani, Robert, 5,559,361, Cl. 257-546.000.
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Padoan, Silvia; and Pascucci, Luigi, 5,559,449, Cl. 326-40.000.
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Shah, Jyotsna S.; Buharin, Amelia; and Lane, David J., to Amoco Corporation. Nucleic acid probes for the detection of *Giardia lamblia. 5,558,989, Cl. 435-6.000.*
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Sharangpani, Harshvardhan P.: *See*—
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Uekane, Kentarou; and Ikeda, Hiroshi, 5,559,554, Cl. 348-333.000.
Wada, Takasumi, 5,559,586, Cl. 355-245.000.
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Blytas, George C.; and Hale, Arthur H., 5,558,939, Cl. 428-414.000.
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Datta, Madhav; and Shenoy, Ravindra V., 5,558,957, Cl. 429-127.000.
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Dawson, William R.; and Gupta, Goutam, 5,559,163, Cl. 522-75.000.
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Sheryll, Richard P. Underwater sampling method and apparatus. 5,559,295, Cl. 73-864.630.
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Nakashima, Akio; and Shibahashi, Yutaka, 5,558,699, Cl. 106-21.00A.
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Shibata, Alan: *See*—
Nguyen, Chan; Shibata, Alan; Kobayashi, Atsushi; and Fujimori, Noriyoshi, 5,559,538, Cl. 347-32.000.
Shibata, Steven K.: *See*—
Knoff, Warren F.; McAllister, Robert W.; Popper, Peter; Shibata, Steven K.; Taylor, Robert E.; and Yngve, Paul W., 5,557,915, Cl. 57-204.000.
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Araya, Katsuhiko; Morita, Youzo; Sumi, Shingo; and Matsuhisa, Hiroaki, 5,559,333, Cl. 250-344.000.
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Hirayama, Hirokazu; and Arakake, Seiichi, 5,558,289, Cl. 242-231.000.
Nagano, Masashi, 5,557,985, Cl. 74-594.600.
Sato, Jun, 5,558,290, Cl. 242-313.000.
Shimizu, Akira: *See*—
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Shimizu, Hiroyuki; Takahashi, Toru; and Kimura, Makoto, to Atsugi Unisia Corporation, Automotive suspension control system for anti-rolling control utilizing a steering sensor and body accelerometers. 5,559,701, Cl. 364-424.050.
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Urawa, Yoshio; Furukawa, Ken; Shimizu, Toshikazu; Yamagishi, Yoji; Tsurugi, Tomio; and Ichino, Tomio, 5,559,236, Cl. 546-14.000.
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Tsukamoto, Takeo; Shimizu, Akira; Suzuki, Akira; Sugata, Masao; Shimoda, Isamu; and Okunuki, Masahiko, 5,559,342, Cl. 257-10.000.
Shimoda, Marion H.: *See*—
Dunstan, Robert A.; Shimoda, Marion H.; Silvester, Kelan C.; and Sun, Jiming, 5,560,022, Cl. 395-750.000.
Shimomura, Tomoyuki, to Tenyo Co., Ltd. Coin transfer apparatus for jugglery use. 5,558,583, Cl. 472-71.000.
Shimp, Alan B.: *See*—
Johnson, Richard A.; Engel, Joseph C.; Saletta, Gary F.; and Shimp, Alan B., 5,559,719, Cl. 364-483.000.
Shin, Dong W., to Hyundai Motor Company. Suspension system for front wheels of a low-body bus. 5,558,361, Cl. 280-697.000.
Shin, Fu-zong. Actuating device for use in powered screwdriver. 5,557,990, Cl. 81-54.000.
Shinada, Tsunetoshi; Wada, Katsuo; Misumi, Masaki; and Kurono, Satoru, to Mitsui Toatsu Chemicals, Inc.; and Moriroku Kabushiki Kaisha. Mold design and process for producing a multilayer part by injection process molding. 5,558,883, Cl. 425-116.000.
Shinanogawa Technopolis Development Organization: *See*—
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Shindou, Tomoyuki; and Higurashi, Seiji, to Victor Company of Japan, Ltd. Compression/decompression system which performs an orthogonal transformation in a time direction with respect to picture planes. 5,559,931, Cl. 395-105.000.
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Chien, Tien-Sheng, deceased; Chien, Jung-Fu; Chien, Paul C.; and Lu, Hsiu-Lan, 5,558,924, Cl. 428-181.000.
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Uchida, Toshiaki; Niyada, Masateru; Shinohara, Shigeru; Orikasa, Hiroaki; and Ishikawa, Hiroyasu, 5,558,476, Cl. 408-1.00R.
Shinomura, Toshihiko: *See*—
Urairi, Masakatsu; Tachibana, Toshimitsu; Matsumoto, Kenji; Shinomura, Toshihiko; Iida, Hiroyuki; Kawamura, Kazunori; Yano, Shuuji; and Ishida, Osamu, 5,558,682, Cl. 29-623.500.
Shiohara, Takashi: *See*—
Noguchi, Yukihiko; Haruta, Keitoshi; Sakamoto, Isamu; Yamanaka, Mituo; Uchinono, Makoto; and Shiohara, Takashi, 5,558,559, Cl. 451-14.000.
Shiono, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Circuit for hands free talking. 5,559,880, Cl. 379-390.000.
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Adachi, Masao; Shioya, Makoto; Sato, Kazuhiko; and Ohkubo, Minoru, 5,558,596, Cl. 477-46.000.
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Ozaki, Thoru; Sunouchi, Kazumasa; Takedai, Seiichi; and Shioyama, Yoshiyuki, 5,559,350, Cl. 257-304.000.
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Saka, Yuuji; Shirouzu, Kouichi; and Shiraki, Kazuyuki, 5,558,535, Cl. 439-357.000.

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Psaros, Georgios; and Johansson, Marie, 5,558,087, Cl. 128-205.120.
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Spindt, Christopher J.; and Macaulay, John M., 5,559,389, Cl. 313-310.000.
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Dunstan, Robert A.; Shimoda, Marion H.; Silvester, Kelan C.; and Sun, Jiming, 5,560,022, Cl. 395-750.000.
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Simhaee, Ebrahim. Plastic bag dispenser. 5,558,262, Cl. 225-106.000.
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Steed, C. Edward; and Gladney, Ricky F., 5,557,813, Cl. 5-239.000.
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Simon, Agnes. Method of exercise. 5,558,603, Cl. 482-52.000.
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Skufca, James; and Skufca, Matthew R., Jr., 5,558,887, Cl. 425-418.000.
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Smith, Donald M.; and Townley, Roderick M., to Freedom Air Services. Method and apparatus for the intermittent delivery of oxygen therapy to a person. 5,558,086, Cl. 128-204.260.
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Moncrief, Frank; Bacco, David R.; McNamara, Charles; Smith, Dwight L.; and Ford, Colin, 5,558,489, Cl. 414-793.700.
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McKay, Albert A.; Pasek, Stanley J.; Porteous, David A.; Reid, Jeffrey D.; Scott, Trevor A.; Smith, Eric G.; Stahmer, Ulf; and Digweed, W. Thomas, 5,559,281, Cl. 73-39.000.
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Smith, Martin S.; and Kitchener, Dean, to Northern Telecom Limited. Layered antenna. 5,559,523, Cl. 343-795.000.
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Conway, Marlene E.; Jooste, Francois; and Smith, Michael D., 5,558,745, Cl. 162-60.000.
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Bryan, Deborah L.; and Elliott, John D., 5,559,105, Cl. 514-63.000.
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Schwartz, Jean-Charles; Arrang, Jean-Michel; Garbarg, Monique; Lecomte, Jeanne-Marie; Ganellin, Charon R.; Fkyerat, Abdellatif; Tertiuk, Wasyl; Schunack, Walter; Lipp, Ralph; Stark, Holger; and Purand, Katja, 5,559,113, Cl. 514-252.000.
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Valentian, Dominique, 5,559,391, Cl. 313-360.100.
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Marechal, Robert R. L., 5,558,309, Cl. 248-424.000.
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Abed, Patrick; Dauzat, Marc; Rouxel, Jean-Marc; and Nogues, Michel, 5,558,715, Cl. 118-429.000.
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McClish, Michael A.; Plee, Steven L.; Remboski, Donald J., Jr.; Lynch, Marvin L.; and Sonday, Susan K., 5,559,705, Cl. 364-431.070.
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Song, Seungyoon P., to International Business Machines Corporation. System for instruction completion independent of result write-back responsive to both exception free completion of execution and completion of all logically prior instructions. 5,559,976, Cl. 395-375.000.
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Quay, Steven C., 5,558,853, Cl. 424-9.500.
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Quay, Steven M., 5,558,094, Cl. 128-662.020.
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Ando, Nobuhiko; Ando, Ryo; and Fujiie, Kazuhiko, 5,559,769, Cl. 369-44.270.

Horimai, Hideyoshi; and Fujita, Goro, 5,559,786, Cl. 369-275.100.
Ikenaga, Takashi, 5,559,776, Cl. 369-47.000.
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Ito, Masayasu; and Chigasaki, Hiroyuki, 5,559,649, Cl. 360-99.060.
Kato, Motoki, 5,559,557, Cl. 348-405.000.
Kitazato, Naohisa, 5,559,558, Cl. 348-416.000.
Maeda, Yasuaki; and Nagashima, Hideki, 5,559,780, Cl. 369-54.000.
Makise, Tetsuro; and Yoshida, Teruyuki, 5,559,643, Cl. 360-46.000.
Mizikovsky, Semyon, 5,559,860, Cl. 379-58.000.
Nakagawa, Kiyoshi, 5,558,487, Cl. 414-744.600.
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Nomura, Tsuneharu, 5,559,564, Cl. 348-779.000.
Ozaki, Shinya; and Nonoyama, Hideki, 5,559,644, Cl. 360-48.000.
Saitou, Kengo; Sasaki, Kazuo; and Aizawa, Taizo, 5,559,655, Cl. 360-132.000.
Sakamoto, Takayuki; and Suito, Taro, 5,559,551, Cl. 348-169.000.
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Tsudaka, Keisuke; and Sugawara, Minoru, 5,558,963, Cl. 430-22.000.
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South, Michael S.; and Miller, Michael J., to Monsanto Company. 3-phenoxypyridazines, herbicidal compositions and uses thereof. 5,559,080, Cl. 504-238.000.
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Strieter, Jerome F., 5,558,112, Cl. 134-103.200.
Southpac Trust International, Inc.: *See*—
Weber, Donald E., 5,557,882, Cl. 47-44.010.
Southwell, William H.: *See*—
Vachss, Frederick R.; Southwell, William H.; Mahus, Joseph; and Khoshnevisan, Mohsen, 5,559,640, Cl. 359-838.000.
Southwest Research Institute: *See*—
Ariga, Susumu; and Lee, Jongmin, 5,558,054, Cl. 123-90.650.
Soyka, Edward J.: *See*—
Rothschild, Wayne H.; Soyka, Edward J.; Hausman, Herbert H.; and Pirzadeh, Joe, 5,558,197, Cl. 194-344.000.
Spahn, Robert G.: *See*—
DePalma, Vito A.; Spahn, Robert G.; Coltrain, Bradley K.; Musshafen, George N.; and Girolmo, Sharon R., 5,558,977, Cl. 430-496.000.
Spall, Roger: *See*—
Beaudet, Phillip; Black, Matthew; Edwards, Jonathan; Jones, Julian; Merks, Eduardus A. T.; and Spall, Roger, 5,559,945, Cl. 395-156.000.
Sparf, Bengt Å.: *See*—
Johansson, Rolf A.; Moses, Pinchas; Nilvebrant, Lisbeth; and Sparf, Bengt Å., 5,559,269, Cl. 564-443.000.
Spater, Stuart S.: *See*—
Kolton, Chester; and Spater, Stuart S., 5,559,567, Cl. 351-158.000.
Specialist Sealing Limited: *See*—
Nicholson, Terence P., 5,558,347, Cl. 277-229.000.
SpecTran Communications Fiber Technologies, Inc.: *See*—
Sarkar, Arnab, 5,558,693, Cl. 65-382.000.
Spectrum Concepts, Inc.: *See*—
Hunt, Thomas A., 5,558,235, Cl. 211-40.000.
Speicher, Vernon L.: *See*—
Heilman, Marlin S.; Kolenik, Steve A.; Capone, Christopher D.; Parisi, Carl M.; Prem, Edward K.; and Speicher, Vernon L., 5,558,617, Cl. 600-16.000.
Spencer, Robert F. Method of intubating a patient and introducer for use with such method. 5,558,082, Cl. 128-200.260.
Spilo, Michael L., to Helix Software Company, Inc. Method for increasing the efficiency of a virtual memory system by selective compression of RAM memory contents. 5,559,978, Cl. 395-413.000.
Spindt, Christopher J.; and Macaulay, John M., to Silicon Video Corporation. Electron-emitting devices having variously constituted electron-emissive elements, including cones or pedestals. 5,559,389, Cl. 313-310.000.
Sponseller, David L., to ERIM. Method of producing a cast multilayered alloy tube and the product thereof. 5,558,150, Cl. 164-95.000.
Spooner, John: *See*—
Young, Alastair J.; Spooner, John; and Chippendale, John P., 5,557,986, Cl. 74-650.000.
Spöring, Heido: *See*—
Focke, Heinz; and Spöring, Heido, 5,558,217, Cl. 206-268.000.
Sprachmann, Gerold: *See*—
Bilek, Norbert; Porcham, Wolfgang; Schlamadinger, Michael; and Sprachmann, Gerold, 5,559,061, Cl. 501-69.000.
Sprouse, Jeffrey S.: *See*—
McDonald, Ian A.; Bernotas, Ronald C.; Dudley, Mark W.; and Sprouse, Jeffrey S., 5,559,143, Cl. 514-419.000.
Square D Company: *See*—
Rettew, Richard R.; Almashy, Richard T.; and Lett, Scott F., 5,558,735, Cl. 156-275.500.
Weiden, Conrad, 5,559,489, Cl. 337-215.000.
Squiller, Edward P.; and Zweiner, Christian, to Bayer Corporation; and Bayer Aktiengesellschaft. Polyisocyanate/polyamine mixtures and their use for the production of polyurea coatings. 5,559,204, Cl. 528-84.000.
Staab, Jeanne E.; Bungo, Edward M.; and Stang, Robert J., to General Motors Corporation. Battery terminal connector having pad contacts. 5,558,545, Cl. 439-762.000.
Stacey, Scott A.: *See*—
Majeed, Kamal N.; and Stacey, Scott A., 5,559,700, Cl. 364-424.150.
Stackpole, Russell P., II: *See*—
Joseph, Brian E.; Stackpole, Russell P., II; and Baker, Everett H., 5,559,329, Cl. 250-306.000.
Staco, Inc.: *See*—
Zimmerman, Leon S., 5,558,039, Cl. 119-52.100.
Stadler, Aloisia: *See*—
Weichmann, Josef; Stadler, Aloisia; and Kern, Alfred, 5,558,709, Cl. 106-727.000.
Stadler, David M. Automatically armed vehicle anti-theft system. 5,559,491, Cl. 340-426.000.
Stahmer, Ulf: *See*—
McKay, Albert A.; Pasek, Stanley J.; Porteous, David A.; Reid, Jeffrey D.; Scott, Trevor A.; Smith, Eric G.; Stahmer, Ulf; and Digweed, W. Thomas, 5,559,281, Cl. 73-39.000.
Stalford, Michael J.: *See*—
Siegfried, Robert H.; Fleming, James M.; Stalford, Michael J.; and Janson, John P., 5,558,713, Cl. 118-308.000.
Stamm, Uwe: *See*—
Berger, Vadim; Kleinschmidt, Jürgen; Stamm, Uwe; and Zschoke, Wolfgang, 5,559,815, Cl. 372-25.000.
Stancil, Charles J.; Vaughn, William M.; and Wolford, Jeff W., to Compaq Computer Corporation. Non-conforming PCI bus master timing compensation circuit. 5,559,968, Cl. 395-306.000.
Stanciuleacu, Maria: *See*—
Ikura, Michio; and Stanciulescu, Maria, 5,558,768, Cl. 208-187.000.
Stang, Robert J.: *See*—
Staab, Jeanne E.; Bungo, Edward M.; and Stang, Robert J., 5,558,545, Cl. 439-762.000.
Stang, Wolfgang: *See*—
Mahler, Peter; Stang, Wolfgang; Scherer, Michael; and Gesche, Roland, 5,558,751, Cl. 204-298.260.
Stanley Electric Co., Ltd.: *See*—
Oki, Yoji; Hanaski, Koichi; and Fujisawa, Shigeo, 5,558,420, Cl. 362-31.000.
Stanley, Lawrence G.: *See*—
Stewart, Albert J.; and Stanley, Lawrence G., 5,559,492, Cl. 340-331.000.
Stanley Mechanics Tools: *See*—
Silvis, Gary; Howland, Thomas E.; and Snoke, Steven R., 5,558,458, Cl. 403-393.000.
Stapensea, Neil P.; Gaskins, Kevin K.; Proska, Dan J.; and Rollison, Gil, to BASF Corporation. Portable chemcial tank with integral transfer system. 5,558,252, Cl. 222-181.200.
Starfire Electgronic Development & Marketing Ltd.: *See*—
Goldstein, Avery N., 5,559,057, Cl. 437-228.000.
Stark, Holger: *See*—
Schwartz, Jean-Charles; Arrang, Jean-Michel; Garbarg, Monique; Lecomte, Jeanne-Marie; Ganellin, Charon R.; Fkyerat, Abdellatif; Tertiuk, Wasyl; Schunack, Walter; Lipp, Ralph; Stark, Holger; and Purand, Katja, 5,559,113, Cl. 514-252.000.
Starke, William J.: *See*—
Scalzi, Casper A.; and Starke, William J., 5,560,013, Cl. 395-700.000.
Starrett, John E., Jr.; Tortolani, David R.; Mansuri, Muzammil M.; and Meanwell, Nicholas A., to Bristol-Myers Squibb Co. Retinoid-like heterocycles. 5,559,248, Cl. 549-79.000.
Stasz, Peter: *See*—
Bowman, Bruce; and Stasz, Peter, 5,558,099, Cl. 128-724.000.
Staubitz, Robert; and Repp, Timothy, to Tenex Corporation. Diskette transporter with side cap surface steps. 5,558,219, Cl. 206-308.100.
Stay, Kevin E., to Livernois Research & Development Company. Method and apparatus for fluid temperature control. 5,558,069, Cl. 123-541.000.
Stearns, Thornton: *See*—
Blanton, Russell; Tucker, David; and Stearns, Thornton, 5,557,924, Cl. 62-50.100.
Stectus Systems-Midwest: *See*—
Card, Geoffrey C., 5,557,894, Cl. 52-204.595.

Steed, C. Edward; and Gladney, Ricky F., to Simmons Company. Knock down mattress system. 5,557,813, Cl. 5-239.000.
Steele, Gavin: *See*—
Rapkin, Edward; and Steele, Gavin, 5,559,324, Cl. 250-252.100.
Steele, Ronald E.: *See*—
Jaegge, Walter J.; Malone, Francis J., Jr.; Overton, Frank H.; Ross, Roger A.; and Steele, Ronald E., 5,558,826, Cl. 264-103.000.
Stefanescu, Michael, to Herlitz Aktiengesellschaft. Packing for paper rolls. 5,558,223, Cl. 206-389.000.
Steffier, Wayne S., to Hyper-Therm High Temperature Composites, Inc. Pseudo-porous fiber coating for toughened ceramic composite materials and method of producing same. 5,558,907, Cl. 427-227.000.
Stehlin, Albert: *See*—
Guth, Christian; Stehlin, Albert; and Kröhnke, Christoph, 5,559,273, Cl. 568-622.000.
Steigerwald, Franz; Schmitt, Martina; and Bock, Gabriele, to Wella Aktiengesellschaft. Arrangement for mixing two components. 5,558,215, Cl. 206-222.000.
Stein Seal Company: *See*—
McNickle, Alan D.; Hwang, Mingfong; and Pope, Adam N., 5,558,341, Cl. 277-3.000.
Steiner, Urs, to Bear Instruments, Inc. Ion filter and mass spectrometer using arcuate hyperbolic quadrapoles. 5,559,327, Cl. 250-292.000.
Steinhardt, Richard A.; John, Varghese; and Fritz, Lawrence C., to University of California, The Regents of the; and Athena Neurosciences, Inc. Methods for screening compounds to determine calcium leak channel inhibition activity. 5,559,004, Cl. 435-29.000.
Steinhauser, Hermann; Brüschke, Hartmut; Ellinghorst, Guido; and Hübner, Andreas, to Deutsche Carbone, AG. Process for the manufacture of a composite plasma membrane and use thereof. 5,558,776, Cl. 210-640.000.
Steinman, Maurice B.: *See*—
Foley, Denis; Steinman, Maurice B., and VanDoren, Stephen R., 5,559,987, Cl. 395-471.000.
Stellwagen, Armin, to Mannesmann Rexroth GmbH. Control arrangement for at least one hydraulic consumer. 5,558,004, Cl. 91-517.000.
Stenfelt, Staffan C. O.: *See*—
Couch, Richard W., Jr.; Sanders, Nicholas A.; Lu, Zhipeng; Luo, Lifeng, and Stenfelt, Staffan C. O., 5,558,786, Cl. 219-121.440.
Stephens, Michael C., Jr.; Reddy, Chitranjan N.; and Poteet, Kenneth A., to Alliance Semiconductor Corporation. Timing control circuit for synchronous static random access memory. 5,559,752, Cl. 365-233.000.
Steritech, Inc.: *See*—
Cook, David; Wollowitz, Susan; and Nerio, Aileen, 5,559,250, Cl. 549-282.000.
Sterling International, Inc.: *See*—
Schneidmiller, Rodney G., 5,557,880, Cl. 43-122.000.
Sterling Winthrop Inc.: *See*—
Delecki, Daniel J.; Saha, Ashis K.; and Snow, Robert A., 5,559,214, Cl. 534-10.000.
Steven, Rachel A.: *See*—
Scott, John D.; and Steven, Rachel A., 5,559,276, Cl. 570-165.000.
Stevens, Albert F.; Chodack, Jeffrey L.; Lange, Russell M.; Dewitt, Robert R.; Coleman, John D.; Bressler, Peter W., and Forsyth, Keith W., to Opex Corporation. Apparatus for sorting documents. 5,558,232, Cl. 209-584.000.
Stevens, John H.: *See*—
Boyd, Stephen W.; Stevens, John H.; Evard, Philip C.; and Adams, Craig L., 5,558,644, Cl. 604-96.000.
Stewart, Albert J.; and Stanley, Lawrence G., to Simplex Time Recorder Co. Synchronized strobe alarm system. 5,559,492, Cl. 340-331.000.
Stewart, Andrew O.: *See*—
Brooks, Dee W.; Stewart, Andrew O.; Kerkman, Daniel J.; Bhatia, Pramila A.; Basha, Anwer; and Martin, Jonathan G., 5,559,144, Cl. 514-445.000.
Stewart, Gregory M.: *See*—
Farrand, Scott C.; Didner, Jonathan R.; Mazina, Daniel J.; Autor, Jeffrey S.; Muraski, Paul J.; Stewart, Gregory M.; and Dysart, John A., 5,559,958, Cl. 395-183.030.
Stilwell, John D.: *See*—
Parker, Barry J.; Krinickas, Alexander; Stilwell, John D., and Brown, Neil L., 5,558,495, Cl. 416-95.000.
Stobbie, Charles W., IV; Tangen, John C.; and Kangas, Lani S., to Minnesota Mining and Manufacturing Company. Article including an adhesively bonded moisture cured material and a method of making the same. 5,558,941, Cl. 428-423.100.
Stobbie, Charles W., IV; Tangen, John C.; and Kangas, Lani S., to Minnesota Mining and Manufacturing Company. Mixture of isocyanate-terminated polyurethane prepolymers. 5,559,196, Cl. 525-458.000.
Stock, Klaus-Friedrich; and Sindermann, Siegmar, to KHS Maschinen- und Anlagenbau AG. Process and apparatus for cleaning container handling machines such as beverage can filling machines. 5,558,138, Cl. 141-90.000.
Stockton, Thomas R., to Ford Motor Company. System for powering rotating vehicle accessories using transmission. 5,557,977, Cl. 74-15.840.
Stockwell, David M.: *See*—
Lerner, Bruce A.; Stockwell, David M.; and Madon, Rostam J., 5,559,067, Cl. 502-68.000.
Stoepker, Ross C.: *See*—
Nielson, Edward G.; DeBruine, Timothy S.; Modzeleski, Daniel P.; and Stoepker, Ross C., 5,559,725, Cl. 364-550.000.
Stöger, Anton, to U.S. Philips Corporation. Magnetic-tape cassette having at least one antifriction foil separated from an antifriction-foil stack. 5,558,292, Cl. 242-345.300.
Stokes, David: *See*—
Gangemi, Ronald J.; and Stokes, David, 5,558,639, Cl. 604-67.000.
Stolka, Milan: *See*—
Hsieh, Bing R.; Johnson, Gordon E.; Antoniadis, Homer; McGrane, Kathleen M.; and Stolka, Milan, 5,558,904, Cl. 427-66.000.
Stoll, Thomas: *See*—
Wei, William; and Stoll, Thomas, 5,557,846, Cl. 29-889.200.
Stone, Roderick W.: *See*—
Harper, Leroy D.; Schlichting, Grayson C.; Hooks, Douglas A.; Cullimore, Ian H. S.; Bradshaw, Gavin A.; Banerjee, Biswa R.; Fairbanks, John P.; and Stone, Roderick W., 5,560,024, Cl. 395-750.000.
Stout, Donald M.: *See*—
Kovacich, John A.; Haefner, Donald R.; Hatton, Bruce M.; Stout, Donald M., Ryczek, Lawrence J.; and Klumb, Arlene M., 5,559,280, Cl. 73-35.130.
Stover, Lon R.: *See*—
Chu, Amy H.; and Stover, Lon R., 5,558,834, Cl. 422-55.000.
Strande, Per: *See*—
Klaveness, Jo; Rongved, Pål; and Strande, Per, 5,558,857, Cl. 424-9.520.
Klaveness, Jo; and Strande, Per, 5,559,266, Cl. 558-275.000.
Strandjord, Lee K.: *See*—
August, Richard J.; Dimond, Kevin B.; Feth, John R.; Laskoskie, Clarence E.; Strandjord, Lee K.; and Szafraniec, Bogdan, 5,559,908, Cl. 385-12.000.
Strategic Diagnostics Inc.: *See*—
Bartlett, William C.; and Melby, James M., 5,558,996, Cl. 435-7.310.
Stratus Computer, Inc.: *See*—
Back, Paul R., Carlin, Paul R.; and Lamb, Joseph M., 5,559,459, Cl. 326-93.000.
Straub, Kartheinz: *See*—
Kottschke, Gerhard; Sollinger, Hans-Peter; Oechsle, Markus; and Straub, Kartheinz, 5,557,860, Cl. 34-455.000.
Strauss, Mark S., to Lucent Technologies Inc. Enhanced RC coupled electrostatic discharge protection. 5,559,659, Cl. 361-56.000.
Strayer, Brian D.: *See*—
Mowry, Gregory S.; Gorka, Phillip E., Strayer, Brian D.; and Kracke, Alan G., 5,559,429, Cl. 324-71.500.
Streif, Eric: *See*—
Fogle, Homer W., Jr.; Bailey, Todd; Pitstick, Brian R.; and Streif, Eric, 5,558,366, Cl. 280-736.000.
Strelow, John L., to Oklahoma Safety Equipment Co. Eccentric scored rupture disk assembly. 5,558,114, Cl. 137-68.270.
Stridsberg, Lennart, to Mydata Automation AB. Magnetostrictive pump for applying pastes and adhesives. 5,558,504, Cl. 417-322.000.
Strieter, Jerome F., to Southern Concepts, Inc. Portable isolation enclosure and process for cleaning environments. 5,558,112, Cl. 134-103.200.
Strob, Wolfgang, to Siemens Aktiengesellschaft. Computed tomography apparatus with a rotating anode x-ray tube and method for operating same. 5,559,845, Cl. 378-4.000.
Strock, Thomas W.: *See*—
Gohara, Wadie F.; Watson, George B.; Reynolds, Randy J.; and Strock, Thomas W., 5,558,818, Cl. 261-17.000.
Strong, Maurice L., III; Tranchita, Charles J.; Welch, Christopher R.; and Griffith, Gerald, to Northrop Grumman Corporation. Aircraft landing site indication and light. 5,559,510, Cl. 340-954.000.
Strul, Bruno: *See*—
Edwards, Stuart D.; Lee, Kee S.; Baker, James; and Strul, Bruno, 5,558,672, Cl. 606-41.000.
Strupczewski, Joseph T.; Helsley, Grover C.; Glamkowski, Edward J.; Chiang, Yulin; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., to Hoechst-Roussel Pharmaceuticals, Inc. N-[(4-heteroaryl-1-piperazinyl) alkyl]-2-Benoxazolinines and related compounds and their therapeutic utility. 5,559,117, Cl. 514-254.000.
Stryker Corporation: *See*—
Orrico, Michael R., 5,558,136, Cl. 141-23.000.
Stubberud, Lars: *See*—
Klaveness, Jo; Rongved, Pal; and Stubberud, Lars, 5,558,856, Cl. 424-9.370.
Studiengesellschaft Kohle mbH: *See*—
Maier, Wilhelm F., 5,559,259, Cl. 554-141.000.
Studzinski, William M.: *See*—
DeRosa, Thomas F., Studzinski, William M.; Russo, Joseph M.; Kaufman, Benjamin J.; and Hahn, Robert T., 5,558,685, Cl. 44-426.000.
Stutz, Peter; and Flöckiger, Daniel, to Ascom Autelca AG. Apparatus and method for protecting data in a memory address range. 5,559,992, Cl. 395-490.000.
Stutz, Stefan: *See*—
Göschke, Richard; Maibaum, Jürgen K.; Schilling, Walter; Stutz, Stefan; Rigollier, Pascal; Yamaguchi, Yasuchika; Cohen, Nissim C.; and Herold, Peter, 5,559,111, Cl. 514-227.500.
Styles, David A.: *See*—
Jackisch, David A.; and Styles, David A., 5,558,228, Cl. 206-524.700.
Su, Hsiu-Ling. Ceiling fixture mounting structure. 5,558,537, Cl. 439-537.000.
Sublett, Bobby J.; and Connell, Gary W., to Eastman Chemical Company. Process including depolymerization in polyester reactor for recycling polyester materials. 5,559,159, Cl. 521-48.500.
Subramanian, Munirpallam A.: *See*—

Rao, V. N. Mallikarjuna; and Subramanian, Munirpallam A., 5,559,069, Cl. 502-226.000.
Succi, Marco; and Lorimer, D'Arcy, to SAES Getters S.p.A. Process for the purification of hydrogen. 5,558,844, Cl. 423-230.000.
Sueda, Nobuo: *See*—
Tsuchida, Masayuki; Uemura, Hirokazu; Miura, Shinji; Saito, Yoshiyuki; Yoshimura, Hiroyuki; Nishimura, Yuichi; and Sueda, Nobuo, 5,559,997, Cl. 395-500.000.
Sugai, Jun: *See*—
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Suganuma, Noboru: *See*—
Nakase, Ryoichi; and Suganuma, Noboru, 5,558,456, Cl. 403-359.000.
Sugata, Masao: *See*—
Tsukamoto, Takeo; Shimizu, Akira; Suzuki, Akira; Sugata, Masao; Shimoda, Isamu; and Okunuki, Masahiko, 5,559,342, Cl. 257-10.000.
Sugawara, Minoru: *See*—
Tsudaka, Keisuke; and Sugawara, Minoru, 5,558,963, Cl. 430-22.000.
Sugawara, Shigeru, to Tenyo Co., Ltd. Variable-display device for amusement. 5,557,867, Cl. 40-493.000.
Sugawara, Shunji: *See*—
Kumagai, Katsuo; Rikiishi, Hidemi; Tamura, Keiji; Sugawara, Shunji; Nemoto, Eiji; Okamoto, Shigefumi; and Onta, Tokio, 5,559,211, Cl. 530-350.000.
Sugimoto, Koji: *See*—
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Sugioka, Takami; Yudate, Toshihiro; and Seike, Yuji, to Teijin Seiki Co., Ltd. Yarn winder. 5,558,286, Cl. 242-18.00A.
Sugita, Kazuyuki: *See*—
Nishi, Toshiyuki; Koda, Hiroko; Sugita, Kazuyuki; Ishida, Yohhei; Takemura, Makoto; and Hayano, Takeshi, 5,559,224, Cl. 540-350.000.
Sugita, Takeshi: *See*—
Sugiura, Yoshinori; Azuma, Jun; Adachi, Nobukazu; Setoriyama, Takeshi; Tenpaku, Chitose; Ishikawa, Noriyoshi; Hamada, Tatsuo; Tsuchiya, Yoshiro; Kubota, Takeshi; Nomura, Yoshiya; Kuroda, Akira; Murooka, Ken; Sugita, Takeshi; Niimura, Takeshi; and Yuza, Akira, 5,559,581, Cl. 355-200.000.
Sugiura, Noboru: *See*—
Fukatsu, Katsuaki; Sugiura, Noboru; Koguchi, Hayato; and Anzo, Yoichi, 5,558,074, Cl. 123-647.000.
Sugiura, Yoshinori; Azuma, Jun; Adachi, Nobukazu; Setoriyama, Takeshi; Tenpaku, Chitose; Ishikawa, Noriyoshi; Hamada, Tatsuo; Tsuchiya, Yoshiro; Kubota, Takeshi; Nomura, Yoshiya; Kuroda, Akira; Murooka, Ken; Sugita, Takeshi; Niimura, Takeshi; and Yuza, Akira, to Canon Kabushiki Kaisha. Image forming apparatus with helical gear drive train. 5,559,581, Cl. 355-200.000.
Sugiyama, Hisataka: *See*—
Maeda, Takeshi; Arai, Shinichi; Isaka, Kazuo; Saito, Atsushi; Mizokami, Takuya; Sugiyama, Hisataka; and Kawamura, Satoshi, 5,559,777, Cl. 369-50.000.
Sugiyama, Isao: *See*—
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Sugiyama, Takahide; Takahashi, Hisashi; and Inagaki, Nakahiro, to Yazaki Corporation. Absorption type heat pump. 5,557,946, Cl. 62-476.000.
Suh, Kyung W.: *See*—
Imeokparia, Daniel D.; Shmidt, Creston D.; Suh, Kyung W.; and Ennis, Michael J., 5,557,896, Cl. 52-408.000.
Suito, Taro: *See*—
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Sukegawa, Hiroshi, to Kabushiki Kaisha Toshiba. Storage system with a flash memory module. 5,559,956, Cl. 395-182.060.
Sullivan, Daniel A., Jr.: *See*—
Turnbull, G. Keith; Peretic, Eileen M.; Rogan, George T.; Powers, John H.; Fugger, Scot R.; and Sullivan, Daniel A., Jr., 5,559,708, Cl. 364-468.030.
Sullivan, Joseph W.: *See*—
Hoover, Rick D.; Kozumplik, Nicholas, Jr.; and Sullivan, Joseph W., 5,559,310, Cl. 181-230.000.
Sumi, Shigeharu: *See*—
Oku, Yoshito; Ibara, Shozo; Sumi, Shigeharu; and Fujii, Hiromasa, 5,559,382, Cl. 310-90.000.
Sumi, Shingo: *See*—
Araya, Katsuhiko; Morita, Youzo; Sumi, Shingo; and Matsuhisa, Hiroaki, 5,559,333, Cl. 250-344.000.
Sumida, Atsushi; and Kanamori, Yoshihiko, to Toyoda Gosei Co., Ltd. Fixing structure for a window glass. 5,558,387, Cl. 296-93.000.
Suminski, David W., to General Motors Corporation. Engine cylinder intake port. 5,558,061, Cl. 123-306.000.
Sumitomo Chemical Company, Limited: *See*—
Abe, Hiroomi; Nishio, Taichi; Suzuki, Yasurou; Tsuji, Mitsuji; and Sanada, Takashi, 5,559,185, Cl. 525-68.000.
Fujii, Takeshi; Suzuki, Yasuro; Kihara, Hayato; and Anbo, Takashi, 5,559,186, Cl. 525-68.000.
Furuta, Motonobu; and Yamaguchi, Takanari, 5,559,184, Cl. 525-68.000.
Ogawa, Hiroyuki; Hirata, Seiji; and Sasaki, Yoshizumi, 5,558,472, Cl. 106-12.000.
Sumitomo Electric Industries, Ltd.: *See*—
Terasawa, Yoshiaki; and Kubo, Yuji, 5,559,921, Cl. 385-124.000.
Sumitomo Metal Industries, Ltd.: *See*—
Noguchi, Yukihiko; Haruta, Keitoshi; Sakamoto, Isamu; Yamanaka, Mituo; Uchinono, Makoto; and Shiohara, Takashi, 5,558,559, Cl. 451-14.000.
Sumitomo Metal Mining Co., Ltd.: *See*—
Itoh, Takashi; Kosaki, Yukio; Chonan, Takeshi; Matsuda, Takashi; Kanno, Yasuharu; Wakabayashi, Masao; and Nakamura, Makoto, 5,559,072, Cl. 502-347.000.
Sumitomo Rubber Industries, Ltd.: *See*—
Nakayasu, Ritsuo; and Miyazaki, Shinichi, 5,558,144, Cl. 152-527.000.
Sumitomo Wiring Systems, Ltd.: *See*—
Okada, Hajime; and Tabata, Masaaki, 5,558,544, Cl. 439-762.000.
Saka, Yuuji; Shirouzu, Kouichi; and Shiraki, Kazuyuki, 5,558,535, Cl. 439-357.000.
Sun, Chong-Qing: *See*—
Gordon, Eric M.; Barrish, Joel C.; Bisacchi, Gregory S.; Sun, Chong-Qing; Tino, Joseph A.; Vite, Gregory D.; and Zahler, Robert, 5,559,256, Cl. 552-303.000.
Sun, Jiming: *See*—
Dunstan, Robert A.; Shimoda, Marion H.; Silvester, Kelan C.; and Sun, Jiming, 5,560,022, Cl. 395-750.000.
Sun-Maid Growers of California: *See*—
Walker, David L., 5,557,883, Cl. 47-46.000.
Sun Microsystems, Inc.: *See*—
Narad, Charles E., 5,560,019, Cl. 395-733.000.
Sunaga, Takashi: *See*—
Hirano, Yutaka; Komatubara, Takeo; Sunaga, Takashi; Takahashi, Yasuki; Tanaka, Kiyoshi; Akazawa, Kiyoshi; Watanabe, Masato; and Jikuhara, Seiki, 5,557,944, Cl. 62-469.000.
Sundell, Robert E.; and Jenkins, Harold J., to General Electric Company. Washing machine auger screw with lip. 5,557,952, Cl. 68-134.000.
Sundell, Robert E.: *See*—
Jenkins, Harold J.; Sundell, Robert E.; and Savkar, Sudhir D., 5,558,193, Cl. 192-45.000.
Sunderland, Robert D., to Wenger Manufacturing Inc. Continuous method of producing masa flour. 5,558,898, Cl. 426-626.000.
Sundstrand Corporation: *See*—
Kirchberg, Maurice; and Cook, Alec, 5,559,689, Cl. 363-95.000.
Parker, Barry J.; Krinickas, Alexander; Stilwell, John D.; and Brown, Neil L., 5,558,495, Cl. 416-95.000.
Patel, Sunil; Ng, Chai-Nam; Dhyanchand, P. John; Nguyen, Vietson M.; and Teagardin, Michael, 5,559,686, Cl. 363-43.000.
Sundwiger Eisenhutte Maschinenfabrik GmbH & Co.: *See*—
Berger, Bernd; Reinthal, Peter; and Benfer, Manfred, 5,558,017, Cl. 100-93.0RP.
Sung, Janmye: *See*—
Chiu, Tzu-Yin; Erceg, Frank M.; Jeon, Duk Y.; and Sung, Janmye, 5,559,360, Cl. 257-531.000.
Sung, Roh Y.: *See*—
Lee, Sang Y.; Sung, Roh Y.; Lee, Cheong D.; and Kim, Dae H., 5,558,736, Cl. 156-345.000.
Sunouchi, Kazumasa: *See*—
Ozaki, Thoru; Sunouchi, Kazumasa; Takedai, Seiichi; and Shioyama, Yoshiyuki, 5,559,350, Cl. 257-304.000.
Superba: *See*—
Massotte, Philippe; and Liebmann, Hubert, 5,557,953, Cl. 68-205.00R.
Superior Transmission Parts, Inc.: *See*—
Erickson, Dennis C.; Erickson, Paul R.; and Arledge, Jimmy, 5,558,591, Cl. 475-159.000.
Surauer, Michael; Bittner, Helmut; Fichter, Walter; and Fischer, Horst-Dieter, to Deutsche Aerospace AG. Measuring arrangement useful for controlling the attitude of a three-axis stabilized satellite, corresponding evaluation process, regulating system and process. 5,558,305, Cl. 244-171.000.
Suri, Bruno; and Schmitz, Albert. Bacterial shuttle vectors. 5,559,007, Cl. 435-69.100.
Šušković, Božidar; Vela, Vanja; and Bunčić, Mira, to Pliva, farmaceutska. Derivatives of amino-ascorbic acid, the processes for their preparation and use. 5,559,251, Cl. 549-315.000.
Sutherland, John W. H.: *See*—
Backus, John W.; and Sutherland, John W. H., 5,559,013, Cl. 435-91.200.
Sutherland, Robert L., to Riverwood International Corporation. Wrap-around carrier with bar code blocker. 5,558,212, Cl. 206-147.000.
Sutherland, Robert L., to Riverwood International Corporation. Wrap-around carrier with bar code blocker. 5,558,213, Cl. 206-147.000.
Sutkaitis, Donna M.: *See*—
Woods, John G.; Rakas, Margaret A.; Jacobine, Anthony F.; Alberino, Louis M.; Kropp, Philip L.; Sutkaitis, Donna M.; Glaser, David M.; and Nakos, Steven T., 5,558,937, Cl. 428-378.000.
Suzuki, Akira: *See*—
Kimura, Akitaka; Nido, Masaaki; Tomita, Akihisa; and Suzuki, Akira, 5,559,820, Cl. 372-46.000.
Tsukamoto, Takeo; Shimizu, Akira; Suzuki, Akira; Sugata, Masao; Shimoda, Isamu; and Okunuki, Masahiko, 5,559,342, Cl. 257-10.000.
Suzuki, Katsuhiro: *See*—
Minato, Takao; Suzuki, Katsuhiro; Hoshi, Hisao; and Yoshida, Masafumi, 5,559,621, Cl. 359-81.000.

Suzuki, Katsunori; and Hata, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Clock synchronous serial information receiving apparatus receiv-

August, Richard J.; Dimond, Kevin B.; Feth, John R.; Laskoskie, Clarence E.; Strandjord, Lee K.; and Szafraniec, Bogdan, 5,559,908,

Shimizu, Shuji; Kuroda, Osamu; Ito, Yasutaka; and Takahashi, Yoshikazu, 5,559,555, Cl. 348-364.000.

Matsui, Tooru; and Takeyama, Kenichi, 5,558,953, Cl. 429-194.000.
Takikawa, Kazunori, to USUI Kokusai Sangyo Kaisha Ltd. Long deformed

Suzuki, Katsunori; and Hata, Masayuki, to Mitsubishi Denki Kabushiki Kaisha. Clock synchronous serial information receiving apparatus receiving reliable information even when noise is present. 5,559,998, Cl. 395-550.000.

Suzuki, Katsuya: *See—*
Kami, Kuniaki; Adachi, Hideyuki; Umeyama, Koichi; Kosaka, Yoshihiro; Yamaguchi, Seiji; Fuse, Eiichi; Sato, Michio; Nakamura, Masakazu; Tanaka, Yasundo; Fukaya, Takashi; Matsuno, Kiyotaka; and Suzuki, Katsuya, 5,558,619, Cl. 600-146.000.

Suzuki, Keiji: *See—*
Inaguma, Yoshiharu; Mori, Yutaka; Suzuki, Keiji; and Ohkubo, Takuya, 5,558,177, Cl. 180-422.000.

Suzuki, Makoto; Abe, Shizuo; and Kawauchi, Masato, to Toyota Jidosha Kabushiki Kaisha. Cylinder block cooling arrangement. 5,558,048, Cl. 123-41.240.

Suzuki, Mamoru: *See—*
Kato, Nobukazu; and Suzuki, Mamoru, 5,558,540, Cl. 439-637.000.

Suzuki, Minoru; Sasaki, Akihiro; Kawai, Hiromasa; and Kanega, Fumiaki, to Hitachi Chemical Company, Ltd. Resin for plastic lens. 5,559,200, Cl. 526-224.000.

Suzuki, Seiichi: *See—*
Kobayashi, Masaru; Suzuki, Seiichi; Iizumi, Hiroshi; and Ouchi, Chiaki, 5,558,728, Cl. 148-421.000.

Suzuki, Seiko; Tsuchitani, Shigeki; Miki, Masayuki; and Matsumoto, Masahiro, to Hitachi, Ltd. Capacitance type accelerometer. 5,559,290, Cl. 73-514.360.

Suzuki, Shinji: *See—*
Kobayashi, Kinzo; Suzuki, Shinji; and Tokunaga, Takahiro, 5,558,345, Cl. 277-168.000.

Suzuki, Syouji: *See—*
Kojima, Takeshi; Yahagi, Toshio; Fukami, Kazuaki; Suzuki, Syouji; and Hatano, Kunimichi, 5,559,702, Cl. 364-426.020.

Suzuki, Takashi: *See—*
Okamura, Yashikoi; Kageyama, Yasuo; Suzuki, Takashi; Fujimori, Junichi; and Funada, Takeshi, 5,559,962, Cl. 395-200.060.

Suzuki, Toru: *See—*
Wakai, Hideyuki; Suzuki, Toru; Terada, Keiji; Moriya, Masato; and Ando, Manabu, 5,559,603, Cl. 356-376.000.

Suzuki, Yasuo, to Fujitsu Limited. Subscriber's line testing apparatus. 5,559,854, Cl. 379-27.000.

Suzuki, Yasuro: *See—*
Fujii, Takeshi; Suzuki, Yasuro; Kihara, Hayato; and Anbo, Takashi, 5,559,186, Cl. 525-68.000.

Suzuki, Yasurou: *See—*
Abe, Hiroomi; Nishio, Taichi; Suzuki, Yasurou; Tsuji, Mitsuji; and Sanada, Takashi, 5,559,185, Cl. 525-68.000.

Svensson, Lars G.: *See—*
Athas, William C.; and Svensson, Lars G., 5,559,478, Cl. 331-117.0FE.

SVG Lithography Systems, Inc.: *See—*
Gallatin, Gregg M.; Kreuzer, Justin L.; and Nelson, Michael L., 5,559,601, Cl. 356-363.000.

Swedowski, John E.: *See—*
Reiner, Richard A.; and Swedowski, John E., 5,557,828, Cl. 16-257.000.

Sweedler, Jonathan B.: *See—*
Avnon, Dror; Sharangpani, Harshvardhan P.; and Sweedler, Jonathan B., 5,559,977, Cl. 395-375.000.

Swensen, Loran L.; and Neville, Jonathan E., to Enhanced Simulation, Inc. Rotating motion simulator. 5,558,582, Cl. 472-43.000.

Swenson, Paul F.; Jordan, Edwin E.; and Gerstmann, Joseph, to Advanced Mechanical Technology, Inc. Two-pipe system for refrigerant isolation. 5,558,273, Cl. 237-2.00B.

Swinson, Thierry W.: *See—*
Brunson, Charles P., IV; and Swinson, Thierry W., 5,559,289, Cl. 73-275.000.

Swirbel, Thomas J.: *See—*
Urbish, Glenn F.; Dorinski, Dale W.; and Swirbel, Thomas J., 5,559,614, Cl. 359-44.000.

Swisher, George W., Jr. Drum mixer having a combined heating/mixing zone with aggregate entry at both ends. 5,558,432, Cl. 366-25.000.

Symantec Corporation: *See—*
Albert, Anthony J., 5,560,010, Cl. 395-700.000.

Symbios Logic Inc.: *See—*
Anderson, Michael B.; and Schmitt, Kenneth C., 5,559,473, Cl. 331-34.000.

Symetrix Corporation: *See—*
McMillan, Larry D.; Mihara, Takashi; Yoshimori, Hiroyuki; Gregory, John W.; and Paz de Araujo, Carlos A., 5,559,733, Cl. 365-145.000.
Scott, Michael C.; Paz de Araujo, Carlos A.; and McMillan, Larry D., 5,559,260, Cl. 556-28.000.

Synaptic Pharmaceutical Corporation: *See—*
Smith, Kelli E.; and Weinshank, Richard L., 5,559,021, Cl. 435-240.200.

Synthotech Marine Limited: *See—*
McCabe, Martin B.; and Saunders, Anthony C., 5,558,130, Cl. 138-89.000.

Syracuse University: *See—*
Birge, Robert R., 5,559,732, Cl. 365-120.000.

Sysgration Ltd.: *See—*
Lin, Chia-Hui, 5,559,534, Cl. 345-165.000

Szafraniec, Bogdan: *See—*
August, Richard J.; Dimond, Kevin B.; Feth, John R.; Laskoskie, Clarence E.; Strandjord, Lee K.; and Szafraniec, Bogdan, 5,559,908, Cl. 385-12.000.

Szarka, Laszlo J.: *See—*
Patel, Ramesh N.; Szarka, Laszlo J.; and Mueller, Richard H., 5,559,017, Cl. 435-120.000.

Szczech, Gerald S.: *See—*
Gilligan, Sean G.; Freeman, Dermot T.; Oliphant, Larry J.; Messmann, Jeffrey S.; Hanley, Patrick J.; and Szczech, Gerald S., 5,558,901, Cl. 427-2.290.

Szczyrbowski, J., to Leybold Aktiengesellschaft. Process and system for coating a substrate. 5,558,750, Cl. 204-192.120.

T3 Innovations, Inc.: *See—*
Adamson, Tamara J.; and Berg, James G., 5,558,326, Cl. 273-67.00A.

Tabanera, Dennis A. Electroluminescent bicycle helmet. 5,559,680, Cl. 362-106.000.

Tabary, Alain A. R.: *See—*
Tabary, Guy A.; and Tabary, Alain A. R., 5,557,868, Cl. 40-471.000.

Tabary, Guy A.; and Tabary, Alain A. R., to Societe Civile D'Innovation. Modules for displaying advertising images, and a display assembly. 5,557,868, Cl. 40-471.000.

Tabata, Masaaki: *See—*
Okada, Hajime; and Tabata, Masaaki, 5,558,544, Cl. 439-762.000.

Tachibana, Toshimitsu: *See—*
Urairi, Masakatsu; Tachibana, Toshimitsu; Matsumoto, Kenji; Shinomura, Toshihiko; Iida, Hiroyuki; Kawamura, Kazunori; Yano, Shuuji; and Ishida, Osamu, 5,558,682, Cl. 29-623.500.

Tachikawa, Hiroshi, to NEC Corporation. Power supply control system comprising a plurality of power supply units. 5,559,376, Cl. 307-86.000.

Taga, Hidenori; Edagawa, Noboru; Yamamoto, Shu; Takeda, Noriyuki; and Akiba, Shigeyuki, to Kokusai Denshin Denwa Kabushiki Kaisha. Wavelength division multiplexed optical fiber transmission equiptment. 5,559,910, Cl. 385-24.000.

Taguchi, Hisao, deceased (by Noriko Taguchi, personal representative): *See—*
Tsukahara, Mikio; Ohishi, Noboru; Taguchi, Hisao, deceased, 5,558,801, Cl. 222-607.000.

Taguchi, Noriko, personal representative: *See—*
Tsukahara, Mikio; Ohishi, Noboru; Taguchi, Hisao, deceased, 5,558,801, Cl. 222-607.000.

Tajima, Youichiro, to Casio Computer Co., Ltd. Method and apparatus for image display, automatic musical performance and musical accompaniment. 5,559,299, Cl. 84-610.000.

Takada, Yoshihiro: *See—*
Hayashi, Yutaka; Miyamoto, Mitsuo; Watarai, Michihito; Atarashi, Takayuki; Tanaka, Tetsuya; Hatada, Toshio; Takada, Yoshihiro; and Daikoku, Takahiro, 5,558,493, Cl. 415-208.100.

Takagi, Atsushi, to Fuji Photo Film Co., Ltd. Image forming apparatus adapted for reflection-type or transmission-type originals. 5,559,585, Cl. 355-228.000.

Takagi, Minoru, to Kabushiki Kaisha Toshiba. Automatic food type determining device for a heating apparatus. 5,558,797, Cl. 219-705.000.

Takagi, Nobuyoshi: *See—*
Tate, Takuo; Takagi, Nobuyoshi; Kobayashi, Tsunekazu; and Sano, Akinori, 5,558,926, Cl. 428-193.000.

Takagi, Shusaku: *See—*
Miura, Kazuya; Takagi, Shusaku; Hira, Takaaki; Kato, Toshiyuki; and Kurosawa, Nobutaka, 5,558,727, Cl. 148-333.000.

Takahashi, Akihito; and Hasegawa, Koji, to Mitsubishi Denki Kabushiki Kaisha. Waveform response improvement circuit. 5,559,563, Cl. 348-625.000.

Takahashi, Hayato: *See—*
Ishikura, Takashi; and Takahashi, Hayato, 5,558,405, Cl. 297-487.000.

Takahashi, Hiroaki: *See—*
Umezawa, Kazuo; Koyano, Takashi; Takahashi, Hiroaki; and Yamamoto, Takashi, 5,559,115, Cl. 514-279.000.

Takahashi, Hisashi: *See—*
Sugiyama, Takahide; Takahashi, Hisashi; and Inagaki, Nakahiro, 5,557,946, Cl. 62-476.000.

Takahashi, Hitoshi: *See—*
Horie, Kaoru; Takahashi, Hitoshi; and Umemoto, Atsushi, 5,558,060, Cl. 123-308.000.

Takahashi, Kiichiro: *See—*
Otsuka, Naoji; Hirabayashi, Hiromitsu; Yano, Kentaro; and Takahashi, Kiichiro, 5,559,535, Cl. 347-14.000.

Takahashi, Tadashi: *See—*
Kanouda, Akihiko; Takahashi, Tadashi; Horie, Hideaki; Onda, Kenichi; and Hagiwara, Syuya, 5,559,682, Cl. 363-21.000.

Takahashi, Tatsuhiro; Flexman, Edmund A.; and Kassal, Robert J., to Du Pont de Nemours, E. I., and Company. Polyacetal compositions for use in wear applications. 5,559,180, Cl. 524-512.000.

Takahashi, Tetsuhiko; Yamamoto, Etsuji; Murakami, Yoshiki; and Matsunaga, Yoshikuni, to Hitachi, Ltd. Magnetic resonance imaging apparatus and RF coil employed therein. 5,559,434, Cl. 324-318.000.

Takahashi, Toru: *See—*
Shimizu, Hiroyuki; Takahashi, Toru; and Kimura, Makoto, 5,559,701, Cl. 364-424.050.

Takahashi, Yasuki: *See—*
Hirano, Yutaka; Komatubara, Takeo; Sunaga, Takashi; Takahashi, Yasuki; Tanaka, Kiyoshi; Akazawa, Kiyoshi; Watanabe, Masato; and Jikuhara, Seiki, 5,557,944, Cl. 62-469.000.

Takahashi, Yoshikazu: *See—*
Shimizu, Shuji; Kuroda, Osamu; Ito, Yasutaka; and Takahashi, Yoshikazu, 5,559,555, Cl. 348-364.000.

Takai, Hideyuki: *See—*
Yoshihara, Toshiyuki; Hanami, Nobuyuki; Takai, Hideyuki; Anayama, Hideki; Miyazaki, Hajime; Kishi, Junichi; Yamazaki, Itaru; Sakoh, Harumi; Kanemaru, Tetsuro; Iuchi, Kazushi; and Ainoya, Hideyuki, 5,558,964, Cl. 430-58.000.

Takaku, Yutaka: *See—*
Numata, Akihito; Mukaihira, Takashi; Ishii, Toshio; Takaku, Yutaka; and Kawano, Kazuya, 5,557,933, Cl. 60-274.000.

Takamatsu, Mitsuo: *See—*
Satoh, Yoshio; Ikata, Osamu; Miyashita, Tsutomu; Matsuda, Takashi; and Takamatsu, Mitsuo, 5,559,481, Cl. 333-143.000.

Takamori, Takeshi: *See—*
Boland, John J.; Dove, Derek B.; and Takamori, Takeshi, 5,559,384, Cl. 310-90.500.

Takano, Hiroshi: *See—*
Nakamura, Nobuhisa; Ohzeki, Kazuhide; and Takano, Hiroshi, 5,558,570, Cl. 451-357.000.

Takano, Satoshi: *See—*
Arai, Makoto; Sohmiya, Norimasa; Konja, Masakuni; and Takano, Satoshi, 5,559,590, Cl. 355-271.000.
Yamanaka, Shigeru; Eto, Yuzuru; Takano, Satoshi; Watanabe, Kunihiko; and Shibai, Hiroshiro, 5,558,861, Cl. 424-93.700.

Takano, Tsunesuke; and Sinzawa, Kouichi, to Daiichi, Denso Buhin Co., Ltd. Connector attachment component. 5,558,543, Cl. 439-699.200.

Takasago, Masahiro: *See—*
Ito, Masamichi; and Takasago, Masahiro, 5,559,768, Cl. 369-44.250.

Takasaki, Mamoru: *See—*
Ozeki, Masamichi; Takasaki, Mamoru; Miyamoto, Katsuyuki; and Tsuruda, Mitsumasa, 5,557,908, Cl. 53-212.000.

Takata, Ikunori: *See—*
Watabe, Kiyoto; Takata, Ikunori; and Harada, Masana, 5,559,348, Cl. 257-141.000.

Takeda Chemical Industries, Ltd.: *See—*
Kubota, Naoki; and Kusaka, Taiki, 5,559,083, Cl. 504-269.000.
Yoshitomi, Sumie; Kurokawa, Tsutomu; and Igarashi, Koichi, 5,559,093, Cl. 514-2.000.

Takeda, Junichi, to Canon Kabushiki Kaisha. Information recording and/or reproducing apparatus and method for adjusting an offset amount of a focusing servo circuit. 5,559,772, Cl. 369-44.360.

Takeda, Masaki, to Namco LTD. Clipping processing device, three-dimensional simulator device, and clipping processing method. 5,559,937, Cl. 395-134.000.

Takeda, Nobutoshi: *See—*
Terao, Kazuhiko; Iida, Hidetoku; Nakayama, Takeyasu; Kubo, Toshiya; Horigome, Jiro; Matsuoka, Yoshihiro; Takeda, Nobutoshi; and Mizuhashi, Tohru, 5,559,916, Cl. 385-85.000.

Takeda, Noriyuki: *See—*
Taga, Hidenori; Edagawa, Noboru; Yamamoto, Shu; Takeda, Noriyuki; and Akiba, Shigeyuki, 5,559,910, Cl. 385-24.000.

Takedai, Seiichi: *See—*
Ozaki, Thoru; Sunouchi, Kazumasa; Takedai, Seiichi; and Shioyama, Yoshiyuki, 5,559,350, Cl. 257-304.000.

Takehisa, Yoshihiro, to Matsushita Electric Industrial Co., Ltd. Button telephone system which displays line status information. 5,559,861, Cl. 379-58.000.

Takei, Jiro; Yoshida, Tetsushi; and Kikuchi, Zenta, to Casio Computer Co., Ltd. Polymer dispersed liquid crystal display device. 5,559,615, Cl. 357-50.000.

Takei, Kazuo: *See—*
Wada, Yutaka; Oda, Yukihiro; Miyo, Tunemasa; Noguchi, Yasuhiro; and Takei, Kazuo, 5,559,939, Cl. 395-146.000.

Takei, Ken; Ohnishi, Masami; and Kuwahara, Mikio, to Hitachi, Ltd. Antenna system including a plurality of meander conductors for a portable radio apparatus. 5,559,524, Cl. 343-895.000.

Takei, Yutaka: *See—*
Miyazawa, Yorikatsu; Ishii, Hideo; Ikariya, Toshiyuki; Kobayashi, Hideo; Koboshi, Shigeharu; Takei, Yutaka; and Hakamada, Haruo, 5,559,577, Cl. 354-297.000.

Takekoshi, Isamu: *See—*
Kaji, Hironori; Ninomiya, Atushi; Takekoshi, Isamu; Seki, Hideo; and Hagiya, Kaoru, 5,559,283, Cl. 73-61.560.

Takemura, Makoto: *See—*
Nishi, Toshiyuki; Koda, Hiroko; Sugita, Kazuyuki; Ishida, Yohhei; Takemura, Makoto; and Hayano, Takeshi, 5,559,224, Cl. 540-350.000.

Takemura, Yasuhiko: *See—*
Yamazaki, Shunpei; and Takemura, Yasuhiko, 5,559,042, Cl. 437-21.000.

Takeuchi, Esther S.; and Thiebolt, William C., III, to Wilson Greatbatch Ltd. Preparation of silver vanadium oxide cathodes utilizing sol-gel technology. 5,558,680, Cl. 29-623.100.

Takeuchi, Yasuo: *See—*
Ogura, Wataru; Kawagoe, Yoshito; Takizawa, Satoru; Takeuchi, Yasuo; Okimura, Kimihiko; Yoshida, Hiroshi, deceased; Kobayashi, Atsushi; Ogura, Noboru; and Arioka, Kenji, 5,559,934, Cl. 395-117.000.

Takeuchi, Yoshio: *See—*
Sakai, Seiichiro; Takeuchi, Yoshio; Ohashi, Masayoshi; and Mizuno, Toshio, 5,559,803, Cl. 370-95.200.

Takeyama, Kenichi: *See—*
Matsui, Tooru; and Takeyama, Kenichi, 5,558,953, Cl. 429-194.000.

Takikawa, Kazunori, to USUI Kokusai Sangyo Kaisha Ltd. Long deformed extruded metallic shape and method for manufacturing said shape. 5,557,962, Cl. 72-260.000.

Takiyama, Makoto, to Nippon Steel Corporation. Semiconductor element having Cr in silicon dioxide. 5,559,351, Cl. 257-324.000.

Takiyasu, Yoshihiro: *See—*
Amada, Eiichi; Takiyasu, Yoshihiro; Ishifuji, Tomoaki; Ishii, Genichi; Jusa, Hidehiko; and Adachi, Shuichi, 5,559,804, Cl. 370-95.300.

Takizawa, Keiji: *See—*
Aruga, Hisashi; Takizawa, Keiji; Sawata, Ryuji; and Kobayashi, Takashi, 5,558,927, Cl. 428-195.000.

Takizawa, Satoru: *See—*
Ogura, Wataru; Kawagoe, Yoshito; Takizawa, Satoru; Takeuchi, Yasuo; Okimura, Kimihiko; Yoshida, Hiroshi, deceased; Kobayashi, Atsushi; Ogura, Noboru; and Arioka, Kenji, 5,559,934, Cl. 395-117.000.

Takuma, Yasuo: *See—*
Umeda, Takao; Miyasaka, Toru; Namikawa, Osamu; Komatsu, Isamu; Nagata, Tetsuya; Takuma, Yasuo; and Igawa, Tatsuo, 5,559,578, Cl. 355-208.000.

Talbot, Janet D.: *See—*
Thomas, Thomas N.; Sheehan, David V.; and Talbot, Janet D., 5,558,987, Cl. 435-4.000.

Talieh, Homayoun; Weldon, David E.; and Nagorski, Boguslaw A., to Ontrak Systems, Inc. Wafer polishing machine with fluid bearings. 5,558,568, Cl. 451-303.000.

Tam, Kwok C., to General Electric Company. Technique for improving processor efficiency in CT imaging. 5,559,846, Cl. 378-4.000.

Tam, Pui Y.: *See—*
Lam, Sheir C., 5,559,657, Cl. 361-42.000.

Tamarack Scientific Co., Inc.: *See—*
Sheets, Ronald E.; and Yuan, Yanrong, 5,559,629, Cl. 359-364.000.

Tambrands Inc.: *See—*
Campion, Terese A.; Albright, Mark D.; and Davison, Betsy A., 5,558,631, Cl. 604-13.000.

Tamco Limited: *See—*
Neal, Leonard; and Elliott, Robert, 5,557,981, Cl. 74-523.000.

Tamura, Keiichi: *See—*
Oe, Naoki; Sato, Koki; and Tamura, Keiichi, 5,558,365, Cl. 280-731.000.

Tamura, Keiji: *See—*
Kumagai, Katsuo; Rikiishi, Hidemi; Tamura, Keiji; Sugawara, Shunji; Nemoto, Eiji; Okamoto, Shigefumi; and Onta, Tokio, 5,559,211, Cl. 530-350.000.

Tamura, Taichi: *See—*
Yagi, Mikio; Mikami, Hiroshi; and Tamura, Taichi, 5,557,822, Cl. 15-369.000.

Tanabe, Hiroyoshi, to NEC Corporation. Exposure system and illuminating apparatus used therein and method for exposing a resist film on a wafer. 5,559,583, Cl. 355-71.000.

Tanaka, Etsuo: *See—*
Kai, Tadao; Tanaka, Etsuo; and Katayama, Akira, 5,559,574, Cl. 354-400.000.

Tanaka, Hisatoshi: *See—*
Ohno, Tadayoshi; Itoh, Shinichi; Yamaguchi, Takashi; and Tanaka, Hisatoshi, 5,559,314, Cl. 235-432.000.

Tanaka, Jun; and Himematsu, Fumio, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyester fiber and method of manufacturing the same. 5,558,935, Cl. 428-364.000.

Tanaka, Kazuyoshi: *See—*
Ibe, Takaya; Tanaka, Kazuyoshi; Ota, Kaname; Yamamoto, Goujun; and Okabe, Toshihiro, 5,558,340, Cl. 273-448.000.

Tanaka, Kiyoshi: *See—*
Hirano, Yutaka; Komatubara, Takeo; Sunaga, Takashi; Takahashi, Yasuki; Tanaka, Kiyoshi; Akazawa, Kiyoshi; Watanabe, Masato; and Jikuhara, Seiki, 5,557,944, Cl. 62-469.000.

Tanaka, Michinori: *See—*
Ogawa, Hidenori; Miyamoto, Hisashi; Kondo, Kazumi; Yamashita, Hiroshi; Nakaya, Kenji; Komatsu, Hajime; Tanaka, Michinori; Kora, Shinya; Tominaga, Michiaki; and Yabuuchi, Yoichi, 5,559,230, Cl. 540-569.000.

Tanaka, Sumio; Atsumi, Shigeru; and Kuriyama, Masao, to Kabushiki Kaisha Toshiba. Nonvolatile semiconductor memory capable of simultaneously equalizing bit lines and sense lines. 5,559,737, Cl. 365-185.250.

Tanaka, Tetsuya: *See—*
Hayashi, Yutaka; Miyamoto, Mitsuo; Watarai, Michihito; Atarashi, Takayuki; Tanaka, Tetsuya; Hatada, Toshio; Takada, Yoshihiro; and Daikoku, Takahiro, 5,558,493, Cl. 415-208.100.

Tanaka, Tomio; and Sakamoto, Katsuhito, to Casio Computer Co., Ltd. Anti-ferroelectric liquid crystal display device with intersecting alignment film directions. 5,559,620, Cl. 359-78.000.

Tanaka, Toyokazu: *See—*
Inami, Yoshiaki; Tanaka, Toyokazu; and Wachi, Masahira, 5,559,669, Cl. 361-612.000.

Tanaka, Tsutomu: *See—*
Ohtani, Yasuo; Kataho, Takuo; Satoh, Makoto; Tanaka, Tsutomu; Nose, Yoshimasa; Kobayashi, Kazuyoshi; Uchikawa, Tetsuhide; and Hamahata, Toshihiro, 5,559,826, Cl. 373-109.000.

Tanaka, Yasundo: *See—*

Kami, Kuniaki; Adachi, Hideyuki; Umeyama, Koichi; Kosaka, Yoshihiro; Yamaguchi, Seiji; Fuse, Eiichi; Sato, Michio; Nakamura, Masakazu; Tanaka, Yasundo; Fukaya, Takashi; Matsuno, Kiyotaka; and Suzuki, Katsuya, 5,558,619, Cl. 600-146.000.

Tanaka, Yoshiyuki; Abe, Masatoshi; and Ito, Taka-aki, to Mitsubishi Materials Corporation. Surge absorber. 5,559,663, Cl. 361-127.000.

Tangen, John C.: *See*—
Stobbie, Charles W., IV; Tangen, John C.; and Kangas, Lani S., 5,558,941, Cl. 428-423.100.
Stobbie, Charles W., IV; Tangen, John C.; and Kangas, Lani S., 5,559,196, Cl. 525-458.000.

Taniguchi, Seihou: *See*—
Yanagihara, Hiroyuki; Taniguchi, Seihou; Hazeyama, Takeshi; Otaka, Hitoshi; Hashimoto, Teiji; and Souma, Sansan, 5,558,689, Cl. 55-492.000.

Taniguchi, Takashi: *See*—
Yamamoto, Shinichi; and Taniguchi, Takashi, 5,559,231, Cl. 544-70.000.

Tanoi, Satoru, to Oki Electric Industry Co., Ltd. Digital signal transmission circuit. 5,559,462, Cl. 327-231.000.

Tanski, William J.; Carroll, Roger; and Branciforte, Emilio J., to Norden Systems, Inc. Low resistance, thermally stable electrode structure for electroluminescent displays. 5,559,399, Cl. 313-506.000.

Tapani, Robert W.: *See*—
Anderson, James S.; Gerfast, Sten R.; Opheim, Warren W.; Tapani, Robert W.; and Tran, Hung T., 5,558,291, Cl. 242-336.000.

Taranowski, Michael G.; Wickert, Douglas E.; Hubbell, Ruth E.; Leveque, Denis J.; and Larsen, Michael R., to Eaton Corporation. Capacitive switching assembly. 5,559,665, Cl. 361-280.000.

Tarlow, Kenneth A.: *See*—
Lehrer, Robert A.; and Tarlow, Kenneth A., 5,558,428, Cl. 362-105.000.

Tarnus, Céline: *See*—
Schirlin, Daniel; Van Dorsselaer, Viviane; and Tarnus, Céline, 5,559,140, Cl. 514-357.000.

Tassone, Joseph V.; Marsh, Richard L.; and Candor, James T., to Dayco Products, Inc. System for conveying a fluid through an under-the-ground location and method of making the same. 5,558,464, Cl. 405-154.000.

Tate, Takuo; Takagi, Nobuyoshi; Kobayashi, Tsunekazu; and Sano, Akinori, to Nippon Filcon, Co., Ltd. Endless multilayer fabric for densifying paper materials and production process thereof. 5,558,926, Cl. 428-193.000.

Taub, Ronald H. Game assembly for multiple sports usage. 5,558,338, Cl. 273-411.000.

Taurand, Christophe: *See*—
Bedouet, Bernard; and Taurand, Christophe, 5,559,438, Cl. 324-418.000.

Tavernier, Serge: *See*—
Uyttendaele, Carlo; de Beeck, Werner O.; Leenders, Luc; and Tavernier, Serge, 5,558,969, Cl. 430-124.000.

Taylor, Bruce: *See*—
Crowley, H. W.; Clifford, John W.; Connolly, Thomas; Fairhurst, John R.; and Taylor, Bruce, 5,558,319, Cl. 270-58.310.

Taylor, Bruce J.: *See*—
Crowley, H. W.; Silva, Stephen E.; Bianchetto, Peter E.; Clifford, John W.; and Taylor, Bruce J., 5,558,318, Cl. 270-39.050.

Taylor, Lucille F.: *See*—
Hartman, Frederick A.; Rice, Ronald J.; Burckett-St. Laurent, James C. T. R.; Taylor, Lucille F.; and Haeggberg, Donna J., 5,559,089, Cl. 510-224.000.

Taylor, Robert E.: *See*—
Knoff, Warren F.; McAllister, Robert W.; Popper, Peter; Shibata, Steven K.; Taylor, Robert E.; and Yngve, Paul W., 5,557,915, Cl. 57-204.000.

Taylor, Stuart A.: *See*—
Bieselin, David N.; Eaton, Glenn A.; McFadden, Joseph A.; Taylor, Stuart A.; Tracy, Edward D.; and Wang, Emil C. W., 5,559,875, Cl. 379-202.000.

Tazaki, Tokuo: *See*—
Kishi, Hajime; Odagiri, Nobuyuki; Tazaki, Tokuo; Nagata, Hideo; Terashita, Takeshi; Nishimura, Akira; and Kato, Hiroyasu, 5,557,831, Cl. 28-167.000.

TDK Corporation: *See*—
Miyazaki, Shinji; Yoshinari, Jiro; and Kobayashi, Koji, 5,558,945, Cl. 428-611.000.
Ohtani, Yasuo; Kataho, Takuo, Satoh, Makoto; Tanaka, Tsutomu; Nose, Yoshimasa; Kobayashi, Kazuyoshi; Uchikawa, Tetsuhide; and Hamahata, Toshihiro, 5,559,826, Cl. 373-109.000.
Terunuma, Koichi, 5,558,944, Cl. 428-611.000.

Teagardin, Michael: *See*—
Patel, Sunil; Ng, Chai-Nam; Dhyanchand, P John; Nguyen, Vietson M.; and Teagardin, Michael, 5,559,686, Cl. 363-43.000.

Technical Manufacturing Corporation: *See*—
Heide, Ulf B., 5,558,920, Cl. 428-116.000.

Technipetrol S.p.A.: *See*—
Zinnamosca, Francesco; and Berruti, Massimo, 5,559,031, Cl. 435-289.100.

Technistan: *See*—
Levy, Claude; Smadja, Jean-Claude; and Opman, Pierre, 5,557,890, Cl. 49-502.000.

Tedesco, James M.: *See*—
Battey, David E., Owen, Harry; and Tedesco, James M., 5,559,597, Cl. 356-328.000.

Tedrow, Kerry; Tsang, Joseph W.; and Wojciechowski, Kenneth, to Intel Corporation. High precision voltage detector utilizing flash EEPROM memory cells. 5,559,717, Cl. 364-483.000.

Tegeler, John J.: *See*—
Strupczewski, Joseph T.; Helsley, Grover C.; Glamkowski, Edward J.; Chiang, Yulin; Bordeau, Kenneth J.; Nemoto, Peter A.; and Tegeler, John J., 5,559,117, Cl. 514-254.000.

Teijin Seiki Co., Ltd.: *See*—
Sugioka, Takami; Yudate, Toshihiro; and Seike, Yuji, 5,558,286, Cl. 242-18.00A.

Teisan K.K.: *See*—
Kawamura, Hideki; Tomita, Shinji; Murayama, Shuichi; and Nishikawa, Yukinobu, 5,557,925, Cl. 62-50.500.

Tekavec, Randall V.: *See*—
Humphrey, Henry L.; Mahle, Richard L.; and Tekavec, Randall V., 5,558,267, Cl. 228-4.500.

Tektronix, Inc.: *See*—
Anderson, Duwayne R.; Reinhold, Steve U.; Twigg, Lorimer L.; and Marineau, Mark D., 5,559,909, Cl. 385-16.000.

Teledyne Industries, Inc.: *See*—
Jacobs, David C.; and Alvesteffer, William J., 5,557,972, Cl. 73-756.000.

Telefonaktiebolaget L M Ericsson (publ): *See*—
Alperovich, Vladimir, 5,559,876, Cl. 379-205.000.

Telefonaktiebolaget LM Ericsson: *See*—
Dent, Paul W.; Raith, Alex K.; and Dahlin, Jan E. Å. S., 5,559,886, Cl. 380-23.000.

Telford, Susan G.; Tseng, Meng C.; Aruga, Michio; and Eizenberg, Moshe, to Applied Materials, Inc. Uniform tungsten silicide films produced by chemical vapor deposition. 5,558,910, Cl. 427-255.000.

Telia AB: *See*—
Einarsson, Göran, 5,559,623, Cl. 359-112.000.

Telingator, Eric; Ward, Owen; and Ross, Edward J., to Core Systems, Inc. Customizable data gathering method which allows the user to define the classes of data which are gathered. 5,559,692, Cl. 364-401.00R.

Teltrust, Inc.: *See*—
Keys, Lyle O.; Gardner, Neil J.; Brunisholz, Arthur C.; and Heath, Richard R., 5,559,878, Cl. 379-265.000.

Temp Top Container Systems, Inc.: *See*—
Huffstutler, M. Conrad, Jr.; Meacham, Patrick E.; Wallace, Mark W.; and Nyberg, Carl R., 5,558,241, Cl. 220-1.500.

Temsamani, Jamal; and Agrawal, Sudhir, to Hybridon, Inc. Detection of synthetic oligonucleotides extracted from body fluids or tissues. 5,558,992, Cl. 435-6.000.

Tenex Corporation: *See*—
Staubitz, Robert; and Repp, Timothy, 5,558,219, Cl. 206-308.100.

Tenpaku, Chitose: *See*—
Sugiura, Yoshinori; Azuma, Jun; Adachi, Nobukazu; Setoriyama, Takeshi; Tenpaku, Chitose; Ishikawa, Noriyoshi; Hamada, Tatsuo; Tsuchiya, Yoshiro; Kubota, Takeshi; Nomura, Yoshiya; Kuroda, Akira; Murooka, Ken; Sugita, Takeshi; Niimura, Takeshi; and Yuza, Akira, 5,559,581, Cl. 355-200.000.

Tenyo Co., Ltd.: *See*—
Shimomura, Tomoyuki, 5,558,583, Cl. 472-71.000.
Sugawara, Shigeru, 5,557,867, Cl. 40-493.000.

TER S.r.l.: *See*—
Albini, Giovanni; Ruscitti, Tommaso; and Carlappi, Franco, 5,558,258, Cl. 222-496.000.

Terabe, Tokiya: *See*—
Uzaki, Nagato; Oishi, Ukichi; Kanayama, Ryoji; Amano, Hironobu; and Terabe, Tokiya, 5,558,148, Cl. 164-7.100.

Terada, Akihiro: *See*—
Nihei, Ryo; Terada, Akihiro; Iwasaki, Kyozi; and Ito, Masatoshi, 5,558,196, Cl. 192-142.00R.

Terada, Keiji: *See*—
Wakai, Hideyuki; Suzuki, Toru; Terada, Keiji; Moriya, Masato; and Ando, Manabu, 5,559,603, Cl. 356-376.000.

Terao, Kazuhiko; Iida, Hidetoku; Nakayama, Takeyasu; Kubo, Toshiya; Horigome, Jiro; Matsuoka, Yoshihiro; Takeda, Nobutoshi; and Mizuhashi, Tohru, to Totoku Electric Co., Ltd.; and Emit Seiko Co., Ltd. Method for manufacturing optical fiber assembly with polished end-face, an end face polishing apparatus, and a method for examining the end point of end-face polishing process of optical fiber. 5,559,916, Cl. 385-85.000.

Teraoka, Yutaka: *See*—
Miyazawa, Yorikatsu; Teraoka, Yutaka; and Ishii, Hideo, 5,559,576, Cl. 354-298.000.

Terasawa, Koji, to Canon Kabushiki Kaisha. Suction recovery device for ink jet recording apparatus. 5,559,537, Cl. 347-30.000.

Terasawa, Yoshiaki; and Kubo, Yuji, to Sumitomo Electric Industries, Ltd. Single mode optical fiber. 5,559,921, Cl. 385-124.000.

Terashita, Takeshi: *See*—
Kishi, Hajime; Odagiri, Nobuyuki; Tazaki, Tokuo; Nagata, Hideo; Terashita, Takeshi; Nishimura, Akira; and Kato, Hiroyasu, 5,557,831, Cl. 28-167.000.

Termine, Enrico J.: *See*—
Kulich, Donald M.; Cleveland, Thomas B.; Termine, Enrico J.; and Mack, Arthur G., 5,559,172, Cl. 524-155.000.

Termotto, Clara M. Carousel cabinet. 5,558,417, Cl. 312-249.900.

Terpening, John P., to J. E. Miller Inc. Tube sheet locator and tube expander. 5,557,840, Cl. 29-727.000.

Tertiuk, Wasyl: *See*—

Schwartz, Jean-Charles; Arrang, Jean-Michel; Garbarg, Monique; Lecomte, Jeanne-Marie; Ganellin, Charon R.; Pkyerat, Abdellatif; Tertiuk, Wasyl; Schunack, Walter; Lipp, Ralph; Stark, Holger; and Purand, Katja, 5,559,113, Cl. 514-252.000.

Terumo Kabushiki Kaisha: *See*—
Umezawa, Kazuo; Koyano, Takashi; Takahashi, Hiroaki; and Yamamoto, Takashi, 5,559,115, Cl. 514-279.000.

Terunuma, Koichi, to TDK Corporation. Magnetic head and a process for production thereof. 5,558,944, Cl. 428-611.000.

Tessera, Inc.: *See*—
DiStefano, Thomas H.; Ehrenberg, Scott G.; and Khandros, Igor Y., 5,558,928, Cl. 428-209.000.

Testa, Thomas. Butt assembly for a fishing pole. 5,557,875, Cl. 43-20.000.

Texaco Inc.: *See*—
DeRosa, Thomas F.; Russo, Joseph M.; Kaufman, Benjamin J.; and Mastropierro, Joseph T., 5,558,684, Cl. 44-419.000.
DeRosa, Thomas F.; Studzinski, William M.; Russo, Joseph M.; Kaufman, Benjamin J.; and Hahn, Robert T., 5,558,685, Cl. 44-426.000.

Texas Instruments Inc.: *See*—
Finklea, John E.; Shea, Chi-Cheong; Vickers, Kenneth G.; and Kressley, Mark A., 5,558,554, Cl. 445-52.000.
Guttag, Karl M.; Read, Christopher J.; Poland, Sydney W.; Gove, Robert J.; and Golston, Jeremiah E., 5,560,030, Cl. 395-800.000.
Humphrey, Henry L.; Mahle, Richard L.; and Tekavec, Randall V., 5,558,267, Cl. 228-4.500.
Meissner, Edward G.; and Beratan, Howard R., 5,559,332, Cl. 250-338.200.
Vogley, Wilbur C., 5,560,000, Cl. 395-550.000.

Textron Automotive Interiors, Inc.: *See*—
Poliquin, Alfred T.; and Hagenow, Paul, 5,558,909, Cl. 427-251.000.

Thai, Lam H., to Borland International, Inc. B-tree key-range bit map index optimization of database queries. 5,560,007, Cl. 395-600.000.

Tham, Robert Q.: *See*—
Bathe, Duncan P. L.; Kohlmann, Thomas S.; Pinkert, John R.; and Tham, Robert Q., 5,558,083, Cl. 128-203.120.

Thanawala, Ashish: *See*—
Maitra, Sidhartha; Thanawala, Ashish; and Young, Steve, 5,559,793, Cl. 370-32.100.

Thermacore, Inc.: *See*—
Sarraf, David B.; and Miller, David L., 5,558,720, Cl. 118-726.000.

Thermedics Detection Inc.: *See*—
Rounbehler, David P.; Appel, Dirk; Dussault, Daniel A.; Levine, Thomas M.; and Bosworth, Jonathan E., 5,558,836, Cl. 422-91.000.

Thermo King Corporation: *See*—
Hanson, Jay L.; and Herrig, Doyle G., 5,557,938, Cl. 62-126.000.
Hanson, Jay L.; Nixon, James E.; Herrig, Doyle G.; and Ladendorf, Gerald J., 5,557,941, Cl. 62-160.000.

ThermoGenesis Corporation: *See*—
Coelho, Philip H.; and Wolf, Terry, 5,557,943, Cl. 62-376.000.

Thetford Corporation: *See*—
Antos, John M.; Selina, John R.; and Byrne, James M., 5,557,810, Cl. 4-321.000.

Thiard-Laforet, Alfred; and Zerlik, Wilibald, to ABB Management AG. Method for repairing stator winding bars. 5,557,837, Cl. 29-596.000.

Thiebolt, William C., III: *See*—
Takeuchi, Esther S.; and Thiebolt, William C., III, 5,558,680, Cl. 29-623.100.

Thierbach, Mark E.: *See*—
Blaker, David M.; Diamondstein, Marc S.; Ellard, Gregory S.; Mobin, Mohammad S.; Sam, Homayoon; and Thierbach, Mark E., 5,559,837, Cl. 375-341.000.

Thigpen, Gary M.; Sherwood, William H., Jr.; and Fielder, Coy M., to Baroid Technology, Inc. Method and apparatus for improving drill bit stability. 5,558,170, Cl. 175-57.000.

Thomas & Betts Corporation: *See*—
Whitehead, James H.; and Lynch, Francis X., 5,559,307, Cl. 174-87.000.

Thomas, Harold L.: *See*—
Washnock, John T.; and Thomas, Harold L., 5,557,821, Cl. 15-3.130.

Thomas Jefferson University: *See*—
Prockop, Darwin J.; Ala-Kokko, Leena; and Ritvaniemi, Pertti, 5,558,988, Cl. 435-6.000.

Thomas, Pascal: *See*—
Challande, Christian; Thomas, Pascal; and Desarmaux, Pierre, 5,558,356, Cl. 280-625.000.

Thomas, Thomas N.; Sheehan, David V.; and Talbot, Janet D., to University of South Florida. Blood levels of CCK peptides relative to panic disorder treatment. 5,558,987, Cl. 435-4.000.

Thompson, Barbara L.: *See*—
Barnett, Andrew C., Jr.; Russell, Larry R.; and Thompson, Barbara L., 5,558,468, Cl. 405-204.000.

Thompson, Scott M., to General Motors Corporation. Transmission oil monitor system. 5,559,494, Cl. 340-439.000.

Thompson, Susan M.: *See*—
Adams, Jerry L.; Gallagher, Timothy G.; and Thompson, Susan M., 5,559,137, Cl. 514-341.000.

Thompson, Wanda G.: *See*—
Claus, David M.; Murphy, Kevin D.; and Thompson, Wanda G., 5,559,313, Cl. 235-380.000.

Thomson, David, to Analog Devices, Inc. Analog-to-digital converter with sigma-delta duty cycle encoded output. 5,559,514, Cl. 341-143.000.

Thomson, Frederick: *See*—
Dogul, James; Sarkar, Sandip; Thomson, Frederick; and Thomson, Robert, 5,559,664, Cl. 361-191.000.

Thomson Industries, Inc.: *See*—
Ng, Alison, 5,558,442, Cl. 384-43.000.

Thomson, Robert: *See*—
Dogul, James; Sarkar, Sandip; Thomson, Frederick; and Thomson, Robert, 5,559,664, Cl. 361-191.000.

Thurk, Gregory E.: *See*—
Schoen, Robert M.; and Thurk, Gregory E., 5,557,829, Cl. 16-375.000.

Tilly, Lynn K.; Silsbe, Donald L.; and Twomley, Michael T., to Chrysler Corporation. Asymmetrical wire hook latch arrangement. 5,558,386, Cl. 296-65.100.

Tilman, Paul A., to Minigrip Inc. Wedge zipper. 5,558,439, Cl. 383-63.000.

Tilman, Paul A.; Scott, Richmond M.; and Machacek, Zdenek, to Minigrap, Inc. Method for reducing the variance in the forces needed to open reclosable plastic bags from within and from without. 5,558,613, Cl. 493-214.000.

Tinguely, Eric: *See*—
Schädeli, Ulrich; Münzel, Norbert; De Leo, Christoph; Holzwarth, Heinz; and Tinguely, Eric, 5,558,978, Cl. 430-270.100.

Tino, Joseph A.: *See*—
Gordon, Eric M.; Barrish, Joel C.; Bisacchi, Gregory S.; Sun, Chong-Qing; Tino, Joseph A.; Vite, Gregory D.; and Zahler, Robert, 5,559,256, Cl. 552-303.000.

Tiorco, Inc.: *See*—
Smith, Julie E., 5,559,263, Cl. 556-183.000.

Titon Hardware Limited: *See*—
Peak, Richard A., 5,558,574, Cl. 454-213.000.

Tkach, Robert W.: *See*—
Chraplyvy, Andrew R.; Forghieri, Fabrizio; Gnauck, Alan H.; and Tkach, Robert W., 5,559,920, Cl. 385-123.000.

Tkatch, Randy T.: *See*—
Dai, Susan W. S.; Gayton, Donald W.; Laird, Brian G.; Tkatch, Randy T.; Bettis, Sonny; Fitzhugh, Marc; Williams, Shandton; Lowman, Phillip; and Gonzalez, Julio, 5,559,859, Cl. 379-51.000.

Toda, Kozo, to Canon Kabushiki Kaisha. Image processing apparatus. 5,559,610, Cl. 358-461.000.

Todd, Douglas W.: *See*—
Patton, Mark W.; Todd, Douglas W.; and Davis, Glenn A., 5,559,870, Cl. 379-107.000.

Tohoku Ricoh Co., Ltd.: *See*—
Ikenoue, Tsuneo; and Kamata, Hisahiro, 5,559,486, Cl. 336-90.000.
Sato, Mitsuo, 5,559,546, Cl. 347-200.000.

Toivonen, Hannu O. E.: *See*—
Bleakley, Ian S.; and Toivonen, Hannu O. E., 5,558,782, Cl. 210-712.000.

Tokai Kogyo Kabushiki Kaisha: *See*—
Yada, Yukihiko; and Niwa, Takeaki, 5,558,828, Cl. 264-252.000.

Toki, Hitoshi: *See*—
Itoh, Shigeo; Yonezawa, Yoshihisa; and Toki, Hitoshi, 5,558,814, Cl. 252-301.40R.

Tokico, Ltd.: *See*—
Kobayashi, Kinzo; Suzuki, Shinji; and Tokunaga, Takahiro, 5,558,345, Cl. 277-168.000.
Osaka, Nobumaro; Amari, Yasuhiko; and Enomoto, Takanobu, 5,558,001, Cl. 91-376.00R.

Tokunaga, Takahiro: *See*—
Kobayashi, Kinzo; Suzuki, Shinji; and Tokunaga, Takahiro, 5,558,345, Cl. 277-168.000.

Tokyo Electron Kabushiki Kaisha: *See*—
Sano, Kunio, 5,559,446, Cl. 324-760.000.

Tokyo Electron Limited: *See*—
Hiroki, Tutomu; Abe, Shoichi; and Akiyama, Kiyotaka, 5,558,482, Cl. 414-217.000.

Tokyo Electron Yamanashi Kabushiki Kaisha: *See*—
Sano, Kunio, 5,559,446, Cl. 324-760.000.

Tokyo Electron Yamanashi Limited: *See*—
Hiroki, Tutomu; Abe, Shoichi; and Akiyama, Kiyotaka, 5,558,482, Cl. 414-217.000.

Toler, Michael D.: *See*—
Lesley, Paul M.; and Toler, Michael D., 5,558,373, Cl. 273-119.00R.

Tomazin, Thomas J.: *See*—
Gallup, Micheal G.; Goke, L. Rodney; Seaton, Robert W., Jr.; Lawell, Terry G.; Osborn, Stephen G.; and Tomazin, Thomas J., 5,559,973, Cl. 395-375.000.

Tominaga, Michiaki: *See*—
Ogawa, Hidenori; Miyamoto, Hisashi; Kondo, Kazumi; Yamashita, Hiroshi; Nakaya, Kenji; Komatsu, Hajime; Tanaka, Michinori; Kora, Shinya; Tominaga, Michiaki; and Yabuuchi, Yoichi, 5,559,230, Cl. 540-569.000.

Tomino, Naoki: *See*—
Kazami, Kazyuki; Daitoku, Koichi; Wakabayashi, Tsutomu; Goto, Tetsuro; Ezawa, Akira; and Tomino, Naoki, 5,559,568, Cl. 394-106.000.

Tomita, Akihisa: *See*—
Kimura, Akitaka; Nido, Masaaki; Tomita, Akihisa; and Suzuki, Akira, 5,559,820, Cl. 372-46.000.

Tomita, Akira: *See*—
Matsuyama, Akinobu; Tomita, Akira; and Kobayashi, Yoshinori, 5,559,030, Cl. 435-280.000.

Tomita, Shinji: *See*—

Kawamura, Hideki; Tomita, Shinji; Murayama, Shuichi; and Nishikawa, Yukinobu, 5,557,925, Cl. 62-50.500.

Oba, Hidehiro; and Kimura, Hiromichi, 5,558,597, Cl. 477-98.000.

Suzuki, Makoto; Abe, Shizuo; and Kawauchi, Masato, 5,558,048, Cl.

Tsuchida, Masayuki; Uemura, Hirokazu; Miura, Shinji; Saito, Yoshiyuki; Yoshimura, Hiroyuki; Nishimura, Yuichi; and Sueda, Nobuo, to Matsushita

Balcerski, Bruce D.; and Tucker, James H., 5,558,741, Cl. 156-244.110.

Tudor, Robin, to Canadian Fracmaster Ltd. Nitrogen/carbon dioxide combi-

Kawamura, Hideki; Tomita, Shinji; Murayama, Shuichi; and Nishikawa, Yukinobu, 5,557,925, Cl. 62-50.500.

Tomlin, Andrew J.: *See*—
Cornea, Joel T.; and Tomlin, Andrew J., 5,558,369, Cl. 280-800.000.

Tomoda, Yoshiyuki, to NEC Corporation. Plastic-molded semiconductor device containing a semiconductor pellet mounted on a lead frame. 5,559,316, Cl. 257-666.000.

Tompkins, Michael E.; and Green, Michael J., to Siegel, Irving C. Spa control system. 5,559,720, Cl. 364-505.000.

Toselli, Fernando A.; and Behmann, Henry, to Zenon Environmental Inc. Aerated bot membrane bioreactor process for treating recalcitrant compounds. 5,558,774, Cl. 210-612.000.

Toni, Darryl M.; Grant, Peter L.; Johnson, Craig F.; Hayse, Steven R.; Forster, William V.; Nowak, Kenneth; and Osiecki, Larry J., to United Technologies Corporation. Duct cover for directing a fluid therethrough. 5,558,919, Cl. 428-116.000.

Toppan Printing Co., Ltd.: *See*—
Minato, Takao; Suzuki, Katsuhiro; Hoshi, Hisao; and Yoshida, Masafumi, 5,559,621, Cl. 359-81.000.

Toray Industries Inc.: *See*—
Kishi, Hajime; Odagiri, Nobuyuki; Tazaki, Tokuo; Nagata, Hideo; Terashita, Takeshi; Nishinaura, Akira; and Kato, Hiroyasu, 5,557,831, Cl. 28-167.000.
Ueda, Kunihiko; Arakane, Shuko; Sano, Takao, and Maeda, Yuhei, 5,558,825, Cl. 264-103.000.
Yamamoto, Shinichi; and Taniguchi, Takashi, 5,559,231, Cl. 544-70.000.

Torii, Kazuo; Iwasaki, Takashi; Onodera, Yoshio; and Hayashi, Hiromichi, to Director General of Agency of Industrial Science and Technology. Synthetic inorganic porous material and method for the preparation thereof. 5,559,070, Cl. 502-240.000.

Torimoto, Yoshifumi, to Jatco Corporation. Control system for automatic transmission. 5,558,598, Cl. 477-110.000.

Toropov, Anatoly I.: *See*—
Tsymbal, Valentin P.; Mochalov, Sergei P.; Shakirov, Kim M.; Aizatulov, Rafik S.; Kustov, Boris A.; Mikheev, Nikolai I.; and Toropov, Anatoly I., 5,558,695, Cl. 75-414.000.

Toropov, Jury M.: *See*—
Komissarova, Irina A.; Gudkova, Julia V.; Soldatenkova, Tatyana D.; Burbenskaya, Natalya M.; Kondrashova, Tatyana T.; Kalantar, Irina L.; Toropov, Jury M.; Semenova, Galina F.; Nartsissov, Rjurik P.; and Kalinina, Elena V., 5,559,152, Cl. 514-557.000.

Torti, Giovanni: *See*—
Gurrieri, Giorgio, 5,559,386, Cl. 310-211.000.

Tortolani, David R.: *See*—
Starrett, John E., Jr.; Tortolani, David R.; Mansuri, Muzammil M., and Meanwell, Nicholas A., 5,559,248, Cl. 549-79.000.

Tortul, Renzo, to Carraro S.p.A. Timing variator between the crankshaft and the camshaft of an internal combustion engine. 5,558,053, Cl. 123-90.170.

Totoku Electric Co., Ltd.: *See*—
Terao, Kazuhiko; Iida, Hidetoku; Nakayama, Takeyasu; Kubo, Toshiya; Horigome, Jiro; Matsuoka, Yoshihiro; Takeda, Nobutoshi, and Mizuhashi, Tohru, 5,559,916, Cl. 385-85.000.

Touchstone Research Laboratory, Ltd.: *See*—
Joseph, Brian E.; Stackpole, Russell P., II; and Baker, Everett H., 5,559,329, Cl. 250-306.000.

Toutain, Laurent: *See*—
Rolin, Pierre; Gombault, Sylvain; and Toutain, Laurent, 5,559,814, Cl. 371-67.100.

Townley, Roderick M.: *See*—
Smith, Donald M.; and Townley, Roderick M., 5,558,086, Cl. 128-204.260.

Townsend Eingineering Company: *See*—
Basile, Vincent L., II.; Veldkamp, Brent M.; McCloskey, Douglas N.; and Hamblin, David S., 5,558,573, Cl. 452-127.000.

Toyo Ink Manufacturing Co., Ltd.: *See*—
Arai, Yoshifumi, 5,559,604, Cl. 356-402.000.

Toyoda, Atsushi: *See*—
Shouji, Shigeru; and Toyoda, Atsushi, 5,559,653, Cl. 360-126.000.

Toyoda Gosei Co., Ltd.: *See*—
Furuie, Tsuneichi; Ueno, Masato; Maeno, Takashi; Ogasawara, Yutaka; Inoue, Masaki; and Mori, Naoki, 5,558,310, Cl. 248-573.000.
Sumida, Atsushi; and Kanamori, Yoshihiko, 5,558,387, Cl. 296-93.000.

Toyoda Koki Kabushiki Kaisha: *See*—
Inaguma, Yoshiharu; Mori, Yutaka; Suzuki, Keiji; and Ohkubo, Takuya, 5,558,177, Cl. 180-422.000.

Toyosaki, Koichi: *See*—
Kohmura, Yukio; and Toyosaki, Koichi, 5,558,721, Cl. 118-730.000.

Toyoshima, Takeshi; Kawakami, Yo; Ishikawa, Hiroyasu; Abe, Takao; Sato, Satsuo; Noto, Nobuhiro; Kaneko, Tadahiro; Kaneta, Takayoshi; Kobayahsi, Juurou; and Kawanobe, Osamu, to Hitachi Koki Company Limited. Portable grinder. 5,558,571, Cl. 451-358.000.

Toyota, Akinori: *See*—
Abe, Yoshiharu; Sagane, Toshihiro; and Toyota, Akinori, 5,559,199, Cl. 526-160.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Fujita, Tomohiro, 5,559,706, Cl. 364-431.110.
Harima, Kenji; Nagai, Toshinari; Kanai, Hiroshi; Osanai, Akinori; Iwano, Kazuhiro; and Yuda, Shuji, 5,558,072, Cl. 123-677.000.
Kubota, Kazuhiko, 5,558,414, Cl. 303-122.080.
Kushida, Tomoyoshi, 5,559,346, Cl. 257-138.000.
Oba, Hidehiro; and Kimura, Hiromichi, 5,558,597, Cl. 477-98.000.
Suzuki, Makoto; Abe, Shizuo; and Kawauchi, Masato, 5,558,048, Cl. 123-41.240.
Yoshioka, Mamoru, 5,558,051, Cl. 123-90.150.

Toyota, Masanobu: *See*—
Ryu, Tadamitsu; Izumi, Hiroyuki; Murakawa, Masahiko; Toyota, Masanobu; Adachi, Takeshi; and Ichikawa, Naomi, 5,560,012, Cl. 395-700.000.

Tozun, Orhan; Mak, Chit-Ah; and Hoeft, Werner, to International Microcircuits, Inc. Pulse generator having controlled delay to control duty cycle. 5,559,477, Cl. 331-97.000.

Tracto-Technik Paul Schmidt Speczialmashinen KG: *See*—
Hesse, Alfons, 5,558,167, Cl. 173-91.000.

Tracy, Edward D.: *See*—
Bieselin, David N.; Eaton, Glenn A.; McFadden, Joseph A.; Taylor, Stuart A.; Tracy, Edward D.; and Wang, Emil C. W., 5,559,875, Cl. 379-202.000.

Traina, John E.; and Myers, Richard, to United Sciences, Inc. Method and apparatus for dynamic calibration of a flow monitor. 5,559,279, Cl. 73-3.000.

Trainor, George L., to Du Pont de Nemours, E. I., and Company. DNA sequencing method using acyclonucleoside triphosphates. 5,558,991, Cl. 435-6.000.

Tram-7 Precision, Inc.: *See*—
Barrett, Mark C.; and Barrett, Coy, 5,558,276, Cl. 239-135.000.

Tran, Hung T.: *See*—
Anderson, James S.; Gerfast, Sten R.; Opheim, Warren W.; Tapani, Robert W.; and Tran, Hung T., 5,558,291, Cl. 242-336.000.

Tranchita, Charles J.: *See*—
Strong, Maurice L., III; Tranchita, Charles J.; Welch, Christopher R.; and Griffith, Gerald, 5,559,510, Cl. 340-954.000.

Trang, Quang H.: *See*—
Nguyen, Le Trong; Lentz, Derek J.; Miyayama, Yoshiyuki; Garg, Sanjiv; Hagiwara, Yasuaki; Wang, Johannes; Lau, Te-Li; Wang, Sze-Shun; and Trang, Quang H., 5,560,032, Cl. 395-800.000.

Trani, Aldo; Dallanoce, Clelia M. L.; and Ciabatti, Romeo, to Gruppo Lepetit Spa. 7'-amino-naphthazarin antibiotic derivatives. 5,559,249, Cl. 549-264.000.

Tredegar Industries, Inc.: *See*—
DiPoto, James P., 5,558,930, Cl. 428-216.000.

Tremmel, Gregor: *See*—
Poepel, Wolfgang J.; Tremmel, Gregor; Buechele, Wolfgang; Deimling, Axel; and Petersen, Hermann, 5,559,066, Cl. 502-20.000.

Tremont, Samuel J.: *See*—
McGrath, Martin P.; and Tremont, Samuel J., 5,559,193, Cl. 525-326.100.

Tremulis, William S.: *See*—
Samson, Wilfred J.; and Tremulis, William S., 5,558,643, Cl. 604-96.000.

Tribuzio, Pasquale; and Errico, Angelantonio, to AlliedSignal Freni SPA. Input lever for actuating a push rod for a brake motor. 5,558,185, Cl. 188-72.600.

Trice, Philip H.: *See*—
Davis, Terry L.; Hart, James A.; O'Malley, Michael F.; Russell, James F.; Sears, John W.; and Trice, Philip H., 5,559,887, Cl. 380-24.000.

Trinberger, Stephen M., to Xilinx, Inc. Electrically configurable integrated circuit configuration using clocked data. 5,559,751, Cl. 365-233.000.

Tronich, Wolfgang: *See*—
Arndt, Otto; and Tronich, Wolfgang, 5,559,257, Cl. 552-308.000.

Trost, David: *See*—
Dewey, David A.; Arnett, Michael; Koop, Dale E.; and Trost, David, 5,558,666, Cl. 606-9.000.

Tru-Fire Corporation: *See*—
Linsmeyer, Louis R., 5,558,077, Cl. 124-35.200.

TRW Inc.: *See*—
Cuevas, Jess A., 5,558,367, Cl. 280-737.000.
Fogle, Homer W., Jr.; Bailey, Todd; Pitstick, Brian R.; and Streif, Eric, 5,558,366, Cl. 280-736.000.
Jacoby, Jerold L.; and Livingston, Peter M., 5,559,322, Cl. 250-203.100.
Kobayashi, Kevin W., 5,559,472, Cl. 330-293.000.

TRW Repa GmbH: *See*—
Acker, Dominique; and Kuhn, Adolf M., 5,558,362, Cl. 280-728.200.

TRW Vehicle Safety Systems Inc.: *See*—
Bauer, Barney J., 5,558,295, Cl. 242-379.100.

Tsai, Daniel T. Microwave steam cooking apparatus. 5,558,798, Cl. 219-731.000.

Tsang, Joseph W.: *See*—
Tedrow, Kerry; Tsang, Joseph W., and Wojciechowski, Kenneth, 5,559,717, Cl. 364-483.000.

Tse, David: *See*—
Clarkson, Kenneth L.; Grossglauser, Matthias; Keshav, Srinivasan; and Tse, David, 5,559,798, Cl. 370-60.100.

Tseng, Meng C.: *See*—
Telford, Susan G.; Tseng, Meng C.; Aruga, Michio, and Eizenberg, Moshe, 5,558,910, Cl. 427-255.000.

Tsuboi, Kazuo. *See*—
Kentatsu, Kunihiro; Tsuboi, Kazuo; and Ishida, Takeshi, 5,559,773, Cl. 369-44.420.

Tsuboi, Seiji; and Cai, Zheng L., to Fujicopian Co., Ltd. Ink ribbon fabric foundation. 5,558,450, Cl. 400-241.300.

Tsuchida, Masayuki; Uemura, Hirokazu; Miura, Shinji; Saito, Yoshiyuki; Yoshimura, Hiroyuki; Nishimura, Yuichi; and Sueda, Nobuo, to Matsushita Electric Industrial Co., Ltd. System and method for designing a printed-circuit board. 5,559,997, Cl. 395-500.000.

Tsuchida, Shinji; Ueda, Shigenori; and Hashizume, Junichiro, to Canon Kabushiki Kaisha. Plasma processing apparatus. 5,558,719, Cl. 118-723.00E.

Tsuchinari, Akihiro; Osaki, Hiroaki; Okamoto, Hisato; and Yamamoto, Tetsuo, to Harima Ceramic Co., Ltd. Chrome-free brick. 5,559,064, Cl. 501-120.000.

Tsuchitani, Shigeki: *See*—
Suzuki, Seiko; Tsuchitani, Shigeki; Miki, Masayuki; and Matsumoto, Masahiro, 5,559,290, Cl. 73-514.360.

Tsuchiya, Kenji: *See*—
Ikeda, Tomohiro; and Tsuchiya, Kenji, 5,558,531, Cl. 439-287.000.

Tsuchiya, Shouichi; Morishita, Tatsuya; Koda, Masanori; Mori, Atsuhiro; and Murasugi, Takashi, to Unisia Jecs Corporation; and Nissan Motor Co., Ltd. Torsional damper having a resiliently coupled damper element and a friction generating device mounted within a padded window of the damper element. 5,558,579, Cl. 464-64.000.

Tsuchiya, Yoshiro: *See*—
Sugiura, Yoshinori; Azuma, Jun; Adachi, Nobukazu; Setoriyama, Takeshi; Tenpaku, Chitose; Ishikawa, Noriyoshi; Hamada, Tatsuo; Tsuchiya, Yoshiro; Kubota, Takeshi; Nomura, Yoshiya; Kuroda, Akira; Murooka, Ken; Sugita, Takeshi; Niimura, Takeshi; and Yuza, Akira, 5,559,581, Cl. 355-200.000.

Tsudaka, Keisuke; and Sugawara, Minoru, to Sony Corporation. Method of producing photomask and exposing. 5,558,963, Cl. 430-22.000.

Tsui, Tat-Chi A.: *See*—
Dyson, James; Millman, Allan D.; and Tsui, Tat-Chi A., 5,558,697, Cl. 95-12.000.

Tsuji, Mitsuji: *See*—
Abe, Hiroomi; Nishio, Taichi; Suzuki, Yasurou; Tsuji, Mitsuji; and Sanada, Takashi, 5,559,185, Cl. 525-68.000.

Tsukahara, Mikio; Ohishi, Noboru; Taguchi, Hisao, deceased (by Noriko Taguchi, personal representative), to Nichias Corporation; and Ohta Kasei Corporation. Casting stalk. 5,558,801, Cl. 222-607.000.

Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Nishida, Masaaki; Yamamoto, Yoshihisa; Kusafuka, Muneo; Mikami, Kazuhiro; and Tsutsui, Hiroshi, to Aisin AW Co., Ltd. Drive to neutral shift control system. 5,558,599, Cl. 477-116.000.

Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Nishida, Masaaki; Yamamoto, Yoshihisa; Tsutsui, Hiroshi; and Nadayoshi, Kaoru, to Aisin AW Co., Ltd. Heavy/light traffic based on vehicle speeds and throttle positions. 5,558,600, Cl. 477-121.000.

Tsukamoto, Takeo; Shimizu, Akira; Suzuki, Akira; Sugata, Masao; Shimoda, Isamu; and Otsuzuki, Masahiko, to Canon Kabushiki Kaisha. Electron emitting device having a polycrystalline silicon resistor coated with a silicide and an oxide of a work function reducing material. 5,559,342, Cl. 257-10.000.

Tsukatani, Shigeki: *See*—
Inokuchi, Tatsuya; Tsukatani, Shigeki; and Misaizu, Tadayuki, 5,559,778, Cl. 369-58.000.

Tsukishima, Chihiro, to Mitsubishi Denki Kabushiki Kaisha. Droplet floating apparatus. 5,558,837, Cl. 422-99.000.

Tsukuda, Ketichiro, to Canon Kabushiki Kaisha. Ink jet head, recording apparatus provided with such a head, and method for manufacturing head. 5,559,542, Cl. 347-58.000.

Tsuruda, Mitsumasa: *See*—
Ozeki, Masamichi; Takasaki, Mamoru; Miyamoto, Katsuyuki; and Tsuruda, Mitsumasa, 5,557,908, Cl. 53-212.000.

Tsurugi, Tomio: *See*—
Urawa, Yoshio; Furukawa, Ken; Shimizu, Toshikazu; Yamagishi, Yoji; Tsurugi, Tomio; and Ichino, Tomio, 5,559,236, Cl. 546-14.000.

Tsuruoka, Akihiko: *See*—
Negi, Shigeto; Yamasaka, Motosuke; Katsu, Kanemasa; Sugiyama, Isao; Komatu, Yuuki; Kanata, Atsushi; Tsuruoka, Akihiko; and Machida, Yoshimasa, 5,559,225, Cl. 540-222.000.

Tsuruoka, Yoshihisa; Hirakawa, Haruhisa; Okamoto, Yoshinari; and Sato, Eiji, to Futaba Denshi Kogyo K.K. Color filter and fluorescent display device having color filters incorporated therein. 5,559,397, Cl. 313-496.000.

Tsutsui, Hiroshi: *See*—
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Nishida, Masaaki; Yamamoto, Yoshihisa; Kusafuka, Muneo; Mikami, Kazuhiro; and Tsutsui, Hiroshi, 5,558,599, Cl. 477-116.000.
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Nishida, Masaaki; Yamamoto, Yoshihisa; Tsutsui, Hiroshi; and Nadayoshi, Kaoru, 5,558,600, Cl. 477-121.000.

Tsutsui, Toshihiro, to Hosada Giken Kogyo Kabushiki. Heat exchanger. 5,558,156, Cl. 165-84.000.

Tsymbal, Valentin P.; Mochalov, Sergei P.; Shakirov, Kim M.; Aizatulov, Rafik S.; Kustov, Boris A.; Mikheev, Nikolai I.; and Toropov, Anatoly I., to Aktsionernoe Obechestvo Otkrytogo Tipa. Process and unit for continuous metal refinement. 5,558,695, Cl. 75-414.000.

Tucker, David: *See*—
Blanton, Russell; Tucker, David; and Stearns, Thornton, 5,557,924, Cl. 62-50.100.

Tucker, James H.: *See*—
Balcerski, Bruce D.; and Tucker, James H., 5,558,741, Cl. 156-244.110.

Tudor, Robin, to Canadian Fracmaster Ltd. Nitrogen/carbon dioxide combination fracture treatment. 5,558,160, Cl. 166-280.000.

TurboChef, Inc.: *See*—
McKee, Philip R.; and Winkelmann, Earl R., 5,558,793, Cl. 219-391.000.

Turin, William: *See*—
Brown, Michael K.; Glinski, Stephen C.; Hu, Jianying; and Turin, William, 5,559,897, Cl. 382-186.000.

Turn it, Inc.: *See*—
Krantz, Tomas, 5,558,328, Cl. 273-146.000.

Turnbull, G. Keith; Peretic, Eileen M.; Rogan, George T.; Powers, John H.; Fugger, Scot R.; and Sullivan, Daniel A., Jr., to Aluminum Company of America. Computer controlled flexible manufacturing of aluminum articles. 5,559,708, Cl. 364-468.030.

Tuttle, Mark E., to Micron Communications, Inc. Method for mounting a battery on a substrate. 5,558,679, Cl. 29-623.100.

Twardzik, Robert J. Apparatus for subjecting hydrocarbon-based fuels to intensified magnetic fields for increasing fuel burning efficiency. 5,558,765, Cl. 210-222.000.

Twenty-First Century Research Corporation: *See*—
Vassiliou, Eustathios; and Dassel, Mark W., 5,558,842, Cl. 422-108.000.

Twigg, Lorimer L.: *See*—
Anderson, Duwayne R.; Reinhold, Steve U.; Twigg, Lorimer L.; and Marineau, Mark D., 5,559,909, Cl. 385-16.000.

Twinhead International Corp.: *See*—
Hsieh, Chih-Ho; and Lee, Ing-Jen, 5,559,675, Cl. 361-707.000.

Twomley, Michael T.: *See*—
Tilly, Lynn K.; Silsbe, Donald L.; and Twomley, Michael T., 5,558,386, Cl. 296-65.100.

Tyndall, Richard L., to Martin Marietta Energy Systems, Inc. Method of dispersing a hydrocarbon using bacteria. 5,559,029, Cl. 435-262.000.

Tytus, Raymond P.: *See*—
Matta, Joseph E., deceased; and Tytus, Raymond P., 5,559,284, Cl. 73-64.520.

U S West Advanced Technologies, Inc.: *See*—
Beveridge, Gregory J., 5,559,858, Cl. 379-56.000.

Uchida, Kazuyuki, to Amada Metrecs Company, Limited. Tool grinding machine. 5,558,560, Cl. 451-24.000.

Uchida, Toshiaki; Niyada, Masateru; Shinohara, Shigeru; Orikasa, Hiroaki; and Ishikawa, Hiroyasu, to Hitachi Koki Co., Ltd. Dual-motor-driven drilling machine and method of controlling currents flowing in motors. 5,558,476, Cl. 408-1.00R.

Uchikawa, Tetsuhide: *See*—
Ohtani, Yasuo; Kataho, Takuo; Satoh, Makoto; Tanaka, Tsutomu; Nose, Yoshimasa; Kobayasshi, Kazuyoshi; Uchikawa, Tetsuhide; and Hamahata, Toshihiro, 5,559,826, Cl. 373-109.000.

Uchinono, Makoto: *See*—
Noguchi, Yukihiko; Haruta, Keitoshi; Sakamoto, Isamu; Yamanaka, Mituo; Uchinono, Makoto; and Shiohara, Takashi, 5,558,559, Cl. 451-14.000.

Uchiyama, Akihiko: *See*—
Kato, Motoi; Fujii, Haruo; Moritani, Toshifumi; Kobayashi, Tatsuya; Kobayashi, Tetsuya; Miyashiro, Toshiaki; Enomoto, Naoki; Uchiyama, Akihiko; and Saito, Yoshiro, 5,559,591, Cl. 355-283.000.

Uclaf, Roussel: *See*—
Matlin, Stephen A.; and Wilkins, Andrew T., 5,558,877, Cl. 424-432.000.

Uda, Hisanori; Sawai, Tetsuro; Imaoka, Toshikazu; Hirai, Toshikazu; and Harada, Yasoo, to Sanyo Electric Co., Ltd. Double-balanced mixer circuit. 5,559,457, Cl. 327-116.000.

Ueckermann, Julius H.: *See*—
Mienie, Lodewyk J.; Van Steenderen, Ronald A.; Erasmus, Elardus; Ueckermann, Julius H.; De Wet, Wouter J.; and Els, Henning J., 5,559,036, Cl. 436-63.000.

Ueda, Daisuke: *See*—
Oishi, Yoshiro; and Ueda, Daisuke, 5,559,046, Cl. 437-39.000.

Ueda, Katsuhiko: *See*—
Marui, Shinichi; and Ueda, Katsuhiko, 5,559,730, Cl. 364-715.080.

Ueda, Kunihiko; Arakane, Shuko; Sano, Takao; and Maeda, Yuhei, to Toray Industries, Inc. Method and apparatus for producing polyester fiber. 5,558,825, Cl. 264-103.000.

Ueda, Shigenori: *See*—
Tsuchida, Shinji; Ueda, Shigenori; and Hashizume, Junichiro, 5,558,719, Cl. 118-723.00E.

Uekane, Kentarou; and Ikeda, Hiroshi, to Sharp Kabushiki Kaisha. Monitor screen-integrated video camera. 5,559,554, Cl. 348-333.000.

Uemura, Fumito; Kodama, Seiki; and Nakamura, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Pressure sensor. 5,557,971, Cl. 73-702.000.

Uemura, Hirokazu: *See*—
Tsuchida, Masayuki; Uemura, Hirokazu; Miura, Shinji; Saito, Yoshiyuki; Yoshimura, Hiroyuki; Nishimura, Yuichi; and Sueda, Nobuo, 5,559,997, Cl. 395-500.000.

Ueno, Masato: *See*—
Furuie, Tsuneichi; Ueno, Masato; Maeno, Takashi; Ogasawara, Yutaka; Inoue, Masaki; and Mori, Naoki, 5,558,310, Cl. 248-573.000.

Ueno, Yoshiki: *See*—
Abe, Katsunori; Kimura, Yuji; Atsumi, Kinya; Ueno, Yoshiki; and Matsushita, Noriyuki, 5,559,819, Cl. 372-46.000.

Uesaka, Tomozumi: *See*—

Akashi, Ryojiro; Ishii, Toru; and Uesaka, Tomozumi, 5,558,813, Cl. 252-299.010.

Ufert, Klaus-Dieter, to Siemens Solar GmbH. Thin-film solar module with electrically conductive substrate and method for the manufacture thereof. 5,558,723, Cl. 136-244.000.

Uffenheimer, Kenneth F., to Becton Dickinson and Company. Sample preparation apparatus. 5,558,838, Cl. 422-100.000.

Uhler, Werner: *See*—
Zabler, Erich; Uhler, Werner; Baumann, Andreas; Eicher, Joachim; and Peters, Ralf-Peter, 5,559,309, Cl. 200-61.45R.

Uhlmann, Rodolphe: *See*—
Sourgen, Laurent; and Uhlmann, Rodolphe, 5,559,989, Cl. 395-481.000.

Ulmer, Ewald R., to CMI Corporation. Pipe paver finishing machine. 5,558,882, Cl. 425-11.000.

Ultradent Products: *See*—
Fischer, David V.; and Ilic, Riccardo, 5,558,230, Cl. 226-570.000.

Umeda, Takao; Miyasaka, Toru; Namikawa, Osamu; Komatsu, Isamu; Nagata, Tetsuya; Takuma, Yasuo; and Igawa, Tatsuo, to Hitachi, Ltd.; and Hitachi Koki Co., Ltd. Electrostatic recording apparatus with electrified cap and managing system thereof. 5,559,578, Cl. 355-208.000.

Umemoto, Atsushi: *See*—
Horie, Kaoru; Takahashi, Hitoshi; and Umemoto, Atsushi, 5,558,060, Cl. 123-308.000.

Umeyama, Koichi: *See*—
Kami, Kuniaki; Adachi, Hideyuki; Umeyama, Koichi; Kosaka, Yoshihiro; Yamaguchi, Seiji; Fuse, Eiichi; Sato, Michio; Nakamura, Masakazu; Tanaka, Yasundo; Fukaya, Takashi; Matsuno, Kiyotaka; and Suzuki, Katsuya, 5,558,619, Cl. 600-146.000.

Umezawa, Kazuo; Koyano, Takashi; Takahashi, Hiroaki; and Yamamoto, Takashi, to Terumo Kabushiki Kaisha; and Umezawa, Kazuo. Oncogene function-inhibitory agent, method for inhibiting oncogene function, and treatment of cancer. 5,559,115, Cl. 514-279.000.

Umpqua Research Company: *See*—
Jolly, Clifford D., 5,559,035, Cl. 436-19.000.

Unger, Evan C.; and Yellowhair, David W., to ImaRx Pharmaceutical Corp. Methods and apparatus for performing diagnostic and therapeutic ultrasound simultaneously. 5,558,092, Cl. 128-660.030.

UnionTools: *See*—
Wehner, Herbert U., 5,558,379, Cl. 294-60.000.

Unisia Jecs Corporation: *See*—
Akaike, Seiji; and Komatsu, Shinichi, 5,558,244, Cl. 220-374.000.
Hara, Seinosuke; and Yamada, Yoshiiko, 5,557,983, Cl. 74-568.00R.
Tsuchiya, Shouichi; Morishita, Tatsuya; Koda, Masanori; Mori, Atsuhiro; and Murasugi, Takashi, 5,558,579, Cl. 464-64.000.

Unisys Corporation: *See*—
Boswell, R. Stephen, 5,559,933, Cl. 395-114.000.
Jennings, Kevin F., 5,559,969, Cl. 395-307.000.
Wasserman, Philip D., 5,559,929, Cl. 395-23.000.
Zscheile, John W., Jr.; Wilson, Michael L.; Saggio, Richard J.; and Lundquist, Alan E., 5,559,788, Cl. 370-18.000.

United Color Manufacturing, Inc.: *See*—
Smith, Michael J.; and Desai, Bharat, 5,558,808, Cl. 508-556.000.

United Microelectronics Corporation: *See*—
Hsue, Chen-Chiu; and Ko, Joe, 5,559,352, Cl. 257-328.000.

United Sciences, Inc.: *See*—
Traina, John E.; and Myers, Richard, 5,559,279, Cl. 73-3.000.

U.S. Filter/Ionpure, Inc.: *See*—
Gallagher, Christopher J.; Wilkins, Frederick; and Ganzi, Gary C., 5,558,753, Cl. 204-632.000.

United States of America
Air Force: *See*—
Kim, Young-Won; and Dimiduk, Dennis M., 5,558,729, Cl. 148-671.000.
Nash, Dudley O., 5,557,932, Cl. 60-266.000.
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Abbate, Agostino; Frankel, Julius; and Doxbeck, Mark, 5,557,970, Cl. 73-597.000.
Eckart, Donald W., 5,558,905, Cl. 427-160.000.
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Scalora, Michael; Dowling, Jonathan P.; Bowden, Charles M.; and Bloemer, Mark J., 5,559,825, Cl. 372-96.000.
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O'Haver, George G., 5,558,462, Cl. 405-81.000.
National Aeronautics and Space Administration: *See*—
Robelen, David B., 5,559,923, Cl. 392-397.000.
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Connolly, George C., Jr., 5,559,756, Cl. 367-125.000.
Ivanivsky, Andrew, 5,559,480, Cl. 333-21.00R

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Bredol, Michael; and Kynast, Ulrich, 5,558,817, Cl. 252-301.650.
Bruijns, Antonius J. C., 5,559,849, Cl. 378-98.200.
De Wit, Hendrik J., 5,559,401, Cl. 315-8.000.
Hayet, Pascal, 5,559,833, Cl. 375-259.000.
Hoogendoorn, Abraham; and Lokhoff, Gerardus C. P., 5,559,642, Cl. 360-27.000.

Linders, Petrus W. J.; Böhmer, Marcel R.; and Severens, Michael J. M. J., 5,559,853, Cl. 378-159.000.
Lobregt, Steven, 5,559,901, Cl. 382-256.000.
Stöger, Anton, 5,558,292, Cl. 242-345.300.
Van Roekel, Jauke; and Kaeser, Georg E., 5,559,938, Cl. 395-141.000.
Vetter, Axel, 5,559,852, Cl. 378-133.000.
Voorman, Johannes O.; and Ramalho, Joao N. V. L., 5,559,646, Cl. 360-67.000.

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Green, David T.; Bolanos, Henry; Ratcliff, Keith; Heaton, Lisa W.; and Robertson, John C., 5,558,266, Cl. 227-178.100.

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Castro, Jaoquin H.; Owen, Samuel S.; and Santangelo, Salvatore, 5,557,928, Cl. 60-260.000.
Kraft, Robert J.; and McClelland, Robert J., 5,558,497, Cl. 416-96.00A.
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Hammond, Mark L.; Jett, James H.; Keller, Richard A.; Marrone, Babetta L.; and Martin, John C., 5,558,998, Cl. 435-6.000.

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Kozarsky, Eliot M.; and Horton, Dianne C., 5,558,835, Cl. 422-56.000.

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Utermohlen, Joseph G., 5,559,001, Cl. 435-6.000.

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Burks, A. Wesley, Jr.; and Helm, Ricki M., 5,558,869, Cl. 424-276.100.

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Hull, John B.; and Langton, Christian M., 5,559,292, Cl. 73-597.000.

University of California, The Regents of the: *See*—
Blanco, David R.; Champion, Cheryl I.; Lovett, Michael A.; Haake, David A.; and Miller, James N., 5,558,993, Cl. 435-6.000.
Chandy, Kanianthara G.; Kalman, Katalin; Chandy, Grischa; and Gutman, George A., 5,559,009, Cl. 435-69.100.
Gui, Jian-Fang; and Fu, Xiang-Dong, 5,559,019, Cl. 435-240.100.
Hu, Chenming; Ko, Ping K.; Assaderaghi, Fariborz; and Parke, Stephen, 5,559,368, Cl. 257-369.000.
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Smedley, Keyue M., 5,559,467, Cl. 330-10.000.
Steinhardt, Richard A.; John, Varghese; and Fritz, Lawrence C., 5,559,004, Cl. 435-29.000.

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Kolhouse, J. Fred; Santhosh-Kumar, Cheruppolil R.; and Deutsch, John C., 5,559,038, Cl. 436-86.000.
Pankove, Jacques I.; Moddel, Garret R.; and Douglas, Kenneth, 5,559,822, Cl. 372-50.000.

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Andersson, Borje S.; Bhagwatwar, Harshal P.; and Chow, Diana S., 5,559,148, Cl. 514-517.000.

University of Leeds, The: *See*—
Haselden, Geoffrey G., 5,557,937, Cl. 62-114.000.

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Borenstein, Johann, 5,559,696, Cl. 364-424.020.

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Li, Jiewen; Rieke, August; Day, Billy N.; and Prather, Randall S., 5,558,636, Cl. 604-49.000.

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Weber, Eckard; and Keana, John F. W., 5,559,154, Cl. 514-634.000.

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Thomas, Thomas N.; Sheehan, David V.; and Talbot, Janet D., 5,558,987, Cl. 435-4.000.

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Athas, William C.; and Svensson, Lars G., 5,559,478, Cl. 331-117.0FE.

University of Utah, The: *See*—
Zeng, Gengsheng L.; and Gullberg, Grant T., 5,559,335, Cl. 250-363.04C.

University of Utah Research Foundation: *See*—
Kimbrough, Scott S.; and Vincent, R. Scott, 5,558,350, Cl. 280-426.000.

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Kowalski, Bruce R.; and Wang, Yongdong, 5,559,728, Cl. 364-571.020.

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Herm, Hartmut; May, Karl; Unverzagt, Karlheinz; and Werdinig, Helmut, 5,558,203, Cl. 198-661.000.

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Barger, Paul T., 5,559,275, Cl. 568-905.000.
Chen, Oianjun; Coughlin, Peter K.; and Pellet, Regis J., 5,559,068, Cl. 502-213.000.
Hammerman, John I.; and Pujado, Peter R., 5,559,274, Cl. 568-803.000.
Mikulicz, Michael Z.; and Gurevich, Serge, 5,558,484, Cl. 414-301.000.
Ressl, Charles T., 5,558,767, Cl. 208-105.000.

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Baig, Mirza A., 5,558,710, Cl. 106-780.000.

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Sakai, Tetsuo; Motoyama, Yasushi; and Ushirozawa, Mizumoto, 5,559,403, Cl. 315-169.400.

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Van Damme, Marc; Uytterhoeven, Herman; and Defieuw, Geert, 5,558,972, Cl. 430-200.000.

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Blanton, Russell; Tucker, David; and Stearns, Thornton, 5,557,924, Cl. 62-50.100.

Vakhshoori, Daryoosh: *See*—
Choquette, Kent D.; Freund, Robert S.; Hong, Minghwei; and Vakhshoori, Daryoosh, 5,559,053, Cl. 437-129.000.

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Valentino, Karen L.: *See*—
Miljanich, George P.; Bowersox, Stephen S.; Fox, James A.; Valentino, Karen L.; Bitner, Robert S.; and Yamashiro, Donald H., 5,559,095, Cl. 514-12.000.

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Wang, Jui-Shang; Jané, Rodney; Longan, John; Gresens, Stanley; Holderfield, Gregory; Hootstein, Donald; and Valentor, Steven R., 5,558,501, Cl. 416-244.00R.

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Pons, Sylvain; and Segaud, Daniel, 5,558,425, Cl. 362-74.000.

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Kokkala, Hannu, 5,557,863, Cl. 34-629.000.
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Oprescu, Florin; and Van Brunt, Roger, 5,559,967, Cl. 395-285.000.

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Capage, Michael A.; Doherty, Daniel H.; Betlach, Michael; and Vanderslice, Rebecca W., 5,559,015, Cl. 435-104.000.

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Foley, Denis; Steinman, Maurice B.; and VanDoren, Stephen R., 5,559,987, Cl. 395-471.000.

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Schirlin, Daniel; Van Dorsselaer, Viviane; and Tarnus, Céline, 5,559,140, Cl. 514-357.000.

Vanek, Laurence D.; Smith, Myron L.; and Aboyade, Ojekunle, to General Electric Company. Method to compute horsepower required by an internal combustion engine coupled to an auxiliary alternator. 5,559,704, Cl. 364-431.010.

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Vankan, Franciscus A. G.; and Pieterse, Rob, to Koninklijke PTT Nederland N.V. Processor circuit comprising a first processor, and system comprising the processor circuit and a second processor. 5,560,031, Cl. 395-800.000.

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Mienie, Lodewyk J.; Van Steenderen, Ronald A.; Erasmus, Elardus; Ueckermann, Julius H.; De Wet, Wouter J.; and Els, Henning J., 5,559,036, Cl. 436-63.000.

Vargas, Patricia A.: *See*—
Sayka, Anthony; and Vargas, Patricia A., 5,558,902, Cl. 427-8.000.

Varma, Ramesh R.: *See*—
Derkits, Gustav E., Jr.; Lourenco, Jose A.; and Varma, Ramesh R., 5,559,817, Cl., 372-36.000.

Vascor, Inc.: *See*—
Heilman, Marlin S.; Kolenik, Steve A.; Capone, Christopher D.; Parisi, Carl M.; Prem, Edward K.; and Speicher, Vernon L., 5,558,617, Cl. 600-16.000.

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Vaughn, William M.: *See*—
Stancil, Charles J.; Vaughn, William M.; and Wolford, Jeff W., 5,559,968, Cl. 395-306.000.

Veatch, Alan: *See*—
Elmore, J. Thomas; Veatch, Alan; Clements, William C.; Elias, Victor; and Wojciechowski, Longine J., 5,558,470, Cl. 405-262.000.

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Johansen, Charles J., Jr.; Hollas, Ernest D.; Vecchio, Robert L.; and Zoumut, Hani, 5,558,708, Cl. 106-712.000.

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Hepburn, George R.; and Vedeloff, Russell, 5,558,624, Cl. 601-33.000.

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Basile, Vincent L., II.; Veldkamp, Brent M.; McCloskey, Douglas N.; and Hamblin, David S., 5,558,573, Cl. 452-127.000.

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Venkitasubrahmanian, Sreeraman; Farkas, Thomas; Jayaraman, Raj; and Xia,

Itoh, Takashi; Kosaki, Yukio; Chonan, Takeshi; Matsuda, Takashi; Kanno, Yasuharu; Wakabayashi, Masao; and Nakamura, Makoto,

Harrison, Maureen M.; Ofslager, Christian L.; Waranis, Robert P.; and Leonard, Thomas W., 5,559,121, Cl. 514-291.000.

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Fain, Eric S., 5,558,098, Cl. 128-706.000.

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Jasinski, Vincent J.; and Briggs, Mark W., 5,559,512, Cl. 341-22.000.

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Loustau, Marie-Thérèse; Verhoog, Roelof; and Precigout, Claude, 5,558,681, Cl. 29-623.400.

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Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Versace, Richard W.; Saksena, Anil K.; and Pinto, Patrick A., 5,559,133, Cl. 514-335.000.

Vesamaa, Jussi, to Mercamer Oy. Package padding material and apparatus for forming package padding material. 5,558,923, Cl. 428-154.000.

Veteran, David R.: *See*—
Botka, Julius K.; and Veteran, David R., 5,558,541, Cl. 439-675.000.

Vetter, Axel, to U.S. Philips Corporation. Rotary-anode X-ray tube comprising a sleeve bearing. 5,559,852, Cl. 378-133.000.

Vetter, Gerhard; and Resch, Ludwig, to M.H. Maschinenfabrik GmbH & Co., KG. Process and apparatus for the continuous heat setting of yarn laid down in loops. 5,557,862, Cl. 34-618.000.

Vetterick, Richard C., to Babcock & Wilcox Company, The. Low NO_x integrated boiler-burner cogeneration apparatus. 5,558,047, Cl. 122-367.100.

Viaud, Jean, to Deere & Company. Pivotable guide pan for round bale wrapping material. 5,557,906, Cl. 53-118.000.

Vicenzi, Jeffrey T., to Eli Lilly and Company. Method for selectively deactivating catalase while retaining damino acid oxidase activity. 5,559,006, Cl. 435-47.000.

Vickers, Kenneth G.: *See*—
Finklea, John E.; Shen, Chi-Cheong; Vickers, Kenneth G.; and Kressley, Mark A., 5,558,554, Cl. 445-52.000.

Victor Company of Japan, Ltd.: *See*—
Shindou, Tomoyuki; and Higurashi, Seiji, 5,559,931, Cl. 395-105.000.

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Magister, Francis M., 5,558,272, Cl. 229-109.000.

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Edwards, Stuart D.; Lee, Kee S.; Baker, James; and Strul, Bruno, 5,558,672, Cl. 606-41.000.

Vidamed, Inc.: *See*—
Edwards, Stuart D.; and Lax, Ronald G., 5,558,673, Cl. 606-41.000.

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Cannon, Lee, 5,559,950, Cl. 395-162.000.

Vincent, R. Scott: *See*—
Kimbrough, Scott S.; and Vincent, R. Scott, 5,558,350, Cl. 280-426.000.

Vinod, Yashavant V.: *See*—
Heim, William W.; Hendrix, James K.; Materniak, Joyce M.; Murphy, Peter M.; Panzier, Neil A.; and Vinod, Yashavant V., 5,558,916, Cl. 428-95.000.

Virmoux, Michel R. C.: *See*—
Lefranc, Bénédicte A.; Linet, Hugues H. R.; and Virmoux, Michel R. C., 5,558,594, Cl. 475-347.000.

Visco, Steven J.: *See*—
Doeff, Marca M.; Peng, Marcus Y., Ma, Yanping; Visco, Steven J.; and DeJonghe, Lutgard C., 5,558,961, Cl. 429-224.000.

Visconti, Carl H.: *See*—
Shah, Suresh D.; and Visconti, Carl H., 5,558,824, Cl. 264-40.300.

Visschedijk, Paulus J.: *See*—
Kuzee, Hendrika C.; Hoeks, Theodorus L., and Visschedijk, Paulus J., 5,558,899, Cl. 426-658.000.

Vite, Gregory D.: *See*—
Gordon, Eric M.; Barrish, Joel C.; Bisacchi, Gregory S.; Sun, Chong-Qing; Tino, Joseph A.; Vite, Gregory D.; and Zahler, Robert, 5,559,256, Cl. 552-303.000.

Vitthal, Sanjay M.; Hardy, Mary A.; McMechan, David E.; Martch, William E.; and Dusterhoft, Ronald G., to Halliburton Company. Method for controlling fluid-loss and fracturing high permeability subterranean formations. 5,558,161, Cl. 166-280.000.

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Hicok, Gary D.; Penner, Dale C.; and Nakahara, Mike, 5,559,533, Cl. 345-162.000.
Misheloff, Michael N., 5,559,715, Cl. 364-488.000.
Pandula, Louis, 5,559,841, Cl. 375-375.000.
Sayka, Anthony; and Vargas, Patricia A., 5,558,902, Cl. 427-8.000.

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Krassnitzer, Otto; Zitz, Alfred; and Felber, Robert, 5,557,979, Cl. 74-377.000.

Vogel, Robert L.: *See*—
Kao, Wenling; Abou-Gharbia, Magid A.; and Vogel, Robert L., 5,559,120, Cl. 514-291.000.

Vogelaar, Jake: *See*—
Lubliner, David J.; Dhaliwal, Jaskaran; Gidney, John; Gore, Gerald E.; Greenfeder, Jack J.; Greenfeld, Joshua; Hinton, Melvin C.; McHugh, William; Parsio, Anthony; Rintel, Ian; Roman, Harry T.; and Vogelaar, Jake, 5,559,894, Cl. 382-100.000.

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Risch, Lothar; Vogelsang, Thomas; Hofmann, Franz; and Hofmann, Karl, 5,559,353, Cl. 257-334.000.

Vogley, Wilbur C., to Texas Instruments Incorporated. Time skewing arrangement for operating memory in synchronism with a data processor. 5,560,000, Cl. 395-550.000.

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Kotitschke, Gerhard; Sollinger, Hans-Peter; Oechsle, Markus; and Straub, Karlheinz, 5,557,860, Cl. 34-455.000.

Voldman, Steven H.; Wallash, Albert J.; and Wilcox, Reginald B., Jr., to International Business Machines Corporation. Process for manufacturing a silicon chip with an integrated magnetoresistive head mounted on a slider. 5,559,051, Cl. 437-51.000.

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Von Der Heydt, Bernd: *See*—
Feldhusen, Joerg; and Von Der Heydt, Bernd, 5,559,371, Cl. 257-686.000.

von Deyn, Wolfgang: *See*—
Kast, Jürgen; von Deyn, Wolfgang; Nübling, Christoph; Walter, Helmut; Gerber, Matthias; and Westphalen, Karl-Otto, 5,559,218, Cl. 534-850.000.

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Hakansson, Bjorn; Von Holst, Peder; and Oskarsson, Rolf, 5,558,475, Cl. 407-54.000.

Vook, Frederick W.; Demange, Mark; and Chang, Hungkun. Power management and packet delivery method for use in a wireless local area network (LAN). 5,560,021, Cl. 395-750.000.

Voorman, Johannes O.; and Ramalho, Joao N. V. L., to U.S. Philips Corporation. Balanced arrangement for reading information from a track on a record carrier which arrangement includes amplifier circuits containing cut-off capacitors which are cross-coupled to reduce noise. 5,559,646, Cl. 360-67.000.

Vorhis, Daniel J.: *See*—
Fife, James F.; Vorhis, Daniel J.; Laughlen, Kenneth D.; and Dienes, Nancy L., 5,558,762, Cl. 210-130.000.

Voron, Daniel M.: *See*—
Elliott, Bob; Katariya, Devinder N.; Minnick, Robert G.; Peralta, Rita A.; Rich, Ronald J.; Voron, Daniel M.; and Cave, Michael J., 5,558,500, Cl. 416-220.00R.

Vortec Corporation: *See*—
Hnat, James G.; and Mathur, Akshay, 5,558,690, Cl. 65-134.800.

Voss, Darrell W.; Klein, Gary G.; and Randall, Richard, to Klein Bicycle Corporation. Composite bicycle handlebar. 5,557,982, Cl. 74-551.100.

Voss, Douglas A.; Link, David G.; Rea, David S.; and Mills, Murray W., to Western Combine Corporation. Stripper header attachment. 5,557,912, Cl. 56-130.000.

Voss, Mark G., to Nartron Corporation. Induction air driven alternator and method for converting intake air into current. 5,559,379, Cl. 310-63.000.

VPL Research, Inc.: *See*—
Browning, Dan D.; Joffe, Ethan D.; and Lanier, Jaron Z., 5,559,995, Cl. 395-500.000.

VSE Schweisstechnik GmbH: *See*—
Schumacher, Johannes A., 5,559,288, Cl. 73-261.000.

W. Braun Company: *See*—
Braun, Morris, 5,558,257, Cl. 222-212.000.

Wachi, Masahira: *See*—
Inami, Yoshiaki; Tanaka, Toyokazu; and Wachi, Masahira, 5,559,669, Cl. 361-612.000.

Wada, Katsuo: *See*—
Shinada, Tsunetoshi; Wada, Katsuo; Misumi, Masaki; and Kurono, Satoru, 5,558,883, Cl. 425-116.000.

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Wada, Takasumi, to Sharp Kabushiki Kaisha. Image forming device having control grid with applied voltage of the same polarity as toner. 5,559,586, Cl. 355-245.000.

Wada, Yutaka; Oda, Yukihiro; Miyo, Tunemasa; Noguchi, Yasuhiro; and Takei, Kazuo, to Hitachi, Ltd. Method and apparatus for preparing a document containing information in real mathematical notation. 5,559,939, Cl. 395-146.000.

Wagenmann, Henric; Baus, Ulf; Beckmann, Eberhard; and Kromm, Erich, to BASF Aktiengesellschaft. Dyeing and printing textile materials made of cellulose fibers. 5,558,677, Cl. 8-607.000.

Wagner, Robert F.: *See*—
Constantinescu, Eugen; and Wagner, Robert F., 5,558,315, Cl. 267-103.000.

Wagner, Robert S.: *See*—
Chervenak, William J.; and Wagner, Robert S., 5,558,692, Cl. 65-382.000.

Wagner Spray Tech Corporation: *See*—
Kieffer, Joseph W., 5,558,492, Cl. 415-119.000.

Wagner, Wendy A.: *See*—
Colwell, Betsy P.; Wagner, Wendy A.; Graham, Paul; and Kline, John, 5,558,040, Cl. 119-52.200.

Wakabayashi, Masao: *See*—
Itoh, Takashi; Kosaki, Yukio; Chonan, Takeshi; Matsuda, Takashi; Kanno, Yasuharu; Wakabayashi, Masao; and Nakamura, Makoto, 5,559,072, Cl. 502-347.000.

Wakabayashi, Tsutomu: *See*—
Kazami, Kazyuki; Daitoku, Koichi; Wakabayashi, Tsutomu; Goto, Tetsuro; Ezawa, Akira; and Tomino, Naoki, 5,559,568, Cl. 354-106.000.

Wakai, Hideyuki; Suzuki, Toru; Terada, Keiji; Moriya, Masato; and Ando, Manabu, to Kabushiki Kaisha Komatsu Seisakusho. three-dimensional image measuring device. 5,559,603, Cl. 356-376.000.

Wako Pure Chemical Industries, Ltd.: *See*—
Urano, Fumiyoshi; Negishi, Takaai; Katsuyama, Akiko; and Endo, Masayuki, 5,558,971, Cl. 430-170.000.
Urano, Fumiyoshi; Negishi, Takaaki; Katsuyama, Akiko; and Endo, Masayuki, 5,558,976, Cl. 430-326.000.

Walden, James R.: *See*—
Groh, Werner; Macholdt, Hans-Tobias; Gibson, Baylor D.; Walden, James R.; and Felton, Clinton D., 5,558,809, Cl. 252-62.540.

Walenty, Allen J.; Leppek, Kevin G.; and Kade, Alexander, to General Motors Corporation. Electrohydraulic braking system. 5,558,409, Cl. 303-10.000.

Walker, Alan: *See*—
Gupta, Bhupendra K.; Farmer, Gilbert; and Walker, Alan, 5,558,922, Cl. 428-141.000.

Walker, David L., to Sun-Maid Growers of California. Trellising system for producing dried-on-the-vine raisins. 5,557,883, Cl. 47-46.000.

Walker, Leigh E., to Lonza Inc. Quaternary ammonium hydroxide compositions and preparation thereof. 5,559,155, Cl. 514-642.000.

Wallace, Anthony M.: *See*—
Larson, James R.; Wallace, Anthony M.; Griffiths, Clifford H.; and Abramsohn, Dennis A., 5,559,588, Cl. 355-256.000.

Wallace, Mark P. Angular positioning devices for stained glass craft items. 5,558,269, Cl. 228-49.100.

Wallace, Mark W.: *See*—
Huffstutler, M. Conrad, Jr.; Meacham, Patrick E.; Wallace, Mark W.; and Nyberg, Carl R., 5,558,241, Cl. 220-1.500.

Wallash, Albert J.: *See*—
Voldman, Steven H.; Wallash, Albert J.; and Wilcox, Reginald B., Jr., 5,559,051, Cl. 437-51.000.

Wallenburg, Ronald C.: *See*—
La Mura, Joseph L.; and Wallenburg, Ronald C., 5,559,303, Cl. 89-28.050.

Walling, John A.: *See*—
Adamczyk, Maciej; Chen, Yon-Yih; Walling, John A.; James, Bryan D.; and Artip, Sharon G., 5,559,210, Cl. 530-345.000.

Wallis, Bernard J.; and Bianchi, Sabatino A., to Livernois Research & Development Company. Modular die transfer system. 5,557,959, Cl. 72-20.200.

Walser, Franz: *See*—
Bolt, Heinz; Walser, Franz; and Schoneborn, Axel, 5,557,923, Cl. 60-274.000.

Walter, Helmut: *See*—
Kast, Jürgen; von Deyn, Wolfgang; Nübling, Christoph; Walter, Helmut; Gerber, Matthias; and Westphalen, Karl-Otto, 5,559,218, Cl. 534-850.000.

Wang, Da Y.; and Oberdier, Larry M., to General Motors Corporation. Exhaust gas sensor diagnostic. 5,558,752, Cl. 204-401.000.

Wang, Edward A.: *See*—
Rowell, Nelson L.; and Wang, Edward A., 5,558,934, Cl. 428-333.000.

Wang, Emil C. W.: *See*—
Bieselin, David N.; Eaton, Glenn A.; McFadden, Joseph A.; Taylor, Stuart A.; Tracy, Edward D.; and Wang, Emil C. W., 5,559,875, Cl. 379-202.000.

Wang, Jenne-Tai, to General Motors Corporation. Method for controlling actuation of a vehicle safety device. 5,559,697, Cl. 364-424.050.

Wang, Johannes: *See*—
Lentz, Derek J.; Wang, Johannes; Deosaran, Trevor; Young, Linley M.; Yap, Kian-Chin; Nguyen, Le Trong; Matsubayashi, Makoto; and Lau, Te-Li, 5,559,951, Cl. 395-163.000.
Nguyen, Le Trong; Lentz, Derek J.; Miyayama, Yoshiyuki; Garg, Sanjiv; Hagiwara, Yasuaki; Wang, Johannes; Lau, Te-Li; Wang, Sze-Shun; and Trang, Quang H., 5,560,032, Cl. 395-800.000.

Wang, Jonas C. T.: *See*—
Clum, Charles E.; and Wang, Jonas C. T., 5,559,149, Cl. 514-529.000.

Wang, Jui-Shang; Jané, Rodney; Longan, John; Gresens, Stanley; Holderfield, Gregory; Hootstein, Donald; and Valentor, Steven R., to Duracraft Corporation. Portable ceiling fan. 5,558,501, Cl. 416-244.00R.

Wang Laboratories, Inc.: *See*—
Barrett, David M.; Letourneau, Mary; Martin, Patricia A.; and McNally, J. Michael, 5,560,017, Cl. 395-733.000.

Wang, Su. Method of preparing collagenous tissue. 5,558,875, Cl. 424-422.000.

Wang, Sze-Shun: *See*—
Nguyen, Le Trong; Lentz, Derek J.; Miyayama, Yoshiyuki; Garg, Sanjiv; Hagiwara, Yasuaki; Wang, Johannes; Lau, Te-Li; Wang, Sze-Shun; and Trang, Quang H., 5,560,032, Cl. 395-800.000.

Wang, Teresa, to Sci-Tw International Inc. Trolley frame foldable in one-step operation. 5,558,357, Cl. 280-647.000.

Wang, Yin M.: *See*—
Krasinski, Jerzy S.; and Wang, Yin M., 5,559,341, Cl. 250-559.260.

Wang, Yongdong: *See*—
Kowalski, Bruce R.; and Wang, Yongdong, 5,559,728, Cl. 364-571.020.

Waranis, Robert P.: *See*—
Harrison, Maureen M.; Ofslager, Christian L.; Waranis, Robert P.; and Leonard, Thomas W., 5,559,121, Cl. 514-291.000.

Ward, L. H. Plant feeder apparatus. 5,558,030, Cl. 111-7.200.

Ward, Michael A. V.; Hill, Winfield; and Pennell, Arthur J., to Combustion Electromagnetics, Inc. Ignition system power converter and controller. 5,558,071, Cl. 123-598.000.

Ward, Owen: *See*—
Telingator, Eric; Ward, Owen; and Ross, Edward J., 5,559,692, Cl. 364-401.00R.

Warner-Lambert Company: *See*—
Ortiz, Ernest A., 5,557,851, Cl. 30-50.000.

Warr, Charles J., to Rex-Rosenlew International Incorporated. Bag with reenforced handle and resealable pour spout opening. 5,558,438, Cl. 383-10.000.

Warrior, Jogesh: *See*—
Lenz, Gary A.; Brown, Gregory C.; and Warrior, Jogesh, 5,558,115, Cl. 137-86.000.

Wartsila Diesel International Ltd Oy: *See*—
Paro, Daniel, 5,558,050, Cl. 123-90.130.

Washnock, John T.; and Thomas, Harold L., to OMT Engineering Inc. Centrifugal packingline machine. 5,557,821, Cl. 15-3.130.

Wasserman, Philip D., to Unisys Corporation. Method of enhancing the selection of a training set for use in training of a neural network. 5,559,929, Cl. 395-23.000.

Wasyl, Joseph: *See*—
Jenkins, Scott A.; Wasyl, Joseph; and Robins, Charles, 5,558,460, Cl. 405-29.000.

Watabe, Kiyoto; Takata, Ikunori; and Harada, Masana, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device having insulated gate bipolar transistor. 5,559,348, Cl. 257-141.000.

Watanabe, Akihiro: *See*—
Maeda, Katsuaki; Watanabe, Akihiro; and Nishihara, Hajime, 5,559,187, Cl. 525-73.000.

Watanabe, Hideo; and Okuda, Sadanao, to Riso Kagaku Corporation. Heat-sensitive stencil sheet. 5,559,074, Cl. 428-447.000.

Watanabe, Hideo: *See*—
Egashira, Yoshinori; Ichikawa, Yasushi; and Watanabe, Hideo, 5,559,188, Cl. 525-74.000.

Watanabe, Hiroshi: *See*—
Uryu, Naoyuki; Watanabe, Hiroshi; and Kato, Hiroyuki, 5,558,578, Cl. 464-52.000.

Watanabe, Keisuke: *See*—
Yoshikawa, Yoshimasa; and Watanabe, Keisuke, 5,559,297, Cl. 84-433.000.

Watanabe, Kunihiko: *See*—
Yamanaka, Shigeru; Eto, Yuzuru; Takano, Satoshi; Watanabe, Kunihiko; and Shibai, Hiroshiro, 5,558,861, Cl. 424-93.700.

Watanabe, Masato: *See*—
Hirano, Yutaka; Komatubara, Takeo; Sunaga, Takashi; Takahashi, Yasuki; Tanaka, Kiyoshi; Akazawa, Kiyoshi; Watanabe, Masato; and Jikuhara, Seiki, 5,557,944, Cl. 62-469.000.

Watanabe, Masatoshi: *See*—
Nakano, Takayuki; Miya, Kazuyuki; Kato, Osamu; and Watanabe, Masatoshi, 5,559,789, Cl. 370-18.000.

Watanabe, Tadakatu: *See*—
Mizobata, Akira; Nagahama, Masanori; and Watanabe, Tadakatu, 5,559,738, Cl. 365-189.010.

Watanabe, Tadashi: *See*—
Watanabe, Tateshi; Watanabe, Tsunao; Watanabe, Tadashi; Matsugu, Hidetomo; and Yamanouchi, Yasuhiro, 5,558,714, Cl. 118-421.000.

Watanabe, Tateshi; Watanabe, Tsunao; Watanabe, Tadashi; Matsugu, Hidetomo; and Yamanouchi, Yasuhiro, to N. E. Chemcat Corporation. Tank and work-holder apparatus for liquid coating for honeycomb structure. 5,558,714, Cl. 118-421.000.

Watanabe, Tetsu; Yamagami, Tamotsu; and Urakawa, Yoshiyuki, to Sony Corporation. Optical disc reproducing apparatus which employs a binary detector for the outer tracks and a ternary detector for the inner tracks. 5,559,774, Cl. 369-47.000.

Watanabe, Toshiharu: *See*—
Matsukawa, Naohiro; Imamiya, Keniti; Watanabe, Toshiharu; and Matsui, Michiharu, 5,559,736, Cl. 365-185.240.

Watanabe, Tsunao: *See*—
Watanabe, Tateshi; Watanabe, Tsunao; Watanabe, Tadashi; Matsugu, Hidetomo; and Yamanouchi, Yasuhiro, 5,558,714, Cl. 118-421.000.

Watarai, Michihito: *See*—
Hayashi, Yutaka; Miyamoto, Mitsuo; Watarai, Michihito; Atarashi, Takayuki; Tanaka, Tetsuya; Hatada, Toshio; Takada, Yoshihiro; and Daikoku, Takahiro, 5,558,493, Cl. 415-208.100.

Water-Jel Technologies, Inc.: *See*—
Cohen, Peter D.; and Haight, Carl, 5,558,914, Cl. 424-59.000.

Watson, Donald R.; and Heyden, Christopher A., to EMC Corporation. Inrush current limiter. 5,559,660, Cl. 361-58.000.

Watson, George B.: *See*—
Gohara, Wadie F.; Watson, George B.; Reynolds, Randy J.; and Strock, Thomas W., 5,558,818, Cl. 261-17.000.

Watson, Thomas L.; Chastain, David M.; and Brewer, Tony M., to Convex Computer Corporation. Scalable parallel processing systems wherein each hypernode has plural processing modules interconnected by crossbar and each processing module has SCI circuitry for forming multi-dimensional network with other hypernodes. 5,560,027, Cl. 395-800.000.

Wautier, Armelle: *See*—
Mourot, Christophe; Wautier, Armelle; and Dany, Jean-Claude, 5,559,723, Cl. 364-517.000.

Weisburn, James T.; Mundorf, Larry K.; Ramsey, Roger H.; and Brazis,

Kast, Jürgen; von Deyn, Wolfgang; Nübling, Christoph; Walter, Helmut; Gerber, Matthias; and Westphalen, Karl-Otto, 5,559,218, Cl. 534-

Röder, Ulrich; Wilhelm, Sigurd; Hehn, Werner; Hammerl, Uwe; Greiner,

Mourot, Christophe; Wautier, Armelle; and Dany, Jean-Claude, 5,559,723, Cl. 364-517.000.
WavePhore, Inc.: *See*—
Jungo, Charles; Montgomery, Gerald D.; and Schur, Christopher J., 5,559,559, Cl. 348-432.000.
Way, Ashley, to Automotive Products, plc. Disk brake. 5,558,183, Cl. 188-71.600.
Waylonis, George W.: *See*—
Gordon, Chrisanne; Waylonis, George W.; and Dirina, John G., 5,558,918, Cl. 428-100.000.
Wayne Pigment Corp.: *See*—
Sinko, John, 5,558,706, Cl. 106-480.000.
Weaver, Jimmie D.: *See*—
Dewprashad, Brahmadeo; and Weaver, Jimmie D., 5,559,086, Cl. 507-219.000.
Webasto Karosseriesysteme GmbH: *See*—
Fürst, Arpad; Danzl, Martin; Mayer, Johann; and Miklosi, Stefan, 5,558,388, Cl. 296-107.000.
Weber, Alfred: *See*—
Ehrle, Bruno; Herzog, Rolf; Mosmann, Andreas; Riedberger, Reto; and Weber, Alfred, 5,558,142, Cl. 144-230.000.
Weber, Donald E., to Southpac Trust International, Inc. Plant package having a waxy wrapper. 5,557,882, Cl. 47-44.010.
Weber, Eckard; and Keana, John F. W., to Oregon State Board of Higher Education; Oregon Health Sciences University; and University of Oregon. Tri- and tetra-substituted guanidines and their use as excitatory amino acid antagonists. 5,559,154, Cl. 514-634.000.
Weber, Helmut: *See*—
Evans, Steven; and Weber, Helmut, 5,559,076, Cl. 503-227.000.
Weber, Michael F., to Minnesota Mining and Manufacturing Company. Retroreflecting polarizer. 5,559,634, Cl. 359-638.000.
Weber, Wolfram: *See*—
Witthaus, Friedrich; Weber, Wolfram; and Leick, Lothar, 5,558,769, Cl. 210-360.100.
Webster, Alexander P.; and Jenski, Gary M., Jr., to Aeroquip Corporation. Fluid actuated ball check valve assembly. 5,558,121, Cl. 137-511.000.
Webster, Marc W.; Rulli, Paul A.; Farrell, Michael E.; and McDaniel, Gene A., to Xerox Corporation. Flexible configuration of document output terminals from autonomous machine modules. 5,559,606, Cl. 358-296.000.
Weeratunga, Gamini: *See*—
Murthy, Keshava; Weeratunga, Gamini; and Andrew, Burchat, 5,559,229, Cl. 540-491.000.
Weger, Friedrich, to Karl Fischer Industrieanlagen GmbH. Process and apparatus for continuous crystallization of plastic granules. 5,558,678, Cl. 23-295.00R.
Wehner, Herbert U., to UnionTools. Implement having an ergonomic step. 5,558,379, Cl. 294-60.000.
Wehrli, Henry A., III: *See*—
Shea, John J.; Bauer, James A.; Wehrli, Henry A., III; Mueller, Denis A.; Wilsdon, Thomas A.; and Wilson, John R., 5,559,426, Cl. 323-319.000.
Wei, Lee-Fang, to Lucent Technologies Inc. Coded modulation with shaping gain and tomlinson precoding. 5,559,561, Cl. 348-470.000.
Wei, William; and Stoll, Thomas, to MTU Motoren- und Turbinen-Union Muenchen GmbH. Blank for the manufacturing of fiber reinforced coatings or metal components. 5,557,846, Cl. 29-889.200.
Weichert, Andreas: *See*—
Schwark, Jan-Robert; Lang, Hans-Jochen; Kleemann, Heinz-Werner; Weichert, Andreas; Scholz, Wolfgang; and Albus, Udo, 5,559,153, Cl. 514-597.000.
Weichmann, Josef; Stadler, Aloisia; and Kern, Alfred, to SKW Trostberg. Flow improving agents for binder suspensions containing cement. 5,558,709, Cl. 106-727.000.
Weide, Joachim: *See*—
Jung, Ruediger; Weide, Joachim; and Metz, Hans J., 5,559,216, Cl. 534-579.000.
Weiden, Conrad, to Square D Company. Fuse holder for an electric switch. 5,559,489, Cl. 337-215.000.
Weier, Detlef, to Maschimpex GmbH. Automatic sorting machine for sorting and classifying small products of the pharmaceutical and confectionery industries according to form and color. 5,558,231, Cl. 209-580.000.
Weihe, Robert C.: *See*—
Avitan, Isaac; and Weihe, Robert C., 5,558,174, Cl. 180-60.000.
Weiler, Peter M., to National Semiconductor Corporation. Method and apparatus for capping metallization layer. 5,559,056, Cl. 437-195.000.
Weinberger, Eric P.; Lavash, Bruce W.; Olsen, Robb E.; and Cree, James W., to Procter & Gamble Company, The. Absorbent articles having undergarment covering components with zones of extensibility. 5,558,663, Cl. 604-387.000.
Weinshank, Richard L.: *See*—
Smith, Kelli E.; and Weinshank, Richard L., 5,559,021, Cl. 435-240.200.
Weinstein, James D. Fluid-like support device. 5,558,314, Cl. 267-91.000.
Weinstein, Valery G., to Illinois Tool Works Inc. Combustion-powered, fastener-driving tool with gas-actuated, fastener-feeding mechanism. 5,558,264, Cl. 227-10.000.
Weir, Steven P., to Harris Corporation. Carbon microphone interface for a modem. 5,559,869, Cl. 379-99.000.
Weis, Alexander L.; Shanmuganathan, Kirupathevy; and Goodhue, Charles T., to Genencor International, Inc.; and Lipitek, Inc. L-ribofuranosyl nucleosides. 5,559,101, Cl. 514-45.000.
Weisburn, James T.; Mundorf, Larry K.; Ramsey, Roger H.; and Brazis, William E., to Alpha Enterprises, Inc. Photograph and negative storage container and method. 5,558,225, Cl. 206-455.000.
Weiss, David: *See*—
Klimek, John R.; and Weiss, David, 5,559,964, Cl. 395-280.000.
Weiss, Harry M.: *See*—
Ordman, Alfred B., 5,558,870, Cl. 424-400.000.
Weiss, Paul S.; Bumm, Lloyd A.; Willis, Barry G.; and Baer, Richard L., to Biotechnology Research and Development Corporation. Small cavity analytical instruments. 5,559,328, Cl. 250-306.000.
Weiss, Wilhelm: *See*—
Kronseder, Hermann; and Weiss, Wilhelm, 5,558,135, Cl. 141-6.000.
Welch Allyn, Inc.: *See*—
Fahrenkrug, Corinn; and Briggman, Shawn, 5,559,422, Cl. 323-221.000.
Welch, Christopher R.: *See*—
Strong, Maurice L., III; Tranchita, Charles J.; Welch, Christopher R.; and Griffith, Gerald, 5,559,510, Cl. 340-954.000.
Weldon, David E.: *See*—
Talieh, Homayoun; Weldon, David E.; and Nagorski, Boguslaw A., 5,558,568, Cl. 451-303.000.
Wella Aktiengesellschaft: *See*—
Steigerwald, Franz; Schmitt, Martina; and Bock, Gabriele, 5,558,215, Cl. 206-222.000.
Wellcutter, Inc.: *See*—
Robinson, Jerry H., 5,557,995, Cl. 82-113.000.
Weller, Matthias; and Eisenmann, Wilhelm, to Alfred Karcher GmbH & Co. High-pressure cleaning device with bypass mechanism and pulsation dampening. 5,558,503, Cl. 417-307.000.
Wellner, Katrin: *See*—
Wohlrab, Wolfgang A.; Neubert, Reinhard; Matschiner, Sybille; and Wellner, Katrin, 5,559,098, Cl. 514-29.000.
Welser, Jeffrey J.: *See*—
Agahi, Farid; Pezeshki, Bardia; Kash, Jeffrey A.; and Welser, Jeffrey J., 5,559,912, Cl. 385-42.000.
Weng, Wolfgang; and Woerndle, Friedrich, to Siemens Aktiengesellschaft. Method for processing program modules being transferred and stored in network management central based on informational contents in updating message from connected data processing system. 5,560,004, Cl. 395-600.000.
Wenger, Alfred: *See*—
Koudal, Ole; and Wenger, Alfred, 5,557,973, Cl. 73-861.355.
Wenger Manufacturing Inc.: *See*—
Sunderland, Robert D., 5,558,898, Cl. 426-626.000.
Wengler, James J., to Davidson, Robert. Strap-style article carrier. 5,558,382, Cl. 294-157.000.
Wentworth, Fred A., Jr., to Ionic Fuel Technology, Inc. Vapor catalyst system for combustion. 5,558,513, Cl. 431-4.000.
Wentworth, Robert J.: *See*—
Belanger, Michael J.; and Wentworth, Robert J., 5,557,820, Cl. 15-1.510.
Werdinig, Helmut: *See*—
Herm, Hartmut; May, Karl; Unverzagt, Karlheinz; and Werdinig, Helmut, 5,558,203, Cl. 198-661.000.
Werzberger, Bernice F. Interactive book assembly. 5,558,520, Cl. 434-317.000.
Wesley-Jessen Corporation: *See*—
Collins, Theresa A., 5,559,848, Cl. 378-58.000.
Wess, Günther: *See*—
Enhsen, Alfons; Glombik, Heiner; Müllner, Stefan; and Wess, Günther, 5,559,258, Cl. 552-550.000.
West, Terence: *See*—
Repphun, William; Wong, Walter; Yates, Robert E.; Johnson, Gregg; and West, Terence, 5,559,650, Cl. 360-97.020.
Western Atlas, Inc.: *See*—
Brown, Jeffrey; and Rochon, Dennis G., 5,559,713, Cl. 364-474.160.
Western Combine Corporation: *See*—
Voss, Douglas A.; Link, David G.; Rea, David S.; and Mills, Murray W., 5,557,912, Cl. 56-130.000.
Westgate, Gillian E.: *See*—
Gibson, Walter T.; and Westgate, Gillian E., 5,559,092, Cl. 514-2.000.
Westinghouse Air Brake Company: *See*—
Daugherty, David W., Jr., 5,558,238, Cl. 213-50.500.
Kanjo, Wajih, 5,558,025, Cl. 105-199.400.
Kanjo, Wajih; Smith, Eric; Demoise, Thomas J.; Girotti, Michael; McCabe, Thomas; Fessler, Charles B.; and Natschke, Scott, 5,558,410, Cl. 303-71.000.
Kanjo, Wajih; Smith, Eric; Demoise, Thomas J.; Girotti, Michael; McCabe, Thomas; Fessler, Charles B.; and Natschke, Scott, 5,558,411, Cl. 303-71.000.
Kanjo, Wajih; Smith, Eric; Demoise, Thomas J.; Girotti, Michael; McCabe, Thomas; Fessler, Charles B.; and Natschke, Scott, 5,558,412, Cl. 303-74.000.
McKay, Albert A.; Pasek, Stanley J.; Porteous, David A.; Reid, Jeffrey D.; Scott, Trevor A.; Smith, Eric G.; Stahmer, Ulf; and Digweed, W. Thomas, 5,559,281, Cl. 73-39.000.
Westinghouse Electric Corporation: *See*—
Kain, Jeffrey A., 5,557,920, Cl. 60-39.230.
Westlake Monomers Corporation: *See*—
Best, James E., 5,558,746, Cl. 202-158.000.
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Imaizumi, Seiko; Yamada, Masao; and Nishino, Tomoki, 5,559,079, Cl. 504-117.000.
Yamada, Syuuzou: *See*—
Yokoya, Yasuhiko; Yamazaki, Noboru; Nakamura, Mitsuo; Hasuda, Syuuichi; Namai, Eisaku; and Yamada, Syuuzou, 5,559,443, Cl. 324-754.000.
Yamada, Yoshihiko: *See*—
Hara, Seinosuke; and Yamada, Yoshihiko, 5,557,983, Cl. 74-568.00R.
Yamada, Yukifumi, to Aisin Seiki Kabushiki Kaisha. Seat reclining apparatus. 5,558,402, Cl. 297-363.000.
Yamagami, Tamotsu: *See*—
Watanabe, Tetsu; Yamagami, Tamotsu; and Urakawa, Yoshiyuki, 5,559,774, Cl. 369-47.000.
Yamagishi, Yoji: *See*—
Urawa, Yoshio; Furukawa, Ken; Shimizu, Toshikazu; Yamagishi, Yoji; Tsurugi, Tomio; and Ichino, Tomio, 5,559,236, Cl. 546-14.000.
Yamaguchi, Seiji: *See*—
Kami, Kuniaki; Adachi, Hideyuki; Umeyama, Koichi; Kosaka, Yoshihiro; Yamaguchi, Seiji; Fuse, Eiichi; Sato, Michio; Nakamura, Masakazu; Tanaka, Yasundo; Fukaya, Takashi; Matsuno, Kiyotaka; and Suzuki, Katsuya, 5,558,619, Cl. 600-146.000.
Yamaguchi, Takanari: *See*—
Furuta, Motonobu; and Yamaguchi, Takanari, 5,559,184, Cl. 525-68.000.
Yamaguchi, Takashi: *See*—
Ohno, Tadayoshi; Itoh, Shinichi; Yamaguchi, Takashi; and Tanaka, Hisatoshi, 5,559,314, Cl. 235-432.000.
Yamaguchi, Yasuchika: *See*—
Göschke, Richard; Maibaum, Jürgen K.; Schilling, Walter; Stutz, Stefan; Rigollier, Pascal; Yamaguchi, Yasuchika; Cohen, Nissim C.; and Herold, Peter, 5,559,111, Cl. 514-227.500.
Yamaha Corporation: *See*—
Ando, Tokiharu, 5,559,994, Cl. 395-494.000.
Fujita, Yoshio, 5,559,300, Cl. 84-624.000.
Honda, Kazuhiko; Fujiwara, Kazunobu; and Osakabe, Katsuichi, 5,559,785, Cl. 369-124.000.
Okamura, Yashikoi; Kageyama, Yasuo; Suzuki, Takashi; Fujimori, Junichi; and Funada, Takeshi, 5,559,962, Cl. 395-200.060.
Shouji, Shigeru; and Toyoda, Atsushi, 5,559,653, Cl. 360-126.000.
Yamashita, Toshinori, 5,559,296, Cl. 84-415.000.
Yoshikawa, Yoshimasa; and Watanabe, Keisuke, 5,559,297, Cl. 84-433.000.
Yamaki, Hideo: *See*—
Niizawa, Koji; Matsuura, Masami; and Yamaki, Hideo, 5,559,580, Cl. 355-219.000.
Yamamoto Chemicals, Inc.: *See*—
Matsumoto, Mansuke; Sasaki, Nobuaki; Sawano, Bunji; Hasegawa, Kiyoharu; and Kikkawa, Kazuyoshi, 5,559,247, Cl. 548-471.000.
Yamamoto, Etsuji: *See*—
Takahashi, Tetsuhiko; Yamamoto, Etsuji; Murakami, Yoshiki; and Matsunaga, Yoshikuni, 5,559,434, Cl. 324-318.000.
Yamamoto, Goujun: *See*—
Ibe, Takaya; Tanaka, Kazuyoshi; Ota, Kaname; Yamamoto, Goujun; and Okabe, Toshihiro, 5,558,340, Cl. 273-448.000.
Yamamoto, Hirofumi: *See*—
Funakoshi, Yasushi; Ogata, Khoji; Kojima, Masayuki; Kawaziri, Hitoshi; Yamamoto, Hirofumi; Noto, Kazuhiko; and Mori, Naomichi, 5,558,763, Cl. 210-150.000.
Yamamoto, Hiroyuki: *See*—
Futami, Hiroyuki; and Yamamoto, Hiroyuki, 5,559,740, Cl. 365-189.040.
Yamamoto, Masanori, to NEC Corporation. Method of fabricating vertical-type double diffused mosfet having a self-aligned field oxide film. 5,559,045, Cl. 437-34.000.
Yamamoto, Michitaka: *See*—
Sakaguchi, Masashi; and Yamamoto, Michitaka, 5,558,867, Cl. 424-199.100.
Yamamoto, Shinichi; and Taniguchi, Takashi, to Toray Industries, Inc. Spiroxazine compounds. 5,559,231, Cl. 544-70.000.
Yamamoto, Shu: *See*—
Taga, Hidenori; Edagawa, Noboru; Yamamoto, Shu; Takeda, Noriyuki; and Akiba, Shigeyuki, 5,559,910, Cl. 385-24.000.
Yamamoto, Takashi: *See*—
Umezawa, Kazuo; Koyano, Takashi; Takahashi, Hiroaki; and Yamamoto, Takashi, 5,559,115, Cl. 514-279.000.
Yamamoto, Tetsuo: *See*—
Tsuchinari, Akihiro; Osaki, Hiroaki; Okamoto, Hisato; and Yamamoto, Tetsuo, 5,559,064, Cl. 501-120.000.
Yamamoto, Yasushi: *See*—
Kajihara, Ryuuji; and Yamamoto, Yasushi, 5,559,483, Cl. 333-195.000.
Yamamoto, Yoshihisa: *See*—
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Nishida, Masaaki; Yamamoto, Yoshihisa; Kusafuka, Muneo; Mikami, Kazuhiro; and Tsutsui, Hiroshi, 5,558,599, Cl. 477-116.000.
Tsukamoto, Kazumasa; Hayabuchi, Masahiro; Nishida, Masaaki; Yamamoto, Yoshihisa; Tsutsui, Hiroshi; and Nadayoshi, Kaoru, 5,558,600, Cl. 477-121.000.
Yamamura, Michio: *See*—
Makino, Masahiko; Yamamura, Michio; Fukushima, Masafumi; and Iwanami, Kunio, 5,558,510, Cl. 418-55.200.
Yamanaka, Mituo: *See*—
Noguchi, Yukihiko; Haruta, Keitoshi; Sakamoto, Isamu; Yamanaka, Mituo; Uchinono, Makoto; and Shiohara, Takashi, 5,558,559, Cl. 451-14.000.
Yamanaka, Motosuke: *See*—
Negi, Shigeto; Yamanaka, Motosuke; Katsu, Kanemasa; Sugiyama, Isao; Komatu, Yuuki; Kamata, Atsushi; Tsuruoka, Akihiko; and Machida, Yoshimasa, 5,559,225, Cl. 540-222.000.
Yamanaka, Shigeru; Eto, Yuzuru; Takano, Satoshi; Watanabe, Kunihiko; and Shibai, Hiroshiro, to Ajinomoto Co., Inc. Modified microbially-produced cellulose gel with human epidermal cells adsorbed thereon for use as a skin graft or vulnerary cover. 5,558,861, Cl. 424-93.700.
Yamanashi, Takanori: *See*—
Aoki, Norihiko; Yamanashi, Takanori; and Hankawa, Masashi, 5,559,638, Cl. 359-749.000.
Yamanouchi, Yasuhiro: *See*—
Watanabe, Tateshi; Watanabe, Tsunao; Watanabe, Tadashi; Matsugu, Hidetomo; and Yamanouchi, Yasuhiro, 5,558,714, Cl. 118-421.000.
Yamashima, Osamu; Inoue, Toshihiro; and Hasegawa, Hiroshi, to Yazaki Corporation. Automatic bundling machine. 5,558,012, Cl. 100-26.000.
Yamashina, Masakazu; Koseki, Youichi; and Mizuno, Masayuki, to NEC Corporation. Drive circuit detecting slow signal transition. 5,559,461, Cl. 327-205.000.

Yamashiro, Donald H.: *See*—
Mizukami, Kazuaki; Ogawa, Atsushi; Yasuda, Masashi; Furukawa,

Yoshie, Takehiko; Sasaki, Masanori; Shibafuchi, Hiroshi; and Imai, Yasushi, to Nippon Carbide Kogyo Kabushiki Kaisha. Processes for producing a salt
Yuza, Akira: *See*—
Sugiura, Yoshinori; Azuma, Jun; Adachi, Nobukazu; Satoiyama,

Yamashiro, Donald H.: *See*—
Miljanich, George P.; Bowersox, Stephen S.; Fox, James A.; Valentino, Karen L.; Bitner, Robert S.; and Yamashiro, Donald H., 5,559,095, Cl. 514-12.000.

Yamashita, Haruo; Matsumiya, Masami; and Fukushima, Tsumoru, to Matsushita Electric Industrial Co., Ltd. Image data processing apparatus. 5,559,530, Cl. 345-136.000.

Yamashita, Hiroshi: *See*—
Ogawa, Hidenori; Miyamoto, Hisashi, Kondo, Kazumi; Yamashita, Hiroshi; Nakaya, Kenji; Komatsu, Hajime; Tanaka, Michinori; Kora, Shinya; Tominaga, Michiaki; and Yabuuchi, Yoichi, 5,559,230, Cl. 540-569.000.

Yamashita, Toshinori, to Yamaha Corporation. Snare drum having parallel snares uniformly mounted by parallel, closely-spaced strainers. 5,559,296, Cl. 84-415.000.

Yamashita, Yasuhiko: *See*—
Yatoh, Hisayoshi; Yamashita, Yasuhiko; Harabuchi, Takashi; and Yano, Seinosuke, 5,558,726, Cl. 148-328.000.

Yamazaki, Akira: *See*—
Dosaka, Katsumi; Kumanoya, Masaki; Hayano, Kouji, Yamazaki, Akira, Iwamoto, Hisashi; Abe, Hideaki; Konishi, Yasuhiro; Himukashi, Katsumitsu; Ishizuka, Yasuhiro; and Saiki, Tsukasa, 5,559,750, Cl. 365-230.060.

Yamazaki, Itaru: *See*—
Yoshihara, Toshiyuki; Hanami, Nobuyuki; Takai, Hideyuki; Anayama, Hideki; Miyazaki, Hajime; Kishi, Junichi; Yamazaki, Itaru; Sakoh, Harumi; Kanemaru, Tetsuro; Iuchi, Kazushi; and Ainoya, Hideyuki, 5,558,964, Cl. 430-58.000.

Yamazaki, Noboru: *See*—
Yokoya, Yasuhiko; Yamazaki, Noboru; Nakamura, Mitsuo; Hasuda, Syuuichi; Namai, Eisaku; and Yamada, Syuuzou, 5,559,443, Cl. 324-754.000.

Yamazaki, Shunpei; and Takemura, Yasuhiko, to Semiconductor Energy Laboratory Co., Inc. Method of fabricating a thin film semiconductor device using an insulating film which contracts when thermally treated. 5,559,042, Cl. 437-21.000.

Yamazaki, Tomoyuki; and Otsuki, Masahito, to Fuji Electronic Co., Ltd. Insulated gate-type bipolar transistor. 5,559,347, Cl. 257-139.000.

Yamazaki, Tomoyuki; Obinata, Shigeyuki; Otsuki, Masahito; Momota, Seiji; and Fujihira, Tatsuhiko, to Fuji Electric Co., Ltd. Vertical MOS semiconductor device. 5,559,355, Cl. 257-341.000.

Yanagi, Yoshihiro: *See*—
Okumura, Tomohiro; Nakayama, Ichiro; and Yanagi, Yoshihiro, 5,558,722, Cl. 118-723.001.

Yanagihara, Hiroyuki; Taniguchi, Seihou; Hazeyama, Takeshi; Otaka, Hitoshi; Hashimoto, Teiji; and Souma, Sansan, to Nittetsu Mining Co., Ltd. Reinforced filter element. 5,558,689, Cl. 55-492.000.

Yanagisawa, Kiyoshi, to Ebara Corporation. Bearing lubricating apparatus for rotary machine. 5,558,180, Cl. 184-11.200.

Yanase, Yukiyoshi: *See*—
Shiga, Koichi; and Yanase, Yukiyoshi, 5,559,979, Cl. 395-421.080.

Yane, Barry: *See*—
Dubé, Pierre; Yane, Barry, and Boudreau, Yvon, 5,557,899, Cl. 52-455.000.

Yang, Chang A. Base structure for a three section type third braking light which can be converted into a triangular failure warning light. 5,558,427, Cl. 362-80.100.

Yang, Lihu: *See*—
Chakravarty, Prasun K.; Nargund, Ravi; Marquis, Robert W.; Patchett, Arthur A.; and Yang, Lihu, 5,559,128, Cl. 514-323.000.

Yang, Sherwin: *See*—
Chiang, Kuang-Tsan K., and Yang, Sherwin, 5,557,927, Cl. 60-257.000.

Yang, Xiao H.. *See*—
MacDougall, Frederick W.; and Yang, Xiao H., 5,559,404, Cl. 315-209.0CD.

Yano, Junichi; Ohgi, Tadaaki; Ishiyama, Koichi; and Hirabayashi, Kazuko, to Nippon Shinyaku Company, Limited. Adenosine and guanosine-3'-5'-cyclic methylphosphonate derivatives. 5,559,102, Cl. 514-46.000.

Yano, Kentaro: *See*—
Otsuka, Naoji; Hirabayashi, Hiromitsu; Yano, Kentaro; and Takahashi, Kiichiro, 5,559,535, Cl. 347-14.000.

Yano, Seinosuke: *See*—
Yatoh, Hisayoshi; Yamashita, Yasuhiko; Harabuchi, Takashi; and Yano, Seinosuke, 5,558,726, Cl. 148-328.000.

Yano, Shuuji: *See*—
Urairi, Masakatsu; Tachibana, Toshimitsu; Matsumoto, Kenji; Shinomura, Toshihiko; Iida, Hiroyuki; Kawamura, Kazunori; Yano, Shuuji; and Ishida, Osamu, 5,558,682, Cl. 29-623.500.

Yano, Takashi; and Doi, Nobukazu, to Hitachi, Ltd. Spread spectrum communication system and transmission power control method therefor. 5,559,790, Cl. 370-18.000.

Yap, Kian-Chin: *See*—
Lentz, Derek J.; Wang, Johannes; Deosaran, Trevor; Young, Linley M.; Yap, Kian-Chin; Nguyen, Le Trong; Matsubayashi, Makoto; and Lau, Te-Li, 5,559,951, Cl. 395-163.000.

Yarborough, J. Michael; Anderson, R. Rox; Marcellino, George; and Mitchell, Gerald M., to Coherent, Inc. Method and apparatus for treating vascular lesions. 5,558,667, Cl. 606-9.000.

Yasuda, Masashi: *See*—
Mizukami, Kazuaki; Ogawa, Atsushi; Yasuda, Masashi; Furukawa, Masahiro; Arima, Hidetoshi, and Ozawa, Yoshio, 5,557,939, Cl. 62-148.000.

Yasuda, Sota: *See*—
Iwata, Toru; and Yasuda, Sota, 5,559,703, Cl. 364-426.030.

Yasunaga, Tomohiro: *See*—
Koshiba, Yoshikazu; Aoki, Yukio; Minakata, Tsuyoshi; Inamura, Michio; Yasunaga, Tomohiro; Imoto, Fujiya; and Nakagawa, Junichi, 5,557,847, Cl. 29-890.000.

Yates, David C. Impedance feedback monitor for electrosurgical instrument. 5,558,671, Cl. 606-38.000.

Yates, Robert E.: *See*—
Repphun, William; Wong, Walter; Yates, Robert E.; Johnson, Gregg; and West, Terence, 5,559,650, Cl. 360-97.020.

Yatoh, Hisayoshi; Yamashita, Yasuhiko; Harabuchi, Takashi; and Yano, Seinosuke, to Nippon Steel Corporation; and Japan Casting & Forging Corporation. Cold rolled steel having excellent machinability and production thereof. 5,558,726, Cl. 148-328.000.

Yazaki Corporation: *See*—
Hashizawa, Shigemi; Inaba, Shigemitsu; and Hasegawa, Toshiaki, 5,558,533, Cl. 439-310.000.
Ikeda, Tomohiro; and Tsuchiya, Kenji, 5,558,531, Cl. 439-287.000.
Sugiyama, Takahide; Takahashi, Hisashi; and Inagaki, Nakahiro, 5,557,946, Cl. 62-476.000.
Yamashima, Osamu; Inoue, Toshihiro; and Hasegawa, Hiroshi, 5,558,012, Cl. 100-26.000.

Yee, Michael W.: *See*—
Kim, Young R.; Yee, Michael W., Mehta, Suresh N.; Sagala, Josefino C.; and Kantor, Johanna, 5,559,037, Cl. 436-63.000.

Yellowhair, David W.: *See*—
Unger, Evan C.; and Yellowhair, David W., 5,558,092, Cl. 128-660.030.

Yeoh, Oon H.: *See*—
Hargis, I. Glen; Miranda, Richard A.; Wilson, John A., and Yeoh, Oon H., 5,558,325, Cl. 273-61.00C.

Yilmaz, Hamza: *See*—
Williams, Richard K.; Yilmaz, Hamza; Cornell, Michael E.; and Chen, Jun W., 5,559,044, Cl. 437-34.000.

Ying, Chu K.: *See*—
Ming, Lam H., and Ying, Chu K., 5,558,058, Cl. 123-196.00A.

Yngve, Paul W.: *See*—
Knoff, Warren F.; McAllister, Robert W.; Popper, Peter; Shibata, Steven K.; Taylor, Robert E.; and Yngve, Paul W., 5,557,915, Cl. 57-204.000.

Yodoshi, Keiichi: *See*—
Shono, Masayuki; Hiroyama, Ryoji; and Yodoshi, Keiichi, 5,559,818, Cl. 372-45.000.

Yokelson, Howard B.: *See*—
Nubel, Philip O.; and Yokelson, Howard B., 5,559,190, Cl. 525-270.000.

Yokota, Kazuto, to Kabushiki Kaisha Toshiba. Single crystal of compound, laser rod, laser oscillator, scintillator, CT scanner, color display and process for preparing the same. 5,558,815, Cl. 252-301.450.

Yokoya, Yasuhiko; Yamazaki, Noboru; Nakamura, Mitsuo; Hasuda, Syuuichi; Namai, Eisaku; and Yamada, Syuuzou, to Hitachi Chemical Company Ltd.; and Yamada Den-On Co., Ltd. Jig for measuring the characteristics of a semiconductor, manufacturing method for the same, and usage of the same. 5,559,443, Cl. 324-754.000.

Yokoyama, Masahide; and Hayata, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Magnetron sputtering apparatus and method. 5,558,749, Cl. 204-192.120.

Yokoyama, Shoji: *See*—
Ito, Toru; Kishi, Hiroshi; Nimura, Mitsuhiro; Nanba, Akimasa; Morimoto, Kyomi; Ohara, Shigekazu; Yokoyama, Shoji; Maekawa, Kazuteru; Katoh, Kiyohide; Masuda, Hiroyoshi; Katoh, Shinichi; and Hashimoto, Koji, 5,559,511, Cl. 340-995.000.

Yoneda, Tadahiro: *See*—
Mori, Yoshikuni; Kushino, Mitsuo; Oishi, Hideki; and Yoneda, Tadahiro, 5,559,168, Cl. 523-205.000.

Yonezawa, Yoshihisa: *See*—
Itoh, Shigeo; Yonezawa, Yoshihisa; and Toki, Hitoshi, 5,558,814, Cl. 252-301.40R.

Yoon, Youngkun: *See*—
Lee, Hyosang; and Yoon, Youngkun, 5,558,316, Cl. 267-140.120.

Yoshida, Hiromi, legal representative: *See*—
Ogura, Wataru; Kawagoe, Yoshito; Takizawa, Satoru; Takeuchi, Yasuo; Okimura, Kimihiko; Yoshida, Hiroshi, deceased; Kobayashi, Atsushi; Ogura, Noboru; and Arioka, Kenji, 5,559,934, Cl. 395-117.000.

Yoshida, Hiroshi, deceased (by Hiromi Yoshida, legal representative): *See*—
Ogura, Wataru; Kawagoe, Yoshito; Takizawa, Satoru; Takeuchi, Yasuo; Okimura, Kimihiko; Yoshida, Hiroshi, deceased; Kobayashi, Atsushi; Ogura, Noboru; and Arioka, Kenji, 5,559,934, Cl. 395-117.000.

Yoshida, Masafumi: *See*—
Minato, Takao; Suzuki, Katsuhiro; Hoshi, Hisao; and Yoshida, Masafumi, 5,559,621, Cl. 359-81.000.

Yoshida, Teruyuki: *See*—
Makise, Tetsuro; and Yoshida, Teruyuki, 5,559,643, Cl. 360-46.000.

Yoshida, Tetsushi: *See*—
Takei, Jiro; Yoshida, Tetsushi; and Kikuchi, Zenta, 5,559,615, Cl. 357-50.000.

Yoshida, Toyohiko, to Mitsubishi Denki Kabushiki Kaisha. Data processing having incircuit emulation function. 5,560,036, Cl. 395-800.000.

Yoshie, Takehiko; Sasaki, Masanori; Shibafuchi, Hiroshi; and Imai, Yasushi, to Nippon Carbide Kogyo Kabushiki Kaisha. Processes for producing a salt of N-guanidino thiourea and 3-amino-5-mercapto-1,2,4-triazole. 5,559,243, Cl. 548-263.800.

Yoshihara, Toshiyuki; Hanami, Nobuyuki; Takai, Hideyuki; Anayama, Hideki; Miyazaki, Hajime; Kishi, Junichi; Yamazaki, Itaru; Sakoh, Harumi; Kanemaru, Tetsuro; Iuchi, Kazushi; and Ainoya, Hideyuki, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member, and electrophotographic apparatus, device unit, and facsimile machine employing the same. 5,558,964, Cl. 430-58.000.

Yoshikawa, Hirofumi, to Matsumoto Yushi-Seiyaku Co., Ltd. Bowl-shape microparticle and production thereof. 5,559,202, Cl. 526-207.000.

Yoshikawa, Yoshimasa; and Watanabe, Keisuke, to Yamaha Corporation. Key for keyboard instrument having a perspiration-absorbing surface. 5,559,297, Cl. 84-433.000.

Yoshimori, Hiroyuki: *See*—
McMillan, Larry D.; Mihara, Takashi; Yoshimori, Hiroyuki; Gregory, John W.; and Paz de Araujo, Carlos A., 5,559,733, Cl. 365-145.000.

Yoshimura, Hiroyuki: *See*—
Tsuchida, Masayuki; Uemura, Hirokazu; Miura, Shinji; Saito, Yoshiyuki; Yoshimura, Hiroyuki; Nishimura, Yuichi; and Sueda, Nobuo, 5,559,997, Cl. 395-500.000.

Yoshinaga, Hiroshi; and Sawada, Akira, to Ricoh Company, Ltd. Cleaning device for an image forming apparatus. 5,559,593, Cl. 355-296.000.

Yoshinaga, Kei; Ito, Katsuhiko; Ebara, Katsumi; Furuhashi, Hitoshi; Shichinohe, Takashi; and Omagari, Masaharu, to Honda Giken Kogyo Kabushiki Kaisha. Power unit for a sitting-type vehicle. 5,558,059, Cl. 123-198.00E.

Yoshinari, Jiro: *See*—
Miyazaki, Shinji; Yoshinari, Jiro; and Kobayashi, Koji, 5,558,945, Cl. 428-611.000.

Yoshioka, Mamoru, to Toyota Jidosha Kabushiki Kaisha. Valve timing control device for an internal combustion engine. 5,558,051, Cl. 123-90.150.

Yoshioka, Toyotoshi: *See*—
Mori, Masakazu; and Yoshioka, Toyotoshi, 5,557,949, Cl. 66-168.000.

Yoshitomi, Sumie; Kurokawa, Tsutomu; and Igarashi, Koichi, to Takeda Chemical Industries, Ltd. N-terminally truncated hst-1 is a platelet-increasing factor. 5,559,093, Cl. 514-2.000.

Youn, Byungwoo: *See*—
Kang, Jemo; Youn, Byungwoo; and Oh, Young H., 5,559,041, Cl. 436-518.000.

Young, Alastair J.; Spooner, John; and Chippendale, John P., to Automotive Products, plc. Differential mechanism. 5,557,986, Cl. 74-650.000.

Young, Bruce: *See*—
Sakoda, Thomas Y.; and Young, Bruce, 5,559,954, Cl. 395-164.000.

Young, David C.: *See*—
Carnaggio, Frank S.; Lambert, Douglas N.; and Young, David C., 5,559,754, Cl. 367-15.000.

Young, Jeffery N. Combination boat/camper shell/pop-up tent. 5,558,392, Cl. 296-157.000.

Young, Linley M.: *See*—
Lentz, Derek J.; Wang, Johannes; Deosaran, Trevor; Young, Linley M.; Yap, Kian-Chin; Nguyen, Le Trong; Matsubayashi, Makoto; and Lau, Te-Li, 5,559,951, Cl. 395-163.000.

Young, Richard N., to DBS Manufacturing, Inc. Method and apparatus for closed loop air circulation composting with an external air manifold. 5,559,033, Cl. 435-290.300.

Young, Roy E.; and Hale, S. Andrew, to Clemson University. Automated system and process for heterotrophic growth of plant tissue. 5,558,984, Cl. 435-3.000.

Young, Steve: *See*—
Maitra, Sidhartha; Thanawala, Ashish; and Young, Steve, 5,559,793, Cl. 370-32.100.

Yu, Chen-Hua D.: *See*—
Lee, Kuo-Hua; and Yu, Chen-Hua D., 5,559,052, Cl. 437-52.000.

Yu, James C.: *See*—
Cheng, Pearl P.; Briner, Michael S.; and Yu, James C., 5,559,990, Cl. 395-484.000.

Yu, Philip S.: *See*—
Chen, Ming-Syan; Hsiao, Hui-I; Li, Chung-Shen; and Yu, Philip S., 5,559,764, Cl. 369-30.000.

Yu, Tsai-Yun, to Seile Tech Industrial Co., Ltd. Bicycle saddle assembly with a bicycle saddle capable of absorbing shock in a plurality of directions.. 5,558,396, Cl. 297-208.000.

Yuan, Yanrong: *See*—
Sheets, Ronald E.; and Yuan, Yanrong, 5,559,629, Cl. 359-364.000.

Yuda, Shuji: *See*—
Harima, Kenji; Nagai, Toshinari; Kanai, Hiroshi; Osanai, Akinori; Iwano, Kazuhiro; and Yuda, Shuji, 5,558,072, Cl. 123-677.000.

Yudase, Toshihiro: *See*—
Sugioka, Takami; Yudase, Toshihiro; and Seike, Yuji, 5,558,286, Cl. 242-18.00A.

Yukawa, Akira, to NEC Corporation. Semiconductor device with large substrate contact region. 5,559,356, Cl. 257-371.000.

Yun, Hoag-Su, to Samsung Electronics Co., Ltd. Convergence correcting method and apparatus for correcting convergence distortion in a CRT. 5,559,565, Cl. 348-806.000.

Yurek, Gregory J.: *See*—
Vandersande, John B.; Yurek, Gregory J.; and Kogure, Toshihiro, 5,559,084, Cl. 505-125.000.

Yuza, Akira: *See*—
Sugiura, Yoshinori; Azuma, Jun; Adachi, Nobukazu; Setoriyama, Takeshi; Tenpaku, Chitose; Ishikawa, Noriyoshi; Hamada, Tatsuo; Tsuchiya, Yoshiro; Kubota, Takeshi; Nomura, Yoshiya; Kuroda, Akira; Murooka, Ken; Sugita, Takeshi; Niimura, Takeshi; and Yuza, Akira, 5,559,581, Cl. 355-200.000.

Zabler, Erich; Uhler, Werner; Baumann, Andreas; Eicher, Joachim; and Peters, Ralf-Peter, to Robert Bosch GmbH. Acceleration switch and method of fabrication. 5,559,309, Cl. 200-61.45R.

Zabron, Florian S.; Rothman, Miles S.; and Kazial, Walter M., to Globe International, Inc. Belting having sealed edge and method of manufacture. 5,558,207, Cl. 198-847.000.

Zahler, Robert: *See*—
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Zalutsky, Michael R.: *See*—
Bigner, Darell D.; and Zalutsky, Michael R., 5,558,852, Cl. 424-1.490.

Zamecnik, Paul C.: *See*—
Agrawal, Sudhir; and Zamecnik, Paul C., 5,559,221, Cl. 536-25.400.

Zamojski, Marek R. Silver alloy. 5,558,833, Cl. 420-502.000.

Zang, Yan, to Quantum Corporation. Shaft seal for hydrodynamic bearing unit. 5,558,443, Cl. 384-112.000.

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Zeligson, Stephen J. Emergency vehicle light bar assembly. 5,558,424, Cl. 362-66.000.

Zenda, Hiroki, to Kabushiki Kaisha Toshiba. Flat panel display control system. 5,559,525, Cl. 345-1.000.

Zeneca Limited: *See*—
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Miller, Scott C., 5,559,132, Cl. 514-329.000.
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Zeng, Gengsheng L.; and Gullberg, Grant T., to University of Utah, The. Rotating and warping projector/backprojector for converging-beam geometries. 5,559,335, Cl. 250-363.040.

Zenon Environmental Inc.: *See*—
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Zerlik, Wilibald: *See*—
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Zexel Corporation: *See*—
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Kunishima, Akira; Hasebe, Tomiaki; Kikuchi, Hideya; Hozumi, Etsuro; and Kushida, Takeo, 5,558,068, Cl. 123-516.000.

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Zhang, Jinshan: *See*—
Venugopal, Ganesh; Reichert, Veronica R.; and Zhang, Jinshan, 5,558,959, Cl. 429-19.200.

Zhang, Zhongxuan; and Du, He, to Cirrus Logic, Inc. Voltage controlled oscillator including voltage controlled delay circuit with power supply noise isolation. 5,559,476, Cl. 331-57.000.

Zhao, Alan H., to Cummins Engine Company, Inc. Fuel system vibration damper. 5,558,066, Cl. 123-495.000.

Zhao, Jun; Cho, Tom; Dornfest, Charles; Wolff, Stefan; Fairbairn, Kevin; Guo, Xin S; Schreiber, Alex; and White, John M., to Applied Materials. CVD Processing chamber. 5,558,717, Cl. 118-715.000.

Zhong, Qian: *See*—
Inniss, Daryl; Vengsarkar, Ashish M.; and Zhong, Qian, 5,559,907, Cl. 385-11.000.

Zimmerman, Leon S., to Staco, Inc. Hog feeder. 5,558,039, Cl. 119-52.100.

Zinnamosca, Francesco; and Berruti, Massimo, to Technipetrol S.p.A. Apparatus for the continuous production of ethanol from cereals. 5,559,031, Cl. 435-289.100.

Zitz, Alfred: *See*—
Krassnitzer, Otto; Zitz, Alfred; and Felber, Robert, 5,557,979, Cl. 74-377.000.

Zlotsky, Dmitry. Stacking puzzle. 5,558,331, Cl. 273-156.000.

Zook, James D.: *See*—
Burns, David W.; Guckel, Henry; and Zook, James D., 5,559,358, Cl. 257-431.000.

Zöphel, Andreas: *See*—
Ahorn, Horst; Maurer-Fogy, Ingrid; Sommergruber, Wolfgang; Zöphel, Andreas; Blaas, Dieter; Küchler, Ernst; Liebig, Hans-Dieter; and Skern, Timothy, 5,559,025, Cl. 435-252.330.

Zory, Peter S., Jr.; Hudson, Douglas A., Jr.; and Grove, Michael J., to Zory, Jr., Peter S. Method for producing native oxides on compound semiconductors. 5,559,058, Cl. 437-237.000.

Zoumut, Hani: *See*—
Johansen, Charles J., Jr.; Hollas, Ernest D.; Vecchio, Robert L.; and Zoumut, Hani, 5,558,708, Cl. 106-712.000.

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Zschoke, Wolfgang: *See*—
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Zuschanko, Hans: *See*—
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Zwecker, Joachim; Buhl, Dieter; and Hesse, Anton, to BASF Aktiengesellschaft. Molding ofBMC molding materials having improved surface properties. 5,558,943, Cl. 428-458.000.

Zweering, Uwe: *See*—
Michels, Gisbert; König, Joachim; Zweering, Uwe; and Korte, Siegfried, 5,558,940, Cl. 428-422.000.

Zweiner, Christian: *See*—
Squiller, Edward P.; and Zweiner, Christian, 5,559,204, Cl. 528-84.000.

1,005,539 Ontario Inc.: *See*—
Pringle, Daniel, 5,559,688, Cl. 363-89.000.

3-Dimensional Pharmaceuticals, Inc.: *See*—
Soll, Richard M., 5,559,150, Cl. 514-562.000.

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Advanced Plastics Partnership: *See*—
Moore, Timothy M.; and Van Der Woude, Gerbrig W., Re. 35,334, Cl. 264-489.000.

Bell Communications Research, Inc.: *See*—
Patel, Jayantilal S.; and Wullert, John R., II, Re. 35,337, Cl. 359-86.000.

Calfee, Craig D. Composite bicycle frame. Re. 35,335, Cl. 280-281.100.

Casi-Rusco, Inc.: *See*—
Ulch, Bryan D.; Sturgis, Donald P.; and Fox, Robert J., Re. 35,336, Cl. 340-825.310.

Fox, Robert J.: *See*—
Ulch, Bryan D.; Sturgis, Donald P.; and Fox, Robert J., Re. 35,336, Cl. 340-825.310.

General Kinematics Corporation: *See*—
Sherman, Raymond W., Re. 35,331, Cl. 209-393.000.

Haynes, Duncan H., to Pharma-Logic, Inc. Sustained release delivery of water soluble bio-molecules and drugs using phosphokipid-coated microcrystals, microdroplets and high-concentration lipsomes. Re. 35,338, Cl. 424-450.000.

Iwasaki, Naoko; and Ohno, Katsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Infrared detector. Re. 35,333, Cl. 250-352.000.

Kurata, Yukio: *See*—
Nagahama, Toshiya; Yoshida, Yoshio; Nakata, Yasuo; and Kurata, Yukio, Re. 35,332, Cl. 250-201.500.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Iwasaki, Naoko; and Ohno, Katsuhiro, Re. 35,333, Cl. 250-352.000.

Moore, Timothy M.; and Van Der Woude, Gerbrig W., to Advanced Plastics Partnership. Process for core removal from molded products. Re. 35,334, Cl. 264-489.000.

Nagahama, Toshiya; Yoshida, Yoshio; Nakata, Yasuo; and Kurata, Yukio, to Sharp Kabushiki Kaisha. Optical pickup device with diffraction device. Re. 35,332, Cl. 250-201.500.

Nakata, Yasuo: *See*—
Nagahama, Toshiya; Yoshida, Yoshio; Nakata, Yasuo; and Kurata, Yukio, Re. 35,332, Cl. 250-201.500.

Ohno, Katsuhiro: *See*—
Iwasaki, Naoko; and Ohno, Katsuhiro, Re. 35,333, Cl. 250-352.000.

Patel, Jayantilal S.; and Wullert, John R., II, to Bell Communications Research, Inc. Temperature compensation of liquid-crystal etalon filters. Re. 35,337, Cl. 359-86.000.

Pharma-Logic, Inc.: *See*—
Haynes, Duncan H., Re. 35,338, Cl. 424-450.000.

Sharp Kabushiki Kaisha: *See*—
Nagahama, Toshiya; Yoshida, Yoshio; Nakata, Yasuo; and Kurata, Yukio, Re. 35,332, Cl. 250-201.500.

Sherman, Raymond W., to General Kinematics Corporation. Material separating apparatus. Re. 35,331, Cl. 209-393.000.

Sturgis, Donald P.: *See*—
Ulch, Bryan D.; Sturgis, Donald P.; and Fox, Robert J., Re. 35,336, Cl. 340-825.310.

Ulch, Bryan D.; Sturgis, Donald P.; and Fox, Robert J., to Casi-Rusco, Inc. Self-contained programmable terminal for security systems. Re. 35,336, Cl. 340-825.310.

Van Der Woude, Gerbrig W.: *See*—
Moore, Timothy M.; and Van Der Woude, Gerbrig W., Re. 35,334, Cl. 264-489.000.

Wullert, John R., II: *See*—
Patel, Jayantilal S.; and Wullert, John R., II, Re. 35,337, Cl. 359-86.000.

Yoshida, Yoshio: *See*—
Nagahama, Toshiya; Yoshida, Yoshio; Nakata, Yasuo; and Kurata, Yukio, Re. 35,332, Cl. 250-201.500.

LIST OF REEXAMINATION PATENTEES

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Allen, Gary R.: *See*—
Parham, Thomas G.; Bateman, Robert L., Jr.; Allen, Gary R.; and Mathews, Paul G., B1 5,196,759, Cl. 313-112.000.

Bateman, Robert L., Jr.: *See*—
Parham, Thomas G.; Bateman, Robert L., Jr.; Allen, Gary R.; and Mathews, Paul G., B1 5,196,759, Cl. 313-112.000.

Brehm, Frederic W.: *See*—
Wolfson, C. Daniel; Brehm, Frederic W.; Flatley, Maura M.; and Voorhees, Ellen M., B1 5,126,932, Cl. 395-200.030.

Celotex Corporation, The: *See*—
Jennus, Robert E.; and Major, Dale P., B1 4,869,942, Cl. 428-77.000.

Cody, Donna R.; DeWitt, Sheila H. H.; Hodges, John C.; Kiely, John S.; Moos, Walter H.; Pavia, Michael R.; Roth, Bruce D.; Schroeder, Mel C.; and Stankovic, Charles J., to Warner-Lambert Company. Apparatus for multiple simultaneous synthesis. B1 5,324,483, Cl. 422-131.000.

DeWitt, Sheila H. H.: *See*—
Cody, Donna R.; DeWitt, Sheila H. H.; Hodges, John C.; Kiely, John S.; Moos, Walter H.; Pavia, Michael R.; Roth, Bruce D.; Schroeder, Mel C.; and Stankovic, Charles J., B1 5,324,483, Cl. 422-131.000.

Flatley, Maura M.: *See*—
Wolfson, C. Daniel; Brehm, Frederic W.; Flatley, Maura M.; and Voorhees, Ellen M., B1 5,126,932, Cl. 395-200.030.

General Electric Company: *See*—
Parham, Thomas G.; Bateman, Robert L., Jr.; Allen, Gary R.; and Mathews, Paul G., B1 5,196,759, Cl. 313-112.000.

Hodges, John C.: *See*—
Cody, Donna R.; DeWitt, Sheila H. H.; Hodges, John C.; Kiely, John S.; Moos, Walter H.; Pavia, Michael R.; Roth, Bruce D.; Schroeder, Mel C.; and Stankovic, Charles J., B1 5,324,483, Cl. 422-131.000.

Hoshino, Ryoichi; Sasaki, Hironaka; and Yasutake, Takayuki, to Showa Aluminum Corporation. Condenser for use in a car cooling system. B1 5,025,855, Cl. 165-150.000.

Jennus, Robert E.; and Major, Dale P., to Celotex Corporation, The. Trilaminated roofing shingle. B1 4,869,942, Cl. 428-77.000.

Kiely, John S.: *See*—
Cody, Donna R.; DeWitt, Sheila H. H.; Hodges, John C.; Kiely, John S.; Moos, Walter H.; Pavia, Michael R.; Roth, Bruce D.; Schroeder, Mel C.; and Stankovic, Charles J., B1 5,324,483, Cl. 422-131.000.

Major, Dale P.: *See*—
Jennus, Robert E.; and Major, Dale P., B1 4,869,942, Cl. 428-77.000.

Mathews, Paul G.: *See*—
Parham, Thomas G.; Bateman, Robert L., Jr.; Allen, Gary R.; and Mathews, Paul G., B1 5,196,759, Cl. 313-112.000.

Moos, Walter H.: *See*—
Cody, Donna R.; DeWitt, Sheila H. H.; Hodges, John C.; Kiely, John S.; Moos, Walter H.; Pavia, Michael R.; Roth, Bruce D.; Schroeder, Mel C.; and Stankovic, Charles J., B1 5,324,483, Cl. 422-131.000.

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Oguchi, Tetsuji, to Nippon Electric Co., Ltd. Display controlling apparatus. B1 4,491,834, Cl. 345-123.000.

Parham, Thomas G.; Bateman, Robert L., Jr.; Allen, Gary R.; and Mathews, Paul G., to General Electric Company. High temperature lamps having UV absorbing quartz envelope. B1 5,196,759, Cl. 313-112.000.

Pavia, Michael R.: *See*—
Cody, Donna R.; DeWitt, Sheila H. H.; Hodges, John C.; Kiely, John S.; Moos, Walter H.; Pavia, Michael R.; Roth, Bruce D.; Schroeder, Mel C.; and Stankovic, Charles J., B1 5,324,483, Cl. 422-131.000.

Roth, Bruce D.: *See*—
Cody, Donna R.; DeWitt, Sheila H. H.; Hodges, John C.; Kiely, John S.; Moos, Walter H.; Pavia, Michael R.; Roth, Bruce D.; Schroeder, Mel C.; and Stankovic, Charles J., B1 5,324,483, Cl. 422-131.000.

Sasaki, Hironaka: *See*—
Hoshino, Ryoichi; Sasaki, Hironaka; and Yasutake, Takayuki, B1 5,025,855, Cl. 165-150.000.

Schroeder, Mel C.: *See*—
Cody, Donna R.; DeWitt, Sheila H. H.; Hodges, John C.; Kiely, John S.; Moos, Walter H.; Pavia, Michael R.; Roth, Bruce D.; Schroeder, Mel C.; and Stankovic, Charles J., B1 5,324,483, Cl. 422-131.000.

Showa Aluminum Corporation: *See*—
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Siemens Corporate Research, Inc.: *See*—
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Theno, Mark H. Decorative ribbons. B1 4,826,712, Cl. 428-4.000.

Voorhees, Ellen M.: *See*—
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Cody, Donna R.; DeWitt, Sheila H. H.; Hodges, John C.; Kiely, John S.; Moos, Walter H.; Pavia, Michael R.; Roth, Bruce D.; Schroeder, Mel C.; and Stankovic, Charles J., B1 5,324,483, Cl. 422-131.000.

Wolfson, C. Daniel; Brehm, Frederic W.; Flatley, Maura M.; and Voorhees, Ellen M., to Siemens Corporate Research, Inc. Method and apparatus for executing a program in a heterogeneous multiple computer system. B1 5,126,932, Cl. 395-200.030.

Yasutake, Takayuki: *See*—
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Broberg, Leif, 374,080, Cl. D24-156.000.

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Axe, Royden; and Bourne, Ewart M., to Rolls-Royce Motor Cars Limited. Automobile. 373,978, Cl. D12-92.000.

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Bennett, Stephen E.; Biasotti, Mark; Brown, Reed S.; Nuttall, Michael J.; and Schaffeld, John H., to AT&T IPM Corp. Telephone handset. 374,012, Cl. D14-248.000.

Bergstedt, Peder. Box for tool parts. 373,901, Cl. D3-294.000.

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Brancazio, Diane M.; Gardner, Susannah E.; Hern, Matthew D.; Labrano, Francis M.; Snow, David A.; and Sykes, David M., to Fountainhead Technologies. Water purifier. 374,064, Cl. D23-209.000.

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Broberg, Leif, to Astra Aktiebolag. Abutment for a dental implant. 374,080, Cl. D24-156.000.

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Cayce, Yvonne. Sports cap brassiere. 373,891, Cl. D2-706.000.

Chan, Raymond W. M., to Jing Mei Industrial Limited. Wall mount shower head. 374,065, Cl. D23-213.000.

Chang, Tsung-Chieh. Handle for a screwdriver. 373,945, Cl. D8-83.000.

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Chen, Mike. Miniature portable lamp. 374,100, Cl. D26-60.000.

Chen, Wan-Chun. Massager. 374,084, Cl. D24-211.000.

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Weaver, John; Runkle, Allen; and LeKander, Dan, to Auto Accessories of America. Combined rear decklid, arch and window panel unit. 373,985, Cl. D12-401.000.

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Ko, Chen-fa, 373,996, Cl. D13-158.000.

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Shenoha, James L.; and Meyer, Dean E., 374,049, Cl. D21-217.000.

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Gibbs, Thomas M., III, 373,933, Cl. D7-555.000.

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Wood, David E.; Wood, Karen L.; and Wood, Ryan D., 374,000, Cl. D14-114.000.

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Takatani, Toshimi; Yoshikawa, Kazumasa; and Ujishima, Toshikazu, 373,897, Cl. D2-957.000.

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Otani, Tomofumi; Nakamura, Joichi; Nakagawa, Takero; Sasamoto, Shuji; and Yoshimura, Yoshitaka, 373,950, Cl. D8-499.000.

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Shimose, Norihiko; and Yukikado, Koji, 374,005, Cl. D14-129.000.

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Atherton, Randy L.; Zwayer, Kent L.; and Robbins, Richard J., 374,059, Cl. D22-140.000.

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Zorzi, Claudio: *See—*

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ISSUED SEPTEMBER 24, 1996

NOTE—First number, class; second number, subclass; third number, patent number

CLASSIFICATION OF PATENTS

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CLASS 2

2 5,557,801
5,557,802
16 5,557,803
23 5,557,804
158 5,557,805
161.1 5,557,806
171.2 5,557,807
211 5,557,808

CLASS 4

245.3 5,557,809
321 5,557,810
502 5,557,811
665 5,557,812

CLASS 5

239 5,557,813
496 5,557,814
636 5,557,815
645 5,557,816
663 5,557,817

CLASS 7

160 5,557,818

CLASS 8

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107 5,558,676
607 5,558,677

CLASS 15

1.51 5,557,820
1.7 5,557,819
3.13 5,557,821
369 5,557,822
400 5,557,823

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82 5,557,825
166 R 5,557,826
237 5,557,827
257 5,557,828
375 5,557,829

CLASS 23

295 R 5,558,678

CLASS 24

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CLASS 28

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CLASS 29

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261 5,557,833
407.05 5,557,834
524.1 5,557,835
527.4 5,557,836
596 5,557,837
597 5,557,838
603.03 5,557,839
623.1 5,558,679
5,558,680
623.4 5,558,681
623.5 5,558,682
727 5,557,840
743 5,557,841
827 5,557,842
851 5,557,843
852 5,557,844
888.022 5,557,845
889.2 5,557,846
890 5,557,847
890.143 5,557,848

CLASS 30

29 5,557,849
43.92 5,557,850
50 5,557,851
167 5,557,852
275 5,557,853

CLASS 33

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613 5,557,855

CLASS 34

117 5,557,856
189 5,557,857
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455 5,557,860
461 5,557,861
618 5,557,862
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CLASS 36

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61 5,557,865
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CLASS 40

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CLASS 42

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CLASS 43

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20 5,557,875
21.2 5,557,876
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43.11 5,557,878
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122 5,557,880

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44.01 5,557,882
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CLASS 49

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362 5,557,888
386 5,557,889
502 5,557,890

CLASS 52

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187 5,557,893
204.595 5,557,894
220.7 5,557,895
408 5,557,896
410 5,557,897
5,557,898
455 5,557,899
506.03 5,557,901
506.07 5,557,902
508 5,557,903
631 5,557,904
736.3 5,557,900

CLASS 53

118 5,557,906
139.2 5,557,907
212 5,557,908
474 5,557,909

CLASS 54

7 5,557,905

CLASS 55

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CLASS 56

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41 5,557,911
130 5,557,912
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244 5,557,913

CLASS 57

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261 5,557,916

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39.04 5,557,918
39.06 5,557,919
39.23 5,557,920
39.53 5,557,921
39.75 5,557,922
247 5,557,926
257 5,557,927
260 5,557,928
266 5,557,932
274 5,557,923
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276 5,557,929
433 5,557,930
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50.5 5,557,925
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149 5,557,940
160 5,557,941
288 5,557,942
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469 5,557,944
474 5,557,945
476 5,557,946
621 5,557,947
648 5,557,951

CLASS 65

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335 5,558,691
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5,558,693

CLASS 66

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168 5,557,949
194 5,557,950

CLASS 68

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CLASS 70

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51 5,557,960
61 5,557,961
260 5,557,962
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389.1 5,557,964

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49.7 5,557,966
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117.3 5,559,285
129 5,559,286
204.21 5,559,287
204.24 5,557,967
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275 5,559,289
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514.36 5,559,290
592 5,557,969
597 5,557,970
5,559,292
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861 5,559,293
861.355 5,557,973
862.335 5,557,974
862.338 5,557,975
862.44 5,559,294
864.63 5,559,295

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15.84 5,557,977
331 5,557,978
377 5,557,979
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523 5,557,981
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568 R 5,557,983
574 5,557,984
594.6 5,557,985
650 5,557,986
810.1 5,557,987
845 5,557,988

CLASS 75

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505 5,558,696

CLASS 76

74 5,557,989

CLASS 81

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57.29 5,557,991
124.5 5,557,992
165 5,557,993
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CLASS 83

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174 5,557,997
875 5,557,998
880 5,557,999

CLASS 84

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607 5,559,298
610 5,559,299
624 5,559,300
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28.05 5,559,303

CLASS 91

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376 R 5,558,001
378 5,558,002
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CLASS 92

66 5,558,005

CLASS 95

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49 5,558,698

CLASS 99

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CLASS 104

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727 5,558,709
780 5,558,710

CLASS 108

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CLASS 109

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CLASS 110

243 5,558,028
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CLASS 111

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723 I 5,558,722
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730 5,558,721

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90.16 5,558,052
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198 E 5,558,059
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495 5,558,066
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516 5,558,068
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598 5,558,071
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687 5,558,076

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299 D 5,558,080

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203.17 5,558,084
204.26 5,558,086
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668 5,558,095
687 5,558,096
705 5,558,097
706 5,558,098
724 5,558,099
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228 5,558,107
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101.11 5,558,116
223 5,558,117
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360 5,558,119
382 5,558,120
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596.17 5,558,122
597 5,558,124
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625.27 5,558,125
625.64 5,558,126
636.1 5,558,127
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93 5,558,131

CLASS 139

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29 5,558,268
67 5,558,810
73 5,558,811
81 R 5,558,342
88 5,558,343

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198 5,559,385
231 5,559,462
300 5,559,463
33 5,559,539
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144 5,559,626
216 5,559,627
248 5,559,628
443 5,559,707
468.01 5,559,709
468.03 5,559,708
32.1 5,559,793
58.3 5,559,794
60 5,559,795

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23 5,558,136
44.000 5,558,137
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95 5,558,139
98 5,558,140
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381 5,558,143

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328 5,558,726
333 5,558,727
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671 5,558,729

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527 5,558,144

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164 5,558,734
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175 5,558,738
203 5,558,739
231 5,558,740
244.11 5,558,741
244.16 5,558,742
275.5 5,558,735
345 5,558,736
352 5,558,743
522 5,558,744

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176.1 5,558,146
190 5,558,147

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95 5,558,150
312 5,558,151
340 5,558,152

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80.3 5,558,155
84 5,558,156
95 5,558,157
122 5,558,158
150 B1 5,025,855
153 5,558,159

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5,558,161
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178 5,558,168
185 5,558,169

CLASS 174

52.4 5,559,305
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87 5,559,307

CLASS 175

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64 5,558,171
228 5,558,172

CLASS 180

53.8 5,558,173
60 5,558,174
65.2 5,558,175
68.3 5,558,176
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422 5,558,177

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11.2 5,558,180

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72.4 5,558,184
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476.1 5,558,201
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781.04 5,558,205
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847 5,558,207
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61.45 R 5,559,309
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513 5,559,311
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753 5,558,755
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455 5,558,225
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105 5,558,767
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580 5,558,231
584 5,558,232
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220 5,558,764
222 5,558,765
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500.25 5,558,771
612 5,558,774
638 5,558,775
640 5,558,776
691 5,558,777
712 5,558,782
761 5,558,783
764 5,558,772
770 5,558,773
774 5,558,778
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121.68 5,558,788
121.69 5,558,789
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202 5,558,792
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702 5,558,796
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731 5,558,798
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189.09 5,558,256
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377 5,558,294
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134 A 5,558,304
134 R 5,558,303
171 5,558,305

CLASS 248

148 5,558,306
309.1 5,558,307
424 5,558,309
507 5,558,308
573 5,558,310
634 5,558,804

CLASS 250

201.5 Re.35,332
201.8 5,559,321
203.1 5,559,322
214.1 5,559,323
252.1 5,559,324
282 5,559,325
288 5,559,326
292 5,559,327
306 5,559,328
5,559,329
5,559,330
338.1 5,559,331
338.2 5,559,332
344 5,559,333
352 Re.35,333
360.1 5,559,334
363.04 5,559,335
370.13 5,559,336
423 R 5,559,337
492.1 5,559,338
551 5,559,340
559.26 5,559,341
573 5,559,339

CLASS 251

129.15 5,558,311

CLASS 252

62.54 5,558,809
67 5,558,810
73 5,558,811
78.3 5,558,803
299.01 5,558,813
301.4 R 5,558,814
301.45 5,558,815
301.65 5,558,817
355 5,558,806
400.62 5,558,816

CLASS 256

65 5,558,312

CLASS 257

10 5,559,342
14 5,559,343
57 5,559,344
59 5,559,345
77 5,559,367
138 5,559,346
139 5,559,347
141 5,559,348
273 5,559,349
304 5,559,350
324 5,559,351
328 5,559,352
334 5,559,353
336 5,559,357
341 5,559,355
342 5,558,313
369 5,559,368
371 5,559,356
431 5,559,358
453 5,559,359
531 5,559,360
546 5,559,361
620 5,559,362
664 5,559,363
666 5,559,316
5,559,364
5,559,365
5,559,366
668 5,559,369
679 5,559,370
686 5,559,371
692 5,559,372
710 5,559,373
723 5,559,374

CLASS 261

17 5,558,818
21 5,558,819

CLASS 264

4.1 5,558,820
13 5,558,821
15 5,558,822
33 5,558,823
40.3 5,558,824
103 5,558,825
5,558,826
220 5,558,827
252 5,558,828
263 5,558,829
441 5,558,830
489 Re.35,334
492 5,558,831
510 5,558,832

CLASS 267

91 5,558,314
103 5,558,315
140.12 5,558,316
156 5,558,317
162 5,558,393

CLASS 270

39.05 5,558,318
58.31 5,558,319

CLASS 271

4.01 5,558,320
98 5,558,321
209 5,558,322

CLASS 273

61.C 5,558,325
67.A 5,558,326
119 R 5,558,373
121 A 5,558,327
146 5,558,328
148 B 5,558,329
150 5,558,330
156 5,558,331
237 5,558,335
260 5,558,324
281 5,558,336
408 5,558,337
411 5,558,338
448 5,558,340

CLASS 277

3 5,558,341
81 R 5,558,342
88 5,558,343
167.5 5,558,344
168 5,558,345
189 5,558,346
229 5,558,347

CLASS 280

281.1 Re.35,335
282 5,558,348
287 5,558,349
426 5,558,350
432 5,558,351
477 5,558,352
602 5,558,353
607 5,558,354
624 5,558,355
625 5,558,356
647 5,558,357
648 5,558,358
654 5,558,359
675 5,558,360
697 5,558,361
728.2 5,558,362
5,558,363
728.3 5,558,364
731 5,558,365
736 5,558,366
737 5,558,367
781 5,558,368
800 5,558,369
806 5,558,370

CLASS 285

23 5,558,375
91 5,558,376
114 5,558,371

CLASS 292

336.3 5,558,372

CLASS 294

1.2 5,558,374
19.1 5,558,377
50.8 5,558,378
60 5,558,379
88 5,558,380
5,558,381
143 5,558,383
157 5,558,382

CLASS 296

37.1 5,558,384
37.12 5,558,385
65.1 5,558,386
93 5,558,387
107 5,558,388
5,558,389
146.14 5,558,390
157 5,558,392
214 5,558,394

CLASS 297

153 5,558,391
199 5,558,395
208 5,558,396
232 5,558,401
281 5,558,397
284.3 5,558,398
284.4 5,558,399
344.18 5,558,400
363 5,558,402
378.12 5,558,403
411.38 5,558,404
487 5,558,405

CLASS 301

63.1 5,558,407
65 5,558,406

CLASS 303

7 5,558,408
10 5,558,409
71 5,558,410
5,558,411
74 5,558,412
115.3 5,558,413
122.08 5,558,414
186 5,558,415

CLASS 307

10.1 5,559,375
86 5,559,376
104 5,559,377

CLASS 310

17 5,559,378
32.8 5,559,387
34 5,559,381
63 5,559,379
64 5,559,380
90 5,559,382
5,559,383

90.5 5,559,384
198 5,559,385
211 5,559,386
334 5,559,388

CLASS 312

139 5,558,416
249.9 5,558,417
321.5 5,558,418
404 5,558,419

CLASS 313

112 B1 5,196,759
308 5,559,390
310 5,559,389
360.1 5,559,391
477 R 5,559,398
490 5,559,392
496 5,559,397
506 5,559,399
5,559,400

CLASS 315

8 5,559,401
58 5,559,393
169.3 5,559,402
169.4 5,559,403
209 CD 5,559,404
209 R 5,559,405
224 5,559,394
247 5,559,395
291 5,559,396
322 5,559,406

CLASS 318

271 5,559,408
282 5,559,409
356 5,559,600
439 5,559,407
445 5,559,410
466 5,559,411
561 5,559,412
568.18 5,559,413
606 5,559,414
609 5,559,415
678 5,559,416
689 5,559,417
785 5,559,418
808 5,559,419

CLASS 320

2 5,559,420

CLASS 322

58 5,559,421

CLASS 323

221 5,559,422
277 5,559,423
5,559,424
315 5,559,425
319 5,559,426

CLASS 324

66 5,559,427
71.5 5,559,428
5,559,429
158.1 5,559,430
202 5,559,431
207.17 5,559,432
207.21 5,559,433
236 5,559,436
240 5,559,437
318 5,559,434
5,559,435
418 5,559,438
509 5,559,439
607 5,559,440
647 5,559,441
753 5,559,442
754 5,559,443
5,559,444
755 5,559,445
760 5,559,446

CLASS 326

30 5,559,447
5,559,448
40 5,559,449
5,559,450
84 5,559,451
88 5,559,452
93 5,559,453
5,559,459

CLASS 327

4 5,559,454
53 5,559,455
5,559,456
116 5,559,457
143 5,559,458
179 5,559,460
205 5,559,461
231 5,559,462
300 5,559,463
333 5,559,464
374 5,559,465
514 5,559,466

CLASS 330

10 5,559,467
110 5,559,468
123 5,559,469
252 5,559,470
277 5,559,471
293 5,559,472

CLASS 331

17 5,559,474
31 5,559,475
34 5,559,473
57 5,559,476
97 5,559,477
117 FE 5,559,478
177 V 5,559,479

CLASS 333

21 R 5,559,480
143 5,559,481
195 5,559,483
222 5,559,485

CLASS 335

151 5,559,482

CLASS 336

90 5,559,486
178 5,559,487

CLASS 337

158 5,559,488
215 5,559,489

CLASS 340

323 R 5,559,490
331 5,559,492
426 5,559,491
5,559,493
5,559,494
447 5,559,484
457 5,559,495
539 5,559,496
573 5,559,497
5,559,498
636 5,559,499
664 5,559,500
825 5,559,501
825.08 5,559,503
825.21 5,559,502
825.30 5,559,504
825.31 Re.35,336
5,559,505
825.44 5,559,506
825.54 5,559,507
902 5,559,508
944 5,559,509
954 5,559,510
995 5,559,511

CLASS 341

22 5,559,512
61 5,559,513
143 5,559,514

CLASS 342

118 5,559,515
5,559,516
156 5,559,517
174 5,559,518
5,559,519
357 5,559,520

CLASS 343

700 MS 5,559,521
702 5,559,522
795 5,559,523
895 5,559,524

CLASS 345

1 5,559,525
96 5,559,526
115 5,559,527
117 5,559,528
123 B1 4,491,834
136 5,559,529
5,559,530
145 5,559,532
162 5,559,533
165 5,559,534
168 5,559,531

CLASS 347

14 5,559,535
25 5,559,536
30 5,559,537
32 5,559,538
33 5,559,539
45 5,559,540
55 5,559,541
58 5,559,542
62 5,559,543
127 5,559,544
171 5,559,545
200 5,559,546
211 5,559,547

CLASS 348

6 5,559,548
5,559,549
5,559,550
169 5,559,551
202 5,559,552
312 5,559,553
333 5,559,554
364 5,559,555
374 5,559,556
405 5,559,557
416 5,559,558
432 5,559,559
465 5,559,560
470 5,559,561
584 5,559,562
625 5,559,563
779 5,559,564
806 5,559,565

CLASS 351

156 5,559,566
158 5,559,567

CLASS 354

106 5,559,568
195.11 5,559,569
202 5,559,570
286 5,559,571
288 5,559,572
5,559,573
297 5,559,577
298 5,559,576
320 5,559,575
400 5,559,574

CLASS 355

30 5,559,582
71 5,559,583
73 5,559,584
200 5,559,581
208 5,559,578
5,559,579
219 5,559,580
228 5,559,585
245 5,559,586
246 5,559,587
256 5,559,588
260 5,559,589
271 5,559,590
283 5,559,591
285 5,559,592
296 5,559,593
317 5,559,594
325 5,559,595

CLASS 356

128 5,559,596
328 5,559,597
356 5,559,598
5,559,599
363 5,559,601
374 5,559,602
376 5,559,603
402 5,559,604
5,559,605

CLASS 357

50 5,559,615

CLASS 358

296 5,559,606
342 5,559,607
343 5,559,608
400 5,559,609
407 5,559,611
461 5,559,610
471 5,559,612

CLASS 359

4 5,559,613
44 5,559,614
56 5,559,616
73 5,559,617
5,559,618
75 5,559,619
78 5,559,620
81 5,559,621
86 Re.35,337
110 5,559,622
112 5,559,623
125 5,559,624
5,559,625
144 5,559,626
216 5,559,627
248 5,559,628
364 5,559,629
371 5,559,630
385 5,559,631
478 5,559,632
484 5,559,633
638 5,559,634
689 5,559,635
5,559,636
708 5,559,637
749 5,559,638
823 5,559,639
838 5,559,640

CLASS 360

14.1 5,559,641
27 5,559,642
46 5,559,643
48 5,559,644
51 5,559,645
67 5,559,646
69 5,559,647
75 5,559,648
97.02 5,559,650
99.06 5,559,649
99.08 5,559,651
106 5,559,652
126 5,559,653
5,559,654
132 5,559,655

CLASS 361

18 5,559,656
42 5,559,657
56 5,559,658
5,559,659
58 5,559,660
93 5,559,661
104 5,559,662
127 5,559,663
191 5,559,664
280 5,559,665
321.4 5,559,666
526 5,559,667
533 5,559,668
612 5,559,669
681 5,559,670
682 5,559,671
684 5,559,672
695 5,559,673
697 5,559,674
707 5,559,675
752 5,559,676
816 5,559,677
818 5,559,678

CLASS 362

31 5,558,420
32 5,558,421
5,558,422
61 5,558,423
5,559,679
66 5,558,424
74 5,558,425
78 5,558,426
80.1 5,558,427
105 5,558,428
106 5,559,680
155 5,558,429
184 5,558,430
252 5,559,681
376 5,558,431

CLASS 363

21 5,559,682
5,559,683
25 5,559,684
37 5,559,685
43 5,559,686
60 5,559,687
89 5,559,688
95 5,559,689

CLASS 364

164 5,559,690
188 5,559,691
401 R 5,559,692
419.08 5,559,693
424.01 5,559,695
424.02 5,559,696
424.05 5,559,697
5,559,698
5,559,699
5,559,701
424.1 5,559,694
424.15 5,559,700
426.02 5,559,702
426.03 5,559,703
431.01 5,559,704
431.07 5,559,705
431.11 5,559,706
443 5,559,707
468.01 5,559,709
468.03 5,559,708
468.06 5,559,710
468.25 5,559,712
470.09 5,559,711
474.16 5,559,713
479.03 5,559,714
479.1 5,559,716
483 5,559,717
5,559,719
488 5,559,715
491 5,559,718
505 5,559,720
514 A 5,559,721
514 R 5,559,722
517 5,559,723
525 5,559,724
550 5,559,725
554 5,559,726
559 5,559,727
571.02 5,559,728
578 5,559,729
715.08 5,559,730

CLASS 365

52 5,559,731
120 5,559,732
145 5,559,733
168 5,559,734
185.17 5,559,735
185.24 5,559,736
185.25 5,559,737
189.01 5,559,738
5,559,739
189.04 5,559,740
200 5,559,741
5,559,742
5,559,743
201 5,559,744
5,559,745
203 5,559,746
207 5,559,747
222 5,559,748
230.02 5,559,749
230.06 5,559,750
233 5,559,751
5,559,752
236 5,559,753

CLASS 366

25 5,558,432
76.4 5,558,433
137 5,558,434
141 5,558,435
208 5,558,437

CLASS 367

15 5,559,754
118 5,559,755
125 5,559,756
134 5,559,757
136 5,559,758
139 5,559,759

CLASS 368

10 5,559,760
69 5,559,761
74 5,559,762

CLASS 369

13 5,559,763
30 5,559,764
32 5,559,765
44.18 5,559,766
44.23 5,559,767
44.25 5,559,768
44.27 5,559,769
44.350 5,559,770
5,559,771
44.360 5,559,772
44.42 5,559,773
47 5,559,774
5,559,775
5,559,776
50 5,559,777
54 5,559,780
58 5,559,778
59 5,559,779
5,559,781
5,559,782
112 5,559,783
124 5,559,784
5,559,785
275.1 5,559,786
275.4 5,559,787

CLASS 370

18 5,559,788
5,559,789
5,559,790
20 5,559,791
5,559,792
32.1 5,559,793
58.3 5,559,794
60 5,559,795
5,559,796
60.1 5,559,798
61 5,559,797
76 5,559,799
85.13 5,559,800
94.1 5,559,801
5,559,802
95.2 5,559,803
95.3 5,559,804
5,559,805
5,559,806
5,559,807
108 5,559,808
120 5,559,809

CLASS 371

5.1 5,559,810
27 5,559,811
31 5,559,812
37.4 5,559,813
67.1 5,559,814

CLASS 372

25 5,559,815
27 5,559,816
36 5,559,817
45 5,559,818
46 5,559,819
5,559,820
5,559,821
50 5,559,822
92 5,559,823
95 5,559,824
96 5,559,825

CLASS 373

109 5,559,826
142 5,559,827

CLASS 374

208 5,558,436

CLASS 375

200 5,559,828
206 5,559,829
230 5,559,830
240 5,559,831
244 5,559,832
259 5,559,833
260 5,559,834
265 5,559,835
318 5,559,836
341 5,559,837
347 5,559,838
350 5,559,839
355 5,559,840
375 5,559,841
376 5,559,842

CLASS 376

261 5,559,843

CLASS 377

116 5,559,844

CLASS 378

4 5,559,845
5,559,846
5,559,847
58 5,559,848
98.2 5,559,849
98.8 5,559,850
133 5,559,852
155 5,559,851
159 5,559,853

CLASS 379

27 5,559,854
51 5,559,859
52 5,559,855
5,559,856
5,559,857
56 5,559,858
58 5,559,860
5,559,861
5,559,862
5,559,863
59 5,559,864
60 5,559,865
5,559,866
69 5,559,867
96 5,559,868
99 5,559,869
107 5,559,870
115 5,559,871
130 5,559,872
161 5,559,873
189 5,559,874
202 5,559,875
205 5,559,876

221 5,559,877
265 5,559,878
347 5,559,879
182.02 5,559,954
182.06 5,559,955

CLASS 403

2 5,558,455
5,559,956
5,559,957
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5,559,959
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5,559,961
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CLASS 452

127 5,558,573

CLASS 494

12 5,558,616

CLASS 524

41 5,559,171
155 5,559,172

CLASS 544

70 5,559,231
121 5,559,232

CLASS 588

205 5,559,278

CLASS 380

4 5,559,883
5,559,884
23 5,559,885
5,559,886
24 5,559,887
25 5,559,888
30 5,559,889
48 5,559,890

CLASS 381

63 5,559,891
68.4 5,559,892
71 5,559,893

CLASS 382

100 5,559,894
119 5,559,895
141 5,559,896
186 5,559,897
218 5,559,898
224 5,559,899
248 5,559,900
256 5,559,901
263 5,559,902
283 5,559,903
286 5,559,904
298 5,559,905

CLASS 383

10 5,558,438
63 5,558,439
87 5,558,440
100 5,558,441

CLASS 384

43 5,558,442
112 5,558,443
122 5,558,444
132 5,558,445
368 5,558,446
418 5,558,447
470 5,558,448

CLASS 385

3 5,559,906
11 5,559,907
12 5,559,908
16 5,559,909
24 5,559,910
33 5,559,911
42 5,559,912
43 5,559,913
49 5,559,914
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85 5,559,916
86 5,559,917
92 5,559,918
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123 5,559,920
124 5,559,921
135 5,559,922

CLASS 392

397 5,559,923
483 5,559,924

CLASS 395

2.4 5,559,925
2.52 5,559,926
3 5,559,928
23 5,559,929
102 5,559,930
105 5,559,931
114 5,559,932
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117 5,559,934
124 5,559,935
128 5,559,936
134 5,559,937
141 5,559,938
146 5,559,939
151 5,559,940
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164 5,559,952
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182.02 5,559,954
182.06 5,559,955
182.21 5,559,956
183.03 5,559,957
183.19 5,559,958
186 5,559,959
188.01 5,559,960
200.03 B1 5,126,932
200.06 5,559,961
200.13 5,559,962
267 5,559,963
280 5,559,964
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284 5,559,966
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413 5,559,978
421.08 5,559,979
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821 5,560,040

CLASS 400

188 5,558,449
241.3 5,558,450
637 5,558,451

CLASS 401

6 5,558,452
137 5,558,453

CLASS 402

79 5,558,454

CLASS 403

2 5,558,455
359 5,558,456
370 5,558,457
393 5,558,458

CLASS 405

21 5,558,459
29 5,558,460
43 5,558,461
81 5,558,462
128 5,558,463
154 5,558,464
178 5,558,465
186 5,558,466
195.1 5,558,467
204 5,558,468
232 5,558,469
262 5,558,470
269 5,558,471

CLASS 406

61 5,558,473
127 5,558,474

CLASS 407

54 5,558,475

CLASS 408

1 R 5,558,476
143 5,558,477
226 5,558,478

CLASS 411

178 5,558,479
368 5,558,480
433 5,558,481

CLASS 414

217 5,558,482
278 5,558,483
301 5,558,484
421 5,558,485
537 5,558,486
744.6 5,558,487
790.4 5,558,488
793.7 5,558,489

CLASS 415

55.1 5,558,490
111 5,558,491
119 5,558,492
208.1 5,558,493
5,558,494

CLASS 416

95 5,558,495
5,558,496
96 A 5,558,497
129 5,558,498
186 R 5,558,499
220 R 5,558,500
244 R 5,558,501

CLASS 417

36 5,558,502
307 5,558,503
322 5,558,504
360 5,558,505
393 5,558,506
474 5,558,507
569 5,558,508

CLASS 418

15 5,558,509
55.2 5,558,510
150 5,558,511
188 5,558,512

CLASS 420

502 5,558,833

CLASS 422

55 5,558,834
56 5,558,835
91 5,558,836
99 5,558,837
100 5,558,838
101 5,558,839
104 5,558,840
105 5,558,841
108 5,558,842
131 B1 5,324,483
186.05 5,558,843
256 5,558,845
301 5,558,846

CLASS 423

111 5,558,847
230 5,558,844
243.01 5,558,848
338 5,558,849
432 5,558,850
702 5,558,851

CLASS 424

1.49 5,558,852
9.37 5,558,856
9.5 5,558,853
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9.52 5,558,854
5,558,857
59 5,558,914
68 5,558,858
70.15 5,558,859
78.03 5,558,872
93.2 5,558,860
93.7 5,558,861
94.4 5,558,862
94.61 5,558,863
133.1 5,558,864
148.1 5,558,865
195.1 5,558,866
199.1 5,558,867
276.1 5,558,869
400 5,558,870
401 5,558,871
5,558,873
402 5,558,874
422 5,558,875
427 5,558,876
432 5,558,877
450 Re.35,338
453 5,558,878
480 5,558,879
484 5,558,880
672 5,558,881

CLASS 425

11 5,558,882
116 5,558,883
174.4 5,558,884
363 5,558,885
376.1 5,558,886
418 5,558,887
549 5,558,888

CLASS 426

89 5,558,889
94 5,558,890
129 5,558,891
283 5,558,892
492 5,558,893
498 5,558,894
515 5,558,895
516 5,558,896
580 5,558,897
626 5,558,898
658 5,558,899

CLASS 427

2.28 5,558,900
2.29 5,558,901
8 5,558,902
11 5,558,903
66 5,558,904
160 5,558,905
180 5,558,906
227 5,558,907
228 5,558,908
251 5,558,909
255 5,558,910
517 5,558,911

CLASS 428

4 B1 4,826,712
35.7 5,558,912
41.5 5,558,913
76 5,558,915
77 B1 4,869,942
95 5,558,916
5,558,917
100 5,558,918
102 5,558,951
116 5,558,919
5,558,920
121 5,558,921
141 5,558,922
154 5,558,923
181 5,558,924
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193 5,558,926
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209 5,558,928
216 5,558,930
218 5,558,931
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364 5,558,935
378 5,558,936
5,558,937
414 5,558,939
422 5,558,940
423.1 5,558,941
426 5,558,942
447 5,559,074
458 5,558,943
611 5,558,944
5,558,945
692 5,558,946

CLASS 429

13 5,558,947
19.2 5,558,950
38 5,558,955
40 5,558,948
99 5,558,949
5,558,956
101 5,558,950
127 5,558,957
139 5,558,952
146 5,558,958
194 5,558,953
205 5,558,960
218 5,558,954
224 5,558,961
233 5,558,962

CLASS 430

22 5,558,963
58 5,558,964
5,558,965
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106.6 5,558,967
109 5,558,968
124 5,558,969
126 5,558,970
170 5,558,971
200 5,558,972
203 5,558,973
264 5,558,974
270.1 5,558,978
283.1 5,558,975
326 5,558,976
496 5,558,977
531 5,558,979
545 5,558,980
567 5,558,981
5,558,982
619 5,558,983

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4 5,558,513
153 5,558,514
284 5,558,515

CLASS 433

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80 5,558,518
201.1 5,558,517

CLASS 434

247 5,558,519
317 5,558,520
322 5,558,521

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4 5,558,985
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5,558,987
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5,558,995 7.24
5,558,996 7.31
5,558,997
5,559,002
5,559,003 7.9
5,559,004 28
5,559,005 29
5,559,006 47
5,559,007 69.1
5,559,008
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5,559,021 240.2
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5,559,028
252.3 5,559,024
252.33 5,559,025
254.2 5,559,026
262 5,559,029
280 5,559,030
289.1 5,559,031
5,559,032
290.3 5,559,033
320.1 5,559,034

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518 5,559,041

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43 5,559,048
44 5,559,049
45 5,559,050
51 5,559,051
52 5,559,052
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183 5,559,054
195 5,559,055
5,559,056
228 5,559,057
237 5,559,058

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160 5,558,528
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310 5,558,532
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352 5,558,534
357 5,558,535
535 5,558,536
537 5,558,537
583 5,558,538
610 5,558,539
637 5,558,540
675 5,558,541
682 5,558,542
699.2 5,558,543
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843 5,558,547

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88 5,558,549

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75 5,558,552
76 5,558,553

CLASS 445

7 5,558,575
52 5,558,554

CLASS 446

26 5,558,550
359 5,558,555

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86 5,558,556

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11 5,558,558
14 5,558,559
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41 5,558,563
066 5,558,564
70 5,558,565
157 5,558,566
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552 5,558,572

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CLASS 454

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341 5,558,332

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112 5,558,587

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285 5,558,592
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347 5,558,594

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129 5,558,608

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326 5,559,071
347 5,559,072

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116 5,559,078
117 5,559,079
238 5,559,080
242 5,559,081
269 5,559,083

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103 5,559,085
219 5,559,086
273 5,559,082

CLASS 508

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251 5,558,807
391 5,558,802
556 5,558,808
579 5,559,087

CLASS 510

102 5,559,088
224 5,559,089
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321 5,558,812
422 5,559,091

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5,559,094
3 5,559,095
12 5,559,096
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21 5,559,098
29 5,559,099
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227.5 5,559,111
252 5,559,113
254 5,559,116
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261 5,559,114
279 5,559,115
291 5,559,112
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304 5,559,122
305 5,559,123
312 5,559,124
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322 5,559,126
323 5,559,127
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338 5,559,135
340 5,559,136
341 5,559,137
342 5,559,138
356 5,559,139
357 5,559,140
400 5,559,141
419 5,559,142
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445 5,559,144
452 5,559,145
468 5,559,146
493 5,559,147
517 5,559,148
529 5,559,149
557 5,559,152
562 5,559,150
567 5,559,151
597 5,559,153
616 5,559,158
634 5,559,154
642 5,559,155
682 5,559,156
777 5,559,157

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48.5 5,559,159
64 5,559,160
129 5,559,161

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60 5,559,162
75 5,559,163
157 5,559,164

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132 5,559,166
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215 5,559,169
223 5,559,170
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155 5,559,172
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494 5,559,179
512 5,559,180
560 5,559,181
5,559,182
862 5,559,183

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105 5,559,189
270 5,559,190
275 5,559,191
300 5,559,192
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160 5,559,199
207 5,559,202
224 5,559,200
266 5,559,201

CLASS 528

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84 5,559,204
279 5,559,205

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300 5,559,207
317 5,559,208
326 5,559,209
345 5,559,210
350 5,559,211
5,559,212
351 5,559,213

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573 5,559,215
579 5,559,216
828 5,559,217
850 5,559,218

CLASS 536

18.6 5,559,219
23.1 5,559,223
23.6 5,559,220
25.4 5,559,221
28.5 5,559,222
115 5,559,226

CLASS 540

222 5,559,225
350 5,559,224
456 5,559,227
460 5,559,228
491 5,559,229
569 5,559,230

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121 5,559,232
321 5,559,233
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220 5,559,237
314 5,559,238
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263.8 5,559,243
371.1 5,559,244
422 5,559,245
468 5,559,246
471 5,559,247

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282 5,559,250
315 5,559,251
342 5,559,252
362 5,559,253
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538 5,559,255

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308 5,559,257
550 5,559,258

CLASS 554

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28 5,559,260
183 5,559,263
479 5,559,264

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275 5,559,266

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172 5,559,268

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484 5,559,270

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469 5,559,277

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25 5,558,618
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226 5,558,621
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49 5,558,635
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60 5,558,637
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93 5,558,641
96 5,558,642
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143 5,558,646
192 5,558,648
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218 5,558,650
263 5,558,651
280 5,558,652
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385.2 5,558,659
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5,558,661
387 5,558,662
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890.1 5,558,664

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5,558,667
14 5,558,668
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18 5,558,670
38 5,558,671
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957 373,897
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318 373,902
D4— 104 373,903
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429 373,954
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526 373,956
D10— 30 373,957
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94 373,960
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373,963
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116 373,965
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183 373,982
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419 373,987
423 373,988
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373,990
424 373,991
D13— 107 373,992
373,993
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158 373,996
164 373,997
168 373,998
D14— 114 373,999
374,000
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124 374,002
126 374,003
374,004
129 374,005
138 374,006
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151 374,008
171 374,009
188 374,010
206 374,011

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253 374,014
5 374,015
D18— 1 374,034
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50 374,031
55 374,032
56 374,033
199 374,048
217 374,049
219 374,050
221 374,051
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261 374,067
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374,086
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	251	374,013		50	374,031		217	374,049		261	374,067	D25—	47	374,085			374,103
	253	374,014		55	374,032		219	374,050		286	374,068		50	374,086		133	374,104
D15—	5	374,015		56	374,033		221	374,051		299	374,069		52	374,087			374,105
	9	374,016	D19—	1	374,034		226	374,052		356	374,070		56	374,088		134	374,106
	14	374,017			374,035		234	374,053		382	374,071		68	374,089		142	374,107
	29	374,018			374,036		245	374,054		386	374,072		124	374,090	D28—	25	374,108
	139	374,019		26	374,037	D22—	107	374,055			374,073			374,091	D30—	121	374,109
D16—	131	374,020		87	374,038		122	374,056		411	374,074			374,092		162	374,110
	132	374,021	D20—	7	374,039			374,057	D24—	111	374,075			374,093			
		374,022	D21—	37	374,040		134	374,058		112	374,076			374,094			
	202	374,023		48	374,041		140	374,059		137	374,077		140	374,095			
	221	374,024		72	374,042		141	374,060		155	374,078		199	374,096			
	330	374,025		120	374,043		142	374,061		156	374,079	D26—	25	374,097			
		374,026		148	374,044		147	374,062			374,080		37	374,098			
D17—	10	374,027		191	374,045	D23—	209	374,063		200	374,081		41	374,099			
D18—	4	374,028		192	374,046			374,064		211	374,082		60	374,100			
	7	374,029		197	374,047		213	374,065			374,083		81	374,101			

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		5,558,536		5,558,117		5,558,672		5,559,154		5,559,718			5,560,039
		5,559,289		5,558,118		5,558,673		5,559,250		5,559,734	08	:	5,557,903
		5,559,566		5,558,119		5,558,688		5,559,256		5,559,751			5,558,023
		5,559,825		5,558,140		5,558,693		5,559,301		5,559,752			5,558,081
04	:	5,557,842		5,558,209		5,558,696		5,559,312		5,559,758			5,558,187
		5,557,872		5,558,222		5,558,698		5,559,322		5,559,781			5,558,202
		5,557,917		5,558,235		5,558,717		5,559,326		5,559,793			5,558,259
		5,558,057		5,558,236		5,558,718		5,559,327		5,559,796			5,558,300
		5,558,092		5,558,240		5,558,730		5,559,336		5,559,801			5,558,400
		5,558,352		5,558,255		5,558,747		5,559,357		5,559,828			5,558,459
		5,558,366		5,558,256		5,558,798		5,559,368		5,559,840			5,558,604
		5,558,367		5,558,262		5,558,838		5,559,369		5,559,841			5,559,015
		5,558,500		5,558,271		5,558,844		5,559,373		5,559,869			5,559,034
		5,558,585		5,558,308		5,558,848		5,559,381		5,559,873			5,559,035
		5,558,667		5,558,313		5,558,851		5,559,389		5,559,875			5,559,038
		5,558,780		5,558,339		5,558,853		5,559,394		5,559,881			5,559,220
		5,559,001		5,558,349		5,558,854		5,559,395		5,559,885			5,559,260
		5,559,359		5,558,354		5,558,855		5,559,413		5,559,898			5,559,263
		5,559,533		5,558,355		5,558,874		5,559,424		5,559,911			5,559,409
		5,559,559		5,558,358		5,558,884		5,559,425		5,559,925			5,559,473
		5,559,656		5,558,376		5,558,885		5,559,436		5,559,927			5,559,548
		5,559,887		5,558,381		5,558,907		5,559,441		5,559,929			5,559,648
		5,559,908		5,558,399		5,558,910		5,559,465		5,559,930			5,559,650
		5,559,982		5,558,406		5,558,913		5,559,467		5,559,942			5,559,692
05	:	5,558,351		5,558,421		5,558,921		5,559,469		5,559,949			5,559,733
		5,558,869		5,558,428		5,558,924		5,559,470		5,559,951			5,559,822
06	:	Re.35,335		5,558,443		5,558,954		5,559,472		5,559,964			5,559,858
		Re.35,336		5,558,445		5,558,956		5,559,476		5,559,966			5,559,980
		5,557,803		5,558,454		5,558,961		5,559,477		5,559,967	09	:	5,557,851
		5,557,811		5,558,460		5,558,965		5,559,478		5,559,971			5,557,875
		5,557,869		5,558,462		5,558,993		5,559,480		5,559,977			5,558,036
		5,557,871		5,558,467		5,559,000		5,559,507		5,559,983			5,558,219
		5,557,883		5,558,481		5,559,004		5,559,514		5,559,986			5,558,220
		5,557,887		5,558,516		5,559,009		5,559,528		5,559,988			5,558,266
		5,557,927		5,558,528		5,559,010		5,559,532		5,559,990			5,558,320
		5,557,943		5,558,541		5,559,011		5,559,538		5,559,995			5,558,346
		5,557,965		5,558,556		5,559,019		5,559,539		5,559,999			5,558,529
		5,557,967		5,558,568		5,559,022		5,559,550		5,560,001			5,558,616
		5,557,991		5,558,606		5,559,032		5,559,627		5,560,002			5,558,631
		5,558,007		5,558,629		5,559,037		5,559,629		5,560,007			5,558,740
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DESIGN PATENTS

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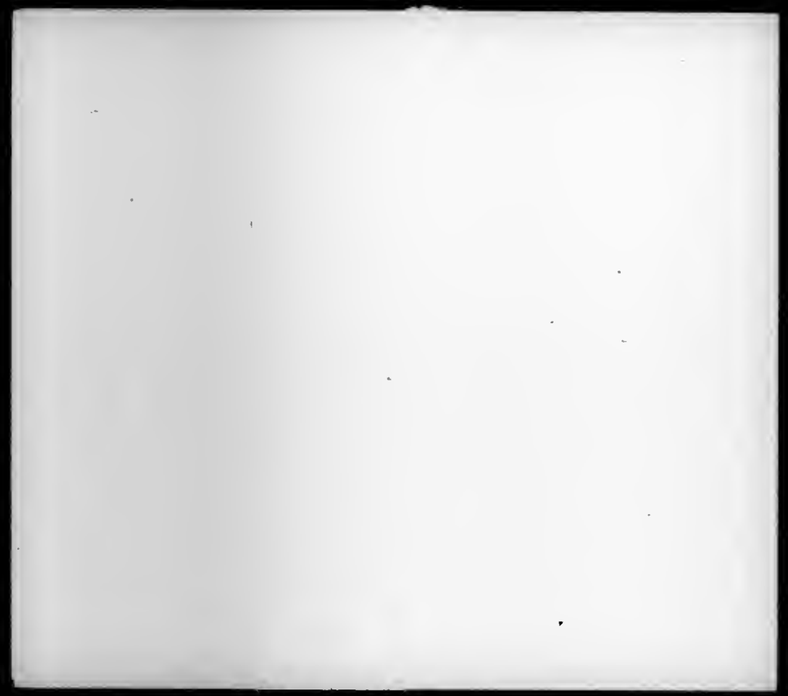

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